FCC SAR Test Report

APPLICANT	:	**ZTE CORPORATION**
EQUIPMENT	:	**LTE uFi**
BRAND NAME	:	**ZTE**
MODEL NAME	:	**MF97B_T**
FCC ID	:	**SRQ-MF97B-T**
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

Jones Tsai

Approved by: Jones Tsai / Manager

ilac-MRA TAF Testing Laboratory 2627

SPORTON INTERNATIONAL (KUNSHAN) INC.
No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P. R. C.

Table of Contents

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA4O2101-02	Rev. 01	This is a variant report for MF97B_T. According to the product equality declaration by the application, test cases were performed on original report which can be referred to SPORTON Report Number FA4O2101 with FCC ID: SRQ-MF97B. Based on the original test report, the new added WWAN Band (WCDMA Band IV, LTE Band 12) and WLAN performed full testing, other WWAN Bands, the worst cases were verified for the differences.	Mar. 16, 2016

1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **ZTE CORPORATION, LTE uFi, MF97B_T** are as follows.

<table>
<tr><th rowspan="3">Equipment Class</th><th rowspan="3" colspan="2">Frequency Band</th><th>Highest 1g SAR Summary</th><th rowspan="3">Highest Simultaneous Transmission 1g SAR (W/kg)</th></tr>
<tr><th>Hotspot (Separation 10mm)</th></tr>
<tr><th>1g SAR (W/kg)</th></tr>
<tr><td rowspan="7">Licensed</td><td rowspan="3">WCDMA</td><td>Band V</td><td>0.53</td><td rowspan="7">1.56</td></tr>
<tr><td>Band II</td><td>1.19</td></tr>
<tr><td>Band IV</td><td>0.96</td></tr>
<tr><td rowspan="4">LTE</td><td>Band 5</td><td>0.55</td></tr>
<tr><td>Band 12</td><td>0.49</td></tr>
<tr><td>Band 4</td><td>1.42</td></tr>
<tr><td>Band 2</td><td>1.18</td></tr>
<tr><td>DTS</td><td rowspan="2">WLAN</td><td>2.4GHz WLAN</td><td>0.16</td><td>1.42</td></tr>
<tr><td>NII</td><td>5GHz WLAN</td><td>0.44</td><td>1.56</td></tr>
<tr><td>DSS</td><td>2.4GHz Band</td><td>Bluetooth</td><td></td><td>1.42</td></tr>
<tr><td colspan="3">Date of Testing:</td><td colspan="2">Nov. 10, 2014 ~ Mar. 03, 2016</td></tr>
</table>

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.

Remark: WWAN(WCDMA Band IV, LTE Band 12) and WLAN full test,Others WWAN Band, the worst cases were verified for the differences. SAR values for the WWAN operations are taken from test report FA4O2101 for FCC ID: SRQ-MF97B. We did perform verification testing on FCC ID: SRQ-MF97B-T to confirm that the SAR values reported for FCC ID: SRQ-MF97B remain representative of FCC ID: SRQ-MF97B-T demonstrates compliance for stand-alone SAR values for the WWAN operations.

2. Administration Data

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL (KUNSHAN) INC.
Test Site Location	No. 3-2, PingXiang Road, Kunshan, Jiangsu Province, P.R.C. TEL: +86-0512-5790-0158 FAX: +86-0512-5790-0958

Applicant	
Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P. R. China

Manufacturer	
Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P. R. China

3. Guidance Standard

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

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

4. Equipment Under Test (EUT) Information

4.1 General Information

Product Feature & Specification	
Equipment Name	LTE uFi
Brand Name	ZTE
Model Name	MF97B_T
FCC ID	SRQ-MF97B-T
IMEI Code	860985030002563
Wireless Technology and Frequency Range	WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 12: 699 MHz ~ 716 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz
Mode	· RMC 12.2Kbps · HSDPA · HSUPA · DC-HSDPA · HSPA+ (16QAM uplink is not supported) · LTE: QPSK, 16QAM · LTE Carrier Aggregation (Downlink only) · 802.11a/b/g/n HT20/HT40 · Bluetooth v2.1+EDR, Bluetooth v4.0 LE
HW Version	d96C
SW Version	SPRO2BV1.0.0B01
EUT Stage	Identical Prototype

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. This device 2.4GHz WLAN supports Hotspot operation, and 5.2GHz /5.8GHz WLAN supports WiFi Direct (GC/GO).
3. This device has no voice function.
4. This device supports inter-band LTE carrier aggregation (CA) in the downlink only. Uplink maximum output power measurement with downlink carrier aggregation active was measured to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than 1⁄4 dB higher than the maximum output measured without downlink carrier aggregation active.

4.2 General LTE SAR Test and Reporting Considerations

<table>
<tr><th colspan="4">Summarized necessary items addressed in KDB 941225 D05 v02r05</th></tr>
<tr><td>FCC ID</td><td colspan="3">SRQ-MF97B-T</td></tr>
<tr><td>Equipment Name</td><td colspan="3">LTE uFi</td></tr>
<tr><td>Operating Frequency Range of each LTE transmission band</td><td colspan="3">LTE Band 2: 1850 MHz ~ 1910 MHz
LTE Band 4: 1710 MHz ~ 1755 MHz
LTE Band 5: 824 MHz ~ 849 MHz
LTE Band 12: 699 MHz ~ 716 MHz</td></tr>
<tr><td>Channel Bandwidth</td><td colspan="3">LTE Band 2:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 4:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz
LTE Band 5:1.4MHz, 3MHz, 5MHz, 10MHz
LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz</td></tr>
<tr><td>uplink modulations used</td><td colspan="3">QPSK, and 16QAM</td></tr>
<tr><td>LTE Voice / Data requirements</td><td colspan="3">Data only</td></tr>
<tr><td>LTE MPR permanently built-in by design</td><td colspan="3">Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (RB)</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
</table></td></tr>
<tr><td>LTE A-MPR</td><td colspan="3">In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)</td></tr>
<tr><td>Spectrum plots for RB configuration</td><td colspan="3">A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
<tr><td rowspan="9">LTE Carrier Aggregation Combinations</td><td>Intra Band</td><td colspan="2">Not support</td></tr>
<tr><td rowspan="8">Inter Band</td><td rowspan="8">B4(PCC)+B12(SCC)</td><td>1.4MHz(B4)+5MHz(B12)</td></tr>
<tr><td>1.4MHz(B4)+10MHz(B12)</td></tr>
<tr><td>3MHz(B4)+5MHz(B12)</td></tr>
<tr><td>3MHz(B4)+10MHz(B12)</td></tr>
<tr><td>5MHz(B4)+5MHz(B12)</td></tr>
<tr><td>5MHz(B4)+10MHz(B12)</td></tr>
<tr><td>10MHz(B4)+5MHz(B12)</td></tr>
<tr><td>10MHz(B4)+10MHz(B12)</td></tr>
</table>

Transmission (H, M, L) channel numbers and frequencies in each LTE band												
LTE Band 2												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	18607	1850.7	18615	1851.5	18625	1852.5	18650	1855	18675	1857.5	18700	1860
M	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880	18900	1880
H	19193	1909.3	19185	1908.5	19175	1907.5	19150	1905	19125	1902.5	19100	1900
LTE Band 4												
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz		Bandwidth 15 MHz		Bandwidth 20 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	19957	1710.7	19965	1711.5	19975	1712.5	20000	1715	20025	1717.5	20050	1720
M	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5	20175	1732.5
H	20393	1754.3	20385	1753.5	20375	1752.5	20350	1750	20325	1747.5	20300	1745

LTE Band 5								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	20407	824.7	20415	825.5	20425	826.5	20450	829
M	20525	836.5	20525	836.5	20525	836.5	20525	836.5
H	20643	848.3	20635	847.5	20625	846.5	20600	844
LTE Band 12								
	Bandwidth 1.4 MHz		Bandwidth 3 MHz		Bandwidth 5 MHz		Bandwidth 10 MHz	
	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)	Ch. #	Freq. (MHz)
L	23017	699.7	23025	700.5	23035	701.5	23060	704
M	23095	707.5	23095	707.5	23095	707.5	23095	707.5
H	23173	715.3	23165	714.5	23155	713.5	23130	711

5. RF Exposure Limits

5.1 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.

5.2 Controlled Environment

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

Limits for Occupational/Controlled Exposure (W/kg)

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

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

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

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

6. Specific Absorption Rate (SAR)

6.1 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.

6.2 SAR Definition

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

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

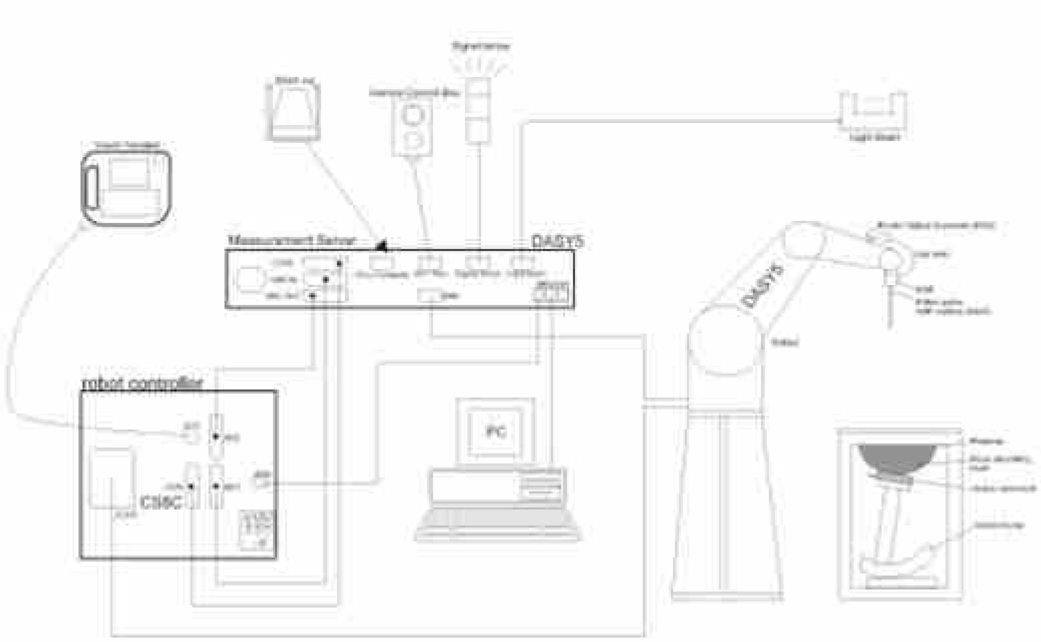
SAR is expressed in units of Watts per kilogram (W/kg)

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

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

7. 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.

7.1 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

7.2 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

7.3 Phantom

<SAM Twin Phantom>

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

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

<ELI Phantom>

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

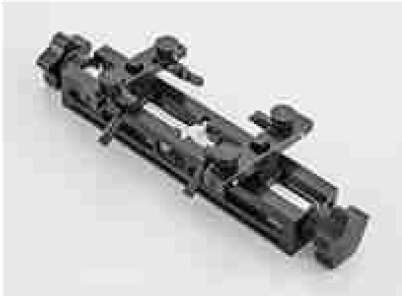
The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

7.4 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

8. 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

8.1 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

8.2 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.

8.3 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.	

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

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

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

8.5 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.

8.6 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.

9. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	750MHz System Validation Kit	D750V3	1012	May 16, 2014	May 15, 2015
SPEAG	750MHz System Validation Kit	D750V3	1065	Nov. 24, 2015	Nov. 23, 2016
SPEAG	835MHz System Validation Kit	D835V2	499	Mar. 24, 2014	Mar. 23, 2015
SPEAG	835MHz System Validation Kit	D835V2	4d091	Nov. 24, 2015	Nov. 23, 2016
SPEAG	1750MHz System Validation Kit	D1750V2	1090	Mar. 27, 2013	Mar. 25, 2015
SPEAG	1750MHz System Validation Kit	D1750V2	1069	Nov. 23, 2015	Nov. 22, 2016
SPEAG	1900MHz System Validation Kit	D1900V2	5d041	Mar. 21, 2014	Mar. 20, 2015
SPEAG	1900MHz System Validation Kit	D1900V2	5d118	Nov. 23, 2015	Nov. 22, 2016
SPEAG	2450MHz System Validation Kit	D2450V2	840	Nov. 25, 2015	Nov. 24, 2016
SPEAG	5000MHz System Validation Kit	D5GHzV2	1113	Nov. 26, 2015	Nov. 25, 2016
SPEAG	Data Acquisition Electronics	DAE4	1210	May 19, 2014	May 18, 2015
SPEAG	Data Acquisition Electronics	DAE4	1210	May 21, 2015	May 20, 2016
SPEAG	Data Acquisition Electronics	DAE4	1279	Jul. 21, 2015	Jul. 20, 2016
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	May 23, 2014	May 22, 2015
SPEAG	Dosimetric E-Field Probe	EX3DV4	3857	May 28, 2015	May 27, 2016
SPEAG	Dosimetric E-Field Probe	EX3DV4	3954	Nov. 27, 2015	Nov. 26, 2016
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1477	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1479	NCR	NCR
SPEAG	SAM Twin Phantom	QD 000 P40 CB	TP-1542	NCR	NCR
SPEAG	Phone Positioner	N/A	N/A	NCR	NCR
Anritsu	Radio communication analyzer	MT8820C	6201091028	Jul, 10, 2014	Jul, 09, 2015
Anritsu	Radio communication analyzer	MT8820C	6201300654	Aug. 10, 2015	Aug. 09, 2016
Agilent	Wireless Communication Test Set	E5515C	MY52102706	May 03, 2014	May 02, 2015
Agilent	Wireless Communication Test Set	E5515C	MY52102706	May 03, 2015	May 02, 2016
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	May 04, 2014	May 03, 2015
Agilent	ENA Series Network Analyzer	E5071C	MY46111157	May 04, 2015	May 03, 2016
Agilent	Dielectric Probe Kit	85070E	MY44300475	NCR	NCR
R&S	Signal Generator	SMBV100A	258305	Feb. 07, 2014	Feb. 06, 2015
Anritsu	Power Senor	MA2411B	0917070	Feb. 27, 2014	Feb. 26, 2015
Anritsu	Power Meter	ML2495A	1005002	Feb. 27, 2014	Feb. 26, 2015
Anritsu	Power Senor	MA2411B	0917070	Jan. 20, 2016	Jan. 19, 2017
Anritsu	Power Meter	ML2495A	1005002	Jan. 20, 2016	Jan. 19, 2017
Anritsu	Power Senor	MA2411B	1339163	Jan. 20, 2016	Jan. 19, 2017
Anritsu	Power Meter	ML2495A	1435004	Jan. 20, 2016	Jan. 19, 2017
R&S	CBT BLUETOOTH TESTER	CBT	100783	Aug. 10, 2015	Aug. 09, 2016
R&S	Spectrum Analyzer	FSP40	100319	Oct. 28, 2014	Oct. 27, 2015
R&S	Spectrum Analyzer	FSP40	100319	Aug. 10, 2015	Aug. 09, 2016
Agilent	Dual Directional Coupler	778D	50422	Note1	
PASTERNACK	Dual Directional Coupler	PE2214-10	N/A	Note1	
AR	Amplifier	5S1G4	333096	Note1	
mini-circuits	Amplifier	ZVE-3W-83+	162601250	Note1	
Woken	Attenuator 1	WK0602-XX	N/A	Note1	
PE	Attenuator 2	PE7005-10	N/A	Note1	
PE	Attenuator 3	PE7005- 3	N/A	Note1	
MCL	Attenuation1	BW-S10W5+	N/A	Note1	
MCL	Attenuation2	BW-S10W5+	N/A	Note1	
MCL	Attenuation3	BW-S10W5+	N/A	Note1	

General Note:

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

2. Referring to KDB 865664 D01v01r03, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged, or repaired during the interval.
3. The justification data of dipole D1750V2, SN: 1090 can be found in appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

10. System Verification

10.1 Tissue Verification

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

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

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	22.7	0.963	54.228	0.96	55.50	0.31	-2.29	±5	Nov. 13, 2014
835	Body	22.7	0.976	54.382	0.97	55.20	0.62	-1.48	±5	Nov. 13, 2014
1750	Body	22.7	1.513	55.500	1.49	53.40	1.54	3.93	±5	Nov. 10, 2014
1900	Body	22.7	1.554	53.519	1.52	53.30	2.24	0.41	±5	Nov. 10, 2014

<Spot Check 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	0.956	54.927	0.96	55.50	-0.42	-1.03	±5	Feb. 28, 2016
835	Body	22.8	1.000	53.687	0.97	55.20	3.09	-2.74	±5	Feb. 28, 2016
1750	Body	22.7	1.529	53.218	1.49	53.40	2.62	-0.34	±5	Feb. 28, 2016
1900	Body	22.7	1.571	52.548	1.52	53.30	3.36	-1.41	±5	Feb. 28, 2016
2450	Body	22.5	1.943	50.981	1.95	52.70	-0.36	-3.26	±5	Feb. 27, 2016
5250	Body	22.6	5.379	49.115	5.36	48.95	0.35	0.34	±5	Mar. 03, 2016
5750	Body	22.6	6.070	47.985	5.95	48.27	2.02	-0.59	±5	Mar. 03, 2016

10.2 System Performance Check Results

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

<System Verification 1g SAR Results>

Date	Frequency (MHz)	Tissue Type	Input Power (mW)	Dipole S/N	Probe S/N	DAE S/N	Measured SAR (W/kg)	Targeted SAR (W/kg)	Normalized SAR (W/kg)	Deviation (%)
Nov. 13, 2014	750	Body	250	1012	3857	1210	2.08	8.65	8.32	-3.82
Nov. 13, 2014	835	Body	250	499	3857	1210	2.23	9.46	8.92	-5.71
Nov. 10, 2014	1750	Body	250	1090	3857	1210	9.14	38.10	36.56	-4.04
Nov. 10, 2014	1900	Body	250	5d041	3857	1210	10.40	41.00	41.6	1.46

<Spot Check System Verification 1g SAR Results>

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 (%)
Feb. 28, 2016	750	Body	250	1065	3954	1279	2.18	8.86	8.72	-1.58
Feb. 28, 2016	835	Body	250	4d091	3954	1279	2.54	9.55	10.16	6.39
Feb. 28, 2016	1750	Body	250	1069	3857	1210	9.34	35.9	37.36	4.07
Feb. 28, 2016	1900	Body	250	5d118	3857	1210	10.90	40.6	43.6	7.39
Feb. 27, 2016	2450	Body	250	840	3857	1210	11.90	51.1	47.6	-6.85
Mar. 03, 2016	5250	Body	100	1113	3954	1279	7.85	76.5	78.5	2.61
Mar. 03, 2016	5750	Body	100	1113	3954	1279	7.41	76.6	74.1	-3.26

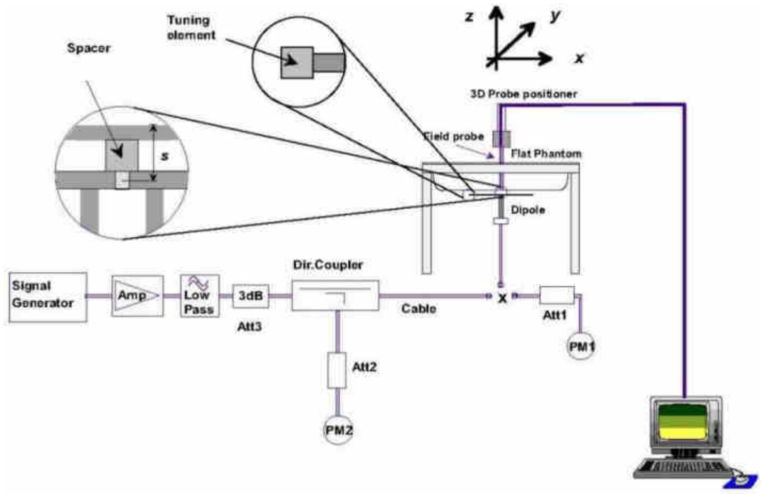


Fig 8.3.1 System Performance Check Setup

Fig 8.3.2 Setup Photo

11. RF Exposure Positions

11.1 Body Position

(a) To position the device parallel to the phantom surface with all sides and either keypad up or down.
(b) To adjust the device parallel to the flat phantom.
(c) To adjust the distance between the device and the flat phantom to 10 mm.

<EUT Setup Photos>

Please refer to Appendix D for the test setup photos.

12. 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 $\beta_{hs} = 30/15 * \beta_c$.

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

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.		

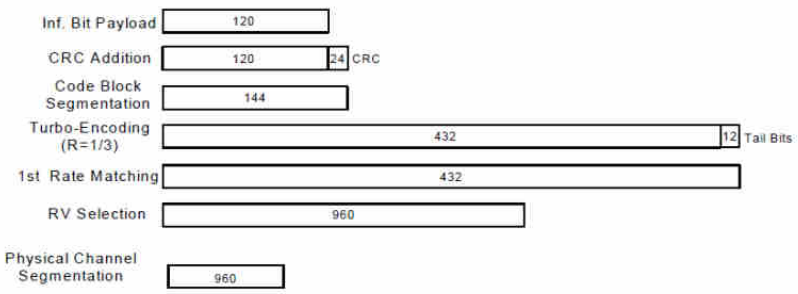


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

Setup Configuration

<WCDMA Conducted Power>

General Note:

1. Per KDB 941225 D01v03r01, SAR for Head / Hotspot / Body-worn exposure 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.

Band			WCDMA Band V				WCDMA Band II			
Tx Channel			4132	4182	4233	Tune-up Limit (dBm)	9262	9400	9538	Tune-up Limit (dBm)
Rx Channel			4357	4407	4458		9662	9800	9938	
Frequency (MHz)			826.4	836.4	846.6		1852.4	1880	1907.6	
MPR (dB)	3GPP Rel 99	RMC 12.2Kbps	22.80	22.77	**22.85**	24.0	22.80	**22.93**	22.69	24.0
0	3GPP Rel 6	HSDPA Subtest-1	21.40	21.34	21.36	21.5	21.42	21.46	21.30	21.5
0	3GPP Rel 6	HSDPA Subtest-2	21.41	21.35	21.35	21.5	21.39	21.45	21.28	21.5
0.5	3GPP Rel 6	HSDPA Subtest-3	21.36	21.29	21.39	21.5	21.40	21.42	21.28	21.5
0.5	3GPP Rel 6	HSDPA Subtest-4	21.40	21.32	21.34	21.5	21.37	21.43	21.26	21.5
0	3GPP Rel 6	HSUPA Subtest-1	22.42	22.56	22.28	23.0	22.62	22.49	22.49	23.0
2	3GPP Rel 6	HSUPA Subtest-2	21.89	22.04	21.65	22.5	21.30	21.69	21.71	22.0
1	3GPP Rel 6	HSUPA Subtest-3	22.14	21.74	21.34	22.5	21.81	21.42	21.35	22.0
2	3GPP Rel 6	HSUPA Subtest-4	22.14	22.29	21.90	22.5	22.27	21.93	21.90	22.5
0	3GPP Rel 6	HSUPA Subtest-5	22.60	22.59	22.56	23.0	22.28	22.30	22.23	22.5

<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 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.

<LTE Band 5>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				20450	20525	20600		
Frequency (MHz)				829	836.5	844		
10	QPSK	1	0	22.98	23.01	22.81	24.0	0
10	QPSK	1	24	22.93	22.78	22.79		
10	QPSK	1	49	22.90	22.80	22.80		
10	QPSK	25	0	21.89	21.97	21.80	23.0	0-1
10	QPSK	25	12	21.93	21.90	21.88		
10	QPSK	25	24	21.90	21.87	21.79		
10	QPSK	50	0	21.98	21.93	21.80		
10	16QAM	1	0	22.24	21.85	21.85	23.0	0-1
10	16QAM	1	24	22.23	21.74	21.65		
10	16QAM	1	49	21.71	21.71	21.82		
10	16QAM	25	0	21.05	20.94	20.90	22.0	0-2
10	16QAM	25	12	20.90	20.92	20.92		
10	16QAM	25	24	21.01	20.91	20.92		
10	16QAM	50	0	20.97	20.87	20.80		
Channel				20425	20525	20625	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	22.92	22.95	22.81	24.0	0
5	QPSK	1	12	22.78	22.84	22.66		
5	QPSK	1	24	22.87	22.90	22.78		
5	QPSK	12	0	21.96	21.93	21.83	23.0	0-1
5	QPSK	12	6	21.97	21.89	21.80		
5	QPSK	12	11	21.98	21.84	21.79		
5	QPSK	25	0	21.87	21.90	21.83		
5	16QAM	1	0	21.98	21.97	21.65	23.0	0-1
5	16QAM	1	12	21.55	21.94	21.49		
5	16QAM	1	24	21.77	21.84	21.59		
5	16QAM	12	0	21.00	20.93	20.90	22.0	0-2
5	16QAM	12	6	21.08	20.91	20.99		
5	16QAM	12	11	21.05	20.88	20.87		
5	16QAM	25	0	20.87	20.96	20.84		
Channel				20415	20525	20635	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	22.98	22.91	22.89	24.0	0
3	QPSK	1	7	22.90	22.78	22.86		
3	QPSK	1	14	22.95	22.81	22.86		
3	QPSK	8	0	22.01	21.93	21.84	23.0	0-1
3	QPSK	8	4	21.97	21.87	21.88		
3	QPSK	8	7	21.95	21.87	21.95		
3	QPSK	15	0	22.02	21.91	21.80		
3	16QAM	1	0	22.10	22.04	21.66	23.0	0-1
3	16QAM	1	7	21.79	21.59	21.37		
3	16QAM	1	14	22.05	21.99	21.54		
3	16QAM	8	0	21.10	20.92	21.01	22.0	0-2
3	16QAM	8	4	21.01	20.97	20.95		
3	16QAM	8	7	21.02	20.96	20.94		
3	16QAM	15	0	21.03	20.73	20.75		

Channel				20407	20525	20643	Tune up Limit (dBm)	Target MPR (dB)
Frequency (MHz)				824.7	836.5	848.3		
1.4	QPSK	1	0	22.98	22.93	22.98	24.0	0
1.4	QPSK	1	2	22.93	22.80	22.86		
1.4	QPSK	1	5	22.94	22.90	22.94		
1.4	QPSK	3	0	22.91	22.85	22.95		
1.4	QPSK	3	1	22.93	22.88	22.90		
1.4	QPSK	3	2	22.95	22.88	22.92		
1.4	QPSK	6	0	22.02	21.91	21.91	23.0	0-1
1.4	16QAM	1	0	22.14	22.13	22.29	23.0	0-1
1.4	16QAM	1	2	21.99	21.78	22.08		
1.4	16QAM	1	5	21.82	21.92	21.52		
1.4	16QAM	3	0	21.85	21.76	21.93		
1.4	16QAM	3	1	22.02	21.86	21.82		
1.4	16QAM	3	2	22.02	21.89	21.93		
1.4	16QAM	6	0	20.95	20.76	20.93	22.0	0-2

<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	22.73	**22.91**	22.69	23.5	0
20	QPSK	1	49	22.68	22.68	22.68		
20	QPSK	1	99	22.58	22.62	22.45		
20	QPSK	50	0	21.76	21.78	21.74	22.5	0-1
20	QPSK	50	24	21.70	21.75	21.70		
20	QPSK	50	49	21.66	21.71	21.57		
20	QPSK	100	0	21.75	21.83	21.71		
20	16QAM	1	0	21.71	21.77	21.68	22.5	0-1
20	16QAM	1	49	21.45	21.67	21.63		
20	16QAM	1	99	21.68	21.36	21.55		
20	16QAM	50	0	20.79	20.76	20.72	21.5	0-2
20	16QAM	50	24	20.71	20.79	20.73		
20	16QAM	50	49	20.68	20.76	20.66		
20	16QAM	100	0	20.74	20.86	20.85		
Channel				20025	20175	20325	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	22.88	22.76	22.73	23.5	0
15	QPSK	1	37	22.64	22.69	22.62		
15	QPSK	1	74	22.60	22.56	22.56		
15	QPSK	36	0	21.74	21.73	21.72	22.5	0-1
15	QPSK	36	18	21.66	21.78	21.64		
15	QPSK	36	37	21.72	21.73	21.59		
15	QPSK	75	0	21.69	21.76	21.65		
15	16QAM	1	0	21.97	21.58	21.59	22.5	0-1
15	16QAM	1	37	21.82	21.54	21.27		
15	16QAM	1	74	21.29	21.36	21.43		
15	16QAM	36	0	20.75	20.76	20.70	21.5	0-2
15	16QAM	36	18	20.68	20.70	20.64		
15	16QAM	36	37	20.72	20.66	20.62		
15	16QAM	75	0	20.70	20.73	20.68		
Channel				20000	20175	20350	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	22.81	22.76	22.62	23.5	0
10	QPSK	1	24	22.62	22.67	22.51		
10	QPSK	1	49	22.71	22.60	22.58		
10	QPSK	25	0	21.70	21.70	21.61	22.5	0-1
10	QPSK	25	12	21.72	21.74	21.58		
10	QPSK	25	24	21.71	21.70	21.58		
10	QPSK	50	0	21.78	21.75	21.70		
10	16QAM	1	0	21.99	21.79	21.72	22.5	0-1
10	16QAM	1	24	21.77	21.41	21.54		
10	16QAM	1	49	21.92	21.74	21.71		
10	16QAM	25	0	20.77	20.79	20.78	21.5	0-2
10	16QAM	25	12	20.66	20.81	20.69		
10	16QAM	25	24	20.81	20.74	20.71		
10	16QAM	50	0	20.81	20.80	20.75		

Channel				19975	20175	20375	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	22.90	22.74	22.69	23.5	0
5	QPSK	1	12	22.68	22.55	22.68		
5	QPSK	1	24	22.62	22.57	22.62		
5	QPSK	12	0	21.76	21.74	21.64	22.5	0-1
5	QPSK	12	6	21.69	21.71	21.65		
5	QPSK	12	11	21.70	21.74	21.46		
5	QPSK	25	0	21.72	21.71	21.55		
5	16QAM	1	0	21.68	21.52	21.43	22.5	0-1
5	16QAM	1	12	21.33	21.48	21.29		
5	16QAM	1	24	21.56	21.41	21.36		
5	16QAM	12	0	20.81	20.94	20.76	21.5	0-2
5	16QAM	12	6	20.76	20.79	20.80		
5	16QAM	12	11	20.87	20.79	20.66		
5	16QAM	25	0	20.73	20.74	20.72		
Channel				19965	20175	20385	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	22.66	22.77	22.66	23.5	0
3	QPSK	1	7	22.47	22.54	22.47		
3	QPSK	1	14	22.53	22.61	22.53		
3	QPSK	8	0	21.61	21.78	21.61	22.5	0-1
3	QPSK	8	4	21.53	21.70	21.53		
3	QPSK	8	7	21.47	21.75	21.47		
3	QPSK	15	0	21.62	21.77	21.62		
3	16QAM	1	0	22.07	21.89	22.07	22.5	0-1
3	16QAM	1	7	21.63	21.82	21.63		
3	16QAM	1	14	21.31	21.57	21.31		
3	16QAM	8	0	20.57	20.86	20.57	21.5	0-2
3	16QAM	8	4	20.65	20.79	20.65		
3	16QAM	8	7	20.78	20.71	20.78		
3	16QAM	15	0	20.69	20.73	20.69		
Channel				19957	20175	20393	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	22.81	22.79	22.68	23.5	0
1.4	QPSK	1	2	22.74	22.74	22.64		
1.4	QPSK	1	5	22.77	22.75	22.59		
1.4	QPSK	3	0	22.80	22.65	22.63		
1.4	QPSK	3	1	22.79	22.70	22.62		
1.4	QPSK	3	2	22.76	22.71	22.64		
1.4	QPSK	6	0	21.84	21.78	21.61	22.5	0-1
1.4	16QAM	1	0	21.98	21.73	21.79	22.5	0-1
1.4	16QAM	1	2	21.66	21.64	21.42		
1.4	16QAM	1	5	21.49	21.40	21.74		
1.4	16QAM	3	0	21.78	21.55	21.50		
1.4	16QAM	3	1	21.73	21.69	21.45		
1.4	16QAM	3	2	21.79	21.67	21.55		
1.4	16QAM	6	0	20.81	20.72	20.54	21.5	0-2

<LTE Band 2>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune up Limit (dBm)	MPR (dB)
Channel				18700	18900	19100		
Frequency (MHz)				1860	1880	1900		
20	QPSK	1	0	22.82	23.15	23.12	23.5	0
20	QPSK	1	49	22.77	23.01	22.97		
20	QPSK	1	99	22.78	23.04	23.04		
20	QPSK	50	0	21.92	22.09	22.00	22.5	0-1
20	QPSK	50	24	21.90	22.08	21.97		
20	QPSK	50	49	21.90	22.08	21.99		
20	QPSK	100	0	21.87	22.10	22.04		
20	16QAM	1	0	22.03	21.91	21.78	22.5	0-1
20	16QAM	1	49	21.95	21.78	21.58		
20	16QAM	1	99	21.44	21.64	21.72		
20	16QAM	50	0	20.77	21.02	21.04	21.5	0-2
20	16QAM	50	24	20.88	21.07	21.14		
20	16QAM	50	49	20.90	21.12	21.14		
20	16QAM	100	0	20.78	21.08	21.05		
Channel				18675	18900	19125	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	22.78	23.07	23.10	23.5	0
15	QPSK	1	37	22.70	22.98	23.07		
15	QPSK	1	74	22.71	23.06	23.03		
15	QPSK	36	0	21.80	21.97	22.01	22.5	0-1
15	QPSK	36	18	21.83	22.05	21.98		
15	QPSK	36	37	21.86	22.08	21.94		
15	QPSK	75	0	21.88	22.05	22.03		
15	16QAM	1	0	21.85	22.11	22.11	22.5	0-1
15	16QAM	1	37	21.81	21.97	21.69		
15	16QAM	1	74	21.74	21.66	22.09		
15	16QAM	36	0	20.84	20.94	21.07	21.5	0-2
15	16QAM	36	18	20.79	21.06	20.96		
15	16QAM	36	37	20.85	21.08	21.04		
15	16QAM	75	0	20.84	21.08	21.07		
Channel				18650	18900	19150	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	22.83	22.97	22.97	23.5	0
10	QPSK	1	24	22.76	22.93	22.91		
10	QPSK	1	49	22.69	22.94	22.91		
10	QPSK	25	0	21.73	22.02	22.06	22.5	0-1
10	QPSK	25	12	21.72	22.06	22.00		
10	QPSK	25	24	21.83	22.09	22.00		
10	QPSK	50	0	21.81	22.09	22.01		
10	16QAM	1	0	21.91	22.25	22.15	22.5	0-1
10	16QAM	1	24	21.88	21.81	21.60		
10	16QAM	1	49	21.67	22.21	21.81		
10	16QAM	25	0	20.80	21.11	21.11	21.5	0-2
10	16QAM	25	12	20.78	21.14	21.16		
10	16QAM	25	24	20.87	21.12	21.16		
10	16QAM	50	0	20.80	21.09	21.12		

Channel				18625	18900	19175	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	22.66	22.99	23.04	23.5	0
5	QPSK	1	12	22.60	22.98	23.01		
5	QPSK	1	24	22.63	22.93	22.93		
5	QPSK	12	0	21.72	22.02	21.97	22.5	0-1
5	QPSK	12	6	21.73	22.01	22.00		
5	QPSK	12	11	21.70	22.01	22.03		
5	QPSK	25	0	21.71	22.05	22.05		
5	16QAM	1	0	21.79	22.24	21.98	22.5	0-1
5	16QAM	1	12	21.30	22.19	21.93		
5	16QAM	1	24	21.76	22.17	21.85		
5	16QAM	12	0	20.78	21.06	21.14	21.5	0-2
5	16QAM	12	6	20.65	21.19	21.06		
5	16QAM	12	11	20.73	21.19	21.09		
5	16QAM	25	0	20.86	21.17	21.10		
Channel				18615	18900	19185	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	22.74	23.01	23.11	23.5	0
3	QPSK	1	7	22.58	22.95	23.02		
3	QPSK	1	14	22.70	22.99	23.09		
3	QPSK	8	0	21.76	22.08	21.98	22.5	0-1
3	QPSK	8	4	21.77	22.11	22.02		
3	QPSK	8	7	21.72	22.09	21.98		
3	QPSK	15	0	21.72	22.07	22.03		
3	16QAM	1	0	21.55	22.02	22.18	22.5	0-1
3	16QAM	1	7	21.37	21.81	21.69		
3	16QAM	1	14	21.31	22.00	21.95		
3	16QAM	8	0	20.85	21.22	20.93	21.5	0-2
3	16QAM	8	4	20.79	21.00	21.15		
3	16QAM	8	7	20.74	21.18	21.14		
3	16QAM	15	0	20.71	21.08	21.19		
Channel				18607	18900	19193	Tune up Limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	22.78	23.06	23.08	23.5	0
1.4	QPSK	1	2	22.69	22.95	22.97		
1.4	QPSK	1	5	22.69	23.02	22.98		
1.4	QPSK	3	0	22.65	23.01	23.02		
1.4	QPSK	3	1	22.71	23.05	23.05		
1.4	QPSK	3	2	22.72	23.02	22.97		
1.4	QPSK	6	0	21.82	22.13	22.04	22.5	0-1
1.4	16QAM	1	0	21.84	22.07	22.20	22.5	0-1
1.4	16QAM	1	2	21.61	22.00	21.80		
1.4	16QAM	1	5	21.49	21.85	22.12		
1.4	16QAM	3	0	21.74	21.96	21.91		
1.4	16QAM	3	1	21.73	21.96	21.97		
1.4	16QAM	3	2	21.62	21.99	21.93		
1.4	16QAM	6	0	20.64	21.06	21.05	21.5	0-2

13. Spot Check Conducted RF Output Power (Unit: dBm)

<WCDMA Conducted Power>

Band		WCDMA Band V			Tune-up Limit (dBm)	WCDMA Band II			Tune-up Limit (dBm)	WCDMA Band IV			Tune-up Limit (dBm)
TX Channel		4132	4182	4233		9262	9400	9538		1312	1413	1513	
Rx Channel		4357	4407	4458		9662	9800	9938		1537	1638	1738	
Frequency (MHz)		826.4	836.4	846.6		1852.4	1880	1907.6		1712.4	1732.6	1752.6	
3GPP Rel 99	RMC 12.2Kbps	23.17	23.19	**23.25**	24.00	23.71	**23.84**	23.83	24.00	23.25	**23.44**	23.39	23.50
3GPP Rel 6	HSDPA Subtest-1	22.03	22.12	22.22	22.50	22.49	22.64	22.66	23.00	22.08	22.31	22.28	22.50
3GPP Rel 6	HSDPA Subtest-2	22.08	22.06	22.24	22.50	22.55	22.63	22.68	23.00	22.05	22.25	22.27	22.50
3GPP Rel 6	HSDPA Subtest-3	21.60	21.59	21.67	22.00	22.01	22.21	22.23	22.50	21.57	21.78	21.70	22.00
3GPP Rel 6	HSDPA Subtest-4	21.47	21.58	21.76	22.00	22.09	22.19	22.21	22.50	21.56	21.77	21.68	22.00
3GPP Rel 8	DC-HSDPA Subtest-1	21.86	21.95	21.93	22.50	22.68	22.76	22.80	23.00	22.16	22.41	22.46	23.00
3GPP Rel 8	DC-HSDPA Subtest-2	22.05	22.11	21.89	22.50	22.53	22.68	22.73	23.00	22.11	22.31	22.39	23.00
3GPP Rel 8	DC-HSDPA Subtest-3	21.49	21.58	21.53	22.00	22.06	22.28	22.21	22.50	21.55	21.76	21.77	22.50
3GPP Rel 8	DC-HSDPA Subtest-4	21.55	21.54	21.56	22.00	22.04	22.24	22.25	22.50	21.52	21.73	21.89	22.50
3GPP Rel 6	HSUPA Subtest-1	21.29	21.49	21.45	22.50	22.18	22.27	22.53	23.00	22.04	21.66	22.30	23.00
3GPP Rel 6	HSUPA Subtest-2	20.79	20.90	20.85	21.00	21.54	21.68	21.36	22.00	20.74	21.23	20.92	21.50
3GPP Rel 6	HSUPA Subtest-3	20.76	20.03	20.93	21.50	21.47	21.02	21.42	22.00	21.16	21.19	21.42	22.00
3GPP Rel 6	HSUPA Subtest-4	21.25	21.42	21.32	22.00	22.18	22.31	21.79	22.50	21.13	21.66	21.41	22.00
3GPP Rel 6	HSUPA Subtest-5	21.93	21.92	22.13	22.50	22.64	22.85	22.86	23.00	22.26	22.45	22.42	23.00

<LTE Conducted Power>

<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	23.23	**23.25**	23.02	23.50	0
20	QPSK	1	49	23.13	23.21	22.99		
20	QPSK	1	99	23.16	23.09	22.95		
20	QPSK	50	0	22.21	22.22	22.01	22.50	0-1
20	QPSK	50	24	22.17	22.19	21.99		
20	QPSK	50	50	22.19	22.21	21.99		
20	QPSK	100	0	22.13	22.15	21.99		
20	16QAM	1	0	22.05	22.20	21.92	22.50	0-1
20	16QAM	1	49	22.09	22.14	21.89		
20	16QAM	1	99	22.07	22.03	21.80		
20	16QAM	50	0	21.23	21.15	20.92	21.50	0-2
20	16QAM	50	24	21.21	21.19	20.91		
20	16QAM	50	50	21.21	21.23	20.92		
20	16QAM	100	0	21.26	21.16	21.00		
Channel				18675	18900	19125	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1857.5	1880	1902.5		
15	QPSK	1	0	23.12	23.19	22.99	23.50	0
15	QPSK	1	37	23.19	23.18	22.97		
15	QPSK	1	74	23.21	23.11	22.94		
15	QPSK	36	0	22.14	22.11	21.99	22.50	0-1
15	QPSK	36	20	22.08	22.14	21.93		
15	QPSK	36	39	22.13	22.17	21.91		
15	QPSK	75	0	22.17	22.20	21.99		
15	16QAM	1	0	22.02	22.10	21.95	22.50	0-1
15	16QAM	1	37	22.09	22.09	21.87		
15	16QAM	1	74	22.08	22.01	21.80		
15	16QAM	36	0	21.15	21.13	20.87	21.50	0-2
15	16QAM	36	20	21.17	21.16	20.92		
15	16QAM	36	39	21.18	21.20	20.82		
15	16QAM	75	0	21.18	21.22	20.94		

Channel				18650	18900	19150	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1855	1880	1905		
10	QPSK	1	0	23.11	23.16	23.00	23.50	0
10	QPSK	1	25	23.16	23.15	22.94		
10	QPSK	1	49	23.21	23.08	22.94		
10	QPSK	25	0	22.01	22.14	21.97	22.50	0-1
10	QPSK	25	12	22.13	22.12	21.97		
10	QPSK	25	25	22.06	22.16	21.97		
10	QPSK	50	0	22.15	22.21	21.94		
10	16QAM	1	0	22.07	22.11	21.92	22.50	0-1
10	16QAM	1	25	22.05	22.09	21.84		
10	16QAM	1	49	22.08	22.02	21.82		
10	16QAM	25	0	21.13	21.17	21.00	21.50	0-2
10	16QAM	25	12	21.18	21.15	20.92		
10	16QAM	25	25	21.19	21.21	20.88		
10	16QAM	50	0	21.17	21.12	20.87		
Channel				18625	18900	19175	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1852.5	1880	1907.5		
5	QPSK	1	0	23.08	23.15	22.93	23.50	0
5	QPSK	1	12	23.02	23.16	22.88		
5	QPSK	1	24	23.18	23.19	22.92		
5	QPSK	12	0	22.04	22.15	21.91	22.50	0-1
5	QPSK	12	7	21.99	22.14	21.89		
5	QPSK	12	13	21.99	22.13	21.89		
5	QPSK	25	0	21.99	22.15	21.90		
5	16QAM	1	0	21.98	22.03	21.78	22.50	0-1
5	16QAM	1	12	21.90	22.02	21.79		
5	16QAM	1	24	22.01	22.06	21.81		
5	16QAM	12	0	21.07	21.18	20.95	21.50	0-2
5	16QAM	12	7	21.07	21.18	20.87		
5	16QAM	12	13	21.07	21.17	20.83		
5	16QAM	25	0	21.12	21.18	20.85		

Channel				18615	18900	19185	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1851.5	1880	1908.5		
3	QPSK	1	0	23.12	23.19	22.96	23.50	0
3	QPSK	1	8	23.05	23.16	22.90		
3	QPSK	1	14	23.06	23.15	22.92		
3	QPSK	8	0	22.00	22.17	21.90	22.50	0-1
3	QPSK	8	4	22.02	22.14	21.91		
3	QPSK	8	7	22.02	22.19	21.89		
3	QPSK	15	0	22.01	22.14	21.94		
3	16QAM	1	0	22.04	22.14	21.83	22.50	0-1
3	16QAM	1	8	21.96	22.09	21.81		
3	16QAM	1	14	22.00	22.09	21.90		
3	16QAM	8	0	21.06	21.17	20.92	21.50	0-2
3	16QAM	8	4	21.12	21.21	20.87		
3	16QAM	8	7	21.08	21.19	20.87		
3	16QAM	15	0	21.04	21.18	20.87		
Channel				18607	18900	19193	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1850.7	1880	1909.3		
1.4	QPSK	1	0	23.07	23.16	22.92	23.50	0
1.4	QPSK	1	3	23.05	23.15	22.88		
1.4	QPSK	1	5	23.04	23.19	22.90		
1.4	QPSK	3	0	23.09	23.16	22.98		
1.4	QPSK	3	1	23.07	23.21	22.91		
1.4	QPSK	3	3	23.03	23.20	22.89		
1.4	QPSK	6	0	22.02	22.11	21.89	22.50	0-1
1.4	16QAM	1	0	21.96	22.08	21.86	22.50	0-1
1.4	16QAM	1	3	21.95	22.15	21.89		
1.4	16QAM	1	5	21.98	22.10	21.75		
1.4	16QAM	3	0	21.97	22.03	21.81		
1.4	16QAM	3	1	21.93	22.07	21.79		
1.4	16QAM	3	3	21.98	22.08	21.80		
1.4	16QAM	6	0	20.94	21.06	20.73	21.50	0-2

<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	23.69	23.83	23.73	24.00	0
20	QPSK	1	49	23.67	23.73	23.72		
20	QPSK	1	99	23.62	23.79	23.63		
20	QPSK	50	0	22.75	22.89	22.85	23.00	0-1
20	QPSK	50	24	22.72	22.76	22.80		
20	QPSK	50	50	22.70	22.86	22.84		
20	QPSK	100	0	22.79	22.80	22.76		
20	16QAM	1	0	22.70	22.79	22.72	23.00	0-1
20	16QAM	1	49	22.57	22.66	22.70		
20	16QAM	1	99	22.57	22.65	22.61		
20	16QAM	50	0	21.70	21.75	21.91	22.00	0-2
20	16QAM	50	24	21.72	21.79	21.75		
20	16QAM	50	50	21.65	21.74	21.75		
20	16QAM	100	0	21.76	21.78	21.77		
Channel				20025	20175	20325	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1717.5	1732.5	1747.5		
15	QPSK	1	0	23.77	23.74	23.82	24.00	0
15	QPSK	1	37	23.66	23.73	23.78		
15	QPSK	1	74	23.63	23.75	23.69		
15	QPSK	36	0	22.67	22.76	22.75	23.00	0-1
15	QPSK	36	20	22.63	22.72	22.77		
15	QPSK	36	39	22.68	22.74	22.69		
15	QPSK	75	0	22.73	22.75	22.86		
15	16QAM	1	0	22.64	22.70	22.81	23.00	0-1
15	16QAM	1	37	22.63	22.64	22.72		
15	16QAM	1	74	22.56	22.64	22.59		
15	16QAM	36	0	21.67	21.67	21.73	22.00	0-2
15	16QAM	36	20	21.63	21.74	21.74		
15	16QAM	36	39	21.59	21.67	21.59		
15	16QAM	75	0	21.73	21.77	21.83		

Channel				20000	20175	20350	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1715	1732.5	1750		
10	QPSK	1	0	23.67	23.72	23.78	24.00	0
10	QPSK	1	25	23.61	23.74	23.82		
10	QPSK	1	49	23.62	23.72	23.69		
10	QPSK	25	0	22.66	22.73	22.81	23.00	0-1
10	QPSK	25	12	22.67	22.74	22.82		
10	QPSK	25	25	22.62	22.69	22.73		
10	QPSK	50	0	22.74	22.76	22.90		
10	16QAM	1	0	22.63	22.66	22.75	23.00	0-1
10	16QAM	1	25	22.58	22.65	22.74		
10	16QAM	1	49	22.55	22.67	22.62		
10	16QAM	25	0	21.66	21.77	21.77	22.00	0-2
10	16QAM	25	12	21.70	21.77	21.83		
10	16QAM	25	25	21.66	21.75	21.75		
10	16QAM	50	0	21.65	21.79	21.78		
Channel				19975	20175	20375	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1712.5	1732.5	1752.5		
5	QPSK	1	0	23.69	23.71	23.79	24.00	0
5	QPSK	1	12	23.61	23.69	23.69		
5	QPSK	1	24	23.67	23.69	23.68		
5	QPSK	12	0	22.66	22.76	22.75	23.00	0-1
5	QPSK	12	7	22.64	22.71	22.70		
5	QPSK	12	13	22.64	22.74	22.74		
5	QPSK	25	0	22.67	22.72	22.70		
5	16QAM	1	0	22.61	22.66	22.72	23.00	0-1
5	16QAM	1	12	22.59	22.62	22.60		
5	16QAM	1	24	22.53	22.62	22.65		
5	16QAM	12	0	21.71	21.80	21.74	22.00	0-2
5	16QAM	12	7	21.66	21.75	21.72		
5	16QAM	12	13	21.68	21.78	21.69		
5	16QAM	25	0	21.69	21.76	21.72		

Channel				19965	20175	20385	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1711.5	1732.5	1753.5		
3	QPSK	1	0	23.66	23.73	23.72	24.00	0
3	QPSK	1	8	23.60	23.72	23.68		
3	QPSK	1	14	23.65	23.75	23.74		
3	QPSK	8	0	22.61	22.73	22.78	23.00	0-1
3	QPSK	8	4	22.62	22.71	22.72		
3	QPSK	8	7	22.64	22.75	22.75		
3	QPSK	15	0	22.65	22.77	22.78		
3	16QAM	1	0	22.54	22.65	22.67	23.00	0-1
3	16QAM	1	8	22.58	22.69	22.66		
3	16QAM	1	14	22.55	22.65	22.68		
3	16QAM	8	0	21.66	21.76	21.74	22.00	0-2
3	16QAM	8	4	21.65	21.79	21.74		
3	16QAM	8	7	21.66	21.76	21.76		
3	16QAM	15	0	21.67	21.70	21.71		
Channel				19957	20175	20393	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				1710.7	1732.5	1754.3		
1.4	QPSK	1	0	23.67	23.75	23.76	24.00	0
1.4	QPSK	1	3	23.63	23.72	23.73		
1.4	QPSK	1	5	23.68	23.80	23.78		
1.4	QPSK	3	0	23.70	23.81	23.75		
1.4	QPSK	3	1	23.67	23.75	23.74		
1.4	QPSK	3	3	23.63	23.80	23.76		
1.4	QPSK	6	0	22.67	22.79	22.80	23.00	0-1
1.4	16QAM	1	0	22.61	22.72	22.72	23.00	0-1
1.4	16QAM	1	3	22.60	22.70	22.68		
1.4	16QAM	1	5	22.62	22.69	22.68		
1.4	16QAM	3	0	22.58	22.71	22.71		
1.4	16QAM	3	1	22.58	22.70	22.69		
1.4	16QAM	3	3	22.62	22.75	22.71		
1.4	16QAM	6	0	21.58	21.66	21.62	22.00	0-2

<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	23.07	23.19	23.08	24.00	0
10	QPSK	1	25	22.93	22.94	23.03		
10	QPSK	1	49	23.00	23.08	23.03		
10	QPSK	25	0	22.10	22.06	22.08	23.00	0-1
10	QPSK	25	12	22.07	22.00	22.04		
10	QPSK	25	25	22.01	21.96	22.06		
10	QPSK	50	0	22.01	22.16	22.10		
10	16QAM	1	0	22.02	22.04	22.00	23.00	0-1
10	16QAM	1	25	21.89	21.91	21.93		
10	16QAM	1	49	21.95	21.97	22.02		
10	16QAM	25	0	21.04	21.04	21.06	22.00	0-2
10	16QAM	25	12	21.08	21.02	21.08		
10	16QAM	25	25	21.12	21.01	21.03		
10	16QAM	50	0	21.07	20.99	21.01		
Channel				20425	20525	20625	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				826.5	836.5	846.5		
5	QPSK	1	0	23.07	23.02	22.99	24.00	0
5	QPSK	1	12	22.97	22.92	23.01		
5	QPSK	1	24	23.00	22.99	23.10		
5	QPSK	12	0	22.13	22.02	22.05	23.00	0-1
5	QPSK	12	7	22.04	22.06	22.00		
5	QPSK	12	13	22.05	22.03	22.14		
5	QPSK	25	0	22.05	22.00	22.04		
5	16QAM	1	0	22.06	22.01	21.98	23.00	0-1
5	16QAM	1	12	21.93	21.91	21.91		
5	16QAM	1	24	21.93	21.91	22.05		
5	16QAM	12	0	21.14	21.05	21.03	22.00	0-2
5	16QAM	12	7	21.05	21.02	21.03		
5	16QAM	12	13	21.03	21.02	21.09		
5	16QAM	25	0	21.02	21.01	21.02		

Channel				20415	20525	20635	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				825.5	836.5	847.5		
3	QPSK	1	0	23.10	23.00	23.05	24.00	0
3	QPSK	1	8	22.95	22.95	23.07		
3	QPSK	1	14	23.00	22.96	23.09		
3	QPSK	8	0	22.09	22.01	22.03	23.00	0-1
3	QPSK	8	4	21.99	22.03	22.17		
3	QPSK	8	7	22.07	22.05	22.16		
3	QPSK	15	0	22.17	22.01	22.19		
3	16QAM	1	0	22.02	21.94	21.94	23.00	0-1
3	16QAM	1	8	21.93	21.86	22.02		
3	16QAM	1	14	21.98	21.90	22.04		
3	16QAM	8	0	21.10	21.05	21.02	22.00	0-2
3	16QAM	8	4	21.05	21.01	21.13		
3	16QAM	8	7	21.07	21.00	21.12		
3	16QAM	15	0	21.09	20.98	21.10		
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	23.03	23.13	24.00	0
1.4	QPSK	1	3	23.10	22.98	23.13		
1.4	QPSK	1	5	23.01	23.03	23.16		
1.4	QPSK	3	0	23.10	23.07	23.11		
1.4	QPSK	3	1	23.11	22.99	23.15		
1.4	QPSK	3	3	23.10	23.04	23.09		
1.4	QPSK	6	0	22.17	22.04	22.16	23.00	0-1
1.4	16QAM	1	0	22.09	22.01	22.12	23.00	0-1
1.4	16QAM	1	3	22.07	21.97	22.07		
1.4	16QAM	1	5	22.05	21.97	22.06		
1.4	16QAM	3	0	22.10	22.00	22.07		
1.4	16QAM	3	1	22.06	21.97	22.11		
1.4	16QAM	3	3	22.11	21.99	22.11		
1.4	16QAM	6	0	21.03	20.89	21.08	22.00	0-2

<LTE Band 12>

BW [MHz]	Modulation	RB Size	RB Offset	Power Low Ch. / Freq.	Power Middle Ch. / Freq.	Power High Ch. / Freq.	Tune-up limit (dBm)	MPR (dB)
Channel				23060	23095	23130		
Frequency (MHz)				704	707.5	711		
10	QPSK	1	0	22.93	**22.96**	22.93	23.50	0
10	QPSK	1	25	22.92	22.87	22.85		
10	QPSK	1	49	22.87	22.84	22.91		
10	QPSK	25	0	22.04	22.05	21.95	22.50	0-1
10	QPSK	25	12	21.98	21.95	21.92		
10	QPSK	25	25	21.99	21.95	21.87		
10	QPSK	50	0	21.86	21.97	21.96		
10	16QAM	1	0	21.82	21.83	21.82	22.50	0-1
10	16QAM	1	25	21.90	21.85	21.77		
10	16QAM	1	49	21.91	21.92	21.87		
10	16QAM	25	0	20.96	20.98	20.91	21.50	0-2
10	16QAM	25	12	20.96	20.94	20.92		
10	16QAM	25	25	21.00	20.94	20.94		
10	16QAM	50	0	20.94	20.93	20.86		
Channel				23035	23095	23155	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				701.5	707.5	713.5		
5	QPSK	1	0	22.87	22.87	22.81	23.50	0
5	QPSK	1	12	22.85	22.89	22.79		
5	QPSK	1	24	22.94	22.84	22.87		
5	QPSK	12	0	21.95	21.91	21.83	22.50	0-1
5	QPSK	12	7	21.90	21.94	21.85		
5	QPSK	12	13	21.96	21.93	21.87		
5	QPSK	25	0	21.93	21.93	21.89		
5	16QAM	1	0	21.80	21.86	21.72	22.50	0-1
5	16QAM	1	12	21.77	21.79	21.73		
5	16QAM	1	24	21.88	21.80	21.81		
5	16QAM	12	0	20.93	20.95	20.87	21.50	0-2
5	16QAM	12	7	20.94	20.95	20.87		
5	16QAM	12	13	20.96	20.94	20.89		
5	16QAM	25	0	20.97	20.93	20.90		

Channel				23025	23095	23165	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				700.5	707.5	714.5		
3	QPSK	1	0	22.86	22.87	22.84	23.50	0
3	QPSK	1	8	22.87	22.88	22.79		
3	QPSK	1	14	22.95	22.85	22.87		
3	QPSK	8	0	21.93	21.95	21.88	22.50	0-1
3	QPSK	8	4	21.93	21.96	21.88		
3	QPSK	8	7	21.97	21.94	21.88		
3	QPSK	15	0	21.91	21.92	21.88		
3	16QAM	1	0	21.82	21.87	21.81	22.50	0-1
3	16QAM	1	8	21.74	21.78	21.80		
3	16QAM	1	14	21.89	21.86	21.80		
3	16QAM	8	0	20.92	20.99	20.87	21.50	0-2
3	16QAM	8	4	20.96	20.97	20.90		
3	16QAM	8	7	20.96	20.92	20.88		
3	16QAM	15	0	20.90	20.92	20.86		
Channel				23017	23095	23173	Tune-up limit (dBm)	MPR (dB)
Frequency (MHz)				699.7	707.5	715.3		
1.4	QPSK	1	0	22.92	22.94	22.86	23.50	0
1.4	QPSK	1	3	22.84	22.88	22.86		
1.4	QPSK	1	5	22.91	22.89	22.89		
1.4	QPSK	3	0	22.95	22.92	22.94		
1.4	QPSK	3	1	22.93	22.89	22.89		
1.4	QPSK	3	3	22.93	22.92	22.90		
1.4	QPSK	6	0	21.97	21.97	21.95	22.50	0-1
1.4	16QAM	1	0	21.94	21.90	21.84	22.50	0-1
1.4	16QAM	1	3	21.93	21.88	21.86		
1.4	16QAM	1	5	21.93	21.84	21.82		
1.4	16QAM	3	0	21.90	21.85	21.88		
1.4	16QAM	3	1	21.81	21.89	21.84		
1.4	16QAM	3	3	21.92	21.87	21.89		
1.4	16QAM	6	0	20.84	20.84	20.83	21.50	0-2

LTE Carrier Aggregation Conducted Power

General Note:

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

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

iii. The device only supports downlink carrier aggregation. Uplink carrier aggregation is not supported. Power measurements were performed with two DL carriers for the Release 8 configuration that had the highest output power across all bandwidths, channels and RB configuration for each band.

iv. During the carrier aggregation conducted power measurements we have attention to throughput traffic to make sure all the power measurement is corrected.

Configure	PCC						SCC				Measured 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 4	10M	1715	20000	1	0	Band 12	10M	707.5	23095	23.62	23.67
	Band 4	10M	1732.5	20175	1	0	Band 12	10M	707.5	23095	23.78	23.72
	Band 4	10M	1750	20350	1	0	Band 12	10M	707.5	23095	23.65	23.78

<WLAN Conducted Power>

General Note:

1. For WLAN SAR testing was performed on single antenna RF power in SISO mode is larger or equal to the single antenna RF power in MIMO mode, and for RF exposure assessment of MIMO mode simultaneous transmission exclusion analysis was performed with SAR test results of each antenna in SISO mode.
2. 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.
3. 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).
4. 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.
5. 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.

<2.4GHz WLAN ANT 0>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN ANT 0	802.11b	CH 1	2412	1Mbps	14.69	15.00	99.00
		CH 6	2437		14.31	14.50	
		CH 11	2462		13.35	14.00	
	802.11g	CH 1	2412	6Mbps	12.25	13.00	93.36
		CH 6	2437		12.11	13.00	
		CH 11	2462		11.00	11.50	
	802.11n-HT20	CH 1	2412	MCS0	11.34	12.00	92.96
		CH 6	2437		12.88	13.00	
		CH 11	2462		10.94	11.50	
	802.11n-HT40	CH 3	2422	MCS0	11.16	11.50	86.93
		CH 6	2437		12.53	13.00	
		CH 9	2452		11.46	12.00	

<2.4GHz WLAN ANT 1>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN ANT 1	802.11b	CH 1	2412	1Mbps	13.36	14.00	98.83
		CH 6	2437		14.20	14.50	
		CH 11	2462		13.38	14.00	
	802.11g	CH 1	2412	6Mbps	12.04	12.50	93.36
		CH 6	2437		12.63	13.00	
		CH 11	2462		13.62	14.00	
	802.11n-HT20	CH 1	2412	MCS0	11.90	12.50	92.94
		CH 6	2437		14.19	14.50	
		CH 11	2462		12.57	13.00	
	802.11n-HT40	CH 3	2422	MCS0	10.74	11.00	86.77
		CH 6	2437		12.04	12.50	
		CH 9	2452		11.16	11.50	

<2.4GHz WLAN ANT 0+1>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
2.4GHz WLAN ANT 0+1	802.11n-HT20	CH 1	2412	MCS0	13.02	13.50	93.04
		CH 6	2437		13.70	14.00	
		CH 11	2462		11.47	12.00	
	802.11n-HT40	CH 3	2422	MCS0	11.83	12.00	86.60
		CH 6	2437		12.00	12.50	
		CH 9	2452		11.83	12.00	

<u><5GHz WLAN ANT0></u>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN ANT 0	802.11n-HT20	CH 36	5180	MCS0	15.30	16.00	92.92
		CH 40	5200		15.15	16.00	
		CH 44	5220		15.39	16.00	
		CH 48	5240		15.53	16.00	
	802.11n-HT40	CH 38	5190	MCS0	13.44	14.00	87.05
		CH 46	5230		13.89	14.00	

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN ANT0	802.11n-HT20	CH 149	5745	MCS0	10.46	12.00	93.05
		CH 157	5785		10.90	12.00	
		CH 165	5825		11.66	12.00	
	802.11n-HT40	CH 151	5755	MCS0	9.01	10.00	87.12
		CH 159	5795		8.16	10.00	

<u><5GHz WLAN ANT1></u>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN ANT1	802.11n-HT20	CH 36	5180	MCS0	12.70	13.00	93.09
		CH 40	5200		12.53	13.00	
		CH 44	5220		11.85	13.00	
		CH 48	5240		11.97	13.00	
	802.11n-HT40	CH 38	5190	MCS0	10.76	11.00	86.98
		CH 46	5230		10.48	11.00	

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN ANT 1	802.11n-HT20	CH 149	5745	MCS0	10.22	10.50	92.56
		CH 157	5785		9.99	10.50	
		CH 165	5825		10.58	11.00	
	802.11n-HT40	CH 151	5755	MCS0	9.71	10.00	87.26
		CH 159	5795		9.23	10.00	

<5GHz WLAN ANT0+1>

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.2GHz WLAN ANT 0+1	802.11n-HT20	CH 36	5180	MCS0	17.03	17.50	93.06
		CH 40	5200		16.91	17.50	
		CH 44	5220		17.12	17.50	
		CH 48	5240		17.35	17.50	
	802.11n-HT40	CH 38	5190	MCS0	15.00	15.50	86.05
		CH 46	5230		14.82	15.50	

	Mode	Channel	Frequency (MHz)	Data Rate	Average power (dBm)	Tune-Up Limit	Duty Cycle %
5.8GHz WLAN ANT 0+1	802.11n-HT20	CH 149	5745	MCS0	13.26	13.50	93.02
		CH 157	5785		12.83	13.50	
		CH 165	5825		12.98	13.50	
	802.11n-HT40	CH 151	5755	MCS0	11.91	12.50	87.26
		CH 159	5795		11.57	12.50	

14. Bluetooth Exclusions Applied

Mode Band	Average power(dBm)	
	Bluetooth v2.1+EDR	Bluetooth v4.0 LE
2.4GHz Bluetooth	10.0	6.5

Note:

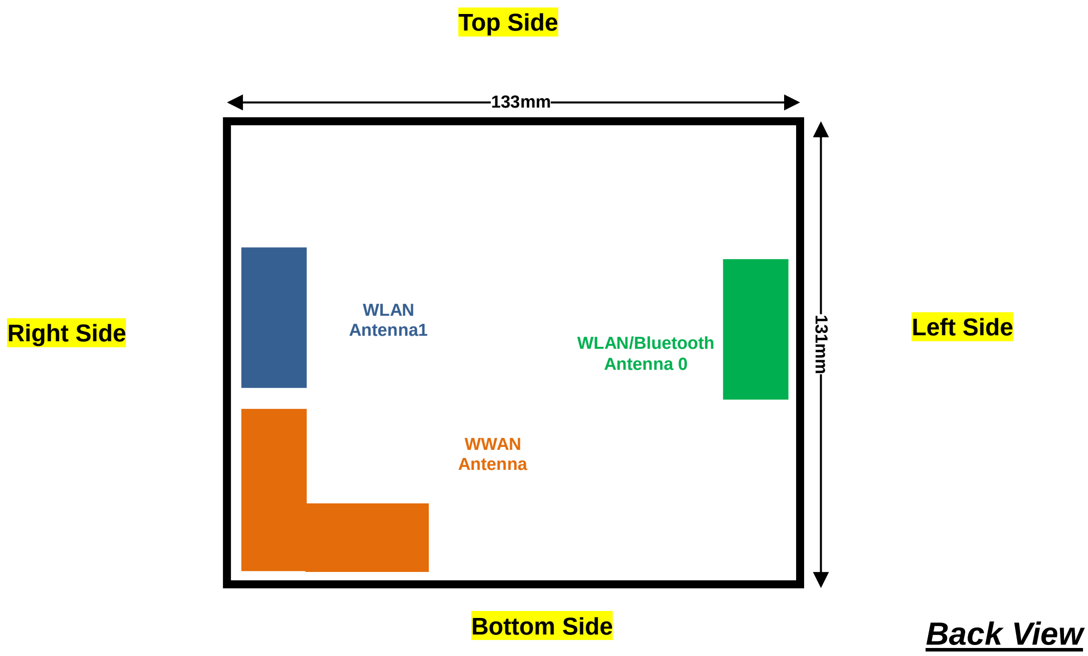
1. Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:
   [(*max. power of channel, including tune-up tolerance, mW*)/(*min. test separation distance, mm*)] ·[√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g 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

Bluetooth Max Power (dBm)	Separation Distance (mm)	Frequency (GHz)	exclusion thresholds
10	10	2.48	1.6

Note:

Per KDB 447498 D01v06, when the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion. The test exclusion threshold is 1.6 which is <= 3, SAR testing is not required.

15. Antenna Location



Distance of the Antenna to the EUT surface/edge						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN	≤ 25mm	≤ 25mm	109mm	≤ 25mm	≤ 25mm	92mm
WLAN/Bluetooth(0)	≤ 25mm	≤ 25mm	68mm	41mm	124mm	≤ 25mm
WLAN(1)	≤ 25mm	≤ 25mm	72mm	39mm	≤ 25mm	124mm

Positions for SAR tests; Hotspot mode						
Antennas	Back	Front	Top Side	Bottom Side	Right Side	Left Side
WWAN	Yes	Yes	No	Yes	Yes	No
WLAN/Bluetooth(0)	Yes	Yes	No	No	No	Yes
WLAN(1)	Yes	Yes	No	No	Yes	No

General Note:

1. This product has three transmitter antenna paths, WWAN Primary Antenna for WCDMA Band 2/4/5 and LTE Band 2/4/5/12, Antenna 0 for WLAN/Bluetooth, WLAN Antenna 1 for WLAN. Each antenna path can transmit simultaneously.
2. Referring to KDB 941225 D06 v02r01, when the overall device length and width are ≥ 9cm*5cm, the test distance is 10 mm. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25mm from that surface or edge

16. 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

UMTS Note:

1. Per KDB 941225 D01v03r01, SAR for Head / Hotspot / Body-worn exposure 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 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, for U-NII-1 Head and Body-worn 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.

16.1 Body SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
#01	WCDMA Band V	RMC 12.2K	Front	10	4233	846.6	22.85	24.00	1.303	0.06	0.403	**0.525**
	WCDMA Band V	RMC 12.2K	Back	10	4233	846.6	22.85	24.00	1.303	0.15	0.298	0.388
	WCDMA Band V	RMC 12.2K	Right Side	10	4233	846.6	22.85	24.00	1.303	-0.1	0.306	0.399
	WCDMA Band V	RMC 12.2K	Bottom Side	10	4233	846.6	22.85	24.00	1.303	0.06	0.301	0.392
	WCDMA Band II	RMC 12.2Kbps	Front	10	9400	1800	22.93	24.00	1.279	-0.03	0.406	0.519
	WCDMA Band II	RMC 12.2Kbps	Back	10	9400	1800	22.93	24.00	1.279	-0.1	0.752	0.962
	WCDMA Band II	RMC 12.2Kbps	Back	10	9262	1852.4	22.80	24.00	1.318	-0.1	0.628	0.828
	WCDMA Band II	RMC 12.2Kbps	Back	10	9538	1907.6	22.69	24.00	1.352	0.11	0.699	0.945
	WCDMA Band II	RMC 12.2Kbps	Right Side	10	9400	1800	22.93	24.00	1.279	-0.07	0.279	0.357
	WCDMA Band II	RMC 12.2Kbps	Bottom Side	10	9400	1800	22.93	24.00	1.279	-0.04	0.845	1.081
	WCDMA Band II	RMC 12.2Kbps	Bottom Side	10	9262	1852.4	22.80	24.00	1.318	-0.09	0.828	1.092
#02	WCDMA Band II	RMC 12.2Kbps	Bottom Side	10	9538	1907.6	22.69	24.00	1.352	-0.11	0.879	**1.188**

<LTE SAR>

Plot No.	Band	BW (MHz)	RB Size	RB offest	Modulation	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
#03	LTE Band 5	10	1	0	QPSK	Front	10	20525	836.5	23.01	24.00	1.256	-0.04	0.437	**0.549**
	LTE Band 5	10	25	0	QPSK	Front	10	20525	836.5	21.97	23.00	1.268	0.08	0.345	0.437
	LTE Band 5	10	1	0	QPSK	Back	10	20525	836.5	23.01	24.00	1.256	-0.17	0.385	0.484
	LTE Band 5	10	25	0	QPSK	Back	10	20525	836.5	21.97	23.00	1.268	-0.14	0.331	0.420
	LTE Band 5	10	1	0	QPSK	Right Side	10	20525	836.5	23.01	24.00	1.256	-0.09	0.314	0.394
	LTE Band 5	10	25	0	QPSK	Right Side	10	20525	836.5	21.97	23.00	1.268	-0.11	0.247	0.313
	LTE Band 5	10	1	0	QPSK	Bottom Side	10	20525	836.5	23.01	24.00	1.256	-0.0093	0.220	0.276
	LTE Band 5	10	25	0	QPSK	Bottom Side	10	20525	836.5	21.97	23.00	1.268	-0.01	0.175	0.222

Plot No.	Band	BW (MHz)	RB Size	RB offest	Modulation	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 4	20	1	0	QPSK	Front	10	20175	1732.5	22.91	23.50	1.146	0.1	0.591	0.677
	LTE Band 4	20	50	0	QPSK	Front	10	20175	1732.5	21.78	22.50	1.180	-0.01	0.541	0.639
	LTE Band 4	20	1	0	QPSK	Back	10	20175	1732.5	22.91	23.50	1.146	-0.16	0.919	1.053
	LTE Band 4	20	1	0	QPSK	Back	10	20050	1720	22.73	23.50	1.194	-0.03	0.905	1.081
	LTE Band 4	20	1	0	QPSK	Back	10	20300	1745	22.69	23.50	1.205	0.0037	0.932	1.123
	LTE Band 4	20	50	0	QPSK	Back	10	20175	1732.5	21.78	22.50	1.180	-0.03	0.759	0.896
	LTE Band 4	20	50	0	QPSK	Back	10	20050	1720	21.76	22.50	1.186	0.036	0.735	0.872
	LTE Band 4	20	50	0	QPSK	Back	10	20300	1745	21.74	22.50	1.191	-0.089	0.760	0.905
	LTE Band 4	20	100	0	QPSK	Back	10	20175	1732.5	21.83	22.50	1.167	0.02	0.761	0.888
	LTE Band 4	20	1	0	QPSK	Right Side	10	20175	1732.5	22.91	23.50	1.146	-0.12	0.309	0.354
	LTE Band 4	20	50	0	QPSK	Right Side	10	20175	1732.5	21.78	22.50	1.180	0.04	0.255	0.301
	LTE Band 4	20	1	0	QPSK	Bottom Side	10	20175	1732.5	22.91	23.50	1.146	-0.09	1.120	1.283
#04	LTE Band 4	20	1	0	QPSK	Bottom Side	10	20050	1720	22.73	23.50	1.194	-0.13	1.190	**1.421**
	LTE Band 4	20	1	0	QPSK	Bottom Side	10	20300	1745	22.69	23.50	1.205	-0.14	1.120	1.350
	LTE Band 4	20	50	0	QPSK	Bottom Side	10	20175	1732.5	21.78	22.50	1.180	-0.02	0.893	1.054
	LTE Band 4	20	50	0	QPSK	Bottom Side	10	20050	1720	21.76	22.50	1.186	-0.14	0.943	1.118
	LTE Band 4	20	50	0	QPSK	Bottom Side	10	20300	1745	21.74	22.50	1.191	-0.13	0.907	1.080
	LTE Band 4	20	100	0	QPSK	Bottom Side	10	20175	1732.5	21.83	22.50	1.167	-0.16	0.924	1.078

Plot No.	Band	BW (MHz)	RB Size	RB offest	Modulation	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	LTE Band 2	20	1	0	QPSK	Front	10	18900	1880	23.15	23.50	1.084	0.19	0.374	0.405
	LTE Band 2	20	50	0	QPSK	Front	10	18900	1880	22.09	22.50	1.099	-0.13	0.353	0.388
	LTE Band 2	20	1	0	QPSK	Back	10	18900	1880	23.15	23.50	1.084	-0.07	0.741	0.803
	LTE Band 2	20	1	0	QPSK	Back	10	18700	1860	22.82	23.50	1.169	-0.007	0.871	1.019
	LTE Band 2	20	1	0	QPSK	Back	10	19100	1900	23.12	23.50	1.091	-0.17	0.813	0.887
	LTE Band 2	20	50	0	QPSK	Back	10	18900	1880	22.09	22.50	1.099	-0.12	0.662	0.728
	LTE Band 2	20	100	0	QPSK	Back	10	18900	1880	22.10	22.50	1.096	-0.03	0.645	0.707
	LTE Band 2	20	1	0	QPSK	Right Side	10	18900	1880	23.15	23.50	1.084	-0.12	0.275	0.298
	LTE Band 2	20	50	0	QPSK	Right Side	10	18900	1880	22.09	22.50	1.099	0.13	0.236	0.259
	LTE Band 2	20	1	0	QPSK	Bottom Side	10	18900	1880	23.15	23.50	1.084	-0.18	0.877	0.951
#05	LTE Band 2	20	1	0	QPSK	Bottom Side	10	18700	1860	22.82	23.50	1.169	-0.12	1.010	**1.181**
	LTE Band 2	20	1	0	QPSK	Bottom Side	10	19100	1900	23.12	23.50	1.091	-0.12	0.885	0.966
	LTE Band 2	20	50	0	QPSK	Bottom Side	10	18900	1880	22.09	22.50	1.099	-0.04	0.691	0.759
	LTE Band 2	20	100	0	QPSK	Bottom Side	10	18900	1880	22.10	22.50	1.096	-0.09	0.649	0.712

16.2 Repeated SAR Measurement

No.	Band	BW (MHz)	RB Size	RB offest	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	LTE Band 4	20	1	0	QPSK	Bottom Side	10	20050	1720	22.73	23.50	1.194	-0.13	1.190	1	1.421
2nd	LTE Band 4	20	1	0	QPSK	Bottom Side	10	20050	1720	22.73	23.50	1.194	-0.03	1.150	1.035	1.373
1st	LTE Band 2	20	1	0	QPSK	Bottom Side	10	18700	1860	22.82	23.50	1.169	-0.12	1.010	1	1.181
2nd	LTE Band 2	20	1	0	QPSK	Bottom Side	10	18700	1860	22.82	23.50	1.169	-0.11	0.997	1.013	1.166

General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/kg
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is ≤ 1.2 and the measured SAR <1.45W/kg, only one repeated measurement is required.
3. 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.

17. Spot Check SAR Test Results

17.1 Body SAR

<WCDMA SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
#01-1	WCDMA Band V	RMC12.2Kbps	Front	10	4233	846.6	23.25	24.00	1.189	0.07	0.378	**0.449**
#02-1	WCDMA Band II	RMC 12.2Kbps	Bottom Side	10	9538	1907.6	23.83	24.00	1.040	-0.02	0.666	**0.693**
	WCDMA Band IV	RMC 12.2Kbps	Front	10	1413	1732.6	23.44	23.50	1.014	-0.18	0.493	0.500
	WCDMA Band IV	RMC 12.2Kbps	Back	10	1413	1732.6	23.44	23.50	1.014	-0.12	0.679	0.688
	WCDMA Band IV	RMC 12.2Kbps	Right Side	10	1413	1732.6	23.44	23.50	1.014	0.05	0.241	0.244
	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	10	1413	1732.6	23.44	23.50	1.014	0.04	0.885	0.897
	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	10	1312	1712.4	23.25	23.50	1.059	0.04	0.740	0.784
#03-1	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	10	1513	1752.6	23.39	23.50	1.026	-0.03	0.940	**0.964**

<LTE SAR>

Plot No.	Band	BW (MHz)	Modulation	RB Size	RB offset	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
#04-1	LTE Band 5	10	QPSK	1	0	Front	10	20525	836.5	23.19	24.00	1.205	-0.05	0.379	**0.457**
#05-1	LTE Band 12	10	QPSK	1	0	Front	10	23095	707.5	22.96	23.50	1.132	-0.08	0.433	**0.490**
	LTE Band 12	10	QPSK	25	0	Front	10	23095	707.5	22.05	22.50	1.109	-0.05	0.344	0.382
	LTE Band 12	10	QPSK	1	0	Back	10	23095	707.5	22.96	23.50	1.132	0.02	0.409	0.463
	LTE Band 12	10	QPSK	25	0	Back	10	23095	707.5	22.05	22.50	1.109	-0.01	0.321	0.356
	LTE Band 12	10	QPSK	1	0	Right Side	10	23095	707.5	22.96	23.50	1.132	0.13	0.262	0.297
	LTE Band 12	10	QPSK	25	0	Right Side	10	23095	707.5	22.05	22.50	1.109	0.06	0.230	0.255
	LTE Band 12	10	QPSK	1	0	Bottom Side	10	23095	707.5	22.96	23.50	1.132	0.19	0.421	0.477
	LTE Band 12	10	QPSK	25	0	Bottom Side	10	23095	707.5	22.05	22.50	1.109	-0.01	0.335	0.372
	LTE Band 4	20	QPSK	1	0	Bottom Side	10	20050	1720	23.69	24.00	1.074	0.1	0.850	0.913
	LTE Band 4	20	QPSK	1	0	Bottom Side	10	20175	1732.5	23.83	24.00	1.040	0.02	0.893	0.929
#06-1	LTE Band 4	20	QPSK	1	0	Bottom Side	10	20300	1745	23.73	24.00	1.064	-0.03	0.929	**0.989**
#07-1	LTE Band 2	20	QPSK	1	0	Bottom Side	10	18700	1860	23.23	23.50	1.064	-0.07	0.744	**0.792**

<WLAN SAR>

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Peak SAR (W/kg)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN2.4GHz	802.11b 1Mbps	Front	10	Ant 0	1	2412	14.69	15.00	1.074	99	1.010		0.153		
	WLAN2.4GHz	802.11b 1Mbps	Back	10	Ant 0	1	2412	14.69	15.00	1.074	99	1.010		0.054		
#08-1	WLAN2.4GHz	802.11b 1Mbps	Left Side	10	Ant 0	1	2412	14.69	15.00	1.074	99	1.010	-0.15	0.211	0.147	0.159
	WLAN2.4GHz	802.11b 1Mbps	Front	10	Ant 1	6	2437	14.20	14.50	1.072	98.83	1.012		0.0395		
	WLAN2.4GHz	802.11b 1Mbps	Back	10	Ant 1	6	2437	14.20	14.50	1.072	98.83	1.012		0.0461		
#09-1	WLAN2.4GHz	802.11b 1Mbps	Right Side	10	Ant 1	6	2437	14.20	14.50	1.072	98.83	1.012	-0.03	0.230	0.144	0.156
	WLAN2.4GHz	802.11n-HT20	Front	10	Ant 0+1	6	2437	13.70	14.00	1.072	93.04	1.075		0.0303		
	WLAN2.4GHz	802.11n-HT20	Back	10	Ant 0+1	6	2437	13.70	14.00	1.072	93.04	1.075		0.0156		
	WLAN2.4GHz	802.11n-HT20	Left Side	10	Ant 0+1	6	2437	13.70	14.00	1.072	93.04	1.075		0.0479		
#10-1	WLAN2.4GHz	802.11n-HT20	Right Side	10	Ant 0+1	6	2437	13.70	14.00	1.072	93.04	1.075	-0.11	0.0637	0.042	0.048

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Peak SAR (W/kg)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN 5.2GHz	802.11n HT20 MCS0	Front	10	Ant 0	48	5240	15.53	16.00	1.114	92.92	1.076		0.252		
	WLAN 5.2GHz	802.11n HT20 MCS0	Back	10	Ant 0	48	5240	15.53	16.00	1.114	92.92	1.076	0.06	0.381	0.193	0.231
#11-1	WLAN 5.2GHz	802.11n HT20 MCS0	Left Side	10	Ant 0	48	5240	15.53	16.00	1.114	92.92	1.076	-0.06	0.728	0.368	0.441
	WLAN 5.2GHz	802.11n HT20 MCS0	Front	10	Ant 1	36	5180	12.70	13.00	1.072	93.09	1.074		0.102		
	WLAN 5.2GHz	802.11n HT20 MCS0	Back	10	Ant 1	36	5180	12.70	13.00	1.072	93.09	1.074		0.106		
#12-1	WLAN 5.2GHz	802.11n HT20 MCS0	Right Side	10	Ant 1	36	5180	12.70	13.00	1.072	93.09	1.074	-0.05	0.17	0.081	0.093
	WLAN 5.2GHz	802.11n HT20 MCS0	Front	10	Ant 0+1	48	5240	17.35	17.50	1.035	93.06	1.075		0.207		
	WLAN 5.2GHz	802.11n HT20 MCS0	Back	10	Ant 0+1	48	5240	17.35	17.50	1.035	93.06	1.075		0.336		
#13-1	WLAN 5.2GHz	802.11n HT20 MCS0	Left Side	10	Ant 0+1	48	5240	17.35	17.50	1.035	93.06	1.075	-0.04	0.675	0.288	0.320
	WLAN 5.2GHz	802.11n HT20 MCS0	Right Side	10	Ant 0+1	48	5240	17.35	17.50	1.035	93.06	1.075		0.221		

Plot No.	Band	Mode	Test Position	Gap (mm)	Antenna	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Duty Cycle %	Duty Cycle Scaling Factor	Power Drift (dB)	Peak SAR (W/kg)	Measured 1g SAR (W/kg)	Reported 1g SAR (W/kg)
	WLAN 5.8GHz	802.11n HT20 MCS0	Front	10	Ant 0	165	5825	11.66	12.00	1.081	93.05	1.075		0.194		
	WLAN 5.8GHz	802.11n HT20 MCS0	Back	10	Ant 0	165	5825	11.66	12.00	1.081	93.05	1.075		0.204		
#14-1	WLAN 5.8GHz	802.11n HT20 MCS0	Left Side	10	Ant 0	165	5825	11.66	12.00	1.081	93.05	1.075	0.02	0.288	0.043	0.050
	WLAN 5.8GHz	802.11n HT20 MCS0	Front	10	Ant 1	165	5825	10.58	11.00	1.102	92.56	1.080		0.108		
	WLAN 5.8GHz	802.11n HT20 MCS0	Back	10	Ant 1	165	5825	10.58	11.00	1.102	92.56	1.080		0.101		
#15-1	WLAN 5.8GHz	802.11n HT20 MCS0	Right Side	10	Ant 1	165	5825	10.58	11.00	1.102	92.56	1.080	-0.09	0.133	0.055	0.065
	WLAN 5.8GHz	802.11n HT20 MCS0	Front	10	Ant 0+1	149	5745	13.26	13.50	1.057	93.02	1.075		0.175		
	WLAN 5.8GHz	802.11n HT20 MCS0	Back	10	Ant 0+1	149	5745	13.26	13.50	1.057	93.02	1.075		0.176		
#16-1	WLAN 5.8GHz	802.11n HT20 MCS0	Left Side	10	Ant 0+1	149	5745	13.26	13.50	1.057	93.02	1.075	0.07	0.345	0.134	0.152
	WLAN 5.8GHz	802.11n HT20 MCS0	Right Side	10	Ant 0+1	149	5745	13.26	13.50	1.057	93.02	1.075		0.227		

17.2 Spot Check Repeated SAR Measurement

No.	Band	Mode	Test Position	Gap (mm)	Ch.	Freq. (MHz)	Average Power (dBm)	Tune-Up Limit (dBm)	Tune-up Scaling Factor	Power Drift (dB)	Measured 1g SAR (W/kg)	Ratio	Reported 1g SAR (W/kg)
1st	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	10	1513	1752.6	23.39	23.50	1.026	-0.03	0.940	1	0.964
2nd	WCDMA Band IV	RMC 12.2Kbps	Bottom Side	10	1513	1752.6	23.39	23.50	1.026	0.13	0.935	1.005	0.959

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.

18. Simultaneous Transmission Analysis

NO.	Simultaneous Transmission Configurations	LTE uFi	Note
		Body	
1.	WCDMA(Data) + WLAN2.4GHz SISO(data)	Yes	2.4GHz Hotspot
2.	WCDMA(Data) + WLAN2.4GHz MIMO(data)	Yes	2.4GHz Hotspot
3.	WCDMA(Data) + WLAN5 GHz SISO(data)	Yes	WiFi Direct
4.	WCDMA(Data) + WLAN5 GHz MIMO(data)	Yes	WiFi Direct
5.	LTE (Data) + WLAN2.4GHz SISO(data)	Yes	2.4GHz Hotspot
6.	LTE (Data) + WLAN2.4GHz MIMO(data)	Yes	2.4GHz Hotspot
7.	LTE (Data) + WLAN5 GHz SISO(data)	Yes	WiFi Direct
8.	LTE (Data) + WLAN5 GHz MIMO(data)	Yes	WiFi Direct
9.	WCDMA(Data) + Bluetooth(data)	Yes	Bluetooth Tethering
10.	LTE(Data) + Bluetooth(data)	Yes	Bluetooth Tethering

General Note:

1. This device has no voice function.
2. This device 2.4GHz WLAN supports hotspot operation, 5.2GHz/5.8GHz WLAN supports hotspot /WiFi Direct (GC/GO).
3. WLAN 2.4GHz antenna0 and Bluetooth share the same antenna, and cannot transmit simultaneously.
4. For Bluetooth can't transmission simultaneous with antenna 1 WLAN according to the network signal condition.
5. EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, they will not transmit simultaneously.
6. EUT will choose either WCDMA or LTE according to the network signal condition; therefore, they will not transmit simultaneously.
7. The worst case 2.4GHz/5 GHz WLAN reported SAR for each configuration was used for SAR summation,. Therefore, the following summations represent the absolute worst cases for simultaneous transmission with 2.4GHz/5 GHz WLAN.
8. for simultaneously transmission SAR analysis, For WCDMA Band IV /LTE Band 12 and WLAN SAR full test, others band SAR values only considered the worst position which we did perform SAR testing on FCC ID: SRQ-MF97B-T, Partial test results were leverage from the parent model which referred to the test report number FA4O2101 (FCC ID: SRQ-MF97B)
9. The Scaled SAR summation is calculated based on the same configuration and test position.
10. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
    i) Scalar SAR summation < 1.6W/kg.
    ii) SPLSR = $(SAR_1 + SAR_2)^{1.5}$ / (*min. separation distance, mm*), and the peak separation distance is determined from the square root of $[(x_1-x_2)^2 + (y_1-y_2)^2 + (z_1-z_2)^2]$, where (x_1, y_1, z_1) and (x_2, y_2, z_2) 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.
11. 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.

Bluetooth Max Power	Exposure Position	Body
	Test separation	10 mm
10 dBm	Estimated SAR (W/kg)	0.210 W/kg

18.1 Body Exposure Conditions

<WWAN PCB + WLAN (Antenna 0) DTS>

WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	WLAN DTS Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
WCDMA	Band V	Front	0.525	0.159	0.68		
		Back	0.388	0.159	0.55		
		Left side		0.159	0.16		
		Right side	0.399		0.40		
		Bottom side	0.392		0.39		
	Band II	Front	0.519	0.159	0.68		
		Back	0.962	0.159	1.12		
		Left side		0.159	0.16		
		Right side	0.357		0.36		
		Bottom side	1.188		1.19		
	Band IV	Front	0.500	0.159	0.66		
		Back	0.688	0.159	0.85		
		Left side		0.159	0.16		
		Right side	0.244		0.24		
		Bottom side	0.964		0.96		
LTE	Band 12	Front	0.490	0.159	0.65		
		Back	0.463	0.159	0.62		
		Left side		0.159	0.16		
		Right side	0.297		0.30		
		Bottom side	0.477		0.48		
	Band 5	Front	0.549	0.159	0.71		
		Back	0.484	0.159	0.64		
		Left side		0.159	0.16		
		Right side	0.394		0.39		
		Bottom side	0.276		0.28		
	Band 4	Front	0.677	0.159	0.84		
		Back	1.123	0.159	1.28		
		Left side		0.159	0.16		
		Right side	0.354		0.35		
		Bottom side	1.421		**1.42**		
	Band 2	Front	0.405	0.159	0.56		
		Back	1.019	0.159	1.18		
		Left side		0.159	0.16		
		Right side	0.298		0.30		
		Bottom side	1.181		1.18		

<WWAN PCB + WLAN (Antenna 1) DTS>

WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	WLAN DTS Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
WCDMA	Band V	Front	0.525	0.156	0.68		
		Back	0.388	0.156	0.54		
		Right side	0.399	0.156	0.56		
		Bottom side	0.392		0.39		
	Band II	Front	0.519	0.156	0.68		
		Back	0.962	0.156	1.12		
		Right side	0.357	0.156	0.51		
		Bottom side	1.188		1.19		
	Band IV	Front	0.500	0.156	0.66		
		Back	0.688	0.156	0.84		
		Right side	0.244	0.156	0.40		
		Bottom side	0.964		0.96		
LTE	Band 12	Front	0.490	0.156	0.65		
		Back	0.463	0.156	0.62		
		Right side	0.297	0.156	0.45		
		Bottom side	0.477		0.48		
	Band 5	Front	0.549	0.156	0.71		
		Back	0.484	0.156	0.64		
		Right side	0.394	0.156	0.55		
		Bottom side	0.276		0.28		
	Band 4	Front	0.677	0.156	0.83		
		Back	1.123	0.156	1.28		
		Right side	0.354	0.156	0.51		
		Bottom side	1.421		1.42		
	Band 2	Front	0.405	0.156	0.56		
		Back	1.019	0.156	1.18		
		Right side	0.298	0.156	0.45		
		Bottom side	1.181		1.18		

<WWAN PCB + WLAN (Antenna 0+1) DTS>

WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	WLAN DTS Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
WCDMA	Band V	Front	0.525	0.048	0.57		
		Back	0.388	0.048	0.44		
		Left side		0.048	0.05		
		Right side	0.399	0.048	0.45		
		Bottom side	0.392		0.39		
	Band II	Front	0.519	0.048	0.57		
		Back	0.962	0.048	1.01		
		Left side		0.048	0.05		
		Right side	0.357	0.048	0.41		
		Bottom side	1.188		1.19		
	Band IV	Front	0.500	0.048	0.55		
		Back	0.688	0.048	0.74		
		Left side		0.048	0.05		
		Right side	0.244	0.048	0.29		
		Bottom side	0.964		0.96		
LTE	Band 12	Front	0.490	0.048	0.54		
		Back	0.463	0.048	0.51		
		Left side		0.048	0.05		
		Right side	0.297	0.048	0.35		
		Bottom side	0.477		0.48		
	Band 5	Front	0.549	0.048	0.60		
		Back	0.484	0.048	0.53		
		Left side		0.048	0.05		
		Right side	0.394	0.048	0.44		
		Bottom side	0.276		0.28		
	Band 4	Front	0.677	0.048	0.73		
		Back	1.123	0.048	1.17		
		Left side		0.048	0.05		
		Right side	0.354	0.048	0.40		
		Bottom side	1.421		1.42		
	Band 2	Front	0.405	0.048	0.45		
		Back	1.019	0.048	1.07		
		Left side		0.048	0.05		
		Right side	0.298	0.048	0.35		
		Bottom side	1.181		1.18		

<WWAN PCE+ Bluetooth DSS>

WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	Bluetooth DSS Estimated SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
WCDMA	Band V	Front	0.525	0.210	0.74		
		Back	0.388	0.210	0.60		
		Left side		0.210	0.21		
		Right side	0.399		0.40		
		Bottom side	0.392		0.39		
	Band II	Front	0.519	0.210	0.73		
		Back	0.962	0.210	1.17		
		Left side		0.210	0.21		
		Right side	0.357		0.36		
		Bottom side	1.188		1.19		
	Band IV	Front	0.500	0.210	0.71		
		Back	0.688	0.210	0.90		
		Left side		0.210	0.21		
		Right side	0.244		0.24		
		Bottom side	0.964		0.96		
LTE	Band 12	Front	0.490	0.210	0.70		
		Back	0.463	0.210	0.67		
		Left side		0.210	0.21		
		Right side	0.297		0.30		
		Bottom side	0.477		0.48		
	Band 5	Front	0.549	0.210	0.76		
		Back	0.484	0.210	0.69		
		Left side		0.210	0.21		
		Right side	0.394		0.39		
		Bottom side	0.276		0.28		
	Band 4	Front	0.677	0.210	0.89		
		Back	1.123	0.210	1.33		
		Left side		0.210	0.21		
		Right side	0.354		0.35		
		Bottom side	1.421		**1.42**		
	Band 2	Front	0.405	0.210	0.62		
		Back	1.019	0.210	1.23		
		Left side		0.210	0.21		
		Right side	0.298		0.30		
		Bottom side	1.181		1.18		

<WWAN PCB + WLAN (Antenna 0) NII>

WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	WLAN NII Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
WCDMA	Band V	Front	0.525	0.441	0.97		
		Back	0.388	0.441	0.83		
		Left side		0.441	0.44		
		Right side	0.399		0.40		
		Bottom side	0.392		0.39		
	Band II	Front	0.519	0.441	0.96		
		Back	0.962	0.441	1.40		
		Left side		0.441	0.44		
		Right side	0.357		0.36		
		Bottom side	1.188		1.19		
	Band IV	Front	0.500	0.441	0.94		
		Back	0.688	0.441	1.13		
		Left side		0.441	0.44		
		Right side	0.244		0.24		
		Bottom side	0.964		0.96		
LTE	Band 12	Front	0.490	0.441	0.93		
		Back	0.463	0.441	0.90		
		Left side		0.441	0.44		
		Right side	0.297		0.30		
		Bottom side	0.477		0.48		
	Band 5	Front	0.549	0.441	0.99		
		Back	0.484	0.441	0.93		
		Left side		0.441	0.44		
		Right side	0.394		0.39		
		Bottom side	0.276		0.28		
	Band 4	Front	0.677	0.441	1.12		
		Back	1.123	0.441	**1.56**		
		Left side		0.441	0.44		
		Right side	0.354		0.35		
		Bottom side	1.421		1.42		
	Band 2	Front	0.405	0.441	0.85		
		Back	1.019	0.441	1.46		
		Left side		0.441	0.44		
		Right side	0.298		0.30		
		Bottom side	1.181		1.18		

<WWAN PCB + WLAN (Antenna 1) NII>

WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	WLAN NII Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
WCDMA	Band V	Front	0.525	0.093	0.62		
		Back	0.388	0.093	0.48		
		Right side	0.399	0.093	0.49		
		Bottom side	0.392		0.39		
	Band II	Front	0.519	0.093	0.61		
		Back	0.962	0.093	1.06		
		Right side	0.357	0.093	0.45		
		Bottom side	1.188		1.19		
	Band IV	Front	0.500	0.093	0.59		
		Back	0.688	0.093	0.78		
		Right side	0.244	0.093	0.34		
		Bottom side	0.964		0.96		
LTE	Band 12	Front	0.490	0.093	0.58		
		Back	0.463	0.093	0.56		
		Right side	0.297	0.093	0.39		
		Bottom side	0.477		0.48		
	Band 5	Front	0.549	0.093	0.64		
		Back	0.484	0.093	0.58		
		Right side	0.394	0.093	0.49		
		Bottom side	0.276		0.28		
	Band 4	Front	0.677	0.093	0.77		
		Back	1.123	0.093	1.22		
		Right side	0.354	0.093	0.45		
		Bottom side	1.421		1.42		
	Band 2	Front	0.405	0.093	0.50		
		Back	1.019	0.093	1.11		
		Right side	0.298	0.093	0.39		
		Bottom side	1.181		1.18		

<WWAN PCB + WLAN (Antenna 0+1) NII>

WWAN Band		Exposure Position	WWAN PCB Max. WWAN SAR (W/kg)	WLAN NII Max. WLAN SAR (W/kg)	Summed SAR (W/kg)	SPLSR	Case No
WCDMA	Band V	Front	0.525	0.320	0.85		
		Back	0.388	0.320	0.71		
		Left side		0.320	0.32		
		Right side	0.399	0.320	0.72		
		Bottom side	0.392		0.39		
	Band II	Front	0.519	0.320	0.84		
		Back	0.962	0.320	1.28		
		Left side		0.320	0.32		
		Right side	0.357	0.320	0.68		
		Bottom side	1.188		1.19		
	Band IV	Front	0.500	0.320	0.82		
		Back	0.688	0.320	1.01		
		Left side		0.320	0.32		
		Right side	0.244	0.320	0.56		
		Bottom side	0.964		0.96		
LTE	Band 12	Front	0.490	0.320	0.81		
		Back	0.463	0.320	0.78		
		Left side		0.320	0.32		
		Right side	0.297	0.320	0.62		
		Bottom side	0.477		0.48		
	Band 5	Front	0.549	0.320	0.87		
		Back	0.484	0.320	0.80		
		Left side		0.320	0.32		
		Right side	0.394	0.320	0.71		
		Bottom side	0.276		0.28		
	Band 4	Front	0.677	0.320	1.00		
		Back	1.123	0.320	1.44		
		Left side		0.320	0.32		
		Right side	0.354	0.320	0.67		
		Bottom side	1.421		1.42		
	Band 2	Front	0.405	0.320	0.73		
		Back	1.019	0.320	1.34		
		Left side		0.320	0.32		
		Right side	0.298	0.320	0.62		
		Bottom side	1.181		1.18		

Test Engineer： Fulu Hu

19. 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 19.1. 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 19.2. 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	7.0	N	1	1	1	7.0	7.0
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	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						12.8%	12.7%
Coverage Factor for 95 %						K=2	K=2
Expanded STD Uncertainty						25.5%	25.4%

Table 19.3. Uncertainty Budget for frequency range 3 GHz to 6 GHz

20. References

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

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

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

[4] SPEAG DASY System Handbook

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

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

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

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

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

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

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

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

Appendix A. Plots of System Performance Check

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab　　　　　　Date: 2014.11.13

System Check_Body_750MHz-141113

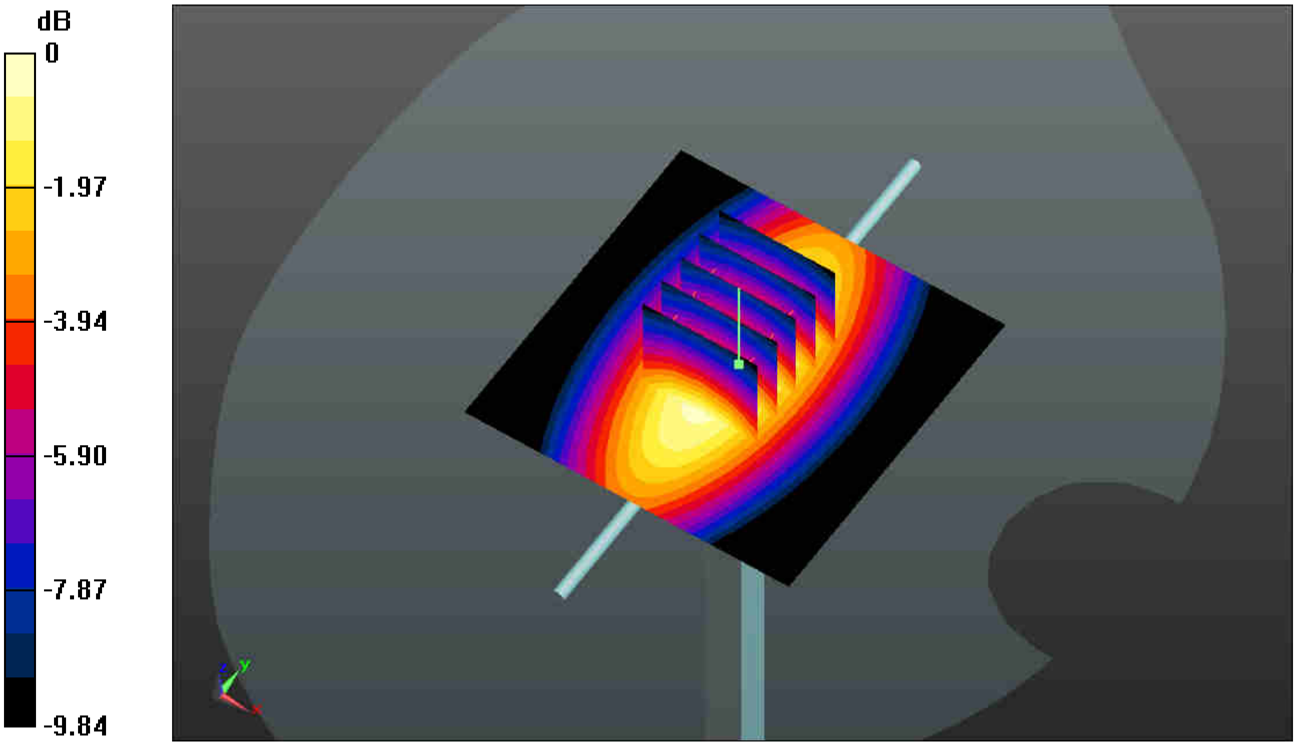
DUT: D750V3 - SN:1012

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: MSL_750_141113 Medium parameters used: f = 750 MHz; σ = 0.963 mho/m; ε_r = 54.228; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.46, 9.46, 9.46); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.598 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 48.426 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 2.982 W/kg
SAR(1 g) = 2.08 mW/g; SAR(10 g) = 1.39 mW/g
Maximum value of SAR (measured) = 2.586 mW/g



0 dB = 2.590mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.11.13

System Check_Body_835MHz_141113

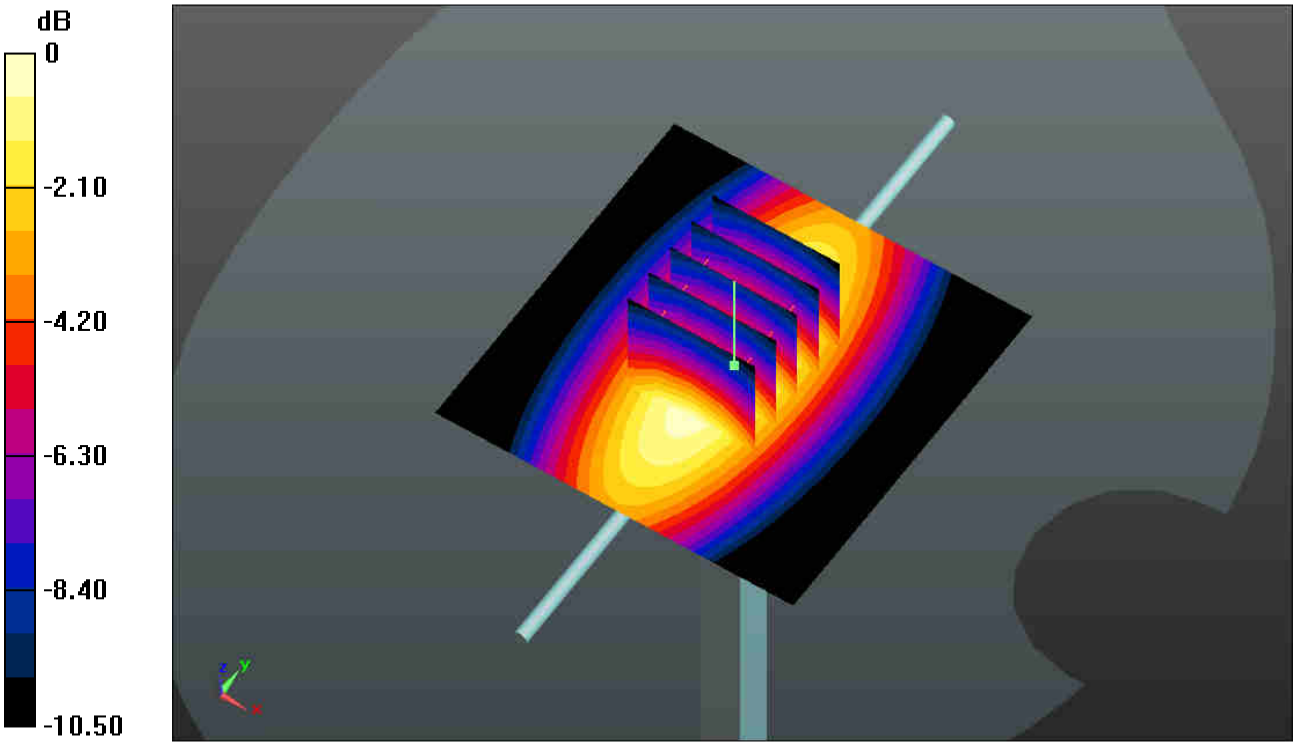
DUT: D835V2 - SN:499

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL_835_141113 Medium parameters used: f = 835 MHz; $\sigma = 0.976$ mho/m; $\varepsilon_r = 54.382$; $\rho = 1000$ kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.31, 9.31, 9.31); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.840 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.007 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.282 W/kg
SAR(1 g) = 2.23 mW/g; SAR(10 g) = 1.47 mW/g
Maximum value of SAR (measured) = 2.821 mW/g



0 dB = 2.820mW/g

System Check_Body_1750MHz-141110

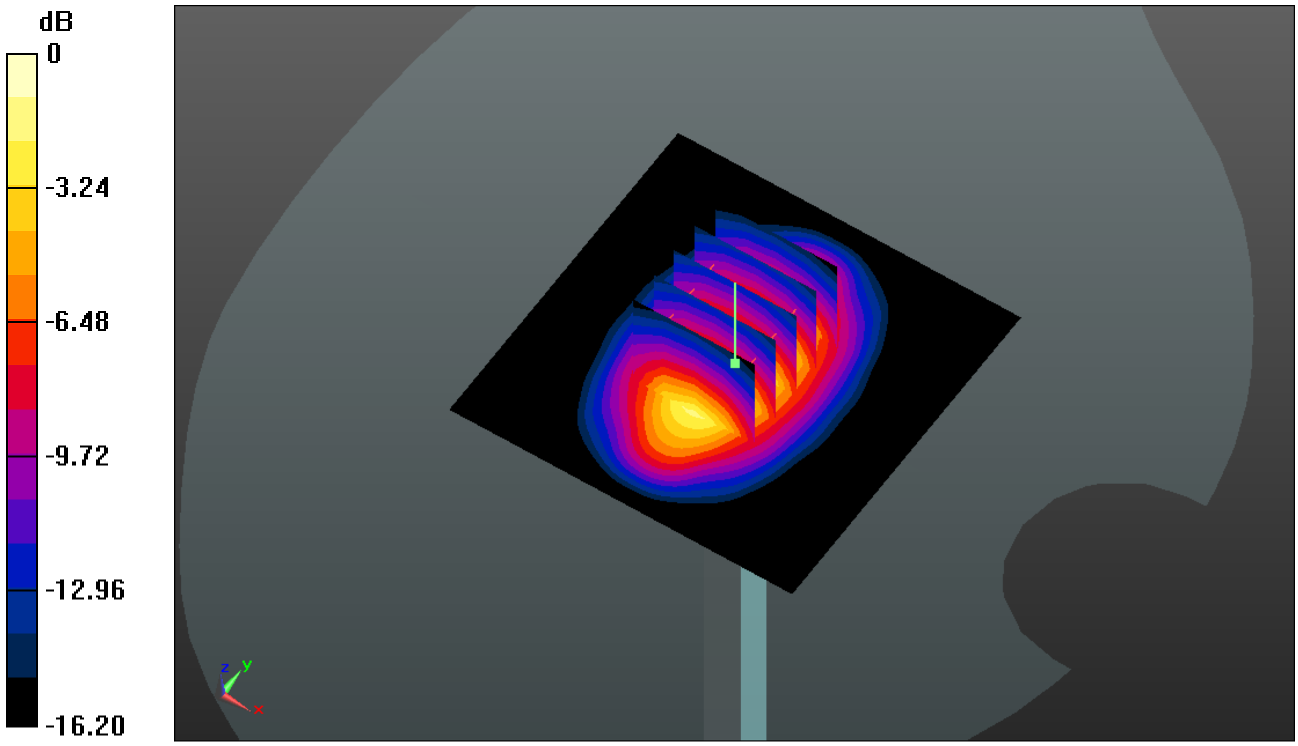
DUT: D1750V2 - SN:1090

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: MSL_1750_141110 Medium parameters used: f = 1750 MHz; $\sigma = 1.513$ mho/m; $\varepsilon_r = 55.5$; $\rho = 1000$ kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.89, 7.89, 7.89); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.815 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 82.327 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 15.994 W/kg
SAR(1 g) = 9.14 mW/g; SAR(10 g) = 4.9 mW/g
Maximum value of SAR (measured) = 12.889 mW/g



0 dB = 12.890mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.11.10

System Check_Body_1900MHz-141110

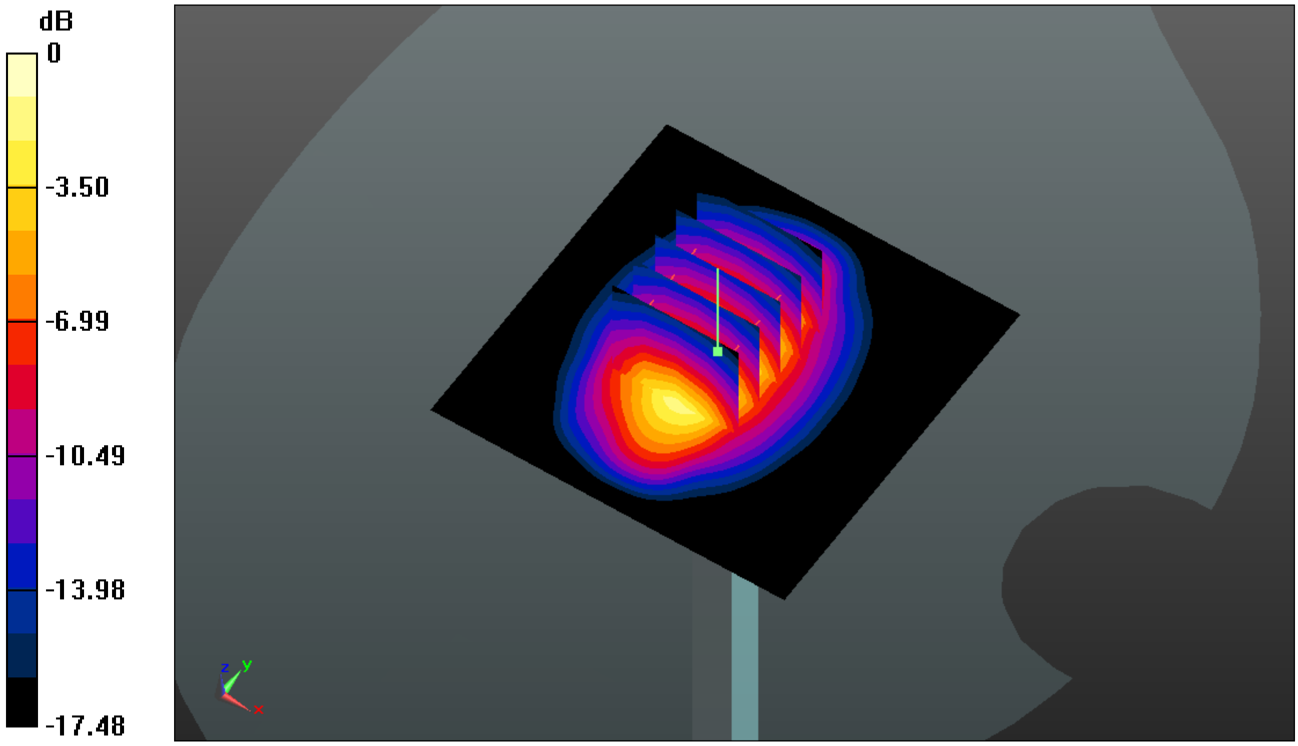
DUT: D1900V2 - SN:5d041

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900_141110 Medium parameters used: f = 1900 MHz; σ = 1.554 mho/m; ε_r = 53.519; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.56, 7.56, 7.56); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 14.462 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 84.874 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 18.088 W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.42 mW/g
Maximum value of SAR (measured) = 14.749 mW/g



0 dB = 14.750mW/g

System Check_Body_750MHz_160228

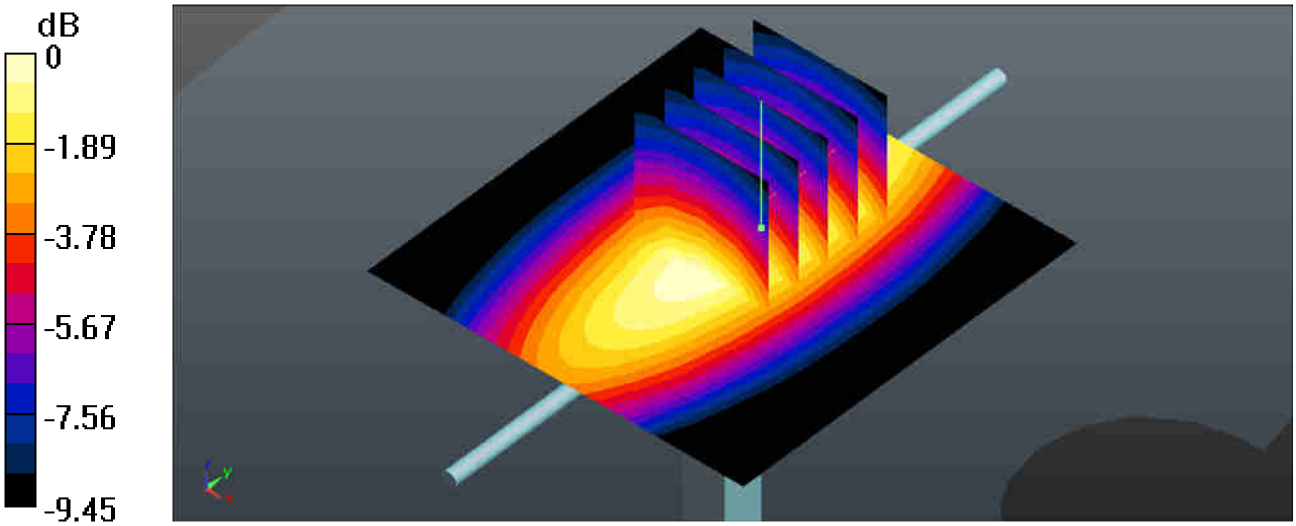
DUT: D750V2 - SN:1065

Communication System: UID 0, CW (0); Frequency: 750 MHz;Duty Cycle: 1:1
Medium: MSL_750_160228 Medium parameters used: f = 750 MHz; σ = 0.956 S/m; ε_r = 54.927; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(10.22, 10.22, 10.22); Calibrated: 2015.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- 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) = 2.75 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.45 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 3.06 W/kg
SAR(1 g) = 2.18 W/kg; SAR(10 g) = 1.49 W/kg
Maximum value of SAR (measured) = 2.68 W/kg



0 dB = 2.68 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.2.28

System Check_Body_835MHz_160228

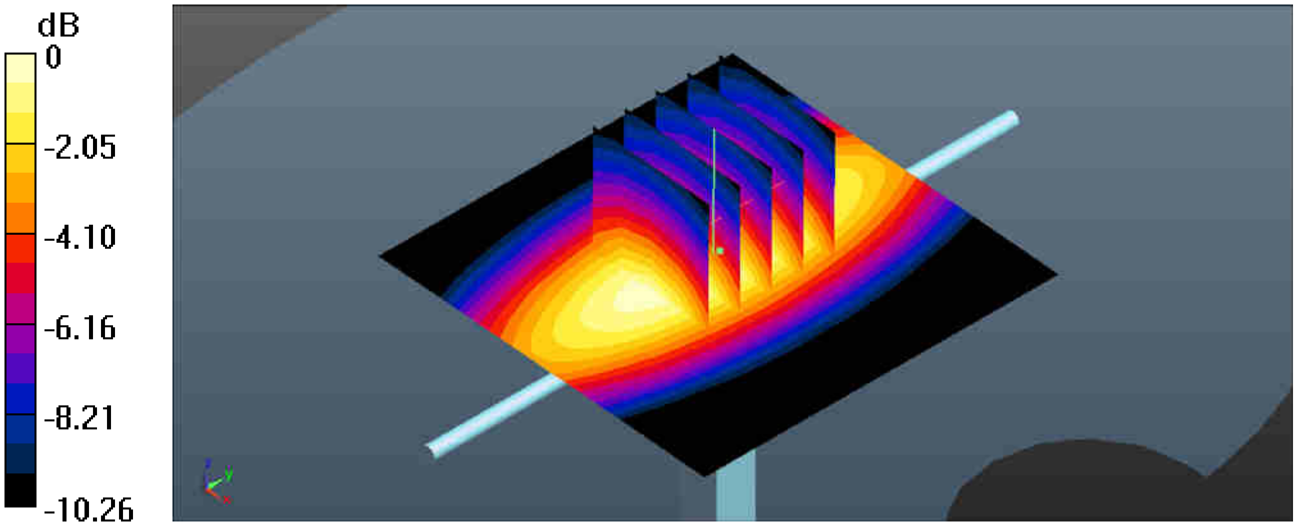
DUT: D835V2 - SN:4d091

Communication System: UID 0, CW (0); Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL_850_160228 Medium parameters used: f = 835 MHz; σ = 1 S/m; ε_r = 53.687; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(10.17, 10.17, 10.17); Calibrated: 2015.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- 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) = 3.19 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 52.24 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 3.66 W/kg
SAR(1 g) = 2.54 W/kg; SAR(10 g) = 1.68 W/kg
Maximum value of SAR (measured) = 3.19 W/kg



0 dB = 3.19 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.2.28

System Check_Body_1750MHz_160228

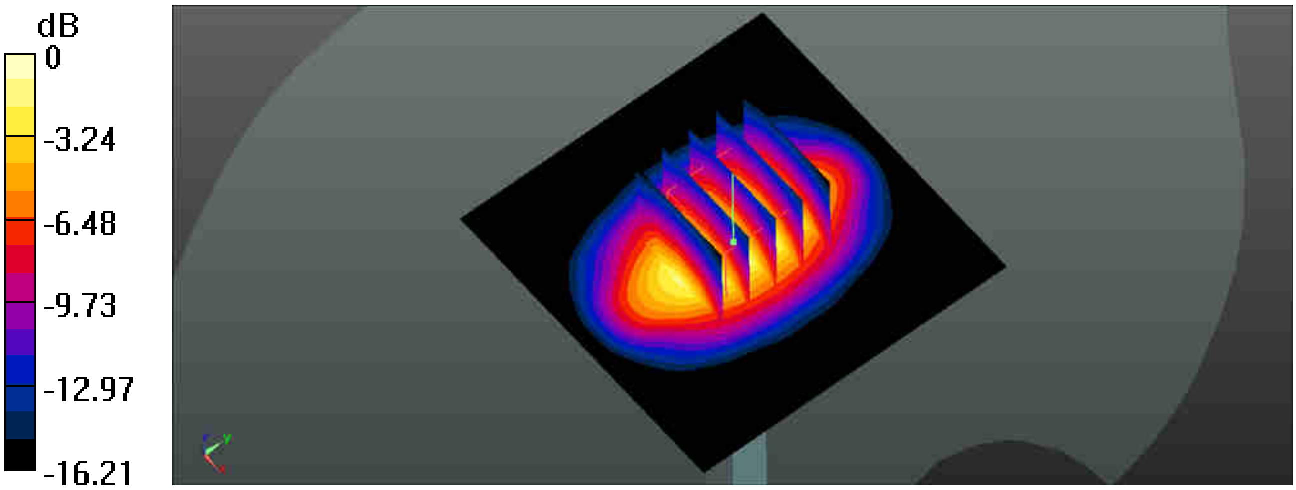
DUT: D1750V2 - SN:1069

Communication System: UID 0, CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: MSL_1750_160228 Medium parameters used: f = 1750 MHz; σ = 1.529 S/m; ε_r = 53.218; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.77, 7.77, 7.77); Calibrated: 2015.5.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.5.21
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- 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) = 13.2 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 83.17 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 16.3 W/kg
SAR(1 g) = 9.34 W/kg; SAR(10 g) = 5.01 W/kg
Maximum value of SAR (measured) = 13.2 W/kg



0 dB = 13.2 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2016.2.28

System Check_Body_1900MHz_160228

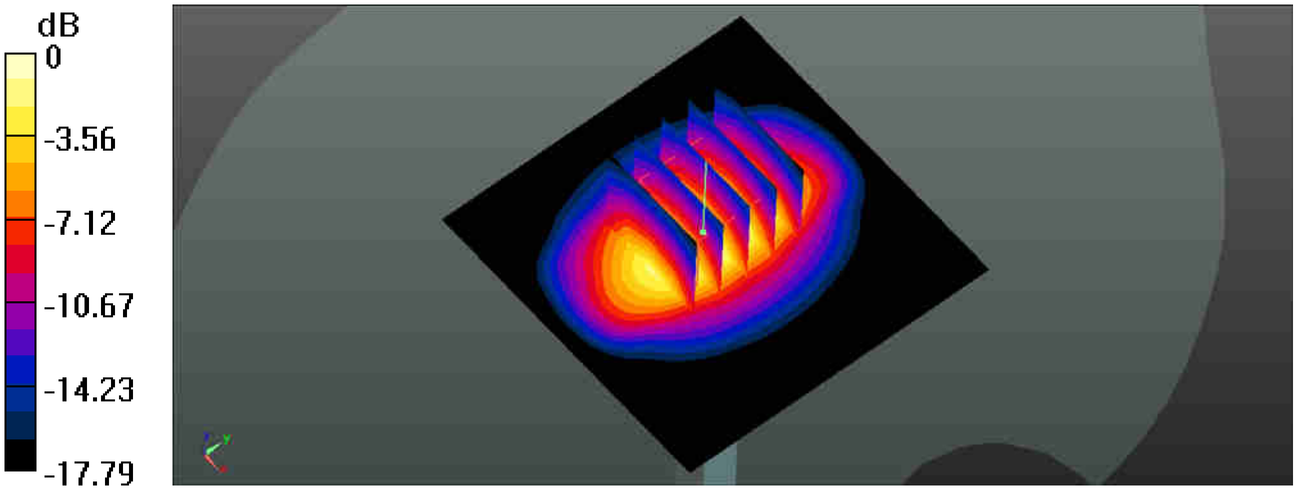
DUT: D1900V2 - SN:5d118

Communication System: UID 0, CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL_1900_160228 Medium parameters used: f = 1900 MHz; σ = 1.571 S/m; ε_r = 52.548; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.54, 7.54, 7.54); Calibrated: 2015.5.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.5.21
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- 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) = 15.1 W/kg

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 83.56 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 19.7 W/kg
SAR(1 g) = 10.9 W/kg; SAR(10 g) = 5.63 W/kg
Maximum value of SAR (measured) = 15.6 W/kg



0 dB = 15.6 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.2.27

System Check_Body_2450MHz_160227

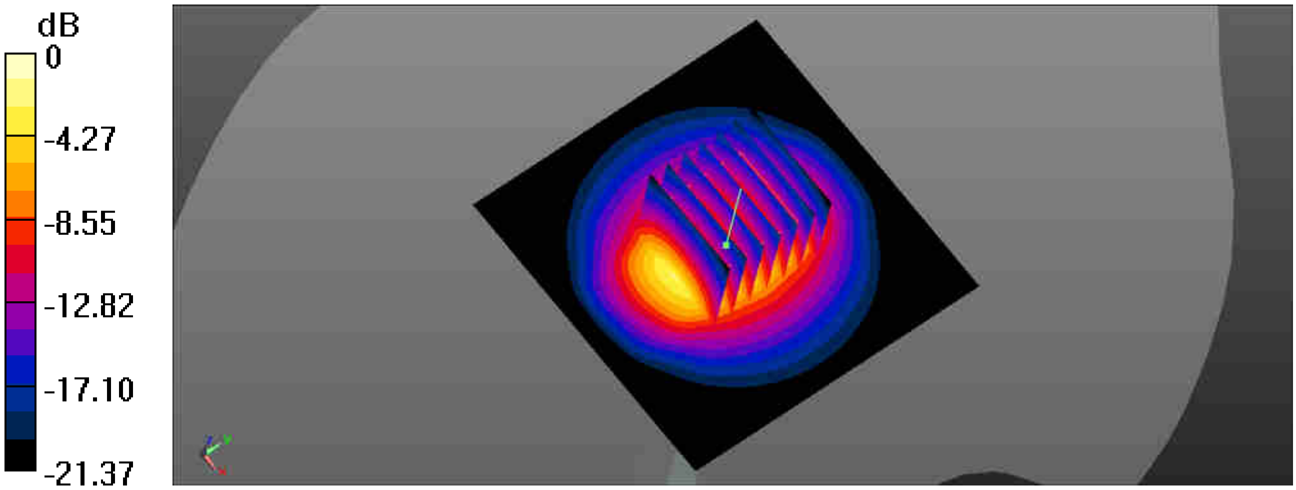
DUT: D2450V2 - SN:840

Communication System: UID 0, CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450_160227 Medium parameters used: f = 2450 MHz; σ = 1.943 S/m; ε_r = 50.981; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.29, 7.29, 7.29); Calibrated: 2015.5.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.5.21
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- 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) = 18.5 W/kg

Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 84.69 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 24.1 W/kg
SAR(1 g) = 11.9 W/kg; SAR(10 g) = 5.53 W/kg
Maximum value of SAR (measured) = 18.1 W/kg



0 dB = 18.1 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.3.3

System Check_Body_5250MHz_160303

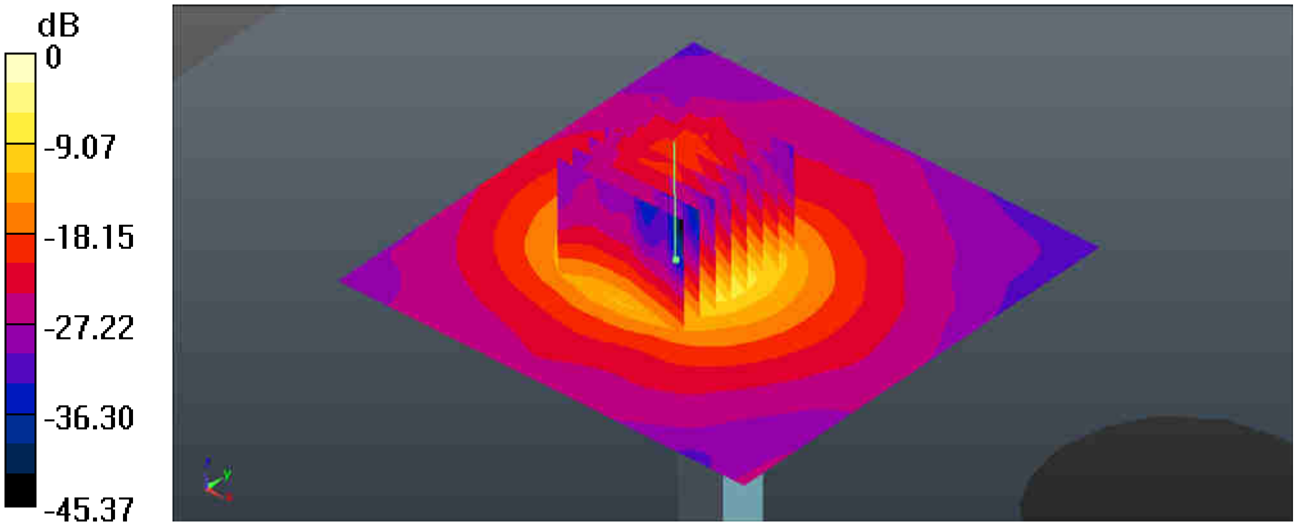
DUT: D5GHzV2 - SN:1113

Communication System: UID 0, CW (0); Frequency: 5250 MHz;Duty Cycle: 1:1
Medium: MSL_5000_160303 Medium parameters used: f = 5250 MHz; σ = 5.379 S/m; ε_r = 49.115; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(4.25, 4.25, 4.25); Calibrated: 2015.11.27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 15.9 W/kg

Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 32.94 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 28.8 W/kg
SAR(1 g) = 7.85 W/kg; SAR(10 g) = 2.27 W/kg
Maximum value of SAR (measured) = 18.9 W/kg



0 dB = 18.9 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.3.3

System Check_Body_5750MHz_160303

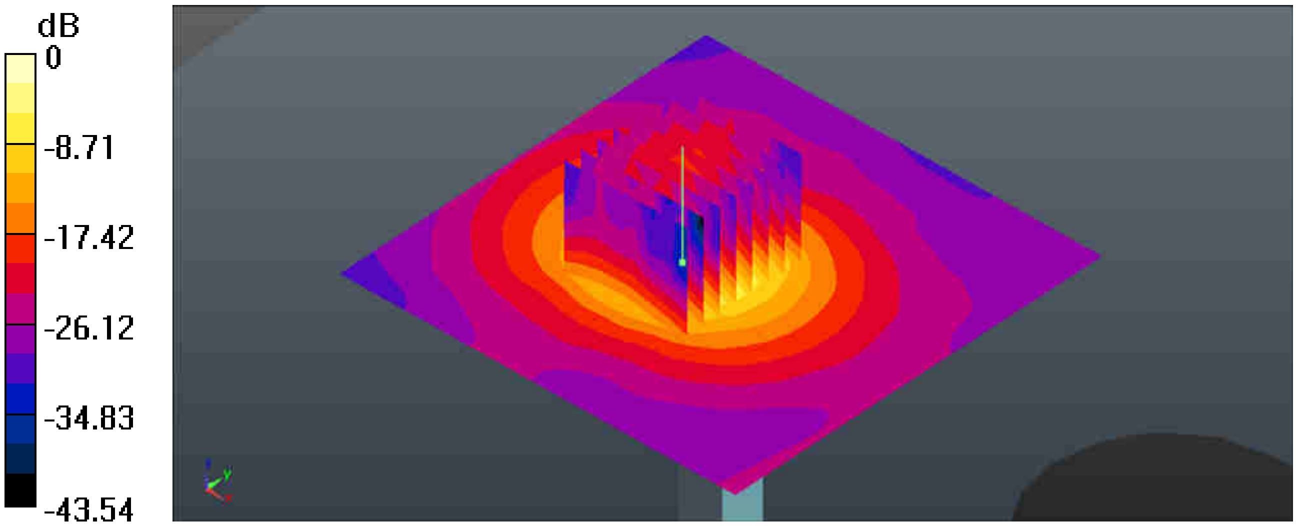
DUT: D5GHzV2 - SN:1113

Communication System: UID 0, CW (0); Frequency: 5750 MHz;Duty Cycle: 1:1
Medium: MSL_5000_160303 Medium parameters used: f = 5750 MHz; σ = 6.07 S/m; ε_r = 47.985; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(3.77, 3.77, 3.77); Calibrated: 2015.11.27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Pin=100mW/Area Scan (91x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 15.8 W/kg

Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 31.03 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 29.6 W/kg
SAR(1 g) = 7.41 W/kg; SAR(10 g) = 2.14 W/kg
Maximum value of SAR (measured) = 18.9 W/kg



0 dB = 18.9 W/kg

Appendix B. Plots of High SAR Measurement

The plots are shown as follows.

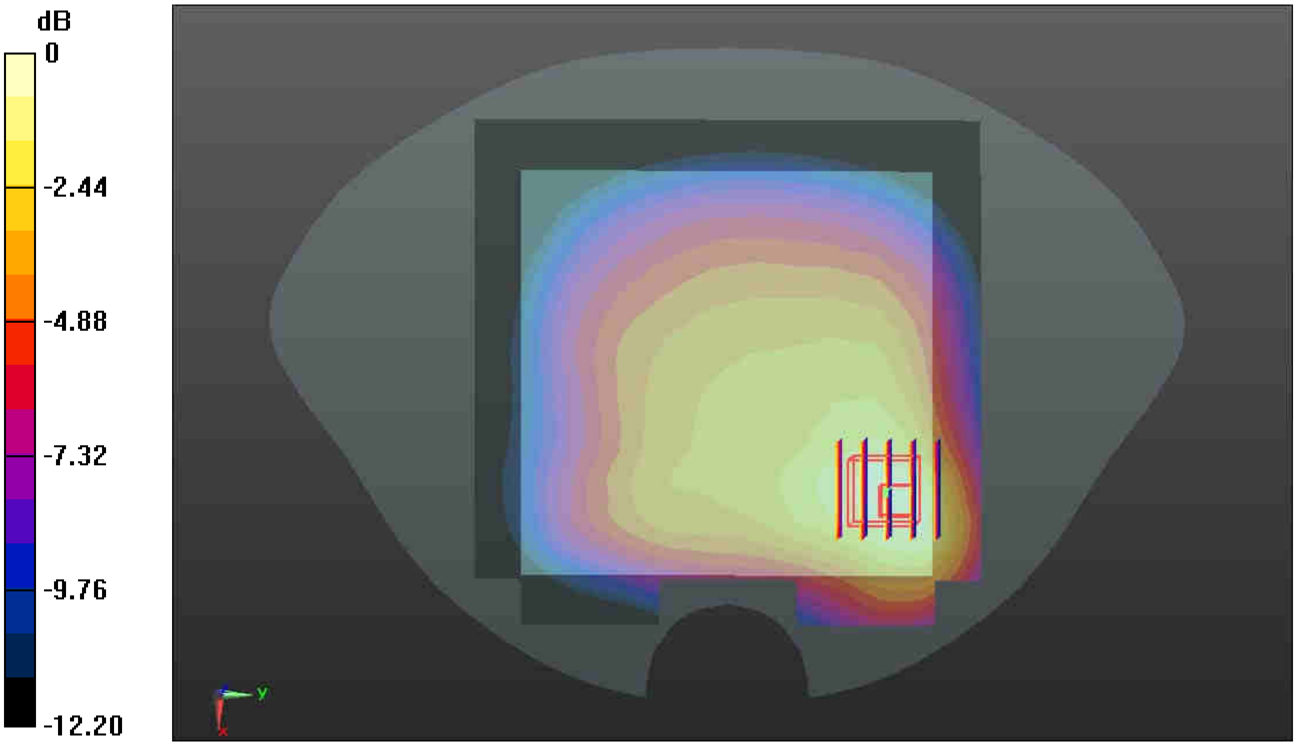
#01_WCDMA Band V_RMC12.2k_Front_10mm_Ch4233

Communication System: UMTS (0); Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: MSL_835_141113 Medium parameters used: f = 846.6 MHz; σ = 0.987 mho/m; ε_r = 54.279; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.31, 9.31, 9.31); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch4233/Area Scan (111x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.528 mW/g

Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.113 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.662 W/kg
SAR(1 g) = 0.403 mW/g; SAR(10 g) = 0.252 mW/g
Maximum value of SAR (measured) = 0.518 mW/g



0 dB = 0.520mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.11.10

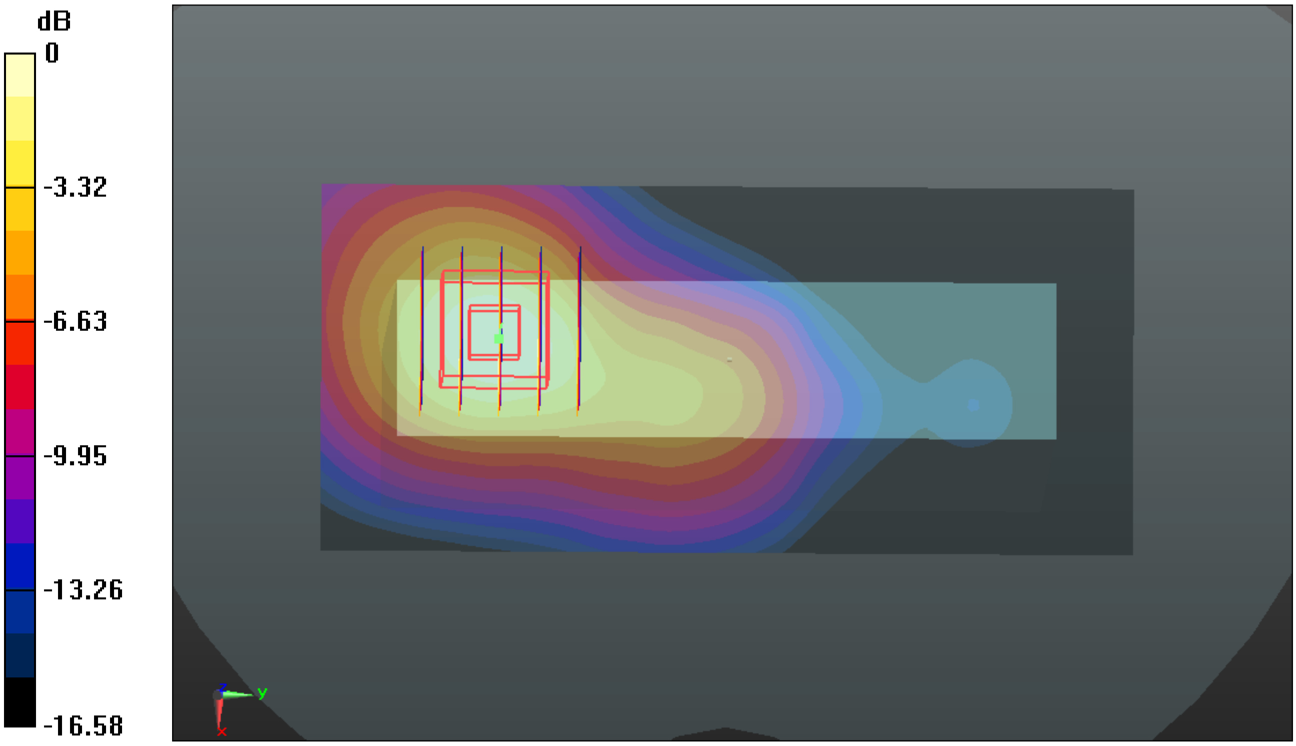
#02_WCDMA Band II_RMC12.2k_Bottom Side_10mm_Ch9538

Communication System: UMTS (0); Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_141110 Medium parameters used: f = 1907.6 MHz; σ = 1.563 mho/m; ε_r = 53.493; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.56, 7.56, 7.56); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch9538/Area Scan (51x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.172 mW/g

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.969 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 1.411 W/kg
SAR(1 g) = 0.879 mW/g; SAR(10 g) = 0.509 mW/g
Maximum value of SAR (measured) = 1.166 mW/g



0 dB = 1.170mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2014.11.13

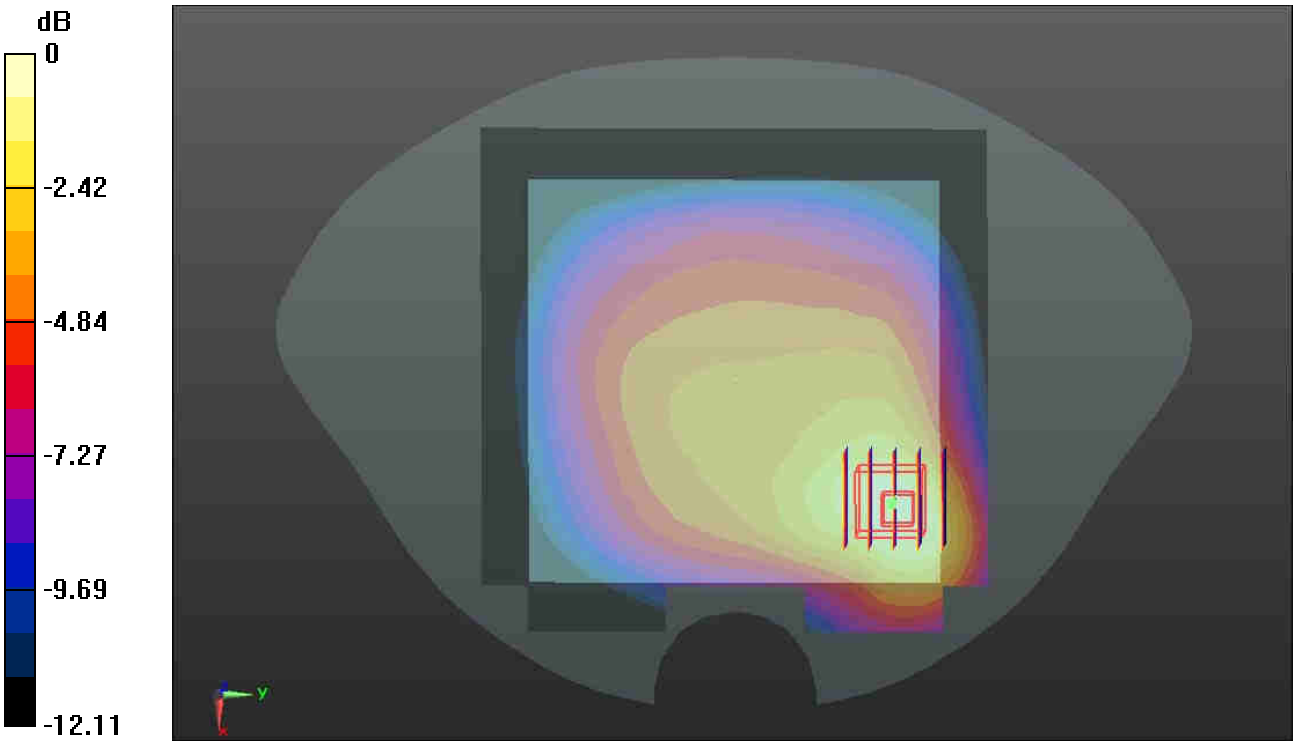
#03_LTE Band5_10M_QPSK(1,0)_Front_10mm_Ch20525

Communication System: FDD_LTE (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: MSL_835_141113 Medium parameters used: f = 836.5 MHz; σ = 0.978 mho/m; ε_r = 54.37; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(9.31, 9.31, 9.31); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch20525/Area Scan (111x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.564 mW/g

Ch20525/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.870 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 0.706 W/kg
SAR(1 g) = 0.437 mW/g; SAR(10 g) = 0.273 mW/g
Maximum value of SAR (measured) = 0.568 mW/g



0 dB = 0.570mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2014.11.10

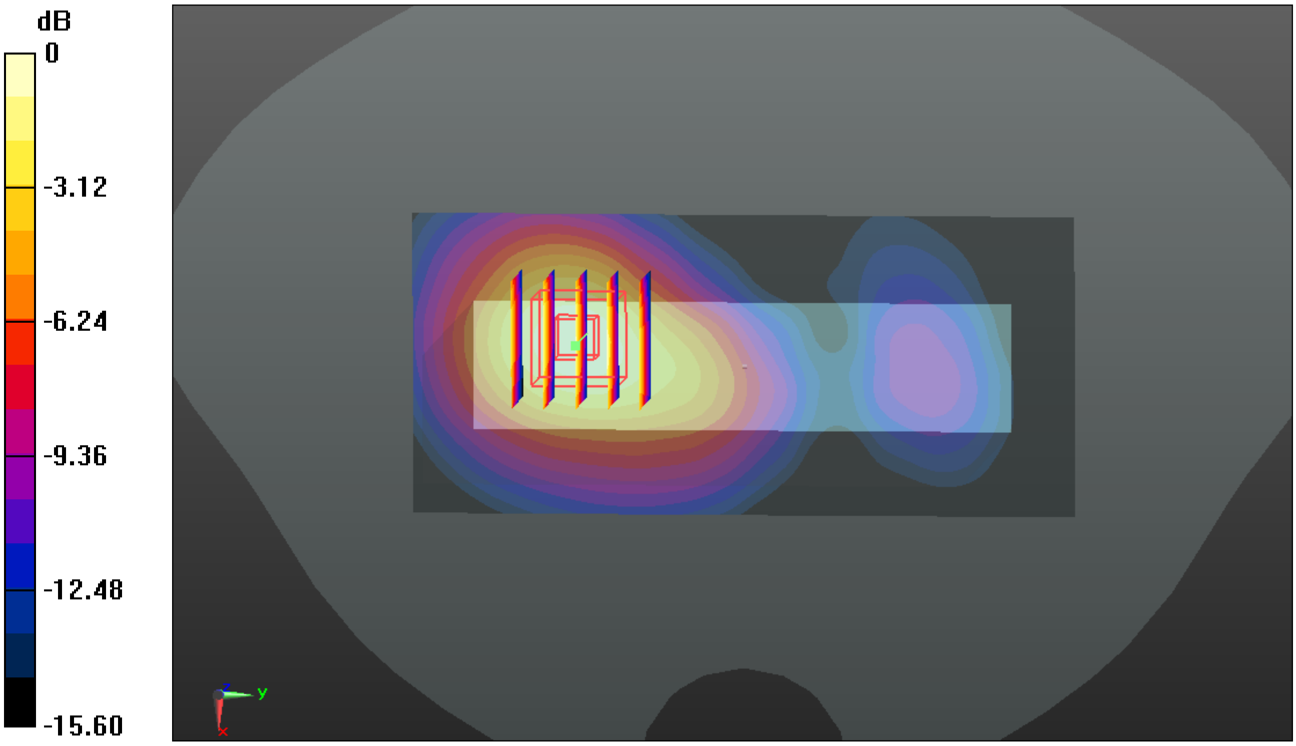
#04_LTE Band4_20M_QPSK(1,0)_Botton Side_10mm_Ch20050

Communication System: FDD_LTE (0); Frequency: 1720 MHz;Duty Cycle: 1:1
Medium: MSL_1750_141110 Medium parameters used: f = 1720 MHz; σ = 1.48 mho/m; ε_r = 55.549; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.89, 7.89, 7.89); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch20050/Area Scan (51x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.588 mW/g

Ch20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.609 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 1.889 W/kg
SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.701 mW/g
Maximum value of SAR (measured) = 1.561 mW/g



0 dB = 1.560mW/g

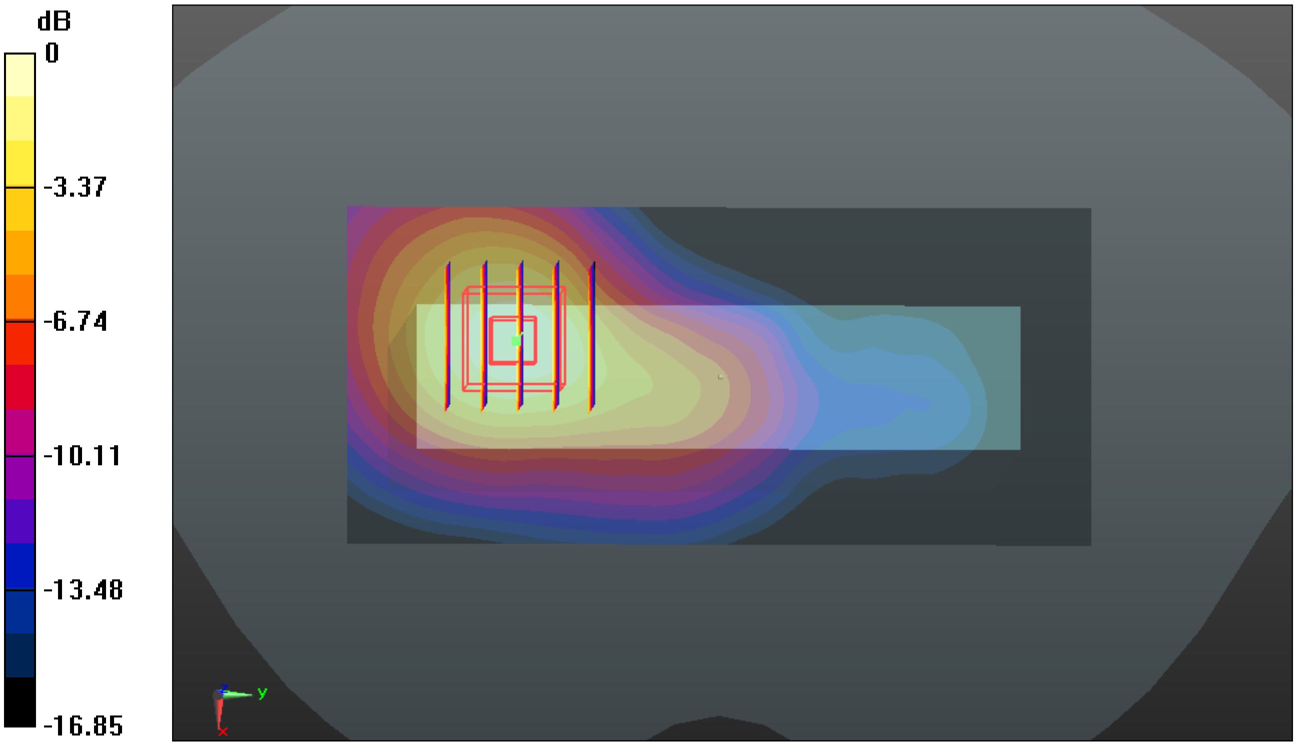
#05_LTE Band2_20M_QPSK(1,0)_Botton Side_10mm_Ch18700

Communication System: FDD_LTE (0); Frequency: 1860 MHz;Duty Cycle: 1:1
Medium: MSL_1900_141110 Medium parameters used: f = 1860 MHz; σ = 1.506 mho/m; ε_r = 53.609; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.56, 7.56, 7.56); Calibrated: 2014.05.23
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2014.05.19
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.4.5 (3634)

Ch18700/Area Scan (51x111x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.350 mW/g

Ch18700/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.277 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.623 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.580 mW/g
Maximum value of SAR (measured) = 1.341 mW/g



0 dB = 1.340mW/g

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab　　　　Date: 2016.2.28

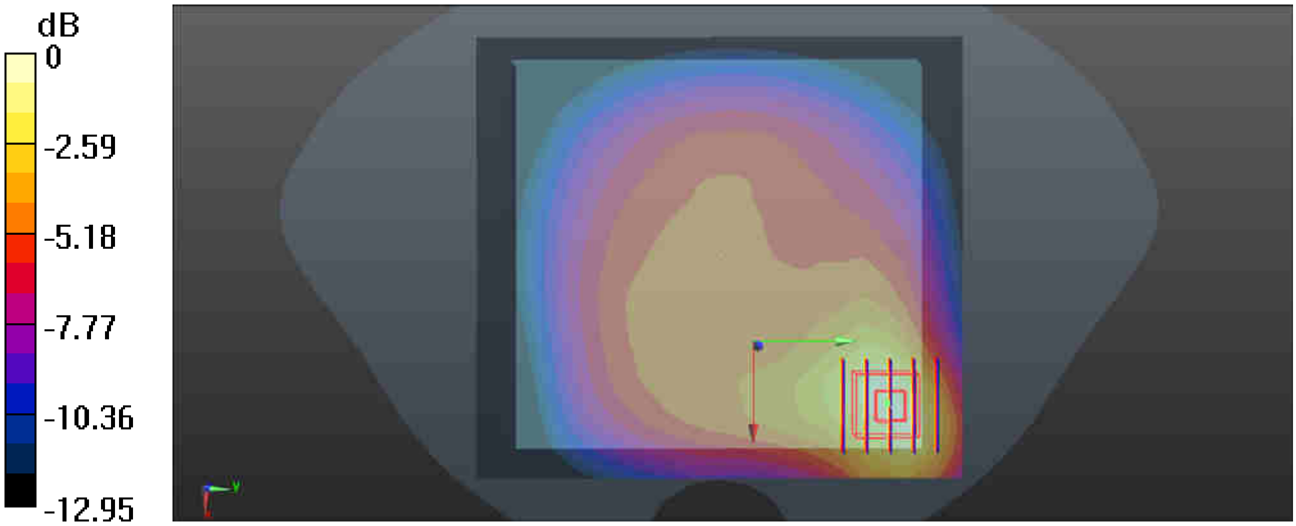
#01-1_WCDMA Band V_RMC 12.2Kbps_Front_10mm_Ch4233

Communication System: UID 0, UMTS (0); Frequency: 846.6 MHz;Duty Cycle: 1:1
Medium: MSL_850_160228 Medium parameters used: f = 846.6 MHz; σ = 1.01 S/m; ε_r = 53.56; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(10.17, 10.17, 10.17); Calibrated: 2015.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch4233/Area Scan (101x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.469 W/kg

Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.26 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.628 W/kg
SAR(1 g) = 0.378 W/kg; SAR(10 g) = 0.227 W/kg
Maximum value of SAR (measured) = 0.514 W/kg



0 dB = 0.514 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.2.28

#02-1_WCDMA Band II_RMC 12.2Kbps_Bottom Side_10mm_Ch9538

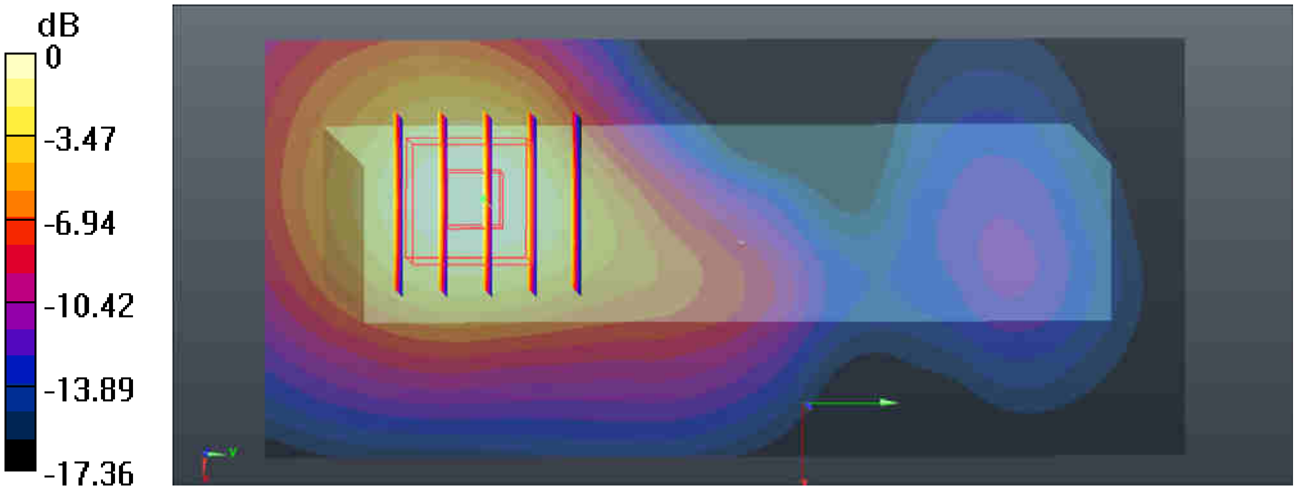
Communication System: UID 0, UMTS (0); Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_160228 Medium parameters used: f = 1907.6 MHz; σ = 1.58 S/m; ε_r = 52.518; ρ= 1000 kg/m3

Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.54, 7.54, 7.54); Calibrated: 2015.5.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.5.21
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch9538/Area Scan (51x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.903 W/kg

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.117 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.666 W/kg; SAR(10 g) = 0.389 W/kg
Maximum value of SAR (measured) = 0.878 W/kg



0 dB = 0.878 W/kg

#03-1_WCDMA Band IV_RMC 12.2Kbps_Bottom Side_10mm_Ch1513

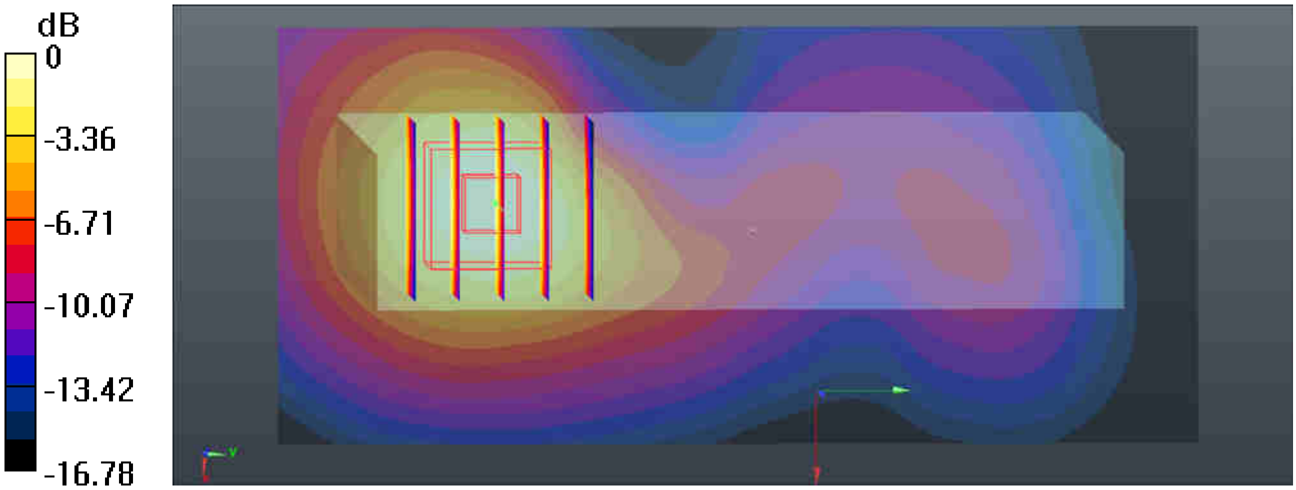
Communication System: UID 0, UMTS (0); Frequency: 1752.6 MHz;Duty Cycle: 1:1
Medium: MSL_1750_160228 Medium parameters used: f = 1752.6 MHz; σ = 1.532 S/m; ε_r = 53.206; ρ= 1000 kg/m3

Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.77, 7.77, 7.77); Calibrated: 2015.5.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.5.21
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch1513/Area Scan (51x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.30 W/kg

Ch1513/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.58 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.940 W/kg; SAR(10 g) = 0.560 W/kg
Maximum value of SAR (measured) = 1.23 W/kg



0 dB = 1.23 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2016.2.28

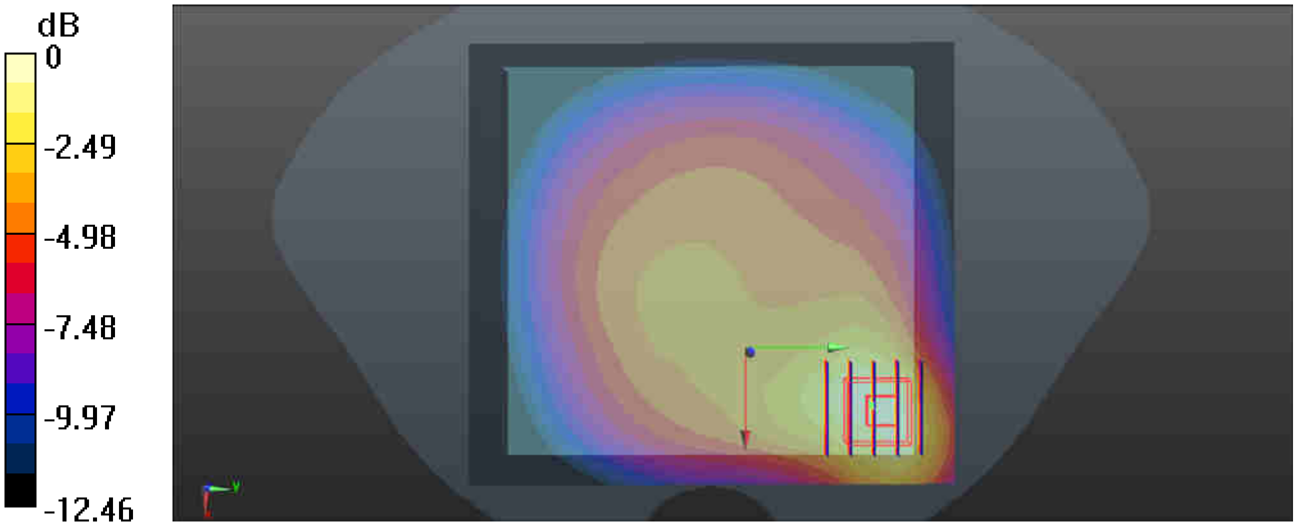
#04-1_LTE Band 5_10M_QPSK_1RB_0Offset_Front_10mm_Ch20525

Communication System: UID 0, FDD_LTE (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: MSL_850_160228 Medium parameters used: f = 836.5 MHz; σ = 1.001 S/m; ε_r = 53.674; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(10.17, 10.17, 10.17); Calibrated: 2015.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch20525/Area Scan (101x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.473 W/kg

Ch20525/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.37 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.622 W/kg
SAR(1 g) = 0.379 W/kg; SAR(10 g) = 0.230 W/kg
Maximum value of SAR (measured) = 0.495 W/kg



0 dB = 0.495 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.2.28

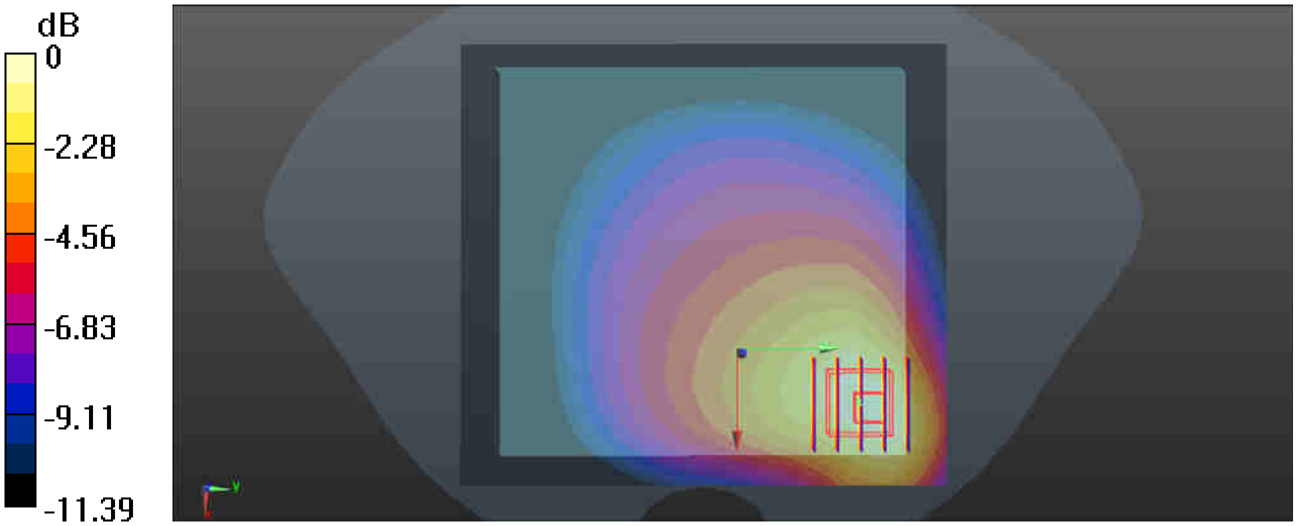
#05-1_LTE Band 12_10M_QPSK_1RB_0Offset_Front_10mm_Ch23095

Communication System: UID 0, FDD_LTE (0); Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: MSL_750_160228 Medium parameters used: f = 707.5 MHz; σ = 0.919 S/m; ε_r = 55.326; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(10.22, 10.22, 10.22); Calibrated: 2015.11.27;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch23095/Area Scan (101x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.534 W/kg

Ch23095/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.46 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.673 W/kg
SAR(1 g) = 0.433 W/kg; SAR(10 g) = 0.283 W/kg
Maximum value of SAR (measured) = 0.544 W/kg



0 dB = 0.544 W/kg

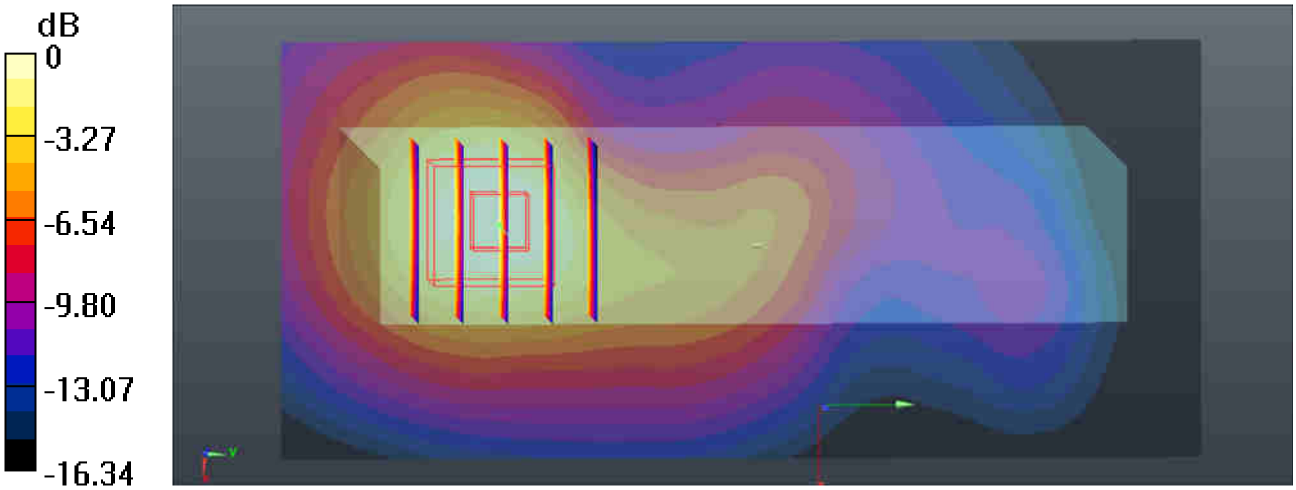
#06-1_LTE Band 4_20M_QPSK_1RB_0Offset_Bottom Side_10mm_Ch20300

Communication System: UID 0, FDD_LTE (0); Frequency: 1745 MHz;Duty Cycle: 1:1
Medium: MSL_1750_160228 Medium parameters used: f = 1745 MHz; σ = 1.523 S/m; ε_r = 53.237; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.77, 7.77, 7.77); Calibrated: 2015.5.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.5.21
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch20300/Area Scan (51x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.26 W/kg

Ch20300/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.58 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.929 W/kg; SAR(10 g) = 0.550 W/kg
Maximum value of SAR (measured) = 1.21 W/kg



0 dB = 1.21 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.2.28

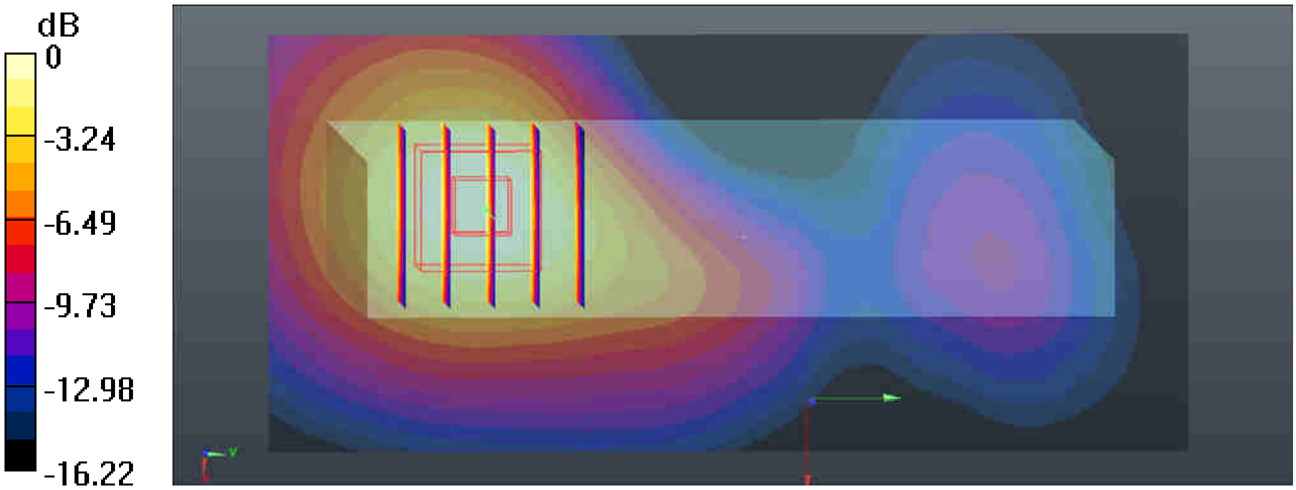
#07-1_LTE Band 2_20M_QPSK_1RB_0Offset_Bottom Side_10mm_Ch18700

Communication System: UID 0, FDD_LTE (0); Frequency: 1860 MHz;Duty Cycle: 1:1
Medium: MSL_1900_160228 Medium parameters used: f = 1860 MHz; σ = 1.527 S/m; ε_r = 52.688; ρ = 1000 kg/m^3
Ambient Temperature：23.4 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.54, 7.54, 7.54); Calibrated: 2015.5.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.5.21
- Phantom: SAM2; Type: SAM; Serial: TP-1477
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch18700/Area Scan (51x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.00 W/kg

Ch18700/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.755 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.744 W/kg; SAR(10 g) = 0.439 W/kg
Maximum value of SAR (measured) = 0.975 W/kg



0 dB = 0.975 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2016.2.27

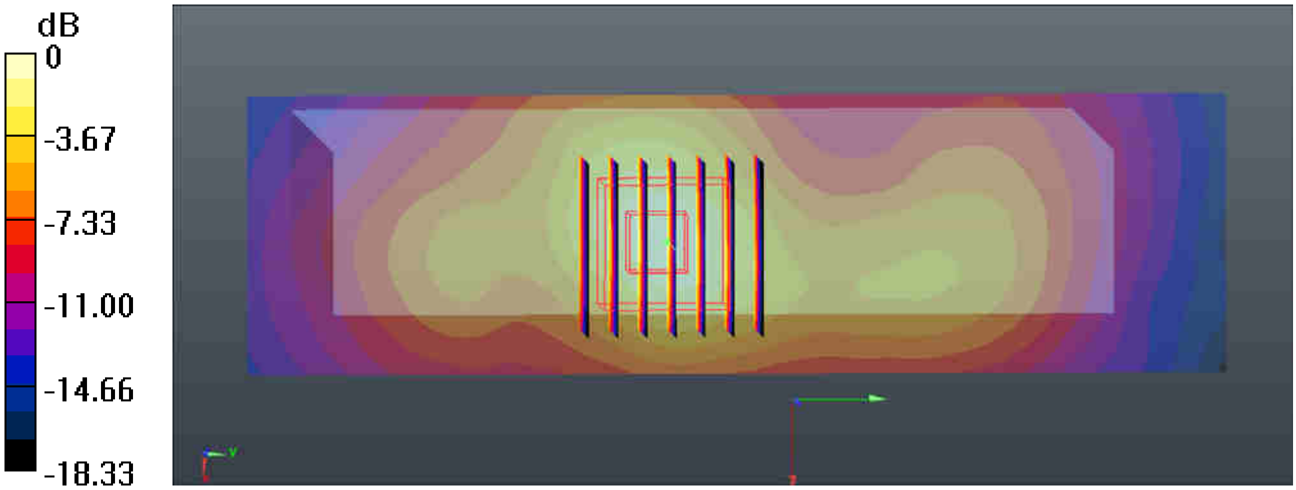
#08-1_WLAN2.4GHz_802.11b 1Mbps_Left Side_10mm_Ch1_Ant 0

Communication System: UID 0, WIFI (0); Frequency: 2412 MHz;Duty Cycle: 1:1.010
Medium: MSL_2450_160227 Medium parameters used: f = 2412 MHz; σ = 1.887 S/m; ε_r = 51.154; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.29, 7.29, 7.29); Calibrated: 2015.5.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.5.21
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch1/Area Scan (41x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.211 W/kg

Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.265 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.285 W/kg
SAR(1 g) = 0.147 W/kg; SAR(10 g) = 0.072 W/kg
Maximum value of SAR (measured) = 0.213 W/kg



0 dB = 0.213 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.2.27

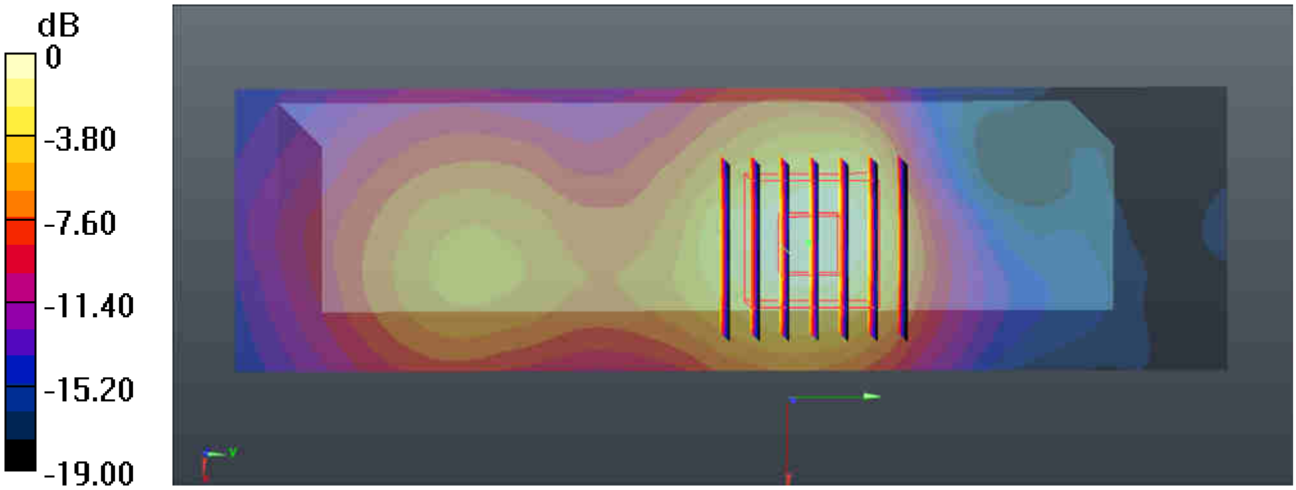
#09-1_WLAN2.4GHz_802.11b 1Mbps_Right Side_10mm_Ch6_Ant 1

Communication System: UID 0, WIFI (0); Frequency: 2437 MHz;Duty Cycle: 1:1.012
Medium: MSL_2450_160227 Medium parameters used: f = 2437 MHz; σ = 1.924 S/m; ε_r = 51.037; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.29, 7.29, 7.29); Calibrated: 2015.5.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.5.21
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch6/Area Scan (41x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.230 W/kg

Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.178 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.290 W/kg
SAR(1 g) = 0.144 W/kg; SAR(10 g) = 0.072 W/kg
Maximum value of SAR (measured) = 0.217 W/kg



0 dB = 0.217 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2016.2.27

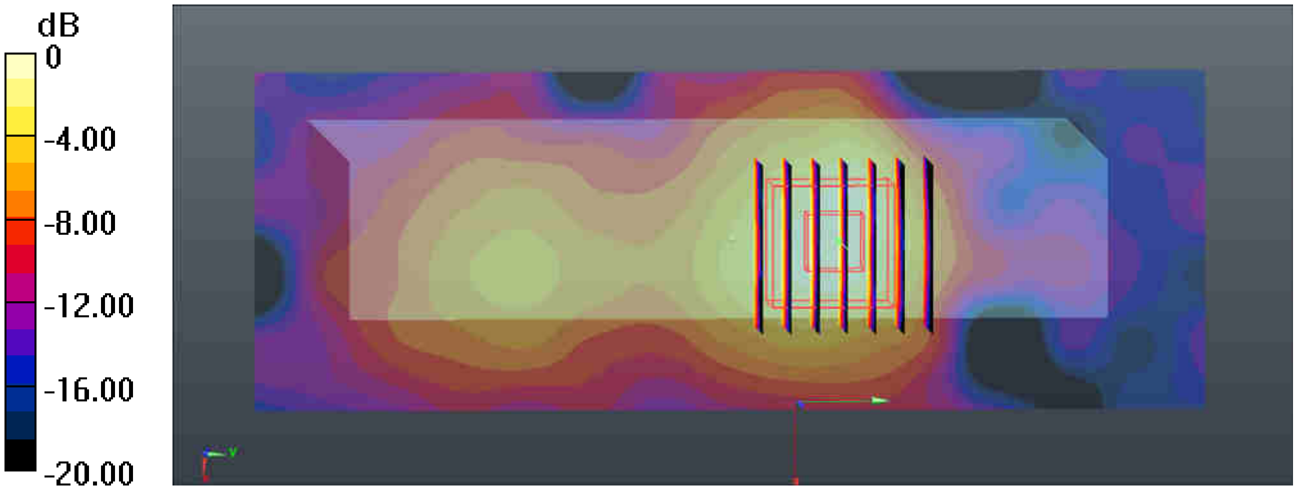
#10-1_WLAN2.4GHz_802.11n-HT20_Right Side_10mm_Ch6_Ant0+1

Communication System: UID 0, WIFI (0); Frequency: 2437 MHz;Duty Cycle: 1:1.075
Medium: MSL_2450_160227 Medium parameters used: f = 2437 MHz; σ = 1.924 S/m; ε_r = 51.037; ρ = 1000 kg/m^3
Ambient Temperature：23.5 ℃; Liquid Temperature：22.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(7.29, 7.29, 7.29); Calibrated: 2015.5.28;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2015.5.21
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch6/Area Scan (51x141x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0637 W/kg

Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.260 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 0.0830 W/kg
SAR(1 g) = 0.042 W/kg; SAR(10 g) = 0.020 W/kg
Maximum value of SAR (measured) = 0.0622 W/kg



0 dB = 0.0622 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2016.3.3

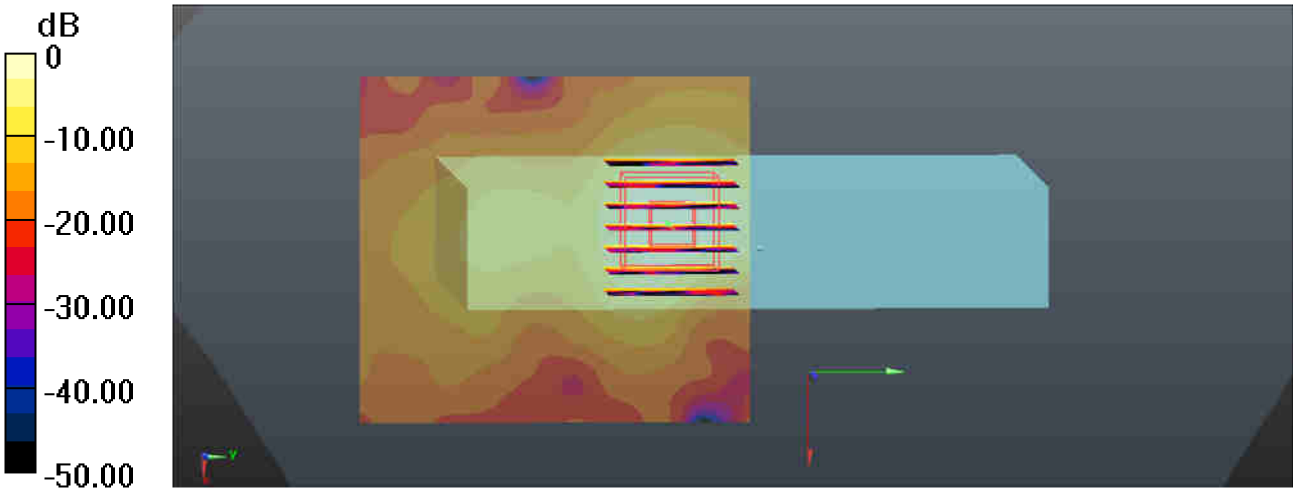
#11-1_WLAN 5GHz_Band1 802.11n-HT20_MCS0_Left Side_10mm_Ant 1_Ch48

Communication System: UID 0, WIFI (0); Frequency: 5240 MHz;Duty Cycle: 1:1.076
Medium: MSL_5000_160303 Medium parameters used: f = 5240 MHz; σ = 5.363 S/m; ε_r = 49.129; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(4.25, 4.25, 4.25); Calibrated: 2015.11.27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch48/Area Scan (81x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.728 W/kg

Ch48/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.934 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.368 W/kg; SAR(10 g) = 0.122 W/kg
Maximum value of SAR (measured) = 0.715 W/kg



0 dB = 0.715 W/kg = -1.46 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.3.3

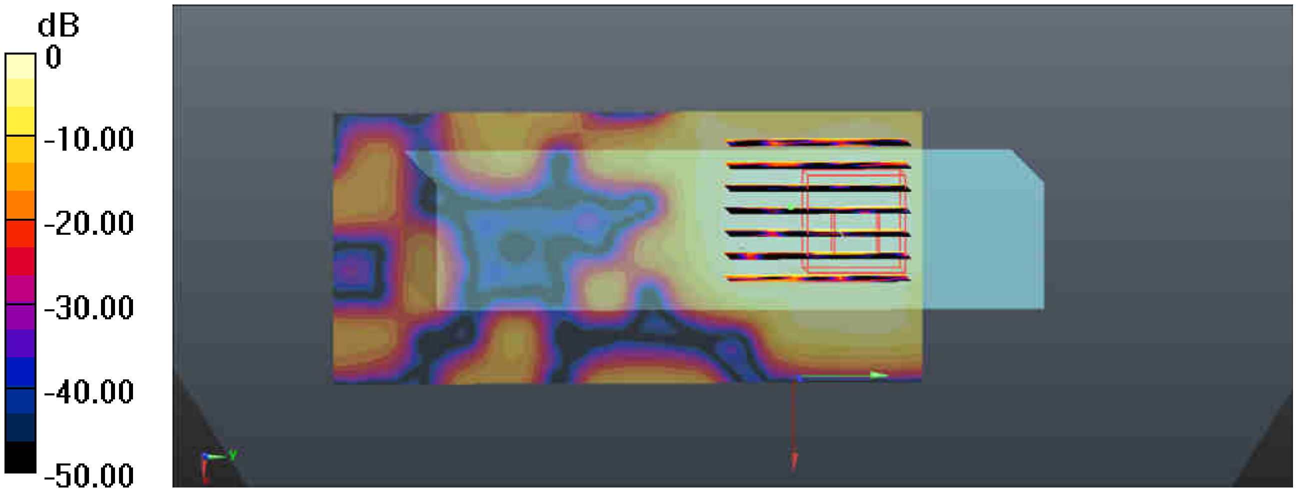
#12-1_WLAN 5GHz_Band1 802.11n-HT20_MCS0_Right Side_10mm_Ant 2_Ch36

Communication System: UID 0, WIFI (0); Frequency: 5180 MHz;Duty Cycle: 1:1.074
Medium: MSL_5000_160303 Medium parameters used: f = 5180 MHz; σ = 5.268 S/m; ε_r = 49.23; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(4.25, 4.25, 4.25); Calibrated: 2015.11.27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch36/Area Scan (61x131x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.170 W/kg

Ch36/Zoom Scan (7x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.607 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.451 W/kg
SAR(1 g) = 0.081 W/kg; SAR(10 g) = 0.026 W/kg
Maximum value of SAR (measured) = 0.183 W/kg



0 dB = 0.183 W/kg = -7.38 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab   Date: 2016.3.3

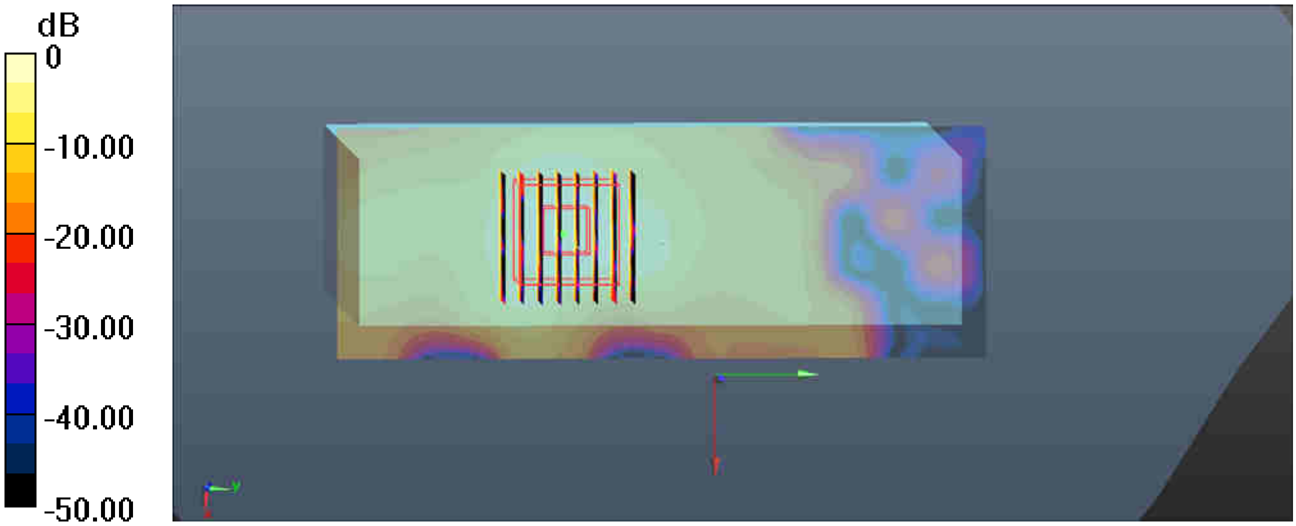
#13-1_WLAN5GHz_Band1 802.11n-HT20 MSC0_Left Side_10mm_Ch48_Ant1+2

Communication System: UID 0, WIFI (0); Frequency: 5240 MHz;Duty Cycle: 1:1.075
Medium: MSL5000_160303 Medium parameters used: f = 5240 MHz; σ = 5.363 S/m; ε_r = 49.129; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(4.25, 4.25, 4.25); Calibrated: 2015.11.27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch48/Area Scan (51x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.675 W/kg

Ch48/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 3.945 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.288 W/kg; SAR(10 g) = 0.093 W/kg
Maximum value of SAR (measured) = 0.659 W/kg



0 dB = 0.659 W/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab　　　　　Date: 2016.3.3

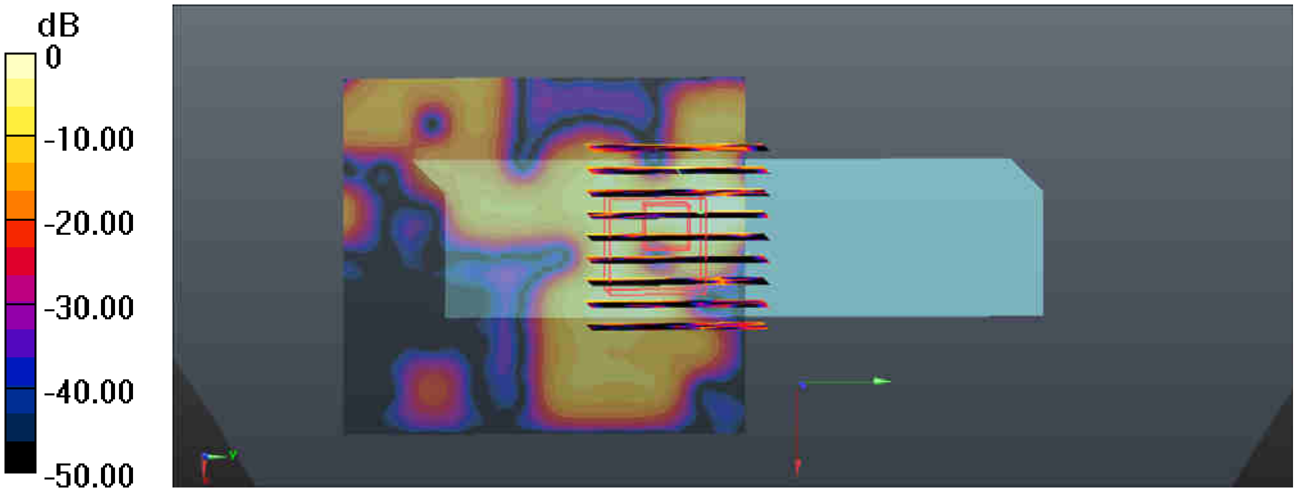
#14-1_WLAN 5GHz_Band4 802.11n-HT20_MCS0_Left Side_10mm_Ant 1_Ch165

Communication System: UID 0, WIFI (0); Frequency: 5825 MHz;Duty Cycle: 1:1.075
Medium: MSL_5800_160303 Medium parameters used: f = 5825 MHz; σ = 6.166 S/m; ε_r = 47.679; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(3.77, 3.77, 3.77); Calibrated: 2015.11.27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch165/Area Scan (81x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.288 W/kg

Ch165/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.941 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.278 W/kg
SAR(1 g) = 0.043 W/kg; SAR(10 g) = 0.015 W/kg
Maximum value of SAR (measured) = 0.205 W/kg



0 dB = 0.205 W/kg = -6.88 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2016.3.3

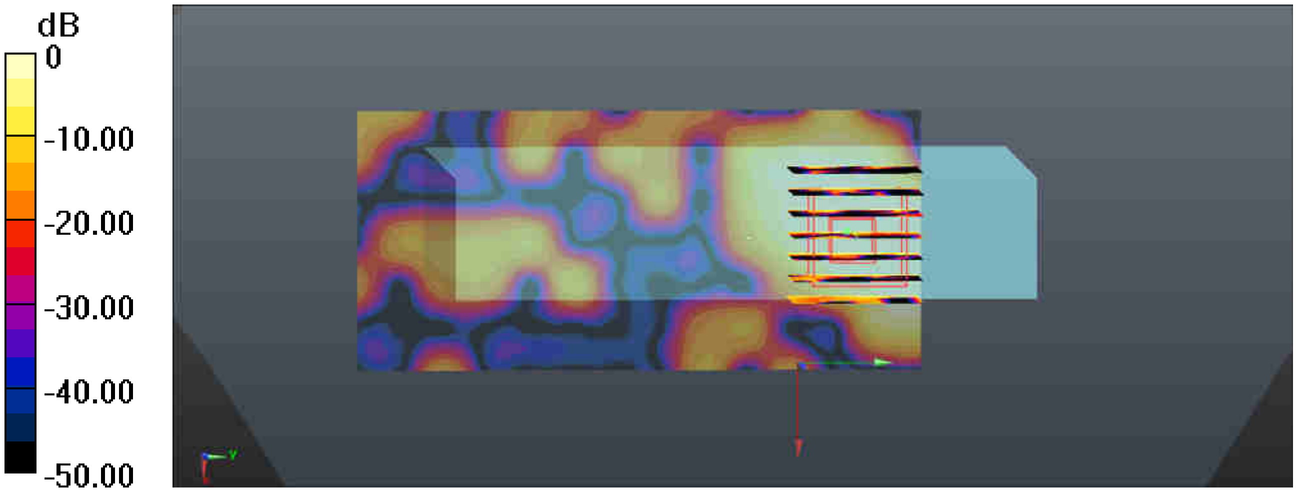
#15-1_WLAN 5GHz_Band4 802.11n-HT20_MCS0_Right Side_10mm_Ant 2_Ch165

Communication System: UID 0, WIFI (0); Frequency: 5825 MHz;Duty Cycle: 1:1.08
Medium: MSL_5800_160303 Medium parameters used: f = 5825 MHz; σ = 6.166 S/m; ε_r = 47.679; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(3.77, 3.77, 3.77); Calibrated: 2015.11.27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch165/Area Scan (61x131x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.133 W/kg

Ch165/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.089 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.382 W/kg
SAR(1 g) = 0.055 W/kg; SAR(10 g) = 0.00909 W/kg
Maximum value of SAR (measured) = 0.129 W/kg



0 dB = 0.129 W/kg = -8.89 dBW/kg

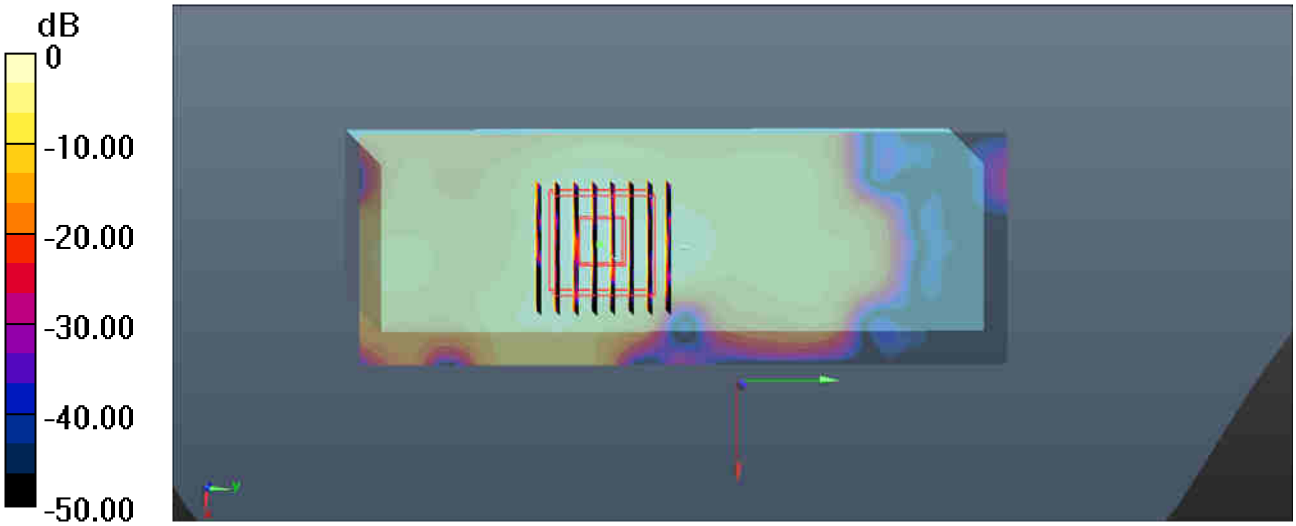
#16-1_WLAN5GHz_Band1 802.11n-HT20 MSC0_Left Side_10mm_Ch149_Ant1+2

Communication System: UID 0, WIFI (0); Frequency: 5745 MHz;Duty Cycle: 1:1.075
Medium: MSL5000_160303 Medium parameters used: f = 5745 MHz; σ = 6.065 S/m; ε_r = 47.996; ρ = 1000 kg/m^3
Ambient Temperature：23.6 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3954; ConvF(3.77, 3.77, 3.77); Calibrated: 2015.11.27;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1279; Calibrated: 2015.7.21
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

Ch149/Area Scan (51x141x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.345 W/kg

Ch149/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 2.787 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.534 W/kg
SAR(1 g) = 0.134 W/kg; SAR(10 g) = 0.040 W/kg
Maximum value of SAR (measured) = 0.330 W/kg



0 dB = 0.330 W/kg

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **Sporton-TW (Auden)**

Certificate No: D750V3-1012_May14

CALIBRATION CERTIFICATE

Object	D750V3 - SN: 1012
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	May 16, 2014

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)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-13 (No. ES3-3205_Dec13)	Dec-14
DAE4	SN: 601	30-Apr-14 (No. DAE4-601_Apr14)	Apr-15

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 20, 2014

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,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 300 MHz to 3 GHz)", February 2005
c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) 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%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
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	40.4 ± 6 %	0.92 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.12 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.30 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	56.8 ± 6 %	1.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.22 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.65 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.45 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.68 W/kg ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.1 Ω + 0.8 jΩ
Return Loss	- 28.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.2 Ω - 1.9 jΩ
Return Loss	- 31.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.035 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
Manufactured on	September 29, 2009

DASY5 Validation Report for Head TSL

Date: 16.05.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1012

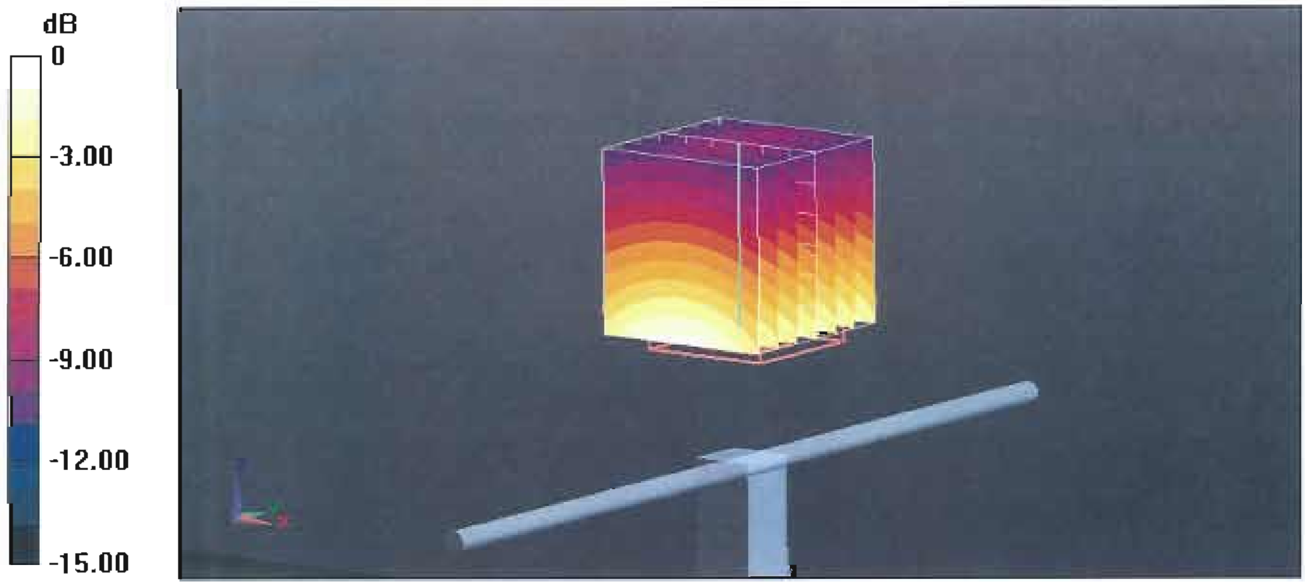
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.92 S/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.37, 6.37, 6.37); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

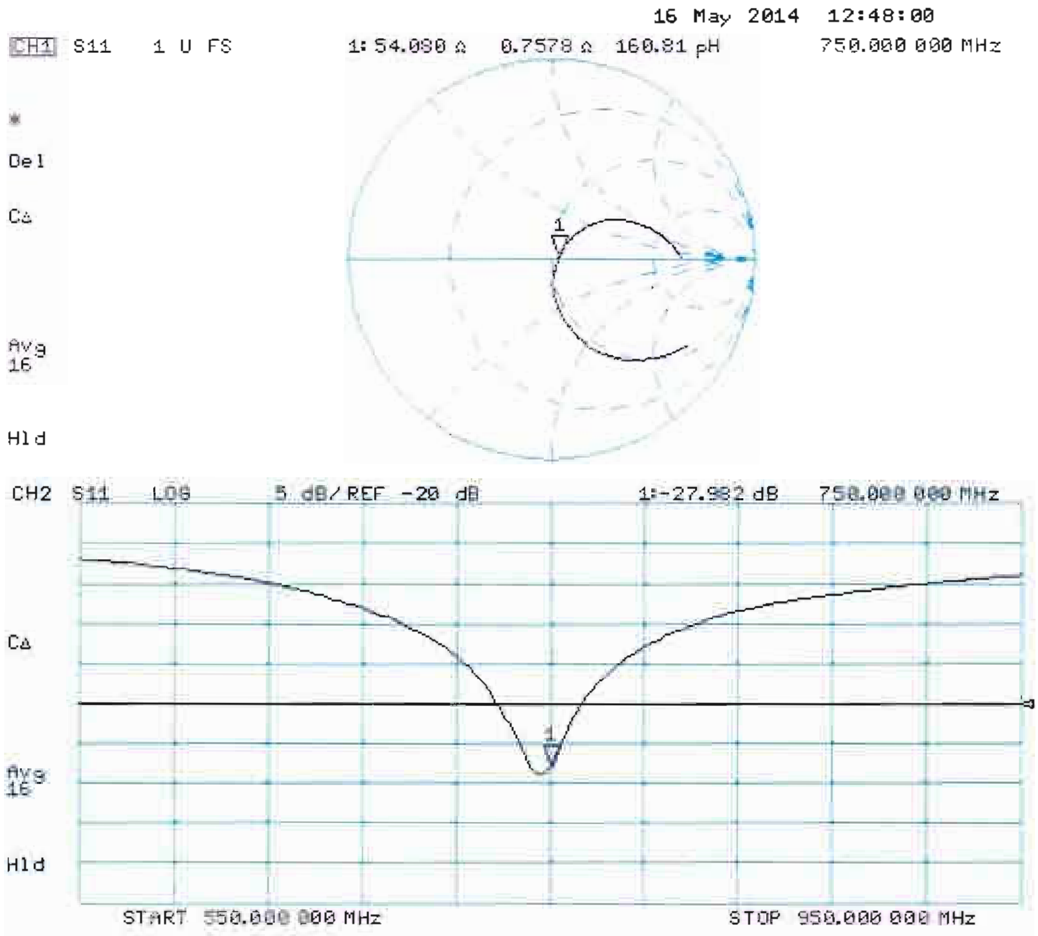
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.52 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.18 W/kg
SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.36 W/kg
Maximum value of SAR (measured) = 2.46 W/kg



0 dB = 2.46 W/kg = 3.91 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 15.05.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1012

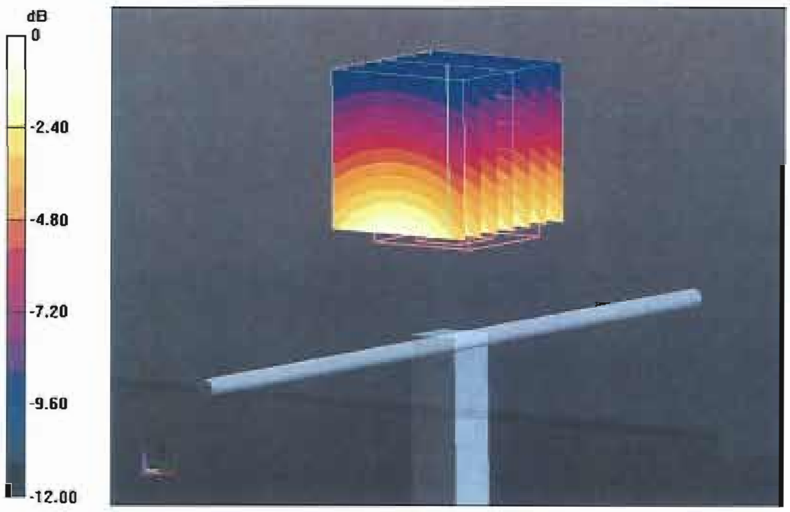
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 1 S/m; ε_r = 56.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.13, 6.13, 6.13); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.04.2014
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

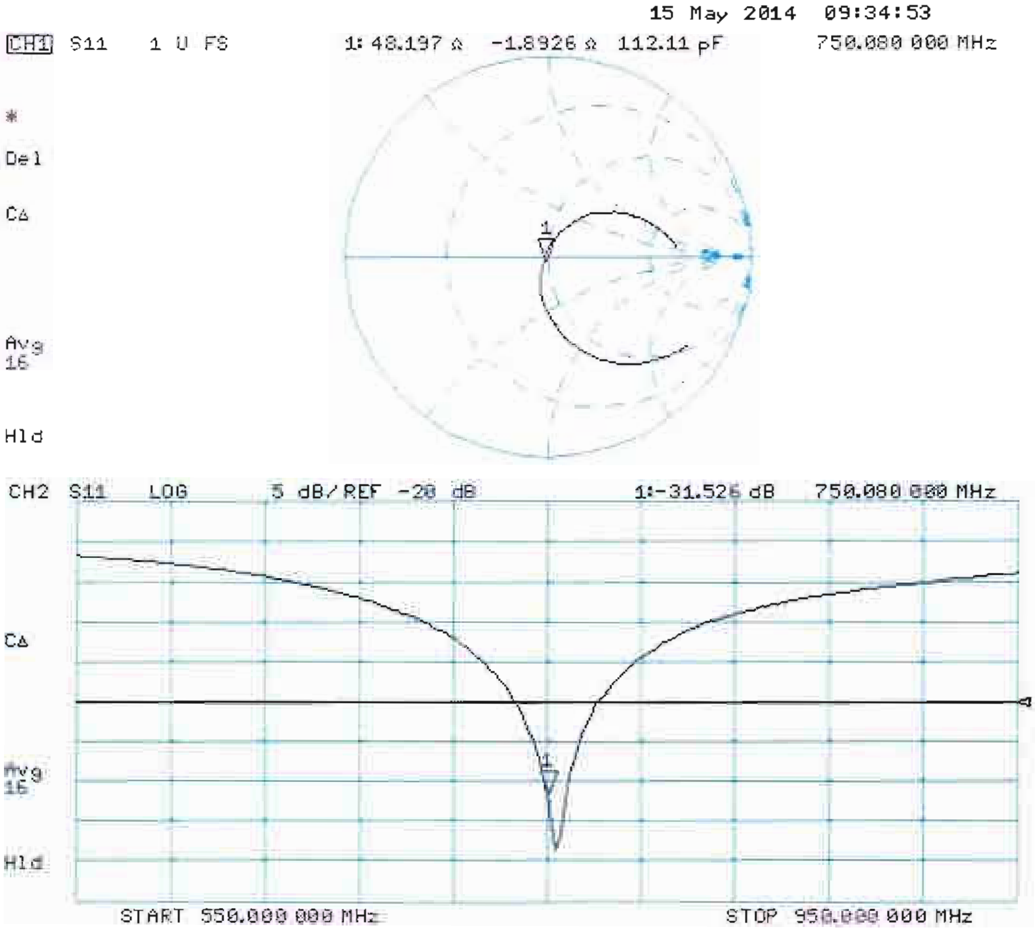
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.79 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.30 W/kg
SAR(1 g) = 2.22 W/kg; SAR(10 g) = 1.45 W/kg
Maximum value of SAR (measured) = 2.60 W/kg



0 dB = 2.60 W/kg = 4.15 dBW/kg

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S **Schweizerischer Kalibrierdienst**
C **Service suisse d'étalonnage**
S **Servizio svizzero di taratura**
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client **Sporton-KS (Auden)**

Certificate No: D750V3-1065_Nov15

CALIBRATION CERTIFICATE

Object	D750V3 - SN: 1065
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	November 24, 2015

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)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	07-Oct-15 (No. 217-02222)	Oct-16
Power sensor HP 8481A	US37292783	07-Oct-15 (No. 217-02222)	Oct-16
Power sensor HP 8481A	MY41092317	07-Oct-15 (No. 217-02223)	Oct-16
Reference 20 dB Attenuator	SN: 5058 (20k)	01-Apr-15 (No. 217-02131)	Mar-16
Type-N mismatch combination	SN: 5047.2 / 06327	01-Apr-15 (No. 217-02134)	Mar-16
Reference Probe EX3DV4	SN: 7349	30-Dec-14 (No. EX3-7349_Dec14)	Dec-15
DAE4	SN: 601	17-Aug-15 (No. DAE4-601_Aug15)	Aug-16

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100972	15-Jun-15 (in house check Jun-15)	In house check: Jun-18
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-15)	In house check: Oct-16

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: November 24, 2015

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,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 300 MHz to 3 GHz)", February 2005
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "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%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
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	42.8 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.07 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**8.25 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.38 W/kg ± 16.5 % (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	55.9 ± 6 %	0.97 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.23 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**8.86 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.48 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**5.89 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.4 Ω - 2.1 jΩ
Return Loss	- 28.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.1 Ω - 3.9 jΩ
Return Loss	- 27.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.032 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
Manufactured on	May 10, 2012

DASY5 Validation Report for Head TSL

Date: 24.11.2015

Test Laboratory: SPEAG, Zurich, Switzerland

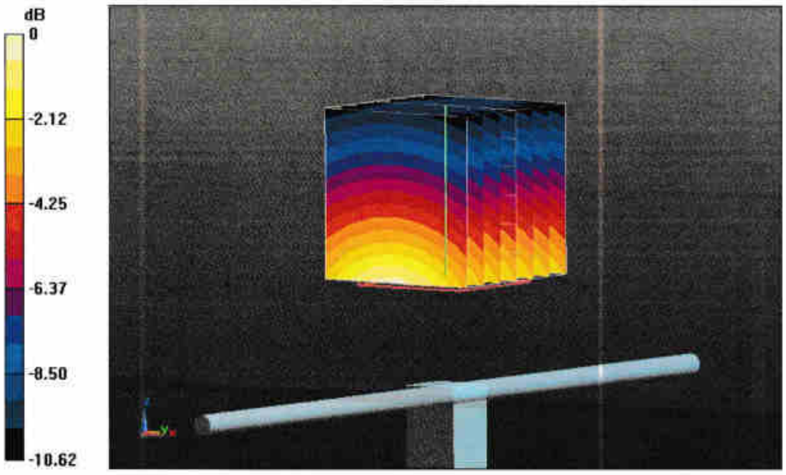
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1065

Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; $\sigma = 0.9$ S/m; $\varepsilon_r = 42.8$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

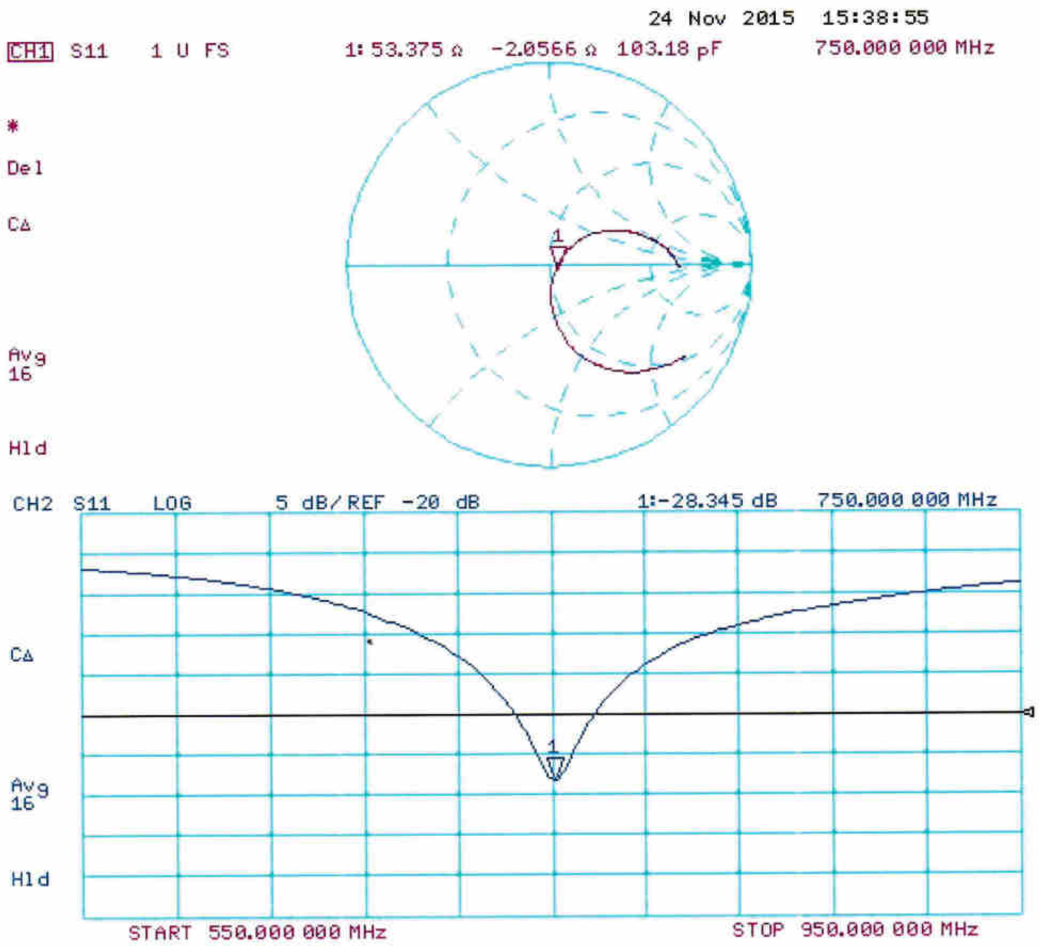
- Probe: EX3DV4 - SN7349; ConvF(10.1, 10.1, 10.1); Calibrated: 30.12.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 17.08.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.14 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.09 W/kg
SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.35 W/kg
Maximum value of SAR (measured) = 2.74 W/kg



0 dB = 2.74 W/kg = 4.38 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 24.11.2015

Test Laboratory: SPEAG, Zurich, Switzerland

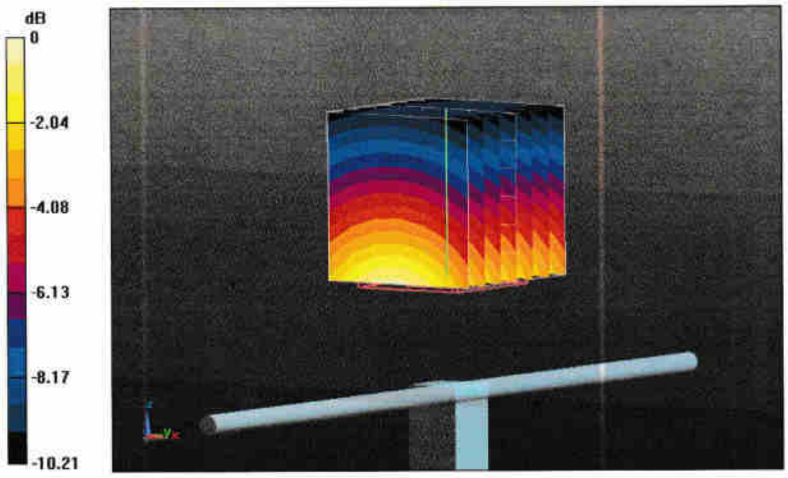
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1065

Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.97 S/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

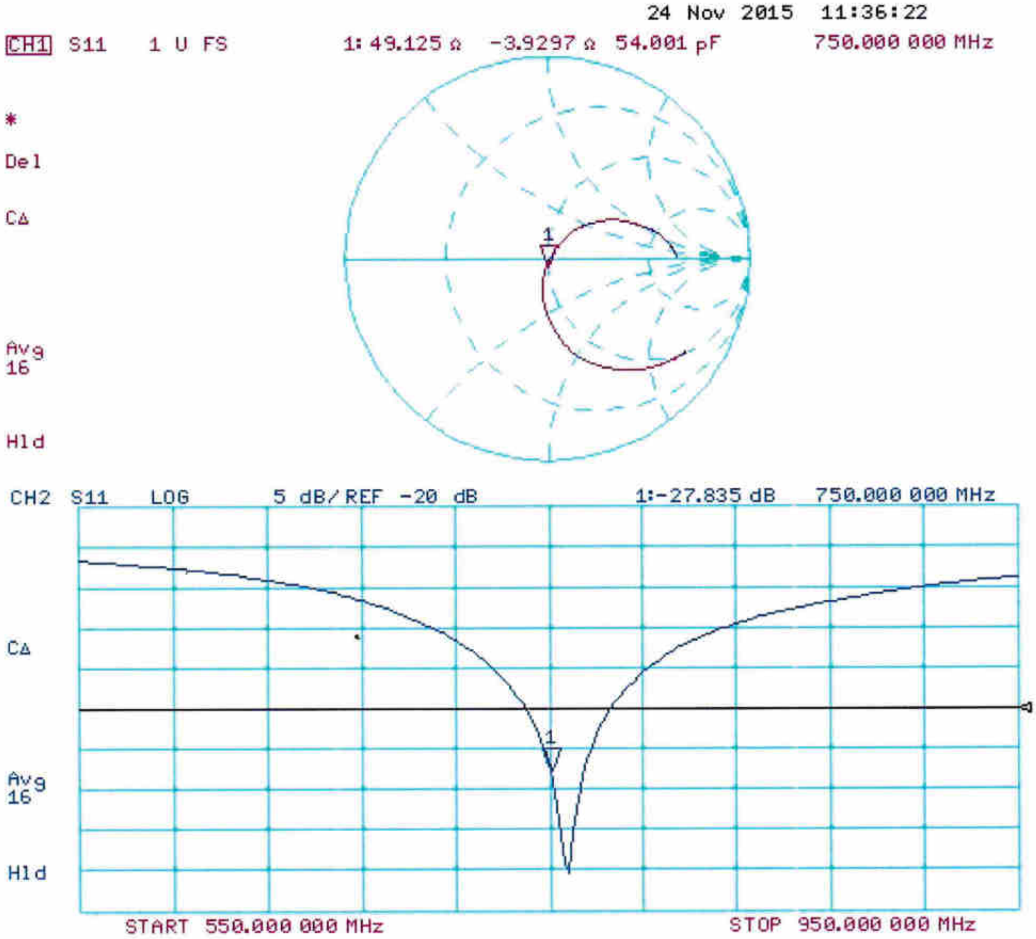
- Probe: EX3DV4 - SN7349; ConvF(9.61, 9.61, 9.61); Calibrated: 30.12.2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 17.08.2015
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.13 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.29 W/kg
SAR(1 g) = 2.23 W/kg; SAR(10 g) = 1.48 W/kg
Maximum value of SAR (measured) = 2.94 W/kg



0 dB = 2.94 W/kg = 4.68 dBW/kg

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Sporton-TW (Auden)**

Certificate No: **D835V2-499_Mar14**

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 499
Calibration procedure(s)	QA CAL-05.v9 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	March 24, 2014

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)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	US37292783	09-Oct-13 (No. 217-01827)	Oct-14
Power sensor HP 8481A	MY41092317	09-Oct-13 (No. 217-01828)	Oct-14
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-13 (No. 217-01736)	Apr-14
Type-N mismatch combination	SN: 5047.3 / 06327	04-Apr-13 (No. 217-01739)	Apr-14
Reference Probe ES3DV3	SN: 3205	30-Dec-13 (No. ES3-3205_Dec13)	Dec-14
DAE4	SN: 601	25-Apr-13 (No. DAE4-601_Apr13)	Apr-14

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	[signature]
Approved by:	Katja Pokovic	Technical Manager	[signature]

Issued: March 24, 2014

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,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 300 MHz to 3 GHz)", February 2005
c) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

d) 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%.

Measurement Conditions

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

DASY Version	DASY5	V52.8.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.5 ± 6 %	0.94 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.13 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.53 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**5.94 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.0 ± 6 %	1.01 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.44 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.46 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.58 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.17 W/kg ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.7 Ω - 2.8 jΩ
Return Loss	- 28.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.2 Ω - 5.6 jΩ
Return Loss	- 23.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.391 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
Manufactured on	July 10, 2003

DASY5 Validation Report for Head TSL

Date: 24.03.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 499

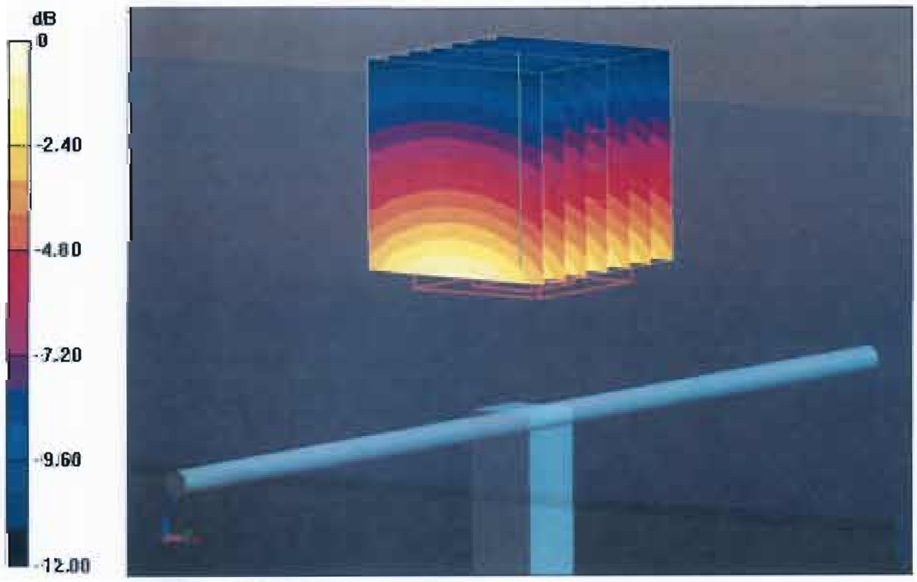
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; $\sigma = 0.94$ S/m; $\varepsilon_r = 40.5$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.22, 6.22, 6.22); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

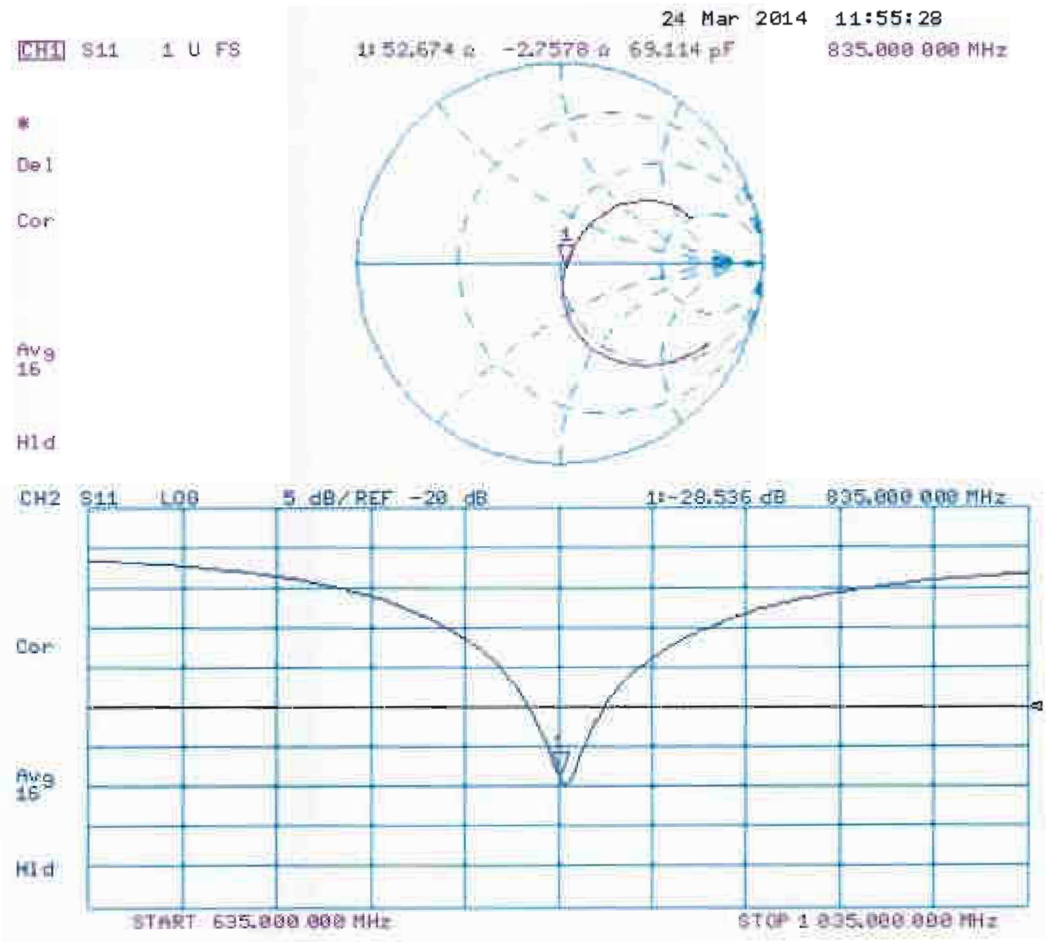
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.333 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 3.60 W/kg
SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.53 W/kg
Maximum value of SAR (measured) = 2.80 W/kg



0 dB = 2.80 W/kg = 4.47 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 24.03.2014

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 499

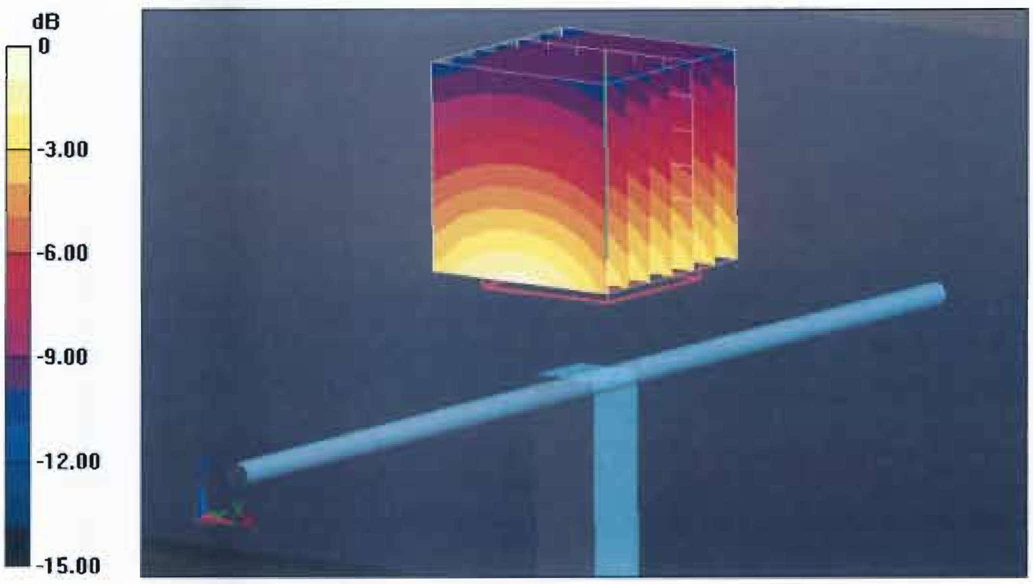
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.01 S/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.09, 6.09, 6.09); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 25.04.2013
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.7(1137); SEMCAD X 14.6.10(7164)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.909 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.65 W/kg
SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.58 W/kg
Maximum value of SAR (measured) = 2.86 W/kg



0 dB = 2.86 W/kg = 4.56 dBW/kg

Impedance Measurement Plot for Body TSL