SAR TEST REPORT

HCT CO., LTD

EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN		
FCC ID:	JYCORBIT		
Model:	MHS291LVW	Trade Name	Pantech
Date of Issue:	Jan.22 , 2013		
Test report No.:	HCTA1301FS02		
Test Laboratory:	**HCT CO., LTD.** 105-1, Jangam-ri, Majang-myeon, Icheon-si,Gyeonggi-do,Korea 467-811 TEL: +82 31 645 6300 FAX: +82 31 645 6401		
Applicant :	**Pantech Co., Ltd.** Pantech Building, I-2, DMC, Sangam-dong, Mapo-gu,Seoul, Korea(ZIP :121-792) Tel: 82-2-2030-1319 Fax: 82-2-2030-2500		
Testing has been carried out in accordance with:	RSS-102 Issue 4; Health Canada Safety Code 6 47CFR §2.1093 FCC OET Bulletin 65(Edition 97-01), Supplement C (Edition 01-01) ANSI/ IEEE C95.1 – 1992 IEEE 1528-2003		
Test result:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		
Signature	Report prepared by : Young-Soo Jang Test Engineer of SAR Part	Approved by : Jae-Sang So Manager of SAR Part	

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1. INTRODUCTION

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. The measurement procedure described in IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86 NCRP, 1986, Bethesda, MD 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative of the incremental electromagnetic energy (d*W*) absorbed by (dissipated in) an incremental mass (d*m*) contained in a volume element (d*V*) of a given density (*r*). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body.

$$SAR = \frac{d}{dt}\left(\frac{dU}{dm}\right) = \frac{d}{dt}\left(\frac{dU}{\rho\, dv}\right)$$

Figure 2. SAR Mathematical Equation

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

$$SAR = \sigma E^2 / \rho$$

where:

σ = conductivity of the tissue-simulant material (S/m)

ρ = mass density of the tissue-simulant material (kg/m^3)

E = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC OET Bulletin 65 Supplement C 01-01, IEEE Standard 1528-2003 & IEEE 1528a-2005 and the following published KDB procedures.

-. 447498 D01 General RF Exposure Guidance v05

-. 450824 D01 SAR Prob Cal and Ver Meas v01r01

-. 450824 D02 Dipole SAR Validation Verification v01

-. 865664 D01 SAR measurement 100 MHz to 6 GHz v01

-. 865664 D02 SAR Reporting v01

-. 941225 D01 SAR test for 3G devices v02

-. 941225 D02 Guidance for 3GPP R6 and R7 HSPA v02v01

-. 941225 D05 SAR for LTE Devices v02

3. DESCRIPTION OF DEVICE

Environmental evaluation measurements of specific absorption rate (SAR) distributions in emulated human head and body tissues exposed to radio frequency (RF) radiation from wireless portable devices for compliance with the rules and regulations of the U.S. Federal Communications Commission (FCC).

EUT Type	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN		
FCC ID	JYCORBIT	Model(s)	MHS291LVW
Trade Name	Pantech	Serial Number(s)	#1
Application Type	Certification		
Operation Band(s)	CDMA835/PCS1900/GSM850/GSM1900/WCDMA850/WCDMA1900/802.11a/b/g/n LTE Band(4/13)		
Tx Frequency	824.70 - 848.31 MHz (CDMA835)/ 824.20 - 848.80 MHz (GSM850) 826.4 - 846.6 MHz (WCDMA850)/ 1 851.25 – 1 908.75 MHz (PCS CDMA) 1 850.20 – 1 909.80 MHz (GSM1900)/ 1 852.4 – 1 907.6 MHz (WCDMA1900) 2 412- 2 462 MHz (802.11b/g/n) /802.11a/n: 5745-5825 MHz 777 – 787 MHz (LTE Band13)/ 1710-1755 MHz (LTE4)		
Rx Frequency	869.70 - 893.31 MHz (CDMA) /869.20 - 893.80 MHz (GSM850) 871.4 - 891.6 (WCDMA850)/ 1 931.25 – 1 988.75 MHz (PCS CDMA) 1 930.20 – 1 989.80 MHz (GSM1900)/ 1 932.4 – 1 987.6 MHz (WCDMA1900) 2 412- 2 462 MHz (802.11b/g/n)/ 802.11a/n: 5745-5825 MHz 746 – 756 MHz (LTE Band13)/ 2110-2155 MHz (LTE4)		
FCC Classification	PCS Licensed Transmitter (PCB)		
Production Unit or Identical Prototype	Prototype		

Max SAR

Band	Tx Frequency (MHz)	Equipment Class	Reported 1g SAR (W/kg)
			Body-worn
CDMA835	824.70 - 848.31	PCB	1.056
PCS1900	1 851.25 – 1 908.75	PCB	1.327
GSM850	824.20 - 848.80	PCB	1.516
GSM1900	1 850.20 - 1 909.80	PCB	0.646
WCDMA850	826.4 - 846.6	PCB	0.760
WCDMA1900	1 852.4 – 1 907.6	PCB	0.899
802.11b	2 412- 2 462	DTS	< 0.1
802.11a	5 745 – 5 825	DTS	< 0.1
LTE 4	1 710-1 755	PCB	0.926
LTE 13	777 – 787	PCB	0.719
Simultaneous SAR per KDB 690783 D01			1.541

Date(s) of Tests	Jan.03 , 2013 ~ Jul.11 , 2013
Antenna Type	Integral Antenna
GPRS	Multislot Class: 10, Mode Class: B

3.1 KDB 941225 LTE information

<table>
<tr><td>Frequency Range:</td><td>Band 13: 777 – 787 MHz
Band 4: 1710MHz-1755MHz</td></tr>
<tr><td>Channel Bandwidth:</td><td>Band 13 10MHz Band 4 5 MHz, 10 MHz 15MHz 20MHz</td></tr>
<tr><td>Channel Number & Frequency:</td><td>
<table>
<tr><th colspan="2">Band 13</th><th colspan="8">Band 4</th></tr>
<tr><th colspan="2">10 MHz</th><th colspan="2">5 MHz</th><th colspan="2">10 MHz</th><th colspan="2">15 MHz</th><th colspan="2">20 MHz</th></tr>
<tr><th>Ch.</th><th>Freq.(MHz)</th><th>Ch.</th><th>Freq.(MHz)</th><th>Ch.</th><th>Freq.(MHz)</th><th>Ch.</th><th>Freq.(MHz)</th><th>Ch.</th><th>Freq.(MHz)</th></tr>
<tr><td rowspan="3">23230</td><td rowspan="3">782</td><td>19975</td><td>1712.5</td><td>20000</td><td>1715</td><td>20025</td><td>1717.5</td><td>20050</td><td>1720</td></tr>
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<tr><td>20375</td><td>1752.5</td><td>20350</td><td>1750</td><td>20325</td><td>1747.5</td><td>20300</td><td>1745</td></tr>
</table>
</td></tr>
<tr><td>UE Category & Uplink</td><td>UE Category 3 QPSK, 16QAM</td></tr>
<tr><td>Power Class</td><td>UE Power Class 3</td></tr>
<tr><td>Description of the LTE Transmitter & antenna</td><td>-CDMA, GSM, WCDMA and LTE . It can not transmit simultaneously.</td></tr>
<tr><td>LTE voice/data requirements</td><td>Data Only,</td></tr>
<tr><td>Identify if MPR is optional or mendatory</td><td>The EUT incorporates MPR as per 3GPP TS36.101.
The MPR is permanently built-in by design as a mandatory.
A-MPR is not implemented.
During SAR testing, A-MPR was disabled by setting NS=01 on the R&S CMW500.</td></tr>
<tr><td>Maximum average (dBm)</td><td>See section 9.4 RF output power measurements in the SAR report.</td></tr>
<tr><td>Identify all other U.S. wireless operating modes, device</td><td>- CDMA/835/1900, GSM850/1900, WCDMA850/1900 and LTE Band 13/4
:</td></tr>
<tr><td>Maximum average conducted output power for other wireless mode and frequency</td><td>See section 9 RF output power measurements in the SAR report.</td></tr>
<tr><td>Simultaneous</td><td>This device supports simultaneous transmission.</td></tr>
<tr><td>Power reduction</td><td>This device doesn't implements power reduction.</td></tr>
<tr><td>Description of the test</td><td>LTE SAR Testing was performed using a CMW500.</td></tr>
</table>

4. DESCRIPTION OF TEST EQUIPMENT

4.1 SAR MEASUREMENT SETUP

These measurements are performed using the DASY4 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Staubli), robot controller, Pentium III computer, near-field probe, probe alignment sensor, and the generic twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Figure.3.1).

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The PC consists of the HP Pentium IV 3.0 GHz computer with Windows XP system and SAR Measurement Software DASY4, A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

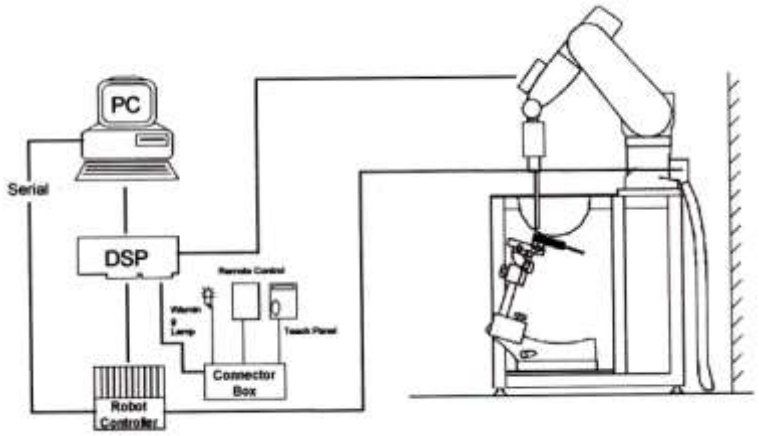


Figure 4.1 HCT SAR Lab. Test Measurement Set-up

The DAE4 consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail in.

4.2 DASY E-FIELD PROBE SYSTEM

4.2.1 ET3DV6 Probe Specification

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection System Built-in shielding against static charges
Calibration	In air from 10 MHz to 2.5 GHz In brain and muscle simulating tissue at Frequencies of 450 MHz, 900 MHz and 1.8 GHz (accuracy: 8 %)
Frequency	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Directivity	± 0.2 dB in brain tissue (rotation around probe axis) ± 0.4 dB in brain tissue (rotation normal probe axis)
Dynamic	5 μW/g to > 100 mW/g;
Range Linearity:	± 0.2 dB
Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces.
Dimensions	Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application	General dissymmetry up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

Figure 4.2 Photograph of the probe and the Phantom

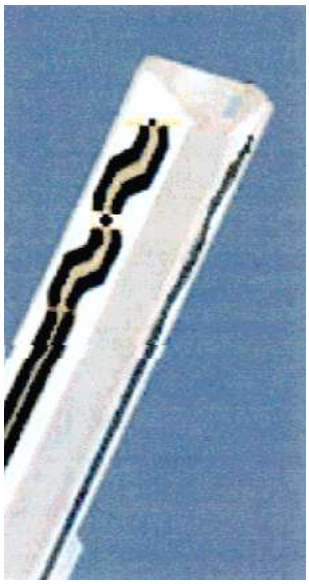


Figure 4.3 ET3DV6 E-field Probe

The SAR measurements were conducted with the dosimetric probe ET3DV6, designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multifiber line ending at the front of the probe tip. It is connected to the EOC box on the robot arm and provides an automatic detection of the phantom surface. Half of the fibers are connected to a pulsed infrared transmitter, the other half to a synchronized receiver. As the probe approaches the surface, the reflection from the surface produces a coupling from the transmitting to the receiving fibers. This reflection increases first during the approach, reaches a maximum and then decreases. If the probe is flatly touching the surface, the coupling is zero. The distance of the coupling maximum to the surface is independent of the surface reflectivity and largely independent of the surface to probe angle. The DASY4 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped at reaching the maximum.

4.3 PROBE CALIBRATION PROCESS

4.3.1 E-Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure with an accuracy better than ± 10 %. The spherical isotropy was evaluated with the proper procedure and found to be better than ± 0.25 dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe is tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a waveguide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermistor-based temperature probe is used in conjunction with the E-field probe.

$$SAR = C\frac{\Delta T}{\Delta t}$$

where:

Δt = exposure time (30 seconds),

C = heat capacity of tissue (brain or muscle),

ΔT = temperature increase due to RF exposure.

SAR is proportional to $\Delta T / \Delta t$, the initial rate of tissue heating, before thermal diffusion takes place. Now it's possible to quantify the electric field in the simulated tissue by equating the thermally derived SAR to the E- field;

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

where:

σ = simulated tissue conductivity,

ρ = Tissue density (1.25 g/cm^3 for brain tissue)

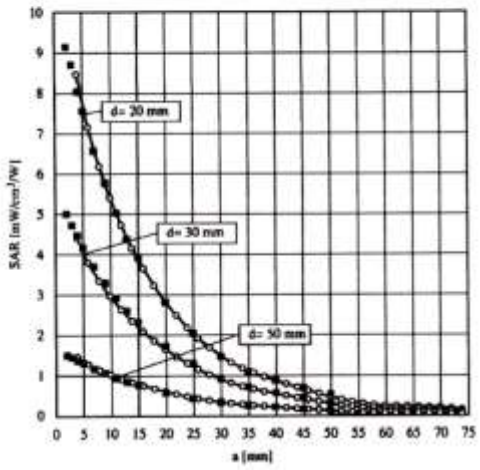


Figure 4.4 E-Field and Temperature measurements at 900 MHz

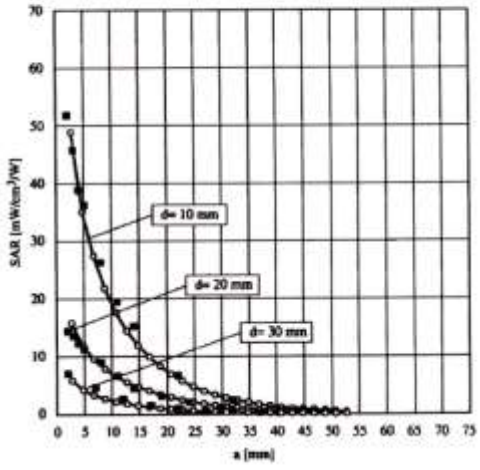


Figure 4.5 E-Field and temperature measurements at 1.8 GHz

4.3.2 Data Extrapolation

The DASY4 software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics. If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given like below;

$$V_i = U_i + U_i^2 \cdot \frac{cf}{dcp_i}$$

with V_i = compensated signal of channel i (i=x,y,z)
U_i = input signal of channel i (i=x,y,z)
cf = crest factor of exciting field (DASY parameter)
dcp_i = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:

E-field probes:

$$E_i = \sqrt{\frac{V_i}{Norm_i \cdot ConvF}}$$

with V_i = compensated signal of channel i (i = x,y,z)
$Norm_i$ = sensor sensitivity of channel i (i = x,y,z)
$\mu V/(V/m)^2$ for E-field probes
ConvF = sensitivity of enhancement in solution
E_i = electric field strength of channel i in V/m

The RSS value of the field components gives the total field strength (Hermetian magnitude):

$$E_{tot} = \sqrt{E_x^2 + E_y^2 + E_z^2}$$

The primary field data are used to calculate the derived field units.

$$SAR = E_{tot}^2 \cdot \frac{\sigma}{\rho \cdot 1000}$$

with SAR = local specific absorption rate in W/g
E_{tot} = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm^3

The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = \frac{E_{tot}^2}{3770}$$

with P_{pwe} = equivalent power density of a plane wave in W/cm^2
E_{tot} = total electric field strength in V/m

4.4 SAM Phantom

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.

Figure 4.6 SAM Phantom

Shell Thickness	2.0 mm
Filling Volume	about 25 L
Dimensions	1 000 mm x 500 mm (L x W)

Triple Modular Phantom consists of tree identical modules which can be installed and removed separately without emptying the liquid. It includes three reference points for phantom installation. Covers prevent evaporation of the liquid. Phantom material is resistant to DGBE based tissue simulating liquids. The MFP V5.1 will be delivered including wooden support only (**non**-standard SPEAG support).
Applicable for system performance check from 700 MHz to 6 GHz (MFP V5.1C) or 800 MHz - 6 GHz (MFP V5.1A) as well as dosimetric evaluations for body-worn operation.

Figure 3.6 MFP V5.1 Triple Modular Phantom

Figure 4.7 Device Holder

Shell Thickness	2.0 mm ± 0.2 mm
Filling Volume	approx. 9.2 L
Dimensions	830 mm x 500 mm (L x W)

4.5 Device Holder for Transmitters

In combination with the SAM Phantom V 4.0, the Mounting Device (POM) enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatable positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

Note: A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produced infinite number of configurations. To produce the Worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.

Figure 4.8 Device Holder

4.6 Brain & Muscle Simulating Mixture Characterization

The brain and muscle mixtures consist of a viscous gel using hydrox-ethyl cellulose (HEC) gelling agent and saline solution (see Table 3.1). Preservation with a bacteriacide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The mixture characterizations used for the brain and muscle tissue simulating liquids are according to the data by C. Gabriel and G. Hartsgrove.

Ingredients (% by weight)	Frequency (MHz)											
	750		835		915		1 900		2 450		5200-5800	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	41.2	51.7	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2	65.52	78.66
Salt (NaCl)	1.4	1.0	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04	0.0	0.0
Sugar	57	47.2	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0	0.0	0.0
HEC	0.2	0.0	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0	0.0	0.0
Bactericide	0.2	0.1	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0	0.0	0.0
Triton X-100	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0	17.24	10.67
DGBE	0.00	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7	0.0	0.0
Diethylene glycol hexyl ether	-	-	-	-	-	-	-	-	-	-	17.24	10.67

Salt:	99 % Pure Sodium Chloride	Sugar:	98 % Pure Sucrose
Water:	De-ionized, 16M resistivity	HEC:	Hydroxyethyl Cellulose
DGBE:	99 % Di(ethylene glycol) butyl ether,[2-(2-butoxyethoxy) ethanol]		
Triton X-100(ultra pure):	Polyethylene glycol mono[4-(1,1,3,3-tetramethylbutyl)phenyl] ether		

Table 4.1 Composition of the Tissue Equivalent Matter

4.7 SAR TEST EQUIPMENT

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
Staubli	Robot RX90L	F01/5K09A1/A/01	N/A	N/A	N/A
Staubli	Robot ControllerCS7MB	F99/5A82A1/C/01	N/A	N/A	N/A
HP	Pavilion t000_puffer	KRJ51201TV	N/A	N/A	N/A
SPEAG	Light Alignment Sensor	265	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D221340.01	N/A	N/A	N/A
SPEAG	DAE3	466	Feb. 21, 2012	Annual	Feb. 21, 2013
SPEAG	E-Field Probe ET3DV6	1605	Apr. 26, 2012	Annual	Apr. 26, 2013
SPEAG	E-Field Probe EX3DV4	3863	July 13, 2012	Annual	July 13, 2013
SPEAG	Validation Dipole D750V3	1014	July 18, 2012	Annual	July 18, 2013
SPEAG	Validation Dipole D835V2	441	May 16, 2012	Annual	May 16, 2013
SPEAG	Validation Dipole D1900V2	5d032	July 20, 2012	Annual	July 20, 2013
SPEAG	Validation Dipole D2450V2	743	Aug. 23, 2012	Annual	Aug. 23, 2013
SPEAG	Validation Dipole D5GHzV2	1107	Aug. 20, 2012	Annual	Aug. 20, 2013
Agilent	Power Meter(F) E4419B	MY41291386	Nov. 02, 2012	Annual	Nov. 02, 2013
Agilent	Power Sensor(G) 8481	MY41090870	Nov. 02, 2012	Annual	Nov. 02, 2013
HP	Dielectric Probe Kit 85070C	00721521	N/A	N/A	N/A
HP	Dual Directional Coupler	16072	Nov. 02, 2012	Annual	Nov. 02, 2013
Agilent	Base Station CMU200	110740	July 23, 2012	Annual	July 23, 2013
HP	Base Station E5515C	GB44400269	Feb. 10, 2012	Annual	Feb. 10, 2013
HP	Signal Generator 8664A	3744A02069	Nov. 02, 2012	Annual	Nov. 02, 2013
R&S	Base Station CMW500	1201.0002K50_116858	Jan. 17,2012	Annual	Jan. 17,2013

NOTE:

The E-field probe was calibrated by SPEAG, by the waveguide technique procedure. Dipole Validation measurement is performed by HCT Lab. before each test. The brain simulating material is calibrated by HCT using the dielectric probe system and network analyzer to determine the conductivity and permittivity (dielectric constant) of the brain-equivalent material.

5. SAR MEASUREMENT PROCEDURE

The evaluation was performed with the following procedure:

1. The SAR value at a fixed location above the ear point was measured and was used as a reference value for assessing the power drop.

2. The SAR distribution at the exposed side of the device was measured at a distance of 3.0 mm from the inner surface of the shell. The area covered the entire dimension of the device and the horizontal grid spacing was 11.0 cm x 11.0 cm. Based on this data, the area of the maximum absorption was determined by spline interpolation.

3. Around this point, a volume of 30 mm x 30 mm x 30 mm was assessed by measuring 7 x 7 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

    a. The data at the surface were extrapolated, since the center of the dipoles is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
    b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the “Not a knot” condition (in x, y, and z directions. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.
    c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

4. The SAR value, at the same location as procedure #1, was re-measured. If the value changed by more than 5 %, the evaluation is repeated.

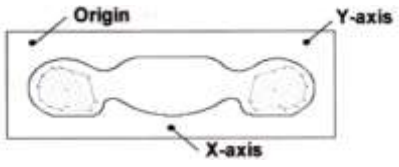


Figure 5.1 SAR Measurement Point in Area Scan

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 extend, 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 is performed around the hightest E-field value to determine the averaged SASR-distribution over 10g.

Area scan and zoom scan resolution setting follow KDB 865664 D01v01 quoted below

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

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

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

6. MEASUREMENT UNCERTAINTY

Error Description	Tol (± %)	Prob. dist.	Div.	c_i	Standard Uncertainty (± %)	v_{eff}
1. Measurement System						
Probe Calibration	6.00	N	1	1	6.00	∞
Axial Isotropy	4.70	R	1.73	0.7	1.90	∞
Hemispherical Isotropy	9.60	R	1.73	0.7	3.88	∞
Boundary Effects	1.00	R	1.73	1	0.58	∞
Linearity	4.70	R	1.73	1	2.71	∞
System Detection Limits	1.00	R	1.73	1	0.58	∞
Readout Electronics	0.30	N	1.00	1	0.30	∞
Response Time	0.8	R	1.73	1	0.46	∞
Integration Time	2.6	R	1.73	1	1.50	∞
RF Ambient Conditions	3.00	R	1.73	1	1.73	∞
Probe Positioner	0.40	R	1.73	1	0.23	∞
Probe Positioning	2.90	R	1.73	1	1.67	∞
Max SAR Eval	1.00	R	1.73	1	0.58	∞
2.Test Sample Related						
Device Positioning	2.90	N	1.00	1	2.90	145
Device Holder	3.60	N	1.00	1	3.60	5
Power Drift	5.00	R	1.73	1	2.89	∞
3.Phantom and Setup						
Phantom Uncertainty	4.00	R	1.73	1	2.31	∞
Liquid Conductivity(target)	5.00	R	1.73	0.64	1.85	∞
Liquid Conductivity(meas.)	2.07	N	1	0.64	1.32	9
Liquid Permitivity(target)	5.00	R	1.73	0.6	1.73	∞
Liquid Permitivity(meas.)	5.02	N	1	0.6	3.01	9
Combind Standard Uncertainty					11.13	
Coverage Factor for 95 %					k=2	
Expanded STD Uncertainty					22.25	

Table 6.1 Uncertainty (750 MHz- 2450 MHz)

Error Description	Tol (± %)	Prob. dist.	Div.	c_i	Standard Uncertainty (± %)	v_{eff}
1. Measurement System						
Probe Calibration	6.55	N	1	1	6.55	∞
Axial Isotropy	4.70	R	1.73	0.7	1.90	∞
Hemispherical Isotropy	9.60	R	1.73	0.7	3.88	∞
Boundary Effects	1.00	R	1.73	1	0.58	∞
Linearity	4.70	R	1.73	1	2.71	∞
System Detection Limits	1.00	R	1.73	1	0.58	∞
Readout Electronics	0.30	N	1.00	1	0.30	∞
Response Time	0.8	R	1.73	1	0.46	∞
Integration Time	2.6	R	1.73	1	1.50	∞
RF Ambient Conditions	3.00	R	1.73	1	1.73	∞
Probe Positioner	0.40	R	1.73	1	0.23	∞
Probe Positioning	2.90	R	1.73	1	1.67	∞
Max SAR Eval	1.00	R	1.73	1	0.58	∞
2.Test Sample Related						
Device Positioning	2.90	N	1.00	1	2.90	145
Device Holder	3.60	N	1.00	1	3.60	5
Power Drift	5.00	R	1.73	1	2.89	∞
3.Phantom and Setup						
Phantom Uncertainty	4.00	R	1.73	1	2.31	∞
Liquid Conductivity(target)	5.00	R	1.73	0.64	1.85	∞
Liquid Conductivity(meas.)	2.07	N	1	0.64	1.32	9
Liquid Permitivity(target)	5.00	R	1.73	0.6	1.73	∞
Liquid Permitivity(meas.)	5.02	N	1	0.6	3.01	9
Combind Standard Uncertainty					11.43	
Coverage Factor for 95 %					$k=2$	
Expanded STD Uncertainty					22.86	

Table 6.2 Uncertainty (5000-5900 MHz)

7. ANSI/ IEEE C95.1 - 1992 RF EXPOSURE LIMITS

HUMAN EXPOSURE	UNCONTROLLED ENVIRONMENT General Population (W/kg) or (mW/g)	CONTROLLED ENVIRONMENT Occupational (W/kg) or (mW/g)
SPATIAL PEAK SAR * (Brain)	1.60	8.00
SPATIAL AVERAGE SAR ** (Whole Body)	0.08	0.40
SPATIAL PEAK SAR *** (Hands / Feet / Ankle / Wrist)	4.00	20.00

Table 7.1 Safety Limits for Partial Body Exposure

NOTES:

* The Spatial Peak value of the SAR averaged over any 1 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

** The Spatial Average value of the SAR averaged over the whole-body.

*** The Spatial Peak value of the SAR averaged over any 10 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e.as a result of employment or occupation).

8. SAR SYSTEM VALIDATION

Per FCC KCB 865664 D02v01, SAR system validation status should be document to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in IEEE 1528-2003 and FCC KDB 865664 D01 v01. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

SAR System Validation Summary

SAR Dasy System 1											
Probe	Tissue Type	Freq. [MHz]	CW Validation				Modulated Validations				
			Date	Dielectric Parameters		Result	Data	Mod. Type	Dielectric Parameters		Result
				Measured σ(S/m)	Measured εr				Measured σ(S/m)	Measured εr	
1609	Body	835	Dec.10,2012	56.9	0.98	Pass	Dec.10,2012	GMSK	56.9	0.98	Pass
1609	Body	1 900	Dec.10,2012	52.2	1.55	Pass	Dec.10,2012	GMSK	52.2	1.55	Pass
3863	Body	750	Dec.20,2012	54.7	0.97	Pass	Dec.21,2012	GMSK	54.7	0.97	Pass
3863	Body	1 800	Dec.20,2012	52.5	1.54	Pass	Dec.21,2012	GMSK	52.5	1.54	Pass
3863	Body	2 450	Dec.20,2012	52.7	1.95	Pass	Dec.21,2012	OFDM	52.7	1.95	Pass
3863	Body	5 200	Dec.19,2012	48.0	5.29	Pass	Dec.21,2012	OFDM	48.0	5.29	Pass
3863	Body	5 800	Dec.19,2012	46.6	5.95	Pass	Dec.21,2012	OFDM	46.6	5.95	Pass

9. SYSTEM VERIFICATION

9.1 Tissue Verification

Band	Date	Liquid	Liquid Temp.[°C]	Parameters	Target Value	Measured Value	Deviation [%]	Limit [%]
835	Jan.3, 2013	Body	21.2	ε r	55.2	53.2	- 3.62	± 5
				σ	0.97	0.986	+ 1.65	± 5
1 900	Jan.4, 2013	Body	21.1	ε r	53.3	52.3	- 1.88	± 5
				σ	1.52	1.56	+ 2.63	± 5
850	Jan.9, 2013	Body	21.2	ε r	55.2	53.2	- 3.62	± 5
				σ	0.97	0.984	+ 1.44	± 5
1 900	Jan.10, 2013	Body	21.1	ε r	53.3	52	- 2.44	± 5
				σ	1.52	1.55	+ 1.97	± 5
2 450	Jan.7, 2013	Body	21.3	ε r	52.7	53.6	+ 1.71	± 5
				σ	1.95	1.94	- 0.51	± 5
LTE13 750	Jan.8, 2013	Body	21.1	ε r	55.5	54.6	- 1.62	± 5
				σ	0.96	0.971	+ 1.15	± 5
LTE4 1 750	Jan.11, 2013	Body	21.2	ε r	53.4	54.7	+ 2.43	± 5
				σ	1.49	1.5	+ 0.67	± 5
5 800	Jan.7, 2013	Body	21.3	ε r	48.2	46.2	- 4.15	± 5
				σ	6.00	6.21	+ 3.50	± 5

The dielectronic parameters of the liquids were measured prior to the SAR evaluation using an Agilent 85070C Dielectronic Probe Kit and Agilent Network Analyzer.

9.2 System Verification

Band	Probe (SN)	Dipole (SN)	Date	Liquid	Liquid Temp. [°C]	1 W Target SAR_{1g} (mW/g)	Measured SAR_{1g} (mW/g)	1 W Normalized SAR_{1g} (mW/g)	Deviation [%]	Limit [%]
835	1605	441	Jan.3, 2013	Body	21.2	9.50	0.932	9.32	- 1.89	± 10
1900		5d032	Jan.4, 2013	Body	21.1	39.9	3.89	38.9	- 2.51	± 10
850		441	Jan.9, 2013	Body	21.2	9.50	0.961	9.61	+ 1.16	± 10
1900		5d032	Jan.10, 2013	Body	21.1	39.9	3.98	39.8	- 0.25	± 10
2 450	3863	743	Jan.7, 2013	Body	21.3	51.2	5.18	51.8	+ 1.17	± 10
LTE13		1014	Jan.8, 2013	Body	21.1	8.87	0.898	8.98	+ 1.24	± 10
LTE4		2d006	Jan.11, 2013	Body	21.2	38.7	3.79	37.9	- 2.07	± 10
5 800		1107	Jan.7, 2013	Body	21.3	74.6	7.5	75	+ 0.54	± 10

9.3 Test System Verification Procedure

SAR measurement was Prior to assessment, the system is verified to the ± 10 % of the specifications at target frequency by using the system validation kit. (Graphic Plots Attached)

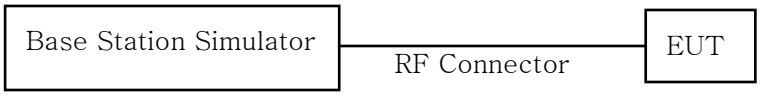
- Cabling the system, using the validation kit equipments.
- Generate about 100 mW Input Level from the Signal generator to the Dipole Antenna.
- Dipole Antenna was placed below the Flat phantom.
- The measured one-gram SAR at the surface of the phantom above the dipole feed-point should be within 10 % of the target reference value.
- The results are normalized to 1 W input power.

Note;
SAR Verification was performed according to the FCC KDB 450824.

10. RF CONDUCTED POWER MEASUREMENT

Power measurements were performed using a base station simulator under digital average power.
The handset was placed into a simulated call using a base station simulator in a shielded chamber.
Such test signals offer a consistent means for testing SAR and are recommended for evaluation SAR
SAR measurements were taken with a fully charged battery. In order to verify that the device was tested
and maintained at full power, this was configured with the base station simulator. The SAR measurement
Software calculates a reference point at the start and end of the test to check for power drifts. If conducted
Power deviations of more then 5 % occurred, the tests were repeated.

Conducted output power measurements were performed using a base station simulator under digital average power.



SAR Test for WWAN & LTE were performed with a base station simulator Agilent E5515C & CMW500. Communication between the device and the emulator was established by air link. Set base station emulator to allow DUT to radiate maximum output power during all tests.

10.1 SAR Measurement Conditions for 1x Ev-Do Devices

The handset was placed into a simulated call using a base station simulator in a shielded chamber. Such test signals offer a consistent means for testing SAR and are recommended for evaluating SAR. In order to verify that the device was tested and maintained at full power, this was configured with the base station simulator. The SAR measurement software calculates a reference point at the start and end of the test to check for power drifts. If conducted power deviations of more then 5% occurred, the tests were repeated.

These procedures were followed according to FCC "SAR Measurement Procedures for 3G Devices",

10.1.1 1xEv-Do Data Devices

The following procedures apply to Access Terminals (AT) operating under CDMA 2000 High Rate packer Data, Rev.0 and Rev.A, 1x Ev-Do protocols. SAR for body exposure conditions are typically required devices with Ev-Do Capabilities, including handsets and data modems. operating in various electronic devices. When VOIP is available for Ev-Do devices to operate in configurations next to the ear, head exposure conditions are applicable. The default test configuration is to measure SAR with an established radio ling between the AT and a communication test set according to 3GPP2 Test Application Protocols(TAP), FTAT/RTAP for Rev.0 and FETAP/RETAP for Rev.A. The code channel power levels, RF channel output power (ALL Bits Up) and other operating parameters should be actively monitored and controlled by the communications test set during the SAR measurement. The use of FTM should be avoided. Maximum output power is verified according to procedures defined in 3 GPP2 C.S0033 and TIA-866, and SAR must be measured according to these maximum output conditions.

10.1.2 Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to procedures in section 3.1.2.3.4 of 3GPP2 C.S0033-0/TIA-866 for Rev.0 and section 4.3.4 of 3GPP2 C.S0033-A for Rev.A For Rev.A, maximum outpour for both Subtype 0/1 and subtype 2 Physical Layer configurations should be measured. The device operating configurations under TAP/ETAP should be documented in the test report; including power control, code channel and RF channel output power levels. The measurement results should be tabulated in the SAR report with any measurement difficulties and equipment limitations clearly identified.

10.1.3 SAR Measurements

SAR is measured using FTAP/RTAP and FETAP/RETAP respectively for Rev.0 and Rev.A device. The AT is Tested with a Reverse Data Channel rate of 153.6kbps in Subtype 0/1 and Subtype 2 Physical Layer configurations should be measured. The device operating configurations under TAP/ETAP should be documented in the test report; including power Control, code channel and RF channel output power levels, The measurement results should be tabulated in the SAR report with any measurement difficulties and equipment limitations clearly identified. output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations. otherwise, SAR is measured on the maximum output channel for Rev.A using the exposure configuration that results in the highest SAR for that RF channels in Rev.0. Head SAR is required for Ev-Do devices that support operations next to the ear; for example, with VOIP, using Subtype 2 Physical Layer configurations according to the required handset test configurations.

10.1.4 1x RTT Support

For Ev-Do device that also support 1xRTT voice and/or data operations ,SAR is not required for 1xRTT when the maximum average output of each channel is less than1/4dB higher than that measured in Subtype 0/1 Physical Layer configurations for Rev.0

10.2 CDMA2000 1xRTT

Agilent 8960 base station was used for output power verification.

Following is the detail set-up configuration.

Protocol Rev.> 6

Radio Config (RC): Body SAR in RC1 is not required when the maximum average output of each channel is less than 1/4 dB higher than that measured in RC3. Otherwise, SAR is measured on the maximum output channel in RC1; with Loopback Service Option SO55, at full rate, using the body exposure configuration that results in the highest SAR for that channel in RC3.

FCH SO: Body-Worn SAR was tested under RC3/SO32 with FCH Only since FCH+SCH modes are not greater than 0.25 dB of the FCH only mode per KDB publication 941225.

Traffic Data Rate > Full

Power: All Up bits

10.3 CDMA2000 1xEv-Do

Body SAR is measured using Subtype 0/1 Physical Layer configurations for Rev.0. SAR for subtype 2 Physical layer configurations is not required for Rev.A when the maximum average output of each RF channels is less than that measured in Subtype 0/1 Physical layer configurations. Otherwise, SAR is measured on the maximum output channel for Rev.A using the exposure configuration that results in the highest SAR for that RF channels in Rev.0.

10.3.1 EVDO Release 0 (RTAP)

Application Config > Enhanced Test Application Protocol > RTAP

RTAP Rate > 153.6 kbps

Protocol Rev > 0 (1x EVDO)

Power: All Up bits

10.3.2 EVDO Release 0 (FTAP)

Application Config > Enhanced Test Application Protocol > FTAP

RTAP Rate > 307.2 kbps

Protocol Rev > 0 (1x EVDO)

Power: All Up bits

10.3.3 EVDO Release A (RETAP)

Protocol Rev > A (1x EVDO A)

Application Config > Enhanced Test Application Protocol > RETAP

R-Data Pkt Size > 4096

Power: All Up bits

10.3.4 EVDO Release A (FETAP)

Protocol Rev > A (1x EVDO A)

Application Config > Enhanced Test Application Protocol > FETAP

F-Traffic Format > 4 (1024, 2, 128) Canonical (307.2k, QPSK)

Power: All Up bits

CDMA835

Target Power : 24.0 dBm

Tune-up Tolerance : -0.5dB/ +0.5dB

PCS1900

Target Power : 24.0 dBm

Tune-up Tolerance : -0.5dB/ +0.85dB

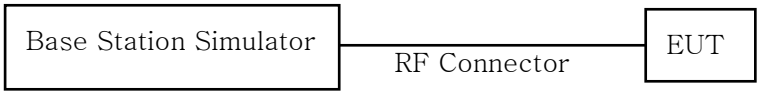
Maximum Average Output Power Measurement for FCC ID: JYCORBIT

Band	Channel	SO2	SO2	SO55	SO55	TDSO SO32	1xEvDO Rev.0	1xEvDO Rev.0	1xEvDO Rev.A	1xEvDO Rev.A
		RC1/1 (dBm)	RC3/3 (dBm)	RC1/1 (dBm)	RC3/3 (dBm)	RC3/3 (dBm)	(FTAP)	(RTAP)	(FETAP)	(RETAP)
CDMA	1013	24.36	24.34	24.25	24.23	24.32	24.34	24.26	24.25	24.20
	384	24.20	24.17	24.07	24.13	24.15	24.17	24.10	24.07	24.04
	777	24.10	23.97	24.04	23.95	23.97	24.11	24.02	24.04	23.94
PCS	25	24.83	24.80	24.79	24.83	24.77	24.74	24.76	24.75	24.78
	600	24.75	24.63	24.75	24.65	24.64	24.62	24.64	24.60	24.61
	1175	24.35	24.28	24.29	24.24	24.23	24.25	24.24	24.20	24.18

CDMA Avergae Conducted output powers (dBm)

10.4 GSM

Conducted output power measurements were performed using a base station simulator under digital average power.



SAR Test for WWAN were performed with a base station simulator Agilent E5515C. Communication between the device and the emulator was established by air link. Set base station emulator to allow DUT to radiate maximum output power during all tests. Please refer to the below worst case SAR operation setup.

- GSM voice: Head SAR
- GPRS Multi-slots : Body SAR with GPRS Multi-slot Class10 1Tx with CS 1 (GMSK)

Note;

CS1/MCS7 coding scheme was used in GPRS/EDGE output power measurements and SAR Testing, as a condition where GMSK/8PSK modulation was ensured. Investigation has shown that CS1 - CS4/ MCS5 – MCS9 settings do not have any impact on the output levels in the GPRS/EDGE modes.

GSM850 GPRS 1Tx

Target Power : 33.0 dBm

Tune-up Tolerance : -1.5dB/ +0.5dB

GSM850 GPRS 2Tx

Target Power : 33.0 dBm

Tune-up Tolerance : -0.5dB/ +0.5dB

GSM1900 GPRS 1Tx

Target Power : 30.0 dBm

Tune-up Tolerance : -1.5dB/ +0.5dB

GSM1900 GPRS 2Tx

Target Power : 30.0 dBm

Tune-up Tolerance : -0.5dB/ +0.5dB

GSM Conducted output powers (Burst-Average)

Band	Channel	Voice	GPRS(GMSK) Data – CS1		EDGE(8PSK) Data – MCS7	
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)
GSM 850	128	33.06	33.1	32.9	27.53	25.09
	190	33.11	33.18	32.96	27.62	25.12
	251	33.14	33.2	32.98	27.67	25.15
GSM 1900	512	30.13	30.19	30.08	26.02	24.02
	661	30.19	30.25	30.13	26.06	24.05
	810	30.18	30.23	30.11	26.16	24.1

GSM Conducted output powers (Frame-Average)

Band	Channel	Voice	GPRS(GMSK) Data – CS1		EDGE(8PSK) Data – MCS7	
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)
GSM 850	128	24.03	24.07	26.88	18.5	19.07
	190	24.08	24.15	26.94	18.59	19.1
	251	24.11	24.17	26.96	18.64	19.13
GSM 1900	512	21.1	21.16	24.06	16.99	18
	661	21.16	21.22	24.11	17.03	18.03
	810	21.15	21.2	24.09	17.13	18.08

Note:

Time slot average factor is as follows:

1 Tx slot = 9.03 dB, Frame-Average output power = Burst-Average output power – 9.03 dB

2 Tx slot = 6.02 dB, Frame-Average output power = Burst-Average output power – 6.02 dB

10.5 WCDMA

Body SAR is not required for handsets with HSDPA capabilities when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75 % of the SAR limit. Otherwise, SAR is Measured for HSDPA, using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA, on the maximum output channel with the body exposure configuration that results in the highest SAR in 12.2 kbps RMC for that RF channel.

10.5.1 Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the general descriptions in section 5.2 of 3 GPP TS 34.121, using the appropriate RMC or AMR with TPC(transmit power control) set to all “1s”.

10.5.2 Head SAR Measurements

SAR for head exposure configurations is measured using the 12.2 kbps RMC with TPC bits configured to all “1s”. SAR in AMR configurations is not required when the maximum average output of each RF channel for 12.2 kbps AMR is less than ¼ dB higher than that measured in 12.2 kbps RMC. Otherwise, SAR is measured on the maximum output channel in 12.2 AMR with a 3.4 kbps SRB (signaling radio bearer using the exposure configuration that results in the highest SAR for that RF channel in 12.2 RMC.

10.5.3 Body SAR Measurement

SAR for body exposure configurations is measured using the 12.2 kbps RMC with the TPC bits all “1s”.

10.5.4 Handsets with Release 5 HSDPA

Body SAR is not required for handsets with HSDPA capabilities when the maximum average output of each RF channel with HSDPA active is less than ¼ dB higher than that measured without HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75 % of the SAR limit. Otherwise, SAR is Measured for HSDPA, using an FRC with H-Set 1 in Sub-test 1 and a 12.2 kbps RMC configured in Test Loop Mode 1, using the highest body SAR configuration in 12.2 kbps RMC without HSDPA, on the maximum output channel with the body exposure configuration that results in the highest SAR in 12.2 kbps RMC for that RF channel.

Sub-Test 1 Setup for Release 5 HSDPA

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	CM (dB)(2)
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15.
Note 3: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

10.5.5 Handsets with Release 6 HSPA (HSDPA/HSUPA)

Body SAR is not required for handsets with HSPA capabilities when the maximum average output of each RF channel with HSUPA/HSDPA active is less than ¼ dB higher than that measured without HSUPA/HSDPA using 12.2 kbps RMC and the maximum SAR for 12.2 kbps RMC is ≤ 75 % of the SAR limit. Body SAR for HSPA is measured with E-DCH Sub-test 5, using H-Set 1 and QPSK for FRC and a 12.2 kbps RMC configured in Test Loop Mode 1 with power control algorithm 2, according to the highest body SAR configuration in 12.1 kbps RMC without HSPA. When VOIP is applicable for head exposure, SAR is not required when the maximum output of each RF channel with HSPA is less than ¼ dB higher than that measured using 12.2 kbps RMC; otherwise, the same HSPA configuration used for body measurement should be used to test for head exposure.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs}(1)	β_{ec}	β_{ed}	β_{ed} (SF)	β_{ed} (codes)	CM(2) (dB)	MPR (dB)	AG(4) Index	E-TFCI
1	11/15(3)	15/15(3)	64	11/15(3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}: 47/15 β_{ed2}: 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15(4)	15/15(4)	64	15/15(4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.
Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.
Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signaled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.
Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.
Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

WCDMA850

Target Power : 23.0 dBm

Tune-up Tolerance : -1.8dB/ +0.5dB

WCDMA1900

Target Power : 23.0 dBm

Tune-up Tolerance : -1.5dB/ +0.5dB

3GPP Release Version	WCDMA850 Mode	3GPP 34.121 Subtest	Cellular Band [dBm]						MPR Target
			UL 4132 DL 4357	Power reduction (dB)	UL 4183 DL 4408	Power reduction (dB)	UL 4233 DL 4458	Power reduction (dB)	
99	WCDMA	12.2 kbps RMC	23.49		23.00		23.45		-
99	WCDMA	12.2 kbps AMR	-		-		-		
5	HSDPA	Subtest 1	22.50	0.00	21.99	0.00	22.50	0.00	0
5		Subtest 2	22.45	-0.05	21.95	-0.04	22.48	-0.02	0
5		Subtest 3	22.02	-0.48	21.46	-0.53	22.03	-0.47	-0.5
5		Subtest 4	22.05	-0.45	21.46	-0.53	22.02	-0.48	-0.5
6	HSUPA	Subtest 1	22.49	0.00	21.80	0.00	22.45	0.00	0
6		Subtest 2	21.25	-1.24	20.52	-1.28	21.30	-1.15	-2
6		Subtest 3	21.15	-1.34	20.73	-1.07	20.98	-1.47	-1
6		Subtest 4	21.42	-1.07	21.02	-0.78	21.45	-1.00	-2
6		Subtest 5	22.19	-0.30	21.90	0.10	22.11	-0.34	0

3GPP Release Version	WCDMA1900 Mode	3GPP 34.121 Subtest	PCS Band [dBm]						MPR Target
			UL 9262 DL 9662	Power reduction (dB)	UL 9400 DL 9800	Power reduction (dB)	UL 9538 DL 9938	Power reduction (dB)	
99	WCDMA	12.2 kbps RMC	22.99		23.04		22.96		-
99	WCDMA	12.2 kbps AMR	-		-		-		
5	HSDPA	Subtest 1	22.02	0.00	22.14	0.00	22.00	0.00	0
5		Subtest 2	22.05	0.03	22.08	-0.06	21.99	-0.01	0
5		Subtest 3	21.58	-0.44	21.64	-0.50	21.52	-0.48	-0.5
5		Subtest 4	21.54	-0.48	21.62	-0.52	21.54	-0.46	-0.5
6	HSUPA	Subtest 1	21.94	0.00	22.02	0.00	22.01	0.00	0
6		Subtest 2	20.66	-1.28	20.92	-1.10	20.64	-1.37	-2
6		Subtest 3	20.92	-1.02	20.64	-1.38	20.97	-1.04	-1
6		Subtest 4	20.91	-1.03	21.02	-1.00	21.15	-0.86	-2
6		Subtest 5	21.60	-0.34	21.95	-0.07	22.01	0.00	0

WCDMA Average Conducted output powers

10.6 WiFi

10.6.1 SAR Testing for 802.11a/b/g/n modes

General Device Setup

Normal Network operating configurations are not suitable for measuring the SAR of 802.11 a/b/g transmitters. Unpredictable fluctuations in network traffic and antenna diversity conditions can introduce undesirable variations in SAR results. The SAR for these devices should be measured using chipset based test mode software to ensure the results are consistent and reliable.

Chipset based test mode software is hardware dependent and generally varies among manufacturers. The device operating parameters established in test mode for SAR measurements must be identical to those programmed in production units, including output power levels, amplifier gain settings and other RF performance tuning parameters. The test frequencies should correspond to actual channel frequencies defined for domestic use. SAR for devices with switched diversity should be measured with only one antenna transmitting at a time during each SAR measurement, according to a fixed modulation and data rate. The same data pattern should be used for all measurements.

Frequency Channel Configurations

802.11 a/b/g and 4.9 GHz operating modes are tested independently according to the service requirements in each frequency band. 802.11 b/g modes are tested on channels 1, 6 and 11.802.11a is tested for UNII operations on channels 36 and 48 in the 5.15-5.25 GHz band; channels 52 and 64 in the 5.25-5.35 GHz band; Channels 104, 116, 124 and 136 in the 5.470-5.725 GHz band; and channels 149 and 161 in the 5.8 GHz band. When 5.8 GHz § 15.247 is also available, channels 149, 157 and 165 should be tested instead of the UNII channels. 4.9 GHz is tested on channels 1, 10 and 5 or 6, whichever has the higher output power, for 5 MHz channels; channels 11,15 and 19 for 10 MHz channels; and channels 21 and 25 for 20 MHz channels.

These are referred to as the “default test channels”. 802.11g mode was evaluated only if the output power was 0.25 dB higher than the 802.11b mode.

Mode		GHz	Channel	Turbo Channel	"Default Test Channels"			
					§15.247		UNII	
					802.11b	802.11g		
802.11 b/g		2.412	1		√	∇		
		2.437	6	6	√	∇		
		2.462	11		√	∇		
802.11a	UNII	5.18	36				√	
		5.20	40	42 (5.21 GHz)				*
		5.22	44					*
		5.24	48	50 (5.25 GHz)			√	
		5.26	52				√	
		5.28	56	58 (5.29 GHz)				*
		5.30	60					*
		5.32	64				√	
		5.500	100	Unknown				*
		5.520	104				√	
		5.540	108					*
		5.560	112					*
		5.580	116				√	
		5.600	120					*
		5.620	124				√	
		5.640	128					*
		5.660	132					*
		5.680	136				√	
		5.700	140					*
	UNII or §15.247	5.745	149		√		√	
		5.765	153	152 (5.76 GHz)		*		*
		5.785	157		√			*
		5.805	161	160 (5.80 GHz)		*	√	
	§15.247	5.825	165		√			

802.11 Test Channels per FCC Requirements

2.4GHz

802.11b : 16 dBm
802.11g : 15 dBm
802.11n : 14.5 dBm

Tune-up Tolerance : -1.5dB/ +0.5dB

Conducted Output Power Measurements (802.11b Mode)

802.11b Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
2412	1	1 Mbps	16.17	30
		2 Mbps	15.74	30
		5.5 Mbps	16.08	30
		11 Mbps	15.61	30
2437	6	1 Mbps	16.08	30
		2 Mbps	16.08	30
		5.5 Mbps	16.04	30
		11 Mbps	16.03	30
2462	11	1 Mbps	15.55	30
		2 Mbps	15.54	30
		5.5 Mbps	15.51	30
		11 Mbps	15.09	30

Conducted Output Power Measurements (802.11g Mode)

802.11g Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
2412	1	6 Mbps	15.46	30
		9 Mbps	15.49	30
		12 Mbps	15.32	30
		18 Mbps	15.38	30
		24 Mbps	13.97	30
		36 Mbps	13.92	30
		48 Mbps	14.53	30
		54 Mbps	13.23	30
2437	6	6 Mbps	15.71	30
		9 Mbps	15.66	30
		12 Mbps	15.67	30
		18 Mbps	15.70	30
		24 Mbps	14.28	30
		36 Mbps	14.24	30
		48 Mbps	14.10	30
		54 Mbps	13.05	30
2462	11	6 Mbps	15.15	30
		9 Mbps	15.18	30
		12 Mbps	15.10	30
		18 Mbps	15.29	30
		24 Mbps	13.73	30
		36 Mbps	13.71	30
		48 Mbps	13.15	30
		54 Mbps	12.19	30

Conducted Output Power Measurements (802.11n Mode)

802.11n Mode		Rate (Mbps)	Measured Power(dBm)	Limit (dBm)
Frequency[MHz]	Channel No.			
2412	1	6.5 Mbps	14.69	30
		13 Mbps	12.26	30
		19.5 Mbps	12.39	30
		26 Mbps	13.41	30
		39 Mbps	12.30	30
		52 Mbps	12.15	30
		58.5 Mbps	12.18	30
		65 Mbps	12.09	30
2437	6	6.5 Mbps	14.41	30
		13 Mbps	12.18	30
		19.5 Mbps	12.30	30
		26 Mbps	13.19	30
		39 Mbps	12.14	30
		52 Mbps	11.95	30
		58.5 Mbps	11.94	30
		65 Mbps	11.83	30
2462	11	6.5 Mbps	13.86	30
		13 Mbps	11.74	30
		19.5 Mbps	11.84	30
		26 Mbps	12.79	30
		39 Mbps	11.71	30
		52 Mbps	11.53	30
		58.5 Mbps	11.52	30
		65 Mbps	11.37	30

WLAN 5GHz Conducted Powers

5.2GHz

802.11a : 10.5 dBm

802.11n (20MHz BW) : 9.5 dBm

802.11n (40MHz BW) : 9.5 dBm

5.8GHz

802.11a : 10.5 dBm

802.11n (20MHz BW) : 9.5 dBm

802.11n (40MHz BW) : 9.5 dBm

Tune-up Tolerance : -1.3dB/ +0.7dB

802.11 a

Mode	Freq [MHz]	Channel	conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11a	5745	149	10.90	10.88	10.86	10.90	9.77	9.63	9.23	8.10
802.11a	5765	153	10.79	10.75	10.72	10.71	9.67	9.54	9.11	8.92
802.11a	5785	157	10.80	10.80	10.79	10.80	9.43	9.27	8.82	9.52
802.11a	5805	161	10.75	10.55	10.62	10.45	9.53	9.43	8.85	8.72
802.11a	5825	165	10.59	10.27	10.45	10.21	9.62	9.63	8.87	8.01

802.11 n

Mode	Freq [MHz]	Channel	conducted Power [dBm]							
			Data Rate [Mbps]							
			6	9	12	18	24	36	48	54
802.11n	5745	149	8.41	5.33	5.46	8.30	6.38	6.33	6.32	6.30
802.11n	5765	153	8.38	5.24	5.03	7.93	6.11	5.98	5.84	6.03
802.11n	5785	157	8.40	4.43	4.54	7.70	5.70	5.75	5.41	5.68
802.11n	5805	161	8.35	5.18	4.82	8.21	5.92	5.87	5.82	5.92
802.11n	5825	165	8.53	5.09	5.32	8.46	6.24	6.08	6.17	6.03

40 MHz

802.11n Mode

Mode	Freq [MHz]	Channel	conducted Power [dBm]							
			Data Rate [Mbps]							
			13.5	27	40.5	54	81	108	121.5	135
802.11n	5755	151	9.28	6.24	6.31	8.48	6.56	6.48	6.14	6.33
802.11n	5795	159	8.87	5.60	5.73	8.33	6.56	6.36	6.37	6.30

Note;
SAR testing was performed according to the FCC KDB 248227.

10.7 LTE

SAR testing was performed according to the FCC KDB 941225 D05 publication.
The JYCSPARKLE developed base on MPR. The MPR is mandatory.
The device will not operate with any other MPR setting than that stated in the table as indicated.
SAR Testing was performed using a CMW500. UE transmits with Maximum output power during SAR testing.
A- MPR has been disabled for all SAR tests by setting NS=01 on the R&S CMW500.

LTE Band 4 /LTE Band 13

Target Power : 23.0 dBm

Tune-up Tolerance : -0.5dB/ +0.5dB

Band 4

Bandwidth	UL Channel	UL Freq.(MHz)	Modulation	RB Size	RB Offset	Max.Average Power (dBm)	Target MPR (dB)	Measured Power reduction (dB)
5 MHz	19975	1712.5	QPSK	1	0	23.14	0	0.00
				1	12	23.02	0	0.12
				1	24	23.11	0	0.03
				12	0	22.15	1	0.99
				12	6	22.31	1	0.83
				12	11	22.06	1	1.08
				25	0	22.23	1	0.91
			16QAM	1	0	22.29	1	0.85
				1	12	22.1	1	1.04
				1	24	22.27	1	0.87
				12	0	21.07	2	2.07
				12	11	21.05	2	2.09
				12	6	21.21	2	1.93
				25	0	21.15	2	1.99
5 MHz	20175	1732.5	QPSK	1	0	23.17	0	0.00
				1	12	23.13	0	0.04
				1	24	23.22	0	-0.05
				12	0	22.26	1	0.91
				12	6	22.33	1	0.84
				12	11	22.22	1	0.95
				25	0	22.2	1	0.97
			16QAM	1	0	22.3	1	0.87
				1	12	22.08	1	1.09
				1	24	22.25	1	0.92
				12	0	21.27	2	1.90
				12	11	21.28	2	1.89
				12	6	21.28	2	1.89
				25	0	21.24	2	1.93
5 MHz	20375	1752.5	QPSK	1	0	22.97	0	0.13
				1	12	23.1	0	0.00
				1	24	23.1	0	0.00
				12	0	22.33	1	0.77
				12	6	22.19	1	0.91
				12	11	22.27	1	0.83
				25	0	22.23	1	0.87
			16QAM	1	0	22.05	1	1.05
				1	12	22.29	1	0.81
				1	24	22.21	1	0.89
				12	0	21.26	2	1.84
				12	11	21.17	2	1.93
				12	6	21.29	2	1.81
				25	0	21.11	2	1.99

Bandwidth	UL Channel	UL Freq.(MHz)	Modulation	RB Size	RB Offset	Max.Average Power (dBm)	Target MPR (dB)	Measured Power reduction (dB)
10MHz	20000	1715	QPSK	1	0	23.3	0	0.00
				1	24	23.21	0	0.09
				1	49	23.27	0	0.03
				25	0	22.15	1	1.15
				25	12	22.3	1	1.00
				12	24	22.13	1	1.17
				50	0	22.26	1	1.04
			16QAM	1	0	22.3	1	1.00
				1	24	22.22	1	1.08
				1	49	22.35	1	0.95
				25	0	21.38	2	1.92
				25	12	21.23	2	2.07
				25	24	21.19	2	2.11
				50	0	21.21	2	2.09
10MHz	20175	1732.5	QPSK	1	0	23.35	0	0.00
				1	12	23.24	0	0.11
				1	24	23.2	0	0.15
				25	0	22.22	1	1.13
				25	12	22.39	1	0.96
				25	24	22.24	1	1.11
				25	0	22.33	1	1.02
			16QAM	1	0	22.45	1	0.90
				1	24	22.22	1	1.13
				1	49	22.2	1	1.15
				25	0	21.04	2	2.31
				25	12	21.23	2	2.12
				25	24	21.05	2	2.30
				50	0	21.31	2	2.04
10MHz	20350	1750	QPSK	1	0	23.01	0	0.29
				1	24	23.3	0	0.00
				1	49	22.98	0	0.32
				25	0	22.18	1	1.12
				25	12	22.06	1	1.24
				25	24	22.33	1	0.97
				50	0	22.16	1	1.14
			16QAM	1	0	22.12	1	1.18
				1	24	22.29	1	1.01
				1	49	22.22	1	1.08
				25	0	21.11	2	2.19
				25	12	21.11	2	2.19
				25	24	21.23	2	2.07
				50	0	21.07	2	2.23

Bandwidth	UL Channel	UL Freq.(MHz)	Modulation	RB Size	RB Offset	Max.Average Power (dBm)	Target MPR (dB)	Measured Power reduction (dB)
15NHz	20025	1717.5	QPSK	1	0	23.22	0	0.04
				1	37	23.26	0	0.00
				1	74	23.15	0	0.11
				38	0	22.22	1	1.04
				38	18	22.24	1	1.02
				38	37	22.17	1	1.09
				75	0	22.27	1	0.99
			16QAM	1	0	22.27	1	0.99
				1	37	22.29	1	0.97
				1	74	22.22	1	1.04
				36	0	21.09	2	2.17
				36	18	21.18	2	2.08
				36	38	21.15	2	2.11
				75	0	21.17	2	2.09
15MHz	20175	1732.5	QPSK	1	0	23.17	0	0.06
				1	37	23.17	0	0.06
				1	74	23.23	0	0.00
				36	0	22.29	1	0.94
				36	18	22.21	1	1.02
				36	38	22.12	1	1.11
				75	0	22.24	1	0.99
			16QAM	1	0	22.35	1	0.88
				1	37	22.17	1	1.06
				1	74	22.27	1	0.96
				36	0	21.19	2	2.04
				36	18	21.22	2	2.01
				36	38	21.17	2	2.06
				75	0	21.24	2	1.99
15MHz	20325	1747.5	QPSK	1	0	23.15	0	0.00
				1	37	23.12	0	0.03
				1	74	23.07	0	0.08
				36	0	22.07	1	1.08
				36	18	22	1	1.15
				36	38	22.28	1	0.87
				75	0	21.92	1	1.23
			16QAM	1	0	22.15	1	1.00
				1	37	22.09	1	1.06
				1	74	22.28	1	0.87
				36	0	21.13	2	2.02
				36	18	21.03	2	2.12
				36	38	21.18	2	1.97
				75	0	20.95	2	2.20

Bandwidth	UL Channel	UL Freq.(MHz)	Modulation	RB Size	RB Offset	Max.Average Power (dBm)	Target MPR (dB)	Measured Power reduction (dB)
20MHz	20500	1720	QPSK	1	0	23.25	0	0.00
				1	49	23.25	0	0.00
				1	99	23.18	0	0.07
				50	0	22.06	1	1.19
				50	25	22.26	1	0.99
				50	49	22.12	1	1.13
				100	0	22.31	1	0.94
			16QAM	1	0	22.3	1	0.95
				1	49	22.22	1	1.03
				1	99	22.25	1	1.00
				50	0	20.97	2	2.28
				50	25	21.21	2	2.04
				50	49	20.9	2	2.35
				100	0	21.33	2	1.92
20MHz	20175	1732.5	QPSK	1	0	23.18	0	0.01
				1	49	23.19	0	0.00
				1	99	23.07	0	0.12
				50	0	22.1	1	1.09
				50	25	22.25	1	0.94
				50	49	21.97	1	1.22
				100	0	22.13	1	1.06
			16QAM	1	0	22.31	1	0.88
				1	49	22.14	1	1.05
				1	99	22.09	1	1.10
				50	0	21.05	2	2.14
				50	25	21.25	2	1.94
				50	49	21.05	2	2.14
				100	0	21.15	2	2.04
20MHz	20300	1745	QPSK	1	0	23.24	0	0.00
				1	49	23	0	0.24
				1	99	23.05	0	0.19
				50	0	21.92	1	1.32
				50	25	21.79	1	1.45
				50	49	22.16	1	1.08
				100	0	21.79	1	1.45
			16QAM	1	0	22.33	1	0.91
				1	49	22.03	1	1.21
				1	99	22.28	1	0.96
				50	0	21.06	2	2.18
				50	25	20.88	2	2.36
				50	49	21.03	2	2.21
				100	0	20.92	2	2.32

LTE Band 13

Bandwidth	UL Channel	UL Freq.(MHz)	Modulation	RB Size	RB Offset	Max.Average Power (dBm)	Target MPR (dB)	Measured Power reduction (dB)
10MHz	23230	782MHz	QPSK	1	0	23.08	0	0.00
				1	24	23.02	0	0.06
				1	49	23.05	0	0.03
				25	0	21.8	1	1.28
				25	12	21.74	1	1.34
				25	24	21.82	1	1.26
				50	0	21.74	1	1.34
			16QAM	1	0	22.08	1	1.00
				1	24	22.04	1	1.04
				1	49	22.07	1	1.01
				25	0	22.09	2	0.99
				25	12	20.7	2	2.38
				25	24	21.05	2	2.03
				50	0	20.66	2	2.42

Note;

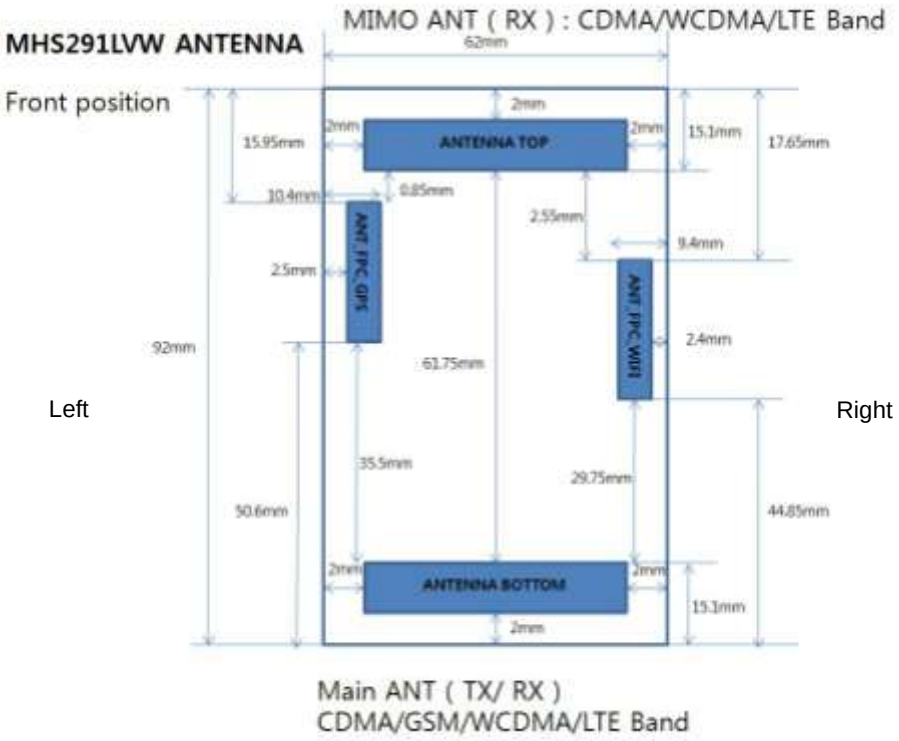
The EUT enables maximum power reduction in accordance with 3GPP 36.101. The MPR settings are configured during the manufacture process and are not configurable by the network, carrier, or end user.

11. SAR Test configuration & Antenna Information

11.1 SAR Test configurations

Mode	Back	Front	Left	Right	Bottom	Top
850 GPRS	Yes	Yes	Yes	Yes	Yes	No
1900 GPRS	Yes	Yes	Yes	Yes	Yes	No
WCDMA850	Yes	Yes	Yes	Yes	Yes	No
WCDMA1900	Yes	Yes	Yes	Yes	Yes	No
LTE Band 13 / 4	Yes	Yes	Yes	Yes	Yes	No
2.4 GHz WLAN	Yes	Yes	No	Yes	No	Yes
5 GHz WLAN	Yes	Yes	No	Yes	No	Yes

11.2 Antenna and Device Information



[Front side View]

Note;

Per FCC KDB Publication 941225 D06, we performed the SAR testing at 1 cm from the top & bottom surfaces and also from side edges with a transmitting antenna ≤ 2.5 cm from an edge.

12. SAR TEST DATA SUMMARY

12.1 Measurement Results (CDMA835 SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	SAR (mW/g)	Scaled up SAR (mW/g)	Plot No.
MHz	ch.								
824.7	1013 (low)	EVDO	24.26	0.024	Rear	1.0 cm	0.733	0.775	1
836.52	384 (Mid)	EVDO	24.10	-0.028	Rear	1.0 cm	0.844	0.925	2
848.31	777 (High)	EVDO	24.02	-0.001	Rear	1.0 cm	0.918	1.025	3
824.7	1013 (low)	EVDO	24.26	-0.170	Front	1.0 cm	0.8	0.845	4
836.52	384 (Mid)	EVDO	24.10	-0.072	Front	1.0 cm	0.963	1.056	5
848.31	777 (High)	EVDO	24.02	0.058	Front	1.0 cm	0.919	1.026	6
836.52	384 (Mid)	EVDO	24.10	0.027	Left	1.0 cm	0.506	0.555	7
836.52	384 (Mid)	EVDO	24.10	0.06	Right	1.0 cm	0.515	0.565	8
836.52	384 (Mid)	EVDO	24.10	-0.099	Bottom	1.0 cm	0.177	0.194	9
ANSI/ IEEE C95.1 1992 – Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**						**Body** **1.6 W/kg (mW/g)** Averaged over 1 gram			

NOTES:

1 The test data reported are the worst-case SAR value with the body position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
8 EVDO Body SAR was tested under EVDO Rev.0 RTAP.
9 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

12.2 Measurement Results (PCS1900 SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	SAR (mW/g)	Scaled up SAR (mW/g)	Plot No.
MHz	ch.								
1 851.25	25 (Low)	EVDO	24.76	- 0.042	Rear	1.0 cm	1.3	1.327	10
1 880.00	600 (Mid)	EVDO	24.64	0.090	Rear	1.0 cm	1.17	1.228	11
1 908.75	1175(High)	EVDO	24.24	- 0.015	Rear	1.0 cm	0.682	0.785	12
1 851.25	25 (Low)	EVDO	24.76	- 0.042	Front	1.0 cm	0.975	0.995	13
1 880.00	600 (Mid)	EVDO	24.64	- 0.100	Front	1.0 cm	1.1	1.154	14
1 908.75	1175(High)	EVDO	24.24	0.129	Front	1.0 cm	0.947	1.090	15
1 851.25	25 (Low)	EVDO	24.76	- 0.055	Left	1.0 cm	0.906	0.925	16
1 880.00	600 (Mid)	EVDO	24.64	0.096	Left	1.0 cm	0.857	0.899	17
1 908.75	1175(High)	EVDO	24.24	0.06	Left	1.0 cm	0.711	0.818	18
1 880.00	600 (Mid)	EVDO	24.64	0.009	Right	1.0 cm	0.588	0.617	19
1 880.00	600 (Mid)	EVDO	24.64	0.025	Bottom	1.0 cm	0.529	0.555	20
ANSI/ IEEE C95.1 1992 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Body 1.6 W/kg (mW/g) Averaged over 1 gram**			

NOTES:

1 The test data reported are the worst-case SAR value with the body position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
8 EVDO Body SAR was tested under EVDO Rev.0 RTAP.
9 According to KDB 447498, Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz.

12.3 Measurement Results (GSM850 SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	SAR (mW/g)	Scaled up SAR (mW/g)	Plot No.
MHz	ch.								
824.2	128 (Low)	GPRS 2Tx	32.90	-0.085	Rear	1.0 cm	1.32	1.516	21
836.6	190 (Mid)	GPRS 2Tx	32.96	-0.050	Rear	1.0 cm	1.22	1.382	22
848.8	251 (High)	GPRS 2Tx	32.98	-0.015	Rear	1.0 cm	1.13	1.274	23
824.2	128 (Low)	GPRS 2Tx	32.90	0.063	Front	1.0 cm	1.16	1.332	24
836.6	190 (Mid)	GPRS 2Tx	32.96	0.016	Front	1.0 cm	1.2	1.359	25
848.8	251 (High)	GPRS 2Tx	32.98	-0.095	Front	1.0 cm	1.12	1.262	26
836.6	190 (Mid)	GPRS 2Tx	32.96	0.073	Left	1.0 cm	0.622	0.704	27
836.6	190 (Mid)	GPRS 2Tx	32.96	0.070	Right	1.0 cm	0.654	0.741	28
836.6	190 (Mid)	GPRS 2Tx	32.96	-0.002	Bottom	1.0 cm	0.292	0.331	29
ANSI/ IEEE C95.1 1992 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Body 1.6 W/kg (mW/g) Averaged over 1 gram**			

NOTES:

1 The test data reported are the worst-case SAR value with the body position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
8 According to KDB 447498, Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz.
9 For body SAR testing, the EUT was set in GPRS multi-slot class10 with 2uplink slots for GSM850 due to maximum source-based time-averaged output power.
According to the KDB 941225 D03 SAR test reduction GSM/GPRS/EDGE, the maximum output power configuration were chosen for Body SAR testing.

12.4 Measurement Results (GSM1900 SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	SAR (mW/g)	Scaled up SAR (mW/g)	Plot No.
MHz	ch.								
1 880.0	661 (Mid)	GPRS 2Tx	30.13	-0.06	Rear	1.0 cm	0.538	0.586	30
1 880.0	661 (Mid)	GPRS 2Tx	30.13	-0.112	Front	1.0 cm	0.593	0.646	31
1 880.0	661 (Mid)	GPRS 2Tx	30.13	-0.118	Left	1.0 cm	0.521	0.567	32
1 880.0	661 (Mid)	GPRS 2Tx	30.13	-0.103	Right	1.0 cm	0.292	0.318	33
1 880.0	661 (Mid)	GPRS 2Tx	30.13	-0.025	Bottom	1.0 cm	0.246	0.268	34
ANSI/ IEEE C95.1 1992 – Safety Limit **Spatial Peak** **Uncontrolled Exposure/ General Population**						**Body** **1.6 W/kg (mW/g)** Averaged over 1 gram			

NOTES:

1 The test data reported are the worst-case SAR value with the body position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
8 According to KDB 447498, Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz.
9 For body SAR testing, the EUT was set in GPRS multi-slot class10 with 2uplink slots for GSM1900 due to maximum source-based time-averaged output power.
According to the KDB 941225 D03 SAR test reduction GSM/GPRS/EDGE, the maximum output power configuration were chosen for Body SAR testing.

12.5 Measurement Results (WCDMA850 SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	SAR (mW/g)	Scaled up SAR (mW/g)	Plot No.
MHz	ch.								
836.6	4183 (Mid)	WCDMA850	23.00	-0.050	Rear	1.0 cm	0.664	0.745	35
836.6	4183 (Mid)	WCDMA850	23.00	-0.128	Front	1.0 cm	0.677	0.760	36
836.6	4183 (Mid)	WCDMA850	23.00	-0.102	Left	1.0 cm	0.292	0.328	37
836.6	4183 (Mid)	WCDMA850	23.00	0.013	Right	1.0 cm	0.358	0.402	38
836.6	4183 (Mid)	WCDMA850	23.00	-0.005	Bottom	1.0 cm	0.187	0.210	39
ANSI/ IEEE C95.1 1992 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Body 1.6 W/kg (mW/g) Averaged over 1 gram**			

NOTES:

1 The test data reported are the worst-case SAR value with the body position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
8 WCDMA Mode was tested under RMC 12.2 kbps and HSPA Inactive.
9 According to KDB 447498, Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz.

12.6 Measurement Results (WCDMA1900 SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	SAR (mW/g)	Scaled up SAR (mW/g)	Plot No.
MHz	ch.								
1 852.4	9262 (Low)	WCDMA1900	22.99	-0.066	Rear	1.0 cm	0.799	0.899	40
1 880.0	9400 (Mid)	WCDMA1900	23.04	-0.058	Rear	1.0 cm	0.761	0.846	41
1 907.6	9538(High)	WCDMA1900	22.96	-0.041	Rear	1.0 cm	0.690	0.781	42
1 852.4	9262 (Low)	WCDMA1900	23.04	-0.024	Front	1.0 cm	0.688	0.765	43
1 880.0	9400 (Mid)	WCDMA1900	23.04	-0.015	Front	1.0 cm	0.741	0.824	44
1 907.6	9538(High)	WCDMA1900	23.04	-0.059	Front	1.0 cm	0.708	0.787	45
1 880.0	9400 (Mid)	WCDMA1900	23.04	0.078	Left	1.0 cm	0.607	0.675	46
1 880.0	9400 (Mid)	WCDMA1900	23.04	0.020	Right	1.0 cm	0.451	0.501	47
1 880.0	9400 (Mid)	WCDMA1900	23.04	0.043	Bottom	1.0 cm	0.295	0.328	48
ANSI/ IEEE C95.1 1992 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Body 1.6 W/kg (mW/g) Averaged over 1 gram**			

NOTES:

1 The test data reported are the worst-case SAR value with the body position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
8 WCDMA Mode was tested under RMC 12.2 kbps and HSPA Inactive.
9 According to KDB 447498, Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz.

12.7 Measurement Results (802.11b/g/n SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	Data Rate	SAR (mW/g)	Scaled up SAR (mW/g)	Plot No.
MHz	Channel									
2 412	1 (low)	802.11b	16.17	0.082	Rear	1.0 cm	1Mbps	0.013	0.014	49
			16.17	0.054	Front	1.0 cm	1Mbps	0.071	0.077	50
			16.17	0.061	Right	1.0 cm	1Mbps	0.074	0.080	51
			16.17	-0.074	Top	1.0 cm	1Mbps	0.001	0.001	52
ANSI/ IEEE C95.1 - 1992– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Body** **1.6 W/kg (mW/g)** Averaged over 1 gram				

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-body position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☒ Manual Test code ☐ Base Station Simulator
7 IEEE 802.11g(including 802.11n) SAR testing is required when the conducted powers are equal to or greater than 0.25 dB Than the conducted powers in IEEE 802.11b.
8 For 2.4GHz WLAN, Highest average power channel for the lowest data rate was selected for SAR evaluation based on KDB 248227. Other channels are not necessary because 1g-average SAR < 0.8 W/Kg and peak SAR < 1.6W/Kg per KDB 248227.

12.8 Measurement Results (802.11a SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	Separation Distance	Data Rate	SAR (mW/g)	Scaled up SAR (mW/g)	Plot No.
MHz	Channel									
5745	149	802.11a	10.90	0.008	Rear	1.0 cm	6Mbps	0.023	0.025	57
5745	149	802.11a	10.90	0.09	Front	1.0 cm	6Mbps	0.047	0.050	58
5745	149	802.11a	10.90	0.09	Right	1.0 cm	6Mbps	0.056	0.060	59
5745	149	802.11a	10.90	0.06	Top	1.0 cm	6Mbps	0.00191	0.002	60
ANSI/ IEEE C95.1 - 1992– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Body 1.6 W/kg (mW/g) Averaged over 1 gram**				

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-body position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☒ Manual Test code ☐ Base Station Simulator
7 IEEE 802.11g(including 802.11n) SAR testing is required when the conducted powers are equal to or greater than 0.25 dB Than the conducted powers in IEEE 802.11b.
8 For 2.4GHz WLAN, Highest average power channel for the lowest data rate was selected for SAR evaluation based on KDB 248227. Other channels are not necessary because 1g-average SAR < 0.8 W/Kg and peak SAR < 1.6W/Kg per KDB 248227.

12.9 Measurement Results (LTE Band13 10MHz SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	RB Size	RB Offset	Separation Distance	SAR (mW/g)	Scaled up SAR (mW/g)	Plot No.	MPR
MH	ch.											
782	23230	QPSK	23.08	-0.0822	Rear	1	0	1.0 cm	0.653	0.719	61	0
		QPSK	21.85	-0.010	Rear	25	24	1.0 cm	0.54	0.627	62	1
		QPSK	23.08	-0.070	Front	1	0	1.0 cm	0.537	0.592	63	0
		QPSK	21.85	-0.038	Front	25	24	1.0 cm	0.452	0.525	64	1
		QPSK	23.08	-0.183	Left	1	0	1.0 cm	0.231	0.254	65	0
		QPSK	21.85	-0.047	Left	25	24	1.0 cm	0.194	0.225	66	1
		QPSK	23.08	-0.035	Right	1	0	1.0 cm	0.218	0.240	67	0
		QPSK	21.85	0.073	Right	25	24	1.0 cm	0.194	0.225	68	1
		QPSK	23.08	-0.07	Bottom	1	0	1.0 cm	0.106	0.117	69	0
		QPSK	21.85	-0.074	Bottom	25	24	1.0 cm	0.078	0.091	70	1
ANSI/ IEEE C95.1 1992 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population									**Body 1.6 W/kg (mW/g)** Averaged over 1 gram			

NOTES:

1 The test data reported are the worst-case SAR value with the body position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 All side of the EUT were tested and the worst-case side is reported.
8 The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
9 KDB 941225 D05 SAR for LTE Devices v02 was followed.
- Testing for Low and High Channel is performed at the highest output power level for 1 RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest report SAR for 1 RB and 50% RB are ≥ 0.8W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
- Testing for 16QAM modulation is not required because the reported SAR for QPSK is 1.45W/kg and its output power is not more than 0.5 dB higher than that of QPSK
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is <1.45 W/kg and its output power is not more than 0.5 dB hidher than that of the highest channel bandwidth

12.10 Measurement Results (LTE Band4 20MHz SAR)

Frequency		Modulation	Conducted Power (dBm)	Power Drift (dB)	Configuration	RB Size	RB Offset	Separation Distance	SAR (mW/g)	Scaled up SAR (mW/g)	Plot No.	MPR
MHz	ch.											
1720	20050	QPSK	23.25	0.058	Rear	1	0	1.0 cm	0.656	0.695	71	0
		QPSK	22.26	-0.013	Rear	50	25	1.0 cm	0.435	0.460	72	1
		QPSK	23.25	-0.031	Front	1	0	1.0 cm	0.397	0.421	73	0
		QPSK	22.26	0.021	Front	50	25	1.0 cm	0.291	0.308	74	1
		QPSK	23.25	-0.006	Left	1	0	1.0 cm	0.375	0.397	75	0
		QPSK	22.26	0.022	Left	50	25	1.0 cm	0.295	0.312	76	1
		QPSK	23.25	0.088	Right	1	0	1.0 cm	0.101	0.107	77	0
		QPSK	22.26	0.134	Right	50	25	1.0 cm	0.078	0.082	78	1
		QPSK	23.25	-0.051	Bottom	1	0	1.0 cm	0.874	0.926	79	0
1732.5	20175	QPSK	23.18	-0.001	Bottom	1	0	1.0 cm	0.758	0.816	80	0
1754	20300	QPSK	23.24	-0.012	Bottom	1	0	1.0 cm	0.871	0.925	81	0
1720	20050	QPSK	22.26	0.028	Bottom	50	25	1.0 cm	0.613	0.648	82	1
1720	20050	QPSK	22.31	-0.046	Bottom	100	0	1.0 cm	0.559	0.584	83	1
ANSI/ IEEE C95.1 1992 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population									**Body 1.6 W/kg (mW/g)** Averaged over 1 gram			

NOTES:

1 The test data reported are the worst-case SAR value with the body position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 All side of the EUT were tested and the worst-case side is reported.
8 The EUT was fixed by using a Styrofoam to avoid perturbation due to the device holder clamps.
9 KDB 941225 D05 SAR for LTE Devices v02 was followed.

- Testing for Low and High Channel is performed at the highest output power level for 1 RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest report SAR for 1 RB and 50% RB are ≥ 0.8W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
- Testing for 16QAM modulation is not required because the reported SAR for QPSK is 1.45W/kg and its output power is not more than 0.5 dB higher than that of QPSK
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is <1.45 W/kg and its output power is not more than 0.5 dB hidher than that of the highest channel bandwidth

13. SAR Summation Scenario

	Position	Applicable Combination
Simultaneous Transmission	Body	CDMA EVDO + 2.4 GHz WiFi
		PCS EVDO + 2.4 GHz WiFi
		GSM850 GPRS + 2.4 GHz WiFi
		GSM1900 GPRS + 2.4 GHz WiFi
		WCDMA850 Data+ 2.4 GHz WiFi
		WCDMA1900 Data+ 2.4 GHz WiFi
		LTE Data+ 2.4 GHz WiFi
		CDMA EVDO + 5 GHz WiFi
		PCS EVDO + 5 GHz WiFi
		GSM850 GPRS + 5 GHz WiFi
		GSM1900 GPRS + 5 GHz WiFi
		WCDMA850 Data+ 5 GHz WiFi
		WCDMA1900 Data+ 5 GHz WiFi
		LTE Data+ 5 GHz WiFi

Simultaneous Transmission Summation for Body (1cm)

Simultaneous TX	configuration	CDMA EVDO Scaled SAR(W/kg)	2.4GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)	Simultaneous TX	configuration	PCS EVDO Scaled SAR(W/kg)	2.4GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)
Body SAR	Back	1.025	0.014	1.039	Body SAR	Back	1.327	0.014	1.341
	Front	1.056	0.077	1.133		Front	1.154	0.077	1.231
	Left	0.555	-	0.555		Left	0.925	-	0.925
	Right	0.565	0.080	0.645		Right	0.617	0.080	0.697
	Bottom	0.194	-	0.194		Bottom	0.555	-	0.555
	Top	-	0.001	0.001		Top	-	0.001	0.001
Simultaneous TX	configuration	GSM850 Scaled SAR(W/kg)	2.4GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)	Simultaneous TX	configuration	GSM1900 Scaled SAR(W/kg)	2.4GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)
Body SAR	Back	1.516	0.014	1.530	Body SAR	Back	0.586	0.014	0.600
	Front	1.359	0.077	1.436		Front	0.646	0.077	0.723
	Left	0.704	-	0.704		Left	0.567	-	0.567
	Right	0.741	0.080	0.821		Right	0.318	0.080	0.398
	Bottom	0.331	-	0.331		Bottom	0.268	-	0.268
	Top	-	0.001	0.001		Top	-	0.001	0.001
Simultaneous TX	configuration	WCDMA850 Scaled SAR(W/kg)	2.4GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)	Simultaneous TX	configuration	WCDMA1900 Scaled SAR(W/kg)	2.4GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)
Body SAR	Back	0.745	0.014	0.759	Body SAR	Back	0.899	0.014	0.913
	Front	0.760	0.077	0.837		Front	0.824	0.077	0.901
	Left	0.328	-	0.328		Left	0.675	-	0.675
	Right	0.402	0.080	0.482		Right	0.501	0.080	0.581
	Bottom	0.210	-	0.210		Bottom	0.328	-	0.328
	Top	-	0.001	0.001		Top	-	0.001	0.001
Simultaneous TX	configuration	LTE Band 13 Scaled SAR(W/kg)	2.4GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)	Simultaneous TX	configuration	LTE Band 4 Scaled SAR(W/kg)	2.4GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)
Body SAR	Back	0.719	0.014	0.733	Body SAR	Back	0.695	0.014	0.709
	Front	0.592	0.077	0.669		Front	0.421	0.077	0.498
	Left	0.254	-	0.254		Left	0.397	-	0.397
	Right	0.240	0.080	0.320		Right	0.107	0.080	0.187
	Bottom	0.117	-	0.117		Bottom	0.926	-	0.926
	Top	-	0.001	0.001		Top	-	0.001	0.001

Simultaneous TX	configuration	CDMA EVDO Scaled SAR(W/kg)	DTS 5GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)	Simultaneous TX	configuration	PCS EVDO Scaled SAR(W/kg)	DTS 5GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)
Body SAR	Back	1.025	0.025	1.050	Body SAR	Back	1.327	0.025	1.352
	Front	1.056	0.050	1.106		Front	1.154	0.050	1.204
	Left	0.555	-	0.555		Left	0.925	-	0.925
	Right	0.565	0.060	0.625		Right	0.617	0.060	0.677
	Bottom	0.194	-	0.194		Bottom	0.555	-	0.555
	Top	-	0.002	0.002		Top	-	0.002	0.002
Simultaneous TX	configuration	GSM850 Scaled SAR(W/kg)	DTS 5GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)	Simultaneous TX	configuration	GSM1900 Scaled SAR(W/kg)	DTS 5GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)
Body SAR	Back	1.516	0.025	1.541	Body SAR	Back	0.586	0.025	0.611
	Front	1.359	0.050	1.409		Front	0.646	0.050	0.696
	Left	0.704	-	0.704		Left	0.567	-	0.567
	Right	0.741	0.060	0.801		Right	0.318	0.060	0.378
	Bottom	0.331	-	0.331		Bottom	0.268	-	0.268
	Top	-	0.002	0.002		Top	-	0.002	0.002
Simultaneous TX	configuration	WCDMA850 Scaled SAR(W/kg)	DTS 5GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)	Simultaneous TX	configuration	WCDMA1900 Scaled SAR(W/kg)	DTS 5GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)
Body SAR	Back	0.745	0.025	0.770	Body SAR	Back	0.899	0.025	0.924
	Front	0.760	0.050	0.810		Front	0.824	0.050	0.874
	Left	0.328	-	0.328		Left	0.675	-	0.675
	Right	0.402	0.060	0.462		Right	0.501	0.060	0.561
	Bottom	0.210	-	0.210		Bottom	0.328	-	0.328
	Top	-	0.002	0.002		Top	-	0.002	0.002
Simultaneous TX	configuration	LTE Band 13 Scaled SAR(W/kg)	DTS 5GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)	Simultaneous TX	configuration	LTE Band 4 Scaled SAR(W/kg)	DTS 5GHz WIFI Scaled SAR (W/kg)	∑SAR (W/kg)
Body SAR	Back	0.719	0.025	0.744	Body SAR	Back	0.695	0.025	0.720
	Front	0.592	0.050	0.642		Front	0.421	0.050	0.471
	Left	0.254	-	0.254		Left	0.397	-	0.397
	Right	0.240	0.060	0.300		Right	0.107	0.060	0.167
	Bottom	0.117	-	0.117		Bottom	0.926	-	0.926
	Top	-	0.002	0.002		Top	-	0.002	0.002

Note;

- Body-Worn SAR : Although body-worn accessory conditions are typically for voice configurations, the GPRS slot frame averaged output power was more conservative and was included for the body-worn accessory SAR assessment.

- The EUT front body-worn configuration is provided to cover any potential accessory that will position the EUT in this manner.

13.1 Simultaneous Transmission Conclusion

The above numerical summed SAR was below the SAR limit. Therefore, the above analysis is sufficient to determine that simultaneous transmission cases will not exceed the SAR limit. No volumetric SAR summation is required per FCC KDB Publication 648474.

The above tables represent the worst-case simultaneous transmission scenarios possibility with this device.

14. SAR Measurement Variability and Uncertainty

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz v01. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).
4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Frequency		Modulation	Battery	Configuration	Original SAR(mW/g)	Repeated SAR(mW/g)	Largest to Smallest SAR Ratio	Plot No.
MHz	Channel							
836.52	384 (Mid)	EVDO	Standard	Front	0.963	0.940	1.024	84

Frequency		Modulation	Battery	Configuration	Original SAR(mW/g)	Repeated SAR(mW/g)	Largest to Smallest SAR Ratio	Plot No.
MHz	Channel							
1 851.25	25 (Low)	EVDO	Standard	Rear	1.3	1.3	1.00	85
1 851.25	25 (Low)	EVDO	Standard	Rear	1.3	1.29	1.008	86

Frequency		Modulation	Battery	Configuration	Original SAR(mW/g)	Repeated SAR(mW/g)	Largest to Smallest SAR Ratio	Plot No.
MHz	Channel							
824.2	128 (Low)	GPRS 2Tx	Standard	Rear	1.32	1.29	1.023	87
824.2	128 (Low)	GPRS 2Tx	Standard	Rear	1.32	1.28	1.031	88

Frequency		Modulation	Battery	Configuration	Original SAR(mW/g)	Repeated SAR(mW/g)	Largest to Smallest SAR Ratio	Plot No.
MHz	Channel							
1720	20050	QPSK	Standard	Bottom	0.874	0.870	1.005	89

Note(s):

1. Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is not > 1.20.

2. Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg.

15. CONCLUSION

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the ANSI/ IEEE C95.1 1992.

These measurements are taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests.

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[21] Mobile and Portable Device RF Exposure Equipment Authorization Procedures #447498.

Attachment 1. – SAR Test Plots

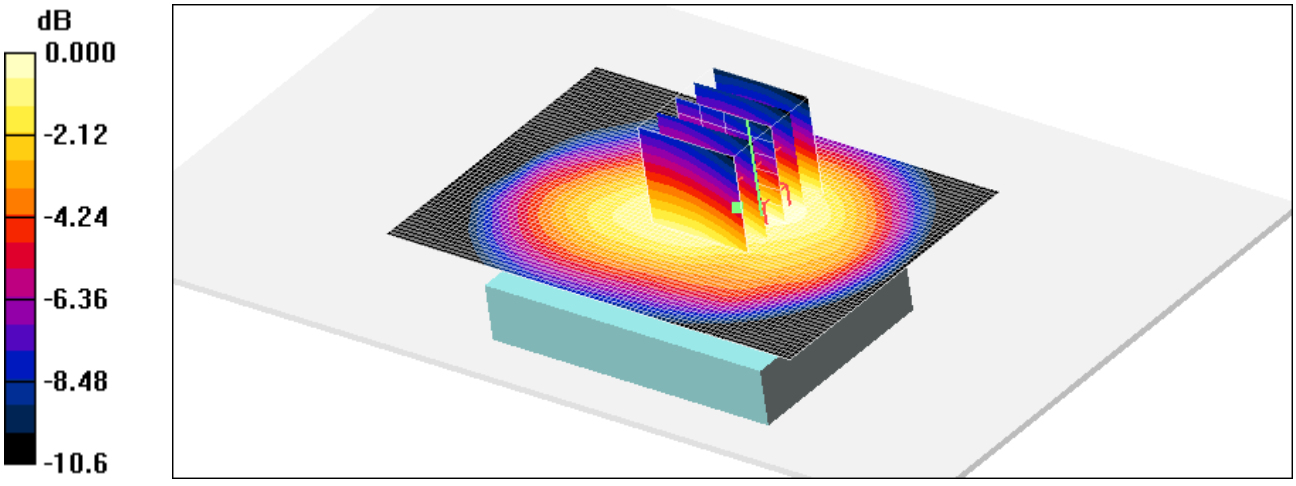
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 3, 2012
Separation Distance:	1.0 cm
Plot NO.	1

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.98 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

CDMA835 EVDO Rear 1013/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.772 mW/g
CDMA835 EVDO Rear 1013/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.0 V/m; Power Drift = 0.024 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.733 mW/g; SAR(10 g) = 0.510 mW/g
Maximum value of SAR (measured) = 0.777 mW/g



0 dB = 0.777mW/g

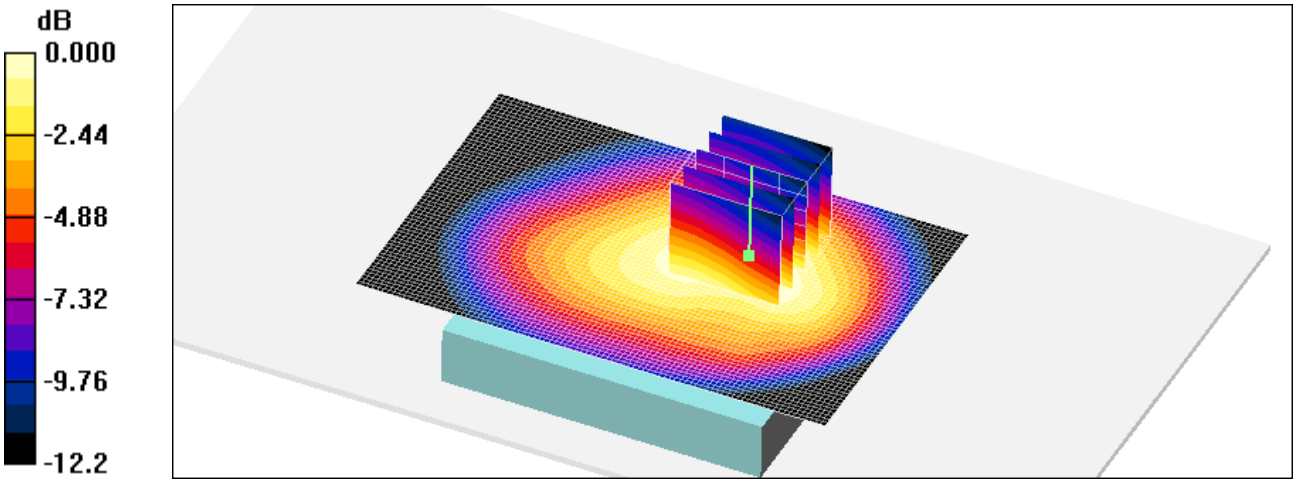
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 3, 2012
Separation Distance:	1.0 cm
Plot NO.	2

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.992 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

CDMA835 EVDO Rear 384/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.884 mW/g
CDMA835 EVDO Rear 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.4 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.844 mW/g; SAR(10 g) = 0.569 mW/g
Maximum value of SAR (measured) = 0.905 mW/g



0 dB = 0.905mW/g

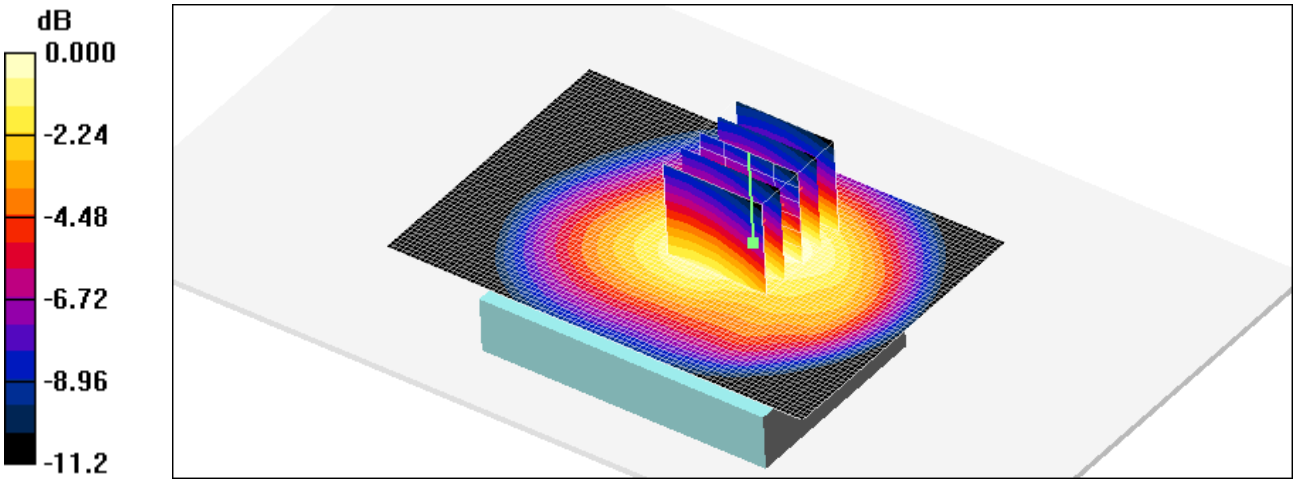
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 3, 2012
Separation Distance:	1.0 cm
Plot NO.	3

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 848.31 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

CDMA835 EVDO Rear 777/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.972 mW/g
CDMA835 EVDO Rear 777/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.4 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.918 mW/g; SAR(10 g) = 0.619 mW/g
Maximum value of SAR (measured) = 0.976 mW/g



0 dB = 0.976mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 3, 2012
Separation Distance:	1.0 cm
Plot NO.	4

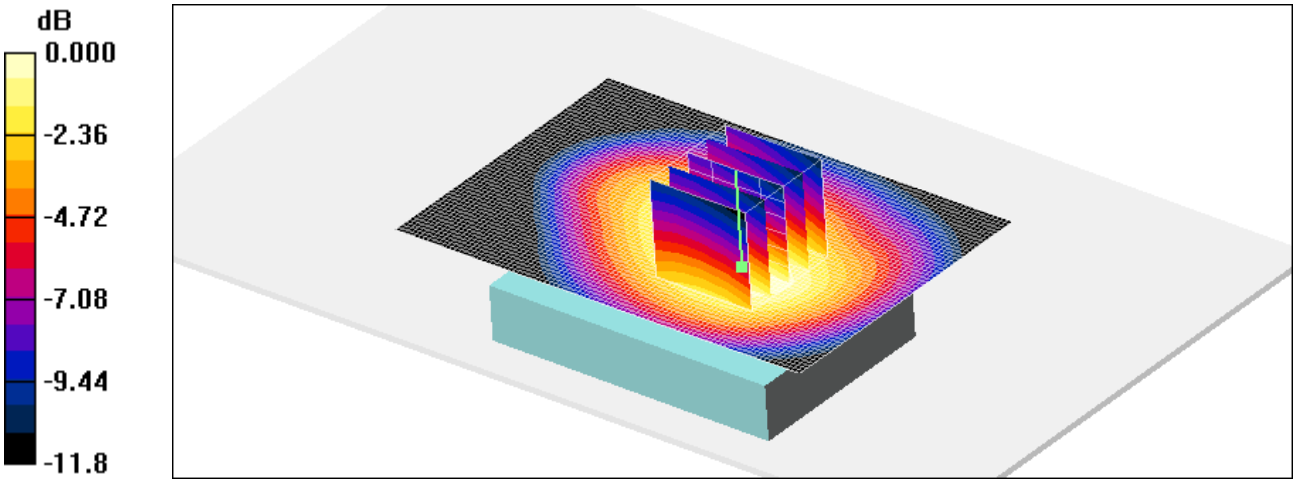
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium parameters used: f = 825 MHz; σ = 0.98 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

CDMA835 EVDO Rear 1013/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.874 mW/g

CDMA835 EVDO Rear 1013/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.3 V/m; Power Drift = -0.170 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.800 mW/g; SAR(10 g) = 0.552 mW/g
Maximum value of SAR (measured) = 0.857 mW/g



0 dB = 0.857mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 3, 2012
Separation Distance:	1.0 cm
Plot NO.	5

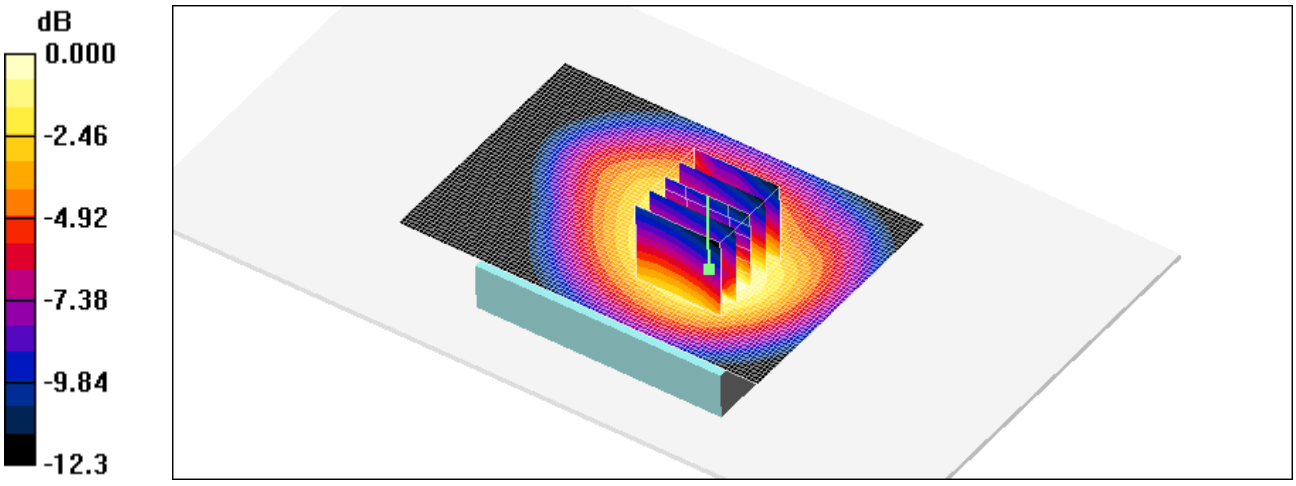
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.986 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

CDMA835 EVDO Front 384/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.01 mW/g
CDMA835 EVDO Front 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.0 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 3.05 W/kg
SAR(1 g) = 0.963 mW/g; SAR(10 g) = 0.624 mW/g
Maximum value of SAR (measured) = 0.996 mW/g



0 dB = 0.996mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 3, 2012
Separation Distance:	1.0 cm
Plot NO.	6

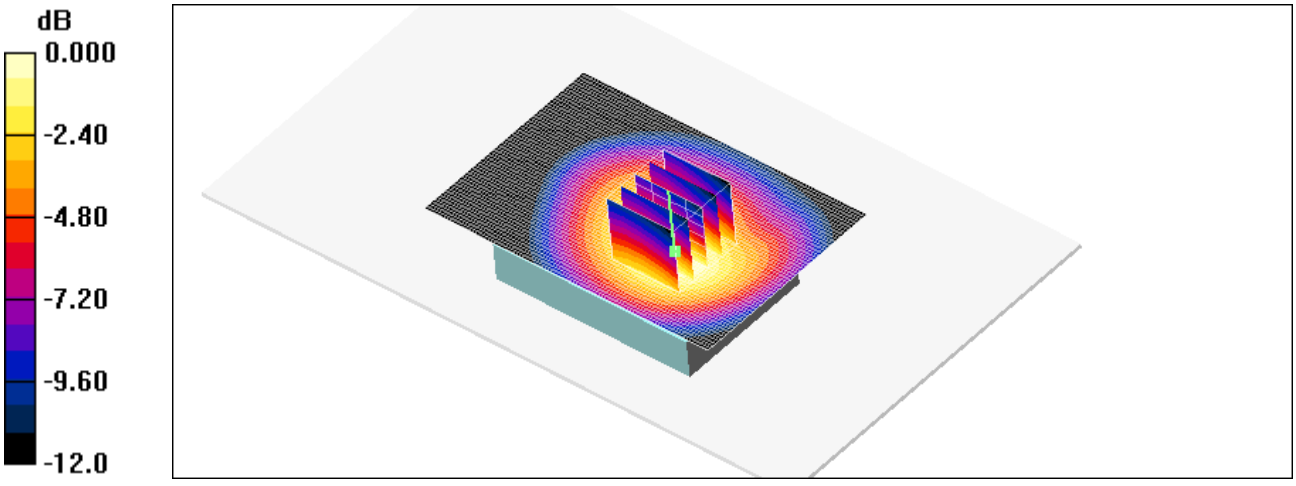
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 848.31 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

CDMA835 EVDO Rear 777/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.978 mW/g
CDMA835 EVDO Rear 777/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.6 V/m; Power Drift = 0.058 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.919 mW/g; SAR(10 g) = 0.613 mW/g
Maximum value of SAR (measured) = 0.985 mW/g



0 dB = 0.985mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 3, 2012
Separation Distance:	1.0 cm
Plot NO.	7

DUT: MHS291LVW; Type: Bar; Serial: #1

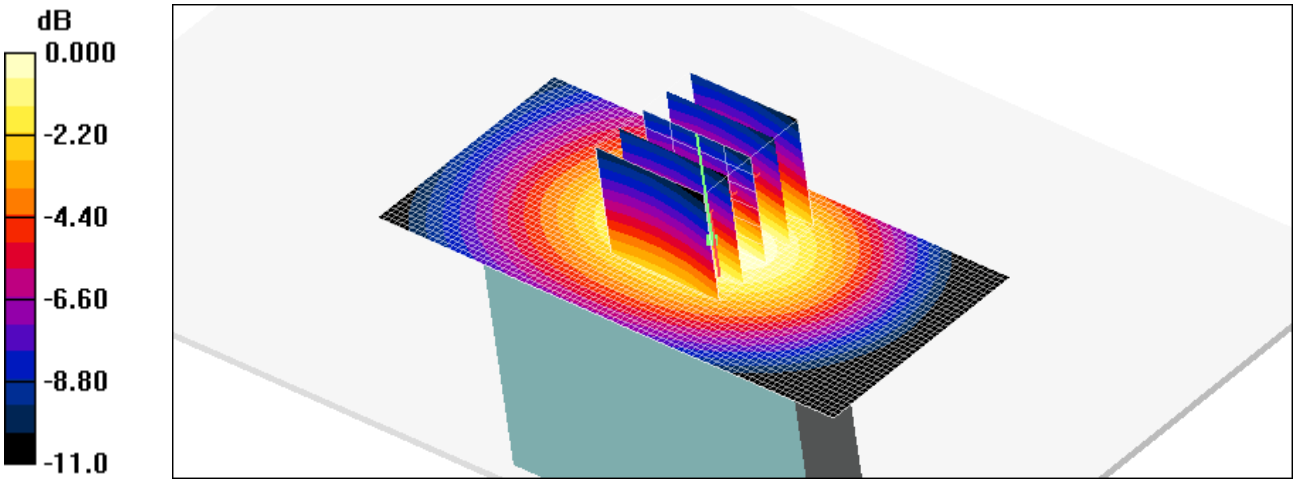
Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.992 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

CDMA835 EVDO Left side 384/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.550 mW/g
CDMA835 EVDO Left side 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.6 V/m; Power Drift = 0.027 dB
Peak SAR (extrapolated) = 0.713 W/kg
SAR(1 g) = 0.506 mW/g; SAR(10 g) = 0.337 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.541 mW/g



0 dB = 0.541mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 3, 2012
Separation Distance:	1.0 cm
Plot NO.	8

DUT: MHS291LVW; Type: Bar; Serial: #1

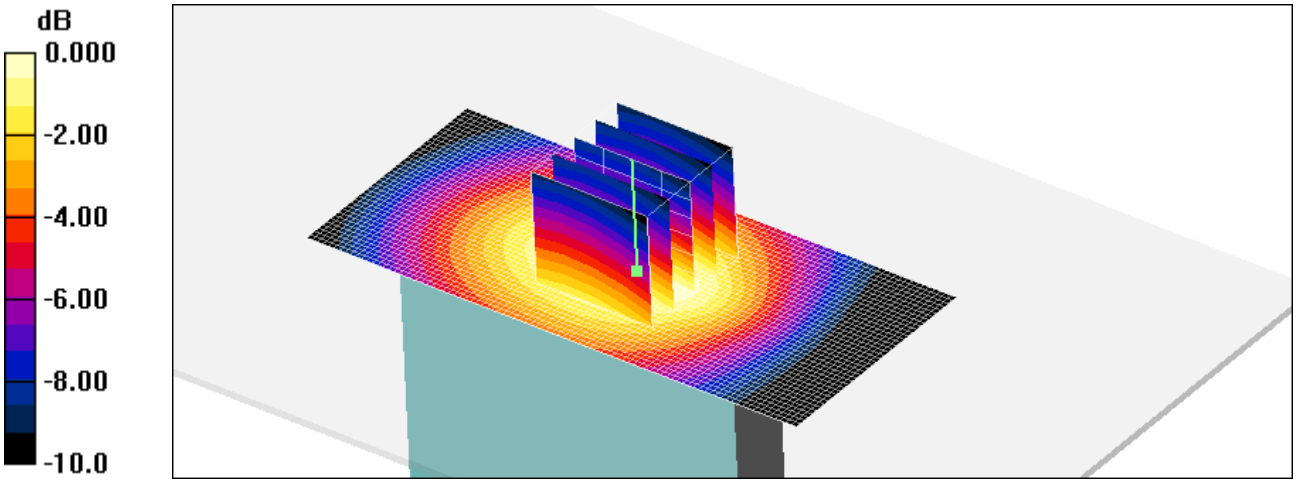
Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.992 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

CDMA835 EVDO Right side 384/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.569 mW/g
CDMA835 EVDO Right side 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.0 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.699 W/kg
SAR(1 g) = 0.515 mW/g; SAR(10 g) = 0.355 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.548 mW/g



0 dB = 0.548mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 3, 2012
Separation Distance:	1.0 cm
Plot NO.	9

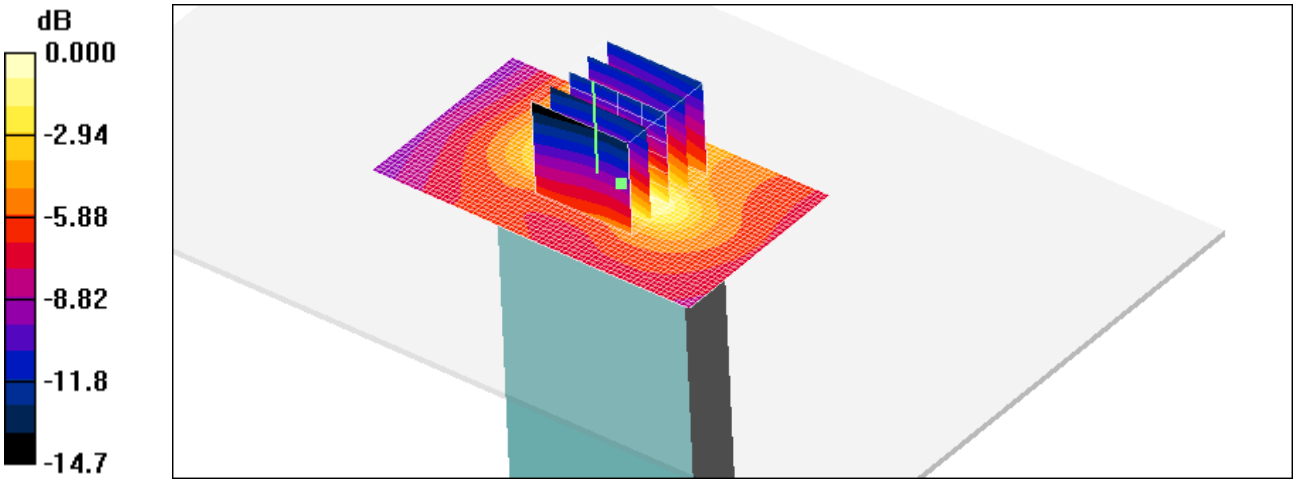
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.992 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

CDMA835 EVDO Bottom side 384/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.205 mW/g
CDMA835 EVDO Bottom side 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.9 V/m; Power Drift = -0.099 dB
Peak SAR (extrapolated) = 0.345 W/kg
SAR(1 g) = 0.177 mW/g; SAR(10 g) = 0.099 mW/g
Maximum value of SAR (measured) = 0.194 mW/g



0 dB = 0.194mW/g

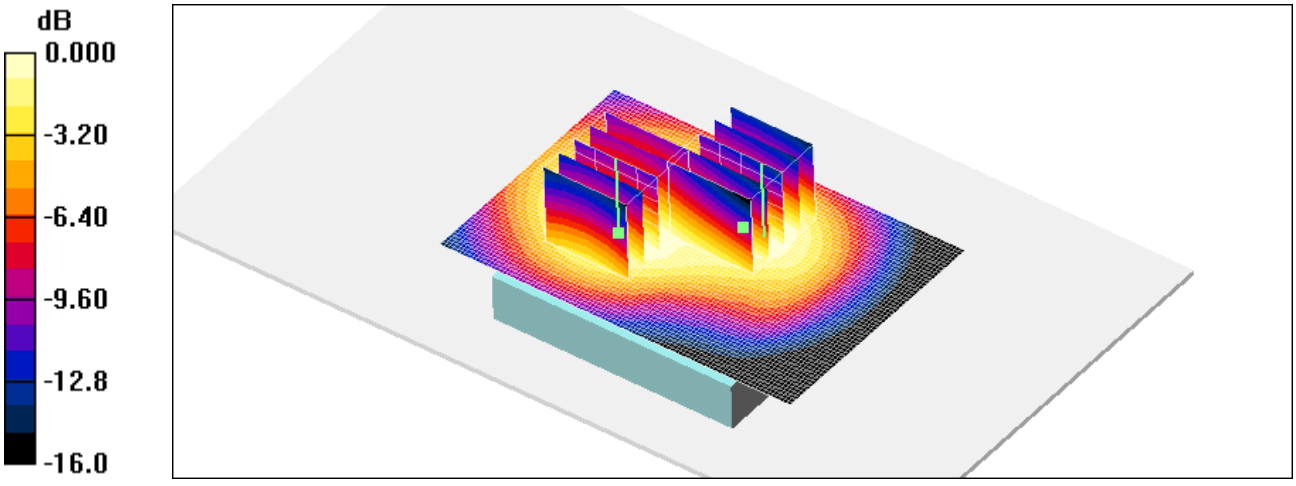
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	10

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1851.25 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.51 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Rear 25/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.44 mW/g
PCS EVDO Rear 25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.5 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 1.84 W/kg
SAR(1 g) = 1.3 mW/g; SAR(10 g) = 0.846 mW/g
Maximum value of SAR (measured) = 1.38 mW/g
PCS EVDO Rear 25/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.5 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 1.76 W/kg
SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.708 mW/g
Maximum value of SAR (measured) = 1.21 mW/g



0 dB = 1.21mW/g

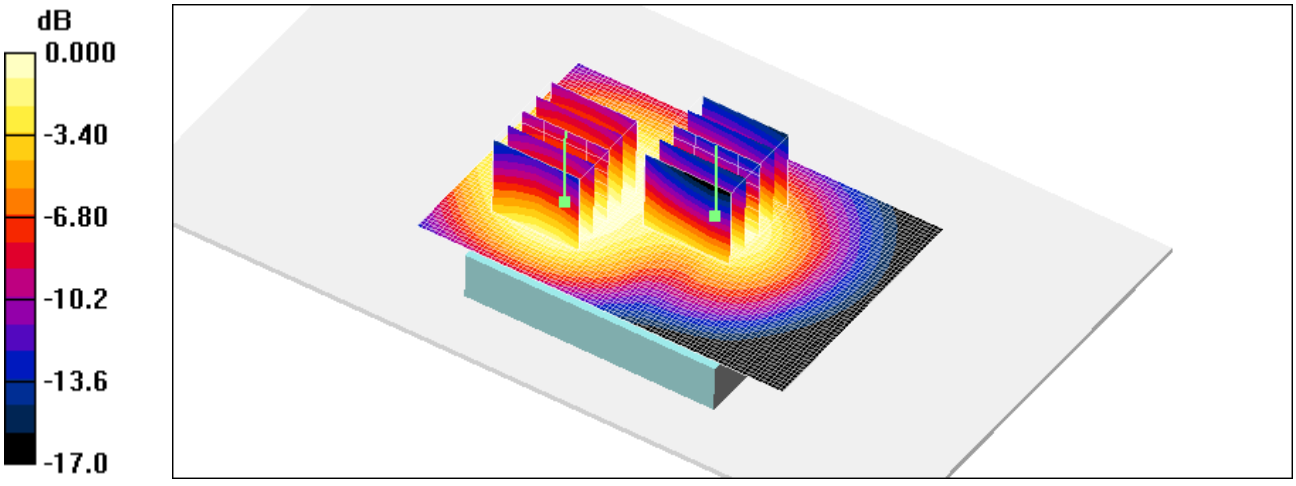
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	11

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Rear 600/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.30 mW/g
PCS EVDO Rear 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.3 V/m; Power Drift = 0.090 dB
Peak SAR (extrapolated) = 1.73 W/kg
SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.763 mW/g
Maximum value of SAR (measured) = 1.25 mW/g
PCS EVDO Rear 600/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.3 V/m; Power Drift = 0.090 dB
Peak SAR (extrapolated) = 1.56 W/kg
SAR(1 g) = 0.932 mW/g; SAR(10 g) = 0.546 mW/g
Maximum value of SAR (measured) = 1.03 mW/g



0 dB = 1.03mW/g

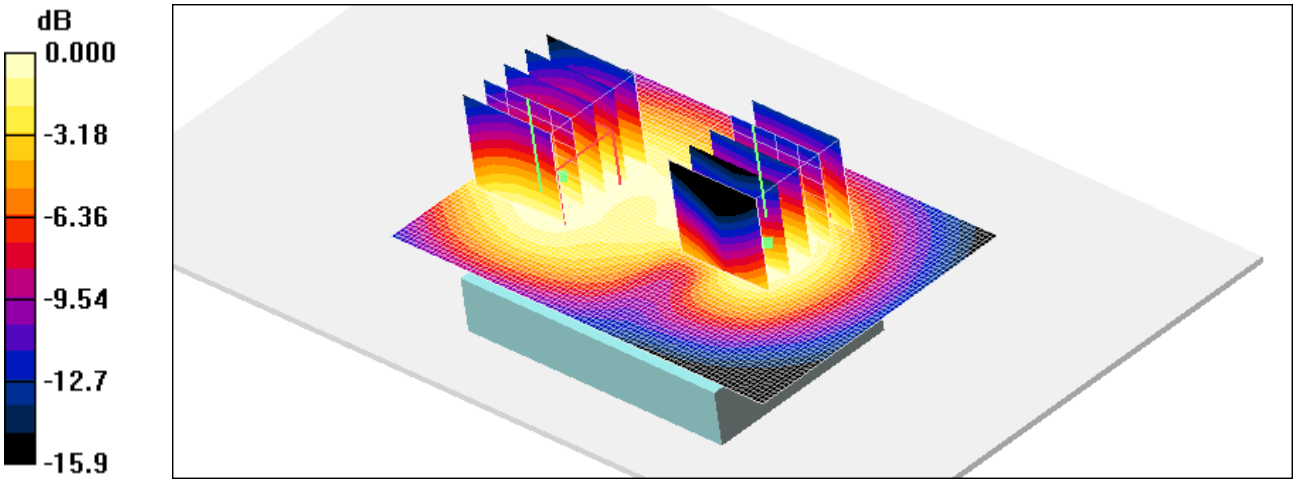
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	12

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1908.75 MHz; σ = 1.49 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Rear 1175/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.925 mW/g
PCS EVDO Rear 1175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.5 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.682 mW/g; SAR(10 g) = 0.405 mW/g
Maximum value of SAR (measured) = 0.740 mW/g
PCS EVDO Rear 1175/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.5 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 0.959 W/kg
SAR(1 g) = 0.646 mW/g; SAR(10 g) = 0.423 mW/g
Maximum value of SAR (measured) = 0.684 mW/g



0 dB = 0.684mW/g

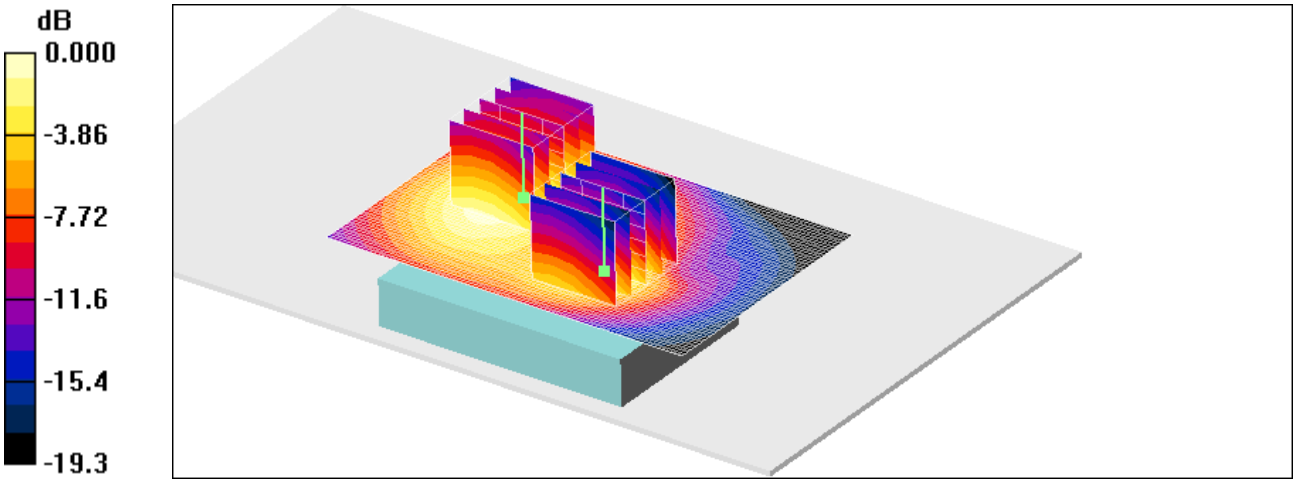
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	13

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1851.25 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.42 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Front 25/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.09 mW/g
PCS EVDO Front 25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.2 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.975 mW/g; SAR(10 g) = 0.629 mW/g
Maximum value of SAR (measured) = 1.04 mW/g
PCS EVDO Front 25/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.2 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 1.73 W/kg
SAR(1 g) = 0.955 mW/g; SAR(10 g) = 0.510 mW/g
Maximum value of SAR (measured) = 1.05 mW/g



0 dB = 1.05mW/g

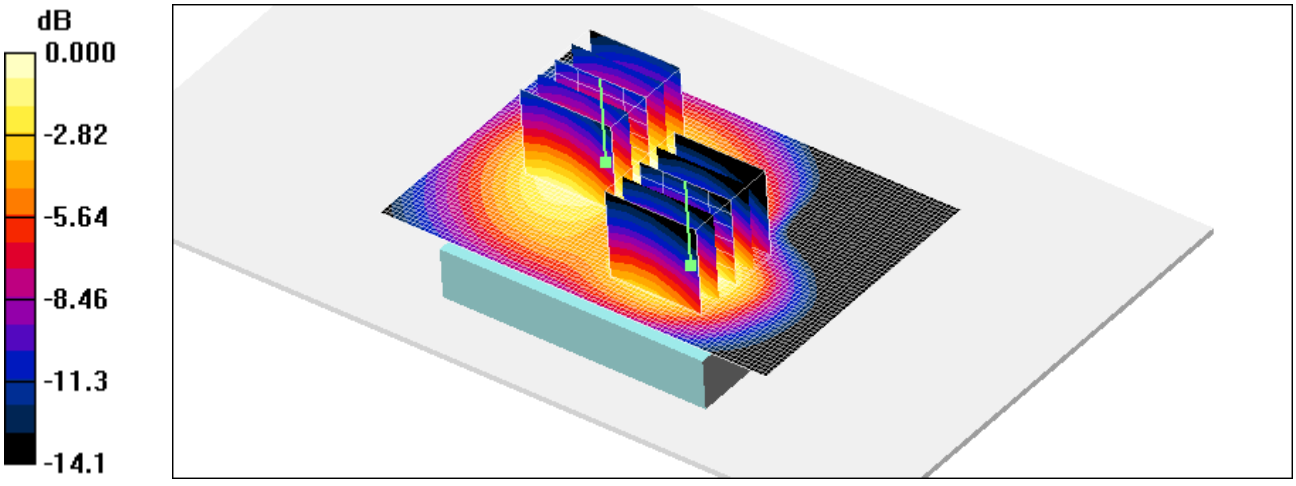
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	14

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS Front 600/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.27 mW/g
PCS Front 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.4 V/m; Power Drift = -0.100 dB
Peak SAR (extrapolated) = 1.97 W/kg
SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.604 mW/g
Maximum value of SAR (measured) = 1.23 mW/g
PCS Front 600/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.4 V/m; Power Drift = -0.100 dB
Peak SAR (extrapolated) = 1.52 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.645 mW/g
Maximum value of SAR (measured) = 1.09 mW/g



0 dB = 1.09mW/g

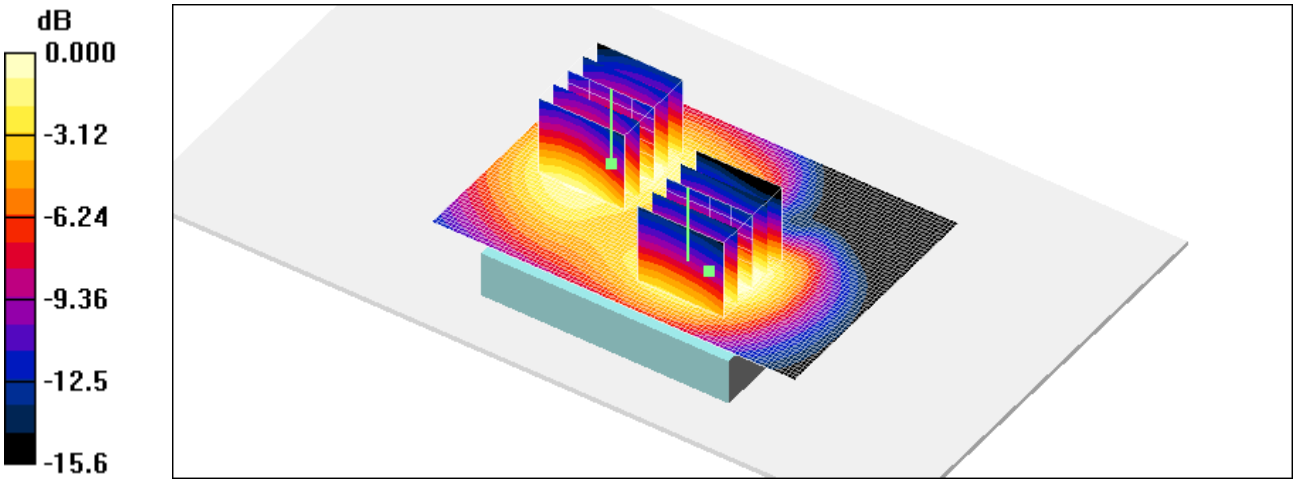
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	15

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1908.75 MHz; σ = 1.49 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Front 1175/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.14 mW/g
PCS EVDO Front 1175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.1 V/m; Power Drift = 0.129 dB
Peak SAR (extrapolated) = 1.68 W/kg
SAR(1 g) = 0.947 mW/g; SAR(10 g) = 0.529 mW/g
Maximum value of SAR (measured) = 1.01 mW/g
PCS EVDO Front 1175/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.1 V/m; Power Drift = 0.129 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.758 mW/g; SAR(10 g) = 0.478 mW/g
Maximum value of SAR (measured) = 0.821 mW/g



0 dB = 0.821mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	16

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1851.25 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.42 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

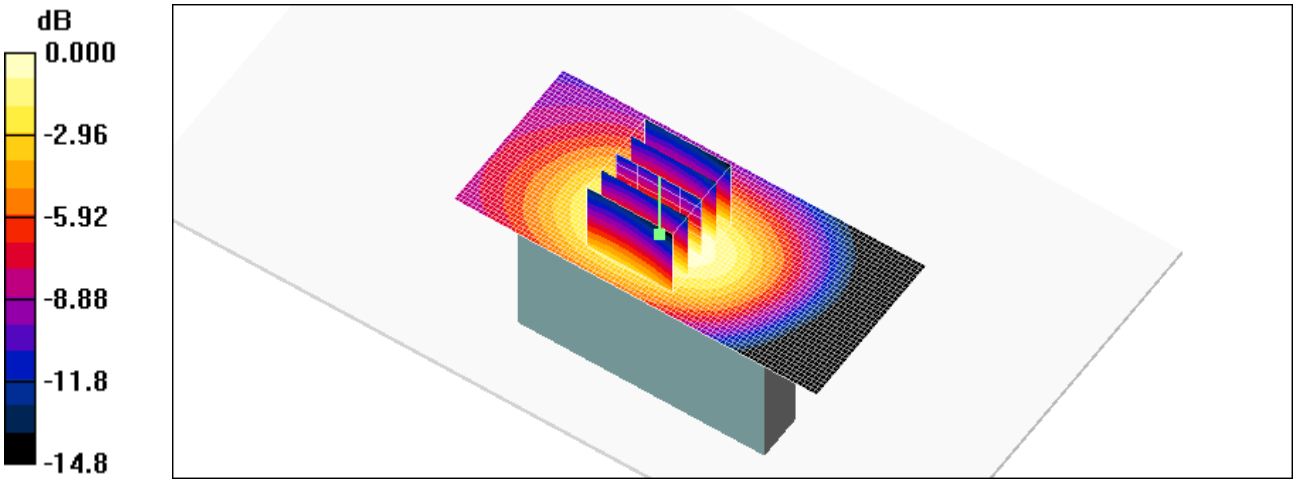
DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Left side 25/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.981 mW/g

PCS EVDO Left side 25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.9 V/m; Power Drift = -0.055 dB
Peak SAR (extrapolated) = 1.40 W/kg
SAR(1 g) = 0.906 mW/g; SAR(10 g) = 0.562 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.974 mW/g



0 dB = 0.974mW/g

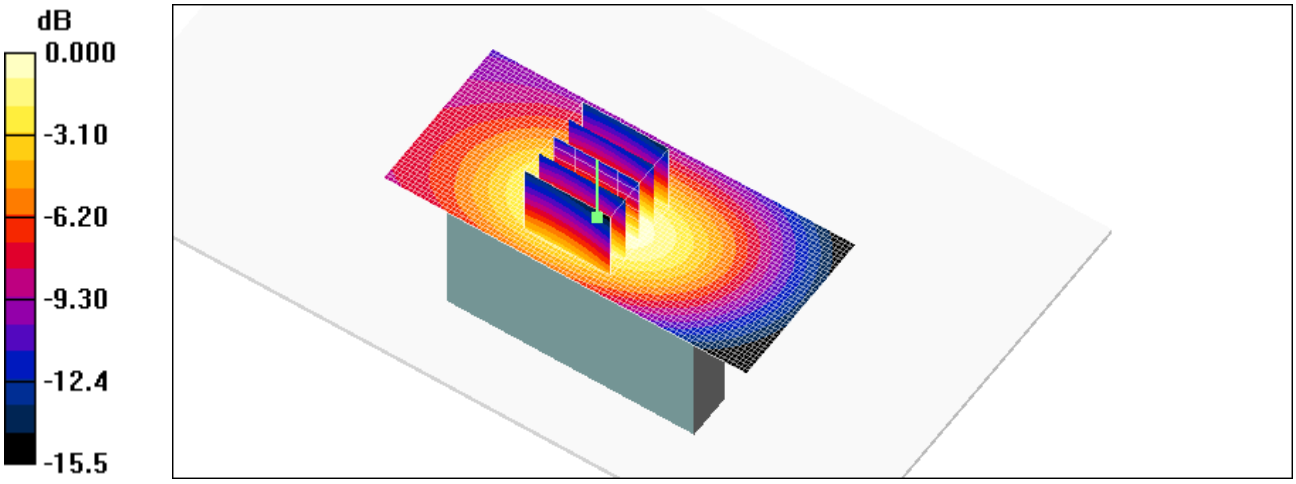
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	17

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Left side 600/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.943 mW/g
PCS EVDO Left side 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.5 V/m; Power Drift = 0.096 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.857 mW/g; SAR(10 g) = 0.522 mW/g
Maximum value of SAR (measured) = 0.921 mW/g



0 dB = 0.921mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	18

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1908.75 MHz; σ = 1.49 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

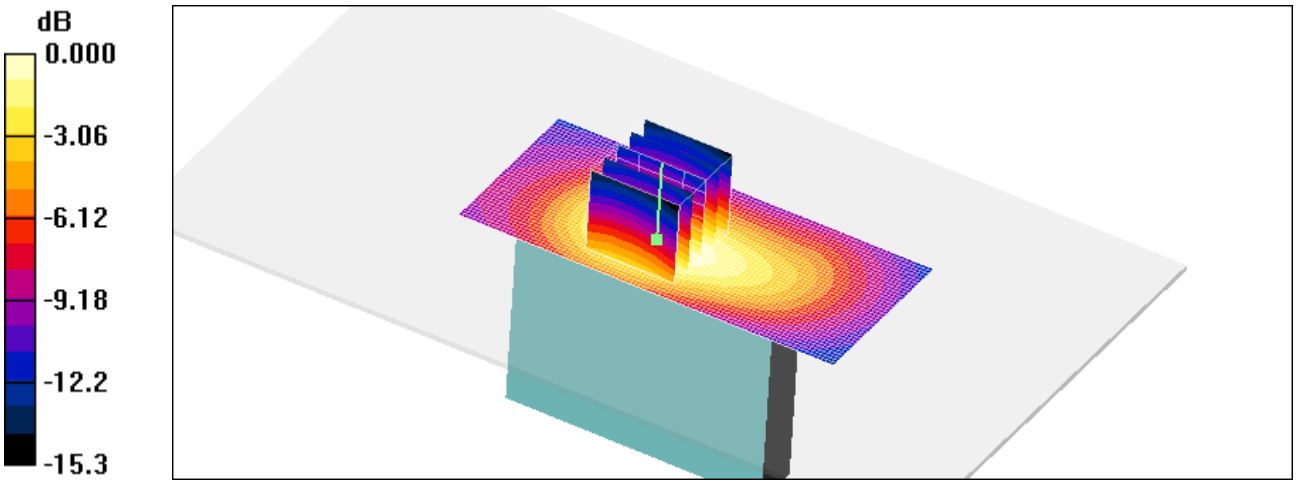
DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Left side 1175/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.801 mW/g

PCS EVDO Left side 1175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.8 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.711 mW/g; SAR(10 g) = 0.430 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.769 mW/g



0 dB = 0.769mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	19

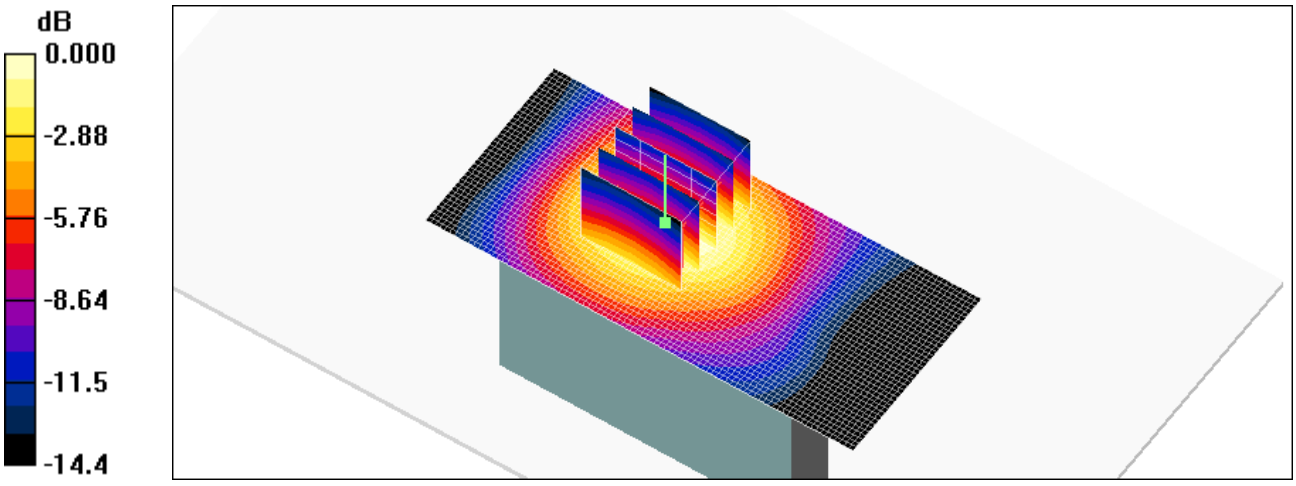
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Right side 600/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.664 mW/g

PCS EVDO Right side 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.1 V/m; Power Drift = 0.009 dB
Peak SAR (extrapolated) = 0.916 W/kg
SAR(1 g) = 0.588 mW/g; SAR(10 g) = 0.365 mW/g
Maximum value of SAR (measured) = 0.631 mW/g



0 dB = 0.631mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	20

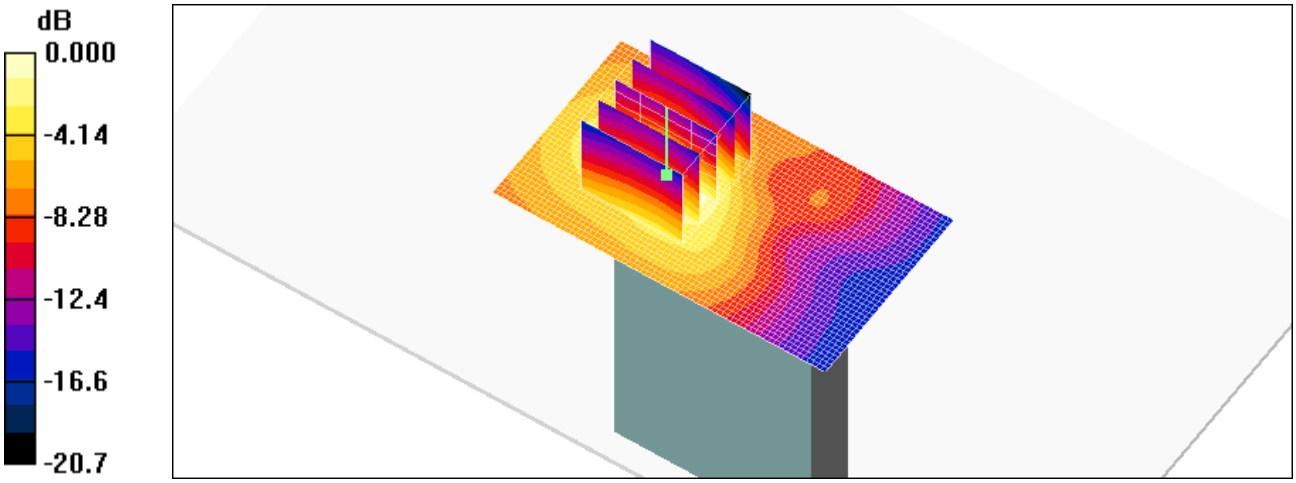
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Bottom side 600/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.615 mW/g

PCS EVDO Bottom side 600/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.3 V/m; Power Drift = 0.025 dB
Peak SAR (extrapolated) = 0.953 W/kg
SAR(1 g) = 0.529 mW/g; SAR(10 g) = 0.284 mW/g
Maximum value of SAR (measured) = 0.579 mW/g



0 dB = 0.579mW/g

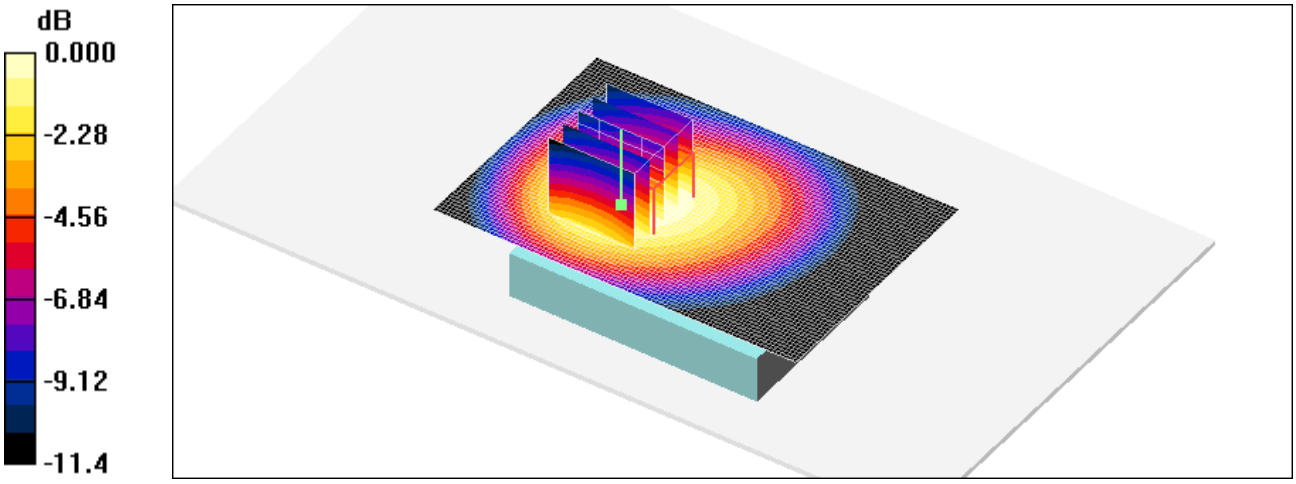
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 9, 2012
Separation Distance:	1.0 cm
Plot NO.	21

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 825 MHz; σ = 0.98 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM850 GPRS 2Tx Rear 128/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.45 mW/g
GSM850 GPRS 2Tx Rear 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 36.1 V/m; Power Drift = -0.085 dB
Peak SAR (extrapolated) = 1.79 W/kg
SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.916 mW/g
Maximum value of SAR (measured) = 1.39 mW/g



0 dB = 1.39mW/g

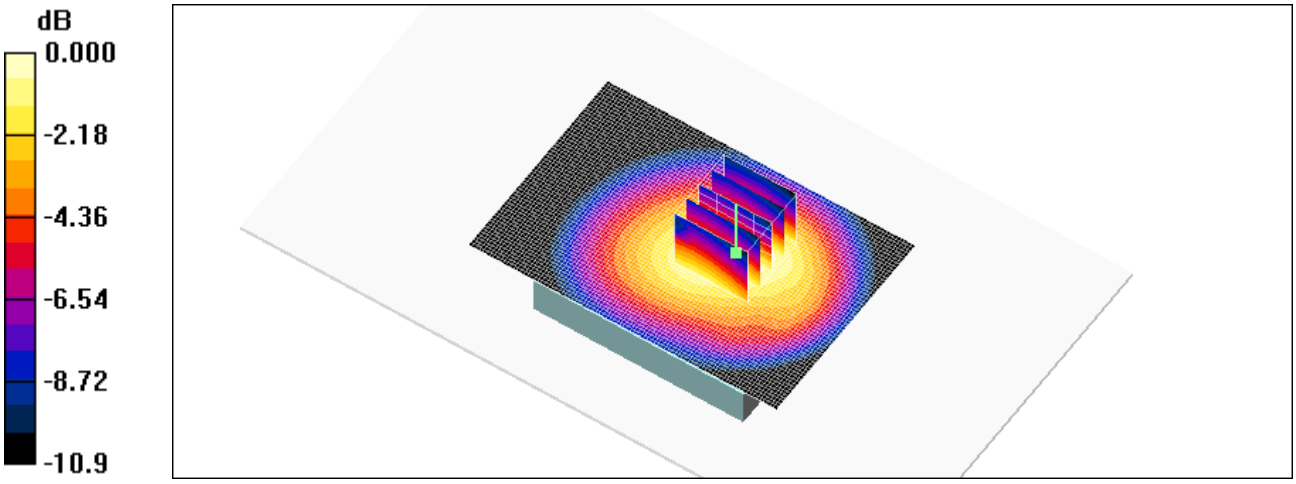
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 9, 2012
Separation Distance:	1.0 cm
Plot NO.	22

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.986 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM850 GPRS 2Tx Rear 190/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.27 mW/g
GSM850 GPRS 2Tx Rear 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.6 V/m; Power Drift = -0.050 dB
Peak SAR (extrapolated) = 1.66 W/kg
SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.844 mW/g
Maximum value of SAR (measured) = 1.31 mW/g



0 dB = 1.31mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 9, 2012
Separation Distance:	1.0 cm
Plot NO.	23

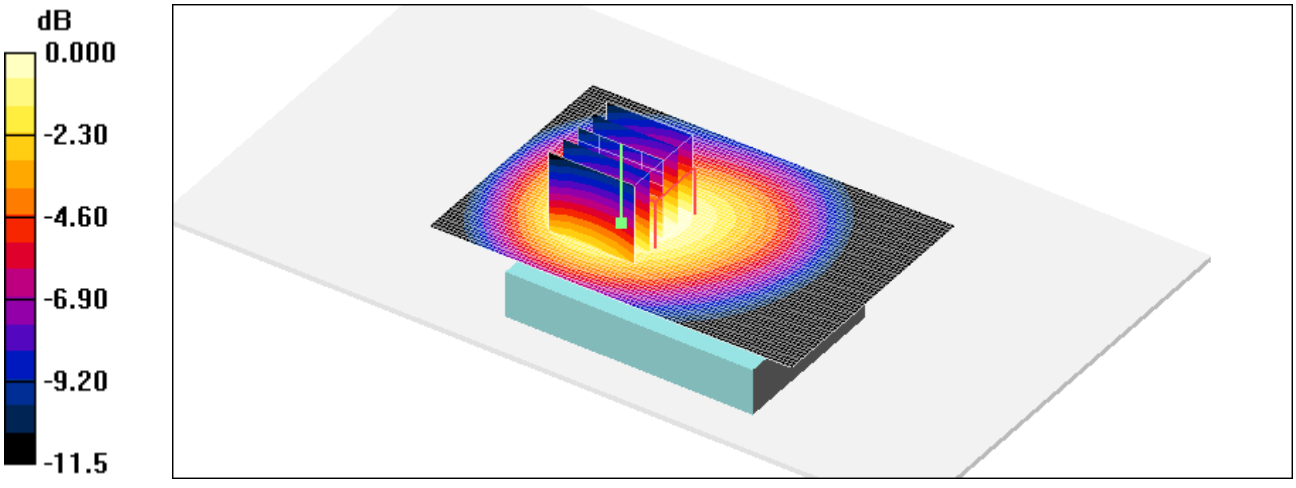
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 849.8 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 850 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM850 GPRS 2Tx Rear 251/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.25 mW/g

GSM850 GPRS 2Tx Rear 251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.3 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 1.57 W/kg
SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.777 mW/g
Maximum value of SAR (measured) = 1.20 mW/g



0 dB = 1.20mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 9, 2012
Separation Distance:	1.0 cm
Plot NO.	24

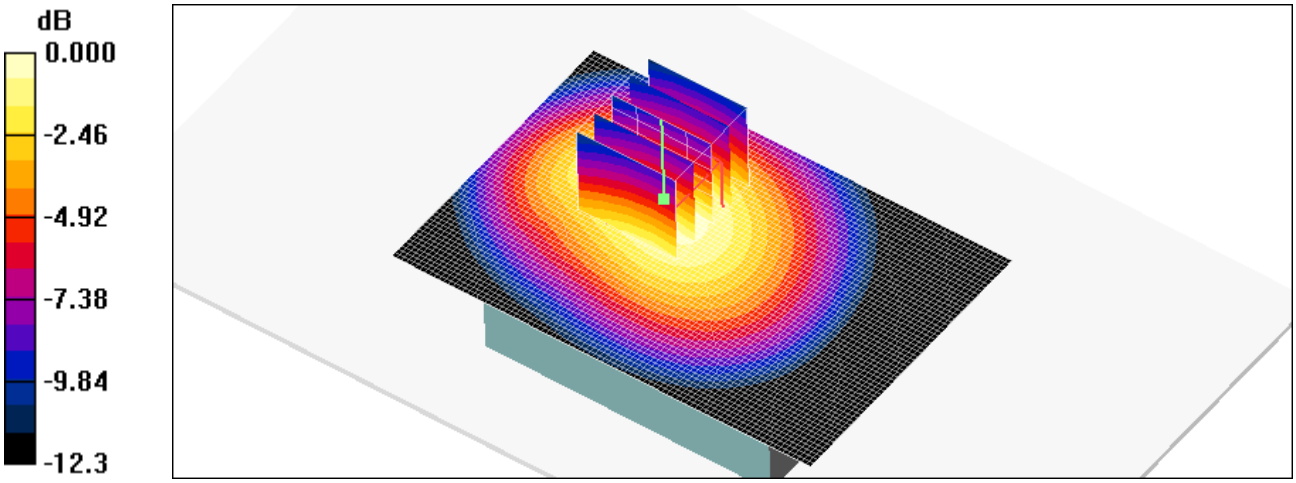
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 825 MHz; σ = 0.98 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM850 GPRS 2Tx Front 128/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.26 mW/g

GSM850 GPRS 2Tx Front 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.4 V/m; Power Drift = 0.063 dB
Peak SAR (extrapolated) = 1.55 W/kg
SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.783 mW/g
Maximum value of SAR (measured) = 1.29 mW/g



0 dB = 1.29mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 9, 2012
Separation Distance:	1.0 cm
Plot NO.	25

DUT: MHS291LVW; Type: Bar; Serial: #1

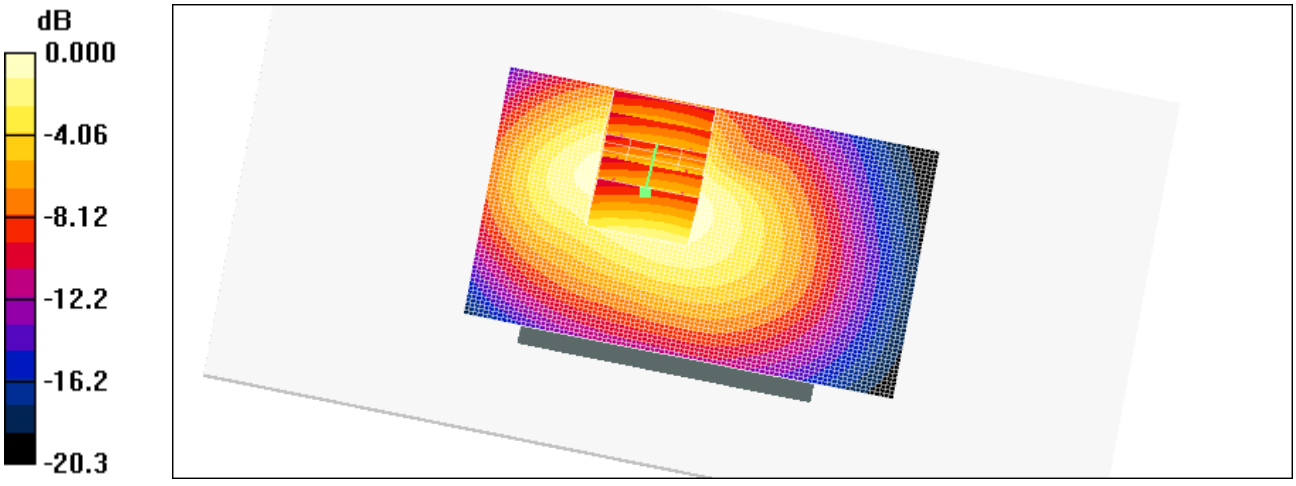
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.992 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM850 GPRS 2Tx Front 190/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.25 mW/g

GSM850 GPRS 2Tx Front 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 32.4 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 2.38 W/kg
SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.815 mW/g
Maximum value of SAR (measured) = 1.27 mW/g



0 dB = 1.27mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 9, 2012
Separation Distance:	1.0 cm
Plot NO.	26

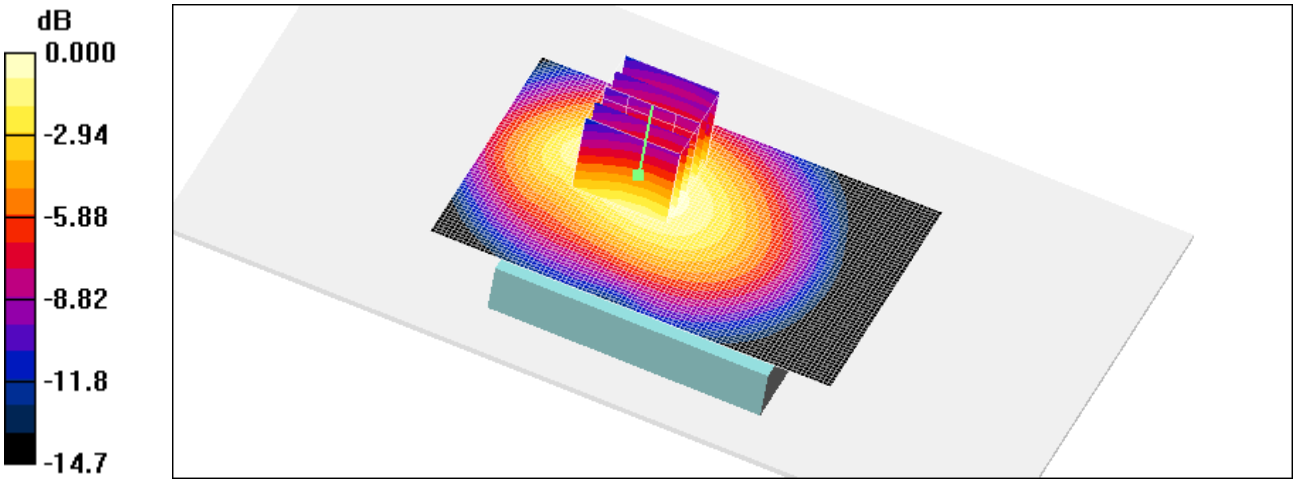
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 849.8 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 850 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM850 GPRS 2Tx Front 251/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.20 mW/g

GSM850 GPRS 2Tx Front 251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 31.8 V/m; Power Drift = -0.095 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.755 mW/g
Maximum value of SAR (measured) = 1.21 mW/g



0 dB = 1.21mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 9, 2012
Separation Distance:	1.0 cm
Plot NO.	27

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.992 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

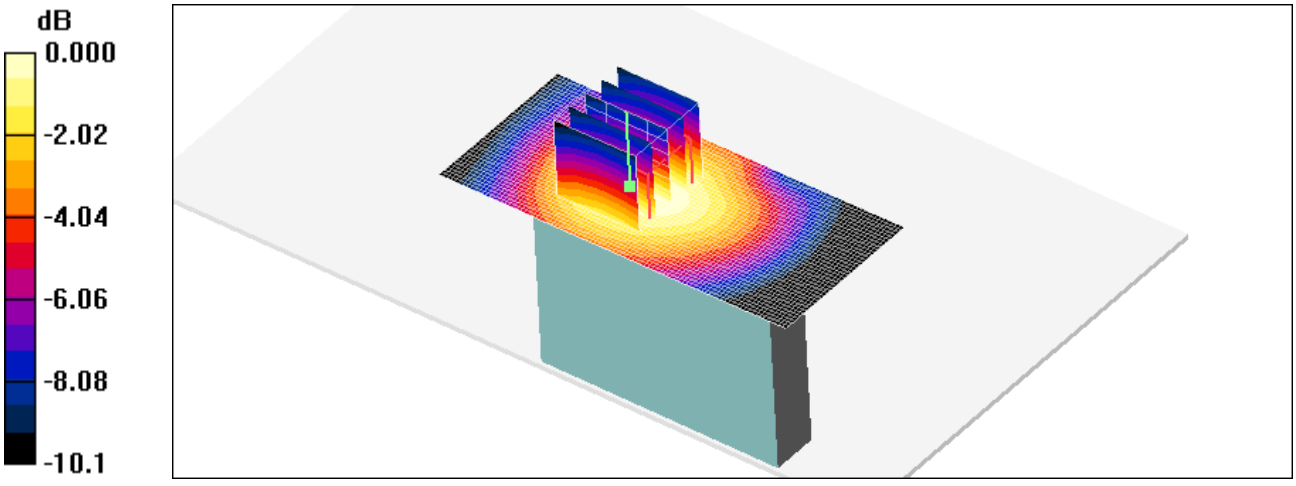
DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM850 GPRS 2Tx Left side 190/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.664 mW/g

GSM850 GPRS 2Tx Left side 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.0 V/m; Power Drift = 0.073 dB
Peak SAR (extrapolated) = 0.829 W/kg
SAR(1 g) = 0.622 mW/g; SAR(10 g) = 0.432 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.662 mW/g



0 dB = 0.662mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 9, 2012
Separation Distance:	1.0 cm
Plot NO.	28

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.992 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

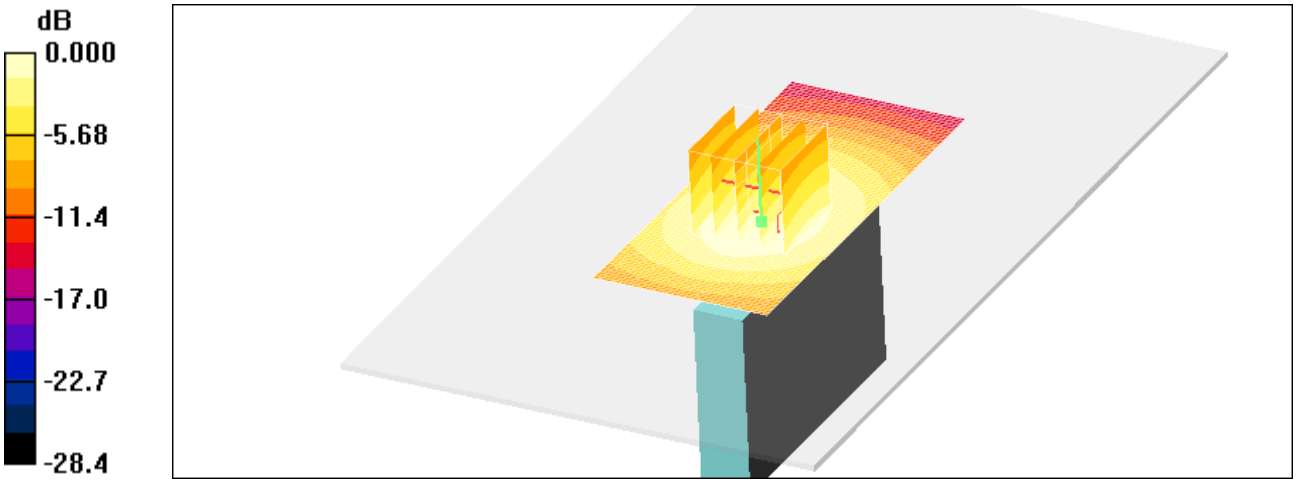
DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM850 GPRS 2Tx Right side 190/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.660 mW/g

GSM850 GPRS 2Tx Right side 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.7 V/m; Power Drift = 0.070 dB
Peak SAR (extrapolated) = 0.881 W/kg
SAR(1 g) = 0.654 mW/g; SAR(10 g) = 0.459 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.702 mW/g



0 dB = 0.702mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 9, 2012
Separation Distance:	1.0 cm
Plot NO.	29

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:4.15
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.992 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

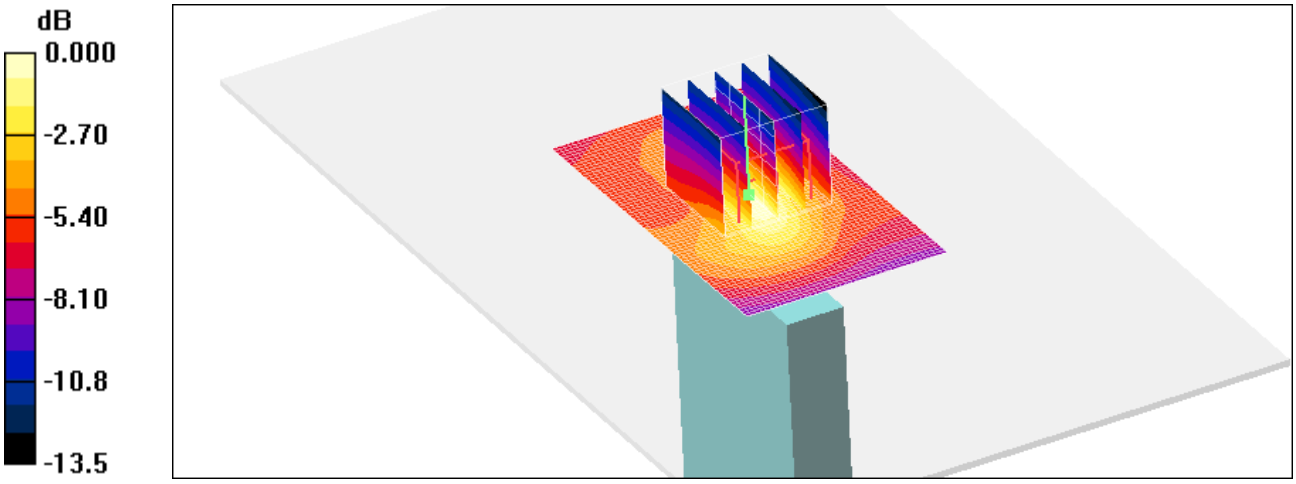
DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM850 GPRS 2Tx Bottom side 190/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.301 mW/g

GSM850 GPRS 2Tx Bottom side 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.5 V/m; Power Drift = -0.002 dB
Peak SAR (extrapolated) = 0.617 W/kg
SAR(1 g) = 0.292 mW/g; SAR(10 g) = 0.155 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.309 mW/g



0 dB = 0.309mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	30

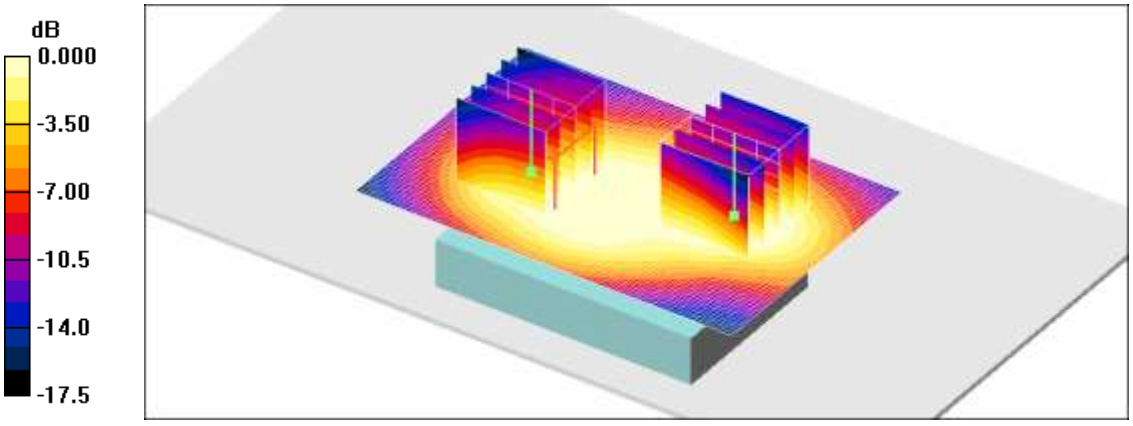
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1880 MHz; σ = 1.43 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM1900 GPRS 2Tx Rear 661/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.616 mW/g
GSM1900 GPRS 2Tx Rear 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.9 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.849 W/kg
SAR(1 g) = 0.538 mW/g; SAR(10 g) = 0.323 mW/g
Maximum value of SAR (measured) = 0.589 mW/g

GSM1900 GPRS 2Tx Rear 661/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.9 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 0.651 W/kg
SAR(1 g) = 0.426 mW/g; SAR(10 g) = 0.274 mW/g
Maximum value of SAR (measured) = 0.450 mW/g



0 dB = 0.450mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	31

DUT: MHS291LVW; Type: Bar; Serial: #1

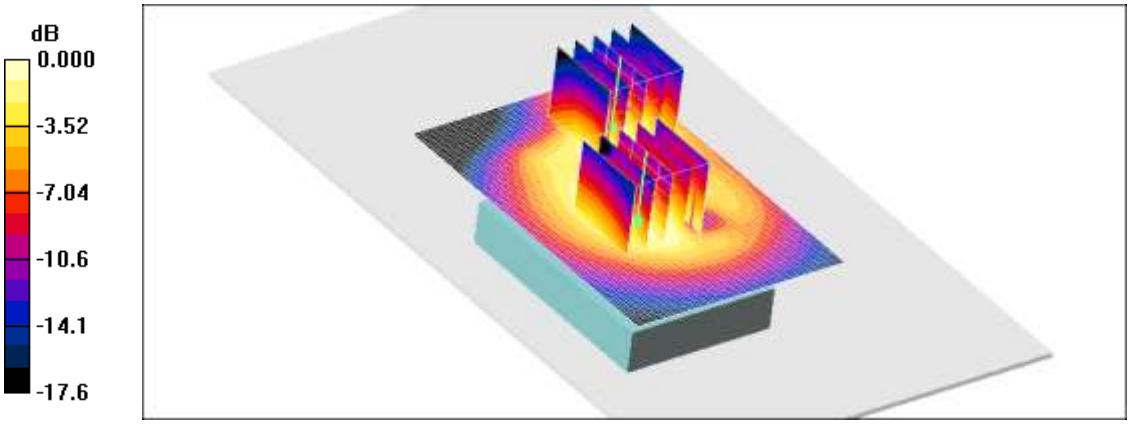
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1880 MHz; σ = 1.43 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM1900 GPRS 2Tx Front 661/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.654 mW/g

GSM1900 GPRS 2Tx Front 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.0 V/m; Power Drift = -0.112 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.593 mW/g; SAR(10 g) = 0.323 mW/g
Maximum value of SAR (measured) = 0.656 mW/g

GSM1900 GPRS 2Tx Front 661/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.0 V/m; Power Drift = -0.112 dB
Peak SAR (extrapolated) = 0.773 W/kg
SAR(1 g) = 0.511 mW/g; SAR(10 g) = 0.327 mW/g
Maximum value of SAR (measured) = 0.541 mW/g



0 dB = 0.541mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	32

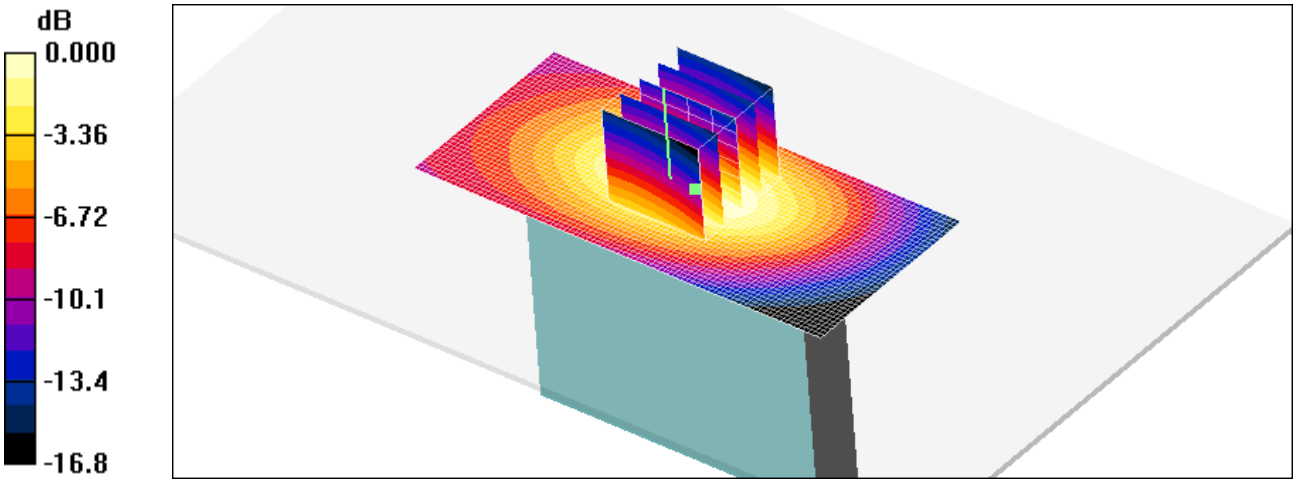
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1880 MHz; σ = 1.43 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM1900 GPRS 2Tx Right side 661/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.601 mW/g

GSM1900 GPRS 2Tx Right side 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.5 V/m; Power Drift = -0.118 dB
Peak SAR (extrapolated) = 0.846 W/kg
SAR(1 g) = 0.521 mW/g; SAR(10 g) = 0.311 mW/g
Maximum value of SAR (measured) = 0.556 mW/g



0 dB = 0.556mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	33

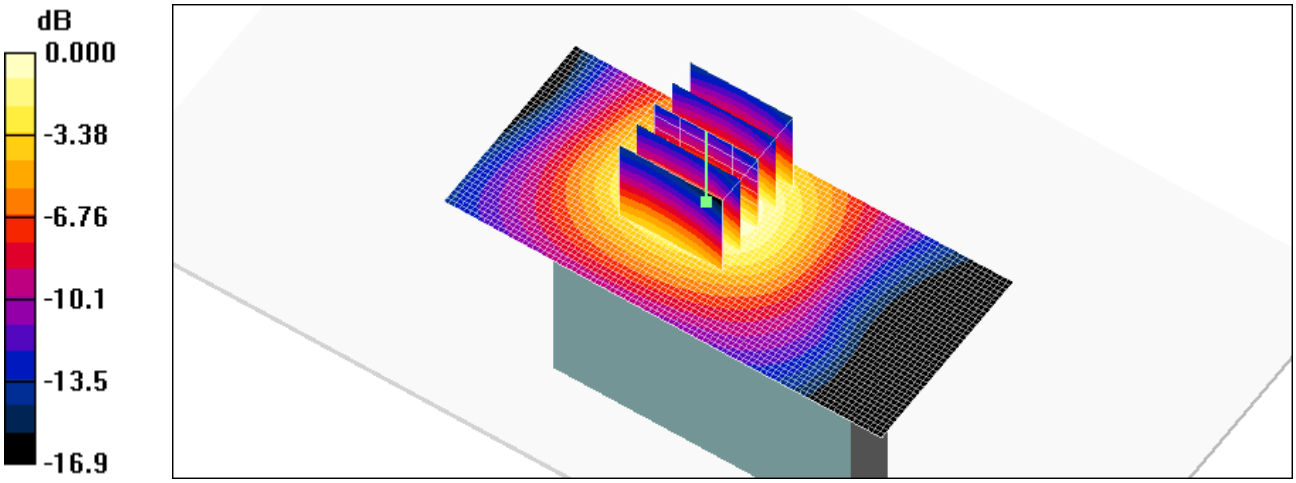
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1880 MHz; σ = 1.43 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM1900 GPRS 2Tx Right side 661/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.326 mW/g

GSM1900 GPRS 2Tx Right side 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.8 V/m; Power Drift = -0.103 dB
Peak SAR (extrapolated) = 0.472 W/kg
SAR(1 g) = 0.292 mW/g; SAR(10 g) = 0.173 mW/g
Maximum value of SAR (measured) = 0.312 mW/g



0 dB = 0.312mW/g

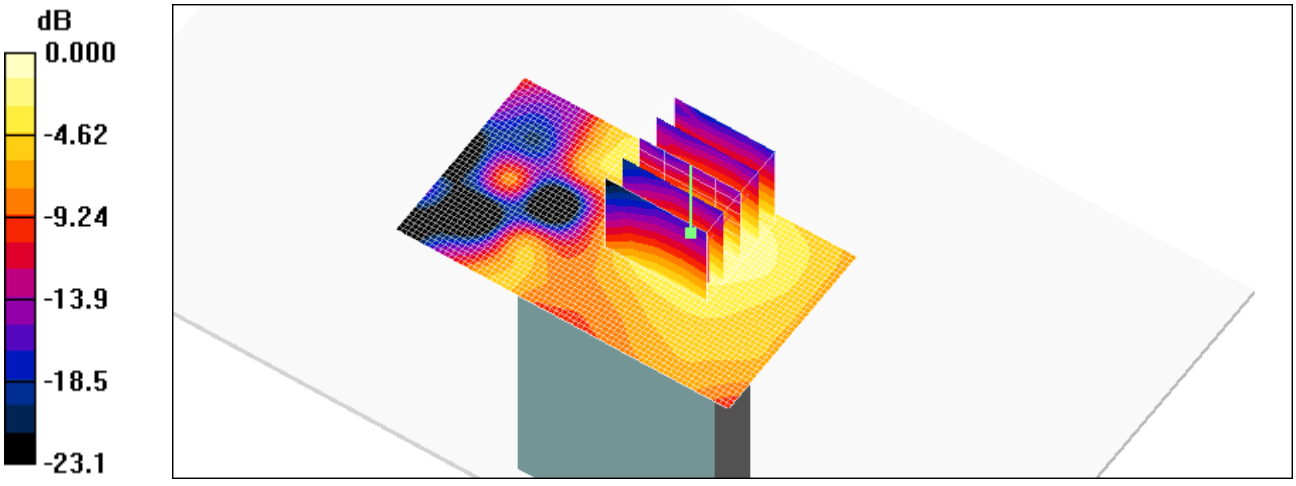
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	34

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1880 MHz; σ = 1.43 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM1900 GPRS 2Tx Bottom side 661/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.251 mW/g
GSM1900 GPRS 2Tx Bottom side 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.97 V/m; Power Drift = -0.025 dB
Peak SAR (extrapolated) = 0.453 W/kg
SAR(1 g) = 0.246 mW/g; SAR(10 g) = 0.130 mW/g
Maximum value of SAR (measured) = 0.280 mW/g



0 dB = 0.280mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 09, 2012
Separation Distance:	1.0 cm
Plot NO.	35

DUT: ORBIT; Type: Bar; Serial: #1

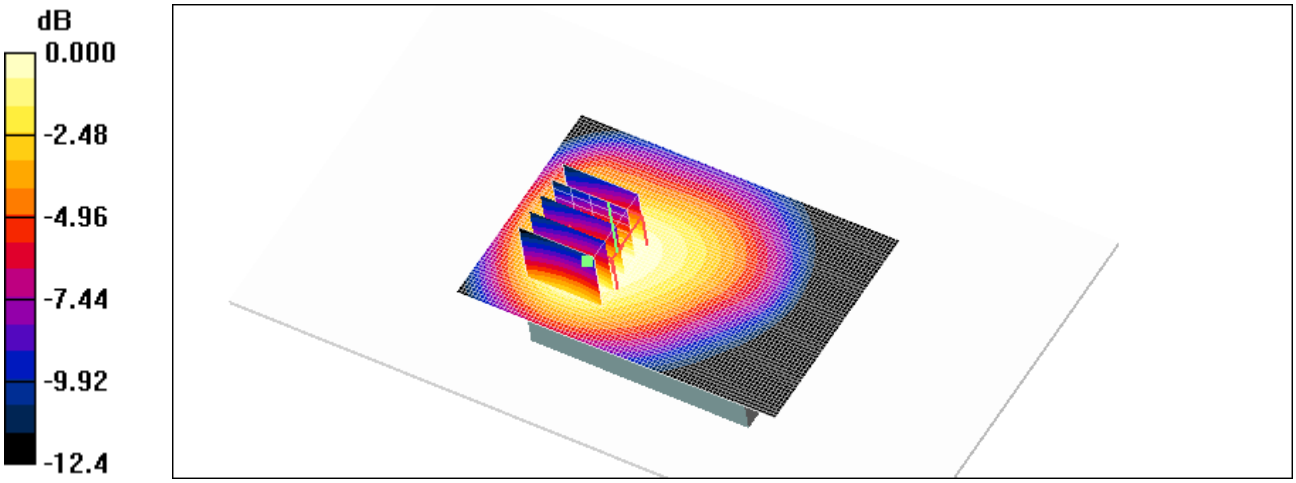
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.951 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA850 Rear 4183/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.809 mW/g

WCDMA850 Rear 4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.2 V/m; Power Drift = -0.050 dB
Peak SAR (extrapolated) = 0.944 W/kg
SAR(1 g) = 0.664 mW/g; SAR(10 g) = 0.445 mW/g
Maximum value of SAR (measured) = 0.705 mW/g



0 dB = 0.705mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 09, 2012
Separation Distance:	1.0 cm
Plot NO.	36

DUT: ORBIT; Type: Bar; Serial: #1

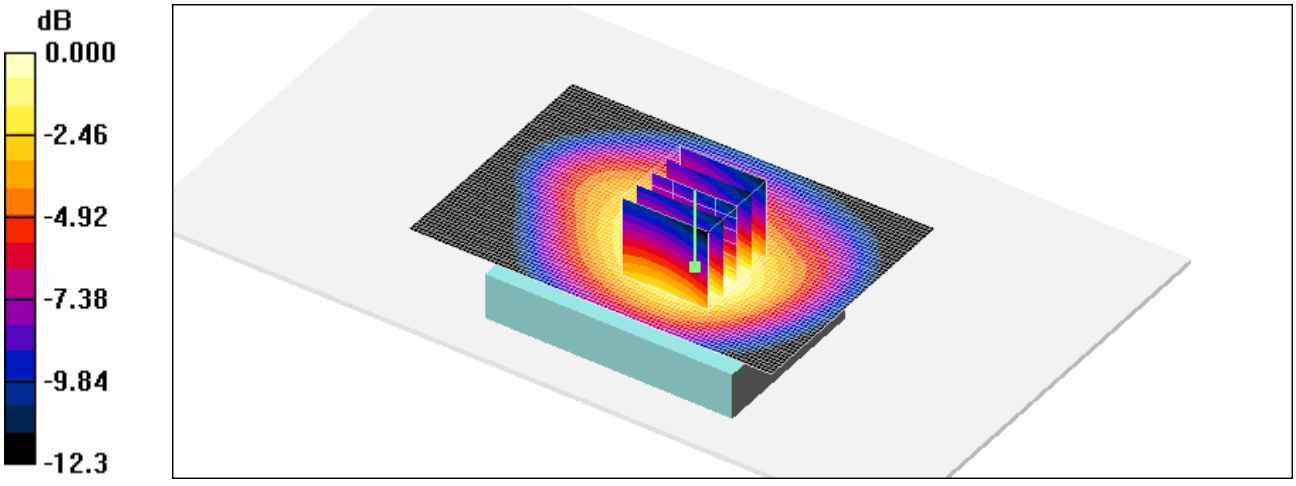
Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.951 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA850 Front 4183/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.725 mW/g

WCDMA850 Front 4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.0 V/m; Power Drift = -0.128 dB
Peak SAR (extrapolated) = 0.989 W/kg
SAR(1 g) = 0.677 mW/g; SAR(10 g) = 0.452 mW/g
Maximum value of SAR (measured) = 0.723 mW/g



0 dB = 0.723mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 09, 2012
Separation Distance:	1.0 cm
Plot NO.	37

DUT: ORBIT; Type: Bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.992 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

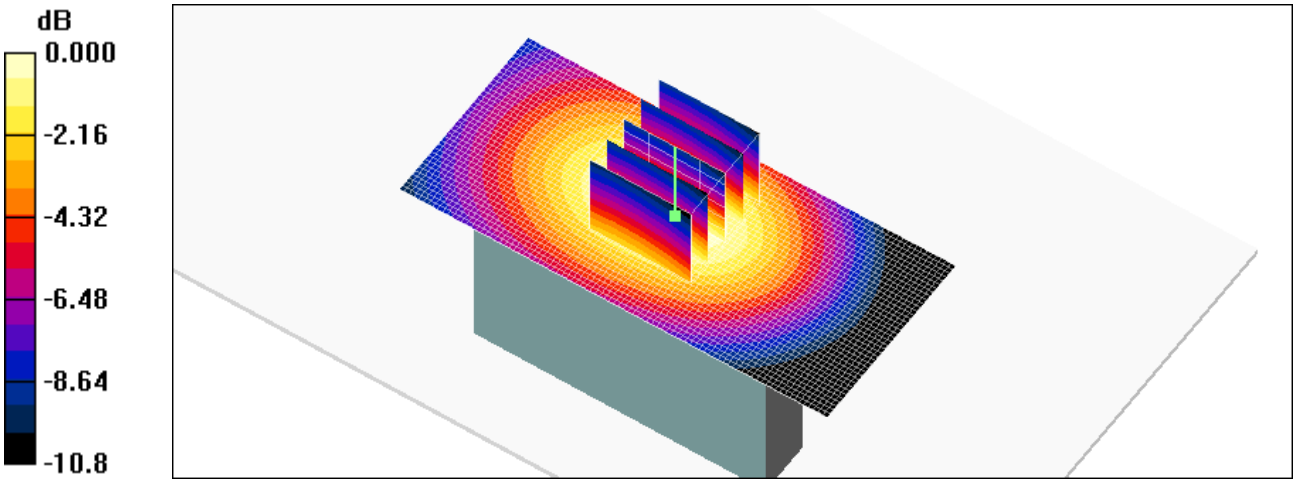
DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA850 Left side 4183/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.316 mW/g

WCDMA850 Left side 4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.8 V/m; Power Drift = 0.102 dB
Peak SAR (extrapolated) = 0.406 W/kg
SAR(1 g) = 0.292 mW/g; SAR(10 g) = 0.197 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.311 mW/g



0 dB = 0.311mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 09, 2012
Separation Distance:	1.0 cm
Plot NO.	38

DUT: ORBIT; Type: Bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.992 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

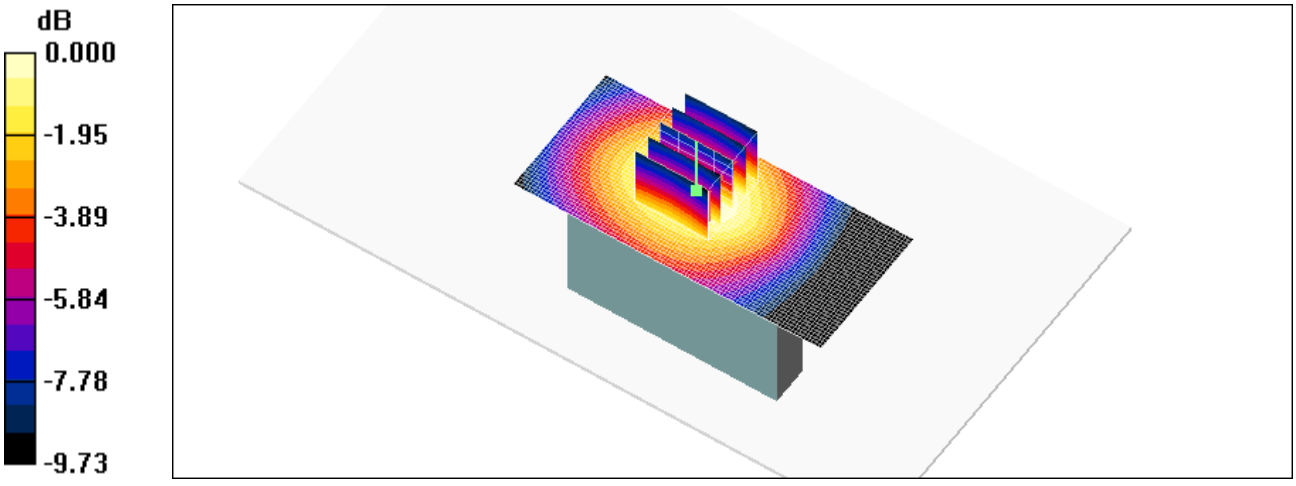
DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA850 Right side 4183/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.378 mW/g

WCDMA850 Right side 4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.0 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 0.490 W/kg
SAR(1 g) = 0.358 mW/g; SAR(10 g) = 0.247 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.382 mW/g



0 dB = 0.382mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 09, 2012
Separation Distance:	1.0 cm
Plot NO.	39

DUT: ORBIT; Type: Bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.992 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

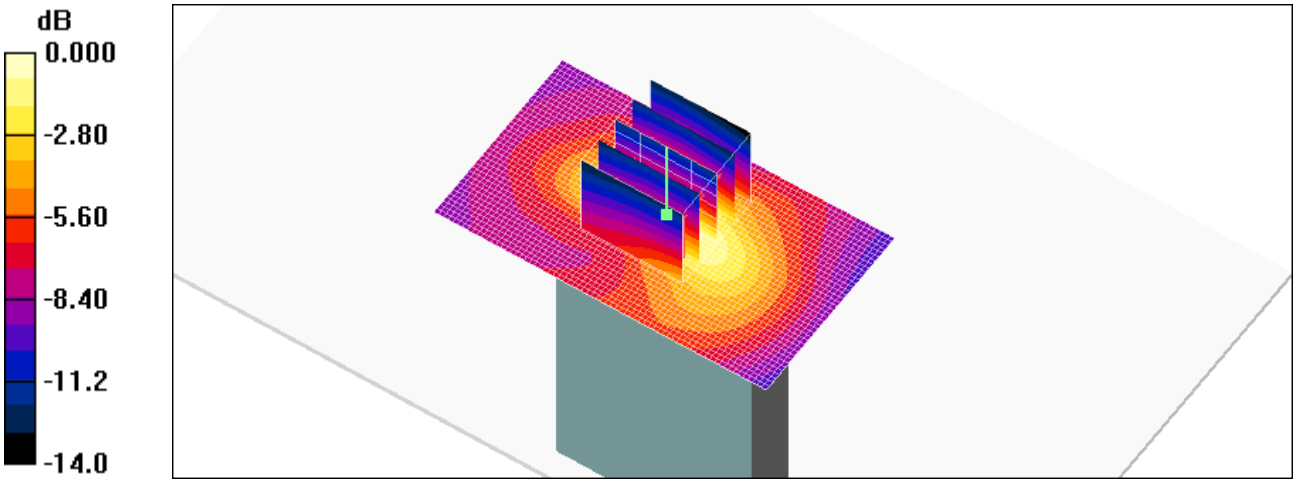
DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA850 Bottom side 4183/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.191 mW/g

WCDMA850 Bottom side 4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = -0.005 dB
Peak SAR (extrapolated) = 0.365 W/kg
SAR(1 g) = 0.187 mW/g; SAR(10 g) = 0.100 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.204 mW/g



0 dB = 0.204mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	40

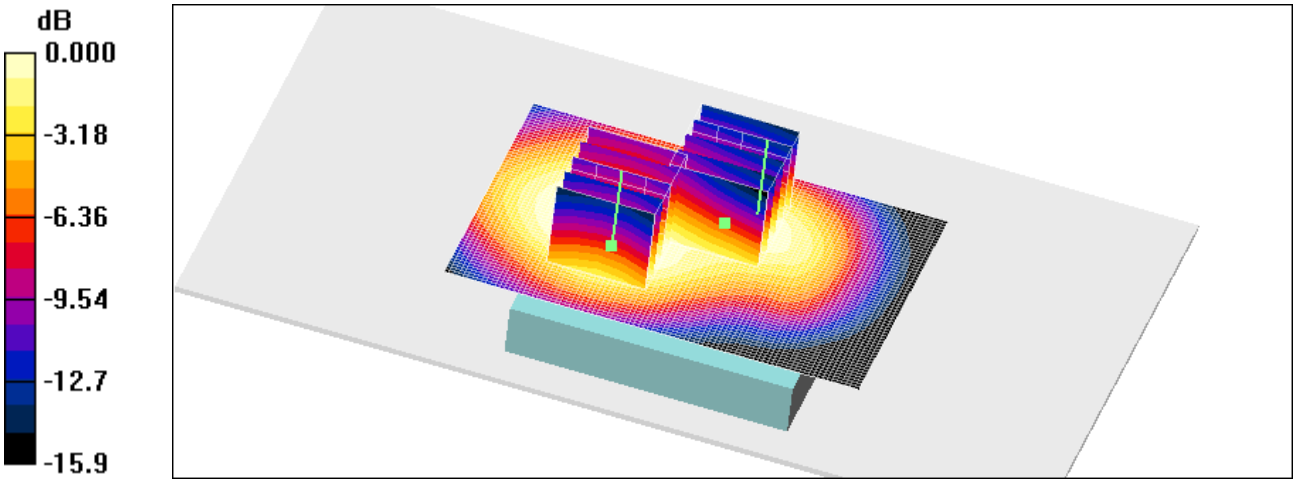
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.5 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA1900 Rear 9262/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.896 mW/g

WCDMA1900 Rear 9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.0 V/m; Power Drift = -0.066 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.799 mW/g; SAR(10 g) = 0.517 mW/g
Maximum value of SAR (measured) = 0.852 mW/g
WCDMA1900 Rear 9262/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.0 V/m; Power Drift = -0.066 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.668 mW/g; SAR(10 g) = 0.411 mW/g
Maximum value of SAR (measured) = 0.705 mW/g



0 dB = 0.705mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	41

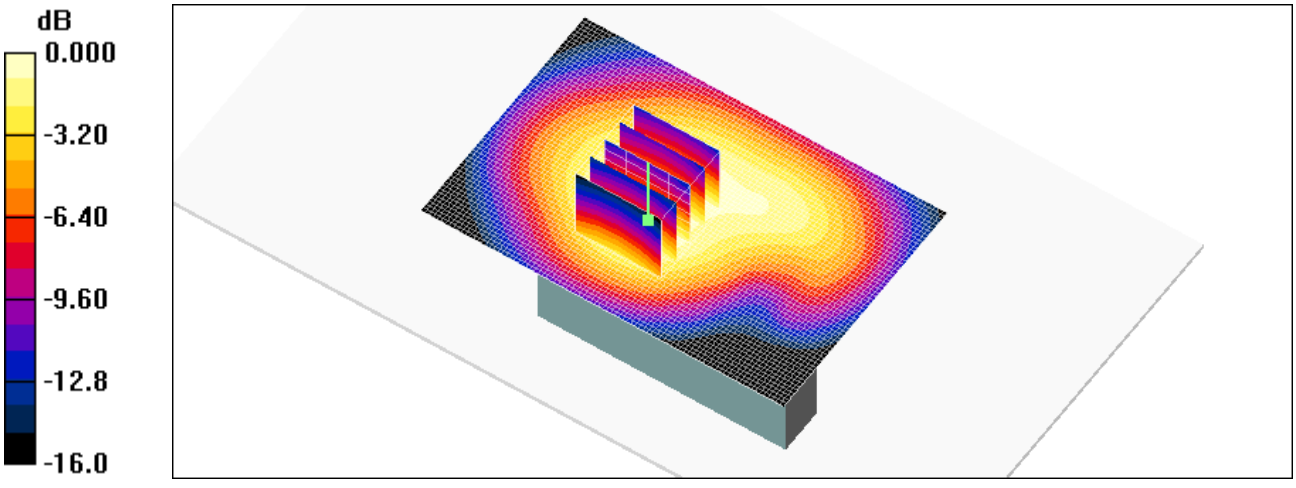
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA1900 Rear 9400/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.843 mW/g

WCDMA1900 Rear 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.0 V/m; Power Drift = -0.058 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.761 mW/g; SAR(10 g) = 0.492 mW/g
Maximum value of SAR (measured) = 0.809 mW/g



0 dB = 0.809mW/g

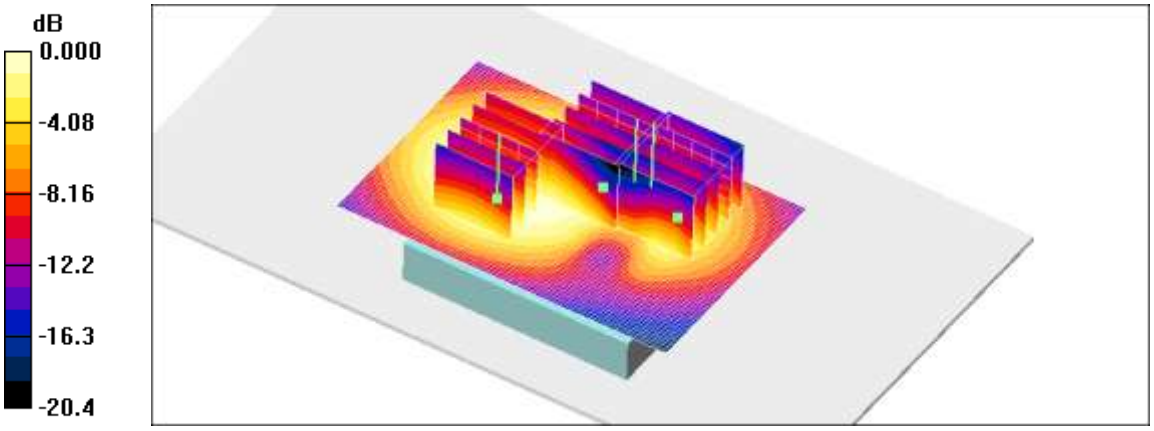
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	42

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1907.6 MHz; σ = 1.56 mho/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA1900 Rear 9538/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.782 mW/g
WCDMA1900 Rear 9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.5 V/m; Power Drift = -0.041 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.690 mW/g; SAR(10 g) = 0.438 mW/g
Maximum value of SAR (measured) = 0.733 mW/g
WCDMA1900 Rear 9538/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.5 V/m; Power Drift = -0.041 dB
Peak SAR (extrapolated) = 0.981 W/kg
SAR(1 g) = 0.597 mW/g; SAR(10 g) = 0.350 mW/g
Maximum value of SAR (measured) = 0.641 mW/g
WCDMA1900 Rear 9538/Zoom Scan (5x5x7)/Cube 2: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.5 V/m; Power Drift = -0.041 dB
Peak SAR (extrapolated) = 0.993 W/kg
SAR(1 g) = 0.587 mW/g; SAR(10 g) = 0.334 mW/g
Maximum value of SAR (measured) = 0.627 mW/g



0 dB = 0.627mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	43

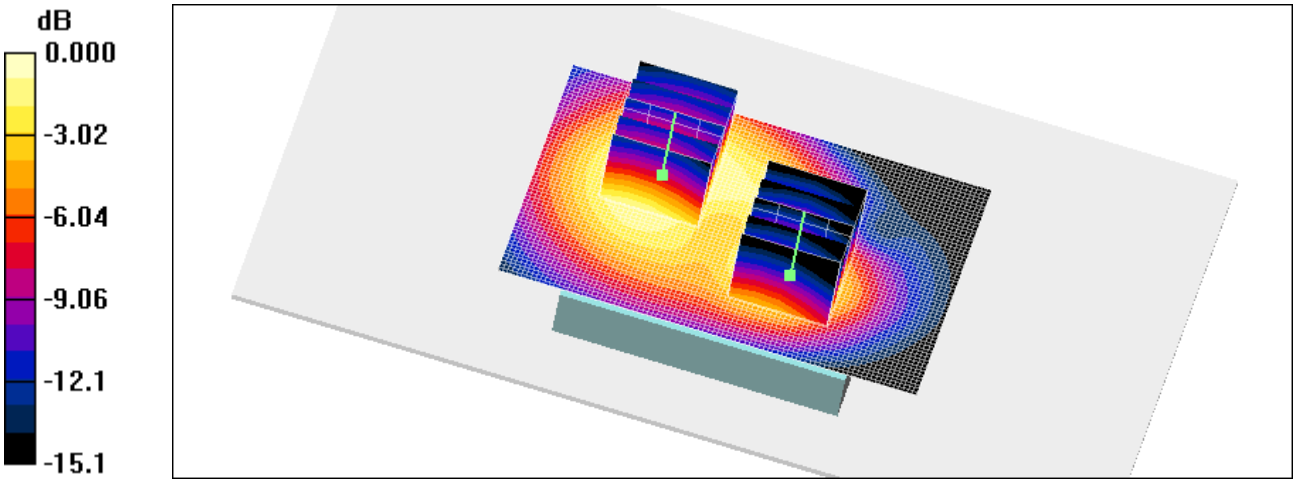
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.5 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA1900 Front 9262/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.729 mW/g

WCDMA1900 Front 9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.8 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.688 mW/g; SAR(10 g) = 0.371 mW/g
Maximum value of SAR (measured) = 0.750 mW/g
WCDMA1900 Front 9262/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.8 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 0.960 W/kg
SAR(1 g) = 0.653 mW/g; SAR(10 g) = 0.414 mW/g
Maximum value of SAR (measured) = 0.707 mW/g



0 dB = 0.707mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	44

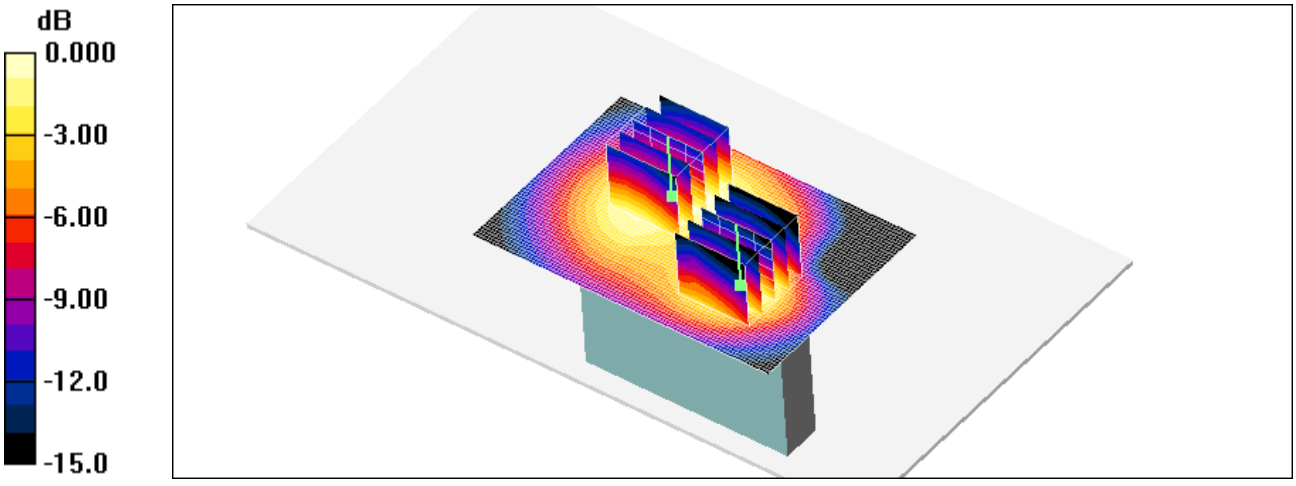
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA1900 Front 9400/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.838 mW/g
WCDMA1900 Front 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.8 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.741 mW/g; SAR(10 g) = 0.395 mW/g
Maximum value of SAR (measured) = 0.805 mW/g

WCDMA1900 Front 9400/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.8 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 0.929 W/kg
SAR(1 g) = 0.609 mW/g; SAR(10 g) = 0.386 mW/g
Maximum value of SAR (measured) = 0.656 mW/g



0 dB = 0.656mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	45

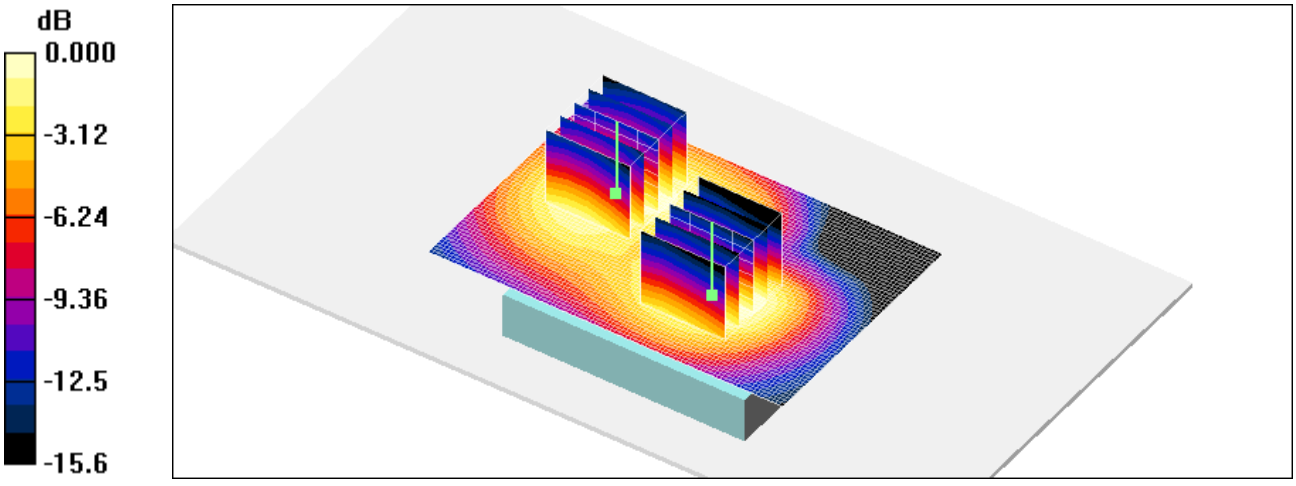
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1907.6 MHz; σ = 1.56 mho/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA1900 Front 9538/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.780 mW/g
WCDMA1900 Front 9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.4 V/m; Power Drift = -0.059 dB
Peak SAR (extrapolated) = 1.24 W/kg
SAR(1 g) = 0.708 mW/g; SAR(10 g) = 0.392 mW/g
Maximum value of SAR (measured) = 0.754 mW/g

WCDMA1900 Front 9538/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.4 V/m; Power Drift = -0.059 dB
Peak SAR (extrapolated) = 0.890 W/kg
SAR(1 g) = 0.596 mW/g; SAR(10 g) = 0.371 mW/g
Maximum value of SAR (measured) = 0.643 mW/g



0 dB = 0.643mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	46

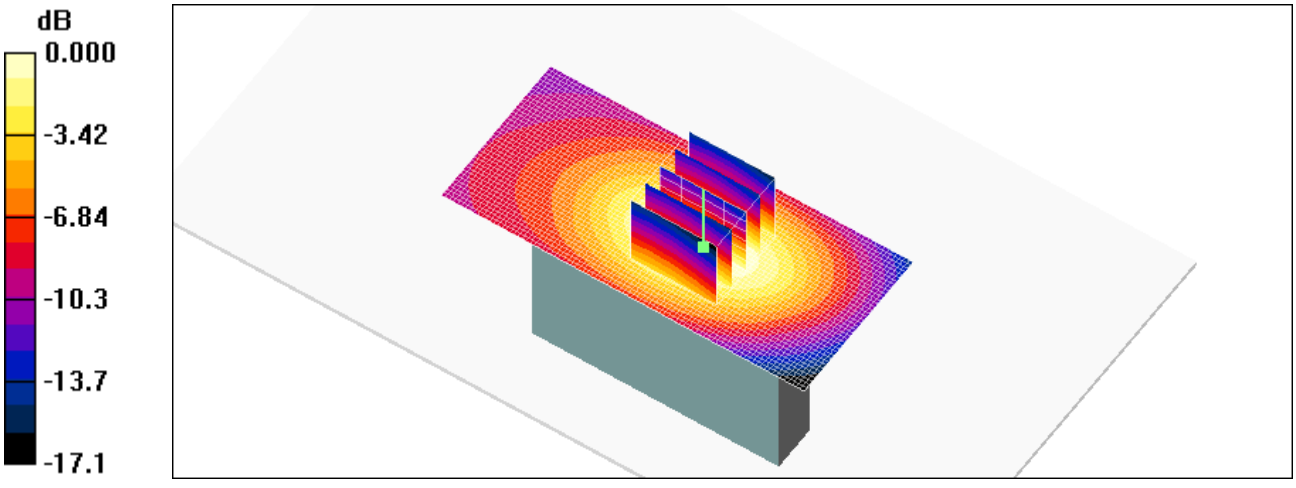
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA1900 Left side 9400/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.671 mW/g

WCDMA1900 Left side 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.5 V/m; Power Drift = 0.078 dB
Peak SAR (extrapolated) = 0.986 W/kg
SAR(1 g) = 0.607 mW/g; SAR(10 g) = 0.361 mW/g
Maximum value of SAR (measured) = 0.647 mW/g



0 dB = 0.647mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	47

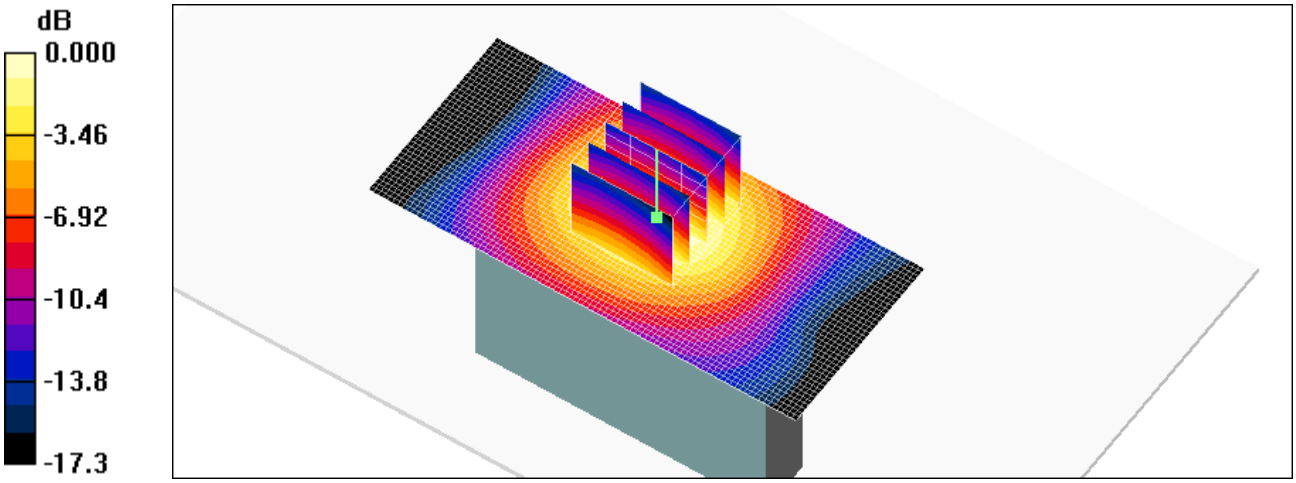
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA1900 Right side 9400/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.500 mW/g

WCDMA1900 Right side 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.5 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 0.732 W/kg
SAR(1 g) = 0.451 mW/g; SAR(10 g) = 0.265 mW/g
Maximum value of SAR (measured) = 0.485 mW/g



0 dB = 0.485mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm
Plot NO.	48

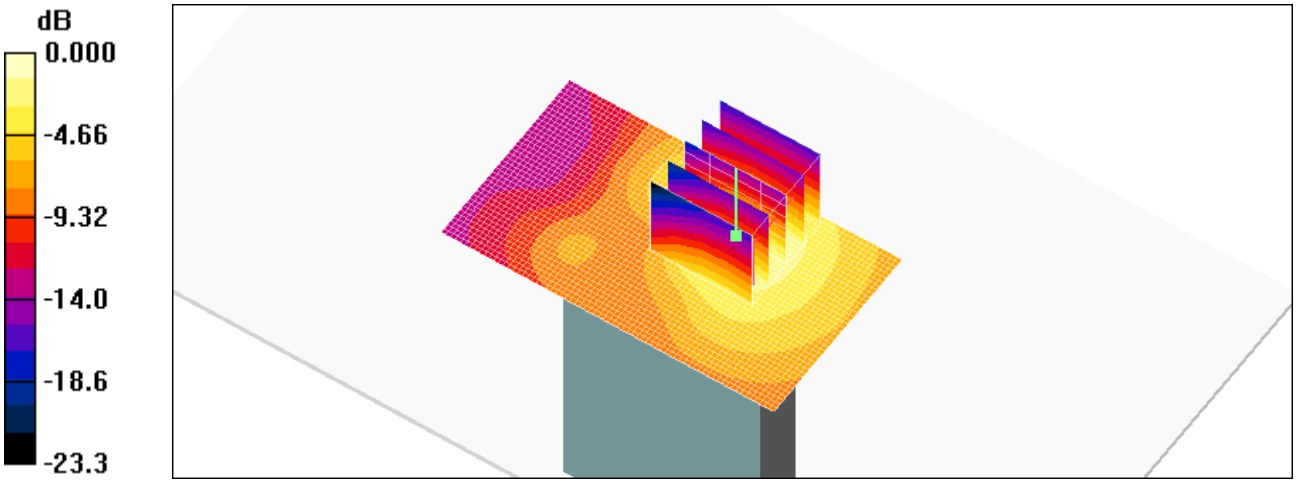
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA1900 Bottom side 9400/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.296 mW/g

WCDMA1900 Bottom side 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.3 V/m; Power Drift = 0.043 dB
Peak SAR (extrapolated) = 0.540 W/kg
SAR(1 g) = 0.295 mW/g; SAR(10 g) = 0.156 mW/g
Maximum value of SAR (measured) = 0.334 mW/g



0 dB = 0.334mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jun. 07, 2012
Separation Distance:	1.0 cm
Plot NO.	49

DUT: MHS291LVW; Type: Bar; Serial: #1

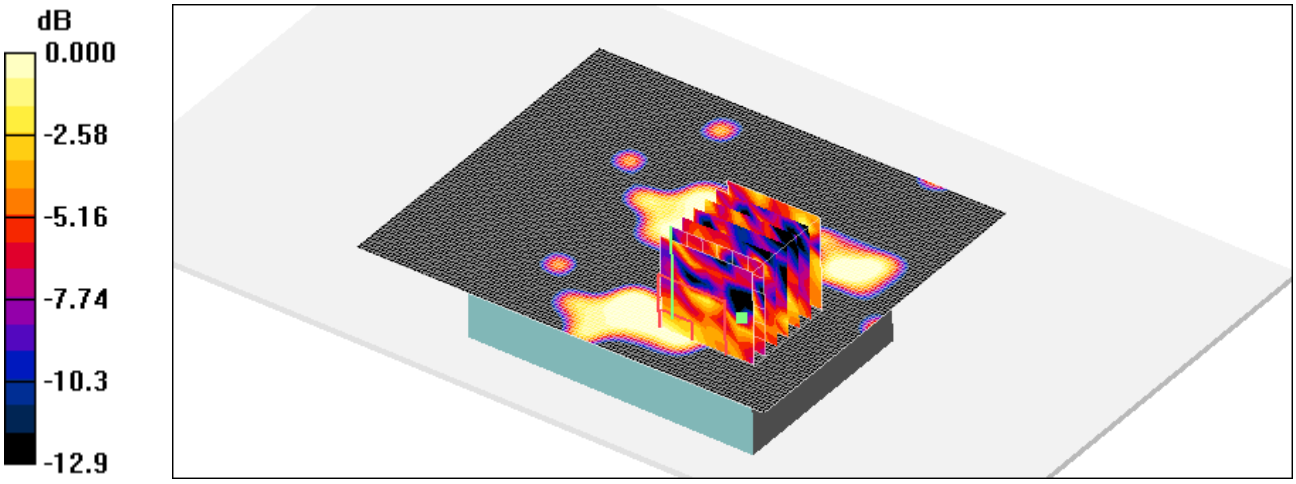
Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.89 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7, 7, 7); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

802.11b Rear 1Mbps 1ch/Area Scan (111x91x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.097 mW/g

802.11b Rear 1Mbps 1ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.01 V/m; Power Drift = 0.082 dB
Peak SAR (extrapolated) = 0.163 W/kg
SAR(1 g) = 0.013 mW/g; SAR(10 g) = 0.00172 mW/g
Maximum value of SAR (measured) = 0.030 mW/g



0 dB = 0.030mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jun. 07, 2012
Separation Distance:	1.0 cm
Plot NO.	50

DUT: MHS291LVW; Type: Bar; Serial: #1

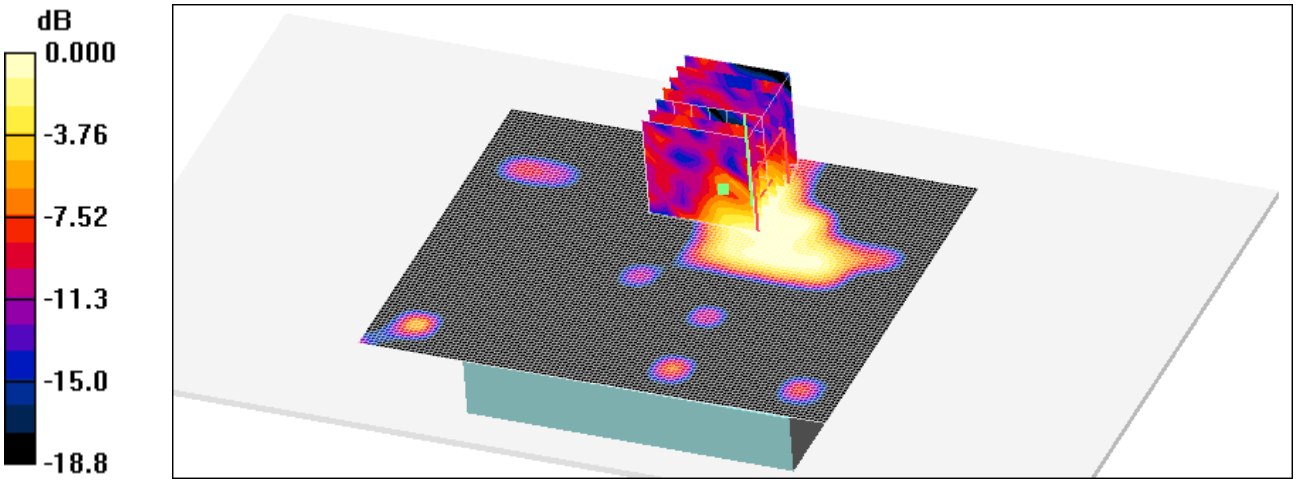
Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.89 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7, 7, 7); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

802.11b Front 1Mbps 1ch/Area Scan (111x91x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.121 mW/g

802.11b Front 1Mbps 1ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.57 V/m; Power Drift = 0.054 dB
Peak SAR (extrapolated) = 0.141 W/kg
SAR(1 g) = 0.071 mW/g; SAR(10 g) = 0.030 mW/g
Maximum value of SAR (measured) = 0.082 mW/g



0 dB = 0.082mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jun. 07, 2012
Separation Distance:	1.0 cm
Plot NO.	51

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.89 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

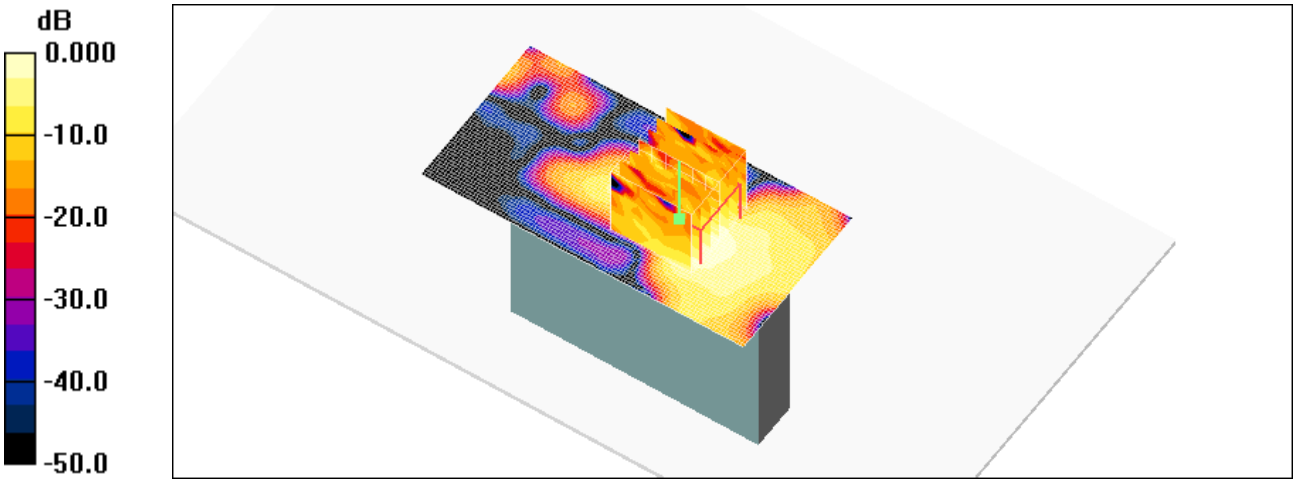
DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(7, 7, 7); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

802.11b Right side 1ch 1Mbps/Area Scan (101x51x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.199 mW/g

802.11b Right side 1ch 1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.13 V/m; Power Drift = 0.061 dB
Peak SAR (extrapolated) = 0.233 W/kg
SAR(1 g) = 0.074 mW/g; SAR(10 g) = 0.028 mW/g
Maximum value of SAR (measured) = 0.091 mW/g



0 dB = 0.091mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jun. 07, 2012
Separation Distance:	1.0 cm
Plot NO.	52

DUT: MHS291LVW; Type: Bar; Serial: #1

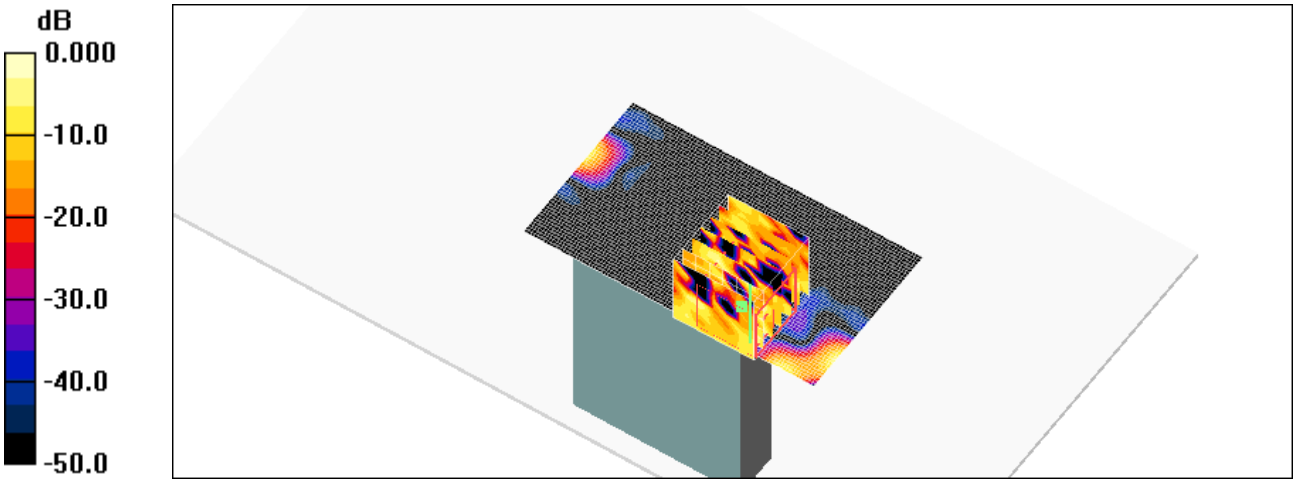
Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.89 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7, 7, 7); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

802.11b 2450MHz Top side 1ch/Area Scan (91x51x1): Measurement grid: dx=12mm, dy=12mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.009 mW/g

802.11b 2450MHz Top side 1ch/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.45 V/m; Power Drift = -0.074 dB
Peak SAR (extrapolated) = 0.021 W/kg
SAR(1 g) = 0.001 mW/g; SAR(10 g) = 0.00025 mW/g
Maximum value of SAR (measured) = 0.021 mW/g



0 dB = 0.021mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jun. 07, 2012
Separation Distance:	1.0 cm
Plot NO.	57

DUT: MHS291LVW; Type: Bar; Serial: #1

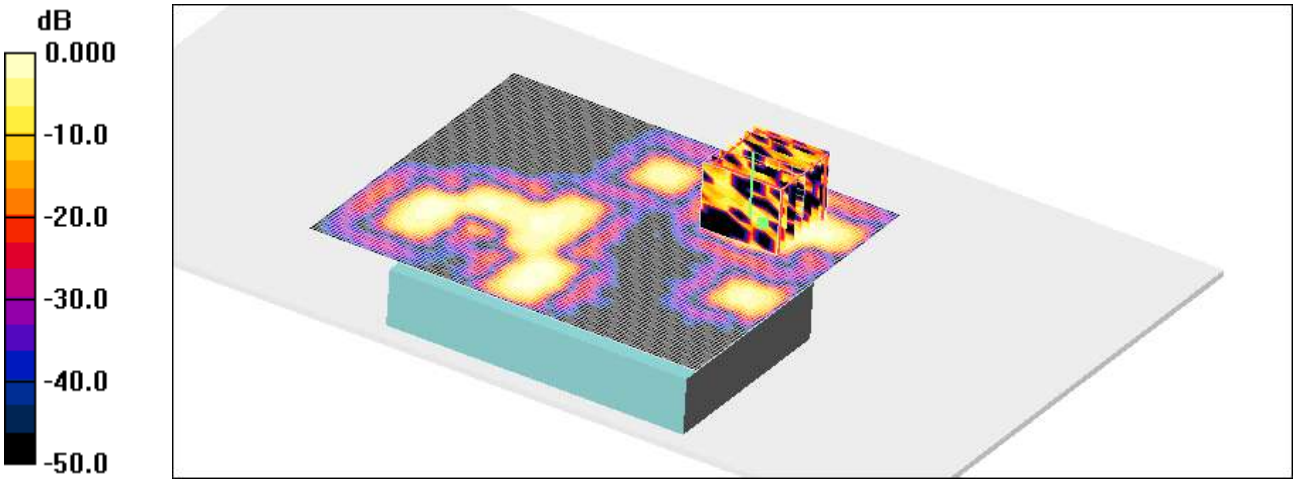
Communication System: WIFI 5GHz; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5745 MHz; σ = 6.17 mho/m; ε_r = 46.1; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(3.81, 3.81, 3.81); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WIFI 5GHz Body Rear 149ch 6Mbps/Area Scan (121x101x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.052 mW/g

WIFI 5GHz Body Rear 149ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.000 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 0.298 W/kg
SAR(1 g) = 0.023 mW/g; SAR(10 g) = 0.00504 mW/g
Maximum value of SAR (measured) = 0.036 mW/g



0 dB = 0.036mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jun. 07, 2012
Separation Distance:	1.0 cm
Plot NO.	58

DUT: MHS291LVW; Type: Bar; Serial: #1

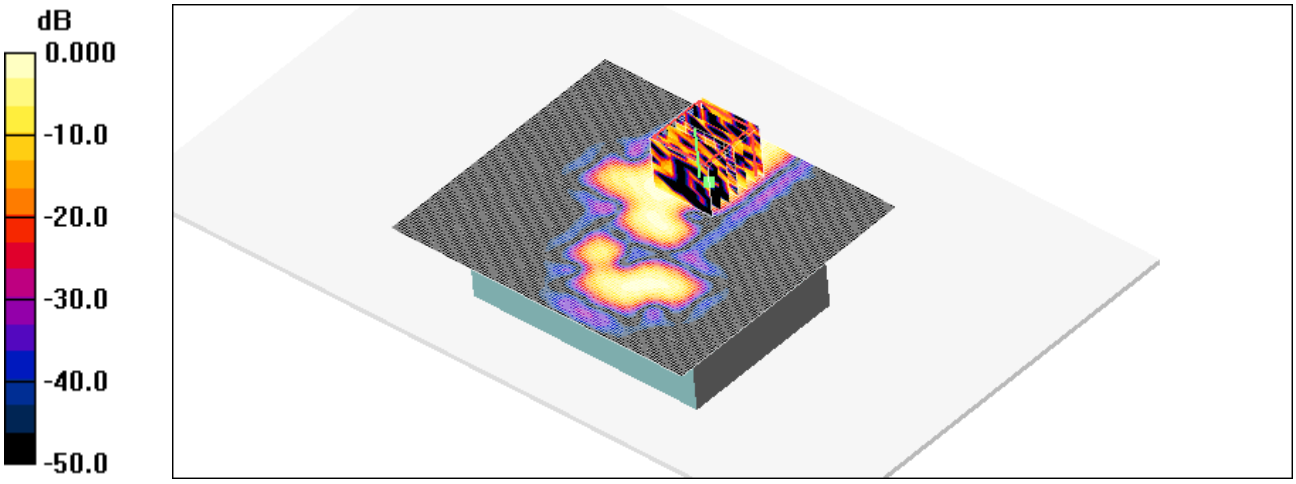
Communication System: WIFI 5GHz; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5745 MHz; σ = 6.24 mho/m; ε_r = 46.1; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(3.81, 3.81, 3.81); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WIFI 5GHz Body Front 149ch 6Mbps/Area Scan (121x101x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.169 mW/g

WIFI 5GHz Body Front 149ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.20 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.552 W/kg
SAR(1 g) = 0.047 mW/g; SAR(10 g) = 0.014 mW/g
Maximum value of SAR (measured) = 0.079 mW/g



0 dB = 0.079mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jun. 07, 2012
Separation Distance:	1.0 cm
Plot NO.	59

DUT: MHS291LVW; Type: Bar; Serial: #1

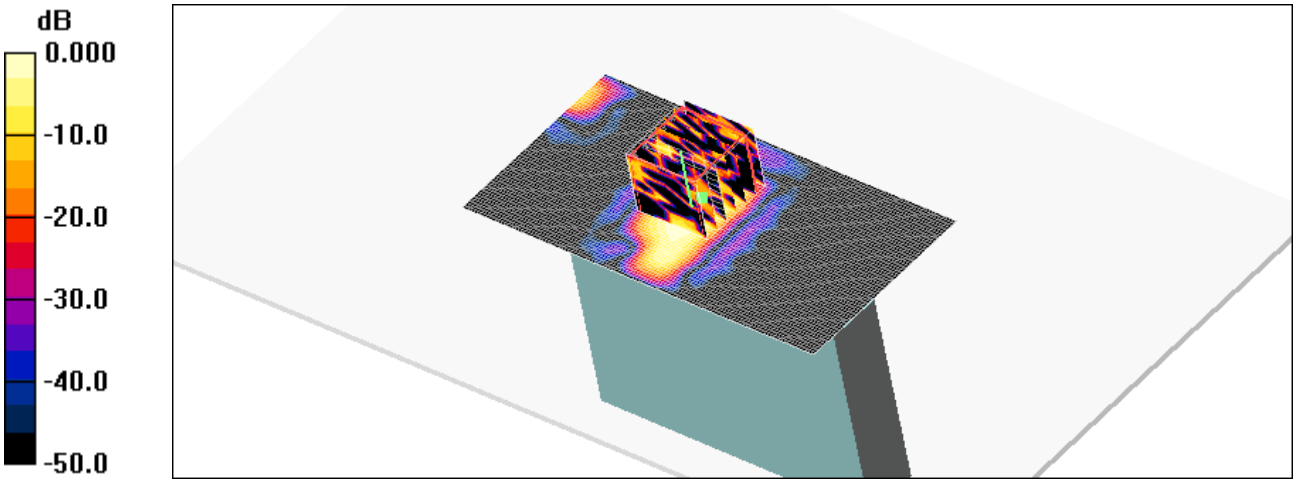
Communication System: WIFI 5GHz; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5745 MHz; σ = 6.24 mho/m; ε_r = 46.1; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(3.81, 3.81, 3.81); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WIFI 5GHz Body Right side 149ch 6Mbps/Area Scan (121x61x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.240 mW/g

WIFI 5GHz Body Right side 149ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.37 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.737 W/kg
SAR(1 g) = 0.056 mW/g; SAR(10 g) = 0.012 mW/g
Maximum value of SAR (measured) = 0.087 mW/g



0 dB = 0.087mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jun. 07, 2012
Separation Distance:	1.0 cm
Plot NO.	60

DUT: MHS291LVW; Type: Bar; Serial: #1

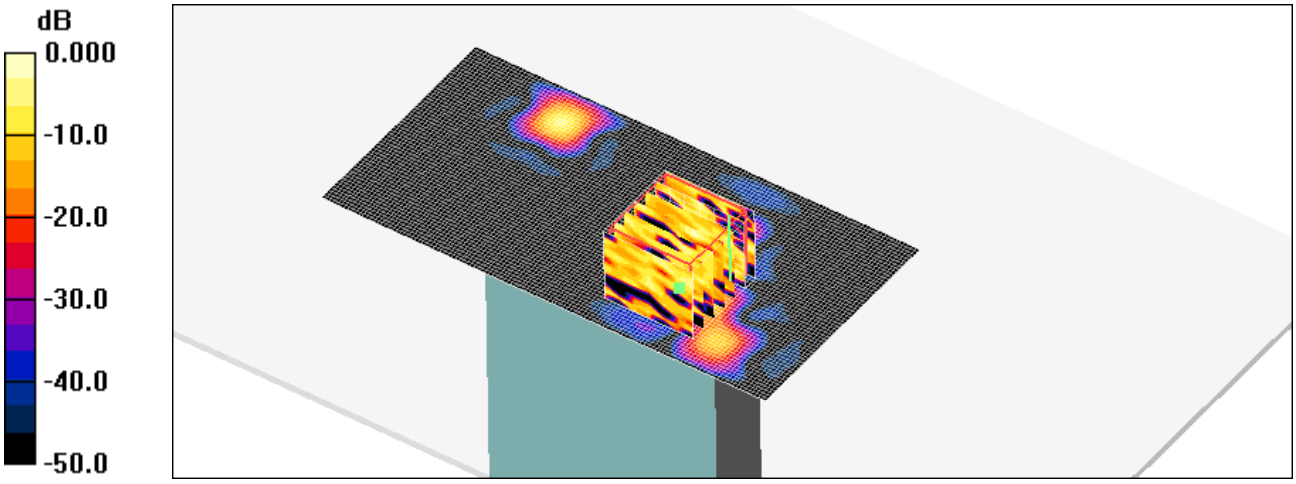
Communication System: WIFI 5GHz; Frequency: 5745 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5745 MHz; σ = 6.24 mho/m; ε_r = 46.1; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(3.81, 3.81, 3.81); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WIFI 5GHz Body Top side 149ch 6Mbps/Area Scan (121x61x1): Measurement grid: dx=10mm, dy=10mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.030 mW/g

WIFI 5GHz Body Top side 149ch 6Mbps/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.909 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.092 W/kg
SAR(1 g) = 0.00191 mW/g; SAR(10 g) = 0.000583 mW/g
Maximum value of SAR (measured) = 0.092 mW/g



0 dB = 0.092mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 08, 2012
Separation Distance:	1.0 cm
Plot NO.	61

DUT: MHS291LVW; Type: Bar; Serial: #1

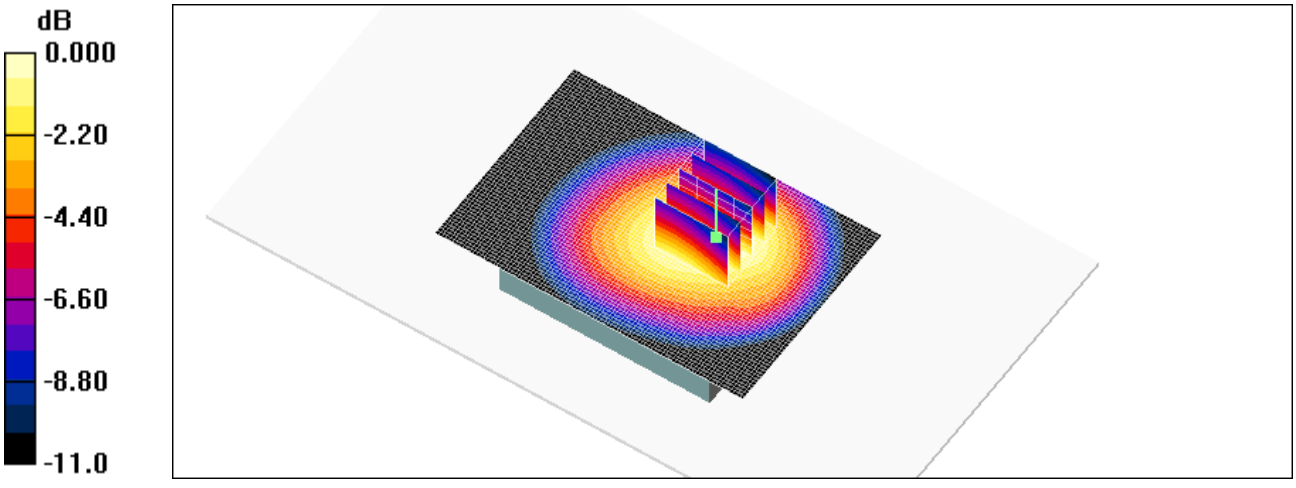
Communication System: LTE Band 13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(9.35, 9.35, 9.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 13 10MHz QPSK Rear 23230 1RB 0 offset/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.716 mW/g
LTE Band 13 10MHz QPSK Rear 23230 1RB 0 offset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.4 V/m; Power Drift = -0.082 dB
Peak SAR (extrapolated) = 0.898 W/kg
SAR(1 g) = 0.653 mW/g; SAR(10 g) = 0.456 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.697 mW/g



0 dB = 0.697mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 08, 2012
Separation Distance:	1.0 cm
Plot NO.	62

DUT: MHS291LVW; Type: Bar; Serial: #1

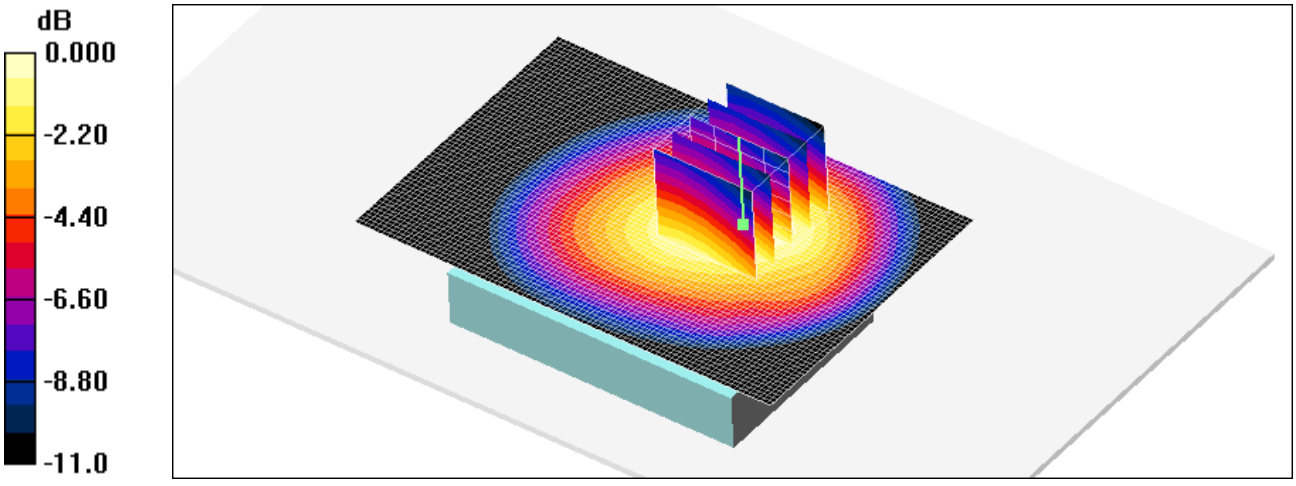
Communication System: LTE Band 13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(9.35, 9.35, 9.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 13 10MHz QPSK Rear 23230 25 RB 24offset/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.575 mW/g

LTE Band 13 10MHz QPSK Rear 23230 25 RB 24offset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.8 V/m; Power Drift = -0.010 dB
Peak SAR (extrapolated) = 0.748 W/kg
SAR(1 g) = 0.540 mW/g; SAR(10 g) = 0.375 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.577 mW/g



0 dB = 0.577mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 08, 2012
Separation Distance:	1.0 cm
Plot NO.	63

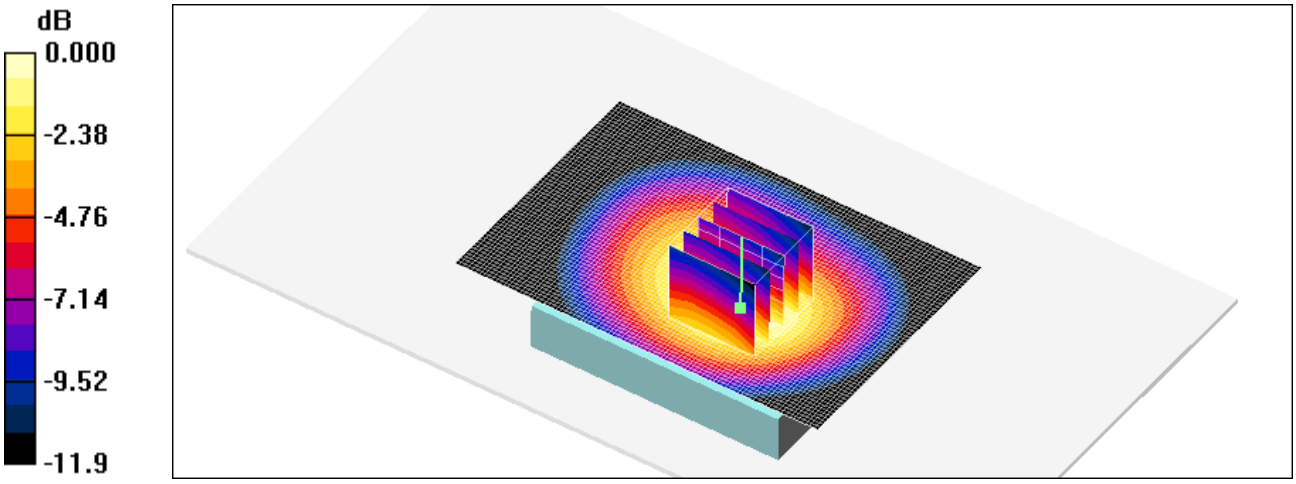
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(9.35, 9.35, 9.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 13 10MHz QPSK Front 23230 1RB 0 offset/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.607 mW/g
LTE Band 13 10MHz QPSK Front 23230 1RB 0 offset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.3 V/m; Power Drift = -0.070 dB
Peak SAR (extrapolated) = 0.775 W/kg
SAR(1 g) = 0.537 mW/g; SAR(10 g) = 0.366 mW/g
Maximum value of SAR (measured) = 0.573 mW/g



0 dB = 0.573mW/g

Test Laboratory: HCT CO., LTD

EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 08, 2012
Separation Distance:	1.0 cm
Plot NO.	64

DUT: MHS291LVW; Type: Bar; Serial: #1

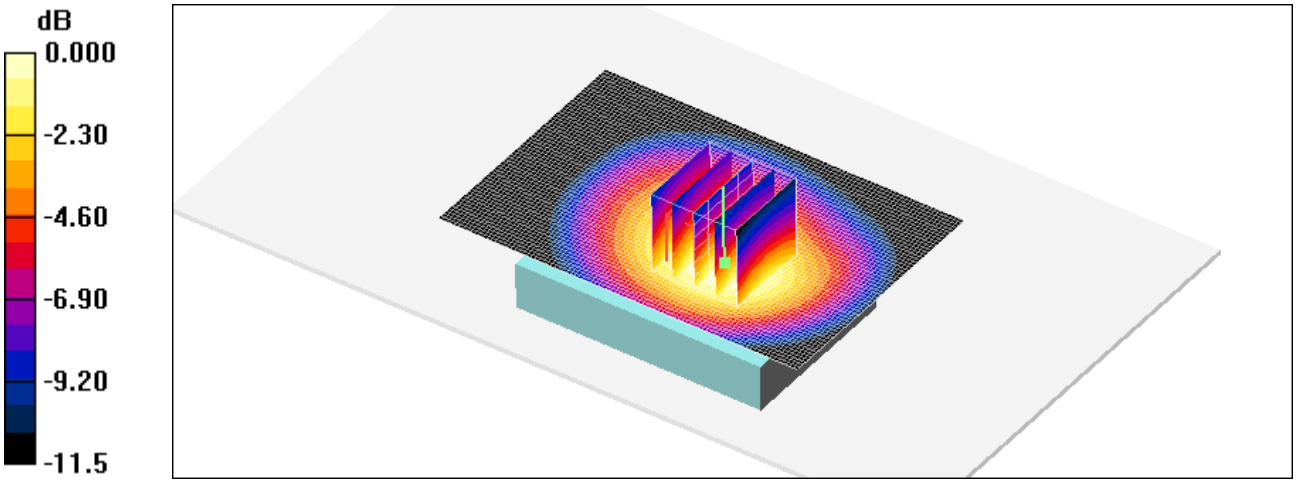
Communication System: LTE Band 13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(9.35, 9.35, 9.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 13 10MHz QPSK Front 23230 25RB 24 offset/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.518 mW/g
LTE Band 13 10MHz QPSK Front 23230 25RB 24 offset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.4 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 0.650 W/kg
SAR(1 g) = 0.452 mW/g; SAR(10 g) = 0.311 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.481 mW/g



0 dB = 0.481mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 08, 2012
Separation Distance:	1.0 cm
Plot NO.	65

DUT: MHS291LVW; Type: Bar; Serial: #1

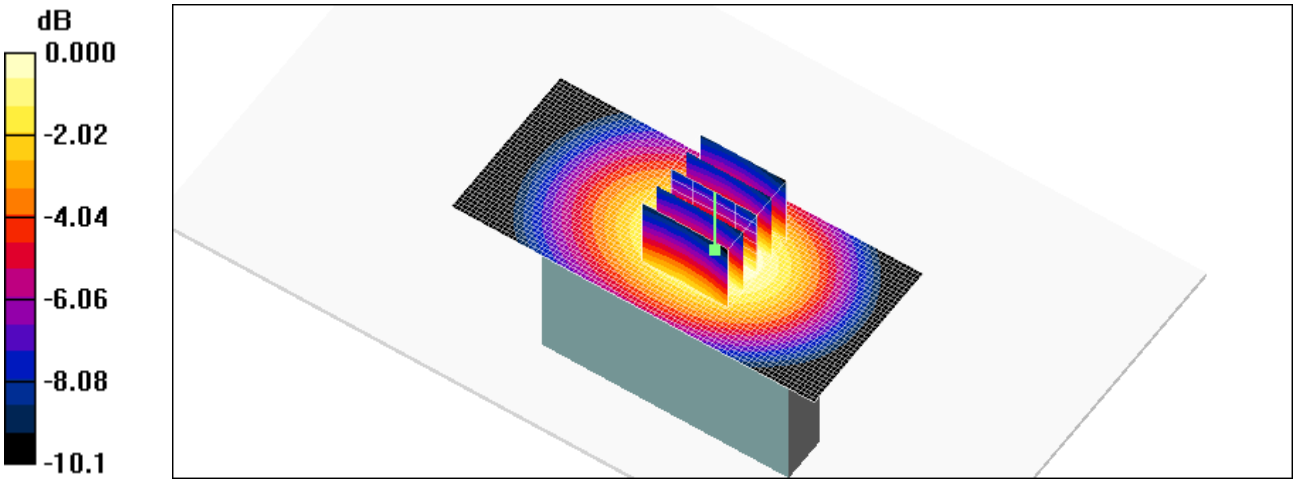
Communication System: LTE Band 13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(9.35, 9.35, 9.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 13 QPSK Left side 1RB 0 Offset 23230/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.250 mW/g

LTE Band 13 QPSK Left side 1RB 0 Offset 23230/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.4 V/m; Power Drift = -0.183 dB
Peak SAR (extrapolated) = 0.319 W/kg
SAR(1 g) = 0.231 mW/g; SAR(10 g) = 0.160 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.246 mW/g



0 dB = 0.246mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 08, 2012
Separation Distance:	1.0 cm
Plot NO.	66

DUT: MHS291LVW; Type: Bar; Serial: #1

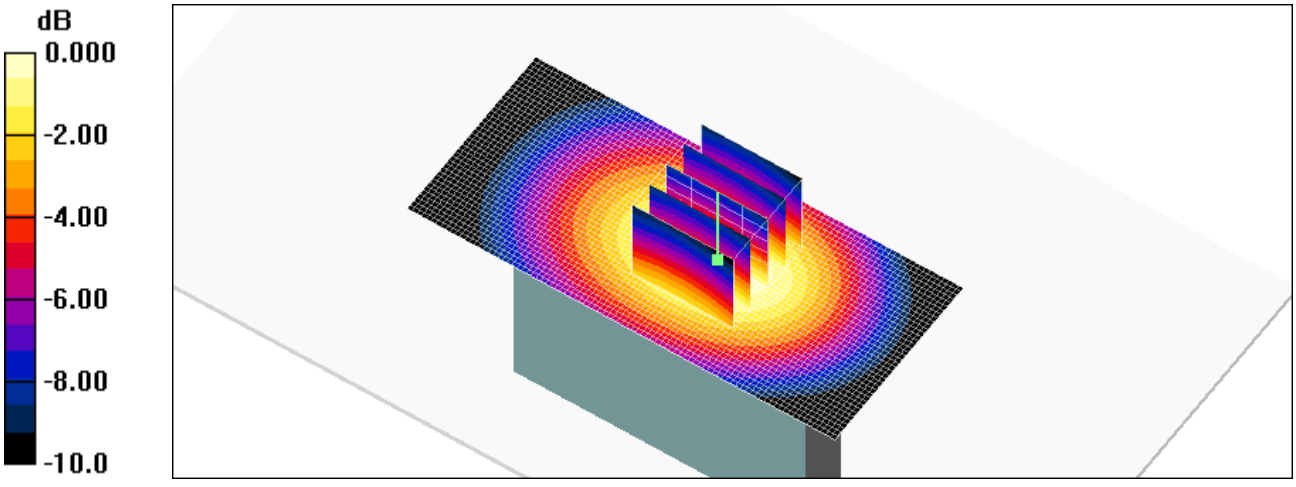
Communication System: LTE Band 13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(9.35, 9.35, 9.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 13 QPSK Left side 25RB 24Offset 23230/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.208 mW/g
LTE Band 13 QPSK Left side 25RB 24Offset 23230/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.0 V/m; Power Drift = -0.047 dB
Peak SAR (extrapolated) = 0.268 W/kg
SAR(1 g) = 0.194 mW/g; SAR(10 g) = 0.134 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.207 mW/g



0 dB = 0.207mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 08, 2012
Separation Distance:	1.0 cm
Plot NO.	67

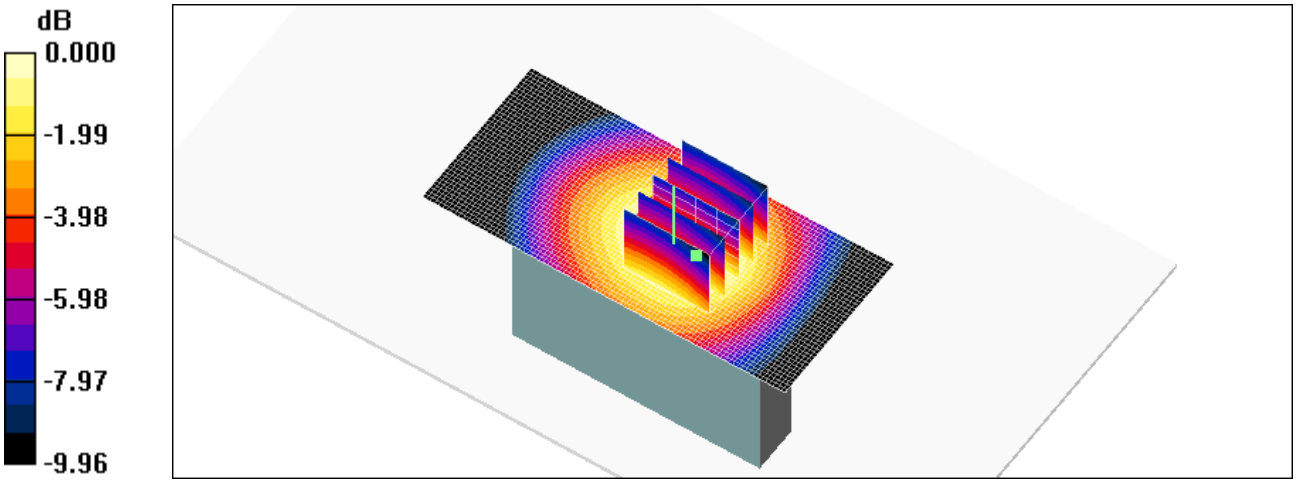
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(9.35, 9.35, 9.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 13 QPSK Right side 1RB 0 Offset 23230/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.238 mW/g
LTE Band 13 QPSK Right side 1RB 0 Offset 23230/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.8 V/m; Power Drift = -0.035 dB
Peak SAR (extrapolated) = 0.294 W/kg
SAR(1 g) = 0.218 mW/g; SAR(10 g) = 0.155 mW/g
Maximum value of SAR (measured) = 0.232 mW/g



0 dB = 0.232mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 08, 2012
Separation Distance:	1.0 cm
Plot NO.	68

DUT: MHS291LVW; Type: Bar; Serial: #1

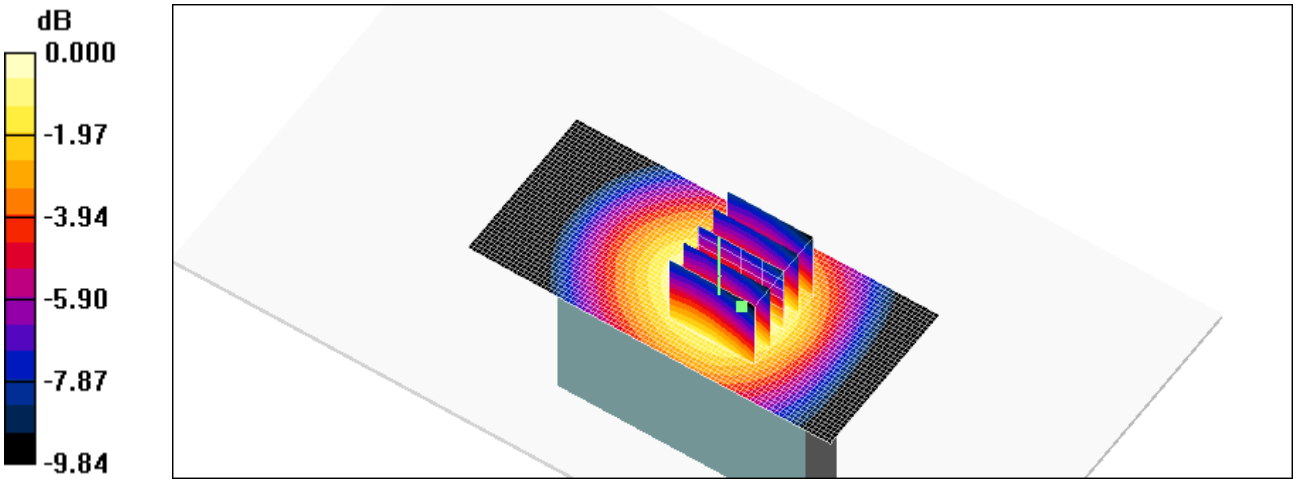
Communication System: LTE Band 13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(9.35, 9.35, 9.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 13 QPSK Right side 25RB 24 Offset 23230/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.207 mW/g

LTE Band 13 QPSK Right side 25RB 24 Offset 23230/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = 0.073 dB
Peak SAR (extrapolated) = 0.262 W/kg
SAR(1 g) = 0.194 mW/g; SAR(10 g) = 0.138 mW/g
Maximum value of SAR (measured) = 0.205 mW/g



0 dB = 0.205mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 08, 2012
Separation Distance:	1.0 cm
Plot NO.	69

DUT: MHS291LVW; Type: Bar; Serial: #1

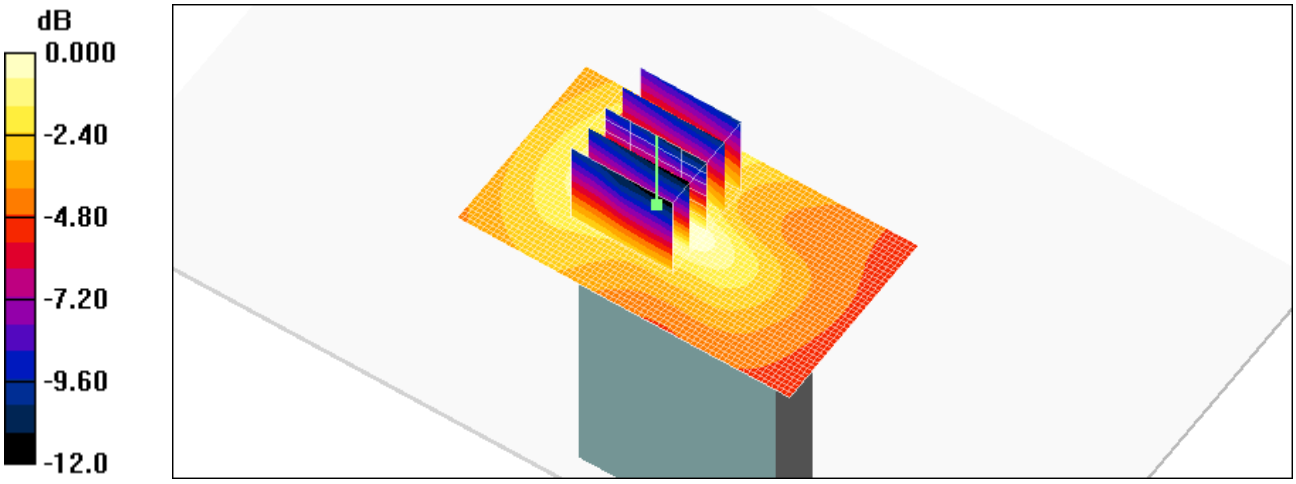
Communication System: LTE Band 13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(9.35, 9.35, 9.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 13 Bottom side 10MHz 1 RB 0 offset QPSK 23230/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.122 mW/g

LTE Band 13 Bottom side 10MHz 1 RB 0 offset QPSK 23230/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.5 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.174 W/kg
SAR(1 g) = 0.106 mW/g; SAR(10 g) = 0.069 mW/g
Maximum value of SAR (measured) = 0.114 mW/g



0 dB = 0.114mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 08, 2012
Separation Distance:	1.0 cm
Plot NO.	70

DUT: MHS291LVW; Type: Bar; Serial: #1

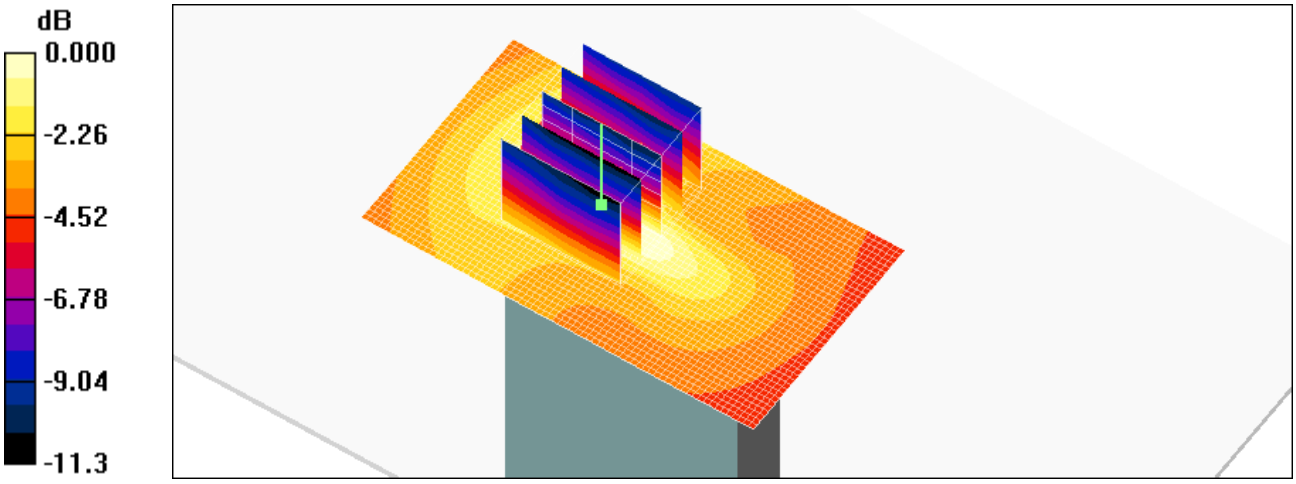
Communication System: LTE Band 13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(9.35, 9.35, 9.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 13 Bottom side 10MHz 25RB 24 offset QPSK 23230/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.087 mW/g

LTE Band 13 Bottom side 10MHz 25RB 24 offset QPSK 23230/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.19 V/m; Power Drift = -0.074 dB
Peak SAR (extrapolated) = 0.130 W/kg
SAR(1 g) = 0.078 mW/g; SAR(10 g) = 0.050 mW/g
Maximum value of SAR (measured) = 0.084 mW/g



0 dB = 0.084mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	71

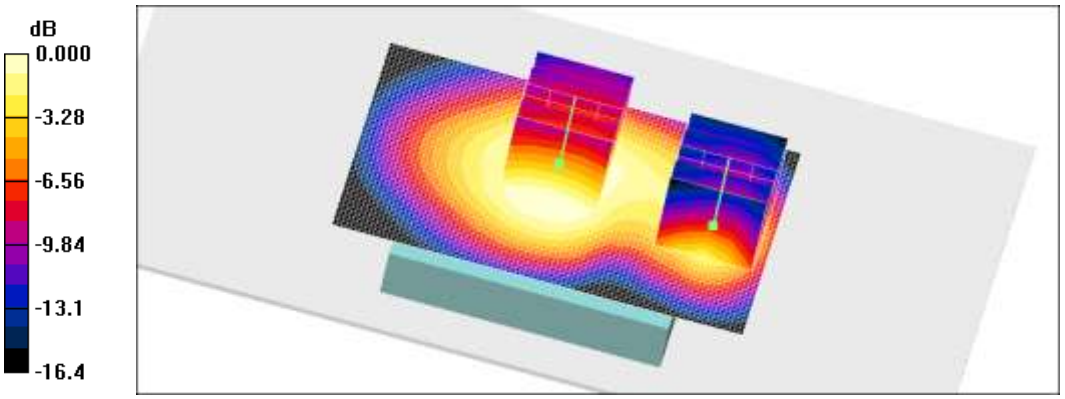
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band4 20MHz QPSK Rear 20050 1RB 0 offset/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.714 mW/g

LTE Band4 20MHz QPSK Rear 20050 1RB 0 offset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.7 V/m; Power Drift = 0.058 dB
Peak SAR (extrapolated) = 0.929 W/kg
SAR(1 g) = 0.656 mW/g; SAR(10 g) = 0.448 mW/g
Maximum value of SAR (measured) = 0.695 mW/g
LTE Band4 20MHz QPSK Rear 20050 1RB 0 offset/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.7 V/m; Power Drift = 0.058 dB
Peak SAR (extrapolated) = 0.962 W/kg
SAR(1 g) = 0.587 mW/g; SAR(10 g) = 0.330 mW/g
Maximum value of SAR (measured) = 0.660 mW/g



0 dB = 0.660mW/g

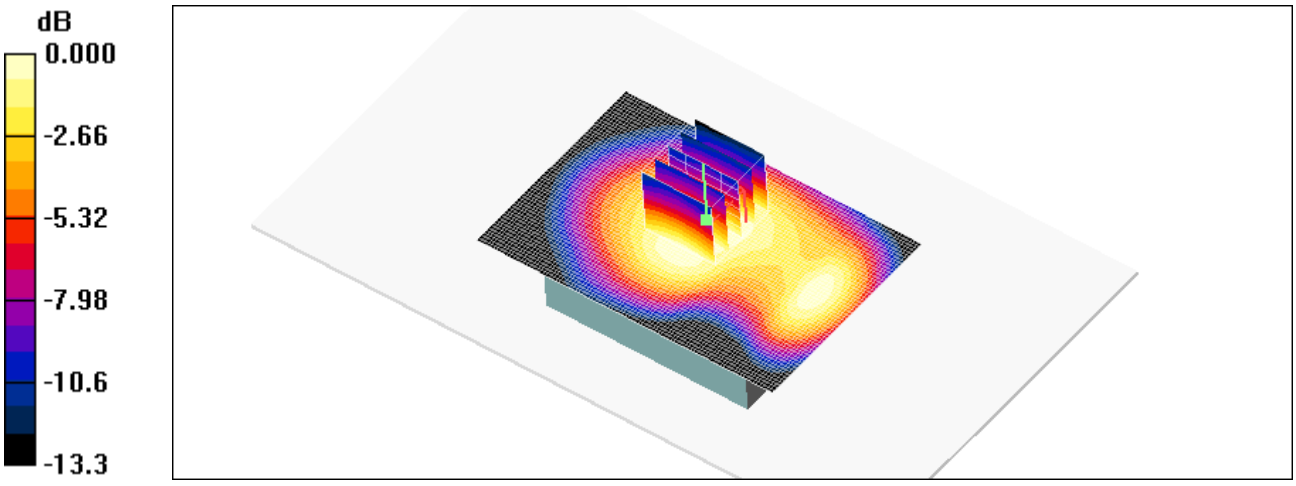
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	72

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band4 20MHz QPSK Rear 20050 50RB 25offset/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.479 mW/g
LTE Band4 20MHz QPSK Rear 20050 50RB 25offset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.0 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 0.647 W/kg
SAR(1 g) = 0.435 mW/g; SAR(10 g) = 0.288 mW/g
Maximum value of SAR (measured) = 0.465 mW/g



0 dB = 0.465mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	73

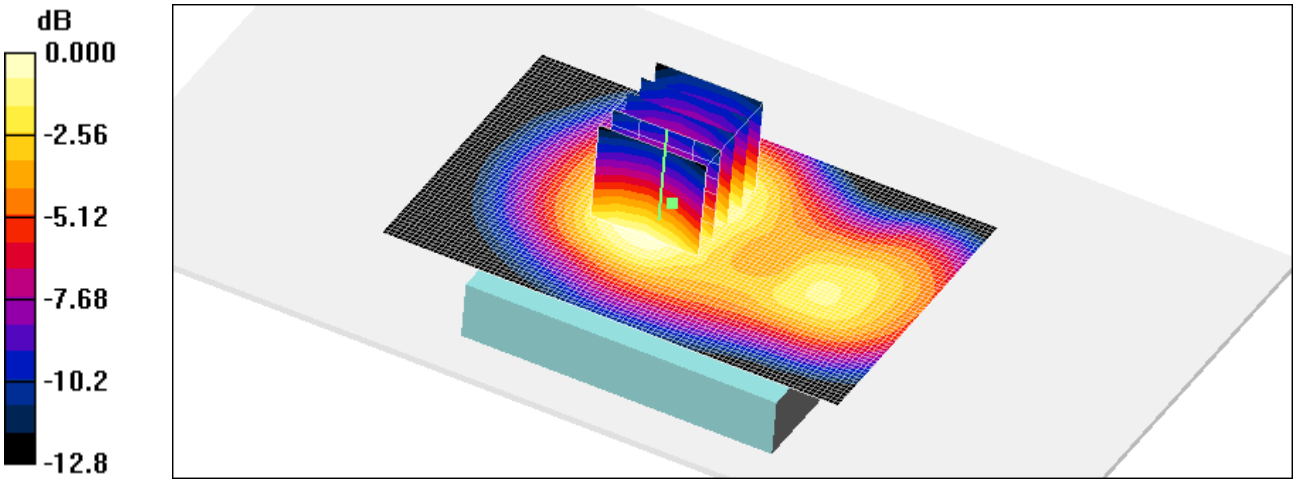
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band4 20MHz QPSK Front 20050 1RB 0 offset/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.436 mW/g

LTE Band4 20MHz QPSK Front 20050 1RB 0 offset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 0.581 W/kg
SAR(1 g) = 0.397 mW/g; SAR(10 g) = 0.263 mW/g
Maximum value of SAR (measured) = 0.425 mW/g



0 dB = 0.425mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	74

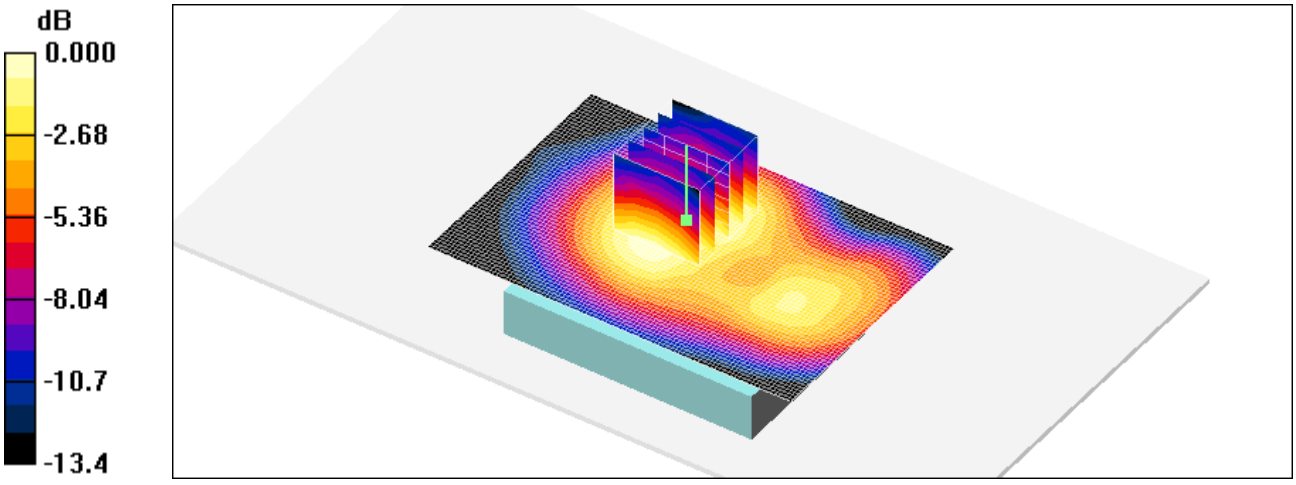
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band4 20MHz QPSK Rear 20050 50RB 25 offset/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.320 mW/g

LTE Band4 20MHz QPSK Rear 20050 50RB 25 offset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.8 V/m; Power Drift = 0.021 dB
Peak SAR (extrapolated) = 0.408 W/kg
SAR(1 g) = 0.291 mW/g; SAR(10 g) = 0.194 mW/g
Maximum value of SAR (measured) = 0.311 mW/g



0 dB = 0.311mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	75

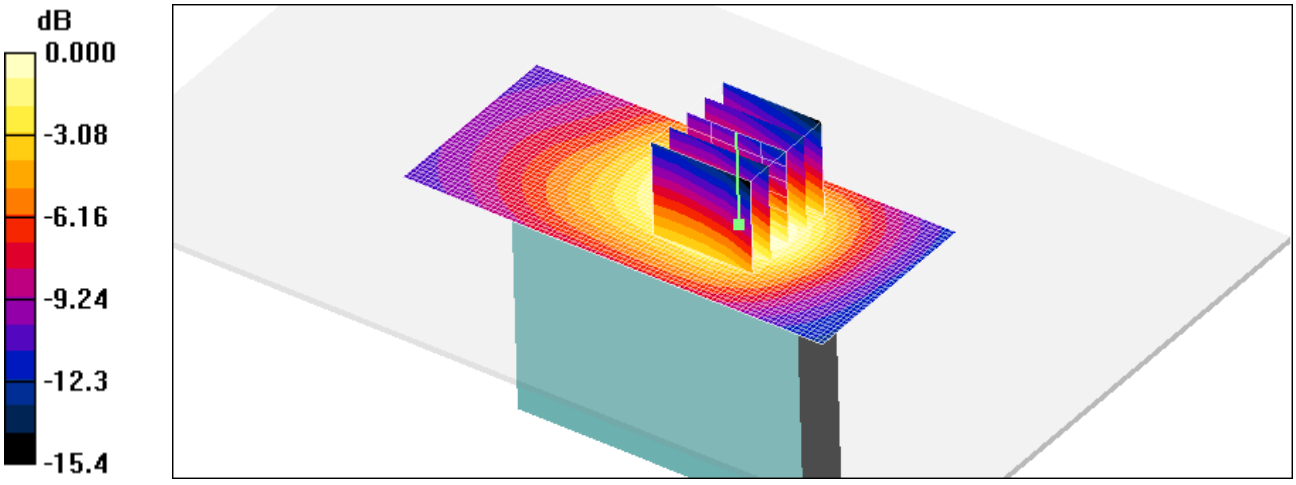
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 4 QPSK Left side 1RB 0 Offset 20050/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.430 mW/g

LTE Band 4 QPSK Left side 1RB 0 Offset 20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.5 V/m; Power Drift = -0.006 dB
Peak SAR (extrapolated) = 0.583 W/kg
SAR(1 g) = 0.375 mW/g; SAR(10 g) = 0.236 mW/g
Maximum value of SAR (measured) = 0.405 mW/g



0 dB = 0.405mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	76

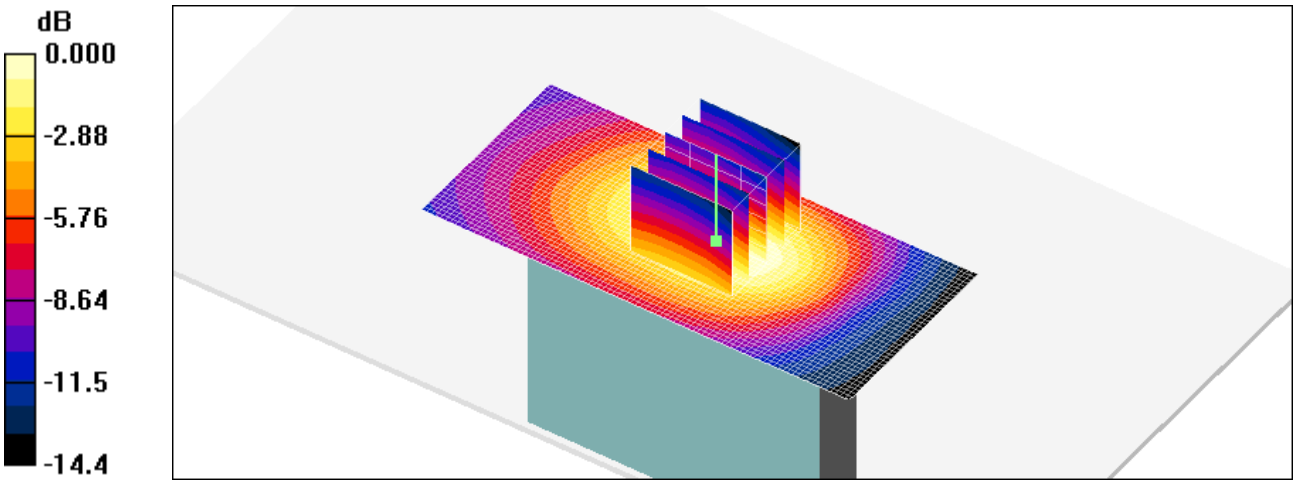
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 4 QPSK Left side 50RB 25 Offset 20050/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.320 mW/g

LTE Band 4 QPSK Left side 50RB 25 Offset 20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.7 V/m; Power Drift = 0.022 dB
Peak SAR (extrapolated) = 0.443 W/kg
SAR(1 g) = 0.295 mW/g; SAR(10 g) = 0.188 mW/g
Maximum value of SAR (measured) = 0.319 mW/g



0 dB = 0.319mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	77

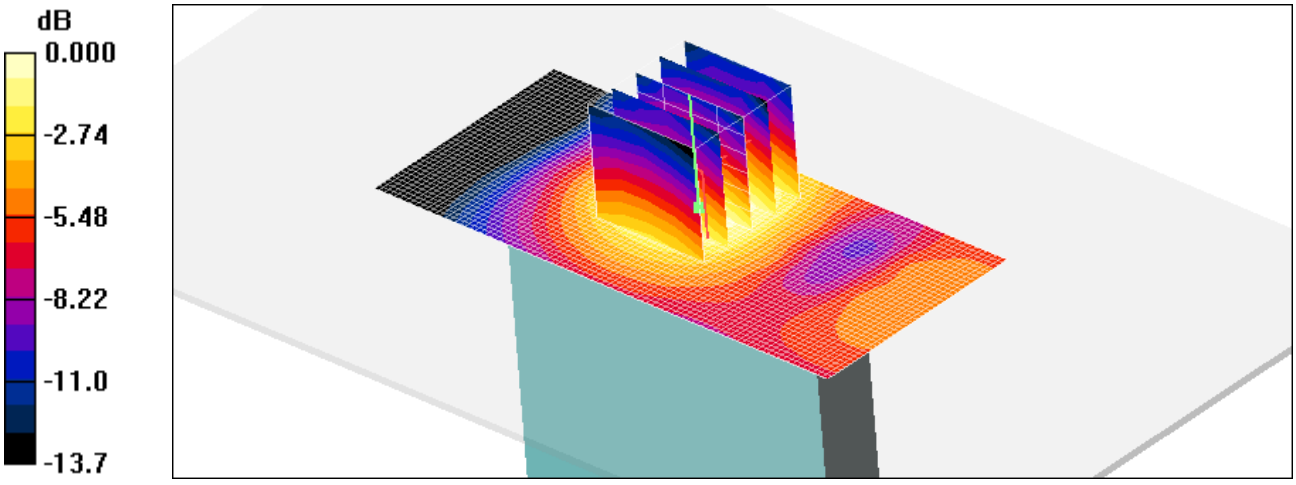
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 4 QPSK Right side 1RB 0 Offset 20050/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.112 mW/g

LTE Band 4 QPSK Right side 1RB 0 Offset 20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.34 V/m; Power Drift = 0.088 dB
Peak SAR (extrapolated) = 0.154 W/kg
SAR(1 g) = 0.101 mW/g; SAR(10 g) = 0.064 mW/g
Maximum value of SAR (measured) = 0.107 mW/g



0 dB = 0.107mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	78

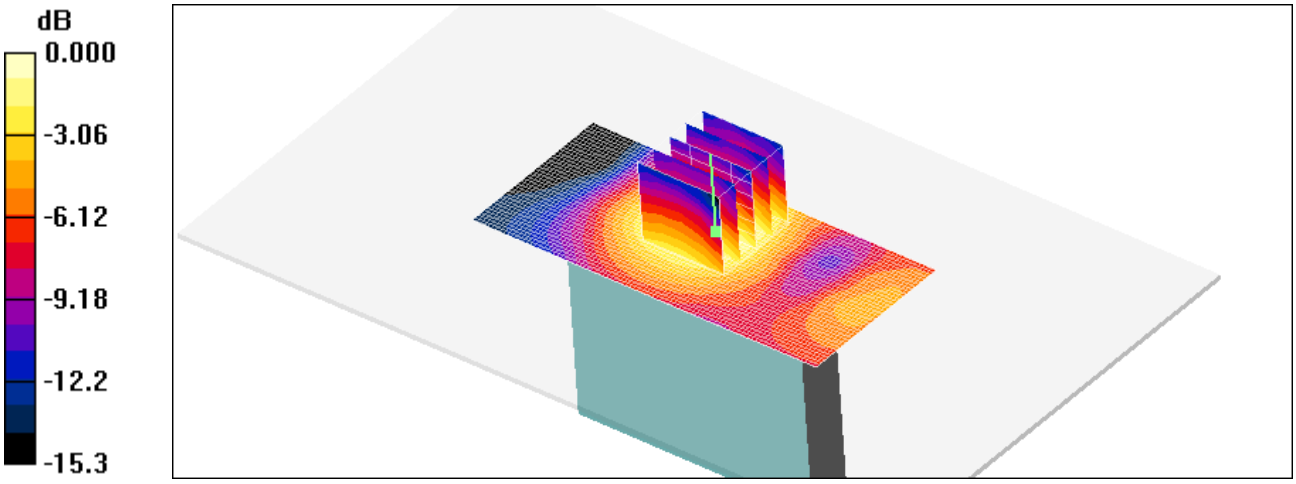
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 4 QPSK Right side 50RB 25 Offset 20050/Area Scan (91x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.087 mW/g

LTE Band 4 QPSK Right side 50RB 25 Offset 20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.28 V/m; Power Drift = 0.134 dB
Peak SAR (extrapolated) = 0.117 W/kg
SAR(1 g) = 0.078 mW/g; SAR(10 g) = 0.050 mW/g
Maximum value of SAR (measured) = 0.084 mW/g



0 dB = 0.084mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	79

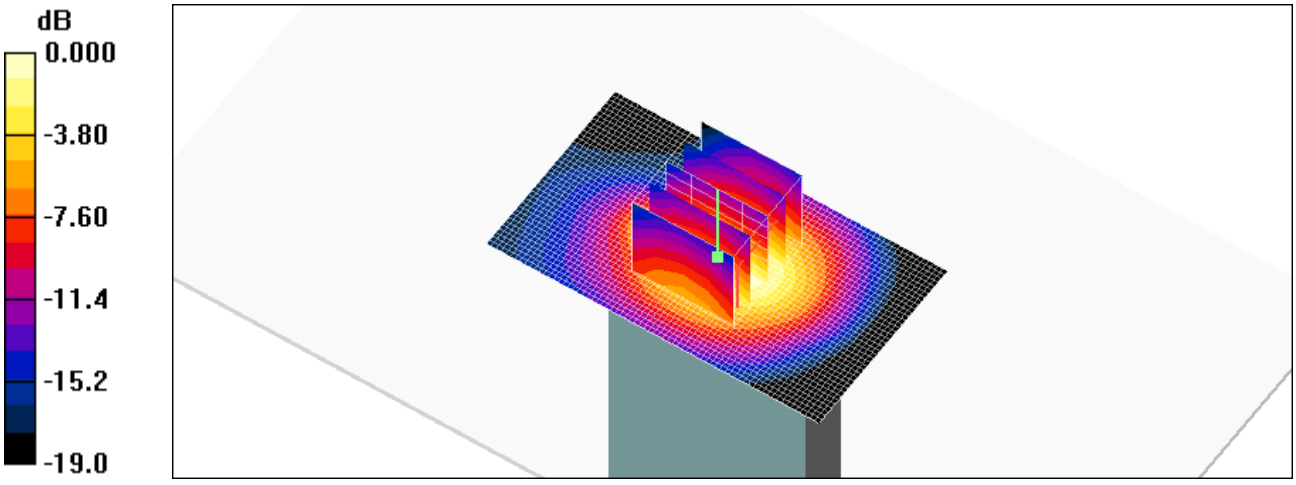
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 4 Bottom side 20MHz 1RB 0 offset QPSK 20050/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.08 mW/g

LTE Band 4 Bottom side 20MHz 1RB 0 offset QPSK 20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.7 V/m; Power Drift = -0.051 dB
Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 0.874 mW/g; SAR(10 g) = 0.470 mW/g
Maximum value of SAR (measured) = 0.977 mW/g



0 dB = 0.977mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	80

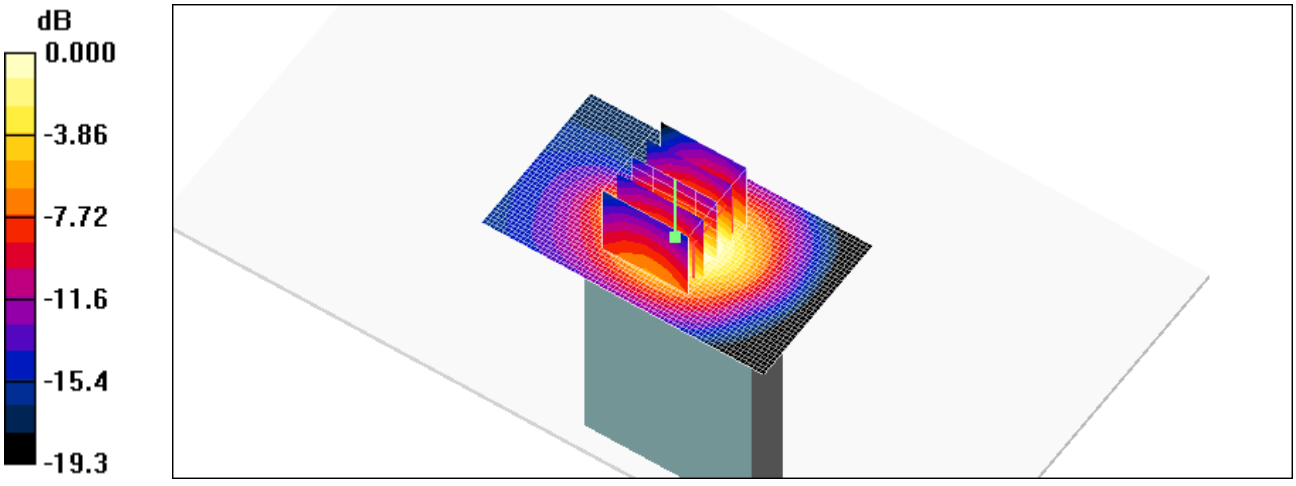
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1732.5 MHz; σ = 1.43 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 4 Bottom side 20MHz 1RB 0 offset QPSK 20175/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.936 mW/g

LTE Band 4 Bottom side 20MHz 1RB 0 offset QPSK 20175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.7 V/m; Power Drift = -0.012 dB
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.758 mW/g; SAR(10 g) = 0.410 mW/g
Maximum value of SAR (measured) = 0.841 mW/g



0 dB = 0.841mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	81

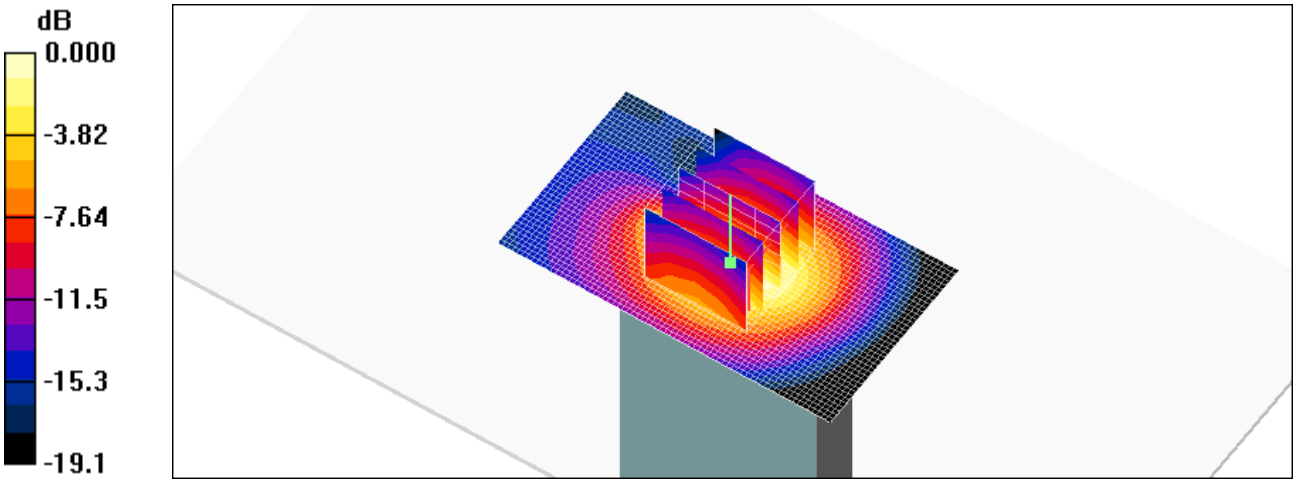
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1754 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1754 MHz; σ = 1.45 mho/m; ε_r = 54.8; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 4 Bottom side 20MHz 1RB 0 offset QPSK 20300/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.07 mW/g

LTE Band 4 Bottom side 20MHz 1RB 0 offset QPSK 20300/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.3 V/m; Power Drift = 0.028 dB
Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 0.871 mW/g; SAR(10 g) = 0.473 mW/g
Maximum value of SAR (measured) = 0.981 mW/g



0 dB = 0.981mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	82

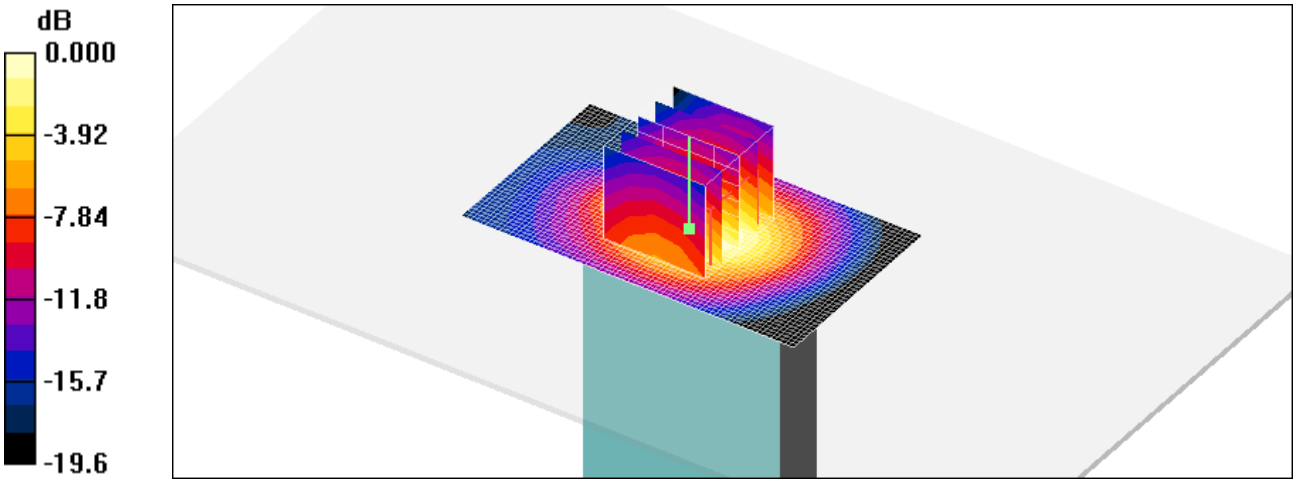
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 4 Bottom side 20MHz 50RB 25offset QPSK 20050/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.750 mW/g

LTE Band 4 Bottom side 20MHz 50RB 25offset QPSK 20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.3 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.613 mW/g; SAR(10 g) = 0.330 mW/g
Maximum value of SAR (measured) = 0.681 mW/g



0 dB = 0.681mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	83

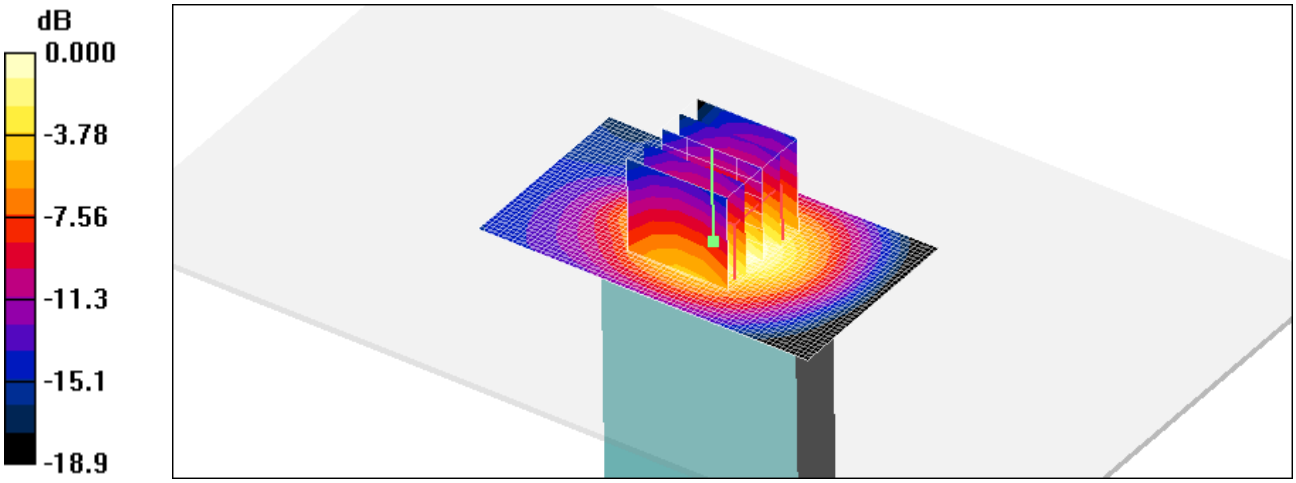
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 4 Bottom side 20MHz 100RB 0 offset QPSK 20050/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.651 mW/g

LTE Band 4 Bottom side 20MHz 100RB 0 offset QPSK 20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.2 V/m; Power Drift = -0.046 dB
Peak SAR (extrapolated) = 0.956 W/kg
SAR(1 g) = 0.559 mW/g; SAR(10 g) = 0.307 mW/g
Maximum value of SAR (measured) = 0.614 mW/g



0 dB = 0.614mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 3, 2012
Separation Distance:	1.0 cm
Plot NO.	84

DUT: MHS291LVW; Type: Bar; Serial: #1

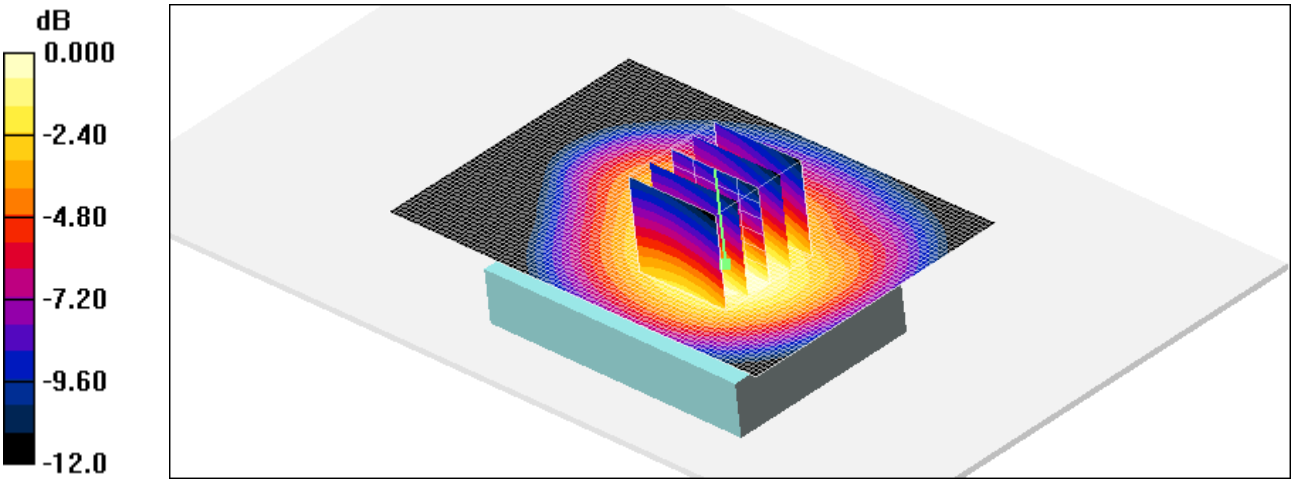
Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.992 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

CDMA835 EVDO Front 384/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.03 mW/g
CDMA835 EVDO Front 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.3 V/m; Power Drift = -0.101 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.940 mW/g; SAR(10 g) = 0.629 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.01 mW/g



0 dB = 1.01mW/g

Test Laboratory: HCT CO., LTD

EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	85

DUT: MHS291LVW; Type: Bar; Serial: #1

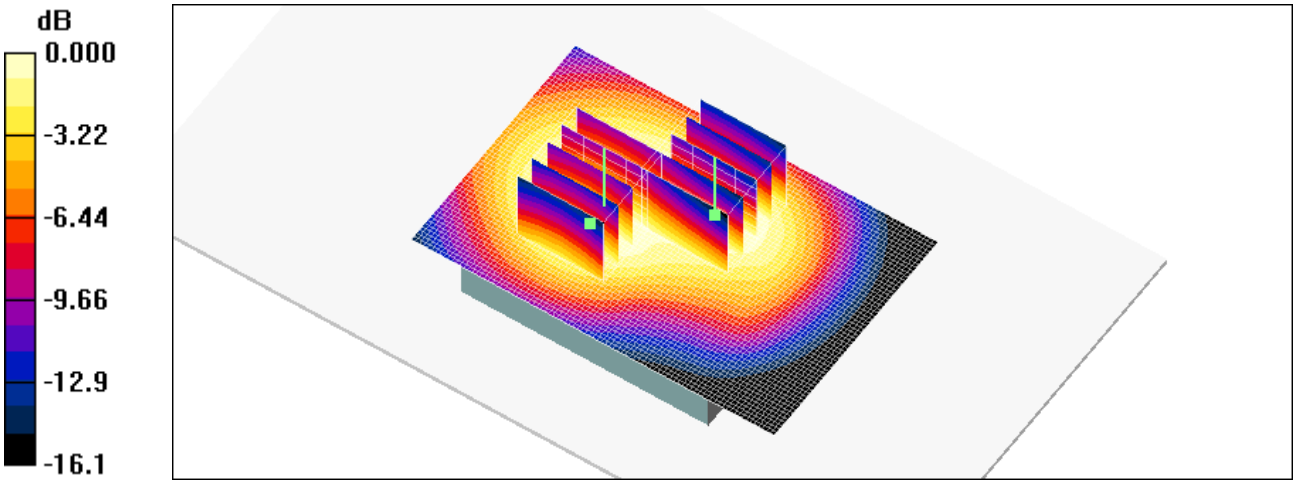
Communication System: PCS 1900; Frequency: 1851.25 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.51 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Rear 25/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.43 mW/g

PCS EVDO Rear 25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.6 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 1.87 W/kg
SAR(1 g) = 1.3 mW/g; SAR(10 g) = 0.839 mW/g
Maximum value of SAR (measured) = 1.38 mW/g

PCS EVDO Rear 25/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.6 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 1.77 W/kg
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.697 mW/g
Maximum value of SAR (measured) = 1.18 mW/g



0 dB = 1.18mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm
Plot NO.	86

DUT: ORBIT; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1851.25 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.42 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

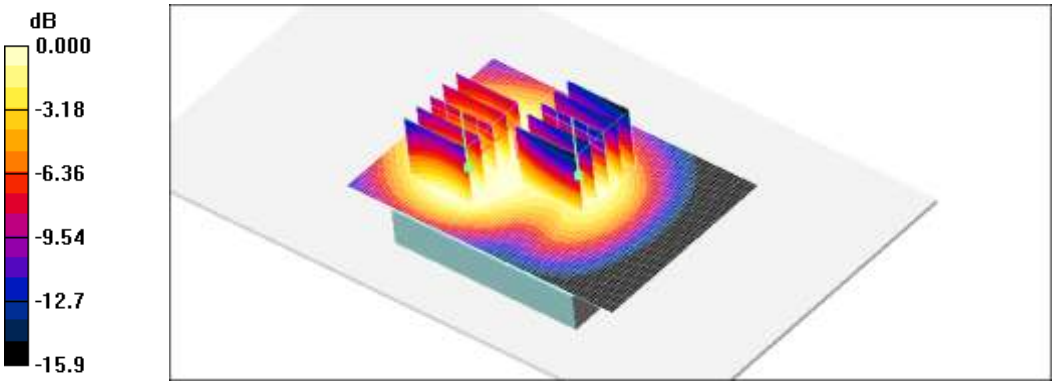
DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Rear 25/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.47 mW/g

PCS EVDO Rear 25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.6 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 1.89 W/kg
SAR(1 g) = 1.29 mW/g; SAR(10 g) = 0.850 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.37 mW/g

PCS EVDO Rear 25/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.6 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.850 mW/g; SAR(10 g) = 0.535 mW/g
Maximum value of SAR (measured) = 0.926 mW/g



0 dB = 0.926mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 9, 2012
Separation Distance:	1.0 cm
Plot NO.	87

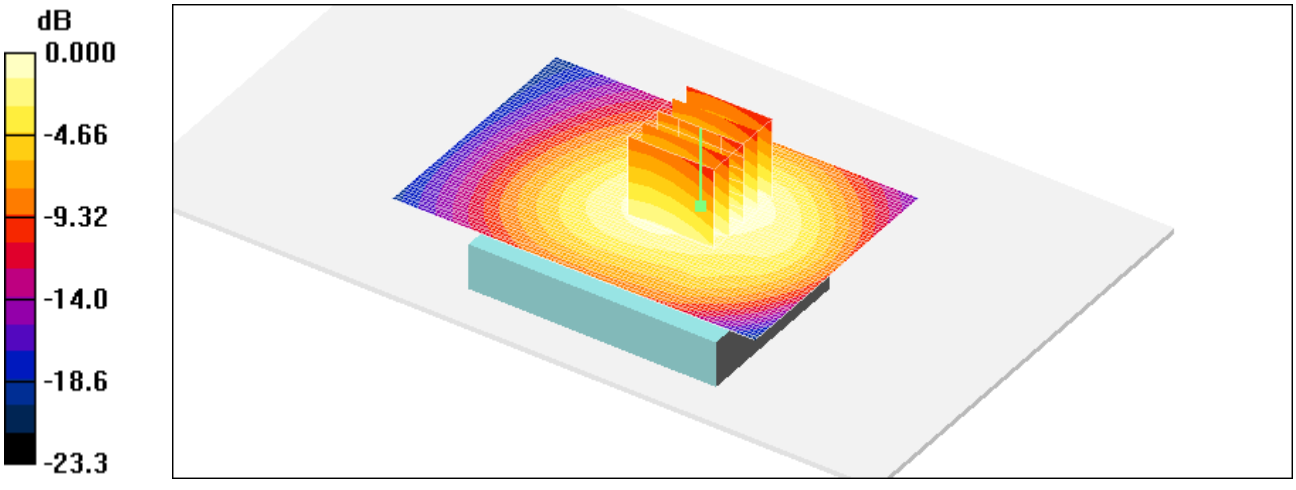
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 825 MHz; σ = 0.979 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM850 GPRS 2Tx Rear 128/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.35 mW/g

GSM850 GPRS 2Tx Rear 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 36.1 V/m; Power Drift = -0.084 dB
Peak SAR (extrapolated) = 2.98 W/kg
SAR(1 g) = 1.29 mW/g; SAR(10 g) = 0.885 mW/g
Maximum value of SAR (measured) = 1.37 mW/g



0 dB = 1.37mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 9, 2012
Separation Distance:	1.0 cm
Plot NO.	88

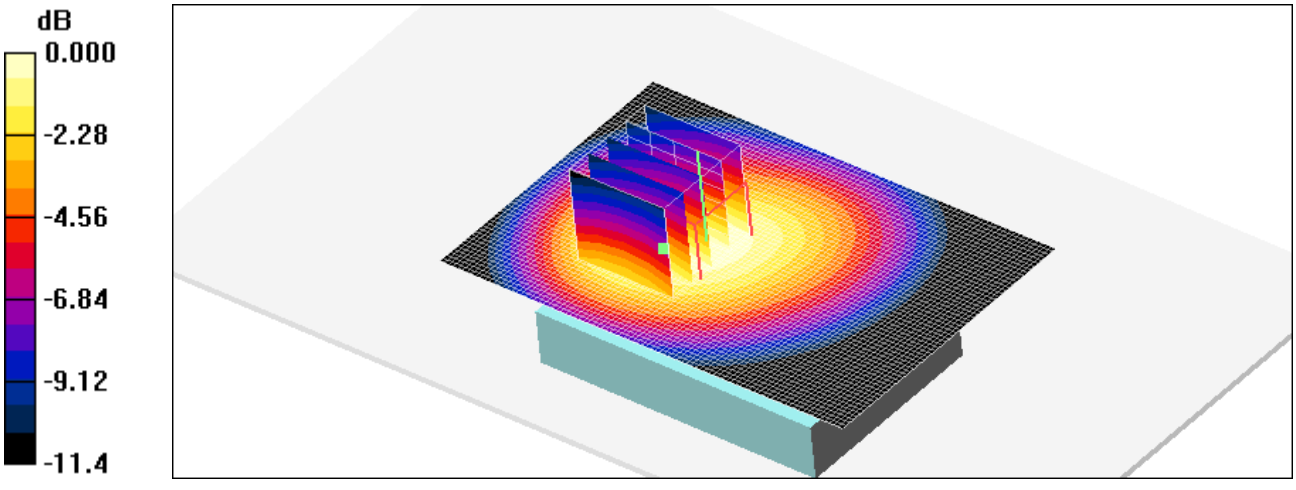
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 825 MHz; σ = 0.98 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM850 GPRS 2Tx Rear 128/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.40 mW/g

GSM850 GPRS 2Tx Rear 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.9 V/m; Power Drift = -0.104 dB
Peak SAR (extrapolated) = 1.77 W/kg
SAR(1 g) = 1.28 mW/g; SAR(10 g) = 0.888 mW/g
Maximum value of SAR (measured) = 1.35 mW/g



0 dB = 1.35mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm
Plot NO.	89

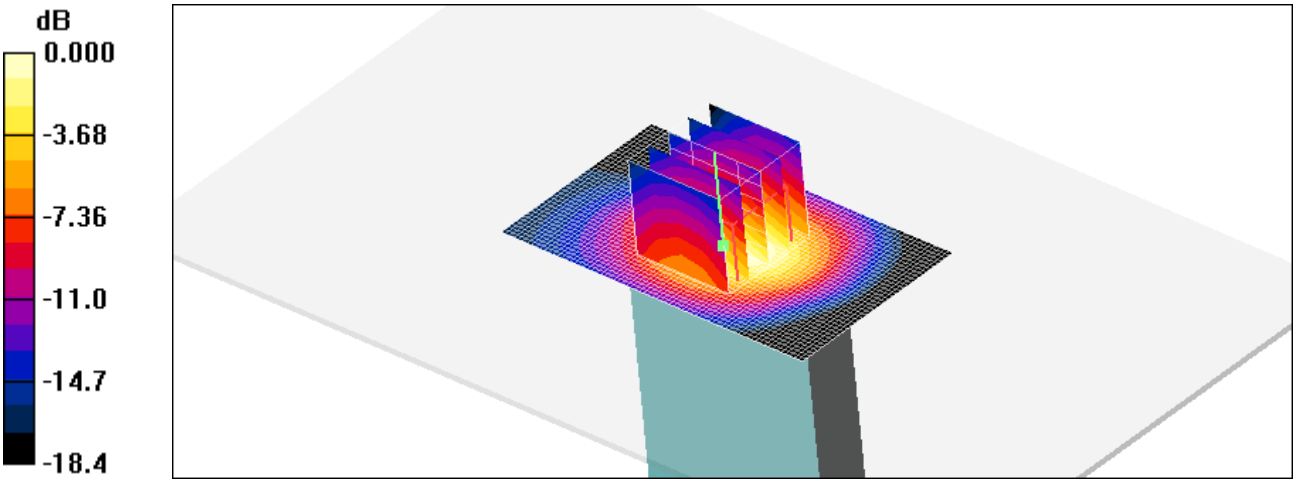
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 4 Bottom side 20MHz 1RB 0 offset QPSK 20050/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.08 mW/g

LTE Band 4 Bottom side 20MHz 1RB 0 offset QPSK 20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.6 V/m; Power Drift = 0.026 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.870 mW/g; SAR(10 g) = 0.470 mW/g
Maximum value of SAR (measured) = 0.962 mW/g



0 dB = 0.962mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 3, 2012
Separation Distance:	1.0 cm

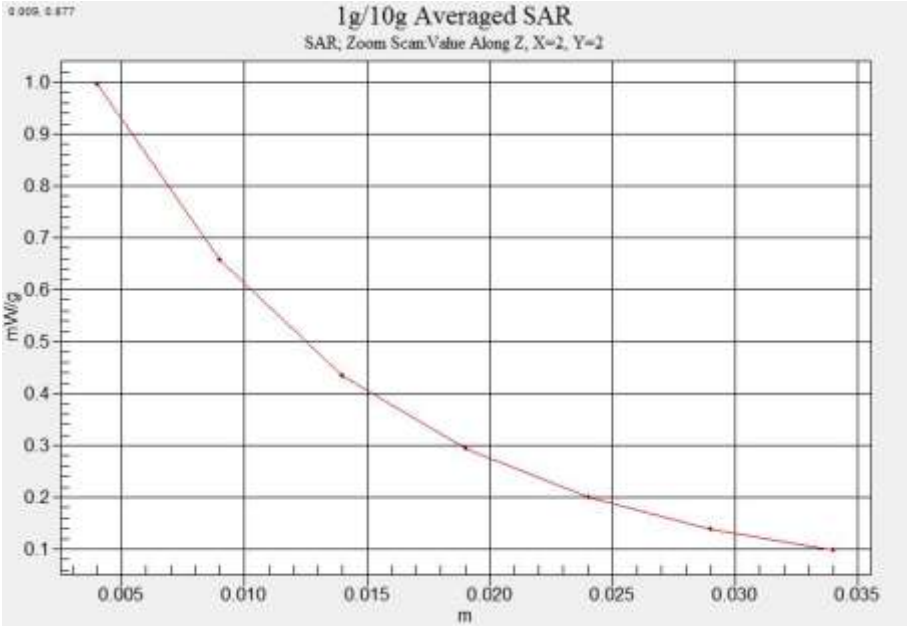
DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: CDMA 835MHz FCC; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.986 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

CDMA835 EVDO Front 384/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.01 mW/g
CDMA835 EVDO Front 384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.0 V/m; Power Drift = -0.072 dB
Peak SAR (extrapolated) = 3.05 W/kg
SAR(1 g) = 0.963 mW/g; SAR(10 g) = 0.624 mW/g
Maximum value of SAR (measured) = 0.996 mW/g



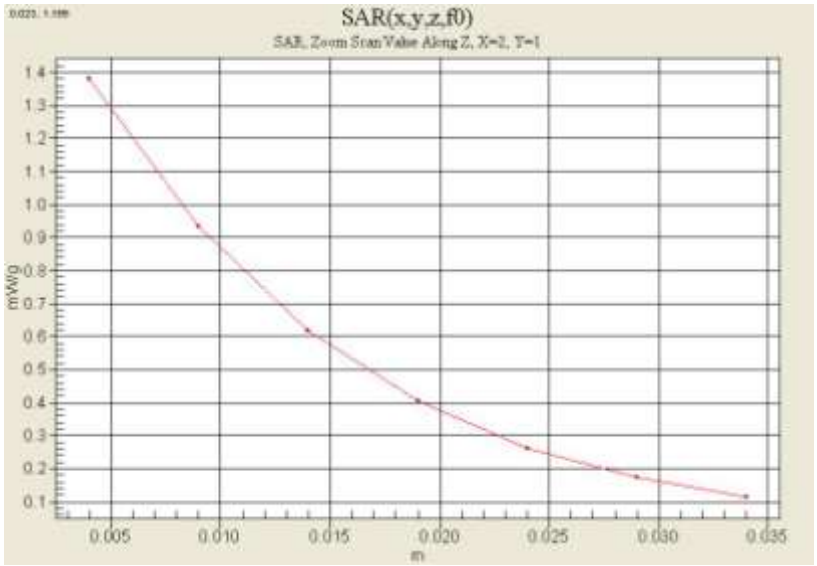
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 4, 2012
Separation Distance:	1.0 cm

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: PCS 1900; Frequency: 1851.25 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.51 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

PCS EVDO Rear 25/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.44 mW/g
PCS EVDO Rear 25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.5 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 1.84 W/kg
SAR(1 g) = 1.3 mW/g; SAR(10 g) = 0.846 mW/g
Maximum value of SAR (measured) = 1.38 mW/g
PCS EVDO Rear 25/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.5 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 1.76 W/kg
SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.708 mW/g
Maximum value of SAR (measured) = 1.21 mW/g



Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 9, 2012
Separation Distance:	1.0 cm

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 825 MHz; σ = 0.98 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM850 GPRS 2Tx Rear 128/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.45 mW/g
GSM850 GPRS 2Tx Rear 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 36.1 V/m; Power Drift = -0.085 dB
Peak SAR (extrapolated) = 1.79 W/kg
SAR(1 g) = 1.32 mW/g; SAR(10 g) = 0.916 mW/g
Maximum value of SAR (measured) = 1.39 mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1880 MHz; σ = 1.43 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

GSM1900 GPRS 2Tx Front 661/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.654 mW/g

GSM1900 GPRS 2Tx Front 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.0 V/m; Power Drift = -0.112 dB
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.593 mW/g; SAR(10 g) = 0.323 mW/g
Maximum value of SAR (measured) = 0.656 mW/g
GSM1900 GPRS 2Tx Front 661/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.0 V/m; Power Drift = -0.112 dB
Peak SAR (extrapolated) = 0.773 W/kg
SAR(1 g) = 0.511 mW/g; SAR(10 g) = 0.327 mW/g
Maximum value of SAR (measured) = 0.541 mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 09, 2012
Separation Distance:	1.0 cm

DUT: ORBIT; Type: Bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.951 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA850 Front 4183/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.725 mW/g
WCDMA850 Front 4183/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.0 V/m; Power Drift = -0.128 dB
Peak SAR (extrapolated) = 0.989 W/kg
SAR(1 g) = 0.677 mW/g; SAR(10 g) = 0.452 mW/g
Maximum value of SAR (measured) = 0.723 mW/g

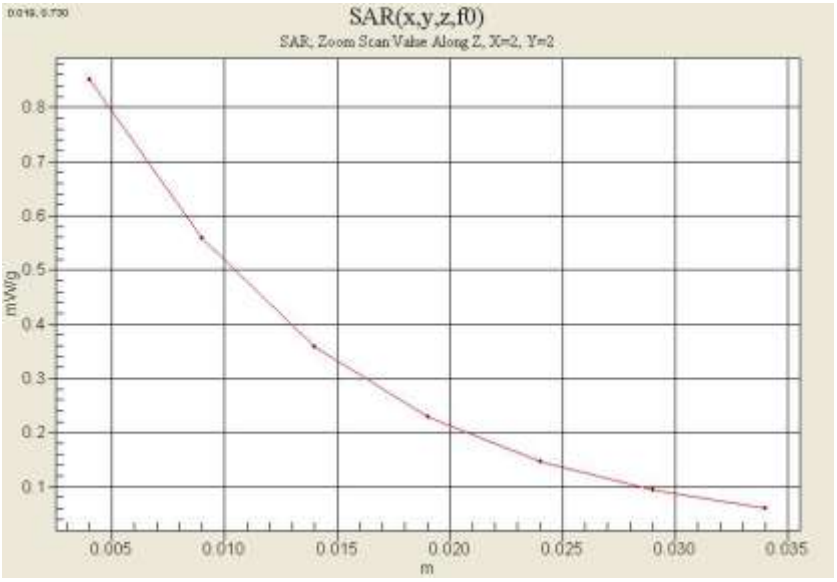
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 10, 2012
Separation Distance:	1.0 cm

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.5 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

WCDMA1900 Rear 9262/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.896 mW/g
WCDMA1900 Rear 9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.0 V/m; Power Drift = -0.066 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.799 mW/g; SAR(10 g) = 0.517 mW/g
Maximum value of SAR (measured) = 0.852 mW/g
WCDMA1900 Rear 9262/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.0 V/m; Power Drift = -0.066 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.668 mW/g; SAR(10 g) = 0.411 mW/g
Maximum value of SAR (measured) = 0.705 mW/g



Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Jun. 07, 2012
Separation Distance:	1.0 cm

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2412 MHz; σ = 1.89 mho/m; ε_r = 53.8; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: EX3DV4 - SN3863; ConvF(7, 7, 7); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

802.11b Right side 1ch 1Mbps/Area Scan (101x51x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 0.199 mW/g
802.11b Right side 1ch 1Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.13 V/m; Power Drift = 0.061 dB
Peak SAR (extrapolated) = 0.233 W/kg
SAR(1 g) = 0.074 mW/g; SAR(10 g) = 0.028 mW/g
Maximum value of SAR (measured) = 0.091 mW/g

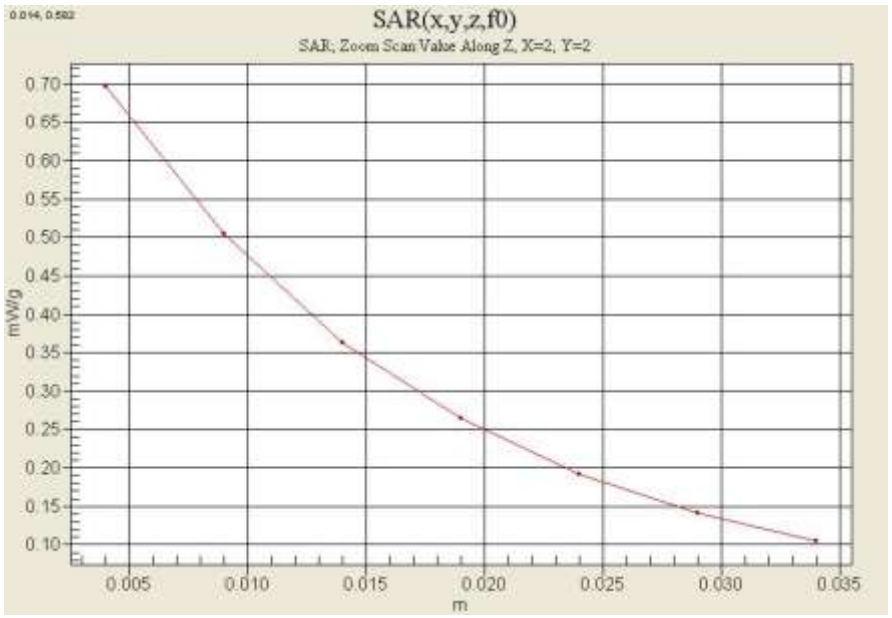
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Jun. 08, 2012
Separation Distance:	1.0 cm

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 13; Frequency: 782 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 782 MHz; σ = 1 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(9.35, 9.35, 9.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 13 10MHz QPSK Rear 23230 1RB 0 offset/Area Scan (91x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.716 mW/g
LTE Band 13 10MHz QPSK Rear 23230 1RB 0 offset/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.4 V/m; Power Drift = -0.082 dB
Peak SAR (extrapolated) = 0.898 W/kg
SAR(1 g) = 0.653 mW/g; SAR(10 g) = 0.456 mW/g
Maximum value of SAR (measured) = 0.697 mW/g



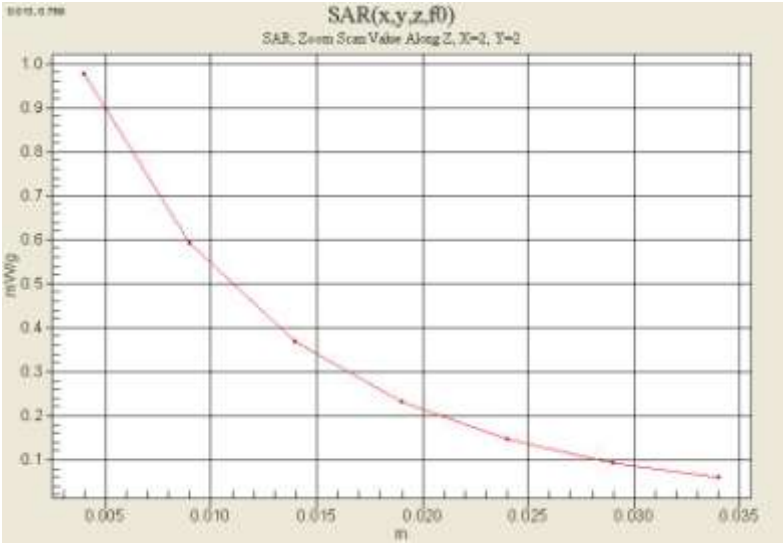
Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS CDMA,GSM, WCDMA and LTE Portable Router with WLAN
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Jun. 11, 2012
Separation Distance:	1.0 cm

DUT: MHS291LVW; Type: Bar; Serial: #1

Communication System: LTE Band 4; Frequency: 1720 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1720 MHz; σ = 1.41 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

LTE Band 4 Bottom side 20MHz 1RB 0 offset QPSK 20050/Area Scan (71x41x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.08 mW/g
LTE Band 4 Bottom side 20MHz 1RB 0 offset QPSK 20050/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.7 V/m; Power Drift = -0.051 dB
Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 0.874 mW/g; SAR(10 g) = 0.470 mW/g
Maximum value of SAR (measured) = 0.977 mW/g



Attachment 2. – Dipole Validation Plots

■ Validation Data (850 MHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.2 ℃

Test Date: Jan.03, 2013

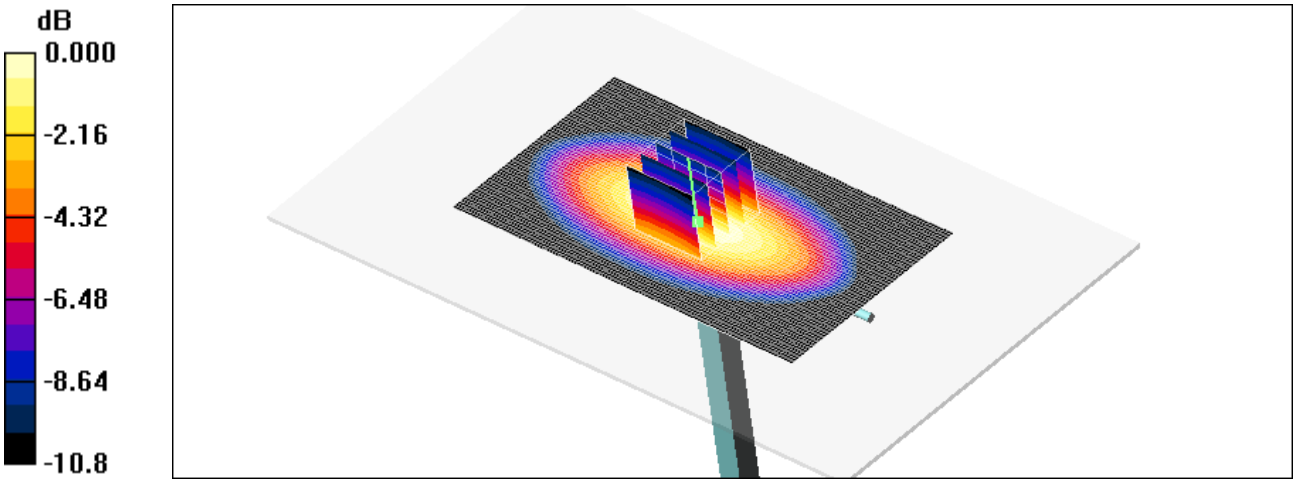
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 – SN:441

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.986 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Validation 835 MHz/Area Scan (111x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.00 mW/g

Validation 835 MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.2 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.932 mW/g; SAR(10 g) = 0.605 mW/g
Maximum value of SAR (measured) = 1.01 mW/g



0 dB = 1.01mW/g

■ Validation Data (850 MHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.2 ℃

Test Date: Jan.09, 2013

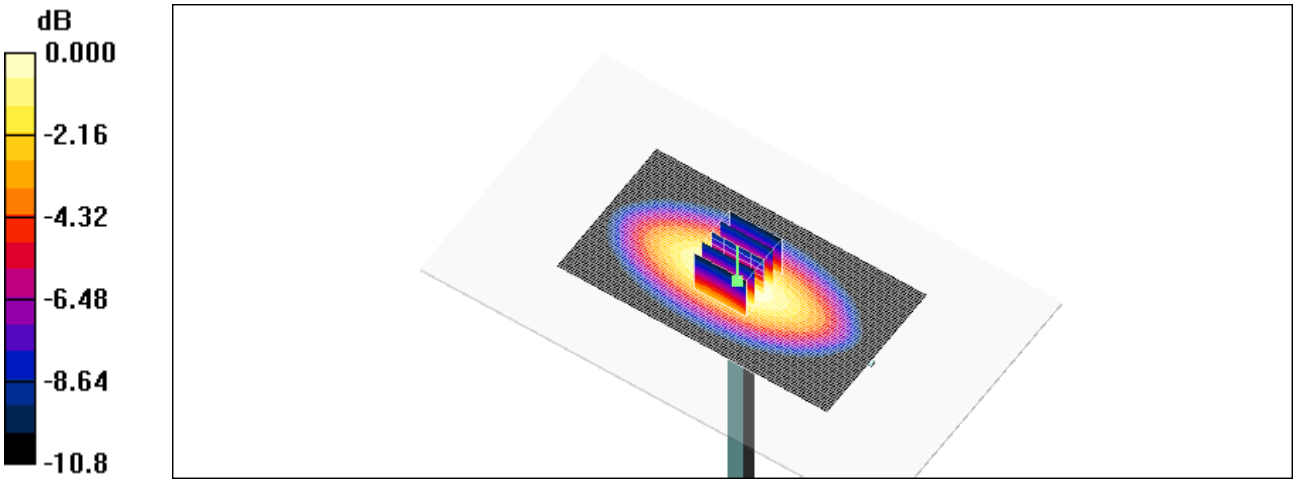
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 – SN:441

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.984 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(6.52, 6.52, 6.52); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Validation 835 MHz/Area Scan (111x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.05 mW/g

Validation 835 MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 33.7 V/m; Power Drift = -0.007 dB
Peak SAR (extrapolated) = 1.39 W/kg
SAR(1 g) = 0.961 mW/g; SAR(10 g) = 0.626 mW/g
Maximum value of SAR (measured) = 1.04 mW/g



0 dB = 1.04mW/g

■ Validation Data (1900 MHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.1 ℃

Test Date: Jan.04, 2013

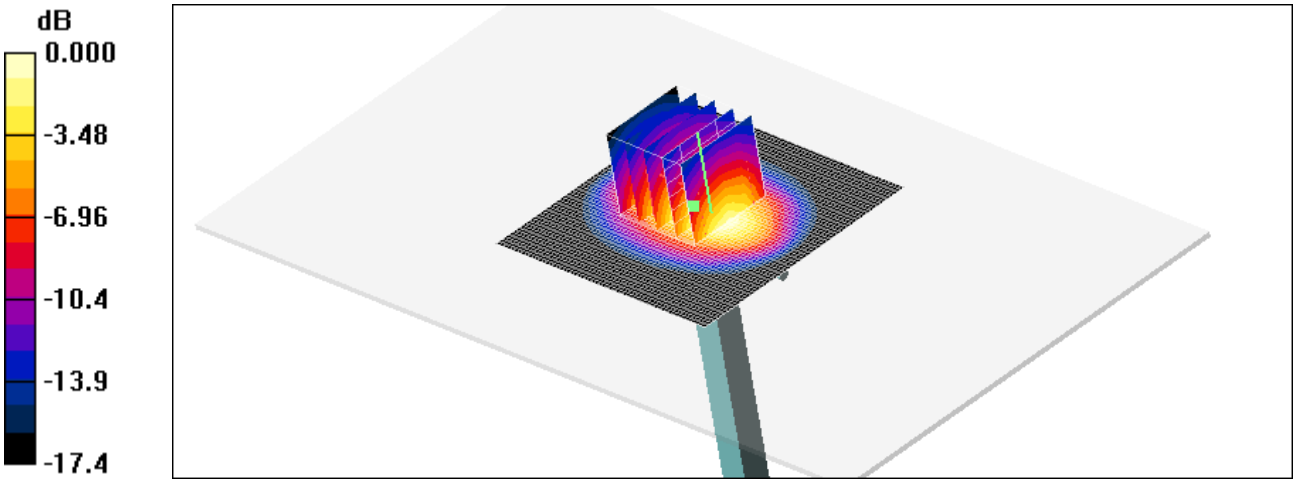
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 – SN:5d032

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.56 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

Validation1900 MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.57 mW/g

Validation1900 MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 56.1 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 6.54 W/kg
SAR(1 g) = 3.89 mW/g; SAR(10 g) = 2.1 mW/g
Maximum value of SAR (measured) = 4.30 mW/g



0 dB = 4.30mW/g

■ Validation Data (1900 MHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.1 ℃

Test Date: Jan.10, 2013

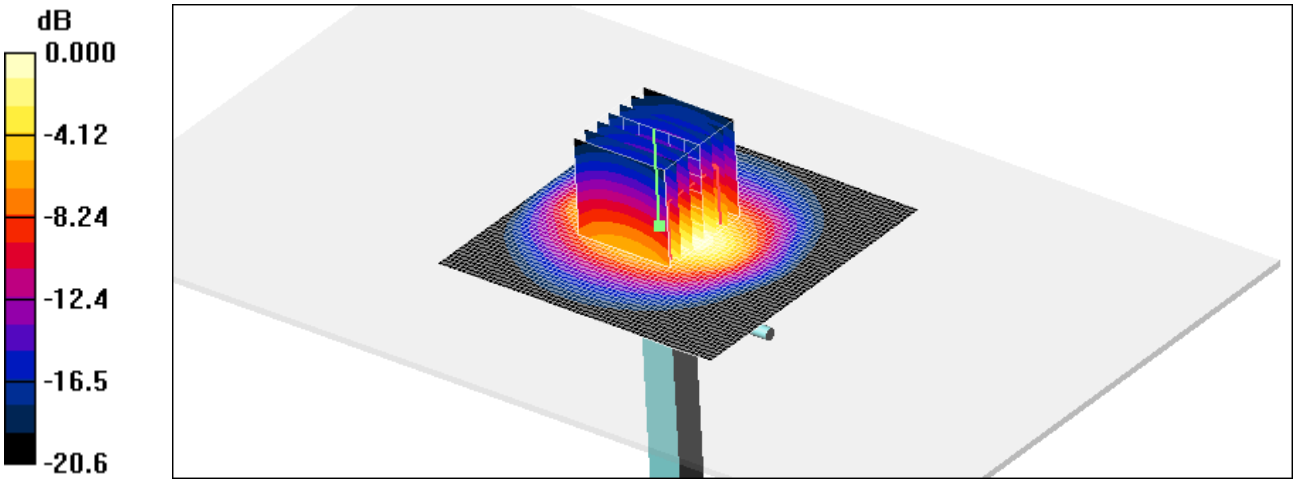
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 – SN:5d032

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.55 mho/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1605; ConvF(4.64, 4.64, 4.64); Calibrated: 2012-04-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

Validation 1900MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 5.05 mW/g

Validation 1900MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.6 V/m; Power Drift = 0.003 dB
Peak SAR (extrapolated) = 7.88 W/kg
SAR(1 g) = 3.98 mW/g; SAR(10 g) = 1.97 mW/g
Maximum value of SAR (measured) = 4.42 mW/g



0 dB = 4.42mW/g

■ Validation Data (2450 MHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.3 ℃

Test Date: Jan.07, 2013

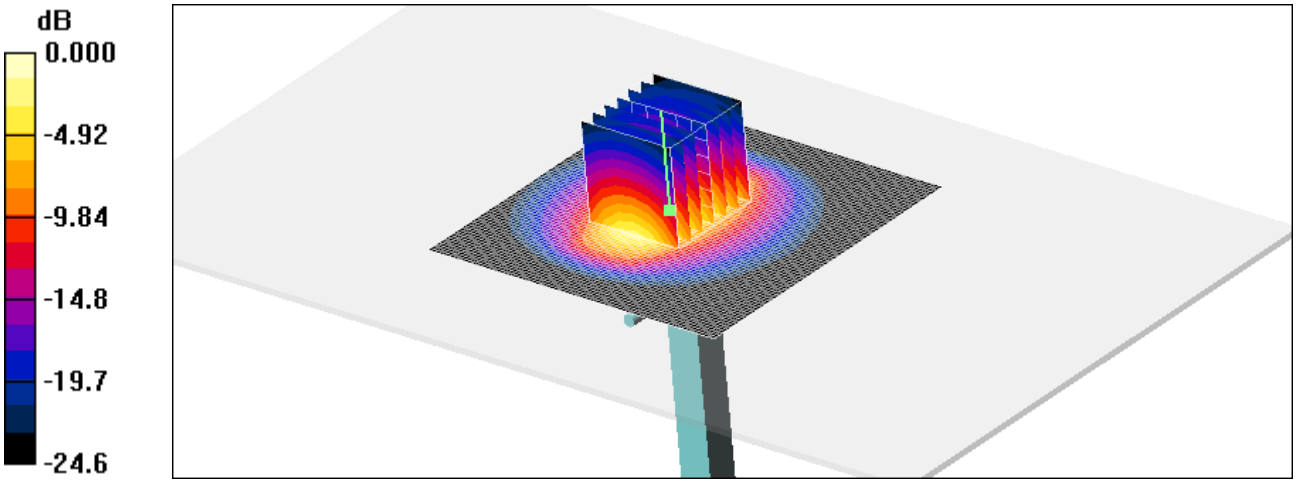
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 – SN:743

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.94 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 – SN3863; ConvF(7, 7, 7); Calibrated: 2012-07-13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Validation 2450MHz/Area Scan (81x81x1): Measurement grid: dx=12mm, dy=12mm
Maximum value of SAR (interpolated) = 8.37 mW/g

Validation 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 48.0 V/m; Power Drift = -0.084 dB
Peak SAR (extrapolated) = 11.6 W/kg
SAR(1 g) = 5.18 mW/g; SAR(10 g) = 2.3 mW/g
Maximum value of SAR (measured) = 8.22 mW/g



0 dB = 8.22mW/g

■ Validation Data (LTE 13 Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.1 ℃

Test Date: Jan.08, 2013

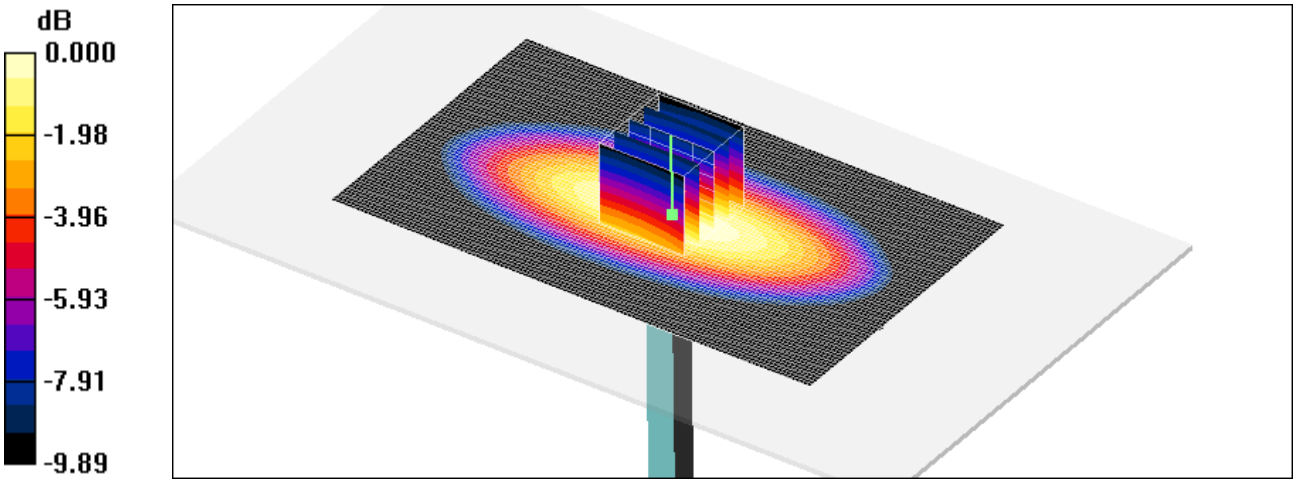
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 – SN:1014

Communication System: CW; Frequency: 750 MHz;Duty Cycle: 1:1
Medium parameters used: f = 750 MHz; σ = 0.971 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(9.35, 9.35, 9.35); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA

Validation 750 MHz/Area Scan (121x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.968 mW/g

Validation 750 MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 31.9 V/m; Power Drift = -0.033 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.898 mW/g; SAR(10 g) = 0.600 mW/g
Maximum value of SAR (measured) = 0.964 mW/g



0 dB = 0.964mW/g

■ Validation Data (LTE4 1800 MHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.2 ℃

Test Date: Jan.11, 2013

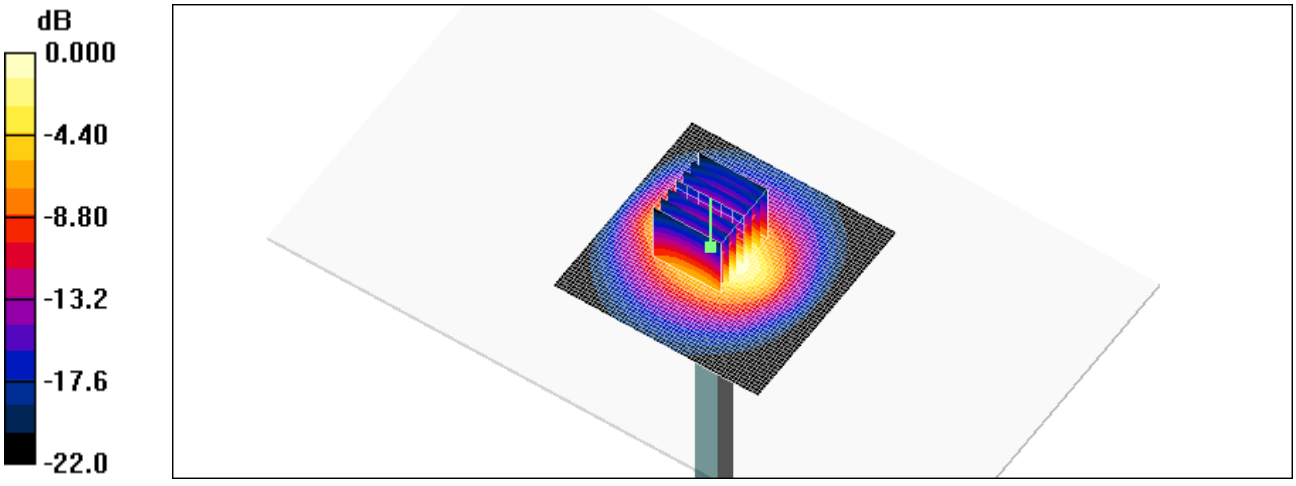
DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 – SN:2d006

Communication System: CW; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1800 MHz; σ = 1.5 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 - SN3863; ConvF(7.8, 7.8, 7.8); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

Validation 1800MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.81 mW/g

Validation 1800MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.8 V/m; Power Drift = -0.014 dB
Peak SAR (extrapolated) = 7.77 W/kg
SAR(1 g) = 3.79 mW/g; SAR(10 g) = 1.83 mW/g
Maximum value of SAR (measured) = 4.24 mW/g



0 dB = 4.24mW/g

■ Validation Data (5_8GHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.3 ℃

Test Date: Jan.07, 2013

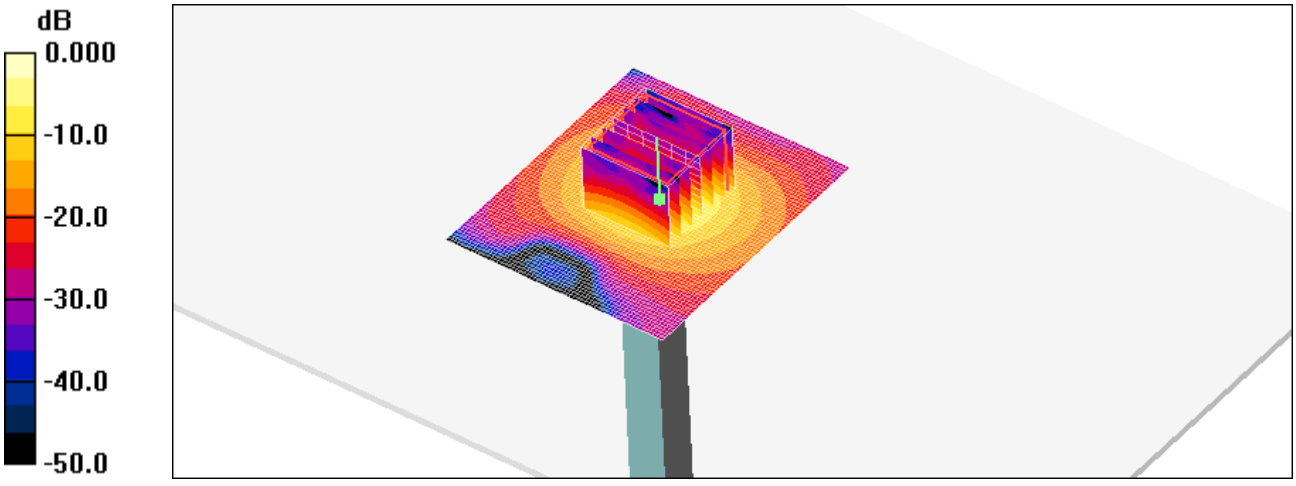
DUT: Dipole 5GHz; Type: D5000V2; Serial: D5000V2 – SN:1107

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5800 MHz; σ = 6.21 mho/m; ε_r = 46.2; ρ = 1000 kg/m^3
Phantom section: Center Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: EX3DV4 – SN3863; ConvF(3.81, 3.81, 3.81); Calibrated: 2012-07-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2012-02-21
- Phantom: Triple Flat Phantom 5.1C_20120905; Type: QD 000 P51 CA

Validation 5800MHz/Area Scan (61x71x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 8.27 mW/g

Validation 5800MHz/Zoom Scan (7x7x11)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 35.3 V/m; Power Drift = 0.085 dB
Peak SAR (extrapolated) = 32.1 W/kg
SAR(1 g) = 7.5 mW/g; SAR(10 g) = 2.13 mW/g
Maximum value of SAR (measured) = 15.7 mW/g



0 dB = 15.7mW/g

■ Dielectric Parameter (835 MHz Body)

Title	MHS291LVW
SubTitle	CDMA 850(Body)
Test Date	Jan.03, 2013

Frequency	e'	e''
800000000.0000	53.3970	21.7387
805000000.0000	53.3599	21.6704
810000000.0000	53.3431	21.5617
815000000.0000	53.2858	21.5129
820000000.0000	53.2800	21.4019
825000000.0000	53.2470	21.3236
830000000.0000	53.1999	21.2510
835000000.0000	53.2004	21.2170
840000000.0000	53.1645	21.1415
845000000.0000	53.1213	21.1347
850000000.0000	53.0926	21.1498
855000000.0000	53.0549	21.1519
860000000.0000	52.9894	21.2073
865000000.0000	52.9400	21.2296
870000000.0000	52.9134	21.2808
875000000.0000	52.8504	21.3452
880000000.0000	52.8318	21.3819
885000000.0000	52.8254	21.3925
890000000.0000	52.8083	21.4279
895000000.0000	52.7932	21.3836
900000000.0000	52.7937	21.3647

■ Dielectric Parameter (835 MHz Body)

Title	MHS291LVW
SubTitle	CDMA 850(Body)
Test Date	Jan.09, 2013

Frequency	e'	e''
800000000.0000	53.3391	21.7360
805000000.0000	53.3225	21.6607
810000000.0000	53.3044	21.5639
815000000.0000	53.2538	21.5017
820000000.0000	53.2549	21.3940
825000000.0000	53.2238	21.3208
830000000.0000	53.1866	21.2447
835000000.0000	53.1572	21.1886
840000000.0000	53.1499	21.1468
845000000.0000	53.1038	21.1465
850000000.0000	53.0700	21.1473
855000000.0000	53.0233	21.1689
860000000.0000	52.9397	21.2041
865000000.0000	52.9117	21.2401
870000000.0000	52.8783	21.2725
875000000.0000	52.8131	21.3592
880000000.0000	52.7876	21.3773
885000000.0000	52.8162	21.3960
890000000.0000	52.7864	21.4258
895000000.0000	52.7686	21.3877
900000000.0000	52.7647	21.3707

■ Dielectric Parameter (1900 MHz Body)

Title	MHS291LVW
SubTitle	PCS1900(Body)
Test Date	Jan.04, 2013

Frequency	e'	e''
1850000000.0000	52.4227	14.6179
1855000000.0000	52.4158	14.6284
1860000000.0000	52.3928	14.6383
1865000000.0000	52.3889	14.6610
1870000000.0000	52.3678	14.6768
1875000000.0000	52.3713	14.6815
1880000000.0000	52.3715	14.6835
1885000000.0000	52.3656	14.6863
1890000000.0000	52.3349	14.6936
1895000000.0000	52.3176	14.7097
1900000000.0000	52.3013	14.7206
1905000000.0000	52.2981	14.7207
1910000000.0000	52.2751	14.7343
1915000000.0000	52.2699	14.7460
1920000000.0000	52.2439	14.7567
1925000000.0000	52.2288	14.7635
1930000000.0000	52.2060	14.7945
1935000000.0000	52.2110	14.8004
1940000000.0000	52.1977	14.8098
1945000000.0000	52.1723	14.8054
1950000000.0000	52.1547	14.8219

■ Dielectric Parameter (1900 MHz Body)

Title	MHS291LVW
SubTitle	PCS1900(Body)
Test Date	Jan.10, 2013

Frequency	e'	e''
1850000000.0000	52.1726	14.5515
1855000000.0000	52.1606	14.5699
1860000000.0000	52.1426	14.5892
1865000000.0000	52.1403	14.6024
1870000000.0000	52.1182	14.6123
1875000000.0000	52.1182	14.6150
1880000000.0000	52.1058	14.6197
1885000000.0000	52.0898	14.6380
1890000000.0000	52.0784	14.6260
1895000000.0000	52.0588	14.6381
1900000000.0000	52.0433	14.6526
1905000000.0000	52.0407	14.6646
1910000000.0000	52.0098	14.6623
1915000000.0000	52.0079	14.6820
1920000000.0000	51.9776	14.6875
1925000000.0000	51.9745	14.7055
1930000000.0000	51.9519	14.7208
1935000000.0000	51.9433	14.7234
1940000000.0000	51.9264	14.7308
1945000000.0000	51.8999	14.7529
1950000000.0000	51.8998	14.7600

■ Dielectric Parameter (2450 MHz Body)

Title	MHS291LVW
SubTitle	2450(Body)
Test Date	Jan.07, 2013

Frequency	e'	e''
2400000000.0000	53.8154	14.0506
2405000000.0000	53.8193	14.0790
2410000000.0000	53.7970	14.0872
2415000000.0000	53.7801	14.1081
2420000000.0000	53.7385	14.1188
2425000000.0000	53.7410	14.1417
2430000000.0000	53.7311	14.1697
2435000000.0000	53.7053	14.1797
2440000000.0000	53.6713	14.1773
2445000000.0000	53.6443	14.2209
2450000000.0000	53.6297	14.2558
2455000000.0000	53.6274	14.2586
2460000000.0000	53.5900	14.2935
2465000000.0000	53.5620	14.3000
2470000000.0000	53.5430	14.3419
2475000000.0000	53.5381	14.3648
2480000000.0000	53.5173	14.4018
2485000000.0000	53.5151	14.4173
2490000000.0000	53.4866	14.4336
2495000000.0000	53.4761	14.4770
2500000000.0000	53.4567	14.4850

■ Dielectric Parameter (LTE13 Body)

Title	MHS291LVW
SubTitle	LTE13 (Body)
Test Date	Jan.08, 2013

Frequency	e'	e''
700000000.0000	55.4190	23.7236
705000000.0000	55.3182	23.6592
710000000.0000	55.2550	23.6092
715000000.0000	55.1350	23.5341
720000000.0000	55.0649	23.5316
725000000.0000	55.0077	23.5066
730000000.0000	54.9615	23.4537
735000000.0000	54.8815	23.3694
740000000.0000	54.8172	23.3482
745000000.0000	54.7251	23.3123
750000000.0000	54.6438	23.2675
755000000.0000	54.5838	23.2463
760000000.0000	54.4713	23.2251
765000000.0000	54.4691	23.1021
770000000.0000	54.3755	23.0761
775000000.0000	54.2660	23.0678
780000000.0000	54.2295	22.9766
785000000.0000	54.2017	22.9766
790000000.0000	54.1469	22.9626
795000000.0000	54.0234	22.8803
800000000.0000	53.9739	22.8080

■ Dielectric Parameter (LTE4 1800 MHz Body)

Title	MHS291LVW
SubTitle	LTE4 (Body)
Test Date	Jan.11, 2013

Frequency	e'	e''
1700000000.0000	55.0757	14.7596
1710000000.0000	55.0614	14.7973
1720000000.0000	54.9733	14.7767
1730000000.0000	54.9215	14.8052
1740000000.0000	54.8960	14.8002
1750000000.0000	54.8725	14.8391
1760000000.0000	54.8095	14.8257
1770000000.0000	54.7988	14.8914
1780000000.0000	54.7948	14.9362
1790000000.0000	54.7699	14.9845
1800000000.0000	54.7239	15.0065
1810000000.0000	54.6853	15.0261
1820000000.0000	54.6745	15.0699
1830000000.0000	54.6080	15.0666
1840000000.0000	54.5770	15.0917
1850000000.0000	54.5483	15.0888
1860000000.0000	54.5212	15.0734
1870000000.0000	54.4899	15.0961
1880000000.0000	54.4252	15.1692
1890000000.0000	54.4071	15.2214
1900000000.0000	54.3946	15.2612
1910000000.0000	54.3727	15.3402
1920000000.0000	54.3473	15.3815
1930000000.0000	54.3232	15.4219
1940000000.0000	54.2971	15.4270
1950000000.0000	54.2571	15.4198
1960000000.0000	54.2312	15.4293
1970000000.0000	54.1498	15.4377
1980000000.0000	54.1128	15.4929
1990000000.0000	54.1110	15.5249
2000000000.0000	54.0673	15.5654

Dielectric Parameter (5.8GHz Body)

Title	MHS291LVW
SubTitle	5.2GHz (Body)
Test Date	Jan.07, 2013

Frequency	e'	e''
5000000000.0000	47.9976	17.9429
5050000000.0000	48.1348	17.8185
5100000000.0000	47.7852	17.9848
5150000000.0000	47.8628	18.0328
5200000000.0000	47.4408	18.1436
5250000000.0000	47.6193	18.1193
5300000000.0000	46.9854	18.2230
5350000000.0000	47.4808	18.3497
5400000000.0000	46.6744	18.2160
5450000000.0000	47.1648	18.7671
5500000000.0000	46.5033	18.3862
5550000000.0000	46.7306	19.0675
5600000000.0000	46.4601	18.6818
5650000000.0000	46.3926	19.2846
5700000000.0000	46.2717	18.9600
5750000000.0000	46.0300	19.5803
5800000000.0000	46.1763	19.2460
5850000000.0000	45.6963	19.6806
5900000000.0000	46.1220	19.6202
5950000000.0000	45.4071	19.7372
6000000000.0000	45.9656	19.9711

Attachment 3. – Probe Calibration Data

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

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Accreditation No.: SCS 108

Client HCT (Dymstec) Certificate No: ET3-1605_Apr12

CALIBRATION CERTIFICATE

Object ET3DV6 - SN:1605

Calibration procedure(s) QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: April 26, 2012

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	10-Jan-12 (No. DAE4-660_Jan12)	Jan-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 26, 2012

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

Certificate No: ET3-1605_Apr12 Page 1 of 11

Calibration Laboratory of
Schmid & Partner
Engineering AG
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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z, VRx,y,z: A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ET3DV6

SN:1605

Manufactured: July 27, 2001
Calibrated: April 26, 2012

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1605

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	1.60	1.96	1.67	± 10.1 %
DCP (mV)[B]	98.4	97.0	98.0	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[C] (k=2)
0	CW	0.00	X	0.00	0.00	1.00	166.8	±3.0 %
			Y	0.00	0.00	1.00	149.9	
			Z	0.00	0.00	1.00	177.8	

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[C] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1605

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	7.03	7.03	7.03	0.25	3.00	± 12.0 %
835	41.5	0.90	6.64	6.64	6.64	0.29	3.00	± 12.0 %
900	41.5	0.97	6.52	6.52	6.52	0.23	3.00	± 12.0 %
1450	40.5	1.20	5.73	5.73	5.73	0.77	2.20	± 12.0 %
1750	40.1	1.37	5.51	5.51	5.51	0.80	1.76	± 12.0 %
1900	40.0	1.40	5.26	5.26	5.26	0.80	1.91	± 12.0 %
1950	40.0	1.40	5.08	5.08	5.08	0.60	1.62	± 12.0 %
2450	39.2	1.80	4.59	4.59	4.59	0.80	2.02	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1605

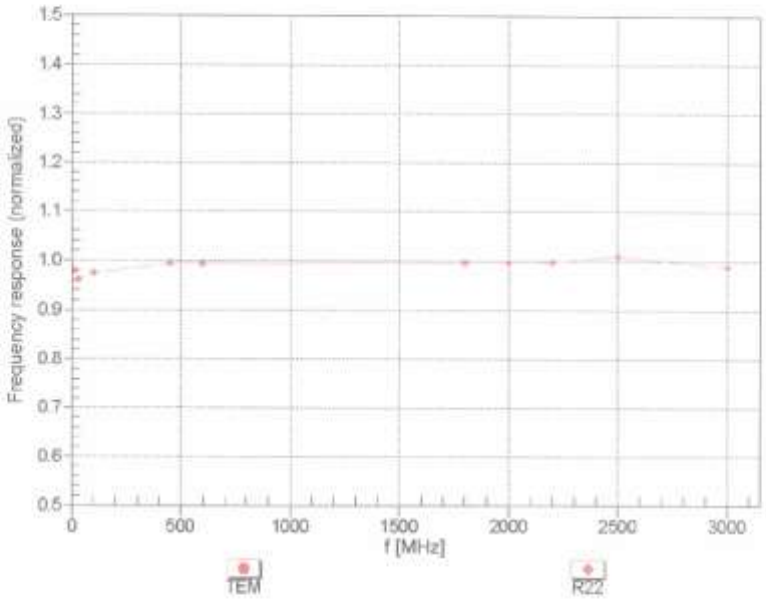
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	6.61	6.61	6.61	0.22	3.00	± 12.0 %
835	55.2	0.97	6.52	6.52	6.52	0.28	3.00	± 12.0 %
1750	53.4	1.49	4.87	4.87	4.87	0.80	2.51	± 12.0 %
1900	53.3	1.52	4.64	4.64	4.64	0.78	2.32	± 12.0 %
2450	52.7	1.95	4.07	4.07	4.07	0.78	2.18	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

ET3DV6- SN:1605 April 26, 2012

Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



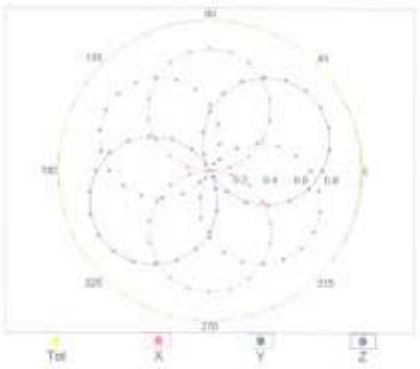
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

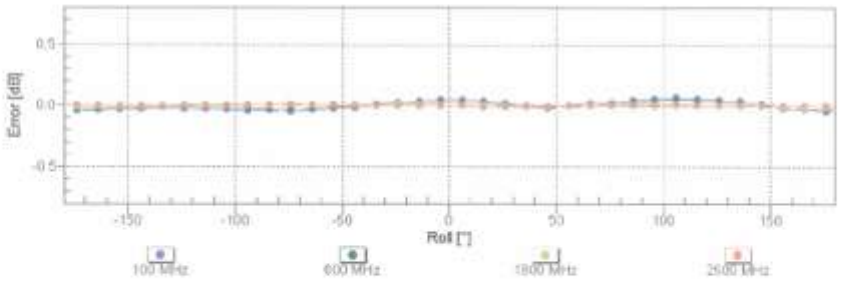
ET3DV6– SN:1605 April 20, 2012

Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM

f=1800 MHz,R22





Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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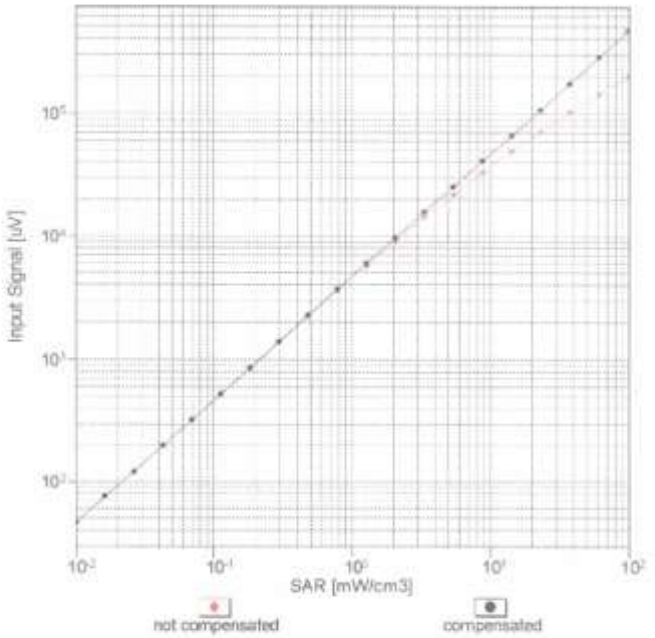
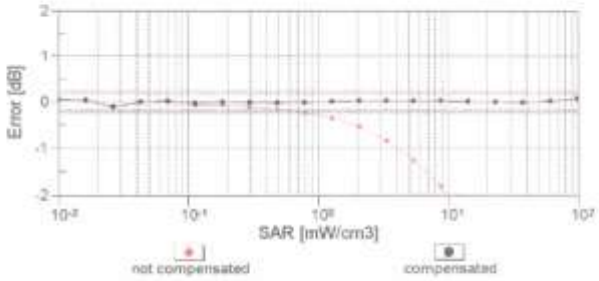
ET3DV6- SN:1605 April 26, 2012

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)



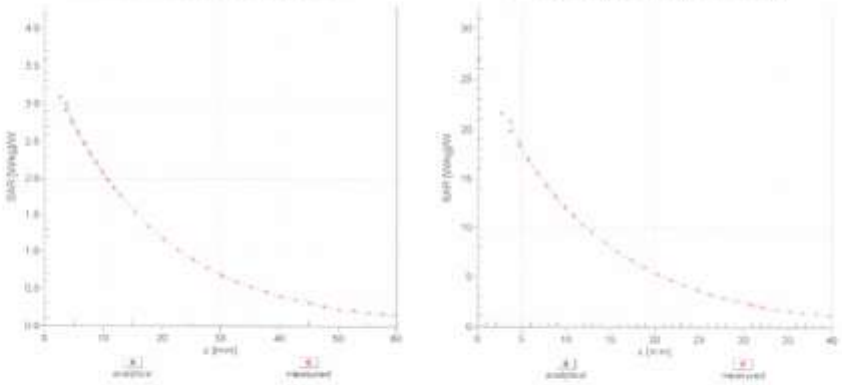


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

ET3DV6– SN:1605 April 26, 2012

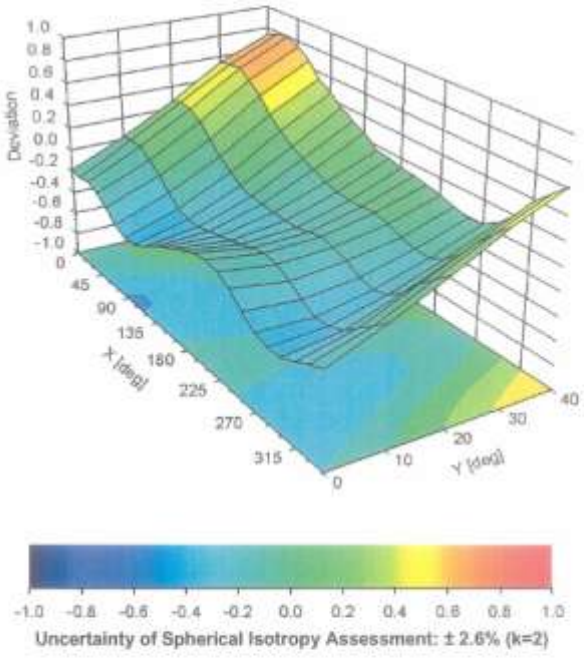
Conversion Factor Assessment

f = 900 MHz,WGLS R9 (H_convF) f = 1750 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: ET3DV6 - SN:1605

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	56
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	6.8 mm
Probe Tip to Sensor X Calibration Point	2.7 mm
Probe Tip to Sensor Y Calibration Point	2.7 mm
Probe Tip to Sensor Z Calibration Point	2.7 mm
Recommended Measurement Distance from Surface	4 mm

Calibration Laboratory of
Schmid & Partner
Engineering AG
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Accreditation No.: SCS 108

Client HCT (Dymstec) Certificate No: EX3-3863_Jul12

CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3863

Calibration procedure(s) QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: July 13, 2012

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	10-Jan-12 (No. DAE4-660_Jan12)	Jan-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 14, 2012

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

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

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z*: Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z*: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR*: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; VRx,y,z*: *A, B, C* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters*: Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe EX3DV4

SN:3863

Manufactured: February 2, 2012
Calibrated: July 13, 2012

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3863

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.36	0.36	0.45	± 10.1 %
DCP (mV)[B]	103.0	100.6	98.8	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
0	CW	0.00	X	0.00	0.00	1.00	138.3	±2.2 %
			Y	0.00	0.00	1.00	134.3	
			Z	0.00	0.00	1.00	115.9	

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

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3863

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	9.53	9.53	9.53	0.48	0.80	± 12.0 %
835	41.5	0.90	9.30	9.30	9.30	0.73	0.63	± 12.0 %
900	41.5	0.97	8.96	8.96	8.96	0.25	1.20	± 12.0 %
1750	40.1	1.37	8.46	8.46	8.46	0.10	0.50	± 12.0 %
1900	40.0	1.40	8.22	8.22	8.22	0.79	0.59	± 12.0 %
1950	40.0	1.40	7.79	7.79	7.79	0.25	1.02	± 12.0 %
2450	39.2	1.80	7.19	7.19	7.19	0.49	0.74	± 12.0 %
5200	36.0	4.66	4.96	4.96	4.96	0.40	1.80	± 13.1 %
5300	35.9	4.76	4.79	4.79	4.79	0.38	1.80	± 13.1 %
5500	35.6	4.96	4.66	4.66	4.66	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.56	4.56	4.56	0.38	1.80	± 13.1 %
5800	35.3	5.27	4.61	4.61	4.61	0.40	1.80	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3863

Calibration Parameter Determined in Body Tissue Simulating Media

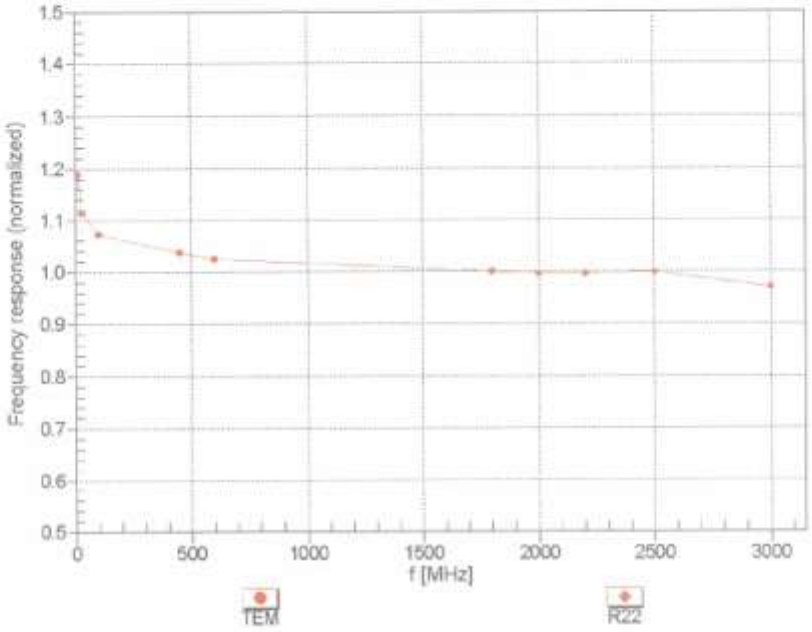
f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	9.35	9.35	9.35	0.28	1.11	± 12.0 %
835	55.2	0.97	9.25	9.25	9.25	0.37	0.91	± 12.0 %
1750	53.4	1.49	7.80	7.80	7.80	0.42	0.86	± 12.0 %
1900	53.3	1.52	7.46	7.46	7.46	0.24	1.19	± 12.0 %
2450	52.7	1.95	7.00	7.00	7.00	0.80	0.50	± 12.0 %
5200	49.0	5.30	4.35	4.35	4.35	0.45	1.90	± 13.1 %
5300	48.9	5.42	4.10	4.10	4.10	0.48	1.90	± 13.1 %
5500	48.6	5.65	3.91	3.91	3.91	0.50	1.90	± 13.1 %
5600	48.5	5.77	3.66	3.66	3.66	0.55	1.90	± 13.1 %
5800	48.2	6.00	3.81	3.81	3.81	0.58	1.90	± 13.1 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

EX3DV4– SN:3863 July 13, 2012

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)



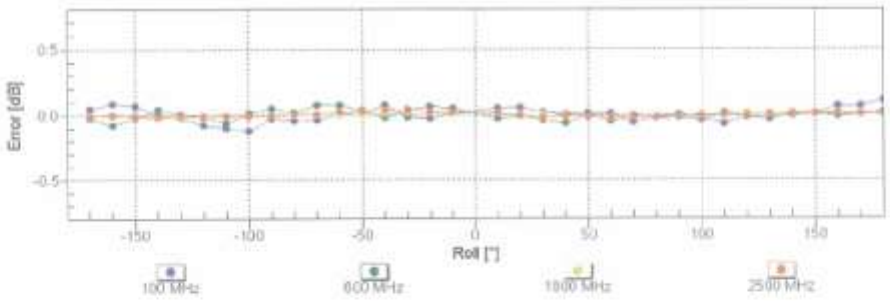
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

EX3DV4– SN:3863 July 13, 2012

Receiving Pattern (ϕ), ϑ = 0°

f=600 MHz,TEM

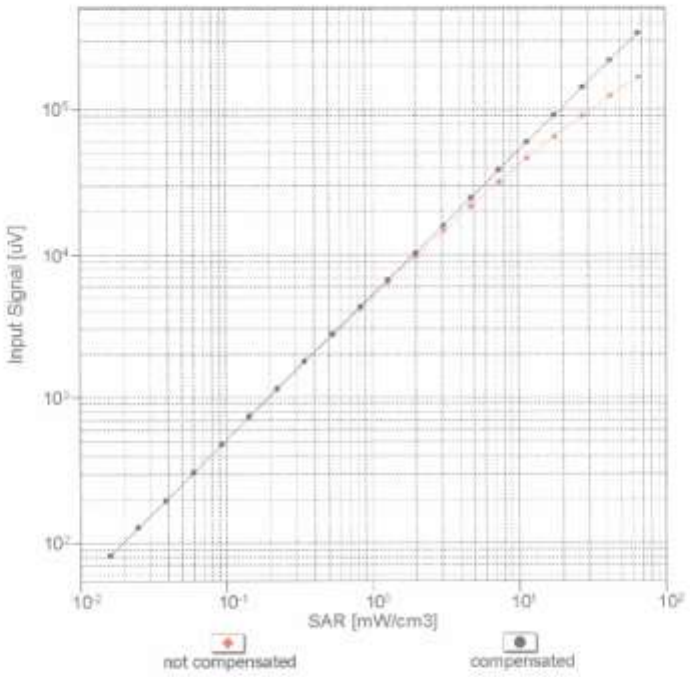
f=1800 MHz,R22

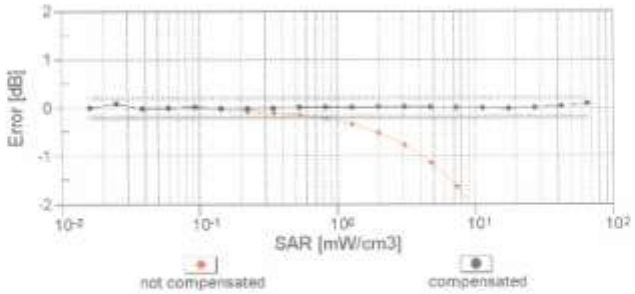


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

EX3DV4– SN:3863 July 13, 2012

Dynamic Range f(SAR_{head})
(TEM cell , f = 900 MHz)



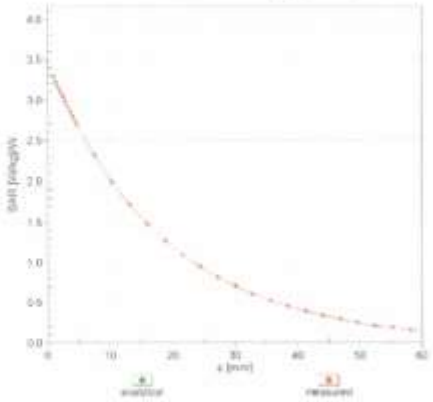


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

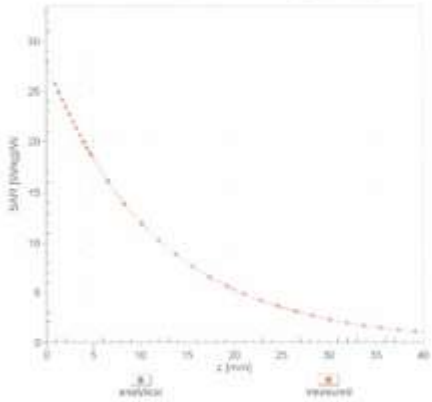
EX3DV4- SN:3863 July 13, 2012

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

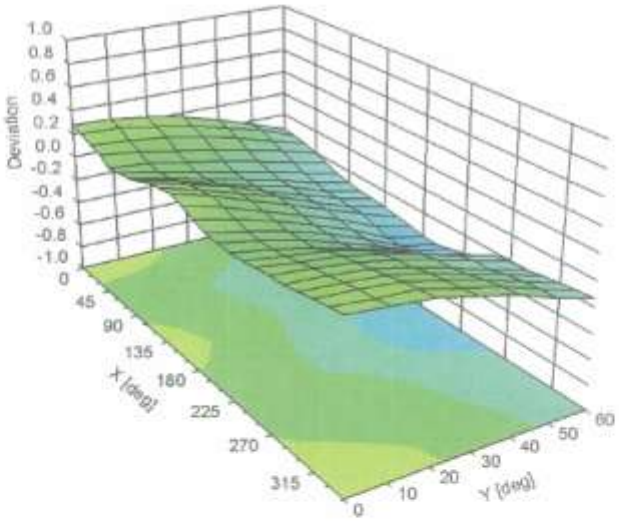


f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3863

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	110
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

Attachment 4. – Dipole Calibration Data

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Accreditation No.: SCS 108

Client HCT (Dymstec) **Certificate No: D750V3-1014_Jul12**

CALIBRATION CERTIFICATE

Object	D750V3 - SN: 1014
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	July 18, 2012

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.2 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	27-Jun-12 (No. DAE4-601_Jun12)	Jun-13

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

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

Issued: July 18, 2012

Calibration Laboratory of
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Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.8.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.4 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.10 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**8.33 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.38 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**5.49 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.4 ± 6 %	0.95 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.18 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**8.75 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.44 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**5.78 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.9 Ω + 3.3 jΩ
Return Loss	- 23.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.0 Ω + 0.8 jΩ
Return Loss	- 38.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.037 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 22, 2010

DASY5 Validation Report for Head TSL

Date: 18.07.2012

Test Laboratory: SPEAG, Zurich, Switzerland

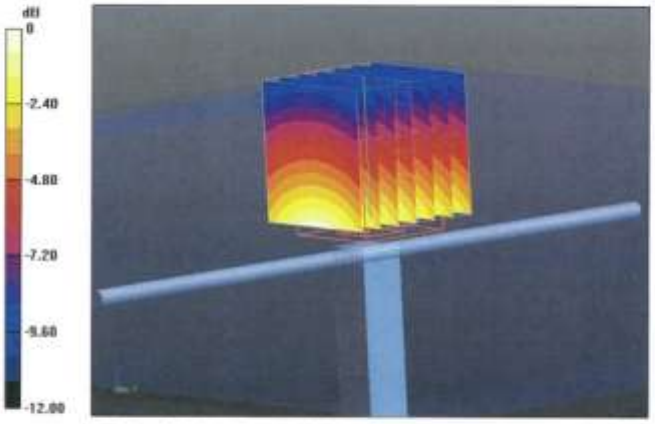
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1014

Communication System: CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.89 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

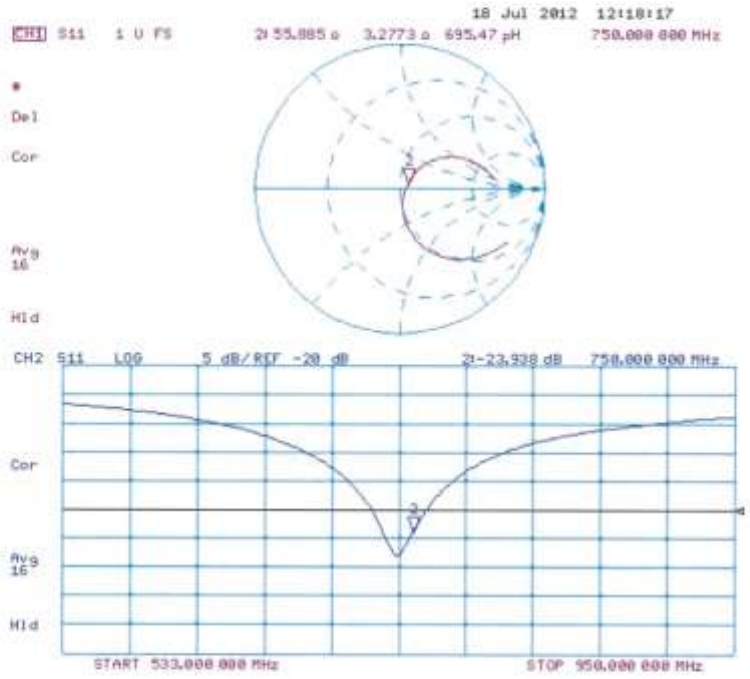
- Probe: ES3DV3 - SN3205; ConvF(6.33, 6.33, 6.33); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Head Tissue/Pin=250mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.729 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 3.190 mW/g
SAR(1 g) = 2.1 mW/g; SAR(10 g) = 1.38 mW/g
Maximum value of SAR (measured) = 2.46 mW/g



0 dB = 2.46 mW/g = 7.82 dB mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 18.07.2012

Test Laboratory: SPEAG, Zurich, Switzerland

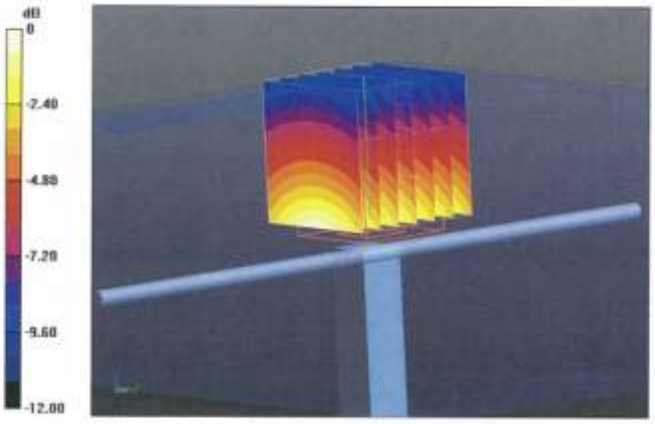
DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1014

Communication System: CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.95 mho/m; ε_r = 54.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

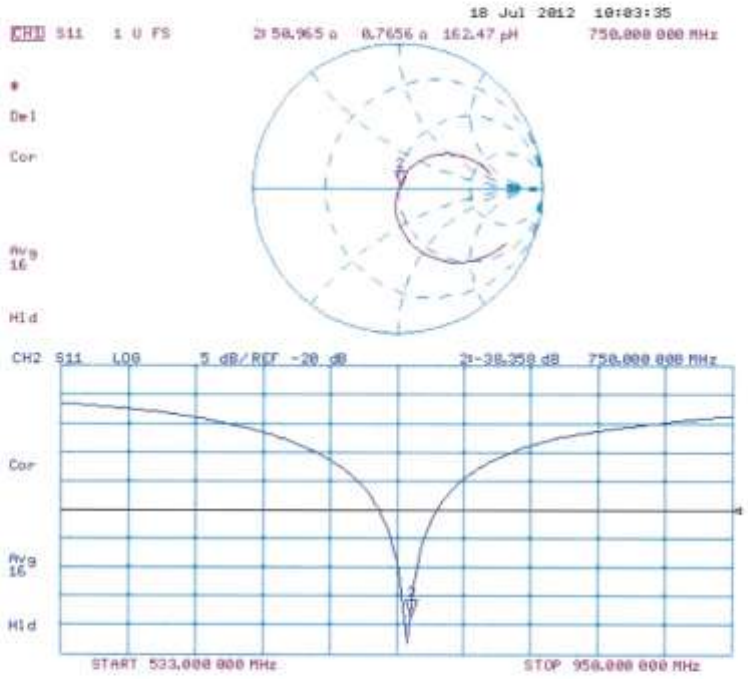
- Probe: ES3DV3 - SN3205; ConvF(6.12, 6.12, 6.12); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Body Tissue/Pin=250mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.921 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.263 mW/g
SAR(1 g) = 2.18 mW/g; SAR(10 g) = 1.44 mW/g
Maximum value of SAR (measured) = 2.55 mW/g



0 dB = 2.55 mW/g = 8.13 dB mW/g

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client HCT (Dymstec) Certificate No: D835V2-441_May12

CALIBRATION CERTIFICATE

Object D835V2 - SN: 441

Calibration procedure(s) QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: May 16, 2012

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.2 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

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

Issued: May 16, 2012

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Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.8.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.6 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.35 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**9.43 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.54 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**6.18 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.3 ± 6 %	1.00 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.44 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**9.50 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.60 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.27 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.1 Ω - 5.8 jΩ
Return Loss	- 24.6 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.0 Ω - 8.1 jΩ
Return Loss	- 21.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.372 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 09, 2001

DASY5 Validation Report for Head TSL

Date: 16.05.2012

Test Laboratory: SPEAG, Zurich, Switzerland

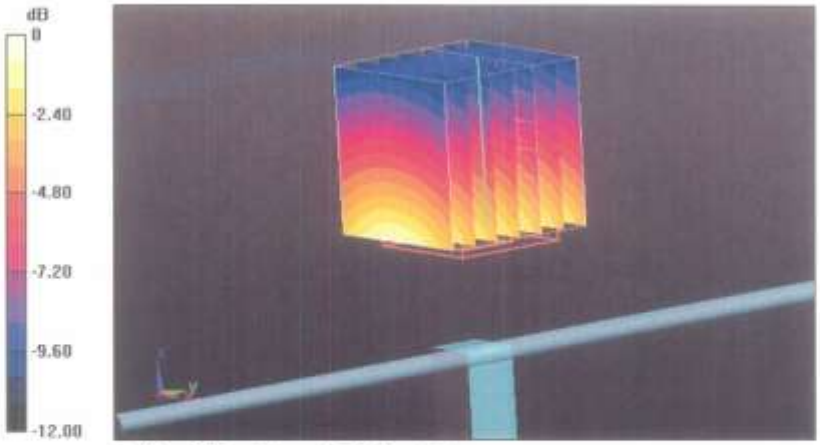
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 441

Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

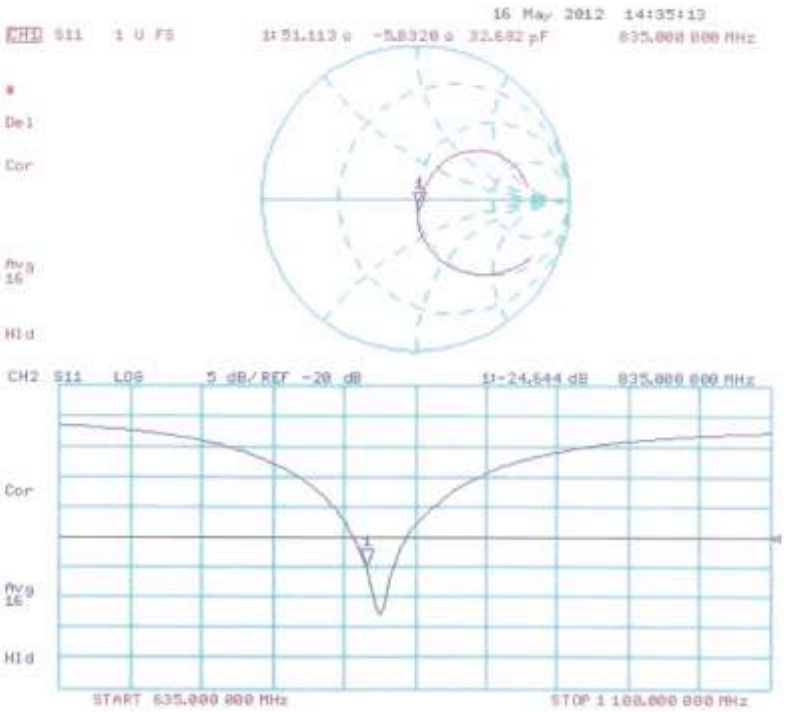
- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm 2/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.129 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 3.474 mW/g
SAR(1 g) = 2.35 mW/g; SAR(10 g) = 1.54 mW/g
Maximum value of SAR (measured) = 2.73 mW/g



0 dB = 2.73 mW/g = 8.72 dB mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 16.05.2012

Test Laboratory: SPEAG, Zurich, Switzerland

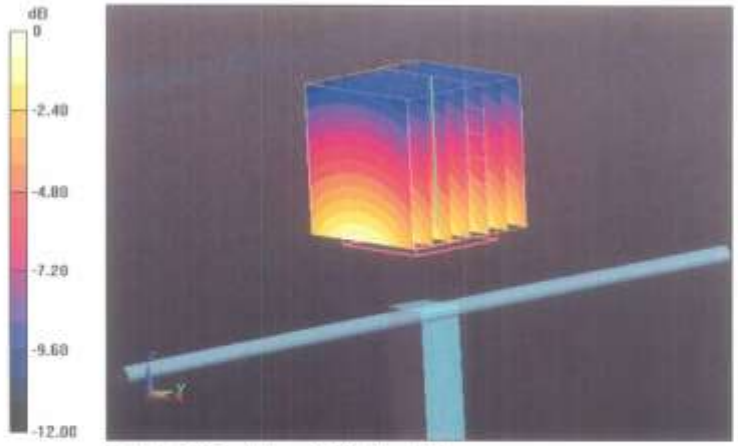
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 441

Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

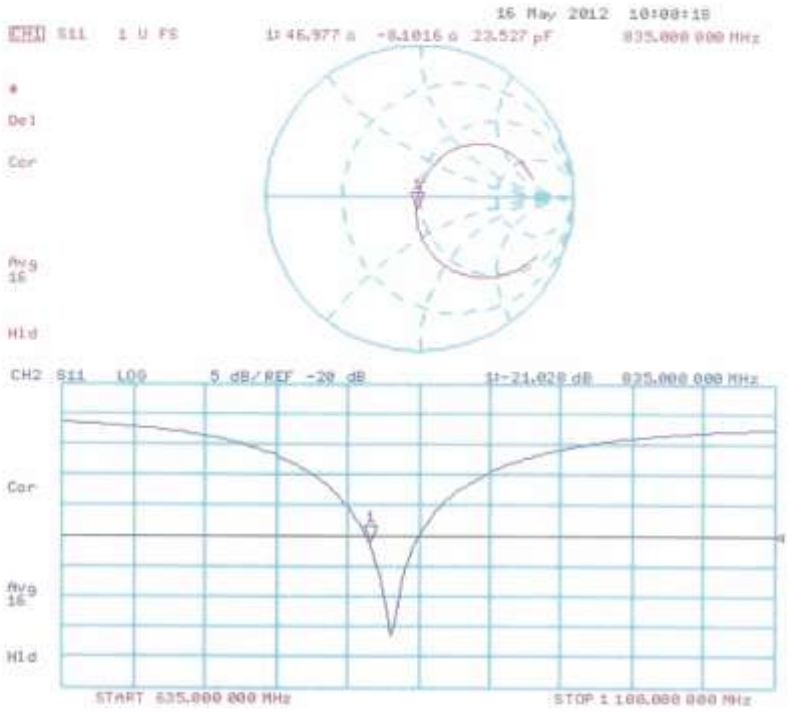
- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.054 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 3.533 mW/g
SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.6 mW/g
Maximum value of SAR (measured) = 2.82 mW/g



0 dB = 2.82 mW/g = 9.00 dB mW/g

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client HCT (Dymstec) Certificate No: D1900V2-5d032_Jul12

CALIBRATION CERTIFICATE

Object D1900V2 - SN: 5d032

Calibration procedure(s) QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: July 20, 2012

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.2 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	27-Jun-12 (No. DAE4-601_Jun12)	Jun-13

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 20, 2012

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

Certificate No: D1900V2-5d032_Jul12 Page 1 of 8

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Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.8.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.9 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.68 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**39.0 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.11 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**20.5 mW /g ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.6 ± 6 %	1.52 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	---	---

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.0 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**39.9 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.30 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.2 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.0 Ω + 3.1 jΩ
Return Loss	- 30.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.2 Ω + 3.7 jΩ
Return Loss	- 25.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.194 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 17, 2003

DASY5 Validation Report for Head TSL

Date: 20.07.2012

Test Laboratory: SPEAG, Zurich, Switzerland

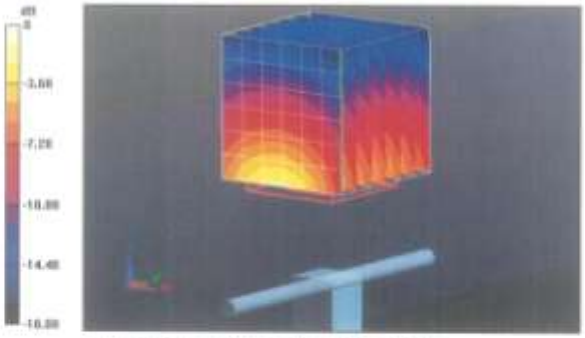
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d032

Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.38 mho/m; ε_r = 39.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

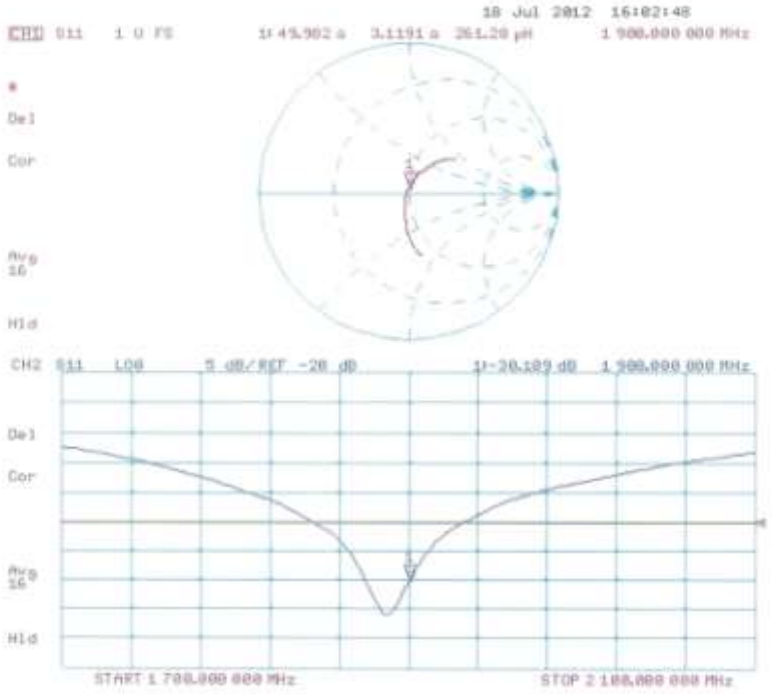
- Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.864 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 17.209 mW/g
SAR(1 g) = 9.68 mW/g; SAR(10 g) = 5.11 mW/g
Maximum value of SAR (measured) = 12.1 mW/g



0 dB = 12.1 mW/g = 21.66 dB mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 20.07.2012

Test Laboratory: SPEAG, Zurich, Switzerland

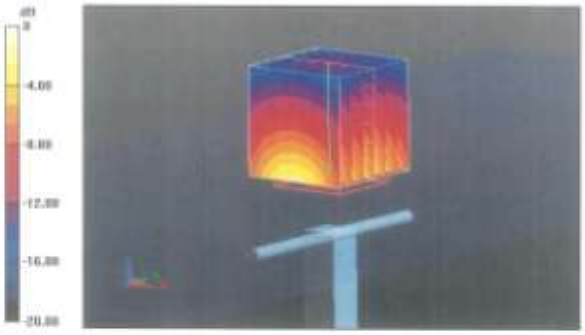
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d032

Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.52 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

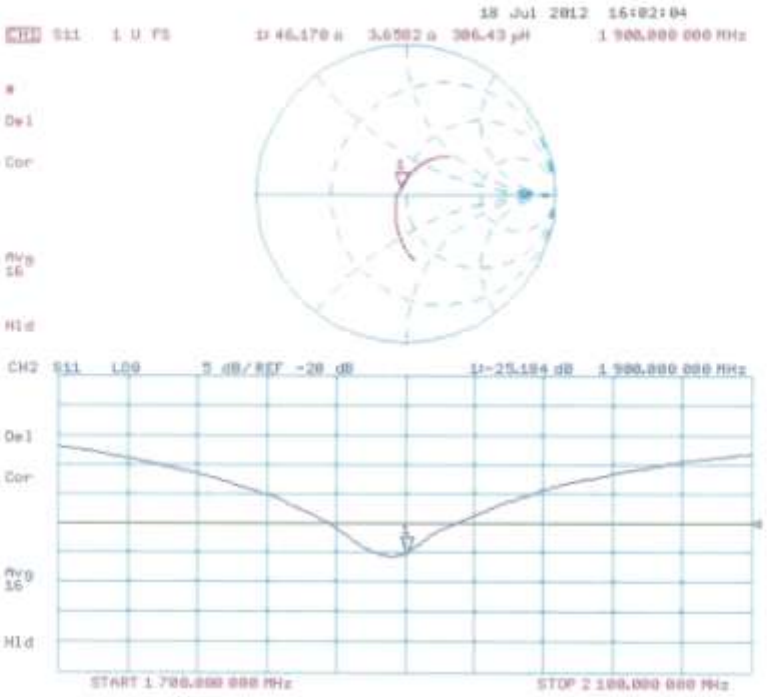
- Probe: ES3DV3 - SN3205; ConvF(4.62, 4.62, 4.62); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.470 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 17.332 mW/g
SAR(1 g) = 10 mW/g; SAR(10 g) = 5.3 mW/g
Maximum value of SAR (measured) = 12.6 mW/g



0 dB = 12.6 mW/g = 22.01 dB mW/g

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client HCT (Dymstec)

Certificate No: D1800V2-2d006_Mar12

CALIBRATION CERTIFICATE

Object D1800V2 - SN: 2d006

Calibration procedure(s) QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: March 15, 2012

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5086 (20g)	29-Mar-11 (No. 217-01368)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

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

Issued: March 16, 2012

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

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Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.8.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1800 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.5 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.24 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**37.4 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.89 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**19.7 mW /g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	46.9 Ω - 7.5 jΩ
Return Loss	- 21.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.209 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 23, 2001

DASY5 Validation Report for Head TSL

Date: 15.03.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 2d006

Communication System: CW; Frequency: 1800 MHz
Medium parameters used: f = 1800 MHz; σ = 1.38 mho/m; ε_r = 40.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

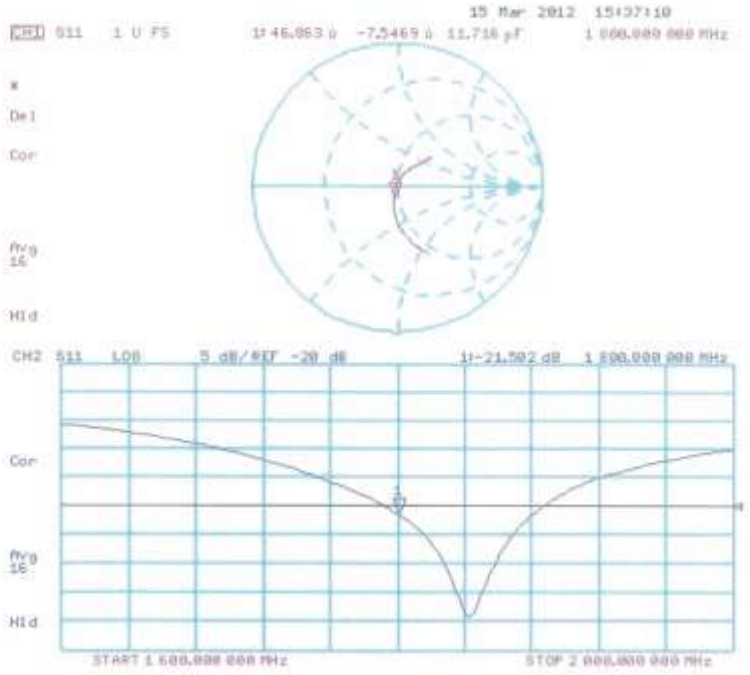
DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.07, 5.07, 5.07); Calibrated: 30.12.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.270 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 16.3460
SAR(1 g) = 9.24 mW/g; SAR(10 g) = 4.89 mW/g
Maximum value of SAR (measured) = 11.318 mW/g

0 dB = 11.320mW/g = 21.08 dB mW/g

Impedance Measurement Plot for Head TSL



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Accreditation No.: SCS 108

Client HCT (Dymstec)

Certificate No: D5GHzV2-1107_Aug12

CALIBRATION CERTIFICATE

Object	D5GHzV2 - SN: 1107
Calibration procedure(s)	QA CAL-22.v1 Calibration procedure for dipole validation kits between 3-6 GHz
Calibration date:	August 20, 2012

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.2 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe EX3DV4	SN: 3503	30-Dec-11 (No. EX3-3503_Dec11)	Dec-12
DAE4	SN: 601	27-Jun-12 (No. DAE4-601_Jun12)	Jun-13

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

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

Issued: August 21, 2012

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

Certificate No: D5GHzV2-1107_Aug12 Page 1 of 13

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Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEC 62209-2, "Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation, and Procedures"; Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for including accessories and multiple transmitters", March 2010

b) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

c) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.8.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 1.4 mm	Graded Ratio = 1.4 (Z direction)
Frequency	5200 MHz ± 1 MHz 5500 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.2 ± 6 %	4.49 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	---	---

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.93 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**78.9 mW /g ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.28 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**22.6 mW /g ± 19.5 % (k=2)**

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.8 ± 6 %	4.77 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	---	---

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	8.27 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**82.2 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.35 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**23.3 mW / g ± 19.5 % (k=2)**

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.4 ± 6 %	5.08 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	---	---

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	100 mW input power	7.81 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**77.6 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.22 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**22.0 mW / g ± 19.5 % (k=2)**

Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.1 ± 6 %	5.42 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.64 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**75.8 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.15 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.3 mW / g ± 19.5 % (k=2)**

Body TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.6	5.65 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.6 ± 6 %	5.79 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL at 5500 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.91 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**78.5 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.21 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.9 mW / g ± 19.5 % (k=2)**

Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.1 ± 6 %	6.20 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	---	---

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	100 mW input power	7.52 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**74.6 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.09 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**20.7 mW / g ± 19.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	46.8 Ω - 9.8 jΩ
Return Loss	- 20.0 dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	50.8 Ω - 5.0 jΩ
Return Loss	- 26.0 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	54.3 Ω - 6.0 jΩ
Return Loss	- 23.0 dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	49.0 Ω - 9.1 jΩ
Return Loss	- 20.7 dB

Antenna Parameters with Body TSL at 5500 MHz

Impedance, transformed to feed point	51.7 Ω - 4.2 jΩ
Return Loss	- 27.0 dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	55.9 Ω - 5.2 jΩ
Return Loss	- 22.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.195 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 11, 2011

DASY5 Validation Report for Head TSL

Date: 20.08.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1107

Communication System: CW; Frequency: 5200 MHz, Frequency: 5500 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 4.49 mho/m; ε_r = 35.2; ρ = 1000 kg/m^3 , Medium parameters used: f = 5500 MHz; σ = 4.77 mho/m; ε_r = 34.8; ρ = 1000 kg/m^3 , Medium parameters used: f = 5800 MHz; σ = 5.08 mho/m; ε_r = 34.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

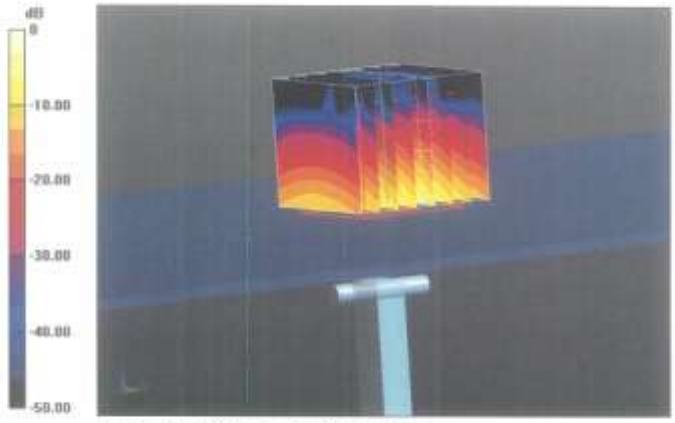
DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.41, 5.41, 5.41); Calibrated: 30.12.2011, ConvF(4.91, 4.91, 4.91); Calibrated: 30.12.2011, ConvF(4.81, 4.81, 4.81); Calibrated: 30.12.2011;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.687 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 29.009 mW/g
SAR(1 g) = 7.93 mW/g; SAR(10 g) = 2.28 mW/g
Maximum value of SAR (measured) = 18.3 W/kg

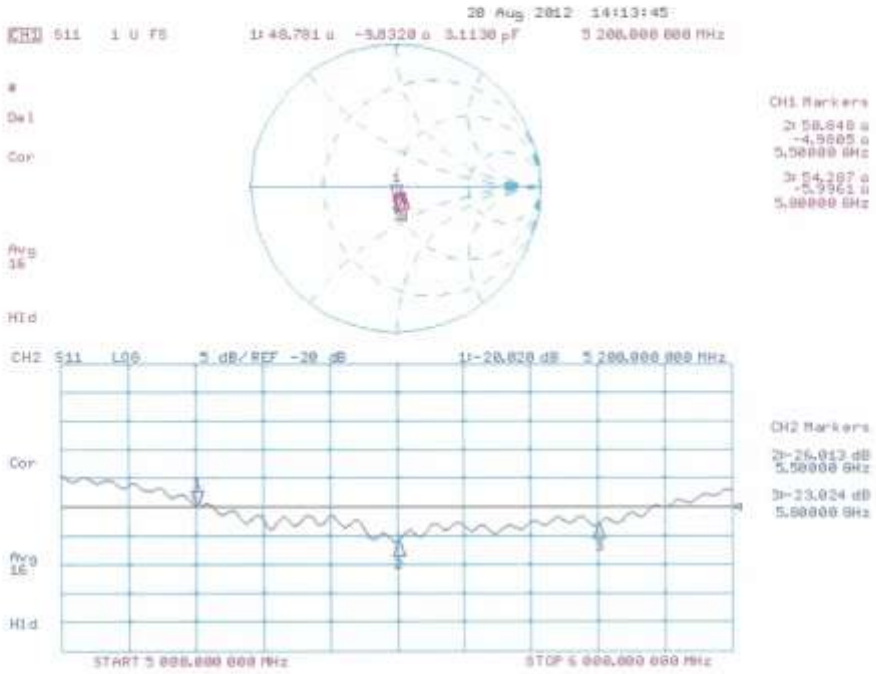
Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.108 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 32.253 mW/g
SAR(1 g) = 8.27 mW/g; SAR(10 g) = 2.35 mW/g
Maximum value of SAR (measured) = 19.5 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 60.743 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 32.139 mW/g
SAR(1 g) = 7.81 mW/g; SAR(10 g) = 2.22 mW/g
Maximum value of SAR (measured) = 19.0 W/kg



0 dB = 19.0 W/kg = 25.58 dB W/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 20.08.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1107

Communication System: CW; Frequency: 5200 MHz, Frequency: 5500 MHz, Frequency: 5800 MHz
Medium parameters used: f = 5200 MHz; σ = 5.42 mho/m; ε_r = 47.1; ρ = 1000 kg/m^3 , Medium parameters used: f = 5500 MHz; σ = 5.79 mho/m; ε_r = 46.6; ρ = 1000 kg/m^3 , Medium parameters used: f = 5800 MHz; σ = 6.2 mho/m; ε_r = 46.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

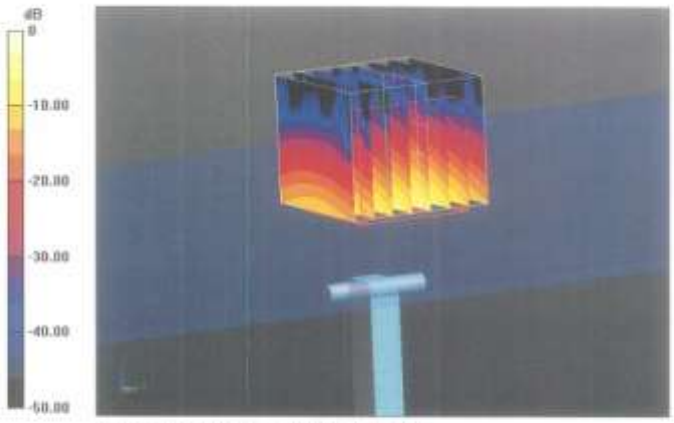
DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.91, 4.91, 4.91); Calibrated: 30.12.2011, ConvF(4.43, 4.43, 4.43); Calibrated: 30.12.2011, ConvF(4.38, 4.38, 4.38); Calibrated: 30.12.2011;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.2(969); SEMCAD X 14.6.6(6824)

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 58.635 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 29.565 mW/g
SAR(1 g) = 7.64 mW/g; SAR(10 g) = 2.15 mW/g
Maximum value of SAR (measured) = 17.9 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 58.287 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 33.410 mW/g
SAR(1 g) = 7.91 mW/g; SAR(10 g) = 2.21 mW/g
Maximum value of SAR (measured) = 19.2 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 55.000 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 34.148 mW/g
SAR(1 g) = 7.52 mW/g; SAR(10 g) = 2.09 mW/g
Maximum value of SAR (measured) = 18.6 W/kg



0 dB = 18.6 W/kg = 25.39 dB W/kg

Impedance Measurement Plot for Body TSL