

# FCC SAR TEST REPORT

**FCC ID** : XHG-RG1100  
**Equipment** : Mobile Hotspot  
**Model Name** : RG1100  
**Applicant** : Franklin Technology Inc.  
906 JEI Platz, 186, Gasan digital 1-ro, Gumcheon-Gu,  
Seoul, South Korea, 08502  
**Manufacturer** : Franklin Technology Inc.  
906 JEI Platz, 186, Gasan digital 1-ro, Gumcheon-Gu,  
Seoul, South Korea, 08502  
**Standard** : FCC 47 CFR Part 2 (2.1093)

The product was received on May 19, 2021 and testing was started from Jun 12, 2021 and completed on Jun 30, 2021. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample provide by manufacturer and the test data has been evaluated in accordance with the test procedures given in 47 CFR Part 2.1093 and FCC KDB and has been pass the FCC requirement.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Cona Huang / Deputy Manager



**Sporton International Inc. EMC & Wireless Communications Laboratory**  
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### History of this test report

Report No.	Version	Description	Issued Date
FA140852	01	Initial issue of report	Aug. 11, 2021



### 1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Franklin Technology Inc., Mobile Hotspot, RG1100, are as follows.

Equipment Class	Frequency Band		Highest SAR Summary	Highest Simultaneous Transmission 1g SAR (W/kg)
			Hotspot (Separation 10mm) 1g SAR (W/kg)	
Licensed	WCDMA	WCDMA II	0.93	1.59
		WCDMA V	0.69	
	LTE	LTE Band 2	0.64	
		LTE Band 7	1.00	
		LTE Band 12	0.55	
		LTE Band 13	0.24	
		LTE Band 25	0.47	
		LTE Band 5 / 26	0.40	
		LTE Band 41	1.16	
		LTE Band 48	0.64	
		LTE Band 4 / 66	0.92	
		LTE Band 71	0.46	
	FR1	FR1 n2 / n25	0.59	
		FR1 n41	0.79	
		FR1 n66	0.52	
		FR1 n71	0.52	
		FR1 n78	0.45	
DTS	WLAN	2.4GHz WLAN	0.67	1.59
NII		5GHz WLAN	0.31	1.51
Date of Testing:			2021/6/12 ~ 2021/6/30	

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

**Reviewed by: Jason Wang**  
**Report Producer: Carlie Tsai**

### 2. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards, the below KDB standard may not including in the TAF code without accreditation.

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01



### 3. Equipment Under Test (EUT) Information

#### 3.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Hotspot
Model Name	RG1100
FCC ID	XHG-RG1100
WWAN IMEI Code	358507757000262
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n25 : 1850 MHz ~ 1915 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n78: 3450MHz ~ 3550MHz WLAN 2.4GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2G Band: 5150 MHz ~ 5250 MHz WLAN 5.8G Band: 5725 MHz ~ 5850 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA LTE: QPSK, 16QAM, 64QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM WLAN: 802.11b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/HE20/HE40/HE80
HW Version	P1
EUT Stage	Identical Prototype



**3.2 General LTE SAR Test and Reporting Considerations**

Summarized necessary items addressed in KDB 941225 D05 v02r05																																																															
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz																																																														
Channel Bandwidth	LTE Band 2: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12: 1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 13: 5MHz, 10MHz LTE Band 25: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 26: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 48: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 66: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 71: 5MHz, 10MHz, 15MHz, 20MHz																																																														
uplink modulations used	QPSK / 16QAM / 64QAM																																																														
LTE Voice / Data requirements	Data only																																																														
LTE MPR permanently built-in by design	<p align="center"><b>Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</b></p> <table border="1"> <thead> <tr> <th rowspan="2">Modulation</th> <th colspan="6">Channel bandwidth / Transmission bandwidth (N<sub>RB</sub>)</th> <th rowspan="2">MPR (dB)</th> </tr> <tr> <th>1.4 MHz</th> <th>3.0 MHz</th> <th>5 MHz</th> <th>10 MHz</th> <th>15 MHz</th> <th>20 MHz</th> </tr> </thead> <tbody> <tr> <td>QPSK</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 1</td> </tr> <tr> <td>16 QAM</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>≤ 5</td> <td>≤ 4</td> <td>≤ 8</td> <td>≤ 12</td> <td>≤ 16</td> <td>≤ 18</td> <td>≤ 2</td> </tr> <tr> <td>64 QAM</td> <td>&gt; 5</td> <td>&gt; 4</td> <td>&gt; 8</td> <td>&gt; 12</td> <td>&gt; 16</td> <td>&gt; 18</td> <td>≤ 3</td> </tr> <tr> <td>256 QAM</td> <td colspan="6">≥ 1</td> <td>≤ 5</td> </tr> </tbody> </table>	Modulation	Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> )						MPR (dB)	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1	16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1	16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2	64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2	64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3	256 QAM	≥ 1						≤ 5
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256 QAM	≥ 1						≤ 5																																																								
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)																																																														
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.																																																														
LTE Carrier Aggregation Combinations	Inter-Band and Intra-Band possible combinations and the detail power measurement please referred to section 11.																																																														
LTE Carrier Aggregation Additional Information	This device supports maximum of 5 carriers in the downlink and 2 carriers in the uplink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.																																																														



Transmission (H, M, L) channel numbers and frequencies in each LTE band													
LTE Band 2													
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860	
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900	
LTE Band 4													
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720	
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745	
LTE Band 5													
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	20407	824.7	20415	825.5	20425	826.5	20450	829	20450	829	20450	829	
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5	20525	836.5	
H	20643	848.3	20635	847.5	20625	846.5	20600	844	20600	844	20600	844	
LTE Band 7													
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	20775	2502.5	20800	2505	20825	2507.5	20850	2510	20850	2510	20850	2510	
M	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535	21100	2535	
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560	21350	2560	21350	2560	
LTE Band 12													
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	23017	699.7	23025	700.5	23035	701.5	23060	704	23060	704	23060	704	
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5	23095	707.5	23095	707.5	
H	23173	715.3	23165	714.5	23155	713.5	23130	711	23130	711	23130	711	
LTE Band 13													
	Bandwidth 5 MHz				Bandwidth 10 MHz				Bandwidth 15 MHz				Bandwidth 20 MHz
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)		Channel #		Freq.(MHz)		Channel #
L	23205		779.5		23230		782		23255		784.5		23230
M	23230		782		23230		782		23230		782		23230
H	23255		784.5		23230		782		23230		782		23230
LTE Band 25													
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	26047	1850.7	26055	1851.5	26065	1852.5	26090	1855	26115	1857.5	26140	1860	
M	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880	26340	1880	
H	26683	1914.3	26675	1913.5	26665	1912.5	26640	1910	26615	1907.5	26590	1905	
LTE Band 26													
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz		
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	
L	26697	814.7	26705	815.5	26715	816.5	26740	819	26765	821.5	26765	821.5	
M	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5	26865	831.5	
H	27033	848.3	27025	847.5	27015	846.5	26990	844	26965	841.5	26965	841.5	



LTE Band 41												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506				
L	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5				
M	40620	2593	40620	2593	40620	2593	40620	2593				
H	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5				
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680				
LTE Band 48												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	55265	3552.5	55290	3555	55315	3557.5	55340	3560				
L	55810	3607	55815	3607.5	55820	3608	55830	3609				
M	56170	3643	56165	3642.5	56160	3642	56150	3641				
H	56715	3697.5	56690	3695	56665	3692.5	56640	3690				
LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	1717.5	132072	1720
M	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745	132322	1745
H	132665	1779.3	132657	1778.5	132647	1777.5	132622	1775	132597	1772.5	132572	1770
LTE Band 71												
	Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	133147	665.5	133172	668	133197	670.5	133222	673				
M	133297	680.5	133297	680.5	133297	680.5	133297	680.5				
H	133447	695.5	133422	693	133397	690.5	133372	688				





**3.3 General 5G NR SAR Test and Reporting Considerations**

5G NR Information																
Operating Frequency Range of each 5G NR transmission band	5G NR n2: 1850 MHz ~ 1910 MHz 5G NR n25: 1850 MHz ~ 1915 MHz 5G NR n41: 2496 MHz ~ 2690 MHz 5G NR n66: 1710 MHz ~ 1780 MHz 5G NR n71: 663 MHz ~ 698 MHz 5G NR n78: 3700 MHz ~ 3800 MHz, 3450MHz ~ 3550MHz															
Channel Bandwidth	5G NR n2: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n25 : 5MHz, 10MHz, 15MHz, 20MHz, 25MHz, 30MHz, 40MHz 5G NR n41: 20MHz, 30MHz, 40MHz, 50MHz, 60MHz, 80MHz, 90MHz, 100MHz 5G NR n66: 5MHz, 10MHz, 15MHz, 20MHz, 30MHz, 40MHz 5G NR n71: 5MHz, 10MHz, 15MHz, 20MHz 5G NR n78: 20MHz, 30MHz, 40MHz, 50MHz, 60MHz, 80MHz, 90MHz, 100MHz															
SCS	FDD: SCS15KHz, TDD: SCS30KHz															
uplink modulations used	DFT-s-OFDM: PI/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM CP-OFDM QPSK / 16QAM / 64QAM / 256QAM															
A-MPR (Additional MPR) disabled for SAR Testing?	Yes															
LTE Anchor Bands for n2	LTE B5/12															
LTE Anchor Bands for n25	LTE B12															
LTE Anchor Bands for n41	LTE B2/66															
LTE Anchor Bands for n66	LTE B2/12															
LTE Anchor Bands for n71	LTE B2/66															
LTE Anchor Bands for n78	LTE 7															
Transmission (H, M, L) channel numbers and frequencies in each 5G NR band																
NR Band 2																
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz				Bandwidth 20MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)		
L	370500	1852.5	371000	1855	371500	1857.5	372000	1860	372500	1862.5	373000	1865	374000	1870		
M	376000	1880	376000	1880	376000	1880	376000	1880	376000	1880	376000	1880	376000	1880		
H	381500	1907.5	381000	1905	380500	1902.5	380000	1900	379000	1895	378000	1890	377000	1885		
NR Band 25																
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 25MHz		Bandwidth 30MHz		Bandwidth 40MHz			
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)		
L	370500	1852.5	371000	1855	371500	1857.5	372000	1860	372500	1862.5	373000	1865	374000	1870		
M	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5	376500	1882.5		
H	382500	1912.5	382000	1910	381500	1907.5	381000	1905	380500	1902.5	380000	1900	379000	1895		
NR Band 41																
	Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth 100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	501204	2506.02	502200	2511	503202	2516.01	504204	2521.02	505200	2526	507204	2536.02	508200	2541	509202	2546.01
M	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99	518598	2592.99
H	535998	2679.99	534996	2674.98	534000	2670	532998	2664.99	531996	2659.98	529998	2649.99	528996	2644.98	528000	2640
NR Band 66																
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz		Bandwidth 30MHz		Bandwidth 40MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)		
L	342500	1712.5	343000	1715	343500	1717.5	344000	1720	345000	1725	346000	1730	347000	1735		
M	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745	349000	1745		
H	355500	1777.5	355000	1775	354500	1772.5	354000	1770	353000	1765	352000	1760	351000	1755		
NR Band 71																
	Bandwidth 5MHz		Bandwidth 10MHz		Bandwidth 15MHz		Bandwidth 20MHz				Bandwidth 30MHz		Bandwidth 40MHz			
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)		
L	133100	665.5	133600	668	134100	670.5	134600	673	135100	675.5	135600	678	136100	680.5		
M	136100	680.5	136100	680.5	136100	680.5	136100	680.5	136100	680.5	136100	680.5	136100	680.5		
H	139100	695.5	138600	693	138100	690.5	137600	688	137100	685.5	136600	683	136100	680.5		
NR Band 78 (3450MHz~3550MHz)																
	Bandwidth 20MHz		Bandwidth 40MHz		Bandwidth 50MHz		Bandwidth 60MHz		Bandwidth 70MHz		Bandwidth 80MHz		Bandwidth 90MHz		Bandwidth 100MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	630668	3460.02	631334	3470.01	631668	3475.02	632000	3480	632334	3485.01	632668	3490.02	633000	3495	633334	3500.01
M	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01	633334	3500.01
H	636000	3540	635334	3530.01	635000	3525	634668	3520.02	634334	3515.01	634000	3510	633668	3505.02	633334	3500.01



### 4. RF Exposure Limits

#### 4.1 Uncontrolled Environment

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

#### 4.2 Controlled Environment

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

**Limits for Occupational/Controlled Exposure (W/kg)**

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

**Limits for General Population/Uncontrolled Exposure (W/kg)**

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.



## **5. Specific Absorption Rate (SAR)**

### **5.1 Introduction**

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

### **5.2 SAR Definition**

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density ( $\rho$ ). The equation description is as below:

$$SAR = \frac{d}{dt} \left( \frac{dW}{dm} \right) = \frac{d}{dt} \left( \frac{dW}{\rho dv} \right)$$

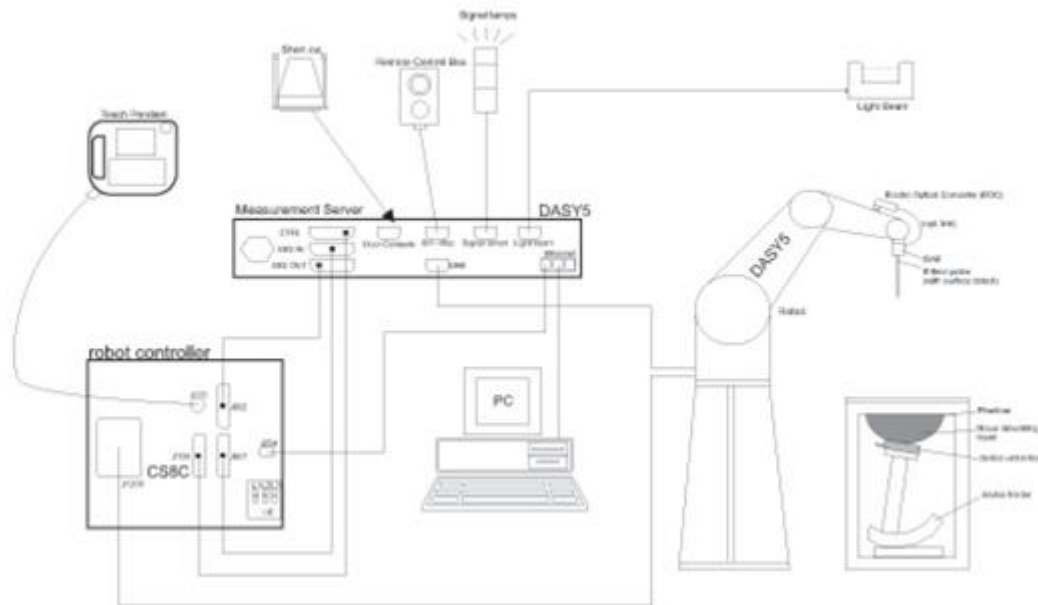
SAR is expressed in units of Watts per kilogram (W/kg)

$$SAR = \frac{\sigma |E|^2}{\rho}$$

Where:  $\sigma$  is the conductivity of the tissue,  $\rho$  is the mass density of the tissue and E is the RMS electrical field strength.

## 6. System Description and Setup

The DASY system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

### 6.1 Test Site Location


The SAR measurement facilities used to collect data are within both Sporton Lab list below test site location are accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190 and 3786) and the FCC designation No. TW1190 and TW3786 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.

Test Site	EMC & Wireless Communications Laboratory		Wensan Laboratory		
Test Site Location	TW1190 No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333, Taiwan		TW3786 No.58, Aly. 75, Ln. 564, Wenhua 3rd, Rd., Guishan Dist., Taoyuan City 333010, Taiwan		
Test Site No.	SAR01-HY	SAR03-HY	SAR08-HY	SAR09-HY	SAR15-HY
	SAR04-HY	SAR05-HY	SAR11-HY	SAR12-HY	
	SAR06-HY	SAR10-HY	SAR13-HY	SAR14-HY	


**6.2 E-Field Probe**

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG).The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

**<ES3DV3 Probe>**

<b>Construction</b>	Symmetric design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
<b>Frequency</b>	10 MHz – 4 GHz; Linearity: ±0.2 dB (30 MHz – 4 GHz)	
<b>Directivity</b>	±0.2 dB in TSL (rotation around probe axis) ±0.3 dB in TSL (rotation normal to probe axis)	
<b>Dynamic Range</b>	5 µW/g – >100 mW/g; Linearity: ±0.2 dB	
<b>Dimensions</b>	Overall length: 337 mm (tip: 20 mm) Tip diameter: 3.9 mm (body: 12 mm) Distance from probe tip to dipole centers: 3.0 mm	

**<EX3DV4 Probe>**

<b>Construction</b>	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
<b>Frequency</b>	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)	
<b>Directivity</b>	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)	
<b>Dynamic Range</b>	10 µW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 µW/g)	
<b>Dimensions</b>	Overall length: 337 mm (tip: 20 mm) Tip diameter: 2.5 mm (body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

**6.3 Data Acquisition Electronics (DAE)**

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.


The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.



**Fig 5.1 Photo of DAE**

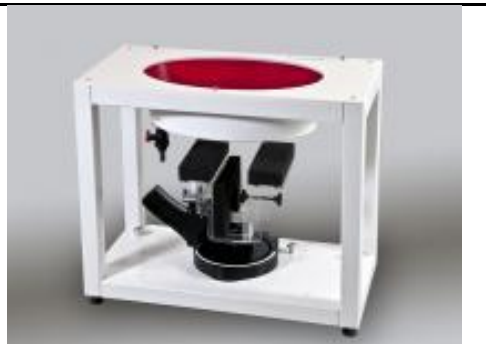
**6.4 Phantom**

**<SAM Twin Phantom>**

<b>Shell Thickness</b>	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm	
<b>Filling Volume</b>	Approx. 25 liters	
<b>Dimensions</b>	Length: 1000 mm; Width: 500 mm; Height: adjustable feet	
<b>Measurement Areas</b>	Left Hand, Right Hand, Flat Phantom	

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

**<ELI Phantom>**

<b>Shell Thickness</b>	2 ± 0.2 mm (sagging: <1%)	
<b>Filling Volume</b>	Approx. 30 liters	
<b>Dimensions</b>	Major ellipse axis: 600 mm Minor axis: 400 mm	

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

## **6.5 Device Holder**

### **<Mounting Device for Hand-Held Transmitter>**

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

### **<Mounting Device for Laptops and other Body-Worn Transmitters>**

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.



Mounting Device for Laptops



## **7. Measurement Procedures**

The measurement procedures are as follows:

### <Conducted power measurement>

- (a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
- (b) Read the WWAN RF power level from the base station simulator.
- (c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
- (d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

### <SAR measurement>

- (a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
- (b) Place the EUT in the positions as Appendix D demonstrates.
- (c) Set scan area, grid size and other setting on the DASY software.
- (d) Measure SAR results for the highest power channel on each testing position.
- (e) Find out the largest SAR result on these testing positions of each band
- (f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- (a) Power reference measurement
- (b) Area scan
- (c) Zoom scan
- (d) Power drift measurement

### **7.1 Spatial Peak SAR Evaluation**

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

- (a) Extraction of the measured data (grid and values) from the Zoom Scan
- (b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
- (c) Generation of a high-resolution mesh within the measured volume
- (d) Interpolation of all measured values from the measurement grid to the high-resolution grid
- (e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
- (f) Calculation of the averaged SAR within masses of 1g and 10g



**7.2 Power Reference Measurement**

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

**7.3 Area Scan**

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB0 is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: $\Delta x_{Area}, \Delta y_{Area}$	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

### **7.4 Zoom Scan**

Zoom scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

		$\leq 3$ GHz	$> 3$ GHz	
Maximum zoom scan spatial resolution: $\Delta x_{Zoom}$ , $\Delta y_{Zoom}$		$\leq 2$ GHz: $\leq 8$ mm 2 – 3 GHz: $\leq 5$ mm*	3 – 4 GHz: $\leq 5$ mm* 4 – 6 GHz: $\leq 4$ mm*	
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$	$\leq 5$ mm	3 – 4 GHz: $\leq 4$ mm 4 – 5 GHz: $\leq 3$ mm 5 – 6 GHz: $\leq 2$ mm	
	graded grid	$\Delta z_{Zoom}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface	$\leq 4$ mm	3 – 4 GHz: $\leq 3$ mm 4 – 5 GHz: $\leq 2.5$ mm 5 – 6 GHz: $\leq 2$ mm
		$\Delta z_{Zoom}(n>1)$ : between subsequent points	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z	$\geq 30$ mm	3 – 4 GHz: $\geq 28$ mm 4 – 5 GHz: $\geq 25$ mm 5 – 6 GHz: $\geq 22$ mm	
Note: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details. * When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is $\leq 1.4$ W/kg, $\leq 8$ mm, $\leq 7$ mm and $\leq 5$ mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.				

### **7.5 Volume Scan Procedures**

The volume scan is used to assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remains in the same test position for all measurements and all volume scans use the same spatial resolution and grid spacing. When all volume scans were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

### **7.6 Power Drift Monitoring**

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASy measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.



### 8. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit <sup>(2)</sup>	D750V3	1107	Mar. 08, 2019	Mar. 05, 2022
SPEAG	835MHz System Validation Kit <sup>(2)</sup>	D835V2	4d167	Nov. 25, 2019	Nov. 23, 2021
SPEAG	1750MHz System Validation Kit <sup>(2)</sup>	D1750V2	1112	Mar. 07, 2019	Mar. 04, 2022
SPEAG	1900MHz System Validation Kit <sup>(2)</sup>	D1900V2	5d185	Mar. 07, 2019	Mar. 04, 2022
SPEAG	2450MHz System Validation Kit <sup>(2)</sup>	D2450V2	929	Nov. 21, 2019	Nov. 19, 2021
SPEAG	2600MHz System Validation Kit <sup>(2)</sup>	D2600V2	1008	Aug. 31, 2018	Aug. 28, 2021
SPEAG	3300MHz System Validation Kit <sup>(2)</sup>	D3300V2	1005	Apr. 11, 2019	Apr. 08, 2022
SPEAG	3500MHz System Validation Kit <sup>(2)</sup>	D3500V2	1014	Jan. 29, 2019	Jan. 26, 2022
SPEAG	3700MHz System Validation Kit <sup>(2)</sup>	D3700V2	1006	Mar. 05, 2019	Mar. 02, 2022
SPEAG	5GHz System Validation Kit <sup>(2)</sup>	D5GHzV2	1006	Sep. 27, 2018	Sep. 24, 2021
SPEAG	Data Acquisition Electronics	DAE4	699	Feb. 16, 2021	Feb. 15, 2022
SPEAG	Data Acquisition Electronics	DAE4	854	Apr. 08, 2021	Apr. 07, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	3642	Apr. 26, 2021	Apr. 25, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	3976	Jan. 27, 2021	Jan. 26, 2022
SPEAG	Dosimetric E-Field Probe	EX3DV4	7625	Jan. 19, 2021	Jan. 18, 2022
RCPTWN	Thermometer	HTC-1	TM685-1	Nov. 10, 2020	Nov. 09, 2021
RCPTWN	Thermometer	HTC-1	TM560-2	Nov. 10, 2020	Nov. 09, 2021
Anritsu	Radio Communication Analyzer	MT8821C	6201341950	Nov. 10, 2020	Nov. 09, 2021
Keysight	Wireless Communication Test Set	E5515C	MY50267236	Mar. 21, 2021	Mar. 20, 2022
SPEAG	Device Holder	N/A	N/A	N/A	N/A
Anritsu	Signal Generator	MG3710A	6201502524	Nov. 11, 2020	Nov. 10, 2021
Keysight	ENA Network Analyzer	E5071C	MY46104758	Sep. 03, 2020	Sep. 02, 2021
SPEAG	Dielectric Probe Kit	DAK-3.5	1126	Sep. 16, 2020	Sep. 15, 2021
LINE SEIKI	Digital Thermometer	DTM3000-spezial	2942	Nov. 06, 2020	Nov. 05, 2021
Anritsu	Power Meter	ML2495A	1419002	Aug. 19, 2020	Aug. 18, 2021
Anritsu	Power Sensor	MA2411B	1911176	Aug. 18, 2020	Aug. 17, 2021
Anritsu	Power Meter	ML2495A	1804003	Oct. 21, 2020	Oct. 20, 2021
Anritsu	Power Sensor	MA2411B	1726150	Oct. 21, 2020	Oct. 20, 2021
Agilent	Spectrum Analyzer	E4408B	MY44211028	Aug. 27, 2020	Aug. 26, 2021
Anritsu	Spectrum Analyzer	N9010A	MY53470118	Jan. 15, 2021	Jan. 14, 2022
Mini-Circuits	Power Amplifier	ZVE-8G+	6418	Oct. 21, 2020	Oct. 20, 2021
Mini-Circuits	Power Amplifier	ZVE-8G+	479102029	Aug. 26, 2020	Aug. 25, 2021
ATM	Dual Directional Coupler	C122H-10	P610410z-02	Note 1	
Woken	Attenuator 1	WK0602-XX	N/A	Note 1	
PE	Attenuator 2	PE7005-10	N/A	Note 1	
PE	Attenuator 3	PE7005- 3	N/A	Note 1	

**General Note:**

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.
2. The dipole calibration interval can be extended to 3 years with justification according to KDB 865664 D01. The dipoles are also not physically damaged, or repaired during the interval. The justification data in appendix C can be found which the return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration for each dipole.



## 9. System Verification

### 9.1 Tissue Verification

The tissue dielectric parameters of tissue-equivalent media used for SAR measurements must be characterized within a temperature range of 18°C to 25°C, measured with calibrated instruments and apparatuses, such as network analyzers and temperature probes. The temperature of the tissue-equivalent medium during SAR measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized. The tissue dielectric measurement system must be calibrated before use. The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements.

The liquid tissue depth was at least 15cm in the phantom for all SAR testing

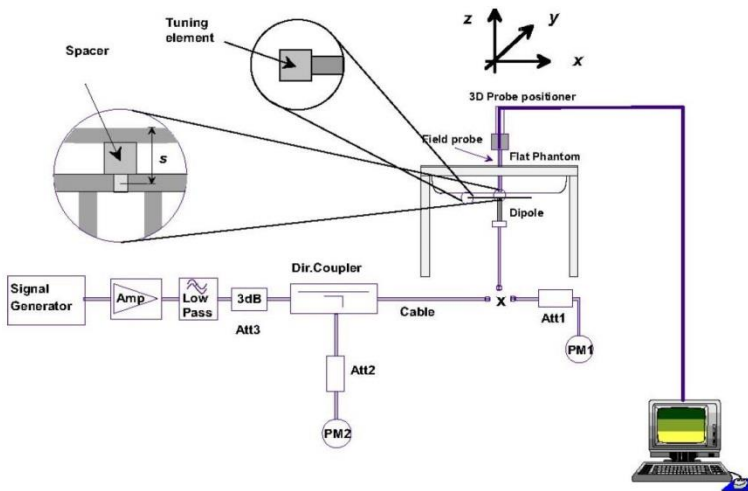
#### <Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Liquid Temp. (°C)	Conductivity (σ)	Permittivity (ε <sub>r</sub> )	Conductivity Target (σ)	Permittivity Target (ε <sub>r</sub> )	Delta (σ) (%)	Delta (ε <sub>r</sub> ) (%)	Limit (%)	Date
750	22.5	0.895	43.476	0.89	41.90	0.56	3.76	±5	2021/6/13
750	22.5	0.907	41.206	0.89	41.90	1.91	-1.66	±5	2021/6/17
835	22.5	0.926	42.880	0.90	41.50	2.89	3.33	±5	2021/6/13
1750	22.5	1.366	40.493	1.37	40.10	-0.29	0.98	±5	2021/6/15
1750	22.5	1.366	40.493	1.37	40.10	-0.29	0.98	±5	2021/6/15
1900	22.5	1.439	40.330	1.40	40.00	2.79	0.82	±5	2021/6/14
1900	22.5	1.439	40.330	1.40	40.00	2.79	0.82	±5	2021/6/14
2450	22.5	1.845	39.760	1.80	39.20	2.50	1.43	±5	2021/6/16
2600	22.5	1.963	38.687	1.96	39.00	0.15	-0.80	±5	2021/6/30
2600	22.5	1.963	38.687	1.96	39.00	0.15	-0.80	±5	2021/6/30
3300	22.5	2.710	38.269	2.70	38.13	0.37	0.36	±5	2021/6/12
3500	22.5	2.916	38.043	2.91	37.90	0.21	0.38	±5	2021/6/12
3700	22.5	3.121	37.817	3.12	37.70	0.03	0.31	±5	2021/6/12
5250	22.5	4.860	36.629	4.71	35.95	3.18	1.89	±5	2021/6/16
5750	22.5	5.369	35.935	5.22	35.35	2.85	1.65	±5	2021/6/16

**9.2 System Performance Check Results**

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

Test Side	Date	Frequency (MHz)	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
SAR01	2021/6/13	750	50	D750V3-1107	EX3DV4 - SN3976	DAE4 Sn854	0.392	8.32	7.84	-5.77
SAR06	2021/6/17	750	50	D750V3-1107	EX3DV4 - SN7625	DAE4 Sn854	0.443	8.32	8.86	6.49
SAR01	2021/6/13	835	50	D835V2-4d167	EX3DV4 - SN3976	DAE4 Sn854	0.448	9.55	8.96	-6.18
SAR01	2021/6/15	1750	50	D1750V2-1112	EX3DV4 - SN3976	DAE4 Sn854	1.83	36.70	36.6	-0.27
SAR06	2021/6/15	1750	250	D1750V2-1112	EX3DV4 - SN7625	DAE4 Sn854	8.78	36.70	35.12	-4.31
SAR06	2021/6/14	1900	250	D1900V2-5d185	EX3DV4 - SN7625	DAE4 Sn854	10.20	39.40	40.8	3.55
SAR01	2021/6/14	1900	50	D1900V2-5d185	EX3DV4 - SN3976	DAE4 Sn854	2.03	39.40	40.6	3.05
SAR06	2021/6/16	2450	250	D2450V2-929	EX3DV4 - SN7625	DAE4 Sn854	13.20	53.10	52.8	-0.56
SAR05	2021/6/30	2600	250	D2600V2-1008	EX3DV4 - SN3642	DAE4 Sn699	13.70	56.40	54.8	-2.84
SAR06	2021/6/30	2600	250	D2600V2-1008	EX3DV4 - SN7625	DAE4 Sn699	14.80	56.40	59.2	4.96
SAR06	2021/6/12	3300	100	D3300V2-1005	EX3DV4 - SN7625	DAE4 Sn854	6.37	65.50	63.7	-2.75
SAR06	2021/6/12	3500	100	D3500V2-1014	EX3DV4 - SN7625	DAE4 Sn854	6.56	67.90	65.6	-3.39
SAR06	2021/6/12	3700	100	D3700V2-1006	EX3DV4 - SN7625	DAE4 Sn854	6.87	67.30	68.7	2.08
SAR06	2021/6/16	5250	100	D5GHZV2-1006-5250	EX3DV4 - SN7625	DAE4 Sn854	8.41	80.70	84.1	4.21
SAR06	2021/6/16	5750	100	D5GHZV2-1006-5750	EX3DV4 - SN7625	DAE4 Sn854	8.28	80.40	82.8	2.99



**Fig 8.3.1 System Performance Check Setup**



**Fig 8.3.2 Setup Photo**



## **10. RF Exposure Positions**

### **10.1 Wireless Router**

Some battery-operated handsets have the capability to transmit and receive user through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06 v02r01 where SAR test considerations for handsets ( $L \times W \geq 9 \text{ cm} \times 5 \text{ cm}$ ) are based on a composite test separation distance of 10mm from the front, back and edges of the device containing transmitting antennas within 2.5cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some body-worn accessory SAR tests.

When the user enables the personal wireless router functions for the handset, actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 publication procedures. The "Portable Hotspot" feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

**11. UMTS/LTE Output Power (Unit: dBm)**

**<WCDMA Conducted Power>**

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

**HSDPA Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
  - i. Set Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters were set according to each
  - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
  - iii. Set RMC 12.2Kbps + HSDPA mode.
  - iv. Set Cell Power = -86 dBm
  - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
  - vi. Select HSDPA Uplink Parameters
  - vii. Set Delta ACK, Delta NACK and Delta CQI = 8
  - viii. Set Ack-Nack Repetition Factor to 3
  - ix. Set CQI Feedback Cycle (k) to 4 ms
  - x. Set CQI Repetition Factor to 2
  - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

**Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH**

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ .

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA,  $\Delta_{ACK}$  and  $\Delta_{NACK} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ , and  $\Delta_{CQI} = 24/15$  with  $\beta_{HS} = 24/15 * \beta_c$ .

Note 3: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{HS}/\beta_c = 24/15$ . For all other combinations of DPDCCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .

**Setup Configuration**



**HSUPA Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting \* :
  - i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
  - ii. Set the Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
  - iii. Set Cell Power = -86 dBm
  - iv. Set Channel Type = 12.2k + HSPA
  - v. Set UE Target Power
  - vi. Power Ctrl Mode= Alternating bits
  - vii. Set and observe the E-TFCl
  - viii. Confirm that E-TFCl is equal to the target E-TFCl of 75 for sub-test 1, and other subtest's E-TFCl
- d. The transmitted maximum output power was recorded.

**Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH**

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note1)	$\beta_{ec}$	$\beta_{ed}$ (Note 4) (Note 5)	$\beta_{ed}$ (SF)	$\beta_{ed}$ (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCl
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ . For sub-test 5,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 5/15$  with  $\beta_{hs} = 5/15 * \beta_c$ .

Note 2: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 10/15$  and  $\beta_d = 15/15$ .

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

**Setup Configuration**



**DC-HSDPA 3GPP release 8 Setup Configuration:**

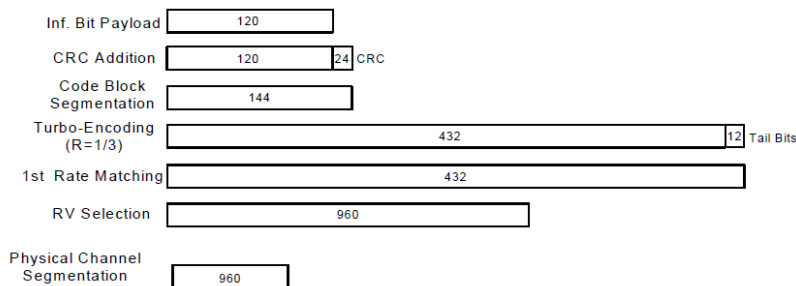
- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
  - i. Set RMC 12.2Kbps + HSDPA mode.
  - ii. Set Cell Power = -25 dBm
  - iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
  - iv. Select HSDPA Uplink Parameters
  - v. Set Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
    - a). Subtest 1:  $\beta_c/\beta_d=2/15$
    - b). Subtest 2:  $\beta_c/\beta_d=12/15$
    - c). Subtest 3:  $\beta_c/\beta_d=15/8$
    - d). Subtest 4:  $\beta_c/\beta_d=15/4$
  - vi. Set Delta ACK, Delta NACK and Delta CQI = 8
  - vii. Set Ack-Nack Repetition Factor to 3
  - viii. Set CQI Feedback Cycle (k) to 4 ms
  - ix. Set CQI Repetition Factor to 2
  - x. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

**C.8.1.12 Fixed Reference Channel Definition H-Set 12**

**Table C.8.1.12: Fixed Reference Channel H-Set 12**

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload ( $N_{INF}$ )	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		



**Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)**

**Setup Configuration**



**<WCDMA Conducted Power>**

**General Note:**

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is  $\leq \frac{1}{4}$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than  $\frac{1}{4}$  dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

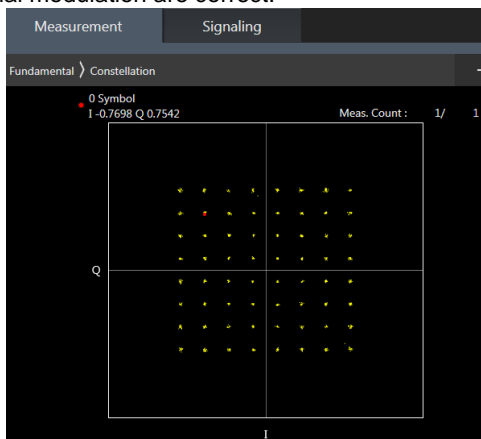
**<Ant 0>**

Band		WCDMA II			Tune-up Limit (dBm)	WCDMA V			Tune-up Limit (dBm)
TX Channel		9262	9400	9538		4132	4182	4233	
Rx Channel		9662	9800	9938		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		826.4	836.4	846.6	
3GPP Rel 99	RMC 12.2Kbps	23.66	23.88	23.69	24.80	23.96	23.97	23.84	24.80
3GPP Rel 6	HSDPA Subtest-1	22.74	22.89	22.67	23.80	23.06	23.03	22.95	23.80
3GPP Rel 6	HSDPA Subtest-2	22.56	22.75	22.55	23.80	22.87	22.91	22.82	23.80
3GPP Rel 6	HSDPA Subtest-3	22.10	22.26	22.02	23.30	22.40	22.36	23.00	23.30
3GPP Rel 6	HSDPA Subtest-4	22.02	22.23	22.03	23.30	22.39	22.44	22.21	23.30
3GPP Rel 8	DC-HSDPA Subtest-1	22.77	22.85	22.75	23.80	22.98	23.00	22.93	23.80
3GPP Rel 8	DC-HSDPA Subtest-2	22.77	22.95	22.75	23.80	23.09	23.07	23.00	23.80
3GPP Rel 8	DC-HSDPA Subtest-3	22.28	22.46	22.26	23.30	22.60	22.61	22.51	23.30
3GPP Rel 8	DC-HSDPA Subtest-4	22.24	22.45	22.25	23.30	22.60	22.60	22.51	23.30
3GPP Rel 6	HSUPA Subtest-1	22.74	22.95	22.74	23.80	21.98	22.01	21.98	23.80
3GPP Rel 6	HSUPA Subtest-2	20.61	20.80	20.60	21.80	20.96	20.93	20.84	21.80
3GPP Rel 6	HSUPA Subtest-3	21.73	21.96	21.75	22.80	21.24	21.29	21.27	22.80
3GPP Rel 6	HSUPA Subtest-4	20.68	20.89	20.89	21.80	20.76	20.81	20.80	21.80
3GPP Rel 6	HSUPA Subtest-5	22.53	22.74	22.51	23.80	22.71	22.69	22.58	23.80

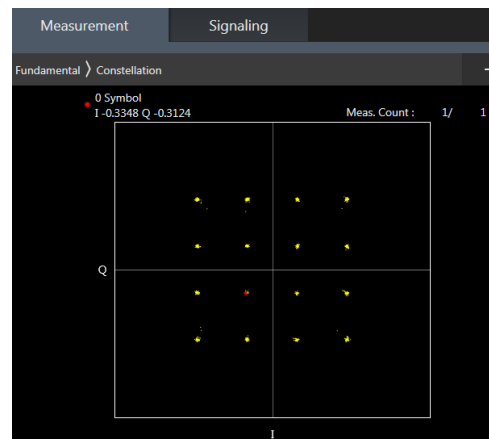
**<LTE Conducted Power>**

**General Note:**

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4/B5/B12/B26/B71 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 2/4/5 SAR test was covered by Band 25/66/26; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - a. the maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion
  - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to 2017 TCB workshop, for 64 QAM and 16 QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



**64QAM**



**16QAM**



**Ant. 0**

**<LTE Band 2>**

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	22.43	22.56	22.42	23.7	0
20	QPSK	1	49	22.33	22.50	22.30		
20	QPSK	1	99	22.40	22.42	22.26		
20	QPSK	50	0	21.56	21.57	21.54	22.7	1
20	QPSK	50	24	21.52	21.61	21.53		
20	QPSK	50	50	21.55	21.59	21.36		
20	QPSK	100	0	21.50	21.58	21.48	22.7	1
20	16QAM	1	0	21.70	21.74	21.70		
20	16QAM	1	49	21.67	21.81	21.60		
20	16QAM	1	99	21.73	21.75	21.58	21.7	2
20	16QAM	50	0	20.40	20.55	20.48		
20	16QAM	50	24	20.51	20.62	20.50		
20	16QAM	50	50	20.53	20.59	20.40	21.7	2
20	16QAM	100	0	20.47	20.55	20.49		
20	64QAM	1	0	20.37	20.29	20.27		
20	64QAM	1	49	20.42	20.33	20.40	21.7	2
20	64QAM	1	99	20.43	20.31	20.05		
20	64QAM	50	0	19.17	19.33	19.24		
20	64QAM	50	24	19.37	19.36	19.23	20.7	3
20	64QAM	50	50	19.29	19.34	19.07		
20	64QAM	100	0	19.33	19.31	19.21		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.32	22.46	22.36	23.7	0
15	QPSK	1	37	22.30	22.47	22.22		
15	QPSK	1	74	22.41	22.43	22.20		
15	QPSK	36	0	21.34	21.51	21.40	22.7	1
15	QPSK	36	20	21.46	21.58	21.46		
15	QPSK	36	39	21.46	21.58	21.46		
15	QPSK	75	0	21.45	21.51	21.40	22.7	1
15	16QAM	1	0	21.61	21.75	21.60		
15	16QAM	1	37	21.63	21.73	21.56		
15	16QAM	1	74	21.74	21.72	21.51	21.7	2
15	16QAM	36	0	20.32	20.49	20.40		
15	16QAM	36	20	20.45	20.55	20.44		
15	16QAM	36	39	20.44	20.49	20.41	21.7	2
15	16QAM	75	0	20.46	20.53	20.43		
15	64QAM	1	0	20.53	20.64	20.62		
15	64QAM	1	37	20.61	20.76	20.46	21.7	2
15	64QAM	1	74	20.68	20.61	20.38		
15	64QAM	36	0	19.38	19.53	19.38		
15	64QAM	36	20	19.44	19.56	19.40	20.7	3
15	64QAM	36	39	19.49	19.56	19.42		
15	64QAM	75	0	19.47	19.55	19.43		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.27	22.41	22.24	23.7	0
10	QPSK	1	25	22.27	22.38	22.22		
10	QPSK	1	49	22.33	22.42	22.21		
10	QPSK	25	0	21.40	21.44	21.34	22.7	1



**FCC SAR TEST REPORT**

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10	QPSK	25	12	21.45	21.49	21.37		
10	QPSK	25	25	21.49	21.53	21.38		
10	QPSK	50	0	21.46	21.52	21.38		
10	16QAM	1	0	21.68	21.77	21.62	22.7	1
10	16QAM	1	25	21.63	21.77	21.59		
10	16QAM	1	49	21.68	21.78	21.63		
10	16QAM	25	0	20.39	20.43	20.32	21.7	2
10	16QAM	25	12	20.46	20.52	20.39		
10	16QAM	25	25	20.49	20.56	20.37		
10	16QAM	50	0	20.42	20.52	20.35		
10	64QAM	1	0	20.52	20.61	20.56	21.7	2
10	64QAM	1	25	20.56	20.68	20.46		
10	64QAM	1	49	20.58	20.60	20.50		
10	64QAM	25	0	19.43	19.49	19.33	20.7	3
10	64QAM	25	12	19.49	19.54	19.44		
10	64QAM	25	25	19.51	19.53	19.39		
10	64QAM	50	0	19.52	19.49	19.36		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.29	22.33	22.20	23.7	0
5	QPSK	1	12	22.31	22.50	22.26		
5	QPSK	1	24	22.32	22.42	22.27		
5	QPSK	12	0	21.42	21.49	21.33	22.7	1
5	QPSK	12	7	21.47	21.52	21.35		
5	QPSK	12	13	21.44	21.51	21.33		
5	QPSK	25	0	21.39	21.49	21.32		
5	16QAM	1	0	21.58	21.63	21.53	22.7	1
5	16QAM	1	12	21.69	21.81	21.61		
5	16QAM	1	24	21.65	21.74	21.60		
5	16QAM	12	0	20.47	20.54	20.38	21.7	2
5	16QAM	12	7	20.52	20.56	20.43		
5	16QAM	12	13	20.50	20.55	20.39		
5	16QAM	25	0	20.46	20.51	20.38		
5	64QAM	1	0	20.70	20.68	20.59	21.7	2
5	64QAM	1	12	20.64	20.77	20.60		
5	64QAM	1	24	20.62	20.74	20.61		
5	64QAM	12	0	19.44	19.53	19.36	20.7	3
5	64QAM	12	7	19.51	19.56	19.42		
5	64QAM	12	13	19.46	19.57	19.42		
5	64QAM	25	0	19.46	19.52	19.37		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.35	22.41	22.23	23.7	0
3	QPSK	1	8	22.40	22.55	22.34		
3	QPSK	1	14	22.37	22.51	22.28		
3	QPSK	8	0	21.47	21.52	21.32	22.7	1
3	QPSK	8	4	21.50	21.56	21.39		
3	QPSK	8	7	21.49	21.60	21.36		
3	QPSK	15	0	21.44	21.50	21.33		
3	16QAM	1	0	21.64	21.68	21.54	22.7	1
3	16QAM	1	8	21.75	21.86	21.66		
3	16QAM	1	14	21.64	21.77	21.61		
3	16QAM	8	0	20.52	20.57	20.43	21.7	2
3	16QAM	8	4	20.55	20.65	20.46		
3	16QAM	8	7	20.56	20.69	20.45		
3	16QAM	15	0	20.51	20.58	20.37		



3	64QAM	1	0	20.70	20.76	20.61	21.7	2
3	64QAM	1	8	20.75	20.87	20.69		
3	64QAM	1	14	20.67	20.82	20.58		
3	64QAM	8	0	19.47	19.51	19.35	20.7	3
3	64QAM	8	4	19.51	19.58	19.39		
3	64QAM	8	7	19.48	19.59	19.39		
3	64QAM	15	0	19.49	19.53	19.41		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.24	22.29	22.11	23.7	0
1.4	QPSK	1	3	22.29	22.40	22.16		
1.4	QPSK	1	5	22.25	22.37	22.12		
1.4	QPSK	3	0	22.33	22.39	22.22		
1.4	QPSK	3	1	22.38	22.53	22.27		
1.4	QPSK	3	3	22.34	22.48	22.22		
1.4	QPSK	6	0	21.36	21.42	21.24	22.7	1
1.4	16QAM	1	0	21.59	21.65	21.45	22.7	1
1.4	16QAM	1	3	21.69	21.76	21.52		
1.4	16QAM	1	5	21.60	21.72	21.51		
1.4	16QAM	3	0	21.42	21.48	21.28		
1.4	16QAM	3	1	21.46	21.56	21.34		
1.4	16QAM	3	3	21.35	21.51	21.28		
1.4	16QAM	6	0	20.41	20.47	20.26	21.7	2
1.4	64QAM	1	0	20.59	20.67	20.49	21.7	2
1.4	64QAM	1	3	20.59	20.77	20.54		
1.4	64QAM	1	5	20.53	20.67	20.45		
1.4	64QAM	3	0	20.53	20.62	20.41		
1.4	64QAM	3	1	20.55	20.69	20.50		
1.4	64QAM	3	3	20.49	20.63	20.39		
1.4	64QAM	6	0	19.46	19.48	19.34	20.7	3

**<LTE Band 4>**

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	22.49	22.51	22.39	23.5	0
20	QPSK	1	49	22.31	22.15	22.28		
20	QPSK	1	99	22.30	22.26	22.25		
20	QPSK	50	0	21.62	21.45	21.53	22.5	1
20	QPSK	50	24	21.52	21.44	21.53		
20	QPSK	50	50	21.42	21.34	21.45		
20	QPSK	100	0	21.48	21.37	21.44		
20	16QAM	1	0	21.80	21.71	21.68	22.5	1
20	16QAM	1	49	21.63	21.58	21.59		
20	16QAM	1	99	21.58	21.61	21.60		
20	16QAM	50	0	20.60	20.41	20.50	21.5	2
20	16QAM	50	24	20.47	20.42	20.52		
20	16QAM	50	50	20.45	20.37	20.46		
20	16QAM	100	0	20.47	20.38	20.43		
20	64QAM	1	0	20.47	20.19	20.17	21.5	2
20	64QAM	1	49	20.23	20.11	20.38		
20	64QAM	1	99	20.36	20.20	20.19		
20	64QAM	50	0	19.31	19.22	19.26	20.5	3
20	64QAM	50	24	19.26	19.24	19.24		



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20	64QAM	50	50	19.21	19.11	19.25		
20	64QAM	100	0	19.26	19.21	19.22		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.48	22.41	22.42	23.5	0
15	QPSK	1	37	22.33	22.22	22.28		
15	QPSK	1	74	22.31	22.21	22.29		
15	QPSK	36	0	21.56	21.39	21.48	22.5	1
15	QPSK	36	20	21.47	21.38	21.41		
15	QPSK	36	39	21.43	21.35	21.46		
15	QPSK	75	0	21.47	21.39	21.43		
15	16QAM	1	0	21.77	21.67	21.81	22.5	1
15	16QAM	1	37	21.63	21.55	21.65		
15	16QAM	1	74	21.58	21.54	21.54		
15	16QAM	36	0	20.56	20.40	20.53	21.5	2
15	16QAM	36	20	20.47	20.38	20.43		
15	16QAM	36	39	20.41	20.36	20.48		
15	16QAM	75	0	20.49	20.41	20.46		
15	64QAM	1	0	20.77	20.57	20.59	21.5	2
15	64QAM	1	37	20.57	20.47	20.56		
15	64QAM	1	74	20.59	20.53	20.55		
15	64QAM	36	0	19.56	19.37	19.49	20.5	3
15	64QAM	36	20	19.47	19.33	19.45		
15	64QAM	36	39	19.43	19.36	19.44		
15	64QAM	75	0	19.49	19.42	19.45		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.40	22.24	22.42	23.5	0
10	QPSK	1	25	22.31	22.24	22.37		
10	QPSK	1	49	22.38	22.21	22.38		
10	QPSK	25	0	21.49	21.31	21.44	22.5	1
10	QPSK	25	12	21.53	21.42	21.45		
10	QPSK	25	25	21.56	21.43	21.54		
10	QPSK	50	0	21.55	21.46	21.48		
10	16QAM	1	0	21.78	21.62	21.77	22.5	1
10	16QAM	1	25	21.71	21.66	21.74		
10	16QAM	1	49	21.75	21.67	21.78		
10	16QAM	25	0	20.47	20.36	20.38	21.5	2
10	16QAM	25	12	20.55	20.43	20.47		
10	16QAM	25	25	20.56	20.44	20.52		
10	16QAM	50	0	20.52	20.41	20.43		
10	64QAM	1	0	20.70	20.55	20.63	21.5	2
10	64QAM	1	25	20.61	20.61	20.69		
10	64QAM	1	49	20.67	20.62	20.66		
10	64QAM	25	0	19.53	19.33	19.44	20.5	3
10	64QAM	25	12	19.56	19.45	19.49		
10	64QAM	25	25	19.57	19.46	19.57		
10	64QAM	50	0	19.57	19.47	19.48		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.42	22.28	22.43	23.5	0
5	QPSK	1	12	22.43	22.29	22.38		
5	QPSK	1	24	22.46	22.33	22.42		
5	QPSK	12	0	21.51	21.40	21.50	22.5	1
5	QPSK	12	7	21.58	21.45	21.51		
5	QPSK	12	13	21.51	21.42	21.51		



5	QPSK	25	0	21.52	21.39	21.49		
5	16QAM	1	0	21.79	21.62	21.73	22.5	1
5	16QAM	1	12	21.78	21.68	21.79		
5	16QAM	1	24	21.73	21.68	21.72		
5	16QAM	12	0	20.58	20.45	20.54	21.5	2
5	16QAM	12	7	20.63	20.48	20.57		
5	16QAM	12	13	20.59	20.48	20.54		
5	16QAM	25	0	20.55	20.41	20.50	21.5	2
5	64QAM	1	0	20.76	20.60	20.81		
5	64QAM	1	12	20.81	20.64	20.79		
5	64QAM	1	24	20.83	20.74	20.74	20.5	3
5	64QAM	12	0	19.57	19.46	19.56		
5	64QAM	12	7	19.62	19.48	19.58		
5	64QAM	12	13	19.58	19.45	19.54	20.5	3
5	64QAM	25	0	19.57	19.42	19.53		
Channel				19965	20175	20385		
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.41	22.24	22.37	23.5	0
3	QPSK	1	8	22.50	22.37	22.45		
3	QPSK	1	14	22.40	22.29	22.37		
3	QPSK	8	0	21.53	21.40	21.47	22.5	1
3	QPSK	8	4	21.54	21.42	21.51		
3	QPSK	8	7	21.54	21.41	21.49		
3	QPSK	15	0	21.50	21.35	21.46	22.5	1
3	16QAM	1	0	21.72	21.54	21.70		
3	16QAM	1	8	21.81	21.67	21.82		
3	16QAM	1	14	21.74	21.58	21.72	21.5	2
3	16QAM	8	0	20.58	20.47	20.56		
3	16QAM	8	4	20.62	20.48	20.61		
3	16QAM	8	7	20.61	20.47	20.56	21.5	2
3	16QAM	15	0	20.55	20.42	20.50		
3	64QAM	1	0	20.74	20.59	20.64		
3	64QAM	1	8	20.77	20.72	20.86	21.5	2
3	64QAM	1	14	20.77	20.67	20.72		
3	64QAM	8	0	19.53	19.43	19.51		
3	64QAM	8	4	19.59	19.47	19.54	20.5	3
3	64QAM	8	7	19.54	19.42	19.51		
3	64QAM	15	0	19.57	19.42	19.52		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.33	22.16	22.26	23.5	0
1.4	QPSK	1	3	22.39	22.23	22.33		
1.4	QPSK	1	5	22.34	22.19	22.28		
1.4	QPSK	3	0	22.37	22.26	22.34		
1.4	QPSK	3	1	22.46	22.32	22.39		
1.4	QPSK	3	3	22.37	22.24	22.37	22.5	1
1.4	QPSK	6	0	21.42	21.30	21.40		
1.4	16QAM	1	0	21.65	21.56	21.64		
1.4	16QAM	1	3	21.72	21.58	21.66	22.5	1
1.4	16QAM	1	5	21.66	21.55	21.62		
1.4	16QAM	3	0	21.43	21.36	21.46		
1.4	16QAM	3	1	21.46	21.39	21.48	21.5	2
1.4	16QAM	3	3	21.46	21.31	21.43		
1.4	16QAM	6	0	20.44	20.35	20.44		
1.4	64QAM	1	0	20.69	20.40	20.64	21.5	2
1.4	64QAM	1	3	20.72	20.58	20.71		





1.4	64QAM	1	5	20.63	20.56	20.64		
1.4	64QAM	3	0	20.57	20.44	20.54		
1.4	64QAM	3	1	20.63	20.49	20.59		
1.4	64QAM	3	3	20.57	20.44	20.52		
1.4	64QAM	6	0	19.48	19.35	19.41		

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.84	23.00	22.73	23.5	0
10	QPSK	1	25	22.78	22.72	22.66		
10	QPSK	1	49	22.79	22.75	22.57		
10	QPSK	25	0	22.00	21.93	21.82	22.5	1
10	QPSK	25	12	21.96	21.89	21.77		
10	QPSK	25	25	21.97	21.92	21.80		
10	QPSK	50	0	21.96	21.89	21.77	22.5	1
10	16QAM	1	0	22.26	22.25	22.13		
10	16QAM	1	25	22.14	22.15	22.02		
10	16QAM	1	49	22.23	22.10	22.03	21.5	2
10	16QAM	25	0	20.90	20.84	20.78		
10	16QAM	25	12	21.00	20.86	20.80		
10	16QAM	25	25	20.94	20.87	20.80	21.5	2
10	16QAM	50	0	20.99	20.87	20.79		
10	64QAM	1	0	20.73	20.89	20.69		
10	64QAM	1	25	20.73	20.86	20.75	21.5	2
10	64QAM	1	49	20.72	20.54	20.58		
10	64QAM	25	0	19.75	19.68	19.61		
10	64QAM	25	12	19.75	19.67	19.51	20.5	3
10	64QAM	25	25	19.67	19.63	19.56		
10	64QAM	50	0	19.70	19.63	19.41		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.97	22.84	22.73	23.5	0
5	QPSK	1	12	22.88	22.82	22.68		
5	QPSK	1	24	22.86	22.78	22.60		
5	QPSK	12	0	22.03	21.92	21.76	22.5	1
5	QPSK	12	7	22.03	21.88	21.74		
5	QPSK	12	13	21.93	21.89	21.72		
5	QPSK	25	0	21.96	21.86	21.76	22.5	1
5	16QAM	1	0	22.31	22.18	22.01		
5	16QAM	1	12	22.19	22.06	21.97		
5	16QAM	1	24	22.21	22.16	21.95	21.5	2
5	16QAM	12	0	21.04	20.93	20.76		
5	16QAM	12	7	21.04	20.87	20.70		
5	16QAM	12	13	20.96	20.90	20.73	21.5	2
5	16QAM	25	0	20.99	20.86	20.76		
5	64QAM	1	0	21.25	21.13	20.99		
5	64QAM	1	12	21.12	21.08	20.89	21.5	2
5	64QAM	1	24	21.17	21.02	20.90		
5	64QAM	12	0	20.12	19.96	19.82		
5	64QAM	12	7	20.03	19.91	19.76	20.5	3
5	64QAM	12	13	20.01	19.92	19.81		
5	64QAM	25	0	20.02	19.88	19.79		



Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.90	22.77	22.71	23.5	0
3	QPSK	1	8	22.89	22.85	22.71		
3	QPSK	1	14	22.80	22.75	22.57		
3	QPSK	8	0	21.98	21.90	21.76	22.5	1
3	QPSK	8	4	21.98	21.87	21.72		
3	QPSK	8	7	21.93	21.88	21.69		
3	QPSK	15	0	21.96	21.84	21.74	22.5	1
3	16QAM	1	0	22.24	22.14	22.03		
3	16QAM	1	8	22.29	22.10	22.00		
3	16QAM	1	14	22.11	22.08	21.86	21.5	2
3	16QAM	8	0	21.02	20.92	20.83		
3	16QAM	8	4	21.04	21.00	20.81		
3	16QAM	8	7	20.99	20.91	20.76	21.5	2
3	16QAM	15	0	21.00	20.83	20.75		
3	64QAM	1	0	21.18	21.06	20.96		
3	64QAM	1	8	21.17	21.12	20.88	21.5	2
3	64QAM	1	14	21.10	21.05	20.86		
3	64QAM	8	0	20.02	19.90	19.79		
3	64QAM	8	4	20.06	19.99	19.82	20.5	3
3	64QAM	8	7	19.99	19.94	19.75		
3	64QAM	15	0	19.98	19.87	19.76		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.83	22.67	22.56	23.5	0
1.4	QPSK	1	3	22.86	22.76	22.57		
1.4	QPSK	1	5	22.76	22.66	22.49		
1.4	QPSK	3	0	22.84	22.69	22.57		
1.4	QPSK	3	1	22.86	22.76	22.58		
1.4	QPSK	3	3	22.77	22.73	22.52		
1.4	QPSK	6	0	21.87	21.80	21.62	22.5	1
1.4	16QAM	1	0	22.16	22.01	21.90	22.5	1
1.4	16QAM	1	3	22.17	22.08	21.92		
1.4	16QAM	1	5	22.08	22.02	21.84		
1.4	16QAM	3	0	21.93	21.76	21.64		
1.4	16QAM	3	1	21.97	21.87	21.69		
1.4	16QAM	3	3	21.90	21.77	21.60		
1.4	16QAM	6	0	20.93	20.88	20.72	21.5	2
1.4	64QAM	1	0	21.07	20.91	20.81	21.5	2
1.4	64QAM	1	3	21.11	21.02	20.88		
1.4	64QAM	1	5	20.99	20.87	20.72		
1.4	64QAM	3	0	21.01	20.89	20.74		
1.4	64QAM	3	1	21.08	20.99	20.79		
1.4	64QAM	3	3	21.01	20.95	20.70		
1.4	64QAM	6	0	19.88	19.80	19.68	20.5	3

<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	21.17	21.35	21.03	21.5	0
20	QPSK	1	49	21.24	21.25	21.00		
20	QPSK	1	99	21.34	21.24	21.05		



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20	QPSK	50	0	20.29	20.41	20.19	20.5	1
20	QPSK	50	24	20.40	20.32	20.20		
20	QPSK	50	50	20.30	20.31	20.19		
20	QPSK	100	0	20.42	20.43	20.20		
20	16QAM	1	0	20.26	20.34	20.30	20.5	1
20	16QAM	1	49	20.22	20.22	20.35		
20	16QAM	1	99	20.24	20.27	20.37		
20	16QAM	50	0	19.30	19.28	19.16	19.5	2
20	16QAM	50	24	19.43	19.32	19.18		
20	16QAM	50	50	19.42	19.30	19.19		
20	16QAM	100	0	19.40	19.29	19.17		
20	64QAM	1	0	19.33	19.38	19.23	19.5	2
20	64QAM	1	49	19.40	19.28	19.28		
20	64QAM	1	99	19.34	19.42	19.27		
20	64QAM	50	0	18.35	18.29	18.18	18.5	3
20	64QAM	50	24	18.44	18.34	18.23		
20	64QAM	50	50	18.46	18.36	18.21		
20	64QAM	100	0	18.43	18.32	18.19		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	20.97	21.28	20.96	21.5	0
15	QPSK	1	37	21.24	21.06	20.93		
15	QPSK	1	74	21.29	21.22	20.88		
15	QPSK	36	0	20.14	20.33	20.17	20.5	1
15	QPSK	36	20	20.29	20.16	20.20		
15	QPSK	36	39	20.21	20.29	20.10		
15	QPSK	75	0	20.24	20.34	20.19		
15	16QAM	1	0	20.06	20.21	20.21	20.5	1
15	16QAM	1	37	20.09	20.18	20.27		
15	16QAM	1	74	20.13	20.12	20.21		
15	16QAM	36	0	19.12	19.16	19.07	19.5	2
15	16QAM	36	20	19.37	19.26	19.13		
15	16QAM	36	39	19.34	19.30	19.19		
15	16QAM	75	0	19.33	19.28	19.08		
15	64QAM	1	0	19.22	19.29	19.18	19.5	2
15	64QAM	1	37	19.34	19.09	19.16		
15	64QAM	1	74	19.17	19.42	19.23		
15	64QAM	36	0	18.28	18.28	18.14	18.5	3
15	64QAM	36	20	18.39	18.30	18.05		
15	64QAM	36	39	18.30	18.21	18.19		
15	64QAM	75	0	18.37	18.24	18.06		
Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	20.80	21.28	20.80	21.5	0
10	QPSK	1	25	21.07	20.98	20.88		
10	QPSK	1	49	21.25	21.12	20.84		
10	QPSK	25	0	20.04	20.14	20.00	20.5	1
10	QPSK	25	12	20.14	19.96	20.08		
10	QPSK	25	25	20.15	20.26	20.01		
10	QPSK	50	0	20.12	20.17	20.15	20.5	1
10	16QAM	1	0	19.96	20.05	20.09		
10	16QAM	1	25	19.93	20.00	20.13		
10	16QAM	1	49	20.11	20.03	20.10	19.5	2
10	16QAM	25	0	19.11	19.12	19.04		
10	16QAM	25	12	19.21	19.23	18.94		
10	16QAM	25	25	19.18	19.22	19.16		



Channel	Frequency (MHz)	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)		
10	16QAM	50	0	19.18	19.23	18.89	19.5	2
10	64QAM	1	0	19.06	19.17	19.02		
10	64QAM	1	25	19.28	18.99	19.02		
10	64QAM	1	49	18.97	19.32	19.22	18.5	3
10	64QAM	25	0	18.19	18.18	18.13		
10	64QAM	25	12	18.39	18.15	17.87		
10	64QAM	25	25	18.10	18.09	18.15		
10	64QAM	50	0	18.17	18.08	17.90		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	20.74	21.12	20.66	21.5	0
5	QPSK	1	12	21.02	20.91	20.68		
5	QPSK	1	24	21.08	21.01	20.70		
5	QPSK	12	0	19.87	19.98	19.99	20.5	1
5	QPSK	12	7	19.98	19.81	20.04		
5	QPSK	12	13	20.15	20.24	19.82		
5	QPSK	25	0	19.93	20.08	19.97		
5	16QAM	1	0	19.82	19.92	19.92	20.5	1
5	16QAM	1	12	19.81	19.81	20.09		
5	16QAM	1	24	20.07	20.01	19.99		
5	16QAM	12	0	19.02	19.02	18.89	19.5	2
5	16QAM	12	7	19.14	19.05	18.84		
5	16QAM	12	13	19.16	19.18	19.07		
5	16QAM	25	0	19.05	19.12	18.75		
5	64QAM	1	0	19.05	18.98	18.92	19.5	2
5	64QAM	1	12	19.16	18.84	18.87		
5	64QAM	1	24	18.95	19.32	19.04		
5	64QAM	12	0	18.19	18.08	17.96	18.5	3
5	64QAM	12	7	18.39	17.95	17.69		
5	64QAM	12	13	18.09	17.95	17.99		
5	64QAM	25	0	18.03	18.05	17.81		

**<LTE Band 12>**

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	22.94	23.00	22.91	23.7	0
10	QPSK	1	25	22.91	22.84	22.85		
10	QPSK	1	49	22.93	22.95	22.89		
10	QPSK	25	0	22.07	22.04	22.07	22.7	1
10	QPSK	25	12	22.06	21.97	22.04		
10	QPSK	25	25	22.05	22.03	22.03		
10	QPSK	50	0	22.06	21.98	22.06		
10	16QAM	1	0	22.28	22.29	22.21	22.7	1
10	16QAM	1	25	22.28	22.25	22.23		
10	16QAM	1	49	22.32	22.27	22.28		
10	16QAM	25	0	21.00	21.00	20.97	21.7	2
10	16QAM	25	12	21.09	21.00	21.04		
10	16QAM	25	25	21.05	21.05	20.97		
10	16QAM	50	0	21.10	21.00	21.04		
10	64QAM	1	0	20.86	20.96	20.80	21.7	2
10	64QAM	1	25	20.80	20.86	20.88		
10	64QAM	1	49	20.64	20.65	20.67		
10	64QAM	25	0	19.67	19.61	19.61	20.7	3



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10	64QAM	25	12	19.82	19.71	19.72		
10	64QAM	25	25	19.73	19.73	19.61		
10	64QAM	50	0	19.73	19.61	19.73		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	22.96	22.93	22.86	23.7	0
5	QPSK	1	12	22.92	22.92	22.92		
5	QPSK	1	24	22.97	22.94	22.89		
5	QPSK	12	0	22.02	22.00	21.94	22.7	1
5	QPSK	12	7	22.01	21.96	22.01		
5	QPSK	12	13	22.01	21.99	21.95		
5	QPSK	25	0	22.02	21.96	21.92		
5	16QAM	1	0	22.28	22.26	22.18	22.7	1
5	16QAM	1	12	22.20	22.26	22.13		
5	16QAM	1	24	22.28	22.23	22.21		
5	16QAM	12	0	21.09	21.00	20.96	21.7	2
5	16QAM	12	7	21.06	21.03	20.99		
5	16QAM	12	13	21.01	21.02	20.97		
5	16QAM	25	0	21.07	20.99	20.98		
5	64QAM	1	0	21.25	21.17	21.13	21.7	2
5	64QAM	1	12	21.17	21.20	21.08		
5	64QAM	1	24	21.19	21.22	21.05		
5	64QAM	12	0	20.10	20.09	20.04	20.7	3
5	64QAM	12	7	20.10	20.04	20.04		
5	64QAM	12	13	20.08	20.08	20.04		
5	64QAM	25	0	20.06	19.97	20.01		
Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	22.97	22.89	22.86	23.7	0
3	QPSK	1	8	22.96	22.97	22.93		
3	QPSK	1	14	22.92	22.91	22.88		
3	QPSK	8	0	22.00	21.95	21.92	22.7	1
3	QPSK	8	4	22.01	22.03	21.93		
3	QPSK	8	7	21.99	21.98	21.94		
3	QPSK	15	0	21.98	21.93	21.89		
3	16QAM	1	0	22.29	22.25	22.21	22.7	1
3	16QAM	1	8	22.30	22.23	22.23		
3	16QAM	1	14	22.22	22.21	22.18		
3	16QAM	8	0	21.11	21.04	20.96	21.7	2
3	16QAM	8	4	21.10	21.07	21.02		
3	16QAM	8	7	21.05	21.00	20.99		
3	16QAM	15	0	21.03	20.97	20.92		
3	64QAM	1	0	21.27	21.16	21.12	21.7	2
3	64QAM	1	8	21.19	21.23	21.16		
3	64QAM	1	14	21.16	21.19	21.05		
3	64QAM	8	0	20.10	20.07	19.95	20.7	3
3	64QAM	8	4	20.10	20.11	20.06		
3	64QAM	8	7	20.05	20.03	19.99		
3	64QAM	15	0	20.04	19.99	19.94		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	22.91	22.79	22.79	23.7	0
1.4	QPSK	1	3	22.91	22.88	22.84		
1.4	QPSK	1	5	22.82	22.84	22.74		
1.4	QPSK	3	0	22.91	22.81	22.79		
1.4	QPSK	3	1	22.90	22.84	22.82		



1.4	QPSK	3	3	22.85	22.88	22.77		
1.4	QPSK	6	0	21.93	21.87	21.85	22.7	1
1.4	16QAM	1	0	22.23	22.12	22.15	22.7	1
1.4	16QAM	1	3	22.22	22.20	22.17		
1.4	16QAM	1	5	22.18	22.12	22.11		
1.4	16QAM	3	0	22.01	21.88	21.92		
1.4	16QAM	3	1	22.07	21.93	21.93		
1.4	16QAM	3	3	21.99	21.89	21.88		
1.4	16QAM	6	0	21.04	20.95	20.95	21.7	2
1.4	64QAM	1	0	21.17	21.00	21.03	21.7	2
1.4	64QAM	1	3	21.21	21.14	21.06		
1.4	64QAM	1	5	21.08	21.10	21.01		
1.4	64QAM	3	0	21.15	21.02	20.98		
1.4	64QAM	3	1	21.17	21.06	21.05		
1.4	64QAM	3	3	21.08	21.05	20.98		
1.4	64QAM	6	0	19.94	19.89	19.90	20.7	3

<LTE Band 13>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23230				
Frequency (MHz)				782				
10	QPSK	1	0		23.00		23.7	0
10	QPSK	1	25		22.91			
10	QPSK	1	49		22.91			
10	QPSK	25	0		22.07		22.7	1
10	QPSK	25	12		22.02			
10	QPSK	25	25		22.06			
10	QPSK	50	0		22.03		22.7	1
10	16QAM	1	0		22.22			
10	16QAM	1	25		22.31			
10	16QAM	1	49		22.26		21.7	2
10	16QAM	25	0		21.03			
10	16QAM	25	12		21.05			
10	16QAM	25	25		21.07		21.7	2
10	16QAM	50	0		21.04			
10	64QAM	1	0		20.63			
10	64QAM	1	25		20.85		21.7	2
10	64QAM	1	49		20.69			
10	64QAM	25	0		19.66			
10	64QAM	25	12		19.71		20.7	3
10	64QAM	25	25		19.66			
10	64QAM	50	0		19.56			
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	22.83	22.88	22.97	23.7	0
5	QPSK	1	12	22.94	22.95	22.94		
5	QPSK	1	24	22.98	22.99	22.98		
5	QPSK	12	0	21.93	21.99	22.01	22.7	1
5	QPSK	12	7	22.00	22.00	22.04		
5	QPSK	12	13	22.02	22.07	22.09		
5	QPSK	25	0	22.00	22.01	22.07	22.7	1
5	16QAM	1	0	22.16	22.12	22.24		
5	16QAM	1	12	22.15	22.16	22.17		
5	16QAM	1	24	22.29	22.21	22.31		



5	16QAM	12	0	21.03	21.03	21.05	21.7	2
5	16QAM	12	7	21.08	21.02	21.12		
5	16QAM	12	13	21.05	21.08	21.10		
5	16QAM	25	0	21.06	21.11	21.10	21.7	2
5	64QAM	1	0	21.15	21.07	21.11		
5	64QAM	1	12	21.28	21.27	21.17		
5	64QAM	1	24	21.29	21.17	21.25	20.7	3
5	64QAM	12	0	20.10	20.06	20.12		
5	64QAM	12	7	20.09	20.08	20.14		
5	64QAM	12	13	20.05	20.14	20.15	20.7	3
5	64QAM	25	0	20.03	20.05	20.10		

**<LTE Band 25>**

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				26140	26340	26590	23.7	0
Frequency (MHz)				1860	1880	1905		
20	QPSK	1	0	22.53	22.60	22.56	23.7	0
20	QPSK	1	49	22.41	22.58	22.49		
20	QPSK	1	99	22.45	22.59	22.53		
20	QPSK	50	0	21.65	21.78	21.64	22.7	1
20	QPSK	50	24	21.66	21.77	21.66		
20	QPSK	50	50	21.61	21.72	21.63		
20	QPSK	100	0	21.63	21.63	21.65	22.7	1
20	16QAM	1	0	21.81	21.94	21.87		
20	16QAM	1	49	21.73	21.89	21.80		
20	16QAM	1	99	21.79	21.88	21.79	21.7	2
20	16QAM	50	0	20.56	20.66	20.57		
20	16QAM	50	24	20.63	20.75	20.62		
20	16QAM	50	50	20.61	20.73	20.59	21.7	2
20	16QAM	100	0	20.63	20.65	20.64		
20	64QAM	1	0	20.54	20.54	20.35		
20	64QAM	1	49	20.40	20.65	20.87	21.7	2
20	64QAM	1	99	20.68	20.57	20.54		
20	64QAM	50	0	19.32	19.35	19.29		
20	64QAM	50	24	19.37	19.41	19.40	20.7	3
20	64QAM	50	50	19.46	19.39	19.32		
20	64QAM	100	0	19.38	19.32	19.31		
Channel				26115	26340	26615	23.7	0
Frequency (MHz)				1857.5	1880	1907.5		
15	QPSK	1	0	22.43	22.44	22.53	23.7	0
15	QPSK	1	37	22.26	22.48	22.40		
15	QPSK	1	74	22.40	22.47	22.36		
15	QPSK	36	0	21.56	21.64	21.51	22.7	1
15	QPSK	36	20	21.46	21.71	21.63		
15	QPSK	36	39	21.56	21.53	21.62		
15	QPSK	75	0	21.46	21.50	21.48	22.7	1
15	16QAM	1	0	21.63	21.85	21.85		
15	16QAM	1	37	21.65	21.76	21.73		
15	16QAM	1	74	21.76	21.73	21.62	21.7	2
15	16QAM	36	0	20.53	20.56	20.38		
15	16QAM	36	20	20.43	20.64	20.51		
15	16QAM	36	39	20.45	20.54	20.53	21.7	2
15	16QAM	75	0	20.44	20.61	20.63		
15	64QAM	1	0	20.42	20.47	20.25	21.7	2



15	64QAM	1	37	20.36	20.55	20.82	20.7	3
15	64QAM	1	74	20.54	20.48	20.53		
15	64QAM	36	0	19.29	19.30	19.12		
15	64QAM	36	20	19.25	19.21	19.21		
15	64QAM	36	39	19.42	19.38	19.32		
15	64QAM	75	0	19.23	19.16	19.23		
Channel				26090	26340	26640	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1910		
10	QPSK	1	0	22.35	22.36	22.52	23.7	0
10	QPSK	1	25	22.13	22.35	22.40		
10	QPSK	1	49	22.40	22.36	22.27		
10	QPSK	25	0	21.55	21.56	21.48	22.7	1
10	QPSK	25	12	21.40	21.54	21.44		
10	QPSK	25	25	21.40	21.44	21.54		
10	QPSK	50	0	21.30	21.31	21.42		
10	16QAM	1	0	21.50	21.78	21.68	22.7	1
10	16QAM	1	25	21.62	21.62	21.56		
10	16QAM	1	49	21.59	21.71	21.58		
10	16QAM	25	0	20.47	20.42	20.23	21.7	2
10	16QAM	25	12	20.34	20.55	20.51		
10	16QAM	25	25	20.43	20.38	20.49		
10	16QAM	50	0	20.27	20.57	20.48		
10	64QAM	1	0	20.24	20.35	20.11	21.7	2
10	64QAM	1	25	20.16	20.42	20.63		
10	64QAM	1	49	20.47	20.28	20.33		
10	64QAM	25	0	19.22	19.23	19.02		
10	64QAM	25	12	19.23	19.03	19.09	20.7	3
10	64QAM	25	25	19.40	19.21	19.26		
10	64QAM	50	0	19.06	19.01	19.15		
Channel				26065	26340	26665		
Frequency (MHz)				1852.5	1880	1912.5		
5	QPSK	1	0	22.26	22.31	22.38	23.7	0
5	QPSK	1	12	22.05	22.23	22.28		
5	QPSK	1	24	22.38	22.35	22.26		
5	QPSK	12	0	21.36	21.36	21.35	22.7	1
5	QPSK	12	7	21.37	21.41	21.42		
5	QPSK	12	13	21.20	21.42	21.40		
5	QPSK	25	0	21.11	21.29	21.38		
5	16QAM	1	0	21.49	21.58	21.67	22.7	1
5	16QAM	1	12	21.46	21.51	21.43		
5	16QAM	1	24	21.39	21.54	21.54		
5	16QAM	12	0	20.33	20.33	20.09	21.7	2
5	16QAM	12	7	20.15	20.41	20.43		
5	16QAM	12	13	20.41	20.37	20.39		
5	16QAM	25	0	20.17	20.48	20.44		
5	64QAM	1	0	20.19	20.34	19.93	21.7	2
5	64QAM	1	12	20.05	20.28	20.56		
5	64QAM	1	24	20.46	20.22	20.23		
5	64QAM	12	0	19.14	19.16	18.90	20.7	3
5	64QAM	12	7	19.21	18.83	18.97		
5	64QAM	12	13	19.20	19.15	19.08		
5	64QAM	25	0	18.93	18.81	19.06		
Channel				26055	26340	26675	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	22.16	22.26	22.32	23.7	0
3	QPSK	1	8	21.93	22.04	22.27		





3	QPSK	1	14	22.36	22.15	22.08		
3	QPSK	8	0	21.21	21.27	21.31	22.7	1
3	QPSK	8	4	21.33	21.27	21.42		
3	QPSK	8	7	21.11	21.28	21.21		
3	QPSK	15	0	20.96	21.26	21.35		
3	16QAM	1	0	21.46	21.50	21.54	22.7	1
3	16QAM	1	8	21.46	21.50	21.39		
3	16QAM	1	14	21.36	21.37	21.40		
3	16QAM	8	0	20.21	20.25	20.01	21.7	2
3	16QAM	8	4	20.09	20.38	20.37		
3	16QAM	8	7	20.24	20.30	20.33		
3	16QAM	15	0	19.99	20.37	20.43		
3	64QAM	1	0	20.09	20.30	19.87	21.7	2
3	64QAM	1	8	20.01	20.14	20.48		
3	64QAM	1	14	20.38	20.05	20.21		
3	64QAM	8	0	18.97	19.02	18.77	20.7	3
3	64QAM	8	4	19.03	18.73	18.92		
3	64QAM	8	7	19.10	19.01	19.05		
3	64QAM	15	0	18.83	18.74	18.98		
Channel				26047	26340	26683	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	22.10	22.23	22.26	23.7	0
1.4	QPSK	1	3	21.93	22.02	22.23		
1.4	QPSK	1	5	22.35	22.13	22.01		
1.4	QPSK	3	0	22.16	22.19	22.23		
1.4	QPSK	3	1	21.89	21.99	22.21		
1.4	QPSK	3	3	22.33	22.11	22.00		
1.4	QPSK	6	0	21.49	21.50	21.44	22.7	1
1.4	16QAM	1	0	21.43	21.43	21.49	22.7	1
1.4	16QAM	1	3	21.52	21.44	21.50		
1.4	16QAM	1	5	21.52	21.44	21.50		
1.4	16QAM	3	0	21.53	21.53	21.45		
1.4	16QAM	3	1	21.47	21.47	21.48		
1.4	16QAM	3	3	21.49	21.49	21.46		
1.4	16QAM	6	0	20.02	20.06	20.03	21.7	2
1.4	64QAM	1	0	20.02	20.08	20.06	21.7	2
1.4	64QAM	1	3	20.10	20.09	20.00		
1.4	64QAM	1	5	20.01	20.03	20.10		
1.4	64QAM	3	0	20.09	20.09	20.04		
1.4	64QAM	3	1	20.05	20.04	20.05		
1.4	64QAM	3	3	20.02	20.00	20.00		
1.4	64QAM	6	0	18.94	18.87	18.88	20.7	3

<LTE Band 26>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				26765	26865	26965		
Frequency (MHz)				821.5	831.5	841.5		
15	QPSK	1	0	22.94	23.00	22.74	23.5	0
15	QPSK	1	37	22.79	22.79	22.68		
15	QPSK	1	74	22.85	22.82	22.60		
15	QPSK	36	0	22.04	22.01	21.92	22.5	1
15	QPSK	36	20	22.02	21.95	21.89		
15	QPSK	36	39	21.96	21.92	21.81		
15	QPSK	75	0	22.02	21.87	21.81		



15	16QAM	1	0	22.25	22.11	22.02	22.5	1
15	16QAM	1	37	22.17	22.10	22.03		
15	16QAM	1	74	22.22	22.11	21.90		
15	16QAM	36	0	21.01	20.92	20.87	21.5	2
15	16QAM	36	20	21.01	20.97	20.87		
15	16QAM	36	39	20.98	20.94	20.84		
15	16QAM	75	0	21.02	20.90	20.81	21.5	2
15	64QAM	1	0	20.83	20.71	20.54		
15	64QAM	1	37	20.80	20.77	20.64		
15	64QAM	1	74	20.67	20.62	20.02	20.5	3
15	64QAM	36	0	19.72	19.67	19.65		
15	64QAM	36	20	19.66	19.63	19.66		
15	64QAM	36	39	19.71	19.61	19.61	20.5	3
15	64QAM	75	0	19.73	19.58	19.48		
Channel				26740	26865	26990		
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	22.88	22.80	22.73	23.5	0
10	QPSK	1	25	22.79	22.67	22.58		
10	QPSK	1	49	22.80	22.74	22.42		
10	QPSK	25	0	21.93	21.81	21.79	22.5	1
10	QPSK	25	12	21.95	21.95	21.83		
10	QPSK	25	25	21.95	21.77	21.80		
10	QPSK	50	0	21.85	21.78	21.78	22.5	1
10	16QAM	1	0	22.05	21.91	21.92		
10	16QAM	1	25	22.04	21.98	21.97		
10	16QAM	1	49	22.06	21.93	21.87	21.5	2
10	16QAM	25	0	20.93	20.85	20.71		
10	16QAM	25	12	20.87	20.93	20.70		
10	16QAM	25	25	20.89	20.89	20.73	21.5	2
10	16QAM	50	0	20.86	20.76	20.79		
10	64QAM	1	0	20.65	20.68	20.47		
10	64QAM	1	25	20.64	20.60	20.50	21.5	2
10	64QAM	1	49	20.49	20.50	19.85		
10	64QAM	25	0	19.68	19.66	19.61		
10	64QAM	25	12	19.55	19.61	19.58	20.5	3
10	64QAM	25	25	19.59	19.47	19.56		
10	64QAM	50	0	19.73	19.51	19.39		
Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	22.79	22.68	22.72	23.5	0
5	QPSK	1	12	22.72	22.66	22.44		
5	QPSK	1	24	22.65	22.62	22.27		
5	QPSK	12	0	21.74	21.72	21.61	22.5	1
5	QPSK	12	7	21.91	21.85	21.65		
5	QPSK	12	13	21.77	21.72	21.60		
5	QPSK	25	0	21.76	21.58	21.71	22.5	1
5	16QAM	1	0	21.93	21.90	21.82		
5	16QAM	1	12	22.02	21.79	21.97		
5	16QAM	1	24	21.89	21.89	21.83	21.5	2
5	16QAM	12	0	20.84	20.67	20.61		
5	16QAM	12	7	20.67	20.79	20.67		
5	16QAM	12	13	20.88	20.74	20.60	21.5	2
5	16QAM	25	0	20.74	20.61	20.70		
5	64QAM	1	0	20.56	20.68	20.44		
5	64QAM	1	12	20.46	20.50	20.45	21.5	2
5	64QAM	1	24	20.38	20.34	19.69		



5	64QAM	12	0	19.65	19.52	19.49	20.5	3
5	64QAM	12	7	19.49	19.49	19.52		
5	64QAM	12	13	19.47	19.46	19.39		
5	64QAM	25	0	19.58	19.39	19.25		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	22.74	22.49	22.56	23.5	0
3	QPSK	1	8	22.54	22.50	22.30		
3	QPSK	1	14	22.50	22.45	22.26		
3	QPSK	8	0	21.57	21.54	21.58	22.5	1
3	QPSK	8	4	21.79	21.79	21.47		
3	QPSK	8	7	21.69	21.61	21.43		
3	QPSK	15	0	21.56	21.47	21.53		
3	16QAM	1	0	21.75	21.82	21.63	22.5	1
3	16QAM	1	8	21.86	21.62	21.83		
3	16QAM	1	14	21.76	21.86	21.76		
3	16QAM	8	0	20.80	20.51	20.49	21.5	2
3	16QAM	8	4	20.64	20.61	20.50		
3	16QAM	8	7	20.84	20.63	20.49		
3	16QAM	15	0	20.72	20.48	20.55		
3	64QAM	1	0	20.43	20.66	20.36	21.5	2
3	64QAM	1	8	20.32	20.43	20.32		
3	64QAM	1	14	20.27	20.25	19.69		
3	64QAM	8	0	19.53	19.35	19.49		
3	64QAM	8	4	19.43	19.49	19.47	20.5	3
3	64QAM	8	7	19.35	19.46	19.38		
3	64QAM	15	0	19.45	19.28	19.17		
Channel				26697	26865	27033		
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	22.00	22.24	22.32	23.5	0
1.4	QPSK	1	3	21.98	22.01	22.20		
1.4	QPSK	1	5	22.28	22.21	22.11		
1.4	QPSK	3	0	22.08	22.21	22.33		
1.4	QPSK	3	1	21.97	22.05	22.16		
1.4	QPSK	3	3	22.27	22.21	22.05		
1.4	QPSK	6	0	21.44	21.41	21.48	22.5	1
1.4	16QAM	1	0	21.47	21.48	21.56	22.5	1
1.4	16QAM	1	3	21.54	21.43	21.46		
1.4	16QAM	1	5	21.58	21.53	21.54		
1.4	16QAM	3	0	21.60	21.62	21.37		
1.4	16QAM	3	1	21.50	21.40	21.45		
1.4	16QAM	3	3	21.49	21.56	21.38		
1.4	16QAM	6	0	20.05	19.98	19.93	21.5	2
1.4	64QAM	1	0	20.07	20.17	19.99	21.5	2
1.4	64QAM	1	3	20.10	20.12	19.90		
1.4	64QAM	1	5	19.95	20.10	20.17		
1.4	64QAM	3	0	19.99	20.18	19.97		
1.4	64QAM	3	1	19.95	20.13	20.12		
1.4	64QAM	3	3	19.96	19.94	20.09		
1.4	64QAM	6	0	19.03	18.84	18.80	20.5	3



<LTE Band 66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	22.67	22.62	22.69	23.5	0
20	QPSK	1	49	22.55	22.50	22.68		
20	QPSK	1	99	22.57	22.53	22.61		
20	QPSK	50	0	21.69	21.72	21.80	22.5	1
20	QPSK	50	24	21.72	21.69	21.76		
20	QPSK	50	50	21.68	21.63	21.78		
20	QPSK	100	0	21.71	21.68	21.77	22.5	1
20	16QAM	1	0	22.01	21.97	21.97		
20	16QAM	1	49	21.90	21.88	22.00		
20	16QAM	1	99	21.80	21.88	21.92	21.5	2
20	16QAM	50	0	20.67	20.62	20.75		
20	16QAM	50	24	20.74	20.68	20.75		
20	16QAM	50	50	20.68	20.65	20.80	21.5	2
20	16QAM	100	0	20.71	20.66	20.72		
20	64QAM	1	0	20.82	20.86	20.84		
20	64QAM	1	49	20.77	20.76	20.87	21.5	2
20	64QAM	1	99	20.83	20.77	20.93		
20	64QAM	50	0	19.69	19.66	19.80		
20	64QAM	50	24	19.74	19.71	19.77	20.5	3
20	64QAM	50	50	19.71	19.68	19.84		
20	64QAM	100	0	19.73	19.68	19.74		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	22.55	22.46	22.54	23.5	0
15	QPSK	1	37	22.45	22.46	22.49		
15	QPSK	1	74	22.53	22.51	22.44		
15	QPSK	36	0	21.65	21.52	21.65	22.5	1
15	QPSK	36	20	21.62	21.63	21.70		
15	QPSK	36	39	21.56	21.61	21.71		
15	QPSK	75	0	21.54	21.60	21.61	22.5	1
15	16QAM	1	0	21.87	21.93	21.79		
15	16QAM	1	37	21.75	21.75	21.82		
15	16QAM	1	74	21.72	21.74	21.77	21.5	2
15	16QAM	36	0	20.67	20.46	20.60		
15	16QAM	36	20	20.64	20.60	20.63		
15	16QAM	36	39	20.51	20.52	20.62	21.5	2
15	16QAM	75	0	20.58	20.64	20.65		
15	64QAM	1	0	20.63	20.79	20.77		
15	64QAM	1	37	20.68	20.61	20.82	21.5	2
15	64QAM	1	74	20.83	20.61	20.88		
15	64QAM	36	0	19.52	19.49	19.71		
15	64QAM	36	20	19.64	19.58	19.65	20.5	3
15	64QAM	36	39	19.61	19.62	19.70		
15	64QAM	75	0	19.65	19.65	19.54		
Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	22.41	22.41	22.44	23.5	0
10	QPSK	1	25	22.26	22.42	22.46		
10	QPSK	1	49	22.40	22.50	22.30		
10	QPSK	25	0	21.52	21.52	21.47	22.5	1
10	QPSK	25	12	21.54	21.63	21.53		



10	QPSK	25	25	21.47	21.53	21.65		
10	QPSK	50	0	21.52	21.55	21.61		
10	16QAM	1	0	21.72	21.88	21.75	22.5	1
10	16QAM	1	25	21.65	21.72	21.70		
10	16QAM	1	49	21.71	21.54	21.67		
10	16QAM	25	0	20.61	20.34	20.43	21.5	2
10	16QAM	25	12	20.51	20.57	20.47		
10	16QAM	25	25	20.48	20.51	20.47		
10	16QAM	50	0	20.41	20.59	20.55	21.5	2
10	64QAM	1	0	20.47	20.59	20.57		
10	64QAM	1	25	20.59	20.47	20.78		
10	64QAM	1	49	20.81	20.47	20.88	20.5	3
10	64QAM	25	0	19.47	19.32	19.53		
10	64QAM	25	12	19.52	19.58	19.65		
10	64QAM	25	25	19.58	19.53	19.65		
10	64QAM	50	0	19.65	19.46	19.36		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	22.28	22.32	22.39	23.5	0
5	QPSK	1	12	22.13	22.23	22.35		
5	QPSK	1	24	22.20	22.31	22.12		
5	QPSK	12	0	21.48	21.41	21.38	22.5	1
5	QPSK	12	7	21.41	21.61	21.53		
5	QPSK	12	13	21.40	21.47	21.64		
5	QPSK	25	0	21.37	21.40	21.53	22.5	1
5	16QAM	1	0	21.62	21.84	21.65		
5	16QAM	1	12	21.52	21.65	21.57		
5	16QAM	1	24	21.65	21.43	21.47	21.5	2
5	16QAM	12	0	20.54	20.17	20.33		
5	16QAM	12	7	20.49	20.50	20.28		
5	16QAM	12	13	20.33	20.38	20.44	21.5	2
5	16QAM	25	0	20.25	20.44	20.46		
5	64QAM	1	0	20.41	20.45	20.44		
5	64QAM	1	12	20.39	20.40	20.69	21.5	2
5	64QAM	1	24	20.74	20.41	20.70		
5	64QAM	12	0	19.44	19.31	19.53		
5	64QAM	12	7	19.41	19.39	19.60	20.5	3
5	64QAM	12	13	19.57	19.40	19.63		
5	64QAM	25	0	19.49	19.32	19.27		
Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	22.21	22.19	22.30	23.5	0
3	QPSK	1	8	21.93	22.20	22.22		
3	QPSK	1	14	22.07	22.22	21.98		
3	QPSK	8	0	21.40	21.22	21.34	22.5	1
3	QPSK	8	4	21.23	21.42	21.46		
3	QPSK	8	7	21.28	21.29	21.55		
3	QPSK	15	0	21.26	21.37	21.35	22.5	1
3	16QAM	1	0	21.55	21.77	21.59		
3	16QAM	1	8	21.36	21.57	21.56		
3	16QAM	1	14	21.60	21.32	21.40	21.5	2
3	16QAM	8	0	20.51	20.10	20.32		
3	16QAM	8	4	20.48	20.45	20.27		
3	16QAM	8	7	20.22	20.33	20.43	21.5	2
3	16QAM	15	0	20.18	20.37	20.28		
3	64QAM	1	0	20.25	20.30	20.28		



3	64QAM	1	8	20.21	20.34	20.64	20.5	3
3	64QAM	1	14	20.69	20.30	20.54		
3	64QAM	8	0	19.28	19.20	19.38		
3	64QAM	8	4	19.38	19.19	19.56		
3	64QAM	8	7	19.52	19.21	19.55		
3	64QAM	15	0	19.43	19.26	19.07		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	21.90	22.24	22.29	23.5	0
1.4	QPSK	1	3	22.06	22.00	22.12		
1.4	QPSK	1	5	22.20	22.17	22.18		
1.4	QPSK	3	0	22.13	22.17	22.39		
1.4	QPSK	3	1	22.01	21.97	22.25		
1.4	QPSK	3	3	22.20	22.17	22.08		
1.4	QPSK	6	0	21.52	21.41	21.51	22.5	1
1.4	16QAM	1	0	21.42	21.43	21.56	22.5	1
1.4	16QAM	1	3	21.50	21.45	21.38		
1.4	16QAM	1	5	21.49	21.49	21.44		
1.4	16QAM	3	0	21.62	21.66	21.35		
1.4	16QAM	3	1	21.48	21.47	21.38		
1.4	16QAM	3	3	21.52	21.52	21.32		
1.4	16QAM	6	0	20.10	20.01	19.91	21.5	2
1.4	64QAM	1	0	20.04	20.22	20.00	21.5	2
1.4	64QAM	1	3	20.09	20.14	19.82		
1.4	64QAM	1	5	19.92	20.17	20.18		
1.4	64QAM	3	0	20.02	20.21	19.97		
1.4	64QAM	3	1	19.96	20.22	20.10		
1.4	64QAM	3	3	19.99	19.97	20.11		
1.4	64QAM	6	0	18.99	18.84	18.79	20.5	3

<LTE Band 71>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				133222	133322	133372		
Frequency (MHz)				673	683	688		
20	QPSK	1	0	22.89	22.76	22.82	23.7	0
20	QPSK	1	49	22.75	22.75	22.79		
20	QPSK	1	99	22.77	22.73	22.72		
20	QPSK	50	0	21.95	21.90	21.91	22.7	1
20	QPSK	50	24	21.94	21.85	21.86		
20	QPSK	50	50	21.93	21.87	21.87		
20	QPSK	100	0	21.88	21.90	21.86	22.7	1
20	16QAM	1	0	22.26	22.14	22.15		
20	16QAM	1	49	22.11	22.14	22.11		
20	16QAM	1	99	22.12	22.13	22.03	21.7	2
20	16QAM	50	0	20.96	20.87	20.94		
20	16QAM	50	24	20.96	20.89	20.88		
20	16QAM	50	50	20.96	20.92	20.90	21.7	2
20	16QAM	100	0	20.93	20.87	20.87		
20	64QAM	1	0	21.05	21.02	21.06		
20	64QAM	1	49	21.03	20.93	20.96	21.7	2
20	64QAM	1	99	21.04	20.94	20.92		
20	64QAM	50	0	19.98	19.93	19.96		
20	64QAM	50	24	19.97	19.96	19.90	20.7	3



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20	64QAM	50	50	19.97	19.80	19.92		
20	64QAM	100	0	20.00	19.94	19.88		
Channel				133197	133297	133397	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				670.5	680.5	690.5		
15	QPSK	1	0	22.84	22.76	22.74	23.7	0
15	QPSK	1	37	22.66	22.74	22.62		
15	QPSK	1	74	22.69	22.73	22.61		
15	QPSK	36	0	21.84	21.82	21.85	22.7	1
15	QPSK	36	20	21.90	21.78	21.77		
15	QPSK	36	39	21.83	21.79	21.87		
15	QPSK	75	0	21.80	21.83	21.73		
15	16QAM	1	0	22.20	22.03	21.96	22.7	1
15	16QAM	1	37	22.04	22.06	22.03		
15	16QAM	1	74	22.05	21.95	21.93		
15	16QAM	36	0	20.91	20.75	20.85	21.7	2
15	16QAM	36	20	20.77	20.76	20.78		
15	16QAM	36	39	20.84	20.79	20.71		
15	16QAM	75	0	20.86	20.85	20.67		
15	64QAM	1	0	21.02	21.01	20.87	21.7	2
15	64QAM	1	37	21.01	20.75	20.77		
15	64QAM	1	74	20.85	20.84	20.85		
15	64QAM	36	0	19.97	19.90	19.96	20.7	3
15	64QAM	36	20	19.82	19.91	19.89		
15	64QAM	36	39	19.93	19.68	19.73		
15	64QAM	75	0	19.83	19.82	19.68		
Channel				133172	133272	133422	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				668	678	693		
10	QPSK	1	0	22.75	22.67	22.59	23.7	0
10	QPSK	1	25	22.65	22.63	22.58		
10	QPSK	1	49	22.60	22.66	22.61		
10	QPSK	25	0	21.80	21.77	21.84	22.7	1
10	QPSK	25	12	21.88	21.66	21.68		
10	QPSK	25	25	21.63	21.67	21.72		
10	QPSK	50	0	21.63	21.68	21.63		
10	16QAM	1	0	22.17	21.87	21.90	22.7	1
10	16QAM	1	25	21.86	21.92	21.97		
10	16QAM	1	49	21.90	21.95	21.75		
10	16QAM	25	0	20.74	20.65	20.85	21.7	2
10	16QAM	25	12	20.67	20.70	20.60		
10	16QAM	25	25	20.67	20.65	20.53		
10	16QAM	50	0	20.66	20.71	20.53		
10	64QAM	1	0	20.83	20.84	20.77	21.7	2
10	64QAM	1	25	20.81	20.71	20.58		
10	64QAM	1	49	20.84	20.69	20.66		
10	64QAM	25	0	19.95	19.77	19.88	20.7	3
10	64QAM	25	12	19.64	19.84	19.79		
10	64QAM	25	25	19.84	19.54	19.71		
10	64QAM	50	0	19.77	19.63	19.59		
Channel				133147	133247	133447	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				665.5	675.5	695.5		
5	QPSK	1	0	22.55	22.67	22.49	23.7	0
5	QPSK	1	12	22.45	22.48	22.42		
5	QPSK	1	24	22.47	22.51	22.52		
5	QPSK	12	0	21.80	21.58	21.70	22.7	1
5	QPSK	12	7	21.84	21.54	21.64		
5	QPSK	12	13	21.60	21.59	21.54		



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5	QPSK	25	0	21.43	21.65	21.60		
5	16QAM	1	0	22.03	21.72	21.75	22.7	1
5	16QAM	1	12	21.79	21.75	21.93		
5	16QAM	1	24	21.85	21.83	21.66		
5	16QAM	12	0	20.56	20.57	20.76	21.7	2
5	16QAM	12	7	20.63	20.54	20.56		
5	16QAM	12	13	20.63	20.46	20.50		
5	16QAM	25	0	20.63	20.66	20.35	21.7	2
5	64QAM	1	0	20.82	20.71	20.62		
5	64QAM	1	12	20.78	20.55	20.55		
5	64QAM	1	24	20.70	20.50	20.62	20.7	3
5	64QAM	12	0	19.85	19.77	19.79		
5	64QAM	12	7	19.57	19.72	19.66		
5	64QAM	12	13	19.64	19.51	19.68	20.7	3
5	64QAM	25	0	19.64	19.45	19.54		





**Ant. 3**

**<LTE Band 2>**

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	22.82	22.81	22.67	23.7	0
20	QPSK	1	49	22.71	22.52	21.86		
20	QPSK	1	99	22.67	22.74	22.59		
20	QPSK	50	0	22.56	22.49	22.47	22.7	1
20	QPSK	50	24	22.55	22.46	21.99		
20	QPSK	50	50	22.52	22.48	22.19		
20	QPSK	100	0	22.46	22.42	22.25	22.7	1
20	16QAM	1	0	22.61	22.22	22.31		
20	16QAM	1	49	22.58	22.51	21.64		
20	16QAM	1	99	22.38	22.62	22.42	21.7	2
20	16QAM	50	0	21.57	21.45	21.52		
20	16QAM	50	24	21.57	21.54	21.58		
20	16QAM	50	50	21.57	21.53	21.42	21.7	2
20	16QAM	100	0	21.57	21.52	21.50		
20	64QAM	1	0	21.62	21.20	21.22		
20	64QAM	1	49	21.66	21.62	21.24	21.7	2
20	64QAM	1	99	21.47	21.62	21.22		
20	64QAM	50	0	20.61	20.55	20.62		
20	64QAM	50	24	20.69	20.61	20.66	20.7	3
20	64QAM	50	50	20.62	20.62	20.48		
20	64QAM	100	0	20.64	20.44	20.45		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.74	22.61	22.53	23.7	0
15	QPSK	1	37	22.64	22.52	21.94		
15	QPSK	1	74	22.55	22.64	22.48		
15	QPSK	36	0	22.52	22.43	22.29	22.7	1
15	QPSK	36	20	22.38	22.44	21.89		
15	QPSK	36	39	22.42	22.30	22.12		
15	QPSK	75	0	22.41	22.35	22.05	22.7	1
15	16QAM	1	0	22.41	22.06	22.31		
15	16QAM	1	37	22.44	22.47	21.49		
15	16QAM	1	74	22.28	22.58	22.40	21.7	2
15	16QAM	36	0	21.46	21.26	21.50		
15	16QAM	36	20	21.41	21.50	21.42		
15	16QAM	36	39	21.39	21.53	21.29	21.7	2
15	16QAM	75	0	21.46	21.39	21.47		
15	64QAM	1	0	21.61	21.13	21.19		
15	64QAM	1	37	21.56	21.52	21.17	21.7	2
15	64QAM	1	74	21.35	21.59	21.21		
15	64QAM	36	0	20.41	20.51	20.42		
15	64QAM	36	20	20.61	20.45	20.63	20.7	3
15	64QAM	36	39	20.53	20.53	20.35		
15	64QAM	75	0	20.50	20.29	20.28		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.66	22.52	22.46	23.7	0
10	QPSK	1	25	22.47	22.50	22.22		
10	QPSK	1	49	22.35	22.62	22.37		
10	QPSK	25	0	22.48	22.25	22.28	22.7	1



10	QPSK	25	12	22.18	22.36	21.87		
10	QPSK	25	25	22.23	22.13	21.97		
10	QPSK	50	0	22.34	22.30	21.97		
10	16QAM	1	0	22.21	22.06	22.28	22.7	1
10	16QAM	1	25	22.31	22.34	21.30		
10	16QAM	1	49	22.28	22.38	22.31		
10	16QAM	25	0	21.36	21.15	21.43	21.7	2
10	16QAM	25	12	21.32	21.44	21.30		
10	16QAM	25	25	21.24	21.41	21.13		
10	16QAM	50	0	21.35	21.19	21.36		
10	64QAM	1	0	21.57	20.97	21.11	21.7	2
10	64QAM	1	25	21.52	21.46	21.07		
10	64QAM	1	49	21.23	21.55	21.03		
10	64QAM	25	0	20.28	20.37	20.23	20.7	3
10	64QAM	25	12	20.52	20.38	20.43		
10	64QAM	25	25	20.48	20.41	20.28		
10	64QAM	50	0	20.41	20.11	20.11		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.51	22.43	22.41	23.7	0
5	QPSK	1	12	22.29	22.38	22.35		
5	QPSK	1	24	22.19	22.53	22.19		
5	QPSK	12	0	22.39	22.07	22.09	22.7	1
5	QPSK	12	7	22.00	22.29	21.79		
5	QPSK	12	13	22.08	21.99	21.89		
5	QPSK	25	0	22.14	22.30	21.78		
5	16QAM	1	0	22.02	21.92	22.27	22.7	1
5	16QAM	1	12	22.19	22.30	21.11		
5	16QAM	1	24	22.28	22.20	22.15		
5	16QAM	12	0	21.29	21.10	21.30	21.7	2
5	16QAM	12	7	21.25	21.38	21.28		
5	16QAM	12	13	21.10	21.26	21.08		
5	16QAM	25	0	21.33	21.08	21.26		
5	64QAM	1	0	21.41	20.79	20.94	21.7	2
5	64QAM	1	12	21.36	21.38	21.01		
5	64QAM	1	24	21.06	21.39	20.92		
5	64QAM	12	0	20.20	20.19	20.21	20.7	3
5	64QAM	12	7	20.47	20.25	20.28		
5	64QAM	12	13	20.47	20.28	20.12		
5	64QAM	25	0	20.21	19.97	20.02		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.49	22.32	22.36	23.7	0
3	QPSK	1	8	22.16	22.21	22.11		
3	QPSK	1	14	22.13	22.48	22.07		
3	QPSK	8	0	22.35	21.94	22.08	22.7	1
3	QPSK	8	4	21.94	22.23	21.74		
3	QPSK	8	7	21.94	21.97	21.70		
3	QPSK	15	0	22.13	22.16	21.60	22.7	1
3	16QAM	1	0	21.96	21.85	22.22		
3	16QAM	1	8	21.99	22.22	20.99		
3	16QAM	1	14	22.17	22.05	21.99	21.7	2
3	16QAM	8	0	21.14	21.02	21.20		
3	16QAM	8	4	21.24	21.34	21.24		
3	16QAM	8	7	20.93	21.23	21.06		
3	16QAM	15	0	21.25	20.97	21.08		



3	64QAM	1	0	21.41	20.72	20.90	21.7	2
3	64QAM	1	8	21.29	21.18	20.91		
3	64QAM	1	14	21.04	21.22	20.88		
3	64QAM	8	0	20.05	20.11	20.05	20.7	3
3	64QAM	8	4	20.46	20.17	20.24		
3	64QAM	8	7	20.43	20.20	20.04		
3	64QAM	15	0	20.06	19.94	19.97		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.44	22.32	22.33	23.7	0
1.4	QPSK	1	3	22.15	22.22	22.05		
1.4	QPSK	1	5	22.16	22.48	22.07		
1.4	QPSK	3	0	22.30	21.88	22.01		
1.4	QPSK	3	1	21.93	22.16	21.77		
1.4	QPSK	3	3	21.90	21.92	21.78		
1.4	QPSK	6	0	21.00	21.02	20.89	22.7	1
1.4	16QAM	1	0	21.98	21.80	22.25	22.7	1
1.4	16QAM	1	3	21.98	22.15	20.99		
1.4	16QAM	1	5	22.12	22.00	21.99		
1.4	16QAM	3	0	21.16	20.98	21.21		
1.4	16QAM	3	1	21.25	21.36	21.21		
1.4	16QAM	3	3	20.92	21.25	21.02		
1.4	16QAM	6	0	20.31	20.90	20.15	21.7	2
1.4	64QAM	1	0	21.42	20.75	20.93	21.7	2
1.4	64QAM	1	3	21.31	21.18	20.86		
1.4	64QAM	1	5	21.07	21.22	20.85		
1.4	64QAM	3	0	19.99	20.11	20.02		
1.4	64QAM	3	1	20.43	20.17	20.18		
1.4	64QAM	3	3	20.40	20.22	19.98		
1.4	64QAM	6	0	19.32	19.13	18.96		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	21.66	23.03	22.90	23.5	0
20	QPSK	1	49	22.93	22.62	21.63		
20	QPSK	1	99	22.81	22.04	21.60		
20	QPSK	50	0	21.96	22.48	21.83	22.5	1
20	QPSK	50	24	22.43	22.47	20.93		
20	QPSK	50	50	22.47	22.35	20.96		
20	QPSK	100	0	22.44	22.49	20.89		
20	16QAM	1	0	21.07	22.38	22.50	22.5	1
20	16QAM	1	49	22.40	22.28	21.62		
20	16QAM	1	99	22.37	21.49	20.82		
20	16QAM	50	0	21.09	21.44	21.10	21.5	2
20	16QAM	50	24	21.38	21.37	20.04		
20	16QAM	50	50	21.39	21.42	20.03		
20	16QAM	100	0	21.37	21.35	19.99		
20	64QAM	1	0	19.55	21.37	21.35	21.5	2
20	64QAM	1	49	20.82	21.50	19.55		
20	64QAM	1	99	21.43	20.27	19.73		
20	64QAM	50	0	19.52	20.41	19.91		
20	64QAM	50	24	20.07	20.08	19.85	20.5	3



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20	64QAM	50	50	20.42	20.47	18.55		
20	64QAM	100	0	20.35	20.38	18.67		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	21.67	23.02	22.92	23.5	0
15	QPSK	1	37	22.86	22.61	21.65		
15	QPSK	1	74	22.84	22.00	21.53		
15	QPSK	36	0	21.93	22.49	21.80	22.5	1
15	QPSK	36	20	22.36	22.40	20.96		
15	QPSK	36	39	22.47	22.32	20.89		
15	QPSK	75	0	22.37	22.42	20.84	22.5	1
15	16QAM	1	0	21.02	22.33	22.49		
15	16QAM	1	37	22.34	22.30	21.63		
15	16QAM	1	74	22.36	21.50	20.76	21.5	2
15	16QAM	36	0	21.11	21.37	21.09		
15	16QAM	36	20	21.34	21.37	19.99		
15	16QAM	36	39	21.36	21.42	20.01	21.5	2
15	16QAM	75	0	21.32	21.36	19.97		
15	64QAM	1	0	21.20	21.37	21.34		
15	64QAM	1	37	20.78	21.47	19.52	21.5	2
15	64QAM	1	74	21.41	20.28	19.67		
15	64QAM	36	0	19.46	20.38	19.90		
15	64QAM	36	20	20.06	20.02	19.84	20.5	3
15	64QAM	36	39	20.38	20.44	18.51		
15	64QAM	75	0	20.33	20.34	18.65		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	21.62	22.99	22.86	23.5	0
10	QPSK	1	25	22.89	22.54	21.68		
10	QPSK	1	49	22.80	22.00	21.55		
10	QPSK	25	0	21.90	21.96	21.80	22.5	1
10	QPSK	25	12	22.38	22.36	20.89		
10	QPSK	25	25	22.40	22.26	20.83		
10	QPSK	50	0	22.36	22.41	20.87	22.5	1
10	16QAM	1	0	21.00	22.26	22.42		
10	16QAM	1	25	22.34	22.26	21.64		
10	16QAM	1	49	22.33	21.43	20.79	21.5	2
10	16QAM	25	0	21.11	21.40	21.04		
10	16QAM	25	12	21.37	21.34	19.92		
10	16QAM	25	25	21.38	21.40	19.95	21.5	2
10	16QAM	50	0	21.25	21.37	19.99		
10	64QAM	1	0	21.19	21.30	21.28		
10	64QAM	1	25	20.75	21.46	20.66	21.5	2
10	64QAM	1	49	21.43	20.31	19.68		
10	64QAM	25	0	19.46	20.32	19.84		
10	64QAM	25	12	20.04	19.97	19.81	20.5	3
10	64QAM	25	25	20.37	20.47	18.54		
10	64QAM	50	0	20.32	20.36	18.68		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	21.60	23.02	22.82	23.5	0
5	QPSK	1	12	22.85	22.52	21.63		
5	QPSK	1	24	22.81	21.97	21.58		
5	QPSK	12	0	21.85	21.91	21.77	22.5	1
5	QPSK	12	7	22.32	22.39	20.87		
5	QPSK	12	13	22.40	22.24	20.84		



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5	QPSK	25	0	22.37	22.42	20.89		
5	16QAM	1	0	20.97	22.21	22.42	22.5	1
5	16QAM	1	12	22.28	22.19	21.57		
5	16QAM	1	24	22.31	21.40	20.82		
5	16QAM	12	0	21.10	21.42	21.06	21.5	2
5	16QAM	12	7	21.36	21.31	19.92		
5	16QAM	12	13	21.40	21.33	19.97		
5	16QAM	25	0	21.28	21.40	19.97	21.5	2
5	64QAM	1	0	21.13	21.26	21.25		
5	64QAM	1	12	20.69	21.45	20.66		
5	64QAM	1	24	21.39	20.24	19.62	20.5	3
5	64QAM	12	0	19.39	20.33	19.87		
5	64QAM	12	7	20.01	20.00	19.84		
5	64QAM	12	13	20.40	20.41	18.53	20.5	3
5	64QAM	25	0	20.31	20.35	18.63		
Channel				19965	20175	20385		
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	21.55	23.02	22.85	23.5	0
3	QPSK	1	8	22.84	22.52	21.59		
3	QPSK	1	14	22.79	21.91	21.61		
3	QPSK	8	0	21.84	21.87	21.78	22.5	1
3	QPSK	8	4	22.30	22.36	20.82		
3	QPSK	8	7	22.35	22.27	20.80		
3	QPSK	15	0	22.32	22.38	20.89	22.5	1
3	16QAM	1	0	20.99	22.14	22.37		
3	16QAM	1	8	22.31	22.18	21.50		
3	16QAM	1	14	22.27	21.35	20.82	21.5	2
3	16QAM	8	0	21.08	21.41	20.99		
3	16QAM	8	4	21.34	21.27	19.91		
3	16QAM	8	7	21.43	21.35	19.98	21.5	2
3	16QAM	15	0	21.31	21.41	19.93		
3	64QAM	1	0	21.15	21.22	21.26		
3	64QAM	1	8	20.67	21.39	20.59	21.5	2
3	64QAM	1	14	21.32	20.19	19.60		
3	64QAM	8	0	19.36	20.31	19.86		
3	64QAM	8	4	19.95	20.00	19.81	20.5	3
3	64QAM	8	7	20.41	20.42	18.53		
3	64QAM	15	0	20.31	20.28	18.58		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	21.57	22.89	22.79	23.5	0
1.4	QPSK	1	3	22.80	22.51	21.52		
1.4	QPSK	1	5	22.79	21.91	21.62		
1.4	QPSK	3	0	21.78	21.89	21.71	22.5	1
1.4	QPSK	3	1	22.29	22.29	21.62		
1.4	QPSK	3	3	22.36	22.26	21.55		
1.4	QPSK	6	0	21.35	21.32	20.89	22.5	1
1.4	16QAM	1	0	20.93	22.12	22.31	22.5	1
1.4	16QAM	1	3	22.31	22.13	21.49		
1.4	16QAM	1	5	22.28	21.34	20.80		
1.4	16QAM	3	0	21.09	21.35	20.96	21.5	2
1.4	16QAM	3	1	21.31	21.30	21.20		
1.4	16QAM	3	3	21.41	21.28	21.05		
1.4	16QAM	6	0	20.46	20.89	19.91	21.5	2
1.4	64QAM	1	0	21.10	21.23	21.28	21.5	2
1.4	64QAM	1	3	20.61	21.36	20.52		



1.4	64QAM	1	5	21.35	20.13	19.55		
1.4	64QAM	3	0	20.11	20.31	19.83		
1.4	64QAM	3	1	19.89	19.97	19.82		
1.4	64QAM	3	3	20.39	20.39	20.32		
1.4	64QAM	6	0	19.30	19.32	19.00		

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BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				132072	132322	132572		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	21.94	21.87	22.11	23.5	0
20	QPSK	1	49	21.76	21.72	21.93		
20	QPSK	1	99	21.50	21.95	22.00		
20	QPSK	50	0	22.10	22.16	22.40	22.5	1
20	QPSK	50	24	22.20	22.26	22.35		
20	QPSK	50	50	22.17	22.20	22.41		
20	QPSK	100	0	22.16	22.21	22.25	22.5	1
20	16QAM	1	0	22.29	22.49	22.46		
20	16QAM	1	49	22.43	21.23	22.32		
20	16QAM	1	99	22.39	22.32	22.42	21.5	2
20	16QAM	50	0	21.21	21.24	21.50		
20	16QAM	50	24	21.30	21.42	21.49		
20	16QAM	50	50	21.26	21.32	21.48	21.5	2
20	16QAM	100	0	21.28	21.28	21.21		
20	64QAM	1	0	20.99	20.62	20.83		
20	64QAM	1	49	20.75	20.82	20.92	21.5	2
20	64QAM	1	99	21.00	20.76	21.29		
20	64QAM	50	0	20.17	20.24	20.41		
20	64QAM	50	24	20.24	20.31	20.45	20.5	3
20	64QAM	50	50	20.23	20.33	20.24		
20	64QAM	100	0	20.13	20.21	19.99		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	21.92	21.89	22.10	23.5	0
15	QPSK	1	37	21.69	21.72	21.91		
15	QPSK	1	74	21.58	21.93	21.98		
15	QPSK	36	0	22.12	22.18	22.36	22.5	1
15	QPSK	36	20	22.13	22.29	22.28		
15	QPSK	36	39	22.11	22.22	22.44		
15	QPSK	75	0	22.09	22.19	22.19	22.5	1
15	16QAM	1	0	22.26	22.47	22.36		
15	16QAM	1	37	22.41	21.23	22.31		
15	16QAM	1	74	22.38	22.27	22.38	21.5	2
15	16QAM	36	0	21.17	21.18	21.46		
15	16QAM	36	20	21.24	21.39	21.48		
15	16QAM	36	39	21.28	21.29	21.47	21.5	2
15	16QAM	75	0	21.26	21.22	21.17		
15	64QAM	1	0	20.92	20.61	20.77		
15	64QAM	1	37	20.76	20.80	20.93	21.5	2
15	64QAM	1	74	20.94	20.72	21.30		
15	64QAM	36	0	20.13	20.18	20.35		
15	64QAM	36	20	20.17	20.27	20.43	20.5	3
15	64QAM	36	39	20.19	20.29	20.25		
15	64QAM	75	0	20.16	20.16	19.93		



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Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	21.87	21.84	22.08	23.5	0
10	QPSK	1	25	21.66	21.75	21.94		
10	QPSK	1	49	21.58	21.95	21.95		
10	QPSK	25	0	22.07	22.16	22.30	22.5	1
10	QPSK	25	12	22.12	22.29	22.23		
10	QPSK	25	25	22.04	22.21	22.43		
10	QPSK	50	0	22.04	22.14	22.13	22.5	1
10	16QAM	1	0	22.26	22.31	22.32		
10	16QAM	1	25	22.42	21.20	22.30		
10	16QAM	1	49	22.36	22.21	22.31	21.5	2
10	16QAM	25	0	21.15	21.11	21.46		
10	16QAM	25	12	21.21	21.40	21.45		
10	16QAM	25	25	21.29	21.27	21.43	21.5	2
10	16QAM	50	0	21.19	21.23	21.18		
10	64QAM	1	0	20.86	20.63	20.71		
10	64QAM	1	25	20.79	20.79	20.92	21.5	2
10	64QAM	1	49	20.95	20.66	21.26		
10	64QAM	25	0	20.08	20.21	20.29		
10	64QAM	25	12	20.20	20.27	20.40	20.5	3
10	64QAM	25	25	20.17	20.26	20.19		
10	64QAM	50	0	20.16	20.13	19.89		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	21.84	21.81	22.11	23.5	0
5	QPSK	1	12	21.69	21.74	21.94		
5	QPSK	1	24	21.61	21.89	21.92		
5	QPSK	12	0	22.02	22.10	22.26	22.5	1
5	QPSK	12	7	22.07	22.23	22.23		
5	QPSK	12	13	22.02	22.17	22.39		
5	QPSK	25	0	21.97	22.07	22.13	22.5	1
5	16QAM	1	0	22.24	22.29	22.28		
5	16QAM	1	12	22.44	21.15	22.31		
5	16QAM	1	24	22.36	22.15	22.33	21.5	2
5	16QAM	12	0	21.18	21.14	21.40		
5	16QAM	12	7	21.18	21.36	21.46		
5	16QAM	12	13	21.31	21.23	21.41	21.5	2
5	16QAM	25	0	21.18	21.23	21.18		
5	64QAM	1	0	20.89	20.58	20.74		
5	64QAM	1	12	20.75	20.72	20.93	21.5	2
5	64QAM	1	24	20.91	20.66	21.28		
5	64QAM	12	0	20.05	20.24	20.32		
5	64QAM	12	7	20.14	20.26	20.35	20.5	3
5	64QAM	12	13	20.15	20.22	20.12		
5	64QAM	25	0	20.11	20.16	19.85		
Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	21.85	21.77	22.10	23.5	0
3	QPSK	1	8	21.62	21.75	21.90		
3	QPSK	1	14	21.62	21.82	21.94		
3	QPSK	8	0	21.99	22.08	22.28	22.5	1
3	QPSK	8	4	22.10	22.24	22.22		
3	QPSK	8	7	22.02	22.20	22.41		
3	QPSK	15	0	21.92	22.03	22.15	22.5	1
3	16QAM	1	0	22.22	22.29	22.28		



3	16QAM	1	8	22.43	21.16	22.28		
3	16QAM	1	14	22.30	22.09	22.33		
3	16QAM	8	0	21.12	21.12	21.41	21.5	2
3	16QAM	8	4	21.20	21.33	21.44		
3	16QAM	8	7	21.28	21.24	21.43		
3	16QAM	15	0	21.11	21.20	21.16		
3	64QAM	1	0	20.85	20.58	20.77		
3	64QAM	1	8	20.73	20.67	20.95	21.5	2
3	64QAM	1	14	20.88	20.62	21.28		
3	64QAM	8	0	20.04	20.26	20.32		
3	64QAM	8	4	20.17	20.28	20.34	20.5	3
3	64QAM	8	7	20.09	20.24	20.06		
3	64QAM	15	0	20.12	20.11	19.82		
Channel				131979	132322	132665		
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	21.87	21.79	22.13	23.5	0
1.4	QPSK	1	3	21.59	21.73	21.88		
1.4	QPSK	1	5	21.59	21.76	21.93		
1.4	QPSK	3	0	21.93	22.09	22.30		
1.4	QPSK	3	1	22.13	22.17	22.15		
1.4	QPSK	3	3	21.95	22.18	22.42		
1.4	QPSK	6	0	21.61	21.66	21.58	22.5	1
1.4	16QAM	1	0	22.18	22.32	22.21	22.5	1
1.4	16QAM	1	3	22.38	21.13	22.29		
1.4	16QAM	1	5	22.25	22.03	22.27		
1.4	16QAM	3	0	21.14	21.11	21.34		
1.4	16QAM	3	1	21.20	21.28	21.37		
1.4	16QAM	3	3	21.28	21.19	21.37		
1.4	16QAM	6	0	20.56	20.70	20.61	21.5	2
1.4	64QAM	1	0	20.82	20.53	20.71	21.5	2
1.4	64QAM	1	3	20.71	20.65	20.94		
1.4	64QAM	1	5	20.83	20.63	21.28		
1.4	64QAM	3	0	20.01	20.19	20.32		
1.4	64QAM	3	1	20.13	20.23	20.27		
1.4	64QAM	3	3	20.06	20.26	20.01		
1.4	64QAM	6	0	19.41	19.45	19.32		

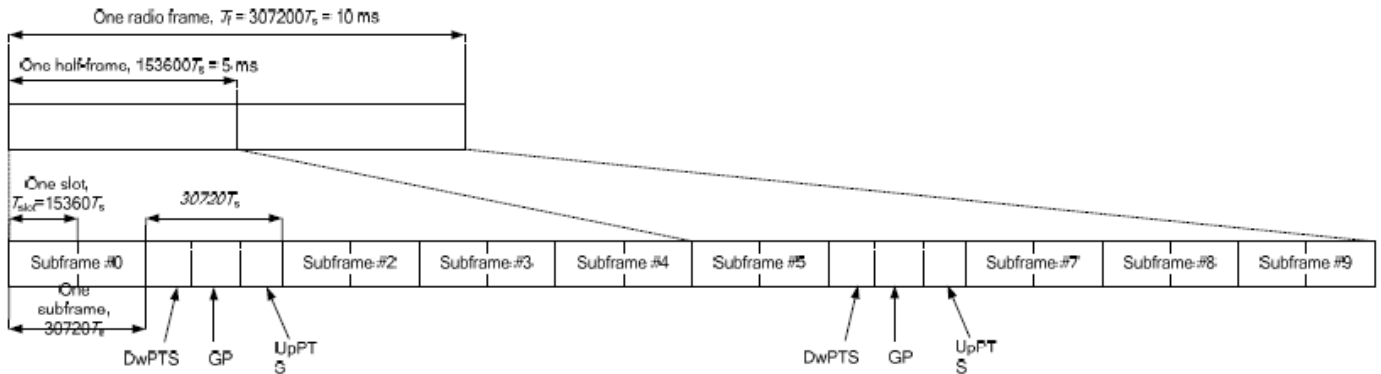


**<TDD LTE SAR Measurement>**

TDD LTE configuration setup for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

- a. 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
- b. “special subframe S” contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS
- c. Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Anritsu MT8820C (firmware: #22.52#004) was used for LTE output power measurements and SAR testing.



**Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).**

**Table 4.2-2: Uplink-downlink configurations.**

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

**Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).**

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink				
	DwPTS	UpPTS		DwPTS	UpPTS			
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		
0	6592 · Ts	2192 · Ts	2560 · Ts	7680 · Ts	2192 · Ts	2560 · Ts		
1	19760 · Ts			20480 · Ts				
2	21952 · Ts			23040 · Ts				
3	24144 · Ts			25600 · Ts				
4	26336 · Ts			7680 · Ts				
5	6592 · Ts	4384 · Ts	5120 · Ts	20480 · Ts	4384 · Ts	5120 · Ts		
6	19760 · Ts			23040 · Ts				
7	21952 · Ts			12800 · Ts				
8	24144 · Ts			-			-	-
9	13168 · Ts			-			-	-

<b>Special subframe (30720·T<sub>s</sub>): Normal cyclic prefix in downlink (UpPTS)</b>			
	<b>Special subframe configuration</b>	<b>Normal cyclic prefix in uplink</b>	<b>Extended cyclic prefix in uplink</b>
<b>Uplink duty factor in one special subframe</b>	<b>0~4</b>	7.13%	8.33%
	<b>5~9</b>	14.3%	16.7%

<b>Special subframe(30720·T<sub>s</sub>): Extended cyclic prefix in downlink (UpPTS)</b>			
	<b>Special subframe configuration</b>	<b>Normal cyclic prefix in uplink</b>	<b>Extended cyclic prefix in uplink</b>
<b>Uplink duty factor in one special subframe</b>	<b>0~3</b>	7.13%	8.33%
	<b>4~7</b>	14.3%	16.7%

The highest duty factor is resulted from:

- i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subframes, uplink operation is in 3 uplink subframes and 1 special subframe.
- ii. special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
- iii. for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is:  $(3+0.167)/5 = 63.3\%$
- iv. for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is:  $(3+0.143)/5 = 62.9\%$
- v. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix  $63.3\%/62.9\% = 1.006$  is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)\* Tune-up Scaling Factor\* scaling factor for extended cyclic prefix.



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**<LTE Band 41>**

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				39750	40185	40620	41055	41490		
Frequency (MHz)				2506	2549.5	2593	2636.5	2680		
20	QPSK	1	0	21.24	21.10	21.25	21.21	21.17	21.5	0
20	QPSK	1	49	21.14	21.20	21.23	21.18	21.20		
20	QPSK	1	99	21.15	21.19	21.15	21.20	21.21		
20	QPSK	50	0	20.32	20.31	20.34	20.31	20.29	20.5	1
20	QPSK	50	24	20.24	20.26	20.31	20.25	20.32		
20	QPSK	50	50	20.26	20.33	20.31	20.26	20.31		
20	QPSK	100	0	20.30	20.28	20.32	20.31	20.30	20.5	1
20	16QAM	1	0	20.33	20.27	20.32	20.27	20.31		
20	16QAM	1	49	20.26	20.24	20.25	20.25	20.33		
20	16QAM	1	99	20.34	20.26	20.33	20.27	20.26	19.5	2
20	16QAM	50	0	19.43	19.31	19.45	19.48	19.34		
20	16QAM	50	24	19.33	19.38	19.38	19.44	19.48		
20	16QAM	50	50	19.42	19.45	19.30	19.46	19.39	19.5	2
20	16QAM	100	0	19.39	19.44	19.43	19.46	19.32		
20	64QAM	1	0	19.46	19.34	19.42	19.30	19.38		
20	64QAM	1	49	19.45	19.45	19.42	19.37	19.31	19.5	2
20	64QAM	1	99	19.37	19.35	19.29	19.45	19.40		
20	64QAM	50	0	18.27	18.28	18.23	18.25	18.30		
20	64QAM	50	24	18.41	18.25	18.34	18.41	18.28	18.5	3
20	64QAM	50	50	18.36	18.39	18.28	18.34	18.27		
20	64QAM	100	0	18.42	18.23	18.30	18.42	18.24		
Channel				39725	40173	40620	41068	41515	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2503.5	2548.3	2593	2637.8	2682.5		
15	QPSK	1	0	21.23	21.14	21.15	21.14	21.23	21.5	0
15	QPSK	1	37	21.23	21.15	21.15	21.23	21.13		
15	QPSK	1	74	21.13	21.17	21.15	21.21	21.22		
15	QPSK	36	0	20.28	20.30	20.26	20.28	20.24	20.5	1
15	QPSK	36	20	20.28	20.24	20.27	20.25	20.31		
15	QPSK	36	39	20.30	20.28	20.25	20.31	20.33		
15	QPSK	75	0	20.33	20.29	20.27	20.28	20.32	20.5	1
15	16QAM	1	0	20.27	20.26	20.28	20.32	20.30		
15	16QAM	1	37	20.29	20.25	20.28	20.31	20.34		
15	16QAM	1	74	20.26	20.27	20.30	20.34	20.26	19.5	2
15	16QAM	36	0	19.38	19.44	19.41	19.45	19.36		
15	16QAM	36	20	19.34	19.39	19.39	19.46	19.45		
15	16QAM	36	39	19.45	19.43	19.43	19.45	19.37	19.5	2
15	16QAM	75	0	19.45	19.36	19.36	19.36	19.48		
15	64QAM	1	0	19.29	19.33	19.35	19.43	19.42		
15	64QAM	1	37	19.46	19.44	19.46	19.36	19.39	19.5	2
15	64QAM	1	74	19.37	19.47	19.43	19.31	19.42		
15	64QAM	36	0	18.36	18.41	18.33	18.28	18.33		
15	64QAM	36	20	18.33	18.24	18.31	18.30	18.28	18.5	3
15	64QAM	36	39	18.26	18.32	18.32	18.30	18.30		
15	64QAM	75	0	18.25	18.24	18.32	18.32	18.26		
Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	21.14	21.23	21.18	21.22	21.13	21.5	0
10	QPSK	1	25	21.18	21.19	21.19	21.14	21.16		
10	QPSK	1	49	21.15	21.17	21.21	21.23	21.17		
10	QPSK	25	0	20.30	20.26	20.34	20.29	20.33	20.5	1



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10	QPSK	25	12	20.34	20.34	20.25	20.33	20.28		
10	QPSK	25	25	20.32	20.33	20.31	20.30	20.32		
10	QPSK	50	0	20.32	20.32	20.32	20.31	20.32		
10	16QAM	1	0	20.32	20.26	20.25	20.24	20.30	20.5	1
10	16QAM	1	25	20.33	20.28	20.24	20.33	20.34		
10	16QAM	1	49	20.34	20.34	20.25	20.24	20.28		
10	16QAM	25	0	19.47	19.42	19.41	19.32	19.48	19.5	2
10	16QAM	25	12	19.40	19.33	19.45	19.28	19.38		
10	16QAM	25	25	19.36	19.28	19.46	19.45	19.46		
10	16QAM	50	0	19.36	19.34	19.43	19.28	19.47		
10	64QAM	1	0	19.43	19.46	19.47	19.39	19.45	19.5	2
10	64QAM	1	25	19.28	19.35	19.33	19.41	19.41		
10	64QAM	1	49	19.29	19.44	19.30	19.33	19.31		
10	64QAM	25	0	18.30	18.23	18.27	18.37	18.30	18.5	3
10	64QAM	25	12	18.42	18.41	18.31	18.41	18.34		
10	64QAM	25	25	18.29	18.42	18.33	18.38	18.34		
10	64QAM	50	0	18.30	18.36	18.24	18.42	18.42		
Channel				39675	40148	40620	41093	41565	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2498.5	2545.8	2593	2640.30	2687.5		
5	QPSK	1	0	21.13	21.22	21.19	21.19	21.15	21.5	0
5	QPSK	1	12	21.20	21.18	21.13	21.23	21.14		
5	QPSK	1	24	21.15	21.22	21.20	21.14	21.16		
5	QPSK	12	0	20.30	20.26	20.25	20.33	20.31	20.5	1
5	QPSK	12	7	20.34	20.30	20.33	20.33	20.30		
5	QPSK	12	13	20.33	20.28	20.30	20.27	20.28		
5	QPSK	25	0	20.24	20.33	20.32	20.24	20.34		
5	16QAM	1	0	20.28	20.34	20.34	20.28	20.33	20.5	1
5	16QAM	1	12	20.27	20.30	20.28	20.26	20.29		
5	16QAM	1	24	20.25	20.34	20.30	20.26	20.33		
5	16QAM	12	0	19.36	19.38	19.44	19.33	19.38	19.5	2
5	16QAM	12	7	19.31	19.35	19.29	19.38	19.48		
5	16QAM	12	13	19.44	19.36	19.33	19.41	19.29		
5	16QAM	25	0	19.47	19.46	19.45	19.37	19.45		
5	64QAM	1	0	19.41	19.41	19.41	19.31	19.28	19.5	2
5	64QAM	1	12	19.32	19.45	19.29	19.30	19.29		
5	64QAM	1	24	19.45	19.37	19.30	19.47	19.45		
5	64QAM	12	0	18.39	18.22	18.27	18.41	18.40	18.5	3
5	64QAM	12	7	18.36	18.33	18.30	18.25	18.42		
5	64QAM	12	13	18.39	18.31	18.42	18.42	18.40		
5	64QAM	25	0	18.30	18.30	18.38	18.42	18.41		



<LTE Band 48>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Low Middle Ch. / Freq.	Power High Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				55340	55830	56150	56640		
Frequency (MHz)				3560	3609	3641	3690		
20	QPSK	1	0	21.88	21.98	21.90	21.77	23.5	0
20	QPSK	1	49	21.80	21.85	21.74	21.66		
20	QPSK	1	99	21.67	21.77	21.62	21.58		
20	QPSK	50	0	20.98	21.08	20.97	20.84	22.5	1
20	QPSK	50	24	20.89	21.00	20.88	20.76		
20	QPSK	50	50	20.82	20.92	20.81	20.69		
20	QPSK	100	0	20.85	20.95	20.90	20.74	22.5	1
20	16QAM	1	0	21.03	21.08	21.03	20.85		
20	16QAM	1	49	20.90	20.91	20.81	20.63		
20	16QAM	1	99	20.82	20.82	20.69	20.56	21.5	2
20	16QAM	50	0	20.02	20.06	19.99	19.90		
20	16QAM	50	24	19.90	20.00	19.93	19.77		
20	16QAM	50	50	19.84	19.93	19.82	19.71	21.5	2
20	16QAM	100	0	19.91	20.01	19.92	19.75		
20	64QAM	1	0	20.48	20.33	20.37	20.72		
20	64QAM	1	49	20.36	20.10	20.22	20.38	21.5	2
20	64QAM	1	99	20.31	20.11	20.13	20.56		
20	64QAM	50	0	19.69	19.53	19.58	19.74		
20	64QAM	50	24	19.53	19.46	19.51	19.70	20.5	3
20	64QAM	50	50	19.47	19.40	19.43	19.67		
20	64QAM	100	0	19.60	19.56	19.60	19.82		
Channel				55315	55820	56160	56665		
Frequency (MHz)				3557.5	3608	3642	3692.5		
15	QPSK	1	0	21.87	21.89	21.85	21.76	23.5	0
15	QPSK	1	37	21.76	21.79	21.70	21.57		
15	QPSK	1	74	21.62	21.75	21.53	21.55		
15	QPSK	36	0	20.95	21.00	20.94	20.77	22.5	1
15	QPSK	36	20	20.85	20.97	20.86	20.66		
15	QPSK	36	39	20.72	20.90	20.80	20.64		
15	QPSK	75	0	20.76	20.91	20.89	20.66	22.5	1
15	16QAM	1	0	21.02	21.05	20.98	20.78		
15	16QAM	1	37	20.84	20.81	20.80	20.54		
15	16QAM	1	74	20.76	20.77	20.68	20.52	21.5	2
15	16QAM	36	0	19.97	19.96	19.98	19.85		
15	16QAM	36	20	19.84	20.00	19.90	19.70		
15	16QAM	36	39	19.75	19.90	19.72	19.71	21.5	2
15	16QAM	75	0	19.89	19.99	19.85	19.65		
15	64QAM	1	0	20.48	20.27	20.27	20.65		
15	64QAM	1	37	20.36	20.10	20.19	20.34	21.5	2
15	64QAM	1	74	20.27	20.07	20.07	20.52		
15	64QAM	36	0	19.60	19.45	19.53	19.69		
15	64QAM	36	20	19.51	19.42	19.48	19.69	20.5	3
15	64QAM	36	39	19.40	19.33	19.38	19.59		
15	64QAM	75	0	19.50	19.52	19.54	19.76		
Channel				55290	55815	56165	56690		
Frequency (MHz)				3555	3607.5	3642.5	3695		
10	QPSK	1	0	21.77	21.83	21.78	21.67	23.5	0
10	QPSK	1	25	21.68	21.69	21.61	21.52		
10	QPSK	1	49	21.58	21.73	21.61	21.50		
10	QPSK	25	0	20.95	20.90	20.90	20.73	22.5	1
10	QPSK	25	12	20.76	20.96	20.84	20.59		



10	QPSK	25	25	20.71	20.89	20.71	20.64		
10	QPSK	50	0	20.76	20.86	20.81	20.63		
10	16QAM	1	0	20.95	21.00	20.88	20.75	22.5	1
10	16QAM	1	25	20.84	20.74	20.76	20.48		
10	16QAM	1	49	20.74	20.74	20.58	20.42		
10	16QAM	25	0	19.90	19.94	19.97	19.81	21.5	2
10	16QAM	25	12	19.76	19.90	19.87	19.63		
10	16QAM	25	25	19.74	19.88	19.64	19.61		
10	16QAM	50	0	19.86	19.89	19.78	19.58		
10	64QAM	1	0	20.44	20.24	20.27	20.56	21.5	2
10	64QAM	1	25	20.30	20.01	20.19	20.34		
10	64QAM	1	49	20.18	20.00	19.98	20.44		
10	64QAM	25	0	19.51	19.45	19.53	19.67	20.5	3
10	64QAM	25	12	19.44	19.39	19.46	19.63		
10	64QAM	25	25	19.34	19.26	19.35	19.56		
10	64QAM	50	0	19.44	19.51	19.44	19.67		
Channel				55265	55810	56170	56715	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				3552.5	3607	3643	3697.5		
5	QPSK	1	0	21.76	21.73	21.69	21.61	23.5	0
5	QPSK	1	12	21.66	21.65	21.59	21.64		
5	QPSK	1	24	21.56	21.66	21.55	21.58		
5	QPSK	12	0	20.85	20.86	20.88	20.71	22.5	1
5	QPSK	12	7	20.75	20.92	20.83	20.52		
5	QPSK	12	13	20.67	20.79	20.66	20.64		
5	QPSK	25	0	20.71	20.77	20.76	20.63		
5	16QAM	1	0	20.89	20.91	20.87	20.70	22.5	1
5	16QAM	1	12	20.76	20.69	20.73	20.40		
5	16QAM	1	24	20.67	20.72	20.58	20.39		
5	16QAM	12	0	19.81	19.93	19.88	19.76	21.5	2
5	16QAM	12	7	19.67	19.90	19.79	19.55		
5	16QAM	12	13	19.65	19.80	19.55	19.51		
5	16QAM	25	0	19.76	19.80	19.70	19.51		
5	64QAM	1	0	20.40	20.24	20.27	20.55	21.5	2
5	64QAM	1	12	20.29	20.01	20.16	20.34		
5	64QAM	1	24	20.16	19.94	19.94	20.42		
5	64QAM	12	0	19.51	19.39	19.48	19.61	20.5	3
5	64QAM	12	7	19.42	19.30	19.36	19.61		
5	64QAM	12	13	19.33	19.23	19.34	19.55		
5	64QAM	25	0	19.36	19.41	19.40	19.58		



**<LTE Carrier Aggregation combinations>**

**General Note:**

1. This device supports Carrier Aggregation on downlink only for intra band. For the device supports combination bands and configurations are according to 3GPP.
2. In applying the existing power measurement procedure of KDB 941225 D05A for DL CA SAR test exclusion, only the subset with the largest number of combinations of the frequency band and CCs in each row need consideration, and that configurations require power measurement should be highlighted in the below table.

2CC Downlink Carrier Aggregation			3CC Downlink Carrier Aggregation			4CC Downlink Carrier Aggregation			5CC Downlink Carrier Aggregation		
Number	Combination	Covered by Measurement Superset	Number	Combination	Covered by Measurement Superset	Number	Combination	Covered by Measurement Superset	Covered by Measurement Superset	Combination	Covered by Measurement Superset
1	CA_2A-5A	17	12	CA_25A-41C	21	21	CA_25A-41D	26	25	CA_41F	
2	CA_2A-12A	16	13	CA_41D	25	22	CA_41E	25	26	CA_25A-25A-41D	
3	CA_5A-25A		14	CA_25A-25A-41A	23	23	CA_25A-25A-41C	26			
4	CA_12A-25A		15	CA_25A-41C	23						
5	CA_25A-41A	14	16	CA_2A-2A-12A							
6	CA_5A-41A		17	CA_2A-2A-5A							
7	CA_25A-25A	14	18	CA_2C-5A							
8	CA_41A-41A	20	19	CA_25A-25A-25A							
9	CA_41C	13	20	CA_41A-41C							
10	CA_2A-2A	16									
11	CA_2C	18									

**<Power verification when LTE Carrier Aggregation Active>**

**General Note:**

- i. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.
- ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.
- iii. The device supports downlink two carrier aggregation. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
- iv. Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.
- v. For non-contiguous intra-band CA, the SCC selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band.
- vi. For Intra-band, contiguous CA, the downlink channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

$$\text{Nominal channel spacing} = \left\lceil \frac{BW_{\text{Channel}(1)} + BW_{\text{Channel}(2)} - 0.1|BW_{\text{Channel}(1)} - BW_{\text{Channel}(2)}|}{0.6} \right\rceil 0.3 \text{ [MHz]}$$

**<Two Carrier power verification>**

Configure	PCC							SCC				Power	
	LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band	5	10	836.5	20525	QPSK	1	0	25	20	1960	8340	22.84	23.00
	12	10	707.5	23095	QPSK	1	0	25	20	1960	8340	22.95	23.00
	5	10	836.5	20525	QPSK	1	0	41	20	2593	40620	22.96	23.00

**<Three Carrier power verification>**

Configure	PCC							SCC1				SCC2				Power	
	LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band	2	20	1880	18900	QPSK	1	0	2	20	1980	1100	12	10	737.5	5095	22.42	22.56
	2	20	1880	18900	QPSK	1	0	2	20	1980	1100	5	10	881.5	2525	22.43	22.56
	2	20	1880	18900	QPSK	1	0	2	20	1979.8	1098	5	10	881.5	2525	22.38	22.56
Intra-Band Non-Contiguous	25	20	1880	26340	QPSK	1	0	25	20	1985	8590	25	20	1940	8140	22.55	22.60
	41	20	2593	40620	QPSK	1	0	41	20	2680	41490	41	20	2660.2	41292	22.75	22.82

**<Five Carrier power verification>**

Configure	PCC							SCC1				SCC2				SCC3				SCC4				Power	
	LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx.Power (dBm)	W/O CA Tx.Power (dBm)
Inter-Band	25	20	1880	26340	QPSK	1	0	25	20	1985	8590	41	20	2593	40620	41	20	2612.8	40818	41	20	2632.6	41016	22.41	22.60
Intra-Band Contiguous	41	20	2593	40620	QPSK	1	0	41	20	2612.8	40818	41	20	2632.6	41016	41	20	2652.4	41214	41	20	2672.2	41412	22.66	22.82





<LTE Uplink carrier aggregation>

2CC Uplink Carrier Aggregation	
Number	Combination
1	41C

<Intra-band>

General Note:

- i. The device supports intra-band uplink carrier aggregation for LTE B41 with a maximum of two 20MHz component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre 3GPP requirement.
- ii. The device supports uplink carrier aggregation with a maximum of two 20MHz component carriers. For intra band contiguous carrier aggregation scenarios, 3GPP 36.101 table 6.2.2A-1 specifies that the aggregate maximum allowed output power is equivalent to the single carrier scenario. 3GPP 36.101 6.2.3A allows for several dB of MPR to be applied when not-contiguous RB allocation is implemented. The conducted power and MPR setting in this device are permanently implemented pre the 3GPP requirement.
- iii. According TCB workshop, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.
- iv. According TCB workshop, the output power with uplink CA active was measured for the configuration with the highest reported SAR with single carrier for each exposure condition. The power was measured with wideband signal integration over both component carriers.
- v. Additional SAR measurement for LTE UL CA whit other DL CA combinations active were not required since the maximum output power for this configuration was not > 0.25dB higher than the maximum output power for UL CA active.

CA_41C										
Combination 20MHz+20MHz (100RB+100RB)										
PCC Channel	SCC Channel	Modulation	PCC		SCC		Total RB Size	Target MPR Level (dB)	Measured Power (dBm)	Tune up Power (dBm)
			RB Size	RB offset	RB Size	RB offset				
39750	39948	QPSK	1	0	0	0	1	0	21.05	21.5
40185	39987	QPSK	1	0	1	99	2	0	20.89	21.5
40620	40422	QPSK	1	0	1	99	2	0	21.11	21.5

## 12. 5G NR Output Power (Unit: dBm)

**General Note:**

1. For 5G NR test procedure was following step similar FCC KDB 941225 D05:
  - a. For DFT-OFDM output power measurement reduction, full measurement on Pi/2 BPSK and QPSK, for 16QAM/64QAM/256QAM spot check 1RB 1offset configuration to ensure the output power will not ½ dB higher than Pi/2 BPSK and QPSK, for smaller bandwidth output power will spot check 1RB 1offset configuration at Pi/2 BPSK to ensure output power will not ½ dB higher than largest supported bandwidth.
  - b. The high order modulations for CP-OFDM maximum power according to tune-up document will not ½ dB higher than DFT-OFDM mode, also DFT-OFDM mode reported SAR is ≤ 1.45 W/kg for this device, for CP-OFDM mode output power and SAR measurement is not necessary.
  - c. SAR testing start with the largest channel bandwidth and measure SAR for Pi/2 BPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
  - d. 50% RB allocation for Pi/2 BPSK SAR testing follows 1RB Pi/2 BPSK allocation procedure
  - e. Pi/2 BPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
  - f. QPSK/16QAM/64QAM/256QAM output powers according to tune-up limit will not ½ dB higher than the same configuration in Pi/2 BPSK, also reported SAR for the Pi/2 BPSK configuration is less than 1.45 W/kg, QPSK/16QAM/64QAM/256QAM SAR testing are not required.
  - g. Smaller bandwidth output power for each RB allocation configuration for this device will not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device
2. Due to test setup limitations, SAR testing for NR was performed using Factory Test Mode software to establish the connection and perform SAR with 100% transmission.

### <3GPP 38.101 MPR for EN-DC>

Table 6.2.2-1 Maximum power reduction (MPR) for power class 3

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	Pi/2 BPSK	≤ 3.5 <sup>1</sup>	≤ 1.2 <sup>1</sup>	≤ 0.2 <sup>1</sup>
		≤ 0.5 <sup>2</sup>	≤ 0.5 <sup>2</sup>	0 <sup>2</sup>
	QPSK	≤ 1		0
	16 QAM	≤ 2		≤ 1
	64 QAM			
CP-OFDM	256 QAM	≤ 2.5		
		≤ 4.5		
	QPSK	≤ 3		≤ 1.5
	16 QAM	≤ 3		≤ 2
	64 QAM			
		≤ 3.5		
		≤ 6.5		

NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability *powerBoosting-pi2BPSK* and if the IE *powerBoostPi2BPSK* is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0 dB MPR is 26 dBm.

NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 with Pi/2 BPSK modulation and if the IE *powerBoostPi2BPSK* is set to 0 and if more than 40 % of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.

Table 6.2.2-2 Maximum power reduction (MPR) for power class 2

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	Pi/2 BPSK	≤ 3.5	≤ 0.5	0
	QPSK	≤ 3.5	≤ 1	0
	16 QAM	≤ 3.5	≤ 2	≤ 1
	64 QAM	≤ 3.5	≤ 2.5	
	256 QAM	≤ 4.5		
CP-OFDM	QPSK	≤ 3.5	≤ 3	≤ 1.5
	16 QAM	≤ 3.5	≤ 3	≤ 2
	64 QAM	≤ 3.5		
		≤ 6.5		



<EN-DC combination>

LTE Band	FR1 Band
LTE Band 2 (Ant 3)	FR1 n41 (Ant 0)
LTE Band 2 (Ant 3)	FR1 n66 (Ant 0)
LTE Band 2 (Ant 3)	FR1 n71 (Ant 0)
LTE Band 7 (Ant 0)	FR1 n78 (Ant 0)
LTE Band 12 (Ant 0)	FR1 n2 (Ant 3)
LTE Band 12 (Ant 0)	FR1 n25 (Ant 3)
LTE Band 12 (Ant 0)	FR1 n66 (Ant 3)
LTE Band 5 (Ant 0)	FR1 n2 (Ant 3)
LTE Band 66 (Ant 3)	FR1 n41 (Ant 0)
LTE Band 66 (Ant 3)	FR1 n71 (Ant 0)

**Ant. 0**

<n41>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				509202	518598	528000	22.5	0.0
Frequency (MHz)				2546.01	2592.99	2640		
100	PI/2 BPSK	1	1	22.39	22.50	22.30	22.5	0.0
100	PI/2 BPSK	1	137	22.23	22.42	22.32		
100	PI/2 BPSK	1	271	22.10	22.20	22.05		
100	PI/2 BPSK	135	0	21.74	21.85	21.81	22.0	0.5
100	PI/2 BPSK	135	69	22.31	22.41	22.29	22.5	0.0
100	PI/2 BPSK	135	138	21.73	21.83	21.75	22.0	0.5
100	PI/2 BPSK	270	0	21.63	21.73	21.66		
100	QPSK	1	1	21.98	22.18	22.11	22.5	0.0
100	QPSK	1	137	22.01	22.05	22.05		
100	QPSK	1	271	21.93	21.99	22.01		
100	QPSK	135	0	21.03	21.13	21.07	22.5	0.0
100	QPSK	135	69	22.00	22.06	21.98		
100	QPSK	135	138	21.01	21.19	21.04		
100	QPSK	270	0	20.96	21.06	21.03	21.5	1.0
100	16QAM	1	1	20.79	20.92	20.89	21.5	1.0
100	64QAM	1	1	19.50	19.66	19.59	20.0	2.5
100	256QAM	1	1	17.44	17.61	17.31	18.0	4.5
Channel				508200	518598	528996	22.5	0.0
Frequency (MHz)				2541	2592.99	2644.98		
90	PI/2 BPSK	1	1	22.24	22.31	22.21	22.5	0.0
Channel				507204	518598	529998		
Frequency (MHz)				2536.02	22.24	2649.99	22.5	0.0
80	PI/2 BPSK	1	1	22.11	22.24	22.09		
Channel				505200	518598	531996	22.5	0.0
Frequency (MHz)				2526	2592.99	2659.98		
60	PI/2 BPSK	1	1	22.24	22.32	22.21	22.5	0.0
Channel				504204	518598	532998		
Frequency (MHz)				2521.02	2592.99	2664.99	22.5	0.0
50	PI/2 BPSK	1	1	22.26	22.38	22.18		
Channel				503202	518598	534000	22.5	0.0
Frequency (MHz)				2516.01	2592.99	2670		
40	PI/2 BPSK	1	1	22.10	22.18	22.04	22.5	0.0
Channel				502200	518598	534996		
Frequency (MHz)				2511	2592.99	2674.98	22.5	0.0
30	PI/2 BPSK	1	1	22.05	22.09	22.04		
Channel				501204	518598	535998	22.5	0.0
Frequency (MHz)				2506.02	2592.99	2679.99		
20	PI/2 BPSK	1	1	22.10	22.17	22.01	22.5	0.0



<n66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				346000	349000	352000	23.0	0.0
Frequency (MHz)				1730	1745	1760		
40	PI/2 BPSK	1	1	22.77	22.83	22.80		
40	PI/2 BPSK	1	108	22.54	22.69	22.60	22.5	0.5
40	PI/2 BPSK	1	214	22.40	22.57	22.42		
40	PI/2 BPSK	108	0	22.04	22.13	22.09		
40	PI/2 BPSK	108	54	22.36	22.48	22.40	23.0	0.0
40	PI/2 BPSK	108	108	22.03	22.11	22.07		
40	PI/2 BPSK	216	0	21.98	22.06	22.03		
40	QPSK	1	1	22.32	22.46	22.38	23.0	0.0
40	QPSK	1	108	22.28	22.41	22.32		
40	QPSK	1	214	22.21	22.34	22.30		
40	QPSK	108	0	21.33	21.49	21.40	22.0	1.0
40	QPSK	108	54	22.30	22.41	22.33		
40	QPSK	108	108	21.38	21.47	21.40		
40	QPSK	216	0	21.32	21.40	21.36	22.0	1.0
40	16QAM	1	1	21.10	21.28	21.22		
40	64QAM	1	1	19.84	19.95	19.86		
40	256QAM	1	1	17.76	17.88	17.62	18.5	4.5
Channel				344000	349000	354000	23.0	0.0
Frequency (MHz)				1720	1745	1770		
20	PI/2 BPSK	1	1	22.44	22.60	22.48	23.0	0.0
Channel				343500	349000	354500		
Frequency (MHz)				1717.5	1745	1772.5	23.0	0.0
15	PI/2 BPSK	1	1	22.21	22.36	22.30		
Channel				343000	349000	355000	23.0	0.0
Frequency (MHz)				1715	1745	1775		
10	PI/2 BPSK	1	1	22.41	22.45	22.44	23.0	0.0
Channel				342500	349000	355500		
Frequency (MHz)				1712.5	1745	1777.5	23.0	0.0
5	PI/2 BPSK	1	1	22.31	22.40	22.32		



<n71>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				134600	136100	137600	24.0	0.0
Frequency (MHz)				673	680.5	688		
20	PI/2 BPSK	1	1	22.89	22.74	22.63		
20	PI/2 BPSK	1	53	22.46	22.42	22.30	23.5	0.5
20	PI/2 BPSK	1	104	22.32	22.30	22.13		
20	PI/2 BPSK	50	0	21.94	21.77	21.73		
20	PI/2 BPSK	50	28	22.43	22.39	22.31	23.5	0.0
20	PI/2 BPSK	50	56	21.93	21.75	21.72		
20	PI/2 BPSK	100	0	21.87	21.69	21.76		
20	QPSK	1	1	22.24	22.12	22.04	24.0	0.0
20	QPSK	1	53	22.15	22.06	22.02		
20	QPSK	1	104	22.14	22.01	22.03		
20	QPSK	50	0	21.24	21.12	21.10	24.0	1.0
20	QPSK	50	28	22.22	22.04	21.98		
20	QPSK	50	56	21.26	21.15	21.07		
20	QPSK	100	0	21.20	21.13	21.06	23.0	1.0
20	16QAM	1	1	21.01	20.94	20.85		
20	64QAM	1	1	19.76	19.68	19.56		
20	256QAM	1	1	17.63	17.51	17.35	19.5	4.5
Channel				134100	136100	138100	24.0	0.0
Frequency (MHz)				670.5	680.5	690.5		
15	PI/2 BPSK	1	1	22.70	22.62	22.60	24.0	0.0
Channel				133600	136100	138600		
Frequency (MHz)				668	680.5	693	24.0	0.0
10	PI/2 BPSK	1	1	22.58	22.44	22.50		
Channel				133100	136100	139100	24.0	0.0
Frequency (MHz)				665.5	680.5	695.5		
5	PI/2 BPSK	1	1	22.61	22.49	22.55	24.0	0.0



<n78>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel					633334		23.0	0.0
Frequency (MHz)					3500.01			
100	PI/2 BPSK	1	1		22.73		23.0	0.0
100	PI/2 BPSK	1	137		22.64			
100	PI/2 BPSK	1	271		22.64			
100	PI/2 BPSK	135	0		22.47		22.5	0.5
100	PI/2 BPSK	135	69		22.72		23.0	0.0
100	PI/2 BPSK	135	138		22.35		22.5	0.5
100	PI/2 BPSK	270	0		22.36			
100	QPSK	1	1		22.68		23.0	0.0
100	QPSK	1	137		22.67			
100	QPSK	1	271		22.73			
100	QPSK	135	0		22.72		23.0	0.0
100	QPSK	135	69		22.66			
100	QPSK	135	138		22.67			
100	QPSK	270	0		21.65		22.0	1.0
100	16QAM	1	1		21.87		22.0	1.0
100	64QAM	1	1		20.68		20.5	2.5
100	256QAM	1	1		18.64		18.5	4.5
Channel				633000	633334	633668	23.0	0.0
Frequency (MHz)				3495	3500.01	3505.02		
90	PI/2 BPSK	1	1	22.48	22.53	22.41	23.0	0.0
Channel				632668	633334	634000	23.0	0.0
Frequency (MHz)				3490.02	3500.01	3510		
80	PI/2 BPSK	1	1	22.36	22.43	22.35	23.0	0.0
Channel				632000	633334	634668	23.0	0.0
Frequency (MHz)				3480	3500.01	3520.02		
60	PI/2 BPSK	1	1	22.44	22.50	22.39	23.0	0.0
Channel				631668	633334	635000	23.0	0.0
Frequency (MHz)				3475.02	3500.01	3525		
50	PI/2 BPSK	1	1	22.43	22.51	22.31	23.0	0.0
Channel				631334	633334	635334	23.0	0.0
Frequency (MHz)				3470.01	3500.01	3530.01		
40	PI/2 BPSK	1	1	22.39	22.44	22.35	23.0	0.0
Channel				631000	633334	635668	23.0	0.0
Frequency (MHz)				3465	3500.01	3535.02		
30	PI/2 BPSK	1	1	22.36	22.49	22.31	23.0	0.0
Channel				630834	633334	635834	23.0	0.0
Frequency (MHz)				3462.51	3500.01	3537.51		
25	PI/2 BPSK	1	1	22.41	22.51	22.36	23.0	0.0
Channel				630334	633334	636334	23.0	0.0
Frequency (MHz)				3455.01	3500.01	3545.01		
10	PI/2 BPSK	1	1	22.43	22.47	22.30	23.0	0.0



**Ant. 3**

<n2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				372000	376000	380000		
Frequency (MHz)				1860	1880	1900		
20	PI/2 BPSK	1	1	22.78	22.65	22.77		
20	PI/2 BPSK	1	53	22.32	22.20	22.27	23.0	0.0
20	PI/2 BPSK	1	104	22.21	22.03	22.11		
20	PI/2 BPSK	50	0	21.84	21.75	21.72		
20	PI/2 BPSK	50	28	22.15	22.06	22.13	23.0	0.0
20	PI/2 BPSK	50	56	21.78	21.76	21.78	22.5	0.5
20	PI/2 BPSK	100	0	21.74	21.62	21.71		
20	QPSK	1	1	22.19	22.01	22.11		
20	QPSK	1	53	22.10	22.00	21.98	23.0	0.0
20	QPSK	1	104	22.02	21.87	22.03		
20	QPSK	50	0	21.20	21.01	21.12		
20	QPSK	50	28	22.12	21.93	21.97	23.0	0.0
20	QPSK	50	56	21.20	21.10	21.12	22.0	1.0
20	QPSK	100	0	21.05	20.96	21.09		
20	16QAM	1	1	20.92	20.80	20.94		
20	64QAM	1	1	19.61	19.55	19.59	20.5	2.5
20	256QAM	1	1	17.61	17.47	17.35	18.5	4.5
Channel				371500	376000	380500	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	PI/2 BPSK	1	1	22.64	22.49	22.54	23.0	0.0
Channel				371000	376000	381000	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	PI/2 BPSK	1	1	22.60	22.47	22.51	23.0	0.0
Channel				370500	376000	381500	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	PI/2 BPSK	1	1	22.48	22.30	22.39	23.0	0.0



<n25>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				372000	376500	381000	23.0	0.0
Frequency (MHz)				1860	1882.5	1905		
20	PI/2 BPSK	1	1	22.51	22.56	22.67		
20	PI/2 BPSK	1	53	22.33	22.19	22.38	22.5	0.5
20	PI/2 BPSK	1	104	22.08	22.09	22.22		
20	PI/2 BPSK	50	0	21.77	21.76	21.86		
20	PI/2 BPSK	50	28	22.06	22.09	22.18	22.5	0.0
20	PI/2 BPSK	50	56	21.72	21.74	21.82		
20	PI/2 BPSK	100	0	21.74	21.63	21.77		
20	QPSK	1	1	22.01	22.02	22.11	23.0	0.0
20	QPSK	1	53	21.95	21.98	22.04		
20	QPSK	1	104	21.97	21.84	21.98		
20	QPSK	50	0	21.07	20.97	21.18	22.0	1.0
20	QPSK	50	28	21.96	21.98	22.09		
20	QPSK	50	56	21.09	21.11	21.13		
20	QPSK	100	0	21.06	21.02	21.10	22.0	1.0
20	16QAM	1	1	20.95	20.75	20.93		
20	64QAM	1	1	19.55	19.50	19.62		
20	256QAM	1	1	17.35	17.41	17.57	18.5	4.5
Channel				371500	376500	381500	23.0	0.0
Frequency (MHz)				1857.5	1882.5	1907.5		
15	PI/2 BPSK	1	1	22.34	22.42	22.54	23.0	0.0
Channel				371000	376500	382000		
Frequency (MHz)				1855	1882.5	1910	23.0	0.0
10	PI/2 BPSK	1	1	22.31	22.34	22.44		
Channel				370500	376500	382500	23.0	0.0
Frequency (MHz)				1852.5	1882.5	1912.5		
5	PI/2 BPSK	1	1	22.32	22.35	22.51	23.0	0.0





<n66>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				346000	349000	352000		
Frequency (MHz)				1730	1745	1760		
40	PI/2 BPSK	1	1	22.93	22.85	23.00		
40	PI/2 BPSK	1	108	22.56	22.47	22.70	23.0	0.0
40	PI/2 BPSK	1	214	22.36	22.41	22.59		
40	PI/2 BPSK	108	0	22.06	22.04	22.06		
40	PI/2 BPSK	108	54	22.40	22.33	22.47	23.0	0.0
40	PI/2 BPSK	108	108	22.00	21.98	22.08	22.5	0.5
40	PI/2 BPSK	216	0	22.04	21.96	22.04		
40	QPSK	1	1	22.34	22.25	22.43		
40	QPSK	1	108	22.30	22.22	22.42	23.0	0.0
40	QPSK	1	214	22.30	22.16	22.31		
40	QPSK	108	0	21.36	21.35	21.52		
40	QPSK	108	54	22.26	22.32	22.44	23.0	0.0
40	QPSK	108	108	21.42	21.35	21.40	22.0	1.0
40	QPSK	216	0	21.33	21.30	21.38		
40	16QAM	1	1	21.16	21.03	21.21		
40	64QAM	1	1	19.83	19.79	19.93	20.5	2.5
40	256QAM	1	1	17.60	17.71	17.88	18.5	4.5
Channel				344000	349000	354000		
Frequency (MHz)				1720	1745	1770		
20	PI/2 BPSK	1	1	22.71	22.64	22.79		
20	PI/2 BPSK	1	53	22.61	22.54	22.78	23.0	0.0
20	PI/2 BPSK	1	104	22.50	22.47	22.70		
20	PI/2 BPSK	50	0	22.21	22.22	22.26		
20	PI/2 BPSK	50	28	22.41	22.51	22.60	23.0	0.0
20	PI/2 BPSK	50	56	22.31	22.26	22.40	22.5	0.5
20	PI/2 BPSK	100	0	22.28	22.24	22.32		
20	QPSK	1	1	22.64	22.61	22.73		
20	QPSK	1	53	22.51	22.45	22.72	23.0	0.0
20	QPSK	1	104	22.37	22.36	22.63		
20	QPSK	50	0	21.07	20.97	21.18		
20	QPSK	50	28	21.96	21.98	22.09	23.0	0.0
20	QPSK	50	56	21.09	21.11	21.13	22.0	1.0
20	QPSK	100	0	21.06	21.02	21.10		
20	16QAM	1	1	20.95	20.75	20.93		
20	64QAM	1	1	19.55	19.50	19.62	20.5	2.5
20	256QAM	1	1	17.33	17.42	17.54	18.5	4.5
Channel				343500	349000	354500		
Frequency (MHz)				1717.5	1745	1772.5		
15	PI/2 BPSK	1	1	22.52	22.51	22.76		
Channel				343000	349000	355000		
Frequency (MHz)				1715	1745	1775		
10	PI/2 BPSK	1	1	22.75	22.71	22.85		
Channel				342500	349000	355500		
Frequency (MHz)				1712.5	1745	1777.5		
5	PI/2 BPSK	1	1	22.65	22.55	22.76		



### **13. WiFi/Bluetooth Output Power (Unit: dBm)**

**General Note:**

1. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
2. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
3. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
4. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures. 18 The initial test position procedure is described in the following:
  - a. When the reported SAR of the initial test position is  $\leq 0.4$  W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
  - b. When the reported SAR of the test position is  $> 0.4$  W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is  $\leq 0.8$  W/kg or all required test position are tested.
  - c. For all positions/configurations, when the reported SAR is  $> 0.8$  W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is  $\leq 1.2$  W/kg or all required channels are tested.
5. Per 201904 TCBC workshops, General principles of FCC KDB Publication 248227 D01 can be applied to determine the SAR Initial Test Configurations and test reduction for 802.11ax SAR testing. For the table below the 802.11ax maximum power is SU (non-OFDMA), and the SU maximum power also higher than RU (OFDMA)
6. In applying the test guidance, the IEEE 802.11 mode with the maximum output power (out of all modes) should be considered for testing
7. For modes with the same maximum output power, the guidance from section 5.3.2 a) of FCC KDB Publication 248227 D01 should be applied, with 802.11ax being considered as the highest 802.11 mode for the appropriate frequency bands
8. When SAR testing for 802.11ax is required
  - a. If the maximum output power is highest for OFDMA scenarios, choose the tone size with the maximum number of tones and the highest maximum output power
  - b. Otherwise, consider the fully allocated channel for SAR testing
  - c. When SAR testing is required on RU sizes less than the fully allocated channel, use the RU number closest to the middle of the channel, choosing the higher RU number when two RUs are equidistant to the middle of the channel
9. For the conducted power measurement is MIMO chains transmitting simultaneously and measured the separately conducted power for both chains and then based on the conducted power of antenna 1 and antenna 2 respectively to calculate sum of the power for MIMO mode
10. All of the wireless technology of this device only supports MIMO mode operation.



<2.4GHz WLAN>

2.4GHz WLAN				Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		Duty Cycle %	Worst Case Scaling Factor		
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Ant 1+2(1)		Ant 1+2(2)	Ant 1+2	
			802.11b 1Mbps	1	2412	18.76	19.00	17.89	19.00	21.36	22.00	97.00	1.057
6	2437	18.83		19.00	17.03	19.00	21.03	22.00	1.040	1.574	1.250		
11	2462	18.91		19.00	17.95	19.00	21.47	22.00	1.021	1.274	1.130		
802.11g 6Mbps	1	2412	Not required	17.00	Not required	17.00	Not required	20.00	Not required	Not required	Not required	Not required	
	6	2437		17.00		17.00		20.00					
	11	2462		17.00		17.00		20.00					
802.11n-HT20 MCS0	1	2412	Not required	14.00	Not required	14.00	Not required	17.00	Not required	Not required	Not required	Not required	
	6	2437		14.00		14.00		17.00					
	11	2462		14.00		14.00		17.00					
802.11ax-HE20 MCS0	1	2412	Not required	14.00	Not required	14.00	Not required	17.00	Not required	Not required	Not required	Not required	
	6	2437		14.00		14.00		17.00					
	11	2462		14.00		14.00		17.00					

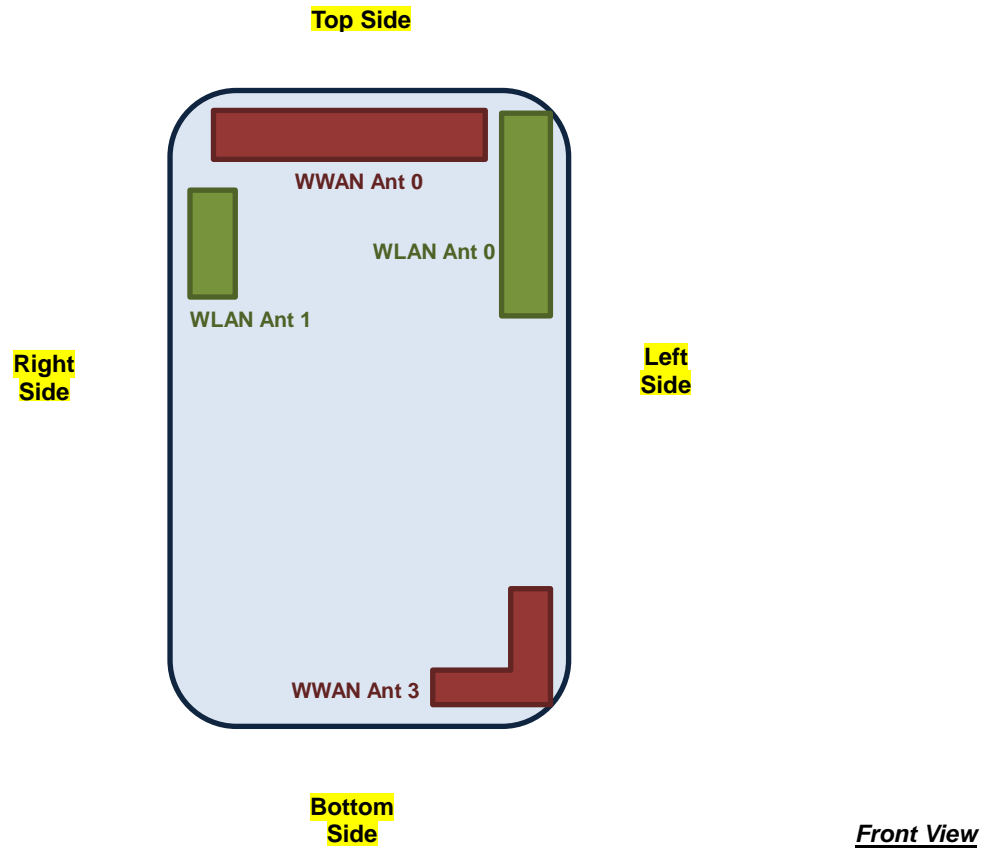


<5GHz WLAN>

5.2GHz WLAN				Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		Duty Cycle %	Worst Case Scaling Factor								
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Ant 1+2(1)		Ant 1+2(2)	Ant 1+2							
5.2GHz WLAN	802.11n-HT20 MCS0	36	5180	Not required	14.00	Not required	14.00	Not required	17.00	Not required	Not required	Not required							
		40	5200		14.00		14.00		17.00										
		44	5220		14.00		14.00		17.00										
		48	5240		14.00		14.00		17.00										
	802.11n-HT40 MCS0	38	5190		12.50		12.50		16.50										
		46	5230		12.50		12.50		16.50										
	802.11ac-VHT20 MCS0	36	5180		13.50		13.50		16.50										
		40	5200		13.50		13.50		16.50										
		44	5220		13.50		13.50		16.50										
	802.11ac-VHT40 MCS0	38	5190		12.50		12.50		16.50										
		46	5230		12.50		12.50		16.50										
	802.11ac-VHT80 MCS0	42	5210		12.50		12.50		15.50										
	802.11ax-HE20 MCS0	36	5180		14.00		14.00		17.00										
		40	5200		14.00		14.00		17.00										
		44	5220		14.00		14.00		17.00										
		48	5240		14.00		14.00		17.00										
	802.11ax-HE40 MCS0	38	5190		14.00		14.00		17.00										
		46	5230		14.00		14.00		17.00										
	802.11ax-HE80 MCS0	42	5210		12.65		14.00		13.54				14.00	16.13	17.00	99.00	1.365	1.112	1.222

5.8GHz WLAN				Ant 1+2 (1)		Ant 1+2 (2)		Ant 1+2		Duty Cycle %	Worst Case Scaling Factor								
Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Average power (dBm)	Tune-Up Limit	Ant 1+2(1)		Ant 1+2(2)	Ant 1+2							
5.8GHz WLAN	802.11n-HT20 MCS0	149	5745	Not required	14.00	Not required	14.00	Not required	17.00	Not required	Not required	Not required							
		157	5785		14.00		14.00		17.00										
		165	5825		14.00		14.00		17.00										
	802.11n-HT40 MCS0	151	5755		13.50		13.50		16.50										
		159	5795		12.50		12.50		16.50										
	802.11ac-VHT20 MCS0	149	5745		13.50		13.50		16.50										
		157	5785		13.50		13.50		16.50										
		165	5825		13.50		13.50		16.50										
	802.11ac-VHT40 MCS0	151	5755		12.50		12.50		16.50										
		159	5795		12.50		12.50		16.50										
	802.11ac-VHT80 MCS0	155	5775		12.50		12.50		15.50										
	802.11ax-HE20 MCS0	149	5745		14.00		14.00		17.00										
		157	5785		14.00		14.00		17.00										
		165	5825		14.00		14.00		17.00										
	802.11ax-HE40 MCS0	151	5755		14.00		14.00		17.00										
		159	5795		14.00		14.00		17.00										
	802.11ax-HE80 MCS0	155	5775		13.55		14.00		13.89				14.00	16.73	17.00	99.00	1.109	1.026	1.064

### 14. Antenna Location





## 15. SAR Test Results

### General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
  - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
  - b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
  - c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)\*Tune-up Scaling Factor
  - d. For WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)\* Duty Cycle scaling factor \* Tune-up scaling factor
  - e. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)\* Tune-up Scaling Factor\* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
  - $\leq 0.8$  W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz
  - $\leq 0.6$  W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
  - $\leq 0.4$  W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\geq 200$  MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8$ W/kg.

### UMTS Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is  $\leq \frac{1}{4}$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than  $\frac{1}{4}$  dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

### LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4/B5/B12/B26/B71 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 2/4/5 SAR test was covered by Band 25/66/26; according to TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - a. The maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion.
  - b. The channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

**5G NR Note:**

1. For 5G NR test procedure was following step similar FCC KDB 941225 D05:
  - a. SAR testing start with the largest channel bandwidth and measure SAR for PI/2 BPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
  - b. 50% RB allocation for PI/2 BPSK SAR testing follows 1RB PI/2 BPSK allocation procedure
  - c. PI/2 BPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
  - d. QPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not  $\frac{1}{2}$  dB higher than the same configuration in PI/2 BPSK, also reported SAR for the PI/2 BPSK configuration is less than 1.45 W/kg, QPSK/16QAM/64QAM/256QAM SAR testing are not required.
  - e. Smaller bandwidth output power for each RB allocation configuration for this device will not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg, smaller bandwidth SAR testing is not required for this device
  - f. For 5G FR1 n41/n71 the maximum bandwidth does not support three non-overlapping channels, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

**WLAN Note:**

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is  $\leq 1.2$  W/kg.
2. Per KDB 248227 D01v02r02, WLAN5.2GHz SAR testing is not required when the WLAN5.3GHz band highest reported SAR for a test configuration is  $\leq 1.2$  W/kg, SAR is not required for WLAN5.2GHz band.
3. When the reported SAR of the test position is  $> 0.4$  W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is  $\leq 0.8$  W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is  $> 0.8$  W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is  $\leq 1.2$  W/kg or all required channels are tested.
5. When in MIMO SAR testing, if the hot spots are separated the scaling factor would scale each hot spot based on the difference between the power for that transmit antenna and the maximum rated power, if the hot spot were not separable or too much overlap which the scaling factor is the worst case rated power/measured power across the two chains in SAR calculation.
6. During SAR testing the WLAN transmission was verified using a spectrum analyzer.



15.1 Hotspot SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA II_Ant 0	RMC 12.2Kbps	Front	10mm	9400	1880	23.88	24.80	1.236	0.11	0.618	0.764
	WCDMA II_Ant 0	RMC 12.2Kbps	Back	10mm	9400	1880	23.88	24.80	1.236	0.04	0.717	0.886
01	WCDMA II_Ant 0	RMC 12.2Kbps	Back	10mm	9262	1852.4	23.66	24.80	1.300	-0.17	0.713	0.927
	WCDMA II_Ant 0	RMC 12.2Kbps	Back	10mm	9538	1907.6	23.69	24.80	1.291	-0.1	0.601	0.776
	WCDMA II_Ant 0	RMC 12.2Kbps	Left Side	10mm	9400	1880	23.88	24.80	1.236	0.15	0.154	0.190
	WCDMA II_Ant 0	RMC 12.2Kbps	Right Side	10mm	9400	1880	23.88	24.80	1.236	0.01	0.454	0.561
	WCDMA II_Ant 0	RMC 12.2Kbps	Top Side	10mm	9400	1880	23.88	24.80	1.236	-0.07	0.348	0.431
	WCDMA II_Ant 0	RMC 12.2Kbps	Bottom Side	10mm	9400	1880	23.88	24.80	1.236	0.19	0.061	0.075
	WCDMA V_Ant 0	RMC 12.2Kbps	Front	10mm	4182	836.4	23.97	24.80	1.211	0.04	0.468	0.567
02	WCDMA V_Ant 0	RMC 12.2Kbps	Back	10mm	4182	836.4	23.97	24.80	1.211	-0.16	0.571	0.691
	WCDMA V_Ant 0	RMC 12.2Kbps	Left Side	10mm	4182	836.4	23.97	24.80	1.211	0.01	0.328	0.397
	WCDMA V_Ant 0	RMC 12.2Kbps	Right Side	10mm	4182	836.4	23.97	24.80	1.211	0.13	0.311	0.376
	WCDMA V_Ant 0	RMC 12.2Kbps	Top Side	10mm	4182	836.4	23.97	24.80	1.211	0.11	0.170	0.206
	WCDMA V_Ant 0	RMC 12.2Kbps	Bottom Side	10mm	4182	836.4	23.97	24.80	1.211	0.11	0.001	0.001

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2_Ant 3	20M	QPSK	1	0	Front	10mm	18700	1860	22.82	23.70	1.225	-0.12	0.431	0.528
	LTE Band 2_Ant 3	20M	QPSK	50	0	Front	10mm	18700	1860	22.56	22.70	1.033	-0.05	0.420	0.434
03	LTE Band 2_Ant 3	20M	QPSK	1	0	Back	10mm	18700	1860	22.82	23.70	1.225	-0.15	0.522	0.639
	LTE Band 2_Ant 3	20M	QPSK	50	0	Back	10mm	18700	1860	22.56	22.70	1.033	-0.08	0.499	0.515
	LTE Band 2_Ant 3	20M	QPSK	1	0	Left Side	10mm	18700	1860	22.82	23.70	1.225	0.11	0.264	0.323
	LTE Band 2_Ant 3	20M	QPSK	50	0	Left Side	10mm	18700	1860	22.56	22.70	1.033	0.07	0.208	0.215
	LTE Band 2_Ant 3	20M	QPSK	1	0	Right Side	10mm	18700	1860	22.82	23.70	1.225	-0.04	0.119	0.145
	LTE Band 2_Ant 3	20M	QPSK	50	0	Right Side	10mm	18700	1860	22.56	22.70	1.033	-0.07	0.100	0.103
	LTE Band 2_Ant 3	20M	QPSK	1	0	Top Side	10mm	18700	1860	22.82	23.70	1.225	-0.19	0.001	0.001
	LTE Band 2_Ant 3	20M	QPSK	50	0	Top Side	10mm	18700	1860	22.56	22.70	1.033	0.08	0.001	0.001
	LTE Band 2_Ant 3	20M	QPSK	1	0	Bottom Side	10mm	18700	1860	22.82	23.70	1.225	0.11	0.287	0.351
	LTE Band 2_Ant 3	20M	QPSK	50	0	Bottom Side	10mm	18700	1860	22.56	22.70	1.033	0.17	0.259	0.267





Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 7_Ant 0	20M	QPSK	1	0	Front	10mm	21100	2535	21.35	21.50	1.035	-0.03	0.425	0.440
	LTE Band 7_Ant 0	20M	QPSK	50	0	Front	10mm	21100	2535	20.41	20.50	1.021	0	0.395	0.403
	LTE Band 7_Ant 0	20M	QPSK	1	0	Back	10mm	21100	2535	21.35	21.50	1.035	-0.09	0.611	0.632
	LTE Band 7_Ant 0	20M	QPSK	50	0	Back	10mm	21100	2535	20.41	20.50	1.021	-0.01	0.550	0.562
	LTE Band 7_Ant 0	20M	QPSK	1	0	Left Side	10mm	21100	2535	21.35	21.50	1.035	-0.11	0.257	0.266
	LTE Band 7_Ant 0	20M	QPSK	50	0	Left Side	10mm	21100	2535	20.41	20.50	1.021	0.03	0.200	0.204
	LTE Band 7_Ant 0	20M	QPSK	1	0	Right Side	10mm	21100	2535	21.35	21.50	1.035	-0.02	0.077	0.080
	LTE Band 7_Ant 0	20M	QPSK	50	0	Right Side	10mm	21100	2535	20.41	20.50	1.021	-0.11	0.056	0.057
	LTE Band 7_Ant 0	20M	QPSK	1	0	Top Side	10mm	21100	2535	21.35	21.50	1.035	-0.13	0.811	0.840
	LTE Band 7_Ant 0	20M	QPSK	1	0	Top Side	10mm	20850	2510	21.17	21.50	1.079	0.19	0.804	0.867
04	LTE Band 7_Ant 0	20M	QPSK	1	0	Top Side	10mm	21350	2560	21.03	21.50	1.114	0.11	0.893	0.995
	LTE Band 7_Ant 0	20M	QPSK	50	0	Top Side	10mm	21100	2535	20.41	20.50	1.021	-0.07	0.744	0.760
	LTE Band 7_Ant 0	20M	QPSK	100	0	Top Side	10mm	21100	2535	20.43	20.50	1.016	0.05	0.725	0.737
	LTE Band 7_Ant 0	20M	QPSK	1	0	Bottom Side	10mm	21100	2535	21.35	21.50	1.035	-0.19	0.001	0.001
	LTE Band 7_Ant 0	20M	QPSK	50	0	Bottom Side	10mm	21100	2535	20.41	20.50	1.021	0.11	0.001	0.001
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	1	0	Front	10mm	21100	2535	21.35	20.50	0.822	-0.03	0.425	0.349
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	50	0	Front	10mm	21100	2535	20.41	19.50	0.811	0	0.395	0.320
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	1	0	Back	10mm	21100	2535	21.35	20.50	0.822	-0.09	0.611	0.502
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	50	0	Back	10mm	21100	2535	20.41	19.50	0.811	-0.01	0.550	0.446
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	1	0	Left Side	10mm	21100	2535	21.35	20.50	0.822	-0.11	0.257	0.211
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	50	0	Left Side	10mm	21100	2535	20.41	19.50	0.811	0.03	0.200	0.162
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	1	0	Right Side	10mm	21100	2535	21.35	20.50	0.822	-0.02	0.077	0.063
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	50	0	Right Side	10mm	21100	2535	20.41	19.50	0.811	-0.11	0.056	0.045
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	1	0	Top Side	10mm	21100	2535	21.35	20.50	0.822	-0.13	0.811	0.667
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	1	0	Top Side	10mm	20850	2510	21.17	20.50	0.857	0.19	0.804	0.689
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	1	0	Top Side	10mm	21350	2560	21.03	20.50	0.885	0.11	0.893	0.790
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	50	0	Top Side	10mm	21100	2535	20.41	19.50	0.811	-0.07	0.744	0.603
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	100	0	Top Side	10mm	21100	2535	20.43	19.50	0.807	0.05	0.725	0.585
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	1	0	Bottom Side	10mm	21100	2535	21.35	20.50	0.822	-0.19	0.001	0.001
	LTE Band 7_Ant 0 (EN-DC)	20M	QPSK	50	0	Bottom Side	10mm	21100	2535	20.41	19.50	0.811	0.11	0.001	0.001
	LTE Band 12_Ant 0	10M	QPSK	1	0	Front	10mm	23095	707.5	23.00	23.70	1.175	-0.17	0.360	0.423
	LTE Band 12_Ant 0	10M	QPSK	25	0	Front	10mm	23095	707.5	22.04	22.70	1.164	0.05	0.278	0.324
05	LTE Band 12_Ant 0	10M	QPSK	1	0	Back	10mm	23095	707.5	23.00	23.70	1.175	-0.12	0.467	0.549
	LTE Band 12_Ant 0	10M	QPSK	25	0	Back	10mm	23095	707.5	22.04	22.70	1.164	0.05	0.400	0.466
	LTE Band 12_Ant 0	10M	QPSK	1	0	Left Side	10mm	23095	707.5	23.00	23.70	1.175	-0.12	0.263	0.309
	LTE Band 12_Ant 0	10M	QPSK	25	0	Left Side	10mm	23095	707.5	22.04	22.70	1.164	0.05	0.218	0.254
	LTE Band 12_Ant 0	10M	QPSK	1	0	Right Side	10mm	23095	707.5	23.00	23.70	1.175	0.16	0.221	0.260
	LTE Band 12_Ant 0	10M	QPSK	25	0	Right Side	10mm	23095	707.5	22.04	22.70	1.164	-0.11	0.154	0.179
	LTE Band 12_Ant 0	10M	QPSK	1	0	Top Side	10mm	23095	707.5	23.00	23.70	1.175	-0.03	0.078	0.091
	LTE Band 12_Ant 0	10M	QPSK	25	0	Top Side	10mm	23095	707.5	22.04	22.70	1.164	-0.17	0.047	0.055
	LTE Band 12_Ant 0	10M	QPSK	1	0	Bottom Side	10mm	23095	707.5	23.00	23.70	1.175	0.09	0.001	0.001
	LTE Band 12_Ant 0	10M	QPSK	25	0	Bottom Side	10mm	23095	707.5	22.04	22.70	1.164	-0.17	0.001	0.001



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 13_Ant 0	10M	QPSK	1	0	Front	10mm	23230	782	23.00	23.70	1.175	-0.15	0.189	0.222
	LTE Band 13_Ant 0	10M	QPSK	25	0	Front	10mm	23230	782	22.07	22.70	1.156	0.1	0.166	0.192
06	LTE Band 13_Ant 0	10M	QPSK	1	0	Back	10mm	23230	782	23.00	23.70	1.175	-0.13	0.205	0.241
	LTE Band 13_Ant 0	10M	QPSK	25	0	Back	10mm	23230	782	22.07	22.70	1.156	-0.19	0.190	0.220
	LTE Band 13_Ant 0	10M	QPSK	1	0	Left Side	10mm	23230	782	23.00	23.70	1.175	0.01	0.073	0.086
	LTE Band 13_Ant 0	10M	QPSK	25	0	Left Side	10mm	23230	782	22.07	22.70	1.156	0.13	0.066	0.076
	LTE Band 13_Ant 0	10M	QPSK	1	0	Right Side	10mm	23230	782	23.00	23.70	1.175	-0.07	0.142	0.167
	LTE Band 13_Ant 0	10M	QPSK	25	0	Right Side	10mm	23230	782	22.07	22.70	1.156	-0.18	0.131	0.151
	LTE Band 13_Ant 0	10M	QPSK	1	0	Top Side	10mm	23230	782	23.00	23.70	1.175	0.19	0.054	0.063
	LTE Band 13_Ant 0	10M	QPSK	25	0	Top Side	10mm	23230	782	22.07	22.70	1.156	-0.06	0.032	0.037
	LTE Band 13_Ant 0	10M	QPSK	1	0	Bottom Side	10mm	23230	782	23.00	23.70	1.175	0.18	0.001	0.001
	LTE Band 13_Ant 0	10M	QPSK	25	0	Bottom Side	10mm	23230	782	22.07	22.70	1.156	0.01	0.001	0.001
	LTE Band 25_Ant 0	20M	QPSK	1	0	Front	10mm	26340	1880	22.60	23.70	1.288	-0.04	0.311	0.401
	LTE Band 25_Ant 0	20M	QPSK	50	0	Front	10mm	26340	1880	21.78	22.70	1.236	0.13	0.286	0.353
07	LTE Band 25_Ant 0	20M	QPSK	1	0	Back	10mm	26340	1880	22.60	23.70	1.288	-0.17	0.364	0.469
	LTE Band 25_Ant 0	20M	QPSK	50	0	Back	10mm	26340	1880	21.78	22.70	1.236	-0.06	0.342	0.423
	LTE Band 25_Ant 0	20M	QPSK	1	0	Left Side	10mm	26340	1880	22.60	23.70	1.288	0.04	0.122	0.157
	LTE Band 25_Ant 0	20M	QPSK	50	0	Left Side	10mm	26340	1880	21.78	22.70	1.236	-0.06	0.110	0.136
	LTE Band 25_Ant 0	20M	QPSK	1	0	Right Side	10mm	26340	1880	22.60	23.70	1.288	-0.17	0.286	0.368
	LTE Band 25_Ant 0	20M	QPSK	50	0	Right Side	10mm	26340	1880	21.78	22.70	1.236	-0.04	0.244	0.302
	LTE Band 25_Ant 0	20M	QPSK	1	0	Top Side	10mm	26340	1880	22.60	23.70	1.288	0.12	0.201	0.259
	LTE Band 25_Ant 0	20M	QPSK	50	0	Top Side	10mm	26340	1880	21.78	22.70	1.236	-0.17	0.190	0.235
	LTE Band 25_Ant 0	20M	QPSK	1	0	Bottom Side	10mm	26340	1880	22.60	23.70	1.288	-0.19	0.001	0.001
	LTE Band 25_Ant 0	20M	QPSK	50	0	Bottom Side	10mm	26340	1880	21.78	22.70	1.236	0.19	0.001	0.001
	LTE Band 26_Ant 0	15M	QPSK	1	0	Front	10mm	26865	831.5	23.00	23.50	1.122	-0.18	0.338	0.379
	LTE Band 26_Ant 0	15M	QPSK	36	0	Front	10mm	26865	831.5	22.01	22.50	1.119	-0.06	0.312	0.349
08	LTE Band 26_Ant 0	15M	QPSK	1	0	Back	10mm	26865	831.5	23.00	23.50	1.122	-0.14	0.354	0.397
	LTE Band 26_Ant 0	15M	QPSK	36	0	Back	10mm	26865	831.5	22.01	22.50	1.119	0	0.338	0.378
	LTE Band 26_Ant 0	15M	QPSK	1	0	Left Side	10mm	26865	831.5	23.00	23.50	1.122	-0.02	0.207	0.232
	LTE Band 26_Ant 0	15M	QPSK	36	0	Left Side	10mm	26865	831.5	22.01	22.50	1.119	0.07	0.207	0.232
	LTE Band 26_Ant 0	15M	QPSK	1	0	Right Side	10mm	26865	831.5	23.00	23.50	1.122	-0.04	0.233	0.261
	LTE Band 26_Ant 0	15M	QPSK	36	0	Right Side	10mm	26865	831.5	22.01	22.50	1.119	-0.02	0.233	0.261
	LTE Band 26_Ant 0	15M	QPSK	1	0	Top Side	10mm	26865	831.5	23.00	23.50	1.122	-0.05	0.118	0.132
	LTE Band 26_Ant 0	15M	QPSK	36	0	Top Side	10mm	26865	831.5	22.01	22.50	1.119	-0.03	0.118	0.132
	LTE Band 26_Ant 0	15M	QPSK	1	0	Bottom Side	10mm	26865	831.5	23.00	23.50	1.122	0.13	0.001	0.001
	LTE Band 26_Ant 0	15M	QPSK	36	0	Bottom Side	10mm	26865	831.5	22.01	22.50	1.119	0.07	0.001	0.001



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 66_Ant 0	20M	QPSK	1	0	Front	10mm	132572	1770	22.69	23.50	1.205	0	0.602	0.725
	LTE Band 66_Ant 0	20M	QPSK	50	0	Front	10mm	132572	1770	21.80	22.50	1.175	0.11	0.548	0.644
	LTE Band 66_Ant 0	20M	QPSK	1	0	Back	10mm	132572	1770	22.69	23.50	1.205	-0.03	0.702	0.846
09	LTE Band 66_Ant 0	20M	QPSK	1	0	Back	10mm	132072	1720	22.67	23.50	1.211	-0.18	0.761	0.921
	LTE Band 66_Ant 0	20M	QPSK	1	0	Back	10mm	132322	1745	22.62	23.50	1.225	0.17	0.750	0.918
	LTE Band 66_Ant 0	20M	QPSK	50	0	Back	10mm	132572	1770	21.80	22.50	1.175	-0.14	0.623	0.732
	LTE Band 66_Ant 0	20M	QPSK	100	0	Front	10mm	132572	1770	21.77	22.50	1.183	-0.02	0.596	0.705
	LTE Band 66_Ant 0	20M	QPSK	1	0	Left Side	10mm	132572	1770	22.69	23.50	1.205	-0.18	0.165	0.199
	LTE Band 66_Ant 0	20M	QPSK	50	0	Left Side	10mm	132572	1770	21.80	22.50	1.175	-0.19	0.151	0.177
	LTE Band 66_Ant 0	20M	QPSK	1	0	Right Side	10mm	132572	1770	22.69	23.50	1.205	-0.18	0.428	0.516
	LTE Band 66_Ant 0	20M	QPSK	50	0	Right Side	10mm	132572	1770	21.80	22.50	1.175	-0.11	0.402	0.472
	LTE Band 66_Ant 0	20M	QPSK	1	0	Top Side	10mm	132572	1770	22.69	23.50	1.205	0.08	0.410	0.494
	LTE Band 66_Ant 0	20M	QPSK	50	0	Top Side	10mm	132572	1770	21.80	22.50	1.175	-0.04	0.365	0.429
	LTE Band 66_Ant 0	20M	QPSK	1	0	Bottom Side	10mm	132572	1770	22.69	23.50	1.205	0.18	0.094	0.113
	LTE Band 66_Ant 0	20M	QPSK	50	0	Bottom Side	10mm	132572	1770	21.80	22.50	1.175	-0.1	0.078	0.092
	LTE Band 66_Ant 3	20M	QPSK	1	0	Front	10mm	132572	1770	22.11	23.50	1.377	0.06	0.083	0.114
	LTE Band 66_Ant 3	20M	QPSK	50	50	Front	10mm	132572	1770	22.41	22.50	1.021	-0.16	0.069	0.070
	LTE Band 66_Ant 3	20M	QPSK	1	0	Back	10mm	132572	1770	22.11	23.50	1.377	0.09	0.171	0.236
	LTE Band 66_Ant 3	20M	QPSK	50	50	Back	10mm	132572	1770	22.41	22.50	1.021	-0.16	0.162	0.165
	LTE Band 66_Ant 3	20M	QPSK	1	0	Left Side	10mm	132572	1770	22.11	23.50	1.377	0.18	0.001	0.001
	LTE Band 66_Ant 3	20M	QPSK	50	50	Left Side	10mm	132572	1770	22.41	22.50	1.021	-0.14	0.001	0.001
	LTE Band 66_Ant 3	20M	QPSK	1	0	Right Side	10mm	132572	1770	22.11	23.50	1.377	-0.01	0.001	0.001
	LTE Band 66_Ant 3	20M	QPSK	50	50	Right Side	10mm	132572	1770	22.41	22.50	1.021	0.1	0.001	0.001
	LTE Band 66_Ant 3	20M	QPSK	1	0	Top Side	10mm	132572	1770	22.11	23.50	1.377	-0.09	0.001	0.001
	LTE Band 66_Ant 3	20M	QPSK	50	50	Top Side	10mm	132572	1770	22.41	22.50	1.021	-0.16	0.001	0.001
	LTE Band 66_Ant 3	20M	QPSK	1	0	Bottom Side	10mm	132572	1770	22.11	23.50	1.377	-0.15	0.089	0.123
	LTE Band 66_Ant 3	20M	QPSK	50	50	Bottom Side	10mm	132572	1770	22.41	22.50	1.021	0.05	0.089	0.091
	LTE Band 71_Ant 0	20M	QPSK	1	0	Front	10mm	133322	683	22.76	23.70	1.242	0.11	0.289	0.359
	LTE Band 71_Ant 0	20M	QPSK	50	0	Front	10mm	133322	683	21.90	22.70	1.202	-0.16	0.266	0.320
10	LTE Band 71_Ant 0	20M	QPSK	1	0	Back	10mm	133322	683	22.76	23.70	1.242	-0.11	0.371	0.461
	LTE Band 71_Ant 0	20M	QPSK	50	0	Back	10mm	133322	683	21.90	22.70	1.202	-0.13	0.354	0.426
	LTE Band 71_Ant 0	20M	QPSK	1	0	Left Side	10mm	133322	683	22.76	23.70	1.242	-0.15	0.162	0.201
	LTE Band 71_Ant 0	20M	QPSK	50	0	Left Side	10mm	133322	683	21.90	22.70	1.202	-0.11	0.155	0.186
	LTE Band 71_Ant 0	20M	QPSK	1	0	Right Side	10mm	133322	683	22.76	23.70	1.242	-0.11	0.189	0.235
	LTE Band 71_Ant 0	20M	QPSK	50	0	Right Side	10mm	133322	683	21.90	22.70	1.202	-0.16	0.176	0.212
	LTE Band 71_Ant 0	20M	QPSK	1	0	Top Side	10mm	133322	683	22.76	23.70	1.242	-0.11	0.065	0.081
	LTE Band 71_Ant 0	20M	QPSK	50	0	Top Side	10mm	133322	683	21.90	22.70	1.202	0.15	0.054	0.065
	LTE Band 71_Ant 0	20M	QPSK	1	0	Bottom Side	10mm	133322	683	22.76	23.70	1.242	0.12	0.001	0.001
	LTE Band 71_Ant 0	20M	QPSK	50	0	Bottom Side	10mm	133322	683	21.90	22.70	1.202	0.04	0.001	0.001



<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 41_Ant 0	20M	QPSK	1	0	Front	10mm	40620	2593	21.25	21.50	1.059	62.9	1.006	-0.14	0.360	0.384
	LTE Band 41_Ant 0	20M	QPSK	50	0	Front	10mm	40620	2593	20.34	20.50	1.038	62.9	1.006	-0.06	0.255	0.266
	LTE Band 41_Ant 0	20M	QPSK	1	0	Back	10mm	40620	2593	21.25	21.50	1.059	62.9	1.006	0	0.776	0.827
	LTE Band 41_Ant 0	20M	QPSK	1	0	Back	10mm	39750	2506	21.24	21.50	1.062	62.9	1.006	0.08	0.725	0.774
	LTE Band 41_Ant 0	20M	QPSK	1	0	Back	10mm	40185	2549.5	21.10	21.50	1.096	62.9	1.006	0.1	0.739	0.815
	LTE Band 41_Ant 0	20M	QPSK	1	0	Back	10mm	41055	2636.5	21.21	21.50	1.069	62.9	1.006	-0.13	0.748	0.805
	LTE Band 41_Ant 0	20M	QPSK	1	0	Back	10mm	41490	2680	21.17	21.50	1.079	62.9	1.006	0.03	0.680	0.739
	LTE Band 41_Ant 0	20M	QPSK	50	0	Back	10mm	40620	2593	20.34	20.50	1.038	62.9	1.006	-0.15	0.674	0.703
	LTE Band 41_Ant 0	20M	QPSK	50	0	Back	10mm	39750	2506	20.32	20.50	1.042	62.9	1.006	0.08	0.668	0.700
	LTE Band 41_Ant 0	20M	QPSK	50	0	Back	10mm	40185	2549.5	20.31	20.50	1.045	62.9	1.006	-0.04	0.655	0.688
	LTE Band 41_Ant 0	20M	QPSK	50	0	Back	10mm	41055	2636.5	20.31	20.50	1.045	62.9	1.006	0.11	0.614	0.645
	LTE Band 41_Ant 0	20M	QPSK	50	0	Back	10mm	41490	2680	20.29	20.50	1.050	62.9	1.006	-0.01	0.635	0.670
	LTE Band 41_Ant 0	20M	QPSK	100	0	Back	10mm	40620	2593	20.32	20.50	1.042	62.9	1.006	-0.14	0.620	0.650
	LTE Band 41_Ant 0	20M	QPSK	1	0	Left Side	10mm	40620	2593	21.25	21.50	1.059	62.9	1.006	-0.16	0.108	0.115
	LTE Band 41_Ant 0	20M	QPSK	50	0	Left Side	10mm	40620	2593	20.34	20.50	1.038	62.9	1.006	-0.1	0.094	0.098
	LTE Band 41_Ant 0	20M	QPSK	1	0	Right Side	10mm	40620	2593	21.25	21.50	1.059	62.9	1.006	-0.14	0.064	0.068
	LTE Band 41_Ant 0	20M	QPSK	50	0	Right Side	10mm	40620	2593	20.34	20.50	1.038	62.9	1.006	-0.07	0.051	0.053
	LTE Band 41_Ant 0	20M	QPSK	1	0	Top Side	10mm	40620	2593	21.25	21.50	1.059	62.9	1.006	-0.03	0.954	1.017
	LTE Band 41_Ant 0	20M	QPSK	1	0	Top Side	10mm	39750	2506	21.24	21.50	1.062	62.9	1.006	-0.11	0.966	1.032
	LTE Band 41_Ant 0	20M	QPSK	1	0	Top Side	10mm	40185	2549.5	21.10	21.50	1.096	62.9	1.006	0.01	0.915	1.009
	LTE Band 41_Ant 0	20M	QPSK	1	0	Top Side	10mm	41055	2636.5	21.21	21.50	1.069	62.9	1.006	0.11	1.025	1.102
11	LTE Band 41_Ant 0	20M	QPSK	1	0	Top Side	10mm	41490	2680	21.17	21.50	1.079	62.9	1.006	0.06	1.070	1.161
	LTE Band 41_Ant 0	20M	QPSK	50	0	Top Side	10mm	40620	2593	20.34	20.50	1.038	62.9	1.006	0.16	0.844	0.881
	LTE Band 41_Ant 0	20M	QPSK	50	0	Top Side	10mm	39750	2506	20.32	20.50	1.042	62.9	1.006	-0.08	0.859	0.901
	LTE Band 41_Ant 0	20M	QPSK	50	0	Top Side	10mm	40185	2549.5	20.31	20.50	1.045	62.9	1.006	-0.14	0.850	0.893
	LTE Band 41_Ant 0	20M	QPSK	50	0	Top Side	10mm	41055	2636.5	20.31	20.50	1.045	62.9	1.006	0.11	0.810	0.851
	LTE Band 41_Ant 0	20M	QPSK	50	0	Top Side	10mm	41490	2680	20.29	20.50	1.050	62.9	1.006	0.06	0.788	0.832
	LTE Band 41_Ant 0	20M	QPSK	100	0	Top Side	10mm	40620	2593	20.32	20.50	1.042	62.9	1.006	-0.08	0.822	0.862
	LTE Band 41_Ant 0	20M	QPSK	1	0	Bottom Side	10mm	40620	2593	21.25	21.50	1.059	62.9	1.006	-0.09	0.001	0.001
	LTE Band 41_Ant 0	20M	QPSK	50	0	Bottom Side	10mm	40620	2593	20.34	20.50	1.038	62.9	1.006	-0.14	0.001	0.001
	LTE Band 41C_Ant 0	20M	QPSK	1	0	Top Side	10mm	39750	2506	21.11	21.50	1.094	62.9	1.006	0.1	0.879	0.967
	LTE Band 48_Ant 0	20M	QPSK	1	0	Front	10mm	55830	3609	21.98	23.50	1.419	62.9	1.006	-0.15	0.132	0.188
	LTE Band 48_Ant 0	20M	QPSK	50	0	Front	10mm	55830	3609	21.08	22.50	1.387	62.9	1.006	-0.19	0.115	0.160
	LTE Band 48_Ant 0	20M	QPSK	1	0	Back	10mm	55830	3609	21.98	23.50	1.419	62.9	1.006	0.02	0.265	0.378
	LTE Band 48_Ant 0	20M	QPSK	50	0	Back	10mm	55830	3609	21.08	22.50	1.387	62.9	1.006	-0.12	0.243	0.339
	LTE Band 48_Ant 0	20M	QPSK	1	0	Left Side	10mm	55830	3609	21.98	23.50	1.419	62.9	1.006	0.11	0.001	0.001
	LTE Band 48_Ant 0	20M	QPSK	50	0	Left Side	10mm	55830	3609	21.08	22.50	1.387	62.9	1.006	0.07	0.001	0.001
12	LTE Band 48_Ant 0	20M	QPSK	1	0	Right Side	10mm	55830	3609	21.98	23.50	1.419	62.9	1.006	-0.07	0.448	0.640
	LTE Band 48_Ant 0	20M	QPSK	1	0	Right Side	10mm	55340	3560	21.88	23.50	1.452	62.9	1.006	-0.11	0.412	0.602
	LTE Band 48_Ant 0	20M	QPSK	1	0	Right Side	10mm	56150	3641	21.90	23.50	1.445	62.9	1.006	-0.05	0.405	0.589
	LTE Band 48_Ant 0	20M	QPSK	1	0	Right Side	10mm	56640	3690	21.77	23.50	1.489	62.9	1.006	-0.02	0.388	0.581
	LTE Band 48_Ant 0	20M	QPSK	50	0	Right Side	10mm	55830	3609	21.08	22.50	1.387	62.9	1.006	0.01	0.411	0.573
	LTE Band 48_Ant 0	20M	QPSK	1	0	Top Side	10mm	55830	3609	21.98	23.50	1.419	62.9	1.006	0.08	0.131	0.187
	LTE Band 48_Ant 0	20M	QPSK	50	0	Top Side	10mm	55830	3609	21.08	22.50	1.387	62.9	1.006	-0.15	0.108	0.151
	LTE Band 48_Ant 0	20M	QPSK	1	0	Bottom Side	10mm	55830	3609	21.98	23.50	1.419	62.9	1.006	-0.01	0.026	0.037
	LTE Band 48_Ant 0	20M	QPSK	50	0	Bottom Side	10mm	55830	3609	21.08	22.50	1.387	62.9	1.006	0.06	0.024	0.033



<5G NR SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n25_Ant 3	20M	BPSK	1	1	Front	10mm	381000	1905	22.67	23.00	1.079	0.12	0.171	0.184
	FR1 n25_Ant 3	20M	BPSK	50	28	Front	10mm	381000	1905	22.18	23.00	1.208	-0.15	0.133	0.161
13	FR1 n25_Ant 3	20M	BPSK	1	1	Back	10mm	381000	1905	22.67	23.00	1.079	-0.12	0.546	0.589
	FR1 n25_Ant 3	20M	BPSK	50	28	Back	10mm	381000	1905	22.18	23.00	1.208	-0.1	0.462	0.558
	FR1 n25_Ant 3	20M	BPSK	1	1	Left Side	10mm	381000	1905	22.67	23.00	1.079	-0.08	0.104	0.113
	FR1 n25_Ant 3	20M	BPSK	50	28	Left Side	10mm	381000	1905	22.18	23.00	1.208	-0.12	0.065	0.079
	FR1 n25_Ant 3	20M	BPSK	1	1	Right Side	10mm	381000	1905	22.67	23.00	1.079	-0.18	0.001	0.001
	FR1 n25_Ant 3	20M	BPSK	50	28	Right Side	10mm	381000	1905	22.18	23.00	1.208	-0.01	0.001	0.001
	FR1 n25_Ant 3	20M	BPSK	1	1	Top Side	10mm	381000	1905	22.67	23.00	1.079	-0.01	0.001	0.001
	FR1 n25_Ant 3	20M	BPSK	50	28	Top Side	10mm	381000	1905	22.18	23.00	1.208	-0.07	0.001	0.001
	FR1 n25_Ant 3	20M	BPSK	1	1	Bottom Side	10mm	381000	1905	22.67	23.00	1.079	0	0.142	0.153
	FR1 n25_Ant 3	20M	BPSK	50	28	Bottom Side	10mm	381000	1905	22.18	23.00	1.208	0.15	0.105	0.127
	FR1 n41_Ant 0	100M	BPSK	1	1	Front	10mm	518598	2592.99	22.50	22.50	1.000	-0.17	0.519	0.519
	FR1 n41_Ant 0	100M	BPSK	135	69	Front	10mm	518598	2592.99	22.41	22.50	1.021	0.08	0.472	0.482
	FR1 n41_Ant 0	100M	BPSK	1	1	Back	10mm	518598	2592.99	22.50	22.50	1.000	-0.07	0.715	0.715
	FR1 n41_Ant 0	100M	BPSK	135	69	Back	10mm	518598	2592.99	22.41	22.50	1.021	0.08	0.654	0.668
	FR1 n41_Ant 0	100M	BPSK	1	1	Left Side	10mm	518598	2592.99	22.50	22.50	1.000	-0.11	0.175	0.175
	FR1 n41_Ant 0	100M	BPSK	135	69	Left Side	10mm	518598	2592.99	22.41	22.50	1.021	-0.14	0.136	0.139
	FR1 n41_Ant 0	100M	BPSK	1	1	Right Side	10mm	518598	2592.99	22.50	22.50	1.000	-0.07	0.141	0.141
	FR1 n41_Ant 0	100M	BPSK	135	69	Right Side	10mm	518598	2592.99	22.41	22.50	1.021	0.1	0.102	0.104
14	FR1 n41_Ant 0	100M	BPSK	1	1	Top Side	10mm	518598	2592.99	22.50	22.50	1.000	0.03	0.791	0.791
	FR1 n41_Ant 0	100M	BPSK	1	1	Top Side	10mm	509202	2546.01	22.39	22.50	1.026	-0.01	0.742	0.761
	FR1 n41_Ant 0	100M	BPSK	1	1	Top Side	10mm	528000	2640.00	22.30	22.50	1.047	0.12	0.731	0.765
	FR1 n41_Ant 0	100M	BPSK	135	69	Top Side	10mm	518598	2592.99	22.41	22.50	1.021	0	0.691	0.705
	FR1 n41_Ant 0	100M	BPSK	270	0	Top Side	10mm	518598	2592.99	21.73	22.00	1.064	0.03	0.654	0.696
	FR1 n41_Ant 0	100M	BPSK	1	1	Bottom Side	10mm	518598	2592.99	22.50	22.50	1.000	-0.16	0.001	0.001
	FR1 n41_Ant 0	100M	BPSK	135	69	Bottom Side	10mm	518598	2592.99	22.41	22.50	1.021	-0.17	0.001	0.001



Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	FR1 n66_Ant 0	40M	BPSK	1	1	Front	10mm	349000	1745	22.83	23.00	1.040	0.07	0.429	0.446
	FR1 n66_Ant 0	40M	BPSK	108	54	Front	10mm	349000	1745	22.48	23.00	1.127	0.03	0.375	0.423
15	FR1 n66_Ant 0	40M	BPSK	1	1	Back	10mm	349000	1745	22.83	23.00	1.040	-0.05	0.504	0.524
	FR1 n66_Ant 0	40M	BPSK	108	54	Back	10mm	349000	1745	22.48	23.00	1.127	0.02	0.432	0.487
	FR1 n66_Ant 0	40M	BPSK	1	1	Left Side	10mm	349000	1745	22.83	23.00	1.040	0.13	0.074	0.077
	FR1 n66_Ant 0	40M	BPSK	108	54	Left Side	10mm	349000	1745	22.48	23.00	1.127	-0.08	0.042	0.047
	FR1 n66_Ant 0	40M	BPSK	1	1	Right Side	10mm	349000	1745	22.83	23.00	1.040	0.12	0.225	0.234
	FR1 n66_Ant 0	40M	BPSK	108	54	Right Side	10mm	349000	1745	22.48	23.00	1.127	-0.15	0.196	0.221
	FR1 n66_Ant 0	40M	BPSK	1	1	Top Side	10mm	349000	1745	22.83	23.00	1.040	0.11	0.271	0.282
	FR1 n66_Ant 0	40M	BPSK	108	54	Top Side	10mm	349000	1745	22.48	23.00	1.127	-0.13	0.211	0.238
	FR1 n66_Ant 0	40M	BPSK	1	1	Bottom Side	10mm	349000	1745	22.83	23.00	1.040	-0.1	0.035	0.037
	FR1 n66_Ant 0	40M	BPSK	108	54	Bottom Side	10mm	349000	1745	22.48	23.00	1.127	-0.02	0.019	0.021
	FR1 n66_Ant 3	40M	BPSK	1	1	Front	10mm	349000	1745	22.85	23.00	1.035	0.14	0.054	0.056
	FR1 n66_Ant 3	40M	BPSK	108	54	Front	10mm	349000	1745	22.33	23.00	1.167	0.11	0.036	0.042
	FR1 n66_Ant 3	40M	BPSK	1	1	Back	10mm	349000	1745	22.85	23.00	1.035	-0.07	0.180	0.186
	FR1 n66_Ant 3	40M	BPSK	108	54	Back	10mm	349000	1745	22.33	23.00	1.167	0.02	0.141	0.165
	FR1 n66_Ant 3	40M	BPSK	1	1	Left Side	10mm	349000	1745	22.85	23.00	1.035	0.15	0.001	0.001
	FR1 n66_Ant 3	40M	BPSK	108	54	Left Side	10mm	349000	1745	22.33	23.00	1.167	-0.07	0.001	0.001
	FR1 n66_Ant 3	40M	BPSK	1	1	Right Side	10mm	349000	1745	22.85	23.00	1.035	0.06	0.001	0.001
	FR1 n66_Ant 3	40M	BPSK	108	54	Right Side	10mm	349000	1745	22.33	23.00	1.167	0.17	0.010	0.012
	FR1 n66_Ant 3	40M	BPSK	1	1	Top Side	10mm	349000	1745	22.85	23.00	1.035	0.05	0.001	0.001
	FR1 n66_Ant 3	40M	BPSK	108	54	Top Side	10mm	349000	1745	22.33	23.00	1.167	0.15	0.001	0.001
	FR1 n66_Ant 3	40M	BPSK	1	1	Bottom Side	10mm	349000	1745	22.85	23.00	1.035	0.02	0.068	0.070
	FR1 n66_Ant 3	40M	BPSK	108	54	Bottom Side	10mm	349000	1745	22.33	23.00	1.167	-0.07	0.049	0.057
	FR1 n71_Ant 0	20M	BPSK	1	1	Front	10mm	136100	680.5	22.74	24.00	1.337	0.19	0.339	0.453
	FR1 n71_Ant 0	20M	BPSK	50	28	Front	10mm	136100	680.5	22.39	24.00	1.449	0.1	0.289	0.419
16	FR1 n71_Ant 0	20M	BPSK	1	1	Back	10mm	136100	680.5	22.74	24.00	1.337	-0.09	0.392	0.524
	FR1 n71_Ant 0	20M	BPSK	50	28	Back	10mm	136100	680.5	22.39	24.00	1.449	0.16	0.339	0.491
	FR1 n71_Ant 0	20M	BPSK	1	1	Left Side	10mm	136100	680.5	22.74	24.00	1.337	0.15	0.128	0.171
	FR1 n71_Ant 0	20M	BPSK	50	28	Left Side	10mm	136100	680.5	22.39	24.00	1.449	-0.01	0.096	0.139
	FR1 n71_Ant 0	20M	BPSK	1	1	Right Side	10mm	136100	680.5	22.74	24.00	1.337	-0.18	0.132	0.176
	FR1 n71_Ant 0	20M	BPSK	50	28	Right Side	10mm	136100	680.5	22.39	24.00	1.449	0.08	0.097	0.141
	FR1 n71_Ant 0	20M	BPSK	1	1	Top Side	10mm	136100	680.5	22.74	24.00	1.337	-0.1	0.084	0.112
	FR1 n71_Ant 0	20M	BPSK	50	28	Top Side	10mm	136100	680.5	22.39	24.00	1.449	0.08	0.049	0.071
	FR1 n71_Ant 0	20M	BPSK	1	1	Bottom Side	10mm	136100	680.5	22.74	24.00	1.337	0.13	0.001	0.001
	FR1 n71_Ant 0	20M	BPSK	50	28	Bottom Side	10mm	136100	680.5	22.39	24.00	1.449	-0.01	0.001	0.001
	FR1 n78_Ant 0	100M	BPSK	1	1	Front	10mm	633334	3500.01	22.73	23.00	1.064	-0.08	0.162	0.172
	FR1 n78_Ant 0	100M	BPSK	135	69	Front	10mm	633334	3500.01	22.72	23.00	1.067	-0.17	0.062	0.066
	FR1 n78_Ant 0	100M	BPSK	1	1	Back	10mm	633334	3500.01	22.73	23.00	1.064	-0.19	0.137	0.146
	FR1 n78_Ant 0	100M	BPSK	135	69	Back	10mm	633334	3500.01	22.72	23.00	1.067	0	0.094	0.100
	FR1 n78_Ant 0	100M	BPSK	1	1	Left Side	10mm	633334	3500.01	22.73	23.00	1.064	-0.06	0.001	0.001
	FR1 n78_Ant 0	100M	BPSK	135	69	Left Side	10mm	633334	3500.01	22.72	23.00	1.067	-0.08	0.001	0.001
17	FR1 n78_Ant 0	100M	BPSK	1	1	Right Side	10mm	633334	3500.01	22.73	23.00	1.064	-0.17	0.421	0.448
	FR1 n78_Ant 0	100M	BPSK	135	69	Right Side	10mm	633334	3500.01	22.72	23.00	1.067	-0.15	0.286	0.305
	FR1 n78_Ant 0	100M	BPSK	1	1	Top Side	10mm	633334	3500.01	22.73	23.00	1.064	0.13	0.060	0.064
	FR1 n78_Ant 0	100M	BPSK	135	69	Top Side	10mm	633334	3500.01	22.72	23.00	1.067	0.09	0.044	0.047
	FR1 n78_Ant 0	100M	BPSK	1	1	Bottom Side	10mm	633334	3500.01	22.73	23.00	1.064	-0.18	0.027	0.029
	FR1 n78_Ant 0	100M	BPSK	135	69	Bottom Side	10mm	633334	3500.01	22.72	23.00	1.067	-0.11	0.017	0.018



**<WLAN SAR>**

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz_Ant 1+2	802.11b 1Mbps	Front	10mm	11	2462	17.95	19.00	1.274	97	1.031	-0.15	0.169	0.222
18	WLAN2.4GHz_Ant 1+2	802.11b 1Mbps	Back	10mm	11	2462	17.95	19.00	1.274	97	1.031	-0.06	0.508	0.667
	WLAN2.4GHz_Ant 1+2	802.11b 1Mbps	Left Side	10mm	11	2462	17.95	19.00	1.274	97	1.031	0.13	0.162	0.213
	WLAN2.4GHz_Ant 1+2	802.11b 1Mbps	Right Side	10mm	11	2462	17.95	19.00	1.274	97	1.031	0	0.200	0.263
	WLAN2.4GHz_Ant 1+2	802.11b 1Mbps	Top Side	10mm	11	2462	17.95	19.00	1.274	97	1.031	-0.13	0.089	0.117
	WLAN2.4GHz_Ant 1+2	802.11b 1Mbps	Bottom Side	10mm	11	2462	17.95	19.00	1.274	97	1.031	-0.07	0.039	0.051
	WLAN5GHz_Ant 1+2	802.11ax-HE80 MCS0	Front	10mm	42	5210	12.65	14.00	1.365	99	1.010	-0.17	0.032	0.044
	WLAN5GHz_Ant 1+2	802.11ax-HE80 MCS0	Back	10mm	42	5210	12.65	14.00	1.365	99	1.010	0.18	0.114	0.157
19	WLAN5GHz_Ant 1+2	802.11ax-HE80 MCS0	Left Side	10mm	42	5210	12.65	14.00	1.365	99	1.010	-0.05	0.222	0.306
	WLAN5GHz_Ant 1+2	802.11ax-HE80 MCS0	Right Side	10mm	42	5210	12.65	14.00	1.365	99	1.010	-0.06	0.133	0.183
	WLAN5GHz_Ant 1+2	802.11ax-HE80 MCS0	Top Side	10mm	42	5210	12.65	14.00	1.365	99	1.010	0.16	0.038	0.052
	WLAN5GHz_Ant 1+2	802.11ax-HE80 MCS0	Bottom Side	10mm	42	5210	12.65	14.00	1.365	99	1.010	0.14	0.039	0.053
	WLAN5GHz_Ant 1+2	802.11ax-HE80 MCS0	Front	10mm	155	5775	13.55	14.00	1.109	99	1.010	-0.12	0.047	0.053
	WLAN5GHz_Ant 1+2	802.11ax-HE80 MCS0	Back	10mm	155	5775	13.55	14.00	1.109	99	1.010	0.01	0.140	0.157
20	WLAN5GHz_Ant 1+2	802.11ax-HE80 MCS0	Left Side	10mm	155	5775	13.55	14.00	1.109	99	1.010	-0.14	0.249	0.279
	WLAN5GHz_Ant 1+2	802.11ax-HE80 MCS0	Right Side	10mm	155	5775	13.55	14.00	1.109	99	1.010	-0.15	0.123	0.137
	WLAN5GHz_Ant 1+2	802.11ax-HE80 MCS0	Top Side	10mm	155	5775	13.55	14.00	1.109	99	1.010	-0.16	0.039	0.043
	WLAN5GHz_Ant 1+2	802.11ax-HE80 MCS0	Bottom Side	10mm	155	5775	13.55	14.00	1.109	99	1.010	0.02	0.036	0.041

**15.2 Repeated SAR Measurement**

No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 41_Ant 0	20M	QPSK	1	0	Top Side	10mm	41490	2680	21.17	21.50	1.079	62.9	1.006	0.06	1.070	-	1.161
2nd	LTE Band 41_Ant 0	20M	QPSK	1	0	Top Side	10mm	41490	2680	21.17	21.50	1.079	62.9	1.006	0.05	1.030	1.04	1.118

**General Note:**

- Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8W/kg$ .
- Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is  $\leq 1.2$  and the measured SAR  $< 1.45W/kg$ , only one repeated measurement is required.
- The ratio is the difference in percentage between original and repeated *measured SAR*.
- All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

**16. Simultaneous Transmission Analysis**

NO.	Simultaneous Transmission Configurations	Body
1.	WWAN + 2.4GHz WLAN Ant 1&2 + FR1	Yes
2.	WWAN + 5GHz WLAN Ant 1&2 + FR1	Yes

**General Note:**

1. The Scaled SAR summation is calculated based on the same configuration and test position.
2. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
  - i) Scalar SAR summation < 1.6W/kg.
  - ii)  $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$ , and the peak separation distance is determined from the square root of  $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$ , where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
  - iii) If  $SPLSR \leq 0.04$ , simultaneously transmission SAR measurement is not necessary.
  - iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
  - v) The SPLSR calculated results please refer to section 16.2.

**16.1 Hotspot Exposure Conditions**

WWAN Band	Exposure Position	1	3	4	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
		WWAN 1g SAR (W/kg)	2.4GHz WLAN Ant 1+2 1g SAR (W/kg)	5GHz WLAN Ant 1+2 1g SAR (W/kg)		
WCDMA II_Ant 0	Front	0.764	0.222	0.053	0.986	0.817
	Back	0.927	0.667	0.157	1.594	1.084
	Left side	0.190	0.213	0.306	0.403	0.496
	Right side	0.561	0.263	0.183	0.824	0.744
	Top side	0.431	0.117	0.052	0.548	0.483
	Bottom side	0.075	0.051	0.053	0.126	0.128
WCDMA V_Ant 0	Front	0.567	0.222	0.053	0.789	0.620
	Back	0.691	0.667	0.157	1.358	0.848
	Left side	0.397	0.213	0.306	0.610	0.703
	Right side	0.376	0.263	0.183	0.639	0.559
	Top side	0.206	0.117	0.052	0.323	0.258
	Bottom side	0.001	0.051	0.053	0.052	0.054
LTE Band 2_Ant 3	Front	0.528	0.222	0.053	0.750	0.581
	Back	0.639	0.667	0.157	1.306	0.796
	Left side	0.323	0.213	0.306	0.536	0.629
	Right side	0.145	0.263	0.183	0.408	0.328
	Top side	0.001	0.117	0.052	0.118	0.053
	Bottom side	0.351	0.051	0.053	0.402	0.404
LTE Band 7_Ant 0	Front	0.440	0.222	0.053	0.662	0.493
	Back	0.632	0.667	0.157	1.299	0.789
	Left side	0.266	0.213	0.306	0.479	0.572
	Right side	0.080	0.263	0.183	0.343	0.263
	Top side	0.995	0.117	0.052	1.112	1.047
	Bottom side	0.001	0.051	0.053	0.052	0.054
LTE Band 12_Ant 0	Front	0.423	0.222	0.053	0.645	0.476
	Back	0.549	0.667	0.157	1.216	0.706
	Left side	0.309	0.213	0.306	0.522	0.615
	Right side	0.260	0.263	0.183	0.523	0.443
	Top side	0.091	0.117	0.052	0.208	0.143
	Bottom side	0.001	0.051	0.053	0.052	0.054





WWAN Band	Exposure Position	1	3	4	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)
		WWAN	2.4GHz WLAN Ant 1+2	5GHz WLAN Ant 1+2		
		1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)		
LTE Band 13_Ant 0	Front	0.222	0.222	0.053	0.444	0.275
	Back	0.241	0.667	0.157	0.908	0.398
	Left side	0.086	0.213	0.306	0.299	0.392
	Right side	0.167	0.263	0.183	0.430	0.350
	Top side	0.063	0.117	0.052	0.180	0.115
	Bottom side	0.001	0.051	0.053	0.052	0.054
LTE Band 25_Ant 0	Front	0.401	0.222	0.053	0.623	0.454
	Back	0.469	0.667	0.157	1.136	0.626
	Left side	0.157	0.213	0.306	0.370	0.463
	Right side	0.368	0.263	0.183	0.631	0.551
	Top side	0.259	0.117	0.052	0.376	0.311
	Bottom side	0.001	0.051	0.053	0.052	0.054
LTE Band 26_Ant 0	Front	0.379	0.222	0.053	0.601	0.432
	Back	0.397	0.667	0.157	1.064	0.554
	Left side	0.232	0.213	0.306	0.445	0.538
	Right side	0.261	0.263	0.183	0.524	0.444
	Top side	0.132	0.117	0.052	0.249	0.184
	Bottom side	0.001	0.051	0.053	0.052	0.054
LTE Band 41_Ant 0	Front	0.384	0.222	0.053	0.606	0.437
	Back	0.827	0.667	0.157	1.494	0.984
	Left side	0.115	0.213	0.306	0.328	0.421
	Right side	0.068	0.263	0.183	0.331	0.251
	Top side	1.161	0.117	0.052	1.278	1.213
	Bottom side	0.001	0.051	0.053	0.052	0.054
LTE Band 48_Ant 0	Front	0.188	0.222	0.053	0.410	0.241
	Back	0.378	0.667	0.157	1.045	0.535
	Left side	0.001	0.213	0.306	0.214	0.307
	Right side	0.640	0.263	0.183	0.903	0.823
	Top side	0.187	0.117	0.052	0.304	0.239
	Bottom side	0.037	0.051	0.053	0.088	0.090
LTE Band 66_Ant 0	Front	0.725	0.222	0.053	0.947	0.778
	Back	0.921	0.667	0.157	1.588	1.078
	Left side	0.199	0.213	0.306	0.412	0.505
	Right side	0.516	0.263	0.183	0.779	0.699
	Top side	0.494	0.117	0.052	0.611	0.546
	Bottom side	0.113	0.051	0.053	0.164	0.166
LTE Band 66_Ant 3	Front	0.114	0.222	0.053	0.336	0.167
	Back	0.247	0.667	0.157	0.914	0.404
	Left side	0.001	0.213	0.306	0.214	0.307
	Right side	0.001	0.263	0.183	0.264	0.184
	Top side	0.001	0.117	0.052	0.118	0.053
	Bottom side	0.123	0.051	0.053	0.174	0.176
LTE Band 71_Ant 0	Front	0.359	0.222	0.053	0.581	0.412
	Back	0.461	0.667	0.157	1.128	0.618
	Left side	0.201	0.213	0.306	0.414	0.507
	Right side	0.235	0.263	0.183	0.498	0.418
	Top side	0.081	0.117	0.052	0.198	0.133
	Bottom side	0.001	0.051	0.053	0.052	0.054



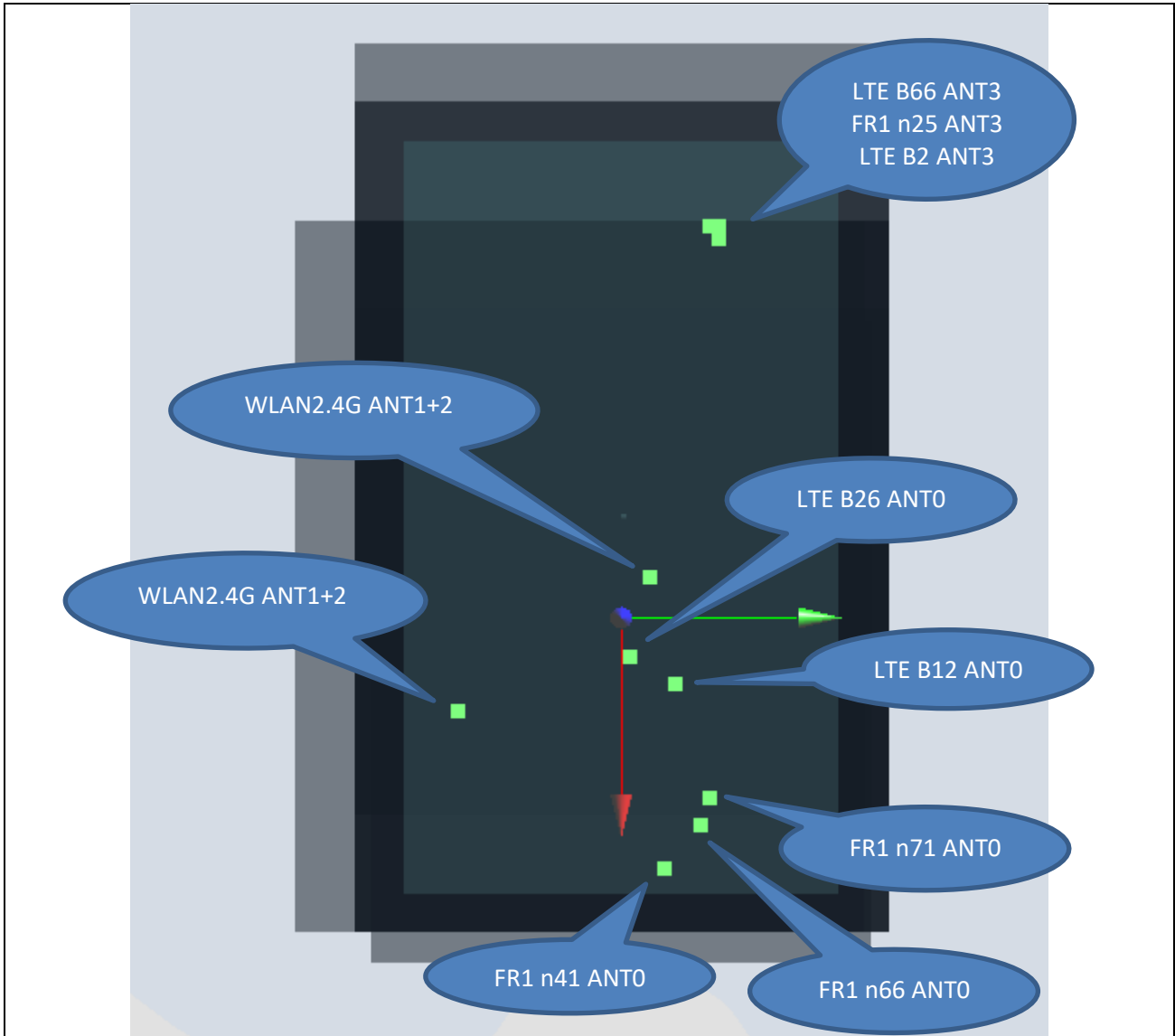
<EN-DC active>

WWAN Band	FR1 Band	Exposure Position	1	2	3	4	1+2+3 Summed 1g SAR (W/kg)	1+2+4 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN	FR1	2.4GHz WLAN Ant 1+2	5GHz WLAN Ant 1+2				
			1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)				
LTE Band 2_Ant 3	FR1 n41_Ant 0	Front	0.528	0.519	0.222	0.053	1.269	1.100	0.04	Case 1
		Back	0.639	0.715	0.667	0.157	2.021	1.511		
		Left side	0.323	0.175	0.213	0.306	0.711	0.804		
		Right side	0.145	0.141	0.263	0.183	0.549	0.469		
		Top side	0.001	0.791	0.117	0.052	0.909	0.844		
		Bottom side	0.351	0.001	0.051	0.053	0.403	0.405		
LTE Band 2_Ant 3	FR1 n66_Ant 0	Front	0.528	0.446	0.222	0.053	1.196	1.027	0.03	Case 2
		Back	0.639	0.524	0.667	0.157	1.830	1.320		
		Left side	0.323	0.077	0.213	0.306	0.613	0.706		
		Right side	0.145	0.234	0.263	0.183	0.642	0.562		
		Top side	0.001	0.282	0.117	0.052	0.400	0.335		
		Bottom side	0.351	0.037	0.051	0.053	0.439	0.441		
LTE Band 2_Ant 3	FR1 n71_Ant 0	Front	0.528	0.453	0.222	0.053	1.203	1.034	0.03	Case 3
		Back	0.639	0.524	0.667	0.157	1.830	1.320		
		Left side	0.323	0.171	0.213	0.306	0.707	0.800		
		Right side	0.145	0.176	0.263	0.183	0.584	0.504		
		Top side	0.001	0.112	0.117	0.052	0.230	0.165		
		Bottom side	0.351	0.001	0.051	0.053	0.403	0.405		
LTE Band 26(5)_Ant 0	FR1 n25_Ant 3	Front	0.379	0.184	0.222	0.053	0.785	0.616	0.04	Case 4
		Back	0.397	0.589	0.667	0.157	1.653	1.143		
		Left side	0.232	0.113	0.213	0.306	0.558	0.651		
		Right side	0.261	0.001	0.263	0.183	0.525	0.445		
		Top side	0.132	0.001	0.117	0.052	0.250	0.185		
		Bottom side	0.001	0.153	0.051	0.053	0.205	0.207		
LTE Band 7_Ant 0	FR1 n78_Ant 0	Front	0.349	0.172	0.222	0.053	0.743	0.574		
		Back	0.502	0.146	0.667	0.157	1.315	0.805		
		Left side	0.211	0.001	0.213	0.306	0.425	0.518		
		Right side	0.063	0.448	0.263	0.183	0.774	0.694		
		Top side	0.790	0.064	0.117	0.052	0.971	0.906		
		Bottom side	0.001	0.029	0.051	0.053	0.081	0.083		
LTE Band 12_Ant 0	FR1 n25_Ant 3	Front	0.423	0.184	0.222	0.053	0.829	0.660	0.04	Case 5
		Back	0.549	0.589	0.667	0.157	1.805	1.295		
		Left side	0.309	0.113	0.213	0.306	0.635	0.728		
		Right side	0.260	0.001	0.263	0.183	0.524	0.444		
		Top side	0.091	0.001	0.117	0.052	0.209	0.144		
		Bottom side	0.001	0.153	0.051	0.053	0.205	0.207		
LTE Band 12_Ant 0	FR1 n25_Ant 3	Front	0.423	0.184	0.222	0.053	0.829	0.660		
		Back	0.549	0.186	0.667	0.157	1.402	0.892		
		Left side	0.309	0.001	0.213	0.306	0.523	0.616		
		Right side	0.260	0.012	0.263	0.183	0.535	0.455		
		Top side	0.091	0.001	0.117	0.052	0.209	0.144		
		Bottom side	0.001	0.070	0.051	0.053	0.122	0.124		
LTE Band 66_Ant 3	FR1 n41_Ant 0	Front	0.114	0.519	0.222	0.053	0.855	0.686	0.04	Case 6
		Back	0.247	0.715	0.667	0.157	1.629	1.119		
		Left side	0.001	0.175	0.213	0.306	0.389	0.482		
		Right side	0.001	0.141	0.263	0.183	0.405	0.325		
		Top side	0.001	0.791	0.117	0.052	0.909	0.844		
		Bottom side	0.123	0.001	0.051	0.053	0.175	0.177		
LTE Band 66_Ant 3	FR1 n71_Ant 0	Front	0.114	0.453	0.222	0.053	0.789	0.620		
		Back	0.247	0.524	0.667	0.157	1.438	0.928		
		Left side	0.001	0.171	0.213	0.306	0.385	0.478		
		Right side	0.001	0.176	0.263	0.183	0.440	0.360		
		Top side	0.001	0.112	0.117	0.052	0.230	0.165		
		Bottom side	0.123	0.001	0.051	0.053	0.175	0.177		

**16.2 SPLSR Evaluation and Analysis**

**General Note:**

1.  $SPLSR = (SAR_1 + SAR_2)^{1.5} / (min. \text{ separation distance, mm})$ . If  $SPLSR \leq 0.04$ , simultaneously transmission SAR measurement is not necessary
2. The detail hotspot point for each transmitter in each exposure condition are showing as below figure and the minimum 3D distance for each sum combination is used for SPLSR analysis.





	Band	Position	SAR (W/kg)	Gap	SAR peak location (mm)			3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
				(mm)	X	Y	Z				
Case 1	LTE Band 2_Ant 3	Back	0.639	10	-48.6	18.1	-1.32	107.5	1.43	0.02	Not required
	FR1 n41 Ant 0		0.795	10	58.4	8.2	-0.64				
	LTE Band 2_Ant 3	Back	0.639	10	-48.6	18.1	-1.32	89.3	1.31	0.02	Not required
	WLAN2.4G Ant1+2		0.667	10	28.8	-26.4	-1.07				
	FR1 n41 Ant 0	Back	0.795	10	58.4	8.2	-0.64	45.5	1.46	0.04	Not required
	WLAN2.4G Ant1+2		0.667	10	28.8	-26.4	-1.07				
Case 2	LTE Band 2_Ant 3	Back	0.639	10	-48.6	18.1	-1.32	100.9	1.16	0.01	Not required
	FR1 n66 Ant 0		0.524	10	52	10.3	-1.09				
	LTE Band 2_Ant 3	Back	0.639	10	-48.6	18.1	-1.32	89.3	1.31	0.02	Not required
	WLAN2.4G Ant1+2		0.667	10	28.8	-26.4	-1.07				
	FR1 n66 Ant 0	Back	0.524	10	52	10.3	-1.09	43.4	1.19	0.03	Not required
	WLAN2.4G Ant1+2		0.667	10	28.8	-26.4	-1.07				
Case 3	LTE Band 2_Ant 3	Back	0.639	10	-48.6	18.1	-1.32	94.6	1.16	0.01	Not required
	FR1 n71 Ant 0		0.524	10	45.9	15	-1.11				
	LTE Band 2_Ant 3	Back	0.639	10	-48.6	18.1	-1.32	89.3	1.31	0.02	Not required
	WLAN2.4G Ant1+2		0.667	10	28.8	-26.4	-1.07				
	FR1 n71 Ant 0	Back	0.524	10	45.9	15	-1.11	44.8	1.19	0.03	Not required
	WLAN2.4G Ant1+2		0.667	10	28.8	-26.4	-1.07				
Case 4	LTE Band 26_Ant 0	Back	0.397	10	23.5	3.1	-1.75	72.2	0.99	0.01	Not required
	FR1 n25 Ant 3		0.589	10	-47.4	16.5	-1				
	LTE Band 26_Ant 0	Back	0.397	10	23.5	3.1	-1.75	30.0	1.06	0.04	Not required
	WLAN2.4G Ant1+2		0.667	10	28.8	-26.4	-1.07				
	FR1 n25 Ant 3	Back	0.589	10	-47.4	16.5	-1	87.4	1.26	0.02	Not required
	WLAN2.4G Ant1+2		0.667	10	28.8	-26.4	-1.07				
Case 5	LTE Band 12_Ant 0	Back	0.549	10	32.8	9	-1.57	80.6	1.14	0.02	Not required
	FR1 n25 Ant 3		0.589	10	-47.4	16.5	-1				
	LTE Band 12_Ant 0	Back	0.549	10	32.8	9	-1.57	35.6	1.22	0.04	Not required
	WLAN2.4G Ant1+2		0.667	10	28.8	-26.4	-1.07				
	FR1 n25 Ant 3	Back	0.589	10	-47.4	16.5	-1	87.4	1.26	0.02	Not required
	WLAN2.4G Ant1+2		0.667	10	28.8	-26.4	-1.07				
Case 6	LTE Band 66_Ant 3	Back	0.247	10	-47.4	15	-1	106.0	0.96	0.01	Not required
	FR1 n41 Ant 0		0.715	10	58.4	8.2	-0.64				
	LTE Band 66_Ant 3	Back	0.247	10	-47.4	15	-1	86.7	0.91	0.01	Not required
	WLAN2.4G Ant1+2		0.667	10	28.8	-26.4	-1.07				
	FR1 n41 Ant 0	Back	0.715	10	58.4	8.2	-0.64	45.5	1.38	0.04	Not required
	WLAN2.4G Ant1+2		0.667	10	28.8	-26.4	-1.07				

Test Engineer : Ken Lin, Willie Huang and Mood Huang



## **17. Uncertainty Assessment**

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be  $\leq 30\%$ , for a confidence interval of  $k = 2$ . If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg. Therefore, the measurement uncertainty table is not required in this report.

### Declaration of Conformity:

The test results with all measurement uncertainty excluded is presented in accordance with the regulation limits or requirements declared by manufacturers.

### Comments and Explanations:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

## **18. References**

- [1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
- [2] ANSI/IEEE Std. C95.1-1992, "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz", September 1992
- [3] IEEE Std. 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", Sep 2013
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 248227 D01 v02r02, "SAR Guidance for IEEE 802.11 (WiFi) Transmitters", Oct 2015.
- [6] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [7] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [8] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
- [9] FCC KDB 941225 D05A v01r02, "Rel. 10 LTE SAR Test Guidance and KDB Inquiries", Oct 2015
- [10] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.
- [11] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [12] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.