FCC SAR Test Report

Report No.	:	**SA111130C18**
Applicant	:	**HTC Corporation**
Address	:	**23,Xinghua Rd.,Taoyuan 330,Taiwan,R.O.C.**
Product	:	**Smart Phone**
FCC ID	:	**NM8PJ83100**
Brand	:	**HTC**
Model No.	:	**PJ83100**
Standards	:	**FCC 47 CFR Part 2 (2.1093) / IEEE C95.1:1991 / IEEE 1528:2003** **FCC OET Bulletin 65 Supplement C (Edition 01-01)** **KDB 248227 D01 v01r02 / KDB 648474 D01 v01r05 / KDB 941225 D01 v02** **KDB 941225 D03 v01 / KDB 941225 D05 v01 / KDB 941225 D06 v01**
Date of Testing	:	**Dec. 19, 2011 ~ Jan. 16, 2012**

CERTIFICATION: The above equipment have been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch - Taiwan HwaYa Lab**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's SAR characteristics under the conditions specified in this report.

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Release Control Record

Issue No.	Reason for Change	Date Issued
R01	Original release	Jan. 17, 2012

1. Summary of Maximum SAR Value

Mode / Band	Test Position	SAR-1g (W/kg)
GSM850	Head	0.613
	Body (Hotspot, 1 cm Gap)	1.15
	Body (Body Worn, 1 cm Gap)	1.15
GSM1900	Head	0.57
	Body (Hotspot, 1 cm Gap)	1.29
	Body (Body Worn, 1 cm Gap)	0.757
WCDMA Band II	Head	0.491
	Body (Hotspot, 1 cm Gap)	1.07
	Body (Body Worn, 1 cm Gap)	0.818
WCDMA Band V	Head	0.473
	Body (Hotspot, 1 cm Gap)	0.892
	Body (Body Worn, 1 cm Gap)	0.892
WLAN 2.4GHz	Head	0.234
	Body (Hotspot, 1 cm Gap)	0.178
	Body (Body Worn, 1 cm Gap)	0.178
WLAN 5GHz	Head	0.169
	Body (Hotspot, 1 cm Gap)	0.245
	Body (Body Worn, 1 cm Gap)	0.202
LTE Band 4	Head	0.599
	Body (Hotspot, 1 cm Gap)	1.06
	Body (Body Worn, 1 cm Gap)	1.06
LTE Band 17	Head	0.424
	Body (Hotspot, 1 cm Gap)	0.178
	Body (Body Worn, 1 cm Gap)	0.178
Bluetooth	Head	N/A
	Body (Hotspot, 1 cm Gap)	N/A
	Body (Body Worn, 1 cm Gap)	N/A

Note:

The SAR limit **(1.6 W/kg)** for general population/uncontrolled exposure is specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1991.

2. Description of Equipment Under Test

DUT Type	Smart Phone
FCC ID	NM8PJ83100
Brand Name	HTC
Model Name	PJ83100
Tx Frequency Bands (Unit: MHz)	GSM850 : 824 ~ 849 GSM1900 : 1850 ~ 1910 WCDMA Band II : 1850 ~ 1910 WCDMA Band V : 824 ~ 849 WLAN : 2400 ~ 2483.5, 5150 ~ 5350, 5470 ~ 5725, 5725 ~ 5825 Bluetooth : 2400 ~ 2483.5 LTE Band 4 : 1710 ~ 1755 LTE Band 17 : 704 ~ 716
Uplink Modulations	GSM & GPRS : GMSK EDGE : 8PSK WCDMA : QPSK 802.11b : DSSS 802.11a/g/n : OFDM Bluetooth : GFSK LTE : QPSK, 16QAM
LTE Supports Channel Bandwidth	LTE Band 4 : 5 MHz, 10 MHz LTE Band 17 : 5 MHz, 10 MHz
Maximum AVG Conducted Power (Unit: dBm)	GSM850 : 33.36 GSM1900 : 30.61 WCDMA Band II : 23.26 WCDMA Band V : 23.55 802.11b : 18.23 802.11g : 12.60 802.11n HT20 (2.4GHz) : 12.21 802.11a : 13.45 802.11n HT20 (5GHz) : 10.49 802.11n HT40 (5GHz) : 10.41 Bluetooth : 8.61 LTE Band 4 : 23.46 LTE Band 17 : 23.19
Antenna Type	Fixed Internal Antenna
DUT Stage	Production Unit

Note:

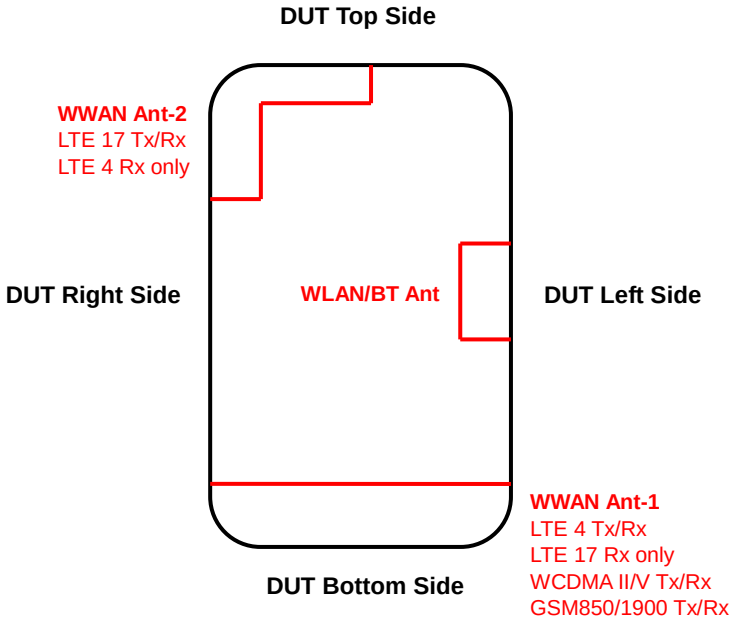
1. The above EUT information is declared by manufacturer and for more detailed features description please refers to the manufacturer's specifications or User's Manual.

This device has two WWAN antennas and one WLAN/BT antenna design. The capabilities of antenna are shown as below. The EUT adopts so-called Circuit Switch Fallback (CSFB) approach. The definition of CSFB is when using LTE to download data and a voice call coming, this scenario (CSFB) will drop the LTE connection then switching link to voice path (GSM) smoothly. In other words, it is impossible to transmit simultaneously under GSM/WCDMA and LTE network at the same time. Since only one WWAN wireless technology can be used at the same time, LTE band 17 cannot transmit simultaneously with GSM850/1900, WCDMA Band V/II and LTE band 4. The details please refer to the operational description document.

The simultaneous transmission possibilities are listed as below.

Simultaneous Tx Combination	Configuration	Head (Voice / VoIP)	Body Worn (Voice / VoIP)	Hotspot (Data)
1	GSM850 (GSM/GPRS/EDGE) + WLAN/BT	V	V	V
2	GSM1900 (GSM/GPRS/EDGE) + WLAN/BT	V	V	V
3	WCDMA Band V (Voice/Data) + WLAN/BT	V	V	V
4	WCDMA Band II (Voice/Data) + WLAN/BT	V	V	V
5	LTE Band 4 (Data) + WLAN/BT	V	V	V
6	LTE Band 17 (Data) + WLAN/BT	V	V	V

<Antenna Capabilities>



WWAN Ant-1 to WLAN/BT : 4.38 cm
WWAN Ant-2 to WLAN/BT : 4.18 cm
WWAN Ant-1 to WWAN Ant-2 : 9.86 cm

This device supports WiFi hotspot function, so body SAR was tested under 1 cm for the surfaces / slide edges where a transmitting antenna is within 2.5 cm from the edge. Since the SAR is required for antenna located within 25 mm from edge, SAR testing for each antenna is listed as below.

WWAN Ant-1 : Front Face, Rear Face, Left Side, Right Side, Bottom Side
WWAN Ant-2 : Front Face, Rear Face, Right Side, Top Side
WLAN : Front Face, Rear Face, Left Side

Confirming the LTE transmitter follows 3GPP standards, is category 3, BW 5MHz and 10MHz, band 4 and 17, and supports QPSK / 16QAM modulations. Tested per 3GPP 36.521 maximum transmit procedures for both QPSK / 16QAM.

LTE Maximum Power Reduction in accordance with 3GPP 36.101: Power Reduction in accordance to 3GPP is active all times during LTE operation.

Modulation	Channel bandwidth / Transmission bandwidth configuration (RB)		3GPP Requirement (dB)	MPR Setting (dB)
	BW 5 MHz	BW 10 MHz		
QPSK	> 8	> 12	<= 1	1
16QAM	<= 8	<= 12	<= 1	1
16QAM	> 8	> 12	<= 2	2

Note: MPR is according to the standard and implemented in the circuit (mandatory).

In addition, the device is compliant with A-MPR requirements defined in 36.101 section 6.2.4 that may be required to meet 3GPP Adjacent Channel Leakage Ratio (“ACLR”) requirements. A-MPR was disabled for all FCC compliance testing. SAR measurements were tested under power level for GSM, GPRS, EDGE, WCDMA, HSDPA, HSUPA and LTE technologies.

3. SAR Measurement System

3.1 Definition of Specific Absorption Rate (SAR)

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.

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)
SAR measurement can be related to the electrical field in the tissue by

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

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

3.2 SPEAG DASY System

DASY system consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY4/5 software defined. The DASY software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.

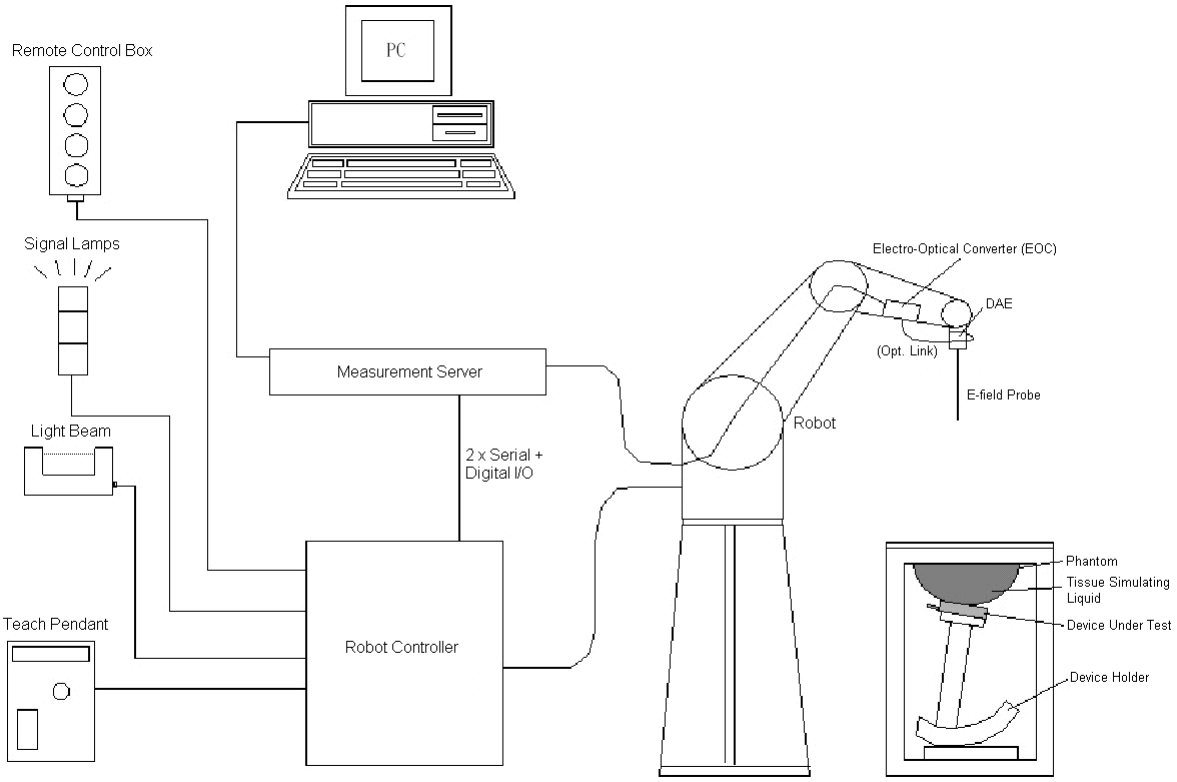


Fig-3.1 DASY System Setup

3.2.1 Robot

The DASY system uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY4: CS7MB; DASY5: CS8c) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ±0.035 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

Fig-3.2 DASY4

Fig-3.3 DASY5

3.2.2 Probes

The SAR measurement is conducted with the dosimetric probe. 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.

Model	EX3DV4	
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 µW/g to 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	

Model	ES3DV3	
Construction	Symmetrical design with triangular core. Interleaved sensors. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 4 GHz Linearity: ± 0.2 dB	
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	5 µW/g to 100 mW/g Linearity: ± 0.2 dB	
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm	

3.2.3 Data Acquisition Electronics (DAE)

Model	DAE3, DAE4	
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.	
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV, 400mV)	
Input Offset Voltage	< 5µV (with auto zero)	
Input Bias Current	< 50 fA	
Dimensions	60 x 60 x 68 mm	

3.2.4 Phantoms

Model	Twin SAM	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	approx. 25 liters	

Model	ELI	
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	

3.2.5 Device Holder

Model	Mounting Device	
Construction	In combination with the Twin SAM Phantom or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).	
Material	POM	

Model	Laptop Extensions Kit	
Construction	Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner.	
Material	POM, Acrylic glass, Foam	

3.2.6 System Validation Dipoles

Model	D-Serial	
Construction	Symmetrical dipole with l/4 balun. Enables measurement of feed point impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.	
Frequency	750 MHz to 5800 MHz	
Return Loss	> 20 dB	
Power Capability	> 100 W (f < 1GHz), > 40 W (f > 1GHz)	

3.2.7 Tissue Simulating Liquids

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in below table.

The dielectric properties of the tissue simulating liquids were verified prior to the SAR evaluation using an Agilent 85070D Dielectric Probe Kit and an Agilent Network Analyzer.

Table-3.1 Targets of Tissue Simulating Liquid

Frequency (MHz)	Target Permittivity	Range of ±5%	Target Conductivity	Range of ±5%
For Head				
750	41.9	39.8 ~ 44.0	0.89	0.85 ~ 0.93
835	41.5	39.4 ~ 43.6	0.90	0.86 ~ 0.95
900	41.5	39.4 ~ 43.6	0.97	0.92 ~ 1.02
1450	40.5	38.5 ~ 42.5	1.20	1.14 ~ 1.26
1640	40.3	38.3 ~ 42.3	1.29	1.23 ~ 1.35
1750	40.1	38.1 ~ 42.1	1.37	1.30 ~ 1.44
1800	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
1900	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2000	40.0	38.0 ~ 42.0	1.40	1.33 ~ 1.47
2300	39.5	37.5 ~ 41.5	1.67	1.59 ~ 1.75
2450	39.2	37.2 ~ 41.2	1.80	1.71 ~ 1.89
2600	39.0	37.1 ~ 41.0	1.96	1.86 ~ 2.06
3500	37.9	36.0 ~ 39.8	2.91	2.76 ~ 3.06
5200	36.0	34.2 ~ 37.8	4.66	4.43 ~ 4.89
5300	35.9	34.1 ~ 37.7	4.76	4.52 ~ 5.00
5500	35.6	33.8 ~ 37.4	4.96	4.71 ~ 5.21
5600	35.5	33.7 ~ 37.3	5.07	4.82 ~ 5.32
5800	35.3	33.5 ~ 37.1	5.27	5.01 ~ 5.53
For Body				
750	55.5	52.7 ~ 58.3	0.96	0.91 ~ 1.01
835	55.2	52.4 ~ 58.0	0.97	0.92 ~ 1.02
900	55.0	52.3 ~ 57.8	1.05	1.00 ~ 1.10
1450	54.0	51.3 ~ 56.7	1.30	1.24 ~ 1.37
1640	53.8	51.1 ~ 56.5	1.40	1.33 ~ 1.47
1750	53.4	50.7 ~ 56.1	1.49	1.42 ~ 1.56
1800	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
1900	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2000	53.3	50.6 ~ 56.0	1.52	1.44 ~ 1.60
2300	52.9	50.3 ~ 55.5	1.81	1.72 ~ 1.90
2450	52.7	50.1 ~ 55.3	1.95	1.85 ~ 2.05
2600	52.5	49.9 ~ 55.1	2.16	2.05 ~ 2.27
3500	51.3	48.7 ~ 53.9	3.31	3.14 ~ 3.48
5200	49.0	46.6 ~ 51.5	5.30	5.04 ~ 5.57
5300	48.9	46.5 ~ 51.3	5.42	5.15 ~ 5.69
5500	48.6	46.2 ~ 51.0	5.65	5.37 ~ 5.93
5600	48.5	46.1 ~ 50.9	5.77	5.48 ~ 6.06
5800	48.2	45.8 ~ 50.6	6.00	5.70 ~ 6.30

The following table gives the recipes for tissue simulating liquids.

Table-3.2 Recipes of Tissue Simulating Liquid

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	0.2	-	0.2	1.5	56.0	-	42.1	-
H835	0.2	-	0.2	1.5	57.0	-	41.1	-
H900	0.2	-	0.2	1.4	58.0	-	40.2	-
H1450	-	43.3	-	0.6	-	-	56.1	-
H1640	-	45.8	-	0.5	-	-	53.7	-
H1750	-	47.0	-	0.4	-	-	52.6	-
H1800	-	44.5	-	0.3	-	-	55.2	-
H1900	-	44.5	-	0.2	-	-	55.3	-
H2000	-	44.5	-	0.1	-	-	55.4	-
H2300	-	44.9	-	0.1	-	-	55.0	-
H2450	-	45.0	-	0.1	-	-	54.9	-
H2600	-	45.1	-	0.1	-	-	54.8	-
H3500	-	8.0	-	0.2	-	20.0	71.8	-
H5G	-	-	-	-	-	17.2	65.5	17.3
B750	0.2	-	0.2	0.8	48.8	-	50.0	-
B835	0.2	-	0.2	0.9	48.5	-	50.2	-
B900	0.2	-	0.2	0.9	48.2	-	50.5	-
B1450	-	34.0	-	0.3	-	-	65.7	-
B1640	-	32.5	-	0.3	-	-	67.2	-
B1750	-	31.0	-	0.2	-	-	68.8	-
B1800	-	29.5	-	0.4	-	-	70.1	-
B1900	-	29.5	-	0.3	-	-	70.2	-
B2000	-	30.0	-	0.2	-	-	69.8	-
B2300	-	31.0	-	0.1	-	-	68.9	-
B2450	-	31.4	-	0.1	-	-	68.5	-
B2600	-	31.8	-	0.1	-	-	68.1	-
B3500	-	28.8	-	0.1	-	-	71.1	-
B5G	-	-	-	-	-	10.7	78.6	10.7

3.3 SAR System Verification

The system check verifies that the system operates within its specifications. It is performed daily or before every SAR measurement. The system check uses normal SAR measurements in the flat section of the phantom with a matched dipole at a specified distance. The system verification setup is shown as below.

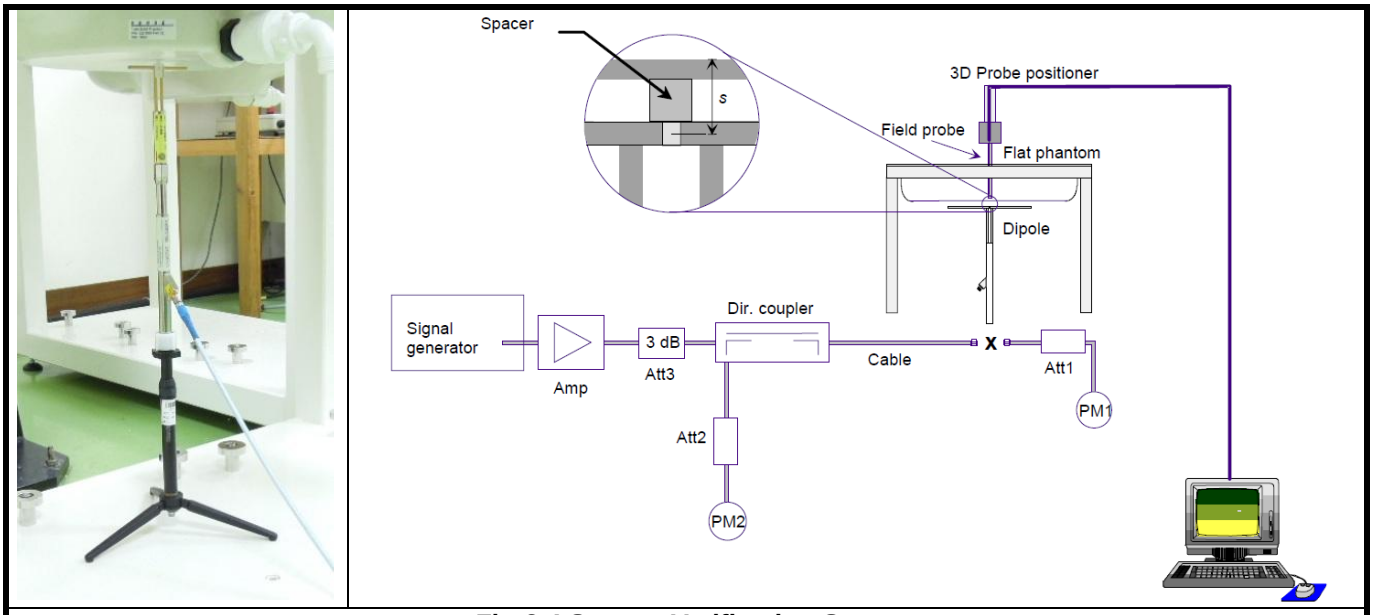


Fig-3.4 System Verification Setup

The validation dipole is placed beneath the flat phantom with the specific spacer in place. The distance spacer is touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The power meter PM1 measures the forward power at the location of the system check dipole connector. The signal generator is adjusted for the desired forward power (250 mW is used for 700 MHz to 3 GHz, 100 mW is used for 3.5 GHz to 6 GHz) at the dipole connector and the power meter PM2 is read at that level. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2.

After system check testing, the SAR result will be normalized to 1W forward input power and compared with the reference SAR value derived from validation dipole certificate report. The deviation of system check should be within 10 %.

3.4 SAR Measurement Procedure

According to the SAR 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

The SAR measurement procedures for each of test conditions are as follows:

(a) Make EUT to transmit maximum output power
(b) Measure conducted output power through RF cable
(c) Place the EUT in the specific position of phantom
(d) Perform SAR testing steps on the DASY system
(e) Record the SAR value

3.4.1 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan measures 5x5x7 points with step size 8, 8 and 5 mm for below 3 GHz, and 7x7x9 points with step size 4, 4 and 2.5 mm for above 5 GHz. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g.

3.4.2 Volume Scan Procedure

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 DUT 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.

3.4.3 Power Drift Monitoring

All SAR testing is under the DUT 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 DUT 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 drift more than 5%, the SAR will be retested.

3.4.4 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

3.4.5 SAR Averaged Methods

In DASY, the interpolation and extrapolation are both based on the modified Quadratic Shepard's method. The interpolation scheme combines a least-square fitted function method and a weighted average method which are the two basic types of computational interpolation and approximation.

Extrapolation routines are used to obtain SAR values between the lowest measurement points and the inner phantom surface. The extrapolation distance is determined by the surface detection distance and the probe sensor offset. The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5 mm.

4. SAR Measurement Evaluation

4.1 EUT Configuration and Setting

For WWAN SAR testing, the EUT was linked and controlled by base station emulator. Communication between the EUT and the emulator was established by air link. The distance between the EUT and the communicating antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of DUT. The EUT was set from the emulator to radiate maximum output power during SAR testing.

For WLAN SAR testing, the EUT has installed WLAN engineering testing software which can provide continuous transmitting RF signal. This RF signal utilized in SAR measurement has almost 100% duty cycle. The data rates for WLAN SAR testing were set in 1 Mbps for 802.11b, 6 Mbps for 802.11g, and MCS0 for 802.11n HT20 and 802.11n HT40 due to the highest RF output power.

The EUT is communicated with base station simulator (Agilent E5515C is used for GSM/WCDMA, and Anritsu MT8820C is used for LTE) by air link. During SAR testing, the base station simulator is set to make the EUT to radiate maximum output power.

For GSM850, the power control level is set to 5. For GPRS850 (GMSK, CS1), the power control level is set to 5. For EDGE850 (GMSK: MCS1, 8PSK:MCS9), the power control level is set to 8. For GSM1900, the power control level is set to 0. For GPRS1900 (GMSK, CS1), the power control level is set to 0. For EDGE1900 (GMSK: MCS1, 8PSK:MCS9), the power control level is set to 2. Head SAR is tested under GSM link mode. Body SAR is tested under maximum source-based time-average power mode of GPRS/EDGE.

For WCDMA, head and body SAR is tested under 12.2k RMC mode with power control set all up bits. SAR for AMR is not required since its power is less than 1/4 dB higher than RMC. SAR for HSDPA/HSUPA is not required since its power is less than 1/4 dB higher than RMC without HSDPA/HSUPA.

For LTE, set the related parameters of operating band, channel bandwidth, uplink channel number, modulation type, and RB in base station simulator. When the EUT has registered and communicated to base station simulator, set the simulator to make EUT transmitting the maximum radiated power. The steps for system simulator (Anritsu ET8820C) setup are as below.

1. Press the “Std” button to select “LTE 22.20S” function
2. Choose the “Screen Select” item to “Fundamental Measurement”
3. Enter the “Common” item
4. Set the Operating Band
5. Set the Channel Bandwidth
6. Set the UL Channel & Frequency
7. Set the Modulation
8. Set the RB number and RB shift
9. Press “Start Call” button when EUT register to the system simulator
10. Set the TX-1 Max. Power to make the EUT transmit maximum output power

4.2 EUT Testing Position

This DUT was tested in **Right Cheek**, **Right Tilted**, **Left Cheek**, **Left Tilted**, **Front Face, Rear Face, Left Side, Right Side, Top Side,** and **Bottom Side** positions as illustrated below:

1. Define two imaginary lines on the handset

(a) The vertical centerline passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.

(b) The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.

(c) The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical centerline is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.

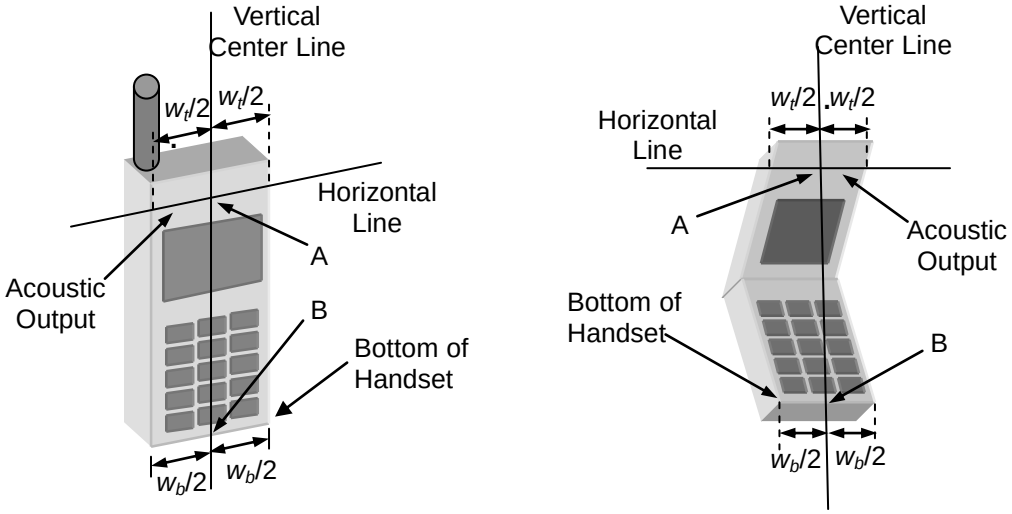


Fig-4.1 Illustration for Handset Vertical and Horizontal Reference Lines

2. Cheek Position

(a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.

(b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost (see Fig-4.2).

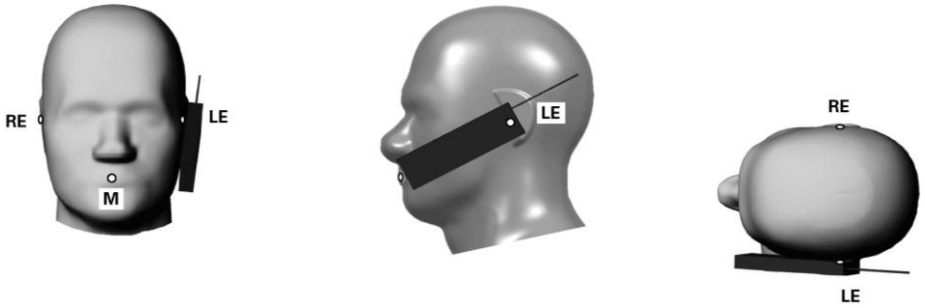


Fig-4.2 Illustration for Cheek Position

3. Tilted Position

(a) To position the device in the “cheek” position described above.

(b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost (see Fig-4.3).

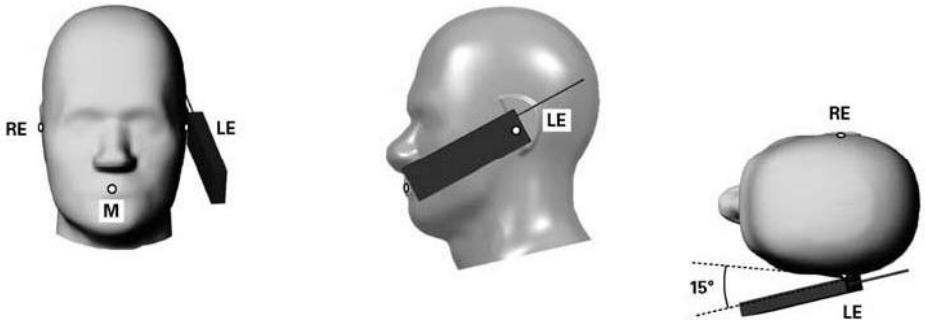


Fig-4.3 Illustration for Tilted Position

4. Body Worn Position

(a) To position the EUT parallel to the phantom surface.

(b) To adjust the EUT parallel to the flat phantom.

(c) To adjust the distance between the EUT surface and the flat phantom to 1 cm.

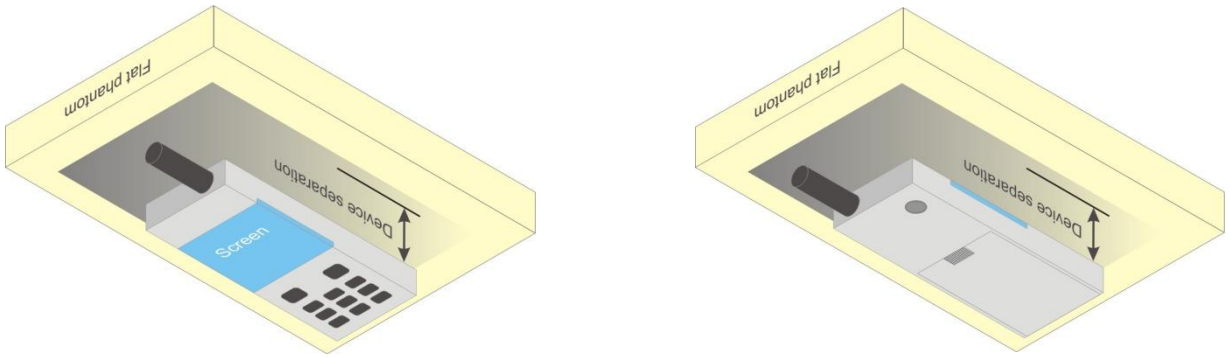


Fig-4.4 Illustration for Body Worn Position

4.3 Tissue Verification

The measuring results for tissue simulating liquid are shown as below.

Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)	Test Date
H835	835	21.3	0.879	42.262	0.90	41.5	-2.33	1.84	Dec. 19, 2011
H835	835	21.3	0.921	43.09	0.90	41.5	2.33	3.83	Jan. 13, 2012
B835	835	21.3	0.996	55.208	0.97	55.2	2.68	0.01	Dec. 22, 2011
B835	835	21.4	0.994	55.056	0.97	55.2	2.47	-0.26	Dec. 30, 2011
B835	835	21.4	0.998	55.464	0.97	55.2	2.89	0.48	Jan. 14, 2012
H1900	1900	21.4	1.438	39.948	1.40	40.0	2.71	-0.13	Dec. 20, 2011
H1900	1900	21.4	1.4	39.1	1.4	40	0.00	-2.25	Dec. 26, 2011
H1900	1900	21.5	1.389	40.164	1.40	40.0	-0.79	0.41	Jan. 13, 2012
B1900	1900	21.5	1.553	53.152	1.52	53.3	2.17	-0.28	Dec. 21, 2011
B1900	1900	21.3	1.548	52.391	1.52	53.3	1.84	-1.71	Dec. 30, 2011
B1900	1900	21.2	1.519	53.711	1.52	53.3	-0.07	0.77	Jan. 14, 2012
H2450	2450	21.5	1.815	38.126	1.8	39.2	0.83	-2.74	Dec. 22, 2011
H2450	2450	21.5	1.811	37.4	1.8	39.2	0.61	-4.59	Jan. 16, 2012
B2450	2450	21.5	1.976	50.932	1.95	52.7	1.33	-3.35	Dec. 22, 2011
B2450	2450	21.5	1.966	51.318	1.95	52.7	0.82	-2.62	Jan. 03, 2012
B2450	2450	21.5	1.971	50.948	1.95	52.7	1.08	-3.32	Jan. 16, 2012
H5G	5200	21.5	4.752	35.533	4.66	36.0	1.97	-1.30	Jan. 02, 2012
H5G	5200	21.5	4.705	34.949	4.66	36.0	0.97	-2.92	Jan. 16, 2012
B5G	5200	21.5	5.168	47.47	5.3	49	-2.49	-3.12	Jan. 04, 2012
B5G	5200	21.5	5.174	48.044	5.3	49	-2.38	-1.95	Jan. 16, 2012
H5G	5500	21.5	5.114	34.826	4.96	35.6	3.10	-2.17	Jan. 02, 2012
H5G	5500	21.5	4.872	34.47	4.96	35.6	-1.77	-3.17	Jan. 16, 2012
B5G	5500	21.5	5.665	47.358	5.65	48.6	0.27	-2.56	Jan. 04, 2012
B5G	5500	21.5	5.678	47.973	5.65	48.6	0.50	-1.29	Jan. 16, 2012
H5G	5800	21.4	5.15	34.962	5.27	35.3	-2.28	-0.96	Dec. 29, 2011
H5G	5800	21.5	5.068	34.231	5.27	35.3	-3.83	-3.03	Jan. 16, 2012
B5G	5800	21.4	6.215	48.332	6.00	48.2	3.58	0.27	Dec. 29, 2011
B5G	5800	21.5	6.268	47.275	6.00	48.2	4.47	-1.92	Jan. 16, 2012
H750	750	20.9	0.896	40.267	0.89	41.9	0.67	-3.90	Jan. 10, 2012
H750	750	21.5	0.892	41.542	0.89	41.9	0.22	-0.85	Jan. 13, 2012
B750	750	21.5	0.966	55.259	0.96	55.5	0.63	-0.43	Jan. 11, 2012
B750	750	21.5	0.974	55.909	0.96	55.5	1.46	0.74	Jan. 14, 2012
H1750	1750	21.2	1.38	39.459	1.37	40.1	0.73	-1.60	Jan. 09, 2012
H1750	1750	21.5	1.38	39.464	1.37	40.1	0.73	-1.59	Jan. 10, 2012
H1750	1750	21.5	1.374	41.32	1.37	40.1	0.00	3.04	Jan. 14, 2012
B1750	1750	21.4	1.486	52.68	1.49	53.4	-0.27	-1.35	Jan. 11, 2012
B1750	1750	21.4	1.488	52.838	1.49	53.4	-0.13	-1.05	Jan. 14, 2012

Note:

The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within ±5% of the target values. Liquid temperature during the SAR testing must be within ±2 ℃.

4.4 System Verification

The measuring results for system check are shown as below.

Test Date	Frequency (MHz)	1W Target SAR-1g (W/kg)	Measured SAR-1g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Deviation (%)	Dipole S/N	Probe S/N	DAE S/N
Dec. 19, 2011	835	9.65	2.25	9.00	-6.74	4d021	3800	579
Jan. 13, 2012	835	9.65	2.48	9.92	2.80	4d021	3650	579
Dec. 22, 2011	835	10.10	2.51	10.04	-0.59	4d021	3650	1277
Dec. 30, 2011	835	10.10	2.44	9.76	-3.37	4d021	3590	861
Jan. 14, 2012	835	10.10	2.59	10.36	2.57	4d021	3650	579
Dec. 20, 2011	1900	40.90	10.30	41.20	0.73	5d022	3800	579
Dec. 26, 2011	1900	40.90	10.20	40.80	-0.24	5d022	3800	1277
Jan. 13, 2012	1900	40.90	9.45	37.80	-7.58	5d022	3650	579
Dec. 21, 2011	1900	40.90	10.40	41.60	1.71	5d022	3800	579
Dec. 30, 2011	1900	40.90	10.00	40.00	-2.20	5d022	3590	861
Jan. 14, 2012	1900	40.90	9.71	38.84	-5.04	5d022	3650	579
Dec. 22, 2011	2450	54.80	13.30	53.20	-2.92	716	3650	1277
Jan. 16, 2012	2450	54.80	12.60	50.40	-8.03	716	3650	579
Dec. 22, 2011	2450	53.30	13.50	54.00	1.31	716	3650	1277
Jan. 03, 2012	2450	53.30	13.80	55.20	3.56	716	3590	861
Jan. 16, 2012	2450	53.30	13.40	53.60	0.56	716	3650	579
Jan. 02, 2012	5200	81.80	7.67	76.70	-6.23	1019	3590	861
Jan. 16, 2012	5200	81.80	7.86	78.60	-3.91	1019	3650	579
Jan. 04, 2012	5200	77.10	8.02	80.20	4.02	1019	3590	1277
Jan. 16, 2012	5200	77.10	7.56	75.60	-1.95	1019	3650	579
Jan. 02, 2012	5500	88.90	8.97	89.70	0.90	1019	3590	861
Jan. 16, 2012	5500	88.90	8.31	83.10	-6.52	1019	3650	579
Jan. 04, 2012	5500	82.40	8.57	85.70	4.00	1019	3590	861
Jan. 16, 2012	5500	82.40	8.33	83.30	1.09	1019	3650	579
Dec. 29, 2011	5800	83.20	7.75	77.50	-6.85	1019	3590	861
Jan. 16, 2012	5800	83.20	7.66	76.60	-7.93	1019	3650	579
Dec. 29, 2011	5800	73.40	7.73	77.30	5.31	1019	3590	861
Jan. 16, 2012	5800	73.40	7.78	77.80	5.99	1019	3650	579
Jan. 10, 2012	750	8.39	2.27	9.08	8.22	1013	3650	579
Jan. 13, 2012	750	8.39	2.28	9.12	8.70	1013	3650	579
Jan. 11, 2012	750	8.96	2.32	9.28	3.57	1013	3650	579
Jan. 14, 2012	750	8.93	2.40	9.60	7.50	1013	3650	579
Jan. 09, 2012	1750	36.60	9.09	36.36	-0.66	1055	3650	579
Jan. 10, 2012	1750	36.60	9.56	38.24	4.48	1055	3650	579
Jan. 14, 2012	1750	36.60	9.05	36.20	-1.09	1055	3650	579
Jan. 11, 2012	1750	38.00	9.29	37.16	-2.21	1055	3650	579
Jan. 14, 2012	1750	38.00	8.89	35.56	-6.42	1055	3650	579

Note:

Comparing to the reference SAR value provided by SPEAG, the validation data should be within its specification of 10 %. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.

4.5 Conducted Power Results

The measuring conducted power (Unit: dBm) are shown as below.

Band	GSM850			GSM1900		
Channel	128	189	251	512	661	810
Frequency (MHz)	824.2	836.4	848.8	1850.2	1880.0	1909.8
Maximum Burst-Averaged Output Power						
GSM (GMSK, 1 slot)	33.36	33.01	33.11	30.55	30.27	30.61
GPRS 8 (GMSK, 1 slot)	33.35	32.98	33.18	30.51	30.16	30.52
GPRS 10 (GMSK, 2 slot)	30.39	30.17	30.07	29.59	29.54	29.50
EDGE 8 (GMSK, 1 slot)	33.21	33.13	33.15	30.28	30.14	30.22
EDGE 10 (GMSK, 2 slot)	30.11	30.06	30.09	29.46	29.39	29.41
EDGE 8 (8PSK, 1 slot)	26.59	26.51	26.47	26.28	26.23	26.15
EDGE 10 (8PSK, 2 slot)	26.74	26.68	26.60	26.40	26.30	26.21
Maximum Frame-Averaged Output Power						
GSM (GMSK, 1 slot)	24.36	24.01	24.11	21.55	21.27	21.61
GPRS 8 (GMSK, 1 slot)	24.35	23.98	24.18	21.51	21.16	21.52
GPRS 10 (GMSK, 2 slot)	24.39	24.17	24.07	23.59	23.54	23.50
EDGE 8 (GMSK, 1 slot)	24.21	24.13	24.15	21.28	21.14	21.22
EDGE 10 (GMSK, 2 slot)	24.11	24.06	24.09	23.46	23.39	23.41
EDGE 8 (8PSK, 1 slot)	17.59	17.51	17.47	17.28	17.23	17.15
EDGE 10 (8PSK, 2 slot)	20.74	20.68	20.60	20.40	20.30	20.21

Note: Body SAR testing for GSM/GPRS/EDGE was performed on the maximum frame-averaged power mode.

Band	WCDMA Band II			WCDMA Band V		
Channel	9262	9400	9538	4132	4182	4233
Frequency (MHz)	1852.4	1880.0	1907.6	826.4	836.4	846.6
RMC 12.2K	23.12	23.26	23.13	23.55	23.51	23.49
HSDPA Subtest-1	22.37	22.62	22.56	22.77	22.75	22.76
HSDPA Subtest-2	22.35	22.62	22.57	22.76	22.81	22.75
HSDPA Subtest-3	21.53	21.72	21.69	22.09	21.95	22.03
HSDPA Subtest-4	21.55	21.75	21.65	22.09	22.05	22.02
HSUPA Subtest-1	21.72	22.28	22.07	22.68	22.65	22.56
HSUPA Subtest-2	19.14	18.90	19.15	19.57	19.52	19.57
HSUPA Subtest-3	20.22	20.27	20.25	20.66	20.67	20.68
HSUPA Subtest-4	19.12	19.06	19.17	19.66	19.65	19.64
HSUPA Subtest-5	22.31	22.47	22.42	22.76	22.72	22.76

Band	802.11b			802.11g		
Channel	1	6	11	1	6	11
Frequency (MHz)	2412	2437	2462	2412	2437	2462
Average Power	18.04	18.23	18.04	12.45	12.60	12.50

Band	802.11n (HT20)			-		
Channel	1	6	11	-	-	-
Frequency (MHz)	2412	2437	2462	-	-	-
Average Power	12.02	12.21	12.10	-	-	-

Band	802.11a							
Channel	36	40	44	48	52	56	60	64
Frequency (MHz)	5180	5200	5220	5240	5260	5280	5300	5320
Average Power	13.45	12.86	13.10	12.96	12.90	12.54	12.65	13.27

Band	802.11a							
Channel	100	104	108	112	116	132	136	140
Frequency (MHz)	5500	5520	5540	5560	5580	5660	5680	5700
Average Power	12.58	13.07	12.95	12.80	12.57	12.63	12.59	13.22

Band	802.11a							
Channel	149	153	157	161	-	-	-	-
Frequency (MHz)	5745	5765	5785	5805	-	-	-	-
Average Power	12.44	12.57	12.67	12.81	-	-	-	-

Band	802.11n (HT20)							
Channel	36	40	44	48	52	56	60	64
Frequency (MHz)	5180	5200	5220	5240	5260	5280	5300	5320
Average Power	10.33	10.02	9.94	9.76	9.86	9.59	9.56	10.49

Band	802.11n (HT20)							
Channel	100	104	108	112	116	132	136	140
Frequency (MHz)	5500	5520	5540	5560	5580	5660	5680	5700
Average Power	9.91	9.76	10.03	9.86	9.59	9.60	9.60	10.35

Band	802.11n (HT20)							
Channel	149	153	157	161	-	-	-	-
Frequency (MHz)	5745	5765	5785	5805	-	-	-	-
Average Power	9.47	9.50	9.15	9.92	-	-	-	-

Band	802.11n (HT40)								
Channel	38	46	54	62	102	118	134	151	159
Frequency (MHz)	5190	5230	5270	5310	5510	5590	5670	5755	5795
Average Power	10.23	9.88	9.50	9.67	9.61	9.64	10.41	9.77	9.88

LTE Band 4								
BW	Modulation	CH	Frequency (MHz)	RB	RB Offset	MPR	Target Power	Measured Power
5 MHz	QPSK	19975	1712.5	1	0	0	23.5	23.36
		20175	1732.5	1	0	0	23.5	23.15
		20375	1752.5	1	0	0	23.5	23.03
		19975	1712.5	1	24	0	23.5	23.35
		20175	1732.5	1	24	0	23.5	23.07
		20375	1752.5	1	24	0	23.5	23.17
		19975	1712.5	12	6	1	23.5	22.42
		20175	1732.5	12	6	1	23.5	22.01
		20375	1752.5	12	6	1	23.5	22.11
		19975	1712.5	25	0	1	23.5	22.55
		20175	1732.5	25	0	1	23.5	22.14
		20375	1752.5	25	0	1	23.5	22.23
	16QAM	19975	1712.5	1	0	1	23.5	22.52
		20175	1732.5	1	0	1	23.5	22.17
		20375	1752.5	1	0	1	23.5	22.17
		19975	1712.5	1	24	1	23.5	22.46
		20175	1732.5	1	24	1	23.5	22.07
		20375	1752.5	1	24	1	23.5	22.22
		19975	1712.5	12	6	2	23.5	21.20
		20175	1732.5	12	6	2	23.5	20.82
		20375	1752.5	12	6	2	23.5	20.90
		19975	1712.5	25	0	2	23.5	21.61
		20175	1732.5	25	0	2	23.5	21.28
		20375	1752.5	25	0	2	23.5	21.38

LTE Band 4								
BW	Modulation	CH	Frequency (MHz)	RB	RB Offset	MPR	Target Power	Measured Power
10 MHz	QPSK	20000	1715.0	1	0	0	23.5	23.46
		20175	1732.5	1	0	0	23.5	23.28
		20350	1750.0	1	0	0	23.5	23.2
		20000	1715.0	1	49	0	23.5	23.25
		20175	1732.5	1	49	0	23.5	23.09
		20350	1750.0	1	49	0	23.5	23.14
		20000	1715.0	25	12	1	23.5	22.5
		20175	1732.5	25	12	1	23.5	22.17
		20350	1750.0	25	12	1	23.5	22.08
		20000	1715.0	50	0	1	23.5	22.55
		20175	1732.5	50	0	1	23.5	22.19
		20350	1750.0	50	0	1	23.5	22.1
	16QAM	20000	1715.0	1	0	1	23.5	22.56
		20175	1732.5	1	0	1	23.5	22.27
		20350	1750.0	1	0	1	23.5	22.18
		20000	1715.0	1	49	1	23.5	22.34
		20175	1732.5	1	49	1	23.5	22.14
		20350	1750.0	1	49	1	23.5	22.22
		20000	1715.0	25	12	2	23.5	21.61
		20175	1732.5	25	12	2	23.5	21.27
		20350	1750.0	25	12	2	23.5	21.19
		20000	1715.0	50	0	2	23.5	21.43
		20175	1732.5	50	0	2	23.5	21.14
		20350	1750.0	50	0	2	23.5	21.05

LTE Band 17								
BW	Modulation	CH	Frequency (MHz)	RB	RB Offset	MPR	Target Power	Measured Power
5 MHz	QPSK	23755	706.5	1	0	0	23.5	22.91
		23790	710.0	1	0	0	23.5	22.95
		23825	713.5	1	0	0	23.5	23.12
		23755	706.5	1	24	0	23.5	22.93
		23790	710.0	1	24	0	23.5	22.85
		23825	713.5	1	24	0	23.5	22.79
		23755	706.5	12	6	1	23.5	21.95
		23790	710.0	12	6	1	23.5	22.14
		23825	713.5	12	6	1	23.5	22.09
		23755	706.5	25	0	1	23.5	22.12
		23790	710.0	25	0	1	23.5	22.05
		23825	713.5	25	0	1	23.5	22.17
	16QAM	23755	706.5	1	0	1	23.5	22.03
		23790	710.0	1	0	1	23.5	22.1
		23825	713.5	1	0	1	23.5	22.26
		23755	706.5	1	24	1	23.5	22.11
		23790	710.0	1	24	1	23.5	22.09
		23825	713.5	1	24	1	23.5	21.88
		23755	706.5	12	6	2	23.5	21.06
		23790	710.0	12	6	2	23.5	21.09
		23825	713.5	12	6	2	23.5	20.94
		23755	706.5	25	0	2	23.5	21.5
		23790	710.0	25	0	2	23.5	21.56
		23825	713.5	25	0	2	23.5	21.28

LTE Band 17								
BW	Modulation	CH	Frequency (MHz)	RB	RB Offset	MPR	Target Power	Measured Power
10 MHz	QPSK	23780	709.0	1	0	0	23.5	22.85
		23790	710.0	1	0	0	23.5	22.95
		23800	711.0	1	0	0	23.5	23.15
		23780	709.0	1	49	0	23.5	22.83
		23790	710.0	1	49	0	23.5	23.03
		23800	711.0	1	49	0	23.5	23.19
		23780	709.0	25	12	1	23.5	22.15
		23790	710.0	25	12	1	23.5	22.01
		23800	711.0	25	12	1	23.5	22.04
		23780	709.0	50	0	1	23.5	21.99
		23790	710.0	50	0	1	23.5	21.97
		23800	711.0	50	0	1	23.5	22.02
	16QAM	23780	709.0	1	0	1	23.5	21.97
		23790	710.0	1	0	1	23.5	22.03
		23800	711.0	1	0	1	23.5	22.04
		23780	709.0	1	49	1	23.5	22.1
		23790	710.0	1	49	1	23.5	22.14
		23800	711.0	1	49	1	23.5	22.16
		23780	709.0	25	12	2	23.5	21.46
		23790	710.0	25	12	2	23.5	21.39
		23800	711.0	25	12	2	23.5	21.48
		23780	709.0	50	0	2	23.5	21.13
		23790	710.0	50	0	2	23.5	21.03
		23800	711.0	50	0	2	23.5	21.16

4.6 SAR Testing Results

4.6.1 SAR Results for Head

Plot No.	Band	Mode	Test Position	Channel	Battery	SAR-1g (W/kg)
1	GSM850	GSM	Right Cheek	128	1	0.476
2	GSM850	GSM	Right Tilted	128	1	0.279
3	GSM850	GSM	Left Cheek	128	1	0.454
4	GSM850	GSM	Left Tilted	128	1	0.302
135	GSM850	GSM	Right Cheek	128	2	0.46
122	GSM850	GPRS10 (VOIP)	Right Cheek	128	1	**0.613**
123	GSM850	GPRS10 (VOIP)	Right Tilted	128	1	0.35
124	GSM850	GPRS10 (VOIP)	Left Cheek	128	1	0.525
125	GSM850	GPRS10 (VOIP)	Left Tilted	128	1	0.362
134	GSM850	GPRS10 (VOIP)	Right Cheek	128	2	0.586
60	GSM1900	GSM	Right Cheek	810	1	0.256
61	GSM1900	GSM	Right Tilted	810	1	0.117
62	GSM1900	GSM	Left Cheek	810	1	0.238
63	GSM1900	GSM	Left Tilted	810	1	0.112
136	GSM1900	GSM	Right Cheek	810	2	0.126
126	GSM1900	GPRS10 (VOIP)	Right Cheek	512	1	0.493
127	GSM1900	GPRS10 (VOIP)	Right Tilted	512	1	0.291
128	GSM1900	GPRS10 (VOIP)	Left Cheek	512	1	**0.57**
129	GSM1900	GPRS10 (VOIP)	Left Tilted	512	1	0.276
130	GSM1900	GPRS10 (VOIP)	Left Cheek	512	2	0.28
5	WCDMA V	RMC12.2K	Right Cheek	4132	1	**0.473**
6	WCDMA V	RMC12.2K	Right Tilted	4132	1	0.308
7	WCDMA V	RMC12.2K	Left Cheek	4132	1	0.417
8	WCDMA V	RMC12.2K	Left Tilted	4132	1	0.298
131	WCDMA V	RMC12.2K	Right Cheek	4132	2	0.361
13	WCDMA II	RMC12.2K	Right Cheek	9400	1	**0.491**
14	WCDMA II	RMC12.2K	Right Tilted	9400	1	0.205
15	WCDMA II	RMC12.2K	Left Cheek	9400	1	0.452
16	WCDMA II	RMC12.2K	Left Tilted	9400	1	0.193
137	WCDMA II	RMC12.2K	Right Cheek	9400	2	0.157

Note:

1. Since GPRS/EDGE and WCDMA of this device supports VOIP capability through 3rd party apps software, we have evaluated data mode for head SAR.

Plot No.	Band	Test Position	Channel	Battery	SAR-1g (W/kg)
45	802.11b	Right Cheek	6	1	**0.234**
46	802.11b	Right Tilted	6	1	0.082
43	802.11b	Left Cheek	6	1	0.192
47	802.11b	Left Tilted	6	1	0.084
122	802.11b	Right Cheek	6	2	0.122
82	802.11a	Right Cheek	36	1	N/A
83	802.11a	Right Tilted	36	1	0.00127
84	802.11a	Left Cheek	36	1	N/A
85	802.11a	Left Tilted	36	1	0.00645
86	802.11a	Left Tilted	36	2	0.00392
87	802.11a	Right Cheek	64	1	0.00352
88	802.11a	Right Tilted	64	1	0.00277
89	802.11a	Left Cheek	64	1	N/A
90	802.11a	Left Tilted	64	1	0.00254
91	802.11a	Right Cheek	64	2	0.00347
92	802.11a	Right Cheek	140	1	0.052
93	802.11a	Right Tilted	140	1	0.019
94	802.11a	Left Cheek	140	1	0.072
95	802.11a	Left Tilted	140	1	N/A
96	802.11a	Left Cheek	140	2	0.071
77	802.11a	Right Cheek	161	1	0.024
78	802.11a	Right Tilted	161	1	0.000972
79	802.11a	Left Cheek	161	1	**0.169**
80	802.11a	Left Tilted	161	1	0.021
81	802.11a	Left Cheek	161	2	0.096

Note:

1. The SAR value for some test positions is too low to be measured. Therefore, only “N/A” was presented in the table.
2. According to KDB 248227, the SAR testing for 802.11g/n is not required since the maximum power of 802.11g/n is less 1/4 dB higher than maximum power of 802.11b.
3. According to KDB 248227, the SAR testing for 802.11n is not required since the maximum power of 802.11n is less 1/4 dB higher than maximum power of 802.11a.
4. Since WLAN of this device supports VOIP capability through 3rd party apps software, we have evaluated data mode for head SAR.

Plot No.	Band	Mode	Test Position	Channel	Battery	RB	Offset	SAR-1g (W/kg)
231	LTE 4	QPSK_10M	Right Cheek	20000	1	25	12	0.533
232	LTE 4	QPSK_10M	Right Tilted	20000	1	25	12	0.27
233	LTE 4	QPSK_10M	Left Cheek	20000	1	25	12	0.493
234	LTE 4	QPSK_10M	Left Tilted	20000	1	25	12	0.307
246	LTE 4	16QAM_10M	Right Cheek	20000	1	25	12	0.397
236	LTE 4	QPSK_10M	Right Cheek	20000	1	1	0	0.491
237	LTE 4	QPSK_10M	Right Tilted	20000	1	1	0	0.309
238	LTE 4	QPSK_10M	Left Cheek	20000	1	1	0	0.566
239	LTE 4	QPSK_10M	Left Tilted	20000	1	1	0	0.33
253	LTE 4	16QAM_10M	Left Cheek	20000	1	1	0	0.457
241	LTE 4	QPSK_10M	Right Cheek	20000	1	1	49	**0.599**
242	LTE 4	QPSK_10M	Right Tilted	20000	1	1	49	0.322
243	LTE 4	QPSK_10M	Left Cheek	20000	1	1	49	0.557
244	LTE 4	QPSK_10M	Left Tilted	20000	1	1	49	0.355
255	LTE 4	16QAM_10M	Right Cheek	20000	1	1	49	0.522
245	LTE 4	QPSK_10M	Right Cheek	20000	2	1	49	0.483
201	LTE 17	QPSK_10M	Right Cheek	23800	1	25	12	0.372
202	LTE 17	QPSK_10M	Right Tilted	23800	1	25	12	0.34
203	LTE 17	QPSK_10M	Left Cheek	23800	1	25	12	0.219
204	LTE 17	QPSK_10M	Left Tilted	23800	1	25	12	0.208
216	LTE 17	16QAM_10M	Right Cheek	23800	1	25	12	0.352
206	LTE 17	QPSK_10M	Right Cheek	23800	1	1	0	**0.424**
207	LTE 17	QPSK_10M	Right Tilted	23800	1	1	0	0.376
208	LTE 17	QPSK_10M	Left Cheek	23800	1	1	0	0.187
209	LTE 17	QPSK_10M	Left Tilted	23800	1	1	0	0.196
221	LTE 17	16QAM_10M	Right Cheek	23800	1	1	0	0.328
210	LTE 17	QPSK_10M	Right Cheek	23800	2	1	0	0.41
211	LTE 17	QPSK_10M	Right Cheek	23800	1	1	49	0.32
212	LTE 17	QPSK_10M	Right Tilted	23800	1	1	49	0.319
213	LTE 17	QPSK_10M	Left Cheek	23800	1	1	49	0.322
214	LTE 17	QPSK_10M	Left Tilted	23800	1	1	49	0.315
228	LTE 17	16QAM_10M	Left Cheek	23800	1	1	49	0.216

Note:

1. According to KDB 941225, the SAR testing for 100% RB is not required since the maximum SAR of 50% RB is less than 1.45 W/kg.
2. According to KDB 941225, the SAR testing was performed on largest channel bandwidth, and SAR for other channel bandwidths is not required since the maximum power of smaller channel bandwidth is within 1/2 dB higher or lower of measured for the largest channel bandwidth and maximum SAR of largest channel bandwidth is less than 1.45 W/kg.
3. Since LTE of this device supports VOIP capability through 3rd party apps software, we have evaluated data mode for head SAR.

4.6.2 SAR Results for Body

<Hotspot Mode>

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Channel	Battery	Ear-phone	SAR-1g (W/kg)
55	GSM850	GPRS10	Front Face	1	128	1	w/o	0.794
56	GSM850	GPRS10	Rear Face	1	128	1	w/o	1.09
57	GSM850	GPRS10	Bottom Side	1	128	1	w/o	0.132
58	GSM850	GPRS10	Left Side	1	128	1	w/o	0.64
59	GSM850	GPRS10	Right Side	1	128	1	w/o	0.685
94	GSM850	GPRS10	Rear Face	1	189	1	w/o	**1.15**
95	GSM850	GPRS10	Rear Face	1	251	1	w/o	1.06
68	GSM850	GPRS10	Rear Face	1	189	2	w/o	1.03
82	GSM1900	GPRS10	Front Face	1	512	1	w/o	0.757
83	GSM1900	GPRS10	Rear Face	1	512	1	w/o	0.647
84	GSM1900	GPRS10	Bottom Side	1	512	1	w/o	1.01
85	GSM1900	GPRS10	Left Side	1	512	1	w/o	0.193
86	GSM1900	GPRS10	Right Side	1	512	1	w/o	0.22
92	GSM1900	GPRS10	Bottom Side	1	661	1	w/o	1.11
93	GSM1900	GPRS10	Bottom Side	1	810	1	w/o	**1.29**
88	GSM1900	GPRS10	Bottom Side	1	810	2	w/o	0.445
17	WCDMA V	RMC12.2K	Front Face	1	4132	1	w/o	0.624
18	WCDMA V	RMC12.2K	Rear Face	1	4132	1	w/o	0.826
19	WCDMA V	RMC12.2K	Bottom Side	1	4132	1	w/o	0.135
20	WCDMA V	RMC12.2K	Left Side	1	4132	1	w/o	0.58
21	WCDMA V	RMC12.2K	Right Side	1	4132	1	w/o	0.612
53	WCDMA V	RMC12.2K	Rear Face	1	4182	1	w/o	**0.892**
54	WCDMA V	RMC12.2K	Rear Face	1	4233	1	w/o	0.836
133	WCDMA V	RMC12.2K	Rear Face	1	4182	2	w/o	0.776
29	WCDMA II	RMC12.2K	Front Face	1	9400	1	w/o	0.812
30	WCDMA II	RMC12.2K	Rear Face	1	9400	1	w/o	0.694
31	WCDMA II	RMC12.2K	Bottom Side	1	9400	1	w/o	**1.07**
32	WCDMA II	RMC12.2K	Left Side	1	9400	1	w/o	0.136
33	WCDMA II	RMC12.2K	Right Side	1	9400	1	w/o	0.154
41	WCDMA II	RMC12.2K	Bottom Side	1	9262	1	w/o	0.836
42	WCDMA II	RMC12.2K	Bottom Side	1	9538	1	w/o	0.911
37	WCDMA II	RMC12.2K	Front Face	1	9262	1	w/o	0.818
38	WCDMA II	RMC12.2K	Front Face	1	9538	1	w/o	0.804
34	WCDMA II	RMC12.2K	Bottom Side	1	9400	2	w/o	0.345

Plot No.	Band	Test Position	Separation Distance (cm)	Channel	Battery	Ear-phone	SAR-1g (W/kg)
48	802.11b	Front Face	1	6	1	w/o	0.061
44	802.11b	Rear Face	1	6	1	w/o	**0.178**
49	802.11b	Left Side	1	6	1	w/o	0.119
51	802.11b	Top Side	1	6	1	w/o	0.016
52	802.11b	Bottom Side	1	6	1	w/o	0.048
123	802.11b	Rear Face	1	6	2	w/o	0.039
98	802.11a	Front Face	1	36	1	w/o	0.00735
99	802.11a	Rear Face	1	36	1	w/o	0.064
100	802.11a	Left Side	1	36	1	w/o	0.038
102	802.11a	Top Side	1	36	1	w/o	0.00692
103	802.11a	Bottom Side	1	36	1	w/o	0.0068
105	802.11a	Rear Face	1	36	2	w/o	0.034
106	802.11a	Front Face	1	64	1	w/o	0.00384
107	802.11a	Rear Face	1	64	1	w/o	0.094
108	802.11a	Left Side	1	64	1	w/o	0.054
110	802.11a	Top Side	1	64	1	w/o	0.0025
111	802.11a	Bottom Side	1	64	1	w/o	0.018
113	802.11a	Rear Face	1	64	2	w/o	0.058
114	802.11a	Front Face	1	140	1	w/o	0.025
115	802.11a	Rear Face	1	140	1	w/o	0.102
116	802.11a	Left Side	1	140	1	w/o	**0.245**
118	802.11a	Top Side	1	140	1	w/o	0.048
119	802.11a	Bottom Side	1	140	1	w/o	0.022
121	802.11a	Left Side	1	140	2	w/o	0.028
69	802.11a	Front Face	1	161	1	w/o	0.043
70	802.11a	Rear Face	1	161	1	w/o	0.158
71	802.11a	Left Side	1	161	1	w/o	0.211
73	802.11a	Top Side	1	161	1	w/o	0.05
74	802.11a	Bottom Side	1	161	1	w/o	0.044
76	802.11a	Left Side	1	161	2	w/o	0.208

Note:

1. According to KDB 248227, the SAR testing for 802.11g/n is not required since the maximum power of 802.11g/n is less 1/4 dB higher than maximum power of 802.11b.
2. According to KDB 248227, the SAR testing for 802.11n is not required since the maximum power of 802.11n is less 1/4 dB higher than maximum power of 802.11a.

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Channel	Battery	Ear-phone	RB	Offset	SAR-1g (W/kg)
349	LTE 4	QPSK_10M	Front Face	1	20000	1	w/o	25	12	0.754
350	LTE 4	QPSK_10M	Rear Face	1	20000	1	w/o	25	12	0.786
351	LTE 4	QPSK_10M	Left Side	1	20000	1	w/o	25	12	0.221
352	LTE 4	QPSK_10M	Right Side	1	20000	1	w/o	25	12	0.182
354	LTE 4	QPSK_10M	Bottom Side	1	20000	1	w/o	25	12	0.432
374	LTE 4	16QAM_10M	Rear Face	1	20000	1	w/o	25	12	0.602
357	LTE 4	QPSK_10M	Front Face	1	20000	1	w/o	1	0	**1.06**
358	LTE 4	QPSK_10M	Rear Face	1	20000	1	w/o	1	0	0.939
359	LTE 4	QPSK_10M	Left Side	1	20000	1	w/o	1	0	0.27
360	LTE 4	QPSK_10M	Right Side	1	20000	1	w/o	1	0	0.208
362	LTE 4	QPSK_10M	Bottom Side	1	20000	1	w/o	1	0	0.49
381	LTE 4	16QAM_10M	Front Face	1	20000	1	w/o	1	0	0.844
363	LTE 4	QPSK_10M	Front Face	1	20000	2	w/o	1	0	0.86
365	LTE 4	QPSK_10M	Front Face	1	20000	1	w/o	1	49	0.901
366	LTE 4	QPSK_10M	Rear Face	1	20000	1	w/o	1	49	0.979
367	LTE 4	QPSK_10M	Left Side	1	20000	1	w/o	1	49	0.256
368	LTE 4	QPSK_10M	Right Side	1	20000	1	w/o	1	49	0.211
370	LTE 4	QPSK_10M	Bottom Side	1	20000	1	w/o	1	49	0.538
390	LTE 4	16QAM_10M	Rear Face	1	20000	1	w/o	1	49	0.907
301	LTE 17	QPSK_10M	Front Face	1	23800	1	w/o	25	12	0.057
302	LTE 17	QPSK_10M	Rear Face	1	23800	1	w/o	25	12	0.144
304	LTE 17	QPSK_10M	Right Side	1	23800	1	w/o	25	12	0.103
305	LTE 17	QPSK_10M	Top Side	1	23800	1	w/o	25	12	0.093
326	LTE 17	16QAM_10M	Rear Face	1	23800	1	w/o	25	12	0.056
309	LTE 17	QPSK_10M	Front Face	1	23800	1	w/o	1	0	0.085
310	LTE 17	QPSK_10M	Rear Face	1	23800	1	w/o	1	0	**0.178**
312	LTE 17	QPSK_10M	Right Side	1	23800	1	w/o	1	0	0.114
313	LTE 17	QPSK_10M	Top Side	1	23800	1	w/o	1	0	0.121
334	LTE 17	16QAM_10M	Rear Face	1	23800	1	w/o	1	0	0.088
315	LTE 17	QPSK_10M	Rear Face	1	23800	2	w/o	1	0	0.161
317	LTE 17	QPSK_10M	Front Face	1	23800	1	w/o	1	49	0.096
318	LTE 17	QPSK_10M	Rear Face	1	23800	1	w/o	1	49	0.132
320	LTE 17	QPSK_10M	Right Side	1	23800	1	w/o	1	49	0.099
321	LTE 17	QPSK_10M	Top Side	1	23800	1	w/o	1	49	0.093
342	LTE 17	16QAM_10M	Rear Face	1	23800	1	w/o	1	49	0.099

Note:

1. According to KDB 941225, the SAR testing for 100% RB is not required since the maximum SAR of 50% RB is less than 1.45 W/kg.
2. According to KDB 941225, the SAR testing was performed on largest channel bandwidth, and SAR for other channel bandwidths is not required since the maximum power of smaller channel bandwidth is within 1/2 dB higher or lower of measured for the largest channel bandwidth and maximum SAR of largest channel bandwidth is less than 1.45 W/kg.

<Body Worn Mode>

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Channel	Battery	Ear-phone	SAR-1g (W/kg)
55	GSM850	GPRS10	Front Face	1	128	1	w/o	0.794
56	GSM850	GPRS10	Rear Face	1	128	1	w/o	1.09
96	GSM850	GPRS10	Rear Face	1	128	1	w/	0.96
94	GSM850	GPRS10	Rear Face	1	189	1	w/o	**1.15**
95	GSM850	GPRS10	Rear Face	1	251	1	w/o	1.06
67	GSM850	GPRS10	Rear Face	1	189	1	w/	1.09
97	GSM850	GPRS10	Rear Face	1	251	1	w/	0.987
82	GSM1900	GPRS10	Front Face	1	512	1	w/o	**0.757**
83	GSM1900	GPRS10	Rear Face	1	512	1	w/o	0.647
87	GSM1900	GPRS10	Front Face	1	512	1	w	0.736
17	WCDMA V	RMC12.2K	Front Face	1	4132	1	w/o	0.624
18	WCDMA V	RMC12.2K	Rear Face	1	4132	1	w/o	0.826
53	WCDMA V	RMC12.2K	Rear Face	1	4182	1	w/o	**0.892**
54	WCDMA V	RMC12.2K	Rear Face	1	4233	1	w/o	0.836
22	WCDMA V	RMC12.2K	Rear Face	1	4182	1	w/	0.698
29	WCDMA II	RMC12.2K	Front Face	1	9400	1	w/o	0.812
30	WCDMA II	RMC12.2K	Rear Face	1	9400	1	w/o	0.694
37	WCDMA II	RMC12.2K	Front Face	1	9262	1	w/o	**0.818**
38	WCDMA II	RMC12.2K	Front Face	1	9538	1	w/o	0.804
89	WCDMA II	RMC12.2K	Front Face	1	9262	1	w/	0.809
90	WCDMA II	RMC12.2K	Front Face	1	9400	1	w/	0.8
91	WCDMA II	RMC12.2K	Front Face	1	9538	1	w/	0.814
48	802.11b	-	Front Face	1	6	1	w/o	0.061
44	802.11b	-	Rear Face	1	6	1	w/o	**0.178**
97	802.11b	-	Rear Face	1	6	1	w/	0.115
98	802.11a	-	Front Face	1	36	1	w/o	0.00735
99	802.11a	-	Rear Face	1	36	1	w/o	0.064
104	802.11a	-	Rear Face	1	36	1	w/	0.056
106	802.11a	-	Front Face	1	64	1	w/o	0.00384
107	802.11a	-	Rear Face	1	64	1	w/o	0.094
112	802.11a	-	Rear Face	1	64	1	w/	0.092
114	802.11a	-	Front Face	1	140	1	w/o	0.025
115	802.11a	-	Rear Face	1	140	1	w/o	0.102
120	802.11a	-	Rear Face	1	140	1	w/	0.099
69	802.11a	-	Front Face	1	161	1	w/o	0.043
70	802.11a	-	Rear Face	1	161	1	w/o	0.158
75	802.11a	-	Rear Face	1	161	1	w/	**0.202**

Note:

1. According to KDB 248227, the SAR testing for 802.11g/n is not required since the maximum power of 802.11g/n is less 1/4 dB higher than maximum power of 802.11b.
2. According to KDB 248227, the SAR testing for 802.11n is not required since the maximum power of 802.11n is less 1/4 dB higher than maximum power of 802.11a.
3. Since GPRS/EDGE, WCDMA and WLAN of this device supports VOIP capability through 3rd party apps software, we have evaluated data mode for body SAR with DUT connected earphone.

Plot No.	Band	Mode	Test Position	Separation Distance (cm)	Channel	Battery	Ear-phone	RB	Offset	SAR-1g (W/kg)
349	LTE 4	QPSK_10M	Front Face	1	20000	1	w/o	25	12	0.754
350	LTE 4	QPSK_10M	Rear Face	1	20000	1	w/o	25	12	0.786
356	LTE 4	QPSK_10M	Rear Face	1	20000	1	w/	25	12	0.67
374	LTE 4	16QAM_10M	Rear Face	1	20000	1	w/o	25	12	0.602
357	LTE 4	QPSK_10M	Front Face	1	20000	1	w/o	1	0	**1.06**
358	LTE 4	QPSK_10M	Rear Face	1	20000	1	w/o	1	0	0.939
364	LTE 4	QPSK_10M	Front Face	1	20000	1	w/	1	0	0.94
381	LTE 4	16QAM_10M	Front Face	1	20000	1	w/o	1	0	0.884
365	LTE 4	QPSK_10M	Front Face	1	20000	1	w/o	1	49	0.901
366	LTE 4	QPSK_10M	Rear Face	1	20000	1	w/o	1	49	0.979
372	LTE 4	QPSK_10M	Rear Face	1	20000	1	w/	1	49	0.786
390	LTE 4	16QAM_10M	Rear Face	1	20000	1	w/o	1	49	0.907
301	LTE 17	QPSK_10M	Front Face	1	23800	1	w/o	25	12	0.057
302	LTE 17	QPSK_10M	Rear Face	1	23800	1	w/o	25	12	0.144
308	LTE 17	QPSK_10M	Rear Face	1	23800	1	w/	25	12	0.098
326	LTE 17	16QAM_10M	Rear Face	1	23800	1	w/o	25	12	0.056
309	LTE 17	QPSK_10M	Front Face	1	23800	1	w/o	1	0	0.085
310	LTE 17	QPSK_10M	Rear Face	1	23800	1	w/o	1	0	**0.178**
316	LTE 17	QPSK_10M	Rear Face	1	23800	1	w/	1	0	0.113
334	LTE 17	16QAM_10M	Rear Face	1	23800	1	w/o	1	0	0.088
317	LTE 17	QPSK_10M	Front Face	1	23800	1	w/o	1	49	0.096
318	LTE 17	QPSK_10M	Rear Face	1	23800	1	w/o	1	49	0.132
324	LTE 17	QPSK_10M	Rear Face	1	23800	1	w/	1	49	0.093
342	LTE 17	16QAM_10M	Rear Face	1	23800	1	w/o	1	49	0.099

Note:

1. According to KDB 941225, the SAR testing for 100% RB is not required since the maximum SAR of 50% RB is less than 1.45 W/kg.
2. According to KDB 941225, the SAR testing was performed on largest channel bandwidth, and SAR for other channel bandwidths is not required since the maximum power of smaller channel bandwidth is within 1/2 dB higher or lower of measured for the largest channel bandwidth and maximum SAR of largest channel bandwidth is less than 1.45 W/kg.
3. Since LTE of this device supports VOIP capability through 3rd party apps software, we have evaluated data mode for body SAR with DUT connected earphone.

Test Engineer：Eli Hsu, Morrison Huang, Harlan Lin and Jerone Chang

4.6.3 Simultaneous Multi-band Transmission Evaluation

<Simultaneous Transmission Configuration 1>

Position (Head)	GSM850 (Voice / VOIP)	802.11a/b/g/n (Data)	Max. SAR Summation
Right Cheek	0.613	0.234	0.847
Right Tilted	0.35	0.082	0.432
Left Cheek	0.525	0.192	0.717
Left Tilted	0.362	0.084	0.446
Position (Hotspot)	**GSM850 (Data)**	**802.11a/b/g/n (Data)**	**Max. SAR Summation**
Front Face	0.794	0.061	0.855
Rear Face	1.15	0.178	1.328
Left Side	0.64	0.245	0.885
Right Side	0.685	0	0.685
Top Side	0	0.05	0.05
Bottom Side	0.132	0.048	0.18
Position (Body Worn)	**GSM850 (Voice / VOIP / Data)**	**802.11a/b/g/n (Data)**	**Max. SAR Summation**
Front Face	0.794	0.061	0.855
Rear Face	1.15	0.202	1.352

<Simultaneous Transmission Configuration 2>

Position (Head)	GSM1900 (Voice / VOIP)	802.11a/b/g/n (Data)	Max. SAR Summation
Right Cheek	0.493	0.234	0.727
Right Tilted	0.291	0.082	0.373
Left Cheek	0.57	0.192	0.762
Left Tilted	0.276	0.084	0.36
Position (Hotspot)	**GSM1900 (Data)**	**802.11a/b/g/n (Data)**	**Max. SAR Summation**
Front Face	0.757	0.061	0.818
Rear Face	0.647	0.178	0.825
Left Side	1.29	0.245	1.535
Right Side	0.22	0	0.22
Top Side	0	0.05	0.05
Bottom Side	1.29	0.048	1.338
Position (Body Worn)	**GSM1900 (Voice / VOIP / Data)**	**802.11a/b/g/n (Data)**	**Max. SAR Summation**
Front Face	0.757	0.061	0.818
Rear Face	0.647	0.202	0.849

<Simultaneous Transmission Configuration 3>

Position (Head)	WCDMA Band V (Voice / VOIP)	802.11a/b/g/n (Data)	Max. SAR Summation
Right Cheek	0.473	0.234	0.707
Right Tilted	0.308	0.082	0.39
Left Cheek	0.417	0.192	0.609
Left Tilted	0.298	0.084	0.382
Position (Hotspot)	**WCDMA Band V (Data)**	**802.11a/b/g/n (Data)**	**Max. SAR Summation**
Front Face	0.624	0.061	0.685
Rear Face	0.892	0.178	1.07
Left Side	0.58	0.245	0.825
Right Side	0.612	0	0.612
Top Side	0	0.05	0.05
Bottom Side	0.135	0.048	0.183
Position (Body Worn)	**WCDMA Band V (Voice / VOIP / Data)**	**802.11a/b/g/n (Data)**	**Max. SAR Summation**
Front Face	0.624	0.061	0.685
Rear Face	0.892	0.202	1.094

<Simultaneous Transmission Configuration 4>

Position (Head)	WCDMA Band II (Voice / VOIP)	802.11a/b/g/n (Data)	Max. SAR Summation
Right Cheek	0.491	0.234	0.725
Right Tilted	0.205	0.082	0.287
Left Cheek	0.452	0.192	0.644
Left Tilted	0.193	0.084	0.277
Position (Hotspot)	**WCDMA Band II (Data)**	**802.11a/b/g/n (Data)**	**Max. SAR Summation**
Front Face	0.818	0.061	0.879
Rear Face	0.694	0.178	0.872
Left Side	0.136	0.245	0.381
Right Side	0.154	0	0.154
Top Side	0	0.05	0.05
Bottom Side	1.07	0.048	1.118
Position (Body Worn)	**WCDMA Band II (Voice / VOIP / Data)**	**802.11a/b/g/n (Data)**	**Max. SAR Summation**
Front Face	0.812	0.061	0.873
Rear Face	0.818	0.202	1.02

<Simultaneous Transmission Configuration 5>

Position (Head)	LTE Band 4 (VOIP)	802.11a/b/g/n (Data)	Max. SAR Summation
Right Cheek	0.599	0.234	0.833
Right Tilted	0.322	0.082	0.404
Left Cheek	0.566	0.192	0.758
Left Tilted	0.355	0.084	0.439
Position (Hotspot)	**LTE Band 4 (Data)**	**802.11a/b/g/n (Data)**	**Max. SAR Summation**
Front Face	1.06	0.061	1.121
Rear Face	0.979	0.178	1.157
Left Side	0.27	0.245	0.515
Right Side	0.211	0	0.211
Top Side	0	0.05	0.05
Bottom Side	0.538	0.048	0.586
Position (Body Worn)	**LTE Band 4 (VOIP / Data)**	**802.11a/b/g/n (Data)**	**Max. SAR Summation**
Front Face	1.06	0.061	1.121
Rear Face	0.979	0.202	1.181

<Simultaneous Transmission Configuration 6>

Position (Head)	LTE Band 17 (VOIP)	802.11a/b/g/n (Data)	Max. SAR Summation
Right Cheek	0.424	0.234	0.658
Right Tilted	0.376	0.082	0.458
Left Cheek	0.322	0.192	0.514
Left Tilted	0.315	0.084	0.399
Position (Hotspot)	**LTE Band 17 (Data)**	**802.11a/b/g/n (Data)**	**Max. SAR Summation**
Front Face	0.096	0.061	0.157
Rear Face	0.178	0.178	0.356
Left Side	0	0.245	0.245
Right Side	0.114	0	0.114
Top Side	0.121	0.05	0.171
Bottom Side	0	0.048	0.048
Position (Body Worn)	**LTE Band 17 (VOIP / Data)**	**802.11a/b/g/n (Data)**	**Max. SAR Summation**
Front Face	0.096	0.061	0.157
Rear Face	0.178	0.202	0.38

Summary:

According to KDB 648474, the simultaneous transmission SAR for WWAN and WLAN was not required, because the SAR summation is less than 1.6 W/kg. The simultaneous transmission SAR for WWAN and BT was not required, because the output power of Bluetooth is less than P_{Ref} (10.8 dBm) and the closest separation distance of these antennas is larger than 2.5 cm. WLAN and BT share the same antenna, and they cannot transmit simultaneously.

5. Equipment List for System Verification and SAR Testing

Equipment	Manufacturer	Model	SN	Cal. Date	Cal. Interval
Dosimetric E-Field Probe	SPEAG	EX3DV4	3590	Feb. 25, 2011	Annual
Dosimetric E-Field Probe	SPEAG	EX3DV4	3650	Oct. 26, 2011	Annual
Dosimetric E-Field Probe	SPEAG	EX3DV4	3800	Aug. 05, 2011	Annual
System Validation Kit	SPEAG	D835V2	4d021	Mar. 23, 2011	Annual
System Validation Kit	SPEAG	D1750V2	1055	Aug. 09, 2011	Annual
System Validation Kit	SPEAG	D1900V2	5d022	Jan. 26, 2011	Annual
System Validation Kit	SPEAG	D2450V2	716	Jan. 26, 2011	Annual
System Validation Kit	SPEAG	D5GHzV2	1019	Jan. 25, 2011	Annual
Data Acquisition Electronics	SPEAG	DAE3	579	Sep. 23, 2011	Annual
Data Acquisition Electronics	SPEAG	DAE4	861	Aug. 29, 2011	Annual
Data Acquisition Electronics	SPEAG	DAE4	1277	Jul. 29, 2011	Annual
SAM Phantom	SPEAG	QD000P40CD	TP-1652	N/A	N/A
SAM Phantom	SPEAG	QD000P40CD	TP-1485	N/A	N/A
SAM Phantom	SPEAG	QD000P40CD	TP-1202	N/A	N/A
SAM Phantom	SPEAG	QD000P40CD	TP-1653	N/A	N/A
ELI Phantom	SPEAG	QDOVA001B	TP-1043	N/A	N/A
Radio Communication Tester	Agilent	E5515C	MY50266628	Sep. 26, 2011	Biennial
Radio Communication Analyzer	Anritsu	MT8820C	6201010284	Aug. 01, 2011	Biennial
ENA Series Network Analyzer	Agilent	E5071C	MY46104190	Apr. 15, 2011	Annual
Signal Generator	Agilent	E8257C	MY43320668	Dec. 20, 2011	Annual
Power Meter	Anritsu	ML2487A	6K00001571	May 25, 2011	Annual
Power Sensor	Anritsu	MA2491A	030954	May 25, 2011	Annual
Dielectric Probe Kit	Agilent	85070D	N/A	N/A	N/A
Thermometer	YFE	YF-160A	110600361	Feb. 21, 2012	Annual

6. Measurement Uncertainty

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Standard Uncertainty (1g)	Vi
Measurement System						
Probe Calibration	6.0	Normal	1	1	± 6.0 %	∞
Axial Isotropy	4.7	Rectangular	√3	0.7	± 1.9 %	∞
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	± 3.9 %	∞
Boundary Effects	1.0	Rectangular	√3	1	± 0.6 %	∞
Linearity	4.7	Rectangular	√3	1	± 2.7 %	∞
System Detection Limits	1.0	Rectangular	√3	1	± 0.6 %	∞
Readout Electronics	0.6	Normal	1	1	± 0.6 %	∞
Response Time	0.0	Rectangular	√3	1	± 0.0 %	∞
Integration Time	1.7	Rectangular	√3	1	± 1.0 %	∞
RF Ambient Noise	3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Reflections	3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	0.5	Rectangular	√3	1	± 0.3 %	∞
Probe Positioning	2.9	Rectangular	√3	1	± 1.7 %	∞
Max. SAR Eval.	2.3	Rectangular	√3	1	± 1.3 %	∞
Test Sample Related						
Device Positioning	3.9	Normal	1	1	± 3.9 %	31
Device Holder	2.7	Normal	1	1	± 2.7 %	19
Power Drift	5.0	Rectangular	√3	1	± 2.9 %	∞
Phantom and Setup						
Phantom Uncertainty	4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	± 1.8 %	∞
Liquid Conductivity (Meas.)	5.0	Normal	1	0.64	± 3.2 %	29
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	± 1.7 %	∞
Liquid Permittivity (Meas.)	5.0	Normal	1	0.6	± 3.0 %	29
Combined Standard Uncertainty					± 11.7 %	
Expanded Uncertainty (K=2)					**± 23.4 %**	

Uncertainty budget for frequency range 300 MHz to 3 GHz

Error Description	Uncertainty Value (±%)	Probability Distribution	Divisor	Ci (1g)	Standard Uncertainty (1g)	Vi
Measurement System						
Probe Calibration	6.55	Normal	1	1	± 6.55 %	∞
Axial Isotropy	4.7	Rectangular	√3	0.7	± 1.9 %	∞
Hemispherical Isotropy	9.6	Rectangular	√3	0.7	± 3.9 %	∞
Boundary Effects	2.0	Rectangular	√3	1	± 1.2 %	∞
Linearity	4.7	Rectangular	√3	1	± 2.7 %	∞
System Detection Limits	1.0	Rectangular	√3	1	± 0.6 %	∞
Readout Electronics	0.3	Normal	1	1	± 0.3 %	∞
Response Time	0.8	Rectangular	√3	1	± 0.5 %	∞
Integration Time	2.6	Rectangular	√3	1	± 1.5 %	∞
RF Ambient Noise	3.0	Rectangular	√3	1	± 1.7 %	∞
RF Ambient Reflections	3.0	Rectangular	√3	1	± 1.7 %	∞
Probe Positioner	0.8	Rectangular	√3	1	± 0.5 %	∞
Probe Positioning	9.9	Rectangular	√3	1	± 5.7 %	∞
Max. SAR Eval.	4.0	Rectangular	√3	1	± 2.3 %	∞
Test Sample Related						
Device Positioning	3.9	Normal	1	1	± 3.9 %	31
Device Holder	2.7	Normal	1	1	± 2.7 %	19
Power Drift	5.0	Rectangular	√3	1	± 2.9 %	∞
Phantom and Setup						
Phantom Uncertainty	4.0	Rectangular	√3	1	± 2.3 %	∞
Liquid Conductivity (Target)	5.0	Rectangular	√3	0.64	± 1.8 %	∞
Liquid Conductivity (Meas.)	5.0	Normal	1	0.64	± 3.2 %	30
Liquid Permittivity (Target)	5.0	Rectangular	√3	0.6	± 1.7 %	∞
Liquid Permittivity (Meas.)	5.0	Normal	1	0.6	± 3.0 %	30
Combined Standard Uncertainty					± 13.4 %	
Expanded Uncertainty (K=2)					**± 26.8 %**	

Uncertainty budget for frequency range 3 GHz to 6 GHz

7. Information on the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation and authorization certificates of our laboratories obtained from approval agencies can be downloaded from our web site. If you have any comments, please feel free to contact us at the following:

Taiwan HwaYa EMC/RF/Safety/Telecom Lab:
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Web Site: www.adt.com.tw

The road map of all our labs can be found in our web site also.

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Appendix A. SAR Plots of System Verification

The plots for system verification are shown as follows.

Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2011/12/19

System Check_H835_111219

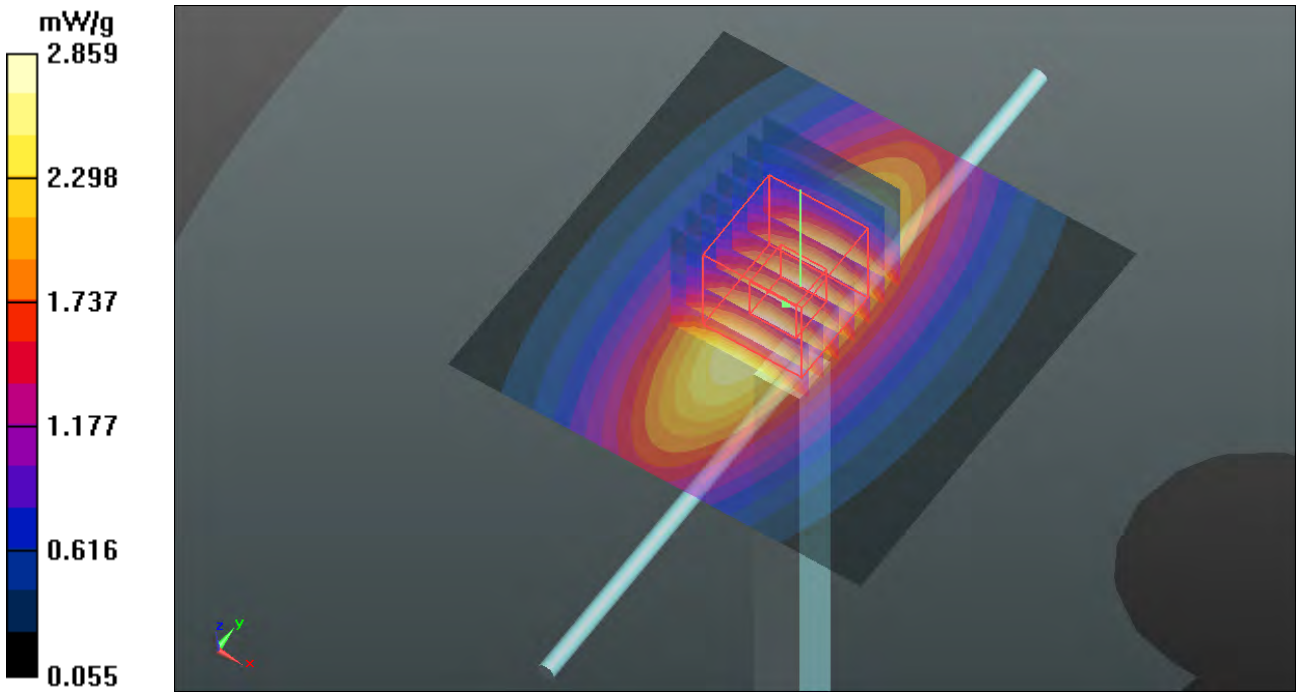
DUT: Dipole 835 MHz; Type: D835V2; SN: 4d021

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: H850_1219 Medium parameters used: f = 835 MHz; σ = 0.879 mho/m; ε_r = 42.262; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(8.7, 8.7, 8.7); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.859 mW/g

Pin=250mW/Zoom Scan(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.048 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.396 W/kg
SAR(1 g) = 2.25 mW/g; SAR(10 g) = 1.48 mW/g
Maximum value of SAR (measured) = 2.853 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/13

System Check_H835_120113

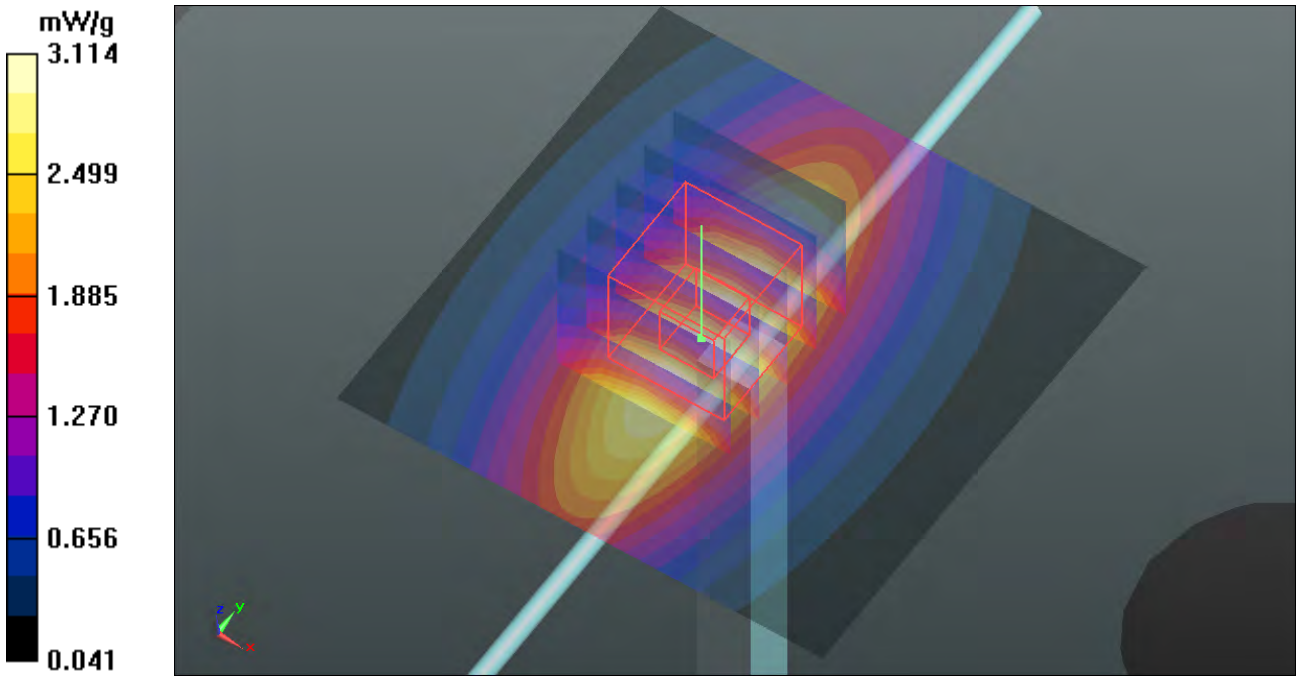
DUT: Dipole 835 MHz; Type: D835V2; SN: 4d021

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: H835_0113 Medium parameters used: f = 835 MHz; σ = 0.921 mho/m; ε_r = 43.09; ρ = 1000 kg/m^3
Ambient Temperature：21.2 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(8.87, 8.87, 8.87); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.114 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 55.035 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.6760
SAR(1 g) = 2.48 mW/g; SAR(10 g) = 1.63 mW/g
Maximum value of SAR (measured) = 3.142 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2011/12/22

System Check_B835_111222

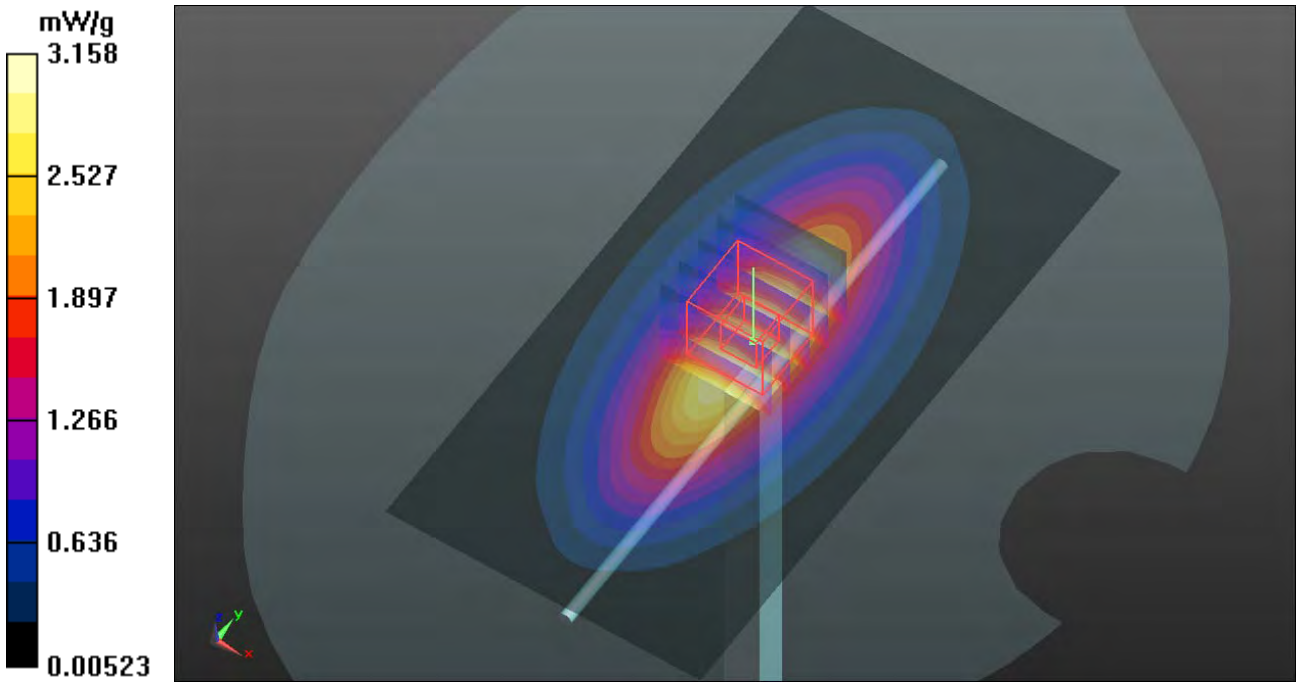
DUT: Dipole 835 MHz; Type: D835V2; SN: 4d021

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: B835_1222 Medium parameters used: f = 835 MHz; σ = 0.996 mho/m; ε_r = 55.208; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.158 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 54.626 V/m; Power Drift = -0.0025 dB
Peak SAR (extrapolated) = 3.685 W/kg
SAR(1 g) = 2.51 mW/g; SAR(10 g) = 1.66 mW/g
Maximum value of SAR (measured) = 3.161 mW/g



System Check_B835_111230

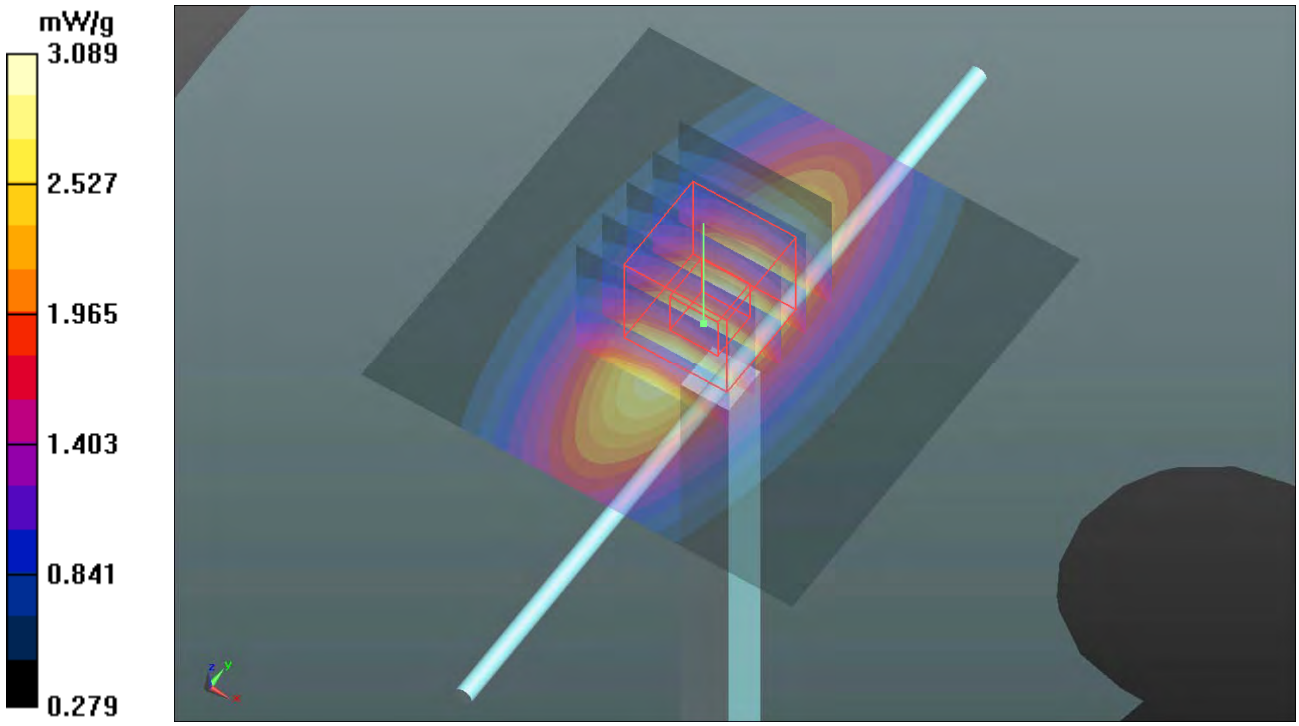
DUT: Dipole 835 MHz; Type: D835V2; SN: 4d021

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: B835_1230 Medium parameters used: f = 835 MHz; σ = 0.994 mho/m; ε_r = 55.056; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3590; ConvF(10.32, 10.32, 10.32); Calibrated: 2011/02/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2011/08/29
- Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: TP:1653
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.105 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 53.684 V/m; Power Drift = 0.0039 dB
Peak SAR (extrapolated) = 3.6430
SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.61 mW/g
Maximum value of SAR (measured) = 3.089 mW/g



System Check_B835_120114

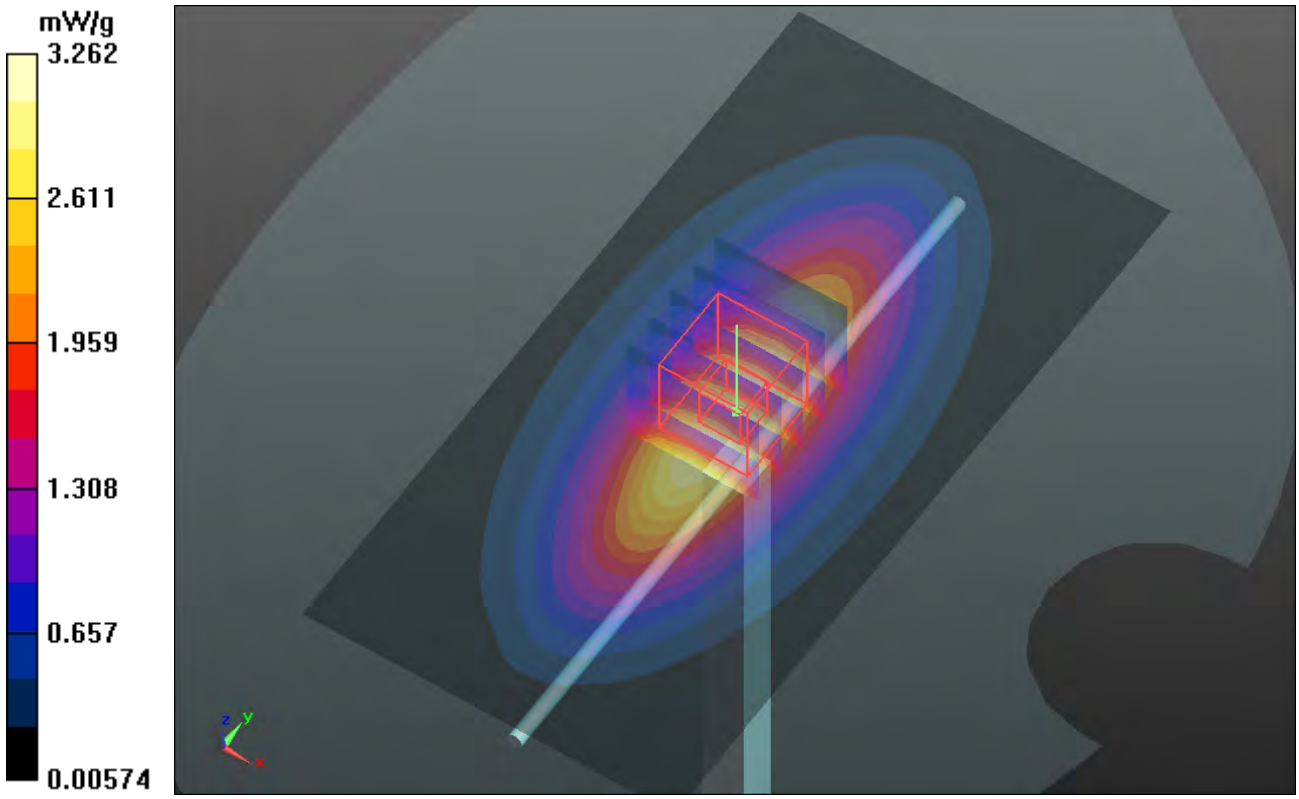
DUT: Dipole 835 MHz; Type: D835V2; SN: 4d021

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: B835_0114 Medium parameters used: f = 835 MHz; σ = 0.998 mho/m; ε_r = 55.464; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.12, 9.12, 9.12); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.262 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 55.494 V/m; Power Drift = -0.0046 dB
Peak SAR (extrapolated) = 3.7980
SAR(1 g) = 2.59 mW/g; SAR(10 g) = 1.72 mW/g
Maximum value of SAR (measured) = 3.259 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2011/12/20

System Check_H1900_111220

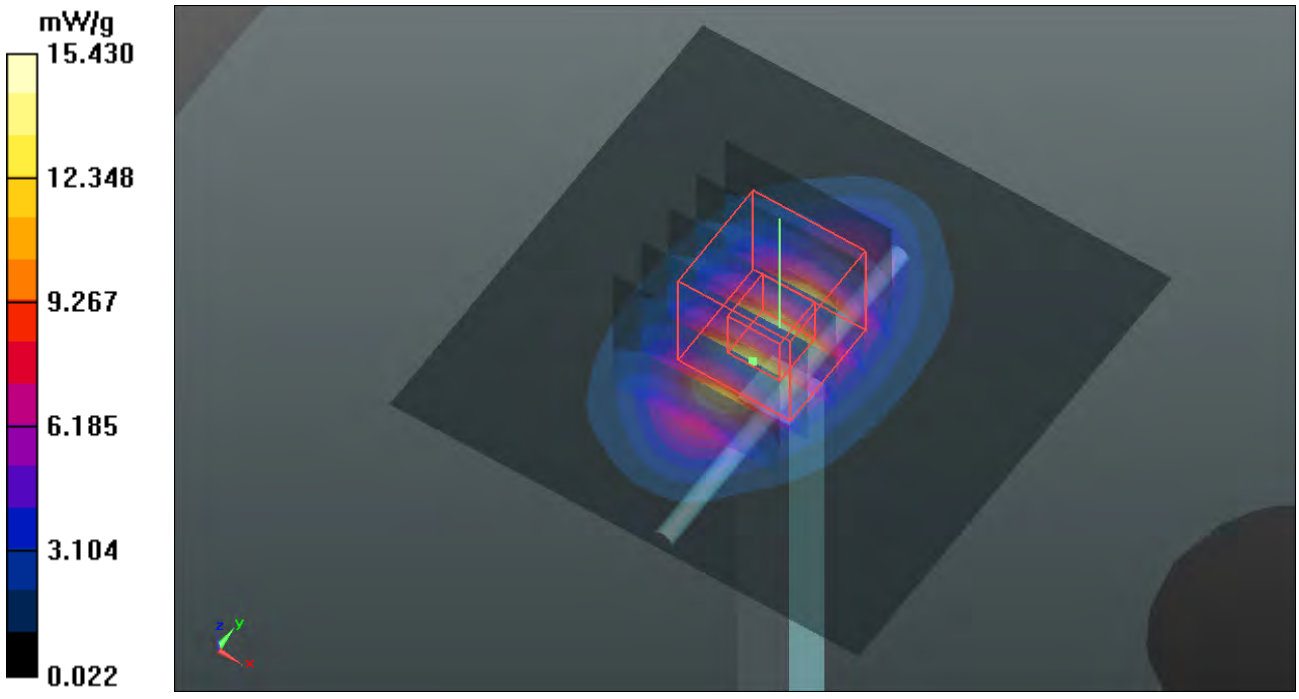
DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d022

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: H1900_1220 Medium parameters used: f = 1900 MHz; σ = 1.438 mho/m; ε_r = 39.948; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(7.46, 7.46, 7.46); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 15.430 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 102.7 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 19.222 W/kg
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.32 mW/g
Maximum value of SAR (measured) = 14.790 mW/g



System Check_H1900_111226

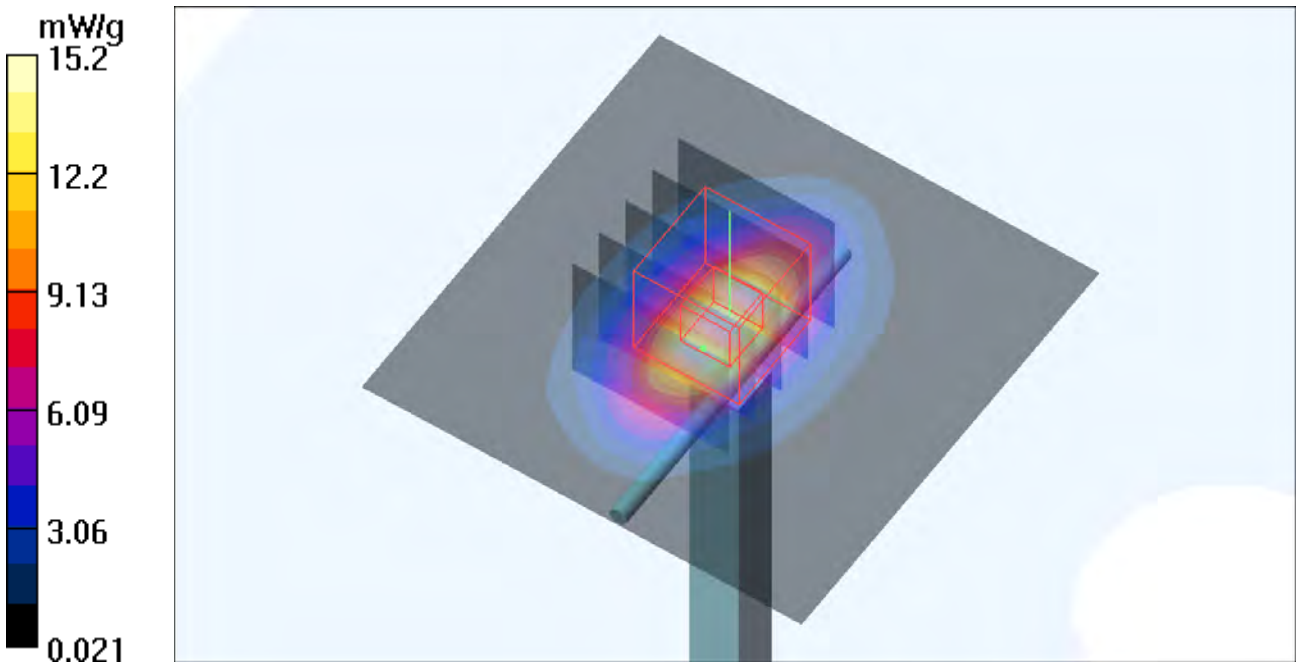
DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d022

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: H1900_1226 Medium parameters used : f = 1900 MHz; σ = 1.4 mho/m; ε_r = 39.1; ρ = 1000 kg/m^3
Ambient Temperature：22.7 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(7.46, 7.46, 7.46); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM V4.0; Serial: TP 1652
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 15.2 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 103.8 V/m; Power Drift = 0.022 dB
Peak SAR (extrapolated) = 19.0 W/kg
SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.27 mW/g
Maximum value of SAR (measured) = 14.6 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/13

System Check_H1900_120113

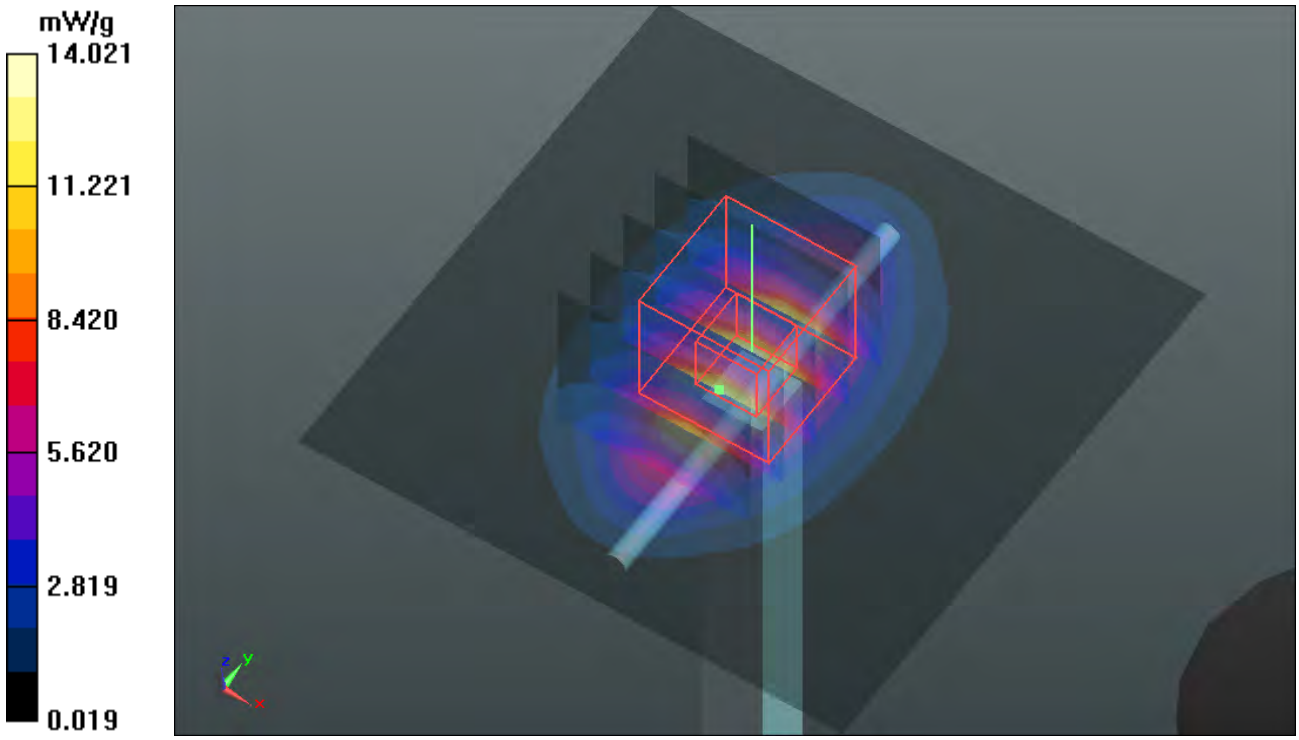
DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d022

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: H1900_0113 Medium parameters used: f = 1900 MHz; σ = 1.389 mho/m; ε_r = 40.164; ρ = 1000 kg/m^3
Ambient Temperature：21.3 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.4, 7.4, 7.4); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 14.021 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 100.8 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 18.0250
SAR(1 g) = 9.45 mW/g; SAR(10 g) = 4.86 mW/g
Maximum value of SAR (measured) = 13.731 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2011/12/21

SystemCheck_B1900_111221

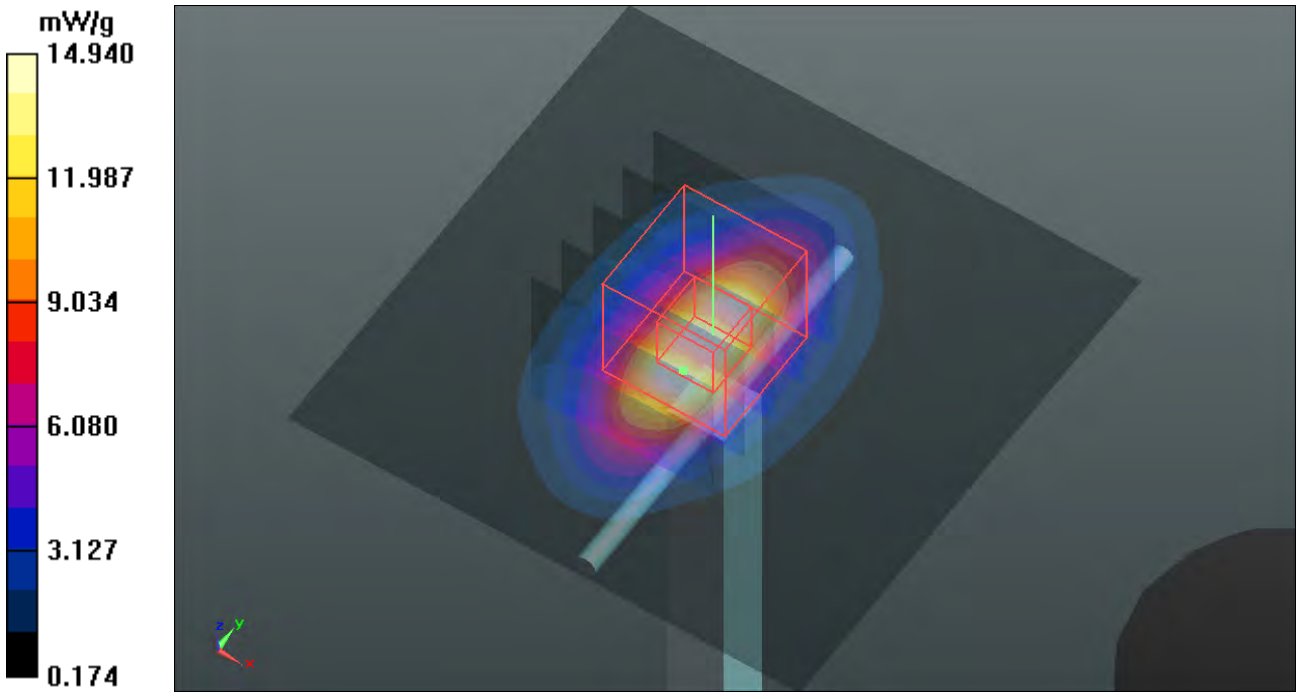
DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d022

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: B1900_1221 Medium parameters used: f = 1900 MHz; σ = 1.553 mho/m; ε_r = 53.152; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3800; ConvF(6.97, 6.97, 6.97); Calibrated: 2011/08/05
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 15.332 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 99.047 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 19.215 W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.38 mW/g
Maximum value of SAR (measured) = 14.940 mW/g



SystemCheck_B1900_111230

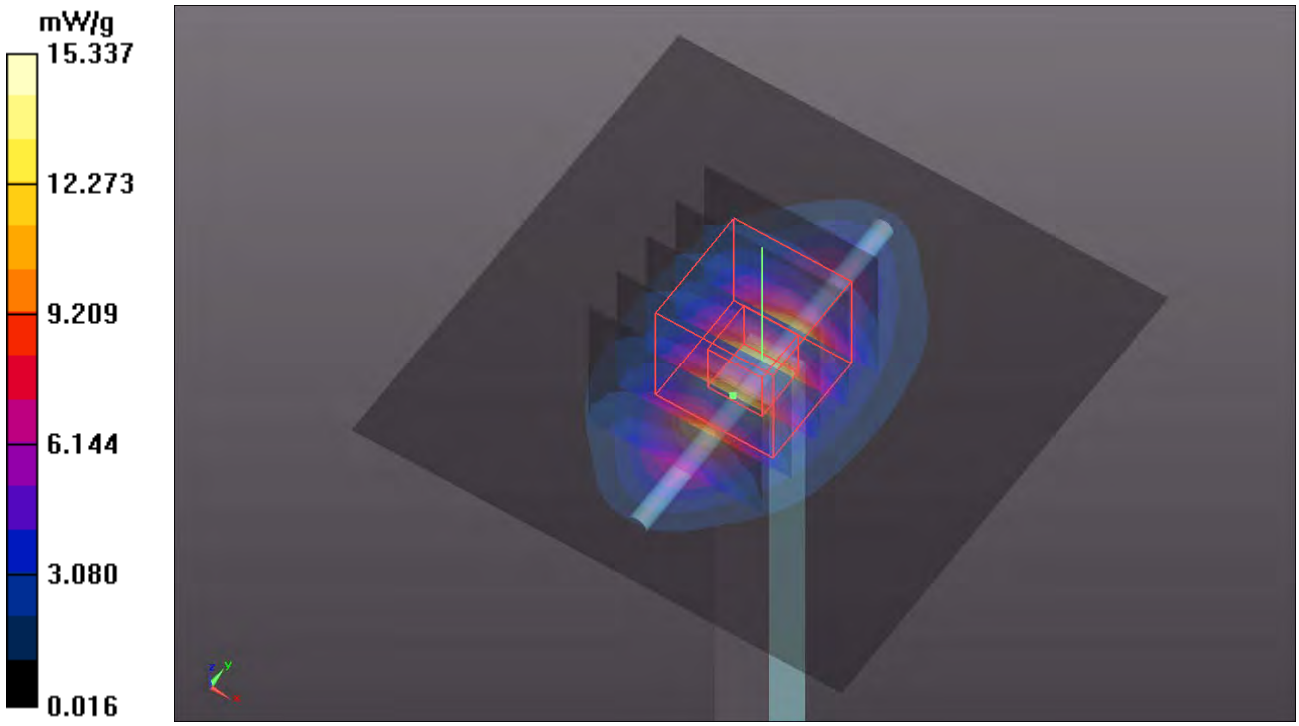
DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d022

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: B1900_1230 Medium parameters used : f = 1900 MHz; σ = 1.548 mho/m; ε_r = 52.391; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3590; ConvF(8.49, 8.49, 8.49); Calibrated: 2011/02/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2011/08/29
- Phantom: ELI v4.0; Type: QDOVA001BA; Serial: TP:1043
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 15.337 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 98.460 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 18.6060
SAR(1 g) = 10 mW/g; SAR(10 g) = 5.12 mW/g
Maximum value of SAR (measured) = 14.450 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/14

SystemCheck_B1900_120114

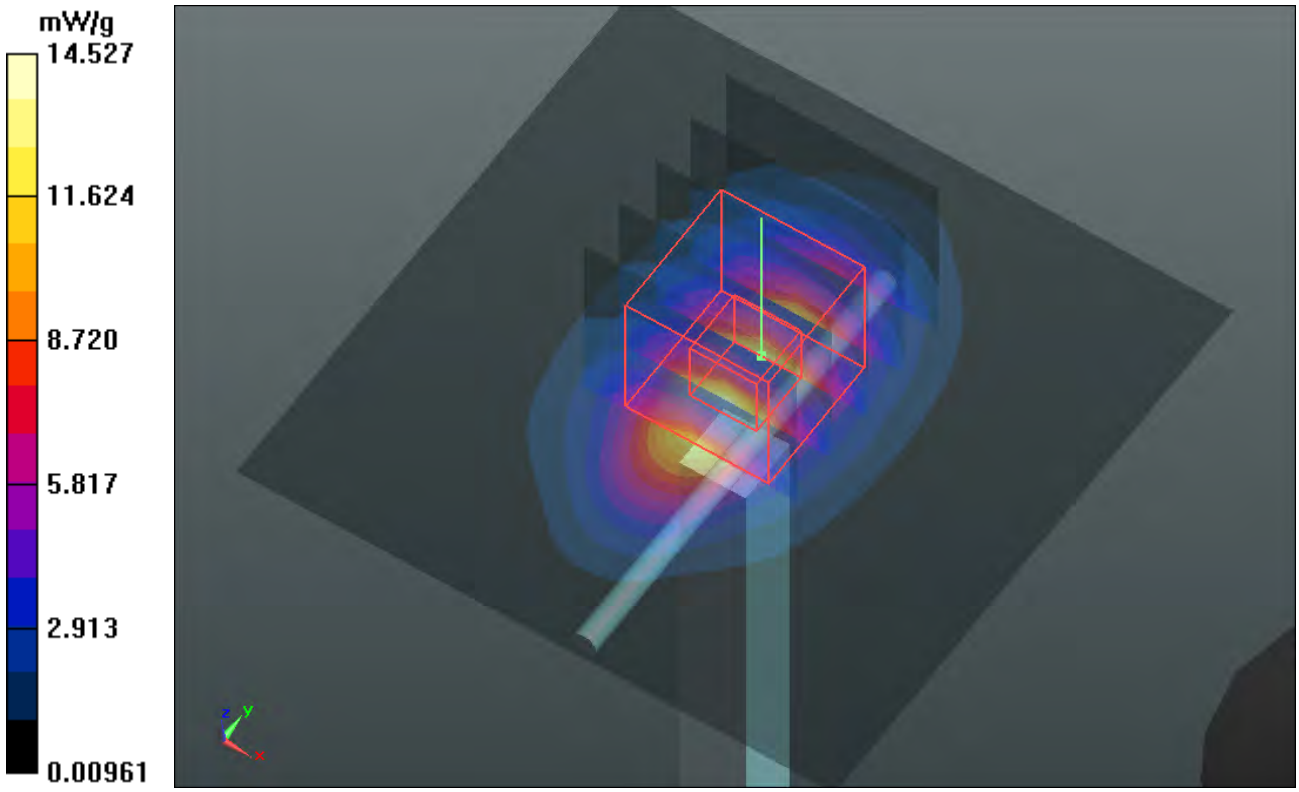
DUT: Dipole 1900 MHz; Type: D1900V2; SN: 5d022

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: B1900_0114 Medium parameters used: f = 1900 MHz; σ = 1.519 mho/m; ε_r = 53.711; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.46, 7.46, 7.46); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 14.527 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 97.296 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 17.5370
SAR(1 g) = 9.71 mW/g; SAR(10 g) = 5.04 mW/g
Maximum value of SAR (measured) = 13.632 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2011/12/22

System Check_H2450_111222

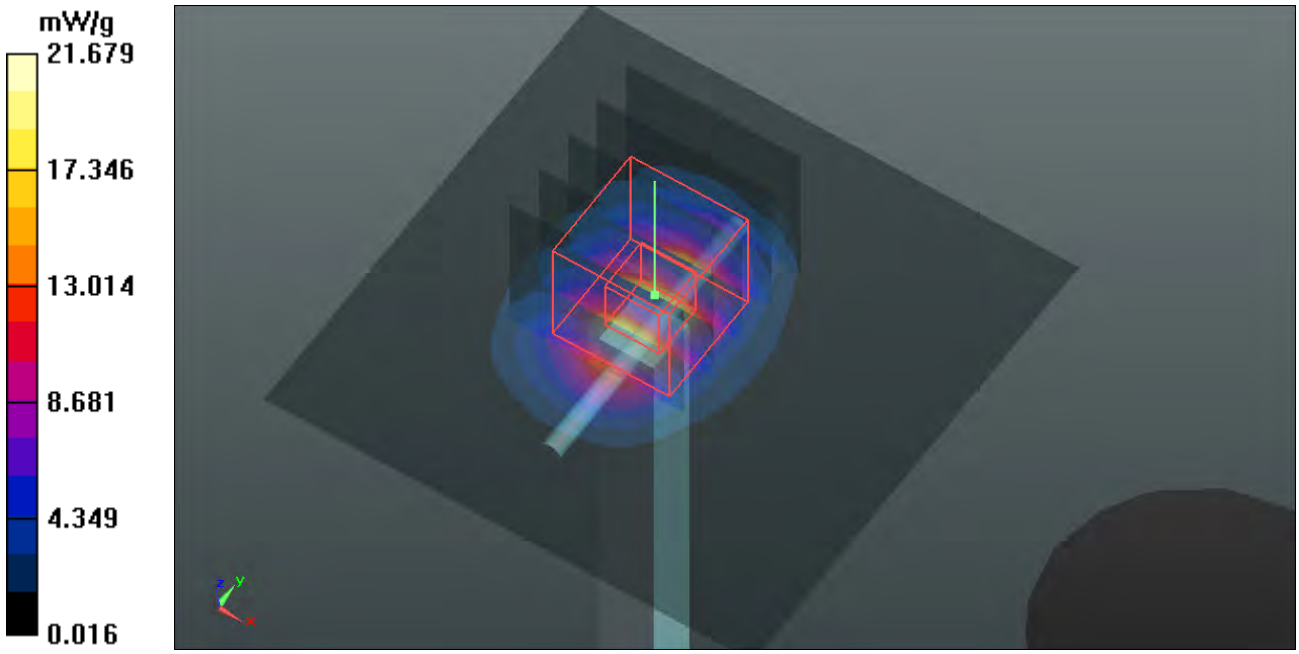
DUT: Dipole 2450 MHz; Type: D2450V2; SN: 716

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL2450_1222 Medium parameters used: f = 2450 MHz; σ = 1.815 mho/m; ε_r = 38.126; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(6.8, 6.8, 6.8); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 21.679 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 107.3 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 28.1280
SAR(1 g) = 13.3 mW/g; SAR(10 g) = 6.07 mW/g
Maximum value of SAR (measured) = 20.195 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/16

System Check_H2450_120116

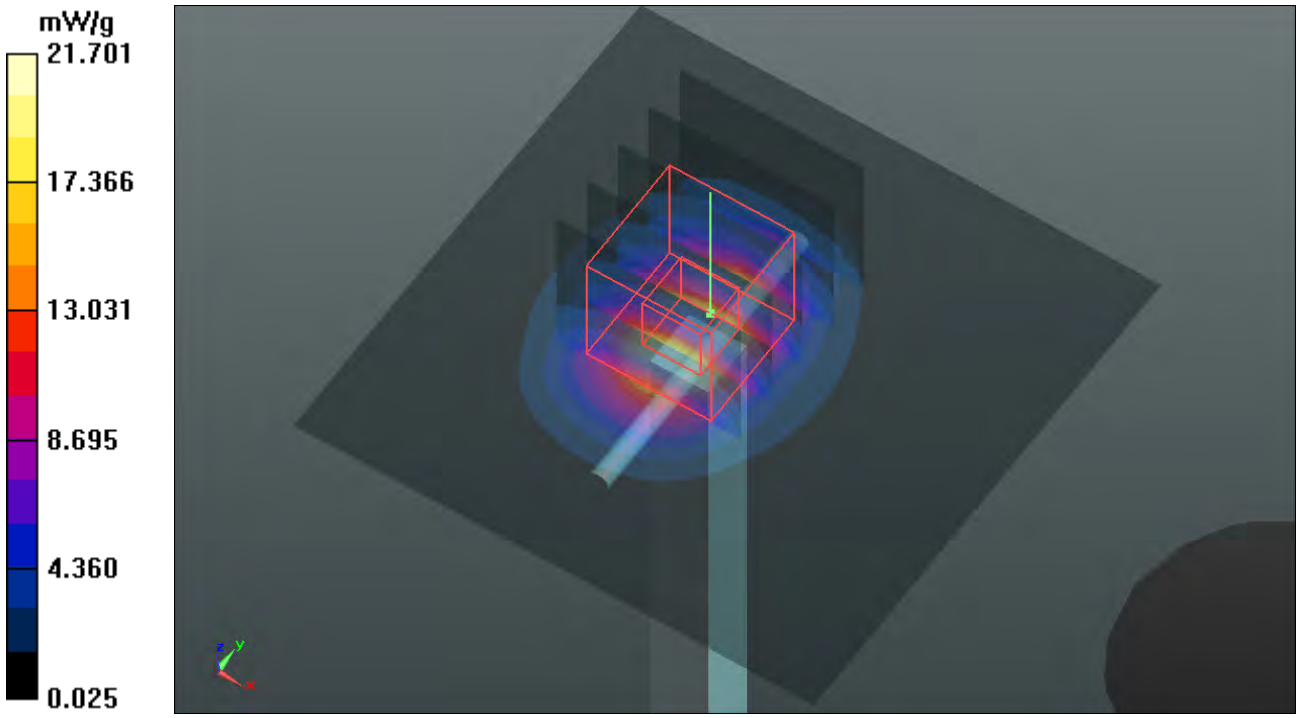
DUT: Dipole 2450 MHz; Type: D2450V2; SN: 716

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: H2450_0116 Medium parameters used: f = 2450 MHz; σ = 1.811 mho/m; ε_r = 37.4; ρ = 1000 kg/m^3
Ambient Temperature：21.3 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(6.8, 6.8, 6.8); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 21.701 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 105.1 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 28.0200
SAR(1 g) = 12.6 mW/g; SAR(10 g) = 5.72 mW/g
Maximum value of SAR (measured) = 19.260 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2011/12/22

System Check_B2450_111222

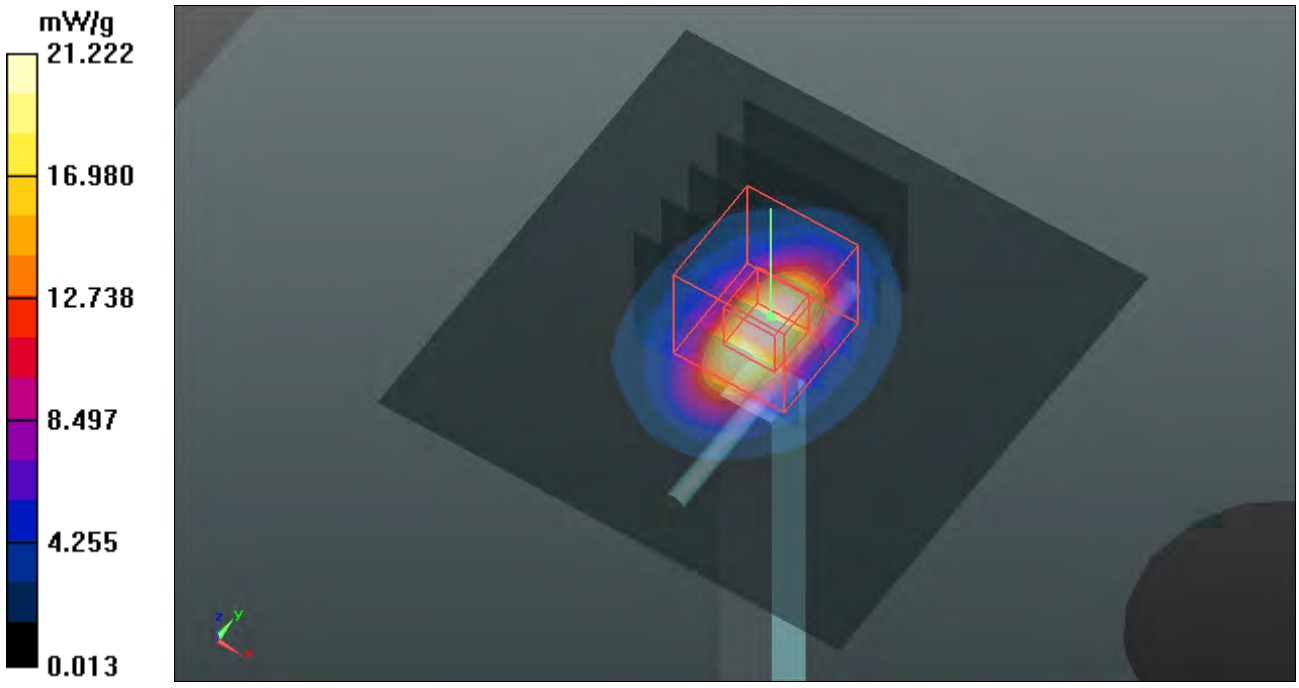
DUT: Dipole 2450 MHz; Type: D2450V2; SN: 716

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: B2450_1222 Medium parameters used: f = 2450 MHz; σ = 1.976 mho/m; ε_r = 50.932; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(6.89, 6.89, 6.89); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.6 (2); SEMCAD X Version 14.4.5 (3634)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 21.222 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 103.5 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 27.762 W/kg
SAR(1 g) = 13.5 mW/g; SAR(10 g) = 6.22 mW/g
Maximum value of SAR (measured) = 20.239 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/03

System Check_B2450_120103

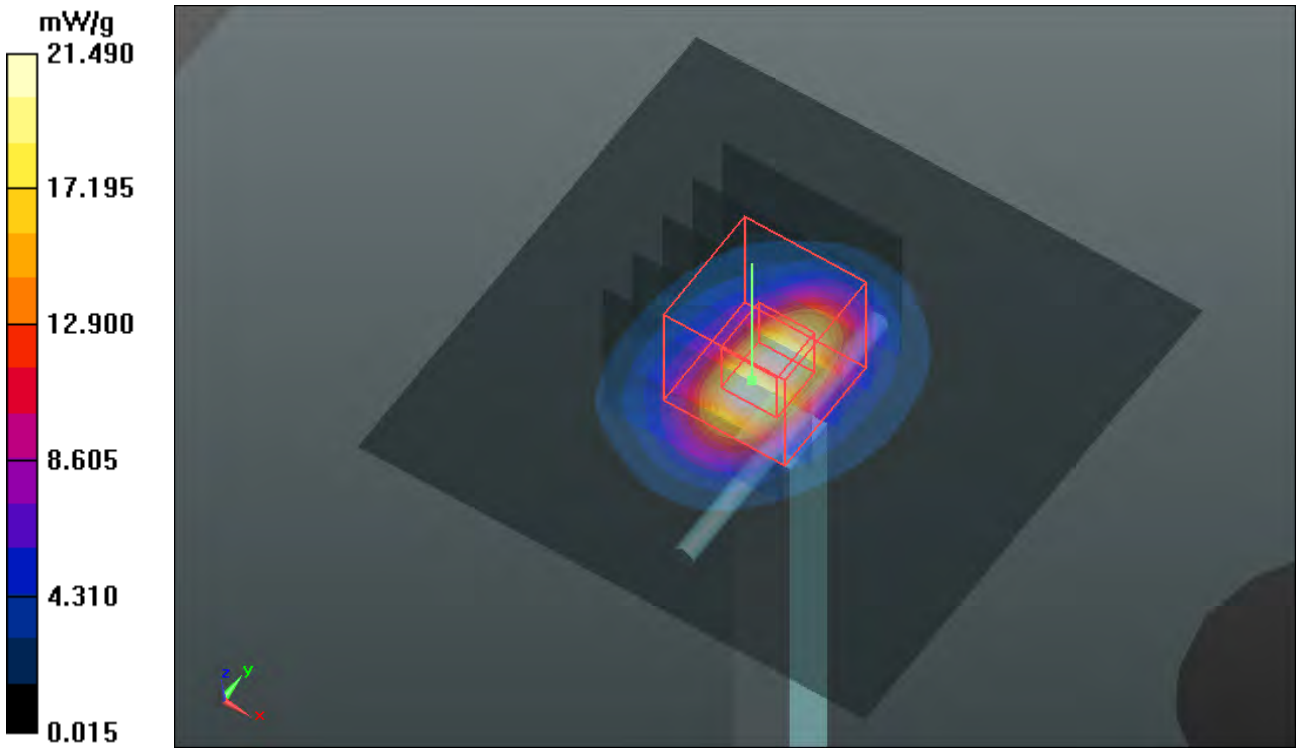
DUT: Dipole 2450 MHz; Type: D2450V2; SN: 716

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: B2450_0103 Medium parameters used: f = 2450 MHz; σ = 1.966 mho/m; ε_r = 51.318; ρ = 1000 kg/m^3
Ambient Temperature：22.1 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3590; ConvF(7.91, 7.91, 7.91); Calibrated: 2011/02/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2011/08/29
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 21.490 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 104.2 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 28.2440
SAR(1 g) = 13.8 mW/g; SAR(10 g) = 6.37 mW/g
Maximum value of SAR (measured) = 20.749 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/16

System Check_B2450_120116

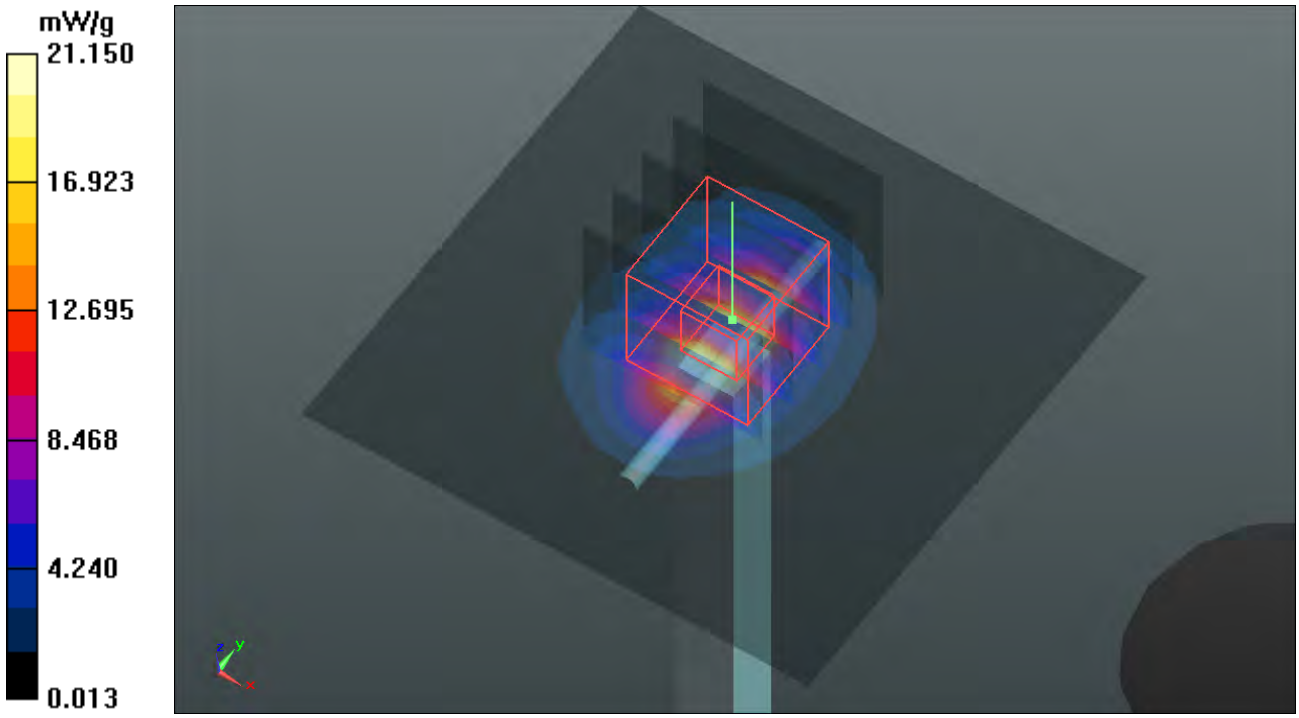
DUT: Dipole 2450 MHz; Type: D2450V2; SN: 716

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: B2450_0116 Medium parameters used: f = 2450 MHz; σ = 1.971 mho/m; ε_r = 50.948; ρ = 1000 kg/m^3
Ambient Temperature：21.3 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(6.89, 6.89, 6.89); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 21.150 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 103.4 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 27.6740
SAR(1 g) = 13.4 mW/g; SAR(10 g) = 6.2 mW/g
Maximum value of SAR (measured) = 20.173 mW/g



System Check_H5200_120102

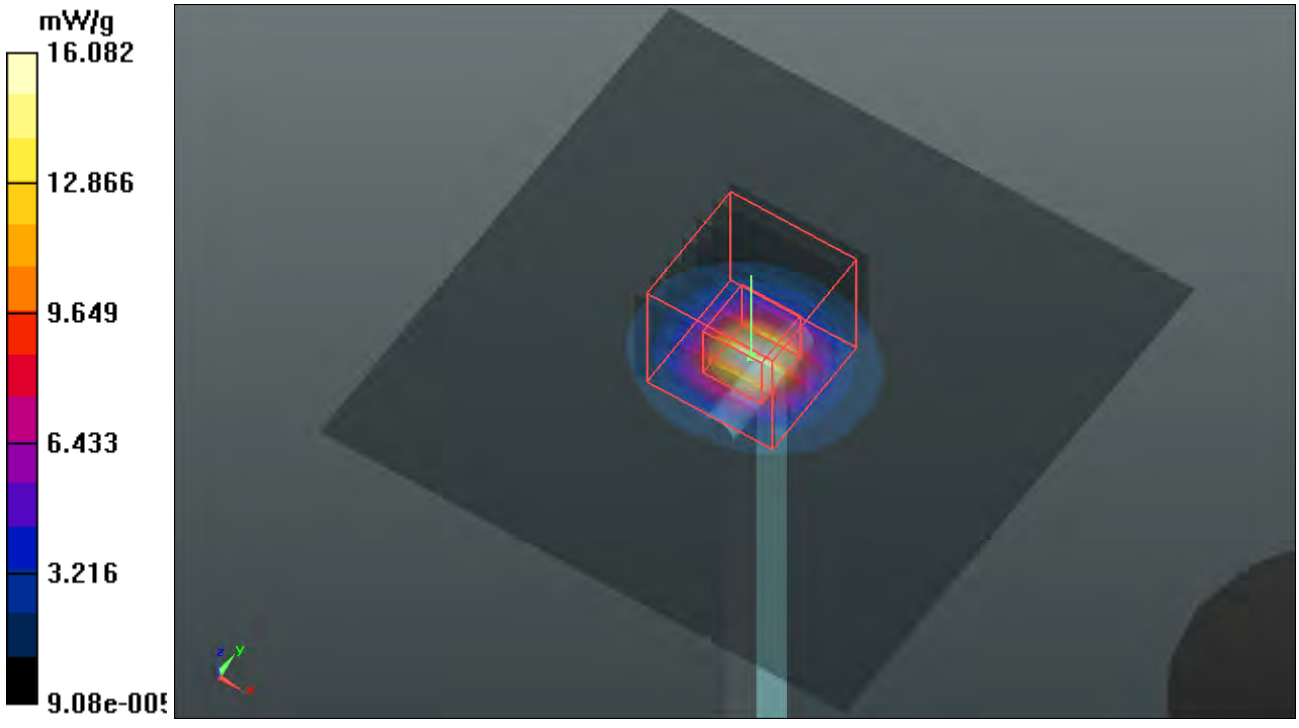
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: H5G_0102 Medium parameters used: f = 5200 MHz; σ = 4.752 mho/m; ε_r = 35.533; ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3590; ConvF(5.51, 5.51, 5.51); Calibrated: 2011/02/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2011/08/29
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=100mW, f=5200 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 16.361 mW/g

Pin=100mW, f=5200 MHz/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 60.753 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 32.2510
SAR(1 g) = 7.67 mW/g; SAR(10 g) = 2.17 mW/g
Maximum value of SAR (measured) = 16.082 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/16

System Check_H5200_120116

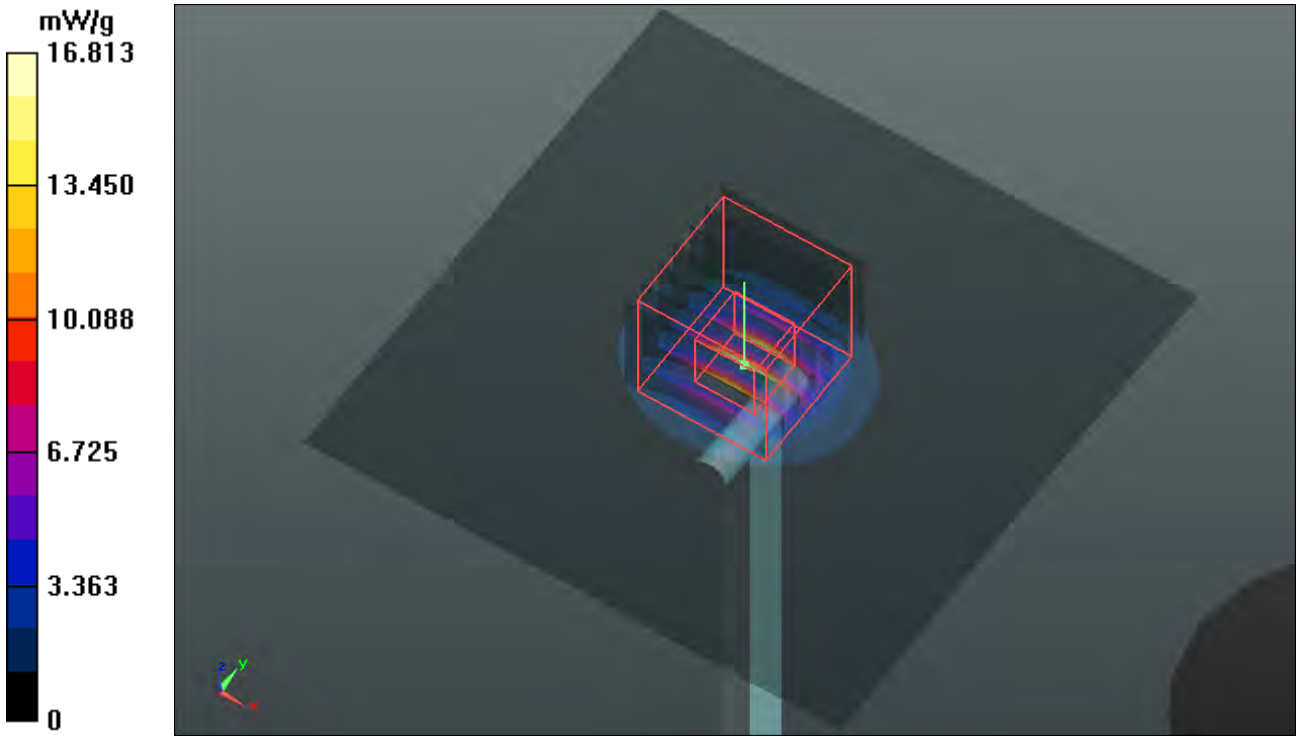
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: H5G_0116 Medium parameters used: f = 5200 MHz; σ = 4.705 mho/m; ε_r = 34.949; ρ = 1000 kg/m^3
Ambient Temperature：21.3 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(5.05, 5.05, 5.05); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=100mW, f=5200 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 16.813 mW/g

Pin=100mW, f=5200 MHz/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 63.280 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 31.7800
SAR(1 g) = 7.86 mW/g; SAR(10 g) = 2.25 mW/g
Maximum value of SAR (measured) = 16.656 mW/g



System Check_B5200_120104

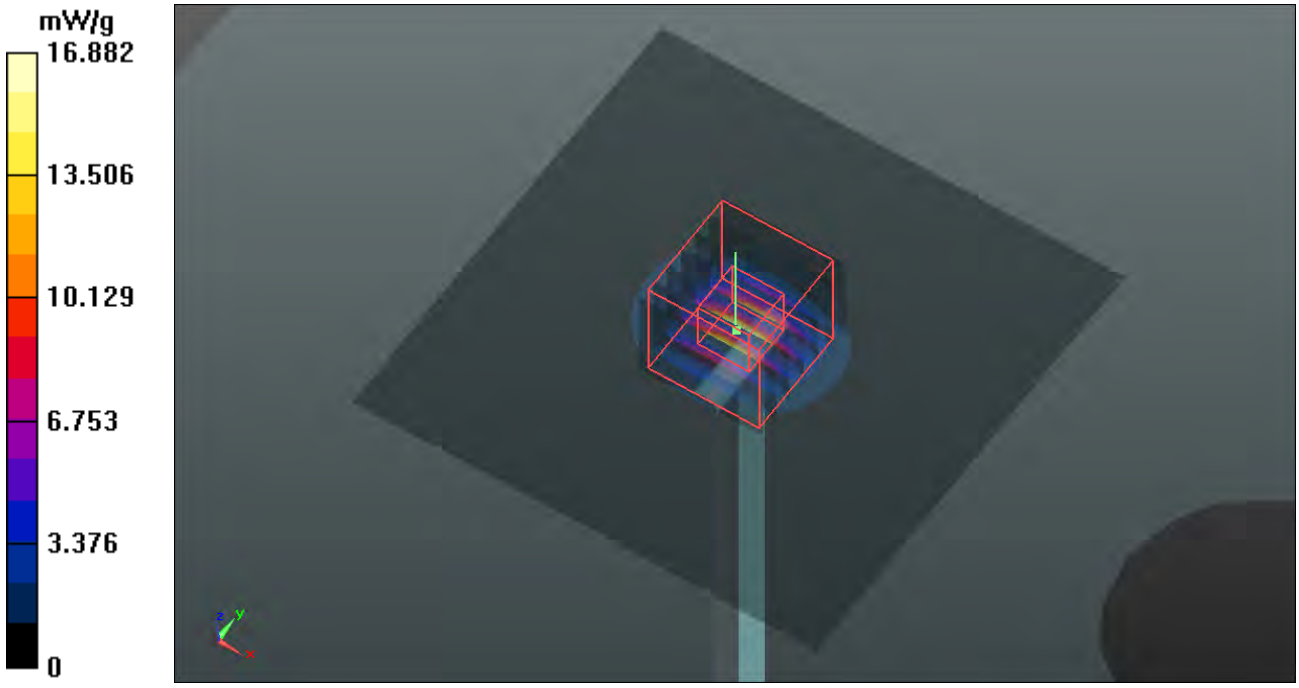
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: B5G_0104 Medium parameters used: f = 5200 MHz; σ = 5.168 mho/m; ε_r = 47.47; ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3590; ConvF(4.81, 4.81, 4.81); Calibrated: 2011/02/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1277; Calibrated: 2011/07/29
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=100mW, f=5200 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 16.882 mW/g

Pin=100mW, f=5200 MHz/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 61.888 V/m; Power Drift = 0.0003 dB
Peak SAR (extrapolated) = 29.1050
SAR(1 g) = 8.02 mW/g; SAR(10 g) = 2.2 mW/g
Maximum value of SAR (measured) = 16.448 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/16

System Check_B5200_120116

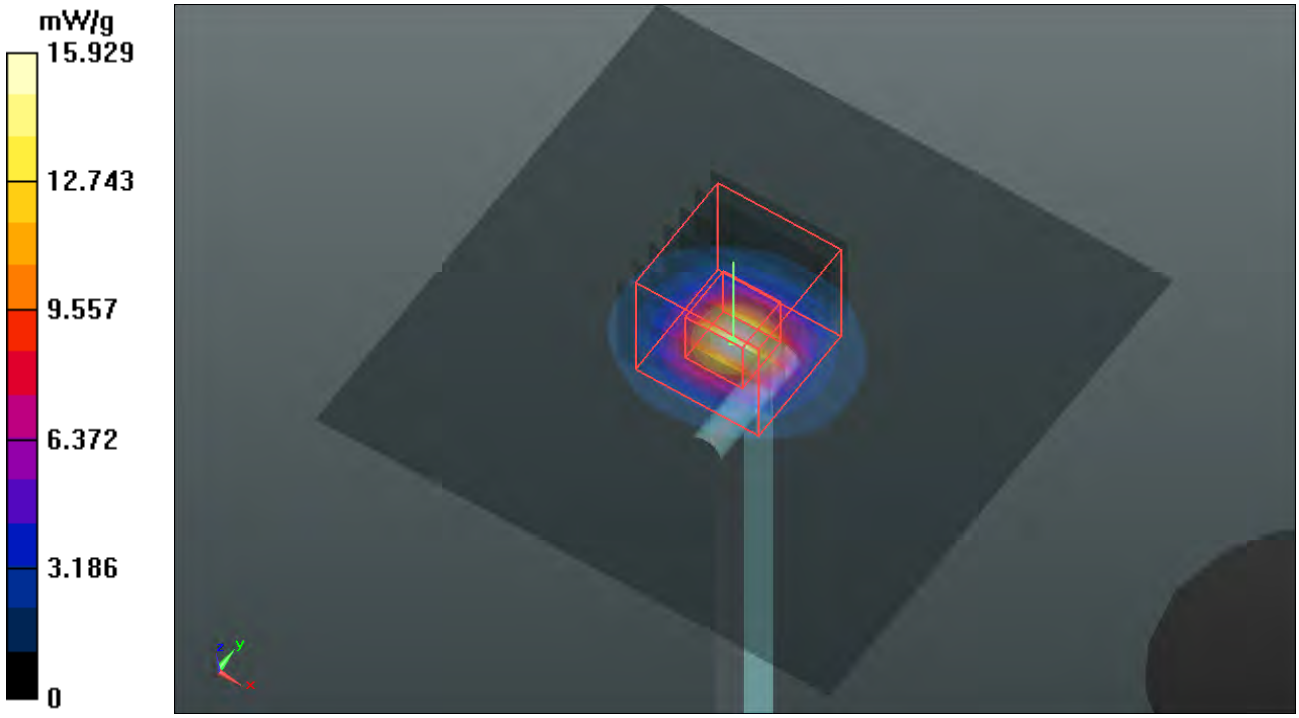
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: B5G_0116 Medium parameters used: f = 5200 MHz; σ = 5.174 mho/m; ε_r = 48.044; ρ = 1000 kg/m^3
Ambient Temperature：21.3 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(4.28, 4.28, 4.28); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=100mW, f=5200 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 15.929 mW/g

Pin=100mW, f=5200 MHz/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 59.865 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 27.0110
SAR(1 g) = 7.56 mW/g; SAR(10 g) = 2.23 mW/g
Maximum value of SAR (measured) = 15.606 mW/g



System Check_H5500_120102

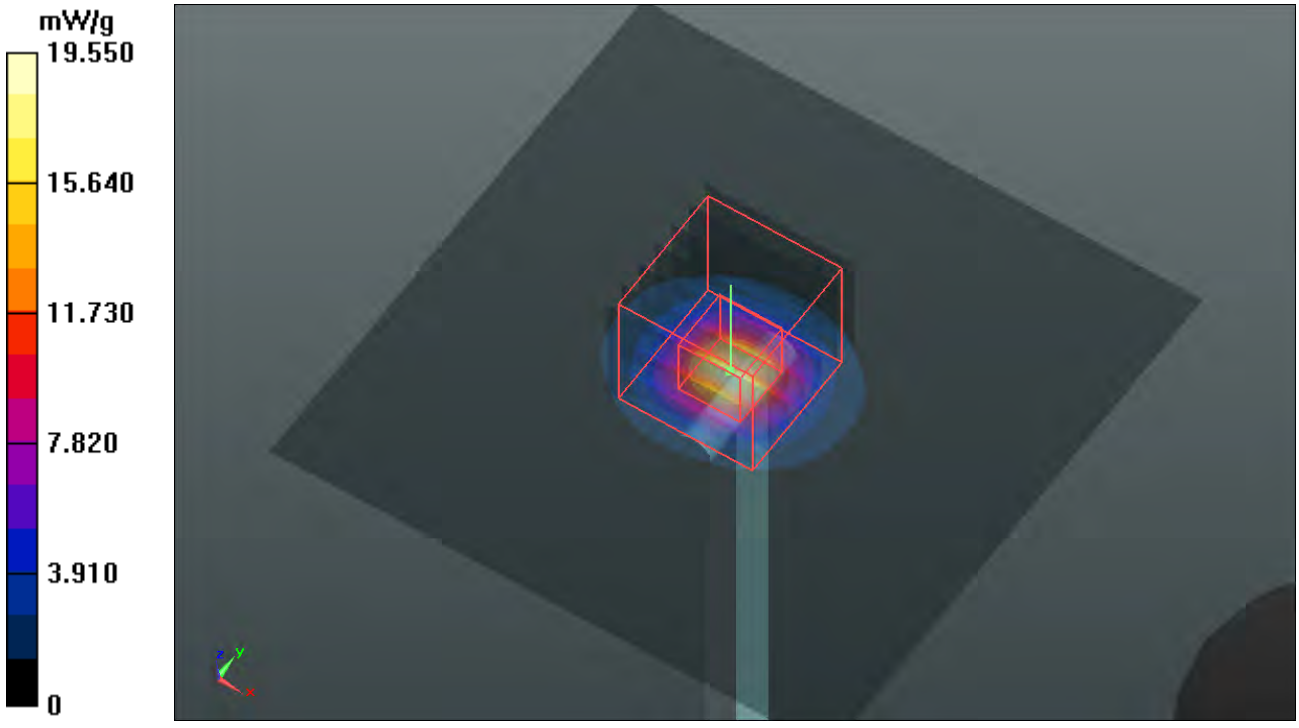
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: H5G_0102 Medium parameters used: f = 5800 MHz; σ = 5.114 mho/m; ε_r = 34.826; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3590; ConvF(4.53, 4.53, 4.53); Calibrated: 2011/02/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2011/08/29
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=100mW, f=5500 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 18.265 mW/g

Pin=100mW, f=5500 MHz/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 64.149 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 37.0410
SAR(1 g) = 8.97 mW/g; SAR(10 g) = 2.5 mW/g
Maximum value of SAR (measured) = 19.550 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/16

System Check_H5500_120116

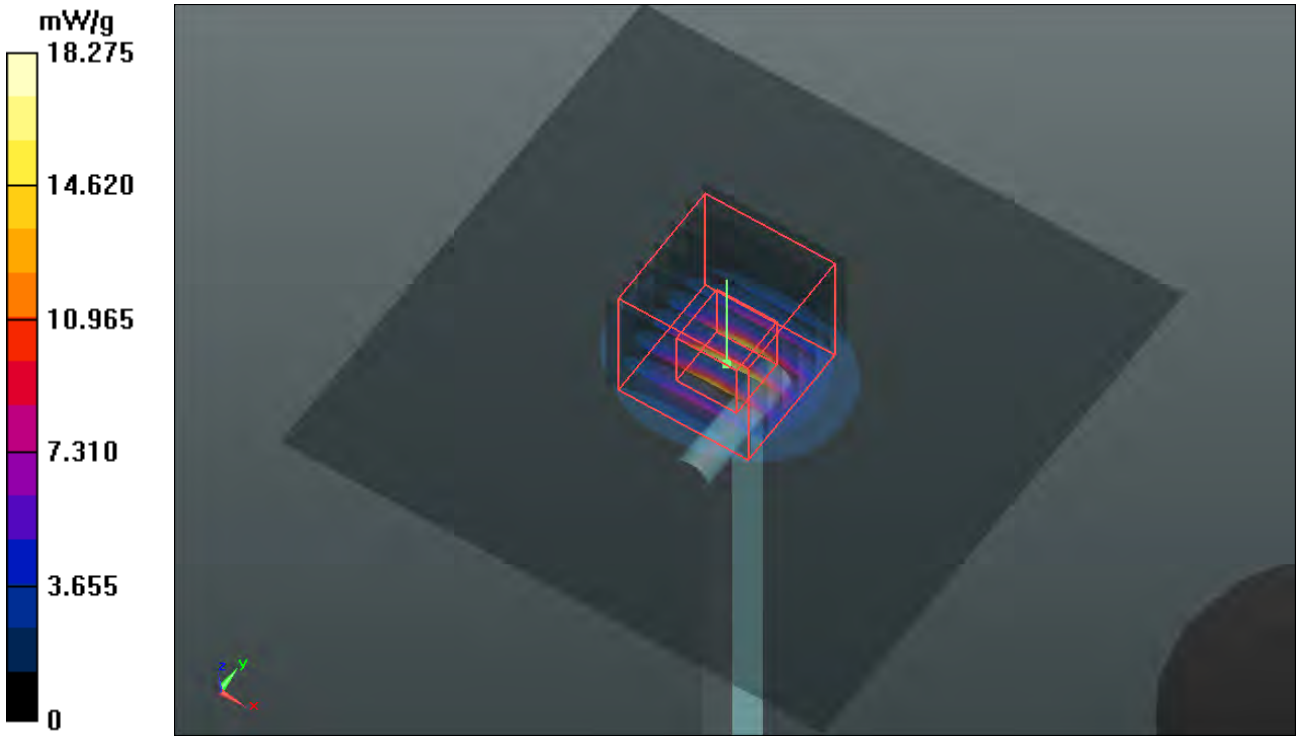
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: H5G_0116 Medium parameters used: f = 5500 MHz; σ = 4.872 mho/m; ε_r = 34.47; ρ = 1000 kg/m^3
Ambient Temperature：21.3 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(4.56, 4.56, 4.56); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=100mW, f=5500 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 18.275 mW/g

Pin=100mW, f=5500 MHz/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 65.615 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 33.9360
SAR(1 g) = 8.31 mW/g; SAR(10 g) = 2.34 mW/g
Maximum value of SAR (measured) = 17.902 mW/g



System Check_B5500_120104

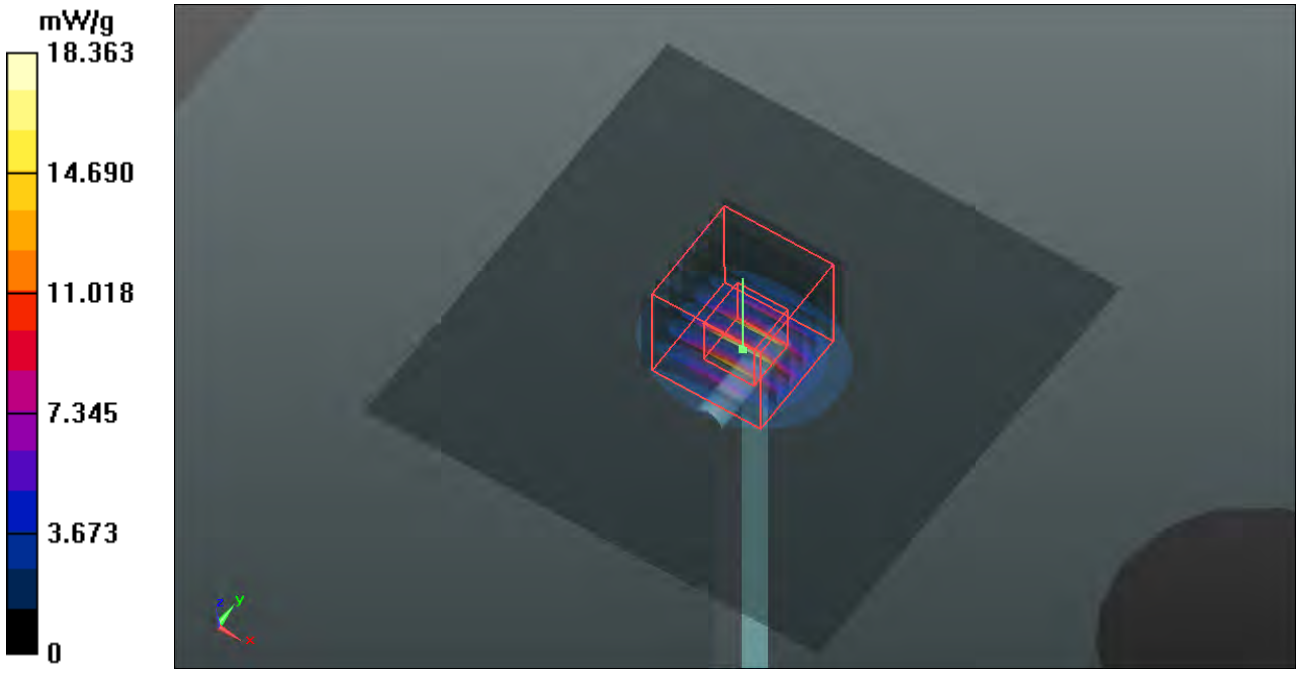
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: B5G_0104 Medium parameters used: f = 5500 MHz; σ = 5.665 mho/m; ε_r = 47.358; ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3590; ConvF(4.32, 4.32, 4.32); Calibrated: 2011/02/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2011/08/29
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=100mW, f=5500 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 18.363 mW/g

Pin=100mW, f=5500 MHz/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 62.870 V/m; Power Drift = -0.13 dB
Peak SAR (extrapolated) = 33.8150
SAR(1 g) = 8.57 mW/g; SAR(10 g) = 2.39 mW/g
Maximum value of SAR (measured) = 18.046 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/16

System Check_B5500_120116

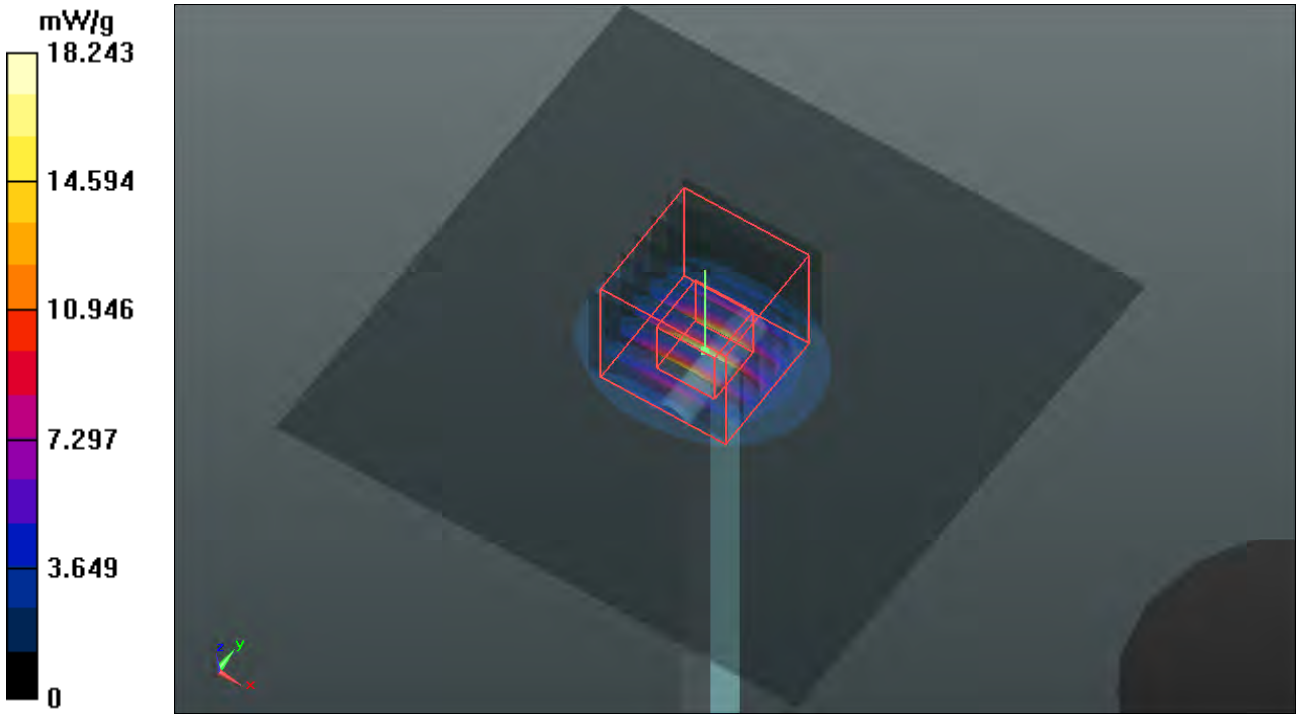
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: B5G_0116 Medium parameters used: f = 5500 MHz; σ = 5.678 mho/m; ε_r = 47.973; ρ = 1000 kg/m^3
Ambient Temperature：21.3 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(3.73, 3.73, 3.73); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=100mW, f=5500 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 18.243 mW/g

Pin=100mW, f=5500 MHz/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 61.917 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 29.9820
SAR(1 g) = 8.33 mW/g; SAR(10 g) = 2.42 mW/g
Maximum value of SAR (measured) = 17.682 mW/g



System Check_H5800_111129

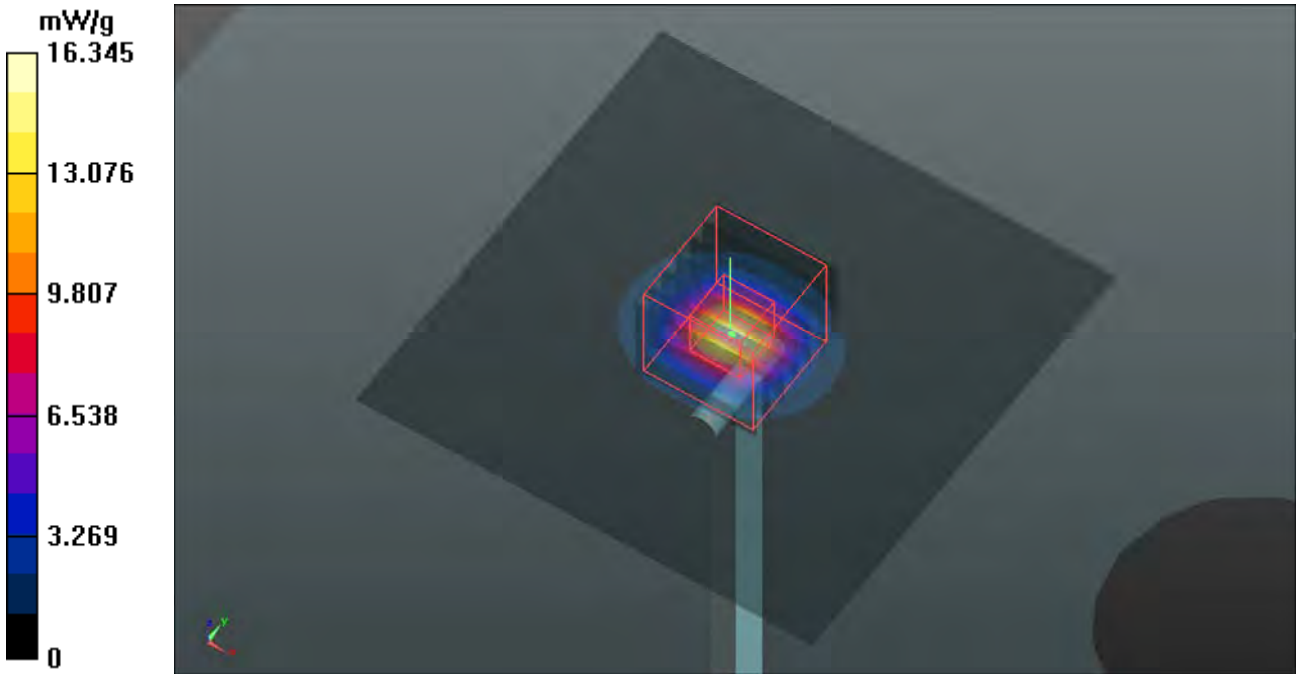
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: H5G_1229 Medium parameters used: f = 5800 MHz; σ = 5.15 mho/m; ε_r = 34.962; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3590; ConvF(4.53, 4.53, 4.53); Calibrated: 2011/02/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2011/08/29
- Phantom: SAM with CRP v5.0 Front; Type: QD000P40CD; Serial: TP:1653
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=100mW, f=5800 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 16.104 mW/g

Pin=100mW, f=5800 MHz/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 61.171 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 34.1730
SAR(1 g) = 7.75 mW/g; SAR(10 g) = 2.1 mW/g
Maximum value of SAR (measured) = 16.345 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/16

System Check_H5800_120116

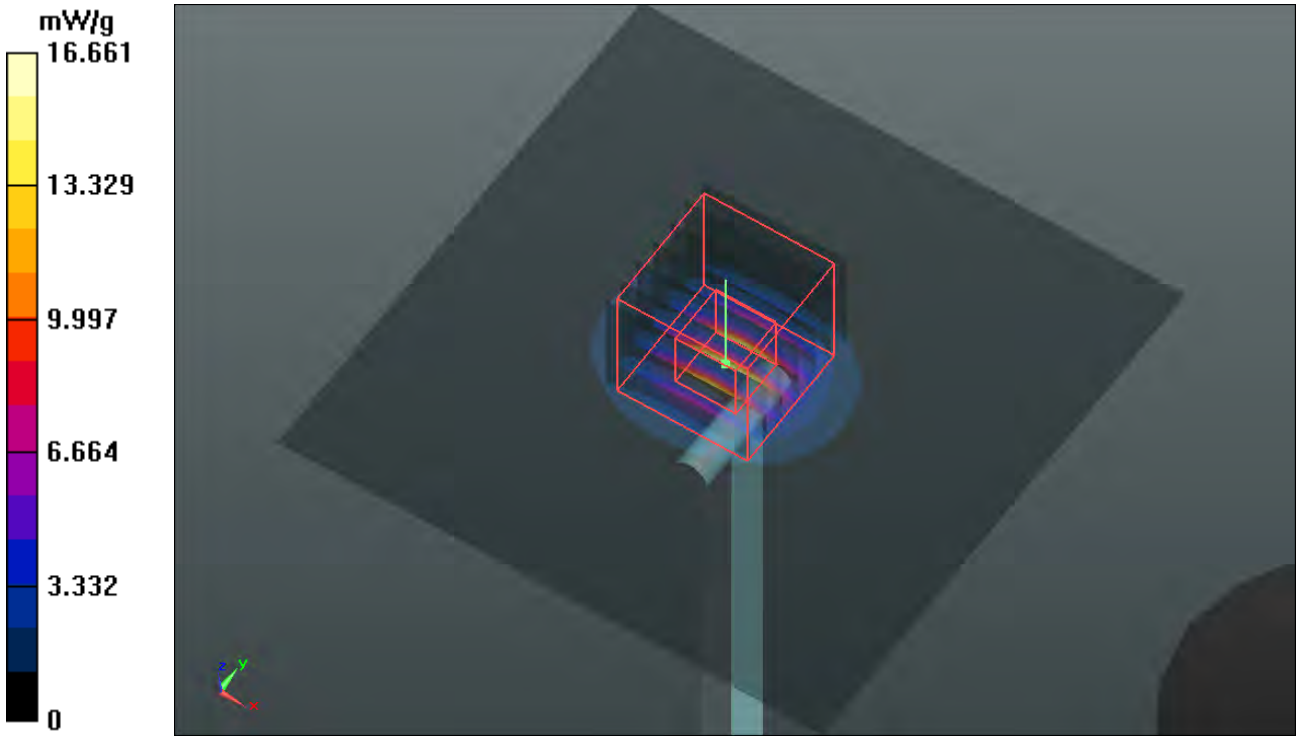
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: H5G_0116 Medium parameters used: f = 5800 MHz; σ = 5.068 mho/m; ε_r = 34.231; ρ = 1000 kg/m^3
Ambient Temperature：21.3 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(4.3, 4.3, 4.3); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=100mW, f=5800 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 16.661 mW/g

Pin=100mW, f=5800 MHz/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 62.525 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 31.8980
SAR(1 g) = 7.66 mW/g; SAR(10 g) = 2.17 mW/g
Maximum value of SAR (measured) = 16.601 mW/g



System Check_B5800_111229

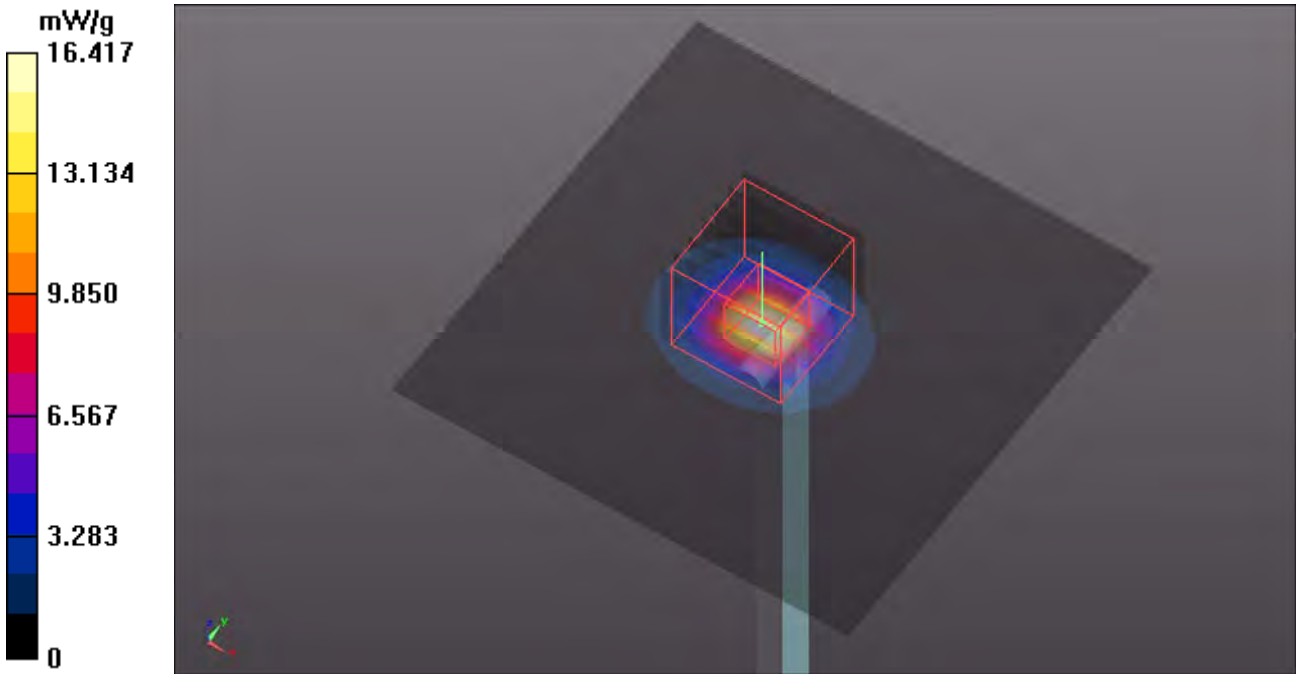
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: B5G_1229 Medium parameters used: f = 5800 MHz; σ = 6.215 mho/m; ε_r = 48.332; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3590; ConvF(4.55, 4.55, 4.55); Calibrated: 2011/02/25
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn861; Calibrated: 2011/08/29
- Phantom: ELI v4.0; Type: QDOVA001BA; Serial: TP:1043
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=100mW, f=5800 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 16.243 mW/g

Pin=100mW, f=5800 MHz/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 56.304 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 31.1820
SAR(1 g) = 7.73 mW/g; SAR(10 g) = 2.23 mW/g
Maximum value of SAR (measured) = 16.417 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/16

System Check_B5800_120116

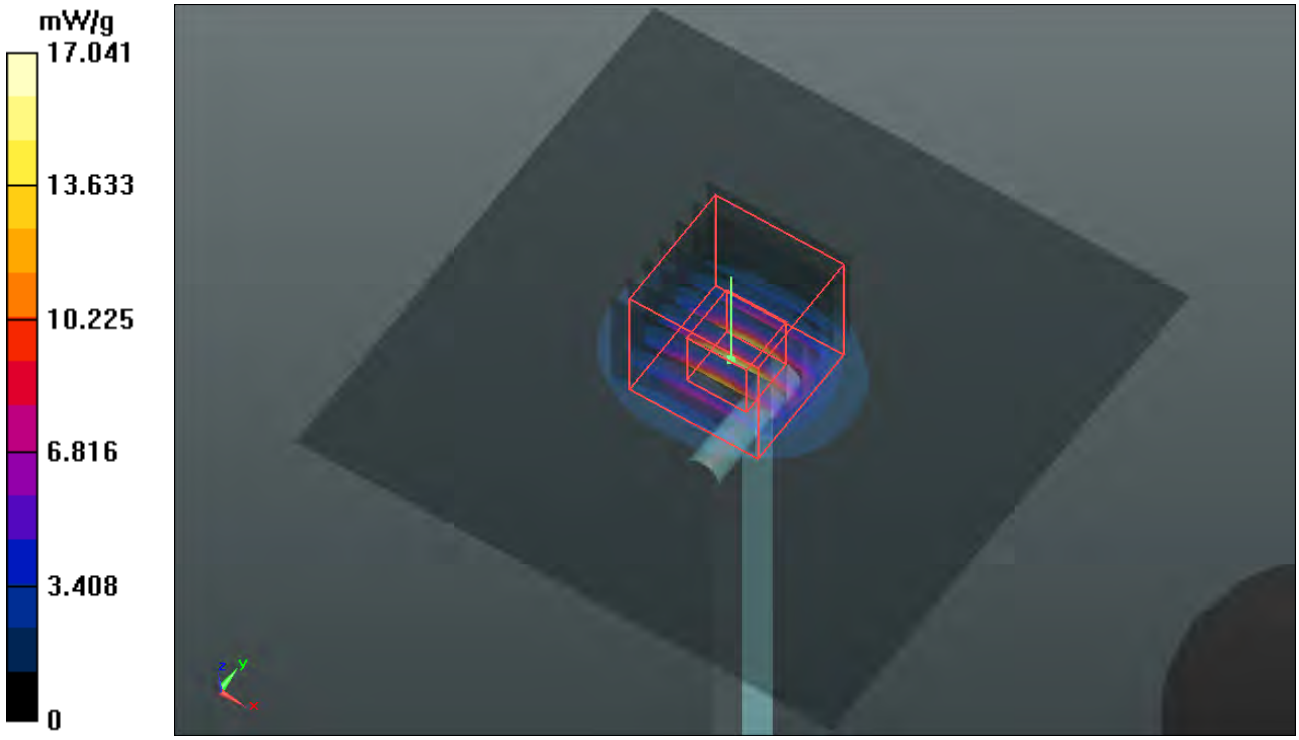
DUT: Dipole 5 GHz; Type: D5GHzV2; SN: 1019

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: B5G_0116 Medium parameters used: f = 5800 MHz; σ = 6.268 mho/m; ε_r = 47.275; ρ = 1000 kg/m^3
Ambient Temperature：21.3 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(3.81, 3.81, 3.81); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=100mW, f=5800 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 17.041 mW/g

Pin=100mW, f=5800 MHz/Zoom Scan (7x7x9)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 56.771 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 29.4490
SAR(1 g) = 7.78 mW/g; SAR(10 g) = 2.26 mW/g
Maximum value of SAR (measured) = 16.462 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/10

System Check_H750_120110

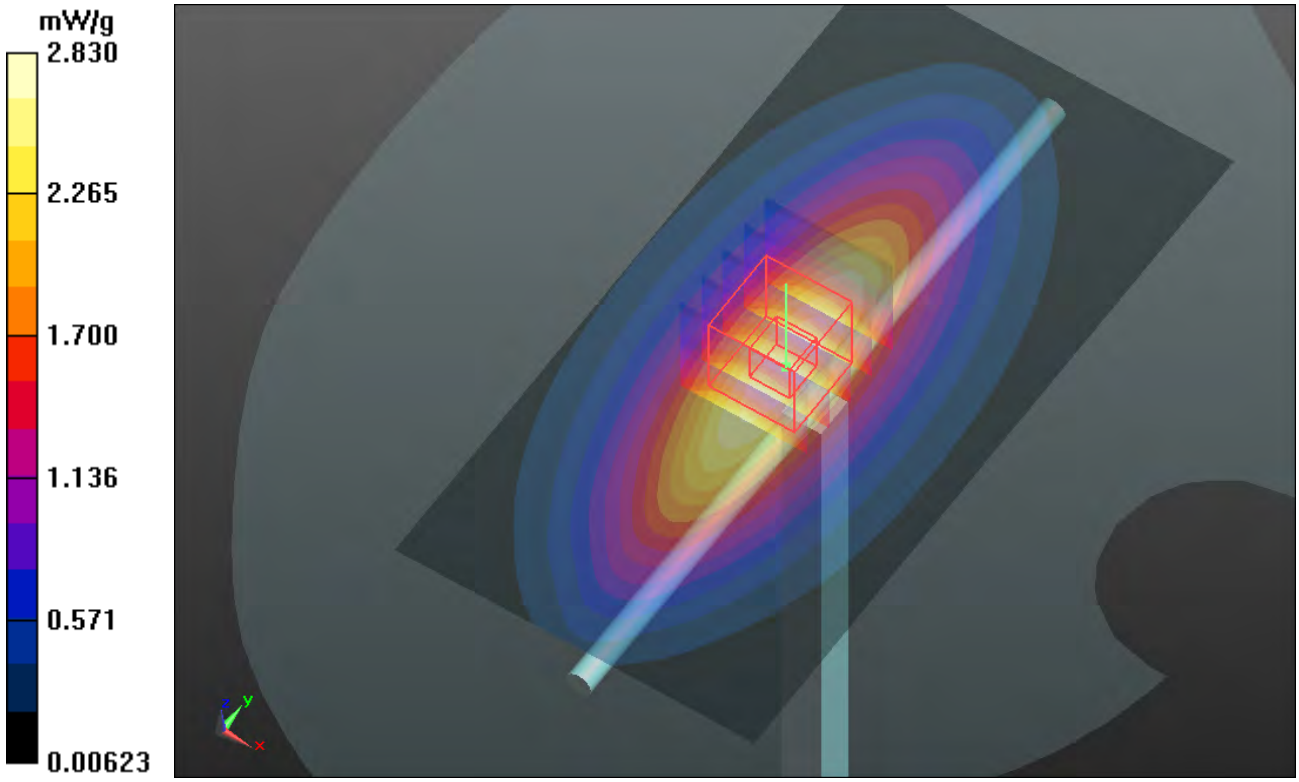
DUT: Dipole 750 MHz; Type: D750V3; SN: 1013

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: H750_0110 Medium parameters used: f = 750 MHz; σ = 0.896 mho/m; ε_r = 40.267; ρ = 1000 kg/m^3
Ambient Temperature：21.6 ℃; Liquid Temperature：20.9 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.2, 9.2, 9.2); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.830 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 53.303 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.2960
SAR(1 g) = 2.27 mW/g; SAR(10 g) = 1.52 mW/g
Maximum value of SAR (measured) = 2.843 mW/g



System Check_H750_120113

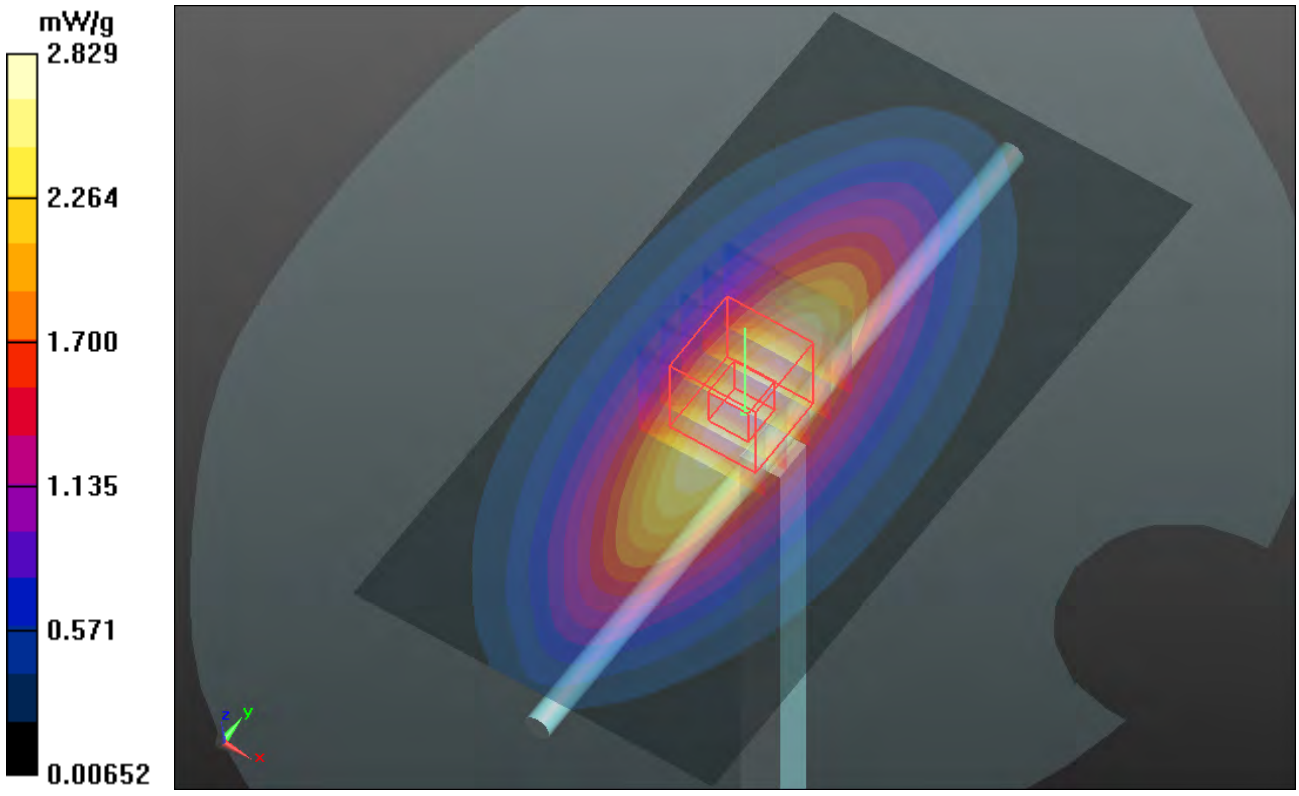
DUT: Dipole 750 MHz; Type: D750V3; SN: 1013

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: H750_0113 Medium parameters used: f = 750 MHz; σ = 0.892 mho/m; ε_r = 41.542; ρ = 1000 kg/m^3
Ambient Temperature：21.7 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.2, 9.2, 9.2); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.829 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 53.597 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.3100
SAR(1 g) = 2.28 mW/g; SAR(10 g) = 1.53 mW/g
Maximum value of SAR (measured) = 2.855 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/11

System Check_B750_120111

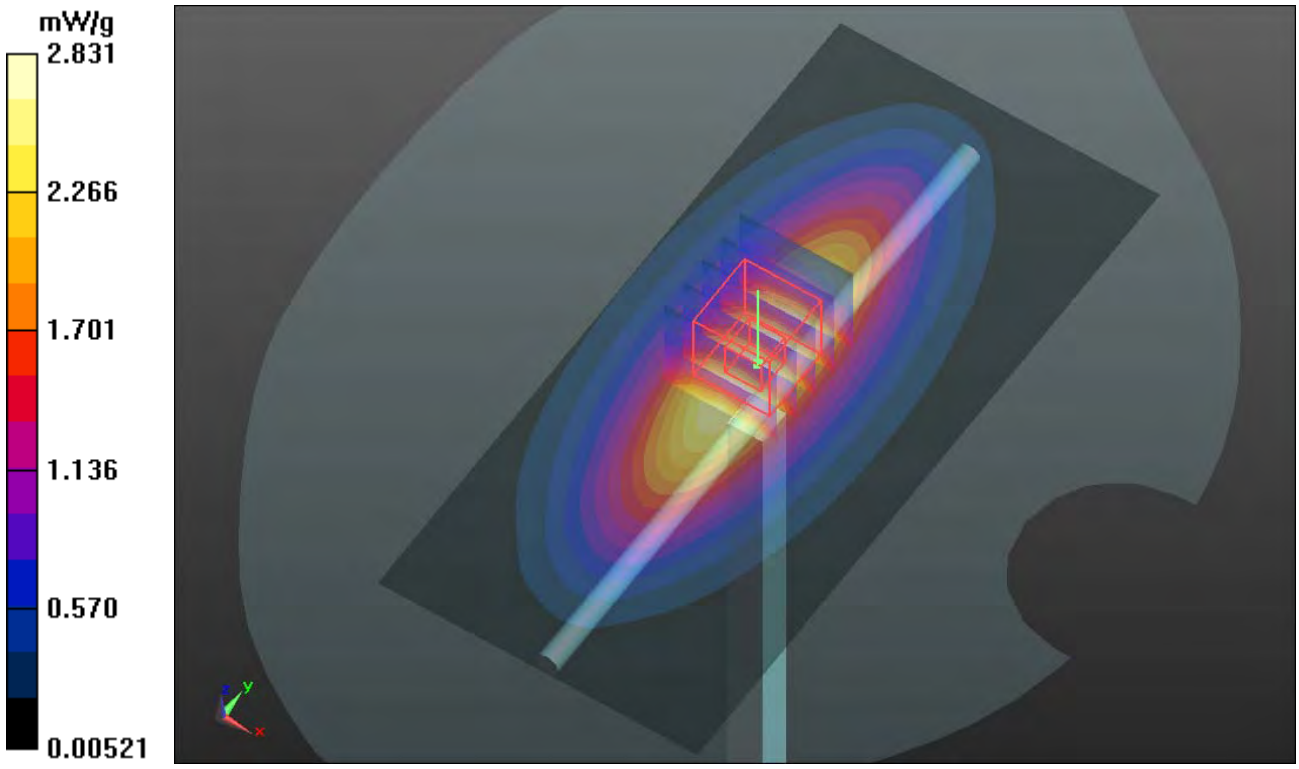
DUT: Dipole 750 MHz; Type: D750V3; SN: 1013

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: B750_0111 Medium parameters used: f = 750 MHz; σ = 0.966 mho/m; ε_r = 55.259; ρ = 1000 kg/m^3
Ambient Temperature：21.8 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.21, 9.21, 9.21); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x131x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.831 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 55.471 V/m; Power Drift = 0.0056 dB
Peak SAR (extrapolated) = 3.3470
SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.57 mW/g
Maximum value of SAR (measured) = 2.901 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/14

System Check_B750_120114

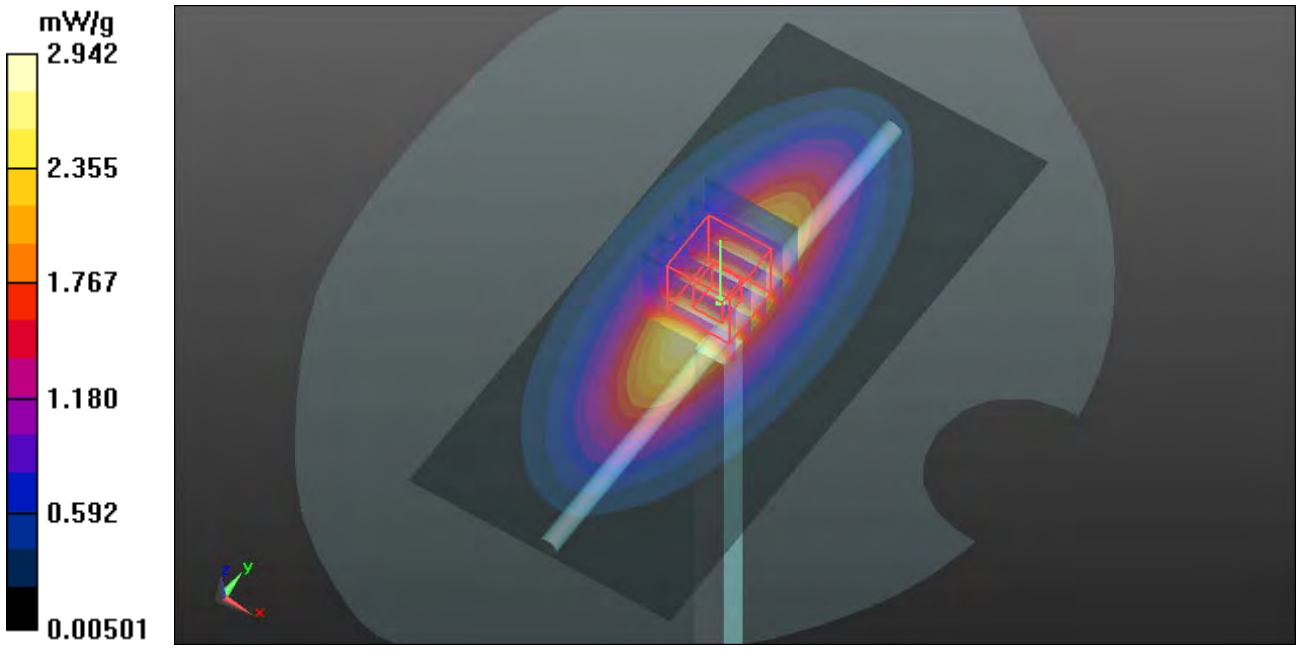
DUT: Dipole 750 MHz; Type: D750V3; SN: 1013

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium: B750_0114 Medium parameters used: f = 750 MHz; σ = 0.974 mho/m; ε_r = 55.909; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(9.21, 9.21, 9.21); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x131x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.942 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 56.215 V/m; Power Drift = -0.007 dB
Peak SAR (extrapolated) = 3.4540
SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.62 mW/g
Maximum value of SAR (measured) = 2.993 mW/g



System Check_H1750_120109

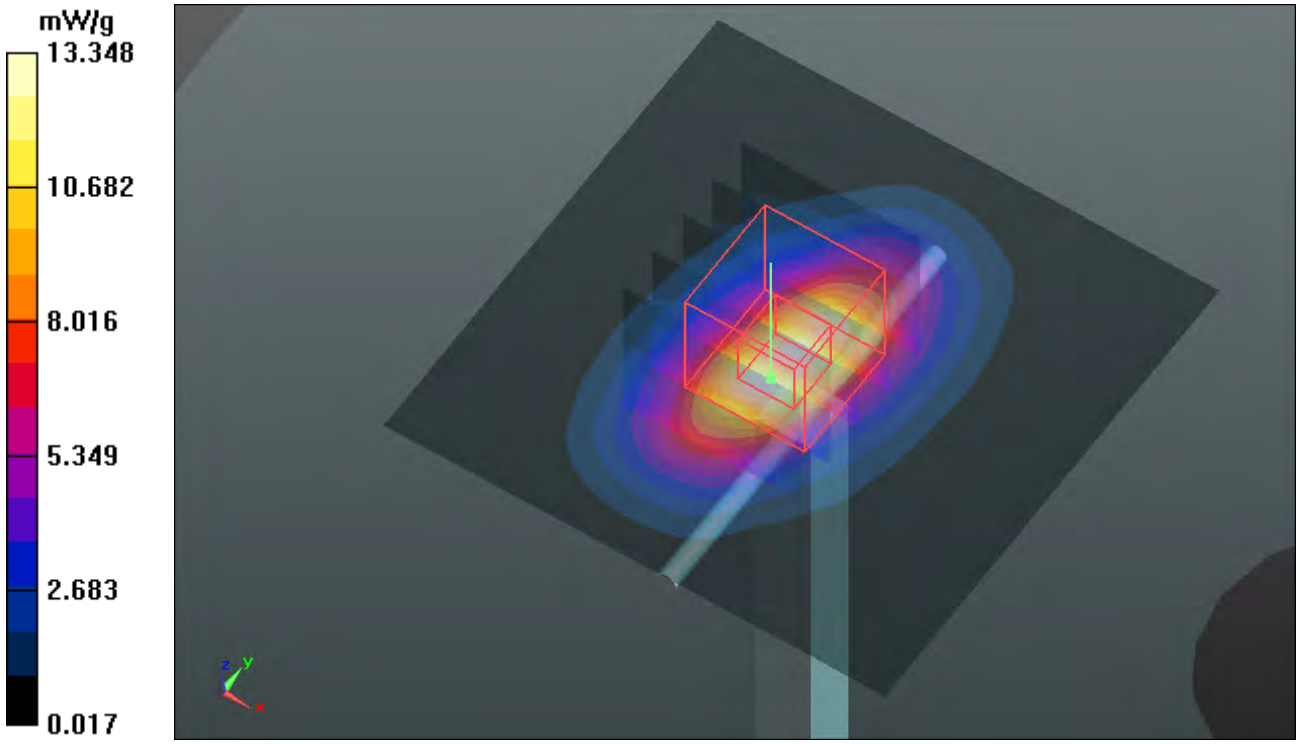
DUT: Dipole 1750 MHz; Type: D1750V2; SN: 1055

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: H1750_0109 Medium parameters used: f = 1750 MHz; σ = 1.38 mho/m; ε_r = 39.459; ρ = 1000 kg/m^3
Ambient Temperature：22.1 ℃; Liquid Temperature：21.2 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.92, 7.92, 7.92); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.348 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 97.842 V/m; Power Drift = -0.0075 dB
Peak SAR (extrapolated) = 16.2490
SAR(1 g) = 9.09 mW/g; SAR(10 g) = 4.89 mW/g
Maximum value of SAR (measured) = 12.643 mW/g



System Check_H1750_120110

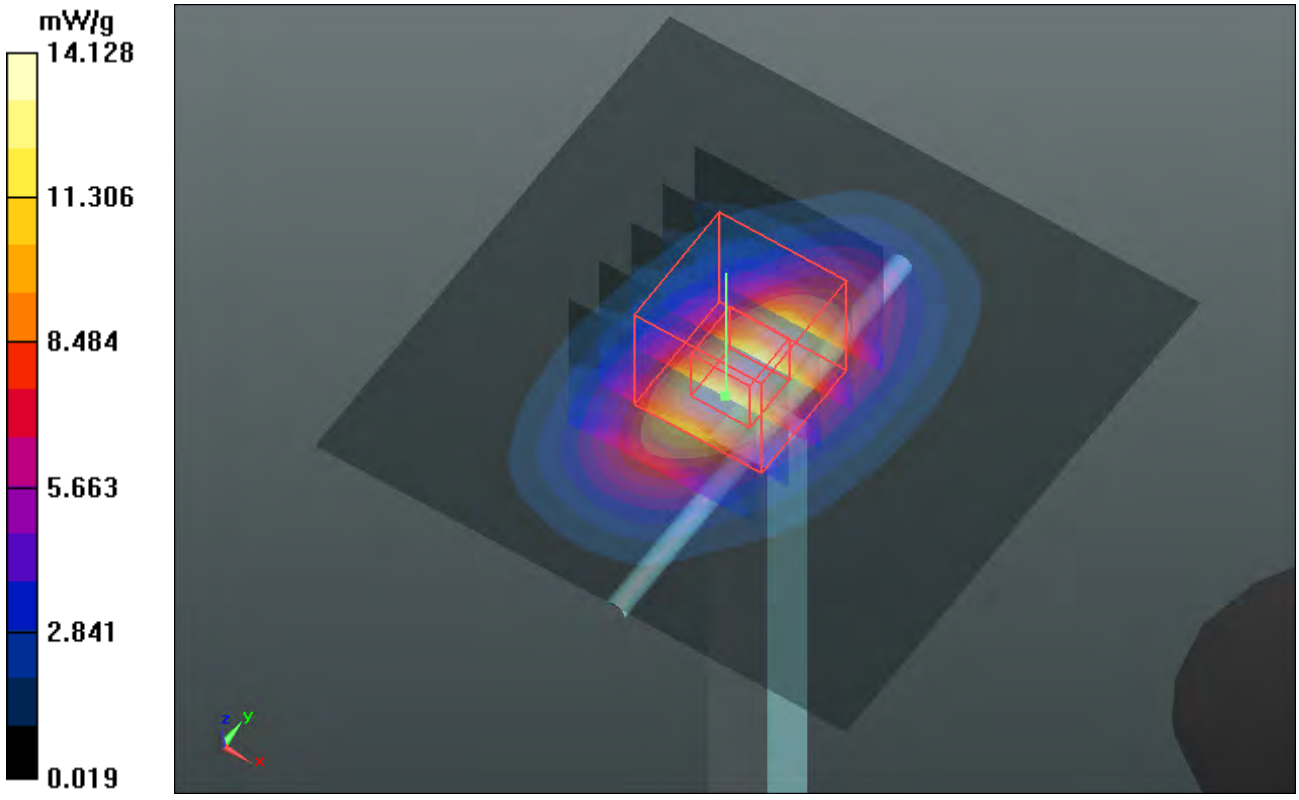
DUT: Dipole 1750 MHz; Type: D1750V2; SN: 1055

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: H1750_0110 Medium parameters used: f = 1750 MHz; σ = 1.38 mho/m; ε_r = 39.464; ρ = 1000 kg/m^3
Ambient Temperature：22.0 ℃; Liquid Temperature：21.5 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.92, 7.92, 7.92); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 14.128 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 100.4 V/m; Power Drift = 0.0083 dB
Peak SAR (extrapolated) = 17.0390
SAR(1 g) = 9.56 mW/g; SAR(10 g) = 5.16 mW/g
Maximum value of SAR (measured) = 13.259 mW/g



System Check_H1750_120114

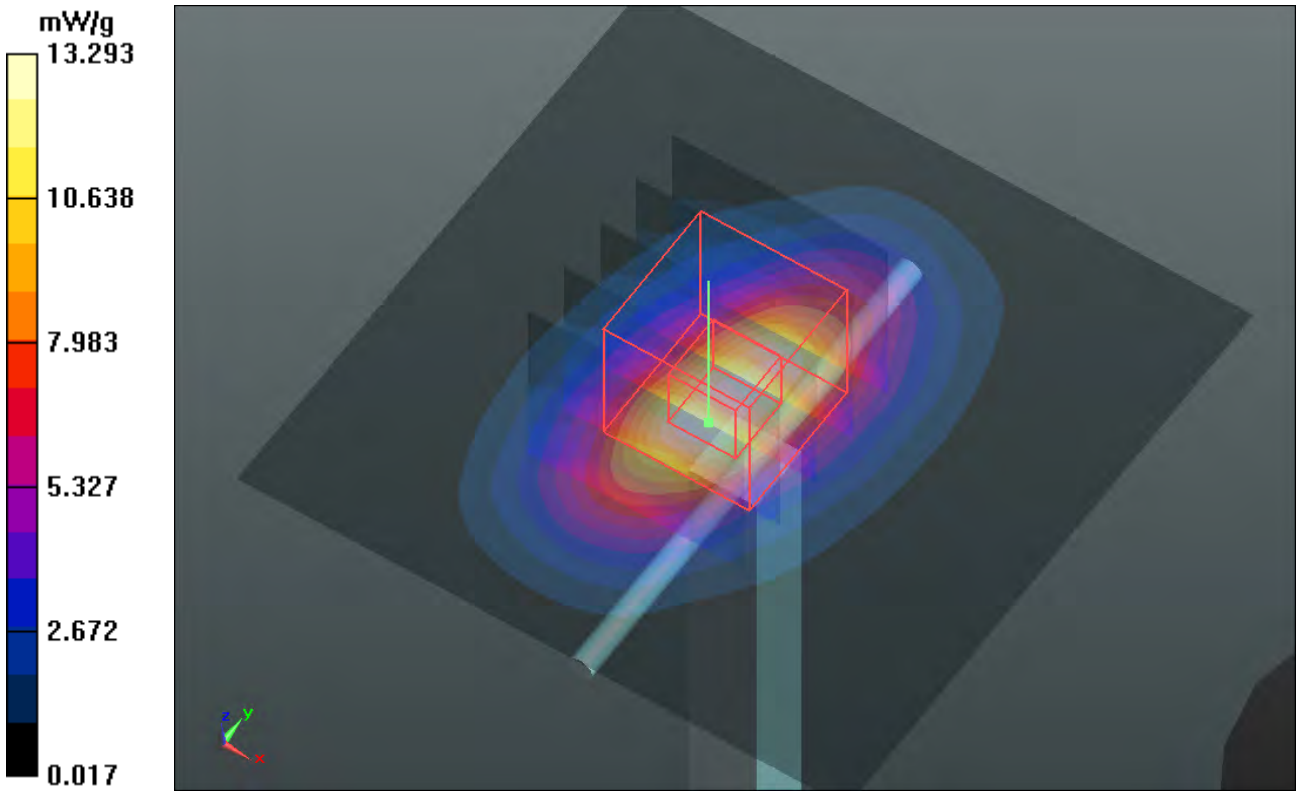
DUT: Dipole 1750 MHz; Type: D1750V2; SN: 1055

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: H1750_0114 Medium parameters used: f = 1750 MHz; σ = 1.374 mho/m; ε_r = 41.23; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.3 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.92, 7.92, 7.92); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.293 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 97.842 V/m; Power Drift = -0.0075 dB
Peak SAR (extrapolated) = 16.1820
SAR(1 g) = 9.05 mW/g; SAR(10 g) = 4.87 mW/g
Maximum value of SAR (measured) = 12.591 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/11

System Check_B1750_120111

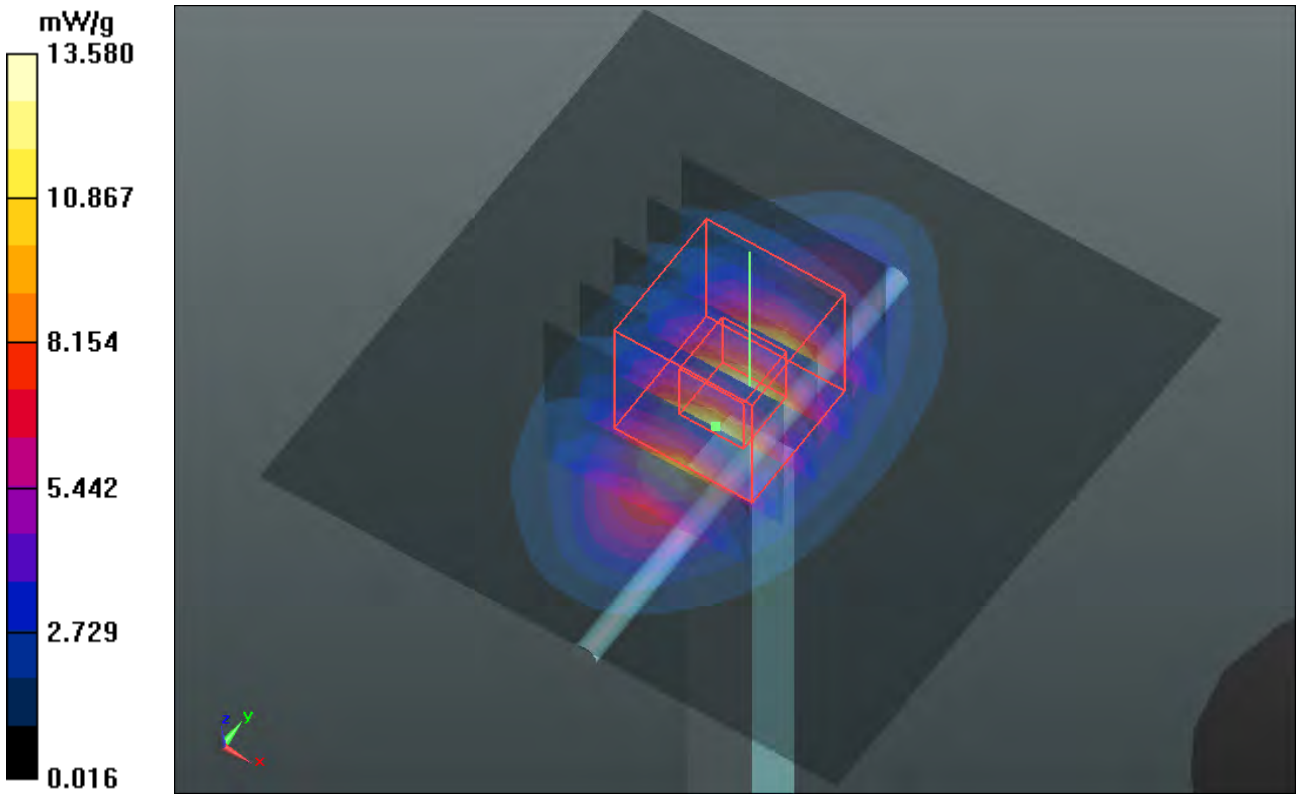
DUT: Dipole 1750 MHz; Type: D1750V2; SN: 1055

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: B1750_0111 Medium parameters used: f = 1750 MHz; σ = 1.486 mho/m; ε_r = 52.68; ρ = 1000 kg/m^3
Ambient Temperature：21.7 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.49, 7.49, 7.49); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Front; Type: SAM; Serial: TP-1485
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.580 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 95.902 V/m; Power Drift = 0.0022 dB
Peak SAR (extrapolated) = 16.5260
SAR(1 g) = 9.29 mW/g; SAR(10 g) = 4.96 mW/g
Maximum value of SAR (measured) = 13.084 mW/g



Test Laboratory: Bureau Veritas ADT SAR/HAC Testing Lab Date: 2012/01/14

System Check_B1750_120114

DUT: Dipole 1750 MHz; Type: D1750V2; SN: 1055

Communication System: CW; Frequency: 1750 MHz;Duty Cycle: 1:1
Medium: B1750_0114 Medium parameters used: f = 1750 MHz; σ = 1.488 mho/m; ε_r = 52.838; ρ = 1000 kg/m^3
Ambient Temperature：22.0 ℃; Liquid Temperature：21.1 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3650; ConvF(7.49, 7.49, 7.49); Calibrated: 2011/10/26
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2011/09/23
- Phantom: SAM Phantom_Left; Type: SAM; Serial: 1202
- Measurement SW: DASY52, Version 52.8 (0); SEMCAD X Version 14.6.4 (4989)

Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.966 mW/g

Pin=250mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 93.652 V/m; Power Drift = 0.0078 dB
Peak SAR (extrapolated) = 15.8270
SAR(1 g) = 8.89 mW/g; SAR(10 g) = 4.74 mW/g
Maximum value of SAR (measured) = 12.454 mW/g