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Contents

Intellectual Property Rights	2
Foreword.....	2
Foreword.....	14
1 Scope	15
2 References	15
3 Definitions, abbreviations and equations	16
3.1 Definitions	16
3.2 Abbreviations	17
3.3 Equations	17
4 Frequency bands and channel arrangement.....	18
4.1 General	18
4.2 Frequency bands.....	18
4.3 TX–RX frequency separation.....	18
4.4 Channel arrangement.....	18
4.4.1 Channel spacing.....	18
4.4.2 Channel raster	18
4.4.3 Channel number	18
4.4.4 UARFCN	18
5 Transmitter Characteristics.....	19
5.1 General	19
5.2 User Equipment maximum output power.....	19
5.2.1 Definition and applicability	19
5.2.2 Minimum Requirements	19
5.2.3 Test purpose.....	20
5.2.4 Method of test	20
5.2.4.1 Initial conditions	20
5.2.4.2 Procedure	21
5.2.5 Test Requirements	21
5.3 UE frequency stability.....	21
5.3.1 Definition and applicability	21
5.3.2 Minimum Requirements	21
5.3.3 Test purpose.....	22
5.3.4 Method of test	22
5.3.4.1 Initial conditions	22
5.3.4.2 Procedure	22
5.3.5 Test Requirements	22
5.4 Output Power Dynamics	22
5.4.1 Uplink power control	22
5.4.1.1 Initial accuracy	23
5.4.1.1.1 Definition and applicability	23
5.4.1.1.2 Minimum requirements	23
5.4.1.1.3 Test purpose	23
5.4.1.1.4 Method of test.....	23
5.4.1.1.4.1 Initial conditions	23
5.4.1.1.4.2 Procedure	24
5.4.1.1.5 Test requirements	24
5.4.1.2 Differential accuracy, controlled input.....	24
5.4.1.2.1 Definition and applicability	24
5.4.1.2.2 Minimum requirements	24
5.4.1.2.3 Test purpose	25
5.4.1.2.4 Method of test.....	25
5.4.1.2.4.1 Initial conditions	25
5.4.1.2.4.2 Procedure	25

5.4.1.2.5	Test requirements	25
5.4.1.2A	Differential accuracy, controlled input.....	26
5.4.2	Minimum output power	26
5.4.2.1	Definition and applicability.....	26
5.4.2.2	Minimum Requirements.....	26
5.4.2.3	Test purpose	26
5.4.2.4	Method of test	26
5.4.2.4.1	Initial conditions	26
5.4.2.4.2	Procedure.....	26
5.4.2.5	Test requirements.....	27
5.4.3	Transmit OFF power.....	27
5.4.3.1	Definition and applicability.....	27
5.4.3.2	Minimum Requirements.....	27
5.4.3.3	Test purpose	27
5.4.3.4	Method of test	27
5.4.3.5	Test requirements.....	27
5.4.4	Transmit ON/OFF Time mask.....	27
5.4.4.1	Definition and applicability.....	27
5.4.4.2	Minimum requirements	28
5.4.4.3	Test Purpose.....	28
5.4.4.4	Method of test	28
5.4.4.4.1	Initial conditions	28
5.4.4.4.2	Procedure.....	28
5.4.4.5	Test requirements	29
5.4.5	Out-of-synchronisation handling of output power for continuous transmission.....	29
5.4.5.1	Definition and applicability.....	29
5.4.5.2	Minimum Requirement	29
5.4.5.3	Test purpose	30
5.4.5.4	Method of test	30
5.4.5.4.1	Initial conditions	30
5.4.5.4.2	Procedure.....	31
5.4.5.5	Test Requirements.....	31
5.4.6	Out-of-synchronisation handling of output power for discontinuous transmission	31
5.4.6.1	Definition and applicability.....	31
5.4.6.2	Minimum Requirement	32
5.4.6.3	Test purpose	33
5.4.6.4	Method of test	33
5.4.6.4.1	Initial conditions	33
5.4.6.4.2	Procedure.....	33
5.4.6.5	Test Requirements.....	33
5.5	Output RF spectrum emissions.....	34
5.5.1	Occupied bandwidth	34
5.5.1.1	Definition and applicability.....	34
5.5.1.2	Minimum Requirements.....	34
5.5.1.3	Test purpose	34
5.5.1.4	Method of test	34
5.5.1.4.1	Initial conditions	34
5.5.1.4.2	Procedure.....	34
5.5.1.5	Test requirements.....	35
5.5.2	Out of band emission	35
5.5.2.1	Spectrum emission mask.....	35
5.5.2.1.1	Definition and applicability	35
5.5.2.1.2	Minimum Requirements	35
5.5.2.1.3	Test purpose	36
5.5.2.1.4	Method of test.....	36
5.5.2.1.5	Test requirements	36
5.5.2.2	Adjacent Channel Leakage power Ratio (ACLR).....	37
5.5.2.2.1	Definition and applicability	37
5.5.2.2.2	Minimum Requirements	37
5.5.2.2.3	Test purpose	37
5.5.2.2.4	Method of test.....	37
5.5.2.2.5	Test requirements	38

5.5.3	Spurious emissions	38
5.5.3.1	Definition and applicability.....	38
5.5.3.2	Minimum Requirements.....	38
5.5.3.3	Test purpose	38
5.5.3.4	Method of test	39
5.5.3.4.1	Initial conditions.....	39
5.5.3.4.2	Procedure.....	39
5.5.3.5	Test requirements.....	39
5.6	Transmit Intermodulation.....	39
5.6.1	Definition and applicability	39
5.6.2	Minimum Requirements	40
5.6.3	Test purpose.....	40
5.6.4	Method of test	40
5.6.4.1	Initial conditions	40
5.6.4.2	Procedure	40
5.6.5	Test requirements.....	40
5.7	Transmit Modulation.....	41
5.7.1	Error Vector Magnitude.....	41
5.7.1.1	Definition and applicability.....	41
5.7.1.2	Minimum Requirements.....	41
5.7.1.3	Test purpose	41
5.7.1.4	Method of test	41
5.7.1.4.1	Initial conditions	41
5.7.1.4.2	Procedure.....	42
5.7.1.5	Test requirements.....	42
5.7.2	Peak code domain error	42
5.7.2.1	Definition and applicability.....	42
5.7.2.2	Minimum Requirement	42
5.7.2.3	Test purpose	42
5.7.2.4	Method of test	42
5.7.2.4.1	Initial conditions	42
5.7.2.4.2	Procedure.....	43
5.7.2.5	Test requirements.....	43
6	Receiver Characteristics	43
6.1	General	43
6.2	Reference sensitivity level.....	44
6.2.1	Definition and applicability	44
6.2.2	Minimum Requirements	44
6.2.3	Test purpose.....	44
6.2.4	Method of test	44
6.2.4.1	Initial conditions	44
6.2.4.2	Procedure	44
6.2.5	Test requirements.....	44
6.3	Maximum Input Level.....	45
6.3.1	Definition and applicability	45
6.3.2	Minimum requirements.....	45
6.3.3	Test purpose.....	45
6.3.4	Method of test.....	45
6.3.4.1	Initial conditions	45
6.3.4.2	Procedure	46
6.3.5	Test requirements.....	46
6.4	Adjacent Channel Selectivity (ACS).....	46
6.4.1	Definition and applicability	46
6.4.2	Minimum Requirements	46
6.4.3	Test purpose.....	46
6.4.4	Method of test	46
6.4.4.1	Initial conditions	46
6.4.4.2	Procedure	47
6.4.5	Test Requirements	47
6.5	Blocking Characteristics.....	47
6.5.1	Definition and applicability	47

6.5.2	Minimum Requirements	47
6.5.3	Test purpose.....	48
6.5.4	Method of test	48
6.5.4.1	Initial conditions	48
6.5.4.2	Procedure	49
6.5.5	Test requirements.....	49
6.6	Spurious Response	50
6.6.1	Definition and applicability	50
6.6.2	Minimum Requirements	50
6.6.3	Test purpose.....	50
6.6.4	Method of test	50
6.6.4.1	Initial conditions	50
6.6.4.2	Procedure	51
6.6.5	Test requirements.....	51
6.7	Intermodulation Characteristics.....	51
6.7.1	Definition and applicability	51
6.7.2	Minimum Requirements	51
6.7.3	Test purpose.....	52
6.7.4	Method of test	52
6.7.4.1	Initial conditions	52
6.7.4.2	Procedure	52
6.7.5	Test requirements.....	52
6.8	Spurious Emissions	53
6.8.1	Definition and applicability	53
6.8.2	Minimum Requirements	53
6.8.3	Test purpose.....	53
6.8.4	Method of test	53
6.8.4.1	Initial conditions	53
6.8.4.2	Procedure	54
6.8.5	Test requirements.....	54
7	Performance Requirements	55
7.1	General	55
7.1.2	Definition of Additive White Gaussian Noise (AWGN) Interferer	55
7.2	Demodulation in static propagation conditions	55
7.2.1	Demodulation of DCH.....	55
7.2.1.1	Definition and applicability.....	55
7.2.1.2	Minimum requirements	55
7.2.1.3	Test purpose	56
7.2.1.4	Method of test	56
7.2.1.4.1	Initial conditions	56
7.2.1.4.2	Procedure.....	56
7.2.1.5	Test requirements.....	57
7.3	Demodulation of DCH in multipath fading conditions	57
7.3.1	Multipath fading Case 1	57
7.3.1.1	Definition and applicability.....	57
7.3.1.2	Minimum requirements	57
7.3.1.3	Test purpose	57
7.3.1.4	Method of test	58
7.3.1.4.1	Initial conditions	58
7.3.1.4.2	Procedure.....	58
7.3.1.5	Test requirements.....	58
7.3.2	Multipath fading Case 2.....	58
7.3.2.1	Definition and applicability.....	58
7.3.2.2	Minimum requirement	58
7.3.2.3	Test purpose	59
7.3.2.4	Method of test	59
7.3.2.4.1	Initial conditions	59
7.3.2.4.2	Procedure.....	59
7.3.2.5	Test requirements	60
7.3.3	Multipath fading Case 3.....	60
7.3.3.1	Definition and applicability.....	60

7.3.3.2	Minimum requirements	60
7.3.3.3	Test purpose	60
7.3.3.4	Method of test	61
7.3.3.4.1	Initial conditions	61
7.3.3.4.2	Procedure	61
7.3.3.5	Test requirements	61
7.4	Base station transmit diversity mode	61
7.4.1	Demodulation of BCH in SCTD mode	61
7.5	Power control in downlink	61
7.5.1	Definition and applicability	61
7.5.2	Minimum requirements	61
7.5.3	Test purpose	62
7.5.4	Method of test	62
7.5.4.1	Initial conditions	62
7.5.4.2	Procedure	62
7.5.5	Test Requirements	63
7.6	Uplink Power Control	63
7.6.1	Definition and applicability	63
7.6.2	Minimum requirements	63
7.6.3	Test purpose	64
7.6.4	Method of test	64
7.6.4.1	Initial conditions	64
7.6.4.2	Procedure	65
7.6.5	Test requirements	65
8	Requirements for Support of RRM	65
8.1	General	65
8.2	Idle Mode Tasks	66
8.2.1	Cell Selection	66
8.2.2	Cell Re-Selection	66
8.2.2.1	Scenario 1: TDD/TDD cell re-selection single carrier case	66
8.2.2.1.1	Definition and applicability	66
8.2.2.1.2	Minimum requirement	66
8.2.2.1.3	Test purpose	66
8.2.2.1.4	Method of test	66
8.2.2.1.4.1	Initial conditions	66
8.2.2.1.4.2	Procedure	68
8.2.2.1.5	Test Requirements	68
8.2.2.2	Scenario 2: TDD/TDD cell re-selection multi carrier case	68
8.2.2.2.1	Definition and applicability	68
8.2.2.2.2	Minimum requirement	68
8.2.2.2.3	Test purpose	69
8.2.2.2.4	Method of test	69
8.2.2.2.4.1	Initial conditions	69
8.2.2.2.4.2	Procedure	70
8.2.2.2.5	Test Requirements	71
8.2.2.3	Scenario 3: TDD/FDD cell re-selection	71
8.2.2.3.1	Definition and applicability	71
8.2.2.3.2	Minimum requirement	71
8.2.2.3.3	Test purpose	71
8.2.2.3.4	Method of test	71
8.2.2.3.4.1	Initial conditions	71
8.2.2.3.4.2	Procedure	72
8.2.2.3.5	Test Requirements	73
8.2.2.4	Scenario 4: inter RAT cell re-selection	73
8.2.2.4.1	Definition and applicability	73
8.2.2.4.2	Minimum requirement	73
8.2.2.4.3	Test purpose	73
8.2.2.4.4	Method of Test	73
8.2.2.4.4.1	Initial conditions	73
8.2.2.4.4.2	Procedure	74
8.2.2.4.5	Test Requirements	75

8.3	UTRAN Connected Mode Mobility	75
8.3.1	TDD/TDD Handover	75
8.3.1.1	Handover to intra-frequency cell.....	75
8.3.1.1.1	Definition and applicability	75
8.3.1.1.2	Minimum requirement.....	75
8.3.1.1.3	Test purpose	76
8.3.1.1.4	Method of test.....	76
8.3.1.1.5	Test requirements	82
8.3.1.2	Handover to inter-frequency cell.....	82
8.3.1.2.1	Definition and applicability	82
8.3.1.2.2	Minimum requirement.....	82
8.3.1.2.3	Test purpose	83
8.3.1.2.4	Method of test.....	83
8.3.1.2.5	Test requirements	89
8.3.2	TDD/FDD Handover	89
8.3.2.1	Definition and applicability.....	89
8.3.2.2	Minimum requirement	89
8.3.2.3	Test purpose	90
8.3.2.4	Method of test	90
8.3.2.4.1	Initial conditions	90
8.3.2.4.2	Procedure.....	92
8.3.2.5	Test requirements	96
8.3.3	TDD/GSM Handover.....	96
8.3.3.1	Definition and applicability.....	96
8.3.3.2	Minimum requirement	96
8.3.3.3	Test purpose	97
8.3.3.4	Method of test	97
8.3.3.5	Test requirements.....	100
8.3.4	Cell Re-selection in CELL_FACH	101
8.3.4.1	Scenario 1: TDD/TDD cell re-selection single carrier case	101
8.3.4.1.1	Definition and applicability	101
8.3.4.1.2	Minimum requirement.....	101
8.3.4.1.3	Test purpose	101
8.3.4.1.4	Method of test.....	101
8.3.4.1.5	Test Requirements	103
8.3.4.2	Scenario 2: TDD/TDD cell re-selection multi carrier case	103
8.3.4.2.1	Definition and applicability	103
8.3.4.2.2	Minimum requirement.....	103
8.3.4.2.3	Test purpose	103
8.3.4.2.4	Method of test.....	103
8.3.4.2.5	Test Requirements	105
8.3.5	Cell Re-selection in CELL_PCH	106
8.3.5.1	Scenario 1: TDD/TDD cell re-selection single carrier case	106
8.3.5.1.1	Definition and applicability	106
8.3.5.1.2	Minimum requirement.....	106
8.3.5.1.3	Test purpose	106
8.3.5.1.4	Method of test.....	106
8.3.5.1.4.1	Initial conditions	106
8.3.5.1.4.2	Procedure	108
8.3.5.1.5	Test Requirements	108
8.3.5.2	Scenario 2: TDD/TDD cell re-selection multi carrier case	109
8.3.5.2.1	Definition and applicability	109
8.3.5.2.2	Minimum requirement.....	109
8.3.5.2.3	Test purpose	109
8.3.5.2.4	Method of test.....	109
8.3.5.2.4.1	Initial conditions	109
8.3.5.2.4.2	Procedure	110
8.3.5.2.5	Test Requirements	111
8.3.6	Cell Re-selection in URA_PCH.....	111
8.3.6.1	Scenario 1: TDD/TDD cell re-selection single carrier case	111
8.3.6.1.1	Definition and applicability	111
8.3.6.1.2	Minimum requirement.....	111

8.3.6.1.3	Test purpose	112
8.3.6.1.4	Method of test.....	112
8.3.6.1.4.1	Initial conditions	112
8.3.6.1.4.2	Procedure	113
8.3.6.1.5	Test Requirements	114
8.3.6.2	Scenario 2: TDD/TDD cell re-selection multi carrier case	114
8.3.6.2.1	Definition and applicability	114
8.3.6.2.2	Minimum requirement	114
8.3.6.2.3	Test purpose	115
8.3.6.2.4	Method of test.....	115
8.3.6.2.4.1	Initial conditions	115
8.3.6.2.4.2	Procedure	116
8.3.6.2.5	Test Requirements	117
8.4	RRC Connection Control	117
8.4.1	RRC re-establishment delay	117
8.4.1.1	RRC re-establishment delay to a known target cell	117
8.4.1.1.1	Definition and applicability	117
8.4.1.1.2	Minimum requirement	118
8.4.1.1.3	Test purpose	118
8.4.1.1.4	Method of test.....	118
8.4.1.1.4.1	Initial conditions	118
8.4.1.1.4.2	Procedure	119
8.4.1.1.5	Test requirements	120
8.4.1.2	RRC re-establishment delay to an unknown target cell	120
8.4.1.2.1	Definition and applicability	120
8.4.1.2.2	Minimum requirement	120
8.4.1.2.3	Test purpose	121
8.4.1.2.4	Method of test.....	121
8.4.1.2.4.1	Initial conditions	121
8.4.1.2.4.2	Procedure	122
8.4.1.2.5	Test requirements	122
8.4.2	Transport Format Combination selection in UE	123
8.4.2.1	Interactive or Background, PS, UL: 64 kbps.....	123
8.4.2.1.1	Definition and applicability	123
8.4.2.1.2	Minimum requirements	123
8.4.2.1.3	Test purpose	124
8.4.2.1.4	Method of test.....	124
8.4.2.1.4.1	Initial conditions	124
8.4.2.1.4.2	Procedure	126
8.4.2.1.5	Test requirements	126
8.5	Timing Characteristics	126
8.5.1	UE Timing Advance	126
8.5.1.1	Definition and applicability	126
8.5.1.2	Minimum requirement	126
8.5.1.3	Test purpose	127
8.5.1.4	Method of test.....	127
8.5.1.5	Test requirements	129
8.5.2	UE Transmit Timing	129
8.6	UE Measurements Procedures.....	129
8.6.1	TDD intra frequency measurements	129
8.6.1.1	Event triggered reporting in AWGN propagation conditions	129
8.6.1.1.1	Definition and applicability	129
8.6.1.1.2	Minimum requirement	129
8.6.1.1.3	Test purpose	129
8.6.1.1.4	Method of test.....	130
8.6.1.1.5	Test requirements	134
8.6.1.2	Event 1H and 1I triggered reporting in AWGN propagation condition	134
8.6.1.2.1	Definition and applicability	134
8.6.1.2.2	Minimum requirement	134
8.6.1.2.3	Test purpose	135
8.6.1.2.4	Method of test.....	135
8.6.1.2.5	Test requirements	142

8.6.1.3	Correct reporting of neighbours in fading propagation conditions	142
8.6.1.3.1	Definition and applicability	142
8.6.1.3.2	Minimum requirement	142
8.6.1.3.3	Test purpose	142
8.6.1.3.4	Method of test	142
8.6.1.3.4.1	Initial conditions	142
8.6.1.3.4.2	Procedure	143
8.6.1.3.5	Test requirements	145
8.6.2	TDD inter frequency measurements	145
8.6.2.1	Correct reporting of neighbours in AWGN propagation condition	145
8.6.2.1.1	Definition and applicability	145
8.6.2.1.2	Minimum requirement	145
8.6.2.1.3	Test purpose	146
8.6.2.1.4	Method of test	146
8.6.2.1.5	Test requirements	150
8.6.3	FDD measurements	151
8.6.3.1	Correct reporting of FDD neighbours in AWGN propagation condition	151
8.6.3.1.1	Definition and applicability	151
8.6.3.1.2	Minimum requirement	151
8.6.3.1.3	Test purpose	152
8.6.3.1.4	Method of test	152
8.6.3.1.5	Test requirements	155
8.7	Measurements Performance Requirements	155
8.7.1	P-CCPCH RSCP	156
8.7.1.1	Intra frequency measurement accuracy	156
8.7.1.1.1	Absolute accuracy requirement	156
8.7.1.1.2	Relative accuracy requirement	159
8.7.1.2	Inter frequency measurement accuracy	160
8.7.1.2.1	Relative accuracy requirement	160
8.7.1.2.1.3	Test Purpose	161
8.7.2	CPICH measurements (FDD)	165
8.7.2.1	CPICH RSCP	165
8.7.2.1.1	Absolute measurement accuracy	165
8.7.2.1.1.1	Definition and applicability	165
8.7.2.1.1.2	Minimum Requirements	165
8.7.2.1.1.3	Test purpose	165
8.7.2.1.1.4	Method of test	165
8.7.2.1.1.4.1	Initial conditions	165
8.7.2.1.1.4.2	Procedure	166
8.7.2.1.1.5	Test requirements	167
8.7.2.2	CPICH Ec/Io	167
8.7.3	Timeslot ISCP	168
8.7.3.1	Intra frequency measurement accuracy	168
8.7.3.1.1	Absolute accuracy requirement	168
8.7.4	UTRA carrier RSSI	171
8.7.4.1	Absolute measurement accuracy	171
8.7.4.1.1	Definition and applicability	171
8.7.4.1.2	Minimum Requirements	171
8.7.4.1.3	Test Purpose	171
8.7.4.1.4	Method of test	172
8.7.4.1.4.1	Initial conditions	172
8.7.4.1.4.2	Procedure	172
8.7.4.1.5	Test requirements	173
8.7.4.2	Relative measurement accuracy	174
8.7.4.2.1	Definition and applicability	174
8.7.4.2.2	Minimum Requirements	174
8.7.4.2.3	Test Purpose	174
8.7.4.2.4	Method of test	174
8.7.4.2.4.1	Initial conditions	174
8.7.4.2.4.2	Procedure	175
8.7.4.2.5	Test requirements	175
8.7.5	GSM carrier RSSI	175

8.7.6	SIR	175
8.7.7	Transport Channel BLER	176
8.7.8	SFN-SFN observed time difference	176
8.7.8.1	SFN-SFN observed time difference type 1	176
8.7.8.1.1	Measurement accuracy	176
8.7.8.1.1.1	Definition and applicability	176
8.7.8.1.1.2	Minimum requirements	176
8.7.8.1.1.3	Test purpose	177
8.7.8.1.1.4	Method of test	177
8.7.8.1.1.4.1	Initial conditions	177
8.7.8.1.1.4.2	Procedure	177
8.7.8.1.1.5	Test requirements	179
8.7.8.2	SFN-SFN observed time difference type 2	179
8.7.9	Observed time difference to GSM cell	179
8.7.10	UE GPS Timing of Cell Frames for UP	179
8.7.11	SFN-CFN observed time difference	179
8.7.11.1	Intra frequency measurement requirement	179
8.7.11.1.1	Definition and applicability	179
8.7.11.1.2	Minimum requirements	179
8.7.11.1.3	Test Purpose	180
8.7.11.1.4	Method of test	180
8.7.11.1.5	Test requirements	182
8.7.11.2	Inter frequency measurement requirement	183
8.7.11.2.1	Definition and applicability	183
8.7.11.2.2	Minimum requirements	183
8.7.11.2.3	Test purpose	183
8.7.11.2.4	Method of test	184
8.7.11.2.5	Test requirements	185
8.7.12	UE transmitted power	186

Annex A (informative): Connection Diagrams187

Annex B (normative): Global In-Channel TX-Test.....191

B.1	General	191
B.2	Definition of the process	191
B.2.1	Basic principle	191
B.2.2	Output signal of the TX under test	191
B.2.3	Reference signal	191
B.2.4	void	192
B.2.5	Classification of measurement results	192
B.2.6	Process definition to achieve results of type "deviation"	192
B.2.7	Process definition to achieve results of type "residual"	193
B.2.7.1	Error Vector Magnitude (EVM)	193
B.2.7.2	Peak Code Domain Error (PCDE)	194
B.3	Notes	194

Annex C (normative): Measurement channels197

C.1	General	197
C.2	UL Reference measurement channels	198
C.2.1	UL reference measurement channel (12.2 kbps)	198
C.2.2	UL multi code reference measurement channel (12.2 kbps)	199
C.2.3	UL reference measurement channel (64 kbps)	200
C.2.4	UL reference measurement channel (144 kbps)	201
C.2.5	UL reference measurement channel (384 kbps)	202
C.3	DL Reference measurement channels	203
C.3.1	DL reference measurement channel (12.2 kbps)	203
C.3.2	DL reference measurement channel (64 kbps)	204
C.3.3	DL reference measurement channel (144 kbps)	205
C.3.4	DL reference measurement channel (384 kbps)	206
C.3.5	BCH reference measurement channel	207

Annex D (normative): Propagation conditions208

D.1	Test Environments.....	208
D.2	Propagation Conditions	208
D.2.1	Static propagation condition	208
D.2.2	Multi-path fading propagation conditions.....	208
Annex E (normative): Common RF test conditions		209
E.1	General	209
E.2	Connection Set-up	209
E.3	During connection	209
E.3.1	Measurement of Tx Characteristics	209
E.3.2	Measurement of Rx Characteristics	210
E.3.3	Measurement of Performance requirements	210
Annex F (normative): General test conditions and declarations.....		211
F.1	Acceptable uncertainty of Test System	211
F.1.1	Measurement of test environments	211
F.1.2	Measurement of transmitter	212
F.1.3	Measurement of receiver	213
F.1.4	Performance requirement.....	213
F.1.5	Requirements for support of RRM	213
F.2	Test Tolerances (This clause is informative).....	213
F.2.1	Transmitter.....	214
F.2.2	Receiver	214
F.2.3	Performance requirements	214
F.2.4	Requirements for support of RRM	215
F.3	Interpretation of measurement results	215
F.4	Derivation of Test Requirements (This clause is informative).....	215
F.5	Acceptable uncertainty of Test Equipment (This clause is informative).....	219
F.5.1	Transmitter measurements	219
F.5.2	Receiver measurements	219
F.5.3	Performance measurements	220
F.6	General rules for statistical testing	220
F.6.1	Statistical testing of receiver BER/BLER performance.....	220
F.6.1.1	Error Definition.....	220
F.6.1.2	Test Method	220
F.6.1.3	Test Criteria.....	220
F.6.1.4	Calculation assumptions.....	220
F.6.1.5	Definition of good pass fail decision.....	221
F.6.1.6	Good balance between testtime and statistical significance	221
F.6.1.7	Pass fail decision rules	222
F.6.1.8	Test conditions for BER,BLER tests.....	223
F.6.1.9	Practical Use (informative)	224
F.6.2	Statistical testing of RRM delay performance.....	226
F.6.2.1	Test Method.....	226
F.6.2.2	Bad Delay Ratio (ER).....	226
F.6.2.3	Test Criteria	226
F.6.2.4	Calculation assumptions	226
F.6.2.4.1	Statistical independence	226
F.6.2.4.2	Applied formulas.....	226
F.6.2.4.3	Approximation of the distribution.....	227
F.6.2.5	Definition of good pass fail decision.	227
F.6.2.6	Good balance between test-time and statistical significance	228
F.6.2.7	Pass fail decision rules.....	228
F.6.2.8	Test conditions for RRM delay tests.....	229
F.6.2.9	Practical Use (informative).....	229
Annex G (normative): Environmental conditions		231
G.1	General	231
G.2	Environmental requirements	231
G.2.1	Temperature.....	231
G.2.2	Voltage.....	231
G.2.3	Vibration.....	232

G.2.4	Specified frequency range	232
Annex H (normative): Terminal Baseline and Service Implementation Capabilities (TDD).....		233
H.1	Baseline Implementation Capabilities:	233
H.2	Service Implementation Capabilities:.....	233
Annex I (normative): Default Message Contents.....		234
Annex J (informative): Change history		237
History		239

Foreword

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

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

Version x.y.z

where:

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

1 Scope

This present document specifies the measurement procedure for the conformance test of the mobile station that contain transmitting characteristics, receiving characteristics and performance requirements and requirements for support of RRM (Radio Resource Management) in TDD mode.

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 25.102: "UTRA (UE) TDD Radio Transmission and Reception (TDD)".

Note: The current version reflects 3G TS 25.102 version 3.2.0.

In addition CRs agreed on RAN4 level (Meeting #13, Turku, Finland, May 2000) are taken into account.

[2] 3GPP TS 25.123: "Requirements for Support of Radio Resource Management (TDD)".

[3] 3GPP TS 34.108 "Common Test Environments for User Equipment (UE) Conformance Testing"

[4] 3GPP TS 34.109: " Terminal logical test interface; Special conformance testing functions".

[5] 3GPP TS 25.224: "Physical Layer Procedures (TDD)".

[6] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[7] 3GPP TR 25.990: "Vocabulary".

[8] ITU-R Recommendation SM.328-9: "Spectra and bandwidth of emissions".

[9] 3GPP TS 25.331: "Radio Resource Control (RRC) Protocol Specification".

[10] 3GPP TS 25.433 "UTRAN Iub Interface NBAP Signalling".

[11] ITU-R Recommendation SM.329: "Spurious emissions".

[12] 3GPP TS 25.304: "UE Procedures in Idle Mode and Procedures for Cell Reselection in Connected Mode".

[13] 3GPP TS 25.303: "Interlayer Procedures in Connected Mode".

[14] 3GPP TS 25.321: "Medium Access Control (MAC) protocol specification".

[15] 3GPP TS 25.223: "Spreading and modulation (TDD)".

[16] ETSI ETR 273-1-2: "Improvement of radiated methods of measurement (using test sites) and evaluation of the corresponding measurement uncertainties; Part 1: Uncertainties in the measurement of mobile radio equipment characteristics; Sub-part 2: Examples and annexes".

[17] 3GPP TR 25.926: "UE Radio Access Capabilities".

[18] 3GPP TR 21.904: "UE capability requirements".

- [19] 3GPP TS 25.221: "Physical channels and mapping of transport channels onto physical channels (TDD)".
- [20] 3GPP TS 05.08: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control".
- [21] 3GPP TS 34.123-1: "User Equipment (UE) Conformance Specification; Part 1: Protocol Conformance Specification".
- [22] 3GPP TS 25.225: "Physical Layer – Measurements (TDD)".

3 Definitions, abbreviations and equations

For the purposes of the present document, the definitions, symbols, abbreviations and equations used in the present document are listed in TR 21.905 [6] and TR 25.990 [7].

3.1 Definitions

For the purpose of the present document, the following definition applies:

Power Spectral Density: The units of Power Spectral Density (PSD) are extensively used in this document. PSD is a function of power versus frequency and when integrated across a given bandwidth, the function represents the mean power in such a bandwidth. When the mean power is normalised to (divided by) the chip-rate it represents the mean energy per chip. Some signals are directly defined in terms of energy per chip, (DPCH_Ec, Ec, and P-CCPCH_Ec) and others defined in terms of PSD (Io, Ioc, Ior and \hat{I} or). There also exist quantities that are a ratio of energy per chip to PSD (DPCH_Ec/Ior, Ec/Ior etc.). This is the common practice of relating energy magnitudes in communication systems.

It can be seen that if both energy magnitudes in the ratio are divided by time, the ratio is converted from an energy ratio to a power ratio, which is more useful from a measurement point of view. It follows that an energy per chip of X dBm/3.84 MHz can be expressed as a mean power per chip of X dBm. Similarly, a signal PSD of Y dBm/3.84 MHz can be expressed as a signal power of Y dBm.

Maximum Output Power: This is a measure of the maximum power the UE can transmit (i.e. the actual power as would be measured assuming no measurement error) in a bandwidth of at least $(1 + \alpha)$ times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period.

Mean Power: When applied to a CDMA modulated signal this is the power (transmitted or received) in a bandwidth of at least $(1 + \alpha)$ times the chip rate of the radio access mode. The period of measurement shall be a transmit timeslot excluding the guard period unless otherwise stated.

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

RRC Filtered Mean Power: The mean power as measured through a root raised cosine filter with roll-off factor α and a bandwidth equal to the chip rate of the radio access mode.

Nominal Maximum Output Power: This is the nominal power defined by the UE power class. The period of measurement shall be a transmit timeslot excluding the guard period.

Received Signal Code Power (RSCP): Given only signal power is received, the RRC filtered mean power of the received signal after despreading and combining.

Interference Signal Code Power (ISCP): Given only interference power is received, the RRC filtered mean power of the received signal after despreading to the code and combining. Equivalent to the RSCP value but now only interference is received instead of signal

NOTE 1: The RRC filtered mean power of a perfectly modulated CDMA signal is 0.246 dB lower than the mean power of the same signal.

NOTE 2: The roll-off factor α is defined in section 6.8.1 of [1].

3.2 Abbreviations

For the purpose of the present document, the following abbreviations apply.

ACLR	Adjacent Channel Leakage power Ratio
ACS	Adjacent Channel Selectivity
AFC	Automatic Frequency Control
ATT	Attenuator
CW	Continuous wave (unmodulated signal)
DPCH	Dedicated physical channel
DPCH_Ec	Average energy per PN chip for DPCH
EVM	Error Vector Magnitude
FFS	For Further Study
Fuw	Frequency of unwanted signal. This is specified in bracket in terms of an absolute frequency(s) or frequency offset from the assigned channel frequency.
HYB	Hybrid
I_{BTS}	Interference signal power level at BTS in dBm, which is broadcasted on BCH
I_{oac}	The power spectral density of the adjacent frequency channel as measured at the UE antenna connector
I_{oc}	The power spectral density (integrated in a noise bandwidth equal to the chip rate and normalized to the chip rate) of a band limited white noise source (simulating interference from other cells) as measured at the UE antenna connector.
I_{or}	The total transmit power spectral density (integrated in a bandwidth of $(1+\alpha)$ times the chip rate and normalized to the chip rate) of the downlink signal at the BS antenna connector
\hat{I}_{or}	The received power spectral density (integrated in a bandwidth of $(1+\alpha)$ times the chip rate and normalized to the chip rate) of the downlink signal as measured at the UE antenna connector
I_{owc}	Unwanted signal power level
OBW	Occupied Bandwidth
OCNS	Orthogonal Channel Noise Simulator, a mechanism used to simulate the users or control signals on the other orthogonal channels of a downlink.
PCDE	Peak Code Domain Error
PPM	Parts Per Million
PRBS	Pseudo Random Bit Sequence
RRC	Root-Raised Cosine
SCTD	Space Code Transmit Diversity
SIR	Signal to Interference ratio
SS	System Simulator
TBD	To Be Defined
TPC	Transmit Power Control
TS	Time Slot

3.3 Equations

For the purpose of the present document, the following additional equations apply:

$\frac{DPCH_Ec}{I_{or}}$	The ratio of the average energy per PN chip of the DPCH to the total transmit power spectral density of the downlink at the BS antenna connector
$\frac{\sum DPCH_Ec}{I_{or}}$	The ratio of the sum of DPCH_Ec for one service in case of multicode to the total transmit power spectral density of the downlink at the BS antenna connector

4 Frequency bands and channel arrangement

4.1 General

The information presented in this clause is based on a chip rate of 3,84 Mcps.

NOTE: Other chip rates may be considered in future releases.

4.2 Frequency bands

UTRA/TDD is designed to operate in the following bands;

- | | |
|-----------------------|---|
| a) 1 900 – 1 920 MHz: | Uplink and downlink transmission |
| 2 010 – 2 025 MHz: | Uplink and downlink transmission |
| b) 1 850 – 1 910 MHz: | Uplink and downlink transmission (note) |
| 1 930 – 1 990 MHz: | Uplink and downlink transmission |
| c) 1 910 – 1 930 MHz: | Uplink and downlink transmission (note) |

NOTE: Used in ITU Region 2.

Additional allocations in ITU region 2 are for further study.

Deployment in existing or other frequency bands is not precluded.

4.3 TX–RX frequency separation

No TX-RX frequency separation is required as Time Division Duplex (TDD) is employed. Each TDMA frame consists of 15 timeslots where each timeslot can be allocated to either transmit or receive.

4.4 Channel arrangement

4.4.1 Channel spacing

The nominal channel spacing is 5 MHz, but this can be adjusted to optimise performance in a particular deployment scenario.

4.4.2 Channel raster

The channel raster is 200 kHz, which means that the carrier frequency must be a multiple of 200 kHz.

4.4.3 Channel number

The carrier frequency is designated by the UTRA absolute radio frequency channel number (UARFCN). The value of the UARFCN in the IMT2000 band is defined as follows:

$$N_f = 5 * F \quad 0,0 \text{ MHz} \leq F \leq 3276,6 \text{ MHz} \quad \text{where } F \text{ is the carrier frequency in MHz}$$

4.4.4 UARFCN

The following UARFCN range shall be supported for each band.

Table 5.1: UTRA Absolute Radio Frequency Channel Number

Frequency Band	Frequency Range	UARFCN Uplink and Downlink transmission
For operation in frequency band as defined in subclause 5.2 (a)	1900-1920 MHz 2010-2025 MHz	9512 to 9588 10062 to 10113
For operation in frequency band as defined in subclause 5.2 (b)	1850-1910 MHz 1930-1990 MHz	9262 to 9538 9662 to 9938
For operation in frequency band as defined in subclause 5.2 (c)	1910-1930 MHz	9562 to 9638

5 Transmitter Characteristics

5.1 General

Transmitting performance test of the UE is implemented during communicating with the SS via air interface. The procedure is uses normal call protocol until the UE is communicating on traffic channel basically. (Refer to TS 34.108 [3] Common Test Environments for User Equipment (UE) Conformance Testing) On the traffic channel, the UE provides special function for testing that is called Logical Test Interface and the UE is tested using this function. (Refer to TS 34.109 [4] Logical Test Interface; Special conformance testing functions).

Unless detailed the transmitter characteristic are specified at the antenna connector of the UE. For UE with integral antenna only, a reference antenna with a gain of 0 dBi is assumed. Transmitter characteristics for UE(s) with multiple antennas/antenna connectors are for further study.

The UE antenna performance has a significant impact on system performance, and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of the present document. It is recognized that different requirements and test methods are likely to be required for the different types of UE.

The common RF test conditions are defined in annex E, and each test conditions in this Clause should refer annex E. Individual test conditions are defined in the paragraph of each test.

5.2 User Equipment maximum output power

5.2.1 Definition and applicability

The nominal maximum output power and its tolerance are defined according to the Power Class of the UE.

The requirements in this test apply to all UTRA – TDD- UEs

Notes copied from TS 25.102 clause 6.2.1:

NOTE 1: For multi-code operation thenominal maximum output power will be reduced by the difference of peak to average ratio between single and multi-code transmission.

NOTE 2: The tolerance allowed for the nominal maximum power applies even at the multi-code transmission mode

NOTE 3: For UE using directive antennas for transmission, a class dependent limit will be placed on the maximum EIRP (Equivalent Isotropic Radiated Power).

5.2.2 Minimum Requirements

The error of the UE maximum output power shall not exceed the tolerance shown in tables 5.2.2 a and b for single and multi-code.

Table 5.2.2.a: Maximum Output Power single code

Power Class	Nominal maximum output power	Tolerance
2	+24 dBm	+1dB/-3dB
3	+21 dBm	+2dB/-2dB

Table 5.2.2.b: Maximum Output Power multi code

Power Class	Nominal maximum output power	Tolerance
2	21 dBm (note)	+1dB/-3dB
3	18 dBm (note)	+2dB/-2dB
NOTE: These figures are not mentioned in 25.102. Instead there is a note, saying: "For multi-code operation the maximum output power will be reduced by the difference of peak to average ratio between single and multi-code transmission." The figures are calculated from maximum output power single code (table 5.2.2.a) and UL multicode reference measurement channel (12,2 kbit/s) (annex C.2.2.) containing two code signals with equal level.		

The normative reference for this requirement is TS 25.102 clause 6.2.

5.2.3 Test purpose

For the following reasons:

Limit interference.

Verify that the maximum output power is achievable.

It is the purpose of the test to verify that the UE's maximum output power is within its tolerance limits under all environmental conditions.

5.2.4 Method of test

5.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.1.
- 2) Calls are set up according to the Generic call setup procedure using parameters as specified in tables 5.2.4.a and b.
- 3) Enter the UE into loopback test mode and start the loopback test.

Table 5.2.4.a: Test parameters for Maximum Output Power single code

Parameter	Value/description
UL Reference measurement channel	12,2kbps, according to annex C.2.1
Uplink Power Control	SS level and signalling values such that UE transmits maximum power.
Data content	real life (sufficient irregular)

Table 5.2.4.b: Test parameters for Maximum Output Power multicode

Parameter	Value/description
Reference measurement channel	Multicode 12,2kbps, according to annex C.2.2
Uplink Power Control	SS level and signalling values such that UE transmits maximum power
Data content	real life (sufficient irregular)

5.2.4.2 Procedure

- 1) Measure the mean power of the UE output signal.
- 2) Run step 1) on RF channels Low / Mid / High.

5.2.5 Test Requirements

The output power, measured in step 2) of clause 5.2.4.2, shall not exceed the prescribed tolerance in table 5.2.5 a and b.

Table 5.2.5.a: Maximum Output Power single code

Power Class	Nominal maximum output power	Tolerance
2	+24 dBm	+1,7 dB / -3,7 dB
3	+21 dBm	+2,7 dB / -2,7 dB

Table 5.2.5.b: Maximum Output Power multi code

Power Class	Nominal maximum output power	Tolerance
2	21 dBm	+1,7dB / -3,7 dB
3	18 dBm	+2,7dB / -2,7 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F clause F.4.

5.3 UE frequency stability

5.3.1 Definition and applicability

The frequency stability is the difference of the modulated carrier frequency between the RF transmission from the UE and the RF transmission from the BS. The UE shall use the same frequency source for both RF frequency generation and chip clocking.

The requirements of this test apply to all types of UTRA- UE.

5.3.2 Minimum Requirements

The UE frequency stability, observed over a period of one timeslot, shall be within $\pm 0,1$ ppm compared to signals received from the BS.

The normative reference for this requirement is TS 25.102 [1] clause 6.3.

5.3.3 Test purpose

Reliable frequency stability of the UE's transmitter in certain tolerance limits is prerequisite for connectivity.

This test stresses the ability of the UE's receiver to derive correct frequency information from the received signal for the transmitter.

5.3.4 Method of test

5.3.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.1.
- 2) A call is set up according to the Generic call setup procedure using parameters as specified in table 5.3.4.1.
- 3) Enter the UE into loopback test mode and start the loopback test.

Table 5.3.4.1: Test parameters for Frequency Stability

Parameter	Value/description
SS level	-105 dBm (reference sensitivity)
UL reference measurement channel	12,2 kbps according to annex C.2.1.
Data content	real life (sufficient irregular)

5.3.4.2 Procedure

- 1) Measure the frequency error Δf across the TS according to annex B.
- 2) Repeat step 1) for 200 bursts (time slots).
- 3) Run Step 1) and 2) for RF channels Low /Mid/ High.

5.3.5 Test Requirements

For all measured bursts (time slots) , the frequency error, derived in clause 5.3.4.2, shall not exceed \pm (0,1 ppm + 10 Hz).

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4

5.4 Output Power Dynamics

Power control is used to limit the interference level.

5.4.1 Uplink power control

Uplink power control is the ability of the UE transmitter to sets its output power in accordance with measured downlink path loss, values determined by higher layer signalling and path loss weighting parameter α as defined in TS 25.331 [9]. The output power is defined as the RRC filtered mean power of the transmit timeslot.

5.4.1.1 Initial accuracy

5.4.1.1.1 Definition and applicability

Initial Uplink power control is the ability of the UE transmitter to set its output power in accordance with measured downlink path loss, and signalling values: I_{BTS} and Constant value, received from the BCH and applicable for the PRACH.

The requirements and this test apply to all types of UTRA - UEs.

5.4.1.1.2 Minimum requirements

The UE power control, initial accuracy, is given in table 5.4.1.1.2.

Table 5.4.1.1.2: Initial uplink power control tolerance

Normal conditions	±9 dB
Extreme conditions	±12 dB

The reference for this requirement is TS 25.102 [1] clause 6.4.1.1.

5.4.1.1.3 Test purpose

The power of the received signal at the UE and the BCH information control the power of the transmitted UE signal with the target to transmit at lowest power, acceptable for proper communication.

The test stresses the ability of the receiver to measure the received power over the receiver dynamic range and to derive from this correct transmitter-power.

5.4.1.1.4 Method of test

5.4.1.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

Connect the SS to the MS antenna connector as shown in figure A.1.

A call is set up according to the generic call setup procedure [3] using parameters as specified in table 5.4.1.1.4. The RACH procedure within the call setup is used for the test.

Table 5.4.1.1.4: Test parameters for uplink Power Control

	RX-Upper dynamic end	RX-middle	RX-Sensitivity level
SS transmit power	-25 dBm/3,84 MHz	-65 dBm/3,84 MHz	-105 dBm/3,84 MHz
Broadcasted transmit-power PCCPCH	35 dBm	35 dBm	24 dBm
Simulated path loss = Broadcasted TX – SS TX Power	60 dB	100 dB	129 dB
I_{BTS} (UL interference)	-75 dBm	-100 dBm	-110 dBm
Constant value	-10 dB	-10 dB	-10 dB
Nominal expected UE TX power	-25 dBm	-10 dBm	+9 dBm ²⁾
NOTE 1: While the SS transmit power shall cover the UE receiver input dynamic range, the logical parameters: broadcasted transmit power, I_{BTS} , and RACH constant value are chosen to achieve a UE TX power, located within the TX output power dynamic range of a class 3 UE.			
NOTE 2: Nominal TX output power 9 dBm allows to check the uplink power control algorithm within the entire tolerance range (9 dBm +12 dB: 9 dBm +12 dB =21 dBm = max power class 3).			

5.4.1.1.4.2 Procedure

- 1) Set the SS transmit power according to table 5.4.1.1.4.
- 2) Measure the RACH output power of the UE according to annex B.
- 3) Repeat the test for all SS transmit powers and parameters in table 5.4.1.1.4.

5.4.1.1.5 Test requirements

The deviation with respect to the nominal expected UE TX power (table 5.4.1.1.2), derived in step 2, shall not exceed the prescribed tolerance in table 5.4.1.1.5.

Table 5.4.1.1.5: Test parameters for uplink Power Control

Expected UE TX power, normal conditions	-25 dBm \pm 10 dB	-10 dBm \pm 10 dB	+9 dBm \pm 10 dB
Expected UE TX power, extreme conditions	-25 dBm \pm 13 dB	-10 dBm \pm 13 dB	+9 dBm \pm 13 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.4.1.2 Differential accuracy, controlled input

5.4.1.2.1 Definition and applicability

Uplink power control, differential accuracy, is the ability of the UE transmitter to sets its output power in accordance with measured downlink path loss, and the signalling values: I_{BTS} , SIR_{Target} , Constant Value, received from higher layers and applicable for the DPCH.

Specifically, the uplink power control, differential accuracy, controlled input, is defined as the error in the UE transmitter power step as a result of a step in SIR_{TARGET} , I_{BTS} or DPCH Constant Value when the path loss weighting parameter $\alpha=0$.

The requirements of this test apply to all types of UTRA -UE.

5.4.1.2.2 Minimum requirements

The step in SIR_{TARGET} shall be rounded to the closest integer dB value. The power control error resulting from a change in SIR_{TARGET} , I_{BTS} or DPCH Constant Value shall not exceed the values in table 5.4.1.2.2.

Table 5.4.1.2.2: Transmitter power step tolerance as a result of control power step

ΔSIR_{TARGET} [dB]	Transmitter power step tolerance [dB]
$\Delta SIR_{TARGET} \leq 1$	$\pm 0,5$
$1 < \Delta SIR_{TARGET} \leq 2$	± 1
$2 < \Delta SIR_{TARGET} \leq 3$	$\pm 1,5$
$3 < \Delta SIR_{TARGET} \leq 10$	± 2
$10 < \Delta SIR_{TARGET} \leq 20$	± 4
$20 < \Delta SIR_{TARGET} \leq 30$	± 6
$30 < \Delta SIR_{TARGET}$	± 9 (note)
NOTE: Value is given for normal conditions. For extreme conditions value is ± 12 .	

The reference for this requirement is TS 25.102 [1] clause 6.4.1.2.

5.4.1.2.3 Test purpose

It is verified if the UE sets correct uplink power steps in response to steps in the signalling value SIR_{Target} and DPCH Constant Value, signalled via the downlink to the UE.

under the following conditions: keeping the other signalling parameters constant and deactivating any influence due to varying pathloss.

5.4.1.2.4 Method of test

5.4.1.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect the SS to the MS antenna connector as shown in figure A.1.
- 2) A call is set up according to the generic call setup procedure using parameters as specified in table 5.4.1.2.4.

Table 5.4.1.2.4: Test parameters for Uplink Power Control, Differential Accuracy, Controlled Input

Parameter	Value/description
UL reference measurement channel	12,2 kbps according to annex C clause C.2.1.
BS Transmit to UE Transmit delay	7 TSs--> $\alpha=0$
SSTransmit power	-65 dBm
Reference transmit power broadcast on BCH	35 dBm
IBTS	-100
Constant value	-10
Data content	real life (sufficient irregular)

5.4.1.2.4.2 Procedure

Using a combination of SIR_{Target} and DPCH constant value signaled in the downlink,

cover the UE-transmitter dynamic range by commanding the UEs power with the signalling value SIR_{Target} in a step resolution (positive and negative direction) of:

- | | |
|------------------|---------------------------------------|
| 1 dB | approx. 68 steps up and 68 steps down |
| 2 dB | approx. 34 steps up and 34 steps down |
| 3 dB | approx. 22 steps up and 22 steps down |
| 10 dB | approx. 7 steps up and 7 steps down |
| 20 dB | approx. 3 steps up and 3 steps down |
| 30 dB | approx. 2 step up and 2 step down |
| maximum stepsize | 1 step up and 1 step down |

Measure the power according to annex B.

5.4.1.2.5 Test requirements

For the UE output power laying between

Max Power minus tolerance and Min Power

the step response shall not exceed the prescribed tolerance in table 5.4.1.2.5.

Table 5.4.1.2.5: Transmitter power step tolerance as a result of control power step

$\Delta\text{SIR}_{\text{TARGET}}$ [dB]	Transmitter power step tolerance [dB]
$\Delta\text{SIR}_{\text{TARGET}} \leq 1$	$\pm 0,6$
$1 < \Delta\text{SIR}_{\text{TARGET}} \leq 2$	$\pm 1,15$
$2 < \Delta\text{SIR}_{\text{TARGET}} \leq 3$	$\pm 1,7$
$3 < \Delta\text{SIR}_{\text{TARGET}} \leq 10$	$\pm 2,5$
$10 < \Delta\text{SIR}_{\text{TARGET}} \leq 20$	$\pm 4,7$
$20 < \Delta\text{SIR}_{\text{TARGET}} \leq 30$	$\pm 6,7$
$30 < \Delta\text{SIR}_{\text{TARGET}}$	± 10

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F clause F.4.

5.4.1.2A Differential accuracy, controlled input

This is not tested.

5.4.2 Minimum output power

5.4.2.1 Definition and applicability

The minimum controlled output power of the UE is when the power is set to a minimum value. The minimum output power is defined as the mean power in one time slot excluding the guard period.

The normative requirements of this test apply to all types of UTRA- UE.

5.4.2.2 Minimum Requirements

The minimum output power shall be lower than or equal to -44 dBm

The normative reference for this requirement is TS 25.102 [1] clause 6.4.5.1.

5.4.2.3 Test purpose

The test purpose is to verify the ability of the UE to reduce its output power to a specified value.

5.4.2.4 Method of test

5.4.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.1.
- 2) A call is set up according to the Generic call setup procedure using parameters as specified in table E.3.1.2.
- 3) Enter the UE into loopback test mode and start the loopback test.

5.4.2.4.2 Procedure

- 1) Configure the UE transmitter to enable power control steps of size 1 dB.

2) Set and send Down power control commands to the UE. The sequence shall be sufficiently long so that the UE output signal reached its minimum power.

2) Measure the mean power of the UE output signal according to annex B.

NOTE: Annex B returns the power in the decision points (displayed as reference power and power offset). This is equivalent to thermal power at the air-interface. Insofar 5.4.2 minimum output power is consistent with 5.2 maximum output power.

3) Configure the UE transmitter to enable power control steps of 2 dB and of 3 dB, respectively, and repeat step 2).

4) Run step 2) for RF channels Low Mid and High.

5.4.2.5 Test requirements

For all measurements, the minimum output power derived in step 3) and 4) of 5.4.2.4.2 shall be below -43 dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.4.3 Transmit OFF power

5.4.3.1 Definition and applicability

Transmit OFF power is defined as the RRC filtered mean power measured over one chip when the transmitter is off. The transmit OFF power state is when the UE does not transmit.

The requirements of this test apply to all types of UTRA-UE.

5.4.3.2 Minimum Requirements

The transmit OFF power shall be below -65 dBm.

The normative reference for this requirement is TS 25.102 clause 6.5.1.

5.4.3.3 Test purpose

Refer clause 5.4.4.3.

5.4.3.4 Method of test

Refer clause 5.4.4.4

5.4.3.5 Test requirements

The transmit OFF power shall be below $-63,5$ dBm.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4

5.4.4 Transmit ON/OFF Time mask

5.4.4.1 Definition and applicability

The transmit ON/OFF time mask defines the ramping time allowed for the UE between transmit OFF power and transmit ON power.

This test applies for all UTRA TTD UEs.

5.4.4.2 Minimum requirements

The transmit power level versus time shall meet the mask specified in figure 5.4.4.2, where the transmission period refers to the burst without guard-period for a single transmission slot, and to the period from the beginning of the burst in the first transmission slot to the end of the burst without guard period in the last transmission timeslot for consecutive transmission slots.

The reference for this requirement is TS 25.102 [1] clause 6.5.2.1.

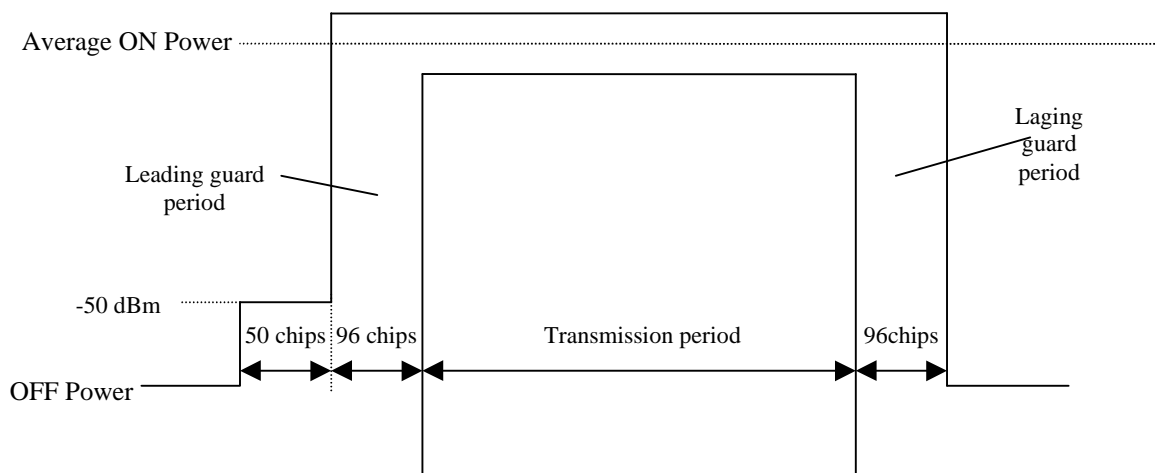


Figure 5.4.4.2: Transmit ON/OFF template

5.4.4.3 Test Purpose

It is tested if the UE TX signal uses the guard period for on-to-off and off-to-on transitions, where the time position of guard period is derived from the burst under test itself.

It is furtheron tested, if the UE TX signal is below certain limits outside transmission period and guard periods where the position in time is derived from the burst under test itself.

With this test interference to other UTRA TDD users are limited.

5.4.4.4 Method of test

5.4.4.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

Connect the SS to the UE antenna connector as shown in figure A.1.

A call is set up according to the generic call setup procedure using parameters as specified in table E.3.1.2.

Enter the UE into loopback test mode and start the loopback test.

5.4.4.4.2 Procedure

- 1) The time position of the midamble of the burst under test (TimeSlot s in Frame f) shall be the reference for the time position of the leading and laging guard-periods of the burst under test and, alternatively, for the equivalent guard periods of the next 2 bursts.
- 2) Record the following time periods with at least 2 samples /chip through a matched filter (RRC 0,22, BW equal to the chiprate): TS $s-1$ and TS $s+1$ in frame f or $f+1$ or $f+2$

- 3) Calculate power samples by averaging the recorded samples of one chip duration.

5.4.4.5 Test requirements

Each power sample shall be below the limits (off Power (clause 5.4.3) and -50 dBm), indicated in figure 5.4.4.2.

NOTE: In this test no power limits apply during guard period.

5.4.5 Out-of-synchronisation handling of output power for continuous transmission

5.4.5.1 Definition and applicability

The UE shall monitor the DPCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.224. [5] The thresholds Q_{out} and Q_{in} specify at what DPCH quality levels the UE shall shut its power off and when it shall turn its power on, respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

The requirement of this clause shall apply to all types of UTRA-UE.

5.4.5.2 Minimum Requirement

When the UE estimates the DPCH quality over the last 160 ms period to be worse than a threshold Q_{out} , the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the DPCH quality exceeds an acceptable level Q_{in} . When the UE estimates the DPCH quality over the last 160 ms period to be better than a threshold Q_{in} , the UE shall again turn its transmitter on within 40 ms.

The quality levels at the thresholds Q_{out} and Q_{in} correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 5.4.5.1, a signal with the quality at the level Q_{out} is generated by a $\Sigma DPCH_Ec/I_{or}$ ratio of -13 dB, and a signal with Q_{in} by a $\Sigma DPCH_Ec/I_{or}$ ratio of -9 dB. In this test, the DL reference measurement channel (12.2) kbps specified in clause C.3.1, where the CRC bits are replaced by data bits, and with static propagation conditions is used.

Table 5.4.5.1: DCH parameters for the Out-of-synch handling test case continuous transmission

Parameter	Unit	Value
\hat{I}_{or}/I_{oc}	dB	-1.1
I_{oc}	dBm/3,84 MHz	-60
$\frac{\Sigma DPCH_Ec}{I_{or}}$	dB	See figure 5.4.5.1
Information Data Rate	kbps	13
TFCI	-	On

Figure 5.4.5.1 shows an example scenario where the $\Sigma DPCH_Ec/I_{or}$ ratio varies from a level where the DPCH is demodulated under normal conditions, down to a level below Q_{out} where the UE shall shut its power off and then back up to a level above Q_{in} where the UE shall turn the power back on.

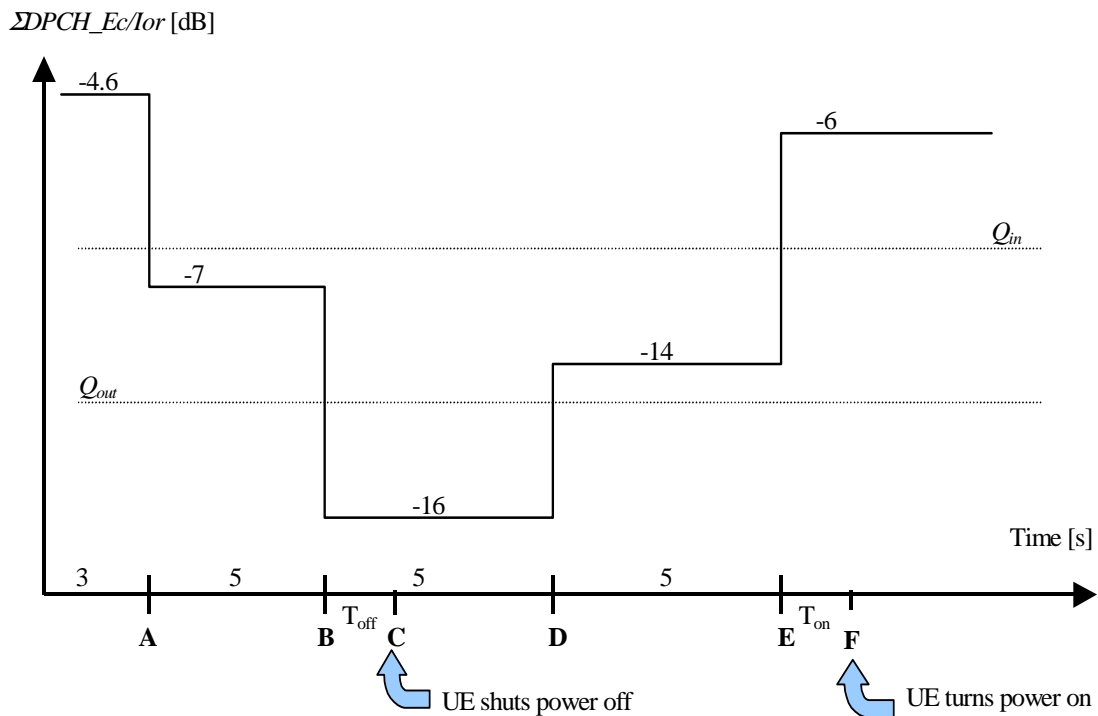


Figure 5.4.5.1: Test case for out-of-synch handling in the UE continuous transmission

In this test case the requirements for the UE are that:

- 1) The UE shall not shut its transmitter off before point B.
- 2) The UE shall shut its transmitter off before point C, which is $T_{\text{off}} = 200$ ms after point B
- 3) The UE shall not turn its transmitter on between points C and E.
- 4) The UE shall turn its transmitter on before point F, which is $T_{\text{on}} = 200$ ms after Point E.

The normative reference for this test is TS 25.102 [1] clause 6.4.3.1.

5.4.5.3 Test purpose

To verify that the UE monitors the DPCCH quality and turns its transmitter on or off according to DPCCH level diagram specified in figure 5.4.5.1.

5.4.5.4 Method of test

5.4.5.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.1.
- 2) Calls are set up according to the Generic call setup procedure using parameters as specified in table 5.4.5.1
- 3) Enter the UE into loopback test mode and start the loopback test.
- 4) The handover triggering level shall be set very high [TBD] to ensure that the beacon channel power never exceeds the value of 10dB above it. Therefore the averaging time for signal quality will always be 160 milliseconds.

5.4.5.4.2 Procedure

- 1) SS level and signalling values are set that the UE transmits maximum power (see annex E clause E.3.1)

2) Set the SS TX signal quality to $\frac{\Sigma DPCH - E_c}{I_{or}} = -4.6[+0.4 - 0]$ dB and verify that the UE TX signal is on.

3) Set the SS TX signal quality to $\frac{\Sigma DPCH - E_c}{I_{or}} = -7[+0.4 - 0]$ dB and verify that the UE TX signal remains on continuously for at least 5 seconds.

4) Set the SS TX signal quality to $\frac{\Sigma DPCH - E_c}{I_{or}} = -16[+0 - 0.4]$ dB and verify that the UE TX signal turns off 200 ms or earlier with respect to that instant.

5) Set the SS TX signal quality to $\frac{\Sigma DPCH - E_c}{I_{or}} = -14[+0 - 0.4]$ dB and verify that the UE TX signal remains off continuously for at least 5 seconds.

6) Set the SS TX signal quality to $\frac{\Sigma DPCH - E_c}{I_{or}} = -6[+0.4 - 0]$ dB and verify that the UE TX signal is switched on 200 ms or earlier with respect to that instant.

5.4.5.5 Test Requirements

The UE TX on-criterion including tolerance window is derived from the initial conditions and is verified with the method of 5.4.2 minimum transmit power. The UE transmitter is considered to be on if the UE transmitted power is higher than the minimum output power.

The UE TX off criterion including tolerance is verified according to clause 5.4.3 of the present document (Transmit off power). The UE transmitter is considered to be off if the UE transmitted power is lower than the transmit OFF power.

To pass the test, steps 1 through 6 of the procedure must be fulfilled.

5.4.6 Out-of-synchronisation handling of output power for discontinuous transmission

5.4.6.1 Definition and applicability

The UE shall monitor the DPCH quality in order to detect a loss of the signal on Layer 1, as specified in TS 25.224. [5] The thresholds Q_{out} and Q_{in} specify at what DPCH quality levels the UE shall shut its power off and when it shall turn its power on, respectively. The thresholds are not defined explicitly, but are defined by the conditions under which the UE shall shut its transmitter off and turn it on, as stated in this clause.

However, during DTX, there are periods when the UE will receive no data from the UTRAN. As specified in TS 25.224, in order to keep synchronization, Special Bursts shall be transmitted by the UTRAN during these periods of no data.

During these periods, the conditions for when the UE shall shut its transmitter on or off are defined by the power level of the received Special Bursts.

When the UE does not detect at least one special burst with a quality above a threshold Q_{sbout} over the last 160 ms period, the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the special burst quality exceeds an acceptable level Q_{sbin} . When the UE estimates the special burst quality to be better than a threshold Q_{sbin} over the last 160 ms, the UE shall again turn its transmitter on within 40 ms.

The requirement of this clause shall apply to all types of UTRA-UE.

5.4.6.2 Minimum Requirement

When the UE estimates the DPCH quality over the last 160 ms period to be worse than a threshold Q_{out} , the UE shall shut its transmitter off within 40 ms. The UE shall not turn its transmitter on again until the DPCH quality exceeds an acceptable level Q_{in} . When the UE estimates the DPCH quality over the last 160 ms period to be better than a threshold Q_{in} , the UE shall again turn its transmitter on within 40 ms.

The quality levels at the thresholds Q_{out} and Q_{in} correspond to different signal levels depending on the downlink conditions DCH parameters. For the conditions in table 5.4.6.1.a, a signal with the quality at the level Q_{out} is generated by a DPCH_Ec/Ior ratio of -16 dB, and a signal with Q_{in} by a DPCH_Ec/Ior ratio of -12 dB.

Table 5.4.6.1: DCH parameters for the Out-of-synch handling test case discontinuous transmission

Parameter	Unit	Value
\hat{I}_{or}/I_{oc}	dB	-1.1
I_{oc}	dBm/3,84 MHz	-60
$\frac{DPCH_E_c}{I_{or}}$	dB	See figure 5.4.6.1
Bits/burst (including TFCI bits)	Bits	244
TFCI	-	On

Figure 5.4.6.1 shows an example scenario where the DPCH_Ec/Ior ratio during Special Bursts varies from a level where the DPCH is demodulated under normal conditions, down to a level below Q_{out} where the UE shall shut its power off and then back up to a level above Q_{in} where the UE shall turn the power back on.

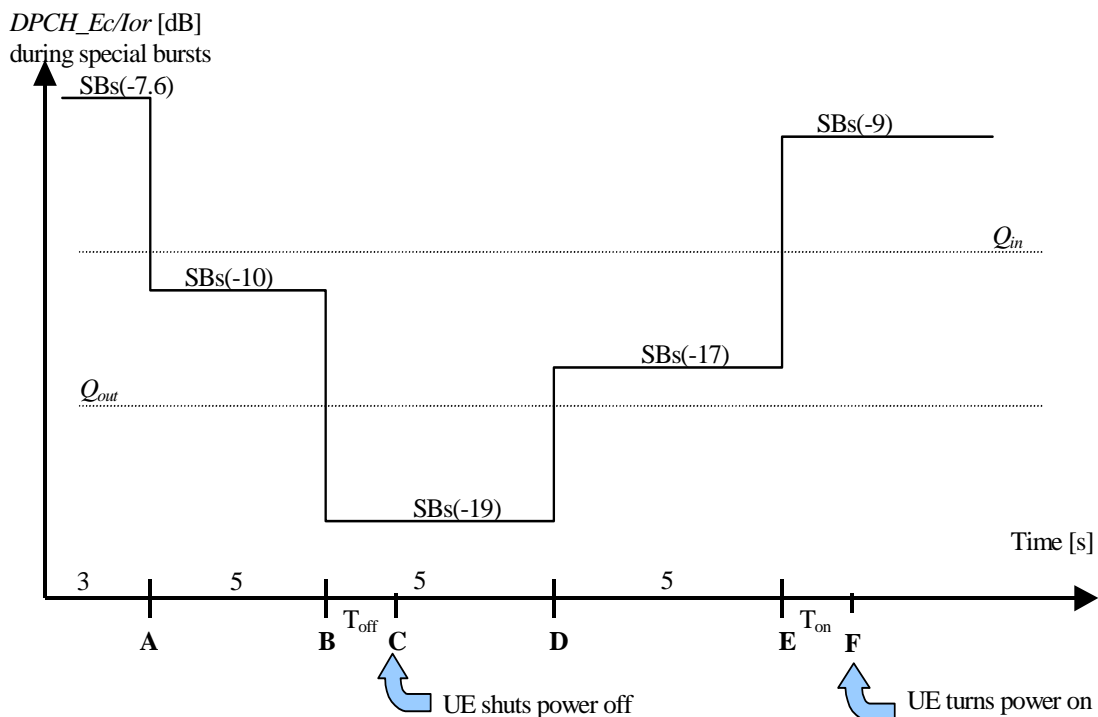


Figure 5.4.6.1: Test case for out-of-synch handling in the UE discontinuous transmission

In this test case the requirements for the UE are that:

- 1) The UE shall not shut its transmitter off before point B.
- 2) The UE shall shut its transmitter off before point C, which is $T_{off} = 200$ ms after point B
- 3) The UE shall not turn its transmitter on between points C and E.

- 4) The UE shall turn its transmitter on before point F, which is $T_{on} = 200$ ms after Point E.

The normative reference for this test is TS 25.102 [1] clause 6.4.3.2.

5.4.6.3 Test purpose

To verify that the UE monitors the Special Burst DPCH quality and turns its transmitter on or off according to level diagram specified in figure 5.4.6.1.

5.4.6.4 Method of test

5.4.6.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.1.
- 2) Calls are set up according to the Generic call setup procedure using parameters as specified in table 5.4.6.1
- 3) Enter the UE into loopback test mode and start the loopback test.
- 4) The handover triggering level shall be set very high [TBD] to ensure that the beacon channel power never exceeds the value of 10dB above it. Therefore the averaging time for signal quality will always be 160 milliseconds.

5.4.6.4.2 Procedure

- 1) SS level and signalling values are set that the UE transmits maximum power (see annex E clause E.3.1)

- 2) Set the SS TX signal quality to $\frac{DPCH - E_c}{I_{or}} = -7.6[+0.4 -0]$ dB and verify that the UE TX signal is on.

- 3) Set the SS TX signal quality to $\frac{DPCH - E_c}{I_{or}} = -10[+0.4 -0]$ dB and verify that the UE TX signal remains on continuously for at least 5 seconds.

- 4) Set the SS TX signal quality to $\frac{DPCH - E_c}{I_{or}} = -19[+0 -0.4]$ dB and verify that the UE TX signal turns off 200 ms or earlier with respect to that instant.

- 5) Set the SS TX signal quality to $\frac{DPCH - E_c}{I_{or}} = -17[+0 -0.4]$ dB and verify that the UE TX signal remains off continuously for at least 5 seconds.

- 6) Set the SS TX signal quality to $\frac{DPCH - E_c}{I_{or}} = -9[+0.4 -0]$ dB and verify that the UE TX signal is switched on 200 ms or earlier with respect to that instant.

5.4.6.5 Test Requirements

The UE TX on-criterion including tolerance window is derived from the initial conditions and is verified with the method of 5.4.2 minimum transmit power. The UE transmitter is considered to be on if the UE transmitted power is higher than the minimum output power.

The UE TX off criterion including tolerance is verified according to clause 5.4.3 of the present document (Transmit off power). The UE transmitter is considered to be off if the UE transmitted power is lower than the transmit OFF power.

To pass the test, steps 1 through 6 of the procedure must be fulfilled.

5.5 Output RF spectrum emissions

5.5.1 Occupied bandwidth

5.5.1.1 Definition and applicability

Occupied bandwidth is a measure of the bandwidth containing 99 % of the total integrated power for transmitted spectrum and is centered on the assigned channel frequency.

The requirements in this clause shall apply to all types of UTRA - UE.

5.5.1.2 Minimum Requirements

The occupied bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.1.

5.5.1.3 Test purpose

The occupied bandwidth, defined in the Radio Regulations of the International Telecommunication Union ITU, is a useful concept for specifying the spectral properties of a given emission in the simplest possible manner; see also ITU-R Recommendation SM.328-9 [8].

The test purpose is to verify that the emission of the UE is sufficiently concentrated in the bandwidth for the service to be provided and is, therefore, not likely to create interference to other users of the spectrum beyond undue limits.

5.5.1.4 Method of test

5.5.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.1.
- 2) A call is set up according to the generic call setup procedure using parameters as specified in table E.3.1.2.
- 3) Enter the UE into loopback test mode and start the loopback test.

5.5.1.4.2 Procedure

- 1) Measure the power of the transmitted signal with a measurement filter of bandwidth [30 kHz]. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The center frequency of the filter shall be stepped in contiguous 30 kHz steps from a minimum frequency, which shall be [7,5 – 0,015] MHz below the assigned channel frequency of the transmitted signal, up to a maximum frequency, which shall be [7,5 – 0,015] MHz above the assigned channel frequency of the transmitted signal. The step duration shall be sufficient slow to capture the active TS. The measured power shall be recorded for each step.
- 2) Determine the total transmitted power by accumulating the recorded power measurements results of all steps.
- 3) Sum up the power upward from the lower boundary of the measured frequency range in '(2)' and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Lower Frequency".
- 4) Sum up the power downward from the upper boundary of the measured frequency range in '(2)' and seek the limit frequency point by which this sum becomes 0,5 % of "Total Power" and save this point as "Upper Frequency".
- 5) Calculate the difference ("Upper Frequency" – "Lower Frequency" = "Occupied Bandwidth") between two limit frequencies obtained in '(4)' and '(5)'.

5.5.1.5 Test requirements

The measured Occupied Bandwidth, derived in step 5), shall not exceed 5 MHz.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.5.2 Out of band emission

Out of band emissions are unwanted emissions immediately outside the nominal channel resulting from the modulation process and non-linearity in the transmitter but excluding spurious emissions. This out of band emission limit is specified in terms of a spectrum emission mask and adjacent channel leakage power ratio (ACLR).

5.5.2.1 Spectrum emission mask

5.5.2.1.1 Definition and applicability

The spectrum emission mask of the UE is a requirement that applies to frequencies which are between 2,5 MHz and 12,5 MHz on both sides of the UE centre carrier frequency. The out of channel emission is specified relative to the RRC filtered mean power of the UE carrier.

The requirements of this test apply to all types of UTRA-UE.

5.5.2.1.2 Minimum Requirements

The power of any UE emission shall not exceed the levels specified in table 5.5.2.1.2.

The normative reference for this requirement is TS 25.102 clause 6.6.2.1.1

Table 5.5.2.1.2: Spectrum Emission Mask Requirement

Δf in MHz (note 1)	Minimum requirement	Measurement bandwidth
2.5 - 3.5	$\left\{ -35 - 15 \cdot \left(\frac{\Delta f}{\text{MHz}} - 2.5 \right) \right\} \text{dBc}$	30 kHz (note 2)
3.5 - 7.5	$\left\{ -35 - 1 \cdot \left(\frac{\Delta f}{\text{MHz}} - 3.5 \right) \right\} \text{dBc}$	1 MHz (note 3)
7.5 - 8.5	$\left\{ -39 - 10 \cdot \left(\frac{\Delta f}{\text{MHz}} - 7.5 \right) \right\} \text{dBc}$	1 MHz (note 3)
8.5 - 12.5	-49 dBc	1 MHz (note 3)
Note 1: Δf is the separation between the carrier frequency and the centre of the measuring filter Note 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz. Note 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.		
The lower limit shall be $-50\text{dBm}/3.84\text{ MHz}$ or the minimum requirement presented in this table which ever is the higher.		

5.5.2.1.3 Test purpose

This test supplements Occupied Bandwidth (verifying the spectral concentration of the UE's emissions) and Adjacent Channel Leakage Ratio (simulating the perception of other UTRA receivers) in a system independent way. It is the purpose of this test to limit interferences to other systems (wideband or narrowband).

5.5.2.1.4 Method of test

5.5.2.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, high range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.1.
- 2) A call is set up according to the generic call setup procedure using parameters as specified in table E.3.1.2.
- 3) Enter the UE into loopback test mode and start the loopback test.

5.5.2.1.4.2 Procedure

- 1) Measure the power of the transmitted signal with a measurement filter of bandwidths according to table 5.5.2.1.2. The characteristic of the filter shall be approximately Gaussian (typical spectrum analyzer filter). The center frequency of the filter shall be stepped in contiguous steps according to table 5.5.2.1.2. The step duration shall be sufficient slow to capture the active TS. The measured power shall be recorded for each step.
- 2) Measure the RRC filtered mean power centered on the assigned channel frequency according to annex B.
- 3) Display the results of 1) in dBc with respect to 2).

5.5.2.1.5 Test requirements

The result 5.5.2.1.4.2 step 3) shall fulfil the requirements of table 5.5.2.1.5.

Table 5.5.2.1.5: Spectrum Emission Mask Requirement

Δf in MHz(note 1)	Minimum requirement	Measurement bandwidth
2.5 - 3.5	$\left\{ -33.5 - 15 \cdot \left(\frac{\Delta f}{\text{MHz}} - 2.5 \right) \right\} \text{dBc}$	30 kHz (note 2)
3.5 - 7.5	$\left\{ -33.5 - 1 \cdot \left(\frac{\Delta f}{\text{MHz}} - 3.5 \right) \right\} \text{dBc}$	1 MHz (note 3)
7.5 - 8.5	$\left\{ -37.5 - 10 \cdot \left(\frac{\Delta f}{\text{MHz}} - 7.5 \right) \right\} \text{dBc}$	1 MHz (note 3)
8.5 - 12.5	-47.5 dBc	1 MHz (note 3)
Note 1: Δf is the separation between the carrier frequency and the centre of the measuring filter. Note 2: The first and last measurement position with a 30 kHz filter is at Δf equals to 2.515 MHz and 3.485 MHz. Note 3: The first and last measurement position with a 1 MHz filter is at Δf equals to 4 MHz and 12 MHz. As a general rule, the resolution bandwidth of the measuring equipment should be equal to the measurement bandwidth. To improve measurement accuracy, sensitivity and efficiency, the resolution bandwidth can be different from the measurement bandwidth. When the resolution bandwidth is smaller than the measurement bandwidth, the result should be integrated over the measurement bandwidth in order to obtain the equivalent noise bandwidth of the measurement bandwidth.		
The lower limit shall be -48.5dBm/3.84 MHz or the minimum requirement presented in this table which ever is the higher.		

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.5.2.2 Adjacent Channel Leakage power Ratio (ACLR)

5.5.2.2.1 Definition and applicability

Adjacent Channel Leakage power Ratio (ACLR) is the ratio of the RRC filtered mean power centered on the assigned channel frequency to the RRC filtered mean power centered on an adjacent channel frequency.

The requirements in this clause shall apply to all types of UTRA-UE.

5.5.2.2.2 Minimum Requirements

If the adjacent channel RRC filtered mean power is greater than -50dBm then the ACLR shall be higher than the value specified in table 5.5.2.2.2.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.2.2.1

Table 5.5.2.2.2: UE ACLR

Power Class	Adjacent channel	ACLR limit
2, 3	UE-channel $\pm 5\text{ MHz}$	33 dB
2, 3	UE-Channel $\pm 10\text{ MHz}$	43 dB

5.5.2.2.3 Test purpose

The test purpose is to verify the ability of the UE to limit the interference produced by the transmitted signal to other UTRA receivers operating at the first or second adjacent RF channel.

5.5.2.2.4 Method of test

5.5.2.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.1.
- 2) A call is set up according to the generic call setup procedure using parameters as specified in table E.3.1.2.
- 3) Enter the UE into loopback test mode and start the loopback test.

5.5.2.2.4.2 Procedure

- 1) Measure the RRC filtered mean power centered on the assigned channel frequency.
- 2) Measure the RRC filtered mean power centered on the first lower adjacent channel frequency.
- 3) Calculate the ACLR by dividing the power measured in (1) by the power measured in (2).
- 4) Repeat steps 2) and 3) for the second lower adjacent RF channel (center frequency 10 MHz below the assigned channel frequency of the transmitted signal) and also for the first and second upper adjacent RF channel (center frequency 5 MHz and 10 MHz, respectively).
- 7) Run step 1) to 4) for RF channels Low/Mid/High.

5.5.2.2.5 Test requirements

The ACLR calculated in steps 3) and 4) of clause 5.5.2.2.4.2 shall be equal or greater than the limits given in table 5.5.2.2.5.

Table 5.5.2.2.5: UE ACLR

Power Class	Adjacent channel	ACLR limit
2, 3	UE-channel ± 5 MHz	32.2 dB
2, 3	UE-Channel ± 10 MHz	42.2 dB

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F.

5.5.3 Spurious emissions

5.5.3.1 Definition and applicability

Spurious emissions are emissions which are caused by unwanted transmitter effects such as harmonics emission, parasitic emission, intermodulation products and frequency conversion products, but exclude out of band emissions.

The frequency boundary and the detailed transitions of the limits between the requirement for out band emissions and spectrum emissions are based on ITU-R Recommendations SM.329 [8].

5.5.3.2 Minimum Requirements

These requirements are only applicable for frequencies which are greater than 12.5 MHz away from the UE center carrier frequency.

The normative reference for this requirement is TS 25.102 [1] clause 6.6.3.1.

Table 5.5.3.2a: General Spurious emissions requirements

Frequency Bandwidth	Resolution Bandwidth	Minimum requirement
$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36 dBm
$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36 dBm
$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36 dBm
$1 \text{ GHz} \leq f < 12,75 \text{ GHz}$	1 MHz	-30 dBm

Table 5.5.3.2b: Additional Spurious emissions requirements

Frequency Bandwidth	Resolution Bandwidth	Minimum requirement
$925 \text{ MHz} \leq f \leq 935 \text{ MHz}$	100 kHz	-67 dBm*
$935 \text{ MHz} < f \leq 960 \text{ MHz}$	100 kHz	-79 dBm*
$1805 \text{ MHz} \leq f \leq 1880 \text{ MHz}$	100 kHz	-71 dBm*

NOTE: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.5.3.2a are permitted for each UARFCN used in the measurement.

5.5.3.3 Test purpose

The test purpose is to verify the ability of the UE to limit the interference caused by unwanted transmitter effects to other systems operating at frequencies which are more than 12,5 MHz away from of the UE's carrier frequency.

5.5.3.4 Method of test

5.5.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.1.
- 2) A call is set up according to the generic call setup procedure using parameters as specified in table E.3.1.2.
- 3) Enter the UE into loopback test mode and start the loopback test.

5.5.3.4.2 Procedure

Measure the power of the spurious emissions applying measurement filters with bandwidths as specified in the relevant tables of 5.5.3.2. The characteristic of the filters shall be approximately Gaussian (typical spectrum analyzer filters). The center frequency of the filter shall be swept over the frequency bands as given in the tables. The sweep time shall be sufficiently low to capture the active time slots.

5.5.3.5 Test requirements

The spurious emissions measured according to clause 5.5.3.4.2 shall not exceed the limits specified in the relevant tables of 5.5.3.5.a and 5.5.3.5.b.

Table 5.5.3.5a: General Spurious emissions requirements

Frequency Bandwidth	Resolution Bandwidth	Test requirement
$9 \text{ kHz} \leq f < 150 \text{ kHz}$	1 kHz	-36 dBm
$150 \text{ kHz} \leq f < 30 \text{ MHz}$	10 kHz	-36 dBm
$30 \text{ MHz} \leq f < 1000 \text{ MHz}$	100 kHz	-36 dBm
$1 \text{ GHz} \leq f < 12.75 \text{ GHz}$	1 MHz	-30 dBm

Table 5.5.3.5b: Additional Spurious emissions requirements

Frequency Bandwidth	Resolution Bandwidth	Test requirement
$925 \text{ MHz} \leq f \leq 935 \text{ MHz}$	100 kHz	-67 dBm*
$935 \text{ MHz} < f \leq 960 \text{ MHz}$	100 kHz	-79 dBm*
$1805 \text{ MHz} \leq f \leq 1880 \text{ MHz}$	100 kHz	-71 dBm*

NOTE 1: The measurements are made on frequencies which are integer multiples of 200 kHz. As exceptions, up to five measurements with a level up to the applicable requirements defined in table 5.5.3.5a are permitted for each UARFCN used in the measurement.

NOTE 2: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.6 Transmit Intermodulation

5.6.1 Definition and applicability

The transmit intermodulation performance is a measure of the capability of the transmitter to inhibit the generation of signals in its non linear elements caused by the presence of the wanted signal and an interfering signal reaching the transmitter via the antenna.

User Equipment(s) transmitting in close vicinity of each other can produce intermodulation products, which can fall into the UE, or BS receive band as an unwanted interfering signal. The UE intermodulation attenuation is defined by the ratio of the RRC filtered mean power of the wanted signal to the RRC filtered mean power of the intermodulation product when an interfering CW signal is added at a level below the wanted signal.

The requirements of this test shall apply for all UTRA-UE.

5.6.2 Minimum Requirements

The requirement of transmitting intermodulation for carrier spacing 5 MHz is prescribed in the table below.

The normative reference for this requirement is TS 25.102 [1] clause 6.7.1

Table 5.6.2: Transmit Intermodulation

Interference Signal Frequency Offset	5MHz	10MHz
Interference Signal Level	-40 dBc	
Interferer Modulation	CW Note: BS Test uses a CDMA modulated signal	
Minimum requirement	-31dBc	-41dBc

5.6.3 Test purpose

User Equipment(s) transmitting in close vicinity of each other can produce intermodulation products, which can fall into other UE, or BS receive band as an unwanted interfering signal.

It is the purpose of this test to limit interferences to the own and other systems due to intermodulation products.

5.6.4 Method of test

5.6.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect the SS and the interferer to the UE antenna connector as shown in figure A.2.
- 2) A call is set up according to the generic call setup procedure using parameters as specified in table E.3.1.2.
- 3) Enter the UE into loopback test mode and start the loopback test.

Parameters of the interferer according to table 5.6.2.

5.6.4.2 Procedure

- 1) Measure the unwanted emissions according to 5.6.2. in a carrier offset spacing of 5 MHz and in a frequency range [5 MHz to 12.75 GHz], using an interferer +5MHz offset.

The frequency occupied by the interferer is excluded from the measurement.

- 2) Repeat 1) with the other 3 interferer-configurations (-5Mz, +10 MHz, -10 MHz).
- 3) Measure the wanted power according to annex B.
- 4) Display 1) and 2) in dBc with respect to 3).

5.6.5 Test requirements

The results in 4) from clause 5.6.4.2 shall not exceed the predescribed values in table 5.6.5.

Table 5.6.5: Transmit Intermodulation

Interference Signal Frequency Offset	5MHz	10MHz
Interference Signal Level	-40 dBc	
Interferer Modulation	CW Note: BS Test uses a CDMA modulated signal	
Minimum requirement	[-31+TT] dBc	[-41+TT] dBc

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.7 Transmit Modulation

5.7.1 Error Vector Magnitude

5.7.1.1 Definition and applicability

The Error Vector Magnitude (EVM) is a measure of the difference between the measured waveform and the theoretical modulated waveform (the error vector). Both waveforms pass through a matched Root Raised Cosine filter with bandwidth 3,84 MHz and roll-off $\alpha = 0,22$. Both waveforms are then further modified by selecting the frequency, absolute phase, absolute amplitude and chip clock timing so as to minimise the error vector. The EVM result is defined as the square root of the ratio of the mean error vector power to the mean reference signal power expressed as a %. The measurement interval is one timeslot.

The requirement of this clause shall apply to all types of UTRA-UE.

5.7.1.2 Minimum Requirements

The Error Vector Magnitude shall not exceed 17,5 % for the parameters specified in table 5.7.1.2.

Table 5.7.1.2: Test parameters for Error Vector Magnitude/Peak Code Domain Error

Parameter	Level	Unit
UE Output Power	≥ -20	dBm
Operating conditions	Normal conditions	
Power control step size	1	dB

The normative reference for this requirement is TS 25.102 [1] clause 6.8.2.

5.7.1.3 Test purpose

The transmitter shall generate a sufficient precise waveform, to enable the receiver to achieve the specified receiver performances.

5.7.1.4 Method of test

5.7.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH, vibration; see clauses G.2.1, G.2.2 and G.2.3.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.1.

- 2) A call is set up according to the generic call setup procedure using parameters as specified in table E.3.1.2.
- 3) Enter the UE into loopback test mode and start the loopback test.

5.7.1.4.2 Procedure

- 1) Starting from the initial conditions, measure EVM (Error Vector Magnitude) of the UE according to annex B.
- 2) Set SS-level and signalling values such that the power level of the UE is between -20 and -19 dBm.
- 3) Measure EVM of the UE according to annex B.

5.7.1.5 Test requirements

The results in step 1) and 2) shall not exceed 17,5 % for parameters specified in table 5.7.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

5.7.2 Peak code domain error

5.7.2.1 Definition and applicability

The code domain error is computed by projecting the error vector power onto the code domain at a specific spreading factor. The error power for each code is defined as the ratio to the mean power of the projection onto the code, to the mean power of the composite reference waveform expressed in dB. And the Peak Code Domain Error is defined as the maximum value for Code Domain Error. The measurement interval is one timeslot.

The present document is applicable for multi-code transmission only.

The requirement of this test applies to all UTRA-UE, applicable for multi-code transmission.

5.7.2.2 Minimum Requirement

The peak code domain error shall not exceed -21 dB at spreading factor 16.

The normative reference for this requirement is TS 25.102 [1] clause 6.8.3.1.

5.7.2.3 Test purpose

It is the purpose of this test to limit crosstalk among codes.

5.7.2.4 Method of test

5.7.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.1.
- 2) A call is set up according to the generic call setup procedure using parameters as specified in table 5.7.2.4.1.
- 3) Enter the UE into loopback test mode and start the loopback test.

Table 5.7.2.4.1: Test parameters for Peak code Domain Error

Parameter	Value/description
Reference measurement channel	Multicode 12,2kbps, according to annex C.2.2
Uplink Power Control	SS level and signalling values such that UE transmits maximum power
Data content	real life (sufficient irregular)

5.7.2.4.2 Procedure

- 1) Starting from the initial conditions, measure peak code error(PCDE)of the UE according to annex B.
- 2) Set SS-level and signalling values such that the power level of the UE is between -20 and -19 dBm
- 3) Measure PCDE of the UE according to annex B.

5.7.2.5 Test requirements

The results in step 1) and 2) shall not exceed -20 dB. for parameters specified in table 5.7.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6 Receiver Characteristics

6.1 General

Receiving performance test of the UE is implemented during communicating with the SS via air interface. The procedure uses normal call protocol until the UE is communicating on traffic channel basically. (Refer to TS 34.108 [3] Common Test Environments for User Equipment (UE) Conformance Testing.) On the traffic channel, the UE provides special function for testing that is described in Logical Test Interface and the UE is tested using this function. (Refer to TS 34.109 [3] Logical Test Interface (FDD/TDD) Special conformance testing functions.)

Unless otherwise stated the receiver characteristics are specified at the antenna connector of the UE. For UE(s) with an integral antenna only, a reference antenna with a gain of 0 dBi is assumed. UE with an integral antenna may be taken into account by converting these power levels into field strength requirements, assuming a 0 dBi gain antenna. Receiver characteristics for UE(s) with multiple antennas/antenna connectors are for further study.

The UE antenna performance has a significant impact on system performance, and minimum requirements on the antenna efficiency are therefore intended to be included in future versions of the present document. It is recognized that different requirements and test methods are likely to be required for the different types of UE.

All the parameters in clause 6 are defined using the DL reference measurement channel (12.2 kbps) specified in clause C.3.3.

All Bit Error ratio (BER) measurements in clause 6 shall be performed according to the general rules for statistical testing in Annex F.6.

6.2 Reference sensitivity level

6.2.1 Definition and applicability

The reference sensitivity level is the minimum mean power received at the UE antenna connector at which the BER shall not exceed the specific value.

The requirements in this clause shall apply to all types of UTRA UE.

6.2.2 Minimum Requirements

For the DL reference measurement channel 12.2 kBit/s specified in annex C, the BER shall not exceed 0.001 for the parameters specified in table 6.2.2.

Table 6.2.2. Test parameters for reference sensitivity

Parameter	Level	Unit
$\frac{\Sigma \text{DPCH}_{Ec}}{I_{or}}$	0	dB
\hat{I}_{or}	-105	dBm/3,84 MHz

The normative reference for this requirement is TS 25.102 [1] clause 7.3.

6.2.3 Test purpose

The test purpose is to verify the ability of the UE to receive a prescribed test signal at the lower end of the dynamic range under defined conditions (no interference, no multipath propagation) with a BER not exceeding a specified level. This test is also used as a reference case for other tests to allow the assessment of degradations due to various sources of interference.

6.2.4 Method of test

6.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: low range, mid range, high range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.3.
- 2) A call is set up according to the Generic call setup procedure.
- 3) Enter the UE into loopback test mode and start the loopback test.
- 4) The level of SS output signal measured at the UE antenna connector shall be -105 dBm.

6.2.4.2 Procedure

- 1) Measure the BER of DCH received from the UE at the SS.

6.2.5 Test requirements

The measured BER, derived in step 1), shall not exceed 0,001 under conditions described in table 6.2.5.

Table 6.2.5: Test parameters for reference sensitivity

Parameter	Level	Unit
$\frac{\Sigma DPCH_Ec}{I_{or}}$	0	dB
\hat{I}_{or}	-104.3	dBm/3,84 MHz

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.3 Maximum Input Level

6.3.1 Definition and applicability

The maximum input level is defined as the maximum mean power received at the UE antenna connector, which does not degrade the specified BER performance.

The requirements in this clause shall apply to all types of UTRA UE.

6.3.2 Minimum requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.3.2.

Table 6.3.2: Maximum input level

Parameter	Level	Unit
$\frac{\Sigma DPCH_Ec}{I_{or}}$	-7	dB
\hat{I}_{or}	-25	dBm/3,84 MHz

The reference for this requirement is TS 25.102 [1] clause 7.4.

6.3.3 Test purpose

The test purpose is to verify the ability of the UE to receive a prescribed test signal at the upper end of the dynamic range under defined conditions (no interference, no multipath propagation) with BER not exceeding a specified value.

6.3.4 Method of test

6.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect the SS to the UE antenna connector as shown in figure A.3.
- 2) A call is set up according to the Generic call setup procedure.
- 3) Enter the UE into loopback test mode and start the loopback test.
- 4) The level of SS output signal measured at the UE antenna connector shall be according to table 6.3.2.

6.3.4.2 Procedure

Measure the BER of DCH received from the UE at the SS.

6.3.5 Test requirements

The measured BER, derived in step 1), shall not exceed 0,001.

6.4 Adjacent Channel Selectivity (ACS)

6.4.1 Definition and applicability

Adjacent Channel Selectivity is a measure of a receiver's ability to receive a wanted signal at its assigned channel frequency in the presence of an adjacent channel signal at a given frequency offset from the centre frequency of the assigned channel. ACS is the ratio of the receive filter attenuation on the assigned channel frequency to the receiver filter attenuation on the adjacent channel(s).

The requirements of this test apply to all UTRA UE.

6.4.2 Minimum Requirements

For the UE of power class 2 and 3, the BER shall not exceed 0,001 for parameters specified in table 6.4.2. This test condition is equivalent to the ACS value 33 dB.

Table 6.4.2: Test parameters for Adjacent Channel Selectivity

Parameter	Unit	Level
$\frac{\Sigma DPCH_Ec}{I_{or}}$	dB	0
I_{or}	dBm/3,84 MHz	-91
I_{oac} mean power (modulated)	dBm	-52
F_{UW} offset	MHz	+5 or -5

Explanatory note:

Within the reference sensitivity BER= 0.001 corresponds to a test signal = -105 dBm/3,84 MHz and a noise level -99 dBm /3,84 MHz BW (S/I -6 dB).

Within ACS BER=0.001 is directly verified.

Known from the reference sensitivity, this corresponds to S/I -6dB in the wanted BW.

As a wanted signal of -91 dBm applied, an in-channel-interfering-signal of -85 dBm can be assumed.

Verifying a filter suppression of 33 dB indirectly, an adjacent-channel-interferer of -52 dBm is needed

The normative reference of this requirement is TS 25.102 [1] clause 7.5.

6.4.3 Test purpose

The test purpose is to verify the ability of the UE-receiver to sufficiently suppress the interfering signal in the channel adjacent to the wanted channel.

6.4.4 Method of test

6.4.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect the SS and the interferer to the UE antenna connector as shown in figure A.4.
- 2) A call is set up according to the Generic call setup procedure.
- 3) Enter the UE into loopback test mode and start the loopback test.
- 4) Set the signal generators to produce wanted and interference signals according table 6.4.2. The interference signal shall be equivalent to a continuously running wideband CDMA signal with one code and chip frequency 3,84 Mchip/s and rolloff 0,22.

6.4.4.2 Procedure

- 1) Set the interference signal 5 MHz above the assigned channel frequency of the wanted signal.
- 2) Measure the BER of the wanted signal received from the UE at the SS.
- 3) Set the interference signal 5 MHz below the assigned channel frequency of the wanted signal and repeat 2).

6.4.5 Test Requirements

The measured BER, derived in step 2), shall not exceed 0,001 under conditions described in table 6.4.5.

Table 6.4.5: Test parameters for Adjacent Channel Selectivity

Parameter	Unit	Level
$\frac{\Sigma DPCH_{-} Ec}{I_{or}}$	dB	0
I_{or}	dBm/3,84 MHz	-91
I_{oac} mean power (modulated)	dBm	-52
F_{uw} offset	MHz	+5 or -5

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.5 Blocking Characteristics

6.5.1 Definition and applicability

The blocking characteristics is a measure of the receiver ability to receive a wanted signal at its assigned channel frequency in the presence of an unwanted interferer on frequencies other than those of the spurious response or the adjacent channels without this unwanted input signal causing a degradation of the performance of the receiver beyond a specified limit. The blocking performance shall apply at all frequencies except those at which a spurious response occur.

The requirements of this test apply to all UTRA UE.

6.5.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.5.2a and table 6.5.2b. For table 6.5.2b up to 24 exceptions are allowed for spurious response frequencies in each assigned frequency channel when measured using a 1MHz step size for the interference signal.

The normative reference for this requirement is TS 25.102 clause 7.6.1.

Table 6.5.2a: In-band blocking

Parameter	Level		Unit
$\frac{\Sigma DPCH_Ec}{I_{or}}$			dB
\hat{I}_{or}	-102		dBm/3,84 MHz
I_{ouw} mean power (modulated)	-56 (for F_{uw} offset ± 10 MHz)	-44 (for F_{uw} offset ± 15 MHz)	dBm

Table 6.5.2b: Out of band blocking

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH_Ec}{I_{or}}$	0	0	0	dB
\hat{I}_{or}	-102	-102	-102	dBm/3,84 MHz
I_{ouw}	-44	-30	-15	dBm
F_{uw} For operation in frequency bands as defined in clause 4.2(a)	1840 < f < 1885 1935 < f < 1995 2040 < f < 2085	1815 < f < 1840 2085 < f < 2110	1 < f < 1815 2110 < f < 12750	MHz
F_{uw} For operation in frequency bands as defined in clause 4.2(b)	1790 < f < 1835 2005 < f < 2050	1765 < f < 1790 2050 < f < 2075	1 < f < 1765 2075 < f < 12750	MHz
F_{uw} For operation in frequency bands as defined in clause 4.2(c)	1850 < f < 1895 1945 < f < 1990	1825 < f < 1850 1990 < f < 2015	1 < f < 1825 2015 < f < 12750	MHz

NOTE 1: For operation referenced in 4.2(a), from 1885 < f < 1900 MHz, 1920 < f < 1935 MHz, 1995 < f < 2010 MHz and 2025 < f < 2040 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 shall be applied.

NOTE 2: For operation referenced in 4.2(b), from 1835 < f < 1850 MHz and 1990 < f < 2005 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 shall be applied.

NOTE 3: For operation referenced in 4.2(c), from 1895 < f < 1910 MHz and 1930 < f < 1945 MHz, the appropriate in-band blocking or adjacent channel selectivity in clause 6.5.2 shall be applied.

6.5.3 Test purpose

"The test stresses the ability of the UE receiver to withstand high-level interference from unwanted signals at frequency offsets of 10 MHz or more, without undue degradation of its sensitivity."

6.5.4 Method of test

6.5.4.1 Initial conditions

For in-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

For out-of-band case:

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: 1 arbitrary frequency chosen from the low, mid or high range; see clause G.2.4.

- 1) Connect the SS and the interfering Signal generator to the UE antenna connector as shown in figure A.5.
- 2) A call is set up according to the Generic call setup procedure.
- 3) Enter the UE into loopback test mode and start the loopback test.

6.5.4.2 Procedure

- 1) The wanted signal frequency channel is set to mid range frequency. The wanted signal power level shall be set according to table 6.5.5a.
- 2) The interfering Signal Generator is stepped through the frequency range indicated in table 6.5.2.a. with a step size of 1 MHz. The interfering signal level shall be set according to table 6.5.5a.
- 3) The interference signal shall be equivalent to a continuously running wideband CDMA signal with one code and chip frequency 3,84 Mchip/s and rolloff 0,22.
- 4) Measure the BER of the wanted signal received from the UE at the SS for each step of the interferer.
- 5) The wanted signal frequency channel is set to an arbitrary frequency chosen from the low, mid or high range. The level of the wanted signal shall be set according to table 6.5.5b.
- 6) The interfering Signal Generator is stepped through the frequency range indicated in table 6.5.2.b with a step size of 1 MHz. The interfering signal level shall be set according to table 6.5.5b.
- 7) The interference signal is a CW signal.
- 8) Measure the BER of the wanted signal received from the UE at the SS for each step of the interferer.
- 9) Record the frequencies for which BER exceed the test requirements in table 6.5.5b. These frequencies are further proceeding in subclause 6.6 Spurious Response.

NOTE: Due to the large amount of time-consuming BER tests it is recommended to speed up a single BER test by reducing the 0.001-BER confidence level [10 000 bits under test or 10 errors] for screening the critical frequencies. Critical frequencies must be identified using standard BER confidence level. [30 000 bits or 30 errors].

6.5.5 Test requirements

The measured BER, derived in step 4), shall not exceed 0,001 (without exception) under test conditions described in table 6.5.5a.

The measured BER, derived in step 8), shall not exceed 0,001 except for up to 24 different frequencies of the interfering signal under test conditions described in table 6.5.5b.

These frequencies are further processed in clause 6.6 Spurious response.

Table 6.5.5a: Test conditions In-band blocking

Parameter	Level		Unit
$\frac{\Sigma DPCH - Ec}{I_{or}}$	0		dB
I_{or}	-102		dBm/3,84 MHz
I_{ouw} mean power (modulated)	-56 (for $F_{uw\ offset} \pm 10$ MHz)	-44 (for $F_{uw\ offset} \pm 15$ MHz)	dBm

Table 6.5.5b: Test conditions Out of band blocking

Parameter	Band 1	Band 2	Band 3	Unit
$\frac{\Sigma DPCH - Ec}{I_{or}}$	0	0	0	dB
\hat{I}_{or}	-102	-102	-102	dBm/3,84 MHz
I_{ouw}	-44	-30	-15	dBm

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.6 Spurious Response

6.6.1 Definition and applicability

Spurious response is a measure of the receiver's ability to receive a wanted signal on its assigned channel frequency without exceeding a given degradation due to the presence of an unwanted CW interfering signal at any other frequency at which a response is obtained i.e. for which the blocking limit is not met.

The requirements of this test apply to all types of UTRA for the UE.

6.6.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.6.2.

The normative reference for this requirement is TS 25.102 [1] clause 7.7.1

Table 6.6.2: Spurious Response

Parameter	Value	Unit
$\frac{\Sigma DPCH - Ec}{I_{or}}$	0	dB
\hat{I}_{or}	-102	dBm/3,84 MHz
I_{ouw}	-44	dBm
F_{uw}	Spurious response frequencies	MHz

6.6.3 Test purpose

Spurious response frequencies, identified in the blocking test, are measured against a less stringent test requirement. The test stresses the ability of the receiver to withstand high level interference signals without undue degradation of its sensitivity due to the receiver's frequency conversion concept.

6.6.4 Method of test

6.6.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequency to be tested: the same frequency as chosen in subclause 6.5.4.1 for Blocking characteristics out-of-band case.

- 1) Connect the SS and the unwanted signal to the UE antenna connector as shown in figure A.6.
- 2) A call is set up according to the Generic call setup procedure.
- 3) Enter the UE into loopback test mode and start the loopback test.

6.6.4.2 Procedure

- 1) Set the wanted signal frequency to the frequency used for the out-of-band blocking test. Set the power level of the wanted signal according to table 6.6.2.
- 2) Set the frequency of the interferer signal according the recorded spurious response frequency values obtained from the out-of-band blocking test as described in 6.5.4.2, at which the blocking test failed. Set the power level of the interferer according to table 6.6.5.
- 3) Measure the BER of DCH received from the UE at the SS.

6.6.5 Test requirements

The measured BER, derived in step 3), shall not exceed 0,001 under test conditions described in table 6.6.5.

Table 6.6.5: Test Parameters Spurious Response

Parameter	Value	Unit
$\frac{\Sigma DPCH - Ec}{I_{or}}$	0	dB
\hat{I}_{or}	-102	dBm/3,84 MHz
I_{ouw}	-44	dBm
F_{Uw}	Spurious response frequencies	MHz

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.7 Intermodulation Characteristics

6.7.1 Definition and applicability

Third and higher order mixing of the two interfering RF signals can produce an interfering signal in the band of the desired channel. Intermodulation response rejection is a measure of the capability of the receiver to receive a wanted signal on its assigned channel frequency in the presence of two or more interfering signals which have a specific frequency relationship to the wanted signal.

The requirements of this test shall apply to all UTRA UE.

6.7.2 Minimum Requirements

The BER shall not exceed 0,001 for the parameters specified in table 6.7.2

The normative reference for this requirement is TS 25.102 [1] clause 7.8.1.

Table 6.7.2: Receive intermodulation characteristics

Parameter	Value	Unit
$\frac{\Sigma DPCH - Ec}{I_{or}}$	0	dB

I_{or}	-102	dBm/3,84 MHz
$I_{ouw1}(CW)$	-46	dBm
I_{ouw2} mean power (modulated)	-46	dBm
F_{uw1} (CW)	± 10	MHz
F_{uw2} (Modulated)	± 20	MHz

6.7.3 Test purpose

The test stresses the ability of the receiver to withstand two or more high level interference signals without undue degradation of its sensitivity due to the receiver's non-linear elements.

6.7.4 Method of test

6.7.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect the SS and the unwanted signals to the UE antenna connector as shown in figure A.7.
- 2) A call is set up according to the Generic call setup procedure.
- 3) Enter the UE into loopback test mode and start the loopback test.

6.7.4.2 Procedure

- 1) Set the wanted and interfering signals as indicated in table 6.7.2. with positive offset with respect to the wanted signal.
- 2) Measure the BER of DCH received from the UE at the SS.
- 3) Set the interfering signals as indicated in table 6.7.2. with negative offset with respect to the wanted signal and repeat 2).

6.7.5 Test requirements

The measured BER, derived in step 2) and 3), shall not exceed 0,001 under test conditions described in table 6.7.5.

Table 6.7.5: Test parameters Receive intermodulation characteristics

Parameter	Value	Unit
$\frac{\Sigma DPCH_Ec}{I_{or}}$	0	dB
I_{or} Wanted Signal Level	-102	dBm/3,84 MHz
$I_{ouw1}(CW)$	-46	dBm
I_{ouw2} mean power (modulated)	-46	dBm
F_{uw1} (CW)	± 10	MHz
F_{uw2} (Modulated)	± 20	MHz

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in annex F clause F.4.

6.8 Spurious Emissions

6.8.1 Definition and applicability

The Spurious Emissions Power is the power of emissions generated or amplified in a receiver that appear at the UE antenna connector.

The requirements of this test are applicable for all UTRA UE.

6.8.2 Minimum Requirements

The power of any spurious emission shall not exceed:

Table 6.8.2: Receiver spurious emission requirements

Band	Maximum level	Measurement Bandwidth	Note
30 MHz – 1 GHz	-57 dBm	100 kHz	
1 GHz – 1,9 GHz and 1,92 GHz – 2,01 GHz and 2,025 GHz – 2,11 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12,5 MHz below the first carrier frequency and 12,5 MHz above the last carrier frequency used by the UE.
1,9 GHz – 1,92 GHz and 2,01 GHz – 2,025 GHz and 2,11 GHz – 2,170 GHz	-60 dBm	3,84 MHz	With the exception of frequencies between 12,5 MHz below the first carrier frequency and 12,5 MHz above the last carrier frequency used by the UE.
2,170 GHz – 12,75 GHz	-47 dBm	1 MHz	

The normative reference for this requirement is TS 25.102 [1] clause 7.9.

6.8.3 Test purpose

The test purpose is to verify the UE's ability to limit interference caused by receiver spurious emissions to the own and the other systems. The test requirements are tighter than in clause 5.5.3 ((TX) Spurious Emissions) because the time of Receive-Only-Operation is generally much longer than RX-TX-Operation.

6.8.4 Method of test

6.8.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: 1 arbitrary frequency selected between low and high range; see clause G.2.4.

- 1) Connect the measurement equipment to the UE antenna connector according to figure A.8.
- 2) RF parameters are setup according to table 6.8.4.1.
- 3) A call is set up according to the setup procedure specified in TS34.108 [3] sub clause 7.3.3, with the following exceptions for information elements in System Information Block type3.

Information Element	Value/Remark
- Cell selection and re-selection info	TDD
- CHOICE mode	0 dB
- Sintrasearch	0 dB
- Sintersearch	This parameter is configurable
- RAT List	0 dB
- Ssearch,RAT	Power level where Pcompensation=0
- Maximum allowed UL TX power	

Note 1: The setup procedure (3) sets the UE into CELL_FACH state. With this state and the SS level (2) it is ensured that UE continuously monitors the S-CCPCH and no cell reselections are performed [see 25.304, subcl. 5.2.3.and 5.2.6]. No transmission of the UE will interfere with the measurement.

Table 6.8.4.1: RF parameters for receiver spurious test

Parameter	Unit	Level
PCCPCH E_c/I_{or}	dB	-3
SCH E_c/I_{or}	dB	-9
\hat{I}_{or}/I_{oc}	dB	9
PCCPCH RSCP	dBm	-64

6.8.4.2 Procedure

Measure the power of spurious emissions by covering the frequency ranges of table 6.8.2. Cover the UTRA/TDD and UTRA/FDD UE receive band in contiguous steps of 200 kHz. Cover the other frequency ranges in contiguous steps of 100 kHz. Apply the corresponding filters of table 6.8.2. The step duration shall be sufficient slow to capture intermittent spurious emissions.

6.8.5 Test requirements

The spurious emissions shall be according to table 6.8.5.

Table 6.8.5: Receiver spurious emission test requirements

Band	Maximum level	Measurement Bandwidth	Note
30 MHz – 1 GHz	-57 dBm	100 kHz	
1 GHz – 1,9 GHz and 1,92 GHz – 2,01 GHz and 2,025 GHz – 2,11 GHz	-47 dBm	1 MHz	With the exception of frequencies between 12,5 MHz below the first carrier frequency and 12,5 MHz above the last carrier frequency used by the UE.
1,9 GHz – 1,92 GHz and 2,01 GHz – 2,025 GHz and 2,11 GHz – 2,170 GHz	-60 dBm	3,84 MHz	With the exception of frequencies between 12,5 MHz below the first carrier frequency and 12,5 MHz above the last carrier frequency used by the UE.
2,170 GHz – 12,75 GHz	-47 dBm	1MHz	

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in Annex F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F.4.

7 Performance Requirements

7.1 General

The performance requirements for the UE in this clause is specified for the measurement channels specified in annex C and the test environments specified in annex D.

All Block Error ratio (BLER) measurements in clause 7 shall be performed according to the general rules for statistical testing in Annex F.6.

7.1.2 Definition of Additive White Gaussian Noise (AWGN) Interferer

The minimum bandwidth of the AWGN interferer shall be 1.5 times chip rate of the radio access mode. (e.g. 5.76 MHz for a chip rate of 3.84 Mcps). The flatness across this minimum bandwidth shall be less than ± 0.5 dB and the peak to average ratio at a probability of 0.001% shall exceed 10 dB.

7.2 Demodulation in static propagation conditions

7.2.1 Demodulation of DCH

7.2.1.1 Definition and applicability

The performance requirement of DCH in static propagation conditions is determined by the maximum Block Error Ratio (BLER). The BLER is specified for each individual data rate of the DCH. DCH is mapped into the Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the datarates, supported. The data-rate-corresponding requirements shall apply to the UE.

7.2.1.2 Minimum requirements

For the parameters specified in table 7.2.1.2a the BLER shall not exceed the piece-wise linear BLER curve specified in table 7.2.1.2b. These requirements are applicable for TFCS size 16.

The reference for this requirement is TS 25.102 [1] clause 8.2.1.1.

Table 7.2.1.2a: DCH parameters in static propagation conditions

Parameters	Unit	Test 1	Test 2	Test 3	Test 4
$\frac{\Sigma DPCH - E_c}{I_{or}}$	dB	-6	-3	0	0
I_{oc}	dBm/3,84 MHz	-60			
Cell Parameter (note)		0,1			
DPCH Channelization Codes (note)	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1 . . 5	C(i,16) i=1 . . 9	C(i,16) i=1 . . 8
OCNS Channelization Code (note)	C(k,Q)	C(3,16)	C(6,16)	-	-
Information Data Rate	kbps	12.2	64	144	384
Note:	Refer to TS 25.223 for definition of channelization codes and cell parameter.				

Table 7.2.1.2.b: Performance requirements in AWGN channel

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	1,1	10^{-2}
2	3,5	10^{-1}
	3,8	10^{-2}
3	3,4	10^{-1}
	3,6	10^{-2}
4	2,7	10^{-1}
	3,0	10^{-2}

7.2.1.3 Test purpose

While the receiver tests in clause 6 aims for the RF hardware, this performance requirement aims for the receiver's signal processing.

The test purpose is to verify the ability of the receiver to receive a predefined test signal ,representing a static propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) not exceeding a specified value.

7.2.1.4 Method of test

7.2.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect the SS, AWGN Generator and additional components to the UE antenna connector as shown in figure A.9.
- 2) A call is set up according to the Generic call setup procedure. The characteristic of the call shall be according to the DL reference measurement channels (12,2 kbit/s) (64 kbit/s), (144 kbit/s), and (384 kbit/s) specified in annex C.
- 3) Enter the UE into loopback test mode and start the loopback test. (test 1) and/or activate the Ack/Nack test mode (test 1 to test 4).
- 4) The levels of the wanted signal and the co-channel signals are set according to table 7.2.1.2a and b.

7.2.1.4.2 Procedure

Measure the BLER of DCH received from the UE at the SS for all 4 tests.

7.2.1.5 Test requirements

The measured BLER shall not exceed the values indicated in table 7.2.1.2b.

7.3 Demodulation of DCH in multipath fading conditions

7.3.1 Multipath fading Case 1

7.3.1.1 Definition and applicability

The performance requirement of DCH is determined by the maximum Block Error Ratio (BLER). The BLER is specified for each individual data ratio of the DCH. DCH is mapped into the Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data ratios, supported. The data-ratio-corresponding requirements shall apply to the UE.

7.3.1.2 Minimum requirements

For the parameters specified in table 7.3.1.2a the BLER shall not exceed the piece-wise linear BLER curve specified in table 7.3.1.2b. These requirements are applicable for TFCS size 16.

The reference for this requirement is TS 25.102 [1] clause 8.3.1.1.

Table 7.3.1.2a: DCH parameters in multipath Case 1 channel

Parameters	Unit	Test 1	Test 2	Test 3	Test 4
$\frac{\Sigma DPCH - E_c}{I_{or}}$	dB	-6	-3	0	0
I_{oc}	dBm/3,84 MHz	-60			
Cell Parameter (note)		0,1			
DPCH Channelization Codes (note)	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1..5	C(i,16) i=1..9	C(i,16) i=1..8
OCNS Channelization Code (note)	C(k,Q)	C(3,16)	C(6,16)	-	-
Information Data Ratio	kbps	12,2	64	144	384
Note:	Refer to TS 25.223 for definition of channelization codes and cell parameter.				

Table 7.3.1.2b: Performance requirements in multipath Case 1 channel

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	13,9	10^{-2}
2	13,7	10^{-1}
	19,8	10^{-2}
3	14,1	10^{-1}
	20,6	10^{-2}
4	13,8	10^{-1}
	20,0	10^{-2}

7.3.1.3 Test purpose

While the receiver tests in clause 6 aims for the RF hardware, this performance requirement aims for the receiver's signal processing.

The test purpose is to verify the ability of the receiver to receive a predefined test signal, representing a multipath propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) not exceeding a specified value.

7.3.1.4 Method of test

7.3.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect the SS, the fading simulator, the AWGN generator and additional components to the UE antenna connector as shown in figure A.10.
- 2) A call is set up according to the Generic call setup procedure. The characteristic of the call shall be according to the DL reference measurement channels (12,2 kbit/s), (64 kbit/s), (144 kbit/s), and (384 kbit/s) specified in annex C.
- 3) Enter the UE into loopback test mode and start the loopback test. (test 1) and/or activate the Ack/Nack test mode (test 1 to test 4).
- 4) The levels of the wanted signal and the co-channel signals are set according to table 7.3.1.2a and b.

7.3.1.4.2 Procedure

Measure the BLER of DCH received from the UE at the SS for all 4 tests.

7.3.1.5 Test requirements

The measured BLER shall not exceed the values indicated in table 7.3.1.2b.

7.3.2 Multipath fading Case 2

7.3.2.1 Definition and applicability

The performance requirement of DCH is determined by the maximum Block Error Ratio (BLER). The BLER is specified for each individual data rate of the DCH. DCH is mapped into the Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the datarates, supported. The data-rate-corresponding requirements shall apply to the UE.

7.3.2.2 Minimum requirement

For the parameters specified in table 7.3.2.2a the BLER should not exceed the piece-wise linear BLER curve specified in table 7.3.2.2b. . These requirements are applicable for TFCS size 16.

The reference for this requirement is TS 25.102 [1] clause 8.3.2.1.

Table 7.3.2.2a: DCH parameters in multipath Case 2 channel

Parameters	Unit	Test 1	Test 2	Test 3	Test 4
$\frac{\Sigma DCH - E_c}{I_{or}}$	DB	-3	0	0	0
I_{oc}	dBm/3,84 MHz	-60			
Cell Parameter (note)		0,1			
DPCH Channelization Codes (note)	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1 . . 5	C(i,16) i=1 . . 9	C(i,16) i=1 . . 8
OCNS Channelization Code (note)	C(k,Q)	C(3,16)	-	-	-
Information Data Rate	kbps	12,2	64	144	384
Note: Refer to TS 25.223 for definition of channelization codes and cell parameter.					

Table 7.3.2.2b: Performance requirements in multipath Case 2 channel

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
1	5,8	10^{-2}
2	5,7	10^{-1}
	9,2	10^{-2}
3	9,3	10^{-1}
	12,7	10^{-2}
4	8,8	10^{-1}
	12,0	10^{-2}

7.3.2.3 Test purpose

While the receiver tests in clause 6 aims for the RF hardware, this performance requirement aims for the receiver's signal processing.

The test purpose is to verify the ability of the receiver to receive a predefined test signal, representing a multipath propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) not exceeding a specified value.

7.3.2.4 Method of test

7.3.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect the SS, the fading simulator, the AWGN generator and additional components to the UE antenna connector as shown in figure A.10.
- 2) A call is set up according to the Generic call setup procedure. The characteristic of the call shall be according to the DL reference measurement channels (12,2 kbit/s) (64 kbit/s), (144 kbit/s), and (384 kbit/s) specified in annex C.
- 3) Enter the UE into loopback test mode and start the loopback test. (test 1) and/or activate the Ack/Nack test mode (test 1 to test 4).
- 4) The levels of the wanted signal and the co-channel signals are set according to table 7.3.2.2a and b.

7.3.2.4.2 Procedure

Measure the BLER of DCH received from the UE at the SS for all 4 tests.

7.3.2.5 Test requirements

The measured BLER shall not exceed the values indicated in table 7.3.2.2b.

7.3.3 Multipath fading Case 3

7.3.3.1 Definition and applicability

The performance requirement of DCH is determined by the maximum Block Error Ratio (BLER). The BLER is specified for each individual data rate of the DCH. DCH is mapped into the Dedicated Physical Channel (DPCH).

The UE shall be tested only according to the data rates, supported. The data-rate-corresponding requirements shall apply to the UE.

7.3.3.2 Minimum requirements

For the parameters specified in table 7.3.3.2a the BLER should not exceed the piece-wise linear BLER curve specified in table 7.3.3.2b. These requirements are applicable for TFCS size 16.

The reference for this requirement is TS 25.102 [1] clause 8.3.3.1.

Table 7.3.3.2a: DCH parameters in multipath Case 3 channel

Parameters	Unit	Test 1	Test 2	Test 3	Test 4
$\frac{\Sigma DPCH - E_c}{I_{or}}$	dB	-3	0	0	0
I_{oc}	dBm/3,84 MHz	-60			
Cell Parameter (note)		0,1			
DPCH Channelization Codes (note)	C(k,Q)	C(i,16) i=1,2	C(i,16) i=1..5	C(i,16) i=1..9	C(i,16) i=1..8
OCNS Channelization Code (note)	C(k,Q)	C(3,16)	-	-	-
Information Data Rate	kbps	12,2	64	144	384
Note: Refer to TS 25.223 for definition of channelization codes and cell parameter.					

Table 7.3.3.2b: Performance requirements in multipath Case 3 channel

Test Number	$\frac{\hat{I}_{or}}{I_{oc}}$ [dB]	BLER
12.2 kbps	4,8	10^{-2}
64 kbps	5,8	10^{-1}
	8,5	10^{-2}
	10,7	10^{-3}
144 kbps	10,3	10^{-1}
	13,3	10^{-2}
	16,0	10^{-3}
384 kbps	8,9	10^{-1}
	11,5	10^{-2}
	13,6	10^{-3}

7.3.3.3 Test purpose

While the receiver tests in clause 6 aims for the RF hardware, this performance requirement aims for the receiver's signal processing.

The test purpose is to verify the ability of the receiver to receive a predefined test signal, representing a multipath propagation channel for the wanted and for the co-channel signals from serving and adjacent cells, with a block error ratio (BLER) not exceeding a specified value.

7.3.3.4 Method of test

7.3.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect the SS, the fading simulator, the AWGN generator and additional components to the UE antenna connector as shown in figure A.10.
- 2) A call is set up according to the Generic call setup procedure. The characteristic of the call shall be according to the DL reference measurement channels (12.2 kbit/s)(64 kbit/s), (144 kbit/s), and (384 kbit/s) specified in annex C.
- 3) Enter the UE into loopback test mode and start the loopback test. (test 1) and/or activate the Ack/Nack test mode (test 1 to test 4).
- 4) The levels of the wanted signal and the co-channel signals are set according to table 7.3.3.2a and b.

7.3.3.4.2 Procedure

Measure the BLER of DCH received from the UE at the SS for all 4 tests.

7.3.3.5 Test requirements

The measured BLER shall not exceed the values indicated in table 7.3.3.2.b.

7.4 Base station transmit diversity mode

7.4.1 Demodulation of BCH in SCTD mode

This is not tested.

7.5 Power control in downlink

7.5.1 Definition and applicability

Power control in the uplink is the ability of the UE to converge to the required link quality set by the network while using minimum uplink power. The requirements of this test shall apply to the UTRA-TDD UE.

7.5.2 Minimum requirements

For the parameters specified in table 7.5.1 the downlink \hat{I}_{or}/I_{oc} averaged over one timeslot shall be below the specified value in table 7.5.2 more than 90% of the time. BLER shall be as shown in table 7.5.2. Downlink power control is ON during the test.

Table 7.5.1: Test parameters for downlink power control

Parameter	Unit	Test 1
$\frac{DPCH_E_c}{I_{or}}$	dB	0
I_{oc}	dBm/3,84 MHz	-60
Information Data Rate	kbps	12,2
Target quality value on DTCH	BLER	0,01
Propagation condition		Case 1
DL Power Control step size, Δ_{TPC}	dB	1
Maximum_DL_power (note)	dB	0
Minimum_DL_power (note)	dB	-27
NOTE: Refer to TS 25.224 for description and definition.		

Note: DL power is relative to P-CCPCH power.

Table 7.5.2: Requirements for downlink power control

Parameter	Unit	Test 1
\hat{I}_{or}/I_{oc}	dB	8,5
Measured quality on DTCH	BLER	0,01±30%

The reference for this requirement is TS 25.102 [1] clause 8.5.1.

7.5.3 Test purpose

To verify that the UE receiver is capable of converging to the required link quality set by the network while using as low power as possible.

7.5.4 Method of test

7.5.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect SS, multipath fading simulator and an AWGN source to the UE antenna connector as shown in figure A.10.
- 2) Set up a call according to the Generic call setup procedure.
- 3) RF parameters are set up according to table 7.5.1.
- 4) Enter the UE into loopback test mode and start the loopback test.
- 5) SS signals to UE target quality value on DTCH as specified in table 7.5.1. SS will vary the physical channel power in downlink according to the TPC commands from UE, and at the same time measure BLER. This is continued until the target quality value on DTCH is met, within the minimum accuracy requirement.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

7.5.4.2 Procedure

- 1) After the target quality on DTCH is met, BLER is measured. Simultaneously the downlink \hat{I}_{or}/I_{oc} power ratio averaged over one slot is measured. This is repeated until adequate amount of measurements is done to reach the required confidence level.

- 2) The measured quality on DTCH (BLER) and the measured downlink \hat{I}_{or}/I_{oc} power ratio values averaged over one slot are compared to the limits in table 7.5.2.

7.5.5 Test Requirements

- a) The measured quality on DTCH does not exceed the values in table 7.5.2.
- b) The downlink \hat{I}_{or}/I_{oc} power ratio values, which are averaged over one slot, shall be below the values in table 7.5.2 more than 90 % of the time.

7.6 Uplink Power Control

7.6.1 Definition and applicability

Power control in the uplink is the ability of the UE to converge to the required link quality set by the network while using minimum uplink power. The requirements of this test shall apply to all types of the UTRA-TDD UE.

7.6.2 Minimum requirements

During period T1, the PCCPCH and a second Beacon Channel are transmitted in the DL in designated slots within each frame and at the same power level.

The UE transmits, using the channel of TS25.105, Annex A.2.1 UL reference measurement channel (12.2 kbps) in one UL slot. For different parts of the test, different UL slots will be designated.

The values of table 7.6.1, period T1 shall be selected. Then, with the received PCCPCH and Beacon power set at -60 dBm, the value of DPCH constant value shall be adjusted so that the mean UE output power is 5 dBm. These conditions are held steady during period T1.

Periods T1 and T2 are each 5 seconds long.

Table 7.6.1: UL Power Control Test Conditions

		Period T1	Period T2
I_{BTS} all slots	dBm	-60	
PCCPCH Power -Broadcast	dBm	18	
PCCPCH Power - Received	dBm	-60	-70
Mean UE transmit power	dBm	5	According to tables 7.6.2 and 7.6.3
SIR_{TARGET}	dB	6	
I_{oc} in PCCPCH and Beacon Slots	dBm	-60	
IE (information element) Alpha	As defined in 25.331	1.0	
PCCPCH slot position	Integer 0 -14	0	
Beacon slot position	Integer 0 -14	8	

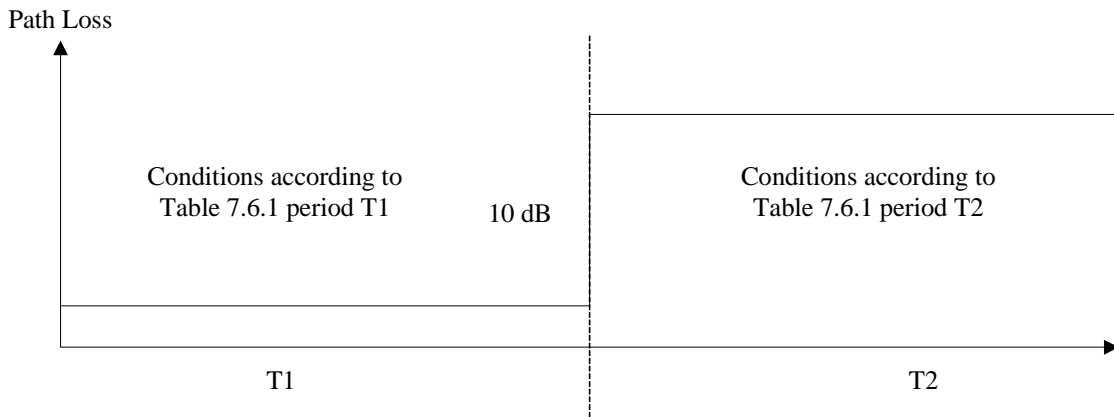


Figure 7.6.1

At the end of period T1, the PCCPCH and Beacon Received power shall be simultaneously decreased by 10 dB. These conditions are summarized in table 7.6.1, period T2.

For the first frame including the change in received power the UE output power shall satisfy the values in table 7.6.2.

For the 20th frame after the change in received power the UE output power shall satisfy the values in table 7.6.3.

Table 7.6.2: Required UE Output Power, Frame Containing Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±4.0	5 ±0.5

Table 7.6.3: Required UE Output Power, 20 Frames after Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±4.0	15 ±4.0

7.6.3 Test purpose

To verify the ability of the UE to converge to the required link quality set by the network while using minimum uplink power.

7.6.4 Method of test

7.6.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

- 1) Connect SS and an AWGN source to the UE antenna connector as shown in figure A.9.
- 2) Set up a call according to the Generic call setup procedure using SS levels and signalling values as specified in table 7.6.1 for Period P1 and table 7.6.4 . The UE shall be signalled to transmit in timeslot position 1.

Table 7.6.4: Test parameters for Uplink Power Control Test

Parameter	Value/description
UL Reference measurement channel	12,2kbps, according to annex C.2.1
DPCH constant value	0
Data content	real life (sufficient irregular)

3) Enter the UE into loopback test mode and start the loopback test.

See TS 34.108 [3] and TS 34.109 [4] for details regarding generic call setup procedure and loopback test.

7.6.4.2 Procedure

- 1) The SS adjusts the DPCH constant value until the UE transmit power is 5 dBm.
- 2) After the UE output power has been held constant at 5 dBm for at least 5 seconds, the received PCCPCH power shall be decreased by 10 dB to -70 dBm as shown in figure 7.6.1.
- 3) Measure the transmit power according to annex B for the first frame including the pathloss change and the 20th frame after the pathloss change.
- 4) Set the received PCCPCH power to -60 dBm.
- 5) SS signals UE to transmit in timeslot 7. Repeat step 1 - 4.
- 6) SS signals UE to transmit in timeslot 9. Repeat step 1 - 4.
- 7) SS signals UE to transmit in timeslot 14. Repeat step 1 - 4.

7.6.5 Test requirements

The measured transmit power shall not exceed the prescribed tolerance in tables 7.6.5 and 7.6.6.

Table 7.6.5: Required UE Output Power, Frame Containing Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±5.5	5 ±0.5

Table 7.6.6: Required UE Output Power, 20 Frames after Power Level Change

Parameter	Units	Value	
UL transmission slot position		1,9	7,14
UE output power	dBm	15 ±5.5	15 ±5.5

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in annex F clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in Annex F clause F.4.

8 Requirements for Support of RRM

8.1 General

Void.

8.2 Idle Mode Tasks

8.2.1 Cell Selection

Void.

8.2.2 Cell Re-Selection

8.2.2.1 Scenario 1: TDD/TDD cell re-selection single carrier case

8.2.2.1.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change causes the UE to camp on a new cell, and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on the new cell.

The requirements and this test apply to the TDD UE.

8.2.2.1.2 Minimum requirement

The cell re-selection delay shall be less than 8 s when the DRX cycle length is 1,28 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE:

The cell re-selection delay can be expressed as: $T_{\text{evaluateTDD}} + T_{\text{SI}}$, where:

$T_{\text{evaluateTDD}}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{\text{evaluateTDD}}$ of 6.4s according to table 4.1 in clause 4.2.2.7.

T_{SI} Maximum repetition rate 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 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 4.2.2 and A.4.2.1.

8.2.2.1.3 Test purpose

This test is to verify the requirement for the cell re-selection delay in the single carrier case

8.2.2.1.4 Method of test

8.2.2.1.4.1 Initial conditions

This scenario implies the presence of 1 carrier and 6 cells as given in table 8.2.2.1.1 and table 8.2.2.1.2. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.2.1.1: General test parameters for Cell Re-selection single carrier multi-cell case

Parameter	Unit	Value	Comment
Initial condition	Active cell	Cell1	
	Neighbour cells	Cell2, Cell3, Cell4, Cell5, Cell6	
Final condition	Active cell	Cell2	
HCS		Not used	
UE_TXPWR_MAX_RACH	dBm	21	The value shall be used for all cells in the test.
Qrxlevmin	dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value		1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}	s	1.28	The value shall be used for all cells in the test.
DRX cycle length	s	1.28	The value shall be used for all cells in the test.
T1	s	15	
T2	s	15	

Table 8.2.2.1.2: Cell re-selection single carrier multi-cell case

Parameter	Unit	Cell 1				Cell 2				Cell 3			
		0		8		0		8		0		8	
Timeslot Number		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_toffset		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
\hat{I}_{or}/I_{oc}	dB	9	7	9	7	7	9	7	9	-1	-1	-1	-1
PCCPCH RSCP	dBm	-64	-66			-66	-64			-74	-74		
Qoffset1 _{s,n}	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1, C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3, C6:0			
Qhyst1 _s	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_toffset		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
\hat{I}_{or}/I_{oc}	dB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset1 _{s,n}	dB	C4, C1: 0; C4, C2:0; C4,C3:0C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1 _s	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

8.2.2.1.4.2 Procedure

- a) The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for RRC CONNECTION REQUEST messages from the UE.
- b) The UE is switched on.
- c) The SS waits until the UE camps on Cell 1 and sends the RRC CONNECTION REQUEST message.
- d) After 15 s, the parameters are changed as described for T2.
- e) The SS waits for RRC CONNECTION REQUEST messages from the UE.
- f) After another 15 s, the parameters are changed as described for T1.
- g) The SS waits for RRC CONNECTION REQUEST messages from the UE.
- h) Repeat steps d) to g) [TBD] times.

8.2.2.1.5 Test Requirements

- 1) In step c), after the UE has responded on cell 1, it shall not respond on any other cell (cell selection).
- 2) In step e), the UE shall respond on cell 2 within 8 s.
- 3) In step g), the UE shall respond on cell 1 within 8 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.2.2.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

8.2.2.2.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change causes the UE to camp on a new cell, and starts to send the RRC CONNECTION REQUEST message to perform a Location Registration on the new cell.

The requirements and this test apply to the TDD UE.

8.2.2.2.2 Minimum requirement

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% with a confidence level of [FFS]%.

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: $T_{\text{evaluateTDD}} + T_{\text{SI}}$, where:

$T_{\text{evaluateTDD}}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{\text{evaluateTDD}}$ of 6.4s according to table 4.1 in clause 4.2.2.7.

T_{SI} Maximum repetition rate 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 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 4.2.2 and A.4.2.2.

8.2.2.2.3 Test purpose

This test is to verify the requirement for the cell re-selection delay in the multi carrier case

8.2.2.2.4 Method of test

8.2.2.2.4.1 Initial conditions

This scenario implies the presence of 2 carriers and 6 cells as given in table 8.2.2.2.1 and table 8.2.2.2.2. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.2.2.1: General test parameters for Cell Re-selection in Multi carrier case

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3, Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
HCS			Not used	
	UE_TXPWR_MAX_RACH	dBm	21	The value shall be used for all cells in the test.
	Qrxlevmin	dBm	-102	The value shall be used for all cells in the test.
	Access Service Class (ASC#0) - Persistence value		1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
	T _{SI}	s	1.28	The value shall be used for all cells in the test.
	DRX cycle length	s	1.28	The value shall be used for all cells in the test.
	T1	s	30	
	T2	s	15	

Table 8.2.2.2.2: Cell re-selection multi carrier multi cell case

Parameter	Unit	Cell 1				Cell 2				Cell 3			
		0		8		0		8		0		8	
Timeslot Number		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_offset		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
\hat{I}_{or}/I_{oc}	dB	6	0	6	0	0	6	0	6	-3	-3	-3	-3
PCCPCH RSCP	dBm	-67	-73			-73	-67			-76	-76		
Qoffset1 _{s,n}	dB	C1, C2: 0; C1, C3:0; C1,C4:0C1, C5:0; C1, C6:0				C2, C1: 0; C2, C3:0; C2,C4:0C2, C5:0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5:0; C3, C6:0			
Qhyst1 _s	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
		Cell 4				Cell 5				Cell 6			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2				Channel 2			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_offset		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
\hat{I}_{or}/I_{oc}	dB	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
PCCPCH RSCP	dBm	-76	-76			-76	-76			-76	-76		
Qoffset1 _{s,n}	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1 _s	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

8.2.2.2.4.2 Procedure

- The SS activates cell 1-6 with T1 defined parameters and monitors cell 1 and 2 for RRC CONNECTION REQUEST messages from the UE.
- The UE is switched on.
- The SS waits until the UE camps on Cell 1 and sends the RRC CONNECTION REQUEST message.
- After 15 s, the parameters are changed as described for T2.
- The SS waits for RRC CONNECTION REQUEST messages from the UE.
- After another 15 s, the parameters are changed as described for T1.
- The SS waits for RRC CONNECTION REQUEST messages from the UE.
- Repeat steps d) to g) [TBD] times.

NOTE: T1 is initially 30 s to allow enough time for the UE to search for cells as it has no prior knowledge of these.

8.2.2.2.5 Test Requirements

- 1) In step c), after the UE has responded on cell 1, it shall not respond on any other cell (cell selection).
- 2) In step e), the UE shall respond on cell 1 within 8 s.
- 3) In step g), the UE shall respond on cell 2 within 8 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.2.2.3 Scenario 3: TDD/FDD cell re-selection

8.2.2.3.1 Definition and applicability

The cell re-selection delay is defined as the time from when the cell quality levels change to the moment when this change makes the UE reselect a better ranked cell, and starts to send preambles on the PRACH for sending the RRC CONNECTION REQUEST message to perform a Location Registration on the new cell.

This test is for the case where the UE camps on a TDD cell and reselects to an FDD cell.

The requirements and this test apply to UEs supporting both TDD and FDD.

8.2.2.3.2 Minimum requirement

The cell re-selection delay shall be less than 8 s when the DRX cycle length is 1,28 s.

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

NOTE:

The cell re-selection delay can be expressed as: $T_{\text{evaluateFDD}} + T_{\text{SI}}$, where:

$T_{\text{evaluateFDD}}$ See TS 25.123 [2] table 4.1 in clause 4.2.2.

T_{SI} Maximum repetition rate 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 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 4.2.2 and A.4.2.3

8.2.2.3.3 Test purpose

This test verifies the UE meets the minimum requirement for the case where the UE camps on a TDD cell and reselects to an FDD cell.

8.2.2.3.4 Method of test

8.2.2.3.4.1 Initial conditions

This scenario implies the presence of 1 TDD and 1 FDD cell as given in table 8.2.2.3.1 and table 8.2.2.3.2. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.2.3.1: General test parameters for the TDD/FDD cell re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	TDD cell
	Neighbour cells		Cell2	FDD cell
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T _{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	30	
T2		s	15	

Table 8.2.2.3.2: TDD/FDD cell re-selection

Parameter	Unit	Cell 1				Cell 2	
		0		8		n.a.	n.a.
Timeslot Number		T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/I _{or}	dB	n.a.		n.a.		-10	-10
PCCPCH_Ec/I _{or}	dB	-3	-3			-12	-12
SCH_Ec/I _{or}	dB	-9	-9	-9	-9	-12	-12
SCH _{toffset}		0	0	0	0	n.a.	n.a.
PICH_Ec/I _{or}	dB			-3	-3	-15	-15
OCNS_Ec/I _{or}	dB	-3,12	-3,12	-3,12	-3,12	-0,941	-0,941
\hat{I}_{or}/I_{oc}	dB	3	-2	3	-2	-2	3
I _{oc}	dBm/3.8 4 MHz	-70					
CPICH_RSCP	dBm	n.a.		n.a.		-82	-77
PCCPCH_RSCP	dBm	-70	-75			n.a.	n.a.
Cell_selection and reselectionquality _measure		CPICH_RSCP				CPICH_RSCP	
Qrxlevmin	dBm	-102				-115	
Qoffset1 _{s,n}	dB	C1, C2: -12				C2, C1: +12	
Qhyst1 _s	dB	0				0	
Treselection	s	0				0	
Sintersearch	dB	not sent				not sent	
Propagation Condition		AWGN				AWGN	

8.2.2.3.4.2 Procedure

- The SS activates cell 1 and cell 2 with T1 defined parameters and monitors them for RRC CONNECTION REQUEST messages from the UE.
- The UE is switched on.
- The SS waits until the UE camps on Cell 1 and sends the RRC CONNECTION REQUEST message.
- After 30 s, the parameters are changed as described for T2.
- The SS waits for RRC CONNECTION REQUEST messages from the UE.
- After another 15 s, the parameters are changed as described for T1.
- The SS waits for RRC CONNECTION REQUEST messages from the UE.

h) Repeat steps d) to g) [TBD] times.

8.2.2.3.5 Test Requirements

- 1) In step c), after the UE has responded on cell 1, it shall not respond on any other cell (cell selection).
- 2) In step e), the UE shall respond on cell 2 within 8 s.
- 3) In step g), the UE shall respond on cell 1 within 8 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.2.2.4 Scenario 4: inter RAT cell re-selection

8.2.2.4.1 Definition and applicability

The cell re-selection delay is defined as the time from when the cell quality levels change to the moment when this change makes the UE reselect a better ranked cell, and starts to send LOCATION UPDATING REQUEST message to perform a Location update to the new cell.

This test is for the case where the UE camps on a TDD cell and reselects to a GSM cell.

The requirements and this test apply to UEs supporting both TDD and GSM.

8.2.2.4.2 Minimum requirement

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

NOTE: The cell re-selection delay can be expressed as:

$$4 * T_{\text{measureGSM}} + T_{\text{BCCH}}$$

where:

$T_{\text{measureGSM}}$ Specified in Table 4.1 in sub clause 4.2.2.7.1 in [2].

T_{BCCH} Equal to 1.9 s, i.e. the maximum time allowed to read BCCH data when synchronised to a BCCH carrier from a GSM cell (specified in TS 45.005).

The rate of correct cell reselections observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

The normative reference for this requirement is TS 25.123 [2] clauses 4.3.2.1 and A.4.2.4

8.2.2.4.3 Test purpose

This test verifies the UE meets the minimum requirement for the case where the UE camps on a TDD cell and reselects to a GSM cell.

8.2.2.4.4 Method of Test

8.2.2.4.4.1 Initial conditions

This scenario implies the presence of 1 TDD and 1 GSM cell as given in table 8.2.2.4.1, 8.2.2.4.2, and 8.2.2.4.3. Cell 1 and cell 2 shall belong to different Location Areas.

Table 8.2.2.4.1: General test parameters for UTRAN to GSM Cell Re-selection

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	TDD Cell
	Neighbour cell		Cell2	GSM Cell
Final condition	Active cell		Cell2	
DRX cycle length		s	1,28	UTRAN cell
BCCH repetition period (GSM cell)		s	1,87	In GSM the system information is scheduled according to an 8 x (51 x 8) cycle (i.e. a system information message is transmitted every 235 ms). The cell selection parameters in system info 3 and 4 are transmitted at least every second. (GSM 05.02)
T1		s	45	
T2		s	35	

Table 8.2.2.4.2: Cell re-selection UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1 (UTRA)			
		0		8	
		T1	T2	T1	T2
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/lor	dB	-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9
SCH_offset		0	0	0	0
PICH_Ec/lor	dB			-3	-3
OCNS_Ec/lor	dB	-3,12	-3,12	-3,12	-3,12
\hat{I}_{or}/I_{oc}	dB	3	-2	3	-2
I_{oc}	dBm/3, 84 MHz	-70		-70	
PCCPCH RSCP	dBm	-70	-75		
Propagation Condition		AWGN		AWGN	
Treselection	s	0			
Ssearch _{RAT}	dB	not sent			

Table 8.2.2.4.3: Cell re-selection UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2 (GSM)	
		T1	T2
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-90	-75
RXLEV_ACCESS_MIN	dBm	-100	
MS_TXPWR_MAX_CCH	dBm	30	

8.2.2.4.4.2 Procedure

- The SS activates cell 1 and 2 with T1 defined parameters and monitors cell 1 and 2 for RRC CONNECTION REQUEST and LOCATION UPDATING REQUEST messages from the UE.
- The UE is switched on.
- The SS waits until the UE camps on Cell 1 and sends the RRC CONNECTION REQUEST message.
- After 45 s, the parameters are changed as described for T2.
- The SS waits for LOCATION UPDATING REQUEST messages from the UE.
- After 35 s, the parameters are changed as described for T1.
- The SS waits for RRC CONNECTION REQUEST messages from the UE.

h) Repeat steps d) to g) [TBD] times.

8.2.2.4.5 Test Requirements

- 1) In step c), after the UE has responded on cell 1, it shall not respond on any other cell (cell selection).
- 2) In step e), the UE shall respond on cell 2 within 27.9 s.
- 3) In step g), the UE shall respond on cell 1.

For the test to pass, the total number of fulfilled test requirements in step 2) shall be at least 90% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3 UTRAN Connected Mode Mobility

8.3.1 TDD/TDD Handover

8.3.1.1 Handover to intra-frequency cell

8.3.1.1.1 Definition and applicability

Handover interruption time is defined as the time between the end of the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH.

The requirements and this test apply to the UTRA TDD UE.

8.3.1.1.2 Minimum requirement

The interruption time shall be less than 40 ms in the single carrier case when the cell is known by the UE and the SFN of the target cell does not need to be decoded. The rate of correct handovers observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.
The interruption time is dependent on whether the target cell is known for the UE or not.

If TDD/TDD intra-frequency handover is commanded, the interruption time shall be less than,

$$T_{\text{interrupt}} = T_{\text{offset}} + T_{\text{UL}} + 30 * F_{\text{SFN}} + 20 * \text{KC} + 180 * \text{UC} \text{ ms}$$

where,

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell and the time that can elapse until the appearance of a Beacon channel
T_{UL}	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
F_{SFN}	Equal to 1 if SFN decoding is required and equal to 0 otherwise
KC	Equal to 1 if a known target cell is indicated in the RRC message implying TDD/TDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying TDD/TDD handover and equal to 0 otherwise

An intra-frequency TDD target cell shall be considered as known by the UE, if either or both of the following conditions are true:

- the target cell has been measured during the last 5 seconds
- the UE has had a radio link connected to the target cell during the last 5 seconds.

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

The normative reference for this requirement is TS 25.123 [2] clauses 5.1.2 and A.5.1.1.

8.3.1.1.3 Test purpose

The purpose of this test is to verify the requirement for the intra-frequency handover delay in CELL_DCH state in the single carrier case.

8.3.1.1.4 Method of test

8.3.1.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in table 8.3.1.1.1 and 8.3.1.1.2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that P-CCPCH RSCP and SFN-CFN observed timed difference shall be reported together with Event 1G. The test consists of three successive time periods, with a 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.

UTRAN shall send a Physical Channel reconfiguration message with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The UL DPCH shall be transmitted in timeslot 12.

Table 8.3.1.1.1: General test parameters for Handover to intra-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 clause A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 2	
HCS			Not used	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1	
T1		s	10	
T2		s	10	
T3		s	10	

Table 8.3.1.1.2: Cell specific test parameters for Handover to intra-frequency cell

Parameter	Unit	Cell 1						Cell 2					
		0			4			0			5		
DL timeslot number		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1						Channel 1					
PCCPCH_Ec/I _{or}	dB	-3			n.a.			-3			n.a.		
SCH_Ec/I _{or}	dB	-9			n.a.			-9			n.a.		
SCH_t _{offset}	dB	0			n.a.			5			n.a.		
DPCH_Ec/I _{or}	dB	n.a.			Note 1		n.a.	n.a.			n.a.		Note 1
OCNS_Ec/I _{or}	dB	-3,12			Note 2		n.a.	n.a.	-3,12		n.a.		Note 2
\hat{I}_{or}/I_{oc}	dB	1						-Inf.	3		-Inf.		3
PCCPCH RSCP	dBm	-72			n.a.			-Inf.	-70		n.a.		
I_{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition		AWGN											
Note 1: The DPCH level is controlled by the power control loop													
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I _{or} .													

8.3.1.1.4.2 Procedure

- 1) The RF parameters are set up according to T1.
- 2) The UE is switched on.
- 3) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.4.
[Editor's note: subclause 7.3.4 in TS 34.108 (Message sequence chart for Handover Test procedure) is not yet specified]
- 4) SS shall transmit a MEASUREMENT CONTROL message.
- 5) After 10 seconds, the SS shall switch the power settings from T1 to T2.
- 6) UE shall transmit a MEASUREMENT REPORT message triggered by event 1G.
- 7) SS shall transmit a PHYSICAL CHANNEL RECONFIGURATION message with activation time at T3.
- 8) After 10 seconds, the SS shall switch the power settings from T2 to T3
- 9) UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on the UL DCCH of cell 2. If the UE transmits the UL DPCH to cell 2 less than 40 ms from the beginning of time period T3 then the number of successful tests is increased by one.
- 10) After 10 seconds, the UE is switched off. Any timing information of cell 2 is deleted in the UE.
- 11) Repeat step 1-10 [TBD] times.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3], with the following exceptions:

MEASUREMENT CONTROL message (step 4):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command (10.3.7.46)	Modify
-Measurement Reporting Mode (10.3.7.49)	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Event trigger
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE <i>Measurement type</i>	Intra-frequency measurement
-Intra-frequency measurement (10.3.7.36)	
-Intra-frequency measurement objects list (10.3.7.33)	Not Present
-Intra-frequency measurement quantity (10.3.7.38)	
-Filter coefficient (10.3.7.9)	0
-CHOICE <i>mode</i>	TDD
-Measurement quantity list	1
-Measurement quantity	Primary CCPCH
-Intra-frequency reporting quantity (10.3.7.41)	
-Reporting quantities for active set cells (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	TRUE (Note 1)
-Cell Identity reporting indicator	TRUE
-CHOICE <i>mode</i>	TDD
-Timeslot ISCP reporting indicator	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	FALSE
-Reporting quantities for monitored set cells (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	TRUE (Note 1)
-Cell Identity reporting indicator	TRUE
-CHOICE <i>mode</i>	TDD
-Timeslot ISCP reporting indicator	FALSE
-Proposed TGSN reporting required	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	FALSE
-Reporting quantities for detected set cells (10.3.7.5)	Not Present
-Reporting cell status (10.3.7.61)	
-CHOICE <i>reported cell</i>	Report all active set cells + cells within monitored set on used frequency
-Maximum number of reported cells	2
-Measurement validity (10.3.7.51)	Not Present
-CHOICE <i>report criteria</i>	Intra-frequency measurement reporting criteria
-Intra-frequency measurement reporting criteria (10.3.7.39)	
-Parameters required for each event	1
-Intra-frequency event identity	Event 1G
-Triggering condition 2	Not Present
-Reporting Range Constant	Not Present
-Cells forbidden to affect Reporting Range	Not Present
-CHOICE <i>mode</i>	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE <i>mode</i>	TDD
-CHOICE <i>sync case</i>	Case 2
-Timeslot	0
-Cell parameters ID	0
-SCTD indicator	FALSE
-W	Not Present
-Hysteresis	0 dB
-Threshold used frequency	Not Present
-Reporting deactivation threshold	Not Present
-Replacement activation threshold	Not Present
-Time to trigger	0 ms
-Amount of reporting	Infinity

Information Element/Group name	Value/Remark
-Reporting interval -Reporting cell status	0 ms (Note 2) Not Present
Physical channel information elements -DPCH compressed mode status info (10.3.6.34)	Not Present
Note 1:	The SFN-CFN observed time difference is calculated from the OFF and Tm parameters contained in the IE "Cell synchronisation information", TS 25.331, clause 10.3.7.6. According to TS 25.331, 8.6.7.7, this IE is included in MEASUREMENT REPORT if IE "Cell synchronisation information reporting indicator" in IE "Cell reporting quantities" TS 25.331, clause 10.3.7.5 is set to TRUE in MEASUREMENT CONTROL.
Note 2:	Reporting interval = 0 ms means no periodical reporting

PHYSICAL CHANNEL RECONFIGURATION message (step 7):

Information Element	Value/Remark
Message Type	
UE Information Elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Integrity protection mode info	Not Present
-Ciphering mode info	Not Present
-Activation time	At T3
-New U-RNTI	Not Present
-New C-RNTI	Not Present
-RRC State Indicator	CELL_DCH
-UTRAN DRX cycle length coefficient	Not Present
CN Information Elements	
-CN Information info	Not Present
UTRAN mobility information elements	
-URA identity	Not Present
RB information elements	
-Downlink counter synchronisation info	Not Present
-RB with PDCP information list	Not Present
-RB with PDCP information	Not Present
PhyCH information elements	
-Frequency info (10.3.6.36)	
-CHOICE <i>mode</i>	TDD
-UARFCN (Nt)	Same UARFCN as used for cell 2
Uplink radio resources	
-Maximum allowed UL TX power	33 dBm
-CHOICE <i>channel requirement</i>	Uplink DPCH info
-Uplink DPCH info (10.3.6.88)	
-Uplink DPCH power control info (10.3.6.91)	
-CHOICE <i>mode</i>	TDD
-UL Target SIR	Not Present
-CHOICE <i>UL OL PC info</i>	Individually signalled
-Individual Timeslot interference info	1
-Individual timeslot interference (10.3.6.38)	
-Timeslot Number (10.3.6.84)	
-Timeslot number	12
-UL Timeslot Interference	-90 dBm
-CHOICE <i>mode</i>	TDD
-Uplink timing advance control (10.3.6.96)	
-CHOICE <i>Timing Advance</i>	Disabled
-UL CCTrCH list	1
-UL Target SIR	TBD dB
-Time Info (10.3.6.83)	
-Activation Time	T3
-Duration	Infinite
-Common timeslot info	Not Present
-Uplink DPCH timeslots and codes (10.3.6.94)	
-Dynamic SF Usage	False
-First individual timeslot info (10.3.6.37)	
-Timeslot Number (10.3.6.84)	
-Timeslot number	12
-TFCl existence	True
-Midamble shift and burst type (10.3.6.41)	
-Choice Burst Type	Type 1
-Midamble Allocation Mode	Default
-Midamble configuration burst type 1 and 3	16
-Midamble shift	Not present
-First timeslot code list	1
-Channelisation code	8/1
-Choice more timeslots	No more timeslots
Downlink radio resources	
-CHOICE <i>mode</i>	TDD
-Downlink information common for all radio links (10.3.6.24)	
-Downlink DPCH info common for all RL (10.3.6.18)	
-Timing indicator	Initialise
-CFN-targetSFN frame offset	Not Present

Information Element	Value/Remark
-Downlink DPCH power control information (10.3.6.23)	
-CHOICE <i>mode</i>	TDD
-TPC Step size	1 dB
-CHOICE <i>mode</i>	TDD
-CHOICE <i>mode</i>	TDD
-TX Diversity mode (10.3.6.86)	None
-Default DPCH Offset Value (10.3.6.16)	0
-Downlink information per radio link list	1
-Downlink information for each radio link (10.3.6.27)	
-CHOICE <i>mode</i>	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE <i>mode</i>	TDD
-CHOICE <i>sync case</i>	Case 2
-Timeslot	0
-Cell parameters ID	20
-SCTD indicator	False
-Downlink DPCH info for each RL (10.3.6.21)	
-CHOICE <i>mode</i>	TDD
-DL CCTrCH list	1
-TFCS ID	Not Present
-Time Info (10.3.6.83)	
-Activation Time	T3
-Duration	Infinite
-Common timeslot info	Not Present
-Downlink DPCH timeslots and codes (10.3.6.32)	
-First individual timeslot info (10.3.6.37)	
-Timeslot Number (10.3.6.84)	
-Timeslot number	5
-TFCI existence	True
-Midamble shift and burst type (10.3.6.41)	
-CHOICE <i>Burst Type</i>	Type 1
-Midamble Allocation Mode	Default
-Midamble configuration burst type 1 and 3	16
-Midamble shift	Not present
-First timeslot channelisation codes (10.3.6.17)	
-CHOICE <i>codes representation</i>	Consecutive codes
-First channelisation code	16/1
-Last channelisation code	16/2
-CHOICE <i>more timeslots</i>	No more timeslots
-SCCPCH information for FACH (10.3.6.70)	Not Present

MEASUREMENT REPORT message (step 6)

Information Element	Value/remark
Message Type (10.2.17)	
Integrity check info	Not Present
Measurement identity	1
Measured Results (10.3.7.44)	
-CHOICE Measurement	Intra-frequency Measured results list
-Intra-frequency measured results	1
-Cell measured results (10.3.7.3)	
-Cell identity	Checked that this IE is present
-SFN-SFN observed time difference	Not Present
-Cell synchronisation info	Checked that this IE is present
-CHOICE mode	TDD
-Cell parameters ID	20
-Proposed TGSN	Not Present
-Primary CCPCH RSCP	Checked that this IE is present
-Pathloss	Not Present
-Timeslot list	Not Present
Measured results on RACH	Not Present
Additional measured results	Not Present
Event results (10.3.7.7)	
-CHOICE event result	Intra-frequency measurement event results
-Intra-frequency event identity	1G
-Cell measurement event results (10.3.7.4)	
-CHOICE mode	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE mode	TDD
-Cell parameters ID	40

8.3.1.1.5 Test requirements

For the test to pass, the total number of successful tests shall be more than [FFS] of the cases.

Note: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3.1.2 Handover to inter-frequency cell

8.3.1.2.1 Definition and applicability

The handover interruption time is defined as the time between the end of the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH.

The requirements and this test apply to the UTRA TDD UE.

8.3.1.2.2 Minimum requirement

The interruption time shall be less than 40 ms in the dual carrier case when the cell is known by the UE and the SFN of the target cell needs to be decoded. The rate of correct handovers observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

The interruption time is dependent on whether the target cell is known for the UE or not.

If TDD/TDD inter-frequency handover is commanded, the interruption time shall be less than,

$$T_{\text{interrupt}} = T_{\text{offset}} + T_{\text{UL}} + 30 * F_{\text{SFN}} + 20 * \text{KC} + 180 * \text{UC} \text{ ms}$$

where,

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

T_{UL}	Equal to 10 ms, the time that can elapse until the appearance of the UL timeslot in the target cell
F_{SFN}	Equal to 1 if SFN decoding is required and equal to 0 otherwise
KC	Equal to 1 if a known target cell is indicated in the RRC message implying TDD/TDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying TDD/TDD handover and equal to 0 otherwise

An inter-frequency TDD target cell shall be considered as known by the UE, if either or both of the following conditions are true:

- the target cell has been measured during the last 5 seconds
- the UE has had a radio link connected to the target cell during the last 5 seconds.

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

The normative reference for this requirement is TS 25.123 [2] clauses 5.1.2 and A.5.1.2.

8.3.1.2.3 Test purpose

The purpose of this test is to verify the requirement for the inter-frequency handover delay in CELL_DCH state in the dual carrier case.

8.3.1.2.4 Method of test

8.3.1.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in table 8.3.1.2.1 and 8.3.1.2.2. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. The PCCPCH RSCP and SFN-CFN observed time difference of the best cell on the unused frequency shall be reported together with Event 2C reporting. At the start of time duration T1, the UE may not have any timing information of cell 2.

UTRAN shall send a Physical Channel reconfiguration message with activation time at beginning of T3 with one active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2. The UL DPCH shall be transmitted in timeslot 12.

Table 8.3.1.2.1: General test parameters for Handover to inter-frequency cell

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 clause A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 2	
HCS			Not used	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	Hysteresis parameter for event 2C
Time to Trigger		ms	0	
Threshold non-used frequency		dBm	-80	Applicable for Event 2C
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1 6 TDD neighbours on Channel 2	
T _{SI}		s	1,28	The value shall be used for all cells in the test.
T1		s	10	
T2		s	10	
T3		s	10	

Table 8.3.1.2.2: Cell Specific parameters for Handover to inter-frequency cell

Parameter	Unit	Cell 1						Cell 2					
		0			4			2			5		
DL timeslot number		T1	T2	T3	T1	T2	T3	T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1						Channel 2					
PCCPCH_Ec/I _{or}	dB	-3			n.a.			-3			n.a.		
SCH_Ec/I _{or}	dB	-9			n.a.			-9			n.a.		
SCH_t _{offset}	dB	0			n.a.			5			n.a.		
DPCH_Ec/I _{or}	dB	n.a.			Note 1		n.a.	n.a.			n.a.		Note 1
OCNS_Ec/I _{or}	dB	-3,12			Note 2		n.a.	n.a.	-3,12		n.a.		Note 2
\hat{I}_{or}/I_{oc}	dB	1						-Inf.	7		-Inf.	7	
PCCPCH RSCP	dBm	-72			n.a.			-Inf.	-66		n.a.		
I _{oc}	dBm/ 3,84 MHz	-70											
Propagation Condition		AWGN											
Note 1: The DPCH level is controlled by the power control loop													
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I _{or} .													

8.3.1.2.4.2 Procedure

- 1) The RF parameters are set up according to T1.
- 2) The UE is switched on.
- 3) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.4.

[Editor's note: subclause 7.3.4 in TS 34.108 (Message sequence chart for Handover Test procedure) is not yet specified]

- 4) SS shall transmit a MEASUREMENT CONTROL message.

- 5) After 10 seconds, the SS shall switch the power settings from T1 to T2.
- 6) UE shall transmit a MEASUREMENT REPORT message triggered by event 2C.
- 7) SS shall transmit a PHYSICAL CHANNEL RECONFIGURATION message with activation time at T3.
- 8) After 10 seconds, the SS shall switch the power settings from T2 to T3
- 9) UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on the UL DCCH of cell 2. If the UE transmits the UL DPCH to cell 2 less than 40 ms from the beginning of time period T3 then the number of successful tests is increased by one.
- 10) After 10 seconds, the UE is switched off. Any timing information of cell 2 is deleted in the UE.
- 11) Repeat step 1-10 [TBD] times.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

MEASUREMENT CONTROL message, event 2C (step 4):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements -RRC transaction identifier -Integrity check info	0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command (10.3.7.46) -Measurement Reporting Mode (10.3.7.49) -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list (10.3.7.1)	1 Modify AM RLC Event trigger Not Present
-CHOICE <i>Measurement type</i> -Inter-frequency measurement (10.3.7.16) -Inter-frequency measurement objects list (10.3.7.13) -Inter-frequency measurement quantity (10.3.7.18) -CHOICE <i>reporting criteria</i> -Inter-frequency reporting criteria -Filter coefficient -CHOICE <i>mode</i> -Measurement quantity for frequency quality estimate	Inter-frequency measurement Not Present Inter-frequency reporting criteria 0 TDD Primary CCPCH RSCP
-Inter-frequency reporting quantity (10.3.7.21) -UTRA Carrier RSSI -Frequency quality estimate -Non frequency related cell reporting quantities (10.3.7.5) -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE <i>mode</i> -Timeslot ISCP reporting indicator -Proposed TGSN reporting required -Primary CCPCH RSCP reporting indicator -Pathloss reporting indicator	FALSE FALSE No Report TRUE TRUE TDD FALSE FALSE TRUE FALSE
-Reporting cell status (10.3.7.61) -CHOICE <i>reported cell</i> -Maximum number of reported cells per reported non-used frequency -Measurement validity (10.3.7.51) -Inter-frequency set update (10.3.7.22) -CHOICE <i>report criteria</i>	Report cells within monitored set on non-used frequency 1 Not Present Not Present Inter-frequency measurement reporting criteria
-Inter-frequency measurement reporting criteria (10.3.7.19) -Parameters required for each event -Inter-frequency event identity (10.3.7.14) -Threshold used frequency -W used frequency -Hysteresis -Time to trigger -Reporting cell status (10.3.7.61) -CHOICE <i>reported cell</i> -Maximum number of reported cells per reported non-used frequency -Parameters required for each non-used frequency -Threshold non-used frequency -W non-used frequency	1 Event 2C Not Present Not Present 0 dB 0 ms Report cells within monitored set on non-used frequency 1 1 -80 dBm 1
Physical channel information elements -DPCH compressed mode status info (10.3.6.34)	Not Present

PHYSICAL CHANNEL RECONFIGURATION message (step 7):

Information Element	Value/Remark
Message Type	
UE Information Elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Integrity protection mode info	Not Present
-Ciphering mode info	Not Present
-Activation time	At T3
-New U-RNTI	Not Present
-New C-RNTI	Not Present
-RRC State Indicator	CELL_DCH
-UTRAN DRX cycle length coefficient	Not Present
CN Information Elements	
-CN Information info	Not Present
UTRAN mobility information elements	
-URA identity	Not Present
RB information elements	
-Downlink counter synchronisation info	Not Present
-RB with PDCP information list	Not Present
-RB with PDCP information	Not Present
PhyCH information elements	
-Frequency info (10.3.6.36)	
-CHOICE <i>mode</i>	TDD
-UARFCN (Nt)	Same UARFCN as used for cell 2
Uplink radio resources	
-Maximum allowed UL TX power	33 dBm
-CHOICE <i>channel requirement</i>	Uplink DPCH info
-Uplink DPCH info (10.3.6.88)	
-Uplink DPCH power control info (10.3.6.91)	
-CHOICE <i>mode</i>	TDD
-UL Target SIR	Not Present
-CHOICE <i>UL OL PC info</i>	Individually signalled
-Individual Timeslot interference info	1
-Individual timeslot interference (10.3.6.38)	
-Timeslot Number (10.3.6.84)	
-Timeslot number	12
- UL Timeslot Interference	-90 dBm
-CHOICE <i>mode</i>	TDD
-Uplink timing advance control (10.3.6.96)	
-CHOICE <i>Timing Advance</i>	Disabled
-UL CCTrCH list	1
-UL Target SIR	TBD dB
-Time Info (10.3.6.83)	
-Activation Time	T3
-Duration	Infinite
-Common timeslot info	Not Present
-Uplink DPCH timeslots and codes (10.3.6.94)	
-Dynamic SF Usage	False
-First individual timeslot info (10.3.6.37)	
-Timeslot Number (10.3.6.84)	
-Timeslot number	12
-TFCl existence	True
-Midamble shift and burst type (10.3.6.41)	
-CHOICE <i>Burst Type</i>	Type 1
-Midamble Allocation Mode	Default
-Midamble configuration burst type 1 and 3	16
-Midamble shift	Not present
-First timeslot code list	1
-Channelisation code	8/1
-CHOICE <i>more timeslots</i>	No more timeslots
Downlink radio resources	
-CHOICE <i>mode</i>	TDD
-Downlink information common for all radio links (10.3.6.24)	
-Downlink DPCH info common for all RL (10.3.6.18)	
-Timing indicator	Initialise
-CFN-targetSFN frame offset	Not Present

Information Element	Value/Remark
-Downlink DPCH power control information (10.3.6.23)	
-CHOICE <i>mode</i>	TDD
-TPC Step size	1 dB
-CHOICE <i>mode</i>	TDD
-CHOICE <i>mode</i>	TDD
-TX Diversity mode (10.3.6.86)	None
-Default DPCH Offset Value (10.3.6.16)	0
-Downlink information per radio link list	1
-Downlink information for each radio link (10.3.6.27)	
-CHOICE <i>mode</i>	TDD
-Primary CCPCH info (10.3.6.57)	
- CHOICE <i>mode</i>	TDD
- CHOICE <i>sync case</i>	Case 2
- Timeslot	2
- Cell parameters ID	20
- SCTD indicator	False
-Downlink DPCH info for each RL (10.3.6.21)	
-CHOICE <i>mode</i>	TDD
- DL CCTrCH list	1
-TFCS ID	Not Present
-Time Info (10.3.6.83)	
-Activation Time	T3
-Duration	Infinite
-Common timeslot info	Not Present
- Downlink DPCH timeslots and codes (10.3.6.32)	
- First individual timeslot info (10.3.6.37)	
- Timeslot Number (10.3.6.84)	
- Timeslot number	5
- TFCI existence	True
- Midamble shift and burst type (10.3.6.41)	
- CHOICE <i>Burst Type</i>	Type 1
- Midamble Allocation Mode	Default
- Midamble configuration burst type 1 and 3	16
- Midamble shift	Not present
- First timeslot channelisation codes (10.3.6.17)	
- CHOICE <i>codes representation</i>	Consecutive codes
- First channelisation code	16/1
- Last channelisation code	16/2
- CHOICE <i>more timeslots</i>	No more timeslots
- SCCPCH information for FACH (10.3.6.70)	Not Present

MEASUREMENT REPORT message (step 6)

Information Element	Value/remark
Message Type (10.2.17)	
Integrity check info	Not Present
Measurement identity	1
Measured Results (10.3.7.44)	
-CHOICE Measurement	Inter-frequency Measured results list
-Inter-frequency measured results	1
-Frequency info	
-CHOICE mode	TDD
-UARFCN(Nt)	Same frequency as channel 2 in Table 8.6.2.4.1.2
-UTRA carrier RSSI	Not Present
-Inter-frequency cell measured results	1
-Cell measured results (10.3.7.3)	
-Cell identity	Checked that this IE is present
-SFN-SFN observed time difference	Not Present
-Cell synchronisation info	Checked that this IE is present
-CHOICE mode	TDD
-Cell parameters ID	Set to cell parameters ID of Cell 2
-Proposed TGSN	Not Present
-Primary CCPCH RSCP	Checked that this IE is present
-Pathloss	Not Present
-Timeslot list	Not Present
Measured results on RACH	Not Present
Additional measured results	Not Present
Event results (10.3.7.7)	
-CHOICE event result	Inter-frequency measurement event results
-Inter-frequency event identity	2C
-Inter-frequency cells	1
-Frequency Info	
-CHOICE mode	TDD
-UARFCN(Nt)	Same frequency as channel 2 in Table 8.6.2.4.1.2
-CHOICE mode	TDD
-Primary CCPCH Info	
-CHOICE mode	TDD
-CHOICE Sync Case	Not Present
-Cell Parameters ID	Set to cell parameters ID of Cell 2
-SCTD Indicator	FALSE

8.3.1.2.5 Test requirements

For the test to pass, the total number of successful tests shall be more than [FFS] of the cases.

Note: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3.2 TDD/FDD Handover

8.3.2.1 Definition and applicability

The handover interruption time is defined as the time between the end of the last TTI containing a transport block on the old DPCH and the time the UE starts transmission of the new uplink DPCH.

The requirements and this test apply to the UTRA TDD / FDD UE.

8.3.2.2 Minimum requirement

The interruption time shall be less than 100 ms in the single carrier case when the cell is known by the UE and the SFN of the target cell does not need to be decoded. The rate of correct handovers observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

The interruption time is dependent on whether the target cell is known for the UE or not.

If TDD/FDD handover is commanded, the interruption time shall be less than,

$$T_{\text{interrupt}} = T_{\text{offset}} + 40 + 50 * KC + 150 * UC \text{ ms}$$

where,

T_{offset}	Equal to 10 ms, the frame timing uncertainty between the old cell and the target cell.
KC	Equal to 1 if a known target cell is indicated in the RRC message implying TDD/FDD handover and equal to 0 otherwise
UC	Equal to 1 if an unknown target cell is indicated in the RRC message implying TDD/FDD handover and equal to 0 otherwise

An inter-frequency FDD target cell shall be considered known by the UE, if the target cell has been measured by the UE during the last 5 seconds.

The phase reference is the Primary CPICH.

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

The normative reference for this requirement is TS 25.123 [2] clauses 5.2 and A.5.2.

8.3.2.3 Test purpose

The purpose of this test is to verify the requirement for the TDD/FDD handover delay in CELL_DCH state.

8.3.2.4 Method of test

8.3.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in table 8.3.2.1, 8.3.2.2 and 8.3.2.3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G and 2B shall be used. The CPICH_RSCP of the best cell on the unused frequency shall be reported together with Event 2B reporting. The test consists of three successive time periods, with a 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.

UTRAN shall send a Physical Channel reconfiguration message with activation time at the beginning of T3 with a new active cell, cell 2. The Physical Channel reconfiguration message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [16].

Table 8.3.2.1: General test parameters for TDD/FDD handover

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 clause A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	TDD cell
	Neighbour cell		Cell 2	FDD cell
Final condition	Active cell		Cell 2	FDD cell
HCS			Not used	
O	dB		0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	3	Hysteresis parameter for event 2B
Time to Trigger		ms	0	
Absolute threshold used frequency		dBm	-71	Applicable for Event 2B
Threshold non-used frequency		dBm	-80	Applicable for Event 2B
W non-used frequency			1	Applicable for Event 2B
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1 6 FDD neighbours on Channel 2	
T _{SI}	s		1.28	The value shall be used for all cells in the test.
T1	s		5	
T2	s		15	
T3	s		5	

Table 8.3.2.2: Cell 1 specific test parameters for TDD/FDD handover

Parameter	Unit	Cell 1					
		0			2		
DL timeslot number		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1					
PCCPCH_Ec/lor	dB	-3			n.a.		
SCH_Ec/lor	dB	-9			n.a.		
SCH_t _{offset}	dB	0			n.a.		
DPCH_Ec/lor	dB	n.a.			Note 1		n.a.
OCNS_Ec/lor	dB	-3,12			Note 2		n.a.
\hat{I}_{or}/I_{oc}	dB	5	-1		5	-1	
PCCPCH RSCP	dBm	-68	-74		n.a.		
I_{oc}	dBm/ 3,84 MHz	-70					
Propagation Condition		AWGN					
Note 1: The DPCH level is controlled by the power control loop							
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor .							

Table 8.3.2.3: Cell 2 specific test parameters for TDD/FDD handover

Parameter	Unit	Cell 2	
		T1, T2	T3
CPICH_Ec/I _{or}	dB	-10	
PCCPCH_Ec/I _{or}	dB	-12	
SCH_Ec/I _{or}	dB	-12	
PICH_Ec/I _{or}	dB	-15	
DPCH_Ec/I _{or}	dB	n.a.	Note 1
OCNS_Ec/I _{or}	dB	-0,941	Note 2
CPICH_RSCP	dBm	-83	-77
\hat{I}_{or}/I_{oc}	dB	-3	3
I_{oc}	dBm/3. 84 MHz	-70	
Propagation Condition		AWGN	
Note 1: The DPCH level is controlled by the power control loop			
Note 2 : The power of the OCNS channel that is added shall make the total power from the cell to be equal to I _{or}			

8.3.2.4.2 Procedure

- 1) The RF parameters are set up according to T1.
- 2) The UE is switched on.
- 3) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.4.

[Editor's note: subclause 7.3.4 in TS 34.108 (Message sequence chart for Handover Test procedure) is not yet specified]

- 4) SS shall transmit a MEASUREMENT CONTROL message.
- 5) After 5 seconds, the SS shall switch the power settings from T1 to T2.
- 6) UE shall transmit a MEASUREMENT REPORT message triggered by event 2B.
- 7) SS shall transmit a PHYSICAL CHANNEL RECONFIGURATION message with activation time at T3.
- 8) After 15 seconds, the SS shall switch the power settings from T2 to T3
- 9) UE shall transmit a PHYSICAL CHANNEL RECONFIGURATION COMPLETE message on the UL DCCH of cell 2. If the UE transmits the UL DPCCCH to cell 2 less than 100 ms from the beginning of time period T3 then the number of successful tests is increased by one.
- 10) After 5 seconds, the UE is switched off. Any timing information of cell 2 is deleted in the UE.
- 11) Repeat step 1-10 [TBD] times.

Specific Message Contents

All messages indicated below shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex A of 34.123-1 [21], with the following exceptions:

MEASUREMENT CONTROL message, event 2B (step 4):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements -RRC transaction identifier -Integrity check info	0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command (10.3.7.46) -Measurement Reporting Mode (10.3.7.49) -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list (10.3.7.1)	1 Modify AM RLC Event trigger Not Present
-CHOICE <i>Measurement type</i> -Inter-frequency measurement (10.3.7.16) -Inter-frequency measurement objects list (10.3.7.13) -Inter-frequency measurement quantity (10.3.7.18) -CHOICE <i>reporting criteria</i> -Inter-frequency reporting criteria -Filter coefficient -CHOICE <i>mode</i> -Measurement quantity for frequency quality estimate	Inter-frequency measurement Not Present Inter-frequency reporting criteria 0 FDD CPICH RSCP
-Inter-frequency reporting quantity (10.3.7.21) -UTRA Carrier RSSI -Frequency quality estimate -Non frequency related cell reporting quantities (10.3.7.5) -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE <i>mode</i> -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator	FALSE FALSE No Report FALSE TRUE FDD FALSE TRUE FALSE
-Reporting cell status (10.3.7.61) -CHOICE <i>reported cell</i> -Maximum number of reported cells per reported non-used frequency -Measurement validity (10.3.7.51) -Inter-frequency set update (10.3.7.22) -CHOICE <i>report criteria</i>	Report cells within monitored set on non-used frequency 1 Not Present Not Present Inter-frequency measurement reporting criteria
-Inter-frequency measurement reporting criteria (10.3.7.19) -Parameters required for each event -Inter-frequency event identity (10.3.7.14) -Threshold used frequency -W used frequency -Hysteresis -Time to trigger -Reporting cell status (10.3.7.61) -CHOICE <i>reported cell</i> -Maximum number of reported cells per reported non-used frequency -Parameters required for each non-used frequency -Threshold non-used frequency -W non-used frequency	1 Event 2B -71 dBm 1 0 dB 0 ms Report cells within monitored set on non-used frequency 1 1 -80 dBm 1
Physical channel information elements -DPCH compressed mode status info (10.3.6.34)	Not Present

PHYSICAL CHANNEL RECONFIGURATION message (step 7):

Information Element	Value/Remark
Message Type	
UE Information Elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
-Integrity protection mode info	Not Present
-Ciphering mode info	Not Present
-Activation time	At T3
-New U-RNTI	Not Present
-New C-RNTI	Not Present
-RRC State Indicator	CELL_DCH
-UTRAN DRX cycle length coefficient	Not Present
CN Information Elements	
-CN Information info	Not Present
UTRAN mobility information elements	
-URA identity	Not Present
RB information elements	
-Downlink counter synchronisation info	Not Present
-RB with PDCP information list	Not Present
-RB with PDCP information	Not Present
PhyCH information elements	
-Frequency info (10.3.6.36)	FDD
-CHOICE <i>mode</i>	Same uplink UARFCN as used for cell 2
-UARFCN uplink(Nu)	Same downlink UARFCN as used for cell 2
-UARFCN downlink(Nd)	
Uplink radio resources	
-Maximum allowed UL TX power	33 dBm
-CHOICE <i>channel requirement</i>	Uplink DPCH info
-Uplink DPCH info (10.3.6.88)	
-Uplink DPCH power control info (10.3.6.91)	
-CHOICE <i>mode</i>	FDD
-DPCCH power offset	-6dB
- PC Preamble	1 frame
- SRB delay	7 frames
- Power Control Algorithm	Algorithm1
- TPC step size	1dB
-CHOICE <i>mode</i>	FDD
-Scrambling code type	Long
-Scrambling code number	0 (0 to 16777215)
-Number of DPDCH	Not Present(1)
-Spreading factor	SF is reference to TS34.108 clause 6.10 Parameter Set
-TFCI existence	TRUE
-Number of FBI bit	Not Present(0)
-Puncturing Limit	Reference to TS34.108 clause 6.10 Parameter Set
Downlink radio resources	
-CHOICE <i>mode</i>	FDD
-Downlink PDSCH information	Not Present
-Downlink information common for all radio links (10.3.6.24)	
-Downlink DPCH info common for all RL (10.3.6.18)	
-Timing indicator	Initialise
-CFN-targetSFN frame offset	Not Present
-Downlink DPCH power control information (10.3.6.23)	
-DPC mode	0 (single)
-CHOICE <i>mode</i>	FDD
-Power offset $P_{\text{Pilot-DPDCH}}$	TBD
-DL rate matching restriction information	Not Present
-Spreading factor	Reference to TS34.108 clause 6.10 Parameter Set
-Fixed or Flexible Position	Flexible
-TFCI existence	TRUE
-CHOICE <i>SF</i>	Not Present
-Number of bits for Pilot bits(SF=128,256)	Not Present
-CHOICE <i>mode</i>	FDD
-DPCH compressed mode info (10.3.6.33)	Not Present (Note 1)

Information Element	Value/Remark
-TX Diversity mode (10.3.6.86)	None
-SSDT information (10.3.6.77)	Not Present
-Default DPCH Offset Value (10.3.6.16)	0
-Downlink information per radio link list	1
-Downlink information for each radio link (10.3.6.27)	
-CHOICE <i>mode</i>	FDD
-Primary CPICH info (10.3.6.60)	
-Primary scrambling code	350
-PDSCH with SHO DCH info (10.3.6.47)	Not Present
-PDSCH code mapping (10.3.6.43)	Not Present
-Downlink DPCH info for each RL (10.3.6.21)	
-CHOICE <i>mode</i>	FDD
-Primary CPICH usage for channel estimation	Primary CPICH may be used
-DPCH frame offset	0 chips
-Secondary CPICH info	Not Present
-DL channelisation code	
-Secondary scrambling code	1
-Spreading factor	Reference to TS34.108 clause 6.10 Parameter Set
-Code number	SF-1(SF is reference to TS34.108 clause 6.10 Parameter Set)
-Scrambling code change	No change
-TPC combination index	0
-SSDT Cell Identity	-a
- Closed loop timing adjustment mode	Not Present
- SCCPCH information for FACH (10.3.6.70)	Not Present
Note 1: IE "DPCH compressed mode info" is not needed as default values are applied that have previously been received in RADIO BEARER SETUP or RRC CONNECTION SETUP	

MEASUREMENT REPORT message (step 6)

Information Element	Value/remark
Message Type (10.2.17)	
Integrity check info	Not Present
Measurement identity	1
Measured Results (10.3.7.44)	
-CHOICE Measurement	Inter-frequency Measured results list
-Inter-frequency measured results	1
-Frequency info	
-CHOICE mode	FDD
-UARFCN uplink (Nu)	Not Present
-UARFCN downlink (Nd)	Same frequency as channel 2 in Table 8.3.2.3
-UTRA carrier RSSI	Not Present
-Inter-frequency cell measured results	1
-Cell measured results (10.3.7.3)	
-Cell identity	Checked that this IE is present
-SFN-SFN observed time difference	Not Present
-Cell synchronisation info	Not Present
-CHOICE mode	FDD
-Primary CPICH Info	
-Primary scrambling code	Set to Primary scrambling code of Cell2
-CPICH Ec/No	Not Present
-CPICH RSCP	Checked that this IE is present
-Pathloss	Not Present
Measured results on RACH	Not Present
Additional measured results	Not Present
Event results (10.3.7.7)	
-CHOICE event result	Inter-frequency measurement event results
-Inter-frequency event identity	2B
-Inter-frequency cells	1
-Frequency Info	
-CHOICE mode	FDD
-UARFCN uplink (Nu)	Not Present
-UARFCN downlink (Nd)	Same frequency as channel 2 in Table 8.3.2.3
-CHOICE mode	FDD
-Primary CPICH info	
-Primary Scrambling Code	Set to Primary scrambling code of Cell2

8.3.2.5 Test requirements

For the test to pass, the total number of successful tests shall be more than [FFS] of the cases.

Note: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3.3 TDD/GSM Handover

8.3.3.1 Definition and applicability

The UTRAN to GSM cell handover interruption time is defined as the time from the end of the last TTI containing an RRC message implying hard handover to the transmission on the channel of the new RAT.

The requirements and this test apply to the combined TDD (3,84 Mcps option) and GSM UE.

8.3.3.2 Minimum requirement

The interruption time shall be less than 40 ms in the case where the UE has synchronised to the GSM cell before the HANDOVER FROM UTRAN COMMAND is received. The rate of correct handovers observed during repeated tests shall be at least 90% with a confidence level of [FFS]%.

The normative reference for this requirement is TS 25.123 [2] clauses 5.3.2 and A.5.3.

8.3.3.3 Test purpose

To verify that the UE meets the minimum requirement.

8.3.3.4 Method of test

8.3.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

[Editor's Note: Annex G.2 must be specified also for GSM; for instance as a reference to TS 51.010-1 clause A1.2]

The test parameters are given in Table 8.3.3.1, 8.3.3.2 and 8.3.3.3 below. In the measurement control information it is indicated to the UE that event-triggered reporting with Event 3C shall be used. The test consists of three successive time periods, with a 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.

UTRAN shall send a HANOVER FROM UTRAN COMMAND message with activation time at beginning of T3 with one active cell, cell 2. The HANOVER FROM UTRAN COMMAND message shall be sent to the UE such that the delay between the last the end of the last received TTI containing the message and the beginning of T3 is at least equal to the RRC procedure delay as defined in [9]. In the GSM Handover command contained in this message, IE starting time shall not be included.

Cell 1 is a UTRA TDD cell and cell 2 is a GSM cell. The Beacon timeslot shall be transmitted in timeslot 0 for cell 1 and no second Beacon timeslot shall be provided for cell 1. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3.

Table 8.3.3.1: General test parameters for TDD/GSM handover

Parameter	Unit	Value	Comment
DCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Initial conditions	Active cell	Cell 1	UTRA TDD cell
	Neighbour cell	Cell 2	GSM cell
Final condition	Active cell	Cell 2	GSM cell
Inter-RAT measurement quantity		GSM carrier RSSI	
BSIC verification required		Required	
Threshold other system	dBm	-80	Absolute GSM carrier RSSI threshold for Event 3C.
Hysteresis	dB	0	
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		12 TDD neighbours on Channel 1 6 GSM neighbours including ARFCN 1	Measurement control information is sent before the start of time period T1.
T _{identify abort}	s	5	
T _{reconfirm abort}	s	5	
T1	s	10	
T2	s	10	
T3	s	10	

Table 8.3.3.2: Cell Specific Parameters for Handover UTRAN to GSM cell case (cell 1)

Parameter	Unit	Cell 1					
		0			1		
DL timeslot number		T1	T2	T3	T1	T2	T3
UTRA RF Channel Number		Channel 1					
PCCPCH_Ec/lor	dB	-3			n.a.		
SCH_Ec/lor	dB	-9			n.a.		
SCH_t_offset	dB	0			n.a.		
DPCH_Ec/lor	dB	n.a.			Note 1		n.a.
OCNS_Ec/lor	dB	-3,12			Note 2		n.a.
\hat{I}_{or}/I_{oc}	dB	6			6		
PCCPCH RSCP	dBm	-68			n.a.		
I_{oc}	dBm/ 3,84 MHz	-70					
Propagation Condition		AWGN					
Note 1:	The DPCH level is controlled by the power control loop						
Note 2:	The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor .						

Table 8.3.3.3: Cell Specific Parameters for Handover UTRAN to GSM cell case (cell 2)

Parameter	Unit	Cell 2	
		T1	T2, T3
Absolute RF Channel Number		ARFCN 1	
RXLEV	dBm	-85	-75

8.3.3.4.2 Procedure

- 1) The RF parameters for cell 1 are set up according to T1.
 - 2) The UE is switched on
 - 3) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.4
 - 4) The RF parameters for cell 2 are set up according to T1 and the SS configures a traffic channel
 - 5) SS shall transmit a MEASUREMENT CONTROL message to cell 1
 - 6) After 10 seconds, the SS shall switch the power settings from T1 to T2
 - 7) UE shall transmit a MEASUREMENT REPORT message triggered by event 3C
 - 8) SS shall transmit a HANDOVER FROM UTRAN COMMAND message with activation time at T3 and indicating the traffic channel of the target GSM cell to the UE through DCCH of the serving UTRAN cell.
 - 9) After 10 seconds, the SS shall switch the power settings from T2 to T3
 - 10) UE shall transmit a burst on the traffic channel of cell 2 implying that it has switched to the GSM cell. The UE sends a HANDOVER ACCESS message. If the UE transmits access bursts on the new DCCH of the target cell less than 40 ms from the beginning of time period T3, then the number of successful tests is increased by one.
- [Editor's note: TS 34.108, 7.3.4 shall specify the messages HANDOVER ACCESS, PHYSICAL INFORMATION, SABM, UA and HANDOVER COMPLETE]
- 11) After 10 seconds, the UE is switched off. Any timing information of cell 2 is deleted in the UE.
 - 12) Repeat step 1-11 [TBD] times

Specific Message Contents

All messages indicated below shall use the same content as described in the default message content in clause 9 of 34.108 [3] with the following exceptions:

MEASUREMENT CONTROL message (step 5):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	4
-Measurement Command (10.3.7.46)	Setup
-Measurement Reporting Mode (10.3.7.49)	AM RLC
-Measurement Report Transfer Mode	Event trigger
-Periodical Reporting / Event Trigger Reporting Mode	Not Present
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE <i>Measurement type</i>	Inter-RAT measurement
-Inter-RAT measurement (10.3.7.27)	Not Present
-Inter-RAT measurement objects list (10.3.7.23)	Not Present
-Inter-RAT measurement quantity (10.3.7.29)	Not Present
-Measurement quantity for UTRAN quality estimate (10.3.7.38)	Not Present
-Filter coefficient	0
-CHOICE mode	TDD
-Measurement quantity list	1
-Measurement quantity	Primary CCPCH RSCP
-CHOICE system	GSM
-Measurement quantity	GSM Carrier RSSI
-Filter coefficient	0
-BSIC verification required	Required
-Inter-RAT reporting quantity (10.3.7.32)	Not Present
-Reporting cell status (10.3.7.61)	Not Present
-CHOICE reported cell	Report cells within active set or within virtual active set or of the other RAT
-Maximum number of reported cells	2
-CHOICE report criteria	Inter-RAT measurement reporting criteria
-Inter-RAT measurement reporting criteria (10.3.7.30)	Inter-RAT measurement reporting criteria
-Parameters required for each event	1
-Inter-RAT event identity (10.3.7.24)	Event 3C
-Threshold own system	Not Present
-W	Not Present
-Threshold other system	-80 dBm
-Hysteresis	0 dB
-Time to trigger	0 ms
-Reporting cell status (10.3.7.61)	Not Present
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present

HANDOVER FROM UTRAN COMMAND message (step 8):

Information Element	Value/remark
Message Type	
UE information elements -RRC transaction identifier -Integrity check info -Activation time	0 Not Present At T3
RB information elements -RAB information list -RAB Info	1 Not present
Other information elements -CHOICE System type -Frequency Band -GSM message -Single GSM message -GSM message List	GSM GSM/DCS 1800 Band [TBD] GSM HANDOVER COMMAND formatted as BIT STRING(1..512). The contents of the HANDOVER COMMAND see next table.

HANDOVER COMMAND

Same as the HANDOVER COMMAND for M = 2 in clause 26.6.5.1 of TS 51.010, except that the CHANNEL MODE IE is included with value = speech full rate or half rate version 3

MEASUREMENT REPORT message (step 7)

Information Element	Value/remark
Message Type (10.2.17)	
Integrity check info	Not Present
Measurement identity	1
Measured Results (10.3.7.44)	
-CHOICE Measurement	Inter-RAT Measured results list
-Inter-RAT-frequency measured results (10.3.7.26)	1
-CHOICE System	GSM
-Measured GSM cells	1
-GSM Carrier RSSI	Checked that this IE is present
-CHOICE BSIC	Verified BSIC
-inter-RAT cell id	Checked that this IE is present
-Observed Time difference to GSM cell	Not Present
Measured results on RACH	Not Present
Additional measured results	Not Present
Event results (10.3.7.7)	
-CHOICE event result	Inter-RAT measurement event results
-Inter-RAT event identity	3C
-Cells to report	1
-CHOICE BSIC	Verified BSIC
-inter-RAT cell id	Checked that this IE is present

8.3.3.5 Test requirements

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

Note: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3.4 Cell Re-selection in CELL_FACH

8.3.4.1 Scenario 1: TDD/TDD cell re-selection single carrier case

8.3.4.1.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change causes the UE to camp on a new cell, and starts to send the CELL UPDATE message with cause value "cell reselection" in the new cell.

The requirements and this test apply to the TDD UE.

8.3.4.1.2 Minimum requirement

The cell re-selection delay shall be less than 2,5 s. The rate of correct cell re-selections observed during repeated tests shall be at least 90%.

The normative reference for this requirement is TS 25.123 [2] clauses 5.4.2 and A.5.4.1.

8.3.4.1.3 Test purpose

This test verifies that the UE meets the minimum requirement for the cell re-selection delay in CELL_FACH for the single carrier case.

8.3.4.1.4 Method of test

8.3.4.1.4.1 Initial conditions

This scenario contains 6 cells operating on the same carrier frequency. The test parameters are given in Tables 8.3.4.1.1, 8.3.4.1.2, 8.3.4.1.3, and 8.3.4.1.4.

Table 8.3.4.1.1: General test parameters for Cell Re-selection in CELL_FACH

Parameter	Unit	Value	Comment
Initial condition	Active cell	Cell1	
	Neighbour cells	Cell2, Cell3, Cell4, Cell5, Cell6	
Final condition	Active cell	Cell2	
HCS		Not used	
UE_TXPWR_MAX_RACH	dBm	21	The value shall be used for all cells in the test.
Qrxlevmin	dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value	-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T _{SI}	s	1,28	The value shall be used for all cells in the test.
T1	s	15	
T2	s	15	

Table 8.3.4.1.2: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	Kbps	24,4
Channel symbol rate	Ksps	12,2
Slot Format #	-	0
Frame allocation	-	Continuous frame allocation
Midamble allocation	-	Default Midamble

Table 8.3.4.1.3: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	20 ms
Type of Error Protection	Convolutional Coding
Coding Rate	1/2
Rate Matching attribute	256
Size of CRC	16

Table 8.3.4.1.4: Cell specific test parameters for Cell Re-selection in CELL_FACH

Parameter	Unit	Cell 1				Cell 2				Cell 3			
		0		8		0		8		0		8	
Timeslot Number		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_offset		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
\hat{I}_{or}/I_{oc}	dB	9	7	9	7	7	9	7	9	-1	-1	-1	-1
PCCPCH RSCP	dBm	-64	-66			-66	-64			-74	-74		
Qoffset1 _{s,n}	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3, C6:0			
Qhyst1 _s	dB	0				0				0			
Treselection		0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											
		Cell 4				Cell 5				Cell 6			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_offset		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
\hat{I}_{or}/I_{oc}	dB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset1 _{s,n}	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1 _s	dB	0				0				0			
Treselection		0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

Note: S-CCPCH shall not be located in TS0.

8.3.4.1.4.2 Procedure

- a) The SS activates cell 1-6 with T1 defined parameters.
- b) The UE is switched on.
- c) A call is set up according to the generic set-up procedure specified in TS 34.108 [3] subclause 7.4.2 to place the UE in CELL_FACH.
- d) After 15 s, the parameters are changed as described for T2.
- e) The SS waits for CELL UPDATE message with cause value "cell reselection" from the UE.
- f) After another 15 s, the parameters are changed as described for T1.
- g) The SS waits for CELL UPDATE message with cause value "cell reselection" from the UE.
- h) Repeat steps d) to g) [TBD] times.

8.3.4.1.5 Test Requirements

- 1) In step d), after the UE has responded on cell 1, it shall not respond on any other cell (cell selection).
- 2) In step e), the UE shall respond on cell 2 within 2,5 s.
- 3) In step g), the UE shall respond on cell 1 within 2,5 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3.4.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

8.3.4.2.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change causes the UE to camp on a new cell, and starts to send the CELL UPDATE message with cause value "cell reselection" in the new cell.

The requirements and this test apply to the TDD UE.

8.3.4.2.2 Minimum requirement

The cell re-selection delay shall be less than 3 s. The rate of correct cell re-selections observed during repeated tests shall be at least 90%.

The normative reference for this requirement is TS 25.123 [2] clauses 5.4.2 and A.5.4.2.

8.3.4.2.3 Test purpose

This test verifies that the UE meets the requirement for the cell re-selection delay in CELL_FACH for the multi carrier case.

8.3.4.2.4 Method of test

8.3.4.2.4.1 Initial conditions

This scenario contains 6 cells and 2 carrier frequencies. The test parameters are given in Tables 8.3.4.2.1, 8.3.4.2.2, 8.3.4.2.3, and 8.3.4.2.4.

Table 8.3.4.2.1: General test parameters for Cell Re-selection in CELL_FACH

Parameter	Unit	Value	Comment
Initial condition	Active cell	Cell1	
	Neighbour cells	Cell2, Cell3, Cell4, Cell5, Cell6	
Final condition	Active cell	Cell2	
HCS		Not used	
UE_TXPWR_MAX_RACH	dBm	21	The value shall be used for all cells in the test.
Qrxlevmin	dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value	-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T _{SI}	s	1,28	The value shall be used for all cells in the test.
T1	s	15	
T2	s	15	

Table 8.3.4.2.2: Physical channel parameters for S-CCPCH.

Parameter	Unit	Level
Channel bit rate	Kbps	24,4
Channel symbol rate	Ksps	12,2
Slot Format #	-	0
Frame allocation	-	Continuous frame allocation
Midamble allocation	-	Default Midamble

Table 8.3.4.2.3: Transport channel parameters for S-CCPCH

Parameter	FACH
Transport Channel Number	1
Transport Block Size	240
Transport Block Set Size	240
Transmission Time Interval	20 ms
Type of Error Protection	Convolutional Coding
Coding Rate	1/2
Rate Matching attribute	256
Size of CRC	16

Table 8.3.4.2.4: Cell specific test parameters for Cell Re-selection in CELL_FACH

Parameter	Unit	Cell 1				Cell 2				Cell 3			
		0	8	0	8	0	8	0	8				
Timeslot Number		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH _↑ offset		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
\hat{I}_{or}/I_{oc}	dB	9	3	9	3	3	9	3	9	-1	-1	-1	-1
PCCPCH RSCP	dBm	-64	-70			-70	-64			-74	-74		
Qoffset1 _{s,n}	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3, C6:0			
Qhyst1 _s	dB	0				0				0			
Treselection		0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			

FACH measurement occasion info		not sent				not sent				not sent			
Inter-frequency TDD measurement indicator		TRUE				TRUE				TRUE			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											
		Cell 4				Cell 5				Cell 6			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2				Channel 2			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_offset		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
\hat{I}_{or}/I_{oc}	dB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset1 _{s,n}	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1 _s	dB	0				0				0			
Treselection		0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
FACH measurement occasion info		not sent				not sent				not sent			
Inter-frequency TDD measurement indicator		TRUE				TRUE				TRUE			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

Note: S-CCPCH shall not be located in TS0.

8.3.4.2.4.2 Procedure

- The SS activates cell 1-6 with T1 defined parameters.
- The UE is switched on.
- A call is set up according to the generic set-up procedure specified in TS 34.108 [3] subclause 7.4.2 to place the UE in CELL_FACH.
- After 15 s, the parameters are changed as described for T2.
- The SS waits for CELL UPDATE message with cause value "cell reselection" from the UE.
- After another 15 s, the parameters are changed as described for T1.
- The SS waits for CELL UPDATE message with cause value "cell reselection" from the UE.
- Repeat steps d) to g) [TBD] times.

8.3.4.2.5 Test Requirements

- In step d), after the UE has responded on cell 1, it shall not respond on any other cell (cell selection).
- In step e), the UE shall respond on cell 1 within 3 s.
- In step g), the UE shall respond on cell 2 within 3 s.

For the test to pass, the total number of fulfilled test requirements 2) and 3) shall be more than [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3.5 Cell Re-selection in CELL_PCH

8.3.5.1 Scenario 1: TDD/TDD cell re-selection single carrier case

8.3.5.1.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change causes the UE to camp on a new cell, and starts to send the CELL UPDATE message with cause value "cell reselection" in the new cell.

The requirements and this test apply to the TDD UE.

8.3.5.1.2 Minimum requirement

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

NOTE:

The cell re-selection delay can be expressed as: $T_{\text{evaluateTDD}} + T_{\text{SI}}$, where:

$T_{\text{evaluateTDD}}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{\text{evaluateTDD}}$ of 6.4s according to TS 25.123 [2] table 4.1 in clause 4.2.2.7.

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 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 5.5 and A.5.5.1.

8.3.5.1.3 Test purpose

This test verifies that the UE meets the minimum requirement for the cell re-selection delay in CELL_PCH for the single carrier case

8.3.5.1.4 Method of test

8.3.5.1.4.1 Initial conditions

This scenario contains 6 cells operating on the same carrier frequency. The test parameters are given in Tables 8.3.5.1.1, and 8.3.5.1.2.

Table 8.3.5.1.1: General test parameters for Cell Re-selection single carrier multi-cell case

Parameter	Unit	Value	Comment
Initial condition	Active cell	Cell1	
	Neighbour cells	Cell2, Cell3, Cell4, Cell5, Cell6	
Final condition	Active cell	Cell2	
HCS		Not used	
UE_TXPWR_MAX_RACH	dBm	21	The value shall be used for all cells in the test.
Qrxlevmin	dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value		1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T _{SI}	s	1.28	The value shall be used for all cells in the test.
DRX cycle length	s	1.28	The value shall be used for all cells in the test.
T1	s	15	
T2	s	15	

Table 8.3.5.1.2: Cell re-selection single carrier multi-cell case

Parameter	Unit	Cell 1				Cell 2				Cell 3			
		0		8		0		8		0		8	
Timeslot Number		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH _{toffset}		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
\hat{I}_{or}/I_{oc}	dB	9	7	9	7	7	9	7	9	-1	-1	-1	-1
PCCPCH RSCP	dBm	-64	-66			-66	-64			-74	-74		
Qoffset1 _{s,n}	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1, C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3, C6:0			
Qhyst1 _s	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Timeslot		Cell 4				Cell 5				Cell 6			
		0		8		0		8		0		8	
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH _{toffset}		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
\hat{I}_{or}/I_{oc}	dB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset1 _{s,n}	dB	C4, C1: 0; C4, C2:0; C4,C3:0C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1 _s	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

8.3.5.1.4.2 Procedure

- a) The SS activates cell 1-6 with T1 defined parameters.
- b) The UE is switched on.
- c) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.4.2.7.1 to place the UE in the CELL_PCH state on Cell 1 and then the SS waits for this process to complete.
- d) After 15 s from the completion of step c) or the beginning of T1, the parameters are changed as described for T2.
- e) If the UE responds on Cell 2 with a PRACH (CELL UPDATE message cause "cell reselection") within 8s, then a success is recorded, the SS shall transmit a CELL UPDATE CONFIRM message and then the procedure moves to step g).
- f) Since the UE has failed to respond with the correct message within the allowed time, a failure is recorded. The SS shall then wait for a total of 15s from the beginning of T2 and if no response is received, the UE shall be switched off and the procedure returns to step a). Otherwise the SS shall transmit a CELL UPDATE CONFIRM message and then the procedure continues with step g).
- g) After a total of 15 s from the beginning of T2, the parameters are changed as described for T1.
- h) If the UE responds on Cell 1 with a PRACH (CELL UPDATE message cause "cell reselection") within 8s, then a success is recorded and the procedure moves to step j).
- i) Since the UE has failed to respond with the correct message within the allowed time, a failure is recorded. The SS shall then wait for a total of 15s from the beginning of T1 and if no response is received the UE shall be switched off and the procedure returns to step a). Otherwise the SS shall transmit a CELL UPDATE CONFIRM message and then the procedure continues with step j).
- j) Repeat steps d) to i) [TBD] times.

NOTE: 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 25.331 for a UTRAN cell. Since the maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell is 1280ms and the maximum RRC procedure delay for reception system information block is 100ms, 1380 ms is assumed in this test case. Therefore this gives a total of 7.78s (Minimum requirement + 100ms), allow 8s in the test case.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3], with the following exceptions:

RADIO BEARER SETUP (Step 3)

Information Element	Value/remark
RRC State Indicator	CELL_PCH
UTRAN DRX cycle length coefficient	7

8.3.5.1.5 Test Requirements

For the test to pass, the total number of successful attempts shall be more than 90% with a confidence level of [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3.5.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

8.3.5.2.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change causes the UE to camp on a new cell, and starts to send the CELL UPDATE message with cause value "cell reselection" in the new cell.

The requirements and this test apply to the TDD UE.

8.3.5.2.2 Minimum requirement

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

NOTE:

The cell re-selection delay can be expressed as: $T_{\text{evaluateTDD}} + T_{\text{SI}}$, where:

$T_{\text{evaluateTDD}}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{\text{evaluateTDD}}$ of 6.4s according to TS 25.123 [2] table 4.1 in clause 4.2.2.7.

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 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 5.5 and A.5.5.2.

8.3.5.2.3 Test purpose

This test verifies that the UE meets the requirement for the cell re-selection delay in CELL_PCH for the multi carrier case.

8.3.5.2.4 Method of test

8.3.5.2.4.1 Initial conditions

This scenario contains 6 cells and 2 carrier frequencies. The test parameters are given in Tables 8.3.5.2.1 and 8.3.5.2.2.

Table 8.3.5.2.1: General test parameters for Cell Re-selection in Multi carrier case

Parameter	Unit	Value	Comment
Initial condition	Active cell	Cell1	
	Neighbour cells	Cell2, Cell3, Cell4, Cell5, Cell6	
Final condition	Active cell	Cell2	
HCS		Not used	
UE_TXPWR_MAX_RACH	dBm	21	The value shall be used for all cells in the test.
Qrxlevmin	dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value		1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T_{SI}	s	1.28	The value shall be used for all cells in the test.
DRX cycle length	s	1.28	The value shall be used for all cells in the test.
T1	s	30	
T2	s	15	

Table 8.3.5.2.2: Cell re-selection multi carrier multi cell case

Parameter	Unit	Cell 1				Cell 2				Cell 3			
		0		8		0		8		0		8	
Timeslot Number		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_offset		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
\hat{I}_{or}/I_{oc}	dB	6	0	6	0	0	6	0	6	-3	-3	-3	-3
PCCPCH RSCP	dBm	-67	-73			-73	-67			-76	-76		
Qoffset1 _{s,n}	dB	C1, C2: 0; C1, C3:0; C1,C4:0C1, C5:0; C1, C6:0				C2, C1: 0; C2, C3:0; C2,C4:0C2, C5:0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5:0; C3, C6:0			
Qhyst1 _s	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
		Cell 4				Cell 5				Cell 6			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2				Channel 2			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_offset		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
\hat{I}_{or}/I_{oc}	dB	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
PCCPCH RSCP	dBm	-76	-76			-76	-76			-76	-76		
Qoffset1 _{s,n}	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1 _s	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

8.3.5.2.4.2 Procedure

- The SS activates cell 1-6 with T1 defined parameters.
- The UE is switched on.
- A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.4.2.7.1 to place the UE in the CELL_PCH state on Cell 1 and then the SS waits for this process to complete.
- After 15 s from the completion of step c) or the beginning of T1, the parameters are changed as described for T2.
- If the UE responds on Cell 2 with a PRACH (CELL UPDATE message cause "cell reselection") within 8s, then a success is recorded, the SS shall transmit a CELL UPDATE CONFIRM message and then the procedure moves to step g).
- Since the UE has failed to respond with the correct message within the allowed time, a failure is recorded. The SS shall then wait for a total of 15s from the beginning of T2 and if no response is received, the UE shall be switched off and the procedure returns to step a). Otherwise the SS shall transmit a CELL UPDATE CONFIRM message and then the procedure continues with step g).

- g) After a total of 15 s from the beginning of T2, the parameters are changed as described for T1.
- h) If the UE responds on Cell 1 with a PRACH (CELL UPDATE message cause "cell reselection") within 8s, then a success is recorded and the procedure moves to step j).
- i) Since the UE has failed to respond with the correct message within the allowed time, a failure is recorded. The SS shall then wait for a total of 15s from the beginning of T1 and if no response is received the UE shall be switched off and the procedure returns to step a). Otherwise the SS shall transmit a CELL UPDATE CONFIRM message and then the procedure continues with step j).
- j) Repeat steps d) to i) [TBD] times.

NOTE: T1 is initially 30 s to allow enough time for the UE to search for cells as it has no prior knowledge of these.

NOTE: 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 25.331 for a UTRAN cell. Since the maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell is 1280ms and the maximum RRC procedure delay for reception system information block is 100ms, 1380 ms is assumed in this test case. Therefore this gives a total of 7.78s (Minimum requirement + 100ms), allow 8s in the test case.

RADIO BEARER SETUP (Step 3)

Information Element	Value/remark
RRC State Indicator	CELL PCH
UTRAN DRX cycle length coefficient	7

8.3.5.2.5 Test Requirements

For the test to pass, the total number of successful attempts shall be more than 90% with a confidence level of [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3.6 Cell Re-selection in URA_PCH

8.3.6.1 Scenario 1: TDD/TDD cell re-selection single carrier case

8.3.6.1.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change causes the UE to camp on a new cell, and starts to send the URA UPDATE message with cause value "change of URA" in the new cell.

The requirements and this test apply to the TDD UE.

8.3.6.1.2 Minimum requirement

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

NOTE:

The cell re-selection delay can be expressed as: $T_{\text{evaluateTDD}} + T_{\text{SI}}$, where:

$T_{\text{evaluateTDD}}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{\text{evaluateTDD}}$ of 6.4s according to TS25.123 [2] table 4.1 in clause 4.2.2.7.

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 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 5.6 and A.5.6.1.

8.3.6.1.3 Test purpose

This test verifies that the UE meets the minimum requirement for the cell re-selection delay in URA_PCH for the single carrier case

8.3.6.1.4 Method of test

8.3.6.1.4.1 Initial conditions

This scenario contains 6 cells operating on the same carrier frequency. The test parameters are given in Tables 8.3.6.1.1, and 8.3.6.1.2.

Table 8.3.6.1.1: General test parameters for Cell Re-selection single carrier multi-cell case

Parameter		Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3, Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
HCS			Not used	
UE_TXPWR_MAX_RACH		dBm	21	The value shall be used for all cells in the test.
Qrxlevmin		dBm	-102	The value shall be used for all cells in the test.
Access Service Class (ASC#0) - Persistence value			1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
T _{SI}		s	1.28	The value shall be used for all cells in the test.
DRX cycle length		s	1.28	The value shall be used for all cells in the test.
T1		s	15	
T2		s	15	

Table 8.3.6.1.2: Cell re-selection single carrier multi-cell case

Parameter	Unit	Cell 1				Cell 2				Cell 3			
		0		8		0		8		0		8	
Timeslot Number		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_offset		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
\hat{I}_{or}/I_{oc}	dB	9	7	9	7	7	9	7	9	-1	-1	-1	-1
PCCPCH RSCP	dBm	-64	-66			-66	-64			-74	-74		
Qoffset1 _{s,n}	dB	C1, C2: 0; C1, C3:0; C1,C4:0 C1, C5:0; C1,C6:0				C2, C1: 0; C2, C3:0; C2,C4:0 C2, C5: 0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5: 0; C3, C6:0			
Qhyst1 _s	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
		Cell 4				Cell 5				Cell 6			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_offset		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
\hat{I}_{or}/I_{oc}	dB	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1	-1
PCCPCH RSCP	dBm	-74	-74			-74	-74			-74	-74		
Qoffset1 _{s,n}	dB	C4, C1: 0; C4, C2:0; C4,C3:0C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1 _s	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

8.3.6.1.4.2 Procedure

- The SS activates cell 1-6 with T1 defined parameters.
- The UE is switched on.
- A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.4.2.7.2 to place the UE in the URA_PCH state on Cell 1 and then the SS waits for this process to complete.
- After 15 s from the completion of step c) or the beginning of T1, the parameters are changed as described for T2.
- If the UE responds on Cell 1 with a PRACH (URA UPDATE message cause "change of URA") within 8s, then a success is recorded, the SS shall transmit a URA UPDATE CONFIRM message and then the procedure moves to step g).
- Since the UE has failed to respond with the correct message within the allowed time, a failure is recorded. The SS shall then wait for a total of 15s from the beginning of T2 and if no response is received, the UE shall be switched off and the procedure returns to step a). Otherwise the SS shall transmit a URA UPDATE CONFIRM message and then the procedure continues with step g).
- After a total of 15 s from the beginning of T2, the parameters are changed as described for T1.

- h) If the UE responds on Cell 1 with a PRACH (URA UPDATE message cause "change of URA") within 8s, then a success is recorded and the procedure moves to step j).
- i) Since the UE has failed to respond with the correct message within the allowed time, a failure is recorded. The SS shall then wait for a total of 15s from the beginning of T1 and if no response is received the UE shall be switched off and the procedure returns to step a). Otherwise the SS shall transmit a URA UPDATE CONFIRM message and then the procedure continues with step j).
- j) Repeat steps d) to i) [TBD] times.

NOTE: 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 25.331 for a UTRAN cell. Since the maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell is 1280ms and the maximum RRC procedure delay for reception system information block is 100ms, 1380 ms is assumed in this test case. Therefore this gives a total of 7.78s (Minimum requirement + 100ms), allow 8s in the test case.

RADIO BEARER SETUP (Step 3)

Information Element	Value/remark
RRC State Indicator	URA PCH
UTRAN DRX cycle length coefficient	7

8.3.6.1.5 Test Requirements

For the test to pass, the total number of successful attempts shall be more than 90% with a confidence level of [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.3.6.2 Scenario 2: TDD/TDD cell re-selection multi carrier case

8.3.6.2.1 Definition and applicability

The cell re-selection delay is defined as the time from a change of cell levels to the moment when this change causes the UE to camp on a new cell, and starts to send the URA UPDATE message with cause value "change of URA" in the new cell.

The requirements and this test apply to the TDD UE.

8.3.6.2.2 Minimum requirement

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

NOTE:

The cell re-selection delay can be expressed as: $T_{\text{evaluateTDD}} + T_{\text{SI}}$, where:

$T_{\text{evaluateTDD}}$ A DRX cycle length of 1280ms is assumed for this test case, this leads to a $T_{\text{evaluateTDD}}$ of 6.4s according to TS 25.123 [2] table 4.1 in clause 4.2.2.7.

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 7.68 s, allow 8s in the test case.

The normative reference for this requirement is TS 25.123 [2] clauses 5.6 and A.5.6.2.

8.3.6.2.3 Test purpose

This test verifies that the UE meets the requirement for the cell re-selection delay in URA_PCH for the multi carrier case.

8.3.6.2.4 Method of test

8.3.6.2.4.1 Initial conditions

This scenario contains 6 cells and 2 carrier frequencies. The test parameters are given in Tables 8.3.6.2.1 and 8.3.6.2.2.

Table 8.3.6.2.1: General test parameters for Cell Re-selection in Multi carrier case

	Parameter	Unit	Value	Comment
Initial condition	Active cell		Cell1	
	Neighbour cells		Cell2, Cell3, Cell4, Cell5, Cell6	
Final condition	Active cell		Cell2	
HCS			Not used	
	UE_TXPWR_MAX_RACH	dBm	21	The value shall be used for all cells in the test.
	Qrxlevmin	dBm	-102	The value shall be used for all cells in the test.
	Access Service Class (ASC#0) - Persistence value		1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
	T _{SI}	s	1.28	The value shall be used for all cells in the test.
	DRX cycle length	s	1.28	The value shall be used for all cells in the test.
	T1	s	30	
	T2	s	15	

Table 8.3.6.2.2: Cell re-selection multi carrier multi cell case

Parameter	Unit	Cell 1				Cell 2				Cell 3			
		0		8		0		8		0		8	
Timeslot Number		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_offset		0	0	0	0	5	5	5	5	10	10	10	10
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
\hat{I}_{or}/I_{oc}	dB	6	0	6	0	0	6	0	6	-3	-3	-3	-3
PCCPCH RSCP	dBm	-67	-73			-67	-70			-76	-76		
Qoffset1 _{s,n}	dB	C1, C2: 0; C1, C3:0; C1,C4:0C1, C5:0; C1, C6:0				C2, C1: 0; C2, C3:0; C2,C4:0C2, C5:0; C2, C6:0				C3, C1: 0; C3, C2:0; C3,C4:0 C3, C5:0; C3, C6:0			
Qhyst1 _s	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
		Cell 4				Cell 5				Cell 6			
Timeslot		0		8		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2				Channel 2			
PCCPCH_Ec/lor	dB	-3	-3			-3	-3			-3	-3		
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9	-9
SCH_offset		15	15	15	15	20	20	20	20	25	25	25	25
PICH_Ec/lor	dB			-3	-3			-3	-3			-3	-3
OCNS_Ec/lor	dB	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
\hat{I}_{or}/I_{oc}	dB	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3	-3
PCCPCH RSCP	dBm	-76	-76			-76	-76			-76	-76		
Qoffset1 _{s,n}	dB	C4, C1: 0; C4, C2:0; C4,C3:0 C4, C5:0; C4, C6:0				C5, C1: 0; C5, C2:0; C5,C3:0 C5, C4:0; C5, C6:0				C6, C1: 0; C6, C2:0; C6,C3:0 C6, C4:0; C6, C5:0			
Qhyst1 _s	dB	0				0				0			
Treselection	s	0				0				0			
Sintrasearch	dB	not sent				not sent				not sent			
Sintersearch	dB	not sent				not sent				not sent			
I_{oc}	dBm/3, 84 MHz	-70											
Propagation Condition		AWGN											

8.3.6.2.4.2 Procedure

- The SS activates cell 1-6 with T1 defined parameters.
- The UE is switched on.
- A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.4.2.7.2 to place the UE in the URA_PCH state on Cell 1 and then the SS waits for this process to complete.
- After 15 s from the completion of step c) or the beginning of T1, the parameters are changed as described for T2.
- If the UE responds on Cell 1 with a PRACH (URA UPDATE message cause "change of URA") within 8s, then a success is recorded, the SS shall transmit a URA UPDATE CONFIRM message and then the procedure moves to step g).
- Since the UE has failed to respond with the correct message within the allowed time, a failure is recorded. The SS shall then wait for a total of 15s from the beginning of T2 and if no response is received, the UE shall be switched off and the procedure returns to step a). Otherwise the SS shall transmit a URA UPDATE CONFIRM message and then the procedure continues with step g).

- g) After a total of 15 s from the beginning of T2, the parameters are changed as described for T1.
- h) If the UE responds on Cell 1 with a PRACH (URA UPDATE message cause "change of URA") within 8s, then a success is recorded and the procedure moves to step j).
- i) Since the UE has failed to respond with the correct message within the allowed time, a failure is recorded. The SS shall then wait for a total of 15s from the beginning of T1 and if no response is received the UE shall be switched off and the procedure returns to step a). Otherwise the SS shall transmit a URA UPDATE CONFIRM message and then the procedure continues with step j).
- j) Repeat steps d) to i) [TBD] times.

NOTE 1: T1 is initially 30 s to allow enough time for the UE to search for cells as it has no prior knowledge of these.

NOTE 2: 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 25.331 for a UTRAN cell. Since the maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell is 1280ms and the maximum RRC procedure delay for reception system information block is 100ms, 1380 ms is assumed in this test case. Therefore this gives a total of 7.78s (Minimum requirement + 100ms), allow 8s in the test case.

RADIO BEARER SETUP (Step 3)

Information Element	Value/remark
RRC State Indicator	URA PCH
UTRAN DRX cycle length coefficient	7

8.3.6.2.5 Test Requirements

For the test to pass, the total number of successful attempts shall be more than 90% with a confidence level of [FFS]% of the cases.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.4 RRC Connection Control

8.4.1 RRC re-establishment delay

8.4.1.1 RRC re-establishment delay to a known target cell

8.4.1.1.1 Definition and applicability

For UTRA TDD, the UE re-establishment delay $T_{UE-RE-ESTABLISH-REQ}$ is defined as the time between the moment when radio link failure is considered by the UE to when the UE starts sending the RRC CELL UPDATE message to the UTRAN on RACH.

$T_{UE-RE-ESTABLISH-REQ}$ is depending on whether the target cell is known by the UE or not. A cell is known if either or both of the following conditions are true:

- the UE has had a radio link connected to the cell during the last 5 seconds
- the cell has been measured by the UE during the last 5 seconds.

The requirements of this test apply to the TDD UE.

8.4.1.1.2 Minimum requirement

The RRC re-establishment delay $T_{RE-ESTABLISH}$ to a known target cell shall be less than 2 s.

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

NOTE: The RRC re-establishment delay in this test case can be expressed as,

$$T_{RE-ESTABLISH} = T_{RRC-RE-ESTABLISH} + T_{UE-RE-ESTABLISH-REQ-KNOWN}$$

where,

$$T_{RRC-RE-ESTABLISH} = 160\text{ms} + (N_{313} - 1) * 10\text{ms} + T_{313}$$

$$T_{UE-RE-ESTABLISH-REQ-KNOWN} = 50\text{ms} + T_{SEARCH-KNOWN} + T_{SI} + T_{RA}$$

and,

N_{313} Equal to 20 and therefore resulting in 200 ms delay.

T_{313} Equal to 0 s.

$T_{SEARCH-KNOWN}$ Equal to 100 ms

T_{SI} Equal to 1280 ms, the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure performance value of system information blocks defined in TS 25.331 [9] for a UTRAN cell.

T_{RA} Equal to 40 ms, the additional delay caused by the random access procedure.

This gives a total of 1820ms, allow 2 s in the test case.

8.4.1.1.3 Test purpose

The test purpose is to verify that the RRC re-establishment delay to a known target cell is within the specified limits.

8.4.1.1.4 Method of test

8.4.1.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in table 8.4.1.1 and table 8.4.1.2 below. The maximum repetition period of the relevant system info blocks that needs to be received by the UE in order to camp on a cell shall be 1280 ms. DRX cycle length shall be 1280ms. In the measurement control information it is indicated to the UE that periodic reporting shall be used. The test consists of 2 successive time periods, with time durations of T1 and T2 respectively.

During T1, the DL DPCH in cell 1 shall be transmitted in timeslot 2 and the UL DPCH in cell 1 shall be transmitted in timeslot 10. At the beginning of time period T2, the DPCH shall be removed.

Cell 1 and cell shall be synchronised, i.e. share the same frame and timeslot timing.

Table 8.4.1.1: General test parameters for RRC re-establishment delay, known target cell case

Parameter		Unit	Value	Comment
DCH parameters			DL reference measurement channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	Cell 2 shall be included in the monitored set in Cell 1.
	Neighbour cell		Cell 2	
Final conditions	Active cell		Cell 2	
Access Service Class (ASC#0) - Persistence value		-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
N313			20	
N315			1	
T313		Seconds	0	
T _{SI}		ms	1280	
Monitored cell list size			24 TDD neighbours on Channel 1	
Reporting frequency		Seconds	4	
T1			10	
T2			6	

Table 8.4.1.2: Cell specific parameters for RRC re-establishment delay test, known target cell case

Parameter	Unit	Cell 1				Cell 2			
		0		8		0		8	
		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 1			
PCCPCH_Ec/lor	dB	-3	-3	n.a.	n.a.	-3	-3	n.a.	n.a.
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t _{offset}		0	0	0	0	15	15	15	15
PICH_Ec/lor	dB	n.a.	n.a.	-3	-3	n.a.	n.a.	-3	-3
OCNS_Ec/lor	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
\hat{I}_{or}/I_{oc}	dB	3	-13	3	-13	5	5	5	5
I_{oc}	dBm/ 3.84 MHz	-70							
P-CCPCH_RSCP	dB	-70	-86	n.a.	n.a.	-68	-68	n.a.	n.a.
Propagation Condition		AWGN							

8.4.1.1.4.2 Procedure

- 1) The RF parameters are set up according to T1.
- 2) The UE is switched on.
- 3) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.4.

[Editor's note: subclause 7.3.4 in TS 34.108 [3] (Message sequence chart for Handover Test procedure) is not yet specified.

- 4) The SS waits for random access requests from the UE on cell 2.
- 5) 10 s after step3 has completed, the parameters are changed to that as described for T2.
- 6) If the UE responds on cell 2 within 2.0 s from the beginning of time period T2 with a CELL_UPDATE command then the number of successful tests is increased by one.

- 7) SS shall transmit a RRC CONNECTION RELEASE message to make the UE transit to idle mode.
- 8) After 6 seconds from the beginning of time period T2, the RF parameters are set up according to T1.
- 9) The SS shall wait for 30s to make the UE complete cell reselection to cell1.
- 10) Repeat step 3-9 [TBD] times.

NOTE: 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 TS 25.331 [9] for a UTRAN cell. Since the maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell is 1280ms and the maximum RRC procedure delay for reception system information block is 100ms, 1380 ms is assumed in this test case. Therefore this gives a total of 1920ms (Minimum requirement + 100ms), allow 2 s in the test case.

8.4.1.1.5 Test requirements

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

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.4.1.2 RRC re-establishment delay to an unknown target cell

8.4.1.2.1 Definition and applicability

For UTRA TDD, the UE re-establishment delay $T_{UE-RE-ESTABLISH-REQ}$ is defined as the time between the moment when radio link failure is considered by the UE to when the UE starts sending the RRC CELL UPDATE message to the UTRAN on RACH.

$T_{UE-RE-ESTABLISH-REQ}$ is depending on whether the target cell is known by the UE or not. A cell is known if either or both of the following conditions are true:

- the UE has had a radio link connected to the cell during the last 5 seconds
- the cell has been measured by the UE during the last 5 seconds.

The requirements of this test apply to the TDD UE.

8.4.1.2.2 Minimum requirement

The RRC re-establishment delay $T_{RE-ESTABLISH}$ to an unknown target cell shall be less than 3,7 s.

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

NOTE: The RRC re-establishment delay in this test case can be expressed as,

$$T_{RE-ESTABLISH} = T_{RRC-RE-ESTABLISH} + T_{UE-RE-ESTABLISH-REQ-UNKNOWN}$$

where,

$$T_{RRC-RE-ESTABLISH} = 160\text{ms} + (N_{313} - 1) * 10\text{ms} + T_{313}$$

$$T_{UE-RE-ESTABLISH-REQ-KNOWN} = 50\text{ms} + T_{SEARCH-UNKNOWN} * NF + T_{SI} + T_{RA},$$

and,

N_{313} Equal to 20 and therefore resulting in 200 ms delay.

T_{313} Equal to 0 s.

$T_{SEARCH-UNKNOWN}$ Equal to 800 ms

NF	Equal to 2, the number of different frequencies in the monitored set of cell 1.
T _{SI}	Equal to 1280 ms, the time required for receiving all the relevant system information data according to the reception procedure and the RRC procedure performance value of system information blocks defined in TS 25.331 [9] for a UTRAN cell.
T _{RA}	Equal to 40 ms, the additional delay caused by the random access procedure.

This gives a total of 3320ms, allow 3,7 s in the test case.

8.4.1.2.3 Test purpose

The test purpose is to verify that the RRC re-establishment delay to an unknown target cell is within the specified limits.

8.4.1.2.4 Method of test

8.4.1.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in table 8.4.1.3 and table 8.4.1.4 below. The maximum repetition period of the relevant system info blocks that needs to be received by the UE in order to camp on a cell shall be 1280 ms. DRX cycle length shall be 1280ms. In the measurement control information it is indicated to the UE that periodic reporting shall be used. The test consists of 2 successive time periods, with time durations of T1 and T2 respectively.

During T1, the DL DPCH in cell 1 shall be transmitted in timeslot 2 and the UL DPCH in cell 1 shall be transmitted in timeslot 10. At the beginning of time period T2, the DPCH shall be removed.

Cell 1 and cell shall be synchronised, i.e. share the same frame and timeslot timing.

Table 8.4.1.3: General test parameters for RRC re-establishment delay, unknown target cell case

Parameter	Unit	Value	Comment
DCH parameters		DL reference measurement channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Initial conditions	Active cell	Cell 1	Cell 2 shall not be included in the monitored set in Cell 1.
	Neighbour cell	Cell 2	
Final conditions	Active cell	Cell 2	
Access Service Class (ASC#0) - Persistence value	-	1	Selected so that no additional delay is caused by the random access procedure. The value shall be used for all cells in the test.
N313		20	
N315		1	
T313	Seconds	0	
T _{SI}	ms	1280	
Monitored cell list size		16 TDD neighbours on Channel 1 16 TDD neighbours on Channel 2	
Reporting frequency	Seconds	4	
T1		10	
T2		6	

Table 8.4.1.4: Cell specific parameters for RRC re-establishment delay test, unknown target cell case

Parameter	Unit	Cell 1				Cell 2			
		0		8		0		8	
Timeslot Number		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/lor	dB	-3	-3	n.a.	n.a.	-3	-3	n.a.	n.a.
SCH_Ec/lor	dB	-9	-9	-9	-9	-9	-9	-9	-9
SCH_t_offset		0	0	0	0	15	15	15	15
PICH_Ec/lor	dB	n.a.	n.a.	-3	-3	n.a.	n.a.	-3	-3
OCNS_Ec/lor	dB	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12	-3,12
\hat{I}_{or}/I_{oc}	dB	3	-13	3	-13	5	5	5	5
I_{oc}	dBm/ 3.84 MHz	-70							
P-CCPCH_RSCP	dB	-70	-86	n.a.	n.a.	-68	-68	n.a.	n.a.
Propagation Condition		AWGN							

8.4.1.2.4.2 Procedure

- 1) The RF parameters are set up according to T1.
- 2) The UE is switched on.
- 3) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.

[Editor's note: subclause 7.3.4 in TS 34.108 (Message sequence chart for Handover Test procedure) is not yet specified]

- 4) The SS waits for random access requests from the UE on cell 2.
- 5) 10 s after step3 has completed, the parameters are changed to that as described for T2.
- 6) If the UE responds on cell 2 within 3.7 s from the beginning of time period T2 with a CELL_UPDATE command then the number of successful tests is increased by one.
- 7) SS shall transmit a RRC CONNECTION RELEASE message to make the UE transit to idle mode.
- 8) After 6 seconds the RF parameters are set up according to T1.
- 9) The SS shall wait for 30s to make the UE complete cell reselection to cell1.
- 10) Repeat step 3-9 [TBD] times

NOTE: 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 TS 25.331 [9] for a UTRAN cell. Since the maximum repetition period of the relevant system info blocks that needs to be received by the UE to camp on a cell is 1280ms and the maximum RRC procedure delay for reception system information block is 100ms, 1380 ms is assumed in this test case. Therefore this gives a total of 3420ms (Minimum requirement + 100ms), allow 3.7s in the test case.

8.4.1.2.5 Test requirements

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

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.4.2 Transport Format Combination selection in UE

8.4.2.1 Interactive or Background, PS, UL: 64 kbps

8.4.2.1.1 Definition and applicability

When the UE estimates that a certain TFC would require more power than the maximum transmit power, it shall limit the usage of transport format combinations for the assigned transport format combination set. This in order to make it possible for the network operator to maximise the coverage. Transport format combination selection is described in section 11.4 of TS 25.321 [14].

8.4.2.1.2 Minimum requirements

The UE shall continuously evaluate based on the *Elimination*, *Recovery* and *Blocking* criteria defined below, how TFCs can be used for the purpose of TFC selection. The evaluation shall be performed using the estimated UE transmit power of a given CCTrCH in its associated timeslots.

In the case of a single CCTrCH or multiple CCTrCHs having mutually exclusive timeslot assignments, the UE shall consider the *Elimination* criterion for a given TFC of a CCTrCH to be fulfilled if for 3 successive frames the estimated UE transmit power is greater than the Maximum UE transmitter power for at least one timeslot associated with the CCTrCH in each frame.

In the case of multiple CCTrCHs not having mutually exclusive timeslot assignments, if for a given CCTrCH for 3 successive frames the estimated UE transmit power is greater than the Maximum UE transmitter power for at least one timeslot associated with the CCTrCH in each frame, the UE shall consider the *Elimination* criterion for a given TFC to be fulfilled if the use of this TFC will cause the estimated UE transmit power to continue to be greater than the Maximum UE transmitter power in at least one timeslot associated with the CCTrCH.

In the case of multi-frame operation of UL Physical Channels, the UE shall only consider active frames for the evaluation of the *Elimination* criterion.

If the *Elimination* criterion for a given TFC is fulfilled, the MAC in the UE shall consider that the TFC is in Excess-Power state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} from the moment the *Elimination* criterion was fulfilled.

The UE shall not consider the *Recovery* criterion for a given TFC to be fulfilled until the use of this TFC will not cause the estimated UE transmit power to be greater than the Maximum UE transmitter power for all UL timeslots associated with the TFC for a minimum of 3 successive frames.

In the case of multi-frame operation of UL Physical Channels, the UE shall only consider active frames for the evaluation of the *Recovery* criterion.

If the *Recovery* criterion for a given TFC is fulfilled, the MAC in the UE shall consider that the TFC is in Supported state for the purpose of TFC selection.

MAC in the UE shall indicate the available bitrate for each logical channel to upper layers within T_{notify} from the moment the *Recovery* criterion was fulfilled.

The UE shall consider the *Blocking* criterion for a given TFC to be fulfilled at the latest at the start of the longest uplink TTI after the moment at which the TFC will have been in Excess-Power state for a duration of

$$(T_{\text{notify}} + T_{\text{modify}} + T_{\text{L1_proc}}).$$

where:

T_{notify} equals 15 ms, and

T_{modify} equals $\text{MAX}(T_{\text{adapt_max}}, T_{\text{TTI}})$, and

$T_{\text{L1_proc}}$ equals 35 ms, and

$T_{\text{adapt_max}}$ equals $\text{MAX}(T_{\text{adapt_1}}, T_{\text{adapt_2}}, \dots, T_{\text{adapt_N}})$, and

N equals the number of logical channels that need to change rate, and

T_{adapt_n} equals the time it takes for higher layers to provide data to MAC in a new supported bitrate, for logical channel n. Table 6A.1 defines T_{adapt} times for different services. For services where no codec is used T_{adapt} shall be considered to be equal to 0 ms.

Table 8.4.2.1.1: T_{adapt}

Service	T_{adapt} [ms]
UMTS AMR	40
UMTS AMR 2	60

T_{TTI} equals the longest uplink TTI of the selected TFC (ms).

The Maximum UE transmitter power is defined as follows

Maximum UE transmitter power = MIN(Maximum allowed UL TX Power, UE maximum transmit power)

where

Maximum allowed UL TX Power is set by SS and defined in TS 25.331 [9], and

UE maximum transmit power is defined by the UE power class, and specified in TS 25.102 [1].

The normative reference for these requirements is TS 25.123 [2] clauses 6A.2 and A.6A.2.

8.4.2.1.3 Test purpose

The purpose is to verify the UE blocks (stops using) a currently used TFC when the UE output power is not sufficient to support that TFC. This test will verify the general requirement on TFC selection in section 8.4.2.1.2 for a RAB intended for packet data services, i.e. Interactive or Background, PS, UL: 64kbps as defined in TS 34.108 [3].

8.4.2.1.4 Method of test

8.4.2.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in Tables 8.4.2.1.2, 8.4.2.1.3, Table 8.4.2.1.4 and Table 8.4.2.1.5 below. The test consists of 2 successive time periods, with a time duration of T1 and T2 respectively.

Details on the UL reference RAB in table 8.4.2.1.3 can be found in TS 34.108 [3] section "Interactive or background / UL:64 DL: 64 kbps / PS RAB + UL:3.4 DL:3.4 kbps SRBs for DCCH".

Table 8.4.2.1.2: General test parameters

Parameter	Unit	Value	Comment
TFCS size		10	
TFCS		UL_TFC0, UL_TFC1, UL_TFC2, UL_TFC3, UL_TFC4, UL_TFC5, UL_TFC6, UL_TFC7, UL_TFC8, UL_TFC9	Gain factors for TFC0 to TFC9 shall be set to 1.
Power Control		On	
Active cell		Cell 1	
Maximum allowed UL TX power	dBm	0	Value of IE "Maximum allowed UL Tx power"
Primary CCPCH Tx power	dBm	18	Value of IE "Primary CCPCH Tx power"
UL timeslot interference	dBm	-80	Value of IE "UL timeslot interference" This value shall apply to all timeslots
α		1	IE "Alpha" either not sent or explicitly set to value
UL target SIR	dB	6	
DPCH constant offset	dB	adjustable	Value of IE "DPCH constant power"
T1	s	10	
T2	s	10	

Table 8.4.2.1.3: Transport channel parameters for UL reference RAB, Interactive or Background and DCCH

Parameter	Unit	64 kbps RAB	DCCH 3.4kbps
Transport Channel Number		1	2
Transmission Time Interval	ms	20	40
Type of Error Protection		Turbo coding	Convolutional coding
Coding Rate			1/3
Size of CRC	bits		16
Transport Block Size	bits	336	148
Transport Block Set Size	bits	336*B (B=0,1,2,3,4)	148*B (B=0,1)
Transport Format Set	bits		
TF0		0x336	0x148
TF1		1x336	1x148
TF2		2x336	N/A
TF3		3x336	N/A
TF4		4x336	N/A

Table 8.4.2.1.4: UL TFCI

TFCI	(64 kbps RAB, DCCH)
UL_TFC0	(TF0, TF0)
UL_TFC1	(TF0, TF1)
UL_TFC2	(TF1, TF0)
UL_TFC3	(TF1, TF1)
UL_TFC4	(TF2, TF0)
UL_TFC5	(TF2, TF1)
UL_TFC6	(TF3, TF0)
UL_TFC7	(TF3, TF1)
UL_TFC8	(TF4, TF0)
UL_TFC9	(TF4, TF1)

Table 8.4.2.1.5: Physical channel parameters

Parameter	Unit	Value
UL timeslot		7
Burst type		1
Resource units		{{(spreading factor 16 x 1 code) + (spreading factor 4 x 1 code)} x 1 time slot
TFCI	Bits	16
TPC	Bits	2
Frame allocation		Continuous

The test shall be performed in AWGN channel propagation conditions. The P-CCPCH in the DL shall be transmitted in timeslot 0.

The amount of available user data shall be sufficient to allow uplink transmission at the highest bit rate (UL_TFC8 or UL_TFC9) during the entire test and it shall be ensured that the UE is using UL_TFC8 or UL_TFC9 at the end of T1.

8.4.2.1.4.2 Procedure

- 1) The UE is switched on.
- 2) The SS shall signal to the UE the allowed TFCS according to table 8.4.2.1.2.
- 3) For T1=30 secs the SS shall ensure that the received P-CCPCH power level in the UE is set to -60dBm and that the value of the DPCH constant value is adjusted such that the mean UE output power is -10dBm.
- 4) The SS shall decrease the received P-CCPCH power level in the UE by 20 dB.
- 5) The time from the beginning of T2 until the UE blocks (stops using) UL_TFC8 and UL_TFC9 shall be measured by the SS. The UE shall stop using UL_TFC8 and UL_TFC9 within 170 ms from beginning of time period T2.
- 6) Repeat steps 3-5 [50] times.

8.4.2.1.5 Test requirements

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

Note: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.5 Timing Characteristics

8.5.1 UE Timing Advance

8.5.1.1 Definition and applicability

Timing advance is the correction to UE transmit timing required in order to avoid large delay spread at the Node B. The timing advance value is provided to the UE by UTRAN.

The requirements and this test apply to the TDD UE.

8.5.1.2 Minimum requirement

The UE shall adjust the timing of its transmissions with an accuracy better than or equal to ± 0.5 chip to the signalled timing advance value.

The normative reference for this requirement is TS 25.123 [2] clauses 7.1.1. and A.7.1.1

8.5.1.3. Test purpose

To verify that the UE meets the minimum requirement.

8.5.1.4 Method of test

8.5.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in table 8.5.1.1 and table 8.5.1.2. The test consists of two successive time periods, with a time duration of T1 and T2 respectively. At the start of time duration T1, the UE shall transmit with the Uplink Timing Advance value set to zero, i.e. Timing Advance disabled.

During time period T1, UTRAN shall send an Uplink Physical Channel control message with activation time at the beginning of T2. The Uplink Physical Channel Control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T2 is greater than or equal to the RRC procedure delay as defined in [9].

Table 8.5.1.1: General test parameters for Timing Advance test

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Timing Advance value		0	IE "Uplink timing advance control" value disabled.
Final condition	Timing Advance value		5	IE "Uplink timing advance" value set to 5.
Monitored cell list size			6 TDD neighbors on Channel 1	
T _{SI}		S	1.28	The value shall be used for all cells in the test.
T1		S	5	
T2		S	5	

Table 8.5.1.2: Cell specific test parameters for Timing Advance test

Parameter	Unit	Cell 1			
		0		2	
DL timeslot number		T1	T2	T1	T2
UTRA RF Channel Number		Channel 1			
PCCPCH_Ec/I _{or}	dB	-3		n.a.	
SCH_Ec/I _{or}	dB	-9		n.a.	
SCH_t _{offset}	dB	0		n.a.	
DPCH_Ec/I _{or}	dB	n.a.		Note 1	
OCNS_Ec/I _{or}	dB	-3,12		Note 2	
\hat{I}_{or}/I_{oc}	dB	3			
I _{oc}	dBm/ 3,84 MHz	-70			
Propagation Condition		AWGN			
Note 1: The DPCH level is controlled by the power control loop					
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to I _{or} .					

8.5.1.4.2 Procedure

- 1) The RF parameters are set up according to T1.
- 2) The UE is switched on.
- 3) A call is set up according to the generic set-up procedure specified in TS 34.108 [3] subclause 7.4.2 to place the UE in CELL_DCH.
- 4) At the start of time interval T1, the SS shall transmit an UPLINK PHYSICAL CHANNEL CONTROL message with timing advance disabled
- 5) During the interval T1, the SS shall transmit an UPLINK PHYSICAL CHANNEL CONTROL message with timing advance enabled and the timing advance value set to 5.
- 6) UE shall apply the signalled timing advance value.
- 7) After 10 seconds, the UE is switched off.
- 8) Repeat Step 1-7 [TBD] times

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3], with the following exceptions:

UPLINK PHYSICAL CHANNEL CONTROL message (step 4):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
PhyCH Information elements	
-CCTrCH Power Control Info	Not Present
-Alpha	Not Present
-Special Burst Scheduling	Not Present
-Timing Advance Control (10.3.6.96)	
-Choice <i>Timing Advance</i>	Disabled
-PRACH Constant Value	Not Present
-PUSCH Constant Value	Not Present
-UE positioning related parameters	Not Present

UPLINK PHYSICAL CHANNEL CONTROL message (step 5):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
PhyCH Information elements	
-CCTrCH Power Control Info	Not Present
-Alpha	Not Present
-Special Burst Scheduling	Not Present
-Timing Advance Control (10.3.6.96)	
-Choice <i>Timing Advance</i>	Enabled
-UL Timing Advance (10.3.6.9.95)	5
-Activation Time	At T2
-PRACH Constant Value	Not Present
-PUSCH Constant Value	Not Present
-UE positioning related parameters	Not Present

8.5.1.5 Test requirements

The UE shall apply the signalled Timing Advance value to the UL DPCH transmission timing at the designated activation time, i.e the beginning of time period T2. The Timing Advance adjustment accuracy shall be within ± 0.5 chip.

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

8.5.2 UE Transmit Timing

Void.

8.6 UE Measurements Procedures

8.6.1 TDD intra frequency measurements

8.6.1.1 Event triggered reporting in AWGN propagation conditions

8.6.1.1.1 Definition and applicability

In the event triggered reporting period the measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit 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.

The requirements and this test apply to the TDD UE.

8.6.1.1.2 Minimum requirement

The UE shall be able to identify a new detectable intra-frequency TDD cell belonging to the monitored set within $T_{\text{identify intra}}$ ms, where $T_{\text{identify intra}} = 800$ ms.

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

In CELL_DCH state, the UE shall be capable of performing P-CCPCH RSCP measurements for $X_{\text{measurement intra}}$ identified intra-frequency TDD cells of the monitored set with a measurement period for intra-frequency P-CCPCH RSCP measurements $T_{\text{measurement period intra}}$, where

$$X_{\text{measurement intra}} = 6 \text{ (cells)}$$

$$T_{\text{measurement period intra}} = 200 \text{ ms}$$

The UE physical layer shall be capable of reporting these measurements to higher layers with the measurement period $T_{\text{measurement period intra}}$.

If the UE has identified more than $X_{\text{measurement intra}}$ intra-frequency TDD cells, the UE shall perform measurements of all identified cells but the reporting rate of P-CCPCH RSCP measurements of cells from the UE physical layer to higher layers may be decreased.. The measurement accuracy for all measured cells shall be as specified in the section 9.

The normative reference for this requirement is TS 25.123 [2] clauses 8.1.2.2.1, 8.1.2.2.2 and A.8.1.1

8.6.1.1.3 Test purpose

To verify that the UE meets the minimum requirement.

8.6.1.1.4 Method of test

8.6.1.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in Table 8.6.1.1.1 and 8.6.1.1.2. The test consists of three successive time periods, with time durations of T1, T2 and T3 respectively. Three cells shall be present in the test, cell 1 being the serving cell and cell 2 and cell 3 being neighbour cells on the used frequency. All cells shall be synchronised, i.e. share the same frame and timeslot timing.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that P-CCPCH RSCP shall be reported together with Event 1G. The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [9].

The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The DL DPCH shall be transmitted in timeslot 2 and the UL DPCH shall be transmitted in timeslot 10. The TTI of the uplink DCCH shall be 20ms.

Table 8.6.1.1.1: General test parameters for Event 1G triggered reporting in AWGN propagation condition

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2, Cell 3	
Final condition	Active cell		Cell 1	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	0	
Threshold used frequency		dBm	-70	Applicable for Event 1G
Filter coefficient			0	
Monitored cell list size			12 TDD neighbours on Channel 1	
T1		s	6	
T2		s	6	
T3		s	6	

Table 8.6.1.1.2: Cell specific parameters for Event 1G triggered correct reporting in AWGN propagation condition

Parameter	Unit	Cell 1			Cell 2			Cell 3		
		T1	T2	T3	T1	T2	T3	T1	T2	T3
DL timeslot number		0			0			0		
UTRA RF Channel Number		Channel 1			Channel 1			Channel 1		
PCCPCH_Ec/I _{or}	dB	-3			-3			-3		
SCH_Ec/I _{or}	dB	-9			-9			-9		
SCH_t _{offset}		0			5			10		
OCNS_Ec/I _{or}	dB	-3,12			-3,12			-3,12		
\hat{I}_{or}/I_{oc}	dB	7	5		5	7	-Inf	-Inf		7
PCCPCH RSCP	dBm	-66	-68		-68	-66	-Inf	-Inf		-66
I_{oc}	dBm / 3,84 MHz	-70								
Propagation Condition		AWGN								

8.6.1.1.4.2 Procedure

- 1) The RF parameters are set up according to T1.
- 2) The UE is switched on.
- 3) A call is set up according to the generic set-up procedure specified in TS 34.108 [3] subclause 7.4.2 to place the UE in CELL_DCH.
- 4) SS shall transmit a MEASUREMENT CONTROL message.
- 5) After 6 seconds from the beginning of T1, the SS shall switch the power settings from T1 to T2.
- 6) UE shall transmit a MEASUREMENT REPORT message triggered by event 1G for cell 2. The measurement reporting delay from the beginning of T2 shall be less than 240 ms. If the UE fails to report the event within the required delay, then a failure is recorded. If the reporting delay for this event is within the required limit, the number of successful tests is increased by one.
- 7) After 6 seconds from the beginning of T2, the SS shall switch the power settings from T2 to T3.
- 8) UE shall transmit a MEASUREMENT REPORT message triggered by event 1G for cell 3. The measurement reporting delay from the beginning of T3 shall be less than 840 ms. If the reporting delay for this event is within the required limit, the number of successful tests is increased by one.
- 9) After 6 seconds from the beginning of T3, the UE is switched off. Any timing information of cell 2 is deleted in the UE.
- 10) Repeat steps 1-9 [TBD] times.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3], with the following exceptions:

MEASUREMENT CONTROL message (step 4):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command (10.3.7.46)	Modify
-Measurement Reporting Mode (10.3.7.49)	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Event trigger
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE <i>Measurement type</i>	Intra-frequency measurement
-Intra-frequency measurement (10.3.7.36)	
-Intra-frequency measurement objects list (10.3.7.33)	Not Present
-Intra-frequency measurement quantity (10.3.7.38)	
-Filter coefficient (10.3.7.9)	0
-CHOICE <i>mode</i>	TDD
-Measurement quantity list	1
-Measurement quantity	Primary CCPCH
-Intra-frequency reporting quantity (10.3.7.41)	
-Reporting quantities for active set cells (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	FALSE
-Cell Identity reporting indicator	TRUE
-CHOICE <i>mode</i>	TDD
-Timeslot ISCP reporting indicator	TRUE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting quantities for monitored set cells (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	FALSE
-Cell Identity reporting indicator	TRUE
-CHOICE <i>mode</i>	TDD
-Timeslot ISCP reporting indicator	FALSE
-Proposed TGSN reporting required	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	FALSE
-Reporting quantities for detected set cells (10.3.7.5)	Not Present
-Reporting cell status (10.3.7.61)	
-CHOICE <i>reported cell</i>	Report all active set cells + cells within monitored set on used frequency
-Maximum number of reported cells	1
-Measurement validity (10.3.7.51)	Not Present
-CHOICE <i>report criteria</i>	Intra-frequency measurement reporting criteria
-Intra-frequency measurement reporting criteria (10.3.7.39)	
-Parameters required for each event	1
-Intra-frequency event identity	Event 1G
-Triggering condition 2	Not Present
-Reporting Range Constant	Not Present
-Cells forbidden to affect Reporting Range	Not Present
-CHOICE <i>mode</i>	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE <i>mode</i>	TDD
-CHOICE <i>sync case</i>	Case 2
-Timeslot	0
-Cell parameters ID	0
-SCTD indicator	FALSE
-W	Not Present
-Hysteresis	0 dB
-Threshold used frequency	Not Present
-Reporting deactivation threshold	Not Present
-Replacement activation threshold	Not Present
-Time to trigger	0 ms
-Amount of reporting	Infinity

Information Element/Group name	Value/Remark
-Reporting interval	0 ms (Note 1)
-Reporting cell status	Not Present
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present
Note 1: Reporting interval = 0 ms means no periodical reporting	

MEASUREMENT REPORT message (step 6)

Information Element	Value/remark
Message Type (10.2.17)	
Integrity check info	Not Present
Measurement identity	1
Measured Results (10.3.7.44)	
-CHOICE Measurement	Intra-frequency Measured results list
-Intra-frequency measured results	1
-Cell measured results (10.3.7.3)	
-Cell identity	Not Present
-SFN-SFN observed time difference	Not Present
-Cell synchronisation info	Not Present
-CHOICE mode	TDD
-Cell parameters ID	Set to Cell parameters ID of Cell 2
-Proposed TGSN	Not Present
-Primary CCPCH RSCP	Checked that this IE is present
-Pathloss	Not Present
-Timeslot list	Not Present
Measured results on RACH	Not Present
Additional measured results	Not Present
Event results (10.3.7.7)	
-CHOICE event result	Intra-frequency measurement event results
-Intra-frequency event identity	1G
-Cell measurement event results (10.3.7.4)	
-CHOICE mode	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE mode	TDD
-Cell parameters ID	Set to Cell parameters ID of Cell 2

MEASUREMENT REPORT message (step 8)

Information Element	Value/remark
Message Type (10.2.17)	
Integrity check info	Not Present
Measurement identity	1
Measured Results (10.3.7.44)	
-CHOICE Measurement	Intra-frequency Measured results list
-Intra-frequency measured results	1
-Cell measured results (10.3.7.3)	
-Cell identity	Not Present
-SFN-SFN observed time difference	Not Present
-Cell synchronisation info	Not Present
-CHOICE mode	TDD
-Cell parameters ID	Set to Cell parameters ID of Cell 3
-Proposed TGSN	Not Present
-Primary CCPCH RSCP	Checked that this IE is present
-Pathloss	Not Present
-Timeslot list	Not Present
Measured results on RACH	Not Present
Additional measured results	Not Present
Event results (10.3.7.7)	
-CHOICE event result	Intra-frequency measurement event results
-Intra-frequency event identity	1G
-Cell measurement event results (10.3.7.4)	
-CHOICE mode	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE mode	TDD
-Cell parameters ID	Set to Cell parameters ID of Cell 3

8.6.1.1.5 Test requirements

The UE shall send one Event 1G triggered measurement report for Cell 2 with a measurement reporting delay less than 240ms from the beginning of time period T2.

The UE shall send one Event 1G triggered measurement report for Cell 3 with a measurement reporting delay less than 840ms from the beginning of time period T3.

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

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

8.6.1.2 Event 1H and 1I triggered reporting in AWGN propagation condition

8.6.1.2.1 Definition and applicability

In the event triggered reporting, the measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit 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.

The requirements and this test apply to the TDD UE.

8.6.1.2.2 Minimum requirement

In CELL_DCH state the measurement period for intra frequency Timeslot ISCP measurements on arbitrary DL timeslots, including Beacon timeslots is 400 ms. When no inter frequency measurement is scheduled, the UE shall be capable of performing Timeslot ISCP measurements for a total of 10 different combinations of an arbitrary DL timeslot and an intra-frequency cell, including the current serving cell.

The normative reference for this requirement is TS 25.123 [2] clauses 8.1.2.2.2.A and A.8.1.2

8.6.1.2.3 Test purpose

To verify that the UE meets the minimum requirement.

8.6.1.2.4 Method of test

8.6.1.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in Tables 8.6.1.2.1, 8.6.1.2.2 and 8.6.1.2.3. The test consists of five successive time periods, with a time duration of T1, T2, T3, T4 and T5 respectively. Two cells shall be present in the test, cell 1 being the current serving cell and cell 2 being a neighbour cell on the used frequency.

In the measurement control information it shall be indicated to the UE that event-triggered reporting with event 1H and event 1I shall be used and that Timeslot ISCP and P-CCPCH RSCP shall be reported together with event 1H and 1I. Measurement control information shall be sent to the UE before the beginning of time period T1.

The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The UL DPCH shall be transmitted in timeslot 10. In addition, timeslots 3 and 4 shall be allocated as DL timeslots. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing.

Table 8.6.1.2.1: General test parameters for correct event 1H and event 1I reporting in AWGN propagation condition

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 1	
HCS			Not used	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Timeslot list cell 1			2, 3, 4	Timeslot numbers in IE "Cell info" for Cell 1
Timeslot list cell 2			4	Timeslot numbers in IE "Cell info" for Cell 2
Threshold used frequency		dBm	-68	Threshold 1 applicable for event 1H, cell 1 timeslots 2, 4 and cell 2 timeslot 4
Threshold used frequency		dBm	-73	Threshold 2 applicable for event 1H, cell 1 timeslots 2, 3, 4 and cell 2 timeslot 4
Threshold used frequency		dBm	-67	Applicable for event 1I, cell 1 timeslots 2, 4 and cell 2 timeslot 4
Hysteresis		dB	0	
Time to Trigger		ms	0	
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1	Cell 2 shall belong to the monitored set
T1		s	5	
T2		s	5	
T3		s	5	
T4		s	5	
T5		s	5	

Table 8.6.1.2.2: Cell 1 specific parameters for correct event 1H and 1I reporting in AWGN propagation condition

Parameter	Unit	Cell 1									
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
UTRA RF Channel Number		Channel 1									
DL timeslot number		0					2				
PCCPCH_Ec/lor	dB	-3					n.a.				
SCH_Ec/lor	dB	-9					n.a.				
SCH_t _{offset}	dB	5					n.a.				
DPCH_Ec/lor	dB	n.a.					Note 1				
OCNS_Ec/lor	dB	-3,12					Note 2				
\hat{I}_{or}/I_{oc}	dB	4					4				
PCCPCH RSCP	dBm	-69					n.a.				
I_{oc}	dBm / 3,84 MHz	-70									
Propagation Condition		AWGN									
DL timeslot number		3					4				
PCCPCH_Ec/lor	dB	n.a.					n.a.				
SCH_Ec/lor	dB	n.a.					n.a.				
SCH_t _{offset}	dB	n.a.					n.a.				
DPCH_Ec/lor	dB	n.a.					n.a.				
OCNS_Ec/lor	dB	0					0				
\hat{I}_{or}/I_{oc}	dB	3					0			6	
PCCPCH RSCP	dBm	n.a.					n.a.				
I_{oc}	dBm / 3,84 MHz	-70									
Propagation Condition		AWGN									
Note 1: The DPCH level is controlled by the power control loop											
Note 2: The power of the OCNS channel that is added shall make the total power from the cell to be equal to lor											

Table 8.6.1.2.3: Cell 2 specific parameters for correct event 1H and 1I reporting in AWGN propagation condition

Parameter	Unit	Cell 2									
		T1	T2	T3	T4	T5	T1	T2	T3	T4	T5
UTRA RF Channel Number		Channel 1									
DL timeslot number		0					2				
PCCPCH_Ec/lor	dB	-3					n.a.				
SCH_Ec/lor	dB	-9					n.a.				
SCH_t _{offset}	dB	10					n.a.				
DPCH_Ec/lor	dB	n.a.					n.a.				
OCNS_Ec/lor	dB	-3,12					0				
\hat{I}_{or}/I_{oc}	dB	1					0	6	0		
PCCPCH RSCP	dBm	-72					n.a.				
I_{oc}	dBm / 3,84 MHz	-70									
Propagation Condition		AWGN									
DL timeslot number		3					4				
PCCPCH_Ec/lor	dB	n.a.					n.a.				
SCH_Ec/lor	dB	n.a.					n.a.				
SCH_t _{offset}	dB	n.a.					n.a.				
DPCH_Ec/lor	dB	n.a.					n.a.				
OCNS_Ec/lor	dB	0					0				
\hat{I}_{or}/I_{oc}	dB	3					6			0	
PCCPCH RSCP	dBm	n.a.					n.a.				
I_{oc}	dBm / 3,84 MHz	-70									
Propagation Condition		AWGN									

8.6.1.2.4.2 Procedure

- 1) The RF parameters are set up according to T1.
- 2) The UE is switched on.
- 3) A call is set up according to the generic set-up procedure specified in TS 34.108 [3] subclause 7.4.2 to place the UE in CELL_DCH.
- 4) SS shall transmit a MEASUREMENT CONTROL message.
- 5) After 5 seconds from the beginning of T1, the SS shall switch the power settings from T1 to T2.
- 6) UE shall transmit a MEASUREMENT REPORT message triggered by event 1I for cell 1 in timeslot 2. The measurement reporting delay from the beginning of T2 shall be less than 480 ms. If the UE fails to report the event within the required delay, then a failure is recorded. If the reporting delay for this event is within the required limit, the number of successful tests is increased by one.
- 7) After 5 seconds from the beginning of T2, the SS shall switch the power settings from T2 to T3.
- 8) UE shall transmit a MEASUREMENT REPORT message triggered by event 1H for cell 1 in timeslot 2. The measurement reporting delay from the beginning of T3 shall be less than 480 ms. If the reporting delay for this event is within the required limit, the number of successful tests is increased by one.
- 9) After 5 seconds from the beginning of T3, the SS shall switch the power settings from T3 to T4.
- 10) UE shall transmit a MEASUREMENT REPORT message triggered by event 1H for cell 1 in timeslot 4. The measurement reporting delay from the beginning of T3 shall be less than 480 ms. If the reporting delay for this event is within the required limit, the number of successful tests is increased by one.
- 11) After 5 seconds from the beginning of T4, the SS shall switch the power settings from T4 to T5.
- 12) UE shall transmit a MEASUREMENT REPORT message triggered by event 1I for cell 2 in timeslot 4. The measurement reporting delay from the beginning of T3 shall be less than 480 ms. If the reporting delay for this event is within the required limit, the number of successful tests is increased by one.
- 13) After 5 seconds from the beginning of T5, the UE is switched off. Any timing information of cell 2 is deleted in the UE.
- 14) Repeat steps 1-13 [TBD] times.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3], with the following exceptions:

MEASUREMENT CONTROL message (step 4):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command (10.3.7.46)	Modify
-Measurement Reporting Mode (10.3.7.49)	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Event trigger
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE <i>Measurement type</i>	Intra-frequency measurement
-Intra-frequency measurement (10.3.7.36)	
-Intra-frequency measurement objects list (10.3.7.33)	Not Present
-Intra-frequency measurement quantity (10.3.7.38)	
-Filter coefficient (10.3.7.9)	0
-CHOICE <i>mode</i>	TDD
-Measurement quantity list	1
-Measurement quantity	Timeslot ISCP
-Intra-frequency reporting quantity (10.3.7.41)	
-Reporting quantities for active set cells (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	FALSE
-Cell Identity reporting indicator	FALSE
-CHOICE <i>mode</i>	TDD
-Timeslot ISCP reporting indicator	TRUE
-Proposed TGSN reporting required	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	FALSE
-Reporting quantities for monitored set cells (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	FALSE
-Cell Identity reporting indicator	TRUE
-CHOICE <i>mode</i>	TDD
-Timeslot ISCP reporting indicator	TRUE
-Proposed TGSN reporting required	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	FALSE
-Reporting quantities for detected set cells (10.3.7.5)	Not Present
-Reporting cell status (10.3.7.61)	
-CHOICE <i>reported cell</i>	Report all active set cells + cells within monitored set on used frequency
-Maximum number of reported cells	1
-Measurement validity (10.3.7.51)	Not Present
-CHOICE <i>report criteria</i>	Intra-frequency measurement reporting criteria
-Intra-frequency measurement reporting criteria (10.3.7.39)	
-Parameters required for each event	2
-Intra-frequency event identity	Event 1H
-Triggering condition 2	Not Present
-Reporting Range Constant	Not Present
-Cells forbidden to affect Reporting Range	Not Present
-CHOICE <i>mode</i>	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE <i>mode</i>	TDD
-CHOICE <i>sync case</i>	Case 2
-Timeslot	0
-Cell parameters ID	Set to Cell parameters ID of cell 1
-SCTD indicator	FALSE
-W	Not Present
-Hysteresis	0 dB
-Threshold used frequency	-68
-Reporting deactivation threshold	Not Present
-Replacement activation threshold	Not Present
-Time to trigger	0 ms

Information Element/Group name	Value/Remark
-Amount of reporting -Reporting interval -Reporting cell status	Infinity 0 ms (Note 1) Not Present
-Intra-frequency event identity -Triggering condition 2 -Reporting Range Constant -Cells forbidden to affect Reporting Range -CHOICE <i>mode</i> -Primary CCPCH info (10.3.6.57) -CHOICE <i>mode</i> -CHOICE <i>sync case</i> -Timeslot -Cell parameters ID -SCTD indicator -W -Hysteresis -Threshold used frequency -Reporting deactivation threshold -Replacement activation threshold -Time to trigger -Amount of reporting -Reporting interval -Reporting cell status	Event 1H Not Present Not Present Not Present Not Present TDD TDD Case 2 0 Set to Cell parameters ID of cell 1 FALSE Not Present 0 dB -73 Not Present Not Present 0 ms Infinity 0 ms (Note 1) Not Present
-Intra-frequency event identity -Triggering condition 2 -Reporting Range Constant -Cells forbidden to affect Reporting Range -CHOICE <i>mode</i> -Primary CCPCH info (10.3.6.57) -CHOICE <i>mode</i> -CHOICE <i>sync case</i> -Timeslot -Cell parameters ID -SCTD indicator -W -Hysteresis -Threshold used frequency -Reporting deactivation threshold -Replacement activation threshold -Time to trigger -Amount of reporting -Reporting interval -Reporting cell status	Event 1I Not Present Not Present Not Present Not Present TDD TDD Case 2 0 Set to Cell parameters ID of cell 1 FALSE Not Present 0 dB -67 Not Present Not Present 0 ms Infinity 0 ms (Note 1) Not Present
Physical channel information elements -DPCH compressed mode status info (10.3.6.34)	Not Present
Note 1: Reporting interval = 0 ms means no periodical reporting	

MEASUREMENT REPORT message (step 6)

Information Element	Value/remark
Message Type (10.2.17)	
Integrity check info	Not Present
Measurement identity	1
Measured Results (10.3.7.44)	
-CHOICE Measurement	Intra-frequency Measured results list
-Intra-frequency measured results	1
-Cell measured results (10.3.7.3)	
-Cell identity	Not Present
-SFN-SFN observed time difference	Not Present
-Cell synchronisation info	Not Present
-CHOICE mode	TDD
-Cell parameters ID	Set to Cell parameters ID of cell 1
-Proposed TGSN	Not Present
-Primary CCPCH RSCP	Checked that this IE is present
-Pathloss	Not Present
-Timeslot list	4
-Timeslot ISCP	Checked that this IE is present for 4 timeslots
Measured results on RACH	Not Present
Additional measured results	Not Present
Event results (10.3.7.7)	
-CHOICE event result	Intra-frequency measurement event results
-Intra-frequency event identity	1I
-Cell measurement event results (10.3.7.4)	
-CHOICE mode	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE mode	TDD
-Cell parameters ID	Set to Cell parameters ID of cell 1

MEASUREMENT REPORT message (step 8)

Information Element	Value/remark
Message Type (10.2.17)	
Integrity check info	Not Present
Measurement identity	1
Measured Results (10.3.7.44)	
-CHOICE Measurement	Intra-frequency Measured results list
-Intra-frequency measured results	1
-Cell measured results (10.3.7.3)	
-Cell identity	Not Present
-SFN-SFN observed time difference	Not Present
-Cell synchronisation info	Not Present
-CHOICE mode	TDD
-Cell parameters ID	Set to Cell parameters ID of cell 1
-Proposed TGSN	Not Present
-Primary CCPCH RSCP	Checked that this IE is present
-Pathloss	Not Present
-Timeslot list	4
-Timeslot ISCP	Checked that this IE is present for 4 timeslots
Measured results on RACH	Not Present
Additional measured results	Not Present
Event results (10.3.7.7)	
-CHOICE event result	Intra-frequency measurement event results
-Intra-frequency event identity	1H
-Cell measurement event results (10.3.7.4)	
-CHOICE mode	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE mode	TDD
-Cell parameters ID	Set to Cell parameters ID of cell 1

MEASUREMENT REPORT message (step 10)

Information Element	Value/remark
Message Type (10.2.17)	
Integrity check info	Not Present
Measurement identity	1
Measured Results (10.3.7.44)	
-CHOICE Measurement	Intra-frequency Measured results list
-Intra-frequency measured results	1
-Cell measured results (10.3.7.3)	
-Cell identity	Not Present
-SFN-SFN observed time difference	Not Present
-Cell synchronisation info	Not Present
-CHOICE mode	TDD
-Cell parameters ID	Set to Cell parameters ID of cell 1
-Proposed TGSN	Not Present
-Primary CCPCH RSCP	Checked that this IE is present
-Pathloss	Not Present
-Timeslot list	4
-Timeslot ISCP	Checked that this IE is present for 4 timeslots
Measured results on RACH	Not Present
Additional measured results	Not Present
Event results (10.3.7.7)	
-CHOICE event result	Intra-frequency measurement event results
-Intra-frequency event identity	1H
-Cell measurement event results (10.3.7.4)	
-CHOICE mode	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE mode	TDD
-Cell parameters ID	Set to Cell parameters ID of cell 1

MEASUREMENT REPORT message (step 12)

Information Element	Value/remark
Message Type (10.2.17)	
Integrity check info	Not Present
Measurement identity	1
Measured Results (10.3.7.44)	
-CHOICE Measurement	Intra-frequency Measured results list
-Intra-frequency measured results	1
-Cell measured results (10.3.7.3)	
-Cell identity	Not Present
-SFN-SFN observed time difference	Not Present
-Cell synchronisation info	Not Present
-CHOICE mode	TDD
-Cell parameters ID	Set to Cell parameters ID of cell 2
-Proposed TGSN	Not Present
-Primary CCPCH RSCP	Checked that this IE is present
-Pathloss	Not Present
-Timeslot list	1
-Timeslot ISCP	Checked that this IE is present
Measured results on RACH	Not Present
Additional measured results	Not Present
Event results (10.3.7.7)	
-CHOICE event result	Intra-frequency measurement event results
-Intra-frequency event identity	1I
-Cell measurement event results (10.3.7.4)	
-CHOICE mode	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE mode	TDD
-Cell parameters ID	Set to Cell parameters ID of cell 2

8.6.1.2.5 Test requirements

The UE shall send one event 1I triggered measurement report, with a measurement reporting delay less than 480 ms from the beginning of time period T2.

The UE shall send one event 1H triggered measurement report, with a measurement reporting delay less than 480 ms from the beginning of time period T3.

The UE shall send one event 1H triggered measurement report, with a measurement reporting delay less than 480 ms from the beginning of time period T4.

The UE shall send one event 1I triggered measurement report, with a measurement reporting delay less than 480 ms from the beginning of time period T5.

The UE shall not send event 1H or 1I triggered measurement reports, as long as the reporting criteria are not fulfilled.

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

8.6.1.3 Correct reporting of neighbours in fading propagation conditions

8.6.1.3.1 Definition and applicability

In the event triggered reporting, the measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit 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.

The requirements and this test apply to the TDD UE.

8.6.1.3.2 Minimum requirement

The requirements are the same as in sub clause 8.6.1.1.2

The normative reference for this requirement is TS 25.123 [2] clauses 8.1.2.2.2.1, 8.1.2.2.2 and A.8.1.3

8.6.1.3.3 Test purpose

To verify that the UE meets the minimum requirements and also verify that the UE performs sufficient layer 1 filtering of the measurements. The test is performed in fading propagation conditions.

8.6.1.3.4 Method of test

8.6.1.3.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in Tables 8.6.1.3.1 and 8.6.1.3.2. The test consists of one time period with time duration of T1. Two cells shall be present in the test, cell 1 being the current serving cell and cell 2 being a neighbour cell on the used frequency. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 1G shall be used, and that P-CCPCH RSCP shall be reported together with Event 1G.

The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The TTI of the UL DCCH shall be 20ms.

Table 8.6.1.3.1: General test parameters for correct reporting of neighbours in fading propagation condition

Parameter		Unit	Value	Comment
DCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	
	Neighbour cell		Cell 2	
Final condition	Active cell		Cell 1	
O		dB	0	Cell individual offset. This value shall be used for all cells in the test.
Hysteresis		dB	0	
Time to Trigger		ms	200	
Filter coefficient			0	
Monitored cell list size			6 TDD neighbours on Channel 1	Sent before the beginning of time period T1
T1		s	200	

Table 8.6.1.3.2: Cell specific test parameters for correct reporting of neighbours in fading propagation condition

Parameter	Unit	Cell 1		Cell 2	
		T1	T1	T1	T1
DL timeslot number		0	8	0	8
UTRA RF Channel Number		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3	n.a.	-3	n.a.
SCH_Ec/Ior	dB	-9	-9	-9	-9
SCH_t_offset		0	0	2	2
PICH_Ec/Ior	dB	n.a.	-3	n.a.	-3
OCNS_Ec/Ior	dB	-3,12	-3,12	-3,12	-3,12
\hat{I}_{or}/I_{oc}	dB	7	7	2	2
PCCPCH RSCP	dBm	-66	n.a.	-71	n.a.
I_{oc}	dBm/ 3,84 MHz	-70			
Propagation Condition		Case 4 as specified in Annex D			

8.6.1.3.4.2 Procedure

- 1) The RF parameters are set up according to T1.
- 2) The UE is switched on.
- 3) A call is set up according to the generic set-up procedure specified in TS 34.108 [3] subclause 7.4.2 to place the UE in CELL_DCH.
- 4) SS shall transmit a MEASUREMENT CONTROL message.
- 5) After 200 seconds from the beginning of T1, the UE is switched off.
- 6) Repeat steps 1-5 [TBD] times.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3], with the following exceptions:

MEASUREMENT CONTROL message (step 4):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command (10.3.7.46)	Modify
-Measurement Reporting Mode (10.3.7.49)	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Event trigger
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE <i>Measurement type</i>	Intra-frequency measurement
-Intra-frequency measurement (10.3.7.36)	
-Intra-frequency measurement objects list (10.3.7.33)	Not Present
-Intra-frequency measurement quantity (10.3.7.38)	
-Filter coefficient (10.3.7.9)	0
-CHOICE <i>mode</i>	TDD
-Measurement quantity list	1
-Measurement quantity	Primary CCPCH
-Intra-frequency reporting quantity (10.3.7.41)	
-Reporting quantities for active set cells (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	FALSE
-Cell Identity reporting indicator	FALSE
-CHOICE <i>mode</i>	TDD
-Timeslot ISCP reporting indicator	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	FALSE
-Reporting quantities for monitored set cells (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	FALSE
-Cell Identity reporting indicator	FALSE
-CHOICE <i>mode</i>	TDD
-Timeslot ISCP reporting indicator	FALSE
-Proposed TGSN reporting required	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	FALSE
-Reporting quantities for detected set cells (10.3.7.5)	Not Present
-Reporting cell status (10.3.7.61)	
-CHOICE <i>reported cell</i>	Report all active set cells + cells within monitored set on used frequency
-Maximum number of reported cells	1
-Measurement validity (10.3.7.51)	Not Present
-CHOICE <i>report criteria</i>	Intra-frequency measurement reporting criteria
-Intra-frequency measurement reporting criteria (10.3.7.39)	
-Parameters required for each event	1
-Intra-frequency event identity	Event 1G
-Triggering condition 2	Not Present
-Reporting Range Constant	Not Present
-Cells forbidden to affect Reporting Range	Not Present
-CHOICE <i>mode</i>	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE <i>mode</i>	TDD
-CHOICE <i>sync case</i>	Case 2
-Timeslot	0
-Cell parameters ID	0
-SCTD indicator	FALSE
-W	Not Present
-Hysteresis	0 dB
-Threshold used frequency	Not Present
-Reporting deactivation threshold	Not Present
-Replacement activation threshold	Not Present
-Time to trigger	0 ms
-Amount of reporting	Infinity

Information Element/Group name	Value/Remark
-Reporting interval	0 ms (Note 1)
-Reporting cell status	Not Present
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present
Note 1: Reporting interval = 0 ms means no periodical reporting	

8.6.1.3.5 Test requirements

The number of Event 1G triggered measurement reports during time period T1 shall be less than 60.

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

8.6.2 TDD inter frequency measurements

8.6.2.1 Correct reporting of neighbours in AWGN propagation condition

8.6.2.1.1 Definition and applicability

In the event triggered reporting period the measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit 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.

The requirements and this test apply to the TDD UE.

8.6.2.1.2 Minimum requirement

When idle intervals are used for inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within

$$T_{\text{identify_inter}} = \text{Max} \left\{ 5000, N_{\text{basic_identify_TDD_inter}} \cdot \frac{T_{\text{measurement_period_TDD_inter}}}{N_{\text{TDD_inter}}} \cdot N_{\text{Freq}} \right\} \text{ms}$$

If the UE does not require idle intervals to perform inter-frequency TDD measurements, the UE shall be able to identify a new detectable inter-frequency TDD cell belonging to the monitored set within 5000 ms.

When idle intervals are used for TDD inter frequency measurements, the UE shall be capable of performing P-CCPCH RSCP measurements for $X_{\text{measurement_TDD_inter}}$ inter-frequency TDD cells per TDD frequency of the monitored set.

The UE physical layer shall be capable of reporting measurements to higher layers with measurement accuracy as specified in section 9 and with a measurement period of $T_{\text{measurement_inter}}$.

$$T_{\text{measurement_inter}} = \text{Max} \left\{ T_{\text{measurement_period_TDD_inter}}, N_{\text{basic_measurement_TDD_inter}} \cdot \frac{T_{\text{measurement_period_TDD_inter}}}{N_{\text{TDD_inter}}} \cdot N_{\text{Freq}} \right\} \text{ms}$$

If the UE does not require idle intervals to perform TDD inter-frequency measurements, the measurement period for inter frequency P-CCPCH RSCP measurements shall be 480 ms.

Where,

$$X_{\text{measurement_TDD_inter}} = 6 \text{ (cells)}$$

$T_{\text{measurement_period_inter}} = 480 \text{ ms}$. The time period used for calculating the measurement period $T_{\text{measurement_inter}}$ for inter frequency P-CCPCH RSCP measurements.

$N_{TDD\ inter}$: This is the available number of measurement opportunities for a Beacon timeslot of an inter-frequency TDD cell during the time period $T_{TDD\ inter}$. The UE shall consider that a measurement opportunity on a Beacon timeslot of an inter-frequency TDD cell is provided if an idle interval of length equal to or greater than 3 timeslots less $2*0.5$ ms implementation margin for frequency switching per idle interval completely overlaps in time with the Beacon timeslot of the inter-frequency TDD cell.

$N_{basic_identify_TDD\ inter} = 80$. This is a number of measurement opportunities for a Beacon timeslot of an inter-frequency TDD cell during the time period used in the inter frequency TDD equation where the maximum allowed time for the UE to identify a new detectable inter-frequency TDD cell is defined.

$N_{basic_measurement_TDD\ inter} = 5$. This is a number of measurement opportunities for a Beacon timeslot of an inter-frequency TDD cell during the time period $T_{TDD\ inter}$ used in the inter-frequency TDD equation where the measurement period for inter-frequency P-CCPCH RSCP measurements is defined.

$N_{Freq\ TDD}$: This is the number of TDD frequencies indicated in the inter frequency measurement control information.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{identify\ inter}$ defined in 25.123 [2]. When L3 filtering is used, an additional delay can be expected.

The normative reference for this requirement is TS 25.123 [2] clauses 8.1.2.3.1, 8.1.2.3.2 and A.8.2.1

8.6.2.1.3 Test purpose

To verify that the UE meets the minimum requirement.

8.6.2.1.4 Method of test

8.6.2.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in Table 8.6.2.1.1 and 8.6.2.1.2. The test consists of 2 successive time periods, with a time duration $T1$ and $T2$. Two cells shall be present in the test, cell 1 being the serving cell and cell 2 being a UTRA TDD neighbour cell on the unused frequency. All cells shall be synchronised, i.e. share the same frame and timeslot timing.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used. P-CCPCH RSCP of the best cell on the unused frequency shall be reported together with Event 2C reporting. The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of $T1$ is at least equal to the RRC procedure delay as defined in [9].

The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3. The TTI of the uplink DCCH shall be 20 ms.

Table 8.6.2.1.1: General test parameters for Correct reporting of TDD inter-frequency neighbours in AWGN propagation condition

Parameter		Unit	Value	Comment
DPCH parameters			DL Reference Measurement Channel 12.2 kbps	As specified in Annex C
Power Control			On	
Target quality value on DTCH		BLER	0.01	
Initial conditions	Active cell		Cell 1	UTRA TDD cell
	Neighbour cell		Cell 2	UTRA TDD cell
Threshold non used frequency		dB	-71	Applicable for event 2C
Hysteresis		dB	0	Applicable for event 2C
Time to Trigger		ms	0	
Filter coefficient			0	
Monitored cell list size			24 on channel 1 16 on channel 2	
T1		s	10	
T2		s	10	

Table 8.6.2.1.2: Cell specific parameters for Correct reporting of TDD inter-frequency neighbours in AWGN propagation condition

Parameter	Unit	Cell 1				Cell 2			
		0		8		0		8	
Timeslot Number		T1	T2	T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2			
PCCPCH_Ec/Ior	dB	-3	-3			-3	-3		
SCH_Ec/Ior	dB	-9	-9	-9	-9	-9	-9	-9	-9
SCH_toffset		0	0	0	0	15	15	15	15
PICH_Ec/Ior				-3	-3			-3	-3
OCNS		-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28	-4,28
\hat{I}_{or}/I_{oc}	dB	3	3	3	3	-Infinity	9	-Infinity	9
I_{oc}	dBm/3.8 4 MHz	-70							
PCCPCH_RSCP	dB	-70	-70			-Infinity	-64		
Propagation Condition		AWGN							

8.6.2.1.4.2 Procedure

- 1) The RF parameters are set up according to T1.
- 2) The UE is switched on.
- 3) A call is set up according to the generic set-up procedure specified in TS 34.108 [3] subclause 7.4.2 to place the UE in CELL_DCH.
- 4) SS shall transmit a MEASUREMENT CONTROL message.
- 5) After 10 seconds from the beginning of T1, the SS shall switch the power settings from T1 to T2.
- 6) UE shall transmit a MEASUREMENT REPORT message triggered by event 2c for cell 2. The measurement reporting delay from the beginning of T2 shall be less than 5080 ms. If the UE fails to report the event within the required delay, then a failure is recorded. If the reporting delay for this event is within the required limit, the number of successful tests is increased by one.
- 7) After 10 seconds from the beginning of T3, the UE is switched off. Any timing information of cell 2 is deleted in the UE.

8) Repeat steps 1-7 [TBD] times.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3], with the following exceptions:

MEASUREMENT CONTROL message (step 4):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command (10.3.7.46)	Modify
-Measurement Reporting Mode (10.3.7.49)	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Event trigger
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE <i>Measurement type</i>	Inter-frequency measurement
-Inter-frequency measurement (10.3.7.16)	
-Inter-frequency measurement objects list (10.3.7.13)	
-CHOICE <i>inter-frequency cell removal</i>	No inter-frequency cells removed
-New inter-frequency cells	1
-Inter-frequency cell id	1
-Frequency info (10.3.6.36)	
-CHOICE <i>mode</i>	TDD
-UARFCN(Nt)	Same frequency as channel 2
-Cell info (10.3.7.2)	
-Cell individual offset	Not Present
-Reference time difference to cell	Not Present
-Read SFN indicator	False
-CHOICE <i>mode</i>	TDD
-Primary CCPCH info (10.3.6.57)	
-CHOICE <i>mode</i>	TDD
-CHOICE Sync case	2
-Timeslot	0
-cell parameters ID	Set to cell parameters ID of cell 2
-SCTD indicator	FALSE
-Primary CCPCH Tx power	Set to Primary CCPCH Tx power of cell 2 as described in Table 8.6.2.1.2
-Timeslot list	Not Present
-Cell selection and re-selection info	Not Present
-Cell for measurement	Not Present
-Inter-frequency measurement quantity (10.3.7.18)	
-CHOICE <i>reporting criteria</i>	Inter-frequency reporting criteria
-Filter coefficient (10.3.7.9)	0
-CHOICE <i>mode</i>	TDD
-Measurement quantity for frequency quality estimate	Primary CCPCH RSCP
-Inter-frequency reporting quantity (10.3.7.21)	
-UTRA carrier RSSI	
-Frequency quality estimate	
-Non frequency related cell reporting quantities (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	FALSE
-Cell identity reporting indicator	FALSE
-CHOICE <i>mode</i>	TDD
-Timeslot ISCP reporting indicator	FALSE
-Proposed TGSN Reporting required	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	FALSE
-Reporting cell status (10.3.7.61)	Not Present
-Measurement validity (10.3.7.51)	Not Present
-CHOICE <i>report criteria</i>	Inter-frequency measurement reporting criteria
-Inter-frequency measurement reporting criteria (10.3.7.19)	
-Parameters required for each event	1
-Intra-frequency event identity	Event 2C
-Threshold used frequency	Not Present
-W Used frequency	Not Present
-Hysteresis	0 dB
-Time to trigger	0 ms
-Reporting Cell Status (10.3.61)	

Information Element/Group name	Value/Remark
-CHOICE reported cell	Report cells within active and/or monitored set on used frequency or within virtual active and/or monitored set on non-used frequency
-Maximum number of reported cells	3
-Parameters required for each non-used frequenc	
- Threshold non-used frequency	-71
- W non-used frequency	1
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present

MEASUREMENT REPORT message (step 6)

Information Element	Value/remark
Message Type (10.2.17)	
Integrity check info	Not Present
Measurement identity	1
Measured Results (10.3.7.44)	
-CHOICE Measurement	Inter-frequency Measured results list
-Inter-frequency measured results	1
-Frequency info	
-CHOICE mode	TDD
-UARFCN(Nt)	Same frequency as channel 2
-UTRA carrier RSSI	Not Present
-Inter-frequency cell measured results	1
-Cell measured results (10.3.7.3)	
-Cell identity	Not Present
-SFN-SFN observed time difference	Not Present
-Cell synchronisation info	Not Present
-CHOICE mode	TDD
-Cell parameters ID	Set to cell parameters ID of Cell 2
-Proposed TGSN	Not Present
-Primary CCPCH RSCP	Checked that this IE is present
-Pathloss	Not Present
-Timeslot list	Not Present
Measured results on RACH	Not Present
Additional measured results	Not Present
Event results (10.3.7.7)	
-CHOICE event result	Inter-frequency measurement event results
-Inter-frequency event identity	2C
-Inter-frequency cells	1
-Frequency Info	
-CHOICE mode	TDD
-UARFCN(Nt)	Same frequency as channel 2
-CHOICE mode	TDD
-Primary CCPCH Info	
-CHOICE mode	TDD
-CHOICE Sync Case	Not Present
-Cell Parameters ID	Set to cell parameters ID of Cell 2
-SCTD Indicator	FALSE

8.6.2.1.5 Test requirements

The UE shall send one Event 2C triggered measurement report for Cell 2 with a measurement reporting delay less than 5080ms 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.

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

8.6.3 FDD measurements

8.6.3.1 Correct reporting of FDD neighbours in AWGN propagation condition

8.6.3.1.1 Definition and applicability

In the event triggered reporting period the measurement reporting delay is defined as the time between any event that will trigger a measurement report until the UE starts to transmit 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.

The requirements and this test apply to the combined FDD and TDD UE.

8.6.3.1.2 Minimum requirement

When idle intervals are used for inter-frequency FDD measurements, the UE shall be able to identify a new detectable inter-frequency FDD cell belonging to the monitored set within

$$T_{\text{identify_FDD_inter}} = \text{Max} \left\{ 5000, T_{\text{basic_identify_FDD_inter}} \cdot \frac{T_{\text{measurement_period_FDD_inter}}}{T_{\text{FDD_inter}}} \cdot N_{\text{Freq}} \right\} \text{ms}$$

If the UE does not require idle intervals to perform FDD inter-frequency measurements, the UE shall be able to identify a new detectable inter-frequency FDD cell belonging to the monitored set within 5000 ms.

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

An inter-frequency FDD cell shall be considered detectable, when CPICH Ec/Io \geq -20 dB, SCH_Ec/Io \geq -17 dB and SCH_Ec/Ior is equally divided between primary synchronisation code and secondary synchronisation code.

When idle intervals are used for FDD inter frequency measurements, the UE physical layer shall be capable of reporting measurements to higher layers with measurement period given by

$$T_{\text{measurement_FDD_inter}} = \text{Max} \left\{ T_{\text{measurement_period_FDD_inter}}, T_{\text{basic_measurement_FDD_inter}} \cdot \frac{T_{\text{measurement_period_FDD_inter}}}{T_{\text{FDD_inter_available}}} \cdot N_{\text{Freq,FDD}} \right\} \text{ms}$$

If the UE does not require idle intervals to perform FDD inter-frequency measurements, the measurement period for inter frequency CPICH measurements shall be 480 ms.

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

$$X_{\text{basic_measurement_FDD_inter}} = 6 \text{ (cells)}$$

$T_{\text{measurement_period_FDD_inter}} = 480$ ms. The time period used for calculating the measurement period $T_{\text{measurement_FDD_inter}}$ for inter frequency CPICH measurements.

$T_{\text{FDD_inter_available}}$: This is the available time for measurements on inter-frequency FDD cells. $T_{\text{FDD_inter_available}}$ shall be derived from $T_{\text{FDD_inter}}$ by assuming 2*0.5 ms implementation margin for frequency switching per idle interval and by only taking into account the remaining number of full timeslots per idle interval. Idle intervals smaller than 3 timeslots shall not be taken into account for calculating $T_{\text{FDD_inter_available}}$.

$T_{\text{basic_identify_FDD_inter}} = 800$ ms. This is the time period used in the inter frequency equation where the maximum allowed time for the UE to identify a new detectable inter-frequency FDD cell is defined.

$T_{\text{basic_measurement_FDD_inter}} = 50$ ms. This is the time period used in the inter-frequency equation for defining the measurement period for inter frequency CPICH measurements.

N_{Freq} : This is the number of FDD frequencies indicated in the inter frequency measurement control information.

The event triggered measurement reporting delay, measured without L3 filtering shall be less than $T_{\text{identify inter}}$ defined in 25.123 [2]. When L3 filtering is used, an additional delay can be expected.

The normative reference for this requirement is TS 25.123 [2] clauses 8.1.2.4 and A.8.3.1

8.6.3.1.3 Test purpose

To verify that the UE meets the minimum requirement.

8.6.3.1.4 Method of test

8.6.3.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

The test parameters are given in Table 8.6.3.1.1 and 8.6.3.1.2. The test consists of two successive time periods, with time durations of T1 and T2 respectively. Two cells shall be present in the test, cell 1 being the serving UTRA TDD cell and cell 2 being a UTRA FDD neighbour cells on the unused frequency.

In the measurement control information it is indicated to the UE that event-triggered reporting with Event 2C shall be used and that CPICH Ec/I0 of the best cell on the unused frequency shall be reported together with Event 2C. The Measurement control message shall be sent to the UE such that the delay between the end of the last received TTI containing the message and the beginning of T1 is at least equal to the RRC procedure delay as defined in [9].

The second Beacon timeslot shall be provided in timeslot 8 for cell 1. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3. The TTI of the uplink DCCH shall be 20 ms.

Table 8.6.3.1.1: General test parameters for Correct reporting of FDD inter-frequency neighbours in AWGN propagation condition

Parameter	Unit	Value	Comment
DPCH parameters		DL Reference Measurement Channel 12.2 kbps	As specified in TS 25.102 section A.2.2
Power Control		On	
Target quality value on DTCH	BLER	0.01	
Initial conditions	Active cell	Cell 1	UTRA TDD cell
	Neighbour cell	Cell 2	UTRA FDD cell
Final conditions	Active cell	Cell 1	
Threshold non used frequency	dB	-18	Applicable for event 2C
W non-used frequency		1	Applicable for event 2C
Hysteresis	dB	0	Applicable for event 2C
Time to Trigger	ms	0	
Filter coefficient		0	
Monitored cell list size		6 TDD neighbours on channel 1 6 FDD neighbours on channel 2	
T1	s	15	
T2	s	10	

Table 8.6.3.1.2: Cell specific parameters for Correct reporting of FDD inter-frequency neighbours in AWGN propagation condition

Parameter	Unit	Cell 1				Cell 2	
		0		8		n.a.	
Timeslot Number		T1	T2	T1	T2	T1	T2
UTRA RF Channel Number		Channel 1				Channel 2	
CPICH_Ec/I _{or}	dB	n.a.		n.a.		-10	
PCCPCH_Ec/I _{or}	dB	-3	-3			-12	
SCH_Ec/I _{or}	dB	-9	-9	-9	-9	-12	
SCH_t _{offset}		0	0	0	0	n.a.	
PICH_Ec/I _{or}				-3	-3	-15	
OCNS	dB	-4,28	-4,28	-4,28	-4,28	-0,941	
\hat{I}_{or}/I_{oc}	dB	3	3	3	3	-infinity	-1.8
I_{oc}	dBm/ 3.84 MHz	-70				-70	
CPICH_Ec/I _o		n.a.				-infinity	-14
PCCPCH_RSCP	dB	-70	-70	-70	-70	n.a.	
Propagation Condition		AWGN				AWGN	

8.6.3.1.4.2 Procedure

- 1) The RF parameters are set up according to T1.
- 2) The UE is switched on.
- 3) A call is set up according to the generic set-up procedure specified in TS 34.108 [3] subclause 7.4.2 to place the UE in CELL_DCH.
- 4) SS shall transmit a MEASUREMENT CONTROL message.
- 5) After 15 seconds from the beginning of T1, the SS shall switch the power settings from T1 to T2.
- 6) UE shall transmit a MEASUREMENT REPORT message triggered by event 2C for cell 2. The measurement reporting delay from the beginning of T2 shall be less than 5040 ms. If the UE fails to report the event within the required delay, then a failure is recorded. If the reporting delay for this event is within the required limit, the number of successful tests is increased by one.
- 7) After 10 seconds from the beginning of T2, the UE is switched off. Any timing information of cell 2 is deleted in the UE.
- 8) Repeat steps 1-7 [TBD] times.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3], with the following exceptions:

MEASUREMENT CONTROL message (step 4):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command (10.3.7.46)	Modify
-Measurement Reporting Mode (10.3.7.49)	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Event trigger
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE <i>Measurement type</i>	Inter-frequency measurement
-Inter-frequency measurement (10.3.7.16)	
-Inter-frequency measurement objects list (10.3.7.13)	
-CHOICE <i>inter-frequency cell removal</i>	No inter-frequency cells removed
-New inter-frequency cells	1
-Inter-frequency cell id	1
-Frequency info (10.3.6.36)	
-CHOICE <i>mode</i>	FDD
-UARFCN uplink (Nu)	Not Present
-UARFCN downlink (Nd)	Same frequency as channel 2
-Cell info (10.3.7.2)	
-Cell individual offset	Not Present
-Reference time difference to cell	Not Present
-Read SFN indicator	False
-CHOICE <i>mode</i>	FDD
-Primary CPICH info	
-Primary scrambling code	Set to Primary scrambling code of Cell2
-Primary CPICH Tx Power	Set to Primary CPICH Tx Power of Cell2 described in Table 8.6.3.1.2
-Tx Diversity Indicator	FALSE
-Cell selection and re-selection info	Not Present
-Cell for measurement	Not Present
-Inter-frequency measurement quantity (10.3.7.18)	
-CHOICE <i>reporting criteria</i>	Inter-frequency reporting criteria
-Filter coefficient (10.3.7.9)	0
-CHOICE <i>mode</i>	FDD
-Measurement quantity for frequency quality estimate	CPICH_Ec/No
-Inter-frequency reporting quantity (10.3.7.21)	
-UTRA carrier RSSI	
-Frequency quality estimate	
-Non frequency related cell reporting quantities (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	FALSE
-Cell identity reporting indicator	FALSE
-CHOICE <i>mode</i>	FDD
-CPICH Ec/No reporting indicator	TRUE
-CPICH RSCP reporting indicator	FALSE
-Pathloss reporting indicator	FALSE
-Reporting cell status (10.3.7.61)	Not Present
-Measurement validity (10.3.7.51)	Not Present
-CHOICE <i>report criteria</i>	Inter-frequency measurement reporting criteria
-Inter-frequency measurement reporting criteria (10.3.7.19)	
-Parameters required for each event	1
-Intra-frequency event identity	Event 2C
-Threshold used frequency	Not Present
-W Used frequency	Not Present
-Hysteresis	0 dB
-Time to trigger	0 ms
-Reporting Cell Status (10.3..61)	
-CHOICE reported cell	Report cells within active and/or monitored set on used frequency or within virtual active and/or monitored set on non-used frequency

Information Element/Group name	Value/Remark
-Maximum number of reported cells	3
-Parameters required for each non-used frequency	
- Threshold non-used frequency	-18
- W non-used frequency	1
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present

MEASUREMENT REPORT message (step 6)

Information Element	Value/remark
Message Type (10.2.17)	
Integrity check info	Not Present
Measurement identity	1
Measured Results (10.3.7.44)	
-CHOICE Measurement	Inter-frequency Measured results list
-Inter-frequency measured results	1
-Frequency info	
-CHOICE mode	FDD
-UARFCN uplink (Nu)	Not Present
-UARFCN downlink (Nd)	Same frequency as channel 2
-UTRA carrier RSSI	Not Present
-Inter-frequency cell measured results	1
-Cell measured results (10.3.7.3)	
-Cell identity	Not Present
-SFN-SFN observed time difference	Not Present
-Cell synchronisation info	Not Present
-CHOICE mode	FDD
-Primary CPICH Info	
-Primary scrambling code	Set to Primary scrambling code of Cell2
-CPICH Ec/No	Checked that this IE is present
-CPICH RSCP	Not Present
-Pathloss	Not Present
Measured results on RACH	Not Present
Additional measured results	Not Present
Event results (10.3.7.7)	
-CHOICE event result	Inter-frequency measurement event results
-Inter-frequency event identity	2C
-Inter-frequency cells	1
-Frequency Info	
-CHOICE mode	FDD
-UARFCN uplink (Nu)	Not Present
-UARFCN downlink (Nd)	Same frequency as channel 2
-CHOICE mode	FDD
-Primary CPICH info	
-Primary Scrambling Code	Set to Primary scrambling code of Cell2

8.6.3.1.5 Test requirements

The UE shall send one Event 2C triggered measurement report for Cell 2 with a measurement reporting delay less than 5040ms 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.

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

8.7 Measurements Performance Requirements

Unless explicitly stated:

- Reported measurements shall be within defined range in 90 % of the cases.

- Measurement channel is 12.2 kbps as defined in annex C, sub-clause C.3.1. This measurement channel is used in active cell and cells to be measured.
- Cell 1 is the active cell.
- Single task reporting.
- Power control is active.

8.7.1 P-CCPCH RSCP

8.7.1.1 Intra frequency measurement accuracy

8.7.1.1.1 Absolute accuracy requirement

8.7.1.1.1.1 Definition and applicability

The absolute accuracy of P-CCPCH RSCP is defined as the P-CCPCH RSCP measured from one cell compared to the actual P-CCPCH RSCP power from the same cell.

The requirements and this test apply to all types of UTRA TDD UE.

8.7.1.1.1.2 Minimum Requirements

The absolute accuracy requirements in table 8.7.1.1.1.1 are valid under the following conditions:

P-CCPCH RSCP \geq -102 dBm.

$$\left(\frac{P - CCPCH - E_c}{I_o} \right)_{in \text{ dB}} \geq -8dB$$

$$\left(\frac{SCH - E_c}{I_o} \right)_{in \text{ dB}} \geq -13dB$$

Table 8.7.1.1.1.1: P-CCPCH_RSCP absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
P-CCPCH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-50

The normative reference for this requirement is TS 25.123 [2] clauses 9.1.1.1.1 and A.9.1.1.1.1.

8.7.1.1.1.3 Test Purpose

The purpose of this test is to verify that the absolute P-CCPCH RSCP measurement accuracy is within the specified limits.

8.7.1.1.1.4 Method of test

8.7.1.1.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are on the same frequency. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. P-CCPCH RSCP intra frequency absolute accuracy requirements are tested by using test parameters in table 8.7.1.1.1.2.

Table 8.7.1.1.1.2: P-CCPCH RSCP intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	0	0	0	0	0
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_offset		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.7		-59.8		-98.7	
Ior/Ioc	dB	5	2	9	2	3	0
PCCPCH RSCP, Note 1	dBm	-73.7	-76.7	-53.8	-60.8	-98.7	-101.7
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

- 1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.1.1.1.2.

8.7.1.1.1.4.2 Procedure

- 1) SS shall transmit MEASUREMENT CONTROL message.
- 2) UE shall transmit periodically MEASUREMENT REPORT messages.
- 3) SS shall check PCCPCH_RSCP value in MEASUREMENT REPORT messages. PCCPCH_RSCP power of Cell 1 reported by UE is compared to actual PCCPCH_RSCP power for each MEASUREMENT REPORT message.
- 4) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 2) and 3) above are repeated. After further 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.1.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 2) and 3) above are repeated.
- 5) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.
- 6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex I, with the following exceptions:

MEASUREMENT CONTROL message (Step 1):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements -RRC transaction identifier -Integrity check info	0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command (10.3.7.46) -Measurement Reporting Mode (10.3.7.49) -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list (10.3.7.1)	1 Modify AM RLC Periodical reporting Not Present
-CHOICE <i>Measurement type</i> -Intra-frequency measurement (10.3.7.36) -Intra-frequency measurement objects list (10.3.7.33) -Intra-frequency measurement quantity (10.3.7.38) -Filter coefficient (10.3.7.9) -CHOICE <i>mode</i> -Measurement quantity list	Intra-frequency measurement Not Present 0 TDD 1
-Measurement quantity	Primary CCPCH RSCP
-Intra-frequency reporting quantity (10.3.7.41)	
-Reporting quantities for active set cells (10.3.7.5) -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE <i>mode</i> -Timeslot ISCP reporting indicator -Primary CCPCH RSCP reporting indicator -Pathloss reporting indicator	No report FALSE TRUE TDD FALSE TRUE FALSE
-Reporting quantities for monitored set cells (10.3.7.5) -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE <i>mode</i> -Timeslot ISCP reporting indicator -Proposed TGSN reporting required -Primary CCPCH RSCP reporting indicator -Pathloss reporting indicator	No report FALSE TRUE TDD FALSE FALSE TRUE FALSE
-Reporting quantities for detected set cells (10.3.7.5)	Not Present
-Reporting cell status (10.3.7.61) -CHOICE <i>reported cell</i> -Maximum number of reported cells -Measurement validity (10.3.7.51) -CHOICE <i>report criteria</i> (10.3.7. -Periodical reporting criteria (10.3.7.53) -Amount of reporting -Reporting interval	Report all active set cells + cells within monitored set on used frequency 1 Not Present Infinity 250 ms
Physical channel information elements -DPCH compressed mode status info (10.3.6.34)	Not Present

8.7.1.1.1.5 Test requirements

The PCCPCH RSCP measurement accuracy shall meet the requirements in clause 8.7.1.1.1.2 for at least 900 of the measurement reports at each input level in step 4.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.1.1.2 Relative accuracy requirement

8.7.1.1.2.1 Definition and applicability

The relative accuracy of PCCPCH RSCP is defined as the PCCPCH RSCP measured from one cell compared to the PCCPCH RSCP measured from another cell on the same frequency.

The requirements and this test apply to all types of UTRA TDD UE.

8.7.1.1.2.2 Minimum Requirements

The relative accuracy requirements in table 8.7.1.1.2.1 are valid under the following conditions:

P-CCPCH RSCP \geq -102 dBm.

$$\left(\frac{P - CCPCH - E_c}{I_o} \right)_{in\ dB} \geq -8dB$$

$$\left(\frac{SCH - E_c}{I_o} \right)_{in\ dB} \geq -13dB$$

$$\left| P - CCPCH\ RSCP1 \Big|_{in\ dB} - P - CCPCH\ RSCP2 \Big|_{in\ dB} \right| \leq 20dB$$

Relative I_o difference [dB] \leq relative RSCP difference [dB]

It is assumed that the measurements of P-CCPCH RSCP1 and P-CCPCH RSCP2 can be performed within 20ms due to slot allocations in the cells concerned.

Table 8.7.1.1.2.1: P-CCPCH_RSCP intra-frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions	
		Normal condition	Extreme condition	Io [dBm]	relative RSCP difference [dB]
P-CCPCH_RSCP	dBm	± 1	± 1	-94...-50	<2
		± 2	± 2		2...14
		± 3	± 3		>14

The normative reference for this requirement is TS 25.123 [2] clauses 9.1.1.1.2 and A.9.1.1.1.1.

8.7.1.1.2.3 Test Purpose

The purpose of this test is to verify that the relative P-CCPCH RSCP measurement accuracy is within the specified limits.

8.7.1.1.2.4 Method of test

8.7.1.1.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are on the same frequency. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. P-CCPCH RSCP intra frequency relative accuracy requirements are tested by using test parameters in table 8.7.1.1.2.

- 1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.1.1.1.2.

8.7.1.1.2.4.2 Procedure

- 1) SS shall transmit MEASUREMENT CONTROL message.
- 2) UE shall transmit periodically MEASUREMENT REPORT messages.
- 3) SS shall check PCCPCH_RSCP value of Cell 1 and Cell 2 in MEASUREMENT REPORT messages. PCCPCH RSCP power value measured from Cell 1 is compared to PCCPCH RSCP power value measured from Cell 2 for each MEASUREMENT REPORT message.
- 4) The result of step 3) is compared to actual power level difference of PCCPCH RSCP of Cell 1 and Cell 2.
- 5) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 3) and 4) above are repeated. After further 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.1.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 3) and 4) above are repeated.
- 6) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.
- 7) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex I, with the following exceptions:

MEASUREMENT CONTROL message for intra frequency measurement in clause 8.7.1.1.1.4.2 shall be used.

8.7.1.1.2.5 Test requirements

The PCCPCH RSCP measurement accuracy shall meet the requirements in clause 8.7.1.1.2.2 for at least 900 of the measurement reports at each input level in step 4.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.1.2 Inter frequency measurement accuracy

8.7.1.2.1 Relative accuracy requirement

8.7.1.2.1.1 Definition and applicability

The P-CCPCH_RSCP inter-frequency relative accuracy is defined as the P-CCPCH_RSCP measured from one cell compared to the P-CCPCH_RSCP measured from another cell on a different frequency.

The requirements and this test apply to all types of UTRA TDD UE.

8.7.1.2.1.2 Minimum Requirements

The relative accuracy requirements in table 8.7.1.2.1.1 are valid under the following conditions:

P-CCPCH RSCP \geq -102 dBm.

$$\left| P - \text{CCPCH RSCP1} \Big|_{in \text{ dB}} - P - \text{CCPCH RSCP2} \Big|_{in \text{ dB}} \right| \leq 20 \text{ dB}$$

$$\left(\frac{P - \text{CCPCH} - E_c}{I_o} \right) \Big|_{in \text{ dB}} \geq -8 \text{ dB}$$

$$\left(\frac{\text{SCH} - E_c}{I_o} \right) \Big|_{in \text{ dB}} \geq -13 \text{ dB}$$

Table 8.7.1.2.1.1: P-CCPCH_RSCP inter-frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm]
P-CCPCH_RSCP	dBm	± 6	± 6	-94...-50

The normative reference for this requirement is TS 25.123 [2] clauses 9.1.1.1.2 and A.9.1.1.

8.7.1.2.1.3 Test Purpose

The purpose of this test is to verify that the relative P-CCPCH RSCP measurement accuracy is within the specified limits for the inter frequency case.

8.7.1.2.1.4 Method of test

8.7.1.2.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case both cells are on different frequencies. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2. P-CCPCH RSCP inter frequency relative accuracy requirements are tested by using test parameters in table 8.7.1.2.1.2.

Table 8.7.1.2.1.2: P-CCPCH RSCP inter frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_offset		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ioc	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.1	-98.7	-97
Ior/Ioc	dB	5	5	7	2	3	0
PCCPCH RSCP, Note 1	dBm	-73.2	-73.2	-54.8	-55.1	-98.7	-100
Io, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: PCCPCH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

- 1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.1.2.1.2.

8.7.1.2.1.4.2 Procedure

- 1) SS shall transmit MEASUREMENT CONTROL message.
- 2) UE shall transmit periodically MEASUREMENT REPORT messages for intra frequency and inter frequency measurements.
- 3) SS shall check PCCPCH_RSCP value of Cell 1 and Cell 2 in MEASUREMENT REPORT messages. PCCPCH RSCP power value measured from Cell 1 is compared to PCCPCH RSCP power value measured from Cell 2 for each MEASUREMENT REPORT message.
- 4) The result of step 3) is compared to actual power level difference of PCCPCH RSCP of Cell 1 and Cell 2.
- 5) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.1.2.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 3) and 4) above are repeated.
- 6) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.
- 7) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex I, with the following exceptions:

First MEASUREMENT CONTROL message for intra frequency measurements (Step 1):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements -RRC transaction identifier -Integrity check info	0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command (10.3.7.46) -Measurement Reporting Mode (10.3.7.49) -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list (10.3.7.1)	1 Modify AM RLC Periodical reporting Not Present
-CHOICE <i>Measurement type</i> -Intra-frequency measurement (10.3.7.36) -Intra-frequency measurement objects list (10.3.7.33) -Intra-frequency measurement quantity (10.3.7.38) -Filter coefficient (10.3.7.9) -CHOICE <i>mode</i> -Measurement quantity list	Intra-frequency measurement Not Present 0 TDD 1
-Measurement quantity	Primary CCPCH RSCP
-Intra-frequency reporting quantity (10.3.7.41)	
-Reporting quantities for active set cells (10.3.7.5) -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE <i>mode</i> -Timeslot ISCP reporting indicator -Primary CCPCH RSCP reporting indicator -Pathloss reporting indicator	No report FALSE FALSE TDD FALSE TRUE FALSE
-Reporting quantities for monitored set cells (10.3.7.5) -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE <i>mode</i> -Timeslot ISCP reporting indicator -Proposed TGSN reporting required -Primary CCPCH RSCP reporting indicator -Pathloss reporting indicator	No report FALSE FALSE TDD FALSE FALSE TRUE FALSE
-Reporting quantities for detected set cells (10.3.7.5)	Not Present
-Reporting cell status (10.3.7.61) -CHOICE <i>reported cell</i> -Maximum number of reported cells -Measurement validity (10.3.7.51) -CHOICE <i>report criteria</i> (10.3.7. -Periodical reporting criteria (10.3.7.53) -Amount of reporting -Reporting interval	Report all active set cells + cells within monitored set on used frequency 1 Not Present Infinity 250 ms
Physical channel information elements -DPCH compressed mode status info (10.3.6.34)	Not Present

Second MEASUREMENT CONTROL message for inter frequency measurements (Step 1):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	2
-Measurement Command (10.3.7.46)	Setup
-Measurement Reporting Mode (10.3.7.49)	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Periodical reporting
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE <i>Measurement type</i>	Inter-frequency measurement
-Inter-frequency measurement (10.3.7.16)	
-Inter-frequency measurement objects list (10.3.7.13)	
-CHOICE <i>inter-frequency cell removal</i>	Not present
-New inter-frequency cells	Cell 2 information is included
-Cell for measurement	Not Present
-Inter-frequency measurement quantity (10.3.7.18)	
-CHOICE <i>reporting criteria</i>	Inter-frequency reporting criteria
-Filter coefficient (10.3.7.9)	0
-CHOICE <i>mode</i>	TDD
-Measurement quantity for frequency quality estimate	Primary CCPCH RSCP
-Inter-frequency reporting quantity (10.3.7.21)	
-UTRA carrier RSSI	FALSE
-Frequency quality estimate	TRUE
-Non frequency related cell reporting quantities (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	FALSE
-Cell identity reporting indicator	FALSE
-CHOICE <i>mode</i>	TDD
-Timeslot ISCP reporting indicator	FALSE
-Proposed TGSN Reporting required	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	FALSE
-Reporting cell status (10.3.7.61)	
-CHOICE reported cell	Report all active set cells + cells within monitored set on used frequency
-Maximum number of reported cells	Virtual/active set cells + 2
-Measurement validity (10.3.7.51)	Not present
-Inter-frequency set update	Not present
-CHOICE <i>report criteria</i> (10.3.7.	
-Periodical reporting criteria (10.3.7.53)	
-Amount of reporting	Infinity
-Reporting interval	500 ms
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present

8.7.1.2.1.5 Test requirements

The PCCPCH RSCP measurement accuracy shall meet the requirements in clause 8.7.1.2.1.2 for at least 900 of the measurement reports at each input level in step 4.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.2 CPICH measurements (FDD)

8.7.2.1 CPICH RSCP

8.7.2.1.1 Absolute measurement accuracy

8.7.2.1.1.1 Definition and applicability

The absolute accuracy of CPICH RSCP is defined as the CPICH RSCP measured in an UTRA FDD cell on one frequency compared to the actual CPICH RSCP power of that cell on the same frequency.

The requirements and this test apply only to UE supporting both UTRA TDD and UTRA FDD.

8.7.2.1.1.2 Minimum Requirements

The accuracy requirements in table 8.7.2.1.1.1 are valid under the following conditions:

- $CPICH_RSCP_{1,2}|_{dBm} \geq -114$ dBm.

$$- \left(\frac{I_o}{\hat{I}_{or}} \right) \Big|_{in\ dB} - \left(\frac{CPICH - E_c}{I_{or}} \right) \Big|_{in\ dB} \leq 20dB .$$

Table 8.7.2.1.1.1: CPICH RSCP inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/ 3.84 MHz]
CPICH_RSCP	dBm	± 6	± 9	-94...-70
	dBm	± 8	± 11	-70...-50

The normative reference for this requirement is TS 25.123 [2] clauses 9.1.1.2.1 and A.9.1.2.1.

8.7.2.1.1.3 Test purpose

The purpose of this test is to verify that the CPICH RSCP absolute measurement accuracy is within the specified limits.

8.7.2.1.1.4 Method of test

8.7.2.1.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case both cells are on different frequencies. Cell 1 is a UTRA TDD cell and cell 2 is a UTRA FDD cell. The DL DPCH shall be transmitted in timeslot 1 and the UL DPCH shall be transmitted in timeslot 3. No second Beacon timeslot shall be provided for cell 1. CPICH RSCP inter frequency absolute accuracy requirements are tested by using test parameters in table 8.7.2.1.1.2.

Table 8.7.2.1.1.2: CPICH RSCP inter frequency tests parameters

Parameter	Unit	Test 1		Test 2	
		Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	n.a.	0	n.a.
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2
CPICH_Ec/Ior	dB	n.a.	-10	n.a.	-10
PCCPCH_Ec/Ior	dB	-3	-12	-3	-12
SCH_Ec/Ior	dB	-9	-12	-9	-12
SCH_t_offset		5	n.a.	5	n.a.
PICH_Ec/Ior	dB	n.a.	-15	n.a.	-15
OCNS_Ec/Ior	dB	-3.12	-0.94	-3.12	-0.94
Ior	dBm/ 3.84 MHz	-57.7	-60	-84.7	-84
Ior/Ior	dB	7	9.54	3	0
PCCPCH RSCP, Note 1	dBm	-53.7	n.a.	-84.7	n.a.
CPICH RSCP, Note 1	dBm	n.a.	-60.46	n.a.	-94
Io, Note 1	dBm/ 3.84 MHz	-50	-50	-80	-81
Propagation condition	-	AWGN		AWGN	
NOTE 1: PCCPCH RSCP, CPICH RSCP and Io levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.					

- 1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.2.1.1.2.

8.7.2.1.1.4.2 Procedure

- 1) SS shall transmit the MEASUREMENT CONTROL message for inter frequency measurement.
- 2) UE shall transmit periodically MEASUREMENT REPORT messages.
- 3) SS shall check CPICH RSCP value of Cell 2 in the MEASUREMENT REPORT messages. CPICH RSCP levels of Cell 2 reported by the UE is compared to the actual CPICH RSCP value of Cell 2 for each MEASUREMENT REPORT message.
- 4) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.2.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 2) and 3) above are repeated.
- 6) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.
- 7) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex I, with the following exceptions:

MEASUREMENT CONTROL message for inter frequency measurement (Step 1):

Information Element	Value/Remark
Message Type	
UE information elements -RRC transaction identifier -Integrity check info	0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command -Measurement Reporting Mode - Measurement Report Transfer Mode - Periodical Reporting / Event Trigger Reporting Mode -Additional measurement list -CHOICE Measurement Type -Inter-frequency measurement object list -CHOICE Inter-frequency cell removal -New inter-frequency cells -Cell for measurement -Inter-frequency measurement quantity -CHOICE reporting criteria -Filter coefficient -CHOICE mode -Measurement quantity for frequency quality estimate -Inter-frequency reporting quantity -UTRA Carrier RSSI -Frequency quality estimate -Non frequency related cell reporting quantities -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE mode -CPICH Ec/N0 reporting indicator -CPICH RSCP reporting indicator -Pathloss reporting indicator -Reporting cell status -CHOICE reported cell -Maximum number of reported cells -Measurement validity -Inter-frequency set update -CHOICE report criteria -Amount of reporting -Reporting interval	2 Setup Acknowledged mode RLC Periodical reporting Not Present Inter-frequency measurement Not Present Cell 2 information is included Not Present Inter-frequency reporting criteria 0 FDD CPICH RSCP FALSE TRUE No report FALSE FALSE FDD FALSE TRUE FALSE Report all active set cells + cells within monitored set on used frequency Virtual/active set cells + 2 Not Present Not Present Periodical reporting criteria Infinity 500 ms
Physical channel information elements -DPCH compressed mode status info	Not Present

8.7.2.1.1.5 Test requirements

The CPICH RSCP measurement accuracy shall meet the requirements in clause 8.7.2.1.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.2.2 CPICH Ec/Io

Void

8.7.3 Timeslot ISCP

8.7.3.1 Intra frequency measurement accuracy

8.7.3.1.1 Absolute accuracy requirement

8.7.3.1.1.1 Definition and applicability

The absolute accuracy of Timeslot ISCP is defined as the Timeslot ISCP measured from one cell / timeslot combination compared to the actual Timeslot ISCP level for the same cell / timeslot combination.

The requirements and this test apply to all types of UTRA TDD UE.

8.7.3.1.1.2 Minimum Requirements

The absolute accuracy requirements in table 8.7.3.1.1.1 are valid under the following conditions:

P-CCPCH RSCP \geq -102 dBm.

$$\left(\frac{P - CCPCH - E_c}{I_o} \right)_{in \text{ dB}} \geq -8dB$$

$$\left(\frac{SCH - E_c}{I_o} \right)_{in \text{ dB}} \geq -13dB$$

Table 8.7.3.1.1.1: Timeslot ISCP intra frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal conditions	Extreme conditions	Io [dBm/ 3.84 MHz]
Timeslot ISCP	dB	± 6	± 9	-105..-74

The normative reference for this requirement is TS 25.123 [2] clauses 9.2.1.2.1.1 and A.9.1.3.

8.7.3.1.1.3 Test Purpose

The purpose of this test is to verify that the Timeslot ISCP measurement accuracy is within the specified limits.

8.7.3.1.1.4 Method of test

8.7.3.1.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are on the same frequency. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for both cell 1 and cell 2. The Timeslot ISCP intra frequency absolute accuracy requirements are tested by using test parameters in table 8.7.3.1.1.2.

Table 8.7.3.1.1.2: Timeslot ISCP intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	0	0	0	0	0
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_t _{offset}		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
I _{oc}	dBm / 3.84 MHz	-75.7		-59.8		-98.7	
I _{or} /I _{oc}	dB	5	2	9	2	3	0
Timeslot ISCP, Note 1	dBm	-73.7	-70.7	-57.8	-50.8	-98.7	-95.7
I _o , Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Timeslot ISCP and I _o levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

- 1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.3.1.1.2.

8.7.3.1.1.4.2 Procedure

- 1) SS shall transmit MEASUREMENT CONTROL message.
- 2) UE shall transmit periodically MEASUREMENT REPORT messages.
- 3) SS shall check Timeslot ISCP values for Cell 1 / Timeslot 0 and Cell 2 / Timeslot 0 combinations in MEASUREMENT REPORT messages. These Timeslot ISCP values reported by the UE are compared to the actual Timeslot ISCP levels for each MEASUREMENT REPORT message.
- 4) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.3.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 2) and 3) above are repeated. After further 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.3.1.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 2) and 3) above are repeated.
- 5) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.
- 6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex I, with the following exceptions:

MEASUREMENT CONTROL message (Step 1):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements -RRC transaction identifier -Integrity check info	0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command (10.3.7.46) -Measurement Reporting Mode (10.3.7.49) -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list (10.3.7.1)	1 Modify AM RLC Periodical reporting Not Present
-CHOICE <i>Measurement type</i> -Intra-frequency measurement (10.3.7.36) -Intra-frequency measurement objects list (10.3.7.33) -CHOICE <i>Intra-frequency cell removal</i> -New intra-frequency cells -Intra-frequency cell id -Cell info -Cell individual offset -Reference time difference to cell -Read SFN indicator -CHOICE <i>mode</i> -Primary CCPCH info (10.3.6.57) -CHOICE <i>mode</i> -CHOICE <i>Sync case</i> -Timeslot -Cell parameters ID -SCTD indicator -Primary CCPCH Tx power -Timeslot number -Burst type -Intra-frequency cell id -Cell info -Cell individual offset -Reference time difference to cell -Read SFN indicator -CHOICE <i>mode</i> -Primary CCPCH info (10.3.6.57) -CHOICE <i>mode</i> -CHOICE <i>Sync case</i> -Timeslot -Cell parameters ID -SCTD indicator -Primary CCPCH Tx power -Timeslot number -Burst type -Intra-frequency measurement quantity (10.3.7.38) -Filter coefficient (10.3.7.9) -CHOICE <i>mode</i> -Measurement quantity list	Intra-frequency measurement Not present 2 1 0 Not present FALSE TDD TDD 2 0 Set to cell parameter ID of cell 1 FALSE Set to Primary CCPCH Tx power of cell 1 as described in Table 8.7.3.1.2. 0 1 2 0 Not present FALSE TDD TDD 2 0 Set to cell parameter ID of cell 2 FALSE Set to Primary CCPCH Tx power of cell 2 as described in Table 8.7.3.1.2. 0 1 0 TDD 1
-Measurement quantity	Timeslot ISCP
-Intra-frequency reporting quantity (10.3.7.41)	
-Reporting quantities for active set cells (10.3.7.5) -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE <i>mode</i> -Timeslot ISCP reporting indicator -Primary CCPCH RSCP reporting indicator -Pathloss reporting indicator	No report FALSE FALSE FALSE TDD TRUE TRUE FALSE
-Reporting quantities for monitored set cells (10.3.7.5) -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator	No report FALSE

Information Element/Group name	Value/Remark
-Cell Identity reporting indicator -CHOICE <i>mode</i> -Timeslot ISCP reporting indicator -Proposed TGSN reporting required -Primary CCPCH RSCP reporting indicator -Pathloss reporting indicator	FALSE TDD TRUE FALSE TRUE FALSE
-Reporting quantities for detected set cells (10.3.7.5)	Not Present
-Reporting cell status (10.3.7.61) -CHOICE <i>reported cell</i> -Maximum number of reported cells -Measurement validity (10.3.7.51) -CHOICE <i>report criteria</i> (10.3.7. -Periodical reporting criteria (10.3.7.53) -Amount of reporting -Reporting interval	Report all active set cells + cells within monitored set on used frequency Virtual / active set cells + 1 Not Present Infinity 500 ms
Physical channel information elements -DPCH compressed mode status info (10.3.6.34)	Not Present

8.7.3.1.1.5 Test requirements

The Timeslot ISCP measurement accuracy shall meet the requirements in clause 8.7.3.1.1.2 for at least 900 of the reported Timeslot ISCP levels at each input level in step 4 for both Cell 1 / Timeslot 0 and Cell 2 / Timeslot 0 combinations.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.4 UTRA carrier RSSI

8.7.4.1 Absolute measurement accuracy

8.7.4.1.1 Definition and applicability

The absolute accuracy of UTRA carrier RSSI is defined as the UTRA carrier RSSI measured from one frequency compared to the actual UTRA carrier RSSI power of that same frequency.

The requirements and this test apply to all types of UTRA TDD UE.

8.7.4.1.2 Minimum Requirements

Table 8.7.4.1.1: UTRA carrier RSSI inter frequency absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions I ₀ [dBm/ 3.84 MHz]
		Normal condition	Extreme condition	
UTRA carrier RSSI	dBm	± 4	± 7	-94...-70
	dBm	± 6	± 9	-70...-50

The normative reference for this requirement is TS 25.123 [2] clause 9.1.1.4.

8.7.4.1.3 Test Purpose

The purpose of this test is to verify that the UTRA carrier RSSI measurement accuracy is within the specified limits.

8.7.4.1.4 Method of test

8.7.4.1.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case both cells are on different frequencies. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2. UTRA carrier RSSI absolute accuracy requirements are tested by using test parameters in table 8.7.4.1.2.

Table 8.7.4.1.2: UTRA carrier RSSI inter frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_offset		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ior	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.1	-98.7	-97
Ior/Ior	dB	5	5	7	2	3	0
Ior, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Ior levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

- 1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.4.1.2.

8.7.4.1.4.2 Procedure

- 1) SS shall transmit the MEASUREMENT CONTROL message for inter frequency measurements.
- 2) UE shall transmit periodically the MEASUREMENT REPORT messages.
- 3) SS shall check UTRA carrier RSSI value of Channel 2 in MEASUREMENT REPORT messages. UTRA carrier RSSI power of Channel 2 reported by UE is compared to actual UTRA carrier RSSI value of Channel 2 for each MEASUREMENT REPORT message.
- 4) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.4.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, step 2) and 3) above are repeated. After further 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.4.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 2) and 3) above are repeated.
- 5) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.
- 6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex I, with the following exceptions:

MEASUREMENT CONTROL message for inter frequency measurement (Step 1):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	2
-Measurement Command (10.3.7.46)	Setup
-Measurement Reporting Mode (10.3.7.49)	AM RLC
-Measurement Report Transfer Mode	Periodical reporting
-Periodical Reporting / Event Trigger Reporting Mode	Not Present
-Additional measurements list (10.3.7.1)	
-CHOICE <i>Measurement type</i>	Inter-frequency measurement
-Inter-frequency measurement (10.3.7.16)	
-Inter-frequency measurement objects list (10.3.7.13)	
-CHOICE <i>inter-frequency cell removal</i>	Not present
-New inter-frequency cells	Cell 2 information is included
-Cell for measurement	Not Present
-Inter-frequency measurement quantity (10.3.7.18)	
-CHOICE <i>reporting criteria</i>	Inter-frequency reporting criteria
-Filter coefficient (10.3.7.9)	0
-CHOICE <i>mode</i>	TDD
-Measurement quantity for frequency quality estimate	Primary CCPCH RSCP
-Inter-frequency reporting quantity (10.3.7.21)	
-UTRA carrier RSSI	TRUE
-Frequency quality estimate	TRUE
-Non frequency related cell reporting quantities (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	FALSE
-Cell identity reporting indicator	FALSE
-CHOICE mode	TDD
-Timeslot ISCP reporting indicator	FALSE
-Proposed TGSN Reporting required	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	FALSE
-Reporting cell status (10.3.7.61)	
-CHOICE reported cell	Report all active set cells + cells within monitored set on used frequency
-Maximum number of reported cells	Virtual/active set cells + 2
-Measurement validity (10.3.7.51)	Not present
-Inter-frequency set update	Not present
-CHOICE <i>report criteria</i> (10.3.7.	
-Periodical reporting criteria (10.3.7.53)	
-Amount of reporting	Infinity
-Reporting interval	500 ms
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present

8.7.4.1.5 Test requirements

The UTRA carrier RSSI absolute measurement accuracy shall meet the requirements in clause 8.7.4.1.2. The effect of assumed thermal noise and noise generated in the receiver (−99 dBm) shall be added into the required accuracy defined in subclause 8.7.4.1.2 as shown in table 8.7.4.1.3.

Table 8.7.4.1.3: UTRA carrier RSSI absolute accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	I _o [dBm/3.84 MHz]
UTRA carrier RSSI	dBm	-4...5.2	-7...8.2	-94...-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

The normative reference for this requirement is TS 25.123 [2] clause A.9.1.4.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.4.2 Relative measurement accuracy

8.7.4.2.1 Definition and applicability

The relative accuracy requirement is defined as the UTRA carrier RSSI measured from one frequency compared to the UTRA Carrier RSSI measured from another frequency.

The requirements and this test apply to all types of UTRA TDD UE.

8.7.4.2.2 Minimum Requirements

The accuracy requirements in table 8.7.4.2.1 are valid under the following condition:

$$| \text{Channel 1_Io}|_{\text{dBm/3.84 MHz}} - \text{Channel 2_Io}|_{\text{dBm/3.84 MHz}} | < 20 \text{ dB.}$$

Table 8.7.4.2.1: UTRA carrier RSSI inter frequency relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	I _o [dBm/3.84 MHz]
UTRA carrier RSSI	dBm	± 7	± 11	-94...-50

The normative reference for this requirement is TS 25.123 [2] clause 9.1.1.4.

8.7.4.2.3 Test Purpose

The purpose of this test is to verify that the UTRA carrier RSSI measurement accuracy is within the specified limits.

8.7.4.2.4 Method of test

8.7.4.2.4.1 Initial conditions

Test environment: normal, TL/VL, TL/VH, TH/VL, TH/VH; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case both cells are on different frequencies. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2. UTRA carrier RSSI absolute accuracy requirements are tested by using test parameters in table 8.7.4.1.2.

- 1) A call is set up according to the test procedure specified in TS 34.108 [3] clause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.4.1.2.

8.7.4.2.4.2 Procedure

- 1) SS shall transmit the MEASUREMENT CONTROL message for Inter-frequency measurements.
- 2) UE shall transmit periodically the MEASUREMENT REPORT messages.
- 3) SS shall check UTRA carrier RSSI value of Channel 2 in MEASUREMENT REPORT messages. UTRA carrier RSSI power of Channel 2 reported by UE is compared to actual UTRA carrier RSSI value of Channel 2 for each MEASUREMENT REPORT message.
- 4) SS shall count number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.4.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated. After further 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.4.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, step 3) above is repeated.
- 5) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.
- 6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex I, with the following exceptions:

MEASUREMENT CONTROL message for inter frequency measurements in clause 8.7.4.1.4.2 is used.

8.7.4.2.5 Test requirements

The UTRA carrier RSSI absolute measurement accuracy shall meet the requirements in clause 8.7.4.2.2. The effect of assumed thermal noise and noise generated in the receiver (-99 dBm) shall be added into the required accuracy defined in subclause 8.7.4.2.2 as shown in table 8.7.4.2.2.

Table 8.7.4.2.2: UTRA carrier RSSI relative accuracy

Parameter	Unit	Accuracy [dB]		Conditions
		Normal condition	Extreme condition	Io [dBm/3.84 MHz]
UTRA carrier RSSI	dBm	-4...5.2	-7...8.2	-94...-87
	dBm	± 4	± 7	-87...-70
	dBm	± 6	± 9	-70...-50

The normative reference for this requirement is TS 25.123 [2] clause A.9.1.4.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.5 GSM carrier RSSI

Void

8.7.6 SIR

Void

8.7.7 Transport Channel BLER

Void

8.7.8 SFN-SFN observed time difference

8.7.8.1 SFN-SFN observed time difference type 1

8.7.8.1.1 Measurement accuracy

8.7.8.1.1.1 Definition and applicability

This measurement is specified in clause 5.1.10 of TS 25.225 [22]. The reference point for the SFN-SFN observed time difference type 1 shall be the antenna connector of the UE.

The requirements and this test apply to all types of UTRA TDD UE.

8.7.8.1.1.2 Minimum requirements

The accuracy requirement in table 8.7.8.1.1.1 is valid under the following conditions:

$P\text{-CCPCH_RSCP}_{1,2} \geq -102 \text{ dBm}$.

$$\left| P\text{-CCPCH_RSCP}_1 \Big|_{in \text{ dBm}} - P\text{-CCPCH_RSCP}_2 \Big|_{in \text{ dBm}} \right| \leq 20 \text{ dB}$$

$$\left(\frac{P\text{-CCPCH} - E_c}{I_o} \right) \Big|_{in \text{ dB}} \geq -8 \text{ dB}$$

$$\left(\frac{SCH - E_c}{I_o} \right) \Big|_{in \text{ dB}} \geq -13 \text{ dB}$$

where the received P-CCPCH E_c/I_o is defined as,

$$\left(\frac{P\text{-CCPCH} - E_c}{I_o} \right) \Big|_{in \text{ dB}} = \left(\frac{P\text{-CCPCH} - E_c}{I_{or}} \right) \Big|_{in \text{ dB}} - \left(\frac{I_o}{\hat{I}_{or}} \right) \Big|_{in \text{ dB}}$$

and the received SCH E_c/I_o is defined as,

$$\left(\frac{SCH - E_c}{I_o} \right) \Big|_{in \text{ dB}} = \left(\frac{SCH - E_c}{I_{or}} \right) \Big|_{in \text{ dB}} - \left(\frac{I_o}{\hat{I}_{or}} \right) \Big|_{in \text{ dB}}$$

and SCH_E_c/I_{or} is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided.

Table 8.7.8.1.1.1: SFN-SFN observed time difference type 1 accuracy

Parameter	Unit	Accuracy [chip]	Conditions
			I_o [dBm/3.84 MHz]
SFN-SFN observed time difference type 1	chip	+/-0,5	-94...-50

The normative reference for this requirement is TS 25.123 [2] clause 9.1.1.8 and A.9.1.8.

8.7.8.1.1.3 Test purpose

The purpose of this test is to verify that the measurement accuracy of SFN-SFN observed time difference type 1 is within the limit specified in clause 8.7.8.1.1.2.

8.7.8.1.1.4 Method of test

8.7.8.1.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are on the same frequency. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2. During the test, the timing difference between cell 1 and cell 2 can be set to any value from 0...9830400 chip. The SFN-SFN observed time difference type 1 accuracy requirements in the intra-frequency case are tested by using test parameters in Table 8.7.8.1.1.2.

Table 8.7.8.1.1.2: SFN-SFN observed time difference type 1 intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/lor	dB	-3		-3		-3	
SCH_Ec/lor	dB	-9		-9		-9	
SCH _{offset}		0	5	0	5	0	5
OCNS_Ec/lor	dB	-3,12		-3,12		-3,12	
lor	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
lor/lor	dB	5	5	7	3	3	3
lor, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: lor levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

- 1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.8.1.1.2.

8.7.8.1.1.4.2 Procedure

- 1) SS shall transmit the MEASUREMENT CONTROL message.
- 2) UE shall transmit periodically MEASUREMENT REPORT messages.
- 3) SS shall check "SFN-SFN observed time difference type 1" value in MEASUREMENT REPORT message. The reported value shall be compared to the actually set SFN-SFN observed time difference type 1 value for each MEASUREMENT REPORT message.
- 4) SS shall count the number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.8.1.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 2) and 3) above are repeated. After further 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.8.1.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 2) and 3) above are repeated.

- 5) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.
- 6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex I, with the following exceptions:

MEASUREMENT CONTROL message (Step 1):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	1
-Measurement Command (10.3.7.46)	Modify
-Measurement Reporting Mode (10.3.7.49)	
-Measurement Report Transfer Mode	AM RLC
-Periodical Reporting / Event Trigger Reporting Mode	Periodical reporting
-Additional measurements list (10.3.7.1)	Not Present
-CHOICE <i>Measurement type</i>	Intra-frequency measurement
-Intra-frequency measurement (10.3.7.36)	
-Intra-frequency measurement objects list (10.3.7.33)	Not Present
-Intra-frequency measurement quantity (10.3.7.38)	
-Filter coefficient (10.3.7.9)	0
-CHOICE <i>mode</i>	TDD
-Measurement quantity list	1
-Measurement quantity	Primary CCPCH RSCP
-Intra-frequency reporting quantity (10.3.7.41)	
-Reporting quantities for active set cells (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	Type 1
-Cell synchronisation information reporting indicator	FALSE
-Cell Identity reporting indicator	FALSE
-CHOICE <i>mode</i>	TDD
-Timeslot ISCP reporting indicator	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting quantities for monitored set cells (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	Type 1
-Cell synchronisation information reporting indicator	FALSE
-Cell Identity reporting indicator	FALSE
-CHOICE <i>mode</i>	TDD
-Timeslot ISCP reporting indicator	FALSE
-Proposed TGSN reporting required	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	TRUE
-Reporting quantities for detected set cells (10.3.7.5)	Not Present
-Reporting cell status (10.3.7.61)	
-CHOICE <i>reported cell</i>	
-Maximum number of reported cells	Report all active set cells + cells within monitored set on used frequency
-Measurement validity (10.3.7.51)	Virtual/active set cells + 2
-CHOICE <i>report criteria</i> (10.3.7.	Not Present
-Periodical reporting criteria (10.3.7.53)	
-Amount of reporting	Infinity
-Reporting interval	250 ms
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present

8.7.8.1.1.5 Test requirements

The SFN-SFN observed time difference type 1 accuracy shall meet the requirements in clause 8.7.8.1.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.8.2 SFN-SFN observed time difference type 2

Void

8.7.9 Observed time difference to GSM cell

Void

8.7.10 UE GPS Timing of Cell Frames for UP

Void

8.7.11 SFN-CFN observed time difference

8.7.11.1 Intra frequency measurement requirement

8.7.11.1.1 Definition and applicability

The intra frequency SFN-CFN observed time difference is defined as the SFN-CFN observed time difference from the active cell to a neighbour cell that is in the same frequency. This measurement is specified in clause 5.1.11 of TS 25.225 [22]. The reference point for the SFN-CFN observed time difference shall be the antenna connector of the UE.

The requirements and this test apply to all types of UTRA TDD UE.

8.7.11.1.2 Minimum requirements

The accuracy requirement in table 8.7.11.1.1 is valid under the following conditions:

$P\text{-CCPCH_RSCP}_{1,2} \geq -102 \text{ dBm}$.

$$\left| P\text{-CCPCH_RSCP}_1 \Big|_{in \text{ dBm}} - P\text{-CCPCH_RSCP}_2 \Big|_{in \text{ dBm}} \right| \leq 20 \text{ dB}$$

$$\left(\frac{P\text{-CCPCH_}E_c}{I_o} \right) \Big|_{in \text{ dB}} \geq -8 \text{ dB}$$

$$\left(\frac{SCH_}E_c}{I_o} \right) \Big|_{in \text{ dB}} \geq -13 \text{ dB}$$

where the received P-CCPCH E_c/I_o is defined as,

$$\left(\frac{P\text{-CCPCH_}E_c}{I_o} \right) \Big|_{in \text{ dB}} = \left(\frac{P\text{-CCPCH_}E_c}{I_{or}} \right) \Big|_{in \text{ dB}} - \left(\frac{I_o}{\hat{I}_{or}} \right) \Big|_{in \text{ dB}}$$

and the received SCH E_c/I_o is defined as,

$$\left(\frac{SCH - E_c}{I_o} \right) \Big|_{in \text{ dB}} = \left(\frac{SCH - E_c}{I_{or}} \right) \Big|_{in \text{ dB}} - \left(\frac{I_o}{\hat{I}_{or}} \right) \Big|_{in \text{ dB}}$$

and SCH_Ec/I_{or} is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided.

Table 8.7.11.1.1: SFN-CFN observed time difference accuracy for an intra frequency UTRA TDD neighbour cell

Parameter	Unit	Accuracy [chip]	Conditions
			I_o [dBm/3.84 MHz]
SFN-CFN observed time difference	chip	+/-0,5	-94...-50

The normative reference for this requirement is TS 25.123 [2] clause 9.1.1.11 and A.9.1.10.

8.7.11.1.3 Test Purpose

The purpose of this test is to verify that the measurement accuracy of SFN-CFN observed time difference is within the limit specified in clause 8.7.11.1.2.

8.7.11.1.4 Method of test

8.7.11.1.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case all cells are on the same frequency. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2. During the test, the timing difference between cell 1 and cell 2 can be set to any value from 0...255 frames. The SFN-CFN observed time difference accuracy requirements in the intra-frequency case are tested by using test parameters in Table 8.7.11.1.2.

Table 8.7.11.1.2: SFN-CFN observed time difference intra frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1		Channel 1		Channel 1	
PCCPCH_Ec/I _{or}	dB	-3		-3		-3	
SCH_Ec/I _{or}	dB	-9		-9		-9	
SCH _{offset}		0	5	0	5	0	5
OCNS_Ec/I _{or}		-3,12		-3,12		-3,12	
I _{oc}	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
\hat{I}_{or}/I_{oc}	dB	5	5	7	3	3	3
I _o , Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: I _o levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

- 1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.11.1.2.

8.7.11.1.4.2 Procedure

- 1) SS shall transmit the MEASUREMENT CONTROL message.
- 2) UE shall transmit periodically MEASUREMENT REPORT messages.
- 3) SS shall check "OFF" and "Tm" values in MEASUREMENT REPORT message and calculate SFN-CFN observed time difference value according to the definition in clause 5.1.11 of TS 25.225 [22]. This value shall be compared to the actually set SFN-CFN observed time difference value for each MEASUREMENT REPORT message.
- 4) SS shall count the number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.11.1.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 2) and 3) above are repeated. After further 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.11.1.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 2) and 3) above are repeated.
- 5) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.
- 6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex I, with the following exceptions:

MEASUREMENT CONTROL message (Step 1):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements -RRC transaction identifier -Integrity check info	0 Not Present
Measurement Information elements -Measurement Identity -Measurement Command (10.3.7.46) -Measurement Reporting Mode (10.3.7.49) -Measurement Report Transfer Mode -Periodical Reporting / Event Trigger Reporting Mode -Additional measurements list (10.3.7.1)	1 Modify AM RLC Periodical reporting Not Present
-CHOICE <i>Measurement type</i> -Intra-frequency measurement (10.3.7.36) -Intra-frequency measurement objects list (10.3.7.33) -Intra-frequency measurement quantity (10.3.7.38) -Filter coefficient (10.3.7.9) -CHOICE <i>mode</i> -Measurement quantity list	Intra-frequency measurement Not Present 0 TDD 1
-Measurement quantity	Primary CCPCH RSCP
-Intra-frequency reporting quantity (10.3.7.41)	
-Reporting quantities for active set cells (10.3.7.5) -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE <i>mode</i> -Timeslot ISCP reporting indicator -Primary CCPCH RSCP reporting indicator -Pathloss reporting indicator	No report TRUE TRUE TDD FALSE TRUE TRUE
-Reporting quantities for monitored set cells (10.3.7.5) -SFN-SFN observed time difference reporting indicator -Cell synchronisation information reporting indicator -Cell Identity reporting indicator -CHOICE <i>mode</i> -Timeslot ISCP reporting indicator -Proposed TGSN reporting required -Primary CCPCH RSCP reporting indicator -Pathloss reporting indicator	No report TRUE TRUE TDD FALSE FALSE TRUE TRUE
-Reporting quantities for detected set cells (10.3.7.5)	Not Present
-Reporting cell status (10.3.7.61) -CHOICE <i>reported cell</i> -Maximum number of reported cells -Measurement validity (10.3.7.51) -CHOICE <i>report criteria</i> (10.3.7. -Periodical reporting criteria (10.3.7.53) -Amount of reporting -Reporting interval	Report all active set cells + cells within monitored set on used frequency Virtual/active set cells + 2 Not Present Infinity 250 ms
Physical channel information elements -DPCH compressed mode status info (10.3.6.34)	Not Present

8.7.11.1.5 Test requirements

The SFN-CFN observed time difference accuracy shall meet the requirements in clause 8.7.11.1.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.11.2 Inter frequency measurement requirement

8.7.11.2.1 Definition and applicability

The inter frequency SFN-CFN observed time difference is defined as the SFN-CFN time difference from the active cell to a UTRA TDD neighbour cell that is in a different frequency. This measurement is specified in clause 5.1.11 of TS 25.225 [22]. The reference point for the SFN-CFN observed time difference shall be the antenna connector of the UE.

The requirements and this test apply to all types of UTRA TDD UE.

8.7.11.2.2 Minimum requirements

The accuracy requirement in table 8.7.11.2.1 is valid under the following conditions:

P-CCPCH_RSCP1,2 ≥ -102 dBm..

$$\left| P\text{-CCPCH RSCP1} \Big|_{in\ dBm} - P\text{-CCPCH RSCP2} \Big|_{in\ dBm} \right| \leq 20dB$$

$$\left(\frac{P\text{-CCPCH}_E_c}{I_o} \right) \Big|_{in\ dB} \geq -8dB$$

$$\left(\frac{SCH}_E_c}{I_o} \right) \Big|_{in\ dB} \geq -13dB$$

where the received P-CCPCH Ec/Io is defined as,

$$\left(\frac{P\text{-CCPCH}_E_c}{I_o} \right) \Big|_{in\ dB} = \left(\frac{P\text{-CCPCH}_E_c}{I_{or}} \right) \Big|_{in\ dB} - \left(\frac{I_o}{\hat{I}_{or}} \right) \Big|_{in\ dB}$$

and the received SCH Ec/Io is defined as,

$$\left(\frac{SCH}_E_c}{I_o} \right) \Big|_{in\ dB} = \left(\frac{SCH}_E_c}{I_{or}} \right) \Big|_{in\ dB} - \left(\frac{I_o}{\hat{I}_{or}} \right) \Big|_{in\ dB}$$

and SCH_Ec/Ior is equally divided between primary synchronisation code and the sum of all secondary synchronisation codes, where the secondary synchronisation codes are also equally divided.

Table 8.7.11.2.1: SFN-CFN observed time difference accuracy for an inter frequency UTRA TDD neighbour cell

Parameter	Unit	Accuracy [chip]	Conditions
			Io [dBm/3.84 MHz]
SFN-CFN observed time difference	chip	+/-0,5	-94...-50

The normative reference for this requirement is TS 25.123 [2] clause 9.1.1.11 and A.9.1.10.

8.7.11.2.3 Test purpose

The purpose of this test is to verify that the measurement accuracy of SFN-CFN observed time difference is within the limit specified in clause 8.7.11.2.2.

8.7.11.2.4 Method of test

8.7.11.2.4.1 Initial conditions

Test environment: normal; see clauses G.2.1 and G.2.2.

Frequencies to be tested: mid range; see clause G.2.4.

In this case, UTRA TDD cell 1 and UTRA TDD cell 2 are on different frequencies. Cell 1 and cell 2 shall be synchronised, i.e. share the same frame and timeslot timing. The DL DPCH shall be transmitted in timeslot 4 and the UL DPCH shall be transmitted in timeslot 12. The second Beacon timeslot shall be provided in timeslot 8 for cell 1 and in timeslot 10 for cell 2. During the test, the timing difference between cell 1 and cell 2 can be set to any value from 0...256 frames. The SFN-CFN observed time difference accuracy requirements in the intra-frequency case are tested by using test parameters in Table 8.7.11.2.2.

Table 8.7.11.2.2: SFN-CFN observed time difference inter frequency test parameters

Parameter	Unit	Test 1		Test 2		Test 3	
		Cell 1	Cell 2	Cell 1	Cell 2	Cell 1	Cell 2
DL timeslot number		0	2	0	2	0	2
UTRA RF Channel number		Channel 1	Channel 2	Channel 1	Channel 2	Channel 1	Channel 2
PCCPCH_Ec/Ior	dB	-3		-3		-3	
SCH_Ec/Ior	dB	-9		-9		-9	
SCH_toffset		0	5	0	5	0	5
OCNS_Ec/Ior	dB	-3,12		-3,12		-3,12	
Ior	dBm / 3.84 MHz	-75.2	-75.2	-57.8	-54.7	-98.7	-98.7
Ior/Ior	dB	5	5	7	3	3	3
Ior, Note 1	dBm / 3.84 MHz	-69		-50		-94	
Propagation condition		AWGN		AWGN		AWGN	
NOTE 1: Ior levels have been calculated from other parameters for information purposes. They are not settable parameters themselves.							

- 1) A call is set up according to the test procedure specified in TS 34.108 [3] subclause 7.3.2.3. The RF parameters for Test 1 are set up according to table 8.7.11.2.2.

8.7.11.2.4.2 Procedure

- 1) SS shall transmit the MEASUREMENT CONTROL message.
- 2) UE shall transmit periodically MEASUREMENT REPORT messages.
- 3) SS shall check "OFF" and "Tm" values in MEASUREMENT REPORT message and calculate SFN-CFN observed time difference value according to the definition in clause 5.1.11 of TS 25.225 [22]. This value shall be compared to the actually set SFN-CFN observed time difference value for each MEASUREMENT REPORT message.
- 4) SS shall count the number of MEASUREMENT REPORT messages transmitted by UE. After 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.11.2.2 for Test 2. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 2) and 3) above are repeated. After further 1000 MEASUREMENT REPORT messages have been received from UE, the RF parameters are set up according to table 8.7.11.2.2 for Test 3. While RF parameters are being set up, MEASUREMENT REPORT messages from UE are ignored. SS shall wait for additional 1s and ignore the MEASUREMENT REPORT messages during this period. Then, steps 2) and 3) above are repeated.
- 5) After further 1000 MEASUREMENT REPORT messages have been received from UE, the SS shall transmit RRC CONNECTION RELEASE message.
- 6) UE shall transmit RRC CONNECTION RELEASE COMPLETE message.

Specific Message Contents

All messages indicated above shall use the same content as described in the default message content in clause 9 of 34.108 [3] and in Annex I, with the following exceptions:

MEASUREMENT CONTROL message for inter frequency measurements (Step 1):

Information Element/Group name	Value/Remark
Message Type (10.2.17)	
UE information elements	
-RRC transaction identifier	0
-Integrity check info	Not Present
Measurement Information elements	
-Measurement Identity	2
-Measurement Command (10.3.7.46)	Setup
-Measurement Reporting Mode (10.3.7.49)	AM RLC
-Measurement Report Transfer Mode	Periodical reporting
-Periodical Reporting / Event Trigger Reporting Mode	Not Present
-Additional measurements list (10.3.7.1)	
-CHOICE <i>Measurement type</i>	Inter-frequency measurement
-Inter-frequency measurement (10.3.7.16)	
-Inter-frequency measurement objects list (10.3.7.13)	
-CHOICE <i>inter-frequency cell removal</i>	Not present
-New inter-frequency cells	Cell 2 information is included
-Cell for measurement	Not Present
-Inter-frequency measurement quantity (10.3.7.18)	
-CHOICE <i>reporting criteria</i>	Inter-frequency reporting criteria
-Filter coefficient (10.3.7.9)	0
-CHOICE <i>mode</i>	TDD
-Measurement quantity for frequency quality estimate	Primary CCPCH RSCP
-Inter-frequency reporting quantity (10.3.7.21)	
-UTRA carrier RSSI	FALSE
-Frequency quality estimate	TRUE
-Non frequency related cell reporting quantities (10.3.7.5)	
-SFN-SFN observed time difference reporting indicator	No report
-Cell synchronisation information reporting indicator	TRUE
-Cell identity reporting indicator	TRUE
-CHOICE mode	TDD
-Timeslot ISCP reporting indicator	FALSE
-Proposed TGSN Reporting required	FALSE
-Primary CCPCH RSCP reporting indicator	TRUE
-Pathloss reporting indicator	FALSE
-Reporting cell status (10.3.7.61)	
-CHOICE reported cell	Report all active set cells + cells within monitored set on used frequency
-Maximum number of reported cells	Virtual/active set cells + 2
-Measurement validity (10.3.7.51)	Not present
-Inter-frequency set update	Not present
-CHOICE <i>report criteria</i> (10.3.7.	
-Periodical reporting criteria (10.3.7.53)	
-Amount of reporting	Infinity
-Reporting interval	500 ms
Physical channel information elements	
-DPCH compressed mode status info (10.3.6.34)	Not Present

8.7.11.2.5 Test requirements

The SFN-CFN observed time difference accuracy shall meet the requirements in clause 8.7.11.2.2.

NOTE: If the above Test Requirement differs from the Minimum Requirement then the Test Tolerance applied for this test is non-zero. The Test Tolerance for this test is defined in clause F.2 and the explanation of how the Minimum Requirement has been relaxed by the Test Tolerance is given in clause F.4.

8.7.12 UE transmitted power

Void

Annex A (informative): Connection Diagrams

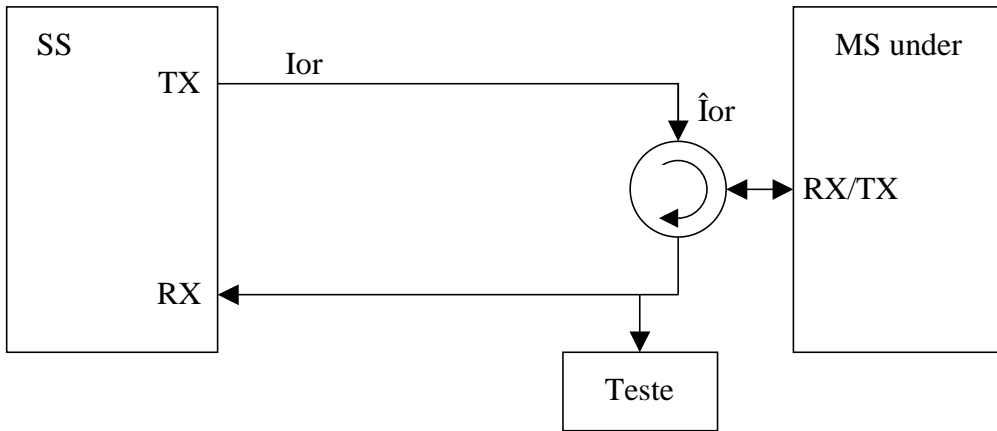


Figure A.1: Connection for Basic TX Test

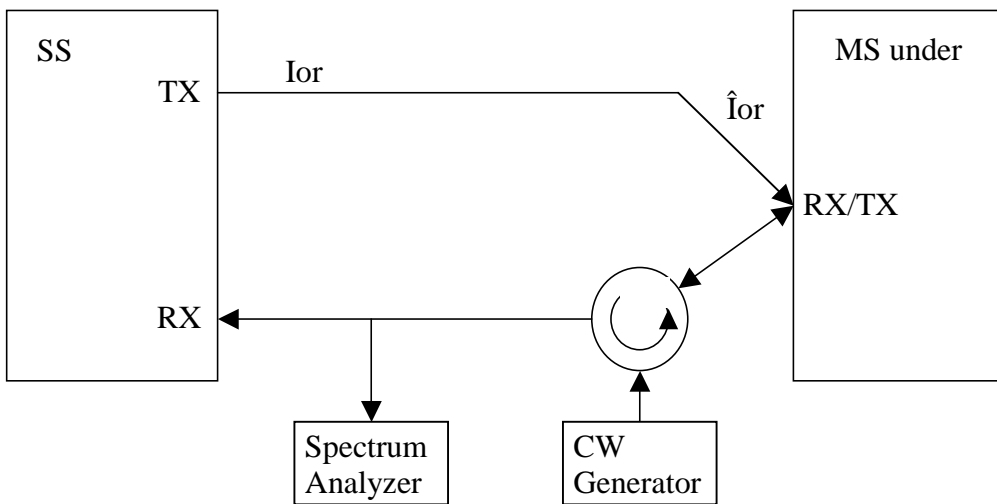


Figure A.2: Connection for TX Intermodulation Test

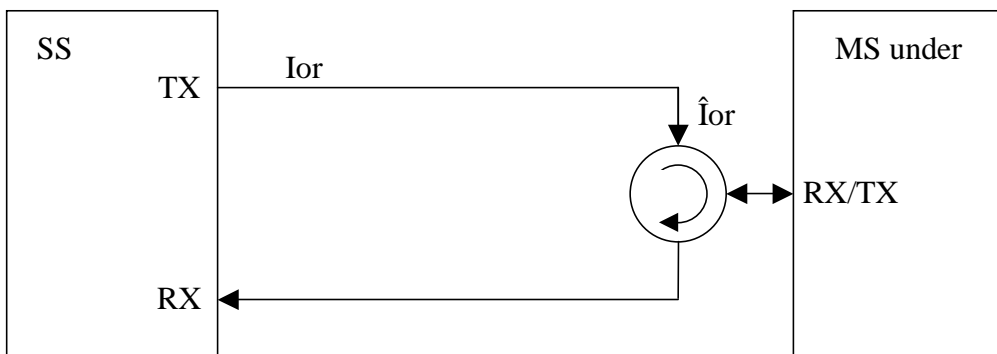


Figure A.3: Connection for Basic RX Test

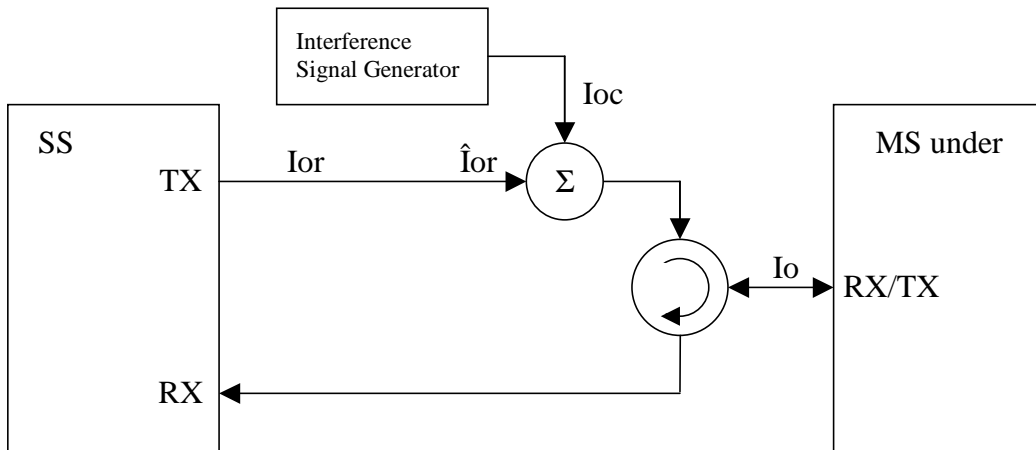


Figure A.4: Connection for RX Test with Interference

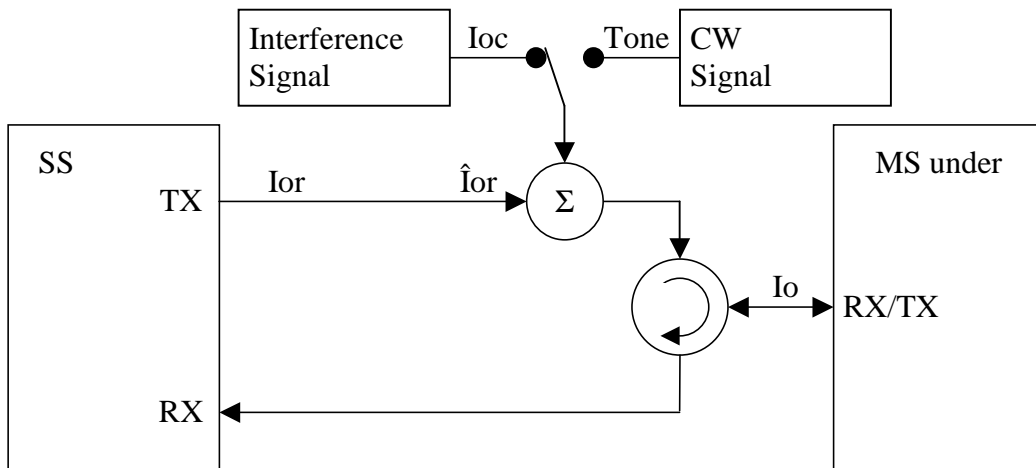


Figure A.5: Connection for RX Test with Interference or additional CW

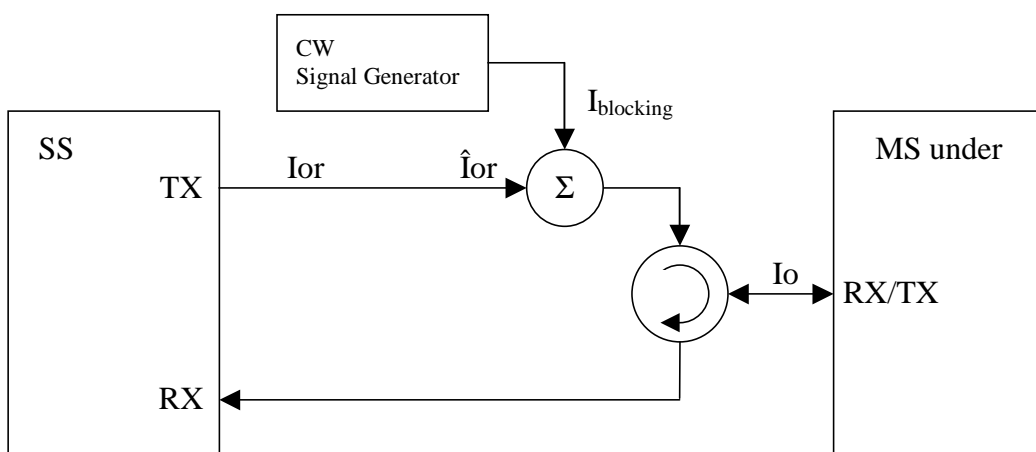


Figure A.6: Connection for RX Test with additional CW

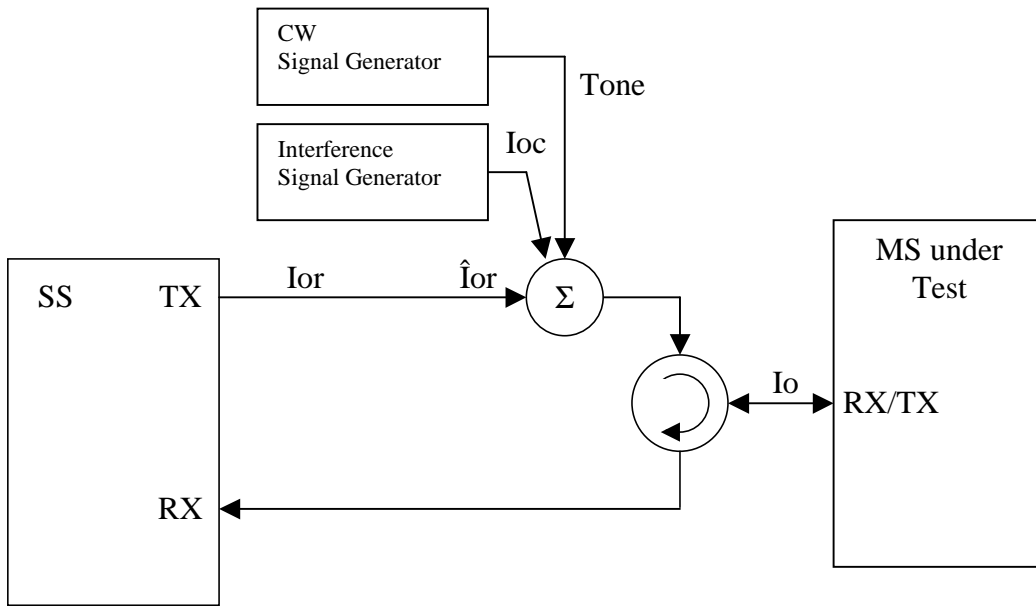


Figure A.7: Connection for RX Test with both Interference and additional CW



Figure A.8: Connection for Spurious Emission Test

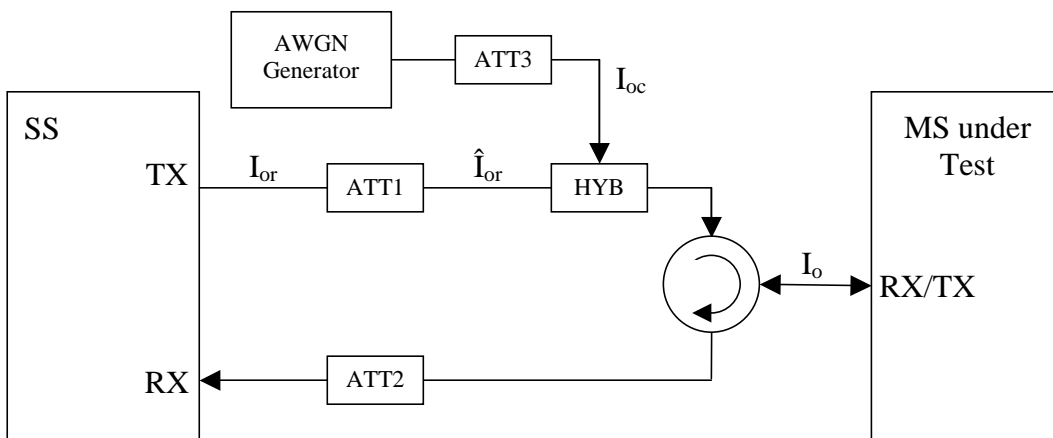


Figure A.9: Connection for Static Channel Test

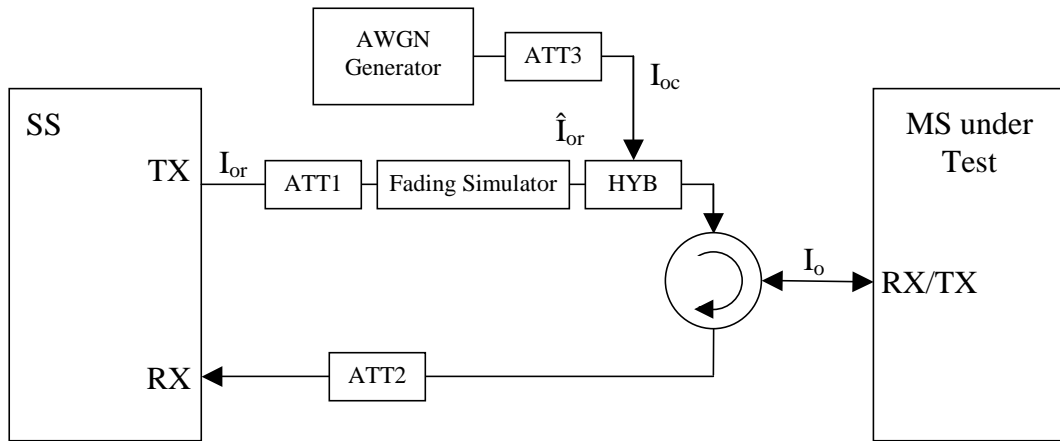


Figure A.10: Connection for Multiple Fading Channel Test

Annex B (normative): Global In-Channel TX-Test

B.1 General

The global in-channel Tx test enables the measurement of all relevant parameters that describe the in-channel quality of the output signal of the Tx under test in a single measurement process.

The parameters describing the in-channel quality of a transmitter, however, are not necessarily independent. The algorithm chosen for description inside this annex places particular emphasis on the exclusion of all interdependencies among the parameters. Any other algorithm (e.g. having better computational efficiency) may be applied, as long as the results are the same within the accuracy limits.

All notes referred in the various clauses of B.2 are put together in B.3.

B.2 Definition of the process

B.2.1 Basic principle

The process is based on the comparison of the actual **output signal of the TX under test**, received by an ideal receiver, with a **reference signal**, that is generated by the measuring equipment and represents an ideal error free received signal. The reference signal shall be composed of the same number of codes at the correct spreading factors as contained in the test signal. Note, for simplification, the notation below assumes only codes of one spreading factor although the algorithm is valid for signals containing multiple spreading factors.

All signals are represented as equivalent (generally complex) baseband signals.

B.2.2 Output signal of the TX under test

The output signal of the TX under test is acquired by the measuring equipment, filtered by a matched filter (RRC 0.22, correct in shape and in position on the frequency axis) and stored for further processing.

The following form represents the physical signal in the entire measurement interval:

one vector **Z**, containing $N = n_s \times sf + m_a$ complex samples;

with

n_s : number of symbols in the measurement interval;

sf : number of chips per symbol. (sf : spreading factor) (see Note: Symbol length)

m_a : number of midamble chips

B.2.3 Reference signal

The reference signal is constructed by the measuring equipment according to the relevant TX specifications.

It is filtered by the same matched filter, mentioned in B.2.2., and stored at the Inter-Symbol-Interference free instants. The following form represents the reference signal in the entire measurement interval:

one vector **R**, containing $N = n_s \times sf + m_a$ complex samples;

n_s , sf , m_a : see B.2.2

B.2.4 void

B.2.5 Classification of measurement results

The measurement results achieved by the global in-channel TX test can be classified into two types:

Results of type "deviation", where the error-free parameter has a non-zero magnitude. (These are the parameters that quantify the integral physical characteristic of the signal). These parameters are:

- RF Frequency
- Power (in case of single code)
- Code Domain Power (in case of multi code)
- Timing

(Additional parameters: see Note: Deviation)

Results of type "residual", where the error-free parameter has value zero. (These are the parameters that quantify the error values of the measured signal, whose ideal magnitude is zero). These parameters are:

- Error Vector Magnitude (EVM);
- Peak Code Domain Error (PCDE).
- (Additional parameters: see Note residual).

B.2.6 Process definition to achieve results of type "deviation"

The reference signal (**R**; see clause B.2.3) and the signal under Test (**Z**; see subclause B.2.2) are varied with respect to the parameters mentioned in clause B.2.5 under "results of type deviation" in order to achieve best fit. Best fit is achieved when the RMS difference value between the varied signal under test and the varied reference signal is an absolute minimum.

Overview:

$$FCT [Z(\tilde{f}, \tilde{t}, \tilde{\varphi}, g_1, g_2, \dots, g_{synch}) - R(f, t, \varphi, \tilde{g}_1, \tilde{g}_2, \dots, \tilde{g}_{synch})] = Minimum !$$

Z : Signal under test.

R: Reference signal,

with frequency f , the timing t , the phase φ , gain of code1 (g_1), gain of code2 (g_2) etc, and the gain of the synch channel g_{synch}

The parameters marked with a tilde in Z and R are varied in order to achieve a best fit.

Detailed formula: see Note: Formula for the minimum process.

The varied reference signal, after the best fit process, will be called **R'**.

The varied signal under test, after the best fit process, will be called **Z'**.

The varying parameters, leading to **R'** and **Z'** represent directly the wanted results of type "deviation". These measurement parameters are expressed as deviation from the reference value with units same as the reference value.

In case of multi code, the type-"deviation"-parameters (frequency, timing and (RF-phase)) are varied commonly for all codes such that the process returns one frequency-deviation, one timing deviation, (one RF-phase –deviation).

(These parameters are not varied on the individual codes signals such that the process would return kr frequency errors... . (kr : number of codes in the reference signal)).

The only type-"deviation"-parameters varied individually are the code domain gain factors (g_1, g_2, \dots).

E.2.5.1 Decision Point Power

The mean-square value of the signal-under-test, sampled at the best estimate of the of Intersymbol-Interference-free points using the process defined in subclause 2.5, is referred to the *Decision Point Power* (DPP):

E.2.5.2 Code-Domain Power

The samples, Z , are separated into symbol intervals to create n_s time-sequential vectors \mathbf{z} with s_f complex samples comprising one symbol interval. The *Code Domain Power* is calculated according to the following steps:

- 1) Take the vectors \mathbf{z} defined above.
- 2) To achieve meaningful results it is necessary to descramble \mathbf{z} , leading to \mathbf{z}'
- 3) Take the orthogonal vectors of the channelization code set \mathbf{C} (all codes belonging to one spreading factor) as defined in TS 25.213 and TS 25.223 (range +1, -1), and normalize by the norm of the vectors to produce $\mathbf{C}_{norm} = \mathbf{C} / \text{sqrt}(s_f)$. (see Note: Symbol length)
- 4) Calculate the inner product of \mathbf{z}' with \mathbf{C}_{norm} . Do this for all symbols of the measurement interval and for all codes in the code space.
This gives an array of format $k \times n_s$, each value representing a specific symbol and a specific code, which can be exploited in a variety of ways.

k : total number of codes in the code space

n_s : number of symbols in the measurement interval

- 5) Calculate k mean-square values, each mean-square value unifying n_s symbols within one code. (These values can be called "*Absolute CodeDomainPower* (CDP)" [Volt²].) The sum of the k values of CDP is equal to DPP.
- 6) Normalize by the decision point power to obtain

$$\text{Relative CodeDomain Power} = \frac{\text{Absolute CodeDomain Power}}{\text{DecisionPointPower}}$$

B.2.7 Process definition to achieve results of type "residual"

The difference between the varied reference signal (\mathbf{R}' ; see clause B.2.6.) and the varied TX signal under test (\mathbf{Z} ; see clause B.2.6) is the error vector \mathbf{E} versus time:

$$\mathbf{E} = \mathbf{Z}' - \mathbf{R}'.$$

Depending on the parameter to be evaluated, it is appropriate to represent \mathbf{E} in one of the following two different forms:

Form EVM (representing the physical error signal in the entire measurement interval)

One vector \mathbf{E} , containing $N = n_s \times s_f + m_a$ complex samples;

n_s , s_f , m_a : see B.2.2

Form PCDE (derived from Form EVM by separating the samples into symbol intervals)

n_s time-sequential vectors \mathbf{e} with s_f complex samples comprising one symbol interval.

\mathbf{E} gives results of type "residual" applying the two algorithms defined in clauses B 2.7.1 and B 2.7.2.

B.2.7.1 Error Vector Magnitude (EVM)

The Error Vector Magnitude EVM is calculated according to the following steps:

- 1) Take the error vector \mathbf{E} defined in clause B.2.7 (Form EVM) and calculate the RMS value of \mathbf{E} ; the result will be called $\text{RMS}(\mathbf{E})$.

- 2) Take the varied reference vector **R'** defined in clause B.2.6 and calculate the RMS value of **R'**; the result will be called RMS(**R'**).
- 3) Calculate EVM according to:

$$EVM = \frac{RMS(E)}{RMS(R')} \times 100\% \quad (\text{here, EVM is relative and expressed in \%})$$

(see note TDD)

(see note: Formula for EVM)

B.2.7.2 Peak Code Domain Error (PCDE)

The Peak Code Domain Error is calculated according to the following steps:

- 1) Take the error vectors **e** defined in clause B.2.7 (Form PCDE).
- 2) Take the orthogonal vectors of the channelisation - code set **C** (all codes belonging to one spreading factor) as defined in TS 25.213 and TS 25.223 (range +1, -1). (see Note: Symbol length) and normalize by the norm of the vectors to produce **Cnorm= C/sqrt(sf)**. (see Note: Symbol length).
- 3) To achieve meaningful results it is necessary to descramble **e**, leading to **e'**.
- 4) Calculate the inner product of **e'** with **Cnorm**. Do this for all symbols of the measurement interval and for all codes in the code space.
This gives an array of format **k x ns**, each value representing an error-vector representing a specific symbol and a specific code, which can be exploited in a variety of ways.

k: total number of codes in the code space
ns: number of symbols in the measurement interval

- 5) Calculate **k** RMS values, each RMS value unifying **ns** symbols within one code.
(These values can be called "*Absolute CodeEVMs*" [Volt].)
- 6) Find the peak value among the **k** "*Absolute CodeEVMs*".
(This value can be called "*Absolute PeakCodeEVM*" [Volt].)
- 7) Calculate PCDE according to:

$$10 \cdot \lg \frac{("Absolute PeakCodeEVM")^2}{(RMS(R'))^2} \quad \text{dB} \quad (\text{a relative value in dB}).$$

(see Note: Scrambling code)

(see Note TDD)

B.3 Notes

Note: Symbol length)

A general code multiplexed signal is multicode and multirate. In order to avoid unnecessary complexity, the measurement applications use a unique symbol-length, corresponding to a spreading factor, regardless of the really intended spreading factor. Nevertheless the complexity with a multicode / multirate signal can be mastered by introducing appropriate definitions.

Note: Deviation)

It is conceivable to regard more parameters as type "deviation" e.g. Chip frequency and RF-phase.

As chip-frequency and RF-frequency are linked together by a statement in the core specifications [1] it is sufficient to process RF frequency only.

A parameter RF-phase must be varied within the best fit process (B 2.6.). Although necessary, this parameter-variation doesn't describe any error, as the modulation schemes used in the system don't depend on an absolute RF-phase.

Note: Residual)

It is conceivable to regard more parameters as type "residual" e.g. IQ origin offset. As it is not the intention of the test to separate for different error sources, but to quantify the quality of the signal, all such parameters are not extracted by the best fit process, instead remain part of EVM and PCDE.

Note Scrambling Code)

To interpret the measurement results in practice it should be kept in mind that erroneous code power on unused codes is generally de-scrambled differently under test conditions and under real life conditions, whereas erroneous code power on used codes is generally de-scrambled equally under test conditions and under real life conditions. It might be indicated if a used or unused code hits PCDE.

Note TDD)

EVM covers the midamble part as well as the data part; however PCDE disregards the midamble part.

NOTE: Formula for the minimum process

$$L(\Delta\tilde{f}, \Delta\tilde{t}, \Delta\tilde{\varphi}, \Delta\tilde{g}_c, \dots, \Delta\tilde{g}_{mid}) = \sum_{v=0}^{N-1} |Z(v) - R(v)|^2$$

Legend:

L : the function to be minimised

The parameters to be varied in order to minimize are:

$\Delta\tilde{f}$: the RF frequency offset

$\Delta\tilde{t}$: the timing offset

$\Delta\tilde{\varphi}$: the phase offset

$\Delta\tilde{g}_c \dots$ code power offsets (one offset for each code)

$\Delta\tilde{g}_{mid}$: the power offset of the midamble

Z(v): Samples of the signal under Test

R(v): Samples of the reference signal

$\sum_{v=0}^{N-1}$: counting index v starting at the beginning of the measurement interval and ending at its end.

N = No of chips during the measurement interval.

Z(v): Samples of the signal under Test. It is modelled as a sequence of complex baseband samples $Z(\gamma)$ with a time-shift Δt , a frequency offset Δf , a phase offset $\Delta\varphi$, the latter three with respect to the reference signal.

$$Z(v) = Z(v - \Delta \tilde{t}) * e^{-j2\pi\Delta\tilde{f}v} * e^{-j\Delta\tilde{\varphi}}$$

R(v): Samples of the reference signal:

$$R(v) = \sum_{c=1}^{\text{No. of codes}} (g_c + \Delta\tilde{g}_c) * \text{Chip}_c(v) + (g_{mid} + \Delta\tilde{g}_{mid}) * \text{Chip}_{mid}(v)$$

g : nominal gain of the code channel or midamble

$\Delta\tilde{g}$: The gain offset to be varied in the minimum process

Chip(v) is the chipsequence of the code channel or midamble

Indices at g , Δg and Chip:

The index indicates the code channel: $c = 1, 2, \dots$ No of code channels

Range for Chip_c : +1, -1

Note: **Formula for EVM**

$$EVM = \sqrt{\frac{\sum_{v=0}^{N-1} |Z'(v) - R'(v)|^2}{\sum_{v=0}^{N-1} |R'(v)|^2}} * 100 \%$$

Z'(v), R'(v) are the varied measured and reference signals.

Annex C (normative): Measurement channels

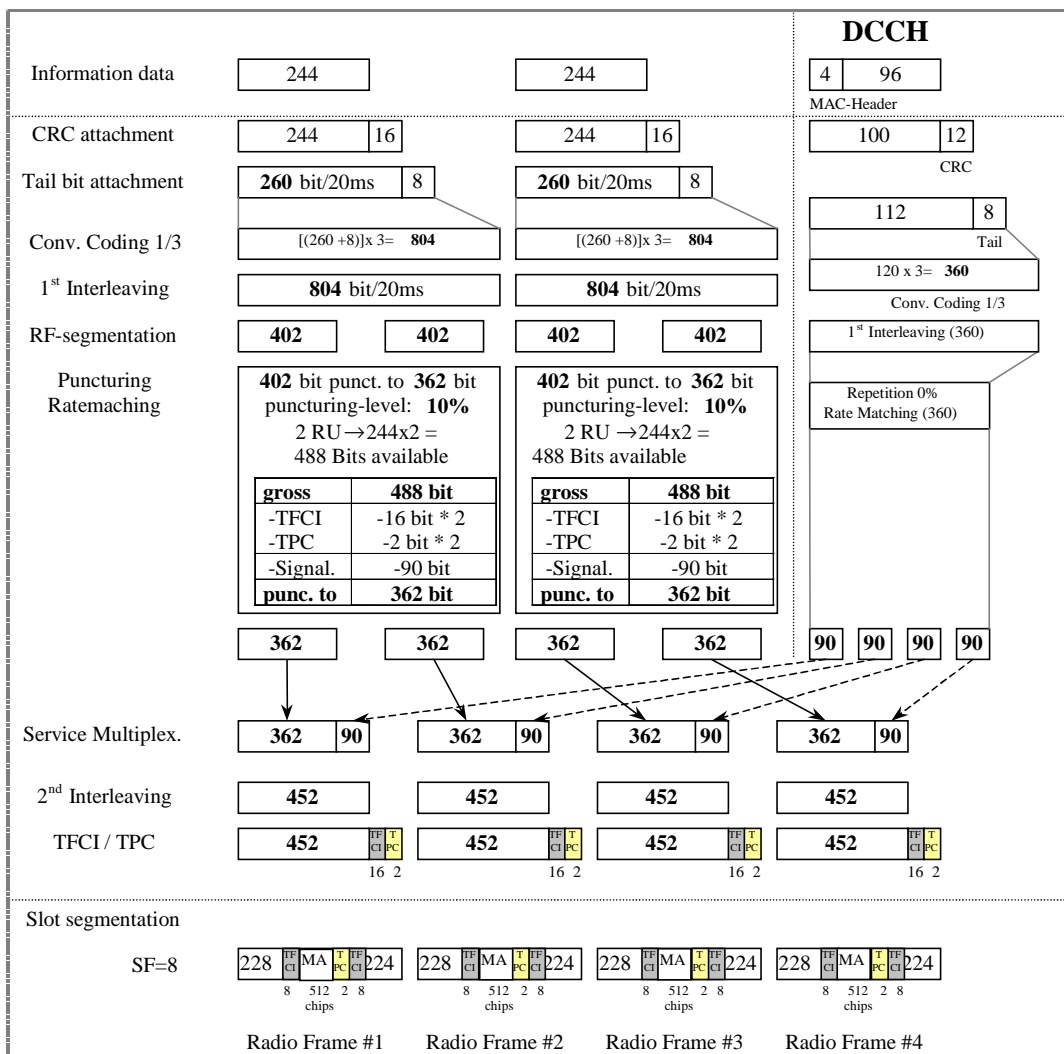
C.1 General

Void.

C.2 UL Reference measurement channels

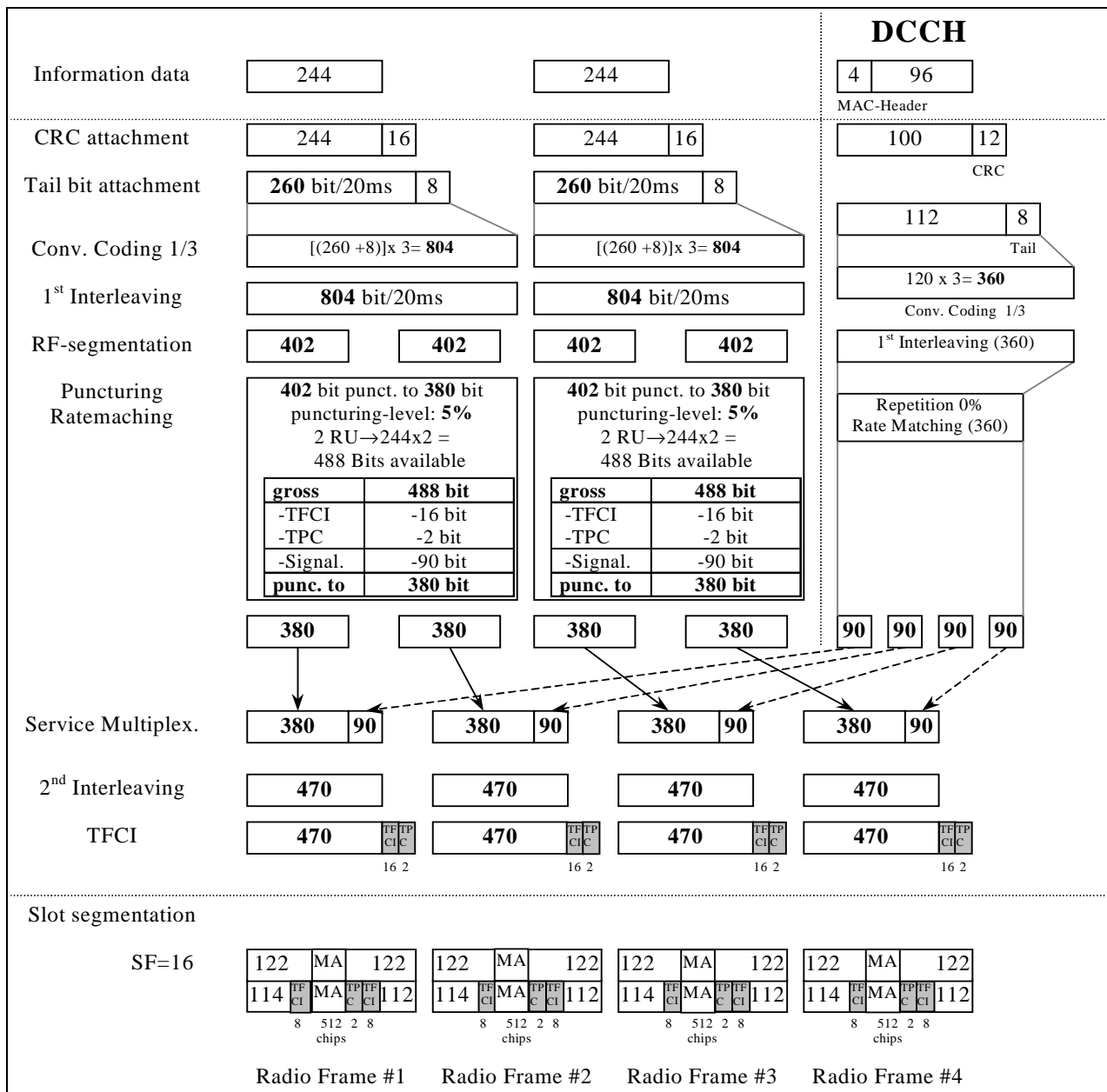
C.2.1 UL reference measurement channel (12.2 kbps)

Parameter	
Information data rate	12.2 kbps
RU's allocated	2 RU
Midamble	512 chips
Interleaving	20 ms
Power control	2 Bit/user
TFCI	16 Bit/user
Inband signalling DCCH	2 kbps
Puncturing level at Code rate 1/3 : DCH / DCCH	10% / 0%



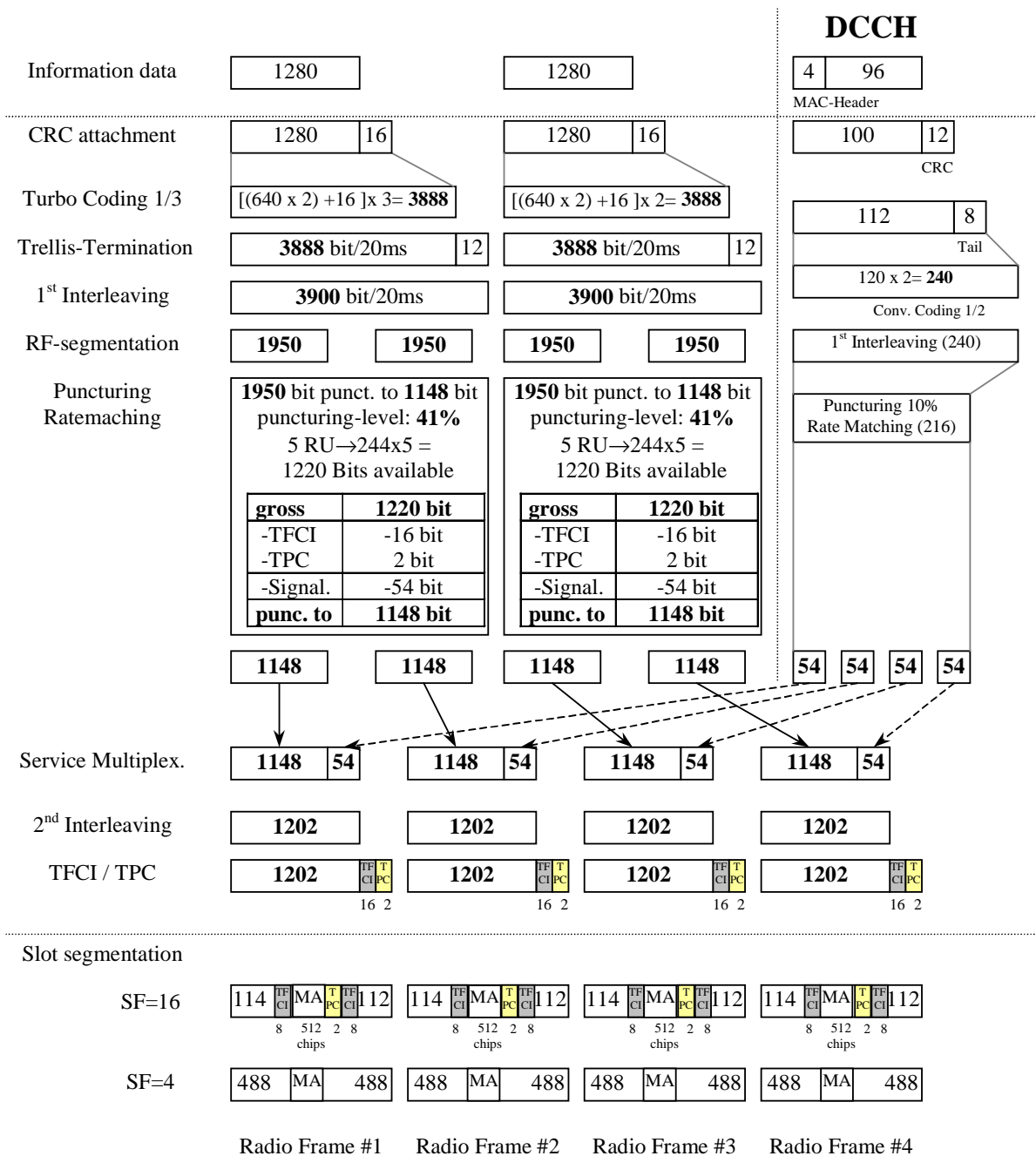
C.2.2 UL multi code reference measurement channel (12.2 kbps)

Parameter	
Information data rate	12.2 kbps
RU's allocated	2 RU
Midamble	512 chips
Interleaving	20 ms
Power control	2 Bit/user
TFCI	16 Bit/user
Inband signalling DCCH	2 kbps
Puncturing level at Code rate 1/3 : DCH / DCCH	5% / 0 %



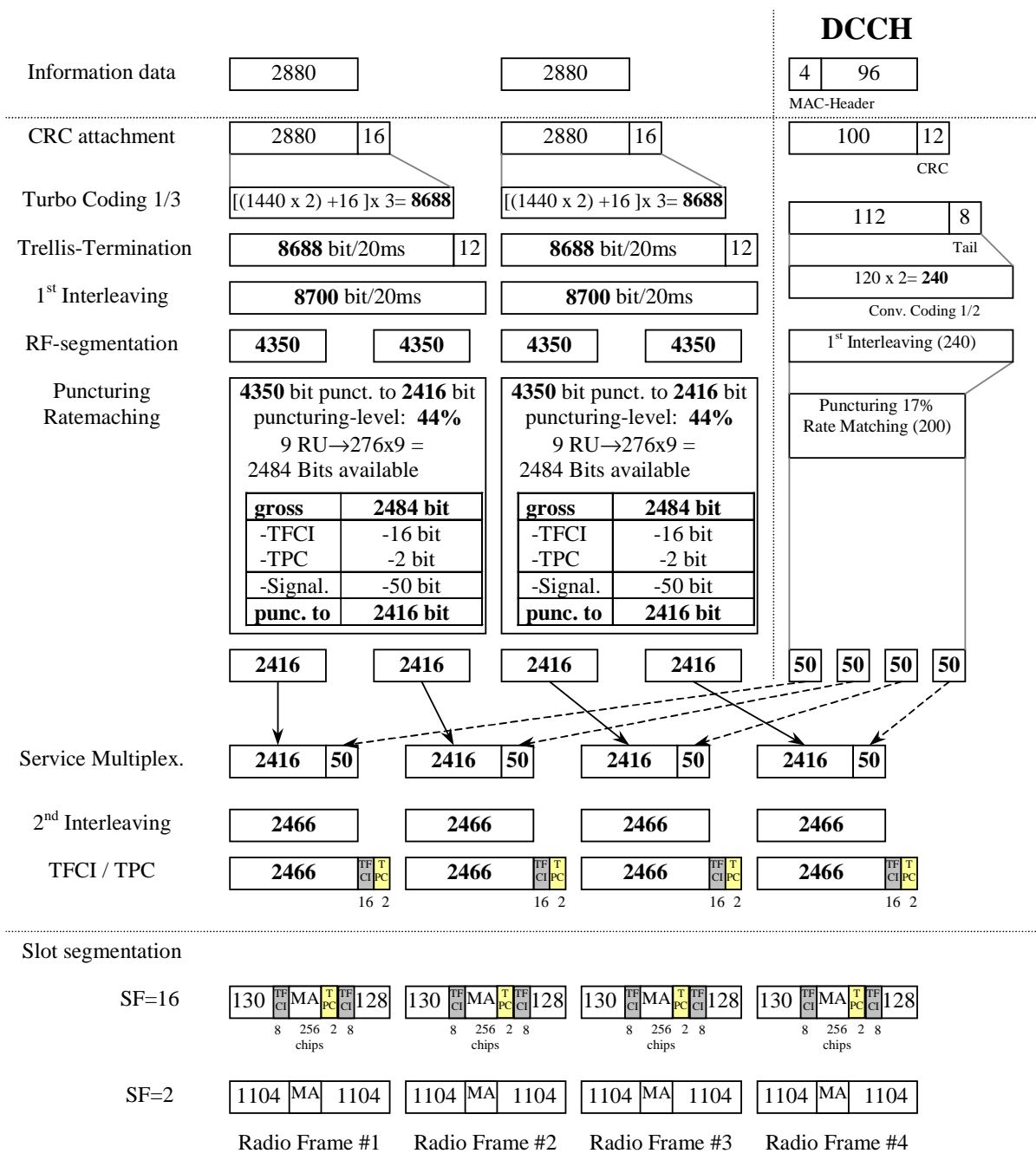
C.2.3 UL reference measurement channel (64 kbps)

Parameter	
Information data rate	64 kbps
RU's allocated	1 SF4 + 1 SF16 = 5RU
Midamble	512 chips
Interleaving	20 ms
Power control	2 Bit/user
TFCI	16 Bit/user
Inband signalling DCCH	2 kbps
Puncturing level at Code rate : 1/3 DCH / 1/2 DCCH	41.2% / 10%



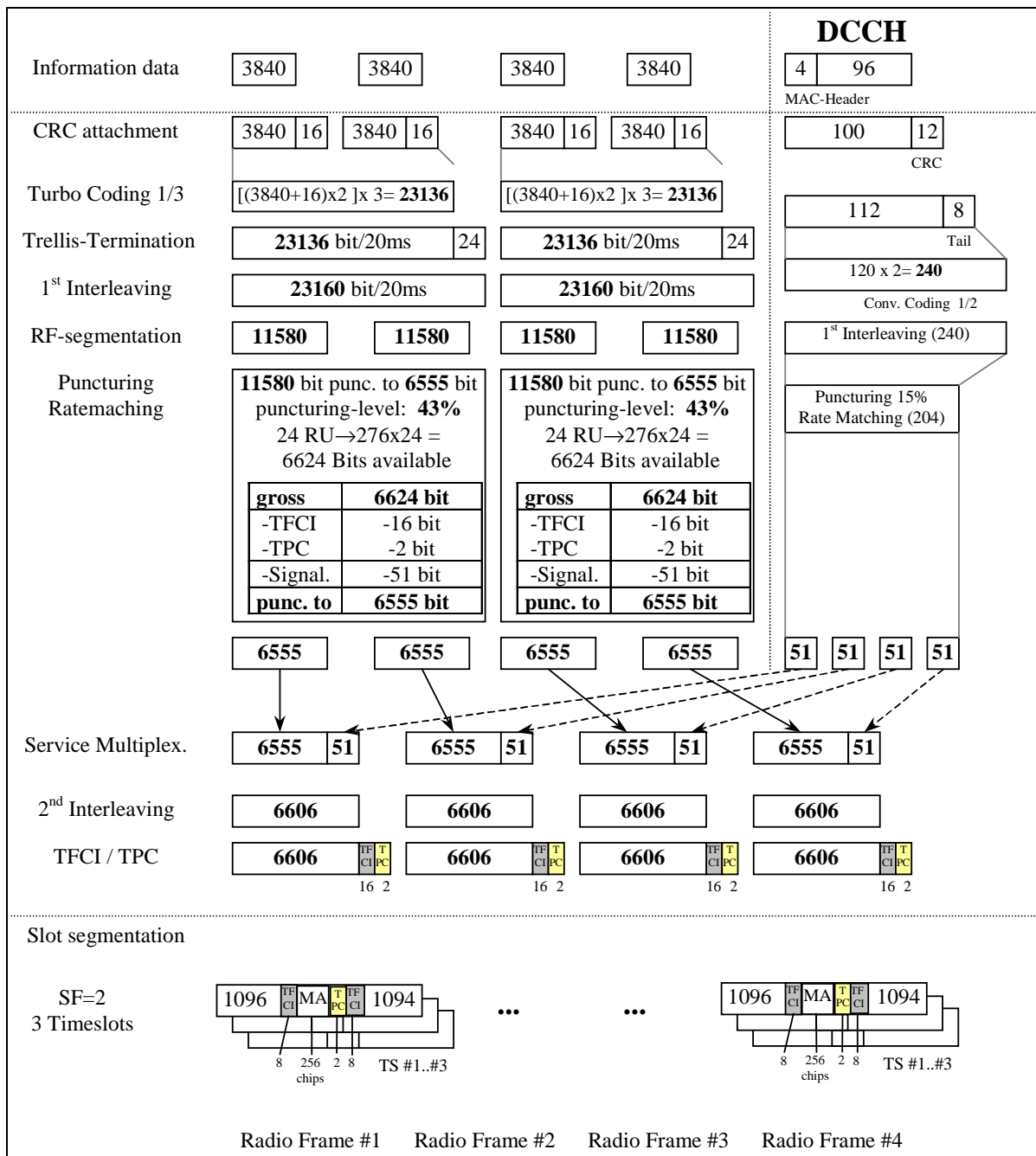
C.2.4 UL reference measurement channel (144 kbps)

Parameter	
Information data rate	144 kbps
RU's allocated	1 SF2 + 1 SF16 = 9RU
Midamble	256 chips
Interleaving	20 ms
Power control	2 Bit/user
TFCI	16 Bit/user
Inband signalling DCCH	2 kbps
Puncturing level at Code rate : 1/3 DCH / 1/2 DCCH	44.4% / 16.6%



C.2.5 UL reference measurement channel (384 kbps)

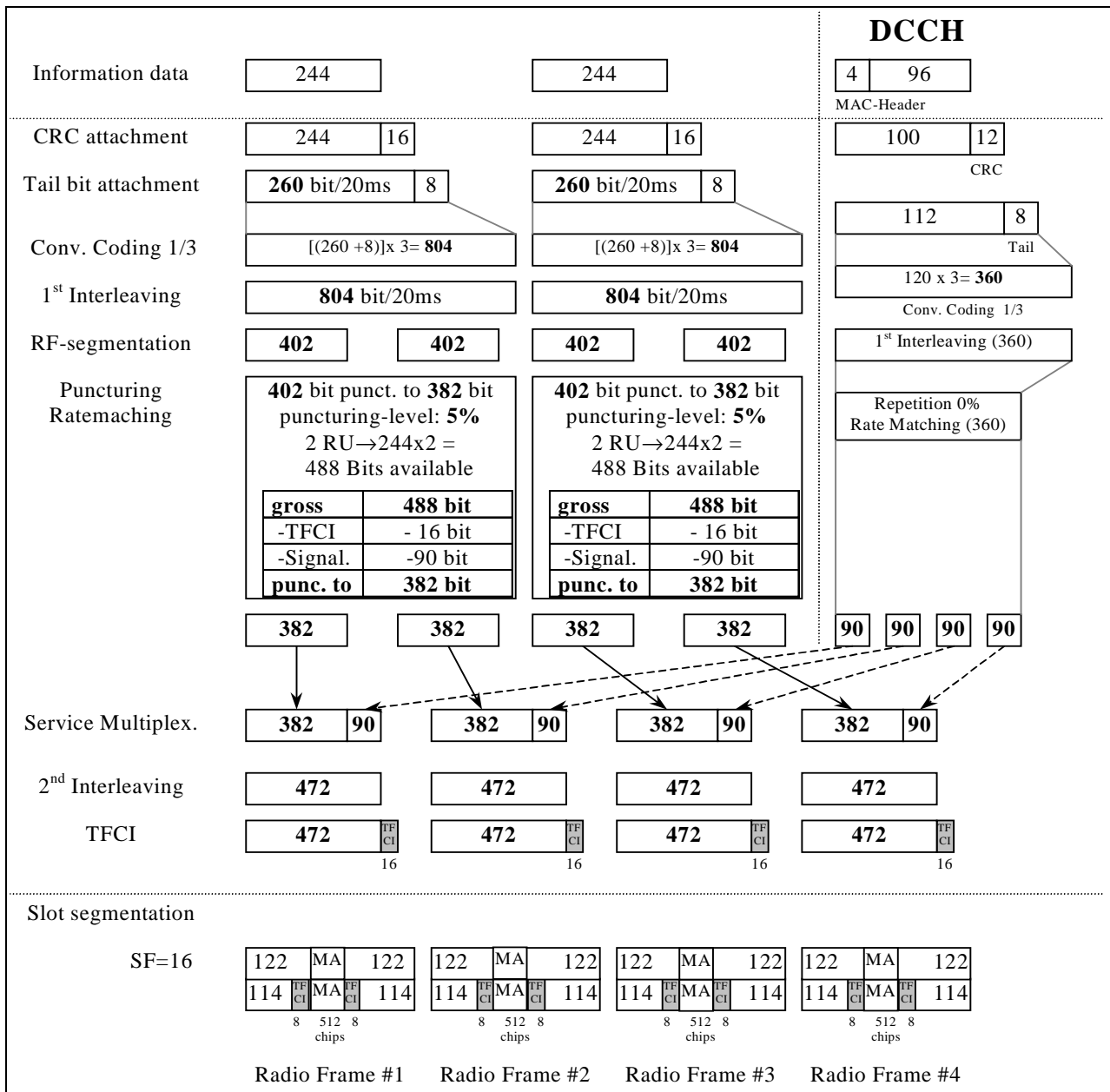
Parameter	
Information data rate	384 kbps
RU's allocated	8*3TS = 24RU
Midamble	256 chips
Interleaving	20 ms
Power control	2 Bit/user
TFCI	16 Bit/user
Inband signalling DCCH	2 kbps
Puncturing level at Code rate : 1/3 DCH / 1/2 DCCH	43.4% / 15.3%



C.3 DL Reference measurement channels

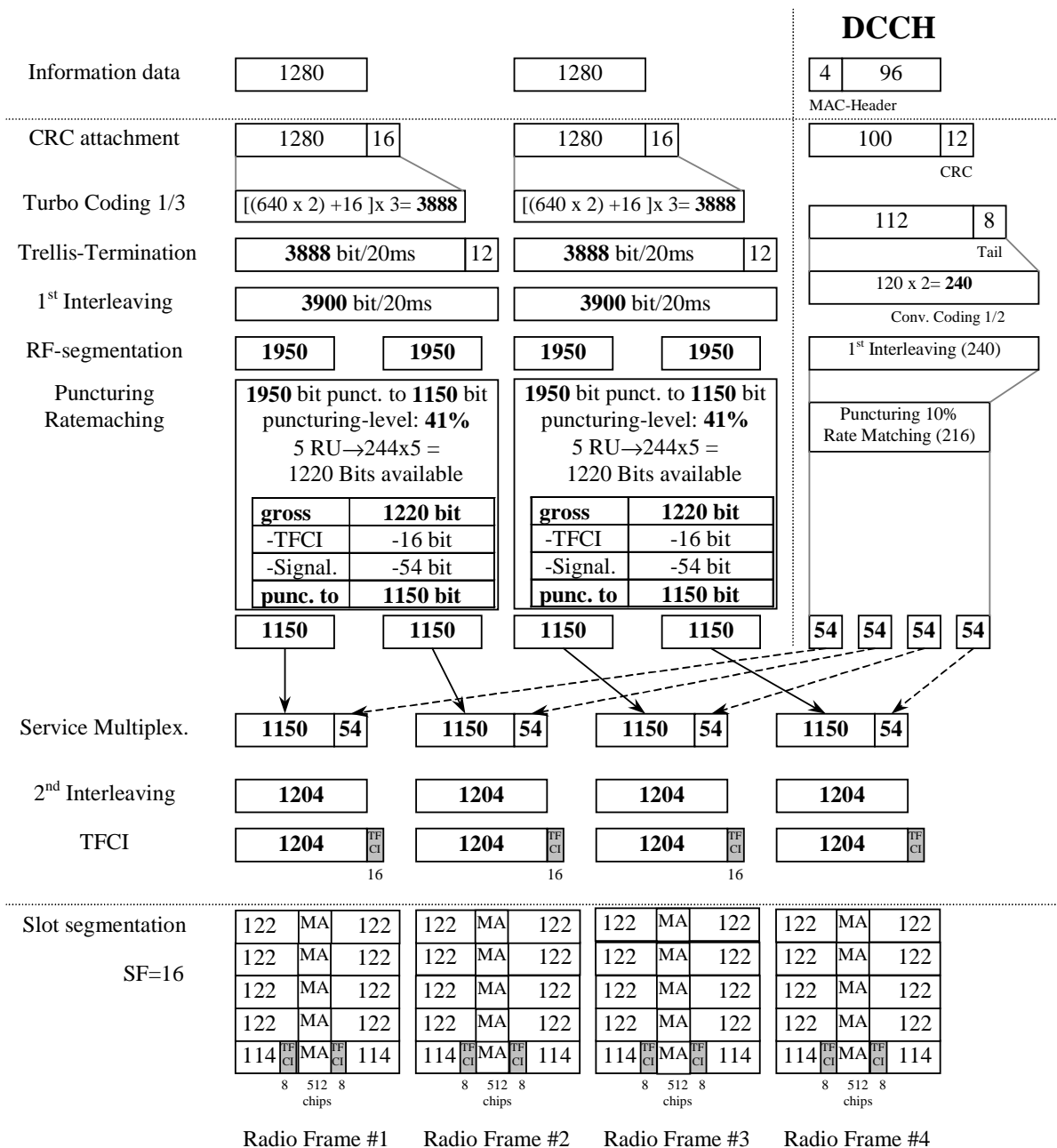
C.3.1 DL reference measurement channel (12.2 kbps)

Parameter	
Information data rate	12.2 kbps
RU's allocated	2 RU
Midamble	512 chips
Interleaving	20 ms
Power control	0 Bit/user
TFCI	16 Bit/user
Inband signalling DCCH	2 kbps
Puncturing level at Code rate 1/3 : DCH / DCCH	5% / 0 %



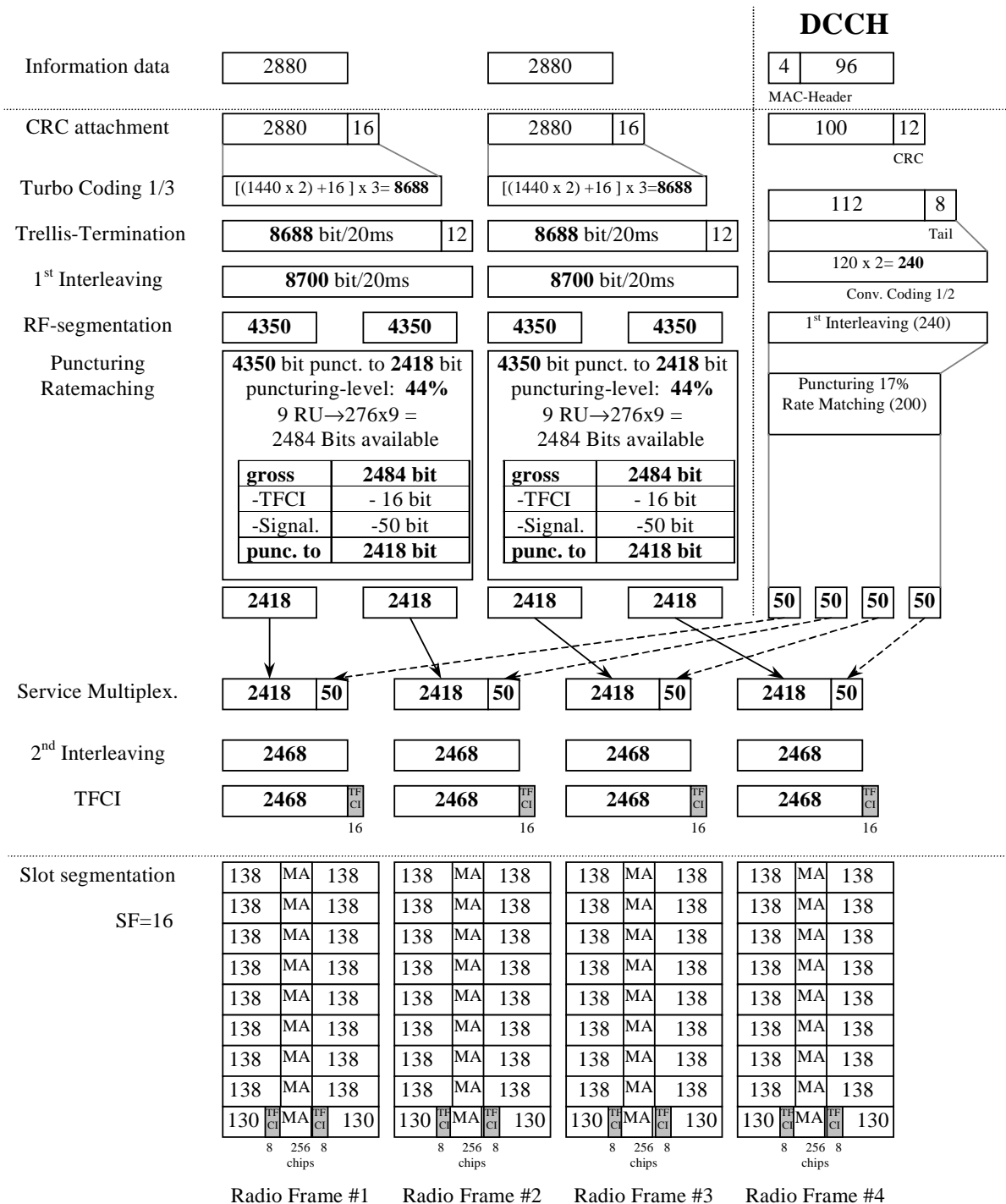
C.3.2 DL reference measurement channel (64 kbps)

Parameter	
Information data rate	64 kbps
RU's allocated	5 codes SF16 = 5RU
Midamble	512 chips
Interleaving	20 ms
Power control	0 Bit/user
TFCI	16 Bit/user
Inband signalling DCCH	2 kbps
Puncturing level at Code rate : 1/3 DCH / 1/2 DCCH	41.1% / 10%



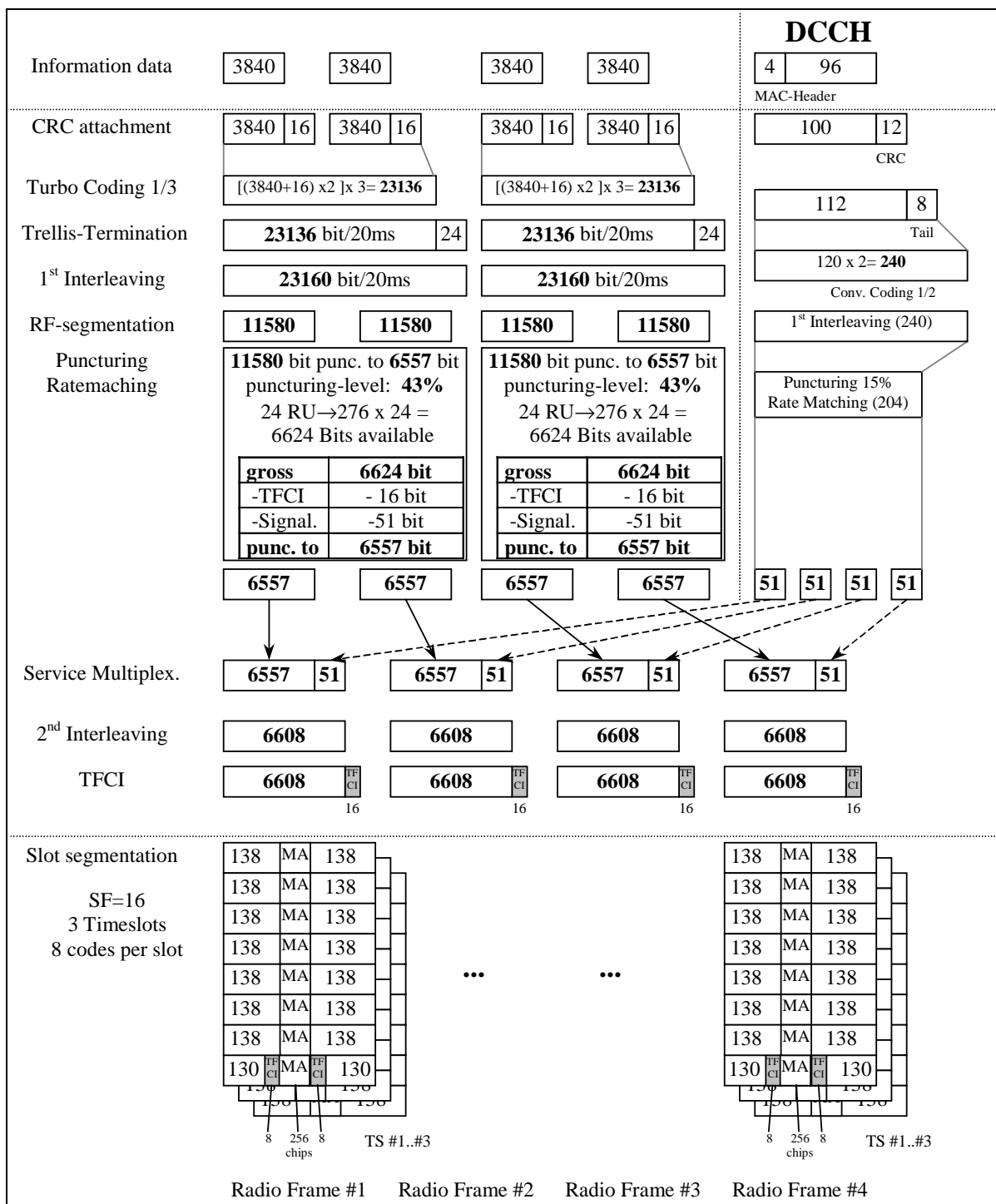
C.3.3 DL reference measurement channel (144 kbps)

Parameter	
Information data rate	144 kbps
RU's allocated	9 codes SF16 = 9RU
Midamble	256 chips
Interleaving	20 ms
Power control	0 Bit/user
TFCI	16 Bit/user
Inband signalling DCCH	2 kbps
Puncturing level at Code rate: 1/3 DCH / 1/2 DCCH	44.5% / 16.6%



C.3.4 DL reference measurement channel (384 kbps)

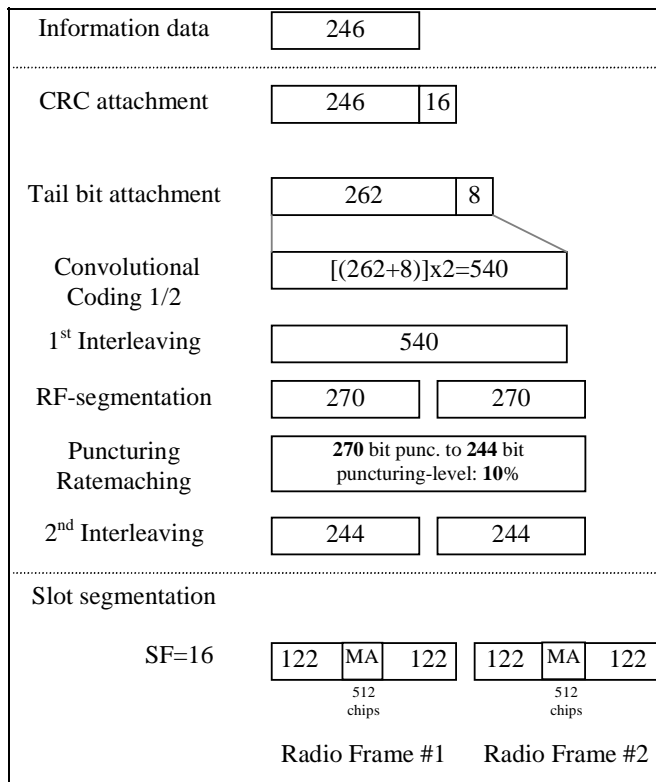
Parameter	
Information data rate	384 kbps
RU's allocated	8*3TS = 24RU
Midamble	256 chips
Interleaving	20 ms
Power control	0 Bit/user
TFCI	16 Bit/user
Inband signalling DCCH	2 kbps
Puncturing level at Code rate : 1/3 DCH / 1/2 DCCH	43.4% / 15.3%



C.3.5 BCH reference measurement channel

[mapped to 1 code SF16]

Parameter	
Information data rate:	12.3 kbps
RU's allocated	1 RU
Midamble	512 chips
Interleaving	20 ms
Power control	0 bit
TFCI	0 bit
Puncturing level	10%



Annex D (normative): Propagation conditions

D.1 Test Environments

Table D.1 details the test services, the information data and the propagation conditions.

Table D.1: Test Environments for UE Performance Specifications

Test Services	Information Data Rate	Static	Multipath Case 1	Multipath Case 2	Multipath Case 3
		Performance metric			
Paging Message			-	-	-
FACH Message			-	-	-
Circuit Switched Services	12.2 kbps	BLER <	BLER <	BLER <	BLER <
	64 kbps	BLER <	BLER <	BLER <	BLER <
	144 kbps	BLER <	BLER <	BLER <	BLER <
	384 kbps	BLER <	BLER <	BLER <	BLER <
	2048 kbps	BLER <	-	-	-
Packet Switched Data	TBD	TBD	TBD	TBD	TBD

D.2 Propagation Conditions

D.2.1 Static propagation condition

The propagation for the static performance measurement is an Additive White Gaussian Noise (AWGN) environment. No fading and multi-paths exist for this propagation model.

D.2.2 Multi-path fading propagation conditions

Table D.2 shows propagation conditions that are used for the performance measurements in multi-path fading environment. All taps have classical Doppler spectrum.

Table D.2: Propagation Conditions for Multi path Fading Environments

Case 1, speed 3km/h		Case 2, speed 3 km/h		Case 3, speed 120 km/h		Case 4, speed 3 km/h	
Relative Delay [ns]	Relative Mean Power [dB]	Relative Delay [ns]	Relative Mean Power [dB]	Relative Delay [ns]	Relative Mean Power [dB]	Relative Delay [ns]	Relative Mean Power [dB]
0	0	0	0	0	0	0	0
976	-10	976	0	260	-3	976	0
		12000	0	521	-6		
				781	-9		

Annex E (normative): Common RF test conditions

E.1 General

This normative annex specifies the common RF test conditions that are needed for setting a connection and channels that are needed during a connection.

E.2 Connection Set-up

Table E.2 describes the downlink Physical Channels that are required for connection set up.

Table E.2: Downlink Physical Channels required for connection set-up

Physical Channel
PSCH
PCCPCH
DPCH
PICH

E.3 During connection

The following clauses describes the uplink and downlink Physical Channels that are transmitted during a connection i.e., when measurements are done.

E.3.1 Measurement of Tx Characteristics

Table E.3.1 is applicable for measurements on the Transmitter Characteristics (Clause 5) with the exception of clause 5.2 (UE maximum output power), 5.3 (Frequency Stability), 5.4.1 (Uplink Power Control). For these cases certain parameters are defined individually.

Table E.3.1.1: Common downlink test condition RF parameters

Physical Channel	Power
DPCH	-93 dBm Data content PRBS
PSCH	TBD
PCCPCH	TBD
PICH	TBD
OCNS	Nothing

Table E.3.1.2: Common TX test parameters

Parameter	Value/description
UL Reference measurement channel	12.2kbps, according to annex C.2.1
Uplink Power Control	SS level and signalling values such that UE transmits maximum power.
Data content	real life (sufficient irregular)

E.3.2 Measurement of Rx Characteristics

Table E.3.2 is applicable for measurements on the Receiver Characteristics (Clause 6)

Table E.3.2: Downlink Physical Channels transmitted during a connection.

Physical Channel	Power
CPICH	TBD
PCCPCH	TBD
SCH	TBD
PICH	TBD
DPCH	TBD

E.3.3 Measurement of Performance requirements

Table E.3.3 is applicable for measurements on the Performance requirements (Clause 7)

Table E.3.3: Downlink Physical Channels transmitted during a connection.

Physical Channel	Power	Note
CPICH	TBD	
PCCPCH	TBD	
SCH	TBD	
PICH	TBD	
DPCH	TBD	
OCNS	TBD	

Annex F (normative): General test conditions and declarations

The requirements of this clause apply to all applicable tests in the present document.

Many of the tests in the present document measure a parameter relative to a value that is not fully specified in the UE specifications. For these tests, the Minimum Requirement is determined relative to a nominal value specified by the manufacturer.

When specified in a test, the manufacturer shall declare the nominal value of a parameter, or whether an option is supported.

In all the relevant clauses in this clause all Bit Error Ratio (BER), Block Error Ratio (BLER) measurements shall be carried out according to the general rules for statistical testing in annex F.6.

F.1 Acceptable uncertainty of Test System

The maximum acceptable uncertainty of the Test System is specified below for each test, where appropriate. The Test System shall enable the stimulus signals in the test case to be adjusted to within the specified range, and the equipment under test to be measured with an uncertainty not exceeding the specified values. All tolerances and uncertainties are absolute values, and are valid for a confidence level of 95 %, unless otherwise stated.

A confidence level of 95% is the measurement uncertainty tolerance interval for a specific measurement that contains 95% of the performance of a population of test equipment.

For RF tests it should be noted that the uncertainties in clause F.1 apply to the Test System operating into a nominal 50 ohm load and do not include system effects due to mismatch between the DUT and the Test System.

F.1.1 Measurement of test environments

The measurement accuracy of the UE test environments defined in Annex G, Test environments shall be.

- Pressure ± 5 kPa.
- Temperature ± 2 degrees.
- Relative Humidity ± 5 %.
- DC Voltage $\pm 1,0$ %.
- AC Voltage $\pm 1,5$ %.
- Vibration 10 %.
- Vibration frequency 0,1 Hz.

The above values shall apply unless the test environment is otherwise controlled and the specification for the control of the test environment specifies the uncertainty for the parameter.

F.1.2 Measurement of transmitter

Table F.1.2 Maximum Test System Uncertainty for transmitter tests

Clause	Maximum Test System Uncertainty
5.2 UE Maximum Output Power	± 0.7 dB
5.3 Frequency Stability	± 10 Hz
5.4.1 Uplink power control	Relative $\pm [0.3]$ dB
5.4.2 Minimum Transmit Power	± 1.0 dB
5.4.3 Transmit OFF Power	± 1.5 dB
5.4.4 Transmit ON/OFF Power	TBD
5.4.5 Out-of-synchronisation handling of output power	± 0.4 dB
5.5.1 Occupied Bandwidth	± 100 kHz
5.5.2.1 Spectrum emission mask	± 1.5 dB
5.5.2.2 ACLR	5 MHz offset: ± 0.8 dB 10 MHz offset: ± 0.8 dB
5.5.3 Spurious emissions	± 2.0 dB for UE and coexistence bands for results > -60 dBm ± 3.0 dB for results < -60 dBm Outside above: f ≤ 2.2 GHz : ± 1.5 dB 2.2 GHz < f ≤ 4 GHz : ± 2.0 dB f > 4 GHz : ± 4.0 dB
5.6 Transmit intermodulation:	Will be based on BS, need to work out freq and level ranges.
5.7.1 Transmit modulation: EVM	± 2.5 %
5.7.2 Transmit modulation: peak code domain error	± 1 dB

F.1.3 Measurement of receiver

Table F.1.3 Maximum Test System Uncertainty for receiver tests

Clause	Maximum Test System Uncertainty
6.2 Reference Sensitivity Level	± 0.7 dB
6.3 maximum input level:	TBD
6.4 Adjacent Channel Selectivity (ACS)	Overall system uncertainty ± 1.1 dB
6.5 Blocking Characteristics	Using ± 0.7 dB for signal and interferer as currently defined, and 68 dB ACLR @ 10 MHz. System error with f < 15 MHz offset: ± 1.4 dB f ≥ 15 MHz offset and f ≤ 2,2 GHz: ±1,0 dB 2,2 GHz < f ≤ 4 GHz : ±1,7 dB f > 4 GHz: ±3,1 dB
6.6 Spurious Response	f < 2,2 GHz: ±1,0dB 2,2 < f < 4GHz: ±1,7dB f > 4 GHz: ±3,1dB
6.7 Intermodulation Characteristics	± 1,3 dB with Formula = $\sqrt{(2 \cdot CW_level_error)^2 + (mod_level_error)^2 + (wanted_signal_level_error)^2}$ (Using CW interferer ±0,5 dB, modulated interferer ±0,5 dB, wanted signal ±0,7 dB)
6.8 Spurious Emissions	± 3,0 dB for UE receive band (-78 dBm) Outside above: f ≤ 2,2GHz : ± 2,0dB (-57 dBm) 2,2 GHz < f ≤ 4 GHz : ± 2,0 dB (-47 dBm) f > 4 GHz : ±4,0 dB (-47 dBm)

F.1.4 Performance requirement

Table F.1.4 Maximum Test System Uncertainty for Performance Requirements

Clause	Maximum Test System Uncertainty
7.6 Uplink Power Control	0.3 dB (relative tolerance for 10 dB stepsize)

F.1.5 Requirements for support of RRM

TBD

F.2 Test Tolerances (This clause is informative)

The Test Tolerances defined in this clause have been used to relax the Minimum Requirements in the present document to derive the Test Requirements.

The Test Tolerances are derived from Test System uncertainties, regulatory requirements and criticality to system performance. As a result, the Test Tolerances may sometimes be set to zero.

The test tolerances should not be modified for any reason e.g. to take account of commonly known test system errors (such as mismatch, cable loss, etc.).

F.2.1 Transmitter

Table F.2.1 Test Tolerances for transmitter tests.

Clause	Test Tolerance
5.2 Maximum Output Power	0,7 dB
5.3 UE Frequency Stability	10 Hz
5.4.1.1 Uplink Power Control, Initial Accuracy	+1,0 dB
5.4.1.2 Uplink Power Control, differential Accuracy	1dB step: 0,1 dB 2 dB step: 0,15 dB 3dB step: 0,2 dB 10 dB step: 0,5 dB 20 dB step: 0,7 dB 30 dB step: 0,7 dB >30 dB step: 1,0 dB
5.4.2 Minimum Transmit Power	1,0 dB
5.4.5 Out-of-synchronisation handling of output power: $\frac{\Sigma DPCH \cdot E_c}{I_{or}}$	0,4 dB
5.4.5 Out-of-synchronisation handling of output power: transmit ON/OFF time	0 ms
5.5.1 Transmit OFF power	1,5 dB
5.5.1 Occupied Bandwidth	0 kHz
5.5.2.1 Spectrum emission mask	1,5 dB
5.5.2.2 Adjacent Channel Leakage Power Ratio (ACLR)	0,8 dB
5.5.3 Spurious Emissions	0 dB
5.6 Transmit Intermodulation	0 dB
5.7.1 Error Vector Magnitude	0%
5.7.2 Peak code domain error	1,0 dB

F.2.2 Receiver

Table F.2.2 Test Tolerances for receiver tests.

Clause	Test Tolerance
6.2 Reference sensitivity level	0.7 dB
6.4 Adjacent channel selectivity	0 dB
6.5 Blocking characteristics	0 dB
6.6 Spurious Response	0 dB
6.7 Intermodulation Characteristics	0 dB
6.8 Spurious emissions	0 dB

F.2.3 Performance requirements

Table F.2.3 Test Tolerances for Performance Requirements.

Clause	Test Tolerance
7.2, Demodulation in Static Propagation Condition	
7.3, Demodulation of DCH in Multipath Fading conditions	
7.4, Base Station Transmit diversity modes	
7.6 Uplink Power Control	0.5 dB (relative tolerance for 10 dB stepsize)

F.2.4 Requirements for support of RRM

TBD

F.3 Interpretation of measurement results

The measurement results returned by the Test System are compared - without any modification - against the Test Requirements as defined by the shared risk principle.

The Shared Risk principle is defined in ETR 273 Part 1 sub-part 2 clause 6.5.

The actual measurement uncertainty of the Test System for the measurement of each parameter shall be included in the test report.

The recorded value for the Test System uncertainty shall be, for each measurement, equal to or lower than the appropriate figure in clause F.1 of the present document.

If the Test System for a test is known to have a measurement uncertainty greater than that specified in clause F.1, it is still permitted to use this apparatus provided that an adjustment is made value as follows.

Any additional uncertainty in the Test System over and above that specified in clause F.1 shall be used to tighten the Test Requirement – making the test harder to pass. (For some tests e.g. receiver tests, this may require modification of stimulus signals). This procedure will ensure that a Test System not compliant with clause F.1 does not increase the chance of passing a device under test where that device would otherwise have failed the test if a Test System compliant with clause F.1 had been used.

F.4 Derivation of Test Requirements (This clause is informative)

The Test Requirements in the present document have been calculated by relaxing the Minimum Requirements of the core specification using the Test Tolerances defined in clause F.2. When the Test Tolerance is zero, the Test Requirement will be the same as the Minimum Requirement. When the Test Tolerance is non-zero, the Test Requirements will differ from the Minimum Requirements, and the formula used for this relaxation is given in table F.4.

Table F.4: Derivation of Test Requirements

Test	Minimum Requirement in TS 25.102	Test Tolerance (TT)	Test Requirement in TS 34.122
5.2 Maximum Output Power	Power single code Power class 2 (24 dBm) Tolerance = +1/-3 dB Power class 3 (21 dBm) Tolerance = +2/-2 dB Power multi code Power class 2 (21 dBm) Tolerance = +1/-3 dB Power class 3 (18 dBm) Tolerance = ± 2 dB	0,7 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT For power class 2 (single and multi): Upper Tolerance limit = +1,7 dB Lower Tolerance limit = -3,7 dB For power class 3 (single and multi): Upper Tolerance limit = +2,7 dB Lower Tolerance limit = -2,7 dB
5.3 UE Frequency Stability	The UE modulated carrier frequency shall be accurate to within ± 0.1 ppm compared to the carrier frequency received from the Node B.	10 Hz	Formula: modulated carrier frequency error + TT modulated carrier frequency error = $\pm(0.1 \text{ ppm} + 10 \text{ Hz})$.
5.4.1.1 Uplink Pwer Control, Initial accuracy	± 9 dB normal conditions ± 12 dB extreme conditions	1.0 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT Nominal expected TX power ± 10 dB (normal conditions) ± 13 dB (extreme conditions)
5.4.1.2 Uplink Power Control, differential accuracy	SIR Target Pow Step Tol <1 dB 0.5 dB <2dB 1 dB <3 dB 1.5 dB <10 dB 2 dB <20dB 4 dB <30 dB 6 dB > 30 dB 9 dB	TT 0.1 dB 0.15 dB 0.2 dB 0.5 dB 0.7 dB 0.7 dB 1.0 dB	Formula: Upper Tolerance limit + TT Lower Tolerance limit – TT
5.4.2 Minimum Transmit Power	UE minimum transmit power shall be less than -44 dBm	1.0 dB	Formula: UE minimum transmit power + TT UE minimum transmit power = -43 dBm
5.4.5 Out-of-synchronisation handling of output power:	$\frac{\Sigma DPCH_E_c}{I_{or}}$ levels before A -4.6 dB AB: -10 dB BD: -16 dB DE: -12 dB EF: -6 dB transmit ON/OFF time 200ms	0,4 dB for $\frac{\Sigma DPCH_E_c}{I_{or}}$ 0 ms for timing measurement	Formulas: Ratio between A and B + TT Ratio between B and D - TT Ratio between D and E - TT Ratio between E and F + TT transmit ON/OFF time + TT timing $\frac{\Sigma DPCH_E_c}{I_{or}}$ levels: Before A: -4.6 AB: $-10 + 0,4$ dB BD: $-16 - 0,4$ dB DE: $-12 - 0,4$ dB EF: $-6 + 0,4$ dB Uncertainty of OFF power measurement is handled by Transmit OFF power test and uncertainty of ON power measurement is handled by Minimum output power test.transmit ON/OFF time 200ms
5.5.1 Transmit OFF power	Transmit OFF power shall be less than -65 dBm	1.5 dB	Formula: Transmit OFF power + TT Transmit OFF power = $-63,5$ dBm

5.5.1 Occupied Bandwidth	The occupied channel bandwidth shall be less than 5 MHz based on a chip rate of 3,84 Mcps.	0 kHz	Formula: occupied channel bandwidth: + TT occupied channel bandwidth = 5,0 MHz	
5.5.2.1 Spectrum emission mask	Minimum requirement defined in TS25.101 table 6.10. The lower limit shall be -50 dBm / 3,84 MHz or which ever is higher.	1.5 dB	Formula: Minimum requirement + TT Lower limit + TT Add 1,5 to Minimum requirement entries in TS25.101 table 6.10 The lower limit shall be -48,5 dBm / 3,84 MHz or which ever is higher.	
5.5.2.2 Adjacent Channel Leakage Power Ratio (ACLR)	Power Classes 2 and 3: UE channel +5 MHz or -5 MHz, ACLR limit: 33 dB UE channel +10 MHz or -10 MHz, ACLR limit: 43 dB	0.8 dB	Formula: ACLR limit - TT Power Classes 2 and 3: UE channel +5 MHz or -5 MHz, ACLR limit: 32,2 dB UE channel +10 MHz or -10 MHz, ACLR limit: 42,2 dB	
5.5.3 Spurious Emissions			Formula: Minimum Requirement+ TT Add zero to all the values of Minimum Requirements in table 5.5.3	
	Frequency Band	Minimum Requirement	Frequency Band	Minimum Requirement
	9 kHz ≤ f < 150 kHz	-36dBm /1kHz	9kHz ≤ f < 1GHz	-36dBm /1kHz
	150 kHz ≤ f < 30 MHz	-36dBm /10kHz	150 kHz ≤ f < 30 MHz	-36dBm /10kHz
	30 MHz ≤ f < 1000 MHz	-36dBm /100kHz	30 MHz ≤ f < 1000 MHz	-36dBm /100kHz
	1 GHz ≤ f < 12.75 GHz	-30dBm /1MHz	1 GHz ≤ f < 2,2 GHz	-30dBm /1MHz
			2,2 GHz ≤ f < 4 GHz	-30dBm /1MHz
			4 GHz ≤ f < 12,75 GHz	-30dBm /1MHz
	925 MHz < f < 935 MHz	-67dBm /100kHz	925 MHz < f < 935 MHz	-67dBm /100kHz
	935 MHz ≤ f ≤ 960 MHz	-79dBm /100kHz	935 MHz ≤ f ≤ 960 MHz	-79dBm /100kHz
	1805 MHz < f ≤ 1880 MHz	-71dBm /100kHz	1805 MHz < f ≤ 1880 MHz	-71dBm /100kHz
	1805 MHz ≤ f ≤ 1880 MHz	-71dBm /100kHz	1805 MHz ≤ f ≤ 1880 MHz	-71dBm /100kHz

5.6 Transmit Intermodulation	Intermodulation Product 5MHz -31 dBc 10MHz -41 dBc	0 dB	Formula: Intermodulation Product + TT Intermodulation Product 5MHz -31 dBc 10MHz -41 dBc	
5.7.1 Error Vector Magnitude	The Error Vector Magnitude shall not exceed 17.5 %	0%	Formula: EVM limit + TT EVM limit = 17,5 %	
5.7.2 Peak code domain error	The peak code domain error shall not exceed -21dB	±1.0 dB	Formula: Peak code domain error + TT Peak code domain error = -20 dB	
6.2 Reference sensitivity level	$I_{or} = -105 \text{ dBm} / 3,84 \text{ MHz}$ BER limit = 0.001	0.7 dB	Formula: $I_{or} + T$ BER limit unchanged $\hat{I}_{or} = -104,3 \text{ dBm} / 3,84 \text{ MHz}$	
6.4 Adjacent Channel Selectivity	$I_{or} = -91 \text{ dBm} / 3,84 \text{ MHz}$ $I_{oac}(\text{modulated}) = -52 \text{ dBm} / 3,84 \text{ MHz}$ BER limit = 0.001	0 dB	Formula: I_{or} unchanged $I_{oac} - TT$ BER limit unchanged $I_{oac} = -52 \text{ dBm} / 3,84 \text{ MHz}$	
6.5 Blocking Characteristics	See table 6.5.2a and 6.5.2b in TS 34.122 BER limit = 0,001	0 dB	Formula: $I_{\text{blocking}}(\text{modulated}) - TT$ (dBm/3,84MHz) $I_{\text{blocking}}(\text{CW}) - TT$ (dBm) BER limit unchanged	
6.6 Spurious Response	$I_{\text{blocking}}(\text{CW}) -44 \text{ dBm}$ F_{uw} : Spurious response frequencies BER limit = 0.001	0 dB	Formula: $I_{\text{blocking}}(\text{CW}) - TT$ (dBm) F_{uw} unchanged BER limit unchanged $I_{\text{blocking}}(\text{CW}) -44 \text{ dBm}$	
6.7 Intermodulation Characteristics	$I_{ow1}(\text{CW}) -46 \text{ dBm}$ $I_{ow2}(\text{modulated}) -46 \text{ dBm} / 3,84 \text{ MHz}$ $F_{uw1}(\text{offset}) 10 \text{ MHz}$ $F_{uw2}(\text{offset}) 20 \text{ MHz}$ BER limit = 0.001	0 dB	Formula: TBD BER limit unchanged.	
6.8 Spurious Emissions			Formula: Maximum level+ TT Add zero to all the values of Maximum Level in table 6.8.1.	
	Frequency Band	Maximum level	Frequency Band	Maximum level
	9kHz ≤ f < 1GHz	-57dBm /100kHz	0 dB	9kHz ≤ f < 1GHz -57dBm /100kHz
	1,9-1,92 GHz 2,01-2.025GHz 2,11-2.170GHz	-60 dBm / 3,84MHz	0 dB	1,9-1,92 GHz 2,01-2.025GHz 2,11-2.170GHz -60 dBm / 3,84MHz
	1 -1,9GHz, 1,92-2,01 GHz 2,025-2,11GHz	-47 dBm/1MHz	0 dB	1 -1,9GHz, 1,92-2,01 GHz 2,025-2,11GHz -47 dBm/1MHz
	1GHz ≤ f ≤ 12,75GHz	-47dBm /1MHz	0 dB	1GHz ≤ f ≤ 2,2GHz -47dBm /1MHz
			0 dB	2,2GHz < f ≤ 4GHz -47dBm /1MHz
		0 dB	4GHz < f ≤ 12,75GHz -47dBm /1MHz	

7.6 Downlink Power Control		TS #1,9	TS #7,14	0.5 dB for 10 dB change in output power, 0 otherwise.	Formula for 10 dB change in transmit power: Upper Tolerance limit + TT Lower Tolerance limit – TT
	1 st frame	15 ±4.0 dBm	5 ±0.5 dBm		
	2 nd frame	15 ±4.0 dBm	15 ±4.0 dBm		

F.5 Acceptable uncertainty of Test Equipment (This clause is informative)

This informative clause specifies the critical parameters of the components of an overall Test System (e.g. Signal generators, Signal Analyzers etc.) which are necessary when assembling a Test System that complies with clause F.1 Acceptable Uncertainty of Test System. These Test Equipment parameters are fundamental to the accuracy of the overall Test System and are unlikely to be improved upon through System Calibration.

F.5.1 Transmitter measurements

Table F.5.1: Equipment accuracy for transmitter measurements

Test	Equipment accuracy	Test conditions
5.2 UE Maximum Output Power	Not applicable	
5.3 Frequency Stability	± 10Hz	
5.4.1 Uplink power control		
5.4.2 Minimum Transmit Power		
5.4.3 Transmit OFF Power		
5.4.4 Transmit ON/OFF Power		
5.4.5 Out-of-synchronisation handling of output power $\frac{DPCCH - E_c}{I_{or}}$		
5.4.5 Out-of-synchronisation handling of output power: transmit ON/OFF time		
5.5.1 Occupied Bandwidth	100 kHz	
5.5.2.1 Spectrum emission mask	Not applicable	
5.5.2.2 ACLR		
5.5.3 Spurious emissions		
5.5.3 Spurious emissions: additional		
5.6 Transmit intermodulation:	Not applicable	
5.7.1 Transmit modulation: EVM	2.5 %	
5.7.2 Transmit modulation: peak code domain error	±[1 dB]	

F.5.2 Receiver measurements

Table F.5.2: Equipment accuracy for receiver measurements

Clause	Equipment accuracy	Test conditions
6.2 Reference Sensitivity Level	Not applicable	
6.3 maximum input level:	Not applicable	
6.4 Adjacent Channel Selectivity (ACS)	Not applicable	
6.5 Blocking Characteristics	Not applicable	
6.6 Spurious Responce	Not applicable	
6.7 Intermodulation Characteristics	Not applicable	
6.8 Spurious Emissions	Not applicable	

F.5.3 Performance measurements

Table G.3 Equipment accuracy for performance measurements

Clause	Equipment accuracy	Test conditions
TBD	TBD	

F.6 General rules for statistical testing

F.6.1 Statistical testing of receiver BER/BLER performance

F.6.1.1 Error Definition

1) Bit Error Ratio (BER)

The Bit Error Ratio is defined as the ratio of the bits wrongly received to all data bits sent. The bits are the information bits above the convolutional/turbo decoder

2) Block Error Ratio (BLER)

A Block Error Ratio is defined as the ratio of the number of erroneous blocks received to the total number of blocks sent. An erroneous block is defined as a Transport Block, the cyclic redundancy check (CRC) of which is wrong.

F.6.1.2 Test Method

Each test is performed in the following manner:

- a) Setup the required test conditions.
- b) Record the number of samples tested and the number of occurred events (bit error or block error)
- c) Stop the test at a stop criterion which is minimum test time or an early pass or an early fail event.
- d) Once the test is stopped decide according to the pass fail decision rules (subclause F.6.1.7)

F.6.1.3 Test Criteria

The test shall fulfil the following requirements:

- a) good pass fail decision
 - 1) to keep reasonably low the probability (risk) of passing a bad unit for each individual test;
 - 2) to have high probability of passing a good unit for each individual test;
- b) good balance between testtime and statistical significance
 - 3) to perform measurements with a high degree of statistical significance;
 - 4) to keep the test time as low as possible.

F.6.1.4 Calculation assumptions

It is assumed, that error events are independent statistical events. Due to the memory of the convolutional / turbo coder in the BER tests this is not quite true. Due to lack of information the assumption of independent error events is applied.

In the BLER test with fading there is the memory of the multipath fading channel which interferes the statistical independency. Independent error events are assumed but a minimum test time is introduced to average fluctuations of the multipath fading channel.

The formulas, applied to describe the BER BLER test, are primarily based on the following experiment:

(1) After having observed a certain number of errors (**ne**) the number of samples are counted to calculate BER BLER.

Provisions are made (note 1) such that the complementary experiment is valid as well:

(2) After a certain number of samples (**ns**) the number of errors, occurred, are counted to calculate BER BLER.

Experiment (1) stipulates to use the following Chi Square Distribution with degree of freedom ne :
 $2 * dchisq(2 * NE, 2 * ne)$ for all calculations.

(NE: average of the distribution)

F.6.1.5 Definition of good pass fail decision.

This is defined by the probability of wrong decision D . The probability of a correct decision is $1-D$

The probability (risk) to fail a good DUT shall be $\leq D$ according to the following definition: A DUT is failed, accepting a probability of $\leq D$ that the DUT is still better than the specified error ratio (Test requirement)

The probability to pass a bad DUT shall be $\leq D$ according to the following definition: A DUT is passed, accepting a probability of $\leq D$ that the DUT is still worse than M times the specified error ratio. ($M \geq 1$ is the bad DUT factor)

This definitions lead to an early pass and an early fail limit:

Early fail: $ber \geq berlim_{fail}$

$$berlim_{fail}(D, ne) = \frac{2 * ne}{qchisq(D, 2 * ne)} \quad (1)$$

For $ne > [5]$

Early pass: $ber \leq berlim_{pass}$

$$berlim_{pass}(D, ne) = \frac{2 * ne * M}{qchisq(1 - D, 2 * ne)} \quad (2)$$

For $ne \geq 1$

With

ber (normalized BER,BLER): BER,BLER according to F.6.1.1 divided by Test requirement

D : wrong decision probability see table F.6.1.8

ne : Number of error events

M : bad DUT factor see table F.6.1.8

$qchisq$: inverse cumulative chi squared distribution

F.6.1.6 Good balance between testtime and statistical significance

3 independent test parameters are introduced into the test and shown in table F.6.1.6.1. These are the obvious basis of testtime and statistical significance. From the first two of them three dependent test parameters are derived. The third independent test parameter is justified separately.

Table F.6.1.6.1 independent and dependent test parameters

Independent test parameters			Dependent test parameters		
Test Parameter	Value	Reference	Test parameter	Value	Reference
Target number of error events	[200]	Table F.6.1.8	Early pass/fail condition	curves	Subclause F.6.1.5 Figure 6.1.9
Probability of wrong pass/fail decision D	[0.2%] [0.02%, Note 3]	Subclause F.6.1.5	Bad DUT factor M	[1.5]	Table 6.1.8
			Test limit factor TL	[1.24]	Table 6.1.8
Minimum test time		Table F.6.1.6.2			

The minimum test time is derived from the following justification:

- 1) For no propagation conditions and static propagation condition

No early fail calculated from fractional number of errors <1 see note 1

- 2) For multipath fading condition

No stop of the test until [10] wavelengths are crossed during relevant UE reception timeslots^{*)} with the speed given in the fading profile. ^{*)} relevant for BER BLER testing

Table F.6.1.6.2 : minimum Test time

Fading profile	Minimum test time
Multipath propagation 3 km/h	[1.8 s*15/TSRX ¹⁾]
Multipath propagation 50 km/h	[0.1 s*15/TSRX]
Multipath propagation 120 km/h	[45 ms*15/TSRX]
Multipath propagation 250 km/h	[22ms*15/TSRX]

¹⁾ TSRX = The number of relevant UE reception timeslots per frame, relevant for BER BLER test

15/ TSRX forms the prolongation factor and depend on the user data rate

Table F.6.1.6.3: Prolongation factor for minimum Test time

User Data rate	TSRX
12.2 kbit/s	1
64 kbit/s	1
144 kbit/s	1
384 kbit/s	3

In table F.6.1.8 the minimum test time is converted in minimum number of samples

F.6.1.7 Pass fail decision rules

No decision is allowed before the minimum test time is elapsed

- 1) If minimum Test time < time for target number of error events then the following applies: The required confidence level (= correct decision probability 1-D) shall be achieved. This is fulfilled at an early pass or early fail event.

For BER: For every TTI (Transmit Time Interval) sum up the number of bits (ns) and the number if errors (ne) from the beginning of the test, including the artificial error at the beginning of the test (Note 1) and calculate BER.

If BER is above the early fail limit, fail the DUT.

If BER is below the early pass limit, pass the DUT.

Otherwise continue the test

For BLER: For every block sum up the number of blocks (ns) and the number of erroneous blocks (ne) from the beginning of the test, including the artificial error at the beginning of the test (Note 1) and calculate BLER.

If BLER is below the early pass limit, pass the DUT.

If BLER is above the early fail limit, fail the DUT.

Otherwise continue the test

- 2) If the minimum test time \geq time for target error events, then the test runs for the minimum test time and the decision is done by comparing the result with the test limit.

F.6.1.8 Test conditions for BER,BLER tests

Table F.6.1.8: Test conditions for a single BER/BLER tests

Type of test (BER)	Propagation conditions	Test requirement (BER/BLER)	Test limit (BER/BLER) = Test requirement (BER/BLER) x TL TL	Target number of error events (time)	Minimum number of samples	Prob that good unit will fail = Prob that bad unit will pass [%]	Bad unit BER/BLER factor M
Reference Sensitivity Level	-	0.001	[1.24]	[200] (13.2s)	Note 1	[0.2]	[1.5]
Maximum Input Level	-	0.001	[1.24]	[200] (13.2s)	Note 1	[0.2]	[1.5]
Adjacent Channel Selectivity	-	0.001	[1.24]	[200] (13.2s)	Note 1	[0.2]	[1.5]
Blocking Characteristics Pass condition Note 2	-	0.001	[1.262]	[252] (16.6s)	Note 1	[0.2]	[1.5]
Blocking Characteristics Fail condition Note 2	-	0.001	[1.262]	[252] (16.6s)	Note 1	[0.02]	[1.5]
Spurious Response	-	0.001	[1.24]	[200] (13.2s)	Note 1	[0.2]	[1.5]
Intermodulation Characteristics	-	0.001	[1.24]	[200] (13.2s)	Note 1	[0.2]	[1.5]

Table F.6.1.8-2: Test conditions for BLER tests Type of test (BLER)	Information Bit rate	Test requirement (BER/BLER)	Test limit (BER/BLER) = Test requirement (BER/BLER) x TL TL	Target number of error events (time)	Minimum number of samples	Prob that bad unit will pass = Prob that good unit will fail [%]	Bad unit BER/BLER factor M
Demodulation in Static Propagation conditions	12.2 64 144 384	0.01 0.1 0.01 0.1 0.01	[1.24]	[200] (322.6s) (32.3s) (322.6s) (32.3s) (322.6s) (16.1s) (161.3s)	Note1	[0.2]	[1.5]
Demodulation of DCH in Multi-path Fading conditions							
3km/h (Case 1, Case 2)	12.2 64 144 384	0.01 0.1 0.01 0.1 0.01 0.1 0.01	[1.24]	[200] (322.6s) (32.3s) (322.6s) (32.3s) (322.6s) (16.1s) (161.3s)	[1350] [1350] [1350] [1350] [1350] [450] [450]	[0.2]	[1.5]
120 km/h (Case3)	12.2 64 144 384	0.01 0.1 0.01 0.1 0.01	[1.24]	[200] (322.6s) (32.3s) (322.6s) (32.3s) (322.6s) (16.1s) (161.3s)	[34] [34] [34] [34] [34] [12] [12]	[0.2]	[1.5]
250 km/h							
Power control in the downlink				Not applicable			

F.6.1.9 Practical Use (informative)

See figure F.6.1.9:

The early fail limit represents formula (1) in F.6.1.5 The range of validity is $[ne > 5, > 6$ in case of blocking test] to $[ne = 200]$

The early pass limit represents the formula (2) in F.6.1.5 The range of validity is $ne = 1$ to $[ne = 200]$. See note 1

The intersection co-ordinates of both curves are: Target number of errors $ne = [200]$ and test limit $TL = [1.24]$

The range of validity for TL is $ne > 200$

A typical BER BLER test, calculated from the number of samples and errors (F.6.1.2.(b)) using experimental method (1) or (2) (see F.6.1.4. calculation assumptions) runs along the yellow trajectory. With an errorless sample the trajectory goes down vertically. With an erroneous sample it goes up right. The tester checks if the BER BLER test intersects the early fail or early pass limits. The real time processing can be reduced by the following actions:

BLER is calculated only in case of an error event.

BER is calculated only in case of an error event within a TTI.

So the early fail limit cannot be missed by errorless samples.

The check against the early pass limit may be done by transforming formula (2) in F.6.1.5 such that the tester checks against a Limit-Number-of-samples (NL(ne)) depending on the current number of errors.

Early pass if

$$NL(ne) \geq \frac{qchisq(1 - D, 2 * ne)}{2 * TR * M}$$

TR: test requirement (0.001)

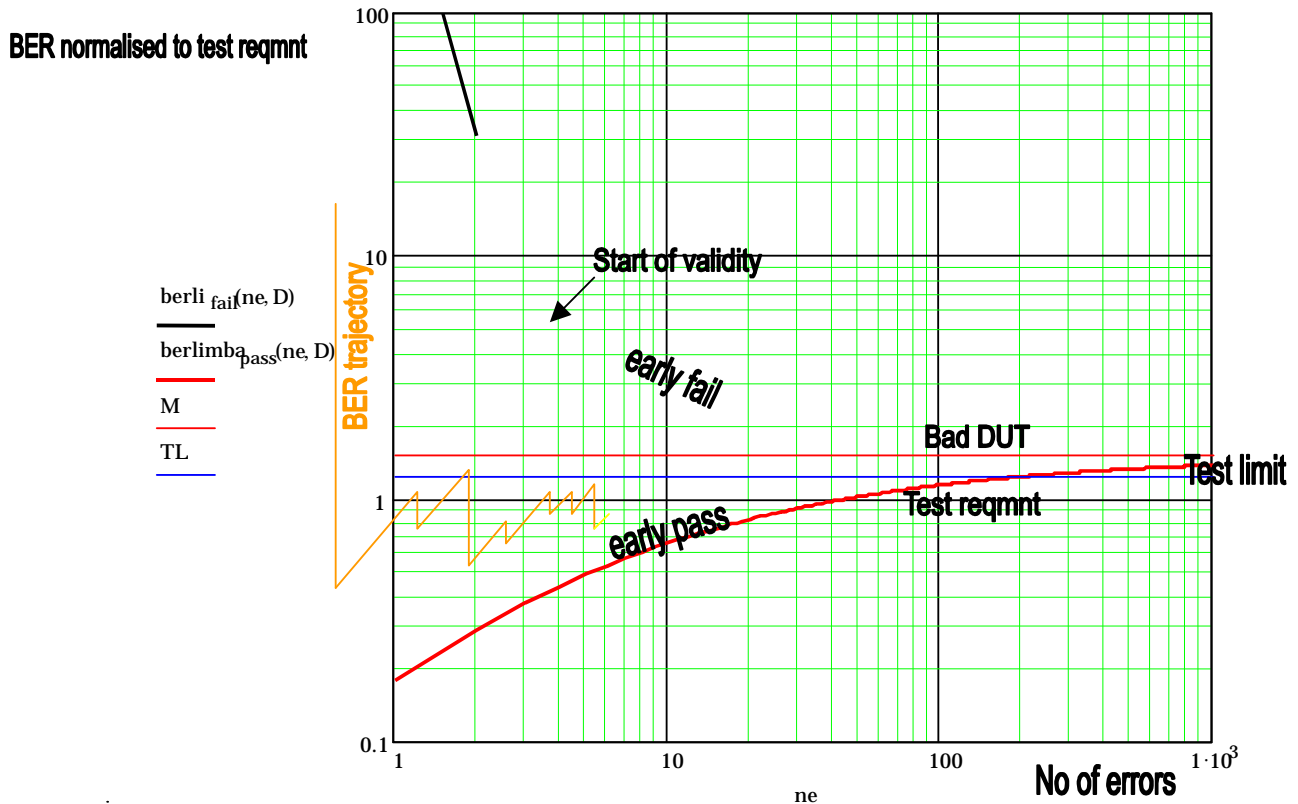


Figure F.6.1.9

Note 1: At the beginning of the test, one artificial erroneous sample is introduced. This ensures that an ideal DUT meets the valid range of the early pass limit. In addition this ensures that the complementary experiment (F.6.1.4. bullet point (2)) is applicable as well.

Due to the nature of the test, namely discrete error events, the early fail condition shall not be valid, when fractional errors <1 are used to calculate the early fail limit: Any early fail decision is postponed until number of errors ne >[5]. In the blocking test any early fail decision is postponed until number of errors ne >[6].

Note2: D=[0.2%] is intended to be used for a test containing a few BER/BLER tests (e.g. receiver sensitivity is repeated 12 times). For a test containing many BER/BLER tests (e.g. blocking test) this value is not appropriate for a single BER/BLER test.

The blocking test contains approx. 12750 single BER tests. A DUT on the limit will fail approx. 25 to 26 times due to statistical reasons (wrong decision probability [0.2%]). 24 fails are allowed in the blocking test but they are reserved for spurious responses. This shall be solved by the following rule:

All passes (based on D=[0.2%]) are accepted, including the wrong decisions due to statistical reasons.

An early fail limit based on D=[0.02%] instead of [0.2%] is established, that ensures that wrong decisions due to statistical reasons are reduced to 2 to 3.

These asymmetric test conditions ensure that a DUT on the test limit consumes hardly more test time for a blocking test than in the symmetric case and on the other hand discriminates sufficiently between statistical fails and spurious response cases.

F.6.2 Statistical testing of RRM delay performance

F.6.2.1 Test Method

Each test is performed in the following manner:

- a) Setup the required test conditions.
- b) Measure the delay repeated times. Start each repetition after sufficient time, such that each delay test is independent from the previous one. The delay-times, measured, are simplified to:
 - a good delay, if the measured delay is \leq limit.
 - a bad delay, if the measured delay is $>$ limit
- c) Record the number of delays (n_s), tested, and the number of bad delays (n_e)
- d) Stop the test at an early pass or an early fail event.
- e) Once the test is stopped, decide according to the pass fail decision rules (subclause F.6.2.7)

F.6.2.2 Bad Delay Ratio (ER)

The Bad Delay Ratio (ER) is defined as the ratio of bad delays (n_e) to all delays (n_s).

(1-ER is the success ratio)

F.6.2.3 Test Criteria

The test shall fulfil the following requirements:

- a) good pass fail decision
 - 1) to keep reasonably low the probability (risk) of passing a bad unit for each individual test;
 - 2) to have high probability of passing a good unit for each individual test;
- b) good balance between test-time and statistical significance
 - 3) to perform measurements with a high degree of statistical significance;
 - 4) to keep the test time as low as possible.

F.6.2.4 Calculation assumptions

F.6.2.4.1 Statistical independence

It is arranged by test conditions, that bad delays are independent statistical events.

F.6.2.4.2 Applied formulas

The specified ER is 10% in most of the cases. This stipulates to use the binomial distribution to describe the RRM delay statistics. With the binomial distribution optimal results can be achieved. However the inverse cumulative operation for the binomial distribution is not supported by standard mathematical tools. The use of the Poisson or Chi Square Distribution requires $ER \rightarrow 0$. Using one of this distributions instead of the binomial distribution gives sub-optimal results in the conservative sense: a pass fail decision is done later than optimal and with a lower wrong decision risk than predefined.

The formulas, applied to describe the RRM delay statistics test, are based on the following experiment:

(1) After having observed a certain number of bad delays (**ne**) the number of all delays (**ns**) are counted to calculate ER. Provisions are made (note 1) such that the complementary experiment is valid as well:

(2) After a certain number of delays (**ns**) the number of bad delays (**ne**), occurred, are counted to calculate ER.

Experiment (1) stipulates to use the Chi Square Distribution with degree of freedom ne : $2 * dchisq(2 * NE, 2 * ne)$.

Experiment (2) stipulates to use the Poisson Distribution: $dpois(ne, NE)$

(NE: mean value of the distribution)

To determine the early stop conditions, the following inverse cumulative operation is applied:

$0.5 * qchisq(D, 2 * ne)$ for experiment (1) and (2)

D: wrong decision risk per test step

Note: other inverse cumulative operations are available, however only this is suited for experiment (1) and (2).

F.6.2.4.3 Approximation of the distribution

The test procedure is as follows:

During a running measurement for a UE ns (Number of Delays) and ne (Number of bad delays) are accumulated and from this the preliminary ER is calculated. Then ne new samples up to the next bad delay are taken. The entire past and the new samples are basis for the next preliminary ER. Depending on the result at every step, the UE can pass, can fail or must continue the test.

As early pass- and early fail-UEs leave the statistical totality under consideration, the experimental conditions are changed every step resulting in a distribution that is truncated more and more towards the end of the entire test. Such a distribution can not any more be handled analytically. The unchanged distribution is used as an approximation to calculate the early fail and early pass bounds.

F.6.2.5 Definition of good pass fail decision.

This is defined by the probability of wrong decision F at the end of the test. The probability of a correct decision is $1 - F$.

The probability (risk) to fail a good DUT shall be $\leq F$ according to the following definition: A DUT is failed, accepting a probability of $\leq F$ that the DUT is still better than the specified bad delay ratio (Test requirement).

The probability (risk) to pass a bad DUT shall be $\leq F$ according to the following definition: A DUT is passed, accepting a probability of $\leq F$ that the DUT is still worse than M times the specified bad delay ratio. ($M \geq 1$ is the bad DUT factor).

This definitions lead to an early pass and an early fail limit:

Early fail: $er \geq erlim_{fail}$

$$erlim_{fail}(D, ne) = \frac{2 * ne}{qchisq(D, 2 * ne)} \quad (1)$$

For $ne \geq [5]$,

Early pass: $er \leq erlim_{pass}$

$$erlim_{pass}(D, ne) = \frac{2 * ne * M}{qchisq(1 - D, 2 * ne)} \quad (2)$$

For $ne \geq 1$,

With,

er (normalized ER): ER according to F.6.2.2 divided by specified ER

D: wrong decision probability for a test step . This is a numerically evaluated fraction of F, the wrong decision probability at the end of the test. see table F.6.2.6.1

ne: Number of bad delays

M: bad DUT factor see table F.6.2.6.1

qchisq: inverse cumulative chi squared distribution

F.6.2.6 Good balance between test-time and statistical significance

Two independent test parameters are introduced into the test and shown in Table F.6.2.6.1. These are the obvious basis of test time and statistical significance. From them four dependent test parameters are derived.

Table F.6.2.6: Independent and dependent test parameters

Independent test parameters			Dependent test parameters		
Test Parameter	Value	Reference	Test parameter	Value	Reference
Bad DUT factor M	[1.5]	Table F.6.1.8	Early pass/fail condition	Curves	Subclause F.6.2.5 Figure 6.2.9
Final probability of wrong pass/fail decision F	[5%]	Table F.6.2.8	Target number of bad delays	[154]	Table 6.2.8
			Probability of wrong pass/fail decision per test step D	[0.6 %]	
			Test limit factor TL	[1.236]	Table 6.2.8

F.6.2.7 Pass fail decision rules

The required confidence level $1-F$ (= correct decision probability) shall be achieved. This is fulfilled at an early pass or early fail event. Sum up the number of all delays (n_s) and the number of bad delays from the beginning of the test and calculate:

ER_1 (including the artificial error at the beginning of the test (Note 1))and

ER_0 (excluding the artificial error at the beginning of the test (Note 1)).

If ER_0 is on or above the early fail limit, fail the DUT.

If ER_1 is on or below the early pass limit, pass the DUT.

Otherwise continue the test.

F.6.2.8 Test conditions for RRM delay tests

Table F.6.2.8: Test conditions for a single RRM delay tests

Type of test	Test requirement Delay (s)	Test requirement (ER)	Testlimit (ER)= Test requirement (ER)x TL TL	Target number of bad delays	Prob that good unit will fail = Prob that bad unit will pass [%]	Bad unit factor M
8.2.2.1 TDD/TDD Cell re-selection in Idle mode (single carrier)	8	0.1	[1.236]	[154]	[5]	[1.5]
8.2.2.2 TDD/TDD Cell re-selection in Idle Mode (multicarrier)	8	0.1	[1.236]	[154]	[5]	[1.5]
8.2.2.3 TDD/FDD Cell re-selection in Idle Mode	8					
8.2.2.4 UTRAN to GSM cell re-selection in Idle Mode	27.9	0.1	[1.236]	[154]	[5]	[1.5]
8.3.1 TDD/TDD handover	40 ms	0.1	[1.236]	[154]	[5]	[1.5]
8.3.2 TDD/FDD handover	100 ms	0.1	[1.236]	[154]	[5]	[1.5]
8.3.3 TDD/GSM handover	40ms	0.1	[1.236]	[154]	[5]	[1.5]
8.3.4 TDD/TDD Cell Re-selection in CELL_FACH	2.5	0.1	[1.236]	[154]	[5]	[1.5]
8.3.5 TDD/TDD Cell Re-selection in CELL_PCH	8	0.1	[1.236]	[154]	[5]	[1.5]
8.3.6 TDD/TDD Cell Re-selection in URA_PCH	8	0.1	[1.236]	[154]	[5]	[1.5]

F.6.2.9 Practical Use (informative)

See figure F.6.2.9:

The early fail limit represents formula (1) in F.6.2.5. The range of validity is $[n_e \geq 5]$ to $[n_e = 154]$

The early pass limit represents the formula (2) in F.6.2.5. The range of validity is $n_e=1$ to $[n_e = 154]$. See note 1. The intersection co-ordinates of both curves are : target number of bad delays $n_e = [154]$ and test limit $TL = [1.236]$.

A typical delay test, calculated from the number of samples and errors (F.6.2.2) using experimental method (1) or (2) (see F.6.2.4.2. calculation assumptions) runs along the yellow trajectory. With a good delay the trajectory goes down vertically. With a bad delay it jumps up right. The tester checks if the ER test intersects the early fail or early pass limits.

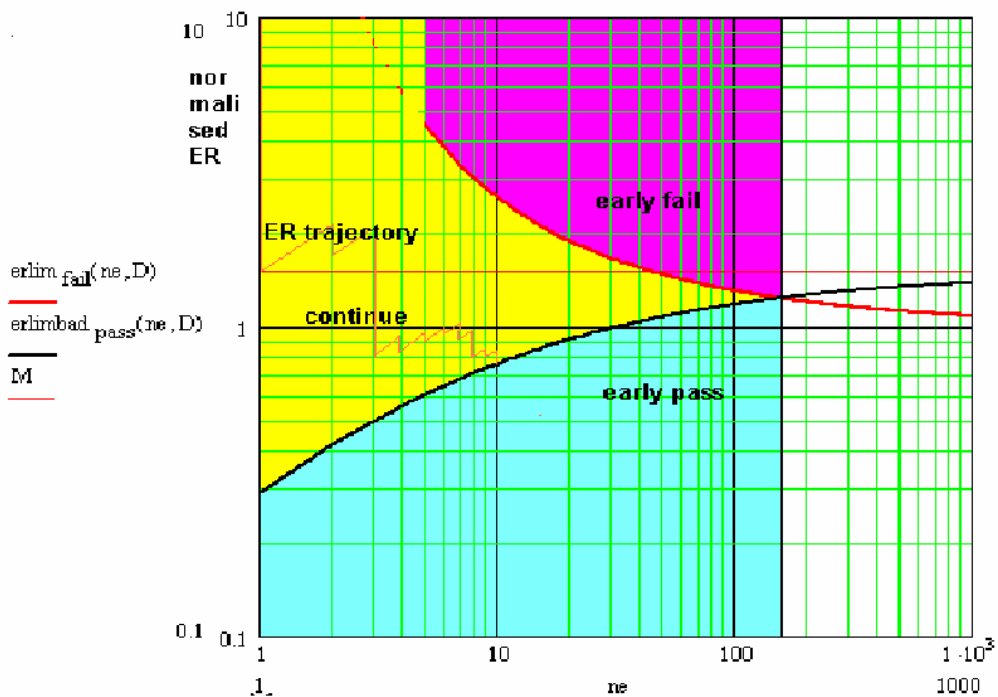


Figure F.6.2.9

NOTE 1: At the beginning of the test, an artificial bad delay is introduced. This ensures that an ideal DUT meets the valid range of the early pass limit. In addition this ensures that the complementary experiment (F.6.2.4.2. bullet point (2)) is applicable as well. For the check against the early fail limit the artificial bad delay sample, introduced at the beginning of the test, is disregarded.

Due to the nature of the test, namely discrete bad delay events, the early fail condition shall not be valid, when fractional bad delays <1 are used to calculate the early fail limit: Any early fail decision is postponed until number of errors $ne \geq [5]$.

Annex G (normative): Environmental conditions

G.1 General

This normative annex specifies the environmental requirements of the UE. Within these limits the requirements of the present document shall be fulfilled.

G.2 Environmental requirements

The requirements in this clause apply to all types of UE(s)

G.2.1 Temperature

The UE shall fulfil all the requirements in the full temperature range of:

+15°C to +35°C	for normal conditions (with relative humidity of 25 % to 75 %)
-10°C to +55°C	for extreme conditions (see IEC publications 68-2-1 and 68-2-2)

Outside this temperature range the UE, if powered on, shall not make ineffective use of the radio frequency spectrum. In no case shall the UE exceed the transmitted levels as defined in TS 25.101 [1] for extreme operation.

Some tests in the present document are performed also in extreme temperature conditions. These test conditions are denoted as TL (temperature low, -10°C) and TH (temperature high, +55°C).

G.2.2 Voltage

The UE shall fulfil all the requirements in the full voltage range, i.e. the voltage range between the extreme voltages.

The manufacturer shall declare the lower and higher extreme voltages and the approximate shutdown voltage. For the equipment that can be operated from one or more of the power sources listed below, the lower extreme voltage shall not be higher, and the higher extreme voltage shall not be lower than that specified below.

Power source	Lower extreme voltage	Higher extreme voltage	Normal conditions voltage
AC mains	0,9 * nominal	1,1 * nominal	nominal
Regulated lead acid battery	0,9 * nominal	1,3 * nominal	1,1 * nominal
Non regulated batteries: Leclanché / lithium Mercury/nickel & cadmium	0,85 * nominal 0,90 * nominal	Nominal Nominal	Nominal Nominal

Outside this voltage range the UE if powered on, shall not make ineffective use of the radio frequency spectrum. In no case shall the UE exceed the transmitted levels as defined in [1] TS 25.101 for extreme operation. In particular, the UE shall inhibit all RF transmissions when the power supply voltage is below the manufacturer declared shutdown voltage.

Some tests in the present document are performed also in extreme voltage conditions. These test conditions are denoted as VL (lower extreme voltage) and VH (higher extreme voltage).

G.2.3 Vibration

The UE shall fulfil all the requirements when vibrated at the following frequency/amplitudes:

Frequency	ASD (Acceleration Spectral Density) random vibration
5 Hz to 20 Hz	0,96 m ² /s ³
20 Hz to 500 Hz	0,96 m ² /s ³ at 20 Hz, thereafter -3 dB/Octave

Outside the specified frequency range the UE, if powered on, shall not make ineffective use of the radio frequency spectrum. In no case shall the UE exceed the transmitted levels as defined in TS 25.101 [1] for extreme operation.

G.2.4 Specified frequency range

The manufacturer shall declare, which of the frequency bands defined in clause 4.2 is supported by the UE.

Some tests in this TS are performed also in low, mid and high range of the operating frequency band of the UE. The UARFCN's to be used for low, mid and high range are defined in TS 34.108 [3] clause 5.1.1.

Annex H (normative): Terminal Baseline and Service Implementation Capabilities (TDD)

H.1 Baseline Implementation Capabilities:

Table H.1: Baseline implementation capabilities

Capability TDD	Clause	UE*	Comments
Chip rate 3,84 Mcps		M	
Frequency bands: (uplink and downlink)			
1900-1920 MHz		M	
2010-2025 MHz		M	
1850-1910 MHz		M	
1930-1990 MHz		M	
1910-1930 MHz		M	
Other spectrum		O	As Declared
Carrier raster 200 kHz		M	
UE maximum output power	6.2.1	M	2, 3

(* M = mandatory, O = optional)

- The special conformance testing functions and the logical test interface as specified in TS 34.109 [3]. This issue is currently under investigation.
- Uplink reference measurement channel 12.2 kbps (FDD), TS 25.102 [1] clause A.2.1.
- Downlink reference measurement channel 12.2 kbps (FDD), TS 25.102 [1] clause A.2.2.

H.2 Service Implementation Capabilities:

- Downlink reference measurement channel 64 kbps (TDD), TS 25.102 clause A.2.3.
- Downlink reference measurement channel 144 kbps (TDD), TS 25.102 clause A.2.4.
- Down-link reference measurement channel 384 kbps (TDD), TS 25.102 clause A.2.5.
- BCH Reference Measurement Channel.

Annex I (normative): Default Message Contents

This Annex contains the default values of common messages, other than those described in TS 34.108. The messages are primarily concerning the RRM test cases in clause 8 and unless indicated otherwise in specific test cases, shall be transmitted and checked by the system simulator. The necessary messages are listed in alphabetical order.

In this Annex, decimal values are normally used. However, sometimes, a hexadecimal value, indicated by an "H", or a binary value, indicated by a "B" is used.

Contents of MEASUREMENT REPORT message for Intra frequency test cases

Information Element	Value/remark
Message Type	
Integrity check info	The presence of this IE is dependent on IXIT statements in TS 34.123-2. If integrity protection is indicated to be active, this IE shall be present with the values of the sub IEs as stated below. Else, this IE and the sub-IEs shall be absent.
- Message authentication code	This IE is checked to see if it is present. The value is compared against the XMAC-I value computed by SS.
- RRC Message sequence number	This IE is checked to see if it is present. The value is used by SS to compute the XMAC-I value.
Measurement identity	1
Measured Results	
- Intra-frequency measured results list	
- Cell measured results	
- Cell Identity	Not present
- SFN-SFN observed time difference	Checked that this IE is present
- Cell synchronisation information	
- CHOICE mode	TDD
- OFF	Checked that this IE is present
- CHOICE mode	TDD
- Cell Parameters ID	4
- Primary CCPCH RSCP	Checked that this IE is present
- Pathloss	Checked that this IE is present
- Timeslot ISCP	Checked that this IE is present
Measured results on RACH	Checked that this IE is absent
Additional measured results	Checked that this IE is absent
Event results	Checked that this IE is absent

Contents of MEASUREMENT REPORT message for Inter frequency TDD test cases

Information Element	Value/remark
Message Type Integrity check info - Message authentication code - RRC Message sequence number	The presence of this IE is dependent on IXIT statements in TS 34.123-2. If integrity protection is indicated to be active, this IE shall be present with the values of the sub IEs as stated below. Else, this IE and the sub-IEs shall be absent. This IE is checked to see if it is present. The value is compared against the XMAC-I value computed by SS. This IE is checked to see if it is present. The value is used by SS to compute the XMAC-I value.
Measurement identity Measured Results - Inter-frequency measured results list - UTRA Carrier RSSI - Inter-frequency cell measurement results - Cell measured results - Cell Identity - SFN-SFN observed time difference - Cell synchronisation information - CHOICE mode - OFF - CHOICE mode - Cell Parameters ID - Primary CCCPCH RSCP - Pathloss - Timeslot ISCP	1 Checked that this IE is present Not present Checked that this IE is present TDD Checked that this IE is present TDD 4 Checked that this IE is present Checked that this IE is present Checked that this IE is present
Measured results on RACH	Checked that this IE is absent
Additional measured results	Checked that this IE is absent
Event results	Checked that this IE is absent

Contents of MEASUREMENT REPORT message for Inter frequency FDD test cases

Information Element	Value/remark
Message Type	
Integrity check info	The presence of this IE is dependent on IXIT statements in TS 34.123-2. If integrity protection is indicated to be active, this IE shall be present with the values of the sub IEs as stated below. Else, this IE and the sub-IEs shall be absent.
- Message authentication code	This IE is checked to see if it is present. The value is compared against the XMAC-I value computed by SS.
- RRC Message sequence number	This IE is checked to see if it is present. The value is used by SS to compute the XMAC-I value.
Measurement identity	1
Measured Results	
- Inter-frequency measured results list	
- UTRA Carrier RSSI	Checked that this IE is present
- Inter-frequency cell measurement results	
- Cell measured results	
- Cell Identity	Not present
- SFN-SFN observed time difference	Checked that this IE is present
- Cell synchronisation information	
-Tm	Checked that this IE is present
- OFF	Checked that this IE is present
- CHOICE mode	FDD
- Primary CPICH info	Checked that this IE is present
- Primary scrambling code	150
- CPICH Ec/N0	Checked that this IE is present
- CPICH RSCP	Checked that this IE is present
- Pathloss	Checked that this IE is present
Measured results on RACH	Checked that this IE is absent
Additional measured results	Checked that this IE is absent
Event results	Checked that this IE is absent

Contents of MEASUREMENT REPORT message for inter – RAT test cases

Information Element	Value/remark
Message Type	
Integrity check info	The presence of this IE is dependent on IXIT statements in TS 34.123-2. If integrity protection is indicated to be active, this IE shall be present with the values of the sub IEs as stated below. Else, this IE and the sub-IEs shall be absent.
- Message authentication code	This IE is checked to see if it is present. The value is compared against the XMAC-I value computed by SS.
- RRC Message sequence number	This IE is checked to see if it is present. The value is used by SS to compute the XMAC-I value.
Measurement identity	1
Measured Results	
- Inter-RAT measured results list	
- CHOICE system	GSM
- Measured GSM cells	Checked that this IE is present
- GSM carrier RSSI	Checked that this IE is present
- Pathloss	Checked that this IE is present
- Observed time difference to GSM cell	Checked that this IE is present
Measured results on RACH	Checked that this IE is absent
Additional measured results	Checked that this IE is absent
Event results	Checked that this IE is absent

Annex J (informative): Change history

Meeting -1st- Level	Doc-1st-Level	CR	Rev	Subject	Cat	Version - Current	Version -New	Doc-2nd- Level
TP-08				Approval of the specification		2.0.0	3.0.0	
TP-09	TP-000134	001		Corrections to EVM and PCDE formulae (B.2.7.1, B2.7.2)	F	3.0.0	3.1.0	T1-000150
TP-10	TP-000217	002		Update of 34.122 according to RAN#9-approved CRs to 25.102	F	3.1.0	3.2.0	T1-000256
TP-10	TP-000217	003		Update according to former CRs to 25.102	F	3.1.0	3.2.0	T1-000257
TP-10	TP-000217	004		editorial corrections for: Global In-Channel TX- Test	D	3.1.0	3.2.0	T1-000259
TP-10	TP-000217	005		Handling of measurement uncertainties in UE conformance testing (TDD)	F	3.1.0	3.2.0	T1-000262
TP-10	TP-000217	006		Uplink Power control	F	3.1.0	3.2.0	T1-000258
TP-10	TP-000217	007		UE maximum output power multicode	F	3.1.0	3.2.0	T1-000260
TP-10	TP-000217	008		Out-of-synchronisation handling of output power	F	3.1.0	3.2.0	T1-000261
TP-11	TP-010020	009		Test tolerance for 5.7.1 TDD EVM	F	3.2.0	3.3.0	T1-010048
TP-11	TP-010020	010		Test tolerance for 5.7.2 TDD PCDE	F	3.2.0	3.3.0	T1-010049
TP-11	TP-010020	011		Test tolerance for 5.2 Maximum Output Power test case	F	3.2.0	3.3.0	T1-010050
TP-11	TP-010020	012		Test tolerance for 5.3 Frequency Stability	F	3.2.0	3.3.0	T1-010051
TP-11	TP-010020	013		Test tolerance for 5.4.2 Minimum Transmit Output Power	F	3.2.0	3.3.0	T1-010052
TP-11	TP-010020	014		Test Tolerance for 5.4.3 Transmit OFF power	F	3.2.0	3.3.0	T1-010053
TP-11	TP-010020	015		Test tolerance for 5.4.5 Out-of-synchronisation handling of output power	F	3.2.0	3.3.0	T1-010054
TP-11	TP-010020	016		Test tolerance for 5.5.1 Occupied Bandwidth	F	3.2.0	3.3.0	T1-010055
TP-11	TP-010020	017		Test tolerance for 5.5.2.1 Spectrum Emission Mask	F	3.2.0	3.3.0	T1-010056
TP-11	TP-010020	018		Test tolerance for 5.5.2.2 ACLR test case	F	3.2.0	3.3.0	T1-010057
TP-11	TP-010020	019		Test Tolerance for 5.5.3 Spurious emissions	F	3.2.0	3.3.0	T1-010058
TP-11	TP-010020	020		Test Tolerance for 5.6 Transmit Intermodulation	F	3.2.0	3.3.0	T1-010059
TP-11	TP-010020	021		Test Tolerance for 6.2 Reference Sensitivity Level	F	3.2.0	3.3.0	T1-010060
TP-11	TP-010020	022		Test Tolerance for 6.4 Adjacent Channel Selectivity	F	3.2.0	3.3.0	T1-010061
TP-11	TP-010020	023		Test tolerances to 6.5 Blocking Characteristics	F	3.2.0	3.3.0	T1-010062
TP-11	TP-010020	024		Test tolerances to 6.6 Spurious Response	F	3.2.0	3.3.0	T1-010063
TP-11	TP-010020	025		Test tolerances to 6.7 Intermodulation Characteristics	F	3.2.0	3.3.0	T1-010064
TP-11	TP-010020	026		Test Tolerance for 6.5 RX Spurious Emissions	F	3.2.0	3.3.0	T1-010065
TP-11	TP-010020	027		Test tolerance for Annex F in TS34.122	F	3.2.0	3.3.0	T1-010068
TP-11	TP-010020	028		Correction concerning the coexistence of TDD and FDD in the same band	F	3.2.0	3.3.0	T1-010045
TP-11	TP-010020	029		Clarification of the mentioned parameter alpha	F	3.2.0	3.3.0	T1-010046
TP-11	TP-010020	030		Correction concerning the channel number calculation	F	3.2.0	3.3.0	T1-010047
TP-11	TP-010020	031		Correction concerning UE maximum output power classes	F	3.2.0	3.3.0	T1-010066
TP-11	TP-010020	032		Correction of Out-of-Sync criteria	F	3.2.0	3.3.0	T1-010067
TP-12	TP-010120	033		CR:New Power Classes require new test tolerances	F	3.3.0	3.4.0	T1-010154
TP-12	TP-010120	034		CR:Test tolerances for Output Power Dynamic	F	3.3.0	3.4.0	T1-010155
TP-13	TP-010185	036		Replacement of Conformance requirements by Minimum requirements	F	3.4.0	3.5.0	T1-010345
TP-13	TP-010185	037		Deletion of the test: Demodulation of BCH in Block STTD mode	F	3.4.0	3.5.0	T1-010344
TP-13	TP-010185	038		Test conditions	F	3.4.0	3.5.0	T1-010347
TP-13	TP-010185	039		Completion of test procedures & test system uncertainties	F	3.4.0	3.5.0	T1-010349
TP-13	TP-010185	040		Maximum Test System Uncertainty for transmitter tests	F	3.4.0	3.5.0	T1-010351
TP-13	TP-010185	041		Correction of Out-of-synchronisation test	F	3.4.0	3.5.0	T1-010353
TP-13	TP-010185	042		UE power classes	F	3.4.0	3.5.0	T1-010354
TP-13	TP-010185	043		Correction of frequency range for receiver spurious emission requirements	F	3.4.0	3.5.0	T1-010365
TP-14	TP-010260	052		Clarification of AWGN definition	F	3.5.0	3.6.0	T1-010502
TP-14	TP-010260	053		RX spurious emissions	F	3.5.0	3.6.0	T1-010503
TP-14	TP-010260	054		Correction of Spurious emissions	F	3.5.0	3.6.0	T1-010504
TP-14	TP-010260	055		Power and ACLR definition corrections	F	3.5.0	3.6.0	T1-010507
TP-14	TP-010260	056		Out of synchronisation handling	F	3.5.0	3.6.0	T1-010509
TP-14	TP-010260	057		Clarification in Spectrum emission mask section	F	3.5.0	3.6.0	T1-010511
TP-14	TP-010260	058		Changes to blocking characteristics and spurious response test cases	F	3.5.0	3.6.0	T1-010513
TP-14	TP-010260	059		maximum output power for multicode transmission	F	3.5.0	3.6.0	T1-010515
TP-14	TP-010260	060		BER/BLER testing based on statistical approach	F	3.5.0	3.6.0	T1-010518
TP-15	TP-020040	070		Corrections to various reference to tables in the document.	F	3.6.0	3.7.0	T1-020150
TP-15	TP-020040	071		Maintenance of Annex B	F	3.6.0	3.7.0	T1-020151

TP-15	TP-020040	072		Power Control in the Downlink	F	3.6.0	3.7.0	T1-020152
TP-15	TP-020040	073		Uplink Power Control Performance Test	F	3.6.0	3.7.0	T1-020153
TP-15	TP-020040	074		Replacement of Block STTD by Space Code Transmit Diversity (SCTD)	F	3.6.0	3.7.0	T1-020154
TP-15	TP-020040	075		New RRM Section Headings	F	3.6.0	3.7.0	T1-020155
TP-15	TP-020040	076		Cell Re-selection in idle mode test cases	F	3.6.0	3.7.0	T1-020156
TP-15	TP-020040	077		Statistical testing of RRM delay performance	F	3.6.0	3.7.0	T1-020157
TP-16	TP-020140	086		Cell Re-selection in CELL_PCH test case Rel99	F	3.7.0	3.8.0	T1-020229
TP-16	TP-020140	087		Cell Re-selection in URA_PCH test case Rel99	F	3.7.0	3.8.0	T1-020230
TP-16	TP-020140	088		TDD/TDD Intra-frequency Handover R99	F	3.7.0	3.8.0	T1-020255
TP-16	TP-020140	089		TDD/TDD Inter-frequency Handover R99	F	3.7.0	3.8.0	T1-020257
TP-16	TP-020140	090		TDD/FDD Handover R99	F	3.7.0	3.8.0	T1-020259
TP-16	TP-020140	091		PCCPCH Measurement Performance R99	F	3.7.0	3.8.0	T1-020261
TP-16	TP-020140	092		Corrections to TDD/TDD Cell Re-selection in CELL_FACH state R99	F	3.7.0	3.8.0	T1-020263
TP-16	TP-020140	093		Power Control in the Downlink for HCR Rel99	F	3.7.0	3.8.0	T1-020424
TP-17	TP-020186	104	-	Message Content for TDD Handover Test Cases	F	3.8.0	3.9.0	T1-020472
TP-17	TP-020186	106	-	General corrections for power definitions and test	F	3.8.0	3.9.0	T1-020487
TP-17	TP-020186	108	-	Correction to Receiver Spurious Emission Test Case	F	3.8.0	3.9.0	T1-020489
TP-18	TP-020295	110	-	Inclusion of TDD RRC re-establishment delay test cases	F	3.9.0	3.10.0	T1-020760
TP-18	TP-020295	111	-	Correction to power control accuracy test cases in 34.122	F	3.9.0	3.10.0	T1-020895
TP-18	TP-020295	112	-	Averaging period for ACLR	F	3.9.0	3.10.0	T1-020647
TP-18	TP-020295	113	-	Various updates to 34.122 based on RAN4 CRs	F	3.9.0	3.10.0	T1-020897
TP-18	TP-020295	114	-	Correction to downlink power control requirements in 34.122	F	3.9.0	3.10.0	T1-020643
TP-18	TP-020295	121	-	Corrections of TDD out-of Synchronisation Output power	F	3.9.0	3.10.0	T1-020899
TP-19	TP-030046	124	-	RRC connection re-establishment test cases Rel99	F	3.10.0	3.11.0	T1-030135
TP-19	TP-030046	126	-	Transport Format Combination Selection test case Rel99	F	3.10.0	3.11.0	T1-030137
TP-19	TP-030046	128	-	Timing Advance test case Rel99	F	3.10.0	3.11.0	T1-030139
TP-19	TP-030046	130	-	Event-triggered reporting in AWGN test case Rel99	F	3.10.0	3.11.0	T1-030141
TP-19	TP-030046	132	-	Event 1H and 1I triggered reporting in AWGN propagation	F	3.10.0	3.11.0	T1-030143
TP-19	TP-030046	134	-	Correct reporting of neighbours in fading propagation	F	3.10.0	3.11.0	T1-030145
TP-19	TP-030046	136	-	Correct reporting of TDD inter-frequency neighbours in	F	3.10.0	3.11.0	T1-030147
TP-19	TP-030046	138	-	Correct reporting of FDD inter-frequency neighbours in	F	3.10.0	3.11.0	T1-030149
TP-19	TP-030046	140	-	Corrections to TDD Cell Reselection and Handover Test	F	3.10.0	3.11.0	T1-030151
TP-19	TP-030046	142	-	CPICH RSCP Measurement test case Rel99	F	3.10.0	3.11.0	T1-030153
TP-19	TP-030046	144	-	Timeslot ISCP Measurement test case Rel99	F	3.10.0	3.11.0	T1-030155
TP-19	TP-030046	146	-	UTRA carrier RSSI Measurement test case Rel99	F	3.10.0	3.11.0	T1-030157
TP-19	TP-030046	148	-	SFN-SFN type 1 test case Rel99	F	3.10.0	3.11.0	T1-030159
TP-19	TP-030046	150	-	SFN-CFN observed time difference measurement test	F	3.10.0	3.11.0	T1-030161
TP-19	TP-030046	152	-	TDD-GSM handover case Rel99	F	3.10.0	3.11.0	T1-030163
TP-19	TP-030046	154	-	Correction to Cell Re-selection in CELL_PCH and	F	3.10.0	3.11.0	T1-030165
TP-19	TP-030046	156	-	Reference and measurement performance sSub-sections	F	3.10.0	3.11.0	T1-030167
TP-19	TP-030046	158	-	Corrections to P-CCPCH RSCP test case Rel99	F	3.10.0	3.11.0	T1-030169
TP-19	TP-030046	160	-	Statistical testing of RRM delay performance in Annex	F	3.10.0	3.11.0	T1-030176

History

Document history		
V3.0.0	June 2000	Publication
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V3.5.0	September 2001	Publication
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V3.7.0	March 2002	Publication
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