FCC SAR Test Report

APPLICANT	:	KonnectONE
EQUIPMENT	:	LTE MiFi
BRAND NAME	:	moxee
MODEL NAME	:	K779HSDL
FCC ID	:	2APQU-K779HSDL
STANDARD	:	FCC 47 CFR PART 2 (2.1093) ANSI/IEEE C95.1-1992 IEEE 1528-2013

The product was received on Nov. 06, 2019 and testing was started from Dec. 23, 2019 and completed on Dec. 31, 2019. We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (Kunshan) Inc., the test report shall not be reproduced except in full.

Rose Wang

Reviewed by: Rose Wang / Supervisor

Kat Yin

Approved by: Kat Yin / Manager

ACCREDITED
Cert #5145.02

Sporton International (Kunshan) Inc.
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China

Table of Contents

1. Statement of Compliance **4**
2. Administration Data **5**
3. Guidance Applied **5**
4. Equipment Under Test (EUT) Information **6**
4.1 General Information 6
4.2 General LTE SAR Test and Reporting Considerations 7
5. Proximity Sensor Triggering Test **10**
6. RF Exposure Limits **18**
6.1 Uncontrolled Environment 18
6.2 Controlled Environment 18
7. Specific Absorption Rate (SAR) **19**
7.1 Introduction 19
7.2 SAR Definition 19
8. System Description and Setup **20**
8.1 E-Field Probe 21
8.2 Data Acquisition Electronics (DAE) 21
8.3 Phantom 22
8.4 Device Holder 23
9. Measurement Procedures **24**
9.1 Spatial Peak SAR Evaluation 24
9.2 Power Reference Measurement 25
9.3 Area Scan 25
9.4 Zoom Scan 26
9.5 Volume Scan Procedures 26
9.6 Power Drift Monitoring 26
10. Test Equipment List **27**
11. System Verification **28**
11.1 Tissue Simulating Liquids 28
11.2 Tissue Verification 29
11.3 System Performance Check Results 30
12. RF Exposure Positions **31**
12.1 Wireless Router 31
13. Conducted RF Output Power (Unit: dBm) **32**
14. Antenna Location **81**
15. SAR Test Results **82**
15.1 Body SAR 84
15.2 Repeated SAR Measurement 88
16. Simultaneous Transmission Analysis **89**
16.1 Body Exposure Conditions 90
17. Uncertainty Assessment **92**
18. References **93**
Appendix A. Plots of System Performance Check
Appendix B. Plots of High SAR Measurement
Appendix C. DASY Calibration Certificate
Appendix D. Test Setup Photos

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA9N0608	Rev. 01	Initial issue of report	Jan. 10, 2020

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **KonnectONE, LTE MiFi, K779HSDL,** are as follows.

Highest Standalone 1g SAR Summary				
Equipment Class	Frequency Band		Body 1g SAR (W/kg)	Highest Simultaneous Transmission 1g SAR (W/kg)
Licensed	LTE	Band 71	0.76	1.59
		Band 12	0.95	
		Band 13	1.01	
		Band 26/Band 5	**1.06**	
		Band 66/Band 4	0.77	
		Band 25/Band 2	1.00	
		Band 41	0.90	
DTS	WLAN	2.4GHz WLAN	0.54	1.59
NII		5GHz WLAN	0.91	1.52
Date of Testing:		2019/12/23~ 2019/12/31		

Remark: This device supports LTE B4 / B5 / B2 and B66 / B26 / B25. Since the supported frequency span for LTE B4 / B5 / B2 falls completely within the supports frequency span for LTE B66 / B26 / B25, both LTE bands have the same target power, and both LTE bands share the same transmission path; therefore, SAR was only assessed for LTE B66 / B26 / B25.

Declaration of Conformity:
The test results with all measurement uncertainty excluded are 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.

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) 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.

2. Administration Data

Sporton International (Kunshan) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Testing Laboratory		
Test Firm	Sporton International (Kunshan) Inc.	
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158 FAX : +86-512-57900958	
Test Site No.	FCC Designation No.	FCC Test Firm Registration No.
	CN1257	314309

Applicant	
Company Name	KonnectONE
Address	40 Lake Bellevue Drive, Suite 350, Bellevue, WA 98005

Manufacturer	
Company Name	MeiG Smart Technology Co., Ltd
Address	No. 1 building, 9th floor, No.20, the 4th road of Zhangba Road, high-tech district, Xi'an,China.

3. Guidance Applied

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- 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 D05 SAR for LTE Devices v02r05
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	LTE MiFi
Brand Name	moxee
Model Name	K779HSDL
FCC ID	2APQU-K779HSDL
S/N	779SDLABY9120600064
Wireless Technology and Frequency Range	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 25: 1850.7 MHz ~ 1914.3 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 41: 2498.5 MHz ~ 2687.5 MHz LTE Band 66: 1710.7 MHz ~ 1779.3 MHz LTE Band 71: 665.5 MHz ~ 695.5 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz
Mode	LTE: QPSK, 16QAM WLAN 2.4GHz : 802.11b/g/n HT20/HT40 WLAN 5GHz : 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80
HW Version	K779HSDL_V1.02_PCB
SW Version	K779HSDL_2.00.10_EQ100
EUT Stage	Identical Prototype

Remark:

1. This device does not support voice function.
2. The device employs proximity sensors that detect the presence of the user's body also a finger or hand near the front/ back/right/bottom side of the device, reduced power will be active for LTE band 2/4/5/13/25/26/66.

4.2 General LTE SAR Test and Reporting Considerations

<table>
<tr><th colspan="2">Summarized necessary items addressed in KDB 941225 D05 v02r05</th></tr>
<tr><td>FCC ID</td><td>2APQU-K779HSDL</td></tr>
<tr><td>Equipment Name</td><td>LTE MiFi</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td>LTE Band 2: 1850.7 MHz ~ 1909.3 MHz
LTE Band 4: 1710.7 MHz ~ 1754.3 MHz
LTE Band 5: 824.7 MHz ~ 848.3 MHz
LTE Band 12: 699.7 MHz ~ 715.3 MHz
LTE Band 13: 779.5 MHz ~ 784.5 MHz
LTE Band 25: 1850.7 MHz ~ 1914.3 MHz
LTE Band 26: 814.7 MHz ~ 848.3 MHz
LTE Band 41: 2498.5 MHz ~ 2687.5 MHz
LTE Band 66: 1710.7 MHz ~ 1779.3 MHz
LTE Band 71: 665.5 MHz ~ 695.5 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>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 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 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 71: 5MHz, 10MHz, 15MHz, 20MHz</td></tr>
<tr><td>Uplink Modulations used</td><td>QPSK / 16QAM / 64QAM (downlink only)</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Data only</td></tr>
<tr><td>LTE Release Version</td><td>R10, Cat 4</td></tr>
<tr><td>CA Support</td><td>Not Supported</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td>
<table>
<tr><th colspan="7">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3</th></tr>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</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>
<tr><td>QPSK</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>≤ 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>> 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>≤ 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>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table>
</td></tr>
<tr><td>LTE A-MPR</td><td>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)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td>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.</td></tr>
<tr><td>Power reduction applied to satisfy SAR compliance</td><td>Yes, The device employs proximity sensors that detect the presence of the user's body also a finger or hand near the front/ back/right/bottom side of the device, reduced power will be active for LTE band 2/4/5/13/25/26/66.</td></tr>
</table>

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	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844

LTE Band 12

	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 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
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

LTE Band 13

	Bandwidth 5 MHz		Bandwidth 10 MHz	
	Channel #	Freq.(MHz)	Channel #	Freq.(MHz)
L	23205	779.5	23230	782
M	23230	782		
H	23255	784.5		

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	
	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
M	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

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)
L	39675	2498.5	39700	2501	39725	2503.5	39750	2506
LM	40148	2545.8	40160	2547	40173	2548.3	40185	2549.5
M	40620	2593	40620	2593	40620	2593	40620	2593
HM	41093	2640.3	41080	2639	41068	2637.8	41055	2636.5
H	41565	2687.5	41540	2685	41515	2682.5	41490	2680

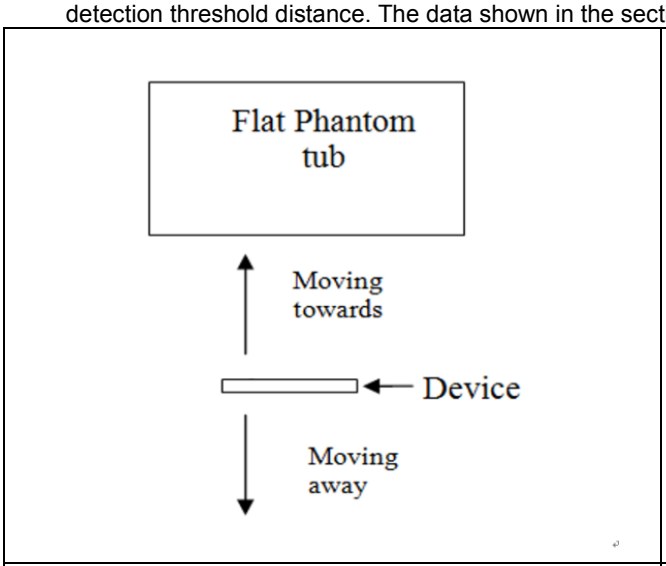
LTE Band 66												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	131979	1710.7	131987	1711.5	131997	1712.5	132022	1715	132047	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)
L	133147	665.5	133172	668	133197	670.5	133222	673
M	133247	675.5	133272	678	133297	680.5	133322	683
H	133447	695.5	133422	693	133397	690.5	133372	688

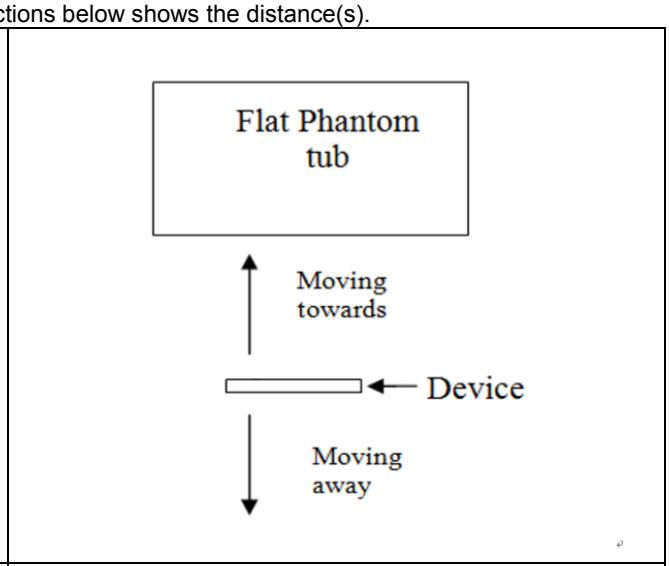
5. Proximity Sensor Triggering Test

<Proximity Sensor Triggering Distance (KDB 616217 D04 section 6.2)>:

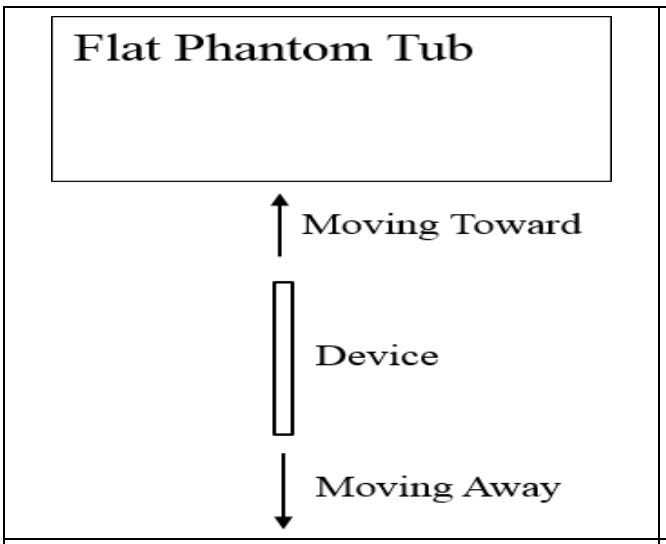
1. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed and the tissue-equivalent medium for highest frequency 1900MHz and lowest 750MHz frequency was used for proximity sensor triggering testing.
2. Capacitive proximity sensor placed coincident with antenna elements at the front/ back/right/bottom side of the device are utilized to determine when the device comes in proximity of the user's body at the front/ back/right/bottom side of the device for WWAN. There is no need to do sensor coverage testing for the proximity sensor is designed to support sufficient detection range and sensitivity to cover regions of the sensors in all applicable directions since the proximity sensor entirely covers the antenna.
3. When the sensor is active, LTE Band 2/4/5/13/25/26/66 reduced power will be active.
4. The sensors used to detect the proximity of the user's body at the front/back/right/bottom side of the device use a detection threshold distance. The data shown in the sections below shows the distance(s).



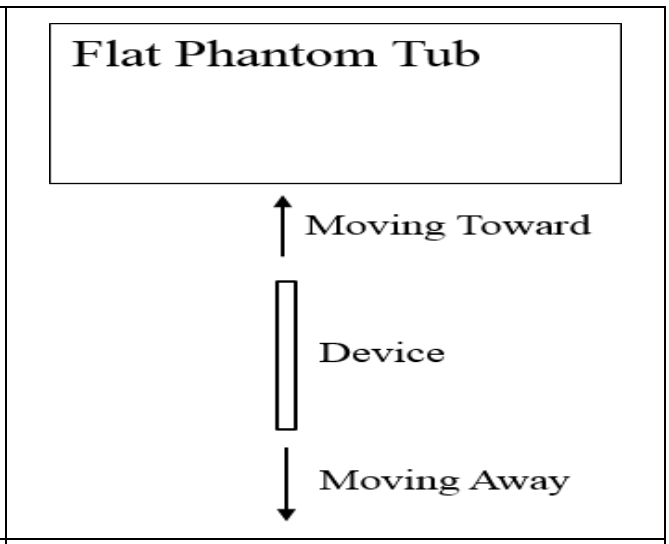
Sensor detection test set-up, Front face



Sensor detection test set-up, back face



Sensor detection test set-up, Right Side



Sensor detection test set-up, bottom side

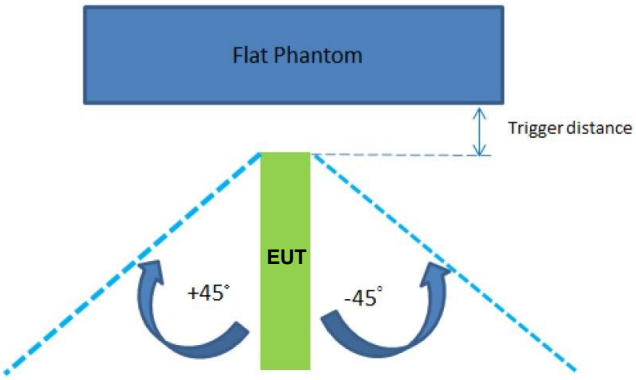
Proximity Sensor Triggering Distance (mm)								
Position	Front Face		Back Face		Right Side		Bottom Side	
	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away	Moving towards	Moving away
Minimum	20	22	18	20	12	14	27	29

<Proximity Sensor Triggering Coverage (KDB 616217 D04 section 6.3)>:

If a sensor is spatially offset from the antenna(s), it is necessary to verify sensor triggering for conditions where the antenna is next to the user but the sensor is laterally further away to ensure sensor coverage is sufficient for reducing the power to maintain compliance. For p-sensor coverage testing, the device is moved and “along the direction of maximum antenna and sensor offset”.
Illustrated in the internal photo exhibit, although the senor is spatially offset, there is no trigger condition where the antenna is next to the user but the sensor is laterally further away, therefore proximity sensor coverage testing is not required.
This procedure is not required because antenna and sensor are collocated and the peak SAR location is overlapping with the sensor.

<Tablet Tilt angle influences to proximity sensor triggering (KDB 616217 D04 section 6.4)>:

The influence of table tilt angles to proximity sensor triggering was determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom, at 11mm for Right Side and 26 mm for Bottom Side separation for WWAN bands.
Rotating the tablet around the edge next to the phantom in ≤ 10° increments until the tablet is ± 45° from the vertical position at 0°, and the maximum output power remains in the reduced mode.



The Sensor Trigger Distance (mm)			
WWAN	Position	Right Side	Bottom Side
	Minimum	12	27

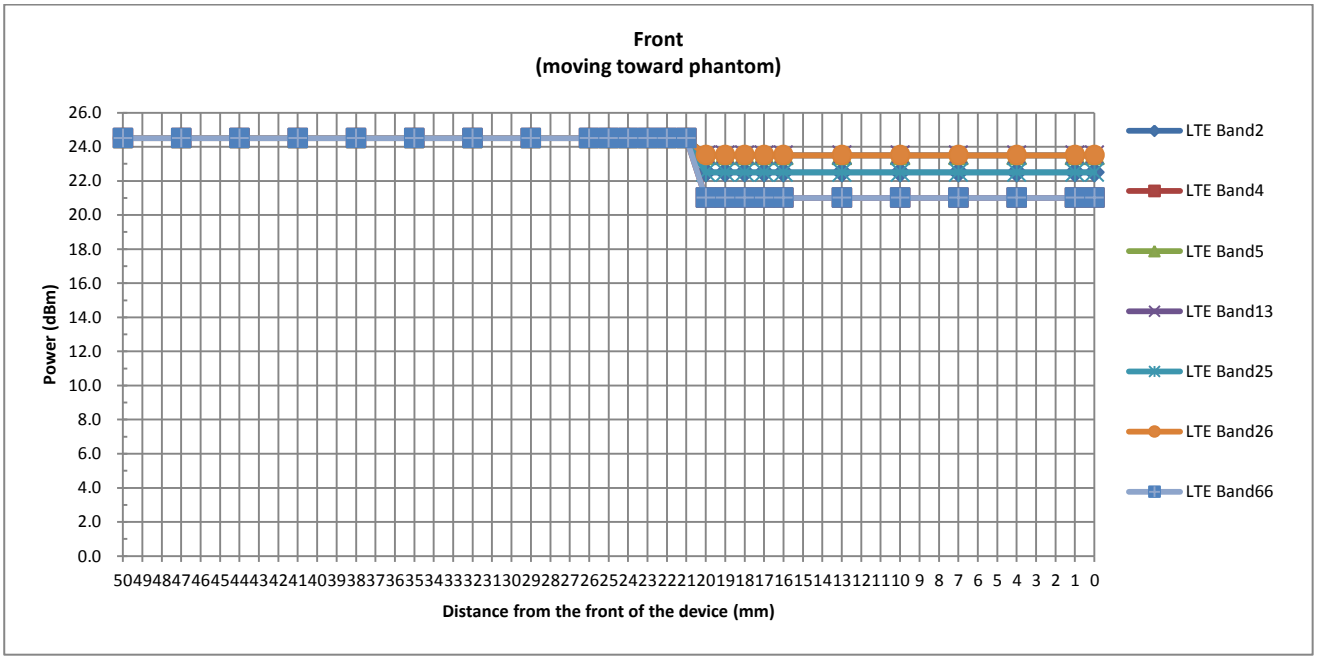
Proximity sensor power reduction

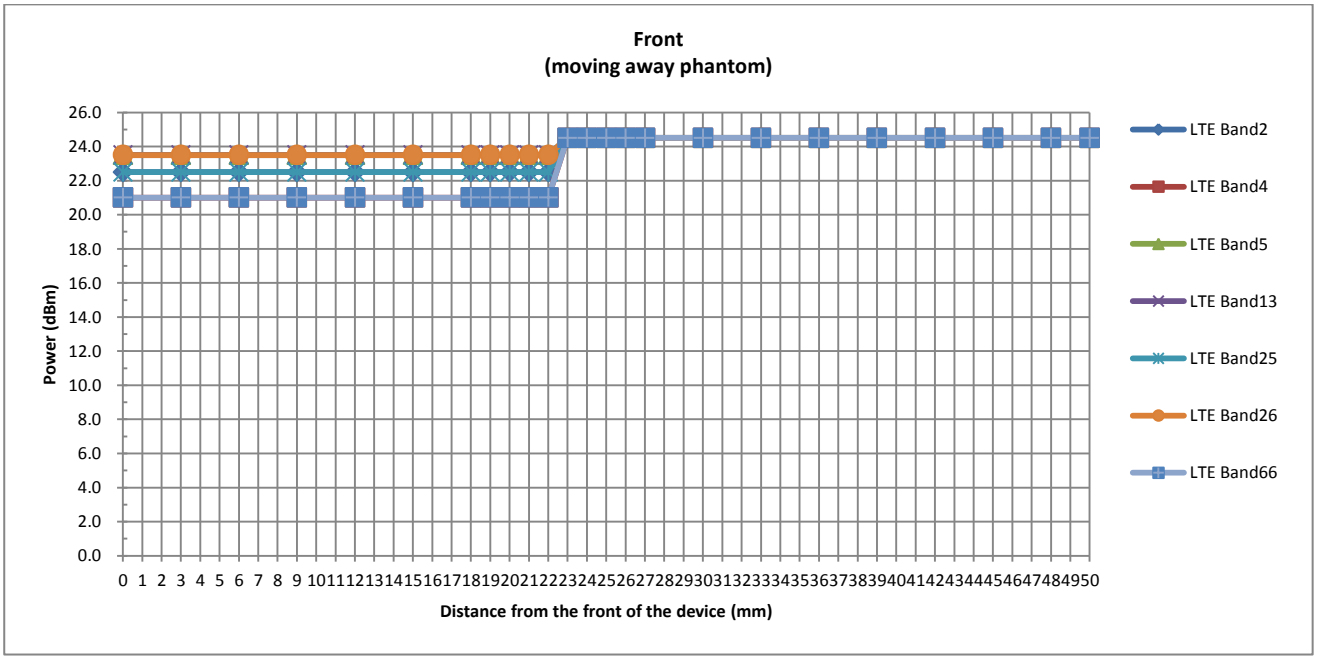
Exposure Position / wireless mode	Front Face	Back Face	Left Side	Right Side	Bottom Side
LTE Band 2	2.0 dB	2.0 dB	0 dB	2.0 dB	2.0 dB
LTE Band 4	3.5dB	3.5dB	0 dB	3.5dB	3.5dB
LTE Band 5	1.0 dB	1.0 dB	0 dB	1.0 dB	1.0 dB
LTE Band 13	1.0 dB	1.0 dB	0 dB	1.0 dB	1.0 dB
LTE Band 25	2.0 dB	2.0 dB	0 dB	2.0 dB	2.0 dB
LTE Band 26	1.0 dB	1.0 dB	0 dB	1.0 dB	1.0 dB
LTE Band 66	3.5dB	3.5dB	0 dB	3.5dB	3.5dB

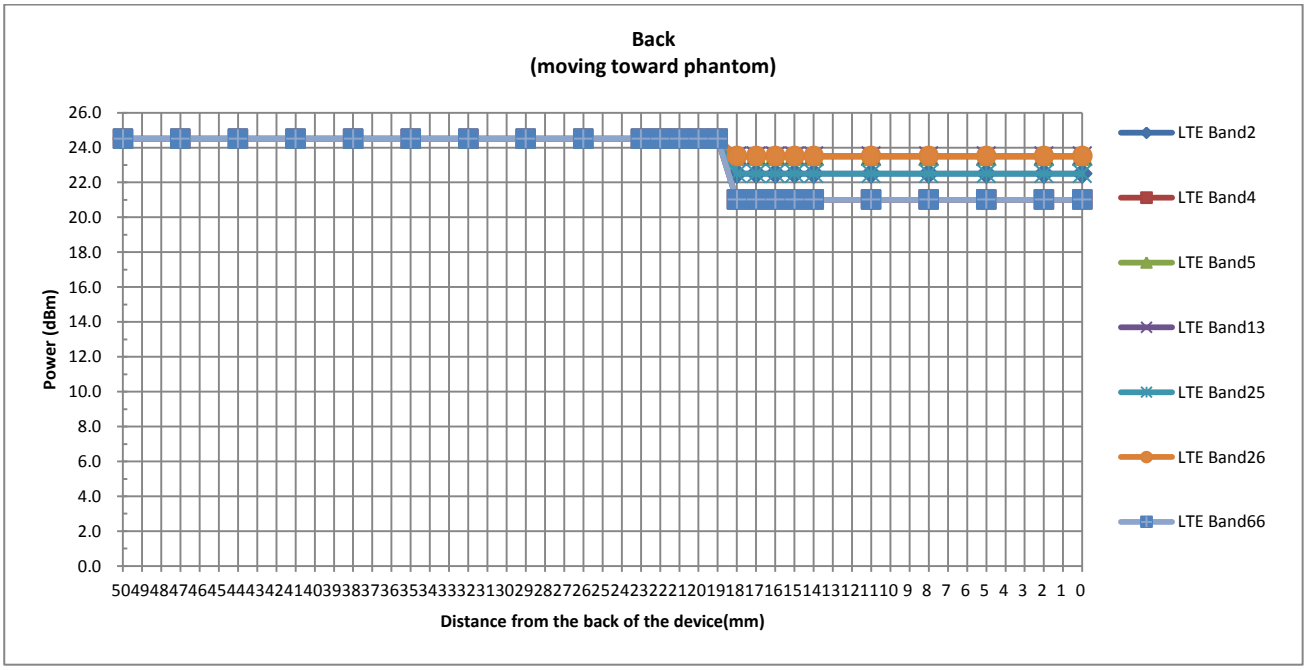
Remark:
1. (1): Reduced maximum limit applied by activation of proximity sensor.
2. Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown and described in exhibit "P-Sensor operational description
3. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:
   - Front Face: 19 mm
   - Back Face: 17 mm
   - Right Side: 11 mm
   - Bottom Side: 26 mm

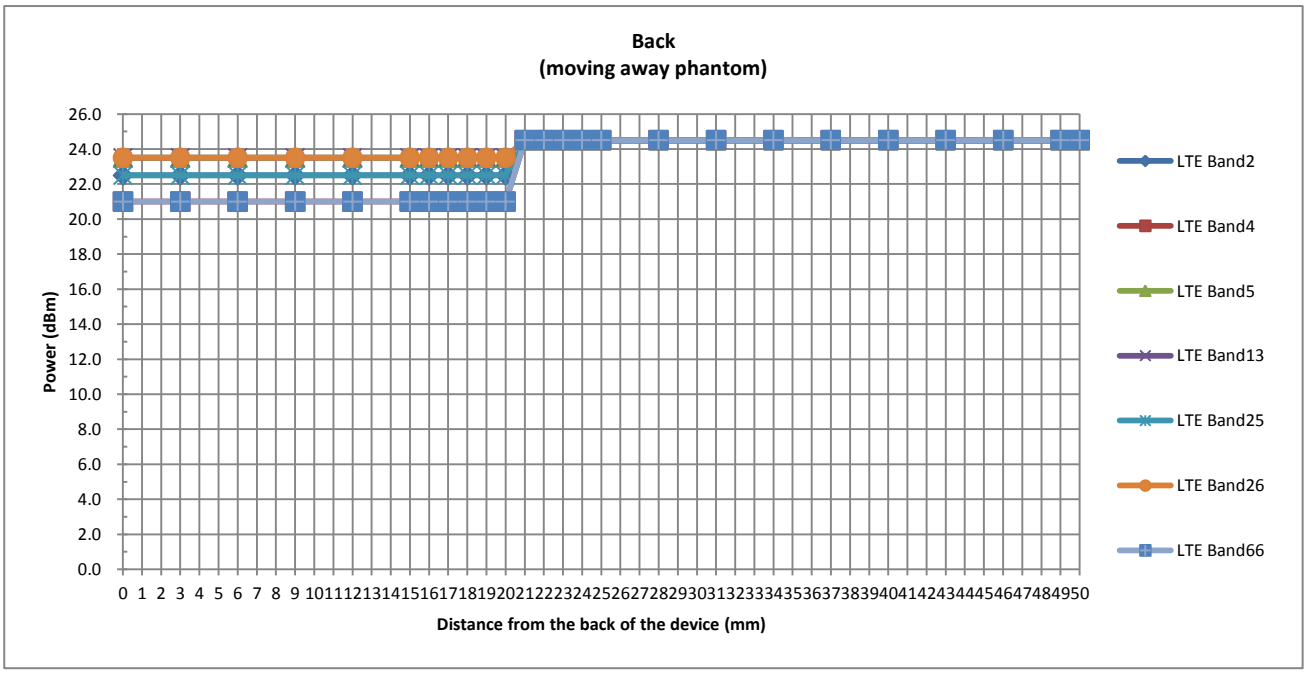
Power Measurement during Sensor Trigger distance testing

Band/Mode	Ch #	Measured power reduction (dBm)		Reduction Levels
		w/o power back-off	w/ power back-off	(dB)
LTE Band 2	18900	23.33	21.16	2.17
LTE Band 4	20175	23.16	19.72	3.44
LTE Band 5	20525	23.29	22.28	1.01
LTE Band 13	21100	23.34	22.25	1.09
LTE Band 25	26340	23.34	21.28	2.06
LTE Band 26	26865	23.45	22.35	1.10
LTE Band 66	132322	23.20	19.79	3.41


Front
(moving toward phantom)
Power (dBm)
Distance from the front of the device (mm)
LTE Band2
LTE Band4
LTE Band5
LTE Band13
LTE Band25
LTE Band26
LTE Band66


Front
(moving away phantom)
Power (dBm)
Distance from the front of the device (mm)
LTE Band2
LTE Band4
LTE Band5
LTE Band13
LTE Band25
LTE Band26
LTE Band66


Back
(moving toward phantom)
Power (dBm)
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
Distance from the back of the device(mm)
LTE Band2
LTE Band4
LTE Band5
LTE Band13
LTE Band25
LTE Band26
LTE Band66


Back
(moving away phantom)
Power (dBm)
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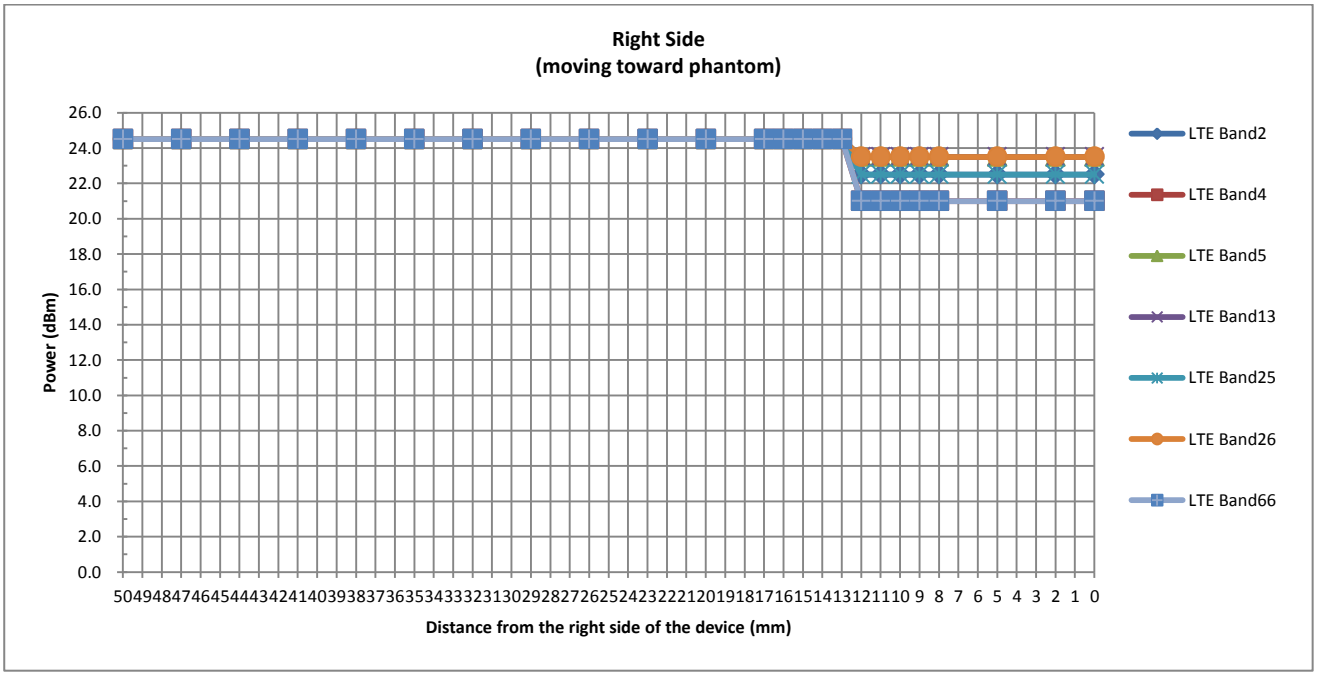
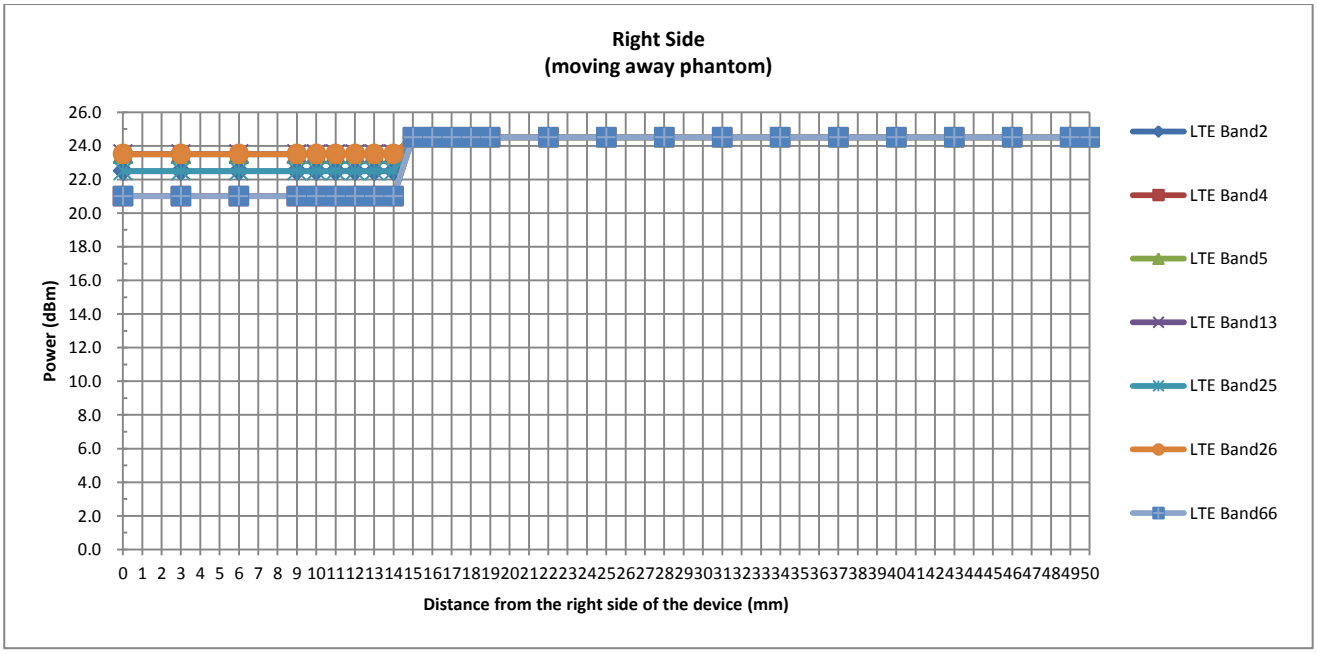
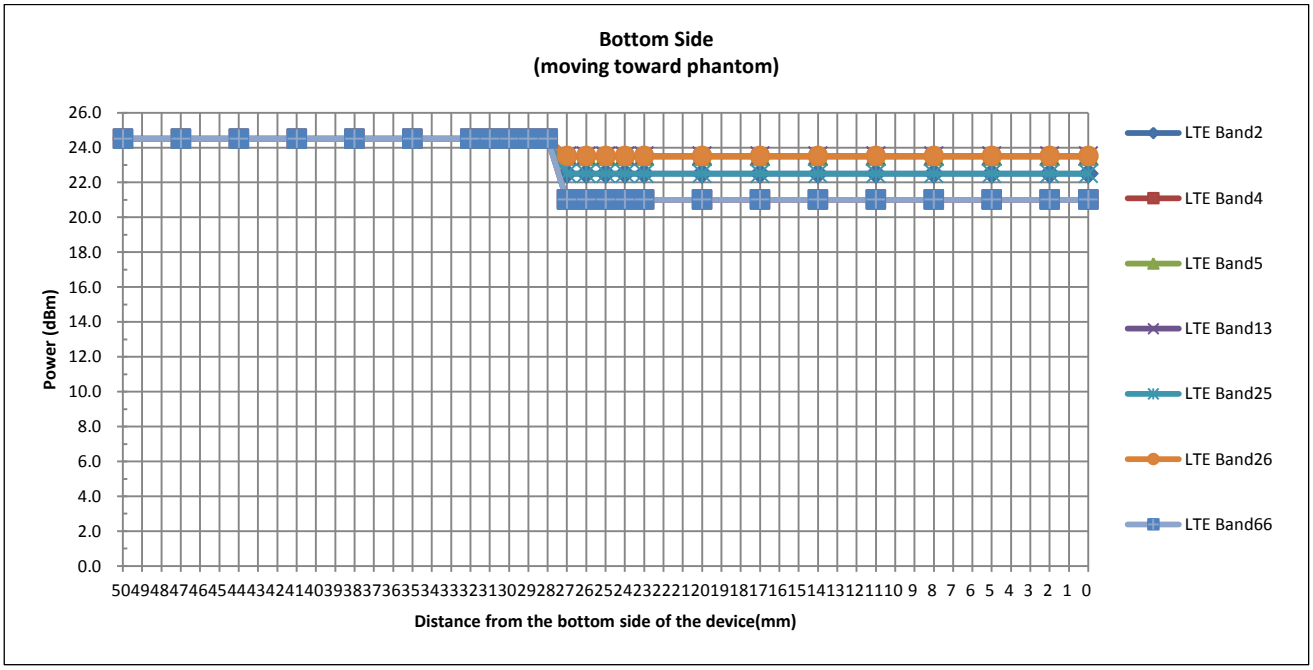
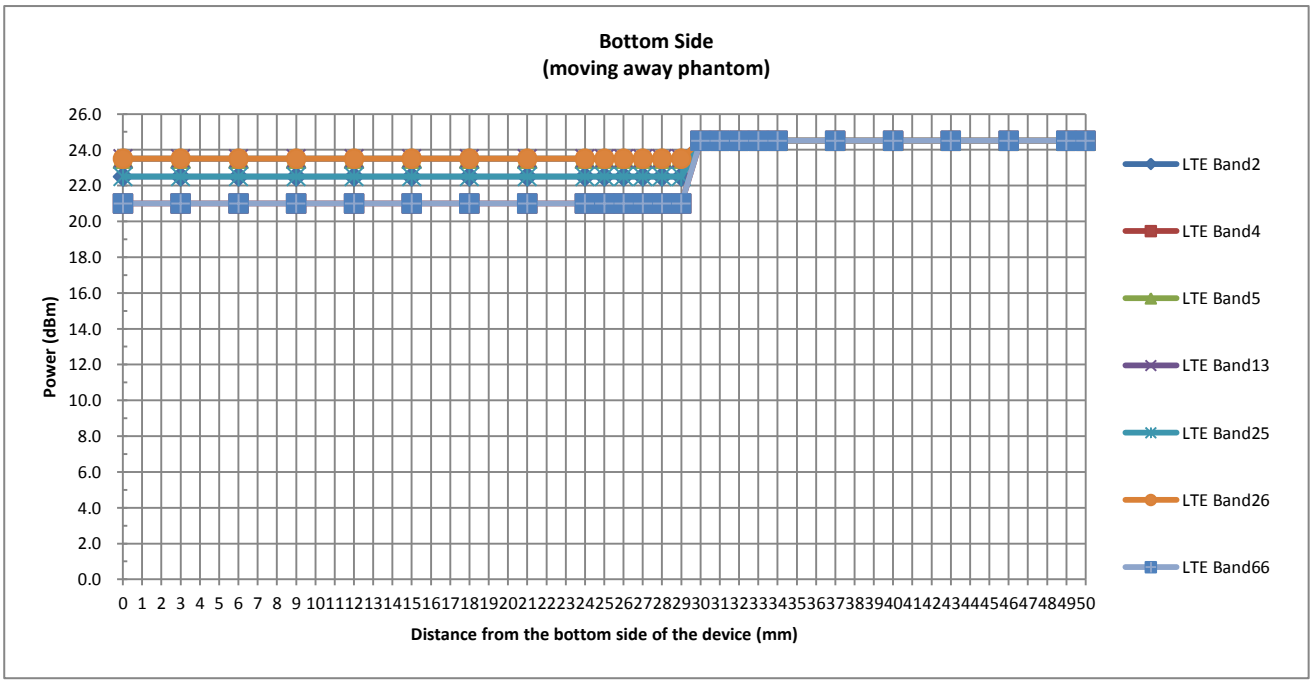
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
Distance from the back of the device (mm)
LTE Band2
LTE Band4
LTE Band5
LTE Band13
LTE Band25
LTE Band26
LTE Band66


Right Side
(moving toward phantom)
Power (dBm)
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
Distance from the right side of the device (mm)
LTE Band2
LTE Band4
LTE Band5
LTE Band13
LTE Band25
LTE Band26
LTE Band66


Right Side
(moving away phantom)
Power (dBm)
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
Distance from the right side of the device (mm)
LTE Band2
LTE Band4
LTE Band5
LTE Band13
LTE Band25
LTE Band26
LTE Band66


Bottom Side
(moving toward phantom)
Power (dBm)
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
Distance from the bottom side of the device(mm)
LTE Band2
LTE Band4
LTE Band5
LTE Band13
LTE Band25
LTE Band26
LTE Band66


Bottom Side
(moving away phantom)
Power (dBm)
26.0
24.0
22.0
20.0
18.0
16.0
14.0
12.0
10.0
8.0
6.0
4.0
2.0
0.0
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
Distance from the bottom side of the device (mm)
LTE Band2
LTE Band4
LTE Band5
LTE Band13
LTE Band25
LTE Band26
LTE Band66

6. RF Exposure Limits

6.1 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.

6.2 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

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.

7. Specific Absorption Rate (SAR)

7.1 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.

7.2 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 (ρ). The equation description is as below:

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

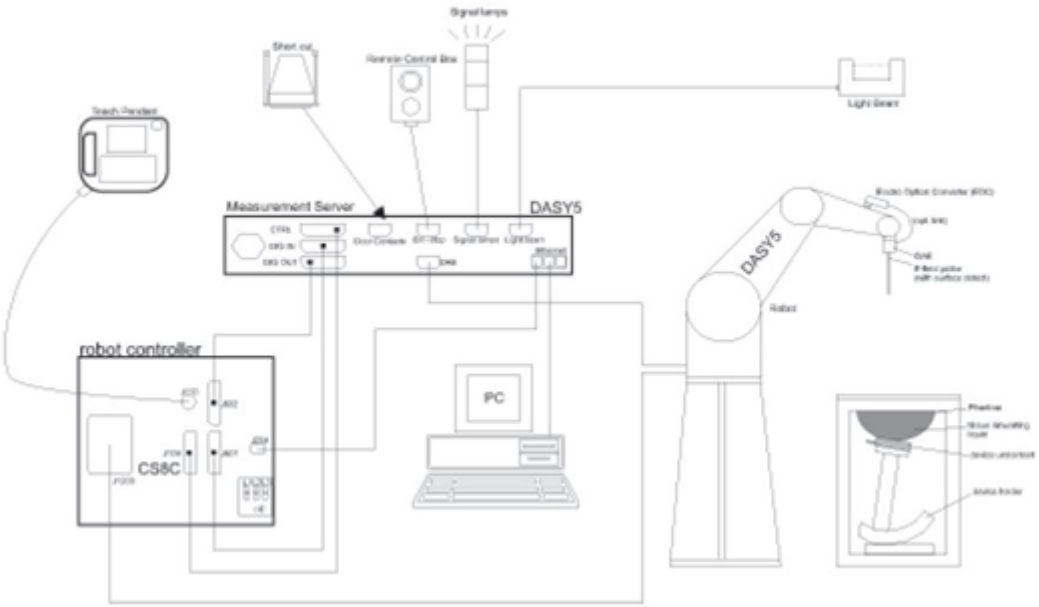
SAR is expressed in units of Watts per kilogram (W/kg)

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

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

8. 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.

8.1 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.

<EX3DV4 Probe>

Construction	Symmetric design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Frequency	10 MHz – >6 GHz Linearity: ±0.2 dB (30 MHz – 6 GHz)
Directivity	±0.3 dB in TSL (rotation around probe axis) ±0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 μW/g – >100 mW/g Linearity: ±0.2 dB (noise: typically <1 μW/g)
Dimensions	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

8.2 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.

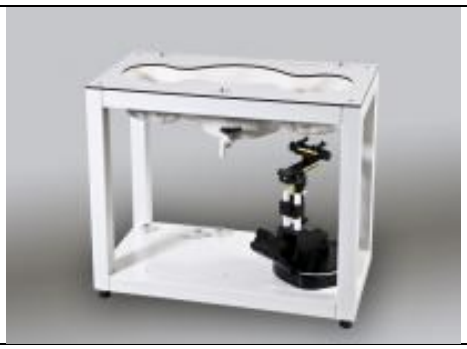
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Photo of DAE

8.3 Phantom

<SAM Twin Phantom>

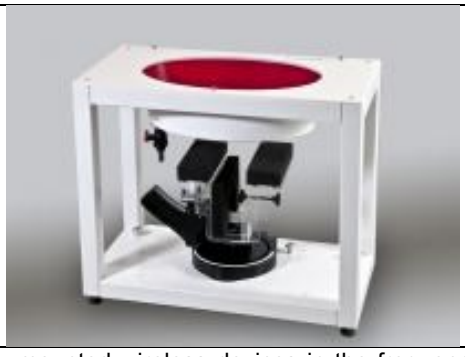
Shell Thickness	2 ± 0.2 mm; Center ear point: 6 ± 0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	Length: 1000 mm; Width: 500 mm; Height: adjustable feet
Measurement Areas	Left Hand, Right Hand, Flat Phantom



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>

Shell Thickness	2 ± 0.2 mm (sagging: <1%)
Filling Volume	Approx. 30 liters
Dimensions	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.

8.4 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

9. 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

9.1 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 form 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

9.2 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.

9.3 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	½·δ·ln(2) ± 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: Δx_{Area}, Δy_{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.	

9.4 Zoom Scan

Zoom scans are used 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 shoes 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.

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 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		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ 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 *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 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.

9.5 Volume Scan Procedures

The volume scan is used for 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 remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

9.6 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.

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1087	2019/3/27	2020/3/26
SPEAG	835MHz System Validation Kit	D835V2	4d151	2019/3/27	2020/3/26
SPEAG	1750MHz System Validation Kit	D1750V2	1090	2019/3/27	2020/3/26
SPEAG	1900MHz System Validation Kit	D1900V2	5d170	2019/3/26	2020/3/25
SPEAG	2450MHz System Validation Kit	D2450V2	908	2019/3/25	2020/3/24
SPEAG	2600MHz System Validation Kit	D2600V2	1078	2019/3/6	2020/3/5
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	2019/9/24	2020/9/23
SPEAG	Data Acquisition Electronics	DAE4	1210	2019/7/23	2020/7/22
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	2019/5/27	2020/5/26
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1697	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio Communication Analyzer	MT8821C	6201432831	2019/4/17	2020/4/16
Agilent	Wireless Communication Test Set	E5515C	MY52102706	2019/4/17	2020/4/16
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	2019/4/17	2020/4/16
SPEAG	Dielectric Probe Kit	DAK-3.5	1071	2019/10/28	2020/10/27
Anritsu	Vector Signal Generator	MG3710A	6201682672	2019/1/14	2020/1/13
R&S	Power Meter	NRVD	102081	2019/8/15	2020/8/14
R&S	Power Sensor	NRV-Z5	100538	2019/8/14	2020/8/13
R&S	Power Sensor	NRV-Z5	100539	2019/8/14	2020/8/13
R&S	CBT BLUETOOTH TESTER	CBT	101641	2019/1/14	2020/1/13
EXA	Spectrum Analyzer	FSV7	101631	2019/1/14	2020/1/13
Testo	Hygrometer	608-H1	1241332088	2019/1/11	2020/1/10
FLUKE	DIGITAC THERMOMETER	51II	97240029	2019/8/15	2020/8/14
ARRA	Power Divider	A3200-2	N/A	Note	
MCL	Attenuation1	BW-S10W5+	N/A	Note	
MCL	Attenuation2	BW-S10W5+	N/A	Note	
MCL	Attenuation3	BW-S10W5+	N/A	Note	
Agilent	Dual Directional Coupler	778D	20500	Note	
Agilent	Dual Directional Coupler	11691D	MY48151020	Note	
BONN	POWER AMPLIFIER	BLMA 0830-3	087193A	Note	
BONN	POWER AMPLIFIER	BLMA 2060-2	087193B	Note	

Note:
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.

11. System Verification

11.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 11.1.

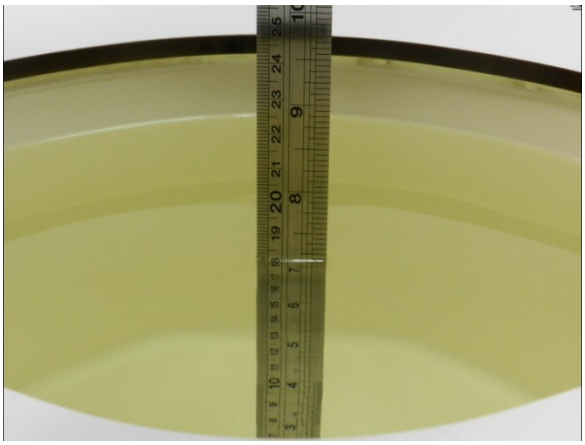


Fig 11.1 Photo of Liquid Height for Body SAR

11.2 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Head								
750	41.1	57.0	0.2	1.4	0.2	0	0.89	41.9
835	40.3	57.9	0.2	1.4	0.2	0	0.90	41.5
1800, 1900, 2000	55.2	0	0	0.3	0	44.5	1.40	40.0
2450	55.0	0	0	0	0	45.0	1.80	39.2
2600	54.8	0	0	0.1	0	45.1	1.96	39.0

Simulating Liquid for 5GHz, Manufactured by SPEAG

Ingredients	(% by weight)
Water	64~78%
Mineral oil	11~18%
Emulsifiers	9~15%
Additives and Salt	2~3%

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Head	22.8	0.894	41.678	0.89	41.90	0.45	-0.53	±5	2019/12/23
835	Head	22.8	0.916	42.845	0.90	41.50	1.78	3.24	±5	2019/12/24
1750	Head	22.7	1.371	40.975	1.37	40.10	0.07	2.18	±5	2019/12/26
1900	Head	22.7	1.403	39.092	1.40	40.00	0.21	-2.27	±5	2019/12/27
2450	Head	22.9	1.871	40.800	1.96	39.00	3.94	4.08	±5	2019/12/31
2600	Head	22.9	2.037	37.817	1.80	39.20	3.93	-3.03	±5	2019/12/28
5250	Head	22.7	4.600	36.383	4.71	35.90	-2.34	1.35	±5	2019/12/29
5750	Head	22.8	5.166	35.551	5.22	35.40	-1.03	0.43	±5	2019/12/29

11.3 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.

Date	Frequency (MHz)	Tissue Type	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 (%)
2019/12/23	750	Head	250	1087	3857	1210	2.18	8.36	8.72	4.31
2019/12/24	835	Head	250	4d151	3857	1210	2.45	9.3	9.8	5.38
2019/12/26	1750	Head	250	1090	3857	1210	9.45	36.4	37.8	3.85
2019/12/27	1900	Head	250	5d170	3857	1210	9.43	39	37.72	-3.28
2019/12/31	2450	Head	250	908	3857	1210	13.7	52.8	54.8	3.79
2019/12/28	2600	Head	250	1078	3857	1210	14.2	57.6	56.8	-1.39
2019/12/29	5250	Head	100	1113	3857	1210	7.84	80.5	78.4	-2.61
2019/12/29	5750	Head	100	1113	3857	1210	7.22	80	72.2	-9.75

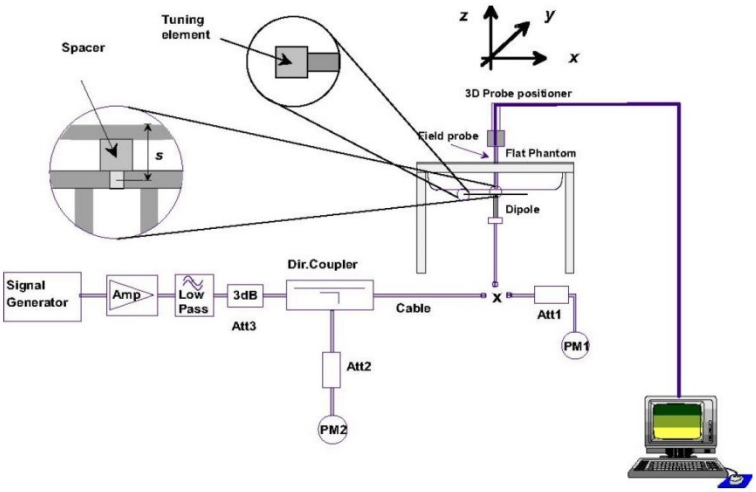


Fig 10.3.1 System Performance Check Setup

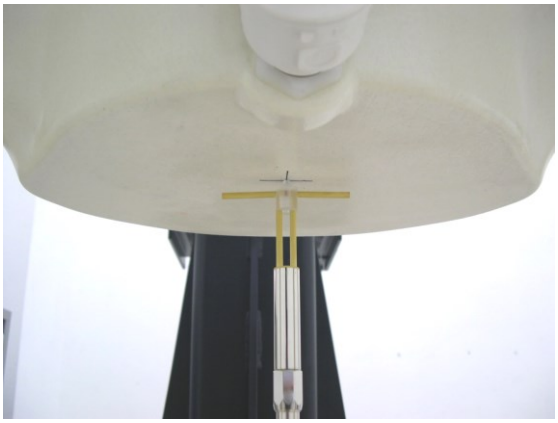


Fig 10.3.2 Setup Photo

12. RF Exposure Positions

12.1 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 x W ≥ 9 cm x 5 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 form 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.

<EUT Setup Photos>

Please refer to Appendix D for the test setup photos.

13. Conducted RF Output Power (Unit: dBm)

<LTE Conducted Power>

General Note:

1. Anritsu MT8821C 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 ≤ 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 ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 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 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; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE 4 / 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 4 / 5 / 2 SAR test was covered by Band 66 / 26 / 25; 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 ≤ 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.

<Full Power Mode>

<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	23.03	23.33	22.94	24.5	0
20	QPSK	1	49	22.97	23.32	23.30		
20	QPSK	1	99	22.96	22.98	23.00		
20	QPSK	50	0	22.13	22.25	21.95	23.5	1
20	QPSK	50	24	22.11	22.24	22.03		
20	QPSK	50	50	22.20	22.16	21.97		
20	QPSK	100	0	22.20	22.21	22.02		
20	16QAM	1	0	21.74	21.91	21.86	23.5	1
20	16QAM	1	49	21.79	22.01	21.63		
20	16QAM	1	99	21.84	21.81	21.58		
20	16QAM	50	0	21.03	21.29	21.03	22.5	2
20	16QAM	50	24	21.13	21.20	21.05		
20	16QAM	50	50	21.07	21.11	21.04		
20	16QAM	100	0	21.01	21.13	20.96		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	23.03	23.03	22.85	24.5	0
15	QPSK	1	37	23.13	23.16	23.17		
15	QPSK	1	74	22.71	23.18	22.83		
15	QPSK	36	0	22.15	22.38	21.92	23.5	1
15	QPSK	36	20	22.13	22.31	21.99		
15	QPSK	36	39	22.09	22.20	21.97		
15	QPSK	75	0	22.14	22.24	22.04		
15	16QAM	1	0	21.71	21.78	21.66	23.5	1
15	16QAM	1	37	21.79	21.97	21.65		
15	16QAM	1	74	21.77	21.73	21.74		
15	16QAM	36	0	21.12	21.19	20.98	22.5	2
15	16QAM	36	20	21.01	21.22	20.95		
15	16QAM	36	39	21.13	21.12	21.04		
15	16QAM	75	0	21.04	21.27	21.10		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.91	22.88	22.86	24.5	0
10	QPSK	1	25	23.25	23.21	23.11		
10	QPSK	1	49	22.94	23.24	22.94		
10	QPSK	25	0	22.15	22.25	21.95	23.5	1
10	QPSK	25	12	22.16	22.23	22.00		
10	QPSK	25	25	22.06	22.27	21.99		
10	QPSK	50	0	22.01	22.24	21.98		
10	16QAM	1	0	21.78	21.61	21.69	23.5	1
10	16QAM	1	25	21.70	21.97	21.63		
10	16QAM	1	49	21.81	21.81	21.67		
10	16QAM	25	0	21.06	21.13	21.16	22.5	2
10	16QAM	25	12	21.09	21.31	20.98		
10	16QAM	25	25	21.09	21.11	21.05		
10	16QAM	50	0	21.04	21.20	21.05		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.87	22.93	23.00	24.5	0
5	QPSK	1	12	23.12	23.20	23.08		
5	QPSK	1	24	23.00	22.96	22.83		
5	QPSK	12	0	22.29	22.24	22.06	23.5	1
5	QPSK	12	7	22.21	22.41	22.14		
5	QPSK	12	13	22.14	22.20	21.96		
5	QPSK	25	0	22.13	22.36	22.03		
5	16QAM	1	0	21.64	21.80	21.65	23.5	1
5	16QAM	1	12	21.75	21.72	21.68		
5	16QAM	1	24	21.69	21.78	21.67		
5	16QAM	12	0	20.89	20.99	20.91	22.5	2
5	16QAM	12	7	21.39	21.17	20.91		
5	16QAM	12	13	21.07	21.22	20.99		
5	16QAM	25	0	20.93	21.34	21.06		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.90	23.03	23.00	24.5	0
3	QPSK	1	8	22.94	23.23	23.19		
3	QPSK	1	14	22.93	23.12	22.99		
3	QPSK	8	0	21.89	22.22	22.21	23.5	1
3	QPSK	8	4	22.05	22.20	22.24		
3	QPSK	8	7	21.95	22.20	22.05		
3	QPSK	15	0	22.00	22.23	22.21		
3	16QAM	1	0	21.93	22.15	22.10	23.5	1
3	16QAM	1	8	22.06	22.21	21.99		
3	16QAM	1	14	22.14	22.02	22.02		
3	16QAM	8	0	21.11	21.19	21.33	22.5	2
3	16QAM	8	4	21.13	21.21	21.09		
3	16QAM	8	7	21.25	21.23	21.22		
3	16QAM	15	0	21.02	21.02	20.98		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	23.04	23.13	23.07	24.5	0
1.4	QPSK	1	3	23.12	23.15	23.10		
1.4	QPSK	1	5	23.16	23.21	22.99		
1.4	QPSK	3	0	23.16	23.16	23.15		
1.4	QPSK	3	1	23.21	23.25	23.19		
1.4	QPSK	3	3	23.03	23.20	23.19		
1.4	QPSK	6	0	22.02	22.23	21.91	23.5	1
1.4	16QAM	1	0	21.85	22.31	21.90	23.5	1
1.4	16QAM	1	3	22.01	22.16	21.94		
1.4	16QAM	1	5	21.86	21.83	21.90		
1.4	16QAM	3	0	21.88	22.26	21.91		
1.4	16QAM	3	1	21.93	22.31	21.98		
1.4	16QAM	3	3	21.87	22.31	22.01		
1.4	16QAM	6	0	20.99	21.30	21.20	22.5	2

<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	23.02	23.16	22.95	24.5	0
20	QPSK	1	49	23.01	23.01	22.95		
20	QPSK	1	99	23.14	23.01	23.05		
20	QPSK	50	0	22.16	22.25	22.24	23.5	1
20	QPSK	50	24	22.24	22.09	22.17		
20	QPSK	50	50	22.08	22.07	22.01		
20	QPSK	100	0	22.13	22.14	22.09		
20	16QAM	1	0	21.68	21.80	21.73	23.5	1
20	16QAM	1	49	21.86	21.73	21.68		
20	16QAM	1	99	21.88	21.82	21.91		
20	16QAM	50	0	21.00	21.24	21.19	22.5	2
20	16QAM	50	24	21.07	21.08	21.24		
20	16QAM	50	50	21.16	21.05	20.98		
20	16QAM	100	0	21.17	20.96	21.17		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.71	23.05	23.01	24.5	0
15	QPSK	1	37	23.10	23.01	23.13		
15	QPSK	1	74	22.98	23.05	22.98		
15	QPSK	36	0	21.96	22.21	22.16	23.5	1
15	QPSK	36	20	22.07	22.11	22.03		
15	QPSK	36	39	22.01	22.11	22.06		
15	QPSK	75	0	22.03	22.08	22.16		
15	16QAM	1	0	21.75	21.88	21.90	23.5	1
15	16QAM	1	37	21.79	21.68	21.62		
15	16QAM	1	74	21.77	21.68	21.65		
15	16QAM	36	0	21.02	21.19	21.01	22.5	2
15	16QAM	36	20	21.13	21.09	21.00		
15	16QAM	36	39	20.98	21.10	21.14		
15	16QAM	75	0	20.98	21.18	21.13		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.97	22.81	22.89	24.5	0
10	QPSK	1	25	23.01	23.12	23.02		
10	QPSK	1	49	22.79	23.09	23.13		
10	QPSK	25	0	22.12	22.32	22.08	23.5	1
10	QPSK	25	12	22.15	22.30	22.26		
10	QPSK	25	25	22.16	22.11	22.27		
10	QPSK	50	0	22.16	22.29	22.31		
10	16QAM	1	0	21.85	21.89	21.97	23.5	1
10	16QAM	1	25	21.84	21.85	21.89		
10	16QAM	1	49	21.85	21.72	22.04		
10	16QAM	25	0	21.26	21.24	21.30	22.5	2
10	16QAM	25	12	21.49	21.26	21.48		
10	16QAM	25	25	21.16	21.29	21.30		
10	16QAM	50	0	21.21	21.16	21.31		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.00	23.13	22.92	24.5	0
5	QPSK	1	12	23.02	23.14	23.02		
5	QPSK	1	24	22.81	23.12	23.15		
5	QPSK	12	0	22.16	22.34	22.12	23.5	1
5	QPSK	12	7	22.17	22.32	22.29		
5	QPSK	12	13	22.19	22.13	22.29		
5	QPSK	25	0	22.18	22.33	22.35		
5	16QAM	1	0	21.89	21.92	22.00	23.5	1
5	16QAM	1	12	21.86	21.89	21.91		
5	16QAM	1	24	21.87	21.74	22.06		
5	16QAM	12	0	21.29	21.27	21.33	22.5	2
5	16QAM	12	7	21.51	21.28	21.50		
5	16QAM	12	13	21.18	21.32	21.32		
5	16QAM	25	0	21.24	21.18	21.34		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.97	22.81	22.89	24.5	0
3	QPSK	1	8	23.02	23.12	23.02		
3	QPSK	1	14	22.79	23.09	23.13		
3	QPSK	8	0	22.12	22.32	22.08	23.5	1
3	QPSK	8	4	22.15	22.30	22.26		
3	QPSK	8	7	22.16	22.11	22.27		
3	QPSK	15	0	22.16	22.29	22.31		
3	16QAM	1	0	21.85	21.89	21.97	23.5	1
3	16QAM	1	8	21.84	21.85	21.89		
3	16QAM	1	14	21.85	21.72	22.04		
3	16QAM	8	0	21.26	21.24	21.30	22.5	2
3	16QAM	8	4	21.49	21.26	21.48		
3	16QAM	8	7	21.16	21.29	21.30		
3	16QAM	15	0	21.21	21.16	21.31		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.89	22.92	22.97	24.5	0
1.4	QPSK	1	3	23.02	23.02	23.13		
1.4	QPSK	1	5	23.02	23.02	23.01		
1.4	QPSK	3	0	23.02	23.01	23.01		
1.4	QPSK	3	1	23.01	23.01	23.02		
1.4	QPSK	3	3	23.06	23.02	23.01		
1.4	QPSK	6	0	22.04	22.27	21.95	23.5	1
1.4	16QAM	1	0	21.89	22.34	21.93	23.5	1
1.4	16QAM	1	3	22.03	22.20	21.96		
1.4	16QAM	1	5	21.88	21.85	21.92		
1.4	16QAM	3	0	21.91	22.29	21.94		
1.4	16QAM	3	1	21.95	22.33	22.00		
1.4	16QAM	3	3	21.89	22.34	22.03		
1.4	16QAM	6	0	21.02	21.32	21.23	22.5	2

<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	22.83	23.29	22.95	24.5	0
10	QPSK	1	25	23.23	23.13	23.24		
10	QPSK	1	49	23.16	22.82	23.18		
10	QPSK	25	0	22.20	22.24	22.15	23.5	1
10	QPSK	25	12	22.23	22.21	22.18		
10	QPSK	25	25	22.15	22.01	22.16		
10	QPSK	50	0	22.19	22.21	22.14		
10	16QAM	1	0	21.95	21.93	21.75	23.5	1
10	16QAM	1	25	22.03	21.88	21.97		
10	16QAM	1	49	21.88	21.75	21.76		
10	16QAM	25	0	21.15	21.26	21.31	22.5	2
10	16QAM	25	12	21.29	21.35	21.04		
10	16QAM	25	25	21.12	21.17	21.02		
10	16QAM	50	0	21.28	21.20	21.24		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	23.03	23.03	22.88	24.5	0
5	QPSK	1	12	23.21	23.10	23.06		
5	QPSK	1	24	22.90	22.95	22.83		
5	QPSK	12	0	22.09	22.15	21.95	23.5	1
5	QPSK	12	7	22.23	22.21	22.09		
5	QPSK	12	13	22.15	22.11	22.02		
5	QPSK	25	0	22.15	22.12	22.07		
5	16QAM	1	0	21.90	21.91	21.79	23.5	1
5	16QAM	1	12	21.93	21.90	21.71		
5	16QAM	1	24	21.75	21.87	21.77		
5	16QAM	12	0	21.24	21.08	21.15	22.5	2
5	16QAM	12	7	21.46	21.14	21.15		
5	16QAM	12	13	21.19	20.97	21.09		
5	16QAM	25	0	21.40	21.06	20.94		

Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.74	23.07	23.04	24.5	0
3	QPSK	1	8	23.14	23.21	23.16		
3	QPSK	1	14	23.00	23.08	23.00		
3	QPSK	8	0	22.00	22.23	22.20	23.5	1
3	QPSK	8	4	22.09	22.13	22.06		
3	QPSK	8	7	22.04	22.13	22.08		
3	QPSK	15	0	22.05	22.12	22.20		
3	16QAM	1	0	21.79	21.91	21.93	23.5	1
3	16QAM	1	8	21.81	21.72	21.64		
3	16QAM	1	14	21.79	21.70	21.67		
3	16QAM	8	0	21.05	21.22	21.04	22.5	2
3	16QAM	8	4	21.15	21.11	21.02		
3	16QAM	8	7	21.00	21.13	21.16		
3	16QAM	15	0	21.01	21.20	21.16		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.91	22.94	22.99	24.5	0
1.4	QPSK	1	3	23.14	23.19	23.15		
1.4	QPSK	1	5	23.20	23.26	22.99		
1.4	QPSK	3	0	23.18	23.16	23.21		
1.4	QPSK	3	1	23.21	23.23	23.20		
1.4	QPSK	3	3	23.08	23.20	23.23		
1.4	QPSK	6	0	22.00	22.25	21.93	23.5	1
1.4	16QAM	1	0	21.87	22.36	21.91	23.5	1
1.4	16QAM	1	3	22.05	22.16	21.98		
1.4	16QAM	1	5	21.98	21.87	21.90		
1.4	16QAM	3	0	21.89	22.25	21.96		
1.4	16QAM	3	1	21.97	22.35	21.98		
1.4	16QAM	3	3	21.91	22.36	22.05		
1.4	16QAM	6	0	21.00	21.28	21.21	22.5	2

<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		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	22.89	23.21	22.82	24.5	0
10	QPSK	1	25	23.20	23.17	23.09		
10	QPSK	1	49	23.10	22.76	22.76		
10	QPSK	25	0	22.11	22.24	22.17	23.5	1
10	QPSK	25	12	22.05	22.10	22.23		
10	QPSK	25	25	22.08	22.05	21.95		
10	QPSK	50	0	22.18	22.19	22.17		
10	16QAM	1	0	21.68	21.75	21.87	23.5	1
10	16QAM	1	25	21.76	21.91	21.93		
10	16QAM	1	49	21.78	21.67	21.51		
10	16QAM	25	0	21.07	21.03	21.16	22.5	2
10	16QAM	25	12	21.02	21.07	21.15		
10	16QAM	25	25	21.24	21.14	20.95		
10	16QAM	50	0	21.14	21.08	21.06		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	22.82	22.84	23.16	24.5	0
5	QPSK	1	12	23.01	23.01	23.09		
5	QPSK	1	24	22.88	22.87	22.98		
5	QPSK	12	0	22.19	22.11	22.25	23.5	1
5	QPSK	12	7	22.22	22.20	22.08		
5	QPSK	12	13	22.00	22.06	22.02		
5	QPSK	25	0	22.18	22.07	22.06		
5	16QAM	1	0	21.90	21.79	21.85	23.5	1
5	16QAM	1	12	21.91	21.85	21.76		
5	16QAM	1	24	21.79	21.87	21.73		
5	16QAM	12	0	21.22	20.90	21.10	22.5	2
5	16QAM	12	7	21.24	20.93	20.88		
5	16QAM	12	13	21.02	21.16	20.74		
5	16QAM	25	0	21.32	21.19	21.12		

Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	22.78	22.91	22.84	24.5	0
3	QPSK	1	8	22.79	22.91	22.77		
3	QPSK	1	14	22.81	22.81	22.66		
3	QPSK	8	0	21.81	21.92	22.07	23.5	1
3	QPSK	8	4	21.94	22.04	22.02		
3	QPSK	8	7	21.94	22.00	21.94		
3	QPSK	15	0	21.83	22.07	21.90		
3	16QAM	1	0	21.74	21.71	21.83	23.5	1
3	16QAM	1	8	21.55	21.80	21.75		
3	16QAM	1	14	21.79	21.78	21.63		
3	16QAM	8	0	20.85	20.86	21.02	22.5	2
3	16QAM	8	4	21.00	20.93	20.91		
3	16QAM	8	7	21.17	21.05	20.83		
3	16QAM	15	0	20.96	20.99	20.79		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	22.89	22.99	22.84	24.5	0
1.4	QPSK	1	3	22.98	22.96	22.88		
1.4	QPSK	1	5	22.65	22.93	22.93		
1.4	QPSK	3	0	22.94	23.05	22.94		
1.4	QPSK	3	1	23.00	23.00	22.86		
1.4	QPSK	3	3	22.92	22.96	23.05		
1.4	QPSK	6	0	21.86	21.95	22.05	23.5	1
1.4	16QAM	1	0	21.78	22.12	21.89	23.5	1
1.4	16QAM	1	3	22.04	22.20	21.85		
1.4	16QAM	1	5	21.77	21.78	22.01		
1.4	16QAM	3	0	21.95	21.93	21.67		
1.4	16QAM	3	1	21.89	21.98	21.78		
1.4	16QAM	3	3	21.79	21.90	21.94		
1.4	16QAM	6	0	20.80	20.92	20.91	22.5	2

<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		23.34		24.5	0
10	QPSK	1	25		23.33			
10	QPSK	1	49		22.87			
10	QPSK	25	0		22.25		23.5	1
10	QPSK	25	12		22.24			
10	QPSK	25	25		22.19			
10	QPSK	50	0		22.23			
10	16QAM	1	0		22.06		23.5	1
10	16QAM	1	25		21.96			
10	16QAM	1	49		21.89			
10	16QAM	25	0		21.26		22.5	2
10	16QAM	25	12		21.16			
10	16QAM	25	25		21.24			
10	16QAM	50	0		21.14			
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	22.96	22.62	22.71	24.5	0
5	QPSK	1	12	22.95	23.06	22.90		
5	QPSK	1	24	22.99	22.79	22.63		
5	QPSK	12	0	21.94	22.01	21.88	23.5	1
5	QPSK	12	7	22.07	22.02	21.98		
5	QPSK	12	13	22.05	21.86	21.86		
5	QPSK	25	0	21.98	21.98	21.87		
5	16QAM	1	0	21.80	21.61	22.01	23.5	1
5	16QAM	1	12	21.74	21.70	21.62		
5	16QAM	1	24	21.64	21.63	21.58		
5	16QAM	12	0	21.00	20.75	20.71	22.5	2
5	16QAM	12	7	21.14	21.08	20.83		
5	16QAM	12	13	21.09	21.00	21.02		
5	16QAM	25	0	21.24	21.03	21.02		

<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		
Frequency (MHz)				1860	1880	1905		
20	QPSK	1	0	23.20	23.34	22.98	24.5	0
20	QPSK	1	49	23.04	23.21	23.17		
20	QPSK	1	99	22.98	22.85	22.95		
20	QPSK	50	0	21.67	21.93	21.82	23.5	1
20	QPSK	50	24	21.82	21.86	21.90		
20	QPSK	50	50	21.77	21.89	21.71		
20	QPSK	100	0	21.67	21.92	21.81		
20	16QAM	1	0	21.41	21.55	21.62	23.5	1
20	16QAM	1	49	21.37	21.62	21.58		
20	16QAM	1	99	21.53	21.61	21.36		
20	16QAM	50	0	20.75	21.02	20.90	22.5	2
20	16QAM	50	24	20.91	21.16	20.99		
20	16QAM	50	50	20.86	20.98	20.70		
20	16QAM	100	0	20.73	20.99	20.92		
Channel				26115	26340	26615	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1907.5		
15	QPSK	1	0	23.03	22.90	22.87	24.5	0
15	QPSK	1	37	23.16	23.02	23.04		
15	QPSK	1	74	22.97	22.91	23.02		
15	QPSK	36	0	21.97	22.23	22.18	23.5	1
15	QPSK	36	20	22.03	22.19	22.04		
15	QPSK	36	39	22.01	22.07	22.03		
15	QPSK	75	0	21.99	22.23	22.08		
15	16QAM	1	0	21.64	21.83	21.88	23.5	1
15	16QAM	1	37	21.94	22.04	21.68		
15	16QAM	1	74	21.83	21.84	21.71		
15	16QAM	36	0	20.94	21.21	21.16	22.5	2
15	16QAM	36	20	21.00	21.28	21.11		
15	16QAM	36	39	21.09	21.17	21.12		
15	16QAM	75	0	21.09	21.20	21.06		

Channel				26090	26340	26640	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1910		
10	QPSK	1	0	22.76	22.95	22.88	24.5	0
10	QPSK	1	25	23.21	23.16	22.99		
10	QPSK	1	49	22.83	22.73	22.87		
10	QPSK	25	0	21.85	22.13	22.11	23.5	1
10	QPSK	25	12	21.84	22.13	21.98		
10	QPSK	25	25	21.79	22.00	22.07		
10	QPSK	50	0	21.86	22.20	21.98		
10	16QAM	1	0	21.55	21.72	21.76	23.5	1
10	16QAM	1	25	21.89	21.94	21.87		
10	16QAM	1	49	21.69	21.68	21.59		
10	16QAM	25	0	20.96	21.24	21.16	22.5	2
10	16QAM	25	12	20.94	21.29	21.01		
10	16QAM	25	25	20.90	21.14	20.89		
10	16QAM	50	0	20.98	21.26	20.92		
Channel				26065	26340	26665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1912.5		
5	QPSK	1	0	22.82	22.98	22.94	24.5	0
5	QPSK	1	12	23.18	23.13	22.96		
5	QPSK	1	24	22.86	22.70	22.90		
5	QPSK	12	0	21.82	22.19	22.02	23.5	1
5	QPSK	12	7	21.90	22.10	22.04		
5	QPSK	12	13	21.70	21.97	21.98		
5	QPSK	25	0	21.92	22.23	21.95		
5	16QAM	1	0	21.52	21.63	21.82	23.5	1
5	16QAM	1	12	21.80	21.91	21.78		
5	16QAM	1	24	21.75	21.74	21.62		
5	16QAM	12	0	20.87	21.15	21.22	22.5	2
5	16QAM	12	7	20.85	21.26	20.92		
5	16QAM	12	13	20.96	21.11	20.80		
5	16QAM	25	0	21.01	21.29	20.98		

Channel				26055	26340	26675	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	22.92	23.03	23.04	24.5	0
3	QPSK	1	8	23.13	23.08	22.91		
3	QPSK	1	14	22.91	22.65	22.95		
3	QPSK	8	0	22.04	22.29	21.87	23.5	1
3	QPSK	8	4	22.00	22.05	22.14		
3	QPSK	8	7	22.14	21.92	21.83		
3	QPSK	15	0	22.02	22.28	21.90		
3	16QAM	1	0	21.47	21.48	21.92	23.5	1
3	16QAM	1	8	21.65	21.86	21.63		
3	16QAM	1	14	21.85	21.84	21.67		
3	16QAM	8	0	20.92	21.00	20.92	22.5	2
3	16QAM	8	4	21.11	21.21	21.11		
3	16QAM	8	7	21.06	21.06	20.96		
3	16QAM	15	0	21.06	20.77	21.01		
Channel				26047	26340	26683	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	22.82	22.98	22.81	24.5	0
1.4	QPSK	1	3	22.95	23.06	23.00		
1.4	QPSK	1	5	22.80	23.04	22.87		
1.4	QPSK	3	0	22.84	23.05	23.00		
1.4	QPSK	3	1	23.09	23.23	23.20		
1.4	QPSK	3	3	23.01	23.18	23.10		
1.4	QPSK	6	0	21.93	22.15	21.97	23.5	1
1.4	16QAM	1	0	21.71	21.97	21.72	23.5	1
1.4	16QAM	1	3	21.84	21.86	21.90		
1.4	16QAM	1	5	21.78	21.88	21.70		
1.4	16QAM	3	0	21.98	22.14	21.92		
1.4	16QAM	3	1	22.11	22.12	22.06		
1.4	16QAM	3	3	21.92	22.05	21.97		
1.4	16QAM	6	0	20.83	20.99	21.00	22.5	2

<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	23.11	23.45	22.99	24.5	0
15	QPSK	1	37	23.21	23.40	23.14		
15	QPSK	1	74	23.21	23.23	23.17		
15	QPSK	36	0	22.13	22.26	21.94	23.5	1
15	QPSK	36	20	22.07	22.13	22.12		
15	QPSK	36	39	22.02	22.16	22.06		
15	QPSK	75	0	22.10	22.11	22.07		
15	16QAM	1	0	21.69	21.76	21.72	23.5	1
15	16QAM	1	37	21.68	21.87	21.85		
15	16QAM	1	74	21.75	21.80	21.62		
15	16QAM	36	0	21.17	21.30	21.07	22.5	2
15	16QAM	36	20	21.02	21.19	21.16		
15	16QAM	36	39	21.08	21.12	21.01		
15	16QAM	75	0	21.28	21.23	21.00		
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	22.97	23.04	22.91	24.5	0
10	QPSK	1	25	23.18	23.34	23.17		
10	QPSK	1	49	22.93	22.92	22.95		
10	QPSK	25	0	22.26	22.16	22.20	23.5	1
10	QPSK	25	12	22.15	22.32	22.05		
10	QPSK	25	25	22.01	22.16	22.00		
10	QPSK	50	0	22.16	22.22	22.03		
10	16QAM	1	0	21.95	21.91	21.68	23.5	1
10	16QAM	1	25	21.76	22.02	21.79		
10	16QAM	1	49	21.67	21.80	21.55		
10	16QAM	25	0	21.30	21.32	21.04	22.5	2
10	16QAM	25	12	21.19	21.28	21.11		
10	16QAM	25	25	21.05	21.11	20.95		
10	16QAM	50	0	21.20	21.14	21.08		

Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	22.79	22.96	22.79	24.5	0
5	QPSK	1	12	22.96	22.97	22.85		
5	QPSK	1	24	22.83	22.89	22.65		
5	QPSK	12	0	22.11	22.16	21.95	23.5	1
5	QPSK	12	7	22.26	22.33	21.94		
5	QPSK	12	13	22.08	22.32	21.85		
5	QPSK	25	0	22.14	22.25	21.93		
5	16QAM	1	0	21.71	21.86	21.73	23.5	1
5	16QAM	1	12	22.02	21.77	21.83		
5	16QAM	1	24	22.21	21.94	21.86		
5	16QAM	12	0	21.07	21.17	20.81	22.5	2
5	16QAM	12	7	21.11	21.18	20.91		
5	16QAM	12	13	21.17	21.28	20.91		
5	16QAM	25	0	21.14	21.04	20.99		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	22.79	22.96	22.79	24.5	0
3	QPSK	1	8	22.96	22.97	22.85		
3	QPSK	1	14	22.83	22.89	22.65		
3	QPSK	8	0	22.11	22.16	21.95	23.5	1
3	QPSK	8	4	22.26	22.33	21.94		
3	QPSK	8	7	22.08	22.32	21.85		
3	QPSK	15	0	22.14	22.25	21.93		
3	16QAM	1	0	21.71	21.86	21.73	23.5	1
3	16QAM	1	8	22.02	21.77	21.83		
3	16QAM	1	14	22.21	21.94	21.86		
3	16QAM	8	0	21.07	21.17	20.81	22.5	2
3	16QAM	8	4	21.11	21.18	20.91		
3	16QAM	8	7	21.17	21.28	20.91		
3	16QAM	15	0	21.14	21.04	20.99		
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	22.89	22.92	22.82	24.5	0
1.4	QPSK	1	3	22.89	22.92	22.93		
1.4	QPSK	1	5	22.99	22.92	22.80		
1.4	QPSK	3	0	22.98	22.93	22.85		
1.4	QPSK	3	1	22.79	22.99	22.92		
1.4	QPSK	3	3	23.03	22.96	22.91		
1.4	QPSK	6	0	22.15	22.20	21.97	23.5	1
1.4	16QAM	1	0	21.74	22.03	21.73	23.5	1
1.4	16QAM	1	3	22.03	21.92	21.87		
1.4	16QAM	1	5	21.64	21.95	21.72		
1.4	16QAM	3	0	21.85	22.03	21.76		
1.4	16QAM	3	1	22.03	22.24	21.97		
1.4	16QAM	3	3	22.17	22.05	21.82		
1.4	16QAM	6	0	21.03	21.08	20.85	22.5	2

<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		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	22.86	23.20	22.73	24.5	0
20	QPSK	1	49	22.85	23.10	22.85		
20	QPSK	1	99	22.86	23.00	22.73		
20	QPSK	50	0	21.74	22.17	21.90	23.5	1
20	QPSK	50	24	21.80	22.16	21.84		
20	QPSK	50	50	21.83	22.16	21.69		
20	QPSK	100	0	21.90	22.11	21.71		
20	16QAM	1	0	21.39	21.85	21.57	23.5	1
20	16QAM	1	49	21.60	21.76	21.48		
20	16QAM	1	99	21.53	21.71	21.45		
20	16QAM	50	0	20.82	21.20	20.90	22.5	2
20	16QAM	50	24	20.90	21.13	20.83		
20	16QAM	50	50	20.93	21.14	20.75		
20	16QAM	100	0	20.85	21.07	20.69		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	22.55	22.93	22.61	24.5	0
15	QPSK	1	37	22.99	22.64	22.68		
15	QPSK	1	74	22.77	22.90	22.66		
15	QPSK	36	0	21.72	22.11	21.82	23.5	1
15	QPSK	36	20	21.71	22.14	21.74		
15	QPSK	36	39	21.86	22.14	21.84		
15	QPSK	75	0	21.78	22.16	21.73		
15	16QAM	1	0	21.44	21.69	21.65	23.5	1
15	16QAM	1	37	21.51	21.77	21.40		
15	16QAM	1	74	21.63	21.58	21.42		
15	16QAM	36	0	20.79	21.20	20.89	22.5	2
15	16QAM	36	20	20.80	21.12	20.74		
15	16QAM	36	39	20.84	21.11	20.86		
15	16QAM	75	0	20.91	21.25	20.84		

Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	23.01	23.01	22.97	24.5	0
10	QPSK	1	25	22.97	23.08	22.98		
10	QPSK	1	49	22.76	23.06	22.84		
10	QPSK	25	0	21.80	22.12	21.79	23.5	1
10	QPSK	25	12	21.75	22.13	21.80		
10	QPSK	25	25	21.79	22.16	21.74		
10	QPSK	50	0	21.77	22.04	21.80		
10	16QAM	1	0	21.30	21.65	21.38	23.5	1
10	16QAM	1	25	21.48	21.80	21.43		
10	16QAM	1	49	21.49	21.78	21.38		
10	16QAM	25	0	20.90	21.25	20.79	22.5	2
10	16QAM	25	12	20.84	21.15	20.80		
10	16QAM	25	25	20.90	21.16	21.07		
10	16QAM	50	0	20.75	21.22	20.92		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	22.95	23.04	23.06	24.5	0
5	QPSK	1	12	23.06	22.94	22.81		
5	QPSK	1	24	22.73	22.84	22.91		
5	QPSK	12	0	21.74	22.15	21.76	23.5	1
5	QPSK	12	7	21.81	22.21	21.76		
5	QPSK	12	13	21.79	22.10	21.80		
5	QPSK	25	0	21.77	22.05	21.83		
5	16QAM	1	0	21.44	21.69	21.45	23.5	1
5	16QAM	1	12	21.49	21.87	21.53		
5	16QAM	1	24	21.41	21.58	21.44		
5	16QAM	12	0	20.75	21.07	20.78	22.5	2
5	16QAM	12	7	20.94	21.11	20.66		
5	16QAM	12	13	20.78	21.11	20.82		
5	16QAM	25	0	20.98	21.06	20.83		

Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	22.97	23.01	23.01	24.5	0
3	QPSK	1	8	22.86	22.78	23.02		
3	QPSK	1	14	22.86	22.82	22.61		
3	QPSK	8	0	21.67	21.87	21.53	23.5	1
3	QPSK	8	4	21.64	22.00	21.74		
3	QPSK	8	7	21.71	21.92	21.62		
3	QPSK	15	0	21.59	21.96	21.57		
3	16QAM	1	0	21.33	21.63	21.31	23.5	1
3	16QAM	1	8	21.31	21.62	21.75		
3	16QAM	1	14	21.64	21.66	21.43		
3	16QAM	8	0	20.75	21.06	20.84	22.5	2
3	16QAM	8	4	20.84	21.07	20.95		
3	16QAM	8	7	20.75	21.19	20.79		
3	16QAM	15	0	20.59	20.96	20.70		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	22.77	22.92	22.74	24.5	0
1.4	QPSK	1	3	22.95	22.93	22.85		
1.4	QPSK	1	5	22.92	22.96	22.93		
1.4	QPSK	3	0	22.89	23.03	22.96		
1.4	QPSK	3	1	23.01	23.06	23.06		
1.4	QPSK	3	3	22.97	23.01	23.01		
1.4	QPSK	6	0	21.98	22.23	21.92	23.5	1
1.4	16QAM	1	0	21.67	21.93	21.60	23.5	1
1.4	16QAM	1	3	21.74	22.01	21.74		
1.4	16QAM	1	5	21.63	21.90	22.05		
1.4	16QAM	3	0	21.76	22.22	21.80		
1.4	16QAM	3	1	21.93	21.76	21.94		
1.4	16QAM	3	3	21.92	22.17	21.90		
1.4	16QAM	6	0	20.91	21.12	20.97	22.5	2

<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	22.86	23.12	22.62	24.5	0
20	QPSK	1	49	22.76	23.08	22.89		
20	QPSK	1	99	22.74	22.73	22.65		
20	QPSK	50	0	21.70	22.06	21.84	23.5	1
20	QPSK	50	24	21.72	21.96	21.77		
20	QPSK	50	50	21.96	21.70	21.80		
20	QPSK	100	0	21.70	21.95	21.75		
20	16QAM	1	0	21.50	21.65	21.67	23.5	1
20	16QAM	1	49	21.49	21.62	21.56		
20	16QAM	1	99	21.43	21.60	21.55		
20	16QAM	50	0	20.75	21.05	20.74	22.5	2
20	16QAM	50	24	20.62	20.97	20.80		
20	16QAM	50	50	21.06	20.62	20.92		
20	16QAM	100	0	20.70	20.84	20.74		
Channel				133197	133297	133397	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				670.5	680.5	690.5		
15	QPSK	1	0	23.03	23.11	22.87	24.5	0
15	QPSK	1	37	22.97	23.11	22.82		
15	QPSK	1	74	22.88	22.73	22.62		
15	QPSK	36	0	21.76	22.06	21.81	23.5	1
15	QPSK	36	20	21.79	22.00	21.95		
15	QPSK	36	39	21.65	21.88	21.88		
15	QPSK	75	0	21.81	21.92	21.88		
15	16QAM	1	0	21.78	21.67	21.81	23.5	1
15	16QAM	1	37	21.84	21.98	21.65		
15	16QAM	1	74	21.70	21.54	21.68		
15	16QAM	36	0	20.70	21.07	20.71	22.5	2
15	16QAM	36	20	20.75	21.00	20.95		
15	16QAM	36	39	20.63	20.69	20.88		
15	16QAM	75	0	20.86	20.94	20.88		

Channel				133172	133272	133422	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				668	678	693		
10	QPSK	1	0	22.66	22.54	22.65	24.5	0
10	QPSK	1	25	22.62	22.97	23.03		
10	QPSK	1	49	22.84	22.88	22.74		
10	QPSK	25	0	21.96	21.93	21.84	23.5	1
10	QPSK	25	12	21.73	21.99	22.00		
10	QPSK	25	25	21.84	21.92	21.93		
10	QPSK	50	0	21.84	22.15	22.03		
10	16QAM	1	0	21.77	21.48	21.63	23.5	1
10	16QAM	1	25	21.41	21.80	21.70		
10	16QAM	1	49	21.64	21.72	21.64		
10	16QAM	25	0	20.91	20.99	20.97	22.5	2
10	16QAM	25	12	20.83	21.02	21.01		
10	16QAM	25	25	20.84	21.09	20.94		
10	16QAM	50	0	20.92	21.05	21.02		
Channel				133147	133247	133447	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				665.5	675.5	695.5		
5	QPSK	1	0	22.65	22.94	22.95	24.5	0
5	QPSK	1	12	23.01	23.04	22.85		
5	QPSK	1	24	22.59	22.85	22.66		
5	QPSK	12	0	21.73	21.67	21.80	23.5	1
5	QPSK	12	7	21.72	22.03	21.94		
5	QPSK	12	13	21.72	22.08	21.86		
5	QPSK	25	0	21.69	21.93	21.84		
5	16QAM	1	0	21.49	21.59	21.41	23.5	1
5	16QAM	1	12	21.60	21.89	21.72		
5	16QAM	1	24	21.51	21.66	21.41		
5	16QAM	12	0	20.78	20.83	20.71	22.5	2
5	16QAM	12	7	20.78	21.03	20.77		
5	16QAM	12	13	20.87	21.10	20.80		
5	16QAM	25	0	20.62	21.08	20.86		

<Reduced Power Mode for P-Sensor On>

<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	20.94	21.16	20.99	22.5	0
20	QPSK	1	49	21.01	20.88	20.82		
20	QPSK	1	99	20.75	20.71	20.83		
20	QPSK	50	0	20.87	20.97	20.86	22.5	0
20	QPSK	50	24	20.88	20.93	20.85		
20	QPSK	50	50	20.78	20.83	20.98		
20	QPSK	100	0	20.90	20.97	20.93		
20	16QAM	1	0	20.54	20.63	20.68	22.5	0
20	16QAM	1	49	20.66	20.71	20.79		
20	16QAM	1	99	20.56	20.65	20.61		
20	16QAM	50	0	20.90	20.81	20.90	22.5	0
20	16QAM	50	24	20.94	20.99	20.89		
20	16QAM	50	50	20.85	20.81	20.81		
20	16QAM	100	0	20.73	20.94	20.85		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	20.74	20.70	20.97	22.5	0
15	QPSK	1	37	21.00	20.99	21.03		
15	QPSK	1	74	20.71	20.69	20.84		
15	QPSK	36	0	20.90	20.94	21.02	22.5	0
15	QPSK	36	20	20.82	20.95	21.03		
15	QPSK	36	39	20.79	20.94	20.93		
15	QPSK	75	0	20.84	20.97	21.00		
15	16QAM	1	0	20.67	20.55	20.75	22.5	0
15	16QAM	1	37	20.52	20.67	20.76		
15	16QAM	1	74	20.54	20.54	20.63		
15	16QAM	36	0	20.74	20.99	21.03	22.5	0
15	16QAM	36	20	20.89	20.90	21.07		
15	16QAM	36	39	20.86	20.86	20.96		
15	16QAM	75	0	20.90	21.01	21.03		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	20.56	20.66	20.75	22.5	0
10	QPSK	1	25	20.90	20.94	21.05		
10	QPSK	1	49	20.76	20.60	20.68		
10	QPSK	25	0	20.92	20.93	21.10	22.5	0
10	QPSK	25	12	20.93	20.97	21.00		
10	QPSK	25	25	20.82	20.90	20.99		
10	QPSK	50	0	20.80	20.91	21.04		
10	16QAM	1	0	20.63	20.57	20.81	22.5	0
10	16QAM	1	25	20.55	20.68	20.82		
10	16QAM	1	49	20.51	20.65	20.66		
10	16QAM	25	0	21.10	21.00	20.82	22.5	0
10	16QAM	25	12	20.80	20.93	21.05		
10	16QAM	25	25	20.71	20.82	20.95		
10	16QAM	50	0	20.87	20.97	20.99		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	20.76	20.62	20.77	22.5	0
5	QPSK	1	12	20.79	20.79	20.90		
5	QPSK	1	24	20.75	20.58	20.71		
5	QPSK	12	0	20.86	20.87	20.94	22.5	0
5	QPSK	12	7	20.85	20.87	21.04		
5	QPSK	12	13	20.81	20.83	20.98		
5	QPSK	25	0	20.81	20.84	21.04		
5	16QAM	1	0	20.60	20.76	20.68	22.5	0
5	16QAM	1	12	20.50	20.57	20.68		
5	16QAM	1	24	20.54	20.58	20.58		
5	16QAM	12	0	20.74	20.73	20.89	22.5	0
5	16QAM	12	7	20.84	20.75	20.90		
5	16QAM	12	13	20.90	20.71	20.95		
5	16QAM	25	0	20.78	20.67	21.00		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	20.73	20.78	20.52	22.5	0
3	QPSK	1	8	20.79	20.94	20.82		
3	QPSK	1	14	20.70	20.53	20.59		
3	QPSK	8	0	20.92	20.93	20.86	22.5	0
3	QPSK	8	4	20.96	20.97	20.85		
3	QPSK	8	7	20.89	20.90	20.98		
3	QPSK	15	0	20.79	20.91	20.93		
3	16QAM	1	0	20.86	20.57	20.68	22.5	0
3	16QAM	1	8	20.85	20.68	20.79		
3	16QAM	1	14	20.81	20.65	20.61		
3	16QAM	8	0	20.81	21.00	20.90	22.5	0
3	16QAM	8	4	20.89	20.93	20.89		
3	16QAM	8	7	20.79	20.85	20.81		
3	16QAM	15	0	20.75	20.97	20.85		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	20.95	20.91	21.06	22.5	0
1.4	QPSK	1	3	20.98	21.06	21.07		
1.4	QPSK	1	5	20.91	21.06	21.01		
1.4	QPSK	3	0	20.94	20.91	20.94		
1.4	QPSK	3	1	20.98	21.06	20.91		
1.4	QPSK	3	3	21.03	21.01	20.98		
1.4	QPSK	6	0	20.94	21.04	20.92	22.5	0
1.4	16QAM	1	0	20.73	20.76	20.87	22.5	0
1.4	16QAM	1	3	20.79	20.90	21.04		
1.4	16QAM	1	5	20.70	20.80	20.95		
1.4	16QAM	3	0	20.92	20.94	20.98		
1.4	16QAM	3	1	20.96	21.07	20.91		
1.4	16QAM	3	3	20.89	20.90	21.07		
1.4	16QAM	6	0	20.79	20.95	21.06	22.5	0

<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	19.40	19.72	19.34	21	0
20	QPSK	1	49	19.30	19.71	19.64		
20	QPSK	1	99	19.44	19.35	19.27		
20	QPSK	50	0	19.36	19.45	19.44	21	0
20	QPSK	50	24	19.37	19.25	19.32		
20	QPSK	50	50	19.32	19.19	19.27		
20	QPSK	100	0	19.40	19.31	19.34		
20	16QAM	1	0	19.27	19.14	19.54	21	0
20	16QAM	1	49	19.44	19.38	19.29		
20	16QAM	1	99	19.24	19.22	19.26		
20	16QAM	50	0	19.28	19.31	19.35	21	0
20	16QAM	50	24	19.31	19.30	19.39		
20	16QAM	50	50	19.34	19.01	19.23		
20	16QAM	100	0	19.27	19.22	19.15		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	19.08	19.23	19.37	21	0
15	QPSK	1	37	19.29	19.41	19.41		
15	QPSK	1	74	19.04	19.11	19.18		
15	QPSK	36	0	19.36	19.29	19.38	21	0
15	QPSK	36	20	19.33	19.28	19.36		
15	QPSK	36	39	19.28	19.17	19.25		
15	QPSK	75	0	19.28	19.21	19.32		
15	16QAM	1	0	19.33	19.23	19.48	21	0
15	16QAM	1	37	19.28	19.29	19.35		
15	16QAM	1	74	19.16	19.18	19.34		
15	16QAM	36	0	19.31	19.32	19.34	21	0
15	16QAM	36	20	19.30	19.24	19.19		
15	16QAM	36	39	19.40	19.30	19.21		
15	16QAM	75	0	19.29	19.33	19.22		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	19.02	19.23	19.00	21	0
10	QPSK	1	25	19.35	19.19	19.45		
10	QPSK	1	49	19.20	19.00	19.17		
10	QPSK	25	0	19.29	19.30	19.33	21	0
10	QPSK	25	12	19.34	19.26	19.32		
10	QPSK	25	25	19.29	19.23	19.23		
10	QPSK	50	0	19.32	19.25	19.39		
10	16QAM	1	0	19.27	19.22	19.19	21	0
10	16QAM	1	25	19.56	19.31	19.21		
10	16QAM	1	49	19.19	19.20	19.35		
10	16QAM	25	0	19.26	19.25	19.21	21	0
10	16QAM	25	12	19.32	19.22	19.48		
10	16QAM	25	25	19.28	19.18	19.17		
10	16QAM	50	0	19.38	19.30	19.17		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	19.00	19.07	19.02	21	0
5	QPSK	1	12	19.07	19.13	19.17		
5	QPSK	1	24	19.16	19.03	19.21		
5	QPSK	12	0	19.09	19.24	19.12	21	0
5	QPSK	12	7	19.15	19.18	19.15		
5	QPSK	12	13	19.12	19.16	19.31		
5	QPSK	25	0	19.09	19.13	19.22		
5	16QAM	1	0	19.17	19.24	19.25	21	0
5	16QAM	1	12	19.09	19.13	19.08		
5	16QAM	1	24	19.06	19.15	19.33		
5	16QAM	12	0	19.27	19.09	19.20	21	0
5	16QAM	12	7	19.26	19.02	19.20		
5	16QAM	12	13	19.21	19.00	19.37		
5	16QAM	25	0	19.16	19.16	19.34		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	19.20	19.21	19.20	21	0
3	QPSK	1	8	19.41	19.19	19.19		
3	QPSK	1	14	19.11	19.00	19.00		
3	QPSK	8	0	19.29	19.30	19.30	21	0
3	QPSK	8	4	19.28	19.26	19.26		
3	QPSK	8	7	19.17	19.23	19.23		
3	QPSK	15	0	19.21	19.25	19.25		
3	16QAM	1	0	19.23	19.22	19.22	21	0
3	16QAM	1	8	19.29	19.31	19.31		
3	16QAM	1	14	19.18	19.20	19.20		
3	16QAM	8	0	19.32	19.25	19.25	21	0
3	16QAM	8	4	19.24	19.22	19.22		
3	16QAM	8	7	19.30	19.18	19.18		
3	16QAM	15	0	19.33	19.30	19.30		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	19.37	19.04	19.08	21	0
1.4	QPSK	1	3	19.41	19.37	19.29		
1.4	QPSK	1	5	19.18	19.21	19.04		
1.4	QPSK	3	0	19.38	19.30	19.36		
1.4	QPSK	3	1	19.36	19.25	19.33		
1.4	QPSK	3	3	19.25	19.19	19.28		
1.4	QPSK	6	0	19.32	19.31	19.28	21	0
1.4	16QAM	1	0	19.48	19.14	19.33	21	0
1.4	16QAM	1	3	19.35	19.38	19.28		
1.4	16QAM	1	5	19.34	19.22	19.16		
1.4	16QAM	3	0	19.34	19.31	19.31		
1.4	16QAM	3	1	19.19	19.30	19.30		
1.4	16QAM	3	3	19.21	19.01	19.40		
1.4	16QAM	6	0	19.22	19.22	19.29	21	0

<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	21.87	22.28	21.90	23.5	0
10	QPSK	1	25	22.22	22.17	22.23		
10	QPSK	1	49	22.11	21.99	22.22		
10	QPSK	25	0	22.17	22.20	22.17	23.5	0
10	QPSK	25	12	22.25	22.18	22.14		
10	QPSK	25	25	22.17	21.97	22.13		
10	QPSK	50	0	22.15	22.18	22.16		
10	16QAM	1	0	21.92	21.89	21.77	23.5	0
10	16QAM	1	25	22.05	21.85	21.93		
10	16QAM	1	49	21.90	21.71	21.73		
10	16QAM	25	0	21.11	21.23	21.33	22.5	1
10	16QAM	25	12	21.26	21.31	21.06		
10	16QAM	25	25	21.14	21.14	20.98		
10	16QAM	50	0	21.30	21.16	21.21		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.07	22.02	21.83	23.5	0
5	QPSK	1	12	22.20	22.14	22.05		
5	QPSK	1	24	21.85	21.90	21.87		
5	QPSK	12	0	22.06	22.11	21.97	23.5	0
5	QPSK	12	7	22.25	22.18	22.05		
5	QPSK	12	13	22.17	22.07	21.99		
5	QPSK	25	0	22.11	22.09	22.09		
5	16QAM	1	0	21.87	21.87	21.81	23.5	0
5	16QAM	1	12	21.95	21.87	21.67		
5	16QAM	1	24	21.77	21.83	21.74		
5	16QAM	12	0	21.20	21.05	21.17	22.5	1
5	16QAM	12	7	21.43	21.10	21.17		
5	16QAM	12	13	21.21	20.94	21.05		
5	16QAM	25	0	21.33	21.02	20.91		

Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	21.78	22.06	21.99	23.5	0
3	QPSK	1	8	22.13	22.25	22.15		
3	QPSK	1	14	21.95	22.03	22.04		
3	QPSK	8	0	21.97	22.19	22.22	23.5	0
3	QPSK	8	4	22.11	22.10	22.02		
3	QPSK	8	7	22.06	22.09	22.05		
3	QPSK	15	0	22.01	22.09	22.22		
3	16QAM	1	0	21.76	21.87	21.95	23.5	0
3	16QAM	1	8	21.83	21.69	21.60		
3	16QAM	1	14	21.81	21.66	21.64		
3	16QAM	8	0	21.01	21.19	21.06	22.5	1
3	16QAM	8	4	21.12	21.07	21.04		
3	16QAM	8	7	21.02	21.10	21.12		
3	16QAM	15	0	21.03	21.16	21.13		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	21.95	21.93	21.94	23.5	0
1.4	QPSK	1	3	22.13	22.23	22.14		
1.4	QPSK	1	5	22.15	22.21	22.03		
1.4	QPSK	3	0	21.95	22.03	22.04		
1.4	QPSK	3	1	22.17	22.07	21.99		
1.4	QPSK	3	3	22.25	22.18	22.05		
1.4	QPSK	6	0	21.96	22.22	21.95	23.5	0
1.4	16QAM	1	0	21.84	22.12	21.93	23.5	0
1.4	16QAM	1	3	22.07	22.13	21.94		
1.4	16QAM	1	5	22.00	21.83	21.87		
1.4	16QAM	3	0	21.85	22.22	21.98		
1.4	16QAM	3	1	21.94	22.11	22.00		
1.4	16QAM	3	3	21.93	22.03	22.01		
1.4	16QAM	6	0	21.02	21.24	21.18	22.5	1

<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		22.25		23.5	0
10	QPSK	1	25		22.22			
10	QPSK	1	49		21.84			
10	QPSK	25	0		22.13		23.5	0
10	QPSK	25	12		22.03			
10	QPSK	25	25		22.12			
10	QPSK	50	0		22.04			
10	16QAM	1	0		21.84		23.5	0
10	16QAM	1	25		21.79			
10	16QAM	1	49		21.95			
10	16QAM	25	0		21.10		22.5	1
10	16QAM	25	12		21.01			
10	16QAM	25	25		20.98			
10	16QAM	50	0		21.12			
Channel				23205	23230	23255	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				779.5	782	784.5		
5	QPSK	1	0	21.97	21.70	21.80	23.5	0
5	QPSK	1	12	22.06	22.07	21.98		
5	QPSK	1	24	22.15	22.11	21.93		
5	QPSK	12	0	22.03	22.05	22.07	23.5	0
5	QPSK	12	7	22.16	22.07	22.08		
5	QPSK	12	13	22.15	22.09	22.06		
5	QPSK	25	0	22.10	22.11	22.00		
5	16QAM	1	0	21.96	21.81	21.70	23.5	0
5	16QAM	1	12	21.85	21.75	21.88		
5	16QAM	1	24	21.76	21.79	21.90		
5	16QAM	12	0	21.04	21.02	20.78	22.5	1
5	16QAM	12	7	21.28	21.08	21.10		
5	16QAM	12	13	21.07	21.02	21.07		
5	16QAM	25	0	21.11	21.24	21.02		

<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		
Frequency (MHz)				1860	1880	1905		
20	QPSK	1	0	21.06	21.28	20.79	22.5	0
20	QPSK	1	49	21.13	21.27	21.25		
20	QPSK	1	99	20.87	20.82	21.09		
20	QPSK	50	0	21.13	21.23	21.22	22.5	0
20	QPSK	50	24	21.15	21.10	21.09		
20	QPSK	50	50	20.92	20.90	21.04		
20	QPSK	100	0	21.14	21.16	21.15		
20	16QAM	1	0	20.79	20.82	20.80	22.5	0
20	16QAM	1	49	20.80	20.76	20.88		
20	16QAM	1	99	20.57	20.60	20.75		
20	16QAM	50	0	21.19	21.07	21.25	22.5	0
20	16QAM	50	24	21.08	21.15	21.12		
20	16QAM	50	50	21.05	20.87	21.07		
20	16QAM	100	0	20.96	20.95	21.16		
Channel				26115	26340	26615	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1907.5		
15	QPSK	1	0	20.78	20.89	20.79	22.5	0
15	QPSK	1	37	21.03	21.15	20.83		
15	QPSK	1	74	20.93	20.78	20.85		
15	QPSK	36	0	20.91	20.92	21.00	22.5	0
15	QPSK	36	20	20.94	20.94	20.92		
15	QPSK	36	39	20.91	20.83	20.93		
15	QPSK	75	0	20.96	20.94	20.90		
15	16QAM	1	0	20.56	20.71	20.71	22.5	0
15	16QAM	1	37	20.52	20.63	20.54		
15	16QAM	1	74	20.53	20.53	20.60		
15	16QAM	36	0	20.85	20.85	20.93	22.5	0
15	16QAM	36	20	20.90	20.99	20.78		
15	16QAM	36	39	20.85	20.72	20.86		
15	16QAM	75	0	21.01	20.78	20.92		

Channel				26090	26340	26640	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1910		
10	QPSK	1	0	20.94	20.89	20.76	22.5	0
10	QPSK	1	25	21.03	20.96	21.17		
10	QPSK	1	49	20.95	20.91	21.07		
10	QPSK	25	0	20.91	20.89	20.98	22.5	0
10	QPSK	25	12	20.92	20.93	21.11		
10	QPSK	25	25	20.91	20.85	20.94		
10	QPSK	50	0	20.89	20.87	21.06		
10	16QAM	1	0	20.68	20.66	20.70	22.5	0
10	16QAM	1	25	20.60	20.58	20.68		
10	16QAM	1	49	20.55	20.53	20.67		
10	16QAM	25	0	21.16	21.05	21.02	22.5	0
10	16QAM	25	12	21.03	20.98	21.05		
10	16QAM	25	25	20.86	20.80	21.07		
10	16QAM	50	0	21.07	20.91	21.04		
Channel				26065	26340	26665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1912.5		
5	QPSK	1	0	20.88	20.85	20.87	22.5	0
5	QPSK	1	12	20.84	20.81	21.06		
5	QPSK	1	24	20.91	20.71	20.99		
5	QPSK	12	0	20.91	20.90	21.01	22.5	0
5	QPSK	12	7	20.91	20.89	21.07		
5	QPSK	12	13	20.86	20.76	21.03		
5	QPSK	25	0	20.86	20.87	21.01		
5	16QAM	1	0	20.65	20.59	20.59	22.5	0
5	16QAM	1	12	20.64	20.52	20.64		
5	16QAM	1	24	20.83	20.52	20.68		
5	16QAM	12	0	20.69	20.77	20.99	22.5	0
5	16QAM	12	7	21.01	20.71	21.19		
5	16QAM	12	13	20.95	20.85	21.16		
5	16QAM	25	0	20.83	20.84	21.13		

Channel				26055	26340	26675	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1913.5		
3	QPSK	1	0	20.76	20.70	20.54	22.5	0
3	QPSK	1	8	20.76	20.70	20.65		
3	QPSK	1	14	20.69	20.68	20.78		
3	QPSK	8	0	20.76	20.79	20.93	22.5	0
3	QPSK	8	4	20.77	20.73	20.93		
3	QPSK	8	7	20.73	20.77	20.89		
3	QPSK	15	0	20.73	20.71	20.84		
3	16QAM	1	0	20.50	20.54	20.66	22.5	0
3	16QAM	1	8	20.52	20.58	20.52		
3	16QAM	1	14	20.54	20.55	20.64		
3	16QAM	8	0	20.86	20.69	20.99	22.5	0
3	16QAM	8	4	20.63	20.73	21.01		
3	16QAM	8	7	20.83	20.65	20.97		
3	16QAM	15	0	20.69	20.66	20.89		
Channel				26047	26340	26683	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1914.3		
1.4	QPSK	1	0	20.88	20.73	20.71	22.5	0
1.4	QPSK	1	3	20.92	20.72	20.75		
1.4	QPSK	1	5	20.84	20.82	20.53		
1.4	QPSK	3	0	21.00	20.92	20.83		
1.4	QPSK	3	1	20.91	20.94	20.86		
1.4	QPSK	3	3	20.99	20.98	20.89		
1.4	QPSK	6	0	20.85	20.79	20.79	22.5	0
1.4	16QAM	1	0	20.57	20.62	20.59	22.5	0
1.4	16QAM	1	3	20.71	20.72	20.65		
1.4	16QAM	1	5	20.63	20.61	20.50		
1.4	16QAM	3	0	20.99	20.96	20.77		
1.4	16QAM	3	1	21.00	21.03	20.79		
1.4	16QAM	3	3	20.70	21.05	20.81		
1.4	16QAM	6	0	20.88	20.81	20.77	22.5	0

<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	22.15	22.35	22.03	23.5	0
15	QPSK	1	37	22.13	22.32	22.29		
15	QPSK	1	74	22.11	22.02	22.17		
15	QPSK	36	0	22.09	22.14	21.99	23.5	0
15	QPSK	36	20	22.13	22.04	21.96		
15	QPSK	36	39	22.07	21.98	21.95		
15	QPSK	75	0	22.04	22.02	21.98		
15	16QAM	1	0	21.82	21.79	21.85	23.5	0
15	16QAM	1	37	21.83	21.83	21.81		
15	16QAM	1	74	21.70	21.74	21.72		
15	16QAM	36	0	21.08	21.05	20.97	22.5	1
15	16QAM	36	20	21.04	21.05	20.97		
15	16QAM	36	39	20.99	21.10	20.87		
15	16QAM	75	0	21.15	21.13	20.94		
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	21.89	21.74	21.79	23.5	0
10	QPSK	1	25	22.18	22.11	22.04		
10	QPSK	1	49	21.74	21.69	21.73		
10	QPSK	25	0	22.17	22.08	21.97	23.5	0
10	QPSK	25	12	22.20	22.09	21.99		
10	QPSK	25	25	22.14	22.06	21.96		
10	QPSK	50	0	22.16	22.06	22.07		
10	16QAM	1	0	21.88	21.67	21.87	23.5	0
10	16QAM	1	25	21.86	21.92	21.76		
10	16QAM	1	49	21.73	21.81	21.73		
10	16QAM	25	0	21.38	21.02	21.14	22.5	1
10	16QAM	25	12	21.13	21.13	20.92		
10	16QAM	25	25	21.37	21.10	21.00		
10	16QAM	50	0	21.08	21.10	21.03		

Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	21.91	21.75	21.70	23.5	0
5	QPSK	1	12	21.99	22.02	21.84		
5	QPSK	1	24	21.85	21.74	21.53		
5	QPSK	12	0	22.06	22.01	21.93	23.5	0
5	QPSK	12	7	22.11	21.99	21.94		
5	QPSK	12	13	22.08	22.01	21.91		
5	QPSK	25	0	22.11	21.99	21.91		
5	16QAM	1	0	21.76	21.67	21.59	23.5	0
5	16QAM	1	12	21.74	21.73	21.63		
5	16QAM	1	24	21.78	21.65	21.60		
5	16QAM	12	0	21.10	20.85	20.91	22.5	1
5	16QAM	12	7	21.06	21.03	20.70		
5	16QAM	12	13	21.03	20.96	20.75		
5	16QAM	25	0	21.07	21.14	20.96		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	22.01	21.93	22.01	23.5	0
3	QPSK	1	8	21.73	21.84	21.93		
3	QPSK	1	14	21.96	21.84	21.64		
3	QPSK	8	0	22.15	22.07	22.03	23.5	0
3	QPSK	8	4	22.13	21.96	21.96		
3	QPSK	8	7	22.12	22.07	21.96		
3	QPSK	15	0	22.07	22.01	21.93		
3	16QAM	1	0	21.86	21.81	21.74	23.5	0
3	16QAM	1	8	21.72	21.75	21.59		
3	16QAM	1	14	21.84	21.82	21.79		
3	16QAM	8	0	21.13	21.12	21.02	22.5	1
3	16QAM	8	4	21.27	21.05	20.85		
3	16QAM	8	7	21.21	21.21	20.94		
3	16QAM	15	0	20.92	20.85	20.99		
Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	21.84	21.81	21.84	23.5	0
1.4	QPSK	1	3	22.08	21.97	21.80		
1.4	QPSK	1	5	22.02	21.87	21.68		
1.4	QPSK	3	0	22.12	22.07	22.04		
1.4	QPSK	3	1	22.34	22.22	21.99		
1.4	QPSK	3	3	22.04	22.07	22.09		
1.4	QPSK	6	0	22.01	22.08	21.94	23.5	0
1.4	16QAM	1	0	21.79	21.80	21.79	23.5	0
1.4	16QAM	1	3	21.98	21.91	21.82		
1.4	16QAM	1	5	21.79	21.71	21.72		
1.4	16QAM	3	0	22.00	22.01	21.98		
1.4	16QAM	3	1	22.01	22.02	21.89		
1.4	16QAM	3	3	21.93	22.14	21.97		
1.4	16QAM	6	0	20.95	20.95	20.76	22.5	1

<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		
Frequency (MHz)				1720	1745	1770		
20	QPSK	1	0	19.50	19.79	19.37	21	0
20	QPSK	1	49	19.69	19.73	19.35		
20	QPSK	1	99	19.40	19.58	19.64		
20	QPSK	50	0	19.65	19.78	19.61	21	0
20	QPSK	50	24	19.78	19.74	19.60		
20	QPSK	50	50	19.55	19.72	19.51		
20	QPSK	100	0	19.69	19.73	19.56		
20	16QAM	1	0	19.37	19.50	19.39	21	0
20	16QAM	1	49	19.58	19.52	19.36		
20	16QAM	1	99	19.19	19.35	19.22		
20	16QAM	50	0	19.50	19.50	19.64	21	0
20	16QAM	50	24	19.74	19.77	19.46		
20	16QAM	50	50	19.59	19.72	19.44		
20	16QAM	100	0	19.72	19.76	19.55		
Channel				132047	132322	132597	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1745	1772.5		
15	QPSK	1	0	19.26	19.26	19.24	21	0
15	QPSK	1	37	19.51	19.43	19.47		
15	QPSK	1	74	19.48	19.37	19.17		
15	QPSK	36	0	19.41	19.39	19.39	21	0
15	QPSK	36	20	19.44	19.41	19.31		
15	QPSK	36	39	19.43	19.34	19.26		
15	QPSK	75	0	19.36	19.41	19.26		
15	16QAM	1	0	19.14	19.14	19.13	21	0
15	16QAM	1	37	19.14	19.12	19.08		
15	16QAM	1	74	19.05	19.07	19.03		
15	16QAM	36	0	19.30	19.30	19.27	21	0
15	16QAM	36	20	19.38	19.43	19.41		
15	16QAM	36	39	19.35	19.45	19.14		
15	16QAM	75	0	19.37	19.52	19.27		

Channel				132022	132322	132622	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1745	1775		
10	QPSK	1	0	19.12	19.16	19.16	21	0
10	QPSK	1	25	19.50	19.32	19.41		
10	QPSK	1	49	19.12	19.23	19.41		
10	QPSK	25	0	19.35	19.46	19.42	21	0
10	QPSK	25	12	19.40	19.50	19.41		
10	QPSK	25	25	19.42	19.46	19.24		
10	QPSK	50	0	19.46	19.49	19.34		
10	16QAM	1	0	19.01	19.00	19.10	21	0
10	16QAM	1	25	19.10	19.13	19.05		
10	16QAM	1	49	19.14	19.12	19.20		
10	16QAM	25	0	19.34	19.38	19.36	21	0
10	16QAM	25	12	19.30	19.43	19.40		
10	16QAM	25	25	19.36	19.27	19.47		
10	16QAM	50	0	19.44	19.42	19.44		
Channel				131997	132322	132647	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1745	1777.5		
5	QPSK	1	0	19.05	19.16	19.32	21	0
5	QPSK	1	12	19.38	19.28	19.31		
5	QPSK	1	24	19.39	19.10	19.05		
5	QPSK	12	0	19.32	19.30	19.40	21	0
5	QPSK	12	7	19.46	19.34	19.35		
5	QPSK	12	13	19.41	19.28	19.28		
5	QPSK	25	0	19.40	19.37	19.35		
5	16QAM	1	0	19.03	19.03	19.02	21	0
5	16QAM	1	12	19.03	19.03	19.02		
5	16QAM	1	24	19.08	19.07	19.08		
5	16QAM	12	0	19.29	19.39	19.38	21	0
5	16QAM	12	7	19.36	19.41	19.43		
5	16QAM	12	13	19.46	19.44	19.18		
5	16QAM	25	0	19.27	19.32	19.35		

Channel				131987	132322	132657	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1745	1778.5		
3	QPSK	1	0	19.32	19.43	19.26	21	0
3	QPSK	1	8	19.09	19.20	19.09		
3	QPSK	1	14	19.14	19.41	19.27		
3	QPSK	8	0	19.27	19.41	19.36	21	0
3	QPSK	8	4	19.33	19.39	19.31		
3	QPSK	8	7	19.27	19.51	19.39		
3	QPSK	15	0	19.36	19.43	19.24		
3	16QAM	1	0	19.04	19.08	19.06	21	0
3	16QAM	1	8	19.03	19.06	19.01		
3	16QAM	1	14	19.06	19.10	19.04		
3	16QAM	8	0	19.32	19.42	19.44	21	0
3	16QAM	8	4	19.44	19.50	19.28		
3	16QAM	8	7	19.47	19.45	19.40		
3	16QAM	15	0	19.32	19.40	19.42		
Channel				131979	132322	132665	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1745	1779.3		
1.4	QPSK	1	0	19.20	19.28	19.17	21	0
1.4	QPSK	1	3	19.45	19.40	19.13		
1.4	QPSK	1	5	19.44	19.39	19.21		
1.4	QPSK	3	0	19.35	19.39	19.21		
1.4	QPSK	3	1	19.42	19.35	19.35		
1.4	QPSK	3	3	19.32	19.56	19.24		
1.4	QPSK	6	0	19.27	19.31	19.28	21	0
1.4	16QAM	1	0	19.16	19.09	19.01	21	0
1.4	16QAM	1	3	19.09	19.23	19.21		
1.4	16QAM	1	5	19.05	19.17	19.01		
1.4	16QAM	3	0	19.14	19.37	19.42		
1.4	16QAM	3	1	19.32	19.41	19.34		
1.4	16QAM	3	3	19.43	19.39	19.41		
1.4	16QAM	6	0	19.19	19.22	19.19	21	0

<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.

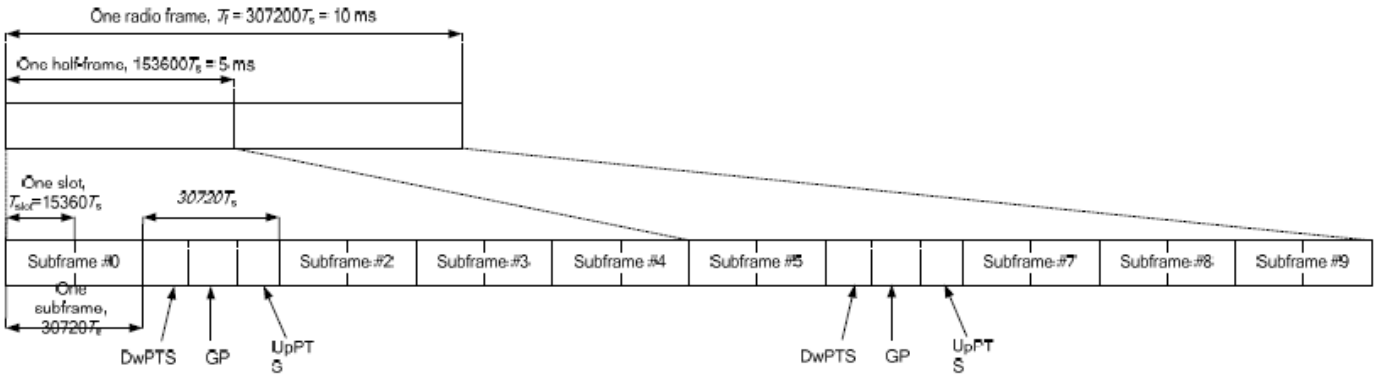


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Special subframe (30720·T_s): Normal cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	**Normal cyclic prefix in uplink**	**Extended cyclic prefix in uplink**
Uplink duty factor in one special subframe	**0~4**	7.13%	8.33%
	5~9	14.3%	16.7%

Special subframe(30720·T_s): Extended cyclic prefix in downlink (UpPTS)			
	Special subframe configuration	**Normal cyclic prefix in uplink**	**Extended cyclic prefix in uplink**
Uplink duty factor in one special subframe	**0~3**	7.13%	8.33%
	4~7	14.3%	16.7%

The highest duty factor is resulted from:

i. Uplink-downlink configuration: 0. In a half-frame consisted of 5 subfames, 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.

<Full Power Mode >

<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	22.80	23.12	22.74	22.94	22.89	24.5	0
20	QPSK	1	49	22.65	23.01	22.87	23.02	22.98		
20	QPSK	1	99	22.75	22.93	22.72	22.81	22.98		
20	QPSK	50	0	21.90	22.24	21.90	21.99	21.94	23.5	1
20	QPSK	50	24	21.91	22.23	21.81	21.87	21.96		
20	QPSK	50	50	21.86	22.14	21.86	21.85	21.96		
20	QPSK	100	0	21.69	22.16	21.92	21.81	21.98		
20	16QAM	1	0	21.35	21.56	21.38	21.85	21.77	23.5	1
20	16QAM	1	49	21.44	21.67	21.81	21.57	21.75		
20	16QAM	1	99	21.59	21.50	21.39	21.44	21.56		
20	16QAM	50	0	20.69	20.96	20.88	20.98	21.07	22.5	2
20	16QAM	50	24	20.65	21.04	20.81	20.96	21.01		
20	16QAM	50	50	20.65	20.93	20.87	20.84	21.01		
20	16QAM	100	0	20.57	21.06	20.73	20.92	21.03		
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	22.67	22.95	22.72	22.83	22.84	24.5	0
15	QPSK	1	37	22.80	23.01	23.00	22.89	23.00		
15	QPSK	1	74	22.68	22.87	22.78	22.66	22.98		
15	QPSK	36	0	21.56	21.97	21.92	21.89	21.95	23.5	1
15	QPSK	36	20	21.67	21.99	21.89	21.90	21.96		
15	QPSK	36	39	21.52	21.97	21.83	21.83	21.93		
15	QPSK	75	0	21.79	22.20	21.81	21.91	22.03		
15	16QAM	1	0	21.54	21.65	21.76	21.81	21.56	23.5	1
15	16QAM	1	37	21.46	21.78	21.78	21.80	21.79		
15	16QAM	1	74	21.56	21.72	21.45	21.33	21.80		
15	16QAM	36	0	20.67	21.03	20.88	20.91	20.92	22.5	2
15	16QAM	36	20	20.65	20.97	20.85	20.96	20.91		
15	16QAM	36	39	20.67	21.05	20.70	20.82	20.96		
15	16QAM	75	0	20.68	21.10	20.81	20.93	21.00		

Channel				39700	40160	40620	41080	41540	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2501	2547	2593	2639	2685		
10	QPSK	1	0	22.54	22.74	22.82	22.98	22.89	24.5	0
10	QPSK	1	25	22.75	22.96	22.86	22.94	22.88		
10	QPSK	1	49	22.67	22.95	22.60	22.73	22.89		
10	QPSK	25	0	21.65	21.99	21.91	21.99	22.11	23.5	1
10	QPSK	25	12	21.77	21.98	21.89	21.97	22.13		
10	QPSK	25	25	21.75	21.89	21.86	21.86	22.03		
10	QPSK	50	0	21.69	21.95	21.89	21.98	22.02		
10	16QAM	1	0	21.67	21.45	21.53	21.60	21.63	23.5	1
10	16QAM	1	25	21.53	21.78	21.82	21.90	21.81		
10	16QAM	1	49	21.53	21.42	21.40	21.45	21.43		
10	16QAM	25	0	20.81	21.17	21.09	21.17	21.10	22.5	2
10	16QAM	25	12	20.86	21.25	21.07	21.07	21.16		
10	16QAM	25	25	20.83	21.16	21.03	21.12	21.10		
10	16QAM	50	0	20.79	20.85	20.90	21.08	21.07		
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	22.61	22.60	22.74	22.72	22.95	24.5	0
5	QPSK	1	12	22.81	22.89	22.91	22.89	22.98		
5	QPSK	1	24	22.63	22.67	22.62	22.71	22.91		
5	QPSK	12	0	21.72	21.84	21.83	21.94	22.04	23.5	1
5	QPSK	12	7	21.76	21.90	21.88	21.91	22.06		
5	QPSK	12	13	21.71	21.80	21.80	21.93	22.10		
5	QPSK	25	0	21.73	21.82	21.77	21.94	22.08		
5	16QAM	1	0	21.56	21.62	21.75	21.81	21.75	23.5	1
5	16QAM	1	12	21.59	21.79	21.73	21.83	21.83		
5	16QAM	1	24	21.56	21.57	21.61	21.80	21.53		
5	16QAM	12	0	20.62	20.71	20.69	20.87	21.02	22.5	2
5	16QAM	12	7	20.67	20.76	20.74	20.74	21.01		
5	16QAM	12	13	20.74	20.83	20.74	20.86	21.01		
5	16QAM	25	0	20.63	20.90	21.01	20.81	21.04		

<WLAN Conducted Power>

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 ≤ 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 ≤ 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 ≤ 1.2 W/kg or all required channels are tested.

<Full Power Mode>

<2.4GHz WLAN ANT 1>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	16.86	17	100
		6	2437	16.88	17	
		11	2462	16.86	17	
	802.11g 6Mbps	1	2412	16.56	17	95.34
		6	2437	16.62	17	
		11	2462	16.68	17	
	802.11n-HT20 MCS0	1	2412	16.44	17	95
		6	2437	16.49	17	
		11	2462	16.48	17	
	802.11n-HT40 MCS0	3	2422	12.74	13.5	90.97
		6	2437	12.78	13.5	
		9	2452	12.70	13.5	

<2.4GHz WLAN ANT 2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	16.62	17	100
		6	2437	16.79	17	
		11	2462	16.78	17	
	802.11g 6Mbps	1	2412	16.30	17	95.98
		6	2437	16.50	17	
		11	2462	16.45	17	
	802.11n-HT20 MCS0	1	2412	16.19	17	95.32
		6	2437	16.38	17	
		11	2462	16.30	17	
	802.11n-HT40 MCS0	3	2422	12.48	13.5	90.97
		6	2437	12.72	13.5	
		9	2452	12.42	13.5	

<2.4GHz WLAN ANT 1+2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	19.75	20	100
		6	2437	19.85	20	
		11	2462	19.83	20	
	802.11g 6Mbps	1	2412	19.44	20	95.98
		6	2437	19.57	20	
		11	2462	19.57	20	
	802.11n-HT20 MCS0	1	2412	19.33	20	95.32
		6	2437	19.45	20	
		11	2462	19.40	20	
	802.11n-HT40 MCS0	3	2422	15.62	16.5	90.97
		6	2437	15.76	16.5	
		9	2452	15.57	16.5	

<5GHz WLAN ANT1>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	13.72	14	95.34
		40	5200	13.63	14	
		44	5220	13.69	14	
		48	5240	13.57	14	
	802.11n-HT20 MCS0	36	5180	13.60	14	95.68
		40	5200	13.57	14	
		44	5220	13.48	14	
		48	5240	13.51	14	
	802.11n-HT40 MCS0	38	5190	12.19	13.5	91.61
		46	5230	12.15	13.5	
	802.11ac-VHT20 MCS0	36	5180	13.51	14	95.73
		40	5200	13.48	14	
		44	5220	13.45	14	
		48	5240	13.56	14	
	802.11ac-VHT40 MCS0	38	5190	12.27	13.5	91.67
		46	5230	12.00	13.5	
	802.11ac-VHT80 MCS0	42	5210	11.78	13.5	84.21

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	13.97	14	95.34
		157	5785	13.95	14	
		165	5825	13.93	14	
	802.11n-HT20 MCS0	149	5745	13.82	14	95.68
		157	5785	13.77	14	
		165	5825	13.97	14	
	802.11n-HT40 MCS0	151	5755	12.55	13.5	91.61
		159	5795	13.00	13.5	
	802.11ac-VHT20 MCS0	149	5745	13.81	14	95.73
		157	5785	13.76	14	
		165	5825	13.99	14	
	802.11ac-VHT40 MCS0	151	5755	12.52	13.5	91.67
		159	5795	13.04	13.5	
	802.11ac-VHT80 MCS0	155	5775	12.17	13.5	84.21

<5GHz WLAN ANT2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	13.65	14	94.97
		40	5200	13.48	14	
		44	5220	13.64	14	
		48	5240	13.47	14	
	802.11n-HT20 MCS0	36	5180	13.52	14	95.33
		40	5200	13.48	14	
		44	5220	13.33	14	
		48	5240	13.40	14	
	802.11n-HT40 MCS0	38	5190	12.14	13.5	91
		46	5230	11.89	13.5	
	802.11ac-VHT20 MCS0	36	5180	13.43	14	94.99
		40	5200	13.41	14	
		44	5220	13.34	14	
		48	5240	13.36	14	
	802.11ac-VHT40 MCS0	38	5190	12.23	13.5	91.63
		46	5230	11.96	13.5	
	802.11ac-VHT80 MCS0	42	5210	11.66	13.5	84.29

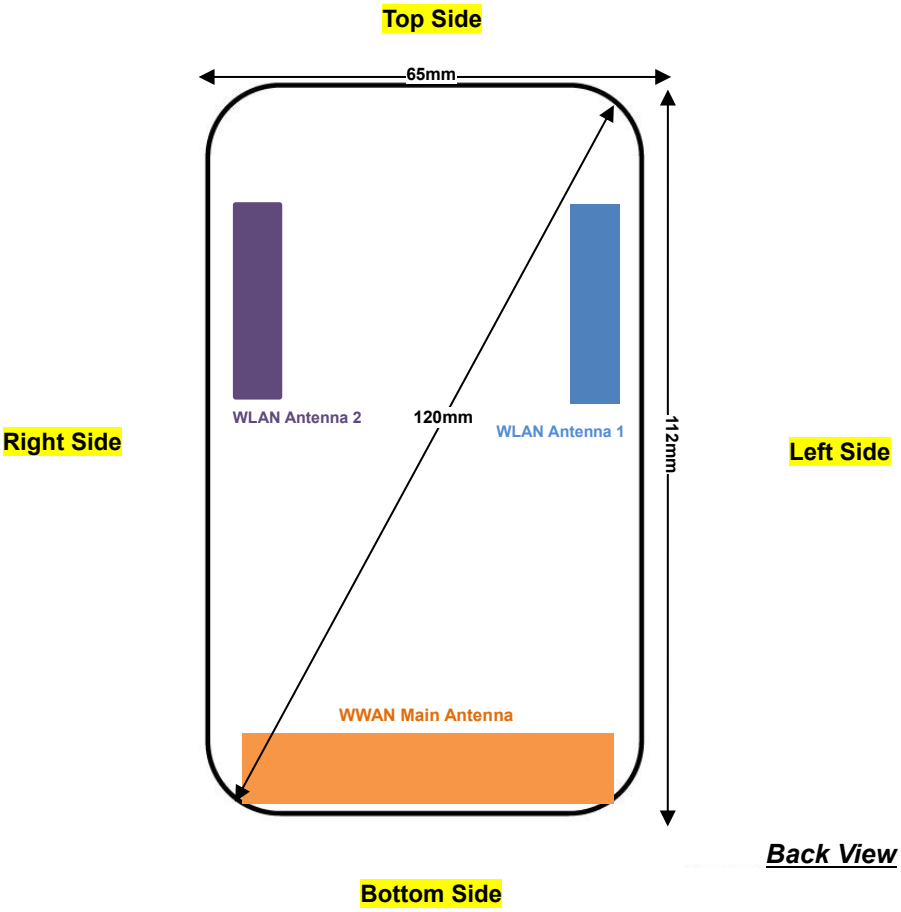
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	13.74	14	94.97
		157	5785	13.54	14	
		165	5825	13.25	14	
	802.11n-HT20 MCS0	149	5745	13.64	14	95.33
		157	5785	13.43	14	
		165	5825	13.27	14	
	802.11n-HT40 MCS0	151	5755	12.05	13.5	91
		159	5795	11.94	13.5	
	802.11ac-VHT20 MCS0	149	5745	13.63	14	94.99
		157	5785	13.45	14	
		165	5825	13.36	14	
	802.11ac-VHT40 MCS0	151	5755	12.13	13.5	91.63
		159	5795	12.01	13.5	
	802.11ac-VHT80 MCS0	155	5775	11.86	13.5	84.29

<5GHz WLAN ANT1+2>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	16.70	17	95.34
		40	5200	16.57	17	
		44	5220	16.68	17	
		48	5240	16.53	17	
	802.11n-HT20 MCS0	36	5180	16.57	17	95.68
		40	5200	16.54	17	
		44	5220	16.42	17	
		48	5240	16.47	17	
	802.11n-HT40 MCS0	38	5190	15.18	16.5	91.61
		46	5230	15.03	16.5	
	802.11ac-VHT20 MCS0	36	5180	16.48	17	95.73
		40	5200	16.46	17	
		44	5220	16.41	17	
		48	5240	16.47	17	
	802.11ac-VHT40 MCS0	38	5190	15.26	16.5	91.67
		46	5230	14.99	16.5	
	802.11ac-VHT80 MCS0	42	5210	14.73	16.5	84.29

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a 6Mbps	149	5745	16.87	17	95.34
		157	5785	16.76	17	
		165	5825	16.61	17	
	802.11n-HT20 MCS0	149	5745	16.74	17	95.68
		157	5785	16.61	17	
		165	5825	16.64	17	
	802.11n-HT40 MCS0	151	5755	15.32	16.5	91.61
		159	5795	15.51	16.5	
	802.11ac-VHT20 MCS0	149	5745	16.73	17	95.73
		157	5785	16.62	17	
		165	5825	16.70	17	
	802.11ac-VHT40 MCS0	151	5755	15.34	16.5	91.67
		159	5795	15.56	16.5	
	802.11ac-VHT80 MCS0	155	5775	15.03	16.5	84.29

14. Antenna Location



Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	≤ 25mm
WLAN Antenna 1	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	>25mm	≤ 25mm
WLAN Antenna 2	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Main	Yes	Yes	No	Yes	Yes	Yes
WLAN Antenna 1	Yes	Yes	Yes	No	No	Yes
WLAN Antenna 2	Yes	Yes	Yes	No	Yes	No

General Note:

1. Referring to KDB 941225 D06 v02r01, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge

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
2. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
3. The device employs proximity sensors that detect the presence of the user's body also a finger or hand near the front/ back/right/bottom side of the device, reduced power will be active for LTE band 2/4/5/13/25/26/66.
4. For the exposure positions that proximity sensor power reduction is applied for SAR compliance, additional SAR testing with EUT transmitting full power in normal mode was performed as followings:
   WWAN bands:
   - Front Face: 19 mm
   - Back Face: 17 mm
   - Right Side: 11 mm
   - Bottom Side: 26 mm

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 ≤ 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 ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 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 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; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.

10. For LTE 4 / 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.
11. LTE band 4 / 5 / 2 SAR test was covered by Band 66 / 26 / 25; 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 ≤ 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

WLAN Note:

1. 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.
2. 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 ≤ 1.2 W/kg.
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 ≤ 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 ≤ 1.2 W/kg or all required channels are tested.
5. During SAR testing the WLAN transmission was verified using a spectrum analyzer.

15.1 Body SAR

<FDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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 71	20M	QPSK	1	0	Front	10	Full	133322	683	23.12	24.50	1.374	-0.03	0.330	0.453
	LTE Band 71	20M	QPSK	50	0	Front	10	Full	133322	683	22.06	23.50	1.393	0.01	0.278	0.387
01	LTE Band 71	20M	QPSK	1	0	Back	10	Full	133322	683	23.12	24.50	1.374	-0.05	0.553	**0.760**
	LTE Band 71	20M	QPSK	50	0	Back	10	Full	133322	683	22.06	23.50	1.393	0.01	0.328	0.457
	LTE Band 71	20M	QPSK	1	0	Left Side	10	Full	133322	683	23.12	24.50	1.374	0.02	0.161	0.221
	LTE Band 71	20M	QPSK	50	0	Left Side	10	Full	133322	683	22.06	23.50	1.393	0.05	0.116	0.162
	LTE Band 71	20M	QPSK	1	0	Right Side	10	Full	133322	683	23.12	24.50	1.374	0.03	0.209	0.287
	LTE Band 71	20M	QPSK	50	0	Right Side	10	Full	133322	683	22.06	23.50	1.393	0.03	0.157	0.219
	LTE Band 71	20M	QPSK	1	0	Bottom Side	10	Full	133322	683	23.12	24.50	1.374	-0.05	0.063	0.087
	LTE Band 71	20M	QPSK	50	0	Bottom Side	10	Full	133322	683	22.06	23.50	1.393	0.01	0.062	0.087
	LTE Band 12	10M	QPSK	1	0	Front	10	Full	23095	707.5	23.21	24.50	1.346	-0.02	0.689	0.927
	LTE Band 12	10M	QPSK	25	0	Front	10	Full	23095	707.5	22.24	23.50	1.337	-0.05	0.488	0.652
	LTE Band 12	10M	QPSK	50	0	Front	10	Full	23095	707.5	22.19	23.50	1.352	-0.02	0.477	0.645
02	LTE Band 12	10M	QPSK	1	0	Back	10	Full	23095	707.5	23.21	24.50	1.346	0.03	0.705	**0.949**
	LTE Band 12	10M	QPSK	25	0	Back	10	Full	23095	707.5	22.24	23.50	1.337	-0.07	0.636	0.850
	LTE Band 12	10M	QPSK	50	0	Back	10	Full	23095	707.5	22.19	23.50	1.352	0.01	0.617	0.834
	LTE Band 12	10M	QPSK	1	0	Left Side	10	Full	23095	707.5	23.21	24.50	1.346	0.05	0.302	0.406
	LTE Band 12	10M	QPSK	25	0	Left Side	10	Full	23095	707.5	22.24	23.50	1.337	0.02	0.244	0.326
	LTE Band 12	10M	QPSK	1	0	Right Side	10	Full	23095	707.5	23.21	24.50	1.346	-0.05	0.356	0.479
	LTE Band 12	10M	QPSK	25	0	Right Side	10	Full	23095	707.5	22.24	23.50	1.337	0.01	0.293	0.392
	LTE Band 12	10M	QPSK	1	0	Bottom Side	10	Full	23095	707.5	23.21	24.50	1.346	0.02	0.106	0.143
	LTE Band 12	10M	QPSK	25	0	Bottom Side	10	Full	23095	707.5	22.24	23.50	1.337	0.05	0.087	0.116
	LTE Band 13	10M	QPSK	1	0	Front	10	Reduced	23230	782	22.25	23.50	1.334	0.05	0.640	0.853
	LTE Band 13	10M	QPSK	25	0	Front	10	Reduced	23230	782	22.13	23.50	1.371	-0.09	0.662	0.908
	LTE Band 13	10M	QPSK	50	0	Front	10	Reduced	23230	782	22.04	23.50	1.400	0.06	0.680	0.952
	LTE Band 13	10M	QPSK	1	0	Back	10	Reduced	23230	782	22.25	23.50	1.334	-0.11	0.699	0.932
	LTE Band 13	10M	QPSK	25	0	Back	10	Reduced	23230	782	22.13	23.50	1.371	-0.09	0.730	1.001
03	LTE Band 13	10M	QPSK	50	0	Back	10	Reduced	23230	782	22.04	23.50	1.400	0.06	0.720	**1.008**
	LTE Band 13	10M	QPSK	1	0	Left Side	10	Full	23230	782	23.34	24.50	1.306	0.01	0.465	0.607
	LTE Band 13	10M	QPSK	25	0	Left Side	10	Full	23230	782	22.25	23.50	1.334	0.06	0.387	0.516
	LTE Band 13	10M	QPSK	1	0	Right Side	10	Reduced	23230	782	22.25	23.50	1.334	0.03	0.402	0.536
	LTE Band 13	10M	QPSK	25	0	Right Side	10	Reduced	23230	782	22.13	23.50	1.371	-0.01	0.398	0.546
	LTE Band 13	10M	QPSK	1	0	Bottom Side	10	Reduced	23230	782	22.25	23.50	1.334	-0.01	0.068	0.090
	LTE Band 13	10M	QPSK	25	0	Bottom Side	10	Reduced	23230	782	22.13	23.50	1.371	0.02	0.069	0.095
	LTE Band 13	10M	QPSK	1	0	Front	19	Full	23230	782	23.34	24.50	1.306	-0.06	0.561	0.733
	LTE Band 13	10M	QPSK	25	0	Front	19	Full	23230	782	22.25	23.50	1.334	0.06	0.440	0.587
	LTE Band 13	10M	QPSK	1	0	Back	17	Full	23230	782	23.34	24.50	1.306	-0.09	0.672	0.878
	LTE Band 13	10M	QPSK	25	0	Back	17	Full	23230	782	22.25	23.50	1.334	0.07	0.527	0.703
	LTE Band 13	10M	QPSK	50	0	Back	17	Full	23230	782	22.23	23.50	1.340	0.02	0.518	0.694
	LTE Band 13	10M	QPSK	1	0	Right Side	11	Full	23230	782	23.34	24.50	1.306	0.06	0.472	0.617
	LTE Band 13	10M	QPSK	25	0	Right Side	11	Full	23230	782	22.25	23.50	1.334	0.07	0.360	0.480
	LTE Band 13	10M	QPSK	1	0	Bottom Side	26	Full	23230	782	23.34	24.50	1.306	0.01	0.016	0.021
	LTE Band 13	10M	QPSK	25	0	Bottom Side	26	Full	23230	782	22.25	23.50	1.334	0.01	0.012	0.016

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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 26	15M	QPSK	1	0	Front	10	Reduced	26865	831.5	22.35	23.50	1.303	-0.09	0.768	1.001
	LTE Band 26	15M	QPSK	36	0	Front	10	Reduced	26865	831.5	22.14	23.50	1.368	0.03	0.752	1.029
	LTE Band 26	15M	QPSK	75	0	Front	10	Reduced	26865	831.5	22.02	23.50	1.406	-0.01	0.742	1.043
	LTE Band 26	15M	QPSK	1	0	Back	10	Reduced	26865	831.5	22.35	23.50	1.303	-0.06	0.728	0.949
	LTE Band 26	15M	QPSK	36	0	Back	10	Reduced	26865	831.5	22.14	23.50	1.368	0.01	0.769	1.052
04	LTE Band 26	15M	QPSK	75	0	Back	10	Reduced	26865	831.5	22.02	23.50	1.406	-0.01	0.751	**1.056**
	LTE Band 26	15M	QPSK	1	0	Left Side	10	Full	26865	831.5	23.45	24.50	1.274	0.03	0.358	0.456
	LTE Band 26	15M	QPSK	36	0	Left Side	10	Full	26865	831.5	22.26	23.50	1.330	0.05	0.259	0.345
	LTE Band 26	15M	QPSK	1	0	Right Side	10	Reduced	26865	831.5	22.35	23.50	1.303	0.03	0.383	0.499
	LTE Band 26	15M	QPSK	36	0	Right Side	10	Reduced	26865	831.5	22.14	23.50	1.368	0.05	0.398	0.544
	LTE Band 26	15M	QPSK	1	0	Bottom Side	10	Reduced	26865	831.5	22.35	23.50	1.303	0.09	0.081	0.106
	LTE Band 26	15M	QPSK	36	0	Bottom Side	10	Reduced	26865	831.5	22.14	23.50	1.368	0.05	0.071	0.097
	LTE Band 26	15M	QPSK	1	0	Front	19	Full	26865	831.5	23.45	24.50	1.274	0.01	0.574	0.731
	LTE Band 26	15M	QPSK	36	0	Front	19	Full	26865	831.5	22.26	23.50	1.330	0.05	0.463	0.616
	LTE Band 26	15M	QPSK	1	0	Back	17	Full	26865	831.5	23.45	24.50	1.274	0.01	0.661	0.842
	LTE Band 26	15M	QPSK	36	0	Back	17	Full	26865	831.5	22.26	23.50	1.330	0.04	0.522	0.694
	LTE Band 26	15M	QPSK	75	0	Back	17	Full	26865	831.5	22.11	23.50	1.377	-0.06	0.498	0.686
	LTE Band 26	15M	QPSK	1	0	Right Side	11	Full	26865	831.5	23.45	24.50	1.274	0.04	0.490	0.624
	LTE Band 26	15M	QPSK	36	0	Right Side	11	Full	26865	831.5	22.26	23.50	1.330	0.03	0.383	0.510
	LTE Band 26	15M	QPSK	1	0	Bottom Side	26	Full	26865	831.5	23.45	24.50	1.274	0.08	0.016	0.020
	LTE Band 26	15M	QPSK	36	0	Bottom Side	26	Full	26865	831.5	22.26	23.50	1.330	0.06	0.014	0.019
	LTE Band 66	20M	QPSK	1	0	Front	10	Reduced	132322	1745	19.79	21.00	1.321	-0.14	0.406	0.536
	LTE Band 66	20M	QPSK	50	0	Front	10	Reduced	132322	1745	19.78	21.00	1.324	0.06	0.439	0.581
05	LTE Band 66	20M	QPSK	1	0	Back	10	Reduced	132322	1745	19.79	21.00	1.321	-0.14	0.580	**0.766**
	LTE Band 66	20M	QPSK	50	0	Back	10	Reduced	132322	1745	19.78	21.00	1.324	-0.07	0.572	0.758
	LTE Band 66	20M	QPSK	1	0	Left Side	10	Full	132322	1745	23.20	24.50	1.349	-0.02	0.383	0.517
	LTE Band 66	20M	QPSK	50	0	Left Side	10	Full	132322	1745	22.17	23.50	1.358	0.03	0.320	0.435
	LTE Band 66	20M	QPSK	1	0	Right Side	10	Reduced	132322	1745	19.79	21.00	1.321	0.05	0.120	0.159
	LTE Band 66	20M	QPSK	50	0	Right Side	10	Reduced	132322	1745	19.78	21.00	1.324	0.09	0.092	0.121
	LTE Band 66	20M	QPSK	1	0	Bottom Side	10	Reduced	132322	1745	19.79	21.00	1.321	0.05	0.159	0.210
	LTE Band 66	20M	QPSK	50	0	Bottom Side	10	Reduced	132322	1745	19.78	21.00	1.324	0.03	0.155	0.205
	LTE Band 66	20M	QPSK	1	0	Front	19	Full	132322	1745	23.20	24.50	1.349	-0.03	0.356	0.480
	LTE Band 66	20M	QPSK	50	0	Front	19	Full	132322	1745	22.17	23.50	1.358	0.05	0.310	0.421
	LTE Band 66	20M	QPSK	1	0	Back	17	Full	132322	1745	23.20	24.50	1.349	-0.04	0.545	0.735
	LTE Band 66	20M	QPSK	50	0	Back	17	Full	132322	1745	22.17	23.50	1.358	0.04	0.430	0.584
	LTE Band 66	20M	QPSK	1	0	Right Side	11	Full	132322	1745	23.20	24.50	1.349	0.03	0.087	0.117
	LTE Band 66	20M	QPSK	50	0	Right Side	11	Full	132322	1745	22.17	23.50	1.358	0.08	0.067	0.091
	LTE Band 66	20M	QPSK	1	0	Bottom Side	26	Full	132322	1745	23.20	24.50	1.349	0.03	0.109	0.147
	LTE Band 66	20M	QPSK	50	0	Bottom Side	26	Full	132322	1745	22.17	23.50	1.358	0.04	0.086	0.116

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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 25	20M	QPSK	1	0	Front	10	Reduced	26340	1880	21.28	22.50	1.324	-0.02	0.592	0.784
	LTE Band 25	20M	QPSK	1	0	Front	10	Reduced	26140	1860	21.06	22.50	1.393	0.03	0.596	0.830
	LTE Band 25	20M	QPSK	1	0	Front	10	Reduced	26590	1905	20.79	22.50	1.483	0.08	0.594	0.881
	LTE Band 25	20M	QPSK	50	0	Front	10	Reduced	26340	1880	21.23	22.50	1.340	-0.06	0.636	0.852
	LTE Band 25	20M	QPSK	50	0	Front	10	Reduced	26140	1860	21.13	22.50	1.371	-0.05	0.606	0.831
	LTE Band 25	20M	QPSK	50	0	Front	10	Reduced	26590	1905	21.22	22.50	1.343	-0.01	0.605	0.812
	LTE Band 25	20M	QPSK	100	0	Front	10	Reduced	26340	1880	21.16	22.50	1.361	-0.08	0.576	0.784
	LTE Band 25	20M	QPSK	1	0	Back	10	Reduced	26340	1880	21.28	22.50	1.324	-0.04	0.704	0.932
06	LTE Band 25	20M	QPSK	1	0	Back	10	Reduced	26140	1860	21.06	22.50	1.393	-0.09	0.715	**0.996**
	LTE Band 25	20M	QPSK	1	0	Back	10	Reduced	26590	1905	20.79	22.50	1.483	-0.08	0.647	0.959
	LTE Band 25	20M	QPSK	50	0	Back	10	Reduced	26340	1880	21.23	22.50	1.340	-0.02	0.701	0.939
	LTE Band 25	20M	QPSK	50	0	Back	10	Reduced	26140	1860	21.13	22.50	1.371	-0.09	0.714	0.979
	LTE Band 25	20M	QPSK	50	0	Back	10	Reduced	26590	1905	21.22	22.50	1.343	-0.02	0.634	0.851
	LTE Band 25	20M	QPSK	100	0	Back	10	Reduced	26340	1880	21.16	22.50	1.361	-0.01	0.645	0.878
	LTE Band 25	20M	QPSK	1	0	Left Side	10	Full	26340	1880	23.34	24.50	1.306	0.05	0.419	0.547
	LTE Band 25	20M	QPSK	50	0	Left Side	10	Full	26340	1880	21.93	23.50	1.435	-0.01	0.353	0.507
	LTE Band 25	20M	QPSK	1	0	Right Side	10	Reduced	26340	1880	21.28	22.50	1.324	0.03	0.235	0.311
	LTE Band 25	20M	QPSK	50	0	Right Side	10	Reduced	26340	1880	21.23	22.50	1.340	0.02	0.197	0.264
	LTE Band 25	20M	QPSK	1	0	Bottom Side	10	Reduced	26340	1880	21.28	22.50	1.324	-0.02	0.216	0.286
	LTE Band 25	20M	QPSK	50	0	Bottom Side	10	Reduced	26340	1880	21.23	22.50	1.340	-0.02	0.214	0.287
	LTE Band 25	20M	QPSK	1	0	Front	19	Full	26340	1880	23.34	24.50	1.306	-0.03	0.352	0.460
	LTE Band 25	20M	QPSK	50	0	Front	19	Full	26340	1880	21.93	23.50	1.435	-0.04	0.318	0.456
	LTE Band 25	20M	QPSK	1	0	Back	17	Full	26340	1880	23.34	24.50	1.306	-0.02	0.391	0.511
	LTE Band 25	20M	QPSK	50	0	Back	17	Full	26340	1880	21.93	23.50	1.435	-0.06	0.361	0.518
	LTE Band 25	20M	QPSK	1	0	Right Side	11	Full	26340	1880	23.34	24.50	1.306	0.02	0.179	0.234
	LTE Band 25	20M	QPSK	50	0	Right Side	11	Full	26340	1880	21.93	23.50	1.435	0.06	0.142	0.204
	LTE Band 25	20M	QPSK	1	0	Bottom Side	26	Full	26340	1880	23.34	24.50	1.306	0.02	0.150	0.196
	LTE Band 25	20M	QPSK	50	0	Bottom Side	26	Full	26340	1880	21.93	23.50	1.435	0.07	0.120	0.172

<TDD LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Power Mode	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	20M	QPSK	1	0	Front	10	Full	40185	2549.5	23.12	24.50	1.374	62.9	1.006	-0.02	0.208	0.288
	LTE Band 41	20M	QPSK	50	0	Front	10	Full	40185	2549.5	22.24	23.50	1.337	62.9	1.006	-0.09	0.175	0.235
	LTE Band 41	20M	QPSK	1	0	Back	10	Full	40185	2549.5	23.12	24.50	1.374	62.9	1.006	-0.02	0.286	0.395
	LTE Band 41	20M	QPSK	50	0	Back	10	Full	40185	2549.5	22.24	23.50	1.337	62.9	1.006	-0.01	0.170	0.229
	LTE Band 41	20M	QPSK	1	0	Left Side	10	Full	40185	2549.5	23.12	24.50	1.374	62.9	1.006	0.05	0.313	0.433
	LTE Band 41	20M	QPSK	50	0	Left Side	10	Full	40185	2549.5	22.24	23.50	1.337	62.9	1.006	-0.01	0.264	0.355
	LTE Band 41	20M	QPSK	1	0	Right Side	10	Full	40185	2549.5	23.12	24.50	1.374	62.9	1.006	-0.05	0.027	0.037
	LTE Band 41	20M	QPSK	50	0	Right Side	10	Full	40185	2549.5	22.24	23.50	1.337	62.9	1.006	-0.01	0.019	0.026
	LTE Band 41	20M	QPSK	1	0	Bottom Side	10	Full	40185	2549.5	23.12	24.50	1.374	62.9	1.006	-0.08	0.495	0.684
07	LTE Band 41	20M	QPSK	1	0	Bottom Side	10	Full	39750	2506	22.80	24.50	1.479	62.9	1.006	-0.09	0.604	**0.899**
	LTE Band 41	20M	QPSK	1	0	Bottom Side	10	Full	40620	2593	22.74	24.50	1.500	62.9	1.006	-0.08	0.486	0.733
	LTE Band 41	20M	QPSK	1	0	Bottom Side	10	Full	41055	2636.5	22.94	24.50	1.432	62.9	1.006	-0.01	0.490	0.706
	LTE Band 41	20M	QPSK	1	0	Bottom Side	10	Full	41490	2680	22.89	24.50	1.449	62.9	1.006	0.05	0.443	0.646
	LTE Band 41	20M	QPSK	50	0	Bottom Side	10	Full	40185	2549.5	22.24	23.50	1.337	62.9	1.006	-0.01	0.221	0.297
	LTE Band 41	20M	QPSK	100	0	Bottom Side	10	Full	40185	2549.5	22.16	23.50	1.361	62.9	1.006	-0.02	0.211	0.289

<WLAN 2.4GHz SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	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	802.11b 1Mbps	Front	10	1	6	2437	16.88	17.00	1.028	100	1.000	0.05	0.241	0.248
	WLAN2.4GHz	802.11b 1Mbps	Back	10	1	6	2437	16.88	17.00	1.028	100	1.000	-0.01	0.216	0.222
08	WLAN2.4GHz	802.11b 1Mbps	Left Side	10	1	6	2437	16.88	17.00	1.028	100	1.000	-0.05	0.307	**0.316**
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10	1	6	2437	16.88	17.00	1.028	100	1.000	-0.16	0.064	0.065
	WLAN2.4GHz	802.11b 1Mbps	Front	10	2	6	2437	16.79	17.00	1.050	100	1.000	-0.03	0.279	0.293
09	WLAN2.4GHz	802.11b 1Mbps	Back	10	2	6	2437	16.79	17.00	1.050	100	1.000	-0.04	0.315	**0.331**
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10	2	6	2437	16.79	17.00	1.050	100	1.000	-0.04	0.129	0.135
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10	2	6	2437	16.79	17.00	1.050	100	1.000	0.02	0.070	0.074
	WLAN2.4GHz	802.11b 1Mbps	Front	10	1+2	6	2437	19.85	20.00	1.036	100	1.000	-0.01	0.423	0.438
10	WLAN2.4GHz	802.11b 1Mbps	Back	10	1+2	6	2437	19.85	20.00	1.036	100	1.000	-0.04	0.516	**0.535**
	WLAN2.4GHz	802.11b 1Mbps	Left Side	10	1+2	6	2437	19.85	20.00	1.036	100	1.000	-0.08	0.338	0.350
	WLAN2.4GHz	802.11b 1Mbps	Right Side	10	1+2	6	2437	19.85	20.00	1.036	100	1.000	-0.03	0.127	0.132
	WLAN2.4GHz	802.11b 1Mbps	Top Side	10	1+2	6	2437	19.85	20.00	1.036	100	1.000	0.01	0.103	0.107

<WLAN5G SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	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)
	WLAN5.2GHz	802.11a 6Mbps	Front	10	1	36	5180	13.72	14.00	1.067	95.34	1.049	-0.05	0.254	0.284
	WLAN5.2GHz	802.11a 6Mbps	Back	10	1	36	5180	13.72	14.00	1.067	95.34	1.049	0.02	0.266	0.298
11	WLAN5.2GHz	802.11a 6Mbps	Left Side	10	1	36	5180	13.72	14.00	1.067	95.34	1.049	0.06	0.774	**0.867**
	WLAN5.2GHz	802.11a 6Mbps	Left Side	10	1	44	5220	13.69	14.00	1.074	95.34	1.049	0.01	0.765	0.862
	WLAN5.2GHz	802.11a 6Mbps	Top Side	10	1	36	5180	13.72	14.00	1.067	95.34	1.049	-0.01	0.021	0.024
	WLAN5.2GHz	802.11a 6Mbps	Front	10	2	36	5180	13.65	14.00	1.084	94.97	1.053	0.03	0.231	0.264
	WLAN5.2GHz	802.11a 6Mbps	Back	10	2	36	5180	13.65	14.00	1.084	94.97	1.053	0.02	0.255	0.291
12	WLAN5.2GHz	802.11a 6Mbps	Right Side	10	2	36	5180	13.65	14.00	1.084	94.97	1.053	-0.09	0.675	**0.770**
	WLAN5.2GHz	802.11a 6Mbps	Top Side	10	2	36	5180	13.65	14.00	1.084	94.97	1.053	0.03	0.032	0.037
	WLAN5.2GHz	802.11a 6Mbps	Front	10	1+2	36	5180	16.70	17.00	1.072	95.34	1.049	0.02	0.263	0.296
	WLAN5.2GHz	802.11a 6Mbps	Back	10	1+2	36	5180	16.70	17.00	1.072	95.34	1.049	0.07	0.263	0.296
13	WLAN5.2GHz	802.11a 6Mbps	Left Side	10	1+2	36	5180	16.70	17.00	1.072	95.34	1.049	0.03	0.809	**0.910**
	WLAN5.2GHz	802.11a 6Mbps	Left Side	10	1+2	44	5220	16.68	17.00	1.076	95.34	1.049	-0.08	0.769	0.868
	WLAN5.2GHz	802.11a 6Mbps	Right Side	10	1+2	36	5180	16.70	17.00	1.072	95.34	1.049	-0.15	0.608	0.684
	WLAN5.2GHz	802.11a 6Mbps	Top Side	10	1+2	36	5180	16.70	17.00	1.072	95.34	1.049	0.02	0.055	0.062
	WLAN5.8GHz	802.11a 6Mbps	Front	10	1	149	5745	13.97	14.00	1.007	95.34	1.049	0	0.221	0.233
	WLAN5.8GHz	802.11a 6Mbps	Back	10	1	149	5745	13.97	14.00	1.007	95.34	1.049	-0.1	0.188	0.199
14	WLAN5.8GHz	802.11a 6Mbps	Left Side	10	1	149	5745	13.97	14.00	1.007	95.34	1.049	0.05	0.515	**0.544**
	WLAN5.8GHz	802.11a 6Mbps	Top Side	10	1	149	5745	13.97	14.00	1.007	95.34	1.049	0.03	0.039	0.041
	WLAN5.8GHz	802.11a 6Mbps	Front	10	2	149	5745	13.74	14.00	1.062	94.97	1.053	-0.09	0.210	0.235
	WLAN5.8GHz	802.11a 6Mbps	Back	10	2	149	5745	13.74	14.00	1.062	94.97	1.053	0.03	0.189	0.211
15	WLAN5.8GHz	802.11a 6Mbps	Right Side	10	2	149	5745	13.74	14.00	1.062	94.97	1.053	-0.08	0.489	**0.547**
	WLAN5.8GHz	802.11a 6Mbps	Top Side	10	2	149	5745	13.74	14.00	1.062	94.97	1.053	0.02	0.033	0.037
	WLAN5.8GHz	802.11a 6Mbps	Front	10	1+2	149	5745	16.87	17.00	1.030	95.34	1.049	-0.01	0.226	0.244
	WLAN5.8GHz	802.11a 6Mbps	Back	10	1+2	149	5745	16.87	17.00	1.030	95.34	1.049	0.05	0.188	0.203
16	WLAN5.8GHz	802.11a 6Mbps	Left Side	10	1+2	149	5745	16.87	17.00	1.030	95.34	1.049	-0.01	0.551	**0.596**
	WLAN5.8GHz	802.11a 6Mbps	Right Side	10	1+2	149	5745	16.87	17.00	1.030	95.34	1.049	-0.05	0.490	0.530
	WLAN5.8GHz	802.11a 6Mbps	Top Side	10	1+2	149	5745	16.87	17.00	1.030	95.34	1.049	0.06	0.042	0.045

15.2 Repeated SAR Measurement

No.	Band	Modulation	Test Position	Gap (mm)	Antenna	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	WLAN5.2GHz	802.11a 6Mbps	Left Side	10	1+2	36	5180	16.70	17.00	1.072	95.34	1.049	0.03	0.809	1	0.910
2nd	WLAN5.2GHz	802.11a 6Mbps	Left Side	10	1+2	36	5180	16.70	17.00	1.072	95.34	1.049	0.03	0.803	1.007	0.903

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. 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.	LTE + 2.4GHz WLAN(SISO/MIMO)	Yes
2.	LTE + 5GHz WLAN(SISO/MIMO)	Yes

General Note:

1. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment though they have independent antenna.
2. The reported SAR summation is calculated based on the same configuration and test position.
3. All licensed modes share the same antenna part and cannot transmit simultaneously.

16.1 Body Exposure Conditions

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN Ant 1 1g SAR (W/kg)	3 2.4GHz WLAN Ant 2 1g SAR (W/kg)	4 5GHz WLAN Ant 1 1g SAR (W/kg)	5 5GHz WLAN Ant 2 1g SAR (W/kg)	6 2.4GHz WLAN Ant 1+2 1g SAR (W/kg)	7 5GHz WLAN Ant 1+2 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	1+5 Summed 1g SAR (W/kg)	1+6 Summed 1g SAR (W/kg)	1+7 Summed 1g SAR (W/kg)
LTE	LTE Band 71	Front	0.453	0.248	0.293	0.284	0.264	0.438	0.296	0.70	0.75	0.74	0.72	0.89	0.75
		Back	0.760	0.222	0.331	0.298	0.291	0.535	0.296	0.98	1.09	1.06	1.05	1.30	1.06
		Left side	0.221	0.316		0.867		0.350	0.910	0.54	0.22	1.09	0.22	0.57	1.13
		Right side	0.287		0.135		0.770	0.132	0.684	0.29	0.42	0.29	1.06	0.42	0.97
		Top side		0.065	0.074	0.041	0.037	0.107	0.062	0.07	0.07	0.04	0.04	0.11	0.06
		Bottom side	0.087							0.09	0.09	0.09	0.09	0.09	0.09
	LTE Band 12	Front	0.927	0.248	0.293	0.284	0.264	0.438	0.296	1.18	1.22	1.21	1.19	1.37	1.22
		Back	0.949	0.222	0.331	0.298	0.291	0.535	0.296	1.17	1.28	1.25	1.24	1.48	1.25
		Left side	0.406	0.316		0.867		0.350	0.910	0.72	0.41	1.27	0.41	0.76	1.32
		Right side	0.479		0.135		0.770	0.132	0.684	0.48	0.61	0.48	1.25	0.61	1.16
		Top side		0.065	0.074	0.041	0.037	0.107	0.062	0.07	0.07	0.04	0.04	0.11	0.06
		Bottom side	0.143							0.14	0.14	0.14	0.14	0.14	0.14
	LTE Band 13	Front	0.952	0.248	0.293	0.284	0.264	0.438	0.296	1.20	1.25	1.24	1.22	1.39	1.25
		Back	1.008	0.222	0.331	0.298	0.291	0.535	0.296	1.23	1.34	1.31	1.30	1.54	1.30
		Left side	0.607	0.316		0.867		0.350	0.910	0.92	0.61	1.47	0.61	0.96	**1.52**
		Right side	0.546		0.135		0.770	0.132	0.684	0.55	0.68	0.55	1.32	0.68	1.23
		Top side		0.065	0.074	0.041	0.037	0.107	0.062	0.07	0.07	0.04	0.04	0.11	0.06
		Bottom side	0.095							0.10	0.10	0.10	0.10	0.10	0.10
	LTE Band 26	Front	1.043	0.248	0.293	0.284	0.264	0.438	0.296	1.29	1.34	1.33	1.31	1.48	1.34
		Back	1.056	0.222	0.331	0.298	0.291	0.535	0.296	1.28	1.39	1.35	1.35	**1.59**	1.35
		Left side	0.456	0.316		0.867		0.350	0.910	0.77	0.46	1.32	0.46	0.81	1.37
		Right side	0.544		0.135		0.770	0.132	0.684	0.54	0.68	0.54	1.31	0.68	1.23
		Top side		0.065	0.074	0.041	0.037	0.107	0.062	0.07	0.07	0.04	0.04	0.11	0.06
		Bottom side	0.106							0.11	0.11	0.11	0.11	0.11	0.11
	LTE Band 66	Front	0.581	0.248	0.293	0.284	0.264	0.438	0.296	0.83	0.87	0.87	0.85	1.02	0.88
		Back	0.766	0.222	0.331	0.298	0.291	0.535	0.296	0.99	1.10	1.06	1.06	1.30	1.06
		Left side	0.517	0.316		0.867		0.350	0.910	0.83	0.52	1.38	0.52	0.87	1.43
		Right side	0.159		0.135		0.770	0.132	0.684	0.16	0.29	0.16	0.93	0.29	0.84
		Top side		0.065	0.074	0.041	0.037	0.107	0.062	0.07	0.07	0.04	0.04	0.11	0.06
		Bottom side	0.210							0.21	0.21	0.21	0.21	0.21	0.21
	LTE Band 25	Front	0.881	0.248	0.293	0.284	0.264	0.438	0.296	1.13	1.17	1.17	1.15	1.32	1.18
		Back	0.996	0.222	0.331	0.298	0.291	0.535	0.296	1.22	1.33	1.29	1.29	1.53	1.29
		Left side	0.547	0.316		0.867		0.350	0.910	0.86	0.55	1.41	0.55	0.90	1.46
		Right side	0.311		0.135		0.770	0.132	0.684	0.31	0.45	0.31	1.08	0.44	1.00
		Top side		0.065	0.074	0.041	0.037	0.107	0.062	0.07	0.07	0.04	0.04	0.11	0.06
		Bottom side	0.287							0.29	0.29	0.29	0.29	0.29	0.29
	LTE Band 41	Front	0.288	0.248	0.293	0.284	0.264	0.438	0.296	0.54	0.58	0.57	0.55	0.73	0.58
		Back	0.395	0.222	0.331	0.298	0.291	0.535	0.296	0.62	0.73	0.69	0.69	0.93	0.69
		Left side	0.433	0.316		0.867		0.350	0.910	0.75	0.43	1.30	0.43	0.78	1.34
		Right side	0.037		0.135		0.770	0.132	0.684	0.04	0.17	0.04	0.81	0.17	0.72
		Top side		0.065	0.074	0.041	0.037	0.107	0.062	0.07	0.07	0.04	0.04	0.11	0.06
		Bottom side	0.899							0.90	0.90	0.90	0.90	0.90	0.90

Full Power distance SAR co-located with WLAN

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN Ant 1 1g SAR (W/kg)	3 2.4GHz WLAN Ant 2 1g SAR (W/kg)	4 5GHz WLAN Ant 1 1g SAR (W/kg)	5 5GHz WLAN Ant 2 1g SAR (W/kg)	6 2.4GHz WLAN Ant 1+2 1g SAR (W/kg)	7 5GHz WLAN Ant 1+2 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	1+5 Summed 1g SAR (W/kg)	1+6 Summed 1g SAR (W/kg)	1+7 Summed 1g SAR (W/kg)
LTE	LTE Band 13	Front(19mm)	0.733	0.248	0.293	0.284	0.264	0.438	0.296	0.98	1.03	1.02	1.00	1.17	1.03
		Back(17mm)	0.878	0.222	0.331	0.298	0.291	0.535	0.296	1.10	1.21	1.18	1.17	1.41	1.17
		Right side(11mm)	0.617		0.135		0.770	0.132	0.684	0.62	0.75	0.62	1.39	0.75	1.30
		Bottom Side(26mm)	0.021							0.02	0.02	0.02	0.02	0.02	0.02
	LTE Band 26	Front(19mm)	0.731	0.248	0.293	0.284	0.264	0.438	0.296	0.98	1.02	1.02	1.00	1.17	1.03
		Back(17mm)	0.842	0.222	0.331	0.298	0.291	0.535	0.296	1.06	1.17	1.14	1.13	1.38	1.14
		Right side(11mm)	0.624		0.135		0.770	0.132	0.684	0.62	0.76	0.62	1.39	0.76	1.31
		Bottom Side(26mm)	0.020							0.02	0.02	0.02	0.02	0.02	0.02
	LTE Band 66	Front(19mm)	0.480	0.248	0.293	0.284	0.264	0.438	0.296	0.73	0.77	0.76	0.74	0.92	0.78
		Back(17mm)	0.735	0.222	0.331	0.298	0.291	0.535	0.296	0.96	1.07	1.03	1.03	1.27	1.03
		Right side(11mm)	0.117		0.135		0.770	0.132	0.684	0.12	0.25	0.12	0.89	0.25	0.80
		Bottom Side(26mm)	0.147							0.15	0.15	0.15	0.15	0.15	0.15
	LTE Band 25	Front(19mm)	0.460	0.248	0.293	0.284	0.264	0.438	0.296	0.71	0.75	0.74	0.72	0.90	0.76
		Back(17mm)	0.518	0.222	0.331	0.298	0.291	0.535	0.296	0.74	0.85	0.82	0.81	1.05	0.81
		Right side(11mm)	0.234		0.135		0.770	0.132	0.684	0.23	0.37	0.23	1.00	0.37	0.92
		Bottom Side(26mm)	0.196							0.20	0.20	0.20	0.20	0.20	0.20

Note：WLAN2.4GHz/ WLAN5GHz always chose the worst 10mm SAR to perform co-located with WWAN distance SAR conservatively.

Test Engineer： Nick Hu, Yuan Zhao, Jiaxing Chang, Yuankai Kong

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 ≤ 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.

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 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

[6] FCC KDB 865664 D02 v01r02, “RF Exposure Compliance Reporting and Documentation Considerations” Oct 2015.

[7] FCC KDB 248227 D01 v02r02, “SAR Guidance for IEEE 802.11 (WiFi) Transmitters”, Oct 2015.

[8] FCC KDB 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[9] FCC KDB 941225 D05 v02r05, “SAR Evaluation Considerations for LTE Devices”, Dec 2015

[10] FCC KDB 616217 D04 v01r02, “SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers”, Oct 2015

[11] FCC KDB 941225 D06 v02r01, "SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities", Oct 2015.

------THE END------

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.23

System Check_Head_750MHz

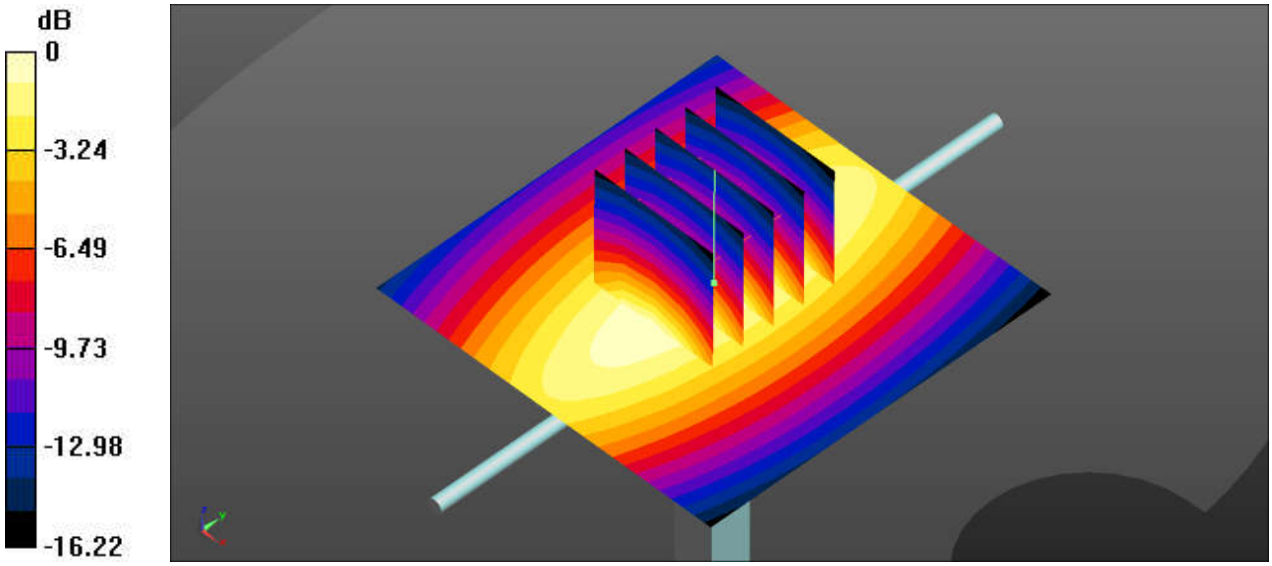
DUT: D750V3 - SN:1087

Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1
Medium: HSL_750 Medium parameters used: f = 750 MHz; σ = 0.894 S/m; ε_r = 41.678; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.77, 9.77, 9.77); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.72 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 61.37 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 3.31 W/kg
SAR(1 g) = 2.18 W/kg; SAR(10 g) = 1.46 W/kg
Maximum value of SAR (measured) = 2.76 W/kg



0 dB = 2.72 W/kg = 4.35 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.24

System Check_Head_835MHz

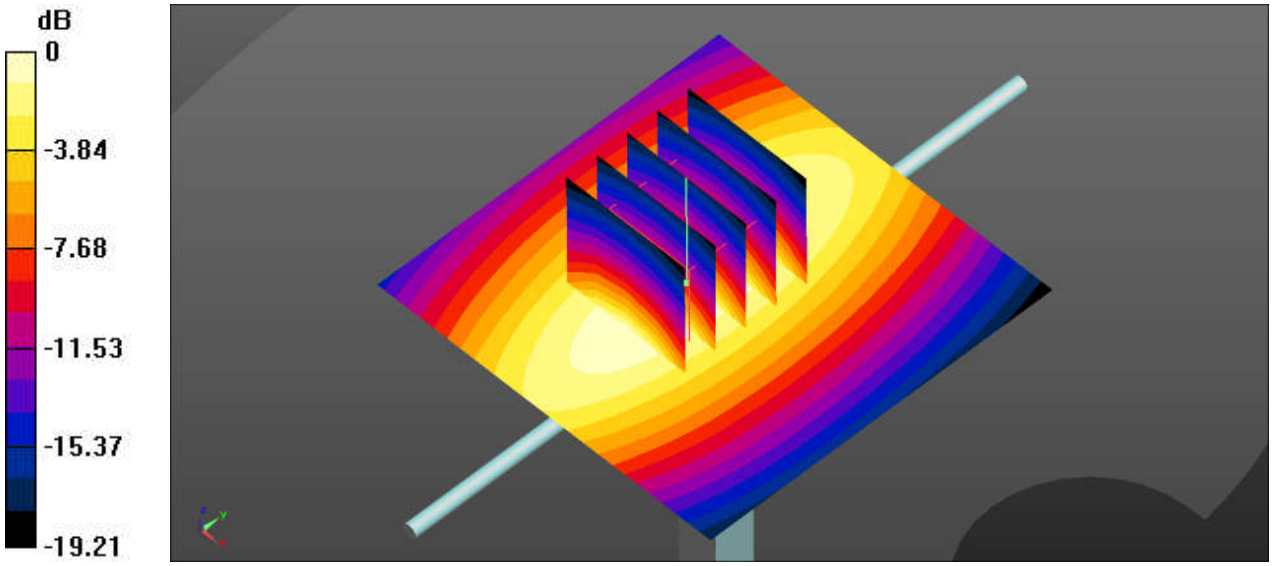
DUT: D835V2 - SN:4d151

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL_835 Medium parameters used: f = 835 MHz; σ = 0.916 S/m; ε_r = 42.845; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 3.48 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 62.41 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 4.12 W/kg
SAR(1 g) = 2.45 W/kg; SAR(10 g) = 1.58 W/kg
Maximum value of SAR (measured) = 3.51 W/kg



0 dB = 3.48 W/kg = 5.42 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.26

System Check_Head_1750MHz

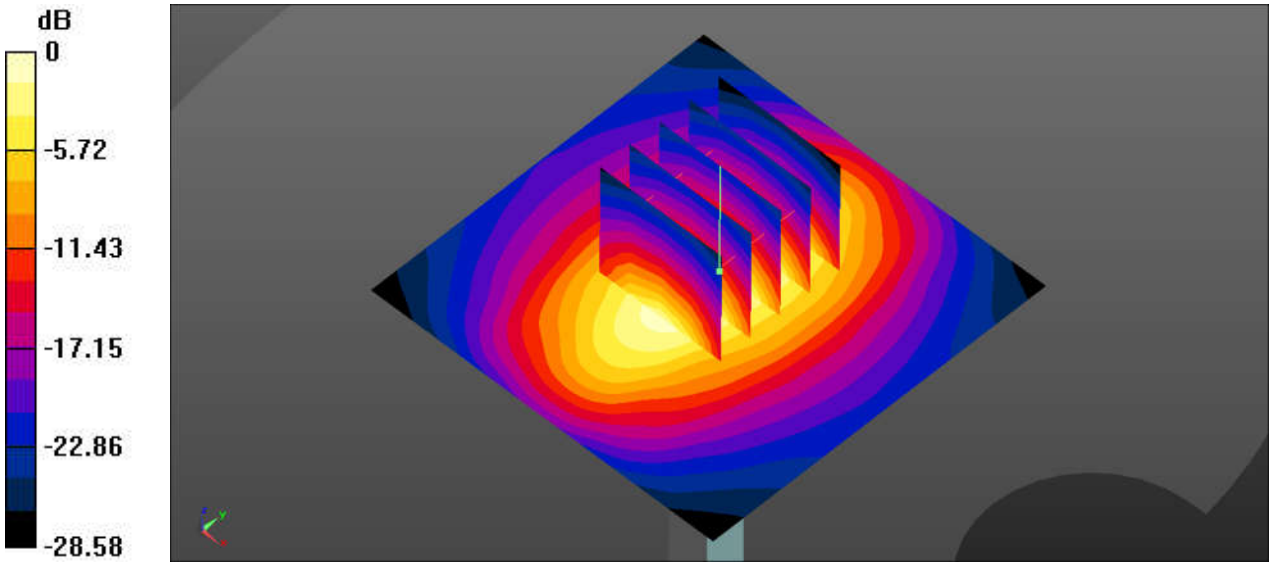
DUT: D1750V2 - SN:1090

Communication System: UID 0, CW (0); Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: HSL_1750 Medium parameters used: f = 1750 MHz; σ = 1.371 S/m; ε_r = 40.975; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.46, 8.46, 8.46); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 15.2 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 77.8 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 9.45 W/kg; SAR(10 g) = 5.08 W/kg
Maximum value of SAR (measured) = 14.8 W/kg



0 dB = 15.2 W/kg = 11.82 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.27

System Check_Head_1900MHz

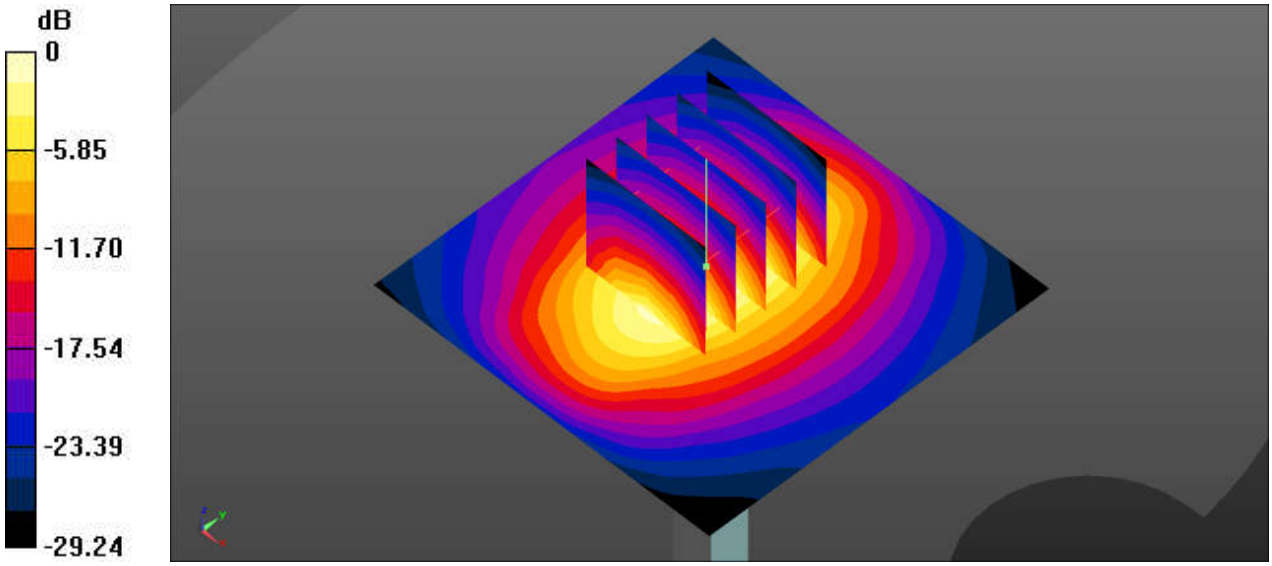
DUT: D1900V2 - SN:5d170

Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: f = 1900 MHz; σ = 1.403 S/m; ε_r = 39.092; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.10, 8.10, 8.10); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 13.5 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 82.95 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 9.43 W/kg; SAR(10 g) = 5.05 W/kg
Maximum value of SAR (measured) = 13.3 W/kg



0 dB = 13.5 W/kg = 11.30 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.31

System Check_Head_2450MHz

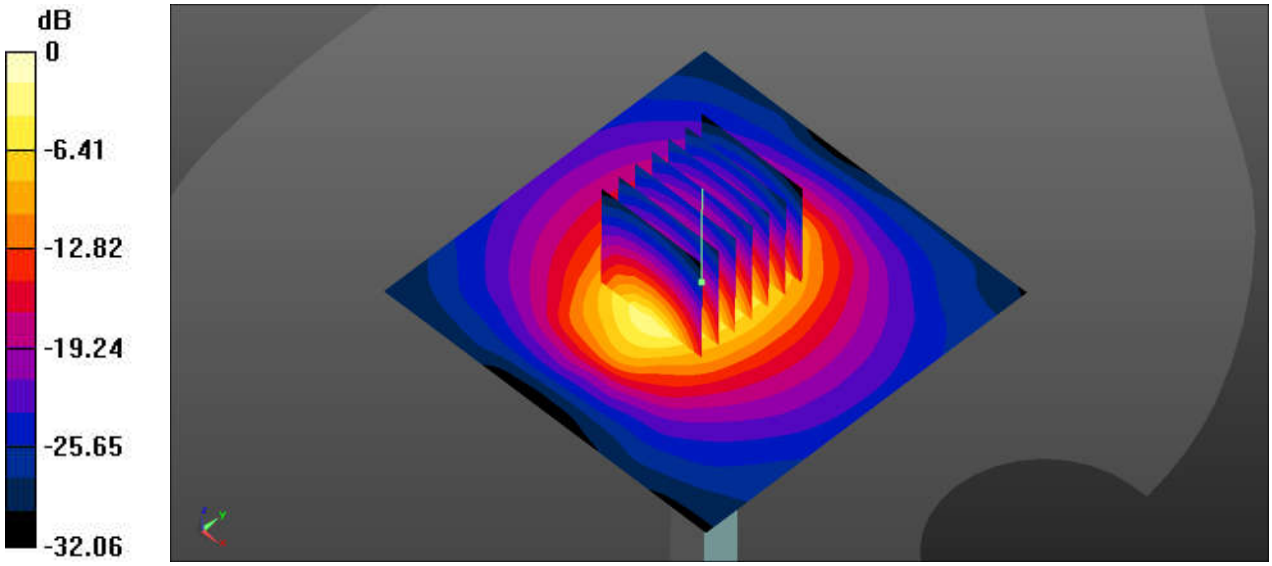
DUT: D2450V2 - SN:908

Communication System: UID 0, CW (0); Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL_2450 Medium parameters used: f = 2450 MHz; σ = 1.871 S/m; ε_r = 40.8; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.50, 7.50, 7.50); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 22.2 W/kg

Pin=250mW/Zoom Scan (7x7x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.76 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 27.8 W/kg
SAR(1 g) = 13.7 W/kg; SAR(10 g) = 6.28 W/kg
Maximum value of SAR (measured) = 22.6 W/kg



0 dB = 22.2 W/kg = 13.46 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.28

System Check_Head_2600MHz

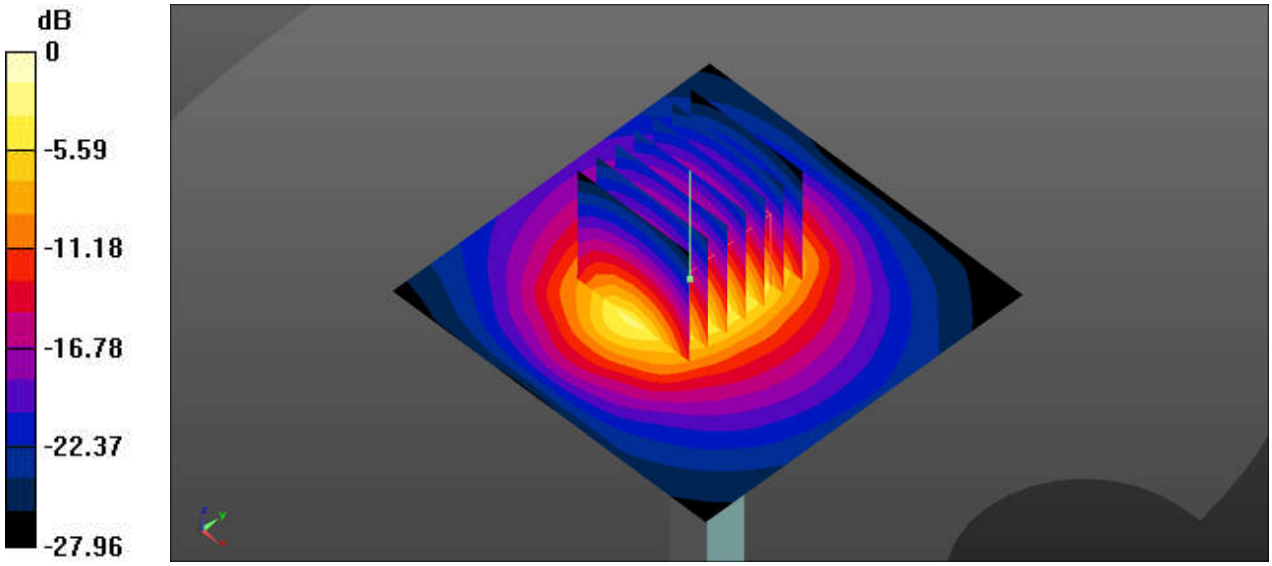
DUT: D2600V2 - SN:1078

Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: HSL_2600 Medium parameters used: f = 2600 MHz; σ = 2.037 S/m; ε_r = 37.817; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.31, 7.31, 7.31); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 18.0 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 86.74 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 22.5 W/kg
SAR(1 g) = 14.2 W/kg; SAR(10 g) = 6.38 W/kg
Maximum value of SAR (measured) = 17.2 W/kg



0 dB = 18.0 W/kg = 12.55 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.29

System Check_Head_5250MHz

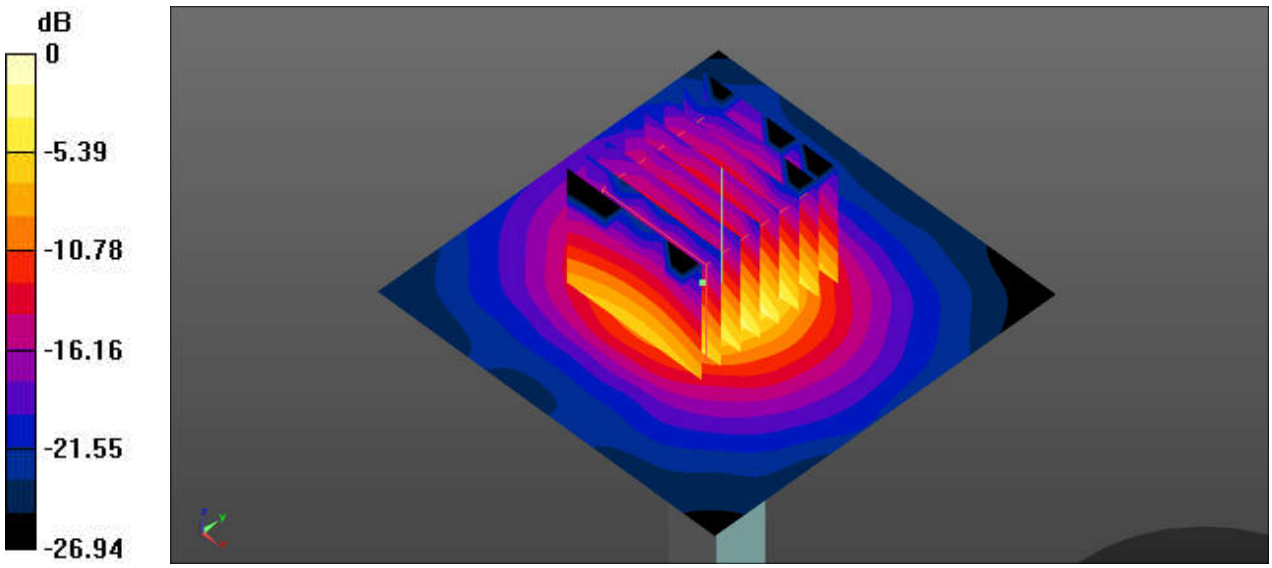
DUT: D5GHzV2 - SN:1113

Communication System: UID 0, CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: HSL_5000 Medium parameters used: f = 5250 MHz; σ = 4.6 S/m; ε_r = 36.383; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(5.19, 5.19, 5.19); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 18.7 W/kg

Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 34.26 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 30.8 W/kg
SAR(1 g) = 7.84 W/kg; SAR(10 g) = 2.25 W/kg
Maximum value of SAR (measured) = 18.5 W/kg



0 dB = 18.7 W/kg = 12.72 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.29

System Check_Head_5750MHz

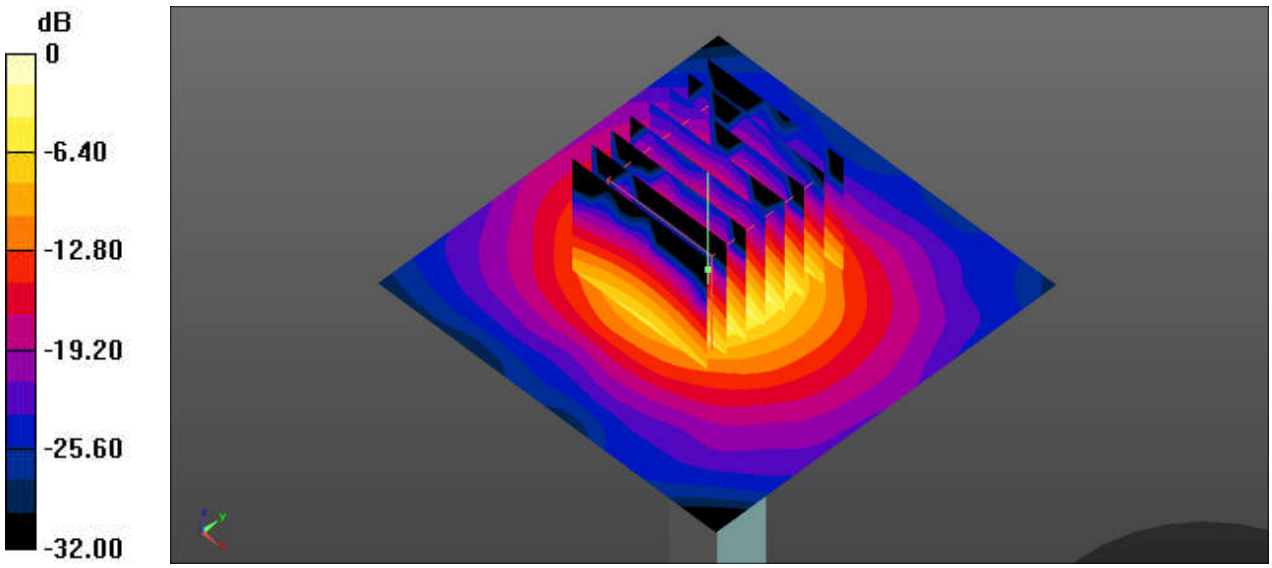
DUT: D5GHzV2 - SN:1113

Communication System: UID 0, CW (0); Frequency: 5750 MHz;Duty Cycle: 1:1
Medium: HSL_5000 Medium parameters used: f = 5750 MHz; σ = 5.166 S/m; ε_r = 35.551; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(5.17, 5.17, 5.17); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.1 W/kg

Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 38.61 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 31.2 W/kg
SAR(1 g) = 7.22 W/kg; SAR(10 g) = 2.13 W/kg
Maximum value of SAR (measured) = 17.5 W/kg



0 dB = 17.1 W/kg = 12.33 dBW/kg

Appendix B. Plots of High SAR Measurement

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.23

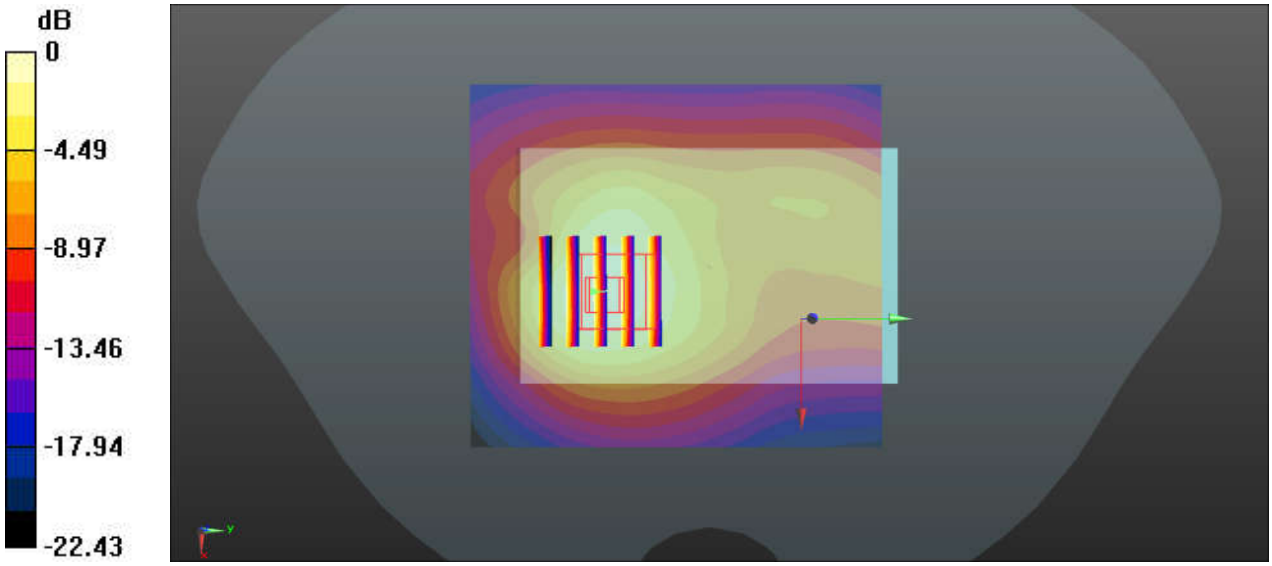
01_LTE Band 71_20M_QPSK_1RB_0Offset_Back_10mm_Ch133322

Communication System: UID 0, LTE-FDD (0); Frequency: 683 MHz;Duty Cycle: 1:1
Medium: HSL_750 Medium parameters used: f = 683 MHz; σ = 0.829 S/m; ε_r = 42.631; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.77, 9.77, 9.77); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch133322/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.941 W/kg

Ch133322/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.90 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.08 W/kg
SAR(1 g) = 0.553 W/kg; SAR(10 g) = 0.293 W/kg
Maximum value of SAR (measured) = 0.865 W/kg



0 dB = 0.941 W/kg = -0.26 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.23

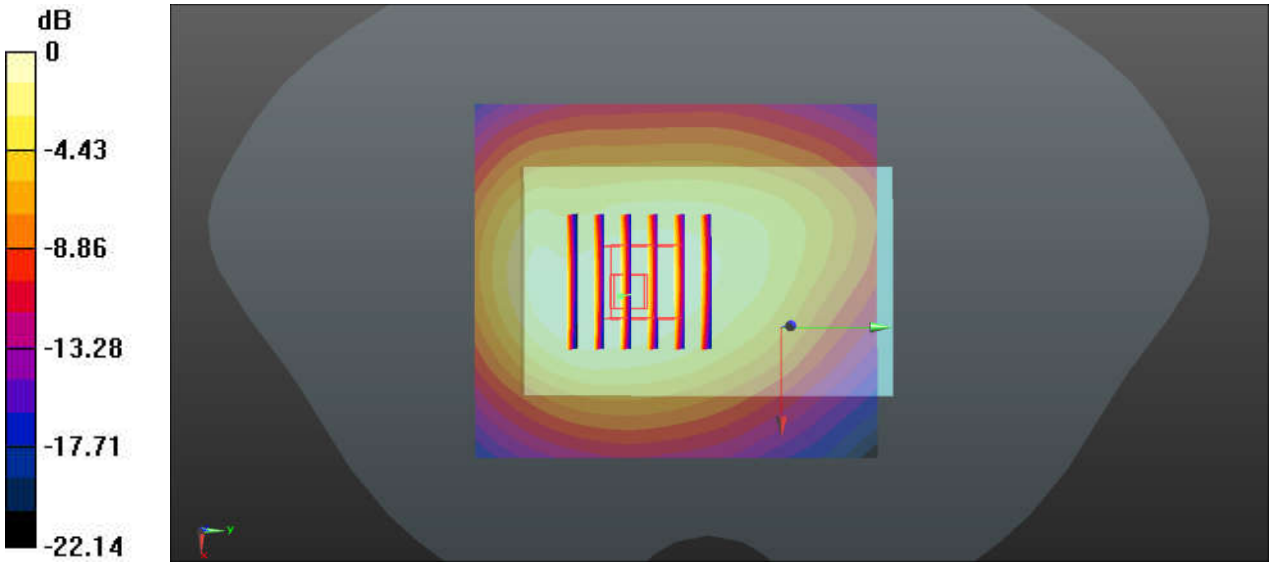
02_LTE Band 12_10M_QPSK_1RB_0Offset_Back_10mm_Ch23095

Communication System: UID 0, LTE-FDD (0); Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: HSL_750 Medium parameters used: f = 707.5 MHz; σ = 0.852 S/m; ε_r = 42.257; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.77, 9.77, 9.77); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch23095/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.932 W/kg

Ch23095/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.34 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.705 W/kg; SAR(10 g) = 0.504 W/kg
Maximum value of SAR (measured) = 0.904 W/kg



0 dB = 0.932 W/kg = -0.31 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.23

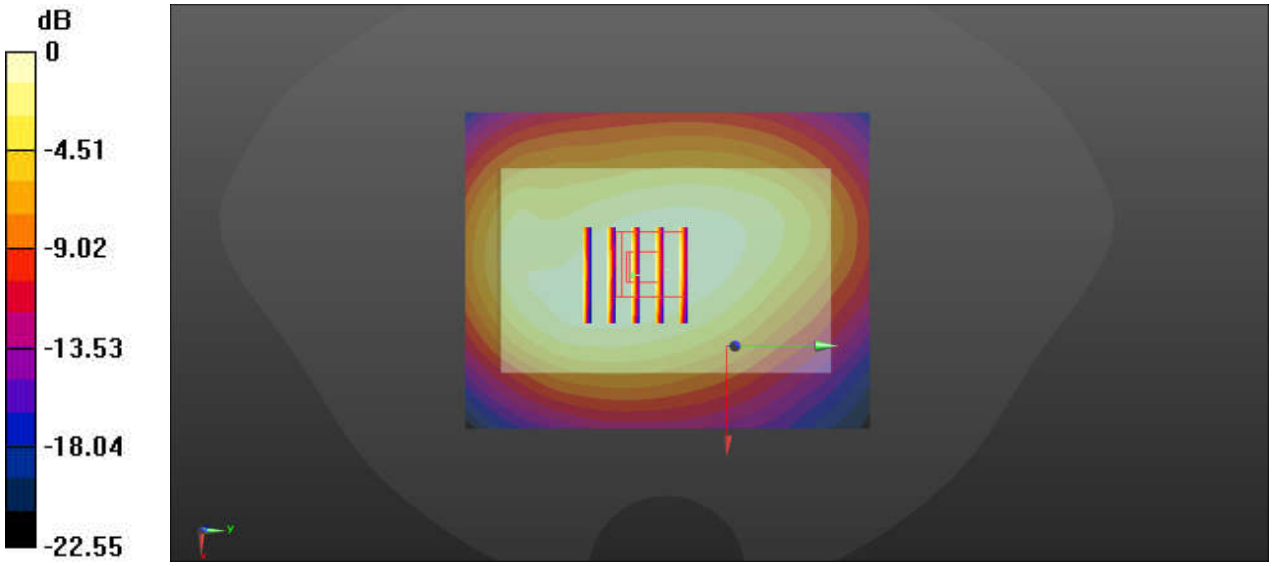
03_LTE Band 13_10M_QPSK_50RB_0Offset_Back_10mm_Ch23230

Communication System: UID 0, LTE-FDD (0); Frequency: 782 MHz;Duty Cycle: 1:1
Medium: HSL_750 Medium parameters used: f = 782 MHz; σ = 0.923 S/m; ε_r = 41.281; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.77, 9.77, 9.77); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch23230/Area Scan (71x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.893 W/kg

Ch23230/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.21 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.977 W/kg
SAR(1 g) = 0.720 W/kg; SAR(10 g) = 0.529 W/kg
Maximum value of SAR (measured) = 0.885 W/kg



0 dB = 0.893 W/kg = -0.49 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.24

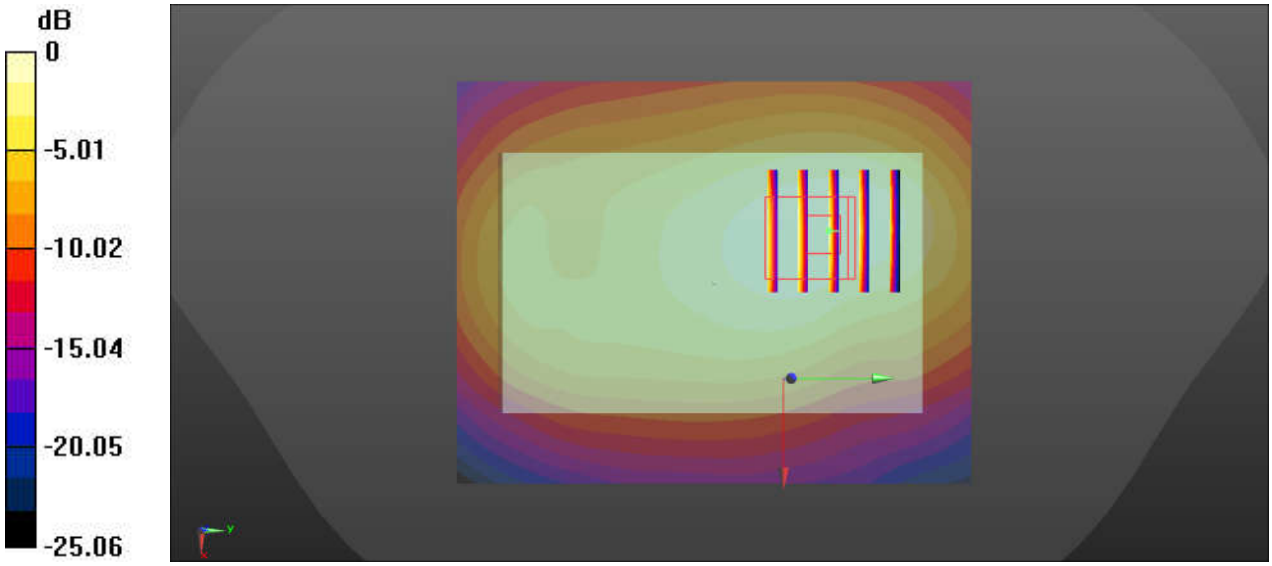
04_LTE Band 26_15M_QPSK_75RB_0Offset_Back_10mm_Ch26865

Communication System: UID 0, LTE-FDD (0); Frequency: 831.5 MHz;Duty Cycle: 1:1
Medium: HSL_835 Medium parameters used: f = 831.5 MHz; σ = 0.913 S/m; ε_r = 42.896; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.48, 9.48, 9.48); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch26865/Area Scan (71x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.02 W/kg

Ch26865/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.54 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 1.11 W/kg
SAR(1 g) = 0.751 W/kg; SAR(10 g) = 0.523 W/kg
Maximum value of SAR (measured) = 0.975 W/kg



0 dB = 1.02 W/kg = 0.09 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.26

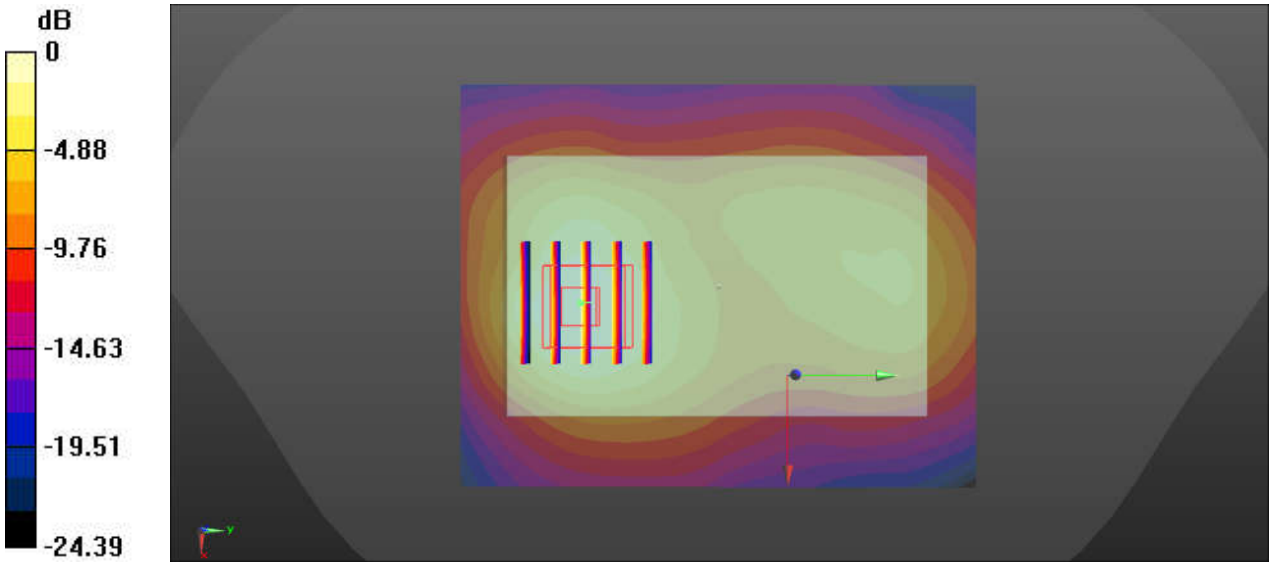
05_LTE Band 66_20M_QPSK_1RB_0Offset_Back_10mm_Ch132322

Communication System: UID 0, LTE-FDD (0); Frequency: 1745 MHz;Duty Cycle: 1:1
Medium: HSL_1750 Medium parameters used: f = 1745 MHz; σ = 1.365 S/m; ε_r = 40.998; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.46, 8.46, 8.46); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch132322/Area Scan (71x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.849 W/kg

Ch132322/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.74 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 0.965 W/kg
SAR(1 g) = 0.580 W/kg; SAR(10 g) = 0.344 W/kg
Maximum value of SAR (measured) = 0.813 W/kg



0 dB = 0.849 W/kg = -0.71 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.27

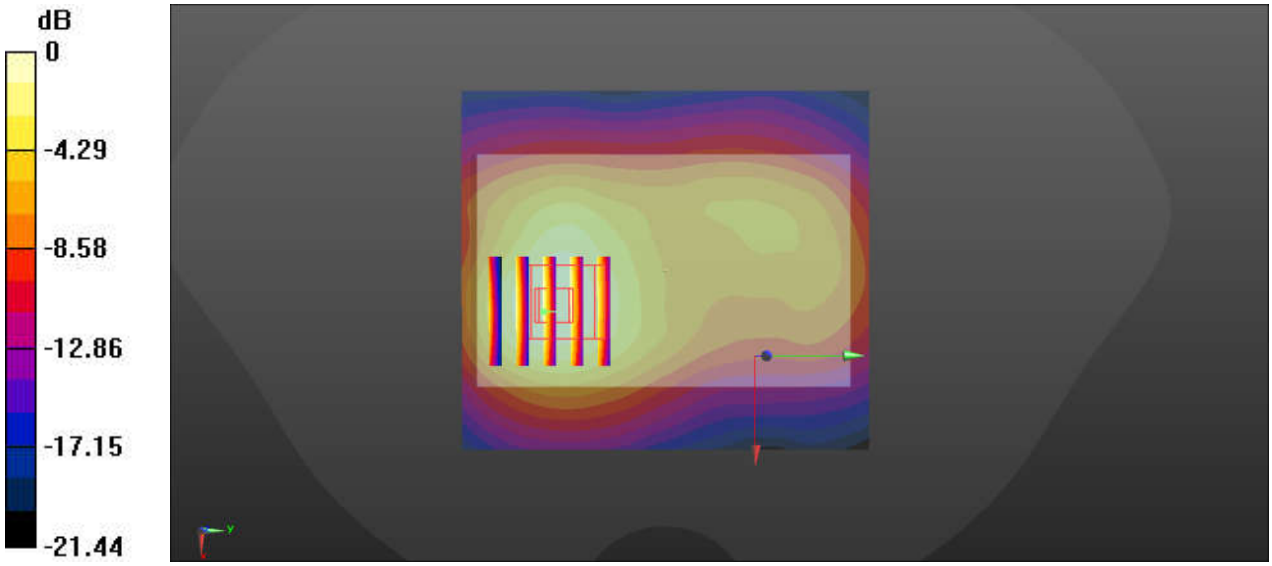
06_LTE Band 25_20M_QPSK_1RB_0Offset_Back_10mm_Ch26140

Communication System: UID 0, LTE-FDD (0); Frequency: 1860 MHz;Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: f = 1860 MHz; σ = 1.363 S/m; ε_r = 39.276; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(8.10, 8.10, 8.10); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch26140/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.04 W/kg

Ch26140/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.29 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.715 W/kg; SAR(10 g) = 0.423 W/kg
Maximum value of SAR (measured) = 1.02 W/kg



0 dB = 1.04 W/kg = 0.17 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.28

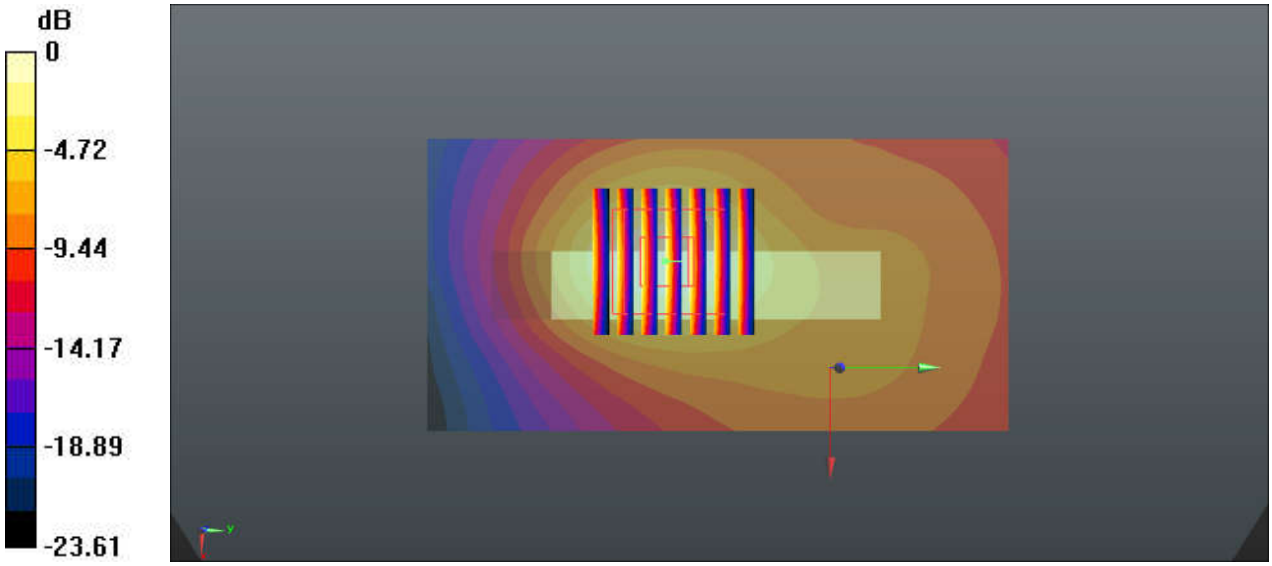
07_LTE Band 41_20M_QPSK_1RB_0Offset_Bottom Side_10mm_Ch39750

Communication System: UID 0, LTE-TDD (0); Frequency: 2506 MHz;Duty Cycle: 1:1.59
Medium: HSL_2600 Medium parameters used: f = 2506 MHz; σ = 1.926 S/m; ε_r = 38.212; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.31, 7.31, 7.31); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch39750/Area Scan (51x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.991 W/kg

Ch39750/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.30 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.604 W/kg; SAR(10 g) = 0.287 W/kg
Maximum value of SAR (measured) = 1.04 W/kg



0 dB = 0.991 W/kg = -0.04 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.31

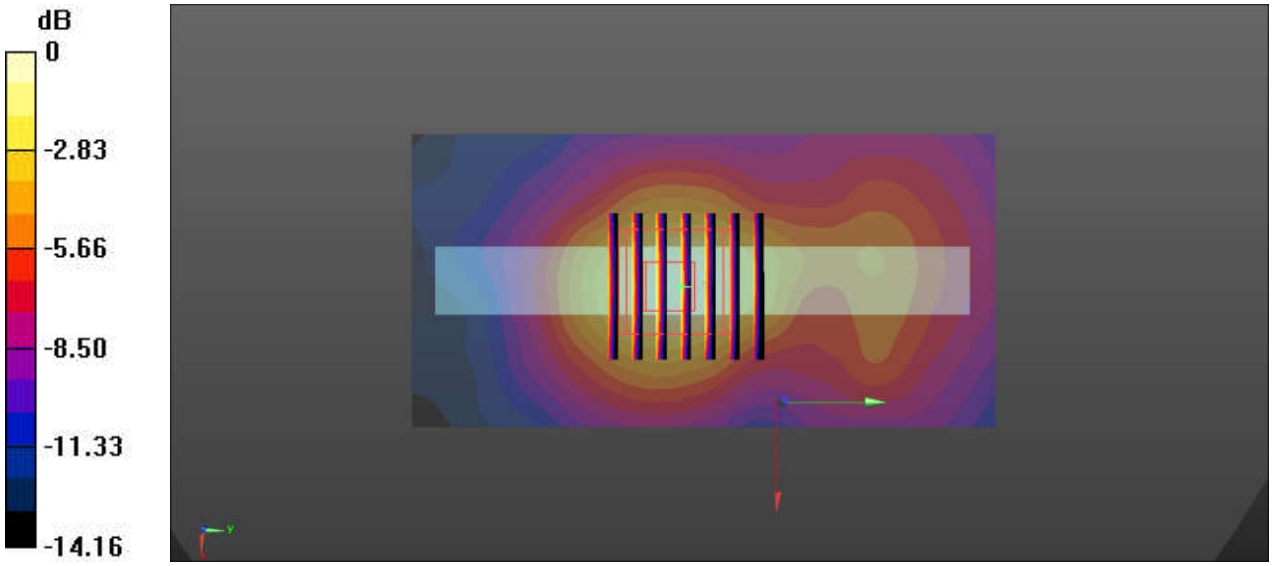
08_WLAN2.4GHz_802.11b 1Mbps_Left Side_10mm_Ant 1_Ch6

Communication System: UID 0, 802.11b (0); Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: HSL_2450 Medium parameters used: f = 2437 MHz; σ = 1.855 S/m; ε_r = 40.853; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.50, 7.50, 7.50); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch6/Area Scan (51x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.525 W/kg

Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.74 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.633 W/kg
SAR(1 g) = 0.307 W/kg; SAR(10 g) = 0.160 W/kg
Maximum value of SAR (measured) = 0.500 W/kg



0 dB = 0.525 W/kg = -2.80 dBW/kg

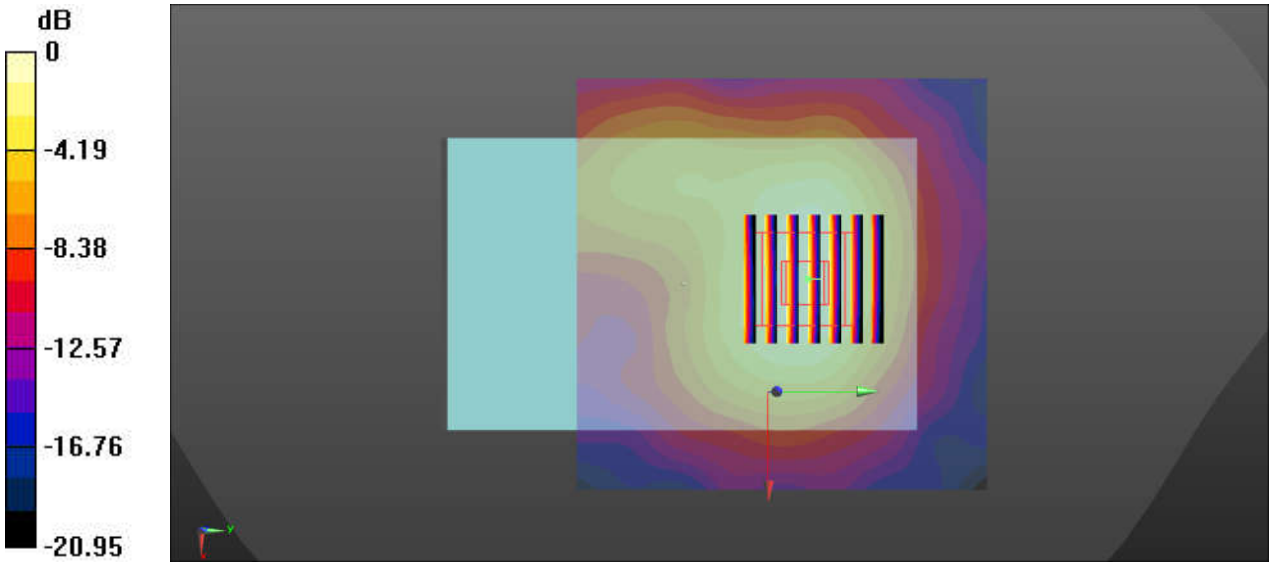
09_WLAN2.4GHz_802.11b 1Mbps_Back_10mm_Ant 2_Ch6

Communication System: UID 0, 802.11b (0); Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: HSL_2450 Medium parameters used: f = 2437 MHz; σ = 1.855 S/m; ε_r = 40.853; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.50, 7.50, 7.50); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch6/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.475 W/kg

Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.193 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.577 W/kg
SAR(1 g) = 0.315 W/kg; SAR(10 g) = 0.173 W/kg
Maximum value of SAR (measured) = 0.477 W/kg



0 dB = 0.475 W/kg = -3.23 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.31

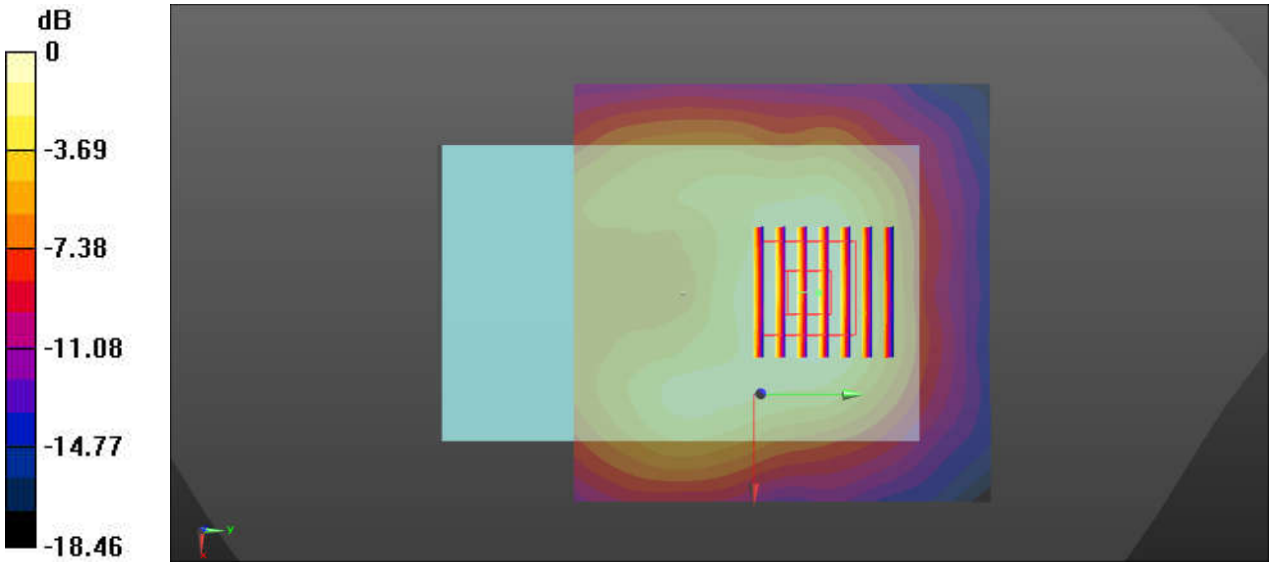
10_WLAN2.4GHz_802.11b 1Mbps_Back_10mm_Ant 1+2_Ch6

Communication System: UID 0, 802.11b (0); Frequency: 2437 MHz;Duty Cycle: 1:1
Medium: HSL_2450 Medium parameters used: f = 2437 MHz; σ = 1.855 S/m; ε_r = 40.853; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.50, 7.50, 7.50); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch6/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.684 W/kg

Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.49 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.00 W/kg
SAR(1 g) = 0.516 W/kg; SAR(10 g) = 0.281 W/kg
Maximum value of SAR (measured) = 0.812 W/kg



0 dB = 0.684 W/kg = -1.65 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.29

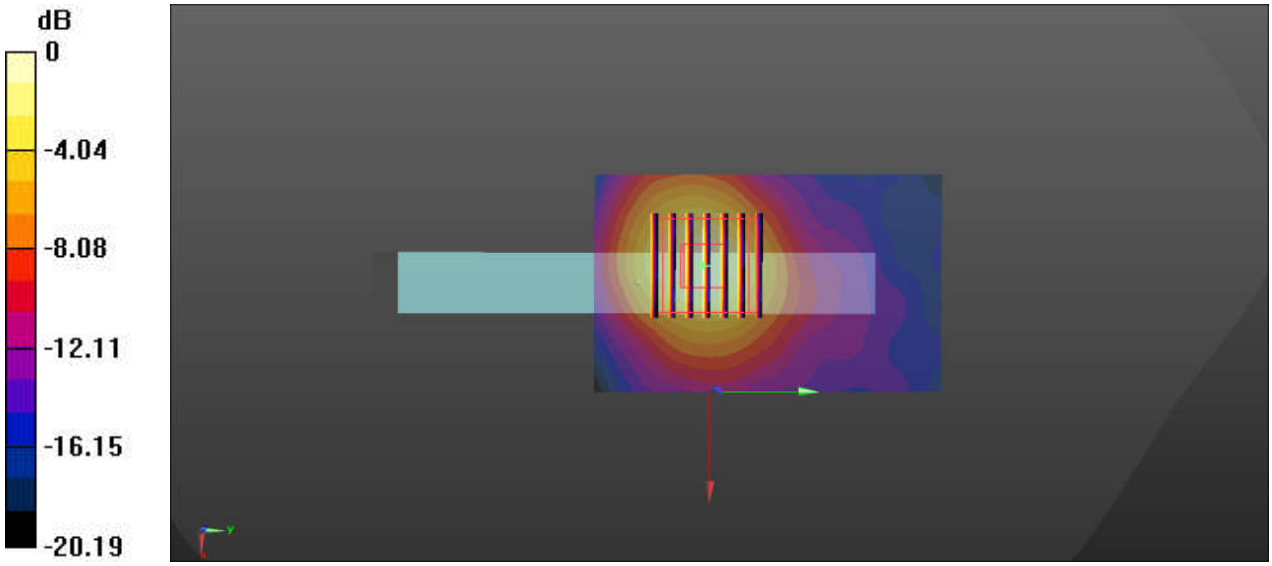
11_WLAN5GHz_802.11a 6Mbps_Left Side_10mm_Ant 1_Ch36

Communication System: UID 0, 802.11a (0); Frequency: 5180 MHz;Duty Cycle: 1:1.049
Medium: HSL_5000 Medium parameters used: f = 5180 MHz; σ = 4.517 S/m; ε_r = 36.545; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(5.19, 5.19, 5.19); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch36/Area Scan (51x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.76 W/kg

Ch36/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 11.69 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 2.62 W/kg
SAR(1 g) = 0.774 W/kg; SAR(10 g) = 0.279 W/kg
Maximum value of SAR (measured) = 1.69 W/kg



0 dB = 1.76 W/kg = 2.46 dBW/kg

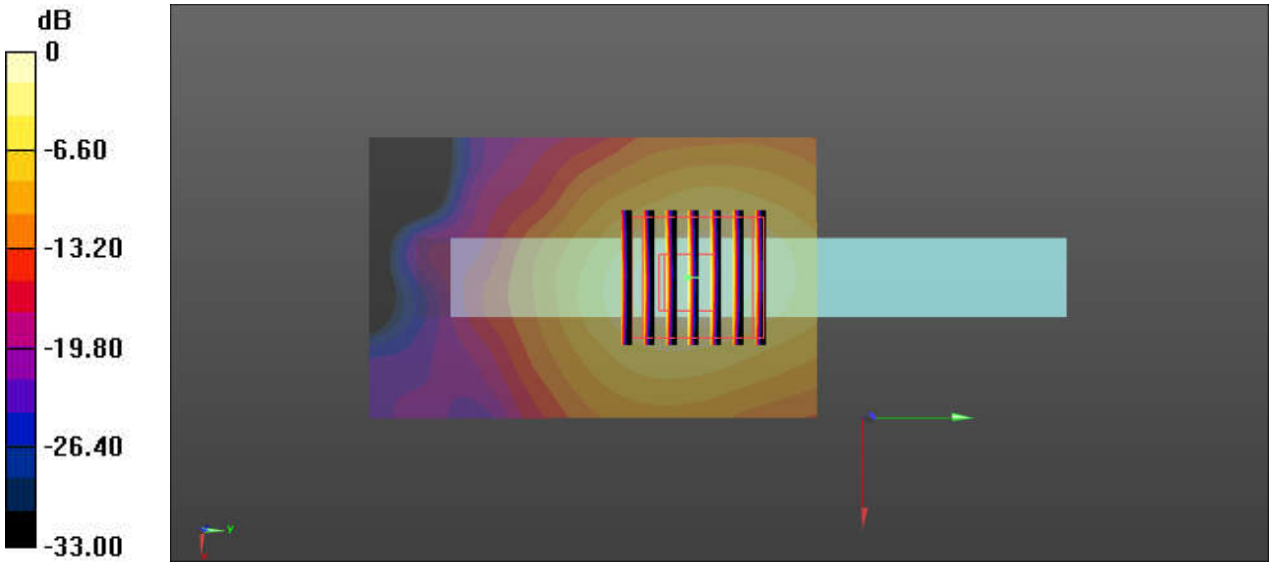
12_WLAN5GHz_802.11a 6Mbps_Right Side_10mm_Ant 2_Ch36

Communication System: UID 0, 802.11a (0); Frequency: 5180 MHz;Duty Cycle: 1:1.053
Medium: HSL_5000 Medium parameters used: f = 5180 MHz; σ = 4.517 S/m; ε_r = 36.545; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(5.19, 5.19, 5.19); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch36/Area Scan (51x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.47 W/kg

Ch36/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 14.99 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 2.35 W/kg
SAR(1 g) = 0.675 W/kg; SAR(10 g) = 0.246 W/kg
Maximum value of SAR (measured) = 1.48 W/kg



0 dB = 1.47 W/kg = 1.67 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.29

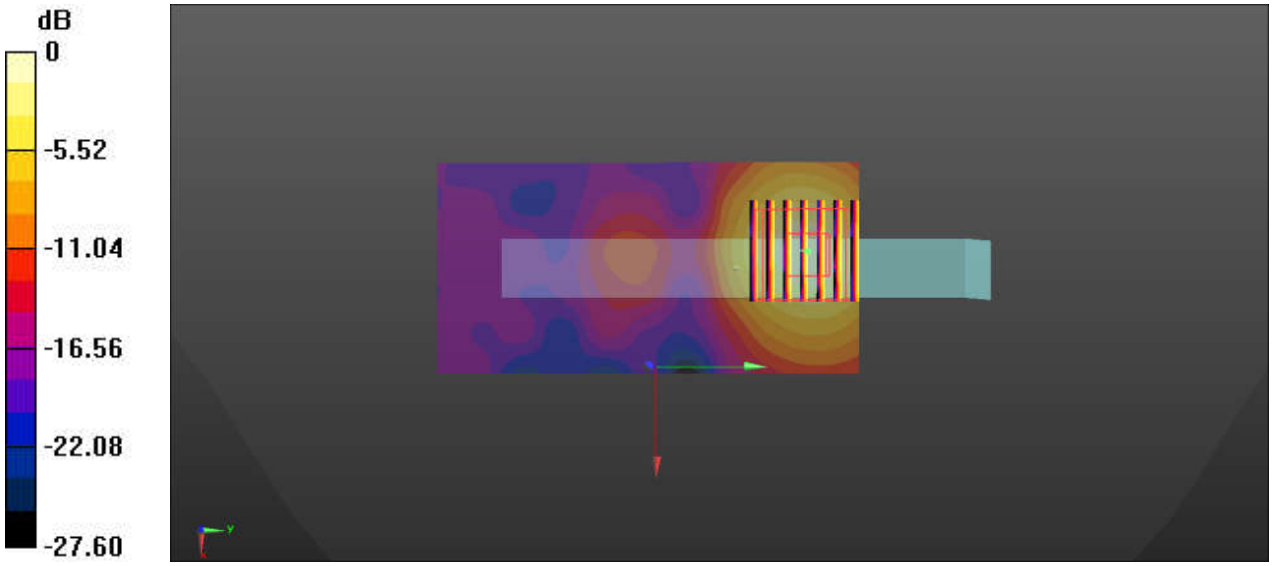
13_WLAN5GHz_802.11a 6Mbps_Left Side_10mm_Ant 1+2_Ch36

Communication System: UID 0, 802.11a (0); Frequency: 5180 MHz;Duty Cycle: 1:1.049
Medium: HSL_5000 Medium parameters used: f = 5180 MHz; σ = 4.517 S/m; ε_r = 36.545; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(5.19, 5.19, 5.19); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch36/Area Scan (51x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.80 W/kg

Ch36/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 9.056 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 2.78 W/kg
SAR(1 g) = 0.809 W/kg; SAR(10 g) = 0.284 W/kg
Maximum value of SAR (measured) = 1.79 W/kg



0 dB = 1.80 W/kg = 2.55 dBW/kg

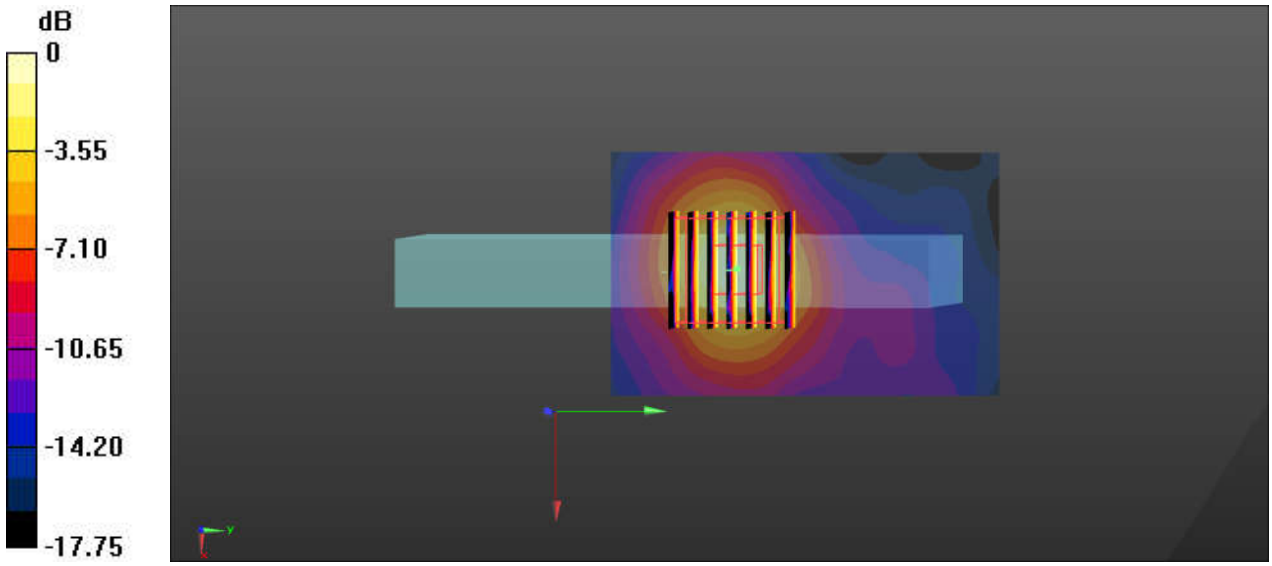
14_WLAN5GHz_802.11a 6Mbps_Left Side_10mm_Ant 1_Ch149

Communication System: UID 0, 802.11a (0); Frequency: 5745 MHz;Duty Cycle: 1:1.049
Medium: HSL_5000 Medium parameters used: f = 5745 MHz; σ = 5.158 S/m; ε_r = 35.562; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(5.17, 5.17, 5.17); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch149/Area Scan (51x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.36 W/kg

Ch149/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 8.149 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 2.24 W/kg
SAR(1 g) = 0.515 W/kg; SAR(10 g) = 0.172 W/kg
Maximum value of SAR (measured) = 1.24 W/kg



0 dB = 1.36 W/kg = 1.34 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.29

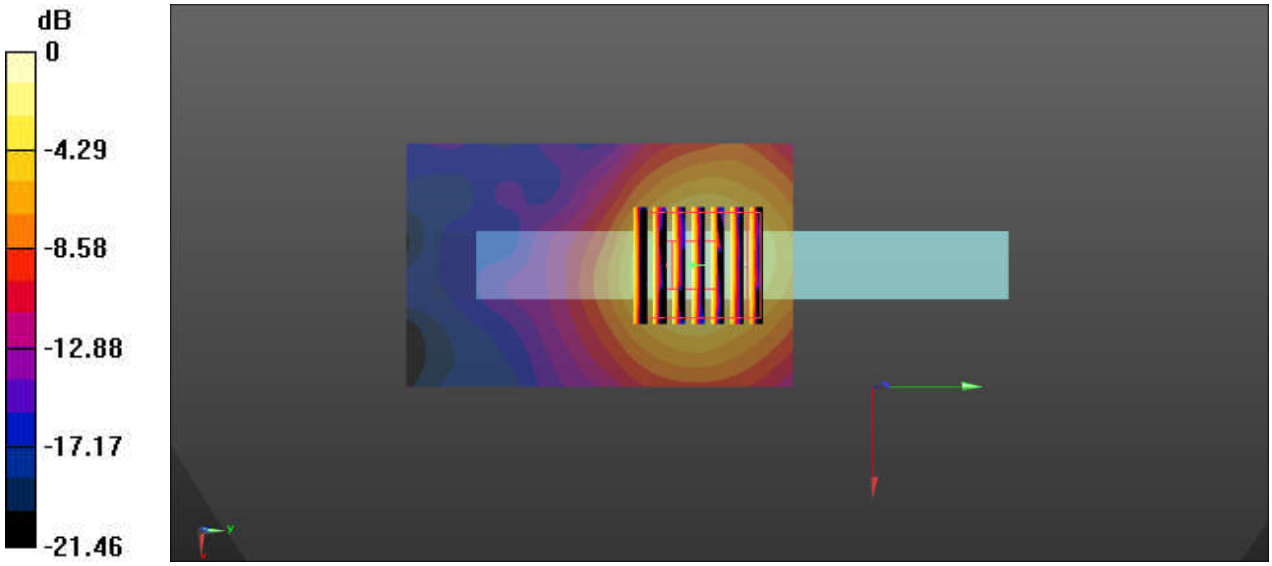
15_WLAN5GHz_802.11a 6Mbps_Right Side_10mm_Ant 2_Ch149

Communication System: UID 0, 802.11a (0); Frequency: 5745 MHz;Duty Cycle: 1:1.053
Medium: HSL_5000 Medium parameters used: f = 5745 MHz; σ = 5.158 S/m; ε_r = 35.562; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(5.17, 5.17, 5.17); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch149/Area Scan (51x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.22 W/kg

Ch149/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 13.56 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 2.04 W/kg
SAR(1 g) = 0.489 W/kg; SAR(10 g) = 0.175 W/kg
Maximum value of SAR (measured) = 1.16 W/kg



0 dB = 1.22 W/kg = 0.86 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2019.12.29

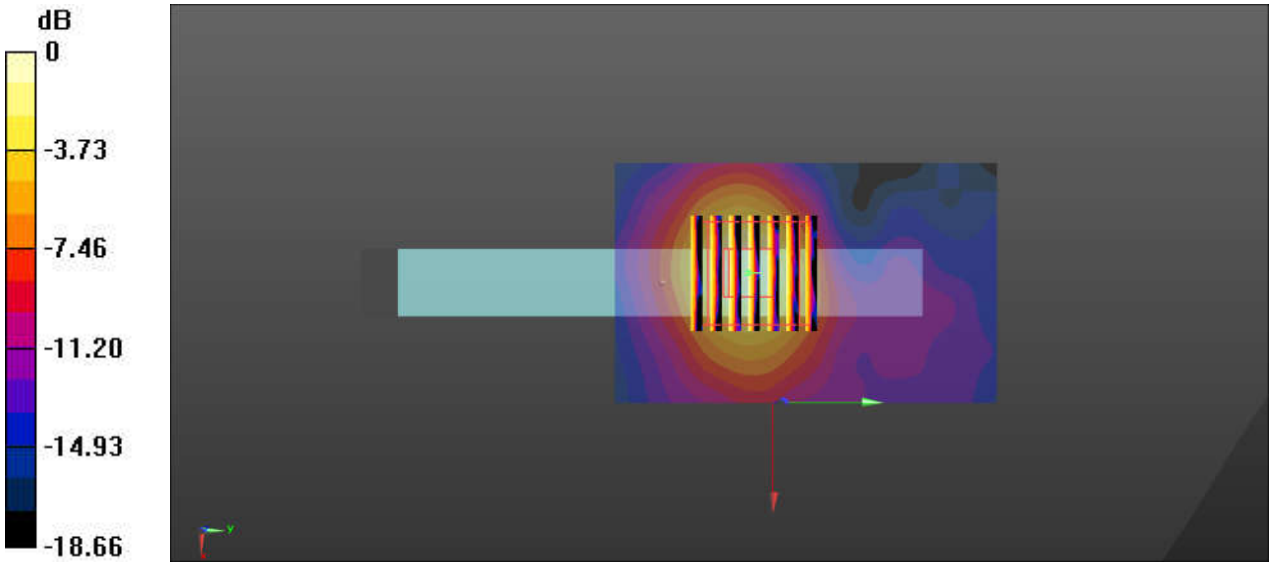
16_WLAN5GHz_802.11a 6Mbps_Left Side _10mm_Ant 1+2_Ch149

Communication System: UID 0, 802.11a (0); Frequency: 5745 MHz;Duty Cycle: 1:1.049
Medium: HSL_5000 Medium parameters used: f = 5745 MHz; σ = 5.158 S/m; ε_r = 35.562; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(5.17, 5.17, 5.17); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2019.7.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch149/Area Scan (51x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.44 W/kg

Ch149/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 7.003 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 2.32 W/kg
SAR(1 g) = 0.551 W/kg; SAR(10 g) = 0.183 W/kg
Maximum value of SAR (measured) = 1.33 W/kg



0 dB = 1.44 W/kg = 1.58 dBW/kg

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.

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校准
CALIBRATION
CNAS L0570

Client **Sporton** **Certificate No: Z19-60081**

CALIBRATION CERTIFICATE

Object	D750V3 - SN: 1087
Calibration Procedure(s)	FF-Z11-003-01 Calibration Procedures for dipole validation kits
Calibration date:	March 27, 2019

This calibration Certificate documents the traceability to national standards, which realize the physical units of measurements(SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature(22±3)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Power sensor NRP8S	104291	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Reference Probe EX3DV4	SN 3617	31-Jan-19(SPEAG,No.EX3-3617_Jan19)	Jan-20
DAE4	SN 1331	06-Feb-19(SPEAG,No.DAE4-1331_Feb19)	Feb-20
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	23-Jan-19 (CTTL, No.J19X00336)	Jan-20
NetworkAnalyzer E5071C	MY46110673	24-Jan-19 (CTTL, No.J19X00547)	Jan-20

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	赵竞
Reviewed by:	Lin Hao	SAR Test Engineer	林皓
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: March 29, 2019

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORMx,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of Measurement multiplied by the coverage factor k=2, which for a normal distribution Corresponds to a coverage probability of approximately 95%.

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Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY52	52.10.2.1495
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	43.0 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.36 W/kg ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.42 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.65 W/kg ± 18.7 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	56.9 ± 6 %	0.94 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.09 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.58 W/kg ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.41 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.75 W/kg ±18.7 % (k=2)**

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.4Ω- 2.59jΩ
Return Loss	- 29.3dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.6Ω- 3.86jΩ
Return Loss	- 27.7dB

General Antenna Parameters and Design

Electrical Delay (one direction)	0.898 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG

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DASY5 Validation Report for Head TSL Date: 03.26.2019

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1087

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 750 MHz; σ = 0.903 S/m; ε_r = 43.01; ρ = 1000 kg/m3

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(10.03, 10.03, 10.03) @ 750 MHz; Calibrated: 1/31/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2/6/2019
- Phantom: MFP_V5.1C ; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

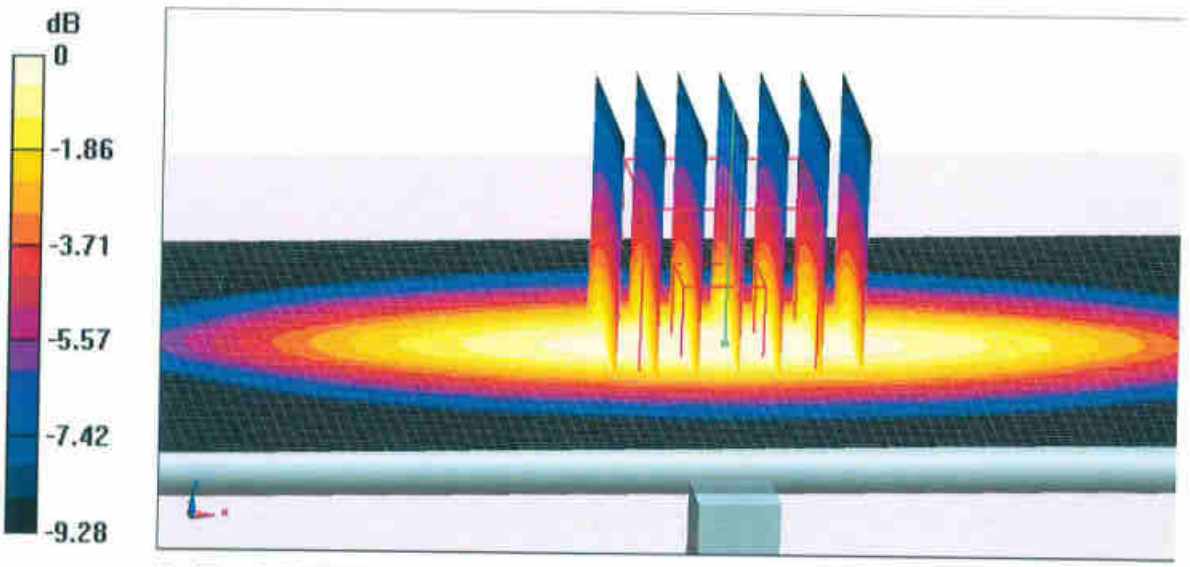
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.05 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.00 W/kg

SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.42 W/kg

Maximum value of SAR (measured) = 2.72 W/kg



0 dB = 2.72 W/kg = 4.35 dBW/kg

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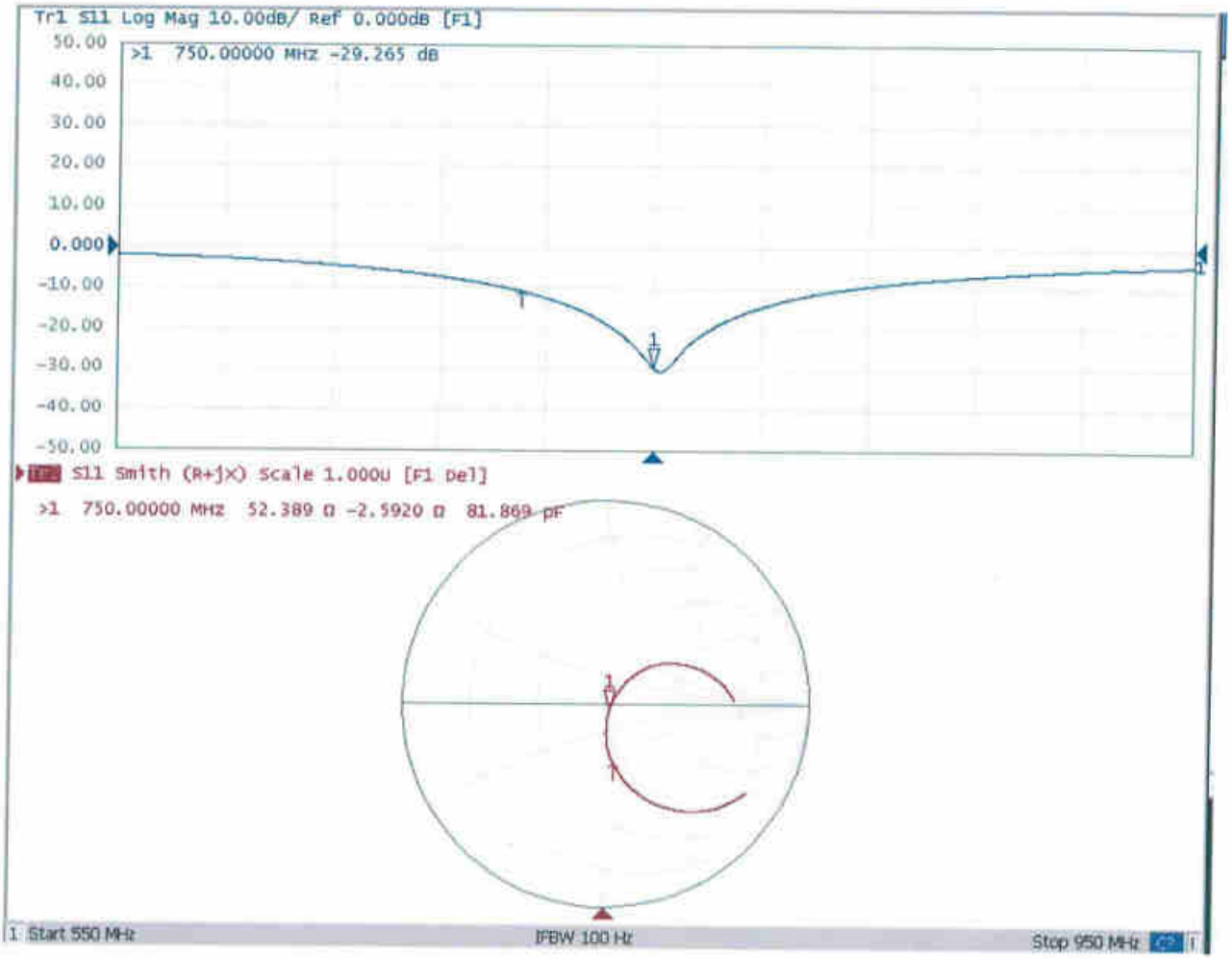
Impedance Measurement Plot for Head TSL