

G.1 LTE Downlink Only Carrier Aggregation Test Selection and Setup

SAR test exclusion for LTE downlink Carrier Aggregation is determined by power measurements according to the number component carriers (CCs) supported by the product implementation. For those configurations required by April 2018 TCBC Workshop Notes, conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink carrier aggregation is inactive on the PCC. Additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.

Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for carrier aggregation configurations when the maximum average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive. All bands required for SAR testing per FCC KDB procedures were considered. Based on the measured maximum powers below, no additional SAR tests were required for DLCA SAR configurations.

General PCC and SCC configuration selection procedure

- PCC uplink channel, channel bandwidth, modulation and RB configurations were selected based on section C)3)b)ii) of KDB 941225 D05 V01r02. All LTE bandwidth conducted powers needed for PCC uplink configuration selection can be found in RF Conducted Powers Section and LTE/NR Lower Bandwidth RF Conducted Powers Appendix. The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation.
- To maximize aggregated bandwidth, highest channel bandwidth available for that CA combination was selected for SCC. For inter-band CA, the SCC downlink channels were selected near the middle of their transmission bands. For contiguous intra-band CA, the downlink channel spacing between the component carriers was set to multiple of 300 kHz less than the nominal channel spacing defined in section 5.4.1A of 3GPP TS 36.521. For non-contiguous intra-band CA, the downlink channel spacing between the component carriers was set to be larger than the nominal channel spacing and provided maximum separation between the component carriers.
- All selected PCC and SCC(s) remained fully within the uplink/downlink transmission band of the respective component carrier.

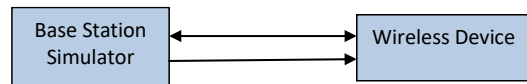


Figure G-1
DL CA Power Measurement Setup

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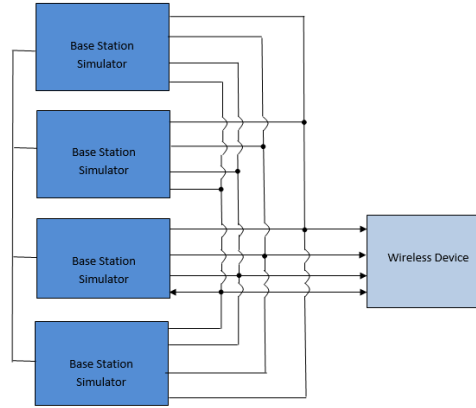


Figure G-2
DL CA with DL 4x4 MIMO Power Measurement Setup

G.2 Downlink Carrier Aggregation RF Conducted Powers

G.2.1 LTE Band 71 as PCC

Table G-3
Maximum Output Powers

Combination	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power						
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)		
CA_4A-71A	LTE B71	20	133297	680.5	16QAM	1	50	68761	634.5	LTE B48	20	55980	3625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.18	18.95		
CA_2A-4A-71A	LTE B71	20	133297	680.5	16QAM	1	50	68761	634.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	-	-	-	-	-	19.18	18.95	
CA_4A-4A-71A	LTE B71	20	133297	680.5	16QAM	1	50	68761	634.5	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	-	-	-	-	-	-	-	-	-	-	-	-	-	19.46	18.95	
CA_2A-6A-6A-71A	LTE B71	20	133297	680.5	16QAM	1	50	68761	634.5	LTE B2	20	900	1960	LTE B65	20	66786	2145	LTE B65	20	67235	2190	-	-	-	-	-	-	-	-	-	-	19.49	18.95
CA_2A-6A-71A	LTE B71	20	133297	680.5	16QAM	1	50	68761	634.5	LTE B2	20	900	1960	LTE B65	20	66786	2145	LTE B65	20	66984	2164.8	-	-	-	-	-	-	-	-	-	19.24	18.95	
CA_2A-2A-7A-6A-71A	LTE B71	20	133297	680.5	16QAM	1	50	68761	634.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B7	20	3100	2655	LTE B65	20	66786	2145	-	-	-	-	-	19.16	18.95	

G.2.2 LTE Band 12 as PCC

Table G-4
Maximum Output Powers

Combination	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power							
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)			
CA_2A-12A (1)	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B2	20	900	1960	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.06	18.59			
CA_4A-12A (1)	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.61	18.59			
CA_4A-12A (2)	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.61	18.59			
CA_12A-2A	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B25	20	8365	1962.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.12	18.59			
CA_12A-4A	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B48	20	55980	3625	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.73	18.59			
CA_12A-6A (1)	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B65	20	66786	2145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.50	18.59			
CA_12A-6A (2)	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B65	20	66786	2145	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.50	18.59			
CA_2C-12A	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	702	1940.2	-	-	-	-	-	-	-	-	-	-	-	-	-	18.17	18.59		
CA_12A-4C	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B48	20	55980	3625	LTE B48	20	56188	3644.8	-	-	-	-	-	-	-	-	-	-	-	-	-	18.25	18.59		
CA_2A-2A-4A-12A	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	-	-	18.00	18.59	
CA_2A-2A-12B	LTE B12	5	23095	707.5	16QAM	1	12	5095	737.5	LTE B12	5	5047	732.7	LTE B2	20	900	1960	LTE B2	20	700	1940	-	-	-	-	-	-	-	-	-	-	17.85	18.57	
CA_2A-4A-4A-12A	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	-	-	-	-	-	-	-	-	-	-	18.05	18.59	
CA_2A-4A-7A-12A	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B7	20	3100	2655	-	-	-	-	-	-	-	-	-	18.03	18.59		
CA_2A-4A-12B	LTE B12	5	23095	707.5	16QAM	1	12	5095	737.5	LTE B12	5	5047	732.7	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	-	-	17.97	18.57	
CA_2A-12A-6A	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B2	20	900	1960	LTE B65	20	66786	2145	LTE B65	20	66984	2164.8	-	-	-	-	-	-	-	-	-	-	18.04	18.59	
CA_4A-4A-12B	LTE B12	5	23095	707.5	16QAM	1	12	5095	737.5	LTE B12	5	5047	732.7	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	-	-	-	-	-	-	-	-	-	-	-	18.03	18.57
CA_2A-2A-7A-12A-6A	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B7	20	3100	2655	LTE B65	20	66786	2145	-	-	-	-	-	-	18.20	18.59	
CA_2A-2A-12A-30A-6A	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B30	10	6620	3355	LTE B65	20	66786	2145	-	-	-	-	-	-	18.27	18.59	
CA_2A-2A-12A-6A-6A	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B65	20	66786	2145	LTE B65	20	67235	2190	-	-	-	-	-	-	18.23	18.59	
CA_2A-12A-30A-6A-6A	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	LTE B2	20	900	1960	LTE B30	10	6620	3355	LTE B65	20	66786	2145	LTE B65	20	67235	2190	-	-	-	-	-	-	18.14	18.59	

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G.2.3 LTE Band 13 as PCC

Table G-5 Maximum Output Powers

Combination	PCC									SCC 1				SCC 2				SCC 3				SCC 4				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Channel	PCC (UL) Freq. [MHz]	Modulation	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DC CA Enabled [dBm]	LTE Single Carrier Tx Power (dBm)
	CA_2A-4A-13A	LTE B13	10	2320	782	QPSK	1	25	5220	751	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	18.67

G.2.4 LTE Band 14 as PCC

Table G-6 Maximum Output Powers

Combination	PCC									SCC 1				SCC 2				SCC 3				SCC 4				Power			
	PCC Band	PCC BW [MHz]	PCC (UL) Channel	PCC (UL) Freq. [MHz]	Modulation	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DC CA Enabled [dBm]	LTE Single Carrier Tx Power (dBm)		
	CA_2A-2A-14A-30A-66A	LTE B14	10	2330	793	QPSK	25	12	5330	763	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B20	10	6020	2355	LTE B66	20	66786	2145	66736	2120	18.69

G.2.5 LTE Band 5 as PCC

Table G-7 Maximum Output Powers

Combination	PCC									SCC 1				SCC 2				SCC 3				SCC 4				Power		
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DC CA Enabled [dBm]	LTE Single Carrier Tx Power (dBm)	
	CA_5A-7A	LTE B5	5	2025	836.5	16QAM	1	12	2525	811.5	LTE B7	20	3100	2655	-	-	-	-	-	-	-	-	-	-	-	-	-	17.40

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G.3 DL CA with DL 4x4 MIMO RF Conduction Powers

This device supports downlink 4x4 MIMO operations for some LTE bands. Uplink transmission is limited to a single output stream. When carrier aggregation was applicable, the general test selection and setup procedures described in Section G.1 were applied.

Per May 2017 TCB Workshop Notes, SAR for 4x4 DL MIMO was not needed since the maximum average output power in 4x4 DL MIMO mode was not more than 0.25 dB higher than the maximum output power with 4x4 DL MIMO inactive. Additionally, SAR for 4x4 MIMO Downlink Carrier Aggregation was not needed since the maximum average output power in 4x4 MIMO Downlink Carrier Aggregation mode was not more than 0.25 dB higher than the maximum output power with 4x4 MIMO Downlink and downlink carrier aggregation inactive.

G.3.1 LTE 4x4 MIMO DL Standalone Powers

Table G-15
Maximum Output Powers - Antenna 2

LTE Band	Bandwidth [MHz]	Channel	Frequency [MHz]	Modulation	RB Size	RB Offset	4x4 DL MIMO Tx. Power [dBm]	Single Antenna Tx. Power [dBm]	Target Power [dBm]
25	10	26365	1882.5	16QAM	1	25	13.12	13.38	13.3
48	5	56715	3697.5	16QAM	1	12	12.65	12.80	11.8

Table G-16
Maximum Output Powers - Antenna 3b

LTE Band	Bandwidth [MHz]	Channel	Frequency [MHz]	Modulation	RB Size	RB Offset	4x4 DL MIMO Tx. Power [dBm]	Single Antenna Tx. Power [dBm]	Target Power [dBm]
7	10	20800	2505	16QAM	1	25	12.93	13.12	12.7
30	10	27710	2310	QPSK	25	12	13.85	13.73	13.6
41	5	39750	2506	QPSK	1	12	14.31	14.29	14.0

Table G-17
Maximum Output Powers - Antenna 4

LTE Band	Bandwidth [MHz]	Channel	Frequency [MHz]	Modulation	RB Size	RB Offset	4x4 DL MIMO Tx. Power [dBm]	Single Antenna Tx. Power [dBm]	Target Power [dBm]
66	5	132322	1745	16QAM	1	12	12.89	13.11	12.5

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G.3.2 LTE Band 71 as PCC

Table G-18
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC				DL Ant. Config.	SCC 1				SCC 2				SCC 3				SCC 4				Power								
						PCC ULA RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]		SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]			
CA [4B]-[7A]	LTE B71	20	133297	680.5	16QAM	1	50	68761	634.5	2x2	LTE B48	20	55900	3625	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.65	19.95			
CA [2A]-[4A]-[7A]	LTE B71	20	133297	680.5	16QAM	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B4	20	2175	2132.5	4x4	-	-	-	-	-	-	-	-	-	-	-	19.54	19.95		
CA [4B]-[4A]-[7A]	LTE B71	20	133297	680.5	16QAM	1	50	68761	634.5	2x2	LTE B66	20	2175	2132.5	4x4	LTE B4	20	2590	2550	4x4	-	-	-	-	-	-	-	-	-	-	-	19.97	19.95		
CA [2A]-[4A]-[6A]-[7A]	LTE B71	20	133297	680.5	16QAM	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	17235	2190	4x4	-	-	-	-	-	-	-	19.73	19.95	
CA [2A]-[6A]-[7A]	LTE B71	20	133297	680.5	16QAM	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	66984	2164.8	4x4	-	-	-	-	-	-	-	19.73	19.95	
CA [2A]-[2A]-[7A]-[6A]-[7A]	LTE B71	5	133147	665.6	16QAM	1	12	68611	619.6	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B7	20	3100	2655	4x4	LTE B66	20	66786	2145	4x4	-	-	-	19.74	19.95

G.3.3 LTE Band 12 as PCC

Table G-19
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC				DL Ant. Config.	SCC 1				SCC 2				SCC 3				SCC 4				Power								
						PCC ULA RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]		SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]			
CA [2A]-[2A] (1)	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.92	18.59		
CA [2A]-[2A] (1)	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B4	20	2175	2132.5	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.92	18.59	
CA [2A]-[2A] (2)	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B4	20	2175	2132.5	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	17.92	18.59	
CA [2A]-[2A]	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B66	20	1960	1960.5	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.57	18.59	
CA [2A]-[4A]	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B48	20	55900	3625	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.57	18.59	
CA [2A]-[6A] (1)	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B66	20	66786	2145	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.93	19.95	
CA [2A]-[6A] (2)	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B66	20	66786	2145	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19.93	19.95	
CA [2C]-[2A]	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	702	1940.2	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	18.23	18.59
CA [2A]-[4B]	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B48	20	55900	3625	4x4	LTE B48	20	56180	3644.8	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	18.88	18.59
CA [2A]-[2A]-[4A]-[2A]	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B4	20	2175	2132.5	4x4	-	-	-	-	-	-	-	-	18.17	18.59
CA [2A]-[2A]-[5B]	LTE B12	5	23095	707.5	16QAM	1	12	5095	737.5	2x2	LTE B12	5	5047	737.7	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	-	-	-	-	-	-	-	-	18.53	18.57
CA [2A]-[4A]-[4A]-[2A]	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B4	20	2175	2132.5	4x4	LTE B4	10	2150	2150	4x4	-	-	-	-	-	-	-	-	18.34	18.59
CA [2A]-[4A]-[2A]-[2A]	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B4	20	2175	2132.5	4x4	LTE B7	20	1650	2655	4x4	-	-	-	-	-	-	-	-	18.46	18.59
CA [2A]-[4A]-[5B]	LTE B12	5	23095	707.5	16QAM	1	12	5095	737.5	2x2	LTE B12	5	5047	737.7	2x2	LTE B2	20	900	1960	4x4	LTE B4	20	2175	2132.5	4x4	-	-	-	-	-	-	-	-	18.49	18.57
CA [2A]-[2A]-[6A]	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	66984	2164.8	4x4	-	-	-	-	-	-	-	-	18.36	18.59
CA [4B]-[4B]-[2B]	LTE B12	6	23095	707.5	16QAM	1	12	5095	737.5	2x2	LTE B12	6	5037	737.7	2x2	LTE B4	20	2175	2132.5	4x4	LTE B4	10	2150	2150	4x4	-	-	-	-	-	-	-	-	18.50	18.57
CA [2A]-[2A]-[2A]-[2A]-[6A]	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B7	20	3100	2655	4x4	LTE B66	20	66786	2145	4x4	-	-	-	18.50	18.59
CA [2A]-[2A]-[2A]-[2A]-[6A]	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B30	10	9820	2365	4x4	LTE B66	20	66786	2145	4x4	-	-	-	18.27	18.59
CA [2A]-[2A]-[2A]-[2A]-[6A]-[6A]	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	-	-	-	18.52	18.59
CA [2A]-[2A]-[2A]-[6A]-[6A]-[6A]	LTE B12	10	23095	707.5	16QAM	1	49	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B30	10	9820	2365	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	-	-	-	18.48	18.59

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G.3.4 LTE Band 13 as PCC

Table G-20
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC				SCC 1				SCC 2				SCC 3				SCC 4				Power															
						PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]									
CA [2A] [4A] [13A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B4	20	2175	2122.5	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	18.74	18.65						
CA [2A] [13A] [4A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B4	20	2175	2122.5	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.58	18.55				
CA [4A] [4A] [13A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B4	20	2175	2122.5	4x4	LTE B4	20	2175	2122.5	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.64	18.55				
CA [13A] [4A] [4A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B4	20	2175	2122.5	4x4	LTE B4	20	2175	2122.5	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.62	18.55				
CA [2A] [7C] [13A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B7	20	3100	2655	4x4	LTE B7	20	2902	2635.2	4x4	-	-	-	-	-	-	-	-	-	-	-	-	18.69	18.65		
CA [2A] [13A] [4A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	4x4	LTE B2	20	900	1960	2x2	LTE B4	20	2175	2122.5	4x4	LTE B4	20	2175	2122.5	4x4	-	-	-	-	-	-	-	-	-	-	-	-	18.54	18.55		
CA [2A] [13A] [6A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B6	15	6678.1	2145	4x4	LTE B6	15	6677.9	2144.3	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	18.55	18.65	
CA [2A] [13A] [6C]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B6	20	6678.6	2145	4x4	LTE B6	20	6678.4	2144.8	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	18.50	18.65	
CA [13A] [4A] [6A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B4	20	2175	2122.5	4x4	LTE B6	20	6678.6	2145	4x4	LTE B6	20	6678.6	2145	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	18.48	18.65	
CA [13A] [6A] [6A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B6	20	6678.6	2145	4x4	LTE B6	15	6678.1	2145	4x4	LTE B6	15	6678.1	2145	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	18.56	18.65	
CA [13A] [6A] [6C]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B6	20	6678.6	2145	4x4	LTE B6	20	6703.8	2170.2	4x4	LTE B6	20	6723.6	2190	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.53	18.65
CA [2A] [2A] [13A] [6A] [6A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B6	20	6678.6	2145	4x4	LTE B6	20	6723.6	2190	4x4	-	-	-	-	-	-	-	-	-	18.77	18.65
CA [2A] [7A] [7A] [13A] [6A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B7	20	3100	2655	4x4	LTE B7	20	2902	2655	4x4	LTE B6	20	6678.6	2145	4x4	-	-	-	-	-	-	-	-	-	18.68	18.65
CA [13A] [4A] [6A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B4	20	2175	2122.5	4x4	LTE B4	20	2175	2122.5	4x4	LTE B4	20	2175	2122.5	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.61	18.65
CA [13A] [6A] [6A]	LTE B13	10	2320	782	QPSK	1	25	5230	751	2x2	LTE B6	20	6678.6	2145	4x4	LTE B6	20	6678.6	2145	4x4	LTE B6	20	6678.6	2145	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	18.53	18.65

G.3.5 LTE Band 14 as PCC

Table G-21
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC				SCC 1				SCC 2				SCC 3				SCC 4				Power																	
						PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]											
CA [2A] [2A] [14A] [30A] [6A]	LTE B14	10	2330	793	QPSK	25	12	5330	763	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B3	10	9620	2355	4x4	LTE B6	20	6678.6	2145	4x4	-	-	-	-	-	-	-	-	18.49	18.49			
CA [2A] [2A] [14A] [6A] [6A]	LTE B14	10	2330	793	QPSK	25	12	5330	763	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B6	20	6678.6	2145	4x4	LTE B6	20	6723.6	2190	4x4	-	-	-	-	-	-	-	-	-	-	18.46	18.49	
CA [2A] [14A] [30A] [6A] [6A]	LTE B14	10	2330	793	QPSK	25	12	5330	763	2x2	LTE B2	20	900	1960	4x4	LTE B3	10	9620	2355	4x4	LTE B6	20	6678.6	2145	4x4	LTE B6	20	6723.6	2190	4x4	-	-	-	-	-	-	-	-	-	-	-	18.47	18.49

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G.3.10 LTE Band 30 as PCC

Table G-26
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power									
			PCC (UL) Freq. [MHz]	PCC (UL) Ch.	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Freq. [MHz]	PCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]						
CA 1(2)30A	LTE B30	10	2770	2310	QPSK	25	12	9820	2355	4x4	LTE B2	20	900	2560	4x4	LTE B2	20	700	2402.0	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.76	13.73	
CA 8B(3)30	LTE B30	10	2770	2310	QPSK	25	12	9820	2355	4x4	LTE B2	20	900	2560	4x4	LTE B2	20	700	2402.0	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.76	13.73

G.3.1 LTE Band 7 as PCC

Table G-27
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power											
			PCC (UL) Freq. [MHz]	PCC (UL) Ch.	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Freq. [MHz]	PCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]								
CA 5A(7)	LTE B7	10	2080	2505	16QAM	1	25	2800	2625	4x4	LTE B5	10	2525	2625	2x2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.17	13.12		
CA 7A(2)A	LTE B7	10	2080	2505	16QAM	1	25	2800	2625	4x4	LTE B2	20	900	2560	4x4	LTE B2	20	700	2402.0	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.17	13.12

G.3.2 LTE Band 41 as PCC

Table G-28
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power												
			PCC (UL) Freq. [MHz]	PCC (UL) Ch.	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Freq. [MHz]	PCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]									
CA 1(4)14(1)	LTE B41	5	3970	3506	QPSK	1	12	3970	3506	4x4	LTE B41	20	4180	3680	4x4	LTE B41	20	4180	3680	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.22	14.20		
CA 1(4)14(2)	LTE B41	5	3970	3506	QPSK	1	12	3970	3506	4x4	LTE B41	20	4180	3680	4x4	LTE B41	20	4180	3680	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.22	14.20

G.3.3 LTE Band 48 as PCC

Table G-29
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC										SCC 1				SCC 2				SCC 3				Power																
			PCC (UL) Freq. [MHz]	PCC (UL) Ch.	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Freq. [MHz]	PCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	SCC (DL) Ch.	DL Ant. Config.	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]														
CA 4(8)A(48A)	LTE B48	5	5675	3697.5	16QAM	1	12	5675	3697.5	4x4	LTE B48	20	5530	3560	4x4	LTE B48	20	5530	3560	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.72	12.80		
CA 4(8)B	LTE B48	5	5675	3697.5	16QAM	1	12	5675	3697.5	4x4	LTE B48	20	5530	3560	4x4	LTE B48	20	5530	3560	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12.72	12.80

G.4 Additional Downlink Carrier Aggregation with Uplink Carrier Aggregation Enabled

This device supports uplink carrier aggregation (ULCA) with additional Carrier Aggregation configurations active in the downlink. Power measurements were performed with ULCA active and additional CA configurations active in the downlink for the configuration per Fall 2017 TCB Workshop Notes.

Per FCC Guidance, additional SAR measurements for these configurations were not required since their maximum output power was not more than 0.25 dB higher than the maximum output power for with only CA_7C, CA_41C, or CA_48C ULCA active.

G.4.1 Additional DL Carrier Aggregation RF Conducted Powers with Uplink Carrier Aggregation Enabled

Table G-30
Maximum Output Powers LTE Band 41

Combination	PCC										SCC 1				SCC 2				SCC 3				SCC 4		Power										
	PCC Band	PCC BW [MHz]	PCC [DL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL# RB	PCC UL# RB Offset	PCC [DL] Channel	PCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	Mod.	SCC UL# RB	SCC UL# RB Offset	SCC [DL] Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	ULCA Tx Power with DL CA Enabled (dBm)	ULCA Tx Power (dBm)			
CA_41C-41A	LTE B41	20	41450	2680	QPSK	50	0	41450	2680	LTE B41	20	41200	2660.2	QPSK	50	0	41200	2660.2	LTE B41	20	40620	2620	-	-	-	-	-	-	-	-	-	13.81	13.80		
CA_41C-41B	LTE B41	20	41450	2680	QPSK	50	0	41450	2680	LTE B41	20	41200	2660.2	QPSK	50	0	41200	2660.2	LTE B41	20	41004	2640.4	LTE B41	20	40620	2620	-	-	-	-	-	-	-	13.81	13.80
CA_41C-41C	LTE B41	20	41450	2680	QPSK	50	0	41450	2680	LTE B41	20	41200	2660.2	QPSK	50	0	41200	2660.2	LTE B41	20	41004	2640.4	LTE B41	20	40620	2620	-	-	-	-	-	-	-	13.81	13.80
CA_41E	LTE B41	20	41450	2680	QPSK	50	0	41450	2680	LTE B41	20	41200	2660.2	QPSK	50	0	41200	2660.2	LTE B41	20	41004	2640.4	LTE B41	20	40620	2620	-	-	-	-	-	-	-	13.81	13.80
CA_41C-41D	LTE B41	20	41450	2680	QPSK	50	0	41450	2680	LTE B41	20	41200	2660.2	QPSK	50	0	41200	2660.2	LTE B41	20	41004	2640.4	LTE B41	20	40620	2620	-	-	-	-	-	-	-	13.81	13.80
CA_41D-41C	LTE B41	20	41450	2680	QPSK	50	0	41450	2680	LTE B41	20	41200	2660.2	QPSK	50	0	41200	2660.2	LTE B41	20	41004	2640.4	LTE B41	20	40620	2620	-	-	-	-	-	-	-	13.81	13.80

Table G-31
Maximum Output Powers LTE Band 48

Combination	PCC										SCC 1				SCC 2				SCC 3				Power												
	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL# RB	PCC UL# RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	Mod.	SCC UL# RB	SCC UL# RB Offset	SCC [DL] Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	ULCA Tx Power with DL CA Enabled (dBm)	ULCA Tx Power (dBm)			
CA_48D	LTE B48	20	56640	3690	QPSK	50	0	56640	3690	LTE B48	20	56442	3670.2	QPSK	50	0	56442	3670.2	LTE B48	20	56244	3650.4	-	-	-	-	-	-	-	-	-	-	12.67	12.64	
CA_48E	LTE B48	20	56640	3690	QPSK	50	0	56640	3690	LTE B48	20	56442	3670.2	QPSK	50	0	56442	3670.2	LTE B48	20	56244	3650.4	LTE B48	20	56046	3630.6	-	-	-	-	-	-	-	12.66	12.64

G.4.2 Additional 4x4 MIMO DL Carrier Aggregation RF Conducted Powers with Uplink Carrier Aggregation Enabled

Note: 4x4 DL MIMO is only operating in the downlink. Uplink transmission is limited to a single output stream for each component carrier of ULCA.

Table G-32
Maximum Output Powers LTE Band 7

Combination	PCC										SCC 1				Power							
	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL# RB	PCC UL# RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [UL] Ch.	SCC [UL] Freq. [MHz]	Mod.	SCC UL# RB	SCC UL# RB Offset	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	ULCA Tx Power with DL CA Enabled (dBm)	ULCA Tx Power (dBm)
CA [7C]	LTE B7	20	21350	2560	QPSK	50	0	3350	2680	4x4	LTE B7	20	21152	2540.2	QPSK	50	0	3152	2660.2	4x4	12.66	12.60

Table G-33
Maximum Output Powers LTE Band 41

Combination	PCC										SCC 1				SCC 2				SCC 3				SCC 4		Power																	
	PCC Band	PCC BW [MHz]	PCC [DL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL# RB	PCC UL# RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	ULCA Tx Power with DL CA Enabled (dBm)	ULCA Tx Power (dBm)										
CA_41C-41A	LTE B41	20	41450	2680	QPSK	50	0	41450	2680	4x4	LTE B41	20	41200	2660.2	QPSK	50	0	41200	2660.2	4x4	LTE B41	20	40620	2620	4x4	-	-	-	-	-	-	-	-	14.03	13.80							
CA_41D-41A	LTE B41	20	41450	2680	QPSK	50	0	41450	2680	4x4	LTE B41	20	41200	2660.2	QPSK	50	0	41200	2660.2	4x4	LTE B41	20	41004	2640.4	4x4	LTE B41	20	40620	2620	4x4	-	-	-	-	-	-	-	13.80	13.80			
CA_41E-41A	LTE B41	20	41450	2680	QPSK	50	0	41450	2680	4x4	LTE B41	20	41200	2660.2	QPSK	50	0	41200	2660.2	4x4	LTE B41	20	40620	2620	4x4	LTE B41	20	40620	2620	4x4	-	-	-	-	-	-	-	13.80	13.80			
CA_41E	LTE B41	20	41450	2680	QPSK	50	0	41450	2680	4x4	LTE B41	20	41200	2660.2	QPSK	50	0	41200	2660.2	4x4	LTE B41	20	41004	2640.4	4x4	LTE B41	20	40620	2620	4x4	-	-	-	-	-	-	-	13.80	13.80			
CA_41C-41D	LTE B41	20	41450	2680	QPSK	50	0	41450	2680	4x4	LTE B41	20	41200	2660.2	QPSK	50	0	41200	2660.2	4x4	LTE B41	20	40620	2620	4x4	LTE B41	20	40620	2620	4x4	LTE B41	20	41004	2640.4	4x4	-	-	-	-	-	13.80	13.80
CA_41E-41D	LTE B41	20	41450	2680	QPSK	50	0	41450	2680	4x4	LTE B41	20	41200	2660.2	QPSK	50	0	41200	2660.2	4x4	LTE B41	20	41004	2640.4	4x4	LTE B41	20	40620	2620	4x4	LTE B41	20	41004	2640.4	4x4	-	-	-	-	-	13.80	13.80

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Table G-34
Maximum Output Powers LTE Band 48

Combination	PCC										SCC 1					SCC 2					SCC 3					Power						
	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [DL] Freq. [MHz]	Mod.	PCC UL # RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [UL] Ch.	SCC [DL] Freq. [MHz]	Mod.	SCC UL # RB	SCC UL RB Offset	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	ULCA Tx Power with DL CA Enabled [dBm]	ULCA Tx Power [dBm]
CA_HB3	LTE_B48	20	56640	3650	QPSK	50	0	56640	3650	4x4	LTE_B48	20	56642	3670.2	QPSK	50	0	56642	3670.2	4x4	LTE_B48	20	56644	3670.4	4x4	LTE_B48	20	56646	3670.6	4x4	12.61	12.54
CA_HB3	LTE_B48	20	56640	3650	QPSK	50	0	56640	3650	4x4	LTE_B48	20	56642	3670.2	QPSK	50	0	56642	3670.2	4x4	LTE_B48	20	56644	3670.4	4x4	LTE_B48	20	56646	3670.6	4x4	12.69	12.54
CA_HB3	LTE_B48	20	56640	3650	QPSK	50	0	56640	3650	4x4	LTE_B48	20	56642	3670.2	QPSK	50	0	56642	3670.2	4x4	LTE_B48	20	56644	3670.4	4x4	LTE_B48	20	56646	3670.6	4x4	12.69	12.54

G.5 Downlink Carrier Aggregation with Inter-band Uplink Carrier Aggregation enabled

This device supports inter-band uplink carrier aggregation (ULCA) with additional Carrier Aggregation configurations active in the downlink. Power measurements were performed with inter-band ULCA active and additional CA configurations active in the downlink for the configuration per Fall 2017 TCB Workshop Notes.

Per FCC Guidance, additional SAR measurements for these configurations were not required since their maximum output power was not more than 0.25 dB higher than the maximum output power for with only ULCA active.

G.5.1 DL Carrier Aggregation RF Conducted Powers

Table G-35
Maximum Output Powers

Combination	PCC										SCC 1					SCC 2					SCC 3					Power						
	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [DL] Freq. [MHz]	Mod.	PCC UL # RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [UL] Ch.	SCC [DL] Freq. [MHz]	Mod.	SCC UL # RB	SCC UL RB Offset	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	ULCA Tx Power with 4x4 DL CA Enabled [dBm]	ULCA Tx Power [dBm]
CA_HB3	LTE_B48	20	56640	3650	QPSK	50	0	56640	3650	4x4	LTE_B48	20	56642	3670.2	QPSK	50	0	56642	3670.2	4x4	LTE_B48	20	56644	3670.4	4x4	LTE_B48	20	56646	3670.6	4x4	12.61	12.54

G.5.2 DL Carrier Aggregation with DL 4x4 MIMO RF Conducted Powers

Note: 4x4 DL MIMO is only operating in the downlink. Uplink transmission is limited to a single output stream for each component carrier of ULCA.

Table G-36
Maximum Output Powers

Combination	PCC										SCC 1					SCC 2					SCC 3					Power						
	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [DL] Freq. [MHz]	Mod.	PCC UL # RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [UL] Ch.	SCC [DL] Freq. [MHz]	Mod.	SCC UL # RB	SCC UL RB Offset	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	ULCA Tx Power with 4x4 DL CA Enabled [dBm]	ULCA Tx Power [dBm]
CA_HB3	LTE_B48	20	56640	3650	QPSK	50	0	56640	3650	4x4	LTE_B48	20	56642	3670.2	QPSK	50	0	56642	3670.2	4x4	LTE_B48	20	56644	3670.4	4x4	LTE_B48	20	56646	3670.6	4x4	12.61	12.54

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