

APPENDIX F: DOWNLINK LTE CA RF CONDUCTED POWERS

1.1 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 1 – Example of Exclusion Table for SISO Configurations

Index	ZCC	Supported Channel Bandwidth [MHz]				Restriction	Completely Covered by Measurement Superset
		CC1	CC2	CC3	CC4		
CCC#1	CA_2A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#2	CA_2A-2A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#3	CA_2A-2A-4A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#4	CA_2A-2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#5	CA_2A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#6	CA_2A-2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#7	CA_2A-4A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#8	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#9	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#10	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#11	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#12	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#13	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#14	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#15	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#16	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#17	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#18	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#19	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#20	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#21	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#22	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#23	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#24	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#25	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#26	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#27	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#28	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#29	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#30	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#31	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#32	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#33	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#34	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#35	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#36	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#37	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#38	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#39	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#40	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#41	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#42	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#43	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#44	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#45	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#46	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#47	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#48	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#49	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#50	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#51	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#52	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#53	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#54	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#55	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#56	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#57	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#58	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#59	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#60	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#61	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#62	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#63	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#64	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#65	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#66	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#67	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#68	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#69	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#70	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#71	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#72	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#73	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#74	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#75	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#76	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#77	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#78	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#79	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#80	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#81	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#82	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#83	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#84	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#85	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#86	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#87	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#88	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#89	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#90	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#91	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#92	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#93	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#94	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#95	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#96	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#97	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#98	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#99	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	
CCC#100	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20			CCC#1	

Table 2 – Example of Exclusion Table for 4x4 Downlink MIMO Configurations

Index	ZCC	Supported Channel Bandwidth [MHz]			Restriction	Completely Covered by Measurement Superset
		CC1	CC2	CC3		
CCC#M1	CA [2C]	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M2	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M3	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M4	CA [2A]-4A (2)	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M5	CA [2A]-4A (2)	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M6	CA [2A]-4A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M7	CA [2A]-12A (1)	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M8	CA [2A]-12A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M9	CA [2A]-12A (1)	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M10	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		B29 SCC Only	
CCC#M11	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M12	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M13	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M14	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M15	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M16	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M17	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M18	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M19	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M20	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M21	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M22	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M23	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M24	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M25	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M26	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M27	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CCC#M1	
CCC#M28	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20			

1.2 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 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. 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.

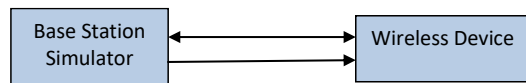





Figure 1
DL CA Power Measurement Setup

FCC ID: A3LSMN981W	 PCTEST Proud to be part of 	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 06/03/20 - 07/13/20	DUT Type: Portable Handset			APPENDIX F: Page 2 of 9

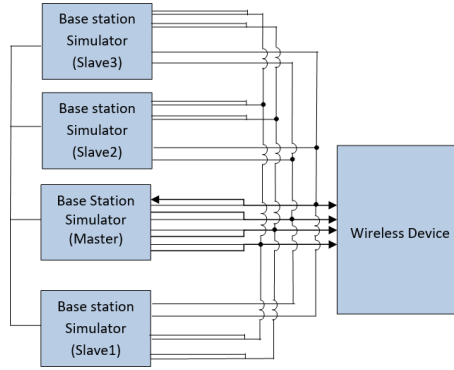


Figure 2
DL CA with DL 4x4 MIMO Power Measurement Setup

1.3 Downlink Carrier Aggregation RF Conducted Powers

1.3.1 LTE Band 12 as PCC

Table 1
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC				SCC 1				SCC 2				SCC 3				Power						
				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]	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	-	-	-	-	-	-	-	-	-	-	25.08	25.04	
CA_2A-12A-30A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B30	10	9820	2355	-	-	-	-	-	-	-	25.07	25.04
CA_2A-7A-12A	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B7	20	3100	2655	-	-	-	25.00	25.04
CA_2A-7A-12B	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	LTE B12	5	5047	732.7	LTE B2	20	900	1960	LTE B7	20	3100	2655	-	-	-	25.05	25.04

1.3.2 LTE Band 13 as PCC

Table 2
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC				SCC 1				SCC 2				SCC 3				Power							
				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]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)				
CA_2A-13A	LTE B13	10	23230	782	QPSK	1	49	5230	751	LTE B2	20	900	1960	-	-	-	-	-	-	-	-	-	-	25.20	25.00		
CA_4A-13A	LTE B13	10	23230	782	QPSK	1	49	5230	751	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	-	-	-	25.99	25.05	
CA_13A-66A	LTE B13	5	23230	782	QPSK	1	24	5230	751	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	-	-	-	25.11	25.11	
CA_2A-13A-66A	LTE B13	5	23230	782	QPSK	1	24	5230	751	LTE B2	20	900	1960	LTE B66	20	66786	2145	-	-	-	-	-	-	-	-	25.16	25.11
CA_13A-66A-66A	LTE B13	5	23230	782	QPSK	1	24	5230	751	LTE B66	20	66786	2145	LTE B66	20	67236	2190	-	-	-	-	-	-	-	-	25.18	25.11
CA_2A-7A-13A	LTE B13	5	23230	782	QPSK	1	24	5230	751	LTE B2	20	900	1960	LTE B7	20	3100	2655	LTE B7	20	2850	2630	-	-	-	-	25.17	25.11

1.3.3 LTE Band 5 as PCC

Table 3
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC				SCC 1				SCC 2				SCC 3				SCC 4				Power				
				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_5A-7A	LTE B5	10	20525	836.5	QPSK	1	0	2025	881.5	LTE B7	20	3100	2655	-	-	-	-	-	-	-	-	-	-	-	-	25.26	25.33	
CA_5A-38A	LTE B5	10	20525	836.5	QPSK	1	0	2025	881.5	LTE B38	20	38000	2595	-	-	-	-	-	-	-	-	-	-	-	-	-	25.24	25.33
CA_6A-7A-7A	LTE B5	10	20525	836.5	QPSK	1	0	2025	881.5	LTE B7	20	3100	2655	LTE B7	20	2850	2630	-	-	-	-	-	-	-	-	-	25.33	25.33
CA_5A-7C	LTE B5	10	20525	836.5	QPSK	1	0	2025	881.5	LTE B7	20	3100	2655	LTE B7	20	2902	2632.5	-	-	-	-	-	-	-	-	-	25.41	25.33
CA_5A-66C	LTE B5	10	20525	836.5	QPSK	1	0	2025	881.5	LTE B66	20	66786	2145	LTE B66	20	66984	2164.8	-	-	-	-	-	-	-	-	-	25.28	25.33
CA_2A-4A-5A-30A	LTE B5	10	20525	836.5	QPSK	1	0	2025	881.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B30	10	9820	2355	-	-	-	-	-	25.25	25.33
CA_2A-2A-5A-66A-66A	LTE B5	10	20525	836.5	QPSK	1	0	2025	881.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B66	20	66786	2145	LTE B66	20	67236	2190	25.30	25.33	
CA_2A-5A-30A-66A-66A	LTE B5	10	20525	836.5	QPSK	1	0	2025	881.5	LTE B2	20	900	1960	LTE B30	10	9820	2355	LTE B66	20	66786	2145	LTE B66	20	67236	2190	25.30	25.33	

FCC ID: A3LSMN981W	PCTEST Proud to be part of element	SAR EVALUATION REPORT		Reviewed by: Quality Manager
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1.4.1 LTE 4x4 MIMO DL Standalone Powers

Table 8
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	20	132572	1770	QPSK	1	0	23.18	23.21	23.0
25	3	26675	1913.5	QPSK	1	7	23.34	23.30	23.0
7	15	20825	2507.5	QPSK	1	36	23.68	23.53	23.0
30	5	27710	2310	QPSK	1	12	23.87	23.78	23.2
41	5	39750	2506	QPSK	1	24	24.77	24.65	24.0

1.4.2 LTE Band 12 as PCC

Table 9
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC				SCC 1				SCC 2				SCC 3				LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]										
						PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band			SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.						
CA [2A]-[2A](1)	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	900	1960	4x4	25.19	25.04	
CA [2A]-[2A]-[30A]	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B30	10	9820	2355	2x2	-	-	-	-	-	-	-	-	-	-	-	25.02	25.04
CA [2A]-[2A]-[30A]	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B30	10	9820	2355	4x4	-	-	-	-	-	-	-	-	-	-	-	24.98	25.04
CA [2A]-[2A]-[7A]-[12A]	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B7	20	3100	2655	2x2	LTE B7	20	3100	2655	4x4	25.24	25.04	
CA [2A]-[2A]-[7A]-[12A]	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B7	20	3100	2655	4x4	LTE B7	20	3100	2655	4x4	25.21	25.04	
CA [2A]-[2A]-[7A]-[12A]	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	2x2	LTE B7	20	3100	2655	4x4	LTE B7	20	3100	2655	4x4	25.20	25.04	
CA [2A]-[2A]-[7A]-[12A]	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	700	1940	4x4	LTE B7	20	3100	2655	4x4	LTE B7	20	3100	2655	4x4	25.07	25.04	
CA [2A]-[7A]-[12B]	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	2x2	LTE B12	5	5047	732.7	2x2	LTE B12	5	900	1960	4x4	LTE B7	20	3100	2655	2x2	LTE B7	20	3100	2655	4x4	25.04	25.04	
CA [2A]-[7A]-[12B]	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	2x2	LTE B12	5	5047	732.7	2x2	LTE B12	5	900	1960	2x2	LTE B7	20	3100	2655	4x4	LTE B7	20	3100	2655	4x4	25.09	25.04	
CA [2A]-[7A]-[12B]	LTE B12	5	23095	707.5	QPSK	1	12	5095	737.5	2x2	LTE B12	5	5047	732.7	2x2	LTE B12	5	900	1960	4x4	LTE B7	20	3100	2655	4x4	LTE B7	20	3100	2655	4x4	25.10	25.04	

1.4.3 LTE Band 13 as PCC

Table 10
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC				SCC 1				SCC 2				SCC 3				LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]											
						PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band			SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.							
CA [2A]-[13A]	LTE B13	10	23320	782	QPSK	1	49	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B06	20	66786	2145	2x2	-	-	-	-	-	-	-	-	-	-	25.24	25.05		
CA [4A]-[13A]	LTE B13	10	23320	782	QPSK	1	49	5230	751	2x2	LTE B4	20	2175	2132.5	4x4	LTE B06	20	66786	2145	4x4	-	-	-	-	-	-	-	-	-	-	-	25.20	25.05	
CA [2A]-[13A]-[66A]	LTE B13	5	23320	782	QPSK	1	24	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B06	20	66786	2145	2x2	-	-	-	-	-	-	-	-	-	-	-	25.14	25.11	
CA [2A]-[13A]-[66A]	LTE B13	5	23320	782	QPSK	1	24	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B06	20	66786	2145	4x4	-	-	-	-	-	-	-	-	-	-	-	-	25.10	25.11
CA [2A]-[13A]-[66A]	LTE B13	5	23320	782	QPSK	1	24	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B06	20	66786	2145	4x4	-	-	-	-	-	-	-	-	-	-	-	-	25.20	25.11
CA [13A]-[66A]-[66A]	LTE B13	5	23320	782	QPSK	1	24	5230	751	2x2	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	2x2	-	-	-	-	-	-	-	-	-	-	-	-	25.23	25.11
CA [2A]-[7A]-[7A]-[13A]	LTE B13	5	23320	782	QPSK	1	24	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B7	20	3100	2655	2x2	LTE B7	20	2850	2630	2x2	LTE B7	20	2850	2630	2x2	24.89	25.11		
CA [2A]-[7A]-[7A]-[13A]	LTE B13	5	23320	782	QPSK	1	24	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B7	20	3100	2655	4x4	LTE B7	20	2850	2630	2x2	LTE B7	20	2850	2630	2x2	24.98	25.11		
CA [2A]-[7A]-[7A]-[13A]	LTE B13	5	23320	782	QPSK	1	24	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B7	20	3100	2655	4x4	LTE B7	20	2850	2630	4x4	LTE B7	20	2850	2630	4x4	25.05	25.11		
CA [2A]-[7A]-[7A]-[13A]	LTE B13	5	23320	782	QPSK	1	24	5230	751	2x2	LTE B2	20	900	1960	4x4	LTE B7	20	3100	2655	4x4	LTE B7	20	2850	2630	4x4	LTE B7	20	2850	2630	4x4	25.11	25.11		

1.4.4 LTE Band 5 as PCC




Table 11
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC				SCC 1				SCC 2				SCC 3				SCC 4				LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]									
						PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.			SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.				
CA [4A](7A)	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	2x2	LTE B7	20	3100	2655	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25.26	25.33			
CA [2A]-[4A]-[5A]	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	2x2	LTE B2	20	900	1960	4x4	LTE B4	20	2175	2132.5	2x2	-	-	-	-	-	-	-	-	-	-	-	-	25.44	25.33		
CA [2A]-[4A]-[5A]	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	2x2	LTE B2	20	900	1960	4x4	LTE B4	20	2175	2132.5	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	25.40	25.33	
CA [2A]-[4A]-[5A]	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	2x2	LTE B2	20	900	1960	4x4	LTE B4	20	2175	2132.5	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	25.37	25.33	
CA [4A]-[5A](3A)	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	2x2	LTE B4	20	2175	2132.5	2x2	LTE B04	20	9820	2355	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	24.97	25.33	
CA [5A]-[7A]-[7A]	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	2x2	LTE B7	20	3100	2655	4x4	LTE B7	20	2950	2630	2x2	-	-	-	-	-	-	-	-	-	-	-	-	25.22	25.33		
CA [5A]-[7A]-[7A]	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	2x2	LTE B7	20	3100	2655	4x4	LTE B7	20	2950	2630	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	25.30	25.33	
CA [5A](7C)	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	2x2	LTE B7	20	3100	2655	4x4	LTE B7	20	2950	2632	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	25.24	25.33	
CA [5A](8C)	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	2x2	LTE B8	20	66786	2145	4x4	LTE B8	20	66984	2148	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25.27	25.33
CA [2A]-[5A]-[5A]-[66A]	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	2x2	LTE B2	20	900	1960	4x4	LTE B30	10	9820	2355	2x2	LTE B66	20	66786	2145	2x2	-	-	-	-	-	-	-	-	24.92	25.33	
CA [2A]-[5A]-[5A]-[66A]	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	2x2	LTE B2	20	900	1960	4x4	LTE B30	10	9820	2355	4x4	LTE B66	20	66786	2145	4x4	-	-	-	-	-	-	-	-	25.00	25.33	
CA [2A]-[5A]-[5A]-[66A]	LTE B5	10	20525	836.5	QPSK	1	0	2525	881.5	2x2	LTE B2	20	900	1960																						

1.4.8 LTE Band 41 as PCC

Table 15
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 (dBm)	LTE Single Carrier Tx Power (dBm)
CA [41C] (1)	LTE B41	5	39750	2506	QPSK	1	24	39750	2506	4x4	LTE B41	20	39867	2517.7	4x4	24.62	24.65

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