6 Transmitter Characteristics

6.1 General

Unless otherwise stated, the transmitter characteristics are specified at the antenna connector of the UE with a single transmit antenna. For UE with integral antenna only, a reference antenna with a gain of 0 dBi is assumed.

The transient periods due to power steps, OFF/ON and ON/OFF transitions could occur at slot or symbol boundary with transients, on one or both sides of the boundary. The measurement period and whether to exclude the transient periods are specified in the respective sections below.

Unless otherwise stated, the Test Equipment shall be synchronised to the Uplink signal for measurement of TDD transmitter characteristics.

For CA tests, Cell ID = 0 applies to P-Cell, and Cell ID = 1 is used for S-Cell.

Parameters given in table 6.1-1 are used throughout this section for CA, unless otherwise stated by the test case.

	Table	6.1-1:	Common	Te st	Parameters
--	-------	--------	--------	-------	-------------------

Parameter	Value	Comments
Cross carrier	Not configured	
scheduling		

6.2 Transmit power

6.2.1 Void

Editor's note: This "void" section was introduced because TS 36.101 v8.1.0 also contains a "void" sub-clause with in the transmit power clause 6.2, and there is a strong desire in RAN5 to keep the test cases clauses numbering matching their specific core requirements as much as possible.

6.2.2 UE Maximum Output Power

6.2.2.1 Test purpose

To verify that the error of the UE maximum output power does not exceed the range prescribed by the specified nominal maximum output power and tolerance.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

6.2.2.2 Test applicability

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

6.2.2.3 Minimum conformance requirements

The following UE Power Classes defines the maximum output power for any transmission bandwidth within the channel bandwidth. The period of measurement shall be at least one sub frame (1ms).

EUTRA band	Class 1 (dBm)	Tolerance (dB)	Class 2 (dBm)	Tolerance (dB)	Class 3 (dBm)	Tolerance (dB)	Class 4 (dBm)	Tolerance (dB)
1	()	()	()	()	23	+2	()	()
2					23	+22		
- 3					23	+22		
4					23	+2		
5					23	±2 ±2		
6					23	±2 ±2		
7					23	±2 ±2 ²		
0					23	±2		
0					23	±2		
9					23	±2		
10					23	±2		
10					23	±2		
12					23	±2		
13					23	±2		
14					23	±2		
1/					23	±2		
18					23	±2°		
19					23	±2		
20					23	±2 ²		
21					23	±2		
22					23	+2/-3.5*		
23					23°	±2°		
24					23	±2		
25					23	±2 ²		
26					23	±2 ²		
27					23	±2		
28					23	+2/-2.5		
31					23	±2		
33					23	±2		
34					23	±2		
35					23	±2		
36					23	±2		
37					23	±2		
38					23	±2		
39					23	±2		
40					23	±2		
41					23	±2 ²		
42					23	+2/-3		
43					23	+2/-3		
44					23	+2/[-3]		
Note 1:	The above t	olerances are	applicable f	or UE(s) that s	support up to	o 4 E-UTRA op	erating band	s. For UE(s)
	that support	t 5 or more E-I	UTRAbands	the maximun	n output pov	ver is expected	to decrease	with each
	additional b	and and is FF	S					
Note 2:	For transmi	ssion bandwid	Iths (Figure 5	5.4.2-1) confin	ed within Fu	JL_low and FUL_lov	v+4 MHzor	$F_{UL_high} - 4$
	MHz and Fu	IL_high, the may	imum outpu	t power requir	ement is rel	axed by reduci	ng the lower	tolerance limit
	by 1.5 dB							
Note 3:	P _{PowerClass} is	the maximum	UEpowers	pecified witho	out taking in	to account the to	oleranœ	
Note 4:	For the UE	whichsupport	s both Band	11 and Band	21 operating	g frequencies, t	he tolerance	is FFS.
Note 5:	When NS_2	20 is signalled	, the total ou	tput power wit	hin 2000-20	005 MHzshall b	e limited to 7	dBm.
Note 6:	For a UE the	at supports bo	oth Band 18	and Band 26,	the maximu	m output power	requirement	is relaxed by
	reducing the	e lower tolerar	nce limit by 1	.5dB for trans	mission bar	ndwidths confine	ed within 815	MHz and
	818 MHz							

Table 6.2.2.3-1: UE Power Class

The normative reference for this requirement is TS 36.101 clause 6.2.2.

6.2.2.4 Test description

6.2.2.4.1 Initial condition

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

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The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.2.2.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexe A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Test Environment as specified in TS 36.508[7] subclause 4.1Nomal, TL/VL, TL/VH, TH/VL, TH/VHTest Frequencies as specified in TS36.508 [7] subclause 4.3.1Low range, Mid range, High rangeTest Channel Bandwidths as specified in TS 36.508 [7] subclause 4.3.1Lowest, 5MHz, HighestTest Parameters for Channel BandwidthsDownlink ConfigurationUplink ConfigurationCh BWN/A for Max UE output power testingMod'nRB allocation1.4MHzPDOWNTDD1.4MHzQPSK113MHzQPSK44								
TS 36.508[7] subclause 4.1 Low range, Mid range, High range Test Frequencies as specified in TS36.508 [7] subclause 4.3.1 Lowest, 5MHz, Highest Test Channel Bandwidths as specified in TS 36.508 [7] subclause 4.3.1 Test Parameters for Channel Bandwidths Uplink Configuration Uplink Configuration Ownlink Configuration Mod'n RB allocation TDD 1.4MHz 1.4MHz QPSK 1 1 1.4MHz QPSK 5 5 5 3MHz QPSK 4 4								
Test Frequencies as specified in TS36.508 [7] subclause 4.3.1 Low range, Mid range, High range Test Channel Bandwidths as specified in TS 36.508 [7] subclause 4.3.1 Lowest, 5MHz, Highest Test Parameters for Channel Bandwidths Ownlink Configuration Uplink Configuration Ownlink Configuration Obwnlink Configuration Mod'n RB allocation Ch BW N/A for Max UE output power testing Mod'n RB allocation 1.4MHz QPSK 1 1 1.4MHz QPSK 5 5 3MHz QPSK 4 4								
Test Channel Bandwidths as specified in TS 36.508 [7] subclause 4.3.1 Lowest, 5MHz, Highest Test Parameters for Channel Bandwidths Downlink Configuration Downlink Configuration Uplink Configuration Ch BW N/A for Max UE output power testing Mod'n RB allocation 1.4MHz 3MHz 3MHz								
Test Channel Bandwidths as specified in TS 36.508 [7] subclause 4.3.1 Lowest, SMH2, Highest Test Parameters for Channel Bandwidths Downlink Configuration Uplink Configuration Ch BW N/A for Max UE output power testing Mod'n RB allocation 1.4MHz QPSK 1 1 1.4MHz QPSK 5 5 3MHz QPSK 4 4								
Test Parameters for Channel Bandwidths Test Parameters for Channel Bandwidths Downlink Configuration Uplink Configuration Ch BW N/A for Max UE output power testing Mod'n RB allocation 1.4MHz PDD TDD 1.4MHz QPSK 1 1 3MHz QPSK 1 1								
Downlink Configuration Uplink Configuration Ch BW N/A for Max UE output power testing Mod'n RB allocation 1.4MHz QPSK 1 1 1.4MHz QPSK 5 5 3MHz QPSK 1 1								
Ch BWN/A for Max UE output power testingMod'nRB allocation1.4MHzQPSK111.4MHzQPSK553MHzQPSK113MHzQPSK44								
Ch BWN/A for Max UE output power testingMod'nRB allocation1.4MHzFDDTDD1.4MHzQPSK113MHzQPSK113MHzQPSK44								
Image: second								
1.4MHz QPSK 1 1 1.4MHz QPSK 5 5 3MHz QPSK 1 1 3MHz QPSK 4 4								
1.4MHz QPSK 1 1 1.4MHz QPSK 5 5 3MHz QPSK 1 1 3MHz QPSK 4 4								
1.4MHz QPSK 5 5 3MHz QPSK 1 1 3MHz QPSK 4 4								
3MHz QPSK 1 1 3MHz QPSK 4 4								
3MHz QPSK 4 4								
5MHz QPSK 1 1								
SMHz QPSK 8 8								
10MHz QPSK 1 1								
10MHz QPSK 12 12								
15MHz QPSK 1 1								
ZUIVINZ UKSK 18 18								
channel bandwidths are specified in Table 5.4.2.1.1								
Note 2: For F-UTRA bands not applied with Note 2 in Table 6.2.2.3-1								
- The 1 RB allocation shall be tested at RB#0 for low and mid range. RB #max for high								
range test frequency.								
- The RBstart of non-1RB allocation shall be RB #0 for low and mid range, RB# (max+1 -								
RB allocation) for high range test frequency.								
Note 3: For E-UTRA bands applied with Note 2 in Table 6.2.2.3-1:								
- If the test channel bandwidth is larger than 4MHz, then the 1 RB allocation shall be								
tested at both RB #0 and RB #max.								
- If the test channel bandwidth is smaller or equal to 4MHz, then the 1 RB allocation shall								
De tested at RB #0.								
- If the test challed ballowidth = (FOL_High - FOL_low) specified by the operating ballo, then only one frequency range shall be tested and the 1 RR allocation shall be tested at								
RB #0, RB # $ N_{RB}^{oL}/2 $ and RB #max.								
- For non-1RB allocation, test frequency is middle range, and the RBstart shall be RB #0.								
Note 4: For E-UTRA band 28, when the test frequency is high range for lower duplexer, 20MHz								
bandwidth is only testable.								

Table 6.2.2.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508[7] Annex A Figure A.3.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.

- 3. Downlink signals are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.2.2.4.1-1.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RFaccording to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.2.2.4.3.

6.2.2.4.2 Test procedure

- 1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.2.2.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 2. Send continuously uplink power control "up" commands in every uplink scheduling information to the UE; allow at least 200ms for the UE to reach P_{UMAX} level.
- 3. Measure the mean power of the UE in the channel bandwidth of the radio access mode. The period of measurement shall be at least the continuous duration of one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.2.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6.

6.2.2.5 Test requirements

The maximum output power, derived in step 3 shall be within the range prescribed by the nominal maximum output power and tolerance in Table 6.2.2.5-1.

Daha (dBm) (dB) (dBn) (dB) (dB) (dB) 1 2.7 2.7 2.7 2.7 1.1 3 2.3 $\pm 2.7^{2}$ 1.1 2.3 $\pm 2.7^{2}$ 1.1 3 1 2.3 $\pm 2.7^{2}$ 1.1 1.1 1.1 5 1 2.3 ± 2.7 1.1 1.2 1.1	EUTRA	Class 1	Tolerance	Class 2	Tolerance	Class 3	Tolerance	Class 4	Tolerance
1 23 $42.7'$ 3 23 $42.7'$ 4 23 $42.7'$ 4 23 $42.7'$ 6 23 42.7 7 23 42.7 8 23 $42.7'$ 9 23 $42.7'$ 10 23 $42.7'$ 11 23 $42.7'$ 12 23 $42.7'$ 13 23 $42.7'$ 14 23 $42.7'$ 15 23 $42.7'$ 14 23 $42.7'$ 18 23 $42.7'$ 18 23 $42.7'$ 19 23 $42.7'$ 11 23 $42.7'$ 12 23 $42.7'$ 14 23 $42.7'$ 15 23 $42.7'$ 16 23 $42.7'$ 17 23 $42.7'$ 20 23 $42.7'$ 21 23 $42.7'$	band	(dBm)	(dB)	(dBm)	(dB)	(dBm)	(dB)	(dBm)	(aB)
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	1					23	±2.7		
3 23 ± 2.7 4 23 ± 2.7 5 23 ± 2.7 6 23 ± 2.7 7 23 $\pm 2.7^{+}$ 8 23 $\pm 2.7^{+}$ 9 23 $\pm 2.7^{-}$ 10 23 $\pm 2.7^{-}$ 11 23 $\pm 2.7^{-}$ 12 23 $\pm 2.7^{-}$ 13 23 $\pm 2.7^{-}$ 14 23 $\pm 2.7^{-}$ 15 23 $\pm 2.7^{-}$ 14 23 $\pm 2.7^{-}$ 14 23 $\pm 2.7^{-}$ 18 23 $\pm 2.7^{-}$ 19 23 $\pm 2.7^{-}$ 20 23 $\pm 2.7^{-}$ 21 23 $\pm 2.7^{-}$ 22 23 $\pm 2.7^{-}$ 24 23 $\pm 2.7^{-}$ 25 23 $\pm 2.7^{-}$ 26 23 $\pm 2.7^{-}$ 28 23 $\pm 2.7^{-}$ 31 23 $\pm 2.7^{-}$ <t< td=""><td>2</td><td></td><td></td><td></td><td></td><td>23</td><td>±2.7</td><td></td><td></td></t<>	2					23	±2.7		
4 23 ± 2.7 5 23 ± 2.7 6 23 $\pm 2.7^{\circ}$ 7 23 $\pm 2.7^{\circ}$ 9 23 $\pm 2.7^{\circ}$ 9 23 $\pm 2.7^{\circ}$ 10 23 ± 2.7 11 23 ± 2.7 12 23 ± 2.7 13 23 ± 2.7 14 23 ± 2.7 15 23 ± 2.7 14 23 ± 2.7 15 23 ± 2.7 16 23 ± 2.7 17 23 ± 2.7 18 23 ± 2.7 19 23 ± 2.7 20 23 ± 2.7 21 23 ± 2.7 22 23 ± 2.7 23 ± 2.7 $= 23$ 24 23 ± 2.7 25 23 ± 2.7 26 23 ± 2.7 33 23 ± 2.7	3					23	±2.7 [±]		
5 23 ± 2.7 6 23 ± 2.7 7 23 $\pm 2.7^{*}$ 8 23 $\pm 2.7^{*}$ 9 23 $\pm 2.7^{*}$ 10 23 $\pm 2.7^{*}$ 11 23 $\pm 2.7^{*}$ 12 23 $\pm 2.7^{*}$ 13 23 $\pm 2.7^{*}$ 14 23 $\pm 2.7^{*}$ 14 23 $\pm 2.7^{*}$ 17 23 $\pm 2.7^{*}$ 18 23 $\pm 2.7^{*}$ 19 23 $\pm 2.7^{*}$ 20 23 $\pm 2.7^{*}$ 21 23 $\pm 2.7^{*}$ 22 23 $\pm 2.7^{*}$ 23 $\pm 2.7^{*}$ $= 23^{*}$ 24 23 $\pm 2.7^{*}$ 25 23 $\pm 2.7^{*}$ 26 23 $\pm 2.7^{*}$ 28 23 $\pm 2.7^{*}$ 33 23 $\pm 2.7^{*}$ 34 23 $\pm 2.7^{*}$ 35 23 $\pm 2.7^{*}$ <td>4</td> <td></td> <td></td> <td></td> <td></td> <td>23</td> <td>±2.7</td> <td></td> <td></td>	4					23	±2.7		
6 23 $\pm 2.7'$ 7 23 $\pm 2.7'$ 8 23 $\pm 2.7'$ 9 23 ± 2.7 10 23 ± 2.7 11 23 ± 2.7 12 23 ± 2.7 13 23 ± 2.7 14 23 ± 2.7 13 23 ± 2.7 14 23 ± 2.7 17 23 ± 2.7 18 23 ± 2.7 19 23 ± 2.7 20 23 ± 2.7 21 23 ± 2.7 22 23 ± 2.7 23 ± 2.7 $= 23$ 24 23 ± 2.7 25 23 $\pm 2.7'$ 26 23 $\pm 2.7'$ 27 23 $\pm 2.7'$ 28 23 $\pm 2.7'$ 33 23 $\pm 2.7'$ 34 23 $\pm 2.7'$ 36 23 ± 2.7 </td <td>5</td> <td></td> <td></td> <td></td> <td></td> <td>23</td> <td>±2.7</td> <td></td> <td></td>	5					23	±2.7		
7 23 $\pm 2.7^{2}$ 8 23 $\pm 2.7^{2}$ 9 23 ± 2.7 10 23 ± 2.7 11 23 ± 2.7 12 23 $\pm 2.7^{2}$ 13 23 $\pm 2.7^{2}$ 14 23 $\pm 2.7^{2}$ 14 23 $\pm 2.7^{2}$ 11 23 $\pm 2.7^{2}$ 14 23 $\pm 2.7^{2}$ 11 23 $\pm 2.7^{2}$ 11 23 $\pm 2.7^{2}$ 11 23 $\pm 2.7^{2}$ 11 23 $\pm 2.7^{2}$ 20 23 $\pm 2.7^{2}$ 20 23 $\pm 2.7^{2}$ 21 23 $\pm 2.7^{2}$ 22 23 $\pm 2.7^{2}$ 21 23 $\pm 2.7^{2}$ 22 23 $\pm 2.7^{2}$ 23 $\pm 2.7^{2}$ $= 23$ 23 $\pm 2.7^{2}$ $= 23$ 24 23 $\pm 2.7^$	6					23	±2.7		
8 23 ± 2.7 9 23 ± 2.7 10 23 ± 2.7 11 23 ± 2.7 12 23 ± 2.7 13 23 ± 2.7 14 23 ± 2.7 14 23 ± 2.7 <td>/</td> <td></td> <td></td> <td></td> <td></td> <td>23</td> <td>±2.7²</td> <td></td> <td></td>	/					23	±2.7 ²		
9 23 ± 2.7 10 23 ± 2.7 11 23 ± 2.7 12 23 ± 2.7 13 23 ± 2.7 14 23 ± 2.7 14 23 ± 2.7 14 23 ± 2.7 14 23 ± 2.7 17 23 ± 2.7 18 23 ± 2.7 20 23 ± 2.7 21 23 ± 2.7 22 23 ± 2.7 23 ± 2.7 $= 23$ 24 23 ± 2.7 25 23 ± 2.7 26 23 ± 2.7 26 23 ± 2.7 28 23 ± 2.7 31 23 ± 2.7 33 23 ± 2.7 34 23 ± 2.7 35 23 ± 2.7 36 23 ± 2.7 36 23 ± 2.7	8					23	±2.7 [±]		
10 23 ± 2.7 11 23 ± 2.7 12 23 ± 2.7 13 23 ± 2.7 14 23 ± 2.7 14 23 ± 2.7	9					23	±2.7		
11 23 ± 2.7 12 23 ± 2.7 13 23 ± 2.7 14 23 ± 2.7 18 23 ± 2.7 19 23 ± 2.7 20 23 ± 2.7 21 23 ± 2.7 22 23 ± 2.7 23 ± 2.7 $= 23$ 23 ± 2.7 $= 23$ 23 ± 2.7 $= 23$ 24 23 ± 2.7 25 $= 23$ ± 2.7 26 23 ± 2.7 31 $= 23$ ± 2.7	10					23	±2.7		
12 23 $\pm 2.7^{+}$ 13 23 ± 2.7 14 23 ± 2.7 14 23 ± 2.7 17 23 ± 2.7 18 23 ± 2.7 19 23 ± 2.7 20 23 ± 2.7 21 23 ± 2.7 22 23 ± 2.7 23 ± 2.7 10 23 ± 2.7 10 24 23 ± 2.7 25 23 $\pm 2.7^{-1}$ 26 23 $\pm 2.7^{-1}$ 24 23 $\pm 2.7^{-1}$ 25 23 $\pm 2.7^{-1}$ 26 23 $\pm 2.7^{-1}$ 27 23 $\pm 2.7^{-1}$ 31 23 $\pm 2.7^{-1}$ 33 23 $\pm 2.7^{-1}$ 34 23 $\pm 2.7^{-1}$ 35 23 $\pm 2.7^{-1}$ 36 23 $\pm 2.7^{-1}$ 38 23 $\pm 2.7^{-1}$	11					23	±2.7		
13 23 ± 2.7 14 23 ± 2.7 14 23 ± 2.7 14 23 ± 2.7 17 23 ± 2.7 18 23 ± 2.7 19 23 ± 2.7 20 23 ± 2.7 21 23 ± 2.7 22 23 ± 2.7 23 ± 2.7 1 22 23 ± 2.7 24 23 ± 2.7 25 23 ± 2.7 26 23 ± 2.7 26 23 ± 2.7 27 23 ± 2.7 28 23 ± 2.7 31 23 ± 2.7 .	12					23	±2.7 ²		
14 23 ± 2.7 23 ± 2.7 17 23 ± 2.7 18 23 ± 2.7 19 23 ± 2.7 20 23 ± 2.7 21 23 ± 2.7 22 23 ± 2.7 21 23 ± 2.7 22 23 ± 2.7 23 ± 2.7 23 24 23 ± 2.7 25 23 ± 2.7 26 23 ± 2.7 27 23 ± 2.7 28 23 ± 2.7 31 23 ± 2.7 33 23 ± 2.7 34 23 ± 2.7 35 23 ± 2.7 36 23 ± 2.7 38 23 ± 2.7 39 23 ± 2.7 40 23 ± 2.7	13					23	±2.7		
17 18 19 20 21 22 23 ± 2.7 23 24 </td <td>14</td> <td></td> <td></td> <td></td> <td></td> <td>23</td> <td>±2.7</td> <td></td> <td></td>	14					23	±2.7		
17 23 ± 2.7 18 23 $\pm 2.7^{\circ}$ 19 23 $\pm 2.7^{\circ}$ 20 23 $\pm 2.7^{\circ}$ 21 23 $\pm 2.7^{\circ}$ 22 23 $\pm 2.7^{\circ}$ 23 $\pm 2.7^{\circ}$ 23 24 23 $\pm 2.7^{\circ}$ 24 23 $\pm 2.7^{\circ}$ 25 23 $\pm 2.7^{\circ}$ 26 23 $\pm 2.7^{\circ}$ 27 23 $\pm 2.7^{\circ}$ 28 23 $\pm 2.7^{\circ}$ 31 23 ± 2.7									
18 23 $\pm 2.7^{\circ}$ 19 23 ± 2.7 20 23 $\pm 2.7^{\circ}$ 21 23 ± 2.7 22 23 ± 2.7 23 ± 2.7 23 23 ± 2.7 23 23 ± 2.7 23 24 23 ± 2.7 25 23 $\pm 2.7^{\circ}$ 26 23 $\pm 2.7^{\circ}$ 27 23 $\pm 2.7^{\circ}$ 28 23 $\pm 2.7^{\circ}$ 31 23 ± 2.7 23 $\pm 2.7^{\circ}$ 23 $\pm 2.7^{\circ}$ 23 $\pm 2.7^{\circ}$ 23 $\pm 2.7^{\circ}$	17					23	±2.7		
19 23 ± 2.7 20 23 ± 2.7 21 23 ± 2.7 22 23 $\pm 3.0/4.5$ 23 ± 2.7 23 24 23 ± 2.7 25 23 ± 2.7 26 23 ± 2.7 27 23 ± 2.7 28 23 ± 2.7 21 23 ± 2.7 28 23 ± 2.7	18					23	±2.7°		
20 23 $\pm 2.7^2$ 21 23 ± 2.7 22 23 $\pm 2.7^3$ 23 23 $\pm 2.7^3$ 24 23 $\pm 2.7^2$ 25 23 $\pm 2.7^2$ 26 23 $\pm 2.7^2$ 26 23 $\pm 2.7^2$ 27 23 $\pm 2.7^2$ 28 23 ± 2.7 31 23 ± 2.7 <td>19</td> <td></td> <td></td> <td></td> <td></td> <td>23</td> <td>±2.7</td> <td></td> <td></td>	19					23	±2.7		
21 23 ± 2.7 22 23 $\pm 3.0^{-4.5}$ 23 23' $\pm 2.7^{\circ}$ 24 23 ± 2.7 25 23 $\pm 2.7^{-2}$ 26 23 $\pm 2.7^{-2}$ 27 23 $\pm 2.7^{-2}$ 28 23 ± 2.7 31 23 ± 2.7	20					23	±2.7 ²		
22 23 $+3.0/-4.5$ 23 23' $\pm 2.7'$ 24 23 $\pm 2.7'$ 25 23 $\pm 2.7'$ 26 23 $\pm 2.7'$ 27 23 $\pm 2.7'$ 28 23 $\pm 2.7'$ 31 23 $\pm 2.7'$ <td>21</td> <td></td> <td></td> <td></td> <td></td> <td>23</td> <td>±2.7</td> <td></td> <td></td>	21					23	±2.7		
23 23 $\pm 2.7^{\circ}$ 23 $\pm 2.7^{\circ}$ 24 23 ± 2.7 23 $\pm 2.7^{\circ}$ 25 23 $\pm 2.7^{\circ}$ 23 $\pm 2.7^{\circ}$ 26 23 $\pm 2.7^{\circ}$ 23 $\pm 2.7^{\circ}$ 27 23 $\pm 2.7^{\circ}$ 23 $\pm 2.7^{\circ}$ 28 23 ± 2.7 23 ± 2.7 31 23 ± 2.7 23 <td>22</td> <td></td> <td></td> <td></td> <td></td> <td>23</td> <td>+3.0/-4.5</td> <td></td> <td></td>	22					23	+3.0/-4.5		
24 23 ± 2.7 25 23 $\pm 2.7^2$ 26 23 $\pm 2.7^2$ 27 23 ± 2.7 28 23 ± 2.7 31 23 ± 2.7 33 23 ± 2.7 33 23 ± 2.7 34 23 ± 2.7 35 23 ± 2.7 36 23 ± 2.7 38 23 ± 2.7 39 23 ± 2.7 40 23 ± 2.7	23					23°	±2.7°		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	24					23	±2.7		
26 23 $\pm 2.7^2$ 27 23 ± 2.7 28 23 ± 2.7 31 23 ± 2.7	25					23	±2.7 ²		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	26					23	$\pm 2.7^{2}$		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	27					23	±2.7		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	28					23	+2.7/-3.2		
33 23 ± 2.7 34 23 ± 2.7 35 23 ± 2.7 36 23 ± 2.7 37 23 ± 2.7 38 23 ± 2.7 39 23 ± 2.7 40 23 ± 2.7	31					23	±2.7		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $									
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	33					23	±2.7		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	34					23	±2.7		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	35					23	±2.7		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	36					23	±2.7		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	37					23	±2.7		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	38					23	±2.7		
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	39					23	±2.7		
	40					23	±2.7		
41 23 ±2.7	41					23	$\pm 2.7^{2}$		
42 23 +3.0/-4.0	42					23	+3.0/-4.0		
43 23 +3.0/-4.0	43					23	+3.0/-4.0		
44 23 +2.7/[-3.7]	44					23	+2.7/[-3.7]		
Note 1: The above tolerances are applicable for UE(s) that support up to 4 E-UTRA operating bands. For UE(s)	Note 1:	The above t	olerances are	applicable f	or UE(s) that	support up t	o 4 E-UTRA op	erating band	s. For UE(s)
that support 5 or more E-UTRA bands the maximum output power is expected to decrease with each		that suppor	t 5 or more E-I	UTRAbands	the maximun	n output pov	ver is expected	to decrease	with each
additional band and is FFS		additional b	and and is FF	S					
Note 2: For transmission bandwidths (Figure 5.4.2-1, Table 5.4.4-1) confined within F _{UL_low} and F _{UL_low} + 4 MHz or	Note 2:	For transmi	ssion bandwid	Iths (Figure 5	5.4.2-1, Table	5.4.4-1) cor	nfined within Fur	$_{low}$ and F_{UL}	_{low} + 4 MHzor
$F_{UL_{high}} - 4$ MHz and $F_{UL_{high}}$, the maximum output power requirement is relaxed by reducing the lower		F _{UL_high} – 4	MHz and F_{UL_h}	_{iigh} , the maxi	mum output p	ower requir	ement is relaxed	d by reducing	g the lower
tolerance limit by 1.5 dB		tolerance lir	nit by 1.5 dB						
Note 3: P _{PowerClass} is the maximum UE power specified without taking into account the tolerance.	Note 3:	P _{PowerClass} is	the maximum	UEpowers	peatied with	out taking in	to account the to	olerance.	
Note 4: For the UE which supports both Band 11 and Band 21 operating frequencies, the tolerance is FFS.	Note 4:	For the UE	whichsupport	s both Band	11 and Band	21 operatin	g trequencies, th	ne tolerance	IS FFS.
Note 5: When NS_20 is signalled, the total output power within 2000-2005 MHz shall be limited to 7 dBm.	Note 5:	When NS_2	20 is signalled	, the total ou	tput power wit	thin 2000-20	005 MHz shall b	e limited to 7	dBm.
Note b: For a UE that supports both Band 18 and Band 26, the maximum output power requirement is relaxed by	Note 6:	For a UE the	at supports bo	orn Band 18	and Band 26,	the maximu	m output power	requirement	is relaxed by
			e lower tolerar	ice imit by 1	.50B IOF TRANS	mission bar	iuwiaths contine	eu within 815	whiz and

Table 6.2.2.5-1: UE Power Class test requirements

6.2.2_1 Maximum Output Power for HPUE

6.2.2_1.1 Test purpose

Same test purpose as in clause 6.2.2.1.

6.2.2_1.2 Test applicability

This test case applies to all types of E-UTRA UE Power Class 1 release 11 and forward.

6.2.2_1.3 Minimum conformance requirements

The following defines the maximum output power for any transmission bandwidth within the channel bandwidth for Power Class 1 UE. The period of measurement shall be at least one sub frame (1ms).

Table	6.2.2	1.3-1:	HPUE	Power	Class
-------	-------	--------	------	-------	-------

EUTRA band	Class 1 (dBm)	Tolerance (dB)	Class 2 (dBm)	Tolerance (dB)	Class 3 (dBm)	Tolerance (dB)	Class 4 (dBm)	Tolerance (dB)	
14	31	+2/-3	N/A	N/A	N/A	N/A	N/A	N/A	
Note 1: The above tolerances are applicable for UE(s) that support up to 4 E-UTRA operating bands. For UE(s) that support 5 or more E-UTRA bands the maximum output power is expected to decrease with each additional band and is FFS									
Note 2-3:	Note 2-3: N/A								
Note 4: P _{PowerClass} is the maximum UE power specified without taking into account the tolerance Note 5-6: N/A									

The normative reference for this requirement is TS 36.101 clause 6.2.2.

6.2.2_1.4 Test description

Same test description as in clause 6.2.2.4 with the following exception:

- Instead of Table 6.2.2.4.1-1→ use Table 6.2.2_1.4-1

Table 6.2.2_1.4-1: Test Configuration Table

Initial Conditions									
Test Env TS 36.	ironment as specified in 508[7] subclause 4.1	Nomal, TL/VL, TL/VH, TH/VL, TH/VH							
Test Frequen	cies as specified in	lid range, High	range						
TS36.508 [7] subclause 4.3.1									
Test Channe	Bandwidths as specified in	Lowest, 5MH	z, Highest						
TS 36.508 [7]	subdause 4.3.1								
	Test Paramete	ers for Channe	Bandwidths						
	Downlink Configur	ation	Upli	nk Configurat	ion				
Ch BW	N/A for Max UE output power testi		Mod'n	RB allo	ocation				
				FDD	TDD				
1.4MHz			QPSK	1	1				
1.4MHz			QPSK	5	5				
3MHz			QPSK	1	1				
3MHz			QPSK	4	4				
5MHz			QPSK	1	1				
5MHz			QPSK	8	8				
10MHz			QPSK	1	1				
10MHz			QPSK	12	12				
15MHz			QPSK	1	1				
15MHz			QPSK	16	16				
20MHz			QPSK	1	1				
20MHz			QPSK	18	18				
Note 1: Te	st Channel Bandwidths are ch	neckedsepara	tely for each E-	UTRA band, th	ne applicable				
ch Note 2: Th rai	channel bandwidths are specified in Table 5.4.2.1-1. Note 2: The 1 RB allocation shall be tested at RB#0 for low and mid range, RB #max for high range test frequency.								
Th RE	e RBstart of non-1RB allocati 3 allocation) for high range tes	on shall be RE st frequency.	#0 for low and	mid range, RE	3# (max +1 -				

6.2.2_1.5 Test requirements

The maximum output power, derived in step 3 shall be within the range prescribed by the nominal maximum output power and tolerance in Table 6.2.2_1.5-1

Table 6.2.2	_1.5-1: HPU	E Power Cl	lass test requ	uirements
-------------	-------------	------------	----------------	-----------

EUTRA	Class 1	Tolerance	Class 2	Tolerance	Class 3	Tolerance	Class 4	Tolerance					
band	(dBm)	(dBm) (dB) (dBm) (dB) (dBm) (dB) (dBm) (dB)											
14	31 +2.7/-3.7 N/A N/A N/A N/A N/A N/A												
Note 1:	Note 1: The above tolerances are applicable for UE(s) that support up to 4 E-UTRA operating bands. For UE(s)												
that support 5 or more E-UTRA bands the maximum output power is expected to decrease with each													
	additional band and is FFS												

6.2.2A UE Maximum Output Power for CA

6.2.2A.1 UE Maximum Output Power for CA (intra-band contiguous DL CA and UL CA)

6.2.2A.1.1 Test purpose

To verify that the error of UE maximum output power in intra-band contiguous carrier aggregation does not exceed the range prescribed by the specified CA Power Class and tolerance.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

6.2.2A.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support intra-band contiguous DL CA and UL CA.

6.2.2A.1.3 Minimum conformance requirements

The following UE Power Classes define the maximum output power for any transmission bandwidth within the aggregated channel bandwidth.

- For inter-band carrier aggregation with uplink assigned to one E-UTRA band the requirements in subclause 6.2.2 apply.

- For intra-band contiguous carrier aggregation the maximum output power is specified in Table 6.2.2A.1.3-1.

The maximum output power is measured as the sum of the maximum output power at each UE antenna connector. The period of measurement shall be at least one sub frame (1ms).

E-UTRA C	JTRA CA Class 1 Tolerance Class 2 Tolerance Class 3 Tolerance				Tolerance	Class 4	Tolerance		
Configurat	ion	(dBm)	(dB) (dBm) (dB) (dBm) (dB) (dBm) (dB						
CA_1C	1C 23 +2/-2								
CA_7C	A_7C 23 +2/-2 ²								
CA_380	38C 23 +2/-2								
CA_40C 23		+2/-2							
CA_410	A_41C 23 +2/-2 ²								
Note 1:	Note 1: The above tolerances are applicable for UE(s) that support up to 4 E-UTRA operating bands. For UE(s) that								
5	suppo	rt 5 or more	E-UTRA ban	ds the maxir	num output p	ower is exp	ected to decreas	se with each	additional
ł	band a	and is FFS							
Note 2:	For tra	nsmission b	pandwidths (F	igure 5.4.2-7	1) confined wi	thin F _{UL_low} a	and F _{UL_low} +4 I	MHzor F _{UL_h}	_{igh} — 4 MH z
á	and Fu	JL_high, the m	aximum outp	ut power rec	uirement is re	laxed by re	ducing the lowe	er tolerance l	imit by 1.5 dB
Note 3:	PPowerC	lass is the m	aximum UE p	ower specifi	ied without tak	king into acc	count the tolerai	nœ	
Note 4:	For int	ra-band cor	ntiguous carrie	er aggregatio	on the maxim	um power re	equirementshou	uld apply to t	he total
t	transm	nitted power	over all com	ponent carrie	ers (per UE).	-	-		

Table 6.2.2A.1.3-1: CA UE Power Class

The normative reference for this requirement is in TS 36.101 [2] clause 6.2.2A.

6.2.2A.1.4 Test description

6.2.2A.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and CC combinations based on E-UTRA CA configurations specified in table 5.4.2A.1-1. All of these configurations shall be tested with applicable test parameters for each CA Configuration, and are shown in table 6.2.2A.1.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexe A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Co	nditions									
Test Envi	ronment a	s specified in		NC, TL/V	/L, TL/VH, TH/V	′L, TH/VH				
15 36.50		ause 4.1								
Test Fred	uencies a	s specified in		C: Low and High range						
TS36.508	3 [7] subcla	ause 4.3.1 for different CA b	oandwidth							
classes.										
Test CC	Combinatio	on setting (N _{RB agg}) as spec	cified in							
subclaus	e 5.4.2A.1	for the CA Configuration a	Highest	N _{RB_agg}						
bandwidt	h combinat	tion sets supported by the l								
Test Para	ameters for	r CA Configurations								
CA Confi	iguration	DL Allocation	CC	UL Allocation						
/ N _{RB_agg}	SCC2			No						
N _{RB}	N _{RB}	allocation		INRB_alloc	IRB_alloc PCC & SCC RB allocations (L _{CRB} @ RB _{start})					
					x -	,				
75	75	N/Afor this test	QPSK	1	P_1@0	S_0@0	-	-		
75	75	1	QPSK	16	P_16@0	S_0@0	-	-		
100	50	-	QPSK	1	P_1@0	S_0@0	-	-		
100	50	-	QPSK	12	P_12@0	S_0@0	-	-		
100	75		0.001/							
100	75		QPSK	1	P_1@0	S_0@0				
100	75	-	QPSK	16	P_16@0	S_0@0		1		
100	100	-	QPSK	1	P 1@0	S 0@0	-	-		
100	100		QPSK	18	P_18@0	S_0@0	-	-		
Note 1:	CAConfi	guration Test CC Combina	ation settings	are checke	ed separately for	r each CA Con	figuratior	ı, which		
	applicabl	e aggregated channel ban	dwidths are s	specified in	Table 5.4.2A.1 -	-1				

Table 6.2.2A.1.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508[7] Annex A Figure group A.32 as appropriate.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals for PCC are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.2.2A.1.4.1-1.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.2.2A.1.4.3.

6.2.2A.1.4.2 Test procedure

- 1. Configure SCC according to Annex C.0, C.1 and Annex C.3.0 for all downlink physical channels except PHICH.
- 2. The SS shall configure SCC as per TS 36.508 [7] clause 5.2A.4. Message contents are defined in clause 6.2.2A.1.4.3.
- 3. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133, clauses 8.3.3.2).

- 4. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.2.2A.1.4.1-1 on both PCC and SCC. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 5. Send continuously uplink power control "up" commands in every uplink scheduling information to the UE; allow at least 200ms for the UE to reach P_{UMAX} level.
- 6. Measure the mean transmitted power over all component carriers in the CA configuration of the radio access mode. The period of measurement shall be at least the continuous duration of one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.2A.1.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6. In test procedure step 2, for SCC configuration there are no additional message contents.

6.2.2A.1.5 Test Requirements

The maximum output power for the CA configuration, derived in step 3 shall be within the range prescribed by the CA UE Power Class and tolerance in Table 6.2.2A.1.5-1.

CA	Class 1	Tolerance	Class 2	Tolerance	Class 3	Tolerance	Class 4	Tolerance	
Conf	(dBm)	(dB)	(dBm)	(dB)	(dBm)	(dB)	(dBm)	(dB)	
CA_1C					23	±2.7			
CA_7C					23	$\pm 2.7^{2}$			
CA_38C					23	±2.7			
CA_40C					23	±2.7			
CA_41C					23	±2.7 ²			
Note 1:	te 1: The above tolerances are applicable for UE(s) that support up to 4 E-UTRA operating bands. For UE(s)								
	that support	5 or more E-	UTRAbands	the maximum	n output pov	wer is expected	to decrease	with each	
	additional ba	and and is FF	S						
Note 2:	For transmis	ssion bandwid	ths (Figure 5	5.4.2-1) confir	ed within F	UL_low and FUL_low	+4 MHzor	F _{UL_high} – 4	
	MHz and F_U	L_high, the max	imum outpu	t power requi	ement is re	laxed by reducir	ng the lower	tolerance limit	
	by 1.5 dB	•							
Note 3:	ProverClass is the maximum UE power specified without taking into account the tolerance								
Note 4:	For intra-ba	nd contiquous	carrier aggi	eqation the m	aximum po	wer requirement	t should appl	v to the total	
	transmitted	power over al	lcomponent	carriers (per	UE).	·			

Table 6.2.2A.1.5-1: CA UE Power Class test requirements

6.2.2B UE Maximum Output Power for UL-MIMO

6.2.2B.1 Test purpose

To verify that the error of UE maximum output power in UL MIMO does not exceed the range prescribed by the specified UL MIMO Power Class and tolerance.

An excess maximum output power has the possibility to interfere to other channels or other systems. A small maximum output power decreases the coverage area.

6.2.2B.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support UL MIMO.

6.2.2B.3 Minimum conformance requirements

For UE with two transmit antenna connectors in closed-loop spatial multiplexing scheme, the maximum output power for any transmission bandwidth within the channel bandwidth is specified in Table 6.2.2B.3-1 with the UL-MIMO configurations specified in Table 6.2.2B.3-2. The maximum output power is measured as the sum of the maximum output power at each UE antenna connector. The period of measurement shall be at least one sub frame (1ms).

EUTRA band	Class 1 (dBm)	Tolerance (dB)	Class 2 (dBm)	Tolerance (dB)	Class 3 (dBm)	Tolerance (dB)	Class 4 (dBm)	Tolerance (dB)
1				1	23	+2/-3		
2					23	+2/-32		
3					23	+2/-32		
4					23	+2/-3		
5					23	+2/-3		
6					23	+2/-3		
7					23	+2/-32		
8					23	+2/-32		
9					23	+2/-3		
10					23	+2/-3		
11					23	+2/-3		
12					23	+2/-32		
13					23	+2/-3		
14					23	+2/-3		
17					23	+2/-3		
18					23	+2/-3		
19					23	+2/-3		
20					23	+2/-32		
21					23	+2/-3		
22					23	+2/-4.5 ²		
23					23	+2/-3		
24					23	+2/-3		
25					23	+2/-32		
26					23	+2/-32		
27					23	+2/-3		
28					23	+2/[-3]		
31					23	+2/-3		
33					23	+2/-3		
34					23	+2/-3		
35					23	+2/-3		
36					23	+2/-3		
37					23	+2/-3		
38					23	+2/-3		
39					23	+2/-3		
40					23	+2/-3		
41					23	+2/-32		
42					23	+2/-4		
43					23	+2/-4		
44					23	+2/[-3]		
Note 1: Note 2: Note 3:	Void For transmi MHz and Fu by 1.5 dB For the UF	ission bandwid JL_high, the max which support	ths (Figure	5.4.2-1) confir It power requir	ned within Fr rement is re 21 operatin	uL_low and FUL_low laxed by reducing	w+4 MHzor ng the lower he tolerance	F _{UL_high} – 4 toleranœ limit is FFS.
Note 4	Prover Class is	the maximum	LIE power	specified with	out taking in	to account the t	olerance	

Table 6.2.2B.3-1: UE Power Class for UL-MIMO in closed loop spatial multiplexing scheme

Table 6.2.2B.3-2: UL-MIMO configuration in closed-loop spatial multiplexing scheme

Transmission mode	DCI format	Codebook Index
Mode 2	DCI format 4	Codebook index 0

The normative reference for this requirement is TS 36.101 clause 6.2.2B.

6.2.2B.4 Test description

6.2.2B.4.1 Initial condition

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

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The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.2.2B.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexe A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Conditions									
Test E	nvironment as specified in	Normal, TL/V	'L, TL/VH, TH/V	L, TH/VH					
TS 3	36.508[7] subclause 4.1								
Test Frequ	encies as specified in	Low range, Mid range, High range							
TS36.508 [[7] subclause 4.3.1								
Test Chanr	nel Bandwidths as specified in	Lowest, 5MH	z, Highest						
TS 36.508 [7] subdause 4.3.1									
Test Parameters for Channel Bandwidths									
	Downlink Configura	ation	Upli	nk Configurat	ion				
Ch BW	N/A for Max UE output po	wer testing	ertesting Mod'n RB a		ocation				
				FDD	TDD				
1.4MHz			QPSK	1	1				
1.4MHz			QPSK	5	5				
3MHz			QPSK	1	1				
3MHz			QPSK	4	4				
5MHz			QPSK	1	1				
5MHz			QPSK	8	8				
10MHz			QPSK	1	1				
10MHz			QPSK	12	12				
15MHz			QPSK	1	1				
15MHz			QPSK	16	16				
20MHz			QPSK	1	1				
20MHz			QPSK	18	18				
Note 1:	Test Channel Bandwidths are cl	heckedsepara	tely for each E-	UTRA band, th	e applicable				
	channel bandwidths are specifie	ed in Table 5.4.	.2.1-1.						
Note 2:	For E-UTRA bands not applied v	with Note 2 in ⁻	Table 6.2.2B.3-	1:					
	- The 1 RB allocation shall be	tested at RB#	0 for low and m	id range, RB #	max for high				
	range test frequency.								
	 The starting resource block of the starting resou	of non-1RB allo	ocation shall be	RB #0 for low	and mid				
	range, RB# (max +1 - RB all	location) for hig	gh range test fre	equency.					
Note 3:	For E-UIRA bands applied with	Note 2 in Tabl	le 6.2.2B.3-1:						
	- If the test channel bandwidth	n is larger than	4 MHZ, then the	A RB allocatio	on shall be				
	tested at both RB #0 and RE	s #max.							
	- II the test channel bandwidtr	is smaller or e	equal to 4IMHZ,		anocation				
	If the test channel bandwidth) – (F., F.) specified	by the operation	ng band				
	then only one frequency ran	r – (r UL_high - r (go chall ho tos:	UL_{10W} specified	B allocation ch	all be tested				
		ge shall be les							
	at RB #0, RB # $ N_{RB}^{UL}/2 $ ar	nd RB #max.							
	- For non-1RB allocation, test	frequency is m	niddle range, ar	nd the starting r	resource				
	block shall be RB #0.		-	_					

Table 6.2.2B.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508[7] Annex A Figure A.28.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.2.2B.4.1-1.

- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RFaccording to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.2.2B.4.3.

6.2.2B.4.2 Test procedure

- 1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 4 for C_RNTI to schedule the UL RMC according to Table 6.2.2B.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 2. Send continuously uplink power control "up" commands in every uplink scheduling information to the UE; allow at least 200ms for the UE to reach P_{UMAX} level.
- 3. Measure the mean sum power of the UE in the channel bandwidth of the radio access mode. The period of measurement shall be at least the continuous duration of one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.2B.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6.

6.2.2B.5 Test requirements

The maximum output power, derived in step 3 shall be within the range prescribed by the nominal maximum output power and tolerance in Table 6.2.2B.5-1.

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	Tolerance (dB)
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	
22 23 +3/-5.5 ² 23 23 +2.7/-3.7 24 23 +2.7/-3.7 25 23 +2.7/-3.7 26 23 +2.7/-3.7 27 23 +2.7/-3.7 28 23 +2.7/[-3.7]	
23 23 +2.7/-3.7 24 23 +2.7/-3.7 25 23 +2.7/-3.7 26 23 +2.7/-3.7 27 23 +2.7/-3.7 28 23 +2.7/-3.7	
24 23 +2.7/-3.7 25 23 +2.7/-3.7 ² 26 23 +2.7/-3.7 27 23 +2.7/-3.7 28 23 +2.7/[-3.7]	
25 23 +2.7/-3.7 ² 26 23 +2.7/-3.7 27 23 +2.7/-3.7 28 23 +2.7/[-3.7]	
26 23 +2.7/-3.7 27 23 +2.7/-3.7 28 23 +2.7/[-3.7]	
27 23 +2.7/-3.7 28 23 +2.7/[-3.7]	
28 23 +2.7/[-3.7]	
31 23 +2.7/-3.7	
33 23 +2.7/-3.7	
34 23 +2.7/-3.7	
35 23 +2.7/-3.7	
36 23 +2.7/-3.7	
37 23 +2.7/-3.7	
38 23 +2.7/-3.7	
39 23 +2.7/-3.7	
40 23 +2.7/-3.7	
41 23 +2.7/-3.7 ²	
42 23 +3/-5	
43 23 +3/-5	
44 23 +2.7/[-3.7]	
Note 1: Void	
 Note 2: For transmission bandwidths (Figure 5.4.2-1) confined within F_{UL_low} and F_{UL_low} + 4 MHz of MHz and F_{UL_high}, the maximum output power requirement is relaxed by reducing the lower by 1.5 dB Note 3: For the UE which supports both Band 11 and Band 21 operating frequencies, the tolerand the tolerand by the toler	or $F_{UL_high} - 4$ For tolerance limit ce is FFS.

Table 6.2.2B.5-1: UE Power Class for UL-MIMO in closed loop spatial multiplexing scheme

6.2.3 Maximum Power Reduction (MPR)

Editor's note:

- Requirement for Band 44 is not yet finalised due to square brackets in core specification TS 36.101 Table 6.2.2-1.

6.2.3.1 Test purpose

The number of RB identified in Table 6.2.3.3-1 is based on meeting the requirements for adjacent channel leakage ratio and the maximum power reduction (MPR) due to Cubic Metric (CM).

Simple scaling can be used to derive the requirement for other bandwidth based on the previously agreed value for 5MHz channel bandwidth.

6.2.3.2 Test applicability

The requirements of this test apply in test cases 6.6.2.3 Adjacent Channel Leakage power Ratio to all types of E-UTRA UE release 8 and forward.

6.2.3.3 Minimum conformance requirements

For UE Power Class 3, the allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2.3-1 due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3.3-1.

Modulation	Channel	MPR (dB)								
	1.4 MHz	1.4 3.0 5 10 15 20 MHz MHz MHz MHz MHz MHz								
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1			
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1			
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤2			

Table 6.2.3.3-1: Maximum Power Reduction (MPR) for Power Class 3

For the UE maximum output power modified by MPR, the power limits specified in subclause 6.2.5.3 apply.

The normative reference for this requirement is TS 36.101 clause 6.2.3.

6.2.3.4 Test description

6.2.3.4.1 Initial condition

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.2.3.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Table 6.2.3.4.1-1:	Test Configuration Table
--------------------	---------------------------------

	Initial Conditions									
Test Environ	ment as specified in	Normal, TL/V	L, TL/VH, TH/\	/L, TH/VH						
TS 36.508[7]	subclause 4.1									
Test Frequer	icies as specified in	Low range, Mid range, High range								
TS36.508 [7]	subclause 4.3.1									
Test Channe	Bandwidths as specified in	Lowest, 5MHz, 10MHz, Highest								
TS 36.508 [7]] subdause 4.3.1									
	Test Paramete	ers for Channe	el Bandwidths							
	Downlink Configur	ation	Upl	ink Configurat	tion					
Ch BW	N/A for Maximum Power	Reduction	Mod'n	RB allo	ocation					
	(MPR) test case	e		FDD	TDD					

1.4MHz		QPSK	5	5
1.4MHz		QPSK	6	6
1.4MHz		16QAM	5	5
1.4MHz		16QAM	6	6
3.0MHz		QPSK	4	4
3.0MHz		QPSK	15	15
3.0MHz		16QAM	4	4
3.0MHz		16QAM	15	15
5MHz		QPSK	8	8
5MHz		QPSK	25	25
5MHz		16QAM	8	8
5MHz		16QAM	25	25
10MHz		QPSK	12	12
10MHz		QPSK	50	50
10MHz		16QAM	12	12
10MHz		16QAM	50	50
			(Note 3)	(Note 3)
15MHz		QPSK	16	16
15MHz		QPSK	75	75
15MHz		16QAM	16	16
15MHz		16QAM	75	75
			(Note 3)	(Note 3)
20MHz		QPSK	18	18
20MHz		QPSK	100	100
20MHz		16QAM	18	18
20MHz		16QAM	100	100
			(Note 3)	(Note 3)
Note 1:	Test Channel Bandwidths are checked separa	tely for each E-	UTRA band, th	e applicable
	channel bandwidths are specified in Table 5.4.	.2.1-1.		
Note 2:	The RB _{start} of partial RB allocation shall be RB	#0 and RB# (m	ax+1 - RB alle	ocation) of
	the channel bandwidth.			
Note 3:	Applies only for UE-Categories ≥2.			

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- 1. Connect the SS and interfering sources to the UE antenna connectors as shown in TS 36.508[7] Annex A Figure A.3.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channels are set according to Table 6.2.3.4.1-1.
- 5. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.2.2.4.3.

6.2.3.4.2 Test procedure

- 1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.2.3.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC
- 2. Send continuously uplink power control "up" commands in the uplink scheduling information to the UE to ensure that the UE transmits at $P_{UMAX1evel}$.
- 3. Measure the mean power of the UE in the channel bandwidth of the radio access mode. The period of measurement shall be at least the continuous duration one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.3.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6.

6.2.3.5 Test requirements

The maximum output power, derived in step 2 shall be within the range prescribed by the nominal maximum output power and tolerance in Table 6.2.3.5-1.

E- UTRA Band	Class 1 (dBm)	Tol. (Db)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	QPSK partial RB allocation Tol. (dB))	QPSK full RB allocation Tol. (dB))	16QAM partial RB allocation Tol. (dB)	16QAM full RB allocation Tol. (dB)
1					23	±2.7	+2.7 /	+2.7 /	+2.7 /
2					23	±2.71	-3.7 +2.7 / ^{1,2} -3 7	-3.7 +2.7 / ^{1,2} -3 7	-4.7 +2.7 / ^{1,2} -4 7
3					23	±2.7'	+2.7 / 1,2	+2.7 / 1,2	+2.7 / 1,2
					20	+2 7	-3.7	-3.7	-4.7 +2.7 /
4					23	±2.7	-3.7	-3.7	-4.7
5					23	±2.7	+2.7 /	+2.7 / -3.7	+2.7 / -4.7
6					23	±2.7	+2.7 / -3.7	+2.7 / -3.7	+2.7 / -4.7
7					23	±2.71	+2.7 / ^{1,2} -3.7	+2.7 / ^{1,2} -3.7	+2.7 / ^{1,2} -4.7
8					23	±2.7 ¹	+2.7 / ^{1,2}	+2.7 / ^{1,2}	+2.7 / 1,2
					00	±2.7	-3.7	-3.7 +2.7 /	-4.7 +2.7 /
9					23	.07	-3.7	-3.7	-4.7
10					23	±2.7	+2.77	+2.7 / -3.7	+2.7 / -4.7
11					23	±2.7	+2.7 / -3.7	+2.7 / -3.7	+2.7 / -4.7
12					23	±2.7 ¹	+2.7 / ^{1,2}	+2.7 / ^{1,2} -3.7	+2.7 / ^{1,2} -4.7
13					23	±2.7	+2.7 /	+2.7 /	+2.7 /
14					23	±2.7	+2.7 / -3.7	+2.7 / -3.7	+2.7 / -4.7
						.07	.07/	.07/	.07/
17					23	±2.7	+2.77	+2.77	+2.77
18					23	±2.7	+2.7 / -3.7	+2.7 / -3.7	+2.7 / -4.7
19					23	±2.7	+2.7 / -3.7	+2.7 / -3.7	+2.7 / -4.7
20					23	±2.71	+2.7 / ^{1,2} -3.7	+2.7 / ^{1,2} -3.7	+2.7 / ^{1,2} -4.7
21					23	±2.7	+2.7 /	+2.7 /	+2.7 /
22					23	+3.0/-4.5	+3.0/-5.5	+3.0/-5.5	+3.0/-6.5
23					23	±2.7	+2.7 /	+2.7 /	+2.7 / -4.7
24					23	±2.7	+2.7 /	+2.7 /	+2.7 / -4.7
25					23	±2.7 ¹	+2.7 / ^{1,2} -3.7	+2.7 / ^{1,2} -3.7	+2.7 / ^{1,2} -4.7
26					23	±2.7 ¹	+2.7 / ^{1,2} -3.7	+2.7 / ^{1,2} -3.7	+2.7 / ^{1,2} -4.7
27					23	±2.7	+2.7 / -3.7	+2.7 / -3.7	+2.7 / -4.7
28					23	+2.7/-3.2	+2.7/-4.2	+2.7/-4.2	+2.7/-5.2
31					23	±2.7	+2.7 / -3.7	+2.7 / -3.7	+2.7 / -4.7
						+27	+27/	+27/	+27/
33					23	±2.1 ±2.7	-3.7	-3.7	-4.7
34					23	±2.1	+2.7 /	+2.7 /	+2.7 /
35					23	±2.7	+2.7 /	+2.7 /	+2.7 /

Table 6.2.3.5-1: UE Power Class test requirements

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							-3.7	-3.7	-4.7
36					23	±2.7	+2.7 /	+2.7 /	+2.7 /
00					20		-3.7	-3.7	-4.7
37					23	±2.7	+2.7 /	+2.7 /	+2.7 /
51					20		-3.7	-3.7	-4.7
38					23	±2.7	+2.7 /	+2.7 /	+2.7 /
00					20		-3.7	-3.7	-4.7
39					23	±2.7	+2.7 /	+2.7 /	+2.7 /
							-3.7	-3.7	-4.7
40					23	±2.7	+2.7 /	+2.7 /	+2.7 /
							-3.7	-3.7	-4.7
41					23	±2.7 ¹	+2.7 / 1,2	+2.7 / 1,2	+2.7 / 1,2
							-3.7	-3.7	-4.7
42					23	+3.0 /	+3.0 /	+3.0 /	+3.0 /
						-4.0	-5.0	-5.0	-6.0
43					23	+3.0 /	+3.0 /	+3.0 /	+3.0 /
						-4.0	-5.0	-5.0	-6.0
44					23	+2.7/	+2.7 /	+2.7 /	+2.7 /
						[-3.7]	[-4.7]	[-4.7]	[-5.7]
Note 1:	For tran	smissic	on bandwid	dths (Fig	ure 5.4.2-	1) confined w	ithin FUL_low	/ and FUL_lov	w + 4 MH z
	or FUL_	_high —	4 MHz and	l FUL_h	igh, the m	aximum outp	ut power requ	irement is rel	axed by
	reducin	g the lo	wer toleraı	nce limit	by 1.5 dB				
Note 2:	For the	UE ma:	kimum out	put pow	ermodifie	d by MPR, the	e power limits	specified in	Table
	6.2.5.3-	1 apply							

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6.2.3_1 Maximum Power Reduction (MPR) for HPUE

6.2.3_1.1 Test purpose

Same test purpose as in clause 6.2.3.1 with the following exception:

- Instead of Table 6.2.3.3-1 \rightarrow use Table 6.2.3_1.3-1

6.2.3_1.2 Test applicability

The requirements of this test apply in test cases 6.6.2.3_1 Adjacent Channel Leakage power Ratio for HPUE to all types of E-UTRA Power Class 1 UE release 11 and forward.

6.2.3_1.3 Minimum conformance requirements

For UE Power Class 1, the allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2_1.3-1 due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3_1.3-1.

Modulation	Channel	Channel bandwidth / Transmission bandwidth configuration [RB]									
	1.4 MH 7	1.4 3.0 5 10 15 20 MHz MHz MHz MHz MHz MHz									
	1411 12		1411 12	1411 12	1411 12	1411 12					
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1				
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1				
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2				

 Table 6.2.3_1.3-1: Maximum Power Reduction (MPR) for Power Class 1

For the UE maximum output power modified by MPR, the power limits specified in subclause 6.2.5_1.3 apply.

The normative reference for this requirement is TS 36.101 clause 6.2.3.

6.2.3_1.4 Test description

Same test description as in clause 6.2.3.4.

6.2.3_1.5 Test requirements

Same test requirements as in clause 6.2.3.5 with the following exceptions:

- Instead of Table 6.2.3.5-1 \rightarrow use Table 6.2.3_1.5-1

E- UTRA Band	Class 1 (dBm)	QPSK partial RB allocation Tol. (dB))	QPSK full RB allocation Tol. (dB))	16QAM partial RB allocation Tol. (dB)	16QAM full RB allocation Tol. (dB)	
14	31	+2.7/	+2.7 /	+2.7 /	+2.7 /	
		-3.7	-4.7	-4.7	-5.7	
Note 1:	For tra	ansmission ba	andwidths (Fig	gure 5.4.2-1)	confined	
	within	FUL_low and	d FUL_low + 4	IMHzor FUL	_high – 4	
	MHza	ind FUL_high	, the maximu	m output pow	ver	
	reauir	ement is relax	xed by reduci	na the lower t	olerance	
limit hv 1 5 dB						
Note 2	For th	e I IF maximu		ver modified h	WMPR the	
NOLE 2.						
	power	Im its specifie	a in Table 6.2	∠.5 1.3-1 abb	VIV	

Table 6.2.3_1.5-1: UE Power Class 1 test requirements

6.2.3A Maximum Power Reduction (MPR) for CA

6.2.3A.1 Maximum Power Reduction (MPR) for CA (intra-band contiguous DL CA and UL CA)

6.2.3A.1.1 Test purpose

The number of RB identified in Table 6.2.3A.1.3-1 is based on meeting the requirements for Adjacent Channel Leakage power Ratio (ACLR) for CA and the maximum power reduction (MPR) for intra-band contiguous CA Bandwidth Class C due to Cubic Metric (CM).

6.2.3A.1.2 Test applicability

The requirements of this test apply in test case 6.6.2.3A.1 Adjacent Channel Leakage power Ratio (ACLR) for CA to all types of E-UTRA UE release 10 and forward that support intra-band contiguous DL CA and UL CA.

6.2.3A.1.3 Minimum conformance requirements

The following is specified for maximum power reduction (MPR) for CA.

- For inter-band carrier aggregation with uplink assigned to one E-UTRA band (Table 5.4.2A-1) the requirements in clause 6.2.3 apply.
- For intra-band contiguous carrier aggregation the allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2A.1.3-1 due to higher order modulation and contiguously aggregated transmits bandwidth configuration (resource blocks) is specified in Table 6.2.3A.1.3-1. In case the modulation format is different on different component carriers then the MPR is determined by the rules applied to higher order of those modulations.

Modulation		CA bandwidth Class C							
	50 RB + 100 RB	75 RB + 75 RB	75 RB + 100 RB	100 RB + 100 RB					
QPSK	> 12 and ≤ 50	> 16 and ≤ 75	> 16 and ≤ 75	> 18 and ≤ 100	≤ 1				
QPSK	> 50	> 75	> 75	> 100	≤2				
16 QAM	≤ 12	≤ 16	≤ 16	≤ 18	≤ 1				
16 QAM	> 12 and ≤ 50	> 16 and ≤ 75	> 16 and ≤ 75	> 18 and ≤ 100	≤2				
16 QAM	> 50	> 75	> 75	> 100	≤ 3				

Table 6.2.3A.1.3-1: Maximum Power Reduction (MPR) for Power Class 3

For intra-band contiguous CA Bandwidth Class C the allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2A.1.3-1due to multi-cluster transmission is specified as follows:

 $MPR = CEIL \{M_{A_1}, 0.5\}$

Where MA is defined as follows:

$$\begin{split} \mathbf{M}_{A} &= 8.2; \; 0 \leq A < 0.025, \\ 9.2 - 40A; \; 0.025 \leq A < 0.05, \\ 8 - 16A; \; 0.05 \leq A < 0.25, \\ 4.83 - 3.33A; \; 0.25 \leq A \leq 0.4, \\ 3.83 - 0.83A; \; 0.4 \leq A \leq 1 \end{split}$$

Where

 $A = N_{RB_alloc} / N_{RB_agg.}$

CEIL{M_A, 0.5} means rounding upwards to closest 0.5dB, i.e. MPR \subseteq [3.0, 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5, 8.0, 8.5]

For intra-band non-contiguous carrier aggregation with uplink carrier on the PCC, the requirements in subclause 6.2.3 apply. For the UE maximum output power modified by MPR, the power limits specified in sub-clause 6.2.5A.1 apply.

The normative reference for this requirement is in TS 36.101 [2] clause 6.2.3A.

6.2.3A.1.4 Test description

6.2.3A.1.4.1 Initial condition

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA CA configurations specified in table 5.4.2A.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.2.3A.1.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Table 6.2.3A.1.4.1-1:	Test	Configuration	Table
-----------------------	------	---------------	-------

Initial Conditions									
Test Environment as specified in TS 36.508[7] subclause 4.1					NC, TL/VL, TL/VH, TH/VL, TH/VH				
Test Frequencies as specified in TS36.508 [7] subclause 4.3.1 for different CA bandwidth classes.			C: Low a	nd High range					
Test CC Combination setting (N _{RB_agg}) as specified in			Lowest N	RB_agg					
subcla bandv	ause 5.4 vidth co	1.2A.1 for the mbination	ne CAConfiguration across sets supported by the UE.		Highest N	J _{RB_agg}			
Test Parameters for CA Configurations									
CA CO N _{RB_ac}	onfigura	ation /	DL Allocation	CC MOD	UL Allocation				
ID	PCC N _{RB}	SCCs N _{RB}	PCC & SCC RB allocation		NRB_alloc PCC & SCC RB allocations (LCRB @ RB _{start})			S	
1	75	75		QPSK	16	P_16@0	S_0@0		
2	75	75		QPSK	75	P_75@0	S_0@0		
3	75	75	-	QPSK	150	P_75@0	S_75@0		
4	75	75	-	16QAM	16	P_16@0	S_0@0		
5	75	75	-	16QAM	75	P_75@0	S_0@0		
6	75	75		16QAM	150	P_75@0	S_75@0		
7	75	75	-	QPSK	2	P_1@0	S_1@74		
8	75	75		QPSK	8	P_2@0	P_2@73	S_2@0	S_2@73
9	75	75		QPSK	60	P_15@0	P_15@60	S_15@0	S_15@60
10	100	50		QPSK	12	P_12@0	S_0@0		
11	100	50		QPSK	50	P_50@0	S_0@0		
12	100	50		QPSK	150	P_100@0	S_50@0		
13	100	50		16QAM	12	P_12@0	S_0@0		
14	100	50	N/A for this test	16QAM	50	P_50@0	S_0@0		
15	100	50		16QAM	150	P_100@0	S_50@0		
16	100	50		QPSK	2	P_1@0	S_1@49		
17	100	50		QPSK	8	P_2@0	P_2@60	S_2@10	S_2@48
18	100	50		QPSK	60	P_15@0	P_15@50	S_15@0	S_15@35
19	100	100		QPSK	18	P_18@0	S_0@0		
20	100	100		QPSK	100	P_100@0	S_0@0		
21	100	100		QPSK	200	P_100@0	S_100@0		
22	100	100		16QAM	18	P_18@0	S_0@0		
23	100	100		16QAM	100	P_100@0	S_0@0		
24	100	100	1	16QAM	200	P_100@0	S_100@0		
25	100	100	1	QPSK	2	P_1@0	S_1@99		
26	100	100	1	QPSK	10	P_3@0	P_2@70	S_3@30	S_2@98
27	100	100]	QPSK	80	P_20@0	P_20@80	S_20@0	S_20@80
NOTE	1: CA ap	Configura	ation Test CC Combination s gregated channel bandwidt	ettings are hs are speci	checked se ified in Tab	eparately for ea le 5.4.2A.1 -1.	ich CA Configu	iration, whic	h

- 1. Connect the SS and interfering sources to the UE antenna connectors as shown in TS 36.508[7] Annex A, Figure group A.32 as appropriate.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals for PCC are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.2.3A.1.4.1-1.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.2.3A.1.4.3.

6.2.3A.1.4.2 Test procedure

- 1. Configure SCC according to Annex C.0, C.1, and Annex C.3.0 for all downlink physical channels except PHICH.
- 2. The SS shall configure SCC as per TS 36.508 [7] clause 5.2A.4. Message contents are defined in clause 6.2.3A.1.4.3.
- 3. SS activates SCC by sending the MAC-CE according to TS 36.321 [13] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
- 4. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.2.5A.1.4.1-1 on both PCC and SCC. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 5. Send continuously uplink power control "up" commands in the uplink scheduling information to the UE to ensure that the UE transmits at P_{UMAX} level.
- 6. Measure the mean power over all component carriers in the CA configuration of the radio access mode. The period of measurement shall be at least the continuous duration one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.3A.1.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6. In test procedure step 2, for SCC configuration there are no additional message contents.

6.2.3A.1.5 Test Requirements

The maximum output power, derived in step 2 shall be within the range prescribed by the nominal maximum output power and tolerance in Table 6.2.3A.1.5-1.

Configuration ID	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1			. ,		23	+2.7/-3.7
2					23	+2.7/-3.7
3					23	+2.7/-4.7
4					23	+2.7/-3.7
5					23	+2.7/-4.7
6					23	+2.7/-5.7
7					23	+2.7/-11.2
8					23	+2.7/-10.2
9					23	+2.7/-6.2
10					23	+2.7/-3.7
11					23	+2.7/-3.7
12					23	+2.7/-4.7
13					23	+2.7/-3.7
14					23	+2.7/-4.7
15					23	+2.7/-5.7
16					23	+2.7/-11.2
17					23	+2.7/-10.2
18					23	+2.7/-6.2
19					23	+2.7/-3.7
20					23	+2.7/-3.7
21					23	+2.7/-4.7
22					23	+2.7/-3.7
23					23	+2.7/-4.7
24					23	+2.7/-5.7
25					23	+2.7/-11.2
26					23	+2.7/-10.2
27					23	+2.7/-6.2

 Table 6.2.3A.1.5-1: CA UE Power Class test requirements

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6.2.3B Maximum Power Reduction (MPR) for UL-MIMO

6.2.3B.1 Test purpose

The number of RB identified in Table 6.2.3B.3-1 is based on meeting the requirements for adjacent channel leakage ratio for UL-MIMO and the maximum power reduction (MPR) for UL-MIMO due to Cubic Metric (CM).

6.2.3B.2 Test applicability

The requirements of this test apply in test cases 6.6.2.3B A djacent Channel Leakage power Ratio to all types of E-UTRA UE release 10 and forward that support UL-MIMO.

6.2.3B.3 Minimum conformance requirements

For UE with two transmit antenna connectors in closed-loop spatial multiplexing scheme, the maximum output power is measured as the sum of the maximum output power at each UE antenna connector. For UE Power Class 3, the allowed Maximum Power Reduction (MPR) for the maximum output power in Table 6.2.2B.3-1 due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3B.3-1 with UL-MIMO configurations defined in Table 6.2.2B.3-2.

Modulation	Channel b	Channel bandwidth / Transmission bandwidth configuration [RB]							
	1.4	3.0	5	10	15	20			
	MHz	MHz	MHz	MHz	MHz	MHz			
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1		
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1		
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤2		

Table 6.2.3B.3-1: Maximum Power Reduction (MPR) for Power Class 3

For the UE maximum output power modified by MPR, the power limits specified in clause 6.2.5B.3 apply.

The normative reference for this requirement is TS 36.101 clause 6.2.3B.

6.2.3B.4 Test description

6.2.3B.4.1 Initial condition

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in clause 5.4.2B.1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.2.3B.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Conditions								
Test Environ	ment as specified in	Normal, TL/V	ΊL, TL/VH, TH/V	/L, TH/VH				
TS 36.508[7]	clause 4.1							
Test Frequer	icies as specified in	Low range, Mid range, High range						
TS36.508 [7]	clause 4.3.1							
Test Channe	I Bandwidths as specified in	Lowest, 5MH	z, 10MHz, High	nest				
TS 36.508 [7] clause 4.3.1							
Test Parameters for Channel Bandwidths								
Downlink Configuration Uplink Configuration								
Ch BW	N/A for Maximum Power	Reduction	Mod'n	RB allo	ocation			
	(MPR) test case	Э		FDD	TDD			
1.4MHz			QPSK	5	5			
1.4MHz			QPSK	6	6			
1.4MHz			16QAM	5	5			
1.4MHz			16QAM	6	6			
3.0MHz			QPSK	4	4			
3.0MHz			QPSK	15	15			
3.0MHz			16QAM	4	4			
3.0MHz			16QAM	15	15			
5MHz			QPSK	8	8			
5MHz			QPSK	25	25			
5MHz			16QAM	8	8			
5MHz			16QAM	25	25			
10MHz			QPSK	12	12			
10MHz			QPSK	50	50			
10MHz			16QAM	12	12			
10MHz			16QAM	50	50			
				(Note 3)	(Note 3)			
15MHz			QPSK	16	16			
15MHz			QPSK	75	75			
15MHz			16QAM	16	16			
15MHz	1		16QAM	75	75			
				(Note 3)	(Note 3)			
20MHz			QPSK	18	18			
20MHz			QPSK	100	100			
20MHz			16QAM	18	18			
20MHz			16QAM	100	100			
				(Note 3)	(Note 3)			
Note 1: Te	st Channel Bandwidths are cl	hecked separa	itely for each E-	UTRA band, th	ne applicable			
ch	annel bandwidths are specifie	d in Table 5.4	.2.1-1.					
Note 2: Th	e RB _{start} of partial RB allocation	on shall be RB	#U and RB# (m	ax + 1 - RB all	ocation) of			
the	e channel bandwidth.	N 0						
Note 3: Ap	plies only for UE-Categories	22.						

Table 6.2.3B.4.1-1: Test Configuration Table

- 1. Connect the SS and interfering sources to the UE antenna connectors as shown in TS 36.508[7] Annex A Figure A.28.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] clause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channels are set according to Table 6.2.3B.4.1-1.
- 5. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.2.3B.4.3.

6.2.3B.4.2 Test procedure

- 1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 4 for C_RNTI to schedule the UL RMC according to Table 6.2.3B.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 2. Send continuously uplink power control "up" commands in the uplink scheduling information to the UE to ensure that the UE trans mits at PUMAX level.
- 3. Measure the sum of mean power of the UE at each transmit antenna connector in the channel bandwidth of the radio access mode. The period of measurement shall be at least the continuous duration one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.3B.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6.

6.2.3B.5 Test requirements

The maximum output power, derived in step 2 shall be within the range prescribed by the nominal maximum output power and tolerance in Table 6.2.3B.5-1.

E- UTRA Band	Class 1 (dBm)	Tol. (Db)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	QPSK partial RB allocation Tol. (dB))	QPSK full RB allocation Tol. (dB))	16QAM partial RB allocation	16QAM full RB allocation Tol. (dB)
								Tol. (dB)	
1					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
2					23	+2.7/-3.7	+2.7/- 4.7 ^{1,2}	+2.7/- 4.7 ^{1,2}	+2.7/- 5.7 ^{1,2}
3					23	+2.7/-3.71	+2.7/- 4.7 ^{1,2}	+2.7/- 4.7 ^{1,2}	+2.7/- 5.7 ^{1,2}
4					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
5					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
6					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
7					23	+2.7/-3.71	+2.7/- 4.7 ^{1,2}	+2.7/- 4.7 ^{1,2}	+2.7/- 5.7 ^{1,2}
8					23	+2.7/-3.71	+2.7/- 4.7 ^{1,2}	+2.7/- 4.7 ^{1,2}	+2.7/- 5.7 ^{1,2}
9					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
10					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
11					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
12					23	+2.7/-3.7	+2.7/- 4.7 ^{1,2}	+2.7/- 4.7 ^{1,2}	+2.7/- 5.7 ^{1,2}
13					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
14					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
17					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
18					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
19					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
20					23	+2.7/-3.7	+2.7/- 4.7 ^{1,2}	+2.7/- 4.7 ^{1,2}	+2.7/- 5.7 ^{1,2}
21					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
22					23	+3.0/-5.5	+3.0/-6.5	+3.0/-6.5	+3.0/-7.5
23					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
24					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
25					23	+2.7/-3.7'	+2.7/- [4.7] ^{1,2}	+2.7/- [4.7] ^{1,2}	+2.7/- [5.7] ^{1,2}
26					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
27					23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7

Table 6.2.3B.5-1:	UE Power	Class te st	requirements
		0.000.000	

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28			23	+2.7/[-3.7]	+2.7/[-4.7]	+2.7/[-4.7]	+2.7/[-5.7]
31			23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
33			23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
34			23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
35			23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
36			23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
37			23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
38			23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
39			23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
40			23	+2.7/-3.7	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
41			23	+2.7/-3.71	+2.7/-4.7	+2.7/-4.7	+2.7/-5.7
42			23	+3.0/-5.0	+3.0/- 6.0 ^{1,2}	+3.0/- 6.0 ^{1,2}	+3.0/- 7.0 ^{1,2}
43			23	+3.0/-5.0	+3.0/-6.0	+3.0/-6.0	+3.0/- 7.0 ^{1,2}
44			23	+2.7/[-3.7]	+2.7/[-4.7]	+2.7/[-4.7]	+2.7/[-5.7]
Note 1: Note 2:	For transmiss MHz or FUL_ by reducing the For the UE m 6.2.5B.3-1 ap	high – 4 MHz and high – 4 MHz and he lower tolerance aximum output po poly	s (Figure FUL_hig e limit by ower mod	5.4.2-1) confine gh, the maximun 1.5 dB. lified by MPR, th	d within FUL_ n output powe e power limits	low and FUL_ r requirement specified in ⁻	low + 4 is relaxed Table

6.2.4 Additional Maximum Power Reduction (A-MPR)

6.2.4.1 Test purpose

Additional ACLR and spectrum emission requirements can be signalled by the network to indicate that the UE shall also meet additional requirements in a specific deployment scenario. To meet these additional requirements, Additional Maximum Power Reduction A-MPR is allowed for the output power as specified in Table 6.2.2.3-1. Unless stated otherwise, an A-MPR of 0 dB shall be used.

6.2.4.2 Test applicability

The requirements of this test apply in test case 6.6.2.2 Additional Spectrum Emission Mask for network signalled values NS_03, NS_04, NS_06, NS_07, NS_11, and NS_20 to all types of E-UTRA UE release 8 and forward.

The requirements of this test apply in test case 6.6.3.3 Additional Spurious Emissions for network signalled values NS_05, NS_07, NS_08, NS_09, NS_12, NS_13, NS_14, NS_15, NS_16, NS_17 and NS_18 to all types of E-UTRA UE release 8 and forward.

6.2.4.3 Minimum conformance requirements

For UE Power Class 3 the specific requirements and identified sub-clauses are specified in Table 6.2.4.3-1 along with the allowed A-MPR values that may be used to meet these requirements. The allowed A-MPR values specified below in

Table 6.2.4.3.-1 to 6.2.4.3-15 are in addition to the allowed MPR requirements specified in clause 6.2.3. For the UE maximum output power modified by A-MPR, the power limits specified in clause 6.2.5 apply.

Network Signalling	Requirements (sub-clause)	E-UTRA Band	Channel bandwidth	Resources Blocks	A-MPR (dB)
value			(MHz)	(<i>N</i> _{RB})	
NS_01	6.6.2.1.1	Table 5.2-1	1.4,3,5,10,1 5,20	Table 5.4.2-1	N/A
			3	>5	≤1
		241023	5	>6	≤ 1
NS_03	6.6.2.2.3.1	25 35 36	10	>6	≤1
		20,00,00	15	>8	≤ 1
			20	>10	≤1
NS 04	662232	41	5	>6	≤1
110_04	0.0.2.2.0.2		10, 15, 20	Table 6	5.2.4.3-4
NS_05	6.6.3.3.3.1	1	10,15,20	≥ 50	≤ 1
NS_06	6.6.2.2.3.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.4.2-1	N/A
NS_07	6.6.2.2.3.3 6.6.3.3.3.2	13	10	Table 6.2.4.3-2	Table 6.2.4.3-2
NS_08	6.6.3.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.3.4	21	10, 15	> 40	≤1 < 2
NS 10		20	15.20	700 Table 6 2 4 3-3	Table 6 2 4 3-3
110_10		20	1435	10010 0.2.4.0 0	10010 0.2.4.0 0
NS_11	6.6.2.2.1	231	10,15,20	Table 6.2.4.3-5	Table 6.2.4.3-5
NS_12	6.6.3.3.5	26	1.4, 3, 5	Table 6.2.4.3-6	Table 6.2.4.3-6
NS_13	6.6.3.3.6	26	5	Table 6.2.4.3-7	Table 6.2.4.3-7
NS_14	6.6.3.3.7	26	10, 15	Table 6.2.4.3-8	Table 6.2.4.3-8
NS_15	6.6.3.3.8	26	1.4, 3, 5, 10, 15	Table 6.2.4.3-9 Table 6.2.4.3-	Table 6.2.4.3-9, Table 6.2.4 3-10
			10	10	
NS 16	6.6.3.3.9	27	3.5.10	Table 6.2.4.3-11	, Table 6.2.4.3-12,
			-,-,-		.2.4.3-13
NS_17	6.6.3.3.10	28	5,10	1 able 5.4.2-1	N/A
NS_18	6.6.3.3.11	28	5	22	51
			10, 15, 20	21	<u>5</u> 4
	60066004				
NS_20	6.6.3.2	23	5, 10, 15, 20	14 14	Table 6.2.4.3-14
NS_32	-	-	-	-	-

Table 6.2.4.3-1: Additional Maximum Power Reduction (A-MPR) / Spectrum Emission requirements

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Table 6.2.4.3-2: A-MPR for "NS_07"

Parameters		Region A		Region B				Region C	
RB _{start} ¹		0 – 12		13 –18		19 – 42		43 – 49	
L _{CRB} ² [RBs]		6 – 8	1 to 5 and 9-50	<8	≥8	<18	≥18	≤2	>2
A-MPR [dB] ≤8 ≤12 0 ≤12 0 ≤6				≤6	≤3	0			
Note 1:	RB _{start} indica	ates the lo	west RB index	of transi	mitted res	source b	locks		
Note 2:	L _{CRB} is the le	ength of a	contiguous re	source bl	lock alloc	ation			
Note 3: For intra-subframe frequency hopping between two regions, notes 1 and 2 apply on a per slot basis.									
Note 4:	 For intra-subframe frequency hopping between two regions, the larger A-MPR value of the two regions may be applied for both slots in the subframe. 								

Channel bandwidth [MH	Parameters z]	Region A		
	RB _{start} ¹	0 – 10		
15	L _{CRB} [RBs]	1 -20		
	A-MPR [dB]	≤2		
	RB _{start} ¹	0 – 15		
20	L _{CRB} [RBs]	1 -20		
	A-MPR [dB]	≤ 5		
Note 1: RB _{star}	t indicates the lowest	RB index of transmitted resource blocks.		
Note 2: L _{CRB} i	s the length of a conti	guous resource block allocation.		
Note 3: For in	tra-subframe frequen	cyhopping which intersects Region A, notes 1 and 2 apply		
on a p	perslotbasis.			
Note 4: For in may t	tra-subframe frequence be applied for both slo	cy hopping which intersect Region A, the larger A-MPR value ts in the subframe.		

Table	6.2.4.3-3:	A-MPR	for	"NS	10"

Table 6.2.4.3-4: A	-MPR for NS	04 for bandwidths:	> 5MHz

Channel bandwidth [MHz]	Parameters	Region A	Region B		Region C		
10	RB _{start} ¹	0 – 12	13	- 36	37 – 49		
	RB _{start} ¹ + L _{CRB} ² [RBs]	N/A	14 - 37	>37	N/A		
		(Note 3)			(Note 3)		
	A-MPR [dB]	≤3dB	0	≤2dB	≤3dB		
15	RB _{start} ¹	0 – 18	19	- 55	56 – 74		
	RB _{start} ¹ + L _{CRB} ² [RBs]	N/A	20 - 56	>56	N/A		
		(Note 3)			(Note 3)		
	A-MPR [dB]	≤3dB	0	≤2dB	≤3dB		
20	RB _{start}	0 – 24	25 – 74		75 – 99		
	RB _{start} ¹ + L _{CRB} ² [RBs]	N/A	26 - 75 >75		N/A		
		(Note 3)			(Note 3)		
	A-MPR [dB]	≤3dB	0	≤2dB	≤3dB		
Note 1: RB _{star}	t indicates the lowest RB indi	dex of transmitted re	esource blocks.				
Note 2: L _{CRB} i	s the length of a contiguous	resource block allo	ocation.				
Note 3: Any R	Note 3: Any RB allocation that starts in Region A or C is allowed the specified A-MPR.						
Note 4: For in	Note 4: For intra-subframe frequency hopping which intersects regions, notes 1 and 2 apply on a per slot basis.						
Note 5: For in	tra-subframe frequency hop	oping which intersed	cts regions, the lar	ger A-MPR value r	nay be applied for		
both s	slots in the subframe.						

Channel Bandwidth [MHz]	Parameters									
	Fc [MHz]	<2004			≥2004					
3	L _{CRB} [RBs]	1-1	15			>5				
	A-MPR [dB]	≤:	5			≤ 1				
	Fc [MHz]	<20	04		200)4 ≤ Fc <	2007		≥20	07
5	L _{CRB} [RBs]	1-2	25		1-6 & 15-25		8-12	>6		6
	A-MPR [dB]	≤	7		≤	4	0		≤´	1
	Fc [MHz]	200)5 ≤	Fc <2	015	5		2015	5	
	RB _{start}		0	-49				0-49		
10	L _{CRB} [RBs]	1-50		-50			1-50			
	A-MPR [dB]	≤ 12				0				
	Fc [MHz]					<2012	2.5			
	RB _{start}	0-4	5-21		1	22	-56		57-74	
	L _{CRB} [RBs]	≥1	≥1 7-50		0-6 & ≥50		≤25	>25	5	>0
	A-MPR [dB]	≤15	15 ≤7		≤10		0	≤6		≤15
15	Fc [MHz]					2012	.5			
	RB _{start}	0-12	•		13-39		40-65		6	66-74
	L _{CRB} [RBs]	≥1		≥3	0	<30	≥ (69 RB _{star}	 rt)		≥1
	A-MPR [dB]	≤10		≤6	6	0	≤2			≤6.5
	Fc [MH z]					201	C			
20	RB _{start}	0-12		1:	3-29	9	30-68			69-99
	L _{CRB} [RBs]	≥1	10	-60		1-9 & >60	1-24	≥25	5	≥1
	A-MPR [dB]	≤15	4	≦7		≤10	0	≤7		≤15

Table 6.2.4.3-5: A-MPR for NS_11

Table 6.2.4.3-6: A-MPR for "NS_12"

Channel bandwidth [MHz]	Parameters	Regio	Region B	
	RB _{start}	0		1-2
1.4	L _{CRB} [RBs]	≤3	≥4	≥4
	A-MPR [dB]	≤3	≤6	≤3
	RB _{start}	0-3	4-5	
3	L _{CRB} [RBs]	4-9	1-3 and 10-15	≥9
	A-MPR [dB]	≤4	≤3	≤3
	RB _{start}	0-6		7-9
5	L _{CRB} [RBs]	≤8	≥9	≥15
	A-MPR [dB]	≤5	≤3	≤3

Channel bandwidth [MHz]	Parameters	Region A		
	RB _{start}	0-2	2	
5	L _{CRB} [RBs]	≤5	≥18	
	A-MPR [dB]	≤3	≤2	

Table 6.2.4.3-7: A-MPR for "NS_13"

Table 6.2.4.3-8: A-MPR for "NS_14"

Channel bandwidth [MHz]	Parameters	Region A		
	RB _{start}	0		
10	L _{CRB} [RBs]	≤5	≥50	
	A-MPR [dB]	≤3	≤1	
	RB _{start}	3≥	3	
15	L _{CRB} [RBs]	≤16	≥50	
	A-MPR [dB]	≤3	≤1	

Table 6.2.4.3-9: A-MPR for "NS_15" for E-UTRA highest channel edge > 845 MHz and ≤ 849 MHz

Channel bandwidth [MHz]	Parameters	Region A	Region B	Region C
1.4	RB _{end} [RB]			4-5
	A-MPR [dB]			≤3
3	RB _{end} [RB]	0-1	8-12	13-14
	L _{CRB} [RB]	≤2	≥8	>0
	A-MPR [dB]	≤4	≤4	≤9
5	RB _{end} [RB]	0-4	12-19	20-24
	L _{CRB} [RB]	≤2	≥8	>0
	A-MPR [dB]	≤4	≤5	≤9
10	RB _{end} [RB]	0-12	23-36	37-49
	L _{CRB} [RB]	≤2	≥15	>0
	A-MPR [dB]	≤4	≤6	≤9
15	RB _{end} [RB]	0-20	26-53	54-74
	L _{CRB} [RB]	≤2	≥20	>0
	A-MPR [dB]	≤4	≤5	≤9

Table 6.2.4.3-10: A-MPR for "NS_15" for E-UTRA highest channel edge ≤ 845 MHz

Channel bandwidth [MHz]	Parameters	Region A	Region B	Region C
	RB _{end} [RB]			19-24
5	L _{CRB} [RB]			≥18
	A-MPR [dB]			≤2
	RB _{end} [RB]	0-4	29-44	45-49
10	L _{CRB} [RB]	≤2	≥24	>0
	A-MPR [dB]	≤4	≤4	≤9
15	RB _{end} [RB]	0-12	44-61	62-74
	L _{CRB} [RB]	≤2	≥20	>0
	A-MPR [dB]	≤4	≤5	≤9

Channel bandwi dth [MHz]	Parameter	Region A	Region B	Region C	Region D	Region E
3 MH z	RB _{start}	0	1-2			
	L _{CRB} [RBs]	≥12	12			
	A-MPR [dB]	≤2	≤1			
5 MH z	RB _{start}	0-1	2	2-9	2-5	
	L _{CRB} [RBs]	1 - 25	12	15-18	20	
	A-MPR [dB]	≤5	≤1	≤2	≤3	
10 MHz	RB _{start}	0 - 8	0-14		15-20	15-24
	L _{CRB} [RBs]	1 - 12	15-20	≥24	≥30	24-27
	A-MPR [dB]	≤5	≤3	≤7	≤3	≤1

Table 6.2.4.3-11: A-MPR for "NS_16" with channel lower edge at ≥807 MHz and <808.5 MHz

Table 6.2.4.3-12: A-MPR for "NS_16" with channel lower edge at ≥808.5 MHz and <812 MHz

Channel bandwi dth [MHz]	Parameter	Region A	Region B	Region C	Region D	Region E
5 MH z	RB _{start}	0	0-1	1-5		
	L _{CRB} [RBs]	16-20	≥24	16-20		
	A-MPR [dB]	≤2	≤3	≤1		
10 MHz	RB _{start}	0	-6	0-10	0-14	11-20
	L _{CRB} [RBs]	1-12	15-20	24-32	≥36	24-32
	A-MPR [dB]	≤5	≤2	≤4	≤5	≤1

Table 6.2.4.3-13: A-MPR for "NS_16" with channel lower edge at ≥812 MHz

Channel bandwi dth [MHz]	Parameter	Region A	Region B	Region C	Region D
10 MHz	RB _{start}	0 - 9	0	1-14	0-5
	L _{CRB} [RBs]	27-32	36-40	36-40	≥45
	A-MPR [dB]	≤1	≤2	≤1	≤3

Channel bandwidth [MHz]	Parameters										
[]	Fc (MHz)	< 2007.5			2007.5 ≤ Fc < 2012.5				2.5	2012.5 ≤ Fc ≤ 2017.5	
_	RB _{start}	≤24		0-3			4-6		≤24		
5	L _{CRB} (RBs)	>0		1	15-19 ≥		:20 ≥18		≥18	1-25	
	A-MPR [dB]	≤17			≤1	≤4			≤2	≤ 0	
	Fc (MHz)	2005									
	RB _{start}			26-34				35-4		49	
	L _{CRB} (RBs)		>0		1	8-15		>	15	>0	
10	A-MPR [dB]		≤16			≤2	≤2		≦5	≤ 6	
10	Fc (MHz)	2015									
	RB _{start}	0-5					6-10				
	L _{CRB} (RBs)	≥32						≥40			
	A-MPR [dB]	≤4					≤2				
	Fc (MHz)	2012.5									
15	RB _{start}	0-14			15-2-			24		25-39	61-74
15	L _{CRB} (RBs)	1-9 & 40-75		10-3	39	24-29			≥30	≥36	≤6
	A-MPR [dB]	≤11		≤6	≨6 ≤1		≤1		≤7	≤5	≤6
	Fc (MHz)	2010									
20	RB _{start}	0-21	22-31		1	32		В	39-49	50-69	70-99
	L _{CRB} (RBs)	>0	1-9 & 3	31-75	10-:	30	≥15		≥24	≥25	>0
	A-MPR [dB]	≤17	≤1	12 ≤		6	≤9		≤7	≤5	≤16
 NOTE 1: When NS_20 is signalled the minimum requirements for the 10 MHz bandwidth are specified for E-UTRA UL carrier centre frequencies of 2005 MHz or 2015 MHz. NOTE 2: When NS_20 is signalled the minimum requirements for the 15 MHz channel bandwidth are specified for E-UTRA UL carrier centre frequency of 2012.5 MHz. 											

Table 6.2.4.3-14: A-MPR for "NS_20"

Table 6.2.4.3-15: A-MPR for "NS_19"

Channel bandwidth [MHz]	Parameters	Region A		Region B	
	RB _{start}			0-6	
10	L _{CRB} [RBs]			≥40	
	A-MPR [dB]			≤1	
	RB _{start}	0	-6	7-20	
15	L _{CRB} [RBs]	≤18	≥36	≥42	
	A-MPR [dB]	≤2	≤3	≤2	
	RB _{start}	0-14		15-30	
20	L _{CRB} [RBs]	≤40	≥45	≥50	
	A-MPR [dB]	≤2	≤3	≤2	

The normative reference for this requirement is TS 36.101 clause 6.2.4.

FDD

TDD

6.2.4.4 Test description

6.2.4.4.1 Initial condition

ĺD

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.2.4.4.1-1 through table 6.2.4.4.1-13. The details of the uplink reference measurement channels (RMCs) are specified in Annex A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Conditions									
Test Environment				NC					
(as specified in	TS 36.508	[7] subclause	e 4.1)						
Test Frequencie	es		Low range, Mid range, High range						
(as specified in	TS36.508 [7	7]subclause							
Test Channel B	andwidths		Lowest, 5MHz, 10MHz, Highest						
(as specified in	TS 36.508	[7] subclause							
Test Parameters for NS_03 A-MPR									
Downlink Configuration			Uplink Configuration						
Configuration Ch BW Mod'n RB allocation				Mod'n	RB allocation				

TDD

FDD

Table 6.2.4.4.1-1: Test Configuration Table (network signalled value "NS_03")

1	1/1MHz	N/A for A-MPR testing	OPSK	6	6			
2		N/ Nor / Wir R testing.		5	5			
3	1.4MHz			5	5			
4	3MHz		OPSK	15	15			
5	3MHz		OPSK	4	4			
6	3MHz		160AM	15	15			
7	3MHz		160AM	4	4			
8	5MHz		OPSK	25	25			
9	5MHz		OPSK	8	8			
10	5MHz		QPSK	6	6			
10	5MHz		160AM	25	25			
12	5MHz		16QAM	8	8			
13	10MHz		OPSK	50	50			
14	10MHz		OPSK	12	12			
15	10MHz		OPSK	6	6			
16	10MHz		160AM	50	50			
				(Note 4)	(Note 4)			
17	10MHz		16QAM	12	12			
18	15MHz		QPSK	75	75			
19	15MHz		QPSK	16	16			
20	15MHz		QPSK	8	8			
21	15MHz		16QAM	75	75			
				(Note 4)	(Note 4)			
22	15MHz		16QAM	16	16			
23	20MHz		QPSK	100	100			
24	20MHz		QPSK	18	18			
25	20MHz		QPSK	10	10			
26	20MHz		16QAM	100	100			
				(Note 4)	(Note 4)			
27	20MHz		16QAM	18	18			
Note 1: Test	Channel Ba	andwidths are checked separately for	or each E-UTRA	band, the ap	plicable			
chan	nel bandwig	ths are specified in Table 5.4.2.1-1						
Note 2: The	Note 2: The Configuration ID will be used to map the applicable Test Configuration to the							
corresponding lest Requirement in subclause 6.2.4.5 as not all combinations are necessarily								
Note 3: The	required based off the applicability of the UE.							
channel bandwidth								
Note 4: Appli	Note 4: Applies only for LIE-Categories >2							
Note 5: For band 23, above table only applies to mid and high range test frequencies. Low range test								
frequencies will be covered by NS_11 test configuration table.								
Initial Conditions								
--	---	------------------	-------------------------------	-----------------	-------------------	--------------	--	
Test Environm	ent			NC				
(as specified in TS 36.508 [7] subclause 4.1)				-				
lest Frequencies (as specified in TS36.508 [7] subclause 4.3.1)				Low range, I	Vid range, High r	ange		
Test Channel E	Bandwidths		- 4.2.4)	5MHz, 10 M	Hz, 15 MHz, 20M	Hz		
(as specified in	15 36.508		e 4.3.1) Deremeters for NS					
	<u>г </u>	Iest Downlink	Parameters for NS		nlink Configurat	ion		
Configuration		Downin		U Mad'n				
ID	CILDVV	MOGIN	TDD	IVIOU N	TDD			
1	5MHz	N/A for	A-MPR testing	QPSK	25	Note 3		
2	5MHz			QPSK	8	Note 3		
3	5MHz			QPSK	6	Note 3		
4	5MHz			16QAM	25	Note 3		
5	5MHz			16QAM	8	Note 3		
6	10MHz			QPSK	1	0		
7	10MHz			QPSK	12	0		
8	10MHz			QPSK	50	0		
9	10MHz			16QAM	50	0		
					(Note 4)	-		
10	10MHz			QPSK	24	13		
11	10MHz			16QAM	24	13		
12	10MHz			QPSK	36	13		
13	10MHz			QPSK	12	37		
14	10MHz			OPSK	1	49		
15	15MHz			OPSK	1	0		
16	15MHz			OPSK	16	0		
17	15MHz			OPSK	75	0		
18	15MHz			160AM	75	0		
10	1011112			10 30 101	(Note 4)	0		
19	15MHz			QPSK	36	19		
20	15MHz			16QAM	36	19		
					(Note 4)			
21	15MHz			QPSK	50	19		
22	15MHz			QPSK	18	56		
23	15MHz			QPSK	1	74		
24	20MHz			QPSK	1	0		
25	20MHz			QPSK	18	0		
26	20MHz			QPSK	100	0		
27	20MHz			16QAM	100	0		
					(Note 4)			
28	20MHz			QPSK	50	25		
29	20MHz			16QAM	50 (Note 4)	25		
30	20MHz			QPSK	75	25		
31	20MHz			QPSK	25	75		
32	20MHz			QPSK	1	99		
Note 1: Test	t Channel F	Bandwidths ar	e checked separate	v for E-UTR A	band, the applica	able channel		
handwidths are specified in Table 5.4.2.1-1								
Note 2 ⁻ The configuration ID will be used to map the applicable Test Configuration to be								
corr	espondina	Test Requirer	ment in subclause 6	.2.4 as not all	combinations are	neœssarilv		
required based on the applicability of the UF.								
Note 3: The	RB _{start} of p	artial RB allo	cation shall be RB#	0 and RB# (ma	ax +1 - RB alloca	tion) of the		
char	nnel bandw	<i>i</i> dth.						
Note 4: Applies only for UE-Categories ≥2.								

Table 6.2.4.4.1-2: Test Configuration Table (network signalled value "NS_04")

Initial Conditions							
TestEnvironment	Normal						
(as specified in TS 36.508 [7] subclause 4.1)	Nominal						
Test Frequencies	Low range, Mid range						
(as specified in TS36.508 [7] subclause 4.3.1)							
	In case of Low range:						
	- For 5MHz Channel						
	Bandwidth: 1927.2MHz (NUL						
	= 18072)						
	- For 10 MHz Channel						
	Bandwidth: 1934.7 MHz (NUL						
	= 18147)						
	 For 15 MHz Channel 						
	Bandwidth: 1932.5 MHz (NUL						
	= 18125)						
	- For 20 MHz Channel						
	Bandwidth: 1930 MHz (NUL =						
	18100)						
Test Channel Bandwidths	5MHz, 10MHz, 15MHz,						
(as specified in TS 36.508 [7] subclause 4.3.1)	20MHz						
Test Parameters for NS_05 A-MPR							
Downlink Configura	tion Uplink Configuration						

Table 6.2.4.4.1-3: Test Configuration Table (network signalled value "NS_05")

Configura	ition	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation		
ID				FDD		FDD		
1		5MHz	N/A for A-	MPR testing	QPSK	1		
2		5MHz		5	QPSK	25		
3		10MHz			QPSK	1		
4		10MHz			OPSK	12		
5		10MHz			OPSK	48		
6		10MHz			OPSK	50		
7		10MHz				50		
1					IUQAM	(Note 4)		
8		15MHz			QPSK	1		
9		15MHz			QPSK	16		
10		15MHz			QPSK	30		
						(Note 5)		
11		15MHz			QPSK	48		
						(Note 6)		
12		15MHz			QPSK	75		
						(Note 6)		
13		15MHz			16QAM	75		
						(Note 4, 6)		
14		20MHz			QPSK	1		
15		20MHz			QPSK	18		
16		20MHz			QPSK	24		
						(Note 5)		
17		20MHz			QPSK	48		
						(Note 6)		
18		20MHz			QPSK	100		
						(Note 6)		
19		20MHz			16QAM	100		
						(Note 4, 6)		
Note 1:	The 1	RB alloca	tion shall be te	ested at both RB #	0 and RB #max	except for		
	15M⊦	Iz and 20N	1Hz of Low Ra	nge.				
	For 1	5MHz of Lo	ow Range, the	1 RB allocation s	hall be tested at	t both RB#8 and		
	RB#6	6.						
	For 2	0MHz of Lo	ow Range, the	1 RB allocation s	hall be tested at	t both RB#24		
	and F	RB#75.						
Note 2:	The F	RB _{start} of pa	rtial RB alloca	tion shall be RB#	0 and RB# (ma	x +1 - RB		
	alloca	ation) of the	e channel band	dwidth except for 1	15MHz and 20M	HzofLow		
	Rang	je.						
	For 1	5MHz of Lo	ow Range, the	RB _{start} shall be R	B#8 and RB# (6	67 – RB		
	alloca	ation).						
	For 2	0MHz of Lo	ow Range, the	RB _{start} shall be R	B#24 and RB# ((76 – RB		
	alloc	ation)						
Note 3:	The (Configuratio	on ID will be us	sed to map the ap	plicable Test Co	onfiguration to		
	the c	orrespondi	ng Test Requir	ementinsubclaus	se 6.2.4.5 as no	it all		
	comb	inations ar	e necessarily i	equired based on	the applicability	of the UE.		
Note 4:	Appli	es only for	UE-Categories	s ≥2.				
Note 5:	Requ	ured for Lo	w Range only.					
NOTE 6:	Not available for Low Range.							

Table 6.2.4.4.1-4: Test Configuration Table (network signalled value "NS_06")

Initial Conditions						
Test Environment (as specified in TS 36.508	Nomal					
Test Frequencies	Low range, Mid range,					
(as specified in TS36.508	High range					
Test Channel Bandwidths	Lowest, 5MHz, 10MHz,					
(as specified in TS 36.508	Highest					
Test Parameters for NS_06 A-MPR						
	Downlink Configuration	Uplink Configuration				

Configura	ition	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation
ID				FDD		FDD
1		1.4MHz	N/A for A-	MPR testing	QPSK	6
2		1.4MHz			QPSK	5
3		1.4MHz			16QAM	5
4		3MHz			QPSK	15
5		3MHz			QPSK	4
6		3MHz			16QAM	4
7		5MHz			QPSK	25
8		5MHz			QPSK	8
9		5MHz			16QAM	8
10		10MHz			QPSK	50
11		10MHz			QPSK	12
12		10MHz			16QAM	12
13		15MHz			QPSK	75
14		15MHz			QPSK	16
15		15MHz			16QAM	16
16		20MHz			QPSK	100
17		20MHz			QPSK	18
18		20MHz			16QAM	18
Note 1:	Test	Channel Ba	andwidths are	checked separate	ely for each	E-UTRA band,
	the a	pplicable c	hannel bandwi	dths are specified	l in Table 5	.4.2.1-1.
Note 2:	The	Configurat	ion ID will be u	sed to map the a	pplicable T	est
	Configuration to the corresponding Test Requirement in subclause 6.2.4.					bclause 6.2.4.5
	as not all combinations are necessarily required based on the applicability					
	of the	UE.				
Note 3:	The F alloca	RB _{start} of pa ation) of the	rtial RB allocat	ion shall be RB# width.	0 and RB#	(max +1 - RB

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Table 6.2.4.4.1-5: Test Configuration Table (network signalled value "NS_07")

Initial Conditions							
Test Environment		NC					
(as specified in TS 36.50	8 [7] subclause 4.1)						
Test Frequencies		Mid range					
(as specified in TS36.508	8 [7] subclause 4.3.1)						
Test Channel Bandwidths	3						
(as specified in TS 36.50	8 [7] subclause 4.3.1)						
	Test Parameters for NS_07 A-MPR						
	Downlink Configuration	Uplink Configuration					

		-					
Configuration	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation	RB start	
ID			FDD		FDD	FDD	
1	10MHz	N/A for	A-MPR testing	QPSK	1	0	
2	10MHz			QPSK	8	0	
3	10MHz			QPSK	6	13	
4	10MHz			QPSK	20	13	
5	10MHz			QPSK	12	13	
6	10MHz			16QAM	36	13	
					(Note 2)		
7	10MHz			QPSK	16	19	
8	10MHz			QPSK	12	19	
9	10MHz			16QAM	16	19	
10	10MHz			QPSK	30	19	
11	10MHz			16QAM	30	19	
					(Note 2)	1	
12	10MHz			QPSK	6	43	
13	10MHz			QPSK	2	48	
14	10MHz			QPSK	50	0	
15	10MHz			QPSK	12	0	
16	10MHz			16QAM	50	0	
					(Note 2)	1	
Note 1: The	Note 1: The Configuration ID will be used to map the applicable Test Configuration to the						
corresponding Test Requirement in subclause 6.2.4.5 as not all combinations are necessarily							
requ	iired based	I on the applic	ability of the UE.				
Note 2: Applies only for UE-Categories ≥2.							

Table 6.2.4.4.1-6: Test Configuration Table (network signalled value "NS_08")

Initial Conditions							
Test Environm	ent			Normal			
(as specified in	n TS 36.508	[7] subclause 4	4.1)	Noimai			
Test Frequence	ies			High rand	A		
(as specified in	n TS36.508	[7] subclause 4	.3.1)	inginang	je		
Test Channel	Bandwidths			5MHz 10	MHz 15MHz		
(as specified in	n TS 36.508	[7] subclause 4	4.3.1)	011112, 10			
	Те	st Parameters	for NS_08 A-MI	PR			
		Downlink (Configuration	Uplink	Configuration		
Configuration	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation		
ID			FDD		FDD		
1	5MHz	N/A for A-	MPR testing	QPSK	1		
2	5MHz			QPSK	8		
3	5MHz			QPSK	25		
4	10MHz			QPSK	1		
5	10MHz			QPSK	12		
6	10MHz			QPSK	40		
7	10MHz			QPSK	50		
8	10MHz			16QAM	50		
					(Note 4)		
9	15MHz			QPSK	1		
10	15MHz			QPSK	16		
11	15MHz			QPSK	40		
12	15MHz			QPSK	75		
13	15MHz			16QAM	75		
					(Note 4)		
Note 1: The	Configurati	on ID will be us	ed to map the ap	plicable Te	st		
Cor	figuration to	the correspon	ding Test Require	ementinsu	bclause 6.2.4.5		
asi	not all combi	nations are ne	cess arily required	based on t	the applicability		
of th	ie UE.						
Note 2: The 1 RB allocation shall be tested at both RB #0 and RB #max.							
Note 3: The	RB _{start} of pa	artial RB allocat	tion shall be RB#	U and RB#	(max + 1 - RB		
allo	cation) of the	e channel band	iwidth				
Note 4: Applies only for UE-Categories ≥2.							

Initial Conditions						
Test Environn	nent			Nomal	Nomal	
(as specified	n TS 36.508	[7] subclause 4	1.1)	Noimai		
Test Frequen	cies			High rand	ie.	
(as specified i	n TS36.508	[7] subclause 4	.3.1)	inginiang	10	
lest Channel (as specified i	Bandwidths n TS 36.508	[7] subclause 4	4.3.1)	5MHz, 10	MHz, 15MHz	
	Test F	Parameters for	Channel Bandw	idths		
		Downlink (Configuration	Uplink (Configuration	
Configuration	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation	
ID			FDD		FDD	
1	5MHz	N/A for A-	MPR testing	QPSK	1	
2	5MHz			QPSK	8	
3	5MHz			QPSK	25	
4	10MHz			QPSK	1	
5	10MHz			QPSK	12	
6	10MHz				40	
7	10MHz			QPSK	50	
8	10MHz			16QAM	50	
-					(Note 4)	
9	15MHz			QPSK	1	
10	15MHz			QPSK	16	
11	15MHz			QPSK	40	
12	15MHz			QPSK	54	
13	15MHz			QPSK	75	
14	15MHz			16QAM	75	
				.	(Note 4)	
Note 1: The	e Configurati	on ID will be us	ed to map the ap	plicable le	St	
0	ntiguration to	the correspon	aing lest Require	ementinsu	DCIAUSE 6.2.4.5	
as	notali combi	nations are neo	cessarily required	based on	the applicability	
Note 2: Th		tion shall be to	stad at both PB +	10 and PP	#max	
Note 3 Th	RBatart of na	artial RR allocat	tion shall be RR#	0 and RR#	(max + 1 - RR	
alla	cation) of the	e channel band	width			
Note 4: Ap	plies only for	UE-Categories	;≥2.			

Table 6.2.4.4.1-7: Test Configuration Table (network signalled value "NS_09")



Void, not tested

Initial Conditions								
Test Enviror	nment (as spe	cified in TS 3	6.508 [7]					
	3 00 01 203	C 1 .1)		Normal				
	Test Frequ	iencies		L	ow range, Mid range, High range			
(as specified in TS36.508 [7] subclause 4.3.1)				For 3 MHz Channel Bandwidth: a. 2001.5 MHz (N _{UL} = 25515) b. 2004.5 MHz (N _{UL} = 25545)				
				For 5 MHz Channel Bandwidth a. 2002.5 MHz (N _{UL} = 25525) b. 2004.5 MHz (N _{UL} = 25545) c. 2007.5 MHz (N _{UL} = 25575) For 10 MHz Channel Bandwidth a. 2005 MHz (N _{UL} = 25550)				
					b. 2005.5 MHz (N _{UL} = 25555) c. 2015 MHz (N _{UL} = 25650)			
					For 15 MHz Channel Bandwidth a. 2007.5 MHz (N _{UL} = 25575) b. 2012.5 MHz (N _{UL} = 25625) For 20 MHz Channel Bandwidth a. 2010 MHz (N _{UL} = 25600)			
Test Channel Bandwidths				3M	Hz, 5MHz, 10MHz, 15MHz, 20MHz			
(as specifie	u iii 13 30.30		66 4.3.1)					
	Test Parameters for NS_11 A-MPR							
		Dow	nlink		Uplink Configuration			
Configuration		Config Mod'n	uration	Modin	PP allocation EDD			
ID		Mod n	allocation FDD	Mod n				
1	3MHz	N/A for A-N	/IPR testing	QPSK	6			
2	3MHz	-	-	QPSK	15			
3	3MHz	-		16QAM	6			
4	3MHz			16QAM	15			
5	5MHz	-		QPSK	1			
6	5MHz	-		QPSK	8			
7	5MHz			QPSK	25			
8	5MHz	-		16QAM	8			
9	5MHz	-		16QAM	25			
10	10MHz	-		QPSK	1			
11	10MHz			QPSK	12			
12	10MHz	-		QPSK	50			
13	10MHz	-		16QAM	12			
14	10MHz	4		16QAM	50			
					(Note 3)			
15	15MHz	1		QPSK	1			
16	15MHz	1		QPSK	7			
17	15MHz	1		QPSK	25			
		1						

Table 6.2.4.4.1-9: Test Configuration Table (network signalled value "NS_11")

Release 11

18	15MHz		QPSK	30			
19	15MHz		QPSK	75			
20	15MHz		16QAM	7			
21	15MHz		16QAM	25			
22	15MHz		16QAM	30			
23	15MHz		16QAM	75			
24	20MHz		QPSK	1			
25	20MHz		QPSK	10			
26	20MHz		QPSK	25			
27	20MHz		QPSK	100			
28	20MHz		16QAM	10			
29	20MHz		16QAM	25			
30	20MHz		16QAM	100			
 Note 1: The Configuration ID will be used to map the applicable Test Configuration to the corresponding Test Requirement in subclause 6.2.4.5 as not all combinations are necessarily required based on the applicability of the UE. Note 2: The RB_{start} of partial RB allocation shall be RB# 0 and RB# (max+1 - RB allocation) of the channel bandwidth. 							
Note 3: App	Applies only for UE-Categories ≥2.						

Initial Conditions							
Test Environment							
(as specified in	TS 36.508 [7]	subclause 4.1)		NC			
Test Frequencie	es						
(as specified in	TS36.508 [7] s	ubclause 4.3.1)	Mid range			
Test Channel B	andwidths						
(as specified in	TS 36.508 [7] :	subclause 4.3.	1)	1.4 MH z, 3 MH	Izand 5 MHz		
Test Paramete	rs for Channe	Bandwidths		•			
		Downlink Co	onfiguration	Upl	ink Configurat	ion	
Configuration ID	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation FDD	RBstart FDD	
1	1.4 MHz	N/A for A-N	IPR testing.	QPSK	1	0	
2	1.4 MHz			QPSK	6	0	
3	1.4 MH z			QPSK	1	1	
4	1.4 MH z			QPSK	5	1	
5	1.4 MHz			16QAM	6	0	
6	3 MH z			QPSK	4	0	
7	3 MH z			QPSK	10	0	
8	3 MH z			QPSK	4	4	
9	3 MH z			QPSK	10	4	
10	3 MH z			16QAM	15	0	
11	5 MH z			QPSK	8	0	
12	5 MH z			QPSK	15	0	
13	5 MHz			QPSK	8	7	
14	5 MH z			QPSK	15	7	
15	5 MHz			16QAM	25	0	

Table 6.2.4.4.1-10: Test Configuration Table (network signalled value "NS_12")

Table 6.2.4.4.1-11: Test Configuration Table (network signalled value "NS_13")

Initial Conditions									
Test Environme	ent								
(as specified in	TS 36.508 [7]	subclause 4.1)		NC					
Test Frequenci	es								
(as specified in	TS36.508 [7] s	ubclause 4.3.1	I)	Mid range					
Test Channel B	andwidths								
(as specified in	TS 36.508 [7]	subclause 4.3.	1)	5 MHz					
Test Paramete	rs for Channe	I Bandwidths							
Downlink Configuration		Uplink Configuration							
		DOWININK C	oninguration	Opi	ink Configurat	lion			
Configuration ID	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation FDD	RBstart FDD			
Configuration ID 1	Ch BW 5 MHz	Mod'n N/A for A-M	RB allocation	Mod'n QPSK	RB allocation FDD 1	RBstart FDD			
Configuration ID 1 2	Ch BW 5 MHz 5 MHz	Mod'n N/A for A-N	RB allocation IPR testing.	Mod'n QPSK QPSK	RB allocation FDD 1 25	RBstart FDD 0			
Configuration ID 1 2 3	Ch BW 5 MHz 5 MHz 5 MHz	Mod'n N/A for A-N	RB allocation /PR testing.	QPSK QPSK QPSK	RB allocation FDD 1 25 15	RBstart FDD 0 0			
Configuration ID 1 2 3 4	Ch BW 5 MHz 5 MHz 5 MHz 5 MHz	N/A for A-N	RB allocation	QPSK QPSK QPSK QPSK QPSK	RB allocation FDD 1 25 15 15	RBstart FDD 0 0 0 7			

Initial Conditio	ns					
Test Environme	ent					
(as specified in	TS 36.508 [7] s	subclause 4.1)	NC			
Test Frequencie	es					
(as specified in	TS36.508 [7] s	ubclause 4.3.1)	Mid range		
Test Channel B	andwidths					
(as specified in	TS 36.508 [7] :	subclause 4.3.	1)	10 MHz, 15 M	1Hz	
Test Paramete	rs for Channel	Bandwidths		•		
		Downlink Co	onfiguration	Upl	ink Configurat	ion
Configuration ID	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation FDD	RBstart FDD
1	10 MHz	N/A for A-M	PR testing.	QPSK	1	0
2	10 MHz			QPSK	25	0
3	10 MHz			QPSK	50	0
4	10 MHz			QPSK	25	1
5 (Note 1)	10 MHz			16QAM	50	0
6	15 MHz			QPSK	8	0
7	15 MHz			QPSK	25	0
8	15 MHz			QPSK	75	0
9 15 MHz			QPSK	50	15	
10 (Note 1)	15 MHz			16QAM	75	0
Note 1: Appli	ies only for UE-	-Categories ≥2		•	•	

Table 6.2.4.4.1-12: Test Configuration Table (network signalled value "NS_14")

Initial Conditions									
Test Environment									
(as specified in 15	0 30.508 [7] S	ubciause 4.1)							
Toot Fraguencies					NC				
(as specified in TS	36.508 [7] su	ubclause 4.3.1)	range		III. HIYII			
				For 3 MHz Cha	nnel Bandwidth: 285) or High ran	UL 843.5			
				10012(1002 - 200)	505) of high ran	ge			
				For 5 MHz Cha MHz (N ₁₁₁ = 269	nnel Bandwidth: 975) or High ran	: UL 842.5 de			
				For 10 MHz Ch	annel Bandwidt	h: UL 840			
				For 15 MH z ($N_{UL} = 269$	950) or High ran annel Bandwidtl	ge h: UL 837.5			
				$MHz(N_{UL} = 269)$	925) or High ran	ge			
Test Channel Ban (as specified in TS	dwidths 36 508 [7] s	ubclause 4.3.1							
	7	Fest Paramete	ers for Channel	Bandwidths	Z, 5 IVIHZ, 10 IVIH	1Z, 15 IVIHZ			
		Downlink C	onfiguration	Uplin	nk Configuratio	n			
Configuration	Ch BW	Mod'n	RB	Mod'n	RB	RBstart			
ID			allocation		allocation FDD	FDD			
1 (note 3)	14 MH 7			OPSK	4	0			
2 (note 3)	1.4 MH 7			160AM	6	0			
3 (note 3)	3 MHz	N/A for A-N	VPR testing.	QPSK	6	7			
4 (note 3)	3 MHz			QPSK	12	1			
5 (note 3)	3 MHz			16QAM	15	0			
6 (note 2)	3 MH z			QPSK	15	0			
7 (note 3)	5 MH z			QPSK	6	14			
8 (note 3)	5 MHz			QPSK	20	0			
9 (note 3)	5 MHz			16QAM	25	0			
10 (note 2)	5 MH z			QPSK	16	9			
11 (note 2)	5 MHz			QPSK	25	0			
12 (note 3)	10 MHz			QPSK	1	39			
13 (note 3)	10 MHz			QPSK	1	10			
14 (note 3)	10 MHz			QPSK	3	0			
15 (note 3)	10 MHz			QPSK	20	3			
16 (note 3)	10 MHz			QPSK	36	1			
17 (note 3)	10 MHz			QPSK	50	0			
18 (note 1, 3)	10 MHz			16QAM	50	0			
19 (note 2)	10 MHz			QPSK	20	25			
20 (note 2)	10 MHz			QPSK	45	0			
21 (note 3)	15 MHz			QPSK	18	36			
22 (note 3)	15 MHz			QPSK	25	1			
23 (note 3)	15 MHz			QPSK	54	0			
24 (note 1, 3)	15 MHz			16QAM	75	0			
25 (note 2)	15 MHz			QPSK	18	44			

Table 6.2.4.4.1-13: Test Configuration Table (network signalled value "NS_15")

26 (note 2)	15 MHz		QPSK	60	2
Note 1: Applies Note 2: Applica Note 3: Applica	only for UE- ble only test ble only to hi	Categories ≥2. requency < high range. gh range frequency testing.			

Initial Conditions								
Test Environme	nt							
(as specified in 15 36.508 [7] subclause 4.1)				NC				
Test Frequencie (as specified in	es TS36.508 [7] s	ubclause 4.3.1)	For 1.4 MHzC range	hannel Bandw	idth: Low			
			For 3 MH z Cha	annel Bandwid z (Nur= 27070	th: Low			
				For 5 MH z Cha range, 811 MH MH z (N _{UL} = 271	annel Bandwid z (N _{UL} = 27080 15)	th: Low)), 814.5		
				For 10 MHz Ch	annel Bandwi	dth: Low		
				range, 813.5 M MHz (N _{UL} = 271	1Hz (N _{∪L} = 2710 140)	05), 817		
Test Channel Ba (as specified in ⁻	andwidths TS 36.508 [7] s	subclause 4.3.1))	1.4 MHz, 3 MH	z, 5 MHz, 10 M	ИНz		
_	٦	Test Parameter	s for Channel	Bandwidths	· · ·			
		Downlink Co	onfiguration	Uplir	nk Configurati	on		
Configuration ID	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation FDD	RBstart FDD		
1	1.4 MHz	N/A for A-M	PR testing.	QPSK	1	0		
2	1.4 MHz			QPSK	6	0		
3	1.4 MHz			16QAM	6	0		
4	3 MHz			QPSK	1	0		
5	3 MHz			QPSK	12	1		
6	3 MHz	•		QPSK	15	0		
7	3 MHz			16QAM	15	0		
8	5 MHz			QPSK	1	0		
9	5 MHz			QPSK	12	2		
10	5 MHz			QPSK	18	2		
11	5 MHz			QPSK	20	0		
12	5 MHz			QPSK	20	2		
13	5 MHz			QPSK	25	0		
14	5 MHz			16QAM	25	0		
15	10 MHz			QPSK	1	0		
16 (Note 2)	10 MHz			QPSK	1	10		

Table 6.2.4.4.1-14: Test Configuration Table (network signalled value "NS_16")

17 (Note 2)	10 MHz		QPSK	20	0
18 (Note 2)	10 MHz		QPSK	27	15
19 (Note 2)	10 MHz		QPSK	32	15
20	10 MHz		QPSK	32	0
21	10 MHz		QPSK	50	0
22 (Note 1)	10 MHz		16QAM	50	0
23 (Note 3)	10 MHz		QPSK	40	0
24 (Note 3)	10 MHz		QPSK	40	1
Note 1: Applie Note 2: Applie Note 3: Applie	es only for UE es only for 10 I es only for 10 I	Categories ≥2. MHz channel for Low Range, a MHz channel for 817 MHz rang	nd 813.5 MHz e		

Table 6.2.4.4.1-15: Test	Configuration Ta	able (network signalled [,]	value "NS_17"	')
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Initial Conditions									
Test Environment (as specified in TS	536.508[7]sub	oclause 4.1)		Nomal					
Test Frequencies (as specified inTS	36.508 [7] sub	dause 4.3.1)		Low range					
Test Channel Bar (as specified in TS	ndwidths 5 36.508 [7] su	bclause 4.3.1)		5MHz, 10MHz					
	Te	st Parameters for	Channel Bandwie	dths					
		Downlink C	onfiguration	Uplink Co	nfiguration				
Configuration ID	Ch BW	Mod'n	RB allocation FDD	Mod'n	RB allocation FDD				
1	5MHz			QPSK	1				
2	5MHz			QPSK	8				
3	5MHz			QPSK	25				
4	5MHz	NI/A for A N	/DP tooting	16QAM	25 (Note 3)				
5	10MHz	N/A 101 A-1	WFR lesting	QPSK	1				
6	10MHz			QPSK	12				
7	10MHz			QPSK	50				
8	8 10MHz 50 (Note 3)								
Note 1: The 1 RB allocation shall be tested at both RB #0 and RB #max. Note 2: The RBstart of partial RB allocation shall be RB# 0 and RB# (max +1 - RB allocation) of the channel bandwidth. Note 3: Applies only for UE-Categories ≥2.									

Table 6.2.4.4.1-16: Test Configuration Table (network signalled value "NS_18")

Initial Conditions

Test Environment (as specified in TS	36.508[7]subc	Nomal						
Test Frequencies (as specified inTS3	36.508 [7] subd	Low range	Low range					
Test Channel Ban (as specified in TS	dwidths 36.508 [7] subo	clause 4.3.1)		5MHz, 10MHz, 1	15MHz, 20MHz			
Test Parameters for Channel Bandwidths								
		Downlink C	onfiguration	Uplink Co	nfiguration			
Configuration ID	Ch BW	Mod'n	RB allocation FDD	Mod'n	RB allocation FDD			
1	5MHz			QPSK	1			
2	5MHz			QPSK	8			
3	5MHz			QPSK	25			
4	5MHz			16QAM	25 (Note 3)			
5	10MHz			QPSK	1			
6	10MHz			QPSK	12			
7	10MHz			QPSK	50			
8	10MHz	N/A for A-	MPR testing	16QAM	50 (Note 3)			
9	15MHz			QPSK	1			
10	15MHz			QPSK	16			
11	15MHz			QPSK	75			
12	15MHz			16QAM	75 (Note 3)			
13	20MHz			QPSK	1			
14	20MHz			QPSK	18			
15	20MHz			QPSK	100			
16	20MHz			16QAM	100 (Note 3)			
Note 1: The 1 RB allocation shall be tested at both RB #0 and RB #max. Note 2: The RBstart of partial RB allocation shall be RB# 0 and RB# (max +1 - RB allocation) of the channel bandwidth. Note 3: Applies only for UE-Categories ≥2.								

Initial Conditions									
Test Enviror	nment (as spe	cified in TS 3	6.508 [7]						
	SUDCIAUS	e 4.1)			Nomal				
	Test Frequ	iencies		L	ow range, Mid range, High range				
(as specified in TS36.508 [7] subclause 4.3.1)			e 4.3.1)		For 5 MHz Channel Bandwidth a. 2002.5 MHz (N _{UL} = 25525) b. 2007.5 MHz (N _{UL} = 25575) c. 2012.5 MHz (N _{UL} = 25625) d. 2017.5 MHz (N _{UL} = 25675)				
					For 10 MHz Channel Bandwidth a. 2005 MHz (N _{UL} = 25550) b. 2015 MHz (N _{UL} = 25650)				
					For 15 MHz Channel Bandwidth a. 2012.5 MHz (N _{UL} = 25625)				
					For 20 MHz Channel Bandwidth a. 2010 MHz (N_{UL} = 25600)				
T (as specifie	est Channel E d in TS 36.508	3andwidths 8 [7] subclaus	se 4.3.1)		5MHz, 10MHz, 15MHz, 20MHz				
		Tes	t Parameters	for NS_20 A	-MPR				
		Downlink Configuration			Uplink Configuration				
Configuration ID	Ch BW	Mod'n	RB allocation FDD	Mod'n	RB allocation FDD				
1	5MHz	N/A for A-N	/IPR testing	QPSK	8				
2	5MHz			QPSK	15				
3	5MHz			QPSK	25				
4	5MHz			16QAM	15				
5	5MHz	•		16QAM	25				
6	10MHz			QPSK	8				
7	10MHz			QPSK	12				
8	10MHz			QPSK	50				
9	10MHz			16QAM	12				
10	10MHz			16QAM	50 (Nata 2)				
					(Note 3)				
11	15MHz			QPSK	6				
12	15MHz			QPSK	25				
13	15MHz			QPSK	36				
14	15MHz			QPSK	/5				
15	15MHz			16QAM	25				
16	15MHz			16QAM	36				
17	15MHz			16QAM	75				
18	20MHz			QPSK	8				
19	20MHz			QPSK	18				
20	20MHz			QPSK	25				

Table 6.2.4.4.1-17: Test Configuration Table (network signalled value "NS_20")

21	20MHz		QPSK	75
22	20MHz		QPSK	100
23	20MHz		16QAM	18
24	20MHz		16QAM	25
25	20MHz		16QAM	75
26	20MHz		16QAM	100
Note 1:	The Configuration Requirement in sul applicability of the I The RB _{start} of partia	ID will be used to map the bclause 6.2.4.5 as not all c UE. al RB allocation shall be RB	applicable Te ombinations a 3# 0 and RB#	st Configuration to the corresponding Test are necessarily required based on the (max +1 - RB allocation) of the channel
Note 3:	Applies only for UE	-Categories ≥2.		

Editor's note: The following lines belong at the end of section 6.2.4.4.1. As new tables are added to this section, these lines should always follow the tables.

- 1. Connect the SS to the UE antenna connectors as shown in Figure TS 36.508 [7] Annex A, Figure A.3.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] clause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channels are set according to the applicable table from Table 6.2.4.4.1-1 to Table 6.2.4.4.1-6.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.2.4.4.3.

6.2.4.4.2 Test procedure

- 1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to the applicable table from Table 6.2.4.4.1-1 to Table 6.2.4.4.1-17. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.
- 2. Send continuously uplink power control "up" commands in the uplink scheduling information to the UE until the UE transmits at P_{UMAX} level.
- 3. Measure the mean power of the UE in the channel bandwidth of the radio access mode. The period of measurement shall be at least the continuous duration one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.4.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6, with the following exceptions for each network signalled value.

6.2.4.4.3.1 Message contents exceptions (network signalled value "NS_03")

1. Information element additionalSpectrumEmission is set to NS_03. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.1-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_03"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1								
Information Element Value/remark Comment Condition								
additionalSpectrumEmission	3 (NS_03)							

6.2.4.4.3.2 Message contents exceptions (network signalled value "NS_04")

1. Information element additionalSpectrumEmission is set to NS_04. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.2-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_04"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1			
Information Element	Value/remark	Comment	Condition
additionalSpectrumEmission	4 (NS_04)		

6.2.4.4.3.3 Message contents exceptions (network signalled value "NS_05")

1. Information element additionalSpectrumEmission is set to NS_05. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.3-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_05"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1			
Information Element	Value/remark	Comment	Condition
additionalSpectrumEmission	5 (NS_05)		

6.2.4.4.3.4 Message contents exceptions (network signalled value "NS_06")

1. Information element additionalSpectrumEmission is set to NS_06. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.4-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_06"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1			
Information Element	Value/remark	Comment	Condition
additionalSpectrumEmission	6 (NS_06)		

6.2.4.4.3.5 Message contents exceptions (network signalled value "NS_07")

1. Information element additionalSpectrumEmission is set to NS_07. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.5-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_07"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1			
Information Element	Value/remark	Comment	Condition
additionalSpectrumEmission	7 (NS_07)		

6.2.4.4.3.6 Message contents exceptions (network signalled value "NS_08")

1. Information element additionalSpectrumEmission is set to NS_08. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.6-1: System Information Block Type2: Additional spurious emissions test requirement for "NS_08"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1			
Information Element	Value/remark	Comment	Condition
additionalSpectrumEmission	8 (NS_08)		

6.2.4.4.3.7 Message contents exceptions (network signalled value "NS_09")

1. Information element additionalSpectrumEmission is set to NS_09. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.7-1: System Information Block Type2: Additional spurious emissions test requirement for "NS_09"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1			
Information Element	Value/remark	Comment	Condition
additionalSpectrumEmission	9 (NS_09)		

6.2.4.4.3.8 Message contents exceptions (network signalled value "NS_10")

Void

6.2.4.4.3.9 Message contents exceptions (network signalled value "NS_11")

1. Information element additionalSpectrumEmission is set to NS_11. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.9-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_11"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1			
Information Element	Value/remark	Comment	Condition
additionalSpectrumEmission	11 (NS_11)		

6.2.4.4.3.10 Message contents exceptions (network signalled value "NS_12")

1. Information element additionalSpectrumEmission is set to NS_12. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.10-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_12"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1			
Information Element	Value/remark	Comment	Condition
additionalSpectrumEmission	12 (NS_12)		

6.2.4.4.3.11 Message contents exceptions (network signalled value "NS_13")

1. Information element additionalSpectrumEmission is set to NS_13. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.11-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_13"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1			
Information Element	Value/remark	Comment	Condition
additionalSpectrumEmission	13 (NS_13)		

6.2.4.4.3.12 Message contents exceptions (network signalled value "NS_14")

1. Information element additionalSpectrumEmission is set to NS_14. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.12-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_14"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1			
Information Element	Value/remark	Comment	Condition
additionalSpectrumEmission	14 (NS_14)		

6.2.4.4.3.13 Message contents exceptions (network signalled value "NS_15")

1. Information element additionalSpectrumEmission is set to NS_15. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.13-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_15"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1			
Information Element	Value/remark	Comment	Condition
additionalSpectrumEmission	15 (NS_15)		

6.2.4.4.3.14 Message contents exceptions (network signalled value "NS_16")

1. Information element additionalSpectrumEmission is set to NS_16. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.14-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_16"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1			
Information Element	Value/remark	Comment	Condition
additionalSpectrumEmission	16 (NS_16)		

6.2.4.4.3.15 Message contents exceptions (network signalled value "NS_17")

1. Information element additionalSpectrumEmission is set to NS_17. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.15-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_17"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1								
Information Element Value/remark Comment Condition								
additionalSpectrumEmission 17 (NS_17)								

6.2.4.4.3.16 Message contents exceptions (network signalled value "NS_18")

1. Information element additionalSpectrumEmission is set to NS_18. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4.4.3.16-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_18"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1								
Information Element Value/remark Comment Condition								
additionalSpectrumEmission 18 (NS_18)								

6.2.4.5 Test requirements

The maximum output power, derived in step 2 shall be within the range prescribed by the nominal maximum output power and tolerance in the applicable table from Table 6.2.4.5-1 to Table 6.2.4.5-16. The allowed A-MPR values specified in Table 6.2.4.3-1 are in addition to the allowed MPR requirements specified in clause 6.2.3. For the UE maximum output power modified by MPR and/or A-MPR, the power limits specified in Table 6.2.5.3-1 apply.

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	4,10,					23	+2.7 /
2	4,10,					23	+2.7 /
	23,35,36						-2.7
3	4,10, 23,35,36					23	+2.7 / -3.7
4	4,10, 23,35,36					23	+2.7 / -4.7
5	4,10, 23,35,36					23	+2.7 /
6	4,10,					23	+2.7 /
7	4,10,					23	+2.7 /
8	4,10, 23.35.36					23	+2.7 /
9	4,10, 23,35.36					23	+2.7 / -3.7
10	4,10, 23,35.36					23	+2.7 / -2.7
11	4,10, 23,35,36					23	+2.7 / -6.2
12	4,10, 23.35.36					23	+2.7 / -4.7
13	4,10, 23.35.36					23	+2.7 /
14	4,10, 23,35,36					23	+2.7 / -3.7
15	4,10, 23,35,36					23	+2.7 / -2.7
16	4,10, 23,35,36					23	+2.7 / -6.2
17	4,10, 23,35,36					23	+2.7 / -4.7
18	4,10,35,36					23	+2.7 / -4.7
19	4,10,35,36					23	+2.7 / -3.7
20	4,10,35,36					23	+2.7 / -2.7
21	4,10,35,36					23	+2.7 / -6.2
22	4,10,35,36					23	+2.7 / -4.7
23	4,10,35,36					23	+2.7 / -4.7
24	4,10,35,36					23	+2.7 / -3.7
25	4,10,35,36					23	+2.7 / -2.7
26	4,10,35,36					23	+2.7 / -6.2
27	4,10,35,36					23	+2.7 /

Table 6.2.4.5-1: UE Power Class test requirements (network signalled value "NS_03")(for Bands 4, 10, 23, 35, and 36)

Configuration	EUTRA	Test	Class	Tol.	Class	Tol.	Class	Tol.
U	band	Freq.	(dBm)	(ав)	∠ (dBm)	(ab)	dBm)	(aB)
1	2, 25	Mid					23	+2.7 / -3.7
1	2, 25	Low, High					23	+2.7 /
2	2, 25	Mid					23	+2.7 /
2	2, 25	Low, High					23	+2.7 /
3	2, 25	Mid					23	+2.7 /
3	2, 25	Low, High					23	+2.7 /
4	2, 25	Mid					23	+2.7 /
4	2, 25	Low, High					23	+2.7 / -7.7
5	2, 25	Mid					23	+2.7 / -2.7
5	2, 25	Low, High					23	+2.7 / -4.2
6	2, 25	Mid					23	+2.7 / -6.2
6	2, 25	Low, High					23	+2.7 / -9.2
7	2, 25	Mid					23	+2.7 / -3.7
7	2, 25	Low, High					23	+2.7 / -5.7
8	2, 25	All					23	+2.7 / -4.7
9	2, 25	Low @ RB#(max+1-RB allocation), Mid, High @ RB#0					23	+2.7 / -3.7
9	2, 25	Low @ RB#0, High @ RB#(max+1-RB allocation)					23	+2.7 / -5.7
10	2, 25	Low @ RB#(max+1-RB allocation), Mid, High @ RB#0					23	+2.7 / -2.7
10	2, 25	Low @ RB#0, High @ RB#(max+1-RB allocation)					23	+2.7 / -4.2
11	2, 25	All					23	+2.7 / -6.2
12	2, 25	Low @ RB#(max+1-RB allocation), Mid, High @ RB#0					23	+2.7 / -4.7
12	2, 25	Low @ RB#0, High @ RB#(max+1-RB allocation)					23	+2.7 / -7.7
13	2, 25	All					23	+2.7 / -4.7
14	2, 25	Low @ RB#(max+1-RB allocation), Mid, High @ RB#0					23	+2.7 / -3.7
14	2, 25	Low @ RB#0, High @ RB#(max+1-RB					23	+2.7 / -5.7

Table 6.2.4.5-2: UE Power Class test requirements (network signalled value "NS_03")(for Bands 2 and 25)

		allocation)					
15	2, 25	Low @ RB#(max+1-RB				23	+2.7 /
		allocation),					-2.7
15	2 25		<u> </u>			23	±27/
15	2,25	High $@$ RB#(max+1-RB				23	-4.2
		allocation)					7.2
16	2,25	All	1			23	+2.7 /
-	, -					-	-6.2
17	2, 25	Low @ RB#(max+1-RB				23	+2.7 /
		allocation),					-4.7
		Mid,					
		High @ RB#0					/
17	2, 25	Low @ RB#0,				23	+2.7/
		nigh @ RB#(max+1-RB					-7.7
18	2 25		<u> </u>			23	±27/
10	2,20	, 41				20	-4.7
19	2,25	Low @ RB#(max+1-RB	1			23	+2.7 /
		allocation),					-3.7
		Mid,					
		High @ RB#0					
19	2, 25	Low @ RB#0,				23	+2.7 /
		High @ RB#(max+1-RB					-5.7
20	2.25		1			22	127/
20	2,25	allocation)				23	-27
		Mid.					2.1
		High @ RB#0					
20	2, 25	Low @ RB#0,				23	+2.7 /
		High @ RB#(max+1-RB					-4.2
		allocation)					/
21	2,25	All				23	+2.7/
22	2 25	Low @ PB#(max+1-PB	<u> </u>			23	-0.2
22	2,25	allocation)				23	-47
		Mid.					
		High @ RB#0					
22	2, 25	Low @ RB#0,				23	+2.7 /
		High @ RB#(max+1-RB					-7.7
		allocation)					• = /
23	2, 25	All				23	+2.7 /
24	2.25	A11	<u> </u>			22	-4.7
24	2,25					23	-37
25	2.25	Low @ RB#(max+1-RB				23	+2.7/
	_,	allocation),					-2.7
		Mid,					
		High @ RB#0					
25	2, 25	Low @ RB#0,				23	+2.7 /
		High @ RB#(max+1-RB					-4.2
	2.05	allocation)	 			22	107/
26	2,25	All				23	+2.//
27	2 25	ΔΙΙ	<u> </u>			 23	+27/
	2,20	/ 11				20	-4.7

Tol. (dB)

ID	band	(MHz)	(dBm)	
1	41	5 MH z	23	+2.7 /
2	41	5 MHz	23	+2.7 /
_				-3.7
3	41	5 MHz	23	+2.7 /
4	41	5 MHz	23	-2.7
		0		-6.2
5	41	5 MH z	23	+2.7 /
6	4.4		22	-4.7
0	41		23	-6.2
7	41	10MHz	23	+2.7/
8	/1	101/147	23	-6.2
0	41		23	-8.2
9	41	10MHz	23	+2.7/
10				-9.7
10	41	TUMHZ	23	+2.7/ -3.7
11	41	10MHz	23	+2.7/
10		4.01.41.1		-4.7
12	41	10MHz	23	+2.7/
13	41	10MHz	23	+2.7/
				-6.2
14	41	10MHz	23	+2.7/
15	41	15MHz	23	+2.7/
				-6.2
16	41	15MHz	23	+2.7/
17	41	15MHz	23	+2.7/
				-8.2
18	41	15MHz	23	+2.7/
19	41	15MHz	23	-9.7
15			20	-3.7
20	41	15MHz	23	+2.7/
21	41	15MHz	23	-4.7
21			20	-6.2
22	41	15MHz	23	+2.7/
23	/1	15MHz	23	-8.2
23	41		23	-6.2
24	41	20MHz	23	+2.7/
25	44	001411-		-6.2
25	41	20MHZ	23	+2.7/ -6.2
26	41	20MHz	23	+2.7/
07		001411-		-8.2
27	41	20MHZ	23	+2.7/ -9.7
28	41	20MHz	23	+2.7/
00		001411		-3.7
29	41	20MHz	23	+2.7/ -4 7
30	41	20MHz	23	+2.7/
		0.01.11		-6.2
31	41	20MHz	23	+2.7/ -8.2
32	41	20MHz	23	+2.7/
	1		1 1	

Table 6.2.4.5-3: UE Power Class test requirements (network signalled value "NS_04")

Configuration EUTRA Bandwidth Class 3

		-6.2

Table 6.2.4.5-4: UE Power Class test requirements (network signalled value "NS_	05")
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Configuration	EUTRA	Class 1	Tol.	Class 2	Tol.	Class 3	Tol. (dB)
ID	band	(dBm)	(dB)	(dBm)	(dB)	(dBm)	
1	1					23	+2.7 /
							-2.7
2	1					23	+2.7 /
							-3.7
3	1					23	+2.7 /
							-2.7
4	1					23	+2.7 /
							-2.7
5	1					23	+2.7 /
							-3.7
6	1					23	+2.7 /
							-4.7
7	1					23	+2.7 /
							-6.2
8	1					23	+2.7 /
							-2.7
9	1					23	+2.7 /
							-2.7
10	1					23	+2.7/
							-3.7
11	1					23	+2.7 /
							-3.7
12	1					23	+2.7 /
							-4.7
13	1					23	+2.7 /
							-6.2
14	1					23	+2.7 /
							-2.7
15	1					23	+2.7 /
							-2.7
16	1					23	+2.7/
							-3.7
17	1					23	+2.7 /
							-3.7
18	1					23	+2.7 /
							-4.7
19	1					23	+2.7 /
							-6.2

Configuration	EUTRA	Class	Tol.	Class	Tol.	Class 3	Tol. (dB)
ID	band	1	(dB)	2	(dB)	(dBm)	
	40 4 4 4 7	(aBM)		(aBm)		00	.07/
1	13,14,17					23	+2.77
2	13.14.17					23	+2.7/
_	, ,						-2.7
3	13,14,17					23	+2.7 /
							-2.7
4	13,14,17					23	+2.7 /
	10 1 1 1 7						-3.7
5	13,14,17					23	+2.7/
6	13 14 17					23	-2.7
Ũ	10,11,17					20	-3.7
7	13,14,17					23	+2.7 /
							-3.7
8	13,14,17					23	+2.7 /
	40.44.47						-2.7
9	13,14,17					23	+2.7/
10	13 14 17					23	-3.7
10	10,11,17					20	-3.7
11	13,14,17					23	+2.7 /
							-2.7
12	13,14,17					23	+2.7 /
10	40.44.47						-3.7
13	13,14,17					23	+2.7/
14	13 14 17					23	+27/
	10,11,17					20	-2.7
15	13,14,17					23	+2.7 /
							-3.7
16	13,14,17					23	+2.7 /
47	40 4 4 4 7					00	-3.7
17	13,14,17					23	+2.1/
18	13 14 17					23	+27/
	,					20	-3.7

Table 6.2.4.5-5: UE Power Class test requirements (network signalled value "NS_06")(for Bands 13, 14, and 17)

Configuration	EUTRA	Test	Class	Tol.	Class	Tol.	Class	Tol.
ID	band	Freq.	1 (dBm)	(dB)	2 (dBm)	(dB)	3 (dBm)	(dB)
1	12	Mid					23	+2.7 / -3.7
1	12	Low, High					23	+2.7 /
2	12	Mid					23	+2.7 /
2	12	Low, High					23	+2.7 /
3	12	Mid					23	+2.7 /
3	12	Low, High					23	+2.7 /
4	12	Mid					23	+2.7 /
4	12	Low, High					23	+2.7 /
5	12	Mid					23	+2.7 /
5	12	Low, High					23	+2.7 /
6	12	Mid					23	+2.7 /
6	12	Low, High					23	+2.7 /
7	12	All					23	+2.7 /
8	12	Low @ RB#(max+1- RB allocation), Mid, High @ RB#0					23	+2.7 / -2.7
8	12	Low @ RB#0, High @ RB#(max+1- RB allocation)					23	+2.7 / -4.2
9	12	Low @ RB#(max+1- RB allocation), Mid, High @ RB#0					23	+2.7 / -3.7
9	12	Low @ RB#0, High @ RB#(max+1- RB allocation)					23	+2.7 / -5.7
10	12	All					23	+2.7 / -3.7
11	12	Low @ RB#(max+1- RB allocation), Mid, High @ RB#0					23	+2.7 / -2.7
11	12	Low @ RB#0, High @ RB#(max+1- RB allocation)					23	+2.7 / -4.2
12	12	Low @ RB#(max+1- RB allocation), Mid, High @ RB#0					23	+2.7 / -3.7
12	12	Low @ RB#0, High @ RB#(max+1- RB allocation)					23	+2.7 / -5.7

Table 6.2.4.5-6: UE Power Class test requirements (network signalled value "NS_06")(for Band 12)

Configuration	EUTRA	Class 1	Tol.	Class 2	Tol.	Class 3	Tol. (dB)
ĪD	band	(dBm)	(dB)	(dBm)	(dB)	(dBm)	
1	13					23	+2.7 /
							-18.7
2	13					23	+2.7 /
							-13.7
3	13					23	+2.7 /
							-2.7
4	13					23	+2.7 /
							-19.7
5	13					23	+2.7 /
							-18.7
6	13					23	+2.7 /
							-20.7
7	13					23	+2.7 /
							-3.7
8	13					23	+2.7 /
							-2.7
9	13					23	+2.7 /
							-4.7
10	13					23	+2.7 /
							-12.7
11	13					23	+2.7/
							-13.7
12	13					23	+2.7/
	10						-2.7
13	13					23	+2.7/
4.4	40					00	-6.2
14	13					23	+2.7 /
1 5	10					22	-19.7
15	13					23	+2.7 /
10	10						-18./
16	13					23	+2.7 /
							-20.7

Table 6.2.4.5-7: UE Power Class test requirements (network signalled value "NS_07")

Configuration	EUTRA	Class 1	Tol.	Class 2	Tol.	Class 3	Tol. (dB)
ID	band	(aBm)	(aB)	(aBm)	(aB)	(aBM)	
1	19					23	+2.7 /
							-2.7
2	19					23	+2.7 /
							-2.7
3	19					23	+2.7 /
							-3.7
4	19					23	+2.7 /
							-2.7
5	19					23	+2.7 /
							-2.7
6	19					23	+2.7 /
							-3.7
7	19					23	+2.7 /
							-8.2
8	19					23	+2.7 /
							-9.7
9	19					23	+2.7 /
							-2.7
10	19					23	+2.7 /
							-2.7
11	19					23	+2.7 /
							-3.7
12	19					23	+2.7 /
							-8.2
13	19					23	+2.7 /
							-9.7

Table 6.2.4.5-8: UE Power Class test requirements (network signalled value "NS_08")

Table 6.2.4.5-9: UE Power Class test requirements (network signalled value "NS	_09)")
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Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	21					23	+2.7 / -2.7
2	21					23	+2.7 / -2.7
3	21					23	+2.7 / -3.7
4	21					23	+2.7 / -2.7
5	21					23	+2.7 / -2.7
6	21					23	+2.7 / -3.7
7	21					23	+2.7 / -4.7
8	21					23	+2.7 / -6.2
9	21					23	+2.7 / -2.7
19	21					23	+2.7 / -2.7
11	21					23	+2.7 / -3.7
12	21					23	+2.7 / -4.7
13	21					23	+2.7 / -6.2
14	21					23	+2.7 / -8.2

Table 6.2.4.5-10: UE Power Class test requirements (network signalled value "NS_10")

Void, not tested

Configuration ID	EUTRA Band	Centre Frequenc y	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1a	23	2001.5 MHz						+ 2.7 / -11.7
1b	23	2004.5 MHz						+ 2.7 / -4.7
2a	23	2001.5 MHz						+ 2.7 / -11.7
2b	23	2004.5 MHz						+ 2.7 / -4.7
За	23	2001.5 MHz						+ 2.7 / -12.7
3b	23	2004.5 MHz						+ 2.7 / -6.2
4a	23	2001.5 MHz						+ 2.7 / -12.7
4b	23	2004.5 MHz						+ 2.7 / -6.2
5a	23	2002.5 MHz						+ 2.7 / -12.7
5b	23	2004.5 MHz						+ 2.7 / -8.2
5c	23	2007.5 MHz						+ 2.7 / -2.7
6a	23	2002.5 MHz						+ 2.7 / -12.7
6b	23	2004.5 MHz						+ 2.7 / -2.7
6c	23	2007.5 MHz						+ 2.7 / -3.7
7a	23	2002.5 MHz						+ 2.7 / -13.7
7b	23	2004.5 MHz						+ 2.7 / -9.7
7c	23	2007.5 MHz						+ 2.7 / -4.7
8a	23	2002.5 MHz						+ 2.7 / -13.7
8b	23	2004.5 MHz						+ 2.7 / -3.7
8c	23	2007.5 MHz						+ 2.7 / -4.7
9a	23	2002.5 MHz						+ 2.7 / -14.7
9b	23	2004.5 MHz						+ 2.7 / -11.7
9c	23	2007.5 MHz						+ 2.7 / -6.2
10a	23	2005 MHz						+ 2.7 / -17.7
10b	23	2005.5 MHz						+ 2.7 /

Table 6.2.4.5-11: UE Power Class test requirements (network signalled value "NS_11 for Band 23")

Configuration	EUTRA	Centre	Class	Tol.	Class 2	Tol.	Class	Tol. (dB)
	Danu	Hequency	(dBm)	(ub)	(ubiii)	(UD)	(dBm)	
								-17.7
10c	23	2015 MHz						+ 2.7 / -2.7
11a	23	2005 MHz						+ 2.7 /
11b	23	2005.5 MHz						+ 2.7 /
11c	23	2015 MHz						-17.7 + 2.7 /
12a	23	2005 MHz						-2.7 + 2.7 /
12b	23	2005.5 MHz						+ 2.7 /
12c	23	2015 MHz						-18.7 + 2.7 /
13a	23	2005 MHz						-3.7 + 2.7 /
101								-18.7
13b	23	2005.5 MHz						+ 2.7 / -18.7
13c	23	2015 MHz						+ 2.7 / -3.7
14a	23	2005 MHz						+ 2.7 / -20.7
14b	23	2005.5 MHz						+ 2.7 / -20.7
14c	23	2015 MHz						+ 2.7 / -4.7
15a	23	2007.5 MHz						+ 2.7 / -21.7
15b	23	2012.5 MHz						+ 2.7 / -16.7
16a	23	2007.5 MHz						+ 2.7 / -13.7
16b	23	2012.5 MHz						+ 2.7 / -13.2
17a	23	2007.5 MHz						+ 2.7 / -3.7
17b	23	2012.5 MHz						+ 2.7 / -3.7
18a	23	2007.5 MHz						+ 2.7 / -12.7
18b	23	2012.5 MHz						+ 2.7 / -12.7
19a	23	2007.5 MHz						+ 2.7 / -16.7
19b	23	2012.5 MHz						+ 2.7 / -8.7
20a	23	2007.5 MHz						+ 2.7 / -13.7
20b	23	2012.5 MHz						+ 2.7 / -13.2
21a	23	2007.5 MHz						+ 2.7 / -4.7
21b	23	2012.5 MHz						+ 2.7 / -3.7
22a	23	2007.5 MHz						+ 2.7 / -13.7
22b	23	2012.5 MHz						+ 2.7 / -13.7

Configuration ID	EUTRA Band	Centre Frequenc y	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
23a	23	2007.5 MHz						+ 2.7 / -17.7
23b	23	2012.5 MHz						+ 2.7 / -9.7
24	23	2010 MHz						+ 2.7 / -20.7
25	23	2010 MHz						+ 2.7 / -2.7
26	23	2010 MHz						+ 2.7 / -13.7
27	23	2010 MHz						+ 2.7 / -16.7
28	23	2010 MHz						+ 2.7 / -3.7
29	23	2010 MHz						+ 2.7 / -14.7
30	23	2010 MHz						+ 2.7 / -17.7

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Table 6.2.4.5-12: UE Power Class test requirements (network signalled value "NS_12")

Configuration	EUTRA	Class 1 (dBm)	Tol. (dB)	Class 2	Tol. (dB)	Class 3	Tol. (dB)
	banu	(ubiii)		(abiii)		(ubiii)	
1	26					23	+2.7 / -6.2
2	26					23	+2.7 / -12.7
3	26					23	+2.7 / -2.7
4	26					23	+2.7 / -6.2
5	26					23	+2.7 / -13.7
6	26					23	+2.7 / -8.2
7	26					23	+2.7 / -8.2
8	26					23	+2.7 / -2.7
9	26					23	+2.7 / -8.2
10	26					23	+2.7 / -9.7
11	26					23	+2.7 / -9.7
12	26					23	+2.7 / -8.2
13	26					23	+2.7 / -2.7
14	26					23	+2.7 / -8.2
15	26					23	+2.7 / -9.7

Table 6.2.4.5-13: UE Power Class test requirements (network signalled value "NS_13")

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	26					23	+2.7 / -6.2
2	26					23	+2.7 / -6.2
3	26					23	+2.7 / -3.7
4	26					23	+2.7 / -3.7
5	26					23	+2.7 / -8.2

Table 6.2.4.5-14: UE Power Class test requirements (network signalled value "NS_14")

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	26					23	+2.7 / -6.2
2	26					23	+2.7 / -3.7
3	26					23	+2.7 / -4.7
4	26					23	+2.7 / -3.7
5	26					23	+2.7 / -6.2
6	26					23	+2.7 / -6.2
7	26					23	+2.7 / -3.7
8	26					23	+2.7 / -4.7
9	26					23	+2.7 / -3.7
10	26					23	+2.7 / -6.2

Table 6.2.4.5-15: UE Power Class test requirements (network signalled value "NS_15")

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	26					23	+2.7 / -3.2
2	26					23	+2.7 / -8.2
3	26					23	+2.7 / -4.2
4	26					23	+2.7 / -8.2
5	26					23	+2.7 / -14.2
6	26					23	+2.7 / -4.2
7	26					23	+2.7 / -3.2
8	26					23	+2.7 / -9.2
9	26					23	+2.7 / -14.2
10	26					23	+2.7 / -4.2
11	26					23	+2.7 / -6.2
12	26					23	+2.7 / -12.2
13	26					23	+2.7 / -7.2
14	26					23	+2.7 / -3.2
15	26					23	+2.7 / -4.2
16	26					23	+2.7 / -8.2
17	26					23	+2.7 / -3.2
18	26					23	+2.7 / -12.2
19	26					23	+2.7 / -4.2
20	26					23	+2.7 / -8.2
21	26					23	+2.7 / -3.2
22	26					23	+2.7 / -4.2
23	26					23	+2.7 / -9.2
24	26					23	+2.7 / -14.2
25	26					23	+2.7 / -3.2
26	26					23	+2.7 / -9.2

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	27					23	+2.7/-2.7
2	27					23	+2.7/-3.7
3	27					23	+2.7-4.7
4	27					23	+2.7/-2.7
5	27					23	+2.7 / -4.7
6	27					23	+2.7 / -6.2
7	27					23	+2.7 / -8.2
8	27					23	+2.7 / -9.7
9	27					23	+2.7 / -4.7
10	27					23	+2.7 / -6.2
11	27					23	+2.7 / -11.7
12	27					23	+2.7 / -8.2
13	27					23	+2.7 / -11.7
14	27					23	+2.7 / -12.7
15	27					23	+2.7 / -9.7
16	27					23	+2.7/-2.7
17	27					23	+2.7 / -8.2
18	27					23	+2.7 / -4.7
19	27					23	+2.7 / -8.2
20	27					23	+2.7 / -13.7
21	27					23	+2.7 / -13.7
22	27					23	+2.7 / -14.7
23	27					23	+2.7 / -13.7
24	27					23	+2.7 / -13.7

Table 6.2.4.5-16A: UE Power Class test requirements (network signalled value "NS_16") when lower channel edge is at 807 MHz
Configuration	EUTRA	Class 1	Tol. (dB)	Class 2	Tol. (dB)	Class 3	Tol. (dB)
1	27	(ubiii)		(ubiii)		23	+2.7/-2.7
2	27					23	+2.7/-3.7
3	27					23	+2.7/-5.2
4	27					23	+2.7/-2.7
5	27					23	+2.7 / -3.7
6	27					23	+2.7 / -3.7
7	27					23	+2.7 / -4.7
8	27					23	+2.7 / -2.7
9	27					23	+2.7 / -3.7
10	27					23	+2.7 / -4.7
11	27					23	+2.7 / -6.2
12	27					23	+2.7 / -6.2
13	27					23	+2.7 / -8.2
14	27					23	+2.7 / -9.7
15	27					23	+2.7 / -9.7
16	27					23	+2.7/-2.7
17	27					23	+2.7 / -6.2
18	27					23	+2.7 / -4.7
19	27					23	+2.7 / -4.7
20	27					23	+2.7 / -9.7
21	27					23	+2.7 / -11.7
22	27					23	+2.7 / -12.7
23	27					23	+2.7 / -11.7
24	27					23	+2.7 / -11.7

Table 6.2.4.5-16B: UE Power Class test requirements (network signalled value "NS_16") when lowerchannel edge is at 808.5 MHz

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	27					23	+2.7/-2.7
2	27					23	+2.7/-3.7
3	27					23	+2.7/-4.7
4	27					23	+2.7/-2.7
5	27					23	+2.7 / -3.7
6	27					23	+2.7 / -3.7
7	27					23	+2.7 / -4.7
8	27					23	+2.7 / -2.7
9	27					23	+2.7 / -3.7
10	27					23	+2.7 / -3.7
11	27					23	+2.7 / -3.7
12	27					23	+2.7 / -3.7
13	27					23	+2.7 / -3.7
14	27					23	+2.7 / -4.7
15	27					23	+2.7 / -2.7
16						23	+2.7/-2.7
17	27					23	+2.7 / -3.7
18	27					23	+2.7 / -3.7
19	27					23	+2.7 / -3.7
20	27					23	+2.7 / -4.7
21	27				Ī	23	+2.7 / -8.2
22	27					23	+2.7 / -9.7
23	27					23	+2.7 / -6.2
24	27				Ì	23	+2.7 / -4.7

Table 6.2.4.5-16C: UE Power Class test requirements (network signalled value "NS_16") when lower channel edge is at 812 MHz

Table 6.2.4.5-17: UE Power Class test requirements (network signalled value "NS_17")

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	28					23	+2.7 / -3.2
2	28					23	+2.7 / -3.2
3	28					23	+2.7 / -4.2
4	28					23	+2.7 / -5.2
5	28					23	+2.7 / -3.2
6	28					23	+2.7 / -3.2
7	28					23	+2.7 / -4.2
8	28					23	+2.7 / -5.2

Table 6.2.4.5-18: UE Power C	Class test requirements (network	signalled value "N	NS_18")
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Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
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1	28			23	+2.7 / -3.2
2	28			23	+2.7 / -4.2
3	28			23	+2.7 / -5.2
4	28			23	+2.7 / -6.2
5	28			23	+2.7 / -7.2
6	28			23	+2.7 / -7.2
7	28			23	+ 2.7 / -8.7
8	28			23	+2.7 / -9.2
9	28			23	+2.7 / -7.2
10	28			23	+2.7 / -7.2
11	28			23	+2.7 / -8.7
12	28			23	+2.7 / -9.2
13	28			23	+2.7 / -7.2
14	28			23	+2.7 / -7.2
15	28			23	+2.7 / -8.7
16	28			23	+2.7 / -9.2

Configuration ID	EUTRA Band	Centre Frequenc y	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1a	23	2002.5 MHz						+ 2.7 / -22.7
1b	23	2007.5 MHz						+ 2.7 / -2.7
1c	23	2012.5 MHz						+ 2.7 / -2.7
1d	23	2017.5 MHz						+ 2.7 / -2.7
2a	23	2002.5 MHz						+ 2.7 / -23.7
2b	23	2007.5 MHz						+ 2.7 / -7.7
2c	23	2012.5 MHz						+ 2.7 / -7.7
2d	23	2017.5 MHz						+ 2.7 / -3.7
3a	23	2002.5 MHz						+ 2.7 / -23.7
3b	23	2007.5 MHz						+ 2.7 / -11.7
3c	23	2012.5 MHz						+ 2.7 / -11.7
3d	23	2017.5 MHz						+ 2.7 / -3.7
4a	23	2002.5 MHz						+ 2.7 / -23.7
4b	23	2007.5 MHz						+ 2.7 / -7.7
4c	23	2012.5 MHz						+ 2.7 / -7.7
4d	23	2017.5 MHz						+ 2.7 / -3.7
5a	23	2002.5 MHz						+ 2.7 / -23.7
5b	23	2007.5 MHz						+ 2.7 / -11.7
5c	23	2012.5 MHz						+ 2.7 / -11.7
5d	23	2017.5 MHz						+ 2.7 / -3.7
6a	23	2005 MHz						+ 2.7 / -21.7
6b	23	2015 MHz						+ 2.7 / -2.7
7a	23	2005 MHz						+ 2.7 / -7.7
7b	23	2015 MHz						+ 2.7 / -2.7

Table 6.2.4.5-17: UE Power Class test requirements (network signalled value "NS_20 for Band 23")

Configuration	EUTRA Band	Centre Frequency	Class	Tol.	Class 2 (dBm)	Tol. (dB)	Class	Tol. (dB)
	Dand	riequency	(dBm)	(ub)	(abiii)	(ab)	(dBm)	
8a	23	2005 MHz						+ 2.7 /
8b	23	2015 MHz						+ 2.7 /
0.0	22	2005 MH-						-8.7
98	23	2005 MHZ						+ 2.77
9b	23	2015 MHz						+ 2.7 /
10a	23	2005 MHz						+ 2.7 /
10b	23							+ 2.7 /
	_	2005 MHz						-8.7
11	23	2012.5 MHz						+ 2.7 / -11.7
12	23	2012.5 MHz						+ 2.7 /
13	23	2012.5 MHz						+ 2.7 /
								-11.7
14	23	2012.5 MHz						+ 2.7 / -17.7
15	23	2012.5 MHz						+ 2.7 / -8.7
16	23	2012.5 MHz						+ 2.7 / -12 7
17	23	2012.5 MHz						+ 2.7 /
18	23	2010 MHz						+ 2.7 /
19	23	2010 MHz						-22.7 + 2.7 /
								-14.7
20	23	2010 MHz						+ 2.7 / -13.7
21	23	2010 MHz						+ 2.7 / -8.7
22	23	2010 MHz						+ 2.7 / -11.7
23	23	2010 MHz						+ 2.7 /
24	23	2010 MHz						+ 2.7 /
25	23	2010 MHz						+ 2.7 /
	22	2010 MUL-						-19.7
20	23							+ 2.77

6.2.4_1 Additional Maximum Power Reduction (A-MPR) for HPUE

6.2.4_1.1 Test purpose

Same test purpose as in clause 6.2.4.1 with the follow exception:

- Instead of Table 6.2.2.3-1 → use Table 6.2.2_1.3-1

6.2.4_1.2 Test applicability

The requirements of this test apply in test case 6.6.2.2 Additional Spectrum Emission Mask for network signalled values NS_06, to all types of E-UTRA Power Class 1 UE release 11 and forward.

6.2.4_1.3 Minimum conformance requirements

For UE Power Class 1 the specific requirements and identified sub-clauses are specified in Table 6.2.4.3-1 along with the allowed A-MPR values that may be used to meet these requirements. The allowed A-MPR values specified in Table 6.2.4.3-1 are in addition to the allowed MPR requirements specified in clause 6.2.3_1. For the UE maximum output power modified by A-MPR, the power limits specified in clause 6.2.5_1 apply.

The normative reference for this requirement is TS 36.101 clause 6.2.4.

6.2.4_1.4 Test description

Same test description as in clause 6.2.4.4 with the following exceptions:

- Instead of Table 6.2.4.4.1-4 → use Table 6.2.4_1.4.1-1

Table 6.2.4_1.4.1-1: Test Configuration Table (network signalled value "NS_06")

			Initial C	onditions		
TestEnvironment					Normal	
(as speci	fied in	TS 36.508	[7] subclause 4	1.1)	Nomai	
Test Free	luencie	S			Low range	e, Mid range,
(as speci	fied in	TS36.508 [7] subclause 4	.3.1)	High rang	je
Test Cha	nnel Ba	andwidths			Lowest, 5	MHz, 10MHz,
(as speci	fied in	TS 36.508	[7] subclause 4	1.3.1)	Highest	
		Те	st Parameters	for NS_06 A-MF	PR	
			Downlink C	Configuration	Uplink C	Configuration
Configura	ation	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation
ID				FDD		FDD
1		5MHz	N/A for A-	MPR testing	QPSK	25
2		5MHz			QPSK	8
3		5MHz			16QAM	8
4		10MHz			QPSK	50
5		10MHz			QPSK	12
6		10MHz			16QAM	12
Note 1:	Test	Channel Ba	andwidths are o	checked separate	ly for each	E-UTRA band,
	the a	pplicable cl	hannel bandwi	dths are specified	l in Table 5	.4.2.1-1.
Note 2:	The C	Configuratio	on ID will be us	ed to map the ap	plicable Te	st
	Confi	guration to	the correspon	ding Test Require	ementinsu	bclause 6.2.4.5
	as not all combinations are necessarily required based on the applicability					
	of the UE.					
Note 3:	The F	RB _{start} of pa	rtial RB allocat	ion shall be RB#	0 and RB#	(max +1 - RB
	alloca	ation) of the	e channel band	width.		

6.2.4_1.5 Test requirements

The maximum output power, derived in step 2 of clause $6.2.4_{-}1.4.2$ shall be within the range prescribed by the nominal maximum output power and tolerance in Table $6.2.4_{-}1.5-1$. The allowed A-MPR values specified in Table 6.2.4.3-1 are in addition to the allowed MPR requirements specified in clause $6.2.3_{-}1$. For the UE maximum output power modified by MPR and/or A-MPR, the power limits specified in Table $6.2.5_{-}1.3-1$ apply.

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)
1	14	31	+2.7 / -4.7
2	14	31	+2.7 / -3.7
3	14	31	+2.7 / -4.7
4	14	31	+2.7 / -4.7
5	14	31	+2.7 / -3.7
6	14	31	+2.7 / -4.7

Table 6.2.4_1.5-1: HPUE Power Class test requirements (network signalled value "NS_06")

6.2.4A Additional Maximum Power Reduction (A-MPR) for CA

6.2.4A.1 Additional Maximum Power Reduction (A-MPR) for CA (intra-band contiguous DL CA and UL CA)

Editor's notes: The following items are missing or incomplete:

- For CA_NS_02 and CA_NS_03 and CA_NS_06 the UL multicluster allocation A-MPR requirements are TBD

6.2.4A.1.1 Test purpose

Additional ACLR, spectrum emission and spurious emission requirements for carrier aggregation can be signalled by the network to indicate that the UE shall also meet additional requirements in a specific deployment scenario. To meet these additional requirements, Additional Maximum Power Reduction (A-MPR) is allowed for the CA Power Class as specified in Table 6.2.2A-1.

6.2.4A.1.2 Test applicability

The requirements of this test apply in test case 6.6.2.2A.1 Additional Spectrum Emission Mask for CA (intra-band contiguous DL CA and UL CA) for network signalled value NS_04 to all types of E-UTRA UE release 8 and forward.

The requirements of this test apply in test case 6.6.3.3A.1 Additional spurious emissions for CA (intra-band contiguous DL CA and UL CA) for network signalled values CA_NS_01, CA_NS_02 and CA_NS_03, CA_NS_05, CA_NS_06 to all types of E-UTRA UE release 10 and forward that support intra-band contiguous DL CA and UL CA.

6.2.4A.1.3 Minimum conformance requirements

If the UE is configured for carrier aggregation and receives CA_NS value indicated by IE additionalSpectrumEmissionSCell-r10, the allowed maximum output power reduction is specified in Table 6.2.4A.1.3-1 and clause 6.2.3A.1 does not apply, i.e. carrier aggregation MPR = 0.

CA Network Signalling value	Requirements	Uplink CA Configuration	A-MPR [dB]
	(clause)		(subclause)
CA_NS_01	6.6.3.3A.1.3.1	CA_1C	6.2.4A.1.3.1
CA_NS_02	6.6.3.3A.1.3.2	CA_1C	6.2.4A.1.3.2
CA_NS_03	6.6.3.3A.1.3.3	CA_1C	6.2.4A.1.3.3
CA_NS_04	6.6.2.2A.1.3.1	CA_41C	6.2.4A.1.3.4
CA_NS_05	6.6.3.3A.1.3.4	CA_38C	6.2.4A.1.3.5
CA_NS_06	6.6.3.3A.1.3.5	CA_7C	6.2.4A.1.3.6

Table 6.2.4A.1.3-1: Additional Maximum Power Reduction (A-MPR) for CA

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For intra-band contiguous carrier aggregation if the UE is configured for CA and it receives CA_NS value indicated by IE *additionalSpectrumEmissionSCell-r10* and if UE has configured the transmitter for transmissions within the aggregated channel bandwidth the requirements for applicable CA_NS value indicated by IE *additionalSpectrumEmissionSCell-r10* according to Table 6.2.4A.1.3-1 apply. If UE has configured the transmitter for transmister for transmissions within E-UTRA channel bandwidths the requirements for NS value indicated in the PCC IE *additionalSpectrumEmission* according to subclause 6.2.4 apply. For the UE maximum output power modified by A-MPR specified in table 6.2.4A.1.3-1, the power limits specified in subclause 6.2.5A.1 apply.

6.2.4A.1.3.1 A-MPR for CA_NS_01 for CA_1C

If the UE is configured to CA_1C and it receives IE CA_NS_01 the allowed maximum output power reduction applied to transmissions on the PCC and the SCC for contiguously aggregated signals is specified in table 6.2.4A.1.3.1-1.

CA_1C: CA_NS_01	RB _{start}	L _{CRB} [RBs]	RB _{start} + L _{CRB} [RBs]	A-MPR for QPSK and 16-QAM [dB]			
	0 – 23 and 176 - 199	> 0	N/A	≤ 12.0			
100 RB / 100 RB	24 – 105	> 64	N/A	≤ 6.0			
	106 – 175	N/A	> 175	≤ 5.0			
	0 - 6 and $1/3 - 1/9$	$0 < L_{CRB} \le 10$	N/A	≤ 11.0			
75 DD / 75 DD	0 – 0 and 145 – 145	> 10	N/A				
73 KD / 73 KD	7 – 90	> 44	N/A	≤ 5.0			
	91 – 142	N/A	> 142	≤ 2.0			
NOTE 1: RB_start indicates the lowest RB index of transmitted resource blocks NOTE 2: L_CRB is the length of a contiguous resource block allocation NOTE 3: For intra-subframe frequency hopping which intersects regions notes 1 and 2 apply on a per slot basis							

NOTE 4: For intra-subframe frequency hopping which intersects regions, the larger A-MPR value may be applied for both slots

If the UE is configured to CA_1C and it receives IE CA_NS_01 the allowed maximum output power reduction applied to transmissions on the PCell and the SCell due to multi-cluster transmission is defined as follows

A-MPR = CEIL
$$\{M_{A}, 0.5\}$$

Where M_A is defined as follows:

in the subframe

$M_A = -22.5 A + 17$; $0 \le A < 0.20$
-11.0 A + 14.7	; $0.20 \le A < 0.70$
-1.7 A + 8.2	; $0.70 \le A \le 1$

Where $A = N_{RB_alloc} / N_{RB_agg}$

The normative reference for requirement is in TS 36.101 [2] clause 6.2.4A

6.2.4A.1.3.2 A-MPR for CA_NS_02 for CA_1C

If the UE is configured to CA_1C and it receives IE CA_NS_02 the allowed maximum output power reduction applied to transmission on the PCC and the SCC for contiguously aggregated signals is specified in Table 6.2.4A.1.3.2-1.

CA_1C: CA_NS_02	RB _{end}	L _{CRB} [RBS]	A-MPR for QPSK and 16 -QAM [dB]
	0 –20	> 0	≤ 4 dB
	21 – 46	> 0	≤ 3 dB
100 RB / 100 RB	47 – 99	$> RB_{end} - 20$	≤ 3 dB
	100 – 184	> 75	≤ 6 dB
	185 – 199	> 0	≤ 10 dB
	0 - 48	> 0	≤ 2 dB
	49 – 80	$> RB_{end} - 20$	≤ 3 dB
75 RB / 75 RB	81 – 129	> 60	≤ 5 dB
	130 – 149	> 85	≤ 6 dB
	130 – 149	1 – 84	≤ 2 dB

Table 6.2.4A.1.3.2-1: Contiguous allocation A-MPR for CA_NS_02

If the UE is configured to CA_1C and it receives IE CA_NS_02 the allowed maximum output power reduction applied to transmissions on the PCell and the SCell due to multi-cluster transmission is defined as follows:

A-MPR = CEIL $\{M_{A_1}, 0.5\}$

Where MA is defined as follows

$$\begin{split} [M_A = -22.5 \ A + 17 & ; \ 0 \leq A < 0.20 \\ -11.0 \ A + 14.7 & ; \ 0.20 & \leq A < 0.70 \\ -1.7 \ A + 8.2 & ; \ 0.70 & \leq A \leq 1] \end{split}$$

Where $A = N_{RB_alloc} / N_{RB_agg.}$

6.2.4A.1.3.3 A-MPR for CA_NS_03 for CA_1C

If the UE is configured to CA_1C and it receives IE CA_NS_03 the allowed maximum output power reduction applied to transmission on the PCC and the SCC for contiguously aggregated signals is specified in Table 6.2.4A.1.3.3-1.

Table 6.2.4A.1.3.3-1: Contiguous allocation A-MPR for CA_NS_03

CA_1C: CA_NS_03	RB _{end}	L _{CRB} [RBs]	A-MPR for QPSK and 16-QAM [dB]
	0 – 26	> 0	≤ 10 dB
	27 – 63	$\geq RB_{end} - 27$	≤ 6 dB
100 PB / 100 PB	27 – 63	< RB _{end} - 27	≤ 1 dB
	64 – 100	> RB _{end} - 20	≤ 4 dB
	101 – 171	> 68	≤ 7 dB
	172 – 199	> 0	≤ 10 dB
	0 – 20	> 0	≤ 10 dB
	21 – 45	> 0	≤ 4 dB
75 PR / 75 PR	46 – 75	> RB _{end} - 13	≤ 2 dB
73 10 / 73 10	76 – 95	> 45	≤ 5 dB
	96 – 149	> 43	≤ 8 dB
	120 – 149	1 – 43	≤ 6 dB

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If the UE is configured to CA_1C and it receives IE CA_NS_03 the allowed maximum output power reduction applied to transmissions on the PCell and the SCell due to multi-cluster transmission is defined as follows:

$$A-MPR = CEIL \{M_{A}, 0.5\}$$

Where MA is defined as follows

$$[M_A = -23.33A + 17.5 \qquad ; \ 0 \leq A < 0.15 \\ -7.65A + 15.15 \qquad ; \ 0.15 \quad \leq A \leq 1]$$

Where $A = N_{RB_alloc} / N_{RB_agg.}$

6.2.4A.1.3.4 A-MPR for CA_NS_04 for CA_41C

If the UE is configured to CA_41C and it receives IE CA_NS_04 the allowed maximum output power reduction applied to transmission on the PCC and the SCC for contiguously aggregated signals is specified in Table 6.2.4A.1.3.4-1.

Table 6.2.4A.1.3.4-1:	Contiguous	Allocation	A-MPR for	CA NS	04

CA Bandwidth	RB _{Start}	LCRB	RB _{start} + L _{CRB}	A-MPR for	A-MPR for			
Class C		[RBs]	[RBs]	QPSK [dB]	16QAM [dB]			
50RB / 100 RB	0 – 44 and 105 – 149	>0	N/A	≤4dB	≤4dB			
	45 – 104	N/A	>105	≤3dB	≤4dB			
75 RB / 75 RB	0 – 44 and 105 – 149	>0	N/A	≤4dB	≤4dB			
	45 – 104	N/A	>105	≤4dB	≤4dB			
100 RB / 75 RB	0 – 49 and 125 – 174	>0	N/A	≤4dB	≤4dB			
	50 - 124	N/A	>125	≤3dB	≤4dB			
100 RB / 100 RB	0 – 59 and 140 – 199	>0	N/A	≤3dB	≤4dB			
	60– 139	N/A	>140	≤3dB	≤4dB			
NOTE 1: RB _{start} inc	licates the lowest RB index of tran	smitted res	ource blocks					
NOTE 2: L _{CRB} is th	e length of a contiguous resource	block alloc	ation					
NOTE 3: For intra-	NOTE 3: For intra-subframe frequency hopping which intersects regions, notes 1 and 2 apply on a per slot basis							
NOTE 4: For intra-	NOTE 4: For intra-subframe frequency hopping which intersects regions, the larger A-MPR value may be applied							
for both s	lots in the subframe							

If the UE is configured to CA_41C and it receives IE CA_NS_04 the allowed maximum output power reduction applied to transmissions on the PCell and the SCell due to multi-cluster transmission is defined as follows

A-MPR = CEIL
$$\{M_{A}, 0.5\}$$

Where MA is defined as follows

M _A	= 10.5,	$0 \le A < 0.05$
	=-50.0A + 13.00,	$0.05 {\leq} A {<} 0.15$
	=-4.0A + 6.10,	$0.15 \le A \le 0.40$
	= -0.83A + 4.83,	$0.40 \leq A \leq 1$

Where $A = N_{RB_alloc} / N_{RB_agg}$.

6.2.4A.1.3.5 A-MPR for CA_NS_05 for CA_38C

If the UE is configured to CA_38C and it receives IE CA_NS_05 the allowed maximum output power reduction applied to transmission on the PCC and the SCC for contiguously aggregated signals is specified in Table 6.2.4A. 1.3.5-1.

CA_38C	RB_{end}	L _{CRB} [RBs]	A-MPR for QPSK and 16-QAM [dB]				
	0 – 12	>0	≤ 5 dB				
	13 – 79	> RB _{end} – 13	≤ 2 dB				
TUURB/TUURB	80 – 180	>60	≤ 6 dB				
	181 – 199	> 0	≤ 11 dB				
	0 - 70	> max(0, RB _{end} -10)	≤ 2 dB				
	71-108	> 60	≤ 5 dB				
75RB/75RB	109 – 140	>0	≤ 5 dB				
	140 – 149	≤ 70	≤ 2 dB				
	140 – 149	>70	≤ 6 dB				
 NOTE 1: RB_{end} indicates the highest RB index of transmitted resource blocks NOTE 2: L_{CRB} is the length of a contiguous resource block allocation NOTE 3: For intra-subframe frequency hopping which intersects regions, notes 1 and 2 apply on a per slot basis 							
MPR va	NOTE 4: For intra-subframe frequency hopping which intersects regions, the larger A- MPR value may be applied for both slots in the subframe						

Table 6.2.4A.1.3.5-1: Contiguous Allocation A-MPR for (CA_N	IS_(05
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If the UE is configured to CA_38C and it receives IE CA_NS_05 the allowed maximum output power reduction applied to transmissions on the PCell and the SCell due to multi-cluster transmission is defined as follows

$$A-MPR = CEIL \{M_{A}, 0.5\}$$

Where MA is defined as follows

$$\begin{split} M_A = -14.17 \ A \ + \ 16.50 \qquad ; \ 0 \leq A < 0.60 \\ -2.50 \ A \ + \ 9.50 \qquad ; \ 0.60 \leq A \leq 1 \end{split}$$

Where $A = N_{RB_alloc} / N_{RB_agg.}$

6.2.4A.1.3.6 A-MPR for CA_NS_06 for CA_7C

If the UE is configured to CA_7C and it receives IE CA_NS_06 the allowed maximum output power reduction applied to transmission on the PCC and the SCC for contiguously aggregated signals is specified in Table 6.2.4A. 1.3.6-1.

Table 6.2.4A.1.3.6-1: Contiguous Allocation A-MPR for CA_NS_06

CA Bandwidth Class C	RB_end	L _{CRB} [RBs]	A-MPR for QPSK and 16-QAM [dB]
	[0 –22]	>[0]	≤ [4] dB
	[23 – 33]	> [RB _{end} – 10]	≤ [2] dB
100RB/100RB	[106 – 142]	> [75]	≤ [3] dB
	[143 – 178]	>[70]	≤ [5] dB
	[179 – 199]	> [0]	≤ [10] dB
	[0 – 7]	>[0]	≤ [5] dB
	[20- 75]	> [RB _{end} – 10]	≤ [2] dB
75RB/75RB	[75 – 110]	>[64]	≤ [2] dB
	[110 – 144]	>[35]	≤ [6] dB
	[145 – 149]	>[0]	≤ [10] dB

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If the UE is configured to CA_7C and it receives IE CA_NS_06 the allowed maximum output power reduction applied to transmissions on the PCell and the SCell due to multi-cluster transmission is defined as follows:

A-MPR = CEIL
$$\{M_{A}, 0.5\}$$

Where MA is defined as follows

$$M_A = [-23.33A + 17.5; \ 0 \le A < 0.15]$$

$$-7.65A + 15.15; 0.15 \le A \le 1$$

Where $A = N_{RB_alloc} / N_{RB_agg.}$

6.2.4A.1.4 Test description

6.2.4A.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and CC combinations based on E-UTRA CA configurations specified in table 5.4.2A.1-1. All of these configurations shall be tested with applicable test parameters for each CA Configuration, and are shown in table 6.2.4A.1.4.1-1 to 6.2.4A.1.4.1-5. The details of the uplink reference measurement channels (RMCs) are specified in Annexe A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Table 6.2.4A.1.4.1-1: Test Configuration Table (network signalled value "CA_NS_01")

Initial Conditions									
Test	Environm	nent as spe	ecified in		NC				
TS 3	6.508[7]	subclause	4.1						
Test	Frequen	cies as spe	ecified in		C: L0	ow and High r	ange		
TS36	6.508 [7] s	subclause	4.3.1 for different CA	bandwidth	1				
class	es.								
Test	CC Com	bination se	etting (N _{RB_agg}) as spe	cified in	As ir	n Table 6.2.4A	.1.3.1-1		
subc	lause 5.4	.2A.1 for th	ne CAConfiguration a	across					
band	bandwidth combination sets supported by the UE.								
Test Parameters for CA Configurations									
ID CA DL Allocation CC UL Allocation									
	Config	uration /	(PDCCH on PCC)	MOD					
	NR	B_agg							
	PCC	SCCs	PCC & SCC RB		N _{RB_allo}	F	CC & SCC R	Ballocation	\$
	NRB	N _{RB}	allocation	0.501/	С	5 1 0 0	(L _{CRB} @	RB _{start})	
1	75	75		QPSK	1	P_1@0	S_0@0		
2	75	75		QPSK	150	P_75@0	S_75@0		
3	75	75		QPSK	45	P_45@7	S_0@0		
4	75	75		QPSK	8	P_0@0	S_8@67		
5	75	75		QPSK	128	P_75@0	S_53@0		
6	75	75		QPSK	2	P_1@0	S_1@74		
7	75	75		QPSK	30	P_10@0	P_5@50	S_5@25	S_10@65
8	75	75	Ν/Δ	QPSK	105	P_35@0	P_20@55	S_15@0	S_35@40
9	100	100	1 1/7 1	QPSK	200	P_100@0	S_100@0		
10	100	100		QPSK	1	P_1@0	S_0@0		
11	100	100		QPSK	175	P_75@25	S_100@0		
12	100	100		QPSK	25	P_0@0	S_25@75		
13	100	100		QPSK	64	P_64@24	S_0@0		
14	100	100		QPSK	2	P_1@0	S_1@99		
15	100	100	1	QPSK	40	P_10@0	P_10@65	S_10@35	S_10@90
16	100	100		QPSK	150	P_40@0	P_35@65	S_35@0	S_40@60
Note	1: CA	Configura	tion Test CC Combin	ation settir	igs are che	cked separate	ly for each C/	A Configuration	on which
	app	olicable ag	gregated channel bar	ndwidths a	re specified	l in Table 5.4.2	2A.1-1	-	

Initial Conditions									
Test	Environm	nent as spe	ecified in		NC				
TS 3	6.508[7]	subclause	4.1						
Test	Test Frequencies as specified in					ow and High r	ange		
TS36	TS36.508 [7] subclause 4.3.1 for different CA bandwidth								
class	es.								
Test	CC Com	bination se	etting (N _{RB_agg}) as spe	cified in	As ir	n Table 6.2.4A	.1.3.2-1		
subc	lause 5.4	.2A.1 for th	e CAConfiguration a	across					
band	bandwidth combination sets supported by the UE.								
	Test Parameters for CA Configurations								
ID CA DL Allocation CC UL A					UL Allocatio	on 🛛			
	Config	uration /	(PDCCH on PCC)	MOD					
	N _R	B_agg				-			
	PCC	SCCs	PCC & SCC RB		N _{RB_allo} PCC & SCC RB allocations			5	
4	NRB	NRB	allocation	0001/	C	D 4@0	<u>(Lcrb @</u>	RB _{start})	<u></u>
1	75	75		QPSK	1	P_1@0	S_0@0		
2	75	75		QPSK	/5	P_75@0	<u>S_0@0</u>		
3	75	75		QPSK	128	P_75@0	S_53@0		
4	75	75		QPSK	128	P_53@22	S_75@0		
5	75	75		QPSK	1	P_0@0	S_1@74		
6	75	75		QPSK	1	P_0@0	S_1@54		
7	75	75		QPSK	TBD	TBD	TBD		
8	75	75	N/A	QPSK	IBD	IBD	IBD		
9	100	100		QPSK	1	P_1@0	S_0@0		
10	100	100		QPSK	1	P_1@21	S_0@0		
11	100	100		QPSK	90	P_90@0	S_0@0		
12	100	100		QPSK	180	P_100@0	S_80@0		
13	100	100		QPSK	1	P_0@0	S_1@99		
14	100	100		QPSK	1	P_0@0	S_1@83		
15	100	100		QPSK	TBD	TBD	TBD		
16	100	100		QPSK TBD TBD TBD					
Note	1: CA	Configura	tion Test CC Combination	ation settir	ngs are che	cked separate	ely for each C	A Configuration	on which
	applicable aggregated channel bandwidths are specified in Table 5.4.2A.1-1								

Table 6.2.4A.1.4.1-2: Test Configuration Table (network signalled value "CA_NS_02")

Table 6.2.4A.1.4.1-3: Test Configuration Table (network signalled value "CA_NS_03")

				Initia	Condition	าร			
Test	Environm	nent as spe	ecified in		NC				
TS 36	6.508[7]	subclause	4.1						
Test Frequencies as specified in				C: Lo	C: Low and High range				
TS36.508 [7] subclause 4.3.1 for different CA bandwid			bandwidth						
classes.									
lest	CC Com	bination se	tting (N _{RB_agg}) as spe	cified in	As in	1 able 6.2.4A	4.1.3.3-1		
SUDC	ause 5.4	.2A.1 for th	e CA Configuration a	across					
bandwidth combination sets supported by the UE.									
Iest Parameters for CA Configurations									
U	Config	GA uration /					UL Anocatio	n	
	Conny M-			WOD					
			DCC & SCC PR		Naa u			B allocations	
	Naa	Nee	allocation					Banocations	
1	75	75	anocation	OPSK	с 1	P 1@0			
2	75	75			1	P 1@21	<u>S_0@0</u>		
2	15	15		GION			0_0@0		
	75	75		ODCK	75	D 75@0	S 0@0		
3	75 75	75 75		QPSK	75	P_75@0	S_0@0		
3 4 5	75 75 75	75 75 75		QPSK QPSK	75 90 150	P_75@0 P_75@0 P_75@0	S_0@0 S_15@0		
3 4 5 6	75 75 75 75	75 75 75 75		QPSK QPSK QPSK	75 90 150	P_75@0 P_75@0 P_75@0 P_0@0	S_0@0 S_15@0 S_75@0 S_1@74		
3 4 5 6 7	75 75 75 75 75	75 75 75 75 75	N/A	QPSK QPSK QPSK QPSK	75 90 150 1	P_75@0 P_75@0 P_75@0 P_0@0	S_0@0 S_15@0 S_75@0 S_1@74		
3 4 5 6 7 8	75 75 75 75 75 75 75	75 75 75 75 75 75	N/A	QPSK QPSK QPSK QPSK QPSK	75 90 150 1 1 TBD	P_75@0 P_75@0 P_75@0 P_0@0 P_0@0 TBD	S_0@0 S_15@0 S_75@0 S_1@74 S_1@44		
3 4 5 6 7 8 9	75 75 75 75 75 75 75	75 75 75 75 75 75 75 75	N/A	QPSK QPSK QPSK QPSK QPSK QPSK	75 90 150 1 1 TBD	P_75@0 P_75@0 P_75@0 P_0@0 P_0@0 TBD P_1@0	S_0@0 S_15@0 S_75@0 S_1@74 S_1@44 TBD S_0@0		
3 4 5 6 7 8 9	75 75 75 75 75 75 75 100	75 75 75 75 75 75 75 100	N/A	QPSK QPSK QPSK QPSK QPSK QPSK QPSK	75 90 150 1 1 TBD 1 60	P_75@0 P_75@0 P_75@0 P_0@0 P_0@0 TBD P_1@0 P_60@0	S_0@0 S_15@0 S_75@0 S_1@74 S_1@44 TBD S_0@0 S_0@0		
3 4 5 6 7 8 9 10	75 75 75 75 75 75 75 100 100	75 75 75 75 75 75 100 100	N/A	QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	75 90 150 1 1 TBD 1 60	P_75@0 P_75@0 P_75@0 P_0@0 P_0@0 TBD P_1@0 P_1@0 P_60@0 P_1@62	S_0@0 S_15@0 S_75@0 S_1@74 S_1@44 TBD S_0@0 S_0@0 S_0@0		
3 4 5 6 7 8 9 10 11	75 75 75 75 75 75 75 100 100 100	75 75 75 75 75 75 100 100 100	N/A	QPSK QPSK QPSK QPSK QPSK QPSK QPSK QPSK	75 90 150 1 1 TBD 1 60 1	P_75@0 P_75@0 P_75@0 P_0@0 P_0@0 TBD P_1@0 P_1@0 P_1@63 P_0@0	S_0@0 S_15@0 S_75@0 S_1@74 S_1@44 TBD S_0@0 S_0@0 S_0@0		

13	100	100		QPSK	162	P_100@0	S_62@0			
14	100	100		QPSK	1	P_0@0	S_1@99			
15	100	100		QPSK	1	P_0@0	S_1@70			
16	100	100		QPSK	TBD	TBD	TBD			
Note	Note 1: CA Configuration Test CC Combination settings are checked separately for each CA Configuration which									
applicable aggregated channel bandwidths are specified in Table 5.4.2A.1-1										

Table 6.2.4A.1.4.1-4: Test Configuration Table (network signalled value "CA_NS_04")

	Initial Conditions									
Test	Environn	nent as spe	ecified in		NC					
TS 3	6.508[7]	subclause	4.1							
Test	Frequen	cies as spe	cified in		C: L	ow and High r	ange			
TS36	6.508 [7]	subclause	4.3.1 for different CA	bandwidth						
class	classes.									
Test	CC Com	bination se	etting (N _{RB_agg}) as spe	cified in	As i	n Table 6.2.4A	.1.3.4-1			
subc	lause 5.4	I.2A.1 for th	ne CA Configuration a	across						
band	width co	mbinations	sets supported by the	UE.						
			Test P	arameters	for CA C	onfigurations				
ID		CA	DL Allocation	CC			UL Allocatio	on		
	Config	juration /	(PDCCH on PCC)	MOD						
	NR	B_agg								
	PCC	SCCs	PCC & SCC RB		NRB_allo	L b		Ballocation	5	
4	N _{RB}	N _{RB}	allocation		с 40	D 10@00	(L _{CRB} @	RB _{start})	T	
1	100	50		QPSK	10	P_10@20	S_0@0			
2	100	50	-	QPSK	60	P_50@50	S_10@0			
3	100	50		16QAM	15	P_0@0	S_15@0			
4	100	50		QPSK	2	P_1@0	S_1@49	0.000	0.0044	
5	100	50		QPSK	24	P_6@0	P_6@50	S_6@0	S_6@44	
6	100	50		QPSK	60	P_20@0	P_20@50	S_10@0	S_10@40	
1	75	75		QPSK	10	P_10@20	S_0@0			
8	75	75		QPSK	75	P_30@45	S_45@0			
9	75	75		QPSK	2	P_1@0	S_1@74	0.0010		
10	75	75		QPSK	24	P_6@0	P_6@60	S_6@10	S_6@69	
11	75	75		QPSK	60	P_15@0	P_15@45	S_15@15	S_15@60	
12	100	75	N/A	QPSK	10	P_10@20	S_0@0			
13	100	75		QPSK	80	P_50@50	S_30@0			
14	100	75		16QAM	20	P_0@0	S_20@15			
15	100	75		QPSK	2	P_1@0	S_1@74			
16	100	75		QPSK	28	P_8@0	P_8@60	S_6@10	S_6@69	
17	100	75		QPSK	75	P_25@0	P_20@55	S_15@10	S_15@60	
18	100	100		QPSK	10	P_10@25	S_0@0			
19	100	100		QPSK	90	P_40@60	S_50@0			
20	100	100		16QAM	15	P_0@0	S_15@40			
21	100	0 100 16QAM 20					S_20@30			
22	100	100		QPSK	2	P_1@0	S_1@99	0.40.000		
23	100	100	1	QPSK	30	P_10@0	P_5@65	S_10@30	S_5@95	
24	100	100		QPSK	80	P_20@0	P_20@60	S_20@20	S_20@80	
Note	1: CA	Configura	tion Test CC Combin	ation settin	igs are che	eckedseparate	ely for each C	A Configuration	on which	
	ар	piicable ag	gregated channel bar	ndwidths ai	e specifie	a in Table 5.4.2	2A.1-1			

	Initial Conditions								
Test	Environm	nent as spe	ecified in		NC				
TS 3	6.508[7]	subclause	4.1						
Test	Frequen	cies as spe	cified in		C: L	C: Low and High range			
TS36	3.508 [7] s	subclause	4.3.1 for different CA	bandwidth					
classes.									
Test	CC Com	bination se	etting (N _{RB_agg}) as spe	cified in	As ir	n Table 6.2.4A	.1.3.5-1		
subc	lause 5.4	.2A.1 for th	e CAConfiguration a	across					
band	width cor	mbination s	sets supported by the	UE.					
	Test Parameters for CA Configurations								
ID		CA	DL Allocation	CC			UL Allocatio	n	
	Config	uration /	(PDCCH on PCC)	MOD					
	NR	B_agg							
	PCC	SCCs	PCC & SCC RB		N _{RB_allo}	F P	CC & SCC R	Ballocations	5
	N _{RB}	N _{RB}	allocation	0.001/	c		<u>(L_{CRB} @</u>	RB _{start})	
1	75	75		QPSK	40	P_40@0	S_0@0		
2	75	75		QPSK	80	P_50@25	S_30@0		
3	75	75		QPSK	60	P_10@65	S_50@0		
4	75	75		QPSK	64	P_1@74	S_63@0		
5	75	75		QPSK	90	P_20@55	S_70@0		
6	75	75		QPSK	2	P_1@0	S_1@74		
7	75	75	N/A	QPSK	90	P_30@0	P_15@40	S_15@25	S_30@45
8	100	100		QPSK	8	P_8@0	S_0@0		
9	100	100		QPSK	40	P_40@0	S_0@0		
10	100	100		QPSK	80	P_50@50	S_30@0		
11	100	100		QPSK	150	P_60@40	S_90@0		
12	100	100		QPSK	2 P_1@0 S_1@99				
13	100	100	<u> </u>	QPSK	120 P_30@0 P_30@45 S_30@25 S_30@70				
Note	1: CA	Configura	tion Test CC Combination	ation settin	gs are che	ckedseparate	ly for each CA	AConfiguratio	on which
	арр	olicable ag	gregated channel bar	ndwidths ar	e specified	in Table 5.4.2	2A.1-1		

Table 6.2.4A.1.4.1-5: Test Configuration Table (network signalled value "CA_NS_05")

Table 6.2.4A.1.4.1-6: Test Configuration Table (network signalled value "CA_NS_06")

	Initial Conditions								
Test	Environm	nent as spe	ecified in		NC				
TS 36	6.508[7]	subclause	4.1						
Test	Frequen	cies as spe	cified in		C: L	ow and High ra	ange		
TS36.508 [7] subclause 4.3.1 for different CA bandwidth									
class	classes.								
Test	CC Com	bination se	etting (N _{RB_agg}) as spe	cified in	As ir	n Table 6.2.4A	.1.3.6-1		
subc	lause 5.4	.2A.1 for th	e CA Configuration						
	Test Parameters for CA Configurations								
ID		CA	DL Allocation	CC			UL Allocatio	n	
	Config	uration /	(PDCCH on PCC)	MOD					
	N _R	B_agg					<u> </u>		
	PCC	SCCS	PUL & SUL RB		NRB_allo	P		B allocations	•
4	NRB	NRB	allocation	0001/	c	D F O O	(LCRB @	RB _{start})	
1	75	75		QPSK	5	P_5@0	S_0@0		<u> </u>
2	75	75		QPSK	45	P_45@0	S_0@0		
3	75	75		QPSK	75	P_60@15	S_15@0		<u> </u>
4	75	75		QPSK	60	P_10@65	S_50@0		
5	75	75		QPSK	90	P_18@57	S_72@0		
6	75	75		QPSK	2	P_1@0	S_1@74		
7	75	75	N/A	QPSK	24	P_6@0	P_6@40	S_6@5	S_6@45
8	100	100		QPSK	10	P_10@0	S_0@0		<u> </u>
9	100	100		QPSK	30	P_30@0	S_0@0		<u> </u>
10	100	100		QPSK	100	P_75@25	S_25@0		
11	100	100		QPSK	90	P_40@60	S_50@0		<u> </u>
12	100	100		QPSK	100	P_15@85	S_85@0		<u> </u>
13	100	100		QPSK	2	P_1@0	S_1@99		
14	100	100		QPSK	32	P_8@0	P_8@50	S_8@0	S_8@50

Note 1: CA Configuration Test CC Combination settings are checked separately for each CA Configuration which applicable aggregated channel bandwidths are specified in Table 5.4.2A.1-1

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508[7] Annex A Figure group A.32 as appropriate.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals for PCC are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to the applicable table from Table 6.2.4A.1.1.4.1-1 to 6.2.4A.1.4.1-3.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.2.4A.1.4.3.

6.2.4A.1.4.2 Test procedure

- 1. Configure SCC according to Annex C.0, C.1 and Annex C.3.0 for all downlink physical channels except PHICH.
- 2. The SS shall configure SCC as per TS 36.508 [7] clause 5.2A.4. Message contents are defined in clause 6.2.4A.1.4.3.
- 3. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133, clauses 8.3.3.2).
- 4. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to the applicable from Table 6.2.4A.1.4.1-1 to Table 6.2.4A.1.4.1-5 on both PCC and SCC. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 5. Send continuously uplink power control "up" commands in every uplink scheduling information to the UE; allow at least 200ms for the UE to reach P_{UMAX} level.
- 6. Measure the mean transmitted power over all component carriers in the CA configuration of the radio access mode. The period of measurement shall be at least the continuous duration of one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.4A.1.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6. The following exceptions apply for each network signalled value.

6.2.4A.1.4.3.1 Message contents exceptions (network signalled value "CA_NS_01")

1. Information element additionalSpectrumEmissionSCell-r10 is set to CA_NS_01. This can be set in the *RadioResourceConfigCommonSCell-r10-DEFAULT* as part of the common RRC messages. This exception indicates that the UE shall meet the additional spectrum emission requirement for a specific deployment scenario.

Table 6.2.4A.1.4.3.1-1: RadioResourceConfigCommonSCell-r10-DEFAULT: Additional spectrum emission test requirement for "CA_NS_01"

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-13A						
Information Element	Value/remark	Comment	Condition			
additionalSpectrumEmissionSCell-r10	1 (CA_NS_01)					

6.2.4A.1.4.3.2 Message contents exceptions (network signalled value "CA_NS_02")

1. Information element additionalSpectrumEmissionSCell-r10 is set to CA_NS_02. This can be set in the *RadioResourceConfigCommonSCell-r10-DEFAULT* as part of the common RRC messages. This exception indicates that the UE shall meet the additional spectrum emission requirement for a specific deployment scenario.

Table 6.2.4A.1.4.3.2-1: RadioResourceConfigCommonSCell-r10-DEFAULT: Additional spectrum emission test requirement for "CA_NS_02"

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-13A						
Information Element	Value/remark	Comment	Condition			
additionalSpectrumEmissionSCell-r10	2 (CA_NS_02)					

6.2.4A.1.4.3.3 Message contents exceptions (network signalled value "CA_NS_03")

1. Information element additionalSpectrumEmissionSCell-r10 is set to CA_NS_03. This can be set in the *RadioResourceConfigCommonSCell-r10-DEFAULT* as part of the common RRC messages. This exception indicates that the UE shall meet the additional spectrum emission requirement for a specific deployment scenario.

Table 6.2.4A.1.4.3.3-1: RadioResourceConfigCommonSCell-r10-DEFAULT: Additional spectrum emission test requirement for "CA_NS_03"

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-13A						
Information Element	Value/remark	Comment	Condition			
additionalSpectrumEmissionSCell-r10	3 (CA_NS_03)					

6.2.4A.1.4.3.4 Message contents exceptions (network signalled value "CA_NS_04")

1. Information element additionalSpectrumEmissionSCell-r10 is set to CA_NS_04. This can be set in the *RadioResourceConfigCommonSCell-r10-DEFAULT* as part of the common RRC messages. This exception indicates that the UE shall meet the additional spectrum emission requirement for a specific deployment scenario.

Table 6.2.4A.1.4.3.4-1: RadioResourceConfigCommonSCell-r10-DEFAULT: Additional spectrum emission test requirement for "CA_NS_04"

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-13A						
Information Element	Value/remark	Comment	Condition			
additionalSpectrumEmissionSCell-r10	4 (CA_NS_04)					

6.2.4A.1.4.3.5 Message contents exceptions (network signalled value "CA_NS_05")

1. Information element additionalSpectrumEmissionSCell-r10 is set to CA_NS_05. This can be set in the *RadioResourceConfigCommonSCell-r10-DEFAULT* as part of the common RRC messages. This exception indicates that the UE shall meet the additional spectrum emission requirement for a specific deployment scenario.

Table 6.2.4A.1.4.3.5-1: RadioResourceConfigCommonSCell-r10-DEFAULT: Additional spectrum emission test requirement for "CA_NS_05"

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-13A							
Information Element	Value/remark	Comment	Condition				
additionalSpectrumEmissionSCell-r10	5 (CA_NS_05)						

6.2.4A.1.5 Test requirements

The maximum output power, derived in step 3 shall be within the range prescribed by the nominal maximum output power and tolerance in the applicable table from Table 6.2.4A.1.5-1 to Table 6.2.4A.1.5-3. The allowed maximum output power reduction is specified in Table 6.2.4A.1.3-1 and clause 6.2.3A.1 does not apply, i.e. carrier aggregation MPR = 0. For the UE maximum output power modified by A-MPR specified in table 6.2.4A.1.3-1, the power limits specified in Table 6.2.5A.1.3-2 apply.

Configuration	Class	Tol.	Class	Tol.	Class 3	Tol. (dB)
ID	1	(dB)	2	(dB)	(dBm)	
	(dBm)		(dBm)			
1					23	+2.7 /
						-17.7
2					23	+2.7/
						-11.7
3					23	+2.7/
						-9.7
4					23	+2.7 /
						-4.7
5					23	+2.7 /
						-2.7
6					23	+2.7 /
						-23.7
7					23	+2.7 /
						-20.2
8					23	+2.7 /
						-13.2
9					23	+2.7 /
						-18.7
10					23	+2.7 /
						-18.7
11					23	+2.7 /
						-11.7
12					23	+2.7 /
						-9.7
13					23	+2.7 /
						-2.7
14					23	+2.7 /
						-23.7
15					23	+2.7 /
						-20.2
16					23	+2.7 /
						-12.7

Table 6.2.4A.1.5-1: Test requirement (network signalled value "CA_NS_01")

Configuration ID	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1					23	+2.7 / -4.7
2					23	+2.7 / -5.2
3					23	+2.7 / -9.7
4					23	+2.7 / -11.7
5					23	+2.7 / -4.7
6					23	+2.7 / -2.7
7					23	TBD
8					23	TBD
9					23	+2.7 / -8.2
10					23	+2.7 / -5.2
11					23	+2.7 / -5.2
12					23	+2.7 / -11.7
13					23	+2.7 / -15.7
14					23	+2.7 / -2.7
15					23	TBD
16					23	TBD

Table 6.2.4A.1.5-2: Test requirement (network signalled value "CA_NS_02")

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Configuration	Class	Tol.	Class	Tol.	Class 3	Tol. (dB)
ID		(dB)	2	(dB)	(dBm)	
	(dBm)		(dBm)			
1					23	+2.7 /
						-15.7
2					23	+2.7 /
						-8.2
3					23	+2.7 /
						-4.7
4					23	+2.7 /
						-9.7
5					23	+2.7 /
						-13.7
6					23	+2.7 /
						-11.7
7					23	+2.7 /
						-2.7
8					23	TBD
9					23	+2.7 /
						-15.7
10					23	+2.7 /
						-11.7
11					23	+2.7 /
						-3.7
12					23	+2.7 /
						-8.2
13					23	+2.7 /
						-12.7
14					23	+2.7 /
						-15.7
15					23	+2.7 /
						-2.7
16			1		23	TBD

Table 6.2.4A.1.5-3: Test requirement (network signalled value "CA_NS_03")

Configuration ID	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1					23	+2.7 /
2					23	-0.2 ⊥2.7 /
2					23	-6.2
3					23	+2.7 /
						-8.2
4					23	+2.7 /
						-17.2
5					23	+2.7 /
						-11.2
6					23	+2.7 /
						-9.2
7					23	+2.7 /
						-8.2
8					23	+2.7/
						-8.2
9					23	+2.7/
40						-17.2
10					23	+2.77
11					00	-11.2
11					23	+2.77
10					22	-9.2
12					23	+2.77
12					22	-0.2
13					23	+2.77
14					23	+27/
					20	-8.2
15					23	+2.7/
						-17.2
16					23	+2.7 /
						-11.2
17					23	+2.7 /
						-9.2
18					23	+2.7 /
						-6.2
19					23	+2.7 /
						-6.2
20					23	+2.7/
						-8.2
21					23	+2.7 /
						-8.2
22					23	+2.7/
0.0			ļ			-17.2
23					23	+2.//
0.4					00	-11.2
24					23	+2.1 /
						-9.2

Table 6.2.4A.1.5-4: Test requirement (network signalled value "CA_NS_04")

Configuration ID	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1					23	+2.7 /
						-0.2
2					23	+2.7 / -12.7
3					23	+2.7 /
-						-11.7
4					23	+2.7 /
						-6.2
5					23	+2.7 /
						-13.7
6					23	+2.7 /
						-32.7
7					23	+2.7 /
						-18.2
8					23	+2.7 /
						-9.7
9					23	+2.7 /
						-6.2
10					23	+2.7 /
						-12.7
11					23	+2.7 /
						-19.7
12					23	+2.7 /
						-32.7
13					23	+2.7 /
						-18.2

Table 6.2.4A.1.5-5: Test requirement (network signalled value "CA_NS_05")

Configuration ID	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1					23	+2.7 / -9.7
2					23	+2.7 / -4.7
3					23	+2.7 / -4.7
4					23	+2.7 / -11.7
5					23	+2.7 / -15.7
6					23	+2.7 / -24.7
7					23	+2.7 / -20.7
8					23	+2.7 / -8.2
9					23	+2.7 / -4.7
10					23	+2.7 / -6.2
11					23	+2.7 / -9.7
12					23	+2.7 / -15.7
13					23	+2.7 / -24.7
14					23	+2.7 / 20.7

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6.2.4B Additional Maximum Power Reduction (A-MPR) for UL-MIMO

6.2.4B.1 Test purpose

Additional ACLR and spectrum emission requirements can be signalled by the network to indicate that the UE shall also meet additional requirements in a specific deployment scenario. To meet these additional requirements, Additional Maximum Power Reduction A-MPR is allowed for the sum output power at each antenna connector as specified in Table 6.2.2B.3-1. Unless stated otherwise, an A-MPR of 0 dB shall be used.

6.2.4B.2 Test applicability

The requirements of this test apply in test case 6.6.2.2 Additional Spectrum Emission Mask for network signalled values NS_03, NS_04, NS_06 and NS_07 to all types of E-UTRA UE release 10 and forward that support UL MIMO.

The requirements of this test apply in test case 6.6.3.3 Additional Spurious Emissions for network signalled values NS_05, NS_07 and NS_08, NS_09 to all types of E-UTRA UE release 10 and forward that support UL MIMO.

6.2.4B.3 Minimum conformance requirements

For UE Power Class 3 the specific requirements and identified clauses are specified in Table 6.2.4B.3-1 along with the allowed A-MPR values that may be used to meet these requirements. The allowed A-MPR values specified below in Table 6.2.4B.3-1 and 6.2.4B.3-2 are in addition to the allowed MPR requirements specified in clause 6.2.3B. For the UE maximum output power modified by A-MPR, the power limits specified in clause 6.2.5B apply.

Table 6.2.4B.3-1: Additional Maximum Power Reduction (A-MPR) / Spectrum Emission requirements

Network	Requirements	E-UTRA Band	Channel bandwidth	Resources	A-MPR (dB)
value	(Sub-clause)		(MHz)	(<i>N</i> _{RB})	
NS_01	6.6.2.1.1	Table 5.2-1	1.4,3,5,10,1 5,20	Table 5.4.2-1	NA
			3	>5	≤ 1
		2/10/23	5	>6	≤1
NS_03	6.6.2.2.3.1	25,35,36	10	>6	≤ 1
		20,00,00	15	>8	≤ 1
			20	>10	≤ 1
NS 04	662232	/11	5	>6	≤1
110_04	0.0.2.2.0.2	71	10, 15, 20	See Table	6.2.4B.3-4
NS_05	6.6.3.3.3.1	1	10,15,20	≥ 50	≤1
NS_06	6.6.2.2.3.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.4.2-1	n/a
NS 07	6.6.2.2.3.3	13	10	Table 6.2.4B.3-2	Table 6.2.4B.3-2
110_07	6.6.3.3.3.2				
NS_08	6.6.3.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤2
NS_10		20	15, 20	Table 6.2.4B.3-3	Table 6.2.4B.3-3
NS_11	6.6.2.2.1	23	1.4, 3, 5, 10, 15, 20	Table 6.2.4B.3-5	Table 6.2.4B.3-5
NS_12	6.6.3.3.5	26	1.4, 3, 5	Table 6.2.4B.3-6	Table 6.2.4B.3-6
NS_13	6.6.3.3.6	26	5	Table 6.2.4B.3-7	Table 6.2.4B.3-7
NS_14	6.6.3.3.7	26	10, 15	Table 6.2.4B.3-8	Table 6.2.4B.3-8
NS_15	6.6.3.3.9	26	1.4, 3, 5, 10,	Table 6.2.4B.3-9	Table 6.2.4B.3-
			15	Table 6.2.4B.3-	9, Table
				10	6.2.4B.3-10
NS 16	66330	27	3 5 10	Table 6.2.4B.3-12	I, Table 6.2.4B.3-
10	0.0.3.3.3	21	5, 5, 10	12, Table 6	6.2.4B.3-13
NS_20	6.2.2, .6.2.2.1,	23	5, 10, 15, 20	Table 6.2.4B.3-	Table 6.2.4B.3-
	6.6.3.2			14	14
NS_32	-	-	-	-	-
Note 1: A	pplies to the lower l	block of Band 23, i.e	. a carrier place	d in the 2000-2010 M	/Hzregion.

Para	ameters	Re	Region A Region B			Region C			
RI	B _{start} ¹	(0 – 12 13 –18		–18	19 – 42		43 - 49	
L_CR	RB ² [RBs]	6 – 8	1 to 5 and 9-50	<8	≥8	<18	≥18	≤2	>2
A-M	PR [dB]	≤8	≤12	0	≤12	0	≤6	≤3	0
Note 1: Note 2: Note 3:	Note 1: RB _{start} indicates the lowest RB index of transmitted resource blocks Note 2: L_CRB is the length of a contiguous resource block allocation Note 3: For intra-subframe frequency hopping between two regions, notes 1 and 2 apply on a per slot basis								
Note 4:	For intra-sul	oframe fre	equency hoppir	ng betwe	en two re in the su	gions, th ubframe	ie larger	A-MPR v	alue of

Table 6.2.4B.3-2: A-MPR for "NS_07"

Table 6.2.4B.3-3: A-MPR for "NS_10"

Channel BW Parameters Region A							
15		RB _{start} ¹	0 – 10				
		L_CRB [RBs]	1 -20				
		A-MPR [dB]	≤2				
		RB _{start} ¹	0 – 15				
20		L_CRB [RBs]	1 -20				
		A-MPR [dB]	≤ 5				
Note 1:	RB _{start} ind	licates the lowest I	RB index of transmitted resource blocks.				
Note 2:	L_CRB is	the length of a co	ntiguous resource block allocation.				
Note 3:	For intra-	subframe frequence	cy hopping which intersects Region A, notes 1 and 2 apply				
Note 4:	on a pers For intra- may be a	slot basis. subframe frequenc pplied for both slot	cy hopping which intersect Region A, the larger A-MPR value is in the subframe.				

Table 6.2.4B.3-4: A-MPR for NS 04	for bandwidths > 5 MHz
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Channel BW	Parameters	Region A	Regi	on B	Region C			
10	RB _{start} ¹	0 – 12	13 -	- 36	37 – 49			
	RB _{start} ⁺ + L _{CRB} ² [RBs]	NA	14 - 37	>37	NA			
		(Note 3)			(Note 3)			
	A-MPR [dB]	≤3dB	0	≤2dB	≤3dB			
15	RB _{start} ¹	0 – 18	19	- 55	56 – 74			
	RB _{start} '+ L _{CRB} ² [RBs]	NA	20 - 56	>56	NA			
		(Note 3)			(Note 3)			
	A-MPR [dB]	≤3dB	0	≤2dB	≤3dB			
20	RB _{start}	0 – 24	25 -	- 74	75 – 99			
	RB _{start} '+ L _{CRB} ² [RBs]	NA	26 - 75	>75	NA			
		(Note 3)			(Note 3)			
	A-MPR [dB]	≤3dB	0	≤2dB	≤3dB			
Note 1: RB _{star}	Note 1: RB _{start} indicates the lowest RB index of transmitted resource blocks.							
Note 2: L _{CRB} i	is the length of a contiguous	resource block all	ocation.					
Nate Q. Any DD allocation that starts in Danian A an Q is allowed the analified A MDD								

Note 3: Any RB allocation that starts in Region A or C is allowed the specified A-MPR.

Note 4: For intra-subframe frequency hopping which intersects regions, notes 1 and 2 apply on a per slot basis. Note 5: For intra-subframe frequency hopping which intersects regions, the larger A-MPR value may be applied for

both slots in the subframe.

Channel Bandwidth	Parameters									
	Fc (MHz)	<20	04			≥2004				
3	L _{CRB} (RBs)	1-15				>5				
	A-MPR	≤{	5			≤1				
	Fc (MHz)	<20	04		200)4 ≤ Fc <	2007	≥2	2007	
5	L _{CRB} (RBs)	1-2	25		1-6 15-	∂& 8 •25	3-12		>6	
	A-MPR	≤.	7		≤	4	0	4	≦ 1	
	Fc (MHz)					2005	5			
	RB _{start} (RBs)					0-49				
10	L _{CRB} (RBs)					1-50)			
	A-MPR	≤ 12								
	Fc (MHz)	[<2012.5]								
	RB _{start} (RBs)	[0-4]		[{	[5-21]		[22-56]		[57-74]	
	L _{CRB} (RBs)	[≥1]	[7-	[7-50] [0-6 & ≥50]		6 & ≥50]	[≤25]	[>25]	[>0]	
	A-MPR	[≤15]	[≤	[≤7] [≤10]		[0]	[≤6]	[≤15]		
15	Fc (MHz)					[2012	.5]			
	RB _{start} (RBs)	[0-12]		[13	-39]	[40-65]		[66-74]	
	L _{CRB} (RBs)	[≥1]		[≥3	0]	[<30]	[≥ (69 – RB _{start})]		[≥1]	
	A-MPR	[≤10]]	[≤6	5]	[0]	[≤2]		[≤6.5]	
	Fc (MHz)					2010)			
	RB _{start} (RBs)	[0-12]		[1]	3-29	9]	[30-68]		[69-99]	
20	L _{CRB} (RBs)	[≥1]	[10	-60]		[1-9 & >60]	[1-24]	[≥25]	[≥1]	
	A-MPR	[≤15]	[≤	≦7]		[≤10]	[0]	[≤7]	[≤15]	

Table 6.2.4B.3-5: A-MPR for "NS_11"

Table 6.2.4B.3-6: A-MPR for "NS_12"

Channel BW	Parameters	Regio	Region B			
	RB _{start}	0	0			
1.4	L _{CRB} [RBs]	≤3	≥4	≥4		
	A-MPR [dB]	≤3	≤6	≤3		
	RB _{start}	0-	4-5			
3	L _{CRB} [RBs]	4-9	1-3 and 10-15	≥9		
	A-MPR [dB]	≤4	≤3	≤3		
	RB _{start}	0-6		7-9		
5	L _{CRB} [RBs]	≤8	≥9	≥15		
	A-MPR [dB]	≤5	≥3	≤3		

Table 6.2.4B.3-7: A-MPR for "NS_13"

Channel BW	Parameters	Region A		
	RB _{start}	0-2	2	
5	L _{CRB} [RBs]	≤5	≥18	
	A-MPR [dB]	≤3	≤2	

Channel BW	Parameters	Region A		
	RB _{start}	0		
10	L _{CRB} [RBs]	≤5	≥50	
	A-MPR [dB]	≤3	≤1	
	RB _{start}	3≥	3	
15	L _{CRB} [RBs]	≤16	≥50	
	A-MPR [dB]	≤3	≤1	

Table 6.2.4B.3-8: A-MPR for "NS_14"

Table 6.2.4B 3-9. A-MPR for "NS	15" for E-LITRA highest channel	daa > 845 MHz and < 849 MHz

E-UTRA Channel bandwidth [MHz]	Parameters	Region A	Region B	Region C
1.4	RB _{end} [RB]			4-5
1.4	A-MPR [dB]			≤3
	RB _{end} [RB]	0-1	8-12	13-14
3	L _{CRB} [RB]	≤2	≥8	>0
	A-MPR [dB]	≤4	≤4	≤9
	RB _{end} [RB]	0-4	12-19	20-24
5	L _{CRB} [RB]	≤2	≥8	>0
	A-MPR [dB]	≤4	≤5	≤9
	RB _{end} [RB]	0-12	23-36	37-49
10	L _{CRB} [RB]	≤2	≥15	>0
	A-MPR [dB]	≤4	≤6	≤9
	RB _{end} [RB]	0-20	26-53	54-74
15	L _{CRB} [RB]	≤2	≥20	>0
	A-MPR [dB]	≤4	≤5	≤9

Table 6.2.4B.3-10: A-MPR for	"NS_15	" for E-UTRA	highest channe	ledge ≤ 845 MHz
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E-UTRA Channel bandwidth [MHz]	Parameters	Region A	Region B	Region C
	RB _{end} [RB]			19-24
5	L _{CRB} [RB]			≥18
	A-MPR [dB]			≤2
	RB _{end} [RB]	0-4	29-44	45-49
10	L _{CRB} [RB]	≤2	≥24	>0
	A-MPR [dB]	≤4	≤4	≤9
	RB _{end} [RB]	0-12	44-61	62-74
15	L _{CRB} [RB]	≤2	≥20	>0
	A-MPR [dB]	≤4	≤5	≤9

CBW	Parameter	Region A	Region B	Region C	Region D	Region E
3 MH z	RB _{start}	0	1-2			
	L _{CRB} [RBs]	≥12	12			
	A-MPR [dB]	≤2	≤1			
5 MH z	RB _{start}	0-1	2	2-9	2-5	
	L _{CRB} [RBs]	1 - 25	12	15-18	20	
	A-MPR [dB]	≤5	≤1	≤2	≤3	
10 MHz	RB _{start}	0 - 8	0-	0-14		15-24
	L _{CRB} [RBs]	1 - 12	15-20	≥24	≥30	24-27
	A-MPR [dB]	≤5	≤3	≤7	≤3	≤1

Table 6.2.4B.3-11: A-MPR for "NS_16" with channel lower edge at ≥807 MHz and <808.5 MHz

Table 6.2.4B.3-12: A-MPR for "NS_16" with channel lower edge at ≥808.5 MHz and <812 MHz

CBW	Parameter	Region A	Region B	Region C	Region D	Region E
5 MH z	RB _{start}	0	0-1	1-5		
	L _{CRB} [RBs]	16-20	≥24	16-20		
	A-MPR [dB]	≤2	≤3	≤1		
10 MHz	RB _{start}	0	-6	0-10	0-14	11-20
	L _{CRB} [RBs]	1-12	15-20	24-32	≥36	24-32
	A-MPR [dB]	≤5	≤2	≤4	≤5	≤1

Table 6.2.4B.3-13: A-MPR for "NS_16" with channel lower edge at ≥812 MHz

CBW	Parameter	Region A	Region B	Region C	Region D
10 MHz	RB _{start}	0 - 9	0	1-14	0-5
	L _{CRB} [RBs]	27-32	36-40	36-40	≥45
	A-MPR [dB]	≤1	≤2	≤1	≤3

Channel Bandwidth	Parameters										
	Fc (MHz)	< 2	007.5		200)7.5	≤ Fc < 201	2.5	2012.5 ≤ F	c ≤ 2017.5	
	RBstart (RBs)	5	24		C	-3		4-6	≤2	24	
5	L _{CRB} (RBs)		>0	1	5-19	≥	:20	≥18	1-2	25	
	A-MPR	4	17		≤1	:	≤4	≤2	≤	0	
10	Fc (MHz)						2005				
	RBstart (RBs)		0-25				26-34		35-	49	
	L _{CRB} (RBs)		>0			3-15		>15	>	0	
	A-MPR				≤2 ≤5		≤5	≤	6		
	Fc (MHz)		2015								
	RB _{start} (RBs)		0-5						6-10		
	L _{CRB} (RBs)		≥32						≥40		
	A-MPR		≤4						≤2		
	Fc (MHz)						2012.5				
15	RB _{start} (RBs)		0-14			15-24			25-39	61-74	
10	L _{CRB} (RBs)	1-9 & 4	10-75	10-3	39	24-29		≥30	≥36	≤6	
	A-MPR	≤1	1	≤6	6	:	≤1	≤7	≤5	≤6	
	Fc (MHz)						2010				
20	RB _{start} (RBs)	0-21		22-3 ⁻	1		32-38	39-49	50-69	70-99	
	L _{CRB} (RBs)	>0	1-9 & 3	31-75	10-3	30	≥15	≥24	≥25	>0	
	A-MPR	≤17	≤1	2	≤6	6	≤9	≤7	≤5	≤16	

Table 6.2.4B.3-14: A-MPR for "NS_20"

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NOTE 2: When NS_20 is signalled the minimum requirements for the 15 MHz channel bandwidth are specified for E-UTRA UL carrier centre frequency of 2012.5 MHz.

6.2.4B.4 Test description

6.2.4B.4.1 Initial condition

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.2.4B.4.1-1 through table 6.2.4B.4.1-12. The details of the uplink reference measurement channels (RMCs) are specified in Annex A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

			Initial C	onditions			
Test Environment (as specified in TS 36.508 [7] clause 4.1)				NC			
Test Frequencies (as specified in TS 36.508 [7]				Low range Mid range High range			
clause 4.3.1)					Eow range, with	a range, mgn	lange
Test Channel I clause 4.3.1)	Bandwidths	(as specified	in TS 36.50	8 [7]	Lowest, 5MHz,	, 10MHz, High	nest
,		Test F	Parameters	for NS_03	A-MPR		
		Downlink C	configuration	۱	Uplink Configu	Iration	
Configuration	Ch BW	Mod'n	RB allo	ocation	Mod'n	RB allo	ocation
שו			FDD	тор		FDD	
1	1 4MH7	N/A fo	r A-MPR te	sting	OPSK	6	6
2	1.4MHz			sung.	OPSK	5	5
3	1 4MHz				160AM	5	5
4	3MHz	-			OPSK	15	15
5	3MHz	-			QPSK	4	4
6	3MHz				16QAM	15	15
7	3MHz	-			16QAM	4	4
8	5MHz	-			QPSK	25	25
9	5MHz	-			QPSK	8	8
10	5MHz	-			QPSK	6	6
11	5MHz				16QAM	25	25
12	5MHz	-			16QAM	8	8
13	10MHz				QPSK	50	50
14	10MHz	-			QPSK	12	12
15	10MHz				QPSK	6	6
16	10MHz				16QAM	50	50
17	10MHz				16QAM	12	12
18	15MHz				QPSK	75	75
19	15MHz				QPSK	16	16
20	15MHz				QPSK	8	8
21	15MHz				16QAM	75	75
22	15MHz				16QAM	16	16
23	20MHz				QPSK	100	100
24	20MHz				QPSK	18	18
25	20MHz				QPSK	10	10
26	20MHz				16QAM	100	100
27	20MHz				16QAM	18	18
Note 1: Tes	t Channel Ba	andwidths are	e checked s	eparatelyfo	or each E-UTRA	band, the ap	plicable
cha	nnel bandwi	dths are spec	cified in Tab	le 5.4.2.1-1	1.		
Note 2: The	Configuration	on ID will be ι	used to map	o the applic	able Test Config	uration to the	
corr	esponding	est Requiren	nent in clau	se 6.2.4B.5	as not all comb	inations are n	ecessanly
requests 2: The		on the applic	ability of the		nd DD# (max + 4		an) of the
INDIE 3: The	R B _{start} OI pa	nual KB alloc	auonshall	ие кв# и а	nu KB# (max+1	- KB allocatio	on) or the
Note 4: Ear		uuri. ove table ool	vannline to	mid and hi	ah rango toot fro		w range test
freq	uencies will	be covered b	y NS_11 te	st configura	ation table.		w range lest

Table 6.2.4B.4.1-1: Test Configuration Table (network signalled value "NS_03")

Initial Conditions									
Test Environm	ent (as spec	ified in TS 36	NC						
Test Frequence	cies (as speci	ified in TS 36	Low range. Mid range. High range						
clause 4.3.1)	D	· · · ·		g_,	······································				
clause 4.3.1)	Bandwidths	(as specified	in TS 36.508 [7]	Lowest, 5N	1Hz, 10MHz, High	nest			
		Test F	Parameters for NS_03	A-MPR					
		Downli	nk Configuration	Up	olink Configurati	on			
Configuration	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation	RB _{start}			
ID			TDD		TDD	TDD			
1	5MHz	N/A fo	r A-MPR testing.	QPSK	25	Note 3			
2	5MHz			QPSK	8	Note 3			
3	5MHz			QPSK	6	Note 3			
4	5MHz			16QAM	25	Note 3			
5	5MHz			16QAM	8	Note 3			
6	10MHz			QPSK	1	0			
7	10MHz			QPSK	12	0			
8	10MHz			QPSK	50	0			
9	10MHz			16QAM	50	0			
10	10MHz			QPSK	24	13			
11	10MHz			16QAM	24	13			
12	10MHz			QPSK	36	13			
13	10MHz			QPSK	12	37			
14	10MHz			QPSK	1	49			
15	15MHz			QPSK	1	0			
16	15MHz			QPSK	16	0			
17	15MHz			QPSK	75	0			
18	15MHz			16QAM	75	0			
19	15MHz			QPSK	36	19			
20	15MHz			16QAM	36	19			
21	15MHz			QPSK	50	19			
22	15MHz			QPSK	18	56			
23	15MHz			QPSK	1	74			
24	20MHz			QPSK	1	0			
25	20MHz			QPSK	18	0			
26	20MHz			QPSK	100	0			
27	20MHz			16QAM	100	0			
28	20MHz			QPSK	50	25			
29	20MHz			16QAM	50	25			
30	20MHz			QPSK	75	25			
31	20MHz			QPSK	25	75			
32	20MHz			QPSK	1	99			
Note 1: Tes	t Channel Ba	andwidths are	e checked separately for	or E-UTRAb	and, the applicab	le channel			
bar	ndwidths are	specified in T	able 5.4.2.1-1.						
Note 2: The	e configuratio	n ID will be u	sed to map the application	able Test Cor	nfiguration to be				
cor	responding T	est Requiren	nentin clause 6.2.4B a	as not all com	binations are neo	cessarily			
req	uired based of	on the applic	ability of the UE.						
Note 3: The	RB _{start} of pa	rtial RB alloc	ation shall be RB# 0 a	nd RB# (max	+1 - RB allocatio	on) of the			
cha	innel bandwi	dth.							

Table 6.2.4B.4.1-2: Test Configuration	า Table (network	signalled value	"NS	04")
		a ginano a Talao		_•· /

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Test Environme	nt	Nomal				
(as specified in	15 36.508	Low rongo Mid rongo				
(as specified in	75 36 508	Low range, Mid range				
(as specified in	13 30.300	[/] clause 4.3.	1)	In case of Low	rance.	
				- For 5MHz Channel		
				Bandwidth: 19	027 2MHz (NUI	
				= 18072)		
				- For 10MHz	z Channel	
				Bandwidth: 19	34.7MHz (NUL	
				= 18147)	,	
				- For 15 MH	z Channel	
				Bandwidth: 19	32.5 MHz (NUL	
				= 18125)		
				- For 20MHz	Channel	
				Bandwidth:	1930 MHz	
				(NUL = 181	100)	
Test Channel B	andwidths			5MHz, 10MHz	, 15MH <i>z</i> ,	
(as specified in	TS 36.508	[7] clause 4.3.	1)	20MHz		
	1	Test Paramete	ers for NS_U5 A-		ufin motion	
Configuration		Downlink C				
Configuration	CUBM	ivioa n	RB allocation	iviod n	RB allocation	
1		N/A for A	FDD MPP testing	OPSK		
2			Wir IX lesting		25	
3	10MHz			OPSK	25	
4	10MHz			OPSK	12	
5	10MHz			OPSK	48	
6	10MHz			OPSK	50	
7	10MHz			160AM	50	
8	15MHz			OPSK	1	
9	15MHz			OPSK	16	
10	15MHz			QPSK	48	
11	15MHz			QPSK	75	
12	15MHz			16QAM	75	
13	20MHz			QPSK	1	
14	20MHz			QPSK	18	
15	20MHz			QPSK	48	
16	20MHz			QPSK	100	
17 20MHz				16QAM	100	
Note 1: The	1 RB alloca	tion shall be te	sted at both RB a	#0 and RB #ma>	ζ.	
Note 2: The I	RB _{start} of pa	rtial RB allocat	tion shall be RB#	0 and RB# (ma	x +1 - RB	
alloc	ation) of the	e channel band	width.			
Note 3: The Configuration ID will be used to map the applicable Test Configuration to						
the corresponding Test Requirement in clause 6.2.4B.5 as not all combinations						
are necessarily required based on the applicability of the UE.						

Table 6.2.4B.4.1-3: Test Configuration Table (network signalled value "NS_05")

Initial Conditions						
Test Environment				Nomal		
(as specified in TS 36.508 [7] clause 4.1)			Noimai			
Test Frequencie	es			Low range, Mid range, High		
(as specified in	TS 36.508	[7] clause 4.3.	1)	range		
Test Channel B	andwidths			Lowest, 5MHz, 10MHz,		
(as specified in	TS 36.508	[7] clause 4.3.	1)	Highest		
		Test Paramete	ers for NS_05 A-	MPR		
		Downlink C	Configuration	Uplink Co	nfiguration	
Configuration	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation	
ID			FDD		FDD	
1	1.4MHz	N/A for A-	MPR testing	QPSK	6	
2	1.4MHz			QPSK	5	
3	1.4MHz			16QAM	5	
4	3MHz			QPSK	15	
5	3MHz			QPSK	4	
6	3MHz			16QAM	4	
7	5MHz			QPSK	25	
8	5MHz			QPSK	8	
9	5MHz			16QAM	8	
10	10MHz			QPSK	50	
11	10MHz			QPSK	12	
12	10MHz			16QAM	12	
13	15MHz			QPSK	75	
14	15MHz			QPSK	16	
15	15MHz			16QAM	16	
16	20MHz			QPSK	100	
17	20MHz			QPSK	18	
18	20MHz			16QAM	18	
Note 1: Test	Channel B	andwidths are	checked separate	ly for each E-U	TRA band, the	
appli	cable chan	nel bandwidths	are specified in	Table 5.4.2.1-1.		
Note 2: The Configuration ID will be used to map the applicable Test Configuration to						
the corresponding Test Requirement in clause 6.2.4B.5 as not all combinations						
are n	are necessarily required based on the applicability of the UE.					
Note 3: The RBstart of partial RB allocation shall be RB# 0 and RB# (max+1 - RB						
allocation) of the channel bandwidth.						

Table 6.2.4B.4.1-4: Test Configuration Table (network signalled value "NS_06")

Initial Conditions							
TestEnvironment				NC			
(as specified in	TS 36.508	8 [7] clause 4.	NC				
Test Frequenci	es			Mid range			
(as specified in	TS 36.508	3 [7] clause 4.	3.1)				
Test Channel B	Bandwidths			10MHz			
(as specified in	TS 36.508	3 [7] clause 4.	3.1)	1010112			
		Test	Parameters for NS_	_07 A-MPR			
		Downlink	Configuration	U	plink Configurat	ion	
Configuration	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation	RB start	
ID			FDD		FDD	FDD	
1	10MHz	N/A for	A-MPR testing	QPSK	1	0	
2	10MHz			QPSK	8	0	
3	10MHz			QPSK	6	13	
4	10MHz			QPSK	20	13	
5	10MHz			QPSK	12	13	
6	10MHz			16QAM	36	13	
7	10MHz			QPSK	16	19	
8	10MHz			QPSK	12	19	
9	10MHz			16QAM	16	19	
10	10MHz			QPSK	30	19	
11	10MHz			16QAM	30	19	
12	10MHz			QPSK	6	43	
13	10MHz			QPSK	2	48	
14	10MHz			QPSK	50	0	
15	10MHz			QPSK	12	0	
16	10MHz			16QAM	50	0	
Note 1: The	Note 1: The Configuration ID will be used to map the applicable Test Configuration to the						
corresponding Test Requirement in clause 6.2.4B.5 as not all combinations are necessarily							
required based on the applicability of the UE.							

Table 6.2.4B.4.1-5:	Test Configuration	Table (network	signalled value	"NS 07")
	i o ot o o i ingai a i o i		alginanio a Tarao	· ···•_•· /

Initial Conditions						
Test Environm	ient	Nomal	Nomal			
(as specified i	n TS 36.508	[7] clause 4.1)		Nolina		
Test Frequence	cies			High range		
(as specified i	n T <u>S 36.508</u>	[7] clause 4.3.	1)	Thymany	Thymange	
Test Channel	Bandwidths			5MHz 10	5MHz 10MHz 15MHz	
(as specified i	n TS 36.508	[7] clause 4.3.	1)	011112, 10	1010112	
	Те	st Parameters	for NS_08 A-M	PR		
		Downlink C	Configuration	Uplink (Configuration	
Configuration	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation	
ID			FDD		FDD	
1	5MHz	N/A for A-	MPR testing	QPSK	1	
2	5MHz			QPSK	8	
3	5MHz			QPSK	25	
4	10MHz			QPSK	1	
5	10MHz			QPSK	12	
6	10MHz	•		QPSK	40	
7	10MHz			QPSK	50	
8	10MHz			16QAM	50	
9	15MHz			QPSK	1	
10	15MHz			QPSK	16	
11	15MHz			QPSK	40	
12	15MHz			QPSK	75	
13	15MHz			16QAM	75	
Note 1: The Configuration ID will be used to map the applicable Test						
Configuration to the corresponding Test Requirement in clause 6.2.4B.5						
as not all combinations are necessarily required based on the applicability						
of the UE.						
Note 2: The 1 RB allocation shall be tested at both RB #0 and RB #max.						
Note 3: The RB _{start} of partial RB allocation shall be RB# 0 and RB# (max + 1 - RB						
allocation) of the channel bandwidth.						

Table 6.2.4B.4.1-6: Test Configuration Table (network signalled value "NS_08")

Initial Conditions						
Test Environment				Normal		
(as specified in TS 36.508 [7] clause 4.1)						
Test Frequ	uencie	es			High range	
(as specifi	ed in	TS 36.508	[7] clause 4.3.	1)		
Test Chan	nel B	andwidths			5MHz 10	MHz 15MHz
(as specifi	ed in	TS 36.508	[7] clause 4.3.	1)	011112, 10	
		Test F	Parameters for	Channel Bandw	vidths	
			Downlink C	Configuration	Uplink (Configuration
Configura ID	tion	Ch BW	Mod'n	RB allocation FDD	Mod'n	RB allocation FDD
1		5MHz	N/A for A-	MPR testing	QPSK	1
2		5MHz		C C	QPSK	8
3		5MHz			QPSK	25
4		10MHz			QPSK	1
5		10MHz			QPSK	12
6	6 10MHz			QPSK	40	
7		10MHz			QPSK	50
8		10MHz			16QAM	50
9		15MHz			QPSK	1
10		15MHz			QPSK	16
11		15MHz			QPSK	40
12		15MHz			QPSK	54
13		15MHz			QPSK	75
14		15MHz			16QAM	75
Note 1: The Configuration ID will be used to map the applicable Test						
Configuration to the corresponding Test Requirement in clause 6.2.4B.5						
as not all combinations are necessarily required based on the applicability						
of the UE.						
Note 2: The 1 RB allocation shall be tested at both RB #0 and RB #max.						
Note 3: Ine KB _{start} of partial RB allocation shall be RB# 0 and RB# (max + 1 - RB						
allocation) of the channel bandwidth.						

Table 6.2.4B.4.1-7: Test Configuration Table (network signalled value "NS_09")

Initial Conditions							
Test Environme clause 4.1)	nt (as specifie	ed in TS 36.50	08 [7]	Nomal			
Test Frequencies (as specified in TS 36.508 [7] clause 4.3.1) Test Channel Bandwidths)	Low range For 3 MHz Channel Bandwidth: a. UL 2001.5 MHz (N_UL=25515), DL 2181.5 MHz(N_DL=7515) b UL 2004.5 MHz (N_UL=25545), DL 2184.5 (N_DL=7545) For 5 MHz Channel Bandwidth: a. UL 2002.5 MHz (N_UL=25525), DL 2182.5 MHz(N_DL=7525) b. UL 2004.5 MHz (N_UL=25545), DL 2184.5 MHz(N_DL=7545) c. UL 2007.5 MHz (N_UL=25575), DL 2187.5 MHz(N_DL=7575) For 10 MHz Channel Bandwidth: UL 2005 MHz (N_UL=25550), DL 2185 MHz (N_DL=7550) 1.4MHz, 3 MHz, 5 MHz, 10MHz			
(as specified in TS 36.508 [7] clause 4.3.1)		for NS 11 A-MDD					
Downlink		Uplink Configuration					
		Configuration					
Configuration ID	Ch BW	Mod'n	RB allocation FDD	Mod'n	RB allocation FDD		
1	3MHz	N/A for A-N	IPR testing	QPSK	6		
2	3MHz			QPSK	15		
3	3MHz			16QAM	6		
4	3MHz			16QAM	15		
5	5MHz			QPSK	1		
6	5MHz			QPSK	8		
7	5MHz			QPSK	25		
8	5MHz			16QAM	8		
9	5MHz			16QAM	25		
10	10MHz				1		
11	10MHz			QPSK	12		
12	10MHz			QPSK	50		
13	10MHz			16QAM	12		
14	10MHz			16QAM	50		
 Note 1: The Configuration ID will be used to map the applicable Test Configuration to the corresponding Test Requirement in clause 6.2.4B.5 as not all combinations are necessarily required based on the applicability of the UE. Note 2: The RB_{start} of partial RB allocation shall be RB# 0 and RB# (max +1 - RB allocation) of the channel bandwidth. 							

Table 6.2.4B.4.1-8: Test Configuration Table (network signalled value "NS_11")
Initial Conditions						
Test Environm	ient					
(as specified i	n TS 36.508 [7]	clause 4.1)		NC		
Test Frequence	cies					
(as specified in	n TS 36.508 [7]	clause 4.3.1)		Mid range		
Test Channel	Bandwidths					
(as specified i	115 30.506 [7]	Tost Paramet	ore for Channe	I.4 IVI⊓Z, 3 IVI⊓ A Bandwidths		
		Test Farallet				-
		Downlink Co	onfiguration	Upl	ink Configurat	tion
TestNumber	Ch BW	Mod'n	RB	Mod'n	RB	RBstart FDD
			allocation		allocation	
					FDD	
1	1.4 MH z	N/A for A-N	IPR testing.	QPSK	1	0
2	1.4 MH z			QPSK	6	0
3	1.4 MH z			QPSK	1	1
4	1.4 MH z			QPSK	5	1
5	1.4 MH z			16QAM	6	0
6	3 MH z			QPSK	4	0
7	3 MH z			QPSK	6	0
8	3 MH z			QPSK	4	4
9	3 MH z			QPSK	6	4
10	3 MH z			16QAM	15	0
11	5 MH z			QPSK	8	0
12	5 MH z			QPSK	15	0
13	5 MH z			QPSK	8	7
14	5 MH z			QPSK	15	7
15	5 MH z			16QAM	25	0

Table 6.2.4B.4.1-9: Test Configuration Table (network signalled value "NS_12")

Table 6.2.4B.4.1-10: Test Configuration Table (network signalled value "NS_13")

Initial Conditions							
Test Environm (as specified i	nent n TS 36.508 [7]	clause 4.1)		NC			
Test Frequencies (as specified in TS 36.508 [7] clause 4.3.1)				Mid range			
Test Channel Bandwidths (as specified in TS 36.508 [7] clause 4.3.1)			5 MHz				
Test Parameters for Channel Bandwidths							
		Downlink C	onfiguration	Uplink Configuration			
Test Number	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation FDD	RBstart FDD	
1	5 MH z	N/A for A-N	/IPR testing.	QPSK	1	0	
2	5 MH z			QPSK	25	0	
3	5 MH z			QPSK	15	0	
4	5 MH z			QPSK	15	7	
5	5 MHz			16QAM	25	0	

		Ir	nitial Condition	าร		
Test Environm (as specified i	ient n TS 36.508 [7]	clause 4.1)		NC		
Test Frequence (as specified in	cies n TS 36.508 [7]	clause 4.3.1)		Mid range		
Test Channel Bandwidths (as specified in TS 36.508 [7] clause 4.3.1)			10 MHz, 15 M	Hz		
		Test Paramete	ers for Channe	el Bandwidths		
		Downlink Co	onfiguration	Upl	ink Configurat	tion
Test Number	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation FDD	RBstart FDD
1	10 MHz	N/A for A-N	IPR testing.	QPSK	1	0
2	10 MHz			QPSK	25	0
3	10 MHz			QPSK	50	0
4	10 MHz			QPSK	25	1
5	10 MHz			16QAM	50	0
6	15 MHz			QPSK	8	0
7	15 MHz			QPSK	25	0
8	15 MHz			QPSK	75	0
9	15 MHz			QPSK	50	15
10	15 MHz			16QAM	75	0

Table 6.2.4B.4.1-11: Test Configuration Table (network signalled value "NS_14")

Initial Conditions						
Test Environment	26 509 [7] 0					
(as specified in 15 36.506 [7] subclause 4.1)						
Test Frequencies				NC For 1.4 MHz Ch	annel Bandwid	th: High
(as specified in TS	36.508 [7] sı	ubclause 4.3.1)	range For 3 MHz Cha MHz (N _{UL} = 269	nnel Bandwidth 985) or High ran	: UL 843.5 ge
				For 5 MHz Cha MHz (N_{UL} = 269 For 10 MHz Ch MHz (N_{UL} = 269 For 15 MHz Ch MHz (N_{UL} = 269	nnel Bandwidth 975) or High ran annel Bandwidt 950) or High ran annel Bandwidt 925) or High rang	: UL 842.5 ge h: UL 840 ge h: UL 837.5 ge
Test Channel Ban	dwidths		1			
(as specified in 15	0 30.508 [7] S	ubclause 4.3.1)			
	-	Fost Paramote	ors for Channel	1.4 MHz, 3 MH	z, 5 MHz, 10 MH	lz, 15 MHz
		Downlink C		Uplir	k Configuratio	n
Configuration	Ch BW	Mod'n	RB	Mod'n	RB	RBstart
ĪD			allocation		allocation FDD	FDD
1 (note 3)	1.4 MH z		I	QPSK	4	0
2 (note 3)	1.4 MHz			16QAM	6	0
3 (note 3)	3 MH z	N/A for A-N	/IPR testing.	QPSK	6	7
4 (note 3)	3 MH z			QPSK	12	1
5 (note 3)	3 MH z			16QAM	15	0
6 (note 2)	3 MH z			QPSK	15	0
7 (note 3)	5 MH z			QPSK	6	14
8 (note 3)	5 MH z			QPSK	20	0
9 (note 3)	5 MH z			16QAM	25	0
10 (note 2)	5 MHz			QPSK	16	9
11 (note 2)	5 MHz			QPSK	25	0
12 (note 3)	10 MHz			QPSK	1	39
13 (note 3)	10 MHz			QPSK	1	10
14 (note 3)	10 MHz			QPSK	3	0
15 (note 3)	10 MHz			QPSK	20	3
16 (note 3)	10 MHz			QPSK	36	1
17 (note 3)	10 MHz			QPSK	50	0
18 (note 1, 3)	10 MHz			16QAM	50	0
19 (note 2)	10 MHz			QPSK	20	25
20 (note 2)	10 MHz			QPSK	45	0
21 (note 3)	15 MHz			QPSK	18	36
22 (note 3)	15 MHz			QPSK	25	1
23 (note 3)	15 MHz			QPSK	54	0
24 (note 1, 3)	15 MHz			16QAM	75	0
25 (note 2)	15 MHz			QPSK	18	44

Table 6.2.4B.4.1-12: Test Configuration Table (network signalled value "NS_15")

26 (note 2	:) 15 MHz		QPSK	60	2
Note 1: Ap	plies only for UE	Categories ≥2.			
Note 2: Ap	2: Applicable only test frequency < high range				
Note 3: Ap	3: Applicable only to high range frequency testing				

		In	itial Condition	s		
Test Environme (as specified in	nt TS 36.508 [7] :	subclause 4.1)				
Test Frequencia	26			NC		
(as specified in	TS36.508 [7] s	ubclause 4.3.1	1)	range		
				For 3 MHz Ch range, 810 MH	annel Bandwid Hz (N _{UL} = 27070	th: Low))
				For 5 MH z Ch range, 811 MH	annel Bandwid Hz (N _{UL} = 27080	th: Low)), 814.5 MHz
				For 10 MHz C range, 813.5 I	hannel Bandwi MHz (N _{UL} = 271)	dth: Low 05), 817 MHz
7 . 01				(N _{UL} = 27140)		
(as specified in	andwidths TS 36.508 [7] :	subclause 4.3.	1)	1.4 MHz, 3 MH	Hz, 5 MHz, 10 I	ИНz
	-	Test Paramete	ers for Channe	I Bandwidths		
		Downlink C	onfiguration	Upl	ink Configurat	ion
Configuration ID	Ch BW	Mod'n	RB allocation	Mod'n	RB allocation FDD	RBstart FDD
1	1.4 MHz	N/A for A-N	PR testing.	QPSK	1	0
2	1.4 MHz			QPSK	6	0
3	1.4 MHz	-		16QAM	6	0
4	3 MHz	-		QPSK	1	0
5	3 MHz			QPSK	12	1
62	3 MHz			QPSK	15	0
7	3 MH z			16QAM	15	0
8	5 MHz			QPSK	1	0
95	5 MH z			QPSK	12	2
10	5 MHz			QPSK	18	2
11	5 MH z			QPSK	20	0
12	5 MHz			QPSK	20	2
13	5 MHz			QPSK	25	0
14	5 MHz			16QAM	25	0
15	10 MHz			QPSK	1	0
16 (Note 2)	10 MHz			QPSK	1	10

Table 6.2.4B.4.1-13: Test Configuration Table (network signalled value "NS_16")

17 (Note 2)	10 MHz		QPSK	20	0
18 (Note 2)	10 MHz		QPSK	27	15
19 (Note 2)	10 MHz		QPSK	32	15
20	10 MHz		QPSK	32	0
21	10 MHz		QPSK	50	0
22 (Note 1)	10 MHz		16QAM	50	0
23 (Note 3)	10 MHz		QPSK	40	0
24 (Note 3)	10 MHz		QPSK	40	1
Note 1:Applies only for UE-Categories ≥2.Note 2:Applies only for 10 MHz channel for Low Range, and 813.5 MHzNote 3:Applies only for 10 MHz channel for 817 MHz range					

Table 6.2.4B.4.1-14: Test Configuration Table (network signalled value "NS_20")

TBD

Editor's note: The following lines belong at the end of section 6.2.4B.4.1. As new tables are added to this section, these lines should always follow the tables.

- 1. Connect the SS to the UE antenna connectors as shown in Figure TS 36.508 [7] Annex A, Figure A.3.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] clause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channels are set according to the applicable table from Table 6.2.4.4.1-1 to Table 6.2.4.4.1-6.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.2.4.4.3.

6.2.4B.4.2 Test procedure

- 1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to the applicable table from Table 6.2.4B.4.1-1 to Table 6.2.4B.4.1-6. Since the UE has no payload data to send, the UE transmits uplink MAC padding bits on the UL RMC.
- 2. Send continuously uplink power control "up" commands in the uplink scheduling information to the UE until the UE transmits at P_{UMAX} level.
- 3. Measure the output power for UE in the channel bandwidth of the radio access mode. The period of measurement shall be at least the continuous duration one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.4B.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6, with the following exceptions for each network signalled value.

6.2.4B.4.3.1 Message contents exceptions (network signalled value "NS_03")

1. Information element additionalSpectrumEmission is set to NS_03. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.1-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_03"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element	Value/remark	Comment	Condition		
additionalSpectrumEmission	3 (NS_03)				

6.2.4B.4.3.2 Message contents exceptions (network signalled value "NS_04")

1. Information element additionalSpectrumEmission is set to NS_04. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.2-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_04"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element	Value/remark	Comment	Condition		
additionalSpectrumEmission	4 (NS_04)				

6.2.4B.4.3.3 Message contents exceptions (network signalled value "NS_05")

1. Information element additionalSpectrumEmission is set to NS_05. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.3-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_05"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element	Value/remark	Comment	Condition		
additionalSpectrumEmission	5 (NS_05)				

6.2.4B.4.3.4 Message contents exceptions (network signalled value "NS_06")

1. Information element additionalSpectrumEmission is set to NS_06. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.4-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_06"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element	Value/remark	Comment	Condition		
additionalSpectrumEmission	6 (NS_06)				

6.2.4B.4.3.5 Message contents exceptions (network signalled value "NS_07")

1. Information element additionalSpectrumEmission is set to NS_07. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.5-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_07"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element	Value/remark	Comment	Condition		
additionalSpectrumEmission	7 (NS_07)				

6.2.4B.4.3.6 Message contents exceptions (network signalled value "NS_08")

Table 6.2.4B.4.3.6-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_08"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element Value/remark Comment Cond					
additionalSpectrumEmission	8 (NS_08)				

6.2.4B.4.3.7 Message contents exceptions (network signalled value "NS_09")

1. Information element additionalSpectrumEmission is set to NS_09. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.7-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_09"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element Value/remark Comment Condition					
additionalSpectrumEmission	9 (NS_09)				

6.2.4B.4.3.8 Message contents exceptions (network signalled value "NS_11")

1. Information element additionalSpectrumEmission is set to NS_11. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.8-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_11"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element Value/remark Comment Condition					
additionalSpectrumEmission	11 (NS_11)				

6.2.4B.4.3.9 Message contents exceptions (network signalled value "NS_12")

1. Information element additionalSpectrumEmission is set to NS_12. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.9-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_12"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element Value/remark Comment Cor					
additionalSpectrumEmission	12 (NS_12)				

^{1.} Information element additionalSpectrumEmission is set to NS_08. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

6.2.4B.4.3.10 Message contents exceptions (network signalled value "NS_13")

1. Information element additionalSpectrumEmission is set to NS_13. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.10-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_13"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element Value/remark Comment Condi					
additionalSpectrumEmission	13 (NS_13)				

6.2.4B.4.3.11 Message contents exceptions (network signalled value "NS_14")

1. Information element additionalSpectrumEmission is set to NS_14. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.11-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_14"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element Value/remark Comment Condition					
additionalSpectrumEmission	14 (NS_14)				

6.2.4B.4.3.12 Message contents exceptions (network signalled value "NS_15")

1. Information element additionalSpectrumEmission is set to NS_15. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.12-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_15"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element Value/remark Comment Condi					
additionalSpectrumEmission	15 (NS_15)				

6.2.4B.4.3.13 Message contents exceptions (network signalled value "NS_16")

1. Information element additionalSpectrumEmission is set to NS_16. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.13-1: SystemInformationBlockType2: Additional spurious emissions test requirement for "NS_16"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1					
Information Element Value/remark Comment Condi					
additionalSpectrumEmission	16 (NS_16)				

6.2.4B.4.3.14 Message contents exceptions (network signalled value "NS_20")

1. Information element additionalSpectrumEmission is set to NS_20. This can be set in the *SystemInformationblockType2* as part of the cell broadcast message. This exception indicates that the UE shall meet the additional spurious emission requirement for a specific deployment scenario.

Table 6.2.4B.4.3.14-1: SystemInformationBlockType2: Additional spurious emissions test
requirement for "NS_20"

Derivation Path: TS 36.508 [7] clause 4.4.3.3, Table 4.4.3.3-1						
Information Element	Comment	Condition				
additionalSpectrumEmission						

6.2.4B.5 Test requirements

The maximum output power, derived in step 2 shall be within the range prescribed by the nominal maximum output power and tolerance in the applicable table from Table 6.2.4B.5-1 to Table 6.2.4B.5-15. The allowed A-MPR values specified in Table 6.2.4B.3-1 are in addition to the allowed MPR requirements specified in clause 6.2.3B. For the UE maximum output power modified by MPR and/or A-MPR, the power limits specified in Table 6.2.5B.3-1 apply.

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	4,10,					23	+2.7 /
2	4,10,					23	+2.7 /
3	4,10,					23	+2.7 /
4	4,10,					23	2.7 /
5	4,10,					23	+2.7 /
6	4,10,					23	+2.7 /
7	4,10,					23	+2.7 /
8	4,10,					23	-3.7 2.7 / -4 7
9	4,10,					23	+2.7 /
10	4,10,					23	+2.7 /
11	4,10,					23	+2.7 /
12	4,10,					23	2.7 /
13	4,10,					23	2.7 /
14	4,10,					23	+2.7 /
15	4,10, 23.35.36					23	+2.7 /
16	4,10, 23,35,36					23	+2.7 /
17	4,10, 23.35.36					23	2.7 /
18	4,10,35,36					23	2.7 / -4.7
19	4,10,35,36					23	+2.7 / -3.7
20	4,10,35,36					23	+2.7 / -2.7
21	4,10,35,36					23	+2.7 / -6.2
22	4,10,35,36					23	2.7 / -4.7
23	4,10,35,36					23	2.7 / -4.7
24	4,10,35,36					23	+2.7 / -3.7
25	4,10,35,36					23	+2.7 / -2.7
26	4,10,35,36					23	+2.7 / -6.2
27	4,10,35,36					23	2.7 / -4.7

Table 6.2.4B.5-1: UE Power Class test requirements (network signalled value "NS_03")(for Bands 4, 10, 23, 35, and 36)

Configuration	EUTRA	Test	Class	Tol.	Class	Tol.	Class	Tol.
ID	band	Freq.	1 (dBm)	(dB)	2 (dBm)	(dB)	3 (dBm)	(dB)
1	2, 25	Mid					23	+2.7 / -3.7
1	2, 25	Low, High					23	+2.7 / -5.7
2	2, 25	Mid					23	+2.7 /
2	2, 25	Low, High					23	+2.7 /
3	2, 25	Mid					23	+2.7 /
3	2, 25	Low, High					23	+2.7 /
4	2, 25	Mid					23	+2.7 /
4	2, 25	Low, High					23	+2.7 /
5	2, 25	Mid					23	+2.7 /
5	2, 25	Low, High					23	+2.7 /
6	2, 25	Mid					23	+2.7 /
6	2, 25	Low, High					23	+2.7 /
7	2, 25	Mid					23	+2.7 /
7	2, 25	Low, High					23	+2.7 /
8	2, 25	All					23	+2.7 /
9	2, 25	Low @ RB#(max+1-RB allocation), Mid					23	+2.7 / -3.7
		High @ RB#0						
9	2, 25	Low @ RB#0, High @ RB#(max+1-RB allocation)					23	+2.7 / -5.7
10	2, 25	Low @ RB#(max+1-RB allocation), Mid, High @ RB#0					23	+2.7 / -2.7
10	2, 25	Low @ RB#0, High @ RB#(max+1-RB allocation)					23	+2.7 / -4.2
11	2, 25	All					23	+2.7 / -6.2
12	2, 25	Low @ RB#(max+1-RB allocation), Mid, High @ RB#0					23	+2.7 / -4.7
12	2, 25	Low @ RB#0, High @ RB#(max+1-RB allocation)					23	+2.7 / -7.7
13	2, 25	All					23	+2.7 / -4.7
14	2, 25	Low @ RB#(max+1-RB allocation), Mid, High @ RB#0					23	+2.7 / -3.7
14	2, 25	Low @ RB#0, High @ RB#(max+1-RB					23	+2.7 / -5.7

Table 6.2.4B.5-2: UE Power Class test requirements (network signalled value "NS_03")(for Bands 2 and 25)

		allocation)						
15	2, 25	Low @ RB#(max+1-RB					23	+2.7 /
		allocation),						-2.7
		Mid,						
15	2.25	Hign @ RB#0						107/
15	2,25	LOW @ RD#U, High @ PB#(may+1-PB					23	+2.17
		allocation)						-4.2
16	2 25	All					23	+27/
10	2,20	,					20	-6.2
17	2,25	Low @ RB#(max+1-RB					23	+2.7 /
		allocation),						-4.7
		Mid,						
		High @ RB#0						
17	2, 25	Low @ RB#0,					23	+2.7 /
		High @ RB#(max+1-RB						-/./
10	0.05	allocation)					00	.07/
18	2,25	All					23	+2.77
19	2 25	Low @ RB#(max+1-RB					23	+27/
10	2,20	allocation).					20	-3.7
		Mid,						
		High @ RB#0						
19	2, 25	Low @ RB#0,					23	+2.7 /
		High @ RB#(max+1-RB						-5.7
	0.05	allocation)					00	.07/
20	2,25	LOW @ RB#(max+1-RB					23	+2.77
		Mid						-2.1
		High @ RB#0						
20	2,25	Low @ RB#0,					23	+2.7 /
		High @ RB#(max+1-RB						-4.2
		allocation)						
21	2, 25	All					23	+2.7 /
	0.05						00	-6.2
22	2,25	LOW @ RB#(max+1-RB					23	+2.1 /
		Mid						-4.7
		High @ RB#0						
22	2,25	Low @ RB#0,					23	+2.7 /
	,	High @ RB#(max+1-RB						-7.7
		allocation)						
23	2, 25	All					23	+2.7 /
	0.05	A11						-4.7
24	2,25	All					23	+2.7 /
25	2 25	Low @ RB#(max+1-RB					23	+27/
20	2,20	allocation).					20	-2.7
		Mid.						
		High @ RB#0						
25	2, 25	Low @ RB#0,					23	+2.7 /
		High @ RB#(max+1-RB						-4.2
		allocation)						
26	2,25	All					23	+2.7 /
07	2.05	ΔΠ					22	-0.2
21	2,20	All					23	+2.1 /
1	1	1	1	1	1	1		7.7

Table 6.2.4B.5-3: UE Power	Class test requirements	(network signalled value	"NS 04")
	olabo to ot lo quil o illo llo	(nothonk orginaliou faluo	110_04 /

Configuration	EUTRA	Bandwidth	Class 3	Tol. (dB)
ID	band	(MHz)	(dBm)	
1	41	5 MHz	23	+2.7 / -4.7
2	41	5 MHz	23	+2.7 /
3	41	5 MHz	23	+2.7 /
4	41	5 MHz	23	+2.7 /
5	41	5 MHz	23	+2.7 /
6	41	10MHz	23	+2.7 /
7	41	10MHz	23	+2.7 /
8	41	10MHz	23	+2.7 /
9	41	10MHz	23	+2.7 /
10	41	10MHz	23	+2.7 /
11	41	10MHz	23	+2.7 /
12	41	10MHz	23	+2.7 /
13	41	10MHz	23	+2.7 /
14	41	10MHz	23	-6.2 +2.7 /
15	41	15MHz	23	-6.2 +2.7 /
16	41	15MHz	23	-6.2
17	41	15MHz	23	-6.2
18	41	15MHz	23	-8.2
19	41	15MHz	23	-9.7 +2.7 /
20	41	15MHz	23	-3.7
21	41	15MHz	23	-4.7 +2.7 /
22	41	15MHz	23	-6.2 +2.7 /
23	41	15MHz	23	-8.2
24	41	20MHz	23	-6.2
25	41	20MHz	23	-6.2 +2.7 /
26	41	20MHz	23	-6.2 +2.7 /
27	41	20MHz	23	-8.2 +2.7/
28	41	20MHz	23	-9.7 +2.7 /
29	41	20MHz	23	-3.7 +2.7 /
30	41	20MHz	23	-4.7 +2.7 /
31	41	20MHz	23	-6.2 +2.7 /
32	41	20MHz	23	-8.2 +2.7 /

		-6.2

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Table 6.2.4B.5-4: UE Power Class test requirements (network signalled value "NS_05")

Configuration	EUTRA	Class 1	Tol. (dB)	Class 2	Tol.	Class 3	Tol. (dB)
ID	band	(dBm)		(dBm)	(dB)	(dBm)	
1	1					23	+2.7 /
							-2.7
2	1					23	+2.7 /
							-3.7
3	1					23	+2.7 /
							-2.7
4	1					23	+2.7 /
							-2.7
5	1					23	+2.7 /
	-						-3.7
6	1					23	+2.7 /
_	-						-4.7
7	1					23	+2.7 /
							-6.2
8	1					23	+2.7/
	4					00	-2.7
9	1					23	+2.7 /
10	4					00	-2.1
10	1					23	+2.7 /
11	1					22	-3.7
11	I					23	+2.7 /
12	1					22	-4./
12	I					23	-6.2
13	1					23	-0.2 +2.7 /
10	I					20	-27
14	1					23	+27/
17	I					20	-27
15	1					23	+27/
	•					20	-3.7
16	1					23	+2.7 /
	-						-4.7
17	1					23	+2.7 /
							-6.2

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	13,14,17					23	+2.7 /
							-3.7
2	13,14,17					23	+2.7 /
-							-2.7
3	13,14,17					23	+2.7 /
1	121417					22	-2.1
4	13,14,17					23	+2.77
5	13 14 17					23	+27/
Ŭ	10,11,17					20	-2.7
6	13,14,17					23	+2.7 /
							-3.7
7	13,14,17					23	+2.7 /
							-3.7
8	13,14,17					23	+2.7 /
-							-2.7
9	13,14,17					23	+2.7 /
10	40 4 4 4 7					00	-3.7
10	13,14,17					23	+2.77
11	13 14 17					23	-3.7
	10,14,17					20	-2.7
12	13.14.17					23	+2.7 /
	, ,						-3.7
13	13,14,17					23	+2.7 /
							-3.7
14	13,14,17					23	+2.7 /
							-2.7
15	13,14,17					23	+2.7 /
40	101117						-3.7
16	13,14,17					23	+2.1 /
17	131/17					23	-3.1 ±2.7 /
17	13,14,17					20	-27
18	13 14 17					23	+27/
						20	-3.7

Table 6.2.4B.5-5: UE Power Class test requirements (network signalled value "NS_06") (for Bands 13, 14, and 17)

Configuration	EUTRA	Test	Class 1	Tol.	Class 2	Tol.	Class 3	Tol. (dB)
ID	band	Freq.	(dBm)	(dB)	(dBm)	(dB)	(dBm)	
1	12	Mid					23	+2.7 /
								-3.7
1	12	Low, High					23	+2.7 /
-								-5.7
2	12	Mid					23	+2.7 /
	4.0							-2.7
2	12	Low, High					23	+2.7/
	10							-4.2
3	12	IVIIC					23	+2.77
2	10	Low High					22	-2.1
5	12	LOW, HIGH					23	-12
1	12	Mid					23	- 7 .2
4	12	IVIIG					23	-37
4	12	Low High					23	+27/
•		2011, 1 igit					20	-5.7
5	12	Mid					23	+2.7 /
-							_	-2.7
5	12	Low, High					23	+2.7 /
								-4.2
6	12	Mid					23	+2.7 /
								-3.7
6	12	Low, High					23	+2.7 /
								-5.7
7	12	All					23	+2.7 /
								-3.7
8	12	Low @ RB#(max+1-					23	+2.7 /
		RB allocation),						-2.7
		Mid,						
0	10	Hign @ RB#0					22	107/
0	12	LOW @ RD#0,					23	+2.77
		PB allocation)						-4.2
9	12	Low @ RB#(max+1-					23	+27/
5	12	RB allocation)					20	-3.7
		Mid.						0.1
		High @ RB#0						
9	12	Low @ RB#0,					23	+2.7 /
		High @ RB#(max+1-						-5.7
		RB allocation)						
10	12	All					23	+2.7 /
								-3.7
11	12	Low @ RB#(max+1-					23	+2.7 /
		RB allocation),						-2.7
		Mid,						
4.4	10	Hign @ RB#0						.07/
11	12						23	+2.77
		High @ RB#(max+1-						-4.2
12	12						23	+27/
12	12	BB allocation)					23	-3.7
		Mid						0.7
		High @ RB#0						
12	12	Low @ RB#0.					23	+2.7 /
		High @ RB#(max+1-					_	-5.7
		RB allocation)						

Table 6.2.4B.5-6: UE Power Class test requirements (network signalled value "NS_06")(for Band 12)

Configuration	EUTRA	Class 1	Tol. (dB)	Class 2	Tol.	Class 3	Tol. (dB)
ID	band	(dBm)		(dBm)	(dB)	(dBm)	
1	13					23	+2.7 /
							-18.7
2	13					23	+2.7 /
							-13.7
3	13					23	+2.7 /
							-2.7
4	13					23	+2.7 /
							-19.7
5	13					23	+2.7 /
							-18.7
6	13					23	+2.7 /
							-20.7
7	13					23	+2.7 /
							-3.7
8	13					23	+2.7 /
							-2.7
9	13					23	+2.7 /
							-4.7
10	13					23	+2.7 /
							-12.7
11	13					23	+2.7/
							-13.7
12	13					23	+2.7 /
10	10						-2.7
13	13					23	+2.07
4.4	10					00	-5.5±11
14	13					23	+2.//
15	10					22	-19.7
10	13					23	+2.1 /
16	10					22	-10./
01	13					23	+2.1 /
							-20.7

Table 6.2.4B.5-7: UE Power Class test requirements (network signalled value "NS_07")

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	19					23	+2.7 / -2.7
2	19					23	+2.7 / -2.7
3	19					23	+2.7 / -3.7
4	19					23	+2.7 / -2.7
5	19					23	+2.7 / -2.7
6	19					23	+2.7 / -3.7
7	19					23	+2.7 / -8.2
8	19					23	+2.7 / -9.7
9	19					23	+2.7 / -2.7
10	19					23	+2.7 / -2.7
11	19					23	+2.7 / -3.7
12	19					23	+2.7 / -8.2
13	19					23	+2.7 / -9.7

Table 6.2.4B.5-8: UE Power Class test requirements (network signalled value "NS_08")

Table 6.2.4B.5-9: UE Power Class test requirements (network signalled value "NS_09")

Configuration	EUTRA	Class 1 (dBm)	Tol. (dB)	Class 2	Tol.	Class 3	Tol. (dB)
	Daliu	(ubiii)		(ubiii)	(ub)	(ubili)	07/
1	21					23	+2.7 /
2	21					22	127/
2	21					23	-2.7
3	21					23	+27/
Ŭ						20	-3.7
4	21					23	+2.7 /
							-2.7
5	21					23	+2.7 /
							-2.7
6	21					23	+2.7 /
							-3.7
7	21					23	+2.7 /
							-4.7
8	21					23	+2.7 /
							-6.2
9	21					23	+2.7 /
							-2.7
19	21					23	+2.7 /
							-2.7
11	21					23	+2.7 /
							-3.7
12	21					23	+2.7 /
							-4.7
13	21					23	+2.7 /
							-6.2
14	21					23	+2.7 /
							-8.2

Configuration	EUTRA	Centre Frequency	Class 1	Tol.	Class 2	Tol.	Class 3	Tol. (dB)
ID	band		(dBm)	(dB)	(dBm)	(dB)	(dBm)	
1a	23	UL 2001.5 MHz						+2.7 /
		DL 2181.5 MHz						-11.7
1b	23	UL 2004.5 MHz						+2.7 /
		DL 2184.5 MHz						-4.7
2a	23	UL 2001.5 MHz						+2.7 /
		DL 2181.5 MHz						-11.7
2b	23	UL 2004.5 MHz						+2.7 /
		DL 2184.5 MHz						-4.7
3a	23	UL 2001.5 MHz						+2.7 /
		DL 2181.5 MHz						-12.7
3b	23	UL 2004.5 MHz						+2.7/
	_	DL 2184.5 MHz						-6.2
4a	23	UL 2001.5 MHz						+2.7/
		DL 2181.5 MHz						-12.7
4h	23	UL 2004 5 MHz						+27/
15	20	DL 2184.5 MHz						-6.2
5a	23							+27/
54	20	DL 2182 5 MHz						-12.7
55	23							+27/
50	20	DL 2184 5 MHz						-8.2
50								-0.2
50	23							72.17
0	00							-2.1
6a	23	UL 2002.5 MHZ						+2.77
01								-12.7
60	23	UL 2004.5 MHz						+2.7/
		DL 2184.5 MHz						-2.7
6C	23	UL 2007.5 MHz						+2.7/
		DL 2187.5 MHz						-3.7
7a	23	UL 2002.5 MHz						+2.7 /
		DL 2182.5 MHz						-13.7
7b	23	UL 2004.5 MHz						+2.7 /
		DL 2184.5 MHz						-9.7
7c	23	UL 2007.5 MHz						+2.7 /
		DL 2187.5 MHz						-4.7
8a	23	UL 2002.5 MHz						+2.7 /
		DL 2182.5 MHz						-13.7
8b	23	UL 2004.5 MHz						+2.7 /
		DL 2184.5 MHz						-3.7
8c	23	UL 2007.5 MHz						+2.7 /
		DL 2187.5 MHz						-4.7
9a	23	UL 2002.5 MHz						+2.7 /
		DL 2182.5 MHz						-14.7
9b	23	UL 2004.5 MHz						+2.7/
	_	DL 2184.5 MHz						-11.7
90	23	UL 2007 5 MHz						+27/
00	20	DL 2187 5 MHz						-6.2
10	23	UI 2005 MH7						+27/
	20							-187
11	22			-				±27/
	23							TZ.//
10	22							-10./
12	23							+2.//
40								-19.7
13	23							+2.//
	00						ļ	-19.7
14	23	UL 2005 MHZ						+2.//
1	1	DL 2185 MHz	1	1	1	1	1	-20.7

Table 6.2.4B.5-10: UE Power Class test requirements (network signalled value "NS_11 for Band 23")

Configuration	EUTRA	Class 1	Tol. (dB)	Class 2	Tol.	Class 3	Tol. (dB)
ID	band	(dBm)		(dBm)	(dB)	(dBm)	
1	26					23	+2.7 /
							-6.2
2	26					23	+2.7 /
							-12.7
3	26					23	+2.7 /
							-2.7
4	26					23	+2.7 /
							-6.2
5	26					23	+2.7 /
							-13.7
6	26					23	+2.7 /
							-8.2
7	26					23	+2.7 /
							-8.2
8	26					23	+2.7 /
							-2.7
9	26					23	+2.7 /
							-8.2
10	26					23	+2.7 /
							-11.7
11	26					23	+2.7 /
							-9.7
12	26					23	+2.7 /
10							-8.2
13	26					23	+2.7 /
4.4	00					00	-2.7
14	26					23	+2.//
45	00						-8.2
15	26					23	+2.7 /
					1		-9.7

Table 6.2.4B.5-11: UE Power Class test requirements (network signalled value "NS_12")

Table 6.2.4B.5-12: UE Power C	lass test requirements (network	signalled value	"NS_13")
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Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	26					23	+2.7 / -6.2
2	26					23	+2.7 / -6.2
3	26					23	+2.7 / -3.7
4	26					23	+2.7 / -3.7
5	26					23	+2.7 / -8.2

Configuration	EUTRA	Class 1	Tol. (dB)	Class 2	Tol.	Class 3	Tol. (dB)
ID	band	(dBm)		(dBm)	(dB)	(dBm)	
1	26					23	+2.7 /
							-6.2
2	26					23	+2.7 /
							-3.7
3	26					23	+2.7 /
							-4.7
4	26					23	+2.7 /
							-3.7
5	26					23	+2.7 /
							-6.2
6	26					23	+2.7 /
							-6.2
7	26					23	+2.7 /
							-3.7
8	26					23	+2.7 /
							-4.7
9	26					23	+2.7 /
							-3.7
10	26					23	+2.7 /
							-6.2

Table 6.2.4B.5-13: UE Power Class test requirements (network signalled value "NS_14")

Table 6.2.4B.5-14: UE Power Class test requirements (network signalled value "NS_15")

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	26					23	+2.7 / -3.2
2	26					23	+2.7 / -8.2
3	26					23	+2.7 / -4.2
4	26					23	+2.7 / -8.2
5	26					23	+2.7 / -14.2
6	26					23	+2.7 / -4.2
7	26					23	+2.7 / -3.2
8	26					23	+2.7 / -9.2
9	26					23	+2.7 / -14.2
10	26					23	+2.7 / -4.2
11	26					23	+2.7 / -6.2
12	26					23	+2.7 / -12.2
13	26					23	+2.7 / -7.2
14	26					23	+2.7 / -3.2
15	26					23	+2.7 / -4.2
16	26					23	+2.7 / -8.2
17	26					23	+2.7 / -3.2
18	26					23	+2.7 / -12.2
19	26					23	+2.7 / -4.2
20	26					23	+2.7 / -8.2
21	26					23	+2.7 / -3.2
22	26					23	+2.7 / -4.2
23	26					23	+2.7 / -9.2
24	26					23	+2.7 / -14.2
25	26					23	+2.7 / -3.2
26	26					23	+2.7 / -9.2

Configuration ID	EUTRA band	Class 1 (dBm)	Tol. (dB)	Class 2 (dBm)	Tol. (dB)	Class 3 (dBm)	Tol. (dB)
1	27					23	+2.7 / -2.7
2	27					23	+2.7 / -3.7
3	27					23	+2.7 / -4.7
4	27					23	+2.7 / -2.7
5	27					23	+2.7 / -4.7
6	27					23	+2.7 / -6.2
7	27					23	+2.7 / -8.2
8	27					23	+2.7 / -9.7
9	27					23	+2.7 / -4.7
10	27					23	+2.7 / -6.2
11	27					23	+2.7 / -11.7
12	27					23	+2.7 / -8.2
13	27					23	+2.7 / -11.7
14	27					23	+2.7 / -12.7
15	27					23	+2.7 / -9.7
16	27					23	+2.7 / -2.7
17	27					23	+2.7 / -8.2
18	27					23	+2.7 / -4.7
19	27					23	+2.7 / -8.2
20	27					23	+2.7 / -13.7
21	27					23	+2.7 / -13.7
22	27					23	+2.7 / -14.7
23	27					23	+2.7 / -13.7
24	27					23	+2.7 / -13.7

Table 6.2.4B.5-15A: UE Power Class test requirements (network signalled value "NS_16") when lower channel edge is at 807 MHz

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Table 6.2.4B.5-15B: UE Power Class test requirements (network signalled value "NS_16") when lower channel edge is at 808.5 MHz

Configuration	EUTRA	Class 1	Tol. (dB)	Class 2	Tol.	Class 3	Tol. (dB)
ID	band	(dBm)		(dBm)	(dB)	(dBm)	
1	27					23	+2.7 / -2.7
2	27					23	+2.7 / -3.7
3	27					23	+2.7 / -5.2
4	27					23	+2.7 / -2.7
5	27					23	+2.7 / -3.7
6	27					23	+2.7 / -3.7
7	27					23	+2.7 / -4.7
8	27					23	+2.7 / -2.7
9	27					23	+2.7 / -3.7
10	27					23	+2.7 / -4.7
11	27					23	+2.7 / -6.2
12	27					23	+2.7 / -6.2
13	27					23	+2.7 / -8.2
14	27					23	+2.7 / -9.7
15	27					23	+2.7 / -9.7
16	27					23	+2.7 / -2.7
17	27					23	+2.7 / -6.2
18	27					23	+2.7 / -4.7
19	27					23	+2.7 / -4.7
20	27					23	+2.7 / -9.7
21	27					23	+2.7 / -11.7
22	27					23	+2.7 / -12.7
23	27					23	+2.7 / -11.7
24	27					23	+2.7 / -11.7

Configuration	EUTRA	Class 1	Tol. (dB)	Class 2	Tol.	Class 3	Tol. (dB)
ID	band	(dBm)		(dBm)	(dB)	(dBm)	
1	27					23	+2.7 / - 2.7
2	27					23	+2.7 / - 3.7
3	27					23	+2.7 / - 4.7
4	27					23	+2.7 / - 2.7
5	27					23	+2.7 / -3.7
6	27					23	+2.7 / -3.7
7	27					23	+2.7 / -4.7
8	27					23	+2.7 / -2.7
9	27					23	+2.7 / -3.7
10	27					23	+2.7 / -3.7
11	27					23	+2.7 / -3.7
12	27					23	+2.7 / -3.7
13	27					23	+2.7 / -3.7
14	27					23	+2.7 / -4.7
15	27					23	+2.7 / -2.7
16	27					23	+2.7 / -2.7
17	27					23	+2.7 / -3.7
18	27					23	+2.7 / -3.7
19	27					23	+2.7 / -3.7
20	27					23	+2.7 / -4.7
21	27					23	+2.7 / -8.2
22	27					23	+2.7 / -9.7
23	27					23	+2.7 / -6.2
24	27					23	+2.7 / -4.7

Table 6.2.4B.5-15C: UE Power Class test requirements (network signalled value "NS_16") when lower channel edge is at 812 MHz

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Table 6.2.4B.5-16: UE Power Class test requirements (network signalled value "NS_20 for Band 23")

TBD

6.2.5 Configured UE transmitted Output Power

6.2.5.1 Test purpose

To verify the UE does not exceed the minimum between the P_{EMAX} maximum allowed UL TX Power signalled by the E-UTRAN and the P_{UMAX} maximum UE power for the UE power class.

6.2.5.2 Test applicability

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

6.2.5.3 Minimum conformance requirements

The UE is allowed to set its configured maximum output power P_{CMAX} . The configured maximum output power P_{CMAX} is set within the following bounds:

$$P_{CMAX_L} \le PCMAX \quad \le P_{CMAX_H}$$

Where

- $P_{CMAX_L} = MIN \{PEMAX \Delta T_C, P_{PowerClass} MAX(MPR + A-MPR + \Delta T_{IB,c}, P-MPR) \Delta T_C \}$
- $P_{CMAX_H} = MIN \{P_{EMAX}, P_{PowerClass}\}$
- P_{EMAX} is the value given to IE *P*-*Max*, defined in [5]
- P_{PowerClass} is the maximum UE power specified in Table 6.2.2.3-1 without taking into account the tolerance specified in the Table 6.2.2.3-1

MRP and A-MPR are specified in Section 6.2.3 and Section 6.2.4, respectively
 ΔT_{IB,c} is the additional tolerance for serving cell *c* as specified in Table 6.2.5A.1.3-3.
 P-MPR is the allowed maximum output power reduction for;

 a) Ensuring compliance with applicable electromagnetic energy absorption requirements and addressing unwanted emissions / self defence requirements in case of simultaneous transmissions on multiple RAT(s) for scenarios not in scope of 3GPP RAN specifications.
 b) Ensuring compliance with applicable electromagnetic energy absorption requirements in case of proximity detection is used to address such requirements that require a lower

The UE shall apply P-MPR only for the above cases. For UE conducted conformance testing P-MPR shall be 0 dB

NOTE 1: P-MPR was introduced in the P_{CMAX} equation such that the UE can report to the eNB the available maximum output transmit power. This information can be used by the eNB for scheduling decisions.

NOTE 2: P-MPR may impact the maximum uplink performance for the selected UL transmission path.

 $\Delta T_{\rm C} = 1.5 \, \text{dB}$ when Note 2 in Table 6.2.2.3-1 applies

 $\Delta T_{C} = 0 dB$ when Note 2 in Table 6.2.2.3-1 does not apply

The measured maximum output power P_{CMAX} shall be within the following bounds:

maximum output power.

 $P_{CMAX_L} - MAX\{T_L, T(P_{CMAX_L})\} \le P_{CMAX} \le P_{CMAX_H} + T(P_{CMAX_H})$

Where $T(P_{CMAX})$ is defined by the tolerance table below and applies to P_{CMAX_L} and P_{CMAX_H} separately, while T_L is the absolute value of the lower tolerance in Table 6.2.2.3-1 for the applicable operating band.

Р _{смах} (dBm)	Tolerance T(P _{СMAX}) (dB)
21 ≤ P _{CMAX} ≤ 23	2.0
20 ≤ P _{CMAX} < 21	2.5
19 ≤ P _{CMAX} < 20	3.5
18 ≤ P _{CMAX} < 19	4.0
13 ≤ P _{CMAX} < 18	5.0
8 ≤ P _{CMAX} < 13	6.0
-40 ≤ P _{CMAX} < 8	7.0

Table 6.2.5.3-1: PCMAX tolerance

The normative reference for this requirement is TS 36.101 [2] clause 6.2.5.

6.2.5.4 Test description

6.2.5.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.2.5.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annex A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Conditions							
Test Environment as specified in Normal, TL/VL, TL/VH, TH/VL, TH/VH							
TS 36.508[7]	subclause 4.1						
Test Frequen	cies as specified in	Mid range					
TS36.508 [7]	subclause 4.3.1						
Test Channel	Bandwidths as specified in	Lowest, 5MH	z, Highest				
TS 36.508 [7]	subdause 4.3.1						
	Test Paramete	ers for Channe	el Bandwidths				
	Downlink Configur	ation	Upli	ink Configurat	tion		
Ch BW	N/A for Configured UE tr	ansmitted	Mod'n	RB allocation			
	Output Power test	case		FDD	TDD		
1.4MHz			QPSK	5	5		
3MHz			QPSK	4	4		
5MHz			QPSK	8	8		
10MHz			QPSK	12	12		
15MHz			QPSK	16	16		
20MHz QPSK 18 18							
Note 1: Test Channel Bandwidths are checked separately for each E-UTRA band, the applicable							
cha	annel bandwidths are specifie	ed in Table 5.4.	.2.1-1.				
Note 2: Fo	r the uplink RB allocation the	RB _{start} shall be	e RB #0.				

Table 6.2.5.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, in Figure A.3.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.2.5.4.1-1
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.2.5.4.3.

6.2.5.4.2 Test procedure

- 1. SS sends uplink scheduling information for each UL HA RQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.2.5.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 2. Send transmit uplink power control "up" commands in every uplink scheduling information to the UE; allow at least 200ms for the UE to reach the Pumax level of the test point.
- 3. Measure the mean power of the UE in the channel bandwidth for each test point in table 6.2.5.5-1 according to the test configuration from Table 6.2.5.4.1-1. The period of measurement shall be at least continuous duration of one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.5.4.3 Message contents

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

Table 6.2.5.4.3-1: SystemInformationBlockType1: Test point 1

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4	4.4.3.2, Table 4.4.3.2-3 System Information Block Type1					
Information Element	Information Element Value/remark Comment Con					
p-Max	-10					

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Derivation Path: IS 36.508 [7] clause 4.4.3.2, Table 4	4.4.3.2, Table 4.4.3.2-3 System Information Block Type1					
Information Element	Value/remark	Comment	Condition			
p-Max	10					

Table 6.2.5.4.3-2: SystemInformationBlockType1: Test point 2

Table 6.2.5.4.3-3: SystemInformationBlockType1: Test point 3

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 System Information Block Type1						
Information Element	Value/remark	Comment	Condition			
p-Max	15					

6.2.5.5 Test requirement

The maximum output power measured shall not exceed the values specified in Table 6.2.5.5-1.

Table 6.2.5.5-1: P_{CMAX} configured UE output power

		Channel bandwidth / maximum output power				
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Measured UE output power test point 1	For carrier frequency f \leq 3.0GHz: -10 dBm \pm 7.7 For carrier frequency 3.0GHz < f \leq 4.2GHz: -10 dBm \pm 8.0					
Measured UE output power test point 2	For carrier frequency f \leq 3.0GHz: 10 dBm ± 6.7 For carrier frequency 3.0GHz < f \leq 4.2GHz: 10 dBm ± 7.0					
Measured UE output power test point 3	For carrier frequency f \leq 3.0GHz: 15 dBm ± 5.7 For carrier frequency 3.0GHz < f \leq 4.2GHz: 15 dBm ± 6.0					
Note: In addition	note 2 in Ta	ble 6.2.2.3-1	I shall apply t	to the tolera	nces.	

6.2.5_1 Configured UE transmitted Output Power for HPUE

6.2.5_1.1 Test purpose

Same test purpose as in clause 6.2.5.1

6.2.5_1.2 Test applicability

This test applies to all types of E-UTRA power Class 1 UE release 11 and forward.

6.2.5_1.3 Minimum conformance requirements

Same minimum conformance requirements as in clause 6.2.5.3 with the following exceptions:

- stead of Table 6.2.2.3-1 \rightarrow use Table 6.2.2_1.3-1
- stead of Section 6.2.3 \rightarrow use Section 6.2.3_1
- stead of Section 6.2.4 \rightarrow use Section 6.2.4_1
- stead of Table 6.2.5.3-1 → use Table 6.2.5_1.3-1

P _{CMAX}	Tolerance T(P _{CMAX})
(uBill)	(ub)
23 < PCMAX ≤ 33	2.0
$21 \le P_{CMAX} \le 23$	2.0
20 ≤ P _{CMAX} < 21	2.5
19 ≤ P _{CMAX} < 20	3.5
18 ≤ P _{CMAX} < 19	4.0
13 ≤ P _{CMAX} < 18	5.0
8 ≤ P _{CMAX} < 13	6.0
-40 ≤ P _{CMAX} < 8	7.0

Table 6.2.5_1.3-1: PCMAX tolerance

The normative reference for this requirement is TS 36.101 [2] clause 6.2.5.

6.2.5_1.4 Test description

6.2.5_1.4.1 Initial conditions

Same initial conditions as in clause 6.2.5.4.1 with the following exceptions

- stead of clause 6.2.5.4.3 \rightarrow use clause 6.2.5_1.4.3

6.2.5_1.4.2 Test procedure

Same test procedure as in clause 6.2.5.4.2 with the following exceptions:

- stead of Table 6.2.5.5-1 \rightarrow use Table 6.2.5_1.5-1

6.2.5_1.4.3 Message contents

Same message contents as in clause 6.2.5.4.3 with the following additional test point:

Table 6.2.5_1.4.3-1: SystemInformationBlockType1: Test point 4

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4	e 4.4.3.2, Table 4.4.3.2-3 System Information Block Type1				
Information Element	Value/remark Comment Condition				
p-Max	20				

6.2.5_1.5 Test requirement

The maximum output power measured shall not exceed the values specified in Table 6.2.5_1.5-1.

Table 6.2.5_1.5-1: P_{CMAX} configured HPUE output power

	Channel bandwidth / maximum output power			
	5MHz	10MHz		
Measured UE output	10 c	IBm + 7.7		
power test point 1	$-10 \text{ dBm} \pm 7.7$			
Measured UE output	$10 dPm \pm 6.7$			
power test point 2	$10 \text{ ubill} \pm 6.7$			
Measured UE output	15 dBm + 5 7			
power test point 3				
Measured UE output	20dBm + 5.7			
power test point 4	200	$BIT \pm 5.7$		
Note: In addition note 2 in Table 6.2.2_1.3-1 shall apply to the tolerances.				

6.2.5A Configured transmitted power for CA

6.2.5A.1 Configured UE transmitted Output Power for CA (intra-band contiguous DL CA and UL CA)

6.2.5A.1.1 Test purpose

To verify the UE does not exceed the minimum between the $P_{EMAX,c}$ maximum allowed ULTX Power signalled by the E-UTRAN and the P_{UMAX} maximum UE power for the UE power class.

6.2.5A.1.2 Test applicability

This test applies to all types of E-UTRA UE release 10 and forward that support intra-band contiguous DL CA and UL CA.

6.2.5A.1.3 Minimum conformance requirements

For carrier aggregation the UE is allowed to set its configured maximum output power $P_{CMAX,c}$ on serving cell c and its total configured maximum output power P_{CMAX} .

The configured maximum output power on serving cell c shall be set within the following bounds:

 $P_{CMAX_L,c} \le P_{CMAX,c} \le P_{CMAX_H,c}$

For intra-band contiguous carrier aggregation:

- $P_{CMAX_L,c} = MIN \{ P_{EMAX,c} - \Delta T_{C,c}, P_{PowerClass} - MAX(MPR_c + A-MPR_c + \Delta T_{IB,c}, P-MPR_c) - \Delta T_{C,c} \}$

For inter-band carrier aggregation:

- $P_{CMAX_L,c} = MIN \{ P_{EMAX,c} \Delta T_{C,c}, P_{PowerClass} MAX(MPR_c + A-MPR_c + \Delta T_{IB,c}, P-MPR_c) \Delta T_{C,c} \}$
- $P_{CMAX_H,c} = MIN \{P_{EMAX,c}, P_{PowerClass}\}$
- $P_{EMAX,c}$ is the value given by IE *P*-Max for serving cell c in [5].
- P_{PowerClass} is the maximum UE power specified in Table 6.2.2.3-1 without taking into account the tolerance specified in the Table 6.2.2.3-1.
- $\Delta T_{IB,c}$ is the additional tolerance for serving cell *c* as specified in Table 6.2.5A.1.3-3.

For inter-band carrier aggregation, MPR_c and $A-MPR_c$ apply per serving cell c and are specified in clause 6.2.3 and clause 6.2.4, respectively. For intra-band contiguous carrier aggregation, $MPR_c = MPR$ and $A-MPR_c = A-MPR$ with MPR and A-MPR specified in clause 6.2.3A and clause 6.2.4A respectively.

- P-MPR_c accounts for power management for serving cell c. For intra-band contiguous carrier aggregation, there is one power management term for the UE, P-MPR, and P-MPR_c = P-MPR.
- $\Delta T_{C,c} = 1.5 \text{ dB}$ when Note 2 in Table 6.2.2.3-1 applies to the serving cell *c*.
- $\Delta T_{C,c} = 0 dB$ when Note 2 in Table 6.2.2.3-1 does not apply to the serving cell c.

For inter-band carrier aggregation with one UL serving cell the total configured maximum output power PCMAX shall be set within the following bounds:

 $P_{CMAX_L} \le P_{CMAX} \le P_{CMAX_H}$

where

- $P_{CMAX_L} = P_{CMAX_L,c}$
- $P_{CMAX_H} = P_{CMAX_H,c}$

For intra-band contiguous carrier aggregation, $P_{CMAX, c}$ is calculated under the assumption that the transmit power is increased by the same amount in dB on all component carriers.

For inter-band carrier aggregation, $P_{CMAX, c}$ is calculated under the assumption that the transmit power is increased independently on all component carriers.

The measured maximum output power P_{UMAX} shall be within the following bounds:

 $\label{eq:product} \begin{array}{rcl} \mbox{-} & P_{CMAX_L} \mbox{-} & MAX\{T_L, T(P_{CMAX_L}) \end{tabular} \} & \leq & P_{UMAX} \end{tabular} \leq & P_{CMAX_H} \mbox{+} & T(P_{CMAX_H}) \end{array}$

Where $T(P_{CMAX})$ is defined by the table below and applies to P_{CMAX_L} and P_{CMAX_H} separately, while T_L is the absolute value of the lower tolerance in Table 6.2.2.3-1 for the applicable operating band.

Р _{смах} (dBm)	Tolerance T(Р _{смах}) (dB)
21 ≤ P _{CMAX} ≤ 23	2.0
20 ≤ P _{CMAX} < 21	2.5
19 ≤ P _{CMAX} < 20	3.5
18 ≤ P _{CMAX} < 19	4.0
13 ≤ P _{CMAX} < 18	5.0
8 ≤ P _{CMAX} < 13	6.0
-40 ≤ P _{CMAX} < 8	7.0

Table 6.2.5A.1.3-1: P_{CMAX} tolerance

For carrier aggregation with two UL serving cells, the total configured maximum output power P_{CMAX} shall be set within the following bounds:

 $P_{CMAX_L}CA \le P_{CMAX} \le P_{CMAX_H}CA$

For intra-band contiguous carrier aggregation,

- $P_{CMAX_L_CA} = MIN\{10 \ \log 10 \sum P_{EMAX,c} \Delta T_C, P_{PowerClass} MAX(MPR + A-MPR + \Delta T_{IB,c}, P-MPR) \Delta T_C\}$
- $P_{CMAX_H_CA} = MIN\{10 \log 10 \sum P_{EMAX,c}, P_{PowerClass}\}$

where

- $P_{\text{EMAX,c}}$ is the linear value of $P_{\text{EMAX,c}}$ which is given by IE *P*-Max for serving cell *c* in [5].
- P_{PowerClass} is the maximum UE power specified in Table 6.2.2A.1.3-1 without taking into account the tolerance specified in the Table 6.2.2A.1.3-1.
- MPR and A-MPR specified in clause 6.2.3A and clause 6.2.4A respectively.
- $\Delta T_{IB,c}$ is the additional tolerance for serving cell c as specified in Table 6.2.5A.1.3-3.
- P-MPR is the power management term for the UE.
- ΔT_C is the highest value $\Delta T_{C,c}$ among all serving cells *c* in the subframe over both timeslots. $\Delta T_{C,c} = 1.5 \text{ dB}$ when Note 2 in Table 6.2.2A.3-1 applies to the serving cell *c*. $\Delta T_{C,c} = 0 \text{ dB}$ when Note 2 in Table 6.2.2A.1.3-1 does not apply to the serving cell *c*.

For inter-band carrier aggregation with up to one serving cell c per operating band:

 $P_{CMAX_L_CA} = MIN \{ 10log10 \sum MIN [P_{EMAX,c'} (\Delta t_{C,c}), P_{PowerClass} / (mpr_c-a - mpr_c - \Delta t_{C,c} - \Delta t_{IB,c}) \}$

 $P_{PowerClass}/(pmpr_c-\Delta t_{C,c})$], $P_{PowerClass}$ }

 $P_{CMAX_H_CA} = MIN\{10 \ log10 \sum P_{EMAX,c}, P_{PowerClass}\}$

where

- $P_{EMAX,c}$ is the linear value of $P_{EMAX,c}$ which is given by IE *P-Max* for serving cell *c* in [5].

- P_{PowerClass} is the maximum UE power specified in Table 6.2.2A.1.3-1 without taking into account the tolerance specified in the Table 6.2.2A.1.3-1. P_{PowerClass} is the linear value of P_{PowerClass}.
- MPR_c and A-MPR_c apply per serving cell c and are specified in clause 6.2.3 and clause 6.2.4, respectively. mpr_c is the linear value of MPR_c. a-mpr_c is the linear value of A-MPR_c.
- P-MPR_c accounts for power management for serving cell c. pmpr_c is the linear value of P-MPR_c.
- $\Delta t_{C,c} = 1.41$ when Note 2 in Table 6.2.2.3-1 applies for a serving cell c
- $\Delta t_{C,c} = 1$ when Note 2 in Table 6.2.2.3-1 does not apply for a serving cell c
- $\Delta t_{IB,c}$ is the linear value of the inter-band relaxation term of the serving cell $c \Delta T_{IB,c}$. $\Delta t_{IB,c} = 1$ when no interband relaxation is allowed..

The measured maximum output power PUMAX over all serving cells shall be within the following range:

 $P_{CMAX_L_CA} - T(P_{CMAX_L_CA}) \le P_{UMAX} \le P_{CMAX_H_CA} + T(P_{CMAX_H_CA})$

 $P_{UMAX} = 10 \log 10 \sum P_{UMAX,c}$

where

- P_{UMAX,c} denotes the measured maximum output power for serving cell c expressed in linear scale.

The tolerance $T(P_{CMAX})$ is defined by the table below and applies to $P_{CMAX_{-L}CA}$ and $P_{CMAX_{-H}CA}$ separately.

Р _{смах} (dBm)	Tolerance T(P _{CMAX}) Intra-band with two active UL serving cells (dB)	Tolerance T(P _{CMAX}) Inter-band with two active UL serving cells (dB)
$21 \le P_{CMAX} \le 23$	2.0	2.0
20 ≤ P _{CMAX} < 21	[2.5]	TBD
19 ≤ P _{CMAX} < 20	[3.5]	TBD
18 ≤ P _{CMAX} < 19	[4.0]	TBD
13 ≤ P _{CMAX} < 18	[5.0]	TBD
8 ≤ P _{CMAX} < 13	[6.0]	TBD
-40 ≤ P _{CMAX} < 8	[7.0]	TBD

Table 6.2.5A.1.3-2: PCMAX tolerance

For the UE which supports inter-band carrier aggregation configurations with uplink assigned to one E-UTRA band the $\Delta T_{IB,c}$ is defined for applicable bands in Table 6.2.5A.1.3-3.

Table 6.2.5A.1.3-3: ΔT_{IB,c}

Inter-band CA Configuration	E-UTRA Band	ΔT _{IB,c} [dB]
CA_1A-5A	1	0.3
	5	0.3
CA_1A-18A	1	0.3
	18	0.3
CA_1A-19A	1	0.3
	19	0.3
CA_1A-21A	1	0.3
	21	0.3
CA_2A-17A	2	0.3
	17	0.8
CA_2A-29A	2	0.3
CA_3A-7A	3	0.5
	7	0.5
CA_3A-8A	3	0.3
	8	0.3

CA_4A-12A	4	0.3		
	12	0.8		
CA_4A-17A	4	0.3		
	17	0.8		
CA_4A-5A	4	0.3		
	5	0.3		
CA_4A-13A	4	0.3		
	13	0.3		
CA_5A-12A	5	0.8		
	12	0.4		
CA_7A-20A	7	0.3		
	20	0.3		
CA_11A-18A	11	0.3		
	18	0.3		
NOTE 1: The above bands the configura NOTE 2: The above supporte carrier ag NOTE 3: In case the aggregate than one - Whee appli Table amove relati tolera involv - Whee appli 5.2.5 confi	18 0.3 ne above additional tolerances are only applicable for the E-UTRA operating ands that belong to the supported inter-band carrier aggregation onfigurations ne above additional tolerances also apply in non-aggregated operation for the upported E-UTRA operating bands that belong to the supported inter-band arrier aggregation configurations case the UE supports more than one of the above inter-band carrier ggregation configurations and a E-UTRA operating band belongs to more an one inter-band carrier aggregation configurations then: When the E-UTRA operating band frequency range is ≤ 1GHz, the applicable additional tolerance shall be the average of the tolerances in Table 6.2.5A-3, truncated to one decimal place for that operating band among the supported CA configurations. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied When the E-UTRA operating band frequency range is >1GHz, the applicable additional tolerance shall be the average of the tolerances in Table 6.2.5A-3, truncated to one decimal place for that operating band among the supported CA configurations. In case there is a harmonic relation between low band UL and high band DL, then the maximum tolerance among the different supported carrier aggregation configurations involving such band shall be applied			

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- NOTE 1: The above additional tolerances do not apply to supported UTRA operating bands with frequency range below 1 GHz that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations when such bands are belonging only to band combination(s) where one band is <1 GHz and another band is >1.7 GHz and there is no harmonic relationship between the low band UL and high band DL. Otherwise the above additional tolerances also apply to supported UTRA operating bands that correspond to the E-UTRA operating bands that belong to the supported inter-band carrier aggregation configurations.
- NOTE 2: To meet the $\Delta T_{IB,c}$ requirements for CA_3A-7A with state-of-the-art technology, an increase in power consumption of the UE may be required. It is also expected that as the state-of-the-art technology evolves in the future, this possible power consumption increase can be reduced or eliminated.

The normative reference for this requirement is TS 36.101 [2] clause 6.2.5A.

6.2.5A.1.4 Test description

6.2.5A.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA CA configurations specified in table 5.4.2A.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.2.5A.1.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annex A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Conditions								
Test Environment as specified in TS 36.508[7] subclause 4.1		NC, TL/VL, TL/VH, TH/VL, TH/VH						
Test Frequencies as specified in TS36.508 [7] subclause 4.3.1 for different CA bandwidth classes.		C: Mid range						
Test CC Combination setting ($N_{RB_{agg}}$) as specified in subclause 5.4.2A.1 for the CA Configuration across bandwidth combination sets supported by the UE.		$\begin{array}{l} Lowest N_{RB_agg} \\ Highest N_{RB_agg} \end{array}$						
Test Para	ameters for	CAConfigurations						
CA Confi / N _{RB agg}	guration	DL Allocation	CC MOD	UL Allocation				
PCC N _{RB}	SCCs N _{RB}	PCC & SCC RB allocation		N _{RB_alloc} PCC & SCC RB allocations (L _{CRB} @ RB _{start})				
75	75		QPSK	16	P_16@0	S_0@0	-	-
100	50	for this test	QPSK	12	P_12@0	S_0@0	-	-
100	100		QPSK	18	P_18@0	S_0@0	-	-
Note 1: C	Note 1: CA Configuration Test CC Combination settings are checked separately for each CA Configuration, which applicable aggregated channel bandwidths are specified in Table 5.4.2A.1-1							

Table 6.2.5A.1.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.32 as appropriate.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals for PCC are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.2.5A.1.4.1-1
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.2.5A.1.4.3.

6.2.5A.1.4.2 Test procedure

- 1. Configure SCC according to Annex C.0, C.1, and Annex C.3.0 for all downlink physical channels except PHICH.
- 2. The SS shall configure SCC as per TS 36.508 [7] clause 5.2A.4. Message contents are defined in clause 6.2.5A.1.4.3.
- 3. SS activates SCC by sending the MAC-CE according to TS 36.321 [13] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
- 4. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.2.5A.1.4.1-1 on both PCC and SCC. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 5. Send transmit uplink power control "up" commands in every uplink scheduling information to the UE; allow at least 200ms for the UE to reach the P_{UMAX} level of the test point.

6. Measure the mean power over all component carriers in the CA configuration for each test point in table 6.2.5A.1.5-1 according to the test configuration from Table 6.2.5A.1.4.1-1. The period of measurement shall be at least continuous duration of one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.5A.1.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6 with the following exceptions. In test procedure step 2, for SCC configuration there are no additional message contents.

Table 6.2.5A.1.4.3-1: SystemInformationBlockType1: Test point 1

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 System Information BlockType1				
Information Element	Value/remark Comment Condition			
p-Max	-10			

Table 6.2.5A.1.4.3-2: SystemInformationBlockType1: Test point 2

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4	4.4.3.2, Table 4.4.3.2-3 System Information Block Type1			
Information Element	Value/remark Comment Condition			
p-Max	10			

Table 6.2.5A.1.4.3-3: SystemInformationBlockType1: Test point 3

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 System Information Block Type1				
Information Element	Value/remark Comment Condition			
p-Max	15			

6.2.5A.1.5 Test requirement

The maximum output power measured shall not exceed the values specified in Table 6.2.5A.1.5-1.

Table 6.2.5A.1.5-1: P_{CMAX} configured UE output power

	Channel bandwidth / maximum output power						
	50RB+100RB (10 MHz + 20 MHz)	75RB + 75RB (15 MHz + 15 MHz)	100RB + 100RB 20 MHz + 20 MHz)				
Measured UE output power test point 1	For carrier frequency f \leq 3.0GHz: -10 dBm \pm 7.7 For carrier frequency 3.0GHz < f \leq 4.2GHz: -10 dBm \pm 8.0						
Measured UE output power test point 2	For carrier frequency f \leq 3.0GHz: 10 dBm ± 6.7 For carrier frequency 3.0GHz < f \leq 4.2GHz: 10 dBm ± 7.0						
Measured UE output power test point 3	For carrier frequency f \leq 3.0GHz: 15 dBm \pm 5.7 For carrier frequency 3.0GHz < f \leq 4.2GHz: 15 dBm \pm 6.0						
Note: In addition	Note 2 in Table 6.2.2A.1	.3-1 shall apply to the t	olerances.				

6.2.5A.2 Configured UE transmitted Output Power for CA (inter-band DL CA without UL CA)

6.2.5A.2.1 Test purpose

Same as in clause 6.2.5A.1.1.

6.2.5A.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support inter-band DL CA but no UL CA.

6.2.5A.2.3 Minimum conformance requirements

Same as in clause 6.2.5A.1.3.

6.2.5A.2.4 Test description

6.2.5A.2.4.1 Initial conditions

Same as in clause 6.2.5A.1.4.1 with the following exceptions:

- Instead of Table 6.2.5A.1.4.1-1 → use Table 6.2.5A.2.4.1-1.

Table 6.2.5A.2.4.1-1: Test Configuration Table

Initial Conditions							
Test Environment as specified in TS 36.508[7] subclause 4.1				NC[, TL/VL, TL/VH, TH/VL, TH/VH]			
Test Frequencies as specified in TS36.508 [7] subclause 4.3.1 for different CA bandwidth classes.			A: Mid range for PCC and SCC				
Test CC Combination setting (N_{RB_agg}) as specified in subclause 5.4.2A.1 for the CA Configuration across bandwidth combination sets supported by the UE.			Lowest $N_{RB_{agg}}$ Highest $N_{RB_{agg}}$				
CA Configuration DI Allocation CC							
/ N _R	B_agg		MOD				
РСС N _{RB}	SCCs N _{RB}	PCC & SCC RB allocation		N _{RB_alloc}	РСС RB allocations (L _{CRB} @ RB _{start})		
6	25	N/A for this test	QPSK	5	P_5@0	-	
15	25		QPSK	4	P_4@0	-	
25	25		QPSK	8	P_8@0		
25	50		QPSK	8	P_8@0	-	
50	50		QPSK	12	P_12@0		
50	75		QPSK	12	P_12@0	-	
75	100		QPSK	16	P_16@0	-	
100	75		QPSK	18	P_18@0	-	
Note 1: Note 2:	Note 1:CA Configuration Test CC Combination settings are checked separately for each CA Configuration, which applicable aggregated channel bandwidths are specified in Table 5.4.2A.1 - 1Note 2:The frequencies of PCC and SCC shall be switched and tested in each configuration.						

6.2.5A.2.4.2 Test procedure

- 1. Configure SCC according to Annex C.0, C.1, and Annex C.3.0 for all downlink physical channels except PHICH.
- 2. The SS shall configure SCC as per TS 36.508 [7] clause 5.2A.4. Message contents are defined in clause 6.2.5A.2.4.3.

- 3. SS activates SCC by sending the MAC-CE according to TS 36.321 [13] clauses 5.13 and 6.1.3.8. Wait for at least 2 seconds as per TS 36.133 [4] clause 8.3.3.2.
- 4. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.2.5A.2.4.1-1 on PCC. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 5. Send transmit uplink power control "up" commands in every uplink scheduling information to the UE; allow at least 200ms for the UE to reach the P_{UMAX} level of the test point.
- 6. Measure the mean power over all component carriers in the CA configuration for each test point in table 6.2.5A.2.5-1 according to the test configuration from Table 6.2.5A.2.4.1-1. The period of measurement shall be at least continuous duration of one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.5A.2.4.3 Message contents

Same as in clause 6.2.5A.1.1.

6.2.5A.2.5 Test requirement

The maximum output power measured shall not exceed the values specified in Table 6.2.5A.2.5-1.

	Channel bandwidth / maximum output power							
	6RB	15 RB	25RB	50 RB	75 RB	100 RB		
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz		
Measured UE								
output power test	-10 dBm							
point 1								
Power tolerance								
f≤3.0GHz	± 7.7dB							
3.0GHz < f ≤	± 8.0dB							
4.2GHz								
Measured UE								
output power test	10 dBm							
point 2								
Power tolerance								
f ≤ 3.0GHz	± 6.7dB							
3.0GHz < f ≤	± 7.0dB							
4.2GHz								
Measured UE								
output power test	15 dBm							
point 3								
Power tolerance								
f ≤ 3.0GHz	± 5.7dB							
3.0GHz < f ≤	± 6.0dB							
4.2GHz								
Note 1: In addition note 2 in Table 6.2.2.3-1 shall apply to the tolerances.								
Note 2: ΔT _{IB,c} in Table 6.2.5A.1.3-3 shall be applied.								

Table 6.2.5A.2.5-1: PCMAX configured UE output power

6.2.5B Configured UE transmitted Output Power for UL-MIMO

Editor's notes: The following items are missing or incomplete:

- Test Tolerance

6.2.5B.1 Test purpose

To verify the UE does not exceed the minimum between the P_{EMAX} maximum allowed ULTX Power for UL-MIMO signalled by the E-UTRAN and the P_{UMAX} maximum UE power for the UE power class.
6.2.5B.2 Test applicability

This test applies to all types of E-UTRA UE release 10 and forward that support UL-MIMO.

6.2.5B.3 Minimum conformance requirements

For UE with multiple transmit antenna connectors, the transmitted power is configured per each UE.

The definitions of configured maximum output power P_{CMAX} , the lower bound P_{CMAX_L} , and the higher bound P_{CMAX_H} specified in Section 6.2.5 shall apply to UE with multiple transmit antenna connectors, where

- $P_{PowerClass}$ and ΔT_C are specified in Section 6.2.2B
- MPR is specified in Section 6.2.3B
- A-MPR is specified in Section 6.2.4B

The measured configured maximum output power P_{UMAX} shall be within the following bounds:

 $P_{CMAX_L} - MAX\{T_L, T_{LOW}(P_{CMAX_L})\} \leq P_{UMAX} \leq P_{CMAX_H} + T_{HIGH}(P_{CMAX_H})$

where $T_{LOW}(P_{CMAX_L})$ and $T_{HIGH}(P_{CMAX_H})$ are defined as the tolerance and applies to P_{CMAX_L} and P_{CMAX_H} separately, while T_L is the absolute value of the lower tolerance in Table 6.2.2B.3-1 for the applicable operating band.

For UE with two transmit antenna connectors, the tolerance is specified in Table 6.2.5B.3-1 with UL-MIMO configurations specified in Table 6.2.2B.3-2.

Table 6.2.5B.3-1: P_{CMAX} tolerance in closed-loop spatial multiplexing scheme

PCMAX (dBm)	Tolerance	Tolerance			
	T _{LOW} (P _{CMAX_L}) (dB)	Т _{ніб} н(Р _{СМАХ_} н) (dB)			
P _{CMAX} =23	3.0	2.0			
[22] ≤ P _{CMAX} < [23]	[5.0]	[2.0]			
[21] ≤ P _{CMAX} < [22]	[5.0]	[3.0]			
[20] ≤ P _{CMAX} < [21]	[6.0]	[4.0]			
[16] ≤ P _{CMAX} < [20]	[5.0]				
[11] ≤ P _{CMAX} < [16]	[6.0]				
[-40] ≤ P _{CMAX} < [11]	[7]	.0]			

The normative reference for this requirement is TS 36.101 [2] clause 6.2.5B.

6.2.5B.4 Test description

6.2.5B.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.2.5B.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annex A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Conditions					
Test Environr	ment as specified in	Normal, TL/V	Nomal, TL/VL, TL/VH, TH/VL, TH/VH		
TS 36.508[7]	subclause 4.1				
Test Frequen	cies as specified in	Mid range			
TS36.508 [7]	subclause 4.3.1				
Test Channel	Bandwidths as specified in	Lowest, 5MH	z, Highest		
TS 36.508 [7]	subdause 4.3.1				
	Test Parameters for Channel Bandwidths				
Downlink Configuration Uplink Configuration				tion	
Ch BW	N/A for Configured UE transmitted		Mod'n	RB allocation	
	Output Power test	case		FDD	TDD
1.4MHz			QPSK	5	5
3MHz			QPSK	4	4
5MHz			QPSK	8	8
10MHz			QPSK	12	12
15MHz			QPSK	16	16
20MHz			QPSK	18	18
Note 1: Test Channel Bandwidths are checked separately for each E-UTRA band, the applicable					
ch	channel bandwidths are specified in Table 5.4.2.1-1.				
Note 2: Fo	r the uplink RB allocation the	RB _{start} shall be	e RB #0.		

Table 6.2.5B.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, in Figure A.28.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.2.5B.4.1-1
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.2.5B.4.3.

6.2.5B.4.2 Test procedure

- 1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 4 for C_RNTI to schedule the UL RMC according to Table 6.2.5B.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 2. Send transmit uplink power control "up" commands in every uplink scheduling information to the UE; allow at least 200ms for the UE to reach the P_{umax} level of the test point.
- 3. Measure the sum mean power of the UE at each UE antenna connector in the associated measurement bandwidth for each test point in table 6.2.5B.5-1 according to the test configuration from Table 6.2.5B.4.1-1. The period of measurement shall be at least continuous duration of one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.2.5B.4.3 Message contents

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

Table 6.2.5B.4.3-1: SystemInformationBlockType1: Test point 1

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 SystemInformationBlockType1					
Information Element Value/remark Comment Condi					
p-Max	-10				

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 System Information BlockType1						
Information Element Value/remark Comment Condition						
p-Max 13						

Table 6.2.5B.4.3-2: SystemInformationBlockType1: Test point 2

Table 6.2.5B.4.3-3: SystemInformationBlockType1: Test point 3

Derivation Path: TS 36.508 [7] clause 4.4.3.2, Table 4.4.3.2-3 SystemInformationBlockType1					
Information Element Value/remark Comment Con					
p-Max	18				

6.2.5B.5 Test requirement

The maximum output power measured shall not exceed the values specified in Table 6.2.5B.5-1.

		Channel bandwidth / maximum output power					
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
Measured UE output power test point 1	For carrier frequency f \leq 3.0GHz: -10 dBm ± [7.7] For carrier frequency 3.0GHz < f \leq 4.2GHz: -10 dBm ± [8]						
Measured UE output power test point 2	For carrier frequency $f \le 3.0$ GHz: 13 dBm ± [6.7] For carrier frequency 3.0 GHz < $f \le 4.2$ GHz: 13 dBm ± [7]						
Measured UE output power test point 3	For carrier frequency f \leq 3.0GHz: 18 dBm ± [5.7] For carrier frequency 3.0GHz < f \leq 4.2GHz: 18 dBm ± [6]						
Note: In addition	note 2 in Ta	ble 6.2.2B.3	-1 shall apply	to the toler	ances.		

6.3 Output Power Dynamics

6.3.1 Void

6.3.2 Minimum Output Power

6.3.2.1 Test purpose

To verify the UE's ability to transmit with a broadband output power below the value specified in the test requirement when the power is set to a minimum value.

6.3.2.2 Test applicability

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

6.3.2.3 Minimum conformance requirements

-

The minimum output power is defined as the mean power in one sub-frame (1ms). The minimum output power shall not exceed the values specified in Table 6.3.2.3-1.

ſable	6.3.2.3	3-1:	Minimum	output	power
-------	---------	------	---------	--------	-------

Channel bandwidth / minimum output power / measurement					
bandwidth					
1.4	3.0	5	10	15	20
MHz	MHz	MHz	MHz	MHz	MHz

Minimum output power	-40 dBm					
Measurement bandwidth	1.08 MHz	2.7 MH z	4.5 MH z	9.0 MH z	13.5 MHz	18 MHz

The normative reference for this requirement is TS 36.101 [2] clause 6.3.2.1.

Minimum output power test verifies the UE's ability to transmit with a broadband output power below the specified limit when the power is set to a minimum value. The broadband output power is defined as the power in the channel bandwidth, for all transmit bandwidth configurations (resource blocks).

An excess minimum output power potentially increases the Rise Over Thermal (RoT) and therefore reduces the cell coverage area for other UEs.

6.3.2.4 Test description

6.3.2.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.3.2.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Conditions					
Test Env	ironment as specified in	Normal, TL/V	L, TL/VH, TH/V	/L, TH/VH	
TS 36.	508[7] subclause 4.1				
Test Frequen	cies as specified in	Low range, M	lid range, High	range	
TS36.508 [7]	subclause 4.3.1				
Test Channel	Bandwidths as specified in	Lowest, 5MH	z, Highest		
TS 36.508 [7]	subdause 4.3.1				
	Test Paramete	ers for Channe	el Bandwidths		
	Downlink Configur	ation	Upli	ink Configurat	ion
Ch BW	N/A for min output pov	wertest	Mod'n	RB allocation	
				FDD	TDD
1.4MHz			QPSK	6	6
3MHz			QPSK	15	15
5MHz			QPSK	25	25
10MHz			QPSK	50	50
15MHz			QPSK	75	75
20MHz			QPSK	100	100
Note 1: Te	st Channel Bandwidths are c	heckedsepara	tely for each E-	UTRA band, th	e applicable
ch	channel bandwidths are specified in Table 5.4.2.1-1.				

Table 6.3.2.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, in Figure A.3.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.3.2.4.1-1.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.2.4.3.

6.3.2.4.2 Test procedure

- SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.3.2.1.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC
- 2. Send continuous uplink power control "down" commands in the uplink scheduling information to the UE to ensure that the UE trans mits at its minimum output power.
- 3. Measure the mean power of the UE in the associated measurement bandwidth specified in Table 6.3.2.5-1 for the specific channel bandwidth under test. The period of measurement shall be the continuous duration of one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.3.2.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6.

6.3.2.5 Test requirement

The minimum output power measured shall not exceed the values specified in Table 6.3.2.5-1.

	Channel bandwidth / minimum output power / measurement bandwidth					
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Minimum output power	For carrier frequency f \leq 3.0GHz: \leq -39 dBm For carrier frequency 3.0GHz < f \leq 4.2GHz: \leq -38.7 dBm					
Measurement bandwidth (Note 1)	1.08 MHz	2.7 MH z	4.5 MH z	9.0 MH z	13.5 MHz	18 MHz
Note 1: Different ir allowed. F as an equi	nplementatio or spectrum a valent noise	ns such as I analyzer app bandwidth.	FT or spect proach the m	rum analyze easurement	r approach a bandwidth is	re defined

Table 6.3.2.5-1: Minimum output power

6.3.2A Minimum Output Power for CA

6.3.2A.1 Minimum Output Power for CA (intra-band contiguous DL CA and UL CA)

6.3.2A.1.1 Test purpose

To verify the UE's ability to transmit with a broadband output power below the value specified in the test requirement when the power on each component carrier is set to a minimum value.

6.3.2A.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support intra-band contiguous DL CA and UL CA.

6.3.2A.1.3 Minimum conformance requirements

For intra-band contiguous carrier aggregation, the minimum controlled output power of the UE is defined as the transmit power of the UE per component carrier, i.e., the power in the channel bandwidth of each component carrier for all transmit bandwidth configurations (resource blocks), when the power on both component carriers are set to a minimum value.

For intra-band contiguous carrier aggregation the minimum output power is defined as the mean power in one sub-frame (1ms). The minimum output power shall not exceed the values specified in Table 6.3.2A.1.3-1.

	CC Channel bandwidth / Minimum output power / Measurement bandwidth						
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
Minimum output power			-40 c	dBm			
Measurement bandwidth	9.0 MH z 13.5 MH z 18 MH						

Table 6.3.2A.1.3-1: Minimum output power for intra-band contiguous CA UE

The normative reference for this requirement is TS 36.101 [2] clause 6.3.2A.

6.3.2A.1.4 Test description

6.3.2A.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and CC combinations based on E-UTRA CA configurations specified in table 5.4.2A.1-1. All of these configurations shall be tested with applicable test parameters for each CA Configuration, and are shown in table 6.3.2A.1.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexe A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Co	onditions							
Test Environment as specified in TS 36.508[7] subclause 4.1			NC, TL/VL, TL/VH, TH/VL, TH/VH					
Test Frequencies as specified in TS36.508 [7] subclause 4.3.1 for different CA bandwidth classes.				C: Low and High range				
Test CC Combination setting (N_{RB_agg}) as specified in subclause 5.4.2A.1 for the CA Configuration across bandwidth combination sets supported by the UE.			Lowest N Highest N	I _{RB_agg} N _{RB_agg}				
Test Parameters for CA Configurations								
CA Confi / N _{RB_agg}	iguration	DL Allocation	CC MOD	UL Alloc	ation			
PCC N _{RB}	SCCs N _{RB}	PCC & SCC RB allocation		N _{RB_alloc} PCC & SCC RB allocations (L _{CRB} @ RB _{start})				
75	75		QPSK	150	P_75@0	S_75@0	-	-
100	50		QPSK	150 P_100@0 S_50@0				
100	100		QPSK	200 P_100@0 S_100@0				-
Note 1:	CA Confi applicabl	guration Test CC Combina e aggregated channel band	tion settings dwidths are	are checke specified in	ed separately for Table 5.4.2A.1 -1	each CA Confi	guration, v	vhich

Table 6.3.2A.1.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508[7] Annex A Figure group A.32 as appropriate.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals for PCC are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.

- 4. The UL Reference Measurement channel is set according to Table 6.3.2A.1.4.1-1.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.2A.1.4.3.

6.3.2A.1.4.2 Test procedure

- 1. Configure SCC according to Annex C0, C.1 and Annex C.3.2 for all down link physical channels except PHICH.
- 2. The SS shall configure SCC as per TS 36.508 [7] clause 5.2A.4. Message contents are defined in clause 6.3.2A.1.4.3.
- 3. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133, clauses 8.3.3.2).
- 4. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.3.2A.1.4.1-1 on both PCC and SCC. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 5. Send continuously uplink power control "down" commands in every uplink s cheduling information to the UE to ensure that the UE trans mits at its minimum output power.
- 6. Measure the mean transmitted power of each component carrier in the CA configuration of the radio access mode. The period of measurement shall be at least the continuous duration of one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.3.2A.1.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6. In test procedure step 2, for SCC configuration there are no additional message contents.

6.3.2A.1.5 Test requirements

For each component carrier, the minimum output power measured shall not exceed the values specified in Table 6.3.2A.1.5-1.

		CC Chann	CC Channel bandwidth / Minimum output power / Measurement bandwidth						
		1.4 3.0 5 10 15					20		
		MHz	MHz	MHz	MHz	MHz	MHz		
Minimum	n output		For carrier frequency f ≤ 3.0GHz: ≤ -39 dBm						
ром	ver	For	For carrier frequency 3.0GHz < f ≤ 4.2GHz: ≤ -38.7 dBm						
Measur bandv	ement width				9.0 MH z	13.5 MHz	18 MHz		
Note 1:	Different in	nplementatio	plementations such as FFT or spectrum analyzer approach are						
	allowed. F	or spectrum analyzer approach the measurement bandwidth is defined							
	as an equi	valent noise l	bandwidth.						

Table 6.3.2A.1.5-1: Minimum output power for intra-band contiguous CA UE

6.3.2B Minimum Output Power for UL-MIMO

6.3.2B.1 Test purpose

To verify the UE's ability to transmit with a UL-MIMO broadband output power below the value specified in the test requirement when the power is set to a minimum value.

6.3.2B.2 Test applicability

This test applies to all types of E-UTRA UE release 10 and forward that support UL-MIMO

6.3.2B.3 Minimum conformance requirements

For UE with two transmit antenna connectors in closed-loop spatial multiplexing scheme, the minimum output power is defined as the sum of the mean power at each UE antenna connector in one sub-frame (1ms). The minimum output power shall not exceed the values specified in Table 6.3.2B.3-1.

	Channel bandwidth / Minimum output power / Measurement bandwidth						
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
Minimum output power			-40 c	IBm			
Measurement bandwidth	1.08 MHz	2.7 MH z	4.5 MH z	9.0 MH z	13.5 MHz	18 MHz	

Table 6.3.2B.3-1: Minimum output power

The normative reference for this requirement is TS 36.101 [2] clause 6.3.2B.1.

6.3.2B.4 Test description

6.3.2B.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.3.2B.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

	In	itial Conditior	IS				
Test Env	ironment as specified in	Norr	nal, TL/VL, TL/	VH, TH/VL, TH	/VH		
TS 36.508[7] subclause 4.1							
Test Free	quencies as specified in	Lo	w range, Mid ra	ange, High ran	ge		
TS36.50	08 [7] subclause 4.3.1						
Test Channe	I Bandwidths as specified in		Lowest, 5M	Hz, Highest			
TS 36.50	08 [7] subclause 4.3.1						
Test Parameters for Channel Bandwidths							
	Downlink Configuration Uplink Configuration						
Ch BW	N/A for min output pov	N/A for min output power test Mod'n RB allocation					
				FDD	TDD		
1.4MHz			QPSK	6	6		
3MHz			QPSK	15	15		
5MHz			QPSK	25	25		
10MHz			QPSK	50	50		
15MHz			QPSK	75	75		
20MHz QPSK 100 100							
Note 1: Te	st Channel Bandwidths are cl	necked separa	tely for each E-	UTRA band, th	e applicable		
ch	annel bandwidths are specifie	d in Table 5.4.	2.1-1.				

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, in Figure A.28.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.3.2B.4.1-1.

- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.2B.4.3.

6.3.2B.4.2 Test procedure

- 1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 4 for C_RNTI to schedule the UL RMC according to Table 6.3.2B.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 2. Send continuous uplink power control "down" commands in the uplink scheduling information to the UE to ensure that the UE transmits at its minimum output power.
- 3. Measure the sum of mean power of the UE at each UE antenna connector in the associated measurement bandwidth specified in Table 6.3.2B.5-1 for the specific channel bandwidth under test. The period of measurement shall be the continuous duration of one sub-frame (1ms). For TDD slots with transient periods are not under test.

6.3.2B.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6.6.3.2B.5 Test requirement

The minimum sum of mean output power of the UE at each antenna connector measured shall not exceed the values specified in Table 6.3.2B.5-1.

	Channel bandwidth / minimum output power / measurement bandwidth					
	1.4 MH z	3.0 MHz	5 MH 7	10 MH 7	15 MH z	20 MH 7
Minimum output		For carrier frequency $f \le 3.0$ GHz: $\le -40 + TT$ dBm				
power	For ca	For carrier frequency 3.0GHz < $f \le 4.2$ GHz: $\le -40 + TT$ dBm				dBm
Measurement bandwidth (Note 1)	1.08 MHz	2.7 MH z	4.5 MH z	9.0 MH z	13.5 MHz	18 MHz
Note 1: Different in	ote 1: Different implementations such as FFT or spectrum analyzer approach are					
allowed. F	allowed. For spectrum analyzer approach the measurement bandwidth is defined				defined	
as an equi	valent noise l	bandwidth.				

Table 6.3.2B.5-1: Minimum output power

6.3.3 Transmit OFF power

6.3.3.1 Test purpose

To verify that the UE transmit OFF power is lower than the value specified in the test requirement.

6.3.3.2 Test applicability

The requirements of this test apply in test cases 6.3.4.1 General ON/OFF time mask and 6.3.4.2 PRACH and SRS time mask to all types of E-UTRA UE release 8 and forward.

6.3.3.3 Minimum conformance requirement

The transmit OFF power is defined as the mean power in a duration of at least one sub-frame (1ms) excluding any transient periods. The requirement for the transmit OFF power shall not exceed the values specified in Table 6.3.3.3-1.

Chann	el bandwid	th / Transmi bandv	t OFF powe vidth	er / measure	ment
1.4	3.0	5	10	15	20
MHz	MHz	MHz	MHz	MHz	MHz

Table 6.3.3.3-1: Transmit OFF power

Transmit OFF power			-50 c	IBm		
Measurement bandwidth	1.08 MHz	2.7 MH z	4.5 MH z	9.0 MH z	13.5 MHz	18 MHz

The normative reference for this requirement is TS 36.101 [2] clause 6.3.3.

Transmit OFF power is defined as the mean power when the transmitter is OFF. The transmitter is considered to be OFF when the UE is not allowed to transmit or during periods when the UE is not transmitting a sub-frame. During DTX and measurements gaps, the UE is not considered to be OFF.

An excess transmit OFF power potentially increases the Rise Over Thermal (RoT) and therefore reduces the cell coverage area for other UEs

6.3.3.4 Test description

This test is covered by clause 6.3.4.1 General ON/OFF time mask and 6.3.4.2 PRACH and SRS time mask.

6.3.3.5 Test requirement

The requirement for the transmit OFF power shall not exceed the values specified in Table 6.3.3.5-1.

	Channel bandwidth / Transmit OFF power / measurement bandwidth						
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
Transmit OFF power	For	For carrier frequency f ≤ 3.0GHz: ≤ -48.5 dBm For carrier frequency 3.0GHz < f ≤ 4.2GHz: ≤ -48.2 dBm				3m	
Measurement bandwidth	1.08 MHz 2.7 MHz 4.5 MHz 9.0 MHz 13.5 MHz 18 MH						

 Table 6.3.3.5-1: Transmit OFF power

6.3.3A UE Transmit OFF power for CA

6.3.3A.1 UE Transmit OFF power for CA (intra-band contiguous DL CA and UL CA)

6.3.3A.1.1 Test purpose

For intra-band contiguous carrier aggregation the transmit OFF power is defined as the mean power per component carrier when the transmitter is OFF on both component carriers. The transmitter is considered to be OFF when the UE is not allowed to transmit or during periods when the UE is not transmitting a sub-frame. During measurements gaps, the UE is not considered to be OFF.

To verify that the UE transmit OFF power for CA is lower than the value specified in the test requirement.

6.3.3A.1.2 Test applicability

The requirements of this test case apply in test cases 6.3.4A.1 General ON/OFF time mask for CA and 6.3.4.2 PRACH and SRS time mask to all types of E-UTRA UE release 10 and forward that support intra-band contiguous DL CA and UL CA.

6.3.3A.1.3 Minimum conformance requirements

For intra-band contiguous carrier aggregation the transmit OFF power is defined as the mean power in a duration of at least one sub-frame (1ms) excluding any transient periods. The transmit OFF power shall not exceed the values specified in Table 6.3.3A.1.3-1.

Table 6.3.3A.1.3-1: Transmit OFF power for intra-band contiguous CA UE

Channel bandwidth / Minimum output power / measurement

	bandwidth							
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz		
Transmit OFF		-50 dBm						
power								
Measurement bandwidth				9.0 MH z	13.5 MHz	18 MHz		

The normative reference for this requirement is TS 36.101[2] clause 6.3.3A

6.3.3A.1.4 Test description

This test is covered by clause 6.3.4A.1.1 General ON/OFF time mask for CA and 6.3.4.2 PRACH and SRS time mask.

6.3.3A.1.5 Test Requirements

Table 6.3.3A.1.5-1: Transmit OFF power for intra-band contiguous CA UE

	Channel bandwidth / Minimum output power / Measurement bandwidth							
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz		
Transmit OFF		-48.5 dBm						
Maggurement								
bandwidth				9.0 MH z	13.5 MHz	18 MHz		

6.3.3B UE Transmit OFF power for UL-MIMO

6.3.3B.1 Test purpose

To verify that the UE transmit OFF power for UL-MIMO is lower than the value specified in the test requirement.

Transmission of the wrong power increases interference to other channels, or increases transmission errors in the uplink channel.

6.3.3B.2 Test applicability

The requirements of this test apply in test cases 6.3.4B.1 General ON/OFF time mask to all types of E-UTRA UE release 10 and forward that support UL-MIMO

6.3.3B.3 Minimum conformance requirement

The transmit OFF power is defined as the mean power at each transmit connector in a duration of at least one sub-frame (1ms) excluding any transient periods. The transmit OFF power at each transmit connector shall not exceed the values specified in Table 6.3.3B.3-1.

	Channel bandwidth / Minimum output power / Measurement bandwidth					
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz
Transmit OFF power	-50 dBm					
Measurement bandwidth	1.08 MHz	2.7 MH z	4.5 MH z	9.0 MH z	13.5 MHz	18 MHz

Table 6.3.3B.3-1: Transmit OFF power per antenna port

The normative reference for this requirement is TS 36.101 [2] clause 6.3.3B.1.

6.3.3B.4 Test description

This test is covered by clause 6.3.4B.1 General ON/OFF time mask.

6.3.3B.5 Test requirement

The requirement for the transmit OFF power at each transmit antenna connector shall not exceed the values specified in Table 6.3.3B.5-1.

	Channel bandwidth / Transmit OFF power / measurement bandwidth					
	1.4	3.0	5	10	15	20
	MHz	MHz	MHz	MHz	MHz	MHz
Transmit OFF	For carrier frequency f \leq 3.0GHz: \leq -48.5 dBm					
power	For carrier frequency 3.0GHz < f \leq 4.2GHz: \leq -48.2 dBm					
Measurement bandwidth	1.08 MHz	2.7 MH z	4.5 MH z	9.0 MH z	13.5 MHz	18 MHz

Table 6.3.3B.5-1: Transmit OFF power

6.3.4 ON/OFF time mask

6.3.4.1 General ON/OFF time mask

Editor's note: The measurement period in the minimum requirement is defined to be 1 subframe (14 symbols). Due to practical reasons the TDD measurement period for off power prior the PUSCH is 10 symbols. It is FFS, if this deviation is acceptable.

6.3.4.1.1 Test purpose

To verify that the general ON/OFF time mask meets the requirements given in 6.3.4.1.5.

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

Transmission of the wrong power increases interference to other channels, or increases transmission errors in the uplink channel.

6.3.4.1.2 Test applicability

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

6.3.4.1.3 Minimum conformance requirement

The General ON/OFF time mask defines the observation period between Transmit OFF and ON power and between Transmit ON and OFF power. ON/OFF scenarios include; the beginning or end of DTX, measurement gap, contiguous, and non contiguous transmission

The OFF power measurement period is defined in a duration of at least one sub-frame excluding any transient periods. The ON power is defined as the mean power over one sub-frame excluding any transient period.

There are no additional requirements on UE transmit power beyond that which is required in clause 6.2.2 and clause 6.6.2.3.





The normative reference for this requirement is TS 36.101 [2] clause 6.3.4.1.

6.3.4.1.4 Test description

6.3.4.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.3.4.1.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2

Table	6.3.4.1	.4.1-1:	Test	Configuration	Table
-------	---------	---------	------	---------------	-------

Initial Conditions						
Test Env	ironment as specified in	Norr	Normal, TL/VL, TL/VH, TH/VL, TH/VH			
TS 36.	508[7] subclause 4.1					
Test Free	quencies as specified in	Lo	w range, Mid ra	ange, High ran	ge	
TS36.50)8 [7] subclause 4.3.1					
Test Channe	Bandwidths as specified in		Lowest, 5M	Hz, Highest		
TS 36.50	08 [7] subclause 4.3.1					
Test Parameters for Channel Bandwidths						
	Downlink Configura	ation	Upli	ink Configurat	ion	
Ch BW	N/A for General On/Off Tim	ne Masktest	Mod'n	RB allo	ocation	
	case			FDD	TDD	
1.4MHz			QPSK	6	6	
3MHz			QPSK	15	15	
5MHz			QPSK	25	25	
10MHz			QPSK	50	50	
15MHz			QPSK	75	75	
20MHz			QPSK	100	100	
Note 1: Test Channel Bandwidths are checked separately for each E-UTRA band, the applicable						
channel bandwidths are specified in Table 5.4.2.1-1.						

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.3.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1 and C.3.0, and uplink signals according to Annex H.1 and H.3.0.

- 4. The UL and DL Reference Measurement channels are set according to Table 6.3.4.1.4.1-1.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.4.1.4.3. Note that PDCCH DCI format 0 sent after resetting uplink power with RRC Connection Reconfiguration, should have TPC command 0dB.

6.3.4.1.4.2 Test procedure

- 1. SS sends uplink scheduling information via PDCCH DCI format 0 with TPC command 0dB for C_RNTI to schedule the UL RMC according to Table 6.3.4.1.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. The UL assignment is such that the UE transmits on UL sub-frame 2 of every radio frame.
- 2. For FDD: Measure the UE transmission OFF power during the sub-frame prior to the PUSCH subframe. For TDD: Measure the UE transmission OFF power during the 10 SCFDMA symbols prior to the PUSCH subframe.
- 3. Measure the output power of the UE PUSCH transmission during one sub-frame, excluding a transient period of 20 µs at the beginning of the subframe.
- 4. Measure the UE transmission OFF power during one sub-frame following the PUSCH subframe, excluding a transient period of 20 μs at the beginning of the subframe.

6.3.4.1.4.3 Message contents

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

Table 6.3.4.1.4.3-1: UplinkPowerControlCommon: Test point 1

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT					
Information Element Value/remark Comment Condition					
UplinkPowerControlCommon-DEFAULT ::=	-105	Test point 1 to			
SEQUENCE {		verify a UE			
p0-NominalPUSCH		relative low initial			
		power			
		transmission			

Table 6.3.4.1.4.3-2: PhysicalConfigDedicated

Derivation Path: TS 36.508 [7] clause 5.5.1.2, Table 5.5.1.2.1 PhysicalConfigDedicated-DEFAULT					
Information Element	Value/remark	Comment	Condition		
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {					
UplinkPowerControlDedicated	UplinkPowerControlDedic	See subclause	SRB1		
	ated-DEFAULT	4.6.3			
	UplinkPowerControlDedic	See subclause	RBC		
	ated-DEFAULT	4.6.3			

Table 6.3.4.1.4.3-3: UplinkPowerControlDedicated

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-26 UplinkPowerControlDedicated-DEFAULT						
Information Element	Value/remark	Comment	Condition			
UplinkPowerControlDedicated-DEFAULT ::=						
SEQUENCE {						
p0-UE-PUSCH	1		SRB1			
	0		RBC			
}						

Derivation Path: 36.508 clause 5.3.1 Table 5.3.1-1 (SystemInformationBlock Type1)						
Information Element	Value/remark	Comment	Condition			
TDD-Config-DEFAULT ::= SEQUENCE {						
subframeAssignment	sa1					
specialSubframePatterns	ssp5	To enable two symbol UpPTS, and to have 9 symbols GP.				
}						

Table 6.3.4.1.3-4: TDD-Config-DEFAULT: On/OFF time mask measurement

6.3.4.1.5 Test requirement

The requirement for the power measured in steps (2), (3) and (4) of the test procedure shall not exceed the values specified in Table 6.3.4.1.5-1.

	Channel bandwidth / minimum output power / measurement						
			bandv	vidth			
	1.4	3.0	5	10	15	20	
	MHz	MHz	MHz	MHz	MHz	MHz	
Transmit OFF	For carrier frequency f ≤ 3.0GHz: ≤ -48.5 dBm						
power	For carrier frequency 3.0 GHz < f ≤ 4.2 GHz: ≤ -48.2 dBm						
Transmission OFF Measurement bandwidth	1.08 MHz	2.7 MHz	4.5 MHz	9.0 MH z	13.5 MHz	18 MHz	
Expected Transmission ON Measured power	-14.8 dBm	-10.8 dBm	-8.6 dBm	-5.6 dBm	-3.9 dBm	-2.6 dBm	
ON power toleranœ f ≤ 3.0GHz 3.0GHz < f ≤ 4.2GHz	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	

Table 6.3.4.1.5-1: General ON/OFF time mask

6.3.4.2 PRACH and SRS time mask

6.3.4.2.1 PRACH time mask

6.3.4.2.1.1 Test purpose

To verify that the PRACH time mask meets the requirements given in 6.3.4.2.1.5.

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

Transmission of the wrong power increases interference to other channels, or increases transmission errors in the uplink channel.

6.3.4.2.1.2 Test applicability

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

6.3.4.2.1.3 Minimum conformance requirement

For the PRACH Power / Time mask defines the observation period for PRACH transmissions. The PRACH ON power is specified as the mean power over the PRACH measurement period excluding any transient periods. The measurement period for different PRACH preamble format is specified in Table 6.3.4.2.1.3-1.

There are no additional requirements on UE transmit power beyond that which is required in clause 6.2.2 and clause 6.6.2.3

Table 6.3.4.2.1.3-1: PRACH ON power measurement period

PRACH preamble format	Measurement period (ms)
0	0.9031
1	1.4844
2	1.8031
3	2.2844
4	0.1479



Figure 6.3.4.2.1.3-1: PRACH ON/OFF time mask

The normative reference for this requirement is TS 36.101 [2] clause 6.3.4.2.1.

- 6.3.4.2.1.4 Test description
- 6.3.4.2.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.3.4.2.1.4.1-1. The details of the uplink and downlink reference measurement channels (RMCs) are specified in Annexes A.2 and A.3.

Table 6.3.4.2.1.4.1-1: Test Configuration Table

Initial Conditions					
Test Environment (as specified in TS 36.508 [7] subclause 4.1)	Nomal, TL/VL, TL/	VH, TH/VL, TH/VH			
Test Frequencies (as specified in TS36.508 [7] subclause 4.3.1)	Mid range				
Test Channel Bandwidths (as specified in TS 36.508 [7] subclause 4.3.1)	Lowest, 5M	Hz, Highest			
PRACH preamble format					
	FDD	TDD			
PRACH Configuration Index	3	51			

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A3.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.

- 3. Downlink signals are initially set up according to Annex C.0, C.1 and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. Propagation conditions are set according to Annex B.0.
- 5. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.4.2.1.4.3.

6.3.4.2.1.4.2 Test procedure

- 1. The SS shall signal a Random Access Preamble ID via a PDCCH order to the UE and initiate a Non-contention based Random Access procedure.
- 2. The UE shall send the signalled preamble to the SS.
- 3. For FDD UE, the SS measure the UE transmission OFF power during the sub-frame preceding the PRACH preamble excluding a transient period of 20 µs according to Figure 6.3.4.2.1.3-1. For TDD UE, the SS measure the UE transmission OFF power starting (20us+the duration of 8 OFDM symbols) before the PRACH starts, and ending 20us before PRACH starts. Note, the nominal PRACH timing for TDD is not aligned with the sub frame and symbol raster.
- 4. Measure the output power of the transmitted PRACH preamble according to Figure 6.3.4.2.1.3-1.
- 5. Measure the UE transmission OFF power, starting 20 μs after the PRACH preamble ends for a measurement period of 980 μs..

6.3.4.2.1.4.3 Message contents

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

Table 6.3.4.2.1.4.3-1: RA CH-Config Common-DEFAULT: PRACH measurement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-12 RACH-ConfigCommon-DEFAULT						
Information Element	Value/remark	Comment	Condition			
RACH-ConfigCommon-DEFAULT ::= SEQUENCE {						
<pre>powerRampingParameters SEQUENCE {</pre>						
powerRampingStep	dB0					
preambleInitialReceivedTargetPower	dBm-104		PRACH			
			Format 0			
	dBm-112		PRACH			
			Format 4			
}						
)						

Table 6.3.4.2.1.4.3-2: PRA CH-Config-DEFAULT: PRACH measurement for TDD

Derivation Path: TS 36.508 [7] clause 5.3.1, Table 5.3.1-3: PRACH-Config-DEFAULT			
Information Element	Value/remark	Comment	Condition
PRACH-Config-DEFAULT ::= SEQUENCE {			
prach-ConfigIndex	51		TDD
}			

Derivation Path: IS 36.508 [7] clause 5.3.1, Table 5.3.1-1: TDD-Config-DEFAULT				
Information Element	Value/remark	Comment	Condition	
TDD-Config-DEFAULT ::= SEQUENCE {				
subframeAssignment	sa1			
specialSubframePatterns	ssp5	To enable two symbol UpPTS, and to have 9 symbols GP.		
}				

Table 6.3.4.2.1.4.3-3: TDD-Config-DEFAULT: PRACH measurement for TDD

6.3.4.2.1.5 Test requirement

The requirement for the power measured in steps (3), (4) and (5) of the test procedure shall not exceed the values specified in Table 6.3.4.2.1.5-1.

	Channe	el bandwidt	h / Output P	ower [dBm]] / measure	ement
			bandv	vidth		
	1.4	3.0	5	10	15	20
	MHz	MHz	MHz	MHz	MHz	MHz
Transmit OFF		For carrier	frequencyf≤	3.0GHz: ≤	-48.5 dBm	
power	For	carrier frequ	ency 3.0GHz	<u> < f ≤ 4.2G</u>	lz: ≤ -48.2 dE	3m
Transmission OFF Measurement bandwidth	1.08 MHz	2.7 MHz	4.5 MH z	9.0 MH z	13.5 MHz	18 MHz
Expected PRACH Transmission ON Measured power	-1 dBm	-1 dBm	-1 dBm	-1 dBm	-1 dBm	-1 dBm
ON power toleranœ f ≤ 3.0GHz 3.0GHz < f ≤ 4.2GHz	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB

Table 6.3.4.2.1.5-1: PRACH time mask

6.3.4.2.2 SRS time mask

6.3.4.2.2.1 Test purpose

To verify that the SRS time mask meets the requirements given in 6.3.4.2.2.5.

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

Transmission of the wrong power increases interference to other channels, or increases transmission errors in the uplink channel.

6.3.4.2.2.2 Test applicability

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

6.3.4.2.2.3 Minimum conformance requirement

In the case a single SRS transmission, the ON power is defined as the mean power for each symbol duration excluding any transient period. Figure 6.3.4.2.2.3-1.

In the case a dual SRS transmission, the ON power is defined as the mean power for each symbol duration excluding any transient period. Figure 6.3.4.2.2.3-2.



Figure 6.3.4.2.2.3-1: Single SRS time mask



Figure 6.3.4.2.2.3-2: Dual SRS time mask for the case of UpPTS transmissions

6.3.4.2.2.4 Test description

6.3.4.2.2.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.3.4.2.2.4.1-1. The details of the uplink and downlink reference measurement channels (RMCs) are specified in Annexes A.2 and A.3.

Initial Conditions			
Test Environment (as specified in TS 36.508 [7] subclause 4.1)	Nomal, TL/VL, TL/VH, TH/VL, TH/VH		
Test Frequencies	Mie	d range	
(as specified in TS36.508 [7] subclause 4.3.1)		-	
Test Channel Bandwidths	Lowest EMHz Highest		
(as specified in TS 36.508 [7] subclause 4.3.1)	LOWESI, C	Juliz, Highest	
SRS configuration			
	FDD	TDD	
srs-BandwidthConfig	bw7	bw7 (for BW 1.4 MHz) bw5 (for BW 3 MHz) bw2 (for BW 5 MHz)	
	~	bw0 (for BW 10, 15, 20 MHz)	
srs-SubframeConfig	sc3	scO	
ackNackSRS-SimultaneousTransmission	FALSE	FALSE	
srsMaxUpPts	N/A	N/A	
srs-Bandwidth	bw3	bw3	
srs-HoppingBandwidth	hbw3	hbw0	
freqDomainPosition	0	0	
Duration	TRUE	TRUE	
srs-ConfigIndex	7	0	
transmissionComb	0	0	
cyclicShift	cs0	cs0	

Table 6.3.4.2.2.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.3.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1 and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. Propagation conditions are set according to Annex B.0.
- 5. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.4.2.2.4.3. Note that PDCCH DCI format 0 sent after resetting uplink power with RRC Connection Reconfiguration, should have TPC command 0dB.

6.3.4.2.2.4.2 Test procedure

- For FDD UE, the SS measure the UE transmission OFF power during the 13 symbols preceding the SRS symbol excluding a transient period of 20 µs according to Figure 6.3.4.2.2.3-1. For TDD UE, the SS measure the UE transmission OFF power during the 8 symbols preceding the two SRS symbols excluding a transient period of 20µs according to Figure 6.3.4.2.2.3-2.
- 2. Measure the output power of the transmitted SRS according to Figure 6.3.4.2.2.3-1 for FDD UE and according to Figure 6.3.4.2.2.3-2 for TDD UE, The transient periods are excluded from measurement accordingly.
- 3. Measure the UE transmission OFF power during the sub-frame following the SRS under test, excluding a transient period of 20 μs according to Figure 6.3.4.2.2.3-1 for FDD UE and according to Figure 6.3.4.2.2.3-2 for TDD UE.

6.3.4.2.2.4.3 Message contents

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

Derivation Path: 36.508 clause 5.3.1 Table 5.3.1-2 RadioResourceConfigCommonSIB-DEFAULT			
Information Element	Value/remark	Comment	Condition
RadioResourceConfigCommon-DEFAULT ::=			
SEQUENCE {			
rach-ConfigCommon	RACH-ConfigCommon-		
	DEFAULT		
bcch-Config	BCCH-Config-DEFAULT		
pcch-Config	PCCH-Config-DEFAULT		
prach-Config	PRACH-ConfigSIB-		
	DEFAULT		
pdsch-ConfigCommon	PDSCH-ConfigCommon-		
	DEFAULT		
pusch-ConfigCommon	PUSCH-ConfigCommon-		
	DEFAULT		
pucch-ConfigCommon	PUCCH-ConfigCommon-		
	DEFAULT		
soundingRSUL-ConfigCommon	SoundingRS-UL-		
	ConfigCommon-		
	DEFAULT		
uplinkPowerControlCommon	UplinkPowerControlCom		
	mon-DEFAULT		
ul-CyclicPrefixLength	len1		
}			

Table 6.3.4.2.2.4.3-1: RadioResourceConfigCommonSIB-DEFAULT: SRS measurement

Table 6.3.4.2.2.4.3-2: Sounding RS-UL-ConfigCommon-DEFAULT: SRS time mask measurement

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-21 SoundingRS-UL-ConfigCommon-DEFAULT			
Information Element	Value/remark	Comment	Condition
SoundingRS-UL-ConfigCommon-DEFAULT ::=			
SEQUENCE {			
setup SEQUENCE {			
srs-BandwidthConfig	bw7		FDD
	bw7		TDD
			(BW 1.4 MHz)
	bw5		TDD
			(BW 3 MHz)
	bw2		TDD
			(BW 5 MHz)
	bw0		TDD (BW 10,
			15, 20 MHz)
srs-SubframeConfig	sc3	Periodicity of 5ms,	FDD
		with offset of 0.	
	sc0	Periodicity of 5ms,	TDD
		with offset of 1.	
ackNackSRS-SimultaneousTransmission	FALSE		
srsMaxUpPts	Notpresent		
}			
}			

Table 6.3.4.2.2.4.3-3: PhysicalConfigDedicated-DEFAULT: SRS time mask measurement

Derivation Path: 36.508 clause 5.5.1 Table 5.5.1.2-1: PhysicalConfigDedicated-DEFAULT			
Information Element	Value/remark	Comment	Condition
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE			
{			
cqi-ReportConfig	Notpresent		
soundingRS-UL-ConfigDedicated	SoundingRSUL-		
	ConfigDedicated-		
	DEFAULT		
}			

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-22 SoundingRS-UL-ConfigDedicated-DEFAULT			
Information Element	Value/remark	Comment	Condition
SoundingRS-UL-ConfigDedicated-DEFAULT ::= CHOICE {			
setup SEQUENCE {			
srs-Bandwidth	bw3	bw3 used to ensure that the bandwidth is constantly 4 RBs irrespective of channel bandwidth.	
srs-HoppingBandwidth	hbw3	This is selected so that hopping is disabled	FDD
	hbw0	This is selected so that hopping is enabled	TDD
freqDomainPosition	0		
Duration	TRUE	Indefinite duration	
srs-ConfigIndex	7	SRS periodicity of 10ms, Toffset=0.	FDD
	0	SRS periodicity of 2ms, Ksrs=0,1, this is two symbols UpPTS in first half subframe.	TDD
transmissionComb	0		
cyclicShift	cs0	No cyclic shift	
}			
}			

Table 6.3.4.2.2.4.3-4: Sounding RSUL-Config Dedicated-DEFAULT: SRS time mask measurement

Table 6.3.4.2.2.4.3-5: TDD-Config-DEFAULT: SRS time mask measurement

Derivation Path: 36.508 331 clause 65.3.21 Table 5.3.1-1 (SystemInformationBlockType1)			
Information Element	Value/remark	Comment	Condition
TDD-Config-DEFAULT ::= SEQUENCE {			
subframeAssignment	sa1		
specialSubframePatterns	ssp5	To enable two symbol UpPTS, and to have 9 symbols GP.	
}			

Table 6.3.4.2.2.4.3-6: PhysicalConfigDedicated

Derivation Path: TS 36.508 [7] clause 5.5.1.2, Table 5.5	5.1.2.1 PhysicalConfigDedica	ted-DEFAULT	
Information Element	Value/remark	Comment	Condition
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {			
uplinkPowerControlDedicated	UplinkPowerControlDedic ated-DEFAULT	See subclause 4.6.3	SRB1
	UplinkPowerControlDedic ated-DEFAULT	See subclause 4.6.3	RBC

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-26 UplinkPowerControlDedicated-DEFAULT			
Information Element	Value/remark	Comment	Condition
UplinkPowerControlDedicated-DEFAULT ::=			
SEQUENCE {			
p0-UE-PUSCH	1		SRB1
	0		RBC
}			

Table 6.3.4.2.2.4.3-7: UplinkPowerControl Dedicated

Condition	Explanation
FDD	FDD cell environment
TDD	TDD cell environment

6.3.4.2.2.5 Test requirement

The requirement for the power measured in steps (1), (2) and (3) of the test procedure shall not exceed the values specified in Table 6.3.4.2.2.5-1.

	Channel bandwidth / Output Power [dBm] / measurement bandwidth						
	1.4	3.0	5	10	15	20	
	MHz	MHz	MHz	MHz	MHz	MHz	
Transmit OFF		For carrier	frequencyf≤	3.0GHz: ≤	-48.5 dBm		
power	For	carrier frequ	ency 3.0GHz	z < f ≤ 4.2GH	lz: ≤ -48.2 dE	3m	
Transmission OFF Measurement bandwidth	1.08 MHz	2.7 MHz	4.5 MHz	9.0 MH z	13.5 MHz	18 MHz	
Expected SRS Transmission ON Measured power	-2.6 dBm	-2.6 dBm	-2.6 dBm	-2.6 dBm	-2.6 dBm	-2.6 dBm	
ON power tolerance $f \le 3.0GHz$ $3.0GHz < f \le$ 4.2GHz	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	± 7.5dB ± 7.8dB	

Table 6.3.4.2.2.5-1: SRS time mask

6.3.4A ON/OFF time mask for CA

6.3.4A.1 General ON/OFF time mask for CA

6.3.4A.1.1 General ON/OFF time mask for CA (intra-band contiguous DL CA and UL CA)

6.3.4A.1.1.1 Test purpose

To verify that the general ON/OFF time mask for CA meets the requirements given in 6.3.4A.1.1.5.

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

Transmission of the wrong power increases interference to other channels, or increases transmission errors in the uplink channel.

6.3.4A.1.1.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support intra-band contiguous DL CA and UL CA.

6.3.4A.1.1.3 Minimum conformance requirements

For intra-band contiguous carrier aggregation, the general output power ON/OFF time mask specified in subclause 6.3.4.1.3 is applicable for each component carrier during the ON power period and transient period. The OFF period as specified in subclause 6.3.4.1.3 shall only be applicable for each component carrier when all the component carriers are OFF.

The normative reference for this requirement is TS 36.101[2] clause 6.3.4A.

6.3.4A.1.1.4 Test description

6.3.4A.1.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and CC combinations based on E UTRA CA configurations specified in table 5.4.2A.1-1. All of these configurations shall be tested with applicable test parameters for each CA Configuration, and are shown in table 6.3.4A.1.1.4.1-1. The details of the uplink and downlink reference measurement channels (RMCs) are specified in Annexe A.2 and A3. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Table	6.3.4A	.1.1.4.1	-1:	Test	Config	guration	Table
-------	--------	----------	-----	------	--------	----------	-------

Initial Conditions									
Test Envi	Test Environment as specified in TS 36.508 [7] clause 4.7				L, TL/VH, TH/	VL, TH/VH			
Test Frequencies as specified in TS 36.508 [7] clause 4.3.1 for different CA bandwidth classes.			C: Low range, High range						
Test CC Combination setting ($N_{RB_{agg}}$) as specified in clause 5.4.2A.1 for the CA Configuration across bandwidth combination sets supported by the UE.			Lowest N _{RB_agg} Highest N _{RB_agg}						
Test Para	ameters for	CAConfigurations							
CA Confi / N _{RI}	iguration B_agg	DL Allocation			UL Allo	ocation			
PCC	SCCs	PCC & SCC RB	CC	N _{RB_alloc}	PC	C & SCC RB a	llocations		
N _{RB}	N _{RB}	allocation	MOD			(L _{CRB} @ RE	start)		
75	75		QPSK	150	P_75@0	S_75@0	-	-	
100	50	N/A for this test	QPSK	150	P_100@0	S_50@0	-	-	
100	100		QPSK 200 P_100@0 S_100@0					-	
Note 1: CA Configuration Test CC Combination settings are checked separately for each CA Configuration, which applicable aggregated channel bandwidths are specified in Table 5.4.2A.1 -1									

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508[7] Annex A Figure group A.32 as appropriate.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] clause 4.4.3.
- 3. Downlink signals for PCC are initially set up according to Annex C.0, C.1, and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.3.4A.1.1.4.1-1.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.4A.1.1.4.3.

6.3.4A.1.1.4.2 Test procedure

- 1. Configure SCC according to Annex C.0, C.1 and Annex C.3.0 for all downlink physical channels except PHICH.
- 2. The SS shall configure SCC as per TS 36.508 [7] clause 5.2A.4. Message contents are defined in clause 6.5.1A 3.4A.1.1.4.3
- 3. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133, clauses 8.3.3.2).
- 4. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.2.2A.4.1-1 on both PCC and SCC. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. The each UL assignment is such that the UE transmits on UL sub-frame 2 of every radio frame.
- 5. For FDD: Measure the UE transmission OFF power for each component carrier during the sub-frame prior to the PUSCH subframe. For TDD: Measure the UE transmission OFF power during the 10 SCFDMA symbols prior to the PUSCH subframe.
- 6. Measure the output power of the UE PUSCH transmission for each component carrier during one sub-frame, excluding a transient period of 20 µs at the beginning of the subframe.
- 7. Measure the UE transmission OFF power for each component carrier during one sub-frame following the PUSCH subframe, excluding a transient period of 20 µs at the beginning of the subframe.

6.3.4A.1.1.4.3 Message contents

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

Table 6.3.4A.1.1.4.3-1: UplinkPowerControlCommon: Test point 1

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT						
Information Element	Value/remark	Comment	Condition			
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE {	-105	Test point 1 to verify a UE relative				
p0-NominalPUSCH		low initial power transmission for PCC				

Table 6.3.4A.1.1.4.3-2: PhysicalConfigDedicated

Derivation Path: TS 36.508 [7] clause 5.5.1.2, Table 5.5.1.2.1 PhysicalConfigDedicated-DEFAULT						
Information Element	Value/remark	Comment	Condition			
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {						
UplinkPowerControlDedicated	UplinkPowerControlDedic ated-DEFAULT	See subclause 4.6.3	RBC			
	UplinkPowerControlDedic ated-DEFAULT	See subclause 4.6.3	UL CA			

Table 6.3.4A.1.1.4.3-3: UplinkPowerControlDedicated

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-26 UplinkPowerControlDedicated-DEFAULT						
Information Element	Value/remark	Comment	Condition			
UplinkPowerControlDedicated-DEFAULT ::=						
SEQUENCE {						
p0-UE-PUSCH	1		RBC			
	0		UL CA			
}						

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25A UplinkPowerControlCommonSCell-r10-DEFAULT						
Information Element	Value/remark	Comment	Condition			
UplinkPowerControlCommonSCell-r10 ::=						
SEQUENCE {						
p0-NominalPUSCH-r10	-105	Test point 1 to verify a UE relative low initial power transmission for SCC				

Table 6.3.4A.1.1.4.3-4: UplinkPowerControlCommonSCell-r10: Test point 1

6.3.4A.1.1.5 Test requirement

The requirement for the power measured in steps 5, 6 and 7 of the test procedure shall not exceed the values specified in Table 6.3.4.1.5-1.6.3.4B ON/OFF time mask for UL-MIMO

6.3.4B ON/OFF time mask for UL-MIMO

6.3.4B.1 General ON/OFF time mask for UL-MIMO

Editor's note: The measurement period in the minimum requirement is defined to be 1 subframe (14 symbols). Due to practical reasons the TDD measurement period for off power prior the PUSCH is 10 symbols. It is FFS, if this deviation is acceptable.

Editor's notes: The following items are missing or incomplete:

The initial conditions and test procedure are subject to further investigation

6.3.4B.1.1 Test purpose

To verify that the general ON/OFF time mask for UL-MIMO meets the requirements given in 6.3.4B.1.5.

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

Transmission of the wrong power increases interference to other channels, or increases transmission errors in the uplink channel.

6.3.4B.1.2 Test applicability

This test applies to all types of E-UTRA UE release 10 and forward that support UL-MIMO

6.3.4B.1.3 Minimum conformance requirement

For UE with multiple transmit antenna connectors, the ON/OFF time mask requirements in subclause 6.3.4.1.3 apply to each transmit antenna connector.

For UE with two transmit antenna connectors in closed-loop spatial multiplexing scheme, the general ON/OFF time mask requirements specified in subclause 6.3.4.1.3 apply to each transmit antenna connector with the UL-MIMO configurations specified in Table 6.2.2B.3-2.

The normative reference for this requirement is TS 36.101 [2] clause 6.3.4B

6.3.4B.1.4 Test description

6.3.4B.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.3.4B.1.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2

Tahla	63/B	1 / 1-1.	Tost	Confic	uration	Table
rable	0.3.40.	1.4.1-1.	rest	COULD	juration	rable

Initial Conditions						
Test Env	ironment as specified in	Norr	nal, TL/VL, TL/VH, TH/VL, TH/VH			
TS 36.	508[7] subclause 4.1					
Test Free	quencies as specified in	Lo	w range, Mid ra	ange, High ran	ge	
TS36.50)8 [7] subclause 4.3.1					
Test Channe	Bandwidths as specified in		Lowest, 5M	Hz, Highest		
TS 36.50	08 [7] subclause 4.3.1					
Test Parameters for Channel Bandwidths						
	Downlink Configuration		Upli	nk Configurat	ion	
Ch BW	N/A for General On/Off Tim	ie Masktest	Mod'n	RB allocation		
	case			FDD	TDD	
1.4MHz			QPSK	6	6	
3MHz			QPSK	15	15	
5MHz			QPSK	25	25	
10MHz			QPSK	50	50	
15MHz			QPSK	75	75	
20MHz			QPSK	100	100	
Note 1: Te	Note 1: Test Channel Bandwidths are checked separately for each E-UTRA band, the applicable					
channel bandwidths are specified in Table 5.4.2.1-1.						

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.28.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1 and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL and DL Reference Measurement channels are set according to Table 6.3.4B.1.4.1-1.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.4B.1.4.3. Note that PDCCH DCI format 4 sent after resetting uplink power with RRC Connection Reconfiguration, should have TPC command 0dB.

6.3.4B.1.4.2 Test procedure

- 1. SS sends uplink scheduling information via PDCCH with DCI format 4 and TPC command 0dB for C_RNTI to schedule the UL RMC according to Table 6.3.4B.1.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. The UL assignment is such that the UE transmits on UL sub-frame 2 of every radio frame.
- 2. For FDD: Measure the UE transmission OFF power during the sub-frame prior to the PUSCH subframe. For TDD: Measure the UE transmission OFF power during the 10 SCFDMA symbols prior to the PUSCH subframe.
- 3. Measure the output power of the UE PUSCH transmission during one sub-frame, excluding a transient period of 20 µs at the beginning of the subframe.
- 4. Measure the UE transmission OFF power during one sub-frame following the PUSCH subframe, excluding a transient period of 20 μs at the beginning of the subframe.
- 5. Repeat step 2) until 4) for each of transmit antenna of the UE.

6.3.4B.1.4.3 Message contents

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

Table 6.3.4B.1.4.3-1: UplinkPowerControlCommon: Test point 1

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT					
Information Element	Value/remark	Comment	Condition		
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE { p0-NominalPUSCH	-105	Test point 1 to verify a UE relative low initial power transmission			

Table 6.3.4B.1.4.3-2: PhysicalConfigDedicated

Derivation Path: TS 36.508 [7] clause 5.5.1.2, Table 5.5.1.2.1 PhysicalConfigDedicated-DEFAULT						
Information Element	Value/remark	Comment	Condition			
PhysicalConfigDedicated-DEFAULT ::=						
SEQUENCE {						
UplinkPowerControlDedicated	UplinkPowerControlDedicated-	See clause 4.6.3	SRB1			
	DEFAULT					
	UplinkPowerControlDedicated-	See clause 4.6.3	RBC			
	DEFAULT					

Table 6.3.4B.1.4.3-3: UplinkPowerControlDedicated

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-26 UplinkPowerControlDedicated-DEFAULT						
Information Element	Value/remark	Comment	Condition			
UplinkPowerControlDedicated-DEFAULT ::=						
SEQUENCE {						
p0-UE-PUSCH	1		SRB1			
	0		RBC			
}						

Table 6.3.4B.1.3-4: TDD-Config-DEFAULT: On/OFF time mask measurement

Derivation Path: 36.508 clause 5.3.1 Table 5.3.1-1 (SystemInformationBlockType1)						
Information Element	Value/remark	Comment	Condition			
TDD-Config-DEFAULT ::= SEQUENCE {						
subframeAssignment	sa1					
specialSubframePatterns	ssp5	To enable two symbol UpPTS, and to have 9 symbols GP.				
}						

6.3.4B.1.5 Test requirement

The requirement for the power measured in steps (2), (3) and (4) of the test procedure shall not exceed the values specified in Table 6.3.4B.1.5-1.

	Channel bandwidth / minimum output power / measurement bandwidth					
	1.4 MH 7	3.0 мн -	5 MH 7	10 мн ,	15 MH 7	20 MH7
Transmit OFF power	For	carrier frequ	irequency is iency 3.0GHz	s.0GH2:≦ z < f ≤ 4.2GH	-48.5 dBm Iz: ≤ -48.2 dE	3m
Transmission OFF Measurement bandwidth	1.08 MHz	2.7 MHz	4.5 MHz	9.0 MHz	13.5 MHz	18 MHz
Expected Transmission ON Measured power	-14.8 dBm	-10.8 dBm	-8.6 dBm	-5.6 dBm	-3.9 dBm	-2.6 dBm
ON power tolerance f ≤ 3.0GHz 3.0GHz < f ≤ 4.2GHz	7.5 dB ±7.8dB	7.5 dB ±7.8dB	7.5dB ±7.8dB	7.5dB ±7.8dB	7.5dB ±7.8dB	7.5dB ±7.8dB

Table 6.3.4B.1.5-1: General ON/OFF time mask

6.3.5 Power Control

Power control is used to limit the interference level and compensate the channel fading. The UE power is defined as the mean power in a subframe or ON power duration, whichever is available.

The UE transmission can be in two contiguity modes, i.e. contiguous transmission and non-contiguous transmission. The former has a transmission gap of 0 and the later has a transmission gap larger than 0. The transmission gap is the time interval between the end of the last UE transmission subframe and the beginning of the next UE transmission subframe or the UpPTS (for TDD).

6.3.5.1 Power Control Absolute power tolerance

6.3.5.1.1 Test purpose

To verify the ability of the UE transmitter to set its initial output power to a specific value at the start of a contiguous transmission or non-contiguous transmission with a long transmission gap, i.e. transmission gap is larger than 20 ms.

6.3.5.1.2 Minimum conformance requirement

Absolute power tolerance is the ability of the UE transmitter to set its initial output power to a specific value for the first sub-frame at the start of a contiguous transmission or non-contiguous transmission with a transmission gap larger than 20ms.

The minimum requirement on absolute power tolerance is given in Table 6.3.5.1.2-1 over the power range bounded by the Maximum output power as defined in sub-clause 6.2.2 and the Minimum output power as defined in sub clause 6.3.2.

For operating bands under Note 2 in Table 6.2.2.3-1, the absolute power tolerance as specified in Table 6.3.5.1.2-1 is relaxed by reducing the lower limit by 1.5 dB when the transmission bandwidth is confined within F_{UL_low} and $F_{UL_low} + 4$ MHz or $F_{UL_high} - 4$ MHz and F_{UL_high} .

Table 6.	.3.5.1.2-1:	Absolute	power	tolerance
----------	-------------	----------	-------	-----------

Conditions	Tolerance
Normal conditions	± 9.0 dB
Extreme conditions	± 12.0 dB

The normative reference for this requirement is TS 36.101 [2] clause 6.3.5.1.1.

6.3.5.1.3 Test applicability

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

6.3.5.1.4 Test description

6.3.5.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.3.5.1.4.1-1. The details of the uplink reference measurement channel (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Conditions							
Test Environment as specified in Nor			nal, TL/VL, TL/VH, TH/VL, TH/VH				
TS 36.	508[7] subclause 4.1						
Test Free	quencies as specified in		Mid ra	ange			
TS36.50)8 [7] subclause 4.3.1						
Test Channe	I Bandwidths as specified in		Lowest, 5M	Hz, Highest			
TS 36.50	08 [7] subclause 4.3.1						
Test Parameters for Channel Bandwidths							
	Downlink Configuration Uplink Configuration				ion		
Ch BW	N/A for Power Control Abs	olute power	Mod'n	RB allocation			
	tolerance test cas	se		FDD	TDD		
1.4MHz			QPSK	6	6		
3MHz			QPSK	15	15		
5MHz			QPSK	25	25		
10MHz			QPSK	50	50		
15MHz			QPSK	75	75		
20MHz QPSK 100 100							
Note 1: Te	st Channel Bandwidths are ch	necked separa	tely for each E-	UTRA band, th	e applicable		
channel bandwidths are specified in Table 5.4.2.1-1.							

Table 6.3.5.1.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.3.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Down link signals are initially set up according to Annex C.0, C.1 and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.3.5.1.4.1-1.
- 5. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.5.1.4.3. Note that PDCCH DCI format 0 sent after resetting uplink power with RRC Connection Reconfiguration, should have TPC command 0dB.

6.3.5.1.4.2 Test procedure

- 1. SS sends uplink scheduling information via PDCCH DCI format 0 with TPC command 0dB for C_RNTI to schedule the UL RMC according to Table 6.3.5.1.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 2. Measure the initial output power of the first subframe of UE PUSCH first transmission. The transient periods of 20us are excluded.
- 3. Repeat for the two test points as indicated in section 6.3.5.1.4.3. The timing of the execution between the two test points shall be larger than 20ms.

6.3.5.1.4.3 Message contents

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

Table 6.3.5.1.4.3-1: UplinkPowerControlCommon: Test point 1

Derivation Path: TS 36.508 [7] claus e 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT						
Information Element	Value/remark	Comment	Condition			
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE { p0-NominalPUSCH	-105	Test point 1 to verify a UE relative low initial power transmission				

Table 6.3.5.1.4.3-2: UplinkPowerControlCommon: Test point 2

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT							
Information Element Value/remark Comment							
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE { p0-NominalPUSCH	-93	Test point 2 to verify a UE relative high initial power transmission					

Table 6.3.5.1.4.3-3: PhysicalConfigDedicated

Derivation Path: TS 36.508 [7] clause 5.5.1.2, Table 5.5.1.2.1 PhysicalConfigDedicated-DEFAULT							
Information Element	Value/remark	Comment	Condition				
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {							
uplinkPowerControlDedicated	UplinkPowerControlDedic	See subclause	SRB1				
	ated-DEFAULT	4.6.3					
	UplinkPowerControlDedic	See subclause	RBC				
	ated-DEFAULT	4.6.3					

Table 6.3.5.1.4.3-4: UplinkPowerControlDedicated

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-26 UplinkPowerControlDedicated-DEFAULT						
Information Element	Value/remark	Comment	Condition			
UplinkPowerControlDedicated-DEFAULT ::= SEQUENCE {						
p0-UE-PUSCH	1		SRB1			
	0		RBC			
}						

6.3.5.1.5 Test requirement

The requirement for the power measured in step (2) of the test procedure is not to exceed the values specified in Table 6.3.5.1.5-1 and 6.3.5.1.5-2.

Channel bandwidth / expected output power (dBm)							
1.4 3.0 5 10 15 20							
MHz	MHz	MHz	MHz	MHz	MHz		

Expected Measured power Normal conditions	-14.8 dBm	-10.8 dBm	-8.6 dBm	-5.6 dBm	-3.9 dBm	-2.6 dBm
Power tolerance f ≤ 3.0GHz 3.0GHz < f ≤ 4.2GHz	± 10.0dB ± 10.4dB	± 10.0dB ± 10.4dB				
Expected Measured power Extreme conditions	-14.8 dBm	-10.8 dBm	-8.6 dBm	-5.6 dBm	-3.9 dBm	-2.6 dBm
Power tolerance f ≤ 3.0GHz 3.0GHz < f ≤ 4.2GHz	± 13.0dB ± 13.4dB	± 13.0dB ± 13.4dB				
Note 1: The lower power limit shall not exceed the minimum output power requirements defined in sub-dause 6.3.2.3						

Table 6.3.5.1.5-2: Absolute power tolerance: test point 2

	Channel bandwidth / expected output power (dBm)					
	1.4	3.0	5	10	15	20
	MHz	MHz	MHz	MHz	MHz	MHz
Expected						
Measured power	-2.8 dBm	1.2 dBm	3.4 dBm	6.4 dBm	8.2 dBm	9.4 dBm
Normal conditions						
Power tolerance						±
f ≤ 3.0GHz	± 10.0dB	± 10.0dB	± 10.0dB	± 10.0dB	± 10.0dB	10.0dB
3.0GHz < f ≤	± 10.4dB	± 10.4dB	± 10.4dB	± 10.4dB	± 10.4dB	±
4.2GHz						10.4dB
Expected						
Measured power	-2.8 dBm	1.2 dBm	3.4 dBm	6.4 dBm	8.2 dBm	9.4 dBm
Extreme conditions						
Power tolerance						±
f ≤ 3.0GHz	± 13.0dB	± 13.0dB	± 13.0dB	± 13.0dB	± 13.0dB	13.0dB
3.0GHz < f ≤	± 13.4dB	± 13.4dB	± 13.4dB	± 13.4dB	± 13.4dB	±
4.2GHz						13.4dB
Note 1: The lower power limit shall not exceed the minimum output power requirements						
defined in sub-dause 6.3.2.3						

6.3.5.2 Power Control Relative power tolerance

6.3.5.2.1 Test purpose

To verify the ability of the UE transmitter to set its output power relatively to the power in a target sub-frame relatively to the power of the most recently transmitted reference sub-frame if the transmission gap between these sub-frames is ≤ 20 ms.

6.3.5.2.2 Test applicability

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

6.3.5.2.3 Minimum conformance requirement

The UE shall meet the requirements specified in Table 6.3.5.2.3-1.

To account for RF Power amplifier mode changes 2 exceptions are allowed for each of two test patterns. The test patterns are a monotonically increasing power sweep and a monotonically decreasing power sweep over a range bounded by the requirements of minimum power and maximum power specified in clauses 6.3.2.3 and 6.2.2.3. For these exceptions the power tolerance limit is a maximum of ± 6.0 dB in Table 6.3.5.2.3-1.

Power step ∆P (Up or down) [dB]		All combinations of PUSCH and PUCCH transitions [dB]		PRACH [dB]	
ΔP < 2		±2.5 (Note 3)	±3.0	±2.5	
2 ≤ ΔP	, < 3	±3.0	±4.0	±3.0	
3 ≤ ∆P < 4		±3.5	±5.0	±3.5	
4 ≤ ΔP ≤ 10		±4.0	±6.0	±4.0	
10 ≤ ΔP < 15		±5.0	±8.0	±5.0	
15 ≤	ΔP	±6.0	±9.0	±6.0	
Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed Note 2: For operating bands under Note 2 in Table 6.2.2.3-1, the relative power tolerance is relaxed by increasing the upper limit by 1.5 dB if the transmission bandwidth of the reference sub-frames is confined within F_{UL_Jow} and $F_{UL_Jow} + 4$ MHz or $F_{UL_high} - 4$ MHz and F_{UL_high} and the target sub-frame is not confined within any one of these frequency ranges; if the transmission bandwidth of the target sub-frame is confined within F_{UL_Jow} and $F_{UL_Jow} + 4$ MHz or $F_{UL_high} - 4$ MHz and F_{UL_high} and the reference sub-frame is not confined within any one of these frequency ranges, then the tolerance is relaxed by reducing the lower limit by 1.5 dB. Note 3: For PUSCH to PUSCH transitions with the allocated resource blocks fixed in frequency and no transmission gaps other than those generated by downlink subframes, DwPTS fields or Guard Periods for TDD: for a power step $\Delta P \le 1$ dB, the relative power tolerance for transmission is					

Table 6.3.5.2.3-1 Relative Power Tolerance for Transmission	(norma	conditions)
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The power step (ΔP) is defined as the difference in the calculated setting of the UE Transmit power between the target and reference sub-frames with the power setting according to Clause 5.1 of TS 36.213. The error is the difference between ΔP and the power change measured at the UE antenna port with the power of the cell-specific reference signals kept constant. The error shall be less than the relative power tolerance specified in Table 6.3.5.2.3-1.

The normative reference for this requirement is TS 36.101 clause 6.3.5.2.

6.3.5.2.4 Test description

6.3.5.2.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.3.5.2.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Conditions					
Test Environment as specified in		Normal, TL/VL, TL/VH, TH/VL, TH/VH			
TS 36.508[7] subclause 4.1					
Test Frequencies as specified in		Low range			
TS36.508 [7] subclause 4.3.1					
Test Channel Bandwidths as specified in		Lowest, 5MHz, Highest			
TS 36.508 [7] subdause 4.3.1					
Test Parameters for Channel Bandwidths					
	Downlink Configuration		Uplink Configuration		

Table 6.3.5.2.4.1-1: Test Configuration Table

Ch BW	N/A for Power Control Relative power	Mod'n	RB allocation		
	tolerance test case		FDD	TDD	
1.4MHz		QPSK	See table	See table	
			6.3.5.2.5-1	6.3.5.2.5-1	
			6.3.5.2.5-2	6.3.5.2.5-2	
			6.3.5.2.5-13	6.3.5.2.5-13	
3MHz		QPSK	See table	See table	
			6.3.5.2.5-3	6.3.5.2.5-3	
			6.3.5.2.5-4	6.3.5.2.5-4	
			6.3.5.2.5-13	6.3.5.2.5-13	
5MHz		QPSK	See table	See table	
			6.3.5.2.5-5	6.3.5.2.5-5	
			6.3.5.2.5-6	6.3.5.2.5-6	
			6.3.5.2.5-13	6.3.5.2.5-13	
10MHz		QPSK	See table	See table	
			6.3.5.2.5-7	6.3.5.2.5-7	
			6.3.5.2.5-8	6.3.5.2.5-8	
			6.3.5.2.5-13	6.3.5.2.5-13	
15MHz		QPSK	See table	See table	
			6.3.5.2.5-9	6.3.5.2.5-9	
			6.3.5.2.5-10	6.3.5.2.5-10	
			6.3.5.2.5-13	6.3.5.2.5-13	
20MHz		QPSK	See table	See table	
			6.3.5.2.5-11	6.3.5.2.5-11	
			6.3.5.2.5-12	6.3.5.2.5-12	
			6.3.5.2.5-13	6.3.5.2.5-13	
Note 1: Test Channel Bandwidths are checked separately for each E-UTRA band, the applicable					
channel bandwidths are specified in Table 5.4.2.1-1					
Note 2: The starting resource block shall be RB# 0.					

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.3.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Down link signals are initially set up according to Annex C.0, C.1 and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to table 6.3.5.2.4.1-1
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.5.2.4.3.

6.3.5.2.4.2 Test procedure

The procedure is separated in various subtests to verify different aspects of relative power control. The power patterns of the subtests are described in figure 6.3.5.2.4.2-1.



Figure 6.3.5.2.4.2-1: FDD ramping up test power patterns



Figure 6.3.5.2.4.2-2: FDD ramping down test power patterns
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Figure 6.3.5.2.4.2-3: TDD ramping up test power patterns



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Figure 6.3.5.2.4.2-4: TDD ramping down test power patterns

3GPP





- 1. Sub test: ramping up pattern
 - 1.1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the PUSCH. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. Send the appropriate TPC commands for PUSCH to the UE to ensure that the UE transmits PUSCH at -36.8dBm +/- 3.2 dB for carrier frequency f \leq 3.0GHz or at -36.5dBm +/- 3.5 dB for carrier frequency 3.0GHz < f \leq 4.2GHz.
 - 1.2. Schedule the UE's PUSCH data transmission as described in Figure 6.3.5.2.4.2-1 (FDD pattern A: subtest is divided in 4 arbitrary radio frames with 10 active uplink sub-frames per radio frame) and Figure 6.3.5.2.4.2-3 (TDD pattern A: sub-test is divided in 10 arbitrary radio frames with 4 active uplink sub-frames per radio frame) with an uplink RB allocation as defined in tables 6.3.5.2.5-1 thru 6.3.5.2.5-12 depending on channel bandwidth. On the PDCCH format 0 for the scheduling of the PUSCH the SS will transmit a +1dB TPC command. Note that the measurement need not be done continuously, provided that interruptions are whole numbers of frames, and TPC commands of 0dB are sent during the interruption.
 - 1.3. Measure the power of PUSCH transmissions to verify the UE relative power control meet test requirements 6.3.5.2.5. For power transients between subframes, transient periods of 40us between subframes are excluded. For ON/OFF or OFF/ON transients, transient periods of 20 us at the beginning of the subframe are excluded.
 - 1.4. Repeat the subtest different pattern B, C to move the RB allocation change at different points in the pattern as described in Table 6.3.5.2.5-1 thru Table 6.3.5.2.5-12 to force bigger UE power steps at various points in the power range.
- 2. Sub test: ramping down pattern
 - 2.1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the PUSCH. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. Send the appropriate TPC commands for PUSCH to the UE to ensure that the UE transmits PUSCH at +18.0dBm +/- 3.2 dB for carrier frequency $f \le 3.0$ GHz or at +17.7dBm +/- 3.5 dB for carrier frequency 3.0GHz < $f \le 4.2$ GHz.
 - 2.2. Schedule the UE's PUSCH data transmission as described in Figure 6.3.5.2.4.2-2 (FDD pattern A: subtest is divided in 4 arbitrary radio frames with 10 active uplink sub-frames per radio frame) and Figure 6.3.5.2.4.2-4 (TDD pattern A: sub-test is divided in 10 arbitrary radio frames with 4 active uplink sub-frames per radio frame) with an uplink RB allocation as defined in tables 6.3.5.2.5-1 thru 6.3.5.2.5-12 depending on channel bandwidth. On the PDCCH format 0 for the scheduling of the PUSCH the SS will transmit a -1dB TPC command. Note that the measurement need not be done continuously, provided that interruptions are whole numbers of frames, and TPC commands of 0dB are sent during the interruption.

- 2.3. Measure the power of PUSCH transmissions to verify the UE relative power control meet test requirements 6.3.5.2.5. For power transients between subframes, transient periods of 40us between subframes are excluded. For ON/OFF or OFF/ON transients, transient periods of 20 us at the beginning of the subframe are excluded.
- 2.4. Repeat the subtest different pattern B, C to move the RB allocation change at different points in the pattern as described in Table 6.3.5.2.5-1 thru Table 6.3.5.2.5-12 to force bigger UE power steps at various points in the power range.
- 3. Sub test: alternating pattern
 - 3.1 SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the PUSCH. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. Send the appropriate TPC commands for PUSCH to the UE to ensure that the UE transmits PUSCH at -10dBm +/- 3.2 dB for carrier frequency $f \leq 3.0$ GHz or at -10dBm +/- 3.5 dB for carrier frequency 3.0GHz < $f \leq 4.2$ GHz. The initial uplink RB allocation is defined as the smaller uplink RB allocation value specified in tables 6.3.5.2.5-13. The power level and RB allocation are reset for each sub-test.
 - 3.2. Schedule the UE's PUSCH data transmission as described in Figure 6.3.5.2.4.2-5for 10 sub-frames with an uplink RB allocation alternating pattern as defined in table 6.3.5.2.5-13 while transmitting 0dB TPC command for PUSCH via the PDCCH.
 - 3.3. Measure the power of PUSCH transmissions to verify the UE relative power control meet test requirements specified in clause 6.3.5.2.5. For power transients between subframes, transient periods of 40us between subframes are excluded. For ON/OFF or OFF/ON transients, transient periods of 20 us at the beginning of the subframe are excluded.

6.3.5.2.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6.

6.3.5.2.5 Test requirement

Each UE power step measured in the test procedure 6.3.5.2.4.2 should satisfy the test requirements specified in Table 6.3.5.2.5-1, thru 6.3.5.2.5-13 for normal conditions; for extreme conditions an additional ± 2.0 dB relaxation is allowed.

To account for RF Power amplifier mode changes 2 exceptions are allowed for each of ramping up and ramping down test patterns. For these exceptions the power tolerance limit is a maximum of ± 6.7 dB. If there is an exception in the power step caused by the RB change for all test patterns (A, B, C) then fail the UE.

Table 6.3.5.2.5-1: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 1.4MHz (ramping up)

Sub-test (ramp up)	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

Subframe before R change	es Fixed = 1 B	TPC=+1dB	1	∆P < 2	1 ± (1.7)			
RB chan	ge Change from 1 to 6 RBs	TPC=+1dB	8.78	4 ≤ ΔP < 10	8.78 ± (4.7) Note 2 8.78 +6.2/-4.7 Note 3			
Subframe after RE change	es Fixed = 6 3	TPC=+1dB	1	∆P < 2	1 ± (1.7)			
Note 1:	Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes Pattern B the position of RB uplink allocation change is after 20 active uplink subframes Pattern C the position of RB uplink allocation change is after 30 active uplink							
Note 2: Note 3:	When Note 3 does not apply. For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within $F_{UL_{low}}$ and $F_{UL_{low}} + 4$ MHz or $F_{UL_{high}} - 4$ MHz and $F_{UL_{high}}$ and the target sub-frame is not confined within any one of these frequency ranges.							
Note 4: Note 5: Note 6:	N/A For extreme conditions an additional ± 2.0 dB relaxation is allowed. The starting resource block shall be RB# 0.							

 Table 6.3.5.2.5-2: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 1.4MHz (ramping down)

Sub-tes (ramp down)	t	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH
				ΔΡ [dB]	ΔP [dB]	[dB]
Subframe before R change	es B	Fixed = 5	TPC=-1dB	1	ΔP < 2	1 ± (1.7)
RB chan	ge	Change from 5 to 1 RBs	TPC=-1dB	7.99	4 ≤ ∆P < 1	7.99 ± (4.7) Note 2 7.99 +4.7/-6.2 Note 4
Subframes after RB change		Fixed = 1	TPC=-1dB	1	ΔP < 2	1 ± (1.7)
Note 1: Note 2: Note 3: Note 4:	Position of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes Pattern B the position of RB uplink allocation change is after 16 active uplink subframes Pattern C the position of RB uplink allocation change is after 26 active uplink subframes When Note 4 does not apply. N/A For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within F _{UL_low} and F _{UL_low} + 4 MHz or F _{UL_high} - 4 MHz and F _{UL_high} and the reference sub-frame is not confined					
Note 5: Note 6:	For The	r extreme con e starting reso	ditions an add	itional \pm 2.0 c all be RB# 0.	IB relaxation i	s allowed.

Sub-test (ramp up)	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH		
			ΔP [dB]	ΔP [dB]	[dB]		
Subframes before RB change	Fixed = 1	TPC=+1dB	1	∆P < 2	1 ± (1.7)		
RB change	Change from 1 to 4 RBs	TPC=+1dB	7.02	4 ≤ ΔP < 10	7.02 ± (4.7) Note 2 7.02 +6.2/-4.7 Note 3		
Subframes after RB change	Fixed =4	TPC=+1dB	1	ΔP < 2	1 ± (1.7)		
Note 1: F F S F S Note 2: V Note 3: F b	Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes Pattern B the position of RB uplink allocation change is after 20 active uplink subframes Pattern C the position of RB uplink allocation change is after 30 active uplink subframes When Note 3 does not apply. For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within Fullow and Fullow + 4 MHz or Full birdh = 4 MHz and Full birdh and the target sub-frame is not confined						
Note 4: N Note 5: F Note 6: 7	vithin any one of I/A for extreme con- the starting resc	these frequer ditions an add ource block sha	ncy ranges. itional ± 2.0 c all be RB# 0.	B relaxation	is allowed.		

Table 6.3.5.2.5-3: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 3MHz (ramping up)

Table 6.3.5.2.5-4: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 3MHz (ramping down)

Sub-test (ramp down)	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH
			ΔP [dB]	∆P [dB]	[dB]

Subframes before RB change	Fixed = 15	TPC=-1dB	1	ΔP < 2	1 ± (1.7)		
RB change	Change from 15 to 1 RBs	TPC=-1dB	12.76	10 ≤ ΔP < 15	12.76 ± (5.7) Note 2 12.76 +5.7/-7.2 Note 4		
Subframes after RB change	Fixed =1	TPC=-1dB	1	∆P < 2	1 ± (1.7)		
Note 1: Pe Pa St Pa Note 2: W Note 3: NA Note 4: Fe ba	 Position of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes Pattern A the position of RB uplink allocation change is after 16 active uplink subframes Pattern C the position of RB uplink allocation change is after 26 active uplink subframes When Note 4 does not apply. N/A For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission 						
or w Note 5: Fo Note 6: Th	or $F_{UL_high} - 4$ MHz and F_{UL_high} and the reference sub-frame is not confined within any one of these frequency ranges. For extreme conditions an additional ± 2.0 dB relaxation is allowed. The starting resource block shall be RB# 0.						

 Table 6.3.5.2.5-5: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 5MHz (ramping up)

Sub-tes (ramp u	st p)	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH	
				ΔP [dB]	ΔP [dB]	[dB]	
Subfram before R change	es B	Fixed = 1	TPC=+1dB	1	ΔP < 2	1 ± (1.7)	
RB chan	ge	Change from 1 to 20	TPC=+1dB	14.01	10 ≤ ΔP < 15	14.01 ± (5.7) Note 2 14.01 +7.2/-5.7 Note 3	
Subframes after RB change		Fixed = 20	TPC=+1dB	1	ΔP < 2	1 ± (1.7)	
Note 1: Note 2:	 Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes Pattern B the position of RB uplink allocation change is after 20 active uplink subframes Pattern C the position of RB uplink allocation change is after 30 active uplink subframes 						
Note 3:	For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within $F_{UL_{low}}$ and $F_{UL_{low}}$ + 4 MHz or $F_{UL_{high}}$ - 4 MHz and $F_{UL_{high}}$ and the target sub-frame is not confined within any one of these frequency ranges.						
Note 5: Note 6:	For	r extreme conc e starting reso	ditions an addi urce blocksha	itional ± 2.0 c all be RB# 0.	B relaxation i	is allowed.	

Sub-test (ramp down)	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH		
			ΔΡ [dB]	ΔP [dB]	[dB]		
Subframes before RB change	Fixed = 25	TPC=-1dB	1	∆P < 2	1 ± (1.7)		
RB change	Change from 25 to 1	TPC=-1dB	14.98	10 ≤ ΔP < 15	14.98 ± (5.7) Note 2 14.98 +5.7/-7.2 Note 4		
Subframes after RB change	Fixed = 1	TPC=-1dB	1	ΔP < 2	1 ± (1.7)		
Note 1: Po Pa sut Pa sut Note 2: Wr Note 3: N// Note 4: For bar or wit	 Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes Pattern B the position of RB uplink allocation change is after 16 active uplink subframes Pattern C the position of RB uplink allocation change is after 26 active uplink subframes Note 2: When Note 4 does not apply. Note 3: N/A Note 4: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within F_{UL_low} and F_{UL_low+4} MHz or F_{UL_high} and the reference sub-frame is not confined 						
Note 5: For Note 6: The	r extreme con e starting reso	ditions an addi urce block sha	itional ± 2.0 c all be RB# 0.	B relaxation	is allowed.		

Table 6.3.5.2.5-6: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 5MHz (ramping down)

Table 6.3.5.2.5-7: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 10MHz (ramping up)

Sub-test (ramp up)	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

Subfram before R	es Fixed = 1	TPC=+1dB	1	ΔP < 2	1 + (1.7)	
change	e				(,	
RB chan	ge Change from 1 to 25	TPC=+1dB	14.98	10 ≤ ΔP < 15	14.98 ± (5.7) Note 2 14.98 +7.2/-5.7 Note 3	
Subfram	es Fixed = 25	TPC=+1dB		45 0		
after RI	3		1	$\Delta P < 2$	1 ± (1.7)	
change						
Note 1:	Position of RB ci	lange:	link allocatio	n change is a	ttor 10 potivo uplink	
	Pattern A the pos	зшоп от къ ир	nink allocatio	n change is a	iller TO active uplink	
	Subirarities	sition of DD un	link allocatio	n ahanga ia a	ttor 20 active uplink	
	eubfromos		nink allocatio	n change is a	iller 20 active uplink	
	Pattern C the no	sition of RB un	link allocatio	n change is a	fter 30 active unlink	
	subframes					
Note 2	When Note 3 do	es not apply				
Note 3	For operating ba	nds under Not	e 2 in Table (6223-1 if th	e transmission	
10000.	bandwidth of the	reference sub	-frames is co	onfined within	$F_{\rm H}$ low and $F_{\rm H}$ low + 4	
	MHz or Full kick – 4 MHz and Full kick and the target sub-frame is not confined					
	within any one of these frequency ranges					
Note 4:	N/A					
Note 5:	For extreme con	ditions an add	itional ± 2.0 c	B relaxation	is allowed.	
Note 6:	The starting reso	ource block sha	all be RB# 0.			

 Table 6.3.5.2.5-8: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 10MHz (ramping down)

Sub-test (ramp down)	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

Subfram before R change	es B Ə	Fixed = 50 (UE- Categories ≥2)	TPC=-1dB	1	ΔP < 2	1 ± (1.7)	
		Fixed = 48 (UE Cat 1)					
RB chan	ge	Change from 50 to 1 (UE- Categories ≥2)		17.99	15 <i><</i> A	17.99 ± (6.7) Note 2 17.99 +6.7/-8.2 Note 4	
		Change from 48 to 1 (UE cat 1)		17.81		17.81 ± (6.7) Note 2 17.81 +6.7/-8.2 Note 4	
Subfram after RI change	es 3 9	Fixed = 1	TPC=-1dB	1	∆P < 2	1 ± (1.7)	
Note 1: Note 2: Note 3: Note 4:	Position of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes Pattern B the position of RB uplink allocation change is after 16 active uplink subframes Pattern C the position of RB uplink allocation change is after 26 active uplink subframes When Note 4 does not apply. N/A For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within Ful_low and Ful_low + 4 MHz						
Note 5: Note 6:	wit Foi The	hin any one of r extreme cond e starting reso	these frequer ditions an add	itional ± 2.0 c all be RB# 0.	B relaxation	is allowed.	

Table 6.3.5.2.5-9: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 15MHz (ramping up)

Sub-test (ramp up)	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH
			ΔP [dB]	∆P [dB]	[dB]

Subframe before R change	es B	Fixed = 1	TPC=+1dB	1	ΔP < 2	1 ± (1.7)
RB chan	ge	Change from 1 to 50	TPC=+1dB	17.99	15 ≤∆P	17.99±(6.7) Note 2 17.99 +8.2/-6.7 Note 3
Subframes after RB change		Fixed = 50	TPC=+1dB	1	∆P < 2	1 ± (1.7)
Note 1:	 Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes Pattern B the position of RB uplink allocation change is after 20 active uplink subframes Pattern C the position of RB uplink allocation change is after 30 active uplink subframes 					
Note 2: Note 3:	 ote 2: When Note 3 does not apply. ote 3: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within F_{UL_low} and F_{UL_low}+ 4 MHz or F_{UL_high} – 4 MHz and F_{UL_high} and the target sub-frame is not confined within any one of these frequency ranges. 					
Note 5: Note 6:	For extreme conditions an additional ± 2.0 dB relaxation is allowed. The starting resource block shall be RB# 0.					

 Table 6.3.5.2.5-10: Test Requirements Relative Power Tolerance for Transmission (normal conditions

 – Note 5) channel bandwidth 15MHz (ramping down)

Sub-test (ramp down)	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

				-		
Subframe before R change	B	Fixed = 75 (UE- Categories ≥2) Fixed = 50 (UF Cat 1)	TPC=-1dB	1	∆P < 2	1 ± (1.7)
RB change		Change from 75 to 1 (UE- Categories ≥2) Change from 50 to 1 (UE Cat 1)	TPC=-1dB	19.75 17.99	15 ≤ΔP	19.75 ± (6.7) Note 2 19.75 +6.7/-8.2 Note 4 17.99 ± (6.7) Note 2 17.99 +6.7/-8.2 Note 4
Subframe after RE change	es B	Fixed = 1	TPC=-1dB	1	ΔP < 2	1 ± (1.7)
Note 1:Position of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes Pattern B the position of RB uplink allocation change is after 16 active uplink subframes Pattern C the position of RB uplink allocation change is after 26 active uplink subframes Note 2:Note 2:When Note 4 does not apply. Note 3:Note 4:For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission					fter 6 active uplink fter 16 active uplink fter 26 active uplink ne transmission	
 bandwidth of the target sub-frame is confined within F_{UL_low} and F_{UL_low} + 4 MH: or F_{UL_high} – 4 MHz and F_{UL_high} and the reference sub-frame is not confined within any one of these frequency ranges. Note 5: For extreme conditions an additional ± 2.0 dB relaxation is allowed. Note 6: The starting resource block shall be RB# 0. 						

Table 6.3.5.2.5-11: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 20MHz (ramping up)

Sub-test (ramp up)	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

Subfram before R	es B	Fixed = 1	TPC=+1dB	1	ΔP < 2	1 ± (1.7)
change	•					
RB chan	ge	Change from 1 to 75	TPC=+1dB	19.75	15 ≤ΔP	19.75 ± (6.7) Note 2 19.75 +8.2/-6.7 Note 3
Subfram	es	Fixed = 75	TPC=+1dB	_		
after RE	3			1	ΔP < 2	1 ± (1.7)
change) 					
Note 1:	Pos	sition of RB ch	nange:			
	Pat	tern A the pos	sition of RB up	link allocatio	n change is a	fter 10 active uplink
	sub	frames				
	Pat	tern B the pos	sition of RB up	link allocatio	n change is a	fter 20 active uplink
	SUD	trames		Real allo and a		the mood and the second limits
	Pat	tern C the pos	sition of RB up	nink allocatio	n change is a	inter 30 active uplink
Note 2	SUD	onames on Noto 2 doc	a not annly			
Note 2.			es not apply.		00004 :64	
Note 3:	For	operating bai	nas under Not	e 2 in Table	6.2.2.3-1, If th	
	bandwidth of the reference sub-frames is confined within $F_{UL_{low}}$ and $F_{UL_{low}}$ + 4					
	$VIII Z OF FUL_{high} - 4$ $VIIII Z ATO FUL_{high} and the target Sub-frame is not confined$					
	within any one of these frequency ranges.					
Note 4:	N/A					
Note 5:	Note 5: For extreme conditions an additional ± 2.0 dB relaxation is allowed.					s allowed.
Note 6:	The starting resource block shall be RB# 0.					

 Table 6.3.5.2.5-12: Test Requirements Relative Power Tolerance for Transmission (normal conditions

 – Note 5) channel bandwidth 20MHz (ramping down)

Sub-test (ramp down)	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

					1	
Subfram	es	Fixed =	TPC=-1dB			
before R	B	100 (UE-				
change	;	Categories				
		≥2)		1	ΔP < 2	$1 \pm (1.7)$
		Fixed = 75				
		(UE Cat 1)				
RB chan	qe	Change	TPC=-1dB			
	0	from 100		21.0		
		to 1 (UE-				21.0 ± (6.7) Note 2
		Categories				21.0 +6.7/-8.2 Note 4
		≥2)				
		,			15 ≤ ΔP	
		Change				19.75 ± (6.7) Note 2
		from 75 to				19.75 +6.7/-8.2 Note 4
		1 (UE Cat		19.75		
		1)				
Subfram	es	Fixed = 1	TPC=-1dB			
after RE	3			1	ΔP < 2	$1 \pm (1.7)$
change	;					
Note 1:	Po	sition of RB ch	nange:			
	Pat	ttern A the pos	sition of RB up	link allocatio	n change is a	fter 6 active uplink
	sub	oframes				
	Pat	ttern B the pos	sition of RB up	link allocatio	n change is a	fter 16 active uplink
	sub	oframes				
	Pat	ttern C the pos	sition of RB up	link allocatio	n change is a	fter 26 active uplink
	sub	oframes				
Note 2:	Wh	en Note 4 doe	es not apply.			
Note 3:	N/A	A				
Note 4:	lote 4: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission					e transmission
	bandwidth of the target sub-frame is confined within F_{ULlow} and F_{ULlow} + 4 MH					_{ow} and F _{UL_low} + 4 MHz
	or $F_{UL high} - 4$ MHz and $F_{UL high}$ and the reference sub-frame is not confined					me is not confined
	wit	hin any one of	these frequer	ncy ranges.		
Note 5:	Foi	extreme cond	ditions an add	itional \pm 2.0 c	B relaxation	is allowed.
Note 6:	The	e starting reso	urce block sha	all be RB# 0.		

Table 6.3.5.2.5-13: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) (Alternating pattern)

Sub-test	Uplink RB allocation	TPC command	Expected power step size (Up or down)	Power step size range (Up or down)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

1.4 MHz	Alternating 1 and 6	TPC=0dB	7.78	4 ≤ ΔP < 10	7.78 ± (6.7) Note 1,2 7.78 +8.2/-6.7 Note 3 7.78 +6.7/-8.2 Note 4		
3 MH z	Alternating 1 and 15	TPC=0dB	11.76	10 ≤ ΔP < 15	$\frac{11.76 \pm (6.7) \text{ Note } 1,2}{11.76 \pm 8.2/-6.7 \text{ Note } 3,2}$		
5 MHZ	Alternating 1 and 25	TPC=0dB	13.98	10 ≤ ΔP < 15	13.98 ± (6.7) Note 1,2 13.98 +8.2/-6.7 Note 3 13.98 +6.7/-8.2 Note 4		
10 MHZ	Alternating 1 and 50 (UE- Categories	TPC=0dB	16.99		16.99 ± (6.7) Note 1,2 16.99 +8.2/-6.7 Note 3 16.99 +6.7/-8.2 Note 4		
	=2)			15 ≤ ΔP			
	Alternating 1 and 48 (UE Cat 1)		16.81		16.81 ± (6.7) Note 1,2 16.81 +8.2/-6.7 Note 3		
	Out I)		10,01		16.81 +6.7/-8.2 Note 4		
15 MHZ	Alternating 1 and 75 (UE- Categories	TPC=0dB	18.75		18.75 ± (6.7) Note 1,2 18.75 +8.2/-6.7 Note 3 18.75 +6.7/-8.2 Note 4		
	≥2)			15 ≤ ΛP			
	Alternating 1			10 - 11			
	and 50 (UE Cat 1)		16.99		16.99 ± (6.7) Note 1,2 16.99 +8.2/-6.7 Note 3 16 99 +6 7/-8 2 Note 4		
20 MHZ	Alternating 1 and 100 (UE-	TPC=0dB	20.00		20.00 ± (6.7) Note 1,2 20.00 +8.2/-6.7 Note 3 20.00 +6.7/-8.2 Note 4		
	Categories ≥2)			15 ≤ ΔP			
	Alternating 1 and 75 (UE Cat 1)		18.75		18.75 ± (6.7) Note 1,2 18.75 +8.2/-6.7 Note 3 18.75 +6.7/-8.2 Note 4		
Note 1:	Fest tolerance +/-	6.7 dB was se	elected to allo	w PAswitch	possible exceptions to		
Note 2: \	When neither Note	e 3 nor Note 4	applies.				
Note 3: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within F _{UL_low} and F _{UL_low} + 4 MHz or F _{UL_high} – 4 MHz and F _{ul_and} the target sub-frame is not confined within any one of these							
f Note 4: F	frequency ranges. lote 4: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within $F_{UL_{low}}$ and $F_{UL_{low}} + 4$ MHz or $F_{UL_{high}} - 4$ MHz and $F_{UL_{high}}$ and the reference sub-frame is not confined within any one of these frequency ranges						
Note 5:	 Trequency ranges. 5: For extreme conditions an additional ± 2.0 dB relaxation is allowed. 5: The starting recourse block shall be RB# 0. 						
	110 3 101 1119 10300	ito bioon anai	$10010\pi 0.$				

6.3.5.3 Aggregate power control tolerance

6.3.5.3.1 Test purpose

To verify the ability of the UE to maintain its power level in non-contiguous transmission within 21 ms in response to 0 dB TPC commands with respect to the first UE transmission, when the power control parameters specified in TS 36.213 are constant.

6.3.5.3.2 Test applicability

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

6.3.5.3.3 Minimum conformance requirement

The UE shall meet the requirements specified in Table 6.3.5.3.3-1 for relative power control over the power range bounded by the minimum output power as defined in sub clause 6.3.2 and the maximum output power in sub-clause 6.2.2.

TPC command	UL channel	Aggregate power tolerance within 21 ms			
0 dB	PUCCH	±2.5 dB			
0 dB	PUSCH	±3.5 dB			
Note 1: The UE transmission gap is 4 ms. TPC command is transmitted via PDCCH 4 subframes preceding each PUCCH/PUSCH transmission.					

Table 6.3.5.3.3-1: Power control tolerance

The normative reference for this requirement is TS 36.101 [2] clause 6.3.5.3.1.

6.3.5.3.4 Test description

6.3.5.3.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.3.5.3.4.1-1. The details of the uplink and downlink reference measurement channels (RMCs) are specified in Annexes A.2 and A.3. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Table 6.3.5.3.4.1-1: Test Configuration Table: PUCCH sub-test

Initial Conditions								
Test Env	Test Environment as specified in			Normal				
TS 36.	508[7] subclau	se 4.1						
Test Free	quencies as sp	ecified in		Mid range				
TS36.50)8 [7] subclau	se 4.3.1						
Test Channe	l Bandwidths a	s specified in		Lowest, 5MHz, Highest				
TS 36.50	08 [7] subclau	se 4.3.1						
		Test Paramete	ers for Channe	el Bandwidths				
	Dowr	nlink Configur	ation	Uplink Configuration				
Ch BW	Mod'n	RB allo	ocation	FDD: PUCCH format = Format 1a				
		FDD	TDD	IDD: PUCCH format = Format 1a/1b				
		-	-					
1.4MHz	QPSK	3	3					
3MHz	QPSK	4	4					
5MHz	QPSK	8	8					
10MHz	0MHz QPSK 16 1		16					
15MHz	QPSK	25	25					
20MHz QPSK 30		30						
Note 1: Te	st Channel Ba	ndwidths are ch	necked separa	tely for each E-UTRA band, the applicable				
channel bandwidths are specified in Table 5.4.2.1-1.								

Initial Conditions						
Test Env	Test Environment as specified in Normal					
TS 36.	508[7] subclause 4.1					
Test Free	quencies as specified in		Mid ra	ange		
TS36.50	08 [7] subclause 4.3.1					
Test Channe	Bandwidths as specified in		Lowest, 5M	Hz, Highest		
TS 36.50	08 [7] subclause 4.3.1					
	Test Paramete	rs for Channe	Bandwidths			
Downlink Configuration Uplink Configuration				ion		
Ch BW	N/A for PUSCH sub-test		Mod'n	RB allocation		
				FDD	TDD	
1.4MHz			QPSK	1	1	
3MHz			QPSK	4	4	
5MHz			QPSK	8	8	
10MHz			QPSK	12	12	
15MHz			QPSK	16	16	
20MHz QPSK 18 18						
Note 1: Te	Note 1: Test Channel Bandwidths are checked separately for each E-UTRA band, the applicable					
channel bandwidths are specified in Table 5.4.2.1-1.						

Table 6.3.5.3.4.1-2: Test Configuration Table: PUSCH sub-test

1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.3.

2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.

- 3. Downlink signals are initially set up according to Annex C0, C.1 and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL and DL Reference Measurement channels are set according to Table 6.3.5.3.4.1-1 (PUCCH sub-test) and Table 6.3.5.3.4.1-2 (PUSCH sub-test).

5. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.5.3.4.3.

6.3.5.3.4.2 Test procedure

The procedure is separated in two subtests to verify PUCCH and PUSCH aggregate power control tolerance respectively. The uplink transmission patterns are described in figure 6.3.5.3.4.2-1.





1. PUCCH sub test:

- 1.1 The SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Table 6.3.5.3.4.1-1. The SS sends downlink MAC padding bits on the DL RMC. The transmission of PDSCH will make the UE send uplink ACK/NACK using PUCCH. Send the appropriate TPC commands for PUCCH to the UE to ensure that the UE transmits PUCCH at 0dBm +/- 3.2 dB for carrier frequency f \leq 3.0GHz or at 0dBm +/- 3.5 dB for carrier frequency 3.0GHz < f \leq 4.2GHz.
- 1.2. Every 5 subframes transmit to the UE down link PDSCH MAC padding bits as well as 0 dB TPC command for PUCCH via the PDCCH to make the UE transmit ACK/NACK on the PUCCH with transmission gap of 4 subframes. The downlink transmission is scheduled in the appropriate sub-frames to make the UE transmit PUCCH as described in figure 6.3.5.3.4.2-1.
- 1.3. Measure the power of 5 consecutive PUCCH transmissions to verify the UE transmitted PUCCH power is maintained within 21 ms. The transient periods of 20us are excluded from the power measurement.
- 2. PUSCH sub test:
- 2.1. The SS sends uplink scheduling information via PDCCH DCI format 0 for C_RNTI to schedule the PUSCH. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. Send the appropriate TPC commands for PUSCH to the UE to ensure that the UE transmits PUSCH at 0dBm +/- 3.2.dB for carrier frequency f \leq 3.0GHz or at 0dBm +/- 3.5 dB for carrier frequency 3.0GHz < f \leq 4.2GHz.
- 2.2. Every 5 subframes schedule the UE's PUSCH data transmission and transmit 0 dB TPC command for PUSCH via the PDCCH to make the UE transmit PUSCH with 4 subframes gap. The uplink transmission patterns are described in figure 6.3.5.3.4.2-1.
- 2.3. Measure the power of 5 consecutive PUSCH transmissions to verify the UE transmitted PUSCH power is maintained within 21 ms. The transient periods of 20us are excluded from the power measurement.

6.3.5.3.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6.

6.3.5.3.5 Test requirement

The requirement for the power measurements made in step (1.3) and (2.3) of the test procedure shall not exceed the values specified in Table 6.3.5.3.5-1. The power measurement period shall be 1 sub-frame excluding transient periods.

TPC command	UL channel	Test requirement measured power			
0 dB	PUCCH	Given 5 power measurements in the pattern, the 2 nd , 3 rd , 4 th , and 5 th measurements shall be within ± 3.2 dB of the 1 st measurement.			
0 dB PUSCH		Given 5 power measurements in the pattern, the 2 nd , 3 rd , 4 th , and 5 th measurements shall be within ± 4.2 dB of the 1 st measurement.			
Note 1: The UE transmission gap is 4 ms. TPC command is transmitted via PDCCH 4 subframes preceding each PUCCH/PUSCH transmission.					

Table 6.3.5.3.5-1: Power control tolerance

6.3.5_1 Power Control for HPUE

Same text as in clause 6.3.5.

6.3.5_1.1 Power Control Absolute power tolerance for HPUE

6.3.5_1.1.1 Test purpose

Same test purpose as in clause 6.3.5.1.1.

6.3.5_1.1.2 Test applicability

This test applies to all types of E-UTRA Power Class 1 UE release 11 and forward.

6.3.5_1.1.3 Minimum conformance requirement

Same minimum conformance requirement as in clause 6.3.5.1.2 with the following exceptions:

- of sub-clause $6.2.2 \rightarrow$ use sub-clause $6.2.2_1$

The normative reference for this requirement is TS 36.101 [2] clause 6.3.5.1.1.

6.3.5_1.1.4 Test description

Same test description as in clause 6.3.5.1.4 with the following exceptions:

- For test point 2, instead of Table 6.3.5.1.4.3-2 → use Table 6.3.5_1.1.4.3-1

Table 6.3.5_1.1.4.3-1: UplinkPowerControlCommon: Test point 2

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT						
Information Element Value/remark Comment Cor						
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE { p0-NominalPUSCH	-85	Test point 2 t verify a UE relative high	o initial			
		power transmission				

6.3.5_1.1.5 Test requirement

The requirement for the power measured in step (2) of the test procedure is not to exceed the values specified in Table $6.3.5_1.1.5-1$ and $6.3.5_1.1.5-2$.

Table 6.3.5_1.1.5-1: Absolute	power tolerance: test point 1
-------------------------------	-------------------------------

	Channel bandwidth / expected output power (dBm)			
	5 MHz	10 MHz		
Expected Measured power Normal conditions	-8.6 dBm	-5.6 dBm		
Power tolerance	± 10.0dB	± 10.0dB		
Expected Measured power Extreme conditions	-8.6 dBm	-5.6 dBm		
Power tolerance	± 13.0dB	± 13.0dB		
Note 1: The lower power limit shall not exceed the minimum output power requirements defined in sub-clause 6.3.2.3				

Table 6.3.5_1.1.5-2: Absolute power tolerance: test point 2

	Channel bandwidth / expected output power (dBm)			
	5 MHz	10 MHz		
Expected Measured power Normal conditions	11.4 dBm	14.4 dBm		
Power tolerance	± 10.0dB	± 10.0dB		
Expected Measured power Extreme conditions	11.4 dBm	14.4 dBm		
Power tolerance	± 13.0dB	± 13.0dB		
Note 1: The lower power limit shall not exceed the minimum output power requirements defined in sub-clause 6.3.2.3				

6.3.5_1.2 Power Control Relative power tolerance for HPUE

6.3.5_1.2.1 Test purpose

Same test purpose as in clause 6.3.5.2.1.

6.3.5_1.2.2 Test applicability

This test applies to all types of E-UTRA Power Class 1 UE release 11 and forward.

6.3.5_1.2.3 Minimum conformance requirement

Same minimum conformance requirement as in clause 6.3.5.2.3 with the following exceptions

- stead of clause 6.2.2.3 \rightarrow use sub-clause 6.2.2_1.3

The normative reference for this requirement is TS 36.101 [2] clause 6.3.5.2.

6.3.5_1.2.4 Test description

Same test description as in clause 6.3.5.2.4 with the following exceptions:

clause 6.3.5.2.4.2, test step 2.1, setting the UE PUSCH power at +26d Bm +/-3.2dB instead of +18.0d Bm +/-3.2dB

6.3.5_1.2.5 Test requirement

Same test requirement as in clause 6.3.5.2.5.

6.3.5_1.3 Aggregate power control tolerance for HPUE

6.3.5_1.3.1 Test purpose

Same test purpose as in clause 6.3.5.3.1.

6.3.5_1.3.2 Test applicability

This test applies to all types of E-UTRA Power Class 1 UE release 11 and forward.

6.3.5_1.3.3 Minimum conformance requirement

Same minimum conformance requirement as in clause 6.3.5.3.3 with the following exception:

- Instead of sub-clause 6.2.2 \rightarrow use sub-clause 6.2.2_1

The normative reference for this requirement is TS 36.101 [2] clause 6.3.5.3.1.

6.3.5_1.3.4 Test description

Same test description as in clause 6.3.5.3.4.

6.3.5_1.3.5 Test requirement

Same test requirement as in clause 6.3.5.3.5.

6.3.5A Power Control for CA

6.3.5A.1 Power Control Absolute power tolerance for CA

6.3.5A.1.1 Power Control Absolute power tolerance for CA (intra-band contiguous DL CA and UL CA)

6.3.5A.1.1.1 Test purpose

To verify the ability of the UE transmitter to set its initial output power to a specific value for the first sub-frame at the start of a contiguous transmission or non-contiguous transmission with a transmission gap on each active component carriers larger than 20ms.

6.3.5A.1.1.2 Test applicability

This test applies to all types of E-UTRA UE release 10 and forward that support intra-band contiguous DL CA and UL CA.

6.3.5A.1.1.3 Minimum conformance requirements

The absolute power tolerance is the ability of the UE transmitter to set its initial output power to a specific value for the first sub-frame at the start of a contiguous transmission or non-contiguous transmission with a transmission gap on each active component carriers larger than 20ms. The requirement can be tested by time aligning any transmission gaps on the component carriers.

For intra-band contiguous carrier aggregation bandwidth class C the absolute power control tolerance per component carrier is given in Table 6.3.5A.1.1.3-1.

The requirements apply for one single PUCCH, PUSCH or SRS transmission of contiguous PRB allocation per component carrier.

Table 6.3.5A.1.1.3-1: Absolute power tolerance for intra-band contiguous CA

Conditions	Tolerance
Normal conditions	± 9.0 dB
Extreme conditions	± 12.0 dB

The normative reference for this requirement is TS 36.101 [2] clause 6.3.5A.1.1.

6.3.5A.1.1.4 Test description

6.3.5A.1.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and CC combinations based on E-UTRA CA configurations specified in table 5.4.2A.1-1. All of these configurations shall be tested with applicable test parameters for each CA Configuration, and are shown in table 6.3.5A.1.1.4.1-1. The details of the uplink reference measurement channel (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Conditions								
Test Environment as specified in		Normal, TL/VL, TL/VH, TH/VL, TH/VH						
TS 36.508[7] clause 4.1								
Test Fred	quencies as	s specified in		C: Mid rai	nge			
TS36.508	3 [7] claus e	e [4.3.1] for different CA band	dwidth					
classes.								
TestCC	Combinatio	on setting (NRB_agg) as spe	cified in	Lowest N	RB_agg			
clause 5.	4.2A.1 for t	he CAConfiguration across		Highest N	RB_agg			
bandwidt	h combinat	tion sets supported by the UI	E.					
Test Parameters for CA Configurations								
CA Confi	iguration	DL Allocation	CC	UL Alloca	ation			
/ N _{RB_agg}			MOD					
PCC	SCCs	PCC & SCC RB		N _{RB_alloc}	PCC & SCC RB	allocations		
N _{RB}	N _{RB}	allocation			(L _{CRB} @ RB _{start})			
75	75	NI/A	QPSK	150 P_75@0 S_75@0				
100	50	for this test	QPSK	150 P_100@0 S_50@0				
100	100		QPSK	200 P_100@0 S_100@0				
Note 1:	CA Confi	guration Test CC Combination	onsettings	are checke	d separately for e	ach CA Conf	iguration, v	vhich
	applicable aggregated channel bandwidths are specified in Table 5.4.2A.1-1.							

Table 6.3.5A.1.1.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.32 as appropriate group A.32 as appropriate.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] clause 4.4.3.
- 3. Downlink signals for PCC are initially set up according to Annex C.0, C.1 and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.3.5A.1.1.4.1-1.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.5A.1.1.4.3. Any PDCCH DCI format 0 sent to the UE during the configuration should have TPC command 0dB.

6.3.5A.1.1.4.2 Test procedure

- 1. Configure SCC according to Annex C.0, C.1 and Annex C.3.0 for all downlink physical channels except PHICH.
- The SS shall configure SCC as per TS 36.508 [7] clause 5.2A.4. Message contents for UplinkPowerControlCommonSCell-r10 are defined in tables 6.3.5A.1.1.4.3-2, 6.3.5A.1.1.4.3-4 and 6.3.5A.1.1.4.3-7. Any PDCCH DCI format 0 sent to the UE during the configuration should have TPC command 0dB.
- 3. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133, clauses 8.3.3.2).
- 4. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 with TPC command 0dB for C_RNTI to schedule the UL RMC according to Table 6.3.5A.1.1.4.1-1 on both PCC and SCC. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 5. Measure the initial output power of the first subframe of the UE PUSH first transmission for each component carrier. The transient periods of 20us are excluded.
- 6. Repeat for the two test points as indicated in section 6.3.5A.1.1.4.3. The timing of the execution between the two test points shall be larger than 20ms.

6.3.5A.1.1.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6 with the following exceptions.

Derivation Path: TS 36.508 [7] clause 6.3.2, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT						
Information Element	Value/remark	Comment	Condition			
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE { p0-NominalPUSCH	-105	Test point 1 to verify a UE relative low initial power				
		transmission				

Table 6.3.5A.1.1.4.3-1: UplinkPowerControlCommon: Test point 1

Table 6.3.5A.1.1.4.3-2: UplinkPowerControlCommonSCell-r10: Test point 1

Derivation Path: TS 36.508 [7] clause 6.3.2, Table 4.6.3-25A UplinkPowerControlCommonSCell-r10-DEFAULT					
Information Element	Value/remark	Comment	Condition		
UplinkPowerControlCommonSCell-r10 ::= SEQUENCE { p0-NominalPUSCH	-105	Test point 1 to verify a UE relative low initial power transmission			

Table 6.3.5A.1.1.4.3-3: UplinkPowerControlCommon: Test point 2

Derivation Path: TS 36.508 [7] clause 6.3.2, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT					
Information Element	Value/rem	ark Comment	Condition		
UplinkPowerControlCommon-DEFAULT ::=	-93	Test point 2 to			
SEQUENCE {		verify a UE			
p0-NominalPUSCH		relative high initial			
		power			
		transmission			

Table 6.3.5A.1.1.4.3-4: UplinkPowerControlCommonSCell-r10: Test point 2

Derivation Path: TS 36.508 [7] clause 6.3.2, Table 4.6.3-25A UplinkPowerControlCommonSCell-r10-DEFAULT						
Information Element Value/remark Comment Conc						
UplinkPowerControlCommonSCell-r10 ::= SEQUENCE { p0-NominalPUSCH	-93		Test point 2 to verify a UE relative high initial power			
			transmission			

Table 6.3.5A.1.1.4.3-5: PhysicalConfigDedicated

Derivation Path: TS 36.508 [7] clause 6.3.2, Table 5.5.1.2.1 PhysicalConfigDedicated -DEFAULT							
Information Element	Value/remark	Comment	Condition				
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {							
uplinkPowerControlDedicated	UplinkPowerControlDedic	See subclause	SRB1				
	ated-DEFAULT	4.6.3					
	UplinkPowerControlDedic	See subclause	RBC				
	ated-DEFAULT	4.6.3					

Table 6.3.5A.1.1.4.3-6: UplinkPowerControlDedicated

Derivation Path: TS 36.508 [7] clause 6.3.2, Table 4.6.3-26 UplinkPowerControlDedicated-DEFAULT							
Information Element	Value/remark	Comment	Condition				
UplinkPowerControlDedicated-DEFAULT ::=							
SEQUENCE {							
p0-UE-PUSCH	1		SRB1				
	0		RBC				
}							

Derivation Path: TS 36.508 [7] clause 6.3.2, Table 4.6.3-26B UplinkPowerControlDedicatedSCell-r10-DEFAULT							
Information Element	Value/remark	Comment	Condition				
UplinkPowerControlDedicatedSCell-r10 ::=							
SEQUENCE {							
p0-UE-PUSCH	1		SRB1				
	0		RBC				
}							

Table 6.3.5A.1.1.4.3-7: UplinkPowerControlDedicatedSCell-r10

6.3.5A.1.1.5 Test requirement

For intra-band contiguous carrier aggregation bandwidth class C, the absolute power control tolerance per component carrier measured in step (5) of the test procedure is not to exceed the values specified in Table 6.3.5A.1.1.5-1 and 6.3.5A.1.1.5-2. The test requirement tables are originated from tables 6.3.5.1.5-1 and 6.3.5.1.5-2.

	Cha	Channel bandwidth / expected output power (dBm)								
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz				
Expected Measured power Normal conditions	-14.8 dBm	-10.8 dBm	-8.6 dBm	-5.6 dBm	-3.9 dBm	-2.6 dBm				
Power tolerance f ≤ 3.0GHz 3.0GHz < f ≤ 4.2GHz	± 10.0dB ± 10.4dB	± 10.0dB ± 10.4dB	± 10.0dB ± 10.4dB	± 10.0dB ± 10.4dB	± 10.0dB ± 10.4dB	± 10.0dB ± 10.4dB				
Expected Measured power Extreme conditions	-14.8 dBm	-10.8 dBm	-8.6 dBm	-5.6 dBm	-3.9 dBm	-2.6 dBm				
Power tolerance f ≤ 3.0GHz 3.0GHz < f ≤ 4.2GHz	± 13.0dB ± 13.4dB	± 13.0dB ± 13.4dB	± 13.0dB ± 13.4dB	± 13.0dB ± 13.4dB	± 13.0dB ± 13.4dB	± 13.0dB ± 13.4dB				
Note 1: The lowe	er power limit de	Note 1: The lower power limit shall not exceed the minimum output power requirements defined in sub-clause 6.3.2.3								

Table 6.3.5A.1.1.5-1: Absolute power tolerance for intra-band contiguous CA: test point 1

Table 6.3.5A.1.1.5-2: Absolute power tolerance for intra-band contiguous CA: test point 2

	Cha	Channel bandwidth / expected output power (dBm)							
	1.4	3.0	5	10	15	20			
	MHz	MHz	MHz	MHz	MHz	MHz			
Expected									
Measured power	-2.8 dBm	1.2 dBm	3.4 dBm	6.4 dBm	8.2 dBm	9.4 dBm			
Normal conditions									
Power tolerance						±			
f ≤ 3.0GHz	± 10.0dB	± 10.0dB	± 10.0dB	± 10.0dB	± 10.0dB	10.0dB			
3.0GHz < f ≤	± 10.4dB	± 10.4dB	± 10.4dB	± 10.4dB	± 10.4dB	±			
4.2GHz						10.4dB			
Expected									
Measured power	-2.8 dBm	1.2 dBm	3.4 dBm	6.4 dBm	8.2 dBm	9.4 dBm			
Extreme conditions									
Power tolerance						±			
f ≤ 3.0GHz	± 13.0dB	± 13.0dB	± 13.0dB	± 13.0dB	± 13.0dB	13.0dB			
3.0GHz < f ≤	± 13.4dB	± 13.4dB	± 13.4dB	± 13.4dB	± 13.4dB	±			
4.2GHz						13.4dB			
Note 1: The lower	power limits	hall not exce	ed the minin	num output	power require	ements			
defined in	sub-dause 6	.3.2.3							

6.3.5A.2 Power Control Relative power tolerance for CA

6.3.5A.2.1 Power Control Relative power tolerance for CA (intra-band contiguous DL CA and UL CA)

In the minimum conformance paragraph and in the test procedure the alignment $(\pm [2])$ of the two component carriers needs to be confirmed.

6.3.5A.2.1.1 Test purpose

To verify the ability of the UE transmitter to change the output power in both assigned component carrier in the uplink with a defined power step sizes between sub-frames on the two respective component carrier.

6.3.5A.2.1.2 Test applicability

This test applies to all types of E-UTRA UE release 10 and forward that support intra-band contiguous DL CA and UL CA.

6.3.5A.2.1.3 Minimum conformance requirement

The requirements apply when the power of the target and reference sub-frames on each component carrier exceed the minimum output power as defined in subclause 6.3.2A and the total power is limited by P_{UMAX} as defined in subclause 6.2.5A.

For intra-band contiguous carrier aggregation bandwidth class C, the UE transmitter shall have the capability of changing the output power in both assigned component carrier in the uplink with a step sizes of ΔP between subframes on the two respective component carrier as follows

- a) The requirements for all combinations of PUSCH and PUCCH transitions per component carrier is given in Table 6.3.5A.2.1.3-1, when the average transmit power per PRB for the transmission on the assigned carriers are aligned to within ±[2] dB in the reference sub-frame and the target subframe after the transition.
- b) For SRS the requirements for combinations of PUSCH/PUCCH and SRS transitions between sub-frames given in Table 6.3.5A.2.1.3-1 apply per component carrier when the target and reference subframes are configured for either simultaneous SRS or simultaneous PUSCH and with the average transmit power per PRB for the transmissions on the assigned carrier aligned to within ±[2] dB in the reference sub-frame and the target subframe after the transition.
- c) For RACH the requirements apply for the primary cell and are given in Table 6.3.5A.2.1.3-1.

Power step ∆P (Up or down) [dB]		All combinations of PUSCH and PUCCH transitions [dB]	All combinations of PUSCH/PUCCH and SRS transitions between sub- frames [dB]	PRACH [dB]					
ΔP <	< 2	±2.5 (Note 3)	±3.0	±2.5					
2 ≤ ∆F	c < 3	±3.0	±4.0	±3.0					
3 ≤ ∆F	° < 4	±3.5	±5.0	±3.5					
4 ≤ ΔP	≤ 10	±4.0	±6.0	±4.0					
10 ≤ ∆P < 15		±5.0	±8.0	±5.0					
15 ≤	ΔP	±6.0	±9.0	±6.0					
Note 1: Note 2:	Note 1: For extreme conditions an additional ± 2.0 dB relaxation is allowed Note 1: For operating bands under Note 2 in Table 6.2.2.3-1, the relative power tolerance is relaxed by increasing the upper limit by 1.5 dB if the transmission bandwidth of the reference sub-frames is confined within FUL_low and FUL_low + 4 MHz or FUL_high - 4 MHz and FUL_high and the target sub-frame is not confined within any one of these frequency ranges; if the transmission bandwidth of the target sub-frame is confined within FUL_low and FUL_low + 4 MHz or FUL_high - 4 MHz and FUL_high and the target sub-frame is not confined within any one of these frequency ranges; if the transmission bandwidth of the target sub-frame is confined within FUL_low and FUL_low + 4 MHz or FUL_high - 4 MHz and FUL_high and the reference sub-frame is not confined within any one of these frequency ranges, then the tolerance is relaxed by reducing the lower limit by 1.5								
Note 3:	For PUS fixed in t by down powers ±1.0 dB	SCH to PUSCH transition frequency and no trans fink subframes, DwPT tep $\Delta P \le 1$ dB, the relation.	ons with the allocated re mission gaps other than S fields or Guard Period tive power toleranœ for	source blocks those generated s for TDD: for a transmission is					

able 6.3.5A.2.1.3-1 Relative	e Power Tolerance for	Transmission	(normal conditions)
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The power step (ΔP) is defined as the difference in the calculated setting of the UE Transmit power between the target and reference sub-frames with the power setting according to Clause 5.1 of TS 36.213. The error is the difference between ΔP and the power change measured at the UE antenna port with the power of the cell-specific reference signals kept constant. The error shall be less than the relative power tolerance specified in Table 6.3.5A.2.1.3-1.

The normative reference for this requirement is TS 36.101 clause 6.3.5A.2.

6.3.5A.2.1.4 Test description

6.3.5A.2.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and CC combinations based on E-UTRA CA configurations specified in table 5.4.2A.1-1. All of these configurations shall be tested with applicable test parameters for each CA Configuration, and are shown in table 6.3.5A.2.1.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Co	Initial Conditions							
Test Envi	ronmenta	s specified in		Nomal, TL/VL, TL/VH, TH/VL, TH/VH				
TS 36.50	8[7] claus e	9 4.1						
Test Free	luencies as	s specified in		C: Mid rai	nge			
TS36.508	3[7]clause	e [4.3.1] for different CA band	width					
classes.								
Test CC 0	Combinatio	on setting (NRB_agg) as spe	cified in	Lowest N	RB_agg			
clause 5.	4.2A.1 for t	he CAConfiguration across		Highest N	RB_agg			
bandwidt	bandwidth combination sets supported by the UE.							
Test Para	ameters for	· CA Configurations						
CA Confi	guration	DL Allocation	CC	UL Alloca	ation			
/ N _{RB_agg}			MOD					
PCC	SCCs	PCC & SCC RB		N _{RB_alloc}	PCC & SCC RB	allocations		
N _{RB}	N _{RB}	allocation			(L _{CRB} @ RB _{start})			
75	75	Ν/Δ	QPSK	150	P_75@0	S_75@0	-	-
100	50	for this test	QPSK	SK 150 P_100@0 S_50@0 -				-
100	100		QPSK	200 P_100@0 S_100@0				
Note 1:	CA Confi	guration Test CC Combination	onsettings	are checke	d separately for ea	ch CA Configurati	on, which	
	applicabl	e aggregated channel bandw	vidths are s	pecified in	Table 5.4.2A.1 -1			

Table 6.3.5A.2.1.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.32 as appropriate .
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] clause 4.4.3.
- 3. Downlink signals for PCC are initially set up according to Annex C.0, C.1 and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to table 6.3.5A.2.1.4.1-1
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.5A.2.1.4.3.

6.3.5A.2.1.4.2 Test procedure

- 1. Configure SCC according to Annex C.0, C.1 and Annex C.3.0 for all downlink physical channels except PHICH.
- 2. The SS shall configure SCC as per TS 36.508 [7] clause 5.2A.4.
- 3. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133, clauses 8.3.3.2).
- 4. The procedure is separated in various subtests to verify different aspects of relative power control. The power patterns of the subtests are described in figure 6.3.5.2.4.2-1, 6.3.5.2.4.2-2, 6.3.5.2.4.2-3, 6.3.5.2.4.2-4 and 6.3.5.2.4.2-5.
- 5. Sub test: ramping up pattern
- 5.1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.3.5A.1.1.4.1-1 on both PCC and SCC. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. Send the appropriate TPC commands for PUSCH on each component carrier to the UE to ensure that the UE transmits PUSCH at -36.8dBm +/- 3.2 dB for carrier frequency f \leq 3.0GHz or at -36.5dBm +/- 3.5 dB for carrier frequency 3.0GHz < f \leq 4.2GHz. In addition, considering that PCC and SCC uplink RB allocations are both active, the average transmit power per PRB for the transmission on the assigned carriers shall aligned within \pm [2] dB in the reference sub-frame and the target subframe after the transition. In case they are not aligned, SS shall send appropriate TPC commands for PUSCH on the relevant component in order to be aligned before continuing the test.
- 5.2. Schedule the UE's PUSCH data transmission on each component carrier as described in Figure 6.3.5.2.4.2-1 (FDD pattern A: sub-test is divided in 4 arbitrary radio frames with 10 active uplink sub-frames per radio frame)

and Figure 6.3.5.2.4.2-3 (TDD pattern A: sub-test is divided in 10 arbitrary radio frames with 4 active uplink sub-frames per radio frame) with an uplink RB allocation as defined in tables 6.3.5.2.5-1 thru 6.3.5.2.5-12 depending on channel bandwidth. On the PDCCH format 0 for the scheduling of the PUSCH of each component carrier the SS will transmit a +1dB TPC command. Note that the measurement need not be done continuously, provided that interruptions are whole numbers of frames, and TPC commands of 0dB are sent during the interruption.

- 5.3. Measure the power of PUSCH transmissions on each component carrier to verify the UE relative power control meet test requirements 6.3.5.2.5. For power transients between subframes, transient periods of 40us between subframes are excluded. For ON/OFF or OFF/ON transients, transient periods of 20 us at the beginning of the subframe are excluded.
- 5.4. Repeat the subtest different pattern B, C to move the RB allocation change at different points in the pattern as described in Table 6.3.5.2.5-1 thru Table 6.3.5.2.5-12 to force bigger UE power steps at various points in the power range on each component carrier.
- 6. Sub test: ramping down pattern
- 6.1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.3.5A.1.1.4.1-1 on both PCC and SCC. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. Send the appropriate TPC commands for PUSCH on each component carrier to the UE to ensure that the UE transmits PUSCH at +18.0dBm +/- 3.2 dB for carrier frequency f \leq 3.0GHz or at +17.7dBm +/- 3.5 dB for carrier frequency 3.0GHz < f \leq 4.2GHz. In addition, considering that PCC and SCC uplink RB allocations are both active, the average transmit power per PRB for the transmission on the assigned carriers shall aligned within \pm [2] dB in the reference sub-frame and the target subframe after the transition. In case they are not aligned, SS shall send appropriate TPC commands for PUSCH on the relevant component in order to be aligned before continuing the test.
- 6.2. Schedule the UE's PUSCH data transmission on each component carrier as described in Figure 6.3.5.2.4.2-2 (FDD pattern A: sub-test is divided in 4 arbitrary radio frames with 10 active uplink sub-frames per radio frame) and Figure 6.3.5.2.4.2-4 (TDD pattern A: sub-test is divided in 10 arbitrary radio frames with 4 active uplink sub-frames per radio frame) with an uplink RB allocation as defined in tables 6.3.5.2.5-1 thru 6.3.5.2.5-12 depending on channel bandwidth. On the PDCCH format 0 for the scheduling of the PUSCH of each component carrier the SS will transmit a -1dB TPC command. Note that the measurement need not be done continuously, provided that interruptions are whole numbers of frames, and TPC commands of 0dB are sent during the interruption.
- 6.3. Measure the power of PUSCH transmissions on each component carrier to verify the UE relative power control meet test requirements 6.3.5.2.5. For power transients between subframes, transient periods of 40us between subframes are excluded. For ON/OFF or OFF/ON transients, transient periods of 20 us at the beginning of the subframe are excluded.
- 6.4. Repeat the subtest different pattern B, C to move the RB allocation change at different points in the pattern as described in Table 6.3.5.2.5-1 thru Table 6.3.5.2.5-12 to force bigger UE power steps at various points in the power range on each component carrier.
- 7. Sub test: alternating pattern
- 7.1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.3.5A.1.1.4.1-1 on both PCC and SCC. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. Send the appropriate TPC commands for PUSCH on each component carrier to the UE to ensure that the UE transmits PUSCH at -10dBm +/- 3.2 dB for carrier frequency $f \leq 3.0$ GHz or at -10dBm +/- 3.5 dB for carrier frequency 3.0GHz < f ≤ 4.2 GHz. The initial uplink RB allocation is defined as the smaller uplink RB allocation value specified in tables 6.3.5.2.5-13. The power level and RB allocation are reset for each sub-test.
- 7.2. Schedule the UE's PUSCH data transmission on each component carrier as described in Figure 6.3.5.2.4.2-5for 10 sub-frames with an uplink RB allocation alternating pattern as defined in table 6.3.5.2.5-13 while transmitting 0dB TPC command for PUSCH via the PDCCH.
- 7.3. Measure the power of PUSCH transmissions on each component carrier to verify the UE relative power control meet test requirements specified in clause 6.3.5.2.5. For power transients between subframes, transient

periods of 40us between subframes are excluded. For ON/OFF or OFF/ON transients, transient periods of 20 us at the beginning of the subframe are excluded.

6.3.5A.2.1.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6.

6.3.5A.2.1.5 Test requirement

For intra-band contiguous carrier aggregation bandwidth class C, the relative power control tolerance per component carrier measured in steps (5), (6) and (7) of the test procedure should satisfy the test requirements specified in Tables 6.3.5A.2.1.5-1, thru 6.3.5A.2.1.5-13 for normal conditions; for extreme conditions an additional ± 2.0 dB relaxation is allowed. The test requirement tables are originated from tables 6.3.52.5-1, thru 6.3.52.5-13.

To account for RF Power amplifier mode changes 2 exceptions are allowed for each of ramping up and ramping down test patterns. For these exceptions the power tolerance limit is a maximum of ± 6.7 dB. If there is an exception in the power step caused by the RB change for all test patterns (A, B, C) then fail the UE.

Table 6.3.5A.2.1.5-1: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 1.4MHz (ramping up) for intra-band contiguous DL CA and UL CA

Sub-test (ramp up	t))	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH		
				ΔP [dB]	ΔP [dB]	[dB]		
Subframe before RI change	s 3	Fixed = 1	TPC=+1dB	1	ΔP < 2	1 ± (1.7)		
RB chang	e	Change from 1 to 6 RBs	TPC=+1dB	8.78	4 ≤ ΔP < 10	8.78 ± (4.7) Note 2 8.78 +6.2/-4.7 Note 3		
Subframe after RB change	S	Fixed = 6	TPC=+1dB	1	ΔP < 2	1 ± (1.7)		
Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes Pattern B the position of RB uplink allocation change is after 20 active uplink subframes Pattern C the position of RB uplink allocation change is after 30 active uplink subframes								
 Note 2: When Note 3 does not apply. Note 3: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within F_{UL_low} and F_{UL_low} + 4 MHz or F_{UL_high} - 4 MHz and F_{UL_high} and the target sub-frame is not confined within any one of these frequency ranges. Note 4: N/A Note 5: For extreme conditions an additional ± 2.0 dB relaxation is allowed. Note 6: The starting resource block shall be RB# 0. 								

Table 6.3.5A.2.1.5-2: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 1.4MHz (ramping down) for intra-band contiguous DL CA and UL CA

Sub-test (ramp down)	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

Subframe before R change	es Fixeo B	d = 5	TPC=-1dB	1	∆P < 2	1 ± (1.7)			
RB chang	ge Cha from RBs	nge 5 to 1	TPC=-1dB	7.99	4 ≤ ∆P < 1	7.99 ± (4.7) Note 2 7.99 +4.7/-6.2 Note 4			
Subframe after RE change	es Fixeo 3	d = 1	TPC=-1dB	1	∆P < 2	1 ± (1.7)			
Note 1:	Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes Pattern B the position of RB uplink allocation change is after 16 active uplink subframes Pattern C the position of RB uplink allocation change is after 26 active uplink subframes								
Note 2: Note 3: Note 4:	Note 2: When Note 4 does not apply. Note 3: N/A Note 4: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within F _{UL_low} and F _{UL_low} + 4 MHz or F _{UL_high} - 4 MHz and F _{UL_high} and the reference sub-frame is not confined within any one of these frequency ranges.								
Note 5: Note 6:	For extre The start	me con ting reso	ditions an add urce blocksha	itional ± 2.0 c all be RB# 0.	B relaxation i	is allowed.			

Table 6.3.5A.2.1.5-3: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 3MHz (ramping up) for intra-band contiguous DL CA and UL CA

Sub-tes (ramp uj	:t 0)	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH		
				ΔP [dB]	ΔP [dB]	[dB]		
Subframe before R change	es B	Fixed = 1	TPC=+1dB	1	ΔP < 2	1 ± (1.7)		
RB chan	ge	Change from 1 to 4 RBs	TPC=+1dB	7.02	4 ≤ ΔP < 10	7.02 ± (4.7) Note 2 7.02 +6.2/-4.7 Note 3		
Subframes after RB change		Fixed =4	TPC=+1dB	1	∆P < 2	1 ± (1.7)		
Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes Pattern B the position of RB uplink allocation change is after 20 active uplink subframes Pattern C the position of RB uplink allocation change is after 30 active uplink subframes								
Note 2: When Note 3 does not apply. Note 3: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within F_{UL_low} and F_{UL_low} + 4 MHz or F_{UL_high} - 4 MHz and F_{UL_high} and the target sub-frame is not confined within any one of these frequency ranges.								
Note 4: Note 5: Note 6:	N/A For The	• • extreme conc e starting reso	ditions an addi urce block sha	itional ± 2.0 d all be RB# 0.	IB relaxation i	is allowed.		

Table 6.3.5A.2.1.5-4: Test Requirements Relative Power Tolerance for Transmission (normal
conditions - Note 5) channel bandwidth 3MHz (ramping down) for intra-band contiguous DL CA and
UL CA

Sub-tes (ramp down)	it	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH		
				ΔΡ [dB]	ΔΡ [dB]	[dB]		
Subframe before R change	es B	Fixed = 15	TPC=-1dB	1	ΔP < 2	1 ± (1.7)		
RB chan	ge	Change from 15 to 1 RBs	TPC=-1dB	12.76	10 ≤ ΔP < 15	12.76 ± (5.7) Note 2 12.76 +5.7/-7.2 Note 4		
Subframe after RE change	es 3	Fixed =1	TPC=-1dB	1	ΔP < 2	1 ± (1.7)		
Note 1: Note 2: Note 3: Note 4:	 te 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes Pattern A the position of RB uplink allocation change is after 16 active uplink subframes Pattern C the position of RB uplink allocation change is after 26 active uplink subframes te 2: When Note 4 does not apply. te 3: N/A te 4: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within Ful_low and Ful_low + 4 MHz or Ful_high - 4 MHz and Ful_high and the reference sub-frame is not confined 							
Note 5: Note 6:	For The	For extreme conditions an additional \pm 2.0 dB relaxation is allowed. The starting resource block shall be RB# 0.						

Table 6.3.5A.2.1.5-5: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 5MHz (ramping up) for intra-band contiguous DL CA and UL CA

Sub-test (ramp up)	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

Subframes before RB changeFixed = 1TPC=+1dB $P < 2$ $\Delta P < 2$ $1 \pm (1.7)$ RB changeChangeTPC=+1dB from 1 to $10 \le \Delta P < 14.01 \pm (5.7)$ Note 2							
changeTPC=+1dB $10 \le \Delta P < 14.01 \pm (5.7)$ Note 2RB changefrom 1 to $14.01 \pm (5.7)$ Note 2							
RB change Change TPC=+1dB 14.01 $10 \le \Delta P < 14.01 \pm (5.7)$ Note 2							
15 14.01 +7.2/-5.7 Note	e 2 ote 3						
Subframes Fixed = 20 TPC=+1dB							
after RB $1 \Delta P < 2 1 \pm (1.7)$							
change							
Note 1: Position of RB change:							
Pattern A the position of RB uplink allocation change is after 10 active uplink							
s ubfram es							
Pattern B the position of RB uplink allocation change is after 20 active uplink							
subframes							
Pattern C the position of RB uplink allocation change is after 30 active uplink							
subframes							
Note 2: When Note 3 does not apply.							
Note 3: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission							
bandwidth of the reference sub-frames is confined within Fullow and Fullow + 4	- 4						
MHz or Full when - 4 MHz and Full when and the target sub-frame is not confined	MHz or Full high – 4 MHz and Full high and the target sub-frame is not confined						
within any one of these frequency ranges	within any one of these frequency ranges						
Note 4. N/A							
Note 5: For extreme conditions an additional + 2.0 dB relaxation is allowed	For extreme conditions an additional + 2.0 dB relavation is allowed						
Note 6: The starting resource block shall be RB# 0	The starting resource block shall be RB# 0						

Table 6.3.5A.2.1.5-6: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 5MHz (ramping down) for intra-band contiguous DL CA and UL CA

Sub-test (ramp down)		Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH
				ΔΡ [dB]	ΔP [dB]	[dB]
Subframes before RE change	5	Fixed = 25	TPC=-1dB	1	ΔP < 2	1 ± (1.7)
RB chang	0)	Change from 25 to 1	TPC=-1dB	14.98	10 ≤ ΔP < 15	14.98 ± (5.7) Note 2 14.98 +5.7/-7.2 Note 4
Subframe after RB change	6	Fixed = 1	TPC=-1dB	1	ΔP < 2	1 ± (1.7)
Note 1: Note 2: Note 3: Note 4:	 Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes Pattern B the position of RB uplink allocation change is after 16 active uplink subframes Pattern C the position of RB uplink allocation change is after 26 active uplink subframes Note 2: When Note 4 does not apply. N/A Note 3: N/A Note 4: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within F_{UL_low} and F_{UL_low}+ 4 MHz or F_{UL_high} – 4 MHz and F_{UL_high} and the reference sub-frame is not confined 					
Note 5: Note 6:	For extreme conditions an additional ± 2.0 dB relaxation is allowed. The starting resource block shall be RB# 0.					

Table 6.3.5A.2.1.5-7: Test Requirements Relative Power Tolerance for Transmission (normal
conditions - Note 5) channel bandwidth 10MHz (ramping up) for intra-band contiguous DL CA and UL
CA

Sub-tes (ramp uj	t 5)	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH
				ΔΡ [dB]	ΔP [dB]	[dB]
Subframe before R change	es B	Fixed = 1	TPC=+1dB	1	ΔP < 2	1 ± (1.7)
RB chan	ge	Change from 1 to 25	TPC=+1dB	14.98	10 ≤ ΔP < 15	14.98 ± (5.7) Note 2 14.98 +7.2/-5.7 Note 3
Subframe after RE change	es B	Fixed = 25	TPC=+1dB	1	ΔP < 2	1 ± (1.7)
Note 1:	Po: Pai sub Pai sub Pai sub	sition of RB cr ttern A the pos oframes ttern B the pos oframes ttern C the pos oframes	nange: sition of RB up sition of RB up sition of RB up	link allocatio link allocatio link allocatio	n change is a n change is a n change is a	fter 10 active uplink fter 20 active uplink fter 30 active uplink
Note 2: Note 3:	When Note 3 does not apply. For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within F_{UL_low} and F_{UL_low} + 4 MHz or F_{UL_high} - 4 MHz and F_{UL_high} and the target sub-frame is not confined within any one of these frequency ranges.					
Note 4: Note 5: Note 6:	N/A Foi The	A extreme conc starting reso	ditions an addi urce block sha	itional ± 2.0 c all be RB# 0.	IB relaxation i	s allowed.

Table 6.3.5A.2.1.5-8: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 10MHz (ramping down) for intra-band contiguous DL CA and UL CA

Sub-test (ramp down)	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

Subframe	es	Fixed $= 50$	TPC=-1dB			
before R	В	(UE-				
change		Categories				
		≥2)		1	ΔP < 2	1 ± (1.7)
		Fixed $= 48$				
		(UE Cat 1)				
RB chang	ge	Change				
		from 50 to				
		1 (UE-		17.99		17.99 ± (6.7) Note 2
		Categories				17.99 +6.7/-8.2 Note 4
		≥2)	TPC=-1dB		15 ≤ Λ	
		.				
		Change				17.81 ± (6.7) Note 2
		from 48 to		17.81		17.81 +6.7/-8.2 Note 4
		1 (UE cat				
0.17		1)	TD0 4 10			
Subtrame	s	Fixed = 1	TPC=-1dB			4 . (4 7)
after RB	5			1	$\Delta P < 2$	$1 \pm (1.7)$
	De	itian of DD ob				
Note 1.	Pot	torn A the ner	iange.	link allocatio	n chango is a	ftor 6 active unlink
	rai	from oc			in change is a	
	Pat	tern R the nos	sition of RB un	link allocatio	n change is a	fter 16 active unlink
	suk	oframes			in change is a	
	Pat	tern C the pos	sition of RB up	link allocatio	n change is a	fter 26 active uplink
	sut	oframes		ano datio	in change ie a	
Note 2 [.]	Wh	en Note 3 doe	es not apply			
Note 3:	N/A	1				
Note 4:	For	operating bai	nds under Not	e 2 in Table (6.2.2.3-1. if th	e transmission
	bar	ndwidth of the	target sub-fra	me is confine	ed within Full	ow and Fullow+ 4 MHz
	or F	- UL high - 4 MH	z and Ful high	and the refer	ence sub-fra	me is not confined
	wit	hin any one of	these frequer	ncy ranges.		
Note 5:	For	extreme cond	ditions an add	itional ± 2.0 c	B relaxation	is allowed.
Note 6:	The starting resource block shall be RB# 0.					

Table 6.3.5A.2.1.5-9: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 15MHz (ramping up) for intra-band contiguous DL CA and UL

CA

Sub-test (ramp up)	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

Subfram before R	es Fixed = 1 B	TPC=+1dB	1	∆P < 2	1 ± (1.7)			
change	;							
RB chan	ge Change	TPC=+1dB	17.00	15 < AD	17.99±(6.7) Note 2			
	50		17.99	15 <u>2</u> <u>D</u> F	17.99 +8.2/-6.7 Note 3			
Subfram	es Fixed = 50	TPC=+1dB						
after RI	3		1	∆P < 2	1 ± (1.7)			
change	9							
Note 1:	Note 1: Position of RB change:							
	Pattern A the position of RB uplink allocation change is after 10 active uplink							
	subframes							
	Pattern B the po	sition of RB up	link allocatio	n change is a	fter 20 active uplink			
	subframes			0	·			
	Pattern C the po	sition of RB up	link allocatio	n change is a	fter 30 active uplink			
	subframes			C C	·			
Note 2:	When Note 3 do	es not apply.						
Note 3:	For operating ba	nds under Not	e 2 in Table (6.2.2.3-1, if th	e transmission			
	bandwidth of the	reference sub	-frames is co	onfined within	Fullow and Fullow + 4			
	MHz or Full high – 4 MHz and Full high and the target sub-frame is not confined							
	within any one of these frequency ranges.							
Note 4:	N/A							
Note 5:	For extreme con	ditions an addi	tional ± 2.0 c	B relaxation i	is allowed.			
Note 6:	The starting resource block shall be RB# 0.							

Table 6.3.5A.2.1.5-10: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 15MHz (ramping down) for intra-band contiguous DL CA and UL CA

Sub-test (ramp down)	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

Subframes before RB change	Fixed = 75 (UE- Categories							
	≥2)	TPC=-1dB	1	∆P < 2	1 ± (1.7)			
	Fixed = 50 (UE Cat 1)							
RB change	Change from 75 to 1 (UE- Categories ≥2)	TPC=-1dB	19.75	15 ≤ ΔP	19.75 ± (6.7) Note 2 19.75 +6.7/-8.2 Note 4			
	Change from 50 to 1 (UE Cat 1)		17.99		17.99 ± (6.7) Note 2 17.99 +6.7/-8.2 Note 4			
Subframes after RB change	Fixed = 1	TPC=-1dB	1	∆P < 2	1 ± (1.7)			
Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes Pattern B the position of RB uplink allocation change is after 16 active uplink subframes Pattern C the position of RB uplink allocation change is after 26 active uplink subframes Pattern C the position of RB uplink allocation change is after 26 active uplink subframes								
Note 2: V Note 3: N Note 4: F b	 When Note 4 does not apply. N/A For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within F_{UL_low} and F_{UL_low}+ 4 MHz or F_{UL_high} - 4 MHz and F_{UL_high} and the reference sub-frame is not confined within any one of these frequency ranges. 							
Note 5: For extreme conditions an additional ± 2.0 dB relaxation is allowed. Note 6: The starting resource block shall be RB# 0.								

Table 6.3.5A.2.1.5-11: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 20MHz (ramping up) for intra-band contiguous DL CA and UL CA

Sub-test (ramp up)	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH			
			ΔP [dB]	ΔP [dB]	[dB]			
Subframe before R change	es Fixe B	d = 1	TPC=+1dB	1	∆P < 2	1 ± (1.7)		
--------------------------------	---	-------------	----------	-------	---------	--	--	--
RB chang	ge Cha from 75	nge 1 to	TPC=+1dB	19.75	15 ≤ ΔP	19.75 ± (6.7) Note 2 19.75 +8.2/-6.7 Note 3		
Subframe after RE change	es Fixe 3	d = 75	TPC=+1dB	1	∆P < 2	1 ± (1.7)		
Note 1:	Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes Pattern B the position of RB uplink allocation change is after 20 active uplink subframes Pattern C the position of RB uplink allocation change is after 30 active uplink							
Note 2: Note 3:	When Note 3 does not apply. For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within $F_{UL_{Jow}}$ and $F_{UL_{Jow}}$ + 4 MHz or $F_{UL_{high}}$ – 4 MHz and $F_{UL_{high}}$ and the target sub-frame is not confined within any one of these frequency ranges.							
Note 4: Note 5: Note 6:	N/A For extreme conditions an additional ± 2.0 dB relaxation is allowed. The starting resource block shall be RB# 0.							

Table 6.3.5A.2.1.5-12: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 20MHz (ramping down) for intra-band contiguous DL CA and UL CA

Sub-test (ramp down)	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

	Subfram	es	Fixed =	TPC=-1dB			
before RB		В	100 (UE-				
change		Categories					
	0		≥2)		1	ΔP < 2	$1 \pm (1.7)$
			,				()
			Fixed - 75				
			$(I) \in Cat(1)$				
	PB chan	00	(OL Cal I)				
	IND Chan	ye	from 100		21.0		
					21.0		21.0 + (6.7) Neta 2
			l0 I (0E-				$21.0 \pm (0.7)$ Note 2
			Calegolies				21.0 +0.7/-0.2 Note 4
			22)			15 ≤ ΔP	
			Change				$19.75 \pm (6.7)$ Note 2
			from 75 to				19.75 +6.7/-8.2 Note 4
			1 (UE Cat		19.75		
			1)				
	Subframes		Fixed = 1	TPC=-1dB			
	after RI	3			1	ΔP < 2	1 ± (1.7)
	change	;					
	Note 1:	Po	sition of RB ch	nange:			
		Pa	ttern A the pos	sition of RB up	link allocatio	n change is a	fter 6 active uplink
		sub	oframes				
		Pa	ttern B the pos	sition of RB up	link allocatio	n change is a	fter 16 active uplink
		sub	oframes				
		Pa	ttern C the pos	sition of RB up	link allocatio	n change is a	fter 26 active uplink
		sub	oframes				
	Note 2:	Wh	en Note 4 doe	es not apply.			
	Note 3:	N//	4	,			
	Note 4:	Fo	r operating bai	nds under Not	e 2 in Table (6.2.2.3-1, if th	e transmission
		ba	ndwidth of the	target sub-fra	me is confine	ed within Fur	ow and Fullow+ 4 MHz
		or	Ful high – 4 MH	z and Full bight	and the refer	ence sub-fra	me is not confined
		wit	hin any one of	these frequer	ncv ranges		
	Note 5:	Fo	r extreme cond	ditions an add	itional ± 2.0 c	B relaxation i	is allowed.
	Note 6	Th	e starting reso	urce block sha	all be RB# 0		

Table 6.3.5A.2.1.5-13: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) (Alternating pattern) for intra-band contiguous DL CA and UL CA

Sub-test	Uplink RB allocation	TPC command	Expected power step size (Up or down)	Power step size range (Up or down)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]

1.4 MHz	Alternating 1 and 6	TPC=0dB	7.78	4 ≤ ΔP < 10	7.78 ± (6.7) Note 1,2 7.78 +8.2/-6.7 Note 3 7.78 +6.7/-8.2 Note 4			
3 MHz	Alternating 1 and 15	TPC=0dB	11.76	10 ≤ ΔP < 15	11.76 ± (6.7) Note 1,2 11.76 ± (6.7) Note 3 11.76 ± 6.7/-8.2 Note 3			
5 MHZ	Alternating 1 and 25	TPC=0dB	13.98	10 ≤ ΔP < 15	13.98 ± (6.7) Note 1,2 13.98 +8.2/-6.7 Note 3 13.98 +6.7/-8.2 Note 4			
10 MHZ	Alternating 1 and 50 (UE- Categories ≥2)	TPC=0dB	16.99		16.99 ± (6.7) Note 1,2 16.99 +8.2/-6.7 Note 3 16.99 +6.7/-8.2 Note 4			
	/			15 ≤ ΔP				
	Alternating 1 and 48 (UE Cat 1)		16,81		16.81 ± (6.7) Note 1,2 16.81 +8.2/-6.7 Note 3 16.81 +6.7/-8.2 Note 4			
15 MHZ	Alternating 1 and 75 (UE- Categories	TPC=0dB	18.75		18.75 ± (6.7) Note 1,2 18.75 +8.2/-6.7 Note 3 18.75 +6.7/-8.2 Note 4			
	~~)			15 ≤ ΔP				
	Alternating 1 and 50 (UE Cat 1)		16.99		16.99 ± (6.7) Note 1,2 16.99 +8.2/-6.7 Note 3 16.99 +6.7/-8.2 Note 4			
20 MHZ	Alternating 1 and 100 (UE Cat 2-5)	TPC=0dB	20.00		20.00 ± (6.7) Note 1,2 20.00 +8.2/-6.7 Note 3 20.00 +6.7/-8.2 Note 4			
	Alternating 1			15 ≤ ΔP				
	Cat 1)		18.75		18.75 ± (6.7) Note 1,2 18.75 +8.2/-6.7 Note 3 18.75 +6.7/-8.2 Note 4			
Note 1: Te	est tolerance +/-	6.7 dB was se	ected to allo	w PAswitch	possible exceptions to			
 Note 2: When neither Note 3 nor Note 4 applies. Note 3: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within Fullow and Fullow + 4 MHz or Full_high - 4 								
Note 4: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within F_{UL_low} and $F_{UL_low} + 4$ MHz or $F_{UL_high} - 4$ MHz and F_{UL_high} and the reference sub-frame is not confined within any one of these fragmence.								
Note 5: Fo Note 6: Th	 Trequency ranges. 5: For extreme conditions an additional ± 2.0 dB relaxation is allowed. 6: The starting resource block shall be RB# 0. 							

6.3.5A.3 Aggregate power control tolerance for CA

6.3.5A.3.1 Aggregate power control tolerance for CA (intra-band contiguous DL CA and UL CA)

6.3.5A.3.1.1 Test purpose

To verify the ability of a UE to maintain its power in non-contiguous transmission within 21 ms in response to 0 dB TPC commands with respect to the first UE transmission, when the power control parameters specified in [TS 36.213] are constant on all active component carriers.

6.3.5A.3.1.2 Test applicability

This test applies to all types of E-UTRA UE release 10 and forward that support intra-band contiguous DL CA and UL CA.

6.3.5A.3.1.3 Minimum conformance requirements

For intra-band contiguous carrier aggregation bandwidth class C, the aggregate power tolerance per component carrier is given in Table 6.3.5A.3.1.3-1 with simultaneous PUCCH and PUSCH configured if supported. The requirement can be tested with the transmission gaps time aligned between component carriers.

Table 6.3.5A.3.1.3-1: Aggregate power control tolerance for	intra-band contiguous CA
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TPC command	UL channel	Aggregate power tolerance within 21 m			
0 dB	PUCCH	±2.5 dB			
0 dB PUSCH		±3.5 dB			
NOTE: The L 4 sub	NOTE: The UE transmission gap is 4 ms. TPC command is transmitted via PDCCH 4 subframes preceding each PUCCH/PUSCH transmission.				

The normative reference for this requirement is TS 36.101 [2] clause 6.3.5A.3.1.

6.3.5A.3.1.4 Test description

6.3.5A.3.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and CC combinations based on E-UTRA CA configurations specified in table 5.4.2A.1-1. All of these configurations shall be tested with applicable test parameters for each CA Configuration, and are shown in table 6.3.5A.3.1.4.1-1 and table 6.3.5A.3.1.4.1-2. The details of the uplink reference measurement channel (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Table 6.3.5A.3.1.4.1-1: Test Configuration Table: PUCCH sub-test

				Initial Co	onditions
Test Env	ironment a	s specified in			Normal
15 36.50		use 4.1			
Test Free	quencies as	s specified in			C: Mid range
1\$36.50	8 [7] subcla	use 4.3.1 for	different CA ba	Indwidth	
classes.					
Test CC	Combinatio	on setting (N _R	_{B_agg}) as specifi	ied in	Lowest N _{RB_agg}
subclaus	e 5.4.2A.1	for the CACc	onfiguration acr	OSS	Highest N _{RB_agg}
bandwidt	th combinat	tion sets supp	orted by the UI	Ξ.	
			Test Par	rameters fo	r CA Configurations
CA Configuration DL Allocation Uplink Co			ion	onfiguration	
/ N _{RB_agg}	•			-	-
PCC	SCCs	CC Mod	PCC &		
N _{RB}	N _{RB}		SCC RB		
			allocation		
75	75			FDD: Pl	JCCH format = Format 1b with channel selection/Format 3
75	15	QPSK	75+75	TDD: PU	CCH format = Format 1b with channel selection/Format 3
100	50	QPSK	100+50		
100	100	0.001/	400.400	-	
100	100	QPSK	100+100		
Note 1	:CA Conf	iguration Tes	t CC Combinat	ionsettings	are checked separately for each CA Configuration, which
	applicabl	e aggregated	channel bandv	vidths are s	pecified in Table 5.4.2A.1-1

Initial Conditions								
Test Envi	ronmentas	s specified in		Normal				
TS 36.50	8[7] claus e	4.1						
Test Fred	luencies as	s specified in		C: Mid rar	nge			
TS36.508	3[7]clause	4.3.1 for different CA band	width					
classes.								
TestCC	Combinatio	on setting (NRB_agg) as spe	ecified in	LowestN	RB_agg			
clause 5.	4.2A.1 for t	he CA Configuration		Highest N	RB_agg			
Test Parameters for CA Configurations								
CA Confi	guration	DL Allocation	CC	UL Allocation				
/ N _{RE}	B_agg		MOD					
PCC	SCCs	PCC & SCC RB		N _{RB_alloc}	PCC	& SCC RB all	locations	
N _{RB}	N _{RB}	allocation				(L _{CRB} @ RBs	_{start})	
75	75		QPSK	150	P_75@0	S_75@0		
100	50	N/A	QPSK	150	P_100@0	S_50@0		
100	100		QPSK	200	P_100@0	S_100@0		
Note 1:	CA Confi	guration Test CC Combinati	onsettings	are checke	d separately for	each CA Conf	iguration,	which
	applicable	e aggregated channel band	widths are s	pecified in	Table 5.4.2A.1-1			

Table 6.3.5A.3.1.4.1-2: Test Configuration Table: PUSCH sub-test

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure group A.32 as appropriate.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] clause 4.4.3.
- 3. Downlink signals for PCC are initially set up according to Annex C.0, C.1 and Annex C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL and DL Reference Measurement channel is set according to Table 6.3.5A.3.1.4.1-1 (PUCCH sub-test) and Table 6.3.5A.3.1.4.1-2 (PUSCH sub-test).
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.5A.3.1.4.3.





Figure 6.3.5A.3.1.4.2-1: Test uplink transmission

- 1. Configure SCC according to Annex C.0, C.1 and Annex C.3.0 for all downlink physical channels except PHICH.
- 2. The SS shall configure SCC as per TS 36.508 [7] clause 5.2A.4.
- 3. SS activates SCC by sending the activation MAC-CE (Refer TS 36.321 [13], clauses 5.13, 6.1.3.8). Wait for at least 2 seconds (Refer TS 36.133, clauses 8.3.3.2).
- 4. The procedure is separated in two subtests to verify PUCCH and PUSCH aggregate power control tolerance respectively. The uplink transmission patterns are described in figure 6.3.5A.3.1.4.2-1.
- 5. PUCCH sub test:
 - 5.1 The SS trans mits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Table 6.3.5A.3.1.4.1-1 on both PCC and SCC. The SS sends downlink MAC padding bits on the DL RMC. The transmission of PDSCH will make the UE send uplink ACK/NACK using PUCCH on PCC. Send the appropriate TPC commands for PUCCH to the UE to ensure that the UE transmits PUCCH at 0dBm +/- 3.2 dB for carrier frequency $f \leq 3.0$ GHz or at 0dBm +/- 3.5 dB for carrier frequency 3.0GHz < f ≤ 4.2 GHz.
 - 5.2 Every 5 subframes transmit to the UE downlink PDSCH MAC padding bits as well as 0 dB TPC command for PUCCH via the PDCCH to make the UE transmit ACK/NACK on the PUCCH with transmission gap of 4 subframes. The downlink transmission is scheduled in the appropriate sub-frames to make the UE transmit PUCCH as described in figure 6.3.5A.3.1.4.2-1.
 - 5.3 Measure the power of 5 consecutive PUCCH transmissions on PCC to verify the UE transmitted PUCCH power is maintained within 21 ms. The transient periods of 20us are excluded from the power measurement.
- 6. PUSCH sub test:
 - 6.1 The SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 0 for C_RNTI to schedule the UL RMC according to Table 6.3.5A.3.1.4.1-2 on both PCC and SCC. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. Send the appropriate TPC commands for PUSCH to the UE to ensure that the UE transmits PUSCH at 0dBm +/- 3.2.dB for carrier frequency f ≤ 3.0 GHz or at 0dBm +/- 3.5 dB for carrier frequency 3.0GHz < f ≤ 4.2 GHz.
 - 6.2 Every 5 subframes schedule the UE's PUSCH data transmission and transmit 0 dB TPC command for PUSCH via the PDCCH to make the UE transmit PUSCH with 4 subframes gap. The uplink transmission patterns are described in figure 6.3.5A.3.1.4.2-1.
 - 6.3 Measure the power on both PCC and SCC of 5 consecutive PUSCH transmissions to verify the UE transmitted PUSCH power is maintained within 21 ms on each component carrier. The transient periods of 20us are excluded from the power measurement.

6.3.5A.3.1.4.3 Message contents

Message contents are according to TS 36.508 [7] subclause 4.6.

6.3.5A.3.1.5 Test requirement

For intra-band contiguous carrier aggregation bandwidth class C, the aggregate power control tolerance per component carrier measured in step (2) of the test procedure is not to exceed the values specified in Table 6.3.5A.3.1.5-1.

Table 6.3.5A.3.1.5-1: Aggregate power control tolerance for intra-band contiguous CA

TPC command	UL channel	Aggregate power tolerance within 21 ms		
0 dB	PUCCH	±3.2 dB		
0 dB	PUSCH	±4.2 dB		
NOTE: The UE transmission gap is 4 ms. TPC command is transmitted via PDCCH 4 subframes preceding each PUCCH/PUSCH transmission.				

6.3.5B Power Control for UL- MIMO

6.3.5B.1 Power Control Absolute Power Tolerance for UL- MIMO

6.3.5B.1.1 Test purpose

To verify the ability of the UE transmitter for UL-MIMO to set its initial output power to a specific value at the start of a contiguous transmission or non-contiguous transmission with a long transmission gap, i.e. transmission gap is larger than 20 ms.

6.3.5B.1.2 Minimum conformance requirement

For UE with multiple transmit antenna connectors, the power control tolerance applies to the sum of output power at each transmit antenna connector.

The power control requirements specified in subclause 6.3.5 apply to UE with two transmit antenna connectors with UL-MIMO configurations specified in Table 6.2.2B.3-2 for closed-loop spatial multiplexing scheme, wherein

- The Maximum output power requirements for UL-MIMO are specified in subclause 6.2.2B
- The Minimum output power requirements for UL-MIMO are specified in subclause 6.3.2B

The normative reference for this requirement is TS 36.101 [2] clause 6.3.5B.

6.3.5B.1.3 Test applicability

This test applies to all types of E-UTRA UE release 10 and forward that support UL-MIMO.

6.3.5B.1.4 Test description

6.3.5B.1.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.3.5 B.1.4.1-1. The details of the uplink reference measurement channel (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Conditions					
Test Environr	ment as specified in	Normal, TL/V	L, TL/VH, TH/V	/L, TH/VH	
TS 36.508[7]	subclause 4.1				
Test Frequen	cies as specified in	Mid range			
TS36.508 [7]	subclause 4.3.1				
Test Channe	Bandwidths as specified in	Lowest, 5MH	z, Highest		
TS 36.508 [7]	subdause 4.3.1				
Test Parameters for Channel Bandwidths					
	Downlink Configur	ation	Uplink Configuration		
Ch BW	N/A for Power Control Abs	olute power	Mod'n	RB allo	ocation
	tolerance test ca	se		FDD	TDD
1.4MHz			QPSK	6	6
3MHz			QPSK	15	15
5MHz			QPSK	25	25
10MHz			QPSK	50	50
15MHz			QPSK	75	75
20MHz			QPSK	100	100
Note 1: Te	st Channel Bandwidths are c	heckedsepara	tely for each E-	UTRA band, th	ne applicable
ch	annel bandwidths are specifie	ed in Table 5.4.	.2.1-1.		

Table 6.3.5B.1.4.1-1: Test Configuration Table

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.28.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] subclause 4.4.3.
- 3. Down link signals are initially set up according to Annex C.0, C.1 and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to Table 6.3.5 B.1.4.1-1.
- 5. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.5B.1.4.3. Note that PDCCH DCI format 4 sent after resetting uplink power with RRC Connection Reconfiguration, should have TPC command 0d B.

6.3.5B.1.4.2 Test procedure

- 1. SS sends uplink scheduling information via PDCCH DCI format 4 with TPC command 0dB for C_RNTI to schedule the UL RMC according to Table 6.3.5B.1.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC.
- 2. Measure the initial sum power of the first subframe of UEPUSCH first transmission at each UE antenna connector. The transient periods of 20us are excluded.
- 3. Repeat for the two test points as indicated in section 6.3.5B.1.4.3. The timing of the execution between the two test points shall be larger than 20ms.

6.3.5B.1.4.3 Message contents

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

Table 6.3.5B.1.4.3-1: UplinkPowerControlCommon: Test point 1

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT				
Information Element	Value/remark	Comment	Condition	
UplinkPowerControlCommon-DEFAULT ::= SEQUENCE { p0-NominalPUSCH	-105	Test point 1 to verify a UE relative low initial power transmission		

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-25 UplinkPowerControlCommon-DEFAULT							
Information Element		Value/remark	Comment	Condition			
PhysicalConfigDedicated-DEFAULT ::= SEQUENCE {	-93		Test point 2 to verify a UE relative high initial power				
			113111551011				

Table 6.3.5B.1.4.3-2: UplinkPowerControlCommon: Test point 2

Table 6.3.5B.1.4.3-3: PhysicalConfigDedicated

Derivation Path: TS 36.508 [7] clause 5.5.1.2, Table 5.5.1.2.1 PhysicalConfigDedicated-DEFAULT								
Information Element	Value/remark	Comment	Condition					
UplinkPowerControlCommon-DEFAULT ::=								
SEQUENCE {								
p0-NominalPUSCH								
uplinkPowerControlDedicated	UplinkPowerControlDedic	See clause 4.6.3	SRB1					
	ated-DEFAULT							
	UplinkPowerControlDedic ated-DEFAULT	See clause 4.6.3	RBC					

Table 6.3.5B.1.4.3-4: UplinkPowerControlDedicated

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-26 UplinkPowerControlDedicated-DEFAULT								
Information Element	Value/remark	Comment	Condition					
UplinkPowerControlDedicated-DEFAULT ::=								
SEQUENCE {								
p0-UE-PUSCH	1		SRB1					
	0		RBC					
}								

6.3.5B.1.5 Test requirement

The requirement for the power measured in step (2) of the test procedure is not to exceed the values specified in Table 6.3.5B.1.5-1 and 6.3.5B.1.5-2.

	Cha	Channel bandwidth / expected output power (dBm)							
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz			
Expected Measured power Normal conditions	-14.8 dBm	-10.8 dBm	-8.6 dBm	-5.6 dBm	-3.9 dBm	-2.6 dBm			
Power tolerance f ≤ 3.0GHz 3.0GHz < f ≤ 4.2GHz	± 10.0dB ± 10.4dB	± 10.0dB ± 10.4dB	± 10.0dB ± 10.4dB	± 10.0dB ± 10.4dB	± 10.0dB ± 10.4dB	± 10.0dB ± 10.4dB			
Expected Measured power Extreme conditions	-14.8 dBm	-10.8 dBm	-8.6 dBm	-5.6 dBm	-3.9 dBm	-2.6 dBm			
Power tolerance $f \le 3.0 GHz$ $3.0 GHz < f \le$ 4.2 GHz	± 13.0dB ± 13.4dB	± 13.0dB ± 13.4dB	± 13.0dB ± 13.4dB	± 13.0dB ± 13.4dB	± 13.0dB ± 13.4dB	± 13.0dB ± 13.4dB			
defined in	Note 1: The lower power limit shall not exceed the minimum output power requirements defined in sub-dause 6.3.2.3								

Table 6.3.5B.1.5-1: Absolute power tolerance: test point 1

Table	6.3.5B.1.	5-2: Ab	solute po	ower to	lerance:	test point 2
-------	-----------	---------	-----------	---------	----------	--------------

Channel bandwidth / expected output power (dBm)						
1.4	3.0	5	10	15	20	
MHz	MHz	MHz	MHz	MHz	MHz	

Expected							
Measured power	-2.8 dBm	1.2 dBm	3.4 dBm	6.4 dBm	8.2 dBm	9.4 dBm	
Normal conditions							
Power tolerance						±	
f≤3.0GHz	± 10.0dB	± 10.0dB	± 10.0dB	± 10.0dB	± 10.0dB	10.0dB	
3.0GHz < f ≤	± 10.4dB	± 10.4dB	± 10.4dB	± 10.4dB	± 10.4dB	±	
4.2GHz						10.4dB	
Expected							
Measured power	-2.8 dBm	1.2 dBm	3.4 dBm	6.4 dBm	8.2 dBm	9.4 dBm	
Extreme conditions							
Power tolerance						±	
f≤3.0GHz	± 13.0dB	± 13.0dB	± 13.0dB	± 13.0dB	± 13.0dB	13.0dB	
3.0GHz < f ≤	± 13.4dB	± 13.4dB	± 13.4dB	± 13.4dB	± 13.4dB	±	
4.2GHz						13.4dB	
Note 1: The lower	power limit sl	hall not exce	ed the minin	num output j	oower require	ements	
defined in sub-dause 6.3.2.3							

6.3.5B.2 Power Control Relative power tolerance for UL-MIMO

6.3.5B.2.1 Test purpose

To verify the ability of the UE transmitter to set its output power relatively to the power in a target sub-frame relatively to the power of the most recently transmitted reference sub-frame if the transmission gap between these sub-frames is ≤ 20 ms.

6.3.5B.2.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support UL MIMO.

6.3.5B.2.3 Minimum conformance requirement

For UE with multiple transmit antenna connectors, the power control tolerance applies to the sum of output power at each transmit antenna connector.

The power control requirements specified in clause 6.3.5 apply to UE with two transmit antenna connectors with UL-MIMO configurations specified in Table 6.2.2B.3-2 for closed-loop spatial multiplexing scheme, wherein:

- The Maximum output power requirements for UL-MIMO are specified in clause 6.2.2B
- The Minimum output power requirements for UL-MIMO are specified in clause 6.3.2B

The normative reference for this requirement is TS 36.101 [2] clause 6.3.5B.

6.3.5B.2.4 Test description

6.3.5B.2.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.3.5B.2.4.1-1. The details of the uplink reference measurement channels (RMCs) are specified in Annexes A.2. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

In	itial Condi	tions			
Test Environment as specified in	Normal, 7	Nomal, TL/VL, TL/VH, TH/VL, TH/VH			
TS 36.508 [7] clause 4.1					
Test Frequencies as specified in	Low rang	е			
TS 36.508 [7] clause 4.3.1					
Test Channel Bandwidths as specified in	Lowest, 5	MHz, High	est		
TS 36.508 [7] clause 4.3.1					
Test Paramete	ers for Cha	nnel Band	widths	-	
Downlink Configurat	tion		Uplink Configura	ation	
Ch BW N/A for Power Control Rela	tive	Mod'n	RB allo	cation	
power tolerance test case			FDD	TDD	
1.4MHz		QPSK	See table	See table	
			6.3.5B.2.5-1	6.3.5B.2.5-1	
			6.3.5B.2.5-2	6.3.5B.2.5-2	
			6.3.5B.2.5-13	6.3.5B.2.5-13	
3MHz		QPSK	See table	See table	
			6.3.5B.2.5-3	6.3.5B.2.5-3	
			6.3.5B.2.5-4	6.3.5B.2.5-4	
			6.3.5B.2.5-13	6.3.5B.2.5-13	
5MHz		QPSK	See table	See table	
			6.3.5B.2.5-5	6.3.5B.2.5-5	
			6.3.5B.2.5-6	6.3.5B.2.5-6	
			6.3.5B.2.5-13	6.3.5B.2.5-13	
10MHz		QPSK	See table	See table	
			6.3.5B.2.5-7	6.3.5B.2.5-7	
			6.3.5B.2.5-8	6.3.5B.2.5-8	
			6.3.5B.2.5-13	6.3.5B.2.5-13	
15MHz		QPSK	See table	See table	
			6.3.5B.2.5-9	6.3.5B.2.5-9	
			6.3.5B.2.5-10	6.3.5B.2.5-10	
			6.3.5B.2.5-13	6.3.5B.2.5-13	
20MHz		QPSK	See table	See table	
			6.3.5B.2.5-11	6.3.5B.2.5-11	
			6.3.5B.2.5-12	6.3.5B.2.5-12	
			6.3.5B.2.5-13	6.3.5B.2.5-13	
Note 1: Test Channel Bandwidths are c	hecked sep ad in Table	arately for	each E-UTRA band	I, the applicable	
Note 2: The starting resource block sha	ll be RB# 0				

Table 6.3.5B.2.4.1-1:	Test	Configuration	Table
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- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.28.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] clause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C.0, C.1 and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL Reference Measurement channel is set according to table 6.3.5B.2.4.1-1.
- 5. Propagation conditions are set according to Annex B.0.
- 6. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.5B.2.4.3.

6.3.5B.2.4.2 Test procedure

The procedure is separated in various subtests to verify different aspects of relative power control. The power patterns of the subtests are described in figure 6.3.5B.2.4.2-1.



Figure 6.3.5B.2.4.2-1: FDD ramping up test power patterns



Figure 6.3.5B.2.4.2-2: FDD ramping down test power patterns







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Figure 6.3.5B.2.4.2-4: TDD ramping down test power patterns



Figure 6.3.5B.2.4.2-5: Alternating Test Power patterns

- 1. Sub test: ramping up pattern
 - 1.1. SS sends uplink scheduling information for each UL HA RQ process via PDCCH DCI format 4 for C_RNTI to schedule the UL RMC according to Table 6.3.5B.2.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MA C padding bits on the UL RMC. Send the appropriate TPC commands for PUSCH to the UE to ensure that the UE transmits PUSCH at -36.8dBm +/- 3.2 dB for carrier frequency $f \le 3.0$ GHz or at -36.5dBm +/- 3.5 dB for carrier frequency 3.0GHz < $f \le 4.2$ GHz.
 - 1.2. Schedule the UE's PUSCH data transmission as described in Figure 6.3.5B.2.4.2-1 (FDD pattern A: subtest is divided in 4 arbitrary radio frames with 10 active uplink sub-frames per radio frame) and Figure 6.3.5B.2.4.2-3 (TDD pattern A: sub-test is divided in 10 arbitrary radio frames with 4 active uplink subframes per radio frame) with an uplink RB allocation as defined in tables 6.3.5B.2.5-1 thru 6.3.5B.2.5-12 depending on channel bandwidth. On the PDCCH format 4 for the scheduling of the PUSCH the SS will transmit a +1dB TPC command. Note that the measurement need not be done continuously, provided that interruptions are whole numbers of frames, and TPC commands of 0dB are sent during the interruption.
 - 1.3. Measure the mean sum power at each antenna connector for PUSCH transmissions to verify the UE relative power control meet test requirements 6.3.5B.2.5. For power transients between subframes, transient periods of 40us between subframes are excluded. For ON/OFF or OFF/ON transients, transient periods of 20 us at the beginning of the subframe are excluded.
 - 1.4. Repeat the subtest different pattern B, C to move the RB allocation change at different points in the pattern as described in Table 6.3.5B.2.5-1 thru Table 6.3.5B.2.5-12 to force bigger UE power steps at various points in the power range.
- 2. Sub test: ramping down pattern
 - 2.1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 4 for C_RNTI to schedule the UL RMC according to Table 6.3.5B.2.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. Send the appropriate TPC commands for PUSCH to the UE to ensure that the UE transmits PUSCH at +18.0dBm +/- 3.2 dB for carrier frequency $f \le 3.0$ GHz or at +17.7dBm +/- 3.5 dB for carrier frequency 3.0GHz < $f \le 4.2$ GHz.
 - 2.2. Schedule the UE's PUSCH data transmission as described in Figure 6.3.5B.2.4.2-2 (FDD pattern A: subtest is divided in 4 arbitrary radio frames with 10 active uplink sub-frames per radio frame) and Figure 6.3.5B.2.4.2-4 (TDD pattern A: sub-test is divided in 10 arbitrary radio frames with 4 active uplink sub-frames per radio frame) with an uplink RB allocation as defined in tables 6.3.5B.2.5-1 thru 6.3.5B.2.5-12 depending on channel bandwidth. On the PDCCH format 4 for the scheduling of the PUSCH the SS will transmit a -1dB TPC command. Note that the measurement need not be done continuously, provided that interruptions are whole numbers of frames, and TPC commands of 0dB are sent during the interruption.
 - 2.3. Measure the mean sum power at each antenna connector for PUSCH transmissions to verify the UE relative power control meet test requirements 6.3.5B.2.5. For power transients between subframes, transient periods of 40us between subframes are excluded. For ON/OFF or OFF/ON transients, transient periods of 20 us at the beginning of the subframe are excluded.
 - 2.4. Repeat the subtest different pattern B, C to move the RB allocation change at different points in the pattern as described in Table 6.3.5B.2.5-1 thru Table 6.3.5B.2.5-12 to force bigger UE power steps at various points in the power range.
- 3. Sub test: alternating pattern
 - 3.1. SS sends uplink scheduling information for each UL HARQ process via PDCCH DCI format 4 for C_RNTI to schedule the UL RMC according to Table 6.3.5B.2.4.1-1. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. Send the appropriate TPC commands for PUSCH to the UE to ensure that the UE transmits PUSCH at -10dBm +/- 3.2 dB for carrier frequency f≤ 3.0GHz or at -10dBm +/- 3.5 dB for carrier frequency 3.0GHz < f ≤ 4.2GHz. The initial uplink RB allocation is defined as the smaller uplink RB allocation value specified in tables 6.3.5B.2.5-13. The power level and RB allocation are reset for each sub-test.</p>
 - 3.2. Schedule the UE's PUSCH data transmission as described in Figure 6.3.5B.2.4.2-5for 10 sub-frames with an uplink RB allocation alternating pattern as defined in table 6.3.5B.2.5-13 while transmitting 0d B TPC command for PUSCH via the PDCCH.

3.3. Measure the mean sum power of each antenna connector for PUSCH transmissions to verify the UE relative power control meet test requirements specified in clause 6.3.5B.2.5. For power transients between subframes, transient periods of 40us between subframes are excluded. For ON/OFF or OFF/ON transients, transient periods of 20 us at the beginning of the subframe are excluded.

6.3.5B.2.4.3 Message contents

Message contents are according to TS 36.508 [7] clause 4.6.

6.3.5B.2.5 Test requirement

Each UE power step measured in the test procedure 6.3.5B.2.4.2 should satisfy the test requirements specified in Table 6.3.5B.2.5-1, thru 6.3.5B.2.5-13 for normal conditions; for extreme conditions an additional ± 2.0 dB relaxation is allowed.

To account for RF Power amplifier mode changes 2 exceptions are allowed for each of ramping up and ramping down test patterns. For these exceptions the power tolerance limit is a maximum of ± 6.7 dB. If there is an exception in the power step caused by the RB change for all test patterns (A, B, C) then fail the UE.

Table 6.3.5B.2.5-1: Test Requirements Relative Power Tolerance for Transmission (normal conditions - Note 5) channel bandwidth 1.4MHz (ramping up)

Sub-test (ramp up	t))	Uplink RB allocation	TPC command	Expected power step size (Up) ΔP [dB]	Power step size range (Up) ΔP [dB]	PUSCH [dB]		
Subframe before RI change	s 3	Fixed = 1	TPC=+1dB	1	ΔP < 2	1 ± 1.7		
RB chang	e	Change from 1 to 6 RBs	TPC=+1dB	8.78	4 ≤ ΔP < 10	8.78 ±4.7 Note 2 8.78 +6.2/-4.7 Note 3		
Subframe after RB change	S	Fixed = 6	TPC=+1dB	1	ΔP < 2	1 ± 1.7		
Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes. Pattern B the position of RB uplink allocation change is after 20 active uplink subframes. Pattern C the position of RB uplink allocation change is after 30 active uplink subframes								
 Note 2: When Note 3 does not apply. Note 3: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within F_{UL_low} and F_{UL_low} + 4 MHz or F_{UL_high} - 4 MHz and F_{UL_high} and the target sub-frame is not confined within any one of these frequency ranges. Note 4: N/A. Note 5: For extreme conditions an additional ± 2.0 dB relaxation is allowed. Note 6: The starting resource block shall be RB# 0. 								

Sub-test (ramp down)		Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH		
Subfromo		Live d E		ΔΡ [αΒ]	ΔΡ [αΒ]	[dB]		
before RB change	5	Fixed = 5	IPC=-Iub	1	∆P < 2	1 ± 1.7		
RB change	9	Change from 5 to 1 RBs	TPC=-1dB	7.99	4 ≤ ΔP < 1	7.99 ± 4.7 Note 2 7.99 +4.7/-6.2 Note 4		
Subframes after RB change	5	Fixed = 1	TPC=-1dB	1	ΔP < 2	1 ± 1.7		
Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes. Pattern B the position of RB uplink allocation change is after 16 active uplink subframes. Pattern C the position of RB uplink allocation change is after 26 active uplink subframes. Note 2: When Note 4 does not apply. Note 3: N/A. Note 4: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within Full low and Full low + 4 MHz or Full high - 4								
 MHz and F_{UL_high} and the reference sub-frame is not confined within any one of these frequency ranges. Note 5: For extreme conditions an additional ± 2.0 dB relaxation is allowed. Note 6: The starting resource block shall be RB# 0. 								

Table 6.3.5B.2.5-2: Test Requirements Relative Power Tolerance for Transmission (normal conditions - Note 5) channel bandwidth 1.4MHz (ramping down)

Table 6.3.5B.2.5-3: Test Requirements Relative Power Tolerance for Transmission (normal conditions - Note 5) channel bandwidth 3MHz (ramping up)

Sub-test (ramp up)	Uplink RB allocation	TPC command	Expected power step size (Up) ΔP [dB]	Power step size range (Up) ΔP [dB]	PUSCH [dB]			
Subframes before RB change	Fixed = 1	TPC=+1dB	1	ΔP < 2	1 ± 1.7			
RB change	Change from 1 to 4 RBs	TPC=+1dB	7.02	4 ≤ ∆P < 10	7.02 ± 4.7 Note 2 7.02 +6.2/-4.7 Note 3			
Subframes after RB change	Fixed =4	TPC=+1dB	1	ΔP < 2	1 ± 1.7			
Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes. Pattern B the position of RB uplink allocation change is after 20 active uplink subframes. Pattern C the position of RB uplink allocation change is after 30 active uplink subframes. Pattern C the position of RB uplink allocation change is after 30 active uplink subframes.								
Note 2: When Note 3 does not apply. Note 3: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within Fullow and Fullow + 4 MHz or Fullohigh - 4 MHz and Fullohigh and the target sub-frame is not confined within any one of these frequency ranges. Note 4: N/A. Note 5: For extreme conditions an additional ± 2.0 dB relaxation is allowed.								

Sub-tes (ramp down)	t	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH	
a				ΔΡ [dB]	ΔP [dB]	[dB]	
Subframe before R change	es B	Fixed = 15	TPC=-1dB	1	∆P < 2	1 ± 1.7	
RB chan	ge	Change from 15 to 1 RBs	TPC=-1dB	12.76	10 ≤ ΔP < 15	12.76 ± 5.7 Note 2 12.76 +5.7/-7.2 Note 4	
Subframes Fixed =1 TPC=-1dB after RB change		1	ΔP < 2	1 ± 1.7			
Note 1:	Interview Position of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes. Pattern A the position of RB uplink allocation change is after 16 active uplink subframes. Pattern C the position of RB uplink allocation change is after 26 active uplink subframes.						
Note 2: Note 3: Note 4: Note 5:	When Note 4 does not apply. N/A. For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within F_{UL_Jow} and $F_{UL_Jow} + 4$ MHz or $F_{UL_high} - 4$ MHz and F_{UL_high} and the reference sub-frame is not confined within any one of these frequency ranges. For extreme conditions an additional ± 2.0 dB relaxation is allowed.						
Note 6:	The	e starting resource block shall be RB# 0.					

Table 6.3.5B.2.5-4: Test Requirements Relative Power Tolerance for Transmission (normal conditions - Note 5) channel bandwidth 3MHz (ramping down)

Table 6.3.5B.2.5-5: Test Requirements Relative Power Tolerance for Transmission (normal conditions - Note 5) channel bandwidth 5MHz (ramping up)

Sub-tes (ramp up	t))	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH
		—	700 (10	ΔΡ [αΒ]	ΔΡ [αΒ]	[aB]
before RI change	is B	Fixed = 1	TPC=+1dB	1	∆P < 2	1 ± 1.7
RB chang	je	Change from 1 to 20	TPC=+1dB	14.01	10 ≤ ΔP < 15	14.01 ± 5.7 Note 2 14.01 +7.2/-5.7 Note 3
Subframes after RB change		Fixed = 20	TPC=+1dB	1	ΔP < 2	1 ± 1.7
Note 1:	 Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes. Pattern B the position of RB uplink allocation change is after 20 active uplink subframes. Pattern C the position of RB uplink allocation change is after 30 active uplink subframes 					
Note 2: Note 3: Note 4: Note 5: Note 6:	Wh For of t - 4 free N/A For The	Then Note 3 does not apply. r operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth the reference sub-frames is confined within $F_{UL_{low}}$ and $F_{UL_{low}} + 4$ MHz or $F_{UL_{high}}$ MHz and $F_{UL_{high}}$ and the target sub-frame is not confined within any one of these quency ranges. A. r extreme conditions an additional ± 2.0 dB relaxation is allowed. e starting resource block shall be RB# 0.				

Table 6.3.5B.2.5-6: Test Requirements Relative Power Tolerance for Transmission
(normal conditions - Note 5) channel bandwidth 5MHz (ramping down)

Sub-test (ramp down)	Uplink RB allocation	TPC command	Expected power step size (down)	Power step size range (down)	PUSCH		
0.17	F : 1 05	TDO 4 15	ΔΡ [αΒ]	ΔΡ [αΒ]	[dB]		
before RB change	Fixed = 25	TPC=-10B	1	∆P < 2	1 ± 1.7		
RB change	Change from 25 to 1	TPC=-1dB	14.98	10 ≤ ΔP < 15	14.98 ± 5.7 Note 2 14.98 +5.7/-7.2 Note 4		
Subframes Fixed = 1 after RB change		TPC=-1dB	1	ΔP < 2	1 ± 1.7		
Note 1: P S P S P	 Diversition of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes. Pattern B the position of RB uplink allocation change is after 16 active uplink subframes. Pattern C the position of RB uplink allocation change is after 26 active uplink subframes. 						
Note 2: W Note 3: N Note 4: F Wote 5: F	 When Note 4 does not apply. N/A. For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within F_{UL_low} and F_{UL_low} + 4 MHz or F_{UL_high} - 4 MHz and F_{UL_high} and the reference sub-frame is not confined within any one of these frequency ranges. For extreme conditions an additional + 2.0 dB relaxation is allowed 						
Note 6: T	The starting resource block shall be RB# 0.						

Table 6.3.5B.2.5-7: Test Requirements Relative Power Tolerance for Transmission(normal conditions - Note 5) channel bandwidth 10MHz (ramping up)

		power step size (Up) AP [dB]	step size range (Up) AP [dB]	PUSCH	
Fixed = 1	TPC=+1dB	1	ΔP < 2	1 ± 1.7	
e Change from 1 to 25	TPC=+1dB	14.98	10 ≤ ΔP < 15	14.98 ± 5.7 Note 2 14.98 +7.2/-5.7 Note 3	
Fixed = 25	TPC=+1dB	1	ΔP < 2	1 ± 1.7	
 Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes. Pattern B the position of RB uplink allocation change is after 20 active uplink subframes. Pattern C the position of RB uplink allocation change is after 30 active uplink subframes 					
When Note 3 does not apply. For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within F_{UL_Jow} and $F_{UL_Jiw} + 4$ MHz or F_{UL_high} - 4 MHz and F_{UL_high} and the target sub-frame is not confined within any one of these frequency ranges. N/A. For extreme conditions an additional ± 2.0 dB relaxation is allowed.					
	Fixed = 1 Change from 1 to 25 Fixed = 25 Position of RB of Pattern A the position subframes. Pattern B the position subframes. Pattern C the position Subframes. When Note 3 do For operating base of the reference 4 MHz and Full frequency range N/A. For extreme cor The starting resu	s Fixed = 1 TPC=+1dB e Change from 1 to 25 TPC=+1dB a Fixed = 25 TPC=+1dB Position of RB change: Pattern A the position of RB up subframes. Pattern A the position of RB up subframes. Pattern B the position of RB up subframes. Pattern C the position of RB up subframes. When Note 3 does not apply. For operating bands under Not of the reference sub-frames is - 4 MHz and Ful_high and the tai frequency ranges. N/A. For extreme conditions an add The starting resource block share	Image: state of the starting resource block shall be RB# 0. Image: state of the starting resource block shall be RB# 0.	Step sizeTange (Up) $\Delta P [dB]$ Tange (Up) $\Delta P [dB]$ aFixed = 1TPC=+1dB1 $\Delta P < 2$ aChange from 1 to 25TPC=+1dB14.98 $10 \le \Delta P < 15$ aFixed = 25TPC=+1dB1 $\Delta P < 2$ Position of RB change: Pattern A the position of RB uplink allocation change is a subframes.1 $\Delta P < 2$ Position of RB change: Pattern B the position of RB uplink allocation change is a subframes.1 $\Delta P < 2$ Pattern C the position of RB uplink allocation change is a subframes.aaPattern C the position of RB uplink allocation change is a subframes.aPattern C the position of RB uplink allocation change is a subframes.aPattern C the position of RB uplink allocation change is a subframes.aPattern C the position of RB uplink allocation change is a subframes.aPattern C the position of RB uplink allocation change is a subframes.aPattern C the position of RB uplink allocation change is a subframes.aWhen Note 3 does not apply.For operating bands under Note 2 in Table 6.2.2.3-1, if the of the reference sub-frames is confined within Ful_low and - 4 MHz and Ful_high and the target sub-frame is not confi frequency ranges.N/A.For extreme conditions an additional ± 2.0 dB relaxation if The starting resource block shall be RB# 0.	

Table 6.3.5B.2.5-8: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 10MHz (ramping down)

Sub-test	Uplink RB	Uplink RB TPC Expected Power						
(ramp	allocation	command	power	step size	DUSCH			
down)			step size	range	FUSCI			
			(down)	(down)				
			ΔP [dB]	ΔP [dB]	[dB]			
Subframes	Fixed $= 50$	TPC=-1dB						
before RB	(UE-							
change	Categories				4 4 7			
	22)		1	$\Delta P < 2$	1 ± 1.7			
	Fixed = 48							
	(UE Cat 1)							
RB change	Change							
	from 50 to		17.00					
	1 (UE-		17.99		17.99 ± 6.7 Note 2			
	Categories				17.99 +6.7/-8.2 Note 4			
	<i>22)</i>	TPC=-1dB		15 ≤∆				
	Change				17.81 + 6.7 Note 2			
	from 48 to		17.81		17.81 +6.7/-8.2 Note 4			
	1 (UE cat							
	1)							
Subframes	Fixed = 1	TPC=-1dB						
after RB			1	ΔP < 2	1 ± 1.7			
change								
Note 1: Po	sition of RB ch	nange:			6 .			
Pa	ttern A the pos	sition of RB up	link allocatio	n change is a	fter 6 active uplink			
su	btrames.			n ahanna in a	fter 10 estive unlink			
Pa	littern B the pos	sition of RB up	nink allocatio	n change is a	inter 16 active uplink			
Su Do	uttorn C tho nor	sition of PR un	link allomtio	n chango is a	ftor 26 active uplink			
Г <i>а</i> Su	hframes		nink anotatio	ii change is a	iner 20 active uplifik			
Note 2: W	nen Note 3 doe	es not apply.						
Note 3: N/	N/A.							
Note 4: Fo	For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission							
ba	bandwidth of the target sub-frame is confined within $F_{UL low}$ and $F_{UL low}$ + 4 MH							
or	or F_{UL_high} - 4 MHz and F_{UL_high} and the reference sub-frame is not confined within							
an	yone of these	frequency rar	iges.					
Note 5: Fo	r extreme con	ditions an add	itional ± 2.0 c	B relaxation	is allowed.			
Note 6: Th	e starting reso	urce block sha	all be RB# 0.					

Sub-tes (ramp up	t))	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH	
				ΔP [dB]	ΔP [dB]	[dB]	
Subframe before RI change	is B	Fixed = 1	TPC=+1dB	1	ΔP < 2	1 ± 1.7	
RB chang	je	Change from 1 to 50	TPC=+1dB	17.99	15 ≤ΔP	17.99±6.7 Note 2 17.99 +8.2/-6.7 Note 3	
Subframe after RB change	S	Fixed = 50	TPC=+1dB	1	ΔP < 2	1 ±1.7	
Note 1:	Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes. Pattern B the position of RB uplink allocation change is after 20 active uplink subframes. Pattern C the position of RB uplink allocation change is after 30 active uplink						
Note 2: Note 3: Note 4: Note 5: Note 6:	When Note 3 does not apply. For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within F_{UL_Jow} and F_{UL_Jow} + 4 MHz or F_{UL_high} - 4 MHz and F_{UL_high} and the target sub-frame is not confined within any one of these frequency ranges. N/A. For extreme conditions an additional ± 2.0 dB relaxation is allowed. The starting resource block shall be RB# 0						

Table 6.3.5B.2.5-9: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 15MHz (ramping up)

Table 6.3.5B.2.5-10: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 15MHz (ramping down)

Sub-test	st Uplink RB TPC Expected Power					
(ramp down)	allocation	command	power sten size	step size	PUSCH	
			(down)	(down)		
			ΔP [dB]	ΔP [dB]	[dB]	
Subframes before RB change	Fixed = 75 (UE- Categories ≥2) Fixed = 50 (UE Cat 1)	TPC=-1dB	1	ΔP < 2	1 ± 1.7	
RB change	 Change from 75 to 1 (UE- Categories ≥2) Change from 50 to 1 (UE Cat 1) 	TPC=-1dB	19.75 17.99	15 ≤ ΔP	19.75 ± 6.7 Note 2 19.75 +6.7/8.2 ±TT Note 4 17.99 ± 6.7 Note 2 17.99 +6.7/-8.2 Note 4	
Subframes after RB change	Fixed = 1	TPC=-1dB	1	ΔP < 2	1 ± 1.7	
Note 1: F	Position of RB change: Pattern A the position of RB uplink allocation change is after 6 active uplink subframes. Pattern B the position of RB uplink allocation change is after 16 active uplink subframes. Pattern C the position of RB uplink allocation change is after 26 active uplink subframes. When Note 4 does not apply. N/A. For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within F_{UL_low} and F_{UL_low} + 4 MHz or F_{UL_high} - 4 MHz and F_{UL_high} and the reference sub-frame is not confined within					
Note 5:	For extreme con The starting resc	ditions an add	itional ± 2.0 c all be RB# 0.	B relaxation	s allowed.	

Sub-test (ramp up)	Uplink RB allocation	TPC command	Expected power step size (Up)	Power step size range (Up)	PUSCH
			ΔP [dB]	ΔP [dB]	[dB]
Subframes before RB change	Fixed = 1	TPC=+1dB	1	ΔP < 2	1 ± 1.7
RB change	Change from 1 to 75	TPC=+1dB	19.75	15 ≤ ΔΡ	19.75 ± 6.7 Note 2 19.75 +8.2/-6.7 Note 3
Subframes after RB change	Fixed = 75	TPC=+1dB	1	ΔP < 2	1 ± 1.7
Note 1: Position of RB change: Pattern A the position of RB uplink allocation change is after 10 active uplink subframes. Pattern B the position of RB uplink allocation change is after 20 active uplink subframes. Pattern C the position of RB uplink allocation change is after 30 active uplink automation change is after 30 active uplink					
Note 2: Note 3: H Note 3: H Note 4: H Note 5: H	When Note 3 does not apply. For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the reference sub-frames is confined within F_{UL_low} and F_{UL_low} + 4 MHz or F_{UL_high} - 4 MHz and F_{UL_high} and the target sub-frame is not confined within any one of these frequency ranges. N/A. For extreme conditions an additional ± 2.0 dB relaxation is allowed.				

Table 6.3.5B.2.5-11: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 20MHz (ramping up)

Table 6.3.5B.2.5-12: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) channel bandwidth 20MHz (ramping down)

Sub-test	Uplink RB	Uplink RB TPC Expected Power						
(ramp	allocation	command	power	step size	PUSCH			
down)			step size	range	100011			
			(down)	(down)				
			ΔP [dB]	ΔP [dB]	[dB]			
Subframes	Fixed =	TPC=-1dB						
before RB	100 (UE-							
cnange	Categories		1		1 . 1 7			
	<i>22)</i>		I	$\Delta P \leq 2$	1 ± 1.7			
	Fixed = 75							
DD ab an an	(UE Cat 1)							
RB change	Change from 100	TPC=-10B	21.0					
	to 1 (UE-		21.0		21 0 + 6 7 Note 2			
	Categories				$21.0 \pm 6.7/-8.2$ Note 4			
	≥2)							
	,			15 ≤ ΔP				
	Change				19.75 ± 6.7 Note 2			
	from 75 to				19.75 +6.7/-8.2 Note 4			
	1 (UE Cat		19.75					
0.17	1)	TDO 4 ID						
Subframes	Fixed = 1	TPC=-1dB	1		1 . 1 7			
change			I	$\Delta P \leq 2$	1 ± 1.7			
Note 1: D	osition of PB ct	ande.						
P	attern A the pos	sition of RB up	link allocatio	n change is a	fter 6 active uplink			
S	ubframes.							
P	attern B the pos	sition of RB up	link allocatio	n change is a	fter 16 active uplink			
S	ubframes.							
P	attern C the pos	sition of RB up	olink allocatio	n change is a	fter 26 active uplink			
S	subframes.							
Note 2: V	When Note 4 does not apply.							
Note 3: IN	N/A.							
	4: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of the target sub-frame is confined within Functional Function 4 Million							
0	bandwidth of the targetsub-frame is confined within F_{ULlow} and F_{ULlow} + 4 MHz or Full black - 4 MHz and Full black and the reference sub-frame is not confined within							
a	nv one of these	frequency rar	ndes.					
Note 5: F	or extreme con	ditions an add	itional ± 2.0 c	B relaxation	is allowed.			
Note 6: T	he starting reso	urce blocksha	all be RB# 0.					

Sub-test	Uplink RB TPC Expected Power						
	allocation	command	power	step size	BUGGU		
			step size	range	PUSCH		
			(Up or down)	(Up or down)			
			ΔP [dB]	ΔP [dB]	[dB]		
1.4 MHz	Alternating 1	TPC=0dB			7.78 ± 6.7 Note 1,2		
	and 6		7.78	4 ≤ <u>∆</u> P <	7.78 +8.2/-6.7 Note 3		
				10	7.78 +6.7/-8.2 Note 4		
3 MH z	Alternating 1	TPC=0dB			11.76 ± 6.76.7 Note 1,2		
	and 15		11.76	10 3 21 5	11.76 +8.2/-6.7 Note 3		
				10	11.76 +6.7/-8.2 Note 4		
5 MHZ	Alternating 1	TPC=0dB		10 ≤ ΔP <	13.98 ± 6.7 Note 1		
	and 25		13.98	15	13.98 +8.2/-6.7 Note 2		
40.1417		TDO 0 10		-	13.98 +6.7/-8.2 Note 3		
10 MHZ	Alternating 1	IPC=0dB	40.00		16.99 ± 6.7 Note 1,2		
	Cotogorios		16.99		$10.99 \pm 0.2 - 0.7$ Note 3		
	Salegolies				10.99 +0.7/-0.2 Note 4		
	<i>22)</i>			15 < AP			
	Alternating 1			10 = Δ			
	and 48 (UE				16.81 ± 6.7 Note 1.2		
	Cat 1)		16,81		16.81 +8.2/-6.7 Note 3		
	,				16.81 +6.7/-8.2 Note 4		
15 MHZ	Alternating 1	TPC=0dB			18.75 ± 6.7 Note 1,2		
	and 75 (UE-		18.75		18.75 +8.2/-6.7 Note 3		
	Categories				18.75 +6.7/-8.2 Note 4		
	≥2)						
	Altornating 1			15 ≤ ΔP			
	and 50 (LIE				16 99 + 6 7 Note 1 2		
	Cat 1)		16.99		16 99 +8 2/-6 7 Note 3		
	Outly		10.00		16.99 +6 7/-8 2 Note 4		
20 MHZ	Alternating 1	TPC=0dB			20.00 ± 6.7 Note 1.2		
	and 100		20.00		20.00 +8.2/-6.7 Note 3		
	(UE-				20.00 +6.7/-8.2 Note 4		
	Categories						
	≥2)			15 ≤ ΔP			
	Alternating 1				18.75 ± 6.7 Note 1,2		
	and 75 (UE		18.75		18.75 +8.2/-6.7 Note 3		
	Cat 1)				18.75 +6.7/-8.2 Note 4		
		0.7 UD Was Se	elected to allo		possible exceptions to		
Note 2: W/	hen neither Note	3 nor Note 1	annlies				
Note 3: Fo	or operating ban	ds under Note	2 in Table 6	2 2 3-1 if the	transmission bandwidth of		
the	the reference sub-frames is confined within Fill low and Fill low + 4 MHz or Fill lobe - 4						
M	MHz and $F_{UL high}$ and the target sub-frame is not confined within any one of these						
fre	frequency ranges.						
Note 4: Fo	Note 4: For operating bands under Note 2 in Table 6.2.2.3-1, if the transmission bandwidth of						
the	e target sub-fran	ne is confined	within F_{UL_low}	and Ful_low	+4 MHzor F _{UL_high} -4 MHz		
ar	nd F _{UL_high} and the	e reference su	ub-frame is no	ot confined w	ithin any one of these		
fre	equency ranges.	,,					
Note 5: Fo	or extreme condi	tions an additi	onal ± 2.0 dE	s relaxation is	allowed.		
Note 6: The starting resource block shall be RB# 0.							

Table 6.3.5B.2.5-13: Test Requirements Relative Power Tolerance for Transmission (normal conditions – Note 5) (Alternating pattern)

6.3.5B.3 Aggregate power control tolerance for UL-MIMO

6.3.5B.3.1 Test purpose

To verify the ability of the UE with UL-MIMO to maintain its power level in non-contiguous transmission within 21 ms in response to 0 dB TPC commands with respect to the first UE transmission, when the power control parameters specified in TS 36.213 are constant.

6.3.5B.3.2 Test applicability

This test case applies to all types of E-UTRA UE release 10 and forward that support UL MIMO.

6.3.5B.3.3 Minimum conformance requirement

For UE with multiple transmit antenna connectors, the power control tolerance applies to the sum of output power at each transmit antenna connector.

The power control requirements specified in clause 6.3.5 apply to UE with two transmit antenna connectors with UL-MIMO configurations specified in Table 6.2.2B.3-2 for closed-loop spatial multiplexing scheme, wherein:

- The Maximum output power requirements for UL-MIMO are specified in clause 6.2.2B.
- The Minimum output power requirements for UL-MIMO are specified in clause 6.3.2B.

The normative reference for this requirement is TS 36.101 [2] clause 6.3.5B.

6.3.5B.3.4 Test description

6.3.5B.3.4.1 Initial conditions

Initial conditions are a set of test configurations the UE needs to be tested in and the steps for the SS to take with the UE to reach the correct measurement state.

The initial test configurations consist of environmental conditions, test frequencies, and channel bandwidths based on E-UTRA operating bands specified in table 5.4.2.1-1. All of these configurations shall be tested with applicable test parameters for each channel bandwidth, and are shown in table 6.3.5B.3.4.1-1. The details of the uplink and downlink reference measurement channels (RMCs) are specified in Annexes A.2 and A.3. Configurations of PDSCH and PDCCH before measurement are specified in Annex C.2.

Initial Conditions					
Test Envi	ironmentas sp	ecified in		Nomal	
TS 36.	508[7] subclau	se 4.1			
Test Fred	quencies as sp	ecified in		Mid range	
TS36.50	8 [7] subclaus	se 4.3.1			
Test Channe	Bandwidths a	s specified in		Lowest, 5MHz, Highest	
TS 36.50)8 [7] subclau	se 4.3.1			
Test Parameters for Channel Bandwidths					
	Dowr	nlink Configur	ation	Uplink Configuration	
Ch BW	Mod'n	RB allo	ocation	FDD: PUCCH format = Format 1a	
		FDD	TDD	TDD: PUCCH format = Format 1a/1b	
1.4MHz	QPSK	3	3		
3MHz	QPSK	4	4		
5MHz	QPSK	8	8		
10MHz	QPSK	16	16		
15MHz	QPSK	25	25		
20MHz	QPSK	30	30		
Note 1: Test Channel Bandwidths are checked separately for each E-UTRA band, the applicable					
channel bandwidths are specified in Table 5.4.2.1-1.					

Table 6.3.5B.3.4.1-1: Test Configuration Table: PUCCH sub-test

Initial Conditions							
Test Environment as specified in		Normal					
TS 36.508[7] subclause 4.1							
Test Frequencies as specified in		Mid range					
TS36.508 [7] subclause 4.3.1							
Test Channel Bandwidths as specified in		Lowest, 5MHz, Highest					
TS 36.50)8 [7] subclause 4.3.1						
Test Parameters for Channel Bandwidths							
	Downlink Configuration		Uplink Configuration				
Ch BW	N/A for PUSCH sub-test		Mod'n	RB allocation			
				FDD	TDD		
1.4MHz			QPSK	1	1		
3MHz			QPSK	4	4		
5MHz			QPSK	8	8		
10MHz			QPSK	12	12		
15MHz			QPSK	16	16		
20MHz			QPSK	18	18		
Note 1: Test Channel Bandwidths are checked separately for each E-UTRA band, the applicable							
channel bandwidths are specified in Table 5.4.2.1-1.							

Table 6.3.5B.3.4.1-2: Test Configuration Table: PUSCH sub-test

- 1. Connect the SS to the UE antenna connectors as shown in TS 36.508 [7] Annex A, Figure A.28.
- 2. The parameter settings for the cell are set up according to TS 36.508 [7] clause 4.4.3.
- 3. Downlink signals are initially set up according to Annex C0, C.1 and C.3.0, and uplink signals according to Annex H.1 and H.3.0.
- 4. The UL and DL Reference Measurement channels are set according to Table 6.3.5B.3.4.1-1 (PUCCH sub-test) and Table 6.3.5B.3.4.1-2 (PUSCH sub-test).
- 5. Ensure the UE is in State 3A-RF according to TS 36.508 [7] clause 5.2A.2. Message contents are defined in clause 6.3.5B.3.4.3.

6.3.5B.3.4.2 Test procedure

The procedure is separated in two subtests to verify PUCCH and PUSCH aggregate power control tolerance respectively. The uplink transmission patterns are described in figure 6.3.5B.3.4.2-1.



Figure 6.3.5B.3.4.2-1 Test uplink transmission

1. PUCCH sub test:

- 1.1 The SS transmits PDSCH via PDCCH DCI format 1A for C_RNTI to transmit the DL RMC according to Table 6.3.5B.3.4.1-1. The SS sends downlink MAC padding bits on the DL RMC. The transmission of PDSCH will make the UE send uplink ACK/NACK using PUCCH. Send the appropriate TPC commands for PUCCH to the UE to ensure that the UE transmits PUCCH at 0dBm +/- 3.2 dB for carrier frequency $f \le 3.0$ GHz or at 0dBm +/- 3.5 dB for carrier frequency 3.0GHz < $f \le 4.2$ GHz.
- 1.2. Every 5 subframes transmit to the UE downlink PDSCH MAC padding bits as well as 0 dB TPC command for PUCCH via the PDCCH to make the UE transmit ACK/NACK on the PUCCH with transmission gap of 4 subframes. The downlink transmission is scheduled in the appropriate sub-frames to make the UE transmit PUCCH as described in figure 6.3.5B.3.4.2-1.
- 1.3. Measure the mean sum power at each antenna connector for UE of 5 consecutive PUCCH transmissions to verify the UE transmitted PUCCH power is maintained within 21 ms. The transient periods of 20us are excluded from the power measurement.
- 2. PUSCH sub test:
 - 2.1. The SS sends uplink scheduling information via PDCCH DCI format 4 for C_RNTI to schedule the UL RMC according to Table 6.3.5B.3.4.1-2. Since the UE has no payload and no loopback data to send the UE sends uplink MAC padding bits on the UL RMC. Send the appropriate TPC commands for PUSCH to the UE to ensure that the UE transmits PUSCH at 0dBm +/- 3.2.dB for carrier frequency $f \le 3.0$ GHz or at 0dBm +/- 3.5 dB for carrier frequency 3.0GHz < $f \le 4.2$ GHz.
 - 2.2. Every 5 subframes schedule the UE's PUSCH data transmission and transmit 0 dB TPC command for PUSCH via the PDCCH to make the UE transmit PUSCH with 4 subframes gap. The uplink transmission patterns are described in figure 6.3.5B.3.4.2-1.
 - 2.3. Measure the mean sum power at each antenna connector for UE of 5 consecutive PUSCH transmissions to verify the UE transmitted PUSCH power is maintained within 21 ms. The transient periods of 20us are excluded from the power measurement.

6.3.5B.3.4.3 Message contents

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

Table 6.3.5B.3.4.3-1: PUCCH-ConfigDedicated-v1020-DEFAULT

Derivation Path: TS 36.508 [7] clause 4.6.3, Table 4.6.3-9A: PUCCH-ConfigDedicated-v1020-DEFAULT					
Information Element	Value/remark	Comment	Condition		
PUCCH-ConfigDedicated-v1020 ::= SEQUENCE {					
twoAntennaPortActivatedPUCCH-Format1a1b-r10	true				
}					

6.3.5B.3.5 Test requirement

The requirement for the power measurements made in step (1.3) and (2.3) of the test procedure shall not exceed the values specified in Table 6.3.5B.3.5-1. The power measurement period shall be 1 sub-frame excluding transient periods.

Table 6.3.5B.3.5-1: Power control tolerance

TPC command	UL channel	Test requirement measured power			
0 dB	PUCCH	Given 5 power measurements in the pattern, the 2 nd , 3 rd , 4 th , and 5 th measurements shall be within ± 3.2 dB of the 1 st measurement.			
0 dB	PUSCH	Given 5 power measurements in the pattern, the 2 nd , 3 rd , 4 th , and 5 th measurements shall be within ± 4.2 dB of the 1 st measurement.			
Note 1: The UE transmission gap is 4 ms. TPC command is transmitted via PDCCH 4 subframes preceding each PUCCH/PUSCH transmission.					

6.4 Void

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