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History		

# Foreword

This Technical Specification has been produced by the 3<sup>rd</sup> 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.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.
- [1] 3GPP 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 Modulation"

- [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".

# 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:

BW <sub>Channel</sub> Channel bandwidth, defined in TS 36.101 subclause 3.2         CPICH_Ec       Average energy per PN chip for the CPICH         CPICH_Ec/Io       The ratio of the received energy per PN chip for the CPICH to the total received power spectral density at the UE antenna connector.         Ec       Average energy per PN chip.         Ês       Received energy per RE (power normalized to the subcarrier spacing) during the useful part of the symbol, i.e. excluding the cyclic prefix, at the UE antenna connector         Io       The total received power density, including signal and interference, as measured at the UE antenna connector.         Ioc       The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited noise source (simulating interference from cells, which are not defined in a test procedure) as measured at the UE antenna connector.         Iot       The received power spectral density of the total noise and interference for a certain RE (power integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector.         Iot       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	[]	Values included in square bracket must be considered for further studies, because it means that a decision about that value was not taken.
CPICH_EcAverage energy per PN chip for the CPICHCPICH_Ec/IoThe ratio of the received energy per PN chip for the CPICH to the total received power spectral density at the UE antenna connector.EcAverage energy per PN chip.ÊsReceived 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 connectorIoThe total received power density, including signal and interference, as measured at the UE antenna connector.locThe 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.lotThe 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 connectorNocThe 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	BW <sub>Channel</sub>	Channel bandwidth, defined in TS 36.101 subclause 3.2
<ul> <li>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.</li> <li>Ec Average energy per PN chip.</li> <li>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</li> <li>Io The total received power density, including signal and interference, as measured at the UE antenna connector.</li> <li>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.</li> <li>Iot The received power spectral density of the total noise and interference for a certain RE (power integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector</li> <li>Noc 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</li> </ul>	CPICH_Ec	Average energy per PN chip for the CPICH
density at the UE antenna connector.EcAverage energy per PN chip.ÊsReceived 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 connectorIoThe total received power density, including signal and interference, as measured at the UE antenna connector.IocThe 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.IotThe 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 connectorN_{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	CPICH_Ec/Io	The ratio of the received energy per PN chip for the CPICH to the total received power spectral
<ul> <li>Ec Average energy per PN chip.</li> <li>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</li> <li>Io The total received power density, including signal and interference, as measured at the UE antenna connector.</li> <li>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.</li> <li>Iot The received power spectral density of the total noise and interference for a certain RE (power integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector</li> <li>N<sub>oc</sub> 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</li> </ul>		density at the UE antenna connector.
<ul> <li>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</li> <li>Io The total received power density, including signal and interference, as measured at the UE antenna connector.</li> <li>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.</li> <li>Iot The received power spectral density of the total noise and interference for a certain RE (power integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector</li> <li>N<sub>oc</sub> 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</li> </ul>	Ec	Average energy per PN chip.
<ul> <li>Io The total received power density, including signal and interference, as measured at the UE antenni connector.</li> <li>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.</li> <li>Iot The received power spectral density of the total noise and interference for a certain RE (power integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector</li> <li>N<sub>oc</sub> 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</li> </ul>	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
<ul> <li>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.</li> <li>Iot The received power spectral density of the total noise and interference for a certain RE (power integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector</li> <li>N<sub>oc</sub> 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</li> </ul>	Іо	The total received power density, including signal and interference, as measured at the UE antenna connector.
Iot       The received power spectral density of the total noise and interference for a certain RE (power integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector         N_{oc}       The power spectral density of a white noise source (average power per RE normalised to the subcarrier spacing), simulating interference from cells that are not defined in a test procedure, as measured at the UE antenna connector	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.
$N_{oc}$ 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	Iot	The received power spectral density of the total noise and interference for a certain RE (power integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna connector
subcarrier spacing), simulating interference from cells that are not defined in a test procedure, as measured at the UE antenna connector	$N_{ac}$	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 <sub>PRB</sub>	Physical Resource Block number as defined in subclause 3.1 in 3GPP TS 36.211.		
$P_{\rm CMAX}$	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 $$		
Snonintrasearch	Defined in TS 36.304, subclause 5.2.4.7		
SsearchRAT	Defined in TS 25.304, subclause 5.2.6.1.5		
Thresh <sub>x, high</sub>	Defined in TS 36.304, subclause 5.2.4.7		
Thresh <sub>x, low</sub>	Defined in TS 36.304, subclause 5.2.4.7		
Thresh <sub>serving, low</sub>	Defined in TS 36.304, subclause 5.2.4.7		
$T_{\rm PRS}$	Cell-specific positioning subframe configuration period as defined in subclause 6.10.4.3 in 3GPP		
	TS 36.211		
T <sub>RE-ESTABLISH-REQ</sub>	The RRC Re-establishment delay requirement, the time between the moment when erroneous		
	CRCs are applied, to when the UE starts to send preambles on the PRACH.		
Treselection	Defined in TS 25.304, subclause 5.2.6.1.5		
Treselection <sub>RAT</sub>	Defined in TS 36.304, subclause 5.2.4.7		
Treselection <sub>EUTR</sub>	Defined in TS 36.304, subclause 5.2.4.7		
Treselection <sub>UTRA</sub>	Defined in TS 36.304, subclause 5.2.4.7		
Treselection <sub>GERA</sub>	Defined in TS 36.304, subclause 5.2.4.7		
Ts	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
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
eNB	E-UTRAN NodeB
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
MAC	Medium Access Control
OCNG	OFDMA Channel Noise Generator
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
PCFICH	Physical Control Format Indicator CHannel
PDCCH	Physical Downlink Control CHannel
PDSCH	Physical Downlink Shared CHannel
PHICH	Physical Hybrid-ARQ Indicator CHannel
PLMN	Public Land Mobile Network
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
RSRQ	Reference Signal Received Quality
RSSI	Received Signal Strength Indicator
RSTD	Reference Signal Time Difference
QAM	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
SCH	Synchronization Channel
SDU	Service Data Unit
SFN	System Frame Number
SI	System Information
SON	Self Optimized Network
TDD	Time Division Duplex
TTI	Transmission Time Interval
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

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 intrafrequency, 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].

DRX cycle length [s]	N <sub>serv</sub> [number of DRX cycles]
0.32	4
0.64	4
1.28	2
2.56	2

Table 4.2.2.1-1: N<sub>serv</sub>

### 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  $T_{detect,EUTRAN\_Intra}$  when that Treselection=0. An intra frequency cell is considered to be detectable if:

- RSRP|<sub>dBm</sub> ≥ -124 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40 and RSRP  $\hat{E}s/Iot \ge -4$  dB,
- RSRP $|_{dBm} \ge -123 \text{ dBm}$  for Band 9 and RSRP  $\hat{E}s/\text{Iot} \ge -4 \text{ dB}$ ,
- RSRP $|_{dBm} \ge -122 \text{ dBm}$  for Bands 2, 5, 7 and RSRP  $\hat{E}s/Iot \ge -4 \text{ dB}$ ,
- RSRP $|_{dBm} \ge -121 \text{ dBm}$  for Bands 3, 8, 12, 13, 14, 17, 20 and RSRP  $\hat{E}_s/Iot \ge -4 \text{ dB}$ ,
- SCH\_RP|<sub>dBm</sub>≥ -124 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40 and SCH Ês/Iot ≥ -4 dB,
- SCH\_RP|<sub>dBm</sub> $\geq$ -123 dBm for Band 9 and SCH  $\hat{E}$ s/Iot  $\geq$  -4 dB,
- SCH\_RP  $|_{dBm} \ge$  -122 dBm for Bands 2, 5, 7 and SCH  $\hat{E}s/Iot \ge$  -4 dB,
- SCH\_RP  $|_{dBm} \ge -121$  dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH  $\hat{E}s/Iot \ge -4$  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  $T_{evaluate,E-UTRAN\_intra}$  when  $T_{reselection} = 0$  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.

DRX cycle length [s]	T <sub>detect,EUTRAN_Intra</sub> [s] (number of DRX cycles)	T <sub>measure,EUTRAN_Intra</sub> [s] (number of DRX cycles)	T <sub>evaluate,E-UTRAN_intra</sub> [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 4.2.2.3-1 : T<sub>detect,EUTRAN\_Intra</sub>, T<sub>measure,EUTRAN\_Intra</sub> and T<sub>evaluate, E-UTRAN\_intra</sub>

### 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|<sub>dBm</sub> ≥ -124 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40 and RSRP  $\hat{E}s/Iot \ge -4$  dB,
- RSRP $|_{dBm} \ge -123$  dBm for Bands 9 and RSRP  $\hat{E}s/Iot \ge -4$  dB,
- RSRP $|_{dBm} \ge -122 \text{ dBm}$  for Bands 2, 5, 7 and RSRP  $\hat{E}s/Iot \ge -4 \text{ dB}$ ,
- RSRP $|_{dBm} \ge -121 \text{ dBm}$  for Bands 3, 8, 12, 13, 14, 17, 20 and RSRP  $\hat{E}s/Iot \ge -4 \text{ dB}$ ,
- SCH\_RP|<sub>dBm</sub> ≥ -124 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40 and SCH Ês/Iot ≥ -4 dB,
- SCH\_RP|<sub>dBm</sub> $\ge$ -123 dBm for Band 9 and SCH  $\hat{E}$ s/Iot  $\ge$  -4 dB,
- SCH\_RP  $|_{dBm} \ge -122$  dBm for Bands 2, 5, 7 and SCH  $\hat{E}s/Iot \ge -4$  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  $T_{measure,E-}_{UTRAN\_Inter}$ . 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

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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 <sub>detect,EUTRAN_Inter</sub> [s] (number of DRX cycles)	T <sub>measure,EUTRAN_Inter</sub> [s] (number of DRX cycles)	T <sub>evaluate,E</sub> - 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<sub>detect,EUTRAN\_Inter</sub>, T<sub>measure,EUTRAN\_Inter</sub> and T<sub>evaluate,E-UTRAN\_Inter</sub>

#### 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.

 $\begin{array}{l} \mbox{Cells which have been detected shall be measured at least every } (N_{UTRA\_carrier}) * T_{measureUTRA\_FDD} \ \mbox{when } Srxlev \leq S_{nonIntraSearchP} \ \mbox{or } Squal \leq S_{nonIntraSearchQ}. \end{array}$ 

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 speficied 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 cycle length [s]	T <sub>detect</sub> UTRA_FDD [S]	T <sub>measureUTRA_FDD</sub> [s] (number of DRX cycles)	T <sub>evaluateUTRA_FDD</sub> [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)	

Table 4.2.2.5.1-1: T<sub>detectUTRA\_FDD</sub>, T<sub>measureUTRA\_FDD</sub>, and T<sub>evaluateUTRA\_FDD</sub>

#### 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  $Srxlev \leq S_{nonIntraSearchP}$  or  $Squal \leq S_{nonIntraSearchP}$  when  $T_{reselection} = 0$  provided that the reselection criteria is met by a margin of at least 6dB.

 $\begin{array}{l} \mbox{Cells which have been detected shall be measured at least every } (N_{UTRA\_carrier\_TDD}) * T_{measureUTRA\_TDD} \ Srxlev \leq S_{nonIntraSearchP} \ or \ Squal \leq S_{nonIntraSearchQ}. \end{array}$ 

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  $N_{\text{UTRA\_carrier\_TDD}} *T_{\text{evaluateUTRA\_TDD}}$  when  $T_{\text{reselection}} = 0$  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.

DRX cycle length [s]	T <sub>detectUTRA_TDD</sub>	T <sub>measureUTRA_TDD</sub> [s] (number of DRX cycles)	T <sub>evaluateUTRA_TDD</sub> [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)	

Table 4.2.2.5.2-1: T<sub>detectUTRA\_TDD</sub>, T<sub>measureUTRA\_TDD</sub> and T<sub>evaluateUTRA\_TDD</sub>

### 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  $T_{measure,GSM}$ , 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 [s]	T <sub>measure,GSM</sub> [s] (number of DRX 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<sub>measure,GSM</sub>,

### 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<sub>measureHRPD</sub>, when the E-UTRA serving cell Srxlev  $\leq$  S<sub>nonIntraSearchP</sub> or Squal  $\leq$  S<sub>nonIntraSearchQ</sub>.

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

Table 4.2.2.5.4-1 gives values of T<sub>measureHRPD</sub> and T<sub>evaluateHRPD</sub>.

DRX cycle length [s]	T <sub>measureHRPD</sub> [s] (number of DRX cycles)	T <sub>evaluateHRPD</sub> [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)

Table 4.2.2.5.4-1: T<sub>measureHRPD and</sub> T<sub>evaluateHRPD</sub>

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<sub>measureCDMA2000\_1X</sub>, when the E-UTRA serving cell Srxlev  $\leq$  S<sub>nonIntraSearchP</sub> or Squal  $\leq$  S<sub>nonIntraSearchQ</sub>. The UE shall be capable of evaluating that the cdma2000 1X cell has met cell reselection criterion defined in [1] within T<sub>evaluateCDMA2000\_1X</sub>.

Table 4.2.2.5.5-1 gives values of T<sub>measureCDMA2000\_1X</sub> and T<sub>evaluateCDMA2000\_1X</sub>.

DRX cycle length [s]	T <sub>measureCDMA2000_1X</sub> [s] (number of DRX cycles)	T <sub>evaluateCDMA2000_1X</sub> [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  $T_{SI-EUTRA}$  + 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  $T_{SI-UTRA} + 50$  ms. For E-UTRAN to GSM cell re-selection the interruption time must not exceed  $T_{BCCH} + 50$  ms.

 $T_{SI-EUTRA}$  is the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure delay of system information blocks 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<sub>BCCH</sub> 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.

 $T_{SI-HRPD}$  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  $T_{SI-cdma2000_{-1X}} + 50$  ms.

 $T_{SI-cdma2000_1X}$  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.

Parameter	Unit	Cell 1	Cell 2
E-UARFCN Note1		Channel 1	Channel 2
CSG indicator		False	True
Physical cell identity <sup>Note1</sup>		1	2
CSG identity		Not sent	Sent (Already stored
			in UE whitelist
			from previous
			visit)
Propagation conditions		Static, non	multipath
CSG cell previously		Ye	S
visited by UE			
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 <sup>Note 1</sup>	dB		
OCNG_RB <sup>Note 1</sup>	dB		
Qrxlevmin	dBm	-140	-140
N <sub>oc</sub>	dBm/15 kHz	Of	f
RSRP Note2	dBm/15 KHz	[≥TBD]	[≥TBD]
Note 1: For this requirer	nent to be applicable	e, the E-UARFCN a	nd physical cell
identity for cell 1	and cell 2 shall be	unchanged from wh	en the CSG cell
was visited prev	iously		
Note 2: Chosen to ensu	re that CSG autonor	mous search has a h	nigh probability
of success on e	very attempt made b	by UE	

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

# 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.

Parameter	Unit	Cell 1	Cell 2
E-UARFCN Note1		Channel 1	N/A
UARFCN Note1		N/A	Channel 2
CSG indicator		False	True
Physical cell identity <sup>Note1</sup>		1	N/A
Primary scrambling code		N/A	Scrambling code 2
CSG identity		Not sent	Sent (Already stored in UE whitelist from previous visit)
Propagation conditions		Static, non	multipath
CSG cell previously visited by UE		Ye	S
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	0	N1/A
PHICH_RB	dB		N/A
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA <sup>Note 1</sup>	dB		
OCNG_RB <sup>Note 1</sup>	dB		
Qrxlevmin	dBm	-140	
N <sub>oc</sub>	dBm/15 kHz	Off	
RSRP Note2	dBm/15 KHz	[≥TBD]	
CPICH_Ec <sup>NOLE2</sup>	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 <sub>oc</sub>	dBm/3.84 MHz		Off
<ul> <li>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</li> <li>Note 2: Chosen to ensure that CSG autonomous search has a high probability of success on every attempt made by UE</li> </ul>			

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# 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

- 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

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

#### 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<sub>IU</sub> 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)
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5.2.2.2.2 (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

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

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<sub>IU</sub> shall depend upon the PRACH configuration used in the target cell.

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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<sub>handover</sub> 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 Tinterrupt1

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

If the target cell is unknown the interruption time shall be less than T<sub>interrupt2</sub>

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

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 <sub>max</sub>	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.

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<sub>handover</sub> 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  $T_{interrupt2}$ 

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

Where:

T <sub>offset</sub>	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 <sub>UL</sub>	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
F <sub>SFN</sub>	Equal to 1 if SFN decoding is required and equal to 0 otherwise
F <sub>max</sub>	denotes the maximum number of radio frames within the transmission time intervals of all transport channels that are multiplexed into the same CCTrCH.

The interruption time requirements for an unknown target cell shall apply only if the signal quality of the unknown target cell is sufficient for successful synchronisation with one attempt.

# 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.

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 handov	er - 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  $T_{interrupt}$ 

$$\Gamma_{\text{interrupt}} = T_{\text{IU}} + 40 + 10 \text{*KC} \text{*SW}_{\text{K}} + 10 \text{*OC} \text{*SW}_{\text{O}} \text{ ms}$$

Where:

 $T_{IU}$ 

It is the interruption uncertainty when changing the timing from the E-UTRAN to the new HRPD cell.  $T_{IU}$  can be up to one HRPD frame (26.66 ms).

SW<sub>K</sub> is SW<sub>K</sub> = 
$$\left| \frac{\text{srch}_win_k}{60} \right|$$
 where srch\_win\_k is the number of HRPD chips indicated by the

search window for known target HRPD cells in the message

SW<sub>0</sub> is SW<sub>0</sub> = 
$$\left| \frac{\text{srch}_win_o}{60} \right|$$
 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<sub>interrupt</sub>:

$$\Gamma_{\text{interrupt}} = T_{\text{IU}} + 40 + 10^{*}\text{KC*SW}_{\text{K}} + 10^{*}\text{OC*SW}_{\text{O}} \text{ ms}$$

Where:

$$T_{IU}$$
It is the interruption uncertainty when changing the timing from the E-UTRAN to the new  
cdma2000 1X cell.  $T_{IU}$  can be up to one cdma2000 1X frame (20 ms). $SW_K$ is  $SW_K = \left[\frac{\text{srch}_win}{60}\right]$  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  $SW_O = \left[\frac{\text{srch}_win}{60}\right]$  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 $SW_O$ is  $SW_O = \left[\frac{\text{srch}_win}{60}\right]$  where srch\_win\_o is the number of cdma2000 1x chips indicated by  
the search window for unknown target cdma2000 1x cells in the messageKCIt is the number of known target cdma2000 1X cells in the message, and  
OCOCIt 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  $T_{re-establish\_delay}$  seconds from the moment it detects a loss in RRC connection. The total RRC connection delay ( $T_{re-establish\_delay}$ ) 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:

 $T_{UE\text{-}re\text{-}establish\_delay} = 50 \ ms + N_{freq} * Tsearch + T_{SI} + T_{PRACH}$ 

T<sub>search</sub>: It is the time required by the UE to search the target cell.

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

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

 $T_{SI}$  = It is the time required for receiving all the relevant system information according to the reception procedure and the RRC procedure delay of system information blocks defined in TS 36.331 [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;  $N_{freq} = 1$  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  $(N_{TA} + N_{TA \text{ offset}}) \times T_s$  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.

Downlink Bandwidth (MHz)	T <sub>e</sub> _		
1.4	24*T <sub>S</sub>		
≥3	12*T <sub>S</sub>		
Note: T <sub>S</sub> is the basic timing unit defined in TS 36.211			

Table 7.1.2-1: T<sub>e</sub> Timing Error Limit

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  $T_q$  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<sub>q</sub> Maximum Autonomous Time Adjustment Step

Downlink Bandwidth (MHz)	T <sub>q_</sub>		
1.4	16*T <sub>S</sub>		
3	8*T <sub>S</sub>		
5	4*T <sub>S</sub>		
≥10	2*Ts		
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 s	ynchronization	requirement	for wide	area BS	(TDD)
---------------	--------------	----------------	-------------	----------	---------	-------

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

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	or Home BS	(TDD)
---------------	------------	-----------------	-----------------	------------	-------

Source Cell Type	Propagation Distance	Requirement
Small cell	≤ 500 m	≤3 μs
Large cell	> 500 m	$\leq$ 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  $\pm 10 \mu s$  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  $\mu$ 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 ±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 serving cell 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 serving cell.

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.

Attribute	Value
DCI format	1A
Number of control OFDM symbols	2; Bandwidth $\ge$ 10 MHz
	3; [3] MHz $\leq$ Bandwidth $\leq$ 5 MHz
	4; Bandwidth = 1.4 MHz
Aggregation level (CCE)	4; Bandwidth = 1.4 MHz
	8; Bandwidth $\ge$ 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 serving cell
	1 dB: when two or four antenna ports are used for cell-specific reference signal transmission by the serving cell
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 serving cell
	1 dB: when two or four antenna ports are used for cell-specific reference signal transmission by the serving cell

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

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.

Attribute	Value
DCI format	1C
Number of control OFDM symbols	2; Bandwidth $\ge$ 10 MHz
	3; 3 MHz $\leq$ Bandwidth $\leq$ 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 serving cell
	-3 dB; when two or four antenna ports are used for cell-specific reference signal transmission by the serving cell
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 serving cell
	1 dB: when two or four antenna ports are used for cell-specific reference signal transmission by the serving cell

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

Note 1: DCI format 1C is defined in section 5.3.3.1.4 in 3GPP TS 36.212 [21].

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

# 7.6.2 Requirements

# 7.6.2.1 Minimum requirement when no DRX is used

When the downlink radio link quality estimated over the last 200 ms period becomes worse than the threshold  $Q_{out}$ , Layer 1 of the UE shall send an out-of-sync indication to the higher layers within [200] ms  $Q_{out}$  evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in [2].

When the downlink radio link quality estimated over the last 100 ms period becomes better than the threshold  $Q_{in}$ , Layer 1 of the UE shall send an in-sync indication to the higher layers within 100 ms  $Q_{in}$  evaluation period. A L3 filter shall be applied to the in-sync indications as specified in [2].

The out-of-sync and in-sync evaluations 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 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 estimated over the last  $T_{Evaluate}Q_{out_DRX}$  [s] period becomes worse than the threshold  $Q_{out}$ , Layer 1 of the UE shall send out-of-sync indication to the higher layers within  $T_{Evaluate}Q_{out_DRX}$  [s] evaluation period. A Layer 3 filter shall be applied to the out-of-sync indications as specified in [2].

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

The out-of-sync and in-sync evaluations 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 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 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.

DRX cycle length (s)	T <sub>Evaluate</sub> _Q <sub>out_DRX</sub> and T <sub>Evaluate</sub> _Q <sub>in_DRX</sub> (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				

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

# 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 Id	MeasurementGap Length (MGL, ms)	Measurement Gap Repetition Period (MGRP, ms)	Minimum available time for inter-frequency and inter-RAT measurements during 480ms period (Tinter1, ms)	Measurement Purpose
0	6	40	60	Inter-Frequency E-UTRAN FDD and TDD, UTRAN FDD, GERAN, LCR TDD, HRPD, CDMA2000 1x
1	6	80	30	Inter-Frequency E-UTRAN 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  $T_{inter1}$ =30ms 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  $N_{\text{freq}}$ , which is defined as:

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

where

N<sub>freq, E-UTRA</sub> 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<sub>freq, cdma2000</sub> is the number of cdma2000 1x carriers being monitored

 $N_{\text{freq, HRPD}}$  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 intrafrequency 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

$$T_{identify intra} = T_{basic\_identify\_E-UTRA\_FDD, intra} \cdot \frac{I_{Measurement\_Period, Intra}}{T_{Intra}} ms$$

where

T<sub>basic identify E-UTRA FDD, intra</sub> 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|<sub>dBm</sub>  $\geq$  -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21 and SCH  $\hat{E}s/Iot \geq$  6 dB.
- SCH\_RP|<sub>dBm</sub> $\geq$  -126 dBm for Band 9 and SCH Ês/Iot  $\geq$  6 dB,
- SCH\_RP  $|_{dBm} \ge$  -125 dBm for Bands 2, 5, 7 and SCH  $\hat{E}s/Iot \ge$  6 dB,
- SCH\_RP  $|_{dBm} \ge -124$  dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH  $\hat{E}s/Iot \ge -6$  dB.

 $T_{Measurement Period, Intra} = 200 \text{ ms.}$  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  $Y_{measurement intra}$  cells, where  $Y_{measurement intra}$  is defined in the following equation. If the UE has identified more than  $Y_{measurement intra}$  cells, the UE shall perform measurements of 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.

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

where

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

T<sub>Measurement Period, Intra</sub> = 200 ms. The measurement period for Intra frequency RSRP measurements.

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

The measurement accuracy for all measured cells shall be as specified in 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  $\leq 5$  seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than  $T_{Measurement\_Period, Intra}$  provided the timing to that cell has not changed more than  $\pm$  50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

#### 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: Re	quirement to identify	y a newly deteo	ctable FDD intrafro	equency cell
-------------------------	-----------------------	-----------------	---------------------	--------------

DRX cycle length (s)	T <sub>identify_intra</sub> (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|\_{dBm}  $\geq$  -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21 and SCH  $\hat{E}s/Iot \geq$  6 dB.
- SCH\_RP|<sub>dBm</sub> $\geq$  -126 dBm for Band 9 and SCH  $\hat{E}$ s/Iot  $\geq$  6 dB,
- SCH\_RP  $|_{dBm} \ge$  -125 dBm for Bands 2, 5, 7 and SCH  $\hat{E}s/Iot \ge$  6 dB,
- SCH\_RP  $|_{dBm} \ge -124$  dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH  $\hat{E}_s/Iot \ge -6$  dB.

In the RRC\_CONNECTED state the measurement period for intra frequency measurements is  $T_{measure\_intra}$  as shown in table 8.1.2.2.1.2-2. 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 <sub>measure_intra</sub> (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.

#### 8.1.2.2.1.2.1 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.

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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:  $2 \times TTI_{DCCH}$ . 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 8.1.2.2.1.2. 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  $\leq 5$  seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than  $T_{measure\_intra}$  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

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

where

T<sub>basic\_identify\_E-UTRA\_TDD, intra</sub> 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  $\geq$  -127 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 and SCH  $\hat{E}_s/Iot \geq$  6 dB.

 $T_{Measurement Period Intra} = 200 \text{ ms.}$  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  $Y_{measurement intra}$  cells, where  $Y_{measurement intra}$  is defined in the following equation. If the UE has identified more than  $Y_{measurement intra}$  cells, the UE shall perform measurements of 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.

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

where

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

T<sub>Measurement Period Intra</sub> = [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<sub>DCCH</sub>. 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  $\leq 5$  seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than  $T_{Measurement\_Period Intra}$  provided the timing to that cell has not changed more than  $\pm$  50 Ts and the L3 filter has not been used. When L3 filtering is used an additional delay can be expected.

#### 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

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

Table 8.1.2.2.2.2-1: Rec	uirement to identify	y a newly detectabl	e TDD intrafrequency cel	
		,		-

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A cell shall be considered detectable when

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

cycle≤2.56

cycle in use

- SCH\_RP  $\geq$  -127 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 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 8.1.2.2.2.2-2: Requirement to measure TDD intra frequency cells

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

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

#### 8.1.2.2.2.2.1 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 9.

#### 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 8.1.2.2.2.2.1.3 Event Triggered Reporting.

#### 8.1.2.2.2.2.1.3 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] 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 8.1.2.2.2.2. 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  $\leq 5$  seconds and then the cell becomes detectable again and triggers an event, the event triggered measurement reporting delay shall be less than  $T_{measure\_intra}$  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:

$$T_{identify\_CGI, intra} = T_{basic\_identify\_CGI, intra}$$
 ms

Where

 $T_{\text{basic\_identify}\_CGI, intra} = 150 \text{ ms.}$  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 and SCH  $\hat{E}s/Iot \geq$  -6 dB,
- SCH\_RP|dBm  $\geq$  -126 dBm for Band 9 and SCH  $\hat{E}s/Iot \geq$  -6 dB,
- SCH\_RP|dBm  $\geq$  -125 dBm for Bands 2, 5, 7 and SCH  $\hat{E}$ s/Iot  $\geq$  -6 dB,
- SCH\_RP|dBm  $\geq$  -124 dBm for Bands 3, 8, 12, 13, 14, 17, 20 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 have more than [60] ACK/NACKs transmitted during 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:

 $T_{identify CGL intra} = T_{basic identify CGL intra} ms$ 

Where

 $T_{\text{basic_identify}\_CGI, intra} = 150 \text{ ms.}$  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 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 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

Tbasic\_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 interfrequency 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:

$$\mathbf{T}_{\text{Identify_Inter}} = \mathbf{T}_{\text{Basic_Identify_Inter}} \cdot \frac{480}{\mathbf{T}_{\text{Inter}}} \cdot N_{freq} \quad ms$$

Where:

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

 $N_{\text{freq}}$  is defined in section 8.1.2.1.1 and  $T_{\text{inter1}}$  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 1, 4, 6, 10, 11, 18, 19, 21 and RSRP  $\hat{E}s/Iot \ge -4 \text{ dB}$ ,
- RSRP $|_{dBm} \ge -124 \text{ dBm}$  for Bands 9 and RSRP  $\hat{E}s/Iot \ge -4 \text{ dB}$ ,
- RSRP $_{dBm} \ge -123 \text{ dBm}$  for Bands 2, 5, 7 and RSRP  $\hat{E}s/Iot \ge -4 \text{ dB}$ ,
- RSRP|<sub>dBm</sub>≥ -122 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and RSRP  $\hat{E}$ s/Iot ≥ -4 dB,
- other RSRP related side conditions given in Section 9.1 are fulfilled.
- SCH\_RP|<sub>dBm</sub> $\ge$  -125 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21 and SCH  $\hat{E}s/Iot \ge -4 dB$ ,
- SCH\_RP|<sub>dBm</sub> $\ge$  -124 dBm for Band 9 and SCH  $\hat{E}$ s/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.

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:	Measurement bandwidth [RB]	
	TMeasurement_Period _Inter_FDD [ms]		
0	480 x N <sub>freq</sub>	6	
1 (Note)	240 x N <sub>freq</sub>	50	
Note: This configuration is optional			

The UE shall be capable of performing RSRP and RSRQ measurements of at least 4 inter-frequency cells per FDD inter-frequency for up to 3 FDD inter-frequencies and the UE physical layer shall be capable of reporting RSRP and RSRQ measurements to higher layers with the measurement period defined in Table 8.1.2.3.1.1-1.

#### 8.1.2.3.1.1.1 Measurement Reporting Requirements

8.1.2.3.1.1.1.1 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.

## 8.1.2.3.1.1.1.3 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<sub>DCCH</sub>. 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 ± 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

DRX	T <sub>identify_inter</sub> (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 <sub>freq</sub>	7.68*N <sub>freq</sub>	
	(20*N <sub>freq</sub> )	(30*N <sub>freq</sub> )	
0.32	6.4*N <sub>freq</sub>	7.68*N <sub>freq</sub>	
	(20*N <sub>freq</sub> )	(24*N <sub>freq</sub> )	
0.32<	Note	Note	
DRX-	(20*N <sub>frea</sub> )	(20*N <sub>freg</sub> )	
cycle≤2.56	(	(	
Note: Time depends upon the DRX			
cycle in use			

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

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 and RSRP  $\hat{E}s/Iot \ge -4 \text{ dB}$ ,
- RSRP $|_{dBm} \ge -124 \text{ dBm}$  for Bands 9 and RSRP  $\hat{E}s/Iot \ge -4 \text{ dB}$ ,
- RSRP $|_{dBm} \ge -123 \text{ dBm}$  for Bands 2, 5, 7 and RSRP  $\hat{E}s/Iot \ge -4 \text{ dB}$ ,

- RSRP|<sub>dBm</sub>≥ -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 and SCH  $\hat{E}s/Iot \geq -4 dB$ ,
- SCH\_RP|<sub>dBm</sub> $\ge$  -124 dBm for Band 9 and SCH  $\hat{E}s/Iot \ge$  -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 <sub>measure_inter</sub> (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<sub>freq</sub>)</td></drx-<>	Note (5*N <sub>freq</sub> )
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 x TTI<sub>DCCH</sub>. 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.

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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 ± 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:

$$T_{Identify\_Inter} = T_{Basic\_Identify\_Inter} \cdot \frac{480}{T_{Interl}} \cdot N_{freq} \quad ms$$

Where:

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

 $N_{\text{freq}}$  is defined in section 8.1.2.1.1 and  $T_{\text{inter1}}$  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 and RSRP  $\hat{E}s/Iot \ge -4 \text{ dB}$ ,
- other RSRP related side conditions given in Section 9.1 are fulfilled,
- SCH\_RP|<sub>dBm</sub> $\ge$  -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 and SCH  $\hat{E}s/Iot \ge -4$  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 ( $T_{Measurement\_Period\_TDD\_Inter}$ ) given by table 8.1.2.3.2.1-1:

Table 8.1.2.3.2.1-1: T<sub>Measurement\_Period\_TDD\_Inter</sub> for different configurations

Configuration	Measurement bandwidth [RB]	Number of UL/DL sub- frames per half frame (5 ms)		Dw	PTS	T <sub>Measurement_</sub> Period_TDD _Inter [ms]
		DL	UL	Normal CP	Extended CP	
0	6	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	480 x N <sub>freq</sub>
1 (Note 1)	50	2	2	$19760 \cdot T_s$	$20480 \cdot T_s$	240 x N <sub>freq</sub>
Note 1: This con	figuration is option	al				
Note 2: T <sub>s</sub> is defi	ned in 3GPP TS 3	6.211 [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  $T_{Measurement\_Period\_TDD\_Inter}$ .

#### 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.

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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<sub>DCCH</sub>. 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

DRX cycle	T <sub>identify_inter</sub> (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: Ti	ime 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 and RSRP  $\hat{E}s/Iot \ge -4 \text{ dB}$ ,
- RSRP related side conditions given in Section 9.1 are fulfilled.
- SCH\_RP|\_{dBm}  $\geq$  -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 and SCH  $\hat{E}s/Iot \geq$  -4 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.

DRX cycle	T <sub>measure_inter</sub> (s)	
length (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<sub>freq</sub>)</td></drx-<>	Note (5*N <sub>freq</sub> )	
cycle≤2.56		
Note: Time	Time depends upon the	
DRX cycle in use		

#### Table 8.1.2.3.2.2-2: Requirement to measure TDD interfrequency cells

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<sub>DCCH</sub>. 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:

 $T_{identify\_CGI, inter} = T_{basic\_identify\_CGI, inter}$  ms

Where

 $T_{\text{basic\_identify\_CGI, inter}} = 150 \text{ ms.}$  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 and SCH  $\hat{E}s/Iot \geq$  -4 dB,
- SCH\_RP|dBm  $\geq$  -124 dBm for Band 9 and SCH  $\hat{E}s/Iot \geq$  -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  $\ge$  -122 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH  $\hat{E}s/Iot \ge -4$  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/NACK transmitted during 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:

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

Where

 $T_{\text{basic\_identify\_CGI, inter}} = 150 \text{ ms.}$  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 and SCH  $\hat{E}s/Iot \geq$  -4 dB,
- SCH\_RP|dBm  $\geq$  -124 dBm for Band 9 and SCH  $\hat{E}s/Iot \geq$  -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  $\hat{E}s/Iot \geq$  -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:

$$\Gamma_{identify\_CGI, inter} = T_{basic\_identify\_CGI, inter} ms$$

Where

 $T_{\text{basic_identify}\_CGI, inter} = 150 \text{ ms.}$  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  $\geq$  -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 and SCH  $\hat{E}s/Iot \geq$  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/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.

#### 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

 $T_{\text{basic\_identify\_CGI, inter}} = 150 \text{ ms.}$  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  $\geq$  -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 and SCH  $\hat{E}s/Iot \geq$  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, 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

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

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  $T_{identify, enhanced\_UTRA\_FDD}$ :

$$T_{\text{identify, enhanced\_UTRA\_FDD}} = (T_{\text{basic\_identify\_enhanced\_UTRA\_FDD}} \cdot \frac{480}{T_{\text{interl}}} + 480) N_{Freq} \quad ms$$

A cell shall be considered detectable when:

- CPICH Ec/Io  $\geq$  -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

$$T_{\text{measurement}\_UTRA\_FDD} = Max \left\{ T_{\text{Measurement}\_Period UTRA\_FDD}, T_{\text{basic}\_measurement}\_UTRA\_FDD} \cdot \frac{480}{T_{\text{inter}1}} \cdot N_{Freq} \right\} ms$$

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

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

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

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

 $T_{\text{basic_identify}\_UTRA\_FDD} = 300 \text{ ms.}$  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.

 $T_{\text{basic\_measurement\_UTRA\_FDD}} = 50$  ms. This is the time period used in the equation for defining the measurement period for inter RAT CPICH measurements.

 $N_{\text{freq}}$  is defined in section 8.1.2.1.1 and  $T_{\text{interl}}$  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 uncertainty for the uplink DCCH. This measurement reporting delay excludes a 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 8.1.2.4.1.1.1 a 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 8.1.2.4.1.1.1 a 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

DRX cycle length (s)	T <sub>identify_UTRA_FDD</sub> (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	3.2* Nfreq (25*	4.8* Nfreq
	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		

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

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 length (s)	T <sub>measure_UTRA_FDD</sub> (s) (DRX cycles)	
	Gap period = 40 ms	Gap period = 80 ms
≤0.04	Non DRX Requirements in section 8.1.2.4.1.1 are applicable	Non DRX Requirements in section 8.1.2.4.1.1 are applicable
0.064	0.48* N <sub>freq</sub> (7.5* N <sub>freq</sub> )	0.8* N <sub>freq</sub> (12.5* N <sub>freq</sub> )
0.08	0.48* N <sub>freq</sub> (6* N <sub>freq</sub> )	0. 8* N <sub>freq</sub> (10* N <sub>freq</sub> )
0.128	0.64* N <sub>freq</sub> (5* N <sub>freq</sub> )	0. 8* N <sub>freq</sub> (6.25* N <sub>freq</sub> )
0.128 <drx- cycle≤2.56</drx- 	Note (5* N <sub>freq</sub> )	Note (5* N <sub>freq</sub> )
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 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 ± 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	E-UTRAN TDD – UTRAN FDD measurements when no DRX is used
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

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

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,
- $DwPCH\_Ec/Io \ge -5 dB$ .

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

$$T_{\text{measurement UTRA_TDD}} = Max \left\{ T_{\text{Measurement_Period UTRA_TDD}}, T_{\text{basic measurement UTRA_TDD}} \cdot \frac{480}{T_{\text{inter1}}} \cdot N_{Freq} \right\} ms$$

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

The UE shall be capable of performing UTRA TDD P-CCPCH RSCP measurements for  $X_{\text{basic measurementUTRA_TDD}}$  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  $T_{\text{Measurement_UTRA_TDD}}$ .

 $X_{\text{basic measurementUTRA_TDD}} = 6$ 

 $T_{Measurement\_Period UTRA\_TDD} = 480$  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.

 $T_{\text{basic\_measurement\_UTRA\_TDD}} = 50 \text{ ms}$  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 uncertainty for the uplink DCCH. This measurement reporting delay excludes a 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

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

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

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  $\geq$  -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.

DRX cycle length (s)	T <sub>measure_UTRA_TDD</sub> (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 <sub>freq</sub>	0.8*N <sub>freq</sub>
	(7.5*N <sub>freq</sub> )	(12.5*N <sub>freq</sub> )
0.08	0.48*N <sub>freq</sub>	0.8*N <sub>freq</sub>
	(6*N <sub>freq</sub> )	(10*N <sub>freq</sub> )
0.128	0.64*N <sub>freq</sub>	0. 8*N <sub>freq</sub>
	(5*N <sub>freq</sub> )	(6.25*N <sub>freq</sub> )
0. 128 <drx-< td=""><td>Note (5*N<sub>freq</sub>)</td><td>Note (5*N<sub>freq</sub>)</td></drx-<>	Note (5*N <sub>freq</sub> )	Note (5*N <sub>freq</sub> )
cycle≤2.56		
Note: Time depends upon the DRX cycle in use		

#### Table 8.1.2.4.3.2-2: Requirement to measure UTRA TDD cells

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 uncertainty for the uplink DCCH. This measurement reporting delay excludes a 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 ( $N_{GSM \text{ carrier RSSI}}$ ) 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.

 $T_{re-confirm,GSM}$  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.

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.

Number	T <sub>identify.gsm</sub> (ms)		T <sub>reconfirm,gsm</sub> (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
		No		No
4	31680	requirement	29280	requirement
		No		No
5	31680	requirement	29280	requirement

#### Table 8.1.2.4.5.1.2.1-1

### 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,  $T_{re-confirm,GSM}$  shall be based on the 80ms 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  $T_{re-confirm,GSM}$  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 <sub>enhanced</sub> ider	<sub>ntify,gsm</sub> (ms)	T <sub>enhanced</sub> reco	<sub>nfirm,gsm</sub> (ms)
		40ms gap		40ms gap
		configuration		configuration
Number		when		when
of		interfrequency		interfrequency
carriers		RSTD		RSTD
other	40ms gap	measurement	40ms gap	measurement
than	configuration	is also	configuration	is also
GSM	(ID 0)	configured	(ID 0)	configured

Table 8.1.2.4.5.1.2a-1

0	1320	2160	1080	1920
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#### 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  $T_{Measurement Period, GSM}$  (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  $2*T_{Measurement Period, GSM}$ , where  $T_{Measurement Period, GSM}$  is defined in section 8.1.2.4.5.1. When L3 filtering is used an additional delay can be expected.

#### 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 ( $N_{GSM \text{ carrier RSSI}}$ ) per DRX cycle. In RRC\_CONNECTED state the measurement period,  $T_{Measurement \text{ Period}, GSM}$ , 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.

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

Table 8.1.2.4.5.2.1-1: GSM measu	rement period for large DRX
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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  $N_{freq}$ \*30 seconds, the UE shall attempt to decode the BSIC of each identified GSM cell.If the UE fails to decode the BSIC after two successive attempts or if the UE has not been able to re-confirm the BSIC for a GSM cell within  $N_{freq}$ \*60 seconds, the UE shall abort the BSIC re-confirmation attempts for that GSM cell. The GSM cell shall be treated as a new GSM cell with unidentified BSIC and the GSM cell shall be moved to the initial BSIC identification procedure, see section 8.1.2.4.5.2.2.1. The parameter  $N_{freq}$  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  $T_{Measurement Period, GSM}$  (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:

$$T_{identify, UTRA_FDD} = T_{basic_identify_UTRA_FDD} \cdot \frac{480}{Tinter1} \cdot N_{Freq} \quad ms$$

 $T_{\text{basic_identify}\_UTRA\_FDD} = 300 \text{ ms.}$  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 <sub>identify, UTRA_FDD</sub> (s) (DRX cycles)		
	Gap period = 40 ms	Gap period = 80 ms	
≤0.04	Non DRX Requirements	Non DRX Requirements	
	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<="" td=""><td>Note (45* N<sub>freq</sub>)</td><td>Note (95* N<sub>freq</sub>)</td></drx>	Note (45* N <sub>freq</sub> )	Note (95* N <sub>freq</sub> )	
0.128	3.84* N <sub>freq</sub> (30* N <sub>freq</sub> )	8.0* N <sub>freq</sub> (62.5* N <sub>freq</sub> )	
0.16	4.0* N <sub>freq</sub> (25* N <sub>freq</sub> )	8.0* N <sub>freq</sub> (50* N <sub>freq</sub> )	
0.256	6.4* N <sub>freq</sub> (25* N <sub>freq</sub> )	8.96* N <sub>freq</sub> (35* N <sub>freq</sub> )	
0.32	8* N <sub>freq</sub> (25* N <sub>freq</sub> )	8.96* N <sub>freq</sub> (28* N <sub>freq</sub> )	
0.32 <drx cycle≤2.56<="" td=""><td>Note (25* N<sub>freq</sub>)</td><td>Note (25* N<sub>freq</sub>)</td></drx>	Note (25* N <sub>freq</sub> )	Note (25* N <sub>freq</sub> )	
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  $\geq$  -17 dB for at least one channel tap and SCH\_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code. When L3 filtering is used an additional delay can be expected.

If the UE is unable to identify the UTRA cell for SON within  $8*T_{identify, UTRA_FDD}$  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

 $\mathbf{T}_{\text{measurement}\_\text{CDMA2000}\_1x} = \mathbf{T}_{\text{basic}\_\text{measurement}\_\text{CDMA2000}\_1x} \cdot N_{Freq} \cdot S_{gap}$ 

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.

Gap Pattern Id	S <sub>gap</sub>
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

 $\mathbf{T}_{\text{measurement}_{\text{CDMA2000}_{1x}}} = \mathbf{T}_{\text{basic}_{\text{measurement}_{\text{CDMA2000}_{1x}}}} \cdot N_{Freq}.$ 

#### 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:

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

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

A cell shall be considered identifiable following conditions are fulfilled:

- P-CCPCH Ec/Io  $\geq$  -8 dB,
- DwPCH\_Ec/Io  $\geq$  -5 dB.

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

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

#### 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.

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

DRX cycle length (s)	T <sub>identify, UTRA_TDD</sub> (s) (DRX cycles)		
	Gap period = 40 ms	Gap period = 80 ms	
≤0.16	Non DRX Requirements in section 8.1.2.3.1.1 are applicable	Non DRX Requirements in section 8.1.2.3.1.1 are applicable	
0.16 <drx cycle≤0.32<="" td=""><td>8* N<sub>freq</sub> (25* N<sub>freq</sub>)</td><td>14.4* N<sub>freq</sub> (45* N<sub>freq</sub>)</td></drx>	8* N <sub>freq</sub> (25* N <sub>freq</sub> )	14.4* N <sub>freq</sub> (45* N <sub>freq</sub> )	
0.32 <drx cycle≤2.56<="" td=""><td>Note (25* N<sub>freq</sub>)</td><td>Note (25* N<sub>freq</sub>)</td></drx>	Note (25* N <sub>freq</sub> )	Note (25* N <sub>freq</sub> )	
Note: Time depends upon the DRX cycle in use			

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

- P-CCPCH Ec/Io  $\geq$  -8 dB,
- DwPCH\_Ec/Io  $\geq$  -5 dB.

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

If the UE is unable to identify the UTRA TDD cell for SON within  $8^{T}_{identify, UTRA_TDD}$  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):

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

where

 $T_{RSTD IntraFreeFDD, E-UTRAN}$  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 $\leq$   $N_{PRS}$   $\leq$ 6) consecutive downlink positioning subframes defined in 3GPP TS 36.211 [16], 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 8.1.2.5.1-1: Number of PRS positioning occasions within	T <sub>RSTD IntraFreqEDD E-UTRAN</sub>
---	--

		KSTD IIIIarteqrDD, E=01KAN	
Positioning subframe	Number of PR	S positioning occasions $M$	
configuration period $T_{ m PRS}$	f1 <sup>Note1</sup>	f1 and f2 <sup>Note2</sup>	
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:

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

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

 $(\text{PRS}\,\hat{\text{E}}_{s} / \text{Iot})_{ref}$  and  $(\text{PRS}\,\hat{\text{E}}_{s} / \text{Iot})_{i}$  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,

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|<sub>dBm</sub>≥ -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.





#### 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:  $2 \times TTI_{DCCH}$ . This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

### 8.1.2.5.2 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:

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

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 <sup>Note1</sup>	f1 and f2 <sup>Note2</sup>	
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  $T_{RSTD IntraFreeTDD, E-UTRAN}$  provided:

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

 $(\operatorname{PRS} \hat{\mathrm{E}}_{\mathrm{s}} / \operatorname{Iot})_i \ge -13 \text{ dB}$  for all Frequency Bands for neighbour cell *i*,

 $(\text{PRS}\,\hat{\text{E}}_{s}/\text{Iot})_{ref}$  and  $(\text{PRS}\,\hat{\text{E}}_{s}/\text{Iot})_{i}$  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.

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 sp	pecified 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:

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

where

 $T_{RSTD InterFreqFDD, E-UTRAN}$  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 8.1.2.6.1-1: Number of PRS positioning occasions within	T <sub>RSTD InterFreqFDD, E-UTRAN</sub>
---	---

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  $T_{RSTD InterFreqFDD, E-UTRAN}$  provided:

 $(\text{PRS } \hat{E}_s / \text{Iot})_{ref} \ge -6 \text{ dB}$  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*,

$$(\text{PRS}\,\hat{\text{E}}_{s}/\text{Iot})_{ref}$$
 and  $(\text{PRS}\,\hat{\text{E}}_{s}/\text{Iot})_{i}$  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,

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:

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

where

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

 $T_{\text{PRS}}$  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 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 RS cells, which belong to the TDD ir Note 2: When inter-frequency RS neighbour cells, which belong to frequency f2 respectively.	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,

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

 $(\operatorname{PRS} \hat{\mathrm{E}}_{\mathrm{s}} / \operatorname{Iot})_{ref}$  and  $(\operatorname{PRS} \hat{\mathrm{E}}_{\mathrm{s}} / \operatorname{Iot})_{i}$  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.

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 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 <sub>measure_FDD_UE_Rx_Tx</sub> (s) (DRX cycles)					
≤0.04	0.2 (Note1)					
0.04 <drx-cycle≤2.56< td=""><td colspan="4">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 cy	cle 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 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.

### 8.1.2.7.2 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)	Tmeasure_TDD_UE_Rx_Tx (s) (DRX cycles)					
≤0.04	0.2 (Note1)					
0.04 <drx-cycle≤2.56< td=""><td colspan="3">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 cy	cle 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 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. 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.

Measurement category	E <sub>cat</sub>	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.

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

# 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, 33, 34, 35, 36, 37, 38, 39, 40,

RSRP|dBm $\geq$  -126 dBm for Bands 9,

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

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

Parameter	Unit	Accura	cy [dB]		Conditions <sup>1</sup>			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Band 9	
				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 <sub>Channel</sub>	BW <sub>Channel</sub>	BW <sub>Channel</sub>	BW <sub>Channel</sub>	
RSRP for Ês/lot ≥	dBm	±8	±11	-70dBm/	-70dBm/	-70dBm/	-70dBm/	
-6 dB				BW <sub>Channel</sub>	BWChannel	BW <sub>Channel</sub>	BW <sub>Channel</sub>	
				50dBm/	50dBm/	50dBm/	50dBm/	
				BW <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	BW <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	

Table 9.1.2.1-1: RSRP Intra frequency absolute accuracy

Note 1. Io is assumed to have constant EPRE 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.

 $RSRP1,2|_{dBm} \ge -127 dBm$  for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40,

RSRP1,2 $|_{dBm} \ge -126 \text{ dBm}$  for Bands 9,

RSRP1,2 $|_{dBm} \ge -125$  dBm for Bands 2, 5, 7,

RSRP1,2|<sub>dBm</sub>≥ -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]		Cond	itions <sup>1</sup>	
		Normal condition	Normal Extreme condition condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Band 9
				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 <sub>Channel</sub>	<b>BW</b> Channel	BW <sub>Channel</sub>	BW <sub>Channel</sub>
RSRP for Ês/lot ≥	dBm	±3	±3	-	-	-	-
-6 dB				121dBm/15kHz	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz
				50dBm/	50dBm/	50dBm/	50dBm/
				<b>BW</b> Channel	<b>BW</b> Channel	<b>BW</b> Channel	<b>BW</b> Channel
Note 1. lo is assur	ned to h	ave constant I	EPRE across	the bandwidth.		increase and a series	

Note 2. The parameter Es/lot is the minimum Es/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, 33, 34, 35, 36, 37, 38, 39, 40,

RSRP|dBm $\geq$  -126 dBm for Bands 9,

RSRP $|dBm \ge -125 dBm$  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

Parameter	Unit	Unit Accuracy [dB]		Conditions <sup>1</sup>			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Band 9
				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/
				<b>BW</b> <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	BW <sub>Channel</sub>
RSRP for Ês/lot ≥	dBm	±8	±11	-70dBm/	-70dBm/	-70dBm/	-70dBm/
-6 dB				BW <sub>Channel</sub>	BW <sub>Channel</sub>	BW <sub>Channel</sub>	BW <sub>Channel</sub>
				50dBm/	50dBm/	50dBm/	50dBm/
				BW <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	BW <sub>Channel</sub>

Note 1. Io is assumed to have constant EPRE across the bandwidth.

### 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.

 $RSRP1|_{dBm} \ge -127 \text{ dBm if } RSRP1 \text{ is on Bands } 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40,$ 

 $RSRP1|_{dBm} \ge -126 \ dBm \ if \ RSRP1$  is on Band 9,

- $RSRP1|_{dBm} \ge -125 dBm$  if RSRP1 is on Bands 2, 5, 7,
- $RSRP1|_{dBm} \ge -124 dBm$  if RSRP1 is on Bands 3, 8, 12, 13, 14, 17, 20,
- $RSRP2|_{dBm} \ge -127 \ dBm \ if \ RSRP2 \ is \ on \ Bands \ 1, \ 4, \ 6, \ 10, \ 11, \ 18, \ 19, \ 21, \ 33, \ 34, \ 35, \ 36, \ 37, \ 38, \ 39, \ 40$
- $RSRP2|_{dBm} \ge -126 \text{ dBm if } RSRP2 \text{ is on Band 9},$

 $RSRP2|_{dBm} \ge -125 dBm$  if RSRP2 is on Bands 2, 5, 7,

 $RSRP2|_{dBm} \ge -124 \text{ dBm if } RSRP2 \text{ is on Bands } 3, 8, 12, 13, 14, 17, 20.$ 

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

| 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 <sup>1</sup>			
		Normal condition	Extreme condition	RSRP is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39 and 40	RSRP is on Bands 2, 5, 7	RSRP is on Bands 3, 8, 12, 13, 14, 17, 20	RSRP is on Band 9	
				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 <sub>Channel</sub>	BW <sub>Channel</sub>	BW <sub>Channel</sub>	BW <sub>Channel</sub>	

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.

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≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40,

RSRP|dBm $\geq$  -126 dBm for Bands 9,

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

RSRP<sub>|dBm</sub>≥ -124 dBm for Bands 3, 8, 12, 13, 14, 17, 20.

Parameter	Unit	Accura	cy [dB]	Conditions <sup>1</sup>			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Band 9
				lo	lo	lo	lo
RSRQ when RSRP	dBm	± 2.5	± 4	-	-	-	-
Ës/lot > -3 dB				121dBm/15kHz	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz
				50dBm/	50dBm/	50dBm/	50dBm/
				BW <sub>Channel</sub>	BW <sub>Channel</sub>	BW <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>
RSRQ when RSRP	dBm	± 3.5	± 4	-	-	-	-
Ês/lot ≥ -6 dB				121dBm/15kHz	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz
				50dBm/	50dBm/	50dBm/	50dBm/
				<b>BW</b> <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	BW <sub>Channel</sub>
Note 1 lo is assumed	to have	constant EP	PRF across t	he bandwidth			

### 9.1.6 Inter-frequency RSRQ Accuracy Requirements

### 9.1.6.1 Absolute RSRQ Accuracy

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≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40,

RSRP|dBm $\geq$  -126 dBm for Bands 9,

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

RSRP|<sub>dBm</sub>≥ -124 dBm for Bands 3, 8, 12, 13, 14, 17, 20.

Parameter	Unit	Accuracy [dB]		Conditions <sup>1</sup>			
		Normal condition	Extreme condition	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Bands 9
				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 <sub>Channel</sub>	BW <sub>Channel</sub>	BW <sub>Channel</sub>	<b>BW</b> 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 <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>

Table 9.1.6.1-1: RSRQ Inter frequency absolute accuracy

Note 1. Io is assumed to have constant EPRE across the 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.

 $RSRP1|_{dBm} \ge -127 dBm$  if RSRP1 is on Band 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40,

 $RSRP1|_{dBm} \ge -126 dBm$  if RSRP1 is on Band 9,

 $RSRP1|_{dBm} \ge -125 dBm$  if RSRP1 is on Bands 2, 5, 7,

 $RSRP1|_{dBm} \ge -124 \text{ dBm if } RSRP1 \text{ is on Bands } 3, 8, 12, 13, 14, 17, 20,$ 

 $RSRP2|_{dBm} \ge -127 \text{ dBm if } RSRP2 \text{ is on Bands } 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40,$ 

 $RSRP2|_{dBm} \ge -126 \text{ dBm if } RSRP2 \text{ is on Band 9},$ 

 $\text{RSRP2}|_{dBm} \ge -125 \text{ dBm}$  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

Parameter	Unit	Accura	cy [dB]	Conditions			
		Normal condition	Extreme condition	RSRQ is on Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40	RSRQ is on Bands 2, 5, 7	RSRQ is on Bands 3, 8, 12, 13, 14, 17, 20	RSRQ is on Band 9
				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 <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>
RSRQ when RSRP	dBm	± 4	± 4	-	-	-	-
Ês/lot ≥ -6 dB				121dBm/15kH	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz
				z50dBm]/	50dBm/	50dBm/	50dBm/
				BW <sub>Channel</sub>	BW <sub>Channel</sub>	BW <sub>Channel</sub>	BW <sub>Channel</sub>
Note 1. lo is assumed	to have	constant FF	PRF across t	he bandwidth			

Note 2. The parameter Ês/lot is the minimum Ês/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.

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

Table 9.1.7-1: RSRQ measurement report mapping

#### 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<sub>CMAX</sub>), 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.

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	$34 \le PH < 35$
POWER_HEADROOM_58	$35 \le PH < 36$
POWER_HEADROOM_59	36 ≤ PH < 37
POWER_HEADROOM_60	37 ≤ PH < 38
POWER_HEADROOM_61	38 ≤ PH < 39
POWER_HEADROOM_62	$39 \le PH < 40$
POWER_HEADROOM_63	PH ≥ 40

Table 9.1.8.4-1: Power headroom report mapping

### 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<sub>|dBm</sub>≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40,

 $RSRP|_{dBm} \ge -126 \text{ dBm}$  for Bands 9,

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

 $RSRP|_{dBm} \ge -124 \text{ dBm}$  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, 33, 34, 35, 36, 37, 38, 39 and 40	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Band 9
				lo	lo	lo	lo
UE RX-TX time difference	$\leq$ 3 MHz	T <sub>s</sub>	± 20	-121dBm /15kHz 	-119dBm /15kHz	-118dBm /15kHz	-120dBm /15kHz
for Es/lot ≥ -3dB	$\geq$ 5 MHz		± 10	-50dBm/ BW <sub>Channel</sub>	-50dBm/ BW <sub>Channel</sub>	-50dBm/ BW <sub>Channel</sub>	-50dBm/ BW <sub>Channel</sub>
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
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Reported value	Measured quantity value	Unit
RX-TX_TIME_DIFFERENCE_0000	T <sub>UE Rx-Tx</sub> < 2	Ts
RX-TX_TIME_DIFFERENCE_0001	$2 \le T_{UE Rx-Tx} < 4$	Ts
RX-TX_TIME_DIFFERENCE_0002	$4 \le T_{UE Rx-Tx} < 6$	Ts
RX-TX_TIME_DIFFERENCE_2046	$4092 \le T_{UE Rx-Tx} < 4094$	Ts
RX-TX_TIME_DIFFERENCE_2047	$4094 \le T_{UE Rx-Tx} < 4096$	Ts
RX-TX_TIME_DIFFERENCE_2048	$4096 \le T_{UE Rx-Tx} < 4104$	Ts
RX-TX_TIME_DIFFERENCE_2049	$4104 \le T_{UE Rx-Tx} < 4112$	Ts
RX-TX_TIME_DIFFERENCE_4093	$20456 \le T_{UE Rx-Tx} < 20464$	Ts
RX-TX_TIME_DIFFERENCE_4094	$20464 \le T_{UE Rx-Tx} < 20472$	Ts
RX-TX_TIME_DIFFERENCE_4095	20472 ≤ T <sub>UE Rx-Tx</sub>	Ts

### 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<sub>|dBm</sub>≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40,

PRP  $1,2|_{dBm} \ge -126 \text{ dBm}$  for Band 9,

PRP  $1,2|_{dBm} \ge -125$  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 RSTDU ncertainty signalled over LPP by E-SMLC as defined in 3GPP TS 36.355 [24] is less than 5  $\mu$ s.

Parameter	Minimum	Minimum	Unit	Accuracy	uracy Conditions			
	PRS	number		[Ts]	Bands	Bands	Bands	Band
	transmission	of available			1, 4, 6,	2, 5, 7	3, 8, 12,	9
	bandwidth	measurement			10, 11,		13, 14,	
	between the	subframes			18, 19,		17, 20	
	reference cell	between the			21, 33,			
	measured	and the			36, 37			
	neighbour	measured			38.39			
	cell	neighbour cell			and 40			
	[RB]				lo	lo	lo	lo
RSTD for	≥6	6	Ts	± 15	-121dBm	-119dBm	-118dBm	-120dBm
(PRS Ês/lot) <sub>ref</sub>					/15kHz	/15kHz	/15kHz	/15kHz
≥ -6dB and								
(PRS Es/lot) <sub>i</sub>	≥25	≥2		± 6	-50dBm/	-50dBm/	-50dBm/	-50dBm/
≥ -13dB	≥50	≥1		± 5	DVV Channel	DVV Channel	DVV Channel	DVV Channel
Note 1: lo is ass Note 2: Ts is the	sumed to have co	onstant EPRE acr it defined in 3GPI	ross the P TS 36	e bandwidth. 5.211 [16].				

Table 9.1.10.1-1: RSTD	measurement accuracy
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Editor's Note: The RSTD measurement accuracy requirements when serving cell channel bandwidth is smaller than the reference cell PRS transmission bandwidth are FFS.

### 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<sub>|dBm</sub>≥ -127 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40,

PRP 1,2 $|_{dBm} \ge -126$  dBm for Band 9,

PRP  $1,2|_{dBm} \ge -125$  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 in cells belonging to the serving carrier frequency.

The parameter expected RSTDU ncertainty signalled over LPP by E-SMLC as defined in 3GPP TS 36.355 [24] is less than 5  $\mu$ s.

Parameter         Minimum         Unit         Accuracy         Conditions					litions			
	PRS transmission bandwidth between the reference cell and the measured neighbour cell	number of available measurement subframes between the reference cell and the measured neighbour cell		[Ts]	Bands 1, 4, 6, 10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39 and 40	Bands 2, 5, 7	Bands 3, 8, 12, 13, 14, 17, 20	Band 9
	[RB]				lo	lo	lo	lo
RSTD for (PRS Ês/lot) <sub>ref</sub> ≥ -6dB and	≥6	≥4	T <sub>s</sub>	±21	-121dBm /15kHz	-119dBm /15kHz	-118dBm /15kHz	-120dBm /15kHz
(PRS Ës/lot) <sub>i</sub>	≥25	≥2		± 10	-50dBm/	-50dBm/	-50dBm/	-50dBm/
≥ -130B	≥50	≥1		±9	DVV Channel	DVV Channel	DVV Channel	DVV Channel
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].								

Table 9.1.10.2-1: RSTD measurement accuracy

9.1.10.3 RSTD Measurement Report Mapping

The reporting range of RSTD is defined from  $-15391T_s$  to  $15391T_s$  with  $1T_s$  resolution for absolute value of RSTD less or equal to  $4096T_s$  and 5Ts for absolute value of RSTD greater than  $4096T_s$ .

The mapping of measured quantity is defined in Table 9.1.10.3-1.

Reported Value	Measured Quantity Value	Unit
RSTD_0000	-15391 > RSTD	T <sub>s</sub>
RSTD_0001	-15391 ≤ RSTD < -15386	T <sub>s</sub>
RSTD_2258	-4106 ≤ RSTD < -4101	Ts
RSTD_2259	-4101 ≤ RSTD < -4096	Ts
RSTD_2260	-4096 ≤ RSTD < -4095	T <sub>s</sub>
RSTD_2261	-4095 ≤ RSTD < -4094	T <sub>s</sub>
•••		
RSTD_6353	-3 ≤ RSTD < -2	Ts
RSTD_6354	-2 ≤ RSTD < -1	Ts
RSTD_6355	$-1 \le RSTD \le 0$	Ts
RSTD_6356	0 < RSTD ≤ 1	Ts
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

Table 9.1.10.3-1:	RSTD	report	mapping
-------------------	------	--------	---------

## 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
--------------------------------	-------------------------

		Accuracy [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]	
	dBm	± 6	± 9	-9470	-9270	-9170	-9370	
	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.

Parameter	Unit	Accuracy	Conditions
		[dB]	lob [dBm/180 kHz]
lob	dBm/180 kHz	± 0.5	-11796
			AND for changes $\leq \pm 9.0 \text{ dB}$

### 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.

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

Table 10.1.3-1: Received Interference Power measurement reporting range

## 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.

Reported value	Measured quantity value	Unit
AOA_ANGLE _000	$0 \le AOA\_ANGLE < 0.5$	degree
AOA_ANGLE _001	$0.5 \le AOA\_ANGLE < 1$	degree
AOA_ANGLE _002	$1 \le AOA\_ANGLE < 1.5$	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

Table 10.2.1-1: AOA measurement report mapping

# 10.3 Timing Advance (T<sub>ADV</sub>)

### 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.

Reported value	Measured quantity value	Unit
TIME_ADVANCE_00	T <sub>ADV</sub> < 2	Ts
TIME_ADVANCE_01	$2 \le T_{ADV} < 4$	Ts
TIME_ADVANCE_02	$4 \le T_{ADV} < 6$	Ts
TIME_ADVANCE_2046	$4092 \le T_{ADV} < 4094$	Ts
TIME_ADVANCE_2047	$4094 \le T_{ADV} < 4096$	Ts
TIME_ADVANCE_2048	$4096 \le T_{ADV} < 4104$	Ts
TIME_ADVANCE_2049	$4104 \le T_{ADV} < 4112$	Ts
TIME_ADVANCE_7688	$49216 \le T_{ADV} < 49224$	Ts
TIME_ADVANCE_7689	$49224 \le T_{ADV} < 49232$	Ts
TIME_ADVANCE_7690	$49232 \le T_{ADV}$	Ts

Table 10.3.1-1:	T <sub>ADV</sub> measurement	report	mapping
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## 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 +/- $3.29\sigma$  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.3.1.1.1-1: PDSCH Reference Measurement Channels for FDD

Parameter	Unit	Value					
Reference channel		R.2			R.0	R.1	
		FDD			FDD	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 fo	r 10 MHz char	nnel BW.	4 symbol	s allocate	ed to PDC	CCH 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.							
I ne payload sizes are defined in 3GPP TS 36.213 [3].							
Note 4. Anotation is located in the middle of bandwidth.							
Note 5. If more than one Code Block is pr	esent, an add	nional CR	C seque	rice of L :	= 24 BI(S	is attache	90 10
Note 6: DDSCH allocation applies only to subframes not configured as DDS subframes							

Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.

#### A.3.1.1.2 TDD

	Parameter	Parameter Unit Value						
Reference	e channel		R.2			R.0	R.1	
			TDD			TDD	TDD	
Channel I	bandwidth	MHz	1.4	3	5	10	10	20
Number of	of transmitter antennas		1			1	2	
Allocated	resource blocks (Note 4)		2			24	24	
Uplink-Do	ownlink Configuration (Note 5)		1			1	1	
Special S	Subframe Configuration (Note 6)		6			6	6	
Allocated	subframes per Radio Frame		6			6	6	
Modulatio	n		QPSK			QPSK	QPSK	
Target Co	oding Rate		1/3			1/3	1/3	
Informatio	on 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	of Code Blocks per Sub-Frame		1			1	1	
(Note 7)								
For Sub-F	Frames 4,9		1			1	1	
For Sub-F	Frame 5		1			1	1	
For Sub-F	Frame 0		1			1	1	
For S	ub-Frame 1, 6 (DwPTS)		1			1	1	
Binary Ch	nannel 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. Thro	oughput averaged over 1 frame	Mbps	0.051			1.041	1.0064	
			2			6		
Note 1:	2 symbols allocated to PDCCH for	10 MHz char	nel BW.	4 symbol	s allocate	ed to PDC	CH for 1	.4 MHz
	channel BW. For special subframe	e (1 & 6) only 2	2 OFDM s	symbols a	are alloca	ited to PD	OCCH for	all
	bandwidths.							
Note 2:	2: Reference signal, synchronization signals and PBCH allocated as defined in 3GPP TS 36.211 [16].							
Note 3:	Note 3: It necessary the information bit payload size can be adjusted to facilitate the test implementation.							
	I ne payload sizes are defined in 3GPP 15 36.213 [3].							
NOTE 4:	Allocation is located in the middle	of bandwidth.						
Note 5:								
NOTE 5:	U. As yet raule 4.2-1 in 10.30.211 [10]							
NOTE 1:	II more than one Code Block is pre	esent, an addi	uonai CR	C sequer	ICE OF L =	= ∠4 BI(S I	s attache	eu to

Table A 3 1 1 2-1. PDSCH	Poforonco Mossuromon	Channels for TDD
Table A.S.T.T.2-1: PDSCR	Reference measurement	Channels for TDD

each Code Block (otherwise L = 0 Bit) PDSCH allocation applies only to subframes not configured as PRS subframes. Note 8:

### 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	Value					
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 <sup>Note1</sup>	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 PC	FICH, PHICI	H and PDC	CH.				
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	R.7		
				TDD	TDD		
Channel bandwidth	MHz	1.4		10	10		
Number of transmitter antennas		1		1	2		
Control region OFDM symbols <sup>Note1</sup>	symbols	4		2	2		
		(Note 6)					
Aggregation level	CCE	2		8	8		
		(Note 7)					
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 PC	FICH, PHIC	H and PDC	CH.				
Note 2: DCI formats are defined in 3GPP	TS 36.212.						
Note 3: DCI format shall depend upon the	e test configu	uration.					
Note 4: Cell ID shall depend upon the tes	t configuration	on.					
Note 5: Payload size shall depend upon t	he test confi	guration.					
Note 6: Only 2 OFDM symbols for special subframes 1 and 6.							
Note 7: For PDCCH using SI/RA/P-RNTI,	, Aggregation	n level 4 is i	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 ( $\gamma$ ) specifies the PDSCH EPRE-to-RS EPRE ratios in OFDM symbols without and with reference
108

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  $\gamma_i$  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  $\gamma$  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

Alloca	ation	Re	lative power l	evel $\gamma_{\scriptscriptstyle PRB}$ [dl	B]	PDSCH	PMCH Data	
$n_{P}$	RB		Data	Data				
		0	5	4,9	1-3, 6-8			
0 —	12	0	0	0	N/A	Note 1	N/A	
37 – 49		0	0	0	N/A			
0-4	19	N/A	N/A	N/A	Note 4	N/A	Note 2	
Note 1:	These p with one be unco $\gamma_{ppp}$ is	hysical resource PDSCH per vir rrelated pseudo used to scale th	e blocks are as tual UE; the d random data, ne power of PE	ssigned to an a ata transmitted which is QPS DSCH.	arbitrary numb d over the OCI K modulated.	er of virtua NG PDSCH The param	l UEs ls shall eter	
Note 2:	Each ph each PR measure contain	ysical resource B shall be unco ement. The MBS cell-specific Ref	block (PRB) is prrelated with c SFN data shall erence Signal	s assigned to N lata in other P be QPSK mo s. PMCH subfi	MBSFN transm RBs over the p dulated. PMCF rames shall co	nission. The period of ar H symbols ntain cell-s	e data in ny shall not pecific	
	Referen	ce Signals only	in the first sym	nbol of the first	time slot. The	paramete	r $\gamma_{_{PRB}}$ is	
Note 3:	used to If two or OCNG s	scale the power more transmit a shall be transmit	of PMCH. Antennas with Ited to the virtu	CRS are used al users by all	in the test, the the transmit a	e PDSCH p antennas w	oart of ith CRS	
	and according to the antenna transmission mode 2. The parameter $\gamma_{_{PRB}}$ applies to							
Note 4:	each an equal be transmis 0dB for 7	tenna port sepa etween all the tra ssion modes are 1 transmit anten	rately, so the t ansmit antenna specified in s na with CRS,	ransmit power as with CRS u ection 7.1 in 3 +3dB for 2 trar	of the PDSCH sed in the test GPP TS 36.21 nsmit antennas	H part of O . The anter 3. s with CRS	CNG is nna	
N/A: Not	Applicable	e						

# Table A.3.2.1.1-1: OP.1 FDD: OCNG FDD Pattern 1

# A.3.2.1.2 OCNG FDD pattern 2: full bandwidth allocation in 10 MHz

Allocation	Re	ative power l	evel $\gamma_{\scriptscriptstyle PRB}$ [d	B]	PDSCH	PMCH Data		
$n_{PRB}$		Data	Data					
	0	5	4, 9	1 – 3, 6 – 8				
0 – 49	0	0	0	N/A	Note 1	N/A		
0-49	N/A	N/A	N/A	Note 4	N/A	Note 2		
Note 1: These p with one be unco	hysical resource PDSCH per vir rrelated pseudo	e blocks are as tual UE; the da random data,	ssigned to an a ata transmitted which is QPS	arbitrary numb d over the OCI K modulated.	er of virtua NG PDSCH The param	l UEs Is shall eter		
$\gamma_{PRB}$ is Note 2: Each ph each PF measure contain	used to scale the hysical resource B shall be unco ement. The MBS cell-specific Ref	e power of PE block (PRB) is prrelated with o SFN data shall erence Signals	DSCH. s assigned to I data in other P be QPSK mo s only in the fin	MBSFN transm RBs over the p dulated. PMCI rst symbol of th	nission. The period of ar H subframe ne first time	e data in ny es shall e slot.		
The part Note 3: If two or OCNG s and acc each an equal be	In parameter $\gamma_{PRB}$ is used to scale the power of PMCH. 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 $\gamma_{PRB}$ 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							
Note 4: 0dB for	Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS							
N/A: Not Applicable	e							

# Table A.3.2.1.2-1: OP.2 FDD: OCNG FDD Pattern 2

# 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	lative power l	evel $\gamma_{\scriptscriptstyle PRB}$ [d	B]	PDSCH Data	PMCH Data
n <sub>PRB</sub>	Subframe				Dulu	Dulu
	0	5	4,9	1-3, 6-8		

0 -	- 1	0	0	0	N/A			
4 -	· 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 $\gamma_{PRB}$ is used to scale the power of PDSCH. Note 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data in								
	contain o	ement. The MBS	SFN data shall ference Signal	be QPSK mod s. PMCH subfi	dulated. PMCI rames shall co	H symbols	shall not pecific	
Note 3:	used to If two or OCNG s	scale the power more transmit a shall be transmir	of PMCH. antennas with tted to the virtu	CRS are used ual users by all	in the test, the	e PDSCH p antennas w	part of the CRS	
	and acc	ording to the an	tenna transmi	ssion mode 2.	The paramete	er $\gamma_{\scriptscriptstyle PRB}$ app	olies to	
<ul> <li>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.</li> <li>Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS</li> </ul>							CNG is nna	
N/A: Not	N/A: Not Applicable							

# A.3.2.1.4 OCNG FDD pattern 4: full bandwidth allocation in 1.4 MHz

Allocation	Re	ative power le	evel $\gamma_{\scriptscriptstyle PRB}$ [d	B]	PDSCH	PMCH	
n <sub>PRB</sub>	Subframe	Dala	Dala				
	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 p with one be unce	ohysical resource e PDSCH per vir orrelated pseudo	e blocks are as tual UE; the da random data,	ssigned to an a ata transmitted which is QPS	arbitrary numb d over the OCI K modulated.7	er of virtua NG PDSCH The parame	l UEs Is shall eter	
${\gamma}_{_{PRB}}$ is	used to scale th	e power of PD	SCH.				
Note 2: Each pl each Pl measur contain	nysical resource RB shall be unco ement. The MBS cell-specific Ref	block (PRB) is prrelated with c SFN data shall erence Signals	assigned to I lata in other P be QPSK mo s only in the find	MBSFN transm RBs over the p dulated. PMCI rst symbol of th	nission. The period of ar H subframe he first time	e data in ny es shall e slot.	
The par	ameter $\gamma_{\scriptscriptstyle PRB}$ is (	used to scale t	he power of P	MCH.			
Note 3: If two or OCNG	more transmit a shall be transmit	intennas with ( ted to the virtu	CRS are used al users by al	in the test, the I the transmit a	e PDSCH p antennas w	art of ith CRS	
and acc	ording to the an	tenna transmis	ssion mode 2.	The paramete	er $\gamma_{\scriptscriptstyle PRB}$ app	olies to	
<ul> <li>each antenna port separately, so the transmit power of the PDSCH part of OCNG i 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.</li> <li>Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS</li> </ul>							
N/A: Not Applicabl	e						

#### Table A.3.2.1.4-1: OP.4 FDD: OCNG FDD Pattern 4

# A.3.2.1.5 OCNG FDD pattern 5: outer resource blocks allocation in 10 MHz (without MBSFN)

	Allocation	cation Relative power level $\gamma_{_{PRB}}$ [dB]									
	$n_{PRB}$	Subframe (No	ote 1)			Data					
		0 5 4,9 1-3, 6-8									
	0 – 12	0 – 12 0 0 0 N/A									
	37 – 49	7 – 49 0 0 N/A									
	0 - 49	0–49 N/A N/A N/A 0									
	lote 1: PDSCH a lote 2: These phy UEs with o PDSCHs The paran lote 3: If two or n of OCNG with CRS parameter of the PDS CRS used 7.1 in 3GF	llocation applies ysical resource bone PDSCH per shall be uncorrel neter $\gamma_{PRB}$ is us nore transmit and shall be transmit and according to $\gamma_{PRB}$ applies to SCH part of OCN I in the test. The PP TS 36.213.	only to subfra plocks are assi virtual UE; the lated pseudo r ed to scale the tennas with CF ted to the virtu to the antenna o each antenna NG is equal be antenna trans	mes not config gned to an arb data transmit andom data, w e power of PDS S are used in ual users by all transmission n a port separate tween all the t mission mode	jured as PRS itrary number ted over the C /hich is QPSK SCH. the test, the F the transmit a hode 2. The ely, so the tran ransmit anten s are specified	subframes. of virtual DCNG modulated. PDSCH part antennas smit power nas with d in section					
Ν	I/A: Not Applic	able									

### Table A.3.2.1.5-1: OP.5 FDD: OCNG FDD Pattern 5

# A.3.2.1.6 OCNG FDD pattern 6: full bandwidth allocation in 10 MHz (without MBSFN)

Alloca	ation	Re	lative power l	evel $\gamma_{\scriptscriptstyle PRB}$ [d	B]	PDSCH Data
$n_{P}$	RB	Subframe (No	ote 1)			Data
		0	5	4, 9		
0 –	49	0	0	0	0	Note 2
Note 1: Note 2:	PDSCH subfram These p virtual U OCNG F	allocation appli es. hysical resourc Es with one PD PDSCHs shall b	es only to sub e blocks are as SCH per virtus e uncorrelated	frames not cor ssigned to an a al UE; the data I pseudo rando	nfigured as PR arbitrary numb a transmitted o om data, which	S er of ver the n is
Note 3:	QPSK m PDSCH If two or PDSCH transmit mode 2. the trans	modulated. The more transmit a part of OCNG s antennas with The parameter smit power of th	parameter $\gamma_p$ antennas with shall be transm CRS and acco $\gamma_{PRB}$ applies e PDSCH par	CRS are used initted to the vir rding to the ar to each anten t of OCNG is e	in the test, the tual users by a tenna transmi na port separa equal between	er of all the ssion ately, so all the
N/A:	modes a	antennas with are specified in s licable	section 7.1 in 3	BETEST. The ar	itenna transmi 13.	SSION

Table A.3.2.1.6-1: OP.6 FDD: OCNG FDD Pattern 6

# A.3.2.1.7 OCNG FDD pattern 7: full bandwidth allocation in 1.4 MHz (without MBSFN)

Alloca	ation	Re	lative power I	evel $\gamma_{\scriptscriptstyle PRB}$ [d	B]	PDSCH		
$n_{P}$	RB	Subframe (No	ote 1)			Data		
		0	5	4, 9	1-3,6-8			
0 -	- 5	0	0	0	0	Note 2		
Note 1:	PDSCH subfram	allocation applies.	es only to sub	frames not cor	nfigured as PR	S		
Note 2:	These p virtual U OCNG F	hysical resourc Es with one PD PDSCHs shall b	e blocks are as SCH per virtus e uncorrelated	ssigned to an a al UE; the data I pseudo rando	arbitrary numb a transmitted o om data, which	er of over the n is		
	QPSK m	nodulated. The	parameter $\gamma_{I}$	PRB is used to s	scale the powe	er of		
Note 3:	PDSCH If two or PDSCH transmit	more transmit part of OCNG s antennas with	antennas with shall be transn CRS and acco	CRS are used nitted to the vir ording to the ar	l in the test, the rtual users by a ntenna transmi	e all the ission		
	mode 2.	The parameter	$\gamma_{\scriptscriptstyle PRB}$ applies	to each anten	ina port separa	ately, so		
	the transmit power of the PDSCH part of OCNG is equal between all transmit antennas with CRS used in the test. The antenna transmiss modes are specified in section 7.1 in 3GPP TS 36.213.							
N/A:	Not App	licable						

Table A.3.2.1.8-1: OP.7 FDD: OCNG FDD Pattern 7

# 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 ( $\gamma$ ) 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  $\gamma_i$  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  $\gamma$  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

Alle	Allocation Relative power level $\gamma_{PRB}$ [dB]							
	n <sub>PRB</sub>		Subframe	(Note 1)				
		0	5	3 , 4, 8, 9 and 6 (as normal subframe) <sup>Note 3</sup>	1 and 6 (as special subframe) <sub>Note 3</sub>			
C	) – 12	0	0	0	Table	Noto 2		
3.	37 - 49 0 0 0 A.3.2.2.1-2							
Note 1: Note 2:	PDSCH alloc These physic virtual UE; the is QPSK mod	ation applies only f cal resource blocks e data transmitted dulated The parame	to subframes not confi are assigned to an ar over the OCNG PDSC eter $\gamma_{PRB}$ is used to sc	gured as PRS subfra bitrary number of virt CHs shall be uncorrel ale the power of PDS	mes. ual UEs with on ated pseudo rar SCH.	e PDSCH per dom data, which		
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 $\gamma_{_{F}}$	PRB applies to each	n antenna port separat	ely, so the transmit p	ower is equal b	etween 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.3.2.2.1-1: OP.1 TDD: OCNG TDD Pattern 1 for 5ms downlink-to-uplink switch-point periodicity

# 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	ţ		Relative power level $\gamma_{PRB}$ [dB] Special subframe configuration																
$n_{PRB}$	bu																		
	e	(	)		1		2		3	4	4	ł	5	(	6		7	8	3
	с В		Control region OFDM symbols																
	•	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
0 - 12			n		n		0		n		0		n		n	(	0	(	)
0 - 12	Ν		J		J		0	,	J		0	,	J		0	>	<	>	<
27 40			n		n		^		n		^		n		<b>^</b>	(	0	(	)
57 - 49	Ν	,	J		J		0	,	J		0	,	J		0	$\land$	<	$\land$	<
Note 1: Special su	Note 1: Special subframe configurations are defined in Table 4.2-1 in TS 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

Alle	Allocation Relative power level $\gamma_{PRB}$ [dB]									
	n <sub>PRB</sub>		Subframe	(Note 1)		1				
		0	5	3 , 4, 8, 9 and 6 (as normal subframe) <sup>Note 3</sup>	1 and 6 (as special subframe) <sub>Note 3</sub>					
C	) – 49	Note 2								
Note 1: Note 2:	PDSCH alloc These physic UE; the data	ation applies only al resource blocks transmitted over th	to subframes not config are assigned to an arl ne OCNG PDSCHs sha	gured as PRS subfram bitrary number of virtua all be uncorrelated pse	nes. al UEs with one F audo random data	PDSCH per virtual a, which is QPSK				
	modulated. T	he parameter $\gamma_{\scriptscriptstyle PRI}$	$_3$ is used to scale the p	ower of PDSCH.						
Note 3:	Subframes av TS 36.211 [10	vailable for DL trar 6].	smission depends on	the Uplink-Downlink co	onfiguration in Ta	ble 4.2-2 in 3GPP				
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 $\gamma_F$ transmit ante 3GPP TS 36.	parameter $\gamma_{PRB}$ 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

All	ocation		Relative power lev	PDSCH Data					
	n <sub>PRB</sub>		Subframe (	Note 1)					
		0	5	3 , 4, 8, 9 and 6 (as normal subframe) <sup>Note 3</sup>	1 and 6 (as special subframe) <sub>Note 3</sub>				
	0 – 1	0	0	0					
4 – 5		0	0	0	0	Note 2			
Note 1: Note 2:	PDSCH alloc These physic virtual UE; the	ation applies only al resource blocks e data transmitted	to subframes not config are assigned to an arb over the OCNG PDSC	gured as PRS subfra pitrary number of virt Hs shall be uncorrela	mes. ual UEs with on ated pseudo rar	e PDSCH per ndom data, which			
	is QPSK mod	lulated.The param	eter ${\gamma}_{\scriptscriptstyle PRB}$ is used to sc	ale the power of PDS	SCH.				
Note 3:	Subframes av 4.2-2 in 3GPF	vailable for DL transmission depends on the Uplink-Downlink configuration define P TS 36.211 [16].							
Note 4:	If two or more virtual users b	e transmit antenna by all the transmit	s with CRS are used in antennas with CRS and	the test, the OCNG d according to the an	shall be transm tenna transmis	itted to the sion mode 2. The			
	parameter $\gamma_P$ transmit anter in 3GPP TS 3	ower is equal b odes are specifi	etween all the ed in section 7.1						

# Table A.3.2.2.3-1: OP.3 TDD: OCNG TDD Pattern 3 for 5 ms downlink-to-uplink switch-point periodicity

# 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

Allocation n <sub>PRB</sub>		_		Relative power I	evel ${\gamma}_{_{PRB}}$ [dB]		PDSCH Data
		gt		ĺ			
		C E E		5	3 , 4, 8, 9 and 6 (as normal subframe) <sup>Note 3</sup>	1 and 6 (as special subframe) <sub>Note 3</sub>	
0 – 5			0	0	0	0	Note 2
Note 1: Note 2:	PDSC These UE; th	CH alloc e physic ne data	ation applies only al resource blocks transmitted over th	to subframes not confi are assigned to an ar ne OCNG PDSCHs sha	gured as PRS subfram bitrary number of virtua all be uncorrelated pse	nes. al UEs with one F eudo random data	PDSCH per virtual a, which is QPSK
	modu	lated.Th	ne parameter $\gamma_{\scriptscriptstyle PRB}$	is used to scale the po	ower of PDSCH.		
Note 3:	3: Subframes available for DL transmission depends on the Uplink-Downlink configuration in Table 4.2-2 in 3GPP						
Note 4:	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 $\gamma_{ppp}$ 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				
longDRX-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, i.e. Cell 2 is not registered with network for the tracking area containing Cell 2.

F	Parameter	Unit	Value	Comment
Initial	Active cell		Cell1	
condition	Neighbour cells		Cell2	
T2 end	Active cell		Cell2	
condition	Neighbour cells		Cell1	
Final	Visited cell		Cell1	
condition				
E-UTRA R	F Channel Number		1	Only one FDD carrier frequency is used.
Channel Ba	andwidth (BW <sub>channel</sub> )	MHz	10	
Time offset	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 12
12		S	40	12 need to be defined so that cell re-
				selection reaction time is taken into
				account.
13		S	15	13 need to be defined so that cell re-
		1		selection reaction time is taken into
				account.

# Table A.4.2.1.1-1: General test parameters for FDD intra frequency cell reselection test case

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	Т3
E-UTRA RF Channel			1			1	
Number							
BW <sub>channel</sub>	MHz		10			10	
OCNG Patterns						00 0 50	_
defined in A.3.2.1.2		C	P.2 FDD			OP.2 FDL	J
(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 <sup>Note 1</sup>							
OCNG_RB <sup>NOLE 1</sup>							
Qrxlevmin	dBm	-140	-140	-140	-140	-140	-140
Pcompensation	dB	0	0	0	0	0	0
Qhyst <sub>s</sub>	dB	0	0	0	0	0	0
Qoffset <sub>s, n</sub>	dB	0	0	0	0	0	0
Cell_selection_and_							
reselection_quality_			RSRP			RSRP	
measurement	5	10	0.44	0.70		0.70	0.44
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dВ	16	-3.11	2.79	-infinity	2.79	-3.11
$N_{oc}$ Note2	dBm/15 kHz				-98		
$\hat{E}/N$	dB	16	13	16	-infinity	16	13
	dBm/15 kHz	82	95	82	infinity	<u>0</u> 2	95
Treselection		-62	-00	-02	-inininty	-02	-65
Sintrasearch	dB	0	Unt sont	0	0	U Not sent	0
Propagation	uв		NUL SEIIL			NOL SEIL	
Condition							
Note 1: OCNG shall be	used such that bo	oth cells are	fully alloca	ted and a	constant tot	al transmitted	power spectral
density is achie	ved for all OFDM	symbols.					
Note 2: Interference fro	m other cells and	noise source	es not spec	cified in th	ne test is assu	umed to be co	onstant over
NZ							

# Table A.4.2.1.1-2: Cell specific test parameters for FDD intra frequency cell reselection test case in AWGN

subcarriers and time and shall be modelled as AWGN of appropriate power for <sup>IV</sup><sub>oc</sub> 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.

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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:  $T_{detect,EUTRAN_{Intra}} + T_{SI}$ , and to an already detected cell can be expressed as:  $T_{evaluateFDD,intra} + T_{SI}$ ,

#### Where:

$T_{detect, EUTRAN\_Intra}$	See Table 4.2.2.3-1 in section 4.2.2.3
T <sub>evaluateFDD,intra</sub>	See Table 4.2.2.3-1 in section 4.2.2.3
T <sub>SI</sub>	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.

Parameter		Unit	Value	Comment
Initial	Active cell		Cell1	
condition	Neighbour cells		Cell2	
T2 end	Active cell		Cell2	
condition	Neighbour cells		Cell1	
Final	Visited cell		Cell1	
condition				
E-UTRA R	F Channel Number		1	Only one TDD carrier frequency is used.
Channel Ba	andwidth (BW <sub>channel</sub> )	MHz	10	
Time offset	between cells	μs	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.4.2.2.1-1: General test parameters for TDD intra frequency cell re-selection test case

Parameter	Unit		Cell 1		Cell 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW <sub>channel</sub>	MHz		10			10	
OCNG Pattern							
defined in A.3.2.2.2		OF	2.2 TDD		O	2 IDD	
SSS RA	_						
PCFICH RB	_						
PHICH RA							
PHICH RB	dB		0			0	
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA <sup>Note 1</sup>							
OCNG_RB <sup>Note 1</sup>							
Qrxlevmin	dBm	-140				-140	
Pcompensation	dB	0			0		
Qhyst <sub>s</sub>	dB	0			0		
Qoffset <sub>s, n</sub>	dB		0		0		
Cell_selection_and_		_					
reselection_quality_		RSRP		RSRP			
	٦٢	10	244	0.70	infinite (	0.70	0.44
$E_s/I_{ot}$	aв	10	-3.11	2.79	-infinity	2.79	-3.11
N Note2	dBm/15 kHz	-		-98			
1 v oc		10	1 4 9				10
$\hat{E}_s / N_{oc}$	dВ	16	13	16	-infinity	16	13
	dBm/15 kHz	-82	-85	-82	-infinity	-82	-85
Treselection	S	0	0	0	0	0	0
Sintrasearch	dB	N	ot sent		N	lot sent	
Propagation				AV	VGN		
Condition	II h a						
Note 1: OCNG sha	III DE USED SUCH THA	t Doth Cells a	are fully a		and a consi	ant total	
Note 2: Interference	from other cells and r	noise sources	not speci	II OFDIV	i SymbolS. Etest is assum	ned to be o	ronstant
Note 2. Interference		10130 3001003	not speci				onstant
over subcar	riers and time and sha	all be modelle	d as AWG	N of app	ropriate power	for <sup>IV</sup> <sub>oc</sub>	to be
IUITIIED.	s have been derived fr	om other nar	ameters fr	or informs	ation nurnases	They are	not
settable par	on onlor par				. mey ale		

# Table A.4.2.2.1-2: Cell specific test parameters for TDD intra frequency cell re-selection test case in AWGN

# 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%.

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NOTE: The cell re-selection delay to a newly detectable cell can be expressed as:  $T_{detect,EUTRAN_Intra} + T_{SI-EUTRA}$ , and to an already detected cell can be expressed as:  $T_{evaluate, E-UTRAN_intra} + T_{SI-EUTRA}$ ,

#### Where:

$T_{detect, EUTRAN\_Intra}$	See Table 4.2.2.3-1 in section 4.2.2.3
Tevaluate, E-UTRAN_ intra	See Table 4.2.2.3-1 in section 4.2.2.3
T <sub>SI-EUTRA</sub>	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.

	Parameter	Unit	Value	Comment
Initial	Active cell		Cell2	UE shall be forced to cell 2 in the initialisation
condition				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 RE	F Channel Number		1, 2	Two FDD carrier frequencies are used.
Time offset	between cells		3 ms	Asynchronous cells
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.
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.4.2.3.1-1: General test parameters for FDD-FDD inter frequency cell re-selection test case

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			2	•
number							
BW <sub>channel</sub>	MHz		10			10	
OCNG Patterns defined in							
A.3.2.1.1 (OP.2 FDD)		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	
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
Qrxlevmin	dBm	-140				-140	
$N_{_{oc}}$ Note 2	dBm/15 kHz				-98		
RSRP <sup>Note 3</sup>	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
TreselectionEUTRAN	S		0			0	
Snonintrasearch	dB	50			Not sent		
Thresh <sub>x, high</sub>	dB		48		48		
Thresh <sub>serving, low</sub>	dB		44		44		
Thresh <sub>x, low</sub> dB			50		50		
Propagation Condition				AWGN			
Note 1: OCNG shall be used s	such that both ce	ells are fully a	allocated	and a	constant to	tal transmitte	d 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 ti	ime and shall be	modelled as	AWGN	of app	ropriate pov	wer for $N_{oc}$	to be
fulfilled							

# Table A.4.2.3.1-2: Cell specific test parameters for FDD-FDD inter-frequency cell reselection test case in AWGN

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:  $T_{evaluateFDD,inter} + T_{SI}$ ,

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Where:

$T_{higher\_priority\_search}$	See section 4.2.2
T <sub>evaluateFDD,inter</sub>	See Table 4.2.2.4-1 in section 4.2.2.4
T <sub>SI</sub>	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.

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 RE	Channel Number		1, 2	Two TDD carrier frequencies are used.
Time offset	between cells		3 μs	Synchronous cells
Access Barring 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	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.4.2.6.1-1: General test parameters for TDD-TDD inter frequency cell reselection test case

### 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 <sub>channel</sub>	MHz		10 10						
OCNG Pattern defined in									
A.3.2.2.2 (OP.2 TDD)		OF	.2 TDD		0	P.2 TDD			
PBCH_RA	dB								
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB				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 <sup>Note 1</sup>	dB								
OCNG_RB <sup>Note 1</sup>	dB	7							

Qrxlevmin	dBm	-140 -140								
$N_{oc}^{\rm Note 2}$	dBm/15 kHz	-98								
RSRP Note 3	dBm/15 KHz	-84	-84	-84	-102	-infinity	-86			
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	14	14	14	-4	-infinity	12			
$\hat{E}_s / N_{oc}$	dB	14	14	14	-4	-infinity	12			
Treselection <sub>EUTRAN</sub>	S		0			0				
Snonintrasearch	dB	50			50 Not sent					
Thresh <sub>x, high</sub>	dB	48 48								
Thresh <sub>serving, low</sub>	dB		44			44				
Thresh <sub>x, low</sub>	dB		50			50				
Propagation Condition				AV	VGN					
Note 1: OCNG shall be used power spectral densit Note 2: Interference from oth constant over subcar N <sub>ce</sub> to be fulfilled.	I such that both ty is achieved for her cells and nois riers and time ar	cells are full r all OFDM s se sources r nd shall be n	y allocate symbols. not speci nodelled	ed and a fied in th as AWC	constant to te test is ass N of approp	tal transmit sumed to be priate power	ted e r for			
Note 3: RSRP levels have b	een derived from	n other para	meters fo	or inform	ation purpos	ses. They a	re not			

### A.4.2.6.2 Test Requirements

settable parameters themselves.

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 <sub>SI-EUTRA</sub>	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	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation	
condition	ndition			phase	
Final	Active cell		Cell2	UE shall perform reselection to cell 2 during T2	
condition					
E-UTRA RI	F Channel Number		1, 2	Two FDD carrier frequencies are used.	
Time offset	between cells		3 ms	Asynchronous cells	
PRACH configuration		ACH 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 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.	
T3		S	[15]	T3 need to be defined so that whether cell re-	
				selection 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	T3	T1	T2	Т3	T1	T2	Т3	
E-UTRA RF Channel Number			1			2			1		
BW <sub>channel</sub>	MHz		10			10			10		
OCNG Patterns defined in A.3.2.1.2 (OP.2 FDD)			OP.2 FDI	)	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		0			0		U			
PDCCH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA <sup>Note 1</sup>	dB										
OCNG_RB <sup>Note</sup>	dB										

Qrxlevmin	dBm	-140 -140 -140								
Qqualmin	dB		[-20]							
$N_{_{oc}}$ Note 2	dBm/15		-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]
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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		Ν	lot sent			Not sen	ıt
Propagation Condition			AWGN							
Note 1: OCNG shall t density is ach Note 2: Interference f	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:  $T_{detect,EUTRAN_Inter} + T_{SI}$ ,

Where:

T<sub>detect,EUTRAN\_Inter</sub> 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	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation	
condition				phase	
Final	Active cell		Cell2	UE shall perform reselection to cell 2 during T2	
condition					
E-UTRA RI	- Channel Number		1, 2	Two TDD carrier frequencies are used.	
Time offset	between cells	μs	3	Synchronous cells	
Uplink-dow	nlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211	
Special subframe configuration			6	As specified in table 4.2-1 in 3GPP TS 36.211	
PRACH co	nfiguration		53	As specified in table 5.7.1-3 in TS 36.211	
Access Bar	ring 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 re-	
				selection would not occur is insured.	

Parameter	Unit		Cell 1 Cell 2 Cell 3								
								(Non-allowed CSG cell)			
		T1	T2	T3	T1	T2	T3	T1	T2	Т3	
E-UTRA RF Channel			1			2			1		
Number											
BW <sub>channel</sub>	MHz		10			10			10		
OCNG Pattern defined in				h	OP	2 TDD				<b>`</b>	
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 0					0				
PDCCH_RA	dB										
PDCCH_RB	dB										
PDSCH_RA	dB										
PDSCH_RB	dB										
OCNG_RA <sup>Note 1</sup>	dB										
OCNG_RB <sup>Note 1</sup>	dB										
Qrxlevmin	dBm		-140		-	·140			-140		
Qqualmin	dB					[-20]					
N Note 2	dBm/					-98					
- ' oc	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]	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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	1		0	<u> </u>	
Snonintrasearch	dB		TBD		No	ot sent			Not sent		
Propagation Condition					A	WGN					
Note 1: OCNG shall be	used such	that both	n cells are	fully allo	cated and a	consta	nt total t	ransmitte	d power s	pectral	
density is achiev	ed for all	OFDM sy	OFDM symbols.								
Note 2: Interference fror	n other ce	ells and no	s and noise sources not specified in the test is assumed to be constant over								
				·			1	V			
subcarriers and	time and	shall be n	nodelled a	as AWGN	of appropria	ate pow	er for 1	' oc to be	fulfilled.		
Note 3: RSRP and RSR	Q levels h	nave beer	n derived f	from othe	r parameters	s for inf	ormatio	n purpose	s. They a	re not	

# 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

### A.4.2.8.2 Test Requirements

settable parameters themselves.

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 <sub>SI</sub>	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.

	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 PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA Access Barring		-	Not Sent	No additional delays in random access
Information				procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	>20	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed. The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2		S	85	T2 needs to be defined so that cell re-selection reaction time is taken into account.
T3		S	25	T3 needs to be defined so that cell re-selection reaction time is taken into account.

# Table A.4.3.1.1.1-1: General test parameters for E-UTRA FDD- higher priority UTRA FDD inter RAT cell re-selection test case

Parameter	Unit		Cell 1				
		T1 T2 T3					
E-UTRA RF Channel			1				
number							
BW <sub>channel</sub>	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		U				
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA	dB						
OCNG_RB <sup>Note 1</sup>	dB						
Qqualmin for UTRA	dB	-20					
neighbour cell	uD		20				
Qrxlevmin for UTRA	dBm		-115				
neighbour cell	abiii		110				
Qrxlevmin	dBm		-140				
$N_{oc}$	dBm/15 kHz		-98				
RSRP	dBm/15 KHz	-84	-84	-84			
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	14	14	14			
$\hat{E}_s/N_{oc}$	dB	14	14	14			
Treselection <sub>EUTRAN</sub>	S		0				
Snonintrasearch	dB		50				
Thresh <sub>x, high</sub> (Note 2)	dB		40				
Propagation Condition			AWGN				
Note 1: OCNG shall be use	d such that both	cells are	fully alloc	ated			
and a constant tota	I transmitted pov	ver spectr	al density	is			
achieved for all OF	DM symbols.		-				
Note 2: This refers to the va	alue of Thresh <sub>x</sub> ,	<sub>high</sub> which	is include	ed in E-			
UTRA system infor	mation, and is a	threshold	for the U	ΓRA			
target cell							

Table A.4.3.1.1.1-2: Cell specific test parameters for cell 1(E-UTRA)

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			
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 <sub>oc</sub>	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			

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UE_TXPWR_MAX_RACH	dBm	21
Treselection	S	0
Sprioritysearch1	dB	62
Sprioritysearch2	dB	0
Thresh <sub>serving, low</sub>	dB	36
Thresh <sub>x, low</sub> (Note 1)	dB	50
Note 1 : his refers to the value of Thresh <sub>x</sub> , 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 <sub>evaluateUTRA-FDD</sub>	See Table 4.2.2.5.1-1
T <sub>SI-UTRA</sub>	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		Cell 1	E-UTRAN cell
T1 end condition	Active cell		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 PI	RACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA Access Barring		-	Not Sent	No additional delays in random access
Information				procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	85	T1 need to be defined so that cell re-selection
				reaction time is taken into account.
T2		S	25	T2 need to be defined so that cell re-selection
				reaction time is taken into account.

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 <sub>channel</sub>	MHz		10
OCNG Patterns defined in			
A.3.2.1.2 (OP.2 FDD)		O	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 <sup>Note 1</sup>	dB		
OCNG_RB <sup>Note 1</sup>	dB		

Qqualmin neighbou	r for UTRA r cell	dB		-20
Qrxlevmir neighbou	Qrxlevmin for UTRA			-115
Qrxlevmi	า	dBm		-140
$N_{oc}$		dBm/15 kHz		-98
RSRP		dBm/15 KHz	-86	-102
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$		dB	12	-4
$\hat{E}_s/N_{oc}$		dB	12	-4
Treselection <sub>EUTRAN</sub>		S		0
Snonintra	Snonintrasearch		Not sent	
Thresh <sub>ser</sub>	ving, low	dB	44	
Thresh <sub>x, k</sub>	w (Note 2)	dB		42
Propagation Condition		AWGN		AWGN
Note 1: 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. This refers to the value of Thresh <sub>x, low</sub> 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 <sub>oc</sub>	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 <sub>x, high</sub> (Note 1)	dB	48	
Note 1: This refers to the value	ue of Thresh <sub>x</sub> ,	<sub>high</sub> which i	s included
in UTRA system info	rmation, and is	a threshold	d for the
E-UTRA target cell			

### 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.

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%.

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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 <sub>SI-UTRA</sub>	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		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	
T3 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
condition	Neighbour cell		Cell1	
E-UTRA PI	RACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA A Information	ccess 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
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

Parameter	Unit	Cell 1			
		T1	T2	Т3	T4
E-UTRA RF Channel number		1			
BW <sub>channel</sub>	MHz	10			
OCNG Patterns defined in A.3					
		OP.2 FD	D		
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 <sup>Note 1</sup>	dB	0			
OCNG_RB <sup>Note 1</sup>	dB	0			
Qqualmin for UTRA neighbour	dB	-20			
Qrxlevmin for UTRA neighbou	dBm	-115			
Qrxlevmin	dBm	-140			
N <sub>oc</sub>	dBm/15 kHz	-104			
RSRP	dBm/15 KHz	-82	-82	-107	-107
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	dB	22	22	-3	-3
$\hat{E}_s/N_{oc}$	dB	22	22	-3	-3
Treselection <sub>EUTRAN</sub>	S	0			
Snonintrasearch	dB	Not sent			
Thresh <sub>serving, low</sub>	dB	44			
Thresh <sub>x, low</sub> (Note 2)	Thresh <sub>x.low</sub> (Note 2) dB 42				
Propagation Condition		ETU70			
Note 1: OCNG shall be use	d such that both	cells are	fully allocat	ted and a d	constant total t
spectral density is achieved for all OFDM symbols.					
Note 2 : This refers to the value of Thresh <sub>x, low</sub> which is included in E-UTRA system infor			A system inforr		
threshold for the UT	RA target cell.				

Table A.4.3.1.3.1-2: Cell specific test parameters for cell 1 (E-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 <sub>oc</sub>	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 <sub>x, high</sub> (Note 1)	dB	44			
Note 1 : This refers to the value of Thresh <sub>x, high</sub> which is included in UTRA system information, and is a threshold for the E-UTRA target cell					

Table A.4.3.1.3.1-3: Cell specific test parameters for cell 2 (UTRA)

#### 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 <sub>SI-UTRA</sub>	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

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	E-UTRAN cell
T1 end Active cell condition			Cell1	UE shall perform reselection to cell 1 during T1 for subsequent iterations of the test
	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 ce	CP length of cell 1		normal	
E-UTRA PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
Time offset 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	Ith	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	

Parameter	Unit	Ce	ll 1		
		T1	T2		
E-UTRA RF Channel		1			
Number					
BW <sub>channel</sub>	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		
PDCCH_PA	dB				
PDCCH_PB	dB				
PDSCH_PA	dB				
PDSCH_PB	dB				
OCNG_RA <sup>Note1</sup>	dB				
OCNG_RB <sup>Note1</sup>	dB				
Qrxlevmin	dBm/15kHz	-140	-140		
$N_{oc}$	dBm/15kHz	-98			
RSRP	dBm/15kHz	-87	-101		
$\hat{E}_{s}/I_{ot}$	dB	11	-3		
Snonintrasearch	dB	Not sent			
Thresh <sub>serving, low</sub>	dB	46 (-94dBm)			
Thresh <sub>x, low</sub> (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.4.3.2.1.2-2: Cell specific test parameters for cell re-selection E-UTRA FDD to UTRA TDD test case (cell 1)

Parameter	Unit	Cell 2 (UTRA)				
Timeslot Number		0		DwPTS		
		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 <sub>oc</sub>	dBm/1.28 MHz	-80				
PCCPCH RSCP	dBm	-72	-72	n.a.	n.a.	
Propagation Condition		AWGN				
Qrxlevmin	dBm	-103				
Qoffset1 <sub>s,n</sub>	dB	C1, C2: 0				
Qhyst1₅	dB	0				
Thresh <sub>x, high</sub> (Note2)	dB	46 (-94dBm)				
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 <sub>x, high</sub> which is included in UTRA system information, and is a threshold for the E-UTRA 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)

#### 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 <sub>SI-UTRA</sub>	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.4.3.3.1-3. 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.4.3.3.1-1: General test parameters for EUTRA TDD- lower priority UTRA FDD inter RAT cell reselection test case

Parameter		Unit	Value	Comment	
Initial condition	Active cell		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 F	PRACH configuration		53	As specified in table 5.7.1-3 in TS 36.211	
Uplink-downlink configuration of cell 1			1	As specified in table 4.2.2 in TS 36.211	
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211	
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.	
DRX cycle length		S	1.28	The value shall be used for all cells in the test	
T1		S	85	T1 need to be defined so that cell re-selection reaction time is taken into account.	
T2		S	25	T2 need to be defined so that cell re-selection reaction time is taken into account.	

### 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 <sub>channel</sub>	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	7		
PHICH_RA	dB			
PHICH_RB	dB		0	
PDCCH_RA	dB	1		
PDCCH_RB	dB	7		
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA <sup>Note 1</sup>	dB	]		
OCNG RB <sup>Note 1</sup>	dB			

Qqualmin for UTRA neighbour cell		dB	-20	
Qrxlevmin for UTRA neighbour cell		dBm	-115	
Qrxlevmi	า	dBm	-140	
N <sub>oc</sub>		dBm/15 kHz	-98	
RSRP		dBm/15 KHz	-86	-102
$\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$		dB	12	-4
$\hat{E}_s/N_{oc}$		dB	12	-4
Treselection <sub>EUTRAN</sub>		S	0	
Snonintrasearch		dB	Not sent	
Thresh <sub>serving, low</sub>		dB	44	
Thresh <sub>x, low</sub> (Note 2)		dB	42	
Propagation Condition			AWGN	
Note 1: 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. This refers to the value of Thresh <sub>x, low</sub> 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 <sub>oc</sub>	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 <sub>x, high</sub> (Note 1)	dB	48			
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%.
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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 <sub>SI-UTRA</sub>	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. 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.

The ranking of the cells shall be made according to the cell reselection criteria specified in TS36.304.

Para	meter	Unit	Value	Comment
Initial	Active cell		Cell 1	UE is on cell 1 in the initialisation phase, so that reselection to
condition				cell 2 occurs during T2
T2 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
condition	Neighbour		Cell2	
	cell			
T3 end	Active cell		Cell 1	UE shall perform reselection to cell 1 during T3
condition	Neighbour		Cell 2	
	cell			
Uplink-downl	link		1	As specified in table 4.2.2 in TS 36.211
configuration	of cell 1			
Special subfi	rame		6	As specified in table 4.2.1 in TS 36.211
configuration	of cell 1			
PRACH conf	iguration of		53	As specified in table 4.7.1-3 in TS 36.211
cell 1				
CP length of	cell 1		Normal	
Time offset b	etween cells		3 ms	Asynchronous cells
Access Barri	ng	-	Not	No additional delays in random access procedure.
Information			sent	
Treselection		s	0	
DRX cycle le	ngth	S	1,28	
HCS			Not	
			used	
T1		S	>20	During T1, cell 2 shall be powered off, and during the off time
				the primary scrambling code shall be changed, The intention is
				to ensure that cell 2 has not been detected by the UE prior to
				the start of period T2.
T2		S	85	T2 needs to be defined so that cell re-selection reaction time is
				taken into account
T3		S	25	T3 needs to be defined so that cell re-selection reaction time is
				taken into account.

# 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

# 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 <sub>channel</sub>	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 <sup>Note 1</sup>	dB	]		
OCNG_RB <sup>Note 1</sup>	dB	]		

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Q <sub>rxlevmin</sub>	dBm/15kHz	-140	-140	-140		
N <sub>oc</sub>	dBm/15kHz		-98			
RSRP	dBm/15kHz	-87 -87		-87		
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	11	11	11		
Thresh <sub>x, high</sub> (Note2)	dB	24(-79dBm)				
S <sub>nonintrasearch</sub> 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 v system information	ote2: This refers to the value of Thresh <sub>x, high</sub> 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	-inf	11	-3	-inf	11	-3
I <sub>oc</sub>	dBm/1.28 MHz			-6	30		
PCCPCH RSCP	dBm	-inf -72 -86 n.a.			n.a.		
Propagation Condition		AWGN					
Qrxlevmin	dBm	-103					
Qoffset1 <sub>s,n</sub>	dB	C1, C2: 0					
Qhyst1 <sub>s</sub>	dB			(	)		
Snonintrasearch	dB			Not	sent		
Thresh <sub>serving, low</sub>	dB			24 (-7	9dBm)		
Thresh <sub>x, low</sub> (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 th system informa	Note2: This refers to the value of Thresh <sub>x, low</sub> which is included in UTRA system information, and is a threshold for the F-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 T2, to the moment when the UE camps on cell 2, and starts to send the SYNCH-UL sequence in the UpPTS for sending the RRC CONNECTION REQUEST message on cell 2.

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

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

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

#### 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 <sub>SI_UTRA</sub>	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

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN cell
T1 end	Active cell		Cell1	UE shall perform reselection to cell 1 during T1 for
condition				subsequent iterations of the test
	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	configuration of		1	As specified in table 4.2.2 in TS 36.211
cell 1				
Special subframe configuration			6	As specified in table 4.2.1 in TS 36.211
of cell 1				
PRACH configura	ation of cell 1		53	As specified in table 4.7.1-3 in TS 36.211
CP length of cell	1		Normal	
Time offset betwe	een cells		3 ms	Asynchronous cells
Access Barring Ir	nformation	-	Not	No additional delays in random access procedure.
			sent	
Treselection		s	0	
DRX cycle length		s	1,28	
HCS			Not	
			used	
T1		S	85	
T2		S	25	

Parameter	Unit	Ce	ll 1			
		T1	T2			
E-UTRA RF Channel			1			
Number						
BW <sub>channel</sub>	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 <sup>Note1</sup>	dB					
OCNG_RB <sup>Note1</sup>	dB					
Qrxlevmin	dBm/15kHz	-140	-140			
N <sub>oc</sub>	dBm/15kHz	-9	98			
RSRP	dBm/15kHz	-87	-101			
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	11	-3			
Snonintrasearch	dB	Not	sent			
Thresh <sub>serving, low</sub>	dB	46 (-9-	4dBm)			
Thresh <sub>x, low</sub> (Note2)	dB	24 (-79dBm)				
Propagation Condition	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 Thresh <sub>x, low</sub> which is included in E-UTRA system information, and is a threshold for the UTRA target cell						

# Table A.4.3.4.2.1.2-2: Cell specific test parameters for cell re-selection E-UTRA TDD to UTRA TDD test case (cell 1)

Parameter	Unit		Cell 2	(UTRA)		
Timeslot Number		C	0		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 <sub>oc</sub>	dBm/1.28 MHz		-8	30		
PCCPCH RSCP	dBm	-72	-72	n.a.	n.a.	
Propagation Condition			AW	'GN		
Qrxlevmin	dBm		-1	03		
Qoffset1 <sub>s,n</sub>	dB	C1, C2: 0				
Qhyst1 <sub>s</sub>	dB	0				
Thresh <sub>x, high</sub> (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 th UTRA system in target cell	Note2: This refers to the value of Thresh <sub>x, high</sub> which is included in UTRA system information, and is a threshold for the E-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)

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 <sub>SI_UTRA</sub>	Maximum repetition period of relevant system info blocks that needs to be received by the UE to camp on a call: 1280 ms is assumed in this test case.
	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		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	
T3 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
condition	Neighbour cell		Cell1	
E-UTRA PI	RACH configuration		53	As specified in table 5.7.1-3 in TS 36.211
Uplink-dow cell 1	nlink configuration of		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1			6	As specified in table 4.2.1 in TS 36.211
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	<85	T1 need to be defined so that cell re-selection reaction time is taken into account. 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
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 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

Parameter	Unit	Cell 1				
		T1	T2	Т3	T4	
E-UTRA RF Channel			1			
number						
BW <sub>channel</sub>	MHz		1	0		
OCNG Patterns defined in			OP.2	TDD		
A.3.2.2.2 (OP.2 TDD)						
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB					
PDCCH_RA	dB		C	)		
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA <sup>Note 1</sup>	dB	7				
OCNG_RB <sup>Note 1</sup>	dB	7				
Qrxlevmin for UTRA	dBm		-1(	03		
neighbour cell						
Qrxlevmin	dBm		-14	40		
$N_{oc}$	dBm/15 kHz		-1(	04		
RSRP	dBm/15 KHz	-82	-82	-107	-107	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	22	22	-3	-3	
$\hat{E}_s/N_{oc}$	dB	22	22	-3	-3	
TreselectionEUTRAN	S	0				
Snonintrasearch	dB	Not sent				
Thresh <sub>serving, low</sub>	dB	44				
Thresh <sub>x, low</sub> (Note 2)	dB	24				
Propagation Condition	agation Condition ETU70					
Note 1: OCNG shall be use	all be used such that both cells are fully allocated and a constant total					
transmitted power s	pectral density i	density is achieved for all OFDM symbols.				
Note 2: This refers to the va	alue of Thresh <sub>x, Ic</sub>	esh <sub>x, low</sub> which is included in E-UTRA system				
information, and is a threshold for the UTRA target cell.						

Table A.4.3.4.3.1-2: Cell specific test parameters for cell 1 (E-UTRA)

Table A.4.3.4.3.1-3: Cell specific test parameters for cell 2 (UTRA)

Parameter	Unit	Cell 2 (UTRA)							
Timeslot Number		0			DwPTS				
		T1	T2	T3	T4	T1	T2	T3	T4
UTRA RF Channel Number (Note1)			Channel 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 <sub>oc</sub>	dBm/1.28 MHz	z -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 <sub>EUTRA</sub>	dBm				-1	40			
UE_TXPWR_MAX_RACH	dBm				2	1			
Treselection	S				(	0			
Thresh <sub>x, high</sub> <sup>(Note2)</sup>	dB	44							
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 <sub>x, high</sub> which is included in UTRA system information, and is a threshold for the E-UTRA target cell									

#### A.4.3.4.3.2 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<sub>evaluateUTRA\_TDD</sub> + T<sub>SI-UTRA</sub>

Where:

$T_{evaluateUTRA_TDD}$	19.2s, See Table 4.2.2.5.2-1
T <sub>SI-UTRA</sub>	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	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation
condition				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	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2.
condition				Cell 2 is a GSM cell.
E-UTRA RI	- Channel Number		1	1 E-UTRA FDD carrier frequency
GSM ARFO	CN		1	12 GSM BCCH carriers are used
PRACH co	nfiguration		4	As specified in table 5.7.1-2 in TS 36.211
Access Barring Information		-	Not Sent	No additional delays in random access
5				procedure.
CP length of	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 <sub>channel</sub>	MHz		10
OCNG Patterns defined in			
A.3.2.1.1 (OP.2 FDD)		O	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 <sup>Note 1</sup>	dB	]	
OCNG_RB <sup>NOTE 1</sup>	dB		

Qrxlevmin	dBm	-140				
N <sub>oc</sub>	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				
Snonintrasearch	dB	Not sent				
Thresh <sub>serving, low</sub>	dB	44				
Thresh <sub>x, low</sub> (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 <sub>x, low</sub> which is included in E-UTRA system information, and is a threshold for GSM target coll						

Paramatar	Unit	Cell 2 (GSM)		
Farameter	Onit	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 <sub>measureGSM</sub>	See Table 4.2.2.5.3-1 in section 4.2.2.5.3.
T <sub>BCCH</sub>	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

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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.

	Parameter	Unit	Value	Comment
Initial	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation
condition				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	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2.
condition				Cell 2 is a GSM cell.
E-UTRA R	F Channel Number		1	1 E-UTRA TDD carrier frequency
GSM ARF	CN		1	12 GSM BCCH carriers are used
Uplink-dow	nlink configuration of		1	As specified in table 4.2.2 in TS 36.211
cell 1				
Special sul	bframe configuration		6	As specified in table 4.2.1 in TS 36.211
for cell 1	-			
PRACH configuration for cell 1			53	As specified in table 5.7.1-3 in TS 36.211
CP length	of cell 1		Normal	
Access Barring Information		-	Not Sent	No additional delays in random access
	-			procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
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.4.4.2-1: General test parameters for E-UTRA TDD GSM cell re-selection test case

Table A 4 4 2-2. Cell-si	necific test narame	eters for Cell 1 – F	-UTRA TDD cell
	peonio test parame		

Parameter	Unit	Cell 1		
		T1	T2	
E-UTRA RF Channel			1	
number				
BW <sub>channel</sub>	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 <sup>Note 1</sup>	dB			
OCNG_RB <sup>Note 1</sup>	dB			

Qrxlevmin	dBm		-140	
N <sub>oc</sub>	dBm/15 kHz		-98	
RSRP	dBm/15 KHz	-89 -102		
$\hat{E}_{s}/I_{ot}$	dB	9	-4	
$\hat{E}_s/N_{oc}$	dB	9	-4	
TreselectionEUTRAN	S		0	
Snonintrasearch	dB	N	ot sent	
Thresh <sub>serving, low</sub>	dB	44		
Thresh <sub>x, low</sub> (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 <sub>x, low</sub> which is included in E-UTRA system				
information, and is a threshold for GSM target cell.				

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Poromotor	Unit	Cell 2 (GSM)	
Farameter	Onit	T1	T2
Absolute RF Channel Number		ARFCN 1	I
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 <sub>measureGSM</sub>	See Table 4.2.2.5.3-1 in section 4.2.2.5.3.
T <sub>BCCH</sub>	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 <sub>channel</sub> )	MHz	10	
HRPD RF Channel Number			1	Only one HRPD carrier
				frequency is used.
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in
				TS 36.211
E_UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random
	-			access procedure.
T1		S	30	
T2		S	30	

Parameter	Unit	Cell	1
		T1	T2
E-UTRA RF Channel number		1	
BW <sub>channel</sub>	MHz	10	)
OCNG Patterns defined in A.3.2.1.1			
(OP.2 FDD)		OP.2 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 <sup>Note 1</sup>	dB		
OCNG_RB <sup>Note 1</sup>	dB		
$N_{oc}$	dBm/15 kHz	-98	3
RSRP	dBm/15 KHz	-89	-100
$\hat{E}_{s}/I_{ot}$	dB	9	-2
$\hat{E}_s/N_{oc}$	dB	9	-2
Treselection <sub>EUTRAN</sub>	S	0	
Snonintrasearch	dB	Not s	ent
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-14	0
Qrxlevminoffset	dB	0	
Pcompensation	dB	0	
S <sub>ServingCell</sub>	dB	51	40
Thresh <sub>serving, low</sub>	dB	43	}
Propagation Condition AWGN			GN
Note 1: CNG shall be used such that	both cells are fully	allocated and a constant	total transmitted
power spectral density is ach	leved for all OFDIN	a symbols.	

# Table A.4.5.1.1.1-2: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

Parameter	Unit	Cel	12
		T1	T2
HRPD RF Channel Number		1	
Control E <sub>b</sub> (38.4 kbps)	۹D	0.	4
N <sub>t</sub>	aв	2	1
Control $E_{b}$ (76.8 kbps)	dD	4.0	0
N <sub>t</sub>	aв	10	5
$\hat{I}_{or}/I_{oc}$	dB	0	0
I <sub>oc</sub>	dBm/ 1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-3	-3
Propagation Condition		AW	GN
SnonServingCell,x		-6	6
Treselection	S	0	)
hrpd-CellReselectionPriority	-	0	
Thresh <sub>x, low</sub>		-1	4

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 <sub>evaluatHRPD</sub>	See Table 4.2.2.5.4-1
T <sub>SI-HRPD</sub>	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	
E-UTRA FDD RF	Channel Number		1	Only one FDD carrier frequency
				is used.
E-UTRA FDD Channel Bandwidth (BW channel)		MHz	10	
cdma2000 1X RF Channel Number			1	Only one cdma2000 1X carrier
				frequency is used.
E-UTRA FDD PRACH configuration			4	As specified in table 5.7.1-2 in
				TS 36.211
E_UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random
				access procedure.
T1		S	30	
T2		S	30	

Parameter	Unit	Ce	1
		T1	T2
E-UTRA RF Channel number		1	
BW <sub>channel</sub>	MHz	1	0
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	(	)
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA <sup>Note 1</sup>	dB		
OCNG_RB <sup>Note 1</sup>	dB		
N <sub>oc</sub> Note 2	dBm/15 kHz	(Hz -98	
RSRP Note 3	dBm/15 KHz	-89	-100
Ê <sub>s</sub> /I <sub>ot</sub>	dB	9	-2
$\hat{E}_s/N_{oc}$	dB	9	-2
Treselection <sub>EUTRAN</sub>	S	(	)
Snonintrasearch	dB	Not	sent
cellReselectionPriority	-	1	
Qrxlevmin	dBm	-14	40
Qrxlevminoffset	dB	0	)
Pcompensation	dB	0	)
S <sub>ServingCell</sub>	dB	51	40
Thresh <sub>serving, low</sub>	dB	4	3
Propagation Condition	dition AWGN		
Note 1: CNG shall be used such that t	ooth cells are full	y allocated and a constan	t total transmitted
<ul> <li>power spectral density is achieved for all OFDM symbols.</li> <li>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</li> </ul>			
$N_{ac}$ to be fulfilled.			
Note 3: SRP levels have been derived	I from other para	meters for information pu	rposes. They are not

# Table A.4.6.1.1.1-2: Cell Specific Test Parameters for E-UTRAN FDD (Cell # 1)

Parameter	Unit	Cel	12
		T1	T2
cdma2000 1X RF Channel Number		1	
$\frac{\text{Pilot} \mathbf{E}_{c}}{\mathbf{I}_{or}}$	dB	[-7]	
$\frac{\text{Sync} E_{c}}{I_{\text{or}}}$	dB	[-16]	
$\frac{Paging E_{c}}{I_{or}}$ (4.8 kbps)	dB	[-1	2]
$\hat{I}_{or}/I_{oc}$	dB	[0]	[0]
I <sub>oc</sub>	dBm/ 1.2288 MHz	-55	
CDMA2000 1xRTT Pilot Strength	dB	[-10]	[-10]
Propagation Condition		AWGN	
SnonServingCell,x		[-20]	
Treselection	S	0	
oneXRTT-CellReselectionPriority	-	0	
Thresh <sub>x, low</sub>		[-2	8]

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:

Tevaluatcdma2000 1X	See Table 4.2.2.5.5-1
T <sub>SI-cdma2000 1X</sub>	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.

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	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chann	el Number		1	Only one FDD carrier frequency is
				used.
Channel Bandwidth	n (BW <sub>channel</sub> )	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 configurati	on		4	As specified in table 5.7.1-2 in TS
				36.211
Time offset between cells			3 ms	Asynchronous cells
T1		s	5	
T2		S	≤5	
T3		S	1	

Parameter	Unit	Cell 1			Cell 2		
		T1	T2	T3	T1	T2	Т3
E-UTRA RF Channel			1			1	
Number							
BW <sub>channel</sub>	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		0			0	
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\mathbf{\hat{E}}_{s}/\mathbf{I}_{ot}$	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	on 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 model	and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be fulfilled.						
Note 3: RSRP levels have themselves.	Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves						

# Table A.5.1.1.1-2: Cell specific test parameters for E-UTRAN FDD-FDD intra frequency handover test case

## 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<sub>interrupt</sub>, 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.

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 cas	se
--	----

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/PDCCHPH	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	n (BW <sub>channel</sub> )	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.	
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		
Т3		S	1		

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	T3	T1	T2	Т3
E-UTRA RF Channel			1			1	
Number							
BW <sub>channel</sub>	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		•			0	
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\hat{E}_{s}/I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}^{\rm Note \ 2}$	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 use	Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved						

# Table A.5.1.2.1-2: Cell specific test parameters for E-UTRAN TDD-TDD Intra frequency handover test case

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.5.1.2.2 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<sub>interrupt</sub>, 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

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 cas	se
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Parameter		Unit	Value	Comment		
PDSCH parameters	S		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1		
PCFICH/PDCCH/P	HICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1		
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1		
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2		
Final condition	Active cell		Cell 2			
E-UTRA RF channe	el number		1, 2	Two FDD carriers are used		
Channel Bandwidth	n (BW <sub>channel</sub> )	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 configuration	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	n 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			

Parameter	Unit	Cell 1 Cell 2						
		T1	T2	T3	T1	T2		Т3
E-UTRA RF Channel		1 2						
number								
BW <sub>channel</sub>	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2 FDD	OP.2	OP.2 FDD	0	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		0			0		
PHICH_RB	dB		0			0		
PDCCH_RA	dB							
PDCCH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RA <sup>Note 1</sup>	dB							
OCNG_RB <sup>Note 1</sup>	dB							
$\hat{E}_{s}/I_{ot}$	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	d such that both cells	s are fully all	ocated and a	constant total tra	nsmitted powe	er spectral densit	ty is a	chieved for
all OFDM symbols.								

#### Table A.5.1.3.1-2: Cell specific test parameters for E-UTRAN FDD-FDD Inter frequency handover test case

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.

## 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 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

Parar	neter	Unit	Value	Comment
			DL Reference Measurement	
PDSCH paramete	rs		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.
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 Bandwidt	th (BW <sub>channel</sub> )	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 Int	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 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
T1		S	5	
T2		S	≤5	
Т3		S	1	

Parameter	Unit	Cell 1		Cell 2				
		T1	T2	Т3	T1	T2		Т3
E-UTRA RF Channel			1	•		2		
number								
BW <sub>channel</sub>	MHz		10			10		
OCNG Patterns		OP.1	OP.1	OP.2 FDD	OP.2	OP.2 FDD	0	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 <sup>Note 1</sup>	dB							
OCNG_RB <sup>Note 1</sup>	dB							
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{oc}$	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	n 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								

# Table A.5.1.4.1-2: Cell specific test parameters for E-UTRAN TDD-TDD Inter frequency handover test case

Note 1. OCING 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.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<sub>interrupt</sub>, 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.

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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 parameters			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 channel	el number		1, 2	Two FDD carriers are used
Channel Bandwidth	n (BW <sub>channel</sub> )	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 between cells			3 ms	Asynchronous cells
T1		S	≤5	
T2		S	1	

Parameter	Unit	Cell	1	Cell 2			
		T1	T2	T1	T2		
E-UTRA RF Channel		1		2			
number							
BW <sub>channel</sub>	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			0			
PHICH_RB	dB	0		0			
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7		
$N_{_{oc}}$ Note 2	dBm/15 kHz			-98			
$\hat{E}_{s}/N_{oc}$	dB	4	4	-Infinity	7		
RSRP <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-Infinity	-91		
Propagation Condition				AWGN			
Note 1: OCNG shall b	e used such that b	oth cells are fully all	located and a con	stant total transmitted p	ower spectral		
density is achi	eved for all OFDM	symbols.					
Note 2: Interference fr	om other cells and	Id noise sources not specified in the test is assumed to be constant over					
· ·				. N			
subcarriers an	d time and shall b	e modelled as AWG	N of appropriate p	power for $\frac{1}{-}$ to be full	filled.		
Note 3: RSRP levels h	have been derived	from other parameter	ers for information	purposes. They are no	ot settable		
parameters th	emselves.						

# 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

## 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	As specified in section A.3.2.2.1
			Channel R.0 TDD	
			DL Reference Measurement	As specified in section A.3.2.2.2
PCFICH/PDCCH/F	HICH parameters		Channel R.6 TDD	
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 TDD carriers
DRX			OFF	Non-DRX test
Access Barring Info	ormation	-	Not sent	No additional delays in random
				access procedure
Special subframe of	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 configurati	on		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	

Parameter	Unit	Ce	1	Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		1			2	
Number						
BW <sub>channel</sub>	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 <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
$N_{oc}^{ m Note 3}$	dBm/15 kHz	-98				
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4	-Infinity	5	
SCH_RP <sup>Note 4</sup>	dBm/15 kHz	-94	-94	-Infinity	-93	
$\hat{E}_{s}/N_{oc}$	dB	4	4	-Infinity	5	
Propagation Condition			A	WGN		
Note 1: OCNG shall b	e used such that bo	th cells are fully	allocated and a	constant total tra	ansmitted power	
spectral densi	ty is achieved for all	OFDM symbols			•	
Note 2: The resources	s for uplink transmis	sion are assigne	d to the UE prio	r to the start of ti	me period T2.	
Note 3: Interference f	rom other cells and i	noise sources no	ot specified in the	e test is assume	d 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 SC	CH_RP levels have b	been derived from	n other paramet	ers for information	on purposes.	
They are not	settable parameters	themselves.	•			

# 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

## 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

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 cell
Neighbouring cell		Cell 2	UTRAN cell
Final condition Active cell		Cell 2	UTRAN cell
Channel Bandwidth (BWchannel)	MHz	10	
Gap Pattern Id		0	As specified in Table 8.1.2.1-1 started before T2 starts
E-UTRAN FDD measurement quantity		RSRP	
Inter-RAT (UTRAN FDD) measurement quantity		CPICH Ec/N0	
b2-Threshold1	dBm	-91	Absolute E-UTRAN RSRP
			threshold for event B2
b2-Threshold2-UTRA	dB	-18	Absolute UTRAN CPICH Ec/N0
			threshold for event B2
Hysteresis	dB	0	
TimeToTrigger	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	MHz	10	
(BWchannel)			
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	

Parameter	Unit	Cell 1 (E-UTRA)		RA)			
		T1	T2	T3			
E-UTRA RF Channel			1				
number							
BW <sub>channel</sub>	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						
PHICH_RB	dB	0					
PDCCH_RA	dB						
PDCCH_RB	dB	1					
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\hat{E}_s/I_{ot}$	dB	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			
Propagation Condition	Condition AWGN						
Note 1: OCNG shall be used such that both cells are fully allocated and a							
constant total transmitted power spectral density is achieved for all							
OFDM symbols.							

# Table A.5.2.1.1-2: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD handover test case (cell 1)

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	Ce	A)			
		T1	T2	T3		
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 <sub>oc</sub>	dBm/3,84 MHz	-70	-70	-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 ${\sf I}_{\rm or}$						

# 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<sub>interrupt</sub>, 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.

T2

Т3

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/ (E-UTRAN TDD)	PHICH parameters		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 c	onfiguration		1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 1
E-UTRAN TDD m	easurement quantity		RSRP	
Inter-RAT (UTRA quantity	FDD) measurement		CPICH Ec/lo	
b2-Threshold1		dBm	-91	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-U1	ΓRA	dB	-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 config	guration Id		0	As specified in Table 8.1.2.1-1; to start before T2 starts
E-UTRA RF Channel Number			1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth		MHz	10	
(BW <sub>channel</sub> )				
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 p	eriod		False	Post verification is not used.
T1		S	5	

≤5

1

s

s

Table A.5.2.2.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD handover

Parameter	Unit	Cell 1 (E-UTRAN)					
		T1	T2	Т3			
E-UTRA RF Channel			1				
Number							
BW <sub>channel</sub>	MHz		10				
OCNG Pattern defined							
in A.3.2.2.1 (OP.1 TDD)			חחד				
and in A.3.2.2.2 (OP.2		UF.1	עטו	OF.2 IDD			
TDD)							
PBCH_RA							
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA		0					
PHICH_RB	dB						
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA <sup>Note 1</sup>							
OCNG_RB <sup>Note 1</sup>							
RSRP	dBm/15 kHz	-98	-98	-98			
Ê /I	dB	0	0	0			
$\mathbf{E}_{s}/\mathbf{I}_{ot}$	0.2	Ũ		Ŭ			
	dB	0	0	0			
$E_s/N_{oc}$	uв	0	0	0			
N	dBm/15 kHz		-98	I			
<sup>1</sup> v <sub>oc</sub>							
Propagation Condition			AWGN				
Note 1: OCNG shall be us	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.5.2.2.1-2: Cell specific test parameters for E-UTRAN TDD (cell 1) for handover to UTRAN FDD (cell # 2)

# 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	ll 1 (UTR/	4)	
		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 <sub>oc</sub>	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 loopNote 2:The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor.					

## 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.
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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<sub>interrupt</sub>, 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.

Para	meter	Unit	Value	Comment
PDSCH paramete	ers		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	
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			0	L3 filtering is not used
DRX				OFF
T1		S	20	
T2		S	7	
Т3		s	1	

#### Table A.5.2.3.1 -1: General test parameters for E-UTRAN FDD-GSM handover

Parameter	Unit	Cell 1				
		T1, T2	T3			
BW <sub>channel</sub>	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 <sup>Note1</sup>	dB					
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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 sh	all be used s	uch that cell 1 is fully allocate	ed and a constant total			
<ul> <li>Note 1. Conversion be used such that cell it is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.</li> <li>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</li> </ul>						
AVUGN OF	appropriate p	ower for a to be fulfilled.				
Note 3: RSRP lever purposes.	els have beer They are not	n derived from other parameter sthemse	ers for information lves.			

# Table A. A.5.2.3.1 - 2: Cell Specific Parameters for Handover from E- UTRAN FDD to GSM cell case (cell 1)

Table A.5.2.3.1 - 3: Cell Specific Parameters for Handover from E-UTRAN FDD to GSM cell case (cell2)

Parameter	Unit	Cell 2 (GSM)			
Farameter	Unit	T1	T2, T3		
Absolute RF Channel Number		ARFCN 1			
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:

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 $T_{Handover delay} = 90 \text{ ms} (Table 5.3.3.2.1-1) + T_{offset} + T_{UL}$ 

- T<sub>offset</sub>: 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.

				•		
Parameter		Unit	Value	Comment		
PDSCH parame	ters		DL Reference Measurement	As specified in section A.3.1.1.2		
			Channel R.0 TDD			
PCFICH/PDCCH	I/PHICH		DL Reference Measurement	As specified in section A.3.1.2.2		
parameters			Channel R.6 TDD	-		
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	configuration of		1	As specified in table 4.2.2 in TS		
cell 1				36.211		
Special subfran	ne configuration		6	As specified in table 4.2.1 in TS		
of cell 1				36.211		
CP length of cell	1		Normal			
Time offset betw	veen cells		3 ms	Asynchronous cells		
Access Barring I	Information		Not Sent	No additional delays in random		
				access procedure.		

# 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

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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	
Т3	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 <sub>channel</sub>	MHz		10		
OCNG Pattern defined in A.3.2.2.1 (OP.1 TDD) and in A.3.2.1.2 (OP.2		OP.1 TDD		OP.2 TDD	
TDD)					
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 <sup>Note 1</sup>	dB				
OCNG_RB <sup>Note 1</sup>	dB				
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	11	-3	-3	
$\hat{E}_{s}/N_{oc}$	dB	11	-3	-3	
N <sub>oc</sub>	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 s transmitted power spectral der	such that cell is fully nsity is achieved for	y allocated a	nd a constar symbols.	nt total	

Parameter	Unit	Cell 2 (UTRA)						
Timeslot Number	0 Dv			0			;	
		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 <sub>oc</sub>	dBm/1.28 MHz	-80						
PCCPCH RSCP	dBm	-86	-72	-72	n.a.			
Propagation Condition		AWGN						
* Note: In the case of is the primar	* Note: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number							

Table A.5.2.4.1.2-3: Cell specific test parameters for cell search E-UTRA to UTRA case (cell 2)

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<sub>interrupt</sub>, 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.

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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	I)
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 Information			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		dBm	-79	Absolute UTRAN RSCP
				threshold for event B2
T1		S	5	
T2		S	≤ 10	
ТЗ		S	1	
15		1		

Parameter	Unit	Cell 1 (E-UTRA)				
		T1		T2		Т3
E-UTRA RF Channel				1		
number						
BW <sub>channel</sub>	MHz					
OCNG Patterns		OP.1 FD	D	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_RANOTE 1	dB					
	dB			1		
$\hat{E}_{s}/N_{oc}$	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	used such that bot	h cells are	fully a	allocated a	nd a	constant
total transmitte	ed power spectral	density is	achie	ved for all	OFDI	VI symbols.

# 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)

# 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			
		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 the primary frequency's channel number.								

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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<sub>interrupt</sub>, 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

Par	rameter	Unit	Value	Comment
PDSCH paramete	ers		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 c	onfiguration 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	
Inter-RAT measurement quantity			GSM Carrier RSSI	
E-UTRA RF Channel Number			1	E-UTRA RF Channel Number
E-UTRA Channel (BW <sub>channel</sub> )	Bandwidth	MHz	10	E-UTRA Channel Bandwidth (BW <sub>channel</sub> )
Threshold other system		dBm	-80	Absolute GSM carrier RSSI threshold for event B1.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
T1		S	20	
T2		S	7	
T3		S	1	

Parameter		Unit	Cell 1				
			T1, T2	Т3			
E-UTRA F	RF Channel Number		1				
<b>BW</b> <sub>channel</sub>		MHz	1	0			
OCNG Pa	tterns 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	A Contraction of the second se	dB					
PBCH_R	В	dB					
PSS_RA		dB					
SSS_RA		dB					
PCFICH_	RB	dB					
PHICH_R	RA	dB					
PHICH_ RB		dB		0			
PDCCH_ RA		dB					
PDCCH_ RB		dB					
PDSCH_ RA		dB					
PDSCH_ RB		dB					
OCNG_ RA Note1		dB					
OCNG_R	B <sup>Note1</sup>	dB					
$\hat{E}_{s}/N_{oc}$		dB	4				
$N_{\it oc}$ Note 2		dBm/15 kHz	-98 (AWGN)				
$\hat{E}_{s}/I_{ot}$		dB	4				
RSRP <sup>Note</sup>	3	dBm/15kHz	-94				
Propagation	on Condition		AW	GN			
NOTE 1:	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.5.2.6.1-2: Cell Specific Parameters for Handover E- UTRAN TDD to GSM handover test case

#### Table A A.5.2.6.1-3: Cell Specific Parameters for Handover E-UTRAN to GSM cell case (cell 2)

Baramatar	Unit	Cell 2 (GSM)		
Falameter	Unit	T1	T2, T3	
Absolute RF Channel		ARECN 1		
Number		ARFONT		
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<sub>offset</sub>: 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

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 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 Bandwidth (BW <sub>channel</sub> )	MHz	10	
E-UTRAN FDD measurement quantity		RSRP	
Inter-RAT (UTRAN FDD) measurement		CPICH Ec/N0	
quantity			
DRX		OFF	Non-DRX test
Access Barring Information	-	Not sent	No additional delays in random
			access procedure
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier
			frequency is used.
E-UTRA Channel Bandwidth (BWchannel)	MHz	10	
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Monitored UTRA FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell before T2.
Post-verification period		False	•
T1	s	≤5	
T2	s	1	

Parameter		Unit	Cell 1 (	E-UTRA)			
			T1 T2				
E-UTRA	RF Channel			1			
number							
BW <sub>channel</sub>		MHz		10			
OCNG P	atterns 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_R	A	dB					
PBCH_R	В	dB					
PSS_RA		dB					
_SSS_RA		dB					
PCFICH_	_RB	dB					
PHICH_F	RA	dB					
PHICH_F	RB	dB		0			
PDCCH_	RA	dB					
PDCCH_	RB	dB					
PDSCH_	RA	dB					
PDSCH_	RB	dB					
OCNG_F	OCNG_RA <sup>Note 1</sup>						
OCNG_F	OCNG_RB <sup>Note 1</sup>						
$\hat{E}_{s}/I_{ot}$		dB	0	0			
$N_{oc}$ Note	2	dBm/15 kHz	-!	98			
$\hat{E}_s / N_{oc}$		dB	0	0			
RSRP <sup>Not</sup>	e 3	dBm/15 KHz	-98	-98			
Propagat	ion Condition		AW	/GN			
Note 1:	OCNG shall be use	d such that both	cells are fully	allocated and			
	a constant total transmitted power spectral density is achieved for all OFDM symbols.						
Note 2:	Note 2: Interference from other cells and noise sources not specified in						
	the test is assumed	to be constant of	over subcarrier	s and time			
				Ν			
	and shall be model	ed as AWGN of	appropriate po	ower for <sup>- · oc</sup>			
	to be fulfilled.						
Note 3:	RSRP levels have l	been derived fro	m other param	eters for			
	information purpose	es. They are not	settable paran	neters			
	themselves.						

# 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 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 <sub>oc</sub>	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 loopNote 2:The power of the OCNS channel that is added shall make the total power from the cell to be equal to I or				

# Table A.5.2.7.1-3: Cell specific test parameters for E-UTRAN FDD to UTRAN FDD handover test case (cell 2)

### 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 +  $T_{interrupt}$ , 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	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	
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	

Parameter	Unit	Cell 1			
		T1	T2		
BW <sub>channel</sub>	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	dB				
OCNG_RB	dB				
${ m \hat{E}}_{ m s}/{ m I}_{ m ot}$	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			
Note 1: OCNG sh transmitte Note 2: Interferen assumed AWGN of	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. 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 lev	RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves				

#### 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

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 2 (GSM)		
Farameter	Unit	T1	T2	
Absolute RF Channel		ARECN 1		
Number		ARFONT		
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:

 $T_{Handover delay} = 190 \text{ ms} (Table 5.3.3.2.1-1) + T_{offset} + T_{UL}$ 

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 $T_{offset}$ : 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<sub>UL</sub>: 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	As specified in section A.3.2.2.1
			Channel R.0 TDD	
PCFICH/PDCCH/	PHICH		DL Reference Measurement	As specified in section A.3.2.2.2
parameters			Channel R.6 TDD	
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	

Parameter	Unit	Cell 1				
		T1	T2			
BW <sub>channel</sub>	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	dB					
OCNG_RB	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		Δ	WGN			
Condition						
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: Interferen	ote 2: Interference from other cells and noise sources not specified in the test is					
assumed	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 lev	3: RSRP levels have been derived from other parameters for information					
purposes.	purposes. They are not settable parameters themselves.					

#### 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

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 (GSM)		
Farameter	Unit	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:

 $T_{Handover delay} = 190 \text{ ms} (Table 5.3.3.2.1-1) + T_{offset} + T_{UL}$ 

 $T_{offset}$ : 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	meter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDC0 parameters	CH/PHICH		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 ce	ell 1		Normal	
Uplink-downlin of cell 1	k configuration		1	As specified in table 4.2.2 in TS 36.211
Special subfraction configuration of	me of cell 1		6	As specified in table 4.2.1 in TS 36.211
Time offset bet	tween cells		3 ms	Asynchronous cells
Access Barring	g Information		Not Sent	No additional delays in random access procedure.
TimeToTrigger	-	S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
T1		S	5	During T1, cell 2 shall be powered off, and during the off time the physical layer cell identity shall be changed.
T2		s	1	

Parameter	Unit	Cell 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 IDD)						
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 <sub>oc</sub>	dBm/15kHz	-9	98			
RSRP	dBm/15kHz	-95	-95			
SCH_RP	dBm/15 kHz	-95	-95			
Propagation Condition AWGN						
Note 1: OCNG shall be used such that cell is fully allocated and a						
constant total transmitted power spectral density is achieved for						
all OFDM symbols.						
Note 2: RSRP and SCH_	RP levels have bee	en derived from	other			
parameters for inf	ormation purposes	. They are not	settable			
parameters thems	selves.					

# 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)

# Table A.5.2.10.1-3: Cell specific test parameters for E-UTRAN TDD to unknown UTRAN TDD cell test case (cell 2)

Parameter	Unit	Cell 2 (UTRA)			
Timeslot Number		0 DwPT		PTS	
		T1	T2	T1	T2
UTRA RF Channel Number <sup>Note1</sup>		Channel 2			
PCCPCH_Ec/lor	dB	Ť	3		
DwPCH_Ec/lor	dB			0	)
OCNS_Ec/lor	dB	-	3		
$\hat{I}_{or}/I_{oc}$	dB	-infinity	13	-infinity	13
$I_{oc}$	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-infinity	-70	n.a	a.
Propagation Condition			AW	GN	
Note1: In the case of multi-frequency cell, the UTRA RF Channel Number is the					
<ul> <li>primary frequency's channel number.</li> <li>Note2: P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.</li> </ul>					

## 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.

Para	ameter	Unit	Value	Comment
PDSCH parameters	S		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	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidth	n (BW <sub>channel</sub> )	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)	measurement		CDMA2000 HRPD Pilot	
quantity			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 c	ell list size		8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-Search	WindowSize		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	
Т3		S	1	

# Table A.5.3.1.1-1: General test parameters for E-UTRAN FDD to HRPD handover test case

Parameter	Parameter Unit Cell 1 (E-UTRA)		4)			
		T1	T2	T3		
E-UTRA RF Channel			1			
number						
BW <sub>channel</sub>	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 <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
N Note 2	dBm/15		-98			
I V oc	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 bo	th cells are fu	Ily 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 $ \Lambda $	$V_{oc}$ to be fulfi	lled.		
Note 3: RSRP levels have be purposes. They ar	en derived fr	om other par e parameters	ameters for ir themselves.	nformation		

# 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 2 (HRPD)		
		T1	T2	Т3
$\frac{\text{Control} E_{b}}{N_{t}}$ (38.4 kbps)	dB	21		
$\frac{\text{Control} E_{b}}{N_{t}}$ (76.8 kbps)	dB	18		
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0	0
I <sub>oc</sub>	dBm/1.2288 MHz		-55	
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3	-3
Propagation Condition		AWGN		

# Table A.5.3.1.1-3: Cell specific test parameters for HRPD (cell # 2) for handover from E-UTRAN FDD cell (cell #1)

### 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<sub>interrupt</sub>, 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	3		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 Bandwidth	(BW <sub>channel</sub> )	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	
Inter-RAT (cdma20	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 Chann	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 neigh	bour 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	
Т3		S	1	

Parameter		Unit	Cell 1 (E-UTRA)				
			T1	T2	T3		
E-UTRA RF Char	nnel			1			
number							
BW <sub>channel</sub>		MHz		10			
OCNG Patterns d	lefined in		OP.1	I FDD	OP.2		
A.3.2.1.1 (OP.1 F	DD) and				FDD		
in A.3.2.1.2 (OP.2	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 <sup>Note 1</sup>		dB					
OCNG_RB <sup>Note 1</sup>		dB					
N Note 2		dBm/15	-98				
r, oc		kHz		-			
		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 Cond	dition			AWGN	•		
Note 1: OCNG	shall be us	ed such that	both cells are	e fully allocate	ed and a		
consta	nt total trans	smitted powe	r spectral de	nsity is achiev	ved for all		
OFDM	OFDM symbols.						
Note 2: Interference from other cells and noise sources not specified in the							
test is	test is assumed to be constant over subcarriers and time and shall						
			• .	. N <sub>a</sub>			
be moo	delled as AV	NGN of appro	opriate powe	rtor <sup>oc</sup> to b	be fulfilled.		
Note 3: RSRP	levels have	been derived	d from other	parameters fo	or 		
information purposes. They are not settable parameters themselves.							

# 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 2 (cdma2000 1X)				
		T1	T2	Т3		
$\frac{\text{Pilot}  \text{E}_{c}}{\text{I}_{or}}$	dB	-7				
$\frac{\text{Sync } \text{E}_{c}}{\text{I}_{or}}$	dB	-16				
$\frac{Paging E_c}{I_{or}}$ (4.8 kbps)	dB	-12				
$\hat{I}_{or}/I_{oc}$	dB	-infinity 0 0				
I <sub>oc</sub>	dBm/1.2288 MHz	-55				
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10	-10		
Propagation Condition			AWGN	AWGN		

# 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)

#### 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<sub>interrupt</sub>, 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	S		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/P	HICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Initial conditions Active cell Neighbouring cell			Cell 1	E-UTRAN FDD cell
			Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidth	n (BW <sub>channel</sub> )	MHz	10	
DRX			OFF	Non-DRX test
Access Barring Information		-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)		MHz	10	
HRPD RF Channel Number			1	One HRPD carrier frequency is used.
cdma2000-SearchWindowSize			8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		S	≤5	
T2		S	1	

Parameter Unit Cell 1 (E-UTRAN FDD)						
		T1	T2			
E-UTRA RF Channel			1			
number						
BW <sub>channel</sub>	MHz		10			
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					
$N_{_{oc}}$ Note 2	dBm/15 kHz	-	98			
RSRP <sup>Note 3</sup>	dBm/15 kHz	-98	-98			
$\hat{E}_s/N_{oc}$	dB	0	0			
$\hat{E}_s/I_{ot}$	dB	0	0			
Propagation Condition	opagation Condition AWGN					
<ul> <li>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.</li> <li>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</li> </ul>						
$N_{oc}$ to be fulfilled.						

# Table A.5.3.3.1-2: Cell specific test parameters for E-UTRAN FDD cell#1 for handover to unknown HRPD cell # 2

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

Parameter	Unit	Cell 2 (HRPD)		
		T1	T2	
Control E <sub>b</sub> (38.4		2	1	
N <sub>t</sub>	dB			
kbps)				
<u>Control <math>E_{b}</math></u> (76.8		1	8	
N <sub>t</sub>	dB			
kbps)				
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0	
I <sub>oc</sub>	dBm/1.22 88 MHz	-55		
CDMA2000 HRPD Pilot Strength	dB	-infinity	-3	
Propagation Condition		AW	GN	

#### 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)

### 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<sub>interrupt</sub>, where:

T<sub>interrupt</sub> 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

Para	meter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/P	HICH 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 Bandwidth	l (BW <sub>channel</sub> )	MHz	10	
DRX			OFF	Non-DRX test
Access Barring Information		-	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 B (BWchannel)	andwidth	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-U	Cell 1 (E-UTRAN FDD)			
		T1	T2			
E-UTRA RF Channel number			1			
BW <sub>channel</sub>	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	(	)			
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA	dB					
OCNG_RB	dB					
$N_{oc}^{\rm Note 2}$	dBm/15 kHz	-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 transmitter						
power spectral density is	achieved for all OFDM	1 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 t	hemselves.	-				

# 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	T2			
Pilot E <sub>c</sub> I <sub>or</sub>	dB	-7				
Sync E <sub>c</sub> I <sub>or</sub>	dB	-16				
$\frac{\text{Paging } E_{c}}{I_{or}}$ (4.8 kbps)	dB	-12				
$\hat{I}_{or}/I_{oc}$	dB	-infinity	0			
I <sub>oc</sub>	dBm/1.22 88 MHz	-55				
CDMA2000 1xRTT Pilot Strength	dB	-infinity	-10			
Propagation Condition		AW	GN			

### 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<sub>interrupt</sub>, where:

T<sub>interrupt</sub> 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.

Parameter		Unit	Value	Comment
PDSCH parameter	rs		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	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chan	nel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidt	h (BW <sub>channel</sub> )	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 Inf	ormation	-	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 betwee	en cells	ms	3	Asynchronous cells
T1	T1		5	
T2		ms	200	
Т3		S	3	

# Table A.6.1.1.1-1: General test parameters for E-UTRAN FDD intra-frequency RRC Re-establishment test case

### 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	Т3	T1	T2	Т3
E-UTRA RF Channel			1			1	
Number							
BW <sub>channel</sub>	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 <sup>Note 1</sup>	dB	]					
OCNG RB <sup>Note 1</sup>	dB						

$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4	
$N_{oc}^{}$ Note 2	dBm/15 KHz		-98					
$\hat{E}_s / N_{oc}$	dB	7	-Infinity	-Infinity	4	4	4	
RSRP Note 3	dBm/15 KHz	-91	-Infinity	-Infinity	-94	-94	-94	
Propagation Condition		AWGN						
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over								
subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{_{oc}}^{}$ to be fulfilled.								
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.								

#### 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:

$$T_{re-establish\_delay} = T_{UL\_grant} + T_{UE\_re-establish\_delay}$$
.

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.

 $T_{UE\_re-establish\_delay} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$ 

 $N_{\text{freq}} = 1$ 

 $T_{search} = 100 \text{ ms}$ 

 $T_{SI} = 1280$  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	meter	Unit	Value	Comment
PDSCH parameters	3		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/P	HICH 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	el Number (cell 1)		1	
E-UTRA RF Chann	el Number (cell 2)		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	(BW <sub>channel</sub> )	MHz	10	
N310		-	1	Maximum consecutive out-of-sync indications from lower layers
N311		-	1	Minimum consecutive in-sync indications from lower layers
T310		ms	0	Radio link failure timer; T310 is disabled
T311		ms	5000	RRC re-establishment timer
DRX			OFF	
CP length			Normal	
Access Barring Information		-	Not Sent	No additional delays in random access procedure.
PRACH configuration index			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells		ms	3	Asynchronous cells
T1		S	5	
T2		ms	200	
Т3		s	5	

#### ETSI

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	T3	T1	T2	Т3
E-UTRA RF Channel			1	•		2	
Number							
BW <sub>channel</sub>	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		0			0	
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7
$N_{oc}^{\rm Note 2}$	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							

#### Table A.6.1.2.1-2: Cell specific test parameters for E-UTRAN FDD inter-frequency RRC Reestablishment test case

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:

 $T_{re\text{-establish\_delay}} = T_{UL\_grant} + T_{UE\_re\text{-establish\_delay}}.$ 

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.

 $T_{UE\_re-establish\_delay} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$ 

$$N_{\text{freq}} = 2$$

 $T_{search} = 800 \text{ ms}$ 

 $T_{SI} = 1280$  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

Parameter		Unit	Value	Comment			
PDSCH parameter	S		DL Reference Measurement	As specified in section A.3.1.1.2			
			Channel R.0 TDD				
PCFICH/PDCCH/F	PHICH parameters		DL Reference Measurement	As specified in section A.3.1.2.2			
			Channel R.6 TDD				
Initial conditions	Active cell		Cell 1				
	Neighbouring cell		Cell 2				
Final condition	Active cell		Cell 2				
E-UTRA RF Chan	nel Number		1	Only one TDD carrier frequency is used.			
Channel Bandwidt	h (BW <sub>channel</sub> )	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 Inf	ormation	-	Not Sent	No additional delays in random access procedure.			
Special subframe of	configuration		6	As specified in table 4.2-1 in TS 36.211			
Uplink-downlink configuration			1	As specified in table 4.2-2 in TS 36.211			
PRACH configuration index			53	As specified in table 5.7.1-3 in TS 36.211			
Time offset betwee	en cells	μs	3	Synchronous cells			
T1		S	5				
T2		ms	200				
Т3		S	3				
Parameter	Unit	Cell 1			Cell 2		
---	------------	--------	-----------	-----------	----------	----------	----------
		T1	T2	Т3	T1	T2	Т3
E-UTRA RF Channel			1			1	
Number							
BW <sub>channel</sub>	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			0	
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
$N_{oc}^{\rm Note \; 2}$	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.							

#### Table A.6.1.3.1-2: Cell specific test parameters for E-UTRAN TDD intra-frequency RRC Reestablishment test case

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:

 $T_{re-establish\_delay} = T_{UL\_grant} + T_{UE\_re-establish\_delay}$ .

Where:

T<sub>UL\_grant</sub> = 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<sub>UL grant</sub> is not used.

 $T_{UE\_re-establish\_delay} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$ 

 $N_{\text{freg}} = 1$ 

 $T_{search} = 100 \text{ ms}$ 

 $T_{SI}$  = 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

Parar	neter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PH	IICH 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 Channe	el Number (cell 1)		1	
E-UTRA RF Channe	el Number (cell 2)		2	
E-UTRA TDD inter-f	requency carrier list		1	2 E-UTRA TDD carrier
size				frequencies in total: 1 intra- frequency and 1 inter-frequency
Channel Bandwidth	(BW <sub>channel</sub> )	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 Infor	mation	-	Not Sent	No additional delays in random access procedure.
Special subframe co	nfiguration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink cont	figuration		1	As specified in table 4.2-2 in TS 36.211
PRACH configuratio	n index		53	As specified in table 5.7.1-3 in TS 36.211
Time offset between	cells	μs	3	Synchronous cells
T1		S	5	
T2		ms	200	
Т3		s	5	

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	T3	T1	T2	Т3
E-UTRA RF Channel			1	•	2		
Number							
BW <sub>channel</sub>	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			0	
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\mathbf{\hat{E}}_{s}/\mathbf{I}_{ot}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7
$N_{oc}^{\rm Note 2}$	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.							

#### Table A.6.1.4.1-2: Cell specific test parameters for E-UTRAN TDD inter-frequency RRC Reestablishment test case

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:

 $T_{re-establish\_delay} = T_{UL\_grant} + T_{UE\_re-establish\_delay}$ .

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<sub>UL grant</sub> is not used.

 $T_{UE\_re-establish\_delay} = 50 \text{ ms} + N_{freq} * T_{search} + T_{SI} + T_{PRACH}$ 

$$N_{\text{freq}} = 2$$

 $T_{search} = 800 \text{ ms}$ 

 $T_{SI}$  = 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.

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
BW <sub>channel</sub>	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	dB		
OCNG_RB	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	
Io Note 2	dBm/9 MHz	-65.5	
RSRP Note 3	dBm/15 KHz	-95	
referenceSignalPower	dBm/15 KHz	-5	As defined in clause 6.3.2 in 3GPP TS 36.331.
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 parameter.

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 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.

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number		1	
BW <sub>channel</sub>	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	dB		
OCNG_RB	dB		
${ m \hat{E}_s}/{ m I_{ot}}$	dB	3	
$N_{oc}$	dBm/15 KHz	-98	
$\hat{E}_s/N_{oc}$	dB	3	
lo Note 2	dBm/9 MHz	-65.5	
RSRP <sup>Note 3</sup>	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	-	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	

#### Table A.6.2.2.1-1: General test parameters for FDD non-contention based random access test

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.6.2.2.1-2: 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 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.

Parameter	Unit	Value	Comments
BW	- MH7	10	
	-		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
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in 3GPP TS 36.211.
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
	dB	0	
	dB	0	
	UD dB		
	dB		
PDSCH RB	dB		
OCNG BA Note 1	dB		
OCNG RB Note 1	dB		
$\hat{\mathbf{r}}$ /I	dB	3	
$\mathbf{E}_{s}/\mathbf{I}_{ot}$		-	
$N_{oc}$	dBm/15 KHz	-98	
$\hat{E}_{s}/N_{oc}$	dB	3	
lo Note 2	dBm/9 MHz	-65.5	
RSRP <sup>Note 3</sup>	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	

Table A.6.2.3.1-1: General test	parameters for ]	TDD contention b	ased random a	access test
	purumotororor			

Propagation Condition

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.

Field	Value	Comment		
numberOfRA-Preambles	n52			
sizeOfRA-PreamblesGroupA	n52	No group B.		
powerRampingStep	dB2			
preambleInitialReceivedTargetPower	dBm-120			
preambleTransMax	n6			
ra-ResponseWindowSize	sf10	10 sub-frames		
mac-ContentionResolutionTimer	sf48	48 sub-frames		
maxHARQ-Msg3Tx	4			
Note: For further information see Section 6.3.2 in 3GPP TS 36.331.				

#### Table A.6.2.3.1-2: RACH-Configuration parameters for TDD contention based random access test

#### 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 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.

Parameter	Unit	Value	Comments
E-UTRA RF Channel Number	- Mu-	1	
OCNG Pattern			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 Uplink-downlink configuration	-	1	IN 3GPP TS 36.211. As specified in table 4.2-2 in 3GPP TS 36.211.
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB	0	
	dB	0	
	dB dB		
	UD dB		
PDSCH_RA	dB		
OCNG RA Note 1	dB		
OCNG RB Note 1	dB		
$\hat{\mathbf{r}}$ /I	dB	3	
$\mathbf{E}_{s}/\mathbf{I}_{ot}$		C C	
N <sub>oc</sub>	dBm/15 KHz	-98	
$\hat{E}_{s}/N_{oc}$	dB	3	
lo Note 2	dBm/9 MHz	-65.5	
RSRP <sup>Note 3</sup>	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	

#### Table A.6.2.4.1-1: General test parameters for TDD non-contention based random access test

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 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 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.

<b>5</b>		Value		
Parameter	Unit	Test 1	Test 2	Test 3
E-UTRA RF Channel Number		1	1	1
Channel Bandwidth (BW <sub>channel</sub> )	MHz	10	10	1.4
DRX cycle	ms	OFF	80 <sup>Note5</sup>	OFF
PDCCH/PCFICH/PHICH				
Reference measurement		R.6 FDD	R.6 FDD	R.8 FDD
channel <sup>Note1</sup>				
OCNG Pattern <sup>Note2</sup>		OP.2 FDD	OP.2 FDD	OP.4 FDD
PBCH_RA				
PBCH_RB				
PSS_RA				
SSS_RA				
PCFICH_RB				
PHICH_RA	dB	0	0	0
PHICH_RB				
PDCCH_RA				
PDCCH_RB				
OCNG_RA <sup>Note3</sup>				
OCNG_RB <sup>Note3</sup>				
N <sub>oc</sub>	dBm/15 kHz	-98	-98	-98
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	3	3	3
$\hat{E}_s/N_{oc}$	dB	3	3	3
L_Note4	dBm/9 MHz	-65.5	-65.5	N/A
10	dBm/1.08 MHz	N/A	N/A	-74.7
Propagation condition	-	AWGN	AWGN	AWGN
Note 1: For the reference measurem	nent channels	s, see section A	3.1.	•
Note 2: For the OCNG pattern, see s	section A.3.2			
Note 3: OCNG shall be used such th	nat both cells	are fully allocate	ed and a consta	nt total
$\hat{E}_s/N_{oc}$ lo <sup>Note4</sup> Propagation condition Note 1: For the reference measurem Note 2: For the OCNG pattern, see 3 Note 3: OCNG shall be used such the temperature density of the operature density of the property of the operature of the ope	dB dBm/9 MHz dBm/1.08 MHz - nent channels section A.3.2 nat both cells	3 -65.5 N/A AWGN s, see section A. are fully allocate	3 -65.5 N/A AWGN 3.1. ed and a consta	3 N/A -74.7 AWGN

#### Table A.7.1.1.1-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN FDD

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	
Field		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.7.1.1.1-3: drx-Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRANFDD

Field	Test2	Comment			
	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.7.1.1.2 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.

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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.

Parameter	Unit	Value			
		Test 1	Test 2	Test 3	
E-UTRA RF Channel Number		1	1	1	
Channel Bandwidth (BW <sub>channel</sub> )	MHz	10	10	1.4	
Special subframe configuration <sup>Note1</sup>		6	6	6	
Uplink-downlink configuration <sup>Note2</sup>		1	1	1	
DRX cycle	ms	OFF	80 <sup>Note7</sup>	OFF	
PDCCH/PCFICH/PHICH					
Reference measurement channel <sup>Note3</sup>		R.6 TDD	R.6 TDD	R.8 TDD	
OCNG Pattern <sup>Note4</sup>		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		0	0	0	
PHICH_RB		0	0	0	
PDCCH_RA					
PDCCH_RB					
OCNG_RA <sup>Note5</sup>					
OCNG_RB <sup>Note5</sup>					
N <sub>oc</sub>	dBm/1 5 kHz	-98	-98	-98	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	3	3	3	
$\hat{E}_s/N_{oc}$	dB	3	3	3	
	dBm/9 MHz	-65.5	-65.5	N/A	
Io <sup>Note6</sup>	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.					
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					

### Table A.7.1.2.1-1: Test Parameters for UE Transmit Timing Accuracy Tests for E-UTRAN TDD

settable parameter. Note 7: DRX related parameters are defined in Table A.7.1.2.1-3.

Field	Test 1	Test 2	Tset3	Comment	
Field	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.7.1.2.1-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN TDD

# Table A.7.1.2.1-3: DRX Configuration to be used in UE Transmit Timing Accuracy Test 2 for E-UTRANTDD

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):

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- 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.

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 <sub>TA</sub> = [128]
DRX		OFF	
T1	S	5	
T2	S	5	

#### Table A.7.2.1.1-1: General Test Parameters for E-UTRAN FDD Timing Advance Accuracy Test

Parameter	Unit	Value		
		T1	T2	
E-UTRA RF Channel Number			1	
BW <sub>channel</sub>	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 <sup>Note1</sup>	dB			
OCNG_RB <sup>Note1</sup>	dB			
Timing Advance Command $(T_A)$		31	[39]	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB		3	
N <sub>oc</sub>	dBm/15 KHz		-98	
$\hat{E}_s/N_{oc}$	dB		3	
lo <sup>Note2</sup>	dBm/9 MHz		-65.5	
Propagation Condition			AWGN	
Note 1: OCNG shall be used such that	at both cells are	fully allocated and a con	stant total transmitted power	
spectral density is achieved for	or all OFDM sym	bols.		
Note 2: Io level has been derived from other parameters for information purpose. It is not a settable				
parameter.				

#### Table A.7.2.1.1-2: Cell specific Test Parameters for E-UTRAN FDD Timing Advance Accuracy Test

# 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.

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 ( <i>T<sub>A</sub></i> ) 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 <sub>TA</sub> = 128
DRX		OFF	
T1	S	5	
T2	S	5	

#### Table A.7.2.2.1-1: General Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test

Parameter	Unit	Unit Value	Value	
		T1	T2	
E-UTRA RF Channel Number			1	
BW <sub>channel</sub>	MHz		10	
Special subframe configuration <sup>Note1</sup>			6	
Uplink-downlink configuration <sup>Note2</sup>			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	0		
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
	dB			
OCNG_RB <sup>Note3</sup>	dB			
Timing Advance Command $(T_A)$		31	[39]	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB		3	
N <sub>oc</sub>	dBm/15 KHz		-98	
$\hat{E}_s/N_{oc}$	dB		3	
Io <sup>Note4</sup>	dBm/9 MHz		-65.5	
Propagation Condition		AWGN		
Note 1: For the special subframe cont	figuration see table	4.2-1 in 3GPP TS 36	5.211.	
Note 2: For the uplink-downlink config	juration see table 4	.2-2 in 3GPP TS 36.2	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.				

#### Table A.7.2.2.1-2: Cell specific Test Parameters for E-UTRAN TDD Timing Advance Accuracy Test

 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 T	S 36.331.

#### 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.

Pa	arameter	Unit		Va	lue		Comment
			Test 1	Test 2	Test 3	Test 4	
PCFICH/PDCC parameters	CH/PHICH		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-UTRĂ RF C	hannel Number		1	1	1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Chan (BW <sub>channel</sub> )	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 <sub>out</sub> and the
parameters	Aggregation level	CCE	8	8	8	8	corresponding
(Note 1)	ρ <sub>Α</sub> , ρ <sub>Β</sub>		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 filtering	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 re	eporting mode		PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting	periodicity	ms	2	2	2	2	Minimum CQI reporting periodicity
Propagation 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	
Т3		S	0.5	0.5	0.5	0.5	
Note 1: PE Re	DCCH/PCFICH corre	espondii ent Cha	ng to the out o nnel.	f sync transmi	ssion paramet	ers need not b	e included in the

## Table A.7.3.1.1-1: General test parameters for E-UTRAN FDD out-of-sync testing

Parameter	Unit		Test 1		Test 2			
		T1	T2	T3	T1	T2	T3	
E-UTRA RF Channel			1		1			
Number								
BW <sub>channel</sub>	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 <sub>A</sub> , ρ <sub>B</sub>			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		•		2			
PHICH_RA	dB		0		-3			
PHICH_RB	dB							
PDSCH_RA	dB							
PDSCH_RB	dB							
OCNG_RANOLE 1	dB							
	dB		1	r		1	r	
SNR Note 6	dB	-4.7	-9.5	-13.5	-4.7	-9.5	-13.5	
Naa	dBm/15		-98			-98		
- 00	kHz							
Propagation condition			AWGN			AWGN		
Note 1: OCNG shall	be used such	that the res	sources in a	cell # 1 are	fully alloca	ated and a	constant	
total transmi	tted power spe	ectral densi	ty is achiev	ed for all C	OFDM syml	bols.		
Note 2: The uplink re	esources for Co	QI reporting	g are assig	ned to the	UE prior to	the start o	f time	
period T1.								
Note 3: The timers a period T1.	nd layer 3 filter	ring related	l paramete	rs are conf	igured prio	r to the sta	rt of time	
Note 4: The signal co	ontains PDCCI	H for UEs of	other than t	he device	under test	as part of C	CNG.	
Note 5: SNR levels of	correspond to t	he signal to	o noise rati	o over the	cell-specifi	c reference	signal	
REs.	·	2					-	
Note 6: The SNR in ti	me periods T1	, T2 and T	3 is denote	d as SNR1	, SNR2 an	d SNR3		
respectively	in figure A.7.3.	.1.1-4.						

# 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 3		Test 4				
		T1	T2	Т3	T1	T2	T3		
E-UTRA RF Channel			1			1			
Number									
BW <sub>channel</sub>	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 <sub>A</sub> , ρ <sub>B</sub>			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		0		2				
PHICH_RA	dB		0		-3				
PHICH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA	dB								
OCNG_RB	dB		I				1		
SNR Note 6	dB	-1.4	-5.5	-11.5	-2.3	-6.2	-12.2		
Naa	dBm/15		-98			-98			
	kHz								
Propagation condition			ETU 70 Hz			ETU 70 Hz	•		
Note 1: OCNG shall	be used such	that the res	sources in a	cell # 1 are	fully alloca	ated and a	constant		
total transm	itted power spe	ctral densi	ty is achiev	ed for all C	OFDM sym	bols.			
Note 2: The uplink r	esources for Co	QI reporting	g are assig	ned to the	UE prior to	the start o	f time		
period T1.									
Note 3: The timers a period T1.	and layer 3 filte	ring related	l paramete	rs are conf	igured prio	r to the sta	rt of time		
Note 4: The signal c	ontains PDCC	H for UEs of	other than t	he device	under test	as part of C	CNG.		
Note 5: SNR levels	correspond to t	he signal to	o noise rati	o over the	cell-specifi	c reference	signal		
Note 6: The SNR in	time periods T	1, T2 and T	3 is denote	ed as SNR	1, SNR2 a	nd SNR3			
respectively	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



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.

Parameter		Unit	Va	Comment			
			Test 1	Test 2	1		
PCFICH/PDC0	CH/PHICH		R.6 FDD	R.7 FDD	As specified in section		
parameters					A.3.1.2.1.		
					None of the PDCCH are		
					Intended for the UE under		
OCNG parameters			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			
E-UTRA RF C	hannel Number		1	1	One E-UTRA FDD carrier		
					frequency is used.		
E-UTRA Chan (BW <sub>channel</sub> )	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]		
			10		Annex B.2.3.2		
	DCI format		10	1C	As defined in section		
In sync	Number of Control		2	2	5.3.3.1.4 III 15 30.212		
transmission	OFDM symbols		2	2	the corresponding		
parameters	Aggregation level	CCE	4	4	hypothetical		
(Note 1)	ρ <sub>A</sub> , ρ <sub>B</sub>		0	-3	PDCCH/PCFICH		
	Ratio of PDCCH		0	-3	transmission parameters		
	to RS EPRE				are as specified in section		
	Ratio of PCFICH		4	1	and Table 7.6.1-2		
	to RS EPRE		4.0	4.0	As defined in eaction		
	DCI format		1A	1A	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	Aggregation level	CCE	8	8	hypothetical		
(Note 1)	ρ <sub>Α</sub> , ρ <sub>Β</sub>		0	-3	PDCCH/PCFICH		
					are as specified in section		
	Ratio of PDCCH	dB	4	1	7.6.1 and Table 7.6.1-1		
	TO RS EPRE	dB	4	1	respectively.		
	to RS EPRE	uВ	4				
DRX			OFF	OFF			
Layer 3 filtering	g		Enabled	Enabled	Counters:		
T310 timer		me	2000	2000	T310 = 1, $T310 = 1$		
T311 timer		ms	1000	1000	T311 is enabled		
Periodic CQI r	eportina mode	1110	PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1		
	<b>J</b>				in TS 36.213.		
CQI reporting	periodicity	ms	2	2	Minimum CQI reporting periodicity		
Propagation ch	nannel		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			
15 Nata 4		S	[ 1 	<u>  1</u>	 		
Note 1: PI	DCCH/PCFICH corr	espond	ing to the in-sy	/nc and out of	sync transmission		
pa	rameters need not	de inclu	aea in the Rel	rerence Measu	irement Channel.		

## Table A.7.3.2.1-1: General test parameters for E-UTRAN FDD in-sync testing

Parameter	Unit			Test	t 1			Test 2					
		T1	T2	T3	T4		T5	T1	T2	ТЗ	3 T.	4	T5
E-UTRA RF Channel				1							1		
Number													
BW <sub>channel</sub>	MHz	10 10											
Correlation Matrix				1x2 L	.ow			2x2 Low					
and Antenna													
Configuration													
OCNG Pattern										_		_	
defined in A.3.2.1			(	DP.2	FDD					OF	P.2 FD	D	
(FDD)													
ρ <sub>A</sub> , ρ <sub>B</sub>				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 dB												
	dB			0				-3					
	dB			Ŭ				, i i i i i i i i i i i i i i i i i i i					
PDSCH RA	dB												
PDSCH RB	dB												
OCNG RA <sup>Note 1</sup>	dB												
OCNG RB <sup>Note 1</sup>	dB												
SNR Note 6	dB	-1.4	-5.5	-11.	.5	-6.4	-1.4	-2.3	-6.2	2	-12.2	-7.3	-2.3
N	dBm/15			-98	3						-98		
1 voc	kHz												
Propagation condition			E	TU 7	0 Hz					ET	U 70 H	Ιz	
Note 1: OCNG shall	be used such t	hat the	resource	es in c	cell #	1 are	fully allo	cated a	and a c	onst	ant tot	al transr	nitted
power spect	ral density is a	chieved	for all O	FDM	sym	ools.							
Note 2: The uplink re	esources for CO	l repor	ting are	assigi	ned	to the l	JE prior	to the s	start of	time	period	d T1.	
Note 3: The timers a	nd layer 3 filter	ing rela	ted para	meter	rs ar	e config	gured pr	ior to th	ne star	t of ti	me pe	riod T1.	
Note 4: The signal co	ontains PDCCI	H for UE	s other t	than t	he d	evice u	nder tes	t as pa	rt of O	CNG	i.		
Note 5: SNR levels of	correspond to t	he signa	al to nois	e ratio		er the c	ell-spec	itic refe	erence	sign	al REs		_
Note 6: The SNR in	time periods T	I, I2, T3	3, 14 an	d 15 i	s de	noted a	is SNR1	, SNR2	2, SNR	3, SI	NR4 ai	nd SNR	5
respectively	in figure A.7.3.	2.1-3.											

# 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



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.

Pa	arameter	Unit		Va	Comment		
			Test 1	Test 2	Test 3	Test 4	1
PCFICH/PDC0	CH/PHICH		R.6 TDD	R.7 TDD	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	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	
E-UTRA RF C	hannel Number		1	1	1	1	One E-UTRA TDD carrier
							frequency is used.
E-UTRA Chan	nel Bandwidth	MHz	10	10	10	10	
(BW <sub>channel</sub> )							
Correlation Ma	trix and Antenna		1x2 Low	2x2 Low	1x2 Low	2x2 Low	Correlation Matrix and
Configuration							Antenna Configuration are
							defined in TS 36.101 [5]
							Annex B.2.3.2
	DCI format		1A	1A	1A	1A	As defined in section
<u> </u>				-	_	_	5.3.3.1.3 in TS 36.212
Out of sync	Number of Control		2	2	2	2	Out of sync threshold Q <sub>out</sub>
transmission	OFDIM symbols	0.05			-		and the corresponding
parameters	Aggregation level	CCE	8	8	8	8	
(Note I)	ρ <sub>A</sub> , ρ <sub>B</sub>		0	-3	0	-3	PDCCH/PCFICH
	Ratio of PDCCH	dB	4	1	4	1	transmission parameters
	to RS EPRE						7.6.1 and Table 7.6.1-1
	Ratio of PCFICH	dВ	4	1	4	1	respectively
DBY	to RS EPRE						respectively.
DRA Laviar 2 filtaria			UFF Enchlad	UFF	UFF	UFF Enchlad	Counterer
Layer 3 filterin	g		Enabled	Enabled	Enabled	Enabled	Noto 1: Noti
T210 timor			0	0	0	0	$T_{210} = 1$ , $T_{210} = 1$
T310 timer		mo	1000	1000	1000	1000	T310 IS disabled
Deriodia COL r	on orting mode	ms					As defined in table 7.2.2.1
Periodic CQI	eponing mode		PUCCH I-U	PUCCH I-U	PUCCH 1-0	PUCCH I-0	in TS 36.213.
CQI reporting	periodicity	ms	1	1	1	1	Minimum CQI reporting periodicity
Propagation cl	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		S	0.5	0.5	0.5	0.5	
Note 1: PI	DCCH/PCFICH corr	espond	ing to the out	of sync transm	nission parame	eters need not	be included in the
Re	eference Measurem	ent Cha	annel.				

## Table A.7.3.3.1-1: General test parameters for E-UTRAN TDD out-of-sync testing

Parameter	Unit		Test 1		Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW <sub>channel</sub>	MHz		10			10	
Correlation Matrix			1x2 Low			2x2 Low	
and Antenna							
Configuration							
Special subframe			6			6	
configuration <sup>Note1</sup>							
Uplink-downlink			1			1	
configuration <sup>Note2</sup>							
OCNG Pattern							
defined in A.3.2.2			OP.2 TDD			OP.2 TDD	
(TDD)							
ρ <sub>A</sub> , ρ <sub>B</sub>			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	1					
SSS_RA	dB	1					
PHICH_RA	dB		0		-3		
PHICH_RB	dB	1					
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG RA <sup>Note 3</sup>	dB						
OCNG_RB <sup>Note 3</sup>	dB						
SNR Note 8	dB	-5.1	-9.1	-13.1	-5.2	-9.2	-13.2
N	dBm/15		-98		-98		
IV <sub>oc</sub>	kHz						
Propagation condition			AWGN			AWGN	
Note 1: For the spec	ial subframe co	onfiguration	n see table	4 2-1 in 30	GPP TS 36	211	
Note 2: For the uplin	k-downlink cor	figuration	see table 4	.2-2 in 3GI	PP TS 36.2	211.	
Note 3: OCNG shall	be used such t	that the res	sources in (	cell # 1 are	fully alloca	ated and a	constant
total transmit	ted power spe	ctral densi	tv is achiev	ed for all C	OFDM svm	bols.	
Note 4: The uplink re	sources for C	QI reportine	are assiq	ned to the	UE prior to	the start o	f time
period T1.			5 0				
Note 5: The timers a	nd layer 3 filter	ring related	l paramete	rs are conf	igured prio	r to the sta	rt of time
period T1.		U U	•		•		
Note 6: The signal co	ontains PDCC	H for UEs of	other than t	he device	under test	as part of C	CNG.
Note 7: SNR levels of	orrespond to t	he signal to	o noise rati	o over the	cell-specifi	c reference	signal
REs.							
Note 8: The SNR in tir	ne periods T1, T	2 and T3 is	denoted as	SNR1, SNR	2 and SNR3	8 respectively	y in figure
Δ7331-4							

# 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 3		Test 4		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW <sub>channel</sub>	MHz		10			10	
Correlation Matrix			1x2 Low			2x2 Low	
and Antenna							
Configuration							
Special subframe			6			6	
configuration <sup>Note1</sup>							
Uplink-downlink			1			1	
configuration <sup>Note2</sup>							
OCNG Pattern							
defined in A.3.2.2			OP.2 TDD			OP.2 TDD	
(TDD)							
ρ <sub>A</sub> , ρ <sub>B</sub>			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 <sup>Note 3</sup>	dB						
OCNG_RB <sup>Note 3</sup>	dB						
SNR Note 8	dB	-1.4	-5.3	-11.3	-2.3	-5.9	-11.9
N	dBm/15		-98		-98		
1 ° 0C	kHz						
Propagation condition			ETU 70 Hz	2		ETU 70 Hz	2
Note 1: For the spec	ial subframe c	onfiguratio	n see table	4.2-1 in 30	GPP TS 36	5.211.	
Note 2: For the uplin	k-downlink cor	nfiguration	see table 4	.2-2 in 3GI	PP TS 36.2	211.	
Note 3: OCNG shall	be used such	that the res	sources in	cell # 1 are	fully alloca	ated and a	constant
total transmi	tted power spe	ctral densi	ty is achiev	ed for all C	OFDM sym	bols.	
Note 4: The uplink re	esources for Co	QI reporting	g are assig	ned to the	UE prior to	the start o	f time
period T1.							
Note 5: The timers a	and layer 3 filte	ring related	d paramete	rs are conf	igured prio	r to the sta	rt of time
period T1.							
Note 6: The signal c	ontains PDCCI	H for UEs o	other than i	the device	under test	as part of C	JCNG.
Note 7: SNR levels ( REs.	correspond to t	ne signal to	o noise rati	o over the	cell-specifi	c reterence	e signal
Note 8: The SNR in til A.7.3.3.1-4.	me periods T1, T	2 and T3 is	denoted as	SNR1, SNR	2 and SNR3	8 respectively	y in figure

# 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

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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.
Parameter		Unit	Va	lue	Comment		
			Test 1	Test 2	1		
PCFICH/PDC0	CH/PHICH		R.6 TDD	R.7 TDD	As specified in section		
parameters					A.3.1.2.2.		
					intended for the LIE 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 <sub>channel</sub> )	nel Bandwidth	MHz	10	10			
Correlation Ma	trix and Antenna		1x2 Low	2x2 Low	Correlation Matrix and		
Configuration					Antenna Configuration are		
					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 <sub>in</sub> and the corresponding		
parameters	Aggregation level	CCE	4	4	hypothetical		
(Note 1)	ρ <sub>A</sub> , ρ <sub>B</sub>		0	-3	PDCCH/PCFICH		
	Ratio of PDCCH		0	-3	transmission parameters		
	to RS EPRE		4	1	and Table 7.6.1-2		
	to RS EPRE		4		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 <sub>out</sub> and the corresponding		
parameters	Aggregation level	CCE	8	8	hypothetical		
(Note 1)	ρ <sub>Α</sub> , ρ <sub>Β</sub>		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 filtering	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 r	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	ETU 70 Hz			
T1 T0		S	0.5	0.5			
12		S	0.4	0.4			
T4		5	0.4	0.4			
T5		s	1	1			
Note 1: Pr	OCCH/PCFICH corr	espond	ing to the in-sy	/nc and out of	svnc transmission		
pa	rameters need not	be inclu	ded in the Ref	erence Measu	irement Channel.		

### Table A.7.3.4.1-1: General test parameters for E-UTRAN TDD in-sync testing

Parameter	Unit			Test	t 1			Test 2					
		T1	T2 .	Т3	T4		T5	T1	T2	T3	6 T4	1	T5
E-UTRA RF Channel				1							1		
Number													
BW <sub>channel</sub>	MHz			10	)						10		
Correlation Matrix				1x2 L	.ow					2	x2 Low	/	
and Antenna													
Configuration													
Special subframe				6							6		
configuration				-							4		
Uplink-downlink				1							1		
defined in A 2.2.2			(	די חר	חחד						יחד כי נ		
(TDD)			(	JF.2 I	ססו					Or	2 10	J	
ρ <sub>A</sub> , ρ <sub>B</sub>				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			~							0		
PHICH_RA	dB			0				-3					
PHICH_RB	dB												
PDSCH_RA	dB												
PDSCH_RB	dB												
OCNG_RA	dB												
OCNG_RB	dB				-								
SNR	dB	-1.4	-5.3	-11.	.3	-6.4	-1.4	-2.3	-5.9	9	-11.9	-7.3	-2.3
N <sub>oc</sub>	dBm/15			-98	3						-98		
	kHz												
Propagation condition			E	:1070	0 Hz					ΕI	U 70 F	IZ	
Note 1: For the spec	ial subframe co	onfigura	tion see	table	4.2-1	in 3G	PP TS 3	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							nitted						
power spectral density is achieved for all OFDM symbols.													
Note 4: I ne uplink resources for CQI reporting are assigned to the UE prior to the start of time period 11.													
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time period 11.													
Note 5. The signal contains PDUCH for UES other than the device under test as part of UCNG. Note 7: SNR levels correspond to the signal to noise ratio over the cell-specific reference signal REs													
Note 8: The SNR in t	Note 7: SNK levels correspond to the signal to noise ratio over the cell-specific reference signal RES.							5					
respectively in figure A.7.3.4.1-3.							~						

# Table A.7.3.4.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for in-sync radio linkmonitoring tests # 1 and # 2



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

Parameter		Unit	Value		Comment
			Test 1	Test 2	
PCFICH/PDC0 parameters	CH/PHICH		R.7 FDD	R.6 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	
E-UTRA RF C	hannel Number		1	1	One E-UTRA FDD carrier frequency is used.
E-UTRA Chan (BW <sub>channel</sub> )	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 <sub>out</sub> 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 <sub>A</sub> , ρ <sub>B</sub>		-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
Periodic CQI r	eporting 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 c	hannel		ETU 70 Hz	AWGN	
T1		S	4	32	
T2		S	1.6	12.8	
Т3		S	1.8	13	
Note 1: PD be	CCH/PCFICH cor	respond eferenc	ding to the out the Measurement	of sync transm nt Channel.	ission parameters need not

Parameter	Unit		Test 1			Test 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW <sub>channel</sub>	MHz		10			10	
Correlation Matrix			2x2 Low			1x2 Low	
and Antenna							
Configuration							
OCNG Pattern							
defined in A.3.2.1			UF.Z FDD			UF.Z FDD	
(FDD)			2			0	
$\rho_A, \rho_B$	15		-3			0	
PCFICH_RB	dB		1			4	
PDCCH_RA	dB		-3			0	
	dB		-3			0	
PBCH_RA	dB	-					
PBCH_RB	dB	-					
PSS_RA	dB	-					
SSS_RA	dB		-3			0	
	0B						
	0B						
	0B						
PDSCH_RB	0B						
	0B						
		2.2	6.2	10.0	47	0.5	12.5
SINK		-2.3	-0.2	-12.2	-4.7	-9.5	-13.5
N <sub>oc</sub>			-90			-90	
Propagation condition			ETU 70 Hz			AWGN	
Note 1: OCNG shall	be used such	that the res	sources in	cell # 1 are	fully alloca	ated and a	constant
total transmi	tted power spe	ctral densi	ty is achiev	ed for all C	OFDM syml	bols.	
Note 2: The uplink resources for CQI reporting are assigned to the UE prior to the start of time							f time
period T1.							
Note 3: The timers a	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.							CNG.
Note 5: SNR levels of	correspond to t	he signal t	o noise rati	o over the	cell-specifi	c reference	signal
KES.		4 TO an 17	FO :!				
INUTE D: I DE SINK IN	in figure A 7 3	1, 1∠ and 5 1-5	i 3 is denot	eu as SNR	I, SINKZ a	IIU SINKS	

# 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

Table A.7.3.5.1-3: DRX-Configuration for E-UTRAN FDD out-of-sync tests

Field	Test1 Value	Test2 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.7.3.5.1-4: TimeAlignmentTimer -Configuration for E-UTRAN FDD out-of-sync testing

Field	Test1	Test2	Comment
rieid	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

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#### 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.

Param	neter	Unit	Value	Comment			
PCFICH/PDCCH/PHICH 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	Number		1	One E-UTRA FDD carrier frequency is used.			
E-UTRA Channel Ban	dwidth (BW <sub>channel</sub> )	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 <sub>in</sub> and the corresponding hypothetical			
(Note 1)	Aggregation level	CCE	4	PDCCH/PCFICH transmission			
	ρ <sub>A</sub> , ρ <sub>B</sub>		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 <sub>out</sub> and the corresponding hypothetical			
parameters	Aggregation level	CCE	8	PDCCH/PCFICH transmission			
(Note 1)	ρ <sub>Α</sub> , ρ <sub>Β</sub>		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		S	0.4				
T5		S	4				
Note 1: PDCCH/P	CFICH correspondi	ng to th	e in-sync and	out of sync transmission			
parameters need not be included in the Reference Measurement Channel.							

### Table A.7.3.6.1-1: General test parameters for E-UTRAN FDD in-sync test in DRX

Parameter	Unit	Test 1						
		T1	T2	Т3	T4	T5		
E-UTRA RF Channel Number				1				
BW <sub>channel</sub>	MHz		10					
Correlation Matrix and				1x2 Low				
Antenna Configuration								
OCNG Pattern defined in								
A.3.2.1 (FDD)				OP.2 FDD				
ρα, ρβ				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	dB							
	dB	4 7	0.5	40.5	0.7	47		
SNR	dB	-4.7	-9.5	-13.5	-8.7	-4.7		
N <sub>oc</sub>	dBm/15			-98				
	kHz							
Propagation condition				AWGN				
Note 1: OCNG shall be used	such that the	resources in	cell # 1 are f	ully allocated	and a consta	int total		
transmitted power sp	pectral density	is achieved f	or all OFDM	symbols.				
Note 2: The uplink resources for CQI reporting are assigned to the CE phor to the start of time period					period 11.			
Note 3: The timers and layer 3 filtering related parameters are configured prior to the start of time period						ne perioa		
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 RF					l REs.			
Note 6: The SNR in time per	iods T1, T2, T	3, T4 and T5	is denoted as	SNR1, SNR	2, SNR3, SN	IR4 and		
SNR5 respectively in figure A.7.3.6.1-5.								

# 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

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: 7	<i>TimeAlignmentTimer</i> -Confi	guration for E-UTRAN	FDD out-of-sync testing
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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	Value		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 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 TDD carrier frequency is used.
E-UTRA Chan (BW <sub>channel</sub> )	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 <sub>out</sub> 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 <sub>A</sub> , ρ <sub>B</sub>		-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
Periodic CQI r	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 c	hannel		ETU 70 Hz	AWGN	
T1		S	4	32	
T2		S	1.6	12.8	
Т3		S	1.8	13	
Note 1: PD be	CCH/PCFICH cor	respond eferenc	ding to the out e Measureme	of sync transm nt Channel.	ission parameters need not

Parameter	Unit		Test 1		Test 2		
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			1	
Number							
BW <sub>channel</sub>	MHz		10			10	
Correlation Matrix			2x2 Low			1x2 Low	
and Antenna							
Configuration							
Special subframe			6			6	
configuration <sup>Note1</sup>							
Uplink-downlink			1			1	
configuration <sup>Note2</sup>							
OCNG Pattern							
defined in A.3.2.2			OP.2 TDD			OP.2 TDD	
(TDD)							
ρ <sub>Α</sub> , ρ <sub>Β</sub>			-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						
PHICH_RA	dB		-3			0	
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note3</sup>	dB						
OCNG_RB <sup>Note3</sup>	dB						
SNR Note 8	dB	-2.3	-5.9	-11.9	-5.1	-9.1	-13.1
N	dBm/15		-98			-98	
1,00	kHz						
Propagation condition			ETU 70 Hz			AWGN	
Note 1: For the spec	ial subframe c	onfiguration	n see table	4.2-1 in 30	GPP TS 36	.211.	
Note 2: For the uplin	k-downlink cor	figuration	see table 4	.2-2 in 3GI	PP TS 36.2	211.	
Note 3: OCNG shall	be used such	that the res	sources in o	cell # 1 are	fully alloca	ated and a	constant
total transmi	tted power spe	ctral densi	ty is achiev	ed for all C	OFDM syml	bols.	
Note 4: The uplink re	esources for Co	QI reporting	g are assigi	ned to the	UE prior to	the start o	f time
period T1.							
Note 5: The timers and layer 3 filtering related parameters are configured prior to the start of time						rt of time	
period T1.	period T1.						
Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.					DCNG.		
Note 7: SNR levels of	correspond to t	he signal to	o noise ratio	o over the	cell-specifi	c reference	signal
REs.							
Note 8: The SNR in	time periods T	1, 12 and 1	13 is denote	ed as SNR	1, SNR2 a	nd SNR3	
respectively	in figure A.7.3.	7.1-5.					

# Table A.7.3.7.1-2: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio linkmonitoring tests # 1 and # 2 in DRX

Table A.7.3.7.1-3: DRX-Configuration for E-UTRAN TDD out-of-sync tests

Field	Test1 Value	Test2 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	

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Field	Test1	Test2	Comment
Field	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.

Table A.7.3.7.1-4: TimeAlignmentTimer -Configuration for E-UTRAN TDD out-of-sync testing



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.

Param	neter	Unit	Value	Comment			
PCFICH/PDCCH/PHICH 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 <sub>channel</sub> )	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 <sub>in</sub> and the corresponding hypothetical			
(Note 1)	Aggregation level	CCE	4	PDCCH/PCFICH transmission			
	ρ <sub>Α</sub> , ρ <sub>Β</sub>		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 <sub>out</sub> and the corresponding hypothetical			
parameters	Aggregation level	CCE	8	PDCCH/PCFICH transmission			
(Note 1)	ρ <sub>A</sub> , ρ <sub>B</sub>		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				
12		S	1.6				
13		S	1.46				
14		S	0.4				
	051011 "	S	4				
paramete	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.7.3.8.1-1: General test parameters for E-UTRAN TDD in-sync test in DRX

Parameter	Unit	Test 1				
		T1	T2	T3	T4	T5
E-UTRA RF Channel Number			•	1		<u> </u>
BW <sub>channel</sub>	MHz			10		
Correlation Matrix and				1x2 Low		
Antenna Configuration						
Special subframe		6				
configuration <sup>Note1</sup>						
Uplink-downlink				1		
configuration <sup>Note2</sup>						
OCNG Pattern defined in						
A.3.2.2 (TDD)				OP.2 TDD		
ρ <sub>Α</sub> , ρ <sub>Β</sub>		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_RANOLES	dB					
OCNG_RB <sup>INOLES</sup>	dB		I	1		1
SNR	dB	-5.1	-9.1	-13.1	-9.1	-5.1
N	dBm/15			-98		
- + oc	kHz					
Propagation condition				AWGN		
Note 1: For the special subfr	ame configura	ation see table	e 4.2-1 in 3G	PP TS 36.211	l.	
Note 2: For the uplink-downl	ink configurati	on see table	4.2-2 in 3GP	P TS 36.211.		
Note 3: OCNG shall be used	such that the	resources in	cell # 1 are f	ully allocated	and a consta	ant total
transmitted power spectral density is achieved for all OFDM symbols.						
Note 4: The uplink resources	Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.					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 UE	s other than	the device u	nder test as p	art of OCNG	
Note 7: SNR levels correspondent	ond to the sign	nal to noise ra	atio over the o	cell-specific re	erence sign	al KES.
SNR5 respectively in	ote 8: The SNR in time periods 11, 12, 13, 14 and 15 is denoted as SNR1, SNR2, SNR3, SNR4 and SNR5 respectively in figure A 7.3.8.1-5					NR4 and

# 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

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 <sub>channel</sub> )			
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	

Parameter	Unit	Ce	ll 1	Cell 2	
		T1	T2	T1	T2
E-UTRA RF Channel			1		1
Number					
BW <sub>channel</sub>	MHz	1	0		10
OCNG Patterns					
defined in A.3.2.1.1		OP.1	FDD	OF	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		_		_
PHICH_RA	dB	(	)		0
PHICH_PB	dB	1			
PDCCH_RA	dB	1			
PDCCH_PB	dB	1			
PDSCH_RA	dB	1			
PDSCH_RB	dB				
OCNG_RA <sup>Note 1</sup>	dB				
OCNG_RB <sup>Note 1</sup>	dB				
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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 <sup>Note 4</sup>	dBm/15 KHz	-94	-94	-Infinity	-94
SCH_RP <sup>Note 4</sup>	dBm/15 KHz	-94	-94	-Infinity	-94
Propagation Condition		ETU70			
Note 1: OCNG shall be used	d such that both ce	ells are fully alloca	ted and a constan	t total transmitte	d 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 12.					
Note 5. Interference from other cens and noise sources not specified in the test is assumed to be constant over					
subcarriers and tim	e and shall be mo	delled as AWGN of	of appropriate pow	er for $N_{oc}$ to b	e fulfilled.
Note 4: RSRP and SCH_RF settable parameter	Plevels have been s themselves.	derived from othe	er parameters for i	nformation purpo	oses. They are not

## 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

### 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

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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	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 <sub>channel</sub> )			
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	1	(	Cell 2
		T1	T2	T1	T2
E-UTRA RF Channel		1			1
Number					
BW <sub>channel</sub>	MHz	1	0		10
OCNG Patterns					
defined in A.3.2.1.1		OP.1	FDD	OF	.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	1			
PDCCH_RA	dB				
PDCCH_RB	dB	1			
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA <sup>Note 1</sup>	dB				
OCNG_RB <sup>Note 1</sup>	dB				
${ m \hat{E}_s}/{ m I_{ot}}$	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 <sup>Note 4</sup>	dBm/15 KHz	-94	-94	-Infinity	-94
SCH_RP <sup>Note 4</sup>	dBm/15 KHz	-94	-94	-Infinity	-94
Propagation Condition			E	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 up	Dink transmission are	assigned to the UI	= prior to the star	t of time period 12.	nt over euboorriere
Note 5. Interference from ou		lices not specified			ni over subcamers
and time and shall I	be modelled as AWGN	l of appropriate po	ower 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.8.1.2.2 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.

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 alignent is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

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 FDD	)	
PCFICH/PDCCH/PHICH		DL Reference Me	easurement	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 <sub>channel</sub> )				
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.8.1.3.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

# 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	1	Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		1			1	
Number						
BW <sub>channel</sub>	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			0	
PHICH_RB	dB					
PDCCH_RA	dB					
PDCCH_RB	dB	1				
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46	
$N_{_{oc}}$ 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			E	TU70		
Note 1: OCNG shall be used	d such that both cells a	are fully allocated a	and a constant to	al transmitted pow	er 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	l of appropriate po	wer for $N_{_{oc}}$ to I	pe fulfilled.		
Note 3: RSRP and SCH_RF	Plevels have been der	ived from other pa	rameters for infor	mation purposes.	They are not settable	
parameters themselves.						

# 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
i lolu	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 Value	Test2 Value	Comment
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.

### 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 <sub>channel</sub> )	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	
Т3	s	5	

Parameter	Unit		Cell 1		Cell 2		
		T1	T2	T3	T1	T2	Т3
E-UTRA RF Channel			1	•		1	
Number							
BW <sub>channel</sub>	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 <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
Note 2	dBm/15 KHz			-9	8		
$\hat{E}_{s}/N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP <sup>Note 3</sup>	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP <sup>Note3</sup>	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 s	symbols.						
Note 2: Interference from other of	cells and noise sourc	es not specifie	ed in the test is	s assumed to	be constant o	ver subcarrier	s and time
and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be fulfilled.							

#### 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

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

### A.8.1.5.2 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.

### 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

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 parameters		DL Reference Measurement	As specified in section A.3.1.2.1
		Channel R.6 FDD	
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 <sub>channel</sub> )	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		ON	DRX related parameters are
			defined in Table A.8.1.6.1-3
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)
ТЗ	S	5	

# 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	T3	T1	T2	Т3
E-UTRA RF Channel			1			1	
Number							
BW <sub>channel</sub>	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 <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}$ Note 2	dBm/15 KHz			-9	8		
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP <sup>Note 3</sup>	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP <sup>Note3</sup>	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. 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 $N_{ca}$ 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.8.1.6.1-3: 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.

### 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 <sub>channel</sub> )	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	Ce	1	Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		1			1	
Number						
BW <sub>channel</sub>	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					
PHICH_RB	dB	(	)	0		
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
$N_{_{oc}}$ Note 3	dBm/15 kHz			-98		
RSRP <sup>Note 4</sup>	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.					er spectral density is	
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	N of appropriate po	ower for $N_{_{oc}}$ to b	e fulfilled.		
Note 4: RSRP and SCH_RF parameters themse	Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

### 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.

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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 alignent is not maintained and UE needs to use RACH to obtain UL allocation for measurement reporting.

Parameter	Unit	Value		Comment
		Test 1	Test 2	
		DL Reference	Measurement	
PDSCH parameters		Channel R.0 T	DD	As specified in section A.3.1.1.2
		DL Reference	Measurement	
PCFICH/PDCCH/PHICH		Channel R.6 T	DD	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		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.8.2.2.1-1: General test parameters for E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells when DRX is used

# 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	Unit	Cell 1		Cell 2			
		T1	T2	T1	T2		
E-UTRA RF Channel		1			1		
Number							
BW <sub>channel</sub>	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 0					
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$N_{_{oc}}$ Note 2	dBm/15 kHz	-98					
RSRP Note 3	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 <sup>Note 3</sup>	dBm/15 kHz	-94	-94	-Infinity	-94		
$\hat{E}_{s}/N_{oc}$	dB	4 4 -Infinity 4					
Propagation Condition	ETU70						
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is							
achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers							
and time and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be fulfilled.							
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

 
 Table 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		
Field	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			

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 section 10.1 in 3GPP TS 36.213.		

# 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

### 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.8.2.3 E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

### A.8.2.3.1 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 8.1.2.2.4.

The test scenario comprises of one E-UTRA TDD carrier and two cells as given in tables A.8.2.3.1-1 and A.8.2.3.1-2. 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.8.2.3.1-1: General test parameters for E-UTRAN TDD - TDD 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 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	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
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
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	μs	3	Synchronous cells
T1	S	5	
T2	s	≤10	
ТЗ	s	5	

# Table A.8.2.3.1-2: Cell specific test parameters for E-UTRAN TDD - TDD Intra-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			1	
Number							
BW <sub>channel</sub>	MHz		10			10	
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.2.1 (OP.1 TDD) and		TDD	TDD	TDD	TDD	TDD	TDD
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		0			0	
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB	]					
OCNG_RB <sup>Note 1</sup>	dB						

$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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 <sup>Note 3</sup>	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP <sup>Note3</sup>	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.           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.8.2.3.2 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 [47] 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 [47] ACK/NACK number is caused by two parts. Firstly, at least [35] ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement for UL/DL configuration #1 in Table 8.1.2.2.4.1-1 of Section 8.1.2.2.4.1. Secondly, given that continuous DL data allocation, additional [12] 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.

### A.8.2.4 E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

#### A.8.2.4.1 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 8.1.2.2.4. The requirement is verified in a DRX configuration.

The test scenario comprises of one E-UTRA TDD carrier and two cells as given in tables A.8.2.4.1-1, A.8.2.4.1-2, A.8.2.4.1-3 and A.8.2.4.1-4. 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.8.2.4.1-1: General test parameters for E-UTRAN TDD - TDD Intra-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 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	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	MHz	10	
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
A3-Offset	dB	-3	
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.8.2.4.1-3
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331.
Time offset between cells	μs	3	Synchronous cells
T1	S	5	
T2	S	≤30	UE should report cell within 25.6s (20 DRX cycles)
ТЗ	S	5	
Table A.8.2.4.1-2: Cell specific test parameters for E-UTRAN TDD - TDD Intra-frequency identification			
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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			1	
Number							
BW <sub>channel</sub>	MHz		10			10	
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.2.1 (OP.1 TDD) and		TDD	TDD	TDD	TDD	TDD	TDD
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		0			0	
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}^{ m Note 2}$	dBm/15 KHz			-9	8		
$\hat{E}_s / N_{oc}$	dB	8	8	8	-Infinity	11	11
RSRP <sup>Note 3</sup>	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
SCH_RP <sup>Note3</sup>	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. 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 a	as AWGN of appropri	iate power for	$N_{\scriptscriptstyle oc}$ to be fu	ılfilled.			
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

# Table A.8.2.4.1-3: DRX configuration for E-UTRAN TDD - TDD 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.8.2.4.1-4: TimeAlignmentTimer -Configuration for E-UTRAN TDD - TDD 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.

### A.8.2.4.2 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 +  $T_{identify CGI, intra}$  + 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.8.3 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 <sub>channel</sub> )			
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	

Parameter	Unit	Ce	ell 1	C	ell 2		
		T1	T2	T1 T2			
E-UTRA RF Channel			1		2		
Number							
BW <sub>channel</sub>	MHz	-	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						
PHICH_RB	dB		0		0		
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$N_{_{oc}}$ Note 3	dBm/15 kHz			-98			
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94	-Infinity	-91		
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4	-Infinity	7		
SCH_RP <sup>Note 4</sup>	dBm/15 kHz	-94	-94	-Infinity	-91		
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7		
Propagation Condition			E	TU70			
Note 1: OCNG shall be used	d such that both cells a	are fully allocated	and a constant tot	al transmitted powe	er spectral density is		
achieved for all OFI	DM symbols.						
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.							

# 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

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.8.3.1.2 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.

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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.

Parameter	Unit	Test 1 Test 2		Comment
		Value		
PDSCH parameters		DL Reference Me	easurement	As specified in section A.3.1.1.1 Note that
		Channel R.0 FDE	)	UE may only be allocated at On Duration
PCFICH/PDCCH/PHICH		DL Reference Me	easurement	As specified in section A.3.1.2.1.
parameters		Channel R.6 FD	)	
E-UTRA RF Channel		1,	2	Two FDD carrier frequencies are used.
Number				
Channel Bandwidth	MHz	1	0	
(BW <sub>channel</sub> )				
Active cell		Ce	ll 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		Nor	mal	
TimeToTrigger	S	(	0	
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.8.3.2.1-3
Time offset between cells		3	ms	Asynchronous cells
T1	S		5	
T2	S	5	30	

## 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

# 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	1	Cell 2			
		T1	T2	T1	T2		
E-UTRA RF Channel		1			2		
Number							
BW <sub>channel</sub>	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						
PHICH_RB	dB	0 0					
PDCCH_RA	dB	7					
PDCCH_RB	dB	1					
PDSCH_RA	dB	1					
PDSCH_RB	dB	]					
OCNG_RA <sup>Note 1</sup>	dB	]					
OCNG_RB <sup>Note 1</sup>	dB						
$N_{_{oc}}$ Note 2	dBm/15 kHz			-98			
RSRP <sup>Note 3</sup>	dBm/15 kHz	-94	-94	-Infinity	-91		
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7		
SCH_RP <sup>Note 3</sup>	dBm/15 kHz	-94	-94	-Infinity	-91		
$\hat{E}_{s}/N_{oc}$	dB	4	4	-Infinity	7		
Propagation Condition		ETU70					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers							
and time and shall I	be modelled as AWGN	l of appropriate po	wer for $N_{_{oc}}$ to b	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.8.3.2.1-3: 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
Field	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

# 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 aligment 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		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 <sub>channel</sub> )	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	1	Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		1			2	
Number						
BW <sub>channel</sub>	MHz	1	0		10	
OCNG Patterns						
defined in A.3.2.1.1						
(OP.1 FDD) and in		UF.1	FDD	UP	.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 0				
PDCCH_RA	dB					
PDCCH_RB	dB	]				
PDSCH_RA	dB	]				
PDSCH_RB	dB	]				
OCNG_RA <sup>Note 1</sup>	dB	1				
OCNG_RB <sup>Note 1</sup>	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	4	24	
$N_{_{oc}}$ Note 2	dBm/15 KHz			-98		
$\hat{E}_{s}/N_{oc}$	dB	4	4	4	24	
RSRP <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-94	-74	
SCH_RP <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-94	-74	
Propagation Condition			A	WGN		
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 I	be modelled as AWG	N of appropriate po	wer for $N_{_{oc}}$ to b	e fulfilled.		
Note 3: RSRP and SCH_RP	levels have been der	ived from other pa	rameters for inforr	mation purposes.	They are not settable	
parameters themse	lves.					

# 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
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.8.3.3.2 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 <sub>channel</sub> )	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	
ТЗ	S	5	

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	Т3
E-UTRA RF Channel			1			2	
Number							
BW <sub>channel</sub>	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	1					
PDSCH_RB	dB	1					
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4	4	-Infinity	7	7
a v Note 2	dBm/15 KHz						
N <sub>oc</sub>				0			
$\hat{E}_{s}/N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP <sup>Note3</sup>	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition		AWGN					
Note 1: OCNG shall be us	sed such that both	cells are full	y allocated a	ind a constar	nt total trans	mitted powe	r 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 $N_{\rm c}$ to be fulfilled.							
Note 2: DSPD and SCH DD lovels have been derived from other parameters for information purpases. They are							
not settable parameters themselves.							

#### 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

### 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.

## 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 <sub>channel</sub> )	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	

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			2	
Number							
BW <sub>channel</sub>	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 <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB	1					
$\hat{E}_{s}/I_{ot}$	dB	4 4 4 -Infinity 7					7
$N_{oc}$ Note 2	dBm/15 KHz			-9	8		
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP <sup>Note3</sup>	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						r 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 $N_{_{ m cc}}$ 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.8.3.5.1-2: 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

 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.

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### 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
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 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	Cell 1		Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		1		2	2	
Number						
BW <sub>channel</sub>	MHz	10	)	1	0	
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 <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
${ m \hat{E}}_{ m s}/{ m I}_{ m ot}$	dB	4	4	-Infinity	7	
$N_{_{oc}}$ Note 3	dBm/15 kHz			-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
SCH_RP <sup>Note 4</sup>	dBm/15 kHz	-94	-94	-infinity	-91	
$\hat{E}_{s}/N_{oc}$	dB	4	4	-Infinity	7	
Propagation Condition		ETU70				
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.						
Note 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 AWG	N of appropriate po	wer for $N_{_{oc}}$ to I	be fulfilled.		
Note 4: RSRP and SCH_RF	Plevels have been der	ived from other par	ameters for infor	mation purposes. The	ey are not settable	

### A.8.4.1.2 Test Requirements

parameters themselves

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.

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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 alignent timer to keep UE uplink time alignend. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignent 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.

Parameter	Unit	Test 1	Test 2	Comment
		Va	lue	
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	)	
E-UTRA RF Channel		1,	2	Two TDD carrier frequencies are used.
Number				
Channel Bandwidth	MHz	1	0	
(BW <sub>channel</sub> )				
Active cell		Ce	1	Cell 1 is on RF channel number 1
Neighbour cell		Ce	2	Cell 2 is on RF channel number 2
Gap Pattern Id		(	)	As specified in 3GPP TS 36.133 section
				8.1.2.1.
Uplink-downlink			1	As specified in 3GPP TS 36.211 section
configuration				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
A3-Offset	dB	-6		
Hysteresis	dB	0		
CP length		Normal		
TimeToTrigger	S	(	)	
Filter coefficient		(	)	L3 filtering is not used
PRACH configuration		4	1	As specified in table 5.7.1-3 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access
_				procedure.
DRX		ON		DRX related parameters are defined in
				Table A.8.4.2.1-3
Time offset between cells		3 μs		Synchronous cells
T1	S	5		
T2	S	5	30	

## Table A.8.4.2.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting when DRX is used in fading propagation conditions

dB

dB

dB

dB

dB

dB

dB

dB

dB

PSS\_RA

SSS\_RA

PCFICH\_RB

PHICH\_RA

PHICH\_RB

PDCCH\_RA

PDCCH\_RB

PDSCH\_RA

PDSCH\_RB

0

lope	and a radii	ig propagatio	l'oonanione	in cynon chou		
Parameter	Unit	Cell 1 T1 T2		Cell 2		
				T1	T2	
E-UTRA RF Channel		1		2		
Number						
BW <sub>channel</sub>	MHz	10		10		
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					

0

#### 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

FD3CH_KD	uБ					
OCNG_RA <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
$N_{_{oc}}$ Note 2	dBm/15 kHz	-98				
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4	-Infinity	7	
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7	
Propagation Condition		ETU70				
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.						
Note 2: Interference from other	lote 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.8.4.2.1-3: 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 Value	Test2 Value	Comment
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		
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 10.1 in 3GPP TS 36.213.		

### 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 filterCoefficent 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 aligment 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 triggeredreporting under AWGN propagation conditions with DRX when L3 filtering is used

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	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth (BW <sub>channel</sub> )	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 of cells		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cells		6	As specified in table 4.2.1 in TS 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	

Parameter		Unit	Cell 1 Cell 2		ell 2	
			T1	T2	T1	T2
E-UTRA RF Channel Numb	ber		1			2
BW <sub>channel</sub>		MHz	1	10	10	
OCNG Patterns defined in A.3.2.2.1			OP.1	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				
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	1			
OCNG_RA <sup>Note 1</sup>		dB				
OCNG_RB <sup>Note 1</sup>		dB				
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$		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 <sup>Note 3</sup>		dBm/15 KHz	-94	-94	-94	-74
SCH_RP Note 3		dBm/15 KHz	-94	-94	-94	-74
Propagation Condition			AWGN			
Note 1: OCNG shall be used	d such that bot	th cells are fully all	ocated and	a constant to	tal transmitte	ed power
spectral density is a	chieved for all	OFDM symbols.				
Note 2: Interference from ot	her cells and r	oise sources not	specified in t	he test is as	sumed to be	constant
over subcarriers and	time and sha	Il be modelled as	AWGN of ap	propriate po	wer for $N_{oc}$	to be
fulfilled.						
Note 3: RSRP and SCH RF	levels have b	een derived from	other param	eters for info	rmation purp	oses. Thev
are not settable para	ameters thems	selves.			····	

# 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

# 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.8.4.4 E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

#### A.8.4.4.1 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 8.1.2.3.7.

The test scenario comprises of two E-UTRA TDD carriers and one cell on each carrier as given in tables A.8.4.4.1-1 and A.8.4.4.1-2. 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.8.4.4.1-1: General test parameters for E-UTRAN TDD - TDD 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 TDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.1
E-UTRA RF channel number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth (BW <sub>channel</sub> )	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	
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
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	μs	3	Synchronous cells
T1	S	5	
T2	S	≤10	
ТЗ	S	5	

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	T3
E-UTRA RF Channel			1			2	
Number							
BW <sub>channel</sub>	MHz		10	-		10	
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.2.1 (OP.1 TDD) and		TDD	TDD	TDD	TDD	TDD	TDD
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		0			0	
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB		-	-			
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4	4	-Infinity	7	7
Note 2	dBm/15 KHz			-6	98		
$\hat{E}_{s}/N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP <sup>Note3</sup>	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition			•	AW	'GN		•
Note 1: OCNG shall be used suc	ch that both cells are	fully allocated	l and a consta	int total transn	nitted power s	pectral densit	y is
achieved for all OFDM s	symbols.						
Note 2: Interference from other of	cells and noise sourc	es not specifie	ed in the test is	s assumed to	be constant o	ver subcarrier	s and time
and shall be modelled a	as AWGN of appropri	ate power for	$N_{\scriptscriptstyle oc}$ to be fu	Ilfilled.			

#### Table A.8.4.4.1-2: Cell specific test parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps

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

### A.8.4.4.2 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 [42] 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 [42] ACK/NACK number is caused by two parts. Firstly, at least [30] ACK/NACK shall be sent during identifying the cell global identifier of cell 2 according to the requirement in Section 8.1.2.3.7.1. Secondly, given that continuous DL data allocation, and the measurement gaps have been deconfigured before the start of T3, additional [12] 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.

## A.8.4.5 E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

### A.8.4.5.1 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 8.1.2.3.7. The requirement is verified in a DRX configuration.

The test scenario comprises of two E-UTRA TDD carriers and one cell on each carrier as given in tables A.8.4.5.1-1, A.8.4.5.1-2, A.8.4.5.1-3 and A.8.4.5.1-4. 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.

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.1
E-UTRA RF channel number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth (BW <sub>channel</sub> )	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	
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
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.8.4.5.1-3
si-RequestForHO		TRUE	As specified in section 5.5.3.1 in TS 36.331.
Time offset between cells	μs	3	Synchronous cells
T1	s	5	
Τ2	S	≤30	UE should report cell within 25.6s (20 DRX cycles)
T3	S	5	

# Table A.8.4.5.1-1: General test parameters for E-UTRAN TDD - TDD Inter-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

Table A.8.4.5.1-2: Cell specific test parameters for E-UTRAN TDD - TDD 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 <sub>channel</sub>	MHz		10			10	
OCNG Patterns defined in		OP.1	OP.1	OP.1	OP.2	OP.2	OP.2
A.3.2.2.1 (OP.1 TDD) and		TDD	TDD	TDD	TDD	TDD	TDD
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		0			0	
PHICH_RB	dB						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	4	-Infinity	7	7
$N_{oc}$ Note 2	dBm/15 KHz			-9	8		
$\hat{E}_{s}/N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP <sup>Note3</sup>	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. 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 level parameters themselves	els have been derive	ed from other p	parameters for	information p	urposes. The	y are not setta	ıble

# Table A.8.4.5.1-3: DRX configuration for E-UTRAN TDD - TDD 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.8.4.5.1-4: TimeAlignmentTimer -Configuration for E-UTRAN TDD - TDD 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.

### A.8.4.5.2 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.8.5 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	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		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 <sub>channel</sub> )			
UTRA RF Channel Number		1	One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH Ec/lo	
measurement quantity			
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	

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel Number		1			
BW <sub>channel</sub>	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	1			
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA <sup>Note 1</sup>	dB				
OCNG_RB <sup>Note 1</sup>	dB				
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4		
$\hat{E}_s/N_{oc}$	dB	4	4		
N <sub>oc</sub>	dBm/15 kHz	-98	3		
RSRP	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94 -94			
Propagation Condition	ETU70				
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2					

# Table 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

# 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	Cell 2			
			T1	T2		
UTRA RF	Channel Number		1			
CPICH_E	c/lor	dB	-10			
PCCPCH	_Ec/lor	dB	-12			
SCH_Ec/	lor	dB	-12			
PICH_Ec	/lor	dB	-15			
DPCH_E	c/lor	dB	N/A			
OCNS			-0.941			
$\hat{I}_{or}/I_{oc}$		dB	-Infinity	-1.8		
Ioc		dBm/3.84 MHz	-70			
CPICH_E	c/lo	dB	-Infinity	-14		
Propagat	ion Condition		Case 5 (Note 3)			
Note 1: The DPCH level is controlled by the power control loop.						
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal						
to I <sub>or</sub> .						
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	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 <sub>channel</sub> )			
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	

Parameter	Unit	Cell 1				
		T1	T2			
E-UTRA RF Channel Number		1				
BW <sub>channel</sub>	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	1				
PDSCH_RB	dB	1				
OCNG_RA <sup>Note 1</sup>	dB	]				
OCNG_RB <sup>Note 1</sup>	dB					
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4 4				
$N_{_{oc}}$ Note 3	dBm/15 kHz	-98				
$\hat{E}_{s}/N_{oc}$	dB	4	4			
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94			
SCH_RP	dBm/15 kHz	-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: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.						
Note 3: Interference from othe	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 be	Note 4: RSRP levels have been derived from other parameters for information purposes. They are not					
settable parameters t	hemselves.	-	•			

# 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

# 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 <sub>oc</sub>	dBm/3.84 MHz	-70		
CPICH_Ec/lo	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 <sub>or</sub> .				

#### 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 Me	easurement	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	easurement	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	1	Cell 1 is on E-UTRA RF channel number
				1.
Neighbour cell		Ce	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	10		
(BW <sub>channel</sub> )				
UTRA RF Channel Number		1		One UTRA FDD carrier frequency is used.
Inter-RAT (UTRA FDD)		CPICH Ec/lo		
measurement quantity				
b1-Threshold-UTRA	dB	-1	8	CPICH Ec/lo threshold for event B1.
Hysteresis	dB	0		
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		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 <sub>channel</sub>	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 <sup>Note 1</sup>	dB				
OCNG_RB <sup>Note 1</sup>	dB				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4 4			
$N_{oc}^{ m Note 2}$	dBm/15 kHz	-98	3		
RSRP <sup>Note 3</sup>	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
$\hat{E}_s/N_{oc}$	dB	4	4		
Propagation Condition	ETU70				
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power					
spectral density is achieved for all OFDM symbols.					
Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant					
over subcarriers and	time and shall be	e modelled as AWGN of appropri	iate power for $N_{oc}$ to be		
fulfilled					
Note 3: RSRP and SCH RP	levels have beer	derived from other parameters	for information purposes.		
They are not settable	parameters the	mselves.			

#### 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			
Note: For further information see section 6.3.2 in 3CPP TS 36.331					

1011 SEE SECTION 0.3.2 IN SUPP 13 30.331.

#### 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
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 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		-0.941		
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8	
I <sub>oc</sub>	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 I <sub>or</sub> .				
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 <sub>channel</sub> )			
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	

Parameter	Unit	Cell 1		
		T1	T2	
E-UTRA RF Channel Number		1		
BW <sub>channel</sub>	MHz	10	)	
OCNG Pattern defined in				
A.3.2.1.1 (OP.1 FDD)		OP.1	FDD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB	1		
SSS_RA	dB	1		
PCFICH_RB	dB			
PHICH_RA	dB	7		
PHICH_RB	dB	0		
PDCCH_RA	dB	-		
PDCCH_RB	dB	1		
PDSCH_RA	dB	1		
PDSCH_RB	dB	1		
OCNG_RA <sup>Note 1</sup>	dB			
OCNG_RB <sup>Note 1</sup>	dB			
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4	
$N_{oc}^{\rm Note 3}$	dBm/15 kHz	-98		
$\hat{E}_s/N_{oc}$	dB	4	4	
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94	
SCH_RP	dBm/15 kHz	-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 ac	hieved for all OF	DM symbols.		
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.				
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant				
over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be				
fulfilled.				
Note 4: RSRP levels have been derived from other parameters for information purposes. They are not				
settable parameters	hemselves.	•	,	

# 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

# 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		-0.941		
$\hat{I}_{or}/I_{oc}$	dB	- ∞	0.02	
I <sub>oc</sub>	dBm/3.84 MHz	-70		
CPICH_Ec/Io <sup>Note 3</sup>	dB	- ∞	-13	
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 <sub>or</sub> .				
Note 3: This gives an SCH E	c/lo of -15dB			

#### 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.

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement	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 <sub>channel</sub> )	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.8.6.1.1-1: General test parameters for E-UTRAN TDD-UTRAN FDD event triggered reporting in fading propagation conditions
Parameter	Unit	Cell 1				
		T1	T2			
E-UTRA RF Channel Number		1				
BW <sub>channel</sub>	MHz	10				
OCNG Pattern defined in						
A.3.2.2.1 (OP.1 TDD)		OP.1	rdd			
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	1				
PDCCH_RB	dB	1				
PDSCH_RA	dB	1				
PDSCH_RB	dB	1				
OCNG_RA <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4			
$\hat{E}_s/N_{oc}$	dB	4	4			
N <sub>oc</sub>	dBm/15 kHz	-98	3			
RSRP	dBm/15 kHz	-94	-94			
SCH_RP	dBm/15 kHz	-94	-94			
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:       The resources for uplink transmission are assigned to the UE prior to the start of time period T2.						

## 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

## 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_E	c/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		
Ioc		dBm/3.84 MHz	-70			
CPICH_E	c/lo	dB	-Infinity	-14		
Propagat	ion Condition		Case 5 (Note 3)			
Note 1:	The DPCH level is co	ontrolled by the p	oower control loop.			
Note 2:	2: The power of the OCNS channel that is added shall make the total power from the cell to be equal					
	to I <sub>or</sub> .					
Note 3:	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.

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	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		1	As specified in table 4.2.2 in TS
cell 1			36.211
Special subframe configuration		6	As specified in table 4.2.1 in TS
of cell 1			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.8.7.1.1.2-1: General test parameters for E-UTRA TDD to UTRA(1.28 Mcps TDD OPTION) cell search in fading propagation conditions

## 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	1		
		T1	T2		
E-UTRA RF Channel			1		
Number					
BW <sub>channel</sub>	MHz	1	0		
OCNG Pattern defined in		OP 1	חחד		
A.3.2.2.1 (OP.1 TDD)		01.1			
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 <sup>Note1</sup>	dB				
OCNG_RB <sup>Note1</sup>	dB				
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	9	9		
$\hat{E}_{s}/N_{oc}$	dB	9	9		
N <sub>oc</sub>	dBm/15kHz	-{	98		
RSRP	dBm/15kHz	-89	-89		
SCH_RP	dBm/15kHz	-89	-89		
Propagation Condition		ETI	J70		
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.					

Parameter	Unit		Cell 2	(UTRA)	
Timeslot Number		0	)	Dwl	PTS
		T1	T2	T1	T2
UTRA RF Channel Number <sup>NOTE1</sup>		Channel 2			
PCCPCH_Ec/lor	dB	-3	-3		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor <sup>NOTE2</sup>	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$	dB	-inf	5	-inf	5
I <sub>oc</sub>	dBm/1.28 MHz	-80			
PCCPCH RSCP	dBm	-inf	-78	n.a.	n.a.
Propagation Condition			Case	3 <sup>NOTE3</sup>	
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 <sub>or</sub> . Note 3: Case 3 propagation conditions are defined in Annex B of 3GPP TS 25.102					

## 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)

- 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 alignent timer to keep UE uplink time alignend. Furthermore UE is allocated with PUSCH resource at every DRX cycle. In Test 2 the uplink time alignent 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
		Va	lue	
PDSCH parameters		DL Reference Me	asurement	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 Me	easurement	As specified in section A.3.1.2.2.
parameters		Channel R.6 TDD	)	
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		1		As specified in 3GPP TS 36.211 section
configuration				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	

Pa	arameter	Unit	Ce	ll 1		
			T1	T2		
E-UTRA	RF Channel			1		
Number						
BWchan	nel	MHz	10			
OCNG P	atterns defined		OP.1	TDD		
in A.3.2.1	.1 (OP.1 TDD)					
PBCH_R	A	dB				
PBCH_R	В	dB				
PSS_RB		dB				
SSS_RB		dB				
PCFICH	PA	dB				
PHICH_F	PA	dB				
PHICH_F	РВ	dB	0	0		
PDCCH	PA	dB				
PDCCH	PB	dB				
PDSCH	PA	dB				
PDSCH	PB	dB				
	ANote1	dB				
OCNG_F	BNote1	dB				
$\hat{F}/I$		dB	4	4		
$L_s/I_{ot}$						
$\hat{E}_s/N_{oc}$		dB	4	4		
N		dBm/15kHz	-9	98		
<sup>1</sup> v <sub>oc</sub> Note	e 2					
RSRP <sup>Not</sup>	e 3	dBm/15kHz	-94	-94		
SCH_RP	Note 3	dBm/15kHz	-94	-94		
Propagat	ion Condition		ET	U70		
Note 1:	OCNG shall be	used such that cel	I is fully alloca	ted and a		
	constant total tra	ansmitted power s	pectral 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					
	. N <sub>22</sub>					
	for <sup>1</sup> oc to be fulfilled.					
Note 3:	KSRP and SCH	_KP levels have b	een derived fr	om other		
	parameters for II	ntormation purpos	es. They are r	iot settable		
	parameters then	nseives.				

# 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)

### 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)

Pa	rameter	Unit	Cell 2 (UTRA)			
Timeslot I	Number		0 DwPTS			PTS
			T1	T2	T1	T2
UTRA RF Number N	Channel NOTE1			Chanr	nel 2	
PCCPCH	_Ec/lor	dB	-3	-3		
DwPCH_I	Ec/lor	dB			0	0
OCNS_E	c/lor <sup>NOTE2</sup>	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.
Propagati Condition	on		Case 3 <sup>NOTE3</sup>			
Note 1:	In the case o Number is th	of multi-frequency cell, the UTRA RF Channel ne primary frequency's channel number. of the OCNS channel that is added shall make the				
Note 3:	total power fr Case 3 propa TS 25.102	the OCNS channel that is added shall make the om the cell to be equal to lor. agation conditions are defined in Annex B of 3GPP				3GPP

### 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	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 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 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.

#### 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	As specified in section A.3.1.1.2
		Channel R.0 TDD	
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement	As specified in section A.3.1.2.2
(E-UTRAN TDD)		Channel R.6 TDD	
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	MHz	10	
(BW <sub>channel</sub> )			
Uplink-downlink configuration of cell		1	As specified in table 4.2.2 in TS 36.211
1			
Special subframe configuration of cell		6	As specified in table 4.2.1 in TS 36.211
1			
Inter-RAT (UTRA TDD)		P-CCPCH RSCP	
measurement quantity			
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	

Parameter	Unit	Ce	11		
		T1	T2		
E-UTRA RF Channel Number		1			
BW <sub>channel</sub>	MHz	10			
OCNG Patterns defined in			חחד		
A.3.2.2.1 (OP.1 TDD)		01.1			
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	Ĺ	)		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
	dB				
	dB				
$\hat{\mathrm{E}}_{_{\mathrm{ot}}}/\mathrm{I}_{_{\mathrm{ot}}}$	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 Condition		AW	GN		
Note 1: OCNG shall be used total transmitted power	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 upl	ink transmission	are assigned to the U	E prior to the start		
of time period 12.	of time period T2.				
Note 3: Interference from othe	Interference from other cells and noise sources not specified in the test is				
assumed to be consta	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 bee purposes. They are n	en derived from ot settable parar	other parameters for in meters themselves.	nformation		

# 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

## 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

Parameter	Unit	Cell 2				
		T1 T2			2	
UTRA RF Channel number Note2			Chan	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.a73 n.a			n.a.	
lo <sup>Note1</sup>	dBm/1.28MHz	-Infinity -70.88				
loc	dBm/1.28MHz	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 th	e primary frequenc	y in this te	st.			

#### 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<sub>DCCH</sub> 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.

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement	As specified in section A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters		DI 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 (BW <sub>channel</sub> )	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.8.8.1.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting in AWGN

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel Number		1			
BW <sub>channel</sub>	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				
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 <sup>Note 1</sup>	dB				
	dB				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	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		AWO			
Note 1: OCNG shall be used	such that both co	ells are fully allocated and a cons	stant total transmitted power		
spectral density is ac	nieved for all OF	DM symbols.			
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.					

### Table A.8.8.1.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for event triggered reporting of GSM cell in AWGN

## 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 =  $2*T_{\text{Measurement Period, GSM}} = 2*480\text{ms} = 960\text{ms}$ .

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.

Parameter	Unit	Test 1	Test 2	Comment
		Value		
PDSCH parameters (E-		DL Reference Me	easurement	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	1	Cell 1 is on E-UTRA RF channel number
				1.
Neighbour cell		Ce	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 <sub>channel</sub> )				
Inter-RAT (GSM)		GSM Car	rier RSSI	
measurement quantity				
B1-Threshold-GERAN	dBm	-8	80	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0		
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		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
		ARF	CN 1	starts.
T1	S	5		
T2	S	5	45	

### 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	Cell 1				
		T1	T2			
E-UTRA RF Channel Number		1				
BW <sub>channel</sub>	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					
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 <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4			
$N_{oc}$ Note 2	dBm/15 kHz	-98	3			
RSRP <sup>Note 3</sup>	dBm/15 kHz	-94	-94			
SCH_RP	dBm/15 kHz	-94	-94			
$\hat{E}_s/N_{oc}$	dB	4	4			
Propagation Condition		AWGN				
Note 1: OCNG shall be used	Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power					
spectral density is ac	nieved for all OF	DM symbols.				
Note 2: Interference from othe	er cells and nois	e sources not specified in the tes	t is assumed to be constant			
over subcarriers and time and shall be modelled as AWGN of appropriate power for ${}^{m N_{oc}}$ to be fulfilled.						
Note 3: RSRP and SCH_RP	Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes.					
They are not settable parameters themselves.						

#### Table A.8.8.2.1-2: Cell specific test parameters for E-UTRAN FDD (cell #1) event triggered reporting of GSM cell when DRX is used in AWGN

#### 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
Field	Value	Value	
onDurationTimer	psf1	psf1	
drx-InactivityTimer	psf1	psf1	
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	Disable	Disable	
Noto: For further information soo s	action 6.2.2 in 2CE	D TS 26 221	

Note: For further information see section 6.3.2 in 3GPP 15 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 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 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		ARFNC 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 <sub>channel</sub> )			
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	

Parameter	Unit	Cell 1				
		T1	T2			
E-UTRA RF Channel Number		1				
BW <sub>channel</sub>	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					
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 <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4			
$\hat{E}_s/N_{oc}$	dB	4	4			
N <sub>oc</sub>	dBm/15 kHz	-98				
RSRP	dBm/15 kHz	-94	-94			
SCH_RP	dBm/15 kHz	-94	-94			
Propagation Condition		AWG				
Note 1: OCNG shall be used	such that both co	ells are fully allocated and a cons	stant 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.8.8.3.1-2: Cell specific test parameters for E-UTRAN FDD (cell # 1) for event triggered reporting of GSM cell in AWGN with enhanced BSIC identification

 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		ARFCN 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<sub>DCCH</sub> 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		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD	
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	

Parameter	Parameter Unit		Cell 1		
		T1	T2		
E-UTRA RF Channel		1			
Number					
BW <sub>channel</sub>	MHz	1(	)		
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 <sup>Note 1</sup>	dB				
OCNG_RB <sup>Note 1</sup>	dB				
N	dBm/15KH	-9	8		
1 ° oc	Z				
RSRP	dBm	-94	-94		
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4		
P-SCH_RP	dBm	-9	4		
S-SCH_RP	dBm	-9	4		
Propagation Condition	Propagation Condition ETU70				
Note 1: OCNG shall be used such that cell 1 is fully allocated and a					
constant total transmitted power spectral density is achieved for all OFDM					
symbols.					
Note 2: The resources for uplink transmission are assigned to the UE prior					
to the start of time period T2.					

## Table A.8.9.1.1-2: Cell specific test parameters for Event triggered reporting of UTRA TDD neighbours in fading propagation conditions (cell1)

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			
		Т	1	-	Г2
Timeslot Number		0	DwPTS	0	DwPTS
UTRA RF Channel			Cha	nnel1	
Number (NOTE1)					
PCCPCH_Ec/lor	dB	-Infi	nity	-3	
DwPCH_Ec/lor	dB	-Infinity			0
OCNS_Ec/lor		-Infinity		-3	
$\hat{I}_{or}/I_{oc}$	dB	-Infinity		9	
$I_{oc}$	dBm/	-70			
0C	1.28				
	MHz				
PCCPCH_RSCP	dB	-Infinity -64			
Propagation		Case 3 (NOTE2)			
Condition					
NOTE1: The DPCH o	f the cell i	is located ir	n a timeslot	other than	0.
NOTE2: Case 3 propagation conditions are specified in TS25.102 Annex B					

#### 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.

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.

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 <sub>channel</sub> )	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.8.10.1.1-1: General test parameters for E-UTRAN TDD-GSM event triggered reporting in AWGN

Parameter	Unit	Cell 1			
		T1	T2		
E-UTRA RF Channel Number		1			
BW <sub>channel</sub>	MHz	10			
OCNG Pattern 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	1			
PDSCH_RB	dB	1			
OCNG_RA <sup>Note 1</sup>	dB				
OCNG_RB <sup>Note 1</sup>	dB	1			
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4		
$N_{oc}$ Note 3	dBm/15 kHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4		
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWC	<u> </u>		
Note 1: OCNG shall be used	such that both c	th 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	over subcarriers and time and shall be modelled as AWGN of appropriate power for $N$ to be				
fulfilled. Note 4: RSRP levels have been derived from other parameters for information purposes. They are not					
settable parameters t	hemselves.		F F C		

### 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

## 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		AF	RFNC 1
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid
Propagation Condition		A	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.

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NOTE 2: The delay for GSM cell identification with BSIC verified is equal to 3120 ms, which is the sum of the event triggered measurement reporting delay and the initial BSIC identification delay.

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

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.

Parameter	Unit	Test 1	Test 2	Comment
		Val	lue	
PDSCH parameters (E-		DL Reference Me	asurement	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	asurement	As specified in section A.3.1.2.2.
parameters (E-UTRAN TDD)		Channel R.6 TDD	)	
Gap Pattern Id		0	)	As specified in 3GPP TS 36.133 section
				8.1.2.1.
Active cell		Ce	ll 1	Cell 1 is on E-UTRA RF channel number
Naighbour call		Ca	<b>II O</b>	I. Coll 2 is an Absolute DE Channel Number
		Ce	11 2	1 (GSM cell)
Special subframe		6	6	As specified in table 4.2-1 in TS 36.211.
configuration				
Uplink-downlink		1		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	10		
(BW <sub>channel</sub> )				
Inter-RAT (GSM)		GSM Carrier RSSI		
measurement quantity				
B1-Threshold-GERAN	dBm	-8	60	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0	)	
TimeToTrigger	S	0	)	
Filter coefficient		0	)	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
Monitored CSM coll list size		6 CSM paighbourg including		List of GSM colls provided before T2
		ARECN 1		starts.
T1	s	5		
T2	S	5	45	

# 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	Cell	1	
		T1	T2	
E-UTRA RF Channel Number		1		
BW <sub>channel</sub>	MHz	10		
OCNG Patterns defined in				
A.3.2.2.1 (OP.1 TDD)		OP.1 7	rdd	
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 <sup>Note 1</sup>	dB			
OCNG_RB <sup>NOTE 1</sup>	dB			
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	
$N_{oc}^{ m Note 2}$	dBm/15 kHz	-98	3	
RSRP <sup>Note 3</sup>	dBm/15 kHz	-94	-94	
SCH_RP	dBm/15 kHz	-94	-94	
$\hat{E}_s/N_{oc}$	dB	4	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 ac	nieved for all OF	DM symbols.		
Note 2: Interference from othe	er cells and nois	e sources not specified in the tes	t is assumed to be constant	
over subcarriers and time and shall be modelled as AWGN of appropriate power for ${}^{m N_{oc}}$ 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.8.10.2.1-2: Cell specific test parameters for E-UTRAN TDD (cell #1) event triggered reporting of GSM cell when DRX is used in AWGN

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		
Field	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.8.10.2.1-4: TimeAlignmentTimer and sr-ConfigIndex -Configuration to be used in E-UTRAN TDD-GSM event triggered reporting when DRX is used in AWGN

Field	Test1 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 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. 8.11.1 Multiple 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 <sub>channel</sub> )	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-		3 ms	Asynchronous cells
T1	s	5	
T2	S	10	

Parameter	Unit	Cell 1 Cell 2		Cell 3			
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number			1	2	2	3	
BW <sub>channel</sub>	MHz		10	1	0	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 FDD	
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB		0	0		0	
PHICH_RB	dB		-	J. J		-	
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note</sup>	dB						
$N_{oc}$ Note 3	dBm/15 kHz				-98		
RSRP Note 4	dBm/15 kHz	-98	-98	-Infinity	-95	-Infinity	-95
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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		AWGN ETU70 ETU70					
<ul> <li>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.</li> <li>Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.</li> <li>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</li> </ul>							
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.							

### 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

#### 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		DL Reference Measurement	As specified in section A.3.1.2.2
parameters		Channel R.6 TDD	
Special subframe		6	As specified in table 4.2-1 in TS 36.211.
configuration			The same configuration in both cells
Uplink-downlink		1	As specified in 3GPP TS 36.211 section
configuration			4.2 Table 4.2-2
E-UTRA RF Channel		1, 2, 3	Three TDD carrier frequencies are used.
Number			
Channel Bandwidth	MHz	10	
(BW <sub>channel</sub> )			
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	Cell 1		Cell 2		Cell 3	
		T1	T2	T1	T2	T1	T2
E-UTRA RF Channel Number			1	2		3	
BW <sub>channel</sub>	MHz		10	10		10	
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		OP.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		0	0		0	
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$N_{_{oc}}$ Note 3	dBm/15 kHz	-98					
RSRP <sup>Note 4</sup>	dBm/15 kHz	-98	-98	-inf	-95	-inf	-95
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	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		AWGN ETU70 ETU70					70
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 <sub>oc</sub> 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<sub>DCCH</sub> 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	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 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 <sub>channel</sub> )			
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	

Parameter	Unit	Cell 1		Cell 2			
		T1	T2	T1	T2		
E-UTRA RF Channel		1		2			
Number							
BW <sub>channel</sub>	MHz	1	0	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						
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA	dB						
OCNG_RB	dB						
$N_{_{oc}}$ Note 3	dBm/15 kHz	-98					
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94	-Infinity	-91		
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4	-Infinity	7		
SCH_RP <sup>Note 4</sup>	dBm/15 kHz	-94	-94	-Infinity	-91		
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7		
Propagation Condition		AWGN ETU70					
Note 1: OCNG shall b	e used such that bo	th cells are fully	allocated and a	constant total trans	smitted power		
spectral densi	ty is achieved for all	OFDM symbols			·		
Note 2: The resources	Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.						
Note 3: Interference fr	om other cells and r	noise sources no	t specified in the	e test is assumed t	to be constant		
over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{oc}$ to be fulfilled.							
They are not a	ettable narameters	themselves	n other parame		puiposes.		
They are not settable parameters themselves.							

# Table A.8.11.3.1-2: Cell specific test parameters for Combined inter-frequency and UTRAN event triggered reporting in fading propagation conditions

## 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		-0.941				
$\hat{I}_{or}/I_{oc}$	dB	-Infinity	-1.8			
I <sub>oc</sub>	dBm/3.84 MHz	-70				
CPICH_Ec/lo	dB	-Infinity	-14			
Propagation Condition		Case 5 (No	ote 3)			
Note 1: The DPCH level is controlled by the power control loop.						
Note 2: The power of the O	Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal					
to I <sub>or</sub> .						
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<sub>DCCH</sub> 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.

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference	As specified in section A.3.1.1.2
		Measurement	
		Channel R.0 TDD	
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		1	As specified in Table 4.2-2 in TS 36.211. The
of cell1 and cell2			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.8.11.4.1-1: General test parameters for combined E-UTRA TDD inter-frequency and UTRA TDD cells search under fading propagation conditions

Parameter	Unit	Ce	1	Cell 2			
		T1	T2	T1	T2		
E-UTRA RF Channel			1		2		
Number							
BWchannel	MHz	1	0	1	0		
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		h		<b>`</b>		
PHICH_RB	dB		J	U			
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 <sub>oc</sub>	dBm/15 kHz		-(	98			
RSRP	dBm/15 kHz	-94	-94	-Infinity	-91		
SCH_RP	dBm/15 kHz	-94	-94	-infinity	-91		
Propagation Condition		AWGN ETU70					
Note 1: OCNG shall b	e used such that	both cells are	fully allocated	and a constan	t 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 SC	CH_RP levels hav	e been derive	d from other pa	arameters for i	nformation		
purposes. They are not settable parameters themselves.							

# 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)

 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		(	)	DwPTS			
		T1	T2	T1	T2		
UTRA RF Channel			Chan	inel 3			
Number*							
PCCPCH_Ec/lor	dB	-:	3				
DwPCH_Ec/lor	dB			(	)		
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.			
Propagation Condition	Case 3						
Note1: The DPCH of all cells are located in a timeslot other than 0.							
Note2: In the case of	Note2: In the case of multi-frequency network, the UTRA RF Channel Number						
can be set for the primary frequency in this test. Note3: P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

#### 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.
3			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 FDD measurement		RSRP	
quantity			
Ofn	dB	0	Parameter for A3 and B2 event
	uD	0	Turuneter for 715 and 52 event
Ocn	dB	0	Parameter for A3 event
	u_	Č	
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
DDV		055	
DRX		OFF	OFF
Time offset between E-	me	3 ms	Asynchronous cells
	1115	5 115	Asynchronous cens
O TRAINT DD Cells			
Inter-RAT (GSM)		GSM Carrier RSSI	
measurement quantity			
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	List of GSM cells provided before T2 starts.
		ARFCN 3	
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		Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		1			2	
Number						
BW <sub>channel</sub>	MHz	1	0	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	1				
PHICH_RA	dB					
PHICH_RB	dB	0 0				
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
$N_{_{oc}}$ Note 3	dBm/15 kHz	-98				
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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 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 5. Interference from other cells and holse sources not specified in the test is assumed to be constant over subcarriers $V$ is the formula of the subcarriers						
and time and shall	be modelled as AWGN	or appropriate po	wer for $IV_{oc}$ to b	e 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.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		ARFCN3		
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%.
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- NOTE 1: The actual overall delays measured in the test may be up to 2xTTI<sub>DCCH</sub> 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 =  $2*T_{\text{Measurement Period, GSM}} = 2*N_{\text{freq}}*480\text{ms} = 1920\text{ms}$ .

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	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.2.
parameters		Channel R.6 TDD	
(E-UTRAN TDD)			
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			
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 <sub>channel</sub> )			
E-UTRAN TDD measurement		RSRP	
quantity			
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 offect between E	ma	2 mg	Agynghrongus golla
LITRAN TOD colle	ms	3 1115	Asynchronous cens
OTRAN TOD Cells			
Inter-RAT (GSM)		GSM Carrier RSSI	
measurement quantity			
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	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		Cell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel		1		2	2	
Number						
BW <sub>channel</sub>	MHz	1	0	1	0	
OCNG Patterns						
defined in A.3.2.2.1		OP.1	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					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	C	)	0		
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
$N_{_{oc}}$ Note 3	dBm/15 kHz			-98		
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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 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.						
and time and shall be modelled as AWGN of appropriate power for $N_{\rm eff}$ 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.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		AF	RFCN3
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%.

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- NOTE 1: The actual overall delays measured in the test may be up to 2xTTI<sub>DCCH</sub> 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 =  $2*T_{\text{Measurement Period, GSM}} = 2*N_{\text{freq}}*480\text{ms} = 1920\text{ms}$ .

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  $\Delta T$  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.

Parameter	Unit	Value	Comment
Reference cell		Cell 1	Reference cell 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 FDD	As specified in section A.3.1.2.1
Channel Bandwidth (BW <sub>channel</sub> )	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 $I_{PRS}$ –1120 DL subframes, as defined in 3GPP TS 36 211 [16] Table 6 10.4 3-1
Number of consecutive downlink positioning subframes $N_{\rm PRS}$		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
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 <sup>Note 1</sup>	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
ТЗ	s	5	The length of the time interval that follows immediately after time interval T2

# Table A.8.12.1.1-1: General test parameters for E-UTRAN FDD intra-frequency RSTD measurement reporting delay under fading propagation conditions

Note 1: The true RSTD, which is the receive time difference for frame 0 between each two cells as seen at the UE antenna connector, shall be within the 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 <sup>Note 1</sup>							
$N_{_{oc}}$ Note 3	dBm/ 15 kHz	-95					
prs $\hat{ ext{E}}_{ ext{s}}/N_{oc}$	dB	-Infinity	-Infinity	-Infinity			
lo	dBm/ 9 MHz -64.		N/A	N/A			
$\hat{\mathrm{E}}_{\mathrm{s}}/N_{oc}$	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. 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.							

Parameter	Unit	C	ell 1	Cell 2		Cell 3	
		T2	T3	T2	T3	T2	T3
E-UTRA RF			1	1			1
Channel Number				-			
OCNG patterns		OP.	5 FDD	OP 6 FDD		OP.6	N/A
defined in A.3.2.1			-			FDD	-
PBCH_RA	•						
PBCH_RB	•						
PSS_RA							
SSS_RA							
PCFICH_RB			-				
PHICH_RA	dB		0	0		0	N/A
PHICH_RB							
PDCCH_RA	ł						
PDCCH_RB	ł						
OCNG_RA <sup>Note 1</sup>							
OCNG_RB							
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 $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$ 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
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		ETU30					
Note 1: OCNG shall	Note 1: OCNG shall be used such that active cells (all, except Cell 3 in T3) are fully allocated and a						
constant tota	constant total transmitted power spectral density is achieved for all OFDM symbols other than						
those in the	the subtrames with transmitted PRS. There is no PDSCH allocated in the subtrames with transmitted PRS.						
Note 2: The resource	ote 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.						
Note 3: Interference constant over	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 $\hat{E}_{s}/I_{ot}$	, Io, and PF	RP levels ha	ve been deriv	ved from othe	r parameters	s and are giv	ven for
information p	ourpose. The	ese are not	settable test p	parameters. Ir	nterference	conditions sl	nall be
applied to all PRS symbols of DL positioning subframes.							

## 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

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 apposition in 2CDD TS
drx-RetransmissionTimer	sf1	AS Specified III 3GPP 15
longDRX-CycleStartOffset	sf320	30.331 [2], Section 0.3.2
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  $\Delta T$  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 <sub>channel</sub> )	MHz	10	
PRS Transmission Bandwidth	RB	50	PRS are transmitted over the system bandwidth
PRS configuration index <i>I</i> <sub>PRS</sub>		1134	This corresponds to periodicity of 1280 ms and PRS subframe offset of $I_{PRS}$ –1120 DL subframes, as defined in 3GPP TS 36.211 [16]. Table 6.10.4.3-1
Number of consecutive downlink positioning subframes $N_{\rm PRS}$		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 $19760 \cdot T_s$ and UpPTS of $4384 \cdot T_s$
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 <sup>Note 1</sup>	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:	The true RSTD, which is the receive time difference for frame 0 between each two cells as seen at the UE antenna connector, shall be within the expected RSTD uncertainty. The true RSTD for Cell 2 and Cell 1 shall be different from the true RSTD for Cell 2 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		•					
OCNG patterns		OP.1 TDD	N/A	N/A			
	ł						
	ł						
SS RA Note 6	ł						
PCFICH RB	+						
PHICH RA				<b>N</b> 1/A			
PHICH RB	dB	0	N/A	N/A			
PDCCH RA	ł						
PDCCH_RB	t						
OCNG_RA <sup>Note 1</sup>	1						
OCNG_RB <sup>Note 1</sup>	]						
PRS_RA							
$N_{_{oc}}$ Note 3,5	dBm/ 15 kHz	-95					
PRS $\hat{ ext{E}}_{ ext{s}}/N_{oc}$ Note 5	dB	-Infinity	-Infinity	-Infinity			
lo <sup>Note 4</sup>	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 $N_{oc}$ to be fulfilled.							
$N_{oc}$ to be t	${N_{oc}}$ to be fulfilled.						

Parameter	Unit	Cell 1		Cell 2		Cell 3	
		T2	T3	T2	T3	T2	T3
E-UTRA RF			1	1			1
Channel Number			-	-		00.0	
OCING patterns		OP.1	TDD	OP.2	TDD		N/A
PBCH_RB <sup>Note 6</sup>	ł						
PSS RA Note 6	+						
SSS RA Note 6	+						
PCFICH RB	ł						
PHICH_RA	dB	(	)	0		0	N/A
PHICH_RB	Ī						
PDCCH_RA							
PDCCH_RB							
OCNG_RA <sup>Note 1</sup>							
OCNG_RB <sup>Note 1</sup>			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 $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$ 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		ETU30					
Note 1: OCNG shall	Note 1: OCNG shall be used such that active cells (all, except Cell 3 in T3) are fully allocated and a						
constant tota	constant total transmitted power spectral density is achieved for all OFDM symbols other than						
transmitted F	transmitted PRS.						
Note 2: The resource	2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.						
Note 3: Interference constant over	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 f	$N_{\it oc}$ to be fulfilled.						
Note 4: PRS $\hat{\mathrm{E}}_{_{\mathrm{s}}}/\mathrm{I}_{_{\mathrm{ot}}}$	, Io, and PF	RP levels ha	ve been der	ived from othe	r parameters	s and are giv	en for
information p	ourpose. The	ese are not s	settable test	parameters. Ir	nterference o	conditions sh	nall be
applied to all PRS symbols of DL positioning subframes.							

## 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

 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 TS
drx-RetransmissionTimer	sf1	AS Specified III 3GPP 15
longDRX-CycleStartOffset	sf320	30.331 [2], Section 0.3.2.
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.

_			Tes	st 1	Tes	st 2	Tes	st 3
Pa	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Ch	annel Number			1		1		1
BW <sub>channel</sub>		MHz	1	0	1	0	1	0
Measurement b	andwidth	n <sub>PRB</sub>	22-	-27	22-	-27	22—27	
PDSCH Refere	nce measurement		R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n <sub>PRB</sub>	13—36	-	13—36	-	13—36	-
PDCCH/PCFIC measurement c A.3.1.2.1	H/PHICH Reference channel defined in		R.6	FDD	R.6	FDD	R.6	FDD
OCNG Patterns (OP.1 FDD) and 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 RB <sup>Note1</sup>								
λ7 Note2	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/15 kHz					-1	16
IN <sub>oc</sub>	Bands 2, 5 and 7 Bands 3, 8, 12, 13,		-106 -106	-106 -88	-88	-88 -88 -	-1	-113
	Band 9						-115	
Ê./I.	201100	dB	2.5	-6	2.5	-6	0.46	-5.76
\$7 01	Bands 1, 4, 6, 10,						-113	-117
DODDNote3	11, 18, 19 and 21 Bands 2, 5 and 7		100	405		07	-111	-115
KOKP	Bands 3, 8, 12, 13, 14, 17 and 20		-100	-105	-02	-07	-110	-114
	Band 9						-112	-116
	Bands 1, 4, 6, 10, 11, 18, 19 and 21						-82	43
Lo <sup>Note3</sup>	Bands 2, 5 and 7		70.27	70.27	50.07	F2 27	-80	.43
10	Bands 3, 8, 12, 13, 14, 17 and 20		-70.27	-70.27	-52.27	-52.27	-79	.43
	Band 9						-81	.43
$\hat{E}_s/N_{oc}$		dB	6	1	6	1	3	-1
Propagation condition		-	AW	GN	AW	GN	AW	'GN
Note 1: OCNG sh achieved Note 2: Interferen time and Note 3: RSRP an	hall be used such that both for all OFDM symbols. Ince from other cells and n I shall be modelled as AW d to levels have been der	h cells are fully allo bise sources not s /GN of appropriate ived from other pa	pecified and a pecified in the power for	a constant to he test is as $N_{oc}$ to be f r information	otal transmit sumed to be fulfilled.	ted power s constant o They are po	pectral dens ver subcarri ot settable p	ity is ers and arameters
					. paipoooo.		. conabio p	

Table A.9.1.1.2-1: RSRP\	FDD Intra	frequency tes	t parameters
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 Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

 Note 4: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

#### 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.

Des		11	Tes	st 1	Tes	st 2	Tes	st 3
Pai	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Ch	nannel Number			1		1		1
BW <sub>channel</sub>		MHz	1	0	10		10	
Special subfrar configuration <sup>Not</sup>	Special subframe configuration <sup>Note1</sup>		6	6	6		6	
Uplink/downlink	configuration <sup>Note1</sup>			1		1		1
Measurement b	pandwidth	n <sub>PRB</sub>	22-	-27	22-	-27	22-	-27
PDSCH Refere	ence measurement		R.0	-	R.0	-	R.0	-
channel defined	d in A.3.1.1.2							
PDSCH allocat	ion	n <sub>PRB</sub>	13—36	-	13—36	-	13—36	-
PDCCH/PCFIC Reference mea defined in A.3.1	H/PHICH asurement channel 1.2.2		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	s defined in I TDD) and 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_RB PDSCH_RA PDSCH_RB OCNG_RA <sup>Note2</sup> OCNG_RB <sup>Note2</sup> N Note3	Bands 33, 34, 35,	dB	0	0	0	0	0	0
N <sub>oc</sub>	36, 37, 38, 39 and 40	dBm/15 kHz	-106	-106	-88	-88	-1	16
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$		dB	2.5	-6	2.5	-6	0.5	-5.76
RSRP <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-100	-105	-82	-87	-113	-117
lo <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-70.27	-70.27	-52.27	-52.27	-82	2.43
$\hat{E}_s/N_{oc}$		dB	6	1	6	1	3	-1
Propagation co	ndition	-	AW	GN	AW	'GN	AW	'GN
Note 1: For speci Note 2: OCNG sh achieved Note 3: Interferen	ial subframe and uplink- nall be used such that be d for all OFDM symbols. nce from other cells and	downlink configurat oth cells are fully all noise sources not s	ions see Tab ocated and a specified in th	bles 4.2-1 ai a constant to he test is as	nd 4.2-2 in 3 otal transmit sumed to be	GPP TS 36 ted power s e constant o	.211. pectral dens ver subcarri	sity is ers and

Table A.9.1.2.2-1: RSRP TDD Intra frequency test parameters

time and shall be modelled as AWGN of appropriate power for  $N_{oc}$  to be fulfilled. Note 4: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

Note 5: RSRP minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

#### 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.

		11-14	Te	st 1	Test 2		
Pa	irameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	
E-UTRA RF Cha	annel Number		1	2	1	2	
BW <sub>channel</sub> Gan Pattern Id		MHz	10	10	10	10	
Measurement ba	andwidth	$n_{\scriptscriptstyle DDD}$	22-	-27	22—27		
PDSCH Referen	ce measurement	TKD	R.0	-	R.0	-	
PDSCH allocation	n	$n_{nnn}$	13—36	-	13—36	-	
PDCCH/PCFICH	I/PHICH Reference	PRB					
A.3.1.2.1	nannel defined in		R.6	FDD	R.6	FDD	
OCNG Patterns (OP.1 FDD) and	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	
PBCH_RA							
PBCH_RB							
SSS_RA							
PCFICH_RB				0	0	0	
PHICH_RA			0				
PRICH_RB		aв	0	0	0	0	
PDCCH RB							
PDSCH_RA							
PDSCH_RB	-						
OCNG_RANote	1						
OCING_REINOLE	Bands 1, 4, 6, 10,				-109	-117	
N Note2	Bands 2, 5 and 7				-107	-115	
1 voc	Bands 3, 8, 12, 13,	dBm/15 kHz	-88.65	-88.65	100	110	
	14, 17 and 20				-106	-114	
/r	Band 9				-108	-116	
$\mathbf{E}_{s}/\mathbf{I}_{ot}$	Pondo 1 4 6 10	dB	10	10	14	-4	
	11, 18, 19 and 21				-95	-121	
RSRP <sup>Note3</sup>	Bands 3, 8, 12, 13,	dBm/15 kHz	-78.65	-78.65	-93	-119	
	14, 17 and 20				-92	-118	
	Band 9				-94	-120	
	11, 18, 19 and 21				-67.05	-87.76	
lo <sup>Note3</sup>	Bands 2, 5 and 7 Bands 3, 8, 12, 13,	dBm/9 MHz	-50.45	-50.45	-65.05	-85.76	
	14, 17 and 20				-64.05	-84.76	
$\hat{E}/N$	Dand 3	dB	10	10	14	-4	
<i>s i oc</i> Propagation con	dition	-	Δ١٨	/GN	A۱۸	GN	
Note 1: OCI	NG shall be used such	h that both cells a	re fully allo	cated and	a constant	total	
tran	smitted power spectra	al density is achiev	ved for all (	OFDM sym	nbols.		
Note 2: Inte	rference from other ce	ells and noise sou	rces not sp	ecified in t	the test is a	assumed	
to b	e constant over subca	arriers and time ar	nd shall be	modelled	as AWGN	of	
app	ropriate power for $N_c$	$c^{c}$ to be fulfilled.					
Note 3: RSF	RP and lo levels have	been derived from	n other par	ameters fo	or informati	on	
purp	ooses. They are not se	ettable parameter	s themselv	es.			
Note 4: RSF nois	RP minimum requirem at each receiver an	ents are specifiec tenna port.	assuming	independ	ent interfer	ence and	

#### Table A.9.1.3.2-1: RSRP FDD—FDD Inter frequency test parameters

#### 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.

_			Test 1 Test 2				
Pa	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	
E-UTRA RF Cha	nnel Number		1	2	1	2	
BW <sub>channel</sub>		MHz	10	10	10	10	
Special subframe	e configuration <sup>Note1</sup>			6	6	3	
Uplink-downlink of	configuration <sup>Note1</sup>			1		1	
Gap Pattern Id			0	-	0	0 -	
Measurement ba	ndwidth	n <sub>PRB</sub>	22—27		22-	-27	
PDSCH Reference channel defined i	ce measurement n A.3.1.1.2		R.0 TDD	-	R.0 TDD	-	
PDSCH allocatio	n	n <sub>PRB</sub>	13—36	-	13—36	-	
PDCCH/PCFICH measurement cha	/PHICH Reference annel defined in		R.6 TDD		R.6	R.6 TDD	
OCNG Patterns of	defined in A.3.2.2.1		OP.1	OP.2	OP.1	OP.2	
(OP.1 TDD) and	A.3.2.2.2 (OP.2 TDD)		TDD	TDD	TDD	TDD	
PBCH_RA							
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_RA		-					
OCNG_RB							
$N_{_{oc}}$ Note3	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-88.65	-88.65	-109	-117	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	10	10	14	-4	
RSRP <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40.	dBm/15 kHz	-78.65	-78.65	-95	-121	
Io <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50.45	-50.45	-67.05	-87.76	
$\hat{E}_s/N_{oc}$		dB	10	10	14	-4	
Propagation cond	dition	-	AM	/GN	AW	GN	
Note 1: For s	special subframe and	l uplink-downlink o	configuratio	ons see Ta	bles 4.2-1	and 4.2-	
2 in 3	3GPP TS 36.211.	·	U U				
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 symbol					nbols.		
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							
N							
appr	opriate power for	<i>bc</i> to be fulfilled.					
Note 4: RSR	P and lo levels have	been derived from	n other par	ameters fo	or informati	on	
purp	oses. They are not se	ettable parameter	s themselv	es.			
Note 5: RSR	P minimum requirem	ents are specified	assuming	independe	ent interfer	ence and	
nois	e at each receiver an	tenna port.					

#### Table A.9.1.4.2-1: RSRP TDD—TDD Inter frequency test parameters

#### A.9.1.4.3 Test Requirements

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.

_			Tes	st 1	Te	st 2	Tes	st 3
Pa	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Cha	Innel Number			1		1		1
BW <sub>channel</sub>		MHz	1	0	1	0	1	0
Measurement ba	andwidth	$n_{PRB}$	22-	27	22-	27	22-	-27
PDSCH Referen	ce measurement	110	R.0	-	R.0	-	R.0	-
PDSCH allocatio	III A.3.1.1.1	n	13—36	_	FDD 13—36	_	13—36	_
PDCCH/PCFICH	I/PHICH Reference	The PRB	10 00		10 00		10 00	<u>i</u>
measurement ch A.3.1.2.1	annel defined in		R.6	FDD	R.6	FDD	R.6	FDD
OCNG Patterns (OP.1 FDD) and	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								
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB		dB	0	0	0	0	0	0
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA <sup>Note1</sup>								
OCNG_RB <sup>Note1</sup>								
	Bands 1, 4, 6, 10, 11, 18, 19 and 21					-103.85	-1	16
$N_{_{oc}}$ Note2	Bands 2, 5 and 7		04.70	04.70	400.05	400.05	-1	14
	Bands 3, 8, 12, 13,	dBm/15 KHZ	-84.76	-84.76	-103.85	-103.85	4	40
	14, 17 and 20						-1	13
	Band 9						-1	15
$\hat{E}_{s}/I_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.46	-5.46
	Bands 1, 4, 6, 10,						-120	-120
	11, 18, 19 and 21 Bands 2, 5 and 7			-81.76 -′	-106.75	-106.75	110	110
RSRP <sup>Note3</sup>	Bande 3, 8, 12, 13	dBm/15 kHz	-81.76				-110	-110
	14 17 and 20						-117	-117
	Band 9						-119	-119
	Bands 1, 4, 6, 10, 11, 18, 19 and 21							
Netro	Bands 2 5 and 7							
RSRQ <sup>Note3</sup>	Bands 3, 8, 12, 13	dB	-14.77	-14.77	-16.76	-16.76	-17.33	-17.33
	14 17 and 20							
	Band 9							
	Bands 1 4 6 10							4
	11 18 19 and 21						-85	.67
Note 2	Bands 2 5 and 7						-83	67
lo <sup>Note3</sup>	Bands 3, 8, 12, 13	dBm/9 MHz	-50	-50	-73	-73		.07
	14 17 and 20						-82	67
	Band 9						-84	67
A / 11	Bana o						01	.07
$E_s/N_{oc}$		dB	3	3	-2.9	-2.9	-4	-4
Propagation con	dition	-	AW	/GN	A۱۸	/GN	A۱۸	/GN
Note 1: OCNG s	hall be used such that he	oth cells are fully all	ocated and a	a constant t	otal transmit	ted power s	pectral dens	sitv is
achieve	d for all OFDM symbols							
Note 2: Interfere	Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and					ers and		
	debellike dit dit dit			N				
time and	a snall be modelled as A	wGN of appropriate	e power for	$IV_{oc}$ to be	rulfilled.			
Note 3: RSRQ, F	RSRP and lo levels have	been derived from	other param	eters for inf	ormation pu	rposes. The	y are not se	ttable
parame	ters themselves		•					

Table A.9.2.1.2-1: RSRQ FDD Intra frequency test parameters

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.

D	romotor	l la it	Tes	st 1	Tes	st 2	Te	st 3
Pa	arameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Cha	annel Number			1		1	1	
BW <sub>channel</sub>	a configuration Note1	MHz	1	0	1	0	10	
Special Subfram				D 1		0 1	1	
Magazina ant h				07		07		07
Measurement ba	andwidth	n <sub>PRB</sub>	22-	-27	22-	-27	22-	-27
PDSCH Referer channel defined	in A.3.1.1.2		R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocation	ิวท	n <sub>PRB</sub>	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH measurement ch A.3.1.2.2	H/PHICH Reference nannel defined in		R.6	TDD	R.6	TDD	R.6	TDD
OCNG Patterns	defined in A.3.2.2.1		OP.1	OP.2	OP.1	OP.2	OP.1	OP.2
(OP.1 TDD) and	A.3.2.2.2 (OP.2 TDD)		TDD	TDD	TDD	TDD	TDD	TDD
PBCH_KA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB		dP	0	0	0	0	0	0
PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA OCNG_RA <sup>Note2</sup> OCNG_RB <sup>Note2</sup>				U	0	U	0	U
$N_{oc}^{\rm Note3}$	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-84.76	-84.76	-103.85	-103.85	-1	16
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$		dB	-1.76	-1.76	-4.7	-4.7	-5.46	-5.46
RSRP <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-81.76	-81.76	-106.75	-106.75	-120	-120
RSRQ <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dB	-14.77	-14.77	-16.76	-16.76	-17.33	-17.33
lo <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50	-50	-73	-73	-85	.67
$\hat{E}_s / N_{oc}$		dB	3	3	-2.9	-2.9	-4	-4
Propagation con	dition		AW	'GN	AW	/GN	AW	/GN
Note 1: For spec Note 2: OCNG s achieve Note 3: Interfere time an	cial subframe and uplink- shall be used such that be ad for all OFDM symbols. Ince from other cells and d shall be modelled as A	downlink configurat oth cells are fully all noise sources not s WGN of appropriate	ions see Tab ocated and a specified in the power for	bles 4.2-1 a a constant to he test is as $N_{oc}$ to be t	nd 4.2-2 in 3 otal transmit ssumed to be fulfilled.	GPP TS 36 ted power s e constant o	0.211. pectral dens	sity is ers and

Table A.9.2.2.2-1: RSRQ TDD Intra frequency test parameters

Note 4: RSRQ, RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves. Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver

antenna port.

#### A.9.2.2.3 **Test Requirements**

The RSRQ measurement accuracy shall fulfil the requirements in Sections 9.1.5.

### 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
---------------------------------------	---------------------------

			Tes	st 1	Test 2		Test 3	
Pa	arameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Cha	annel Number		1	2	1	2	1	2
BW <sub>channel</sub>		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Measurement ba	andwidth	n <sub>PRB</sub>	22-	-27	22-	27	22—27	
channel defined	in A.3.1.1.1		R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation	on	n <sub>PRB</sub>	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH measurement ch	H/PHICH Reference nannel defined in		R.6	FDD	R.6	FDD	R.6 F	DD
OCNG Patterns	defined in A.3.2.1.1		OP.1	OP.2	OP.1	OP.2		OP.2
(OP.1 FDD) and	A.3.2.1.2 (OP.2 FDD)		FDD	FDD	FDD	FDD	OP.1 FDD	FDD
PBCH_RA								
PBCH_KB								
SSS RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB		dB	0	0	0	0	0	0
PDCCH_RA								
PDCCH_RB								
PDSCH_RA								
OCNG RA <sup>Note1</sup>		•						
OCNG RB <sup>Note1</sup>								
	Bands 1, 4, 6, 10,						-119.50	-119.50
$N_{\scriptscriptstyle oc}$ Note2	Bands 2, 5 and 7						-117 50	-117 50
	Bands 3, 8, 12, 13, 14, 17 and 20	dBm/15 kHz	-80	-80	-104.70	-104.70	-116.50	-116.50
	Band 9						-118.50	-118.50
$\hat{E}_{s}/I_{ot}$		dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
	Bands 1, 4, 6, 10,						-123.50	-123.50
DODDNote3	Bands 2, 5 and 7		04 75	04 75	400 70	400 70	-121.50	-121.50
RSRP	Bands 3, 8, 12, 13,	dBm/15 kHz	-81.75	-81.75	-108.70	-108.70	120 50	120.50
	14, 17 and 20						-120.30	-120.30
	Band 9						-122.50	-122.50
	Bands 1, 4, 6, 10, 11, 18, 19 and 21							
DODO Note3	Bands 2, 5 and 7		4470	4470	40.05	40.05	40.05	40.05
RSRQ	Bands 3, 8, 12, 13,	dB	-14.76	-14.76	-16.25	-16.25	-16.25	-16.25
	14, 17 and 20							
	Band 9	l						
	Bands 1, 4, 6, 10,						-90.26	-90.26
. Noto3	Bands 2, 5 and 7						-88.26	-88.26
lonoies	Bands 3, 8, 12, 13,	dBm/9 MHz	-50	-50	-75.46	-75.46	07.00	07.00
	14, 17 and 20						-87.26	-87.26
	Band 9						-89.26	-89.26
$\hat{E}_s/N_{oc}$		dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
Propagation cor	dition	-	AW	'GN	AW	/GN	AWO	GN
Note 1: OC	NG shall be used suc	h that both cell	s are fully a	allocated a	nd a const	ant total tra	ansmitted pov	wer
spe	ctral density is achiev	ed for all OFD	M symbols					
Note 2: Inte	rference from other co	ells and noise	sources no	t specified	in the test	is assume	d to be const	ant over
						N		
sub	carriers and time and	shall be mode	lled as AW	GN of app	ropriate po	wer for 1	<sup>oc</sup> to be fulfill	ed.
Note 3: RSI	RQ, RSRP and lo leve	els have been	derived from	m other pa	rameters for	or informati	on purposes	. They
are	not settable paramete	ers themselves	5.					
Note 4: RSI	Note 4: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at							

#### 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.

Ba	romotor	Unit	Te	st 1	Tes	st 2	Tes	t 3
Pa	rameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Cha	nnel Number	N 41 1-	1	2	1	2	1	2
BW <sub>channel</sub>		MHz	10	10	10	10	10	10
Gap Pattern Id	Gap Pattern Id		0	-	0	-	0	-
Uplink-downlink				5 1		5 1	0	
Measurement ba	Indwidth	n	22-		22-		22-	-27
		PRB						
channel defined i	in A.3.1.1.2		R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocatio	n	$n_{PRB}$	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH measurement ch A.3.1.2.2	I/PHICH Reference annel defined in		R.6	TDD	R.6	TDD	R.6 1	DD
OCNG Patterns	defined in A.3.2.2.1		OP.1	OP.2	OP.1	OP.2	OP.1	OP.2
(OP.1 TDD) and	A.3.2.2.2 (OP.2 TDD)		TDD	TDD	TDD	TDD	TDD	TDD
PBCH_RA							0	0
PBCH_RB								
PSS_RA								
PCFICH RB								
PHICH RB		dD	0	0	0	0		
PDCCH RA		ub	0	0	0	0		
PDCCH RB								
PDSCH RA								
PDSCH_RB								
OCNG_RA <sup>Note2</sup>								
OCNG_RB <sup>Note2</sup>								
$N_{_{oc}}$ Note3	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-80	-80	-104.70	-104.70	-119.50	-119.50
$\hat{E}_{s}/I_{ot}$		dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
RSRP <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-81.75	-81.75	-108.70	-108.70	-123.50	-123.50
RSRQ <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dB	-14.76	-14.76	-16.25	-16.25	-16.25	-16.25
lo <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50	-50	-75.46	-75.46	-90.26	-90.26
$\hat{E}_s / N_{oc}$		dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
Propagation condition -			AW	'GN	AW	'GN	AW	GN
Note 1: For speci Note 2: OCNG sh achieved Note 3: Interferer and sha	al subframe and uplink- nall be used such that b d for all OFDM symbols nee from other cells and II be modelled as AWG	downlink configurat oth cells are fully all noise sources not s Nof appropriate pov	ions see Tab ocated and a specified in th ver for $N_{ac}^{}$	oles 4.2-1 ar a constant to ne test is as to be fulfille	nd 4.2-2 in 30 otal transmitt sumed to be d.	GPP TS 36.2 ed power sp constant ov	211. ectral density er subcarriers	is and time
Note 4: RSRQ, R	SRP and lo levels have	been derived from	other param	eters for info	ormation pur	poses. They	are not setta	ble

Table A 9.2.4.2-1: RSRQ TDD—TDD Inter frequency test parameters

parameters themselves. Note 5: RSRP and RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

#### A.9.2.4.3 Test Requirements

The RSRQ measurement accuracy shall fulfil the requirements in Section 9.1.6.

## 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	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	
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 <sub>channel</sub> )			
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	
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

Parameter	Unit	Test 1	Test 2				
E-UTRAN RF Channel			1				
Number		l 					
BW <sub>channel</sub>	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	(	)				
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB	1					
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$N_{_{oc}}$ Note 2	dBm/15 kHz	-9	98				
RSRP <sup>Note 3</sup>	dBm/15 kHz	 Ç	)4				
$\hat{E}_{s}/I_{ot}$	dB	2	4				
SCH_RP <sup>Note 3</sup>	dBm/15 kHz	-Ç	)4				
$\hat{E}_s/N_{oc}$	dB	2	4				
Propagation Condition		AW	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 a	and shall be mode	eled as AWGN of appropriate	e power for $N_{_{oc}}$ to be				
fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes.							

# 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	
			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,	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		dB	9.54	-9.54	
CPICH	Band I, IV, VI, X, XI, XIX,	dBm		-114.0	
RSCP,	XXI				
Note 1	Note 1 Band II, V, VII		-60.46	-112.0	
Band III, VIII, XII, XIII, XIV				-111.0	
	Band IX (Note 2)			-113.0	
lo, 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	
Propagation condition		-	AWGN	AWGN	
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 barro in sinar apply to the monitorial OCE.					
2	2 shall be set within 5 seconds so that LE does not loose the Cell 2 in between the tests				

## 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

#### 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	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.2
parameters		Channel R.6 TDD	
E-UTRAN RF Channel		1	One E-UTRAN TDD carrier frequency is
Number			used.
UTRAN RF Channel		1	One UTRAN FDD carrier frequency is
Number			used.
E-UTRAN Channel	MHz	10	
Bandwidth (BW <sub>channel</sub> )			
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)		CPICH RSCP	
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.9.3.2.2-2: 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 <sub>channel</sub>	MHz	10	
Special subframe configuration <sup>Note1</sup>		6	
Uplink-downlink configuration <sup>Note1</sup>		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 <sup>Note 2</sup>	dB					
OCNG_RB <sup>Note 2</sup>	dB					
$N_{_{oc}}$ Note 3	dBm/15 kHz	-98				
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4				
SCH_RP Note 4	dBm/15 kHz	-94				
$\hat{E}_{s}/N_{oc}$	dB	4				
Propagation Condition		AWGN				
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211. Note 2: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.						
Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant						
over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{_{oc}}$ to be						
fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes.						

# 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 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 barlo in shall apply to the multi-barlo OE.					
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 parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
E-UTRAN RF Channel Number		1	One E-UTRAN FDD carrier frequency is used.
UTRAN RF Channel Number		1	One UTRAN FDD carrier frequency is used.
E-UTRAN Channel Bandwidth (BW <sub>channel</sub> )	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.9.4.1.2-2: 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 <sub>channel</sub>	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	â			
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA <sup>Note 1</sup>	dB				
OCNG_RB <sup>Note 1</sup>	dB				
$N_{_{oc}}$ Note 2	dBm/15 kHz	-98			
RSRP <sup>Note 3</sup>	dBm/15 kHz	-94			
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4			
SCH_RP Note 3	dBm/15 kHz	-94			
$\hat{E}_s/N_{oc}$	dB	4			
Propagation Condition		AWGN			
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power					
spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant					
over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{_{oc}}$ to be					
fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

## Table 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
			Cell 2	Cell 2	Cell 2
CPICH_Ec/lor		dB	-10	-10	-10
P	CCPCH_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,				-94.46
	XI, XIX, XXI	dBm/			-94.40
loc	Band II, V, VII	3.8/	-52.22	-87.27	-92.46
100	Band III, VIII, XII,	MH <sub>7</sub>			-91 46
	XIII, XIV				
	Band IX (Note 2)				-93.46
Îor/loc		dB	-1.75	-4.7	-9.54
CPICH Ec/lo, Note 1		dBm	-14.0	-16.0	-20.0
Band I, IV, VI, X,					-94
lo,	Band II V VII	dBm/	-50	-86	-92.0
Note	Band III VIII XII	3.84 MHz			02.0
1	XIII, XIV				-91.0
	Band IX (Note 2)				-93
Propagation 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.					
For the DE which supports both Band III and Band IA operating frequencies, the measurement performance					
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been everyted test parameters for tests 2 and 2 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	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	
E-UTRAN RF Channel		1	One E-UTRAN TDD carrier frequency is
Number			used.
UTRAN RF Channel		1	One UTRAN FDD carrier frequency is
Number			used.
E-UTRAN Channel	MHz	10	
Bandwidth (BW <sub>channel</sub> )			
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.9.4.2.2-2: 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 <sub>channel</sub>	MHz	10			
Special subframe configuration <sup>Note1</sup>		6			
Uplink-downlink configuration <sup>Note1</sup>			1		
OCNG Patterns defined in					
A.3.2.1.2 (OP.1 TDD)		OP.1 IDD			

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 <sup>Note 2</sup>	dB				
OCNG_RB <sup>Note 2</sup>	dB				
N Note 3	dBm/15	-08			
1 voc	kHz	-98			
RSRP <sup>Note 4</sup>	dBm/15	-04			
	kHz	-0-			
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4			
SCH_RP <sup>Note 4</sup>	dBm/15	-94			
	kHz				
$\hat{E}_s/N_{oc}$	dB	4			
Propagation Condition		AWGN			
Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS					
36.211.					
Note 2: OUNG 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.

Deremeter		Unit	Test 1	Test 2	Test 3	
	Parameter	Unit	Cell 2	Cell 2	Cell 2	
	CPICH_Ec/lor	dB	-10	-10	-10	
F	CCPCH_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,				-94.46	
	XI, XIX, XXI	dBm/	-52.22		-94.40	
loc	Band II, V, VII	3.84		-87 27	-92.46	
100	Band III, VIII, XII,	VIII, XII, MHz	-01.21	-91 46		
	XIII, XIV	101112			01110	
	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,				-94	
10	XI, XIX, XXI	dBm/			-54	
IO, Note	Band II, V, VII	3.84	-50	-86	-92.0	
1	Band III, VIII, XII,	0.04 MH7	-30	-86	-91.0	
	XIII, XIV	101112			-31.0	
	Band IX (Note 2)				-93	
Pro	pagation condition	-	AWGN	AWGN	AWGN	
NOTE	1: CPICH Ec/lo and I	o levels hav	e been calculated from other p	parameters for information pu	rposes. They are not	
NOTE	settable parameter	rs themselve	es.			
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.						
be set within 5 seconds so that LIF does not loose the Cell 2 in between the tests						

# 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

### 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	10				
OCNG Patterns defined in A.3.2.1.1 (OP.1						
FDD)		OF : IT DD				
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 <sup>Note1</sup>						
OCNG_RB <sup>Note1</sup>						
$N_{oc}^{ m Note2}$	dBm/15 kHz	-98				
$\hat{E}_s / I_{ot}$	dB	4				
RSRP <sup>Note3</sup>	dBm/15 kHz	-94				
Io <sup>Note3</sup>	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 de	ensity is achieve	d for all OFDM symbols.				
Note 2: Interference from other cells and noi	se sources not	specified in the test is				
assumed to be constant over subc	carriers and time	and shall be modelled as				
AWGN of appropriate power for <b>N</b> to be fulfilled						
Note 3: RSRP and to 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	Tes	st 1	Tes	st 2	Tes	st 3
DL timeslot number		0		DwPTS		0	DwPTS
UTRA RF Channel number Note2		Char	nel 2	Char	inel 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	-7	5.2	-9	97
Îor/loc	dB	4	2	Ę	5	(	)
PCCPCH RSCP Note1	dBm	-55.1		-73.2		-100	
lo Note1	dBm/1.28MHz	-5	50	-6	69	-9	)4
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.					ses. They		
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.					set for		

#### 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	

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				<b>)</b>		
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						
$N_{oc}^{ m Note2}$	dBm/15 kHz	-98				
$\hat{E}_s / I_{ot}$	dB	4				
RSRP <sup>Note3</sup>	dBm/15 kHz		-94			
lo <sup>Note3</sup>	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.9.5.2-2: UTRA TDD P-CCPCH RSCP measurement tests parameters (cell 1)

#### Table A.9.5.2-3: UTRA TDD P-CCPCH RSCP measurement tests parameters (cell 2)

Parameter	Unit	Tes	st 1	Tes	st 2	Tes	st 3
DL timeslot number		0		DwPTS		0	DwPTS
UTRA RF Channel number Note2		Chan	nel 2	Char	nel 2	Char	inel 2
PCCPCH_Ec/lor	dB	-3		-3		-3	
DwPCH_Ec/lor	dB		0		0		0
OCNS_Ec/lor	dB	dB -3		-3		-3	
loc	dBm/1.28MHz	-54	4.1	-7	5.2	-9	)7
Îor/loc	dB	2	2	Ę	5	(	)
PCCPCH RSCP Note1	dBm	-55.1		-73.2		-100	
Io Note1	dBm/1.28MHz	-5	50	-6	69	-9	)4
Propagation condition		AWGN					
Note 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							
Note 2: In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for							

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.

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel	As specified in section A.3.1.1.1.
(E-UTRAN FDD)		R.0 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement Channel	As specified in section A.3.1.2.1.
parameters		R.6 FDD	
(E-UTRAN FDD)			
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		GSM Carrier RSSI	
quantity			
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 <sub>channel</sub>	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 <sup>Note 1</sup>	dB				
OCNG_RB <sup>Note 1</sup>	dB				
$N_{_{oc}}$ Note 2	dBm/15 kHz	-98			
RSRP <sup>Note 3</sup>	dBm/15 kHz	-94			
$\hat{E}_{s}/I_{ot}$	dB	4			
SCH_RP <sup>Note 3</sup>	dBm/15 kHz	-94			
$\hat{E}_s/N_{oc}$	dB	4			
Propagation Condition		AWGN			
Note 1: OCNG shall be used such that all cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over					
subcarriers and time	and shall be modele	ed as AWGN of appropriate power for $N_{ac}$ to be fulfilled.			
Note 3: RSRP and SCH_RP not settable paramet	levels have been der ters themselves.	rived from other parameters for information purposes. They are			

Step	BCCH1	BCCH2	BCCH3	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.9.6.1.2 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.

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 Carri	ier RSSI test parameters
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Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in section A.3.1.1.2.
(E-UTRAN TDD)		Channel R.0 TDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.2.
parameters		Channel R.6 TDD	
(E-UTRAN TDD)			
Active cell	-	Cell 1	
DRX	-	OFF	
Uplink-downlink		1	As specified in table 4.2.2 in TS
configuration of cell 1			36.211
Special subframe		6	As specified in table 4.2.1 in TS
configuration of cell 1			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		GSM Carrier RSSI	
quantity			
Monitored cell list size		6 GSM neighbours including	Included in the Measurement
		ARFCN 1	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 <sub>channel</sub>	MHz	10
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD)		OP.1 TDD

	JD	
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 <sup>Note 1</sup>	dB	
OCNG_RB <sup>Note 1</sup>	dB	
$N_{_{oc}}$ Note 2	dBm/15 kHz	-98
RSRP <sup>Note 3</sup>	dBm/15 kHz	-94
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4
SCH_RP <sup>Note 3</sup>	dBm/15 kHz	-94
$\hat{E}_{_{s}}/N_{_{oc}}$	dB	4
Propagation Condition		AWGN
	de the contraction and faille	a subscription of a second part to tall the exercisity of a second second second

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.

Step	BCCH1	BCCH2	BCCH3	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

#### Table A.9.6.2.1-3: BCCH signal levels at receiver input in dBm

#### 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.

Parameter	Unit	Test 1	Test 2	
E-UTRAN RF Channel Number		1	1	
BW <sub>channel</sub>	MHz	1.4	10	
DRX		O	FF	
PDSCH Reference measurement channel defined in A.3.1.1.1		R.2 FDD	R.0 FDD	
PDSCH allocation	n <sub>PRB</sub>	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 <sup>Note1</sup>	dB			
OCNG_RB <sup>Note1</sup>	dB	-		
N <sub>oc</sub> Note2	dBm/15 kHz	-98	-98	
RSRP Note3	dBm/15 kHz	-101	-101	
$\hat{E}_s/N_{oc}$	dB	-3	-3	
lo <sup>Note3</sup>	dBm/1.08 MHz	-77.66	N/A	
	dBm/9 MHz	N/A	-68.45	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	-3	-3	
Propagation Condition AWGN				
<ul> <li>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.</li> <li>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<sub>ac</sub> to be fulfilled.</li> </ul>				
Note 3: RSRP and Io levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

### Table A.9.7.1.2-1: FDD UE Rx – Tx time difference test parameters

# 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	Commont		
rieia	Value		Comment		
srsBandwidthConfiguration	bw7	bw5			
srsSubframeConfiguration	S	c1			
ackNackSrsSimultaneousTransmission	FAI	_SE			
srsMaxUpPTS	N	/A	Not applicable for FDD		
srsBandwidth	(	)	No hopping		
srsHoppingBandwidth	hbw0				
frequencyDomainPosition	0				
Duration	TRUE		TRUE		Indefinite duration
Srs-ConfigurationIndex	0		SRS periodicity of 2ms for all		
			Tests.		
transmissionComb	0				
cyclicShift	/clicShift cs0		No cyclic shift		
Note: For further information see section 6.3.2 in 3GPP TS 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.

Parameter	Unit	Tests 1	Tests 2		
E-UTRAN RF Channel Number	-	1	1		
BW <sub>channel</sub>	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	-	R.2 TDD	R.0 TDD		
A.3.1.1.2					
PDSCH allocation	$n_{PRB}$	2-3	13-36		
PDCCH/PCFICH/PHICH Reference measurement	-	R.8 TDD	R.6 TDD		
channel defined in A.3.1.2.2					
OCNG Patterns defined in A.3.2.2.4 (OP.4 TDD) and	-	OP.4 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	0		
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA <sup>Note2</sup>	dB				
OCNG_RB <sup>N0062</sup>	dB				
N <sub>oc</sub> Note 3	dBm/15 kHz	-98	-98		
RSRP <sup>Note 4</sup>	dBm/15 kHz	-101	-101		
$\hat{E}_s/N_{oc}$	dB	-3	-3		
IO Note 4	dBm/1.08 MHz	-77.66	N/A		
	dBm/9 MHz	N/A	-68.45		
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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	s AWGN of ap	opropriate		
power for $N_{oc}$ to be fulfilled.					
Note 4: RSRP and Io levels have been derived from	n other parameters	for informatio	n 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	Commont
Field	Va	lue	Comment
srsBandwidthConfiguration	bw7	bw5	
srsSubframeConfiguration	S	c1	
ackNackSrsSimultaneousTransmission	FAI	_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		0	
cyclicShift	C	s0	No cyclic shift
Note: For further information see sect	ion 6.3.2 in 3GPF	PTS 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 OTDOA assistance data as defined in TS 36.355, Section 6.5.1, shall be provided to the UE before the measurement period. The last TTI containing the OTDOA assistance data shall be provided to the UE  $\Delta$ T ms before the start of measurement period, where  $\Delta$ T = 150 ms is the maximum processing time of the OTDOA assistance data.

A time span of  $T_{RSTD IntraFreqFDD, E-UTRAN}$  is provided for the measurement period, and PRS are configured according to  $I_{PRS}$  in Tables A.9.8.1.1-1 and A.9.8.1.1-2 during this time.

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		Va	lue		Comment
		Test1	Test2	Test3	Test4	
PCFICH/PDCCH/PHICH		R 8		R 6	FDD	As specified in section A.3.1.2.1
parameters		14.0		14.0		
OCNG Patterns defined in A.3.2.1		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.
			Ce			
			Ce	11 2		
E-UTRA RF Channel Number				1	One FDD carrier frequency is used.	
Channel Bandwidth (BW <sub>channel</sub> )	MHz	1	.4	1	0	
PRS Transmission Bandwidth	RB	6	6	50		
PRS configuration Index $I_{PRS}$			2		2	As defined in 3GPP TS 36.211
Number of consecutive						As defined in 3GPP TS 36.211
positioning downlink		6	6	1		
sunbframes $N_{\rm PRS}$						
prs-MutingInfo			Cell 1: '1	1110000'		See section 6.5.1.2 in 3GPP TS
			Cell 2: '1	1110000'		36.355 for more information
Cell ID		(Cell ID	(Cell ID	(Cell ID	(Cell ID	
		of cell 1	of cell 1	of cell 1	of cell 1	
		of cell 2)	of cell 2)	of cell 2)	of cell 2)	
		mod 6 =	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	mod 6 =	mod 6 =	
expectedRSTD <sup>Note4</sup>	us	3	0	0	-3	
expectedRSTDUncertainty	us	5	5	5	5	
CP length			Nor	mal		
DRX			0	FF		
Radio frame transmit time			3	us		Synchronous cells
difference between cells (cell 2						
TX time – cell 1 TX time) Note4						
Number of cells provided in			1	6		The number of cells includes the
OTDOA assistance data			1	0		reference cell
T <sub>RSTD IntraFreqFDD, E-UTRAN</sub>	ms		25	60		Derived according to the RSTD measurement requirements
						specified in Section 6.1.2.3.1

Deremeter	l lus it	Те	st1	Те	st2	Те	st3	Test4	
Parameter	Unit	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2
E-UTRA RF			•				•		
Channel Number									
PBCH_RA									
PBCH_RB									
PSS_RA									
SSS_RA									
PCFICH_RB									
PHICH_RA	dB	0	0	0	0	0	0	0	0
PHICH_RB	uв	0	0	0	0	0	0	0	0
PDCCH_RA	-								
PDCCH_RB	-								
OCNG_RA <sup>Note1</sup>									
OCNG_RB <sup>Note1</sup>									
PRS_RA									
$N_{_{oc}}$ Note2	dBm/15 kHz	-98	-98	-98	-98	-98	-98	-98	-98
PRS ${ m \hat{E}}_{_{ m s}}/{ m I}_{_{ m ot}}$	dB	-3	-10	-6	-13	-3	-10	-6	-13
lo <sup>Note3</sup>	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					AW	GN			
Note 1: OCNG sh	all he used such	that both ce	lls are fully a	llocated	and a con	stant total tr	ansmitted no	wer sner	rtral
density is	achieved for all (	OFDM symbol	ols (other th	an those i	n the PR	S subframes	) There is n		-
allocated i	n the subframe t	ransmitting F	PRS					01 2001	
Note 2: Interferen	ce from other cel	Is and noise	sources not	specified	l in the te	st is assume	d to be cons	tant over	
subcarrier	s and time and s	hall be mode	elled as AW	GN of app	propriate p	bower for $N$	$\frac{1}{\rho_c}$ to be fulfi	lled.	
Note 3: Io and PR parameter	P levels have be s themselves. lo	en derived fi values are d	rom other pa derived in the	arameters e case tha	for inforn at there is	nation purpo no PBCH, F	ses. They ai PSS or SSS	re not set in the OF	table <sup>-</sup> DM
Note 4: The test e	quipment shall e	nsure that th	e receive tir	ne differe	nce betwe	een the two	cells radio fr	ame 0 sta	art at

#### Table A.9.8.1.1-2: Cell Specific Test Parameters for intra frequency RSTD Tests for E-UTRAN FDD

### 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 OTDOA assistance data as defined in TS 36.355, Section 6.5.1, shall be provided to the UE before the measurement period. The last TTI containing the OTDOA assistance data shall be provided to the UE  $\Delta$ T ms before the start of measurement period, where  $\Delta$ T = 150 ms is the maximum processing time of the OTDOA assistance data.

A time span of  $T_{RSTD IntraFreqTDD, E-UTRAN}$  is provided for the measurement period, and PRS are configured according to  $I_{PRS}$  in Tables A.9.8.2.1-1 and A.9.8.2.1-2 during this time.

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						As specified in section A.3.1.2.2
parameters		R.0 IDD		IX.0 TDD		
OCNG Patterns defined in A.3.2.2		OP.4 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.
		Cell 2				
E-UTRA RF Channel Number		1				Une TDD carrier frequency is used.
Channel Bandwidth (BWchannel)	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		1		As specified in table 4.2-2 in TS 36.211 and table 8.1.2.5.2-2. The same configuration in both cells.
PRS configuration Index $I_{PRS}$		2		2		As defined in 3GPP TS 36.211
Number of consecutive positioning downlink sunbframes $N_{\rm PRS}$		6		1		As defined in 3GPP TS 36.211
prs-MutingInfo			Cell 1: '1 Cell 2: '1	1110000' 1110000'		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 <sup>Note4</sup>	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) <sup>Note4</sup>		3 us				Synchronous cells
Number of cells provided in OTDOA assistance data		16				The number of cells includes the reference cell
T <sub>RSTD IntraFreqFDD, E-UTRAN</sub>	ms	2560				Derived according to the RSTD measurement requirements specified in Section 8.1.2.5.1

Deremeter	Unit	Те	st1	Те	st2	Те	st3	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	0
PHICH_RB	uБ	0	0	0	U	0	0	0	0
PDCCH_RA									
PDCCH_RB									
OCNG_RA <sup>Note1</sup>									
OCNG_RB <sup>Note1</sup>									
PRS_RA									
$N_{_{oc}}$ Note2	dBm/15 kHz	-98	-98	-98	-98	-98	-98	-98	-98
PRS $\hat{E}_{_{ m s}}/I_{_{ m ot}}$	dB	-3	-10	-6	-13	-3	-10	-6	-13
lo <sup>Note3</sup>	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 <sup>Note3</sup>	dBm/15kHz	-100.373	-106.016	-104	-111	-100.373	-106.016	-104	-111
Propagation					۵۱۸/	GN			
condition									
Note 1: OCNG shall be for all OFDM s PRS.	used such that bo symbols (other that	th cells are fund the sells are fund the sells are fund to the sel	Ily allocated a PRS subfra	and a cons mes). The	tant total t re is no P	ransmitted po DSCH allocat	wer spectral of ed in the sub	density is a frame trai	achieved nsmitting
Note 2: Interference fro	m other cells and	noise sources	s not specifie	d in the te	st is assun	ned to be cor	stant over su	bcarriers a	and time
and shall be me	odelled as AWGN	of appropriate	power for $N$	$\int_{oc}$ to be fu	ulfilled.				
Note 3: Io and PRP le themselves. Io	evels have been o values are derived	lerived from of in the case the	other parame	ters for in PBCH, PS	formation   SS or SSS	purposes. The in the OFDM	ey are not se symbols carry	ettable pai /ing PRS.	rameters

#### Table A.9.8.2.1-2: Cell Specific Test Parameters for intra frequency RSTD Tests for E-UTRAN TDD

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 Hi	story						
Date	TSG#	TSG Doc	CR	Rev	Subject	Old	New
2007-12	RP#38	RP-071037	UN	i.ev	Approved version in TSG RAN#38	-	800
2007-12	DD#20	DD 000122	2		Undetee of TS26 122	- • • • •	0.0.0
2008-03	RF#39	RF-000123	2		Updates of TS36.133	0.0.0	0.1.0
2008-05	RP#40	RP-060325	3	4	Updates of 1530.133	0.1.0	0.2.0
2008-09	RP#41	RP-080644	006	1	E-UTRAN TDD Intra frequency measurements when DRX is	8.2.0	8.3.0
0000.00	00/14	<b>DD</b> 000044	000				
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	8.2.0	8.3.0
					requirements		
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	8.2.0	8.3.0
					requirement		
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	8.2.0	8.3.0
					Requirements		
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	8.2.0	8.3.0
					multiple laver monitoring		
2008-09	RP#41	RP-080642	025		Side conditions for UE measurement procedures and	8.2.0	8.3.0
					measurement performance requirements		
2008-09	RP#41	RP-080642	026		Correction to cell reselection Requirement from F-UTRAN to	8.2.0	8.3.0
2000 00			020		HRPD/cdma200 1x	0.2.0	0.010
2008-09	RP#41	RP-080642	027		IRAT Measurement requirements in TS 36 133	820	830
2008-09	RP#41	RP-080713	022	1	Corrections to Handover requirements	820	830
2008-09	RP#41	RP-080713	022		Measurement reporting requirements	820	830
2008-09	RD#/1	RP-080713	020	2	BPC re-establishment requirements	820	830
2008-09	DD#/1	PD 080713	023	2	Correction to LE mossurement requirements	0.2.0 9.2.0	930
2008-09	DD#41	RF-000713	032		Correction for the definition of interruption time	0.2.0	0.3.0
2008-09		RF-000713	033	1	Correction to the definition of interruption time	0.2.0	0.3.0
2008-09		RF-000713	040	1		0.2.0	0.3.0
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	8.2.0	8.3.0
0000.40	DD#40	DD 000040	50		state from RAN 4#47bis and RAN 4#48	0.0.0	0.4.0
2008-12	RP#42	RP-080919	53	4	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	8.3.0	8.4.0
					state		
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	8.3.0	8.4.0
				ļ	Idle state		
2008-12	KP#42	RP-080930	/6	ļ	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	8.3.0	8.4.0
					HRPD Handovers		
2008-12	RP#42	RP-080933	49		E-UTRAN TDD-TDD intra/inter frequency measurement	8.3.0	8.4.0
					reporting requirements		
2008-12	RP#42	RP-080933	50		E-UTRAN FDD – UTRAN FDD Measurement reporting	8.3.0	8.4.0
					requirements		
2008-12	RP#42	RP-080933	58		Measurement requirement for E-UTRAN TDD to UTRAN	8.3.0	8.4.0
					TDD/FDD when DRX is used		
2008-12	RP#42	RP-080933	60		Interfrequency and GSM measurement performance	8.3.0	8.4.0
					requirements in large DRX		
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	8.3.0	8.4.0
-	İ İ				monitoring	-	-

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		UE transmit timing requirement	8.3.0	8.4.0
2008 12	DD#/12	DD 080033	56		Correction of TS 36 123 section 8 1 2 1 1	830	910
2000-12	RF#4Z	KF-000933	50			0.3.0	0.4.0
2008-12	RP#42	RP-080934	77		Correction to RSRQ Report Mapping	8.3.0	8.4.0
2008-12	RP#42		86		Missing side conditions for RSRP and RSRO	830	840
2000 12			04	4	Rhose I DDM Test Coses	0.0.0	0.1.0
2006-12	RP#42	KP-060935	01	I	Phase I RRIVI Test Cases	0.3.0	0.4.0
2008-12	RP#42		80	1	Test Configuration for RRM Tests: Measurement Reference	8.3.0	8.4.0
					Channels and OCNG		
0000.40	DD// 40						0.4.0
2008-12	RP#42	RP-080936	75		Cdma200 1xRTT Measurement Requirements	8.3.0	8.4.0
2008-12	RP#42	RP-080937	74	1	F-UTRA to UTRA cell search requirements for SON	8.3.0	8.4.0
2000 02	DD#42	DD 000100	101	1	Correction of A2 offect noremeter in DDM test acco	0.0.0	0.1.0
2009-03	KF#43	KF-090102	101	I	Conection of AS-onset parameter in RRIV lest case	0.4.0	0.5.0
2009-03	RP#43	RP-090182	105		Some Editorial Corrections	8.4.0	8.5.0
2000-03	PD#/3	PP-000182	1/15		Clarifications for the DRX state	840	850
2003-03	111 #43	RT-030102	145			0.4.0	0.5.0
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	840	850
2000 00		111 000100	01			0.4.0	0.0.0
					a multiple of the mode reselection evaluation period		
2009-03	RP#43	RP-090183	98		Clarification of 'Out of Service Area' Concept and Definition	8.4.0	8.5.0
2000 03	DD#/12	PD 000192	110		Padia link monitoring	940	850
2003-03	111 #43	11-030103	110		Radio link monitoring	0.4.0	0.5.0
2009-03	RP#43	RP-090183	142	1	Update of RRC_IDLE state mobility side conditions	8.4.0	8.5.0
2000 00				-		00	0.010
2009-03	RP#43	RP-090183	150		UE measurement capability in Idle mode	8.4.0	8.5.0
			1			1	1
2000.02	DD#40	DD 000494	100		Removal of RRC re-actabliabment presedure delay	040	0 5 0
2009-03	KP#43	KF-090184	133		Removal of RRC re-establishment procedure delay	0.4.0	0.5.0
						1	
2009-03	RP#43	RP-090184	138	1	Correction for the UF Re-establishment delay requirement	840	850
2003 03	111 #45	11 030104	150			0.4.0	0.5.0
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
2000.02	DD#42	DD 000195	120		LIE Transmit Timing	010	9 5 0
2009-03	KF#43	KF-090100	120		OE Manshik mining	0.4.0	0.5.0
2009-03	RP#43	RP-090185	137	1	Clarification of the reference point for the UE initial	840	850
2000 00	10	14 000100				0.1.0	0.0.0
					transmission timing control requirement		
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
					•		
0000.00	DD// 40	<b>DD</b> 000400				0.4.0	0.5.0
2009-03	RP#43	RP-090186	94		Event Triggered Periodic Reporting Requirements for IRAT	8.4.0	8.5.0
					Measurements		
2000.02	DD#/2	PD 000186	05		Measurement Penerting Pequirements for E LITRAN TOD	840	850
2003-03	111 #43	11-030100	35			0.4.0	0.5.0
					UTRAN TDD Measurements		
2009-03	RP#43	RP-090186	99	1	Clarification of UE behavior when measurement gap is used	8.4.0	8.5.0
2000 00				-		00	0.010
2009-03	RP#43	RP-090186	100		E-UTRA to UTRA cell search requirements in DRX for SON	8.4.0	8.5.0
0000.00	DD#40		110	4	Convertion to CCM DCIC Descritements for Devalled	0.4.0	0 5 0
2009-03	RP#43	RP-090186	110	1	Correction to GSM BSIC Requirements for Parallel	8.4.0	8.5.0
					Monitoring		
2000-03	RP#43	RP-000186	117		Alianment of terminology for GAP	840	850
2003-03	111 #43	111-030100	,		Alignment of terminology for OA	0.4.0	0.5.0
L						L	
2009-03	RP#43	RP-090186	134		Inter frequency and Inter RAT cell search requirement when	8.4.0	8.5.0
		_			DRX is used		
0000.00	DD// 40		400			0.4.0	050
2009-03	KP#43	KP-090186	139		Correction of E-UTRAN FDD – UTRAN FDD measurements	8.4.0	8.5.0
			1		when no DRX	1	
2000-02	RP#/2	RP-000196	1/6		Addition of the definition of "when DRY is used"	810	850
2009-03	NF #43	116-030100	140			0.4.0	0.0.0
		<u> </u>					
2009-03	RP#43	RP-090186	147	1	Corrections to E-UTRAN inter-frequency side conditions	8.4.0	8.5.0
						1	
0000		DD 000					0
2009-03	RP#43	RP-090187	96		Correction to Intra-frequency RSRP Accuracy Requirements	8.4.0	8.5.0
					•••	1	
2000.02	DD#42	DD 000407	126	1	Power Headroom reporting delay	940	950
2009-03	57#43	KE-090101	130	1	Fower meautoont reporting delay	0.4.0	0.5.0
			1			1	
2000-03	RP#/3	RP-000370	103	1	F-UTRAN -GSM Handover Test Case	840	850
2003-03	DD#10		100			0.4.0	0.0.0
2009-03	KP#43	KP-090370	104	1	E-UTRAN FDD - UTRAN TDD Cell Search Test Cases in	8.4.0	8.5.0
					Fading		
2000 02	<b>RD#</b> /2	PD_000270	106	1	E-LITRA EDD to LITRA EDD Handovor Toot Coop	810	850
2009-03	INF#43	11-090310	100			0.4.0	0.0.0
2009-03	RP#43	RP-090370	107	1	Correction of E-UTRA FDD-FDD Intra-frequency cell	8.4.0	8.5.0
			1		reselection test case	1	
2000.02	DD#42	DD 000070	100	1	Correction of E LITRA EDD EDD priority based later	940	9 5 0
2009-03	57#43	KE-090310	100	1	Conection of E-OTRA FUD-FUD phonty based inter-	0.4.0	0.5.0
					frequency cell reselection test case		
2009-03	DD#40	RP-000370	111		F-UTRAN TDD - UTRAN FDD Handover Test Case	840	850
	RP#4 4						
2000 00	RP#43		440	4		0.1.0	0.5.0
2009-03	RP#43 RP#43	RP-090370	112	1	E-UTRAN FDD - GSM Cell Search Test Case in AWGN	8.4.0	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	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		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	facting environment when DPX is used	8.5.0	8.6.0
2009-05	RP#44	RP-090546	152	1	E-LITRA TDD, GSM handover test case	850	860
2009-05	RP#44	RP-090546	178	1	Test cases of F-UTRA FDD intra-frequency cell search in	8.5.0	8.6.0
2009-05	RP#44	RP-090546	201	1	fading environment when DRX is used	850	860
2009-05	RP#44	RP-090546	185	1	Correction to Radio Link Monitoring Tests	850	860
2009-05	RP#44	RP-090546	203		Correction to E-UTRAN FDD to HRPD Cell Reselection Test	8.5.0	8.6.0
2009-05	RP#44	RP-090546	177	1	Case Introduction of New Reference Channels and OCNG Patterns	850	860
2009-05		PP-090546	200	2	for 1.4MHz Bandwidth	85.0	860
2003-05		DD 000547	200	2	cell search when DRX is used in factor DD internequency	0.5.0	0.0.0
2009-05	KP#44	KP-090547	100		testcases with core requirements. (Technically Endorsed CR in R4-50bis - R4-091094)	8.5.0	0.0.0
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	8.5.0	8.6.0
2000-05	RD#AA	RP-000549	176		Corrections of Random Access Requirements	850	860
2009-05	RP#44	RP-090548	154		Correction of TGRP in clause 81211	850	860

2009-05	RP#44	RP-090548	168		Clarifications for the Relative RSRP and RSRQ measurement requirements. (Technically Endorsed CR in	8.5.0	8.6.0
2009-05	RP#44	RP-090549	161		E-UTRAN UTRAN HO Command Processing Delay.	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#43	RP-090860	207		Addition of DRA configurations into non DRA test cases	9.0.0	9.1.0
2009-05	RP#45	80-00000	220		Correction to F-LITRAN CSM RSIC Identification	9.0.0	9.1.0
2009-05	DD#45	RF-090000	221		Requirements with DRX	9.0.0	9.1.0
2009-05	RP#45 RD#45	RP-090660	209		E-LITRA EDD - E-LITRA EDD and LITRA EDD cell search test	9.0.0	9.1.0
2003-03	111 #45	11-030000	514		Cases	3.0.0	3.1.0
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	9.0.0	9.1.0
2009-05	RP#45	RP-090836	269		under fading 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, F-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		E-UTRAN FDD cdma2000 Blind HO Test cases	9.0.0	9.1.0
2009-05	RP#45	RP-090836	302		RRM Test case for multiple E-UTRAN FDD-FDD Inter- 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	KP#45	KP-090879	249		Removal of [] from I detect, I measure and I evaluate	9.0.0	9.1.0
2009-05	KP#45	RP-090879	245	1	Clarification to applicability of KSKP side conditions in Idle mode	9.0.0	9.1.0
2009-05	RP#45	RF-0900/9	210		CR Idle mode IF measurement pariod	9.0.0	9.1.0
2009-05	RP#45	RP-090879	217	2	Corrections to E-UTRAN RRC_IDLE state mobility	9.0.0	9.1.0
2009-05	RP#45	RP-090814	265	1	Correction to Random Access	9.0.0	9.1.0
2009-05	RP#45	RP-090816	221		E-UTRAN TDD-TDD inter frequency cell search/measurement requirements when DRX is used	9.0.0	9.1.0
2009-05	RP#45	RP-090816	223		E-UTRAN inter RAT measurement requirements	9.0.0	9,1.0
2009-05	RP#45	RP-090816	229		Correction to Monitoring of Multiple Lavers Using Gaps	9.0.0	9.1.0
2009-05	RP#45	RP-090816	219	1	E-UTRAN FDD-FDD inter frequency measurements when DRX is used	9.0.0	9.1.0
2009-05	RP#45	RP-090816	322		CR GSM measurement period	9.0.0	9.1.0
2009-05	RP#45	RP-090816	323		CR cdma2000 1x and HRPD number of carriers	9.0.0	9.1.0

2009-05	RP#45	RP-090816	213	1	Editorial correction on E-UTRAN inter frequency	9.0.0	9.1.0
2009-05	RP#45	RP-090816	261	1	F-LITRAN TDD intra frequency measurements	900	910
2009-05	RP#45	RP-090816	319	1	Clarification of the number of monitoring cells for intra	9.0.0	9.1.0
	_				frequency measurements		
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	9.1.0	9.2.0
					SON (Technically endorsed at RAN 4 52bis in R4-093512)		
2009-12	RP-46	RP-091272	332		Modification of test case of E-UTRA TDD intra frequency cell	9.1.0	9.2.0
					reselection (Technically endorsed at RAN 4 52bis in R4-		
					093552)		
2009-12	RP-46	RP-091272	333		Modification of test case of E-UTRA TDD inter frequency cell	9.1.0	9.2.0
					reselection (Technically endorsed at RAN 4 52bis in R4-		
					093553)		
2009-12	RP-46	RP-091286	334		Introduction of Extended LTE1500 requirements for	9.1.0	9.2.0
					1536.133 (Technically endorsed at RAN 4 52bis in R4-		
2000.42		DD 004070	220		093030)	0.4.0	0.0.0
2009-12	RP-40	RP-091272	330		Addition of E-OTRA TDD to OTRA FDD teselection test	9.1.0	9.2.0
2009-12	PD-16	PP-001271	338		Correction of missing accuracy requirements for LITRAN	010	920
2003-12	111-40	111-031271	550		EDD (Technically endorsed at RAN 4 52bis in R4-093689)	3.1.0	5.2.0
2009-12	RP-46	RP-091275	340		CR cdma2000 HRPD measurement period (Technically	910	920
2000 12			0.0		endorsed at RAN 4 52bis in R4-093720)	00	0.2.0
2009-12	RP-46	RP-091275	342		CR cdma2000 1x measurement period (Technically endorsed	9.1.0	9.2.0
					at RAN 4 52bis in R4-093721)		
2009-12	RP-46	RP-091272	344		Correction for E-UTRAN FDD - UTRAN FDD Cell Search in	9.1.0	9.2.0
					DRX Test Cases (Technically endorsed at RAN 4 52bis in		
					R4-093890)		
2009-12	RP-46	RP-091272	346		Revise geometry factors for Intra freq Reselection Test	9.1.0	9.2.0
					Cases		
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	9.1.0	9.2.0
					measurement in E-UTRAN		
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-LIE Handover to	9.1.0	9.2.0
2000 12		DD 001070	265		Unknown Target Cell	010	0.2.0
2009-12	KF-40	KF-091273	305		test cases (Scenario set 3.2)	9.1.0	9.2.0
2009-12	RP-46	RP-091271	367	1	Correction in LIE LITRA TOD P-CCPCH RSCP measurement	910	920
2003 12	111 40	111-051271	507		capability for R9	5.1.0	5.2.0
2009-12	RP-46	RP-091273	374		F-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	9.1.0	9.2.0
	_				Accuracy Tests		
2009-12	RP-46	RP-091273	376		E-UTRAN UTRAN FDD CPICH Ec/No Measurement	9.1.0	9.2.0
					Accuracy Tests		
2009-12	RP-46	RP-091275	378		Cell Timing Change Requirements for Event Triggered	9.1.0	9.2.0
					Reporting		
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-	9.1.0	9.2.0
					establishment test cases		
2009-12	RP-46	RP-091272	389	1	Introduction of cell search test case in DRX to verify L3	9.1.0	9.2.0
					filtering		
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	9.1.0	9.2.0
2000 12		DD 001070	222		SON (Technically endorsed at RAN 4 52bis in R4-093512)	010	0.2.0
2009-12	RP-40	RP-091272	332		modification of test case of E-OTRA TDD initia frequency cell resoluction (Technically enderged at RAN 4.52 his in R4	9.1.0	9.2.0
2009-12	<b>RP-46</b>	RP-091272	333		Modification of test case of E-LITRA TDD inter frequency cell	910	920
2000 12		10 001272	000		reselection (Technically endorsed at RAN 4.52bis in R4-	0.1.0	0.2.0
					093553)		
2010-03	RP-47	RP-100254	410		Idle mode corrections	9.2.0	9.3.0
2010-03	RP-47	RP-100254	405	1	LIF measurement canability requirements in Idle and	9.2.0	9.3.0
2010 00		100201	-05	1	Connected	0.2.0	0.0.0
2010-02	RD_/7	RP-100254	400	+ '	Correction to LIE Measurement Carability	920	930
2010-03	111-4/	111100204	423		Conculion to DE measurement Capability	0.2.0	0.0.0
2010.02	74 00	DD 400054	440		Requirements in fulle Wode	0.2.0	0.2.0
2010-03	RP-47	KF-100254	412		Removal of activation time from interRAT handover	9.2.0	9.3.0
0010.00	DD (7			<u> </u>		0.0.0	0.0.0
2010-03	KP-47	KP-100254	417	1	Correction to UE Transmit Timing Requirements	9.2.0	9.3.0
	L PD_/17	I RP-100254	1 102	i i	$($ orrection of $\vdash I \cup PAN TDD$ inter frequency	1 420	1 4 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
0010.00	DD 47	DD 400055	0.07		trequency reselection test	0.0.0	0.0.0
2010-03	RP-47	RP-100255	397		Addition of missing Es/Noc parameters in RRM test cases	9.2.0	9.3.0
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		Introduction of LTE in 800 MHz for Europe	9.2.0	9.3.0
					requirements in TS 36.133		
2010-03	RP-47	RP-100264	395		Corrections for Extended UMTS1500 in TS36.133(Rel-	9.2.0	9.3.0
2010-03	RP-47	RP-100269	202		$\frac{9}{1000}$	920	930
2010-03	RD-47	RF-100209	393	2	AOA and TA measurement report mappings	9.2.0	9.3.0
2010-03	DD /7	RT -100203	403	2	Hama aNada B aunabranization requirement	0.2.0	9.3.0
2010-03	RF-47 RD-47	RF-100200	420	2	Minimum requirements on SL reading for HoNP	9.2.0	9.3.0
2010-03	111-47	111-100200	424	2	inhound mobility	3.2.0	3.3.0
2010-06	PD-/18	PP-100622	173	2	Clarification on radio link monitoring	030	940
2010-00	NF -40	KF-100022	473		Corrections of section numbering on the test case of F-	9.3.0	9.4.0
2010 00					UTRAN FDD-FDD inter-frequency cell search requirements	0.0.0	5.4.0
	RP-48	RP-100622	472		for L3 fitering		
2010-06	RP-48	RP-100622	466	1	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		UE Measurement Capability Requirements for CDMA2000	9.3.0	9.4.0
2010-06	<b>DD</b> (0				Correction of E-UTRAN Inter-frequency Cell Re-selection	9.3.0	9.4.0
2010.00	RP-48	RP-100622	455	1	Requirements	0.0.0	0.4.0
2010-06	RP-48	RP-100622	451	1	Correction to Idle mode requirements(Rei-9)	9.3.0	9.4.0
2010-06	RP-40	RP-100622	449	1	Correction to TDD intrafrequency accuracy test case	9.3.0	9.4.0
2010-00	111-40	111-100022	447		Correction of Io value in E-UTRAN FDD and TDD Inter	9.3.0	940
2010 00	RP-48	RP-100622	441	1	frequency RSRP tests	0.0.0	0.1.0
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	RP-48	RP-100630	470	1	Test cases for R9 cell reselection enhancements	9.3.0	9.4.0
2010-06	RP-48	RP-100630	460		Missing E-UTRA - UTRA FDD DRX Requirements	9.3.0	9.4.0
2010-06	RP-48	RP-100631	442	2	Corrections to enhanced cell identification core requirement	9.3.0	9.4.0
2010-06	DD /9	PD 100632	460		Applicability of mobility requirements with inter-frequency	9.3.0	9.4.0
2010-06	NF -40	KF-100032	409		LIF Rx-Tx Time Difference Measurement Requirements for	930	940
2010 00	RP-48	RP-100632	439		E-CID	0.0.0	5.4.0
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	<b>DD</b> (0				A clarification text in the RSTD intra-frequency accuracy		
2010.00	RP-49	RP-100919	537		requirements	9.4.0	9.5.0
2010-09	RP-49	KP-100920	000		Correction of lo value in RSPR EDD and TDD Intro froguency	9.4.0	9.5.0
2010-09							
2010-09	RP-49	RP-100915	508		test	9.4.0	9.5.0
	RP-49 RP-49	RP-100915 RP-100920	508 521	1	Editorial corrections to 36.133 (R9)	9.4.0 9.4.0	9.5.0 9.5.0
2010-09	RP-49 RP-49 RP-49	RP-100915 RP-100920 RP-100914	508 521 523	1	Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 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	RP-49 RP-49 RP-49 RP-49	RP-100915 RP-100920 RP-100914 RP-100920	508 521 523 525	1	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	9.5.0 9.5.0 9.5.0 9.5.0
2010-09 2010-09 2010-09	RP-49 RP-49 RP-49 RP-49 RP-49	RP-100915 RP-100920 RP-100914 RP-100920 RP-100915	508 521 523 525 505	1 1 1	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)	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
2010-09 2010-09 2010-09 2010-09	RP-49 RP-49 RP-49 RP-49 RP-49	RP-100915 RP-100920 RP-100914 RP-100920 RP-100915	508 521 523 525 505	1	Editorial corrections to 36.133 (R9) Alignment of REFSENS between 36.101 and 36.133(R9) Corrections to 36.133(R9) Corrections to 36.133(R9) E-UTRAN FDD Intra Frequency RSTD Measurement	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
2010-09 2010-09 2010-09 2010-09	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920	508 521 523 525 505 528	1 1 1 1	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	9.5.0 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	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919	508 521 523 525 505 528 538 538	1 1 1 1 1	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 Enbaged CSEP Requirements with DDY	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
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-49	RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919 RP-100919 RP-100919	508 521 523 525 505 528 538 539 540	1 1 1 1 1	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
2010-09 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-49	RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100920 RP-100919 RP-100919 RP-100919	508 521 523 525 505 528 538 538 539 540	1 1 1 1	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 LITRA 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 9.4.0	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	RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49 RP-49	RP-100915 RP-100920 RP-100914 RP-100920 RP-100915 RP-100919 RP-100919 RP-100919 RP-100920	508 521 523 525 505 528 538 538 539 540 544	1 1 1 1 1	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         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-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49	RP-100915           RP-100920           RP-100914           RP-100920           RP-100915           RP-100919           RP-100919           RP-100919           RP-100919           RP-100920	508           521           523           525           505           528           538           539           540           544	1 1 1 1 1	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         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-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49	RP-100915           RP-100920           RP-100914           RP-100920           RP-100915           RP-100919           RP-100919           RP-100919           RP-100919           RP-100920           RP-100919           RP-100919           RP-100920           RP-100919	508           521           523           525           505           528           538           539           540           544           547	1 1 1 1 1 1 1 1	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 9.4.0	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         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-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49           RP-49	RP-100915           RP-100920           RP-100914           RP-100920           RP-100915           RP-100919	508           521           523           525           505           528           538           539           540           544           547           479	1 1 1 1 1 1 1 1 1	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 9.4.0	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         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-49	RP-100915           RP-100920           RP-100914           RP-100920           RP-100915           RP-100919	508           521           523           525           505           528           538           539           540           544           547           479           549	1 1 1 1 1 1 1 1 1	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 9.4.0 9.4.0	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	RP-49           RP-49	RP-100915           RP-100920           RP-100914           RP-100920           RP-100915           RP-100919           RP-100919           RP-100919           RP-100919           RP-100919           RP-100919           RP-100919           RP-100919           RP-100919           RP-100920           RP-100920           RP-100920           RP-100914           RP-100920	508           521           523           525           505           528           538           539           540           544           547           479           549           527	1 1 1 1 1 1 1 1	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 9.4.0 9.4.0 9.4.0	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-49	RP-100915           RP-100920           RP-100914           RP-100920           RP-100915           RP-100919           RP-100919           RP-100919           RP-100919           RP-100919           RP-100919           RP-100919           RP-100919           RP-100920           RP-100920           RP-100920           RP-100914           RP-100920           RP-100920           RP-100920	508           521           523           525           505           528           538           539           540           544           547           479           549           527           488	1 1 1 1 1 1 1 1 2	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) Test case for TDD 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 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	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 2010-09	RP-49           RP-49	RP-100915           RP-100920           RP-100920           RP-100920           RP-100915           RP-100919           RP-100919           RP-100919           RP-100920           RP-100919           RP-100919           RP-100920           RP-100920           RP-100920           RP-100920           RP-100914           RP-100920           RP-100920           RP-100914           RP-100914           RP-100914	508           521           523           525           505           528           538           539           540           544           547           479           549           527           488           483	1 1 1 1 1 1 1 1 2	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) Test case for TDD UE Rx-Tx time difference measurement Clarification of Radio link monitoring 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 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0 9.4.0	9.5.0           9.5.0

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					L3 filtering is used in R9		
2010-09					E-UTRA TDD - UTRA TDD cell reselection in fading		
	RP-49	RP-100915	487		propagation conditions: UTRA TDD is of lower priority in R9	9.4.0	9.5.0
2010.00		14 100010	101		Test appender E LITRAN TOD in the evictance of non-allowed	0.1.0	0.0.0
2010-09					Test case for E-UTRAIN TDD in the existence of non-allowed		
	RP-49	RP-100924	492		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					Correction of ES/lot value in E-UTRAN RSRQ FDD intra		
2010 00	PD-10	PP-100015	503		frequency test	940	950
0040.00	IXI -43	RI -100313	303			3.4.0	3.5.0
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	940	950
2010 00	PD 40	PD 100014	177	1	Coll identity change time in PPM Test cases	0.1.0	0.0.0
2010-09	KF-49	KF-100914	4//	1		9.4.0	9.5.0
2010-09					A clarification text in the RSTD intra-frequency accuracy		
	RP-49	RP-100919	537		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					Correction of lo value in RSRP EDD and TDD Intra frequency		
2010-03		DD 100015	500			0.4.0	050
	RF-49	RF-100913	508			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)	940	950
2010-00		DD 400045	525	1		0.4.0	0.5.0
2010-09	RP-49	RP-100915	505	1	Corrections to 36.133(R9)	9.4.0	9.5.0
2010-09					E-UTRAN FDD Intra Frequency RSTD Measurement	1	
	RP-49	RP-100920	528	1	Accuracy test case	9.4.0	9.5.0
2010-09	RP-40	RP-100010	538	1	Correction to Enhanced BSIC Verification Requirements	940	950
2010 03		DD 100010	E00	-	Enhanced CSED Dequirements with DDV	0.4.0	0.0.0
2010-09	RP-49	RP-100919	539		Ennanced 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					Addition of UTRA and GSM enhanced cell identification test		
_0.000	PD-10	PP-100020	544	1		940	950
0040.00	111-43	111-100320	J44	1		3.4.0	3.3.0
2010-09					E-UTRAN FDD UE RX – TX TIME Difference Measurement		
	RP-49	RP-100920	547	1	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	940	950
2010 00		DD 100000	507		correction of redundent Unstargaig(Una) for 26 122(D0)	0.4.0	0.0.0
2010-09	RP-49	RP-100920	527	_		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					Test case for E-LITRA TDD event triggered reporting when		
2010 00	<b>DD 40</b>	DD 100015	105		1.2 filtering is used in P0	040	0.5.0
0040.00	KF-49	KF-100913	405			9.4.0	9.5.0
2010-09					E-UTRA TDD - UTRA TDD cell reselection in fading		
	RP-49	RP-100915	487		propagation conditions: UTRA TDD is of lower priority in R9	9.4.0	9.5.0
2010-09					Test case for E-UTRAN TDD in the existence of non-allowed		
	RP-49	RP-100924	492		CSG cell	940	950
2010.00	DD 40	DD 400045	404		BDCCLLA arrestation lavel for BDM tests	0.4.0	0.5.0
2010-09	RP-49	RP-100915	494		PDCCH Aggregation level for RRIVI tests	9.4.0	9.5.0
2010-09					Correction of ES/lot value in E-UTRAN RSRQ FDD intra		
	RP-49	RP-100915	503		frequency test	9.4.0	9.5.0
2010-09	RP-49	RP-100915	496		Corrections to RRM OCNG Patterns	940	950
2010.00	PD 40	DD 100010	409		BBC timer ecourceu requirement	0.4.0	0.5.0
2010-09	KF-49	RF-100919	490			9.4.0	9.5.0
2010-09	RP-49	RP-100915	501		Correction of OCNG	9.4.0	9.5.0
2010-12	RP-50	RP-101331	634		Corrections to 36.133 performance requirements	9.5.0	9.6.0
2010-12	RP-50	RP-101331	637		Correction to intra frequency cell identification time	950	960
2010 12	RP 50	PD_101221	501	1	Correction to Radio link monitoring tost coope	0.5.0	960
2010-12	NF-30	NF-101331	591			9.0.0	9.0.0
2010-12	KP-50	KP-101331	565	1	Corrections and Clarifications to 1S36.133	9.5.0	9.6.0
<u>20</u> 10-12	RP-50	RP-101332	562		PDCCH Aggregation Level for RRM Tests	9.5.0	9.6.0
2010-12	RP-50	RP-101332	570		MIMO correlation scenario for RLM test cases	9.5.0	9.6.0
2010-12	RP-50	RP-101332	570		Removal of [] from PDSCH and PCFICH/DDCCH/DHICH	950	960
2010-12	11.50	11-101352	513		Management Channel references in America	5.5.0	5.0.0
2010-12	RP-50	RP-101332	584		Enabling HARQ for RRM Tests	9.5.0	9.6.0
2010-12	RP-50	RP-101335	642	1	Completion of CSG cell reselection requirements	9.5.0	9.6.0
2010-12	RP-50	RP-101343	567		Clarification of measurements requirements for HRPD and	950	960
2010 12	11 00		001		cdma2000 1v	0.0.0	0.0.0
0010.10	DD 55		500			0.5.0	0.0.0
2010-12	KP-50	KP-101343	588		Addition of Band 18, 19 and 21 into UE Rx - 1x time	9.5.0	9.6.0
					difference requirements		
2010-12	RP-50	RP-101343	603		Correction to Enhanced GSM Cell Identification	9.5.0	9.6.0
					Requirements		
2010 12		DD 101040	551	2	E LITRANI TOD Intro Ereguenou PETO Macouroment	050	060
2010-12	KP-50	RP-101343	551	3	E-OTRAN TOD Initia Frequency RSTD Measurement	9.5.0	9.6.0
L	ļ				Accuracy test case	ļ'	
2010-12	RP-50	RP-101343	639		Correction to Enhanced UTRA FDD Cell Identification	9.5.0	9.6.0
1					Requirements	1	
2010-12	RD-50	RP-101242	631	1	Correction of reselection requirement for LITRAN EDD collo	950	960
2010-12		DD 404040	001	0	Consolion of reselection requirement for UTRAN FDD Cells	3.3.0	0.0.0
2010-12	RP-50	KP-101343	620	2	Correction for Measurements of Inter-RAT cells	9.5.0	9.6.0
2010-12	RP-50	RP-101343	597	1	E-UTRAN FDD intra-frequency RSTD measurement	9.5.0	9.6.0
					reporting delay test case	1	
2010-12	RP-50	RP-1013/3	500	1	E-LITRAN TDD intra-frequency RSTD measurement	950	960
2010-12	11-30	11 - 101343	533	<b>'</b>		0.0.0	5.0.0
	DD	<b>DD</b> (0)	o :=			0	0.0.0
2010-12	RP-50	RP-101387	647		Removal of square brackets from scope of TS36.133	9.5.0	9.6.0

2011-04 2011-04	RP-51 RP-51	RP-110340 RP-110348	0662 0664	- 1	Correction to E-UTRAN TDD in-sync test requirements RSTD requirements, RMC and OCNG patterns	9.6.0 9.6.0	9.7.0 9.7.0
2011-04	RP-51	RP-110339	0675	-	Modification on test case of E-UTRA TDD to UTRA TDD cell reselection(R9)	9.6.0	9.7.0
2011-04	RP-51	RP-110348	0678	2	Corrections to RSTD measurement for Rel-9	9.6.0	9.7.0
2011-04	RP-51	RP-110339	0680	1	Value of MS_TXPWR_MAX_CCH for EUTRA-GSM reselection test cases A.4.4.x	9.6.0	9.7.0
2011-04	RP-51	RP-110339	0686	1	Rearrangement of Time periods for EUTRA-UTRA reselection test case A 4 3 1 1	9.6.0	9.7.0
2011-04	RP-51	RP-110339	0689	1	Removal of "Force to Cell 2" during initialisation for EUTRA- UTRA reselection test case A.4.3.1.2	9.6.0	9.7.0
2011-04	RP-51	RP-110340	0692	1	SNR for RRM A.8.x test cases using ETU70	9.6.0	9.7.0
2011-04	RP-51	RP-110339	0702	-	Correction to test cases of E-UTRA to UTRA cell reselection when UE is in idle state	9.6.0	9.7.0
2011-04	RP-51	RP-110347	0708	1	Addition of test cases for FDD intra-frequency SI reading using autonomous gaps with both non DRX and DRX for Rel- 9	9.6.0	9.7.0
2011-04	RP-51	RP-110347	0710	1	Addition of test cases for FDD inter-frequency SI reading using autonomous gaps with both non DRX and DRX for Rel- 9	9.6.0	9.7.0
2011-04	RP-51	RP-110339	0718	1	Modification on Test Requirements in E-UTRA - UTRA TDD SON Test Case (A.8.7.3) (R9)	9.6.0	9.7.0
2011-04	RP-51	RP-110348	0726	2	Requirements for reporting criteria with positioning measurements	9.6.0	9.7.0
2011-04	RP-51	RP-110340	0735	-	Correction of RLM evaluation period in DRX	9.6.0	9.7.0
2011-04	RP-51	RP-110340	0738	-	Correction of inter-frequency measurement accuracy test cases	9.6.0	9.7.0
2011-04	RP-51	RP-110339	0743	-	Modification on Test Requirements in E-UTRA GSM cell reselection Test Case (A.4.4) (R9)	9.6.0	9.7.0
2011-04	RP-51	RP-110348	0746	-	Correction on FDD Intra Frequency RSTD Measurement Accuracy test case	9.6.0	9.7.0
2011-04	RP-51	RP-110348	0750	1	RSTD test case corrections	9.6.0	9.7.0
2011-04	RP-51	RP-110344	0752	-	Correction of serving cell performance requirements for autonomous SI acquisition	9.6.0	9.7.0
2011-06	RP-52	RP-110786	764		Rearrangement of Time periods for EUTRA-UTRA reselection test case A.4.3.4.1	9.7.0	9.8.0
2011-06	RP-52	RP-110786	767		Removal of "Force to Cell 2" during initialisation for EUTRA - UTRA reselection test cases	9.7.0	9.8.0
2011-06	RP-52	RP-110787	770		Clarification of Radio link monitoring test requirements	9.7.0	9.8.0
					(The CR was not implemented as it is not based on the latest version of the specification)		
2011-06	RP-52	RP-110794	796		Editorial Correction to Cell Re-selection Requirements	9.7.0	9.8.0
2011-06	RP-52	RP-110789	807		Correction to side conditions for TDD inter-frequency CGI identification for Rel-9	9.7.0	9.8.0
2011-06	RP-52	RP-110786	813		Correction to inter-RAT cell identificiation time in DRX for Rel-9	9.7.0	9.8.0
2011-06	RP-52	RP-110787	816		Correction to identification time of UTRA FDD cell for SON in DRX for Rel-9	9.7.0	9.8.0
2011-06	RP-52	RP-110787	821		Correction to requirements of E-UTRAN TDDUTRAN TDD measurements for SON when DRX is used for Rel-9	9.7.0	9.8.0
2011-06	RP-52	RP-110794	779	1	Correction to RSTD measurement for Rel-9	9.7.0	9.8.0
2011-06	RP-52	RP-110789	855		Correction on E-UTRAN FDD RSTD intra frequency case	9.7.0	9.8.0
2011-06	RP-52	RP-110790	803	1	Addition of test cases for TDD intra-frequency SI reading using autonomous gaps with both non DRX and DRX for Rel- 9	9.7.0	9.8.0
2011-06	RP-52	RP-110790	805	1	Addition of test cases for TDD inter-frequency SI reading using autonomous gaps with both non DRX and DRX for Rel- 9	9.7.0	9.8.0

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2011-06	RP-52	RP-110787	827	1	Addition of missing EsNoc parameters in E-UTRAN TDD UTRAN TDD Measurements test cases for Rel-9	9.7.0	9.8.0
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# History

Document history					
V9.1.0	October 2009	Publication			
V9.2.0	February 2010	Publication			
V9.3.0	April 2010	Publication			
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V9.5.0	October 2010	Publication			
V9.6.0	January 2011	Publication			
V9.7.0	May 2011	Publication			
V9.8.0	June 2011	Publication			