

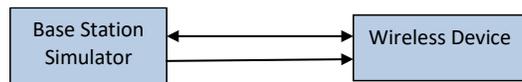
only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the 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 active measured among the channel bandwidth, modulation, and RB combinations in each frequency band.

This device supports LAA with downlink carrier aggregation only. It uses carrier aggregation in the downlink to combine LTE in the unlicensed spectrum (i.e. LTE Band 46) with LTE in the licensed band (served as PCC). All uplink communications and acknowledgements on the PCC remain identical to specifications when downlink carrier aggregation is inactive.

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 Section 9.3 and Appendix I. 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 J-1
DL CA Power Measurement Setup**

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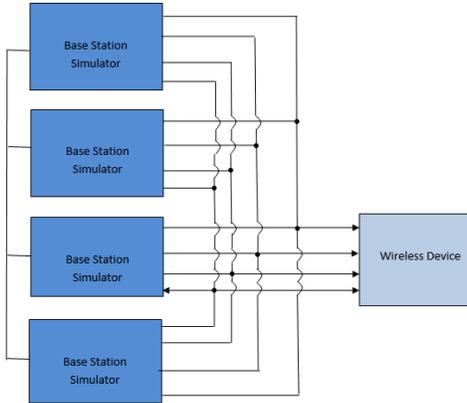


Figure J-2
DL CA with DL 4x4 MIMO Power Measurement Setup

J.2 Downlink Carrier Aggregation RF Conducted Powers

J.2.1 LTE Band 71 as PCC

Table J-3
Maximum Output Powers

Combination	PCC										SCC 1				SCC 2				SCC 3				Power	
	PCC Band	PCC BW [MHz]	PCC (U) Ch. Freq. [MHz]	PCC (U) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (D) Channel	PCC (D) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (D) Channel	SCC (D) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (D) Channel	SCC (D) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (D) Channel	SCC (D) Freq. [MHz]	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]	
CA_4A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68836	622	LTE B4	20	2175	2132.5	LTE B4	10	2360	2150	-	-	-	-	-	25.15	25.50
CA_4B-4B-71A	LTE B71	10	133172	668	QPSK	1	25	68836	622	LTE B4B	20	55990	3625	LTE B4B	20	56640	3690	-	-	-	-	-	25.14	25.50
CA_4B-71A	LTE B71	10	133172	668	QPSK	1	25	68836	622	LTE B4B	20	55990	3625	LTE B4B	20	56188	3644.8	-	-	-	-	-	25.14	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68836	622	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	25.41	25.50	
CA_2A-2A-6A-71A	LTE B71	10	133172	668	QPSK	1	25	68836	622	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6B	20	67296	2145	25.47	25.50	
CA_2A-6B-6A-71A	LTE B71	10	133172	668	QPSK	1	25	68836	622	LTE B2	20	900	1960	LTE B6B	20	66796	2145	LTE B6B	20	67296	2150	25.49	25.50	
CA_2A-6B-71A	LTE B71	10	133172	668	QPSK	1	25	68836	622	LTE B2	20	900	1960	LTE B6B	20	66796	2145	LTE B6B	20	66984	2164.8	25.48	25.50	

J.2.2 LTE Band 12 as PCC

Table J-4
Maximum Output Powers

Combination	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power	
	PCC Band	PCC BW [MHz]	PCC (U) Ch. Freq. [MHz]	PCC (U) Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (D) Channel	PCC (D) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (D) Channel	SCC (D) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (D) Channel	SCC (D) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (D) Channel	SCC (D) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (D) Channel	SCC (D) 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	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	-	-	-	-	-	-	-	-	-	-	-	-	25.32	25.50	
CA_4A-12A (1)	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	-	-	-	-	25.33	25.50	
CA_4A-12A (2)	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	-	-	-	-	25.31	25.50	
CA_12A-25A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B25	20	8365	1962.5	-	-	-	-	-	-	-	-	-	-	-	-	25.31	25.50	
CA_12A-6A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B6A	20	5086	5037.5	-	-	-	-	-	-	-	-	-	-	-	-	25.31	25.50	
CA_12A-4B	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4B	20	55990	3625	-	-	-	-	-	-	-	-	-	-	-	-	25.49	25.50	
CA_12A-6B (1)	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B6B	20	66786	2145	-	-	-	-	-	-	-	-	-	-	-	-	25.23	25.50	
CA_12A-6B (2)	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B6B	20	66786	2145	-	-	-	-	-	-	-	-	-	-	-	-	25.23	25.50	
CA_12A-4B-2	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4B	20	55995	5537.5	LTE B4B	20	50467	5517.7	-	-	-	-	-	-	-	-	-	25.43	25.50
CA_12A-4B-2	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4B	20	50467	5517.7	LTE B4B	20	48188	5444.8	-	-	-	-	-	-	-	-	-	25.46	25.50
CA_12A-4B-2	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4B	20	50467	5517.7	LTE B4B	20	48188	5444.8	-	-	-	-	-	-	-	-	-	25.34	25.50
CA_2A-4A-12A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B4	20	2175	2132.5	-	-	-	-	-	25.31	25.50
CA_2A-4A-12A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B4	20	2175	2132.5	-	-	-	-	-	25.31	25.50
CA_2A-4A-12B	LTE B12	5	23035	701.5	QPSK	1	12	5035	731.5	LTE B12	10	5107	738.7	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	-	-	-	-	-	24.88	25.40
CA_2A-12B-6B-2	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B6B	20	66786	2145	LTE B6B	20	66984	2164.8	-	-	-	-	-	25.26	25.50
CA_4A-4A-12B	LTE B12	5	23035	701.5	QPSK	1	12	5035	731.5	LTE B12	10	5107	738.7	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	-	-	-	-	-	25.06	25.40
CA_12A-4B-2	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4B	20	50467	5537.5	LTE B4B	20	50467	5517.7	LTE B4B	20	50467	5517.7	-	-	-	-	-	25.25	25.50
CA_2A-2A-12A-2A-6A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6B	20	66786	2145	LTE B6B	20	66786	2145	24.82	25.50	
CA_2A-2A-12A-6A-6A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6B	20	66786	2145	LTE B6B	20	67236	2190	24.75	25.50	
CA_2A-2A-12B-6A	LTE B12	5	23035	701.5	QPSK	1	12	5035	731.5	LTE B12	10	5107	738.7	LTE B2	20	900	1960	LTE B6B	20	66786	2145	LTE B6B	20	66786	2145	24.12	25.40	
CA_2A-12A-30A-6A-6A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B30	10	8620	2335	LTE B6B	20	66786	2145	LTE B6B	20	67236	2190	24.75	25.50	
CA_2A-12B-6A-6A	LTE B12	5	23035	701.5	QPSK	1	12	5035	731.5	LTE B12	10	5107	738.7	LTE B2	20	900	1960	LTE B6B	20	66786	2145	LTE B6B	20	67236	2190	24.43	25.40	

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J.2.8 LTE Band 30 as PCC

Table J-10
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 DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]
CA_2A-2A-2A-30A	LTE B30	5	2771.0	2310	QPSK	1	0	8820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B29	10	9715	722.5	-	-	-	-	22.86	22.97
CA_2A-2A-2A-30A-66A	LTE B30	5	2771.0	2310	QPSK	1	0	8820	2355	LTE B2	20	900	1960	LTE B29	10	9715	722.5	LTE B66	20	66786	2145	-	-	-	-	22.89	22.97
CA_2A-2A-2A-66A-66A	LTE B30	5	2771.0	2310	QPSK	1	0	8820	2355	LTE B29	10	9715	722.5	LTE B66	20	66786	2145	LTE B66	20	66786	2145	-	-	-	-	22.92	22.97
CA_2A-2A-5A-30A-66A	LTE B30	5	2771.0	2310	QPSK	1	0	8820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B5	10	2525	881.5	LTE B60	20	66786	2145	22.87	22.97
CA_2A-2A-12A-30A-66A	LTE B30	5	2771.0	2310	QPSK	1	0	8820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B12	10	5095	737.5	LTE B60	20	66786	2145	22.91	22.97
CA_2A-2A-14A-30A-66A	LTE B30	5	2771.0	2310	QPSK	1	0	8820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B14	10	5340	761	LTE B60	20	66786	2145	22.89	22.97
CA_2A-5A-30A-66A-66A	LTE B30	5	2771.0	2310	QPSK	1	0	8820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B60	20	66786	2145	LTE B60	20	67236	2190	22.91	22.97
CA_2A-5A-30A-66A	LTE B30	5	2771.0	2310	QPSK	1	0	8820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B60	20	66786	2145	22.90	22.97
CA_2A-12A-30A-66A-66A	LTE B30	5	2771.0	2310	QPSK	1	0	8820	2355	LTE B2	20	900	1960	LTE B12	10	5095	737.5	LTE B60	20	66786	2145	LTE B60	20	67236	2190	22.91	22.97
CA_2A-14A-30A-66A-66A	LTE B30	5	2771.0	2310	QPSK	1	0	8820	2355	LTE B2	20	900	1960	LTE B14	10	5340	761	LTE B60	20	66786	2145	LTE B60	20	67236	2190	22.95	22.97
CA_5B-30A-66A-66A	LTE B30	5	2771.0	2310	QPSK	1	0	8820	2355	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B60	20	66786	2145	LTE B60	20	67236	2190	22.84	22.97

J.2.9 LTE Band 41 as PCC

Table J-11
Maximum Output Powers

Combination	PCC					SCC 1				SCC 2			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]	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]
CA_41C (1)	LTE B41	5	40620	2593	QPSK	1	12	40620	2593	LTE B41	20	40737	2604.7	24.43	24.45
CA_41D	LTE B41	10	40620	2593	QPSK	1	25	40620	2593	LTE B41	20	40476	2578.6	24.27	24.28

J.2.10 LTE Band 48 as PCC

Table J-12
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 DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]	
CA_48A-48A	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56340	3660	-	-	-	-	-	-	-	-	-	-	-	-	-	19.45	
CA_48A-48C	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56340	3660	LTE B48	20	55538	3679.8	-	-	-	-	-	-	-	-	-	19.23	19.45
CA_48C-48A	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3677.5	LTE B48	20	55538	3679.8	-	-	-	-	-	-	-	-	-	19.27	19.45
CA_48A-48D	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56340	3660	LTE B48	20	55538	3679.8	LTE B48	20	55736	3696.6	-	-	-	-	-	19.33	19.45
CA_48C-48A	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3677.5	LTE B48	20	55977	3677.7	LTE B48	20	55640	3660	-	-	-	-	-	19.30	19.45
CA_48C-48C	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3677.5	LTE B48	20	56340	3660	LTE B48	20	55538	3679.8	-	-	-	-	-	19.27	19.45
CA_48A-48E	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	55340	3660	LTE B48	20	55538	3679.8	LTE B48	20	55736	3696.6	LTE B48	20	55934	3699.4	19.28	19.45	
CA_48E-48A	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3677.5	LTE B48	20	55977	3677.7	LTE B48	20	55736	3696.6	LTE B48	20	55340	3660	19.41	19.45	
CA_48C-48D	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3677.5	LTE B48	20	55340	3660	LTE B48	20	55538	3679.8	LTE B48	20	55736	3696.6	19.26	19.45	
CA_48D-48C	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3677.5	LTE B48	20	55977	3677.7	LTE B48	20	55640	3660	LTE B48	20	56442	3670.2	19.25	19.45	
CA_48F	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3677.5	LTE B48	20	55977	3677.7	LTE B48	20	55736	3696.6	LTE B48	20	55521	3678.1	19.47	19.45	

FCC ID A3LSMS901U	 Proud to be part of element	SAR EVALUATION REPORT		Approved by: Quality Manager
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J.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 J.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.

J.3.1 LTE 4x4 MIMO DL Standalone Powers

Table J-13
Maximum Output Powers

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	10	132622	1775	QPSK	1	25	24.21	24.14	23.8
25	5	26065	1852.5	QPSK	1	12	24.29	24.15	24.2
30	5	27710	2310	QPSK	1	0	23.02	22.97	22.5
41	5	40620	2593	QPSK	1	12	24.47	24.45	24.0
48	5	56232	3649.2	64QAM	1	12	19.41	19.45	19.5

J.3.2 LTE Band 71 as PCC

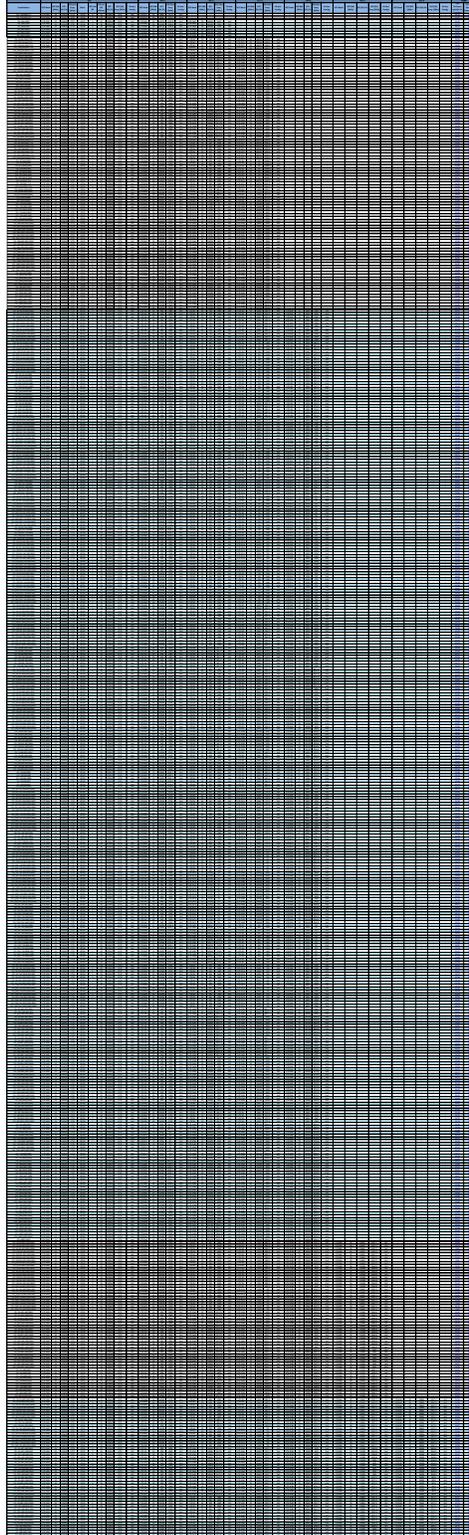
Table J-14
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Freq. [MHz]	Mod.	PCC			SCC 1				SCC 2				SCC 3				Power											
					PCC UL RB	PCC UL RB Offset	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.	LTE Tx Power with DL CA Enabled	LTE Single Carrier Tx Power [dBm]						
CA_1A1-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B4	20	2175	2132.5	4x4	LTE B4	20	2350	2150	2x2	-	-	-	-	-	-	-	-	25.43	25.50	
CA_1A1-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B4	20	2175	2132.5	4x4	LTE B4	20	2350	2150	4x4	-	-	-	-	-	-	-	-	-	25.42	25.50
CA_1A1-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B48	20	55990	3625	4x4	LTE B48	20	55640	3600	2x2	-	-	-	-	-	-	-	-	-	25.48	25.50
CA_1A1-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B48	20	55990	3625	4x4	LTE B48	20	55340	3560	4x4	-	-	-	-	-	-	-	-	-	25.44	25.50
CA_1A1-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B48	20	55990	3625	4x4	LTE B48	20	56188	3644.8	4x4	-	-	-	-	-	-	-	-	-	25.47	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	2x2	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	-	-	-	-	25.40	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	-	-	-	-	25.36	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	-	-	-	-	25.43	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B4	20	2175	2132.5	2x2	-	-	-	-	25.38	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B4	20	2175	2132.5	4x4	-	-	-	-	25.40	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	2x2	LTE B2	20	700	1940	2x2	LTE B66	20	66786	2145	4x4	-	-	-	-	25.42	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B66	20	66786	2145	2x2	-	-	-	-	25.38	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B66	20	66786	2145	4x4	-	-	-	-	25.37	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B66	20	66786	2145	2x2	-	-	-	-	25.40	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B66	20	66786	2145	4x4	-	-	-	-	25.35	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	2x2	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	2x2	-	-	-	-	25.37	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	2x2	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	-	-	-	-	25.42	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	2x2	LTE B66	20	67236	2190	2x2	-	-	-	-	25.41	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	2x2	-	-	-	-	25.40	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	-	-	-	-	25.39	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	2x2	LTE B66	20	66786	2145	4x4	LTE B66	20	66984	2164.8	4x4	-	-	-	-	25.38	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	2x2	LTE B66	20	66984	2164.8	2x2	-	-	-	-	25.36	25.50
CA_2A-2A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	66984	2164.8	4x4	-	-	-	-	25.33	25.50

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J.3.7 LTE Band 66 as PCC

Table J-19
Maximum Output Powers



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J.3.8 LTE Band 25 as PCC

Table J-20
Maximum Output Powers

Combination	PCC Band	PCC							SCC 1				Power				
		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 (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled	LTE Single Carrier Tx Power (dBm)
CA_5A-[25A]	LTE B25	5	26065	1852.5	QPSK	1	12	8065	1932.5	4x4	LTE B5	10	2525	881.5	2x2	24.25	24.15
CA_25A-[25A] (1)	LTE B25	5	26065	1852.5	QPSK	1	12	8065	1932.5	2x2	LTE B25	20	8590	1985	4x4	24.21	24.15
CA_[25A]-25A (1)	LTE B25	5	26065	1852.5	QPSK	1	12	8065	1932.5	4x4	LTE B25	20	8590	1985	2x2	24.26	24.15
CA_[25A]-[25A] (1)	LTE B25	5	26065	1852.5	QPSK	1	12	8065	1932.5	4x4	LTE B25	20	8590	1985	4x4	24.24	24.15

J.3.9 LTE Band 30 as PCC

Table J-21
Maximum Output Powers

Combination	PCC Band	PCC										SCC 1				SCC 2				SCC 3				SCC 4				SCC 5				SCC 6				Power	
		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 (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.	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled	LTE Single Carrier Tx Power (dBm)
CA_30A-[30A]	LTE B30	5	2710	2310	QPSK	1	0	1850	2310	4x4	LTE B30	20	8590	2310	4x4	LTE B30	20	8590	2310	4x4	LTE B30	20	8590	2310	4x4	LTE B30	20	8590	2310	4x4	LTE B30	20	8590	2310	4x4	23.00	23.00
CA_30A-[30A] (1)	LTE B30	5	2710	2310	QPSK	1	0	1850	2310	2x2	LTE B30	20	8590	2310	2x2	LTE B30	20	8590	2310	2x2	LTE B30	20	8590	2310	2x2	LTE B30	20	8590	2310	2x2	LTE B30	20	8590	2310	2x2	23.00	23.00
CA_[30A]-30A (1)	LTE B30	5	2710	2310	QPSK	1	0	1850	2310	4x4	LTE B30	20	8590	2310	4x4	LTE B30	20	8590	2310	4x4	LTE B30	20	8590	2310	4x4	LTE B30	20	8590	2310	4x4	LTE B30	20	8590	2310	4x4	23.00	23.00
CA_[30A]-[30A] (1)	LTE B30	5	2710	2310	QPSK	1	0	1850	2310	4x4	LTE B30	20	8590	2310	4x4	LTE B30	20	8590	2310	4x4	LTE B30	20	8590	2310	4x4	LTE B30	20	8590	2310	4x4	LTE B30	20	8590	2310	4x4	23.00	23.00

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J.4 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 ULCA active.

J.4.1 DL Carrier Aggregation RF Conducted Powers

Table J-24
Maximum Output Powers

Combination	PCC										SCC 1						SCC 2				Power			
	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Modulation	PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Modulation	PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	ULCA Tx Power with add'l CA config. active on DL (dBm)	ULCA Tx Power (dBm)
CA_41D	LTE B41	20	39750	2506	QPSK	1	99	39750	2506	LTE B41	20	39948	2525.8	QPSK	1	0	39948	2525.8	LTE B41	20	40146	2545.6	23.88	23.80

J.4.2 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 J-25
Maximum Output Powers

Combination	PCC										SCC						Power					
	PCC Band	PCC Bandwidth [MHz]	PCC [UL] Channel	PCC [UL] Frequency [MHz]	Modulation	PCC UL RB	PCC UL RB Offset	PCC [DL] Channel	PCC [DL] Frequency [MHz]	DL Ant. Config.	SCC Band	SCC Bandwidth [MHz]	SCC [UL] Channel	SCC [UL] Frequency [MHz]	Modulation	PCC UL RB	PCC UL RB Offset	PCC [DL] Channel	PCC [DL] Frequency [MHz]	DL Ant. Config.	ULCA Tx Power with add'l CA config. active on DL (dBm)	ULCA Tx Power (dBm)
CA_41C (1)	LTE B41	20	39750	2506	QPSK	1	99	39750	2506	4x4	LTE B41	20	39948	2525.8	QPSK	1	0	39948	2525.8	4x4	23.80	23.80
CA_48C	LTE B48	20	56207	3646.7	QPSK	1	99	56207	3646.7	4x4	LTE B48	20	56405	3666.5	QPSK	1	0	56405	3666.5	4x4	19.00	19.00
CA_66B	LTE B66	10	132622	1775	QPSK	1	0	67086	2175	4x4	LTE B66	10	132523	1765.1	QPSK	1	49	66987	2165.1	4x4	24.00	24.00
CA_66C	LTE B66	20	132572	1770	QPSK	1	0	67036	2170	4x4	LTE B66	20	132374	1750.2	QPSK	1	99	66838	2150.2	4x4	23.79	23.79

Table J-26
Maximum Output Powers

Combination	PCC										SCC 1						SCC 2				Power						
	PCC Band	PCC Bandwidth [MHz]	PCC [UL] Channel	PCC [UL] Frequency [MHz]	Modulation	PCC UL RB	PCC UL RB Offset	PCC [DL] Channel	PCC [DL] Frequency [MHz]	DL Ant. Config.	SCC Band	SCC Bandwidth [MHz]	PCC [UL] Channel	PCC [UL] Frequency [MHz]	Modulation	PCC UL RB	PCC UL RB Offset	SCC [DL] Channel	SCC [DL] Frequency [MHz]	DL Ant. Config.	SCC Band	SCC Bandwidth [MHz]	SCC [DL] Channel	SCC [DL] Frequency [MHz]	DL Ant. Config.	ULCA Tx Power with add'l CA config. active on DL (dBm)	ULCA Tx Power (dBm)
CA_41D	LTE B41	20	39750	2506	QPSK	1	99	39750	2506	4x4	LTE B41	20	39948	2525.8	QPSK	1	0	39948	2525.8	4x4	LTE B41	20	40146	2545.6	4x4	23.70	23.80

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