

LTE Downlink Carrier Aggregation configuration

1. DL Inter Band(2CC)

E-UTRA CA configuration	Bandwidth Combination Set	E-UTRA Band	Bandwidth						Max Aggregated BW
			1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
2A-4A	(0)	Band 2	Yes	Yes	Yes	Yes	Yes	Yes	40
		Band 4	Yes	Yes	Yes	Yes	Yes	Yes	40
	(1)	Band 2			Yes	Yes			20
2A-5A	(0)	Band 2			Yes	Yes	Yes	Yes	40
		Band 4			Yes	Yes	Yes	Yes	40
	(1)	Band 2			Yes	Yes			20
2A-13A	(0)	Band 2			Yes	Yes	Yes	Yes	30
		Band 13			Yes	Yes			30
	(1)	Band 2			Yes	Yes			20
2A-48A	(0)	Band 2			Yes	Yes	Yes	Yes	40
		Band 48			Yes	Yes	Yes	Yes	40
	(1)	Band 2			Yes	Yes			20
2A-66A	(0)	Band 2	Yes	Yes	Yes	Yes	Yes	Yes	40
		Band 66			Yes	Yes			20
	(1)	Band 2			Yes	Yes	Yes	Yes	40
4A-5A	(0)	Band 4			Yes	Yes			20
		Band 5			Yes	Yes			20
	(1)	Band 4			Yes	Yes	Yes	Yes	30
4A-13A	(0)	Band 4			Yes	Yes	Yes	Yes	30
		Band 13			Yes	Yes			30
	(1)	Band 4			Yes	Yes			20
4A-48A	(0)	Band 4			Yes	Yes	Yes	Yes	40
		Band 48			Yes	Yes	Yes	Yes	40
5A-48A	(0)	Band 5			Yes	Yes	Yes	Yes	30
		Band 48			Yes	Yes	Yes	Yes	30
5A-66A	(0)	Band 5			Yes	Yes			30
		Band 48			Yes	Yes	Yes	Yes	30
13A-48A	(0)	Band 13			Yes	Yes	Yes	Yes	30
		Band 48			Yes	Yes	Yes	Yes	30
13A-66A	(0)	Band 13			Yes	Yes			30
		Band 66			Yes	Yes	Yes	Yes	30
48A-66A	(0)	Band 48			Yes	Yes	Yes	Yes	40
		Band 66			Yes	Yes	Yes	Yes	40

2. DL Inter Band(3CC)

E-UTRA CA configuration	Bandwidth Combination Set	E-UTRA Band	Bandwidth						Max Aggregated BW
			1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
2A-2A-4A	(0)	Band 2	2A-2A BCS 0						60
		Band 4			Yes	Yes	Yes	Yes	
2A-2A-5A	(0)	Band 2	2A-2A BCS 0						50
		Band 5			Yes	Yes	Yes	Yes	
2A-2A-13A	(0)	Band 2	2A-2A BCS 0						50
		Band 13			Yes	Yes	Yes	Yes	
2A-2A-66A	(0)	Band 2	2A-2A BCS 0						60
		Band 66			Yes	Yes	Yes	Yes	
2A-4A-4A	(0)	Band 2	4A-4A BCS 0						60
		Band 4			Yes	Yes	Yes	Yes	
2A-4A-5A	(0)	Band 2			Yes	Yes	Yes	Yes	50
		Band 4			Yes	Yes	Yes	Yes	
		Band 5			Yes	Yes			
2A-4A-13A	(0)	Band 2			Yes	Yes	Yes	Yes	50
		Band 4			Yes	Yes	Yes	Yes	
		Band 13			Yes	Yes			
2A-5A-48A	(0)	Band 2	Yes	Yes	Yes	Yes	Yes	Yes	50
		Band 5			Yes	Yes			
		Band 48			Yes	Yes	Yes	Yes	
2A-5A-66A	(0)	Band 2	Yes	Yes	Yes	Yes	Yes	Yes	50
		Band 5			Yes	Yes			
		Band 66			Yes	Yes	Yes	Yes	
2A-5B	(0)	Band 2	5B BCS 0						40
		Band 5			Yes	Yes	Yes	Yes	
2A-13A-48A	(0)	Band 2			Yes	Yes	Yes	Yes	50
		Band 13			Yes	Yes			
		Band 48			Yes	Yes	Yes	Yes	
2A-13A-66A	(0)	Band 2			Yes	Yes	Yes	Yes	50
		Band 13			Yes	Yes			
		Band 66			Yes	Yes	Yes	Yes	
2A-48A-48A	(0)	Band 2	48A-48A BCS0						60
		Band 48			Yes	Yes	Yes	Yes	
2A-48A-66A	(0)	Band 2			Yes	Yes	Yes	Yes	60
		Band 48			Yes	Yes	Yes	Yes	
		Band 66			Yes	Yes	Yes	Yes	
2A-48C	(0)	Band 2	48C BCS 0						60
		Band 48			Yes	Yes	Yes	Yes	
2A-66A-66A	(0)	Band 2	66A-66A BCS 0						60
		Band 66			Yes	Yes	Yes	Yes	
2A-66B	(0)	Band 2	66B BCS 0						60
		Band 66			Yes	Yes	Yes	Yes	
2A-66C	(0)	Band 2	66C BCS 0						60
		Band 66			Yes	Yes	Yes	Yes	
4A-4A-5A	(0)	Band 4	4A-4A BCS 0						50
		Band 5			Yes	Yes			
4A-4A-13A	(0)	Band 4	4A-4A BCS 0						50
		Band 13			Yes	Yes			
4A-5B	(0)	Band 4			Yes	Yes	Yes	Yes	40
		Band 5			Yes	Yes			
4A-48C	(0)	Band 4	48C BCS 0						60
		Band 48			Yes	Yes	Yes	Yes	
5A-5A-66A	(0)	Band 5	5A-5A BCS 0						40
		Band 66			Yes	Yes	Yes	Yes	
5A-48A-66A	(0)	Band 5			Yes	Yes			50
		Band 48			Yes	Yes	Yes	Yes	
		Band 66			Yes	Yes	Yes	Yes	
5A-48C	(0)	Band 5	48C BCS 0						60
		Band 48			Yes	Yes			
5A-66A-66A	(0)	Band 5	66A-66A BCS 0						50
		Band 66			Yes	Yes			
5A-66B	(0)	Band 5	66B BCS 0						30
		Band 66			Yes	Yes			
5A-66C	(0)	Band 5	66C BCS 0						50
		Band 66			Yes	Yes			
5B-66A	(0)	Band 5	5B BCS 0						50
		Band 66			Yes	Yes	Yes	Yes	
13A-48A-66A	(0)	Band 13			Yes	Yes			50
		Band 48			Yes	Yes	Yes	Yes	
		Band 66			Yes	Yes	Yes	Yes	

3. DL Inter Band(4CC)

E-UTRA CA configuration	Bandwidth Combination Set	E-UTRA Band	Bandwidth						Max Aggregated BW
			1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
2A-2A-4A-4A	(0)	Band 2	2A-2A BCS 0						80
		Band 4			Yes	Yes	Yes	Yes	
2A-2A-4A-5A	(0)	Band 2	2A-2A BCS 0						70
		Band 4			Yes	Yes	Yes	Yes	
		Band 5			Yes	Yes			
2A-2A-5B	(0)	Band 2	2A-2A BCS 0						60
		Band 5			5B BCS 0				
2A-2A-5A-66A	(0)	Band 2	2A-2A BCS 0						70
		Band 5			Yes	Yes	Yes	Yes	
		Band 66			Yes	Yes	Yes	Yes	
2A-2A-13A-66A	(0)	Band 2	2A-2A BCS 0						70
		Band 13			Yes	Yes	Yes	Yes	
		Band 66			Yes	Yes	Yes	Yes	
2A-2A-66A-66A	(0)	Band 2	2A-2A BCS 0						80
		Band 66			66A-66A BCS 0				
2A-2A-66B	(0)	Band 2	2A-2A BCS 0						60
		Band 66			66B BCS 0				
2A-2A-66C	(0)	Band 2	2A-2A BCS 0						80
		Band 66			66C BCS 0				
2A-4A-4A-5A	(0)	Band 2			Yes	Yes	Yes	Yes	70
		Band 4			4A-4A BCS 0				
		Band 5			Yes	Yes	Yes	Yes	
2A-4A-5B	(0)	Band 2			Yes	Yes	Yes	Yes	60
		Band 4			Yes	Yes	Yes	Yes	
2A-5A-48C	(0)	Band 2	Yes	Yes	Yes	Yes	Yes	Yes	70
		Band 5			Yes	Yes	Yes	Yes	
		Band 48			48C BCS 0				
2A-5B-66A	(0)	Band 2	2A-5B BCS 0						60
		Band 5			Yes	Yes	Yes	Yes	
2A-5A-66A-66A	(0)	Band 2	2A-5A BCS 0						70
		Band 5			Yes	Yes	Yes	Yes	
		Band 66			Yes	Yes	Yes	Yes	
2A-5A-66B	(0)	Band 2	2A-5A BCS 0						50
		Band 5			Yes	Yes	Yes	Yes	
2A-5A-66C	(0)	Band 2	2A-5A BCS 0						70
		Band 5			Yes	Yes	Yes	Yes	
2A-13A-48C	(0)	Band 2	2A-13A BCS 0						70
		Band 13			Yes	Yes	Yes	Yes	
		Band 48			48C BCS 0				
2A-13A-66A-66A	(0)	Band 2	2A-13A BCS 0						70
		Band 13			Yes	Yes	Yes	Yes	
		Band 66			66A-66A BCS 0				
2A-13A-66B	(0)	Band 2	2A-13A BCS 0						50
		Band 13			Yes	Yes	Yes	Yes	
		Band 66			66B BCS 0				
2A-13A-66C	(0)	Band 2	2A-13A BCS 0						70
		Band 13			Yes	Yes	Yes	Yes	
		Band 66			66C BCS 0				
2A-48A-48C	(0)	Band 2	2A-48A BCS 0						80
		Band 48			48A-48C BCS 0				
2A-48C-66A	(0)	Band 2	2A-48C BCS 0						80
		Band 48			Yes	Yes	Yes	Yes	
2A-48D	(0)	Band 2	2A-48D BCS 0						80
		Band 48			Yes	Yes	Yes	Yes	
4A-4A-5B	(0)	Band 4	4A-4A BCS 0						60
		Band 5			5B BCS 0				
4A-48D	(0)	Band 4	4A-48D BCS 0						80
		Band 48			Yes	Yes	Yes	Yes	
5A-5A-66A-66A	(0)	Band 5	5A-5A BCS 0						60
		Band 66			66A-66A BCS 0				
5A-5A-66B	(0)	Band 5	5A-5A BCS 0						40
		Band 66			Yes	Yes	Yes	Yes	
5A-5A-66C	(0)	Band 5	5A-5A BCS 0						60
		Band 66			66B BCS 0				

LTE Downlink Carrier Aggregation configurations (Continued)

2. DL Inter Band(3CC)

E-UTRA CA configuration	Bandwidth Combination Set	E-UTRA Band	Bandwidth						Max Aggregated BW
			1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
13A-48A-48A	(0)	Band 13			Yes	Yes			50
		Band 48	48A-48A BCS 0						
13A-66A-66A	(0)	Band 13			Yes	Yes			50
		Band 66	66A-66A BCS 0						
13A-66B	(0)	Band 13			Yes	Yes			30
		Band 66	66B BCS 0						
13A-66C	(0)	Band 13			Yes	Yes			50
		Band 66	66C BCS 0						
48A-48A-66A	(0)	Band 48			Yes	Yes	Yes	Yes	60
		Band 66	66A-66A BCS 0						
48A-66A-66A	(0)	Band 48			Yes	Yes	Yes	Yes	60
		Band 66	66A-66A BCS 0						
48A-66B	(0)	Band 48			Yes	Yes	Yes	Yes	40
		Band 66	66B BCS 0						
48A-66C	(0)	Band 48			Yes	Yes	Yes	Yes	40
		Band 66	66C BCS 0						
48C-66A	(0)	Band 48			Yes	Yes	Yes	Yes	60
		Band 66	66A BCS 0						
48C-66A-66A	(0)	Band 48			Yes	Yes	Yes	Yes	80
		Band 66	66A-66A BCS 0						
48C-66B	(0)	Band 48			Yes	Yes	Yes	Yes	60
		Band 66	66B BCS 0						

3. DL Inter Band(4CC)

E-UTRA CA configuration	Bandwidth Combination Set	E-UTRA Band	Bandwidth						Max Aggregated BW
			1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
5A-48C-66A	(0)	Band 5			Yes	Yes			70
		Band 48	48C BCS 0						
		Band 66	Yes	Yes	Yes	Yes	Yes	Yes	
5A-48D	(0)	Band 5			Yes	Yes			70
		Band 48	48D BCS 0						
5B-66A-66A	(0)	Band 5			Yes	Yes			60
		Band 66	66A-66A BCS 0						
5B-66B	(0)	Band 5			Yes	Yes			40
		Band 66	66B BCS 0						
5B-66C	(0)	Band 5			Yes	Yes			60
		Band 66	66C BCS 0						
13A-48A-48C	(0)	Band 5			Yes	Yes			60
		Band 66	48C-48C BCS 0						
13A-48A-66A	(0)	Band 13			Yes	Yes			50
		Band 48			Yes	Yes	Yes	Yes	
		Band 66	66A BCS 0						
13A-48A-66C	(0)	Band 13			Yes	Yes			70
		Band 48			Yes	Yes	Yes	Yes	
		Band 66	66C BCS 0						
13A-48C-66A	(0)	Band 13			Yes	Yes			50
		Band 48			Yes	Yes	Yes	Yes	
		Band 66			Yes	Yes	Yes	Yes	
48A-48A-66C	(0)	Band 66	66C BCS 0						60
48A-48C-66A	(0)	Band 48			Yes	Yes	Yes	Yes	60
		Band 66			Yes	Yes	Yes	Yes	

4. DL Intra Band(non-contiguous)

E-UTRA CA configuration	Bandwidth Combination Set	E-UTRA Band	Allowed Channel BW Per Carrier (MHz)				Max Aggregated BW
			1st Carrier	2nd Carrier	3rd Carrier	4th Carrier	
2A-2A	(0)	Band 2	5, 10, 15, 20	5, 10, 15, 20			40
4A-4A	(0)	Band 4	5, 10, 15, 20	5, 10, 15, 20			40
	(1)	Band 4	5, 10	5, 10			20
5A-5A	(0)	Band 5	5, 10	5, 10			20
	(1)	Band 5	3	5			8
48A-48A	(0)	Band 48	5, 10, 15, 20	5, 10, 15, 20			40
48A-48C	(0)	Band 48	5, 10, 15, 20	48C BCS0			40
	(0)	Band 48	48C BCS0	5, 10, 15, 20			60
48A-48D	(0)	Band 48	5, 10, 15, 20	48D BCS0			40
	(0)	Band 48	48D BCS0	5, 10, 15, 20			80
48C-48C	(0)	Band 48	48C BCS0	48C BCS0			80
66A-66A	(0)	Band 66	5, 10, 15, 20	5, 10, 15, 20			40
66A-66A-66A	(0)	Band 66	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		60
66A-66B	(0)	Band 66	5, 10, 15, 20	66B BCS0			40
	(0)	Band 66	66B BCS0	5, 10, 15, 20			40
66A-66C	(0)	Band 66	5, 10, 15, 20	66C BCS0			40
	(0)	Band 66	66C BCS0	5, 10, 15, 20			60

5. DL Intra Band(contiguous)

E-UTRA CA configuration	Bandwidth Combination Set	E-UTRA Band	Allowed Channel BW Per Carrier (MHz)					Max Aggregated BW
			1st Carrier	2nd Carrier	3rd Carrier	4th Carrier	5th Carrier	
5B	(0)	Band 5	5	20				20
			10	15, 20				
	(1)	Band 5	15	10, 15, 20				8
48C	(0)	Band 48	20	5, 10, 15, 20				40
			5, 10, 15, 20	20				
66B	(0)	Band 66	5	5, 10, 15				20
			10	5, 10				
66C	(0)	Band 66	5	20				40
			10	15, 20				
			15	10, 15, 20				
48D	(0)	Band 48	20	5, 10, 15, 20				60
			5, 10, 15, 20	20	20			
			20	20	5, 10, 15			
48E	(0)	Band 48	5, 10, 15, 20	20	20	20		80
			20	20	20	5, 10, 15, 20		

LTE Downlink Carrier Aggregation configurations (Continued)

E-UTRA CA configuration	Bandwidth Combination Set	E-UTRA Band	Allowed Channel BW Per Carrier (MHz)					Max Aggregated BW
			1st Carrier	2nd Carrier	3rd Carrier	4th Carrier	5th Carrier	
48C	(0)	Band 48	5,10,15,20	20				40
			20	5,10,15				

Note(s):

LTE CA_48C is supported in both Uplink and Downlink, other CA configurations are supported only Downlink.

LTE Uplink Carrier Aggregation Combinations

Maximum Output Power (Tune-up Limit) for LTE UL Carrier Aggregation

UL CA shall be tested based on the worst-case SAR configuration determined from non-CA SAR testing result. The channel BW, channel number, RB Allocation, etc. would be selected to allow contiguous CA of PCC and SCC. Uplink output power for UL CA is the total power measured across the PCC and SCC.

UL CA power measurements were performed with QPSK modulation based on the worst-case standalone SAR. The tune-up limits are provided in table below. The UL CA mode power measurements represent the total power across both carriers. Measurements were made for all supported PCC bandwidths using the channel/RB combination resulting in the highest standalone output power at the least MPR (0 dB). SCCs were set to use configurations similar to the PCC to establish conservative or worst case equivalent SAR test conditions (highest maximum power with MPR of 0 dB).

The standalone power measurement is the power for the PCC in the non-CA mode (i.e. single carrier power). In all cases the UL CA power is less than or equal to the standalone power, which is in accordance with the tune-up limits in table below.

According to November 2017 TCB workshop, Uplink CA SAR Test Guidance as follows;

- a) When the maximum output for UL CA is \leq standalone LTE mode (without CA)
 - PCC is configured according to the highest standalone SAR configuration tested
 - SCC and subsequent CCs are configured according to procedures used for power measurement and parameters (BW, RB etc.) similar to that used for the PCC.
- b) When the Reported SAR for UL CA configuration, described above, is > 1.2 W/kg, UL CA SAR is also required for all required test channels (PCC based).
- c) UL CA SAR is also required for standalone SAR configurations > 1.2 W/kg when they are scaled to the UL CA power level.

SAR measurement is not required for the 16QAM and 64QAM. When the highest maximum output power for 16QAM and 64QAM is ≤ 0.25 dB higher than the QPSK or when the reported SAR for the QPSK configuration is ≤ 1.45 W/kg.

RF Exposure conditions	Pwr back-off	Antenna	E-UTRA CA configuration (BCS)	Bands		DL						UL																			
				PCC	SCC	PCC			SCC			PCC						SCC						MPR	Standalone		PCC + SCC				
				1st	2nd	BW	Freq	ch	BW	Freq	ch	Modulation	RB	Offset	BW	Freq	ch	Modulation	RB	Offset	BW	Freq	ch		LTE Rel.8	Aggregated BW	MPR	Tune-Up Limit	CA power (total PCC+SCC)	Delta	3GPP Rel.
Head & Body Worn	Off	Main 2	CA_48C(0)	48C	48C	20	3646.7	56207	20	3626.9	56009	QPSK	50	0	20	3646.7	56207	QPSK	50	50	20	3626.9	56009	0	19.62	40	0	20.0	19.56	0.06	16
Hotspot	Off	Main 2	CA_48C(0)	48C	48C	20	3646.7	56207	20	3626.9	56009	QPSK	1	0	20	3646.7	56207	QPSK	1	99	20	3626.9	56009	0	19.45	40	0	20.0	19.41	0.04	16

Note:

Standalone output power values are referenced from Sec.9.3 in the SAR Part.1 Test Report.

LTE Downlink Carrier Aggregation Combinations

The DL CA power measurement conditions for various CC's combinations were determined according LTE DL CA SAR Test Exclusion guidance in TCB workshop note (April 2018). Only yellow highlighted cells need power measurement. The following power measurements were performed with a single carrier uplink; CA for this particular project only supports one (1) uplink and up to four (4) downlinks.

LTE Release 10 Carrier Aggregation

Index	2CC	Restriction	Completely Covered by Measurement Superset
2CC#1	2A-2A		3CC#1
2CC#2	2A-4A		3CC#1
2CC#3	2A-5A		3CC#2
2CC#4	2A-13A		3CC#3
2CC#5	2A-48A	48A SCC only	3CC#8
2CC#6	2A-66A		3CC#4
2CC#7	4A-4A		3CC#5
2CC#8	4A-5A		3CC#6
2CC#9	4A-13A		3CC#7
2CC#10	4A-48A	48A SCC only	
2CC#11	5A-5A		3CC#23
2CC#12	5A-48A	48A SCC only	3CC#24
2CC#13	5A-66A		3CC#24
2CC#14	5B		3CC#29
2CC#15	13A-48A	48A SCC only	3CC#11
2CC#16	13A-66A		3CC#12
2CC#17	48A-48A		
2CC#18	48C		
2CC#19	66A-48A	48A SCC only	3CC#38
2CC#20	66A-66A		3CC#43
2CC#21	66B		3CC#44
2CC#22	66C		3CC#45

Index	3CC	Restriction	Completely Covered by Measurement Superset
3CC#1	2A-2A-4A		4CC#1
3CC#2	2A-2A-5A		4CC#2
3CC#3	2A-2A-13A		4CC#5
3CC#4	2A-2A-66A		4CC#6
3CC#5	2A-4A-4A		4CC#9
3CC#6	2A-4A-5A		4CC#9
3CC#7	2A-4A-13A		
3CC#8	2A-5A-48A	48A SCC only	
3CC#9	2A-5A-66A		4CC#12
3CC#10	2A-5B		4CC#10
3CC#11	2A-13A-48A	48A SCC only	
3CC#12	2A-13A-66A		
3CC#13	2A-48A-48A	48A SCC only	
3CC#14	2A-48A-66A	48A SCC only	
3CC#15	2A-48C	48C SCC only	4CC#16
3CC#16	2A-66A-66A		4CC#12
3CC#17	2A-66B		4CC#13
3CC#18	2A-66C		4CC#14
3CC#19	4A-4A-5A		4CC#9
3CC#20	4A-4A-13A		
3CC#21	4A-5B		4CC#23
3CC#22	4A-48C	48C SCC only	
3CC#23	5A-5A-66A		4CC#25
3CC#24	5A-48A-66A	48A SCC only	
3CC#25	5A-48C		4CC#28
3CC#26	5A-66A-66A		4CC#25
3CC#27	5A-66B		4CC#26
3CC#28	5A-66C		4CC#27
3CC#29	5B-66A		4CC#30
3CC#30	13A-48A-48A	48A SCC only	
3CC#31	13A-48A-66A	48A SCC only	
3CC#32	13A-48C	48C SCC only	4CC#33
3CC#33	13A-66A-66A		
3CC#34	13A-66B		4CC#38
3CC#35	13A-66C		4CC#35
3CC#36	48A-48A-66A	48A SCC only	4CC#39
3CC#37	48A-48C	48A, 48C SCC only	
3CC#38	48A-66A-66A	48A SCC only	4CC#39
3CC#39	48A-66B	48A SCC only	4CC#34
3CC#40	48A-66C	48A SCC only	4CC#35
3CC#41	48C-66A	48C SCC only	4CC#36
3CC#42	48D		4CC#43
3CC#43	66A-66A-66A		
3CC#44	66A-66B		4CC#38
3CC#45	66A-66C		

Index	4CC	Restriction	Completely Covered by Measurement Superset
4CC#1	2A-2A-4A-4A		
4CC#2	2A-2A-4A-5A		
4CC#3	2A-2A-5A-66A		
4CC#4	2A-2A-5B		
4CC#5	2A-2A-13A-66A		
4CC#6	2A-2A-66A-66A		
4CC#7	2A-2A-66B		
4CC#8	2A-2A-66C		
4CC#9	2A-4A-4A-5A		
4CC#10	2A-4A-5B		
4CC#11	2A-5A-48C		
4CC#12	2A-5A-66A-66A		
4CC#13	2A-5A-66B		
4CC#14	2A-5A-66C		
4CC#15	2A-5B-66A		
4CC#16	2A-13A-48C	48C SCC only	
4CC#17	2A-13A-66A-66A		
4CC#18	2A-13A-66B		
4CC#19	2A-13A-66C		
4CC#20	2A-48A-48C	48C SCC only	
4CC#21	2A-48C-66A		
4CC#22	2A-48D	48D SCC only	
4CC#23	4A-4A-5B		
4CC#24	4A-48D		
4CC#25	5A-5A-66A-66A	48D SCC only	
4CC#26	5A-5A-66B		
4CC#27	5A-5A-66C		
4CC#28	5A-48C-66A	48D SCC only	
4CC#29	5A-48D	48D SCC only	
4CC#30	5B-66A-66A		
4CC#31	5B-66B		
4CC#32	5B-66C		
4CC#33	13A-48A-48C	48A, 48C SCC only	
4CC#34	13A-48A-66B	48A, 48B SCC only	
4CC#35	13A-48A-66C	48A SCC only	
4CC#36	13A-48C-66A	48C SCC only	
4CC#37	13A-48D	48D SCC only	
4CC#38	13A-66A-66B		
4CC#39	48A-48A-66A-66A	48A SCC only	
4CC#40	48A-48A-66B	48A SCC only	
4CC#41	48A-48A-66C	48A SCC only	
4CC#42	48A-48C-66A	48A, 48B SCC only	
4CC#43	48A-48D		
4CC#44	48C-48C		
4CC#45	48C-66A-66A	48C SCC only	
4CC#46	48C-66B	48C SCC only	
4CC#47	48C-66C	48C SCC only	
4CC#48	48D-66A	48D SCC only	
4CC#49	48E		

Note:

Only yellow highlight cells need power measurement according to LTE DL CA SAR test Exclusion in TCB workshop (April.2018).

LTE Release 10 Carrier Aggregation with 4x4 MIMO

Index	2CC	Restriction	Completely Covered by Measurement Superset	Index	3CC	Restriction	Completely Covered by Measurement Superset
2CC#1	2A-[2A]		3CC#2	3CC#1	2A-2A-[4A]		
2CC#2	[2A]-[2A]			3CC#2	2A-[2A]-4A		
2CC#3	2A-[4A]		3CC#1	3CC#3	2A-[2A]-5A		
2CC#4	[2A]-4A		3CC#2	3CC#4	2A-[2A]-13A		
2CC#5	[2A]-[4A]			3CC#5	2A-2A-[66A]		
2CC#6	[2A]-5A		3CC#10	3CC#6	2A-[2A]-66A		
2CC#7	[2A]-13A		3CC#12	3CC#7	2A-[4A]-4A		
2CC#8	2A-[48A]	48A SCC only	3CC#13	3CC#8	[2A]-4A-4A		
2CC#9	[2A]-48A	48A SCC only	3CC#14	3CC#9	2A-[4A]-5A		
2CC#10	[2A]-[48A]	48A SCC only		3CC#10	[2A]-4A-5A		
2CC#11	2A-[66A]		3CC#15	3CC#11	2A-[4A]-13A		
2CC#12	[2A]-66A		3CC#16	3CC#12	[2A]-4A-13A		
2CC#13	[2A]-[66A]			3CC#13	2A-5A-[48A]	48A SCC only	
2CC#14	4A-[4A]		3CC#7	3CC#14	[2A]-5A-48A	48A SCC only	
2CC#15	[4A]-[4A]			3CC#15	2A-5A-[66A]		
2CC#16	[4A]-5A		3CC#9	3CC#16	[2A]-5A-66A		
2CC#17	[4A]-13A		3CC#11	3CC#17	[2A]-5B		
2CC#18	4A-[48A]	48A SCC only		3CC#18	2A-13A-[48A]	48A SCC only	
2CC#19	[4A]-48A	48A SCC only		3CC#19	[2A]-13A-48A	48A SCC only	
2CC#20	[4A]-[48A]	48A SCC only		3CC#20	2A-13A-[66A]		
2CC#21	5A-[48A]	48A SCC only	3CC#13	3CC#21	[2A]-13A-66A		
2CC#22	5A-[66A]		3CC#15	3CC#22	2A-[48A]-48A	48A SCC only	
2CC#23	13A-[48A]	48A SCC only	3CC#18	3CC#23	[2A]-48A-48A	48A SCC only	
2CC#24	13A-[66A]		3CC#20	3CC#24	2A-48A-[66A]	48A SCC only	
2CC#25	48A-[48A]			3CC#25	2A-[48A]-66A	48A SCC only	
2CC#26	[48A]-[48A]			3CC#26	[2A]-48A-66A	48A SCC only	
2CC#27	[66A]-48A	48A SCC only	3CC#45	3CC#27	[2A]-48C	48C SCC only	
2CC#28	66A-[48A]	48A SCC only	3CC#46	3CC#28	2A-[66A]-66A		
2CC#29	[66A]-[48A]	48A SCC only		3CC#29	[2A]-66A-66A		
2CC#30	[48C]			3CC#30	[2A]-66B		
2CC#31	66A-[66A]		3CC#44	3CC#31	[2A]-66C		
2CC#32	[66A]-[66A]			3CC#32	4A-[4A]-5A		
2CC#33	[66B]			3CC#33	4A-[4A]-13A		
2CC#34	[66C]			3CC#34	[4A]-5B		
				3CC#35	[4A]-48C	48C SCC only	
				3CC#36	5A-5A-[66A]		
				3CC#37	5A-48A-[66A]	48A SCC only	
				3CC#38	5A-[48A]-66A	48A SCC only	
				3CC#39	5A-[66A]-66A		
				3CC#40	5B-[66A]		
				3CC#41	13A-[48A]-48A	48A SCC only	
				3CC#42	13A-48A-[66A]	48A SCC only	
				3CC#43	13A-[48A]-66A	48A SCC only	
				3CC#44	13A-[66A]-66A		
				3CC#45	[66A]-48A-48A	48A SCC only	
				3CC#46	66A-48A-[48A]	48A SCC only	
				3CC#47	[48A]-48C		
				3CC#48	[66A]-66A-48A	48A SCC only	
				3CC#49	66A-66A-[48A]	48A SCC only	
				3CC#50	66B-[48A]	48A SCC only	
				3CC#51	66C-[48A]	48A SCC only	
				3CC#52	[66A]-48C	48C SCC only	
				3CC#53	[66A]-66B		
				3CC#54	[66A]-66C		

Note:

Only yellow highlight cells need power measurement according to LTE DL CA SAR test Exclusion in TCB workshop (April.2018).

4x4 MIMO Single Carrier Downlink 4x4 MIMO output power results

LTE Bands	Modulation	BW (MHz)	Channel	Freq. (MHz)	RB/Offset	LTE Rel 8 Tx. Power [dBm]	DL 4x4 MIMO Tx. Power [dBm]	Delta
Band 2	QPSK	20	19100	1900	1/99	24.0	24.0	-0.02
Band 4	QPSK	20	20175	1732.5	1/0	23.2	23.2	-0.01
Band 48	QPSK	20	56207	3646.7	50/0	19.6	19.6	-0.01
Band 66	QPSK	20	132072	1745	50/24	23.2	23.2	-0.04

Note:

According to LTE Test Conditions in TCB workshop (May, 2017), SAR is excluded for LTE downlink 4x4 MIMO operation when uplink output with DL MIMO does not exceed highest uplink output power configuration without DL MIMO by more than 1/4 dB. And for DL MIMO with carrier aggregation, the same SAR test exclusion procedure is considered.

DL CA output power results

E-UTRA CA configuration (BCS)	Bands				UL					DL									LTE Rel 8 Tx. Power [dBm]	LTE Rel 10 Tx. Power	Delta				
	PCC	SCC1	SCC2	SCC3	PCC					PCC			SCC1			SCC2						SCC3			
	1st	2nd	3rd	4th	Mode	BW (MHz)	Channel	Freq. (MHz)	RB/Offsets	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)				BW (MHz)	Channel	Freq. (MHz)	
4A-48A	4A	48A			QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	55990	3625								23.07	23.09	0.02
48A-48A	48A	48A			QPSK	20	56207	3646.7	50/0	20	56207	3646.7	20	55340	3560								19.62	19.65	0.03
48C	48C	48C			QPSK	20	56207	3646.7	50/0	20	56207	3646.7	20	56405	3666.5								19.62	19.63	0.01
2A-4A-13A	2A	4A	13A		QPSK	20	19100	1900	1/99	20	1100	1980	20	2175	2132.5	10	5230	751					24.03	24.02	-0.01
	4A	2A	13A		QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	900	1960	10	5230	751					23.07	23.09	0.02
	13A	2A	4A		QPSK	10	23230	782	1/25	10	5230	751	20	900	1960	20	2175	2132.5					24.38	24.35	-0.03
2A-5A-48A	2A	5A	48A		QPSK	20	19100	1900	1/99	20	1100	1980	10	2525	881.5	20	55990	3625					24.03	24.06	0.03
	5A	2A	48A		QPSK	10	20525	836.5	1/0	10	2525	881.5	20	900	1960	20	55990	3625					24.81	24.85	0.04
2A-13A-48A	2A	13A	48A		QPSK	20	19100	1900	1/99	20	1100	1980	10	5230	751	20	55990	3625					24.03	24.07	0.04
	13A	2A	48A		QPSK	10	23230	782	1/25	10	5230	751	20	900	1960	20	55990	3625					24.38	24.41	0.03
2A-13A-66A	2A	13A	66A		QPSK	20	19100	1900	1/99	20	1100	1980	10	5230	751	20	66536	2120					24.03	24.04	0.01
	13A	2A	66A		QPSK	10	23230	782	1/25	10	5230	751	20	900	1960	20	66536	2120					24.38	24.36	-0.02
	66A	2A	13A		QPSK	20	132072	1720	50/24	20	66536	2120	20	900	1960	10	5230	751					23.02	23.21	0.01
2A-48A-48A	2A	48A	48A		QPSK	20	19100	1900	1/99	20	1100	1980	20	55340	3560	20	56640	3690					24.03	24.02	-0.01
	2A	48A	66A		QPSK	20	19100	1900	1/99	20	1100	1980	20	55990	3625	20	66786	2145					24.03	24.01	-0.02
2A-48A-66A	66A	2A	48A		QPSK	20	132072	1720	50/24	20	66536	2120	20	900	1960	20	55990	3625					23.2	23.17	-0.03
	4A	4A	13A		QPSK	20	20175	1732.5	1/0	20	2175	2132.5	10	2000	2115	10	5230	751					23.07	23.11	0.04
4A-4A-13A	13A	4A	4A		QPSK	10	23230	782	1/25	10	5230	751	20	2175	2132.5	10	2000	2115					24.38	24.36	-0.02
	4A	48C	48C		QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	55990	3625	20	56188	3644.8					23.07	23.06	-0.01
5A-48A-66A	5A	48A	66A		QPSK	10	20525	836.5	1/0	10	2525	881.5	20	55990	3625	20	66786	2145					24.81	24.83	0.02
	66A	5A	48A		QPSK	20	132072	1720	50/24	20	66536	2120	10	2525	881.5	20	55990	3625					23.2	23.23	0.03
13A-48A-48A	13A	48A	48A		QPSK	10	23230	782	1/25	10	5230	751	20	55340	3560	20	56640	3690					24.38	24.39	0.01
	13A	48A	66A		QPSK	10	23230	782	1/25	10	5230	751	20	55990	3625	20	66786	2145					24.38	24.39	0.01
13A-48A-66A	66A	13A	48A		QPSK	20	132072	1720	50/24	20	66536	2120	10	5230	751	20	55990	3625					23.20	23.22	0.02
	13A	66A	66A		QPSK	10	23230	782	1/25	10	5230	751	20	66536	2120	20	67036	2170					24.38	24.36	-0.02
13A-66A-66A	66A	66A	13A		QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	10	5230	751					23.20	23.21	0.01
	48A	48C	48C		QPSK	20	56207	3646.7	50/0	20	56207	3646.7	20	55340	3560	20	55538	3579.8					19.62	19.64	0.02
48A-48C	48C	48C	48A		QPSK	20	56207	3646.7	50/0	20	56207	3646.7	20	56405	3666.5	20	55340	3560					19.62	19.61	-0.01
	66A	66A	66A		QPSK	20	132072	1720	50/24	20	66536	2120	20	66786	2145	20	67036	2170					23.20	23.21	0.01
66A-66A-66A	66A	66C	66C		QPSK	20	132072	1720	50/24	20	66536	2120	20	66786	2145	20	66984	2164.8					23.20	23.24	0.04
	66C	66C	66A		QPSK	20	132072	1720	50/24	20	66536	2120	20	66734	2139.8	20	66984	2164.8					23.20	23.23	0.03
2A-2A-4A-4A	2A	2A	4A	4A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	20	2175	2132.5	10	2000	2115		24.03	24.04	0.01
	4A	4A	2A	2A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	10	2000	2115	20	700	1940	20	1100	1980		23.07	23.06	-0.01
2A-2A-4A-5A	2A	2A	4A	5A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	20	2175	2132.5	10	2525	881.5		24.03	24.05	0.02
	4A	2A	2A	5A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	700	1940	20	1100	1980	10	2525	881.5		23.07	23.09	0.02
	5A	2A	2A	4A	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	700	1940	20	1100	1980	20	2175	2132.5		24.81	24.79	-0.02
2A-2A-5A-66A	2A	2A	5A	66A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	10	2525	881.5	20	66786	2145		24.03	24.04	0.01
	5A	2A	2A	66A	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	700	1940	20	1100	1980	20	66786	2145		24.81	24.82	0.01
	66A	2A	2A	5A	QPSK	20	132072	1720	50/24	20	66536	2120	20	700	1940	20	1100	1980	10	2525	881.5		23.20	23.18	-0.02
2A-2A-5B	2A	2A	5B	5B	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	10	2525	881.5	5	2597	888.7		24.03	24.04	0.01
	5B	5B	2A	2A	QPSK	10	20525	836.5	1/0	10	2525	881.5	5	888.7	2597	20	700	1940	20	1100	1980		24.81	24.83	0.02
2A-2A-13A-66A	2A	2A	13A	66A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	10	5230	751	20	66786	2145		24.03	24.01	-0.02
	13A	2A	2A	66A	QPSK	10	23230	782	1/25	10	5230	751	20	700	1940	20	1100	1980	20	66786	2145		24.38	24.35	-0.03
	66A	2A	2A	13A	QPSK	20	132072	1720	50/24	20	66536	2120	20	700	1940	20	1100	1980	10	5230	751		23.20	23.17	-0.03
2A-2A-66A-66A	2A	2A	66A	66A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	20	66536	2120	20	67036	2170		24.03	24.04	0.01
	66A	66A	2A	2A	QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	20	700	1940	20	1100	1980		23.20	23.22	0.02
2A-2A-66B	2A	2A	66B	66B	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	15	66786	2145	5	66879	2154.3		24.03	24.06	0.03
	66B	66B	2A	2A	QPSK	15	132047	1717.5	36/20	15	66511	2117.5	5	66604	2126.8	20	700	1940	20	1100	1980		23.05	23.01	-0.04
2A-2A-66C	2A	2A	66C	66C	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	20	66786	2145	20	66984	2164.8		24.03	24.07	0.04
	66C	66C	2A	2A	QPSK	20	132072	1720	50/24	20	66536	2120	20	66734	2139.8	20	7								

DL CA output power results (Continued)

E-UTRA CA configuration (BCS)	Bands				UL					DL										LTE Rel 8 Tx. Power [dBm]	LTE Rel 10 Tx. Power	Delta		
	PCC	SCC1	SCC2	SCC3	PCC					SCC1			SCC2			SCC3								
	1st	2nd	3rd	4th	Mode	BW (MHz)	Channel	Freq. (MHz)	RB/Offset	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)				Channel	Freq. (MHz)
2A-5A-66C	2A	5A	66C	66C	QPSK	20	19100	1900	1/99	20	1100	1980	10	2525	881.5	20	66786	2145	20	66984	2164.8	24.03	24.05	0.02
	5A	2A	66C	66C	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	900	1960	20	66786	2145	20	66984	2164.8	24.81	24.8	-0.01
	66C	66C	2A	5A	QPSK	20	132072	1720	50/24	20	66536	2120	20	66734	2139.8	20	900	1960	10	2525	881.5	23.20	23.23	0.03
2A-5B-66A	2A	5B	5B	66A	QPSK	20	19100	1900	1/99	20	1100	1980	10	2525	881.5	5	888.7	2597	20	66786	2145	24.03	24.05	0.02
	5B	5B	2A	66A	QPSK	10	20525	836.5	1/0	10	2525	881.5	5	888.7	2597	20	900	1960	20	66786	2145	24.81	24.82	0.01
	66A	2A	5B	5B	QPSK	20	132072	1720	50/24	20	66536	2120	20	900	1960	10	2525	881.5	5	888.7	2597	23.20	23.22	0.02
2A-13A-48C	2A	13A	48C	48C	QPSK	20	19100	1900	1/99	20	1100	1980	10	5230	751	20	55990	3625	20	56188	3644.8	24.03	24.02	-0.01
	13A	2A	48C	48C	QPSK	10	23230	782	1/25	10	5230	751	20	900	1960	20	55990	3625	20	56188	3644.8	24.38	24.37	-0.01
	2A	13A	66A	66A	QPSK	20	19100	1900	1/99	20	1100	1980	10	5230	751	20	66536	2120	20	67036	2170	24.03	24.05	0.02
2A-13A-66A-66A	13A	2A	66A	66A	QPSK	10	23230	782	1/25	10	5230	751	20	900	1960	20	66536	2120	20	67036	2170	24.38	24.41	0.03
	66A	66A	2A	13A	QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	20	900	1960	10	5230	751	23.20	23.18	-0.02
	2A	13A	66B	66B	QPSK	20	19100	1900	1/99	20	1100	1980	10	5230	751	15	66786	2145	5	66879	2154.3	24.03	23.99	-0.04
2A-13A-66B	13A	2A	66B	66B	QPSK	10	23230	782	1/25	10	5230	751	20	900	1960	15	66786	2145	5	66879	2154.3	24.38	24.4	0.02
	66B	66B	2A	13A	QPSK	15	132047	1717.5	36/20	15	66511	2117.5	5	66604	2126.8	20	900	1960	10	5230	751	23.05	23.06	0.01
	2A	13A	66C	66C	QPSK	20	19100	1900	1/99	20	1100	1980	10	5230	751	20	66786	2145	20	66984	2164.8	24.03	24.05	0.02
2A-13A-66C	13A	2A	66C	66C	QPSK	10	23230	782	1/25	10	5230	751	20	900	1960	20	66786	2145	20	66984	2164.8	24.38	24.41	0.03
	66C	66C	2A	13A	QPSK	20	132072	1720	50/24	20	66536	2120	20	66734	2139.8	20	900	1960	10	5230	751	23.20	23.23	0.03
	2A	48A	48C	48C	QPSK	20	19100	1900	1/99	20	1100	1980	20	55340	3560	20	56440	3690	20	56442	3670.2	24.03	24.04	0.01
2A-48C-66A	2A	48C	48C	66A	QPSK	20	19100	1900	1/99	20	1100	1980	20	55990	3625	20	56188	3644.8	20	56786	2145	24.03	24.02	-0.01
	66A	2A	48C	48C	QPSK	20	132072	1720	50/24	20	66536	2120	20	900	1960	20	55990	3625	20	56188	3644.8	23.20	23.21	0.01
	2A	48D	48D	48D	QPSK	20	19100	1900	1/99	20	1100	1980	20	55340	3560	20	55338	3579.8	20	55736	3599.6	24.03	24.01	-0.02
4A-4A-5B	4A	4A	5B	5B	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	10	2000	2115	10	2525	881.5	5	888.7	2597	23.07	23.09	0.02
	5B	5B	4A	4A	QPSK	10	20525	836.5	1/0	10	2525	881.5	5	888.7	2597	20	2175	2132.5	10	2000	2115	24.81	24.84	0.03
	4A	48D	48D	48D	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	55340	3560	20	55338	3579.8	20	55736	3599.6	23.07	23.08	0.01
5A-5A-66A-66A	5A	5A	66A	66A	QPSK	10	20525	836.5	1/0	10	2525	881.5	5	2425	871.5	20	66536	2120	20	67036	2170	24.81	24.83	0.02
	66A	66A	5A	5A	QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	10	2525	881.5	5	2425	871.5	23.20	23.16	-0.04
	5A	5A	66B	66B	QPSK	10	20525	836.5	1/0	10	2525	881.5	5	2425	871.5	15	66786	2145	5	66879	2154.3	24.81	24.82	0.01
5A-5A-66B	66B	66B	66B	5A	QPSK	15	132047	1717.5	36/20	15	66511	2117.5	5	66604	2126.8	10	2525	881.5	5	2425	871.5	23.05	23.07	0.02
	5A	5A	66C	66C	QPSK	10	20525	836.5	1/0	10	2525	881.5	5	2425	871.5	20	66786	2145	20	66984	2164.8	24.81	24.8	-0.01
	66C	66C	5A	5A	QPSK	20	132072	1720	50/24	20	66536	2120	20	66734	2139.8	10	2525	881.5	5	2425	871.5	23.20	23.22	0.02
5A-48C-66A	5A	66A	48C	48C	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	66786	2145	20	55990	3625	20	56188	3644.8	24.81	24.83	0.02
	66A	5A	48C	48C	QPSK	20	132072	1720	50/24	20	66536	2120	10	2525	881.5	20	55990	3625	20	56188	3644.8	23.20	23.18	-0.02
	5A	48D	48D	48D	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	55340	3560	20	55338	3579.8	20	55736	3599.6	24.81	24.83	0.02
5B-66A-66A	5B	5B	66A	66A	QPSK	10	20525	836.5	1/0	10	2525	881.5	5	888.7	2597	20	66536	2120	20	67036	2170	24.81	24.82	0.01
	66A	66A	5B	5B	QPSK	20	132072	1720	50/24	20	66536	2120	20	66786	2145	10	2525	881.5	5	888.7	2597	23.20	23.22	0.02
	5B	5B	66B	66B	QPSK	10	20525	836.5	1/0	10	2525	881.5	5	888.7	2597	15	66786	2145	5	66879	2154.3	24.81	24.84	0.03
5B-66B	66B	66B	5B	5B	QPSK	15	132047	1717.5	36/20	15	66511	2117.5	5	66604	2126.8	10	2525	881.5	5	888.7	2597	23.05	23.08	0.03
	5B	5B	66C	66C	QPSK	10	20525	836.5	1/0	10	2525	881.5	5	888.7	2597	20	66786	2145	20	66984	2164.8	24.81	24.82	0.01
	66C	66C	5B	5B	QPSK	20	132072	1720	50/24	20	66536	2120	20	66734	2139.8	10	2525	881.5	5	888.7	2597	23.20	23.19	-0.01
13A-48A-48C	13A	48A	48C	48C	QPSK	10	23230	782	1/25	10	5230	751	20	56207	3646.7	20	55340	3560	20	55538	3579.8	24.38	24.4	0.02
	13A	66B	66B	48A	QPSK	10	23230	782	1/25	10	5230	751	15	66786	2145	5	66879	2154.3	20	55990	3625	24.38	24.4	0.02
	66B	66B	13A	48A	QPSK	15	132047	1717.5	36/20	15	66511	2117.5	5	66604	2126.8	10	5230	751	20	55990	3625	23.05	23.04	-0.01
13A-48A-66C	13A	66C	66C	48A	QPSK	10	23230	782	1/25	10	5230	751	20	66786	2145	20	66984	2164.8	20	55990	3625	24.38	24.41	0.03
	66C	66C	13A	48A	QPSK	20	132072	1720	50/24	20	66536	2120	20	66734	2139.8	10	5230	751	20	55990	3625	23.20	23.22	0.02
	13A	66A	48C	48C	QPSK	10	23230	782	1/25	10	5230	751	20	66786	2145	20	55990	3625	20	56188	3644.8	24.38	24.36	-0.02
13A-48C-66A	66A	13A	48C	48C	QPSK	20	132072	1720	50/24	20	66536	2120	10	5230	751	20	55990	3625	20	56188	3644.8	23.20	23.22	0.02
	13A	48D	48D	48D	QPSK	10	23230	782	1/25	10	5230	751	20	55340	3560	20	55338	3579.8	20	55736	3599.6	24.38	24.41	0.03
	13A	66A	66B	66B	QPSK	10	23230	782	1/25	10	5230	751	20	66786	2145	15	66786	2145	5	66879	2154.3	24.38	24.39	0.01
13A-66A-66B	66A	13A	66B	66B	QPSK	20	132072	1720	50/24	20	66536	2120	10	5230	751	15	66786	2145	5	66879	2154.3	23.20	23.22	0.02
	66B	66B	66A	13A	QPSK	15	132047	1717.5	36/20	15	66511	2117.5	5	66604	2126.8	20	67036	2170	10	5230	751	23.05	23.01	-0.04
	48A-48A-66A-66A	66A	66A	48A	48A	QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	20	55340	3560	20	56640	3690	23.20	23.21
48A-48A-66B	66B	66B	48A	48A	QPSK	15	132047	1717.5	36/20	15	66511	2117.5	5	66604	2126.8	20	55340	3560	20	56640	3690	23.05	23.07	0.02
	66C	66C	48A	48A	QPSK	20	132072	1720	50/24	20	66536	2120	20	66734	2139.8	20	55340	3560	20	56640	3690	23.20	23.19	

DL CA with 4x4 MIMO output power results

E-UTRA CA configuration (BCS)	Bands			UL PCC				DL SCC1						DL SCC2			LTE Rel 8 Tx. Power [dBm]	LTE Rel 10 Tx. Power	Delta	
	PCC	SCC1	SCC2	Mode	BW (MHz)	Channel	Freq. (MHz)	RB/Offset	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel				Freq. (MHz)
	1st	2nd	3rd																	
[2A]-[2A]	[2A]	[2A]		QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940				24.03	24.05	0.02
[2A]-[4A]	[2A]	[4A]		QPSK	20	19100	1900	1/99	20	1100	1980	20	2175	2132.5				24.03	24.04	0.01
	[4A]	[2A]		QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	900	1960				23.07	23.06	-0.01
[2A]-[48A]	[2A]	[48A]		QPSK	20	19100	1900	1/99	20	1100	1980	20	55990	3625				24.03	24.06	0.03
[2A]-[66A]	[2A]	[66A]		QPSK	20	19100	1900	1/99	20	1100	1980	20	66786	2145				24.03	24.07	0.04
	[66A]	[2A]		QPSK	20	132072	1720	50/24	20	66536	2120	20	900	1960				23.20	23.25	0.05
[4A]-[4A]	[4A]	[4A]		QPSK	20	20175	1732.5	1/0	20	2175	2132.5	10	2000	2115				23.07	23.13	0.06
4A-[48A]	4A	[48A]		QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	55990	3625				23.07	23.08	0.01
[4A]-48A	[4A]	48A		QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	55990	3625				23.07	23.08	0.01
[4A]-[48A]	[4A]	[48A]		QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	55990	3625				23.07	23.06	-0.01
48A-[48A]	48A	[48A]		QPSK	20	56207	3646.7	50/0	20	56207	3646.7	20	55340	3560				19.62	19.64	0.02
	[48A]	48A		QPSK	20	56207	3646.7	50/0	20	56207	3646.7	20	55340	3560				19.62	19.60	-0.02
[48A]-[48A]	[48A]	[48A]		QPSK	20	56207	3646.7	50/0	20	56207	3646.7	20	55340	3560				19.62	19.65	0.03
[66A]-[48A]	[66A]	[48A]		QPSK	20	132072	1720	50/24	20	66536	2120	20	55990	3625				23.20	23.25	0.05
[48C]	[48C]	[48C]		QPSK	20	56207	3646.7	50/0	20	56207	3646.7	20	56009	3626.9				19.62	19.65	0.03
[66A]-[66A]	[66A]	[66A]		QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170				23.20	23.22	0.02
[66B]	[66B]	[66B]		QPSK	15	132047	1717.5	36/20	15	66511	2117.5	5	66604	2126.8				23.05	23.04	-0.01
[66C]	[66C]	[66C]		QPSK	20	132072	1720	50/24	20	66536	2120	20	66734	2139.8				23.20	23.21	0.01
2A-2A-[4A]	2A	2A	[4A]	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	20	2175	2132.5	24.03	24.05	0.02
	[4A]	2A	2A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	700	1940	20	1100	1980	23.07	23.10	0.03
2A-[2A]-4A	2A	[2A]	4A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	20	2175	2132.5	24.03	24.04	0.01
	[2A]	2A	4A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	20	2175	2132.5	24.03	24.05	0.02
	4A	[2A]	2A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	700	1940	20	1100	1980	23.07	23.09	0.02
2A-[2A]-5A	2A	[2A]	5A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	10	2525	881.5	24.03	24.07	0.04
	[2A]	2A	5A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	10	2525	881.5	24.03	24.02	-0.01
	5A	[2A]	2A	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	700	1940	20	1100	1980	24.81	24.79	-0.02
2A-[2A]-13A	2A	[2A]	13A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	10	5230	751	24.03	24.06	0.03
	[2A]	2A	13A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	10	5230	751	24.03	24.05	0.02
	13A	[2A]	2A	QPSK	10	23230	782	1/25	10	5230	751	20	700	1940	20	1100	1980	24.38	24.39	0.01
2A-2A-[66A]	2A	2A	[66A]	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	20	66786	2145	24.03	24.05	0.02
	[66A]	2A	2A	QPSK	20	132072	1720	50/24	20	66536	2120	20	700	1940	20	1100	1980	23.20	23.23	0.03
2A-[2A]-66A	2A	[2A]	66A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	20	66786	2145	24.03	24.06	0.03
	[2A]	2A	66A	QPSK	20	19100	1900	1/99	20	1100	1980	20	700	1940	20	66786	2145	24.03	24.04	0.01
	66A	[2A]	2A	QPSK	20	132072	1720	50.24	20	66536	2120	20	700	1940	20	1100	1980	23.20	23.19	-0.01
2A-[4A]-4A	2A	[4A]	4A	QPSK	20	19100	1900	1/99	20	1100	1980	20	2175	2132.5	10	2000	2115	24.03	24.04	0.01
	[4A]	4A	2A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	10	2000	2115	20	900	1960	23.07	23.05	-0.02
	4A	[4A]	2A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	10	2000	2115	20	900	1960	23.07	23.09	0.02
[2A]-4A-4A	[2A]	4A	4A	QPSK	20	19100	1900	1/99	20	1100	1980	20	2175	2132.5	10	2000	2115	24.03	24.06	0.03
	4A	4A	[2A]	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	10	2000	2115	20	900	1960	23.07	23.08	0.01
2A-[4A]-5A	2A	[4A]	5A	QPSK	20	19100	1900	1/99	20	1100	1980	20	2175	2132.5	10	2525	881.5	24.03	24.05	0.02
	[4A]	2A	5A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	900	1960	10	2525	881.5	23.07	23.03	-0.04
	5A	2A	[4A]	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	900	1960	20	2175	2132.5	24.81	24.82	0.01
[2A]-4A-5A	[2A]	4A	5A	QPSK	20	19100	1900	1/99	20	1100	1980	20	2175	2132.5	10	2525	881.5	24.03	24.05	0.02
	4A	[2A]	5A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	900	1960	10	2525	881.5	23.07	23.08	0.01
	5A	4A	[2A]	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	2175	2132.5	20	900	1960	24.81	24.86	0.05
2A-[4A]-13A	2A	[4A]	13A	QPSK	20	19100	1900	1/99	20	1100	1980	20	2175	2132.5	10	5230	751	24.03	24.05	0.02
	[4A]	2A	13A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	900	1960	10	5230	751	23.07	23.05	-0.02
	13A	2A	[4A]	QPSK	10	23230	782	1/25	10	5230	751	20	700	1940	20	2175	2132.5	24.38	24.39	0.01
[2A]-4A-13A	[2A]	4A	13A	QPSK	20	19100	1900	1/99	20	1100	1980	20	2175	2132.5	10	5230	751	24.03	24.05	0.02
	4A	[2A]	13A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	900	1960	10	5230	751	23.07	23.10	0.03
	13A	4A	[2A]	QPSK	10	23230	782	1/25	10	5230	751	20	2175	2132.5	20	900	1960	24.38	24.39	0.01
2A-5A-[48A]	2A	5A	[48A]	QPSK	20	19100	1900	1/99	20	1100	1980	10	2525	881.5	20	55990	3625	24.03	24.06	0.03
	5A	2A	[48A]	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	900	1960	20	55990	3625	24.81	24.84	0.03
[2A]-5A-48A	[2A]	5A	48A	QPSK	20	19100	1900	1/99	20	1100	1980	10	2525	881.5	20	55990	3625	24.03	24.00	-0.03
	5A	[2A]	48A	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	900	1960	20	55990	3625	24.81	24.77	-0.04
	2A	5A	[66A]	QPSK	20	19100	1900	1/99	20	1100	1980	10	2525	881.5	20	66786	2145	24.03	24.06	0.03
2A-5A-[66A]	5A	[66A]	2A	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	66786	2145	20	900	1960	24.81	24.82	0.01
	[66A]	2A	5A	QPSK	20	132072	1720	50/24	20	66536	2120	20	900	1960	10	2525	881.5	23.20	23.19	-0.01
	[2A]	5A	66A	QPSK	20	19100	1900	1/99	20	1100	1980	10	2525	881.5	20	66786	2145	24.03	24.04	0.01
[2A]-5A																				

DL CA with 4x4 MIMO output power results (Continued)

E-UTRA CA configuration (BCS)	Bands			UL				DL							LTE Rel 8 Tx Power [dBm]	LTE Rel 10 Tx Power	Delta			
	PCC	SCC1	SCC2	Mode	BW (MHz)	Channel	Freq. (MHz)	RB/Offsets	PCC			SCC1						SCC2		
	1st	2nd	3rd						BW (MHz)	Channel	Freq. (MHz)	BW (MHz)	Channel	Freq. (MHz)				BW (MHz)	Channel	Freq. (MHz)
2A-13A-[66A]	2A	13A	[66A]	QPSK	20	19100	1900	1/99	20	1100	1980	10	5230	751	20	66786	2145	24.03	24.05	0.02
	13A	2A	[66A]	QPSK	10	23230	782	1/25	10	5230	751	20	900	1960	20	66786	2145	24.38	24.41	0.03
	[66A]	2A	13A	QPSK	20	132072	1720	50/24	20	66536	2120	20	900	1960	10	5230	751	23.20	23.23	0.03
[2A]-13A-66A	[2A]	13A	[66A]	QPSK	20	19100	1900	1/99	20	1100	1980	10	5230	751	20	66786	2145	24.03	24.04	0.01
	13A	[2A]	[66A]	QPSK	10	23230	782	1/25	10	5230	751	20	900	1960	20	66786	2145	24.38	24.37	-0.01
	[66A]	[2A]	13A	QPSK	20	132072	1720	50/24	20	66536	2120	20	900	1960	10	5230	751	23.20	23.21	0.01
2A-[48A]-48A	2A	[48A]	48A	QPSK	20	19100	1900	1/99	20	1100	1980	20	55340	3560	20	56640	3690	24.03	24.08	0.05
[2A]-48A-48A	[2A]	48A	48A	QPSK	20	19100	1900	1/99	20	1100	1980	20	55340	3560	20	56640	3690	24.03	24.09	0.06
2A-48A-[66A]	2A	48A	[66A]	QPSK	20	19100	1900	1/99	20	1100	1980	20	55990	3625	20	66786	2145	24.03	24.04	0.01
[66A]	2A	48A	48A	QPSK	20	132072	1720	50/24	20	66536	2120	20	900	1960	20	55990	3625	23.20	23.21	0.01
2A-[48A]-66A	2A	[48A]	66A	QPSK	20	19100	1900	1/99	20	1100	1980	20	55990	3625	20	66786	2145	24.03	24.02	-0.01
[66A]	2A	[48A]	2A	QPSK	20	132072	1720	50/24	20	66536	2120	20	55990	3625	20	900	1960	23.20	23.22	0.02
[2A]-48A-66A	[2A]	48A	66A	QPSK	20	19100	1900	1/99	20	1100	1980	20	55990	3625	20	66786	2145	24.03	24.01	-0.02
[66A]	48A	[2A]	66A	QPSK	20	132072	1720	50/24	20	66536	2120	20	55990	3625	20	900	1960	23.20	23.24	0.04
[2A]-48C	[2A]	48C	48C	QPSK	20	19100	1900	1/99	20	1100	1980	20	55990	3625	20	56188	3644.8	24.03	24.06	0.03
2A-[66A]-66A	2A	[66A]	66A	QPSK	20	19100	1900	1/99	20	1100	1980	20	66536	2120	20	67036	2170	24.03	24.06	0.03
[66A]	66A	2A	66A	QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	20	900	1960	23.20	23.19	-0.01
[66A]	66A	2A	66A	QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	20	900	1960	23.20	23.18	-0.02
[2A]-66A-66A	[2A]	66A	66A	QPSK	20	19100	1900	1/99	20	1100	1980	20	66536	2120	20	67036	2170	24.03	24.04	0.01
[66A]	66A	[2A]	66A	QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	20	900	1960	23.20	23.18	-0.02
[2A]-66B	[2A]	66B	66B	QPSK	20	19100	1900	1/99	20	1100	1980	15	66786	2145	5	66879	2154.3	24.03	24.04	0.01
[66B]	66B	[2A]	66B	QPSK	15	132047	1717.5	36/20	15	66511	2117.5	5	66604	2126.8	20	900	1960	23.05	23.09	0.04
[2A]-66C	[2A]	66C	66C	QPSK	20	19100	1900	1/99	20	1100	1980	20	66786	2145	20	66984	2164.8	24.03	24.00	-0.03
[66C]	66C	[2A]	66C	QPSK	20	132072	1720	50/24	20	66536	2120	20	66734	2139.8	20	900	1960	23.20	23.23	0.03
4A-[4A]-5A	4A	[4A]	5A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	10	2000	2115	10	2525	881.5	23.07	23.10	0.03
[4A]	4A	4A	5A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	10	2000	2115	10	2525	881.5	23.07	23.09	0.02
5A	4A	[4A]	4A	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	2175	2132.5	10	2000	2115	24.81	24.79	-0.02
4A-[4A]-13A	4A	[4A]	13A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	10	2000	2115	10	5230	751	23.07	23.03	-0.04
[4A]	4A	13A	4A	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	10	2000	2115	10	5230	751	23.07	23.08	0.01
[4A]	4A	[4A]	4A	QPSK	10	23230	782	1/25	10	5230	751	20	2175	2132.5	10	2000	2115	24.38	24.40	0.02
[4A]-5B	[4A]	5B	5B	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	10	2525	881.5	5	888.7	2597	23.07	23.12	0.05
5B	5B	[4A]	4A	QPSK	10	20525	836.5	1/0	10	2525	881.5	5	888.7	2597	20	2175	2132.5	24.81	24.84	0.03
[4A]-48C	[4A]	48C	48C	QPSK	20	20175	1732.5	1/0	20	2175	2132.5	20	55990	3625	20	56188	3644.8	23.07	23.05	-0.02
5A-5A-[66A]	5A	5A	[66A]	QPSK	10	20525	836.5	1/0	10	2525	881.5	5	2425	871.5	20	66786	2145	24.81	24.80	-0.01
[66A]	5A	5A	5A	QPSK	20	132072	1720	50/24	20	66536	2120	10	2525	881.5	5	2425	871.5	23.20	23.16	-0.04
5A-48A-[66A]	5A	48A	[66A]	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	55990	3625	20	66786	2145	24.81	24.85	0.04
[66A]	5A	48A	48A	QPSK	20	132072	1720	50/24	20	66536	2120	10	2525	881.5	20	55990	3625	23.20	23.23	0.03
5A-[48A]-66A	5A	[48A]	66A	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	55990	3625	20	66786	2145	24.81	24.84	0.03
[66A]	5A	48A	48A	QPSK	20	132072	1720	50/24	20	66536	2120	10	2525	881.5	20	55990	3625	23.20	23.21	0.01
5A-[66A]-66A	5A	[66A]	66A	QPSK	10	20525	836.5	1/0	10	2525	881.5	20	66536	2120	20	67036	2170	24.81	24.80	-0.01
[66A]	66A	5A	66A	QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	10	2525	881.5	23.20	23.21	0.01
[66A]	66A	5A	66A	QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	10	2525	881.5	23.20	23.25	0.05
5B-[66A]	5B	5B	[66A]	QPSK	10	20525	836.5	1/0	10	2525	881.5	5	888.7	2597	20	66786	2145	24.81	24.87	0.06
[66A]	5B	5B	5B	QPSK	20	132072	1720	50/24	20	66536	2120	10	2525	881.5	5	888.7	2597	23.20	23.22	0.02
13A-[48A]-48A	13A	[48A]	48A	QPSK	10	23230	782	1/25	10	5230	751	20	55340	3560	20	56640	3690	24.38	24.39	0.01
[66A]	13A	48A	[66A]	QPSK	10	23230	782	1/25	10	5230	751	20	55990	3625	20	66786	2145	24.38	24.37	-0.01
[66A]	13A	48A	48A	QPSK	20	132072	1720	50/24	20	66536	2120	10	5230	751	20	55990	3625	23.20	23.23	0.03
13A-[48A]-66A	13A	[48A]	66A	QPSK	10	23230	782	1/25	10	5230	751	20	55990	3625	20	66786	2145	24.38	24.37	-0.01
[66A]	66A	13A	66A	QPSK	10	23230	782	1/25	10	5230	751	20	55990	3625	10	5230	751	23.20	23.16	-0.04
[66A]	66A	13A	66A	QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	10	5230	751	24.38	24.42	0.04
[66A]	66A	13A	66A	QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	10	5230	751	23.20	23.23	0.03
[66A]	66A	13A	66A	QPSK	20	132072	1720	50/24	20	66536	2120	20	67036	2170	10	5230	751	23.20	23.21	0.01
[48A]-48C	[48A]	48C	48C	QPSK	20	56207	3646.7	50/0	20	56207	3646.7	20	55340	3560	20	55538	3579.8	19.62	19.61	-0.01
[48C]	48C	[48A]	48A	QPSK	20	56207	3646.7	50/0	20	56207	3646.7	20	56405	3666.5	20	55340	3560	19.62	19.64	0.02
[66A]-48A-48A	[66A]	48A	48A	QPSK	20	132072	1720	50/24	20	66536	2120	20	55340	3560	20	56640	3690	23.20	23.18	-0.02
[66A]	48A	[48A]	48A	QPSK	20	132072	1720	50/24	20	66536	2120	20	55340	3560	20	56640	3690	23.20	23.23	0.03
[66A]	66A	48A																		