FCC SAR Test Report

APPLICANT	:	Lenovo (Shanghai) Electronics Technology Co., Ltd.
EQUIPMENT	:	Portable Tablet Computer
BRAND NAME	:	Lenovo
MODEL NAME	:	TB-X704A
FCC ID	:	O57TBX704A
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.

Mark Qu

Prepared by: Mark Qu / Manager

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Approved by: Jones Tsai / Manager

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2627

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA731307	Rev. 01	Initial issue of report	Jun. 06, 2017

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **Lenovo (Shanghai) Electronics Technology Co., Ltd., Portable Tablet Computer, TB-X704A** are as follows.

Equipment Class	Frequency Band		Highest SAR Summary Body 1g SAR (W/kg)	Highest Simultaneous Transmission SAR (W/kg)
Licensed	WCDMA	Band V	**1.20**	1.59
		Band II	1.17	
	LTE	Band 12	1.15	
		Band 5	1.15	
		Band 4	1.09	
		Band 2	1.19	
		Band 7	1.17	
		Band 30	0.97	
DTS	WLAN	2.4GHz WLAN	0.31	1.51
NII		5GHz WLAN	0.99	1.59
DSS	Bluetooth	Bluetooth		1.44
Date of Testing:			2017/5/9 ~ 2017/5/18	

This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) 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, Pingxiang Road, Kunshan Development Zone, Jiangsu, China TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958

Applicant	
Company Name	Lenovo (Shanghai) Electronics Technology Co., Ltd.
Address	NO.68 BUILDING, 199 FENJU RD, China (Shanghai) Pilot Free Trade Zone, 200131, CHINA

Manufacturer	
Company Name	Lenovo PC HK Limited
Address	23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong

3. Guidance Applied

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

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02
- 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

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	Portable Tablet Computer
Brand Name	Lenovo
Model Name	TB-X704A
FCC ID	O57TBX704A
IMEI Code	865301030001438
Wireless Technology and Frequency Range	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 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 30: 2307.5 MHz ~ 2312.5 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
Mode	RMC 12.2Kbps HSDPA HSUPA HSPA+ (16QAM uplink is not supported) DC-HSDPA LTE: QPSK, 16QAM WLAN 2.4GHz 802.11b/g/n HT20/HT40 WLAN 5GHz 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80 Bluetooth v3.0+EDR, Bluetooth v4.0 LE, Bluetooth v4.1 LE, Bluetooth v4.2 LE
HW Version	Lenovo Tablet TB-X704A
SW Version	TB-X704A_RF04_170515
EUT Stage	Identical Prototype

Remark:

1. WLAN operation in 5600 MHz ~ 5650 MHz is notched.
2. This device has no voice function.
3. This device has two WWAN antennas. One antenna is located on the bottom edge of the device and another antenna is located on the top edge of the device. Bottom antenna includes low WWAN frequency bands like WCDMA Band V and LTE Band 5/12 and Top antenna includes high WWAN frequency bands like includes WCDMA Band II and LTE Band 2/4/7/30.
4. The device is capable of switching between the Top antenna and Bottom antenna based on signal strength.
5. This device implanted proximity sensor function at bottom face and edge1, power reduction will be implemented immediately at all high WWAN frequency bands and WLAN bands. For all low WWAN frequency bands only at bottom face can trigger power reduction.

4.2 Component List

There are two types of EUT, the detailed differences between them are shown in the table. According to the differences, we choose sample 1 to perform full test and sample 2 to verify worst case.

Component	Sample 1		Sample 2	
	Spec	Supplier	Spec	Supplier
CPU	MSM8953	Qualcomm	MSM8953	Qualcomm
Flash	MCP_32GB-eMMC_16Gb-LPDDR3	Samsung	MCP_32GB-eMMC_16Gb-LPDDR3	Hynix
LCD+TP	A6090A_OCA_4.8 mm_G+F+F_NEG_COF_10.1_1200*1920_IPS_400_GT9110P_INX_INX_OFLIM_ZIF+ZIF	O-film	A6090A_OCA_4.7 mm_GFF_NEG_COF_10.1_1200*1920_IPS_350_GT9110P_BOE_BOE_GIS_ZIF+ZIF	GIS
Front Camera	Camera_6.5*6.5*3.9_OV5695_5M_FF	Q Technology Limited	Camera_6.5*6.5*3.9_500W_OV5695_FF	AVC
Rear Camera	camera_8.62*8.56*5.06_IMX219_8MP_AF_	Q Technology Limited	Camera_8.5*8.5*5.0mm-800W-OV8856-AF-BB	O-film
Battery	7000 mAh_4.4V_ATL268494	SCUD(FUJIAN)	7000 mAh_4.4V_CA278494G_A6090	Celxpert

4.3 General LTE SAR Test and Reporting Considerations

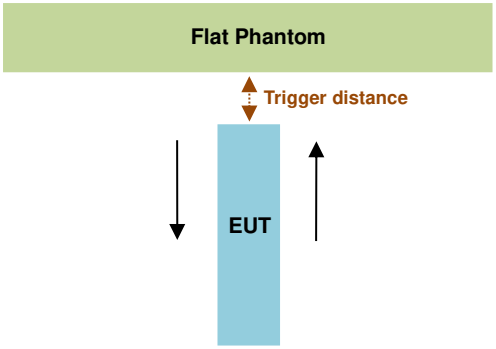
Summarized necessary items addressed in KDB 941225 D05 v02r05	
FCC ID	O57TBX704A
Equipment Name	Portable Tablet Computer
Operating Frequency Range of each LTE transmission band	LTE Band 2: 1850.7 MHz ~ 1909.3 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz LTE Band 5: 824.7 MHz ~ 848.3 MHz LTE Band 7: 2502.5 MHz ~ 2567.5 MHz LTE Band 12: 699.7 MHz ~ 715.3 MHz LTE Band 30: 2307.5 MHz ~ 2312.5 MHz
Channel Bandwidth	LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 7: 5MHz, 10MHz, 15MHz, 20MHz LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz LTE Band 30: 5MHz, 10MHz
Uplink modulations used	QPSK, and 16QAM
LTE Voice / Data requirements	Data only
LTE Release	R10,Cat 6
CA Support	Yes, Downlink only
LTE MPR permanently built-in by design	Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3 Modulation | Channel bandwidth / Transmission bandwidth (RB) | MPR (dB) 1.4 MHz | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz QPSK: > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 1 16 QAM: ≤ 5 | ≤ 4 | ≤ 8 | ≤ 12 | ≤ 16 | ≤ 18 | ≤ 1 16 QAM: > 5 | > 4 | > 8 | > 12 | > 16 | > 18 | ≤ 2
LTE A-MPR	In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)
Spectrum plots for RB configuration	A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.
Power reduction applied to satisfy SAR compliance	1. Yes, Proximity Sensor. 2. Power reduction will be active.
LTE Carrier Aggregation Combinations	Inter-Band possible combinations as below page and the detail power verification please referred to section 13.
LTE Carrier Aggregation Additional Information	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.

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745
LTE Band 5												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	20407	824.7	20415	825.5	20425	826.5	20450	829				
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5				
H	20643	848.3	20635	847.5	20625	846.5	20600	844				
LTE Band 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 12												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz					
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)				
L	23017	699.7	23025	700.5	23035	701.5	23060	704				
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5				
H	23173	715.3	23165	714.5	23155	713.5	23130	711				
LTE Band 30												
	Bandwidth 5 MHz				Bandwidth 10 MHz							
	Channel #		Freq.(MHz)		Channel #		Freq.(MHz)					
L	27685		2307.5		27710		2310					
M	27710		2310									
H	27735		2312.5									

5. Proximity Sensor Triggering Test

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

Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed. The details are illustrated in the exhibit “P-Sensor operational description”, and the shortest triggering distances were reported and used for SAR assessment.
In the preliminary triggering distance testing, the tissue-equivalent medium for different frequency bands were used for verification; no other frequency bands tissue-equivalent medium was found to result in shortest triggering distance, and the tissue-equivalent medium was used for formal proximity sensor triggering testing.



<Low WWAN Frequency Bands>

Proximity Sensor Trigger Distance (mm)	
Position	Bottom Face
Minimum	10

<High WWAN Frequency Bands and WLAN Bands>

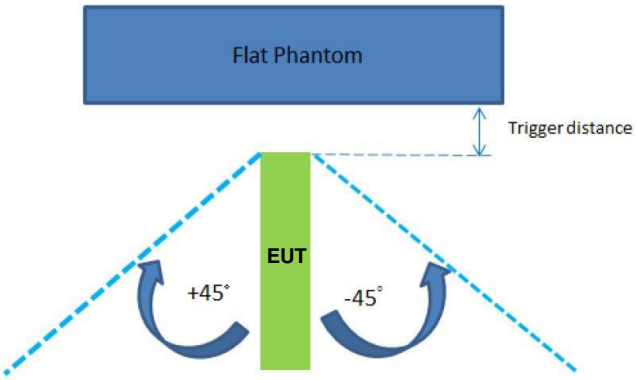
Proximity Sensor Trigger Distance (mm)		
Position	Bottom Face	Edge 1
Minimum	17	20

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

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

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

The influence of table tilt angles to proximity sensor triggering was determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom, at 20 mm separation.
Rotating the tablet around the edge next to the phantom in ≤ 10° increments until the tablet is ± 45° from the vertical position at 0°, and the maximum output power remains in the reduced mode.



<High WWAN Frequency Bands and WLAN Bands>

The Sensor Trigger Distance (mm)	
Position	Edge 1
Minimum	20

Proximity sensor power reduction

Exposure Position / wireless mode	Bottom Face(1)	Edge 1(1)	Edge 2	Edge 3	Edge 4
WCDMA Band V	7.0 dB	0 dB	0 dB	0 dB	0 dB
LTE Band 5	5.0 dB	0 dB	0 dB	0 dB	0 dB
LTE Band 12	5.0 dB	0 dB	0 dB	0 dB	0 dB
WCDMA Band II	8.5 dB	8.5 dB	0 dB	0 dB	0 dB
LTE Band 2	9.0 dB	9.0 dB	0 dB	0 dB	0 dB
LTE Band 4	9.0 dB	9.0 dB	0 dB	0 dB	0 dB
LTE Band 7	11.0 dB	11.0 dB	0 dB	0 dB	0 dB
LTE Band 30	9.0 dB	9.0 dB	0 dB	0 dB	0 dB
WLAN 2.4GHz	6.0 dB	6.0 dB	0 dB	0 dB	0 dB
WLAN 5.2GHz	4.0 dB	4.0 dB	0 dB	0 dB	0 dB
WLAN 5.3GHz	4.0 dB	4.0 dB	0 dB	0 dB	0 dB
WLAN 5.5GHz	4.5 dB	4.5 dB	0 dB	0 dB	0 dB
WLAN 5.8GHz	4.5 dB	4.5 dB	0 dB	0 dB	0 dB

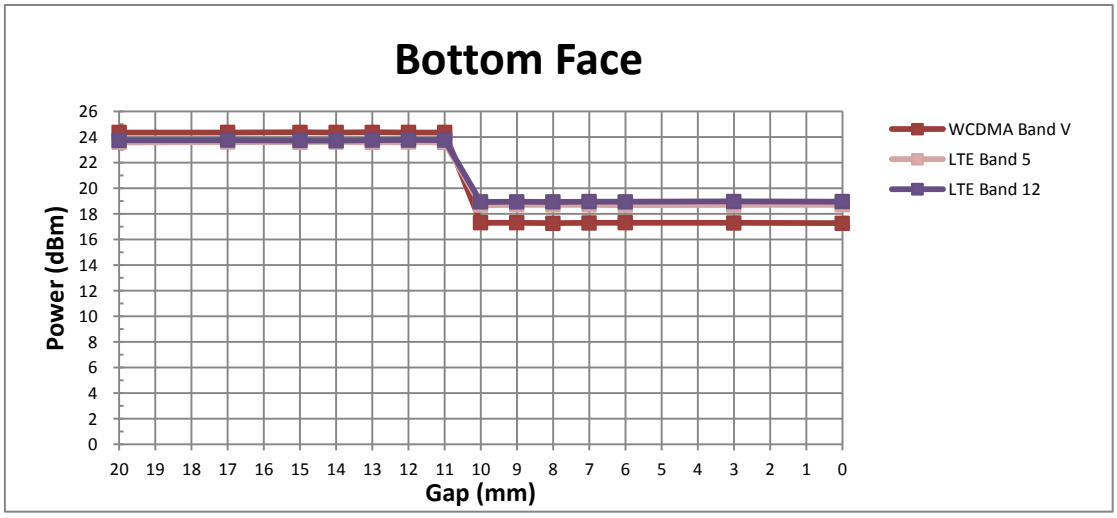
Remark:

1. (1): Reduced maximum limit applied by activation of proximity sensor.
2. Power reduction is not applicable for Bluetooth.
3. Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown and described in exhibit “P-Sensor operational description
4. For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:
   - Bottom Face: 8 mm for Low WWAN Frequency Bands
   - Bottom Face: 15 mm for High WWAN Frequency Bands and WLAN Bands
   - Edge 1: 18 mm for High WWAN Frequency Bands and WLAN Bands

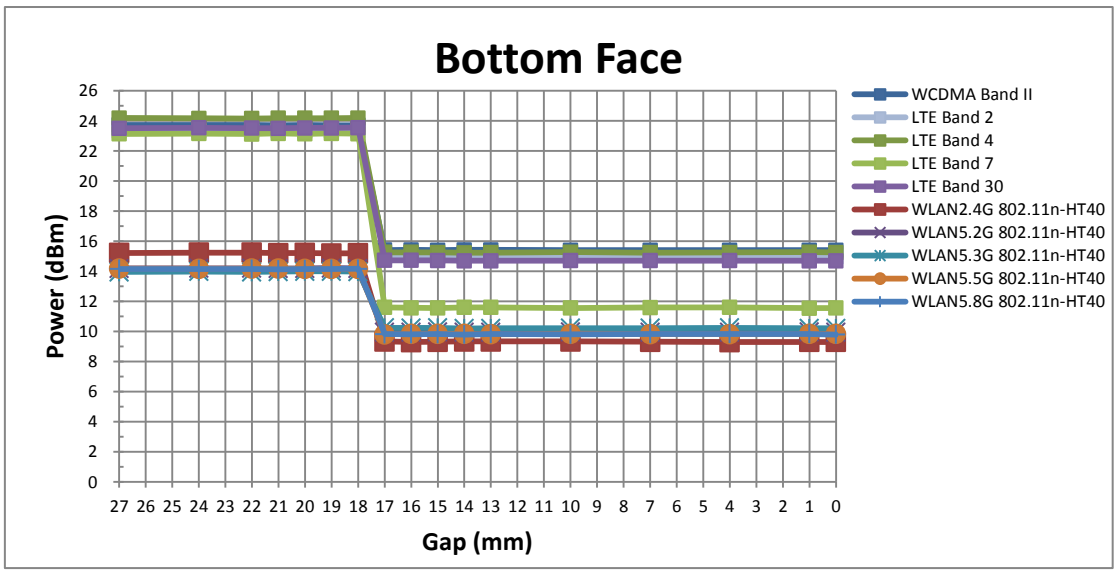
Power Measurement during Sensor Trigger distance testing

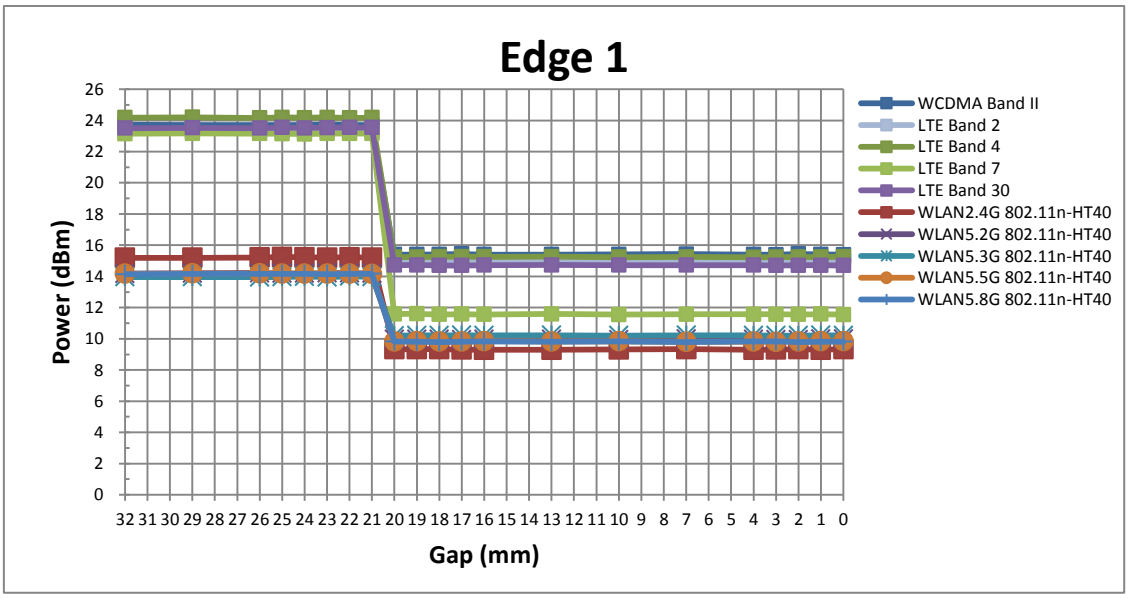
Band/Mode	Ch #	Measured power reduction (dBm)		Reduction Levels
		w/o power back-off	w/ power back-off	(dB)
WCDMA Band V (RMC 12.2Kbps)	4182	23.98	17.19	6.79
LTE Band 5 (10MHz 1RB 25offset)	20525	23.52	18.37	5.15
LTE Band 12 (10MHz 1RB 25offset)	23095	23.66	18.19	5.47
WCDMA Band II (RMC 12.2Kbps)	9400	23.69	15.39	8.3
LTE Band 2 (20MHz 1RB 49offset)	18900	22.95	14.53	8.42
LTE Band 4 (20MHz 1RB 49offset)	20175	24.15	14.69	9.46
LTE Band 7 (20MHz 1RB 0offset)	21100	22.67	10.53	12.14
LTE Band 30 (20MHz 1RB 49offset)	27710	23.50	14.69	8.81
WLAN 2.4GHz 802.11n-HT40 MCS0	6	14.88	9.16	5.72
WLAN 5.2GHz 802.11n-HT40 MCS0	38	14.17	9.94	4.23
WLAN 5.3GHz 802.11n-HT40 MCS0	54	13.95	10.18	3.77
WLAN 5.5GHz 802.11n-HT40 MCS0	110	13.75	9.46	4.29
WLAN 5.8GHz 802.11n-HT40 MCS0	151	14.12	9.79	4.33

<Low WWAN Frequency Bands>



<High WWAN Frequency Bands and WLAN Bands>





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:

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

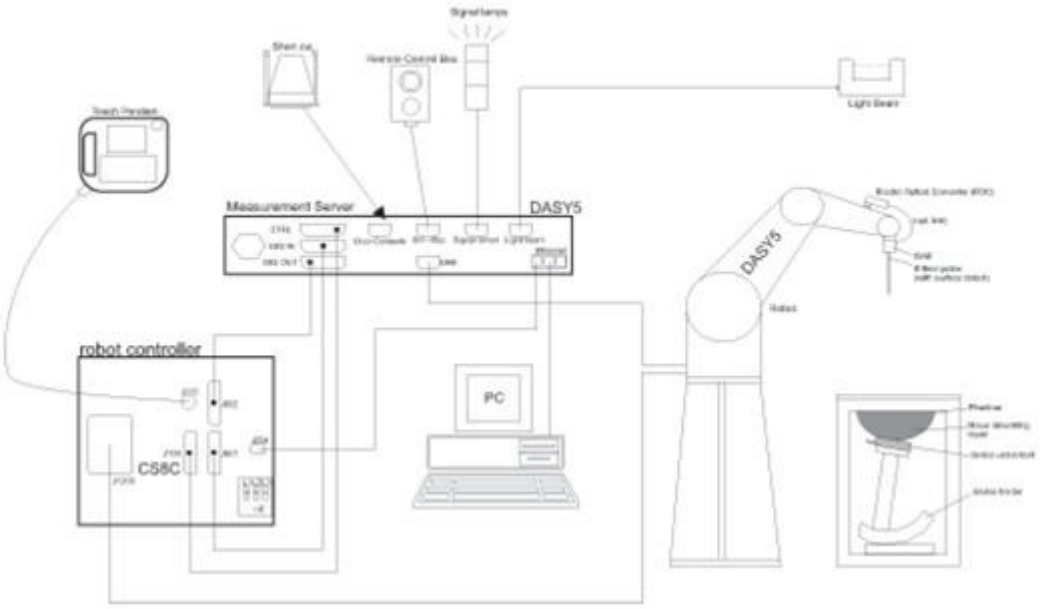
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

8. System Description and Setup

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



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

8.1 E-Field Probe

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

<EX3DV4 Probe>

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

8.2 Data Acquisition Electronics (DAE)

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

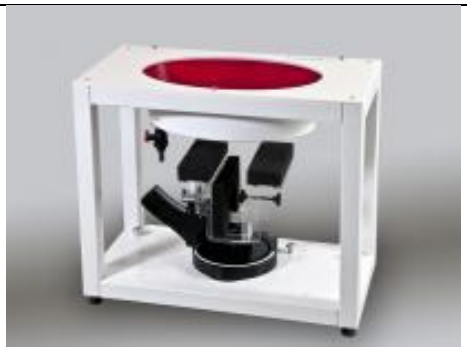
The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.

Fig 5.1 Photo of DAE

8.3 Phantom

<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	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

9.5 Volume Scan Procedures

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

9.6 Power Drift Monitoring

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

10. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1065	2016/11/21	2017/11/20
SPEAG	835MHz System Validation Kit	D835V2	4d091	2016/11/22	2017/11/21
SPEAG	1750MHz System Validation Kit	D1750V2	1069	2016/11/23	2017/11/22
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	2016/11/24	2017/11/23
SPEAG	2300MHz System Validation Kit	D2300V2	1055	2016/8/31	2017/8/30
SPEAG	2450MHz System Validation Kit	D2450V2	840	2016/11/25	2017/11/24
SPEAG	2600MHz System Validation Kit	D2600V2	1061	2016/11/24	2017/11/23
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	2016/12/13	2017/12/12
SPEAG	Data Acquisition Electronics	DAE4	1437	2016/7/12	2017/7/11
SPEAG	Dosimetric E-Field Probe	EX3DV4	3954	2016/11/28	2017/11/27
SPEAG	ELI4 Phantom	QD OVA 001 BB	TP-1127	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201300654	2016/8/8	2017/8/7
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	1144	2016/11/23	2017/11/22
R&S	Signal Generator	SMR40	100455	2017/1/19	2018/1/18
R&S	CBT BLUETOOTH TESTER	CBT	101137	2016/8/9	2017/8/8
Anritsu	Power Senor	MA2411B	1644003	2016/12/23	2017/12/22
Anritsu	Power Meter	ML2495A	1531197	2016/12/23	2017/12/22
Anritsu	Power Senor	MA2411B	1644004	2016/12/23	2017/12/22
Anritsu	Power Meter	ML2495A	1531198	2016/12/23	2017/12/22
R&S	Spectrum Analyzer	FSV7	101631	2016/8/8	2017/8/7
ARRA	Power Divider	A3200-2	N/A	Note	
Agilent	Dual Directional Coupler	778D	50422	Note	
PASTERNACK	Dual Directional Coupler	PE2214-10	N/A	Note	
MCL	Attenuation1	BW-S10W5+	N/A	Note	
MCL	Attenuation2	BW-S10W5+	N/A	Note	
MCL	Attenuation3	BW-S10W5+	N/A	Note	
AR	Amplifier	5S1G4	333096	Note	
mini-circuits	Amplifier	ZVE-3W-83+	162601250	Note	

Note:
Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

11. System Verification

11.1 Tissue Simulating Liquids

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.1.

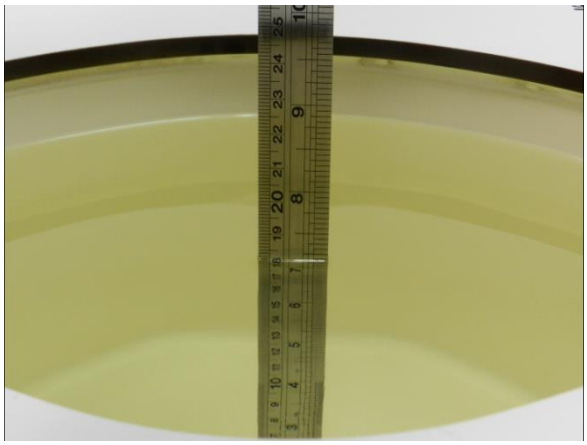


Fig 10.1 Photo of Liquid Height for Body SAR

11.2 Tissue Verification

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

Frequency (MHz)	Water (%)	Sugar (%)	Cellulose (%)	Salt (%)	Preventol (%)	DGBE (%)	Conductivity (σ)	Permittivity (εr)
For Body								
750	51.7	47.2	0	0.9	0.1	0	0.96	55.5
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
2450	68.6	0	0	0	0	31.4	1.95	52.7
2600	68.1	0	0	0.1	0	31.8	2.16	52.5

Simulating Liquid for 5GHz, Manufactured by SPEAG

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

<Tissue Dielectric Parameter Check Results>

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (ε_r)	Conductivity Target (σ)	Permittivity Target (ε_r)	Delta (σ) (%)	Delta (ε_r) (%)	Limit (%)	Date
750	Body	22.8	0.958	55.875	0.96	55.50	-0.21	0.68	±5	2017/5/9
835	Body	22.8	0.965	55.063	0.97	55.20	-0.52	-0.25	±5	2017/5/9
1750	Body	22.6	1.450	52.920	1.49	53.40	-2.68	-0.90	±5	2017/5/16
1900	Body	22.6	1.515	52.452	1.52	53.30	-0.33	-1.59	±5	2017/5/16
2300	Body	22.5	1.855	53.205	1.81	52.90	2.49	0.58	±5	2017/5/17
2450	Body	22.5	2.021	52.544	1.95	52.70	3.64	-0.30	±5	2017/5/17
2600	Body	22.5	2.180	52.618	2.16	52.50	0.93	0.22	±5	2017/5/17
5250	Body	22.7	5.264	48.303	5.36	48.90	-1.79	-1.22	±5	2017/5/18
5600	Body	22.7	5.834	47.448	5.77	48.50	1.11	-2.17	±5	2017/5/18
5750	Body	22.7	6.096	46.929	5.94	48.30	2.63	-2.84	±5	2017/5/18

11.3 System Performance Check Results

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

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured 1g SAR (W/kg)	Targeted 1g SAR (W/kg)	Normalized 1g SAR (W/kg)	Deviation (%)
2017/5/9	750	Body	250	1065	3954	1437	2.14	8.71	8.56	-1.72
2017/5/9	835	Body	250	4d091	3954	1437	2.27	9.68	9.08	-6.20
2017/5/16	1750	Body	250	1069	3954	1437	9.81	37.70	39.24	4.08
2017/5/16	1900	Body	250	5d118	3954	1437	10.40	40.80	41.6	1.96
2017/5/17	2300	Body	250	1055	3954	1437	12.68	49.40	50.72	2.67
2017/5/17	2450	Body	250	840	3954	1437	13.19	50.90	52.76	3.65
2017/5/17	2600	Body	250	1061	3954	1437	13.90	55.40	55.6	0.36
2017/5/18	5250	Body	100	1113	3954	1437	7.68	76.10	76.8	0.92
2017/5/18	5600	Body	100	1113	3954	1437	7.84	79.80	78.4	-1.75
2017/5/18	5750	Body	100	1113	3954	1437	7.31	75.20	73.1	-2.79

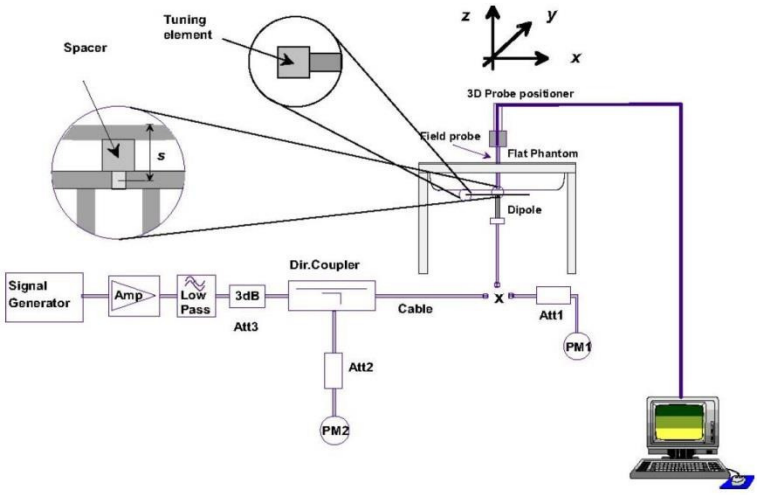


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

12. RF Exposure Positions

12.1 SAR Testing for Tablet

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR exclusion threshold in KDB 447498 D01v06 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

This EUT was tested in four different positions. They are bottom-face, Edge1, Edge2 and Edge3. EUT has proximity sensor function, it would be on bottom-face and Edge1. The distance is 8 mm for low WWAN frequency bands at bottom-face and the distance is 15 mm for high WWAN frequency bands and WLAN bands at bottom-face, the distance is 18 mm at Edge1 with full power. EUT transmitting reduced power was performed when touching with phantom 0 mm. Additional the surface of EUT is touching with phantom 0mm for Edge2 and Edge3 with full power.

13. Conducted RF Output Power (Unit: dBm)

<WCDMA Conducted Power>

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.

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 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	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	β_{ed}1: 47/15 β_{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 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * 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: For subtest 5 the β_c/β_d ratio of 15/15 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 = 14/15 and β_d = 15/15.
Note 5: 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 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

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	Proces ses	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.		

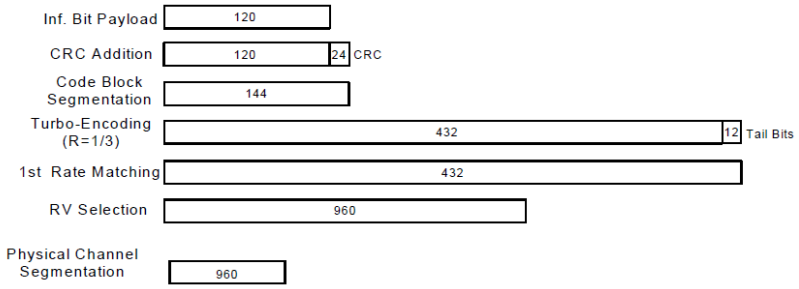


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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. If 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.

Maximum Average RF Power (Proximity Sensor Inactive)

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	RMC 12.2Kbps	23.39	**23.69**	23.55	24.00	24.05	23.98	**24.33**	24.50
3GPP Rel 6	HSDPA Subtest-1	22.30	22.72	22.54	23.00	22.84	22.73	23.21	24.00
3GPP Rel 6	HSDPA Subtest-2	22.35	22.79	22.58	23.00	22.87	22.70	22.40	24.00
3GPP Rel 6	HSDPA Subtest-3	21.90	22.33	22.14	23.00	22.53	22.26	22.60	24.00
3GPP Rel 6	HSDPA Subtest-4	21.89	22.33	22.14	23.00	22.53	22.27	22.61	24.00
3GPP Rel 8	DC-HSDPA Subtest-1	22.35	22.53	22.49	23.00	23.43	23.16	23.56	24.00
3GPP Rel 8	DC-HSDPA Subtest-2	22.34	22.54	22.47	23.00	23.38	23.21	23.51	24.00
3GPP Rel 8	DC-HSDPA Subtest-3	22.41	22.56	22.51	23.00	23.41	23.25	23.49	24.00
3GPP Rel 8	DC-HSDPA Subtest-4	22.36	22.58	22.50	23.00	23.43	23.16	23.47	24.00
3GPP Rel 6	HSUPA Subtest-1	22.37	22.79	22.63	23.00	22.87	22.71	23.21	23.50
3GPP Rel 6	HSUPA Subtest-2	20.32	20.78	20.56	21.00	20.93	20.70	21.17	21.50
3GPP Rel 6	HSUPA Subtest-3	21.41	21.76	21.63	22.00	21.87	21.71	22.17	22.50
3GPP Rel 6	HSUPA Subtest-4	20.50	20.87	20.65	21.00	20.96	20.71	21.20	21.50
3GPP Rel 6	HSUPA Subtest-5	22.20	22.70	22.50	23.00	22.80	22.70	23.20	23.50

Reduced Average RF Power (Proximity Sensor Active)

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	RMC 12.2Kbps	15.25	**15.39**	15.03	15.50	17.06	17.19	**17.27**	17.50
3GPP Rel 6	HSDPA Subtest-1	14.11	14.40	13.98	14.50	15.86	16.07	15.99	17.00
3GPP Rel 6	HSDPA Subtest-2	14.14	14.43	14.02	14.50	16.05	16.17	16.09	17.00
3GPP Rel 6	HSDPA Subtest-3	13.72	13.98	13.60	14.50	15.57	15.69	15.62	17.00
3GPP Rel 6	HSDPA Subtest-4	13.70	14.01	13.58	14.50	15.59	15.71	15.64	17.00
3GPP Rel 8	DC-HSDPA Subtest-1	14.14	14.17	13.93	14.50	16.61	16.81	16.75	17.00
3GPP Rel 8	DC-HSDPA Subtest-2	14.16	14.19	13.93	14.50	16.83	16.97	16.89	17.00
3GPP Rel 8	DC-HSDPA Subtest-3	14.22	14.24	13.95	14.50	16.37	16.45	16.43	17.00
3GPP Rel 8	DC-HSDPA Subtest-4	14.15	14.22	13.94	14.50	16.32	16.51	16.42	17.00
3GPP Rel 6	HSUPA Subtest-1	14.19	14.44	14.09	14.50	15.61	16.33	15.99	16.50
3GPP Rel 6	HSUPA Subtest-2	12.13	12.46	12.00	13.00	13.77	13.98	13.86	14.50
3GPP Rel 6	HSUPA Subtest-3	13.20	13.40	13.07	14.50	14.68	15.31	14.69	15.50
3GPP Rel 6	HSUPA Subtest-4	12.32	12.52	12.11	13.00	13.79	14.01	13.88	14.50
3GPP Rel 6	HSUPA Subtest-5	14.01	14.38	13.94	14.50	15.80	16.20	15.90	16.50

<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 B12 / B5 / B4 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.

Maximum Average RF Power (Proximity Sensor Inactive)

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	23.05	22.83	22.85	24	0
20	QPSK	1	49	23.30	22.95	22.87		
20	QPSK	1	99	22.94	22.85	22.86		
20	QPSK	50	0	22.14	21.95	21.72	23	1
20	QPSK	50	24	22.11	21.84	21.74		
20	QPSK	50	50	22.07	21.79	21.73		
20	QPSK	100	0	22.07	21.90	21.70		
20	16QAM	1	0	21.89	22.00	21.50	23	1
20	16QAM	1	49	21.93	21.72	21.65		
20	16QAM	1	99	21.65	21.70	21.68		
20	16QAM	50	0	21.09	20.84	20.61	22	2
20	16QAM	50	24	21.10	20.84	20.65		
20	16QAM	50	50	21.10	20.70	20.70		
20	16QAM	100	0	20.80	20.78	20.61		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.97	22.98	22.70	24	0
15	QPSK	1	37	23.15	22.92	22.87		
15	QPSK	1	74	23.09	22.69	22.75		
15	QPSK	36	0	22.05	21.89	21.76	23	1
15	QPSK	36	20	22.11	21.90	21.76		
15	QPSK	36	39	22.07	21.77	21.77		
15	QPSK	75	0	22.07	21.88	21.75		
15	16QAM	1	0	21.85	21.78	21.56	23	1
15	16QAM	1	37	21.83	21.84	21.42		
15	16QAM	1	74	21.84	21.87	21.64		
15	16QAM	36	0	21.15	20.76	20.67	22	2
15	16QAM	36	20	21.14	20.81	20.67		
15	16QAM	36	39	21.16	20.68	20.75		
15	16QAM	75	0	21.14	20.97	20.65		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.99	22.70	22.63	24	0
10	QPSK	1	25	23.01	22.63	22.60		
10	QPSK	1	49	22.99	22.60	22.71		
10	QPSK	25	0	22.05	21.90	21.77	23	1
10	QPSK	25	12	22.08	21.87	21.82		
10	QPSK	25	25	22.01	21.90	21.76		
10	QPSK	50	0	22.06	21.94	21.76		
10	16QAM	1	0	22.11	21.71	21.64	23	1
10	16QAM	1	25	21.86	22.10	21.74		
10	16QAM	1	49	21.86	21.73	21.65		
10	16QAM	25	0	21.10	20.89	20.75	22	2
10	16QAM	25	12	21.19	20.88	20.75		
10	16QAM	25	25	21.25	20.82	20.81		
10	16QAM	50	0	21.06	20.94	20.69		

Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.85	22.70	22.55	24	0
5	QPSK	1	12	23.03	22.83	22.84		
5	QPSK	1	24	22.79	22.54	22.78		
5	QPSK	12	0	21.99	21.90	21.79	23	1
5	QPSK	12	7	22.07	21.90	21.72		
5	QPSK	12	13	22.06	21.94	21.76		
5	QPSK	25	0	21.99	21.82	21.81		
5	16QAM	1	0	21.85	21.96	21.53	23	1
5	16QAM	1	12	22.01	22.00	21.57		
5	16QAM	1	24	22.03	21.54	21.54		
5	16QAM	12	0	21.29	21.01	20.81	22	2
5	16QAM	12	7	21.26	21.00	20.80		
5	16QAM	12	13	21.26	21.05	20.86		
5	16QAM	25	0	21.09	20.92	20.82		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	23.11	22.82	22.80	24	0
3	QPSK	1	8	23.28	22.91	22.93		
3	QPSK	1	14	23.00	22.81	22.80		
3	QPSK	8	0	22.03	21.84	21.90	23	1
3	QPSK	8	4	22.03	21.89	21.91		
3	QPSK	8	7	22.08	21.93	21.92		
3	QPSK	15	0	22.09	21.97	21.83		
3	16QAM	1	0	21.96	21.71	21.68	23	1
3	16QAM	1	8	21.83	22.04	21.65		
3	16QAM	1	14	21.89	21.59	22.00		
3	16QAM	8	0	21.12	20.89	20.85	22	2
3	16QAM	8	4	21.11	20.90	20.86		
3	16QAM	8	7	21.13	21.26	20.80		
3	16QAM	15	0	21.20	20.99	20.94		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.96	22.70	22.56	24	0
1.4	QPSK	1	3	23.04	22.72	22.61		
1.4	QPSK	1	5	23.05	22.71	22.64		
1.4	QPSK	3	0	23.17	22.93	22.75		
1.4	QPSK	3	1	23.24	23.08	22.89		
1.4	QPSK	3	3	22.99	22.82	22.81		
1.4	QPSK	6	0	22.09	21.86	21.80	23	1
1.4	16QAM	1	0	21.86	21.67	21.40	23	1
1.4	16QAM	1	3	21.80	21.79	21.60		
1.4	16QAM	1	5	21.71	21.78	21.47		
1.4	16QAM	3	0	21.99	21.97	21.81		
1.4	16QAM	3	1	22.13	21.85	21.84		
1.4	16QAM	3	3	22.15	21.91	21.93		
1.4	16QAM	6	0	20.92	20.89	20.59	22	2

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	23.86	23.72	23.83	24.5	0
20	QPSK	1	49	23.93	24.15	24.00		
20	QPSK	1	99	23.84	23.65	23.70		
20	QPSK	50	0	23.02	23.07	22.90	23.5	1
20	QPSK	50	24	22.93	22.90	22.70		
20	QPSK	50	50	22.79	22.99	22.62		
20	QPSK	100	0	22.93	22.90	22.67		
20	16QAM	1	0	22.93	22.93	22.86	23.5	1
20	16QAM	1	49	22.79	22.65	22.45		
20	16QAM	1	99	22.75	22.54	22.48		
20	16QAM	50	0	22.16	22.09	21.94	22.5	2
20	16QAM	50	24	22.09	22.04	21.67		
20	16QAM	50	50	22.12	21.88	21.68		
20	16QAM	100	0	22.05	21.99	21.64		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	23.84	23.95	23.78	24.5	0
15	QPSK	1	37	24.00	23.92	23.88		
15	QPSK	1	74	23.96	23.54	23.67		
15	QPSK	36	0	22.99	23.07	22.75	23.5	1
15	QPSK	36	20	22.95	22.90	22.62		
15	QPSK	36	39	22.96	22.80	22.63		
15	QPSK	75	0	22.95	22.90	22.60		
15	16QAM	1	0	22.93	22.93	22.75	23.5	1
15	16QAM	1	37	22.80	22.52	22.46		
15	16QAM	1	74	22.78	22.48	22.47		
15	16QAM	36	0	22.03	22.07	21.79	22.5	2
15	16QAM	36	20	22.09	21.98	21.69		
15	16QAM	36	39	22.01	21.80	21.68		
15	16QAM	75	0	22.11	22.08	21.69		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	23.83	23.83	23.43	24.5	0
10	QPSK	1	25	23.87	23.75	23.47		
10	QPSK	1	49	23.74	23.40	23.78		
10	QPSK	25	0	23.04	23.00	22.64	23.5	1
10	QPSK	25	12	22.95	22.86	22.60		
10	QPSK	25	25	22.95	22.84	22.55		
10	QPSK	50	0	22.96	22.92	22.63		
10	16QAM	1	0	22.89	22.81	22.41	23.5	1
10	16QAM	1	25	22.76	22.59	22.40		
10	16QAM	1	49	22.70	22.49	22.49		
10	16QAM	25	0	22.20	22.19	21.90	22.5	2
10	16QAM	25	12	22.03	22.16	21.84		
10	16QAM	25	25	22.10	21.82	21.70		
10	16QAM	50	0	22.03	21.95	21.72		

Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	24.02	23.80	23.68	24.5	0
5	QPSK	1	12	24.11	23.74	23.65		
5	QPSK	1	24	23.84	23.67	23.65		
5	QPSK	12	0	23.03	22.92	22.62	23.5	1
5	QPSK	12	7	23.01	22.93	22.62		
5	QPSK	12	13	23.04	22.86	22.69		
5	QPSK	25	0	23.05	22.96	22.61		
5	16QAM	1	0	22.91	22.64	22.44	23.5	1
5	16QAM	1	12	22.84	22.46	22.50		
5	16QAM	1	24	22.85	22.54	22.44		
5	16QAM	12	0	21.96	21.80	21.55	22.5	2
5	16QAM	12	7	22.00	21.83	21.56		
5	16QAM	12	13	21.95	21.65	21.65		
5	16QAM	25	0	22.22	22.05	21.75		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	24.04	23.85	23.68	24.5	0
3	QPSK	1	8	24.14	23.79	23.65		
3	QPSK	1	14	23.97	23.70	23.67		
3	QPSK	8	0	23.08	22.97	22.67	23.5	1
3	QPSK	8	4	23.04	22.92	22.68		
3	QPSK	8	7	23.06	22.89	22.69		
3	QPSK	15	0	23.04	22.88	22.58		
3	16QAM	1	0	22.50	22.50	22.32	23.5	1
3	16QAM	1	8	22.70	22.80	22.35		
3	16QAM	1	14	22.60	22.62	22.30		
3	16QAM	8	0	22.26	22.00	21.87	22.5	2
3	16QAM	8	4	22.22	21.89	21.86		
3	16QAM	8	7	22.25	21.93	21.85		
3	16QAM	15	0	22.15	21.89	21.69		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	23.95	23.74	23.56	24.5	0
1.4	QPSK	1	3	24.05	23.95	23.63		
1.4	QPSK	1	5	23.87	23.72	23.69		
1.4	QPSK	3	0	24.02	23.95	23.61		
1.4	QPSK	3	1	24.05	24.01	23.66		
1.4	QPSK	3	3	23.92	23.91	23.59		
1.4	QPSK	6	0	22.94	22.94	22.74	23.5	1
1.4	16QAM	1	0	22.72	22.77	22.67	23.5	1
1.4	16QAM	1	3	22.78	22.70	22.86		
1.4	16QAM	1	5	22.81	22.66	22.73		
1.4	16QAM	3	0	23.19	22.92	22.74		
1.4	16QAM	3	1	23.21	22.93	22.81		
1.4	16QAM	3	3	23.13	22.93	22.84		
1.4	16QAM	6	0	22.05	21.78	21.74	22.5	2

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	23.50	23.30	23.40	24	0
10	QPSK	1	25	23.58	23.52	23.52		
10	QPSK	1	49	23.34	23.29	23.20		
10	QPSK	25	0	22.32	22.28	22.33	23	1
10	QPSK	25	12	22.34	22.30	22.26		
10	QPSK	25	25	22.35	22.32	22.24		
10	QPSK	50	0	22.29	22.26	22.26		
10	16QAM	1	0	22.23	22.25	22.48	23	1
10	16QAM	1	25	22.72	22.25	22.35		
10	16QAM	1	49	22.73	22.47	22.25		
10	16QAM	25	0	21.34	21.31	21.34	22	2
10	16QAM	25	12	21.33	21.43	21.33		
10	16QAM	25	25	21.30	21.45	21.31		
10	16QAM	50	0	21.32	21.10	21.32		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	23.25	23.08	23.34	24	0
5	QPSK	1	12	23.46	23.45	23.38		
5	QPSK	1	24	23.18	23.00	23.01		
5	QPSK	12	0	22.39	22.37	22.26	23	1
5	QPSK	12	7	22.41	22.35	22.26		
5	QPSK	12	13	22.37	22.35	22.27		
5	QPSK	25	0	22.45	22.27	22.22		
5	16QAM	1	0	22.35	21.93	22.12	23	1
5	16QAM	1	12	22.36	22.17	22.09		
5	16QAM	1	24	22.03	22.00	21.98		
5	16QAM	12	0	21.33	21.24	21.06	22	2
5	16QAM	12	7	21.38	21.18	21.02		
5	16QAM	12	13	21.31	21.18	21.15		
5	16QAM	25	0	21.30	21.28	21.12		

Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	23.23	23.12	23.23	24	0
3	QPSK	1	8	23.23	23.30	23.26		
3	QPSK	1	14	23.44	23.30	22.99		
3	QPSK	8	0	22.41	22.27	22.36	23	1
3	QPSK	8	4	22.35	22.38	22.26		
3	QPSK	8	7	22.43	22.32	22.29		
3	QPSK	15	0	22.37	22.39	22.39		
3	16QAM	1	0	22.08	22.04	22.03	23	1
3	16QAM	1	8	22.34	22.17	22.34		
3	16QAM	1	14	22.35	22.05	22.19		
3	16QAM	8	0	21.61	21.31	21.28	22	2
3	16QAM	8	4	21.37	21.30	21.20		
3	16QAM	8	7	21.45	21.29	21.23		
3	16QAM	15	0	21.00	21.21	21.23		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	23.13	23.25	23.30	24	0
1.4	QPSK	1	3	23.14	23.20	23.35		
1.4	QPSK	1	5	23.10	23.09	23.30		
1.4	QPSK	3	0	23.40	23.37	23.49		
1.4	QPSK	3	1	23.54	23.54	23.43		
1.4	QPSK	3	3	23.29	23.32	23.26		
1.4	QPSK	6	0	22.28	22.26	22.25	23	1
1.4	16QAM	1	0	22.12	22.11	22.02	23	1
1.4	16QAM	1	3	22.12	22.20	22.12		
1.4	16QAM	1	5	22.03	22.02	22.03		
1.4	16QAM	3	0	22.19	22.29	22.22		
1.4	16QAM	3	1	22.34	22.50	22.27		
1.4	16QAM	3	3	22.57	22.36	22.27		
1.4	16QAM	6	0	21.29	21.12	21.09	22	2

<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	23.12	22.67	23.00	23.5	0
20	QPSK	1	49	22.65	22.65	23.05		
20	QPSK	1	99	22.89	22.65	22.87		
20	QPSK	50	0	22.16	21.77	21.66	22.5	1
20	QPSK	50	24	21.89	21.81	21.86		
20	QPSK	50	50	21.88	21.72	21.84		
20	QPSK	100	0	21.98	21.81	21.71		
20	16QAM	1	0	21.70	21.52	21.20	22.5	1
20	16QAM	1	49	21.68	21.59	21.63		
20	16QAM	1	99	21.60	21.52	21.61		
20	16QAM	50	0	21.05	20.76	20.65	21.5	2
20	16QAM	50	24	20.85	20.79	20.77		
20	16QAM	50	50	20.81	20.70	20.72		
20	16QAM	100	0	20.93	20.78	20.69		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	23.04	22.81	22.73	23.5	0
15	QPSK	1	37	22.98	22.85	23.10		
15	QPSK	1	74	22.86	22.79	22.90		
15	QPSK	36	0	22.19	21.78	21.87	22.5	1
15	QPSK	36	20	22.07	21.82	21.90		
15	QPSK	36	39	21.93	21.85	21.78		
15	QPSK	75	0	22.00	21.73	21.79		
15	16QAM	1	0	22.10	21.61	21.62	22.5	1
15	16QAM	1	37	21.62	21.65	22.06		
15	16QAM	1	74	21.70	21.60	21.93		
15	16QAM	36	0	21.08	20.86	20.74	21.5	2
15	16QAM	36	20	21.07	20.81	20.79		
15	16QAM	36	39	20.86	20.67	20.76		
15	16QAM	75	0	21.07	20.65	20.77		

Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	22.87	22.60	22.81	23.5	0
10	QPSK	1	25	22.90	22.79	22.80		
10	QPSK	1	49	22.66	22.48	22.50		
10	QPSK	25	0	22.17	21.75	21.79	22.5	1
10	QPSK	25	12	22.14	21.81	21.80		
10	QPSK	25	25	21.95	21.81	21.80		
10	QPSK	50	0	22.14	21.83	21.76		
10	16QAM	1	0	22.11	21.69	21.66	22.5	1
10	16QAM	1	25	22.10	21.68	21.65		
10	16QAM	1	49	21.75	21.71	21.70		
10	16QAM	25	0	21.14	20.76	20.76	21.5	2
10	16QAM	25	12	21.15	20.81	20.75		
10	16QAM	25	25	20.99	20.82	20.91		
10	16QAM	50	0	21.14	20.79	20.75		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	22.88	22.63	22.40	23.5	0
5	QPSK	1	12	22.87	22.85	22.64		
5	QPSK	1	24	22.73	22.58	22.40		
5	QPSK	12	0	22.22	21.80	21.76	22.5	1
5	QPSK	12	7	22.14	21.83	21.78		
5	QPSK	12	13	22.11	21.83	21.77		
5	QPSK	25	0	22.09	21.75	21.78		
5	16QAM	1	0	21.97	21.50	21.51	22.5	1
5	16QAM	1	12	22.00	21.63	21.52		
5	16QAM	1	24	21.87	21.52	21.57		
5	16QAM	12	0	21.06	20.63	20.65	21.5	2
5	16QAM	12	7	20.96	20.66	20.67		
5	16QAM	12	13	21.11	20.69	20.75		
5	16QAM	25	0	21.28	20.83	20.85		

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	23.48	23.25	23.28	24.5	0
10	QPSK	1	25	23.72	23.66	23.48		
10	QPSK	1	49	23.25	23.06	23.09		
10	QPSK	25	0	22.45	22.46	22.44	23.5	1
10	QPSK	25	12	22.45	22.35	22.38		
10	QPSK	25	25	22.45	22.43	22.34		
10	QPSK	50	0	22.43	22.42	22.42		
10	16QAM	1	0	22.28	22.24	22.21	23.5	1
10	16QAM	1	25	22.35	22.37	21.93		
10	16QAM	1	49	22.26	22.03	22.07		
10	16QAM	25	0	21.58	21.36	21.39	22.5	2
10	16QAM	25	12	21.52	21.40	21.32		
10	16QAM	25	25	21.41	21.41	21.35		
10	16QAM	50	0	21.45	21.37	21.19		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	23.29	23.23	22.92	24.5	0
5	QPSK	1	12	23.94	23.66	23.40		
5	QPSK	1	24	23.36	23.19	23.14		
5	QPSK	12	0	22.46	22.49	22.30	23.5	1
5	QPSK	12	7	22.60	22.48	22.38		
5	QPSK	12	13	22.51	22.45	22.20		
5	QPSK	25	0	22.46	22.45	22.31		
5	16QAM	1	0	22.31	22.29	22.00	23.5	1
5	16QAM	1	12	22.64	22.17	22.47		
5	16QAM	1	24	22.33	22.03	21.98		
5	16QAM	12	0	21.25	21.46	21.18	22.5	2
5	16QAM	12	7	21.46	21.30	21.06		
5	16QAM	12	13	21.63	21.35	21.31		
5	16QAM	25	0	21.68	21.40	21.19		

Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	23.51	23.48	23.17	24.5	0
3	QPSK	1	8	23.88	23.68	23.65		
3	QPSK	1	14	23.51	23.13	23.30		
3	QPSK	8	0	22.61	22.52	22.35	23.5	1
3	QPSK	8	4	22.51	22.51	22.26		
3	QPSK	8	7	22.61	22.45	22.33		
3	QPSK	15	0	22.57	22.44	22.35		
3	16QAM	1	0	22.24	22.40	22.06	23.5	1
3	16QAM	1	8	22.24	22.33	22.46		
3	16QAM	1	14	22.37	22.11	22.27		
3	16QAM	8	0	21.52	21.78	21.58	22.5	2
3	16QAM	8	4	21.60	21.37	21.21		
3	16QAM	8	7	21.60	21.48	21.36		
3	16QAM	15	0	21.47	21.45	21.21		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	23.44	23.27	23.15	24.5	0
1.4	QPSK	1	3	23.53	23.48	23.30		
1.4	QPSK	1	5	23.34	23.45	23.04		
1.4	QPSK	3	0	23.55	23.57	23.28		
1.4	QPSK	3	1	23.60	23.61	23.40		
1.4	QPSK	3	3	23.51	23.52	23.23		
1.4	QPSK	6	0	22.42	22.36	22.20	23.5	1
1.4	16QAM	1	0	22.30	22.23	21.91	23.5	1
1.4	16QAM	1	3	22.40	22.30	22.10		
1.4	16QAM	1	5	22.16	22.05	22.06		
1.4	16QAM	3	0	22.70	22.39	22.19		
1.4	16QAM	3	1	22.78	22.67	22.09		
1.4	16QAM	3	3	22.82	22.61	22.55		
1.4	16QAM	6	0	21.40	21.39	21.12	22.5	2

<LTE Band 30>

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					27710			
Frequency (MHz)					2310			
10	QPSK	1	0		23.17		24	0
10	QPSK	1	25		23.24			
10	QPSK	1	49		23.50			
10	QPSK	25	0		22.35		23	1
10	QPSK	25	12		22.30			
10	QPSK	25	25		22.23			
10	QPSK	50	0		22.35			
10	16QAM	1	0		22.19		23	1
10	16QAM	1	25		22.10			
10	16QAM	1	49		21.99			
10	16QAM	25	0		21.30		22	2
10	16QAM	25	12		21.36			
10	16QAM	25	25		21.21			
10	16QAM	50	0		21.28			
Channel				27685	27710	27735	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2307.5	2310	2312.5		
5	QPSK	1	0	23.00	23.11	23.00	24	0
5	QPSK	1	12	23.38	23.45	23.36		
5	QPSK	1	24	22.95	23.12	23.06		
5	QPSK	12	0	22.30	22.29	22.37	23	1
5	QPSK	12	7	22.27	22.34	22.38		
5	QPSK	12	13	22.22	22.28	22.25		
5	QPSK	25	0	22.21	22.33	22.36		
5	16QAM	1	0	22.35	22.02	22.02	23	1
5	16QAM	1	12	22.19	22.06	21.98		
5	16QAM	1	24	21.91	21.85	22.03		
5	16QAM	12	0	21.12	21.22	21.00	22	2
5	16QAM	12	7	21.34	21.46	21.26		
5	16QAM	12	13	21.19	21.39	21.15		
5	16QAM	25	0	21.10	21.45	21.09		

Reduced Average RF Power (Proximity Sensor Active)

<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	14.03	13.89	13.66	15	0
20	QPSK	1	49	14.93	14.53	14.49		
20	QPSK	1	99	14.02	13.71	13.61		
20	QPSK	50	0	14.67	14.22	14.55	15	0
20	QPSK	50	24	14.58	14.50	14.14		
20	QPSK	50	50	14.61	14.20	14.04		
20	QPSK	100	0	14.65	14.26	14.00		
20	16QAM	1	0	14.26	14.27	13.89	15	0
20	16QAM	1	49	14.89	14.75	14.47		
20	16QAM	1	99	14.35	13.94	13.85		
20	16QAM	50	0	14.70	14.32	14.03	15	0
20	16QAM	50	24	14.90	14.50	14.14		
20	16QAM	50	50	14.73	14.20	14.03		
20	16QAM	100	0	14.65	14.27	13.98		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	14.25	14.08	13.74	15	0
15	QPSK	1	37	14.80	14.47	14.18		
15	QPSK	1	74	14.46	13.90	13.80		
15	QPSK	36	0	14.65	14.28	14.07	15	0
15	QPSK	36	20	14.89	14.52	14.10		
15	QPSK	36	39	14.91	14.39	14.13		
15	QPSK	75	0	14.78	14.38	14.15		
15	16QAM	1	0	14.52	14.41	13.99	15	0
15	16QAM	1	37	14.87	14.70	14.51		
15	16QAM	1	74	14.72	14.15	14.05		
15	16QAM	36	0	14.66	14.39	14.08	15	0
15	16QAM	36	20	14.89	14.53	14.12		
15	16QAM	36	39	14.83	14.40	14.14		
15	16QAM	75	0	14.79	14.39	14.14		
Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	14.55	14.22	14.12	15	0
10	QPSK	1	25	14.73	14.51	14.08		
10	QPSK	1	49	14.78	14.29	14.15		
10	QPSK	25	0	14.76	14.54	14.21	15	0
10	QPSK	25	12	14.72	14.51	14.09		
10	QPSK	25	25	14.88	14.56	14.25		
10	QPSK	50	0	14.81	14.60	14.23		
10	16QAM	1	0	14.82	14.58	14.36	15	0
10	16QAM	1	25	14.91	14.75	14.44		
10	16QAM	1	49	14.88	14.53	14.42		
10	16QAM	25	0	14.79	14.56	14.20	15	0
10	16QAM	25	12	14.73	14.52	14.19		
10	16QAM	25	25	14.86	14.57	14.24		
10	16QAM	50	0	14.84	14.60	14.22		

Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	14.41	14.23	13.88	15	0
5	QPSK	1	12	14.66	14.46	14.19		
5	QPSK	1	24	14.45	14.22	14.08		
5	QPSK	12	0	14.70	14.51	14.17	15	0
5	QPSK	12	7	14.70	14.54	14.24		
5	QPSK	12	13	14.60	14.37	14.17		
5	QPSK	25	0	14.70	14.52	14.26		
5	16QAM	1	0	14.65	14.46	14.07	15	0
5	16QAM	1	12	14.92	14.69	14.52		
5	16QAM	1	24	14.72	14.46	14.31		
5	16QAM	12	0	14.72	14.54	14.17	15	0
5	16QAM	12	7	14.71	14.55	14.34		
5	16QAM	12	13	14.60	14.38	14.27		
5	16QAM	25	0	14.71	14.54	14.26		
Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	14.72	14.56	14.30	15	0
3	QPSK	1	8	14.70	14.52	14.27		
3	QPSK	1	14	14.74	14.56	14.40		
3	QPSK	8	0	14.64	14.45	14.21	15	0
3	QPSK	8	4	14.74	14.56	14.31		
3	QPSK	8	7	14.67	14.44	14.26		
3	QPSK	15	0	14.65	14.48	14.22		
3	16QAM	1	0	14.91	14.78	14.50	15	0
3	16QAM	1	8	14.87	14.75	14.60		
3	16QAM	1	14	14.87	14.78	14.59		
3	16QAM	8	0	14.72	14.49	14.34	15	0
3	16QAM	8	4	14.80	14.62	14.44		
3	16QAM	8	7	14.72	14.49	14.40		
3	16QAM	15	0	14.69	14.50	14.33		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	14.61	14.46	14.14	15	0
1.4	QPSK	1	3	14.78	14.58	14.34		
1.4	QPSK	1	5	14.61	14.39	14.20		
1.4	QPSK	3	0	14.69	14.54	14.27		
1.4	QPSK	3	1	14.75	14.57	14.33		
1.4	QPSK	3	3	14.76	14.56	14.35		
1.4	QPSK	6	0	14.73	14.56	14.32	15	0
1.4	16QAM	1	0	14.79	14.68	14.49	15	0
1.4	16QAM	1	3	14.89	14.81	14.67		
1.4	16QAM	1	5	14.81	14.60	14.53		
1.4	16QAM	3	0	14.71	14.57	14.39		
1.4	16QAM	3	1	14.78	14.60	14.46		
1.4	16QAM	3	3	14.78	14.58	14.46		
1.4	16QAM	6	0	14.82	14.64	14.49	15	0

<LTE Band 4>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20050	20175	20300		
Frequency (MHz)				1720	1732.5	1745		
20	QPSK	1	0	13.94	14.01	13.71	15.5	0
20	QPSK	1	49	15.22	14.69	14.72		
20	QPSK	1	99	13.80	13.67	13.62		
20	QPSK	50	0	14.92	14.56	14.63	15.5	0
20	QPSK	50	24	14.58	14.44	14.33		
20	QPSK	50	50	14.46	14.23	14.26		
20	QPSK	100	0	14.56	14.27	14.22		
20	16QAM	1	0	14.24	14.30	14.00	15.5	0
20	16QAM	1	49	15.19	15.03	15.03		
20	16QAM	1	99	14.12	14.01	13.88		
20	16QAM	50	0	14.46	14.52	14.29	15.5	0
20	16QAM	50	24	14.84	14.66	14.60		
20	16QAM	50	50	14.34	14.19	14.23		
20	16QAM	100	0	14.45	14.35	14.28		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	14.10	14.22	14.04	15.5	0
15	QPSK	1	37	14.96	14.53	14.66		
15	QPSK	1	74	14.14	13.91	13.76		
15	QPSK	36	0	14.69	14.51	14.45	15.5	0
15	QPSK	36	20	14.91	14.54	14.70		
15	QPSK	36	39	14.77	14.30	14.51		
15	QPSK	75	0	14.67	14.43	14.41		
15	16QAM	1	0	14.41	14.46	14.39	15.5	0
15	16QAM	1	37	15.21	14.87	14.94		
15	16QAM	1	74	14.40	14.20	14.11		
15	16QAM	36	0	14.57	14.57	14.32	15.5	0
15	16QAM	36	20	14.82	14.58	14.67		
15	16QAM	36	39	14.70	14.29	14.40		
15	16QAM	75	0	14.56	14.44	14.31		
Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	14.48	14.53	14.44	15.5	0
10	QPSK	1	25	14.89	14.67	14.69		
10	QPSK	1	49	14.69	14.25	14.17		
10	QPSK	25	0	14.69	14.59	14.70	15.5	0
10	QPSK	25	12	14.86	14.60	14.68		
10	QPSK	25	25	14.91	14.41	14.53		
10	QPSK	50	0	14.79	14.50	14.67		
10	16QAM	1	0	14.84	14.93	14.60	15.5	0
10	16QAM	1	25	15.14	15.01	14.96		
10	16QAM	1	49	14.92	14.51	14.61		
10	16QAM	25	0	14.57	14.61	14.59	15.5	0
10	16QAM	25	12	14.80	14.66	14.65		
10	16QAM	25	25	14.84	14.38	14.43		
10	16QAM	50	0	14.69	14.46	14.56		

Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	14.36	14.29	14.37	15.5	0
5	QPSK	1	12	14.71	14.52	14.52		
5	QPSK	1	24	14.51	14.10	14.01		
5	QPSK	12	0	14.59	14.58	14.60	15.5	0
5	QPSK	12	7	14.76	14.55	14.55		
5	QPSK	12	13	14.75	14.48	14.45		
5	QPSK	25	0	14.66	14.42	14.51		
5	16QAM	1	0	14.70	14.62	14.58	15.5	0
5	16QAM	1	12	14.96	14.90	14.82		
5	16QAM	1	24	14.70	14.36	14.37		
5	16QAM	12	0	14.65	14.56	14.52	15.5	0
5	16QAM	12	7	14.70	14.62	14.54		
5	16QAM	12	13	14.69	14.56	14.42		
5	16QAM	25	0	14.56	14.40	14.40		
Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	14.58	14.63	14.65	15.5	0
3	QPSK	1	8	14.90	14.58	14.59		
3	QPSK	1	14	14.76	14.44	14.37		
3	QPSK	8	0	14.69	14.57	14.55	15.5	0
3	QPSK	8	4	14.89	14.58	14.62		
3	QPSK	8	7	14.74	14.52	14.46		
3	QPSK	15	0	14.81	14.48	14.52		
3	16QAM	1	0	14.90	14.88	14.82	15.5	0
3	16QAM	1	8	15.01	14.96	14.75		
3	16QAM	1	14	14.91	14.71	14.73		
3	16QAM	8	0	14.69	14.68	14.60	15.5	0
3	16QAM	8	4	14.80	14.71	14.55		
3	16QAM	8	7	14.72	14.64	14.51		
3	16QAM	15	0	14.69	14.57	14.41		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	14.53	14.46	14.42	15.5	0
1.4	QPSK	1	3	14.78	14.67	14.56		
1.4	QPSK	1	5	14.63	14.39	14.34		
1.4	QPSK	3	0	14.76	14.62	14.49		
1.4	QPSK	3	1	14.79	14.68	14.57		
1.4	QPSK	3	3	14.77	14.59	14.59		
1.4	QPSK	6	0	14.73	14.53	14.53	15.5	0
1.4	16QAM	1	0	14.79	14.83	14.63	15.5	0
1.4	16QAM	1	3	15.04	15.01	14.85		
1.4	16QAM	1	5	14.84	14.76	14.54		
1.4	16QAM	3	0	14.76	14.68	14.49		
1.4	16QAM	3	1	14.77	14.76	14.58		
1.4	16QAM	3	3	14.75	14.67	14.61		
1.4	16QAM	6	0	14.76	14.68	14.61	15.5	0

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	18.00	18.50	18.19	19	0
10	QPSK	1	25	18.67	18.37	18.26		
10	QPSK	1	49	18.17	18.33	18.19		
10	QPSK	25	0	18.39	18.33	18.29	19	0
10	QPSK	25	12	18.40	18.37	18.27		
10	QPSK	25	25	18.42	18.37	18.32		
10	QPSK	50	0	18.40	18.29	18.30		
10	16QAM	1	0	18.04	18.18	18.44	19	0
10	16QAM	1	25	18.15	18.20	18.49		
10	16QAM	1	49	18.29	18.04	18.42		
10	16QAM	25	0	18.62	18.45	18.36	19	0
10	16QAM	25	12	18.66	18.40	18.28		
10	16QAM	25	25	18.63	18.47	18.24		
10	16QAM	50	0	18.32	18.41	18.34		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	18.26	17.93	17.98	19	0
5	QPSK	1	12	18.53	18.42	18.40		
5	QPSK	1	24	17.94	18.20	17.80		
5	QPSK	12	0	18.30	18.39	18.36	19	0
5	QPSK	12	7	18.40	18.33	18.37		
5	QPSK	12	13	18.35	18.30	18.24		
5	QPSK	25	0	18.35	18.28	18.25		
5	16QAM	1	0	18.32	18.41	18.43	19	0
5	16QAM	1	12	18.58	18.54	18.58		
5	16QAM	1	24	18.29	18.19	18.23		
5	16QAM	12	0	18.46	18.25	18.48	19	0
5	16QAM	12	7	18.61	18.14	18.12		
5	16QAM	12	13	18.56	18.16	18.25		
5	16QAM	25	0	18.22	18.12	18.57		

Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	18.21	18.13	18.26	19	0
3	QPSK	1	8	18.22	18.04	18.26		
3	QPSK	1	14	18.39	18.01	18.13		
3	QPSK	8	0	18.32	18.35	18.36	19	0
3	QPSK	8	4	18.26	18.37	18.33		
3	QPSK	8	7	18.31	18.30	18.30		
3	QPSK	15	0	18.27	18.39	18.27		
3	16QAM	1	0	18.00	18.04	18.32	19	0
3	16QAM	1	8	18.04	18.17	18.32		
3	16QAM	1	14	18.28	18.07	17.96		
3	16QAM	8	0	17.95	18.03	18.32	19	0
3	16QAM	8	4	18.51	18.46	18.28		
3	16QAM	8	7	18.66	18.47	18.54		
3	16QAM	15	0	18.31	18.28	18.30		
Channel				20407	20525	20643	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	18.21	18.22	18.16	19	0
1.4	QPSK	1	3	18.30	18.32	18.31		
1.4	QPSK	1	5	18.35	18.27	18.23		
1.4	QPSK	3	0	18.34	18.58	18.45		
1.4	QPSK	3	1	18.29	18.38	18.55		
1.4	QPSK	3	3	18.31	18.42	18.32		
1.4	QPSK	6	0	18.30	18.26	18.15	19	0
1.4	16QAM	1	0	18.01	18.02	17.94	19	0
1.4	16QAM	1	3	18.27	18.18	18.34		
1.4	16QAM	1	5	18.12	17.94	17.93		
1.4	16QAM	3	0	18.20	18.18	18.15		
1.4	16QAM	3	1	18.18	18.28	18.20		
1.4	16QAM	3	3	18.26	18.19	18.26		
1.4	16QAM	6	0	18.20	18.36	18.22	19	0

<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	10.51	10.53	10.60	12.5	0
20	QPSK	1	49	11.55	11.09	11.48		
20	QPSK	1	99	11.28	10.99	10.98		
20	QPSK	50	0	11.50	11.42	11.71	12.5	0
20	QPSK	50	24	11.94	11.78	11.88		
20	QPSK	50	50	11.90	11.38	11.50		
20	QPSK	100	0	11.60	11.34	11.60		
20	16QAM	1	0	10.67	10.51	10.56	12.5	0
20	16QAM	1	49	11.58	11.47	11.81		
20	16QAM	1	99	11.06	11.50	10.95		
20	16QAM	50	0	11.64	11.37	11.66	12.5	0
20	16QAM	50	24	11.94	11.58	11.92		
20	16QAM	50	50	11.73	11.62	11.47		
20	16QAM	100	0	11.74	11.56	11.55		
Channel				20825	21100	21375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2507.5	2535	2562.5		
15	QPSK	1	0	11.49	11.29	11.59	12.5	0
15	QPSK	1	37	11.87	11.42	11.74		
15	QPSK	1	74	11.77	11.26	11.37		
15	QPSK	36	0	11.75	11.43	11.89	12.5	0
15	QPSK	36	20	11.92	11.48	11.82		
15	QPSK	36	39	11.73	11.48	11.52		
15	QPSK	75	0	11.68	11.34	11.60		
15	16QAM	1	0	11.89	11.51	11.78	12.5	0
15	16QAM	1	37	11.97	11.79	11.82		
15	16QAM	1	74	11.84	11.78	11.60		
15	16QAM	36	0	11.88	11.66	11.69	12.5	0
15	16QAM	36	20	11.93	11.58	11.85		
15	16QAM	36	39	11.87	11.72	11.48		
15	16QAM	75	0	11.82	11.58	11.57		

Channel				20800	21100	21400	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2505	2535	2565		
10	QPSK	1	0	11.44	11.17	11.63	12.5	0
10	QPSK	1	25	11.91	11.46	11.57		
10	QPSK	1	49	11.38	11.17	11.38		
10	QPSK	25	0	11.72	11.51	11.84	12.5	0
10	QPSK	25	12	11.94	11.46	11.57		
10	QPSK	25	25	11.60	11.48	11.59		
10	QPSK	50	0	11.69	11.38	11.61		
10	16QAM	1	0	11.81	11.70	11.70	12.5	0
10	16QAM	1	25	11.97	11.87	11.90		
10	16QAM	1	49	11.83	11.68	11.61		
10	16QAM	25	0	11.86	11.75	11.65	12.5	0
10	16QAM	25	12	11.95	11.58	11.64		
10	16QAM	25	25	11.73	11.73	11.56		
10	16QAM	50	0	11.84	11.62	11.59		
Channel				20775	21100	21425	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2502.5	2535	2567.5		
5	QPSK	1	0	11.35	11.03	11.12	12.5	0
5	QPSK	1	12	11.93	11.41	11.61		
5	QPSK	1	24	11.30	11.09	11.27		
5	QPSK	12	0	11.78	11.37	11.46	12.5	0
5	QPSK	12	7	11.98	11.48	11.66		
5	QPSK	12	13	11.92	11.42	11.58		
5	QPSK	25	0	11.64	11.32	11.50		
5	16QAM	1	0	11.75	11.51	11.33	12.5	0
5	16QAM	1	12	11.89	11.78	11.93		
5	16QAM	1	24	11.67	11.57	11.48		
5	16QAM	12	0	11.93	11.62	11.45	12.5	0
5	16QAM	12	7	11.98	11.61	11.73		
5	16QAM	12	13	11.92	11.54	11.67		
5	16QAM	25	0	11.79	11.58	11.49		

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	18.10	18.11	18.21	19.5	0
10	QPSK	1	25	18.93	18.19	18.29		
10	QPSK	1	49	18.18	17.92	18.00		
10	QPSK	25	0	18.42	18.40	18.38	19.5	0
10	QPSK	25	12	18.37	18.35	18.26		
10	QPSK	25	25	18.35	18.31	18.29		
10	QPSK	50	0	18.42	18.36	18.40		
10	16QAM	1	0	17.71	18.14	18.14	19.5	0
10	16QAM	1	25	18.20	18.27	18.12		
10	16QAM	1	49	17.69	18.05	17.93		
10	16QAM	25	0	18.45	18.36	18.43	19.5	0
10	16QAM	25	12	18.33	18.35	18.35		
10	16QAM	25	25	18.73	18.36	18.34		
10	16QAM	50	0	18.48	18.33	18.30		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	18.08	18.18	17.87	19.5	0
5	QPSK	1	12	18.81	18.40	18.59		
5	QPSK	1	24	18.16	18.01	17.96		
5	QPSK	12	0	18.44	18.39	18.24	19.5	0
5	QPSK	12	7	18.55	18.45	18.26		
5	QPSK	12	13	18.48	18.39	18.15		
5	QPSK	25	0	18.47	18.35	18.20		
5	16QAM	1	0	18.20	18.15	18.08	19.5	0
5	16QAM	1	12	18.59	18.74	18.01		
5	16QAM	1	24	18.22	18.01	17.80		
5	16QAM	12	0	18.47	18.49	18.21	19.5	0
5	16QAM	12	7	18.62	18.47	18.17		
5	16QAM	12	13	18.47	18.32	18.32		
5	16QAM	25	0	18.46	18.33	18.28		

Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	18.15	18.40	18.03	19.5	0
3	QPSK	1	8	18.28	18.37	17.97		
3	QPSK	1	14	18.42	18.12	18.11		
3	QPSK	8	0	18.45	18.38	18.31	19.5	0
3	QPSK	8	4	18.46	18.35	18.25		
3	QPSK	8	7	18.45	18.43	18.10		
3	QPSK	15	0	18.46	18.35	18.24		
3	16QAM	1	0	18.12	18.26	18.12	19.5	0
3	16QAM	1	8	18.20	18.18	17.89		
3	16QAM	1	14	18.38	17.97	17.88		
3	16QAM	8	0	18.92	18.41	18.45	19.5	0
3	16QAM	8	4	18.92	18.38	18.12		
3	16QAM	8	7	18.91	18.22	18.21		
3	16QAM	15	0	18.63	18.46	18.25		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	18.51	18.38	18.13	19.5	0
1.4	QPSK	1	3	18.47	18.36	18.26		
1.4	QPSK	1	5	18.49	18.26	18.25		
1.4	QPSK	3	0	18.74	18.52	18.21		
1.4	QPSK	3	1	18.66	18.52	18.23		
1.4	QPSK	3	3	18.41	18.39	18.18		
1.4	QPSK	6	0	18.41	18.34	18.23	19.5	0
1.4	16QAM	1	0	18.41	18.26	18.07	19.5	0
1.4	16QAM	1	3	18.32	18.25	18.06		
1.4	16QAM	1	5	18.15	18.52	18.04		
1.4	16QAM	3	0	18.35	18.56	18.15		
1.4	16QAM	3	1	18.33	18.56	18.17		
1.4	16QAM	3	3	18.33	18.58	18.20		
1.4	16QAM	6	0	18.52	18.43	18.01	19.5	0

<LTE Band 30>

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					27710			
Frequency (MHz)					2310			
10	QPSK	1	0		14.29		15	0
10	QPSK	1	25		14.31			
10	QPSK	1	49		14.69			
10	QPSK	25	0		14.51		15	0
10	QPSK	25	12		14.32			
10	QPSK	25	25		14.50			
10	QPSK	50	0		14.34			
10	16QAM	1	0		14.56		15	0
10	16QAM	1	25		14.81			
10	16QAM	1	49		14.60			
10	16QAM	25	0		14.28		15	0
10	16QAM	25	12		14.45			
10	16QAM	25	25		14.43			
10	16QAM	50	0		14.28			
Channel				27685	27710	27735	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				2307.5	2310	2312.5		
5	QPSK	1	0	13.76	13.85	13.97	15	0
5	QPSK	1	12	14.42	14.46	14.60		
5	QPSK	1	24	13.82	13.98	13.92		
5	QPSK	12	0	14.16	14.16	14.32	15	0
5	QPSK	12	7	14.46	14.49	14.63		
5	QPSK	12	13	14.33	14.49	14.49		
5	QPSK	25	0	14.15	14.17	14.31		
5	16QAM	1	0	14.01	14.12	14.25	15	0
5	16QAM	1	12	14.69	14.70	14.86		
5	16QAM	1	24	14.07	14.28	14.21		
5	16QAM	12	0	14.11	14.11	14.28	15	0
5	16QAM	12	7	14.41	14.45	14.58		
5	16QAM	12	13	14.28	14.45	14.45		
5	16QAM	25	0	14.08	14.11	14.25		

<LTE Carrier Aggregation>

General Note:

This device supports Carrier Aggregation on downlink for inter and intra band, on uplink for intra band. For the device supports bands and bandwidths and configurations are provided as follow table was according to 3GPP.

E-UTRA CA configuration / Bandwidth combination set										
E-UTRA CA Configuration	Uplink CA configurations	E- UTRA Bands	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	Maximum aggregated bandwidth [MHz]	Bandwidth combination set
CA_2A-5A	-	2			Yes	Yes	Yes	Yes	30	0
		5			Yes	Yes				
		2			Yes	Yes			20	1
		5			Yes	Yes				
CA_2A-12A	-	2			Yes	Yes	Yes	Yes	30	0
		12			Yes	Yes				
		2			Yes	Yes	Yes	Yes	30	1
		12		Yes	Yes	Yes				
		2			Yes	Yes			20	2
		12			Yes	Yes				
CA_2A-29A	-	2			Yes	Yes			20	0
		29		Yes	Yes	Yes				
		2			Yes	Yes			20	1
		29			Yes	Yes				
		2			Yes	Yes	Yes	Yes	30	2
		29			Yes	Yes				
CA_4A-5A	-	4			Yes	Yes			20	0
		5			Yes	Yes				
		4			Yes	Yes	Yes	Yes	30	0
		5			Yes	Yes				
CA_4A-12A	-	4	Yes	Yes	Yes	Yes			20	0
		12			Yes	Yes				
		4	Yes	Yes	Yes	Yes	Yes	Yes	30	1
		12			Yes	Yes				
		4			Yes	Yes	Yes	Yes	30	2
		12		Yes	Yes	Yes				
		4			Yes	Yes			20	3
		12			Yes	Yes				
		4			Yes	Yes	Yes	Yes	30	4
		12			Yes	Yes				
		4			Yes	Yes	Yes		20	5
		12			Yes					
CA_4A-29A	-	4			Yes	Yes			20	0
		29		Yes	Yes	Yes				
		4			Yes	Yes			20	1
		29			Yes	Yes				
		4			Yes	Yes	Yes	Yes	30	2
		29			Yes	Yes				

LTE Carrier Aggregation Conducted Power (Downlink)

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. 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 inter-band CA, the SCC selected highest bandwidth and near the middle of its transmission band. For SCC DL RB size and offset will base on the PCC corresponding RB allocation.

Maximum Average RF Power (Proximity Sensor Inactive)

Configure	PCC						SCC				Power	
	LTE Band	BW (MHz)	Freq. (MHz)	Channel	UL# RB	UL RB Offset	LTE Band	BW (MHz)	Freq. (MHz)	Channel	LTE Rel 10 Tx.Power (dBm)	LTE Rel 8 Tx.Power (dBm)
Inter-Band	Band 2	20M	1860	18700	1	49	Band 5	10M	881.5	2525	23.28	23.30
	Band 5	10M	829	20450	1	25	Band 2	20M	1960	900	23.56	23.58
	Band 2	20M	1860	18700	1	49	Band 12	10M	737.5	5095	23.29	23.30
	Band 12	10M	704	23060	1	25	Band 2	20M	1960	900	23.68	23.72
	Band 2	20M	1860	18700	1	49	Band 29	10M	722.5	9715	23.26	23.30
	Band 4	20M	1732.5	20175	1	49	Band 5	10M	881.5	2525	24.13	24.15
	Band 5	10M	829	20450	1	25	Band 4	20M	2132.5	2175	23.55	23.58
	Band 4	20M	1732.5	20175	1	49	Band 12	10M	737.5	5095	24.12	24.15
	Band 12	10M	704	23060	1	25	Band 4	10M	2132.5	2175	23.71	23.72
	Band 4	20M	1732.5	20175	1	49	Band 29	10M	722.5	9715	24.13	24.15

Maximum Average RF Power (Proximity Sensor Active)

Configure	PCC						SCC				Power	
	LTE Band	BW (MHz)	Freq. (MHz)	Channel	UL# RB	UL RB Offset	LTE Band	BW (MHz)	Freq. (MHz)	Channel	LTE Rel 10 Tx.Power (dBm)	LTE Rel 8 Tx.Power (dBm)
Inter-Band	Band 2	20M	1860	18700	1	49	Band 5	10M	881.5	2525	14.91	14.93
	Band 5	10M	829	20450	1	25	Band 2	20M	1960	900	18.65	18.67
	Band 2	20M	1860	18700	1	49	Band 12	10M	737.5	5095	14.92	14.93
	Band 12	10M	704	23060	1	25	Band 2	20M	1960	900	18.91	18.93
	Band 2	20M	1860	18700	1	49	Band 29	10M	722.5	9715	14.92	14.93
	Band 4	20M	1720	20050	1	49	Band 5	10M	881.5	2525	15.21	15.22
	Band 5	10M	829	20450	1	25	Band 4	20M	2132.5	2175	18.62	18.67
	Band 4	20M	1720	20050	1	49	Band 12	10M	737.5	5095	15.21	15.22
	Band 12	10M	704	23060	1	25	Band 4	10M	2132.5	2175	18.91	18.93
	Band 4	20M	1720	20050	1	49	Band 29	10M	722.5	9715	15.20	15.22

<WLAN Conducted Power>

General Note:

1. Per KDB 248227 D01v02r02, SAR test reduction is determined according to 802.11 transmission mode configurations and certain exposure conditions with multiple test positions. In the 2.4 GHz band, separate SAR procedures are applied to DSSS and OFDM configurations to simplify DSSS test requirements. For OFDM, in both 2.4 and 5 GHz bands, an initial test configuration must be determined for each standalone and aggregated frequency band, according to the transmission mode configuration with the highest maximum output power specified for production units to perform SAR measurements. If the same highest maximum output power applies to different combinations of channel bandwidths, modulations and data rates, additional procedures are applied to determine which test configurations require SAR measurement. When applicable, an initial test position may be applied to reduce the number of SAR measurements required for next to the ear, UMPC mini-tablet or hotspot mode configurations with multiple test positions.
2. For 2.4 GHz 802.11b DSSS, either the initial test position procedure for multiple exposure test positions or the DSSS procedure for fixed exposure position is applied; these are mutually exclusive. For 2.4 GHz and 5 GHz OFDM configurations, the initial test configuration is applied to measure SAR using either the initial test position procedure for multiple exposure test position configurations or the initial test configuration procedures for fixed exposure test conditions. Based on the reported SAR of the measured configurations and maximum output power of the transmission mode configurations that are not included in the initial test configuration, the subsequent test configuration and initial test position procedures are applied to determine if SAR measurements are required for the remaining OFDM transmission configurations. In general, the number of test channels that require SAR measurement is minimized based on maximum output power measured for the test sample(s).
3. For OFDM transmission configurations in the 2.4 GHz and 5 GHz bands, When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel for each frequency band.
4. DSSS and OFDM configurations are considered separately according to the required SAR procedures. SAR is measured in the initial test position using the 802.11 transmission mode configuration required by the DSSS procedure or initial test configuration and subsequent test configuration(s) according to the OFDM procedures.18 The initial test position procedure is described in the following:
    a. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band.
    b. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
    c. For all positions/configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

<Maximum Average RF Power (Proximity Sensor Inactive)>

<2.4GHz WLAN>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-up limit (dBm)	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	15.15	15.50	97.66
		6	2437	14.95	15.50	
		11	2462	14.06	15.50	
	802.11g 6Mbps	1	2412	14.86	15.50	82.60
		6	2437	14.35	15.50	
		11	2462	13.64	15.50	
	802.11n-HT20 MCS0	1	2412	15.16	15.50	86.58
		6	2437	14.88	15.50	
		11	2462	13.84	15.50	
	802.11n-HT40 MCS0	3	2422	**15.19**	15.50	86.56
		6	2437	14.88	15.50	
		9	2452	14.25	15.50	

<5GHz WLAN>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	14.20	14.50	87.50
		40	5200	14.00	14.50	
		44	5220	13.87	14.50	
		48	5240	13.94	14.50	
	802.11n-HT20 MCS0	36	5180	14.18	14.50	86.09
		40	5200	13.99	14.50	
		44	5220	13.78	14.50	
		48	5240	14.12	14.50	
	802.11n-HT40 MCS0	38	5190	14.17	14.50	86.56
		46	5230	14.05	14.50	
	802.11ac-VHT20 MCS0	36	5180	13.23	14.00	82.72
		40	5200	13.14	14.00	
		44	5220	13.03	14.00	
		48	5240	13.34	14.00	
	802.11ac-VHT40 MCS0	38	5190	13.19	14.00	70.83
		46	5230	13.15	14.00	
	802.11ac-VHT80 MCS0	42	5210	12.15	13.00	55.34

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	**14.09**	14.50	87.50
		56	5280	13.83	14.50	
		60	5300	13.79	14.50	
		64	5320	13.86	14.50	
	802.11n-HT20 MCS0	52	5260	13.96	14.50	86.09
		56	5280	13.87	14.50	
		60	5300	13.84	14.50	
		64	5320	13.92	14.50	
	802.11n-HT40 MCS0	54	5270	13.95	14.50	86.56
		62	5310	13.88	14.50	
	802.11ac-VHT20 MCS0	52	5260	13.16	14.00	82.72
		56	5280	13.09	14.00	
		60	5300	12.99	14.00	
		64	5320	12.83	14.00	
	802.11ac-VHT40 MCS0	54	5270	13.12	14.00	70.83
		62	5310	12.91	14.00	
	802.11ac-VHT80 MCS0	58	5290	12.06	13.00	55.34

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	13.75	14.50	87.50
		116	5580	13.74	14.50	
		132	5660	13.82	14.50	
		140	5700	13.69	14.50	
	802.11n-HT20 MCS0	100	5500	13.80	14.50	86.09
		116	5580	13.83	14.50	
		132	5660	13.99	14.50	
		140	5700	14.07	14.50	
	802.11n-HT40 MCS0	102	5510	14.01	14.50	86.56
		110	5550	13.75	14.50	
		134	5670	**14.14**	14.50	
	802.11ac-VHT20 MCS0	100	5500	13.10	13.50	82.72
		116	5580	12.66	13.50	
		132	5660	12.90	13.50	
		140	5700	12.97	13.50	
	802.11ac-VHT40 MCS0	102	5510	13.16	13.50	70.83
		110	5550	12.93	13.50	
		134	5670	13.22	13.50	
	802.11ac-VHT80 MCS0	106	5530	12.08	13.50	55.34

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a MCS0	149	5745	**14.14**	14.50	87.50
		157	5785	13.64	14.50	
		165	5825	13.90	14.50	
	802.11n-HT20 MCS0	149	5745	14.03	14.50	86.09
		157	5785	13.89	14.50	
		165	5825	14.12	14.50	
	802.11n-HT40 MCS0	151	5755	14.12	14.50	86.56
		159	5795	13.74	14.50	
	802.11ac-VHT20 MCS0	149	5745	12.98	13.50	82.72
		157	5785	13.03	13.50	
		165	5825	13.18	13.50	
	802.11ac-VHT40 MCS0	151	5755	13.21	13.50	70.83
		159	5795	12.84	13.50	
	802.11ac-VHT80 MCS0	155	5775	12.10	13.50	55.34

<Maximum Average RF Power (Proximity Sensor Active)>

<2.4GHz WLAN>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN	802.11b 1Mbps	1	2412	9.03	9.50	97.66
		6	2437	9.11	9.50	
		11	2462	8.21	9.50	
	802.11g 6Mbps	1	2412	9.26	9.50	82.60
		6	2437	8.97	9.50	
		11	2462	8.05	9.50	
	802.11n-HT20 MCS0	1	2412	9.19	9.50	86.58
		6	2437	8.45	9.50	
		11	2462	7.45	9.00	
	802.11n-HT40 MCS0	3	2422	**9.29**	9.50	86.56
		6	2437	9.16	9.50	
		9	2452	8.38	9.50	

<5GHz WLAN>

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN	802.11a 6Mbps	36	5180	9.89	10.50	87.50
		40	5200	9.73	10.50	
		44	5220	9.57	10.50	
		48	5240	9.93	10.50	
	802.11n-HT20 MCS0	36	5180	9.91	10.50	86.09
		40	5200	9.86	10.50	
		44	5220	9.79	10.50	
		48	5240	9.97	10.50	
	802.11n-HT40 MCS0	38	5190	9.94	10.50	86.56
		46	5230	**10.02**	10.50	
	802.11ac-VHT20 MCS0	36	5180	9.60	10.00	82.72
		40	5200	9.48	10.00	
		44	5220	9.34	10.00	
		48	5240	9.45	10.00	
	802.11ac-VHT40 MCS0	38	5190	9.82	10.00	70.83
		46	5230	9.73	10.00	
	802.11ac-VHT80 MCS0	42	5210	9.66	10.00	55.34

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.3GHz WLAN	802.11a 6Mbps	52	5260	9.97	10.50	87.50
		56	5280	9.74	10.50	
		60	5300	9.84	10.50	
		64	5320	9.55	10.50	
	802.11n-HT20 MCS0	52	5260	9.62	10.50	86.09
		56	5280	9.91	10.50	
		60	5300	9.78	10.50	
		64	5320	9.86	10.50	
	802.11n-HT40 MCS0	54	5270	**10.18**	10.50	86.56
		62	5310	9.92	10.50	
	802.11ac-VHT20 MCS0	52	5260	9.67	10.00	82.72
		56	5280	9.44	10.00	
		60	5300	9.35	10.00	
		64	5320	9.47	10.00	
	802.11ac-VHT40 MCS0	54	5270	9.63	10.00	70.83
		62	5310	9.43	10.00	
	802.11ac-VHT80 MCS0	58	5290	9.61	10.00	55.34

	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.5GHz WLAN	802.11a 6Mbps	100	5500	9.52	10.00	87.50
		116	5580	9.72	10.00	
		132	5660	9.77	10.00	
		140	5700	9.09	10.00	
	802.11n-HT20 MCS0	100	5500	9.56	10.00	86.09
		116	5580	9.76	10.00	
		132	5660	9.71	10.00	
		140	5700	9.09	10.00	
	802.11n-HT40 MCS0	102	5510	9.69	10.00	86.56
		110	5550	9.46	10.00	
		134	5670	**9.80**	10.00	
	802.11ac-VHT20 MCS0	100	5500	9.26	9.50	82.72
		116	5580	9.21	9.50	
		132	5660	9.41	9.50	
		140	5700	8.28	9.50	
	802.11ac-VHT40 MCS0	102	5510	9.26	9.50	70.83
		110	5550	9.18	9.50	
		134	5670	9.32	9.50	
	802.11ac-VHT80 MCS0	106	5530	9.29	9.50	55.34

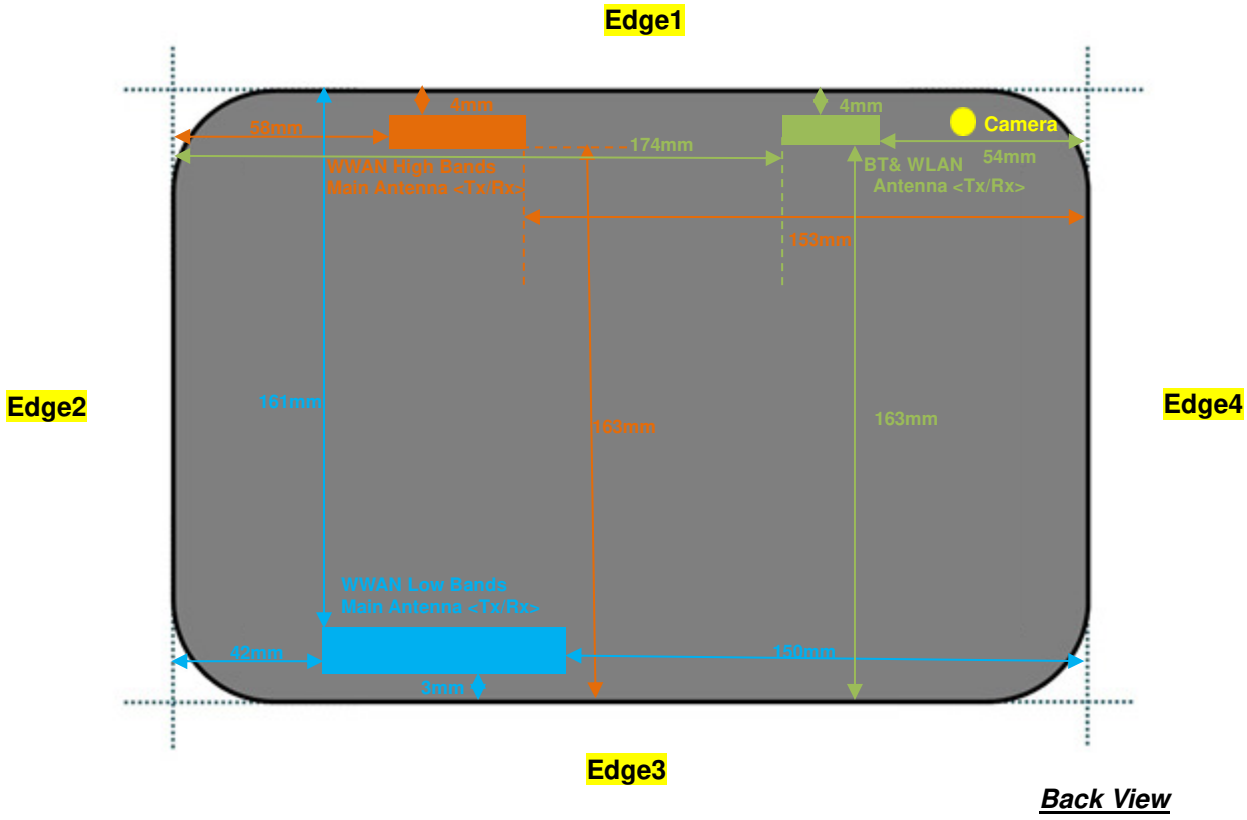
	Mode	Channel	Frequency (MHz)	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN	802.11a MCS0	149	5745	9.46	10.00	87.50
		157	5785	8.69	10.00	
		165	5825	9.20	10.00	
	802.11n-HT20 MCS0	149	5745	9.50	10.00	86.09
		157	5785	8.50	10.00	
		165	5825	9.23	10.00	
	802.11n-HT40 MCS0	151	5755	**9.79**	10.00	86.56
		159	5795	9.02	10.00	
	802.11ac-VHT20 MCS0	149	5745	9.33	9.50	82.72
		157	5785	8.14	9.50	
		165	5825	8.70	9.50	
	802.11ac-VHT40 MCS0	151	5755	9.24	9.50	70.83
		159	5795	8.22	9.50	
	802.11ac-VHT80 MCS0	155	5775	8.94	9.50	55.34

<Bluetooth>

Mode	Channel	Frequency (MHz)	Average power (dBm)
			1Mbps
v3.0 with EDR	CH 00	2402	6.42
	CH 39	2441	**7.58**
	CH 78	2480	5.29
Tune-up limit (dBm)			8.00

Mode	Channel	Frequency (MHz)	Average power (dBm)
			GFSK
v4.0/4.1/4.2 with LE	CH 00	2402	1.22
	CH 19	2440	**1.71**
	CH 39	2480	-0.92
Tune-up limit (dBm)			2.00

14. Antenna Location



Back View

Diagonal Dimension: 294mm

General Note:

1. The below table, when the distance is < 50 mm exclusion threshold is "Ratio", when the distance is > 50 mm exclusion threshold is "mW"
2. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
3. Per KDB 447498 D01v06, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
4. Per KDB 447498 D01v06, standalone SAR test exclusion threshold is applied; If the test separation distance is < 5mm, 5mm is used to determine SAR exclusion threshold.
5. Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
   - f(GHz) is the RF channel transmit frequency in GHz
   - Power and distance are rounded to the nearest mW and mm before calculation
   - The result is rounded to one decimal place for comparison
6. Per KDB 447498 D01v06, at 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following
   a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·(f(MHz)/150)] mW, at 100 MHz to 1500 MHz
   b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm)·10] mW at > 1500 MHz and ≤ 6 GHz

Exposure Position	Wireless Interface	WCDMA Band V	LTE Band 12	LTE Band 5	WCDMA Band II	LTE Band 4	LTE Band 2	LTE Band 30	LTE Band 7	Bluetooth	2.4GHz WLAN	5GHz WLAN
	Calculated Frequency (MHz)	846.6	715.3	848.3	1907.6	1754.3	1909.3	2312.5	2567.5	2480	2462	5825
	Maximum power (dBm)	24.50	24.5	24	24	24.5	24	24	23.5	8	15.5	14.5
	Maximum rated power(mW)	282.0	282.0	251.0	251.0	282.0	251.0	251.0	224.0	6.0	35.0	28.0
Bottom Face	Separation distance(mm)	0			0					0		
	exclusion threshold	51.9	47.7	46.2	69.3	74.7	69.4	69.5	71.8	1.9	11.0	13.5
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Edge 1	Separation distance(mm)	161			4					4		
	exclusion threshold	789.0	706.0	790.0	69.3	74.7	69.4	69.5	71.8	1.9	11.0	13.5
	Testing required?	No	No	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Edge 2	Separation distance(mm)	42			58					174		
	exclusion threshold	6.2	5.7	5.5	189.0	193.0	189.0	188.0	174.0	1335.0	1336.0	1302.0
	Testing required?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No
Edge 3	Separation distance(mm)	3			163					163		
	exclusion threshold	51.9	47.7	46.2	1239.0	1243.0	1239.0	1238.0	1224.0	1225.0	1226.0	1192.0
	Testing required?	Yes	Yes	Yes	No	No	No	No	No	No	No	No
Edge 4	Separation distance(mm)	150			153					54		
	exclusion threshold	727.0	654.0	728.0	1139.0	1143.0	1139.0	1138.0	1124.0	135.0	136.0	102.0
	Testing required?	No	No	No	No	No	No	No	No	No	No	No

15. SAR Test Results

General Note:

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
   a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
   b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
   c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)*Tune-up Scaling Factor
   d. For WLAN: Reported SAR(W/kg)= Measured SAR(W/kg)* Duty Cycle scaling factor * Tune-up scaling factor
2. Per KDB 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 only when the measured SAR is ≥0.8W/kg.

Tablet Note:

1. For the exposure positions that proximity sensor power reduction is applied for SAR compliance, additional SAR testing with EUT transmitting full power in normal mode was performed; 8mm for bottom face for low WWAN frequency bands, 15mm for bottom face for high WWAN frequency bands and WLAN bands, 18mm for edge1.
2. Per KDB 616217 D04v01r02, the additional separation introduced by the contour against a flat phantom is < 5 mm on this device and reported SAR is < 1.2 W/kg, a curved or contoured back surface or edge SAR is not required, more detail information please refer to the setup photo.

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. If 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.

LTE Note:

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is > not ½ dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, smaller bandwidth output power for each RB allocation configuration is > not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B12 / B5 / B4 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.

WLAN Note:

1. Per KDB 248227 D01v02r02, for 2.4GHz 802.11g/n SAR testing is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.
2. Per KDB 248227 D01v02r02, U-NII-1 SAR testing is not required when the U-NII-2A band highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band.
3. When the reported SAR of the test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position to measure the subsequent next closet/smallest test separation distance and maximum coupling test position on the highest maximum output power channel, until the report SAR is ≤ 0.8 W/kg or all required test position are tested.
4. For all positions / configurations, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions / configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.
5. During SAR testing the WLAN transmission was verified using a spectrum analyzer.
6. WLAN Bottom face 8mm SAR testing is for co-located with WWAN analysis.

15.1 Body SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WCDMA Band V	RMC 12.2Kbps	Bottom Face	8	1	Off	4233	846.6	24.33	24.50	1.040	0.01	0.985	1.024
	WCDMA Band V	RMC 12.2Kbps	Bottom Face	8	1	Off	4132	826.4	24.05	24.50	1.109	-0.04	0.732	0.812
	WCDMA Band V	RMC 12.2Kbps	Bottom Face	8	1	Off	4182	836.4	23.98	24.50	1.127	0.03	1.010	1.138
	WCDMA Band V	RMC 12.2Kbps	Edge 2	0	1	Off	4233	846.6	24.33	24.50	1.040	-0.11	0.269	0.280
	WCDMA Band V	RMC 12.2Kbps	Edge 3	0	1	Off	4233	846.6	24.33	24.50	1.040	0.02	1.070	1.113
01	WCDMA Band V	RMC 12.2Kbps	Edge 3	0	1	Off	4132	826.4	24.05	24.50	1.109	0.02	1.080	**1.198**
	WCDMA Band V	RMC 12.2Kbps	Edge 3	0	1	Off	4182	836.4	23.98	24.50	1.127	0.19	0.986	1.111
	WCDMA Band V	RMC 12.2Kbps	Bottom Face	0	1	On	4233	846.6	17.27	17.50	1.054	0.05	0.330	0.348
	WCDMA Band V	RMC 12.2Kbps	Edge 3	0	2	Off	4132	826.4	24.05	24.50	1.109	0.02	0.984	1.091
	WCDMA Band V	RMC 12.2Kbps	Edge 3	0	2	Off	4182	836.4	23.98	24.50	1.127	0.03	0.823	0.928
	WCDMA Band V	RMC 12.2Kbps	Edge 3	0	2	Off	4233	846.6	24.33	24.50	1.040	0.01	0.891	0.927
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	15	1	Off	9400	1880	23.69	24.00	1.074	-0.13	0.570	0.612
	WCDMA Band II	RMC 12.2Kbps	Edge 1	18	1	Off	9400	1880	23.69	24.00	1.074	0.06	0.221	0.237
	WCDMA Band II	RMC 12.2Kbps	Edge 2	0	1	Off	9400	1880	23.69	24.00	1.074	0.07	0.287	0.308
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	0	1	On	9400	1880	15.39	15.50	1.026	-0.05	1.110	1.138
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	0	1	On	9262	1852.4	15.25	15.50	1.059	0.03	1.090	1.155
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	0	1	On	9538	1907.6	15.03	15.50	1.114	0.01	1.040	1.159
	WCDMA Band II	RMC 12.2Kbps	Edge 1	0	1	On	9400	1880	15.39	15.50	1.026	0.1	0.414	0.425
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	0	2	On	9400	1880	15.39	15.50	1.026	0.02	1.070	1.097
02	WCDMA Band II	RMC 12.2Kbps	Bottom Face	0	2	On	9262	1852.4	15.25	15.50	1.059	0.08	1.100	**1.165**
	WCDMA Band II	RMC 12.2Kbps	Bottom Face	0	2	On	9538	1907.6	15.03	15.50	1.114	-0.06	0.764	0.851

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Sample	Power Reduction	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	LTE Band 12	10M	QPSK	1	25	Bottom Face	8	1	Off	23095	707.5	23.66	24.50	1.213	-0.19	0.950	**1.153**
	LTE Band 12	10M	QPSK	25	0	Bottom Face	8	1	Off	23095	707.5	22.46	23.50	1.271	-0.05	0.660	0.839
	LTE Band 12	10M	QPSK	50	0	Bottom Face	8	1	Off	23095	707.5	22.42	23.50	1.282	-0.11	0.668	0.857
	LTE Band 12	10M	QPSK	1	25	Edge 2	0	1	Off	23095	707.5	23.66	24.50	1.213	0.16	0.145	0.176
	LTE Band 12	10M	QPSK	25	0	Edge 2	0	1	Off	23095	707.5	22.46	23.50	1.271	0.15	0.116	0.147
	LTE Band 12	10M	QPSK	1	25	Edge 3	0	1	Off	23095	707.5	23.66	24.50	1.213	0.02	0.756	0.917
	LTE Band 12	10M	QPSK	25	0	Edge 3	0	1	Off	23095	707.5	22.46	23.50	1.271	0.03	0.626	0.795
	LTE Band 12	10M	QPSK	50	0	Edge 3	0	1	Off	23095	707.5	22.42	23.50	1.282	0.01	0.632	0.810
	LTE Band 12	10M	QPSK	1	25	Bottom Face	0	1	On	23095	707.5	18.19	19.50	1.352	0.03	0.550	0.744
	LTE Band 12	10M	QPSK	25	0	Bottom Face	0	1	On	23095	707.5	18.40	19.50	1.288	0.05	0.619	0.797
	LTE Band 12	10M	QPSK	1	25	Bottom Face	8	2	Off	23095	707.5	23.66	24.50	1.213	0.07	0.834	1.012
04	LTE Band 5	10M	QPSK	1	25	Bottom Face	8	1	Off	20525	836.5	23.52	24.00	1.117	0.09	1.030	**1.150**
	LTE Band 5	10M	QPSK	25	25	Bottom Face	8	1	Off	20525	836.5	22.32	23.00	1.169	0.04	0.828	0.968
	LTE Band 5	10M	QPSK	50	0	Bottom Face	8	1	Off	20525	836.5	22.26	23.00	1.186	0.02	0.844	1.001
	LTE Band 5	10M	QPSK	1	25	Edge 2	0	1	Off	20525	836.5	23.52	24.00	1.117	-0.05	0.283	0.316
	LTE Band 5	10M	QPSK	25	25	Edge 2	0	1	Off	20525	836.5	22.32	23.00	1.169	0.18	0.246	0.288
	LTE Band 5	10M	QPSK	1	25	Edge 3	0	1	Off	20525	836.5	23.52	24.50	1.253	0.09	0.841	1.054
	LTE Band 5	10M	QPSK	25	25	Edge 3	0	1	Off	20525	836.5	22.32	23.00	1.169	0.16	0.805	0.941
	LTE Band 5	10M	QPSK	50	0	Edge 3	0	1	Off	20525	836.5	22.26	23.00	1.186	0.06	0.807	0.957
	LTE Band 5	10M	QPSK	1	25	Bottom Face	0	1	On	20525	836.5	18.37	19.00	1.156	-0.15	0.444	0.513
	LTE Band 5	10M	QPSK	25	25	Bottom Face	0	1	On	20525	836.5	18.37	19.00	1.156	0.06	0.476	0.550
	LTE Band 5	10M	QPSK	1	25	Bottom Face	8	2	Off	20525	836.5	23.52	24.00	1.117	0.07	0.980	1.095
	LTE Band 4	20M	QPSK	1	49	Bottom Face	15	1	Off	20175	1732.5	24.15	24.50	1.084	0.02	0.485	0.526
	LTE Band 4	20M	QPSK	50	0	Bottom Face	15	1	Off	20175	1732.5	23.07	23.50	1.104	0.03	0.415	0.458
	LTE Band 4	20M	QPSK	1	49	Edge 1	18	1	Off	20175	1732.5	24.15	24.50	1.084	0.06	0.437	0.474
	LTE Band 4	20M	QPSK	50	0	Edge 1	18	1	Off	20175	1732.5	23.07	23.50	1.104	0.08	0.350	0.386
	LTE Band 4	20M	QPSK	1	49	Edge 2	0	1	Off	20175	1732.5	24.15	24.50	1.084	-0.02	0.430	0.466
	LTE Band 4	20M	QPSK	50	0	Edge 2	0	1	Off	20175	1732.5	23.07	23.50	1.104	-0.03	0.345	0.381
05	LTE Band 4	20M	QPSK	1	49	Bottom Face	0	1	On	20175	1732.5	14.69	15.50	1.205	0.09	0.906	**1.092**
	LTE Band 4	20M	QPSK	50	0	Bottom Face	0	1	On	20175	1732.5	14.56	15.50	1.242	0.15	0.811	1.007
	LTE Band 4	20M	QPSK	100	0	Bottom Face	0	1	On	20175	1732.5	14.27	15.50	1.327	0.11	0.790	1.049
	LTE Band 4	20M	QPSK	1	49	Edge 1	0	1	On	20175	1732.5	14.69	15.50	1.205	-0.14	0.276	0.333
	LTE Band 4	20M	QPSK	50	0	Edge 1	0	1	On	20175	1732.5	14.56	15.50	1.242	-0.13	0.241	0.299
	LTE Band 4	20M	QPSK	1	49	Bottom Face	0	2	On	20175	1732.5	14.69	15.50	1.205	0.04	0.640	0.771

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Sample	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20M	QPSK	1	49	Bottom Face	15	1	Off	18700	1860	23.30	24.00	1.175	-0.05	0.588	0.691
	LTE Band 2	20M	QPSK	50	0	Bottom Face	15	1	Off	18700	1860	22.14	23.00	1.219	-0.09	0.466	0.568
	LTE Band 2	20M	QPSK	1	49	Edge 1	18	1	Off	18700	1860	23.30	24.00	1.175	-0.05	0.242	0.284
	LTE Band 2	20M	QPSK	50	0	Edge 1	18	1	Off	18700	1860	22.14	23.00	1.219	0.06	0.185	0.226
	LTE Band 2	20M	QPSK	1	49	Edge 2	0	1	Off	18700	1860	23.30	24.00	1.175	0.02	0.273	0.321
	LTE Band 2	20M	QPSK	50	0	Edge 2	0	1	Off	18700	1860	22.14	23.00	1.219	0.03	0.216	0.263
	LTE Band 2	20M	QPSK	1	49	Bottom Face	0	1	On	18700	1860	14.93	15.00	1.016	0.11	0.987	1.003
	LTE Band 2	20M	QPSK	1	49	Bottom Face	0	1	On	18900	1880	14.53	15.00	1.114	0.14	0.932	1.039
06	LTE Band 2	20M	QPSK	1	49	Bottom Face	0	1	On	19100	1900	14.49	15.00	1.125	0.12	1.060	**1.192**
	LTE Band 2	20M	QPSK	50	0	Bottom Face	0	1	On	18700	1860	14.67	15.00	1.079	0.03	0.851	0.918
	LTE Band 2	20M	QPSK	50	0	Bottom Face	0	1	On	18900	1880	14.22	15.00	1.197	0.02	0.953	1.140
	LTE Band 2	20M	QPSK	50	0	Bottom Face	0	1	On	19100	1900	14.55	15.00	1.109	-0.09	1.050	1.165
	LTE Band 2	20M	QPSK	100	0	Bottom Face	0	1	On	18700	1860	14.65	15.00	1.084	-0.07	0.895	0.970
	LTE Band 2	20M	QPSK	1	49	Edge 1	0	1	On	18700	1860	14.93	15.00	1.016	0.05	0.413	0.420
	LTE Band 2	20M	QPSK	50	0	Edge 1	0	1	On	18700	1860	14.67	15.00	1.079	0.08	0.357	0.385
	LTE Band 2	20M	QPSK	1	49	Bottom Face	0	2	On	19100	1900	14.49	15.00	1.125	0.09	1.040	1.170
	LTE Band 2	20M	QPSK	1	49	Bottom Face	0	2	On	18700	1860	14.93	15.00	1.016	0.01	0.887	0.901
	LTE Band 2	20M	QPSK	1	49	Bottom Face	0	2	On	18900	1880	14.53	15.00	1.114	0.1	0.717	0.799
	LTE Band 7	20M	QPSK	1	0	Bottom Face	15	1	Off	20850	2510	23.12	23.50	1.091	-0.13	0.684	0.747
	LTE Band 7	20M	QPSK	50	0	Bottom Face	15	1	Off	20850	2510	22.16	22.50	1.081	0.15	0.635	0.687
	LTE Band 7	20M	QPSK	1	0	Edge 1	18	1	Off	20850	2510	23.12	23.50	1.091	0.11	0.867	0.946
	LTE Band 7	20M	QPSK	1	0	Edge 1	18	1	Off	21100	2535	22.67	23.50	1.211	-0.08	0.943	1.142
	LTE Band 7	20M	QPSK	1	0	Edge 1	18	1	Off	21350	2560	23.00	23.50	1.122	0.16	1.010	1.133
	LTE Band 7	20M	QPSK	50	0	Edge 1	18	1	Off	20850	2510	22.16	22.50	1.081	-0.19	0.717	0.775
	LTE Band 7	20M	QPSK	100	0	Edge 1	18	1	Off	20850	2510	21.98	22.50	1.127	-0.06	0.703	0.792
	LTE Band 7	20M	QPSK	1	0	Edge 2	0	1	Off	20850	2510	23.12	23.50	1.091	0.06	0.002	0.002
	LTE Band 7	20M	QPSK	1	0	Edge 2	0	1	Off	20850	2510	22.16	22.50	1.081	0.06	0.002	0.002
	LTE Band 7	20M	QPSK	1	49	Bottom Face	0	1	On	20850	2510	11.55	12.50	1.245	0.04	0.583	0.726
	LTE Band 7	20M	QPSK	50	24	Bottom Face	0	1	On	20850	2510	11.94	12.50	1.138	0.05	0.706	0.803
07	LTE Band 7	20M	QPSK	50	24	Bottom Face	0	1	On	21100	2535	11.78	12.50	1.180	0.05	0.994	**1.173**
	LTE Band 7	20M	QPSK	50	24	Bottom Face	0	1	On	21350	2560	11.88	12.50	1.153	0.06	1.000	1.153
	LTE Band 7	20M	QPSK	100	0	Bottom Face	0	1	On	20850	2510	11.60	12.50	1.230	0.09	0.680	0.837
	LTE Band 7	20M	QPSK	1	49	Edge 1	0	1	On	20850	2510	11.55	12.50	1.245	-0.07	0.469	0.584
	LTE Band 7	20M	QPSK	50	24	Edge 1	0	1	On	20850	2510	11.94	12.50	1.138	0.05	0.571	0.650
	LTE Band 7	20M	QPSK	50	24	Bottom Face	0	2	On	21100	2535	11.78	12.50	1.180	0.06	0.847	1.000
	LTE Band 7	20M	QPSK	50	24	Bottom Face	0	2	On	20850	2510	11.94	12.50	1.138	0.05	0.477	0.543
	LTE Band 7	20M	QPSK	50	24	Bottom Face	0	2	On	21350	2560	11.88	12.50	1.153	0.1	0.791	0.912

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Sample	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 30	10M	QPSK	1	49	Bottom Face	15	1	Off	27710	2310	23.50	24.00	1.122	0.03	0.442	0.496
	LTE Band 30	10M	QPSK	25	0	Bottom Face	15	1	Off	27710	2310	22.35	23.00	1.161	0.02	0.278	0.323
	LTE Band 30	10M	QPSK	1	49	Edge 1	18	1	Off	27710	2310	23.50	24.00	1.122	0.05	0.378	0.424
	LTE Band 30	10M	QPSK	25	0	Edge 1	18	1	Off	27710	2310	22.35	23.00	1.161	0.04	0.300	0.348
	LTE Band 30	10M	QPSK	1	49	Edge 2	0	1	Off	27710	2310	23.50	24.00	1.122	0.01	0.062	0.070
	LTE Band 30	10M	QPSK	25	0	Edge 2	0	1	Off	27710	2310	22.35	23.00	1.161	0.08	0.048	0.056
08	LTE Band 30	10M	QPSK	1	49	Bottom Face	0	1	On	27710	2310	14.69	15.00	1.074	0.02	0.900	**0.967**
	LTE Band 30	10M	QPSK	25	0	Bottom Face	0	1	On	27710	2310	14.51	15.00	1.119	0.06	0.816	0.913
	LTE Band 30	10M	QPSK	50	0	Bottom Face	0	1	On	27710	2310	14.34	15.00	1.164	0.12	0.779	0.907
	LTE Band 30	10M	QPSK	1	49	Edge 1	0	1	On	27710	2310	14.69	15.00	1.074	-0.13	0.318	0.342
	LTE Band 30	10M	QPSK	25	0	Edge 1	0	1	On	27710	2310	14.51	15.00	1.119	-0.09	0.269	0.301
	LTE Band 30	10M	QPSK	1	49	Bottom Face	0	2	On	27710	2310	14.69	15.00	1.074	-0.05	0.854	0.917

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Sample	Power Reduction	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)
	WLAN 2.4GHz	802.11n-HT40 MCS0	Bottom Face	15	1	Off	3	2422	15.19	15.50	1.074	86.56	1.155	0.03	0.051	0.063
	WLAN 2.4GHz	802.11n-HT40 MCS0	Bottom Face	8	1	Off	3	2422	15.19	15.50	1.074	86.56	1.155	0.11	0.185	0.229
	WLAN 2.4GHz	802.11n-HT40 MCS0	Edge 1	18	1	Off	3	2422	15.19	15.50	1.074	86.56	1.155	0.09	0.056	0.069
09	WLAN 2.4GHz	802.11n-HT40 MCS0	Bottom Face	0	1	On	3	2422	9.29	9.50	1.050	86.56	1.155	-0.02	0.258	**0.313**
	WLAN 2.4GHz	802.11n-HT40 MCS0	Edge 1	0	1	On	3	2422	9.29	9.50	1.050	86.56	1.155	0.07	0.086	0.104
	WLAN 2.4GHz	802.11n-HT40 MCS0	Bottom Face	0	2	On	3	2422	9.29	9.50	1.050	86.56	1.155	0.06	0.252	0.305
	WLAN 5.3GHz	802.11n-HT40 MCS0	Bottom Face	15	1	Off	54	5270	13.95	14.50	1.136	86.56	1.155	0.01	0.101	0.133
	WLAN 5.3GHz	802.11n-HT40 MCS0	Bottom Face	8	1	Off	54	5270	13.95	14.50	1.136	86.56	1.155	0.11	0.264	0.346
	WLAN 5.3GHz	802.11n-HT40 MCS0	Edge 1	18	1	Off	54	5270	13.95	14.50	1.136	86.56	1.155	0.03	0.140	0.184
	WLAN 5.3GHz	802.11n-HT40 MCS0	Bottom Face	0	1	On	54	5270	10.18	10.50	1.076	86.56	1.155	-0.05	0.398	0.495
	WLAN 5.3GHz	802.11n-HT40 MCS0	Edge 1	0	1	On	54	5270	10.18	10.50	1.076	86.56	1.155	-0.11	0.751	0.934
10	WLAN 5.3GHz	802.11n-HT40 MCS0	Edge 1	0	1	On	62	5310	9.92	10.50	1.143	86.56	1.155	0.16	0.753	**0.994**
	WLAN 5.3GHz	802.11n-HT40 MCS0	Edge 1	0	2	On	62	5310	9.92	10.50	1.143	86.56	1.155	0.15	0.647	0.854
	WLAN 5.5GHz	802.11n-HT40 MCS0	Bottom Face	15	1	Off	134	5670	14.14	14.50	1.086	86.56	1.155	0.05	0.141	0.177
	WLAN 5.5GHz	802.11n-HT40 MCS0	Bottom Face	8	1	Off	134	5670	14.14	14.50	1.086	86.56	1.155	0.07	0.304	0.381
	WLAN 5.5GHz	802.11n-HT40 MCS0	Edge 1	18	1	Off	134	5670	14.14	14.50	1.086	86.56	1.155	0.09	0.262	0.329
	WLAN 5.5GHz	802.11n-HT40 MCS0	Bottom Face	0	1	On	134	5670	9.80	10.00	1.047	86.56	1.155	-0.08	0.395	0.478
	WLAN 5.5GHz	802.11n-HT40 MCS0	Edge 1	0	1	On	134	5670	9.80	10.00	1.047	86.56	1.155	-0.17	0.608	0.735
	WLAN 5.5GHz	802.11n-HT40 MCS0	Edge 1	0	1	On	102	5510	9.69	10.00	1.074	86.56	1.155	0.11	0.655	0.812
11	WLAN 5.5GHz	802.11n-HT40 MCS0	Edge 1	0	2	On	102	5510	9.69	10.00	1.074	86.56	1.155	-0.05	0.788	**0.977**
	WLAN 5.5GHz	802.11n-HT40 MCS0	Edge 1	0	2	On	134	5670	9.80	10.00	1.047	86.56	1.155	-0.15	0.550	0.665
	WLAN 5.8GHz	802.11n-HT40 MCS0	Bottom Face	15	1	Off	151	5755	14.12	14.50	1.091	86.56	1.155	0.13	0.122	0.154
	WLAN 5.8GHz	802.11n-HT40 MCS0	Bottom Face	8	1	Off	151	5755	14.12	14.50	1.091	86.56	1.155	0.01	0.230	0.290
	WLAN 5.8GHz	802.11n-HT40 MCS0	Edge 1	18	1	Off	151	5755	14.12	14.50	1.091	86.56	1.155	0.05	0.215	0.271
	WLAN 5.8GHz	802.11n-HT40 MCS0	Bottom Face	0	1	On	151	5755	9.79	10.00	1.050	86.56	1.155	0.07	0.377	0.457
12	WLAN 5.8GHz	802.11n-HT40 MCS0	Edge 1	0	1	On	151	5755	9.79	10.00	1.050	86.56	1.155	-0.07	0.388	**0.470**
	WLAN 5.8GHz	802.11n-HT40 MCS0	Edge 1	0	2	On	151	5755	9.79	10.00	1.050	86.56	1.155	0.19	0.365	0.442

15.2 Repeated SAR Measurement

Plot No.	Band	BW (MHz)	Mode/ Modulation	RB Size	RB Offset	Test Position	Gap (mm)	Sample	Power Reduction	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA Band V	-	RMC 12.2Kbps	-	-	Edge 3	0	1	Off	4132	826.4	24.05	24.50	1.109	0.02	1.080	1	1.198
2nd	WCDMA Band V	-	RMC 12.2Kbps	-	-	Edge 3	0	1	Off	4132	826.4	24.05	24.50	1.109	0.06	1.060	1.019	1.176
1st	WCDMA Band II	-	RMC 12.2Kbps	-	-	Bottom Face	0	1	On	9400	1880	15.39	15.50	1.026	-0.05	1.110	1	1.138
2nd	WCDMA Band II	-	RMC 12.2Kbps	-	-	Bottom Face	0	1	On	9400	1880	15.39	15.50	1.026	0.05	1.090	1.018	1.118
1st	LTE Band 12	10M	QPSK	1	25	Bottom Face	8	1	Off	23095	707.5	23.66	24.50	1.213	-0.19	0.950	1	1.153
2nd	LTE Band 12	10M	QPSK	1	25	Bottom Face	8	1	Off	23095	707.5	23.66	24.50	1.213	0.15	0.946	1.004	1.148
1st	LTE Band 4	20M	QPSK	1	49	Bottom Face	0	1	On	20175	1732.5	14.69	15.50	1.205	0.09	0.906	1	1.092
2nd	LTE Band 4	20M	QPSK	1	49	Bottom Face	0	1	On	20175	1732.5	14.69	15.50	1.205	0.06	0.904	1.002	1.089
1st	LTE Band 7	20M	QPSK	1	0	Edge 1	18	1	Off	21350	2560	23.00	23.50	1.122	0.16	1.010	1	1.133
2nd	LTE Band 7	20M	QPSK	1	0	Edge 1	18	1	Off	21350	2560	23.00	23.50	1.122	-0.08	0.966	1.046	1.084
1st	LTE Band 30	10M	QPSK	1	49	Bottom Face	0	1	On	27710	2310	14.69	15.00	1.074	0.02	0.900	1	0.967
2nd	LTE Band 30	10M	QPSK	1	49	Bottom Face	0	1	On	27710	2310	14.69	15.00	1.074	0.09	0.891	1.010	0.957

General Note:

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

16. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	Tablet
		Body
1.	WCDMA + WLAN2.4GHz	Yes
2.	LTE + WLAN2.4GHz	Yes
3.	WCDMA + WLAN5GHz	Yes
4.	LTE + WLAN5GHz	Yes
5.	WCDMA+ Bluetooth	Yes
6.	LTE + Bluetooth	Yes

General Note:

1. EUT will choose each WCDMA and LTE according to the network signal condition; therefore, they will not operate simultaneously at any moment.
2. WLAN and Bluetooth share the same antenna, and cannot transmit simultaneously.
3. 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.
4. According to the EUT character, WLAN 5GHz and Bluetooth cannot transmit simultaneously
5. The worst case 5 GHz WLAN reported SAR for each configuration was used for SAR summation
6. WLAN Bottom face 8mm SAR testing is for co-located with WWAN analysis.
7. The reported SAR summation is calculated based on the same configuration and test position.
8. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
   i) Scalar SAR summation < 1.6W/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, simultaneously transmission SAR measurement is not necessary.
   iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
   v) The SPLSR calculated results please refer to section 16.2.
9. For simultaneous transmission analysis, Bluetooth SAR is estimated per KDB 447498 D01v06 based on the formula below.
   i) (*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)]·[√f(GHz)/*x*] W/kg for *test separation distances* ≤ 50 mm; where *x* = 7.5 for 1-g SAR, and *x* = 18.75 for 10-g SAR.
   ii) When the minimum separation distance is < 5mm, the distance is used 5mm to determine SAR test exclusion.
   iii) 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the *test separation distances* is > 50 mm.
10. Bluetooth estimated SAR is conservatively determined by 5mm separation, for all applicable exposure positions.

Bluetooth Max Power	Exposure Position	All Positions
8 dBm	Estimated SAR (W/kg)	0.252 W/kg

16.1 Body Exposure Conditions

<WWAN + WLAN 2.4GHz>

WWAN Band		Exposure Position	1	2	1+2 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN	2.4GHz WLAN			
			1g SAR (W/kg)	1g SAR (W/kg)			
WCDMA	Band V	Bottom Face at 8mm	1.138	0.229	1.37		
		Bottom Face at 15mm		0.063	0.06		
		Edge 1 at 18mm		0.069	0.07		
		Bottom Face at 0mm	0.348	0.313	0.66		
		Edge 1 at 0mm		0.104	0.10		
		Edge 2 at 0mm	0.280		0.28		
		Edge 3 at 0mm	1.198		1.20		
	Band II	Bottom Face at 8mm		0.229	0.23		
		Bottom Face at 15mm	0.612	0.063	0.68		
		Edge 1 at 18mm	0.237	0.069	0.31		
		Bottom Face at 0mm	1.165	0.313	1.48		
		Edge 1 at 0mm	0.425	0.104	0.53		
		Edge 2 at 0mm	0.308		0.31		

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	2 2.4GHz WLAN 1g SAR (W/kg)	1+2 Summed 1g SAR (W/kg)	SPLSR	Case No
LTE	Band 12	Bottom Face at 8mm	1.153	0.229	1.38		
		Bottom Face at 15mm		0.063	0.06		
		Edge 1 at 18mm		0.069	0.07		
		Bottom Face at 0mm	0.797	0.313	1.11		
		Edge 1 at 0mm		0.104	0.10		
		Edge 2 at 0mm	0.176		0.18		
		Edge 3 at 0mm	0.917		0.92		
	Band 5	Bottom Face at 8mm	1.150	0.229	1.38		
		Bottom Face at 15mm		0.063	0.06		
		Edge 1 at 18mm		0.069	0.07		
		Bottom Face at 0mm	0.550	0.313	0.86		
		Edge 1 at 0mm		0.104	0.10		
		Edge 2 at 0mm	0.316		0.32		
		Edge 3 at 0mm	1.054		1.05		
	Band 4	Bottom Face at 8mm		0.229	0.23		
		Bottom Face at 15mm	0.526	0.063	0.59		
		Edge 1 at 18mm	0.474	0.069	0.54		
		Bottom Face at 0mm	1.092	0.313	1.41		
		Edge 1 at 0mm	0.333	0.104	0.44		
		Edge 2 at 0mm	0.466		0.47		
	Band 2	Bottom Face at 8mm		0.229	0.23		
		Bottom Face at 15mm	0.691	0.063	0.75		
		Edge 1 at 18mm	0.284	0.069	0.35		
		Bottom Face at 0mm	1.192	0.313	**1.51**		
		Edge 1 at 0mm	0.420	0.104	0.52		
		Edge 2 at 0mm	0.321		0.32		
	Band 7	Bottom Face at 8mm		0.229	0.23		
		Bottom Face at 15mm	0.747	0.063	0.81		
		Edge 1 at 18mm	1.142	0.069	1.21		
		Bottom Face at 0mm	1.173	0.313	1.49		
		Edge 1 at 0mm	0.650	0.104	0.75		
		Edge 2 at 0mm	0.002		<0.01		
	Band 30	Bottom Face at 8mm		0.229	0.23		
		Bottom Face at 15mm	0.496	0.063	0.56		
		Edge 1 at 18mm	0.424	0.069	0.49		
		Bottom Face at 0mm	0.967	0.313	1.28		
		Edge 1 at 0mm	0.342	0.104	0.45		
		Edge 2 at 0mm	0.070		0.07		

<WWAN + WLAN 5GHz>

WWAN Band		Exposure Position	1	3	1+3 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN	5GHz WLAN			
			1g SAR (W/kg)	1g SAR (W/kg)			
WCDMA	Band V	Bottom Face at 8mm	1.138	0.381	1.52		
		Bottom Face at 15mm		0.177	0.18		
		Edge 1 at 18mm		0.329	0.33		
		Bottom Face at 0mm	0.348	0.495	0.84		
		Edge 1 at 0mm		0.994	0.99		
		Edge 2 at 0mm	0.280		0.28		
		Edge 3 at 0mm	1.198		1.20		
	Band II	Bottom Face at 8mm		0.381	0.38		
		Bottom Face at 15mm	0.612	0.177	0.79		
		Edge 1 at 18mm	0.237	0.329	0.57		
		Bottom Face at 0mm	1.165	0.495	**1.66**	**0.02**	**#1**
		Edge 1 at 0mm	0.425	0.994	1.42		
		Edge 2 at 0mm	0.308		0.31		

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	3 5GHz WLAN 1g SAR (W/kg)	1+3 Summed 1g SAR (W/kg)	SPLSR	Case No
LTE	Band 12	Bottom Face at 8mm	1.153	0.381	1.53		
		Bottom Face at 15mm		0.177	0.18		
		Edge 1 at 18mm		0.329	0.33		
		Bottom Face at 0mm	0.797	0.495	1.29		
		Edge 1 at 0mm		0.994	0.99		
		Edge 2 at 0mm	0.176		0.18		
		Edge 3 at 0mm	0.917		0.92		
	Band 5	Bottom Face at 8mm	1.150	0.381	1.53		
		Bottom Face at 15mm		0.177	0.18		
		Edge 1 at 18mm		0.329	0.33		
		Bottom Face at 0mm	0.550	0.495	1.05		
		Edge 1 at 0mm		0.994	0.99		
		Edge 2 at 0mm	0.316		0.32		
		Edge 3 at 0mm	1.054		1.05		
	Band 4	Bottom Face at 8mm		0.381	0.38		
		Bottom Face at 15mm	0.526	0.177	0.70		
		Edge 1 at 18mm	0.474	0.329	0.80		
		Bottom Face at 0mm	1.092	0.495	**1.59**		
		Edge 1 at 0mm	0.333	0.994	1.33		
		Edge 2 at 0mm	0.466		0.47		
	Band 2	Bottom Face at 8mm		0.381	0.38		
		Bottom Face at 15mm	0.691	0.177	0.87		
		Edge 1 at 18mm	0.284	0.329	0.61		
		Bottom Face at 0mm	1.192	0.495	**1.69**	**0.02**	**#2**
		Edge 1 at 0mm	0.420	0.994	1.41		
		Edge 2 at 0mm	0.321		0.32		
	Band 7	Bottom Face at 8mm		0.381	0.38		
		Bottom Face at 15mm	0.747	0.177	0.92		
		Edge 1 at 18mm	1.142	0.329	1.47		
		Bottom Face at 0mm	1.173	0.495	**1.67**	**0.02**	**#3**
		Edge 1 at 0mm	0.650	0.994	**1.64**	**0.02**	**#4**
		Edge 2 at 0mm	0.002		<0.01		
	Band 30	Bottom Face at 8mm		0.381	0.38		
		Bottom Face at 15mm	0.496	0.177	0.67		
		Edge 1 at 18mm	0.424	0.329	0.75		
		Bottom Face at 0mm	0.967	0.495	1.46		
		Edge 1 at 0mm	0.342	0.994	1.34		
		Edge 2 at 0mm	0.070		0.07		

<WWAN + Bluetooth>

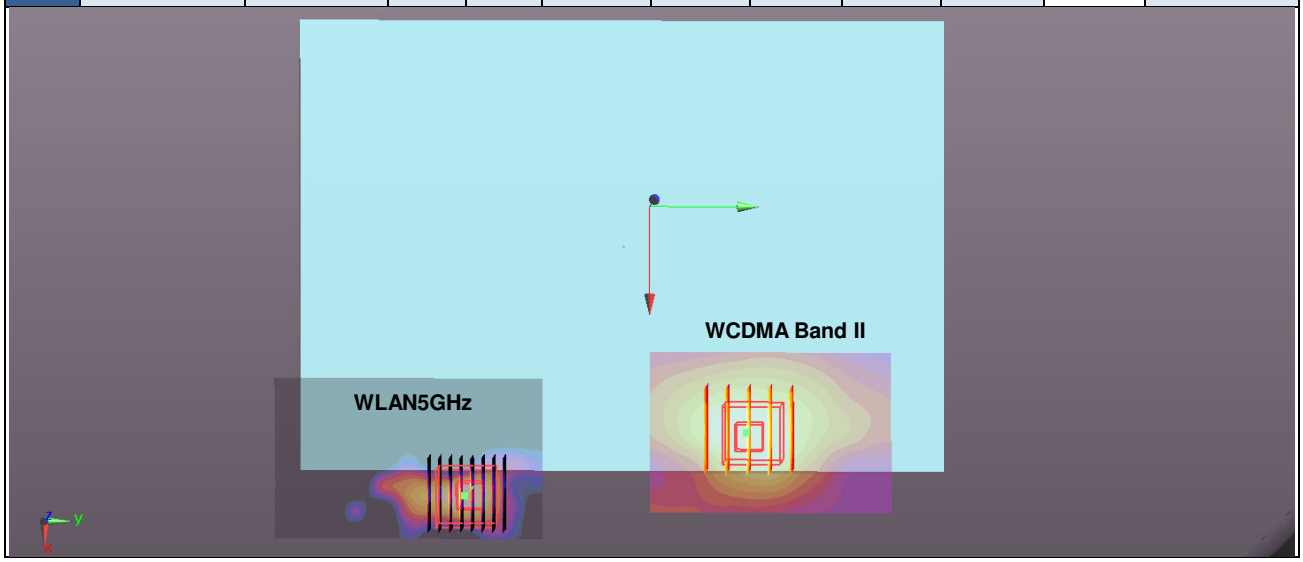
WWAN Band		Exposure Position	1	4	1+4 Summed 1g SAR (W/kg)	SPLSR	Case No
			WWAN	Bluetooth			
			1g SAR (W/kg)	Estimated 1g SAR (W/kg)			
WCDMA	Band V	Bottom Face at 8mm	1.138	0.252	1.39		
		Bottom Face at 15mm		0.252	0.25		
		Edge 1 at 18mm		0.252	0.25		
		Bottom Face at 0mm	0.348	0.252	0.60		
		Edge 1 at 0mm		0.252	0.25		
		Edge 2 at 0mm	0.280	0.252	0.53		
		Edge 3 at 0mm	1.198	0.252	1.45		
	Band II	Bottom Face at 8mm		0.252	0.25		
		Bottom Face at 15mm	0.612	0.252	0.86		
		Edge 1 at 18mm	0.237	0.252	0.49		
		Bottom Face at 0mm	1.165	0.252	1.42		
		Edge 1 at 0mm	0.425	0.252	0.68		
		Edge 2 at 0mm	0.308	0.252	0.56		

WWAN Band		Exposure Position	1 WWAN 1g SAR (W/kg)	4 Bluetooth Estimated 1g SAR (W/kg)	1+4 Summed 1g SAR (W/kg)	SPLSR	Case No
LTE	Band 12	Bottom Face at 8mm	1.153	0.252	1.41		
		Bottom Face at 15mm		0.252	0.25		
		Edge 1 at 18mm		0.252	0.25		
		Bottom Face at 0mm	0.797	0.252	1.05		
		Edge 1 at 0mm		0.252	0.25		
		Edge 2 at 0mm	0.176	0.252	0.43		
		Edge 3 at 0mm	0.917	0.252	1.17		
	Band 5	Bottom Face at 8mm	1.150	0.252	1.40		
		Bottom Face at 15mm		0.252	0.25		
		Edge 1 at 18mm		0.252	0.25		
		Bottom Face at 0mm	0.550	0.252	0.80		
		Edge 1 at 0mm		0.252	0.25		
		Edge 2 at 0mm	0.316	0.252	0.57		
		Edge 3 at 0mm	1.054	0.252	1.31		
	Band 4	Bottom Face at 8mm		0.252	0.25		
		Bottom Face at 15mm	0.526	0.252	0.78		
		Edge 1 at 18mm	0.474	0.252	0.73		
		Bottom Face at 0mm	1.092	0.252	1.34		
		Edge 1 at 0mm	0.333	0.252	0.59		
		Edge 2 at 0mm	0.466	0.252	0.72		
	Band 2	Bottom Face at 8mm		0.252	0.25		
		Bottom Face at 15mm	0.691	0.252	0.94		
		Edge 1 at 18mm	0.284	0.252	0.54		
		Bottom Face at 0mm	1.192	0.252	1.44		
		Edge 1 at 0mm	0.420	0.252	0.67		
		Edge 2 at 0mm	0.321	0.252	0.57		
	Band 7	Bottom Face at 8mm		0.252	0.25		
		Bottom Face at 15mm	0.747	0.252	1.00		
		Edge 1 at 18mm	1.142	0.252	1.39		
		Bottom Face at 0mm	1.173	0.252	1.43		
		Edge 1 at 0mm	0.650	0.252	0.90		
		Edge 2 at 0mm	0.002	0.252	0.25		
	Band 30	Bottom Face at 8mm		0.252	0.25		
		Bottom Face at 15mm	0.496	0.252	0.75		
		Edge 1 at 18mm	0.424	0.252	0.68		
		Bottom Face at 0mm	0.967	0.252	1.22		
		Edge 1 at 0mm	0.342	0.252	0.59		
		Edge 2 at 0mm	0.070	0.252	0.32		

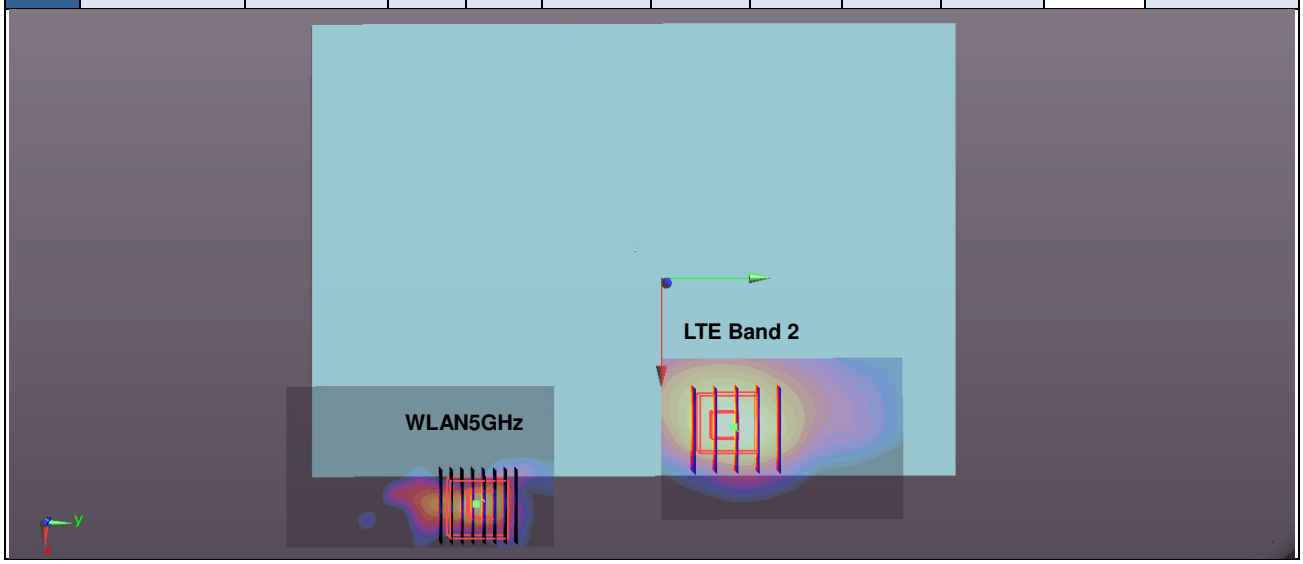
16.2 SPLSR Evaluation and Analysis

General Note:
SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*). If SPLSR ≤ 0.04, simultaneously transmission SAR measurement is not necessary.

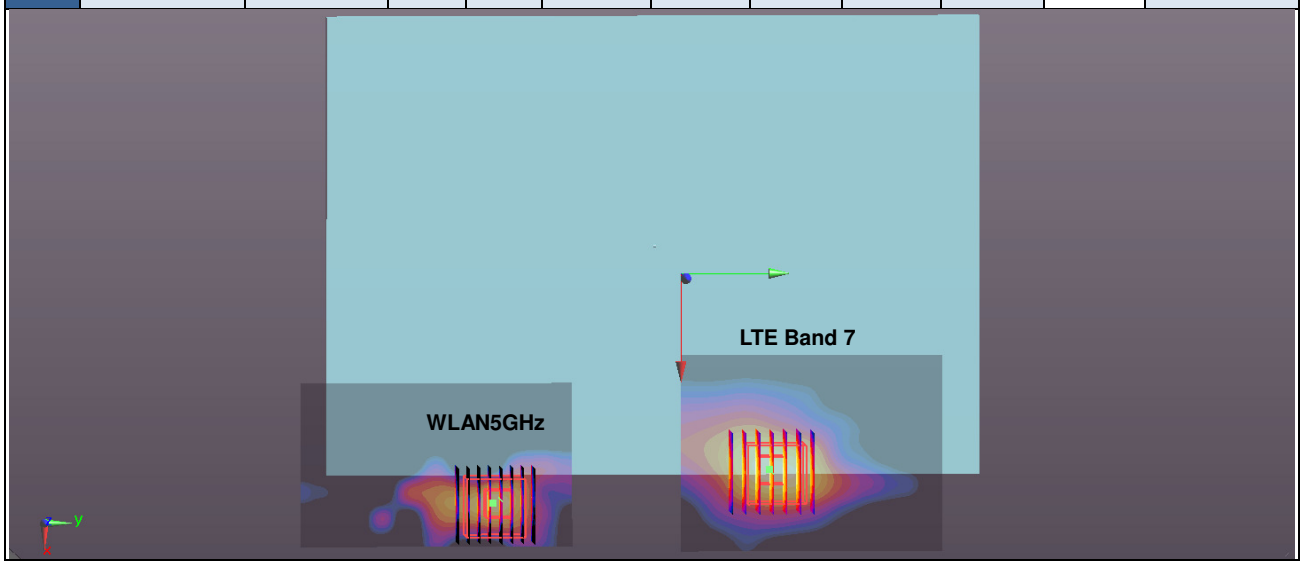
Case #1	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	WCDMA Band II	Bottom Face	1.165	0	0.07	0.046	-0.177	105.3	1.66	0.02	Not required
	WLAN 5GHz		0.495	0	0.092	-0.057	-0.177				



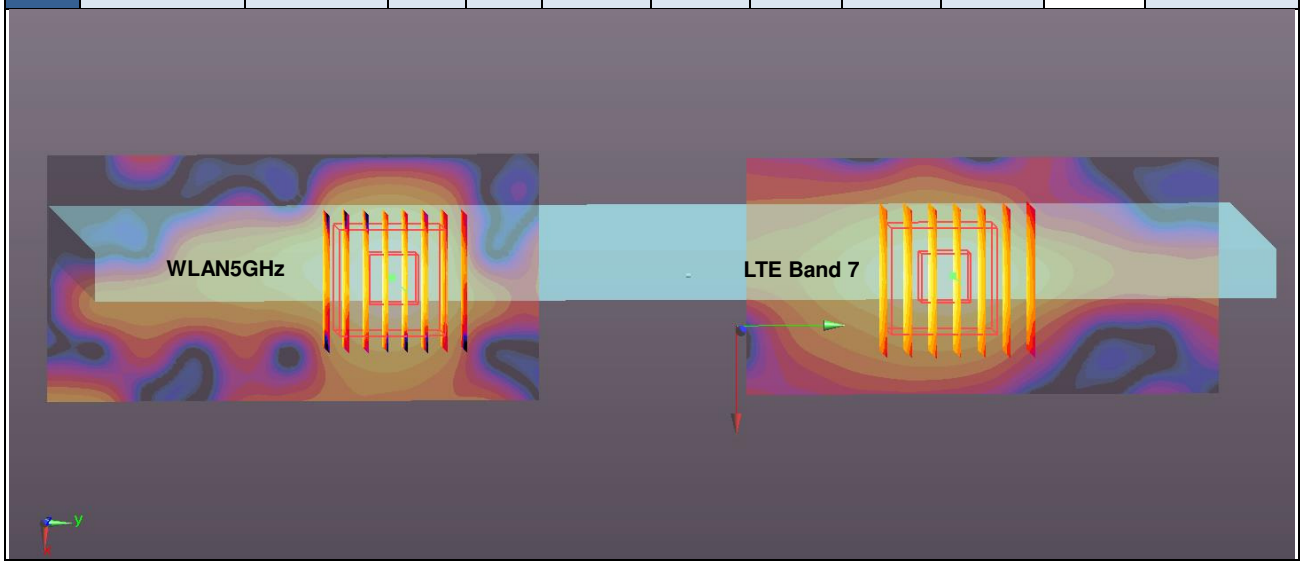
Case #2	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 2	Bottom Face	1.192	0	0.0655	0.037	-0.177	97.7	1.69	0.02	Not required
	WLAN 5GHz		0.495	0	0.092	-0.057	-0.177				



Case #3	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 7	Bottom Face	1.173	0.082	0.0424	-0.177	0.082	99.9	1.67	0.02	Not required
	WLAN 5GHz		0.495	0	0.092	-0.057	-0.177				



Case #4	Band	Position	SAR (W/kg)	Gap (mm)	SAR peak location (m) X	Y	Z	3D distance (mm)	Summed SAR (W/kg)	SPLSR Results	Simultaneous SAR
	LTE Band 7	Edge 1	0.650	0	8.74E-11	0.054	-0.178	112.0	1.64	0.02	Not required
	WLAN 5GHz		0.994	0	0.002	-0.058	-0.178				



Test Engineer： Nick Hu

17. Uncertainty Assessment

The component of uncertainly may generally be categorized according to the methods used to evaluate them. The evaluation of uncertainly by the statistical analysis of a series of observations is termed a Type An evaluation of uncertainty. The evaluation of uncertainty by means other than the statistical analysis of a series of observation is termed a Type B evaluation of uncertainty. Each component of uncertainty, however evaluated, is represented by an estimated standard deviation, termed standard uncertainty, which is determined by the positive square root of the estimated variance.

A Type A evaluation of standard uncertainty may be based on any valid statistical method for treating data. This includes calculating the standard deviation of the mean of a series of independent observations; using the method of least squares to fit a curve to the data in order to estimate the parameter of the curve and their standard deviations; or carrying out an analysis of variance in order to identify and quantify random effects in certain kinds of measurement.

A type B evaluation of standard uncertainty is typically based on scientific judgment using all of the relevant information available. These may include previous measurement data, experience, and knowledge of the behavior and properties of relevant materials and instruments, manufacture's specification, data provided in calibration reports and uncertainties assigned to reference data taken from handbooks. Broadly speaking, the uncertainty is either obtained from an outdoor source or obtained from an assumed distribution, such as the normal distribution, rectangular or triangular distributions indicated in table below.

Uncertainty Distributions	Normal	Rectangular	Triangular	U-Shape
Multi-plying Factor[a]	1/k[b]	$1/\sqrt{3}$	$1/\sqrt{6}$	$1/\sqrt{2}$

(a) standard uncertainty is determined as the product of the multiplying factor and the estimated range of variations in the measured quantity

(b) κ is the coverage factor

Table 17.1. Standard Uncertainty for Assumed Distribution

The combined standard uncertainty of the measurement result represents the estimated standard deviation of the result. It is obtained by combining the individual standard uncertainties of both Type A and Type B evaluation using the usual "root-sum-squares" (RSS) methods of combining standard deviations by taking the positive square root of the estimated variances.

Expanded uncertainty is a measure of uncertainty that defines an interval about the measurement result within which the measured value is confidently believed to lie. It is obtained by multiplying the combined standard uncertainty by a coverage factor. Typically, the coverage factor ranges from 2 to 3. Using a coverage factor allows the true value of a measured quantity to be specified with a defined probability within the specified uncertainty range. For purpose of this document, a coverage factor two is used, which corresponds to confidence interval of about 95 %. The DASY uncertainty Budget is shown in the following tables.

Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	6.0	N	1	1	1	6.0	6.0
Axial Isotropy	4.7	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.6	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	1.0	R	1.732	1	1	0.6	0.6
Linearity	4.7	R	1.732	1	1	2.7	2.7
System Detection Limits	1.0	R	1.732	1	1	0.6	0.6
Modulation Response	3.2	R	1.732	1	1	1.8	1.8
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.0	R	1.732	1	1	0.0	0.0
Integration Time	2.6	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.0	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	1.732	1	1	1.7	1.7
Probe Positioner	0.4	R	1.732	1	1	0.2	0.2
Probe Positioning	2.9	R	1.732	1	1	1.7	1.7
Max. SAR Eval.	2.0	R	1.732	1	1	1.2	1.2
Test Sample Related							
Device Positioning	3.0	N	1	1	1	3.0	3.0
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	1.732	1	1	2.9	2.9
Power Scaling	0.0	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.1	R	1.732	1	1	3.5	3.5
SAR correction	0.0	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.2	N	1	0.78	0.71	0.1	0.1
Liquid Conductivity (target)	5.0	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.5	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.4	R	1.732	0.78	0.71	1.5	1.4
Liquid Permittivity Repeatability	0.15	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.0	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.5	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.83	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						11.4%	11.4%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						22.9%	22.7%

Table 17.2. Uncertainty Budget for frequency range 300 MHz to 3 GHz

Error Description	Uncertainty Value (±%)	Probability	Divisor	(Ci) 1g	(Ci) 10g	Standard Uncertainty (1g) (±%)	Standard Uncertainty (10g) (±%)
Measurement System							
Probe Calibration	6.55	N	1	1	1	6.6	6.6
Axial Isotropy	4.7	R	1.732	0.7	0.7	1.9	1.9
Hemispherical Isotropy	9.6	R	1.732	0.7	0.7	3.9	3.9
Boundary Effects	2.0	R	1.732	1	1	1.2	1.2
Linearity	4.7	R	1.732	1	1	2.7	2.7
System Detection Limits	1.0	R	1.732	1	1	0.6	0.6
Modulation Response	3.2	R	1.732	1	1	1.8	1.8
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.0	R	1.732	1	1	0.0	0.0
Integration Time	2.6	R	1.732	1	1	1.5	1.5
RF Ambient Noise	3.0	R	1.732	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	1.732	1	1	1.7	1.7
Probe Positioner	0.4	R	1.732	1	1	0.2	0.2
Probe Positioning	6.7	R	1.732	1	1	3.9	3.9
Max. SAR Eval.	4.0	R	1.732	1	1	2.3	2.3
Test Sample Related							
Device Positioning	3.0	N	1	1	1	3.0	3.0
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	1.732	1	1	2.9	2.9
Power Scaling	0.0	R	1.732	1	1	0.0	0.0
Phantom and Setup							
Phantom Uncertainty	6.6	R	1.732	1	1	3.8	3.8
SAR correction	0.0	R	1.732	1	0.84	0.0	0.0
Liquid Conductivity Repeatability	0.2	N	1	0.78	0.71	0.1	0.1
Liquid Conductivity (target)	5.0	R	1.732	0.78	0.71	2.3	2.0
Liquid Conductivity (mea.)	2.5	R	1.732	0.78	0.71	1.1	1.0
Temp. unc. - Conductivity	3.4	R	1.732	0.78	0.71	1.5	1.4
Liquid Permittivity Repeatability	0.15	N	1	0.23	0.26	0.0	0.0
Liquid Permittivity (target)	5.0	R	1.732	0.23	0.26	0.7	0.8
Liquid Permittivity (mea.)	2.5	R	1.732	0.23	0.26	0.3	0.4
Temp. unc. - Permittivity	0.83	R	1.732	0.23	0.26	0.1	0.1
Combined Std. Uncertainty						12.5%	12.5%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						25.1%	25.0%

Table 17.3. Uncertainty Budget for frequency range 3 GHz to 6 GHz

18. References

[1] FCC 47 CFR Part 2 “Frequency Allocations and Radio Treaty Matters; General Rules and Regulations”

[2] ANSI/IEEE Std. C95.1-1992, “IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz”, September 1992

[3] IEEE Std. 1528-2013, “IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”, Sep 2013

[4] SPEAG DASY System Handbook

[5] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.

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

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

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

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2017.5.9

System Check_Body_750MHz

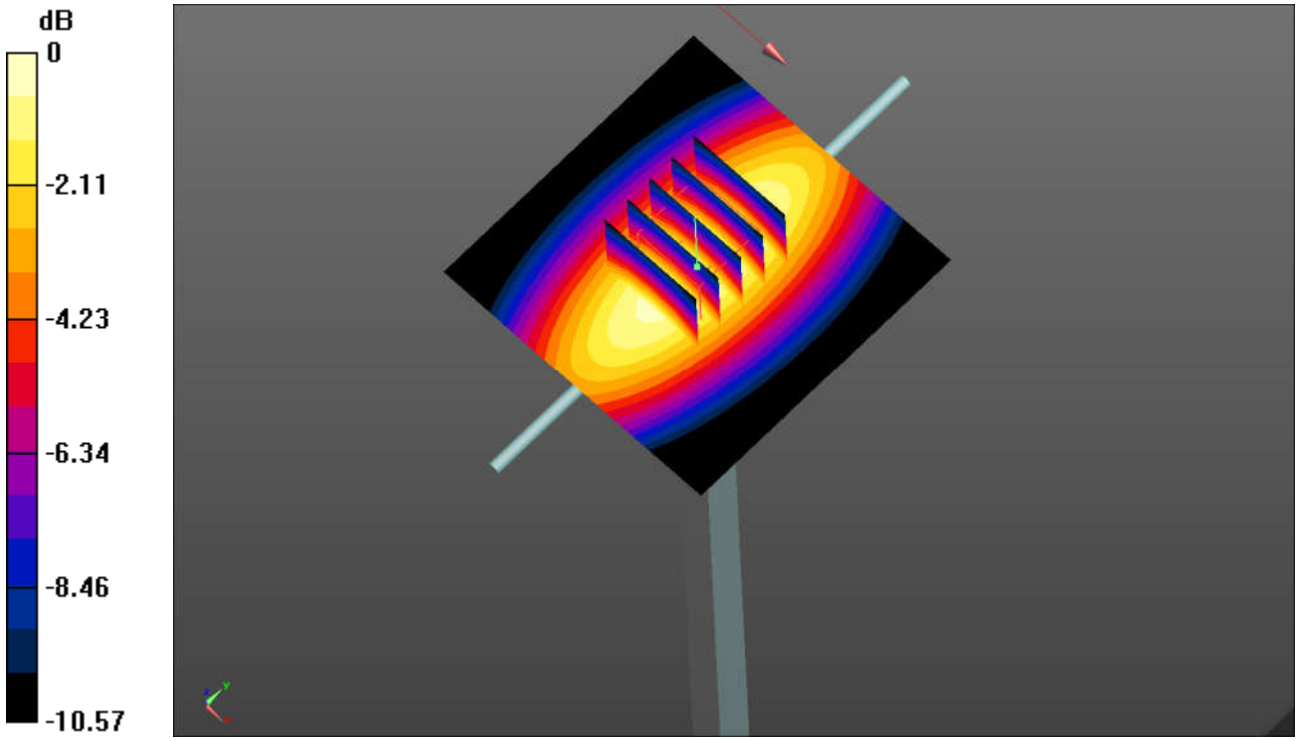
DUT: D750V3 - SN:1065

Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1
Medium: MSL_750 Medium parameters used: f = 750 MHz; σ = 0.958 S/m; ε_r = 55.875; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(10.54, 10.54, 10.54); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- 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) = 2.69 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 51.13 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.31 W/kg
Maximum value of SAR (measured) = 2.61 W/kg



0 dB = 2.61 W/kg = 4.24 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2017.5.9

System Check_Body_835MHz

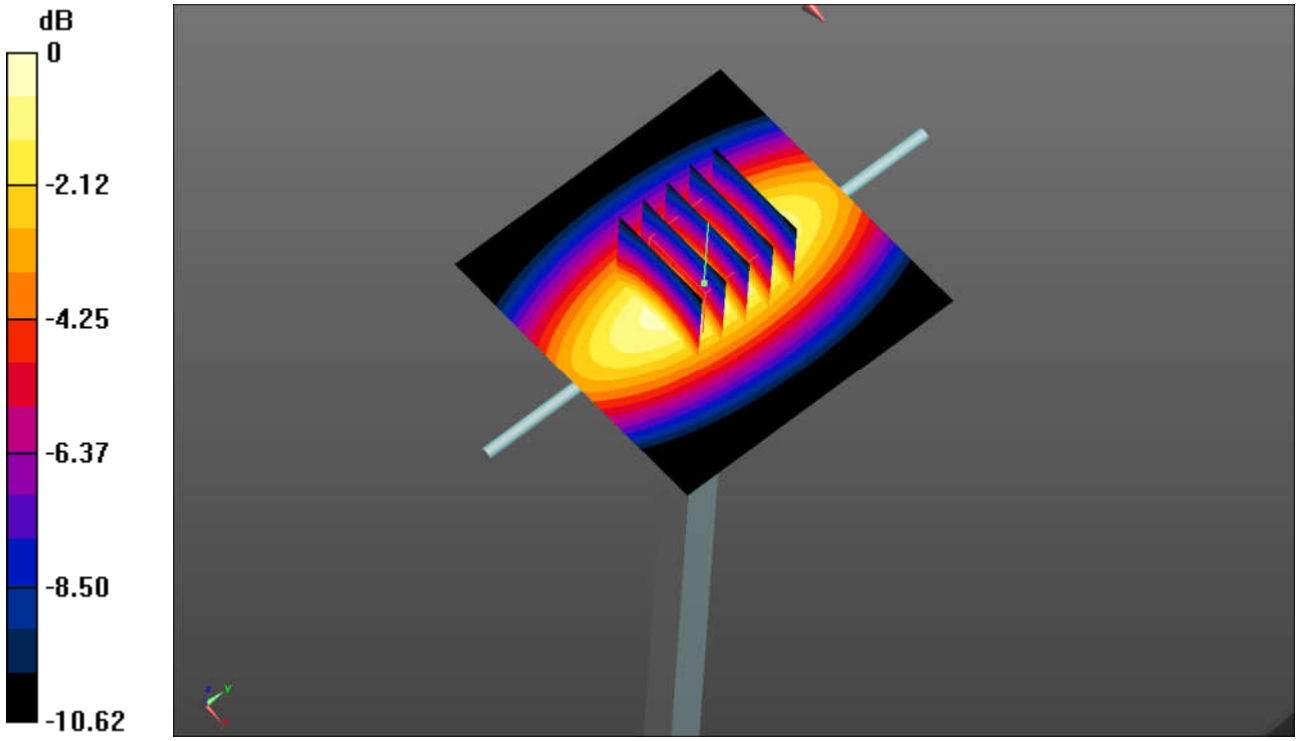
DUT: D835V2 - SN:4d091

Communication System: UID 0, CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL_850 Medium parameters used: f = 835 MHz; σ = 0.965 S/m; ε_r = 55.063; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(10.54, 10.54, 10.54); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- 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) = 2.85 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 51.33 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.43 W/kg
SAR(1 g) = 2.27 W/kg; SAR(10 g) = 1.52 W/kg
Maximum value of SAR (measured) = 2.86 W/kg



0 dB = 2.86 W/kg = 4.54 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2017.5.16

System Check_Body_1750MHz

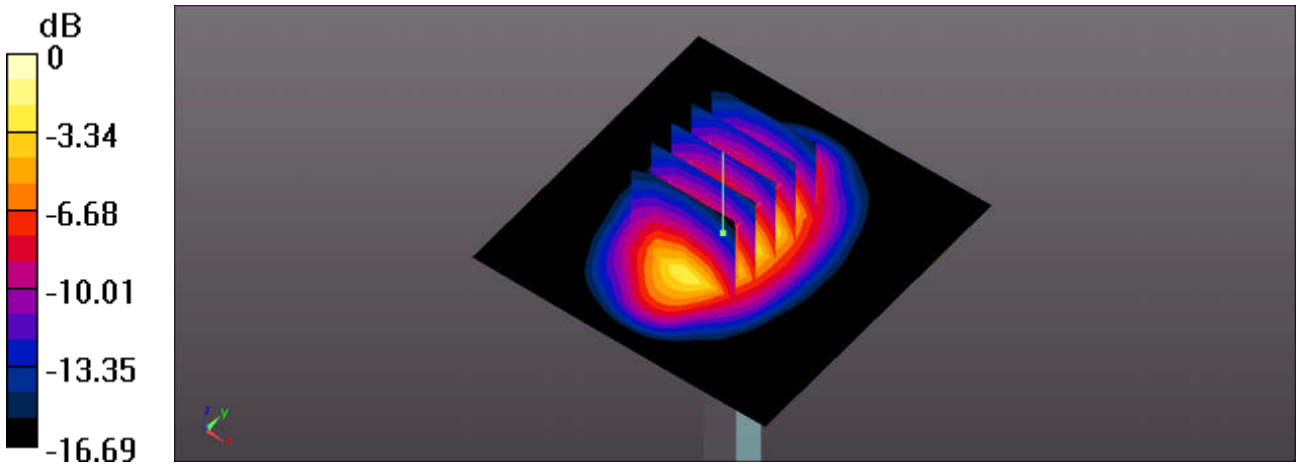
DUT: D1750V2 - SN:1069

Communication System: UID 0, CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: MSL_1750 Medium parameters used: f = 1750 MHz; σ = 1.45 S/m; ε_r = 52.92; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(8.32, 8.32, 8.32); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- 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) = 13.8 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 85.43 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 17.3 W/kg
SAR(1 g) = 9.81 W/kg; SAR(10 g) = 5.21 W/kg
Maximum value of SAR (measured) = 13.4 W/kg



0 dB = 13.4 W/kg = 11.47 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2017.5.16

System Check_Body_1900MHz

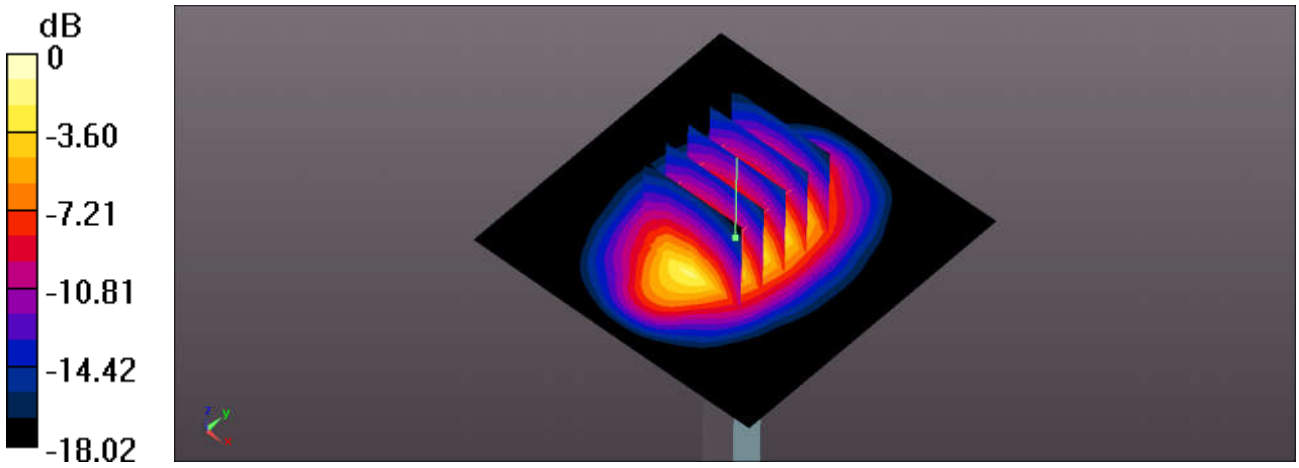
DUT: D1900V2 - SN:5d118

Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900 Medium parameters used: f = 1900 MHz; σ = 1.515 S/m; ε_r = 52.452; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(8.01, 8.01, 8.01); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- 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) = 14.7 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 87.14 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 18.2 W/kg
SAR(1 g) = 10.4 W/kg; SAR(10 g) = 5.48 W/kg
Maximum value of SAR (measured) = 15.2 W/kg



0 dB = 15.2 W/kg = 11.71 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2017.5.17

System Check_Body_2300MHz

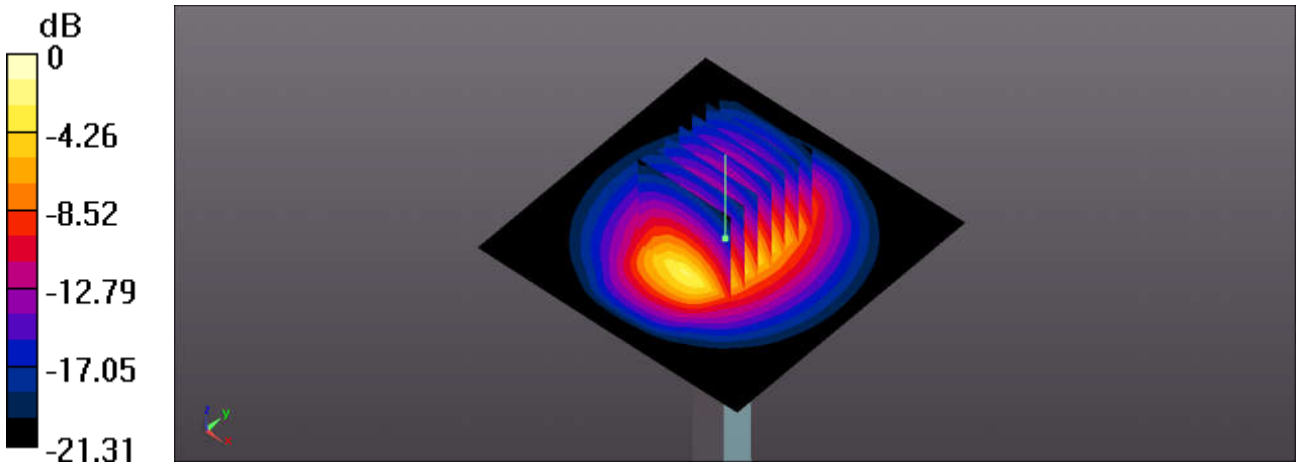
DUT: D2300V2 - SN:1055

Communication System: UID 0, CW; Frequency: 23000 MHz;Duty Cycle: 1:1
Medium: MSL_2300 Medium parameters used: f = 2300 MHz; σ = 1.855 S/m; ε_r = 53.205; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(7.8, 7.8, 7.8); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 18.85 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 83.43 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 18.4 W/kg
SAR(1 g) = 12.68 W/kg; SAR(10 g) = 5.75 W/kg
Maximum value of SAR (measured) = 19.37 W/kg



0 dB = 19.37 W/kg = 12.87 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2017.5.17

System Check_Body_2450MHz

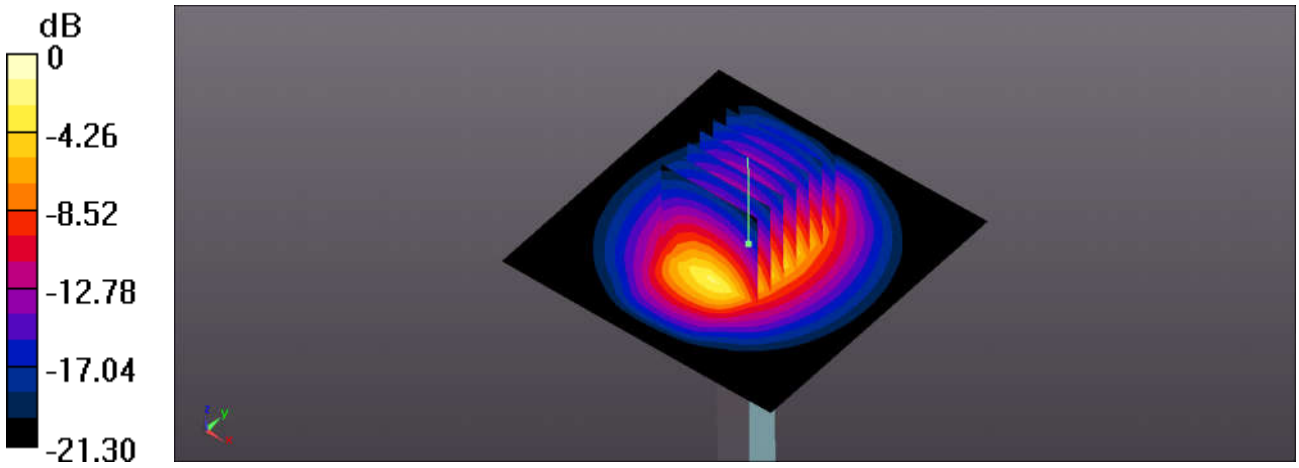
DUT: D2450V2 - SN:840

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2450 MHz; σ = 2.021 S/m; ε_r = 52.544; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(7.55, 7.55, 7.55); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 20.41 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 87.83 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 27.08 W/kg
SAR(1 g) = 13.19 W/kg; SAR(10 g) = 6.17 W/kg
Maximum value of SAR (measured) = 20.18 W/kg



0 dB = 20.18 W/kg = 13.03 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2017.5.17

System Check_Body_2600MHz

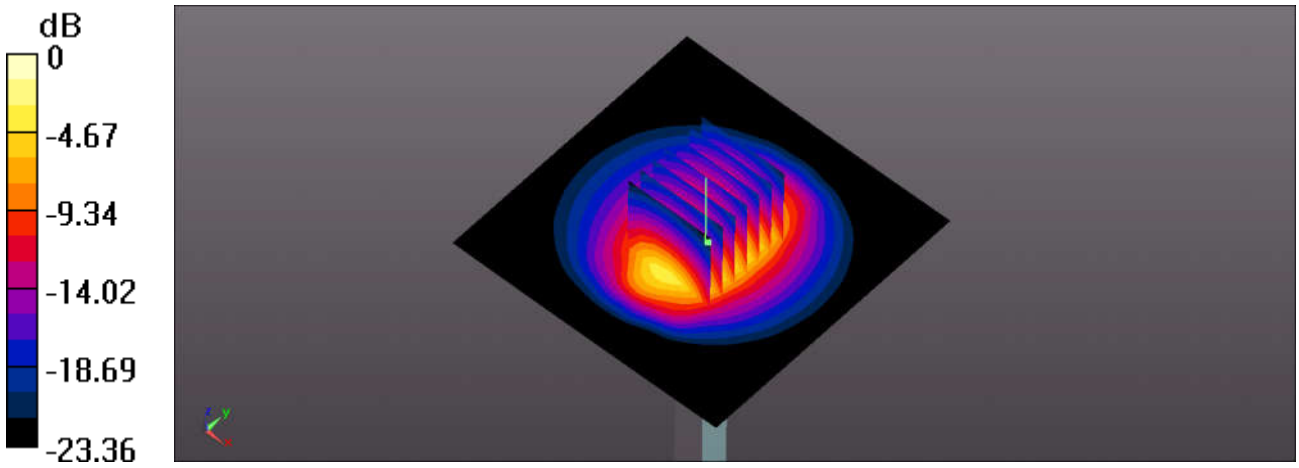
DUT: D2600V2 - SN:1061

Communication System: UID 0, CW; Frequency: 2600 MHz;Duty Cycle: 1:1
Medium: MSL_2600 Medium parameters used: f = 2600 MHz; σ = 2.18 S/m; ε_r = 52.618; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(7.05, 7.05, 7.05); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- 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) = 21.7 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 84.42 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 27.2 W/kg
SAR(1 g) = 13.9 W/kg; SAR(10 g) = 6.45 W/kg
Maximum value of SAR (measured) = 21.4 W/kg



0 dB = 21.4 W/kg = 13.28 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2017.5.18

System Check_Body_5250MHz

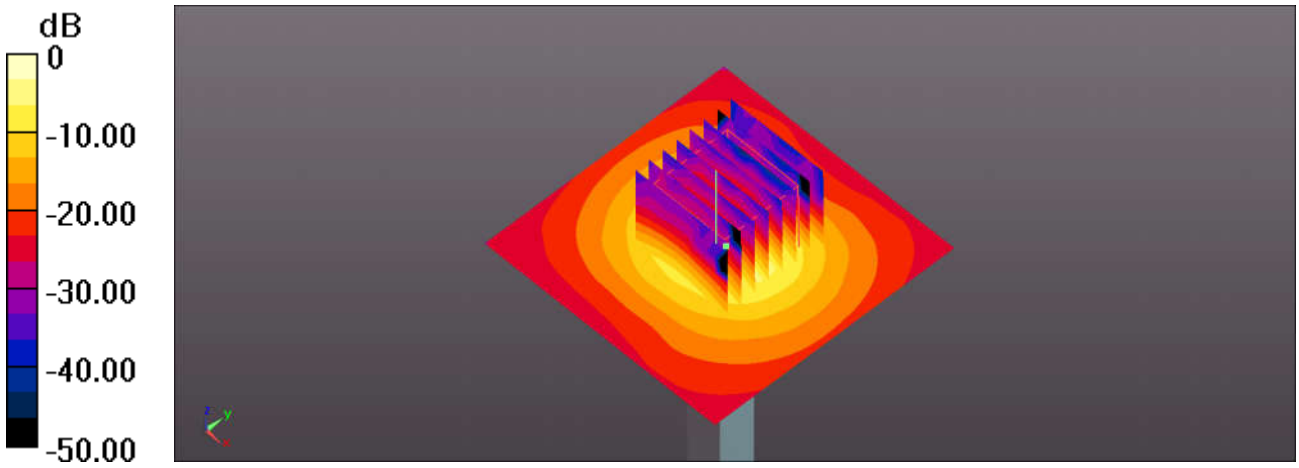
DUT: D5GHzV2-SN:1113

Communication System: UID 0, CW; Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: MSL_5000 Medium parameters used: f = 5250 MHz; σ = 5.264 S/m; ε_r = 48.303; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(4.5, 4.5, 4.5); Calibrated: 2016.11.28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 18.09 W/kg

Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 40.92 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 29.3 W/kg
SAR(1 g) = 7.68 W/kg; SAR(10 g) = 2.23 W/kg
Maximum value of SAR (measured) = 17.61 W/kg



0 dB = 17.61 W/kg = 12.45 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2017.5.18

System Check_Body_5600MHz

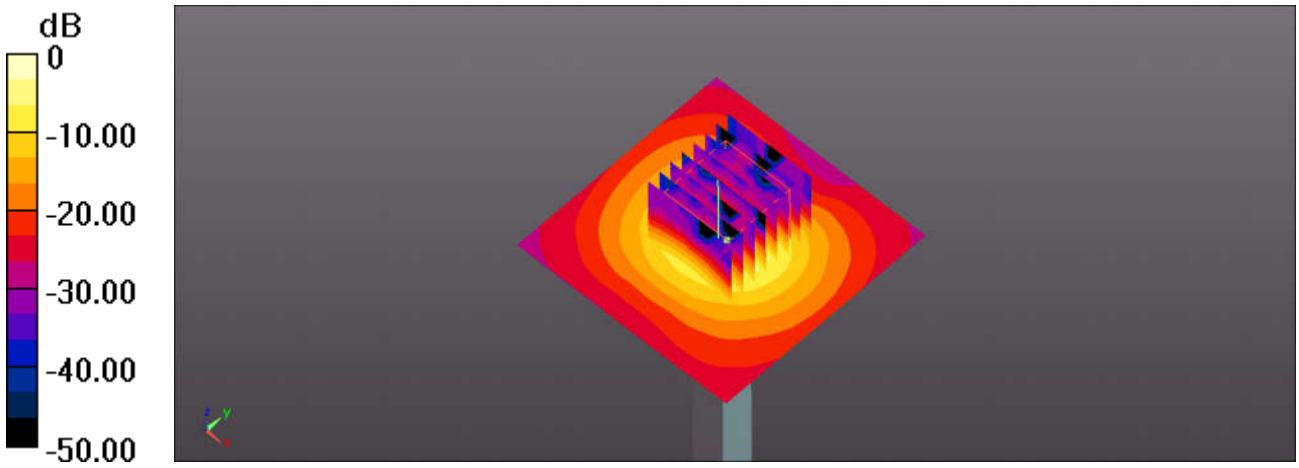
DUT: D5GHzV2-SN:1113

Communication System: UID 0, CW (0); Frequency: 5600 MHz;Duty Cycle: 1:1
Medium: MSL_5000 Medium parameters used: f = 5600 MHz; σ = 5.834 S/m; ε_r = 47.448; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(3.92, 3.92, 3.92); Calibrated: 2016.11.28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 19.2 W/kg

Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 40.08 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 32.7 W/kg
SAR(1 g) = 7.84 W/kg; SAR(10 g) = 2.17 W/kg
Maximum value of SAR (measured) = 19.2 W/kg



0 dB = 19.2 W/kg = 12.89 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2017.5.18

System Check_Body_5750MHz

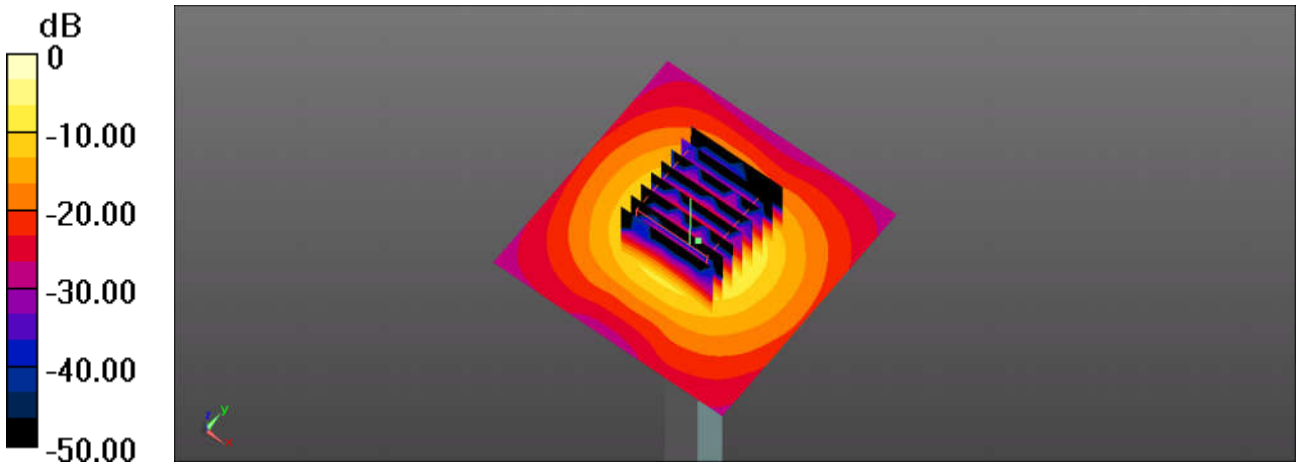
DUT: D5GHzV2-SN:1113

Communication System: UID 0, CW (0); Frequency: 5750 MHz;Duty Cycle: 1:1
Medium: MSL_5000 Medium parameters used: f = 5750 MHz; σ = 6.096 S/m; ε_r = 46.929; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(4.05, 4.05, 4.05); Calibrated: 2016.11.28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.9 W/kg

Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 37.75 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 30.5 W/kg
SAR(1 g) = 7.31 W/kg; SAR(10 g) = 2.11 W/kg
Maximum value of SAR (measured) = 17.4 W/kg



0 dB = 17.4 W/kg = 12.47 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: 2017.5.9

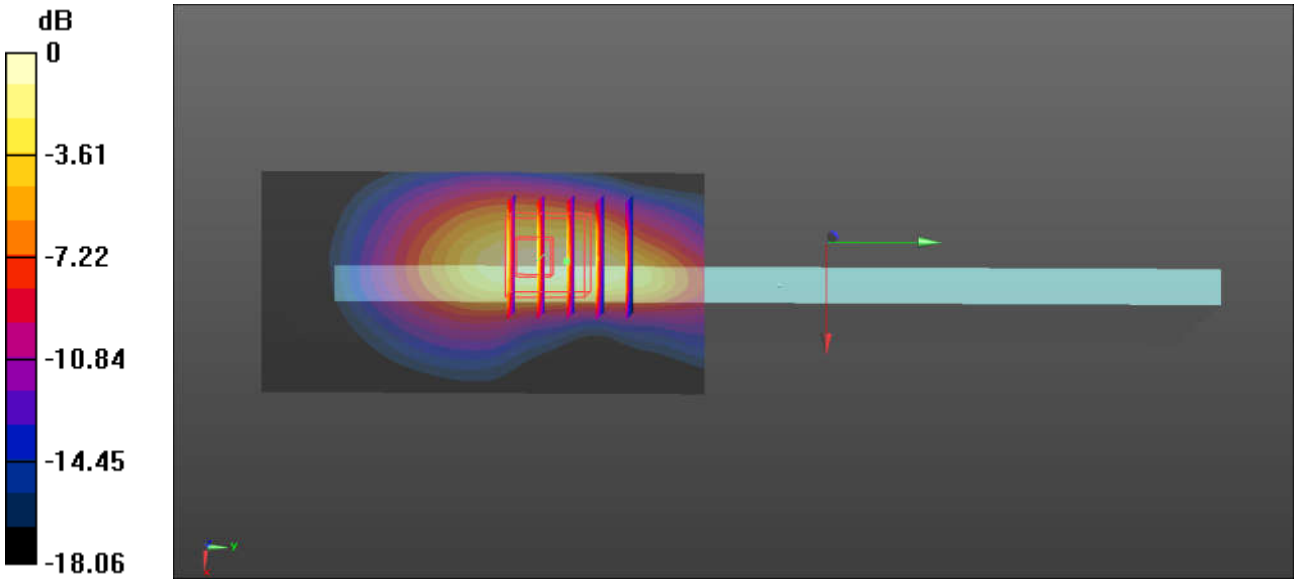
01_WCDMA Band V_RMC 12.2Kbps_Edge3_0mm_Ch4132_Sensor Off

Communication System: UID 0, UMTS (0); Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium: MSL_850 Medium parameters used: f = 826.4 MHz; σ = 0.956 S/m; ε_r =55.148; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(10.54, 10.54, 10.54); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch4132/Area Scan (41x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.48 W/kg

Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.21 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 2.03 W/kg
SAR(1 g) = 1.08 W/kg; SAR(10 g) = 0.578 W/kg
Maximum value of SAR (measured) = 1.58 W/kg



0 dB = 1.58 W/kg = 1.99 dBW/kg

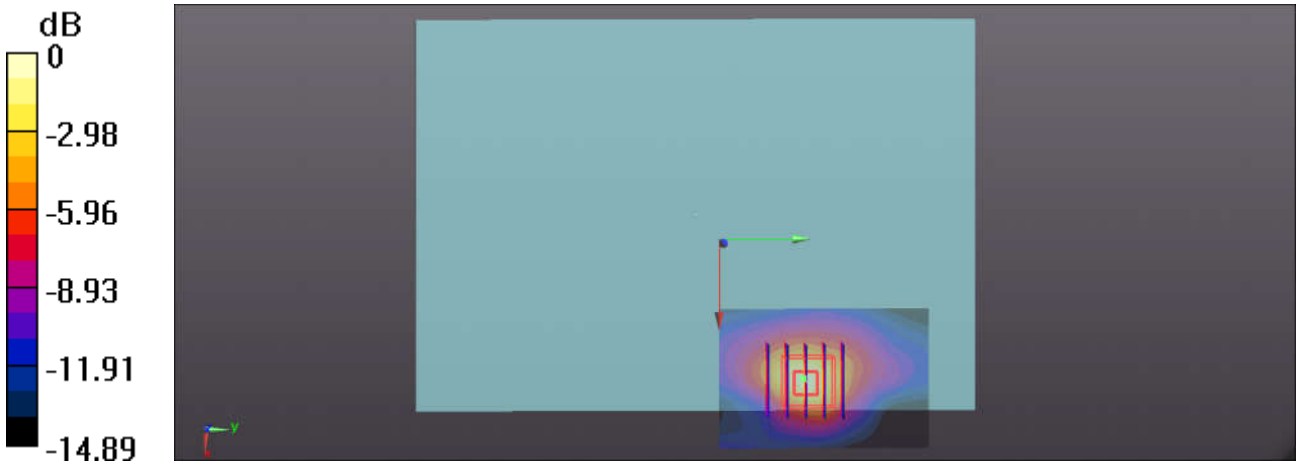
02_WCDMA Band II_RMC 12.2Kbps_Bottom Face_0mm_Ch9262_Sensor On

Communication System: UID 0, UMTS (0); Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: MSL_1900 Medium parameters used: f = 1852.4 MHz; σ = 1.465 S/m; ε_r = 52.581; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(8.01, 8.01, 8.01); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch9262/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.39 W/kg

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.210 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.94 W/kg
SAR(1 g) = 1.1 W/kg; SAR(10 g) = 0.559 W/kg
Maximum value of SAR (measured) = 1.58 W/kg



0 dB = 1.58 W/kg = 1.99 dBW/kg

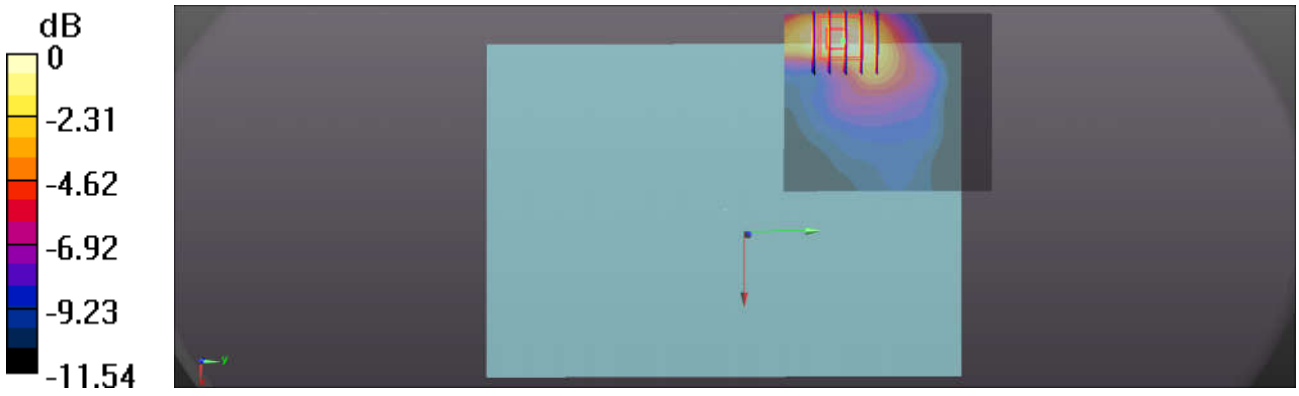
03_LTE Band 12_10M_QPSK_1RB_25Offset_Bottom Face_8mm_Ch23095_Sensor Off

Communication System: UID 0, FDD_LTE (0); Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: MSL_750 Medium parameters used: f = 707.5 MHz; σ = 0.918 S/m; ε_r = 56.289; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(10.54, 10.54, 10.54); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch23095/Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.23 W/kg

Ch23095/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.813 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.950 W/kg; SAR(10 g) = 0.572 W/kg
Maximum value of SAR (measured) = 1.30 W/kg



0 dB = 1.30 W/kg = 1.14 dBW/kg

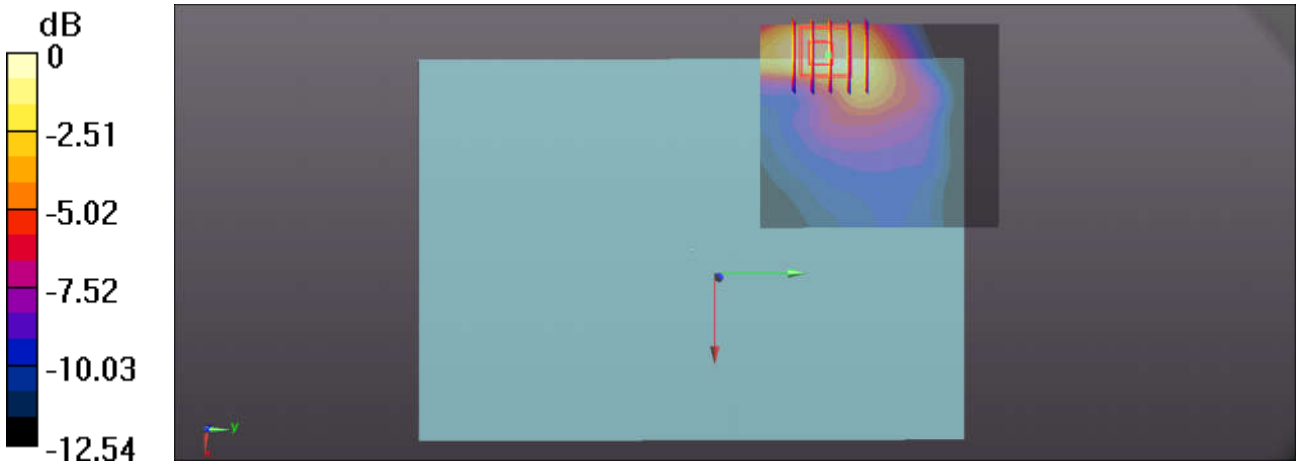
04_LTE Band 5_10M_QPSK_1RB_25Offset_Bottom Face_8mm_Ch20525_Sensor Off

Communication System: UID 0, FDD_LTE (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: MSL_850 Medium parameters used: f = 836.5 MHz; σ = 0.967 S/m; ε_r = 55.051; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(10.54, 10.54, 10.54); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch20525/Area Scan (61x71x1): Interpolated grid:
dx=1.500 mm, dy=1.500 mmMaximum value of SAR (interpolated) = 1.37 W/kg

Ch20525/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.880 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.65 W/kg
SAR(1 g) = 1.03 W/kg; SAR(10 g) = 0.620 W/kg
Maximum value of SAR (measured) = 1.39 W/kg



0 dB = 1.39 W/kg = 1.43 dBW/kg

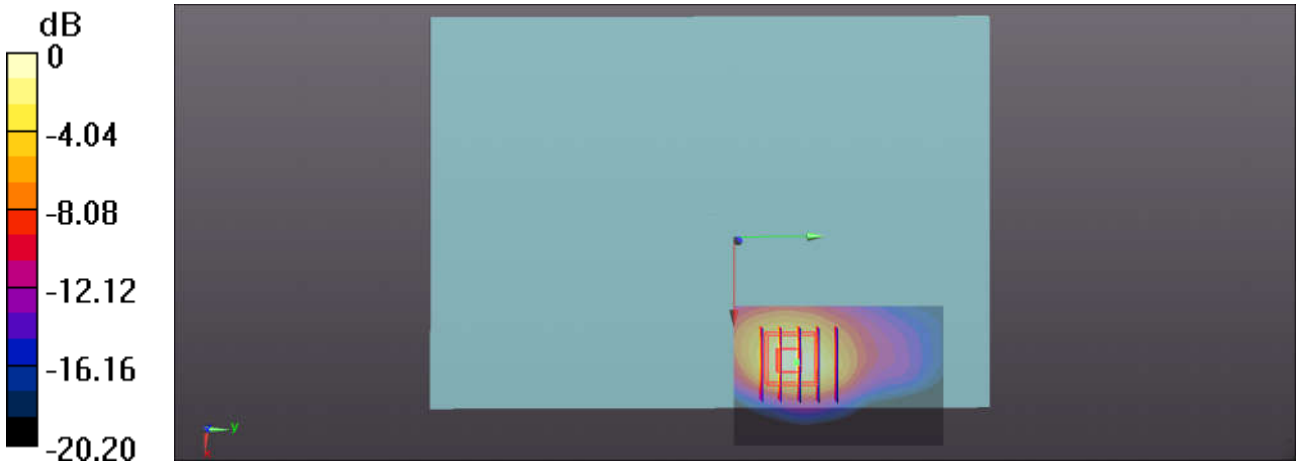
05_LTE Band 4_20M_QPSK_1RB_49Offset_Bottom Side_0mm_Ch20175_Sensor On

Communication System: UID 0, FDD_LTE (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: MSL_1750 Medium parameters used: f = 1732.5 MHz; σ = 1.431 S/m; ε_r = 52.947; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(8.32, 8.32, 8.32); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch20175/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.32 W/kg

Ch20175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.599 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.91 W/kg
SAR(1 g) = 0.906 W/kg; SAR(10 g) = 0.425 W/kg
Maximum value of SAR (measured) = 1.35 W/kg



0 dB = 1.35 W/kg = 1.30 dBW/kg

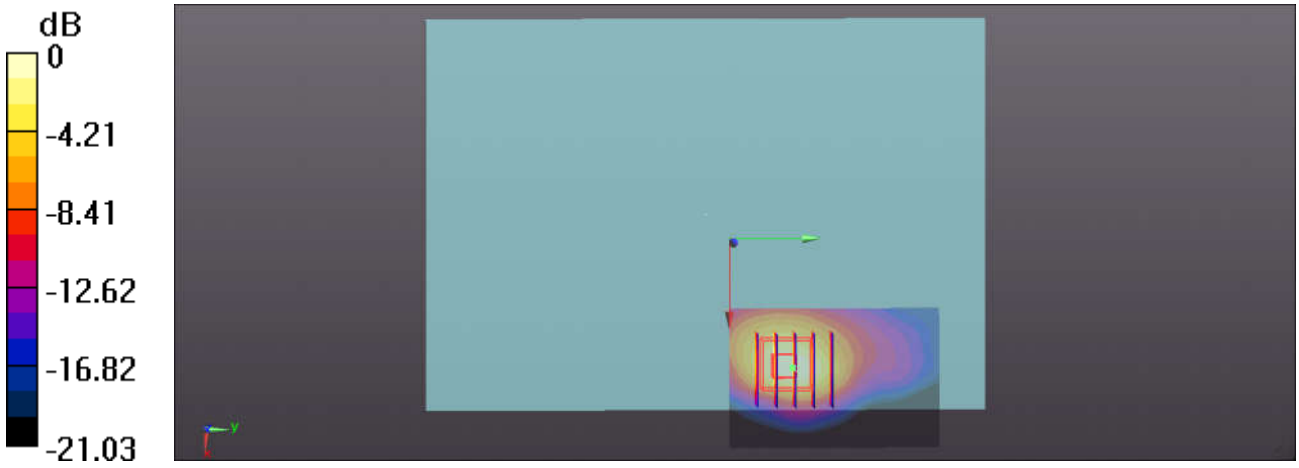
06_LTE Band 2_20M_QPSK_1RB_49Offset_Bottom Side_0mm_Ch19100_Sensor On

Communication System: UID 0, FDD_LTE (0); Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900 Medium parameters used: f = 1900 MHz; σ = 1.515 S/m; ε_r = 52.452; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(8.01, 8.01, 8.01); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch19100/Area Scan (41x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.57 W/kg

Ch19100/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.546 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 2.32 W/kg
SAR(1 g) = 1.06 W/kg; SAR(10 g) = 0.482 W/kg
Maximum value of SAR (measured) = 1.55 W/kg



0 dB = 1.55 W/kg = 1.90 dBW/kg

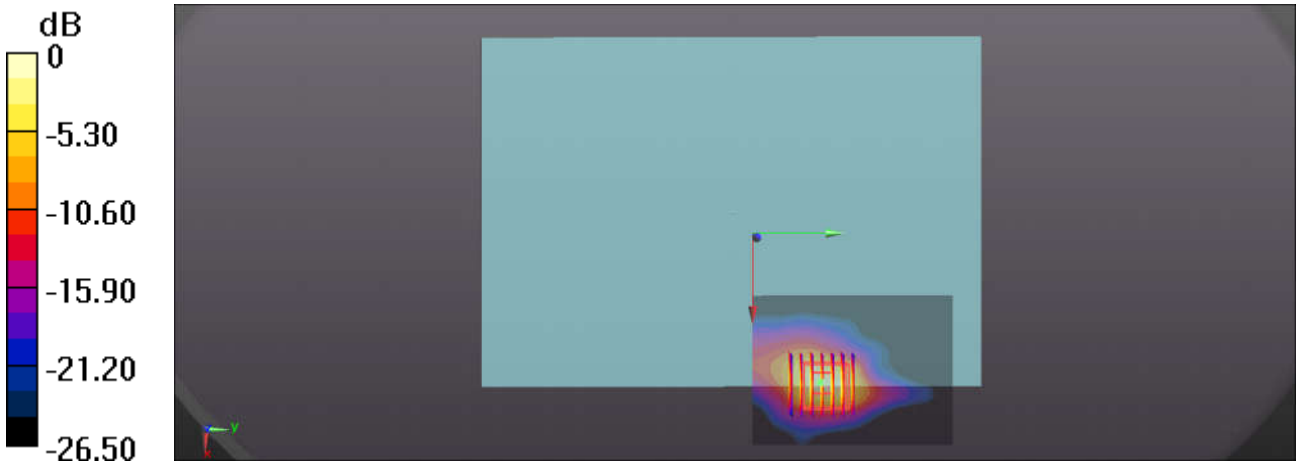
07_LTE Band 7_20M_QPSK_50RB_24Offset_Bottom Face_0mm_Ch21100_Sensor On

Communication System: UID 0, FDD_LTE (0); Frequency: 2535 MHz;Duty Cycle: 1:1
Medium: MSL_2600 Medium parameters used: f = 2535 MHz; σ = 2.089 S/m; ε_r = 52.876; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(7.55, 7.55, 7.55); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch21100/Area Scan (61x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.41 W/kg

Ch21100/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.5550 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 2.03 W/kg
SAR(1 g) = 0.994 W/kg; SAR(10 g) = 0.414 W/kg
Maximum value of SAR (measured) = 1.56 W/kg



0 dB = 1.56 W/kg = 1.93 dBW/kg

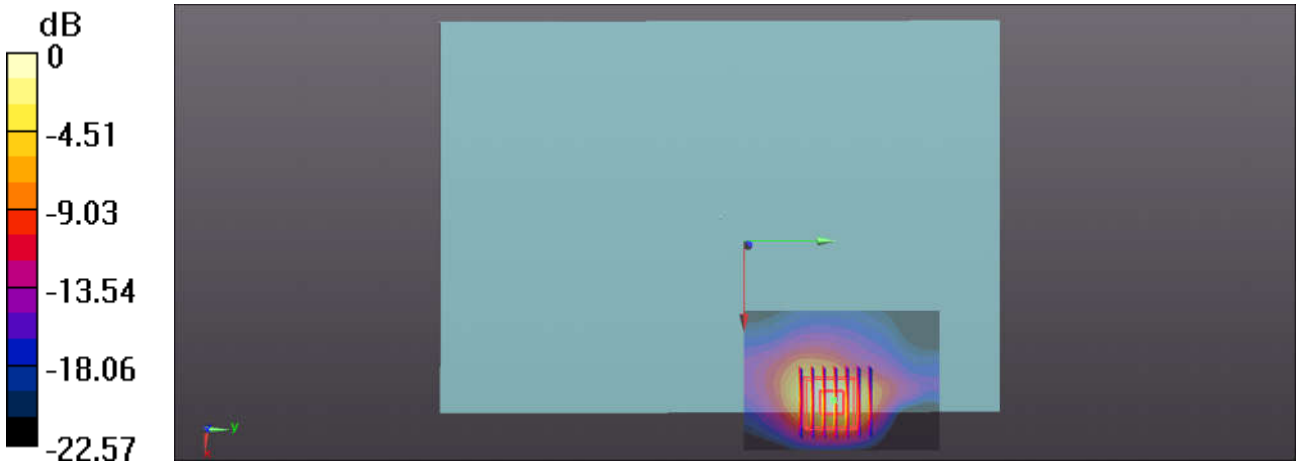
08_LTE Band 30_10M_QPSK_1RB_49Offset_Bottom Face_0mm_Ch27710_Sensor On

Communication System: UID 0, FDD_LTE (0); Frequency: 2310 MHz;Duty Cycle: 1:1
Medium: MSL_2300 Medium parameters used: f = 2310 MHz; σ = 1.772 S/m; ε_r = 53.669; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(7.8, 7.8, 7.8); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch27710/Area Scan (51x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.33 W/kg

Ch27710/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.014 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.86 W/kg
SAR(1 g) = 0.900 W/kg; SAR(10 g) = 0.386 W/kg
Maximum value of SAR (measured) = 1.41 W/kg



0 dB = 1.41 W/kg = 1.49 dBW/kg

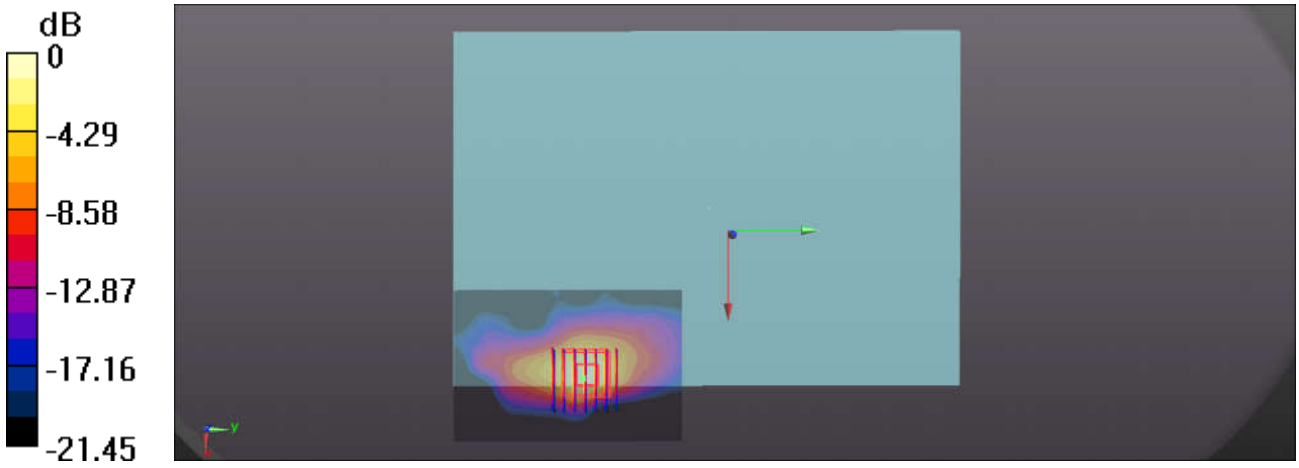
09_WLAN2.4GHz _802.11n-HT40 MCS0_Bottom Face_0mm_Ch3_Sensor On

Communication System: UID 0, WIFI (0); Frequency: 2422 MHz;Duty Cycle: 1:1.155
Medium: MSL_2450 Medium parameters used: f = 2422 MHz; σ = 1.984 S/m; ε_r = 52.666; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(7.55, 7.55, 7.55); Calibrated: 2016.11.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch3/Area Scan (61x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.451 W/kg

Ch3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.6510 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.582 W/kg
SAR(1 g) = 0.258 W/kg; SAR(10 g) = 0.112 W/kg
Maximum value of SAR (measured) = 0.414 W/kg



0 dB = 0.414 W/kg = -3.83 dBW/kg

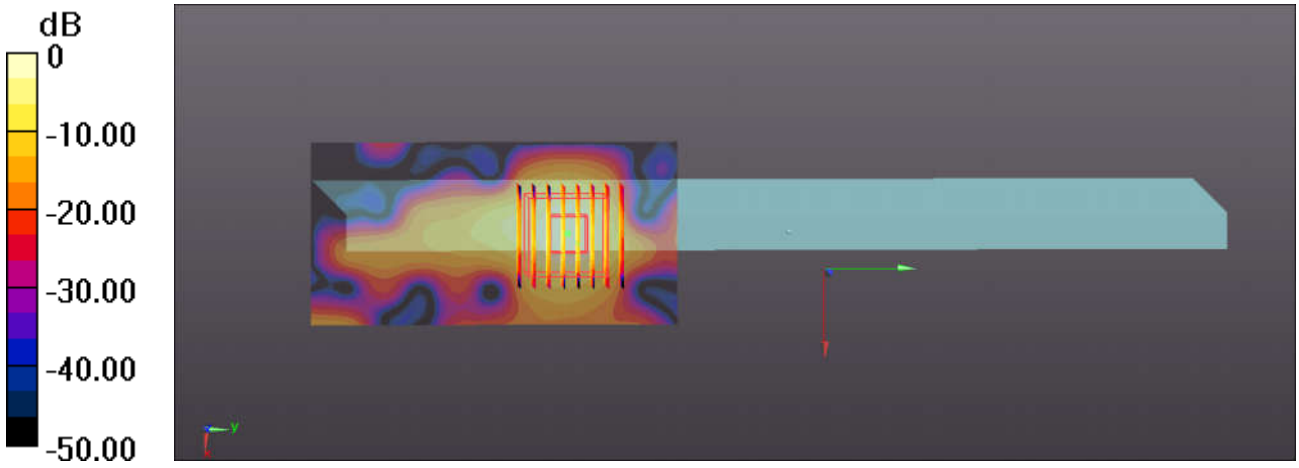
10_WLAN5.3GHz _802.11n -HT40 MCS0_Edge 1_0mm_Ch62_Sensor On

Communication System: UID 0, WIFI (0); Frequency: 5310 MHz;Duty Cycle: 1:1.155
Medium: MSL_5000 Medium parameters used: f = 5310 MHz; σ = 5.419 S/m; ε_r = 48.063; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(4.5, 4.5, 4.5); Calibrated: 2016.11.28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch62/Area Scan (51x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.52 W/kg

Ch62/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 0.6230 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 2.38 W/kg
SAR(1 g) = 0.753 W/kg; SAR(10 g) = 0.233 W/kg
Maximum value of SAR (measured) = 1.35 W/kg



0 dB = 1.35 W/kg = 1.30 dBW/kg

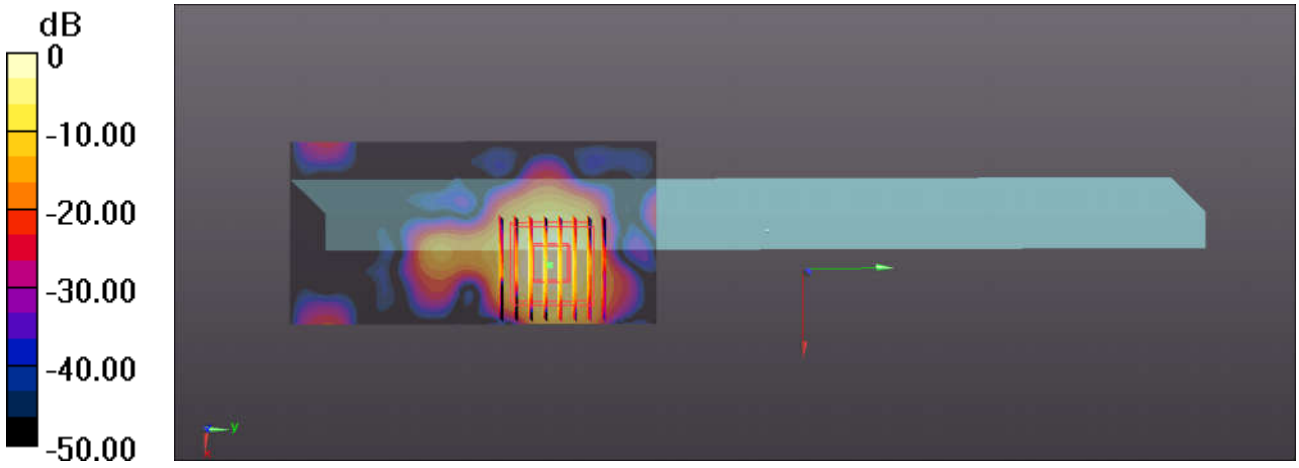
11_WLAN5.5GHz _802.11n-HT40 MCS0_Edge 1_0mm_Ch102_Sensor On

Communication System: UID 0, WIFI (0); Frequency: 5510 MHz;Duty Cycle: 1:1.155
Medium: MSL_5000 Medium parameters used: f = 5510 MHz; σ = 5.712 S/m; ε_r = 47.69; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(3.92, 3.92, 3.92); Calibrated: 2016.11.28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch102/Area Scan (51x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.74 W/kg

Ch102/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 0.7580 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 2.60 W/kg
SAR(1 g) = 0.788 W/kg; SAR(10 g) = 0.224 W/kg
Maximum value of SAR (measured) = 1.55 W/kg



0 dB = 1.55 W/kg = 1.90 dBW/kg

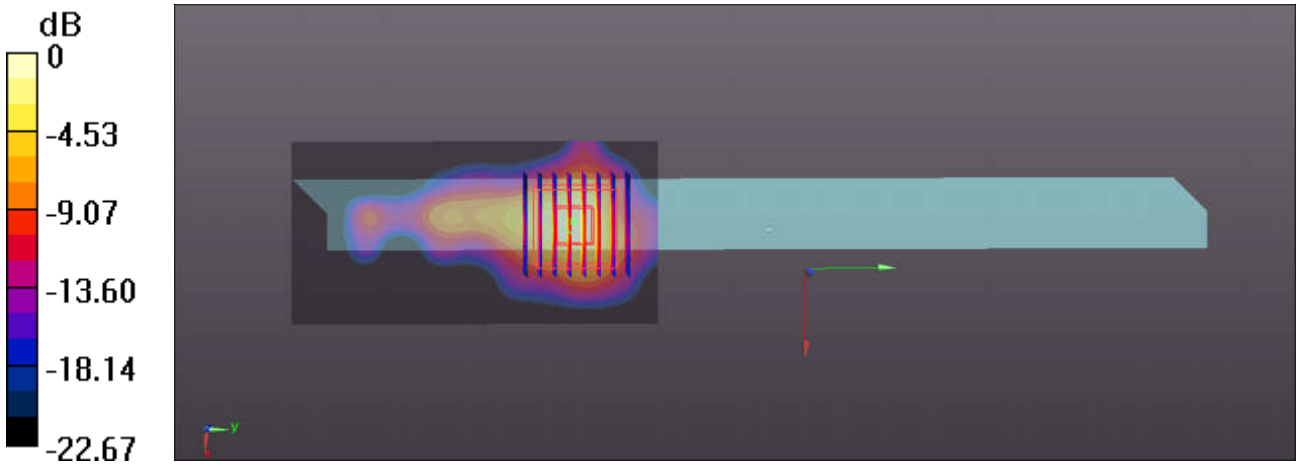
12_WLAN5.8GHz _802.11n-HT40 MCS0_Edge 1_0mm_Ch151_Sensor On

Communication System: UID 0, WIFI (0); Frequency: 5755 MHz;Duty Cycle: 1:1.155
Medium: MSL_5000 Medium parameters used: f = 5755 MHz; σ = 6.047 S/m; ε_r = 47.108; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(4.05, 4.05, 4.05); Calibrated: 2016.11.28;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1437; Calibrated: 2016.7.12
- Phantom: SAM4; Type: SAM; Serial: TP-1127
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch151/Area Scan (51x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.775 W/kg

Ch151/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 4.368 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.998 W/kg
SAR(1 g) = 0.388 W/kg; SAR(10 g) = 0.130 W/kg
Maximum value of SAR (measured) = 0.704 W/kg



0 dB = 0.704 W/kg = -1.52 dBW/kg

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.

In Collaboration with
s p e a g
CALIBRATION LABORATORY

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com Http://www.chinattl.cn

中国认可
国际互认
校准
CALIBRATION
CNAS L0570

Client **Sporton-CN** **Certificate No: Z16-97221**

CALIBRATION CERTIFICATE

Object D750V3 - SN: 1065

Calibration Procedure(s) FD-Z11-003-01
Calibration Procedures for dipole validation kits

Calibration date: November 21, 2016

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	27-Jun-16 (CTTL, No.J16X04771)	Jun-17
Power sensor NRP-Z91	101547	27-Jun-16 (CTTL, No.J16X04771)	Jun-17
Reference Probe EX3DV4	SN 7433	26-Sep-16(SPEAG,No.EX3-7433_Sep16)	Sep-17
DAE4	SN 771	02-Feb-16(CTTL-SPEAG,No.Z16-97011)	Feb-17
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	01-Feb-16 (CTTL, No.J16X00893)	Jan-17
Network Analyzer E5071C	MY46110673	26-Jan-16 (CTTL, No.J16X00894)	Jan-17

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: November 26, 2016

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Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005

c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010

d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

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Measurement Conditions

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

DASY Version	DASY52	52.8.8.1258
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.8 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.11 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**8.32 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.41 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**5.58 mW /g ± 20.4 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.5 ± 6 %	0.95 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.16 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**8.71 mW /g ± 20.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.46 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**5.88 mW /g ± 20.4 % (k=2)**

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.7Ω- 3.08jΩ
Return Loss	- 29.3dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.9Ω- 2.07jΩ
Return Loss	- 32.5dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.021 ns

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

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

Additional EUT Data

Manufactured by	SPEAG

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DASY5 Validation Report for Head TSL Date: 11.21.2016

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1065

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

Medium parameters used: f = 750 MHz; σ = 0.906 S/m; ε_r = 41.82; ρ = 1000 kg/m^3

Phantom section: Center Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7433; ConvF(10.01, 10.01, 10.01); Calibrated: 9/26/2016;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2/2/2016
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

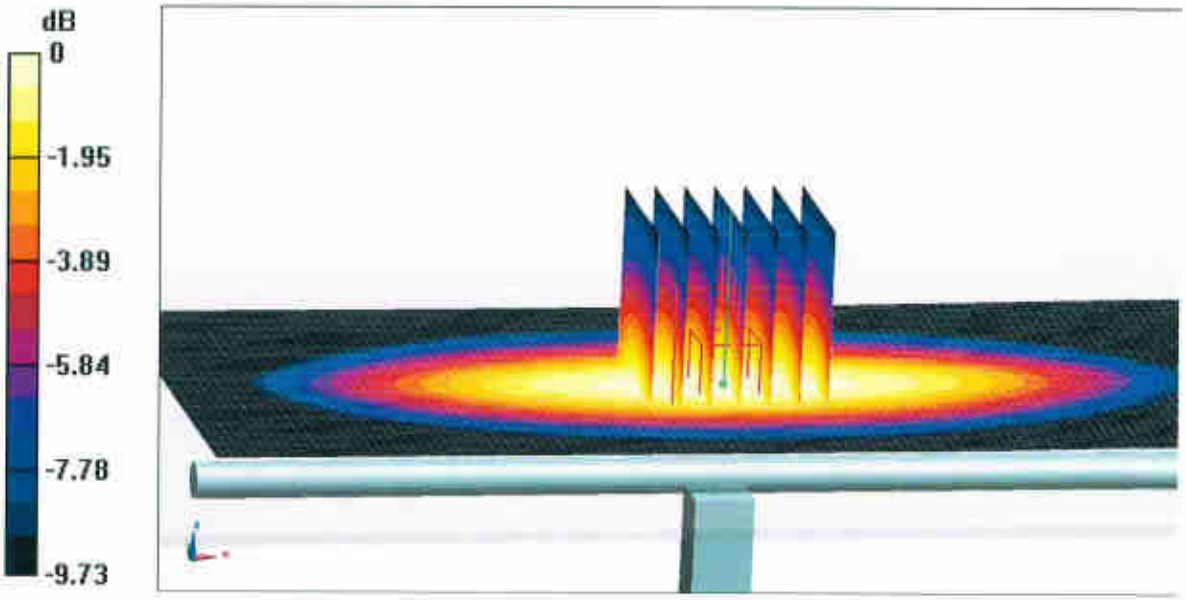
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.09 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 3.09 W/kg

SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.41 W/kg

Maximum value of SAR (measured) = 2.65 W/kg



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

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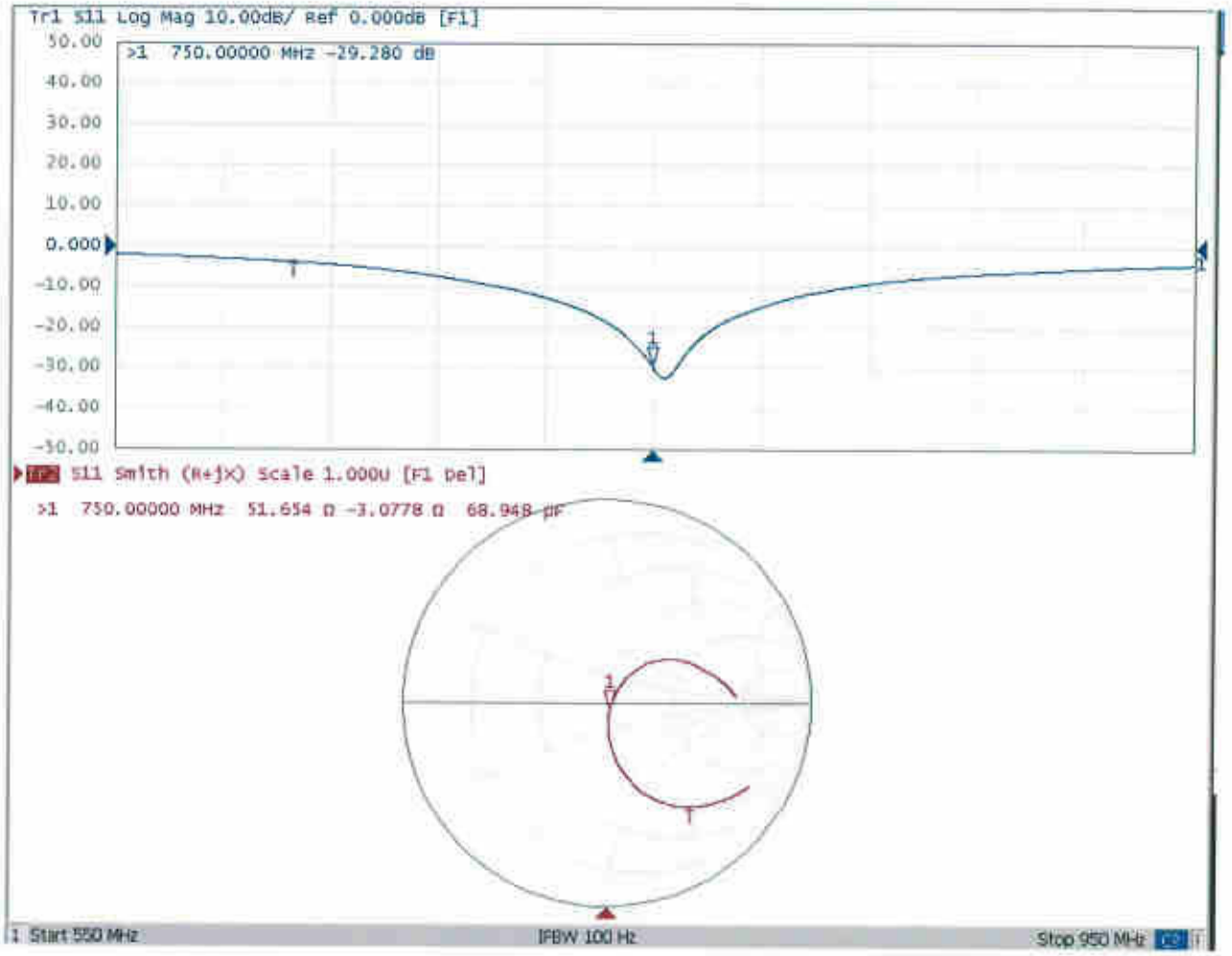
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL Date: 11.21.2016

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1065

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

Medium parameters used: f = 750 MHz; σ = 0.945 S/m; ε_r = 54.47; ρ = 1000 kg/m^3

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7433; ConvF(9.83, 9.83, 9.83); Calibrated: 9/26/2016;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn771; Calibrated: 2/2/2016
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

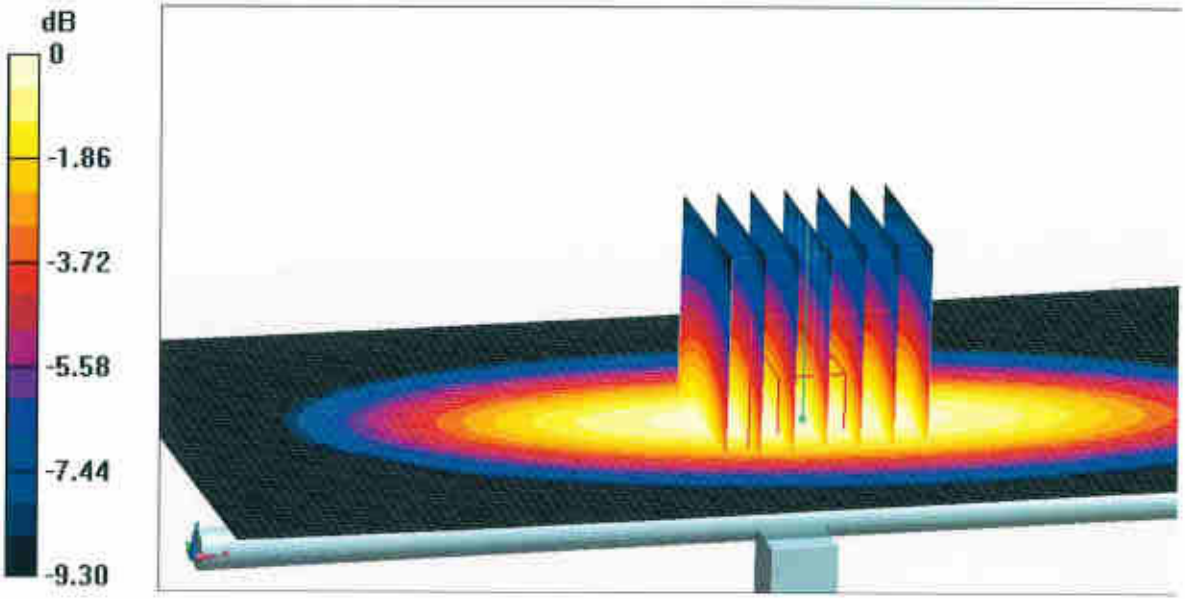
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.84 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 3.09 W/kg

SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.46 W/kg

Maximum value of SAR (measured) = 2.68 W/kg



0 dB = 2.68 W/kg = 4.28 dBW/kg

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Impedance Measurement Plot for Body TSL