

2 Composition / Information on ingredients

The Item is composed of the following ingredients:

Water	50 – 65%
Mineral oil	10 – 30%
Emulsifiers	8 – 25%
Sodium salt	0 – 1.5%

Figure D-6

Composition of 5 GHz Head Tissue Equivalent Matter

Note: 5 GHz head liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

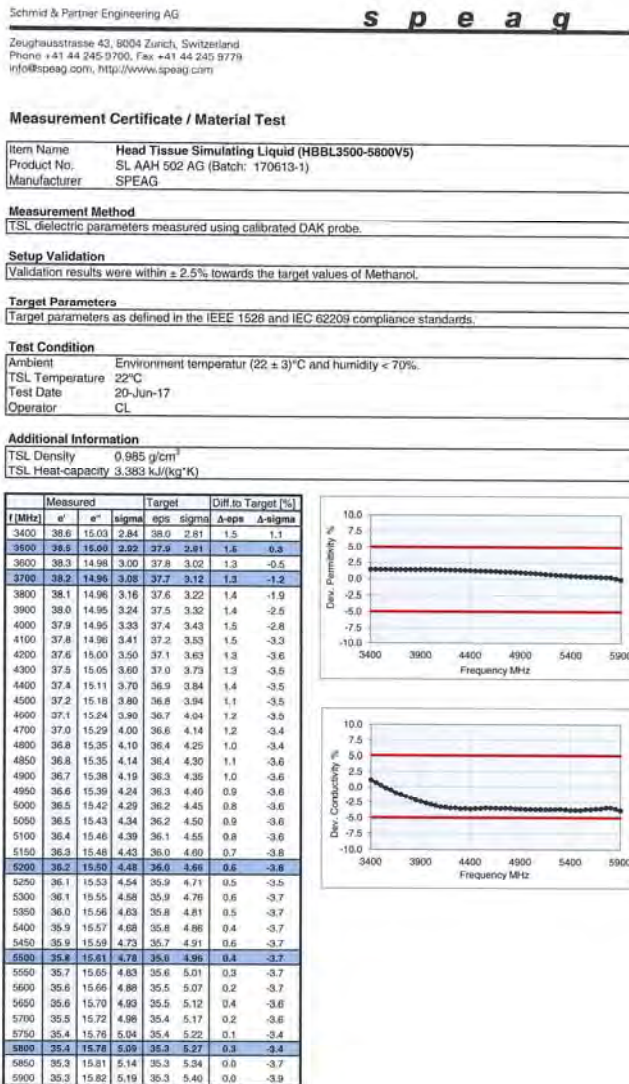


Figure D-7

5 GHz Head Tissue Equivalent Matter

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3 Composition / Information on ingredients

The Item is composed of the following ingredients:

Water	60 – 80%
Esters, Emulsifiers, Inhibitors	20 – 40%
Sodium salt	0 – 1.5%

Figure D-8
Composition of 5 GHz Body Tissue Equivalent Matter

Note: 5 GHz Body liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

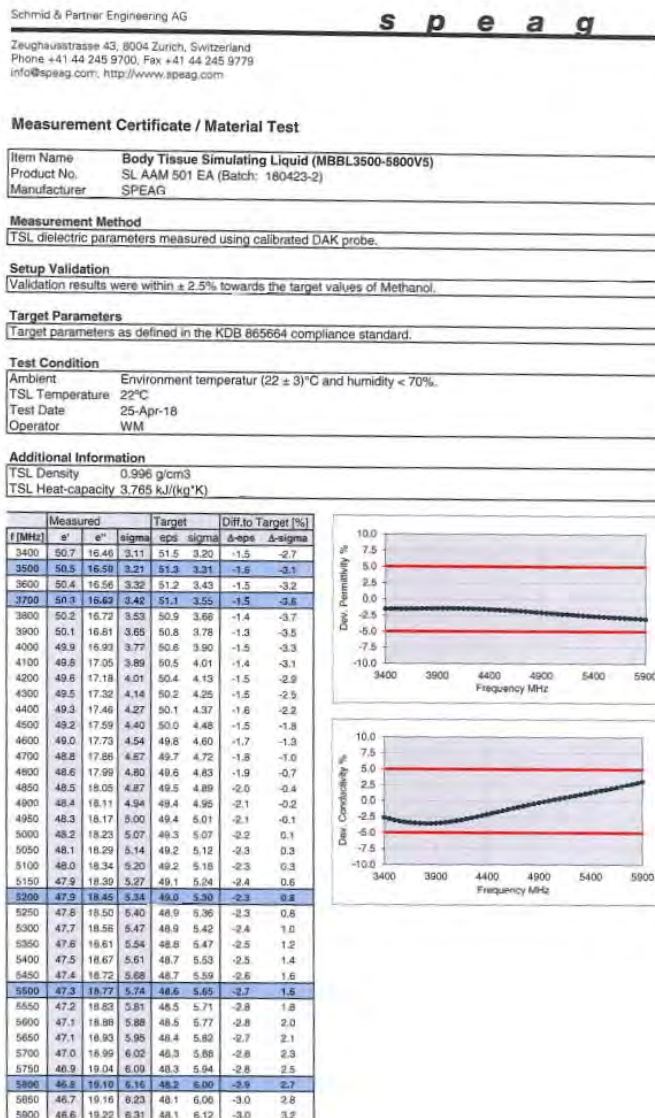


Figure D-9
5 GHz Body Tissue Equivalent Matter

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APPENDIX E: SAR SYSTEM VALIDATION

Per FCC KDB Publication 865664 D02v01r02, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

Table E-1
SAR System Validation Summary – 1g

SAR System	Freq. (MHz)	Date	Probe SN	Probe Cal Point		Cond. (σ)	Perm. (εr)	CW VALIDATION			MOD. VALIDATION		
								SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
G	750	8/9/2018	7410	750	Head	0.898	41.769	PASS	PASS	PASS	N/A	N/A	N/A
G	835	8/9/2018	7410	835	Head	0.889	40.915	PASS	PASS	PASS	GMSK	PASS	N/A
H	835	7/13/2018	7409	835	Head	0.932	43.227	PASS	PASS	PASS	GMSK	PASS	N/A
H	1750	7/16/2018	7409	1750	Head	1.331	41.186	PASS	PASS	PASS	N/A	N/A	N/A
G	1900	8/9/2018	7410	1900	Head	1.429	38.607	PASS	PASS	PASS	GMSK	PASS	N/A
G	2300	8/8/2018	7410	2300	Head	1.701	40.133	PASS	PASS	PASS	N/A	N/A	N/A
G	2450	8/7/2018	7410	2450	Head	1.865	39.618	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
H	2450	8/8/2018	7409	2450	Head	1.844	40.474	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
E	2450	2/5/2019	3589	2450	Head	1.825	39.836	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
G	2600	8/8/2018	7410	2600	Head	2.04	39.033	PASS	PASS	PASS	TDD	PASS	N/A
E	2600	2/7/2019	3589	2600	Head	1.964	40.46	PASS	PASS	PASS	TDD	PASS	N/A
H	5250	7/5/2018	7409	5250	Head	4.492	34.994	PASS	PASS	PASS	OFDM	N/A	PASS
H	5600	7/5/2018	7409	5600	Head	4.839	34.496	PASS	PASS	PASS	OFDM	N/A	PASS
H	5750	7/5/2018	7409	5750	Head	4.995	34.288	PASS	PASS	PASS	OFDM	N/A	PASS
E	750	2/5/2019	3589	750	Body	0.984	54.096	PASS	PASS	PASS	N/A	N/A	N/A
J	750	3/5/2019	7488	750	Body	0.956	54.048	PASS	PASS	PASS	N/A	N/A	N/A
D	835	8/15/2018	7357	835	Body	1.000	53.368	PASS	PASS	PASS	GMSK	PASS	N/A
J	835	3/10/2019	7488	835	Body	0.988	53.868	PASS	PASS	PASS	GMSK	PASS	N/A
J	1750	9/5/2018	3347	1750	Body	1.454	53.515	PASS	PASS	PASS	N/A	N/A	N/A
G	1750	8/29/2018	7410	1750	Body	1.464	52.807	PASS	PASS	PASS	N/A	N/A	N/A
E	1900	12/3/2018	3332	1900	Body	1.518	51.796	PASS	PASS	PASS	GMSK	PASS	N/A
J	1900	2/8/2019	7488	1900	Body	1.571	52.538	PASS	PASS	PASS	GMSK	PASS	N/A
K	2300	4/3/2018	3319	2300	Body	1.871	51.575	PASS	PASS	PASS	N/A	N/A	N/A
K	2450	4/3/2018	3319	2450	Body	2.043	51.13	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
K	2600	4/3/2018	3319	2600	Body	2.225	50.665	PASS	PASS	PASS	TDD	PASS	N/A
L	5250	10/29/2018	7308	5250	Body	5.511	48.77	PASS	PASS	PASS	OFDM	N/A	PASS
L	5600	10/29/2018	7308	5600	Body	5.994	48.2	PASS	PASS	PASS	OFDM	N/A	PASS
L	5750	10/29/2018	7308	5750	Body	6.219	47.96	PASS	PASS	PASS	OFDM	N/A	PASS

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Table E-2
SAR System Validation Summary – 10g

SAR System	Freq. (MHz)	Date	Probe SN	Probe Cal Point		Cond. (σ)	Perm. (ϵ_r)	CW VALIDATION			MOD. VALIDATION		
								SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
E	750	2/5/2019	3589	750	Body	0.984	54.096	PASS	PASS	PASS	N/A	N/A	N/A
D	835	8/15/2018	7357	835	Body	1.000	53.368	PASS	PASS	PASS	GMSK	PASS	N/A
J	1750	9/5/2018	3347	1750	Body	1.454	53.515	PASS	PASS	PASS	N/A	N/A	N/A
G	1750	8/29/2018	7410	1750	Body	1.464	52.807	PASS	PASS	PASS	N/A	N/A	N/A
E	1900	12/3/2018	3332	1900	Body	1.518	51.796	PASS	PASS	PASS	GMSK	PASS	N/A
J	1900	2/8/2019	7488	1900	Body	1.571	52.538	PASS	PASS	PASS	GMSK	PASS	N/A
K	2300	4/3/2018	3319	2300	Body	1.871	51.575	PASS	PASS	PASS	N/A	N/A	N/A
K	2450	4/3/2018	3319	2450	Body	2.043	51.13	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
K	2600	4/3/2018	3319	2600	Body	2.225	50.665	PASS	PASS	PASS	TDD	PASS	N/A
L	5250	10/29/2018	7308	5250	Body	5.511	48.77	PASS	PASS	PASS	OFDM	N/A	PASS
L	5600	10/29/2018	7308	5600	Body	5.994	48.2	PASS	PASS	PASS	OFDM	N/A	PASS
L	5750	10/29/2018	7308	5750	Body	6.219	47.96	PASS	PASS	PASS	OFDM	N/A	PASS

NOTE: While the probes have been calibrated for both CW and modulated signals, all measurements were performed using communication systems calibrated for CW signals only. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01r04 for scenarios when CW probe calibrations are used with other signal types. SAR systems were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to FCC KDB Publication 865664 D01v01r04.

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APPENDIX G POWER REDUCTION VERIFICATION

Per the May 2017 TCBC Workshop Notes, demonstration of proper functioning of the power reduction mechanisms is required to support the corresponding SAR configurations. The verification process was divided into two parts: (1) evaluation of output power levels for individual or multiple triggering mechanisms and (2) evaluation of the triggering distances for proximity-based sensors.

G.1 Power Verification Procedure

The power verification was performed according to the following procedure:

1. A base station simulator was used to establish a conducted RF connection and the output power was monitored. The power measurements were confirmed to be within expected tolerances for all states before and after a power reduction mechanism was triggered.
2. Step 1 was repeated for all relevant modes and frequency bands for the mechanism being investigated.
3. Steps 1 and 2 were repeated for all individual power reduction mechanisms and combinations thereof. For the combination cases, one mechanism was switched to a 'triggered' state at a time; powers were confirmed to be within tolerances after each additional mechanism was activated.

G.2 Distance Verification Procedure

The distance verification procedure was performed according to the following procedure:

1. A base station simulator was used to establish an RF connection and to monitor the power levels. The device being tested was placed below the relevant section of the phantom with the relevant side or edge of the device facing toward the phantom.
2. The device was moved toward and away from the phantom to determine the distance at which the mechanism triggers and the output power is reduced, per KDB Publication 616217 D04v01r02 and FCC Guidance. Each applicable test position was evaluated. The distances were confirmed to be the same or larger (more conservative) than the minimum distances provided by the manufacturer.
3. Steps 1 and 2 were repeated for low, mid, and high bands, as appropriate (see note below Table G-2 for more details).
4. Steps 1 through 3 were repeated for all distance-based power reduction mechanisms.

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G.3 Main Antenna Verification Summary

Table G-1
Power Measurement Verification for Main Antenna

Mechanism(s)		Mode/Band	Conducted Power (dBm)		
1st	2nd		Un-triggered (Max)	Mechanism #1 (Reduced)	Mechanism #2 (Reduced)
Hotspot On		PCS CDMA	24.76	21.45	
Grip		PCS CDMA	24.76	20.14	
Hotspot On	Grip	PCS CDMA	24.82	21.5	20.14
Grip	Hotspot On	PCS CDMA	24.8	20.18	20.17
Hotspot On		GPRS 1900	29.98	28.02	
Grip		GPRS 1900	29.93	26.95	
Hotspot On	Grip	GPRS 1900	29.94	28.03	27
Grip	Hotspot On	GPRS 1900	29.94	26.95	26.97
Hotspot On		UMTS 1750	24.46	20.05	
Grip		UMTS 1750	24.51	19.45	
Hotspot On	Grip	UMTS 1750	24.35	20.08	20.03
Grip	Hotspot On	UMTS 1750	24.5	19.38	19.52
Hotspot On		UMTS 1900	24.51	20.06	
Grip		UMTS 1900	24.58	19.1	
Hotspot On	Grip	UMTS 1900	24.57	20.1	19.08
Grip	Hotspot On	UMTS 1900	24.55	19.14	19.15
Hotspot On		LTE FDD Band 4	24.47	20.02	
Grip		LTE FDD Band 4	24.52	19.5	
Hotspot On	Grip	LTE FDD Band 4	24.31	20.04	19.52
Grip	Hotspot On	LTE FDD Band 4	24.44	19.49	19.51
Hotspot On		LTE FDD Band 66	24.47	19.95	
Grip		LTE FDD Band 66	24.48	19.45	
Hotspot On	Grip	LTE FDD Band 66	24.47	19.99	19.47
Grip	Hotspot On	LTE FDD Band 66	24.55	19.45	19.44
Hotspot On		LTE FDD Band 2	24.38	20.35	
Grip		LTE FDD Band 2	24.35	20.38	
Hotspot On	Grip	LTE FDD Band 2	24.36	20.37	20.37
Grip	Hotspot On	LTE FDD Band 2	24.42	20.44	20.42
Hotspot On		LTE FDD Band 25	24.32	20.22	
Grip		LTE FDD Band 25	24.32	20.35	
Hotspot On	Grip	LTE FDD Band 25	24.33	20.23	20.23
Grip	Hotspot On	LTE FDD Band 25	24.29	20.35	20.31
Hotspot On		LTE FDD Band 30	24.51	20.51	
Grip		LTE FDD Band 30	24.53	20.46	
Hotspot On	Grip	LTE FDD Band 30	24.53	20.45	20.51
Grip	Hotspot On	LTE FDD Band 30	24.53	20.46	20.49
Hotspot On		LTE FDD Band 7	24.74	20.48	
Grip		LTE FDD Band 7	24.75	19.42	
Hotspot On	Grip	LTE FDD Band 7	24.74	20.48	19.45
Grip	Hotspot On	LTE FDD Band 7	24.73	19.42	19.46
Hotspot On		LTE FDD Band 38	24.35	20.28	
Grip		LTE FDD Band 38	24.3	20.28	
Hotspot On	Grip	LTE FDD Band 38	24.27	20.27	20.27
Grip	Hotspot On	LTE FDD Band 38	24.24	20.28	20.28
Hotspot On		LTE TDD Band 41 (PC3)	24.21	21.95	
Grip		LTE TDD Band 41 (PC3)	24.32	20.46	
Hotspot On	Grip	LTE TDD Band 41 (PC3)	24.21	21.96	20.47
Grip	Hotspot On	LTE TDD Band 41 (PC3)	24.36	20.57	20.53
Hotspot On		LTE TDD Band 41 (PC2)	27.42	21.99	
Grip		LTE TDD Band 41 (PC2)	27.46	20.55	
Hotspot On	Grip	LTE TDD Band 41 (PC2)	27.44	21.95	20.46
Grip	Hotspot On	LTE TDD Band 41 (PC2)	27.46	20.57	20.43

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Table G-2
Distance Measurement Verification for Main Antenna in Closed Configuration

Mechanism(s)	Test Condition	Band	Distance Measurements (mm)		Minimum Distance per Manufacturer (mm)
			Moving Toward	Moving Away	
Grip - Closed	Body - Back Side	Mid	10	17	8
Grip - Closed	Body - Back Side	High	10	17	8
Grip - Closed	Body - Bottom Edge	Mid	12	19	12
Grip - Closed	Body - Bottom Edge	High	12	19	12

*Note: Mid band refers to: CDMA BC1, GSM1900, UMTS B2/4, LTE B2/4/25/66; High band refers to: LTE B7/30/38/41

Table G-3
Distance Measurement Verification for Main Antenna in Open Configuration

Mechanism(s)	Test Condition	Band	Distance Measurements (mm)		Minimum Distance per Manufacturer (mm)
			Moving Toward	Moving Away	
Grip - Open	Body - Back Side	Mid	11	15	9
Grip - Open	Body - Back Side	High	11	15	9
Grip - Open	Body - Front Side	Mid	10	14	9
Grip - Open	Body - Front Side	High	10	14	9
Grip - Open	Body - Bottom Edge	Mid	14	22	14
Grip - Open	Body - Bottom Edge	High	14	22	14

*Note: Mid band refers to: CDMA BC1, GSM1900, UMTS B2/4, LTE B2/4/25/66; High band refers to: LTE B7/30/38/41

G.4 WIFI Verification Summary

Table G-4
Power Measurement Verification WIFI

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
		Un-triggered (Max)	Mechanism #1 (Reduced)
Held-to-Ear	802.11b	19.84	14.71
Held-to-Ear	802.11g	16.84	14.60
Held-to-Ear	802.11n (2.4GHz)	17.07	14.93
Held-to-Ear	802.11a	16.97	12.38
Held-to-Ear	802.11n (5GHz, 20MHz BW)	16.99	12.51
Held-to-Ear	802.11n (5GHz, 40MHz BW)	15.99	11.97
Held-to-Ear	802.11ac (20MHz BW)	16.95	12.57
Held-to-Ear	802.11ac (40MHz BW)	16.00	12.05
Held-to-Ear	802.11ac (80MHz BW)	14.84	11.92

*Note: 802.11ax and MIMO WIFI modes were not evaluated due to equipment limitations.

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Table G-5
Distance Measurement Verification for WIFI

Mechanism(s)	Test Condition	Band	Distance Measurements (mm)		Minimum Distance per Manufacturer (mm)
			Moving Toward	Moving Away	
Held-to-Ear	Head - Right Cheek	2.4GHz	61	76	50
Held-to-Ear	Head - Right Cheek	5GHz	61	77	50
Held-to-Ear	Head - Left Cheek	2.4GHz	60	77	50
Held-to-Ear	Head - Left Cheek	5GHz	61	77	50

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APPENDIX H: 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

[illegible]

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

Table 1: Example Channel Bandwidths for 100 MHz Channel Configurations																				
Index	2CC	Supported Channel Bandwidth (MHz)		Restriction	Completely Covered by Measurement Superband	Index	3CC	Supported Channel Bandwidth (MHz)			Restriction	Completely Covered by Measurement Superband	Index	4CC	Supported Channel Bandwidth (MHz)				Restriction	Completely Covered by Measurement Superband
		CC1	CC2					CC1	CC2	CC3					CC1	CC2	CC3	CC4		
CC#RM1	CA [2C]	5, 10, 15, 20	5, 10, 15, 20		CC#RM6	CA [2A]-2A-4A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		CC#RM11	CA [2A]-S8-66A	5, 10, 15, 20	5, 10	5, 10, 15, 20		No			
CC#RM2	CA [2A]-3A	5, 10, 15, 20	5, 10, 15, 20		CC#RM7	CA [2C]-2A-5A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		CC#RM12	CA [2A]-S8-66A	5, 10, 15, 20	5, 10	5, 10, 15, 20		No			
CC#RM3	CA [2A]-2A	5, 10, 15, 20	5, 10, 15, 20		CC#RM8	CA [2A]-2A-12A	5, 10, 15, 20	5, 10, 15, 20	5, 10		CC#RM13	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM4	CA [2A]-4A-2	5, 10, 15, 20	5, 10, 15, 20		CC#RM9	CA [2A]-2A-13A	5, 10, 15, 20	5, 10, 15, 20	10		CC#RM14	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM5	CA [2A]-1A-4	5, 10, 15, 20	5, 10, 15, 20	No	CC#RM10	CA [2A]-2A-14A	5, 10, 15, 20	5, 10, 15, 20	10		CC#RM15	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM6	CA [2A]-5A	5, 10, 15, 20	5, 10		CC#RM11	CA [2C]-2A-15A	5, 10, 15, 20	5, 10, 15, 20	10		CC#RM16	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM7	CA [2A]-1A-1	5, 10, 15, 20	5, 10		CC#RM12	CA [2C]-6A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		CC#RM17	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM8	CA [2A]-3A	5, 10, 15, 20	10		CC#RM13	CA [2C]-16A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		CC#RM18	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM9	CA [2A]-17A	5, 10, 15, 20	5, 10		CC#RM14	CA [2A]-2A-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		CC#RM19	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM10	CA [2A]-29A-2	5, 10, 15, 20	5, 10	B29 SC Only	CC#RM15	CA [2A]-2A-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		CC#RM20	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM11	CA [2A]-18A	5, 10, 15, 20	5, 10		CC#RM16	CA [2A]-13A-71A	5, 10, 15, 20	5, 10, 15, 20	5, 10		CC#RM21	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM12	CA [2A]-66A-2	5, 10, 15, 20	5, 10, 15, 20		CC#RM17	CA [2A]-4A-29A	5, 10, 15, 20	5, 10, 15, 20	5, 10	B29 SC Only	CC#RM22	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM13	CA [2A]-66A-2	5, 10, 15, 20	5, 10, 15, 20		CC#RM18	CA [2A]-4A-71A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		CC#RM23	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM14	CA [2A]-66A-2	5, 10, 15, 20	5, 10, 15, 20	No	CC#RM19	CA [2A]-S8-66A	5, 10, 15, 20	5, 10			CC#RM24	CA [2A]-S8-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM15	CA [2A]-71A	5, 10, 15, 20	5, 10, 15, 20		CC#RM20	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15, 20		CC#RM25	CA [2A]-S6-66A	5, 10, 15, 20	5, 10	5, 10, 15		5, 10, 15			
CC#RM16	CA [S6]-66A	5, 10	5, 10, 15, 20		CC#RM21	CA [2A]-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15	4CC RM3	CC#RM26	CA [2A]-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		4CC RM6			
CC#RM17	CA [2A]-13A-66A-4	5, 10	5, 10, 15, 20		CC#RM22	CA [2A]-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15	CC#RM4	CC#RM27	CA [2A]-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
CC#RM18	CA [S6]-66A	5, 10	5, 10, 15, 20		CC#RM23	CA [2A]-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20	4CC RM5	CC#RM28	CA [2A]-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
CC#RM19	CA [S6]-66A	5, 10	5, 10, 15, 20		CC#RM24	CA [2A]-13A-66A	5, 10, 15, 20	5, 10	5, 10, 15, 20		CC#RM29	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
CC#RM20	CA [S6]-66A	5, 10, 15	5, 10, 15		CC#RM25	CA [2A]-30A-66A	5, 10, 15, 20	5, 10	5, 10, 15, 20		CC#RM30	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
CC#RM21	CA [66C]	5, 10, 15, 20	5, 10, 15, 20		CC#RM26	CA [2A]-66B	5, 10, 15, 20	5, 10, 15	5, 10, 15	4CC RM3	CC#RM31	CA [2A]-66B	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
CC#RM22	CA [66A]-66A	5, 10, 15, 20	5, 10, 15, 20		CC#RM27	CA [2A]-66B	5, 10, 15, 20	5, 10, 15	5, 10, 15	CC#RM4	CC#RM32	CA [2A]-66B	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
CC#RM23	CA [66A]-66A	5, 10, 15, 20	5, 10, 15, 20	No	CC#RM28	CA [2A]-66B	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20	4CC RM5	CC#RM33	CA [2A]-66C	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM34	CA [2A]-66C	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM35	CA [2A]-66C	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM36	CA [2A]-66C	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM37	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM38	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM39	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM40	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM41	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM42	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM43	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM44	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM45	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM46	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM47	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM48	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM49	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM50	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM51	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM52	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM53	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM54	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM55	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM56	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM57	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM58	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM59	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM60	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM61	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM62	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM63	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM64	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM65	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM66	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM67	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM68	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM69	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM70	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM71	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM72	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM73	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM74	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM75	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM76	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM77	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM78	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM79	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM80	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM81	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM82	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM83	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM84	CA [2A]-66A-66A	5, 10, 15, 20	5, 10, 15	5, 10, 15		CC#RM6			
											CC#RM85	CA [2A]-66A-66A	5, 1							

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

FCC ID: A3LSMF900U	 PCTEST TECHNOLOGY CORPORATION, INC.	SAR EVALUATION REPORT	Reviewed by: Quality Manager
Test Dates: 01/21/19 - 03/13/19	DUT Type: Portable Handset	APPENDIX H: Page 1 of 7	

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 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. 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.

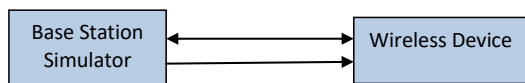


Figure 1
DL CA Power Measurement Setup

FCC ID: A3LSMF900U	 SAR EVALUATION REPORT	Reviewed by: Quality Manager
Test Dates: 01/21/19 - 03/13/19	DUT Type: Portable Handset	APPENDIX H: Page 2 of 7

1.3 Downlink Carrier Aggregation RF Conducted Powers

1.3.1 LTE Band 71 as PCC

Table 1
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC				PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC 1			SCC Band	SCC 2			SCC 3			Power			
				Mod.	PCC UL RB	PCC UL RB Offset	PCC (UL) 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)
CA_46A-71A	LTE B71	15	133297	680.5	QPSK	1	74	68761	634.5	LTE B46	20	50665	5537.5	-	-	-	-	-	-	24.96	24.90		
CA_2A-2A-4A-71A	LTE B71	15	133297	680.5	QPSK	1	74	68761	634.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	24.59	24.90
CA_2A-2A-6B-71A	LTE B71	15	133297	680.5	QPSK	1	74	68761	634.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6	20	66786	2145	24.59	24.90
CA_2A-4A-4A-71A	LTE B71	15	133297	680.5	QPSK	1	74	68761	634.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	24.97	24.90
CA_2A-6B-6B-71A	LTE B71	15	133297	680.5	QPSK	1	74	68761	634.5	LTE B2	20	900	1960	LTE B6	20	66786	2145	LTE B6	20	67236	2150	24.96	24.90
CA_2A-6B-71A	LTE B71	15	133297	680.5	QPSK	1	74	68761	634.5	LTE B2	20	900	1960	LTE B6	20	66786	2145	LTE B6	20	66984	2164.8	24.97	24.90

1.3.2 LTE Band 12 as PCC

Table 2
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch. Freq. [MHz]	PCC				PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC 1			SCC 2			SCC 3			SCC 4			Power				
				Mod.	PCC UL RB	PCC UL RB Offset	PCC (UL) Channel			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)
CA_2A-12A (1)	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	-	-	-	-	-	-	-	-	-	-	-	24.56	24.61	
CA_4A-12A (1)	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	-	-	-	24.59	24.61	
CA_4A-12A (2)	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	-	-	-	24.59	24.61	
CA_12A-25A	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B25	20	8365	1962.5	-	-	-	-	-	-	-	-	-	-	-	24.57	24.61	
CA_12A-6B (1)	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B6	20	66786	2145	-	-	-	-	-	-	-	-	-	-	-	24.60	24.61	
CA_12A-6B (2)	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B6	20	66786	2145	-	-	-	-	-	-	-	-	-	-	-	24.60	24.61	
CA_4A-4A-12A	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	-	-	-	-	-	-	-	24.62	24.61	
CA_12A-46C	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B46	20	50665	5537.5	LTE B46	20	50667	5517.7	-	-	-	-	-	-	-	24.68	24.61	
CA_2A-12A-12A	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	-	-	-	24.56	24.61	
CA_2A-4A-7A-12A	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B7	20	5100	2055	-	-	-	24.55	24.61	
CA_2A-4A-12A-30A	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	LTE B30	10	4020	2305	-	-	-	24.60	24.61	
CA_2A-12A-6B	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B6	20	66786	2145	LTE B6	20	66984	2164.8	-	-	-	24.54	24.61	
CA_2A-12A-6B	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B6	20	66786	2145	LTE B6	20	66984	2164.8	-	-	-	24.57	24.61	
CA_2C-4A-12A	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	-	-	-	24.60	24.61	
CA_12A-12A	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6	20	66786	2145	-	-	-	24.55	24.61	
CA_4A-7A-12B	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B12	5	5047	732.7	LTE B4	20	2175	2132.5	LTE B7	20	5100	2055	-	-	-	24.55	24.61	
CA_12A-46C	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B46	20	50665	5537.5	LTE B46	20	50667	5517.7	LTE B46	20	50663	5557.3	-	-	-	24.69	24.61	
CA_2A-2A-7A-12A-6B	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B7	20	5100	2055	LTE B6	20	66786	2145	24.58	24.61
CA_2A-12A-30A-6B	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B30	10	4020	2305	LTE B6	20	66786	2145	24.55	24.61
CA_2A-12A-12A-6B	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B6	20	66786	2145	LTE B6	20	67236	2150	-	-	-	24.58	24.61	
CA_12A-12A-30A-6B-6B	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B2	20	900	1960	LTE B30	10	4020	2305	LTE B6	20	67236	2150	LTE B6	20	67236	2150	24.60	24.61
CA_2A-7A-12B-30A	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B12	5	5047	732.7	LTE B2	20	900	1960	LTE B7	20	5100	2055	LTE B6	20	66786	2145	24.52	24.61
CA_12A-46C	LTE B12	5	23095	QPSK	1	12	5095	737.5	LTE B46	20	50665	5537.5	LTE B46	20	50667	5517.7	LTE B46	20	50663	5557.3	LTE B46	20	50269	5497.9	24.63	24.61

1.3.3 LTE Band 13 as PCC

Table 3
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch. Freq. [MHz]	PCC				PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC 1			SCC 2			SCC 3			SCC 4			Power					
				Mod.	PCC UL RB	PCC UL RB Offset	PCC (UL) Ch. 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-13A-46A	LTE B13	10	23230	72Q	QPSK	1	49	5230	751	LTE B2	20	900	1960	LTE B46	20	50665	5537.5	-	-	-	-	-	-	24.63	24.77		
CA_13A-46A-6B	LTE B13	10	23230	72Q	QPSK	1	49	5230	751	LTE B46	20	50665	5537.5	LTE B46	20	66786	2145	-	-	-	-	-	-	24.66	24.77		
CA_2A-13A-6B	LTE B13	10	23230	72Q	QPSK	1	49	5230	751	LTE B2	20	900	1960	LTE B6	15	66786	2145	LTE B6	5	66979	2154.3	-	-	24.63	24.77		
CA_2A-13A-6B	LTE B13	10	23230	72Q	QPSK	1	49	5230	751	LTE B2	20	900	1960	LTE B6	20	66786	2145	LTE B6	20	66984	2164.8	-	-	24.64	24.77		
CA_2A-13A-46C	LTE B13	10	23230	72Q	QPSK	1	49	5230	751	LTE B2	20	900	1960	LTE B46	20	50665	5537.5	LTE B46	20	50667	5517.7	-	-	24.66	24.77		
CA_13A-46C-6B	LTE B13	10	23230	72Q	QPSK	1	49	5230	751	LTE B46	20	50665	5537.5	LTE B46	20	50667	5517.7	LTE B6	20	66786	2145	-	-	24.65	24.77		
CA_2A-2A-4A-13A	LTE B13	10	23230	72Q	QPSK	1	49	5230	751	LTE B4	20	900	1960	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	24.61	24.77
CA_2A-13A-6B-6B	LTE B13	10	23230	72Q	QPSK	1	49	5230	751	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6	20	66786	2145	LTE B6	20	67236	2150	24.67	24.77
CA_2A-13A-46C	LTE B13	10	23230	72Q	QPSK	1	49	5230	751	LTE B2	20	900	1960	LTE B46	20	50665	5537.5	LTE B46	20	50667	5517.7	LTE B46	20	50663	5557.3	24.65	24.77
CA_13A-46C	LTE B13	10	23230	72Q	QPSK	1	49	5230	751	LTE B46	20	50665	5537.5	LTE B46	20	50667	5517.7	LTE B46	20	50663	5557.3	LTE B46	20	51061	5577.1	24.75	24.77
CA_13A-46C-6B	LTE B13	10	23230	72Q	QPSK	1	49	5230	751	LTE B46	20	50665	5537.5	LTE B46	20	50667	5517.7	LTE B46	20	50663	5557.3	LTE B6	20	66786	2145	24.66	24.77

1.3.4 LTE Band 14 as PCC

Table 4
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC				SCC 1				SCC 2				SCC 3				SCC 4				Power			
			PCC (UL) Ch. 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) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)	
CA_2A-2A-14A-30A-6B	LTE B14	10	23130	QPSK	1	25	5130	763	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B30	10	4020	2335	LTE B6	20	66786	2145	24.68	24.80
CA_2A-2A-14A-6B	LTE B14	10	23130	QPSK	1	25	5130	763	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6	20	66786	2145	LTE B6	20	67236	2150	24.69	24.80
CA_2A-14A-30A-6B-6B	LTE B14	10	23130	QPSK	1	25	5130	763	LTE B2	20	900	1960	LTE B30	10	4020	2335	LTE B6	20	66786	2145	-	-	24.70	24.80		

1.3.5 LTE Band 26 as PCC

Table 5
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	
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1.3.6 LTE Band 5 as PCC

Table 6
Maximum Output Powers

[illegible]

1.3.7 LTE Band 66 as PCC

Table 7
Maximum Output Powers

[illegible]

FCC ID: A3LSMF900U

Test Dates:
01/21/19 - 03/13/19



DUT Type:
Portable Handset

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Reviewed by:
Quality ManagerAPPENDIX H
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1.3.8 LTE Band 25 as PCC

Table 8
Maximum Output Powers

Combination	PCC										SCC 1				SCC 2				SCC 3				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch. Freq. [MHz]	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 5A-25A	LTE B25	20	26140	1860	QPSK	1	50	8140	1940	LTE B5	10	2525	881.5	-	-	-	-	-	-	-	-	-	24.62	24.51
CA 12A-25A	LTE B25	20	26140	1860	QPSK	1	50	8140	1940	LTE B12	10	5095	737.5	-	-	-	-	-	-	-	-	-	24.61	24.51
CA 25A-26A	LTE B25	20	26140	1860	QPSK	1	50	8140	1940	LTE B26	15	8865	876.5	-	-	-	-	-	-	-	-	-	24.68	24.51
CA 25A-41A	LTE B25	20	26140	1860	QPSK	1	50	8140	1940	LTE B41	20	40620	2593	-	-	-	-	-	-	-	-	-	24.67	24.51
CA 25A-46A	LTE B25	20	26140	1860	QPSK	1	50	8140	1940	LTE B46	20	50605	5537.5	-	-	-	-	-	-	-	-	-	24.63	24.51
CA 25A-25A-26A	LTE B25	20	26140	1860	QPSK	1	50	8140	1940	LTE B25	20	8860	1985	LTE B26	5	8865	876.5	-	-	-	-	-	24.68	24.51
CA 25A-41C	LTE B25	20	26140	1860	QPSK	1	50	8140	1940	LTE B41	20	40620	2593	LTE B41	20	40422	2573.2	-	-	-	-	-	24.59	24.51
CA 25A-41D	LTE B25	20	26140	1860	QPSK	1	50	8140	1940	LTE B41	20	40422	2573.2	LTE B41	20	40620	2593	LTE B41	20	40818	2612.8	24.66	24.51	

1.3.9 LTE Band 30 as PCC

Table 9
Maximum Output Powers

Combination	PCC										SCC 1				SCC 2				SCC 3				Power				
	PCC Band	PCC BW [MHz]	PCC (UL) Ch. Freq. [MHz]	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 DC CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)				
CA 2A-2A-25A-30A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1990	LTE B2	20	700	1940	LTE B29	10	8715	722.5	-	24.45	24.38			
CA 2A-4A-25A-30A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1990	LTE B4	20	2175	2132.5	LTE B12	10	2025	861.5	-	24.50	24.38			
CA 2A-4A-12A-30A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1990	LTE B4	20	2175	2132.5	LTE B10	10	2095	727.5	-	24.49	24.38			
CA 2A-4A-25A-30A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1990	LTE B4	20	2175	2132.5	LTE B29	10	8715	722.5	-	24.48	24.38			
CA 2A-25A-30A-66A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1990	LTE B29	10	8715	722.5	LTE B66	20	66785	2145	-	24.47	24.38			
CA 2A-2A-30A-66A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1990	LTE B2	20	700	1940	LTE B5	20	2025	861.5	LTE B66	20	66785	2145	24.49	24.38
CA 2A-2A-12A-30A-66A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1990	LTE B2	20	700	1940	LTE B12	10	2025	727.5	LTE B66	20	66785	2145	24.44	24.38
CA 2A-2A-1A-30A-66A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1990	LTE B2	20	700	1940	LTE B14	10	5330	763	LTE B66	20	66785	2145	24.50	24.38
CA 2A-2A-30A-66A-66A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1990	LTE B5	10	2525	881.5	LTE B66	20	66785	2145	LTE B66	20	67236	2190	24.52	24.38
CA 2A-12A-30A-66A-66A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1990	LTE B12	10	5095	737.5	LTE B66	20	66785	2145	LTE B66	20	67236	2190	24.49	24.38
CA 2A-1A-30A-66A-66A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B2	20	900	1990	LTE B14	10	5330	763	LTE B66	20	66785	2145	LTE B66	20	67236	2190	24.48	24.38
CA 2A-30A-30A-66A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B5	10	2525	881.5	LTE B5	10	2525	881.5	LTE B66	20	66785	2145	LTE B66	20	66785	2145	24.45	24.38
CA 30A-30A-66A-66A	LTE B30	10	27710	2310	QPSK	1	0	9820	2355	LTE B5	10	2525	881.5	LTE B5	5	2453	874.3	LTE B66	20	66785	2145	LTE B66	20	67236	2190	24.50	24.38

1.3.10 LTE Band 7 as PCC

Table 10
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC										SCC 1		SCC 2		SCC 3		SCC 4		SCC 5		LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)				
			PCC (DL) Ch. Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Ch. Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel			SCC (DL) Freq. [MHz]			
CA 5A-7A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B5	10	2525	881.5	-	-	-	-	-	-	-	-	-	-	24.50	24.38			
CA 7A-6A (1)	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B4	20	50605	5537.5	-	-	-	-	-	-	-	-	-	-	24.50	24.38			
CA 4A-4A-7A (1)	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B4	20	2175	2132.5	LTE B4	10	2025	861.5	-	-	-	-	-	-	24.50	24.38			
CA 7A-7A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B7	20	50605	5537.5	-	-	-	-	-	-	-	-	-	-	24.50	24.38			
CA 5A-7C	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B7	20	50605	5537.5	-	-	-	-	-	-	-	-	-	-	24.50	24.38			
CA 2A-7A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B2	20	900	1990	LTE B46	20	50605	5537.5	-	-	-	-	-	-	24.50	24.38			
CA 2A-7A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B5	10	2525	881.5	LTE B46	20	50605	5537.5	-	-	-	-	-	-	24.50	24.38			
CA 7A-6A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B46	20	50605	5537.5	LTE B66	20	66785	2145	-	-	-	-	-	-	24.50	24.38			
CA 7C-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B7	20	50605	5537.5	LTE B46	20	50605	5537.5	-	-	-	-	-	-	24.50	24.38			
CA 2A-4A-7A-7A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B7	20	50605	5537.5	LTE B2	20	900	1990	LTE B4	20	2175	2132.5	-	-	-	24.50	24.38		
CA 2A-4A-7A-12A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B12	20	900	1990	LTE B4	20	2175	2132.5	LTE B12	10	5095	737.5	-	-	-	24.50	24.38		
CA 2A-7A-6A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B2	20	900	1990	LTE B66	20	66785	2145	LTE B66	20	67236	2190	-	-	-	24.50	24.38		
CA 2A-4A-7C	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B7	20	50605	5537.5	LTE B4	20	50605	5537.5	-	-	-	-	-	-	24.50	24.38			
CA 2A-7A-6A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B2	20	900	1990	LTE B4	20	2175	2132.5	LTE B4	10	2025	861.5	-	-	-	24.50	24.38		
CA 7C-6A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B7	20	50605	5537.5	LTE B66	20	66785	2145	LTE B66	20	67236	2190	-	-	-	24.50	24.38		
CA 2A-7A-7A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B7	20	50605	5537.5	LTE B2	20	900	1990	LTE B4	20	2175	2132.5	-	-	-	24.50	24.38		
CA 7A-7A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B7	20	50605	5537.5	LTE B46	20	50605	5537.5	-	-	-	-	-	-	24.50	24.38			
CA 7A-6A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B46	20	50605	5537.5	LTE B46	20	50467	5517.7	LTE B46	20	50467	5517.7	-	-	-	24.50	24.38		
CA 7C-6A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B46	20	50605	5537.5	LTE B46	20	50467	5517.7	LTE B46	20	50467	5517.7	-	-	-	24.50	24.38		
CA 2A-2A-7A-12A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B2	20	900	1990	LTE B2	20	700	1940	LTE B12	10	5095	737.5	LTE B66	20	66785	2145	-	24.50	24.38
CA 2A-7A-12A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B2	20	900	1990	LTE B12	10	5095	737.5	LTE B66	20	66785	2145	-	-	-	24.50	24.38		
CA 2A-7A-6A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B7	20	50605	5537.5	LTE B46	20	50605	5537.5	-	-	-	-	-	-	24.50	24.38			
CA 2A-7A-6A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B7	20	50605	5537.5	LTE B46	20	50605	5537.5	-	-	-	-	-	-	24.50	24.38			
CA 7A-7A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B7	20	50605	5537.5	LTE B46	20	50605	5537.5	-	-	-	-	-	-	24.50	24.38			
CA 7A-6A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B46	20	50605	5537.5	LTE B46	20	50467	5517.7	LTE B46	20	50467	5517.7	-	-	-	24.50	24.38		
CA 7C-6A-6A	LTE B7	20	20850	2510	QPSK	1	99	2850	2830	LTE B46	20	50605	5537.5	LTE B46	20	50467	5517.7	LTE B46	20	50467	5517.7	-	-	-	24.50	24.38		

1.3.11 LTE Band 41 PC3 as PCC

Table 11
Maximum Output Powers

Combination	PCC										SSC 1				SSC 2				SSC 3				SSC 4				Power		
	PCC Band	PCC BW [MHz]	PCC [LH] Ch	PCC [LH] Freq. [MHz]	Mod.	PCC ULB RB	PCC ULB RB Offset	PCC [DL] Channel	PCC [DL] Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC [DL] Freq. [MHz]	SSC [DL] Channel	SSC [DL] Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC [DL] Channel	SSC [DL] Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC [DL] Channel	SSC [DL] Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC [DL] Channel	SSC [DL] Freq. [MHz]	LTE Tx Power with CA Power [dBm]	LTE Single Carrier Tx Power [dBm]	
CA 41A+41A (1)	LTE B41	20	41055	2636.5	QPSK	-	0	41055	2636.5	LTE B41	20	39790	2506	-	-	-	-	39790	2506	-	-	-	39790	2506	-	-	24.58	24.58	
CA 41A+41C	LTE B41	20	41055	2636.5	QPSK	-	0	41055	2636.5	LTE B41	20	39948	2506.8	LTE B41	20	39790	2506	-	-	-	-	-	39790	2506	-	-	24.65	24.58	
CA 41C+41C	LTE B41	20	41055	2636.5	QPSK	-	0	41055	2636.5	LTE B41	20	40098	2507.6	LTE B41	20	39790	2506	-	-	-	-	-	39790	2506	-	-	24.65	24.58	
CA 41C+41E	LTE B41	20	41055	2636.5	QPSK	-	0	41055	2636.5	LTE B41	20	40146	2508.4	LTE B41	20	39790	2506	-	-	-	-	-	39790	2506	-	-	24.65	24.58	
CA 41D+41A	LTE B41	20	41055	2636.5	QPSK	-	0	41055	2636.5	LTE B41	20	40166	2508.6	LTE B41	20	39948	2506.8	LTE B41	20	39790	2506	-	-	39790	2506	-	-	24.66	24.58
CA 41C+41E	LTE B41	20	41055	2636.5	QPSK	-	0	41055	2636.5	LTE B41	20	40087	2507.6	LTE B41	20	39948	2506.8	LTE B41	20	39790	2506	-	-	39790	2506	-	-	24.66	24.58
CA 41E+41E	LTE B41	20	41055	2636.5	QPSK	-	0	41055	2636.5	LTE B41	20	40167	2508.7	LTE B41	20	39948	2506.8	LTE B41	20	39790	2506	-	-	39790	2506	-	-	24.66	24.58
CA 41E+41D	LTE B41	20	41055	2636.5	QPSK	-	0	41055	2636.5	LTE B41	20	40157	2508.7	LTE B41	20	40048	2506.4	LTE B41	20	39948	2506.8	LTE B41	20	39790	2506	-	-	24.63	24.58
CA 41D+41C	LTE B41	20	41055	2636.5	QPSK	-	0	41055	2636.5	LTE B41	20	40057	2507.6	LTE B41	20	40048	2506.4	LTE B41	20	39948	2506.8	LTE B41	20	39790	2506	-	-	24.63	24.58
CA 41E+41C	LTE B41	20	41055	2636.5	QPSK	-	0	41055	2636.5	LTE B41	20	40057	2507.6	LTE B41	20	40048	2506.4	LTE B41	20	39948	2506.8	LTE B41	20	39790	2506	-	-	24.63	24.58

1.3.12 LTE Band 41 PC2 as PCC

Table 12
Maximum Output Powers

Case	PCC Band	PCC				SSC 1				SSC 2				SSC 3				SSC 4				Power					
		PCC BW [MHz]	PCC (UL) Ch. Freq. [MHz]	Mod.	PCC UL# RB	PCC UL# RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC (DL) Channel	SSC (DL) Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC (DL) Channel	SSC (DL) Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC (DL) Channel	SSC (DL) Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC (DL) Channel	SSC (DL) Freq. [MHz]	LTE Power with CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]	
CA 41A-41A(1)	LTE B41 PCC2	20	41400	2680	QPSK	1	0	41400	2680	LTE B41 PCC2	20	39750	2506												27.78	27.82	
CA 41A-41C	LTE B41 PCC2	20	41400	2680	QPSK	1	0	41400	2680	LTE B41 PCC2	20	39948	2525.8	LTE B41 PCC2	20	39750	2506								27.78	27.81	
CA 41C-41A	LTE B41 PCC2	20	41400	2680	QPSK	1	0	41400	2680	LTE B41 PCC2	20	41020	2660.2	LTE B41 PCC2	20	39750	2506								27.78	27.82	
CA 41A-41D	LTE B41 PCC2	20	41400	2680	QPSK	1	0	41400	2680	LTE B41 PCC2	20	41020	2660.2	SSC 2	2568.6	LTE B41 PCC2	20	39948	2525.8	SSC 3	2506				27.78	27.82	
CA 41D-41A	LTE B41 PCC2	20	41400	2680	QPSK	1	0	41400	2680	LTE B41 PCC2	20	41020	2660.2	LTE B41 PCC2	20	41020	2660.2	SSC 2	2568.6	LTE B41 PCC2	20	39948	2525.8	SSC 3	2506	27.78	27.82
CA 41C-41D	LTE B41 PCC2	20	41400	2680	QPSK	1	0	41400	2680	LTE B41 PCC2	20	41020	2660.2	SSC 2	2568.6	LTE B41 PCC2	20	39948	2525.8	SSC 3	2506				27.78	27.82	
CA 41D-41C	LTE B41 PCC2	20	41400	2680	QPSK	1	0	41400	2680	LTE B41 PCC2	20	41020	2660.2	SSC 2	2568.6	LTE B41 PCC2	20	39948	2525.8	SSC 3	2506				27.78	27.82	
CA 41C-41D	LTE B41 PCC2	20	41400	2680	QPSK	1	0	41400	2680	LTE B41 PCC2	20	41292	2660.2	SSC 2	2568.6	LTE B41 PCC2	20	41020	2660.2	SSC 3	2506				27.78	27.82	
CA 41D-41D	LTE B41 PCC2	20	41400	2680	QPSK	1	0	41400	2680	LTE B41 PCC2	20	41292	2660.2	SSC 2	2568.6	LTE B41 PCC2	20	41020	2660.2	SSC 3	2506				27.78	27.82	

1.4 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.

1.4.1 UL Carrier Aggregation with DLCA Active RF Conducted Powers

Table 13
LTE Band 5 Maximum Output Powers

[illegible]

Table 14
LTE Band 66 Maximum Output Powers

[illegible]

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Table 15
LTE Band 41 PC3 Maximum Output Powers

Combination	PCC										SCC 1						SCC 2						SCC 3						SCC 4						Power	
	PCC Band	PCC BW [MHz]	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC UL Ch.	SCC UL Freq. [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	Modulation	SCC UL RB	SCC UL RB Offset	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	ULCA Tx Power with 4x4 CA config, active in CC [dBm]	ULCA Tx Power [dBm]				
CA 41C-41A	LTE-B41	20	41055	2620.5	QPSK	1	0	41055	2620.5	LTE-B41	20	40857	2618.7	QPSK	1	99	40857	2618.7	LTE-B41	20	39750	2526	-	-	-	-	-	-	-	-	24.55	24.55				
CA 41C-41C	LTE-B41	20	41055	2620.5	QPSK	1	0	41055	2620.5	LTE-B41	20	40857	2618.7	QPSK	1	99	40857	2618.7	LTE-B41	20	39948	2525.8	LTE-B41	20	39750	2526	-	-	-	-	24.63	24.63				
CA 41C-41D	LTE-B41	20	41055	2620.5	QPSK	1	0	41055	2620.5	LTE-B41	20	40857	2618.7	QPSK	1	99	40857	2618.7	LTE-B41	20	40346	2545.6	LTE-B41	20	39948	2525.8	LTE-B41	20	39750	2526	24.62	24.62				

Table 16
LTE Band 41 PC2 Maximum Output Powers

Combination	PCC										SCC 1				SCC 2				SCC 3				SCC 4				Power					
	PCC Band	PCC BW [MHz]	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC UL Ch.	SCC UL Freq. [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	Modulation	SCC UL RB	SCC UL RB Offset	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	ULCA Tx Power with 4x4 CA config, active in CC [dBm]	ULCA Tx Power [dBm]				
CA 41C-41A	LTE-B41-PC2	20	41055	2620.5	QPSK	1	0	41055	2620.5	LTE-B41-PC2	20	40857	2618.7	QPSK	1	99	40857	2618.7	LTE-B41-PC2	20	39750	2526	-	-	-	-	-	-	24.55	24.55		
CA 41C-41C	LTE-B41-PC2	20	41055	2620.5	QPSK	1	0	41055	2620.5	LTE-B41-PC2	20	40857	2618.7	QPSK	1	99	40857	2618.7	LTE-B41-PC2	20	39948	2525.8	LTE-B41-PC2	20	39750	2526	-	-	24.63	24.63		
CA 41C-41D	LTE-B41-PC2	20	41055	2620.5	QPSK	1	0	41055	2620.5	LTE-B41-PC2	20	40857	2618.7	QPSK	1	99	40857	2618.7	LTE-B41-PC2	20	40346	2545.6	LTE-B41-PC2	20	39948	2525.8	LTE-B41-PC2	20	39750	2526	24.62	24.62

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APPENDIX I: IEEE 802.11AX RU SAR EXCLUSION

1.1 IEEE 802.11ax RU SAR Exclusion

To make the most efficient use of the additional available subcarriers (data tones), IEEE 802.11ax can utilize Orthogonal Frequency-Division Multiple Access (OFDMA) which divides the existing 802.11 channels into smaller subchannels called Resource Units (RUs). Possible RU sizes are: 26T, 52T, 106T, 242T, 484T and 996T.

Per FCC Guidance, 802.11ax was considered a higher order 802.11 mode when compared to a/b/g/n/ac to apply KDB Publication 248227 D01v02r02 for OFDM mode selection. Therefore, SAR tests were not required for 802.11ax based on the maximum allowed output powers of OFDM modes and the reported SAR values. Per FCC Guidance, maximum conducted powers were performed for each RU size to demonstrate that the output powers would not be higher than the other OFDM 802.11 modes.

1.2 IEEE 802.11ax RU Target Powers

1.2.1 Maximum 802.11ax RU WLAN Output Power

Tones		SISO (ANT1) /in dBm				SISO (ANT2) /in dBm				MIMO (ALL) /in dBm			
		2.4G	5G/20Mhz	5G/40Mhz	5G/80Mhz	2.4G	5G/20Mhz	5G/40Mhz	5G/80Mhz	2.4G	5G/20Mhz	5G/40Mhz	5G/80Mhz
		Ch & RU index											
26T	Maximum	14	11	11	11	14	11	11	11	14	11	11	11
		Ch 13: -3.0				Ch 13: 4.5				Ch 12: 10.0 Ch 13: 3.0			
	Nominal	13				13				13			
		Ch 13: -4.0				Ch 13: 3.5				Ch 12: 9.0 Ch 13: 2.0			
52T	Maximum	15	13	12	11	15	13	12	11	15	13	12	11
		Ch 13: -1.5				Ch 13: 6.0				Ch 12: 11.5 Ch 13: 5.0			
	Nominal	14				14				14			
		Ch 13: -2.5				Ch 13: 5.0				Ch 12: 10.5 Ch 13: 4.0			
106T	Maximum	16	15	13	12	16	15	13	12	16	15	13	12
		Ch 13: 2.5				Ch 13: 9.5				Ch 12: 14.0 Ch 13: 8.0			
	Nominal	15				15				15			
		Ch 13: 1.5				Ch 13: 8.5				Ch 12: 13.0 Ch 13: 7.0			
242T	Maximum	17	16	14	13	17	16	14	13	17	16	14	13
		Ch 1: 11.5 Ch 2: 14.0 Ch 3: 16.0 Ch 10: 15.0 Ch 11: 12.0 Ch 12: 11.5 Ch 13: 6.0				Ch 11: 16.0 Ch 12: 13.5 Ch 13: 13.5				Ch 1: 15.5 Ch 11: 15.5 Ch 12: 13.5 Ch 13: 13.5			
	Nominal	16				16				16			
		Ch 1: 10.5 Ch 2: 13.0 Ch 3: 15.0 Ch 10: 14.0 Ch 11: 11.0 Ch 12: 10.5 Ch 13: 5.0				Ch 11: 15.0 Ch 12: 12.5 Ch 13: 12.5				Ch 1: 14.5 Ch 11: 14.5 Ch 12: 12.5 Ch 13: 12.5			
484T	Maximum			14	13			14	13			14	13
	Nominal			13	12			13	12			13	12
996T	Maximum				13				13				13
	Nominal				12				12				12

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1.2.2 Reduced 802.11ax RU WLAN Output Power

		SISO (ANT1) /in dBm				SISO (ANT2) /in dBm				MIMO (ALL) /in dBm			
Tones		2.4G	5G/20Mhz	5G/40Mhz	5G/80Mhz	2.4G	5G/20Mhz	5G/40Mhz	5G/80Mhz	2.4G	5G/20Mhz	5G/40Mhz	5G/80Mhz
		Ch & RU index											
26T	Maximum	14	11	11	11	14	11	11	11	14	11	11	11
		Ch 13: -3.0				Ch 13: 4.5				Ch 12: 10.0 Ch 13: 3.0			
	Nominal	13	10	10	10	13	10	10	10	13	10	10	10
		Ch 13: -4.0				Ch 13: 3.5				Ch 12: 9.0 Ch 13: 2.0			
52T	Maximum	15	13	12	11	15	13	12	11	15	13	12	11
		Ch 13: -1.5				Ch 13: 6.0				Ch 12: 11.5 Ch 13: 5.0			
	Nominal	14	12	11	10	14	12	11	10	14	12	11	10
		Ch 13: -2.5				Ch 13: 5.0				Ch 12: 10.5 Ch 13: 4.0			
106T	Maximum	16	14	13	12	16	14	13	12	16	15	13	12
		Ch 13: 2.5				Ch 13: 9.5				Ch 12: 14.0 Ch 13: 8.0			
	Nominal	15	13	12	11	15	13	12	11	15	14	12	11
		Ch 13: 1.5				Ch 13: 8.5				Ch 12: 13.0 Ch 13: 7.0			
242T	Maximum	17	14	14	13	17	14	14	13	17	16	14	13
		Ch 1: 11.5 Ch 2: 14.0 Ch 3: 16.0 Ch 10: 15.0 Ch 11: 12.0 Ch 12: 11.5 Ch 13: 6.0				Ch 11: 16.0 Ch 12: 13.5 Ch 13: 13.5				Ch 1: 15.5 Ch 11: 15.5 Ch 12: 13.5 Ch 13: 13.5			
	Nominal	16	13	13	12	16	13	13	12	16	15	13	12
		Ch 1: 10.5 Ch 2: 13.0 Ch 3: 15.0 Ch 10: 14.0 Ch 11: 11.0 Ch 12: 10.5 Ch 13: 5.0				Ch 11: 15.0 Ch 12: 12.5 Ch 13: 12.5				Ch 1: 14.5 Ch 11: 14.5 Ch 12: 12.5 Ch 13: 12.5			
484T	Maximum				14	13				14	13		
	Nominal				13	12				13	12		
996T	Maximum				13				13				13
	Nominal				12				12				12

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1.2.3 Maximum 802.11ax RU WLAN Output Power During Conditions with Simultaneous 2.4 GHz WLAN and 5 GHz WLAN

		SISO (ANT1) /in dBm				SISO (ANT2) /in dBm				MIMO (ALL) /in dBm			
Tones		2.4G	5G/20Mhz	5G/40Mhz	5G/80Mhz	2.4G	5G/20Mhz	5G/40Mhz	5G/80Mhz	2.4G	5G/20Mhz	5G/40Mhz	5G/80Mhz
		Ch & RU index											
26T	Maximum	14	11	11	11	14	11	11	11	14	11	11	11
		Ch 13: -3.0				Ch 13: 4.5				Ch 12: 10.0 Ch 13: 3.0			
	Nominal	13	10	10	10	13	10	10	10	13	10	10	10
		Ch 13: -4.0				Ch 13: 3.5				Ch 12: 9.0 Ch 13: 2.0			
52T	Maximum	15	13	12	11	15	13	12	11	15	13	12	11
		Ch 13: -1.5				Ch 13: 6.0				Ch 12: 11.5 Ch 13: 5.0			
	Nominal	14	12	11	10	14	12	11	10	14	12	11	10
		Ch 13: -2.5				Ch 13: 5.0				Ch 12: 10.5 Ch 13: 4.0			
106T	Maximum	16	14	13	12	16	14	13	12	16	15	13	12
		Ch 13: 2.5				Ch 13: 9.5				Ch 12: 14.0 Ch 13: 8.0			
	Nominal	15	13	12	11	15	13	12	11	15	14	12	11
		Ch 13: 1.5				Ch 13: 8.5				Ch 12: 13.0 Ch 13: 7.0			
242T	Maximum	17	14	14	13	17	14	14	13	17	16	14	13
		Ch 1: 11.5 Ch 2: 14.0 Ch 3: 16.0 Ch 10: 15.0 Ch 11: 12.0 Ch 12: 11.5 Ch 13: 6.0				Ch 11: 16.0 Ch 12: 13.5 Ch 13: 13.5				Ch 1: 15.5 Ch 11: 15.5 Ch 12: 13.5 Ch 13: 13.5			
	Nominal	16	13	13	12	16	13	13	12	16	15	13	12
		Ch 1: 10.5 Ch 2: 13.0 Ch 3: 15.0 Ch 10: 14.0 Ch 11: 11.0 Ch 12: 10.5 Ch 13: 5.0				Ch 11: 15.0 Ch 12: 12.5 Ch 13: 12.5				Ch 1: 14.5 Ch 11: 14.5 Ch 12: 12.5 Ch 13: 12.5			
484T	Maximum			14	13			14	13			14	13
	Nominal			13	12			13	12			13	12
996T	Maximum				13				13				13
	Nominal				12				12				12

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1.2.4 Reduced 802.11ax RU WLAN Output Power During Conditions with Simultaneous 2.4 GHz WLAN and 5 GHz WLAN

		SISO (ANT1) /in dBm				SISO (ANT2) /in dBm				MIMO (ALL) /in dBm			
Tones		2.4G	5G/20Mhz	5G/40Mhz	5G/80Mhz	2.4G	5G/20Mhz	5G/40Mhz	5G/80Mhz	2.4G	5G/20Mhz	5G/40Mhz	5G/80Mhz
		Ch & RU index											
26T	Maximum	14	11	11	11	14	11	11	11	14	11	11	11
		Ch 13: -3.0				Ch 13: 4.5				Ch 12: 10.0 Ch 13: 3.0			
	Nominal	13	10	10	10	13	10	10	10	13	10	10	10
		Ch 13: -4.0				Ch 13: 3.5				Ch 12: 9.0 Ch 13: 2.0			
52T	Maximum	14	13	12	11	14	13	12	11	15	13	12	11
		Ch 13: -1.5				Ch 13: 6.0				Ch 12: 11.5 Ch 13: 5.0			
	Nominal	13	12	11	10	13	12	11	10	14	12	11	10
		Ch 13: -2.5				Ch 13: 5.0				Ch 12: 10.5 Ch 13: 4.0			
106T	Maximum	14	14	13	12	14	14	13	12	16	15	13	12
		Ch 13: 2.5				Ch 13: 9.5				Ch 12: 14.0 Ch 13: 8.0			
	Nominal	13	13	12	11	13	13	12	11	15	14	12	11
		Ch 13: 1.5				Ch 13: 8.5				Ch 12: 13.0 Ch 13: 7.0			
242T	Maximum	14	14	14	13	14	14	14	13	17	16	14	13
		Ch 1: 11.5 Ch 11: 12.0 Ch 12: 11.5 Ch 13: 6.0				Ch 12: 13.5 Ch 13: 13.5				Ch 1: 15.5 Ch 11: 15.5 Ch 12: 13.5 Ch 13: 13.5			
	Nominal	13	13	13	12	13	13	13	12	16	15	13	12
		Ch 1: 10.5 Ch 11: 11.0 Ch 12: 10.5 Ch 13: 5.0				Ch 12: 12.5 Ch 13: 12.5				Ch 1: 14.5 Ch 11: 14.5 Ch 12: 12.5 Ch 13: 12.5			
484T	Maximum			14	13			14	13			14	13
	Nominal			13	12			13	12			13	12
996T	Maximum				13				13				13
	Nominal				12				12				12

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1.3 IEEE 802.11ax Measured Powers

Table 1
Maximum 2.4 GHz 802.11ax RU Output Power – Ant 1

2.4GHz - 20MHz [dBm]				
RU Index	Tonnes	Ch. 1	Ch. 6	Ch. 11
		Average	Average	Average
0	26	13.97	13.65	13.92
4	26	13.56	13.71	13.97
8	26	13.63	13.99	13.99
37	52	14.9	14.83	14.61
38	52	14.92	14.89	14.53
40	52	14.72	14.97	14.59
53	106	15.79	15.72	15.98
54	106	15.64	15.87	15.90
61	242	11.46	16.58	11.95

Table 2
Maximum 2.4 GHz 802.11ax RU Output Power – Ant 2

2.4GHz - 20MHz [dBm]				
RU Index	Tonnes	Ch. 1	Ch. 6	Ch. 11
		Average	Average	Average
0	26	13.73	13.97	13.78
4	26	13.64	13.79	13.97
8	26	13.98	13.78	13.91
37	52	14.91	14.75	14.91
38	52	14.93	14.89	14.63
40	52	14.79	14.98	14.76
53	106	15.95	15.89	15.98
54	106	15.97	15.77	15.92
61	242	15.49	16.91	15.99

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Table 3
Maximum 5 GHz 802.11ax RU Output Power – Ant 1

RU Index	Tonnes	UNII 1			UNII 2A			UNII 2C			UNII 3		
		Ch. 36	Ch. 40	Ch. 48	Ch. 52	Ch. 56	Ch. 64	Ch. 100	Ch. 120	Ch. 144	Ch. 149	Ch. 157	Ch. 165
		Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average
0	26	10.81	10.91	10.97	10.76	10.83	10.99	10.72	10.86	10.75	10.81	10.56	10.98
4	26	10.99	10.98	10.83	10.97	10.57	10.67	10.80	10.89	10.90	10.77	10.94	10.74
8	26	10.91	10.93	10.95	10.74	10.76	10.91	10.97	10.98	10.98	10.98	10.99	10.97
37	52	12.90	12.98	12.76	12.75	12.87	12.93	12.89	12.99	12.97	12.81	12.74	12.95
38	52	12.61	12.73	12.93	12.92	12.96	12.98	12.72	12.63	12.74	12.87	12.92	12.98
40	52	12.98	12.99	12.79	12.79	12.90	12.89	12.77	12.95	12.95	12.92	12.98	12.87
53	106	14.60	14.67	14.77	14.76	14.84	14.93	14.97	14.86	14.84	14.69	14.94	14.89
54	106	14.67	14.70	14.80	14.78	14.79	14.80	14.88	14.78	14.73	14.98	14.97	14.86
61	242	15.95	15.65	15.75	15.98	15.67	15.65	15.67	15.98	15.98	15.89	15.87	15.64

5GHz - 40MHz [dBm]

RU Index	Tonnes	UNII 1		UNII 2A		UNII 2C			UNII 3	
		Ch. 38	Ch. 46	Ch. 54	Ch. 62	Ch. 102	Ch. 118	Ch. 142	Ch. 151	Ch. 159
		Average	Average	Average	Average	Average	Average	Average	Average	Average
0	26	10.77	10.81	10.62	10.71	10.97	10.95	10.99	10.80	10.65
8	26	10.93	10.99	10.61	10.75	10.91	10.89	10.64	10.60	10.65
17	26	10.81	10.90	10.55	10.97	10.98	10.92	10.98	10.85	10.66
37	52	11.98	11.66	11.86	11.83	11.72	11.71	11.81	11.98	11.50
40	52	11.93	11.97	11.65	11.77	11.98	11.94	11.61	11.80	11.67
44	52	11.99	11.68	11.74	11.72	11.65	11.98	11.76	11.90	11.99
53	106	12.89	12.99	12.59	12.98	12.74	12.91	12.96	12.80	12.70
54	106	12.95	12.56	12.63	12.67	12.88	12.80	12.98	12.72	12.62
56	106	12.84	12.96	12.98	12.96	12.76	12.86	12.95	12.75	12.93
61	242	13.95	13.75	13.76	13.81	13.97	13.98	13.98	13.81	13.98
62	242	13.99	13.66	13.65	13.70	13.94	13.97	13.99	13.91	13.61
65	484	13.93	13.98	13.55	13.97	13.83	13.74	13.92	13.60	13.89

5GHz - 80MHz [dBm]

RU Index	Tonnes	UNII 1	UNII 2A	UNII 2C			UNII 3
		Ch. 42	Ch. 58	Ch. 106	Ch. 122	Ch. 138	Ch. 155
		Average	Average	Average	Average	Average	Average
0	26	10.87	10.51	10.75	10.97	10.98	10.90
17	26	10.83	10.99	10.72	10.75	10.96	10.94
36	26	10.91	10.98	10.56	10.60	10.52	10.80
37	52	10.97	10.45	10.72	10.70	10.75	10.98
44	52	10.98	10.94	10.79	10.77	10.99	10.95
52	52	10.60	10.98	10.76	10.99	10.83	10.92
53	106	11.76	11.63	11.72	11.70	11.80	11.70
56	106	11.96	11.95	11.77	11.85	11.99	11.99
60	106	11.82	11.65	11.80	11.60	11.98	11.57
61	242	12.93	12.94	12.72	12.81	12.99	12.94
62	242	12.99	12.54	12.88	12.95	12.98	12.91
64	242	12.98	12.92	12.99	12.91	12.71	12.87
65	484	12.70	12.72	12.95	12.72	12.80	12.98
66	484	12.90	12.86	12.92	12.75	12.93	12.99
67	996	12.89	12.79	12.98	12.83	12.92	12.50

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Table 4
Maximum 5 GHz 802.11ax RU Output Power – Ant 2

RU Index	Tonnes	UNII 1			UNII 2A			UNII 2C			UNII 3		
		Ch. 36	Ch. 40	Ch. 48	Ch. 52	Ch. 56	Ch. 64	Ch. 100	Ch. 120	Ch. 144	Ch. 149	Ch. 157	Ch. 165
		Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average
0	26	10.84	10.77	10.85	10.99	10.99	10.81	10.94	10.89	10.99	10.97	10.89	10.78
4	26	10.95	10.98	10.99	10.76	10.78	10.96	10.98	10.99	10.44	10.99	10.68	10.51
8	26	10.63	10.70	10.80	10.91	10.91	10.79	10.66	10.53	10.75	10.96	10.75	10.82
37	52	12.85	12.81	12.90	12.97	12.99	12.85	12.96	12.99	12.99	12.54	12.76	12.73
38	52	12.99	12.99	12.93	12.72	12.74	12.92	12.62	12.55	12.98	12.75	12.91	12.91
40	52	12.75	12.82	12.72	12.50	12.98	12.71	12.67	12.63	12.81	12.91	12.55	12.63
53	106	14.82	14.87	14.80	14.61	14.97	14.83	14.96	14.93	14.97	14.99	14.93	14.99
54	106	14.73	14.79	14.73	14.46	14.98	14.82	14.87	14.75	14.80	14.91	14.99	14.99
61	242	15.85	15.88	15.83	15.52	15.62	15.88	15.99	15.94	15.85	15.99	15.99	15.97

5GHz - 40MHz [dBm]

RU Index	Tonnes	UNII 1		UNII 2A		UNII 2C			UNII 3	
		Ch. 38	Ch. 46	Ch. 54	Ch. 62	Ch. 102	Ch. 118	Ch. 142	Ch. 151	Ch. 159
		Average	Average	Average	Average	Average	Average	Average	Average	Average
0	26	10.72	10.79	10.98	10.65	10.98	10.96	10.80	10.88	10.80
8	26	10.80	10.83	10.95	10.96	10.61	10.67	10.99	10.99	10.55
17	26	10.99	10.70	10.99	10.96	10.87	10.83	10.96	10.81	10.69
37	52	11.99	11.90	11.60	11.86	11.50	11.75	11.86	11.96	11.99
40	52	11.98	11.78	11.98	11.98	11.74	11.84	11.99	11.73	11.72
44	52	11.92	11.96	11.62	11.62	11.54	11.60	11.72	11.85	11.96
53	106	12.75	12.78	12.98	12.50	12.89	12.99	12.67	12.98	12.73
54	106	12.86	12.80	12.97	12.99	12.80	12.88	12.98	12.99	12.99
56	106	12.76	12.67	12.93	12.97	12.99	12.98	12.98	12.87	12.71
61	242	13.94	13.90	13.72	13.82	13.99	13.62	13.87	13.87	13.67
62	242	13.62	13.84	13.70	13.66	13.68	13.73	13.82	13.99	13.78
65	484	13.85	13.92	13.68	13.72	13.95	13.99	13.70	13.99	13.99

5GHz - 80MHz [dBm]

RU Index	Tonnes	UNII 1	UNII 2A	UNII 2C			UNII 3
		Ch. 42	Ch. 58	Ch. 106	Ch. 122	Ch. 138	Ch. 155
		Average	Average	Average	Average	Average	Average
0	26	10.81	10.91	10.92	10.99	10.85	10.78
17	26	10.65	10.96	10.63	10.81	10.89	10.97
36	26	10.66	10.91	10.96	10.73	10.82	10.71
37	52	10.99	10.65	10.60	10.85	10.95	10.90
44	52	10.75	10.98	10.87	10.90	10.99	10.66
52	52	10.87	10.67	10.62	10.99	10.57	10.73
53	106	11.71	11.71	11.67	11.78	11.99	11.94
56	106	11.91	11.99	11.94	11.99	11.97	11.70
60	106	11.46	11.70	11.72	11.78	11.71	11.91
61	242	12.93	12.95	12.99	12.99	12.79	12.99
62	242	12.99	12.79	12.98	12.62	12.72	12.99
64	242	12.91	12.67	12.63	12.52	12.61	12.82
65	484	12.73	12.91	12.80	12.95	12.93	12.99
66	484	12.87	12.98	12.98	12.99	12.99	12.66
67	996	12.71	12.53	12.93	12.93	12.97	12.99

FCC ID: A3LSMF900U



SAR EVALUATION REPORT



Reviewed by:
Quality Manager

Test Dates:

01/21/19 – 03/13/19

DUT Type:

Portable Handset

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