

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.

- 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 1: Summary of the 2019-2020 Financial Year Performance										Table 2: Summary of the 2020-2021 Financial Year Performance									
Department A: Marketing & Sales					Department B: Operations					Department C: Finance & HR					Department D: IT & Support				
Year	Q1	Q2	Q3	Q4	Year	Q1	Q2	Q3	Q4	Year	Q1	Q2	Q3	Q4	Year	Q1	Q2	Q3	Q4
2019-2020	100	120	110	130	2020-2021	110	130	120	140	2019-2020	200	220	210	230	2020-2021	210	230	220	240
2019-2020	140	160	150	170	2020-2021	150	170	160	180	2019-2020	300	320	310	330	2020-2021	310	330	320	340
2019-2020	180	200	190	210	2020-2021	190	210	200	220	2019-2020	400	420	410	430	2020-2021	410	430	420	440
2019-2020	220	240	230	250	2020-2021	230	250	240	260	2019-2020	500	520	510	530	2020-2021	510	530	520	540
2019-2020	260	280	270	290	2020-2021	270	290	280	300	2019-2020	600	620	610	630	2020-2021	610	630	620	640
2019-2020	300	320	310	330	2020-2021	310	330	320	340	2019-2020	700	720	710	730	2020-2021	710	730	720	740
2019-2020	340	360	350	370	2020-2021	350	370	360	380	2019-2020	800	820	810	830	2020-2021	810	830	820	840
2019-2020	380	400	390	410	2020-2021	390	410	400	420	2019-2020	900	920	910	930	2020-2021	910	930	920	940
2019-2020	420	440	430	450	2020-2021	430	450	440	460	2019-2020	1000	1020	1010	1030	2020-2021	1010	1030	1020	1040
2019-2020	460	480	470	490	2020-2021	470	490	480	500	2019-2020	1100	1120	1110	1130	2020-2021	1110	1130	1120	1140
2019-2020	500	520	510	530	2020-2021	510	530	520	540	2019-2020	1200	1220	1210	1230	2020-2021	1210	1230	1220	1240
2019-2020	540	560	550	570	2020-2021	550	570	560	580	2019-2020	1300	1320	1310	1330	2020-2021	1310	1330	1320	1340
2019-2020	580	600	590	610	2020-2021	590	610	600	620	2019-2020	1400	1420	1410	1430	2020-2021	1410	1430	1420	1440
2019-2020	620	640	630	650	2020-2021	630	650	640	660	2019-2020	1500	1520	1510	1530	2020-2021	1510	1530	1520	1540
2019-2020	660	680	670	690	2020-2021	670	690	680	700	2019-2020	1600	1620	1610	1630	2020-2021	1610	1630	1620	1640
2019-2020	700	720	710	730	2020-2021	710	730	720	740	2019-2020	1700	1720	1710	1730	2020-2021	1710	1730	1720	1740
2019-2020	740	760	750	770	2020-2021	750	770	760	780	2019-2020	1800	1820	1810	1830	2020-2021	1810	1830	1820	1840
2019-2020	780	800	790	810	2020-2021	790	810	800	820	2019-2020									

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	ACC	Supported Channel Bandwidth (MHz)				Restriction	Completely Covered by Measurement SuperSet
		CC1	CC2					CC1	CC2	CC3					CC1	CC2	CC3	CC1		
ACC#M5	CA [2C]	5, 10, 15, 20	5, 10, 15, 20		ACC#M6	CA [2A]-2A-4A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		ACC#M1	CA [2A]-5B-66A	5, 10, 15, 20	5, 10	5, 10, 15, 20		No			
ACC#M2	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		ACC#M7	CA [2A]-2A-5A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		ACC#M2	CA [2A]-5B-66A	5, 10, 15, 20	5, 10	5, 10, 15, 20		No			
ACC#M3	CA [2A]-[2A]	5, 10, 15, 20	5, 10, 15, 20		ACC#M8	CA [2A]-2A-12A	5, 10, 15, 20	5, 10, 15, 20	5, 10		ACC#M3	CA [2A]-5A-66B	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M4	CA [2A]-[4A]	5, 10, 15, 20	5, 10, 15, 20		ACC#M9	CA [2A]-2A-13A	5, 10, 15, 20	5, 10, 15, 20	5, 10		ACC#M4	CA [2A]-5A-66B	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M5	CA [2A]-[4A]	5, 10, 15, 20	5, 10, 15, 20		ACC#M10	CA [2A]-2A-13A	5, 10, 15, 20	5, 10, 15, 20	5, 10		ACC#M5	CA [2A]-5A-66C	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M6	CA [2A]-5A	5, 10, 15, 20	5, 10	ACC#M3	ACC#M7	CA [2C]-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		ACC#M6	CA [2A]-5A-66C	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M7	CA [2A]-[2A]	5, 10, 15, 20	5, 10		ACC#M8	CA [2C]-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		ACC#M7	CA [2A]-5A-66C	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M8	CA [2A]-[2A]	5, 10, 15, 20	5, 10		ACC#M9	CA [2C]-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		ACC#M8	CA [2A]-5A-66C	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M9	CA [2A]-[2A]	5, 10	5, 10		ACC#M10	CA [2A]-2A-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		ACC#M9	CA [2A]-5A-66C	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M10	CA [2A]-[2A]	5, 10, 15, 20	5, 10	B29 SC Only	ACC#M11	CA [2A]-2A-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		ACC#M10	CA [2A]-5A-66C	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M11	CA [2A]-[2A]	5, 10, 15, 20	5, 10		ACC#M12	CA [2A]-2A-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		ACC#M11	CA [2A]-5A-66C	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M12	CA [2A]-66A [2]	5, 10, 15, 20	5, 10, 15, 20		ACC#M13	CA [2A]-2A-71A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		ACC#M12	CA [2A]-5A-66C	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M13	CA [2A]-66A [2]	5, 10, 15, 20	5, 10, 15, 20		ACC#M14	CA [2A]-4A-29A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		ACC#M13	CA [2A]-5A-66C	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M14	CA [2A]-66A [2]	5, 10, 15, 20	5, 10, 15, 20		ACC#M15	CA [2A]-4A-71A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		ACC#M14	CA [2A]-5A-66C	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M15	CA [2A]-71A	5, 10, 15, 20	5, 10, 15, 20		ACC#M16	CA [2A]-4A-71A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		ACC#M15	CA [2A]-5A-66C	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M16	CA [2A]-66A	5, 10	5, 10, 15, 20		ACC#M17	CA [2A]-5A-66A	5, 10, 15, 20	5, 10	5, 10, 15, 20		ACC#M16	CA [2A]-5A-66A	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15	No			
ACC#M17	CA [2A]-66A [4]	5, 10	5, 10, 15, 20		ACC#M18	CA [2A]-5A-66A	5, 10, 15, 20													

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

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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.

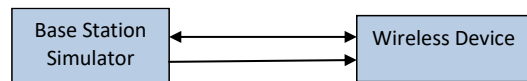


Figure J-1
DL CA Power Measurement Setup

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Test Dates: 09/12/21 – 11/08/21	DUT Type: Portable Handset		APPENDIX J: Page 2 of 14

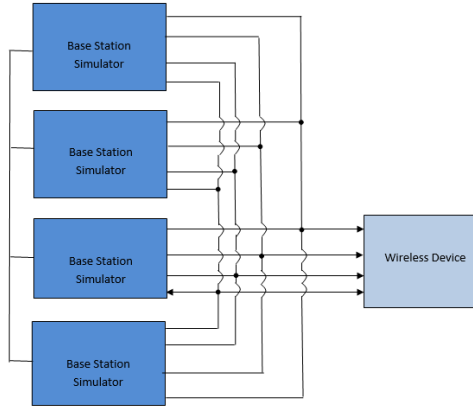


Figure J-2
DL CA with DL 4x4 MIMO Power Measurement Setup

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) 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				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_4A-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	LTE B4	20	2175	2132.5	LTE B4	10	2360	2150	-	-	-	-	25.45	25.50
CA_4B-4B-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	LTE B4B	20	55990	3625	LTE B4B	20	55640	3690	-	-	-	-	25.15	25.50
CA_4B-71A	LTE B71	10	133172	668	QPSK	1	25	68636	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	68636	622	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	25.41	25.50
CA_2A-2A-66A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6B	20	66786	2145	25.47	25.50
CA_2A-66A-66A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	LTE B2	20	900	1960	LTE B6B	20	66786	2145	LTE B6B	20	67236	2190	25.49	25.50
CA_2A-66C-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	LTE B2	20	900	1960	LTE B6B	20	66786	2145	LTE B6B	20	66884	2164.8	25.48	25.50

J.2.2 LTE Band 12 as PCC

Table J-4
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC				SCC 1				SCC 2				SCC 3				SCC 4				LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]		
				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]	
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	-	-	-	-	-	-	-	-	-	-	25.31	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-48A (1)	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B48	20	50950	5037.5	-	-	-	-	-	-	-	-	-	-	25.31	25.50		
CA_12A-48A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B48	20	50990	3625	-	-	-	-	-	-	-	-	-	-	25.49	25.50		
CA_12A-66A (1)	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	-	-	25.23	25.50		
CA_12A-66A (2)	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	-	-	25.23	25.50		
CA_12A-49C	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B49	20	50665	5537.5	LTE B49	20	50467	5517.7	-	-	-	-	-	-	25.43	25.50		
CA_12A-49C	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B49	20	50690	3625	LTE B49	20	50488	3644.8	-	-	-	-	-	-	25.46	25.50		
CA_2A-2A-4A-12A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	-	-	25.36	25.50		
CA_2A-4A-4A-12A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	2175	2132.5	LTE B4	20	2360	2150	-	-	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-12A-66C	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B66	20	66786	2145	LTE B66	20	66884	2164.8	-	-	25.36	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	20	2360	2150	-	-	25.06	25.40		
CA_12A-46D	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B46	20	50665	5537.5	LTE B46	20	50467	5517.7	LTE B46	20	50863	5507.3	-	-	25.25	25.50		
CA_2A-2A-12A-30A-66A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B95	20	66240	2195	LTE B95	20	66786	2145	24.82	25.50
CA_2A-2A-12A-66A-66A	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	24.75	25.50
CA_2A-2A-12B-66A	LTE B12	5	23035	701.5	QPSK	1	12	5035	731.5	LTE B12	10	5107	738.7	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6B	20	66786	2145	25.12	25.40
CA_2A-12A-30A-66A-66A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B100	10	8620	2335	LTE B6B	20	66786	2145	LTE B6B	20	66786	2145	24.75	25.50
CA_2A-12B-66A-66A	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	24.43	25.40

FCC ID A3LSMS901U		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 09/12/21 – 11/08/21	DUT Type: Portable Handset			APPENDIX J: Page 3 of 14

J.2.3 LTE Band 13 as PCC

Table J-5
Maximum Output Powers

[illegible]

J.2.4 LTE Band 14 as PCC

Table J-6
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 Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC Channel	LTE Tx Power [dBm]	LTE Single Carrier Tx Power [dBm]		
CA_ZA-2A-14A-90A-66A	LTE B14	10	23330	793	QPSK	1	25	5330	763	LTE B2	20	900	1560	LTE B2	20	700	1940	LTE B30	20	9820	2355	LTE B30	20	67286	2145	25.41	25.35	
CA_ZA-2A-14A-90A-66A	LTE B14	10	23330	793	QPSK	1	25	5330	763	LTE B2	20	900	1560	LTE B2	20	700	1940	LTE B30	20	66796	2145	LTE B30	20	67286	2145	25.41	25.35	
CA_ZA-14A-90A-66A	LTE B14	10	23330	793	QPSK	1	25	5330	763	LTE B2	20	900	1560	LTE B2	20	700	1940	LTE B30	20	66796	2145	LTE B30	20	67286	2145	25.41	25.35	

J.2.5 LTE Band 5 as PCC

Table J-7
Maximum Output Powers

[illegible]

FCC ID A3LSMS901U	 SAR EVALUATION REPORT 	Approved by: Quality Manager
Test Dates: 09/12/21 – 11/08/21	DUT Type: Portable Handset	APPENDIX J: Page 4 of 14

J.2.6 LTE Band 66 as PCC

Table J-8
Maximum Output Powers

[illegible]

J.2.7 LTE Band 25 as PCC

Table J-9
Maximum Output Powers

Combination	PCC									SCC 1				Power	
	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC [DL] 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_5A-25A	LTE B25	5	26065	1852.5	QPSK	1	12	8065	1932.5	LTE B5	10	2525	881.5	<u>23.91</u>	<u>24.15</u>
CA_12A-25A	LTE B25	5	26065	1852.5	QPSK	1	12	8065	1932.5	LTE B12	10	5095	737.5	<u>23.90</u>	<u>24.15</u>
CA_25A-25A (1)	LTE B25	5	26065	1852.5	QPSK	1	12	8065	1932.5	LTE B25	20	8590	1985	<u>23.91</u>	<u>24.15</u>

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-30A-66A	LTE B30	5	27710	2310	QPSK	1	0	B820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B29	10	9715	722.5	-	-	-	-	22.86	22.97	
CA_2A-20A-30A-66A	LTE B30	5	27710	2310	QPSK	1	0	B820	2355	LTE B2	20	900	1960	LTE B29	10	9715	722.5	LTE B66	20	66786	2145	-	-	-	-	22.89	22.97	
CA_20A-30A-66A-66A	LTE B30	5	27710	2310	QPSK	1	0	B820	2355	LTE B29	10	9715	722.5	LTE B66	20	66786	2145	LTE B66	20	67236	2190	-	-	-	-	22.92	22.97	
CA_2A-2A-30A-66A	LTE B30	5	27710	2310	QPSK	1	0	B820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	22.87	22.97	
CA_2A-2A-11A-30A-66A	LTE B30	5	27710	2310	QPSK	1	0	B820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	22.91	22.97	
CA_2A-2A-11A-20A-66A	LTE B30	5	27710	2310	QPSK	1	0	B820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B14	10	5330	761	LTE B66	20	66786	2145	22.89	22.97	
CA_2A-5A-30A-66A-66A	LTE B30	5	27710	2310	QPSK	1	0	B820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B66	20	66786	2145	LTE B66	20	67236	2190	22.91	22.97	
CA_2A-5B-30A-66A	LTE B30	5	27710	2310	QPSK	1	0	B820	2355	LTE B2	20	900	1960	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B66	20	66786	2145	22.90	22.97	
CA_2A-11A-30A-66A-66A	LTE B30	5	27710	2310	QPSK	1	0	B820	2355	LTE B2	20	900	1960	LTE B12	10	5095	737.5	LTE B66	20	66786	2145	LTE B66	20	67236	2190	22.91	22.97	
CA_2A-11A-30A-66A-66A	LTE B30	5	27710	2310	QPSK	1	0	B820	2355	LTE B2	20	900	1960	LTE B14	10	5330	761	LTE B66	20	66786	2145	LTE B66	20	67236	2190	22.91	22.97	
CA_5B-30A-66A-66A	LTE B30	5	27710	2310	QPSK	1	0	B820	2355	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B66	20	66786	2145	LTE B66	20	67236	2190	22.84	22.97	

J.2.9 LTE Band 41 as PCC

Table J-11
Maximum Output Powers

	PCC									SCC 1				SCC 2				Power	
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 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	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	LTE B41	20	40764	2607.4	24.27	24.28

J.2.10 LTE Band 48 as PCC

Table J-12
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC					SCC 1				SCC 2				SCC 3				SCC 4				Power		
				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	-	-	-	-	-	-	-	-	-	-	-	19.38	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	3579.8	-	-	-	-	-	-	-	19.23	19.45	
CA_48C-48A	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3637.5	LTE B48	20	56340	3660	-	-	-	-	-	-	-	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	3579.8	LTE B48	20	55736	3599.6	-	-	-	-	19.27	19.45
CA_48D-48A	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3637.5	LTE B48	20	55817	3617.7	LTE B48	20	55640	3600	-	-	-	-	19.30	19.45
CA_48C-48C	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3637.5	LTE B48	20	56340	3660	LTE B48	20	55538	3579.8	-	-	-	-	19.27	19.45
CA_48A-48E	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	55340	3560	LTE B48	20	55538	3579.8	LTE B48	20	55736	3599.6	LTE B48	20	55538	3579.8	19.23	19.45
CA_48E-48A	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3637.5	LTE B48	20	55537	3617.7	LTE B48	20	55739	3599.9	LTE B48	20	55340	3560	19.41	19.45
CA_48C-48D	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3637.5	LTE B48	20	55340	3560	LTE B48	20	55538	3579.8	LTE B48	20	55736	3599.6	19.26	19.45
CA_48D-48C	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3637.5	LTE B48	20	55537	3617.7	LTE B48	20	55640	3600	LTE B48	20	55642	3620.2	19.25	19.45
CA_48F	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	LTE B48	20	56115	3637.5	LTE B48	20	55537	3617.7	LTE B48	20	55739	3599.9	LTE B48	20	55521	3578.1	19.47	19.45

FCC ID A3LSMS901U	 Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 09/12/21 – 11/08/21	DUT Type: Portable Handset			APPENDIX J: Page 6 of 14

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] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC 1				SCC 2				SCC 3				Power						
											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 [4A]-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B4	20	2175	2132.5	4x4	LTE B4	10	2350	2150	2x2	-	-	-	-	-	-	25.43	25.50	
CA [4A]-4A-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B4	20	2175	2132.5	4x4	LTE B4	10	2350	2150	4x4	-	-	-	-	-	-	-	25.42	25.50
CA [4B]-4B-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B4B	20	55990	3625	4x4	LTE B4B	20	55640	3600	2x2	-	-	-	-	-	-	-	25.48	25.50
CA [4B]-4B-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B4B	20	55990	3625	4x4	LTE B4B	20	55990	3625	4x4	-	-	-	-	-	-	-	25.48	25.50
CA [4B]-71A	LTE B71	10	133172	668	QPSK	1	25	68636	622	2x2	LTE B4B	20	55990	3625	4x4	LTE B4B	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	25.39	25.50		
CA [2A]-2A-66A-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-66A-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-66A-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	25.37	25.50		
CA [2A]-2A-66A-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]-66A-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]-66A-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]-66A-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]-66A-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	25.40	25.50		
CA [2A]-66C-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]-66C-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]-66C-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		

FCC ID A3LSMS901U	 PCTEST Proud to be part of element	SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 09/12/21 – 11/08/21	DUT Type: Portable Handset	APPENDIX J: Page 7 of 14		

J.3.3 LTE Band 12 as PCC

Table J-15
Maximum Output Powers

[illegible]

FCC ID A3LSMS901U	 SAR EVALUATION REPORT 	Approved by: Quality Manager
Test Dates: 09/12/21 – 11/08/21	DUT Type: Portable Handset	APPENDIX J: Page 8 of 14

J.3.6 LTE Band 5 as PCC

Table J-18
Maximum Output Powers

[illegible]

J.3.7 LTE Band 66 as PCC

Table J-19
Maximum Output Powers

[illegible]

FCC ID A3LSMS901U	 PCTEST Proud to be part of element		Approved by: Quality Manager
Test Dates: 09/12/21 – 11/08/21	DUT Type: Portable Handset	APPENDIX J: Page 11 of 14	

J.3.8 LTE Band 25 as PCC

Table J-20
Maximum Output Powers

Combination	PCC										SCC 1					Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL# RB	PCC UL RB Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC (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

[illegible]

J.3.10 LTE Band 41 as PCC

Table J-22
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] 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.	LTE Tx Power with DL CA Enabled	LTE Single Carrier Tx Power [dBm]
CA [41C] (1)	LTE B41	5	40620	2593	QPSK	1	12	40620	2593	4x4	LTE B41	20	40737	2604.7	4x4	-	-	-	-	24.48	24.45	
CA [41D]	LTE B41	10	40620	2593	QPSK	1	25	40620	2593	4x4	LTE B41	20	40476	2578.6	4x4	LTE B41	20	40764	2607.4	4x4	24.32	24.28

J.3.11 LTE Band 48 as PCC

Table J-23
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Freq. [MHz]	Mod.	PCC UL# RB	PCC UL# RB Offset	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC 1		DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC 2		DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC 3		DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC 4		DL Ant. Config.	LTE Tx Power with DL CA Enabled	LTE Single Carrier Tx Power [dBm]		
											SCC [DL] Freq. [MHz]	SCC [DL] Ch.				SCC [DL] Freq. [MHz]	SCC [DL] Ch.				SCC [DL] Freq. [MHz]	SCC [DL] Ch.				SCC [DL] Freq. [MHz]	SCC [DL] Ch.					
CA 48A (48A)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	2x2	LTE B48	20	55340	3560	4x4	-	-	-	-	-	-	-	-	-	-	-	-	19.46	19.45			
CA 48B (48B)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	55340	3560	2x2	-	-	-	-	-	-	-	-	-	-	-	-	19.44	19.45			
CA 48A (48A)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	55340	3560	4x4	-	-	-	-	-	-	-	-	-	-	-	-	19.41	19.45			
CA 48C (48A)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	2x2	LTE B48	20	55340	3560	4x4	LTE B48	20	55538	3579.8	4x4	-	-	-	-	-	-	-	19.40	19.45			
CA 48C (48C)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	56115	3637.5	4x4	LTE B48	20	55340	3560	2x2	-	-	-	-	-	-	-	19.43	19.45			
CA 48A (48C)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	55340	3560	2x2	LTE B48	20	55538	3579.8	2x2	-	-	-	-	-	-	-	19.40	19.45			
CA 48C (48A)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	2x2	LTE B48	20	56115	3637.5	2x2	LTE B48	20	55340	3560	4x4	-	-	-	-	-	-	-	19.39	19.45			
CA 48A (48C)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	55340	3560	4x4	LTE B48	20	55538	3579.8	4x4	-	-	-	-	-	-	-	19.42	19.45			
CA 48A (48D)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	2x2	LTE B48	20	55340	3560	4x4	LTE B48	20	55538	3579.8	4x4	LTE B48	20	55736	3599.6	4x4	-	-	19.44	19.45			
CA 48D (48A)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	56115	3637.5	4x4	LTE B48	20	55917	3617.7	4x4	LTE B48	20	56640	3690	2x2	-	-	19.53	19.45			
CA 48A (48D)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	55340	3560	2x2	LTE B48	20	55538	3579.8	2x2	LTE B48	20	55736	3599.6	2x2	-	-	19.48	19.45			
CA 48D (48A)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	2x2	LTE B48	20	56115	3637.5	2x2	LTE B48	20	55917	3617.7	2x2	LTE B48	20	56640	3690	4x4	19.39	19.45					
CA 48A (48C)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	55340	3560	4x4	LTE B48	20	55538	3579.8	4x4	LTE B48	20	55736	3599.6	4x4	-	-	19.51	19.45			
CA 48C (48A)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	56115	3637.5	4x4	LTE B48	20	55917	3617.7	4x4	LTE B48	20	56640	3690	4x4	-	-	19.49	19.45			
CA 48C (48C)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	2x2	LTE B48	20	55340	3560	2x2	LTE B48	20	55340	3560	4x4	-	-	-	-	-	-	-	19.46	19.45			
CA 48C (48C)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	56115	3637.5	4x4	LTE B48	20	55340	3560	2x2	LTE B48	20	55538	3579.8	2x2	-	-	19.44	19.45			
CA 48C (48C)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	56115	3637.5	4x4	LTE B48	20	55340	3560	4x4	LTE B48	20	55538	3579.8	4x4	-	-	19.47	19.45			
CA 48A (48E)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	2x2	LTE B48	20	55340	3560	4x4	LTE B48	20	55538	3579.8	4x4	LTE B48	20	55736	3599.6	4x4	LTE B48	20	55934	3619.4	4x4	19.36	19.45
CA 48E (48A)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	56115	3637.5	4x4	LTE B48	20	55917	3617.7	4x4	LTE B48	20	56640	3690	2x2	-	-	19.49	19.45			
CA 48A (48E)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	55340	3560	2x2	LTE B48	20	55538	3579.8	2x2	LTE B48	20	55736	3599.6	2x2	LTE B48	20	55934	3619.4	2x2	19.50	19.45
CA 48E (48A)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	2x2	LTE B48	20	56115	3637.5	2x2	LTE B48	20	55917	3617.7	2x2	LTE B48	20	56640	3690	4x4	19.41	19.45					
CA 48A (48E)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	55340	3560	4x4	LTE B48	20	55538	3579.8	4x4	LTE B48	20	55736	3599.6	4x4	LTE B48	20	55934	3619.4	4x4	19.54	19.45
CA 48E (48A)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	56115	3637.5	4x4	LTE B48	20	55917	3617.7	4x4	LTE B48	20	56640	3690	4x4	LTE B48	20	56838	3710.2	4x4	19.55	19.45
CA 48C (48D)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	2x2	LTE B48	20	56115	3637.5	2x2	LTE B48	20	55340	3560	4x4	LTE B48	20	55538	3579.8	4x4	LTE B48	20	55736	3599.6	4x4	19.46	19.45
CA 48D (48C)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	56115	3637.5	4x4	LTE B48	20	55917	3617.7	4x4	LTE B48	20	56640	3690	2x2	LTE B48	20	56838	3710.2	2x2	19.51	19.45
CA 48C (48D)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	56115	3637.5	4x4	LTE B48	20	55340	3560	2x2	LTE B48	20	55538	3579.8	2x2	LTE B48	20	55736	3599.6	2x2	19.47	19.45
CA 48D (48C)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	2x2	LTE B48	20	56115	3637.5	2x2	LTE B48	20	55917	3617.7	2x2	LTE B48	20	56640	3690	4x4	LTE B48	20	56838	3710.2	4x4	19.47	19.45
CA 48C (48D)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	56115	3637.5	4x4	LTE B48	20	55340	3560	4x4	LTE B48	20	55538	3579.8	4x4	LTE B48	20	55736	3599.6	4x4	19.48	19.45
CA 48D (48C)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	56115	3637.5	4x4	LTE B48	20	55917	3617.7	4x4	LTE B48	20	56640	3690	4x4	LTE B48	20	56838	3710.2	4x4	19.54	19.45
CA 48D (48C)	LTE B48	5	56232	3649.2	64QAM	1	12	56232	3649.2	4x4	LTE B48	20	56115	3637.5	4x4	LTE B48	20	55917	3617.7	4x4	LTE B48	20	56640	3690	4x4	LTE B48	20	56838	3710.1	4x4	19.49	19.45

FCC ID A3LSMS901U



SAR EVALUATION REPORT



Approved by:
Quality Manager

Test Dates:
09/12/21 – 11/08/21

DUT Type:
Portable Handset

APPENDIX J:
Page 13 of 14

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

	PCC										SCC 1										SCC 2				Power	
Combination	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

	PCC										SCC 1										SCC 2										Power	
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.	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_41D1	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					

FCC ID A3LSMS901U	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 09/12/21 – 11/08/21	DUT Type: Portable Handset			APPENDIX J: Page 14 of 14