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# Contents

Intelle	ectual Property Rights	2
Forew	vord	2
Forew	vord	17
1	Scope	18
2	References	18
3	Definitions, symbols and abbreviations	19
3.1	Definitions	
3.2	Symbols	
3.3	Abbreviations	
3.4	Test tolerances	
4	E-UTRAN RRC_IDLE state mobility	
4.1	Cell Selection	
4.2	Cell Re-selection	
4.2.1 4.2.2	Introduction	
4.2.2	Requirements	
4.2.2.1		
4.2.2.3		
4.2.2.4		
4.2.2.5		
4.2.2.5	5.1 Measurements of UTRAN FDD cells	25
4.2.2.5		
4.2.2.5		
4.2.2.5		
4.2.2.5		
4.2.2.6		
4.2.2.7		
4.2.2.9		
4.2.2.1		
4.2.2.1		
4.2.2.1		
5	E-UTRAN RRC_CONNECTED state mobility	
5.1	E-UTRAN Handover	
5.1.1	Introduction	
5.1.2	Requirements	
5.1.2.1		
5.1.2.1 5.1.2.1		
5.2.2.2	1	
5.2.2.2		
5.2.2.2		
5.2.2.3		
5.2.2.3	3.1 (Void)	
5.2.2.3		
5.2.2.4		
5.2.2.4		
5.2.2.4	1	
5.3 5.3.1	Handover to other RATs E-UTRAN - UTRAN FDD Handover	
5.3.1.1		
5.3.1.1		
5.3.1.1		

5.3.2	E-UTRAN - UTRAN TDD Handover	
5.3.2.1	Introduction	
5.3.2.2	Requirements	35
5.3.2.2.1	Handover delay	35
5.3.2.2.2	Interruption time	
5.3.3	E-UTRAN - GSM Handover	
5.3.3.1	Introduction	
5.3.3.2	Requirements	
5.3.3.2.1	Handover delay	
5.3.3.2.2	Interruption time	
5.4	Handover to Non-3GPP RATs	
5.4.1	E-UTRAN – HRPD Handover	
5.4.1.1	Introduction	
5.4.1.1.1	Handover delay	
5.4.1.1.2	Interruption time	
5.4.2	E-UTRAN – cdma2000 1X Handover	
5.4.2.1	Introduction	
5.4.2.1.1	Handover delay	
5.4.2.1.2	Interruption time	
6 DI	DC Connection Mehility Control	29
	RC Connection Mobility Control	
6.1	RRC Re-establishment	
6.1.1	Introduction	
6.1.2	Requirements	
6.1.2.1	UE Re-establishment delay requirement	
6.2	Random Access	
6.2.1	Introduction	
6.2.2	Requirements	
6.2.2.1	Contention based random access	
6.2.2.1.1	Correct behaviour when receiving Random Access Response reception	
6.2.2.1.2	Correct behaviour when not receiving Random Access Response reception	
6.2.2.1.3	Correct behaviour when receiving a NACK on msg3	40
6.2.2.1.4	Void	
6.2.2.1.5	Correct behaviour when receiving a message over Temporary C-RNTI	
6.2.2.1.6	Correct behaviour when 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	
6.2.2.2.2	Correct behaviour when not receiving Random Access Response	
6.3	RRC Connection Release with Redirection	
6.3.1	Introduction	
6.3.2	Requirements	
6.3.2.1	RRC connection release with redirection to UTRAN FDD	
6.3.2.2	RRC connection release with redirection to GERAN	
6.3.2.3	RRC connection release with redirection to UTRAN TDD	41
<b>7</b> T:	noine and signalling about desire	40
	ming and signalling characteristics	
7.1	UE transmit timing	
7.1.1	Introduction	
7.1.2	Requirements	
7.2	UE timer accuracy	
7.2.1	Introduction	
7.2.2	Requirements	
7.3	Timing Advance	43
7.3.1	Introduction	43
7.3.2	Requirements	43
7.3.2.1	Timing Advance adjustment delay	
7.3.2.2	Timing Advance adjustment accuracy	
7.4	Cell phase synchronization accuracy (TDD).	
7.4.1	Definition	
7.4.2	Minimum requirements	
7.5	Synchronization Requirements for E-UTRAN to 1xRTT and HRPD Handovers	
7.5.1	Introduction.	
1.2.1	1111 · GUVUVII	

7.5.2	eNodeB Synchronization Requirements	45
7.5.2.1	Synchronized E-UTRAN	45
7.5.2.2	Non-Synchronized E-UTRAN	
7.6 R	adio Link Monitoring	45
7.6.1	Introduction	45
7.6.2	Requirements	47
7.6.2.1	Minimum requirement when no DRX is used	47
7.6.2.2	Minimum requirement when DRX is used	47
7.6.2.3	Minimum requirement at transitions	48
8 UE I	Measurements Procedures in RRC_CONNECTED State	
	eneral Measurement Requirements	
8.1.1	Introduction	
8.1.2	Requirements	
8.1.2.1	UE measurement capability	48
8.1.2.1.1	Monitoring of multiple layers using gaps	
8.1.2.2	E-UTRAN intra frequency measurements	
8.1.2.2.1	E-UTRAN FDD intra frequency measurements	
8.1.2.2.2	E-UTRAN TDD intra frequency measurements	
8.1.2.2.3	E-UTRAN FDD intra frequency measurements with autonomous gaps	
8.1.2.2.3.2	ECGI Reporting Delay	
8.1.2.2.4	E-UTRAN TDD intra frequency measurements with autonomous gaps	
8.1.2.2.4.2	ECGI Reporting Delay	
8.1.2.3 8.1.2.3.1	E-UTRAN inter frequency measurements	
8.1.2.3.1	E-UTRAN FDD – FDD inter frequency measurements E-UTRAN TDD – TDD inter frequency measurements	
8.1.2.3.2	E-UTRAN TDD – TDD inter frequency measurements	
8.1.2.3.4	E-UTRAN FDD – TDD inter frequency measurements	
8.1.2.3.5	E-UTRAN FDD-FDD inter frequency measurements with autonomous gaps	
8.1.2.3.6	E-UTRAN TDD-FDD inter frequency measurements using autonomous gaps	
8.1.2.3.7	E-UTRAN TDD-TDD inter frequency measurements with autonomous gaps	
8.1.2.3.7.2	ECGI Reporting Delay	
8.1.2.3.8	E-UTRAN FDD-TDD inter frequency measurements using autonomous gaps	
8.1.2.4	Inter RAT measurements	67
8.1.2.4.1	E-UTRAN FDD – UTRAN FDD measurements	
8.1.2.4.2	E-UTRAN TDD – UTRAN FDD measurements	
8.1.2.4.3	E-UTRAN TDD – UTRAN TDD measurements	
8.1.2.4.4	E-UTRAN FDD – UTRAN TDD measurements	
8.1.2.4.5	E-UTRAN FDD – GSM measurements	
8.1.2.4.6	E-UTRAN TDD – GSM measurements	
8.1.2.4.7	E-UTRAN FDD – UTRAN FDD measurements for SON	
8.1.2.4.8	E-UTRAN TDD – UTRAN FDD measurements for SON E-UTRAN FDD – cdma2000 1xRTT measurements	
8.1.2.4.9 8.1.2.4.9.1A		
8.1.2.4.9.1A 8.1.2.4.10	E-UTRAN TDD – cdma2000 1xR11 measurements when no DRX is used	
8.1.2.4.11	E-UTRAN FDD – HRPD measurements	
8.1.2.4.12	E-UTRAN TDD – HRPD measurements	
8.1.2.4.13	E-UTRAN TDD – UTRAN TDD measurements for SON	
8.1.2.4.14	E-UTRAN FDD – UTRAN TDD measurements for SON	
8.1.2.5	E-UTRAN OTDOA Intra-Frequency RSTD Measurements	
8.1.2.5.1	E-UTRAN FDD Intra-Frequency OTDOA Measurements	
8.1.2.5.1.1	RSTD Measurement Reporting Delay	
8.1.2.5.2	E-UTRAN TDD Intra-Frequency OTDOA Measurements	
8.1.2.5.2.1	RSTD Measurement Reporting Delay	
8.1.2.6	E-UTRAN Inter-Frequency OTDOA Measurements	
8.1.2.6.1	E-UTRAN FDD-FDD Inter-Frequency OTDOA Measurements	
8.1.2.6.1.1	RSTD Measurement Reporting Delay	
8.1.2.6.2	E-UTRAN TDD-FDD Inter-Frequency OTDOA Measurements	
8.1.2.6.3	E-UTRAN TDD-TDD Inter-Frequency OTDOA Measurements	
8.1.2.6.4	E-UTRAN FDD-TDD Inter-Frequency OTDOA Measurements	
8.1.2.7 8.1.2.7.1	E-UTRAN E-CID Measurements E-UTRAN FDD UE Rx-Tx Time Difference Measurements	
0.1.2./.1	E-OTKAN FDD UE KX-TX Thile Difference measurements	88

8.1.2.7.2	E-UTRAN TDD UE Rx-Tx Time Difference Measurements	
8.2	Capabilities for Support of Event Triggering and Reporting Criteria	
8.2.1	Introduction	
8.2.2	Requirements	
0		00
	easurements performance requirements for UE	
9.1	E-UTRAN measurements	
	oduction	
9.1.2	Intra-frequency RSRP Accuracy Requirements	
9.1.2.1	Absolute RSRP Accuracy	
9.1.2.2	Relative Accuracy of RSRP	
9.1.3	Inter-frequency RSRP Accuracy Requirements	
9.1.3.1	Absolute RSRP Accuracy	
9.1.3.2	Relative Accuracy of RSRP	
9.1.4	RSRP Measurement Report Mapping	
9.1.5	Intra-frequency RSRQ Accuracy Requirements	
9.1.5.1	Absolute RSRQ Accuracy	
9.1.6	Inter-frequency RSRQ Accuracy Requirements	
9.1.6.1	Absolute RSRQ Accuracy	
9.1.6.2	Relative Accuracy of RSRQ	
9.1.7	RSRQ Measurement Report Mapping	
9.1.8	Power Headroom	
9.1.8.1	Period	
9.1.8.2	Reporting Delay	
9.1.8.3	Void	
9.1.8.4	Report Mapping	
9.1.9	UE Rx – Tx time difference	
9.1.9.1	Measurement Requirement	
9.1.9.2	Measurement Report mapping	
9.1.10	Reference Signal Time Difference (RSTD)	
9.1.10.1	Intra-Frequency Accuracy Requirement	
9.1.10.2	Inter-Frequency Accuracy Requirement	
9.1.10.3	RSTD Measurement Report Mapping	
9.2	UTRAN FDD Measurements	
9.2.1	UTRAN FDD CPICH RSCP	
9.2.2	UTRAN FDD carrier RSSI	
9.2.3	UTRAN FDD CPICH Ec/No	
9.3	UTRAN TDD Measurements	
9.3.1	UTRAN TDD P-CCPCH RSCP	
9.3.2	UTRAN TDD carrier RSSI	
9.3.3	Void	
9.4	GSM Measurements	
9.4.1	GSM carrier RSSI	
9.5	CDMA2000 1x RTT Measurements	
9.5.1	CDMA2000 1x RTT Pilot Strength	
10 M		105
	easurements Performance Requirements for E-UTRAN	
10.1	Received Interference Power	
10.1.1	Absolute accuracy requirement	
10.1.2	Relative accuracy requirement	
10.1.3	Received Interference Power measurement report mapping	
10.2	Angle of Arrival (AOA)	
10.2.1	Range/mapping	
10.3	Timing Advance (T <sub>ADV</sub> )	
10.3.1	Report mapping	106
Annex A	A (normative): Test Cases	
A.1 Pu	rpose of annex	
A.2 R	equirement classification for statistical testing	107
A.2.1	Types of requirements in TS 36.133	
A.2.1.1	Time and delay requirements on UE higher layer actions	
	since and the second se	

A.2.1.2	Measurements of power levels, relative powers and time	108
A.2.1.3	Implementation requirements	
A.2.1.4	Physical layer timing requirements	108
A.3 RRM	I test configurations	100
	eference Measurement Channels	
A.3.1.1	PDSCH	
A.3.1.1	FDD	
A.3.1.1.2	TDD	
A.3.1.2	PCFICH/PDCCH/PHICH	
A.3.1.2.1	FDD	
A.3.1.2.2	TDD	
	FDMA Channel Noise Generator (OCNG)	111
A.3.2.1	OCNG Patterns for FDD.	
A.3.2.1.1	OCNG FDD pattern 1: outer resource blocks allocation in 10 MHz	
A.3.2.1.2	OCNG FDD pattern 2: full bandwidth allocation in 10 MHz	
A.3.2.1.3	OCNG FDD pattern 3: outer resource blocks allocation in 1.4 MHz	
A.3.2.1.4	OCNG FDD pattern 4: full bandwidth allocation in 1.4 MHz	
A.3.2.1.5	OCNG FDD pattern 5: outer resource blocks allocation in 10 MHz (without MBSFN)	
A.3.2.1.6	OCNG FDD pattern 6: full bandwidth allocation in 10 MHz (without MBSFN)	
A.3.2.1.7	OCNG FDD pattern 7: full bandwidth allocation in 1.4 MHz (without MBSFN)	
A.3.2.2	OCNG Patterns for TDD	
A.3.2.2.1	OCNG TDD pattern 1: outer resource blocks allocation in 10 MHz	
A.3.2.2.2	OCNG TDD pattern 2: full bandwidth allocation in 10 MHz	
A.3.2.2.3	OCNG TDD pattern 3: outer resource blocks allocation in 1.4 MHz	
A.3.2.2.4	OCNG TDD pattern 4: full bandwidth allocation in 1.4 MHz	
A.3.3 R	eference DRX Configurations	
A4 E-U	FRAN RRC IDLE state	121
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	
A.4.2.1.2	Test Requirements	
A.4.2.2	E-UTRAN TDD – TDD Intra frequency case	
A.4.2.2.1	Test Purpose and Environment	
A.4.2.2.2	Test Requirements	
A.4.2.3	E-UTRAN FDD – FDD Inter frequency case	
A.4.2.3.1	Test Purpose and Environment	
A.4.2.3.2	Test Requirements	
A.4.2.4	E-UTRAN FDD – TDD Inter frequency case	
A.4.2.4.1	Test Purpose and Environment	
A.4.2.4.2	Test Requirements	
A.4.2.5	E-UTRAN TDD – FDD Inter frequency case	
A.4.2.5.1	Test Purpose and Environment	130
A.4.2.5.2	Test Requirements	131
A.4.2.6	E-UTRAN TDD – TDD: Inter frequency case	132
A.4.2.6.1	Test Purpose and Environment	132
A.4.2.6.2	Test Requirements	
A.4.2.7	E-UTRAN FDD – FDD Inter frequency case in the existence of non-allowed CSG cell	134
A.4.2.7.1	Test Purpose and Environment	
A.4.2.7.2	Test Requirements	
A.4.2.8	E-UTRAN TDD – TDD Inter frequency case in the existence of non-allowed CSG cell	
A.4.2.8.1	Test Purpose and Environment	
A.4.2.8.2	Test Requirements	137
	total of 33.28 s, allow 34 s for the cell re-selection delay to a newly detectable cell in the test	100
	use.A.4.3E-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	
A.4.3.1.1.2	Test Requirements	
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	140

A.4.3.1.2.2	Test Requirements	
A.4.3.1.3	EUTRA FDD-UTRA FDD cell reselection in fading propagation conditions: UTRA FDD is	
	lower priority	
A.4.3.1.3.1	Test Purpose and Environment	
A.4.3.1.3.2	Test Requirements	
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	
A.4.3.2.1.3	7.68Mcps TDD option	
A.4.3.2.1 A.4.3.2.1.1	Test Requirements	
A.4.3.2.1.1 A.4.3.2.1.2	3.84Mcps TDD option	
A.4.3.2.1.2 A.4.3.2.2.2.3	1.28Mcps TDD option 7.68Mcps TDD option	
A.4.3.2.2.2.3 A.4.3.3	E-UTRAN TDD – UTRAN FDD:	
A.4.3.3 A.4.3.3.1	Test Purpose and Environment	
A.4.3.3.1 A.4.3.3.2	Test Requirements	
A.4.3.4	E-UTRAN TDD – UTRAN TDD:	130
A.4.3.4.1	E-UTRAN TDD – UTRAN TDD. E-UTRA to UTRA TDD cell re-selection: UTRA is of higher priority	151
A.4.3.4.1 A.4.3.4.1.1	Test Purpose and Environment.	
A.4.3.4.1.1 A.4.3.4.1.1.1		
A.4.3.4.1.1.2		
A.4.3.4.1.1.2 A.4.3.4.1.1.3		
A.4.3.4.1.2	Test Requirements	
A.4.3.4.1.2.1		
A.4.3.4.1.2.1 A.4.3.4.1.2.2		
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		
A.4.3.4.2.1.1 A.4.3.4.2.1.2		
A.4.3.4.2.1.2 A.4.3.4.2.1.3		
A.4.3.4.2.2	Test Requirements	
A.4.3.4.2.2.1	*	
A.4.3.4.2.2.2		
A.4.3.4.2.2.3		
A.4.3.4.3	EUTRA TDD-UTRA TDD cell reselection in fading propagation conditions: UTRA TDD is	
11.1.5.1.5	lower priority	
A.4.3.4.3.1	Test Purpose and Environment	
A.4.3.4.3.2	Test Requirements	
	UTRAN to GSM Cell Re-Selection	
A.4.4.1	E-UTRAN FDD – GSM:	
	est Purpose and Environment	
A.4.4.1.2	Test Requirements	
A.4.4.2	E-UTRAN TDD – GSM:	
A.4.4.2.1	Test Purpose and Environment	
A.4.4.2.2	Test Requirements	
	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	
A.4.5.1.1.2	Test Requirements	
A.4.5.2	E-UTRAN TDD – HRPD	
A.4.5.2.1	E-UTRAN TDD – HRPD Cell Reselection: HRPD is of Lower Priority	
A.4.5.2.1.1	Test Purpose and Environment	
A.4.5.2.1.2	Test Requirements	
A.4.6	E-UTRAN to cdma2000 1X Cell Re-Selection	
A.4.6.1	E-UTRAN FDD – cdma2000 1X	169
A.4.6.1.1	E-UTRAN FDD - cdma2000 1X Cell Reselection: cdma2000 1X is of Lower Priority	169
A.4.6.1.1.1	Test Purpose and Environment	169
A.4.6.1.1.2	Test Requirements	
A.4.6.2	E-UTRAN TDD – cdma2000 1X	
A.4.6.2.1	E-UTRAN TDD -cdma2000 1X Cell Reselection: cdma2000 1X is of Lower Priority	172

A.4.6.2.1.1Test Purpose and EnvironmentA.4.6.2.1.2Test Requirements	
A.5 E-UTRAN RRC CONNECTED Mode Mobility	175
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	175
A.5.1.1.2 Test Requirements	
A.5.1.2 E-UTRAN TDD - TDD Intra frequency handover	
A.5.1.2.1 Test Purpose and Environment	
A.5.1.2.2 Test Requirements	
A.5.1.3 E-UTRAN FDD – FDD Inter frequency handover A.5.1.3.1 Test Purpose and Environment	
A.5.1.3.1       Test Purpose and Environment         A.5.1.3.2       Test Requirements	
A.5.1.4 E-UTRAN TDD – TDD Inter frequency handover	
A.5.1.4.1 Test Purpose and Environment	
A.5.1.4.2 Test Requirements	
A.5.1.5 E-UTRAN FDD – FDD Inter frequency handover: unknown target cell	
A.5.1.5.1 Test Purpose and Environment	
A.5.1.5.2 Test Requirements	
A.5.1.6 E-UTRAN TDD – TDD Inter frequency handover; unknown Target Cell	
A.5.1.6.1 Test Purpose and Environment	
A.5.1.6.2 Test Requirements	
A.5.1.7 E-UTRAN FDD – TDD Inter frequency handover	
A.5.1.7.1 Test Purpose and Environment	
A.5.1.7.2 Test Requirements	
A.5.1.8 E-UTRAN TDD – FDD Inter frequency handover	
<ul><li>A.5.1.8.1 Test Purpose and Environment</li><li>A.5.1.8.2 Test Requirements</li></ul>	
A.5.1.6.2 Test Requirements 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	
A.5.2.1.2 Test Requirements	
A.5.2.2 E-UTRAN TDD - UTRAN FDD Handover	
A.5.2.2.1 Test Purpose and Environment	
A.5.2.2.2 Test Requirements	
A.5.2.3 E-UTRAN FDD- GSM Handover	
A.5.2.3.1 Test Purpose and Environment	
A.5.2.3.2 Test Requirements	
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	
A.5.2.4.1.37.68 Mcps TDD optionA.5.2.4.2Test Requirements	
A.5.2.4.2 Test Requirements. A.5.2.4.2.1 3.84 Mcps TDD option	
A.5.2.4.2.1 5.64 Mcps TDD option	
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	205
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	
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	
A.5.2.6.2 Test Requirements A.5.2.7 E-UTRAN FDD – UTRAN FDD Handover: Unknown Target Cell	
A.5.2.7E-UTRAN FDD – UTRAN FDD Handover; Unknown Target CellA.5.2.7.1Test Purpose and Environment	

A.5.2.7.2	Test Requirements	
A.5.2.8 E-U	FRAN FDD - GSM Handover; Unknown Target Cell	
A.5.2.8.1	Test Purpose and Environment	
A.5.2.8.2	Test Requirements	
A.5.2.9 E-U	TRAN TDD - GSM Handover; Unknown Target Cell	
A.5.2.9.1	Test Purpose and Environment	
A.5.2.9.2	Test Requirements	
A.5.2.10	E-UTRAN TDD to UTRAN TDD handover: unknown target cell	
A.5.2.10	Test Purpose and Environment	
A.5.2.10.2	Test Requirements	
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	
A.5.3.1.2	Test Requirements	
A.5.3.2	E-UTRAN FDD – cdma2000 1X Handover	
A.5.3.2.1	Test Purpose and Environment	
A.5.3.2.2	Test Requirements	
A.5.3.3	E-UTRAN FDD – HRPD Handover; Unknown Target Cell	
A.5.3.3.1	Test Purpose and Environment	
A.5.3.3.2	Test Requirements	
A.5.3.4	E-UTRAN FDD – cdma2000 1X Handover; Unknown Target cell	
A.5.3.4.1	Test Purpose and Environment	
A.5.3.4.2	Test Requirements	
A.5.3.5	E-UTRAN TDD – HRPD Handover	
A.5.3.5.1	Test Purpose and Environment	
A.5.3.5.2	Test Requirements	
A.5.3.6	E-UTRAN TDD – cdma2000 1X Handover	
A.5.3.6.1	Test Purpose and Environment	
A.5.3.6.2	Test Requirements	
	-	
A.6 RRC	Connection Control	
A.6.1 R	RC Re-establishment	
A.6.1.1	E-UTRAN FDD Intra-frequency RRC Re-establishment	
A.6.1.1.1	Test Purpose and Environment	
A.6.1.1.2	Test Requirements	
A.6.1.2	E-UTRAN FDD Inter-frequency RRC Re-establishment	
A.6.1.2.1	Test Purpose and Environment	
A.6.1.2.2	Test Requirements	
A.6.1.3	E-UTRAN TDD Intra-frequency RRC Re-establishment	
A.6.1.3.1	Test Purpose and Environment	
A.6.1.3.2	Test Requirements	
A.6.1.4	E-UTRAN TDD Inter-frequency RRC Re-establishment	
A.6.1.4.1	Test Purpose and Environment	
A.6.1.4.2	Test Requirements	
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	
A.6.2.1.2.1	Random Access Response Reception	
A.6.2.1.2.2	No Random Access Response Reception	
A.6.2.1.2.3		
	Receiving a NACK on msg3	
A.6.2.1.2.4	Reception of an Incorrect Message over Temporary C-RNTI	
A.6.2.1.2.5	Reception of a Correct Message over Temporary C-RNTI	
A.6.2.1.2.6	Contention Resolution Timer expiry	
A.6.2.2	E-UTRAN FDD – Non-Contention Based Random Access Test	
A.6.2.2.1	Test Purpose and Environment	
A.6.2.2.2.1	Random Access Response Reception	
A.6.2.2.2.2	No Random Access Response Reception	
A.6.2.3	E-UTRAN TDD – Contention Based Random Access Test	
A.6.2.3.1	Test Purpose and Environment	
A.6.2.3.2.1	Random Access Response Reception	
A.6.2.3.2.2	No Random Access Response reception	
A.6.2.3.2.2 A.6.2.3.2.3		
A.U.Z.J.Z.J	Receiving a NACK on msg3	

A.6.2.3.2.4	4 Reception of an Incorrect Message over Temporary C-RNTI	253
A.6.2.3.2.	5 Reception of a Correct Message over Temporary C-RNTI	253
A.6.2.3.2.	6 Contention Resolution Timer expiry	253
A.6.2.4	E-UTRAN TDD - Non-Contention Based Random Access Test	253
A.6.2.4.1	Test Purpose and Environment	253
A.6.2.4.2.	1 Random Access Response Reception	255
A.6.2.4.2.	1 1	
A.6.3	RRC Connection Release with Redirection.	
A.6.3.1	Redirection from E-UTRAN FDD to UTRAN FDD	
A.6.3.1.1	Test Purpose and Environment	
A.6.3.1.2	Test Requirements	
A.6.3.2	Redirection from E-UTRAN TDD to UTRAN FDD	
A.6.3.2.1	Test Purpose and Environment	
A.6.3.2.2	Test Requirements	
A.6.3.3	Redirection from E-UTRAN FDD to GERAN when System Information is provided	
A.6.3.3.1	Test Purpose and Environment	
A.6.3.3.2	Test Requirements	
A.6.3.4	Redirection from E-UTRAN TDD to GERAN when System Information is provided	
A.6.3.4.1	Test Purpose and Environment	
A.6.3.4.2	Test Requirements	
A.6.3.5	E-UTRA TDD RRC connection release redirection to UTRA TDD	
A.6.3.5.1	Test Purpose and Environment	
A.6.3.5.2	Test Requirements	
A.6.3.6	E-UTRA FDD RRC connection release redirection to UTRA TDD	
A.6.3.6.1	Test Purpose and Environment	
A.6.3.6.2	Test Requirements	
A.6.3.7	E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided	
A.6.3.7.1	Test Purpose and Environment	
A.6.3.7.1 A.6.3.7.2		
	Test Requirements	
A.6.3.8 A.6.3.8.1	E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided	
A.6.3.8.2	Test Purpose and Environment	
A.0.3.8.2	Test Requirements	
A.7 Tin	ning and Signalling Characteristics	275
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	
A.7.1.1.2	Test Requirements	
A.7.1.2	E-UTRAN TDD - UE Transmit Timing Accuracy Tests	
A.7.1.2.1	Test Purpose and Environment	
A.7.1.2.2	Test Requirements	
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	
A.7.2.1.1 A.7.2.1.2	Test Requirements	
A.7.2.1.2 A.7.2.2	E-UTRAN TDD – UE Timing Advance Adjustment Accuracy Test	
A.7.2.2 A.7.2.2.1	Test Purpose and Environment	
A.7.2.2.1 A.7.2.2.2		
A.7.2.2.2 A.7.3	Test Requirements	
	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	
A.7.3.1.2	Test Requirements	
A.7.3.2	E-UTRAN FDD Radio Link Monitoring Test for In-sync	
A.7.3.2.1	Test Purpose and Environment	
A.7.3.2.2	Test Requirements.	
A.7.3.3	E-UTRAN TDD Radio Link Monitoring Test for Out-of-sync	
A.7.3.3.1	Test Purpose and Environment	
A.7.3.3.2		
	Test Requirements.	
A.7.3.4	E-UTRAN TDD Radio Link Monitoring Test for In-sync	297
A.7.3.4.1	E-UTRAN TDD Radio Link Monitoring Test for In-sync Test Purpose and Environment	297 297
	E-UTRAN TDD Radio Link Monitoring Test for In-sync	

A.7.3.5.1	Test Domess and Environment	200
	Test Purpose and Environment	
A.7.3.5.2	Test Requirements	
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	
A.7.3.6.2	Test Requirements	
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	307
A.7.3.7.2	Test Requirements	310
A.7.3.8	E-UTRAN TDD Radio Link Monitoring Test for In-sync in DRX	311
A.7.3.8.1	Test Purpose and Environment	
A.7.3.8.2	Test Requirements	
	-	
A.8 UE N	leasurements Procedures	
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 condition	IS
	in asynchronous cells	314
A.8.1.1.1	Test Purpose and Environment	314
A.8.1.1.2	Test Requirements	
A.8.1.2	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation condition	
110112	in synchronous cells.	
A.8.1.2.1	Test Purpose and Environment	
A.8.1.2.2	Test Requirements	
A.8.1.3	E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation condition	
A.6.1.5		
4 0 1 2 1	in synchronous cells with DRX	
A.8.1.3.1	Test Purpose and Environment	
A.8.1.3.2	Test Requirements	
A.8.1.4	Void	321
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	321
A.8.1.5.2	Test Requirements	323
A.8.1.6	E-UTRAN FDD - FDD Intra-frequency identification of a new CGI of E-UTRA cell using	
	autonomous gaps with DRX	324
A.8.1.6.1	Test Purpose and Environment	
A.8.1.6.2	Test Requirements	
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	
11.0.2.1	conditions in synchronous cells	326
A.8.2.1.1	Test Purpose and Environment	
A.8.2.1.2	Test Requirements	
A.8.2.2	E-UTRAN TDD-TDD intra-frequency event triggered reporting under fading propagation	
A.0.2.2		207
A 0 0 0 1	conditions in synchronous cells with DRX	
A.8.2.2.1	Test Purpose and Environment	
A.8.2.2.2	Test Requirements	
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	
A.8.2.3.2	Test Requirements	332
A.8.2.4	E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using	
	autonomous gaps with DRX	332
A.8.2.4.1	Test Purpose and Environment	332
A.8.2.4.2	Test Requirements	335
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	335
A.8.3.1.1	Test Purpose and Environment	
A.8.3.1.2	Test Requirements	
A.8.3.2	E-UTRAN FDD-FDD Inter-frequency event triggered reporting when DRX is used under fading	
11.0.3.2	propagation conditions in asynchronous cells	336
A.8.3.2.1	Test Purpose and Environment	
A.8.3.2.1 A.8.3.2.2		
n.o.j.2.2	Test Requirements	

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	339
A.8.3.3.2	Test Requirements	342
A.8.3.4	E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using	
	autonomous gaps	342
A.8.3.4.2	Test Requirements	344
A.8.3.5	E-UTRAN FDD - FDD Inter-frequency identification of a new CGI of E-UTRA cell using	
	autonomous gaps with DRX	345
A.8.3.5.2	Test Requirements	
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	
A.8.4.1.2	Test Requirements	
A.8.4.2	E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading	
A.0. <del>4</del> .2	propagation conditions in synchronous cells	3/18
A.8.4.2.1	Test Purpose and Environment	
A.8.4.2.1 A.8.4.2.2	Test Requirements	
A.8.4.3	E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation	251
	conditions in synchronous cells with DRX when L3 filtering is used	
A.8.4.3.1	Test Purpose and Environment	
A.8.4.3.2	Test Requirements	353
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	
A.8.4.4.2	Test Requirements	356
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	357
A.8.4.5.2	Test Requirements	359
A.8.5	E-UTRAN FDD - UTRAN FDD Measurements	359
A.8.5.1	E-UTRAN FDD - UTRAN FDD event triggered reporting under fading propagation conditions	359
A.8.5.1.1	Test Purpose and Environment	359
A.8.5.1.2	Test Requirements	361
A.8.5.2	E-UTRAN FDD - UTRAN FDD SON ANR cell search reporting under AWGN propagation	
	conditions	361
A.8.5.2.1	Test Purpose and Environment	361
A.8.5.2.2	Test Requirements	
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	
A.8.5.3.2	Test Requirements	
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	
A.8.5.4.2		
A.8.6	Test Requirements 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	
A.8.6.1.2	Test Requirements.	
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.		
A.8.7.1.1.		
A.8.7.1.1.		
A.8.7.1.2	Test Requirements	
A.8.7.1.2.	1 1	
A.8.7.1.2.2	2 1.28 Mcps TDD option	373
A.8.7.1.2.	3 7.68 Mcps TDD option	373
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	373

A.8.7.2.2	Test Requirements	376
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	
A.8.7.3.2	Test Parameters	
A.8.7.3.3	Test Requirements	
A.8.7.4	E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	379
A.8.7.4.1	Test Purpose and Environment	
A.8.7.4.2	Test Requirements	
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	
A.8.8.1.2	Test Requirements	
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	
A.8.8.2.2	Test Requirements	
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	
A.8.8.3.2	Test Requirements	
	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	
A.8.9.1.2	Test Requirements	
A.8.9.2	E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions	
A.8.9.2.1	Test Purpose and Environment	
	•	
A.8.9.2.2	Test Requirements	
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	
A.8.10.1.2	Test Requirements	
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	
A.8.10.2.2	Test Requirements	398
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	
A. 8.11.1.2	Test Requirements	400
A.8.11.2	E-UTRAN TDD – E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered	
	reporting under fading propagation conditions	
A.8.11.2.1	Test Purpose and Environment	
A.8.11.2.2	Test Requirements	402
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	403
A.8.11.3.2	Test Requirements	
A.8.11.4	InterRAT E-UTRA TDD to E-UTRA TDD and UTRA TDD cell search test case	405
A.8.11.4.1	Test Purpose and Environment	405
A.8.11.4.2	Test Requirements	408
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	408
A.8.11.5.1	Test Purpose and Environment	
A.8.11.5.2	Test Requirements	
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	412
A.8.11.6.1	Test Purpose and Environment	
A.8.11.6.2	Test Requirements	
	TD 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	
A.8.12.1.2	Test Requirements	
A.8.12.2	E-UTRAN TDD intra-frequency RSTD measurement reporting delay test case	
A.8.12.2.1	Test Purpose and Environment	
A.8.12.2.2	Test Requirements	
	1 · · · · · · · · · · · · · · · · · · ·	

A.8.13	Void	
A.8.14	E-UTRAN TDD - FDD Inter-frequency Measurements	
A.8.14.1	E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation	
	conditions in asynchronous cells	
A.8.14.1.	1 Test Purpose and Environment	423
A.8.14.1.	2 Test Requirements	
A.8.14	E-UTRAN FDD-TDD Inter-frequency Measurements	
A.8.15.1	E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation	
	conditions in asynchronous cells	
A.8.15.1.	1 Test Purpose and Environment	426
A.8.15.1.	2 Test Requirements	
A.9 M	easurement Performance Requirements	107
A.9 M A.9.1	RSRP	
A.9.1 A.9.1.1	FDD Intra frequency case	
A.9.1.1 A.9.1.1.1	1 0	
A.9.1.1.1 A.9.1.1.2	Test Purpose and Environment Test parameters	
A.9.1.1.2 A.9.1.1.3	Test Requirements	
A.9.1.2	TDD Intra frequency case	
A.9.1.2 A.9.1.2.1	Test Purpose and Environment	
A.9.1.2.1 A.9.1.2.2	Test parameters	
A.9.1.2.2 A.9.1.2.3	Test Requirements	
A.9.1.2.3 A.9.1.3	*	
A.9.1.3 A.9.1.3.1	FDD—FDD Inter frequency case	
A.9.1.3.1 A.9.1.3.2	Test Purpose and Environment	
A.9.1.3.2 A.9.1.3.3	Test parameters Test Requirements	
A.9.1.3.3 A.9.1.4	TDD—TDD Inter frequency case	
A.9.1.4 A.9.1.4.1	Test Purpose and Environment	
A.9.1.4.1 A.9.1.4.2	Test parameters	
A.9.1.4.2 A.9.1.4.3	Test Requirements	
A.9.1.4.3 A.9.1.5	*	
A.9.1.5 A.9.1.5.1	FDD—TDD Inter frequency case Test Purpose and Environment	
A.9.1.5.1 A.9.1.5.2	Test parameters	
A.9.1.5.2 A.9.1.5.3	Test Requirements	
A.9.1.5.5 A.9.2	RSRQ	
A.9.2.1	FDD Intra frequency case	
A.9.2.1 A.9.2.1.1	Test Purpose and Environment	
A.9.2.1.1 A.9.2.1.2	Test parameters	
A.9.2.1.2 A.9.2.1.3	Test Requirements	
A.9.2.1.3 A.9.2.2	TDD Intra frequency case	
A.9.2.2.1	Test Purpose and Environment	
A.9.2.2.1	Test parameters	
A.9.2.2.3	Test Requirements	
A.9.2.3	FDD—FDD Inter frequency case	
A.9.2.3.1	Test Purpose and Environment	
A.9.2.3.2	Test parameters	
A.9.2.3.3	Test Requirements	
A.9.2.4	TDD—TDD Inter frequency case	
A.9.2.4.1	Test Purpose and Environment	
A.9.2.4.2	Test parameters	
A.9.2.4.3	Test Requirements	
A.9.2.5	FDD—TDD Inter frequency case	
A.9.2.5.1	Test Purpose and Environment	
A.9.2.5.2	Test parameters	
A.9.2.5.3	Test Requirements	
	-UTRAN FDD	
A.9.3.1.1	Test Purpose and Environment	
A.9.3.1.2	Parameters	
A.9.3.1.3	Test Requirements	
	-UTRAN TDD	
A.9.3.2.1	Test Purpose and Environment	
A.9.3.2.2	Parameters	

A.9.3.2.3	Test Requirements	457
A.9.4.1 E	-UTRAN FDD	
A.9.4.1.1	Test Purpose and Environment	
A.9.4.1.2	Parameters	
A.9.4.1.3	Test Requirements	
A.9.4.2 E	-UTRAN TDD	
A.9.4.2.1	Test Purpose and Environment	
A.9.4.2.2	Parameters	
A.9.4.2.3	Test Requirements	
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	
A.9.5.1.2	Test parameters	
A.9.5.1.3	Test Requirements	
A.9.5.2	P-CCPCH RSCP absolute accuracy for E-UTRAN TDD	
A.9.5.2.1	Test Purpose and Environment	
A.9.5.2.2	Test parameters	
A.9.5.2.3	Test Requirements	
A.9.6	GSM Carrier RSSI	
A.9.6.1	E-UTRAN FDD	
A.9.6.1.1	Test Purpose and Environment	
A.9.6.1.2	Test Requirements	
A.9.6.2	E-UTRAN TDD	
A.9.6.2.1	Test Purpose and Environment	
A.9.6.2.2	Test Requirements	
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	
A.9.7.1.2	Test parameters	
A.9.7.1.3	Test Requirements	
A.9.7.2	E-UTRA TDD	
A.9.7.2.1	Test Purpose and Environment	
A.9.7.2.2	Test parameters	
A.9.7.2.3	Test Requirements	
A.9.8	RSTD	
A.9.8.1	E-UTRAN FDD RSTD intra frequency case	
A.9.8.1.1	Test Purpose and Environment	
A.9.8.1.2	Test Requirements	477
A.9.8.2	E-UTRAN TDD RSTD intra frequency case	
A.9.8.2.1	Test Purpose and Environment	477
A.9.8.2.2	Test Requirements	479
Annex B	(informative): Change history:	480
nistory.		

# 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:

[]	Values included in square bracket must be considered for further studies, because it means that a decision about that value was not taken.
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
101	integrated over the RE and normalized to the subcarrier spacing) as measured at the UE antenna
	connector
$N_{oc}$	The power spectral density of a white noise source (average power per RE normalised to the
	subcarrier spacing), simulating interference from cells that are not defined in a test procedure, as
	measured at the UE antenna connector

$N_{PRS}$	Number of consecutive downlink positioning subframes as defined in subclause 6.10.4.3 in 3GPP
	TS 36.211
$n_{PRB}$	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
$T_{\text{RE-ESTABLISH-REQ}}$	The RRC Re-establishment delay requirement, the time between the moment when erroneous
	CRCs are applied, to when the UE starts to send preambles on the PRACH.
Treselection	Defined in TS 25.304, subclause 5.2.6.1.5
Treselection <sub>RAT</sub>	Defined in TS 36.304, subclause 5.2.4.7
Treselection	
	Defined in TS 36.304, subclause 5.2.4.7
	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 Ês/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.

 $\label{eq:started} \begin{array}{l} If \ Srxlev > S_{nonIntraSearchP} \ and \ Squal > S_{nonIntraSearchQ} \ then \ the \ UE \ shall \ search \ for \ inter-frequency \ layers \ of \ higher \ priority \ at \ least \ every \ T_{higher\_priority\_search} \ where \ T_{higher\_priority\_search} \ is \ described \ in \ section \ 4.2.2. \end{array}$ 

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

#### 3GPP TS 36.133 version 9.11.1 Release 9

25

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  $Squal \leq S_{nonIntraSearchQ}$  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  $N_{UTRA\_carrier\_TDD} *T_{evaluateUTRA\_TDD}$  when  $T_{reselection} = 0$  as specified in table 4.2.2.5.2-1 provided that the reselection criteria is met by a margin of at least 6dB.

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

DRX cycle length [s]	T <sub>detectUTRA_TDD</sub> [S]	T <sub>measureUTRA_TDD</sub> [s] (number of DRX cycles)	T <sub>evaluateUTRA_TDD</sub> [s] (number of DRX cycles)
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)\* $T_{measureCDMA2000_1X}$ , when the E-UTRA serving cell Srxlev  $\leq S_{nonIntraSearchP}$  or Squal  $\leq S_{nonIntraSearchQ}$ . The UE shall be capable of evaluating that the cdma2000 1X cell has met cell reselection criterion defined in [1] within  $T_{evaluateCDMA2000_1X}$ .

Table 4.2.2.5.5-1 gives values of T<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)

Table 4.2.2.5.5-1: TmeasureCDMA2000 1)	x and TevaluateCDMA2000 1X
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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	
CSG cell previously		Ye	S
visited by UE			1
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		
Qrxlevmin	dBm	-140	-140
$N_{oc}$	dBm/15 kHz	Of	f
RSRP Note2	dBm/15 KHz	[≥TBD]	[≥TBD]
		e, the E-UARFCN a	
		unchanged from wh	en the CSG cell
was visited prev	viously		
Note 2: Chosen to ensu	re that CSG autono	mous search has a h	nigh probability
	very attempt made b		

#### 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
Note1			code 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	0	N1/A
PHICH_RB	dB	0	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	
$N_{oc}$	dBm/15 kHz	Off	
RSRP <sup>Note2</sup>	dBm/15 KHz	[≥TBD]	
CPICH_Ec <sup>Note2</sup>	dBm		[≥TBD]
CPICH_Ec/lor	dB		-10
PCCPCH_Ec/lor	dB		-12
SCCPCH_Ec/lor	dB		-12
AICH_Ec/lor	dB	N/A	-15
SCH_Ec/lor	dB		-15
PICH_Ec/lor	dB		-15
I <sub>oc</sub>	dBm/3.84 MHz		Off
Note 1: For this requirer	nent to be applicable	e, the E-UARFCN a	nd physical cell
identity for cell 1	and the UARFCN a	and scrambling code	for cell 2 shall
be unchanged f	rom when the CSG	cell was visited prev	iously
Note 2: Chosen to ensure that CSG autonomous search has a high probability			
of success on e	very attempt made b	by UE	

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

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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.

5.2.2.3.2 (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.

#### 3GPP TS 36.133 version 9.11.1 Release 9

34

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 Tinterrupt2

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

This requirement shall be met, provided that there is one target cell in the MOBILITY FROM E-UTRA command. Performance requirements for E-UTRA to UTRA soft handover are not specified. When UE is connected to an E-UTRA cell, UTRA SFN timing measurements are not reported. This implies that the timing of the DPCH of the UTRA target cells in the active set cannot be configured by UTRAN to guarantee that all target cells fall within the UE reception window of  $T_0$  +/- 148 chips.

Where:

T <sub>IU</sub>	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 ha	andover - interruption time
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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>:

$$T_{interrupt} = T_{IU} + 40 + 10*KC*SW_{K} + 10*OC*SW_{O} ms$$

Where:

$$T_{IU}$$
It is the interruption uncertainty when changing the timing from the E-UTRAN to the new  
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  $SW_O = \left[\frac{\text{srch}_win}{0}\right]$  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  $SW_O = \left[\frac{\text{srch}_win}{0}\right]$  where srch\_win\_o is the number of cdma2000 1x chips indicated by  
the search window for unknown target cdma2000 1x cells in the message $KC$ It is the number of known target cdma2000 1X cells in the message, and  
It is the number of unknown target cdma2000 1X cells in the message.

# 6 RRC Connection Mobility Control

# 6.1 RRC Re-establishment

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

# 6.1.1 Introduction

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

## 6.1.2 Requirements

In RRC connected mode the UE shall be capable of sending *RRCConnectionReestablishmentRequest* message within  $T_{re-establish\_delay}$  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.

# 6.3 RRC Connection Release with Redirection

# 6.3.1 Introduction

RRC connection release with redirection is initiated by the UE upon receiving the "*RRCConnectionRelease*" message from the E-UTRAN [2]. The RRC connection release with redirection procedure is specified in section 5.3.8 in TS 36.331 [2].

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

# 6.3.2 Requirements

## 6.3.2.1 RRC connection release with redirection to UTRAN FDD

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN FDD cell within  $T_{connection\_release\_redirect\_UTRA FDD}$ .

The time delay ( $T_{connection\_release\_redirect\_UTRA\,FDD}$ ) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" [2] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA FDD cell. The time delay ( $T_{connection\_release\_redirect\_UTRA\,FDD}$ ) shall be less than:

 $T_{connection\_release\_redirect\_UTRA~FDD} = T_{RRC\_procedure\_delay} + T_{identify\_UTRA~FDD} + T_{SI\_UTRA~FDD} + T_{RA}$ 

The target UTRA FDD cell shall be considered detectable when:

- CPICH Ec/Io  $\geq$  -15 dB,
- SCH\_Ec/Io  $\geq$  -15 dB for at least one channel tap and SCH\_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

 $T_{RRC\_procedure\_delay}$ : It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

T<sub>identify-UTRA FDD</sub>: It is the time to identify the target UTRA FDD cell. It shall be less than 500 ms.

 $T_{SI-UTRA FDD}$ : It is the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released.

 $T_{RA}$ : It is the delay caused due to the random access procedure when sending random access to the target UTRA FDD cell.

#### 6.3.2.2 RRC connection release with redirection to GERAN

The UE shall be capable of performing the RRC connection release with redirection to the target GERAN cell within  $T_{connection\_release\_redirect\_GERAN}$ .

The time delay ( $T_{connection\_release\_redirect\_GERAN$ ) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" [2] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target GERAN cell. The time delay ( $T_{connection\_release\_redirect\_GERAN$ ) shall be less than:

 $T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\_GERAN} + T_{SI\_GERAN} + T_{RA}$ 

The target GERAN cell shall be considered detectable when the UE receives the GERAN cell at levels down to 10 dB + the reference sensitivity level or reference interference levels as specified in [9].

 $T_{RRC\_procedure\_delay}$ : It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

T<sub>identify-UTRA GERAN</sub>: It is the time to identify the BSIC of the target GERAN cell. It shall be less than 1 second.

 $T_{SI-UTRA GERAN}$ : It is the time required for acquiring all the relevant system information of the target GERAN cell. This time depends upon whether the UE is provided with the relevant system information of the target GERAN cell or not by the E-UTRAN before the RRC connection is released.

 $T_{RA}$ : It is the delay caused due to the random access procedure when sending random access burst to the target GERAN cell.

#### 6.3.2.3 RRC connection release with redirection to UTRAN TDD

The UE shall be capable of performing the RRC connection release with redirection to the target UTRAN TDD cell within  $T_{connection\_release\_redirect\_UTRA\_TDD}$ .

The time delay ( $T_{connection\_release\_redirect\_UTRA\ TDD}$ ) is the time between the end of the last TTI containing the RRC command, "*RRCConnectionRelease*" [2] on the E-UTRAN PDSCH and the time the UE starts to send random access to the target UTRA TDD cell. The time delay ( $T_{connection\_release\_redirect\_UTRA\ TDD}$ ) shall be less than:

 $T_{connection\_release\_redirect\_UTRA\ TDD} = T_{RRC\_procedure\_delay} + T_{identify\_UTRA\ TDD} + T_{SI\_UTRA\ TDD} + T_{RA}$ 

The target UTRA TDD cell shall be considered detectable when:

- P-CCPCH Ec/Io  $\geq$  -6 dB,
- $DwPCH\_Ec/Io \ge -1 dB$ .

 $T_{RRC\_procedure\_delay}$ : It is the RRC procedure for processing the received message "*RRCConnectionRelease*". It shall be less than 110 ms.

 $T_{identify-UTRA TDD}$ : It is the time to identify the target UTRA TDD cell. It shall be less than 500 ms.

 $T_{SI-UTRA TDD}$ : It is the time required for acquiring all the relevant system information of the target UTRA TDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA TDD cell or not by the E-UTRAN before the RRC connection is released.

 $T_{RA}$ : It is the delay caused due to the random access procedure when sending random access to the target UTRA TDD cell.

# 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*Ts	
≥3	12*T <sub>S</sub>	
Note: T <sub>S</sub> is the basic timing unit defined in TS 36.211		

When it is not the first transmission in a DRX cycle or there is no DRX cycle, and when it is the transmission for PUCCH, PUSCH and SRS transmission, the UE shall be capable of changing the transmission timing according to the received downlink frame except when the timing advance in section 7.3 is applied. When the transmission timing error between the UE and the reference timing exceeds  $\pm T_e$  the UE is required to adjust its timing to within  $\pm T_e$ . The reference timing shall be  $(N_{TA\_Ref} + N_{TA \text{ offset}}) \times T_s$  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.

Downlink Bandwidth (MHz)	T <sub>q_</sub>
1.4	16*T <sub>S</sub>
3	8*Ts
5	4*Ts
≥10	2*Ts
Note: T <sub>S</sub> is the basic timing unit defined in TS 36.211	

Table 7.1.2-2: T<sub>q</sub> Maximum Autonomous Time Adjustment Step

# 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).

Timer value [s]	Accuracy
timer value < 4	±0.1s
timer value $\geq$ 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<sub>s</sub> 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<sub>s</sub> and is relative to the current uplink timing.

# 7.4 Cell phase synchronization accuracy (TDD)

# 7.4.1 Definition

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

# 7.4.2 Minimum requirements

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

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

Cell Type	Cell Radius	Requirement
Small cell	≤ 3 km	≤ 3 μs
Large cell	> 3 km	≤ 10 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 Hon	ne BS (TDD)
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Source Cell Type	Propagation Distance	Requirement
Small cell	≤ 500 m	≤ 3 μs
Large cell	> 500 m	$\leq$ 1.33 + <i>T</i> <sub>propagation</sub> 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 $\geq$ 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 $\geq$ 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

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

for cell-specific reference signal transmission by the serving cell

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 $\geq$ 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
	<ul> <li>-3 dB; when two or four antenna ports are used for cell-specific reference signal transmission by the serving cell</li> </ul>
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<sub>freq, UTRA</sub> 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

$$T_{\text{identify intra}} = T_{\text{basic_identify}\_E-\text{UTRA}\_\text{FDD, intra}} \cdot \frac{\mathbf{I}_{\text{Measurement}\_\text{Period, Intra}}}{T_{\text{Intra}}} \quad ms$$

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.

 $T_{Intra}$ : 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

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

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

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: Requirement to identify a newly detectable FDD intrafrequency 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|<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  $\hat{E}$ 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 and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of  $T_{measure\_intra}$ .

Table 8.1.2.2.1.2-2: Red	uirement to measure F	DD 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

#### 8.1.2.2.1.2.1.1 Periodic Reporting

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

#### 8.1.2.2.1.2.1.2 Event-triggered Periodic Reporting

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

#### 3GPP TS 36.133 version 9.11.1 Release 9

53

The first report in event triggered periodic measurement reporting shall meet the requirements specified in section 8.1.2.2.1.3 Event Triggered Reporting.

#### 8.1.2.2.1.2.1.3 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  $_{identify_{intra}}$  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.

 $T_{Intra}$ : 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 and RSRQ measurements for 8 identified-intra-frequency cells, and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of 200 ms. When measurement gaps are activated the UE shall be capable of performing measurements for at least  $Y_{measurement intra}$  cells , where  $Y_{measurement intra}$  is defined in the following equation. If the UE has identified more than  $Y_{measurement intra}$  cells, the UE shall perform measurements of 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.

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

where

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

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

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

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		

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

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.

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 and RSRQ measurements for 8 identified-intra-frequency cells and the UE physical layer shall be capable of reporting measurements to higher layers with the measurement period of  $T_{measure\_intra}$ .

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:

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

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 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> $\geq$  -124 dBm for Band 9 and SCH  $\hat{E}s/Iot \geq$  -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: T <sub>Measurement_Period_Inter_FDD</sub> [ms]	Measurement bandwidth [RB]
0	480 x N <sub>freg</sub>	6
1 (Note)	240 x N <sub>freq</sub>	50

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. 3.1.1.1.3 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>freq</sub> )	(20*N <sub>freq</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  $\hat{E}s/\text{Iot} \ge -4 \text{ dB}$ ,
- 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> $\geq$  -122 dBm for Bands 3, 8, 12, 13, 14, 17, 20 and RSRP Ês/Iot  $\geq$  -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> $\geq$  -124 dBm for Band 9 and SCH  $\hat{E}$ s/Iot  $\geq$  -4 dB,
- SCH\_RP  $|_{dBm} \ge$  -123 dBm for Bands 2, 5, 7 and SCH  $\hat{E}s/Iot \ge -4 dB$ ,
- SCH\_RP  $|_{dBm} \ge -122$  dBm for Bands 3, 8, 12, 13, 14, 17, 20 and SCH  $\hat{E}_s/Iot \ge -4$  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

#### 8.1.2.3.1.2.1.1 Periodic Reporting

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

#### 8.1.2.3.1.2.1.2 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. 3.1.2.1.3 Event Triggered Reporting.

#### 8.1.2.3.1.2.1.3 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 8.1.2.3.1.2. When L3 filtering is used an additional delay can be expected.

#### 3GPP TS 36.133 version 9.11.1 Release 9

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|\_{dBm}  $\geq$  -125 dBm for Bands 33, 34, 35, 36, 37, 38, 39, 40 and SCH  $\hat{E}s/Iot \geq -4$  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 m		DwPTS		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>

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.

#### 3GPP TS 36.133 version 9.11.1 Release 9

62

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	Note: Time depends upon the DRX		
Су	cle 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	ne 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.

#### 8.1.2.3.4 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:

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

Where

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

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Section 9.1 are fulfilled for a corresponding Band,
- SCH\_RP|dBm  $\geq$  -125 dBm for Bands 1, 4, 6, 10, 11, 18, 19, 21 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, 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:

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

Where

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

A cell shall be considered identifiable following conditions are fulfilled:

- RSRP related side conditions given in Section 9.1 are fulfilled for a corresponding Band,
- SCH\_RP  $\geq$  -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

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

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.

 $T_{\text{basic_identify}\_enhanced\_UTRA\_FDD} = 60 \text{ ms.}$  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	9		

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 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 8.1.2.4.1.2. 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.

#### 8.1.2.4.3.1.1a Enhanced UTRA TDD 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<sub>identify, enhanced\_UTRA\_TDD</sub>:

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

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 500 ms.

A cell shall be considered detectable when:

- P-CCPCH\_Ec/Io  $\geq$  -6 dB,
- DwPCH\_Ec/Io  $\geq$  -1 dB

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

#### 8.1.2.4.3.1.2 UE UTRA TDD P-CCPCH RSCP measurement capability

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

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

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.

 $T_{\text{basic\_identify}\_UTRA\_TDD} = 800 \text{ ms}$  is the time period used in the inter RAT equation in section 8.1.2.4.3.1.1 where the maximum allowed time for the UE to identify a new UTRA TDD cell is defined.

 $T_{\text{basic\_identify\_enhanced\_UTRA\_TDD}} = 80 \text{ ms}$  is the time period used in the inter RAT equation in section 8.1.2.4.3.1.1a 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 for the minimum requirements or  $T_{identify, enhanced_UTRA_TDD}$  defined in Section 8.1.2.4.3.1.1 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  $T_{identify, UTRA_TDD}$  defined in section 8.1.2.4.3.1.1 for the minimum requirements and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than  $T_{measurement\_UTRA\_TDD}$  defined in section 8.1.2.4.3.1.2 provided the timing to that cell has not changed more than ± [10] 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.

### 8.1.2.4.3.1.5 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 cycle length (s)	T <sub>identify_UTRA_TDD</sub> (s) (DRX cycles)		
iengui (3)	Gap period =	Gap period =	
	40 ms	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	
0.32 <drx-< td=""><td>Note (20*</td><td>Note (25*</td></drx-<>	Note (20*	Note (25*	
cycle≤0.512	Nfreq)	Nfreq)	
0.512 <drx-< td=""><td>Note (20*</td><td>Note</td></drx-<>	Note (20*	Note	
cycle≤2.56	Nfreq)	(20* Nfreq)	
Note: Tin	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 ms	Gap period = 80 ms	
≤0.04	Non DRX Requirements in section 8.1.2.4.3.1 are	Non DRX Requirements in section 8.1.2.4.3.1 are	
0.064	applicable 0.48*N <sub>freq</sub> (7.5*N <sub>freg</sub> )	applicable 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			

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.

If a cell which has been detectable at least for the time period  $T_{identify, UTRA_TDD}$  defined in section 8.1.2.4.3.2 and then enters or leaves the reporting range, the event triggered measurement reporting delay shall be less than  $T_{measurement_UTRA_TDD}$  defined in section 8.1.2.4.3.2 provided the timing to that cell has not changed more than ± [10] 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.

### 8.1.2.4.3.2.3 Event-triggered Periodic Reporting

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

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

### 8.1.2.4.4 E-UTRAN FDD – UTRAN TDD measurements

The requirements in section 8.1.2.4.3 also apply for this section.

# 8.1.2.4.5 E-UTRAN FDD – GSM measurements

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

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

Measurements on GSM cells can be requested with BSIC verified.

In RRC\_CONNECTED state when a supported measurement gap pattern sequence according to Table 8.1.2.1-1 is configured by E-UTRAN the UE shall continuously measure GSM cells, search for new GSM cells given in the monitored set and re-confirm the BSIC for already detected cells.

# 8.1.2.4.5.1.1 GSM carrier RSSI

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

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

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

# 8.1.2.4.5.1.2 BSIC verification

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

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

- **Initial BSIC identification:** Includes searching for the BSIC and decoding the BSIC for the first time when there is no knowledge about the relative timing between the E-UTRAN FDD and GSM cells. The UE shall trigger the initial BSIC identification within the available measurement gap pattern sequence. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.1.
- **BSIC re-confirmation:** Tracking and decoding the BSIC of a GSM cell after initial BSIC identification is performed. The UE shall trigger the BSIC re-confirmation within the available measurement gap pattern. The requirements for BSIC re-confirmation can be found in section 8.1.2.4.5.1.2.2.

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

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

The BSIC of a GSM cell is considered to be "verified" if the UE has decoded the SCH of the BCCH carrier and identified the BSIC at least one time (initial BSIC identification). Once a GSM cell has been identified the BSIC shall

be re-confirmed at least once every  $8*T_{re-confirm,GSM}$  seconds. Otherwise the BSIC of the GSM cell is considered as "non-verified". If a measurement gap pattern sequence is deactivated by the network after BSIC has been identified or verified, the UE shall consider the BSIC as non-verified.

 $T_{identify,GSM}$  indicates the maximum time allowed for the UE to decode the unknown BSIC of the GSM cell in one GSM BCCH carrier in the initial BSIC identification procedure.

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

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

Table 8.1.2.4.5.1.2-1: The gap length and maximum time difference for BSIC verification

Gap length [ms]	Maximum time difference [µs]
6	± 2350 μs

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

#### 8.1.2.4.5.1.2.1 Initial BSIC identification

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

The UE shall continuously attempt to decode the BSIC of SCH on the BCCH carrier of the 8 strongest BCCH carriers of the GSM cells indicated in the Inter-RAT cell info list. The UE shall give priority for BSIC decoding attempts in decreasing signal strength order to BCCH carriers with unknown BSIC. The strongest BCCH carrier is defined as the BCCH carrier having the highest measured GSM carrier RSSI value.

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

If the UE has not successfully decoded the BSIC of the GSM BCCH carrier within  $T_{identify,GSM}$  ms, the UE shall abort the BSIC identification attempts for that GSM BCCH carrier. The UE shall continue to try to perform BSIC identification of the next GSM BCCH carrier in signal strength order. The GSM BCCH carrier for which the BSIC identification failed shall not be re-considered for BSIC identification until BSIC identification attempts have been made for all the rest of the 8 strongest GSM BCCH carriers in the monitored set with unknown BSIC.

 $T_{identify,GSM}$  values are given for a set of reference gap patterns in table 8.1.2.4.5.1.2.1-1. The requirements in the table represent the time required to guarantee at least two attempts to decode the BSIC for one GSM BCCH carrier. If interfrequency RSTD measurements are configured as a part of the measurement configuration,  $T_{identify,GSM}$  shall be based on the 80ms gap configuration.

Number	T <sub>identify.gsm</sub> (ms)		T <sub>reconfirm.gsm</sub> (ms)	
of				
carriers	10	00	10	00
other	40ms gap	80ms gap	40ms gap	80ms gap
than	configuration	configuration	configuration	configuration
GSM	(ID 0)	(ID 1)	(ID 0)	(ID 1)
0	2160	5280	1920	5040
1	5280	21760	5040	17280
2	5280	31680	5040	29280
		No		No
3	19440	requirement	13320	requirement
4	31680	No	29280	No

Table	8.1	.2.4	.5.1	.2.	1-1
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		requirement		requirement
		No		No
5	31680	requirement	29280	requirement

### 8.1.2.4.5.1.2.2 BSIC re-confirmation

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

For each measurement gap used for GSM BSIC reconfirmation as described in section 8.1.2.4.5.1.2, the UE shall attempt to decode the BSIC falling within the measurement gap according to table 8.1.2.4.5.1.2.1-1. If more than one BSIC can be decoded within the same measurement gap, priority shall be given to the least recently decoded BSIC. If inter-frequency RSTD measurements are configured as a part of the measurement configuration,  $T_{re-confirm,GSM}$  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_identify,gsm</sub> (ms)		T <sub>enhanced_reconfirm,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
0	1320	2160	1080	1920

### 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 8.1.2.1.1.

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 measurement period for large DRX

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 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<sub>identify, UTRA\_FDD</sub> as defined in table 8.1.2.4.7.1.2-1.

DRX cycle length (s)	Tidentify, UTRA_FDD (S) (DRX cycles)			
	Gap period = 40 ms	Gap period = 80 ms		
≤0.04	Non DRX Requirements in section 8.1.2.4.7.1.1are applicable	Non DRX Requirements in section 8.1.2.4.7.1.1 are 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  $Ec/Io \ge -20 dB$ ,
- 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

 $\mathbf{T}_{\text{measurement}\_CDMA2000\_1x} = \mathbf{T}_{\text{basic}\_measurement}\_CDMA2000\_1x} \cdot N_{Freq} \cdot S_{gap}$ 

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

 $\mathbf{T}_{\text{measurement}\_CDMA2000\_1x} = \mathbf{T}_{\text{basic}\_measurement}\_CDMA2000\_1x} \cdot N_{Freq}.$ 

### 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 8.1.2.4.3.1 are applicable	Non DRX Requirements in section 8.1.2.4.3.1 are applicable
0.16 <drx cycle≤0.256<="" td=""><td>Note (25* N<sub>freg</sub>)</td><td>Note (50* N<sub>freq</sub>)</td></drx>	Note (25* N <sub>freg</sub> )	Note (50* N <sub>freq</sub> )
0.256 <drx cycle≤0.32<="" td=""><td>Note (25* N<sub>freq</sub>)</td><td>Note (45* N<sub>freq</sub>)</td></drx>	Note (25* N <sub>freq</sub> )	Note (45* N <sub>freq</sub> )
0.32 <drx (25*="" cycle≤2.56="" n<sub="" note="">freq) Note (25* N<sub>freq</sub>)</drx>		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

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

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

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

 $\Delta = 160 \cdot \left| \frac{n}{M} \right|$  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  $T_{RSTD IntraFreqFDD, E-UTRAN}$ 

Positioning subframe	Number of PRS positioning occasions $M$	
configuration period $T_{ m PRS}$	f1 <sup>Note1</sup>	f1 and f2 Note2
160 ms	16	32
>160 ms	8	16
serving FDD carrier frequency f1. Note 2: When intra-frequency RS	y RSTD measurements are perform TD and inter-frequency RSTD meas rier frequency f1 and one inter-frequ	urements are performed over cells

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:

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

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

 $(\text{PRS}\,\hat{\text{E}}_{s}/\text{Iot})_{ref}$  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|<sub>dBm</sub>≥ -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 both the OTDOA-RequestLocationInformation message and the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in 3GPP TS 36.355 [24], are delivered to the physical layer of the UE as illustrated in Figure 8.1.2.5.1-1.

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

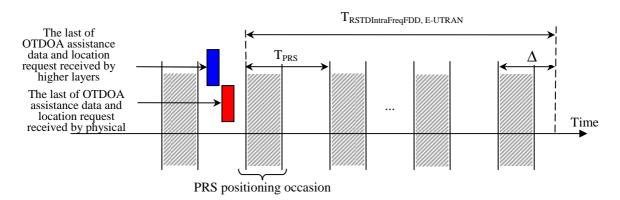


Figure 8.1.2.5.1-1. Illustration of the RSTD reporting time requirement in an FDD system.

### 8.1.2.5.1.1 RSTD Measurement Reporting Delay

This requirement assumes that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is:  $2 \times TTI_{DCCH}$ . 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<sub>RSTD IntraFreqTDD, E-UTRAN</sub> ms as given below:

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

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 Note1	f1 and f2 Note2
160 ms	16	32
>160 ms	8	16
Note 1: When only intra-frequency RSTD measurements are performed over cells belonging to the serving TDD carrier frequency f1. Note 2: When intra-frequency RSTD and inter-frequency RSTD measurements are performed over cells belonging to the serving TDD carrier frequency f1 and one inter-frequency carrier frequency f2		
respectively.		

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

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

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

occasions,

PRP 1,2|<sub>dBm</sub>≥ -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 both the OTDOA-RequestLocationInformation message and the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in 3GPP TS 36.355 [24], are delivered to the physical layer of the UE.

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

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

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

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

### 8.1.2.5.2.1 RSTD Measurement Reporting Delay

This requirement assumes that the measurement report is not delayed by other LPP signalling on the DCCH. This measurement reporting delay excludes a delay uncertainty resulted when inserting the measurement report to the TTI of the uplink DCCH. The delay uncertainty is:  $2 \times TTI_{DCCH}$ . This measurement reporting delay excludes any delay caused by no UL resources for UE to send the measurement report.

### 8.1.2.6 E-UTRAN Inter-Frequency OTDOA Measurements

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

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

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

When the physical layer cell identities of neighbour cells together with the OTDOA assistance data are provided, the UE shall be able to detect and measure inter-frequency RSTD, specified in 3GPP TS 36.214 [4], for at least n=16 cells, including the reference cell, within  $T_{RSTD InterFreeFDD, E-UTRAN}$  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>
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Positioning subframe	Number of PRS positioning occasions $M$	
configuration period $T_{ m PRS}$	f2 <sup>Note1</sup>	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:

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

 $(\operatorname{PRS} \hat{\mathrm{E}}_{s} / \operatorname{Iot})_{i} \ge -13 \text{ dB}$  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|<sub>dBm</sub>≥ -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 both the OTDOA-RequestLocationInformation message and the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in 3GPP TS 36.355 [24], are 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,

 $T_{\rm PRS}$  is the largest value of the cell-specific positioning subframe configuration period, defined in 3GPP TS 36.211

[16], among the measured *n* cells including the reference cell,

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

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

and the processing time.

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

Positioning subframe	Number of 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 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  $T_{RSTD InterFreeTDD, E-UTRAN}$  provided:

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

 $(\text{PRS}\,\hat{\text{E}}_{s}/\text{Iot})_{ref}$  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|<sub>dBm</sub>≥ -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 both the OTDOA-RequestLocationInformation message and the OTDOA assistance data in the OTDOA-ProvideAssistanceData message as specified in 3GPP TS 36.355 [24], are 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.

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>Note2 (5)</td></drx-cycle≤2.56<>	Note2 (5)	
Note1: Number of DRX cycle depends upon the DRX cycle in use		
Note2: Time depends upon the DRX cycle in use		

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

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

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

#### 8.1.2.7.2.1 UE Rx-Tx Measurement Reporting Delay

This requirement assumes that 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 periodic 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.

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,

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

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

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>	<b>BW</b> Channel		
RSRP for Ês/lot ≥	dBm	<u>±8</u>	±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/		
				<b>BW</b> <sub>Channel</sub>	<b>BW</b> <sub>Channel</sub>	<b>BW</b> <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|<sub>dBm</sub> $\geq$  -126 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]	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, Band 9 13, 14, 17, 20		
				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/	
				BWChannel	BW <sub>Channel</sub>	<b>BW</b> Channel	<b>BW</b> Channel	
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 assun					o which the requ	iromont applies		

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

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

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

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

| Channel 1\_Io -Channel 2\_Io |  $\leq$  20 dB

#### Table 9.1.3.2-1: RSRP Inter frequency relative accuracy

Parameter	Unit	Accura	cy [dB]	Conditions <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,

 $RSRP|_{dBm} \ge -124 \text{ dBm}$  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	Band 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/	
				<b>BW</b> <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	± 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>	<b>BW</b> <sub>Channel</sub>	

# 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,

 $RSRP|_{dBm} \ge -124 \text{ dBm}$  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	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/	
				<b>BW</b> <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,

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

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

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

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

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

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

| Channel 1\_Io -Channel 2\_Io |  $\leq$  20 dB

Ē	Accuracy [dB]		Conditions <sup>1</sup>				
	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			
dBm	± 3	± 4	-	-	-	-	
			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>	
dBm	± 4	± 4	-	-	-	-	
			121dBm/15kH	119dBm/15kHz	118dBm/15kHz	120dBm/15kHz	
			z50dBm] /	50dBm/	50dBm/	50dBm/	
			BW <sub>Channel</sub>	BW <sub>Channel</sub>	BW <sub>Channel</sub>	<b>BW</b> Channel	
c	зВт	dBm ± 3 dBm ± 4	$\frac{1}{3}Bm \qquad \pm 3 \qquad \pm 4$ $\frac{1}{3}Bm \qquad \pm 4 \qquad \pm 4$	ID         10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40           IBm         ± 3         ± 4           IBm         ± 3         ± 4           IBm         ± 4         -           121dBm/15kH         z         -50dBm] / BW           IBm         ± 4         -           IBm         ± 4         -           IBm         ± 4         -	Image: Horizontal State of State o	10, 11, 18, 19, 21, 33, 34, 35, 36, 37, 38, 39, 40         13, 14, 17, 20           dBm         ± 3         ± 4         -         -         -         -         -         -         -         13, 14, 17, 20         13, 14, 17, 20         13, 14, 17, 20         13, 14, 17, 20         13, 14, 17, 20         13, 14, 17, 20         14, 19, 17, 18, 18, 17, 18, 19,	

Table 9.1.6.2-1: RSRQ In	nter frequency	relative accuracy
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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	$36 \le PH < 37$
POWER_HEADROOM_60	37 ≤ PH < 38
POWER_HEADROOM_61	$38 \le PH < 39$
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 Ês/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 map	bing

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  $1,2|_{dBm} \ge -126$  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		Conc	litions	
	bandwidth	number		[Ts]	Bands	Bands	Bands	Band
	between the	of available			1, 4, 6,	2, 5, 7	3, 8, 12,	9
	serving cell channel BW,	measurement subframes			10, 11,		13, 14,	
	the reference	between the			18, 19, 21, 33,		17, 20	
	cell and the	reference cell			34, 35,			
	measured	and the			36, 37,			
	neighbour	measured			38, 39			
	cell PRS BW	neighbour cell			and 40	1.5	1.5	10
	[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					 50dDm/	 50dDm/	 -50dBm/	 50dDm/
(PRS Ês/lot) <sub>i</sub>	≥25	≥2		± 6	-50dBm/ BW <sub>Channel</sub>	-50dBm/ BW <sub>Channel</sub>	-500Bm/ BW <sub>Channel</sub>	-50dBm/ BW <sub>Channel</sub>
≥ -13dB	≥50	≥1		± 5			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].								
Note 3: Reference cell and neighbour's PRS bandwidths are as indicated in <i>prs-Bandwidth</i> in the OTDOA								
assis	tance data defin	assistance data defined in [24].						

Table 9.1.10.1-1: RSTD measurement	accuracy
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### 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	Minimum	Unit	Accuracy		Conc	litions	
	PRS bandwidth between the reference cell and the measured neighbour cell [RB]	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
	[[[]]]	neighbeur een			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 Ês/lot) <sub>i</sub>	≥25	≥2		± 10	-50dBm/ BW <sub>Channel</sub>	-50dBm/ BW <sub>Channel</sub>	-50dBm/ BW <sub>Channel</sub>	-50dBm/ BW <sub>Channel</sub>
≥ -13dB	≥50	≥1		± 9	Channel	Channel	Channel	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].Note 3:PRS bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].								

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	T <sub>s</sub>
RSTD_2259	-4101 ≤ RSTD < -4096	T <sub>s</sub>
RSTD_2260	-4096 ≤ RSTD < -4095	T <sub>s</sub>
RSTD_2261	-4095 ≤ RSTD < -4094	Ts
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

# 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,.

T		
	Table 9.2.1-1: UTR /	AN FDD CPICH_RSCP absolute accuracy

		Accura	cy [dB]	Conditions			
Parameter	neter Unit Normal		Extreme	Band I, IV, VI, X XI, XIX and XXI		Band III, VIII, XII, XIII, XIV and	Band IX
		condition	condition		-	XX	-
			oonanion	lo	lo	lo	lo
				[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84 MHz]	[dBm/3,84 MHz]
CPICH_RSCP	dBm	± 6	± 9	-9470	-9270	-9170	-9370
	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 ≤ 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
- FDD A.3.1.1.1

#### Table A.3.1.1.1-1: PDSCH Reference Measurement Channels for FDD

Parameter	Unit			Va	lue			
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								
Note 3: If necessary the information bit pa			sted to fac	cilitate the	e test imp	plementat	tion.	
The payload sizes are defined in 3								
Note 4: Allocation is located in the middle			0		04 04-			
Note 5: If more than one Code Block is present, an additional CRC sequence of $L = 24$ Bits is attached to								
each Code Block (otherwise L = 0		t configur	od oc DD	Scubfro	moc			
Note 6: PDSCH allocation applies only to subframes not configured as PRS subframes.								

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

## A.3.1.1.2 TDD

	Parameter	Unit	Value					
Reference cha	innel		R.2			R.0	R.1	
			TDD			TDD	TDD	
Channel band		MHz	1.4	3	5	10	10	20
	nsmitter antennas		1			1	2	
	urce blocks (Note 4)		2			24	24	
	nk Configuration (Note 5)		1			1	1	
	me Configuration (Note 6)		6			6	6	
Allocated subf	rames per Radio Frame		6			6	6	
Modulation			QPSK			QPSK	QPSK	
Target Coding			1/3			1/3	1/3	
Information Bit								
For Sub-Fran		Bits	120			2088	2088	
For Sub-Fran	ne 5	Bits	104			2088	2088	
For Sub-Fran		Bits	56			2088	1736	
	ne 1, 6 (DwPTS)	Bits	56			1032	1032	
Number of Co	de Blocks per Sub-Frame		1			1	1	
(Note 7)								
For Sub-Frame		1			1	1		
	For Sub-Frame 5					1	1	
For Sub-Frame		1			1	1		
	ame 1, 6 (DwPTS)		1			1	1	
	el Bits Per Sub-Frame							
For Sub-Fran		Bits	456			6624	6336	
For Sub-Fran		Bits	408			6480	6192	
For Sub-Fran		Bits	224			5928	5664	
	ne 1, 6 (DwPTS)	Bits	272			3696	3504	
Max. Through	out averaged over 1 frame	Mbps	0.051			1.041	1.0064	
			2			6		
cha	mbols allocated to PDCCH for nnel BW. For special subframe dwidths.							
	erence signal, synchronization							
	ecessary the information bit pay			sted to fac	cilitate the	e test imp	lementat	ion.
	payload sizes are defined in 3		13 [3].					
	cation is located in the middle							
Note 5: As per Table 4.2-2 in TS 36.211 [16]								
Note 6: As per Table 4.2-1 in TS 36.211 [16]								
	ore than one Code Block is pre		tional CR	C sequer	nce of L =	= 24 Bits i	is attache	ed to
	h Code Block (otherwise $L = 0$				~			
Note 8: PDS	SCH allocation applies only to	subtrames no	t configur	ed as PR	S subtrai	mes.		

## 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									
	Note 4: Cell ID shall depend upon the test configuration.								
Note 5: Payload size shall depend upon t									
Note 6: For PDCCH using SI/RA/P-RNTI,	Aggregatior	n 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		Va	lue		
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	
	005	(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						
Note 4: Cell ID shall depend upon the tes						
Note 5: Payload size shall depend upon t						
Note 6: Only 2 OFDM symbols for specia						
Note 7: For PDCCH using SI/RA/P-RNTI	, Aggregatio	n level 4 is	used.			

# A.3.2 OFDMA Channel Noise Generator (OCNG)

## A.3.2.1 OCNG Patterns for FDD

The following OCNG patterns are used for modelling allocations to virtual UEs (which are not under test) and/or allocations used for MBSFN. The OCNG pattern for each sub frame specifies the allocations that shall be filled with OCNG, and furthermore, the relative power level of each such allocation.

In each test case the OCNG is expressed by parameters OCNG\_RA and OCNG\_RB which together with a relative power level ( $\gamma$ ) 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 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		Re	Relative power level $\gamma_{\scriptscriptstyle PRB}$ [dB]						
$n_{P}$	RB		Subfr	ame		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	NOLE	IN/A		
0-4	49	N/A	N/A	N/A	Note 4	N/A	Note 2		
Note 1:	Note 1: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter $\gamma_{PRB}$ is used to scale the power of PDSCH.								
Note 2:	Each ph each PF measure	ysical resource B shall be unco ement. The MBS cell-specific Ref	block (PRB) is prrelated with c SFN data shall	assigned to lata in other F be QPSK mo	PRBs over the podulated. PMCI	period of ar H symbols	ny shall not		
Note 3:	used to If two or	ce Signals only scale the power more transmit shall be transmit	of PMCH.	CRS are used	d in the test, the	e PDSCH p	part of		
Note 4:	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 transmission modes are specified in section 7.1 in 3GPP TS 36.213. e 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS								
N/A: Not	Applicable	Э							

### 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	lative power l	PDSCH Data	PMCH Data			
$n_{_{PRB}}$		Subfr	ame		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	
with one	hysical resource PDSCH per vie rrelated pseudo	rtual UE; the d	ata transmitte	d over the OCI	NG PDSCH	ls shall	
Note 2: Each ph each PF measur contain	used to scale th hysical resource RB shall be unco ement. The MBS cell-specific Ref	block (PRB) is prrelated with o SFN data shall erence Signal	s assigned to l lata in other P be QPSK mo s only in the fi	RBs over the dulated. PMCI rst symbol of th	period of a H subframe	ny es shall	
Note 3: If two or OCNG s	ameter $\gamma_{PRB}$ is more transmit a shall be transmit	antennas with ( tted to the virtu	CRS are used Ial users by al	in the test, the I the transmit a	antennas w	ith CRS	
each an equal be transmis	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 transmission modes are specified in section 7.1 in 3GPP TS 36.213. 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS						
N/A: Not Applicabl	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	Relative power level $\gamma_{\scriptscriptstyle PRB}$ [dB]					
$n_{PRB}$	Subframe				Data	Data	
	0	5	4,9	1-3, 6-8			

0 -	- 1	0	0	0	N/A	Note 1	N/A
4 -	- 5	0 0 0 N/A		NOLE I	IN/A		
0 -	- 5	N/A	N/A	N/A	Note 4	N/A	Note 2
Note 1: Note 2:	with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs sha be uncorrelated pseudo random data, which is QPSK modulated. The parameter $\gamma_{PRB}$ is used to scale the power of PDSCH. 2: Each physical resource block (PRB) is assigned to MBSFN transmission. The data each PRB shall be uncorrelated with data in other PRBs over the period of any measurement. The MBSFN data shall be QPSK modulated. PMCH symbols shall contain cell-specific Reference Signals. PMCH subframes shall contain cell-specific					Hs shall leter e data in ny shall not specific	
Reference Signals only in the first symbol of the first time slot. The parameter $\gamma_{PRB}$ is used to scale the power of PMCH. Note 3: If two or more transmit antennas with CRS are used in the test, the PDSCH part of OCNG shall be transmitted to the virtual users by all the transmit antennas with CRS and according to the antenna transmission mode 2. The parameter $\gamma_{PRB}$ 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 transmission modes are specified in section 7.1 in 3GPP TS 36.213. Note 4: 0dB for 1 transmit antenna with CRS, +3dB for 2 transmit antennas with CRS							
N/A: Not	Applicable	e					

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

Allocation	Re	ative power l	evel $\gamma_{\scriptscriptstyle PRB}$ [	dB]	PDSCH Data	PMCH Data			
$n_{_{PRB}}$	Subframe				Data	Data			
	0	5	4, 9	1-3,6-8					
0 – 5	0	0	0	N/A	Note 1	N/A			
0 – 5	N/A	N/A	N/A	Note 4	N/A	Note 2			
with one be unco	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								
Note 2: Each ph each PF measure	used to scale th hysical resource RB shall be unco ement. The MBS cell-specific Ref	block (PRB) is prrelated with c SFN data shall	assigned to lata in other be QPSK m	PRBs over the odulated. PMCI	period of a H subframe	ny es shall			
Note 3: If two or	ameter $\gamma_{_{PRB}}$ is a more transmit a shall be transmit	intennas with	CRS are use	d in the test, the					
and acc	ording to the an	tenna transmis	ssion mode 2	2. The paramete	er $\gamma_{_{PRB}}$ app	olies to			
equal be	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 ransmission modes are specified in section 7.1 in 3GPP TS 36.213.								
Note 4: 0dB for									
N/A: Not Applicabl	е								

#### 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 Relative power level $\gamma_{PRB}$ [dB]							
	1	n <sub>PRB</sub>	Subframe (No	ote 1)			Data		
			0	5	4,9	1-3, 6-8			
	0	- 12	0	0	0	N/A			
	37	7 – 49	0	0	0	N/A	Note 2		
	0	- 49	N/A	N/A	N/A	0			
	Note 2: These physical resource blocks are assigned to an arbitrary number of virtual UEs with one PDSCH per virtual UE; the data transmitted over the OCNG PDSCHs shall be uncorrelated pseudo random data, which is QPSK modulated. The parameter $\gamma_{PRB}$ is used to scale the power of PDSCH. 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 transmission modes are specified in section 7.1 in 3GPP TS 36.213.							
Ν	I/A:	Not Applica	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			
$n_{P_{e}}$	RB	Subframe (No	ote 1)			Dulu			
		0	5	4, 9	1 – 3, 6 – 8				
0	49	0	0	0	0	Note 2			
Note 1: Note 2:	subframes. Note 2: These physical resource blocks are assigned to an arbitrary numbrivirtual UEs with one PDSCH per virtual UE; the data transmitted or								
Note 3:	QPSK m PDSCH If two or PDSCH	modulated. The p more transmit a part of OCNG s	DSCHs shall be uncorrelated pseudo random data, which is odulated. The parameter $\gamma_{PRB}$ is used to scale the power of more transmit antennas with CRS are used in the test, the part of OCNG shall be transmitted to the virtual users by all the antennas with CRS and according to the antenna transmission						
	mode 2. the trans transmit	The parameter $\gamma_{PRB}$ applies to each antenna port separately, so smit power of the PDSCH part of OCNG is equal between all the tantennas with CRS used in the test. The antenna transmission are specified in section 7.1 in 3GPP TS 36.213.							
N/A:	Not App	licable							

### 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		Re	lative power l	evel $\gamma_{\scriptscriptstyle PRB}$ [d	B]	PDSCH Data				
$n_{P_{P}}$	RB	Subframe (No	Dulu							
		0	5	4, 9	1 – 3, 6 – 8					
0 –	0-5 0 0 0 0					Note 2				
Note 1: Note 2:	subfram These p virtual U	SCH allocation applies only to subframes not configured as PRS oframes. ese physical resource blocks are assigned to an arbitrary number of tual UEs with one PDSCH per virtual UE; the data transmitted over the CNG PDSCHs shall be uncorrelated pseudo random data, which is								
Note 3:	PDSCH. If two or PDSCH	more transmit a	dulated. The parameter $\gamma_{PRB}$ is used to scale the power of nore transmit antennas with CRS are used in the test, the art of OCNG shall be transmitted to the virtual users by all the ntennas with CRS and according to the antenna transmission							
	the trans transmit	The parameter $\gamma_{PRB}$ applies to each antenna port separately, so smit power of the PDSCH part of OCNG is equal between all the antennas with CRS used in the test. The antenna transmission 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

All	AllocationRelative power level $\gamma_{PRB}$ [dB] $n_{PRB}$ Subframe (Note 1)								
	n <sub>PRB</sub>								
		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	Note 2			
3	7 – 49	0	0	0	0 A.3.2.2.1-2				
Note 1: Note 2:	······································								
	is QPSK mod	lulated The parame	eter ${\gamma}_{_{PRB}}$ is used to sc	ale the power of PDS	SCH.				
Note 3:		vailable for DL tran P TS 36.211 [16].	smission depends on	the Uplink-Downlink	configuration de	fined in Table			
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 $\gamma_{_{PRB}}$ applies to each antenna port separately, so the transmit power is equal between all the								
	transmit antennas with CRS used in the test. The antenna transmission modes are specified in section 7.1 in 3GPP TS 36.213.								

#### Table A.3.2.2.1-1: 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	Ę		Relative power level $\gamma_{PRB}$ [dB] Special subframe configuration																
n <sub>PRB</sub>	length																		
			0		1		2	3	3	4	4	Ę	5	6	6		7	8	3
	C D		Control region OFDM symbols																
	•	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
0 – 12	N		0	(	0		0	(	)	(	0	(	D	(	)	$\bigvee$	$\sim$	$\sum$	$^{\checkmark}$
37 – 49	N		0	(	C		0	(	)	(	0	(	C	(	)	$\sum$	$\sim$	$\geq$	$^{<}$
Note 1: Special su	ubframe o	config	uratio	ins ar	e defi	ned ir	n Tabl	e 4.2-	1 in 1	FS 36	5.211	[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

	ocation		Relative power	level $\gamma_{\scriptscriptstyle PRB}$ [dB]		PDSCH Data			
	n <sub>PRB</sub>		Subframe (Note 1)						
		0		3 , 4, 8, 9 and 6 (as normal subframe) <sup>Note 3</sup>	1 and 6 (as special subframe) <sub>Note 3</sub>				
(	0-49 0 0 0 0								
Note 1:	PDSCH alloc	ation applies only t	o subframes not conf	igured as PRS subfram	es.				
Note 2:				rbitrary number of virtua nall be uncorrelated pse					
	modulated. T	he parameter $\gamma_{_{PRB}}$	is used to scale the	power of PDSCH.					
Note 3:		vailable for DL tran		the Uplink-Downlink co	onfiguration in Ta	ble 4.2-2 in 3GPP			
Note 4:				in the test, the OCNG slording to the antenna tra					
	parameter $\gamma_{\mu}$	PRB applies to each	antenna port separa	tely, so the transmit po	wer is equal betw	veen all the			
	transmit ante 3GPP TS 36.		d in the test. The ant	enna transmission mod	es are specified	in section 7.1 in			

### A.3.2.2.3 OCNG TDD pattern 3: outer resource blocks allocation in 1.4 MHz

	ocation		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					
	0 – 1	0	0	0	0				
	4 – 5	0	0	0	0	Note 2			
Note 1: Note 2:	These physic virtual UE; the	al resource blocks e data transmitted o	o subframes not confi are assigned to an arl over the OCNG PDSC	bitrary number of virtu Hs shall be uncorrela	ual UEs with on ated pseudo rar				
	is QPSK mod	lulated.The parame	eter $\gamma_{\scriptscriptstyle PRB}$ is used to sc	ale the power of PDS	SCH.				
Note 3:		vailable for DL trans P TS 36.211 [16].	smission depends on	the Uplink-Downlink	configuration de	fined in Table			
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 $\gamma_{\scriptscriptstyle P}$	parameter $\gamma_{_{PRB}}$ applies to each antenna port separately, so the transmit power is equal between all the							
		nnas with CRS use	d in the test. The ante						

## 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			Relative power l	evel ${\gamma}_{\scriptscriptstyle PRB}$ [dB]		PDSCH Data			
$n_{PRI}$				Subframe (Note 1)						
n <sub>PRB</sub> tig ee d d d		<b>5</b> 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>					
	0-5 0 0 0 0 Note 2									
Note 1: Note 2:	These UE; th	e physic ne data f	al resource blocks transmitted over th	to subframes not config are assigned to an art be OCNG PDSCHs sha	oitrary number of virtua all be uncorrelated pse	al UEs with one F				
Note 3: Note 4:	TS 36.211 [16].									
	transr		nnas with CRS use	n antenna port separate ed in the test. The ante						

## 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 see	ction 6.3.2 in 3GPP	TS 36.331.	

## A.4 E-UTRAN RRC\_IDLE state

## A.4.2 Cell Re-Selection

### A.4.2.1 E-UTRAN FDD – FDD Intra frequency case

### A.4.2.1.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-FDD intra frequency cell reselection requirements specified in section 4.2.2.3.

The test scenario comprises of 1 E-UTRA FDD carrier and 2 cells as given in tables A.4.2.1.1-1 and A.4.2.1.1-2. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Only Cell 1 is already identified by the UE prior to the start of the test, i.e. Cell 2 is not identified by the UE prior to the start of the test. Cell 1 and Cell 2 belong to different tracking areas. Furthermore, UE has not registered with network for the tracking area containing Cell 2.

F	Parameter	Unit	Value	Comment
Initial	Active cell		Cell1	
condition	Neighbour cells		Cell2	
T2 end	Active cell		Cell2	
condition	Neighbour cells		Cell1	
Final condition	Visited cell		Cell1	
	F Channel Number		1	Only one FDD carrier frequency is used.
Channel Ba	andwidth (BW <sub>channel</sub> )	MHz	10	
Time offset	t between cells		3 ms	Asynchronous cells
Access Ba	Access Barring Information		Not Sent	No additional delays in random access procedure.
PRACH co	nfiguration		4	As specified in table 5.7.1-2 in 3GPP TS 36.211
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	>7	During T1, Cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that Cell 2 has not been detected by the UE prior to the start of period T2
T2		S	40	T2 need to be defined so that cell re- selection reaction time is taken into account.
Т3		S		T3 need to be defined so that cell re- 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 Number			1			1	
BW <sub>channel</sub>	MHz		10			10	
OCNG Patterns defined in A.3.2.1.2 (OP.2 FDD)		C	OP.2 FDD			OP.2 FDD	
PBCH_RA							
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB	dB		0			0	
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA <sup>Note 1</sup>							
OCNG_RB <sup>Note 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_ measurement			RSRP			RSRP	
$\hat{E}_{s}/I_{ot}$	dB	16	-3.11	2.79	-infinity	2.79	-3.11
$N_{_{oc}}$ Note2	dBm/15 kHz				-98		
$\hat{E}_s / N_{oc}$	dB	16	13	16	-infinity	16	13
RSRP <sup>Note3</sup>	dBm/15 kHz	-82	-85	-82	-infinity	-82	-85
Treselection	S	0	0	0	0	0	0
Sintrasearch	dB	Not sent Not sent					
Propagation Condition					AWGN		
Note 1: OCNG shall be density is achie Note 2: Interference fro	eved for all OFDM	symbols.					

## 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  $N_{oc}$  to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

### A.4.2.1.2 Test Requirements

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

The cell re-selection delay to a newly detectable cell shall be less than 34 s.

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

The cell re-selection delay to an already detected cell shall be less than 8 s.

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.

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				
	F Channel Number		1	Only one TDD carrier frequency is used.
Channel Ba	andwidth (BW <sub>channel</sub> )	MHz	10	
Time offset	t 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
			40	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	Т3	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		O	P.2 TDD		O	P.2 TDD	
(OP.2 TDD)							
PBCH_RA							
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA							
PHICH_RB	dB		0			0	
PDCCH_RA							
PDCCH_RB							
PDSCH_RA							
PDSCH_RB							
OCNG_RA <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	
measurement							
$\hat{E}_{s}/I_{ot}$	dB	16	-3.11	2.79	-infinity	2.79	-3.11
	dBm/15 kHz				98		
$N_{oc}^{ m Note2}$				-	90		
$\hat{E}_s/N_{oc}$	dB	16	13	16	-infinity	16	13
RSRP Note3	dBm/15 kHz	-82	-85	-82	-infinity	-82	-85
Treselection	S	0	0	0	0	0	0
Sintrasearch	dB	N	lot sent		N	lot sent	
Propagation				AV	VGN		
Condition							
	be used such that					tant total	
	power spectral der						
Note 2: Interference f	rom other cells and r	noise sources	s not speci	fied in the	e test is assum	ned to be o	constant
	and the second the	II haa ar - 1-9		NI = f =		$N_{cc}$	ta ha
over subcarrie fulfilled.	ers and time and sha	ili pe modelle	a as AWG	on or app	ropriate power	10r 00	to de
iuiiiieu.	have been derived fr						
	neters themselves.	e ettier pui					

## 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%.

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			
$T_{evaluate,E-UTRAN_{}}$ intra	See Table 4.2.2.3-1 in section 4.2.2.3			
	faximum repetition period of relevant system info blocks that needs to be received by the UE to amp 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	Active cell		Cell2	UE shall perform reselection to cell 2 during T3
condition				, , , , , , , , , , , , , , , , , , ,
E-UTRA R	F Channel Number		1, 2	Two FDD carrier frequencies are used.
Time offset	between cells		3 ms	Asynchronous cells
PRACH co	nfiguration		4	As specified in table 5.7.1-2 in TS 36.211
Access Ba	rring Information	-	Not Sent	No additional delays in random access
				procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	15	T1 need to be defined so that cell re-selection
				reaction time is taken into account.
T2		S	>7	During T2, cell 2 shall be powered off, and
				during the off time the physical cell identity shall
				be changed, The intention is to ensure that cell 2
				has not been detected by the UE prior to the
				start of period T3.
Т3	Т3		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	C	ell 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							
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	1					
PDSCH_RA	dB	1					
PDSCH_RB	dB	1					
OCNG_RA <sup>Note 1</sup>	dB	1					
OCNG_RB <sup>Note 1</sup>	dB						
Qrxlevmin	dBm		·140		-140		
$N_{_{oc}}$ Note 2	dBm/15 kHz				-98		
RSRP Note 3	dBm/15 KHz	-84	-84	-84	-102	-infinity	-86
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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 spectral density is ac Note 2: Interference from oth	hieved for all OFC	OM symbols					-
over subcarriers and	time and shall be	modelled a	s AWGN	of app	ropriate po	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:  $T_{evaluateFDD,inter} + T_{SI}$ ,

Where:

$T_{higher\_priority\_search}$	See section 4.2.2
$T_{evaluateFDD,inter}$	See Table 4.2.2.4-1 in section 4.2.2.4
T <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.4.2.4.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-TDD inter-frequency cell reselection requirements specified in section 4.2.2.4.

The test scenario comprises of 1 E-UTRA FDD cell and 1 E-UTRA TDD cell as given in tables A.4.2.4.1-1 and A.4.2.4.1-2. 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
Number	TRA RF Channel		1	One FDD carrier frequency is used. And Cell 1 is on RF channel number 1.
Cell 2 E-UT Number	TRA RF Channel		2	One TDD carrier frequencies is used. And Cell 2 is on RF channel number 2.
Time offset	t between cells		3 ms	Asynchronous cells
E-UTRA FI configuration	DD PRACH on		4	As specified in table 5.7.1-2 in 3GPP TS 36.211
E-UTRA TI configuration	E-UTRA TDD PRACH		53	As specified in table 5.7.1-3 in 3GPP TS 36.211
Special subframe 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
E-UTRA FDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
E-UTRA TI	DD Access Barring	-	Not Sent	No additional delays in random access procedure.
DRX cycle		s	1.28	The value shall be used for all cells in the test.
T1	i i i juli	S	15	T1 need to be defined so that cell re-selection
To			-	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.4.2.4.1-1: General test parameters for FDD-TDD inter frequency cell re-selection test case

Parameter	Unit	C	ell 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) and		OP	.2 FDD		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	1					
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
Qrxlevmin	dBm	-140				-140	
$N_{oc}^{\rm Note 2}$	dBm/15 kHz				-98		
RSRP Note 3	dBm/15 KHz	-84	-84	-84	-102	-infinity	-86
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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			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 use	ed such that both	cells are fu	lly alloca	ted and	l a constan	t total transmi	itted
<ul> <li>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>						е	
$N_{ac}$ to be fulfilled							
Note 3: RSRP levels have							

## Table A.4.2.4.1-2: Cell specific test parameters for FDD-TDD inter-frequency cell reselection test case in AWGN

### A.4.2.4.2 Test Requirements

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

The cell re-selection delay to higher priority shall be less than 68 s.

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

The cell re-selection delay to lower priority shall be less than 8 s.

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

NOTE: The cell re-selection delay to higher priority cell can be expressed as:  $T_{higher\_priority\_search} + T_{evaluate,E-UTRAN\_inter} + T_{SI-EUTRA}$ , and to lower priority cell can be expressed as:  $T_{evaluate,E-UTRAN\_inter} + T_{SI-EUTRA}$ ,

Where:

$T_{higher\_priority\_search}$	See section 4.2.2
$T_{evaluate,E-UTRAN_inter}$	See Table 4.2.2.4-1 in section 4.2.2.4
T <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.4.2.5 E-UTRAN TDD – FDD Inter frequency case

#### A.4.2.5.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-FDD inter-frequency cell reselection requirements specified in section 4.2.2.4.

The test scenario comprises of 1 E-UTRA TDD cell and 1 E-UTRA FDD cell as given in tables A.4.2.5.1-1 and A.4.2.5.1-2. The test consists of three successive time periods, with time duration of T1, T2 and T3 respectively. Both cell 1 and cell 2 are already identified by the UE prior to the start of the test. Cell 1 and cell 2 belong to different tracking areas and cell 2 is of higher priority than cell 1. Furthermore, UE has not registered with network for the tracking area containing cell 2.

#### Table A.4.2.5.1-1: General test parameters for TDD-FDD inter frequency cell re-selection test case

	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
Cell 1 E-U	TRA RF Channel		1	One TDD carrier frequency is used. And Cell 1 is
Number				on RF channel number 1.
Cell 2 E-U	TRA RF Channel		2	One FDD carrier frequencies is used. And Cell 2
Number				is on RF channel number 2.
Time offset	t between cells		3 ms	Asynchronous cells
E-UTRA TI	DD PRACH		53	As specified in table 5.7.1-3 in 3GPP TS 36.211
configuration	on			
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
E-UTRA FDD PRACH			4	As specified in table 5.7.1-2 in 3GPP TS 36.211
configuration				
E-UTRA FI	DD Access Barring	-	Not Sent	No additional delays in random access
Information				procedure.
E-UTRA TI	DD 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	15	T1 need to be defined so that cell re-selection
				reaction time is taken into account.
T2	T2		>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.

Parameter	Unit	C	ell 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								
A.3.2.1.1 (OP.2 FDD) and		OP	.2 TDD			OP.2 FDD		
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>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	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	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			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	50	
Propagation Condition					AWGN			
Note 1: OCNG shall be use	ed such that both	cells are fu	lly alloca	ted and		t total transmi	tted	
<ul> <li>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>						е		
$N_{ac}$ to be fulfilled								
Note 3: RSRP levels have								

## Table A.4.2.5.1-2: Cell specific test parameters for TDD-FDD inter-frequency cell reselection test case in AWGN

### A.4.2.5.2 Test Requirements

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

The cell re-selection delay to higher priority shall be less than 68 s.

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

The cell re-selection delay to lower priority shall be less than 8 s.

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

NOTE: The cell re-selection delay to higher priority cell can be expressed as:  $T_{higher\_priority\_search} + T_{evaluate,E-UTRAN\_inter} + T_{SI-EUTRA}$ , and to lower priority cell can be expressed as:  $T_{evaluate,E-UTRAN\_inter} + T_{SI-EUTRA}$ ,

Where:

$T_{higher\_priority\_search}$	See section 4.2.2
$T_{evaluate,E-UTRAN_inter}$	See Table 4.2.2.4-1 in section 4.2.2.4
T <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.4.2.6 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 R	F Channel Number		1, 2	Two TDD carrier frequencies are used.
Time offset	t between cells		3 μs	Synchronous cells
Access Ba	Access Barring Information		Not Sent	No additional delays in random access procedure.
Special sul	oframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-dow	nlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211
PRACH configuration index			53	As specified in table 5.7.1-3 in 3GPP TS 36.211
DRX cycle length		S	1.28	The value shall be used for all cells in the test.
T1		S	15	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		S	>7	During T2, cell 2 shall be powered off, and during the off time the physical cell identity shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T3.
Т3		S	75	T3 need to be defined so that cell re-selection reaction time is taken into account.

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 Pattern defined in									
A.3.2.2.2 (OP.2 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								
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								
Qrxlevmin	dBm		-140		-140				
$N_{oc}^{}$ 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		
	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				AV	VGN				
Note 1: OCNG shall be use	ed such that both o	cells are fully	/ allocate	ed and a	constant to	tal transmit	ted		
power spectral dens									
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									

## Table A.4.2.6.1-2: Cell specific test parameters for TDD-TDD inter-frequency cell reselection test case in AWGN

 $N_{oc}$  to be fulfilled.

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

### A.4.2.6.2 Test Requirements

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

The cell re-selection delay to higher priority shall be less than 68 s.

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

The cell re-selection delay to lower priority shall be less than 8 s.

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

NOTE: The cell re-selection delay to higher priority cell can be expressed as:  $T_{higher\_priority\_search} + T_{evaluate,E-UTRAN\_inter} + T_{SI-EUTRA}$ , and to lower priority cell can be expressed as:  $T_{evaluate,E-UTRAN\_inter} + T_{SI-EUTRA}$ ,

Where:

$T_{higher\_priority\_search}$	See section 4.2.2
$T_{evaluate,E-UTRAN_inter}$	See Table 4.2.2.4-1 in section 4.2.2.4
T <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 condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase
Final condition	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
E-UTRA R	F Channel Number		1, 2	Two FDD carrier frequencies are used.
Time offset	t between cells		3 ms	Asynchronous cells
PRACH co	nfiguration		4	As specified in table 5.7.1-2 in TS 36.211
Access Ba	rring Information	-	Not Sent	No additional delays in random access procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1	-	S	[15]	T1 need to be defined so that 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	Т3	T1	T2	T3	
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	D	0	P.2 FDD	)		OP.2 FD	D	
PBCH_RA	dB										
PBCH_RB	dB										
PSS_RA	dB										
SSS_RA	dB	1									
PCFICH_RB	dB										
PHICH_RA	dB										
PHICH_RB	dB		0			0			0		
PDCCH_RA	dB	0			0			0			
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 kHz					-98					
RSRP <sup>Note 3</sup>	dBm/15 kHz	[-90]	[-90]	[-85]	[- Infinity]	[-85]	[-90]	[-90]	[-85]	[-60]	
RSRQ Note 3	dB	[-14.1]	[-17.1]	[-35.8]				[-14.1]	[-12.1]	[-10.8]	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	[-0.64]	[-5.21]	[-25]	[- Infinity]	[13]	[8]	[-0.64]	[4.36]	[24.8]	
$\hat{E}_{s}/N_{oc}$	dB	[8]	[8]	[13]	[- Infinity]	[13]	[8]	[8]	[13]	[38]	
Treselection	S	0			0			0			
Snonintrasearch	dB	TBD			Not sent			Not sent			
Propagation Condition		AWGN									
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over											
	subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{ac}$ to be fulfilled.										
Note 3: RSRP and RSRQ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.											

## 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

## 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 R	F 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 sub	Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211
PRACH co	PRACH configuration		53	As specified in table 5.7.1-3 in TS 36.211
Access Ba	rring Information	-	Not Sent	No additional delays in random access
				procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	[15]	T1 need to be defined so that the non-allowed
				CSG cell is identified.
T2		S	[40]	T2 need to be defined so that cell re-selection
				reaction time is taken into account.
T3		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	Т3	T1	T2	T3
E-UTRA RF Channel			1	_		2	_		1	
Number										
BW <sub>channel</sub>	MHz		10			10			10	
OCNG Pattern defined in			OP.2 TDE	<u>,</u>		.2 TDD			OP.2 TDD	,
A.3.2.2.2 (OP.2 TDD)			UP.Z IDL	)	OF	.2 100			UP.Z IDL	,
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 <sub>oc</sub> Note 2	dBm/					-98				
	15kHz		-							
RSRP Note 3	dBm/	[-90]	[-90]	[-85]	[-Infinity]	[-85]	[-90]	[-90]	[-85]	[-60]
Noto 2	15kHz									
RSRQ Note 3	dB	[-14.1]	[-17.1]	[-35.8]				[-14.1]	[-12.1]	[-10.8]
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	[-0.64]	[-5.21]	[-25]	[-Infinity]	[13]	[8]	[-0.64]	[4.36]	[24.8]
$\hat{E}_s / N_{oc}$	dB	[8]	[8]	[13]	[-Infinity]	[13]	[8]	[8]	[13]	[38]
Treselection	S		0			0			0	
Snonintrasearch	dB	TBD			Not sent				Not sent	
Propagation Condition		AWGN								
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral						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 for $N_{oc}$ to be fulfilled. Note 3: RSRP and RSRQ levels have been derived from other parameters for information purposes. They are not settable parameters themselves.										

## 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

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 P	RACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA A	ccess Barring	-	Not Sent	No additional delays in random access
Information	1			procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	>20	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed. The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2		S	85	T2 needs to be defined so that cell re-selection reaction time is taken into account.
Т3	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		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					
Qqualmin for UTRA	dB		-20			
neighbour cell	uВ	-20				
Qrxlevmin for UTRA	dBm		-115			
neighbour cell	-	-115				
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						
and a constant tota	and a constant total transmitted power spectral density is					
	achieved for all OFDM symbols.					
Note 2 : This refers to the value of $\operatorname{Thresh}_{x, high}$ which is included in E-						
UTRA system information, and is a threshold for the UTRA						
target cell						

Table A.4.3.1.1.1-2: Cell s	pecific test paramet	ters for cell 1(E-UTRA)
	pooline toot paramet	

Table A.4.3.1.1.1-3: Cell specific test parameters for cell 2(UTRA)

Parameter	Unit	Ce	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		

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, low</sub> which is included in UTRA system information, and is a threshold for the E-UTRA target cell					

#### A.4.3.1.1.2 Test Requirements

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

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

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

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

#### Where:

$T_{higher\_priority\_search}$	See section 4.2.2; 60s is assumed in this test case
$T_{evaluateUTRA-FDD}$	See Table 4.2.2.5.1-1
T <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 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	T1		85	T1 need to be defined so that cell re-selection
				reaction time is taken into account.
T2		S	25	T2 need to be defined so that cell re-selection
				reaction time is taken into account.

Table A.4.3.1.2.1-2: 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 for UTRA neighbour cell		dB		-20
Qrxlevmin for UTRA neighbour cell		dBm	-115	
Qrxlevmin		dBm	-140	
N <sub>oc</sub>		dBm/15 kHz	-98	
RSRP		dBm/15 KHz	-86 -102	
$\hat{E}_{s}/I_{ot}$		dB	12	-4
$\hat{E}_s/N_{oc}$		dB	12	-4
Treselection <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:OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 2 :This refers to the value of Thresh <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 of Thresh <sub>x, high</sub> which is included in UTRA system information, and is a threshold for the E-UTRA target cell				

#### A.4.3.1.2.2 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%.

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 P	RACH configuration		4	As specified in table 5.7.1-2 in TS 36.211
E_UTRA Access Barring Information		-	Not Sent	No additional delays in random access procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	<85	T1 need to be defined so that cell re-selection reaction time is taken into account. 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
Τ4		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	T3	T4
E-UTRA RF Channel number		1	•		
BW <sub>channel</sub>	MHz	10			
OCNG Patterns defined in A.3					
		OP.2 FE	DD		
PSS_RA	dB	0			
SSS_RA	dB	0			
PCFICH_RB	dB	0			
PHICH_RA	dB	0			
PHICH_RB	dB	0			
PDCCH_RA	dB	0			
PDCCH_RB	dB	0			
PDSCH_RA	dB	0			
PDSCH_RB	dB	0			
OCNG_RA <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			
$N_{oc}$	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 sen	t		
Thresh <sub>serving, low</sub>	dB	44			
Thresh <sub>x, low</sub> (Note 2)	dB	42			
Propagation Condition		ETU70			
<ul> <li>Note 1: OCNG shall be used such that both cells are fully allocated and a constant total t spectral density is achieved for all OFDM symbols.</li> <li>Note 2 : This refers to the value of Thresh<sub>x, low</sub> which is included in E-UTRA system inforr</li> </ul>					
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	<b>T</b> 3	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 va information, and is a					system

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

Para	meter	Unit	Value	Comment
Initial condition	Active cell		Cell1	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	1.28 Mcps TDD OPTION cell
T2 end	Active cell		Cell2	UE shall perform reselection to cell 2 during T2
condition	Neighbour cell		Cell1	E-UTRA FDD cell
CP length of c	CP length of cell 1		normal	
E-UTRA PRA	СН		4	As specified in table 5.7.1-2 in TS 36.211
Time offset be	Time offset between cells		3 ms	Asynchronous cells
Access Barrin	g Information	-	Not sent	No additional delays in random access procedure.
Treselection		S	0	
DRX cycle len	gth	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	Cell 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 <sub>oc</sub>	dBm/15kHz	-98		
RSRP	dBm/15kHz	-87	-101	
$\hat{E}_{s}/I_{ot}$	dB	11	-3	
Snonintrasearch	dB	Not	tsent	
Thresh <sub>serving, low</sub>	dB	46 (-9	94dBm)	
Thresh <sub>x, low</sub> (Note2)	dB	24 (-79dBm)		
Propagation Condition		AV	WGN	
Note 1: OCNG shall be u constant total tran all OFDM symbols	smitted power spe			
Note2: This refers to the UTRA system info target cell	value of Threshx, lo prmation, and is a th			

# 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		(		· · · ·	PTS
		T1	T2	T1	T2
UTRA RF Channel Number (Note1)			Char	nel 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		-1	03	
Qoffset1 <sub>s,n</sub>	dB		C1, (	C2: 0	
Qhyst1 <sub>s</sub>	dB		(	)	
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 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 I	PRACH configuration		53	As specified in table 5.7.1-3 in TS 36.211
Uplink-dov	wnlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special sub	oframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
_	RA Access Barring Information	-	Not Sent	No additional delays in random access procedure.
DR	X 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)		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			

Qqualmin for UTRA neighbour cell	dB		-20
Qrxlevmin for UTRA neighbour cell	dBm		-115
Qrxlevmin	dBm		-140
N <sub>oc</sub>	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	
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:       OCNG shall be use and a constant tota achieved for all OF         Note 2 :       This refers to the v. UTRA system infor target cell	l transmitted pov DM symbols. alue of Thresh <sub>x,</sub>	ver spectral <sub>Iow</sub> which is	density is included in E-

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 in UTRA system info 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%.

151

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	T2 end Active cell		Cell2	UE shall perform reselection to cell 2 during T2
condition	Neighbour cell		Cell2	
T3 end	Active cell		Cell 1	UE shall perform reselection to cell 1 during T3
condition	Neighbour cell		Cell 2	
Uplink-down configuration			1	As specified in table 4.2.2 in TS 36.211
Special subf configuratior			6	As specified in table 4.2.1 in TS 36.211
PRACH con cell 1	PRACH configuration of		53	As specified in table 4.7.1-3 in TS 36.211
CP length of	cell 1		Normal	
Time offset b	petween cells		3 ms	Asynchronous cells
Access Barr	ing	-	Not	No additional delays in random access procedure.
Information			sent	
Treselection		S	0	
DRX cycle le	ength	s	1,28	
HCS			Not	
			used	
Τ1		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	T2		85	T2 needs to be defined so that cell re-selection reaction time is taken into account
Т3		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			
		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			

Q <sub>rxlevmin</sub>	dBm/15kHz	-140	-140	-140		
$N_{oc}$	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)				
Snonintrasearch	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.						
	e2: 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			6	
		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	-80					
PCCPCH RSCP	dBm	-inf	-72	-86	n.a.		
Propagation Condition		AWGN					
Qrxlevmin	dBm			-1	03		
Qoffset1 <sub>s,n</sub>	dB			C1, 0	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 the value of Thresh <sub>x, low</sub> which is included in UTRA system information, and is a threshold for the E-UTRA target cell							

A.4.3.4.1.1.3 7.68 Mcps TDD option

- A.4.3.4.1.2 Test Requirements
- A.4.3.4.1.2.1 3.84 Mpcs TDD option
- A.4.3.4.1.2.2 1.28 Mpcs TDD option

The cell reselection delay to higher priority is defined as the time from the beginning of time period 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%.

3GPP TS 36.133 version 9.11.1 Release 9

154

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

#### Where:

$T_{higher\_priority\_search}$	60s, See section 4.2.2
$T_{evaluateUTRA_TDD}$	19.2s, See Table 4.2.2.5.2-1
T <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

Paran	Parameter		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 cell 1	configuration of		1	As specified in table 4.2.2 in TS 36.211
Special subframe of cell 1	Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
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 I	nformation	-	Not	No additional delays in random access procedure.
			sent	
Treselection		S	0	
DRX cycle length	ו	S	1,28	
HCS			Not	
			used	
T1		S	85	
T2		S	25	

Parameter	Unit	Ce	ell 1			
		T1	T2			
E-UTRA RF Channel			1			
Number						
BW <sub>channel</sub>	MHz	1	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	-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 (-7	'9dBm)			
Propagation Condition		AW	VGN			
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 UTRA system info target cell	value of Thresh <sub>x, lov</sub> prmation, and is a tl					

# 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		(	) DwP		PTS	
		T1	T2	T1	T2	
UTRA RF Channel Number (Note1)			Channel 2			
PCCPCH_Ec/lor	dB	-3	-3			
DwPCH_Ec/lor	dB			0	0	
OCNS_Ec/lor	dB	-3	-3			
$\hat{I}_{or}/I_{oc}$	dB	11	11	11	11	
$I_{oc}$	dBm/1.28 MHz	-80				
PCCPCH RSCP	dBm	-72	-72	n.a.	n.a.	
Propagation Condition		AWGN				
Qrxlevmin	dBm		-1	03		
Qoffset1 <sub>s,n</sub>	dB		C1, (	C2: 0		
Qhyst1 <sub>s</sub>	dB		(	)		
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 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 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			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 P	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 sul cell 1	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			<85	T1 need to be defined so that cell re-selection reaction time is taken into account. T1 is terminated when the UE starts to send preambles to cell 1												
T2	T2										S		s 64		64	The start of T2 is defined as the time when the UE starts to send PRACH preambles to cell 1
Т3	Τ3		<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												
Τ4		S	64	The start of T4 is defined as the time when the UE starts to send PRACH preambles to cell 2												

Parameter	Unit		Ce	II 1		
		T1	T2	T3	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		(	0		
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RA <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
Qrxlevmin for UTRA	dBm	-103				
neighbour cell						
Qrxlevmin	dBm			40		
$N_{oc}$	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	
TreselectionEUTRAN	S	0				
Snonintrasearch	dB	Not sent				
Thresh <sub>serving, low</sub>	dB		4	4		
Thresh <sub>x, low</sub> (Note 2)	dB	24				
Propagation Condition			ET	U70		
Note 1: OCNG shall be use	d such that both	cells are fu	Illy allocate	d and a cor	stant total	
transmitted power s	transmitted power spectral density is achieved for all OFDM symbols.					
Note 2: This refers to the va				E-UTRA sy	/stem	
information, and is	a threshold for th	ne UTRA ta	rget 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	-80							
PCCPCH RSCP	dBm	-70	-70	-70	-70	n.a.	n.a.	n.a.	n.a.
Propagation Condition		AWGN							
Qrxlevmin	dBm	-103							
Qrxlevmin <sub>EUTRA</sub>	dBm				-1	40			
UE_TXPWR_MAX_RACH	dBm	21							
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 condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase and shall be able to detect and monitor the 4 strongest GSM BCCH carriers in T1. Cell 1 is an E-UTRA FDD cell.
Final condition	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2. Cell 2 is a GSM cell.
E-UTRA R	F Channel Number		1	1 E-UTRA FDD carrier frequency
GSM ARF	CN		1	12 GSM BCCH carriers are used
PRACH co	onfiguration		4	As specified in table 5.7.1-2 in TS 36.211
Access Ba	rring Information	-	Not Sent	No additional delays in random access procedure.
CP length	of cell 1		Normal	
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	35	T1 need to be defined so that cell re-selection reaction time is taken into account.
T2		S	35	T2 need to be defined so that the higher layer search periodicity and cell re-selection reaction time are taken into account.
Propagatio	n channel		AWGN	

 Table A.4.4.1-2: Cell-specific test parameters for Cell 1 – E-UTRA FDD cell

Parameter	Unit	Cell 1	
		T1	T2
E-UTRA RF Channel			1
number			
BW <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	]	
	dB		

Qrxlevmin	dBm	-140			
N <sub>oc</sub>	dBm/15 kHz	-98			
RSRP	dBm/15 KHz	-89	-102		
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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 cell.					

Parameter	Unit	Cell 2 (GSM)		
Falameter	Onit	T1	T2	
Absolute RF Channel Number		ARFCN <sup>2</sup>	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

162

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 condition	Active cell		Cell1	UE shall be forced to cell 1 in the initialisation phase and shall be able to detect and monitor the 4 strongest GSM BCCH carriers in T1. Cell 1 is an E-UTRA TDD cell.
Final condition	Neighbour cell		Cell2	UE shall perform reselection to cell 2 during T2. Cell 2 is a GSM cell.
E-UTRA R	F Channel Number		1	1 E-UTRA TDD carrier frequency
GSM ARF	CN		1	12 GSM BCCH carriers are used
Uplink-dow cell 1	vnlink configuration of		1	As specified in table 4.2.2 in TS 36.211
Special sul for cell 1	bframe configuration		6	As specified in table 4.2.1 in TS 36.211
PRACH co	onfiguration for cell 1		53	As specified in table 5.7.1-3 in TS 36.211
CP length	of cell 1		Normal	
Access Ba	rring Information	-	Not Sent	No additional delays in random access procedure.
DRX cycle	length	S	1.28	The value shall be used for all cells in the test.
T1		S	35	T1 need to be defined so that cell re-selection reaction time is taken into account.
Т2		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	on channel		AWGN	

Table A.4.4.2-1: General test parameters for E-UTRA TDD GSM cell re-selection test case

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)		OF	P.2 TDD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB	7		
SSS_RA	dB	7		
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		
	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 cell.					

Table A.4.4.2-3: Cell-specific test pa	arameters for Cell 2 – GSM cell
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Parameter	Unit	Cell 2 (GSM)	
Farameter	Onit	T1	T2
Absolute RF Channel Number		ARFCN <sup>2</sup>	1
RXLEV	dBm	-90	-75
RXLEV_ACCESS_MIN	dBm	-105	
MS_TXPWR_MAX_CCH	dBm	24	

## A.4.4.2.2 Test Requirements

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

The cell re-selection delay shall be less than  $26 \text{ s} + T_{BCCH}$ , where  $T_{BCCH}$  is the maximum time allowed to read BCCH data from GSM cell [8].

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

NOTE: The cell re-selection delay can be expressed as:  $4* T_{measureGSM} + T_{BCCH}$ , where:

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

Parameter Unit		Cel	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	FDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	C	)		
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>	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		
Treselection <sub>EUTRAN</sub>	S	C	)		
Snonintrasearch	dB	Not	sent		
cellReselectionPriority	-	1			
Qrxlevmin	dBm	-140			
Qrxlevminoffset	dB	0			
Pcompensation	dB	C	)		
S <sub>Serving</sub> Cell	dB	51	38		
Thresh <sub>serving, low</sub>	dB	4	4		
Propagation Condition		AW	GN		
Note 1: CNG shall be used such that both cells are fully allocated and a constant total transmitted					
power spectral density is ach					

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

Parameter	Unit	Cell 2	
		T1	T2
HRPD RF Channel Number		1	
$\frac{\text{Control}  \text{E}_{\text{b}}}{\text{N}_{\text{t}}}  \text{(38.4 kbps)}$	dB	21	
$\frac{\text{Control}  \text{E}_{\text{b}}}{\text{N}_{\text{t}}} $ (76.8 kbps)	dB	18	
$\hat{I}_{or}/I_{oc}$	dB	0	0
I <sub>oc</sub>	dBm/ 1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-3	-3
Propagation Condition		AWGN	
SnonServingCell,x		-6	
Treselection	S	0	
hrpd-CellReselectionPriority	-	0	
Thresh <sub>x, low</sub>		-14	

Table A.4.5.1.1.1-3: Cell Specific Test	Parameters for HRPD (	cell # 2)
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### 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.4.5.2 E-UTRAN TDD – HRPD

### A.4.5.2.1 E-UTRAN TDD – HRPD Cell Reselection: HRPD is of Lower Priority

#### A.4.5.2.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN TDD- 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 TDD cells as given in tables A.4.5.2.1.1-1, A.4.5.2.1.1-2 and A.4.5.2.1.1-3.

The test consists of two successive time periods, with time duration of T1 and T2 respectively. Both E-UTRAN TDD 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.4.5.2.1.1-1: General Test Parameters for E-UTRAN TDD - lower priority HRPD Cell Reselection

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbour cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell is selecting during T2
Uplink-downlink co	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	
DRX cycle length		S	1.28	
E-UTRA TDD RF Channel Number			1	Only one TDD carrier frequency is used.
E-UTRA TDD Cha	nnel Bandwidth (BW <sub>channel</sub> )	MHz	10	
HRPD RF Channel Number			1	Only one HRPD carrier frequency is used.
E-UTRA TDD PRACH configuration of cell 1			53	As specified in table 4.7.1-3 in TS 36.211
E_UTRA TDD Acc	ess 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.3.2.2.2				
(OP.2 TDD)		OP.2	TDD	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB	C	)	
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		
RSRP	dBm/15 KHz	-89	-102	
${\hat{\rm E}}_{ m s}/{ m I}_{ m ot}$	dB	9	-4	
$\hat{E}_s/N_{oc}$	dB	9	-4	
Treselection <sub>EUTRAN</sub>	S	(	)	
Snonintrasearch	dB	Not	sent	
cellReselectionPriority	-	1		
Qrxlevmin	dBm	-140		
Qrxlevminoffset	dB	0		
Pcompensation	dB	0		
S <sub>Serving</sub> Cell	dB	51	38	
Thresh <sub>serving, low</sub>	dB	4	4	
Propagation Condition		AWGN		
Note 1: OCNG shall be used such th	at both cells are fu	lly allocated and a consta	ant total transmitted	
power spectral density is ach	ieved for all OFDN	1 symbols.		

## Table A.4.5.2.1.1-2: Cell Specific Test Parameters for E-UTRAN TDD (Cell # 1)

Parameter	Unit Cell 2		
		T1	T2
HRPD RF Channel Number		1	
$\frac{\text{Control}  \text{E}_{\text{b}}}{\text{N}_{\text{t}}}  \text{(38.4 kbps)}$	dB	21	
$\frac{\text{Control}  \text{E}_{\text{b}}}{\text{N}_{\text{t}}} \text{ (76.8 kbps)}$	dB	18	
$\hat{I}_{or}/I_{oc}$	dB	0	0
I <sub>oc</sub>	dBm/ 1.2288 MHz	-55	
CDMA2000 HRPD Pilot Strength	dB	-3	-3
Propagation Condition		AWGN	
S <sub>nonServingCell,x</sub>		-6	
Treselection	S	0	
hrpd-CellReselectionPriority	-	0	
Thresh <sub>x, low</sub>		-14	

Table A.4.5.2.1.1-3: Cell	<b>Specific Test Parameters</b>	for HRPD (cell # 2)
	epeenne reetraannetere	

#### A.4.5.2.1.2 Test Requirements

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

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

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

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

Where:

$T_{evaluatHRPD}$	See Table 4.2.2.5.4-1
T <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	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 Cha	annel Bandwidth (BW <sub>channel</sub> )	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	Cel	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 FDD				
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	C				
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	-89	-102			
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	9	-4			
$\hat{E}_{s}/N_{oc}$	dB	9	-4			
Treselection <sub>EUTRAN</sub>	S	0				
Snonintrasearch	dB	Not sent				
cellReselectionPriority	-	1				
Qrxlevmin	dBm	-14	40			
Qrxlevminoffset	dB	C				
Pcompensation	dB	C	)			
S <sub>ServingCell</sub>	dB	51	38			
Thresh <sub>serving, low</sub>	dB	4	4			
Propagation Condition		AW	GN			
<ul> <li>Note 1: CNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.</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>						
$N_{\scriptscriptstyle oc}$ to be fulfilled.	$N_{oc}$ to be fulfilled.					
Note 3: SRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						

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

Parameter	Unit	Cell	2	
		T1	T2	
cdma2000 1X RF Channel Number		1		
$\frac{\text{Pilot} E_{c}}{I_{\text{or}}}$	dB	-7		
Sync E <sub>c</sub> I <sub>or</sub>	dB	-16		
$\frac{\underline{\text{Paging } E_c}}{I_{\text{or}}} $ (4.8 kbps)	dB	-12		
$\hat{I}_{or}/I_{oc}$	dB	0	0	
I <sub>oc</sub>	dBm/ 1.2288 MHz	-55		
CDMA2000 1xRTT Pilot Strength	dB	-10	-10	
Propagation Condition		AWG	N	
SnonServingCell,x		-20		
Treselection	S	0		
oneXRTT-CellReselectionPriority	-	0		
Thresh <sub>x, low</sub>		-28		

Table A.4.6.1.1.1-3: Cell Specific Test Parameters for cdma2000 1X (cell # 2)

## A.4.6.1.1.2 Test Requirements

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

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

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

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

Where:

Tevaluatcdma2000 1XSee Table 4.2.2.5.5-1TSI-cdma2000 1XMaximum 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.4.6.2 E-UTRAN TDD - cdma2000 1X

## A.4.6.2.1 E-UTRAN TDD –cdma2000 1X Cell Reselection: cdma2000 1X is of Lower Priority

#### A.4.6.2.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN TDD- 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 TDD cells as given in tables A.4.6.2.1.1-1, A.4.6.2.1.1-2 and A.4.6.2.1.1-3.

The test consists of two successive time periods, with time duration of T1 and T2 respectively. Both E-UTRAN TDD 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.4.6.2.1.1-1: General Test Parameters for E-UTRAN TDD - lower priority cdma2000 1X Cell Reselection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell 1	E-UTRAN TDD 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 TDD RF (	Channel Number		1	Only one TDD carrier frequency is used.
E-UTRA TDD Cha	nnel Bandwidth (BW <sub>channel</sub> )	MHz	10	
cdma2000 1X RF Channel Number			1	Only one cdma2000 1X carrier frequency is used.
E-UTRA TDD 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 TDD Access Barring Information		-	Not Sent	No additional delays in random access procedure.
T1		S	30	
T2		S	30	

Parameter	Unit	Ce	11			
		T1	T2			
E-UTRA RF Channel number		1				
BW <sub>channel</sub>	MHz	1	0			
OCNG Patterns defined in A.3.2.2.2						
(OP.2 TDD)		OP.2	TDD			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB	]				
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	C				
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	-89	-102			
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	9	-4			
$\hat{E}_s/N_{oc}$	dB	9	-4			
Treselection <sub>EUTRAN</sub>	S	0				
Snonintrasearch	dB	Not sent				
cellReselectionPriority	-	1				
Qrxlevmin	dBm	-14	40			
Qrxlevminoffset	dB	0	)			
Pcompensation	dB	0	)			
S <sub>Serving</sub> Cell	dB	51	38			
Thresh <sub>serving, low</sub>	dB	4	4			
Propagation Condition AWGN						
Note 1: OCNG shall be used such the	at both cells are fu	illy allocated and a consta	ant total transmitted			
power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be						
	constant over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{\rm c}$ to be fulfilled					
00	$N_{oc}$ to be fulfilled.					
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						

## Table A.4.6.2.1.1-2: Cell Specific Test Parameters for E-UTRAN TDD (Cell # 1)

Parameter	Unit	Ce	2	
		T1	T2	
cdma2000 1X RF Channel Number		1	1	
$\frac{\text{Pilot} E_{c}}{I_{\text{or}}}$	dB	[-]	7]	
$\frac{\text{Sync } E_{c}}{I_{\text{or}}}$	dB	[-16]		
$\frac{Paging E_{c}}{I_{or}} (4.8 \text{ kbps}) dB$		[-12]		
$\hat{I}_{or}/I_{oc}$	dB	[0]	[0]	
I <sub>oc</sub>	dBm/ 1.2288 MHz	-5	55	
CDMA2000 1xRTT Pilot Strength	dB	[-10]	[-10]	
Propagation Condition		AWGN		
SnonServingCell,x		[-20]		
Treselection	S	0		
oneXRTT-CellReselectionPriority	-	(	)	
Thresh <sub>x, low</sub>		[-2	28]	

Table A.4.6.2.1.1-3: Cell Specific Test Parameters for cdma2000 1X (cell # 2)

### A.4.6.2.1.2 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 1XSee Table 4.2.2.5.5-1TSI-cdma2000 1XMaximum repetition period of relevant system information blocks that need to be received by<br/>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.

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chan	nel Number		1	Only one FDD carrier frequency is used.
Channel Bandwidt	h (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 Inf	ormation	-	Not Sent	No additional delays in random
				access procedure.
PRACH configuration			4	As specified in table 5.7.1-2 in TS 36.211
Time offset between cells			3 ms	Asynchronous cells
T1		S	5	
T2		S	≤5	
Т3		S	1	

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		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						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}$ Note 2	dBm/15 KHz			•	-98		
$\hat{E}_s/N_{oc}$	dB	8	8	8	- Infinity	11	11
RSRP Note 3	dBm/15 KHz	-90	-90	-90	- Infinity	-87	-87
Propagation Condition	Condition AWGN						
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.           Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time							
and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be fulfilled.							
Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

## Table A.5.1.1.1-2: 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 case
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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/PDCCHP	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 Chani	nel Number		1	Only one TDD carrier frequency is used.
Channel Bandwidt	h (BW <sub>channel</sub> )	MHz	10	
A3-Offset	<u> </u>	dB	0	
Hysteresis		dB	0	
Time To Trigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX				OFF
CP length			Normal	
Access Barring Information		-	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 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	T3
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			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		AWGN					
Note 1: OCNG shall be use		lls are fully al	located and a	constant total	transmitted powe	er spectral densit	y 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  $\,N_{_{
m oc}}\,$  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.

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/F	HICH parameters		DL Reference Measurement	As specified in section A.3.1.2.1
			Channel R.6 FDD	
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF chann	el number		1, 2	Two FDD carriers are used
Channel Bandwidth	n (BW <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 configurati	on		4	As specified in table 5.7.1-2 in 3GPP TS 36.211
Access Barring Info	ormation	-	Not sent	No additional delays in random access procedure
Time offset betwee	en cells		3 ms	Asynchronous cells
Gap pattern config	uration Id		0	As specified in Table 8.1.2.1-1
				started before T2 starts
T1		S	5	
T2		S	≤5	
Т3		S	1	

T1T2T3E-UTRA RF Channel number11BWchannelMHz10OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)OP.1 FDDOP.1 FDDOP.2 FDDPBCH_RAdBPBCH_RBdBPSS_RAdBPSS_RAdBPFICH_RBdBPHICH_RBdBPDCCH_RAdBPDCCH_RAdBPDCCH_RAdBPDCCH_RAdBPDCCH_RAdBPDCCH_RAdBPDCCH_RAdBPDSCH_RAdBPDSCH_RAdB	T1         T2         T3           2         10         0           OP.2         OP.2 FDD         OP.1 FD           FDD         0         0				
numberBW channelMHz10OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)OP.1 FDDOP.1 FDDPBCH_RAdBPBCH_RBdBPSS_RAdBPSS_RAdBPCFICH_RBdBPHICH_RAdBPDCCH_RAdBPDCCH_RAdBPDCCH_RBdBPDCCH_RBdBPDCCH_RBdBPDCCH_RBdBPDCCH_RBdBPDCCH_RBdBPDCCH_RBdB	10 OP.2 OP.2 FDD OP.1 FD				
BW channelMHz10OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in 	OP.2 OP.2 FDD OP.1 FD				
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)OP.1 FDDOP.1 FDDOP.2 FDDPBCH_RAdBPBCH_RBdBPSS_RAdBSSS_RAdBPHICH_RBdBPDCCH_RAdBPDCCH_RBdBPDCCH_RBdBPDCCH_RBdB	OP.2 OP.2 FDD OP.1 FD				
defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)FDDFDDPBCH_RAdBPBCH_RBdBPSS_RAdBSSS_RAdBPCFICH_RBdBPHICH_RAdBPDCCH_RAdBPDCCH_RBdBPDCCH_RBdBPDCCH_RBdB					
(OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)PBCH_RAdBPBCH_RBdBPSS_RAdBSSS_RAdBPCFICH_RBdBPHICH_RAdBPDCCH_RAdBPDCCH_RBdBPDCCH_RBdBPDCCH_RBdB	FDD				
A.3.2.1.2 (OP.2 FDD)       PBCH_RA       PBCH_RB       PBS_RA       SSS_RA       BPCFICH_RB       PHICH_RA       BB       PDCCH_RA       BB       PDCCH_RB       BB       PDCCH_RB       BB       PDCCH_RB       BB					
PBCH_RAdBPBCH_RBdBPSS_RAdBPSS_RAdBPCFICH_RBdBPHICH_RAdBPDCCH_RBdBPDCCH_RAdBPDCCH_RBdB					
PBCH_RBdBPSS_RAdBSSS_RAdBPCFICH_RBdBPHICH_RAdBPDCCH_RBdBPDCCH_RAdBPDCCH_RBdB					
PSS_RAdBSSS_RAdBPCFICH_RBdBPHICH_RAdBPDCCH_RBdBPDCCH_RAdBPDCCH_RBdB					
SSS_RAdBPCFICH_RBdBPHICH_RAdBPHICH_RBdB00PDCCH_RAdBPDCCH_RBdB					
PCFICH_RBdBPHICH_RAdBPHICH_RBdB00PDCCH_RAdBPDCCH_RBdB					
PHICH_RA     dB     0       PHICH_RB     dB     0       PDCCH_RA     dB       PDCCH_RB     dB					
PHICH_RB     dB     0       PDCCH_RA     dB       PDCCH_RB     dB					
PDCCH_RA dB PDCCH_RB dB	0				
PDCCH_RB dB	0				
PDSCH_RA dB					
PDSCH_RBdB					
OCNG_RA <sup>Note 1</sup> dB					
OCNG_RB <sup>Note 1</sup> dB					
$\hat{E}_s/I_{ot}$ dB 4 4	-Infinity 7 7				
N <sub>oc</sub> 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 Note 1: OCNG shall be used such that both cells are fully allocated and a constant total tra	AWGN				

#### 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  $\,N_{_{OC}}\,$  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 inter frequency handover requirements 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 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

Para	meter	Unit	Value	Comment
			DL Reference Measurement	
PDSCH paramete	ers		Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH			DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Gap Pattern Id			1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
E-UTRA RF chan	nel number		1, 2	Two TDD carriers are used
Channel Bandwid	lth (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 In	formation	-	Not Sent	No additional delays in random access procedure.
Special subframe	configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211
Uplink-downlink c	onfiguration		1	As specified in table 4.2-2 in 3GPP TS 36.211
PRACH configura			53	As specified in table 5.7.1-3 in 3GPP TS 36.211
Time offset betwe	en 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	T3		
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	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		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								
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{oc}$	dB	4	4	4	-Infinity	7	7		
$N_{oc}$ Note 2	dBm/15 kHz			·	-98	·	<u>.</u>		
$\hat{E}_s / N_{oc}$	dB	4	4	4	-Infinity	7	7		
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-infinity	-91	-91		
Propagation Condition		AWGN							

## Table A.5.1.4.1-2: Cell specific test parameters for E-UTRAN TDD-TDD Inter 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  $N_{ac}$  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.

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

Par	ameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement	As specified in section A.3.1.1.1
-			Channel R.0 FDD	
PCFICH/PDCCH/F	PHICH parameters		DL Reference Measurement	As specified in section A.3.1.2.1
			Channel R.6 FDD	
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF chann	nel number		1, 2	Two FDD carriers are used
Channel Bandwidt	h (BW <sub>channel</sub> )	MHz	10	
DRX			OFF	Non-DRX test
PRACH configurat	ion		4	As specified in table 5.7.1-2 in
				3GPP TS 36.211
Access Barring Inf	ormation	-	Not sent	No additional delays in random
				access procedure
Time offset betwee	en cells		3 ms	Asynchronous cells
T1		S	≤5	
T2		S	1	

Parameter	Unit	Cel	1	Cel	12		
		T1	T2	T1	T2		
E-UTRA RF Channel		1		2			
number							
BW <sub>channel</sub>	MHz	10	)	1(	)		
OCNG Patterns		OP.1 FDD	OP.2 FDD	OP.2 FDD	OP.1 FDD		
defined in A.3.2.1.1							
(OP.1 FDD) and in							
A.3.2.1.2 (OP.2 FDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB	0		0			
PDCCH_RA	dB						
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <sup>Note 1</sup>	dB						
OCNG_RB <sup>Note 1</sup>	dB						
$\hat{E}_s / I_{ot}$	dB	4	4	-Infinity	7		
$N_{oc}^{\rm Note  2}$	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			
	e used such that b	oth cells are fully al	located and a con	stant total transmitted	power spectral		
Note 1:OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 2:Interference from other cells and noise sources not specified in the test is assumed to be constant over							
subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{oc}$ to be fulfilled. Note 3: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

## Table A.5.1.5.1-2: 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

Para	ameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.3.2.2.1
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.3.2.2.2
Initial conditions	Active cell		Cell 1	Cell 1 is on RF channel number 1
	Neighbouring cell		Cell 2	Cell 2 is on RF channel number 2
Final condition	Active cell		Cell 2	
E-UTRA RF 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 co	nfiguration		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 betwee	en cells		3 μs	Synchronous cells
Gap pattern config	uration		-	No gap pattern configured
T1		S	≤5	
T2		S	1	

Parameter	Unit	Ce	1	ell 2		
		T1	T2	T1	T2	
E-UTRA RF Channel					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		<b>`</b>		0	
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	-93	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	5	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-93	
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	5	
Propagation Condition			A	WGN		
	e used such that bo	th cells are fully	allocated and a	constant total tra	ansmitted power	
spectral densit	y is achieved for all	OFDM symbols				
	for uplink transmiss					
Note 3: Interference fro	from other cells and noise sources not specified in the test is assumed to be constant					
over subcarrie	rs and time and sha	all be modelled a	s AWGN of app	ropriate power fo	or $N_{\scriptscriptstyle oc}$ to be	
fulfilled.						
	H_RP levels have t ettable parameters		m other parame	ters for information	on purposes.	

## 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.5.1.7 E-UTRAN FDD – TDD Inter frequency handover

#### A.5.1.7.1 Test Purpose and Environment

This test is to verify the requirement for the FDD-TDD inter frequency handover requirements specified in section 5.2.2.2.

The test scenario comprises of one E-UTRA FDD cell and one E-UTRA TDD cell as given in tables Table A.5.1.7.1-1, Table A.5.1.7.1-2 and Table A.5.1.7.1-3. 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.

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.

Parameter	Unit	Value	Comment
Cell 1 PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
Cell 1 PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD	
		DL Reference Measurement	
Cell 2 PDSCH parameters		Channel R.0 TDD	As specified in section A.3.1.1.2
		DL Reference Measurement	
Cell 2 PCFICH/PDCCH/PHICH		Channel R.6 TDD	As specified in section A.3.1.2.2
parameters			
Gap Pattern Id		0	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	
Cell 1 E-UTRA RF channel number		1	One FDD carrier is used
Cell 2 E-UTRA RF channel number		2	One TDD carrier is used
Channel Bandwidth (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	
E-UTRA FDD Access Barring	-	Not Sent	No additional delays in random
Information			access procedure.
E-UTRA TDD Access Barring	-	Not Sent	No additional delays in random
Information			access procedure.
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 2.
Uplink-downlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 2
E-UTRA FDD PRACH configuration		4	As specified in table 5.7.1-2 in 3GPP TS 36.211
E-UTRA TDD PRACH configuration		53	As specified in table 5.7.1-3 in 3GPP TS 36.211
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	≤5	
Т3	S	1	

### Table A.5.1.7.1-1: General test parameters for E-UTRAN FDD-TDD Inter frequency handover test case

## Table A.5.1.7.1-2: Cell specific test parameters for E-UTRAN FDD (cell #1) in E-UTRAN FDD-TDD Inter frequency handover test case

Parameter	Unit		Cell 1	
		T1	T2	T3
E-UTRA RF Channel number			1	
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.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_F	RA <sup>Note 1</sup>	dB				
OCNG_F	RB <sup>Note 1</sup>	dB				
$\hat{E}_s/I_{ot}$		dB	4	4	4	
$N_{\scriptscriptstyle oc}$ Note	2	dBm/15 kHz		-98		
$\hat{E}_s / N_{oc}$		dB 4 4			4	
RSRP <sup>Not</sup>	e 3	dBm/15 KHz	-94	-94	-94	
Propagat	ion Condition	AWGN				
Note 1: Note 2:	transmitted power spectral density is achieved for all OFDM symbols.					
	for $N_{oc}$ to be fulfilled.					
Note 3:	RSRP levels have bee are not settable para		parameters for	information purp	oses. They	

 Table A.5.1.7.1-3: Cell specific test parameters for E-UTRAN TDD (cell #2) in E-UTRAN FDD-TDD Inter

 frequency handover test case

Parameter	Unit		Cell 2				
		T1	T2	T3			
E-UTRA RF Channel number			2				
BW <sub>channel</sub>	MHz		10				
OCNG Patterns defined in		OP.2 TDD	OP.2 TDD	OP.1 TDD			
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		0				
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						
$\hat{E}_s / I_{ot}$	dB	-Infinity 7 7		7			
$N_{oc}^{ m Note 2}$	dBm/15 kHz	-98					
$\hat{E}_{s}/N_{oc}$	dB	-Infinity	7	7			
RSRP <sup>Note 3</sup>	dBm/15 KHz	-Infinity	-91	-91			
Propagation Condition		AWG	N				
Note 1: OCNG shall be used s	such that both cells a	re fully allocated	and a constant	total			
	transmitted power spectral density is achieved for all OFDM symbols.						
constant over subcarr	constant over subcarriers and time and shall be modelled as AWGN of appropriate power						
00	for $N_{_{oc}}$ to be fulfilled.						
Note 3: RSRP levels have bee are not settable para		r parameters for	information purp	oses. They			

### A.5.1.7.2 Test Requirements

The UE shall start to transmit the PRACH to Cell 2 less than 50 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay +  $T_{interrupt}$ , where:

### RRC procedure delay = 15 ms and is specified in section 11.2 in [2].

 $T_{interrupt} = 35$  ms in the test;  $T_{interrupt}$  is defined in section 5.2.2.4.2.

This gives a total of 50 ms.

### A.5.1.8 E-UTRAN TDD – FDD Inter frequency handover

### A.5.1.8.1 Test Purpose and Environment

This test is to verify the requirement for the TDD-FDD inter-frequency handover requirements specified in section 5.2.2.3.

The test scenario comprises of one E-UTRA TDD cell and one E-UTRA FDD cell as given in tables Table A.5.1.8.1-1, Table A.5.1.8.1-2 and Table A.5.1.8.1-3. 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.5.1.8.1-1: General test parameters for E-UTRAN TDD-FDD Inter frequency handover test case

Para	ameter	Unit	Value	Comment
Cell 1 PDSCH para	ameters		DL Reference Measurement	As specified in section A.3.1.1.2
			Channel R.0 TDD	
Cell 1 PCFICH/PD	CCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.2
parameters			Channel R.6 TDD	
Cell 2 PDSCH para	ameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
Cell 2 PCFICH/PD parameters	CCH/PHICH		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	
Cell 1 E-UTRA RF	channel number		1	One TDD carrier is used
Cell 2 E-UTRA RF	channel number		2	One FDD carrier is used
Channel Bandwidtl	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
E-UTRA TDD PRA	CH configuration		53	As specified in table 5.7.1-3 in 3GPP TS 36.211
E-UTRA FDD PRA	CH configuration		4	As specified in table 5.7.1-2 in 3GPP TS 36.211
E-UTRA TDD Acce Information	ess Barring	-	Not sent	No additional delays in random access procedure
E-UTRA FDD Acce	ess Barring	-	Not sent	No additional delays in random access procedure
Time offset between cells			3 ms	Asynchronous cells
Gap pattern config			0	As specified in Table 8.1.2.1-1 started before T2 starts
T1		s	5	
T2		S	≤5	
Т3		S	1	

Parameter	Unit	Cell 1			
		T1	T2	Т3	
E-UTRA RF Channel number			1		
BW <sub>channel</sub>	MHz	10			
OCNG Patterns defined in		OP.1 TDD	OP.1 TDD	OP.2 TDD	
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				
$\hat{E}_s/I_{ot}$	dB	4	4	4	
$N_{oc}^{\rm Note \ 2}$	dBm/15 kHz		-98		
$\hat{E}_s/N_{oc}$	dB	4	4	4	
RSRP <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-94	
Propagation Condition		AWG			
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 sha					
Note 3: RSRP levels have been deriv parameter themselves.	red from other parameter	ers for information	purposes. They a	re not settable	

## Table A.5.1.8.1-2: Cell specific test parameters for E-UTRAN TDD (cell #1) in E-UTRAN TDD-FDD Inter frequency handover test case

Table A.5.1.8.1-3: Cell specific test parameters for E-UTRAN FDD (cell #2) in E-UTRAN TDD-FDD Inter frequency handover test case

Parameter	Unit		Cell 2	
		T1	T2	T3
E-UTRA RF Channel number			2	
BW <sub>channel</sub>	MHz		10	
OCNG Patterns defined in		OP.2 FDD	OP.2 FDD	OP.1 FDD
A.3.2.1.1 (OP.1 FDD) and in				
A.3.2.1.2 (OP.2 FDD)				
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB		_	
PHICH_RB	dB		0	
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA <sup>Note 1</sup>	dB			
OCNG_RB <sup>Note 1</sup>	dB			

$\hat{E}_s/I_{ot}$	dB	-Infinity	7	7		
$N_{oc}$ Note 2	dBm/15 kHz	-98				
$\hat{E}_{s}/N_{oc}$	dB	-Infinity	7	7		
RSRP <sup>Note 3</sup>	dBm/15 KHz	-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 levels have been derived from other parameters for information purposes. They are not settable parameter themselves.						

### A.5.1.8.2 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.5.2 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	5		DL Reference Measurement	As specified in section A.3.1.1.1
			Channel R.0 FDD	
PCFICH/PDCCH/PI	HICH 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	
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 (UTRAN	FDD) measurement		CPICH Ec/N0	
quantity	,			
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP
				threshold for event B2
b2-Threshold2-UTR	A	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 Info	rmation	-	Not sent	No additional delays in random
				access procedure
E-UTRA RF Channe	el Number		1	One E-UTRA FDD carrier
				frequency is used.
E-UTRA Channel B	andwidth	MHz	10	
(BWchannel)				
UTRA RF Channel	Number		1	One UTRA FDD carrier frequency
				is used.
Monitored UTRA FE	DD cell list size		12	UTRA cells on UTRA RF channel
				1 provided in the cell before T2.
Post-verification per	riod		False	
T1		s	5	
T2		s	≤5	
Т3		s	1	

Parameter	Unit	Cell 1 (E-UTRA)				
		T1	T2	Т3		
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	7				
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	0	0	0		
$N_{oc}$	dBm/15 kHz		-98			
$\hat{E}_{s}/N_{oc}$	dB	0	0	0		
RSRP Note 2	dBm/15 KHz	-98	-98	-98		
lo Note 2	dBm/9 MHz	-67.21 -67.21		-67.21		
Propagation Condition	ppagation 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.						
	levels have been					
information pu	irposes. They are	not settable	parameters	themselves.		

## 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	Cell 2 (UTRA)			
		T1	T2	Т3	
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
DCH_Ec/lor	dB	N/A	N/A	Note 1	
OCNS_Ec/lor	dB	-0.941	0.941	Note 2	
$\hat{I}_{or}/I_{oc}$	dB	-infinity	-1.8	-1.8	
I <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 powe	er from the cell t	o be equal to	ol <sub>or.</sub>		

### 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.

Parameter		Unit	Value	Comment
	ers (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)			DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Initial conditions	Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
	Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Final conditions	Active cell		Cell 2	
Special subframe	configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 1.
Uplink-downlink c	onfiguration		1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 1
	easurement quantity		RSRP	
Inter-RAT (UTRA quantity	FDD) measurement		CPICH Ec/lo	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-U1	ſRA	dB	-18	UTRAN FDD CPICH Ec/lo threshold for event B2
Hysteresis		dB	0	
DRX			OFF	No DRX configured.
Time to Trigger		ms	0	U
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 Char	nel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel (BW <sub>channel</sub> )	Bandwidth	MHz	10	
UTRA RF Channe	el Number		1	One UTRA FDD carrier frequency is used.
Monitored UTRA	FDD cell list size		12	UTRA cells on UTRA RF channel 1 provided in the cell list before T2.
Post-verification p	eriod		False	Post verification is not used.
T1		S	5	
T2		S	≤5	
Т3		s	1	

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)		OP 1	TDD	OP.2 TDD	
and in A.3.2.2.2 (OP.2		01.1	100	01.2100	
TDD)					
PBCH_RA					
PBCH_RB					
PSS_RA	-				
SSS_RA					
PCFICH_RB					
PHICH_RA					
PHICH_RB	dB		0		
PDCCH_RA					
PDCCH_RB					
PDSCH_RA					
PDSCH_RB					
OCNG_RA <sup>Note 1</sup>					
OCNG_RB <sup>Note 1</sup>					
RSRP Note 2	dBm/15 kHz	-98	-98	-98	
Ê /I	dB	0	0	0	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	u.D	Ŭ	Ŭ	Ũ	
	JD	0		0	
$\hat{E}_s/N_{oc}$	dB	0	0	0	
37 00					
N <sub>oc</sub>	dBm/15 kHz		-98		
	JDue /0 Mill	07.04	07.04	07.04	
	dBm/9 MHz	-67.21 -67.21 -67.21			
Propagation Condition         AWGN           Note 1:         OCNG shall be used such that the cell is fully allocated and a constant total transmitted					
				total transmitted	
		ed for all OFDM sy		notion numeros	
			parameters for inform	nation purposes.	
They are not settable parameters themselves.					

## 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	Cell 1 (UTRA)			
		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 I or.					

### A.5.2.2.2 Test Requirements

The UE shall start to transmit the UL DPCCH to Cell 2 less than 190 ms from the beginning of time period T3.

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

NOTE: The handover delay can be expressed as: RRC procedure delay + T<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 parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/ parameters	PHICH		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Gap Pattern Id			1	As specified in TS 36.133 section8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Inter-RAT measu	rement quantity		GSM Carrier RSSI	
Threshold other s	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	DRX			OFF
T1		S	20	
T2		S	7	
T3		S	1	

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

Parameter	Unit	Се	ll 1		
		T1, T2	T3		
BW <sub>channel</sub>	MHz	10			
OCNG Patterns					
defined in A.3.2.1.1 (OP.1 FDD) and in		OP.1 FDD	OP.2 FDD		
A.3.2.1.2 (OP.2			01.2100		
FDD)					
PBCH_RA	dB				
PBCH_RB PSS_RA	dB 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 OCNG_RA <sup>Note1</sup>	dB dB				
OCNG_RB <sup>Note1</sup>	dB				
$\hat{E}_{s}/I_{ot}$	dB	4			
$N_{oc}$ Note 2	dBm/15 kHz	-98 (AWGN)			
$\hat{E}_{s}/N_{oc}$	dB	4			
RSRP <sup>Note 3</sup>	dBm/15kH z	-94			
Propagation Condition		AWGN			
		uch that cell 1 is fully allocate			
		tral density is achieved for al			
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.					
		n derived from other parameter stranger			

## 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:

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

- 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 parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCC parameters	H/PHICH		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Initial	Active cell		Cell 1	E-UTRA TDD cell
conditions	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Final conditions	Active cell		Cell 2	
Gap Pattern Id			0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlinl cell 1	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
CP length of cell 1			Normal	
Time offset between cells			3 ms	Asynchronous cells
Access Barring	Information		Not Sent	No additional delays in random access procedure.

## 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

Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Ofn	dB	0	
Thresh1	dBm	-93	E-UTRA event B2 threshold
Thresh2	dBm	-80	UTRA event B2 threshold
T1	S	5	
T2	S	≤10	
T3	S	1	

Table A.5.2.4.1.2-2: Cell specific test parameters for E-UTRA TDD to UTRA TDD handover test case
(cell 1)

Parameter	Unit		Cell 1			
		T1	T2	T3		
E-UTRA RF Channel			1			
Number						
BW <sub>channel</sub>	MHz		10			
OCNG Pattern defined in						
A.3.2.2.1 (OP.1 TDD)		OP 1	TDD	OP.2		
and in A.3.2.1.2 (OP.2		01.1	100	TDD		
TDD)			1			
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	13 -3		-3		
$\hat{E}_{s}/N_{oc}$	dB	13 -3		-3		
$N_{oc}$	dBm/15kHz		-98			
RSRP Note 2	dBm/15kHz	-85	-101	-101		
SCH_RP Note 2	dBm/15 kHz	-85	-101	-101		
lo Note 2	dBm/9MHz	-57.01	-68.45	-68.45		
Propagation Condition		AWGN				
total transmitted symbols.	total transmitted power spectral density is achieved for all OFDM symbols.					
parameters for in	<ol> <li>RSRP, SCH_RP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.</li> </ol>					

Parameter	Unit	Cell 2 (UTRA)					
Timeslot Number		0				DwPTS	
		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number <sup>Note 1</sup>		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 Note 2	dBm	-86	-72	-72		n.a.	
Io Note 2	dBm/1.28 MHz	-78.24	-68.67	-68.67			
Propagation Condition		AWGN					
Note 1:       In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.         Note 2:       PCCPCH_RSCP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

#### 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.

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.

Parar	Parameter		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
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 quantity	easurement		RSRP	
UTRAN TDD mea quantity	surement		RSCP	
CP length of cell 1			Normal	
	Access Barring Information		Not Sent	No additional delays in random access procedure.
Hysteresis		dB	0	
Time To Trigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
Ofn		dB	0	
Thresh1	Thresh1		-93	Absolute E-UTRAN RSRP threshold for event B2
Thresh2		dBm	-80	Absolute UTRAN RSCP threshold for event B2
T1	T1		5	
T2		S	≤ 10	
Т3		S	1	

### Table A.5.2.5.1.2-1: General test parameters for E-UTRA FDD to UTRA (1.28 Mcps TDD option) handover test case

Parameter	Unit		Ce	ell 1 (E-UT	RA)	
		T1		T2		Т3
E-UTRA RF Channel				1		
number						
BW <sub>channel</sub>	MHz			10		
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_RA <sup>Note 1</sup>	dB					
OCNG_RB <sup>Note 1</sup>	dB					
$\hat{E}_{s}/N_{oc}$	dB	13		-3		-3
N oc	dBm/15 kHz			-98		
$\hat{E}_s / I_{ot}$	dB	13		-3		-3
RSRP Note 2	dBm/15 KHz	-85		-101		-101
lo Note 2	dBm/9MHz	-57.0	1	-68.45	5	-68.45
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.						
	levels have been					
information pu	rposes. They are	not settab	le par	ameters th	emse	elves.

## 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	L	Jnit			Cell 2 (U	rra)		
Timeslot Number	ot Number		0				DwPTS	
			T1	T2	T3	T1	T2	T3
UTRA RF Chann Number Note 1	el		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>		.28 MHz			-80	80		
PCCPCH RSCP	Note 2 d	Bm	-86	-72	-72		n.a.	
lo Note 2	dBm/1	.28 MHz	-78.24	-68.67	-68.67			
Propagation Condition			AWGN					
Note 1:       In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.         Note 2:       PCCPCH_RSCP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.								

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

Pa	rameter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH,	PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Gap Pattern Id			1	As specified in TS 36.133 section 8.1.2.1.
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Uplink-downlink o	configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe	configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell	1		Normal	
Inter-RAT measu	rement quantity		GSM Carrier RSSI	
E-UTRA RF Char	nnel Number		1	E-UTRA RF Channel Number
E-UTRA Channel (BW <sub>channel</sub> )	Bandwidth	MHz	10	E-UTRA Channel Bandwidth (BW <sub>channel</sub> )
Threshold other s	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	Се	ll 1	
			T1, T2	Т3	
E-UTRA F	RF Channel Number			1	
BW <sub>channel</sub>		MHz	10		
OCNG Pa	atterns defined in				
A.3.2.2.1	(OP.1 TDD) and in		OP.1 TDD	OP.2 TDD	
	(OP.2 TDD)				
PBCH_R/		dB			
PBCH_R		dB			
PSS_RA		dB			
SSS_RA		dB			
PCFICH_		dB			
PHICH_F		dB			
PHICH_F		dB	(	)	
PDCCH_		dB			
PDCCH_		dB			
PDSCH_		dB			
PDSCH_	RB	dB			
OCNG_F	RA Note1	dB			
	RB <sup>Note1</sup>	dB			
$\hat{E}_{s}/N_{oc}$		dB	2	1	
$N_{_{oc}}$ Note 2		dBm/15 kHz	-98 (A	WGN)	
$\hat{E}_{s}/I_{ot}$		dB	4	1	
RSRP <sup>Note</sup>	93	dBm/15kHz	-9	)4	
Propagati	ion Condition		AW	GN	
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)

Parameter	Unit	Cell	2 (GSM)
Farameter	Unit	T1	T2, T3
Absolute RF Channel Number		AR	FCN 1
RXLEV	dBm	-85	-75

### A.5.2.6.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 100 ms from the beginning of time period T3.

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

NOTE: The test requirement in this test case is expressed as:

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

- T<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/F	PHICH parameters		DL Reference Measurement	As specified in section A.3.1.2.1	
			Channel R.6 FDD		
Initial conditions	Active cell		Cell 1	E-UTRAN cell	
	Neighbouring cell		Cell 2	UTRAN cell	
Final condition	Active cell		Cell 2	UTRAN cell	
Channel Bandwidt	h (BW <sub>channel</sub> )	MHz	10		
E-UTRAN FDD me	easurement quantity		RSRP		
Inter-RAT (UTRAN quantity	I FDD) measurement		CPICH Ec/N0		
DRX			OFF	Non-DRX test	
Access Barring Information		-	Not sent	No additional delays in random	
				access procedure	
E-UTRA RF Channel Number			1	One E-UTRA FDD carrier	
				frequency is used.	
E-UTRA Channel	Bandwidth	MHz	10		
/	(BWchannel)		4		
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 pe	eriod		False		
T1		S	≤5		
T2		S	1		

I	Parameter	Unit	Cell 1 (I	E-UTRA)	
			T1	T2	
E-UTRA	RF Channel			1	
number					
BW <sub>channel</sub>		MHz	1	10	
OCNG Pa	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_R	RA	dB			
PHICH_R	RB	dB		0	
PDCCH_	RA	dB			
PDCCH_	PDCCH_RB				
	PDSCH_RA				
	PDSCH_RB				
	OCNG_RA <sup>Note 1</sup>				
OCNG_R	OCNG_RB <sup>Note 1</sup>				
$\hat{E}_{s}/I_{ot}$		dB	0	0	
$N_{oc}$ Note 2	2	dBm/15 kHz	-!	98	
$\hat{E}_s / N_{oc}$		dB	0	0	
RSRP <sup>Note</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:	•				
	the test is assumed	to be constant of	over subcarrier	s and time	
Note 3:	information purposes. They are not settable parameters				
Note 3:					

## 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		-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.			

## 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 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	
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		OP.1 FDD	OP.2 FDD	
A.3.2.1.2 (OP.2				
FDD)				
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	dB			
SSS_RA	dB			
PCFICH_RB	dB			
PHICH_RA	dB			
PHICH_RB	dB		0	
PDCCH_RA	dB			
PDCCH_RB	dB			
PDSCH_RA	dB			
PDSCH_RB	dB			
OCNG_RA <sup>Note1</sup>	dB			
OCNG_RB <sup>Note1</sup>	dB			
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB		4	
$N_{oc}$ Note 2	dBm/15 kHz		-98	
$\hat{E}_s/N_{oc}$	dB		4	
RSRP <sup>Note 3</sup>	dBm/15 kHz		-94	
Propagation		٨	WCN	
Condition		A	WGN	
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 $N_{\it oc}$ to be fulfilled.				
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 Number		ARFCN 1		
RXLEV	dBm	-Infinity	-75	

### A.5.2.8.2 Test Requirements

The UE shall begin to send access bursts on the new DCCH of the target cell less than 200 ms from the beginning of time period T2.

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

NOTE: The test requirement in this test case is expressed as:

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

 $T_{offset}$ : 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<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 parameters			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 <sup>Note1</sup>	dB					
OCNG_RB <sup>Note1</sup>	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 <sup>Note 3</sup>	dBm/15 kHz		-94			
Propagation		۸	WGN			
Condition			-			
		hat cell 1 is fully allocate				
	transmitted power spectral density is achieved for all OFDM symbols.					
Note 2: Interference from other cells and noise sources not specified in the test is						
assumed	assumed to be constant over subcarriers and time and shall be modelled as					
AWGN of appropriate power for ${}^{N_{oc}}$ to be fulfilled.						
		rived from other parameter				
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		AR	FCN 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

Parame	eter	Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH parameters	I/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
	Neighbour cell		Cell 2	UTRA 1.28Mcps TDD cell
Final / conditions	inal Active cell		Cell 2	UTRA 1.28Mcps TDD cell
CP length of cell	1		Normal	
Uplink-downlink of cell 1	configuration		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of c			6	As specified in table 4.2.1 in TS 36.211
Time offset betwe	een cells		3 ms	Asynchronous cells
Access Barring I	nformation		Not Sent	No additional delays in random access procedure.
TimeToTrigger		S	0	
Filter coefficient			0	L3 filtering is not used
DRX			OFF	
Τ1		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	Ce	ll 1	
		T1	T2	
E-UTRA RF Channel			1	
Number				
BWchannel	MHz	1	0	
OCNG Patterns defined in		OP.1 TDD	OP.2 TDD	
TS36.133 A.3.2.2.1 (OP.1				
TDD) and in A.3.2.2.2				
(OP.2 TDD)				
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RB	dB			
SSS_RB	dB			
PCFICH_PA	dB			
PHICH_PA	dB			
PHICH_PB	dB	0	0	
PDCCH_PA	dB			
PDCCH_PB	dB			
PDSCH_PA	dB			
PDSCH_PB	dB			
OCNG_RANote 1	dB			
OCNG_RBNote 1	dB			
$\hat{E}_{s}/I_{ot}$	dB	3	3	
$\hat{E}_{s}/N_{oc}$	dB	3	3	
N <sub>oc</sub>	dBm/15kHz	-{	98	
RSRP	dBm/15kHz	-95	-95	
SCH_RP	dBm/15 kHz	-95	-95	
Propagation Condition		AW	'GN	
<ul> <li>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.</li> <li>Note 2: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.</li> </ul>				

# 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		DwF	PTS
		T1	T2	T1	T2
UTRA RF Channel Number <sup>Note1</sup>			Char	nnel 2	
PCCPCH_Ec/lor	dB	-:	3		
DwPCH_Ec/lor	dB			C	)
OCNS_Ec/lor	dB	-3			
$\hat{I}_{or}/I_{oc}$	dB	-infinity	13	-infinity	13
I <sub>oc</sub>	dBm/1.28 MHz		-8	30	
PCCPCH RSCP	dBm	-infinity -70		n.a.	
Propagation Condition			AW	/GN	
Note1: In the case of	n the case of multi-frequency cell, the UTRA RF Channel Number is the				
primary frequency's channel number.           Note2:         P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

### A.5.2.10.2 Test Requirements

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than [280] ms from the beginning of time period T2.

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

## A.5.3 E-UTRAN Handover to Non-3GPP RATs

## A.5.3.1 E-UTRAN FDD – HRPD Handover

### A.5.3.1.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to HRPD handover requirements specified in section 5.4.1.

The test parameters are given in Tables A.5.3.1.1-1, A.5.3.1.1-2 and A.5.3.1.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

Parameter		Unit	Value	Comment
PDSCH parameters	3		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	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD 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 me	asurement quantity		RSRP	
Inter-RAT (HRPD)			CDMA2000 HRPD Pilot	
quantity	neusurement		Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP
		abiii	30	threshold for event B2
b2-Threshold2-CD	/A2000	dB	-7	Absolute 'CDMA2000 HRPD Pilot
DZ-THIESHOIDZ-ODMA2000		uD		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 B	andwidth	MHz	10	
(BWchannel)				
HRPD RF Channel	Number		1	One HRPD carrier frequency is
				used.
HRPD neighbour cell list size			8	HRPD cells on HRPD RF channel
				1 provided in the cell list before
				T2.
cdma2000-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	

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

Parameter	Unit	C	ell 1 (E-UTR/	A)
		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			
$N_{oc}^{ m Note 2}$	dBm/15		-98	
	kHz			
RSRP Note 3	dBm/15	-98	-98	-98
	KHz			
$\frac{\hat{E}_{s}/N_{oc}}{\hat{E}_{s}/I_{ot}}$	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 tran	smitted powe	r spectral dei	nsity is achiev	ved for all
OFDM symbols.				
Note 2: Interference from oth				
is assumed to be cor	nstant over su	bcarriers and	I time and sh	all be
modelled as AWGN	of appropriate	power for $ \Lambda $	$V_{oc}$ to be fulfi	lled.
Note 3: RSRP levels have be purposes. They at				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	Т2	Т3	
$\frac{\text{Control} \ \text{E}_{b}}{\text{N}_{t}} $ (38.4 kbps)	dB	21			
$\frac{\text{Control}  \text{E}_{b}}{\text{N}_{t}} \text{ (76.8 kbps)}$	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 +  $T_{interrupt}$ , where:

RRC procedure delay = 50 ms, which is specified in section 5.4.1.1.1.

 $T_{interrupt} = 76.66$  ms in the test;  $T_{interrupt}$  is defined in section 5.4.1.1.2.

This gives a total of 126.66 ms, allow 127 ms in the test.

## A.5.3.2 E-UTRAN FDD – cdma2000 1X Handover

#### A.5.3.2.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN FDD to cdma2000 1X handover requirements specified in section 5.4.2.

The test parameters are given in Tables A.5.3.2.1-1, A.5.3.2.1-2 and A.5.3.2.1-3. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. At the start of time duration T1, the UE does not have any timing information of Cell 2. Starting T2, Cell 2 becomes detectable and the UE is expected to detect and send a measurement report. Gap pattern configuration with id #0 as specified in Table 8.1.2.1-1 is configured before T2 begins to enable inter-RAT frequency monitoring.

A RRC message implying handover shall be sent to the UE during period T2, after the UE has reported Event B2. The start of T3 is the instant when the last TTI containing the RRC message implying handover is sent to the UE. The handover message shall contain cell 2 as the target cell.

### Table A.5.3.2.1-1: General test parameters for E-UTRAN FDD to cdma2000 1X handover test case

Parameter		Unit	Value	Comment
PDSCH parameters	3		DL Reference Measurement	As specified in section A.3.1.1.1
			Channel R.0 FDD	
PCFICH/PDCCH/PI	HICH 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 FDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
	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 (cdma200	00 1X) measurement		CDMA2000 1xRTT Pilot	
quantity			Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP
				threshold for event B2
b2-Threshold2-CDN	/IA2000	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 Channe	el Number		1	One E-UTRA FDD carrier
				frequency is used.
E-UTRA Channel B	andwidth	MHz	10	
(BWchannel)				
cdma2000 1X RF C	hannel Number		1	One HRPD carrier frequency is
				used.
cdma2000 1X neighbour cell list size			8	cdma2000 1X cells on cdma2000
				1X RF channel 1 provided in the
				cell list before T2.
cdma2000-SearchV	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	≤10	
Т3		s	1	

Parameter	Unit	Ce	ell 1 (E-UTR	A)	
		T1	T2	Т3	
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				
Note 2	dBm/15	-98			
	kHz				
RSRP <sup>Note 3</sup>	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 us	sed such that	both cells are	e fully allocate	ed and a	
constant total tran	smitted powe	r spectral der	nsity is achiev	ved for all	
OFDM symbols.					
test is assumed to	be constant	over subcarri	ers and time	and shall	
	NON 1	• .	. N		
be modelled as A	WGN of appro	opriate power	tor <sup>oc</sup> to b	be fulfilled.	
Note 3: RSRP levels have					
information purpo	ses. They are	not settable	parameters t	hemselves.	

# 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	Т2	Т3	
$\frac{\text{Pilot } E_{c}}{I_{\text{or}}}$	dB	-7			
Sync E <sub>c</sub> I <sub>or</sub>	dB	-16			
$\frac{\text{Paging} \ \text{E}_{c}}{\text{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		

## 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

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/	PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	HRPD cell
Final condition	Active cell		Cell 2	HRPD cell
Channel Bandwidt	th (BW <sub>channel</sub> )	MHz	10	
DRX	· ·		OFF	Non-DRX test
Access Barring In	formation	-	Not sent	No additional delays in random
-				access procedure
E-UTRA RF Chan	nel Number		1	One E-UTRA FDD carrier
				frequency is used.
E-UTRA Channel (BWchannel)	Bandwidth	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-U	TRAN FDD)		
		T1	T2		
E-UTRA RF Channel			1		
number					
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	0			
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$N_{_{oc}}$ Note 2	dBm/15 kHz	-9	98		
RSRP <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 AWGN					
Note 1: OCNG shall be used power spectral de Note 2: Interference from oth	nsity is achieved for a ner cells and noise so	all OFDM symbols.	st is assumed to be		
$N_{\it oc}$ 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.

0

-3

Parameter	Unit	Cell 2 (HF	RPD)
		T1	T2
Control E <sub>b</sub> (38.4		21	
N <sub>t</sub>	dB		
kbps)			
Control E <sub>b</sub> (76.8		18	
N <sub>t</sub>	dB		

-infinity

-infinity

-55

AWGN

#### 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

CDMA2000 HRPD

**Propagation Condition** 

Pilot Strength

kbps)

 $I_{\alpha}$ 

 $\hat{I}_{or}/I_{oc}$ 

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%.

dB

dB

dBm/1.22

88 MHz

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

Parameter		Unit	Value	Comment
PDSCH parameter	S		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/F	PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Initial conditions	Active cell		Cell 1	E-UTRAN FDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
Final condition	Active cell		Cell 2	cdma2000 1X cell
Channel Bandwidt	h (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 Chanr	nel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel I (BWchannel)	Bandwidth	MHz	10	
cdma2000 1X RF (	Channel Number		1	One HRPD carrier frequency is used.
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	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	TRAN 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	1			
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB Note 1	dB				
$N_{_{oc}}$ Note 2	dBm/15 kHz	-9	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		AW	GN		
Note 1: OCNG shall be used suc	h that both cells are ful	ly allocated and a const	ant total transmitted		
power spectral density is					
Note 2: Interference from other c	ells and noise sources	not specified in the test	is assumed to be		
constant over subcarriers	s and time and shall be	modelled as AWGN of	appropriate power for		
$N_{oc}$ to be fulfilled.					
Note 3: RSRP levels have been of	•	ameters for information	ourposes. 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	Т2	
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.5.3.5 E-UTRAN TDD – HRPD Handover

#### A.5.3.5.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN TDD to HRPD handover requirements specified in section 5.4.1.

The test parameters are given in Tables A.5.3.5.1-1, A.5.3.5.1-2 and A.5.3.5.1-3. 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.

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 parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Initial conditions Active cell		Cell 1	E-UTRAN TDD cell
Neighbouring cell		Cell 2	HRPD cell
Final condition Active cell		Cell 2	HRPD 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 TDD measurement 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-CDMA2000	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 Information	-	Not sent	No additional delays in random access procedure
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BWchannel)	MHz	10	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
HRPD RF Channel Number		1	One HRPD carrier frequency is used.
HRPD neighbour cell list size		8	HRPD cells on HRPD RF channel 1 provided in the cell list before T2.
cdma2000-SearchWindowSize		8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1	S	5	
T2	S	≤10	
ТЗ	S	1	

### Table A.5.3.5.1-1: General test parameters for E-UTRAN TDD to HRPD handover test case

Parameter	Unit	C	ell 1 (E-UTR/	A)	
		T1	T3		
E-UTRA RF Channel		1			
number					
BW <sub>channel</sub>	MHz		10		
OCNG Patterns defined in		OP.1	TDD	OP.2	
TS36.133 A.3.2.2.1 (OP.1				TDD	
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_RANote 1	dB				
OCNG_RB <sup>Note 1</sup>	dB				
$N_{oc}^{ m Note 2}$	dBm/15		-98		
	kHz				
RSRP <sup>Note 3</sup>	dBm/15	-98	-98	-98	
	KHz				
$\hat{E}_s/N_{oc}$	dB	0	0	0	
$\hat{E}_s/I_{ot}$	dB	0	0	0	
$\boldsymbol{L}_{s} / \boldsymbol{I}_{ot}$		_	-	-	
Propagation Condition			AWGN		
Note 1: OCNG shall be used					
constant total tran	smitted powe	r spectral de	nsity is achiev	/ed 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 be			00		
purposes. They al					

### Table A.5.3.5.1-2: Cell specific test parameters for E-UTRAN TDD cell#1 for handover to HRPD cell # 2

Parameter	Unit	Cell 2 (HRPD)			
		T1	T2	T3	
$\frac{\text{Control } E_{b}}{N_{t}}$ (38.4 kbps)	dB	21			
$\frac{\text{Control}  \text{E}_{b}}{\text{N}_{t}} \text{ (76.8 kbps)}$	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.5.3.5.1-3: Cell specific test parameters for HRPD (cell # 2) for handover from E-UTRAN TDD cell (cell #1)

#### A.5.3.5.2 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.5.3.6 E-UTRAN TDD – cdma2000 1X Handover

#### A.5.3.6.1 Test Purpose and Environment

This test is to verify the requirement for the E-UTRAN TDD to cdma2000 1X handover requirements specified in section 5.4.2.

The test parameters are given in Tables A.5.3.6.1-1, A.5.3.6.1-2 and A.5.3.6.1-3. 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.5.3.6.1-1: General test parameters for E-UTRAN TDD to cdma2000 1X handover test case

Parameter		Unit	Value	Comment
PDSCH parameters			Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters			DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
	Active cell		Cell 1	E-UTRAN TDD cell
	Neighbouring cell		Cell 2	cdma2000 1X cell
	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 TDD mea	asurement quantity		RSRP	
Inter-RAT (cdma200 quantity	00 1X) measurement		CDMA2000 1xRTT Pilot Strength	
b2-Threshold1		dBm	-90	Absolute E-UTRAN RSRP threshold for event B2
b2-Threshold2-CDM	1A2000	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 Channe	el Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel B (BWchannel)	andwidth	MHz	10	
cdma2000 1X RF C	hannel Number		1	One cdma2000 1X 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-SearchW	/indowSize		8 (60 PN chips)	Search window size as defined in section 6.3.5 in 3GPP TS 36.331
T1		S	5	
T2		S	≤10	
T3		s	1	

Parameter	Unit	C	ell 1 (E-UTR	A)		
		T1	T2	Т3		
E-UTRA RF Channel			1			
number						
BW <sub>channel</sub>	MHz		10			
OCNG Patterns defined in		OP.1	TDD	OP.2		
A.3.2.2.1 (OP.1 TDD) and				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					
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		-98			
	kHz					
RSRP Note 3	dBm/15	-98	-98	-98		
	KHz					
$\hat{E}_s/N_{oc}$	dB	0	0	0		
$\hat{E}_s/I_{ot}$	dB	0	0	0		
Propagation Condition			AWGN			
Note 1: OCNG shall be us	ed such that	both cells are	e fully allocate	ed and a		
constant total tran	constant total transmitted power spectral density is achieved for all					
OFDM symbols.	OFDM symbols.					
Note 2: Interference from other cells and noise sources not specified in the						
test is assumed to	test is assumed to be constant over subcarriers and time and shall					
	$N_{\rm M}$					
be modelled as A	be modelled as AWGN of appropriate power for $N_{oc}$ to be fulfilled.					
Note 3: RSRP levels have been derived from other parameters for						
information purposes. They are not settable parameters themselves.						

# Table A.5.3.6.1-2: Cell specific test parameters for E-UTRAN TDD cell#1 for handover to cdma2000 1X cell # 2

Parameter	Unit	Cell 2 (cdma2000 1X)				
		T1	Т2	Т3		
Pilot E <sub>c</sub> I <sub>or</sub>	dB	-7				
$\frac{\text{Sync } \text{E}_{c}}{\text{I}_{\text{or}}}$	dB	-16				
$\frac{\text{Paging } E_{c}}{I_{\text{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			

## Table A.5.3.6.1-3: Cell specific test parameters for cdma2000 1X (cell # 2) for handover from E-UTRAN TDD cell (cell #1)

#### A.5.3.6.2 Test Requirements

The UE shall start transmission of the reverse control channel in cdma2000 1X to Cell 2 less than 200 ms from the beginning of time period T3.

NOTE: The handover delay can be expressed as: RRC procedure delay +  $T_{interrupt}$ , where:

RRC procedure delay = 130 ms, which is specified in section 5.4.2.1.1.

 $T_{interrupt} = 70$  ms in the test;  $T_{interrupt}$  is defined in section 5.4.2.1.2.

This gives a total of 200 ms.

## A.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 parameters			DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/I	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	th (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	formation	-	Not Sent	No additional delays in random access procedure.
PRACH configura	tion 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	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		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						

238

$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	1.54	-Infinity	-Infinity	-3.79	4	4
N <sub>oc</sub> 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				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 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.

Parameter		Unit	Value	Comment
PDSCH parameters			DL Reference Measurement Channel R.0 FDD	
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- size	frequency carrier list		1	2 E-UTRA FDD carrier 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 Info	ormation	-	Not Sent	No additional delays in random access procedure.
PRACH configuration	on index		4	As specified in table 5.7.1-2 in TS 36.211
Time offset betwee	n cells	ms	3	Asynchronous cells
T1		s	5	
T2		ms	200	
T3		S	5	

# Table A.6.1.2.1-1: General test parameters for E-UTRAN FDD inter-frequency RRC Re-establishment test case

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	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							
$\hat{E}_{s}/I_{ot}$	dB	4	-Infinity	-Infinity	-Infinity	-Infinity	7	
$N_{oc}$ Note 2	dBm/15 KHz				-98	·		
$\hat{E}_s/N_{oc}$	dB	4	-Infinity	-Infinity	- Infinity	- Infinity	7	
RSRP Note 3	dBm/15 KHz	-94	-Infinity	-Infinity	- Infinity	-Infinity	-91	
Propagation Condition	AWGN							
Note 1: OCNG shall be u density is achie Note 2: Interference from	ved for all OFDM	symbols.	-				-	

#### 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  $N_{ac}$  to be fulfilled.

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

### A.6.1.2.2 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 parameters			DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/P	HICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Initial conditions	Active cell		Cell 1	
	Neighbouring cell		Cell 2	
Final condition	Active cell		Cell 2	
E-UTRA RF Chann	el Number		1	Only one TDD carrier frequency is used.
Channel Bandwidth	n (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 Info	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	n 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 <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
$N_{oc}^{\rm Note 2}$	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 u density is achieve			-	d and a cons			pectral

#### 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

Unit	Value	Comment
	DL Reference Measurement	As specified in section A.3.1.1.2
	Channel R.0 TDD	
	DL Reference Measurement	As specified in section A.3.1.2.2
	Channel R.6 TDD	
	Cell 1	
	Cell 2	
	Cell 2	
	1	
	2	
t	1	2 E-UTRA TDD carrier
		frequencies in total: 1 intra-
		frequency and 1 inter-frequency
MHz	10	
-	1	Maximum consecutive out-of-sync
		indications from lower layers
-	1	Minimum consecutive in-sync
		indications from lower layers
ms	0	Radio link failure timer; T310 is
		disabled
ms	5000	RRC re-establishment timer
	OFF	
	Normal	
-	Not Sent	No additional delays in random
		access procedure.
	6	As specified in table 4.2-1 in TS
		36.211
	1	As specified in table 4.2-2 in TS
		36.211
	53	As specified in table 5.7.1-3 in TS
		36.211
μs	3	Synchronous cells
s	5	
ms	200	
S	5	
	μs           μs           μs           s	DL Reference Measurement Channel R.0 TDD           DL Reference Measurement Channel R.6 TDD           Cell 1           Cell 2           Cell 2           Cell 1           2           t           MHz           1           -           1           -           1           -           1           -           1           -           1           -           1           -           Normal           -           6           1           53           μs         3           s         5           ms         200

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	OP.2 TDD	OP.2 TDD	OP.1 TDD
defined in A.3.2.2.1		TDD	TDD	TDD			
(OP.1 TDD) and in							
A.3.2.2.2 (OP.2 TDD)							
PBCH_RA	dB						
PBCH_RB	dB						
PSS_RA	dB						
SSS_RA	dB						
PCFICH_RB	dB						
PHICH_RA	dB						
PHICH_RB	dB						
PDCCH_RA	dB		0			0	
PDCCH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB						
OCNG_RA <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 u density is achieve				d and a cons		mitted power s	pectral

#### 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.

245

 $T_{PRACH} = 15$  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 Note 1		OP.1/2 FDD Note 1	As defined in A.3.2.1.1/2.		
PDSCH parameters Note 4		DL Reference Measurement	As defined in A.3.1.1.1.		
		Channel R.0 FDD Note 4			
PCFICH/PDCCH/PHICH		DL Reference Measurement	As defined in A.3.1.2.1.		
parameters		Channel R.6 FDD			
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	0			
PDCCH_RA	dB				
PDCCH_RB	dB				
PDSCH_RA	dB				
PDSCH_RB	dB				
OCNG_RA Note 1	dB				
OCNG_RB <sup>Note 1</sup>	dB				
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	3			
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 ( $P_{\rm CMAX}$ )			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. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.					
<ul> <li>Note 2: Io level has been derived from other parameters for information purpose. It is not a settable parameter.</li> <li>Note 3: RSRP level has been derived from other parameters for information purposes. It is not a settable parameter.</li> <li>Note 4: The DL PDSCH reference measurement channel is used in the test only when a downlink</li> </ul>					

#### Table A.6.2.1.1-1: General test parameters for FDD contention based random access test

Note 4: The DL PDSCH reference measurement channel is used in the test only when a downlink transmission dedicated to the UE under test is required.

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.					

#### Table A.6.2.1.1-2: RACH-Configuration parameters for FDD contention based random access test

### 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	As defined in A.3.1.1.1.
-		Channel R.0 FDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As defined in A.3.1.2.1.
parameters		Channel R.6 FDD	
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	0	
PDCCH_RA	dB		
PDCCH_RB	dB		
PDSCH_RA	dB		
PDSCH_RB	dB		
OCNG_RA Note 1	dB		
OCNG_RB <sup>Note 1</sup>	dB		
$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	3	
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 ( $P_{\rm CMAX}$ )			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 s spectral density is achieved for Note 2: lo level has been deriv	all OFDM symb	is fully allocated and a constant	
parameter.		a novement and for information and	

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	
E-UTRA RF Channel Number	-	1		
BW <sub>channel</sub>	MHz	10		
OCNG Pattern Note 1	-	OP.1/2 TDD Note 1	As defined in A.3.2.2.1/2.	
PDSCH parameters Note 4	-	DL Reference Measurement Channel R.0 TDD Note 4	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 configuration	-	6	As specified in table 4.2-1 in 3GPP TS 36.211.	
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in 3GPP TS 36.211.	
PBCH_RA	dB			
PBCH_RB	dB			
PSS_RA	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 <sup>Note 1</sup>	dB			
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	3		
$N_{oc}$	dBm/15 KHz	-98		
$\hat{E}_{s}/N_{oc}$	dB	3		
lo Note 2	dBm/9 MHz	-65.5		
RSRP <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		
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. The OCNG pattern is chosen during the test according to the presence of a DL reference measurement channel.Note 2:Io level has been derived from other parameters for information purpose. It is not a settable				
Note 2: RSRP level has been derived from other parameters for information purposes. It is not a settable settable parameter.				

#### Table A.6.2.3.1-1: General test parameters for TDD contention based random access test

Note 4: The DL PDSCH reference measurement channel is used in the test only when a downlink transmission dedicated to the UE under test is required.

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 -22 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 -22 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	-	1	
BW <sub>channel</sub>	MHz	10	
OCNG Pattern	-	OP.1 TDD	As defined in A.3.2.2.1.
PDSCH parameters	-	DL Reference Measurement	As defined in A.3.1.1.2.
-		Channel R.0 TDD	
PCFICH/PDCCH/PHICH	-	DL Reference Measurement	As defined in A.3.1.2.2.
parameters		Channel R.6 TDD	
Special subframe	-	6	As specified in table 4.2-1
configuration			in 3GPP TS 36.211.
Uplink-downlink configuration	-	1	As specified in table 4.2-2 in 3GPP TS 36.211.
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	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		
${ m \hat{E}}_{ m s}/{ m I}_{ m ot}$	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	-	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.

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.					

Table A.6.2.4.1-2: RACH-Configuration parameters for TDD non-contention based random access test

### 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 -22 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 -22 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.6.3 RRC Connection Release with Redirection

### A.6.3.1 Redirection from E-UTRAN FDD to UTRAN FDD

### A.6.3.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct performing the RRC connection release with redirection to the target UTRAN FDD cell. This test will partly verify the RRC connection release with redirection to UTRAN FDD cell requirements in section 6.3.2.1.

256

The test parameters are given in Tables A.6.3.1.1-1, A.6.3.1.1-2 and A.6.3.1.1-3 below. The test consists of two successive time periods, with time duration of T1, and T2 respectively. The "*RRCConnectionRelease*" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message is sent to the UE. 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.6.3.1.1-1: General test parameters for RRC Connection Release with Redirection from E-UTRAN FDD to UTRAN FDD under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1.
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) measurement quantity		CPICH Ec/lo	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
UTRA FDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the " <i>RRCConnectionRelease</i> " message from the E-UTRAN
T1	S	≤5	
T2	S	1	

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				
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 3	dBm/15 kHz	-98	3		
$\hat{E}_{s}/N_{oc}$	dB	4	4		
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWO	GN		
spectral density is act Note 2: The resources for upl	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. 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 is assumed to be constant				
over subcarriers and	nd time and shall be modelled as AWGN of appropriate power for $N_{ac}$ to be				
fulfilled.	been derived from other parameters for information purposes. They are not				

# Table A.6.3.1.1-2: Cell specific test parameters for cell #1 E-UTRAN FDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

# Table A.6.3.1.1-3: Cell specific test parameters for cell #2 E-UTRAN FDD to UTRAN FDD RRC release with redirection 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 co				
Note 2: The power of the OC	e 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 Ec/lo of -15dB				

258

### A.6.3.1.2 Test Requirements

The RRC connection release with redirection delay  $T_{connection\_release\_redirect\_UTRA\,FDD}$  to UTRAN FDD cell shall be less than 650 ms.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

NOTE: The Re-establishment delay in this case can be expressed as

 $T_{connection\_release\_redirect\_UTRA~FDD} = T_{RRC\_procedure\_delay} + T_{identify\_UTRA~FDD} + T_{SI\_UTRA~FDD} + T_{RA}$ 

where

 $T_{RRC_{procedure_{delay}}} = 110 \text{ ms}$ 

 $T_{identify-UTRA FDD} = 500 \text{ ms}$ 

 $T_{SI-UTRA FDD}$  = the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released. 0 ms is assumed in this test case.

 $T_{RA}$  = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

This gives a total of 650 ms.

### A.6.3.2 Redirection from E-UTRAN TDD to UTRAN FDD

### A.6.3.2.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct performing the RRC connection release with redirection to the target UTRAN FDD cell. This test will partly verify the RRC connection release with redirection to UTRAN TDD cell requirements in section 6.3.2.1.

The test parameters are given in Tables A.6.3.2.1-1, A.6.3.2.1-2 and A.6.3.2.1-3 below. The test consists of two successive time periods, with time duration of T1, and T2 respectively. The "*RRCConnectionRelease*" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message is sent to the UE. 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.6.3.2.1-1: General test parameters for RRC Connection Release with Redirection from E-UTRAN TDD to UTRAN FDD under AWGN propagation conditions

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1.
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> )			
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211
Uplink-downlink configuration		1	As specified in table 4.2-2 in TS 36.211
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	
UTRA FDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the " <i>RRCConnectionRelease</i> " message from the E-UTRAN
T1	S	≤5	
T2	S	1	

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 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				
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4		
Noce Note 3	dBm/15 kHz	-98	8		
$\hat{E}_s/N_{oc}$	dB	4	4		
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWG	GN		
Note 1:         OCNG shall be used spectral density is acl           Note 2:         The resources for upl	NG shall be used such that the cell is fully allocated and a constant total transmitted power ctral density is achieved for all OFDM symbols. resources for uplink transmission are assigned to the UE prior to the start of time period T2. ference from other cells and noise sources not specified in the test is assumed to be constant				
	s and time and shall be modelled as AWGN of appropriate power for $N_{ac}$ to be				
fulfilled.	en derived from other parameters for information purposes. They are not				

# Table A.6.3.2.1-2: Cell specific test parameters for cell #1 E-UTRAN TDD to UTRAN FDD RRC release with redirection under AWGN propagation conditions

# Table A.6.3.2.1-3: Cell specific test parameters for cell #2 E-UTRAN TDD to UTRAN FDD RRC release with redirection 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	<b>-∞</b> 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 OC	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 Ec/lo of -15dB				

261

#### A.6.3.2.2 Test Requirements

The RRC connection release with redirection delay T<sub>connection\_release\_redirect\_UTRA FDD</sub> to UTRAN FDD cell shall be less than 650 ms.

The rate of correct RRC re-establishments observed during repeated tests shall be at least 90%.

The Re-establishment delay in this case can be expressed as NOTE:

 $T_{\text{connection release redirect UTRA FDD}} = T_{\text{RRC procedure delay}} + T_{\text{identify-UTRA FDD}} + T_{\text{SI-UTRA FDD}} + T_{\text{RA}}$ 

where

 $T_{RRC_procedure_delay} = 110 \text{ ms}$ 

 $T_{identify-UTRA FDD} = 500 \text{ ms}$ 

 $T_{SLUTRA FDD}$  = the time required for acquiring all the relevant system information of the target UTRA FDD cell. This time depends upon whether the UE is provided with the relevant system information of the target UTRA FDD cell or not by the E-UTRAN before the RRC connection is released. 0 ms is assumed in this test case.

 $T_{RA}$  = The additional delay caused by the random access procedure. 40 ms is assumed in this test case.

This gives a total of 650 ms.

Monitored GSM cell list size

T1

T2

### A.6.3.3 Redirection from E-UTRAN FDD to GERAN when System Information is provided

#### A.6.3.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA FDD to the target GERAN cell within T<sub>connection\_release\_redirect\_GERAN</sub>. This test will partly verify the RRC connection release with redirection to GERAN requirements in section 6.3.2.2.

The test parameters are given in Tables A.6.3.3.1-1, A.6.3.3.1-2 and A.6.3.3.1-3 below. No measurement gaps are configured. 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. The start of T2 is the instant when the last TTI containing the RRC message, "RRCConnectionRelease", is received by the UE from cell 1. The "RRCConnectionRelease" message shall contain all the relevant system information of cell 2.

UTRAN FDD to GERAN in AWGN				
Parameter	Unit	Value	Comment	
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1.	
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1.	
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		
DRX		OFF		

6 GSM neighbour including

ARFCN 1

5

2

s

s

GSM cells are provided in the "RRCConnectionRelease" message.

Table A.6.3.3.1-1: General test parameters for RRC connection release with redirection from E-
UTRAN FDD to GERAN 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	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				
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		AWO	GN		
		II is fully allocated and a constan	t total transmitted power		
	s achieved for all OFDM symbols. 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 be settable parameters t		n derived from other parameters for information purposes. They are not emselves.			

### Table A.6.3.3.1-2: Cell specific test parameters for E-UTRA FDD cell (cell #1) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Table A.6.3.3.1-3: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN FDD to GERAN in AWGN

Parameter	Unit	Cell 2		
		T1	T2	
Absolute RF Channel Number		ARFNC 1		
RXLEV	dBm	-Infinity	-75	
GSM BSIC		N/A	Valid	

### A.6.3.3.2 Test Requirements

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 1120 ms from the beginning of time period T2.

The rate of correct "RRC connection release with redirection to GERAN" observed during repeated tests shall be at least 90%.

NOTE: The test requirement in this test case is expressed as:

 $T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\_GERAN} + T_{SI\_GERAN} + T_{RA}$ 

 $T_{RRC\_procedure\_delay} = 110$  ms, which is the time for processing the received message "*RRCConnectionRelease*.

 $T_{identify-GERAN} = 1000$  ms, which is the time for identifying the target GERAN cell.

 $T_{SI-GERAN} = 0$ ; UE does not have to read the system information of the GERAN cell since all relevant SI is provided to the UE in the "*RRCConnectionRelease*" message.

 $T_{RA} = 10$  ms, which is about 2 GSM frames (2\*4.65 ms) to account for the GSM timing uncertainty.

### A.6.3.4 Redirection from E-UTRAN TDD to GERAN when System Information is provided

### A.6.3.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA TDD to the target GERAN cell within  $T_{connection\_release\_redirect\_GERAN}$ . This test will partly verify the RRC connection release with redirection to GERAN requirements in section 6.3.2.2.

The test parameters are given in Tables A.6.3.4.1-1, A.6.3.4.1-2 and A.6.3.4.1-3 below. No measurement gaps are configured. 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. The start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall contain all the relevant system information of cell 2.

#### Table A.6.3.4.1-1: General test parameters for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

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	
Active		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
Special subframe configuration		6	As specified in table 4.2.1 in TS 36.211. The
		0	same configuration applies to all cells.
Uplink-downlink configuration		1	
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW <sub>channel</sub> )			
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbour including	GSM cells are provided in the
		ARFCN 1	"RRCConnectionRelease" message.
T1	S	5	
T2	S	2	

Parameter	Unit	Cel	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					
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		AWO				
	such that the cell is fully allocated and a constant total transmitted power					
	achieved for all OFDM symbols.					
over subcarriers and	time and shall be	e modelled as AWGN of appropr	iate power for $N_{_{oc}}$ to be			
	fulfilled.					

### Table A.6.3.4.1-2: Cell specific test parameters for E-UTRA TDD cell (cell #1) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

 Table A.6.3.4.1-3: Cell specific test parameters for GERAN cell (cell #2) for RRC connection release with redirection from E-UTRAN TDD to GERAN in AWGN

Parameter	Unit	Cell 2		
		T1	T2	
Absolute RF Channel Number		ARFNC 1		
RXLEV	dBm	-Infinity	-75	
GSM BSIC		N/A	Valid	

### A.6.3.4.2 Test Requirements

The UE shall begin to send access bursts on RACH of the target GERAN cell (cell #2) less than 1120 ms from the beginning of time period T2.

The rate of correct "RRC connection release with redirection to GERAN" observed during repeated tests shall be at least 90%.

NOTE: The test requirement in this test case is expressed as:

 $T_{connection\_release\_redirect\_GERAN} = T_{RRC\_procedure\_delay} + T_{identify\_GERAN} + T_{SI\_GERAN} + T_{RA}$ 

 $T_{RRC\_procedure\_delay} = 110$  ms, which is the time for processing the received message "*RRCConnectionRelease*.

 $T_{identify-GERAN} = 1000$  ms, which is the time for identifying the target GERAN cell.

### A.6.3.5 E-UTRA TDD RRC connection release redirection to UTRA TDD

### A.6.3.5.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA TDD to the target UTRA TDD cell within  $T_{connection\_release\_redirect\_UTRA TDD}$ . This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in section 6.3.2.3.

The test parameters are given in table A.6.3.5.1-1, table A.6.3.5.1-2, and table A.6.3.5.1-3. No measurement gaps are configured. 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. The "*RRCConnectionRelease*" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall contain all the relevant system information of Cell 2.

### Table A.6.3.5.1-1: General test parameters for E-UTRA TDD RRC connection release redirection to UTRA TDD

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW <sub>channel</sub> )	MHz	10	
CP length		Normal	Applicable to cell 1
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		16	UTRA cells on UTRA RF channel 1 provided in the " <i>RRCConnectionRelease</i> " message from the E-UTRAN
T1	S	5	
T2	S	1	

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					
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 <sub>oc</sub> Note 3	dBm/15 kHz	-98	3			
$\hat{E}_s / N_{oc}$	dB	4	4			
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94			
SCH_RP	dBm/15 kHz	-94	-94			
Propagation Condition		AWO	GN			
Note 1: OCNG shall be used spectral density is acl						
	rces for uplink transmission are assigned to the UE prior to the start of time period T2.					
Note 3: Interference from othe	er cells and noise	e sources not specified in the tes	at is assumed to be constant			
over subcarriers and	time and shall be	e modelled as AWGN of appropr	iate power for $N_{_{oc}}$ to be			
fulfilled. Note 4: RSRP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						

# Table A.6.3.5.1-2: Cell specific test parameters for cell 1 in E-UTRA TDD RRC connection release redirection to UTRA TDD test

### Table A.6.3.5.1-3: Cell specific test parameters for cell 2 in E-UTRA TDD RRC connection release redirection to UTRA TDD test

Parameter	Unit Cell 2 (UTRA TDD)				
Timeslot Number		0 DwPTs			PTS
		T1	T2	T1	T2
UTRA RF Channel Number <sup>Note1</sup>			Char	nnel 1	
PCCPCH_Ec/lor	dB	-4.77	-4.77		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor <sup>Note2</sup>	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8
I <sub>oc</sub>	dBm/1.28 MHz	-80			
PCCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io Note3	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/lo	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition			AW	'GN	
Note 1: In the case of multi-frequency's channel nun	nber.				,
Note 2: The power of the OCNS	channel that is a	dded shall n	nake the to	tal power fr	om the
<ul> <li>cell to be equal to l<sub>or</sub>.</li> <li>Note 3: P-CCPCH RSRP, PCCPCH_Ec/lo and DwPCH_Ec/lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.</li> </ul>					

### A.6.3.5.2 Test Requirements

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRA TDD observed during repeated tests shall be at least 90%.

NOTE: The time delay can be expressed as:  $T_{RRC_{procedure_{delay}}} + T_{identify-UTRA TDD} + T_{SI-UTRA TDD} + T_{RA}$ , where:

 $T_{RRC_{procedure_{delay}}} = 110 \text{ ms}$ , which is specified in section 6.3.2.3.

 $T_{identify-UTRA TDD} = 500 \text{ ms}$ ; which is defined in section 6.3.2.3.

- $T_{SI-UTRA TDD} = 0$  ms, UE does not have to read the system information of the UTRAN TDD since all relevant SI is provided to the UE in the "*RRCConnectionRelease*" message.
- $T_{RA} = 40$ ms. This is the additional delay caused by the random access procedure

It gives a total delay of 650 ms.

### A.6.3.6 E-UTRA FDD RRC connection release redirection to UTRA TDD

### A.6.3.6.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA FDD to the target UTRA TDD cell within  $T_{connection\_release\_redirect\_UTRA TDD}$ . This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in section 6.3.2.3.

The test parameters are given in table A.6.3.6.1-1, table A.6.3.6.1-2, and table A.6.3.6.1-3. No measurement gaps are configured. 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. The "*RRCConnectionRelease*" message containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from cell 1. The "*RRCConnectionRelease*" message shall contain all the relevant system information of Cell 2.

Table A.6.3.6.1-1: General test parameters for E-UTRA FDD RRC connection release redirection to

# UTRA TDDParameterUnitValueCommentPDSCH parameters (E-UTRAN<br/>FDD)DL Reference Measurement<br/>Channel R.0 FDDAs specified in section A.3.1.1.1.<br/>Channel R.0 FDDPCFICH/PDCCH/PHICHDL Reference Measurement<br/>DL Reference MeasurementAs specified in section A.3.1.2.1.

PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1.
parameters (E-UTRAN FDD)		Channel R.6 FDD	
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
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is
			used.
E-UTRA Channel Bandwidth	MHz	10	
(BW <sub>channel</sub> )			
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		16	UTRA cells on UTRA RF channel 1
			provided in the "RRCConnectionRelease"
			message from the E-UTRAN
T1	S	5	
T2	S	1	

# Table A.6.3.6.1-2: Cell specific test parameters for cell 1 in E-UTRA FDD RRC connection release redirection to UTRA TDD test

	Parameter	Unit	Cell 1				
			T1	T2			
E-UTRA R	RF Channel Number		1				
BW <sub>channel</sub>		MHz	10				
	tterns defined in		OP.1 F	חח:			
A.3.2.1.1 (	OP.1 FDD)		01:11	66			
PBCH_RA		dB					
PBCH_RB	3	dB					
PSS_RA		dB					
SSS_RA		dB					
PCFICH_F		dB					
PHICH_R		dB					
PHICH_RI		dB	0				
PDCCH_F		dB					
PDCCH_F		dB					
PDSCH_R		dB					
PDSCH_R	RB	dB					
OCNG_R/	ANote 1	dB					
OCNG_R		dB					
$\hat{E}_{s}/I_{ot}$		dB	4	4			
$N_{\scriptscriptstyle oc}$ Note 3		dBm/15 kHz	-98				
$\hat{E}_s / N_{oc}$		dB	4	4			
RSRP Note	4	dBm/15 kHz	-94	-94			
SCH_RP		dBm/15 kHz	-94	-94			
Propagatio	on Condition		AWG	βN			
Note 1:	OCNG shall be used	such that both co	ells are fully allocated and a cons	tant total transmitted power			
	spectral density is act	nieved for all OF	ved for all OFDM symbols.				
			transmission are assigned to the UE prior to the start of time period T2.				
Note 3:							
	over subcarriers and	time and shall be	e modelled as AWGN of appropria	ate power for $N_{_{oc}}$ to be			
	fulfilled.						
Note 4:		evels have been derived from other parameters for information purposes. They are not					

### Table A.6.3.6.1-3: Cell specific test parameters for cell 2 in E-UTRA FDD RRC connection release redirection to UTRA TDD test

Parameter	Unit Cell 2 (UTRA TDD)					
Timeslot Number		0 DwPTS			PTS	
		T1	T2	T1	T2	
UTRA RF Channel Number <sup>Note1</sup>			Char	nel 1		
PCCPCH_Ec/lor	dB	-4.77	-4.77			
DwPCH_Ec/lor	dB			0	0	
OCNS_Ec/lor <sup>Note2</sup>	dB	-1.76	-1.76			
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8	
I <sub>oc</sub>	dBm/1.28 MHz	-80				
PCCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.	
PCCPCH_Ec/Io Note3	dB	-inf	-5.41	n.a.	n.a.	
DwPCH_Ec/lo	dB	n.a.	n.a.	-inf	-0.64	
Propagation Condition				'GN		
Note 1: In the case of multi-frequ frequency's channel nun		RA RF Cha	nnel Numb	er is the pri	mary	
Note 2: The power of the OCNS	channel that is a	dded shall n	nake the to	tal power fr	om the	
cell to be equal to I <sub>or</sub> .						
	Note 3: P-CCPCH RSRP, PCCPCH_Ec/lo and DwPCH_Ec/lo levels have been derived from other parameters for information purposes. They are not settable parameters					

### A.6.3.6.2 Test Requirements

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 650 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRA TDD observed during repeated tests shall be at least 90%.

NOTE: The time delay can be expressed as:  $T_{RRC_{procedure_{delay}}} + T_{identify-UTRA TDD} + T_{SI-UTRA TDD} + T_{RA}$ , where:

 $T_{RRC_{procedure_{delay}}} = 110 \text{ ms}$ , which is specified in section 6.3.2.3.

 $T_{identify-UTRA TDD} = 500 \text{ ms}$ ; which is defined in section 6.3.2.3.

 $T_{SI-UTRA TDD} = 0$  ms, UE does not have to read the system information of the UTRAN TDD since all relevant SI is provided to the UE in the "*RRCConnectionRelease*" message.

 $T_{RA} = 40$ ms. This is the additional delay caused by the random access procedure.

This gives a total delay of 650 ms.

# A.6.3.7 E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided

### A.6.3.7.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA TDD to the target UTRA TDD cell within  $T_{connection\_release\_redirect\_UTRA TDD}$ . This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in section 6.3.2.3.

The test parameters are given in table A.6.3.7.1-1, table A.6.3.7.1-2, and table A.6.3.7.1-3. No measurement gaps are configured. 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. The "*RRCConnectionRelease*" message not containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from Cell 1.

# Table A.6.3.7.1-1: General test parameters for E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN		DL Reference Measurement	As specified in section A.3.1.1.2.
TDD)		Channel R.0 TDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.2.
parameters (E-UTRAN TDD)		Channel R.6 TDD	
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.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is
			used.
E-UTRA Channel Bandwidth	MHz	10	
(BW <sub>channel</sub> )			
CP length		Normal	Applicable to cell 1
Uplink-downlink configuration of		1	As specified in table 4.2.2 in TS 36.211
cell 1			
Special subframe configuration of		6	As specified in table 4.2.1 in TS 36.211
cell 1			
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is
			used.
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	
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.3.2.2.1 (OP.1 TDD)		OP.1 T	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	7			
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		
$N_{_{oc}}$ Note 3	dBm/15 kHz	-98			
$\hat{E}_s/N_{oc}$	dB	4	4		
RSRP Note 4	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWG	N .		
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. 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.	en derived from	other parameters for information			

# Table A.6.3.7.1-2: Cell specific test parameters for cell 1 in E-UTRA TDD RRC connection release redirection to UTRA TDD test without SI provided

# Table A.6.3.7.1-3: Cell specific test parameters for cell 2 in E-UTRA TDD RRC connection release redirection to UTRA TDD test without SI provided

Parameter	Unit		Cell 2 (UT	(RA TDD)	
Timeslot Number		0 DwPT		PTS	
		T1	T2	T1	T2
UTRA RF Channel Number <sup>Note1</sup>			Chan	inel 1	
PCCPCH_Ec/lor	dB	-4.77	-4.77		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor <sup>Note2</sup>	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8
I <sub>oc</sub>	dBm/1.28 MHz		-8	30	
PCCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.
PCCPCH_Ec/Io Note3	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io Note3	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition	AWGN				
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: P-CCPCH RSRP, PCCPCH	I_Ec/lo and DwP	CH_Ec/lo le	evels have t	been derive	d from

themselves.

### A.6.3.7.2 Test Requirements

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 1930 ms from the beginning of time period T2.

other parameters for information purposes. They are not settable parameters

The rate of correct RRC connection release redirection to UTRA TDD observed during repeated tests shall be at least 90%.

NOTE: The time delay can be expressed as:  $T_{RRC_procedure_delay} + T_{identify-UTRA TDD} + T_{SI-UTRA TDD} + T_{RA}$ , where:

 $T_{RRC_{procedure_{delay}}} = 110 \text{ ms}$ , which is specified in section 6.3.2.3.

 $T_{identify-UTRA TDD} = 500 \text{ ms}$ ; which is defined in section 6.3.2.3.

T<sub>SI-UTRA TDD</sub>: Maximum repetition period of relevant system info blocks that need to be received by the UE during RRC connection release redirection to UTRA TDD cell. 1280 ms is assumed in this test case.

 $T_{RA} = 40$ ms, this is the additional delay caused by the random access procedure.

This gives a total delay of 1930 ms.

### A.6.3.8 E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided

### A.6.3.8.1 Test Purpose and Environment

The purpose of this test is to verify that the UE performs the RRC connection release with redirection from the E-UTRA FDD to the target UTRA TDD cell within  $T_{connection\_release\_redirect\_UTRA TDD}$ . This test will partly verify the RRC connection release with redirection to UTRA TDD requirements in section 6.3.2.3.

The test parameters are given in table A.6.3.8.1-1, table A.6.3.8.1-2, and table A.6.3.8.1-3. No measurement gaps are configured. 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. The "*RRCConnectionRelease*" message not containing the relevant system information of Cell 2 shall be sent to the UE during period T1 and the start of T2 is the instant when the last TTI containing the RRC message, "*RRCConnectionRelease*", is received by the UE from Cell 1.

# Table A.6.3.8.1-1: General test parameters for E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth	MHz	10	
(BW <sub>channel</sub> )			
CP length		Normal	Applicable to cell 1
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
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	
T2	S	2	

### ETSI

Parameter	Unit	Cell	1
		T1	T2
E-UTRA RF Channel Number		1	
BW <sub>channel</sub>	MHz	10	
OCNG Patterns defined in		OP.1 F	DD
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		
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4
$N_{_{oc}}$ Note 3	dBm/15 kHz	-98	3
$\hat{E}_s/N_{oc}$	dB	4	4
RSRP Note 4	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWG	GN
Note 1: OCNG shall be used spectral density is ac	hieved for all OF	ells are fully allocated and a cons	stant total transmitted power
		e sources not specified in the tes	
		•	
over subcarriers and	time and shall be	e modelled as AWGN of appropri	ate power for $IN_{oc}$ to be
		other parameters for information	purposes. They are not
settable parameters t	hemselves.		

# Table A.6.3.8.1-2: Cell specific test parameters for cell 1 in E-UTRA FDD RRC connection release redirection to UTRA TDD test without SI provided

Table A.6.3.8.1-3: Cell specific test parameters for cell 2 in E-UTRA FDD RRC connection release
redirection to UTRA TDD test without SI provided

	Parameter	Unit		Cell 2 (U	(RA TDD)	
Timeslot	Number		0 DwP		PTS	
			T1	T2	T1	T2
UTRA RE	Channel Number <sup>Note1</sup>			Char	nnel 1	
PCCPCH	I_Ec/lor	dB	-4.77	-4.77		
DwPCH_		dB			0	0
OCNS_E	c/lor <sup>Note2</sup>	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$		dB	-inf	8	-inf	8
I <sub>oc</sub>		dBm/1.28 MHz	-80			
PCCPCH	RSCP Note3	dBm -inf -76.77 n.a.				n.a.
	CCPCH_Ec/Io <sup>Note3</sup> dB		-inf	-5.41	n.a.	n.a.
DwPCH_	Ec/lo <sup>Note3</sup>	dB	n.a.	n.a.	-inf	-0.64
Propagat	ion Condition		AWGN			
Note 1:	frequency's channel number.					
Note 2:	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: P-CCPCH RSRP, PCCPCH_Ec/lo and DwPCH_Ec/lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						

### A.6.3.8.2 Test Requirements

The UE shall start to transmit the SYNCH-UL sequence in the UpPTS to Cell 2 less than 1930 ms from the beginning of time period T2.

The rate of correct RRC connection release redirection to UTRA TDD observed during repeated tests shall be at least 90%.

NOTE: The time delay can be expressed as:  $T_{RRC_procedure_delay} + T_{identify-UTRA TDD} + T_{SI-UTRA TDD} + T_{RA}$ , where:

 $T_{RRC procedure delay} = 110 \text{ ms}$ , which is specified in section 6.3.2.3.

 $T_{identify-UTRA TDD} = 500 \text{ ms}$ ; which is defined in section 6.3.2.3.

T<sub>SI-UTRA TDD</sub>: Maximum repetition period of relevant system info blocks that need to be received by the UE during RRC connection release redirection to UTRA TDD cell. 1280 ms is assumed in this test case.

 $T_{RA} = 40$ ms, this is the additional delay caused by the random access procedure.

This gives a total delay of 1930 ms.

### A.7 Timing and Signalling Characteristics

### A.7.1 UE Transmit Timing

### A.7.1.1 E-UTRAN FDD – UE Transmit Timing Accuracy Tests

### A.7.1.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE is capable of following the frame timing change of the connected eNode B and that the UE initial transmit timing accuracy, maximum amount of timing change in one adjustment, minimum and maximum adjustment rate are within the specified limits. This test will verify the requirements in section 7.1.2.

For this test a single cell is used. Table A.7.1.1.1-1 defines the strength of the transmitted signals and the propagation condition. The transmit timing is verified by the UE transmitting sounding reference symbols using the configuration defined in Table A.7.1.1.1-2.

Table A.7.1.1.1-1: Te	est Parameters for UE	Transmit Timing A	Accuracy Tests for	E-UTRAN FDD
		rianonii inniing /	loouraby rooto ior	

<b>D</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	
${ m \hat{E}_s}/{ m I_{ot}}$	dB	3	3	3	
$\hat{E}_{s}/N_{oc}$	dB	3	3	3	
lo <sup>Note4</sup>	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 3: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.

Note 4: lo level has been derived from other parameters for information purpose. It is not a settable parameter.

Note 5: DRX related parameters are defined in Table A.7.1.1.1-3.

# Table A.7.1.1.1-2: Sounding Reference Symbol Configuration to be used in UE Transmit Timing Accuracy Tests for E-UTRAN FDD

Field	Test 1	Test 2	Test 3	Comment
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 3GF	PTS 36.33	1.	

# 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 se	ection 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.

278

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					
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. Note 5: OCNG shall be used such that both cells are fully allocated and a constant total					
transmitted power spectral density is achieved for all OFDM symbols. Note 6: lo level has been derived from other parameters for information purpose. It is not a					

### 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	Commont	
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	

# 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
Fleid	Value	
onDurationTimer	psf1	
drx-InactivityTimer	psf1	
drx-RetransmissionTimer	psf1	
longDRX-CycleStartOffset	sf80	
shortDRX	disable	
Note: For further information see section	n 6.3.2 in 3GP	P TS 36.331.

### A.7.1.2.2 Test Requirements

For parameters specified in Tables A.7.1.2.1-1 and A.7.1.2.1-2, the initial transmit timing accuracy, the maximum amount of timing change in one adjustment, the minimum and the maximum adjustment rate shall be within the limits defined in section 7.1.2.

The following sequence of events shall be used to verify that the requirements are met.

For the 10MHz channel bandwith, the test sequence shall be carried out in RRC\_CONNECTED for both non-DRX and DRX with a cycle length of 80 ms (Tests 1 and 2, respectively):

- a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within  $(N_{TA} + 624) \times T_S \pm 12 \times T_S$  with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- b) The test system adjusts the downlink transmit timing for the cell by  $+64 \times T_s$  (approximately  $+2\mu s$ ) compared to that in (a).
- c) The test system shall verify that for test 1 the adjustment step size and the adjustment rate shall be according to the requirements in section 7.1.2 until the UE transmit timing offset is within  $(N_{TA} + 624) \times T_S \pm 12 \times T_S$  with respect to the first detected path (in time) of the corresponding downlink frame of cell 1. Skip this step for test 2.
- d) The test system shall verify that the UE transmit timing offset stays within  $(N_{TA} + 624) \times T_S \pm 12 \times T_S$  with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

For the 1.4MHz channel bandwith, the test sequence shall be carried out in RRC\_CONNECTED for non-DRX (Tests 3):

- a) After a connection is set up with the cell, the test system shall verify that the UE transmit timing offset is within  $(N_{TA} + 624) \times T_S \pm 24 \times T_S$  with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- b) The test system adjusts the downlink transmit timing for the cell by  $+128 \times T_s$  (approximately  $+4\mu s$ ) compared to that in (a).
- c) The test system shall verify that the adjustment step size and the adjustment rate shall be according to the requirements in section 7.1.2 until the UE transmit timing offset is within  $(N_{TA}+624)\times T_S \pm 24\times T_S$  with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.
- d) The test system shall verify that the UE transmit timing offset stays within  $(N_{TA} + 624) \times T_S \pm 24 \times T_S$  with respect to the first detected path (in time) of the corresponding downlink frame of cell 1.

### A.7.2 UE Timing Advance

### A.7.2.1 E-UTRAN FDD – UE Timing Advance Adjustment Accuracy Test

### A.7.2.1.1 Test Purpose and Environment

The purpose of the test is to verify E-UTRAN FDD Timing Advance adjustment accuracy requirements, defined in section 7.3.2.2, in an AWGN model.

The test parameters are given in tables A.7.2.1.1-1, A.7.2.1.1-2, and A.7.2.1.1-3. The test consists of two successive time periods, with time duration of T1 and T2 respectively. In each time period, timing advance commands are sent to the UE and Sounding Reference Signals (SRS), as specified in table A.7.2.1.1-3, are sent from the UE and received by the test equipment. By measuring the reception of the SRS, the transmit timing, and hence the timing advance adjustment accuracy, can be measured.

During time period T1, the test equipment shall send one message with a Timing Advance Command MAC Control Element, as specified in Section 6.1.3.5 in TS 36.321. The Timing Advance Command value shall be set to 31, which according to Section 4.2.3 in TS 36.213 results in zero adjustment of the Timing Advance. In this way, a reference value for the timing advance used by the UE is established.

During time period T2, the test equipment shall send a sequence of messages with Timing Advance Command MAC Control Elements, with Timing Advance Command value specified in table A.7.2.1.1-2. This value shall result in changes of the timing advance used by the UE, and the accuracy of the change shall then be measured, using the SRS sent from the UE.

As specified in Section 7.3.2.1, the UE adjusts its uplink timing at sub-frame n+6 for a timing advance command received in sub-frame n. This delay must be taken into account when measuring the timing advance adjustment accuracy, via the SRS sent from the UE.

The UE Time Alignment Timer, described in Section 5.2 in TS 36.321, shall be configured so that it does not expire in the duration of the test.

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 ( <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.7.2.1.1-1: 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		0		
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 <sub>A</sub> )		31	[39]		
$\hat{E}_{s}/I_{ot}$	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 spectral density is achieved for Note 2: lo level has been deri parameter.	or all OFDM sym	bols.	stant total transmitted power on purpose. It is not a settable		

### 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	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				
OCNG_RA <sup>Note3</sup>	dB				
OCNG_RB <sup>Note3</sup>	dB				
Timing Advance Command (T <sub>A</sub> )		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 con	figuration see table	4.2-1 in 3GPP TS 36			
Note 2: For the uplink-downlink config					
Note 3: OCNG shall be used such that					
spectral density is achieved for	or all OFDM symbol	S.			
Note 4: lo level has been deri	ved from other para	meters for information	on 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 TS 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

In the following section, any uplink signal transmitted by the UE is used for detecting the In-/Out-of-Sync state of the UE. In terms of measurement, the uplink signal is verified on the basis of the UE output power:

- UE output power higher than Transmit OFF power -50 dBm (as defined in TS 36.101 [5] clause 6.3.3.1) means uplink signal
- UE output power equal to or less than Transmit OFF power -50 dBm (as defined in TS 36.101 [5] clause 6.3.3.1) means no uplink signal

### 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.

Parameter		Unit	Value				Comment
			Test 1	Test 2	Test 3	Test 4	1
PCFICH/PDC0 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-UTRA 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 Matrix and Antenna Configuration			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>A</sub> , ρ <sub>B</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			Enabled	Enabled	Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	0	0	T310 is disabled
T311 timer		ms	1000	1000	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	2	2	2	2	Minimum CQI reporting periodicity
Propagation channel			AWGN	AWGN	ETU 70 Hz	ETU 70 Hz	
T1		S	1	1	1	1	
T2		S	0.4	0.4	0.4	0.4	
Т3		s	0.5	0.5	0.5	0.5	

### 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	Т3	T1	T2	Т3			
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			•				
PHICH_RA	dB		0			-3				
PHICH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA <sup>Note 1</sup>	dB									
OCNG_RB <sup>Note 1</sup>	dB									
SNR Note 6	dB	-4.7	-9.5	-13.5	-4.7	-9.5	-13.5			
N <sub>oc</sub>	dBm/15		-98			-98				
	kHz									
Propagation condition			AWGN			AWGN				
	be used such						constant			
	ted power spe									
	sources for C	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	tering related parameters are configured prior to the start of time								
	ontains PDCCI	H for UEs o	other than t	he device	under test	as part of C	DCNG.			
	orrespond to t									
Note 6: The SNR in ti	me periods T1 in figure A.7.3.		3 is denote	d as SNR1	, SNR2 an	d SNR3				

# 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		-		2					
PHICH_RA	dB		0		-3					
PHICH_RB	dB									
PDSCH_RA	dB									
PDSCH_RB	dB									
OCNG_RA <sup>Note 1</sup>	dB									
OCNG_RB <sup>Note 1</sup>	dB									
SNR <sup>Note 6</sup>	dB	-1.4	-5.5	-11.5	-2.3	-6.2	-12.2			
N <sub>oc</sub>	dBm/15		-98			-98				
1,00	kHz									
Propagation condition			ETU 70 Hz			ETU 70 Hz	<u>-</u>			
Note 1: OCNG shall	be used such	that the res	sources in a	cell # 1 are	fully alloca	ated and a	constant			
total transmit	ted power spe	ctral densi	ty is achiev	ed for all C	OFDM syml	bols.				
Note 2: The uplink re	sources 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	Itering related parameters are configured prior to the start of								
Note 4: The signal co	ontains PDCCI	PDCCH for UEs other than the device under test as part of OCN								
Note 5: SNR levels of	orrespond to t	oond to the signal to noise ratio over the cell-specific reference signation								
REs.		-			-		-			
	ime periods T		3 is denote	ed as SNR	1, SNR2 a	nd SNR3				
respectively	in figure A.7.3.	1.1-4.								

## Table A.7.3.1.1-3: Cell specific test parameters for E-UTRAN FDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

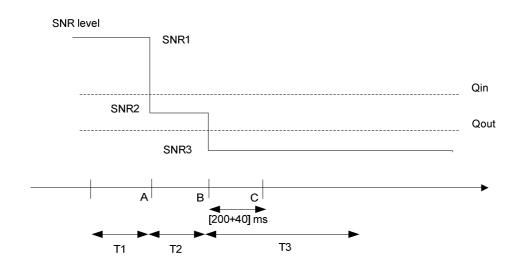


Figure A.7.3.1.1-4 SNR variation for out-of-sync testing

#### 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 the period from time point A to time point B UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (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.

CH Number ndwidth d Antenna	MHz	Test 1 R.6 FDD OP.2 FDD Cell 1 Normal 1	Test 2 R.7 FDD OP.2 FDD Cell 1 Normal	As specified in section A.3.1.2.1. None of the PDCCH are intended for the UE under test As specified in section A.3.2.1.2. Cell 1 is on E-UTRA RF channel number 1
Number	MHz	OP.2 FDD Cell 1 Normal	OP.2 FDD Cell 1	A.3.1.2.1. None of the PDCCH are intended for the UE under test As specified in section A.3.2.1.2. Cell 1 is on E-UTRA RF
ndwidth	MHz	Cell 1 Normal	Cell 1	A.3.2.1.2. Cell 1 is on E-UTRA RF
ndwidth	MHz	Normal		Cell 1 is on E-UTRA RF
ndwidth	MHz		Normal	
ndwidth	MHz	1	INUITIAL	
	MHz		1	One E-UTRA FDD carrier frequency is used.
d Antenna	1	10	10	
		1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2
format		1C	1C	As defined in section 5.3.3.1.4 in TS 36.212
ber of Control M symbols		2	2	In sync threshold Q <sub>in</sub> and the corresponding
egation level	CCE	4	4	hypothetical
В		0	-3	PDCCH/PCFICH
o of PDCCH S EPRE		0	-3	transmission parameters are as specified in section
o of PCFICH S EPRE		4	1	and Table 7.6.1-2 respectively.
format		1A	1A	As defined in section 5.3.3.1.3 in TS 36.212
ber of Control M symbols		2	2	Out of sync threshold Q <sub>out</sub> and the corresponding
egation level	CCE	8	8	hypothetical
В		0	-3	PDCCH/PCFICH transmission parameters
o of PDCCH S EPRE	dB	4	1	are as specified in section 7.6.1 and Table 7.6.1-1
o of PCFICH S EPRE	dB	4	1	respectively.
		OFF	OFF	
		Enabled	Enabled	Counters: N310 = 1; N311 = 1
	ms	2000	2000	T310 is enabled
	ms	1000	1000	T311 is enabled
g mode		PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
city	ms	2	2	Minimum CQI reporting periodicity
		ETU 70 Hz	ETU 70 Hz	
	S			
	S			
	S			
	S	0.4	0.4	
	S	•	•	I
		s s s CFICH correspond	s         0.5           s         0.4           s         1.46           s         0.4           s         1	s         0.5         0.5           s         0.4         0.4           s         1.46         1.46           s         0.4         0.4           cFICH corresponding to the in-sync and out of         1

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

Parameter	Unit	Test 1								Т	est 2					
		T1 T2 T3 T4 T5						T1	T2	T3	Т	4	T5			
E-UTRA RF Channel			1							1						
Number																
BW <sub>channel</sub>	MHz					10										
Correlation Matrix				1x2 L	_ow					2x	2 Lov	V				
and Antenna																
Configuration																
OCNG Pattern										_						
defined in A.3.2.1			OP.2 FDD							OP	.2 FD	D				
(FDD)																
ρ <sub>Α</sub> , ρ <sub>Β</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							-3								
PHICH_RA	dB			0												
PHICH_RB	dB															
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 -	12.2	-7.3	-2.3			
N <sub>oc</sub>	dBm/15			-98	8						-98					
1 ° oc	kHz															
Propagation condition			E	ETU 7	'0 Hz	2				ΕΤι	J 70 I	Ηz				
Note 1: OCNG shall	be used such	that the	hat the resources in cell # 1 are fully allo						nd a d	consta	nt tot	al trans	mitted			
power spectr	al density is a	chieved	for all C	FDM	sym	bols.	-									
	sources for C															
	nd layer 3 filte											eriod T1				
	ontains PDCCI															
	correspond to t															
	time periods T		3, T4 an	d T5 i	is de	noted a	s SNR1	, SNR2	2, SNF	3, SN	R4 a	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

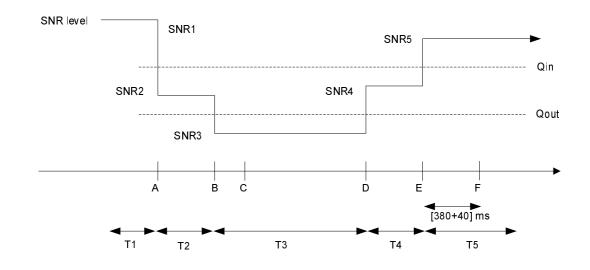


Figure A.7.3.2.1-3 SNR variation for in-sync testing

#### 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 the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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.

		1		1	Value						
	CFICH/PDCCH/PHICH		Test 1	Test 2	Test 3	Test 4					
PCFICH/PDCC parameters	CH/PHICH		R.6 TDD	R.7 TDD	R.6 TDD	R.7 TDD	As specified in section A.3.1.2.2. None of the PDCCH are intended for the UE under test				
OCNG parame	eters		OP.2 TDD	OP.2 TDD	OP.2 TDD	OP.2 TDD	As specified in section A.3.2.2.2.				
Active cell			Cell 1	Cell 1	Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1				
CP length			Normal	Normal	Normal	Normal					
E-UTRA RF Cł	hannel Number		1	1	1	1	One E-UTRA TDD carrier frequency is used.				
E-UTRA Chani (BW <sub>channel</sub> )		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 corresponding				
parameters	Aggregation level	CCE	8	8	8	8	hypothetical				
(Note 1)	ρ <sub>A</sub> , ρ <sub>B</sub>		0	-3	0	-3	PDCCH/PCFICH				
	Ratio of PDCCH to RS EPRE	dB	4	1	4	1	transmission parameters are as specified in section				
	Ratio of PCFICH to RS EPRE	dB	4	1	4	1	7.6.1 and Table 7.6.1-1 respectively.				
DRX			OFF	OFF	OFF	OFF					
Layer 3 filtering	9		Enabled	Enabled	Enabled	Enabled	Counters: N310 = 1; N311 = 1				
T310 timer		ms	0	0	0	0	T310 is disabled				
T311 timer		ms	1000	1000	1000	1000	T311 is enabled				
Periodic CQI re			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 p	·	ms	1	1	1	1	Minimum CQI reporting periodicity				
Propagation ch	nannel	1	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					

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

Parameter	Unit		Test 1								
		T1	T2	T3	T1 T2 1						
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		0			-3					
PHICH_RA	dB	-	0			-3					
PHICH_RB	dB	-									
PDSCH_RA	dB										
PDSCH_RB OCNG_RA <sup>Note 3</sup>	dB										
OCNG_RA	dB										
SNR <sup>Note 8</sup>	dB dB	<b>F</b> 4	0.4	-13.1	-5.2	0.0	-13.2				
		-5.1	-9.1	-13.1	-5.2	-9.2	-13.Z				
$N_{oc}$	dBm/15		-98			-98					
	kHz		AWGN			AWGN					
Propagation condition		<i>c</i>		4.0.4 in 0/							
Note 1: For the spec Note 2: For the uplin	cial subframe c	onfiguration	n see table	4.2-1 IN 30		).211. 					
	hk-downlink cor						aanatant				
	be used such						constant				
							ftimo				
period T1.		s for CQI reporting are assigned to the UE prior to the start of									
	and laver 3 filte	er 3 filtering related parameters are configured prior to the start of									
period T1.		o membre plate parameters are compared phor to the start of									
	ontains PDCC	PDCCH for UEs other than the device under test as part of OCNG.									
	correspond to t										
	me periods T1, T	2 and T3 is	denoted as	SNR1, SNR	2 and SNR3	3 respectivel	y in figure				

# 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							
		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 Note2										
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		-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 <sup>Note 3</sup>	dB									
OCNG_RB <sup>Note 3</sup>	dB									
SNR <sup>Note 8</sup>	dB	-1.4	-5.3	-11.3	-2.3	-5.9	-11.9			
$N_{oc}$	dBm/15		-98			-98				
	kHz									
Propagation condition			ETU 70 Hz			ETU 70 Hz				
	cial subframe c									
	nk-downlink cor									
	l be used such						constant			
		r spectral density is achieved for all OFDM symbols. for CQI reporting are assigned to the UE prior to the start of								
Note 4: The uplink uplink period T1.	esources for Co	reporting	y are assig	ned to the		o ine staft o	ume			
	and layer 3 filto	3 filtering related parameters are configured prior to the start of								
period T1.	and layer 5 lille	ing related	Paramete	is are coll	iguieu pilo					
	contains PDCC	H for LIFs of	other than t	he device	under test	as part of C	CNG			
	correspond to t									
REs.		ine orginal a	5 110100 ruti	0 0 001 110			, orginal			
Note 8: The SNR in t	ime periods T1, T	2 and T3 is	denoted as	SNR1, SNR	2 and SNR3	8 respectively	y in figure			
A.7.3.3.1-4.							-			

# Table A.7.3.3.1-3: Cell specific test parameters for E-UTRAN TDD (cell # 1) for out-of-sync radio link monitoring tests # 3 and # 4

297

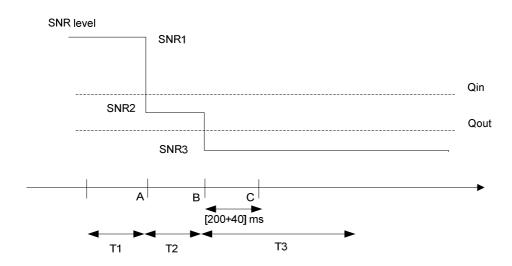


Figure A.7.3.3.1-4. SNR variation for out-of-sync testing

### 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 the period from time point A to time point B the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

The UE shall stop transmitting uplink signal no later than time point C (240 ms after 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.

Pa	rameter	Unit	Va	lue	Comment		
			Test 1	Test 2	]		
PCFICH/PDC0 parameters	CH/PHICH		R.6 TDD	R.7 TDD	As specified in section A.3.1.2.2. None of the PDCCH are intended for the UE under test		
OCNG parame	eters		OP.2 TDD	OP.2 TDD	As specified in section A.3.2.2.2.		
Active cell	əll		ctive cell		Cell 1	Cell 1	Cell 1 is on E-UTRA RF channel number 1
CP length			Normal	Normal			
	hannel Number		1	1	One E-UTRA FDD carrier frequency is used.		
E-UTRA Chan (BW <sub>channel</sub> )		MHz	10	10			
Correlation Ma Configuration	Correlation Matrix and Antenna		1x2 Low	2x2 Low	Correlation Matrix and Antenna Configuration are defined in TS 36.101 [5] Annex B.2.3.2		
	DCI format		1C	1C	As defined in section 5.3.3.1.4 in TS 36.212		
In sync transmission	Number of Control OFDM symbols		2	2	In sync threshold Q <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 to RS EPRE		0	-3	transmission parameters are as specified in section		
	Ratio of PCFICH to RS EPRE		4	1	and Table 7.6.1-2 respectively.		
	DCI format		1A	1A	As defined in section 5.3.3.1.3 in TS 36.212		
Out of sync transmission	Number of Control OFDM symbols		2	2	Out of sync threshold Q <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			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.		
CQI reporting	•	ms	1	1	Minimum CQI reporting periodicity		
Propagation ch	nannel	ļ	ETU 70 Hz	ETU 70 Hz			
<u>T1</u>		S	0.5	0.5			
T2		S	0.4	0.4			
T3		S	1.46	1.46			
T4		S	0.4	0.4			
T5 Note 1: PI		S	1	1			
	DCCH/PCFICH corr						

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

Parameter	Unit			Tes	st 1			Test 2						
		T1	Т5	T1	T2	T3	T	4	T5					
E-UTRA RF Channel				1										
Number														
BW <sub>channel</sub>	MHz			1					10					
Correlation Matrix				1x2	Low			2x2 Low						
and Antenna														
Configuration		<u> </u>												
Special subframe			6								6			
configuration <sup>Note1</sup> Uplink-downlink											1			
configuration <sup>Note2</sup>			1								1			
OCNG Pattern														
defined in A.3.2.2											.2 TD	П		
(TDD)			OP.2 TDD							OF	.2 10	U		
ρ <sub>A</sub> , ρ <sub>B</sub>				C	)						-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			C	)			-3						
PHICH_RB	dB													
PDSCH_RA	dB													
PDSCH_RB	dB													
OCNG_RA <sup>Note 3</sup>	dB													
OCNG_RB <sup>Note 3</sup>	dB	ļ		-										
SNR Note 8	dB	-1.4	-5.3	-11	.3	-6.4	-1.4	-2.3	-5	.9 -	11.9	-7.	3 -	2.3
N <sub>oc</sub>	dBm/15			-9	8						-98			
	kHz													
Propagation condition					70 Hz					ETL	J 70 F	Ιz		
	ial subframe co													
	k-downlink cor													
	be used such t						fully allo	cated a	and a d	consta	nt tot	al trar	nsmitte	d
	al density is a													
		or CQI reporting are assigned to the UE prior to the start of time period T1. filtering related parameters are configured prior to the start of time period T												
												riod T	1.	
	ontains PDCCI													
Note 7: SNR levels c	orrespond to t	ne signa	al to nois	se rat		r the c	ell-spec	itic refe	erence	signa				
	time periods T		3, 14 an	d 15	is der	noted a	IS SNR1	, SNR2	2, SNF	(3, SN	R4 a	nd SN	IK5	
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

300

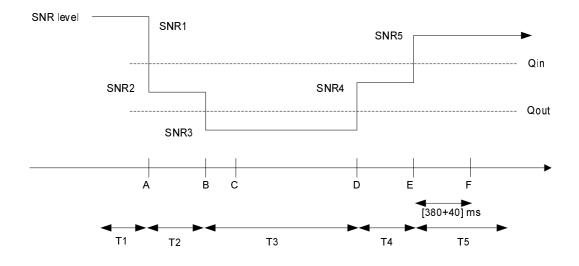


Figure A.7.3.4.1-3. SNR variation for in-sync testing

### 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 the period from time point A to time point F (420 ms after the start of time duration T5) the UE shall transmit uplink signal at least in all uplink subframes configured for CQI transmission according to the configured CQI reporting mode (PUCCH 1-0).

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
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Pa	rameter	Unit	Va	lue	Comment
			Test 1	Test 2	
PCFICH/PDC	CH/PHICH		R.7 FDD	R.6 FDD	As specified in section
parameters					A.3.1.2.1. None of the PDCCH are
					intended for the UE under test
OCNG parame	eters		OP.2 FDD	OP.2 FDD	As specified in section
			0	01.21.22	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> )			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		ms	2	2	Minimum CQI reporting periodicity
Propagation cl	nannel		ETU 70 Hz	AWGN	
T1		S	4	32	
T2		S	1.6	12.8	
Т3		s	1.8	13	
	CCH/PCFICH core included in the R				ission parameters need not

Parameter	Unit		Test 2						
		T1	T2	T3	T1	T2	T3		
E-UTRA RF Channel Number			1		1				
BW <sub>channel</sub>	MHz		10		10				
Correlation Matrix			2x2 Low			1x2 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>			-3			0			
PCFICH_RB	dB		1			4			
PDCCH_RA	dB		-3			0			
PDCCH_RB	dB		-3			0			
PBCH_RA	dB								
PBCH_RB	dB								
PSS_RA	dB								
SSS_RA	dB		-3			0			
PHICH_RA	dB		-			•			
PHICH_RB	dB								
PDSCH_RA	dB								
PDSCH_RB	dB								
OCNG_RA <sup>Note1</sup>	dB								
OCNG_RB <sup>Note1</sup>	dB								
SNR Note 6	dB	-2.3	-6.2	-12.2	-4.7	-9.5	-13.5		
$N_{oc}$	dBm/15 kHz		-98			-98			
Propagation condition			ETU 70 Hz			AWGN			
total transmit	be used such t ted power spe	ctral densi	ty is achiev	ed for all C	OFDM sym	bols.			
Note 2: The uplink re period T1.	esources for CO	QI reportin	g are assig	ned to the	UE prior to	the start c	of time		
	nd layer 3 filter	ring related	l paramete	rs are conf	igured prio	r to the sta	rt of time		
	ontains PDCCI	H for UEs of	other than t	he device	under test	as part of (	DCNG.		
	correspond to t								
Note 6: The SNR in t	time periods T <sup>r</sup> in figure A.7.3.		F3 is denot	ed as SNR	1, SNR2 a	nd SNR3			

## 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

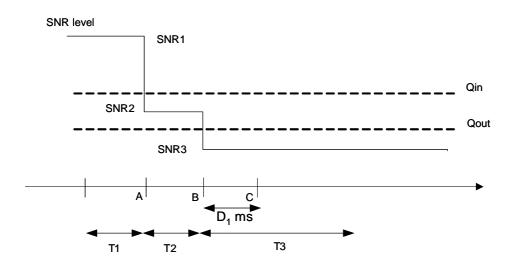
Table A.7.3.5.1-3: DRX-Configuration for E-UTRAN FDD out-of-sync tests

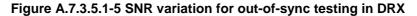
Field	Test1 Value	Test2 Value	Comment
onDurationTimer	psf2	psf2	As specified in section 6.3.2 in 3GPP
drx-InactivityTimer	psf1	psf1	TS 36.331
drx-RetransmissionTimer	psf1	psf1	
longDRX-CycleStartOffset	sf40	sf1280	
shortDRX	disable	disable	

Table A.7.3.5.1-4: TimeAlignmentTimer -Configuration for E-UTRAN FDD out-of-sync testing

Field	Test1 Value	Test2 Value	Comment
TimeAlignmentTimer	infinity	infinity	As specified in section 6.3.2 in 3GPP TS 36.331
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and section10.1 in 3GPP TS 36.213.

303





### 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 the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

In test 1 the UE shall stop transmitting uplink signal no later than time point C (duration  $D_1 = 900$  ms after the start of time duration T3).

In test 2 the UE shall stop transmitting uplink signal no later than time point C (duration  $D_1 = 6500$  ms after the start of 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.

Parameter		Parameter 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-UTRĂ RF Channel Number			1	One E-UTRA FDD carrier frequency is used.	
E-UTRA Channel Ban		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 periodic	ity	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		
				out of sync transmission 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	T1 T2 T3 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			0			
PHICH_RB	dB						
PDSCH_RA	dB						
PDSCH_RB	dB	1					
OCNG_RA <sup>Note1</sup>	dB	4					
OCNG_RB <sup>Note1</sup>	dB						
SNR Note 8	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	I such that the	resources in	cell # 1 are f	ully allocated	and a consta	int total	
transmitted power sp							
Note 2: The uplink resources							
Note 3: The timers and layer T1.	3 filtering rela	ated paramete	ers are config	ured prior to	the start of tir	ne period	
Note 4: The signal contains	PDCCH for UE	Es other than	the device ur	nder test as p	art of OCNG		
Note 5: SNR levels correspo							
Note 6: The SNR in time per	iods T1, T2, T	3, T4 and T5	is denoted as	s SNR1, SNF	2, SNR3, SN	IR4 and	
SNR5 respectively in	n figure A.7.3.6	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	

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.

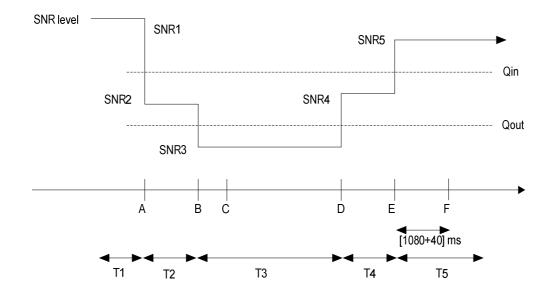


Figure A.7.3.6.1-5 SNR variation for in-sync testing in DRX

### 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 period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the subframe according to the configured CQI reporting mode (PUCCH 1-0).

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	nc tests in DRX

Parameter		Unit	Va	lue	Comment
			Test 1	Test 2	
PCFICH/PDCCH/PHICH parameters			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> )		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	transmission Control OFDM		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-
	$\rho_A, \rho_B$		-3	0	1 respectively.
	Ratio of PDCCH to RS EPRE	dB	1	4	
	Ratio of PCFICH to RS EPRE	dB	1	4	
DRX cycle		ms	40	1280	See Table A.7.3.7.1-3
Layer 3 filterin	g		Enabled	Enabled	Counters: N310 = 1; N311 = 1
T310 timer		ms	0	0	T310 is disabled
T311 timer		ms	1000	1000	T311 is enabled
Periodic CQI reporting mode			PUCCH 1-0	PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.
CQI reporting periodicity		ms	1	1	Minimum CQI reporting periodicity
Propagation cl	Propagation channel		ETU 70 Hz	AWGN	
T1		S	4	32	
T2		S	1.6	12.8	
Т3		S	1.8	13	
	CCH/PCFICH cor included in the R				ission parameters need not

Parameter	Unit	Test 1			Test 2			
		T1	T2	Т3	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 configuration Note1		6				6		
Uplink-downlink configuration <sup>Note2</sup>			1			1		
OCNG Pattern								
defined in A.3.2.2			OP.2 TDD			OP.2 TDD	<b>`</b>	
(TDD)			UP.2 IDD			UP.2 IDL	)	
( )			-3			0		
ρ <sub>Α</sub> , ρ <sub>Β</sub> PCFICH_RB	dB		 1			4		
PDCCH_RA	dB		-3			0		
PDCCH_RB	dB		-3			0		
PBCH RA	dB		-3			0		
PBCH_RB	dB	-						
PSS_RA	dB							
SSS_RA	dB	-3			0			
PHICH_RA	dB							
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 <sub>oc</sub>	dBm/15		-98			-98		
1 V oc	kHz							
Propagation condition		ETU 70 Hz AWGN						
Note 1: For the spec	ial subframe co	onfiguratio	n see table	4.2-1 in 30	GPP TS 36	5.211.		
	k-downlink cor							
	be used such						constant	
	total transmitted power spectral density is achieved for all OFDM symbols.							
Note 4: The uplink resources for CQI reporting are assigned to the UE prior to the start of time period T1.								
Note 5: The timers a period T1.	nd layer 3 filter	ring relate	d paramete	rs are conf	igured prio	r to the sta	irt of time	
	ontains PDCCI	H for UEs	other than t	he device	under test	as part of (	OCNG.	
	correspond to t							
Note 8: The SNR in	time periods T in figure A.7.3.		T3 is denot	ed as SNR	1, SNR2 a	nd SNR3		

# 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	

310

Field	Test1 Test2		Comment	
i leid	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

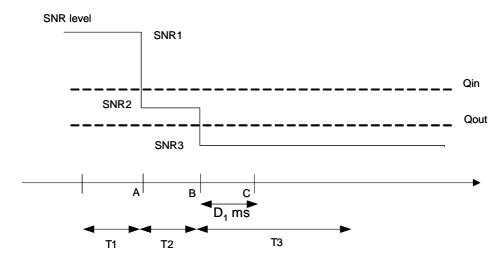


Figure A.7.3.7.1-5 SNR variation for out-of-sync testing in DRX

#### 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 the period from time point A to time point B the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe according to the configured CQI reporting mode (PUCCH 1-0).

In test 1 the UE shall stop transmitting uplink signal no later than time point C (duration  $D_1 = 900$  ms after the start of time duration T3).

In test 2 the UE shall stop transmitting uplink signal no later than time point C (duration  $D_1 = 6500$  ms after the start of 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	Parameter		Value	Comment	
PCFICH/PDCCH/PHIC	CH parameters		R.6 TDD	As specified in section A.3.1.2.2. None of the PDCCH are intended for the UE under test	
OCNG parameters			OP.2 TDD	As specified in section A.3.2.2.2.	
Active cell			Cell 1	Cell 1 is on E-UTRA RF channel number 1	
CP length			Normal		
E-UTRA RF Channel N	Number		1	One E-UTRA TDD carrier frequency is used.	
E-UTRA Channel Ban		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.7.3.8.1-3	
Layer 3 filtering			Enabled	Counters: N310 = 1; N311 = 1	
T310 timer		ms	2000	T310 is enabled	
T311 timer		ms	1000	T311 is enabled	
Periodic CQI reporting mode			PUCCH 1-0	As defined in table 7.2.2-1 in TS 36.213.	
CQI reporting periodicity		ms	1	Minimum CQI reporting periodicity	
Propagation channel			AWGN		
T1		S	4		
T2		S	1.6		
T3	S	1.46			
T4		S	0.4		
T5		S	4		
				out of sync transmission 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	Т3	T4	T5				
E-UTRA RF Channel Number		1								
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						
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									
PHICH_RA	dB	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	-5.1	-9.1	-13.1	-9.1	-5.1				
N <sub>oc</sub>	dBm/15			-98	•	•				
1 V oc	kHz									
Propagation condition				AWGN						
Note 1: For the special subfi	ame configura	tion see table	e 4.2-1 in 3G	PP TS 36.211	1.					
Note 2: For the uplink-down										
Note 3: OCNG shall be used	I 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.						
T1.										
	Note 6: The signal contains PDCCH for UEs other than the device under test as part of OCNG.									
Note 7: SNR levels corresp										
Note 8: The SNR in time per			is denoted a	s SNR1, SNR	2, SNR3, SN	IR4 and				
SNR5 respectively in	n figure A.7.3.8	3.1-5.		SNR5 respectively in figure A.7.3.8.1-5.						

## 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.

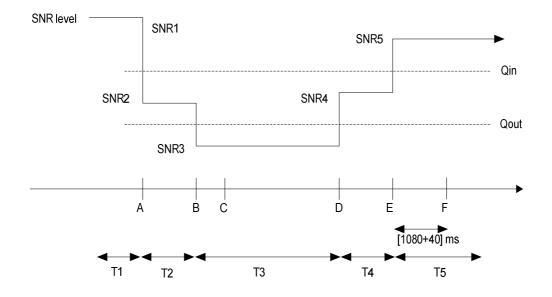


Figure A.7.3.8.1-5 SNR variation for in-sync testing in DRX

#### 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 period from time point A to time point F (1120 ms after the start of time duration T5) the UE shall transmit uplink signal at least once every DRX cycle, in the On-duration part of the cycle in the uplink subframe according to the configured CQI reporting mode (PUCCH 1-0).

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 Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel		1	One FDD carrier frequency is used.
Number			
Channel Bandwidth	MHz	10	
(BW <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	2.2 FDD	
(OP.1 FDD) and in						
A.3.2.1.2 (OP.2 FDD)						
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB		_		•	
PHICH_RA	dB	(	)		0	
PHICH_PB	dB					
PDCCH_RA	dB					
PDCCH_PB	dB	1				
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	-1.46	-Infinity	-1.46	
$N_{oc}$ Note 3	dBm/15 KHz			-98		
$\hat{E}_{s}/N_{oc}$	dB	4	4	-Infinity	4	
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94	
Propagation Condition			E	TU70		
Note 1: OCNG shall be used			ted and a consta	nt total transmitted	power spectral	
density is achieved					1.70	
Note 2: The resources for up						
Note 3: Interference from ot		•				
subcarriers and tim	e and shall be mo	delled as AWGN o	of appropriate pov	ver for $N_{_{oc}}$ to be	e fulfilled.	
Note 4: RSRP and SCH_RF settable parameters		derived from othe	er parameters for	information purpo	ses. 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

317

The test parameters are given in Table A.8.1.2.1-1 and A.8.1.2.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. PDCCHs indicating new transmissions or retransmissions should be sent continuously to ensure that the UE would not enter the DRX state. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

#### Table A.8.1.2.1-1: General test parameters for E-UTRAN FDD-FDD intra-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel		1	One FDD carrier frequency is used.
Number			
Channel Bandwidth	MHz	10	
(BW <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	

Parameter	Unit	Cell 1		C	ell 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
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	-1.46	-Infinity	-1.46
$N_{oc}^{}$ Note 3	dBm/15 KHz			-98	
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	4
RSRP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
SCH_RP Note 4	dBm/15 KHz	-94	-94	-Infinity	-94
Propagation Condition			E	TU70	
Note 1: OCNG shall be used achieved for all OF Note 2: The resources for u	DM symbols. plink transmission are a	assigned to the U	E prior to the star	t of time period T2.	
Note 3: Interference from ot	her cells and noise sou	rces not specified	d in the test is ass	sumed to be constant	nt over subcarriers

## 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

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.8.1.2.2 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	Parameter Unit Value		Comment	
		Test 1	Test 2	
PDSCH parameters		DL Reference Me		As specified in section A.3.1.1.1
		Channel R.0 FDI		
PCFICH/PDCCH/PHICH		DL Reference Me		As specified in section A.3.1.2.1
parameters		Channel R.6 FDI	)	
Active cell		Cell 1		
Neighbour cell		Cell 2		Cell to be identified.
E-UTRA RF Channel		1		One FDD carrier frequency is used.
Number				
Channel Bandwidth	MHz	10		
(BW <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	ll 1	C	cell 2	
		T1	T1 T2		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				
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					
$\mathbf{\hat{E}}_{s}/\mathbf{I}_{ot}$	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 <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-Infinity	-94	
Propagation Condition				ETU70		
Note 1: OCNG shall be used achieved for all OF Note 2: Interference from ot	DM symbols.	·	and a constant to	tal transmitted powe		
	be modelled as AWGI					
Note 3: RSRP and SCH_RF parameters themse	Plevels have been der				hey are not settable	

#### 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
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	

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	-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 Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87		
Propagation Condition		AWGN							
Note 1: OCNG shall be used suc		fully allocated	l and a consta	nt total transn	nitted power s	pectral densit	y 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.									

#### 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	<u> </u>	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						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
$N_{oc}$ Note 2	dBm/15 KHz			-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 Note3	dBm/15 KHz	-90	-90	-90	-Infinity	-87	-87
Propagation Condition				AW	GN		
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. 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 lev	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
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	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	II 1	C	cell 2	
		T1	T1 T2		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	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 Note 4	dBm/15 kHz	-94	-94	-Infinity	-94	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	-1.46	-Infinity	-1.46	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-94	
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	4	
Propagation Condition			Ē	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. Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers						
and time and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be fulfilled.						
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.						

#### A.8.2.1.2 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.

328

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	Va	lue	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 <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		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	Ce	ell 1	C	ell 2	
		T1	T1 T2		T2	
E-UTRA RF Channel			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 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 Note 3	dBm/15 kHz	-94	-94	-Infinity	-94	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	-1.46	-Infinity	-1.46	
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-94	
$\hat{E}_s / N_{oc}$	dB	4	4	-Infinity	4	
Propagation Condition						
Note 1: OCNG shall be used achieved for all OF Note 2: Interference from ot	DM symbols.		and a constant to	tal transmitted powe		
	be modelled as AWGN					
Note 3: RSRP and SCH_RF parameters themse	Plevels have been der		00		hey are not settable	

 
 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 Value	Test2 Value	Comment
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 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 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	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.3.2.2.1 (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									

332

$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36
N <sub>oc</sub> 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	
Τ2	S	≤30	UE should report cell within 25.6s (20 DRX cycles)
ТЗ	S	5	

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									
$\hat{E}_{s}/I_{ot}$	dB	8	-3.3	-3.3	-Infinity	2.36	2.36			
$N_{oc}$ Note 2	dBm/15 KHz			-9	98					
$\hat{E}_s/N_{oc}$	dB	8	8	8	-Infinity	11	11			
	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 sur achieved for all OFDM Note 2: Interference from other of	symbols.						-			
and shall be modelled a	as AWGN of appropri	iate power for	$N_{oc}$ to be fu	ulfilled.						
Note 3: RSRP and SCH_RP lev	els have been derive		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.8.2.4.1-2: Cell specific test parameters for E-UTRAN TDD - TDD Intra-frequency identification of a new CGI of E-UTRA cell using autonomous gaps with DRX

 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	

MHz	T1	<b>T2</b>		<b>T2</b>		
MHz				2		
MHz	,	0				
MHz		0				
			-	10		
	OP.1	FDD	OP.2	2 FDD		
-						
-						
-						
-						
-	0 0					
-						
-						
-						
-						
-						
dBm/15 kHz			-98			
dBm/15 kHz	-94	-94	-Infinity	-91		
dB	4	4	-Infinity	7		
dBm/15 kHz	-94	-94	-Infinity	-91		
dB	4	4	-Infinity	7		
			ETU70			
0M symbols. link transmission are a	ssigned to the U	E prior to the sta	rt of time period T2.			
	dB dBm/15 kHz dB such that both cells ar M symbols. ink transmission are a er cells and noise sour	dB         dB	dB         dB	dB         dB		

## 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

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.

337

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 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		Channel R.6 FDD	)	
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	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	(	)	
CP length		Normal		
TimeToTrigger	S	(	)	
Filter coefficient		(	)	L3 filtering is not used
PRACH configuration		4	1	As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not	Sent	No additional delays in random access
, i i i i i i i i i i i i i i i i i i i				procedure.
DRX		ON		DRX related parameters are defined in
				Table A.8.3.2.1-3
Time offset between cells		3 ו	ns	Asynchronous cells
T1	S	Ļ	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

Parameter	Unit	Cell 1		C	Cell 2		
		T1 T2		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	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 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	opagation Condition ETU70						
Note 1: OCNG shall be used achieved for all OF Note 2: Interference from ot	DM symbols.						
and time and shall	be modelled as AWGN	of appropriate po	wer for $N_{oc}$ to	be fulfilled.			
Note 3: RSRP and SCH_RF parameters themse	P levels have been deriv		00		hey are not settable		

# 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

# 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

Test1	Test2	Comment				
Value	Value					
psf1	psf1					
psf1	psf1					
psf1	psf1					
sf40	sf1280					
shortDRX disable disable						
	Value           psf1           psf1           psf1           sf1	Value         Value           psf1         psf1           psf2         psf1				

# 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 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 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	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 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

Number         Image: mark terms         MHz         10         10           OCNG Patterns         defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)         OP.1 FDD         OP.2 FDD           PBCH_RA         dB         DPSC_RA         dB         OP.1 FDD         OP.2 FDD           PBCH_RB         dB         PSS_RA         dB         OP.1 FDD         OP.2 FDD           PBCH_RB         dB         PSS_RA         dB         OP.1 FDD         OP.2 FDD           PBCH_RA         dB         OP.1 FDD         OP.2 FDD         OP.2 FDD           PBCH_RA         dB         OP.1 FDD         OP.2 FDD         OP.2 FDD           PBCH_RA         dB         OP.1 FDD         OP.2 FDD         OP.2 FDD           PS_RA         dB         OP.2 FDD         OP.2 FDD         OP.2 FDD           SSS_RA         dB         OP.2 FDD         OP.2 FDD         OP.2 FDD           SSS_RA         dB         OP.2 FDD         OP.2 FDD         OP.2 FDD           OCNG_RAM         dB         OP.2 FDD         OP.2 FDD         OP.2 FDD           OCNG_RANORE1         dB         OP.2 FDD         OP.2 FDD         OP.2 FDD           OCNG_RANORE1         dB         OP.2 FDD         OP.2 FDD<	Parameter	Unit	Ce	ll 1	(	Cell 2		
NumberMHz1010BW channelMHz1010OCNG Patterns defined in A.3.2.1.1 (DP.1 FDD) and in A.3.2.1.2 (DP.2 FDD)OP.1 FDDOP.2 FDDPBCH_RAdBdBPBCH_RAdBBPSS_RAdBBPSS_RAdBOP.1 FDDOP.2 FDDPBCH_RBdBOP.1 FDDOP.2 FDDPBCH_RAdBOOPDCH_RBdBOOPDCCH_RBdBOOPDCCH_RAdBOOPDSCH_RBdBOOOCNG_RANDE1dBA4 $\frac{1}{2}, / I_{ot}$ dB44 $N_{oc}$ dB44 $\frac{1}{2}, N_{oc}$ dB44RSRP Note 3dBm/15 KHz-94-94Propagation ConditionMGNA-74Note 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.AWGNNote 1: Interference from other cells are 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			T1	T2	T1	T2		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	E-UTRA RF Channel			1	2			
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Number							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	BW <sub>channel</sub>	MHz	1	0		10		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	OCNG Patterns							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	defined in A.3.2.1.1			EDD				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	(OP.1 FDD) and in		01.1			.2100		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	A.3.2.1.2 (OP.2 FDD)							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PBCH_RA	dB						
$\frac{SS_RA}{PCFICH_RB} \ dB \ PCFICH_RB \ dB \ PHICH_RA \ dB \ PHICH_RA \ dB \ PHICH_RB \ dB \ PDCCH_RA \ dB \ PDCCH_RB \ dB \ dB \ dA \ dA \ dA \ dA \ dA \ d$	PBCH_RB	dB						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PSS_RA	dB						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	SSS_RA	dB						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PCFICH_RB	dB						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PHICH_RA	dB						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PHICH_RB	dB	1 0 0			0		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PDCCH_RA	dB						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PDCCH_RB	dB						
$\begin{array}{c c c c c c c c c }\hline OCNG_RA^{Note 1} & dB & \\\hline OCNG_RB^{Note 1} & dB & \\\hline DCNG_RB^{Note 1} & dB & \\\hline OCNG_RB^{Note 2} & dBm/15 \ KHz & -98 & \\\hline \hline N_{oc} & & \\\hline N_{oc} & & \\\hline CNC $	PDSCH_RA	dB						
$\begin{array}{c c c c c c c c c } \hline OCNG_RB^{Note 1} & dB & & & & & & & & & & & & & \\ \hline \hat{E}_s/I_{ot} & & & & & & & & & & & & & & & & & & &$	PDSCH_RB	dB						
$\begin{array}{c c c c c c c c c } \hline OCNG_RB^{Note 1} & dB & & & & & & & & & & & & & \\ \hline \hat{E}_s/I_{ot} & & & & & & & & & & & & & & & & & & &$	OCNG_RA <sup>Note 1</sup>	dB						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	OCNG_RB <sup>Note 1</sup>	dB						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4	4	24		
Ls / Note 3       dBm/15 KHz       -94       -94       -94       -74         RSRP Note 3       dBm/15 KHz       -94       -94       -94       -74         SCH_RP Note 3       dBm/15 KHz       -94       -94       -74         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	$N_{_{oc}}$ Note 2	dBm/15 KHz			-98			
RSRP       Note 3       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 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	$\hat{E}_s/N_{oc}$	dB	4	4	4	24		
SCH_RP       Note 3       dBm/15 KHz       -94       -94       -94       -74         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.       AWGN         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	RSRP <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-94	-74		
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	SCH_RP <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-94	-74		
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	Propagation Condition AWGN							
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable								
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable								
			weu nom other pa		mation pulposes.	mey are not settable		

# 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	
Т3	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						
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4	4	-Infinity	7	7
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							
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 SCH_RP levels have been derived from other parameters for information purposes. 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		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	
Τ2	S	≤30	UE should report cell within 25.6s (20 DRX cycles)
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.3.2.1.1 (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	4	4	4	-Infinity	7	7
N <sub>oc</sub> 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							
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.8.3.5.1-2: 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.

347

#### A.8.3.5.2 Test Requirements

The UE shall transmit a measurement report containing the cell global identifier of cell 2 within [170] milliseconds from the start of T3.

Test requirement = RRC Procedure delay +  $T_{identify CGI, inter}$  + reporting delay

= 15 + [150] + 2ms from the start of T3

= [167] ms, allow [170] ms.

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

#### A.8.4 E-UTRAN TDD - TDD Inter-frequency Measurements

# A.8.4.1 E-UTRAN TDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

#### A.8.4.1.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event. This test will partly verify the TDD-TDD inter-frequency cell search requirements in section 8.1.2.3.4.

The test parameters are given in Table A.8.4.1.1-1 and A.8.4.1.1-2 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event A3 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. During time duration T1, the UE shall not have any timing information of cell 2.

### Table A.8.4.1.1-1: General test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
		DL Reference Measurement	
PDSCH parameters		Channel R.0 TDD	As specified in section A.3.1.1.2
		DL Reference Measurement	
PCFICH/PDCCH/PHICH		Channel R.6 TDD	As specified in section A.3.1.2.2
parameters			
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
CP length		Normal	
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are used.
Channel Bandwidth (BWchannel)	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	

Parameter	Unit	Ce	11	Ce	ll 2		
		T1	T2	T1	T2		
E-UTRA RF Channel		1		2	2		
Number							
BW <sub>channel</sub>	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				0		
PHICH_RB	dB	C		(			
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	-Infinity	7		
$N_{oc}$ Note 3	dBm/15 kHz			-98			
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91		
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-91		
$\hat{E}_s/N_{oc}$	dB	4 4 -Infinity 7					
Propagation Condition			E	TU70			
Note 2: The resources for uplink transmission are assigned to the UE priori to the start of time period T2.							
Note 3: Interference from ot	her cells and noise so	urces not specified	in the test is ass	umed to be constant	over subcarriers		
and time and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be fulfilled.							

## Table A.8.4.1.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Note 4: RSRP and SCH\_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.

#### A.8.4.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

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

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

NOTE: The actual overall delays measured in the test may be up to  $2xTTI_{DCCH}$  higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

# A.8.4.2 E-UTRAN TDD-TDD Inter-frequency event triggered reporting when DRX is used under fading propagation conditions in synchronous cells

#### A.8.4.2.1 Test Purpose and Environment

The purpose of these tests is to verify that the UE makes correct reporting of an event in DRX. These test will partly verify the TDD-TDD inter-frequency cell search requirements when DRX is used in section 8.1.2.3.

349

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
		Value		
PDSCH parameters		DL Reference Measurement		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	asurement	As specified in section A.3.1.2.2.
parameters		Channel R.6 TDD		
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		ŕ		As specified in 3GPP TS 36.211 section
configuration				4.2 Table 4.2-2
Special subframe		6	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	(	)	
CP length		Nor	mal	
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	Ę		
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

Parameter	Unit	Ce	1	C	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	TDD	OP	.2 TDD	
(OP.1 TDD) and in						
A.3.2.1.2 (OP.2 TDD)						
PBCH_RA	dB	-				
PBCH_RB	dB	-				
PSS_RA	dB	-				
SSS_RA	dB	-				
PCFICH_RB	dB			0		
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					
$N_{_{oc}}$ Note 2	dBm/15 kHz			-98		
RSRP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4	-Infinity	7	
SCH_RP Note 3	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{E}_{s}/N_{oc}$	dB	4	4	-Infinity	7	
Propagation Condition	ETU70					
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. 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	N of appropriate po	ower 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.8.4.2.1-2: Cell specific test parameters for E-UTRAN TDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

# 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 Value	Test2 Value	Comment
TimeAlignmentTimer	sf500	sf500	For further information see section 6.3.2 in 3GPP TS 36.331.
sr-ConfigIndex	0	0	For further information see section 6.3.2 in 3GPP TS 36.331 and 10.1 in 3GPP TS 36.213.

#### A.8.4.2.2 Test Requirements

In Test1 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 3840 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 20\*1280ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

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

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event A3 measurement report

#### A.8.4.3 E-UTRAN TDD-TDD inter-frequency event triggered reporting under AWGN propagation conditions in synchronous cells with DRX when L3 filtering is used

#### A.8.4.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event in DRX when L3 filtering is used. This test will partly verify the TDD-TDD inter-frequency cell search in DRX requirements in section 8.1.2.3.2.2 and the UE behaviour with the filterCoefficient defined in [2].

The test parameters are given in Tables A.8.4.3.1-1, A.8.4.3.1-2, A.8.4.3.1-3 and A.8.4.3.1-4. In the measurement control information, it is indicated to the UE that event-triggered reporting with Event A3 and the filter coefficient is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. In this test, there are two cells on different carrier frequencies and gap pattern configuration # 1 as defined in Table 8.1.2.1-1 is provided.

The uplink time 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 triggered reporting under AWGN propagation conditions with DRX when L3 filtering is used

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement	As specified in section A.3.1.1.2
		Channel R.0 TDD	
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.2
parameters		Channel R.6 TDD	
Active cell		Cell 1	
Neighbour cell		Cell 2	Cell to be identified.
E-UTRA RF Channel Number		1, 2	Two TDD carrier frequencies are
			used.
Channel Bandwidth (BW <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		1	As specified in table 4.2.2 in TS
of cells			36.211
Special subframe configuration		6	As specified in table 4.2.1 in TS
of cells			36.211
Neighbour A3-Offset Ofn	dB	-14	
CP length		Normal	
Hysteresis	dB	0	
Time To Trigger	S	0	
Filter coefficient		9	L3 filtering is used
DRX		ON	DRX related parameters are
			defined in Table A.8.4.3.1-3
T1	S	30	
T2	S	7	

	Parameter	Unit	C	Cell 1	C	ell 2
			T1	T2	T1	T2
E-UT	RA RF Channel Number		1		2	2
BW <sub>cha</sub>	annel	MHz	10		1	0
(C	G Patterns defined in A.3.2.2.1 OP.1 TDD) and in A.3.2.2.2 (OP.2 DD)		OP.1 TDD		OP.2 TDD	
PBCH	H_RA	dB				
PBCH	H_RB	dB				
PSS_	RA	dB				
SSS_	RA	dB				
PCFI	CH_RB	dB				
PHIC	H_RA	dB				
PHIC	H_RB	dB	(	0	0	
PDCC	CH_RA	dB				
PDCC	CH_RB	dB				
PDSC	CH_RA	dB	1			
PDSC	CH_RB	dB				
OCNO	G_RA <sup>Note 1</sup>	dB				
OCNO	 G_RB <sup>Note 1</sup>	dB				
$\hat{E}_{s}/I$	[ ot	dB	4	4	4	24
$N_{oc}$	Note 2	dBm/15 KHz		-?	-98	
$\hat{E}_s/\hat{E}_s$		dB	4	4	4	24
RSRF	Note 3	dBm/15 KHz	-94	-94	-94	-74
SCH_	_RP <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-94	-74
Propa	agation Condition				/GN	
Note 1: Note 2:	OCNG shall be used such that bo spectral density is achieved for all Interference from other cells and r	OFDM symbols.				-
	over subcarriers and time and sha	Il be modelled as	AWGN of ap	propriate po	wer for $N_{ac}$	to be
Note 3:	fulfilled. RSRP and SCH_RP levels have b are not settable parameters thems	een derived from				

# 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	
Т3	S	5	

Parameter	Unit		Cell 1			Cell 2	
		T1	T2	T3	T1	T2	Т3
E-UTRA RF Channel			1			2	
Number							
3W <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
n 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						
DCNG_RA <sup>Note 1</sup>	dB						
DCNG_RB <sup>Note 1</sup>	dB						
$\hat{E}_{s}/I_{ot}$	dB	4	4	4	-Infinity	7	7
Note 2	dBm/15 KHz			-	98		L
$\hat{E}_s / N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP <sup>Note 3</sup>	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
CH_RP <sup>Note3</sup>	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition			•	AV	/GN	•	•
Note 1: OCNG shall be used so achieved for all OFDM Note 2: Interference from other	l symbols. cells and noise sourc	es not specifi	ed in the test is	s assumed to			
and shall be modelled	as AWGN of appropri	ate power for	$N_{oc}$ 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

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.3.2.2.1 (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
$N_{oc}$ Note 2	dBm/15 KHz	-98					
$\hat{E}_s/N_{oc}$	dB	4	4	4	-Infinity	7	7
RSRP Note 3	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
SCH_RP <sup>Note3</sup>	dBm/15 KHz	-94	-94	-94	-Infinity	-91	-91
Propagation Condition				AW	GN		•
Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time							
and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be fulfilled.							
Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

#### Table A.8.4.5.1-2: 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

 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	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		
$\hat{E}_s/N_{oc}$	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		ETUZ			
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_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 co	1: The DPCH level is controlled by the power control loop.				
Note 2: The power of the OC	CNS channel that is added shall make the total power from the cell to be equal				
to l <sub>or</sub> .	to I <sub>or</sub> .				

#### 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.
		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			
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 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				
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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		AWO			
Note 1:         OCNG shall be used spectral density is acl           Note 2:         The resources for upl	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The 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 is assumed to be constant				
		•			
fulfilled.	rriers and time and shall be modelled as AWGN of appropriate power for $N_{oc}$ to be s have been derived from other parameters for information purposes. They are not rameters themselves.				

## 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 OC	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 Measurement		As specified in section A.3.1.1.1 Note that
UTRAN FDD)		Channel R.0 FDD	)	UE may only be allocated at On Duration
PCFICH/PDCCH/PHICH		DL Reference Me		As specified in section A.3.1.2.1.
parameters (E-UTRAN FDD)		Channel R.6 FDD	)	
Gap Pattern Id		(	)	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Ce	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				One E-UTRA FDD carrier frequency is
Number				used.
E-UTRA Channel Bandwidth	MHz	1	0	
(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		
TimeToTrigger	S	(		
Filter coefficient		(		L3 filtering is not used
PRACH configuration		4		As specified in table 5.7.1-2 in TS 36.211
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table A.8.5.3.1-3
Monitored UTRA FDD cell		12		UTRA cells on UTRA RF channel 1
list size		12		provided in the cell list.
T1	S	Ę	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	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	7				
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	8			
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		ETU	70			
Note 1: OCNG shall be used	such that both c	ells are fully allocated and a con	stant 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		els have been derived from other parameters for information purposes.				
They are not settable	parameters ther	nselves.				

#### 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	

INTSEE SECTOR 0.3.2 IN SUPPLIES 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 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 section10.1 in 3GPP TS 36.213.

## Table A.8.5.3.1-5: Cell specific test parameters for UTRAN FDD (cell # 2) for event triggered reporting of UTRAN FDD cell when DRX is used under fading propagation conditions

Parameter	Unit	Cell 2			
		T1	T2		
UTRA RF Channel Number		1			
CPICH_Ec/lor	dB	-10			
PCCPCH_Ec/lor	dB	-12			
SCH_Ec/lor	dB	-12			
PICH_Ec/lor	dB	-15			
DPCH_Ec/lor	dB	N/A			
OCNS		-0.94	1		
$\hat{I}_{or}/I_{oc}$	dB	-Infinity -1.8			
I <sub>oc</sub>	dBm/3.84 MHz	-70			
CPICH_Ec/lo	dB	-Infinity -14			
Propagation Condition		Case 5 (Note 3)			
Note 2: The power of the OC	power of the OCNS channel that is added shall make the total power from the cell to be equal				
to I <sub>or</sub> .	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 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 UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA FDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW <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	
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				
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	7			
OCNG_RB <sup>Note 1</sup>	dB				
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4		
Note 3	dBm/15 kHz	-98	3		
$\hat{E}_s/N_{oc}$	dB	4	4		
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94		
SCH_RP	dBm/15 kHz	-94	-94		
Propagation Condition		AWO			
Note 1:         OCNG shall be used spectral density is ac           Note 2:         The resources for upl	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The resources for uplink transmission are assigned to the UE prior to the start of time period T2.				
over subcarriers and	ers and time and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be				
fulfilled. Note 4: RSRP levels have be					

## 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 c	ontrolled by the p	ower control loop.				
Note 2: The power of the OC	CNS 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	Ec/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 Channel R.0 TDD	As specified in section A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2.
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
Special subframe configuration		6	As specified in table 4.2-1 in 3GPP TS 36.211. Applicable to cell 1.
Uplink-downlink configuration		1	As specified in table 4.2-2 in 3GPP TS 36.211. Applicable to cell 1.
CP length		Normal	Applicable to cell 1.
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW <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 T	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			
$\hat{E}_s/N_{oc}$	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		ETU7				
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	2			
		T1	T2			
UTRA RF Channel Number		1				
CPICH_Ec/lor	dB	-10				
PCCPCH_Ec/lor	dB	-12				
SCH_Ec/lor	dB	-12				
PICH_Ec/lor	dB	-15				
DPCH_Ec/lor	dB	N/A				
OCNS		-0.94	1			
$\hat{I}_{or}/I_{oc}$	dB	-Infinity -1.8				
I <sub>oc</sub>	dBm/3.84 MHz	-70				
CPICH_Ec/lo	dB	-Infinity	-14			
Propagation Condition		Case 5 (Note 3)				
	The DPCH level is controlled by the power control loop.					
Note 2: The power of the OC	CNS 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						

#### 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 Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Active cell		Cell 1	E-UTRA TDD cell
Neighbour cell		Cell 2	UTRA 1.28Mcps TDD Cell
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
CP length of cell 1		normal	
Hysteresis	dB	0	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	
Time offset between cells		3 ms	Asynchronous cells
Ofn	dB	0	
Thresh	dBm	-87	
T1	S	5	
T2	S	10	

## Table A.8.7.1.1.2-1: 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	ll 1		
		T1	T2		
E-UTRA RF Channel		1			
Number					
<b>BW</b> <sub>channel</sub>	MHz	1	0		
OCNG Pattern defined in		OP 1	TDD		
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	Propagation Condition ETU70				
Note 1: OCNG shall be	used such that ce	Il is fully allocat	ted and a		
constant total tra	ansmitted power s	pectral density	is achieved		
for all OFDM symbols.					
	or uplink transmis		ed to the UE		
prior to the start	of time period T2.				

Parameter	Unit		Cell 2	(UTRA)	
Timeslot Number	•	0 DwPT		PTS	
		T1	T2	T1	T2
UTRA RF Channel Number <sup>NOTE1</sup>			Char	nel 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
		Value		
PDSCH parameters		DL Reference Me	easurement	As specified in section A.3.1.1.2. Note that
		Channel R.0 TDD	)	UE may only be allocated at On Duration
PCFICH/PDCCH/PHICH		DL Reference 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 configuration		1		As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
Special subframe		6		As specified in table 4.2-1 in TS 36.211.
configuration				The same configuration in both cells
PRACH configuration		53		As specified in table 5.7.1-3 in 3GPP TS 36.211
CP length of cell 1		Normal		
Ofn	dB	0		
Thresh	dBm	-83		Absolute P-CCPCH RSCP threshold for event B1
Hysteresis	dB	0		
TimeToTrigger	S	0		
Filter coefficient		0		L3 filtering is not used
Access Barring Information	-	Not Sent		No additional delays in random access procedure.
DRX		ON		DRX related parameters are defined in Table A.8.4.2.1-3
Time offset between cells		3 ms		Asynchronous cells
T1	S	5		
T2	S	8	30	

Pa	arameter	Unit	Ce	ell 1	
			T1	T2	
E-UTRA	RF Channel			1	
Number					
BWchan		MHz	10		
	atterns defined		OP.1	TDD	
	.1 (OP.1 TDD)				
PBCH_R		dB			
PBCH_R	В	dB			
PSS_RB		dB			
SSS_RB		dB			
PCFICH_		dB			
PHICH_F		dB			
PHICH_F		dB	0	0	
PDCCH_		dB			
PDCCH_		dB			
PDSCH_		dB			
PDSCH_		dB			
OCNG_R		dB			
OCNG_R	BNote1	dB			
$\hat{E}_{s}/I_{ot}$		dB	4	4	
$\hat{E}_s/N_{oc}$		dB	4	4	
	e 2	dBm/15kHz	-{	98	
RSRP		dBm/15kHz	-94	-94	
SCH_RP	Note 3	dBm/15kHz	-94	-94	
Propagat	ion Condition		ET	U70	
Note 1:		used such that cel	l is fully alloca	ted and a	
	constant total transmitted power spectral density is achieved for all OFDM symbols.				
Note 2:					
	in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power				
	time and shall be	e modelled as AW	GN of approp	riate power	
	$N_{ac}$	16111			
Note 2:	for $N_{oc}$ to be fulfilled. RSRP and SCH_RP levels have been derived from other				
Note 3:					
		nformation purpos	es. They are n	ioi settable	
	parameters then	ISEIVES.			

# 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	Parameter Unit			Cell 2 (l	JTRA)	
Timeslot	Number			0	DwPTS	
			T1	T2	T1	T2
UTRA RF Number N	Channel NOTE1			Chanr	nel 2	
PCCPCH	_Ec/lor	dB	-3	-3		
DwPCH_		dB			0	0
OCNS_E	c/lor <sup>NOTE2</sup>	dB	-3	-3		
$\hat{I}_{or}/I_{oc}$		dB	-inf	9	-inf	9
I <sub>oc</sub>		dBm/1.28 MHz	-80			
PCCPCH	RSCP	dBm	-inf	-74	n.a.	n.a.
Propagati Condition			Case 3 <sup>NOTE3</sup>			
Note 1:	Note 1: In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number.					
Note 2:						
Note 3:	Case 3 propa TS 25.102	agation condition	ns are de	fined in An	nex B of	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 Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Gap Pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell		Cell 2	Cell 2 is on UTRA RF channel number 1.
CP length		Normal	Applicable to cell 1
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier frequency is used.
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
E-UTRA Channel Bandwidth (BW <sub>channel</sub> )	MHz	10	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
Inter-RAT (UTRA TDD) measurement quantity		P-CCPCH RSCP	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		None	No explicit neighbour list is provided to the UE
T1	S	>5	During T1, cell 2 shall be powered off, and during the off time the primary scrambling code shall be changed, The intention is to ensure that cell 2 has not been detected by the UE prior to the start of period T2.
T2	S	14	

Parameter	Unit	Cel	1
		T1	T2
E-UTRA RF Channel Number		1	
BW <sub>channel</sub>	MHz	1	0
OCNG Patterns defined in		OP.1	חחד
A.3.2.2.1 (OP.1 TDD)		UF.1	סטו
PBCH_RA	dB		
PBCH_RB	dB		
PSS_RA	dB		
SSS_RA	dB		
PCFICH_RB	dB		
PHICH_RA	dB		
PHICH_RB	dB	C	)
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
$N_{oc}^{}$ 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           Note 2:         The resources for upl of time period T2.           Note 3:         Interference from other	er spectral densi ink transmission er cells and noise	ells are fully allocated ty is achieved for all C are assigned to the U	and a constant FDM symbols. IE prior to the start d in the test is
AWGN of appropriate	00		
Note 4: RSRP levels have be purposes. They are n			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		Ce	ll 2	
		T1 T2		2	
UTRA RF Channel number Note2		Channel 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.			n.a.
Io Note1	dBm/1.28MHz	Iz -Infinity -70.88			).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-freque				RA RF Ch	annel
Number can be set for the	e primary frequenc	cy 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.8.7.4 E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

#### A.8.7.4.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct enhanced reporting of UTRAN TDD cells. This test will partly verify the Enhanced UTRA TDD cell identification requirements in section 8.1.2.4.3.1.1a under AWGN propagation conditions.

The test parameters are given in Tables A.8.7.4.1-1, A.8.7.4.1-2 and A.8.7.4.1-3 below. The test consists of two successive time periods of T1 and T2 respectively. During time period T1, measurement gaps are activated and an inter-RAT measurement reporting configuration is configured with linkage to a UTRA measurement object corresponding to UARFCN channel number 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 T2.

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 UTRA RF channel number 1.
Time offset between cells	ms	3	Asynchronous cells
E-UTRA RF Channel Number		1	One E-UTRA TDD carrier
			frequency is used.
E-UTRA Channel Bandwidth (BW <sub>channel</sub> )	MHz	10	
CP length		Normal	Applicable to cell 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
UTRA RF Channel Number		1	One UTRA TDD carrier frequency is used.
Inter-RAT (UTRA TDD) measurement quantity		P-CCPCH RSCP	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		None	No explicit neighbour list is provided to the UE
T1	S	5	
T2	S	2	

#### Table A.8.7.4.1-1: General test parameters for E-UTRAN TDD - UTRAN TDD enhanced cell identification under AWGN 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	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		
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4
Noc Note 3	dBm/15 kHz	-98	8
$\hat{E}_{s}/N_{oc}$	dB	4	4
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94
SCH_RP	dBm/15 kHz	-94	-94
Propagation Condition		AWO	GN
Note 1: OCNG shall be used spectral density is acl		ells are fully allocated and a cons	stant total transmitted power
Note 2: The resources for upl	ink transmission	are assigned to the UE prior to t	
Note 3: Interference from othe	er cells and nois	e sources not specified in the tes	st is assumed to be constant
over subcarriers and	time and shall be	e modelled as AWGN of appropr	iate power for $N_{_{oc}}$ to be
fulfilled.			
Note 4: RSRP levels have be settable parameters t		other parameters for information	purposes. They are not

## Table A.8.7.4.1-2: Cell specific test parameters for cell 1 in E-UTRAN TDD - UTRAN TDD enhanced cell identification test under AWGN propagation conditions

 Table A.8.7.4.1-3: Cell specific test parameters for cell 2 in E-UTRAN TDD - UTRAN TDD enhanced cell identification test under AWGN propagation conditions

Parameter	Unit Cell 2 (UTRA			FRA TDD)	
Timeslot Number		0 DwPT		PTS	
		T1	T2	T1	T2
UTRA RF Channel Number <sup>Note1</sup>			Char	nnel 1	
P-CCPCH_Ec/lor	dB	-4.77	-4.77		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor <sup>Note2</sup>	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8
I <sub>oc</sub>	dBm/1.28 MHz	z -80			
P-CCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.
P-CCPCH_Ec/Io Note3	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io Note3	dB	dB n.a. n.ainf		-inf	-0.64
Propagation Condition		AWGN			
channel number.	In the case of multi-frequency cell, the UTRA RF Channel Number is the primary frequency's channel number. 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: P-CCPCH RSRP, PCCPCH parameters for information p		-			other

### A.8.7.4.2 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 1120 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 measurement reports 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.8.8 E-UTRAN FDD – GSM Measurements

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### 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 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 (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	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		
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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		AWG	
		ells are fully allocated and a cons	stant total transmitted power
spectral density is ac			
Note 2: The resources for up	ink transmission	are assigned to the UE prior to t	he 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		AF	RFNC 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
		Va	lue	
PDSCH parameters (E-		DL Reference Me		As specified in section A.3.1.1.1.
UTRAN FDD)		Channel R.0 FDD		
PCFICH/PDCCH/PHICH		DL Reference Me		As specified in section A.3.1.2.1.
parameters (E-UTRAN FDD)		Channel R.6 FDD	)	
Gap Pattern Id			)	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Ce	1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cell				Cell 2 is on Absolute RF Channel Number 1 (GSM cell)
CP length		Nor	mal	Applicable to cell 1
E-UTRA RF Channel			1	One E-UTRA FDD carrier frequency is
Number				used.
E-UTRA Channel Bandwidth	MHz	1	0	
(BW <sub>channel</sub> )				
Inter-RAT (GSM)		GSM Carrier RSSI		
measurement quantity				
B1-Threshold-GERAN	dBm	-8	30	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0		
TimeToTrigger	S		)	
Filter coefficient		(	)	L3 filtering is not used
PRACH configuration			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		0	N	DRX related parameters are defined in Table A.8.8.2.1-3
Monitored GSM cell list size		6 GSM neighb ARF	ours including	List of GSM cells provided before T2 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	Parameter Unit		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		AWG	
Note 1: OCNG shall be used spectral density is act		ells are fully allocated and a cons	stant total transmitted power
Note 2: Interference from othe	er cells and nois	e sources not specified in the tes	
Note 3: RSRP and SCH_RP I	evels have beer	e modelled as AWGN of appropri	
They are not settable	parameters ther	mseives.	

#### 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	

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		AF	RFNC 1
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

#### A.8.8.2.2 Test Requirements

In Test1 the UE shall send one Event B1 triggered measurement report including BSIC of cell # 2, with a measurement reporting delay less than 3120 ms from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE send the measurement report on PUSCH.

In Test2 the UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 42.8 seconds from the beginning of time period T2. The measurement reporting delay is defined as the time from the beginning of time period T2, to the moment when the UE starts to send preambles on the PRACH for scheduling request (SR) to obtain allocation to send the measurement report on PUSCH.

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

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

- NOTE 1: The actual overall delays measured in the test may be up to one DRX cycle higher than the measurement reporting delays above because UE is allowed to delay the initiation of the measurement reporting procedure to the next until the Active Time.
- NOTE 2: In order to calculate the rate of correct events the system simulator shall verify that it has received correct Event B1 measurement report

### A.8.8.3 E-UTRAN FDD – GSM event triggered reporting in AWGN with enhanced BSIC identification

#### A.8.8.3.1 Test Purpose and Environment

The purpose of this test is to verify that the UE makes correct reporting of an event when doing inter-RAT (GSM) measurements with enhanced BSIC identification. This test will partly verify the E-UTRAN FDD - GSM cell search requirements in section 8.1.2.4.5.1.2a

The test parameters are given in Tables A.8.8.3.1-1, A.8.8.1.1-2 and A.8.8.3.1-3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event B1 is used. The test consists of two successive time periods, with time duration of T1, and T2 respectively. Prior time duration T1, the UE shall not have any timing information of cell 2. During time period T1, gaps are activated and an interRAT measurement reporting configuration is configured, and linked to a GSM measurement object including channel ARFCN 1. Cell 2 is powered up at the beginning of T2.

## Table A.8.8.3.1-1: General test parameters for E-UTRAN FDD-GSM event triggered reporting in AWGN with enhanced BSIC identification

Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement	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 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		GSM Carrier RSSI	
quantity			
b1-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B1.
Hysteresis	dB	0	
Time To Trigger	ms	0	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored GSM cell list size		6 GSM neighbours including	List of GSM cells provided before T2 starts.
		ARFCN 1	
T1	S	5	T1 ends at the end of the last TTI where the
			measurement configuration is given
T2	S	3	

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	0			
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		
$\hat{E}_s/N_{oc}$	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		AWO	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: The resources for upl	ink transmission	are assigned to the UE prior to t	he 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		AF	RFCN 1
RXLEV	dBm	-∞	-75
GSM BSIC		N/A	Valid

#### A.8.8.3.2 Test Requirements

The UE shall send one Event B1 triggered measurement report including BSIC of cell # 2, with a measurement reporting delay less than [2280] ms from the beginning of time period T2.

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

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

- NOTE 1: The actual overall delays measured in the test may be up to 2xTTI<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 =  $2*T_{\text{Measurement Period, GSM}} = 2*480 \text{ms} = 960 \text{ms}.$ 

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	-75	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	Unit	Cel	11			
		T1	T2			
E-UTRA RF Channel		1				
Number						
BW <sub>channel</sub>	MHz	1(	C			
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					
$N_{oc}$	dBm/15KH	-9	8			
	Z		-			
RSRP	dBm	-94	-94			
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4	4			
P-SCH_RP	dBm	-9	4			
S-SCH_RP	dBm	-9				
Propagation Condition		ETU				
	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 1	2.					

# 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			
		T1		•	Т2	
Timeslot Number		0	DwPTS	0	DwPTS	
UTRA RF Channel			Cha	nnel1		
Number (NOTE1)						
PCCPCH_Ec/lor	dB	-Inf	inity	-3		
DwPCH_Ec/lor	dB	-Inf	finity		0	
OCNS_Ec/lor		-Inf	finity	-3		
$\hat{I}_{or}/I_{oc}$	dB	-Infinity		9		
I <sub>oc</sub>	dBm/1.28 MHz	-70				
PCCPCH_RSCP Note 3	dB	-Infinity		-64		
lo <sup>Note 3</sup>	dBm/1.28 MHz	-70.00		-60.49		
Propagation			Case 3	(NOTE2)		
Condition						
NOTE1: The DPCH of	CH of the cell is located in a timeslot other than 0.					
NOTE3: PCCPCH_R	SRP and lo levels	have been	derived from	n other para	ameters for	
information p	ourposes. They are	not settab	le paramete	rs themselv	/es.	

### 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.8.9.2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

#### A.8.9.2.1 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 TDD cell identification requirements in section 8.1.2.4.4 under AWGN propagation conditions.

This test scenario comprised of 1 E-UTRA FDD serving cell, and 1 UTRA TDD cell to be searched. Test parameters are given in Table A.8.9.2.1-1, A.8.9.2.1-2, and A.8.9.2.1-3. 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.

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 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 TDD carrier frequency is used.
Inter-RAT (UTRA TDD) measurement quantity		P-CCPCH RSCP	
Filter coefficient		0	L3 filtering is not used.
DRX		OFF	
Monitored UTRA TDD cell list size		None	No explicit neighbour list is provided to the UE
Time offset between cells	ms	3	
T1	S	5	
T2	S	2	

### Table A.8.9.2.1-1: General test parameters for E-UTRAN FDD- UTRAN TDD cell search in AWGN propagation conditions

Parameter	Unit	Unit Cell 1				
		T1	T2			
E-UTRA RF Channel Number		1				
BW <sub>channel</sub>	MHz	10	0			
OCNG Patterns defined in		OP.1				
A.3.2.1.1 (OP.1 FDD)		UP.1	FUD			
PBCH_RA	dB					
PBCH_RB	dB					
PSS_RA	dB					
SSS_RA	dB					
PCFICH_RB	dB					
PHICH_RA	dB					
PHICH_RB	dB	C	)			
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			
$N_{oc}$ 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           Note 2:         The resources for upl of time period T2.           Note 3:         Interference from other	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The 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 is assumed to be constant over subcarriers and time and shall be modelled as					
Note 4: RSRP levels have be	AWGN of appropriate power for $N_{_{oc}}$ to be fulfilled. RSRP levels have been derived from other parameters for information					
purposes. They are n	ot settable parar	meters themselves.				

# Table A.8.9.2.1-2: Cell specific test parameters for cell #1 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

Parameter	Unit		Cell 2 (UT	(RA TDD)	
Timeslot Number		0		Dw	PTS
		T1	T2	T1	T2
UTRA RF Channel Number <sup>Note1</sup>			Char	nel 1	
P-CCPCH_Ec/lor	dB	-4.77	-4.77		
DwPCH_Ec/lor	dB			0	0
OCNS_Ec/lor <sup>Note2</sup>	dB	-1.76	-1.76		
$\hat{I}_{or}/I_{oc}$	dB	-inf	8	-inf	8
I <sub>oc</sub>	dBm/1.28 MHz	-80			
P-CCPCH RSCP Note3	dBm	-inf	-76.77	n.a.	n.a.
P-CCPCH_Ec/lo Note3	dB	-inf	-5.41	n.a.	n.a.
DwPCH_Ec/Io Note3	dB	n.a.	n.a.	-inf	-0.64
Propagation Condition			AW	'GN	
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 char	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: P-CCPCH RSRP, PCCPCH_Ec/lo and DwPCH_Ec/lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.				

### Table A.8.9.2.1-3: Cell specific test parameters for cell #2 E-UTRAN FDD - UTRAN TDD enhanced cell identification under AWGN propagation conditions

#### A.8.9.2.2 Test Requirements

The UE shall send one Event B1 triggered measurement report, with a measurement reporting delay less than 1120 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.8.10 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					
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 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 spectral density is ac           Note 2:         The resources for upl	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols. The 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 is assumed to be constant					
over subcarriers and	over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be					
	fulfilled.					

### 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		ARFNC 1	
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid
Propagation Condition		AWGN	

#### 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.

395

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	
		Va			
PDSCH parameters (E-		DL Reference Measurement		As specified in section A.3.1.1.2. Note that	
UTRAN TDD)		Channel R.0 TDD		UE may only be allocated at On Duration	
PCFICH/PDCCH/PHICH		DL Reference Me	asurement	As specified in section A.3.1.2.2.	
parameters (E-UTRAN TDD)		Channel R.6 TDD	)		
Gap Pattern Id		(	)	As specified in 3GPP TS 36.133 section	
				8.1.2.1.	
Active cell		Ce	ll 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)	
Special subframe		6	6	As specified in table 4.2-1 in TS 36.211.	
configuration					
Uplink-downlink				As specified in 3GPP TS 36.211 section	
configuration				4.2 Table 4.2-2	
CP length		Normal		Applicable to cell 1	
E-UTRA RF Channel				One E-UTRA TDD carrier frequency is	
Number				used.	
E-UTRA Channel Bandwidth	MHz	1	0		
(BW <sub>channel</sub> )					
Inter-RAT (GSM)		GSM Car	rier RSSI		
measurement quantity					
B1-Threshold-GERAN	dBm	-8	0	GSM Carrier RSSI threshold for event B1.	
Hysteresis	dB	(	)		
TimeToTrigger	S	(			
Filter coefficient		(	)	L3 filtering is not used	
PRACH configuration		4	ļ.	As specified in table 5.7.1-2 in TS 36.211	
Access Barring Information	-	Not Sent		No additional delays in random access	
_				procedure.	
DRX		ON		DRX related parameters are defined in	
				Table A.8.10.2.1-3	
Monitored GSM cell list size		6 GSM neighbours including		List of GSM cells provided before T2	
		ARFCN 1		starts.	
T1	S	Ę	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 T	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	
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		AWG	N
	such that both c	ells are fully allocated and a cons	tant total transmitted power
spectral density is acl			-
		e sources not specified in the test	
fulfilled.		e modelled as AWGN of appropria	
Note 3: RSRP and SCH_RP They are not settable		n derived from other parameters for mselves.	or information purposes.

## 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
Tield	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	ion 6.3.2 in 3GF	P TS 36.331	

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

Field	Test1 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- UTRAN FDD cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	10	

Parameter	Unit	C	ell 1	Cell	2	Cell 3		
		T1 T2 T1 T2		T1	T2			
E-UTRA RF		1		2		3		
Channel Number								
BW <sub>channel</sub>	MHz		10	10	)	10		
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and in A.3.2.1.2 (OP.2 FDD)		OP.	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		-	_			-	
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 <sup>Note 4</sup>	dBm/15 kHz	-98	-98	-Infinity	-95	-Infinity	-95	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	0	0	-Infinity	3	-Infinity	3	
SCH_RP Note 4	dBm/15 kHz	-98	-98	-Infinity	-95	-Infinity	-95	
$\hat{E}_{s}/N_{oc}$	dB	0	0	-Infinity	3	-Infinity	3	
Propagation Condition		AWGN ETU70		ETU70				
Note 1: OCNG sha	all be used a	such tha	at both ce	Is are fully a	llocated a	nd a constant total		
transmitted Note 2: The resourtime period Note 3: Interference	time period T2.				of			
Note 4: RSRP and	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.				ation			

## 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 parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211. The same configuration in both cells
Uplink-downlink configuration		1	As specified in 3GPP TS 36.211 section 4.2 Table 4.2-2
E-UTRA RF Channel Number		1, 2, 3	Three TDD carrier frequencies are used.
Channel Bandwidth (BW <sub>channel</sub> )	MHz	10	
Active cell		Cell 1	Cell 1 is on RF channel number 1
Neighbor cells		Cell 2 and Cell 3	Cell 2 and 3 are on RF channel numbers 2 and 3 respectively
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 μs	Synchronous cells
T1	S	5	
T2	S	10	

## Table A.8.11.2.1-2: Cell specific test parameters for E-UTRAN TDD - E-UTRAN TDD and E-UTRAN TDD Inter-frequency event triggered reporting under fading propagation conditions cells

Parameter	Unit	C	ell 1	Cel	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		_	_				
PHICH_RB	dB		0	0		0		
PDCCH_RA	dB	- -						
PDCCH_RB	DCCH_RB dB							
PDSCH_RA								
PDSCH_RB	dB							
OCNG_RA <sup>Note 1</sup>	dB		dB					
OCNG_RB <sup>Note 1</sup>	dB							
$N_{oc}^{ m Note 3}$	dBm/15 kHz			-9	8			
RSRP <sup>Note 4</sup>	dBm/15 kHz	-98	-98	-inf	-95	-inf	-95	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	0	0	-inf	3	-inf	3	
SCH_RP Note 4	dBm/15 kHz	-98	-98	-inf	-95	-inf	-95	
$\hat{E}_{s}/N_{oc}$	dB		0	-inf	3	-inf	3	
Propagation Condition		AV	VGN	ETU	70	ETU	70	
spectral density Note 2: The resources	hall be used such that all cells are fully allocated and a constant total transmitted power density is achieved for all OFDM symbols. urces for uplink transmission are assigned to the UE prior to the start of time period T2. nce from other cells and noise sources not specified in the test is assumed to be constant over					2.		
subcarriers and	d time and shall be	modelled a	as AWGN of	appropriate	power for a	$N_{_{oc}}$ to be fulf	illed.	
Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					s. They			

#### 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	-86	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	Се	II 1	Ce	12	
		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.3.2.1.1		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	C	)	
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	-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	AWGN ETU70					
Note 1: OCNG shall be	e used such that bo ty is achieved for all			constant total tran	smitted power	
	for uplink transmiss			r to the start of tim	e 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.						
	H_RP levels have b ettable parameters		m other parame	ters for information	purposes.	

## 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 (N	ote 3)			
	ote 1: The DPCH level is controlled by the power control loop.					
Note 2: The power of the OC						
to I <sub>or</sub> .						
Note 3: Case 5 propagation of	conditions are de	efined in Annex A of 3GPP TS 25.1	01.			

#### 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 cell2			same configuration in both cells
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section
Gap Pattern Id		0	8.1.2.1.
E-UTRAN TDD		RSRP	0.1.2.1.
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	-86	Absolute E-UTRAN RSRP threshold for event
			B2
Thresh2	dBm	-84	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	ll 1	Ce	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		_			
PHICH_RB	dB	(	)	0		
PDCCH_RA	dB					
PDCCH_RB	dB					
PDSCH_RA	dB					
PDSCH_RB	dB					
OCNG_RANote 1	dB					
OCNG_RBNote 1	dB					
$\hat{E}_{s}/I_{ot}$	dB	4	4	-Infinity	7	
$\hat{E}_{s}/N_{oc}$	dB	4	4	-Infinity	7	
N <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	n AWGN 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 priori to the start of time period T2.</li> <li>Note 3: RSRP and SCH_RP levels have been derived from other parameters for information</li> </ul>						
	A_RP levels hav			arameters for l	normation	

## 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)

Pa	rameter	Unit		Cell 3 (		(UTRA)	
Timeslot	Number		0		DwPTS		
			T1	T2	T1	T2	
UTRA RE	- Channel			Char	nnel 3		
Number*							
PCCPCH	I_Ec/lor	dB	-3	3			
DwPCH_	Ec/lor	dB			(	)	
OCNS_E	c/lor	dB -3					
$\hat{I}_{or}/I_{oc}$		dB	-Infinity	9	-Infinity	9	
$I_{oc}$	I <sub>oc</sub> dBm/1.28 MHz			-80			
PCCPCH	I RSCP	dBm	-Infinity -74 n.a.			a.	
Propagat	tion Condition			Cas	se 3		
Note1:	The DPCH of all cells are located in a timeslot other than 0.						
Note2:	In the case of multi-frequency network, the UTRA RF Channel Number						
Note3:	<ul> <li>can be set for the primary frequency in this test.</li> <li>Note3: P-CCPCH RSCP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.</li> </ul>						

#### 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- UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1.
Gap Pattern Id		0	As specified in 3GPP TS 36.133 section 8.1.2.1.
Active cell		Cell 1	Cell 1 is on E-UTRA RF channel number 1.
Neighbour cells		Cell 2, 3	Cell 2 is on E-UTRA RF channel number 2. Cell 3 is on Absolute RF Channel Number 3 (GSM cell).
CP length		Normal	Applicable to cell 1 and cell 2
E-UTRA Channel Bandwidth (BW <sub>channel</sub> )	MHz	10	
E-UTRAN FDD measurement quantity		RSRP	
Ofn	dB	0	Parameter for A3 and B2 event
Ocn	dB	0	Parameter for A3 event
Hysteresis	dB	0	Parameter for A3 and B2 event
Ofs	dB	0	Parameter for A3 event
Ocs	dB	0	Parameter for A3 event
A3-Offset	dB	-6	
TimeToTrigger	s	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between E- UTRAN FDD cells	ms	3 ms	Asynchronous cells
Inter-RAT (GSM) measurement quantity		GSM Carrier RSSI	
A3-Offset	dB	-6	
b2-Threshold-E-UTRA	dBm	-83	RSRP threshold for event B2. This is the threshold for E-UTRA in the B2 configuration. E- UTRA serving cell RSCP is below this throughout the test to account for measurement accuracy and fading
b2-Threshold-GERAN	dBm	-80	GSM Carrier RSSI threshold for event B2.
Monitored GSM cell list size		6 GSM neighbours including ARFCN 3	List of GSM cells provided before T2 starts.
T1	S	5	
T2	S	10	

#### Table A.8.11.5.1-2: Cell specific test parameters for E-UTRAN FDD cells for combined E-UTRAN FDD – E-UTRA FDD and GSM cell search. E-UTRA cells in fading; GSM cell in static propagation conditions

Parameter	Unit	Ce	ll 1	Ce	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		<b>_</b>			
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 Note 4	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			-Infinity	7	
Propagation Condition		ET	J70	ETU	J70	
Note 1: OCNG shall be used						
achieved for all OF						
Note 2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2. Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers						
	and time and shall be modelled as AWGN of appropriate power for $N_{ac}$ to be fulfilled.					
Note 4: RSRP and SCH_RF parameters themse	Plevels have been der				ey are not settable	

### 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 3	
		T1	T2
Absolute RF Channel Number		AF	RFCN3
RXLEV	dBm	-Infinity	-75
GSM BSIC		N/A	Valid

#### A.8.11.5.2 Test Requirements

The UE shall send one Event A3 triggered measurement report for cell 2, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

The UE shall send one Event B2 triggered measurement report including BSIC of cell 3, with a measurement reporting delay less than [7200] ms from the beginning of time period T2.

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

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

- NOTE 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.
5			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
2			
Ofs	dB	0	Parameter for A3 event
Ocs	dB	0	Parameter for A3 event
A3-Offset	dB	-6	
TimeToTrigger	S	0	
		0	LO filtarian is not used
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
BIX		011	011
Time offset between E-	ms	3 ms	Asynchronous cells
UTRAN TDD cells	1115	0 113	
Inter-RAT (GSM)		GSM Carrier RSSI	
measurement quantity			
b2-Threshold-E-UTRA	dBm	-83	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	Ce	ll 1	Ce	ll 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	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			-Infinity	7	
Propagation Condition		ET	J70	ETI	J70	
Note 1: OCNG shall be used	d such that both cells a					
achieved for all OF		·				
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 AWG	N of appropriate po	ower for $N_{_{oc}}$ to b	e fulfilled.		
	and time and shall be modelled as AWGN of appropriate power for $N_{oc}$ to be fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

### Table 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%.

415

- 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 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 Bandwidth	RB	50	PRS bandwidth is as indicated in prs-Bandwidth in the OTDOA assistance data defined in [24]. Here, PRS are transmitted over the system bandwidth
PRS configuration index I <sub>PRS</sub>		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 parameters are further
DRX		ON	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 <sup>Note2</sup>	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]
Т1	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

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

тз		s	5	The length of the time interval that follows immediately after time interval T2			
Note 1:	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. The parameters of expected RSTD						
Note 2:	of all neighbour cells in the OTDOA assistance data are identical in the test. The parameters of expected RSTD uncertainty of all neighbour cells in the OTDOA assistance data are identical in the test.						

## 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		1	1	1			
Channel Number		I	l	ļ			
OCNG patterns		OP.5 FDD	N/A	N/A			
defined in A.3.2.1		01:0100	11/7 (	11/7			
PBCH_RA	1						
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA	dB	0	N/A	N/A			
PHICH_RB							
PDCCH_RA	1						
PDCCH_RB	1						
OCNG_RA <sup>Note 1</sup>	1						
OCNG_RB <sup>Note 1</sup>	1						
$N_{_{oc}}$ Note 3	dBm/ 15 kHz		-95				
PRS $\hat{ ext{E}}_{ ext{s}}/N_{oc}$	dB	-Infinity	-Infinity	-Infinity			
lo	dBm/ 9 MHz	-64.21	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	Ce	ell 1	Cell 2		Cell 3	
		T2	Т3	T2	Т3	T2	T3
E-UTRA RF			1	1			1
Channel Number			I	-			1
OCNG patterns		OP.	5 FDD	OP.6	FDD	OP.6	N/A
defined in A.3.2.1		•		0.10		FDD	
PBCH_RA							
PBCH_RB							
PSS_RA							
SSS_RA							
PCFICH_RB							
PHICH_RA	dB		0	0		0	N/A
PHICH_RB							
PDCCH_RA							
PDCCH_RB							
OCNG_RA <sup>Note 1</sup>							
OCNG_RB <sup>Note 1</sup>							
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
lo <sup>Note 4</sup>	dBm/ 9 MHz	-69.87	N/A	N/A	-67.15	-69.87	N/A
PRP Note 4	dBm/ 15 kHz	-102	-Infinity	-Infinity	-105	-108	-Infinity
RSRP	dBm/ 15 kHz	-102	-102	-105	-105	-108	-Infinity
Propagation Condition				ETU	30		
$\begin{array}{c} \text{constant tota}\\ \text{those in the}\\ \text{transmitted I}\\ \text{Note 2:} \\ \text{Note 3:} \\ \text{Interference}\\ \text{constant ove}\\ N_{oc}  to be final sector of the $	<ul> <li>constant total transmitted power spectral density is achieved for all OFDM symbols other than those in the subframes with transmitted PRS. There is no PDSCH allocated in the subframes with transmitted PRS.</li> <li>2: The resources for uplink transmission are assigned to the UE prior to the start of time period T2.</li> <li>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<sub>oc</sub> to be fulfilled.</li> <li>4: PRS Ê<sub>s</sub>/I<sub>ot</sub>, Io, and PRP levels have been derived from other parameters and are given for</li> </ul>						
			settable test p sitioning subf		nterference	conditions sl	hall be

## 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 appointed in 2000 TS
drx-RetransmissionTimer	sf1	As specified in 3GPP TS 36.331 [2], Section 6.3.2
longDRX-CycleStartOffset	sf320	50.551 [2], Section 0.5.2
shortDRX	Disable	

#### A.8.12.1.2 Test Requirements

The RSTD measurement 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%, where the reported RSTD measurement for each correct event shall be within the RSTD reporting range specified in Section 9.1.10.3, i.e., between RSTD\_0000 and RSTD\_12711.

NOTE: The RSTD measurement time 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 measurement time 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 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 Bandwidth	RB	50	PRS bandwidth is as indicated in <i>prs- Bandwidth</i> in the OTDOA assistance data defined in [24]. Here, PRS are transmitted over the system bandwidth
PRS configuration index $I_{\rm PRS}$		1134	This corresponds to periodicity of 1280 ms and PRS subframe offset of $I_{PRS}$ –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 Note 2	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

Т2		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 3 and Cell 1. The parameters of expected RSTD of all neighbour cells in the OTDOA assistance data are identical in the test.					
Note 2:	The parameters o identical in the test		ed RSTD uncertainty of all neighbour cells	s in the OTDOA assistance data are	

# 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		I	•	'			
OCNG patterns		OP.1 TDD	N/A	N/A			
defined in A.3.2.2							
PBCH_RA Note 6							
PBCH_RB Note 6							
PSS_RA Note 6							
SSS_RA Note 6							
PCFICH_RB							
PHICH_RA	dB	0	N/A	N/A			
PHICH_RB	üD	Ũ		14/7			
PDCCH_RA							
PDCCH_RB							
OCNG_RA <sup>Note 1</sup>							
OCNG_RB <sup>Note 1</sup>							
PRS_RA							
$N_{_{oc}}$ Note 3,5	dBm/ 15 kHz		-95				
PRS $\hat{\mathrm{E}}_{\mathrm{s}}/N_{\mathit{oc}}$ 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. 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	Ce	ll 1	Cel	2	Cell 3	
		T2	T3	T2	T3	T2	T3
E-UTRA RF		,	1	1		1	
Channel Number			•				
OCNG patterns		OP.1	TDD	OP.2	TDD	OP.2	N/A
defined in A.3.2.2						TDD	
PBCH_RA Note 6	+						
PBCH_RB Note 6	-						
PSS_RA Note 6							
SSS_RA Note 6							
PCFICH_RB							
PHICH_RA	dB	(	)	0		0	N/A
PHICH_RB							
PDCCH_RA	T						
PDCCH_RB	Ī						
OCNG_RA <sup>Note 1</sup>	1						
OCNG_RB <sup>Note 1</sup>	Ī						
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
lo <sup>Note 4</sup>	dBm/ 9 MHz	-69.87	N/A	N/A	-67.15	-69.87	N/A
PRP Note 4	dBm/ 15 kHz	-102	-Infinity	-Infinity	-105	-108	-Infinity
RSRP	dBm/ 15 kHz	-102	-102	-105	-105	-108	-Infinity
Propagation Condition				ETU	30		
Note 1: OCNG shall				xcept Cell 3 in			
		ed power spectral density is achieved for all OFDM symbols other than with transmitted PRS. There is no PDSCH allocated in the subframes with					
transmitted							
	es for uplink transmission are assigned to the UE prior to the start of time period T2.						
		ner cells and noise sources not specified in the test are assumed to be rriers and time and shall be modelled as AWGN of appropriate power for					
$N_{_{oc}}$ to be	fulfilled.						
Note 4: PRS $\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	, Io, and PF	RP levels ha	ve been der	ved from othe	r parameters	s and are giv	ven for
	ourpose. The	ese are not s	settable test	parameters. Ir			

## 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 apparitized in 2000 TS
drx-RetransmissionTimer	sf1	<ul> <li>As specified in 3GPP TS</li> <li>36.331 [2], Section 6.3.2.</li> </ul>
longDRX-CycleStartOffset	sf320	30.331 [2], Section 0.3.2.
shortDRX	disable	

### A.8.12.2.2 Test Requirements

The RSTD measurement time 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%, where the reported RSTD measurement for each correct event shall be within the RSTD reporting range specified in Section 9.1.10.3, i.e., between RSTD\_0000 and RSTD\_12711.

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 measurement time of 9280 ms for Cell 2 and Cell 3 with respect to the reference cell Cell 1.

### A.8.13 Void

### A.8.14 E-UTRAN TDD - FDD Inter-frequency Measurements

# A.8.14.1 E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

#### A.8.14.1.1 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-FDD inter-frequency cell search requirements in section 8.1.2.3.3.

The test parameters are given in Tables A.8.14.1.1-1 and A.8.14.1.1-2. 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.

Parameter	Unit	Value	Comment
Cell 1 PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
Cell 1 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2
Cell1 Special subframe configuration		6	As specified in table 4.2-1 in TS 36.211.
Cell1 Uplink-downlink configuration		1	As specified in TS 36.211 section 4.2 Table 4.2-2.
Cell 2 PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
Cell 2 PCFICH/PDCCH/PHICH parameters		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1
Cell 1 E-UTRA TDD RF Channel Number		1	One TDD carrier frequency is used.
Cell 2 E-UTRA FDD RF Channel Number		2	One FDD carrier frequency is 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 2 is on RF channel number 2
Gap Pattern Id		0	As specified in TS 36.133 section 8.1.2.1.
A3-Offset	dB	-6	
Hysteresis	dB	0	
CP length		Normal	
TimeToTrigger	S	0	
Filter coefficient		0	L3 filtering is not used
DRX		OFF	OFF
Time offset between cells		3 ms	Asynchronous cells
T1	S	5	
T2	S	5	

# Table A.8.14.1.1-1: General test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting in fading propagation conditions

#### Table A.8.14.1.1-2: Cell specific test parameters for E-UTRAN TDD-FDD inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

Parameter	Unit	C	ell 1	(	Cell 2	
		T1	T2	T1	T2	
E-UTRA RF Channel			1		2	
Number						
BW <sub>channel</sub>	MHz		10		10	
OCNG Patterns						
defined in A.3.2.2.1		OP.	1 TDD	OP	.2 FDD	
(OP.1 TDD) 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					
$N_{_{oc}}$ Note 3	dBm/15 kHz			-98		
RSRP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{E}_{s}/I_{ot}$	dB	4	4	-Infinity	7	
SCH_RP Note 4	dBm/15 kHz	-94	-94	-Infinity	-91	
$\hat{E}_s/N_{oc}$	dB	4 4 -Infinity 7			7	
Propagation Condition				ETU70		
Note 1: OCNG shall be used achieved for all OF Note 2: The resources for up Note 3: Interference from oth	DM symbols. plink transmission are a her cells and noise sou	assigned to the lurces not specifie	JE prior to the sta d in the test is as	rt of time period T2. sumed to be consta		
and time and shall I	be modelled as AWGN	or appropriate p	power for $IV_{oc}$ 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.8.14.1.2 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.8.14 E-UTRAN FDD-TDD Inter-frequency Measurements

# A.8.15.1 E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells

#### A.8.15.1.1 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-TDD inter-frequency cell search requirements in section 8.1.2.3.4.

The test parameters are given in Table A.8.15.1.1-1 and A.8.15.1.1-2 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.8.15.1.1-1: General test parameters for E-UTRAN FDD-TDD inter-frequency event triggered reporting in fading propagation conditions

Parameter	Unit	Value	Comment
		DL Reference Measurement	
Cell 1 PDSCH parameters		Channel R.0 FDD	As specified in section A.3.1.1.1
		DL Reference Measurement	
Cell 1 PCFICH/PDCCH/PHICH		Channel R.6 FDD	As specified in section A.3.1.2.1
parameters			
		DL Reference Measurement	
Cell 2 PDSCH parameters		Channel R.0 TDD	As specified in section A.3.1.1.2
		DL Reference Measurement	
Cell 2 PCFICH/PDCCH/PHICH		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.
Cell2 Special subframe		6	As specified in table 4.2-1 in TS 36.211.
configuration		°	Applicable to Cell 2.
<u> </u>			
Cell2 Uplink-downlink		1	As specified in TS 36.211 section 4.2
configuration			Table 4.2-2. Applicable to Cell 2.
CP length		Normal	
Cell 1 E-UTRA FDD RF		1	One TDD carrier frequency is used.
Channel Number			
Cell 2 E-UTRA TDD RF		2	One FDD carrier frequency is used.
Channel Number			
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 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 ms	Asynchronous cells
T1	S	5	
T2	S	10	

#### Table A.8.15.1.1-2: Cell specific test parameters for E-UTRAN FDD-TDD inter-frequency event triggered reporting under fading propagation conditions in synchronous cells

Parameter	Unit	Ce	ll 1	C	ell 2		
		T1	T2	T1	T2		
E-UTRA RF Channel			1		2		
Number							
BW <sub>channel</sub>	MHz	1	0		10		
OCNG Pattern defined							
in A.3.2.1.1 (OP.1		OP.1	FDD	OP.2	2 TDD		
FDD) 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		)		0		
PHICH_RB	dB		J		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	-Infinity	7		
$N_{_{oc}}$ Note 3	dBm/15 kHz			-98			
RSRP <sup>Note 4</sup>	dBm/15 kHz	-94	-94	-Infinity	-91		
SCH_RP Note 4	dBm/15 kHz	-94	-94	-infinity	-91		
$\hat{E}_s/N_{oc}$	dB	4	4	-Infinity	7		
Propagation Condition			E	TU70	•		
	e used such that bo			constant total tra	nsmitted power		
	ty is achieved for al			rito the start of the	ma pariod TO		
Note 2:The resources for uplink transmission are assigned to the UE priori to the start of time period T2.Note 3:Interference from other cells and noise sources not specified in the test is assumed to be constant							
over subcarriers and time and shall be modelled as AWGN of appropriate power for $N_{_{oc}}$ to be							
fulfilled. Note 4: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.							

#### A.8.15.1.2 Test Requirements

The UE shall send one Event A3 triggered measurement report, with a measurement reporting delay less than 7680 ms from the beginning of time period T2.

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

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

NOTE: The actual overall delays measured in the test may be up to  $2xTTI_{DCCH}$  higher than the measurement reporting delays above because of TTI insertion uncertainty of the measurement report in DCCH.

### A.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.

Parameter		Unit		Test 1		Test 2		st 3
		Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1			1		1
BW <sub>channel</sub>		MHz	10		10		10	
Measurement bandwidth		n <sub>PRB</sub>	22—27		22—27		22—27	
PDSCH Reference measurement channel defined in A.3.1.1.1			R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocation		n <sub>PRB</sub>	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.1			R.6 FDD		R.6 FDD		R.6 FDD	
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD) and 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		dB	0	0	0	0	0	0
PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB								
PDSCH_RA PDSCH_RB OCNG_RA <sup>Note1</sup> OCNG_RB <sup>Note1</sup>								
$N_{oc}^{\rm Note2}$	Bands 1, 4, 6, 10, 11, 18, 19 and 21		-106	-106	-88	-88	-116	
	Bands 2, 5 and 7 Bands 3, 8, 12, 13, 14, 17 and 20	dBm/15 kHz					-114 -113	
	Band 9						-115	
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$		dB	2.5	-6	2.5	-6	0.46	-5.76
s/ ot	Bands 1, 4, 6, 10,	dBm/15 kHz	-100	-105	-82	-87	-113	-117
RSRP <sup>Note3</sup>	11, 18, 19 and 21 Bands 2, 5 and 7						-111	-115
RSRP	Bands 3, 8, 12, 13, 14, 17 and 20						-110	-114
	Band 9						-112	-116
Io <sup>Note3</sup>	Bands 1, 4, 6, 10, 11, 18, 19 and 21	dBm/9 MHz	-70.27	-70.27	-52.27	-52.27	-82.43	
	Bands 2, 5 and 7						-80.43	
	Bands 3, 8, 12, 13, 14, 17 and 20						-79.43	
	Band 9						-81.43	
$\hat{E}_s/N_{oc}$		dB	6	1	6	1	3	-1
Propagation of Note 1: OCNG achiev	shall be used such that both ved for all OFDM symbols.	-	ocated and a		otal transmit		pectral dens	-
Propagation of Note 1: OCNG achiev Note 2: Interfer time a	shall be used such that both red for all OFDM symbols. rence from other cells and no nd shall be modelled as AW and lo levels have been der	- h cells are fully all oise sources not s /GN of appropriate	AW ocated and a specified in the power for	A constant to he test is as $N_{oc}$ to be t	AW otal transmit ssumed to be fulfilled.	/GN tted power s e constant o	AW spectral dens	sity iers

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.

Parameter		Unit	Test 1		Test 2		Test 3	
			Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Channel Number			1		1		1	
BW <sub>channel</sub>		MHz	10		10		10	
Special subframe configuration Note1			6		6		6	
Uplink/downlin	k configuration <sup>Note1</sup>		1		1		1	
Measurement bandwidth		n <sub>PRB</sub>	22—27		22—27		22—27	
PDSCH Reference channel define	ence measurement ed in A.3.1.1.2		R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH alloca	tion	$n_{PRB}$	13—36	-	13—36	-	13—36	-
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2			R.6 TDD		R.6 TDD		R.6 TDD	
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD) and A.3.2.2.2 (OP.2 TDD)			OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD	OP.1 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RA PDCCH_RB PDCCH_RB PDSCH_RA PDSCH_RB OCNG_RA <sup>Note2</sup> OCNG_RB <sup>Note2</sup>		dB	0	0	0	0	0	0
$N_{\scriptscriptstyle oc}$ Note3	36, 37, 38, 39 and 40	dBm/15 kHz	-106	-106	-88	-88	-116	
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		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	-82.43	
$\hat{E}_{s}/N_{oc}$		dB	6	1	6	1	3	-1
Propagation condition		-	AW	AWGN AWGN		'GN	AWGN	
Note 1: For spec Note 2: OCNG s achieve	cial subframe and uplink- shall be used such that be ad for all OFDM symbols. nce from other cells and	oth cells are fully all	ions see Tab ocated and a	oles 4.2-1 a a constant te	nd 4.2-2 in 3 otal transmit	GPP TS 36 ted power s	.211. pectral den	sity is

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.

Parameter E-UTRA RF Channel Number			Te	st 1	Test 2		
		Unit	Cell 1	Cell 2	Cell 1	Cell 2	
			1	2	1	2	
BW <sub>channel</sub>		MHz	10	10	10	10	
Gap Pattern Id			0	-	0	-	
Measurement ba		$n_{PRB}$	22-	—27	22-	-27	
PDSCH Referer channel defined	ice measurement		R.0 FDD	-	R.0 FDD	-	
PDSCH allocation		12	13—36	_	13—36		
	H/PHICH Reference	n <sub>PRB</sub>	13—30	-	13—30	-	
	nannel defined in		R.6	FDD	R.6	FDD	
OCNG Patterns	defined in A.3.2.1.1		OP.1	OP.2	OP.1	OP.2	
· /	A.3.2.1.2 (OP.2 FDD)		FDD	FDD	FDD	FDD	
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_RANote	1						
OCNG_RANOLE							
	Bands 1, 4, 6, 10,				100	447	
37	11, 18, 19 and 21	dBm/15 kHz	-88.65	-88.65	-109	-117	
$N_{_{oc}}$ Note2	Bands 2, 5 and 7				-107	-115	
	Bands 3, 8, 12, 13, 14, 17 and 20				-106	-114	
	Band 9				-108	-116	
$\hat{E}_{s}/I_{ot}$		dB	10	10	13	-4	
5, 60	Bands 1, 4, 6, 10, 11, 18 , 19 and 21				-96	-121	
DODDNote3	Bands 2, 5 and 7		70.05	-78.65	-94	-119	
RSRP <sup>Note3</sup>	Bands 3, 8, 12, 13,	dBm/15 kHz	-78.65				
	14, 17 and 20				-93	-118	
	Band 9				-95	-120	
	Bands 1, 4, 6, 10, 11, 18, 19 and 21				-68.01	-87.76	
lo <sup>Note3</sup>	Bands 2, 5 and 7	dBm/9 MHz	-50.45	-50.45	-66.01	-85.76	
	Bands 3, 8, 12, 13, 14, 17 and 20				-65.01	-84.76	
•	Band 9				-67.01	-86.76	
$\hat{E}_s/N_{oc}$		dB	10	10	13	-4	
Propagation cor		-		/GN	AW		
	NG shall be used such					total	
<ul> <li>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</li> </ul>							
Note 3: RSI pur	ropriate power for $N_c$ RP and Io levels have poses. They are not so	been derived from ettable parameter	s themselv	es.			
	RP minimum requirem se at each receiver an		d 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.

			То	st 1	То	st 2	
Parameter		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	
Uplink-downlink				1		1	
Gap Pattern Id	senngaration		0	-	0	-	
	and a statute		-	07	-		
Measurement ba		$n_{PRB}$		-27	22-	-27	
PDSCH Referen			R.0	_	R.0	_	
channel defined	in A.3.1.1.2		TDD		TDD		
PDSCH allocatio	n	n <sub>PRB</sub>	13—36	-	13—36	-	
PDCCH/PCFICH	/PHICH Reference						
measurement ch	annel defined in		R.6	TDD	R.6	TDD	
A.3.1.2.2							
	defined in A.3.2.2.1		OP.1	OP.2	OP.1	OP.2	
	A.3.2.2.2 (OP.2 TDD)		TDD	TDD	TDD	TDD	
PBCH_RA		4					
PBCH_RB		4					
PSS_RA							
SSS_RA		4					
PCFICH_RB		4					
PHICH_RA		4					
PHICH_RB		dB	0	0	0	0	
PDCCH_RA		4					
PDCCH_RB		4					
PDSCH_RA		4					
PDSCH_RB		4					
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	-88.65	-88.65	-109	-117	
$\hat{E}_{s}/I_{ot}$		dB	10	10	13	-4	
RSRP <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40.	dBm/15 kHz	-78.65	-78.65	-96	-121	
Io <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50.45	-50.45	-68.01	-87.76	
$\hat{E}_s/N_{oc}$		dB	10	10	13	-4	
Propagation con	dition	-	AW	/GN	AW	/GN	
Note 1: For	special subframe and	uplink-downlink o					
2 in 3GPP TS 36.211. Note 2: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.							
Note 3: Inter	ference from other constant over subca	ells and noise sou	rces not sp	ecified in t	he test is a		
						-	
appropriate power for $N_{oc}$ to be fulfilled. Note 4: RSRP and lo levels have been derived from other parameters for information							
	oses. They are not s				n morriali		
Note 5: RSF	RP minimum requirem at each receiver an	nents are specified			ent interfer	ence and	

#### 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.9.1.5 FDD—TDD Inter frequency case

#### A.9.1.5.1 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—TDD inter frequency measurements.

#### A.9.1.5.2 Test parameters

In this set of test cases the cells are on different carrier frequencies. Both absolute and relative accuracy of RSRP inter frequency measurements are tested by using the parameters in Table A.9.1.5.2-1 and Table A.9.1.5.2-2. In all test cases, Cell 1 is the serving cell and Cell 2 the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. The inter frequency measurements are supported by a measurement gap.

Parameter		Unit		st 1    1	Tes Ce	st 2    1
E-UTRA RF Channel Number			1		1	
BW <sub>channel</sub>		MHz		0		0
Gap Pattern Id			0		0	
Measurement		$n_{PRB}$	22-	-27	22—27	
PDSCH Refer	ence measurement		R.0	FDD	R.0	FDD
PDSCH alloca		n <sub>PRB</sub>	13–	-36	13–	-36
defined in A.3	asurement channel .1.2.1		R.6	FDD	R.6	FDD
OCNG Pattern A.3.2.1.1 (OP A.3.2.1.2 (OP	.1 FDD) and		OP.1	FDD	OP.1	FDD
PBCH_RA						
PBCH_RB PSS_RA						
SSS_RA						
PCFICH_RB						
PHICH_RA						
PHICH_RB		dB	0	0	0	0
PDCCH_RA PDCCH_RB						
PDCCH_RA						
PDSCH_RB		-				
OCNG_RANo	te1					
OCNG_RBNo						
$N_{\scriptscriptstyle oc}$ Note2	Bands 1, 4, 6, 10, 11, 18, 19, 21, 23 and 24 Bands 2, 5 and 7		-88.65		-109 -107	
, oc	Band 25 Bands 3, 8, 12, 13, 14, 17, 20	dBm/15 kHz			<u>-105.5</u> -106	
	and 22 Band 9				-108	
$\hat{E}_{s}/I_{ot}$	-	dB	10		14	
	Bands 1, 4, 6, 10, 11, 18 , 19, 21, 23 and 24				-95	
	Bands 2, 5 and 7		-78.65		-93	
RSRP <sup>Note3</sup>	Band 25	dBm/15 kHz				1.5
	Bands 3, 8, 12, 13, 14, 17, 20 and 22				-g	2
	Band 9	ł			-9	4
	Bands 1, 4, 6, 10, 11, 18, 19, 21, 23 and 24				-67	.05
lo <sup>Note3</sup>	Bands 2, 5 and 7 Band 25	dBm/9 MHz		-50.45	-65 -63	.05 .55
	Bands 3, 8, 12, 13, 14, 17, 20 and 22					.05
Band 9					-66	.05
$\hat{E}_{s}/N_{oc}$		dB	1	0	1	4
Propagation c	ondition	-	AW	'GN	AW	GN
Note 1: OC trar Note 2: Inte	NG shall be used such asmitted power spectra erference from other ca be constant over subca	al density is achievells and noise sour	ved for all ( rces not sp	OFDM sym ecified in t	a constant bols. he test is a	total issumed

#### Table A.9.1.5.2-1: RSRP FDD—TDD Inter frequency test parameters (FDD Cell1)

	appropriate power for $N_{oc}$ to be fulfilled.
	appropriate power for the furnied.
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.

	Parameter	Unit	Test 1	Test 2						
		Onit	Cell 2	Cell 2						
	Channel Number		2	2						
BW <sub>channel</sub> Special sub	fromo	MHz	10	10						
configuratio	n <sup>Note1</sup>		6	6						
Uplink-dowr	link configuration <sup>Note1</sup>		1	1						
Gap Pattern			-	-						
Measureme	nt bandwidth	n <sub>PRB</sub>	22—27	22—27						
	erence measurement		-	-						
channel def	ned in A.3.1.1.2									
PDSCH allo		n <sub>PRB</sub>	-	-						
	FICH/PHICH			DATOD						
defined in A	neasurement channel		R.6 TDD	R.6 TDD						
	erns defined in									
	P.1 TDD) and		OP.2 TDD	OP.2 TDD						
A.3.2.2.2 (C	P.2 TDD)									
PBCH_RA										
PBCH_RB PSS_RA										
SSS RA		-								
PCFICH_R	3									
PHICH_RA			0							
PHICH_RB		dB		0						
PDCCH_RA		_								
PDCCH_RE		-								
PDSCH_RA		-								
PDSCH_RE										
OCNG_RA	lote2	-								
	Bands 33, 34, 35,									
$N_{\scriptscriptstyle oc}$ Note3	36, 37, 38, 39, 40	dBm/15 kHz	-88.65	-117						
	Band 41, 42, 43		00.00	-115						
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	, ,	dB	10	-4						
$\mathbf{L}_{s}/\mathbf{I}_{ot}$	Danda 22, 24, 25	UB	10	-4						
RSRP <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39, 40	dBm/15 kHz	-78.65	-121						
	Band 41, 42, 43		10.00	-119						
. Noted	Bands 33, 34, 35,			-87.76						
lo <sup>Note4</sup>	36, 37, 38, 39, 40 Band 41, 42, 43	dBm/9 MHz	-50.45	-85.76						
$\hat{E}_s/N_{oc}$	,,, .0	dB	10	-4						
Propagation condition			AWGN	AWGN						
Note 1: F	or special subframe and	uplink-downlink c								
2	in 3GPP TS 36.211.		·							
	CNG shall be used suc									
	ansmitted power spectra terference from other c									
	be constant over subc									
	IV	<i>oc</i> to be fulfilled.								
	ppropriate power for	to be fulfilled.	Note 4: RSRP and lo levels have been derived from other parameters for information							
Note 4: R	SRP and lo levels have	been derived fron		or information						
Note 4: F	ppropriate power for SRP and lo levels have urposes. They are not s SRP minimum requiren	<ul> <li>been derived from ettable parameters</li> </ul>	s themselves.							

#### Table A.9.1.5.2-2: RSRP FDD—TDD Inter frequency test parameters (TDD cell2)

### A.9.1.5.3 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.

	arameter	Unit		st 1		st 2	Те	st 3
		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>		MHz	1	0	1	0	10	
Measurement b	andwidth	$n_{PRB}$	22-	-27	22-	-27	22-	—27
PDSCH Referent channel defined	nce measurement I in A.3.1.1.1		R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocati	on	n <sub>PRB</sub>	13—36	-	13—36	-	13—36	-
	H/PHICH Reference hannel defined in		R.6	FDD	R.6	FDD	R.6	FDD
	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		-84.76	-84.76	-103.85	-103.85	-116	
$N_{_{oc}}$ Note2	Bands 2, 5 and 7	dBm/15 kHz					-114	
1 oc	Bands 3, 8, 12, 13,							
	14, 17 and 20						-1	13
	Band 9						-1	15
Ê./τ	201100							
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-1.76	-1.76	-4.7	-4.7	-5.46	-5.46
	Bands 1, 4, 6, 10,						-120	-120
	11, 18, 19 and 21		-81.76	-81.76	76 -106.75	-106.75		
RSRP <sup>Note3</sup>	Bands 2, 5 and 7	dBm/15 kHz					-118	-118
	Bands 3, 8, 12, 13,						-117	-117
	14, 17 and 20							
	Band 9						-119	-119
	Bands 1, 4, 6, 10,							
	11, 18, 19 and 21							
RSRQ <sup>Note3</sup>	Bands 2, 5 and 7	dB	-14.77	-14.77	-16.76	-16.76	-17.33	-17.33
	Bands 3, 8, 12, 13,							
	14, 17 and 20							
	Band 9							
	Bands 1, 4, 6, 10,						-85	5.67
	11, 18, 19 and 21							
lo <sup>Note3</sup>	Bands 2, 5 and 7	dBm/9 MHz	-50	-50	-73	-73	-83	3.67
	Bands 3, 8, 12, 13,						-82	2.67
	14, 17 and 20							
	Band 9						-84	1.67
$\hat{E}_s / N_{oc}$		dB	3	3	-2.9	-2.9	-4	-4
Propagation cor	adition		۸۱۸	'GN	۸۱۸	/GN	۸۱۸	/GN
	shall be used such that bo	- oth cells are fully al						
	ed for all OFDM symbols.							
	ence from other cells and	noise sources not	specified in t	he test is as	sumed to be	e constant o	ver subcarr	iers and
							. Si Gaboulli	
time an	nd shall be modelled as A	WGN of appropriat	e power for	IV oc to be	tulfilled.			
Note 3: RSRO	RSRP and lo levels have	been derived from	other param	eters for inf	ormation pu	rposes. The	y are not se	ettable
	eters themselves.							-

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	arameter	Unit	Test 1		Test 2		Test 3	
		Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell
E-UTRA RF Cha	annel Number			1		1		1
BW <sub>channel</sub>		MHz	1	0	1	0	1	0
Special subfram	e configuration <sup>Note1</sup>			6		6	6	
Uplink-downlink	configuration <sup>Note1</sup>			1		1		1
Measurement b	andwidth	$n_{PRB}$	22-	—27	22-	27	22-	-27
PDSCH Referer	nce measurement		R.0		R.0		R.0	
channel defined	in A.3.1.1.2		TDD	-	TDD	-	TDD	-
PDSCH allocation	on	n <sub>PRB</sub>	13—36	-	13—36	-	13—36	-
PDCCH/PCFICI	H/PHICH Reference	110				1		
	nannel defined in		R.6	TDD	R.6	TDD	R.6	TDD
A.3.1.2.2								
	defined in A.3.2.2.1		OP.1	OP.2	OP.1	OP.2	OP.1	OP.2
	A.3.2.2.2 (OP.2 TDD)		TDD	TDD	TDD	TDD	TDD	TDD
PBCH_RA								
PBCH_RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB		dB	0	0	0	0	0	0
PDCCH_RA		30	Ŭ	Ŭ	Ĭ	Ŭ	Ĭ	Ĭ
PDCCH_RB								
PDSCH_RA PDSCH_RB OCNG_RA <sup>Note2</sup>								
OCNG_RB <sup>Note2</sup>								
	Bands 33, 34, 35,		1	1	1			1
$N_{oc}$ Note3	36, 37, 38, 39 and 40	dBm/15 kHz	-84.76	-84.76	-103.85	-103.85	-1	16
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$		dB	-1.76	-1.76	-4.7	-4.7	-5.46	-5.46
87 OL	Bands 33, 34, 35,							
RSRP <sup>Note4</sup>	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	-17.3
0 <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50	-50	-73	-73	-85	5.67
$\hat{E}_s/N_{oc}$		dB	3	3	-2.9	-2.9	-4	-4
Propagation cor	dition	-	AM	/GN	AW	/GN	AM	/GN
	cial subframe and uplink-	downlink configurat						
lote 2: OCNG s	shall be used such that be ad for all OFDM symbols.							sity is

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

time and shall be modelled as AWGN of appropriate power for  $\,N_{oc}\,$  to be fulfilled.

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

antenna port.

#### A.9.2.2.3 **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
------------------------------	--------------------------------------

-	aramotor	Unit	Tes	st 1	Tes	st 2	Test	3
	arameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Ch	annel Number	NAL I-	1	2	1	2	1	2
BW <sub>channel</sub> Gap Pattern Id		MHz	10 0	10	10 0	10	10 0	10
Measurement b	andwidth	n <sub>PRB</sub>	22-	-27		-27	22—	27
PDSCH Refere channel defined	nce measurement d in A.3.1.1.1	T KD	R.0 FDD	-	R.0 FDD	-	R.0 FDD	-
PDSCH allocati	ion	n <sub>PRB</sub>	13—36	-	13—36	-	13—36	-
	H/PHICH Reference hannel defined in		R.6	FDD	R.6	FDD	R.6 F	DD
OCNG Patterns	defined in A.3.2.1.1 d A.3.2.1.2 (OP.2 FDD)		OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD	OP.1 FDD	OP.2 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA								
PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB		dB	0	0	0	0	0	0
PDSCH_RA PDSCH_RA PDSCH_RB OCNG_RA <sup>Note1</sup> OCNG_RB <sup>Note1</sup>		•						
$N_{oc}$ Note2	Bands 1, 4, 6, 10, 11, 18, 19 and 21 Bands 2, 5 and 7	dBm/15 kHz	-80	-80	-104.70	-104.70	-119.50 -117.50	-119.50
l'oc	Bands 3, 8, 12, 13, 14, 17 and 20 Band 9						-116.50	-116.50
$\hat{E}_{s}/I_{ot}$	Danu 3	dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
	Bands 1, 4, 6, 10,						-123.50	-123.50
RSRP <sup>Note3</sup>	11, 18 ,19 and 21 Bands 2, 5 and 7	dBm/15 kHz	-81.75	-81.75	-108.70	-108.70	-121.50	-121.50
KOKP	Bands 3, 8, 12, 13, 14, 17 and 20		-01.70	-01.70	-106.70		-120.50	-120.50
	Band 9 Bands 1, 4, 6, 10,						-122.50	-122.50
RSRQ <sup>Note3</sup>	Bands 1, 4, 6, 10, 10           11, 18, 19 and 21           Bands 2, 5 and 7           Bands 3, 8, 12, 13, 14, 17 and 20           Band 9	dB	-14.76	-14.76	-16.25	-16.25	-16.25	-16.25
	Bands 1, 4, 6, 10, 11, 18 ,19 and 21						-90.26	-90.26
Io <sup>Note3</sup>	Bands 2, 5 and 7	dBm/9 MHz	-50	-50	-75.46	-75.46	-88.26	-88.26
IU	Bands 3, 8, 12, 13, 14, 17 and 20		-50	-30	-73.40	-70.40	-87.26	-87.26
	Band 9	1					-89.26	-89.26
$\hat{E}_{s}/N_{oc}$		dB	-1.75	-1.75	-4.0	-4.0	-4.0	-4.0
Propagation condition		-	AW			/GN	AWC	
spe Note 2: Inte	NG shall be used such actral density is achiev arference from other co	ed for all OFD ells and noise	M symbols sources no	t specified	in the test	is assume	d to be const	ant over
Note 3: RS are	ocarriers and time and RQ, RSRP and lo leve not settable paramete	els have been o ers themselves	derived froi	n other pa	rameters fo	or informati	on purposes	. They
	RP and RSRQ minimu		its are spec	illea assul	ning indep	endent inte	errerence 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.

F	Paramotor	Unit	Tes	Test 1		st 2	Test 3	
	Parameter	Unit	Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
E-UTRA RF Ch	hannel Number		1	2	1	2	1	2
BW <sub>channel</sub>		MHz	10	10	10	10	10	10
Gap Pattern Id			0	-	0	-	0	-
Special subfrar	me configuration Note1		(	6		6	6	5
Uplink-downlin	k configuration Note1			1		1	1	
Measurement I		$n_{PRB}$	22-	27	22-	—27	22–	-27
PDSCH Refere channel define	ence measurement		R.0 TDD	-	R.0 TDD	-	R.0 TDD	-
PDSCH allocat		n <sub>PRB</sub>	13—36	-	13—36	-	13—36	-
PDCCH/PCEIC	CH/PHICH Reference	PRB						
	channel defined in		R.6	TDD	R.6	TDD	R.6	ГDD
	s defined in A.3.2.2.1		OP.1	OP.2	OP.1	OP.2	OP.1	OP.2
	nd A.3.2.2.2 (OP.2 TDD)		TDD	TDD	TDD	TDD	TDD	TDD
PBCH_RA							0	0
PBCH RB								
PSS_RA								
SSS_RA								
PCFICH_RB								
PHICH_RA								
PHICH_RB		dB	0	0	0	0		
PDCCH_RA		äb	0	0	0	0		
PDCCH_RB								
PDSCH_RA								
PDSCH_RB								
OCNG_RA <sup>Note2</sup>								
OCNG_RB <sup>Note2</sup>								
	Bands 33, 34, 35,							
$N_{oc}$ Note3	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
	Bands 33, 34, 35,		1					1
RSRP <sup>Note4</sup>	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
Io <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 co	ondition	-	AW	'GN	AM	/GN	AW	ĠN
Note 1: For spe Note 2: OCNG achiev	ecial subframe and uplink- shall be used such that b ved for all OFDM symbols. rence from other cells and	oth cells are fully all	ions see Tab ocated and a	oles 4.2-1 ar a constant to	nd 4.2-2 in 30 otal transmitt	GPP TS 36.2 ed power sp	211. ectral density	/ is
	nall be modelled as AWGN							
param Note 5: RSRP	, RSRP and Io levels have leters themselves. and RSRQ minimum requ na port.							

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

## A.9.2.4.3 Test Requirements

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

## A.9.2.5 FDD—TDD Inter frequency case

#### A.9.2.5.1 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 for FDD—TDD inter frequency measurements.

#### A.9.2.5.2 Test parameters

In this set of test cases the two cells are on different carrier frequencies. Both absolute and relative accuracy of RSRQ inter frequency measurements are tested by using the parameters in Table A.9.2.5.2-1 and Table A.9.2.5.2-2. In all test cases, Cell 1 is the serving cell and Cell 2 the target cell. Cell 1 is FDD cell and Cell 2 is TDD cell. The inter frequency measurements are supported by a measurement gap.

Table A.9.2.5.2-1: RSRQ FDD—TDD Inter	frequency test parameters	s (FDD Cell1)
---------------------------------------	---------------------------	---------------

	Parameter	Unit	Test 1	Test 2	Test 3
		Unit	Cell 1	Cell 1	Cell 1
	Channel Number		1	1	1
BW <sub>channel</sub> Gap Pattern	Id	MHz	<u> </u>	10 0	<u>10</u> 0
Measurement bandwidth		n <sub>PRB</sub>	22—27	22—27	22—27
PDSCH Refe	erence measurement	PRB	R.0 FDD	R.0 FDD	R.0 FDD
	ned in A.3.1.1.1				
PDSCH allo		n <sub>PRB</sub>	13—36	13—36	13—36
defined in A.	neasurement channel 3.1.2.1		R.6 FDD	R.6 FDD	R.6 FDD
A.3.2.1.1 (Ol A.3.2.1.2 (Ol	rns defined in P.1 FDD) and P.2 FDD)		OP.1 FDD	OP.1 FDD	OP.1 FDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RB PDCCH_RA PDCCH_RB PDSCH_RA PDSCH_RA OCNG_RA <sup>NC</sup>	Die1	dB	0	0	0
$N_{\scriptscriptstyle oc}$ Note2	Bands 1, 4, 6, 10, 11, 18, 19 and 21 Bands 2, 5 and 7 Bands 3, 8, 12, 13, 14, 17 and 20 Band 9	dBm/15 kHz	-80	-104.70	-119.50 -117.50 -116.50 -118.50
$\hat{E}_{s}/I_{ot}$		dB	-1.75	-4.0	-4.0
37 01	Bands 1, 4, 6, 10, 11, 18 ,19 and 21				-123.50
RSRP <sup>Note3</sup>	Bands 2, 5 and 7	dBm/15	-81.75	-108.70	-121.50
	Bands 3, 8, 12, 13, 14, 17 and 20 Band 9	kHz	01110	100.70	-120.50 -122.50
RSRQ <sup>Note3</sup>	Bands 1, 4, 6, 10, 11, 18, 19 and 21 Bands 2, 5 and 7 Bands 3, 8, 12, 13, 14, 17 and 20 Band 9	dB	-14.76	-16.25	-16.25
	Bands 1, 4, 6, 10, 11, 18 ,19 and 21				-90.26
Io <sup>Note3</sup>	Bands 2, 5 and 7	dBm/9	-50	-75.46	-88.26
-	Bands 3, 8, 12, 13, 14, 17 and 20	MHz			-87.26
	Band 9				-89.26
$\hat{E}_{s}/N_{oc}$		dB	-1.75	-4.0	-4.0
Propagation c	ondition	-	AWGN	AWGN	AWGN

Note 1: OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.
 Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modelled as AWGN of appropriate power for <sup>N</sup><sub>oc</sub> to be fulfilled.
 Note 3: RSRQ, RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.
 Note 4: RSRQ minimum requirements are specified assuming independent interference and noise at each receiver antenna port.

Pa	rameter	Unit	Test 1 Cell 2	Test 2 Cell 2	Test 3 Cell 2
E-UTRA RF Channel Number			2	2	2
BW <sub>channel</sub>		MHz	10	10	10
Gap Pattern Id			-	-	-
Note1	me configuration		6	6	6
Uplink-downlin	k configuration Note1		1	1	1
Measurement		n <sub>PRB</sub>	22—27	22—27	22—27
PDSCH Refere channel define	ence measurement d in A.3.1.1.2		-	-	-
PDSCH alloca	tion	$n_{PRB}$	-	-	-
PDCCH/PCFIC Reference mea defined in A.3.	asurement channel		R.6 TDD	R.6 TDD	R.6 TDD
OCNG Pattern A.3.2.2.1 (OP. A.3.2.2.2 (OP.)	s defined in 1 TDD) and		OP.2 TDD	OP.2 TDD	OP.2 TDD
PBCH_RA PBCH_RB PSS_RA SSS_RA PCFICH_RB PHICH_RA PHICH_RA PDCCH_RA PDCCH_RA PDSCH_RB OCNG_RA <sup>Note:</sup> OCNG_RB <sup>Note:</sup>	2	dB	0	0	0
$N_{_{oc}}^{_{ m Note3}}$	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-80	-104.70	-119.50
$\hat{E}_{s}/I_{ot}$		dB	-1.75	-4.0	-4.0
RSRP <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/15 kHz	-81.75	-108.70	-123.50
RSRQ <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dB	-14.76	-16.25	-16.25
Io <sup>Note4</sup>	Bands 33, 34, 35, 36, 37, 38, 39 and 40	dBm/9 MHz	-50	-75.46	-90.26
$\hat{E}_s/N_{oc}$		dB	-1.75	-4.0	-4.0
Propagation condition		-	AWGN	AWGN	AWGN
Note 1: For 36.2 Note 2: OCN spec Note 3: Inte	special subframe and 211. NG shall be used such ctral density is achieve rference from other ce	n that both cells ar ed for all OFDM s ells and noise sou	e fully allocated and a ymbols. rces not specified in th	a constant total trans he test is assumed t	smitted power o be constant ove
Note 4: RSF	carriers and time and RQ, RSRP and lo leve not settable paramete	els have been deri		00	

Table A.9.2.5.2-2: RSRQ FDD—TDD Inter frequency test parameters (TDD cell2)

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.9.2.5.3 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 Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD	
E-UTRAN RF Channel		1	One E-UTRAN FDD carrier frequency is
Number			used.
UTRAN RF Channel		1	One UTRAN FDD carrier frequency is
Number			used.
E-UTRAN Channel	MHz	10	
Bandwidth (BW <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					
Number		1			
BW <sub>channel</sub>	MHz	1	0		
OCNG Patterns defined in A.3.2.1.1 (OP.1 FDD)		OP.1	FDD		
PBCH_RA	dB				
PBCH_RB	dB				
PSS_RA	dB				
SSS_RA	dB				
PCFICH_RB	dB				
PHICH_RA	dB				
PHICH_RB	dB	(	)		
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	-9	98		
RSRP <sup>Note 3</sup>	dBm/15 kHz	-9	)4		
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4	4		
SCH_RP <sup>Note 3</sup>	dBm/15 kHz	-ç	)4		
$\hat{E}_s/N_{oc}$	dB				
Propagation Condition		AW			
Note 1: OCNG shall be used such t			otal transmitted power		
spectral density is achieved for all OFDM symbols. Note 2: Interference from other cells and noise sources not specified in the test is assumed to be constant					
over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{_{oc}}$ to be					
fulfilled. Note 3: RSRP and SCH_RP levels have been derived from other parameters for information purposes. They are not settable parameters themselves.					

# Table A.9.3.1.2-2: E-UTRAN FDD cell specific test parameters for UTRAN FDD CPICH RSCP absolute measurement accuracy test in E-UTRAN FDD

	Parameter		Test 1	Test 2
			Cell 2	Cell 2
CPICH_Ec/lor		dB	-10	-10
	PCCPCH_Ec/lor		-12	-12
	SCH_Ec/lor	dB	-12	-12
	PICH_Ec/lor	dB	-15	-15
	DPCH_Ec/lor	dB	-	-
	OCNS_Ec/lor	dB	-0.94	-0.94
loc	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz		-94.46
	Band II, V, VII		60.00	-92.46
	Band III, VIII, XII, XIII, XIV, XX		-60.00	-91.46
	Band IX (Note 2)			-93.46
	Îor/loc	dB	9.54	-9.54
CPICH RSCP,	CPICH Band I, IV, VI, X, XI, XIX,			-114.0
Note 1	Band II, V, VII		60.46	-112.0
	Band III, VIII, XII, XIII, XIV, XX		-60.46	-111.0
	Band IX (Note 2)			-113.0
Io, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz		-94.0
	Band II, V, VII		-50.00	-92.0
	Band III, VIII, XII, XIII, XIV, XX		-50.00	-91.0
	Band IX (Note 2)			-93.0
	opagation condition	-	AWGN	AWGN
NOTE 2: F	CPICH RSCP and Io levels have They are not settable parameters For the UE which supports both E performance requirements for Ba	themselves. Band III and B nd III shall ap	and IX operating frequencies ply to the multi-band UE.	, the measurement
	e done sequentially. Test 1 shall 2 shall be set within 5 seconds so			

## 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 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	
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

#### ETSI

Parameter	Unit	Test 1	Test 2		
E-UTRAN RF Channel Number			1		
BW <sub>channel</sub>	MHz	10			
Special subframe configuration			6		
Uplink-downlink configuration <sup>Note1</sup>			1		
OCNG Patterns defined in A.3.2.2.1		OP 1	TDD		
(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		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			
$\hat{E}_{s}/I_{ot}$	dB	4			
SCH_RP Note 4	dBm/15 kHz	-94			
$\hat{E}_s/N_{oc}$	dB		4		
Propagation Condition			/GN		
Note 1: For special subframe and in 3GPP TS 36.211.	Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2				
	e 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 ce					
appropriate power for $N_{ac}^{}$ to be fulfilled.					
Note 4: RSRP and SCH_RP levels purposes. They are not se	s have been deri		eters for information		

# 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	
			Cell 2	Cell 2	
	CPICH_Ec/lor	dB	-10	-10	
	PCCPCH_Ec/lor		-12	-12	
	SCH_Ec/lor	dB	-12	-12	
	PICH_Ec/lor	dB	-15	-15	
	DPCH_Ec/lor	dB	-	-	
	OCNS_Ec/lor	dB	-0.94	-0.94	
loc	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz		-94.46	
	Band II, V, VII		00.00	-92.46	
	Band III, VIII, XII, XIII, XIV, XX		-60.00	-91.46	
	Band IX (Note 2)		-	-93.46	
	Îor/loc		9.54	-9.54	
CPICH RSCP.	Band I, IV, VI, X, XI, XIX, XXI	dBm		-114.0	
Note 1	Band II, V, VII	-	<b>22 1 2</b>	-112.0	
	Band III, VIII, XII, XIII, XIV, XX	-	-60.46	-111.0	
	Band IX (Note 2)	-	-	-113.0	
Io, Note 1	Band I, IV, VI, X, XI, XIX, XXI	dBm/3.84 MHz		-94.0	
	Band II, V, VII		50.00	-92.0	
	Band III, VIII, XII, XIII, XIV, XX		-50.00	-91.0	
	Band IX (Note 2)			-93.0	
	opagation condition	-	AWGN	AWGN	
NOTE 1: 0	CPICH RSCP and lo levels ha	ave been ca	Iculated from other parame	eters for information	
NOTE 2: F	burposes. They are not settab For the UE which supports bo neasurement performance re Fests shall be done sequentia est parameters for test 2 shal n between the tests.	th Band III a quirements Illy. Test 1 s	and Band IX operating freq for Band III shall apply to t hall be done first. After tes	he multi-band UE. t 1 has been executed	

## 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

#### A.9.3.2.3 Test Requirements

The CPICH RSCP measurement absolute accuracy shall meet the requirements in Section 9.2.1.

## A.9.4 UTRAN FDD CPICH Ec/No

### A.9.4.1 E-UTRAN FDD

#### A.9.4.1.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH Ec/No absolute measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.2.3. There are three different test setups with different UTRAN parameters.

#### A.9.4.1.2 Parameters

The test parameters are given in Tables A.9.4.1.2-1, A.9.4.1.2-2 and A.9.4.1.2-3 below.

# Table A.9.4.1.2-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN FDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1
PCFICH/PDCCH/PHICH		DL Reference Measurement	As specified in section A.3.1.2.1
parameters		Channel R.6 FDD	
E-UTRAN RF Channel		1	One E-UTRAN FDD carrier frequency is
Number			used.
UTRAN RF Channel		1	One UTRAN FDD carrier frequency is
Number			used.
E-UTRAN Channel	MHz	10	
Bandwidth (BW <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.9.4.1.2-2: 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					
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 Note 3	dBm/15 kHz	-94				
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	dB	4				
SCH_RP <sup>Note 3</sup>	dBm/15 kHz	-94				
$\hat{E}_s/N_{oc}$	dB	4				
Propagation Condition		AWGN				
		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
	r urumotor		Cell 2	Cell 2	Cell 2
	CPICH_Ec/lor	dB	-10	-10	-10
P	PCCPCH_Ec/lor	dB	-12	-12	-12
	SCH_Ec/lor	dB	-12	-12	-12
	PICH_Ec/lor	dB	-15	-15	-15
	DPCH_Ec/lor	dB	-	-	-
	OCNS_Ec/lor	dB	-0.94	-0.94	-0.94
	Band I, IV, VI, X, XI, XIX, XXI				-94.46
loc	Band II, V, VII		-52.22	-87.27	-92.46
	Band III, VIII, XII, XIII, XIV, XX	MHz		0	-91.46
	Band IX (Note 2)				-93.46
	Îor/loc	dB	-1.75	-4.7	-9.54
CP	ICH Ec/lo, Note 1	dBm	-14.0	-16.0	-20.0
	Band I, IV, VI, X, XI, XIX, XXI	j <b>n</b> (			-94
lo, Note	Band II, V, VII	dBm/ 3.84	-50	-86	-92.0
1	Band III, VIII, XII, XIII, XIV, XX	MHz			-91.0
	Band IX (Note 2)				-93
Pro	pagation condition	-	AWGN	AWGN	AWGN
NOTE 1:         CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.           NOTE 2:         For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.					
Tests	shall be done sequential	ly. Test 1 sh	all be done first. After test 1 ha		meters for tests 2 and 3 shall

#### A.9.4.1.3 Test Requirements

The CPICH Ec/No measurement absolute accuracy shall meet the requirements in Section 9.2.3.

### A.9.4.2 E-UTRAN TDD

#### A.9.4.2.1 Test Purpose and Environment

The purpose of this test is to verify that the CPICH Ec/No absolute measurement accuracy is within the specified limits. This test will verify the requirements in Section 9.2.3. There are three different test setups with different UTRAN parameters.

#### A.9.4.2.2 Parameters

The test parameters are given in Tables A.9.4.2.2-1, A.9.4.2.2-2 and A.9.4.2.2-3 below.

# Table A.9.4.2.2-1: General test parameters for UTRAN FDD CPICH Ec/No absolute measurement accuracy test in E-UTRAN TDD

Parameter	Unit	Value	Comment
PDSCH parameters		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2
PCFICH/PDCCH/PHICH		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				
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 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	-98
	kHz	-90
RSRP <sup>Note 4</sup>	dBm/15	-94
	kHz	-94
$\hat{\mathrm{E}}_{\mathrm{s}}/\mathrm{I}_{\mathrm{ot}}$	dB	4
SCH_RP <sup>Note 4</sup>	dBm/15	-94
	kHz	-94
$\hat{E}_{s}/N_{oc}$	dB	4
Propagation Condition		AWGN
	uplink-downlink configura	tions see Tables 4.2-1 and 4.2-2 in 3GPP TS
36.211.		
		cated and a constant total transmitted power
spectral density is achieve	ed for all OFDM symbols.	

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	l Init	Test 1	Test 2	Test 3	
	Parameter	Unit	Cell 2	Cell 2	Cell 2	
	CPICH_Ec/lor	dB	-10	-10	-10	
F	PCCPCH_Ec/lor	dB	-12	-12	-12	
	SCH_Ec/lor	dB	-12	-12	-12	
	PICH_Ec/lor	dB	-15	-15	-15	
	DPCH_Ec/lor	dB	-	-	-	
	OCNS_Ec/lor	dB	-0.94	-0.94	-0.94	
	Band I, IV, VI, X, XI, XIX, XXI				-94.46	
laa	Band II, V, VII	dBm/	F0 00	07.07	-92.46	
loc	Band III, VIII, XII, XIII, XIV, XX	3.84 MHz	-52.22	-52.22	-87.27	-91.46
	Band IX (Note 2)				-93.46	
	Îor/loc	dB	-1.75	-4.7	-9.54	
CP	PICH Ec/lo, Note 1	dBm	-14.0	-16.0	-20.0	
	Band I, IV, VI, X, XI, XIX, XXI				-94	
lo,	Band II, V, VII	dBm/	50	20	-92.0	
Note 1	Band III, VIII, XII, XIII, XIV, XX	3.84 MHz	-50	-86	-91.0	
	Band IX (Note 2)				-93	
Pro	pagation condition	-	AWGN	AWGN	AWGN	
NOTE 1:         CPICH Ec/Io and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.           NOTE 2:         For the UE which supports both Band III and Band IX operating frequencies, the measurement performance requirements for Band III shall apply to the multi-band UE.						
Tests shall be done sequentially. Test 1 shall be done first. After test 1 has been executed test parameters for tests 2 and 3 shall						
be set within 5 seconds so that UE does not loose the Cell 2 in between the tests.						

## Table 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		OP.1 FDD			
FDD)		OF.1 FDD			
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 <sub>oc</sub> 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 all	ocated and a constant			
total transmitted power spectral de	ensity is achieve	d 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					
1	V.				
AWGN of appropriate power for					
Note 3: RSRP and lo levels have been derived from other parameters for information					
purposes. They are not settable parameters themselves.					
Note 4: RSRP minimum requirements are specified assuming independent					
interference and noise at each receiver antenna port.					

#### Table A.9.5.1-3: UTRA TDD P-CCPCH RSCP measurement tests parameters (cell 2)

Parameter	Unit	Tes	st 1	Tes	st 2	Те	st 3
DL timeslot number		0		DwPTS		0	DwPTS
UTRA RF Channel number Note2		Char	nel 2	Chan	nel 2	Cha	nnel 2
PCCPCH_Ec/lor	dB	-3		-3		-3	
DwPCH_Ec/lor	dB		0		0		0
OCNS_Ec/lor	dB	-3		-3		-3	
loc	dBm/1.28MHz	-54	4.1	-75	5.2	-	97
Îor/loc	dB		2	5	5		0
PCCPCH RSCP Note1	dBm	-55.1		-73.2		-100	
lo Note1	dBm/1.28MHz	-5	50	-6	9	-	94
Propagation condition				AW	GN		
Note 1:PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.Note 2:In the case of multi-frequency network of 1.28 Mcps TDD, the UTRA RF Channel Number can be set for							
the primary frequency in this test.							

#### 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		OP.1 TDD			
TDD)		OF.1 IDD			
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 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 $N$	$V_{oc}$ to be fulfilled	d.			
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 sp interference and noise at each rec					

#### 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	Te	st 3
DL timeslot number		0		DwPTS		0	DwPTS
UTRA RF Channel number Note2		Char	nel 2	Chan	nel 2	Char	nel 2
PCCPCH_Ec/lor	dB	-3		-3		-3	
DwPCH_Ec/lor	dB		0		0		0
OCNS_Ec/lor	dB	-3		-3		-3	
loc	dBm/1.28MHz	-54	4.1	-75	5.2	-(	97
Îor/loc	dB	1	2	Ę	5		0
PCCPCH RSCP Note1	dBm	-55.1		-73.2		-100	
lo <sup>Note1</sup>	dBm/1.28MHz	-5	50	-6	69	-(	94
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.

Table A.9.6.1.1-1: General	GSM Carrier RSSI t	est parameters
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Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.0 FDD	As specified in section A.3.1.1.1.
PCFICH/PDCCH/PHICH parameters (E-UTRAN FDD)		DL Reference Measurement Channel R.6 FDD	As specified in section A.3.1.2.1.
Active cell	-	Cell 1	
DRX	-	OFF	
Gap pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Filtering coefficient	-	0	L3 filtering is not used.
Inter-RAT measurement quantity		GSM Carrier RSSI	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Included in the Measurement control information

## Table A.9.6.1.1.-2: E-UTRAN FDD Cell specific test parameters for GSM Carrier RSSI accuracy test in E-UTRAN FDD

Parameter	Unit	Tests 1-12
E-UTRAN RF Channel Number		1
BW <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	e and shall be modele	ed as AWGN of appropriate power for $N_{_{lpha c}}$ to be fulfilled.			
	levels have been de	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: Gen	eral GSM Carrier	<b>RSSI</b> test	parameters
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Parameter	Unit	Value	Comment
PDSCH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.0 TDD	As specified in section A.3.1.1.2.
PCFICH/PDCCH/PHICH parameters (E-UTRAN TDD)		DL Reference Measurement Channel R.6 TDD	As specified in section A.3.1.2.2.
Active cell	-	Cell 1	
DRX	-	OFF	
Uplink-downlink configuration of cell 1		1	As specified in table 4.2.2 in TS 36.211
Special subframe configuration of cell 1		6	As specified in table 4.2.1 in TS 36.211
Gap pattern Id		1	As specified in 3GPP TS 36.133 section 8.1.2.1.
Filtering coefficient	-	0	L3 filtering is not used.
Inter-RAT measurement quantity		GSM Carrier RSSI	
Monitored cell list size		6 GSM neighbours including ARFCN 1	Included in the Measurement control information

# Table A.9.6.2.1-2: E-UTRAN TDD Cell specific test parameters for GSM Carrier RSSI accuracy test in E-UTRAN TDD

Parameter	Unit	Tests 1 - 12
E-UTRAN RF Channel Number		1
BW <sub>channel</sub>	MHz	10
OCNG Patterns defined in A.3.2.2.1 (OP.1 TDD)		OP.1 TDD

PBCH_RA	dB	
PBCH_RB	dB	
PSS_RA	dB	
SSS_RA	dB	
PCFICH_RB	dB	
PHICH_RA	dB	
PHICH_RB	dB	0
PDCCH_RA	dB	
PDCCH_RB	dB	
PDSCH_RA	dB	
PDSCH_RB	dB	
OCNG_RA <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
$\hat{\mathbf{E}}_{s}/\mathbf{I}_{ot}$	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 su	ch that all cells are fully	v allocated and a constant total transmitted power spectral

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		OFF	
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
Io Note3	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:         OCNG shall be used such that the resources in the active cell a transmitted power spectral density is achieved for all OFDM sy           Note 2:         Interference from other cells and noise sources not specified in subcarriers and time and shall be modeled as AWGN of appropriate	mbols. 1) the test is assumed priate power for $N_{\it oc}$	l to be constan to be fulfilled.	t over
Note 3: RSRP and Io levels have been derived from other parameters parameters themselves.	for information purpo	oses. They are	not settable

## 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	Comment
Field	Value		Comment
srsBandwidthConfiguration	bw7	bw5	
srsSubframeConfiguration	S	c1	
ackNackSrsSimultaneousTransmission	FA	LSE	
srsMaxUpPTS	N	/A	Not applicable for FDD
srsBandwidth		0	No hopping
srsHoppingBandwidth	hb	w0	
frequencyDomainPosition	/DomainPosition 0		
Duration	TRUE		Indefinite duration
Srs-ConfigurationIndex	0		SRS periodicity of 2ms for all
			Tests.
transmissionComb	0		
cyclicShift	C	s0	No cyclic shift
Note: For further information see secti	on 6.3.2 in 3GPI	P 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.

E-UTRAN RF Channel Number-11BWchannelMHz1.410Uplink-downlink configuration of cell Note111Special subframe configuration of cell Note166PDSCH Reference measurement channel defined in A.3.1.1.2-R.2 TDDR.0 TDDPDSCH allocation $n_{Pres}$ 2-313-36PDSCH allocation $n_{Pres}$ 2-313-36PDSCH/PCFICH/PHICH Reference measurement channel defined in A.3.2.2.4 (OP.4 TDD) and A.3.2.2.2 (OP.2 TDD)-OP.4 TDDOP.2 TDDPBCH_RAdBPBCH_RBdBPSS, RAdBPSS, RAdBPCFICH RBdBPDCCH_RAdBPDSCH_RAdBPDSCH_RAdBPDSCH_RAdBPDSCH_RAdBPDSCH_RAdBPDSCH_RAdBPDSCH_RAdBPDSCH_RAdBPDSCH_RAdBPDSCH_RAdBPDSCH_RAdBPDSCH_RAdBPDSCH_RAdBNore 3dBm/15 KHzNore 4dBm/15 KHzCNG_RANNE2dBNore 4dBCNG 8R Note 4dBCNG 8R Note 4dBRSP Note 4dBRSP Note 4dBRSP Note 4AWGNNote 1:For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3CP TS 36.211.Note 2:CONG shall be used such that the cell is fully allocated and a co	Parameter	Unit	Tests 1	Tests 2		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	E-UTRAN RF Channel Number	-		1		
$\begin{array}{  c   } \hline Uplink-downlink configuration of cell ^{Note1} & 1 & 1 \\ Special subframe configuration of cell ^{Note1} & 6 & 6 \\ \hline PDSCH Reference measurement channel defined in \ R.2 \ TDD & R.0 \ TDD \\ A.3.1.1.2 & R.2 \ TDD & R.6 \ TDD \\ \hline PDSCH allocation & n_{PRB} & 2.3 & 13.36 \\ PDCCH/PCFICH/PHICH Reference measurement & - & R.8 \ TDD & R.6 \ TDD \\ \hline channel defined in A.3.1.2.2 & OP.4 \ TDD & OP.2 \ TDD \\ \hline OCNG Patterns defined in A.3.2.2.4 (OP.4 \ TDD) and \\ A.3.2.2.2 (OP.2 \ TDD) & - & OP.4 \ TDD & OP.2 \ TDD \\ \hline PBCH_RA & dB \\ PBCH_RB & dB \\ PSS_RA & dB \\ PSS_RA & dB \\ PCFICH_RB & dB \\ PHICH_RB & dB \\ PDCCH_RB & dB \\ PDCCH_RB & dB \\ PDCCH_RB & dB \\ PDSCH_RA & dB \\ PDSCH_RA & dB \\ OCNG_RB^{Note2} & dB \\ OCNG_RB^{Note4} & dBm/15 \ KHz \ -98 \ -98 \\ RSRP \ Note 4 & dB \\ N_{ac}^{Note 3} & dBm/15 \ KHz \ -77.66 \ N/A \\ dBm/9 \ MHz \ N/A \ -68.45 \\ \widehat{L}_{a}^{'}/I_{ot} & dB \\ ONGe \ Solution \ Solution$		MHz	1.4	10		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	Uplink-downlink configuration of cell Note1		1	1		
PDSCH Reference measurement channel defined in A.3.1.2R.2 TDDR.0 TDDPDSCH allocation $n_{pea}$ 2-313-36PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2-R.6 TDDOCNG Patterns defined in A.3.2.2.4 (OP.4 TDD) and A.3.2.2.2 (OP.2 TDD)-OP.4 TDDOP.2 TDDPBCH_RAdB-OP.4 TDDOP.2 TDDOP.2 TDDPBCH_RAdB-0P.4 TDDOP.2 TDDPBCH_RAdB-000PSS_RAdB-00SSS_RAdB-00PDCCH_RBdB000PDCCH_RAdB000PDSCH_RAdB000PDSCH_RAdB000PDSCH_RBdB000OCNG_RA <sup>NOREZ</sup> dB00OCNG_RA <sup>NOREZ</sup> dB-3-3IoNote 3dBm/15 kHz-98-98RSRP Note 4dBm/1.08 MHz-77.66N/AIoN/AdBm/1.08 MHzN/A-68.45Ê_s/L_adB-3-3-3IoNote 1:For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.Note 3:AWGN of appropriate 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 appropr	Special subframe configuration of cell Note1		6	6		
PDSCH allocation $n_{\rm PRB}$ 2-313-36PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2-R.8 TDDR.6 TDDOCNG Patterns defined in A.3.2.2.4 (OP.4 TDD) and A.3.2.2.2 (OP.2 TDD)-OP.4 TDDOP.2 TDDPBCH_RAdB-OP.4 TDDOP.2 TDDOP.2 TDDPBCH_RBdB-B-OP.4 TDDOP.2 TDDPSS_RAdBB-OP.4 TDDOP.2 TDDPSS_RAdBB-OP.4 TDDOP.2 TDDPSCH_RBdBBO0OPDCCH_RBdBBO0PDCCH_RAdBDOOPDSCH_RAdBOBOOOCNG_RA^Note2dBOBOOOCNG_RB^Note4dBm/15 kHz-101-101 $\hat{F}_x/N_{ac}$ dB-3-3Io Note4dB-3-3Io Note4dB-3-3Propagation ConditionAWGNAWGNNote 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.AWGN of appropriate power spectral density is achieved for all OFDM symbols.Note 2: OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 3: Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{ac}$ to be fulfilled. </td <td></td> <td>-</td> <td>R.2 TDD</td> <td>R.0 TDD</td>		-	R.2 TDD	R.0 TDD		
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2R.8 TDDR.6 TDDOCNG Patterns defined in A.3.2.2.4 (OP.4 TDD) and A.3.2.2.2 (OP.2 TDD)-OP.4 TDDOP.2 TDDPBCH_RAdBPBCH_RAdBPBCH_RAdBPBCH_RBdBPSS_RAdBPCFICH_RBdBPHICH_RAdBPDCCH_RBdBPDCCH_RBdBPDCCH_RBdBPDSCH_RBdBOCNG_RA^Note2dBOCNG_RA^Note2dBOCNG_RB^Note2dBOCNG RBdBNote 3dBm/15 kHzNote 4dBCNote 4dBCNote 4dBCNote 4dBON tote 5-3ON tote 5-3OCNG Shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 3:Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{oc}$ to be fulfilled.	A.3.1.1.2					
PDCCH/PCFICH/PHICH Reference measurement channel defined in A.3.1.2.2R.6 TDDR.6 TDDOCNG Patterns defined in A.3.2.2.4 (OP.4 TDD) and A.3.2.2.2 (OP.2 TDD)-OP.4 TDDOP.2 TDDPBCH_RAdBdB-OP.4 TDDOP.2 TDDPBCH_RAdBdB-OP.4 TDDOP.2 TDDPSS_RAdBdB-OP.4 TDDOP.2 TDDSSS_RAdBdB-OP.4 TDDOP.2 TDDPCFICH_RBdBOBOOPDCCH_RBdBOOPDCCH_RBdBOOPDSCH_RAdBOOOCNG_RA^Note2dBOOOCNG_RANote3dBm/15 KHz-98-98RSRP Note 4dBm/15 kHz-101-101 $\hat{L}_x/N_{ac}$ dB-3-3Io Note 4dBm/1.08 MHz-77.66N/A $\hat{E}_x/I_{at}$ dB-3-3Propagation ConditionAWGNAWGNNote 1:For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.AUGEP 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.AWGN of appropriate power for $N_{ac}$ to be fulfilled.	PDSCH allocation	n <sub>PRB</sub>	2-3	13-36		
$\begin{array}{ c c c c c c c c c c c c c c c c c c c$	PDCCH/PCFICH/PHICH Reference measurement	-	R.8 TDD	R.6 TDD		
A.3.2.2.2 (OP.2 TDD)dBPBCH_RAdBPBCH_RBdBPSS_RAdBSSS_RAdBPCFICH_RBdBPHICH_RAdBPDCCH_RBdBPDCCH_RBdBPDSCH_RAdBPDSCH_RAdBOCNG_RA^Note2dBOCNG_RA Note3dBm/15 kHz-98-98RSRP Note 4dBm/15 kHz-101-101 $\hat{f}_s/N_{oc}$ dB-3-3IoNike 4 $\hat{f}_s/I_{ot}$ dBPropagation ConditionAWGNNote 1:For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.Note 2:OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 3:Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{oc}$ to be fulfilled.						
PBCH_RAdBPBCH_RBdBPSS_RAdBSSS_RAdBPCFICH_RBdBPHICH_RAdBPHICH_RBdBPDCCH_RAdBPDSCH_RBdBOCNG_RRNotezdBOCNG_RBNotezdBOCNG_RBNote3dBm/15 kHz-98-98RSRP Note 4dB $\delta_{s}/I_{ot}$ dBPropagation ConditionAWGNNote 1:For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.Note 2:OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 3:Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{oc}$		-	OP.4 TDD	OP.2 TDD		
PSS_RAdBSSS_RAdBPCFICH_RBdBPHICH_RAdBPHICH_RAdBPDCCH_RAdBPDCCH_RAdBPDSCH_RAdBOCNG_RA^NOTE2dBOCNG_RB^NOTE2dBN_{oc}^{Note 3}dBm/15 kHz-98-98RSRP NOTE 4dBm/15 kHz $dBm/1.08$ MHz-77.66N/AdBm/1.08 MHz $f_{s}/N_{oc}$ dB-3-3IoNote 4 $Bm/10.8$ MHzN/A-68.45 $\hat{E}_{s}/I_{ot}$ dB-3-3Propagation ConditionAWGNNote 1:For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.Note 2:OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 3:Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{oc}$ to be fulfilled.		dB				
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$	PBCH_RB	dB				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		dB				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		dB				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PCFICH_RB	dB				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	PHICH_RA	dB				
PDCCH_RBdBPDSCH_RAdBPDSCH_RBdBOCNG_RA^Note2dBOCNG_RB^Note2dBN_{oc}dBm/15 kHzNote 3dBm/15 kHzRSRP Note 4dBm/15 kHz $dBm/108$ MHz-101 $f_s/N_{oc}$ dBlo Note 4dBm/1.08 MHz $f_s/N_{oc}$ dBlo Note 4dBm/9 MHzN/A-68.45 $f_s/I_{ot}$ dB-3-3Propagation ConditionAWGNNote 1:For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.Note 2:OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 3:Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{oc}$ to be fulfilled.	PHICH_RB	dB	0	0		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		dB				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $						
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		dB				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $		dB				
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	OCNG_RA <sup>Note2</sup>					
$\begin{array}{c c c c c c c c c c c c c c c c c c c $						
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	N <sub>oc</sub> Note 3	dBm/15 kHz	-98	-98		
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	RSRP Note 4	dBm/15 kHz	-101	-101		
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	$\hat{E}_s/N_{oc}$	dB	-3	-3		
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	lo Note 4	dBm/1.08 MHz	-77.66	N/A		
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 the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.           Note 3:         Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for N <sub>oc</sub> to be fulfilled.		dBm/9 MHz	N/A	-68.45		
Note 1:For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in 3GPP TS 36.211.Note 2:OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 3:Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{oc}$ to be fulfilled.	$\hat{\mathbf{E}}_{\mathrm{s}}/\mathbf{I}_{\mathrm{ot}}$	dB	-3	-3		
3GPP TS 36.211.Note 2:OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 3:Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{oc}$ to be fulfilled.	Propagation Condition					
Note 2:OCNG shall be used such that the cell is fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols.Note 3:Interference from other cells and noise sources not specified in the test is assumed to be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{oc}$ to be fulfilled.	Note 1: For special subframe and uplink-downlink configurations see Tables 4.2-1 and 4.2-2 in					
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 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.						
be constant over subcarriers and time and shall be modeled as AWGN of appropriate power for $N_{oc}$ to be fulfilled.						
power for $N_{oc}$ to be fulfilled.						
Note 4. DCDD and to lovale have been derived from other nerver stars for information						
Note 4: RSRP and lo levels have been derived from other parameters for information purposes. They are not settable parameters themselves.	n purposes.					

# Table A.9.7.2.2-2: Sounding Reference Symbol Configuration to be used in TDD UE Rx – Tx time difference test

Field	Test 1	Test 2	Comment
Field	Va	lue	Comment
srsBandwidthConfiguration	bw7	bw5	
srsSubframeConfiguration	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	(	)	
cyclicShift	C	s0	No cyclic shift
Note: For further information see section	on 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 parameters		R.8	FDD	R.6	FDD	As specified in section A.3.1.2.1
OCNG Patterns defined in A.3.2.1		OP.7	FDD		FDD	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
Reference cell				<u>   1</u>		
Neighbour cell E-UTRA RF Channel Number				ll 2 1		
						One FDD carrier frequency is used.
Channel Bandwidth (BW <sub>channel</sub> )	MHz	1	.4	1	0	
PRS Bandwidth	RB		6	5	0	PRS bandwidth is as indicated in <i>prs-Bandwidth</i> in the OTDOA assistance data defined in [24].
PRS configuration Index I <sub>PRS</sub>		2	2	2	2	As defined in 3GPP TS 36.211
Number of consecutive positioning downlink subframes $N_{\rm PRS}$		(	3		1	As defined in 3GPP TS 36.211
prs-MutingInfo				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 Notes	us	5	5	5	5	
CP length				mal		
DRX				FF		
Radio frame transmit time difference between cells (cell 2 TX time – cell 1 TX time) Note4			3	us		Synchronous cells
Number of cells provided in OTDOA assistance data			1	6		The number of cells includes the reference cell
T <sub>RSTD</sub> IntraFreqFDD, E-UTRAN	ms		25	60		Derived according to the RSTD measurement requirements specified in Section 8.1.2.5.1

		Те	st1	Те	st2	Те	st3	Те	st4
Parameter	Unit	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2
E-UTRA RF			•	•	1	•	•		•
Channel Numbe	er				Ĩ				
PBCH_RA									
PBCH_RB									
PSS_RA									
SSS_RA									
PCFICH_RB									
PHICH_RA	JD	0	0	0	0	0	0	0	0
PHICH_RB	dB	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 $\hat{E}_{_{s}}/I_{_{ot}}$	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 condition					AW	GN			
Note 1: OCN dens alloca	G shall be used such ity is achieved for all ated in the subframe erence from other ce	OFDM symb transmitting I	ols (other the PRS.	an those i	in the PR	S subframes	). There is n	o PDŚCI	4
subc	arriers and time and s	shall be mod	elled as AW	GN of app	propriate p	bower for $N$	oc to be fulfi	lled.	
Note 3: Io an parai symb	d PRP levels have be meters themselves. Ic pols carrying PRS	een derived f values are o	rom other pa derived in th	arameters e case tha	for inforn at there is	nation purpo no PBCH, F	ses. They a PSS or SSS	re not set in the OF	DM
the L cells	est equipment shall e JE antenna connector in the OTDOA assista	is equal to e ance data ar	expectedRS	TD. The p the test.	arameters	s of expecte	d RSTD of a	ll neighb	our
	parameters of expecterical in the test.	ea KSID und	certainty of a	all neighbo	our cells II	n the OIDO	A assistance	e data are	;

#### 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		R.8 TDD		R.6 TDD		As specified in section A.3.1.2.2
OCNG Patterns defined in A.3.2.2		OP.4 TDD	,	OP.2 TDD	,	OCNG shall be used such that both cells are fully allocated and a constant total transmitted power spectral density is achieved for all OFDM symbols (other than those in the PRS subframes). There is no PDSCH allocated in the subframe transmitting PRS.
Reference cell		Cell 1				
Neighbour cell		Cell 2				
E-UTRA RF Channel Number		1				One TDD carrier frequency is used.
Channel Bandwidth (BW <sub>channel</sub> )	MHz	1.4		10		
PRS Bandwidth	RB	6		50		PRS bandwidth is as indicated in prs-Bandwidth in the OTDOA assistance data defined in [24].
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 <sub>PRS</sub>		9		14		As defined in 3GPP TS 36.211
Number of consecutive positioning downlink subframes $N_{\rm PRS}$		6		1		As defined in 3GPP TS 36.211
prs-MutingInfo				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 Note5	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</sub> IntraFreqFDD, E-UTRAN	ms	2560				Derived according to the RSTD measurement requirements specified in Section 8.1.2.5.1

Durante		Те	st1	Те	st2	Те	st3	Те	st4
Parameter	Unit	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2	Cell1	Cell2
E-UTRA RF			•	•	1	•	•		
Channel Number					Ĩ				
PBCH_RA									
PBCH_RB									
PSS_RA									
SSS_RA									
PCFICH_RB									
PHICH_RA	dD	0	0	0	0	0	0	0	0
PHICH_RB	dB	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 $\hat{E}_{_{ m s}}/I_{_{ m ot}}$	dB	-3	-10	-6	-13	-3	-10	-6	-13
lo Note3	dBm/1.08 MHz	-78.92	-78.92	-79.21	-79.21	N/A	N/A	N/A	N/A
	dBm/9 MHz	N/A	N/A	N/A	N/A	-69.72	-69.72	-70	-70
PRP Note3	dBm/15kHz	-100.373	-106.016	-104	-111	-100.373	-106.016	-104	-111
Propagation condition					AW	GN			
Note 1: OCNG s density is allocated	hall be used such s achieved for all ( l in the subframe t nce from other cel	OFDM symb ransmitting I	ols (other the PRS.	an those i	in the PR	S subframes	). There is n	o PDSCI	4
subcarrie	ers and time and s	hall be mode	elled as AW	GN of app	propriate p	bower for $N$	$o_{c}$ to be fulfi	lled.	
paramete symbols	RP levels have be ers themselves. Io carrying PRS.	values are	derived in th	e case th	at there is	no PBCH, F	PSS or SSS	in the OF	DM
the UE a cells in th	equipment shall e intenna connector ne OTDOA assista	is equal to e ance data are	expectedRS	TD. The p the test.	arameters	s of expecte	d RSTD of a	ll neighb	our
	meters of expecters in the test.	a KSID UN	certainty of a	all neighbo	our ceiis II	n the OTDO	A assistance	e data are	•

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

## 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:

2008-05           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09	TSG#           RP#38           RP#39           RP#40           RP#41           RP#41	TSG Doc.           RP-071037           RP-080123           RP-080325           RP-080644           RP-080642           RP-080642	CR           2           3           006           012           018           020           043           044           047           048           004           016           019           021	Rev           1           1           1           1           1           1           1           1           1           1           1           1           1           1	Subject           Approved version in TSG RAN#38           Updates of TS36.133           Updates of TS36.133           E-UTRAN TDD intra frequency measurements when DRX is used           E-UTRAN TDD - UTRAN TDD measurements           RSRQ reporting Range           Interfrequency and UTRA interRAT DRX peformance requirements           Additions to UE transmit timing requirements           Received interference power measurement performance requirement           Cell Synchronization requirement for E-UTRA TDD           Power Headroom Requirements           Event Triggering and Reporting Criteria Capability           Requirements           Correction of E-UTRAN to UTRAN TDD handover	Old - 8.0.0 8.1.0 8.2.0	New           8.0.0           8.1.0           8.2.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0           8.3.0
2008-03           2008-03           2008-09	RP#39 RP#40 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080123           RP-080325           RP-080644           RP-080642           RP-080642           RP-080642           RP-080642           RP-080642           RP-080642	3 006 012 018 020 043 044 047 048 004 016 019	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Updates of TS36.133 Updates of TS36.133 E-UTRAN TDD intra frequency measurements when DRX is used E-UTRAN TDD - UTRAN TDD measurements RSRQ reporting Range Interfrequency and UTRA interRAT DRX peformance requirements Additions to UE transmit timing requirements Received interference power measurement performance requirement Cell Synchronization requirement for E-UTRA TDD Power Headroom Requirements Event Triggering and Reporting Criteria Capability Requirements Correction of E-UTRAN to UTRAN TDD handover	8.1.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0	8.1.0         8.2.0         8.3.0         8.3.0         8.3.0         8.3.0         8.3.0         8.3.0         8.3.0         8.3.0         8.3.0         8.3.0         8.3.0         8.3.0         8.3.0         8.3.0         8.3.0
2008-05           2008-09	RP#40 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080325           RP-080644           RP-080642           RP-080642           RP-080642           RP-080642           RP-080642           RP-080642	3 006 012 018 020 043 044 047 048 004 016 019	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Updates of TS36.133 E-UTRAN TDD intra frequency measurements when DRX is used E-UTRAN TDD - UTRAN TDD measurements RSRQ reporting Range Interfrequency and UTRA interRAT DRX peformance requirements Additions to UE transmit timing requirements Received interference power measurement performance requirement Cell Synchronization requirement for E-UTRA TDD Power Headroom Requirements Event Triggering and Reporting Criteria Capability Requirements Correction of E-UTRAN to UTRAN TDD handover	8.1.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0	8.2.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0
2008-09           2008-09	RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080644 RP-080644 RP-080644 RP-080644 RP-080644 RP-080644 RP-080644 RP-080644 RP-080642 RP-080642 RP-080642 RP-080642 RP-080642 RP-080642	006 008 012 018 020 043 044 047 048 044 047 048 004 016 019	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	E-UTRAN TDD intra frequency measurements when DRX is used E-UTRAN TDD - UTRAN TDD measurements RSRQ reporting Range Interfrequency and UTRA interRAT DRX peformance requirements Additions to UE transmit timing requirements Received interference power measurement performance requirement Cell Synchronization requirement for E-UTRA TDD Power Headroom Requirements Event Triggering and Reporting Criteria Capability Requirements Correction of E-UTRAN to UTRAN TDD handover	8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0         8.2.0	8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0
2008-09           2008-09	RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080644           RP-080644           RP-080644           RP-080644           RP-080644           RP-080644           RP-080644           RP-080642           RP-080642           RP-080642           RP-080642           RP-080642           RP-080642           RP-080642           RP-080642	012 018 020 043 044 047 048 004 004 016 019	1	E-UTRAN TDD - UTRAN TDD measurements RSRQ reporting Range Interfrequency and UTRA interRAT DRX peformance requirements Additions to UE transmit timing requirements Received interference power measurement performance requirement Cell Synchronization requirement for E-UTRA TDD Power Headroom Requirements Event Triggering and Reporting Criteria Capability Requirements Correction of E-UTRAN to UTRAN TDD handover	8.2.0 8.2.0 8.2.0 8.2.0 8.2.0 8.2.0 8.2.0 8.2.0	8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0
2008-09           2008-09	RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080644           RP-080644           RP-080644           RP-080644           RP-080644           RP-080644           RP-080644           RP-080642           RP-080642           RP-080642           RP-080642           RP-080642           RP-080642           RP-080642           RP-080642	012 018 020 043 044 047 048 004 004 016 019	1	RSRQ reporting Range         Interfrequency and UTRA interRAT DRX peformance         requirements         Additions to UE transmit timing requirements         Received interference power measurement performance         requirement         Cell Synchronization requirements         Power Headroom Requirements         Event Triggering and Reporting Criteria Capability         Requirements         Correction of E-UTRAN to UTRAN TDD handover	8.2.0 8.2.0 8.2.0 8.2.0 8.2.0 8.2.0 8.2.0 8.2.0	8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0
2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09	RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080644 RP-080644 RP-080644 RP-080644 RP-080644 RP-080644 RP-080642 RP-080642 RP-080642 RP-080642 RP-080642 RP-080642	018 020 043 044 047 048 004 004 016 019	1	Interfrequency and UTRA interRAT DRX peformance requirements Additions to UE transmit timing requirements Received interference power measurement performance requirement Cell Synchronization requirement for E-UTRA TDD Power Headroom Requirements Event Triggering and Reporting Criteria Capability Requirements Correction of E-UTRAN to UTRAN TDD handover	8.2.0 8.2.0 8.2.0 8.2.0 8.2.0 8.2.0 8.2.0	8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0
2008-09 2008-09 2008-09 2008-09 2008-09 2008-09 2008-09 2008-09 2008-09 2008-09 2008-09 2008-09	RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080644 RP-080644 RP-080644 RP-080644 RP-080644 RP-080642 RP-080642 RP-080642 RP-080642 RP-080642	020 043 044 047 048 004 004 016 019	1	requirements Additions to UE transmit timing requirements Received interference power measurement performance requirement Cell Synchronization requirement for E-UTRA TDD Power Headroom Requirements Event Triggering and Reporting Criteria Capability Requirements Correction of E-UTRAN to UTRAN TDD handover	8.2.0 8.2.0 8.2.0 8.2.0 8.2.0 8.2.0	8.3.0 8.3.0 8.3.0 8.3.0 8.3.0 8.3.0
2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09	RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080644 RP-080644 RP-080644 RP-080644 RP-080642 RP-080642 RP-080642 RP-080642 RP-080642	043 044 047 048 004 016 019	1	Received interference power measurement performance requirement Cell Synchronization requirement for E-UTRA TDD Power Headroom Requirements Event Triggering and Reporting Criteria Capability Requirements Correction of E-UTRAN to UTRAN TDD handover	8.2.0 8.2.0 8.2.0 8.2.0	8.3.0 8.3.0 8.3.0 8.3.0
2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09	RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080644 RP-080644 RP-080644 RP-080642 RP-080642 RP-080642 RP-080642 RP-080642	044 047 048 004 016 019		requirement Cell Synchronization requirement for E-UTRA TDD Power Headroom Requirements Event Triggering and Reporting Criteria Capability Requirements Correction of E-UTRAN to UTRAN TDD handover	8.2.0 8.2.0 8.2.0	8.3.0 8.3.0 8.3.0
2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09	RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080644 RP-080644 RP-080642 RP-080642 RP-080642 RP-080642 RP-080642	047 048 004 016 019		Cell Synchronization requirement for E-UTRA TDD Power Headroom Requirements Event Triggering and Reporting Criteria Capability Requirements Correction of E-UTRAN to UTRAN TDD handover	8.2.0 8.2.0	8.3.0 8.3.0
2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09	RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080644 RP-080644 RP-080642 RP-080642 RP-080642 RP-080642 RP-080642	047 048 004 016 019		Power Headroom Requirements Event Triggering and Reporting Criteria Capability Requirements Correction of E-UTRAN to UTRAN TDD handover	8.2.0 8.2.0	8.3.0 8.3.0
2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09           2008-09	RP#41 RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080644 RP-080642 RP-080642 RP-080642 RP-080642 RP-080642	048 004 016 019		Event Triggering and Reporting Criteria Capability Requirements Correction of E-UTRAN to UTRAN TDD handover	8.2.0	8.3.0
2008-09 2008-09 2008-09 2008-09 2008-09 2008-09 2008-09	RP#41 RP#41 RP#41 RP#41 RP#41 RP#41	RP-080642 RP-080642 RP-080642 RP-080642 RP-080642	004 016 019		Requirements Correction of E-UTRAN to UTRAN TDD handover		
2008-09         2008-09           2008-09         2008-09           2008-09         2008-09           2008-09         2008-09           2008-09         2008-09	RP#41 RP#41 RP#41 RP#41 RP#41	RP-080642 RP-080642 RP-080642 RP-080642	016 019			8.2.0	000
2008-09 2008-09 2008-09 2008-09 2008-09 2008-09	RP#41 RP#41 RP#41 RP#41	RP-080642 RP-080642 RP-080642	019				8.3.0
2008-09 2008-09 2008-09 2008-09	RP#41 RP#41 RP#41	RP-080642 RP-080642			Definition of Symbols	8.2.0	8.3.0
2008-09 2008-09 2008-09	RP#41 RP#41	RP-080642	021	1	Idle mode requirements updates	8.2.0	8.3.0
2008-09 2008-09	RP#41			1	General updates to 36.133	8.2.0	8.3.0
2008-09		RP-080642	023	1	Handover requirements for E-UTRAN to cdma200 HRPD/1x	8.2.0	8.3.0
	RP#41		024		Inter-frequency and inter-RAT measurement requirements for multiple layer monitoring	8.2.0	8.3.0
2008-09		RP-080642	025		Side conditions for UE measurement procedures and measurement performance requirements	8.2.0	8.3.0
	RP#41	RP-080642	026		Correction to cell reselection Requirement from E-UTRAN to HRPD/cdma200 1x	8.2.0	8.3.0
2008-09	RP#41	RP-080642	027		IRAT Measurement requirements in TS 36.133	8.2.0	8.3.0
	RP#41	RP-080713	022	1	Corrections to Handover requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080713	028		Measurement reporting requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080713	029	2	RRC re-establishment requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080713	032		Correction to UE measurement requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080713	033		Correction for the definition of interruption time	8.2.0	8.3.0
2008-09	RP#41	RP-080713	040	1	Correction to idle mode higher priority search requirements	8.2.0	8.3.0
	RP#41	RP-080713	045		E-UTRAN TDD inter frequency measurement requirements	8.2.0	8.3.0
2008-09	RP#41	RP-080713	046		Updates of the Measurement procedures in RRC_Connected state from RAN 4#47bis and RAN 4#48	8.2.0	8.3.0
2008-12	RP#42	RP-080919	53		Introduction of 700MHz Bands 12, 14 and 17	8.3.0	8.4.0
2008-12	RP#42	RP-080928	88	1	CR to 36.133 on Radio Link Failure Monitoring	8.3.0	8.4.0
	RP#42	RP-080929	51		Correction to idle mode requirements	8.3.0	8.4.0
	RP#42	RP-080929	52		Definition of out of service area	8.3.0	8.4.0
2008-12	RP#42	RP-080929	54		Measurement requirements for UTRAN TDD cells in idle state	8.3.0	8.4.0
2008-12	RP#42	RP-080929	69	2	Correction of Inter-RAT UTRA cell reselection requirement	8.3.0	8.4.0
2008-12	RP#42	RP-080929	55		Correction of E_UTRAN cell measurement requirements in idle state	8.3.0	8.4.0
	RP#42	RP-080930	76		Correction to HO Requirements	8.3.0	8.4.0
	RP#42	RP-080931	71		Random access requirements	8.3.0	8.4.0
2008-12	RP#42	RP-080932	85		Cell phase synchronization error for large cell	8.3.0	8.4.0
2008-12	RP#42	RP-080932	63	4	Synchronization Requirements for E-UTRAN to 1xRTT and HRPD Handovers	8.3.0	8.4.0
2008-12	RP#42	RP-080933	49		E-UTRAN TDD-TDD intra/inter frequency measurement reporting requirements	8.3.0	8.4.0
2008-12	RP#42	RP-080933	50		E-UTRAN FDD – UTRAN FDD Measurement reporting requirements	8.3.0	8.4.0
2008-12	RP#42	RP-080933	58		Measurement requirement for E-UTRAN TDD to UTRAN TDD/FDD when DRX is used	8.3.0	8.4.0
2008-12	RP#42	RP-080933	60		Interfrequency and GSM measurement performance requirements in large DRX	8.3.0	8.4.0
2008-12	RP#42	RP-080933	62		Correction of implementation margin for transmission gap.	8.3.0	8.4.0
2008-12	RP#42	RP-080933	72		Alignement of DRX cycle dependent requirements	8.3.0	8.4.0
2008-12	RP#42	RP-080933	73	1	Alignement of side conditions for mobility measurements	8.3.0	8.4.0
2008-12	RP#42	RP-080933	66	1	Measurement models in RRC_CONNECTED	8.3.0	8.4.0
2008-12	RP#42	RP-080933	78	1	Limitation of maximum number of layers for multiple	8.3.0	8.4.0

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2008-12	RP#42	RP-080933	83	1	GSM Cell identification requirements for parallel monitoring	8.3.0	8.4.0
2008-12 2008-12	RP#42	RP-080933	87		UE transmit timing requirement	8.3.0	8.4.0
	RP#42	RP-080933	56		Correction of TS 36.133 section 8.1.2.1.1.	8.3.0	8.4.0
2008-12 2008-12	RP#42 RP#42	RP-080934	77 86		Correction to RSRQ Report Mapping Missing side conditions for RSRP and RSRQ	8.3.0 8.3.0	8.4.0 8.4.0
2008-12	RP#42 RP#42	RP-080935	81	1	Phase I RRM Test Cases	8.3.0	8.4.0
2008-12	RP#42	KF-000955	80	1	Test Configuration for RRM Tests: Measurement Reference	8.3.0	8.4.0
2000-12	KF#42		80	1	Channels and OCNG	0.3.0	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	E-UTRA to UTRA cell search requirements for SON	8.3.0	8.4.0
2009-03	RP#43	RP-090182	101	1	Correction of A3-offset parameter in RRM test case	8.4.0	8.5.0
2009-03	RP#43	RP-090182	105	· ·	Some Editorial Corrections	8.4.0	8.5.0
2009-03	RP#43	RP-090182	145		Clarifications for the DRX state	8.4.0	8.5.0
2009-03	RP#43	RP-090183	89		Modification on measurements of UTRAN TDD cells	8.4.0	8.5.0
2009-03	RP#43	RP-090183	91		Clarification of the correct behavior when Treselection is not	8.4.0	8.5.0
2000 00			01		a multiple of idle mode reselection evaluation period	0.1.0	0.0.0
2009-03	RP#43	RP-090183	98		Clarification of 'Out of Service Area' Concept and Definition	8.4.0	8.5.0
2009-03	RP#43	RP-090183	118		Radio link monitoring	8.4.0	8.5.0
					· · · · · · · · · · · · · · · · · · ·		
2009-03	RP#43	RP-090183	142	1	Update of RRC_IDLE state mobility side conditions	8.4.0	8.5.0
2009-03	RP#43	RP-090183	150		UE measurement capability in Idle mode	8.4.0	8.5.0
2009-03	RP#43	RP-090184	133		Removal of RRC re-establishment procedure delay	8.4.0	8.5.0
2009-03	RP#43	RP-090184	138	1	Correction for the UE Re-establishment delay requirement	8.4.0	8.5.0
2000 00			100			0.1.0	0.0.0
2009-03	RP#43	RP-090185	92	2	Cell phase synchronization accuracy	8.4.0	8.5.0
2009-03	RP#43	RP-090185	97		Radio link monitoring in DRX	8.4.0	8.5.0
2009-03	NF#43	KF-090105	97			0.4.0	0.5.0
2009-03	RP#43	RP-090185	120		UE Transmit Timing	8.4.0	8.5.0
2009-03	RP#43	RP-090185	137	1	Clarification of the reference point for the UE initial	8.4.0	8.5.0
	DD// 40	<b>DD</b> 000400			transmission timing control requirement	0.4.0	0.5.0
2009-03	RP#43	RP-090186	90		Correction of section 8.1.2.2.2.2 in TS36.133	8.4.0	8.5.0
2009-03	RP#43	RP-090186	93	1	cdma2000 1xRTT and HRPD Measurement Requirements	8.4.0	8.5.0
2009-03	NF #43	KF-090100	93	1	cumazooo TXKTT and TIKFD Measurement Requirements	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
2000 00		11 000100	0.		Measurements	0.1.0	0.0.0
2009-03	RP#43	RP-090186	95		Measurement Reporting Requirements for E-UTRAN TDD -	8.4.0	8.5.0
					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
2009-03	RP#43	RP-090186	100		E-UTRA to UTRA cell search requirements in DRX for SON	8.4.0	8.5.0
2009-03	RP#43	RP-090186	110	1	Correction to GSM BSIC Requirements for Parallel	8.4.0	8.5.0
					Monitoring		
2009-03	RP#43	RP-090186	117		Alignment of terminology for GAP	8.4.0	8.5.0
2009-03	RP#43	RP-090186	134		Inter frequency and Inter RAT cell search requirement when	8.4.0	8.5.0
0000.00	DD#40	DD 000400	400			0.4.0	0.5.0
2009-03	RP#43	RP-090186	139		Correction of E-UTRAN FDD – UTRAN FDD measurements	8.4.0	8.5.0
2009-03	RP#43	RP-090186	146		when no DRX Addition of the definition of "when DRX is used"	940	8.5.0
2009-03	rr#43	KE-090,190	140			8.4.0	0.5.0
2009-03	RP#43	RP-090186	147	1	Corrections to E-UTRAN inter-frequency side conditions	8.4.0	8.5.0
2003-03	111 #45	11-030100	147	· ·		0.4.0	0.5.0
2009-03	RP#43	RP-090187	96		Correction to Intra-frequency RSRP Accuracy Requirements	8.4.0	8.5.0
_000 00						0. 1.0	0.0.0
2009-03	RP#43	RP-090187	136	1	Power Headroom reporting delay	8.4.0	8.5.0
2009-03	RP#43	RP-090370	103	1	E-UTRAN -GSM Handover Test Case	8.4.0	8.5.0
2009-03	RP#43	RP-090370	104	1	E-UTRAN FDD - UTRAN TDD Cell Search Test Cases in	8.4.0	8.5.0
					Fading		
2009-03	RP#43	RP-090370	106	1	E-UTRA FDD to UTRA FDD Handover Test Case	8.4.0	8.5.0
2009-03	RP#43	RP-090370	107	1	Correction of E-UTRA FDD-FDD Intra-frequency cell	8.4.0	8.5.0
					reselection test case		
2009-03	RP#43	RP-090370	108	1	Correction of E-UTRA FDD-FDD priority based Inter-	8.4.0	8.5.0
			<u>.</u>		frequency cell reselection test case		
0000 5	RP#43	RP-090370	111	1	E-UTRAN TDD - UTRAN FDD Handover Test Case	8.4.0	8.5.0
2009-03			440			0 1 0	0 5 0
2009-03 2009-03 2009-03	RP#43 RP#43	RP-090370 RP-090370	112 113	1	E-UTRAN FDD - GSM Cell Search Test Case in AWGN E-UTRAN - UTRAN FDD Cell Search Test Cases in Fading	8.4.0 8.4.0	8.5.0 8.5.0

2009-03	RP#43	RP-090370	114	1	E-UTRAN UE Timing Accuracy Related Test Cases	8.4.0	8.5.0
2009-03 2009-03	RP#43 RP#43	RP-090370 RP-090370	115 116	1	Inclusion of MBSFN Configurations for RRM Test Cases E-UTRAN FDD HRPD Cell Reselection Test Case; HRPD of	8.4.0 8.4.0	8.5.0 8.5.0
2009-03	RP#43	RP-090370	122	1	Low Priority Clarification on Annex A.9: Measurement performance requirements	8.4.0	8.5.0
2009-03	RP#43	RP-090370	125		E-UTRA TDD – UTRA TDD cell reselection: UTRA is of higher priority	8.4.0	8.5.0
2009-03	RP#43	RP-090370	126		E-UTRA TDD – UTRA TDD cell reselection: UTRA is of lower priority	8.4.0	8.5.0
2009-03	RP#43	RP-090370	127		E-UTRA FDD – UTRA TDD cell reselection	8.4.0	8.5.0
2009-03	RP#43	RP-090370	128	1	E-UTRA TDD-UTRA TDD cell search (fading)	8.4.0	8.5.0
2009-03	RP#43	RP-090370	129	1	E-UTRA TDD-UTRA TDD handover	8.4.0	8.5.0
2009-03	RP#43	RP-090370	132	1	Addition of E-UTRA FDD to UTRA FDD reselection test cases	8.4.0	8.5.0
2009-03	RP#43	RP-090370	141	1	Correction and introduction of some test related parameters	8.4.0	8.5.0
2009-03	RP#43	RP-090370	143		Description of Annex A in TS 36.133	8.4.0	8.5.0
2009-03	RP#43	RP-090370	148		Reselection from E-UTRA to GSM cell test case	8.4.0	8.5.0
2009-03	RP#43	RP-090370	149		Radio Link Monitoring Test Cases	8.4.0	8.5.0
2009-05	RP#44	RP-090546	151		E-UTRA FDD UTRA TDD HO delay test case	8.5.0	8.6.0
2009-05	RP#44	RP-090546	153		Correction of CQI reporting periodicity for TDD RLM test cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	157		Correction to inter RAT reselection requirements to exclude equal priority. (Technically Endorsed CR in R4-50bis - R4- 091092)	8.5.0	8.6.0
2009-05	RP#44	RP-090546	167		Clarification of the number of monitoring carriers in idle mode. (Technically Endorsed CR in R4-50bis - R4-091394)	8.5.0	8.6.0
2009-05	RP#44	RP-090546	180		Correction of Core spec references in A.9 Measurements performance test cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	984		UTRA FDD-E-UTRA FDD/ TDD handover test cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	184		SON ANR UTRAN FDD Cell Search Test Case	8.5.0	8.6.0
2009-05	RP#44	RP-090546	187		E-UTRAN FDD cdma2000 1x RTT Cell Reselection Test Case; Cdma2000 1X of Low Priority	8.5.0	8.6.0
2009-05	RP#44	RP-090546	188		E-UTRAN FDD cdma2000 HO Test cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	190		E-UTRAN Random Access Test Cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	191		E-UTRAN RRC Re-establishment Test Cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	192		E-UTRAN TDD - GSM Cell Search Test Case in AWGN	8.5.0	8.6.0
2009-05	RP#44	RP-090546	197		Correction to E-UTRAN FDD - GSM Handover Test case	8.5.0	8.6.0
2009-05	RP#44	RP-090546	173	1	Correction of cell reselection test cases	8.5.0	8.6.0
2009-05	RP#44	RP-090546	179	1	Test cases of E-UTRA TDD intra-frequency cell search in fading environment when DRX is used	8.5.0	8.6.0
2009-05	RP#44	RP-090546	152	1	E-UTRA TDD GSM handover test case	8.5.0	8.6.0
2009-05	RP#44	RP-090546	178	1	Test cases of E-UTRA FDD intra-frequency cell search in fading environment when DRX is used	8.5.0	8.6.0
2009-05	RP#44	RP-090546	201	1	Test case for E-UTRA FDD E-UTRA FDD inter frequency cell search when DRX is used in fading conditions	8.5.0	8.6.0
2009-05	RP#44 RP#44	RP-090546	185	1	Correction to Radio Link Monitoring Tests	8.5.0	8.6.0
2009-05		RP-090546	203		Correction to E-UTRAN FDD to HRPD Cell Reselection Test Case	8.5.0	8.6.0
2009-05	RP#44	RP-090546 RP-090546	177 200	1	Introduction of New Reference Channels and OCNG Patterns for 1.4MHz Bandwidth Test case for E-UTRA TDD E-UTRA TDD inter frequency	8.5.0 8.5.0	8.6.0 8.6.0
2009-05	RP#44	RP-090547	158	2	cell search when DRX is used in fading conditions Alignment of inter frequency and inter RAT RRM reselection	8.5.0	8.6.0
2009-00					testcases with core requirements. (Technically Endorsed CR in R4-50bis - R4-091094)		
	RP#44	RP-090547	160		Correction relating E-UTRAN TDD - UE Transmit Timing	8.5.0	8.6.0
					Accuracy Tests. (Technically Endorsed CR in R4-50bis - R4- 091198)		
	RP#44	RP-090547	165			8.5.0	8.6.0
2009-05 2009-05	RP#44 RP#44	RP-090547 RP-090547	165 172		091198) Modifications of T3 and the verification point for in-sync test cases. (Technically Endorsed CR in R4-50bis - R4-091386) E-UTRAN UE Timing Accuracy Related Test Cases. (Technically Endorsed CR in R4-50bis - R4-091517)	8.5.0	8.6.0
2009-05 2009-05 2009-05 2009-05	RP#44 RP#44 RP#44	RP-090547 RP-090547 RP-090547	165 172 171	1	091198) Modifications of T3 and the verification point for in-sync test cases. (Technically Endorsed CR in R4-50bis - R4-091386) E-UTRAN UE Timing Accuracy Related Test Cases. (Technically Endorsed CR in R4-50bis - R4-091517) Reference measurement Channels for Radio Link Monitoring Tests with 2 Antennas. (Technically Endorsed CR in R4- 50bis - R4-091508)	8.5.0 8.5.0	8.6.0 8.6.0
2009-05 2009-05 2009-05 2009-05	RP#44 RP#44 RP#44 RP#44	RP-090547 RP-090547 RP-090547 RP-090548	165 172 171 170	1	091198)Modifications of T3 and the verification point for in-sync test cases. (Technically Endorsed CR in R4-50bis - R4-091386)E-UTRAN UE Timing Accuracy Related Test Cases. (Technically Endorsed CR in R4-50bis - R4-091517)Reference measurement Channels for Radio Link Monitoring Tests with 2 Antennas. (Technically Endorsed CR in R4- 50bis - R4-091508)Misalignment between TS36.133 and TS36.321. (Technically Endorsed CR in R4-50bis - R4-091457)	8.5.0 8.5.0 8.5.0	8.6.0 8.6.0 8.6.0
2009-05 2009-05 2009-05 2009-05 2009-05	RP#44 RP#44 RP#44 RP#44 RP#44	RP-090547 RP-090547 RP-090547 RP-090548 RP-090548	165 172 171 170 193	1	091198)Modifications of T3 and the verification point for in-sync test cases. (Technically Endorsed CR in R4-50bis - R4-091386)E-UTRAN UE Timing Accuracy Related Test Cases. (Technically Endorsed CR in R4-50bis - R4-091517)Reference measurement Channels for Radio Link Monitoring Tests with 2 Antennas. (Technically Endorsed CR in R4- 50bis - R4-091508)Misalignment between TS36.133 and TS36.321. (Technically Endorsed CR in R4-50bis - R4-091457)Correction to Inter-RAT HO Interruption Time Definition	8.5.0 8.5.0 8.5.0 8.5.0	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0
2009-05 2009-05 2009-05 2009-05 2009-05 2009-05	RP#44 RP#44 RP#44 RP#44 RP#44 RP#44	RP-090547 RP-090547 RP-090547 RP-090548 RP-090548 RP-090548	165 172 171 170 193 195	1	091198)         Modifications of T3 and the verification point for in-sync test cases. (Technically Endorsed CR in R4-50bis - R4-091386)         E-UTRAN UE Timing Accuracy Related Test Cases. (Technically Endorsed CR in R4-50bis - R4-091517)         Reference measurement Channels for Radio Link Monitoring Tests with 2 Antennas. (Technically Endorsed CR in R4-50bis - R4-091508)         Misalignment between TS36.133 and TS36.321. (Technically Endorsed CR in R4-50bis - R4-091457)         Correction to Inter-RAT HO Interruption Time Definition         CR c2k RRC delay	8.5.0 8.5.0 8.5.0 8.5.0 8.5.0	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0
2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05	RP#44 RP#44 RP#44 RP#44 RP#44 RP#44 RP#44	RP-090547 RP-090547 RP-090547 RP-090548 RP-090548 RP-090548 RP-090548	165 172 171 170 193 195 196	1	091198)         Modifications of T3 and the verification point for in-sync test cases. (Technically Endorsed CR in R4-50bis - R4-091386)         E-UTRAN UE Timing Accuracy Related Test Cases. (Technically Endorsed CR in R4-50bis - R4-091517)         Reference measurement Channels for Radio Link Monitoring Tests with 2 Antennas. (Technically Endorsed CR in R4-50bis - R4-091508)         Misalignment between TS36.133 and TS36.321. (Technically Endorsed CR in R4-50bis - R4-091457)         Correction to Inter-RAT HO Interruption Time Definition         CR c2k RRC delay         CR c2k interruption time	8.5.0 8.5.0 8.5.0 8.5.0 8.5.0 8.5.0	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0 8.6.0
2009-05 2009-05 2009-05 2009-05	RP#44 RP#44 RP#44 RP#44 RP#44 RP#44	RP-090547 RP-090547 RP-090547 RP-090548 RP-090548 RP-090548	165 172 171 170 193 195	1	091198)         Modifications of T3 and the verification point for in-sync test cases. (Technically Endorsed CR in R4-50bis - R4-091386)         E-UTRAN UE Timing Accuracy Related Test Cases. (Technically Endorsed CR in R4-50bis - R4-091517)         Reference measurement Channels for Radio Link Monitoring Tests with 2 Antennas. (Technically Endorsed CR in R4-50bis - R4-091508)         Misalignment between TS36.133 and TS36.321. (Technically Endorsed CR in R4-50bis - R4-091457)         Correction to Inter-RAT HO Interruption Time Definition         CR c2k RRC delay	8.5.0 8.5.0 8.5.0 8.5.0 8.5.0	8.6.0 8.6.0 8.6.0 8.6.0 8.6.0

2009-05	RP#44	RP-090548	168		Clarifications for the Relative RSRP and RSRQ measurement requirements. (Technically Endorsed CR in R4-50bis - R4-091407)	8.5.0	8.6.0
2009-05	RP#44	RP-090549	161		E-UTRAN UTRAN HO Command Processing Delay. (Technically Endorsed CR in R4-50bis - R4-091291)	8.5.0	8.6.0
2009-05	RP#44	RP-090549	175		Corrections of Cell Reselection Requirements in Idle Mode	8.5.0	8.6.0
2009-05	RP#44	RP-090549	181	2	Removal of [] from ranking criteria in Idle mode cell reselection	8.5.0	8.6.0
2009-05	RP#44	RP-090550	156		Correction on the TDD-TDD inter frequency measurements. (Technically Endorsed CR in R4-50bis - R4-091071)	8.5.0	8.6.0
2009-05	RP#44	RP-090550	159		Correction to the Referenced Section Number for Tinter1. (Technically Endorsed CR in R4-50bis - R4-091153)	8.5.0	8.6.0
2009-05	RP#44	RP-090551	166		Further clarification of DRX/Non-DRX state. (Technically Endorsed CR in R4-50bis - R4-091389)	8.5.0	8.6.0
2009-05	RP#44	RP-090551	202		Correction on reference to 3GPP2 specification	8.5.0	8.6.0
2009-05	RP#44	RP-090551	169		OCNG simplification. (Technically Endorsed CR in R4-50bis - R4-091410)	8.5.0	8.6.0
2009-05	RP#44	RP-090559	155		Introduction of Extended LTE800 requirements. (Technically Endorsed CR in R4-50bis - R4-091063)	8.6.0	9.0.0
2009-05	RP#45	RP-090817	211		Correction to TDD RMC references in RLM test cases	9.0.0	9.1.0
2009-05	RP#45	RP-090880	205		Introduction of Reference DRX configurations	9.0.0	9.1.0
2009-05	RP#45	RP-090880	207		Addition of DRX configurations into non DRX test cases	9.0.0	9.1.0
2009-05	RP#45	RP-090880	225		Correction to HO Test Cases	9.0.0	9.1.0
2009-05	RP#45	RP-090880	227		Correction to E-UTRAN GSM BSIC Identification Requirements with DRX	9.0.0	9.1.0
2009-05	RP#45	RP-090880	259		Corrections of Test Cases	9.0.0	9.1.0
2009-05	RP#45	RP-090880	314		E-UTRA FDD - E-UTRA FDD and UTRA FDD cell search test cases	9.0.0	9.1.0
2009-05	RP#45	RP-090880	315		E-UTRAN Radio Link Monitoring Test Cases in DRX	9.0.0	9.1.0
2009-05	RP#45	RP-090880	316		Inter-frequency E-UTRA - E-UTRA HO test cases: unknown target cell	9.0.0	9.1.0
2009-05	RP#45	RP-090880	263	2	E-UTRA FDD UTRA FDD Blind Handover test case: unknown target cell	9.0.0	9.1.0
2009-05	RP#45	RP-090836	321	1	Small corrections to Measurements performance tests parameters	9.0.0	9.1.0
2009-05	RP#45	RP-090836	285	1	E-UTRAN GSM Cell Search in DRX Test Cases	9.0.0	9.1.0
2009-05	RP#45	RP-090836	267		Set 3.2. E-UTRA TDD to UTRA TDD cell search in DRX under fading	9.0.0	9.1.0
2009-05	RP#45	RP-090836	269		Set 3.6. Test case of E-UTRA TDD to E-UTRA TDD and UTRA TDD combined cell search under fading	9.0.0	9.1.0
2009-05	RP#45	RP-090836	271		Set 3.12. E-UTRA TDD to UTRA TDD blind handover test	9.0.0	9.1.0
2009-05	RP#45	RP-090836	279		E-UTRAN FDD - UTRAN FDD Cell Search in DRX Test Cases	9.0.0	9.1.0
2009-05	RP#45	RP-090836	281		E-UTRAN TDD- E-UTRAN TDD and E-UTRAN TDD Inter- frequency Cell Search Test Case	9.0.0	9.1.0
2009-05	RP#45	RP-090836	283		E-UTRAN GSM Blind Handover Test Cases	9.0.0	9.1.0
2009-05	RP#45	RP-090836	287		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
							9.1.0
2009-05	RP#45	RP-090828	233		CR SI HRPD correction	9.0.0	
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 2009-05	RP#45 RP#45	RP-090879 RP-090879	215 231		Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction	9.0.0 9.0.0	9.1.0 9.1.0
2009-05 2009-05 2009-05	RP#45 RP#45 RP#45	RP-090879 RP-090879 RP-090879	215 231 235	1	Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction Corrections to Measurements of GSM cells in RRC_IDLE	9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05	RP#45 RP#45 RP#45 RP#45	RP-090879 RP-090879 RP-090879 RP-090879	215 231 235 247		Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction Corrections to Measurements of GSM cells in RRC_IDLE Range of Idle Mode Es/Iot side conditions	9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05 2009-05	RP#45 RP#45 RP#45 RP#45 RP#45	RP-090879 RP-090879 RP-090879 RP-090879 RP-090879	215 231 235 247 249	1	Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction Corrections to Measurements of GSM cells in RRC_IDLE Range of Idle Mode Es/Iot side conditions Removal of [] from Tdetect, Tmeasure and Tevaluate	9.0.0 9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05 2009-05 2009-05	RP#45           RP#45           RP#45           RP#45           RP#45           RP#45           RP#45           RP#45	RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879	215 231 235 247 249 245		Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction Corrections to Measurements of GSM cells in RRC_IDLE Range of Idle Mode Es/Iot side conditions Removal of [] from Tdetect, Tmeasure and Tevaluate Clarification to applicability of RSRP side conditions in Idle mode	9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05	RP#45           RP#45           RP#45           RP#45           RP#45           RP#45           RP#45           RP#45           RP#45	RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879	215 231 235 247 249 245 317	1	Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction Corrections to Measurements of GSM cells in RRC_IDLE Range of Idle Mode Es/Iot side conditions Removal of [] from Tdetect, Tmeasure and Tevaluate Clarification to applicability of RSRP side conditions in Idle mode CR Idle mode IF measurement condition	9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05 2009-05	RP#45           RP#45           RP#45           RP#45           RP#45           RP#45           RP#45           RP#45	RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879	215 231 235 247 249 245	1	Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction Corrections to Measurements of GSM cells in RRC_IDLE Range of Idle Mode Es/Iot side conditions Removal of [] from Tdetect, Tmeasure and Tevaluate Clarification to applicability of RSRP side conditions in Idle mode CR Idle mode IF measurement condition CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility	9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05	RP#45	RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879	215 231 235 247 249 245 317 318 217	1 1 1 2	Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction Corrections to Measurements of GSM cells in RRC_IDLE Range of Idle Mode Es/Iot side conditions Removal of [] from Tdetect, Tmeasure and Tevaluate Clarification to applicability of RSRP side conditions in Idle mode CR Idle mode IF measurement condition CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility requirements	9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05	RP#45 RP#45 RP#45 RP#45 RP#45 RP#45 RP#45 RP#45	RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879	215 231 235 247 249 245 317 318	1	Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction Corrections to Measurements of GSM cells in RRC_IDLE Range of Idle Mode Es/Iot side conditions Removal of [] from Tdetect, Tmeasure and Tevaluate Clarification to applicability of RSRP side conditions in Idle mode CR Idle mode IF measurement condition CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility requirements Correction to Random Access E-UTRAN TDD-TDD inter frequency cell	9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05	RP#45	RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090814 RP-090816	215 231 235 247 249 245 317 318 217 265 221	1 1 1 2	Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction Corrections to Measurements of GSM cells in RRC_IDLE Range of Idle Mode Es/Iot side conditions Removal of [] from Tdetect, Tmeasure and Tevaluate Clarification to applicability of RSRP side conditions in Idle mode CR Idle mode IF measurement condition CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility requirements Correction to Random Access E-UTRAN TDD-TDD inter frequency cell search/measurement requirements when DRX is used	9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05	RP#45	RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090814 RP-090816	215 231 235 247 249 245 317 318 217 265 221 223	1 1 1 2	Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction Corrections to Measurements of GSM cells in RRC_IDLE Range of Idle Mode Es/Iot side conditions Removal of [] from Tdetect, Tmeasure and Tevaluate Clarification to applicability of RSRP side conditions in Idle mode CR Idle mode IF measurement condition CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility requirements Correction to Random Access E-UTRAN TDD-TDD inter frequency cell search/measurement requirements when DRX is used E-UTRAN inter RAT measurement requirements	9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0	9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0         9.1.0
2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05	RP#45	RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090814 RP-090816	215 231 235 247 249 245 317 318 217 265 221	1 1 1 2	Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction Corrections to Measurements of GSM cells in RRC_IDLE Range of Idle Mode Es/Iot side conditions Removal of [] from Tdetect, Tmeasure and Tevaluate Clarification to applicability of RSRP side conditions in Idle mode CR Idle mode IF measurement condition CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility requirements Correction to Random Access E-UTRAN TDD-TDD inter frequency cell search/measurement requirements when DRX is used	9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0
2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05 2009-05	RP#45           RP#45	RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090879 RP-090814 RP-090816 RP-090816	215 231 235 247 249 245 317 318 217 265 221 223 229	1 1 2 1	Corrections to Measurements of HRPD cells and cdma2000 1X CR reference correction Corrections to Measurements of GSM cells in RRC_IDLE Range of Idle Mode Es/lot side conditions Removal of [] from Tdetect, Tmeasure and Tevaluate Clarification to applicability of RSRP side conditions in Idle mode CR Idle mode IF measurement condition CR Idle mode IF measurement period Corrections to E-UTRAN RRC_IDLE state mobility requirements Correction to Random Access E-UTRAN TDD-TDD inter frequency cell search/measurement requirements when DRX is used E-UTRAN inter RAT measurement requirements Correction to Monitoring of Multiple Layers Using Gaps E-UTRAN FDD-FDD inter frequency measurements when	9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0 9.0.0	9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0 9.1.0

2009-05	RP#45	RP-090816	213	1	Editorial correction on E-UTRAN inter frequency measurements	9.0.0	9.1.0
2009-05	RP#45	RP-090816	261	1	E-UTRAN TDD intra frequency measurements	9.0.0	9.1.0
2009-05	RP#45	RP-090816	319	1	Clarification of the number of monitoring cells for intra frequency measurements	9.0.0	9.1.0
2009-05	RP#45	RP-090815	237		Correction of timing advance adjustment accuracy test case	9.0.0	9.1.0
2009-05	RP#45	RP-090815	291		Correction to UE Transmit Timing Requirements	9.0.0	9.1.0
2009-12	RP-46	RP-091275	329		Defining requirements for UTRA TDD measurements for SON (Technically endorsed at RAN 4 52bis in R4-093512)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	332		Modification of test case of E-UTRA TDD intra frequency cell reselection (Technically endorsed at RAN 4 52bis in R4- 093552)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	333		Modification of test case of E-UTRA TDD inter frequency cell reselection (Technically endorsed at RAN 4 52bis in R4- 093553)	9.1.0	9.2.0
2009-12	RP-46	RP-091286	334		Introduction of Extended LTE1500 requirements for TS36.133 (Technically endorsed at RAN 4 52bis in R4- 093636)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	336		Addition of E-UTRA TDD to UTRA FDD reselection test cases (Technically endorsed at RAN 4 52bis in R4-093686)	9.1.0	9.2.0
2009-12	RP-46	RP-091271	338		Correction of missing accuracy requirements for UTRAN FDD (Technically endorsed at RAN 4 52bis in R4-093689)	9.1.0	9.2.0
2009-12	RP-46	RP-091275	340		CR cdma2000 HRPD measurement period (Technically endorsed at RAN 4 52bis in R4-093720)	9.1.0	9.2.0
2009-12	RP-46	RP-091275	342		CR cdma2000 1x measurement period (Technically endorsed at RAN 4 52bis in R4-093721)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	344		Correction for E-UTRAN FDD - UTRAN FDD Cell Search in DRX Test Cases (Technically endorsed at RAN 4 52bis in R4-093890)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	346		Revise geometry factors for Intra freq Reselection Test Cases	9.1.0	9.2.0
2009-12	RP-46	RP-091271	348		Corrections on RRM parameters for Bands 12, 14, 17	9.1.0	9.2.0
2009-12	RP-46	RP-091271	351	1	Corrections to PDSCH RMC-s	9.1.0	9.2.0
2009-12	RP-46	RP-091271	353		Corrections of TS36.133	9.1.0	9.2.0
2009-12	RP-46	RP-091275	356	1	UTRA TDD P-CCPCH RSCP absolute accuracy measurement in E-UTRAN	9.1.0	9.2.0
2009-12	RP-46	RP-091275	358	1	E-UTRAN TDD - UTRAN TDD cell search for SON	9.1.0	9.2.0
2009-12	RP-46	RP-091275	361		Cell Search Requirements for Intra-LTE Handover to Unknown Target Cell	9.1.0	9.2.0
2009-12	RP-46	RP-091273	365		Combined E-UTRAN interfrequency and GSM cell search test cases (Scenario set 3.2)	9.1.0	9.2.0
2009-12	RP-46	RP-091271	367	1	Correction in UE UTRA TDD P-CCPCH RSCP measurement capability for R9	9.1.0	9.2.0
2009-12	RP-46	RP-091273	374		E-UTRAN GSM RSSI Measurement Accuracy Tests	9.1.0	9.2.0
2009-12	RP-46	RP-091273	375		E-UTRAN UTRAN FDD CPICH RSCP Measurement Accuracy Tests	9.1.0	9.2.0
2009-12	RP-46	RP-091273	376		E-UTRAN UTRAN FDD CPICH Ec/No Measurement Accuracy Tests	9.1.0	9.2.0
2009-12	RP-46	RP-091275	378		Cell Timing Change Requirements for Event Triggered Reporting	9.1.0	9.2.0
2009-12	RP-46	RP-091271	380		Correction to Power Headroom Requirements	9.1.0	9.2.0
2009-12	RP-46	RP-091271	382		Editorial corrections to 36.133	9.1.0	9.2.0
2009-12	RP-46	RP-091271	387		Editorial corrections to the time units for RRC Re- establishment test cases	9.1.0	9.2.0
2009-12	RP-46	RP-091272	389	1	Introduction of cell search test case in DRX to verify L3 filtering	9.1.0	9.2.0
2009-12	RP-46	RP-091271	391		Correction to ONCG Patterns	9.1.0	9.2.0
2009-12	RP-46	RP-091275	329		Defining requirements for UTRA TDD measurements for SON (Technically endorsed at RAN 4 52bis in R4-093512)	9.1.0	9.2.0
2009-12	RP-46	RP-091272	332		Modification of test case of E-UTRA TDD intra frequency cell reselection (Technically endorsed at RAN 4 52bis in R4- 093552)	9.1.0	9.2.0
			000		Modification of test case of E-UTRA TDD inter frequency cell	9.1.0	9.2.0
	RP-46	RP-091272	333		reselection (Technically endorsed at RAN 4 52bis in R4- 093553)		
	RP-47	RP-100254	410		093553) Idle mode corrections	9.2.0	9.3.0
				1	093553)	9.2.0 9.2.0	9.3.0 9.3.0
2010-03	RP-47	RP-100254	410	1	093553) Idle mode corrections UE measurement capability requirements in Idle and Connected Correction to UE Measurement Capability		-
2010-03 2010-03	RP-47 RP-47	RP-100254 RP-100254	410 405	1	093553) Idle mode corrections UE measurement capability requirements in Idle and Connected Correction to UE Measurement Capability Requirements in Idle Mode Removal of activation time from interRAT handover	9.2.0	9.3.0
2010-03 2010-03 2010-03	RP-47 RP-47 RP-47	RP-100254 RP-100254 RP-100254	410 405 423	1	093553) Idle mode corrections UE measurement capability requirements in Idle and Connected Correction to UE Measurement Capability Requirements in Idle Mode	9.2.0 9.2.0	9.3.0 9.3.0

2010-03	RP-47	RP-100254	414	1	measurements_R9 Enhanced GSM Requirements for CSFB	9.2.0	9.3.0
2010-03	RP-47	RP-100254	414	1	Enhanced UTRA FDD Requirements for CSFB	9.2.0	9.3.0
2010-03	RP-47	RP-100254	399	1	Correction of RSRP value in E-UTRAN FDDFDD Inter	9.2.0	9.3.0
2010-03	KF-4/	KF-100255	399		frequency reselection test	9.2.0	9.3.0
2010-03	RP-47	RP-100255	397		Addition of missing Es/Noc parameters in RRM test	9.2.0	9.3.0
2010 00		11 100200	557		cases	0.2.0	0.0.0
2010-03	RP-47	RP-100255	421	ł –	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	1	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
2010 00	111 47	100203	413		requirements in TS 36.133	5.2.0	5.5.0
2010-03	RP-47	RP-100264	395		Corrections for Extended UMTS1500 in TS36.133(Rel-	9.2.0	9.3.0
			000		9)		
2010-03	RP-47	RP-100269	393		AOA and TA measurement report mappings	9.2.0	9.3.0
2010-03	RP-47	RP-100269	403	2	Mapping of UE RxTx time difference measurement	9.2.0	9.3.0
2010-03	RP-47	RP-100266	425	2	Home eNode B synchronization requirement	9.2.0	9.3.0
2010-03	RP-47	RP-100266	424	-	Minimum requirements on SI reading for HeNB	9.2.0	9.3.0
				2	inbound mobility		
2010-06	RP-48	RP-100622	473		Clarification on radio link monitoring	9.3.0	9.4.0
2010-06					Corrections of section numbering on the test case of E-	9.3.0	9.4.0
					UTRAN FDD-FDD inter-frequency cell search requirements		
0040.00	RP-48	RP-100622	472	<u> </u>	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	4	Correction to RRM Requirements	9.3.0	9.4.0
2010-06 2010-06	RP-48 RP-48	RP-100622 RP-100622	462 457	1	Correction to Absolute RSRP/RSRQ Definitions UE Measurement Capability Requirements for CDMA2000	9.3.0 9.3.0	9.4.0 9.4.0
2010-06	RP-40	RP-100622	457		Correction of E-UTRAN Inter-frequency Cell Re-selection	9.3.0	9.4.0
2010-00	RP-48	RP-100622	455	1	Requirements	9.3.0	9.4.0
2010-06	RP-48	RP-100622	451	1	Correction to idle mode requirements(Rel-9)	9.3.0	9.4.0
2010-06	RP-48	RP-100622	449	1	Editorial corrections to 36.133(Rel-9)	9.3.0	9.4.0
2010-06	RP-48	RP-100622	447	· ·	Correction to TDD intrafrequency accuracy test case	9.3.0	9.4.0
2010-06					Correction of Io value in E-UTRAN FDD and TDD Inter	9.3.0	9.4.0
	RP-48	RP-100622	441	1	frequency RSRP tests		
2010-06	RP-48	RP-100627	444	2	Corrections to CSG SI reading core requirement	9.3.0	9.4.0
2010-06	RP-48	RP-100627	445	1	RSRQ idle mode requirements	9.3.0	9.4.0
2010-06	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 40	DD 400000	400		Applicability of mobility requirements with inter-frequency	9.3.0	9.4.0
2010.00	RP-48	RP-100632	469		RSTD measurements UE Rx-Tx Time Difference Measurement Requirements for	0.0.0	9.4.0
2010-06	RP-48	RP-100632	439		F-CID	9.3.0	9.4.0
2010-06	RP-48	RP-100632	439	2	CR UE RX-TX time-difference measurement requirement	9.3.0	9.4.0
2010-00	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	1	1			A clarification text in the RSTD intra-frequency accuracy	00	0.0.0
	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 FDD and TDD Intra frequency		
	RP-49	RP-100915	508		test	9.4.0	9.5.0
2010-09	RP-49	RP-100920	521	1	Editorial corrections to 36.133 (R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100914	523	<u> </u>	Alignment of REFSENS between 36.101 and 36.133(R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100920	525	1	Correction of Time to Trigger unit for 36.133(R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100915	505	1	Corrections to 36.133(R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100920	528	1	E-UTRAN FDD Intra Frequency RSTD Measurement	9.4.0	9.5.0
2010-09	RP-49 RP-49	RP-100920 RP-100919	528	1	Accuracy test case Correction to Enhanced BSIC Verification Requirements	9.4.0	9.5.0
2010-09	RP-49 RP-49	RP-100919 RP-100919	538	<u> </u>	Enhanced CSFB Requirements with DRX	9.4.0	9.5.0
2010-09	RP-49 RP-49	RP-100919 RP-100919	540		Correction to E-CID Requirements	9.4.0	9.5.0
2010-09	111 40	100019	040	1	Addition of UTRA and GSM enhanced cell identification test	0.4.0	0.0.0
_0.0.00	RP-49	RP-100920	544	1	cases	9.4.0	9.5.0
2010-09				t	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	9.4.0	9.5.0
2010-09	RP-49	RP-100920	527		correction of redundant Hysteresis(Hys) for 36.133(R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100920	488	2	Test case for TDD UE Rx-Tx time difference measurement	9.4.0	9.5.0
2010-09	RP-49	RP-100914	483		Clarification of Radio link monitoring test cases	9.4.0	9.5.0
2010-09	RP-49	RP-100915	485		Test case for E-UTRA TDD event triggered reporting when	9.4.0	9.5.0

2010-09					L3 filtering is used in R9 E-UTRA TDD - UTRA TDD cell reselection in fading		
2010-09	RP-49	RP-100915	487		propagation conditions: UTRA TDD is of lower priority in R9	9.4.0	9.5.0
2010-09	KF-49	KF-100915	407		Test case for E-UTRAN TDD in the existence of non-allowed	9.4.0	9.5.0
2010 00	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		
	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	9.4.0	9.5.0
2010-09	RP-49	RP-100919	498		RRC timer accuracy requirement	9.4.0	9.5.0
2010-09	RP-49	RP-100915	501		Correction of OCNG	9.4.0	9.5.0
2010-09	RP-49	RP-100914	477	1	Cell identity change time in RRM Test cases	9.4.0	9.5.0
2010-09	RP-49	RP-100919	537		A clarification text in the RSTD intra-frequency accuracy requirements	0.4.0	0 5 0
2010-09	RP-49 RP-49	RP-100919 RP-100920	506		Correction of drx-RetransmissionTimer parameters	9.4.0 9.4.0	9.5.0 9.5.0
2010-09	KF-49	KF-100920	500		Correction of lo value in RSRP FDD and TDD Intra frequency	9.4.0	9.5.0
2010-03	RP-49	RP-100915	508		test	9.4.0	9.5.0
2010-09	RP-49	RP-100920	521	1	Editorial corrections to 36.133 (R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100914	523		Alignment of REFSENS between 36.101 and 36.133(R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100920	525	1	Correction of Time to Trigger unit for 36.133(R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100915	505	1	Corrections to 36.133(R9)	9.4.0	9.5.0
2010-09					E-UTRAN FDD Intra Frequency RSTD Measurement		
	RP-49	RP-100920	528	1	Accuracy test case	9.4.0	9.5.0
2010-09	RP-49	RP-100919	538	1	Correction to Enhanced BSIC Verification Requirements	9.4.0	9.5.0
2010-09	RP-49	RP-100919	539		Enhanced CSFB Requirements with DRX	9.4.0	9.5.0
2010-09	RP-49	RP-100919	540		Correction to E-CID Requirements	9.4.0	9.5.0
2010-09	RP-49	RP-100920	544	1	Addition of UTRA and GSM enhanced cell identification test cases	9.4.0	9.5.0
2010-09	KF-49	KF-100920	544	1	E-UTRAN FDD UE Rx – Tx Time Difference Measurement	9.4.0	9.5.0
2010-09	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	9.4.0	9.5.0
2010-09	RP-49	RP-100920	527		correction of redundant Hysteresis(Hys) for 36.133(R9)	9.4.0	9.5.0
2010-09	RP-49	RP-100920	488	2	Test case for TDD UE Rx-Tx time difference measurement	9.4.0	9.5.0
2010-09	RP-49	RP-100914	483		Clarification of Radio link monitoring test cases	9.4.0	9.5.0
2010-09					Test case for E-UTRA TDD event triggered reporting when		
	RP-49	RP-100915	485		L3 filtering is used in R9	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	DD 40	DD 400004	400		Test case for E-UTRAN TDD in the existence of non-allowed	0.4.0	0.5.0
2010-09	RP-49 RP-49	RP-100924 RP-100915	492 494		CSG cell PDCCH Aggregation level for RRM tests	9.4.0 9.4.0	9.5.0 9.5.0
2010-09	RP-49	RP-100915	494		Correction of ES/lot value in E-UTRAN RSRQ FDD intra	9.4.0	9.5.0
2010-09	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	9.4.0	9.5.0
2010-09	RP-49	RP-100919	498		RRC timer accuracy requirement	9.4.0	9.5.0
2010-09	RP-49	RP-100915	501		Correction of OCNG	9.4.0	9.5.0
2010-12	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	9.5.0	9.6.0
2010-12	RP-50	RP-101331	591	1	Correction to Radio link monitoring test cases	9.5.0	9.6.0
2010-12	RP-50	RP-101331	565	1	Corrections and Clarifications to TS36.133	9.5.0	9.6.0
2010-12	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	579		Removal of [] from PDSCH and PCFICH/PDCCH/PHICH	9.5.0	9.6.0
0040.40			<b>FO</b> (		Measurement Channel references in Annex A.	0.5.0	0.00
2010-12	RP-50	RP-101332	584		Enabling HARQ for RRM Tests	9.5.0	9.6.0
2010-12 2010-12	RP-50 RP-50	RP-101335 RP-101343	642 567	1	Completion of CSG cell reselection requirements Clarification of measurements requirements for HRPD and	9.5.0 9.5.0	9.6.0 9.6.0
2010-12	KP-50	RP-101343	100		cdma2000 1x	9.5.0	9.6.0
2010-12	RP-50	RP-101343	588		Addition of Band 18, 19 and 21 into UE Rx - Tx time	9.5.0	9.6.0
2010 12	14 00		000		difference requirements	0.0.0	0.0.0
2010-12	RP-50	RP-101343	603		Correction to Enhanced GSM Cell Identification	9.5.0	9.6.0
					Requirements		
2010-12	RP-50	RP-101343	551	3	E-UTRAN TDD Intra Frequency RSTD Measurement	9.5.0	9.6.0
0040 / -	DD 7-		0.00	ļ	Accuracy test case	0	
2010-12	RP-50	RP-101343	639		Correction to Enhanced UTRA FDD Cell Identification	9.5.0	9.6.0
2010 10	DD 50	DD 101242	621	1	Requirements	0.5.0	0.6.0
2010-12 2010-12	RP-50 RP-50	RP-101343 RP-101343	631 620	1	Correction of reselection requirement for UTRAN FDD cells Correction for Measurements of inter-RAT cells	9.5.0 9.5.0	9.6.0 9.6.0
2010-12	RP-50 RP-50	RP-101343 RP-101343	620 597	2	E-UTRAN FDD intra-frequency RSTD measurement	9.5.0	9.6.0
2010-12	11-30	111-101343	591	'	reporting delay test case	9.0.0	3.0.0
			•	1		1	
2010-12	RP-50	RP-101343	599	1	E-UTRAN TDD intra-frequency RSTD measurement	9.5.0	9.6.0
2010-12	RP-50	RP-101343	599	1	E-UTRAN TDD intra-frequency RSTD measurement reporting delay test case	9.5.0	9.6.0

2011-04	RP-51	RP-110340	0662	-	Correction to E-UTRAN TDD in-sync test requirements	9.6.0	9.7.0
2011-04	RP-51	RP-110348	0664	1	RSTD requirements, RMC and OCNG patterns	9.6.0	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-	9.7.0	9.8.0

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
2011-09	RP-53	RP-111246	862		Thresholds and margins for reporting of neighbour cells in RRM test A.8.9.1	9.8.0	9.9.0
2011-09	RP-53	RP-111246	901		Thresholds and margins for RRM tests A.5.2.1 and A.5.2.2	9.8.0	9.9.0
2011-09	RP-53	RP-111246	904		Thresholds and margins for RRM tests A.5.2.4 and A.5.2.5	9.8.0	9.9.0
2011-09	RP-53	RP-111247	888		Removing [] in section 8.1.2.2.2.2 for Rel-9	9.8.0	9.9.0
2011-09	RP-53	RP-111247	914		Adding condition of UTRA TDD measurement report delay requirements applied	9.8.0	9.9.0
2011-09	RP-53	RP-111247	929		Clarify time points and time duration for RLM tests A.7.3.x	9.8.0	9.9.0
2011-09	RP-53	RP-111250	948	1	Correction of references	9.8.0	9.9.0
2011-09	RP-53	RP-111251	925	1	Adding enhanced UTRA TDD cell identification requirements for Rel-9	9.8.0	9.9.0
2011-09	RP-53	RP-111251	968		CR for E-UTRAN FDD GSM event triggered reporting in AWGN with enhanced BSIC identification in R9	9.8.0	9.9.0
2011-09	RP-53	RP-111252	893		Requirements for RRC Connection Release with Redirection	9.8.0	9.9.0
2011-09	RP-53	RP-111252	959		Missing RSRQ in Intra-frequency measurement requirements	9.8.0	9.9.0
2011-09	RP-53	RP-111252	964	1	Requirements for RRC Connection Release with Redirection for TDD in R9	9.8.0	9.9.0

2011-12	RP-54	RP-111681	981		Corrections of inter-frequency measurement accuracy RSRP test cases	9.9.0	9.10.0
2011-12	RP-54	RP-111682	983		Removing [] in CSFB requirement for Rel-9	9.9.0	9.10.0
2011-12	RP-54	RP-111683	986		Clarification on RSTD test cases	9.9.0	9.10.0
2011-12	RP-54	RP-111683	991		Clarification on PRS bandwidth	9.9.0	9.10.0
2011-12	RP-54	RP-111683	1000		Test case for enhanced UTRA TDD cell identification for R9	9.9.0	9.10.0
2011-12	RP-54	RP-111683	1002		Test case for RRC connection release redirection to UTRA TDD for R9	9.9.0	9.10.0
2011-12	RP-54	RP-111683	1015		E-UTRAN FDD - UTRAN TDD enhanced cell identification test under AWGN propagation conditions in R9	9.9.0	9.10.0
2011-12	RP-54	RP-111683	1017	1	E-UTRAN FDD RRC connection release with redirection to UTRAN TDD in R9	9.9.0	9.10.0
2011-12	RP-54	RP-111681	1030		Correction for the identification time in DRX for UTRA TDD in R9	9.9.0	9.10.0
2011-12	RP-54	RP-111681	1038	1	Correction of E-UTRAN TDD-TDD inter frequency handover test case in R9	9.9.0	9.10.0
2011-12	RP-54	RP-111683	1040		Clarification of Expected RSTD and Expected RSTD uncertainty in RSTD test cases in R9	9.9.0	9.10.0
2011-12	RP-54	RP-111680	1042		Thresholds and margins for RRM tests A.8.11.3 and A.8.11.4	9.9.0	9.10.0
2011-12	RP-54	RP-111683	1045		Thresholds and margins for RRM tests A.8.11.5 and A.8.11.6	9.9.0	9.10.0
2011-12	RP-54	RP-111683	1048		RRC Connection Release with Redirection from E-UTRAN FDD to GERAN	9.9.0	9.10.0
2011-12	RP-54	RP-111683	1050		RRC Connection Release with Redirection from E-UTRAN TDD to GERAN	9.9.0	9.10.0
2011-12	RP-54	RP-111683	1057		Adding Band XX	9.9.0	9.10.0
2011-12	RP-54	RP-111683	1065		Test cases for RRC connection release with redirection to UTRAN FDD	9.9.0	9.10.0
2011-12	RP-54	RP-111683	1073		Applicable PRS BW for RSTD accuracy requirements	9.9.0	9.10.0
2012-03	RP-55	RP-120294	1076	1	RSTD signalling modifications	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1078	1	Test case for E-UTRA TDD RRC connection release redirection to UTRA TDD without SI provided for R9	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1080	1	Test case for E-UTRA FDD RRC connection release redirection to UTRA TDD without SI provided for R9	9.10.0	9.11.0
2012-03	RP-55	RP-120291	1083		Thresholds and margins for E-UTRAN to C2K RRM reselection test cases (ReI-9)	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1086		Addition of E-UTRAN TDD-HRPD Cell Reselection: HRPD is of Lower Priority test case R9	9.10.0	9.11.0
2012-03	RP-55	RP-120293	1088		Addition of E-UTRAN TDD-cdma2000 1X Cell Reselection: cdma2000 1X is of Lower Priority test case R9	9.10.0	9.11.0
2012-03	RP-55	RP-120293	1090		Addition of E-UTRAN TDD-HRPD Handover test case R9	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1092		Addition of E-UTRAN TDD-cdma2000 1X Handover test case R9	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1098		Addition of E-UTRAN FDD-TDD inter frequency RSRQ measurement accuracy test case R9	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1100		Addition of E-UTRAN FDD-TDD Inter frequency cell reselection test case R9	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1101		Addition of E-UTRAN TDD-FDD Inter frequency cell reselection test case R9	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1102		Addition of E-UTRAN FDD-TDD Inter frequency handover test case R9	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1103		Addition of E-UTRAN TDD-FDD Inter frequency handover test case R9	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1104		Addition of E-UTRAN TDD-FDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells test case R9	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1105		Addition of E-UTRAN FDD-TDD Inter-frequency event triggered reporting under fading propagation conditions in asynchronous cells test case R9	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1106		Addition of E-UTRAN FDD-TDD inter frequency measurement accuracy test case R9	9.10.0	9.11.0
2012-03	RP-55	RP-120292	1117	1	Thresholds and margins in RRM test case A.8.11.4	9.10.0	9.11.0
2012-03	RP-55	RP-120292	1120		TDD PRACH Test cases value of PRACH Configuration Index and first preamble power	9.10.0	9.11.0
2012-03	RP-55	RP-120292	1123	1	PDSCH and OCNG pattern in PRACH Test cases A.6.2.1 and A.6.2.3	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1130	1	Correction of PRS BW definition for RSTD measurements	9.10.0	9.11.0
2012-03	RP-55	RP-120294	1147		Correction of RSTD accuracy test cases for TDD	9.10.0	9.11.0
2012-07					Correction of the Change History table	9.11.0	9.11.1

# History

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