APPENDIX H: LTE DOWNLINK CA RF CONDUCTED POWERS

LTE Downlink Only Carrier Aggregation Test Reduction Methodology

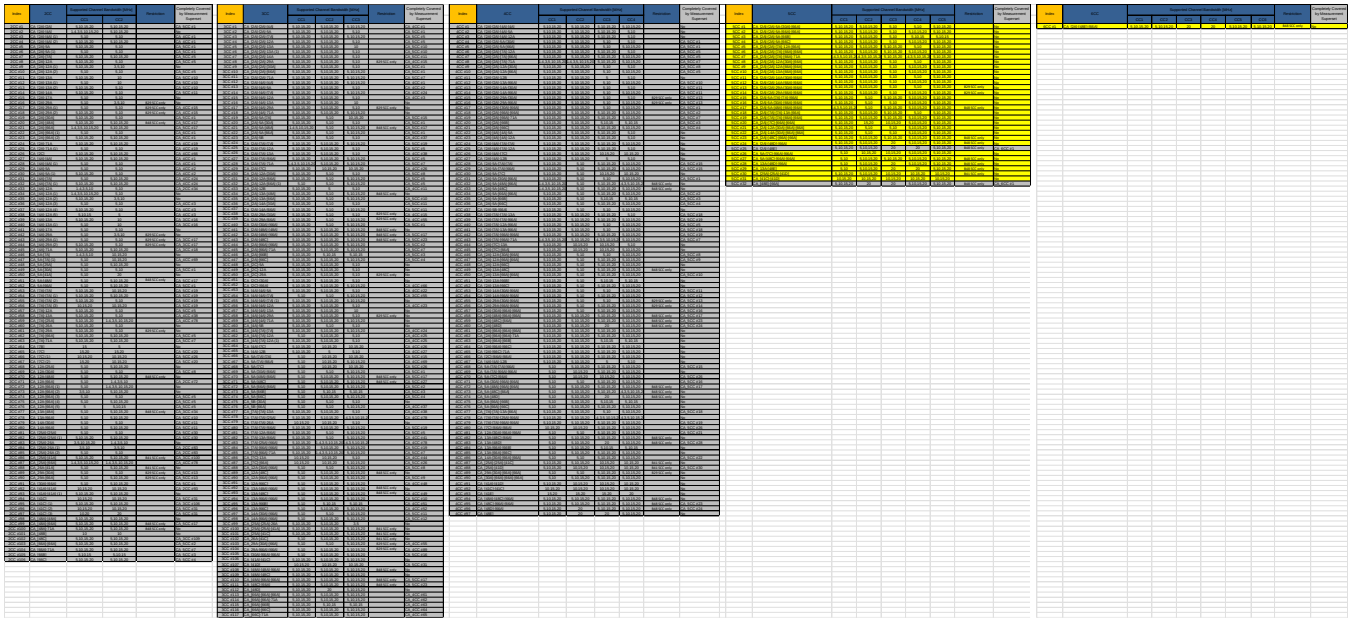
Per October 2024 TCBC Workshop Notes, the use of Carrier Aggregation (CA, hereafter) requires ensuring that the applicable rules are met in each portion of the spectrum that is used by each component carrier. CA can be applied to both transmissions, or uplink (UL) from the device under test perspective and reception, or downlink (DL). For FCC compliance, only UL operations are relevant. It is possible that in some cases the DL impacts the available options for UL. Therefore, spot-check conducted power measurements will be evaluated.

SAR test exclusion for LTE downlink Carrier Aggregation is determined by power measurements according to the number of component carriers (CCs) supported by the product implementation. Per April 2018 TCBC Workshop Notes, the following test reduction methodology was applied to determine the combinations required for conducted power measurements.

LTE DLCA Test Reduction Methodology:

- The supported combinations were arranged by the number of component carriers in columns.
- Any limitations on the PCC or SCC for each combination were identified alongside the combination (e.g. CA_2A-2A-4A-12A, but B12 can only be configured as a SCC).
- Power measurements were performed for "supersets" (LTE CA combinations with multiple components carriers) and any "subsets" (LTE CA combinations with fewer component carriers) that were not completely covered by the supersets.
- Only subsets that have the exact same components as a superset were excluded for measurement.
- When there were certain restrictions on component carriers that existed in the superset that were not applied for the subset, the subset configuration was additionally evaluated.
- Both inter-band and intra-band downlink carrier aggregation scenarios were considered.
- Downlink CA combinations for 4x4 Downlink MIMO operations were measured and represent the worst-case to cover all SISO configurations with the same bands and component carriers.
- Evaluate MIMO combinations with the maximum number of frequency bands, component carriers, and largest aggregated bandwidth to represent worst-case scenarios for spot-check measurements.

Table H-1 – Exclusion Table for MIMO Configurations for Spot-check Measurements



Note: [CC] indicates component carrier with 4x4 DL MIMO antenna configuration

H.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 the RF Conducted Powers Section and LTE/NR Lower Bandwidth RF Conducted Power Appendix. The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation.
- To maximize aggregated bandwidth, the 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.

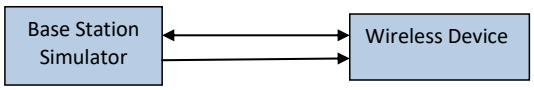


Figure H-1
DL CA Power Measurement Setup

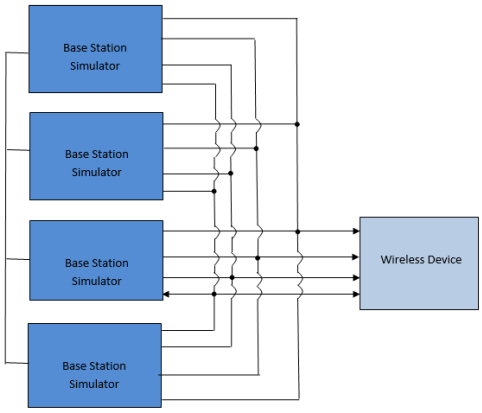


Figure H-2
DL CA with DL 4x4 MIMO Power Measurement Setup

H.2 Downlink Carrier Aggregation RF Conducted Powers

H.2.1 LTE Band 71 as PCC

Table H-2
Maximum Output Powers

	PCC										SCC 1					SCC 2					SCC 3					SCC 4					Power	
Combination	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 (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}-{7A}-{66A}-71A	LTE B71	5	133147	665.5	16QAM	1	12	68611	619.5	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	20.74	21.22

H.2.2 LTE Band 12 as PCC

Table H-3
Maximum Output Powers

	PCC										SCC 1					SCC 2					SCC 3					SCC 4					Power	
Combination	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 (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}-{7A}-12A-{66A}	LTE B12	5	23095	707.5	64QAM	1	0	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	18.74	19.39
CA_{2A}-{2A}-12A-{30A}-{66A}	LTE B12	5	23095	707.5	64QAM	1	0	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B30	10	9820	2355	4x4	LTE B66	20	66786	2145	4x4	18.85	19.39
CA_{2A}-{2A}-12A-{66A}-{66A}	LTE B12	5	23095	707.5	64QAM	1	0	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	18.87	19.39
CA_{2A}-12A-{30A}-{66A}-{66A}	LTE B12	5	23095	707.5	64QAM	1	0	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B30	10	9820	2355	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	18.98	19.39

H.2.3 LTE Band 13 as PCC

Table H-4
Maximum Output Powers

	PCC										SCC 1					SCC 2					SCC 3					SCC 4					Power	
Combination	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 (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}-13A-{66A}-{66A}	LTE B13	10	23230	782	64QAM	1	0	5230	751	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	17.89	18.37
CA_{2A}-{7A}-{7A}-13A-{66A}	LTE B13	10	23230	782	64QAM	1	0	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B7	20	2850	2630	4x4	LTE B7	20	3100	2655	4x4	LTE B66	20	66536	2120	4x4	17.87	18.37
CA_13A-{48D}-{66A}	LTE B13	10	23230	782	64QAM	1	0	5230	751	2x2	LTE B48	20	55990	3625	4x4	LTE B48	20	56188	3644.8	4x4	LTE B48	20	56386	3664.6	4x4	LTE B66	20	66786	2145	4x4	17.63	18.37
CA_13A-{48E}	LTE B13	10	23230	782	64QAM	1	0	5230	751	2x2	LTE B48	20	55990	3625	4x4	LTE B48	20	56188	3644.8	4x4	LTE B48	20	56386	3664.6	4x4	LTE B48	20	56584	3684.4	4x4	17.43	18.37

H.2.4 LTE Band 14 as PCC

Table H-5
Maximum Output Powers

	PCC										SCC 1					SCC 2					SCC 3					SCC 4					Power	
Combination	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 (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}-{66A}	LTE B14	5	23330	793	16QAM	1	12	5330	763	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B30	10	9820	2355	4x4	LTE B66	20	66786	2145	4x4	17.88	18.30
CA_{2A}-{2A}-14A-{66A}-{66A}	LTE B14	5	23330	793	16QAM	1	12	5330	763	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	17.71	18.30
CA_{2A}-14A-{30A}-{66A}-{66A}	LTE B14	5	23330	793	16QAM	1	12	5330	763	2x2	LTE B2	20	900	1960	4x4	LTE B30	10	9820	2355	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	17.52	18.30

H.2.5 LTE Band 5 as PCC

Table H-6
Maximum Output Powers

	PCC										SCC 1					SCC 2					SCC 3					SCC 4					Power	
Combination	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 (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}-{2A}-5A-{30A}-{66A}	LTE B5	5	20425	826.5	16QAM	1	12	2425	871.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B30	10	9820	2355	4x4	LTE B66	20	66786	2145	4x4	18.02	18.60
CA_{2A}-{2A}-5A-{66A}-{66A}	LTE B5	5	20425	826.5	16QAM	1	12	2425	871.5	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	17.98	18.60
CA_{2A}-{2A}-5A-{66B}	LTE B5	5	20425	826.5	16QAM	1	12	2425	871.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B66	15	66796	2145	4x4	LTE B66	5	66879	2154.3	4x4	18.70	18.60
CA_{2A}-{2A}-5A-{66C}	LTE B5	5	20425	826.5	16QAM	1	12	2425	871.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	66984	2164.8	4x4	18.75	18.60
CA_{2A}-5A-{7A}-{7A}-{66A}	LTE B5	5	20425	826.5	16QAM	1	12	2425	871.5	2x2	LTE B7	20	2850	2630	4x4	LTE B2	20	900	1960	4x4	LTE B7	20	3152	2660.2	4x4	LTE B66	20	66536	2120	4x4	17.99	18.60
CA_{2A}-5A-{30A}-{66A}-{66A}	LTE B5	5	20425	826.5	16QAM	1	12	2425	871.5	2x2	LTE B2	20	900	1960	4x4	LTE B30	10	9820	2355	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	18.18	18.60
CA_{2A}-5A-{48A}-{66A}-{66A}	LTE B5	5	20425	826.5	16QAM	1	12	2425	871.5	2x2	LTE B2	20	900	1960	4x4	LTE B48	20	55990	3625	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	18.22	18.60
CA_5A-{7C}-{66A}-{66A}	LTE B5	5	20425	826.5	16QAM	1	12	2425	871.5	2x2	LTE B7	20	3100	2655	4x4	LTE B7	20	2902	2635.2	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	17.96	18.60
CA_5A-{48C}-{66A}-{66A}	LTE B5	5	20425	826.5	16QAM	1	12	2425	871.5	2x2	LTE B48	20	55990	3625	4x4	LTE B48	20	56188	3644.8	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	18.17	18.60

H.2.6 LTE Band 66 as PCC

Table H-7
Maximum Output Powers

	PCC										SCC 1					SCC 2					SCC 3					SCC 4					SCC 5					Power	
Combination	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 (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 (dBm)	LTE Single Carrier Tx Power (dBm)
CA_[2A]-[2A]-SA-[30A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B5	10	2525	881.5	2x2	LTE B30	10	9820	2355	4x4	-	-	-	-	-	13.79	14.45
CA_[2A]-[2A]-SA-[66A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	67236	2190	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B5	10	2525	881.5	2x2	-	-	-	-	-	13.99	14.45
CA_[2A]-[2A]-SA-[66B]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	15	66554	2121.8	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B5	10	2525	881.5	2x2	-	-	-	-	-	13.95	14.45
CA_[2A]-[2A]-SA-[66C]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	66578	2124.2	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B5	10	2525	881.5	2x2	-	-	-	-	-	14.02	14.45
CA_[2A]-[2A]-[7A]-12A-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B7	20	3100	2655	4x4	LTE B12	10	5095	737.5	2x2	-	-	-	-	-	14.03	14.45
CA_[2A]-[2A]-[7A]-[66A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B7	20	3100	2655	4x4	LTE B66	20	66538	2120	4x4	-	-	-	-	-	14.61	14.45
CA_[2A]-[2A]-[7A]-[66A]-71A	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B7	20	3100	2655	4x4	LTE B71	20	68761	634.5	2x2	-	-	-	-	-	13.97	14.45
CA_[2A]-[2A]-12A-[30A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B12	10	5095	737.5	2x2	LTE B30	10	9820	2355	4x4	-	-	-	-	-	13.80	14.45
CA_[2A]-[2A]-12A-29A-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	67236	2190	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B12	10	5095	737.5	2x2	-	-	-	-	-	14.07	14.45
CA_[2A]-[2A]-13A-29A-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	67236	2190	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B13	10	5230	751	2x2	-	-	-	-	-	14.00	14.45
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B14	10	5330	763	2x2	LTE B30	10	9820	2355	4x4	-	-	-	-	-	13.81	14.45
CA_[2A]-[2A]-14A-29A-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	67236	2190	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B14	10	5330	763	2x2	-	-	-	-	-	14.05	14.45
CA_[2A]-[2A]-29A-[30A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B29	10	9715	722.5	2x2	LTE B30	10	9820	2355	4x4	-	-	-	-	-	13.91	14.45
CA_[2A]-[2A]-29A-[66A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B29	10	9715	722.5	4x4	LTE B66	20	66538	2120	4x4	-	-	-	-	-	13.95	14.45
CA_[2A]-5A-[7A]-[7A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B2	20	900	1960	4x4	LTE B5	10	2525	881.5	2x2	LTE B7	20	3100	2655	4x4	LTE B7	20	2850	2630	4x4	-	-	-	-	-	13.94	14.45
CA_[2A]-5A-[30A]-[66A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	67236	2190	4x4	LTE B2	20	900	1960	4x4	LTE B5	10	2525	881.5	2x2	LTE B30	10	9820	2355	4x4	-	-	-	-	-	13.90	14.45
CA_[2A]-5A-14A-[66A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	67236	2190	4x4	LTE B2	20	900	1960	4x4	LTE B5	10	2525	881.5	2x2	LTE B48	20	55990	3625	4x4	-	-	-	-	-	14.08	14.45
CA_[2A]-[7A]-[7A]-13A-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B13	10	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B7	20	3100	2655	4x4	LTE B7	20	2850	2630	4x4	-	-	-	-	-	14.01	14.45
CA_[2A]-[7A]-[7A]-[66A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	67236	2190	4x4	LTE B2	20	900	1960	4x4	LTE B7	20	3100	2655	4x4	LTE B7	20	2850	2630	4x4	-	-	-	-	-	14.06	14.45
CA_[2A]-[7C]-[66A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	67236	2190	4x4	LTE B2	20	900	1960	4x4	LTE B7	20	3100	2655	4x4	LTE B7	20	2902	2635.2	4x4	-	-	-	-	-	14.09	14.45
CA_[2A]-12A-[30A]-[66A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	67236	2190	4x4	LTE B2	20	900	1960	4x4	LTE B12	10	5095	737.5	2x2	LTE B30	10	9820	2355	4x4	-	-	-	-	-	13.81	14.45
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	67236	2190	4x4	LTE B2	20	900	1960	4x4	LTE B14	10	5330	763	2x2	LTE B30	10	9820	2355	4x4	-	-	-	-	-	13.83	14.45
CA_[2A]-[48C]-[66A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	67236	2190	4x4	LTE B2	20	900	1960	4x4	LTE B48	20	55990	3625	2x2	LTE B48	20	56188	3644.8	2x2	-	-	-	-	-	13.95	14.45
CA_[2A]-[48D]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B2	20	900	1960	4x4	LTE B48	20	55990	3625	4x4	LTE B48	20	56188	3644.8	4x4	LTE B48	20	56386	3664.6	4x4	-	-	-	-	-	13.86	14.45
CA_5A-[7C]-[66A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B66	20	67236	2190	4x4	LTE B5	10	2525	881.5	2x2	LTE B7	20	3100	2655	4x4	LTE B7	20	2902	2635.2	4x4	-	-	-	-	-	14.25	14.45
CA_5A-[48C]-[66A]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	2x2	LTE B66	20	67236	2190	4x4	LTE B5	10	2525	881.5	4x4	LTE B48	20	55990	3625	4x4	LTE B48	20	56188	3644.8	4x4	-	-	-	-	-	13.89	14.45
CA_13A-[48D]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B13	10	5230	751	2x2	LTE B48	20	55990	3625	4x4	LTE B48	20	56188	3644.8	4x4	LTE B48	20	56386	3664.6	4x4	-	-	-	-	-	13.87	14.45
CA_[2A]-[48E]-[66A]	LTE B66	5	131997	1712.5	16QAM	1	12	66461	2112.5	4x4	LTE B2	20	900	1960	4x4	LTE B48	20	55990	3625	4x4	LTE B48	20	56188	3644.8	4x4	LTE B48	20	56386	3664.6	4x4	LTE B48	20	55792	3605.2	4x4	14.44	14.45

H.2.7 LTE Band 25 as PCC

Table H-8
Maximum Output Powers

	PCC									SCC 1					SCC 2					SCC 3					SCC 4					Power	
Combination	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 (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_[25A]-[25A]-[41D]	LTE B25	5	26065	1852.5	64QAM	1	12	8065	1932.5	4x4	LTE B25	20	8590	1985	4x4	LTE B41	20	40422	2573.2	4x4	LTE B41	20	40620	2593	4x4	LTE B41	20	40818	2612.8	4x4	13.54	14.28

H.2.8 LTE Band 30 as PCC

Table H-9
Maximum Output Powers

	PCC									SCC 1					SCC 2					SCC 3					SCC 4					Power	
Combination	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 (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]-SA-[30A]-[66A]	LTE B30	10	27710	2310	16QAM	1	0	9820	2355	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B5	10	2525	881.5	2x2	LTE B66	20	66786	2145	4x4	13.42	13.54
CA_[2A]-[2A]-12A-[30A]-[66A]	LTE B30	10	27710	2310	16QAM	1	0	9820	2355	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B12	10	5095	737.5	2x2	LTE B66	20	66786	2145	4x4	13.35	13.54
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B30	10	27710	2310	16QAM	1	0	9820	2355	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B14	10	5330	763	2x2	LTE B66	20	66786	2145	4x4	13.41	13.54
CA_[2A]-[2A]-29A-[30A]-[66A]	LTE B30	10	27710	2310	16QAM	1	0	9820	2355	4x4	LTE B2	20	900	1960	4x4	LTE B29	10	9715	722.5	2x2	LTE B5	10	2525	881.5	4x4	LTE B66	20	66786	2145	4x4	13.44	13.54
CA_[2A]-5A-[30A]-[66A]-[66A]	LTE B30	10	27710	2310	16QAM	1	0	9820	2355	4x4	LTE B2	20	900	1960	4x4	LTE B5	10	2525	881.5	2x2	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	13.39	13.54
CA_[2A]-12A-[30A]-[66A]-[66A]	LTE B30	10	27710	2310	16QAM	1	0	9820	2355	4x4	LTE B2	20	900	1960	4x4	LTE B12	10	5095	737.5	2x2	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	13.40	13.54
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B30	10	27710	2310	16QAM	1	0	9820	2355	4x4	LTE B2	20	900	1960	4x4	LTE B14	10	5330	763	2x2	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	13.45	13.54

H.2.9 LTE Band 7 as PCC

Table H-10
Maximum Output Powers

	PCC									SCC 1					SCC 2					SCC 3					SCC 4					Power	
Combination	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 (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]-[7A]-12A-[66A]	LTE B7	10	21100	2535	256QAM	1	25	3100	2655	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B12	10	5095	737.5	2x2	LTE B66	20	66786	2145	4x4	12.80	12.83
CA_[2A]-[2A]-[7A]-[66A]-[66A]	LTE B7	10	21100	2535	256QAM	1	25	3100	2655	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B66	20	67236	2190	4x4	LTE B66	20	66786	2145	4x4	12.79	12.83
CA_[2A]-5A-[7A]-[7A]-[66A]	LTE B7	10	21100	2535	256QAM	1	25	3100	2655	4x4	LTE B2	20	900	1960	4x4	LTE B5	10	2525	881.5	2x2	LTE B7	20	3100	2655	4x4	LTE B66	20	66786	2145	4x4	12.86	12.83
CA_[2A]-[7A]-[7A]-13A-[66A]	LTE B7	10	21100	2535	256QAM	1	25	3100	2655	4x4	LTE B7	20	2850	2630	4x4	LTE B2	20	900	1960	4x4	LTE B13	20	5230	751	2x2	LTE B66	20	67236	2190	4x4	12.75	12.83
CA_[2A]-[7A]-[7A]-[66A]-[66A]	LTE B7	10	21100	2535	256QAM	1	25	3100	2655	4x4	LTE B7	20	2850	2630	4x4	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	12.74	12.83
CA_[2A]-[7C]-[66A]-[66A]	LTE B7	10	21100	2535	256QAM	1	25	3100	2655	4x4	LTE B7	20	2956	2640.6	4x4	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	12.85	12.83
CA_5A-[7C]-[66A]-[66A]	LTE B7	10	21100	2535	256QAM	1	25	3100	2655	4x4	LTE B7	20	2956	2640.6	4x4	LTE B5	10	2525	881.5	2x2	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	12.84	12.83

H.2.10 LTE Band 41 as PCC

Table H-11
Maximum Output Powers

	PCC									SCC 1					SCC 2					SCC 3					SCC 4					Power	
Combination	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 (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_[41C]-[41D]	LTE B41	10	39740	2505	QPSK	25	12	39740	2505	4x4	LTE B41	20	39884	2519.4	4x4	LTE B41	20	41094	2640.4	4x4	LTE B41	20	41292	2660.2	4x4	LTE B41	20	41490	2680	4x4	15.57	15.58
CA_[41D]-[41C]	LTE B41	10	39740	2505	QPSK	25	12	39740	2505	4x4	LTE B41	20	39884	2519.4	4x4	LTE B41	20	40062	2538.2	4x4	LTE B41	20	41292	2660.2	4x4	LTE B41	20	41490	2680	4x4	15.56	15.58

H.3 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.

H.3.1 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 H-12
Maximum Output Powers

	PCC										SCC 1										Power	
Combination	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	ULCA Tx Power (dBm)
CA_[7C]	LTE B7	20	20850	2510	QPSK	1	99	2850	2630	4x4	LTE B7	20	21048	2529.8	QPSK	1	0	3048	2649.8	4x4	12.76	12.76

Table H-13
Maximum Output Powers

	PCC										SCC 1										SCC 2					SCC 3					SCC 4					Power	
Combination	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.	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	41490	2680	QPSK	1	0	41490	2680	4x4	LTE B41	20	41292	2660.2	QPSK	1	99	41292	2660.2	4x4	LTE B41	20	41094	2640.4	4x4	-	-	-	-	-	-	-	-	-	-	-	13.84	13.89
CA_41D-41A	LTE B41	20	41490	2680	QPSK	1	0	41490	2680	4x4	LTE B41	20	41292	2660.2	QPSK	1	99	41292	2660.2	4x4	LTE B41	20	41094	2640.4	4x4	LTE B41	20	40620	2593	4x4	-	-	-	-	-	-	13.85	13.89
CA_41C-41C	LTE B41	20	41490	2680	QPSK	1	0	41490	2680	4x4	LTE B41	20	41292	2660.2	QPSK	1	99	41292	2660.2	4x4	LTE B41	20	40620	2593	4x4	LTE B41	20	40818	2612.8	4x4	-	-	-	-	-	-	13.81	13.89
CA_41E	LTE B41	20	41490	2680	QPSK	1	0	41490	2680	4x4	LTE B41	20	41292	2660.2	QPSK	1	99	41292	2660.2	4x4	LTE B41	20	41094	2640.4	4x4	LTE B41	20	40806	2620.6	4x4	-	-	-	-	-	-	13.88	13.89
CA_41C-41D	LTE B41	20	41490	2680	QPSK	1	0	41490	2680	4x4	LTE B41	20	41292	2660.2	QPSK	1	99	41292	2660.2	4x4	LTE B41	20	40620	2593	4x4	LTE B41	20	40818	2612.8	4x4	LTE B41	20	41018	2632.6	4x4	13.80	13.89
CA_41D-41C	LTE B41	20	41490	2680	QPSK	1	0	41490	2680	4x4	LTE B41	20	41292	2660.2	QPSK	1	99	41292	2660.2	4x4	LTE B41	20	41094	2640.4	4x4	LTE B41	20	40620	2593	4X4	LTE B41	20	40818	2573.2	4X4	13.85	13.89

Table H-14
Maximum Output Powers

	PCC										SCC 1										SCC 2					SCC 3					Power	
Combination	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.	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_48C	LTE B48	20	56640	3690	QPSK	50	0	56640	3690	4x4	LTE B48	20	56442	3670.2	QPSK	50	50	56442	3670.2	4x4	-	-	-	-	-	-	-	-	-	-	13.96	13.96
CA_48D	LTE B48	20	56640	3690	QPSK	50	0	56640	3690	4x4	LTE B48	20	56442	3670.2	QPSK	50	50	56442	3670.2	4x4	LTE B48	20	56244	3650.4	4x4	-	-	-	-	-	13.97	13.96
CA_48E	LTE B48	20	56640	3690	QPSK	50	0	56640	3690	4x4	LTE B48	20	56442	3670.2	QPSK	50	50	56442	3670.2	4x4	LTE B48	20	56244	3650.4	4x4	LTE B48	20	56046	3630.6	4x4	13.99	13.96

H.4 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.

H.4.1 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 H-15
Maximum Output Powers

		PCC										
	Combination	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.
CA_[2A]-[2A]-5A-[66A]-[66A]	CA_[2A]-[2A]-5A-[66A]-[66A]	LTE B5	10	20525	836.5	QPSK	1	25	2525	881.5	2x2
CA_[2A]-[2A]-14A-[30A]-[66A]	CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2
CA_[2A]-[2A]-14A-[30A]-[66A]	CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2
CA_[2A]-[2A]-14A-[30A]-[66A]	CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2
CA_[2A]-[2A]-14A-[30A]-[66A]	CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	4x4
CA_[2A]-[2A]-14A-[30A]-[66A]	CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B66	20	132322	1745	QPSK	1	50	66786	2145	4x4
CA_[2A]-[2A]-14A-[66A]-[66A]	CA_[2A]-[2A]-14A-[66A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2
CA_[2A]-[2A]-14A-[66A]-[66A]	CA_[2A]-[2A]-14A-[66A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2
CA_[2A]-[2A]-14A-[66A]-[66A]	CA_[2A]-[2A]-14A-[66A]-[66A]	LTE B66	20	132322	1745	QPSK	1	50	66786	2145	4x4
CA_[2A]-14A-[30A]-[66A]-[66A]	CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2
CA_[2A]-14A-[30A]-[66A]-[66A]	CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2
CA_[2A]-14A-[30A]-[66A]-[66A]	CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2
CA_[2A]-14A-[30A]-[66A]-[66A]	CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	4x4
CA_[2A]-14A-[30A]-[66A]-[66A]	CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B66	20	132322	1745	QPSK	1	50	66786	2145	4x4

	SCC 1									
	SCC Band	SCC Bandwidth [MHz]	SCC (UL) Ch.	SCC (UL) Freq. [MHz]	Modulation	SCC UL# RB	SCC UL RB Offset	SCC (DL) Channel	SCC (DL) Frequency [MHz]	DL Ant. Config.
CA_[2A]-[2A]-5A-[66A]-[66A]	LTE B2	20	18900	1880	QPSK	1	50	900	1960	4x4
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B2	20	18900	1880	QPSK	1	50	900	1960	4x4
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	4x4
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B66	20	132322	1745	QPSK	1	50	66786	2145	4x4
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2
CA_[2A]-[2A]-14A-[66A]-[66A]	LTE B2	20	18900	1880	QPSK	1	50	900	1960	4x4
CA_[2A]-[2A]-14A-[66A]-[66A]	LTE B66	20	132322	1745	QPSK	1	50	66786	2145	4x4
CA_[2A]-[2A]-14A-[66A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B2	20	18900	1880	QPSK	1	50	900	1960	4x4
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	4x4
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B66	20	132322	1745	QPSK	1	50	66786	2145	4x4
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B14	10	23330	793	QPSK	1	25	5330	793	2x2

	SCC 2					SCC 3				
	SCC Band	SCC Bandwidth [MHz]	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.
CA_[2A]-[2A]-5A-[66A]-[66A]	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	4x4
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B2	20	700	1940	4x4	LTE B30	10	9820	2355	4x4
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4
CA_[2A]-[2A]-14A-[66A]-[66A]	LTE B2	20	700	1940	4x4	LTE B66	20	66786	2145	4x4
CA_[2A]-[2A]-14A-[66A]-[66A]	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4
CA_[2A]-[2A]-14A-[66A]-[66A]	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B30	10	9820	2355	4x4	LTE B66	20	66786	2145	4x4
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	4x4
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B2	20	900	1960	4x4	LTE B30	10	9820	2355	4x4
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B2	20	900	1960	4x4	LTE B66	20	66786	2145	4x4
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B2	20	900	1960	4x4	LTE B30	10	9820	2355	4x4

	SCC 4					Antenna		Power					
	SCC Band	SCC Bandwidth [MHz]	SCC (DL) Channel	SCC (DL) Frequency [MHz]	DL Ant. Config.	PCC Ant	SCC Ant	Interband ULCA Tx.Power with add'l DL CA active (dBm)		LTE Interband ULCA Tx Power (dBm)			
								PCC	SCC	PCC	PCC Target	SCC	SCC Target
CA_[2A]-[2A]-5A-[66A]-[66A]	LTE B66	20	67236	2190	4x4	4	3a	18.07	13.76	18.06	18.00	13.78	13.80
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B66	20	66786	2145	4x4	4	3a	17.57	13.75	17.65	18.20	13.78	13.80
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B66	20	66786	2145	4x4	4	2b	17.75	13.31	17.65	18.20	13.25	13.20
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B30	10	9820	2355	4x4	4	3a	17.65	12.83	17.65	18.20	12.82	12.80
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B66	20	66786	2145	4x4	2b	4	13.33	17.71	13.25	13.20	17.65	18.20
CA_[2A]-[2A]-14A-[30A]-[66A]	LTE B30	10	9820	2355	4x4	4	3b	13.65	16.57	13.73	14.20	16.58	16.50
CA_[2A]-[2A]-14A-[66A]-[66A]	LTE B66	20	67236	2190	4x4	4	3a	17.69	13.72	17.65	18.20	13.78	13.80
CA_[2A]-[2A]-14A-[66A]-[66A]	LTE B66	20	67236	2190	4x4	4	3a	17.62	12.79	17.65	18.20	12.82	12.80
CA_[2A]-[2A]-14A-[66A]-[66A]	LTE B66	20	67236	2190	4x4	4	3b	13.58	16.55	13.73	14.20	16.58	16.50
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B66	20	67236	2190	4x4	4	3a	17.66	13.83	17.65	18.20	13.78	13.80
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B66	20	67236	2190	4x4	4	2b	17.77	13.23	17.65	18.20	13.25	13.20
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B66	20	67236	2190	4x4	4	3a	17.69	12.81	17.65	18.20	12.82	12.80
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B66	20	67236	2190	4x4	2b	4	13.35	17.70	13.25	13.20	17.65	18.20
CA_[2A]-14A-[30A]-[66A]-[66A]	LTE B66	20	67236	2190	4x4	4	3b	13.61	16.56	13.73	14.20	16.58	16.50