

APPENDIX I: LTE DLCA TEST REDUCTION METHODOLOGY

SAR test exclusion for LTE downlink Carrier Aggregation is determined by power measurements according to the number of component carriers (CCCs) 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 component 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 I-1 – Example of Exclusion Table for SISO Configurations

Index	CC	Supported Channel Bandwidth [MHz]		Restriction	Completely Covered by Measurement Superset
		CC1	CC2		
GC #41	CA_2C	5, 10, 15, 20	5, 10, 15, 20	No	GC #41
GC #42	CA_2B-2A	5, 10, 15, 20	5, 10	GC #41	GC #42
GC #43	CA_2B-2A	5, 10, 15, 20	5, 10	GC #41	GC #43
GC #44	CA_2B-2A	5, 10, 15, 20	5, 10	GC #41	GC #44
GC #45	CA_2B-2A-2B	5, 10, 15, 20	5, 10	GC #41	GC #45
GC #46	CA_2B-2A-2B	5, 10, 15, 20	5, 10	GC #41	GC #46
GC #47	CA_2B-2A-2B	5, 10, 15, 20	5, 10	GC #41	GC #47
GC #48	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #48
GC #49	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #49
GC #50	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #50
GC #51	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #51
GC #52	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #52
GC #53	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #53
GC #54	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #54
GC #55	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #55
GC #56	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #56
GC #57	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #57
GC #58	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #58
GC #59	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #59
GC #60	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #60
GC #61	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #61
GC #62	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #62
GC #63	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #63
GC #64	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #64
GC #65	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #65
GC #66	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #66
GC #67	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #67
GC #68	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #68
GC #69	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #69
GC #70	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #70
GC #71	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #71
GC #72	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #72
GC #73	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #73
GC #74	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #74
GC #75	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #75
GC #76	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #76
GC #77	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #77
GC #78	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #78
GC #79	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #79
GC #80	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #80
GC #81	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #81
GC #82	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #82
GC #83	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #83
GC #84	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #84
GC #85	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #85
GC #86	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #86
GC #87	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #87
GC #88	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #88
GC #89	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #89
GC #90	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #90
GC #91	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #91
GC #92	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #92
GC #93	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #93
GC #94	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #94
GC #95	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #95
GC #96	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #96
GC #97	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #97
GC #98	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #98
GC #99	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #99
GC #100	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #100
GC #101	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #101
GC #102	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #102
GC #103	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #103
GC #104	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #104
GC #105	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #105
GC #106	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #106
GC #107	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #107
GC #108	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #108
GC #109	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #109
GC #110	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #110
GC #111	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #111
GC #112	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #112
GC #113	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #113
GC #114	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #114
GC #115	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #115
GC #116	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #116
GC #117	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #117
GC #118	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #118
GC #119	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #119
GC #120	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #120
GC #121	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #121
GC #122	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #122
GC #123	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #123
GC #124	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #124
GC #125	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #125
GC #126	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #126
GC #127	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #127
GC #128	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #128
GC #129	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #129
GC #130	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #130
GC #131	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #131
GC #132	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #132
GC #133	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #133
GC #134	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #134
GC #135	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #135
GC #136	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #136
GC #137	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #137
GC #138	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #138
GC #139	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #139
GC #140	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #140
GC #141	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #141
GC #142	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #142
GC #143	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #143
GC #144	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #144
GC #145	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #145
GC #146	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #146
GC #147	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #147
GC #148	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #148
GC #149	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #149
GC #150	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #150
GC #151	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #151
GC #152	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #152
GC #153	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #153
GC #154	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #154
GC #155	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #155
GC #156	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #156
GC #157	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #157
GC #158	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #158
GC #159	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #159
GC #160	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #160
GC #161	CA_2B-2A-2B-2B	5, 10, 15, 20	5, 10, 15, 20	GC #41	GC #161
GC #162	CA_2B-2A-2B-2B	5, 10, 15, 20	5,		

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 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, 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.

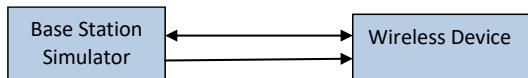


Figure I-1
DL CA Power Measurement Setup

FCC ID: A3LSMF731U	SAR EVALUATION REPORT	Approved by: Technical Manager
DUT Type: Portable Handset		APPENDIX I: Page 2 of 13

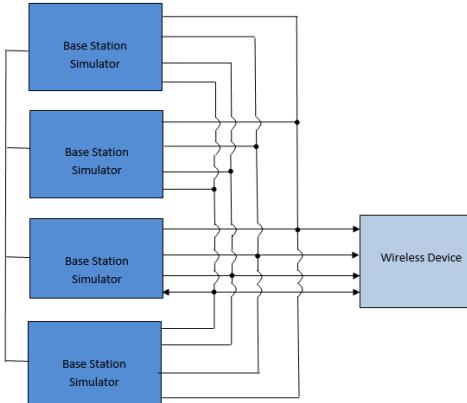


Figure I-2
DL CA with DL 4x4 MIMO Power Measurement Setup

I.2 Downlink Carrier Aggregation RF Conducted Powers

I.2.1 LTE Band 71 as PCC

Table I-3
Maximum Output Powers

Combination	PCC								SCC 1				SCC 2				SCC 3				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Channel	PCC (UL) Freq. [MHz]	Modulation	PCC ULS RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	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	20	133297	680.5	QPSK	1	50	68761	634.5	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	-	-	-	25.29	25.28
CA_4B-4B-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	LTE B48	20	55990	3625	LTE B48	20	56640	3690	-	-	-	25.27	25.28
CA_4C-4C-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	LTE B48	20	55990	3625	LTE B48	20	56188	3644.8	-	-	-	25.24	25.28
CA_2A-2A-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B66	20	66066	2175	2132.5
CA_2B-2B-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B66	20	66066	2145	2132.5
CA_2C-2C-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B66	20	67236	2190	2132.5
CA_2D-2D-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	LTE B2	20	900	1960	LTE B2	20	66796	2145	LTE B66	20	67236	2151	2132.5
CA_2E-2E-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	LTE B2	20	900	1960	LTE B2	20	66796	2145	LTE B66	20	66984	2164.8	2132.5

I.2.2 LTE Band 12 as PCC

Table I-4
Maximum Output Powers

Combination	PCC								SCC 1				SCC 2				SCC 3				SCC 4		Power		
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC ULS RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)			
CA_2A-12A(1)	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	-	-	-	-	-	-	-	24.94	24.08			
CA_4A-4A-12A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	2175	2132.5	-	-	-	-	-	-	-	24.31	24.58			
CA_4B-4B-12A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	55990	3625	-	-	-	-	-	-	-	24.31	24.58			
CA_12A-25A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B25	20	8365	1962.5	-	-	-	-	-	-	-	24.34	24.58			
CA_12A-48A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B48	20	50695	9537.8	-	-	-	-	-	-	-	24.55	24.58			
CA_12A-68A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B68	20	50670	9537.8	-	-	-	-	-	-	-	24.48	24.58			
CA_12A-88A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B88	20	66796	2145	-	-	-	-	-	-	-	24.31	24.58			
CA_12A-128A(1)	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B12	20	5047	732.7	LTE B4	20	2175	2132.5	LTE B4	20	2350	2150	-	-		
CA_12A-128A(2)	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B12	20	5047	732.7	LTE B4	20	900	1960	LTE B4	20	2175	2132.5	-	-		
CA_12A-48B	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B48	20	50670	9537.8	-	-	-	-	-	-	-	24.41	24.58			
CA_12A-68B	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B48	20	50683	9537.8	-	-	-	-	-	-	-	24.54	24.58			
CA_12A-88B	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B48	20	50683	9537.8	-	-	-	-	-	-	-	24.54	24.58			
CA_2A-12A(1)	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	5047	732.7	LTE B4	20	2175	2132.5	LTE B4	20	2350	2150	-	-		
CA_2A-12A(2)	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	5047	732.7	LTE B4	20	700	1940	LTE B4	20	66786	2145	2132.5	-		
CA_2A-2A-4A-12A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	5047	732.7	LTE B4	20	2175	2132.5	LTE B4	20	2350	2150	-	-		
CA_2A-2A-4A-12B	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	5047	732.7	LTE B4	20	900	1960	LTE B4	20	2175	2132.5	-	-		
CA_2A-2A-4A-12C	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	5047	732.7	LTE B4	20	900	1960	LTE B4	20	2175	2132.5	-	-		
CA_2A-2A-12B	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	5047	732.7	LTE B4	20	700	1940	LTE B4	20	66786	2145	2132.5	-		
CA_2A-2A-12B-68A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	5047	732.7	LTE B4	20	700	1940	LTE B4	20	66786	2145	2132.5	-		
CA_2A-12A-30A-68A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	5047	732.7	LTE B4	20	900	1960	LTE B4	20	9820	2155	LTE B4	20	67236	2150
CA_2A-12A-30A-68B	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	5047	732.7	LTE B4	20	900	1960	LTE B4	20	9820	2155	LTE B4	20	67236	2150
CA_2A-12A-68A-68B	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	5047	732.7	LTE B4	20	900	1960	LTE B4	20	9820	2155	LTE B4	20	67236	2150
CA_12A-46E	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B46	20	50665	5537.5	LTE B46	20	50467	5517.7	LTE B46	20	50676	2145	LTE B46	20	50071	5479.1

I.2.3 LTE Band 13 as PCC

Table I-5
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 ULS RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)			
CA_13A-46A	LTE B13	5	23230	782	QPSK	1	0	5230	751	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B4	20	56640	3625	LTE B4	20	66786	2145
CA_13A-46B	LTE B13	5	23230	782	QPSK	1	0	5230	751	LTE B2	20	900	1960	LTE B4	20	700	1940	LTE B4	20	66786	2145	LTE B4	20	67236	2150
CA_13A-46C	LTE B13	5	23230	782	QPSK	1	0	5230	751	LTE B2	20	900	1960	LTE B4	20	700	1940	LTE B4	20	66786	2145	LTE B4	20	67236	2150
CA_13A-46D	LTE B13	5	23230	782	QPSK	1	0	5230	751	LTE B2	20	900	1960	LTE B4	20	700	1940	LTE B4	20	66786	2145	LTE B4	20	67236	2150
CA_13A-46E	LTE B13	5	23230	782	QPSK	1	0	5230	751	LTE B2	20	900	1960	LTE B4	20	700	1940	LTE B4	20	66786	2145	LTE B4	20	67236	2150
CA_13A-46F	LTE B13	5	23230	782	QPSK	1	0	5230	751	LTE B2	20	900	1960	LTE B4	20	700	1940	LTE B4	20	66786	2145	LTE B4	20	67236	2150
CA_13A-46G	LTE B13																								



I.2.1 LTE Band 14 as PCC

Table I-6
Maximum Output Powers

Combination	PCC						SCC 1						SCC 2						SCC 3						Power	
	PCC Band	PCC BW [MHz]	PCC UL Channel	PCC (UL) Freq. [MHz]	Modulation	PCC ULP RB	PCC UL, RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (UL) Channel	SCC (UL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (UL) Channel	SCC (UL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (UL) Channel	SCC (UL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (UL) Channel	SCC (UL) Freq. [MHz]	LTE Tx Power with CA Enabled [dBm]
CA_2A_1A-2A_1A-3A_1A-6A_6A	LTE B14	5	23300	793	QPSK	1	0	5380	763	LTE B2	20	1000	1960	LTE B6	20	700	1940	LTE B10	20	2155	LTE B16	20	66736	24.32	24.48	
CA_2A_1A-2A_1A-3A_1A-6A_6A	LTE B14	5	23300	793	QPSK	1	0	5380	763	LTE B2	20	900	1960	LTE B6	20	9820	2355	LTE B10	20	66736	24.33	24.48				
CA_2A_1A-2A_1A-3A_1A-6A_6A	LTE B14	5	23300	793	QPSK	1	0	5380	763	LTE B2	20	900	1960	LTE B6	20	9820	2355	LTE B10	20	66736	24.33	24.48				

I.2.2 LTE Band 5 as PCC

Table I-7
Maximum Output Powers

I.2.3 LTE Band 66 as PCC

Table I-8
Maximum Output Powers

I.2.4 LTE Band 25 as PCC

Table I-9
Maximum Output Powers

Maximum Output Powers																						
Combination	PCC								SCC 1				SCC 2				SCC 3				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	PCC (DL) Mod.	PCC UL/RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC (UL) BW [MHz]	SCC (UL) Channel	SCC (UL) Freq. [MHz]	SCC Band	SCC (DL) BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC (UL) BW [MHz]	SCC (UL) Channel	SCC (UL) Freq. [MHz]	LTE Tx Power with DU Enabled [dBm]	LTE Single Carrier Tx Power [dBm]
CA_5A-25A	LTE B25	5	26665	1912.5	QPSK	1	12	8665	1992.5	LTE B5	10	2525	881.5	-	-	-	-	-	-	-	25.01	25.12
CA_12A-25A	LTE B25	5	26665	1912.5	QPSK	1	12	8665	1992.5	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	25.02	25.12
CA_25A-25A (1)	LTE B25	5	26665	1912.5	QPSK	1	12	8665	1992.5	LTE B25	20	8140	1940	-	-	-	-	-	-	-	25.02	25.12
CA_25A-41A	LTE B25	5	26665	1912.5	QPSK	1	12	8665	1992.5	LTE B41	20	40620	2593	-	-	-	-	-	-	-	24.97	25.12
CA_25A-41C	LTE B25	5	26665	1912.5	QPSK	1	12	8665	1992.5	LTE B41	20	40620	2593	LTE B41	20	40422	2593.2	-	-	-	24.96	25.12

FCC ID: A3LSMF731U	SAR EVALUATION REPORT	Approved by: Technical Manager
DUT Type: Portable Handset		APPENDIX I: Page 4 of 13

I.2.5 LTE Band 30 as PCC

Table I-10
Maximum Output Powers

Combination	PCC								SCC 1								SCC 2								SCC 3								Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Channel	PCC (UL) Freq. [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)							
CA_29A-30A-66A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B29	10	9715	722.5	LTE B69	20	66786	2145	LTE B66	20	67236	2190	-	-	-	-	23.49	23.52							
CA_29A-29A-30A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B5	10	2125	881.5	LTE B66	20	66786	2145	23.44	23.52							
CA_29A-29A-30A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B5	10	2125	881.5	LTE B66	20	66786	2145	23.44	23.52							
CA_29A-14A-20A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B14	10	5330	763.5	LTE B66	20	66786	2145	23.40	23.52							
CA_29A-14A-20A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B2	10	5095	737.5	LTE B66	20	66786	2145	LTE B66	20	67236	2190	23.39	23.52							
CA_29A-14A-30A-66A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B2	10	5330	763.5	LTE B66	10	66786	2145	LTE B66	20	67236	2190	23.40	23.52							
CA_29A-29A-29A-30A-66A	LTE B30	10	27710	2310	QPSK	1	25	9820	2355	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B29	10	9715	722.5	LTE B66	20	66786	2145	23.36	23.52							

I.2.1 LTE Band 7 as PCC

Table I-11
Maximum Output Powers

Combination	PCC								SCC 1								SCC 2								SCC 3								Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Channel	PCC (UL) Freq. [MHz]	Modulation	PCC UL# RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)							
CA_7A-7A-7A-13A	LTE B7	5	20775	2620.5	QPSK	1	12	2775	2622.5	LTE B7	20	3350	2680	LTE B2	20	900	1960	LTE B13	10	5230	751	-	-	-	-	24.22	24.47							
CA_7A-7A-7A-66A	LTE B7	5	20775	2620.5	QPSK	1	12	2775	2622.5	LTE B7	20	3350	2680	LTE B2	20	900	1960	LTE B13	10	66786	2145	-	-	-	-	24.27	24.47							
CA_7A-7C-13A	LTE B7	20	20850	2510	QPSK	1	50	2850	2630	LTE B7	20	3048	2648.8	LTE B2	20	900	1960	LTE B13	10	5230	751	-	-	-	-	24.29	24.41							
CA_7A-7C-66A	LTE B7	20	20850	2510	QPSK	1	50	2850	2630	LTE B7	20	3048	2648.8	LTE B2	20	900	1960	LTE B13	10	66786	2145	-	-	-	-	24.30	24.41							

I.2.2 LTE Band 41 as PCC

Table I-12
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) 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 Power (dBm)							
CA_41A-41A (1)	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	LTE B41	20	39750	2506	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.48	24.54					
CA_41A-41C	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	LTE B41	20	39948	2528.5	LTE B41	20	39750	2506	-	-	-	-	-	-	-	-	24.44	24.54							
CA_41C-41A	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	LTE B41	20	40911	2622.1	LTE B41	20	39750	2506	-	-	-	-	-	-	-	-	24.47	24.54							
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	-	-	-	-	-	-	-	-	24.48	24.54							

I.2.3 LTE Band 48 as PCC

Table I-13
Maximum Output Powers

Combination	PCC								SCC 1								SCC 2								SCC 3								Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Freq. [MHz]	PCC (UL) Ch.	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	20	55340	3560	64QAM	1	50	55340	3560	LTE B48	20	56640	3600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20.12	20.21					
CA_48C-48A	LTE B48	20	55340	3560	64QAM	1	50	55340	3560	LTE B48	20	55028	3079.8	LTE B48	20	56640	3600	-	-	-	-	-	-	-	-	-	20.07	20.21						
CA_48A-48C	LTE B48	20	55340	3560	64QAM	1	50	55340	3560	LTE B48	20	56640	3670.2	LTE B48	20	56642	3605.4	-	-	-	-	-	-	-	-	-	20.20	20.21						
CA_48B-48A	LTE B48	20	55340	3560	64QAM	1	50	55340	3560	LTE B48	20	55028	3079.8	LTE B48	20	55736	3698.6	LTE B48	20	56640	3600	-	-	-	-	-	-	-	-	20.21	20.21			
CA_48D-48A	LTE B48	20	55340	3560	64QAM	1	50	55340	3560	LTE B48	20	55028	3079.8	LTE B48	20	56640	3600	-	-	-	-	-	-	-	-	-	20.23	20.23						
CA_48A-48E	LTE B48	20	55340	3560	64QAM	1	50	55340	3560	LTE B48	20	56640	3670.2	LTE B48	20	56642	3605.4	LTE B48	20	56640	3630.6	-	-	-	-	-	-	-	20.21	20.21				
CA_48E-48A	LTE B48	20	55340	3560	64QAM	1	50	55340	3560	LTE B48	20	55338	3579.8	LTE B48	20	55736	3598.6	LTE B48	20	55334	3615.4	LTE B48	20	56640	3600	-	-	-	-	-	-	20.21	20.21	
CA_48C-48B	LTE B48	20	55340	3560	64QAM	1	50	55340	3560	LTE B48	20	55338	3579.8	LTE B48	20	55736	3598.6	LTE B48	20	56640	3600	-	-	-	-	-	-	-	20.20	20.21				
CA_48B-48C	LTE B48	20	55340	3560	64QAM	1	50	55340	3560	LTE B48	20	55338	3579.8	LTE B48	20	55736	3598.6	LTE B48	20	56640	3600	-	-	-	-	-	-	-	20.21	20.21				
CA_48F	LTE B48	20	55340	3																														

I.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 I.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.

I.3.1 LTE 4x4 MIMO DL Standalone Powers

**Table I-14
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	0	25.35	25.35	25.3
25	5	26665	1912.5	QPSK	1	12	25.10	25.12	25.3
30	10	27710	2310	QPSK	1	25	23.46	23.52	24.0
41	10	41055	2636.5	QPSK	1	25	24.51	24.54	25.0
48	20	55340	3560	64QAM	1	50	20.11	20.21	20.5

I.3.2 LTE Band 71 as PCC

**Table I-15
Maximum Output Powers**

Combination	PCC Band	PCC						SCC 1			SCC 2			SCC 3			Power										
		PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC ULF RB	PCC ULF 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 [dBm]	LTE Single Carrier Tx Power [dBm]					
CA [44]-[47]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B4	20	2175	2132.5	4x4	LTE B4	10	2350	2150	2x2	-	-	-	-	-	25.35	25.28
CA [44]-[49]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B4	20	2175	2132.5	4x4	LTE B4	10	2350	2150	4x4	-	-	-	-	-	25.11	25.28
CA [48A]-[48A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B4B	20	55990	3625	4x4	LTE B4B	20	56640	3690	2x2	-	-	-	-	-	25.24	25.28
CA [48A]-[48B]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B4B	20	55990	3625	4x4	LTE B4B	20	55340	3560	4x4	-	-	-	-	-	25.24	25.28
CA [48C]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B4B	20	55990	3625	4x4	LTE B4B	20	56188	3644.8	4x4	-	-	-	-	-	25.22	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	2x2	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.39	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.40	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	2x2	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B4	20	2175	2132.5	4x4	25.37	25.28
CA [2A]-[2A]-[4A]-71A	LTE B71	20	133297	680.5	QPSK	1	50	68761	634.5	2x2	LTE B2	20	900	19													



I.3.3 LTE Band 12 as PCC

Table I-16
Maximum Output Powers

I.3.4 LTE Band 13 as PCC

Table I-17
Maximum Output Powers

Approved by:

DUT Type:

APPENDIX I:
Page 3 of 12



I.3.5 LTE Band 14 as PCC

Table I-18
Maximum Output Powers

I.3.6 LTE Band 5 as PCC

Table I-19
Maximum Output Powers

FCC ID: A3LSMF731U	SAR EVALUATION REPORT	Approved by: Technical Manager
DUT Type: Portable Handset		APPENDIX I: Page 8 of 13



I.3.7 LTE Band 66 as PCC

Table I-20
Maximum Output Powers

FCC ID: A3LSMF731U

SAR EVALUATION REPORT

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Technical Manager

DUT Type:

APPENDIX I:
Page 9 of 13



FCC ID: A3LSMF731U	SAR EVALUATION REPORT	Approved by: Technical Manager
DUT Type: Portable Handset		APPENDIX I: Page 10 of 13



I.3.8 LTE Band 25 as PCC

Table I-21
Maximum Output Powers

Combination	Maximum Output Power												Power														
	PCC				SCC 1				SCC 2				LTE Tx Power with DL CA Enabled (dBm)														
PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL Rb	PCC UL RB Offset	PCC [DL] Ch.	PCC [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 Single Carrier Tx Power (dBm)		
CA_5A-[25A]	LTE B25	5	26665	1912.5	QPSK	1	12	86651	1992.5	4x4	LTE B5	10	2525	881.5	2x2	-	-	-	-	-	-	-	-	-	25.08	25.12	
CA_5A-[25A]	LTE B25	5	26665	1912.5	QPSK	1	12	86651	1992.5	4x4	LTE B12	10	2095	2573.5	2x2	-	-	-	-	-	-	-	-	-	25.07	25.12	
CA_5A-[25A]	LTE B25	5	26665	1912.5	QPSK	1	12	86651	1992.5	2x2	LTE B41	20	40242	2593	4x4	LTE B41	20	40422	2573.2	4x4	-	-	-	-	-	25.15	25.12
CA_5A-[41C]	LTE B25	5	26665	1912.5	QPSK	1	12	86651	1992.5	4x4	LTE B41	20	40242	2593	2x2	LTE B41	20	40422	2672.7	2x2	-	-	-	-	-	25.14	25.12
CA_[25A]-[41C]	LTE B25	5	26665	1912.5	QPSK	1	12	86651	1992.5	4x4	LTE B41	20	40242	2593	4x4	LTE B41	20	40422	2573.2	4x4	-	-	-	-	-	25.14	25.12
CA_[25A]-[41D]	LTE B25	5	26665	1912.5	QPSK	1	12	86651	1992.5	4x4	LTE B41	20	40242	2593	4x4	LTE B41	20	40422	2573.2	4x4	LTE B41	20	40818	2612.8	4x4	25.05	25.12
CA_[25A]-[41D]	LTE B25	5	26665	1912.5	QPSK	1	12	86651	1992.5	4x4	LTE B41	20	40242	2593	2x2	LTE B41	20	40620	2593	2x2	LTE B41	20	40818	2612.8	2x2	25.07	25.12
CA_[25A]-[41D]	LTE B25	5	26665	1912.5	QPSK	1	12	86651	1992.5	4x4	LTE B41	20	40242	2593	4x4	LTE B41	20	40620	2593	4x4	LTE B41	20	40818	2612.8	4x4	25.09	25.12

I.3.9 LTE Band 30 as PCC

Table I-22
Maximum Output Powers

I-3-10 I LTE Band 41 as PCC

Table I-23
Maximum Output Powers

	Maximum Output Powers																					
Combination	PCC Band	PCC				Mod.	SCC 1				SCC 2				Power							
		PCC BW [MHz]	PCC [UL] Ch.	PCC (UL) Freq. [MHz]	PCC UL Offset		PCC RB	PCC UL RB	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.	
CA_41[41A]-41A (1)	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	4x4	LTE B41	20	39750	2506	2x2	-	-	-	-	-	24.50	24.54
CA_41[41A]-41A (1)	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	2x2	LTE B41	20	39750	2506	4x4	-	-	-	-	-	24.60	24.54
CA_41A-[41C]	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	2x2	LTE B41	20	39948	252.8	4x4	LTE B41	20	39750	2506	4x4	24.61	24.54
CA_[41C]-41A	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	4x4	LTE B41	20	40911	2622.1	4x4	LTE B41	20	39750	2506	2x2	24.61	24.54
CA_[41A]-41C	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	4x4	LTE B41	20	39948	252.8	2x2	LTE B41	20	39750	2506	2x2	24.59	24.54
CA_41C-[41A]	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	2x2	LTE B41	20	40911	2622.1	2x2	LTE B41	20	39750	2506	4x4	24.60	24.54
CA_[41A]-[41C]	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	4x4	LTE B41	20	39948	252.8	4x4	LTE B41	20	39750	2506	4x4	24.57	24.54
CA_[41C]-[41A]	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	4x4	LTE B41	20	40911	2622.1	4x4	LTE B41	20	39750	2506	4x4	24.54	24.54
CA_41D1	LTE B41	10	41055	2636.5	QPSK	1	25	41055	2636.5	4x4	LTE B41	20	40911	2622.1	4x4	LTE B41	20	40713	2602.3	4x4	24.51	24.54

FCC ID: A3LSMF731U	SAR EVALUATION REPORT	Approved by: Technical Manager
DUT Type: Portable Handset		APPENDIX I: Page 11 of 13



I.3.11 LTE Band 48 as PCC

Table I-24
Maximum Output Powers

FCC ID: A3LSMF731U	SAR EVALUATION REPORT	Approved by: Technical Manager
DUT Type: Portable Handset		APPENDIX I: Page 12 of 13



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

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

Per FCC Guidance, additional SAR measurements for these configurations were not required since their maximum output power was not more than 0.25 dB higher than the maximum output power for with only CA_66B, CA_66C, CA_41C, or CA_48C ULCA active.

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

Table I-25
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 (UL) Ch.	SCC (UL) Freq. [MHz]	Mod.	SCC UL# RB	SCC UL RB Offset	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	ULCA Tx Power with add'l CA config. active [dBm]	ULCA Tx Power (dBm)				
CA_41C-41A	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	41490	2680	24.26	24.27				
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	24.22	24.27				
	PCC												SCC 2												Power			
	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 Band	SCC BW [MHz]	SCC (UL) Ch.	SCC (UL) Freq. [MHz]	Mod.	SCC UL# RB	SCC UL RB Offset	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch.	SCC (DL) Freq. [MHz]	ULCA Tx Power with add'l CA config. active [dBm]	ULCA Tx Power (dBm)			
CA_48D	LTE B48	20	56207	3646.7	QPSK	1	99	56207	3646.7	LTE B48	20	56405	3666.5	QPSK	1	0	56405	3666.5	LTE B48	20	56009	3626.9	-	-	15.74	15.87		
CA_48E	LTE B48	20	56207	3646.7	QPSK	1	99	56207	3646.7	LTE B48	20	56405	3666.5	QPSK	1	0	56405	3666.5	LTE B48	20	56009	3626.9	LTE B48	20	58111	3607.1	15.77	15.87

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

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

Table I-26
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 (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]	ULCA Tx Power with add'l CA config. active [dBm]	ULCA Tx Power (dBm)									
CA_66B	LTE B66	10	132022	1715	QPSK	1	49	66486	2115	4x4	LTE B66	10	132121	1724.9	QPSK	1	0	66585	2124.9	4x4	25.04	25.07	CA_66C	LTE B66	20	132072	1720	QPSK	1	99	66536	2120	4x4	24.85	24.91
	PCC												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) 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]	ULCA Tx Power with add'l CA config. active [dBm]	ULCA Tx Power (dBm)								
CA_41C	LTE B41	20	39750	2506	QPSK	1	99	39750	2506	4x4	LTE B41	20	39948	2525.8	QPSK	1	0	39948	2525.8	4x4	-	-	-	-	-	-	24.33	24.27							
CA_41C-41A	LTE B41	20	39750	2506	QPSK	1	99	39750	2506	2x2	LTE B41	20	39948	2525.8	QPSK	1	0	39948	2525.8	2x2	LTE B41	20	41490	2680	4x4	24.28	24.27								
CA_41C-41A	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	41490	2680	2x2	24.31	24.27								
CA_41C-41A	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	41490	2680	4x4	24.29	24.27								
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	24.32	24.27								
	PCC												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]	ULCA Tx Power with add'l CA config. active [dBm]	ULCA Tx Power (dBm)								
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	-	-	-	-	-	-	19.82	19.87							
CA_48D	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	LTE B48	20	56009	3626.9	4x4	19.83	19.87								
CA_48E	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	LTE B48	20	56009	3626.9	4x4	19.84	19.87								

FCC ID: A3LSMF731U	SAR EVALUATION REPORT												Approved by: Technical Manager			
DUT Type: Portable Handset													APPENDIX I: Page 13 of 13			