FCC SAR Test Report

APPLICANT	:	**Motorola Mobility LLC**
EQUIPMENT	:	**Mobile Cellular Phone**
BRAND NAME	:	**Motorola**
MODEL NAME	:	**XT1925-7**
FCC ID	:	**IHDT56XD7**
STANDARD	:	**FCC 47 CFR Part 2 (2.1093)** **ANSI/IEEE C95.1-1992** **IEEE 1528-2013**

We, Sporton International (Kunshan) Inc., would like to declare that the tested sample has been evaluated in accordance with the procedures and had 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.

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Approved by: Mark Qu / Manager

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA7D2507-01	Rev. 01	Initial issue of report	Mar. 05, 2018

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Motorola Mobility LLC, Mobile Cellular Phone, XT1925-7**, are as follows.

Highest 1g SAR Summary						
Equipment Class	Frequency Band		Head (Separation 0mm)	Hotspot (Separation 5mm)	Body-worn (Separation 5mm)	Highest Simultaneous Transmission 1g SAR (W/kg)
			1g SAR (W/kg)			
Licensed	GSM	GSM850	0.56	**1.17**	**1.17**	1.58
		GSM1900	0.13	**1.17**	0.86	
	WCDMA	Band V	0.51	0.90	0.90	
		Band II	0.30	0.97	0.56	
	LTE	Band 26/Band 5	0.23	0.85	0.85	
		Band 2	0.16	1.08	0.68	
		Band 7	0.84	1.00	1.00	
		Band 38	0.73	1.02	1.02	
DTS	WLAN	2.4GHz WLAN	0.74	0.43	0.43	1.58
NII		5GHz WLAN	**0.99**	0.82	0.85	1.58
DSS	Bluetooth	2.4GHz Bluetooth		0.11	0.11	1.25

Highest 10g SAR Summary				
Equipment Class	Frequency Band		Product Specific 10g SAR (W/kg) (Separation 0mm)	Highest Simultaneous Transmission 10g SAR (W/kg)
Licensed	GSM	GSM850	1.42	3.75
		GSM1900	**3.21**	
	WCDMA	Band V	1.97	
		Band II	2.48	
	LTE	Band 2	1.69	
		Band 7	2.95	
		Band 38	**3.21**	
NII	WLAN	5GHz WLAN	0.54	3.75
Date of Testing:			2018/1/3 ~ 2018/2/8	

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

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications.

2. Administration Data

Testing Laboratory	
Test Site	Sporton International (Kunshan) Inc.
Test Site Location	No.3-2 Ping-Xiang Rd, Kunshan Development Zone Kunshan City Jiangsu Province 215335 China TEL : +86-512-57900158 FAX : +86-512-57900958

Applicant	
Company Name	Motorola Mobility LLC
Address	222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

Manufacturer	
Company Name	Motorola Mobility LLC
Address	222 W, Merchandise Mart Plaza, Chicago IL 60654 USA

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 648474 D04 SAR Evaluation Considerations for Wireless Handsets v01r03
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02
- FCC KDB 941225 D06 Hotspot Mode SAR v02r01

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Mobile Cellular Phone
Brand Name	Motorola
Model Name	XT1925-7
FCC ID	IHDT56XD7
IMEI Code	SIM1: 351848090017291 SIM2: 351848090017309
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 26: 814.7 MHz ~ 848.3 MHz LTE Band 38: 2572.5 MHz ~ 2617.5 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC : 13.56 MHz
Mode	GSM/GPRS/EGPRS RMC/AMR 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ (16QAM uplink is not supported) LTE: QPSK, 16QAM, 64QAM WLAN 2.4GHz 802.11b/g/n HT20 WLAN 5GHz 802.11a/n HT20/HT40 Bluetooth v3.0+EDR, Bluetooth v4.0 LE, Bluetooth v4.1 LE, Bluetooth v4.2 LE NFC:ASK
HW Version	DVT1-B
SW Version	ali_n-userdebug 8.0.0 OPS27.55 1276 intcfg,test-keys
GSM / (E)GPRS Transfer mode	Class B – EUT cannot support Packet Switched and Circuit Switched Network simultaneously but can automatically switch between Packet and Circuit Switched Network.
EUT Stage	Identical Prototype

Remark:

1. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
2. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
3. This device 2.4GHz WLAN/5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WiFi Direct (GC/GO), and 5.3GHz / 5.5GHz supports WiFi Direct (GC only).
4. This device does not support DTM operation and supports GRPS/EGRPS mode up to multi-slot class 12.
5. When operating in any other radiated condition, the device uses the default power which is the same as full power level.
6. The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device. When front or back body worn condition is detected, GSM850/GSM1900, WCDMA band II/V and LTE band 2/7/38 reduced power will be active. (P-sensor can't work at detecting presence of the user's body at the four edges of the device.)
7. When hotspot mode is enabled, power reduction will be activated to limit the maximum power of GSM850/GSM1900, WCDMA band II/V and LTE band 2/7/38.
8. P-sensor can detect handheld state, for product specific 10g SAR condition, GSM1900, WCDMA band II, LTE band 2 reduced powers will be active.

9. This device hotspot reduced power and P-sensor reduced power level are the same. So only show one reduced power level for hotspot reduced power and P-sensor reduced power for this application.
10. When the phone is in talking mode and receiver worked, then power reduction will be implemented immediately at WLAN5.2/5.3GHz.
11. This device has three WWAN transmitter antennas. WWAN antenna 1 is located at the middle of bottom edge of the device, WWAN antenna 2 is located at the right side of bottom edge of the device, and WWAN antenna 3 is located at the left side of bottom edge of the device which can refer to antenna location chapter. WWAN antenna 1 frequency bands include GSM850/1900, WCDMA Band II/V, LTE Band 2/5/26, WWAN antenna 2 frequency bands include LTE Band 7/38 and WWAN antenna 3 frequency bands also include LTE 7/38.
12. The device is capable of switching between the WWAN antenna 2 and WWAN antenna 3 based on signal strength. When WWAN antenna 2 acted as a transmitter, then WWAN antenna 3 acted as a receiver. The same as the reversed.
13. The dual SIM card mobile has 2 SIM slots and supports dual SIM dual standby. The WWAN radio transmission will be enabled by either one SIM at a time (single active). After pre-scan two SIM cards power, we found test result of the SIM1 was the worse, so we chose dual SIM1 card to perform all tests.
14. This device implements antenna tuning techniques for several WWAN (cellular) operating modes and frequencies for the purpose of improving antenna efficiency over a broad range of frequencies. Specifically, these techniques are employed in the GSM, WCDMA and LTE modes of WWAN antenna 1. In this report SAR was measured according to the normally required SAR configurations with the tuner active and worst tune state (auto tune) was used for SAR testing. The detail descriptions of the antenna tuner are included in the operational description and supplemental data for additional information on section17.

4.2 Specification of Accessory

Specification of Accessory				
AC Adapter 1(US)	Brand Name	Motorola (Salom)	Model Name	SC-22
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
AC Adapter 1(EU)	Brand Name	Motorola (Salom)	Model Name	SC-23
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
AC Adapter 1(UK)	Brand Name	Motorola (Salom)	Model Name	SC-24
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
AC Adapter 1(IN)	Brand Name	Motorola (Salom)	Model Name	SC-25
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
AC Adapter 1(AU)	Brand Name	Motorola (Salom)	Model Name	SC-26
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
AC Adapter 1 (Indonesia)	Brand Name	Motorola (Salom)	Model Name	SC-23
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
AC Adapter 2(US)	Brand Name	Motorola (Chenyang)	Model Name	SC-22
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
AC Adapter 2(EU)	Brand Name	Motorola (Chenyang)	Model Name	SC-23
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
AC Adapter 2(UK)	Brand Name	Motorola (Chenyang)	Model Name	SC-24
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
AC Adapter 2(IN)	Brand Name	Motorola (Chenyang)	Model Name	SC-25
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
AC Adapter 2(AU)	Brand Name	Motorola (Chenyang)	Model Name	SC-26
	Power Rating	I/P: 100-240 Vac, 500mA, O/P: 5Vdc,3000mA or 9Vdc,1600mA or 12Vdc,1200mA		
Battery	Brand Name	Motorola (ATL)	Model Name	HG30
	Power Rating	3.8Vdc,3000mAh	Type	Li-ion
Earphone 1	Brand Name	Motorola (Jiahe)	Model Name	LS-118M-12
	Signal Line Type	1.2 meter, non-shielded cable, without ferrite core		
Earphone 2	Brand Name	Motorola (Lianyun)	Model Name	TS910A-38AMS01WHR-M
	Signal Line Type	1.2 meter, non-shielded cable, without ferrite core		
USB Cable	Brand Name	Motorola (Liqi)	Model Name	L32B-053000100-ALL
	Signal Line Type	1.0 meter, shielded cable, without ferrite core		

4.3 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>IHDT56XD7</td></tr>
<tr><td>Equipment Name</td><td>Mobile Cellular Phone</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 5: 824.7 MHz ~ 848.3 MHz
LTE Band 7: 2502.5 MHz ~ 2567.5 MHz
LTE Band 26: 814.7 MHz ~ 848.3 MHz
LTE Band 38: 2572.5 MHz ~ 2617.5 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td>LTE Band 2: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 5: 1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 26: 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz
LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz</td></tr>
<tr><td>uplink modulations used</td><td>QPSK, 16QAM and 64QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td>Voice and Data</td></tr>
<tr><td>LTE Release Version</td><td>R10, Cat 6</td></tr>
<tr><td>CA Support</td><td>Yes, Downlink Only</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
1. The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device. When front or back body worn condition is detected, LTE band 2/7/38 reduced power will be active. (P-sensor can't work at detecting presence of the user's body at the four edges of the device.)
2. When hotspot mode is enabled, power reduction will be activated to limit the maximum power of LTE band 2/7/38.
3. P-sensor can detect handheld state, for product specific 10g SAR condition LTE band 2 reduced powers will be active.</td></tr>
<tr><td>LTE Carrier Aggregation Combinations</td><td>Inter-Band and Intra-Band possible combinations as below page and the detail power verification please referred to section 13.</td></tr>
<tr><td>LTE Carrier Aggregation Additional Information</td><td>This device does not support full CA features on 3GPP Release 10. It supports a maximum of 2 carriers in the downlink only. All uplink communications are identical to the Release 8 Specifications. Uplink communications are done on the PCC. Due to carrier capability, only the combinations listed above are supported. The following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.</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 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 7

	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	20775	2502.5	20800	2505	20825	2507.5	20850	2510
M	21100	2535	21100	2535	21100	2535	21100	2535
H	21425	2567.5	21400	2565	21375	2562.5	21350	2560

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 38

	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	37775	2572.5	37800	2575	37825	2577.5	37850	2580
M	38000	2595	38000	2595	38000	2595	38000	2595
H	38225	2617.5	38200	2615	38175	2612.5	38150	2610

5. Re-use of Measured Data

5.1 Introduction Section

This application re-uses data collected on a similar device. The subject device of this application (Model: XT1925-7, FCC ID: IHDT56XD7) is electrically identical to the reference device (Model: XT1925-6, XT1925-12, XT1925DL, FCC ID: IHDT56XD1 for WLAN2.4GHz and Bluetooth, and Model: XT1925-2, XT1925-1, FCC ID: IHDT56XD5 for WLAN5GHz) for the portions of the circuitry corresponding to the data being re-used, as treated by KDB Publication 178919 D01.

5.2 Difference Section

For details concerning the similarity with respect to component placement, mechanical/electrical design etc., please refer to the Product Equality Declaration “PED” file.

The re-used RF data includes the following bands provided in Appendix F

a. Sporton SAR Report No. FA7D2507 for the reference device Model: XT1925-6, XT1925-12, XT1925DL, FCC ID: IHDT56XD1 for WLAN2.4GHz/Bluetooth.
   - WLAN2.4GHz/Bluetooth

b. Sporton SAR Report No. FA7D2507-03 for the reference device Model: XT1925-2, XT1925-1, FCC ID: IHDT56XD5 for WLAN5GHz.
   - WLAN5GHz

WWAN all bands for full SAR test, spot check for WLAN2.4GHz, Bluetooth and WLAN5GHz are performed for ensure that SAR measurement for both device are the same. So, the original SAR value can represent this application.

5.3 Spot Check Verification Data Section

Band	Mode	Test Position	Gap (mm)	Power Mode	Ch.	Freq. (MHz)	Original model (FCC ID: IHDT56XD1)				Spot check model (FCC ID: IHDT56XD7)				Deviation
							Average Power (dBm)	Tune-Up Limit (dBm)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Average Power (dBm)	Tune-Up Limit (dBm)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	
WLAN2.4GHz	802.11b 1Mbps	Left Tilted	0	Full	6	2437	17.44	18.00	0.637	0.740	17.44	18.00	0.608	0.706	-0.05%
Bluetooth	1Mbps	Back	5	Full	39	2441	11.63	12.00	0.093	0.110	11.63	12.00	0.078	0.092	-0.16%

Band	Mode	Test Position	Gap (mm)	Power Mode	Ch.	Freq. (MHz)	Original model (FCC ID: IHDT56XD5)				Spot check model (FCC ID: IHDT56XD7)				Deviation
							Average Power (dBm)	Tune-Up Limit (dBm)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	Average Power (dBm)	Tune-Up Limit (dBm)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)	
WLAN5.3GHz	802.11a 6Mbps	Left Cheek	0	Receiver On	52	5260	12.54	13.00	0.781	0.993	12.54	13.00	0.750	0.954	-0.04%
WLAN5.5GHz	802.11a 6Mbps	Left Cheek	0	Full	124	5620	14.94	15.50	0.686	0.893	14.94	15.50	0.675	0.878	-0.02%
WLAN 5.8GHz	802.11a 6Mbps	Back	5	Full	157	5785	15.31	15.50	0.517	0.618	15.31	15.50	0.505	0.604	-0.02%

Note: In the table above, all the deviation of SAR test results are compliant with uncertainty budget.

5.4 Reference detail Section

Reference FCC ID	Folder Test/RF Exposure	Report Title/Section
IHDT56XD1	RF Exposure(FA7D2507)	All sections applicable (WLAN2.4GHz, Bluetooth)
IHDT56XD5	RF Exposure(FA7D2507-03)	All sections applicable (WLAN5GHz)

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:

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

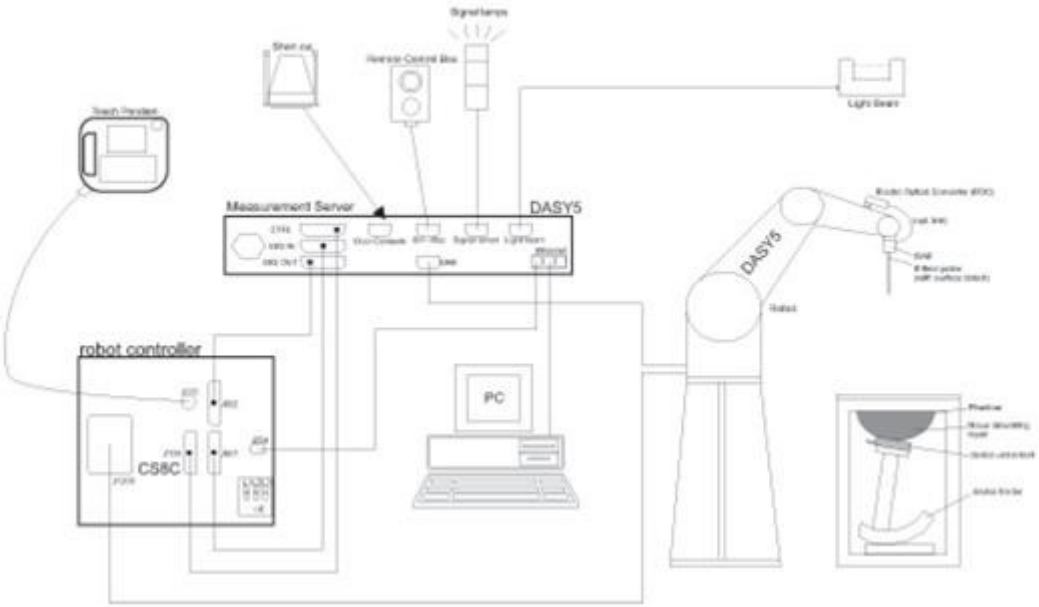
SAR is expressed in units of Watts per kilogram (W/kg)

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

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.

<ES3DV3 Probe>

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

<EX3DV4 Probe>

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)

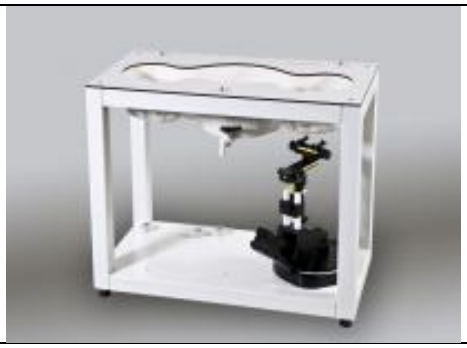
The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an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

Fig 5.1 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	835MHz System Validation Kit	D835V2	4d091	2017/12/5	2018/12/4
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	2017/12/6	2018/12/5
SPEAG	2600MHz System Validation Kit	D2600V2	1061	2017/12/7	2018/12/6
SPEAG	Data Acquisition Electronics	DAE4	1338	2017/12/4	2018/12/3
SPEAG	Data Acquisition Electronics	DAE4	1326	2017/9/15	2018/9/14
SPEAG	Data Acquisition Electronics	DAE4	1279	2018/1/3	2019/1/2
SPEAG	Dosimetric E-Field Probe	EX3DV4	3753	2017/5/5	2018/5/4
SPEAG	Dosimetric E-Field Probe	ES3DV3	3293	2017/9/25	2018/9/24
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1842	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1839	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201300654	2017/8/7	2018/8/6
Anritsu	Radio communication analyzer	MT8821C	6201692204	2017/3/29	2018/3/28
Agilent	Wireless Communication Test Set	E5515C	MY52102706	2017/4/18	2018/4/17
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	2017/4/18	2018/4/17
SPEAG	DAK Kit	DAK3.5	1146	2017/7/18	2018/7/17
R&S	Signal Generator	SMR20	102049	2017/8/17	2018/8/16
Anritsu	Power Meter	ML2495A	1419002	2017/5/15	2018/5/14
Anritsu	Power Sensor	MA2411B	1339124	2017/5/15	2018/5/14
Anritsu	Power Meter	ML2495A	1218006	2017/10/6	2018/10/5
Anritsu	Power Sensor	MA2411B	1207363	2017/10/6	2018/10/5
WISEWIND	Hygrometer	WISEWIND 0905	0905	2017/4/20	2018/4/19
JM	DIGITAC THERMOMETER	JM222	AA1207166	2017/4/19	2018/4/18
EXA	Spectrum Analyzer	N9010A	MY55150244	2017/4/18	2018/4/17
Agilent	Dual Directional Coupler	778D	50422	Note	
PASTERNACK	Dual Directional Coupler	PE2214-10	N/A	Note	
ARRA	Power Divider	A3200-2	N/A	Note	
AR	Amplifier	5S1G4	333096	Note	
mini-circuits	Amplifier	ZVE-3W-83+	162601250	Note	
MCL	Attenuation1	BW-S10W5+	N/A	Note	
MCL	Attenuation2	BW-S10W5+	N/A	Note	
MCL	Attenuation3	BW-S10W5+	N/A	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 head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.1. 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. 10.2.

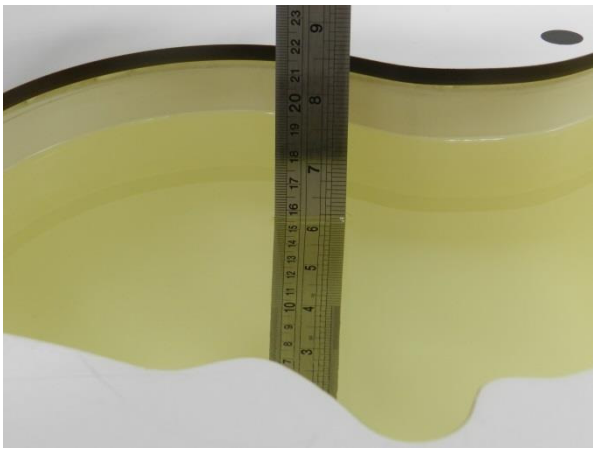


Fig 10.1Photo of Liquid Height for Head SAR

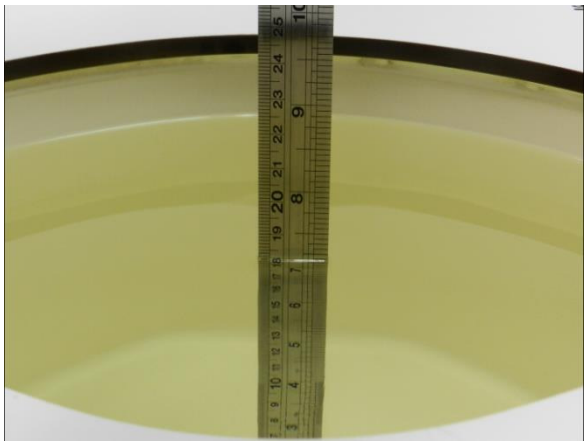


Fig 10.2 Photo of Liquid Height for Body SAR

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								
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
2600	54.8	0	0	0.1	0	45.1	1.96	39.0
For Body								
835	50.8	48.2	0	0.9	0.1	0	0.97	55.2
1800, 1900, 2000	70.2	0	0	0.4	0	29.4	1.52	53.3
2600	68.1	0	0	0.1	0	31.8	2.16	52.5

<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
835	Head	22.8	0.920	42.023	0.90	41.50	2.22	1.26	±5	2018/1/3
1900	Head	22.8	1.397	39.647	1.40	40.00	-0.21	-0.88	±5	2018/1/4
2600	Head	22.7	2.049	38.658	1.96	39.00	4.54	-0.88	±5	2018/1/26
835	Body	22.7	0.995	54.629	0.97	55.20	2.58	-1.03	±5	2018/1/14
1900	Body	22.7	1.526	51.737	1.52	53.30	0.39	-2.93	±5	2018/1/14
2600	Body	22.8	2.224	52.974	2.16	52.50	2.96	0.90	±5	2018/2/8

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.

<1g SAR>

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 (%)
2018/1/3	835	Head	250	4d091	3293	1326	2.22	9.48	8.88	-6.3
2018/1/4	1900	Head	250	5d118	3293	1326	9.74	39.70	38.96	-1.9
2018/1/26	2600	Head	250	1061	3753	1338	13.8	58.2	55.2	-5.15
2018/1/14	835	Body	250	4d091	3293	1326	2.20	9.72	8.80	-9.5
2018/1/14	1900	Body	250	5d118	3293	1326	9.50	40.40	38.00	-5.9
2018/2/8	2600	Body	250	1061	3753	1279	13.30	56.40	53.20	-5.7

<10g SAR>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 10g SAR (W/kg)	Targeted 10g SAR (W/kg)	Normalized 10g SAR (W/kg)	Deviation (%)
2018/1/3	835	Head	250	4d091	3293	1326	1.55	6.22	6.20	-0.3
2018/1/4	1900	Head	250	5d118	3293	1326	5.11	20.70	20.44	-1.3
2018/1/26	2600	Head	250	1061	3753	1338	6.44	26.00	25.76	-0.9
2018/1/14	835	Body	250	4d091	3293	1326	1.58	6.42	6.32	-1.6
2018/1/14	1900	Body	250	5d118	3293	1326	4.91	21.10	19.64	-6.9
2018/2/8	2600	Body	250	1061	3753	1279	6.32	25.00	25.28	1.1

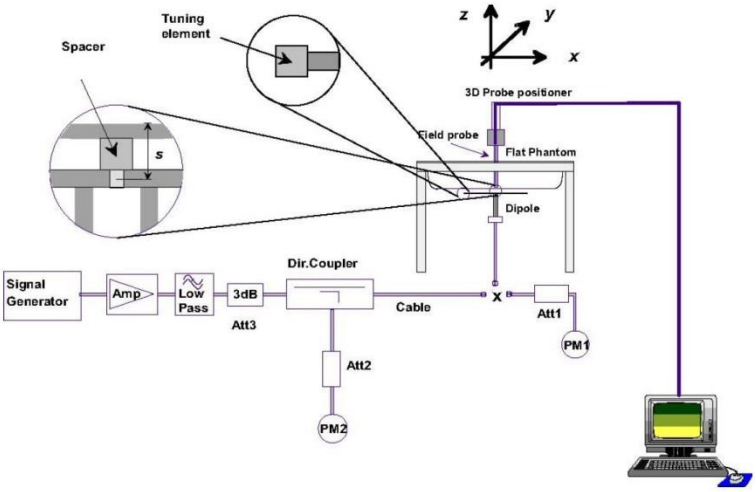


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

12. RF Exposure Positions

12.1 Ear and handset reference point

Figure 9.1.1 shows the front, back, and side views of the SAM phantom. The center-of-mouth reference point is labeled “M,” the left ear reference point (ERP) is marked “LE,” and the right ERP is marked “RE.” Each ERP is 15 mm along the B-M (back-mouth) line behind the entrance-to-ear-canal (EEC) point, as shown in Figure 9.1.2 The Reference Plane is defined as passing through the two ear reference points and point M. The line N-F (neck-front), also called the reference pivoting line, is normal to the Reference Plane and perpendicular to both a line passing through RE and LE and the B-M line (see Figure 9.1.3). Both N-F and B-M lines should be marked on the exterior of the phantom shell to facilitate handset positioning. Posterior to the N-F line the ear shape is a flat surface with 6 mm thickness at each ERP, and forward of the N-F line the ear is truncated, as illustrated in Figure 9.1.2. The ear truncation is introduced to preclude the ear lobe from interfering with handset tilt, which could lead to unstable positioning at the cheek.

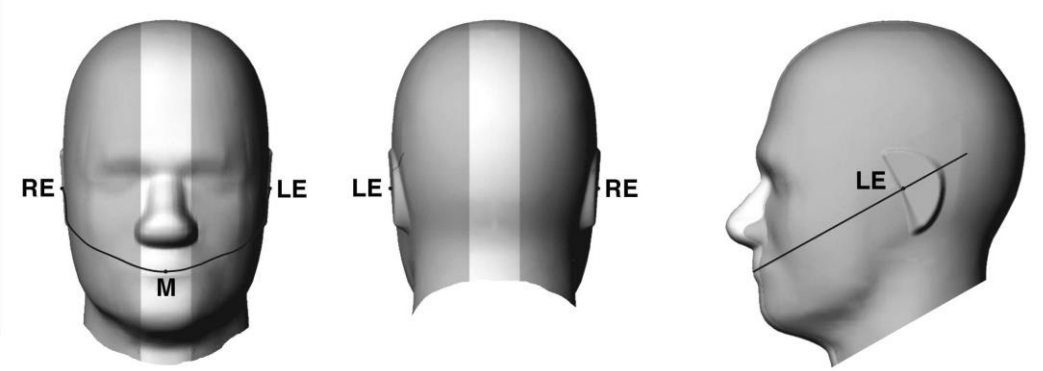


Fig 9.1.1 Front, back, and side views of SAM twin phantom

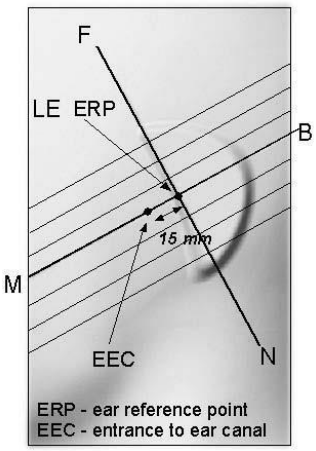


Fig 9.1.2 Close-up side view of phantom showing the ear region.

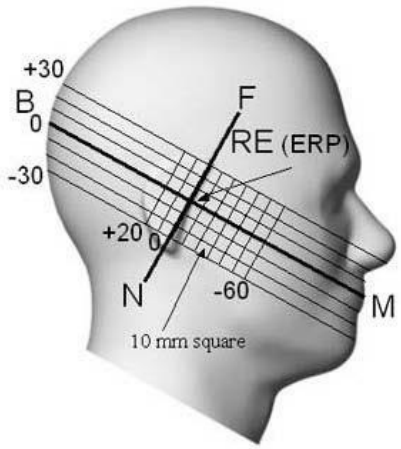


Fig 9.1.3 Side view of the phantom showing relevant markings and seven cross-sectional plane locations

12.2 Definition of the cheek position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. Define two imaginary lines on the handset—the vertical centerline and the horizontal line. The vertical centerline passes through two points on the front side of the handset—the midpoint of the width wt of the handset at the level of the acoustic output (point A in Figure 9.2.1 and Figure 9.2.2), and the midpoint of the width wb of the bottom of the handset (point B). The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output (see Figure 9.2.1). The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset (see Figure 9.2.2), especially for clamshell handsets, handsets with flip covers, and other irregularly-shaped handsets.
3. Position the handset close to the surface of the phantom such that point A is on the (virtual) extension of the line passing through points RE and LE on the phantom (see Figure 9.2.3), such that the plane defined by the vertical centerline and the horizontal line of the handset is approximately parallel to the sagittal plane of the phantom.
4. Translate the handset towards the phantom along the line passing through RE and LE until handset point A touches the pinna at the ERP.
5. While maintaining the handset in this plane, rotate it around the LE-RE line until the vertical centerline is in the plane normal to the plane containing B-M and N-F lines, i.e., the Reference Plane.
6. Rotate the handset around the vertical centerline until the handset (horizontal line) is parallel to the N-F line.
7. While maintaining the vertical centerline in the Reference Plane, keeping point A on the line passing through RE and LE, and maintaining the handset contact with the pinna, rotate the handset about the N-F line until any point on the handset is in contact with a phantom point below the pinna on the cheek. See Figure 9.2.3. The actual rotation angles should be documented in the test report.

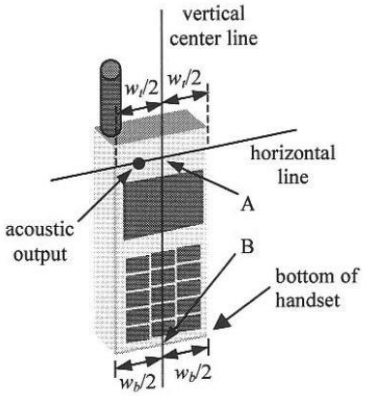


Fig 9.2.1 Handset vertical and horizontal reference lines—"fixed case

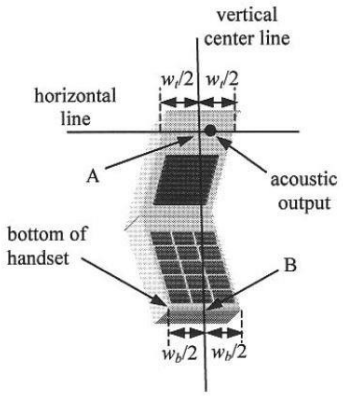


Fig 9.2.2 Handset vertical and horizontal reference lines—"clam-shell case"

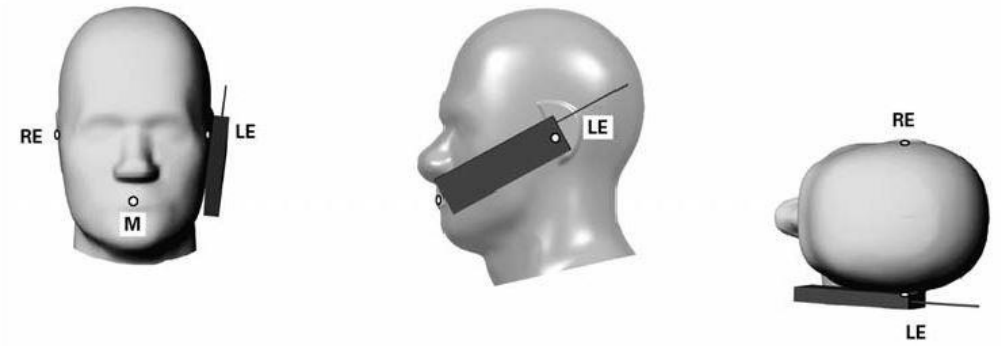


Fig 9.2.3 cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

12.3 Definition of the tilt position

1. Ready the handset for talk operation, if necessary. For example, for handsets with a cover piece (flip cover), open the cover. If the handset can transmit with the cover closed, both configurations must be tested.
2. While maintaining the orientation of the handset, move the handset away from the pinna along the line passing through RE and LE far enough to allow a rotation of the handset away from the cheek by 15°.
3. Rotate the handset around the horizontal line by 15°.
4. While maintaining the orientation of the handset, move the handset towards the phantom on the line passing through RE and LE until any part of the handset touches the ear. The tilt position is obtained when the contact point is on the pinna. See Figure 9.3.1. If contact occurs at any location other than the pinna, e.g., the antenna at the back of the phantom head, the angle of the handset should be reduced. In this case, the tilt position is obtained if any point on the handset is in contact with the pinna and a second point

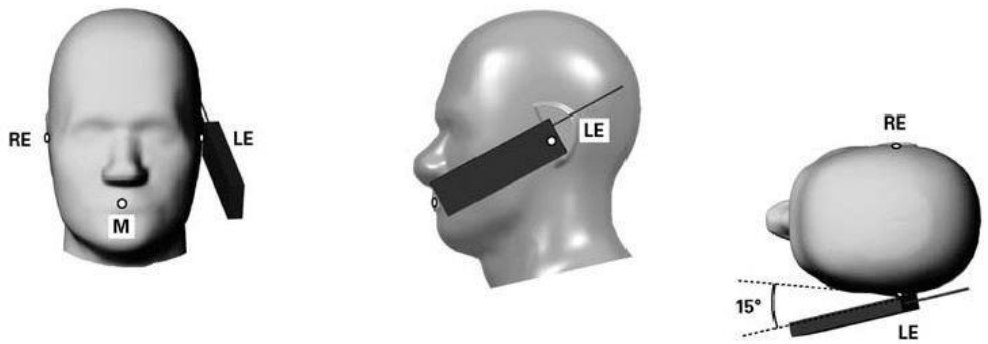


Fig 9.3.1 Tilt position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which define the Reference Plane for handset positioning, are indicated.

12.4 Body Worn Accessory

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 9.4). Per KDB648474 D04v01r03, body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in FCC KDB 447498 D01v06 should be used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode, when applicable. When the reported SAR for body-worn accessory, measured without a headset connected to the handset is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for that body-worn accessory with a handset attached to the handset.

Accessories for body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are test with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-chip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

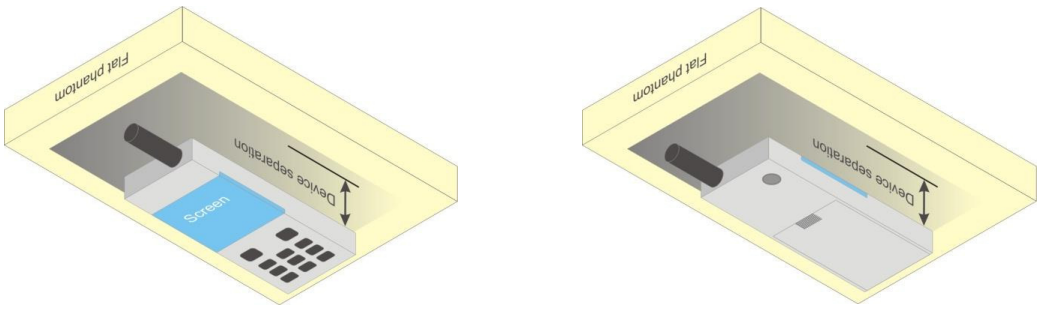


Fig 9.4 Body Worn Position

12.5 Product Specific 10g SAR Exposure

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, According to KDB648474 D04v01r03, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance

1. The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.

2. The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions.6 The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

12.6 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.

13. Conducted RF Output Power (Unit: dBm)

<GSM Conducted Power>

1. Per KDB 447498 D01v06, the maximum output power channel is used for SAR testing and for further SAR test reduction.
2. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS (2Tx slots) for GSM850/GSM1900 are considered as the primary mode.
3. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the secondary mode.
4. Power reduction which is triggered by hotspot mode/p-sensor on is implemented in GSM850/GSM1900 and handheld on is implemented in GSM1900, for SAR testing EUT was set in reduced power mode and GPRS 2 Tx slots due to its highest frame-average power.

<Full Power Mode>

GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
Tx Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM 1 Tx slot	33.09	32.86	32.91	33.50	24.09	23.86	23.91	24.50
GPRS 1 Tx slot	33.07	32.84	32.89	33.50	24.07	23.84	23.89	24.50
GPRS 2 Tx slots	31.08	31.14	30.85	31.50	25.08	25.14	24.85	25.50
GPRS 3 Tx slots	28.73	28.85	28.61	29.50	24.47	24.59	24.35	25.24
GPRS 4 Tx slots	27.25	27.11	27.20	28.00	24.25	24.11	24.20	25.00
EDGE 1 Tx slot	26.76	26.81	26.72	27.00	17.76	17.81	17.72	18.00
EDGE 2 Tx slots	24.54	24.50	24.47	25.00	18.54	18.50	18.47	19.00
EDGE 3 Tx slots	22.59	22.68	22.61	23.00	18.33	18.42	18.35	18.74
EDGE 4 Tx slots	22.97	23.01	22.81	23.50	19.97	20.01	19.81	20.50
GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
Tx Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	29.51	29.82	29.91	30.50	20.51	20.82	20.91	21.50
GPRS 1 Tx slot	29.49	29.80	29.89	30.50	20.49	20.80	20.89	21.50
GPRS 2 Tx slots	27.98	28.28	28.36	29.00	21.98	22.28	22.36	23.00
GPRS 3 Tx slots	25.91	26.11	26.19	27.00	21.65	21.85	21.93	22.74
GPRS 4 Tx slots	24.46	24.86	24.70	25.50	21.46	21.86	21.70	22.50
EDGE 1 Tx slot	25.50	25.69	25.70	26.00	16.50	16.69	16.70	17.00
EDGE 2 Tx slots	23.26	23.42	23.40	24.00	17.26	17.42	17.40	18.00
EDGE 3 Tx slots	22.20	22.31	22.42	23.00	17.94	18.05	18.16	18.74
EDGE 4 Tx slots	20.66	20.80	20.82	21.00	17.66	17.80	17.82	18.00

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method are shown as below:
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

<Reduced Power Mode for Hotspot On/P-Sensor On>

GSM850	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
Tx Channel	128	189	251		128	189	251	
Frequency (MHz)	824.2	836.4	848.8		824.2	836.4	848.8	
GSM 1 Tx slot	30.92	31.01	30.72	31.50	21.92	22.01	21.72	22.50
GPRS 1 Tx slot	30.93	31.02	30.73	31.50	21.93	22.02	21.73	22.50
GPRS 2 Tx slots	29.14	29.26	28.87	29.50	23.14	23.26	22.87	23.50
GPRS 3 Tx slots	27.22	27.28	27.12	27.50	22.96	23.02	22.86	23.24
GPRS 4 Tx slots	25.82	25.84	25.68	26.00	22.82	22.84	22.68	23.00
EDGE 1 Tx slot	26.76	26.81	26.72	27.00	17.76	17.81	17.72	18.00
EDGE 2 Tx slots	24.54	24.50	24.47	25.00	18.54	18.50	18.47	19.00
EDGE 3 Tx slots	22.59	22.68	22.61	23.00	18.33	18.42	18.35	18.74
EDGE 4 Tx slots	22.97	23.01	22.81	23.50	19.97	20.01	19.81	20.50
GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
Tx Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	24.15	24.15	24.18	24.50	15.15	15.15	15.18	15.50
GPRS 1 Tx slot	24.08	24.12	24.12	24.50	15.08	15.12	15.12	15.50
GPRS 2 Tx slots	23.13	23.19	23.23	23.50	17.13	17.19	17.23	17.50
GPRS 3 Tx slots	21.35	21.15	21.38	21.50	17.09	16.89	17.12	17.24
GPRS 4 Tx slots	19.48	19.53	19.68	20.00	16.48	16.53	16.68	17.00
EDGE 1 Tx slot	24.91	24.95	24.98	25.50	15.91	15.95	15.98	16.50
EDGE 2 Tx slots	21.88	21.81	21.83	22.00	15.88	15.81	15.83	16.00
EDGE 3 Tx slots	21.31	21.15	21.25	21.50	17.05	16.89	16.99	17.24
EDGE 4 Tx slots	18.31	18.35	18.28	19.00	15.31	15.35	15.28	16.00

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method are shown as below:
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

<Reduced Power Mode for Product Specific 10g SAR>

GSM1900	Burst Average Power (dBm)			Tune-up Limit (dBm)	Frame-Average Power (dBm)			Tune-up Limit (dBm)
Tx Channel	512	661	810		512	661	810	
Frequency (MHz)	1850.2	1880	1909.8		1850.2	1880	1909.8	
GSM 1 Tx slot	27.19	27.24	27.08	27.50	18.19	18.24	18.08	18.50
GPRS 1 Tx slot	27.21	27.25	27.10	27.50	18.21	18.25	18.10	18.50
GPRS 2 Tx slots	24.56	24.67	24.44	25.00	18.56	18.67	18.44	19.00
GPRS 3 Tx slots	22.61	22.72	22.48	23.00	18.35	18.46	18.22	18.74
GPRS 4 Tx slots	21.31	21.43	21.18	21.50	18.31	18.43	18.18	18.50
EDGE 1 Tx slot	25.50	25.69	25.70	26.00	16.50	16.69	16.70	17.00
EDGE 2 Tx slots	23.26	23.42	23.40	24.00	17.26	17.42	17.40	18.00
EDGE 3 Tx slots	22.20	22.31	22.42	23.00	17.94	18.05	18.16	18.74
EDGE 4 Tx slots	20.66	20.80	20.82	21.00	17.66	17.80	17.82	18.00

Remark: The frame-averaged power is linearly scaled the maximum burst averaged power over 8 time slots.
The calculated method are shown as below:
Frame-averaged power = Maximum burst averaged power (1 Tx Slot) - 9 dB
Frame-averaged power = Maximum burst averaged power (2 Tx Slots) - 6 dB
Frame-averaged power = Maximum burst averaged power (3 Tx Slots) - 4.26 dB
Frame-averaged power = Maximum burst averaged power (4 Tx Slots) - 3 dB

<WCDMA Conducted Power>

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

A summary of these settings are illustrated below:

HSDPA Setup Configuration:

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

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d *(SF)*	β_c/β_d	β_{HS} *(Note1, Note 2)*	CM (dB) *(Note 3)*	MPR (dB) *(Note 3)*
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 *(Note 4)*	15/15 *(Note 4)*	64	12/15 *(Note 4)*	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .

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

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

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

Setup Configuration

HSUPA Setup Configuration:

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

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

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

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c . For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c .

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

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

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

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

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

Setup Configuration

DC-HSDPA 3GPP release 8 Setup Configuration:

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

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

C.8.1.12 Fixed Reference Channel Definition H-Set 12

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

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

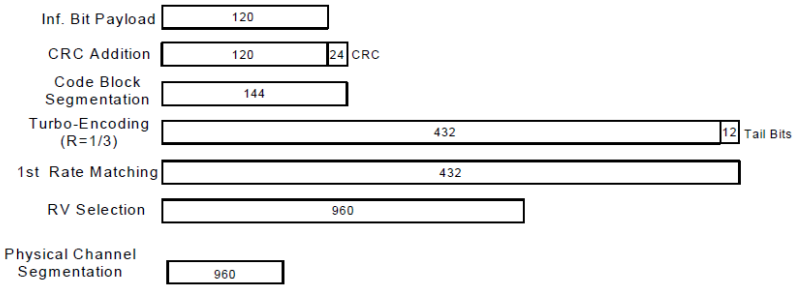


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

<Full Power Mode>

Band		WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band V			Tune-up Limit (dBm)
Tx Channel		9262	9400	9538		4132	4182	4233	
Rx Channel		9662	9800	9938		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	22.31	22.55	22.53	24.00	22.50	22.40	22.41	24.00
3GPP Rel 99	RMC 12.2Kbps	22.33	22.56	22.55	24.00	22.52	22.41	22.43	24.00
3GPP Rel 6	HSDPA Subtest-1	21.39	21.64	21.56	23.00	21.42	21.24	21.39	23.00
3GPP Rel 6	HSDPA Subtest-2	21.38	21.68	21.56	23.00	21.44	21.25	21.42	23.00
3GPP Rel 6	HSDPA Subtest-3	20.88	21.17	21.10	22.50	20.91	20.73	20.89	22.50
3GPP Rel 6	HSDPA Subtest-4	20.93	21.16	21.09	22.50	20.91	20.77	20.93	22.50
3GPP Rel 8	DC-HSDPA Subtest-1	21.35	21.62	21.56	23.00	21.35	21.13	21.35	23.00
3GPP Rel 8	DC-HSDPA Subtest-2	21.26	21.58	21.51	23.00	21.48	21.25	21.42	23.00
3GPP Rel 8	DC-HSDPA Subtest-3	20.87	21.15	21.05	22.50	20.89	20.71	20.85	22.50
3GPP Rel 8	DC-HSDPA Subtest-4	20.80	21.05	21.06	22.50	20.88	20.78	20.89	22.50
3GPP Rel 6	HSUPA Subtest-1	21.37	21.62	21.55	23.00	21.43	21.22	21.33	23.00
3GPP Rel 6	HSUPA Subtest-2	19.38	19.59	19.54	21.00	19.38	19.23	19.37	21.00
3GPP Rel 6	HSUPA Subtest-3	20.42	20.64	20.56	22.00	20.38	20.24	20.35	22.00
3GPP Rel 6	HSUPA Subtest-4	19.36	19.64	19.54	21.00	19.40	19.25	19.34	21.00
3GPP Rel 6	HSUPA Subtest-5	21.40	21.60	21.60	23.00	21.40	21.20	21.40	23.00

<Reduced Power Mode for Hotspot On/P-Sensor On>

Band		WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band V			Tune-up Limit (dBm)
Tx Channel		9262	9400	9538		4132	4182	4233	
Rx Channel		9662	9800	9938		4357	4407	4458	
Frequency (MHz)		1852.4	1880	1907.6		826.4	836.4	846.6	
3GPP Rel 99	AMR 12.2Kbps	16.04	16.09	16.08	17.50	20.75	20.71	20.78	21.00
3GPP Rel 99	RMC 12.2Kbps	16.05	16.13	16.10	17.50	20.79	20.73	20.78	21.00
3GPP Rel 6	HSDPA Subtest-1	15.19	15.36	15.24	16.50	19.38	19.18	19.32	20.00
3GPP Rel 6	HSDPA Subtest-2	15.18	15.37	15.21	16.50	19.41	19.15	19.28	20.00
3GPP Rel 6	HSDPA Subtest-3	14.68	14.85	14.81	16.00	18.98	18.68	18.81	19.50
3GPP Rel 6	HSDPA Subtest-4	14.73	14.88	14.77	16.00	18.91	18.65	18.89	19.50
3GPP Rel 8	DC-HSDPA Subtest-1	15.13	15.32	15.21	16.50	19.36	19.08	19.35	20.00
3GPP Rel 8	DC-HSDPA Subtest-2	15.08	15.31	15.25	16.50	19.38	19.25	19.34	20.00
3GPP Rel 8	DC-HSDPA Subtest-3	14.65	14.82	14.78	16.00	18.92	18.68	18.89	19.50
3GPP Rel 8	DC-HSDPA Subtest-4	14.68	14.82	14.65	16.00	18.88	18.71	18.78	19.50
3GPP Rel 6	HSUPA Subtest-1	15.17	15.30	15.26	16.50	19.45	19.21	19.38	20.00
3GPP Rel 6	HSUPA Subtest-2	13.18	13.31	13.22	14.50	17.31	17.25	17.51	18.00
3GPP Rel 6	HSUPA Subtest-3	14.22	14.33	14.21	15.50	18.32	18.25	18.32	19.00
3GPP Rel 6	HSUPA Subtest-4	13.16	13.32	13.25	14.50	17.38	17.21	17.41	18.00
3GPP Rel 6	HSUPA Subtest-5	15.20	15.32	15.28	16.50	19.42	19.28	19.35	20.00

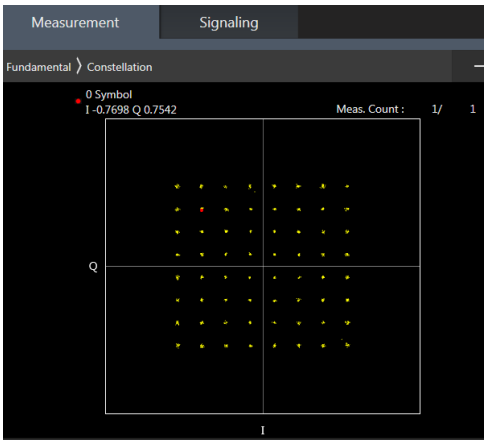
<Reduced Power Mode for Product Specific 10g SAR>

Band		WCDMA Band II			Tune-up Limit (dBm)
Tx Channel		9262	9400	9538	
Rx Channel		9662	9800	9938	
Frequency (MHz)		1852.4	1880	1907.6	
3GPP Rel 99	AMR 12.2Kbps	18.50	18.67	18.51	19.50
3GPP Rel 99	RMC 12.2Kbps	18.52	18.68	18.51	19.50
3GPP Rel 6	HSDPA Subtest-1	17.29	17.08	17.18	18.50
3GPP Rel 6	HSDPA Subtest-2	17.19	17.13	17.17	18.50
3GPP Rel 6	HSDPA Subtest-3	16.68	16.78	16.68	18.00
3GPP Rel 6	HSDPA Subtest-4	16.63	16.76	16.61	18.00
3GPP Rel 8	DC-HSDPA Subtest-1	17.21	17.18	17.18	18.50
3GPP Rel 8	DC-HSDPA Subtest-2	17.18	17.08	17.15	18.50
3GPP Rel 8	DC-HSDPA Subtest-3	16.61	16.71	16.65	18.00
3GPP Rel 8	DC-HSDPA Subtest-4	16.65	16.81	16.61	18.00
3GPP Rel 6	HSUPA Subtest-1	17.18	17.25	17.18	18.50
3GPP Rel 6	HSUPA Subtest-2	15.21	15.18	15.28	16.50
3GPP Rel 6	HSUPA Subtest-3	16.15	16.28	16.18	17.50
3GPP Rel 6	HSUPA Subtest-4	15.16	15.30	15.19	16.50
3GPP Rel 6	HSUPA Subtest-5	16.53	16.59	16.51	18.50

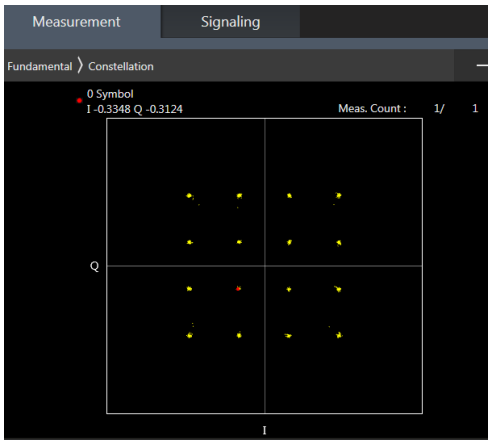
<LTE Conducted Power>

General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 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 B5 / B26 / B38 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 5 SAR test was covered by Band 26; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
   a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion
   b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to 2017 TCB workshop, for 64QAM and 16QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



64QAM



16QAM

<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	22.69	22.99	22.77	24	0
20	QPSK	1	49	22.5	22.38	22.59		
20	QPSK	1	99	22.36	22.39	22.56		
20	QPSK	50	0	21.62	21.83	21.89	23	1
20	QPSK	50	24	21.49	21.82	21.82		
20	QPSK	50	50	21.45	21.79	21.74		
20	QPSK	100	0	21.45	21.93	21.88		
20	16QAM	1	0	21.93	22.16	22.17	23	1
20	16QAM	1	49	21.68	22.02	22.08		
20	16QAM	1	99	21.77	21.81	21.87		
20	16QAM	50	0	20.55	20.85	20.92	22	2
20	16QAM	50	24	20.55	20.91	20.84		
20	16QAM	50	50	20.37	20.7	20.83		
20	16QAM	100	0	20.53	20.91	20.8		
20	64QAM	1	0	20.92	21.07	21.04	22	2
20	64QAM	1	49	20.51	20.92	20.91		
20	64QAM	1	99	20.58	20.61	20.9		
20	64QAM	50	0	19.6	19.82	19.86	21	3
20	64QAM	50	24	19.55	19.81	19.85		
20	64QAM	50	50	19.42	19.74	19.69		
20	64QAM	100	0	19.53	19.87	19.84		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.63	22.79	22.81	24	0
15	QPSK	1	37	22.05	22.7	22.26		
15	QPSK	1	74	22.67	22.86	22.89		
15	QPSK	36	0	21.59	21.68	21.82	23	1
15	QPSK	36	20	21.46	21.85	21.87		
15	QPSK	36	39	21.42	21.75	21.71		
15	QPSK	75	0	21.4	21.76	21.85		
15	16QAM	1	0	21.86	22.17	22.34	23	1
15	16QAM	1	37	21.66	21.89	22.27		
15	16QAM	1	74	21.97	22.25	22.22		
15	16QAM	36	0	20.61	20.71	20.77	22	2
15	16QAM	36	20	20.5	20.85	20.82		
15	16QAM	36	39	20.47	20.74	20.83		
15	16QAM	75	0	20.38	20.77	20.82		
15	64QAM	1	0	20.99	21.06	21.12	22	2
15	64QAM	1	37	20.91	20.84	20.99		
15	64QAM	1	74	21.04	21.04	21.08		
15	64QAM	36	0	19.61	19.83	19.79	21	3
15	64QAM	36	20	19.49	19.83	19.78		
15	64QAM	36	39	19.44	19.68	19.87		
15	64QAM	75	0	19.42	19.76	19.89		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.64	22.89	22.85	24	0
10	QPSK	1	25	22.39	22.68	22.72		
10	QPSK	1	49	22.42	22.81	22.94		
10	QPSK	25	0	21.45	21.66	21.8	23	1
10	QPSK	25	12	21.39	21.75	21.79		
10	QPSK	25	25	21.47	21.69	21.85		
10	QPSK	50	0	21.39	21.64	21.82		
10	16QAM	1	0	21.74	21.96	22.32	23	1
10	16QAM	1	25	21.56	21.94	22		
10	16QAM	1	49	21.71	21.96	22.22		
10	16QAM	25	0	20.4	20.71	20.82	22	2
10	16QAM	25	12	20.44	20.74	20.77		
10	16QAM	25	25	20.56	20.66	20.84		
10	16QAM	50	0	20.41	20.63	20.87		
10	64QAM	1	0	20.81	20.96	21.28	22	2
10	64QAM	1	25	20.64	20.96	20.91		
10	64QAM	1	49	20.73	20.92	21.22		
10	64QAM	25	0	19.39	19.71	19.83	21	3
10	64QAM	25	12	19.39	19.74	19.78		
10	64QAM	25	25	19.49	19.68	19.9		
10	64QAM	50	0	19.33	19.63	19.8		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.57	22.82	22.89	24	0
5	QPSK	1	12	22.42	22.71	22.81		
5	QPSK	1	24	22.36	22.72	22.8		
5	QPSK	12	0	21.46	21.74	21.89	23	1
5	QPSK	12	7	21.43	21.7	21.83		
5	QPSK	12	13	21.39	21.73	21.81		
5	QPSK	25	0	21.39	21.75	21.91		
5	16QAM	1	0	21.69	21.96	22.24	23	1
5	16QAM	1	12	21.52	21.84	21.96		
5	16QAM	1	24	21.62	21.93	22.07		
5	16QAM	12	0	20.52	20.81	20.94	22	2
5	16QAM	12	7	20.42	20.82	20.92		
5	16QAM	12	13	20.46	20.72	20.85		
5	16QAM	25	0	20.44	20.78	20.88		
5	64QAM	1	0	20.7	20.96	21.07	22	2
5	64QAM	1	12	20.48	20.86	20.96		
5	64QAM	1	24	20.54	20.82	20.96		
5	64QAM	12	0	19.54	19.82	19.94	21	3
5	64QAM	12	7	19.43	19.79	19.89		
5	64QAM	12	13	19.49	19.73	19.87		
5	64QAM	25	0	19.52	19.76	19.92		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.37	22.77	22.81	24	0
3	QPSK	1	8	22.4	22.7	22.85		
3	QPSK	1	14	22.33	22.66	22.75		
3	QPSK	8	0	21.42	21.72	21.81	23	1
3	QPSK	8	4	21.43	21.77	21.86		
3	QPSK	8	7	21.41	21.7	21.84		
3	QPSK	15	0	21.4	21.7	21.85		
3	16QAM	1	0	21.69	21.91	22.08	23	1
3	16QAM	1	8	21.57	21.81	21.92		
3	16QAM	1	14	21.74	21.91	22.13		
3	16QAM	8	0	20.48	20.78	20.93	22	2
3	16QAM	8	4	20.48	20.77	20.9		
3	16QAM	8	7	20.44	20.74	20.87		
3	16QAM	15	0	20.46	20.74	20.85		
3	64QAM	1	0	20.6	20.88	21.12	22	2
3	64QAM	1	8	20.58	20.98	20.94		
3	64QAM	1	14	20.53	20.83	21.1		
3	64QAM	8	0	19.49	19.76	19.9	21	3
3	64QAM	8	4	19.46	19.74	19.86		
3	64QAM	8	7	19.43	19.78	19.86		
3	64QAM	15	0	19.41	19.72	19.81		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.23	22.64	22.75	24	0
1.4	QPSK	1	3	22.29	22.71	22.8		
1.4	QPSK	1	5	22.28	22.67	22.69		
1.4	QPSK	3	0	22.32	22.68	22.7		
1.4	QPSK	3	1	22.36	22.68	22.76		
1.4	QPSK	3	3	22.36	22.66	22.78		
1.4	QPSK	6	0	21.36	21.68	21.78	23	1
1.4	16QAM	1	0	21.5	21.93	21.99	23	1
1.4	16QAM	1	3	21.5	21.92	22.07		
1.4	16QAM	1	5	21.51	21.85	21.93		
1.4	16QAM	3	0	21.29	21.74	21.74		
1.4	16QAM	3	1	21.33	21.72	21.87		
1.4	16QAM	3	3	21.34	21.74	21.84		
1.4	16QAM	6	0	20.48	20.81	20.86	22	2
1.4	64QAM	1	0	20.5	20.79	20.94	22	2
1.4	64QAM	1	3	20.61	20.89	20.95		
1.4	64QAM	1	5	20.53	20.78	20.83		
1.4	64QAM	3	0	20.56	20.85	20.94		
1.4	64QAM	3	1	20.56	20.86	20.95		
1.4	64QAM	3	3	20.57	20.81	20.94		
1.4	64QAM	6	0	19.37	19.66	19.78	21	3

<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	23.02	22.98	22.98	24	0
10	QPSK	1	25	23.11	22.76	23.25		
10	QPSK	1	49	23.19	23.42	23.57		
10	QPSK	25	0	21.96	22.28	22.45	23	1
10	QPSK	25	12	21.93	22.17	22.39		
10	QPSK	25	25	21.92	22.26	22.43		
10	QPSK	50	0	21.98	22.25	22.5		
10	16QAM	1	0	22.25	22.54	22.71	23	1
10	16QAM	1	25	22.07	22.34	22.66		
10	16QAM	1	49	22.42	22.94	22.99		
10	16QAM	25	0	20.87	21.22	21.39	22	2
10	16QAM	25	12	20.93	21.15	21.41		
10	16QAM	25	25	20.92	21.25	21.33		
10	16QAM	50	0	20.92	21.22	21.44		
10	64QAM	1	0	21.15	21.5	21.62	22	2
10	64QAM	1	25	20.98	21.27	21.51		
10	64QAM	1	49	21.34	21.68	21.63		
10	64QAM	25	0	19.88	20.21	20.38	21	3
10	64QAM	25	12	19.94	20.13	20.33		
10	64QAM	25	25	19.97	20.26	20.37		
10	64QAM	50	0	19.98	20.13	20.45		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.85	22.71	22.69	24	0
5	QPSK	1	12	22.8	22.7	23.15		
5	QPSK	1	24	22.87	23.06	22.99		
5	QPSK	12	0	21.83	22.11	22.17	23	1
5	QPSK	12	7	21.77	22.06	22.15		
5	QPSK	12	13	21.82	22.08	22.23		
5	QPSK	25	0	21.85	22.08	22.2		
5	16QAM	1	0	22.02	22.33	22.51	23	1
5	16QAM	1	12	22.12	22.34	22.59		
5	16QAM	1	24	21.98	22.37	22.29		
5	16QAM	12	0	20.92	21.17	21.17	22	2
5	16QAM	12	7	20.8	21.09	21.24		
5	16QAM	12	13	20.83	21.1	21.22		
5	16QAM	25	0	20.89	21.04	21.19		
5	64QAM	1	0	21	21.29	21.38	22	2
5	64QAM	1	12	21.01	21.05	21.3		
5	64QAM	1	24	20.93	21.29	21.29		
5	64QAM	12	0	19.92	20.19	20.14	21	3
5	64QAM	12	7	19.84	20.09	20.21		
5	64QAM	12	13	19.86	20.05	20.12		
5	64QAM	25	0	19.82	20.04	20.22		

Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.77	22.71	22.54	24	0
3	QPSK	1	8	22.73	23.05	22.74		
3	QPSK	1	14	22.76	23	22.94		
3	QPSK	8	0	21.82	22.12	22.09	23	1
3	QPSK	8	4	21.9	22.07	22.1		
3	QPSK	8	7	21.79	22.03	22.02		
3	QPSK	15	0	21.81	21.99	22.04		
3	16QAM	1	0	22	22.15	22.3	23	1
3	16QAM	1	8	21.98	22.22	22		
3	16QAM	1	14	22.14	22.22	22.29		
3	16QAM	8	0	20.86	21.21	21.23	22	2
3	16QAM	8	4	20.88	21.19	21.25		
3	16QAM	8	7	20.85	21.19	21.27		
3	16QAM	15	0	20.83	21.06	21.08		
3	64QAM	1	0	20.95	21.15	21.26	22	2
3	64QAM	1	8	20.95	21.35	21.49		
3	64QAM	1	14	20.94	21.37	21.27		
3	64QAM	8	0	19.9	20.2	20.05	21	3
3	64QAM	8	4	19.83	20.11	20.1		
3	64QAM	8	7	19.81	20.06	20.06		
3	64QAM	15	0	19.85	19.99	20.04		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.76	22.71	22.84	24	0
1.4	QPSK	1	3	22.83	22.87	23.07		
1.4	QPSK	1	5	22.74	22.81	23.08		
1.4	QPSK	3	0	22.74	22.91	22.94		
1.4	QPSK	3	1	22.78	23.03	23.03		
1.4	QPSK	3	3	22.76	23	22.93		
1.4	QPSK	6	0	21.79	22.05	22.03	23	1
1.4	16QAM	1	0	21.98	22.1	22.14	23	1
1.4	16QAM	1	3	22.08	22.32	22.12		
1.4	16QAM	1	5	22.06	22.11	22.12		
1.4	16QAM	3	0	21.78	22.05	22.21		
1.4	16QAM	3	1	21.82	22.12	22.25		
1.4	16QAM	3	3	21.81	22.09	22.18		
1.4	16QAM	6	0	20.86	21.06	20.93	22	2
1.4	64QAM	1	0	20.91	21.07	21.02	22	2
1.4	64QAM	1	3	20.91	21.03	21.1		
1.4	64QAM	1	5	20.94	21.31	21.45		
1.4	64QAM	3	0	20.91	21.05	21.02		
1.4	64QAM	3	1	20.92	21.15	21.13		
1.4	64QAM	3	3	20.97	21.17	21.23		
1.4	64QAM	6	0	19.85	19.98	19.84	21	3

<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	23.24	23.16	23.25	24	0
20	QPSK	1	49	22.99	23.09	23.07		
20	QPSK	1	99	23.17	23.08	23.22		
20	QPSK	50	0	22.2	22.26	22.32	23	1
20	QPSK	50	24	22.2	22.23	22.3		
20	QPSK	50	50	22.19	22.24	22.28		
20	QPSK	100	0	22.2	22.24	22.28		
20	16QAM	1	0	22.48	22.43	22.63	23	1
20	16QAM	1	49	22.37	22.55	22.6		
20	16QAM	1	99	22.41	22.45	22.5		
20	16QAM	50	0	21.2	21.22	21.3	22	2
20	16QAM	50	24	21.22	21.22	21.28		
20	16QAM	50	50	21.22	21.26	21.3		
20	16QAM	100	0	21.2	21.25	21.31		
20	64QAM	1	0	21.35	21.41	21.49	22	2
20	64QAM	1	49	21.25	21.28	21.23		
20	64QAM	1	99	21.36	21.35	21.36		
20	64QAM	50	0	20.19	20.28	20.29	21	3
20	64QAM	50	24	20.18	20.22	20.31		
20	64QAM	50	50	20.18	20.23	20.34		
20	64QAM	100	0	20.19	20.26	20.26		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	22.75	22.9	22.91	24	0
15	QPSK	1	37	22.95	23.12	23.56		
15	QPSK	1	74	23.12	23	23.11		
15	QPSK	36	0	22.17	22.2	22.21	23	1
15	QPSK	36	20	22.16	22.15	22.2		
15	QPSK	36	39	22.12	22.04	22.17		
15	QPSK	75	0	22.12	22.16	22.23		
15	16QAM	1	0	22.17	22.15	22.19	23	1
15	16QAM	1	37	22.03	22.42	22.33		
15	16QAM	1	74	22.3	22.37	22.42		
15	16QAM	36	0	21.13	21.17	21.16	22	2
15	16QAM	36	20	21.18	21.15	21.24		
15	16QAM	36	39	21.13	21.15	21.14		
15	16QAM	75	0	21.13	21.17	21.22		
15	64QAM	1	0	21.2	21.32	21.32	22	2
15	64QAM	1	37	21.36	20.94	21.13		
15	64QAM	1	74	21.15	21.06	21.25		
15	64QAM	36	0	20.17	20.2	20.22	21	3
15	64QAM	36	20	20.16	20.17	20.22		
15	64QAM	36	39	20.19	20.11	20.17		
15	64QAM	75	0	20.12	20.14	20.17		

Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	23.06	23.08	23.18	24	0
10	QPSK	1	25	22.95	22.84	22.95		
10	QPSK	1	49	23.18	23.05	23.22		
10	QPSK	25	0	22.15	22.05	22.17	23	1
10	QPSK	25	12	22.1	22.07	22.13		
10	QPSK	25	25	22.13	22.04	22.12		
10	QPSK	50	0	22.16	22.07	22.18		
10	16QAM	1	0	22.62	22.42	22.57	23	1
10	16QAM	1	25	22.2	22.1	22.3		
10	16QAM	1	49	22.52	22.37	22.52		
10	16QAM	25	0	21.2	21.1	21.22	22	2
10	16QAM	25	12	21.09	21.02	21.14		
10	16QAM	25	25	21.1	21.04	21.09		
10	16QAM	50	0	21.08	21	21.13		
10	64QAM	1	0	21.52	21.31	21.51	22	2
10	64QAM	1	25	21.13	21.17	21.27		
10	64QAM	1	49	21.36	21.28	21.39		
10	64QAM	25	0	20.2	20.06	20.25	21	3
10	64QAM	25	12	20.14	19.99	20.15		
10	64QAM	25	25	20.11	20.03	20.17		
10	64QAM	50	0	20.14	20.03	20.12		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	22.9	22.94	23	24	0
5	QPSK	1	12	22.97	22.85	23.03		
5	QPSK	1	24	23.03	22.91	23.05		
5	QPSK	12	0	22.21	22.09	22.19	23	1
5	QPSK	12	7	22.11	22.06	22.15		
5	QPSK	12	13	22.11	22.06	22.19		
5	QPSK	25	0	22.14	22.07	22.18		
5	16QAM	1	0	22.39	22.15	22.52	23	1
5	16QAM	1	12	22.29	21.64	22.33		
5	16QAM	1	24	22.29	22.24	22.27		
5	16QAM	12	0	21.12	21.09	21.2	22	2
5	16QAM	12	7	21.11	21.02	21.16		
5	16QAM	12	13	21.13	21.02	21.15		
5	16QAM	25	0	21.15	21.03	21.21		
5	64QAM	1	0	21.31	21.24	21.31	22	2
5	64QAM	1	12	21.12	21.35	21.16		
5	64QAM	1	24	21.17	21.11	21.21		
5	64QAM	12	0	20.2	20.13	20.22	21	3
5	64QAM	12	7	20.15	20.1	20.23		
5	64QAM	12	13	20.12	20.09	20.19		
5	64QAM	25	0	20.12	20.07	20.18		

<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	22.99	22.85	23.19	24	0
15	QPSK	1	37	22.82	22.77	23.58		
15	QPSK	1	74	23.1	23.82	23.82		
15	QPSK	36	0	22.01	22.79	22.79	23	1
15	QPSK	36	20	21.81	22.09	22.55		
15	QPSK	36	39	21.66	22.08	22.41		
15	QPSK	75	0	21.82	22.70	22.7		
15	16QAM	1	0	22.35	22.40	22.89	23	1
15	16QAM	1	37	22.02	22.07	22.82		
15	16QAM	1	74	22.21	22.91	22.91		
15	16QAM	36	0	21.08	21.31	21.82	22	2
15	16QAM	36	20	20.83	21.13	21.57		
15	16QAM	36	39	20.74	21.07	21.4		
15	16QAM	75	0	20.74	21.22	21.68		
15	64QAM	1	0	21.14	21.50	21.95	22	2
15	64QAM	1	37	20.88	21.20	21.81		
15	64QAM	1	74	21.28	21.79	21.94		
15	64QAM	36	0	20.17	20.27	20.83	21	3
15	64QAM	36	20	19.83	20.13	20.56		
15	64QAM	36	39	19.69	20.05	20.44		
15	64QAM	75	0	19.81	20.22	20.68		
Channel				26740	26865	26990	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				819	831.5	844		
10	QPSK	1	0	23.04	23.16	23.33	24	0
10	QPSK	1	25	22.66	23.15	23.51		
10	QPSK	1	49	23.15	23.4	23.79		
10	QPSK	25	0	21.94	22.09	22.72	23	1
10	QPSK	25	12	21.9	22.17	22.75		
10	QPSK	25	25	21.96	22.14	22.71		
10	QPSK	50	0	21.95	22.18	22.74		
10	16QAM	1	0	22.49	22.31	22.94	23	1
10	16QAM	1	25	22.08	22.27	22.84		
10	16QAM	1	49	22.28	22.69	22.93		
10	16QAM	25	0	21.02	21.13	21.67	22	2
10	16QAM	25	12	20.94	21.17	21.71		
10	16QAM	25	25	20.97	21.2	21.7		
10	16QAM	50	0	20.93	21.19	21.64		
10	64QAM	1	0	21.3	21.48	21.95	22	2
10	64QAM	1	25	20.95	21.25	21.63		
10	64QAM	1	49	21.33	21.53	21.98		
10	64QAM	25	0	19.97	20.11	20.65	21	3
10	64QAM	25	12	19.91	20.25	20.75		
10	64QAM	25	25	20.01	20.18	20.69		
10	64QAM	50	0	19.95	20.18	20.69		

Channel				26715	26865	27015	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				816.5	831.5	846.5		
5	QPSK	1	0	22.78	22.98	23.05	24	0
5	QPSK	1	12	22.64	23.11	23.42		
5	QPSK	1	24	22.75	22.99	23.29		
5	QPSK	12	0	21.9	22.08	22.54	23	1
5	QPSK	12	7	21.92	22.17	22.53		
5	QPSK	12	13	21.74	22.2	22.5		
5	QPSK	25	0	21.89	22.12	22.51		
5	16QAM	1	0	21.91	22.25	22.85	23	1
5	16QAM	1	12	22.08	22.18	22.92		
5	16QAM	1	24	22.06	22.3	22.92		
5	16QAM	12	0	20.99	21.11	21.57	22	2
5	16QAM	12	7	20.94	21.18	21.49		
5	16QAM	12	13	20.78	21.2	21.52		
5	16QAM	25	0	20.87	21.13	21.49		
5	64QAM	1	0	20.94	21.24	21.54	22	2
5	64QAM	1	12	21.06	21.25	21.77		
5	64QAM	1	24	20.95	21.22	21.39		
5	64QAM	12	0	19.97	20.13	20.52	21	3
5	64QAM	12	7	19.98	20.2	20.53		
5	64QAM	12	13	19.81	20.19	20.45		
5	64QAM	25	0	19.86	20.2	20.45		
Channel				26705	26865	27025	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				815.5	831.5	847.5		
3	QPSK	1	0	22.74	22.91	22.97	24	0
3	QPSK	1	8	22.81	23.02	23.24		
3	QPSK	1	14	22.71	23.02	23.14		
3	QPSK	8	0	21.82	22.12	22.53	23	1
3	QPSK	8	4	21.86	22.14	22.48		
3	QPSK	8	7	21.85	22.06	22.41		
3	QPSK	15	0	21.9	22.11	22.47		
3	16QAM	1	0	21.97	22.19	22.94	23	1
3	16QAM	1	8	22.05	22.23	22.87		
3	16QAM	1	14	21.92	22.22	22.49		
3	16QAM	8	0	20.9	21.12	21.63	22	2
3	16QAM	8	4	20.95	21.18	21.64		
3	16QAM	8	7	20.94	21.13	21.4		
3	16QAM	15	0	20.92	21.16	21.43		
3	64QAM	1	0	20.93	21.17	21.76	22	2
3	64QAM	1	8	20.95	21.19	21.64		
3	64QAM	1	14	20.88	21.18	21.82		
3	64QAM	8	0	19.82	20.13	20.52	21	3
3	64QAM	8	4	19.93	20.17	20.52		
3	64QAM	8	7	19.89	20.1	20.44		
3	64QAM	15	0	19.86	20.14	20.48		

Channel				26697	26865	27033	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				814.7	831.5	848.3		
1.4	QPSK	1	0	22.76	22.92	23.01	24	0
1.4	QPSK	1	3	22.9	23.02	23.36		
1.4	QPSK	1	5	22.78	23.02	23.35		
1.4	QPSK	3	0	22.72	23.11	23.56		
1.4	QPSK	3	1	22.82	23.08	23.53		
1.4	QPSK	3	3	22.77	23.08	23.51		
1.4	QPSK	6	0	21.86	22.06	22.43	23	1
1.4	16QAM	1	0	21.98	22.17	22.75	23	1
1.4	16QAM	1	3	22.06	22.42	22.82		
1.4	16QAM	1	5	22.03	22.27	22.93		
1.4	16QAM	3	0	21.73	22.03	22.56		
1.4	16QAM	3	1	21.83	22.08	22.52		
1.4	16QAM	3	3	21.71	22.05	22.43		
1.4	16QAM	6	0	20.86	21.21	21.42	22	2
1.4	64QAM	1	0	21.01	21.19	21.7	22	2
1.4	64QAM	1	3	20.91	21.26	21.72		
1.4	64QAM	1	5	20.98	21.18	21.49		
1.4	64QAM	3	0	20.93	21.24	21.6		
1.4	64QAM	3	1	20.98	21.24	21.66		
1.4	64QAM	3	3	20.92	21.23	21.61		
1.4	64QAM	6	0	19.89	20.14	20.49	21	3

<Reduced Power Mode for Hotspot On/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	14.41	14.63	14.57	16	0
20	QPSK	1	49	14.36	14.06	14.30		
20	QPSK	1	99	14.13	14.36	14.25		
20	QPSK	50	0	13.53	13.67	13.61	15	1
20	QPSK	50	24	13.46	13.66	13.63		
20	QPSK	50	50	13.27	13.56	13.46		
20	QPSK	100	0	13.36	13.54	13.53		
20	16QAM	1	0	13.36	13.61	13.73	15	1
20	16QAM	1	49	13.49	13.80	13.79		
20	16QAM	1	99	13.14	13.47	13.14		
20	16QAM	50	0	12.51	12.68	12.60	14	2
20	16QAM	50	24	12.47	12.71	12.62		
20	16QAM	50	50	12.33	12.49	12.39		
20	16QAM	100	0	12.40	12.55	12.50		
20	64QAM	1	0	12.87	12.88	13.05	14	2
20	64QAM	1	49	12.98	12.96	13.07		
20	64QAM	1	99	12.56	12.49	13.00		
20	64QAM	50	0	11.94	11.88	12.11	13	3
20	64QAM	50	24	11.99	11.96	12.14		
20	64QAM	50	50	11.77	11.80	11.93		
20	64QAM	100	0	11.83	11.88	12.00		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	14.47	14.58	14.63	16	0
15	QPSK	1	37	14.41	14.24	14.19		
15	QPSK	1	74	14.13	14.36	14.11		
15	QPSK	36	0	13.41	13.66	13.54	15	1
15	QPSK	36	20	13.40	13.65	13.49		
15	QPSK	36	39	13.37	13.61	13.50		
15	QPSK	75	0	13.36	13.62	13.46		
15	16QAM	1	0	13.65	13.98	13.86	15	1
15	16QAM	1	37	13.35	13.51	13.34		
15	16QAM	1	74	13.53	13.84	13.60		
15	16QAM	36	0	12.41	12.63	12.52	14	2
15	16QAM	36	20	12.40	12.67	12.59		
15	16QAM	36	39	12.36	12.56	12.50		
15	16QAM	75	0	12.35	12.63	12.55		
15	64QAM	1	0	12.72	12.94	13.20	14	2
15	64QAM	1	37	12.82	13.05	12.87		
15	64QAM	1	74	13.02	13.12	13.03		
15	64QAM	36	0	11.81	11.94	11.97	13	3
15	64QAM	36	20	11.86	11.82	12.07		
15	64QAM	36	39	11.83	11.89	11.91		
15	64QAM	75	0	11.74	11.78	12.01		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	14.42	14.68	14.64	16	0
10	QPSK	1	25	14.08	14.54	14.29		
10	QPSK	1	49	14.46	14.41	14.14		
10	QPSK	25	0	13.37	13.53	13.47	15	1
10	QPSK	25	12	13.30	13.63	13.44		
10	QPSK	25	25	13.35	13.59	13.49		
10	QPSK	50	0	13.33	13.65	13.45		
10	16QAM	1	0	13.59	13.84	13.78	15	1
10	16QAM	1	25	13.34	13.79	13.59		
10	16QAM	1	49	13.50	13.68	13.71		
10	16QAM	25	0	12.37	12.60	12.51	14	2
10	16QAM	25	12	12.33	12.66	12.46		
10	16QAM	25	25	12.36	12.58	12.48		
10	16QAM	50	0	12.33	12.62	12.47		
10	64QAM	1	0	13.13	13.42	13.24	14	2
10	64QAM	1	25	13.17	13.14	13.01		
10	64QAM	1	49	13.07	13.47	13.18		
10	64QAM	25	0	12.00	12.35	12.14	13	3
10	64QAM	25	12	12.11	12.38	12.06		
10	64QAM	25	25	12.05	12.37	12.17		
10	64QAM	50	0	12.10	12.42	12.12		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	14.46	14.66	14.57	16	0
5	QPSK	1	12	14.33	14.19	14.08		
5	QPSK	1	24	14.47	14.19	14.07		
5	QPSK	12	0	13.44	13.73	13.60	15	1
5	QPSK	12	7	13.41	13.63	13.43		
5	QPSK	12	13	13.37	13.60	13.39		
5	QPSK	25	0	13.40	13.64	13.45		
5	16QAM	1	0	13.65	13.90	13.74	15	1
5	16QAM	1	12	13.58	13.86	13.61		
5	16QAM	1	24	13.52	13.63	13.64		
5	16QAM	12	0	12.36	12.71	12.54	14	2
5	16QAM	12	7	12.38	12.69	12.42		
5	16QAM	12	13	12.41	12.67	12.38		
5	16QAM	25	0	12.38	12.65	12.51		
5	64QAM	1	0	13.20	13.33	13.41	14	2
5	64QAM	1	12	13.35	13.09	13.05		
5	64QAM	1	24	13.18	13.05	13.16		
5	64QAM	12	0	12.54	12.36	12.22	13	3
5	64QAM	12	7	12.44	12.00	12.08		
5	64QAM	12	13	12.38	12.07	12.09		
5	64QAM	25	0	12.42	12.06	12.15		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	14.28	14.64	14.53	16	0
3	QPSK	1	8	14.00	14.19	14.46		
3	QPSK	1	14	14.48	14.20	14.49		
3	QPSK	8	0	13.30	13.64	13.43	15	1
3	QPSK	8	4	13.34	13.61	13.46		
3	QPSK	8	7	13.29	13.57	13.42		
3	QPSK	15	0	13.30	13.58	13.43		
3	16QAM	1	0	13.49	13.69	13.57	15	1
3	16QAM	1	8	13.52	13.70	13.56		
3	16QAM	1	14	13.52	13.81	13.51		
3	16QAM	8	0	12.40	12.69	12.44	14	2
3	16QAM	8	4	12.40	12.63	12.42		
3	16QAM	8	7	12.36	12.59	12.39		
3	16QAM	15	0	12.32	12.65	12.48		
3	64QAM	1	0	13.18	13.03	13.75	14	2
3	64QAM	1	8	13.27	13.14	13.12		
3	64QAM	1	14	13.23	13.49	13.54		
3	64QAM	8	0	12.07	12.39	12.46	13	3
3	64QAM	8	4	12.07	12.28	12.43		
3	64QAM	8	7	12.16	12.22	12.45		
3	64QAM	15	0	12.05	12.27	12.40		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	14.17	14.47	14.20	16	0
1.4	QPSK	1	3	14.48	14.61	14.37		
1.4	QPSK	1	5	14.29	14.64	14.47		
1.4	QPSK	3	0	14.39	14.73	14.49		
1.4	QPSK	3	1	14.43	14.62	14.55		
1.4	QPSK	3	3	14.45	14.58	14.49		
1.4	QPSK	6	0	13.26	13.52	13.34	15	1
1.4	16QAM	1	0	13.41	13.69	13.50	15	1
1.4	16QAM	1	3	13.49	13.74	13.58		
1.4	16QAM	1	5	13.44	13.68	13.42		
1.4	16QAM	3	0	13.26	13.47	13.31		
1.4	16QAM	3	1	13.26	13.49	13.38		
1.4	16QAM	3	3	13.17	13.55	13.30		
1.4	16QAM	6	0	12.39	12.63	12.50	14	2
1.4	64QAM	1	0	13.16	13.55	13.10	14	2
1.4	64QAM	1	3	13.24	13.48	13.52		
1.4	64QAM	1	5	13.17	13.36	13.69		
1.4	64QAM	3	0	13.09	13.21	13.33		
1.4	64QAM	3	1	13.00	13.17	13.31		
1.4	64QAM	3	3	13.13	13.24	13.46		
1.4	64QAM	6	0	12.22	12.42	12.55	13	3

<LTE Band 7>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20850	21100	21350		
Frequency (MHz)				2510	2535	2560		
20	QPSK	1	0	19.75	19.70	19.95	20	0
20	QPSK	1	49	19.45	19.35	19.56		
20	QPSK	1	99	19.51	19.45	19.52		
20	QPSK	50	0	17.12	17.08	17.25	19	1
20	QPSK	50	24	17.10	17.00	17.19		
20	QPSK	50	50	17.07	17.04	17.24		
20	QPSK	100	0	17.05	17.09	17.24		
20	16QAM	1	0	17.17	17.08	17.01	19	1
20	16QAM	1	49	17.10	17.11	17.31		
20	16QAM	1	99	17.07	17.07	17.14		
20	16QAM	50	0	16.09	16.05	16.23	18	2
20	16QAM	50	24	16.10	17.08	16.29		
20	16QAM	50	50	16.08	16.03	16.17		
20	16QAM	100	0	16.11	16.09	16.24		
20	64QAM	1	0	17.15	17.06	16.99	18	2
20	64QAM	1	49	17.11	17.12	17.32		
20	64QAM	1	99	17.03	17.03	17.10		
20	64QAM	50	0	16.07	16.03	16.21	17	3
20	64QAM	50	24	16.11	16.06	16.30		
20	64QAM	50	50	16.04	16.19	16.13		
20	64QAM	100	0	16.09	16.07	16.22		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	19.97	19.97	19.93	20	0
15	QPSK	1	37	19.69	19.82	19.81		
15	QPSK	1	74	19.75	19.61	19.73		
15	QPSK	36	0	17.22	17.17	17.29	19	1
15	QPSK	36	20	17.23	17.09	17.39		
15	QPSK	36	39	17.05	17.07	17.32		
15	QPSK	75	0	17.20	17.08	17.34		
15	16QAM	1	0	17.20	17.24	17.22	19	1
15	16QAM	1	37	17.27	17.14	17.53		
15	16QAM	1	74	17.13	17.16	17.27		
15	16QAM	36	0	16.22	16.19	16.30	18	2
15	16QAM	36	20	16.23	16.12	16.39		
15	16QAM	36	39	16.09	16.08	16.35		
15	16QAM	75	0	16.23	16.08	16.34		
15	64QAM	1	0	17.18	17.22	17.20	18	2
15	64QAM	1	37	17.23	17.10	17.49		
15	64QAM	1	74	17.08	17.11	17.22		
15	64QAM	36	0	16.20	16.17	16.28	17	3
15	64QAM	36	20	16.19	16.08	16.35		
15	64QAM	36	39	16.04	16.03	16.30		
15	64QAM	75	0	16.21	16.06	16.32		

Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	19.85	19.89	19.96	20	0
10	QPSK	1	25	19.64	19.45	19.91		
10	QPSK	1	49	19.68	19.56	19.92		
10	QPSK	25	0	17.20	17.18	17.33	19	1
10	QPSK	25	12	17.23	17.11	17.41		
10	QPSK	25	25	17.20	17.07	17.47		
10	QPSK	50	0	17.15	17.06	17.41		
10	16QAM	1	0	17.18	17.26	17.38	19	1
10	16QAM	1	25	17.27	17.09	17.33		
10	16QAM	1	49	17.19	17.02	17.57		
10	16QAM	25	0	16.25	16.19	16.39	18	2
10	16QAM	25	12	16.25	16.12	16.39		
10	16QAM	25	25	16.23	16.08	16.41		
10	16QAM	50	0	16.22	16.13	16.41		
10	64QAM	1	0	17.16	17.24	17.36	18	2
10	64QAM	1	25	17.24	17.06	17.30		
10	64QAM	1	49	17.22	17.05	17.60		
10	64QAM	25	0	16.23	16.17	16.37	17	3
10	64QAM	25	12	16.22	16.09	16.36		
10	64QAM	25	25	16.26	16.11	16.44		
10	64QAM	50	0	16.20	16.11	16.39		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	19.97	19.96	19.92	20	0
5	QPSK	1	12	19.93	19.87	19.85		
5	QPSK	1	24	19.94	19.91	19.94		
5	QPSK	12	0	17.38	17.29	17.37	19	1
5	QPSK	12	7	17.30	17.22	17.37		
5	QPSK	12	13	17.32	17.13	17.39		
5	QPSK	25	0	17.33	17.27	17.37		
5	16QAM	1	0	17.60	17.69	17.72	19	1
5	16QAM	1	12	17.30	17.37	17.51		
5	16QAM	1	24	17.48	17.30	17.53		
5	16QAM	12	0	16.41	16.32	16.44	18	2
5	16QAM	12	7	16.35	16.24	16.35		
5	16QAM	12	13	16.32	16.20	16.37		
5	16QAM	25	0	16.36	16.30	16.46		
5	64QAM	1	0	17.62	17.71	17.74	18	2
5	64QAM	1	12	17.31	17.38	17.52		
5	64QAM	1	24	17.46	17.28	17.51		
5	64QAM	12	0	16.43	16.34	16.46	17	3
5	64QAM	12	7	16.36	16.25	16.36		
5	64QAM	12	13	16.30	16.18	16.35		
5	64QAM	25	0	16.38	16.32	16.48		

<Reduced Power Mode for Product Specific 10g SAR>

<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	17.52	17.75	17.51	19	0
20	QPSK	1	49	17.13	17.02	17.08		
20	QPSK	1	99	17.36	17.4	17.42		
20	QPSK	50	0	16.34	16.56	16.5	18	1
20	QPSK	50	24	16.33	16.52	16.4		
20	QPSK	50	50	16.08	16.34	16.3		
20	QPSK	100	0	16.2	16.41	16.39		
20	16QAM	1	0	16.35	16.31	16.55	18	1
20	16QAM	1	49	16.44	16.56	16.56		
20	16QAM	1	99	16.19	16.32	16.17		
20	16QAM	50	0	15.29	15.58	15.46	17	2
20	16QAM	50	24	15.29	15.56	15.59		
20	16QAM	50	50	15.11	15.36	15.39		
20	16QAM	100	0	15.26	15.37	15.29		
20	64QAM	1	0	15.54	15.44	15.55	17	2
20	64QAM	1	49	15.29	15.22	15.6		
20	64QAM	1	99	15.07	15.14	15.13		
20	64QAM	50	0	14.16	14.11	14.26	16	3
20	64QAM	50	24	14.01	14.06	14.34		
20	64QAM	50	50	14.05	14	14.26		
20	64QAM	100	0	14.11	14.18	14.26		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	17.13	17.36	17.47	19	0
15	QPSK	1	37	17.43	17.59	17.61		
15	QPSK	1	74	17.01	17.25	17.11		
15	QPSK	36	0	16.26	16.52	16.4	18	1
15	QPSK	36	20	16.26	16.54	16.42		
15	QPSK	36	39	16.22	16.45	16.35		
15	QPSK	75	0	16.26	16.5	16.35		
15	16QAM	1	0	16.6	16.73	16.66	18	1
15	16QAM	1	37	16.01	16.36	16.18		
15	16QAM	1	74	16.39	16.54	16.46		
15	16QAM	36	0	15.22	15.49	15.42	17	2
15	16QAM	36	20	15.24	15.57	15.43		
15	16QAM	36	39	15.2	15.42	15.32		
15	16QAM	75	0	15.23	15.53	15.42		
15	64QAM	1	0	15.65	15.54	15.59	17	2
15	64QAM	1	37	15.19	15.08	15.56		
15	64QAM	1	74	15.41	15.32	15.77		
15	64QAM	36	0	14.15	14.09	14.18	16	3
15	64QAM	36	20	14.07	14.1	14.17		
15	64QAM	36	39	14.07	14.08	14.28		
15	64QAM	75	0	14.03	14.23	14.48		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	17.27	17.54	17.52	19	0
10	QPSK	1	25	17.81	17.58	17.9		
10	QPSK	1	49	17.87	17.66	18.04		
10	QPSK	25	0	16.21	16.45	16.41	18	1
10	QPSK	25	12	16.21	16.49	16.36		
10	QPSK	25	25	16.25	16.47	16.31		
10	QPSK	50	0	16.19	16.52	16.3		
10	16QAM	1	0	16.5	16.77	16.65	18	1
10	16QAM	1	25	16.36	16.68	16.54		
10	16QAM	1	49	16.26	16.67	16.53		
10	16QAM	25	0	15.18	15.42	15.37	17	2
10	16QAM	25	12	15.17	15.49	15.31		
10	16QAM	25	25	15.21	15.46	15.38		
10	16QAM	50	0	15.27	15.48	15.38		
10	64QAM	1	0	15.19	15.35	15.58	17	2
10	64QAM	1	25	15.15	15.16	15.5		
10	64QAM	1	49	15.24	15.44	15.69		
10	64QAM	25	0	14.06	14.05	14.26	16	3
10	64QAM	25	12	14.01	14.03	14.28		
10	64QAM	25	25	14.01	14.03	14.38		
10	64QAM	50	0	14.07	14.09	14.26		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	17.26	17.49	17.44	19	0
5	QPSK	1	12	17.69	17.95	17.79		
5	QPSK	1	24	17.76	17.11	17.94		
5	QPSK	12	0	16.28	16.62	16.44	18	1
5	QPSK	12	7	16.24	16.58	16.36		
5	QPSK	12	13	16.26	16.55	16.33		
5	QPSK	25	0	16.23	16.53	16.4		
5	16QAM	1	0	16.5	16.67	16.69	18	1
5	16QAM	1	12	16.35	16.64	16.24		
5	16QAM	1	24	16.32	16.57	16.44		
5	16QAM	12	0	15.25	15.62	15.48	17	2
5	16QAM	12	7	15.28	15.61	15.37		
5	16QAM	12	13	15.23	15.49	15.38		
5	16QAM	25	0	15.24	15.53	15.4		
5	64QAM	1	0	15.3	15.32	15.52	17	2
5	64QAM	1	12	15.21	15.44	15.37		
5	64QAM	1	24	15.21	15.26	15.46		
5	64QAM	12	0	14.09	14.06	14.37	16	3
5	64QAM	12	7	14.02	14.07	14.41		
5	64QAM	12	13	14.01	14.08	14.41		
5	64QAM	25	0	14.04	14.06	14.45		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	17.16	17.5	17.34	19	0
3	QPSK	1	8	17.9	18.08	17.79		
3	QPSK	1	14	17.79	18.05	17.94		
3	QPSK	8	0	16.22	16.51	16.35	18	1
3	QPSK	8	4	16.24	16.53	16.35		
3	QPSK	8	7	16.22	16.47	16.33		
3	QPSK	15	0	16.21	16.51	16.34		
3	16QAM	1	0	16.44	16.54	16.51	18	1
3	16QAM	1	8	16.39	16.59	16.3		
3	16QAM	1	14	16.39	16.41	16.46		
3	16QAM	8	0	15.29	15.56	15.43	17	2
3	16QAM	8	4	15.3	15.52	15.37		
3	16QAM	8	7	15.24	15.53	15.31		
3	16QAM	15	0	15.25	15.55	15.32		
3	64QAM	1	0	15.2	15.28	15.51	17	2
3	64QAM	1	8	15.15	15.39	15.48		
3	64QAM	1	14	15.15	15.21	15.18		
3	64QAM	8	0	14.01	14.01	14.32	16	3
3	64QAM	8	4	14.08	14.05	14.39		
3	64QAM	8	7	14.02	14.01	14.42		
3	64QAM	15	0	14.01	14.02	14.25		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	17.05	17.33	17.16	19	0
1.4	QPSK	1	3	17.82	17.1	17.73		
1.4	QPSK	1	5	17.76	17.03	17.92		
1.4	QPSK	3	0	17.79	17.09	17.85		
1.4	QPSK	3	1	17.84	17.16	17.91		
1.4	QPSK	3	3	17.83	17.14	17.93		
1.4	QPSK	6	0	16.18	16.48	16.26	18	1
1.4	16QAM	1	0	16.44	16.69	16.46	18	1
1.4	16QAM	1	3	16.38	16.62	16.53		
1.4	16QAM	1	5	16.4	16.58	16.4		
1.4	16QAM	3	0	16.17	16.43	16.23		
1.4	16QAM	3	1	16.19	16.52	16.28		
1.4	16QAM	3	3	16.2	16.51	16.29		
1.4	16QAM	6	0	15.3	15.58	15.4	17	2
1.4	64QAM	1	0	15.21	15.11	15.07	17	2
1.4	64QAM	1	3	15.23	15.18	15.18		
1.4	64QAM	1	5	15.03	15.21	15.11		
1.4	64QAM	3	0	15.01	15.01	15.3		
1.4	64QAM	3	1	15.08	15.08	15.39		
1.4	64QAM	3	3	15.06	15	15.35		
1.4	64QAM	6	0	14.05	14.01	14.28	16	3

<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.

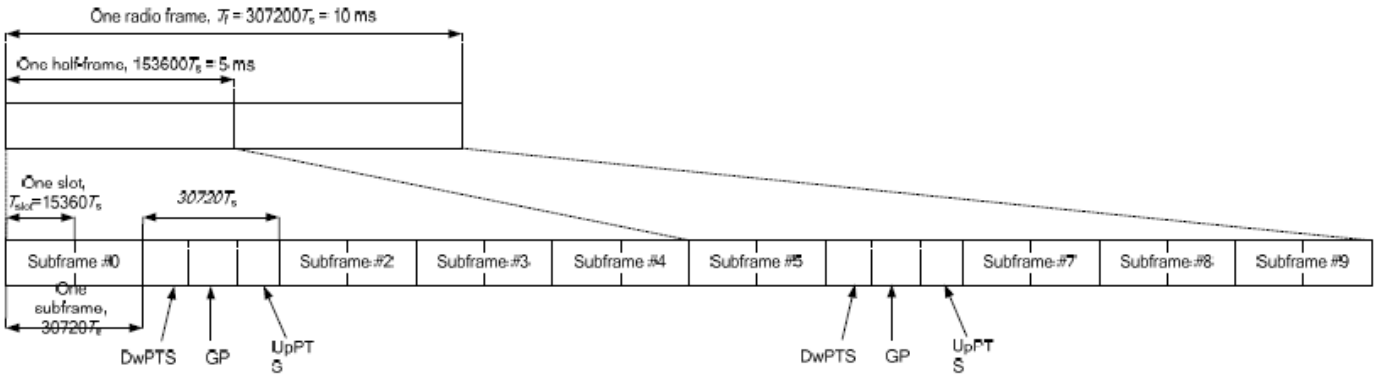


Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).

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 38>

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				37850	38000	38150		
Frequency (MHz)				2580	2595	2610		
20	QPSK	1	0	23.52	23.43	23.57	24	0
20	QPSK	1	49	23.32	23.41	23.45		
20	QPSK	1	99	23.4	23.29	23.49		
20	QPSK	50	0	22.51	22.42	22.55	23	1
20	QPSK	50	24	22.5	22.37	21.99		
20	QPSK	50	50	22.6	22.37	22.38		
20	QPSK	100	0	22.12	22.37	22.39		
20	16QAM	1	0	22.66	22.49	22.51	23	1
20	16QAM	1	49	22.53	22.12	22.35		
20	16QAM	1	99	22.61	22.88	22.5		
20	16QAM	50	0	21.58	21.51	21.43	22	2
20	16QAM	50	24	21.56	21.53	21.42		
20	16QAM	50	50	21.6	21.5	21.42		
20	16QAM	100	0	21.52	21.51	21.43		
20	64QAM	1	0	21.54	21.31	21.4	22	2
20	64QAM	1	49	21.31	21.19	21.23		
20	64QAM	1	99	21.6	21.36	21.33		
20	64QAM	50	0	20.6	20.12	20.43	21	3
20	64QAM	50	24	20.63	20.38	20.4		
20	64QAM	50	50	20.69	20.33	20.37		
20	64QAM	100	0	20.39	20.34	20.37		
Channel				37825	38000	38175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2577.5	2595	2612.5		
15	QPSK	1	0	23.55	23.27	23.32	24	0
15	QPSK	1	37	23.61	23.25	23.71		
15	QPSK	1	74	23.53	23.19	23.1		
15	QPSK	36	0	22.38	22.36	22.1	23	1
15	QPSK	36	20	22.56	22.39	22.2		
15	QPSK	36	39	22.52	22.44	22.41		
15	QPSK	75	0	22.52	22.21	22.41		
15	16QAM	1	0	22.96	22.42	22.44	23	1
15	16QAM	1	37	22.89	22.12	22.18		
15	16QAM	1	74	22.79	22.39	22.46		
15	16QAM	36	0	21.54	21.34	21.35	22	2
15	16QAM	36	20	21.64	21.37	21.31		
15	16QAM	36	39	21.68	21.38	21.39		
15	16QAM	75	0	21.61	21.43	21.38		
15	64QAM	1	0	21.26	21.33	21.35	22	2
15	64QAM	1	37	21.4	21.3	21.26		
15	64QAM	1	74	21.47	21.06	21.27		
15	64QAM	36	0	20.49	19.98	20.3	21	3
15	64QAM	36	20	20.48	20.31	20.36		
15	64QAM	36	39	20.49	20.34	20.38		
15	64QAM	75	0	20.5	20.37	20.4		

Channel				37800	38000	38200	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2575	2595	2615		
10	QPSK	1	0	23.67	23.13	23.46	24	0
10	QPSK	1	25	23.61	23.46	23.42		
10	QPSK	1	49	23.61	23.67	23.32		
10	QPSK	25	0	22.59	22.43	22.45	23	1
10	QPSK	25	12	22.52	22.41	22.44		
10	QPSK	25	25	22.51	22.46	22.54		
10	QPSK	50	0	22.57	22.47	22.48		
10	16QAM	1	0	22.72	22.89	22.91	23	1
10	16QAM	1	25	22.55	22.77	22.81		
10	16QAM	1	49	22.81	22.22	22.99		
10	16QAM	25	0	21.58	21.46	21.72	22	2
10	16QAM	25	12	21.53	21.43	21.56		
10	16QAM	25	25	21.57	21.49	21.59		
10	16QAM	50	0	21.61	21.5	21.61		
10	64QAM	1	0	21.61	21.53	21.54	22	2
10	64QAM	1	25	21.43	21.36	21.26		
10	64QAM	1	49	21.65	21.55	21.49		
10	64QAM	25	0	20.53	20.47	20.64	21	3
10	64QAM	25	12	20.48	20.47	20.42		
10	64QAM	25	25	20.62	20.51	20.55		
10	64QAM	50	0	20.5	20.48	20.54		
Channel				37775	38000	38225	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2572.5	2595	2617.5		
5	QPSK	1	0	23.48	23	23.6	24	0
5	QPSK	1	12	23.44	22.95	23.66		
5	QPSK	1	24	23.48	23.41	23.15		
5	QPSK	12	0	22.57	22.59	22.5	23	1
5	QPSK	12	7	22.55	22.43	22.42		
5	QPSK	12	13	22.64	22.48	22.39		
5	QPSK	25	0	22.13	22.45	22.5		
5	16QAM	1	0	22.93	22.4	22.88	23	1
5	16QAM	1	12	22.99	22.93	23		
5	16QAM	1	24	22.77	22.81	22.69		
5	16QAM	12	0	21.58	21.54	21.49	22	2
5	16QAM	12	7	21.59	21.47	21.5		
5	16QAM	12	13	21.59	21.55	21.42		
5	16QAM	25	0	21.57	21.47	21.49		
5	64QAM	1	0	21.39	21.42	21.39	22	2
5	64QAM	1	12	21.28	21.18	21.18		
5	64QAM	1	24	21.24	21.1	21.21		
5	64QAM	12	0	20.51	20.56	20.51	21	3
5	64QAM	12	7	20.43	20.45	20.49		
5	64QAM	12	13	20.46	20.42	20.4		
5	64QAM	25	0	20.53	20.5	20.53		

<Reduced Power Mode for Hotspot On/P-Sensor On>

<LTE Band 38>

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				37850	38000	38150		
Frequency (MHz)				2580	2595	2610		
20	QPSK	1	0	19.76	19.88	19.62	20	0
20	QPSK	1	49	19.57	19.73	19.59		
20	QPSK	1	99	19.51	19.59	19.13		
20	QPSK	50	0	17.19	17.31	17.28	19	1
20	QPSK	50	24	17.20	17.30	17.04		
20	QPSK	50	50	17.16	17.20	17.14		
20	QPSK	100	0	17.14	17.23	17.13		
20	16QAM	1	0	17.22	17.37	17.40	19	1
20	16QAM	1	49	17.52	17.48	17.25		
20	16QAM	1	99	17.19	17.16	17.10		
20	16QAM	50	0	16.21	16.37	16.36	18	2
20	16QAM	50	24	16.22	16.33	16.16		
20	16QAM	50	50	16.23	16.30	16.03		
20	16QAM	100	0	16.20	16.28	16.02		
20	64QAM	1	0	17.21	17.36	17.39	18	2
20	64QAM	1	49	17.54	17.50	17.27		
20	64QAM	1	99	17.16	17.13	17.07		
20	64QAM	50	0	16.20	16.36	16.35	17	3
20	64QAM	50	24	16.24	16.35	16.18		
20	64QAM	50	50	16.20	16.27	16.00		
20	64QAM	100	0	16.19	16.27	16.01		
Channel				37825	38000	38175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2577.5	2595	2612.5		
15	QPSK	1	0	19.32	19.41	19.52	20	0
15	QPSK	1	37	19.39	19.49	19.42		
15	QPSK	1	74	19.28	19.29	18.94		
15	QPSK	36	0	17.08	17.06	17.15	19	1
15	QPSK	36	20	17.08	17.15	17.12		
15	QPSK	36	39	17.05	17.05	17.03		
15	QPSK	75	0	17.04	17.06	17.06		
15	16QAM	1	0	17.12	17.28	17.26	19	1
15	16QAM	1	37	17.15	17.36	17.21		
15	16QAM	1	74	17.07	17.06	17.03		
15	16QAM	36	0	16.13	16.14	16.18	18	2
15	16QAM	36	20	16.16	16.26	16.06		
15	16QAM	36	39	16.08	16.12	16.12		
15	16QAM	75	0	16.12	16.23	16.18		
15	64QAM	1	0	17.11	17.27	17.25	18	2
15	64QAM	1	37	17.17	17.38	17.23		
15	64QAM	1	74	17.04	17.03	17.00		
15	64QAM	36	0	16.12	16.13	16.17	17	3
15	64QAM	36	20	16.18	16.28	16.08		
15	64QAM	36	39	16.05	16.09	16.09		
15	64QAM	75	0	16.11	16.22	16.17		

Channel				37800	38000	38200	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2575	2595	2615		
10	QPSK	1	0	19.08	19.14	19.28	20	0
10	QPSK	1	25	19.28	19.12	19.57		
10	QPSK	1	49	19.40	19.52	19.25		
10	QPSK	25	0	17.29	17.39	17.13	19	1
10	QPSK	25	12	17.62	17.71	17.07		
10	QPSK	25	25	17.20	17.33	17.07		
10	QPSK	50	0	17.14	17.09	17.08		
10	16QAM	1	0	17.09	17.12	17.24	19	1
10	16QAM	1	25	17.15	17.10	17.10		
10	16QAM	1	49	17.32	17.51	17.20		
10	16QAM	25	0	16.81	16.88	16.53	18	2
10	16QAM	25	12	16.19	16.22	16.07		
10	16QAM	25	25	16.25	16.36	16.15		
10	16QAM	50	0	16.10	16.12	16.12		
10	64QAM	1	0	17.08	17.11	17.23	18	2
10	64QAM	1	25	17.17	17.12	17.12		
10	64QAM	1	49	17.29	17.48	17.17		
10	64QAM	25	0	16.80	16.87	16.52	17	3
10	64QAM	25	12	16.21	16.24	16.09		
10	64QAM	25	25	16.22	16.33	16.12		
10	64QAM	50	0	16.09	16.11	16.11		
Channel				37775	38000	38225	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2572.5	2595	2617.5		
5	QPSK	1	0	19.68	19.81	19.81	20	0
5	QPSK	1	12	19.49	19.83	19.80		
5	QPSK	1	24	19.29	19.61	19.53		
5	QPSK	12	0	17.06	17.12	17.44	19	1
5	QPSK	12	7	17.39	17.61	17.43		
5	QPSK	12	13	17.38	17.67	17.37		
5	QPSK	25	0	17.29	17.56	17.35		
5	16QAM	1	0	17.43	17.64	17.36	19	1
5	16QAM	1	12	17.40	17.79	17.53		
5	16QAM	1	24	17.18	17.46	17.16		
5	16QAM	12	0	16.29	16.58	16.47	18	2
5	16QAM	12	7	16.30	16.64	16.51		
5	16QAM	12	13	16.42	16.62	16.35		
5	16QAM	25	0	16.55	16.64	16.44		
5	64QAM	1	0	17.40	17.61	17.33	18	2
5	64QAM	1	12	17.42	17.81	17.55		
5	64QAM	1	24	17.15	17.43	17.13		
5	64QAM	12	0	16.26	16.55	16.44	17	3
5	64QAM	12	7	16.32	16.66	16.53		
5	64QAM	12	13	16.39	16.59	16.32		
5	64QAM	25	0	16.52	16.61	16.41		

<LTE Carrier Aggregation>

General Note:

This device supports Carrier Aggregation on downlink for inter and intra band, uplink CA is not supported. For the device supports bands and bandwidths and configurations are provided as follow table was according to 3GPP.

<Intra-Band Carrier Combination>

E-UTRA CA configuration / Bandwidth combination set							
E-UTRA CA configuration	Uplink CA configurations	Component carriers in order of increasing carrier frequency				Maximum aggregated bandwidth [MHz]	Bandwidth combination set
		Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]	Channel bandwidths for carrier [MHz]		
CA_7C	-	15	15			40	0
		20	20				
		10	20				
		15	15, 20			40	1
		20	10, 15, 20				
		15	10, 15				
		20	15, 20			40	2
CA_7A-7A	-	5	15			40	0
		10	10, 15				
		15	15, 20				
		20	20				
		5, 10, 15, 20	5, 10, 15, 20			40	1
		5, 10, 15, 20	5, 10			30	2
		10, 15, 20	10, 15, 20			40	3

LTE Carrier Aggregation Conducted Power (Downlink)

General Note:

i. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.

ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.

iii. The device supports downlink carrier aggregation only. Uplink carrier aggregation is not supported. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.

iv. Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.

v. For non-contiguous intra-band CA, the SCC selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band. For SCC DL RB size and offset will base on the PCC corresponding RB allocation.

vi. For Intra-band, contiguous CA, the downlink channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

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

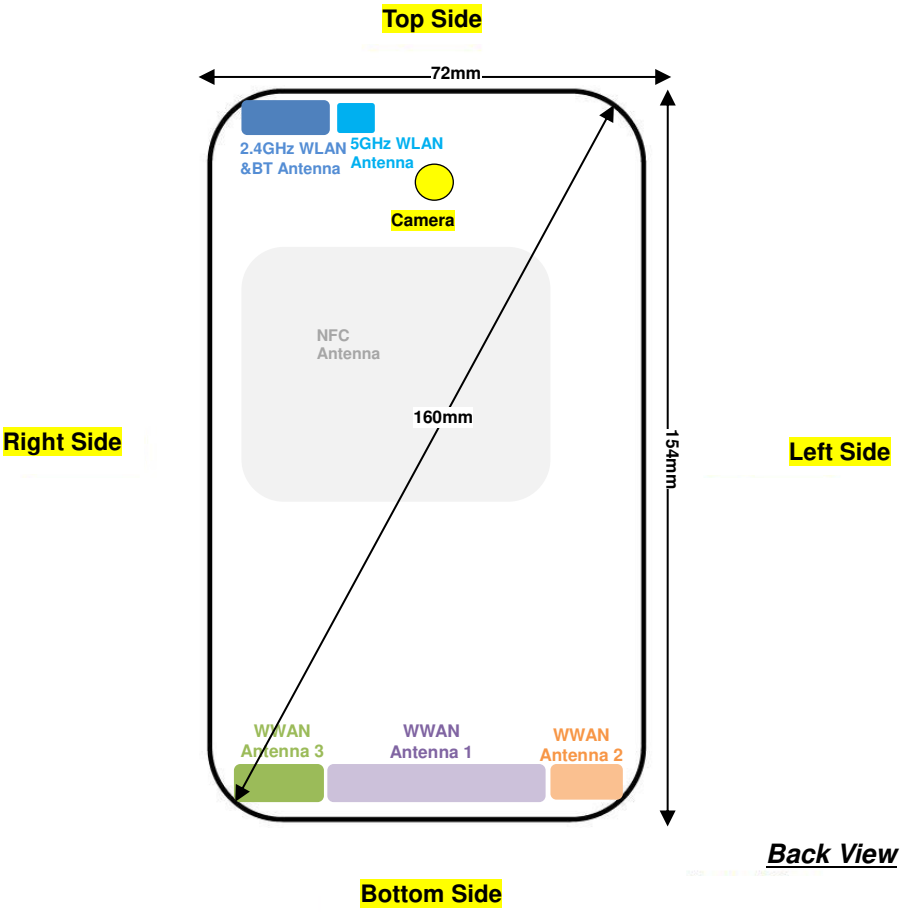
<Full Power Mode>

Configure		PCC							SCC				Power	
		LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx. Power (dBm)	Without CA Tx. Power (dBm)
Intra-Band	Contiguous	Band 7	20M	2560	21350	QPSK	1	0	Band 7	20M	2660.2	3152	23.21	23.25
	Non-Contiguous	Band 7	20M	2560	21350	QPSK	1	0	Band 7	5M	2622.5	2775	23.23	23.25

<Reduced Power Mode for Hotspot On/P-Sensor On>

Configure		PCC							SCC				Power	
		LTE Band	BW (MHz)	UL Freq. (MHz)	UL Channel	Mod.	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Freq. (MHz)	DL Channel	With CA Tx. Power (dBm)	Without CA Tx. Power (dBm)
Intra-Band	Contiguous	Band 7	20M	2560	21350	QPSK	1	0	Band 7	20M	2660.2	3152	19.87	19.95
	Non-Contiguous	Band 7	20M	2560	21350	QPSK	1	0	Band 7	5M	2622.5	2775	19.91	19.95

14. Antenna Location



Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Antenna 1	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	≤ 25mm
WWAN Antenna 2	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm	≤ 25mm
WWAN Antenna 3	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	≤ 25mm	>25mm
2.4GHz WLAN & BT	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm
5GHz WLAN	≤ 25mm	≤ 25mm	≤ 25mm	>25mm	≤ 25mm	>25mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN Antenna 1	Yes	Yes	No	Yes	Yes	Yes
WWAN Antenna 2	Yes	Yes	No	Yes	No	Yes
WWAN Antenna 3	Yes	Yes	No	Yes	Yes	No
2.4GHz WLAN & BT	Yes	Yes	Yes	No	Yes	No
5GHz WLAN	Yes	Yes	Yes	No	Yes	No

General Note:

1. This device has three WWAN transmitter antennas. WWAN antenna 1 is located at the middle of bottom edge of the device, WWAN antenna 2 is located at the right side of bottom edge of the device, and WWAN antenna 3 is located at the left side of bottom edge of the device which can refer to antenna location. WWAN antenna 1 frequency bands include GSM850/1900, WCDMA Band II/V, LTE Band 2/5/26, WWAN antenna 2 frequency bands include LTE Band 7/38 and WWAN antenna 3 frequency bands aslo include LTE 7/38.
2. The device is capable of switching between the WWAN antenna 2 and WWAN antenna 3 based on signal strength. When WWAN antenna 2 acted as a transmitter, then WWAN antenna 3 acted as a receiver. The same as the reversed.
3. 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 WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   c. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix 63.3%/62.9% = 1.006 is applied to scale-up the measured SAR result. The Reported TDD LTE SAR = measured SAR (W/kg)* Tune-up Scaling Factor* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required when the measured SAR is ≥ 0.8W/kg. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. Per KDB 648474 D04v01r03, when the reported SAR for a body-worn accessory measured without a headset connected to the handset is ≤ 1.2 W/kg, SAR testing with a headset connected to the handset is not required.
5. The device employs proximity sensors that detect the presence of the user's body at the front or back faces of the device. When front or back body worn condition is detected, GSM850/GSM1900, WCDMA band II/V and LTE band 2/7/38. (P-sensor can't work at detecting presence of the user's body at the four edges of the device.)
6. When hotspot mode is enabled, power reduction will be activated to limit the maximum power of GSM850/GSM1900, WCDMA band II/V and LTE band 2/7/38.
7. P-sensor can detect handheld state, for product specific 10g SAR condition, GSM1900, WCDMA band II and LTE band 2 reduced powers will be active.
8. This device hotspot reduced power and P-sensor reduced power level are the same. So only show one reduced power level for hotspot reduced power and P-sensor reduced power for this application.
9. When the phone is in talking mode and receiver worked, then power reduction will be implemented immediately at WLAN5.2/5.3GHz.
10. This device has three WWAN transmitter antennas. WWAN antenna 1 is located at the middle of bottom edge of the device, WWAN antenna 2 is located at the right side of bottom edge of the device, and WWAN antenna 3 is located at the left side of bottom edge of the device which can refer to antenna location chapter. WWAN antenna 1 frequency bands include GSM850/1900, WCDMA Band II/V, LTE Band 2/5/26, WWAN antenna 2 frequency bands include LTE Band 7/38 and WWAN antenna 3 frequency bands aslo include LTE 7/38.
11. The device is capable of switching between the WWAN antenna 2 and WWAN antenna 3 based on signal strength. When WWAN antenna 2 acted as a transmitter, then WWAN antenna 3 acted as a receiver. The same as the reversed.
12. Per KDB648474 D04v01r03, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm, when hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg, however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold.
    a. For this device for WWAN transmitter scaled to reduced power mode for product specific 10g SAR is higher than 1.2W/kg of GSM850/1900, WCDMA band V/II, LTE band 2/7/38, therefore product specific SAR is necessary.
    b. WLAN 5.3/5.5GHz tested the product specific 10g SAR since it has no hotspot mode.
    c. When 10-g product specific 10g SAR is considered, SAR thresholds is specified in the procedures for SAR test reduction and exclusion should be multiplied by 2.5.

GSM Note:

1. Per KDB 941225 D01v03r01, for SAR test reduction for GSM / GPRS / EDGE modes is determined by the source-based time-averaged output power including tune-up tolerance. The mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested. Therefore, the GPRS 2Tx slots for GSM850/GSM1900 are considered as the primary mode.
2. Other configurations of GSM / GPRS / EDGE are considered as secondary modes. The 3G SAR test reduction procedure is applied, when the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode, SAR measurement is not required for the secondary mode.
3. Power reduction which is triggered by hotspot mode/p-sensor on is implemented in GSM850/GSM1900 and handheld on is implemented in GSM1900, for SAR testing EUT was set in reduced power mode and GPRS 2 Tx slots due to its highest frame-average power.

WCDMA Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all “1’s”.
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is ≤ ¼ dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSDPA / HSUPA / DC-HSDPA) are less than ¼ dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 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/64QAM 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/64QAM 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.
6. For LTE B5 / B26 / B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE B5 SAR test was covered by B26; 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.

15.1 Head SAR

<GSM SAR>

Plot No.	Ant.	Band	Mode	Test Position	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)
01	1	GSM850	GPRS 2 Tx slots	Right Cheek	Full	189	836.4	31.14	31.50	1.086	0.18	0.516	**0.561**
	1	GSM850	GPRS 2 Tx slots	Right Tilted	Full	189	836.4	31.14	31.50	1.086	-0.08	0.299	0.325
	1	GSM850	GPRS 2 Tx slots	Left Cheek	Full	189	836.4	31.14	31.50	1.086	-0.11	0.393	0.427
	1	GSM850	GPRS 2 Tx slots	Left Tilted	Full	189	836.4	31.14	31.50	1.086	-0.03	0.277	0.301
02	1	GSM1900	GPRS 2 Tx slots	Right Cheek	Full	810	1909.8	28.36	29.00	1.159	0.13	0.114	**0.132**
	1	GSM1900	GPRS 2 Tx slots	Right Tilted	Full	810	1909.8	28.36	29.00	1.159	0.04	0.050	0.058
	1	GSM1900	GPRS 2 Tx slots	Left Cheek	Full	810	1909.8	28.36	29.00	1.159	-0.05	0.105	0.122
	1	GSM1900	GPRS 2 Tx slots	Left Tilted	Full	810	1909.8	28.36	29.00	1.159	-0.06	0.044	0.051

<WCDMA SAR>

Plot No.	Ant.	Band	Mode	Test Position	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)
03	1	WCDMA Band V	RMC 12.2Kbps	Right Cheek	Full	4132	826.4	22.52	24.00	1.406	-0.05	0.360	**0.506**
	1	WCDMA Band V	RMC 12.2Kbps	Right Tilted	Full	4132	826.4	22.52	24.00	1.406	-0.05	0.216	0.304
	1	WCDMA Band V	RMC 12.2Kbps	Left Cheek	Full	4132	826.4	22.52	24.00	1.406	0.06	0.303	0.426
	1	WCDMA Band V	RMC 12.2Kbps	Left Tilted	Full	4132	826.4	22.52	24.00	1.406	-0.11	0.226	0.318
04	1	WCDMA Band II	RMC 12.2Kbps	Right Cheek	Full	9400	1880	22.56	24.00	1.393	0.01	0.216	**0.301**
	1	WCDMA Band II	RMC 12.2Kbps	Right Tilted	Full	9400	1880	22.56	24.00	1.393	0.05	0.108	0.150
	1	WCDMA Band II	RMC 12.2Kbps	Left Cheek	Full	9400	1880	22.56	24.00	1.393	0.10	0.202	0.281
	1	WCDMA Band II	RMC 12.2Kbps	Left Tilted	Full	9400	1880	22.56	24.00	1.393	-0.04	0.070	0.098

<FDD LTE SAR>

Plot No.	Ant.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	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)
05	1	LTE Band 26	15M	QPSK	1	74	Right Cheek	Full	26865	831.5	23.82	24.00	1.042	0.08	0.221	**0.230**
	1	LTE Band 26	15M	QPSK	36	0	Right Cheek	Full	26865	831.5	22.79	23.00	1.050	-0.04	0.122	0.128
	1	LTE Band 26	15M	QPSK	1	74	Right Tilted	Full	26865	831.5	23.82	24.00	1.042	0.05	0.068	0.071
	1	LTE Band 26	15M	QPSK	36	0	Right Tilted	Full	26865	831.5	22.79	23.00	1.050	0.02	0.069	0.072
	1	LTE Band 26	15M	QPSK	1	74	Left Cheek	Full	26865	831.5	23.82	24.00	1.042	-0.04	0.173	0.180
	1	LTE Band 26	15M	QPSK	36	0	Left Cheek	Full	26865	831.5	22.79	23.00	1.050	-0.08	0.097	0.102
	1	LTE Band 26	15M	QPSK	1	74	Left Tilted	Full	26865	831.5	23.82	24.00	1.042	0.01	0.115	0.120
	1	LTE Band 26	15M	QPSK	36	0	Left Tilted	Full	26865	831.5	22.79	23.00	1.050	-0.09	0.067	0.070
06	1	LTE Band 2	20M	QPSK	1	0	Right Cheek	Full	18900	1880	22.99	24.00	1.262	0.03	0.127	**0.160**
	1	LTE Band 2	20M	QPSK	50	0	Right Cheek	Full	19100	1900	21.89	23.00	1.291	0.04	0.071	0.092
	1	LTE Band 2	20M	QPSK	1	0	Right Tilted	Full	18900	1880	22.99	24.00	1.262	0.04	0.063	0.079
	1	LTE Band 2	20M	QPSK	50	0	Right Tilted	Full	19100	1900	21.89	23.00	1.291	-0.03	0.041	0.053
	1	LTE Band 2	20M	QPSK	1	0	Left Cheek	Full	18900	1880	22.99	24.00	1.262	0.08	0.082	0.103
	1	LTE Band 2	20M	QPSK	50	0	Left Cheek	Full	19100	1900	21.89	23.00	1.291	0.09	0.070	0.090
	1	LTE Band 2	20M	QPSK	1	0	Left Tilted	Full	18900	1880	22.99	24.00	1.262	0.03	0.046	0.058
	1	LTE Band 2	20M	QPSK	50	0	Left Tilted	Full	19100	1900	21.89	23.00	1.291	0.14	0.025	0.032
	2	LTE Band 7	20M	QPSK	1	0	Right Cheek	Full	21350	2560	23.25	24.00	1.189	0.11	0.333	0.396
	2	LTE Band 7	20M	QPSK	50	0	Right Cheek	Full	21350	2560	22.32	23.00	1.169	-0.04	0.181	0.212
	2	LTE Band 7	20M	QPSK	1	0	Right Tilted	Full	21350	2560	23.25	24.00	1.189	-0.03	0.248	0.295
	2	LTE Band 7	20M	QPSK	50	0	Right Tilted	Full	21350	2560	22.32	23.00	1.169	-0.03	0.132	0.154
	2	LTE Band 7	20M	QPSK	1	0	Left Cheek	Full	21350	2560	23.25	24.00	1.189	0.13	0.666	0.792
	2	LTE Band 7	20M	QPSK	50	0	Left Cheek	Full	21350	2560	22.32	23.00	1.169	-0.02	0.364	0.426
	2	LTE Band 7	20M	QPSK	1	0	Left Tilted	Full	21350	2560	23.25	24.00	1.189	0.01	0.167	0.198
	2	LTE Band 7	20M	QPSK	50	0	Left Tilted	Full	21350	2560	22.32	23.00	1.169	-0.08	0.089	0.104
07	3	LTE Band 7	20M	QPSK	1	0	Right Cheek	Full	21350	2560	23.25	24.00	1.189	0.06	0.708	**0.841**
	3	LTE Band 7	20M	QPSK	1	0	Right Cheek	Full	20850	2510	23.24	24.00	1.191	0.05	0.703	0.837
	3	LTE Band 7	20M	QPSK	1	0	Right Cheek	Full	21100	2535	23.16	24.00	1.213	0.05	0.681	0.826
	3	LTE Band 7	20M	QPSK	50	0	Right Cheek	Full	21350	2560	22.32	23.00	1.169	0.01	0.452	0.529
	3	LTE Band 7	20M	QPSK	100	0	Right Cheek	Full	21350	2560	22.28	23.00	1.180	-0.17	0.456	0.538
	3	LTE Band 7	20M	QPSK	1	0	Right Tilted	Full	21350	2560	23.25	24.00	1.189	0.02	0.179	0.213
	3	LTE Band 7	20M	QPSK	50	0	Right Tilted	Full	21350	2560	22.32	23.00	1.169	-0.01	0.102	0.119
	3	LTE Band 7	20M	QPSK	1	0	Left Cheek	Full	21350	2560	23.25	24.00	1.189	-0.06	0.404	0.480
	3	LTE Band 7	20M	QPSK	50	0	Left Cheek	Full	21350	2560	22.32	23.00	1.169	-0.04	0.230	0.269
	3	LTE Band 7	20M	QPSK	1	0	Left Tilted	Full	21350	2560	23.25	24.00	1.189	-0.13	0.283	0.336
	3	LTE Band 7	20M	QPSK	50	0	Left Tilted	Full	21350	2560	22.32	23.00	1.169	-0.04	0.159	0.186

<TDD LTE SAR>

Plot No.	Ant.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	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)
	2	LTE Band 38	20M	QPSK	1	0	Right Cheek	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	0.07	0.354	0.406
	2	LTE Band 38	20M	QPSK	50	50	Right Cheek	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.11	0.185	0.215
	2	LTE Band 38	20M	QPSK	1	0	Right Tilted	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	0.09	0.297	0.341
	2	LTE Band 38	20M	QPSK	50	50	Right Tilted	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.14	0.158	0.184
08	2	LTE Band 38	20M	QPSK	1	0	Left Cheek	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	0.07	0.638	**0.732**
	2	LTE Band 38	20M	QPSK	50	50	Left Cheek	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.12	0.336	0.391
	2	LTE Band 38	20M	QPSK	1	0	Left Tilted	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	-0.01	0.196	0.225
	2	LTE Band 38	20M	QPSK	50	50	Left Tilted	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.02	0.101	0.117
	3	LTE Band 38	20M	QPSK	1	0	Right Cheek	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	0.12	0.557	0.639
	3	LTE Band 38	20M	QPSK	50	50	Right Cheek	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.05	0.284	0.330
	3	LTE Band 38	20M	QPSK	1	0	Right Tilted	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	0.01	0.165	0.189
	3	LTE Band 38	20M	QPSK	50	50	Right Tilted	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.09	0.085	0.099
	3	LTE Band 38	20M	QPSK	1	0	Left Cheek	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	0.17	0.316	0.362
	3	LTE Band 38	20M	QPSK	50	50	Left Cheek	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.03	0.165	0.192
	3	LTE Band 38	20M	QPSK	1	0	Left Tilted	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	0.16	0.217	0.249
	3	LTE Band 38	20M	QPSK	50	50	Left Tilted	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.07	0.114	0.133

15.2 Hotspot SAR

<GSM SAR>

Plot No.	Ant.	Band	Mode	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)
	1	GSM850	GPRS 2 Tx slots	Front	5	Hotspot On	189	836.4	29.26	29.50	1.057	-0.11	0.968	1.023
09	1	GSM850	GPRS 2 Tx slots	Front	5	Hotspot On	128	824.2	29.14	29.50	1.086	0.01	1.080	**1.173**
	1	GSM850	GPRS 2 Tx slots	Front	5	Hotspot On	251	848.8	28.87	29.50	1.156	0.01	0.877	1.014
	1	GSM850	GPRS 2 Tx slots	Back	5	Hotspot On	189	836.4	29.26	29.50	1.057	0.02	0.784	0.829
	1	GSM850	GPRS 2 Tx slots	Back	5	Hotspot On	128	824.2	29.14	29.50	1.086	0.12	0.861	0.935
	1	GSM850	GPRS 2 Tx slots	Back	5	Hotspot On	251	848.8	28.87	29.50	1.156	-0.05	0.704	0.814
	1	GSM850	GPRS 2 Tx slots	Left Side	5	Hotspot On	189	836.4	29.26	29.50	1.057	0.03	0.176	0.186
	1	GSM850	GPRS 2 Tx slots	Right Side	5	Hotspot On	189	836.4	29.26	29.50	1.057	0.07	0.313	0.331
	1	GSM850	GPRS 2 Tx slots	Bottom Side	5	Hotspot On	189	836.4	29.26	29.50	1.057	0.08	0.315	0.333
	1	GSM1900	GPRS 2 Tx slots	Front	5	Hotspot On	810	1909.8	23.23	23.50	1.064	0.01	0.671	0.714
	1	GSM1900	GPRS 2 Tx slots	Front	5	Hotspot On	512	1850.2	23.13	23.50	1.089	-0.16	0.788	0.858
	1	GSM1900	GPRS 2 Tx slots	Front	5	Hotspot On	661	1880	23.19	23.50	1.074	-0.04	0.762	0.818
	1	GSM1900	GPRS 2 Tx slots	Back	5	Hotspot On	810	1909.8	23.23	23.50	1.064	-0.04	0.453	0.482
	1	GSM1900	GPRS 2 Tx slots	Left Side	5	Hotspot On	810	1909.8	23.23	23.50	1.064	0.06	0.078	0.083
	1	GSM1900	GPRS 2 Tx slots	Right Side	5	Hotspot On	810	1909.8	23.23	23.50	1.064	-0.07	0.026	0.027
	1	GSM1900	GPRS 2 Tx slots	Bottom Side	5	Hotspot On	810	1909.8	23.23	23.50	1.064	0.16	1.000	1.064
10	1	GSM1900	GPRS 2 Tx slots	Bottom Side	5	Hotspot On	512	1850.2	23.13	23.50	1.089	0.06	1.070	**1.165**
	1	GSM1900	GPRS 2 Tx slots	Bottom Side	5	Hotspot On	661	1880	23.19	23.50	1.074	0.09	1.080	1.160

<WCDMA SAR>

Plot No.	Ant.	Band	Mode	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)
	1	WCDMA Band V	RMC 12.2Kbps	Front	5	Hotspot On	4132	826.4	20.79	21.00	1.050	0.05	0.753	0.790
	1	WCDMA Band V	RMC 12.2Kbps	Front	5	Hotspot On	4182	836.4	20.73	21.00	1.064	0.02	0.762	0.811
11	1	WCDMA Band V	RMC 12.2Kbps	Front	5	Hotspot On	4233	846.6	20.78	21.00	1.052	-0.05	0.853	**0.897**
	1	WCDMA Band V	RMC 12.2Kbps	Back	5	Hotspot On	4132	826.4	20.79	21.00	1.050	0.04	0.628	0.659
	1	WCDMA Band V	RMC 12.2Kbps	Left Side	5	Hotspot On	4132	826.4	20.79	21.00	1.050	0.11	0.122	0.128
	1	WCDMA Band V	RMC 12.2Kbps	Right Side	5	Hotspot On	4132	826.4	20.79	21.00	1.050	0.18	0.213	0.224
	1	WCDMA Band V	RMC 12.2Kbps	Bottom Side	5	Hotspot On	4132	826.4	20.79	21.00	1.050	0.05	0.207	0.217
	1	WCDMA Band II	RMC 12.2Kbps	Front	5	Hotspot On	9400	1880	16.13	17.50	1.371	-0.16	0.411	0.563
	1	WCDMA Band II	RMC 12.2Kbps	Back	5	Hotspot On	9400	1880	16.13	17.50	1.371	0.08	0.316	0.433
	1	WCDMA Band II	RMC 12.2Kbps	Left Side	5	Hotspot On	9400	1880	16.13	17.50	1.371	0.10	0.067	0.092
	1	WCDMA Band II	RMC 12.2Kbps	Right Side	5	Hotspot On	9400	1880	16.13	17.50	1.371	-0.08	0.022	0.030
12	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	5	Hotspot On	9400	1880	16.13	17.50	1.371	0.06	0.710	**0.973**
	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	5	Hotspot On	9262	1852.4	16.05	17.50	1.396	0.03	0.610	0.852
	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	5	Hotspot On	9538	1907.6	16.10	17.50	1.380	0.01	0.580	0.801

<FDD LTE SAR>

Plot No.	Ant.	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)
13	1	LTE Band 26	15M	QPSK	1	74	Front	5	Full	26865	831.5	23.82	24.00	1.042	-0.06	0.816	**0.851**
	1	LTE Band 26	15M	QPSK	36	0	Front	5	Full	26865	831.5	22.79	23.00	1.050	0.06	0.638	0.670
	1	LTE Band 26	15M	QPSK	75	0	Front	5	Full	26865	831.5	22.70	23.00	1.072	0.15	0.605	0.648
	1	LTE Band 26	15M	QPSK	1	74	Back	5	Full	26865	831.5	23.82	24.00	1.042	-0.13	0.702	0.732
	1	LTE Band 26	15M	QPSK	36	0	Back	5	Full	26865	831.5	22.79	23.00	1.050	0.02	0.568	0.596
	1	LTE Band 26	15M	QPSK	1	74	Left Side	5	Full	26865	831.5	23.82	24.00	1.042	0.02	0.196	0.204
	1	LTE Band 26	15M	QPSK	36	0	Left Side	5	Full	26865	831.5	22.79	23.00	1.050	0.05	0.122	0.128
	1	LTE Band 26	15M	QPSK	1	74	Right Side	5	Full	26865	831.5	23.82	24.00	1.042	0.02	0.398	0.415
	1	LTE Band 26	15M	QPSK	36	0	Right Side	5	Full	26865	831.5	22.79	23.00	1.050	0.19	0.235	0.247
	1	LTE Band 26	15M	QPSK	1	74	Bottom Side	5	Full	26865	831.5	23.82	24.00	1.042	0.02	0.426	0.444
	1	LTE Band 26	15M	QPSK	36	0	Bottom Side	5	Full	26865	831.5	22.79	23.00	1.050	0.06	0.224	0.235
	1	LTE Band 2	20M	QPSK	1	0	Front	5	Hotspot On	18900	1880	14.63	16.00	1.371	-0.15	0.495	0.679
	1	LTE Band 2	20M	QPSK	50	0	Front	5	Hotspot On	18900	1880	13.67	15.00	1.358	0.01	0.204	0.277
	1	LTE Band 2	20M	QPSK	1	0	Back	5	Hotspot On	18900	1880	14.63	16.00	1.371	0.03	0.353	0.484
	1	LTE Band 2	20M	QPSK	50	0	Back	5	Hotspot On	18900	1880	13.67	15.00	1.358	0.01	0.301	0.409
	1	LTE Band 2	20M	QPSK	1	0	Left Side	5	Hotspot On	18900	1880	14.63	16.00	1.371	-0.02	0.071	0.097
	1	LTE Band 2	20M	QPSK	50	0	Left Side	5	Hotspot On	18900	1880	13.67	15.00	1.358	-0.03	0.037	0.050
	1	LTE Band 2	20M	QPSK	1	0	Right Side	5	Hotspot On	18900	1880	14.63	16.00	1.371	0.07	0.021	0.029
	1	LTE Band 2	20M	QPSK	50	0	Right Side	5	Hotspot On	18900	1880	13.67	15.00	1.358	0.02	0.014	0.019
14	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	5	Hotspot On	18900	1880	14.63	16.00	1.371	-0.15	0.791	**1.084**
	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	5	Hotspot On	18700	1860	14.41	16.00	1.442	0.15	0.730	0.992
	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	5	Hotspot On	19100	1900	14.57	16.00	1.390	-0.03	0.782	1.072
	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	5	Hotspot On	18900	1880	13.67	15.00	1.358	-0.05	0.431	0.585
	1	LTE Band 2	20M	QPSK	100	0	Bottom Side	5	Hotspot On	18900	1880	13.54	15.00	1.400	-0.12	0.423	0.592
	2	LTE Band 7	20M	QPSK	1	0	Front	5	Hotspot On	21350	2560	19.95	20.00	1.012	-0.14	0.624	0.631
	2	LTE Band 7	20M	QPSK	50	0	Front	5	Hotspot On	21350	2560	17.25	19.00	1.496	-0.04	0.333	0.498
	2	LTE Band 7	20M	QPSK	1	0	Back	5	Hotspot On	21350	2560	19.95	20.00	1.012	-0.03	0.607	0.614
	2	LTE Band 7	20M	QPSK	50	0	Back	5	Hotspot On	21350	2560	17.25	19.00	1.496	-0.05	0.327	0.489
	2	LTE Band 7	20M	QPSK	1	0	Left Side	5	Hotspot On	21350	2560	19.95	20.00	1.012	0.05	0.588	0.595
	2	LTE Band 7	20M	QPSK	50	0	Left Side	5	Hotspot On	21350	2560	17.25	19.00	1.496	0.09	0.323	0.483
	2	LTE Band 7	20M	QPSK	1	0	Bottom Side	5	Hotspot On	21350	2560	19.95	20.00	1.012	-0.11	0.163	0.165
	2	LTE Band 7	20M	QPSK	50	0	Bottom Side	5	Hotspot On	21350	2560	17.25	19.00	1.496	0.04	0.092	0.137
	3	LTE Band 7	20M	QPSK	1	0	Front	5	Hotspot On	21350	2560	19.95	20.00	1.012	0.03	0.917	0.928
15	3	LTE Band 7	20M	QPSK	1	0	Front	5	Hotspot On	20850	2510	19.75	20.00	1.059	0.02	0.939	**0.995**
	3	LTE Band 7	20M	QPSK	1	0	Front	5	Hotspot On	21100	2535	19.70	20.00	1.072	0.04	0.920	0.986
	3	LTE Band 7	20M	QPSK	50	0	Front	5	Hotspot On	21350	2560	17.25	19.00	1.496	-0.05	0.501	0.750
	3	LTE Band 7	20M	QPSK	100	0	Front	5	Hotspot On	21350	2560	17.24	19.00	1.500	-0.04	0.501	0.751
	3	LTE Band 7	20M	QPSK	1	0	Back	5	Hotspot On	21350	2560	19.95	20.00	1.012	0.04	0.850	0.860
	3	LTE Band 7	20M	QPSK	1	0	Back	5	Hotspot On	20850	2510	19.75	20.00	1.059	0.01	0.903	0.957
	3	LTE Band 7	20M	QPSK	1	0	Back	5	Hotspot On	21100	2535	19.70	20.00	1.072	-0.02	0.862	0.924
	3	LTE Band 7	20M	QPSK	50	0	Back	5	Hotspot On	21350	2560	17.25	19.00	1.496	-0.07	0.458	0.685
	3	LTE Band 7	20M	QPSK	100	0	Back	5	Hotspot On	21350	2560	17.24	19.00	1.500	0.09	0.461	0.691
	3	LTE Band 7	20M	QPSK	1	0	Right Side	5	Hotspot On	21350	2560	19.95	20.00	1.012	0.11	0.656	0.664
	3	LTE Band 7	20M	QPSK	50	0	Right Side	5	Hotspot On	21350	2560	17.25	19.00	1.496	0.14	0.367	0.549
	3	LTE Band 7	20M	QPSK	1	0	Bottom Side	5	Hotspot On	21350	2560	19.95	20.00	1.012	-0.04	0.071	0.072
	3	LTE Band 7	20M	QPSK	50	0	Bottom Side	5	Hotspot On	21350	2560	17.25	19.00	1.496	0.01	0.041	0.061

<TDD LTE SAR>

Plot No.	Ant.	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)
	2	LTE Band 38	20M	QPSK	1	0	Front	5	Hotspot On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.05	0.901	0.932
	2	LTE Band 38	20M	QPSK	50	0	Front	5	Hotspot On	38000	2595	17.31	19.00	1.476	62.9	1.006	-0.06	0.476	0.707
	2	LTE Band 38	20M	QPSK	100	0	Front	5	Hotspot On	38000	2595	17.23	19.00	1.503	62.9	1.006	0.04	0.463	0.700
	2	LTE Band 38	20M	QPSK	1	0	Back	5	Hotspot On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.03	0.829	0.857
	2	LTE Band 38	20M	QPSK	50	0	Back	5	Hotspot On	38000	2595	17.31	19.00	1.476	62.9	1.006	0.02	0.441	0.655
	2	LTE Band 38	20M	QPSK	100	0	Back	5	Hotspot On	38000	2595	17.23	19.00	1.503	62.9	1.006	-0.05	0.434	0.656
	2	LTE Band 38	20M	QPSK	1	0	Left Side	5	Hotspot On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.03	0.480	0.496
	2	LTE Band 38	20M	QPSK	50	0	Left Side	5	Hotspot On	38000	2595	17.31	19.00	1.476	62.9	1.006	0.01	0.481	0.714
	2	LTE Band 38	20M	QPSK	1	0	Bottom Side	5	Hotspot On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.02	0.167	0.173
	2	LTE Band 38	20M	QPSK	50	0	Bottom Side	5	Hotspot On	38000	2595	17.31	19.00	1.476	62.9	1.006	0.02	0.090	0.133
16	3	LTE Band 38	20M	QPSK	1	0	Front	5	Hotspot On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.05	0.985	**1.019**
	3	LTE Band 38	20M	QPSK	50	0	Front	5	Hotspot On	38000	2595	17.31	19.00	1.476	62.9	1.006	0.11	0.598	0.888
	3	LTE Band 38	20M	QPSK	100	0	Front	5	Hotspot On	38000	2595	17.23	19.00	1.503	62.9	1.006	0.12	0.593	0.897
	3	LTE Band 38	20M	QPSK	1	0	Back	5	Hotspot On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.05	0.922	0.954
	3	LTE Band 38	20M	QPSK	50	0	Back	5	Hotspot On	38000	2595	17.31	19.00	1.476	62.9	1.006	0.12	0.645	0.958
	3	LTE Band 38	20M	QPSK	100	0	Back	5	Hotspot On	38000	2595	17.23	19.00	1.503	62.9	1.006	-0.11	0.645	0.975
	3	LTE Band 38	20M	QPSK	1	0	Right Side	5	Hotspot On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.10	0.765	0.791
	3	LTE Band 38	20M	QPSK	50	0	Right Side	5	Hotspot On	38000	2595	17.31	19.00	1.476	62.9	1.006	0.15	0.485	0.720
	3	LTE Band 38	20M	QPSK	1	0	Bottom Side	5	Hotspot On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.06	0.153	0.158
	3	LTE Band 38	20M	QPSK	50	0	Bottom Side	5	Hotspot On	38000	2595	17.31	19.00	1.476	62.9	1.006	0.05	0.098	0.145

15.3 Body Worn Accessory SAR

<GSM SAR>

Plot No.	Ant.	Band	Mode	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)
	1	GSM850	GPRS 2 Tx slots	Front	5	P-Sensor On	189	836.4	29.26	29.50	1.057	-0.11	0.968	1.023
17	1	GSM850	GPRS 2 Tx slots	Front	5	P-Sensor On	128	824.2	29.14	29.50	1.086	0.01	1.080	**1.173**
	1	GSM850	GPRS 2 Tx slots	Front	5	P-Sensor On	251	848.8	28.87	29.50	1.156	0.01	0.877	1.014
	1	GSM850	GPRS 2 Tx slots	Back	5	P-Sensor On	189	836.4	29.26	29.50	1.057	0.02	0.784	0.829
	1	GSM850	GPRS 2 Tx slots	Back	5	P-Sensor On	128	824.2	29.14	29.50	1.086	0.12	0.861	0.935
	1	GSM850	GPRS 2 Tx slots	Back	5	P-Sensor On	251	848.8	28.87	29.50	1.156	-0.05	0.704	0.814
	1	GSM1900	GPRS 2 Tx slots	Front	5	P-Sensor On	810	1909.8	23.23	23.50	1.064	0.01	0.671	0.714
18	1	GSM1900	GPRS 2 Tx slots	Front	5	P-Sensor On	512	1850.2	23.13	23.50	1.089	0.11	0.788	**0.858**
	1	GSM1900	GPRS 2 Tx slots	Front	5	P-Sensor On	661	1880	23.19	23.50	1.074	-0.04	0.762	0.818
	1	GSM1900	GPRS 2 Tx slots	Back	5	P-Sensor On	810	1909.8	23.23	23.50	1.064	-0.04	0.453	0.482

<WCDMA SAR>

Plot No.	Ant.	Band	Mode	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)
	1	WCDMA Band V	RMC 12.2Kbps	Front	5	P-Sensor On	4132	826.4	20.79	21.00	1.050	0.05	0.753	0.790
	1	WCDMA Band V	RMC 12.2Kbps	Front	5	P-Sensor On	4182	836.4	20.73	21.00	1.064	0.02	0.762	0.811
19	1	WCDMA Band V	RMC 12.2Kbps	Front	5	P-Sensor On	4233	846.6	20.78	21.00	1.052	-0.05	0.853	**0.897**
	1	WCDMA Band V	RMC 12.2Kbps	Back	5	P-Sensor On	4132	826.4	20.79	21.00	1.050	0.04	0.628	0.659
20	1	WCDMA Band II	RMC 12.2Kbps	Front	5	P-Sensor On	9400	1880	16.13	17.50	1.371	0.11	0.411	**0.563**
	1	WCDMA Band II	RMC 12.2Kbps	Back	5	P-Sensor On	9400	1880	16.13	17.50	1.371	0.08	0.316	0.433

<FDD LTE SAR>

Plot No.	Ant.	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)
21	1	LTE Band 26	15M	QPSK	1	74	Front	5	Full	26865	831.5	23.82	24.00	1.042	-0.06	0.816	**0.851**
	1	LTE Band 26	15M	QPSK	36	0	Front	5	Full	26865	831.5	22.79	23.00	1.050	0.06	0.638	0.670
	1	LTE Band 26	15M	QPSK	75	0	Front	5	Full	26865	831.5	22.70	23.00	1.072	0.15	0.605	0.648
	1	LTE Band 26	15M	QPSK	1	74	Back	5	Full	26865	831.5	23.82	24.00	1.042	-0.13	0.702	0.732
	1	LTE Band 26	15M	QPSK	36	0	Back	5	Full	26865	831.5	22.79	23.00	1.050	0.02	0.568	0.596
22	1	LTE Band 2	20M	QPSK	1	0	Front	5	P-Sensor On	18900	1880	14.63	16.00	1.371	-0.15	0.495	**0.679**
	1	LTE Band 2	20M	QPSK	50	0	Front	5	P-Sensor On	18900	1880	13.67	15.00	1.358	0.01	0.204	0.277
	1	LTE Band 2	20M	QPSK	1	0	Back	5	P-Sensor On	18900	1880	14.63	16.00	1.371	0.03	0.353	0.484
	1	LTE Band 2	20M	QPSK	50	0	Back	5	P-Sensor On	18900	1880	13.67	15.00	1.358	0.01	0.301	0.409
	2	LTE Band 7	20M	QPSK	1	0	Front	5	P-Sensor On	21350	2560	19.95	20.00	1.012	-0.14	0.624	0.631
	2	LTE Band 7	20M	QPSK	50	0	Front	5	P-Sensor On	21350	2560	17.25	19.00	1.496	-0.04	0.333	0.498
	2	LTE Band 7	20M	QPSK	1	0	Back	5	P-Sensor On	21350	2560	19.95	20.00	1.012	-0.03	0.607	0.614
	2	LTE Band 7	20M	QPSK	50	0	Back	5	P-Sensor On	21350	2560	17.25	19.00	1.496	-0.05	0.327	0.489
	3	LTE Band 7	20M	QPSK	1	0	Front	5	P-Sensor On	21350	2560	19.95	20.00	1.012	0.03	0.917	0.928
23	3	LTE Band 7	20M	QPSK	1	0	Front	5	P-Sensor On	20850	2510	19.75	20.00	1.059	0.02	0.939	**0.995**
	3	LTE Band 7	20M	QPSK	1	0	Front	5	P-Sensor On	21100	2535	19.70	20.00	1.072	0.04	0.920	0.986
	3	LTE Band 7	20M	QPSK	50	0	Front	5	P-Sensor On	21350	2560	17.25	19.00	1.496	-0.05	0.501	0.750
	3	LTE Band 7	20M	QPSK	100	0	Front	5	P-Sensor On	21350	2560	17.24	19.00	1.500	-0.04	0.501	0.751
	3	LTE Band 7	20M	QPSK	1	0	Back	5	P-Sensor On	21350	2560	19.95	20.00	1.012	0.04	0.850	0.860
	3	LTE Band 7	20M	QPSK	1	0	Back	5	P-Sensor On	20850	2510	19.75	20.00	1.059	0.01	0.903	0.957
	3	LTE Band 7	20M	QPSK	1	0	Back	5	P-Sensor On	21100	2535	19.70	20.00	1.072	-0.02	0.862	0.924
	3	LTE Band 7	20M	QPSK	50	0	Back	5	P-Sensor On	21350	2560	17.25	19.00	1.496	-0.07	0.458	0.685
	3	LTE Band 7	20M	QPSK	100	0	Back	5	P-Sensor On	21350	2560	17.24	19.00	1.500	0.09	0.461	0.691

<TDD LTE SAR>

Plot No.	Ant.	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)
	2	LTE Band 38	20M	QPSK	1	0	Front	5	P-Sensor On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.05	0.901	0.932
	2	LTE Band 38	20M	QPSK	50	0	Front	5	P-Sensor On	38000	2595	17.31	19.00	1.476	62.9	1.006	-0.06	0.476	0.707
	2	LTE Band 38	20M	QPSK	100	0	Front	5	P-Sensor On	38000	2595	17.23	19.00	1.503	62.9	1.006	0.04	0.463	0.700
	2	LTE Band 38	20M	QPSK	1	0	Back	5	P-Sensor On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.03	0.829	0.857
	2	LTE Band 38	20M	QPSK	50	0	Back	5	P-Sensor On	38000	2595	17.31	19.00	1.476	62.9	1.006	0.02	0.441	0.655
	2	LTE Band 38	20M	QPSK	100	0	Back	5	P-Sensor On	38000	2595	17.23	19.00	1.503	62.9	1.006	-0.05	0.434	0.656
24	3	LTE Band 38	20M	QPSK	1	0	Front	5	P-Sensor On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.05	0.985	**1.019**
	3	LTE Band 38	20M	QPSK	50	0	Front	5	P-Sensor On	38000	2595	17.31	19.00	1.476	62.9	1.006	0.11	0.598	0.888
	3	LTE Band 38	20M	QPSK	100	0	Front	5	P-Sensor On	38000	2595	17.23	19.00	1.503	62.9	1.006	0.12	0.593	0.897
	3	LTE Band 38	20M	QPSK	1	0	Back	5	P-Sensor On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.05	0.922	0.954
	3	LTE Band 38	20M	QPSK	50	0	Back	5	P-Sensor On	38000	2595	17.31	19.00	1.476	62.9	1.006	0.12	0.645	0.958
	3	LTE Band 38	20M	QPSK	100	0	Back	5	P-Sensor On	38000	2595	17.23	19.00	1.503	62.9	1.006	-0.11	0.645	0.975

15.4 Product specific 10g SAR

<GSM SAR>

Plot No.	Ant.	Band	Mode	Test Position	Gap (mm)	Power Mode	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
25	1	GSM850	GPRS 2 Tx slots	Front	0	Full	189	836.4	31.14	31.50	1.086	-0.01	1.310	**1.423**
	1	GSM850	GPRS 2 Tx slots	Back	0	Full	189	836.4	31.14	31.50	1.086	0.06	1.100	1.195
	1	GSM1900	GPRS 2 Tx slots	Front	0	Handheld On	661	1880	24.67	25.00	1.079	0.03	2.560	2.762
26	1	GSM1900	GPRS 2 Tx slots	Front	0	Handheld On	512	1850.2	24.56	25.00	1.107	-0.08	2.900	**3.209**
	1	GSM1900	GPRS 2 Tx slots	Front	0	Handheld On	810	1909.8	24.44	25.00	1.138	0.07	2.370	2.696
	1	GSM1900	GPRS 2 Tx slots	Back	0	Handheld On	661	1880	24.67	25.00	1.079	0.03	2.320	2.503
	1	GSM1900	GPRS 2 Tx slots	Back	0	Handheld On	512	1850.2	24.56	25.00	1.107	0.08	2.400	2.656
	1	GSM1900	GPRS 2 Tx slots	Back	0	Handheld On	810	1909.8	24.44	25.00	1.138	0.15	2.160	2.457
	1	GSM1900	GPRS 2 Tx slots	Bottom Side	0	Handheld On	661	1880	24.67	25.00	1.079	0.01	1.670	1.802

<WCDMA SAR>

Plot No.	Ant.	Band	Mode	Test Position	Gap (mm)	Power Mode	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 10g SAR (W/kg)	Reported 10g SAR (W/kg)
27	1	WCDMA Band V	RMC 12.2Kbps	Front	0	Full	4132	826.4	22.52	24.00	1.406	-0.12	1.400	**1.968**
	1	WCDMA Band V	RMC 12.2Kbps	Back	0	Full	4132	826.4	22.52	24.00	1.406	-0.02	1.250	1.758
	1	WCDMA Band II	RMC 12.2Kbps	Front	0	Handheld On	9400	1880	18.68	19.50	1.208	0.01	1.660	2.005
28	1	WCDMA Band II	RMC 12.2Kbps	Front	0	Handheld On	9262	1852.4	18.52	19.50	1.253	-0.17	1.980	**2.481**
	1	WCDMA Band II	RMC 12.2Kbps	Front	0	Handheld On	9538	1907.6	18.51	19.50	1.256	0.03	1.820	2.286
	1	WCDMA Band II	RMC 12.2Kbps	Back	0	Handheld On	9400	1880	18.68	19.50	1.208	0.08	1.750	2.114
	1	WCDMA Band II	RMC 12.2Kbps	Back	0	Handheld On	9262	1852.4	18.52	19.50	1.253	-0.05	1.660	2.080
	1	WCDMA Band II	RMC 12.2Kbps	Back	0	Handheld On	9538	1907.6	18.51	19.50	1.256	0.01	1.630	2.047
	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	0	Handheld On	9400	1880	18.68	19.50	1.208	-0.01	1.900	2.295
	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	0	Handheld On	9262	1852.4	18.52	19.50	1.253	0.03	1.840	2.306
	1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	0	Handheld On	9538	1907.6	18.51	19.50	1.256	-0.05	1.640	2.060

<FDD LTE SAR>

Plot No.	Ant.	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 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	1	LTE Band 2	20M	QPSK	1	0	Front	0	Handheld On	18900	1880	17.75	19.00	1.334	-0.03	1.110	1.480
	1	LTE Band 2	20M	QPSK	50	0	Front	0	Handheld On	18900	1880	16.56	18.00	1.393	0.05	0.619	0.862
	1	LTE Band 2	20M	QPSK	1	0	Back	0	Handheld On	18900	1880	17.75	19.00	1.334	0.02	1.190	1.587
	1	LTE Band 2	20M	QPSK	50	0	Back	0	Handheld On	18900	1880	16.56	18.00	1.393	-0.01	0.658	0.917
29	1	LTE Band 2	20M	QPSK	1	0	Bottom Side	0	Handheld On	18900	1880	17.75	19.00	1.334	-0.17	1.270	**1.694**
	1	LTE Band 2	20M	QPSK	50	0	Bottom Side	0	Handheld On	18900	1880	16.56	18.00	1.393	-0.05	0.701	0.977
	2	LTE Band 7	20M	QPSK	1	0	Front	0	Full	21350	2560	23.25	24.00	1.189	0.05	2.350	2.793
	2	LTE Band 7	20M	QPSK	1	0	Front	0	Full	20850	2510	23.24	24.00	1.191	0.07	2.440	2.907
30	2	LTE Band 7	20M	QPSK	1	0	Front	0	Full	21100	2535	23.16	24.00	1.213	0.11	2.430	**2.949**
	2	LTE Band 7	20M	QPSK	50	0	Front	0	Full	21350	2560	22.32	23.00	1.169	0.01	1.430	1.672
	2	LTE Band 7	20M	QPSK	100	0	Back	0	Full	21350	2560	22.28	23.00	1.180	0.09	1.380	1.629
	2	LTE Band 7	20M	QPSK	1	0	Back	0	Full	21350	2560	23.25	24.00	1.189	-0.11	2.170	2.579
	2	LTE Band 7	20M	QPSK	1	0	Back	0	Full	20850	2510	23.24	24.00	1.191	0.08	2.260	2.692
	2	LTE Band 7	20M	QPSK	1	0	Back	0	Full	21100	2535	23.16	24.00	1.213	0.08	2.260	2.742
	2	LTE Band 7	20M	QPSK	50	0	Back	0	Full	21350	2560	22.32	23.00	1.169	0.08	1.330	1.555
	2	LTE Band 7	20M	QPSK	100	0	Back	0	Full	21350	2560	22.28	23.00	1.180	0.09	1.310	1.546
	2	LTE Band 7	20M	QPSK	1	0	Left Side	0	Full	21350	2560	23.25	24.00	1.189	0.11	2.080	2.472
	2	LTE Band 7	20M	QPSK	1	0	Left Side	0	Full	20850	2510	23.24	24.00	1.191	-0.08	2.170	2.585
	2	LTE Band 7	20M	QPSK	1	0	Left Side	0	Full	21100	2535	23.16	24.00	1.213	-0.12	2.170	2.633
	2	LTE Band 7	20M	QPSK	50	0	Left Side	0	Full	21350	2560	22.32	23.00	1.169	0.01	1.280	1.497
	2	LTE Band 7	20M	QPSK	100	0	Left Side	0	Full	21350	2560	22.28	23.00	1.180	0.09	1.290	1.523
	3	LTE Band 7	20M	QPSK	1	0	Front	0	Full	21350	2560	23.25	24.00	1.189	0.09	1.980	2.353
	3	LTE Band 7	20M	QPSK	1	0	Front	0	Full	20850	2510	23.24	24.00	1.191	0.01	2.250	2.680
	3	LTE Band 7	20M	QPSK	1	0	Front	0	Full	21100	2535	23.16	24.00	1.213	0.11	2.130	2.585
	3	LTE Band 7	20M	QPSK	50	0	Front	0	Full	21350	2560	22.32	23.00	1.169	0.03	1.350	1.579
	3	LTE Band 7	20M	QPSK	100	0	Front	0	Full	21350	2560	22.28	23.00	1.180	0.01	1.380	1.629
	3	LTE Band 7	20M	QPSK	1	0	Back	0	Full	21350	2560	23.25	24.00	1.189	0.07	2.240	2.662
	3	LTE Band 7	20M	QPSK	1	0	Back	0	Full	20850	2510	23.24	24.00	1.191	0.04	2.400	2.859
	3	LTE Band 7	20M	QPSK	1	0	Back	0	Full	21100	2535	23.16	24.00	1.213	0.03	2.400	2.912
	3	LTE Band 7	20M	QPSK	50	0	Back	0	Full	21350	2560	22.32	23.00	1.169	0.01	1.320	1.544
	3	LTE Band 7	20M	QPSK	100	0	Back	0	Full	21350	2560	22.28	23.00	1.180	0.05	1.310	1.546
	3	LTE Band 7	20M	QPSK	1	0	Right Side	0	Full	21350	2560	23.25	24.00	1.189	0.02	1.560	1.854
	3	LTE Band 7	20M	QPSK	50	0	Right Side	0	Full	21350	2560	22.32	23.00	1.169	0.01	1.580	1.848

<TDD LTE SAR>

Plot No.	Ant.	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 10g SAR (W/kg)	Reported 10g SAR (W/kg)
	2	LTE Band 38	20M	QPSK	1	0	Front	0	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	0.11	2.580	2.959
	2	LTE Band 38	20M	QPSK	50	50	Front	0	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.02	1.390	1.617
	2	LTE Band 38	20M	QPSK	100	0	Front	0	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.1	1.380	1.605
	2	LTE Band 38	20M	QPSK	1	0	Back	0	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	0.02	2.640	3.028
	2	LTE Band 38	20M	QPSK	50	50	Back	0	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.01	1.580	1.838
	2	LTE Band 38	20M	QPSK	100	0	Back	0	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.07	1.520	1.768
31	2	LTE Band 38	20M	QPSK	1	0	Left Side	0	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	-0.01	2.800	**3.212**
	2	LTE Band 38	20M	QPSK	50	50	Left Side	0	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.05	1.780	2.070
	2	LTE Band 38	20M	QPSK	100	0	Left Side	0	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.07	1.820	2.117
	3	LTE Band 38	20M	QPSK	1	0	Front	0	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	-0.15	1.290	1.480
	3	LTE Band 38	20M	QPSK	50	50	Front	0	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.12	1.010	1.175
	3	LTE Band 38	20M	QPSK	1	0	Back	0	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	0.03	1.530	1.755
	3	LTE Band 38	20M	QPSK	50	50	Back	0	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.01	0.950	1.105
	3	LTE Band 38	20M	QPSK	1	0	Right Side	0	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	0.07	1.150	1.319
	3	LTE Band 38	20M	QPSK	50	50	Right Side	0	Full	38000	2595	22.37	23.00	1.156	62.9	1.006	0.05	0.760	0.884

15.5 Repeated SAR Measurement

<1g SAR>

No.	Ant.	Band	Mode	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)	Ratio	Reported 1g SAR (W/kg)
1st	1	GSM850	GPRS 2 Tx slots	-	-	-	-	Front	5	Hotspot On	128	824.2	29.14	29.50	1.086	-	-	0.01	1.080	1	1.173
2nd	1	GSM850	GPRS 2 Tx slots	-	-	-	-	Front	5	Hotspot On	128	824.2	29.14	29.50	1.086	-	-	0.08	1.060	1.019	1.152
1st	1	GSM1900	GPRS 2 Tx slots	-	-	-	-	Bottom Side	5	Hotspot On	661	1880	23.19	23.50	1.074	-	-	0.09	1.080	1	1.160
2nd	1	GSM1900	GPRS 2 Tx slots	-	-	-	-	Bottom Side	5	Hotspot On	661	1880	23.19	23.50	1.074	-	-	-0.03	1.070	1.009	1.149
1st	3	LTE Band 38	-	20M	QPSK	1	0	Front	5	Hotspot On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.05	0.985	1	1.019
2nd	3	LTE Band 38	-	20M	QPSK	1	0	Front	5	Hotspot On	38000	2595	19.88	20.00	1.028	62.9	1.006	0.03	0.975	1.010	1.008

<10g SAR>

No.	Ant.	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 10g SAR (W/kg)	Ratio	Reported 10g SAR (W/kg)
1st	1	GSM1900	-	-	-	-	Front	0	Handheld On	512	1850.2	24.56	25.00	1.107	-	-	0.02	2.900	1	3.209
2nd	1	GSM1900	-	-	-	-	Front	0	Handheld On	512	1850.2	24.56	25.00	1.107	-	-	0.02	2.810	1.032	3.110
1st	2	LTE Band 38	20M	QPSK	1	0	Left Side	0	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	-0.01	2.800	1	3.212
2nd	2	LTE Band 38	20M	QPSK	1	0	Left Side	0	Full	38000	2595	23.43	24.00	1.140	62.9	1.006	0.03	2.760	1.014	3.166

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. Per KDB 865664 D01v01r04, if the extremity repeated SAR is necessary, the same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.
4. The ratio is the difference in percentage between original and repeated *measured SAR*.
5. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

16. Simultaneous Transmission Analysis

No.	Simultaneous Transmission Configurations	Portable Handset				Note
		Head	Body-worn	Hotspot	Product specific 10g SAR	
1.	GSM Voice + WLAN2.4GHz	Yes	Yes			
2.	GPRS/EDGE + WLAN2.4GHz	Yes	Yes	Yes	Yes	WLAN Hotspot
3.	WCDMA + WLAN2.4GHz	Yes	Yes	Yes	Yes	WLAN Hotspot
4.	LTE + WLAN2.4GHz	Yes	Yes	Yes	Yes	WLAN Hotspot
5.	GSM Voice + WLAN5.3/5.5GHz	Yes	Yes			
6.	GPRS/EDGE + WLAN5.3/5.5GHz	Yes	Yes		Yes	WLAN Direct (GC only)
7.	WCDMA + WLAN5.3/5.5GHz	Yes	Yes		Yes	WLAN Direct (GC only)
8.	LTE + WLAN5.3/5.5GHz	Yes	Yes		Yes	WLAN Direct (GC only)
9.	GSM Voice + WLAN5.2/5.8GHz	Yes	Yes			
10.	GPRS/EDGE + WLAN5.2/5.8GHz	Yes	Yes	Yes	Yes	WLAN Hotspot/Direct(GC/GO)
11.	WCDMA + WLAN5.2/5.8GHz	Yes	Yes	Yes	Yes	WLAN Hotspot/Direct(GC/GO)
12.	LTE + WLAN5.2/5.8GHz	Yes	Yes	Yes	Yes	WLAN Hotspot/Direct(GC/GO)
13.	GSM Voice + Bluetooth		Yes			
14.	GPRS/EDGE + Bluetooth		Yes	Yes	Yes	BT Tethering
15.	WCDMA + Bluetooth		Yes	Yes	Yes	BT Tethering
16.	LTE + Bluetooth		Yes	Yes	Yes	BT Tethering

General Note:

1. For simultaneously transmission SAR analysis, SAR values only considered WWAN bands which we did perform SAR testing on FA7D2507-01. Since spot check for BT/WLAN are performed for this application and found the original SAR value can represent this application, so other test results were leverage from the original data which released from original report (Sporton Report Number FA7D2507 and FA7D2507-03 or refer to Appendix F) to do co-located analysis.
2. This device supports VoIP in GPRS, EGPRS, WCDMA and LTE (e.g. for 3rd-party VoIP), LTE supports VoLTE operation.
3. EUT will choose each GSM, WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
4. This device 2.4GHz WLAN support hotspot operation and Bluetooth support tethering applications.
5. This device 2.4GHz WLAN/ 5.2GHz WLAN/5.8GHz WLAN support hotspot operation, and 5.2GHz WLAN/5.8GHz WLAN supports WLAN Direct (GC/GO), and 5.3GHz / 5.5GHz supports WLAN Direct (GC only).
6. 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.
7. WLAN 2.4GHz and Bluetooth share the same antenna so can't transmit simultaneously.
8. According to the EUT character, WLAN 5GHz and Bluetooth can't transmit simultaneously.
9. Chose the worst zoom scan SAR of WLAN correspondingly for co-located with WWAN analysis.
10. The reported SAR summation is calculated based on the same configuration and test position.
11. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
    i) 1g Scalar SAR summation < 1.6W/kg and 10g Scalar SAR summation < 4.0W/kg.
    ii) SPLSR = (SAR1 + SAR2)^1.5 / (min. separation distance, mm), and the peak separation distance is determined from the square root of [(x1-x2)2 + (y1-y2)2 + (z1-z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
    iii) If SPLSR ≤ 0.04 for 1g SAR, SPLSR ≤ 0.10 for 10g SAR simultaneously transmission SAR measurement is not necessary.
    iv) Simultaneously transmission SAR measurement, and the reported multi-band 1g SAR < 1.6W/kg and 10g SAR < 4.0W/kg.
    v) The SPLSR calculated results please refer to section 16.5.

16.1 Head Exposure Conditions

WWAN Band		Exposure Position	1		2	3	1+2			1+3		
			WWAN		2.4GHz WLAN	5GHz WLAN	Summed 1g SAR (W/kg)	SPLSR	Case No	Summed 1g SAR (W/kg)	SPLSR	Case No
			Ant.	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)						
GSM	GSM850	Right Cheek	1	0.561	0.740	0.721	1.30			1.28		
		Right Tilted	1	0.325	0.740	0.758	1.07			1.08		
		Left Cheek	1	0.427	0.472	0.993	0.90			1.42		
		Left Tilted	1	0.301	0.740	0.830	1.04			1.13		
	GSM1900	Right Cheek	1	0.132	0.740	0.721	0.87			0.85		
		Right Tilted	1	0.058	0.740	0.758	0.80			0.82		
		Left Cheek	1	0.122	0.472	0.993	0.59			1.12		
		Left Tilted	1	0.051	0.740	0.830	0.79			0.88		
WCDMA	Band V	Right Cheek	1	0.506	0.740	0.721	1.25			1.23		
		Right Tilted	1	0.304	0.740	0.758	1.04			1.06		
		Left Cheek	1	0.426	0.472	0.993	0.90			1.42		
		Left Tilted	1	0.318	0.740	0.830	1.06			1.15		
	Band II	Right Cheek	1	0.301	0.740	0.721	1.04			1.02		
		Right Tilted	1	0.150	0.740	0.758	0.89			0.91		
		Left Cheek	1	0.281	0.472	0.993	0.75			1.27		
		Left Tilted	1	0.098	0.740	0.830	0.84			0.93		
LTE	Band 26	Right Cheek	1	0.230	0.740	0.721	0.97			0.95		
		Right Tilted	1	0.072	0.740	0.758	0.81			0.83		
		Left Cheek	1	0.180	0.472	0.993	0.65			1.17		
		Left Tilted	1	0.120	0.740	0.830	0.86			0.95		
	Band 2	Right Cheek	1	0.160	0.740	0.721	0.90			0.88		
		Right Tilted	1	0.079	0.740	0.758	0.82			0.84		
		Left Cheek	1	0.103	0.472	0.993	0.58			1.10		
		Left Tilted	1	0.058	0.740	0.830	0.80			0.89		
	Band 7	Right Cheek	2	0.396	0.740	0.721	1.14			1.12		
		Right Tilted	2	0.295	0.740	0.758	1.04			1.05		
		Left Cheek	2	0.792	0.472	0.993	1.26			**1.79**	**0.03**	**#01**
		Left Tilted	2	0.198	0.740	0.830	0.94			1.03		
		Right Cheek	3	0.841	0.740	0.721	**1.58**			1.56		
		Right Tilted	3	0.213	0.740	0.758	0.95			0.97		
		Left Cheek	3	0.480	0.472	0.993	0.95			1.47		
		Left Tilted	3	0.336	0.740	0.830	1.08			1.17		
	Band 38	Right Cheek	2	0.406	0.740	0.721	1.15			1.13		
		Right Tilted	2	0.341	0.740	0.758	1.08			1.10		
		Left Cheek	2	0.732	0.472	0.993	1.20			**1.73**	**0.03**	**#02**
		Left Tilted	2	0.225	0.740	0.830	0.97			1.06		
		Right Cheek	3	0.639	0.740	0.721	1.38			1.36		
		Right Tilted	3	0.189	0.740	0.758	0.93			0.95		
		Left Cheek	3	0.362	0.472	0.993	0.83			1.36		
		Left Tilted	3	0.249	0.740	0.830	0.99			1.08		

16.2 Hotspot Exposure Conditions

WWAN Band		Exposure Position	1		2	3	4	1+2			1+3			1+4		
			WWAN		2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	SPLSR	Case No	Summed 1g SAR (W/kg)	SPLSR	Case No	Summed 1g SAR (W/kg)	SPLSR	Case No
			Ant.	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)									
GSM	GSM850	Front	1	1.173	0.171	0.493	0.078	1.34			**1.67**	**0.01**	**#03**	1.25		
		Back	1	0.935	0.427	0.817	0.110	1.36			**1.75**	**0.02**	**#04**	1.05		
		Left Side	1	0.186				0.19			0.19			0.19		
		Right Side	1	0.331	0.427	0.161	0.018	0.76			0.49			0.35		
		Top Side	1		0.427	0.304	0.072	0.43			0.30			0.07		
		Bottom Side	1	0.333				0.33			0.33			0.33		
	GSM1900	Front	1	0.858	0.171	0.493	0.078	1.03			1.35			0.94		
		Back	1	0.482	0.427	0.817	0.110	0.91			1.30			0.59		
		Left Side	1	0.083				0.08			0.08			0.08		
		Right Side	1	0.027	0.427	0.161	0.018	0.45			0.19			0.05		
		Top Side	1		0.427	0.304	0.072	0.43			0.30			0.07		
		Bottom Side	1	1.165				1.17			1.17			1.17		
WCDMA	Band V	Front	1	0.897	0.171	0.493	0.078	1.07			1.39			0.98		
		Back	1	0.659	0.427	0.817	0.110	1.09			1.48			0.77		
		Left Side	1	0.128				0.13			0.13			0.13		
		Right Side	1	0.224	0.427	0.161	0.018	0.65			0.39			0.24		
		Top Side	1		0.427	0.304	0.072	0.43			0.30			0.07		
		Bottom Side	1	0.217				0.22			0.22			0.22		
	Band II	Front	1	0.563	0.171	0.493	0.078	0.73			1.06			0.64		
		Back	1	0.433	0.427	0.817	0.110	0.86			1.25			0.54		
		Left Side	1	0.092				0.09			0.09			0.09		
		Right Side	1	0.030	0.427	0.161	0.018	0.46			0.19			0.05		
		Top Side	1		0.427	0.304	0.072	0.43			0.30			0.07		
		Bottom Side	1	0.973				0.97			0.97			0.97		

WWAN Band		Exposure Position	1		2	3	4	1+2			1+3			1+4		
			WWAN		2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	SPLSR	Case No	Summed 1g SAR (W/kg)	SPLSR	Case No	Summed 1g SAR (W/kg)	SPLSR	Case No
			Ant.	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)									
LTE	Band 26	Front	1	0.851	0.171	0.493	0.078	1.02			1.34			0.93		
		Back	1	0.732	0.427	0.817	0.110	1.16			1.55			0.84		
		Left Side	1	0.204				0.20			0.20			0.20		
		Right Side	1	0.415	0.427	0.161	0.018	0.84			0.58			0.43		
		Top Side	1		0.427	0.304	0.072	0.43			0.30			0.07		
		Bottom Side	1	0.444				0.44			0.44			0.44		
	Band 2	Front	1	0.679	0.171	0.493	0.078	0.85			1.17			0.76		
		Back	1	0.484	0.427	0.817	0.110	0.91			1.30			0.59		
		Left Side	1	0.097				0.10			0.10			0.10		
		Right Side	1	0.029	0.427	0.161	0.018	0.46			0.19			0.05		
		Top Side	1		0.427	0.304	0.072	0.43			0.30			0.07		
		Bottom Side	1	1.084				1.08			1.08			1.08		
	Band 7	Front	2	0.631	0.171	0.493	0.078	0.80			1.12			0.71		
		Back	2	0.614	0.427	0.817	0.110	1.04			1.43			0.72		
		Left Side	2	0.595				0.60			0.60			0.60		
		Right Side	2		0.427	0.161	0.018	0.43			0.16			0.02		
		Top Side	2		0.427	0.304	0.072	0.43			0.30			0.07		
		Bottom Side	2	0.165				0.17			0.17			0.17		
		Front	3	0.995	0.171	0.493	0.078	1.17			1.49			1.07		
		Back	3	0.957	0.427	0.817	0.110	1.38			**1.77**	**0.02**	**#05**	1.07		
		Right Side	3	0.664	0.427	0.161	0.018	1.09			0.83			0.68		
		Top Side	3		0.427	0.304	0.072	0.43			0.30			0.07		
		Bottom Side	3	0.072				0.07			0.07			0.07		
	Band 38	Front	2	0.932	0.171	0.493	0.078	1.10			1.43			1.01		
		Back	2	0.857	0.427	0.817	0.110	1.28			**1.67**	**0.02**	**#06**	0.97		
		Left Side	2	0.714				0.71			0.71			0.71		
		Right Side	2		0.427	0.161	0.018	0.43			0.16			0.02		
		Top Side	2		0.427	0.304	0.072	0.43			0.30			0.07		
		Bottom Side	2	0.173				0.17			0.17			0.17		
		Front	3	1.019	0.171	0.493	0.078	1.19			1.51			1.10		
		Back	3	0.975	0.427	0.817	0.110	1.40			**1.79**	**0.02**	**#07**	1.09		
		Right Side	3	0.791	0.427	0.161	0.018	1.22			0.95			0.81		
		Top Side	3		0.427	0.304	0.072	0.43			0.30			0.07		
		Bottom Side	3	0.158				0.16			0.16			0.16		

16.3 Body-Worn Accessory Exposure Conditions

WWAN Band		Exposure Position	1		2	3	4	1+2			1+3			1+4		
			WWAN		2.4GHz WLAN	5GHz WLAN	Bluetooth	Summed 1g SAR (W/kg)	SPLSR	Case No	Summed 1g SAR (W/kg)	SPLSR	Case No	Summed 1g SAR (W/kg)	SPLSR	Case No
			Ant.	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)	1g SAR (W/kg)									
GSM	GSM850	Front	1	1.173	0.171	0.511	0.078	1.34			**1.68**	**0.01**	**#08**	**1.25**		
		Back	1	0.935	0.427	0.849	0.110	1.36			**1.78**	**0.02**	**#09**	1.05		
	GSM1900	Front	1	0.858	0.171	0.511	0.078	1.03			1.37			0.94		
		Back	1	0.482	0.427	0.849	0.110	0.91			1.33			0.59		
WCDMA	Band V	Front	1	0.897	0.171	0.511	0.078	1.07			1.41			0.98		
		Back	1	0.659	0.427	0.849	0.110	1.09			1.51			0.77		
	Band II	Front	1	0.563	0.171	0.511	0.078	0.73			1.07			0.64		
		Back	1	0.433	0.427	0.849	0.110	0.86			1.28			0.54		
LTE	Band 26	Front	1	0.851	0.171	0.511	0.078	1.02			1.36			0.93		
		Back	1	0.732	0.427	0.849	0.110	1.16			**1.58**			0.84		
	Band 2	Front	1	0.679	0.171	0.511	0.078	0.85			1.19			0.76		
		Back	1	0.484	0.427	0.849	0.110	0.91			1.33			0.59		
	Band 7	Front	2	0.631	0.171	0.511	0.078	0.80			1.14			0.71		
		Back	2	0.614	0.427	0.849	0.110	1.04			1.46			0.72		
		Front	3	0.995	0.171	0.511	0.078	1.17			1.51			1.07		
		Back	3	0.957	0.427	0.849	0.110	1.38			**1.81**	**0.02**	**#10**	1.07		
	Band 38	Front	2	0.932	0.171	0.511	0.078	1.10			1.44			1.01		
		Back	2	0.857	0.427	0.849	0.110	1.28			**1.71**	**0.02**	**#11**	0.97		
		Front	3	1.019	0.171	0.511	0.078	1.19			1.53			1.10		
		Back	3	0.975	0.427	0.849	0.110	1.40			**1.82**	**0.02**	**#12**	1.09		

16.4 Product specific 10g SAR Exposure Conditions

WWAN Band		Exposure Position	1		2	1+2		
			WWAN		5GHz WLAN			
			Ant.	10g SAR (W/kg)	10g SAR (W/kg)	Summed 10g SAR (W/kg)	SPLSR	Case No
GSM	GSM850	Front	1	1.423	0.536	1.96		
		Back	1	1.195	0.536	1.73		
	GSM1900	Front	1	3.209	0.536	3.75		
		Back	1	2.656	0.536	3.19		
		Bottom Side	1	1.802		1.80		
WCDMA	Band V	Front	1	1.968	0.536	2.50		
		Back	1	1.758	0.536	2.29		
	Band II	Front	1	2.481	0.536	3.02		
		Back	1	2.114	0.536	2.65		
		Bottom Side	1	2.306		2.31		
LTE	Band 2	Front	1	1.480	0.536	2.02		
		Back	1	1.587	0.536	2.12		
		Bottom Side	1	1.694		1.69		
	Band 7	Front	2	2.949	0.536	3.49		
		Back	2	2.742	0.536	3.28		
		Left Side	2	2.633		2.63		
		Front	3	2.680	0.536	3.22		
		Back	3	2.912	0.536	3.45		
		Right Side	3	1.854		1.85		
	Band 38	Front	2	2.959	0.536	3.50		
		Back	2	3.028	0.536	3.56		
		Left Side	2	3.212		3.21		
		Front	3	1.480	0.536	2.02		
		Back	3	1.755	0.536	2.29		
		Right Side	3	1.319		1.32		

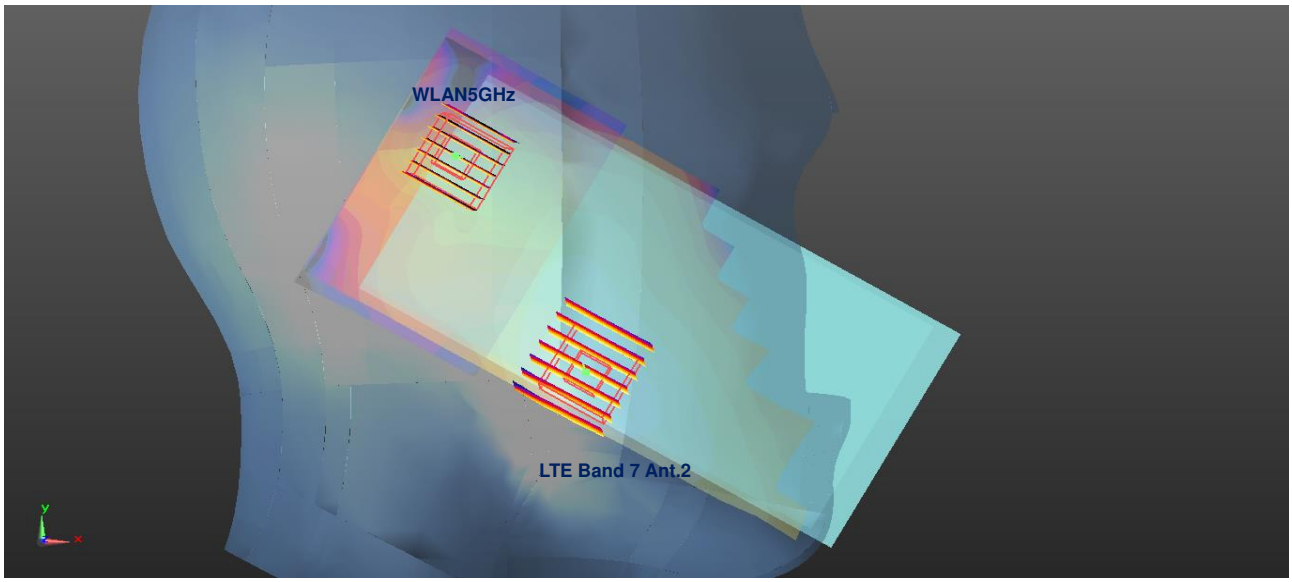
Remark: For Bluetooth/WLAN2.4GHz Product specific 10g stand-alone SAR is not required for a transmitter or antenna, due to 1g hotspot SAR is <1.2W/kg.

16.5 SPLSR Evaluation and Analysis

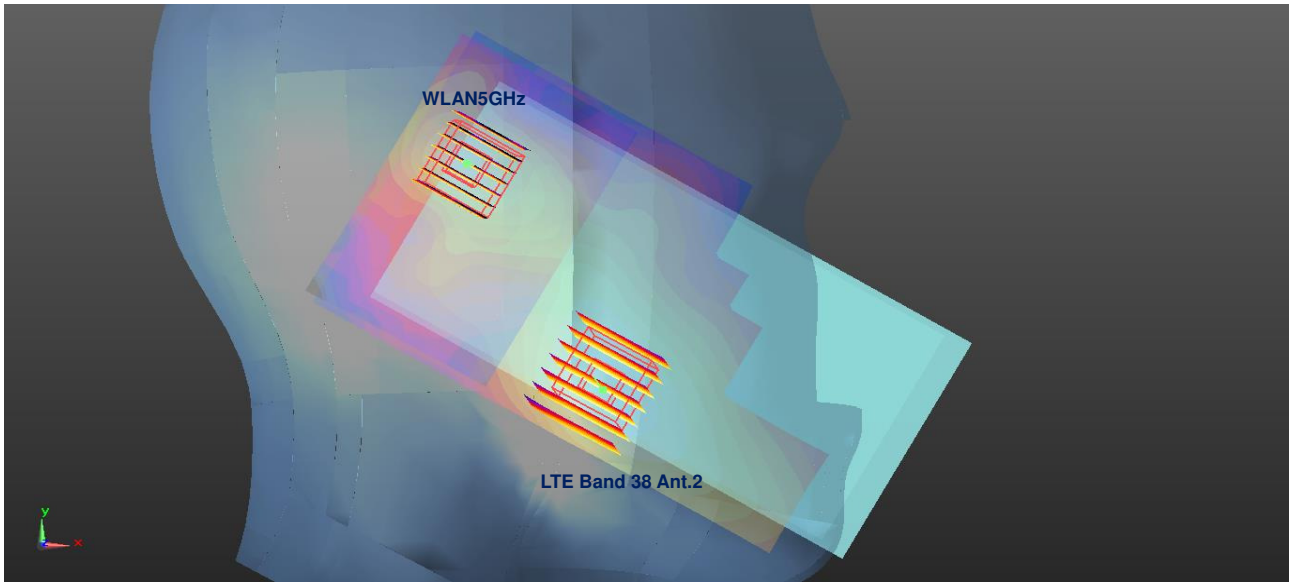
General Note:

1. When standalone SAR is measured for both antennas in the pair, the peak location separation distance is computed by the square root of [(x1−x2)2 + (y1−y2)2 + (z1−z2)2], where (x1, y1, z1) and (x2, y2, z2) are the coordinates in the area scans or extrapolated peak SAR locations in the zoom scans, as appropriate.
2. SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*). If SPLSR ≤ 0.04 for 1g SAR and SPLSR ≤ 0.10 for 10g SAR, simultaneously transmission SAR measurement is not necessary.

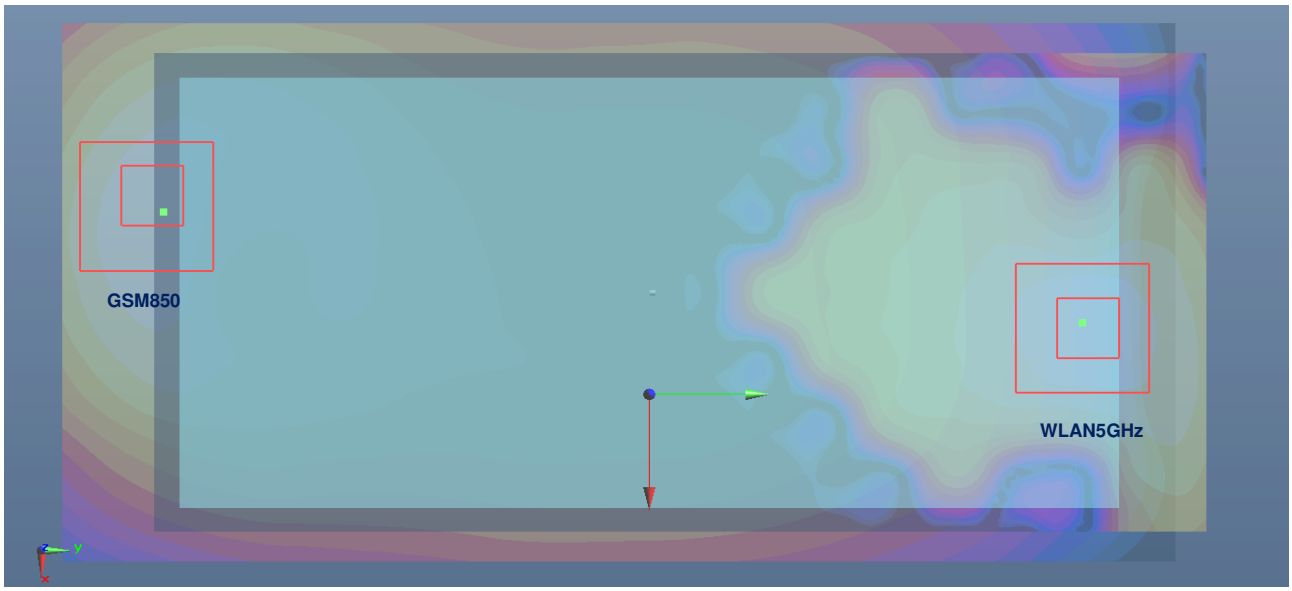
Case #01	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed 1g SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 7 Ant.2	Left Cheek	0.792	0	4.28	-5.89	-0.10	81.66	1.79	0.03	Not required
	WLAN 5GHz		0.993	0	0.41	1.30	-0.17				



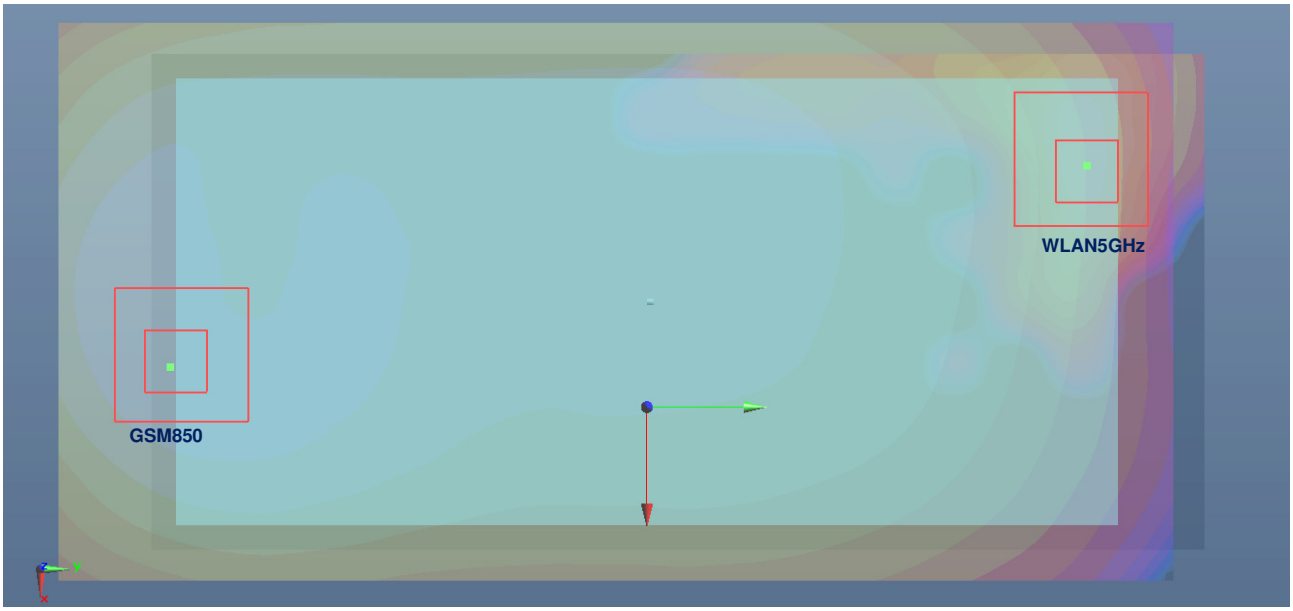
Case #02	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed 1g SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 38 Ant.2	Left Cheek	0.732	0	4.63	-5.89	-0.10	83.37	1.73	0.03	Not required
	WLAN 5GHz		0.993	0	0.41	1.30	-0.17				



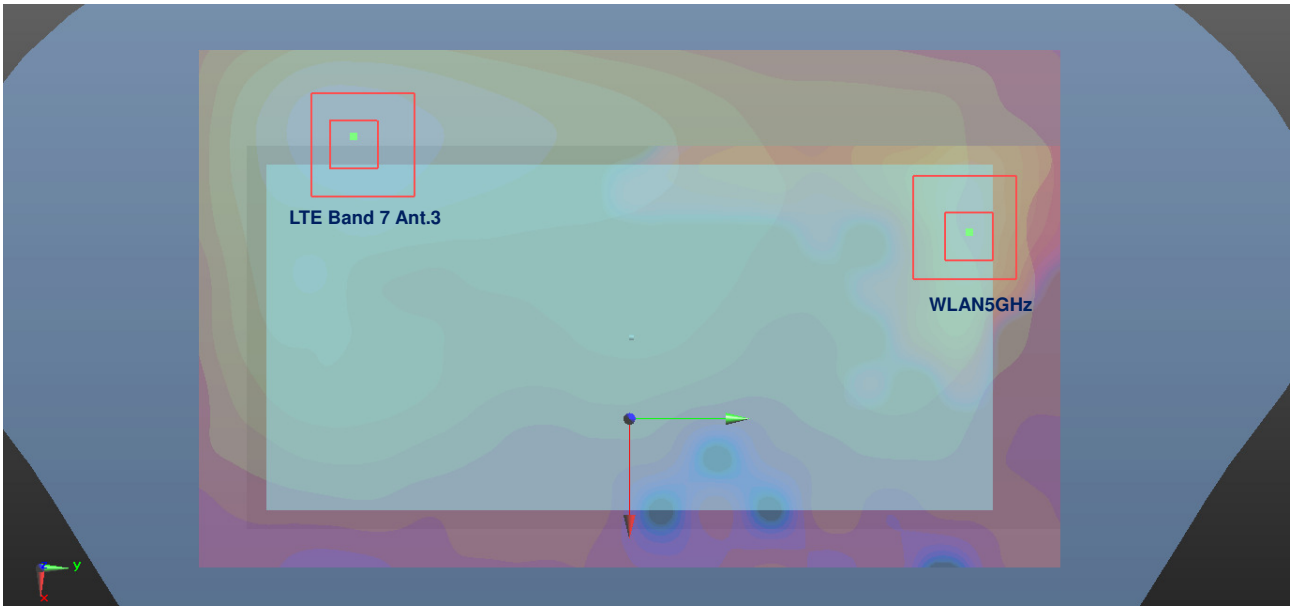
Case #03	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed 1g SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM850	Front	1.173	5	5.39	-8.85	0.13	151.07	1.67	0.01	Not required
	WLAN 5GHz		0.493	5	-6.41	0.58	0.35				



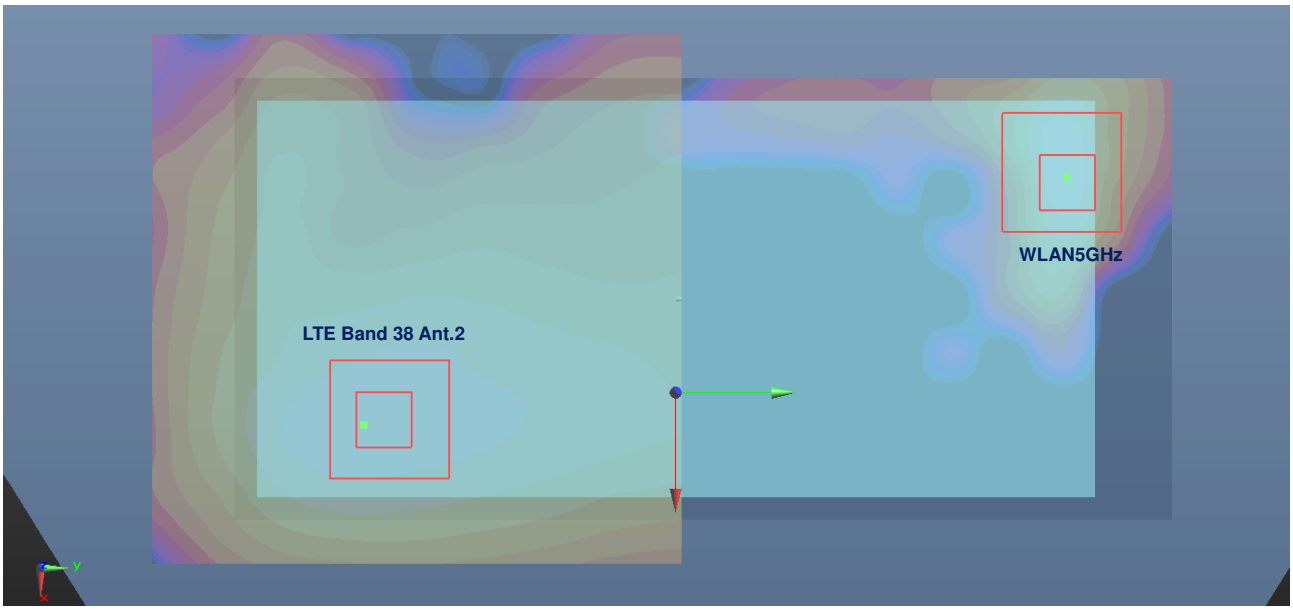
Case #04	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed 1g SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM850	Back	0.935	5	5.35	-7.54	-0.12	136.25	1.75	0.02	Not required
	WLAN 5GHz		0.817	5	-6.48	-0.80	0.40				



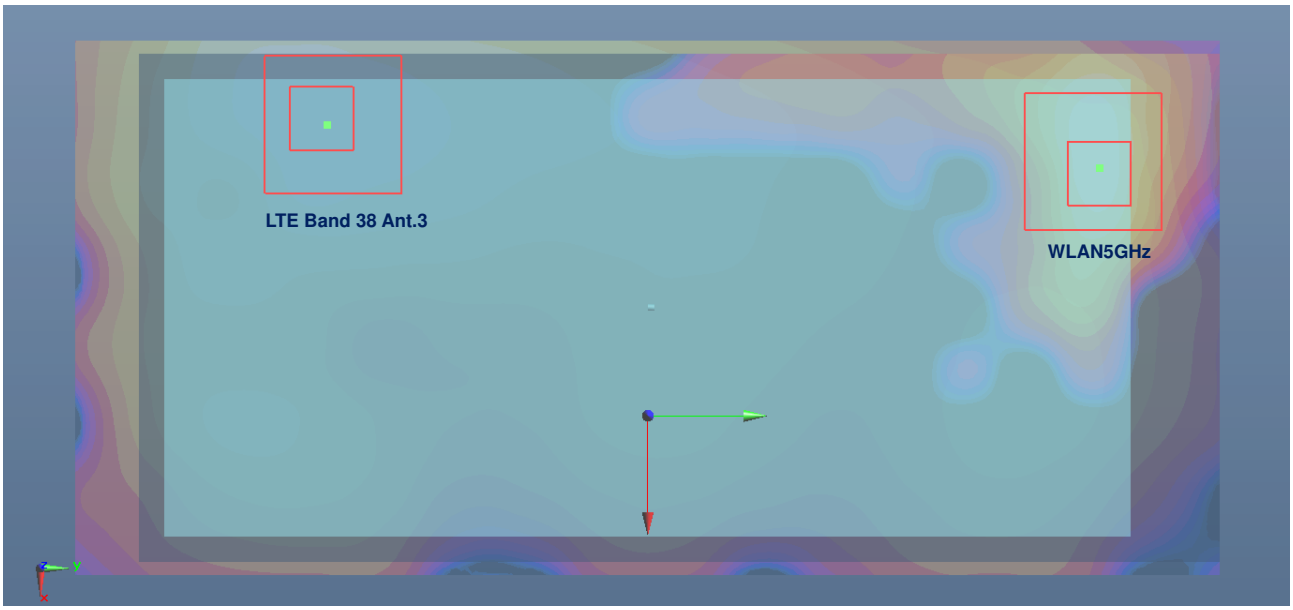
Case #05	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed 1g SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 7 Ant.3	Back	0.957	5	5.10	-5.96	-0.20	126.92	1.77	0.02	Not required
	WLAN 5GHz		0.817	5	-6.48	-0.80	0.40				



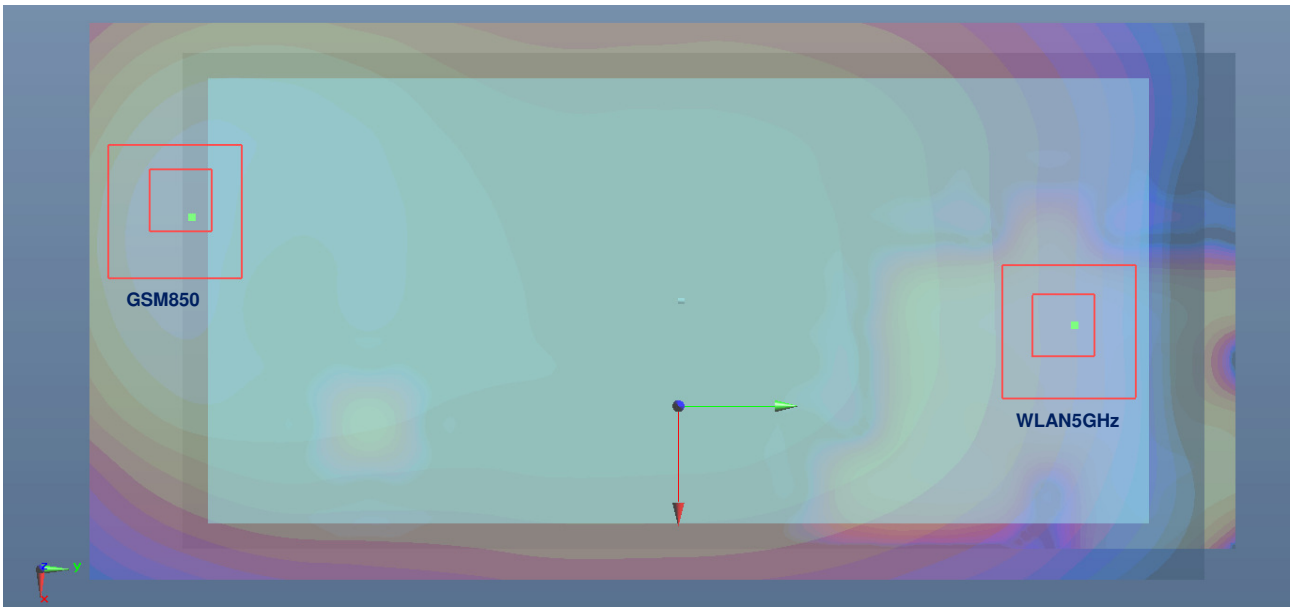
Case #06	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed 1g SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 38 Ant.2	Back	0.857	5	3.18	9.56	0.14	141.67	1.67	0.02	Not required
	WLAN 5GHz		0.817	5	-6.48	-0.80	0.40				



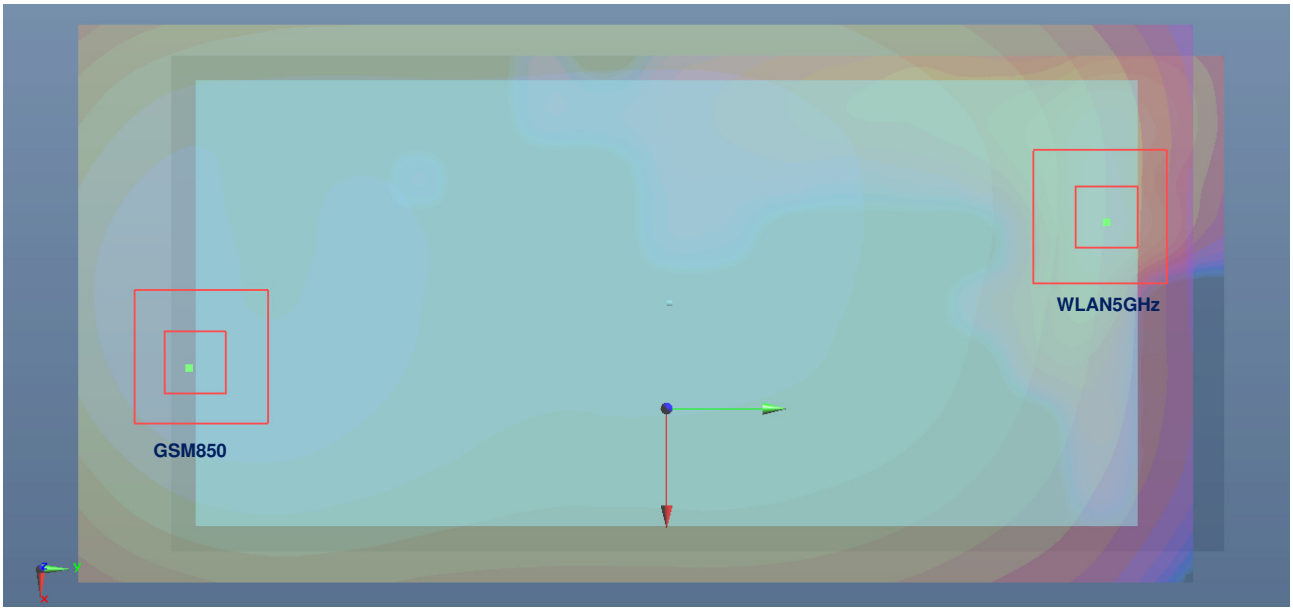
Case #07	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed 1g SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 38 Ant.3	Back	0.975	5	6.18	-6.24	-0.17	137.91	1.79	0.02	Not required
	WLAN 5GHz		0.817	5	-6.48	-0.80	0.40				



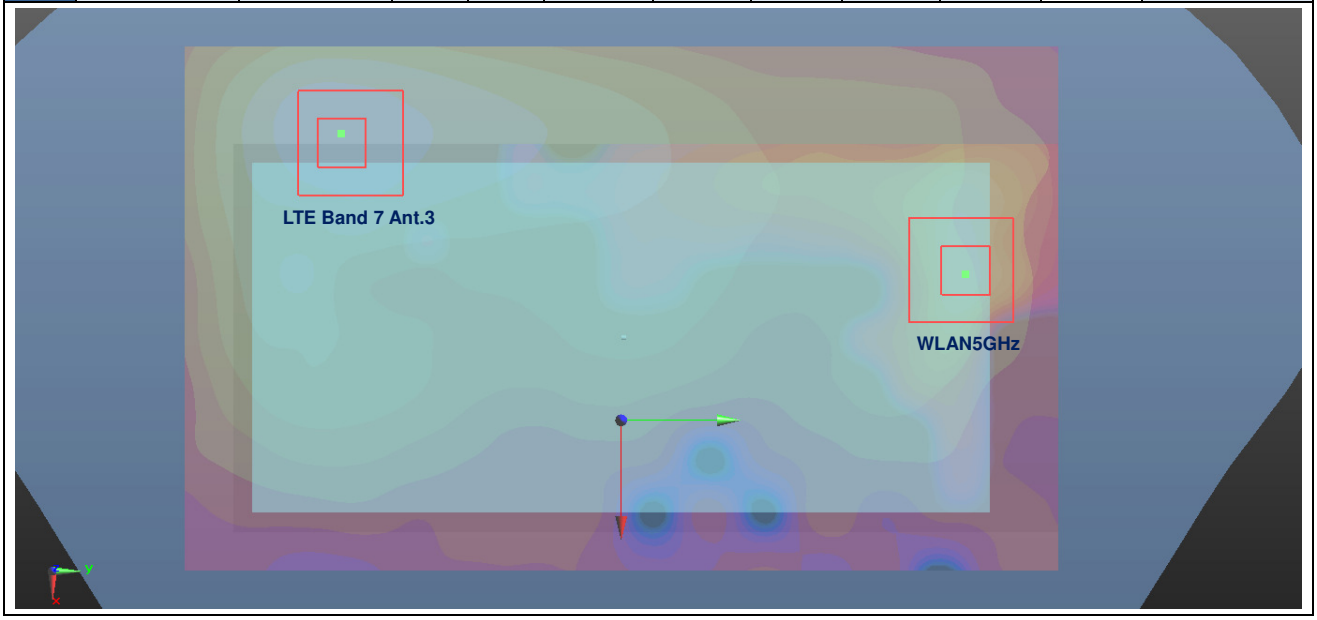
Case #08	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed 1g SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM850	Front	1.173	5	5.39	-8.85	0.13	154.32	1.68	0.01	Not required
	WLAN 5GHz		0.511	5	-6.32	1.20	0.25				



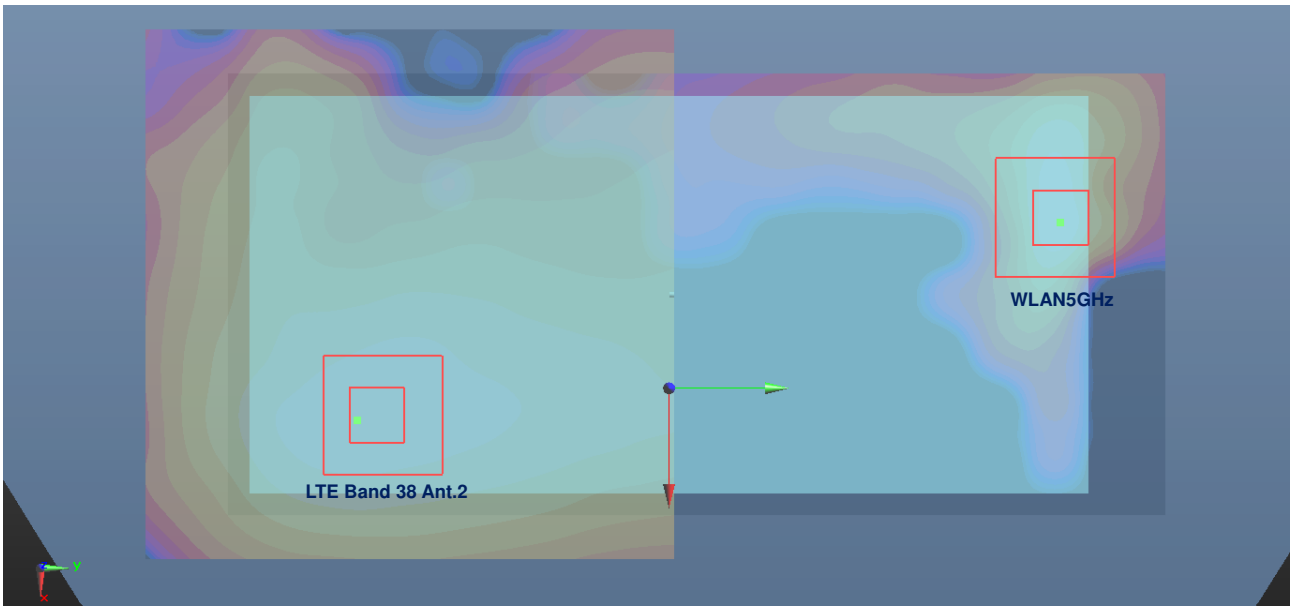
Case #09	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed 1g SAR (W/kg)	SPLSR Results	Simultaneous SAR
	GSM850	Back	0.935	5	5.35	-7.54	-0.12	145.38	1.78	0.02	Not required
	WLAN 5GHz		0.849	5	-6.56	0.78	0.4				



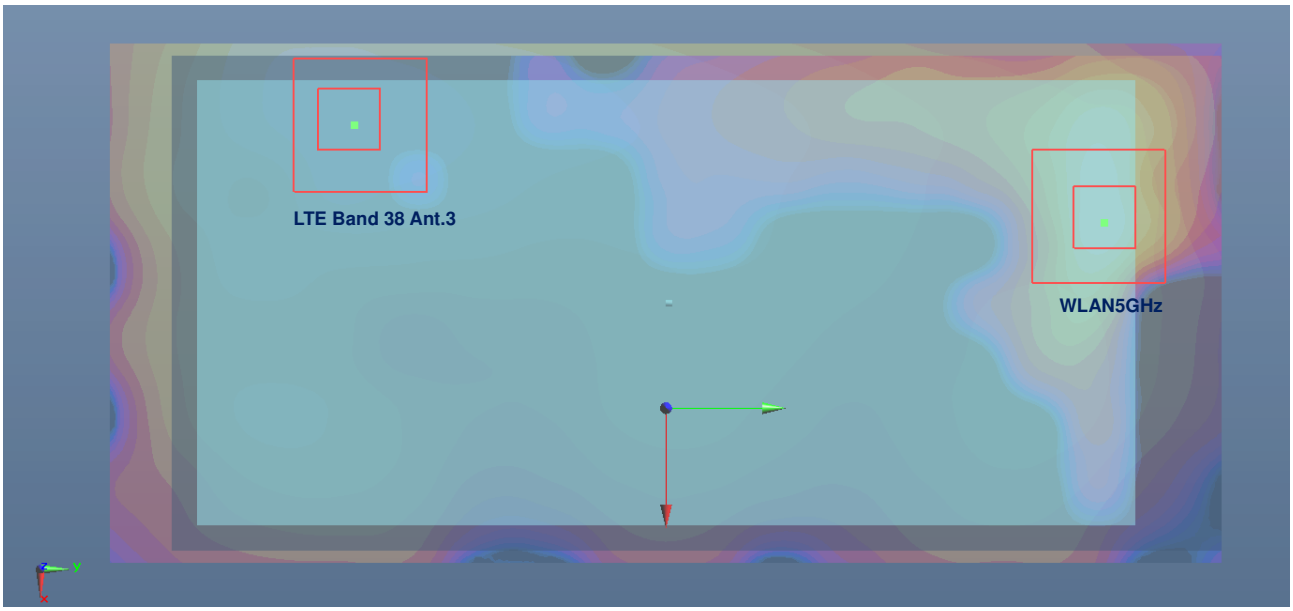
Case #10	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed 1g SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 7 Ant.3	Back	0.957	5	5.10	-5.96	-0.20	134.81	1.81	0.02	Not required
	WLAN 5GHz		0.849	5	-6.56	0.78	0.40				



Case #11	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed 1g SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 38 Ant.2	Back	0.857	5	3.18	9.56	0.14	131.16	1.71	0.02	Not required
	WLAN 5GHz		0.849	5	-6.56	0.78	0.40				



Case #12	Band	Position	1g SAR (W/kg)	Gap (mm)	SAR peak location (cm) X	Y	Z	3D distance (mm)	Summed 1g SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 38 Ant.3	Back	0.975	5	6.18	-6.24	-0.17	145.57	1.82	0.02	Not required
	WLAN 5GHz		0.849	5	-6.56	0.78	0.40				



17. Supplemental Tuner Tests Results

General Note:

1. The following test procedure was followed to demonstrate that the SAR results in this report represent the appropriate SAR test conditions. For bands with dynamic tuning implemented, SAR will be measured according to the required FCC SAR test procedures with the dynamic tuner active to allow the device to automatically tune to the antenna state for the respective RF exposure test configurations. Additional single point SAR time-sweep measurements will be evaluated for other tuner states to determine that the other tuner configurations would result in equivalent or lower SAR values. The additional tuner hardware has no influence to the antenna characteristics, other than impedance matching.
2. To evaluate all of the tuner states, the 366 tuner states are divided evenly among band, mode and exposure combinations so that at least one single point SAR measurement is measured in each configuration. Single point time-sweep measurements will be performed at the peak SAR location determined by the zoom scan of the configuration with the highest reported SAR for each combination. The tuner state will be established remotely so that the device is not moved for the entire series of single point SAR for the tuner states in each combination. The SAR probe will remain stationary at the same position throughout the entire series of single point measurements for each combination. The bands which are dynamically tuned are split into two separate antennas, so each antenna system will have its own test plan to cover the corresponding 366 tuner states.
3. The operational decryption contains more information about the design and implementation of the dynamic antenna tuning.
4. The device supports both LTE B26 / B5. Since the supported frequency span for LTE B5 fall completely within the supported frequency span for LTE B26, and both bands have the same target power and both LTE bands share the same transmission path, therefore standalone SAR and antenna tuner single point SAR measurement was only assessed for LTE B26.

17.1 Supplemental Tuner Head & Body SAR Results

Please refer to Appendix C.

Test Engineer: Nick Hu

18. 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 and highest measured 10-g SAR is less 3.75W/kg. Therefore, the measurement uncertainty table is not required in this report.

19. 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 447498 D01 v06, “Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies”, Oct 2015

[8] FCC KDB 648474 D04 v01r03, “SAR Evaluation Considerations for Wireless Handsets”, Oct 2015.

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

[10] FCC KDB 941225 D01 v03r01, “3G SAR MEAUREMENT PROCEDURES”, Oct 2015

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

[12] FCC KDB 941225 D05A v01r02, “Rel. 10 LTE SAR Test Guidance and KDB Inquiries”, Oct 2015

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

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.3

System Check_Head_835MHz

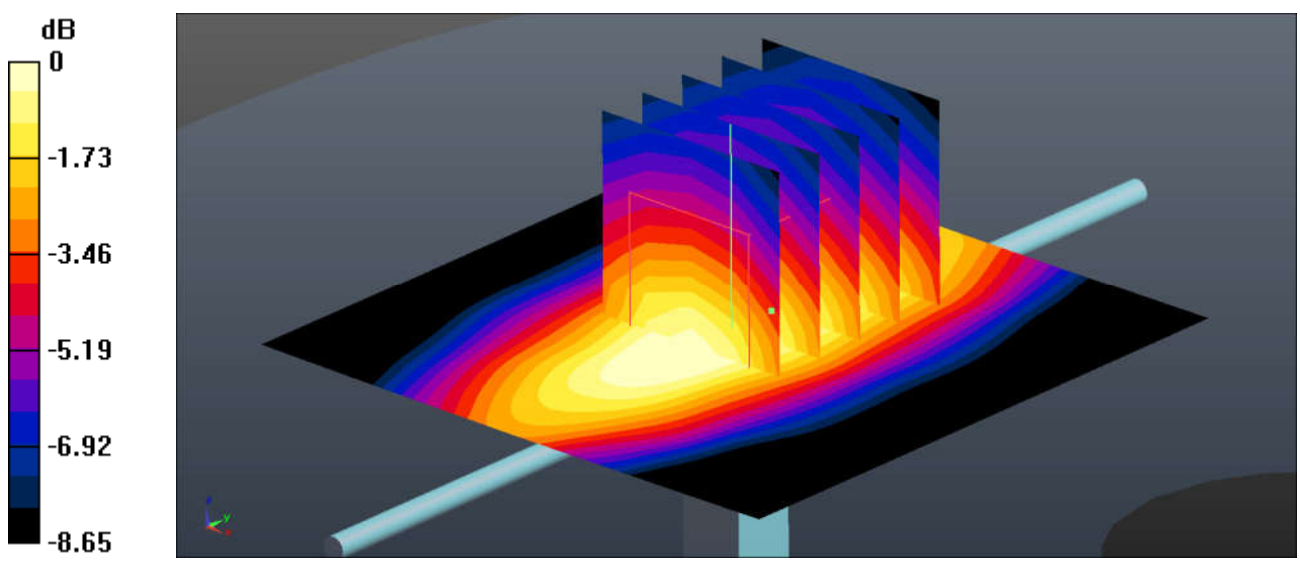
DUT: D835V2 - SN:4d091

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL_850 Medium parameters used: f = 835 MHz; σ = 0.92 S/m; ε_r = 42.023; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(6.3, 6.3, 6.3); Calibrated: 2017.9.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.8 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 51.28 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 2.38 W/kg
SAR(1 g) = 2.22 W/kg; SAR(10 g) = 1.55 W/kg
Maximum value of SAR (measured) = 2.66 W/kg



0 dB = 2.66 W/kg = 4.25 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.4

System Check_Head_1900MHz

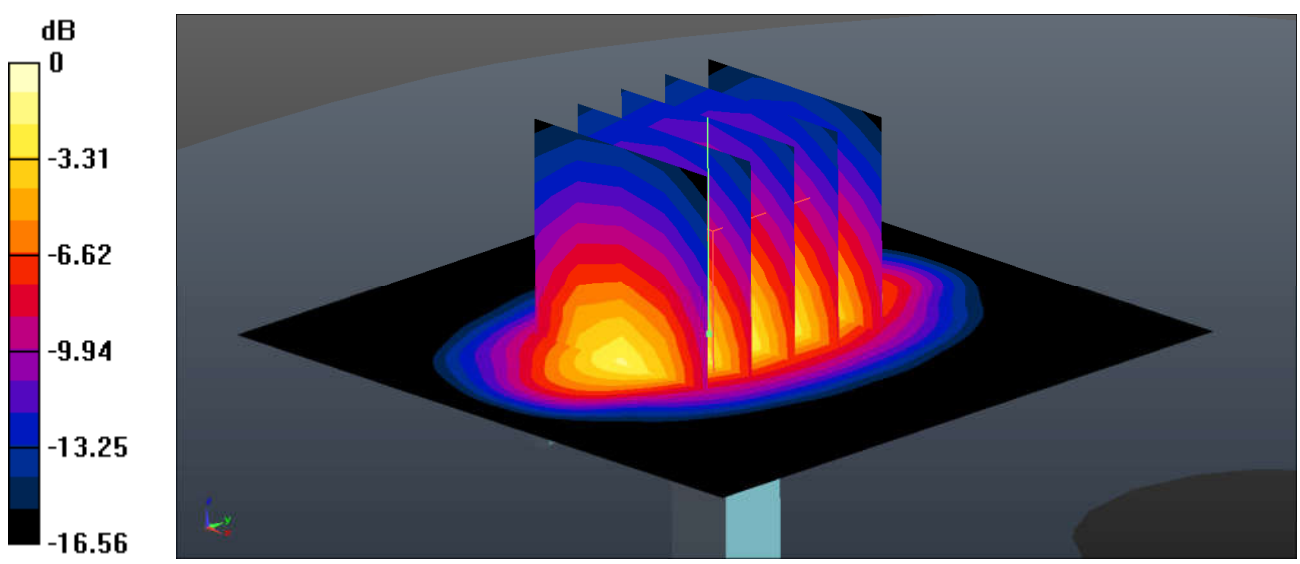
DUT: D1900V2 - SN:5d118

Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: f = 1900 MHz; σ = 1.397 S/m; ε_r = 39.647; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(5.23, 5.23, 5.23); Calibrated: 2017.9.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 13.7 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 84.7 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 11.4 W/kg
SAR(1 g) = 9.74 W/kg; SAR(10 g) = 5.11 W/kg
Maximum value of SAR (measured) = 13.8 W/kg



0 dB = 13.8 W/kg = 11.40 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.26

System Check_Head_2600MHz

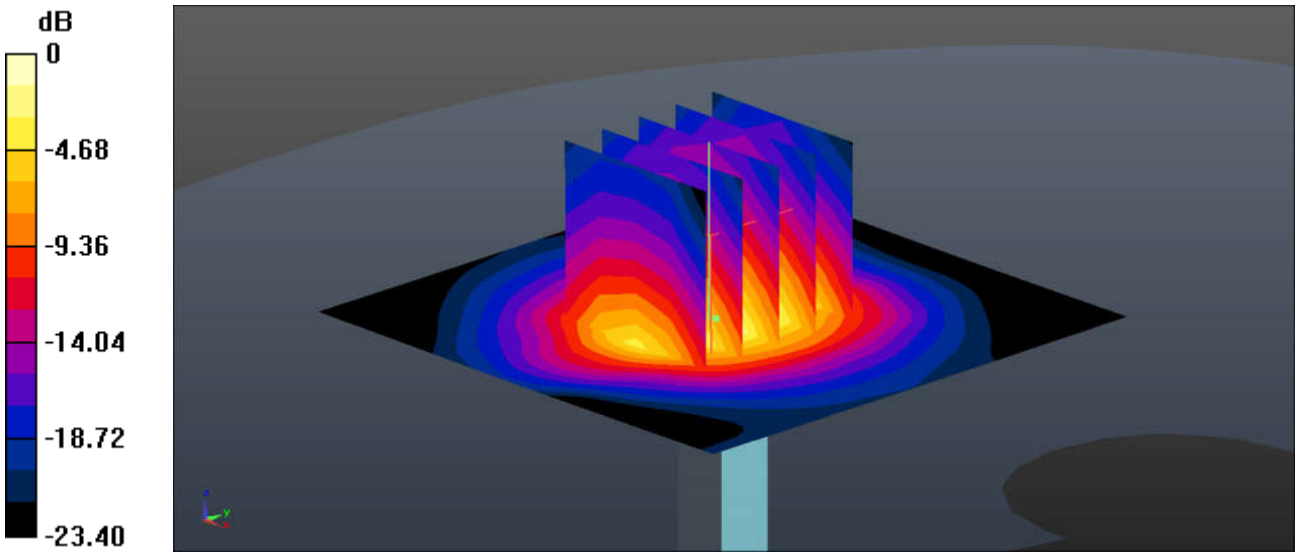
DUT: D2600V2 - SN:1061

Communication System: UID 0, CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: HSL_2600 Medium parameters used: f = 2600 MHz; σ = 2.049 S/m; ε_r = 38.658; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(7.2, 7.2, 7.2); Calibrated: 2017.5.5;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2017.12.4
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 29.4 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 101.1 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 40.2 W/kg
SAR(1 g) = 13.8 W/kg; SAR(10 g) = 6.44 W/kg
Maximum value of SAR (measured) = 29.1 W/kg



0 dB = 29.1 W/kg = 14.64 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.14

System Check_Body_835MHz

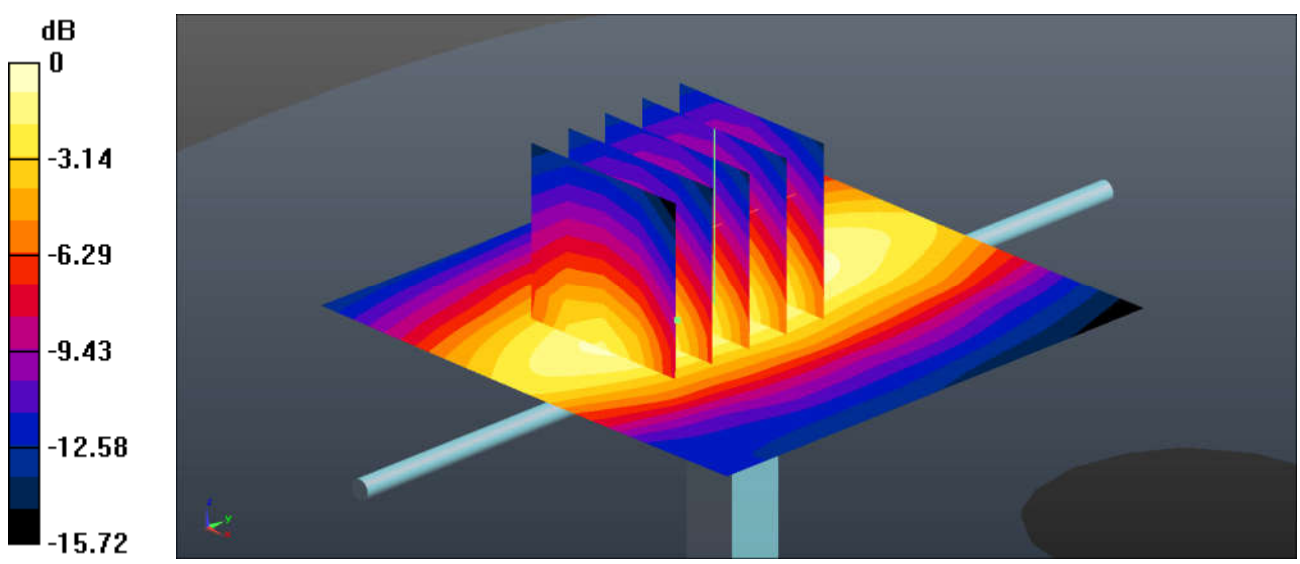
DUT: D835V2 - SN:4d091

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL_850 Medium parameters used: f = 835 MHz; σ = 0.995 S/m; ε_r = 54.629; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(6.19, 6.19, 6.19); Calibrated: 2017.9.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.65 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 48.34 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 2.54 W/kg
SAR(1 g) = 2.2 W/kg; SAR(10 g) = 1.58 W/kg
Maximum value of SAR (measured) = 2.49 W/kg



0 dB = 2.65 W/kg = 4.23 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.14

System Check_Body_1900MHz

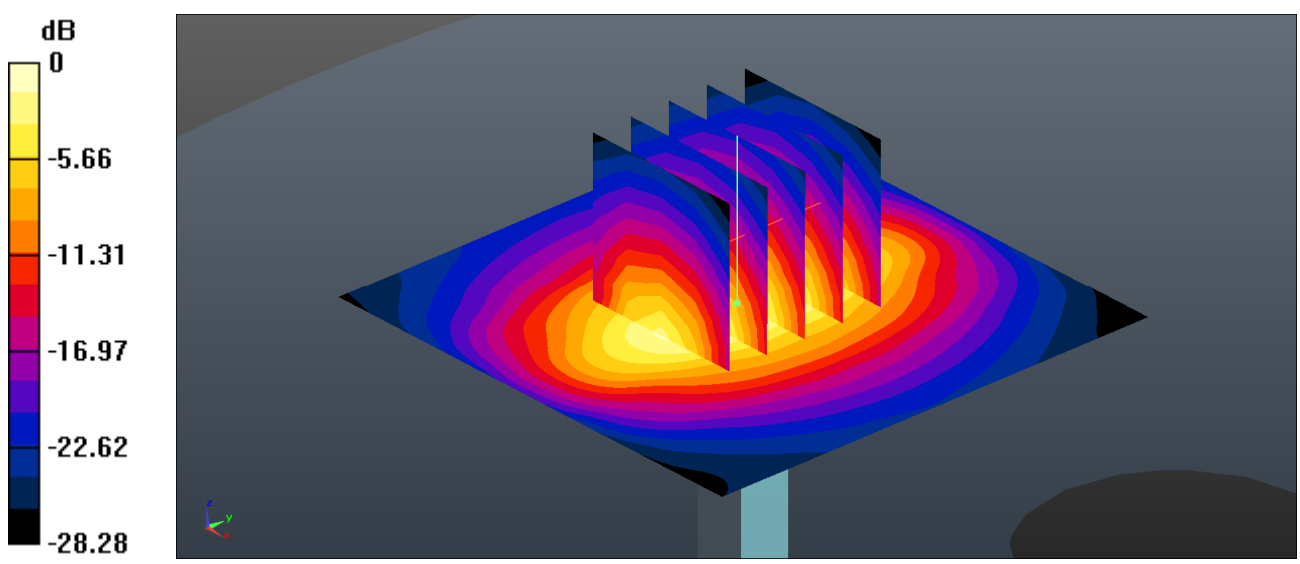
DUT: D1900V2 - SN:5d118

Communication System: UID 0, CW (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900 Medium parameters used: f = 1900 MHz; σ = 1.526 S/m; ε_r = 51.737; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(4.86, 4.86, 4.86); Calibrated: 2017.9.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.1 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 84.34 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 13.5 W/kg
SAR(1 g) = 9.5 W/kg; SAR(10 g) = 4.91 W/kg
Maximum value of SAR (measured) = 12.1 W/kg



0 dB = 12.1 W/kg = 10.83 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.2.8

System Check_Body_2600MHz

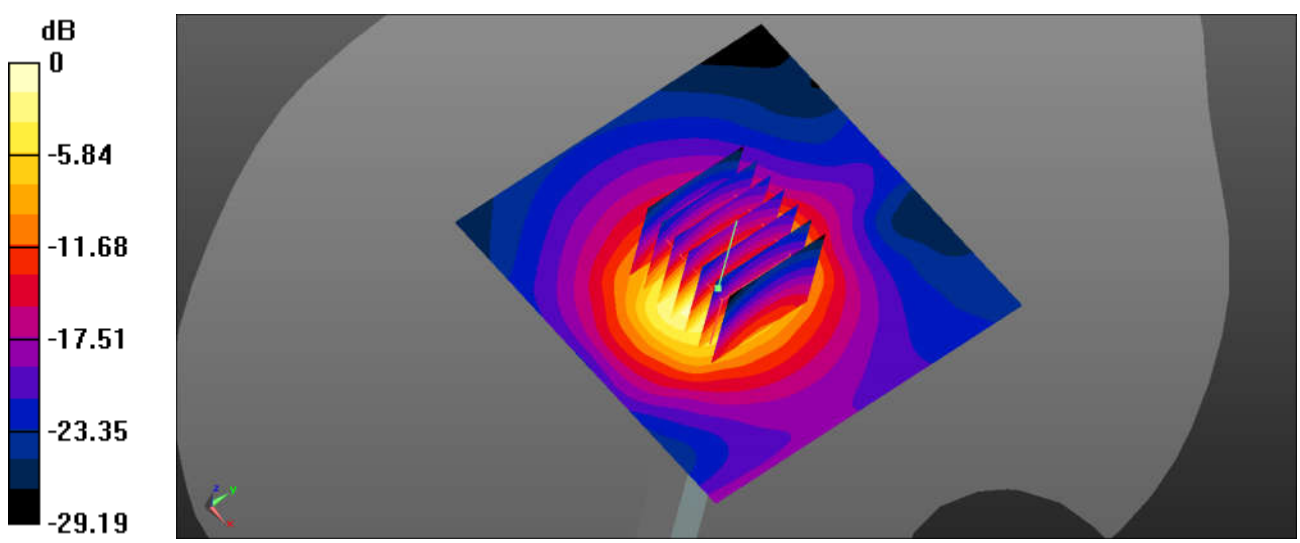
DUT: D2600V2 - SN:1061

Communication System: UID 0, CW (0); Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: MSL_2600 Medium parameters used: f = 2600 MHz; σ = 2.224 S/m; ε_r = 52.974; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(7.14, 7.14, 7.14); Calibrated: 2017.5.5;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2018.1.3
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (81x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 19.4 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 82.21 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 22.4 W/kg
SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.32 W/kg
Maximum value of SAR (measured) = 19.1 W/kg



0 dB = 19.4 W/kg = 12.88 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: 2018.1.3

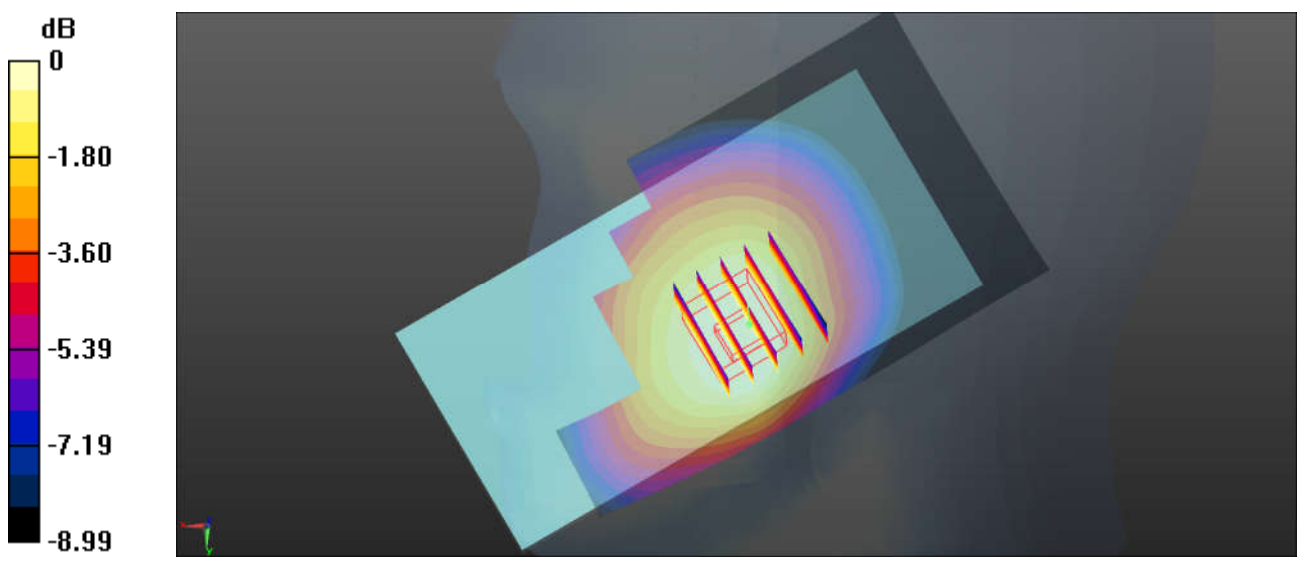
01_GSM850_GPRS 2 Tx slots_Right Cheek_0mm_Ch189

Communication System: UID 0, GPRS/EDGE (2 Tx slots) (0); Frequency: 836.4 MHz;Duty Cycle:1:4.15
Medium: HSL_850 Medium parameters used: f = 836.4 MHz; σ = 0.921 S/m; ε_r = 42.001;
ρ = $1000_{kg/m^3}$
Ambient Temperature：23.6 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(6.3, 6.3, 6.3); Calibrated: 2017.9.25;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch189/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.582 W/kg

Ch189/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.448 V/m; Power Drift = 0.18 dB
Peak SAR (extrapolated) = 0.660 W/kg
SAR(1 g) = 0.516 W/kg; SAR(10 g) = 0.398 W/kg
Maximum value of SAR (measured) = 0.562 W/kg



0 dB = 0.562 W/kg = -2.50 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.4

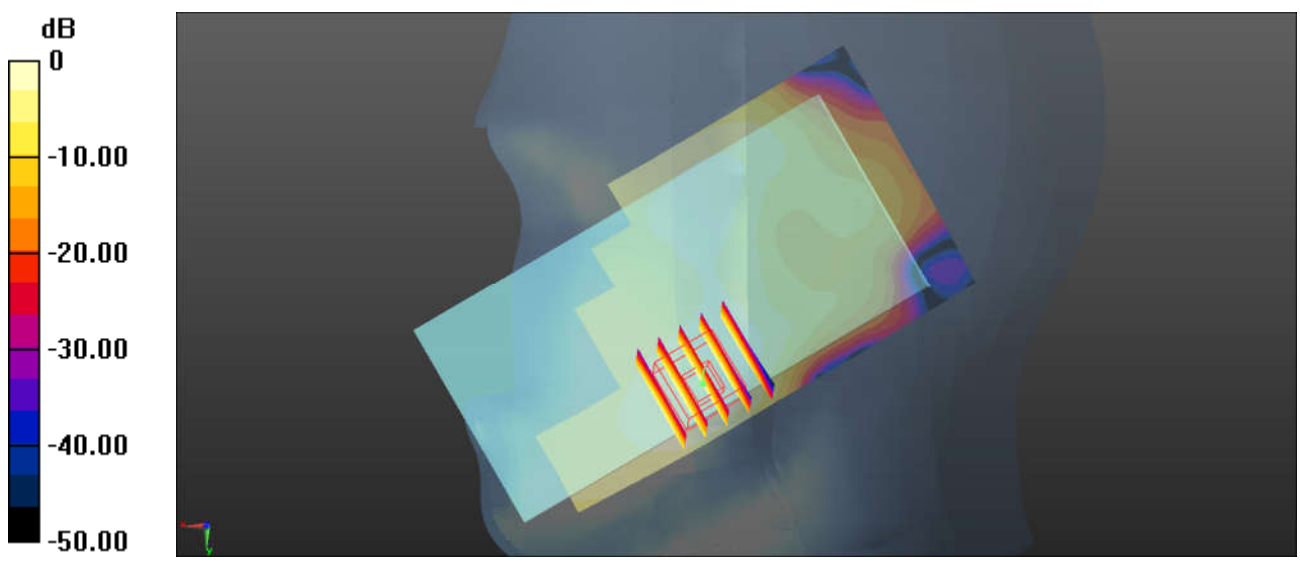
02_GSM1900_GPRS 2 Tx slots_Right Cheek_0mm_Ch810

Communication System: UID 0, GPRS/EDGE (2 Tx slots) (0); Frequency: 1909.8 MHz;Duty Cycle:1:4.15
Medium: HSL_1900 Medium parameters used: f = 1909.8 MHz; σ = 1.408 S/m; ε_r = 39.599;
ρ =1000$_{kg/m^3}$
Ambient Temperature：23.6 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(5.23, 5.23, 5.23); Calibrated: 2017.9.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch810/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.137 W/kg

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.296 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 0.182 W/kg
SAR(1 g) = 0.114 W/kg; SAR(10 g) = 0.068 W/kg
Maximum value of SAR (measured) = 0.137 W/kg



0 dB = 0.137 W/kg = -8.63 dBW/kg

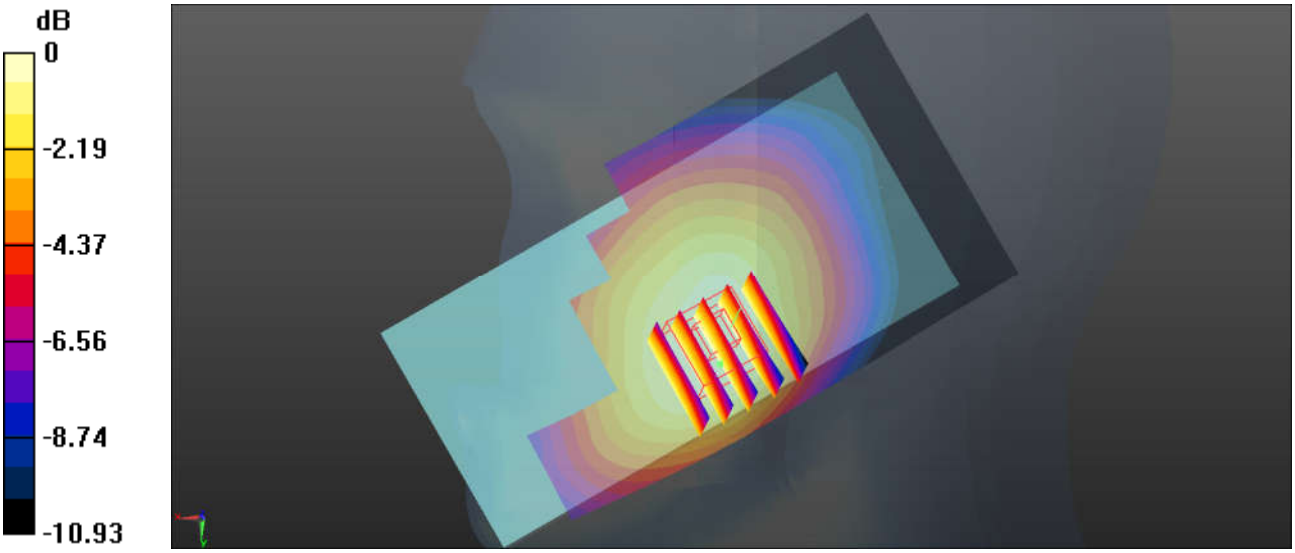
03_WCDMA Band V_RMC 12.2Kbps_Right Cheek_0mm_Ch4132

Communication System: UID 0, UMTS (0); Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: HSL_850 Medium parameters used: f = 826.4 MHz; σ = 0.911 S/m; ε_r = 42.136; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(6.3, 6.3, 6.3); Calibrated: 2017.9.25;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch4132/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.389 W/kg

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.837 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.461 W/kg
SAR(1 g) = 0.360 W/kg; SAR(10 g) = 0.270 W/kg
Maximum value of SAR (measured) = 0.392 W/kg



0 dB = 0.392 W/kg = -4.07 dBW/kg

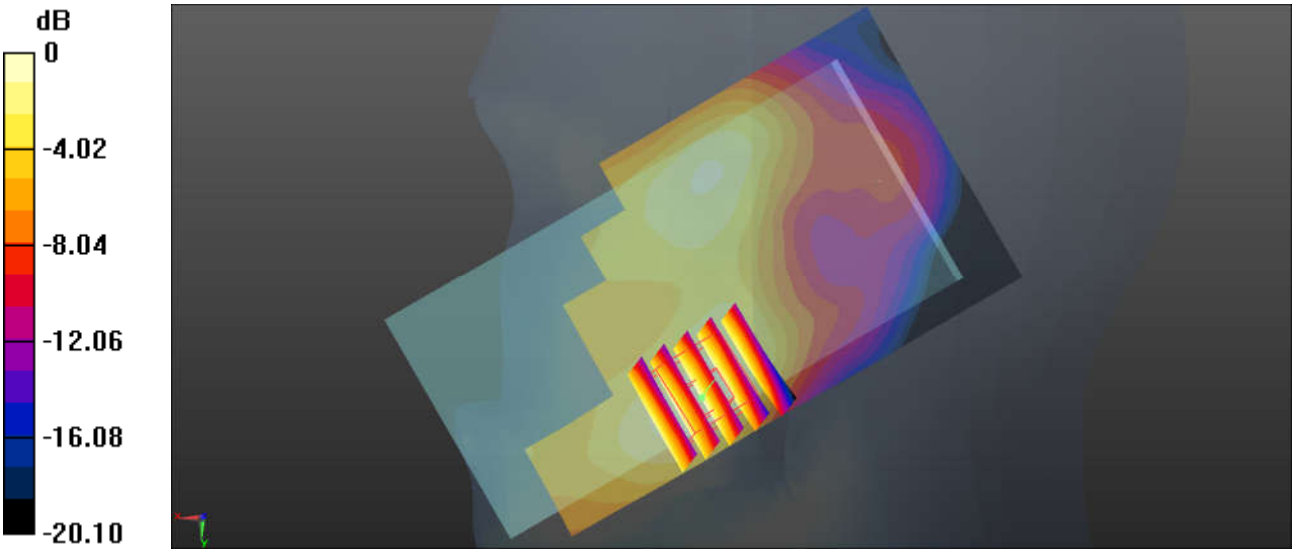
04_WCDMA Band II_RMC 12.2Kbps_Right Cheek_0mm_Ch9400

Communication System: UID 0, UMTS (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: f = 1880 MHz; σ = 1.376 S/m; ε_r = 39.751; ρ = 1000$_{kg/m^3}$
Ambient Temperature：23.6 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(5.23, 5.23, 5.23); Calibrated: 2017.9.25;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch9400/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.251 W/kg

Ch9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.067 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.352 W/kg
SAR(1 g) = 0.216 W/kg; SAR(10 g) = 0.128 W/kg
Maximum value of SAR (measured) = 0.260 W/kg



0 dB = 0.260 W/kg = -5.85 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.3

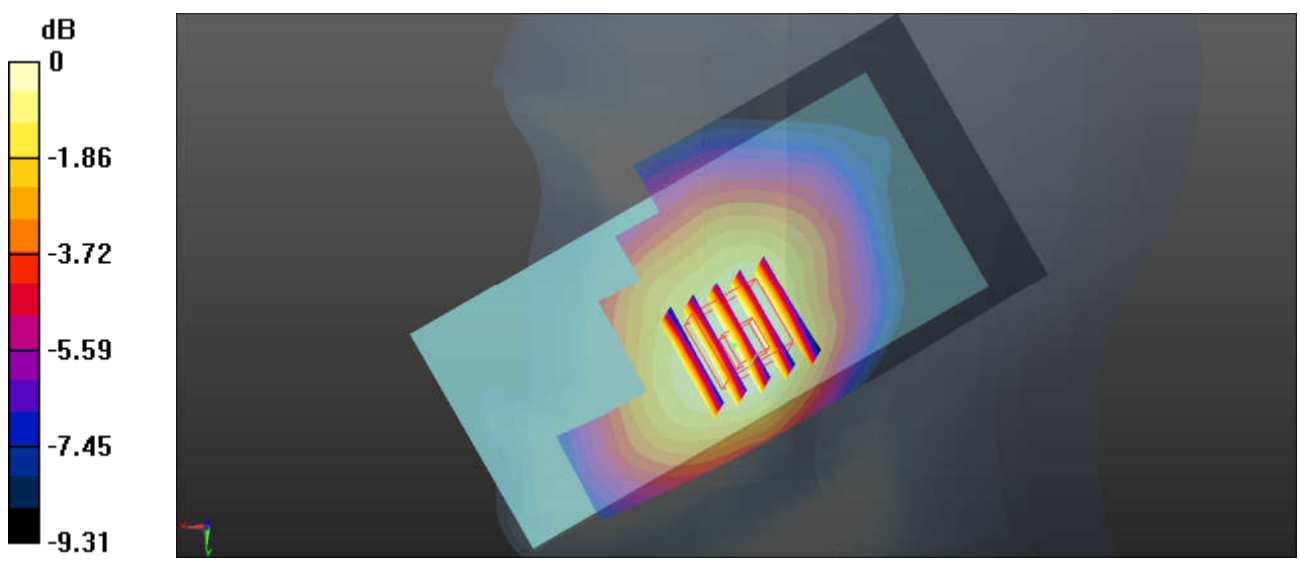
05_LTE Band 26_15M_QPSK_1RB_74Offset_Right Cheek_0mm_Ch26865

Communication System: UID 0, FDD_LTE (0); Frequency: 831.5 MHz;Duty Cycle: 1:1
Medium: HSL_850 Medium parameters used: f = 831.5 MHz; σ = 0.916 S/m; ε_r = 42.071;
ρ = 1000$_{kg/m^3}$
Ambient Temperature：23.6 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(6.3, 6.3, 6.3); Calibrated: 2017.9.25;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch26865/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.250 W/kg

Ch26865/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.887 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.293 W/kg
SAR(1 g) = 0.221 W/kg; SAR(10 g) = 0.170 W/kg
Maximum value of SAR (measured) = 0.243 W/kg



0 dB = 0.243 W/kg = -6.14 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.4

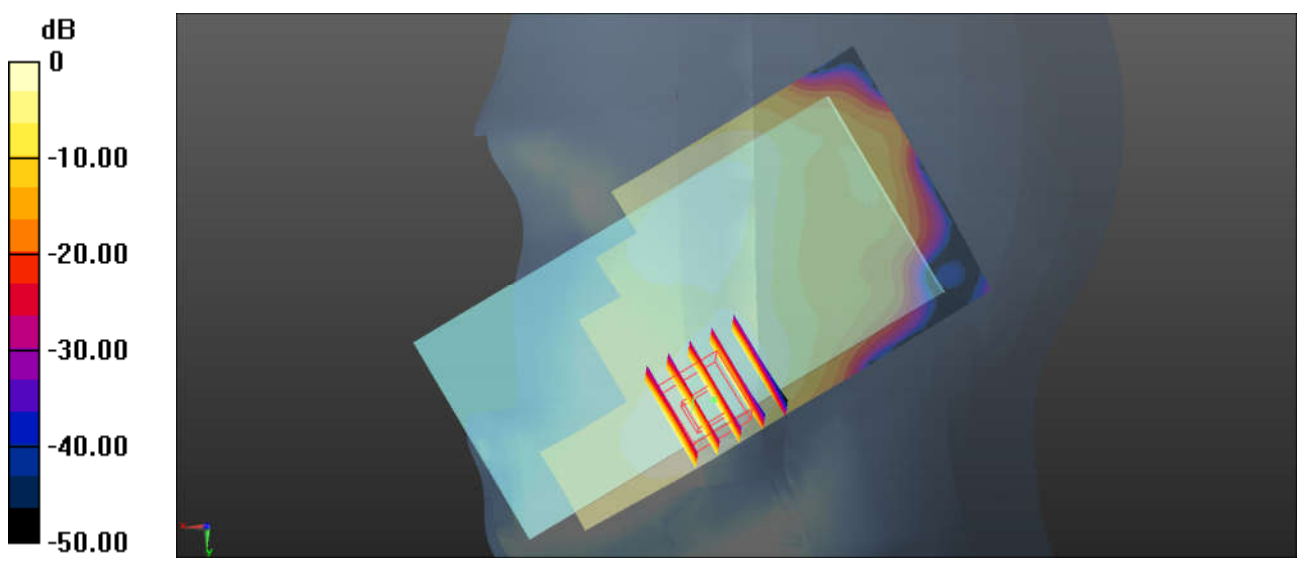
06_LTE Band 2_20M_QPSK_1RB_0Offset_Right Cheek_0mm_Ch18900

Communication System: UID 0, FDD_LTE (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: f = 1880 MHz; σ = 1.376 S/m; ε_r = 39.751;
ρ = 1000$_{kg/m^3}$
Ambient Temperature：23.6 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(5.23, 5.23, 5.23); Calibrated: 2017.9.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch18900/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.151 W/kg

Ch18900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.183 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 0.207 W/kg
SAR(1 g) = 0.127 W/kg; SAR(10 g) = 0.078 W/kg
Maximum value of SAR (measured) = 0.152 W/kg



0 dB = 0.151 W/kg = -8.21 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.26

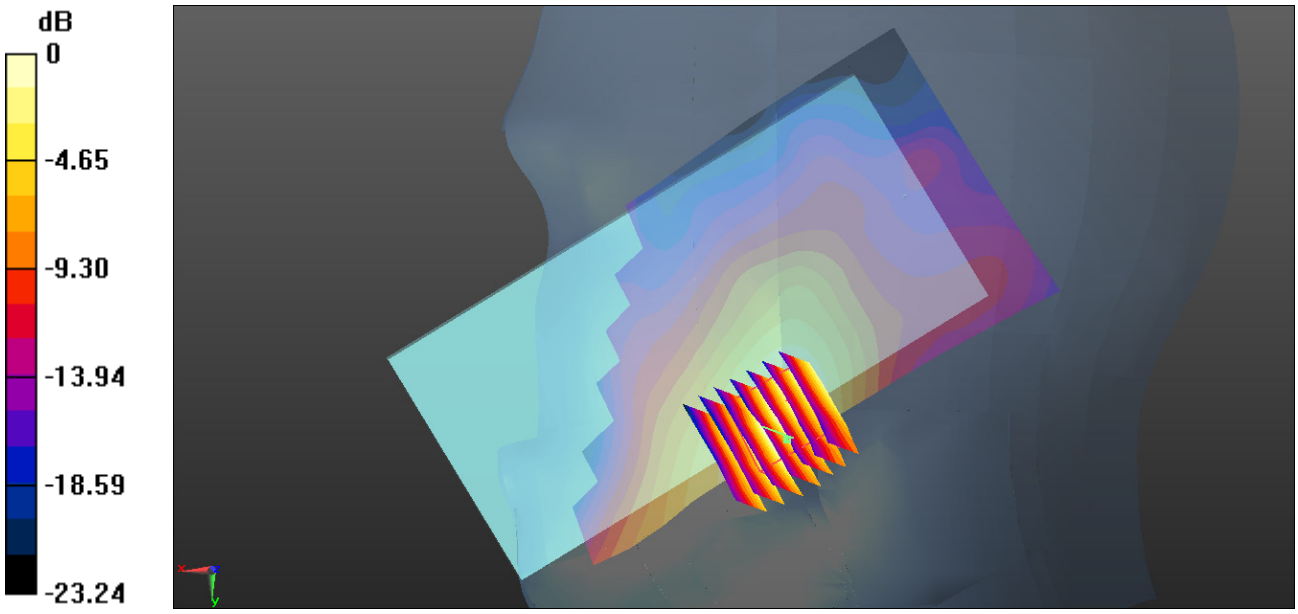
07_LTE Band 7_20M_QPSK_1RB_0Offset_Right Cheek_0mm_Ch21350

Communication System: UID 0, FDD_LTE (0); Frequency: 2560 MHz;Duty Cycle: 1:1
Medium: HSL_2600 Medium parameters used: f = 2560 MHz; σ = 1.957 S/m; ε_r = 37.945; ρ = 1000kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(7.2, 7.2, 7.2); Calibrated: 2017.5.5;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2017.12.4
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch21350/Area Scan (71x151x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.01 W/kg

Ch21350/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.431 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.64 W/kg
SAR(1 g) = 0.708 W/kg; SAR(10 g) = 0.356 W/kg
Maximum value of SAR (measured) = 1.00 W/kg



0 dB = 1.01 W/kg = 0.04 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.26

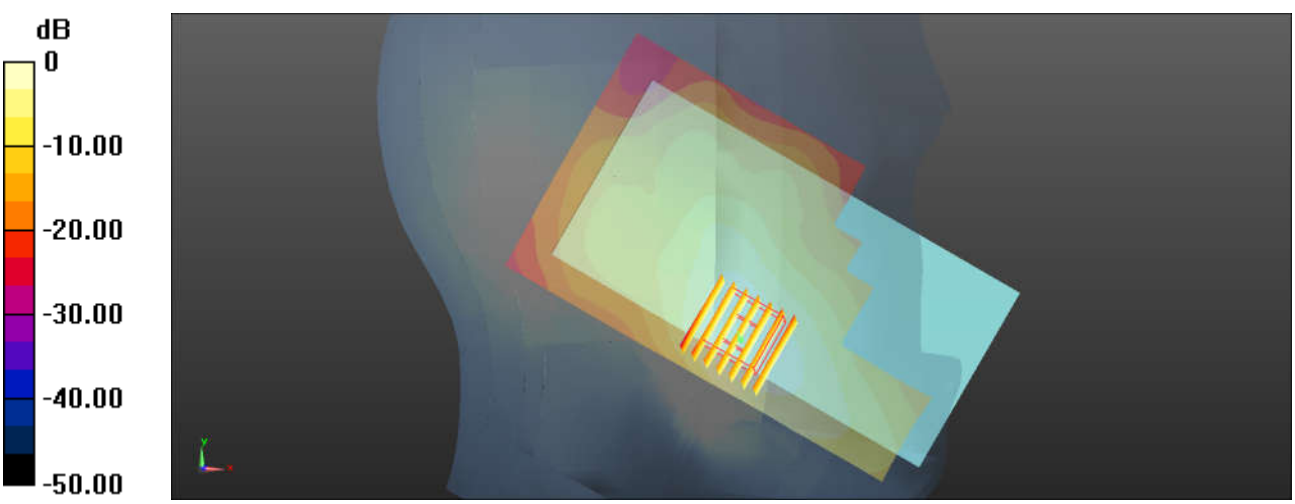
08_LTE Band 38_20M_QPSK_1RB_0Offset_Left Cheek_0mm_Ch38000

Communication System: UID 0, TDD_LTE (0); Frequency: 2595 MHz;Duty Cycle: 1:1.59
Medium: HSL_2600 Medium parameters used: f = 2595 MHz; σ = 1.999 S/m; ε_r = 37.808; ρ = $1000_{kg/m^3}$
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3753; ConvF(7.2, 7.2, 7.2); Calibrated: 2017.5.5;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2017.12.4
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch38000/Area Scan (81x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.919 W/kg

Ch38000/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.931 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.24 W/kg
SAR(1 g) = 0.638 W/kg; SAR(10 g) = 0.326 W/kg
Maximum value of SAR (measured) = 0.923 W/kg



0 dB = 0.919 W/kg = -0.37 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.14

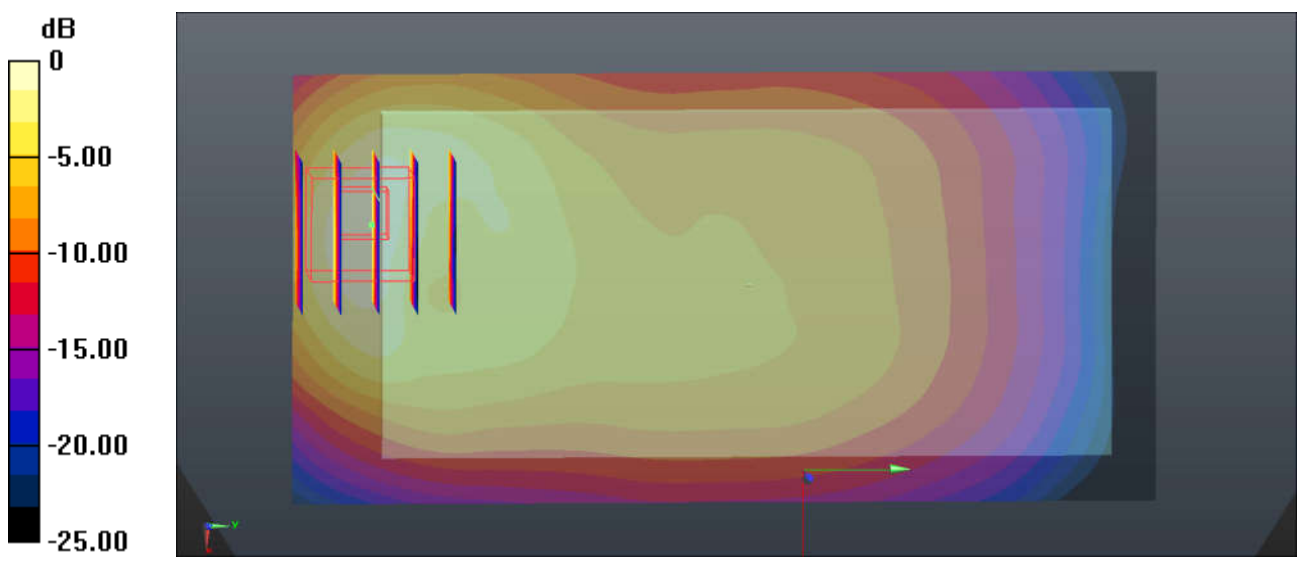
09_GSM850_GPRS 2 Tx slots_Front_5mm_Ch128

Communication System: UID 0, GPRS/EDGE (2 Tx slots) (0); Frequency: 824.2 MHz;Duty Cycle:1:4.15
Medium: MSL_850 Medium parameters used: f = 824.2 MHz; σ = 0.984 S/m; ε_r = 54.735;
ρ = 1000$_{kg/m^3}$
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(6.19, 6.19, 6.19); Calibrated: 2017.9.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch128/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.45 W/kg

Ch128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.94 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 2.16 W/kg
SAR(1 g) = 1.080 W/kg; SAR(10 g) = 0.566 W/kg
Maximum value of SAR (measured) = 1.36 W/kg



0 dB = 1.45 W/kg = 1.61 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.14

10_GSM1900_GPRS 2 Tx slots_Bottom Side_5mm_Ch512

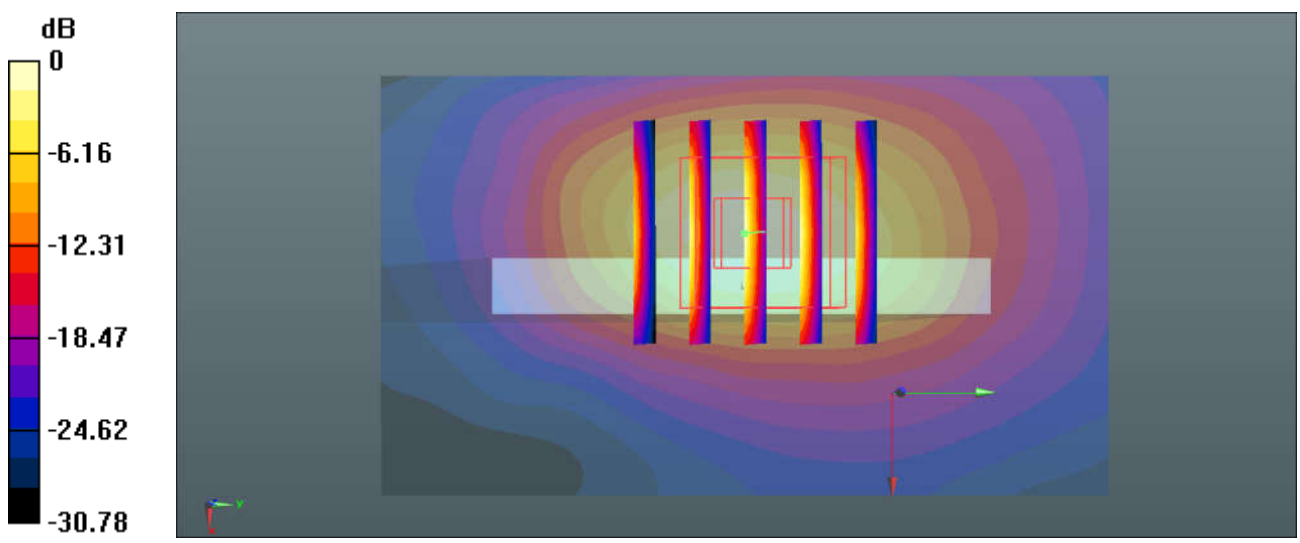
Communication System: UID 0, GPRS/EDGE (2 Tx slots) (0); Frequency: 1850.2 MHz;Duty Cycle: 1:4.15
Medium: MSL_1900 Medium parameters used: f = 1850.2 MHz; σ = 1.471 S/m; ε_r = 51.941;
ρ = 1000 kg/m^3

Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(4.86, 4.86, 4.86); Calibrated: 2017.9.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch512/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.75 W/kg

Ch512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.46 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.91 W/kg
SAR(1 g) = 1.070 W/kg; SAR(10 g) = 0.520 W/kg
Maximum value of SAR (measured) = 1.37 W/kg



0 dB = 1.75 W/kg = 2.43 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.14

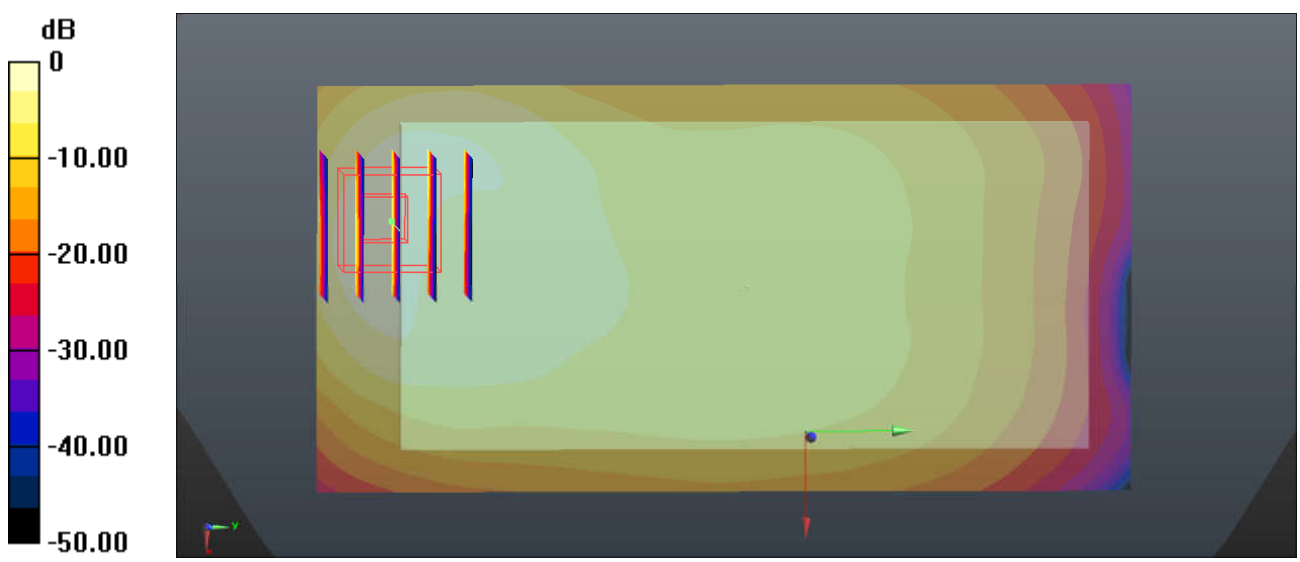
11_WCDMA Band V_RMC 12.2Kbps_Front_5mm_Ch4233

Communication System: UID 0, UMTS (0); Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: MSL_850 Medium parameters used: f = 846.6 MHz; σ = 1.007 S/m; ε_r = 54.512; ρ =1000$_{kg/m^3}$
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(6.19, 6.19, 6.19); Calibrated: 2017.9.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch4233/Area Scan (61x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.12 W/kg

Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.73 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.66 W/kg
SAR(1 g) = 0.853 W/kg; SAR(10 g) = 0.446 W/kg
Maximum value of SAR (measured) = 1.10 W/kg



0 dB = 1.12 W/kg = 0.49 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.14

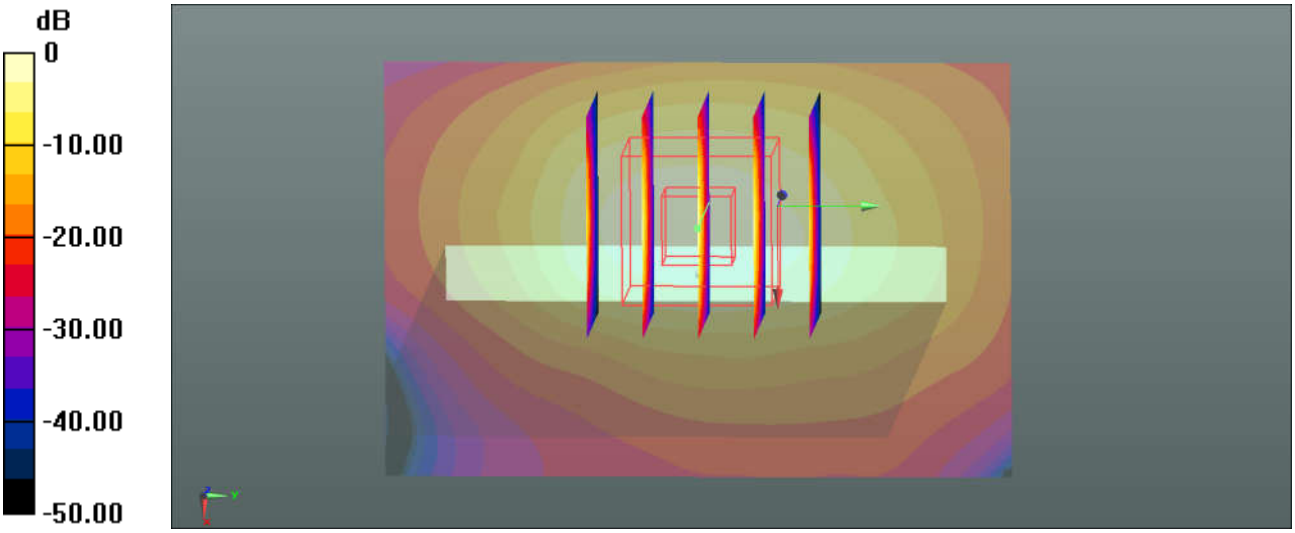
12_WCDMA Band II_RMC 12.2Kbps_Bottom Side_5mm_Ch9400

Communication System: UID 0, UMTS (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL_1900 Medium parameters used: f = 1880 MHz; σ = 1.502 S/m; ε_r = 51.824;
ρ = 1000$_{kg/m^3}$
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(4.86, 4.86, 4.86); Calibrated: 2017.9.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch9400/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.974 W/kg

Ch9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.67 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.34 W/kg
SAR(1 g) = 0.710 W/kg; SAR(10 g) = 0.343 W/kg
Maximum value of SAR (measured) = 0.921 W/kg



0 dB = 0.974 W/kg = -0.11 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.1.14

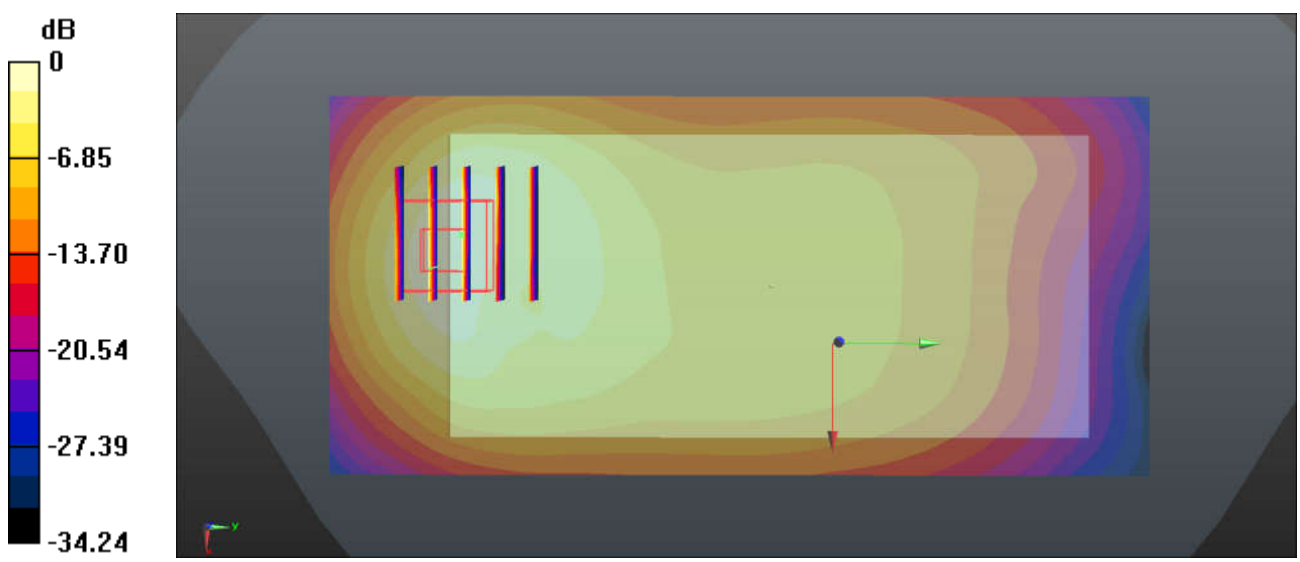
13_LTE Band 26_15M_QPSK_1RB_74Offset_Front_5mm_Ch26865

Communication System: UID 0, FDD_LTE (0); Frequency: 831.5 MHz;Duty Cycle: 1:1
Medium: MSL_850 Medium parameters used: f = 831.5 MHz; σ = 0.991 S/m; ε_r =54.669;
ρ =1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(6.19, 6.19, 6.19); Calibrated: 2017.9.25;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch26865/Area Scan (61x131x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.07 W/kg

Ch26865/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.75 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.61 W/kg
SAR(1 g) = 0.816 W/kg; SAR(10 g) = 0.430 W/kg
Maximum value of SAR (measured) = 0.973 W/kg



0 dB = 1.07 W/kg = 0.29 dBW/kg

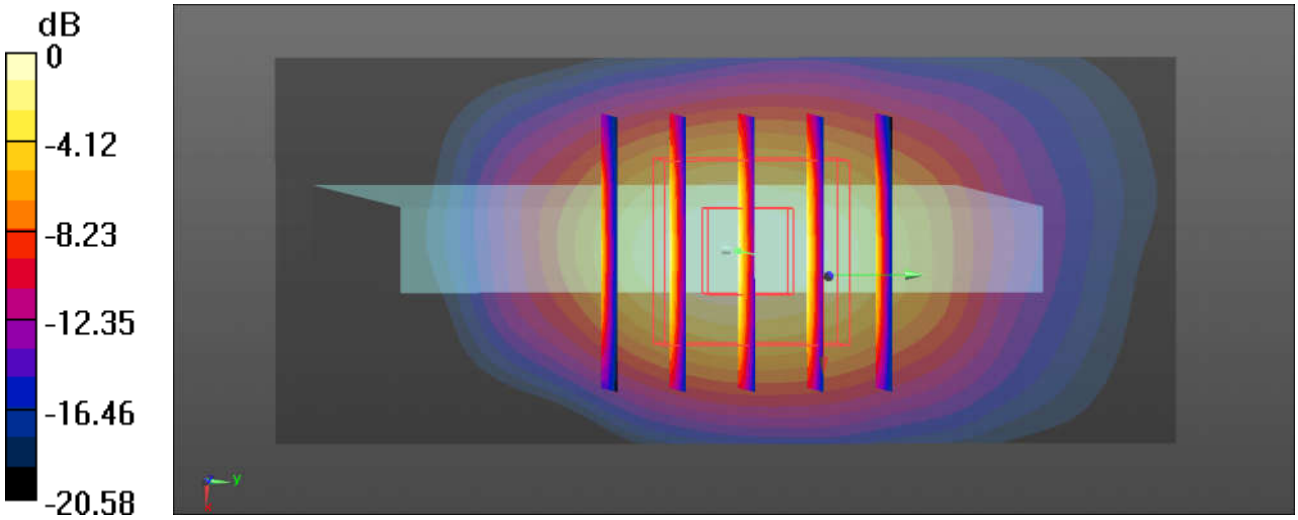
14_LTE Band 2_20M_QPSK_1RB_0Offset_Bottom Side_5mm_Ch18900

Communication System: UID 0, FDD_LTE (0); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL_1900 Medium parameters used: f = 1880 MHz; σ = 1.502 S/m; ε_r = 51.824; ρ = 1000kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: ES3DV3 - SN3293; ConvF(4.86, 4.86, 4.86); Calibrated: 2017.9.25;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1326; Calibrated: 2017.9.15
- Phantom: SAM3; Type: SAM; Serial: TP-1839
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch18900/Area Scan (31x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.37 W/kg

Ch18900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.25 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.51 W/kg
SAR(1 g) = 0.791 W/kg; SAR(10 g) = 0.380 W/kg
Maximum value of SAR (measured) = 1.17 W/kg



0 dB = 1.17 W/kg = 0.68 dBW/kg