

APPENDIX J: LTE DOWNLINK ONLY CARRIER AGGREGATION TEST REDUCTION METHODOLOGY

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 SISO and 4x4 Downlink MIMO operations were measured independently, per May 2017 TCBC Workshop notes.

Table J-1 – Example of Exclusion Table for SISO Configurations

Index	ZCC	Supported Channel Bandwidth (MHz)	Restriction	Completely Covered by Measurement Superset	Index	ZCC	Supported Channel Bandwidth (MHz)	Restriction	Completely Covered by Measurement Superset	Index	ZCC	Supported Channel Bandwidth (MHz)	Restriction	Completely Covered by Measurement Superset
CCC#01	CA_2A	5, 10, 15, 20		Yes	CCC#01	CA_2A-2A-4A	5, 10, 15, 20		Yes	CCC#01	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#02	CA_2A-4A	5, 10, 15, 20		Yes	CCC#02	CA_2A-2A-8A	5, 10, 15, 20		Yes	CCC#02	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#03	CA_2A-8A	5, 10, 15, 20		Yes	CCC#03	CA_2A-2A-12A	5, 10, 15, 20		Yes	CCC#03	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#04	CA_2A-12A	5, 10, 15, 20		Yes	CCC#04	CA_2A-4A-8A	5, 10, 15, 20		Yes	CCC#04	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#05	CA_2A-16A	5, 10, 15, 20		Yes	CCC#05	CA_2A-4A-12A	5, 10, 15, 20		Yes	CCC#05	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#06	CA_2A-20A	5, 10, 15, 20		Yes	CCC#06	CA_2A-8A-12A	5, 10, 15, 20		Yes	CCC#06	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#07	CA_2A-24A	5, 10, 15, 20		Yes	CCC#07	CA_2A-12A-16A	5, 10, 15, 20		Yes	CCC#07	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#08	CA_2A-28A	5, 10, 15, 20		Yes	CCC#08	CA_2A-16A-20A	5, 10, 15, 20		Yes	CCC#08	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#09	CA_2A-32A	5, 10, 15, 20		Yes	CCC#09	CA_2A-20A-24A	5, 10, 15, 20		Yes	CCC#09	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#10	CA_2A-36A	5, 10, 15, 20		Yes	CCC#10	CA_2A-24A-28A	5, 10, 15, 20		Yes	CCC#10	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#11	CA_2A-40A	5, 10, 15, 20		Yes	CCC#11	CA_2A-28A-32A	5, 10, 15, 20		Yes	CCC#11	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#12	CA_2A-44A	5, 10, 15, 20		Yes	CCC#12	CA_2A-32A-36A	5, 10, 15, 20		Yes	CCC#12	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#13	CA_2A-48A	5, 10, 15, 20		Yes	CCC#13	CA_2A-36A-40A	5, 10, 15, 20		Yes	CCC#13	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#14	CA_2A-52A	5, 10, 15, 20		Yes	CCC#14	CA_2A-40A-44A	5, 10, 15, 20		Yes	CCC#14	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#15	CA_2A-56A	5, 10, 15, 20		Yes	CCC#15	CA_2A-44A-48A	5, 10, 15, 20		Yes	CCC#15	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#16	CA_2A-60A	5, 10, 15, 20		Yes	CCC#16	CA_2A-48A-52A	5, 10, 15, 20		Yes	CCC#16	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#17	CA_2A-64A	5, 10, 15, 20		Yes	CCC#17	CA_2A-52A-56A	5, 10, 15, 20		Yes	CCC#17	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#18	CA_2A-68A	5, 10, 15, 20		Yes	CCC#18	CA_2A-56A-60A	5, 10, 15, 20		Yes	CCC#18	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#19	CA_2A-72A	5, 10, 15, 20		Yes	CCC#19	CA_2A-60A-64A	5, 10, 15, 20		Yes	CCC#19	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#20	CA_2A-76A	5, 10, 15, 20		Yes	CCC#20	CA_2A-64A-68A	5, 10, 15, 20		Yes	CCC#20	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#21	CA_2A-80A	5, 10, 15, 20		Yes	CCC#21	CA_2A-68A-72A	5, 10, 15, 20		Yes	CCC#21	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#22	CA_2A-84A	5, 10, 15, 20		Yes	CCC#22	CA_2A-72A-76A	5, 10, 15, 20		Yes	CCC#22	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#23	CA_2A-88A	5, 10, 15, 20		Yes	CCC#23	CA_2A-76A-80A	5, 10, 15, 20		Yes	CCC#23	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#24	CA_2A-92A	5, 10, 15, 20		Yes	CCC#24	CA_2A-80A-84A	5, 10, 15, 20		Yes	CCC#24	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#25	CA_2A-96A	5, 10, 15, 20		Yes	CCC#25	CA_2A-84A-88A	5, 10, 15, 20		Yes	CCC#25	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#26	CA_2A-100A	5, 10, 15, 20		Yes	CCC#26	CA_2A-88A-92A	5, 10, 15, 20		Yes	CCC#26	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#27	CA_2A-104A	5, 10, 15, 20		Yes	CCC#27	CA_2A-92A-96A	5, 10, 15, 20		Yes	CCC#27	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#28	CA_2A-108A	5, 10, 15, 20		Yes	CCC#28	CA_2A-96A-100A	5, 10, 15, 20		Yes	CCC#28	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#29	CA_2A-112A	5, 10, 15, 20		Yes	CCC#29	CA_2A-100A-104A	5, 10, 15, 20		Yes	CCC#29	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#30	CA_2A-116A	5, 10, 15, 20		Yes	CCC#30	CA_2A-104A-108A	5, 10, 15, 20		Yes	CCC#30	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#31	CA_2A-120A	5, 10, 15, 20		Yes	CCC#31	CA_2A-108A-112A	5, 10, 15, 20		Yes	CCC#31	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#32	CA_2A-124A	5, 10, 15, 20		Yes	CCC#32	CA_2A-112A-116A	5, 10, 15, 20		Yes	CCC#32	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#33	CA_2A-128A	5, 10, 15, 20		Yes	CCC#33	CA_2A-116A-120A	5, 10, 15, 20		Yes	CCC#33	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#34	CA_2A-132A	5, 10, 15, 20		Yes	CCC#34	CA_2A-120A-124A	5, 10, 15, 20		Yes	CCC#34	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#35	CA_2A-136A	5, 10, 15, 20		Yes	CCC#35	CA_2A-124A-128A	5, 10, 15, 20		Yes	CCC#35	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#36	CA_2A-140A	5, 10, 15, 20		Yes	CCC#36	CA_2A-128A-132A	5, 10, 15, 20		Yes	CCC#36	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#37	CA_2A-144A	5, 10, 15, 20		Yes	CCC#37	CA_2A-132A-136A	5, 10, 15, 20		Yes	CCC#37	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#38	CA_2A-148A	5, 10, 15, 20		Yes	CCC#38	CA_2A-136A-140A	5, 10, 15, 20		Yes	CCC#38	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#39	CA_2A-152A	5, 10, 15, 20		Yes	CCC#39	CA_2A-140A-144A	5, 10, 15, 20		Yes	CCC#39	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#40	CA_2A-156A	5, 10, 15, 20		Yes	CCC#40	CA_2A-144A-148A	5, 10, 15, 20		Yes	CCC#40	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#41	CA_2A-160A	5, 10, 15, 20		Yes	CCC#41	CA_2A-148A-152A	5, 10, 15, 20		Yes	CCC#41	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#42	CA_2A-164A	5, 10, 15, 20		Yes	CCC#42	CA_2A-152A-156A	5, 10, 15, 20		Yes	CCC#42	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#43	CA_2A-168A	5, 10, 15, 20		Yes	CCC#43	CA_2A-156A-160A	5, 10, 15, 20		Yes	CCC#43	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#44	CA_2A-172A	5, 10, 15, 20		Yes	CCC#44	CA_2A-160A-164A	5, 10, 15, 20		Yes	CCC#44	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#45	CA_2A-176A	5, 10, 15, 20		Yes	CCC#45	CA_2A-164A-168A	5, 10, 15, 20		Yes	CCC#45	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#46	CA_2A-180A	5, 10, 15, 20		Yes	CCC#46	CA_2A-168A-172A	5, 10, 15, 20		Yes	CCC#46	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#47	CA_2A-184A	5, 10, 15, 20		Yes	CCC#47	CA_2A-172A-176A	5, 10, 15, 20		Yes	CCC#47	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#48	CA_2A-188A	5, 10, 15, 20		Yes	CCC#48	CA_2A-176A-180A	5, 10, 15, 20		Yes	CCC#48	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#49	CA_2A-192A	5, 10, 15, 20		Yes	CCC#49	CA_2A-180A-184A	5, 10, 15, 20		Yes	CCC#49	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#50	CA_2A-196A	5, 10, 15, 20		Yes	CCC#50	CA_2A-184A-188A	5, 10, 15, 20		Yes	CCC#50	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#51	CA_2A-200A	5, 10, 15, 20		Yes	CCC#51	CA_2A-188A-192A	5, 10, 15, 20		Yes	CCC#51	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#52	CA_2A-204A	5, 10, 15, 20		Yes	CCC#52	CA_2A-192A-196A	5, 10, 15, 20		Yes	CCC#52	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#53	CA_2A-208A	5, 10, 15, 20		Yes	CCC#53	CA_2A-196A-200A	5, 10, 15, 20		Yes	CCC#53	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#54	CA_2A-212A	5, 10, 15, 20		Yes	CCC#54	CA_2A-200A-204A	5, 10, 15, 20		Yes	CCC#54	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#55	CA_2A-216A	5, 10, 15, 20		Yes	CCC#55	CA_2A-204A-208A	5, 10, 15, 20		Yes	CCC#55	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#56	CA_2A-220A	5, 10, 15, 20		Yes	CCC#56	CA_2A-208A-212A	5, 10, 15, 20		Yes	CCC#56	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#57	CA_2A-224A	5, 10, 15, 20		Yes	CCC#57	CA_2A-212A-216A	5, 10, 15, 20		Yes	CCC#57	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#58	CA_2A-228A	5, 10, 15, 20		Yes	CCC#58	CA_2A-216A-220A	5, 10, 15, 20		Yes	CCC#58	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#59	CA_2A-232A	5, 10, 15, 20		Yes	CCC#59	CA_2A-220A-224A	5, 10, 15, 20		Yes	CCC#59	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#60	CA_2A-236A	5, 10, 15, 20		Yes	CCC#60	CA_2A-224A-228A	5, 10, 15, 20		Yes	CCC#60	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#61	CA_2A-240A	5, 10, 15, 20		Yes	CCC#61	CA_2A-228A-232A	5, 10, 15, 20		Yes	CCC#61	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#62	CA_2A-244A	5, 10, 15, 20		Yes	CCC#62	CA_2A-232A-236A	5, 10, 15, 20		Yes	CCC#62	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#63	CA_2A-248A	5, 10, 15, 20		Yes	CCC#63	CA_2A-236A-240A	5, 10, 15, 20		Yes	CCC#63	CA_2A-2A-4A-12A	5, 10, 15, 20		Yes
CCC#64	CA_2A-252A	5, 10, 15, 20		Yes	CCC#64	CA_2A-240A-244								

J.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.

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.

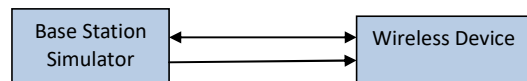




Figure J-1
DL CA Power Measurement Setup

FCC ID A3LSMS908U	 PCTEST <small>Proud to be part of element</small>	SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 09/21/21 – 12/06/21	DUT Type: Portable Handset			APPENDIX J: Page 2 of 15

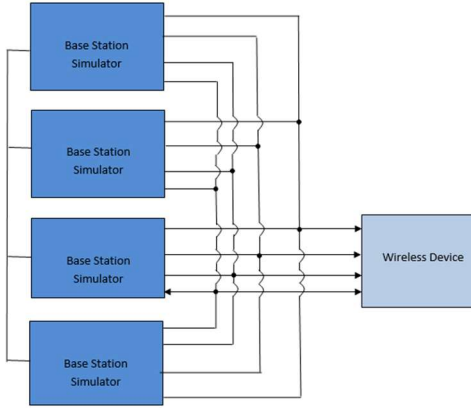


Figure J-2
DL CA with DL 4x4 MIMO Power Measurement Setup

J.2 Downlink Carrier Aggregation RF Conducted Powers

J.2.1 LTE Band 71 as PCC

Table J-3
Maximum Output Powers

Combination	PCC 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 1			SCC 2			SCC 3			Power				
										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-4A-71A	LTE B71	5	133147	665.5	QPSK	1	12	68611	619.5	LTE B4	20	2175	2132.5	LTE B4	10	2350	2130	-	-	-	-	25.23	25.21
CA 4B-4B-71A	LTE B71	5	133147	665.5	QPSK	1	12	68611	619.5	LTE B4B	20	55990	3625	LTE B4B	20	55940	3625	-	-	-	-	25.28	25.21
CA 4B-71A	LTE B71	5	133147	665.5	QPSK	1	12	68611	619.5	LTE B4B	20	55990	3625	LTE B4B	20	55188	3644.8	-	-	-	-	25.27	25.21
CA 2A-2A-4A-71A	LTE B71	5	133147	665.5	QPSK	1	12	68611	619.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	25.26	25.21
CA 2A-2A-6B-71A	LTE B71	5	133147	665.5	QPSK	1	12	68611	619.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6B	20	66786	2145	25.33	25.21
CA 2A-6B-6B-71A	LTE B71	5	133147	665.5	QPSK	1	12	68611	619.5	LTE B2	20	900	1960	LTE B6B	20	66786	2145	LTE B6B	20	67236	2190	25.34	25.21
CA 2A-6B-71A	LTE B71	5	133147	665.5	QPSK	1	12	68611	619.5	LTE B2	20	900	1960	LTE B6B	20	66786	2145	LTE B6B	20	66984	2164.8	25.35	25.21

J.2.2 LTE Band 12 as PCC

Table J-4
Maximum Output Powers

Combination	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 1			SCC 2			SCC 3			SCC 4			Power		
										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
CA 2A-12A (1)	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B2	20	900	1960	-	-	-	-	-	-	-	-	-	24.93	24.85
CA 4A-12A (1)	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	-	24.93	24.85
CA 4A-12A (2)	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B4B	20	55990	3625	-	-	-	-	-	-	-	-	-	24.87	24.85
CA 12A-6B	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B4B	20	55990	3625	-	-	-	-	-	-	-	-	-	24.98	24.85
CA 12A-4B	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B4B	20	55990	3625	-	-	-	-	-	-	-	-	-	24.86	24.85
CA 12A-6B (1)	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B6B	20	66786	2145	-	-	-	-	-	-	-	-	-	24.89	24.85
CA 12A-6B (2)	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B6B	20	66786	2145	-	-	-	-	-	-	-	-	-	24.82	24.85
CA 12A-6B	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B4B	20	55990	3625	LTE B4B	20	55188	3644.8	-	-	-	-	-	24.95	24.85
CA 2A-2A-12A	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	24.77	24.85	
CA 2A-4A-4A-12A	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B4	20	2350	2130	24.83	24.85	
CA 2A-4A-12B	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	-	-	-	-	-	24.89	24.85
CA 2A-12A-6B	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B2	20	900	1960	LTE B6B	20	66786	2145	LTE B6B	20	66884	2164.8	24.78	24.85	
CA 4A-4A-12B	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B4	20	2350	2130	24.91	24.85	
CA 12A-6B	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B6B	20	66786	2145	LTE B6B	20	66984	2164.8	-	-	-	-	-	24.95	24.85
CA 2A-2A-12A-30A-6B	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B30	10	66786	2145	24.76	24.85	
CA 2A-2A-12A-6B-6B	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6B	20	66786	2145	24.91	24.85	
CA 2A-2A-12B-6B	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6B	20	66786	2145	24.91	24.85	
CA 2A-12A-30A-6B-6B	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B2	20	900	1960	LTE B30	10	66786	2145	LTE B6B	20	67236	2190	24.91	24.85	
CA 2A-12B-6B-6B	LTE B12	5	23155	713.5	QPSK	1	12	6155	743.5	LTE B2	20	900	1960	LTE B6B	20	66786	2145	LTE B6B	20	67236	2190	24.91	24.85	

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J.2.6 LTE Band 66 as PCC

Table J-8 Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch. Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC 1												SCC 2												SCC 3												SCC 4												LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
									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]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]																						
CA 5A-5A (1)	LTE B50	5	2710	2310	QPSK	1	12	8620	1882.5	LTE B50	20	800	1960	LTE B50	20	700	1940	LTE B50	20	800	1960	LTE B50	20	700	1940	LTE B50	20	800	1960	LTE B50	20	700	1940	LTE B50	20	800	1960	LTE B50	20	700	1940	23.78	23.87															
CA 12A-25A	LTE B25	5	26365	2310	QPSK	1	12	8365	1882.5	LTE B25	20	800	1960	LTE B25	20	700	1940	LTE B25	20	800	1960	LTE B25	20	700	1940	LTE B25	20	800	1960	LTE B25	20	700	1940	LTE B25	20	800	1960	LTE B25	20	700	1940	23.75	23.87															
CA 25A-25A (1)	LTE B25	5	26365	2310	QPSK	1	12	8365	1882.5	LTE B25	20	800	1960	LTE B25	20	700	1940	LTE B25	20	800	1960	LTE B25	20	700	1940	LTE B25	20	800	1960	LTE B25	20	700	1940	LTE B25	20	800	1960	LTE B25	20	700	1940	23.86	23.87															

J.2.7 LTE Band 25 as PCC

Table J-9 Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch. Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC 1												LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
									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]		
CA 5A-25A	LTE B25	5	26365	1882.5	QPSK	1	12	8365	1962.5	LTE B5	10	2525	881.5	23.78	23.87							
CA 12A-25A	LTE B25	5	26365	1882.5	QPSK	1	12	8365	1962.5	LTE B12	10	5095	737.5	23.75	23.87							
CA 25A-25A (1)	LTE B25	5	26365	1882.5	QPSK	1	12	8365	1962.5	LTE B25	20	8140	1940	23.86	23.87							

J.2.8 LTE Band 30 as PCC

Table J-10 Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch. Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC 1												SCC 2												SCC 3												SCC 4												LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
									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]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]																						
CA 2A-25A-30A	LTE B30	5	27710	2310	QPSK	1	12	8620	2355	LTE B2	20	800	1960	LTE B2	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	22.22	22.54															
CA 2A-25A-30A-30A	LTE B30	5	27710	2310	QPSK	1	12	8620	2355	LTE B2	20	800	1960	LTE B2	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	22.28	22.54															
CA 25A-30A-30A	LTE B30	5	27710	2310	QPSK	1	12	8620	2355	LTE B29	10	9715	722.5	LTE B29	20	800	1960	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	22.38	22.54															
CA 2A-25A-30A-30A-30A	LTE B30	5	27710	2310	QPSK	1	12	8620	2355	LTE B2	20	800	1960	LTE B2	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	22.39	22.54															
CA 2A-25A-30A-30A-30A-30A	LTE B30	5	27710	2310	QPSK	1	12	8620	2355	LTE B2	20	800	1960	LTE B2	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	22.39	22.54															
CA 2A-25A-30A-30A-30A-30A-30A	LTE B30	5	27710	2310	QPSK	1	12	8620	2355	LTE B2	20	800	1960	LTE B2	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	22.44	22.54															
CA 2A-25A-30A-30A-30A-30A-30A-30A	LTE B30	5	27710	2310	QPSK	1	12	8620	2355	LTE B2	20	800	1960	LTE B2	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	22.44	22.54															
CA 2A-25A-30A-30A-30A-30A-30A-30A-30A	LTE B30	5	27710	2310	QPSK	1	12	8620	2355	LTE B2	20	800	1960	LTE B2	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	LTE B29	20	800	1960	LTE B29	20	700	1940	22.44	22.54															

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J.2.9 LTE Band 41 as PCC

Table J-11
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC				SCC 1			SCC 2			Power			
						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]	LTE Tx. Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA 41C (1)	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	LTE B41	20	40911	2622.1	-	-	-	-	24.13	24.15
CA 41D	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	LTE B41	20	40911	2622.1	LTE B41	20	40713	2602.3	24.10	24.15

J.2.10 LTE Band 48 as PCC

Table J-12
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC				SCC 1			SCC 3			SCC 4			Power				
						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]	LTE Tx. Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA 48A-48A	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	LTE B48	20	55340	3590	-	-	-	-	-	-	19.08	19.13		
CA 48A-48C	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	LTE B48	20	55340	3590	LTE B48	20	55340	3590	-	-	-	19.02	19.13	
CA 48A-48D	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	LTE B48	20	55340	3590	LTE B48	20	55340	3590	LTE B48	20	55736	3595.6	19.05	19.13
CA 48B-48A	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	LTE B48	20	56009	3606.9	LTE B48	20	55811	3607.1	-	-	-	-	19.05	19.13
CA 48C-48C	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	LTE B48	20	56009	3606.9	LTE B48	20	55640	3600	LTE B48	20	55538	3679.8	19.06	19.13
CA 48A-48E	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	LTE B48	20	55340	3590	LTE B48	20	55736	3595.6	LTE B48	20	55934	3618.4	19.05	19.13
CA 48E-48A	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	LTE B48	20	56009	3626.9	LTE B48	20	55811	3607.1	LTE B48	20	55340	3560	19.16	19.13
CA 48C-48D	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	LTE B48	20	56009	3626.9	LTE B48	20	55640	3600	LTE B48	20	55538	3679.8	19.05	19.13
CA 48D-48C	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	LTE B48	20	56009	3626.9	LTE B48	20	55811	3607.1	LTE B48	20	56442	3670.2	19.05	19.13
CA 48F	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	LTE B48	20	56009	3626.9	LTE B48	20	55811	3607.1	LTE B48	20	55613	3587.3	19.01	19.13

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	132022	1715	QPSK	1	25	23.48	23.41	23.8
25	5	26365	1882.5	QPSK	1	12	23.86	23.87	23.5
30	5	27710	2310	QPSK	1	12	22.61	22.54	22.5
41	10	41055	2636.5	QPSK	1	25	24.21	24.15	24.0
48	20	56207	3646.7	QPSK	1	50	19.05	19.13	19.0



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Table J-22
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Freq. [MHz]	Mod.	PCC					SCC1					SCC2					SCC3					Power	
					PCC (UL) RB	PCC (UL) Ch.	PCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE TxPower with DL CA [dBm]	LTE Single Carrier Tx Power [dBm]				
CA 25A-42E-25A-98A	LTE B25	5	26365	1882.5	QPSK	1	12	8365	1962.5	4x4	LTE B25	10	2525	881.5	2x2	LTE B25	10	2525	881.5	2x2	23.84	23.87				
CA 25A-42E-25A-98A (1)	LTE B25	5	26365	1882.5	QPSK	1	12	8365	1962.5	2x2	LTE B25	20	8140	1940	4x4	LTE B25	20	8140	1940	4x4	23.76	23.87				
CA [25A]-25A (1)	LTE B25	5	26365	1882.5	QPSK	1	12	8365	1962.5	4x4	LTE B25	20	8140	1940	2x2	LTE B25	20	8140	1940	2x2	23.90	23.87				
CA [25A]-[25A] (1)	LTE B25	5	26365	1882.5	QPSK	1	12	8365	1962.5	4x4	LTE B25	20	8140	1940	4x4	LTE B25	20	8140	1940	4x4	23.84	23.87				

J.3.8 LTE Band 25 as PCC

Table J-23
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Freq. [MHz]	Mod.	PCC					SCC1					Power		
					PCC (UL) RB	PCC (UL) Ch.	PCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (DL) Freq. [MHz]	DL Ant. Config.	LTE TxPower with DL CA [dBm]	LTE Single Carrier Tx Power [dBm]			
CA 5A-[25A]	LTE B25	5	26365	1882.5	QPSK	1	12	8365	1962.5	4x4	LTE B5	10	2525	881.5	2x2	23.84	23.87
CA 25A-[25A] (1)	LTE B25	5	26365	1882.5	QPSK	1	12	8365	1962.5	2x2	LTE B25	20	8140	1940	4x4	23.76	23.87
CA [25A]-[25A] (1)	LTE B25	5	26365	1882.5	QPSK	1	12	8365	1962.5	4x4	LTE B25	20	8140	1940	2x2	23.90	23.87
CA [25A]-[25A] (1)	LTE B25	5	26365	1882.5	QPSK	1	12	8365	1962.5	4x4	LTE B25	20	8140	1940	4x4	23.84	23.87

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J.3.11 LTE Band 48 as PCC

**Table J-26
Maximum Output Powers**

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] Freq. [MHz]	DL Ant. Config.	SCC Band	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 [dBm]	LTE Tx Power with DL CA Enabled [dBm]		
CA_48A_48A	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	2x2	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	19.15	19.15
CA_48A_48B	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	19.17	19.13
CA_48A_48C	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	19.17	19.13
CA_48B_48A	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	19.19	19.13
CA_48B_48B	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	19.19	19.13
CA_48B_48C	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	19.14	19.13
CA_48C_48A	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	19.17	19.13
CA_48C_48B	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	19.13	19.13
CA_48C_48C	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	19.13	19.13
CA_48A_48D	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	19.13	19.13
CA_48B_48D	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	19.13	19.13
CA_48C_48D	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	19.13	19.13
CA_48A_48E	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	19.13	19.13
CA_48B_48E	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	19.13	19.13
CA_48C_48E	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	LTE B48	20	56207	3646.7	2x2	19.13	19.13
CA_48A_48F	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	19.13	19.13
CA_48B_48F	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	19.13	19.13
CA_48C_48F	LTE B48	20	56207	3646.7	QPSK	1	50	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	LTE B48	20	56207	3646.7	4x4	19.13	19.13

J.4 Downlink Carrier Aggregation with CA_41C 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-27
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] 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.	ULCA Tx Power with add'l CA config. active [dBm]	ULCA Tx Power [dBm]
CA_41D	LTE B41	20	38750	2506	QPSK	1	99	38750	2506	4x4	LTE B41	20	38948	2525.8	QPSK	1	0	39948	2525.8	4x4	LTE B41	20	40146	2545.6	4x4	23.68	23.74

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-28
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] 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.	ULCA Tx Power with add'l CA config. active [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	LTE B41	20	40146	2545.6	4x4	23.70	23.74
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	23.74
CA_41C(2)	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	23.74
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	23.74
CA_41C	LTE B48	20	56207	3646.7	QPSK	50	0	56207	3646.7	4x4	LTE B48	20	56009	3626.9	QPSK	50	0	56009	3626.9	4x4	LTE B48	20	56009	3626.9	4x4	19.02	19.05

FCC ID A3LSMS908U	PCTEST Proud to be part of @element	SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 09/21/21 – 12/06/21	DUT Type: Portable Handset			APPENDIX J: Page 15 of 15