Ex. 1030

3GPP TSG-RAN WG4 Meeting #65 ⌘ **R4-126923**
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CR-Form-v10

CHANGE REQUEST

⌘ **36.101** **CR** **1490** ⌘**rev** **1** ⌘**Current version:** **11.2.0** ⌘

*For **HELP** on using this form look at the pop-up text over the ⌘ symbols. Comprehensive instructions on how to use this form can be found at http://www.3gpp.org/Change-Requests.*

Proposed change affects: ⌘ UICC apps⌘ ☐ ME ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Introduction of Band 29
Source to WG:	⌘	Ericsson, ST-Ericsson, AT&T, Nokia Corporation
Source to TSG:	⌘	R4
Work item code:	⌘	LTE_DL_FDD700-Core
Date:	⌘	2012-11-12
Category:	⌘	**B**
Release:	⌘	Rel-11

Use one of the following categories:
F *(correction)*
A *(mirror corresponding to a change in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)
Rel-8 (Release 8)
Rel-9 (Release 9)
Rel-10 (Release 10)
Rel-11 (Release 11)
Rel-12 (Release 12)

Reason for change:	⌘	Introduce Band 29 (DL700) as a down-link only band in a part of the frequency range 716-728 MHz for E-UTRA operation and include CA_2-29, CA_4-29 to the specifications.
Summary of change:	⌘	The DL700 band is introduced as a down-link only band in a part of the frequency range 716-728 MHz, specifically717-728 MHz, due to BS-BS co-existence with Band 12. The band is defined for carrier-aggregation operation only and is restricted to carry SCell(s) without configured uplinks. The duplex mode is still defined as FDD but with the downlink paired with the (external) uplink band supporting the Pcell. Minimum requirements for Band 29 are only specified for the UE receiver configured with carrier aggregation (CA_2-29, CA_4-29). Spurious emissions requirements for protection of Band 29 are also specified.
Consequences if not approved:	⌘	The range 716-728 MHz cannot be used for E-UTRA operation and the inter-band CA between Band 2 and DL700 as well as Band 4 and DL700 is not specified

Clauses affected:	⌘	5.5, 5.5A, 5.6A.1, 5.7.3, 6.6.3.2, 7.3.1A, 7.5.1A, 7.6.3.1A, 7.7.1A, 7.8.1A			
		Y	**N**		
Other specs affected:	⌘	X		Other core specifications	⌘ TS 36.307, TS 36.133
		X		Test specifications	TS 36.521-1
(show related CRs)			X	O&M Specifications	
Other comments:	⌘				

5 Operating bands and channel arrangement

5.1 General

The channel arrangements presented in this clause are based on the operating bands and channel bandwidths defined in the present release of specifications.

NOTE: Other operating bands and channel bandwidths may be considered in future releases.

5.2 Void

5.3 Void

5.4 Void

5.5 Operating bands

E-UTRA is designed to operate in the operating bands defined in Table 5.5-1.

Table 5.5-1 E-UTRA operating bands

E-UTRA Operating Band	Uplink (UL) operating band BS receive UE transmit	Downlink (DL) operating band BS transmit UE receive	Duplex Mode
	F_{UL_low} – F_{UL_high}	F_{DL_low} – F_{DL_high}	
1	1920 MHz – 1980 MHz	2110 MHz – 2170 MHz	FDD
2	1850 MHz – 1910 MHz	1930 MHz – 1990 MHz	FDD
3	1710 MHz – 1785 MHz	1805 MHz – 1880 MHz	FDD
4	1710 MHz – 1755 MHz	2110 MHz – 2155 MHz	FDD
5	824 MHz – 849 MHz	869 MHz – 894MHz	FDD
6[1]	830 MHz – 840 MHz	875 MHz – 885 MHz	FDD
7	2500 MHz – 2570 MHz	2620 MHz – 2690 MHz	FDD
8	880 MHz – 915 MHz	925 MHz – 960 MHz	FDD
9	1749.9 MHz – 1784.9 MHz	1844.9 MHz – 1879.9 MHz	FDD
10	1710 MHz – 1770 MHz	2110 MHz – 2170 MHz	FDD
11	1427.9 MHz – 1447.9 MHz	1475.9 MHz – 1495.9 MHz	FDD
12	699 MHz – 716 MHz	729 MHz – 746 MHz	FDD
13	777 MHz – 787 MHz	746 MHz – 756 MHz	FDD
14	788 MHz – 798 MHz	758 MHz – 768 MHz	FDD
15	Reserved	Reserved	FDD
16	Reserved	Reserved	FDD
17	704 MHz – 716 MHz	734 MHz – 746 MHz	FDD
18	815 MHz – 830 MHz	860 MHz – 875 MHz	FDD
19	830 MHz – 845 MHz	875 MHz – 890 MHz	FDD
20	832 MHz – 862 MHz	791 MHz – 821 MHz	FDD
21	1447.9 MHz – 1462.9 MHz	1495.9 MHz – 1510.9 MHz	FDD
22	3410 MHz – 3490 MHz	3510 MHz – 3590 MHz	FDD
23	2000 MHz – 2020 MHz	2180 MHz – 2200 MHz	FDD
24	1626.5 MHz – 1660.5 MHz	1525 MHz – 1559 MHz	FDD
25	1850 MHz – 1915 MHz	1930 MHz – 1995 MHz	FDD
26	814 MHz – 849 MHz	859 MHz – 894 MHz	FDD
27	807 MHz – 824 MHz	852 MHz – 869 MHz	FDD
28	703 MHz – 748 MHz	758 MHz – 803 MHz	FDD
...			
33	1900 MHz – 1920 MHz	1900 MHz – 1920 MHz	TDD
34	2010 MHz – 2025 MHz	2010 MHz – 2025 MHz	TDD
35	1850 MHz – 1910 MHz	1850 MHz – 1910 MHz	TDD
36	1930 MHz – 1990 MHz	1930 MHz – 1990 MHz	TDD
37	1910 MHz – 1930 MHz	1910 MHz – 1930 MHz	TDD
38	2570 MHz – 2620 MHz	2570 MHz – 2620 MHz	TDD
39	1880 MHz – 1920 MHz	1880 MHz – 1920 MHz	TDD
40	2300 MHz – 2400 MHz	2300 MHz – 2400 MHz	TDD
41	2496 MHz 2690 MHz	2496 MHz 2690 MHz	TDD
42	3400 MHz – 3600 MHz	3400 MHz – 3600 MHz	TDD
43	3600 MHz – 3800 MHz	3600 MHz – 3800 MHz	TDD
44	703 MHz – 803 MHz	703 MHz – 803 MHz	TDD
NOTE 1: Band 6 is not applicable			

5.5A Operating bands for CA

E-UTRA carrier aggregation is designed to operate in the operating bands defined in Tables 5.5A-1 and 5.5A-2.

Table 5.5A-1: Intra-band contiguous CA operating bands

E-UTRA CA Band	E-UTRA Band	Uplink (UL) operating band BS receive / UE transmit			Downlink (DL) operating band BS transmit / UE receive			Duplex Mode
		F_{UL_low}	–	F_{UL_high}	F_{DL_low}	–	F_{DL_high}	
CA_1	1	1920 MHz	–	1980 MHz	2110 MHz	–	2170 MHz	FDD
CA_7	7	2500 MHz	–	2570 MHz	2620 MHz	–	2690 MHz	FDD
CA_38	38	2570 MHz	–	2620 MHz	2570MHz	–	2620 MHz	TDD

CA_40	40	2300 MHz	–	2400 MHz	2300 MHz	–	2400 MHz	TDD
CA_41	41	2496 MHz		2690 MHz	2496 MHz		2690 MHz	TDD

Table 5.5A-2: Inter-band CA operating bands

E-UTRA CA Band	E-UTRA Band	Uplink (UL) operating band BS receive / UE transmit F_{UL_low} – F_{UL_high}			Downlink (DL) operating band BS transmit / UE receive F_{DL_low} – F_{DL_high}			Duplex Mode
CA_1-5	1	1920 MHz	–	1980 MHz	2110 MHz	–	2170 MHz	FDD
	5	824 MHz	–	849 MHz	869 MHz	–	894 MHz	
CA_1-18	1	1920	–	1980 MHz	2110	–	2170 MHz	FDD
	18	815	–	830 MHz	860	–	875 MHz	
CA_1-19	1	1920 MHz	–	1980 MHz	2110 MHz	–	2170 MHz	FDD
	19	830 MHz	–	845 MHz	875 MHz	–	890 MHz	
CA_1-21	1	1920 MHz	–	1980 MHz	2110 MHz	–	2170 MHz	FDD
	21	1447.9 MHz	–	1462.9 MHz	1495.9 MHz	–	1510.9 MHz	
CA_2-17	2	1850 MHz	–	1910 MHz	1930 MHz	–	1990 MHz	FDD
	17	704 MHz	–	716 MHz	734 MHz	–	746 MHz	
CA_3-5	3	1710 MHz	–	1785 MHz	1805 MHz	–	1880 MHz	FDD
	5	824 MHz	–	849 MHz	869 MHz	–	894 MHz	
CA_3-7	3	1710 MHz	–	1785 MHz	1805 MHz	–	1880 MHz	FDD
	7	2500 MHz	–	2570 MHz	2620 MHz	–	2690 MHz	
CA_3-20	3	1710 MHz	–	1785 MHz	1805 MHz	–	1880 MHz	FDD
	20	832 MHz	–	862 MHz	791 MHz	–	821 MHz	
CA_4-12	4	1710 MHz	–	1755 MHz	2110 MHz	–	2155 MHz	FDD
	12	699 MHz	–	716 MHz	629 MHz	–	746 MHz	
CA_4-13	4	1710 MHz	–	1755 MHz	2110 MHz	–	2155 MHz	FDD
	13	777 MHz	–	787 MHz	746 MHz	–	756 MHz	
CA_4-17	4	1710 MHz	–	1755 MHz	2110 MHz	–	2155 MHz	FDD
	17	704 MHz	–	716 MHz	734 MHz	–	746 MHz	
CA_7-20	7	2500 MHz	–	2570 MHz	2620 MHz	–	2690 MHz	FDD
	20	832 MHz	–	862 MHz	791 MHz	–	821 MHz	

5.6A.1 Channel bandwidths per operating band for CA

The requirements for carrier aggregation in this specification are defined for carrier aggregation configurations with associated bandwidth combination sets. For inter-band carrier aggregation, a *carrier aggregation configuration* is a combination of operating bands, each supporting a carrier aggregation bandwidth class. For intra-band contiguous carrier aggregation, a carrier aggregation configuration is a single operating band supporting a carrier aggregation bandwidth class.

For each carrier aggregation configuration, requirements are specified for all bandwidth combinations contained in a *bandwidth combination set*, which is indicated per supported band combination in the UE radio access capability. A UE can indicate support of several bandwidth combination sets per band combination. Furthermore, if the UE indicates support of a bandwidth combination set that is a superset of another applicable bandwidth combination set, the latter is supported by the UE even if not indicated.

Requirements for intra-band contiguous carrier aggregation are defined for the carrier aggregation configurations and bandwidth combination sets specified in Table 5.6A.1-1. Requirements for inter-band carrier aggregation are defined for the carrier aggregation configurations and bandwidth combination sets specified in Table 5.6A.1-2.

The DL component carrier combinations for a given CA configuration shall be symmetrical in relation to channel centre unless stated otherwise in Table 5.6A.1-1 or 5.6A.1-2.

Table 5.6A.1-1: E-UTRA CA configurations and bandwidth combination sets defined for intra-band contiguous CA

CA Configuration / N_{RB_agg}							
CA Configuration	**E-UTRA Band**	**50RB+100RB (10 MHz + 20 MHz)**	**75RB+75RB (15 MHz + 15 MHz)**	**75RB+100RB (15MHz + 20 MHz)**	**100RB+100RB (20 MHz + 20 MHz)**	**Maximum aggregated bandwidth [MHz]**	**Bandwidth Combination Set**
CA_1C	1		Yes		Yes	40	0
CA_7C	7		Yes		Yes		
CA_38C	38		Yes		Yes		
CA_40C	40	Yes	Yes		Yes	40	0
CA_41C	41	Yes	Yes	Yes	Yes	40	0
NOTE 1: The CA Configuration refers to an operating band and a CA bandwidth class specified in Table 5.6A-1 (the indexing letter). Absence of a CA bandwidth class for an operating band implies support of all classes.							
NOTE 2: For the supported CC bandwidth combinations, the CC downlink and uplink bandwidths are equal							

Table 5.6A.1-2: E-UTRA CA configurations and bandwidth combination sets defined for inter-band CA

CA operating / Channel bandwidth									
CA Configuration	**E-UTRA Bands**	**1.4 MHz**	**3 MHz**	**5 MHz**	**10 MHz**	**15 MHz**	**20 MHz**	**Maximum aggregated bandwidth [MHz]**	**Bandwidth combination set**
CA_1A-5A	1				Yes			20	0
	5				Yes				
CA_1A-18A	1			Yes	Yes	Yes	Yes		
	18			Yes	Yes	Yes			
CA_1A-19A	1			Yes	Yes	Yes	Yes	35	0
	19			Yes	Yes	Yes			
CA_1A-21A	1			Yes	Yes	Yes	Yes		
	21			Yes	Yes	Yes			
CA_2A-17A	2			Yes	Yes				
	17			Yes	Yes				
CA_3A-5A	3				Yes	Yes	Yes	30	0
	5			Yes	Yes				
	3				Yes			20	1
	5			Yes	Yes				
CA_3A-7A	3			Yes	Yes	Yes	Yes		
	7				Yes	Yes	Yes		
CA_3A-20A	3			Yes	Yes	Yes	Yes		
	20			Yes	Yes				
CA_4A-12A	4	Yes	Yes	Yes	Yes				
	12			Yes	Yes				
CA_4A-13A	4			Yes	Yes	Yes	Yes		
	13				Yes				
CA_4A-17A	4			Yes	Yes			20	0
	17			Yes	Yes				
CA_7A-20A	7				Yes	Yes	Yes		
	20			Yes	Yes				

NOTE 1: The CA Configuration refers to a combination of an operating band and a CA bandwidth class specified in Table 5.6A-1 (the indexing letter). Absence of a CA bandwidth class for an operating band implies support of all classes.
NOTE 2: For each band combination, all combinations of indicated bandwidths belong to the set
NOTE 3: For the supported CC bandwidth combinations, the CC downlink and uplink bandwidths are equal

5.7.3 Carrier frequency and EARFCN

The carrier frequency in the uplink and downlink is designated by the E-UTRA Absolute Radio Frequency Channel Number (EARFCN) in the range 0 - 65535. The relation between EARFCN and the carrier frequency in MHz for the downlink is given by the following equation, where F_{DL_low} and $N_{Offs\text{-}DL}$ are given in Table 5.7.3-1 and N_{DL} is the downlink EARFCN.

$$F_{DL} = F_{DL_low} + 0.1(N_{DL} - N_{Offs\text{-}DL})$$

The relation between EARFCN and the carrier frequency in MHz for the uplink is given by the following equation where F_{UL_low} and $N_{Offs\text{-}UL}$ are given in Table 5.7.3-1 and N_{UL} is the uplink EARFCN.

$$F_{UL} = F_{UL_low} + 0.1(N_{UL} - N_{Offs\text{-}UL})$$

Table 5.7.3-1: E-UTRA channel numbers

E-UTRA Operating Band	Downlink			Uplink		
	F_{DL_low} (MHz)	$N_{Offs-DL}$	Range of N_{DL}	F_{UL_low} (MHz)	$N_{Offs-UL}$	Range of N_{UL}
1	2110	0	0 – 599	1920	18000	18000 – 18599
2	1930	600	600 – 1199	1850	18600	18600 – 19199
3	1805	1200	1200 – 1949	1710	19200	19200 – 19949
4	2110	1950	1950 – 2399	1710	19950	19950 – 20399
5	869	2400	2400 – 2649	824	20400	20400 – 20649
6	875	2650	2650 – 2749	830	20650	20650 – 20749
7	2620	2750	2750 – 3449	2500	20750	20750 – 21449
8	925	3450	3450 – 3799	880	21450	21450 – 21799
9	1844.9	3800	3800 – 4149	1749.9	21800	21800 – 22149
10	2110	4150	4150 – 4749	1710	22150	22150 – 22749
11	1475.9	4750	4750 – 4949	1427.9	22750	22750 – 22949
12	729	5010	5010 - 5179	699	23010	23010 - 23179
13	746	5180	5180 – 5279	777	23180	23180 – 23279
14	758	5280	5280 – 5379	788	23280	23280 – 23379
…						
17	734	5730	5730 – 5849	704	23730	23730 - 23849
18	860	5850	5850 – 5999	815	23850	23850 – 23999
19	875	6000	6000 – 6149	830	24000	24000 – 24149
20	791	6150	6150 – 6449	832	24150	24150 – 24449
21	1495.9	6450	6450 – 6599	1447.9	24450	24450 – 24599
22	3510	6600	6600 – 7399	3410	24600	24600 – 25399
23	2180	7500	7500 – 7699	2000	25500	25500 – 25699
24	1525	7700	7700 - 8039	1626.5	25700	25700 – 26039
25	1930	8040	8040 - 8689	1850	26040	26040 - 26689
26	859	8690	8690 - 9039	814	26690	26690 - 27039
27	852	9040	9040 – 9209	807	27040	27040 – 27209
28[2]	758	9210	9210 – 9659	703	27210	27210 – 27659
…						
33	1900	36000	36000 – 36199	1900	36000	36000 – 36199
34	2010	36200	36200 – 36349	2010	36200	36200 – 36349
35	1850	36350	36350 – 36949	1850	36350	36350 – 36949
36	1930	36950	36950 – 37549	1930	36950	36950 – 37549
37	1910	37550	37550 – 37749	1910	37550	37550 – 37749
38	2570	37750	37750 – 38249	2570	37750	37750 – 38249
39	1880	38250	38250 – 38649	1880	38250	38250 – 38649
40	2300	38650	38650 – 39649	2300	38650	38650 – 39649
41	2496	39650	39650 –41589	2496	39650	39650 –41589
42	3400	41590	41590 – 43589	3400	41590	41590 – 43589
43	3600	43590	43590 – 45589	3600	43590	43590 – 45589
44	703	45590	45590 – 46589	703	45590	45590 – 46589

NOTE: The channel numbers that designate carrier frequencies so close to the operating band edges that the carrier extends beyond the operating band edge shall not be used. This implies that the first 7, 15, 25, 50, 75 and 100 channel numbers at the lower operating band edge and the last 6, 14, 24, 49, 74 and 99 channel numbers at the upper operating band edge shall not be used for channel bandwidths of 1.4, 3, 5, 10, 15 and 20 MHz respectively.

6.2.5A Configured transmitted power for CA

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:

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

For intra-band contiguous carrier aggregation:

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

For inter-band carrier aggregation:

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

- $P_{CMAX_H,c} = MIN \{P_{EMAX,c}, P_{PowerClass}\}$

- $P_{EMAX,c}$ is the value given by IE *P-Max* for serving cell *c* in [7].

- $P_{PowerClass}$ is the maximum UE power specified in Table 6.2.2-1 without taking into account the tolerance specified in the Table 6.2.2-1.

- $\Delta T_{IB,c}$ is the additional tolerance for serving cell *c* as specified in Table 6.2.5A-3.

For inter-band carrier aggregateion, MPR_c and $A\text{-}MPR_c$ apply per serving cell *c* and are specified in subclause 6.2.3 and subclause 6.2.4, respectively. For intra-band contiguous carrier aggregation, MPR_c = MPR and $A\text{-}MPR_c$ = A-MPR with MPR and A-MPR specified in subclause 6.2.3A and subclause 6.2.4A respectively.

- $P\text{-}MPR_c$ 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 $P\text{-}MPR_c$ = P-MPR.

- $\Delta T_{C,c}$ = 1.5 dB when Note 2 in Table 6.2.2-1 applies to the serving cell *c*.

- $\Delta T_{C,c}$ = 0 dB when Note 2 in Table 6.2.2-1 does not apply to the serving cell *c*.

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

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

where

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

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

For intra-band contiguous carrier aggregation, Pcmax,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, Pcmax,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:

$$P_{CMAX_L} - T(P_{CMAX_L}) \leq P_{UMAX} \leq P_{CMAX_H} + T(P_{CMAX_H})$$

$T(P_{CMAX})$ is defined by the table below and applies to P_{CMAX_L} and P_{CMAX_H} separately.

Table 6.2.5A-1: P_{CMAX} tolerance

P_{CMAX} (dBm)	Tolerance $T(P_{CMAX})$ (dB)
$21 \le P_{CMAX} \le 23$	2.0
$20 \le P_{CMAX} < 21$	2.5
$19 \le P_{CMAX} < 20$	3.5
$18 \le P_{CMAX} < 19$	4.0
$13 \le P_{CMAX} < 18$	5.0
$8 \le P_{CMAX} < 13$	6.0
$-40 \le P_{CMAX} < 8$	7.0

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,

- $P_{CMAX_L_CA} = MIN\{10 \log_{10} \sum p_{EMAX,c} - \Delta T_C , P_{PowerClass} - MAX(MPR + A\text{-}MPR, P\text{-}MPR) - \Delta T_C\}$

- $P_{CMAX_H_CA} = MIN\{10 \log_{10} \sum p_{EMAX,c} , P_{PowerClass}\}$

where

- $p_{EMAX,c}$ is the linear value of $P_{EMAX,c}$ which is given by IE *P-Max* for serving cell *c* in [7].

- $P_{PowerClass}$ is the maximum UE power specified in Table 6.2.2A-1 without taking into account the tolerance specified in the Table 6.2.2A-1.

- MPR and A-MPR specified in subclause 6.2.3A and subclause 6.2.4A respectively.

- 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 dB when Note 2 in Table 6.2.2A-1 applies to the serving cell *c*. $\Delta T_{C,c}$ = 0 dB when Note 2 in Table 6.2.2A-1 does not apply to the serving cell *c*.

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

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

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

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

where

- $p_{EMAX,c}$ is the linear value of $P_{EMAX,c}$ which is given by IE *P-Max* for serving cell *c* in [7].

- $P_{PowerClass}$ is the maximum UE power specified in Table 6.2.2A-1 without taking into account the tolerance specified in the Table 6.2.2A-1. $p_{PowerClass}$ is the linear value of $P_{PowerClass}$.

- MPR_c and $A\text{-}MPR_c$ apply per serving cell *c* and are specified in subclause 6.2.3 and subclause 6.2.4, respectively. mpr_c is the linear value of MPR_c. $a\text{-}mpr_c$ is the linear value of $A\text{-}MPR_c$.

- $P\text{-}MPR_c$ accounts for power management for serving cell *c*. $pmpr_c$ is the linear value of $P\text{-}MPR_c$.

- $\Delta t_{C,c}$ = 1.41 when Note 2 in Table 6.2.2-1 applies for a serving cell *c*

- $\Delta t_{C,c}$ = 1 when Note 2 in Table 6.2.2-1 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 inter-band relaxation is allowed.

The measured maximum output power P_{UMAX} over all serving cells shall be within the following range:

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

$P_{UMAX} = 10 \log_{10} \sum p_{UMAX,c}$

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.

Table 6.2.5A-2: P_{CMAX} tolerance

P_{CMAX} (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)
$21 \leq P_{CMAX} \leq 23$	2.0	2.0
$20 \leq P_{CMAX} < 21$	[2.5]	TBD
$19 \leq P_{CMAX} < 20$	[3.5]	TBD
$18 \leq P_{CMAX} < 19$	[4.0]	TBD
$13 \leq P_{CMAX} < 18$	[5.0]	TBD
$8 \leq P_{CMAX} < 13$	[6.0]	TBD
$-40 \leq P_{CMAX} < 8$	[7.0]	TBD

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-3.

Table 6.2.5A-3: $\Delta T_{IB,c}$

Inter-band CA Configuration	E-UTRA Band	$\Delta T_{IB,c}$ [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_3A-5A	3	0.3
	5	0.3
CA_3A-7A	3	0.5
	7	0.5
CA_3A-20A	3	0.3
	20	0.3
CA_4A-12A	4	0.3
	12	0.8
CA_4A-13A	4	0.3
	13	0.3
CA_4A-17A	4	0.3
	17	0.8
CA_7A-20A	7	0.3
	20	0.3

NOTE: The $\Delta T_{IB,c}$ above have been derived for a UE supporting a single interband LTE CA band combination. For a UE supporting additional interband LTE CA band combinations, the $\Delta T_{IB,c}$ for all bands supported by the UE, need to be studied.

NOTE: 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.

6.6.3.2 Spurious emission band UE co-existence

This clause specifies the requirements for the specified E-UTRA band, for coexistence with protected bands

NOTE: For measurement conditions at the edge of each frequency range, the lowest frequency of the measurement position in each frequency range should be set at the lowest boundary of the frequency range plus MBW/2. The highest frequency of the measurement position in each frequency range should be set at the highest boundary of the frequency range minus MBW/2. MBW denotes the measurement bandwidth defined for the protected band.

Table 6.6.3.2-1: Requirements

E-UTRA Band	Spurious emission						
	Protected band	Frequency range (MHz)			Maximum Level (dBm)	MBW (MHz)	Note
1	E-UTRA Band 1, 7, 8, 11, 18, 19, 20, 21, 22, 26, 27, 28, 38, 40, 42, 43, 44	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 3, 9, 34	F_{DL_low}	-	F_{DL_high}	-50	1	15
	E-UTRA band 33	F_{DL_low}	-	F_{DL_high}	-50	1	3
	E-UTRA band 39	F_{DL_low}	-	F_{DL_high}	-50	1	3
	Frequency range	1884.5	-	1915.7	-41	0.3	6, 8, 15
2	E-UTRA Band 4, 5, 10, 12, 13, 14, 17, 22, 23, 24, 26, 27, 28, 41, 42	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 2, 25	F_{DL_low}	-	F_{DL_high}	-50	1	15
	E-UTRA Band 43	F_{DL_low}	-	F_{DL_high}	-50	1	2
3	E-UTRA Band 1, 7, 8, 20, 27, 28, 33, 34, 38, 43, 44	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 3	F_{DL_low}	-	F_{DL_high}	-50	1	15
	E-UTRA Band 11, 18, 19, 21	F_{DL_low}	-	F_{DL_high}	-50	1	13
	E-UTRA Band 22, 42	F_{DL_low}	-	F_{DL_high}	-50	1	2
	Frequency range	1884.5	-	1915.7	-41	0.3	13
4	E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17, 22, 23, 24, 25, 26, 27, 28, 41, 43	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 42	F_{DL_low}	-	F_{DL_high}	-50	1	2
5	E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17, 22, 23, 24, 25, 28, 42, 43	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 41	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 26	859	-	869	-27	1	
	E-UTRA Band 27	852	-	869	-10	1	17
6	E-UTRA Band 1, 9, 11, 34	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	860	-	875	-37	1	
	Frequency range	875	-	895	-50	1	
		1884.5	-	1919.6	-41	0.3	7
	Frequency range	1884.5	-	1915.7			8
7	E-UTRA Band 1, 3, 7, 8, 20, 22, 27, 28,33, 34, 42, 43	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	2570	-	2575	+1.6	5	15, 21
	Frequency range	2575	-	2595	-15.5	5	15, 21
	Frequency range	2595	-	2620	-40	1	15, 21
8	E-UTRA Band 1, 20, 28, 33, 34, 38, 39, 40	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA band 3	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA band 7	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 8	F_{DL_low}	-	F_{DL_high}	-50	1	15
	E-UTRA Band 22, 42, 43	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 11, 21	F_{DL_low}	-	F_{DL_high}	-50	1	23
	Frequency range	860	-	890	-40	1	15, 23
	Frequency range	1884.5	-	1915.7	-41	0.3	8, 23
9	E-UTRA Band 1, 9, 11, 18, 19, 21, 26, 28, 34	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	1884.5	-	1915.7	-41	0.3	8
	Frequency range	945	-	960	-50	1	
10	E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17, 23, 24, 25, 26, 27, 28, 41, 43	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 22, 42	F_{DL_low}	-	F_{DL_high}	-50	1	2
11	E-UTRA Band 1, 9, 11, 18, 19, 21, 28, 34	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	1884.5	-	1915.7	-41	0.3	8
	Frequency range	945	-	960	-50	1	
12	E-UTRA Band 2, 5, 13, 14, 17, 23, 24, 25, 26, 27, 41	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 4, 10	F_{DL_low}	-	F_{DL_high}	-50	1	2

	E-UTRA Band 12	F_{DL_low}	-	F_{DL_high}	-50	1	15
13	E-UTRA Band 2, 4, 5, 10, 12, 13, 17, 23, 25, 26, 27, 41	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	769	-	775	-35	0.00625	15
	Frequency range	799	-	805	-35	0.00625	11, 15
	E-UTRA Band 14	F_{DL_low}	-	F_{DL_high}	-50	1	15
	E-UTRA Band 24	F_{DL_low}	-	F_{DL_high}	-50	1	2
14	E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17, 23, 24, 25, 26, 27, 41	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	769	-	775	-35	0.00625	12, 15
	Frequency range	799	-	805	-35	0.00625	11, 12, 15
17	E-UTRA Band 2, 5, 13, 14, 17, 23, 24, 25, 26, 27, 41	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 4, 10	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 12	F_{DL_low}	-	F_{DL_high}	-50	1	15
18	E-UTRA Band 1, 9, 11, 21, 34	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	860	-	890	-40	1	
	Frequency range	1884.5	-	1915.7	-41	0.3	8
	Frequency range	758	-	799	-50	1	
	Frequency range	799	-	803	-40	1	15
	Frequency range	945	-	960	-50	1	
19	E-UTRA Band 1, 9, 11, 21, 28, 34	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	860	-	890	-40	1	9, 15
	Frequency range	1884.5	-	1915.7	-41	0.3	8
	Frequency range	945	-	960	-50	1	
20	E-UTRA Band 1, 3, 7, 8, 20, 22, 33, 34, 43	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 20	F_{DL_low}	-	F_{DL_high}	-50	1	15
	E-UTRA Band 38, 42	F_{DL_low}	-	F_{DL_high}	-50	1	2
21	E-UTRA Band 11	F_{DL_low}	-	F_{DL_high}	-35	1	10, 15
	E-UTRA Band 1, 9, 18, 19, 28, 34	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 21	F_{DL_low}	-	F_{DL_high}	-50	1	10
	Frequency range	1884.5	-	1915.7	-41	0.3	8
	Frequency range	945	-	960	-50	1	
22	E-UTRA Band 1, 3, 7, 8, 20, 26, 27, 28, 33, 34, 38, 39, 40, 43	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	3510	-	3525	-40	1	15
	Frequency range	3525	-	3590	-50	1	
23	E-UTRA Band 4, 5, 10, 12, 13, 14, 17, 23, 24, 26, 27, 41	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 2	F_{DL_low}	-	F_{DL_high}	-50	1	14, 15
	Frequency range	1998	-	1999	-21	1	14, 15
	Frequency range	1997	-	1998	-27	1	14, 15
	Frequency range	1996	-	1997	-32	1	14, 15
	Frequency range	1995	-	1996	-37	1	14, 15
24	E-UTRA Band 2, 4, 5, 10, 12, 13, 14, 17, 23, 24, 25, 26, 41	F_{DL_low}	-	F_{DL_high}	-50	1	
25	E-UTRA Band 4, 5, 10,12, 13, 14, 17, 22, 23, 24, 26, 27, 28, 41, 42	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 2	F_{DL_low}	-	F_{DL_high}	-50	1	15
	E-UTRA Band 25	F_{DL_low}	-	F_{DL_high}	-50	1	15
	E-UTRA Band 43	F_{DL_low}	-	F_{DL_high}	-50	1	2
26	E-UTRA Band 1, 2, 4, 5, 9, 10, 11, 12, 13, 14, 17, 18,19, 21, 22, 23, 24, 25, 26,34, 40, 42, 43	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 41	F_{DL_low}	-	F_{DL_high}	-50	1	2
	Frequency range	1884.5	-	1915.7	-41	0.3	8
	Frequency range	703	-	799	-50	1	
		799	-	803	-40	1	15
	Frequency range	851	-	859	-53	0.00625	20
	E-UTRA Band 27	F_{DL_low}	-	859	-32	1	18
	Frequency range	945	-	960	-50	1	
27	E-UTRA Band 1, 2, 3, 4, 5, 7, 10, 12, 13,	F_{DL_low}	-	F_{DL_high}	-50	1	

	14, 17, 22, 23, 25, 26, 27, 41, 42, 43						
	Frequency range	799	-	805	-35	0.00625	
		790	-	F_{DL_high}	-32	1	16
	E-UTRA Band 28	F_{DL_low}	-	790	-50	1	
28	E-UTRA Band 2, 3, 5, 7, 8, 9, 18, 19, 25, 26, 27, 34, 38, 41	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 1, 4, 10, 22, 42, 43	F_{DL_low}	-	F_{DL_high}	-50	1	2
	E-UTRA Band 11, 21	F_{DL_low}	-	F_{DL_high}	-50	1	19, 24
	E-UTRA Band 1	F_{DL_low}	-	F_{DL_high}	-50	1	19, 25
	Frequency range	758	-	773	-32	1	15
	Frequency range	773	-	803	-50	1	
	Frequency range	662	-	694	-26.2	6	15
	Frequency range	1884.5	-	1915.7	-41	0.3	8, 19
…							
33	E-UTRA Band 1, 7, 8, 20, 22, 34, 38, 39, 40, 42, 43	F_{DL_low}	-	F_{DL_high}	-50	1	5
	E-UTRA Band 3	F_{DL_low}	-	F_{DL_high}	-50	1	15
34	E-UTRA Band 1, 3, 7, 8, 9, 11, 18, 19, 20, 21, 22, 26, 28, 33, 38,39, 40, 42, 43, 44	F_{DL_low}	-	F_{DL_high}	-50	1	5
	Frequency range	1884.5	-	1915.7	-41	0.3	8
35							
36							
37			-				
38	E-UTRA Band 1,3, 8, 20, 22, 28, 33, 34, 42, 43, 44	F_{DL_low}	-	F_{DL_high}	-50	1	
	Frequency range	2620	-	2645	-15.5	5	15, 22
	Frequency range	2645	-	2690	-40	1	15, 22
39	E-UTRA Band 22, 34, 40, 42, 44	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 43	F_{DL_low}	-	F_{DL_high}	-50	1	2
40	E-UTRA Band 1, 3, 22, 26, 27, 33, 34, 39, 42, 43, 44	F_{DL_low}	-	F_{DL_high}	-50	1	
41	E-UTRA Band 2, 4, 5, 10, 12, 13 , 14, 17, 23, 24, 25, 26, 27, 28	F_{DL_low}	-	F_{DL_high}	-50	1	
42	E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 10, 20, 25, 26, 27, 28, 33, 34, 38, 40, 44	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 43	F_{DL_low}	-	F_{DL_high}	-50	1	3
43	E-UTRA Band 1, 2, 3, 4, 5, 7, 8, 10, 20, 25, 26, 27, 28, 33, 34, 38, 40, 44	F_{DL_low}	-	F_{DL_high}	-50	1	
	E-UTRA Band 42	F_{DL_low}	-	F_{DL_high}	-50	1	3
	E-UTRA Band 22	F_{DL_low}	-	F_{DL_high}	[-50]	[1]	3
44	E-UTRA Band 1, 3, 5, 8, 34, 38, 39, 40, 42, 43	F_{DL_low}	-	F_{DL_high}	-50	1	2

NOTE 1: F_{DL_low} and F_{DL_high} refer to each E-UTRA frequency band specified in Table 5.5-1
NOTE 2: As exceptions, measurements with a level up to the applicable requirements defined in Table 6.6.3.1-2 are permitted for each assigned E-UTRA carrier used in the measurement due to 2nd, 3rd, 4th [or 5th] harmonic spurious emissions. An exception is allowed if there is at least one individual RB within the transmission bandwidth (see Figure 5.6-1) for which the 2nd, 3rd or 4th harmonic totally or partially overlaps the measurement bandwidth (MBW).
NOTE 3: To meet these requirements some restriction will be needed for either the operating band or protected band
NOTE 4: N/A
NOTE 5: For non synchronised TDD operation to meet these requirements some restriction will be needed for either the operating band or protected band
NOTE 6: Applicable when NS_05 in section 6.6.3.3.1 is signalled by the network.
NOTE 7: Applicable when co-existence with PHS system operating in 1884.5-1919.6MHz.
NOTE 8: Applicable when co-existence with PHS system operating in 1884.5 -1915.7MHz.
NOTE 9: Applicable when NS_08 in subclause 6.6.3.3.3 is signalled by the network
NOTE 10: Applicable when NS_09 in subclause 6.6.3.3.4 is signalled by the network
NOTE 11: Whether the applicable frequency range should be 793-805MHz instead of 799-805MHz is TBD
NOTE 12: The emissions measurement shall be sufficiently power averaged to ensure a standard deviation < 0.5 dB
NOTE 13: This requirement applies for 5, 10, 15 and 20 MHz E-UTRA channel bandwidth allocated within 1749.9MHz and 1784.9MHz.
NOTE 14: To meet this requirement NS_11 value shall be signalled when operating in 2000-2020 MHz
NOTE 15: These requirements also apply for the frequency ranges that are less than Δf_{OOB} (MHz) in Table 6.6.3.1-1 and Table 6.6.3.1A-1 from the edge of the channel bandwidth.
NOTE 16: Applicable when NS_16 in subclause 6.6.3.3.9 is signalled by the network.
NOTE 17: Band 5 does not need to provide protection for Band 27 beyond the SEM limits
NOTE 18: Applicable when NS_15 in section 6.6.3.3.4 is signalled by the network.
NOTE 19: Applicable when the assigned E-UTRA carrier is confined within 718 MHz and 748 MHz and when the channel bandwidth used is 5 or 10 MHz.
NOTE 20: Applicable when NS_15 in subclause 6.6.3.3.8 is signalled by the network.
NOTE 21: This requirement is applicable for an uplink transmission bandwidth less than or equal to 54 RB for carriers of 15 MHz bandwidth when carrier center frequency is within the range 2560.5 - 2562.5 MHz and for carriers of 20 MHz bandwidth when carrier center frequency is within the range 2552 - 2560 MHz. No other restrictions apply for carriers with bandwidths confined in 2500-2570 MHz.
NOTE 22: This requirement is applicable for an uplink transmission bandwidth less than or equal to 54 RB for carriers of 15 MHz bandwidth when carrier center frequency is within the range 2605.5 - 2607.5 MHz and for carriers of 20 MHz bandwidth when carrier center frequency is within the range 2597 – 2605 MHz. No other restrictions apply for carriers with bandwidths confined in 2570-2615 MHz. For assigned carriers with bandwidths overlapping the frequency range 2615-2620 MHz the requirements apply with the maximum output power configured to +20 dBm in the IE *P-Max*.
NOTE 23 For carriers of 5 MHz channel bandwidth with carrier center frequencies (F_c) in the range 902.5MHz ≤ F_c < 907.5 MHz, the requirement applies for uplink transmission bandwidths less than or equal to 20 RB. No restrictions apply in the range 907.5 MHz ≤ F_c ≤ 912.5 MHz. For carriers of 10 MHz channel bandwidth, the requirement only applies for F_c = 910 MHz and uplink transmission bandwidths less than or equal to 32 RB with RB_{start} > 3.
NOTE 24: As exceptions, measurements with a level up to the applicable requirement of -38 dBm/MHz is permitted for each assigned E-UTRA carrier used in the measurement due to 2nd harmonic spurious emissions. An exception is allowed if there is at least one individual RB within the transmission bandwidth (see Figure 5.6-1) for which the 2nd harmonic totally or partially overlaps the measurement bandwidth (MBW).
NOTE 25: As exceptions, measurements with a level up to the applicable requirement of -36 dBm/MHz is permitted for each assigned E-UTRA carrier used in the measurement due to 3rd harmonic spurious emissions. An exception is allowed if there is at least one individual RB within the transmission bandwidth (see Figure 5.6-1) for which the 3rd harmonic totally or partially overlaps the measurement bandwidth (MBW).

7.3.1A Minimum requirements (QPSK) for CA

For inter-band carrier aggregation with uplink assigned to one E-UTRA band the throughput shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2, A.2.3 and A.3.2 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in Annex A.5.1.1/A.5.2.1) with parameters specified in Table 7.3.1-1 and Table 7.3.1-2. The reference sensitivity is defined to be met with both downlink component carriers active and either of the uplink carriers active. The UE shall meet the requirements specified in subclause 7.3.1 with the following exceptions for the UE that supports any of the E-UTRA CA configurations given in Table 7.3.1A-0 when the uplink active in the lower-frequency operating band within a specified

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frequency range (as noted in Table Table 7.3.1A-0b). For these exceptions, the UE shall meet the requirements specified in Table 7.3.1A-0a, Table 7.3.1A-0a and Table 7.3.1A-0c.

Table 7.3.1A-0a: Reference sensitivity for carrier aggregation QPSK $P_{REFSENS, CA}$

Channel bandwidth								
EUTRA CA Configuration	EUTRA band	1.4 MHz (dBm)	3 MHz (dBm)	5 MHz (dBm)	10 MHz (dBm)	15 MHz (dBm)	20 MHz (dBm)	Duplex mode
CA_4A-12A	4	TBD	TBD	[-90]	[-89.5]			FDD
	12			-97	-94			
CA_4A-17A	4			[-90]	[-89.5]			FDD
	17			-97	-94			

NOTE 1: The transmitter shall be set to P_{UMAX} as defined in subclause 6.2.5
NOTE 2: Reference measurement channel is A.3.2 with one sided dynamic OCNG Pattern OP.1 FDD/TDD as described in Annex A.5.1.1/A.5.2.1
NOTE 3: The signal power is specified per port

Table 7.3.1A-0b: Uplink configuration for the low band

E-UTRA Band / Channel bandwidth of the high band / NRB / Duplex mode								
EUTRA CA Configuration	UL band	1.4 MHz (dBm)	3 MHz (dBm)	5 MHz (dBm)	10 MHz (dBm)	15 MHz (dBm)	20 MHz (dBm)	Duplex mode
CA_4A-12A	12	2[3]	5[3]	8[3]	16[3]			FDD
CA_4A-17A	17			8[3]	16[3]			FDD

NOTE 1: refers to the UL resource blocks, which shall be centred within the transmission bandwidth configuration for the channel bandwidth
NOTE 2: the UL configuration applies regardless of the channel bandwidth of the low band unless the UL resource blocks exceed that specified in Table 7.3.1-2 for the uplink bandwidth in which case the allocation according to Table 7.3.1-2 applies
NOTE 3: the UL EARFCN of the low band (superscript LB) should be such that $f_{UL}^{LB} = \lfloor f_{DL}^{HB} / 0.3 \rfloor 0.1$ and $F_{DL_low}^{LB} + BW_{Channel}^{LB}/2 < f_{UL}^{LB} < F_{DL_high}^{LB} - BW_{Channel}^{LB}/2$ with f_{DL}^{HB} the DL EARFCN of the high band and $BW_{Channel}^{LB}$ the channel bandwidth configured in the low band.

Unless given by Table 7.3.1A-0c, the minimum requirements specified in Tables 7.3.1A-0a and 7.3.1A-0b shall be verified with the network signalling value NS_01 (Table 6.2.4-1) configured.

Table 7.3.1A-0c: Network signalling value for reference sensitivity

E-UTRA CA Configuration	Uplink Band	Network Signalling value
CA_4A-12A	12	NS_06
CA_4A-17A	17	NS_06

For intra-band contiguous carrier aggregation the throughput of each component carrier shall be ≥ 95% of the maximum throughput of the reference measurement channels as specified in Annexes A.2.2, A.2.3 and A.3.2 (with one sided dynamic OCNG Pattern OP.1 FDD/TDD for the DL-signal as described in Annex A.5.1.1/A.5.2.1) with parameters specified in Table 7.3.1-1 and Table 7.3.1A-1. Table 7.3.1A-1 specifies the maximum number of allocated uplink

resource blocks for which the intra-band contiguous carrier aggregation reference sensitivity requirement shall be met. The PCC and SCC allocations follow Table 7.3.1-2 and form a contiguous allocation where TX–RX frequency separations are as defined in Table 5.7.4-1. For UE(s) supporting one uplink carrier, the uplink configuration of the PCC shall be

Table 7.3.1A-1: Intra-band CA uplink configuration for reference sensitivity

CA configuration / CC combination / N_{RB_agg} / Duplex mode									
CA configuration	100RB+50RB		75RB+75RB		100RB+75RB		100RB+100RB		Duplex Mode
	PCC	SCC	PCC	SCC	PCC	SCC	PCC	SCC	
CA_1C	n/a	n/a	75	55	n/a	n/a	100	30	FDD
CA_7C	n/a	n/a	75	0	n/a	n/a	75	0	FDD
CA_38C			PCC	SCC			PCC	SCC	TDD
			75	75			100	100	
CA_40C	100	50	75	75	n/a	n/a	100	100	TDD
CA_41C	100	50	75	75	100	75	100	100	TDD

NOTE 1: The carrier centre frequency of SCC in the UL operating band is configured closer to the DL operating band.
NOTE 2: The transmitted power over both PCC and SCC shall be set to P_{UMAX} as defined in subclause 6.2.5.
NOTE 3: The UL resource blocks in both PCC and SCC shall be confined within the transmission bandwidth configuration for the channel bandwidth (Table 5.6-1).
NOTE 4. The UL resource blocks in PCC shall be located as close as possible to the downlink operating band, while the UL resource blocks in SCC shall be located as far as possible from the downlink operating band.

7.5.1A Minimum requirements for CA

For inter-band carrier aggregation with uplink assigned to one E-UTRA band, the adjacent channel requirements are defined with the uplink active on the band other than the band whose downlink is being tested. The UE shall meet the requirements specified in subclause 7.5.1 for each component carrier while both downlink carriers are active.7.6.1.1A Minimum requirements for CA

For inter-band carrier aggregation with uplink assigned to one E-UTRA band the in-band blocking requirements are defined with the uplink active on the band other than the band whose downlink is being tested. The UE shall meet the requirements specified in subclause 7.6.1.1 for each component carrier while both downlink carriers are active. For the UE which supports inter band CA configuration in Table 7.3.1A-2, $P_{Interferer}$ power defined in Table 7.6.1.1-2 is increased by the amount given by $\Delta R_{IB,c}$ in Table 7.3.1A-2.

7.6.3.1A Minimum requirements for CA

For inter-band carrier aggregation with uplink assigned to one E-UTRA band the narrow-band blocking requirements are defined with the uplink active on the band other than the band whose downlink is being tested. The UE shall meet the requirements specified in subclause 7.6.3.1 for each component carrier while both downlink carriers are active.7.7.1A Minimum requirements for CA

For inter-band carrier aggregation with uplink assigned to one E-UTRA band the spurious response requirements are defined with the uplink active on the band other than the band whose downlink is being tested. The UE shall meet the requirements specified in subclause 7.7.1 for each component carrier while both downlink carriers are active. 7.8.1AMinimum requirements for CA

For inter-band carrier aggregation with uplink assigned to one E-UTRA band the wide band intermodulation requirements are defined with the uplink active on the band other than the band whose downlink is being tested. The UE shall meet the requirements specified in subclause 7.8.1.1 for each component carrier while both downlink carriers are active.