SAR TEST REPORT

HCT CO., LTD

EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
FCC ID:	BEJP990H
Model:	LG-P990h
Additional Model:	P990h,LGP990h,LG-P990H,LGP990H,P990H
Date of Issue:	Apr.11, 2011
Test report No.:	HCTA1104FS02
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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 – 2005 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 C95.1-2005 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. 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 GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN GPRS Class 12and GPRS mode class B(GPRS and GSM, but not simultaneously)		
FCC ID:	BEJP990H		
Model:	LG-P990h		
Additional Model:	P990h,LGP990h,LG-P990H,LGP990H,P990H		
Trade Name	LG	Serial Number(s)	#1
Application Type	Certification		
Mode(s) of Operation	GSM850/GSM1900/ WCDMA 850/ WCDMA1900/802.11b/g/n		
Tx Frequency	824.20 - 848.80 MHz (GSM850) 1 850.20 – 1 909.80 MHz (GSM1900) 826.4~846.6 MHz (WCDMA850) 1 852.4 – 1 907.6 MHz (WCDMA1900) 2 412- 2 462 MHz (DSSS/ OFDM)		
Rx Frequency	869.20 - 893.80 MHz (GSM850) 1 930.20 – 1 989.80 MHz (GSM1900) 871.4 - 891.6 MHz (WCDMA850) 1 932.4 – 1 987.6 MHz (WCDMA1900) 2 412- 2 462 MHz (DSSS/ OFDM)		
FCC Classification	Licensed Portable Transmitter Held to Ear (PCE)		
Production Unit or Identical Prototype	Prototype		
Max SAR	0.434 W/kg GSM850 Head SAR / 0.902 W/kg GSM850 Body SAR 0.383 W/kg GSM1900 Head SAR / 0.477 W/kg GSM1900 Body SAR 0.497 W/kg WCDMA850 Head SAR / 0.847 W/kg WCDMA850 Body SAR 0.445 W/kg WCDMA1900 Head SAR / 0.688 W/kg WCDMA1900 Body SAR 0.693 W/kg Wi-Fi 802.11b Head SAR / 0.236 W/kg Wi-Fi 802.11b Body SAR		
Date(s) of Tests	Apr. 4, 2011 ~ Apr. 6, 2011		
Antenna Type	Intenna		

3. DESCRIPTION OF TEST EQUIPMENT

3.1 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.

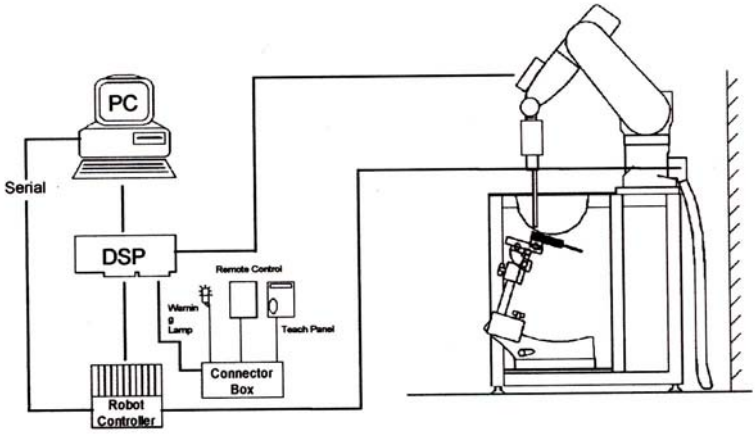


Figure 3.1 HCT SAR Lab. Test Measurement Set-up

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.

3.2 DASY4 E-FIELD PROBE SYSTEM

3.2.1 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 3.2 Photograph of the probe and the Phantom

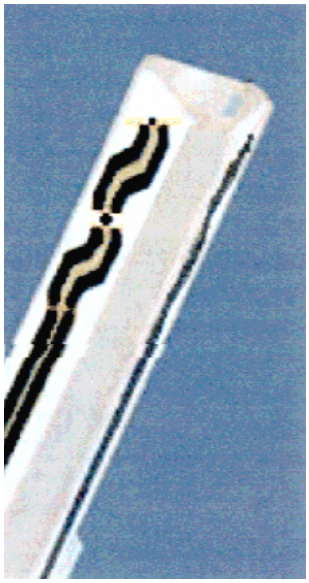


Figure 3.3 ET3DV6 E-field Probe

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.

3.3 PROBE CALIBRATION PROCESS

3.3.1 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)

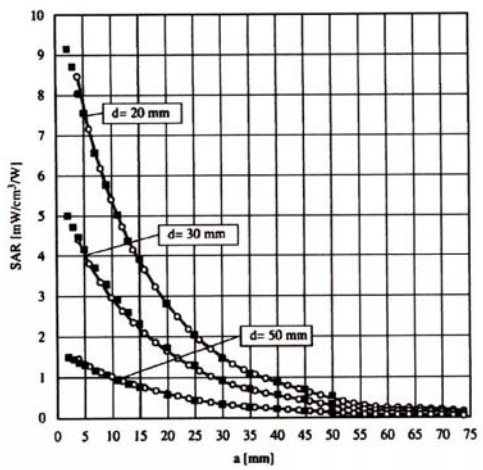


Figure 3.4 E-Field and Temperature measurements at 900 MHz

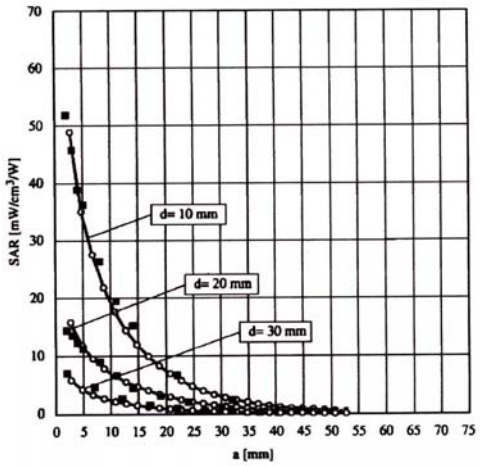


Figure 3.5 E-Field and temperature measurements at 1.8 GHz

3.3.2 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

3.4 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 3.6 SAM Phantom

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

3.5 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 3.7 Device Holder

3.6 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)									
	450		835		915		1 900		2 450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body	Head	Body
Water	38.56	51.16	41.45	52.4	41.05	56.0	54.9	40.4	62.7	73.2
Salt (NaCl)	3.95	1.49	1.45	1.4	1.35	0.76	0.18	0.5	0.5	0.04
Sugar	56.32	46.78	56.0	45.0	56.5	41.76	0.0	58.0	0.0	0.0
HEC	0.98	0.52	1.0	1.0	1.0	1.21	0.0	1.0	0.0	0.0
Bactericide	0.19	0.05	0.1	0.1	0.1	0.27	0.0	0.1	0.0	0.0
Triton X-100	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	0.0
DGBE	0.0	0.0	0.0	0.0	0.0	0.0	44.92	0.0	0.0	26.7

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 3.1 Composition of the Tissue Equivalent Matter

3.7 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	DAE4	869	Sep 18, 2010	Annual	Sep 18, 2011
SPEAG	E-Field Probe ET3DV6	1630	May 25, 2010	Annual	May 25, 2011
SPEAG	Validation Dipole D835V2	441	May 21, 2010	Annual	May 21, 2011
SPEAG	Validation Dipole D1900V2	5d032	July 16, 2010	Annual	July 16, 2011
SPEAG	Validation Dipole D2450V2	743	Aug. 25, 2010	Biennial	Aug. 27, 2012
Agilent	Power Meter(F) E4419B	MY41291386	Nov. 05, 2010	Annual	Nov. 05, 2011
Agilent	Power Sensor(G) 8481	MY41090870	Nov. 05, 2010	Annual	Nov. 05, 2011
HP	Dielectric Probe Kit 85070C	00721521	N/A	N/A	N/A
HP	Dual Directional Coupler	16072	Nov. 05, 2010	Annual	Nov. 05, 2011
R&S	Base Station CMU200	110740	July 26, 2010	Annual	July 26, 2011
Agilent	Base Station E5515C	GB44400269	Feb. 10, 2011	Annual	Feb. 10, 2012
HP	Signal Generator E4438C	MY42082646	Nov. 11, 2010	Annual	Nov. 11, 2011
HP	Network Analyzer 8753ES	JP39240221	Mar. 30, 2011	Annual	Mar. 30, 2012

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.

4. 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 head was measured at a distance of 3.9 mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 20 mm x 20 mm. Based on this data, the area of the maximum absorption was determined by spline interpolation.

3. Around this point, a volume of 32 mm x 32 mm x 30 mm was assessed by measuring 5 x 5 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.

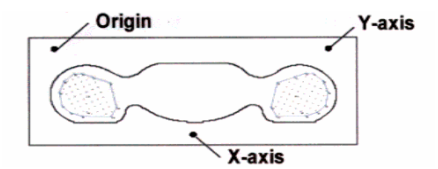


Figure 4.1 SAR Measurement Point in Area Scan

5. DESCRIPTION OF TEST POSITION

5.1 HEAD POSITION

The device was placed in a normal operating position with the Point A on the device, as illustrated in following drawing, aligned with the location of the RE(ERP) on the phantom. With the ear-piece pressed against the head, the vertical center line of the body of the handset was aligned with an imaginary plane consisting of the RE, LE and M. While maintaining these alignments, the body of the handset was gradually moved towards the cheek until any point on the mouth-piece or keypad contacted the cheek. This is a cheek/touch position. For ear/tilt position, while maintain the device aligned with the BM and FN lines, the device was pivot against ERP back for 15º or until the device antenna touch the phantom. Please refer to IEEE 1528-2003 illustration below.

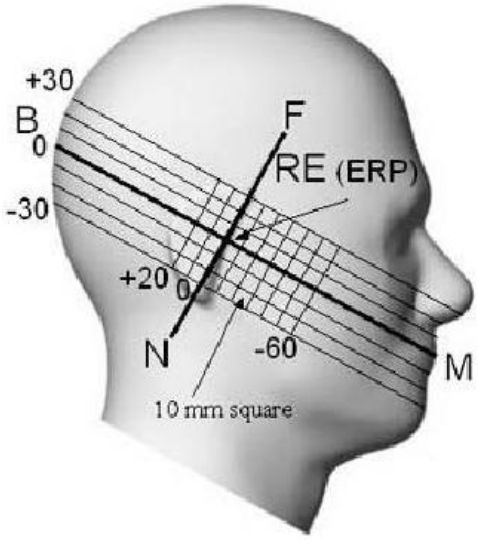


Figure 5.1 Side view of the phantom

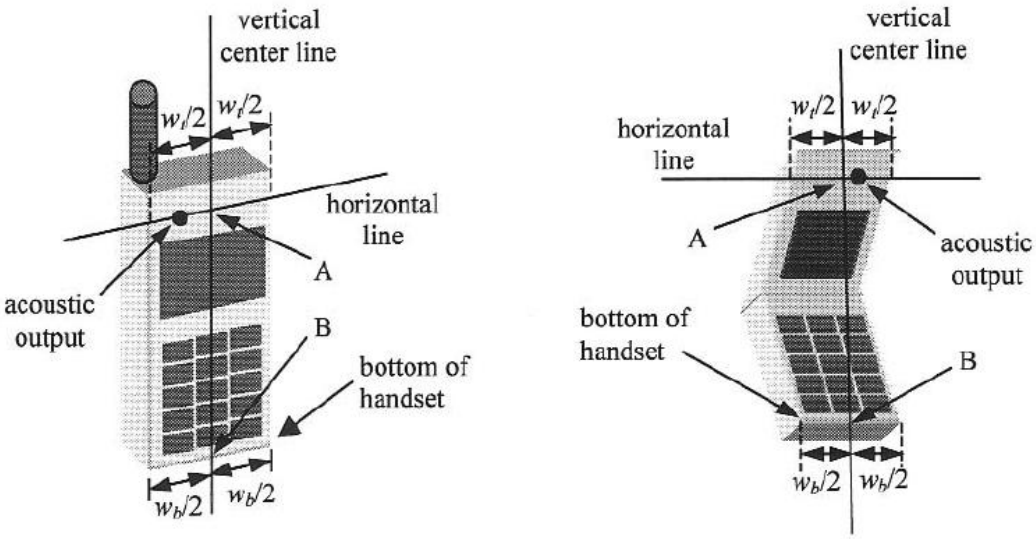


Figure 5.2 Handset vertical and horizontal reference lines

5.2 Body Holster/Belt Clip Configurations

Body-worn operating configurations are tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in a normal use configuration. A device with a headset output is tested with a headset connected to the device. Body dielectric parameters are used.

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

Body-worn accessories may not always be supplied or available as options for some Devices intended to be authorized for body-worn use. In this case, a test configuration with a separation distance between the back of the device and the flat phantom is used.

Since this EUT does not supply any body worn accessory to the end user a distance of 1.0 cm from the EUT back surface to the liquid interface is configured for the generic test.

"See the Test SET-UP Photo"

Transmitters that are designed to operate in front of a person's face, as in push-to-talk configurations, are tested for SAR compliance with the front of the device positioned to face the flat phantom. For devices that are carried next to the body such as a shoulder, waist or chest-worn transmitters, SAR compliance is tested with the accessory(ies), Including headsets and microphones, attached to the device and positioned against a flat phantom in a normal use configuration.

In all cases SAR measurements are performed to investigate the worst-case positioning. Worstcase positioning is then documented and used to perform Body SAR testing.

6. MEASUREMENT UNCERTAINTY

Error Description	Tol (± %)	Prob. dist.	Div.	c_i	Standard Uncertainty (± %)	v_{eff}
1. Measurement System						
Probe Calibration	5.50	N	1	1	5.50	∞
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 Noise	3.00	R	1.73	1	1.73	∞
RF Ambient Reflection	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	1.80	N	1.00	1	1.80	9
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					10.76	
Coverage Factor for 95 %					k=2	
Expanded STD Uncertainty					21.53	

Table 6.1 Uncertainty (800 MHz- 2450 MHz)

7. ANSI/ IEEE C95.1 - 2005 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. SYSTEM VERIFICATION

8.1 Tissue Verification

Freq. [MHz]	Date	Liquid	Liquid Temp.[°C]	Parameters	Target Value	Measured Value	Deviation [%]	Limit [%]
835	Apr. 4, 2011	Head	21.1	ε r	41.5	41.5	0.00	± 5
				σ	0.90	0.89	- 0.01	± 5
835	Apr. 4, 2011	Body	21.1	ε r	55.2	56.9	+ 1.70	± 5
				σ	0.97	0.981	+ 0.01	± 5
1 900	Apr. 5, 2011	Head	21.4	ε r	40.0	41.6	+ 1.60	± 5
				σ	1.40	1.40	0.00	± 5
1 900	Apr. 5, 2011	Body	21.4	ε r	53.3	53.5	+ 0.20	± 5
				σ	1.52	1.49	- 0.03	± 5
2 450	Apr. 6, 2011	Head	21.4	ε r	39.2	39.6	+ 0.40	± 5
				σ	1.80	1.84	+ 0.04	± 5
2 450	Apr. 6, 2011	Body	21.4	ε r	52.7	51.9	- 1.52	± 5
				σ	1.95	1.93	- 1.02	± 5

8.2 System Validation

Prior to assessment, the system is verified to the ± 10 % of the specifications at 835 MHz / 1 900 MHz/ 2 450 MHz by using the system validation kit. (Graphic Plots Attached)

* Input Power: 100 m W

Freq. [MHz]	Date	Liquid	Liquid Temp. [°C]	SAR Average	Target Value (SPEAG) (mW/g)	*Measured Value (mW/g)	Deviation [%]	Limit [%]
835	Apr. 4, 2011	Head	21.1	1 g	9.66	0.966	+ 0.00	± 10
835	Apr. 4, 2011	Body	21.1	1 g	9.92	1.01	+ 0.18	± 10
1 900	Apr. 5, 2011	Head	21.4	1 g	39.9	4.12	+ 1.30	± 10
1 900	Apr. 5, 2011	Body	21.4	1 g	41.5	4.28	+ 1.30	± 10
2 450	Apr. 6, 2011	Head	21.4	1 g	54	5.36	- 0.40	± 10
2 450	Apr. 6, 2011	Body	21.4	1 g	54	5.3	- 1.85	± 10

9. SAR Testing with IEEE 802.11 a/b/g Transmitters

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.

9.1 General Device Setup

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.

9.2 Frequency Channel Configurations

80.11 a/b/g and 4.9 GHz operating modes are tested independently according to the service requirements in each frequency band. 80.211 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

10. RF CONDUCTED POWER

Power measurements were performed using a base station simulator under digital average power

10.1 Procedures Used to Establish RF Signal for SAR

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[4] 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.

10.2 SAR Measurement Conditions for UMTS

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.

10.2.1 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”

10.2.2 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.

10.2.3 Body SAR Measurement

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

10.2.4 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.

10.2.5 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.

Band	Channel	Voice	GPRS Data				EDGE Data			
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)	EDGE 3 TX Slot (dBm)	EDGE 4 TX Slot (dBm)
GSM 850	128	33.3	33.3	30.10	28.45	27.59	27.47	24.47	22.41	21.51
	190	33.30	33.30	30.12	28.45	27.62	27.47	24.44	22.48	21.61
	251	33.24	33.24	30.11	28.46	27.82	27.46	24.44	22.31	21.77
GSM 1900	512	29.96	29.96	27.01	25.13	24.40	26.20	23.31	21.21	20.45
	661	30.01	30.01	27.01	25.20	24.44	26.17	23.27	21.18	20.40
	810	30.02	30.03	27.01	25.21	24.47	26.25	23.31	21.21	20.31

Table 1. GSM Conducted output powers

3GPP Release Version	Mode	3GPP 34.121	Cellular Band [dBm]			PCS Band [dBm]			MPR
		Subtest	UL 4132 (826.4)	UL 4183 (836.6)	UL 4233 (846.6)	UL 9262 (1852.4)	UL 9400 (1880.0)	UL 9538 (1907.6)	
99	WCDMA	12.2kbps(RMC)	23.60	23.63	23.55	22.62	22.46	22.47	-
5	HSDPA	Subtest1	23.60	23.60	23.57	22.66	22.46	22.34	0
5		Subtest2	23.50	23.30	23.30	22.50	22.30	22.20	0
5		Subtest3	23.00	23.10	22.90	22.00	21.79	21.80	0.5
5		Subtest4	22.90	22.98	22.80	22.10	21.70	21.76	0.5
5	HSUPA	Subtest1	23.20	23.20	23.20	22.59	22.47	22.38	0
5		Subtest2	21.06	21.07	21.08	20.65	20.67	20.51	2
5		Subtest3	21.84	21.96	21.96	21.44	21.31	21.42	1
5		Subtest4	20.92	21.18	20.91	20.49	20.35	20.55	2
5		Subtest5	22.90	22.98	22.87	22.68	22.52	22.53	0

Table 2. WCDMA Conducted output powers

Band	Channel	Mbps (dBm)			
		1	2	5.5	11
IEEE 802.11b	1	14.55	14.54	14.02	13.58
	6	15.20	15.10	14.59	14.08
	11	15.43	15.16	14.65	14.34

Table 3. Average IEEE 802.11b Conducted output power

Band	Channel	Mbps (dBm)							
		6	9	12	18	24	36	48	54
IEEE 802.11g	1	8.21	7.80	7.52	7.02	6.38	5.71	5.31	5.08
	6	8.86	8.36	7.96	7.52	7.21	6.36	5.91	5.68
	11	9.69	8.56	8.25	7.67	7.14	6.42	5.97	5.72

Table 4. Average IEEE 802.11g Conducted output power

Band	Channel	Mbps (dBm)							
		6.5	13	20	26	39	52	58	65
IEEE 802.11n (HT-20)	1	5.18	5.05	5.10	5.17	4.90	5.12	5.07	5.16
	6	5.82	5.74	5.81	5.58	5.65	5.81	5.71	5.72
	11	5.89	5.70	5.89	5.78	5.66	5.65	5.85	5.80

Table 5. Average IEEE 802.11n Conducted output power

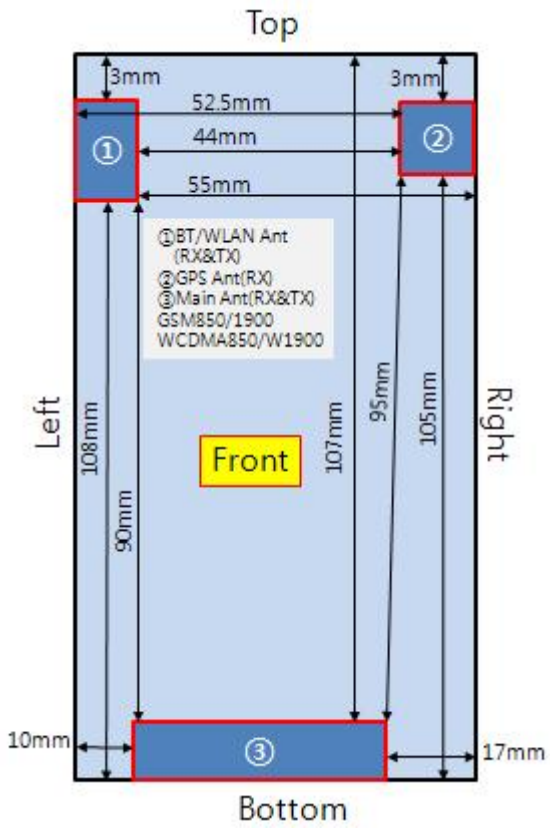
11. Mobile Hotspot Side for SAR Testing

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
WLAN	Yes	Yes	No	Yes	No	Yes

11.2 Antenna and Device Information

- This device doesn't have power back-off capabilities.



Note;

Per Oct.2010 TCB Workshop guidance, 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 Evaluation Considerations for Handsets with Multiple Transmitters and Antennas

12.1 SAR Evaluation Considerations

These procedures were followed according to FCC "SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas", May 2008. The procedures are applicable to phones with built-in unlicensed transmitters, such as 802.11 a/b/g and Bluetooth devices.

	2.45	5.15 - 5.35	5.47 - 5.85	GHz
P_{Ref}	12	6	5	mW
Device output power should be rounded to the nearest mW to compare with values specified in this				

Table. 12.1 Output Power Thresholds for Unlicensed Transmitters

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	Routine evaluation required	SAR not required: Unlicensed only ○ when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas Licensed & Unlicensed ○ when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas ○ when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3 SAR required: Licensed & Unlicensed antenna pairs with SAR to peak location separation ratio ≥ 0.3; test is only required for the configuration that results in the highest SAR in stand-alone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply
Unlicensed Transmitters	When there is no simultaneous transmission – ○ output ≤ 60/f: SAR not required ○ output > 60/f: stand-alone SAR required When there is simultaneous transmission – Stand-alone SAR not required when ○ output ≤ 2·P_{Ref} and antenna is ≥ 5.0 cm from other antennas ○ output ≤ P_{Ref} and antenna is ≥ 2.5 cm from other antennas ○ output ≤ P_{Ref} and antenna is < 2.5 cm from other antennas, each with either output power ≤ P_{Ref} or 1-g SAR < 1.2 W/kg Otherwise stand-alone SAR is required When stand-alone SAR is required ○ test SAR on highest output channel for each wireless mode and exposure condition ○ if SAR for highest output channel is > 50% of SAR limit, evaluate all channels according to normal procedures	
Jaw, Mouth and Nose	Flat phantom SAR required ○ when measurement is required in tight regions of SAM and it is not feasible or the results can be questionable due to probe tilt, calibration, positioning and orientation issues ○ position rectangular and clam-shell phones according to flat phantom procedures and conduct SAR measurements for these specific locations	When simultaneous transmission SAR testing is required, contact the FCC Laboratory for interim guidance.

Table. 12.2 SAR Evaluation Requirements for Cellphones with Multiple Transmitters

FCC ID: BEJP990H / BT Max. RF output power: 2.34dBm 1.71 mW

Antenna separation distance between Main and BT/ WLAN: 90 mm

WLAN Max. RF output power: Wi-Fi 802.11b(15.43 dBm) / Wi-Fi 802.11g (9.69 dBm)) / Wi-Fi 802.11n (5.89 dBm)

12.2 Conclusion

Because the conducted output power level of the BT transmitter is less than 2*P_{ref}, and the BT antenna is more than 5 cm from the Main antenna, neither simultaneous SAR nor stand-alone BT SAR are required for the EUT.

Simultaneous Transmission Summation for Held to Ear

Simultaneous TX	configuration	850 GSM SAR(W/kg)	WIFI SAR (W/kg)	∑SAR (W/kg)	Simultaneous TX	configuration	1900 GSM SAR(W/kg)	WIFI SAR (W/kg)	∑SAR (W/kg)
Head SAR	Right Cheek	0.434	0.693	1.127	Head SAR	Right Cheek	0.383	0.693	1.076
	Right Tilt	0.259	0.381	0.64		Right Tilt	0.165	0.381	0.546
	Left Cheek	0.374	0.351	0.725		Left Cheek	0.256	0.351	0.607
	Left Tilt	0.265	0.239	0.504		Left Tilt	0.194	0.239	0.433
Simultaneous TX	configuration	850 WCDMA SAR(W/kg)	WIFI SAR (W/kg)	∑SAR (W/kg)	Simultaneous TX	configuration	1900 WCDMA SAR(W/kg)	WIFI SAR (W/kg)	∑SAR (W/kg)
Head SAR	Right Cheek	0.497	0.693	1.19	Head SAR	Right Cheek	0.445	0.693	1.138
	Right Tilt	0.300	0.381	0.681		Right Tilt	0.199	0.381	0.58
	Left Cheek	0.442	0.351	0.793		Left Cheek	0.355	0.351	0.706
	Left Tilt	0.302	0.239	0.541		Left Tilt	0.242	0.239	0.481

Simultaneous Transmission Summation for Hotspot

Simultaneous TX	configuration	850 GSM SAR(W/kg)	WIFI SAR (W/kg)	∑SAR (W/kg)	Simultaneous TX	configuration	1900 GSM SAR(W/kg)	WIFI SAR (W/kg)	∑SAR (W/kg)
Body SAR	Back	0.715	0.226	0.941	Body SAR	Back	0.472	0.226	0.698
	Front	0.559	0.198	0.757		Front	0.477	0.198	0.675
	Left	0.561	0.236	0.797		Left	0.307	0.236	0.543
	Right	0.902	-	0.902		Right	0.216	-	0.216
	Bottom	0.147	-	0.147		Bottom	0.374	-	0.374
	Top	-	0.157	0.157		Top	-	0.157	0.157
Simultaneous TX	configuration	850 WCDMA SAR(W/kg)	WIFI SAR (W/kg)	∑SAR (W/kg)	Simultaneous TX	configuration	1900 WCDMA SAR(W/kg)	WIFI SAR (W/kg)	∑SAR (W/kg)
Body SAR	Back	0.847	0.226	1.073	Body SAR	Back	0.554	0.226	0.78
	Front	0.613	0.198	0.811		Front	0.688	0.198	0.886
	Left	0.523	0.236	0.759		Left	0.386	0.236	0.622
	Right	0.704	-	0.704		Right	0.26	-	0.26
	Bottom	0.077	-	0.077		Bottom	0.654	-	0.654
	Top	-	0.157	0.157		Top	-	0.157	0.157

Note: WLAN DATA was measured at 1.0cm representing worst-case scenario

13. SAR TEST DATA SUMMARY

13.1 Measurement Results (GSM850 Head SAR)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
836.6	190 (Mid)	GSM850	33.30	33.15	Standard	Left Ear	Intenna	0.374
836.6	190 (Mid)	GSM850	33.30	33.28	Standard	Left Tilt 15°	Intenna	0.265
836.6	190 (Mid)	GSM850	33.30	33.26	Standard	Right Ear	Intenna	0.434
836.6	190 (Mid)	GSM850	33.30	33.25	Standard	Right Tilt 15°	Intenna	0.259
ANSI/ IEEE C95.1 - 2005– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Head 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-head 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 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).

13.2 Measurement Results (GSM1900 Head SAR)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 880.0	661 (Mid)	GSM1900	30.01	29.96	Standard	Left Ear	Intenna	0.256
1 880.0	661 (Mid)	GSM1900	30.01	29.97	Standard	Left Tilt 15°	Intenna	0.194
1 880.0	661 (Mid)	GSM1900	30.01	30.11	Standard	Right Ear	Intenna	0.383
1 880.0	661 (Mid)	GSM1900	30.01	30.04	Standard	Right Tilt 15°	Intenna	0.165
ANSI/ IEEE C95.1 - 2005– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Head 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-head 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 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).

13.3 Measurement Results (WCDMA850 Head SAR)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
836.6	4183 (Mid)	WCDMA850	23.63	23.61	Standard	Left Ear	Intenna	0.442
836.6	4183 (Mid)	WCDMA850	23.63	23.52	Standard	Left Tilt 15°	Intenna	0.302
836.6	4183 (Mid)	WCDMA850	23.63	23.60	Standard	Right Ear	Intenna	0.497
836.6	4183 (Mid)	WCDMA850	23.63	23.57	Standard	Right Tilt 15°	Intenna	0.300
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Head 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-head 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 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).
8 WCDMA Mode was tested under RMC 12.2 kbps and HSPA Inactive.

13.4 Measurement Results (WCDMA1900 Head SAR)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 880.0	9400 (Mid)	WCDMA1900	22.46	22.45	Standard	Left Ear	Intenna	0.355
1 880.0	9400 (Mid)	WCDMA1900	22.46	22.38	Standard	Left Tilt 15°	Intenna	0.242
1 880.0	9400 (Mid)	WCDMA1900	22.46	22.45	Standard	Right Ear	Intenna	0.445
1 880.0	9400 (Mid)	WCDMA1900	22.46	22.51	Standard	Right Tilt 15	Intenna	0.199
ANSI/ IEEE C95.1 - 2005– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Head 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-head 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 WCDMA Mode was tested under RMC 12.2 kbps and HSPA Inactive.

13.5 Measurement Results (802.11b/g/n Head)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
2 462	11 (High)	802.11b	15.43	15.33	Standard	Left Ear	Intenna	0.351
2 462	11 (High)	802.11b	15.43	15.33	Standard	Left Tilt 15°	Intenna	0.239
2 462	11 (High)	802.11b	15.43	15.29	Standard	Right Ear	Intenna	0.693
2 462	11 (High)	802.11b	15.43	15.55	Standard	Right Tilt 15	Intenna	0.381
ANSI/ IEEE C95.1 - 2005– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Head 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-head 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 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.

13.6 Measurement Results (GSM850 Hotspot Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Configuration	Separation Distance	SAR(mW/g)
MHz	Channel		Begin	End			
836.6	190 (Mid)	GPRS 4Tx	27.62	27.72	Rear	1.0 cm	0.715
836.6	190 (Mid)	GPRS 4Tx	27.62	27.64	Front	1.0 cm	0.559
836.6	190 (Mid)	GPRS 4Tx	27.62	27.71	Left	1.0 cm	0.561
824.2	128 (Low)	GPRS 4Tx	27.59	27.57	Right	1.0 cm	0.713
836.6	190 (Mid)	GPRS 4Tx	27.62	27.64	Right	1.0 cm	0.826
848.8	251 (High)	GPRS 4Tx	27.82	27.78	Right	1.0 cm	0.902
836.6	190 (Mid)	GPRS 4Tx	27.62	27.53	Bottom	1.0 cm	0.147
ANSI/ IEEE C95.1 - 2005– 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-head 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 Both side of the phone were tested and the worst-case side is reported.
8 Test Configuration ☐ With Holster ☒ Without Holster
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).

13.7 Measurement Results (GSM1900 Hotspot Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Configuration	Separation Distance	SAR(mW/g)
MHz	Channel		Begin	End			
1 880.0	661 (Mid)	GPRS 4Tx	24.44	24.42	Rear	1.0 cm	0.472
1 880.0	661 (Mid)	GPRS 4Tx	24.44	24.36	Front	1.0 cm	0.477
1 880.0	661 (Mid)	GPRS 4Tx	24.44	24.55	Left	1.0 cm	0.307
1 880.0	661 (Mid)	GPRS 4Tx	24.44	24.43	Right	1.0 cm	0.216
1 880.0	661 (Mid)	GPRS 4Tx	24.44	24.42	Bottom	1.0 cm	0.374
ANSI/ IEEE C95.1 - 2005– 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-head 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 Both side of the phone were tested and the worst-case side is reported.
8 Test Configuration ☐ With Holster ☒ Without Holster
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).

13.8 Measurement Results (WCDMA850 Hotspot Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Configuration	Separation Distance	SAR(mW/g)
MHz	Channel		Begin	End			
826.4	4132 (Low)	WCDMA850	23.60	23.53	Rear	1.0 cm	0.699
836.6	4183 (Mid)	WCDMA850	23.63	23.62	Rear	1.0 cm	0.847
846.4	4233 (High)	WCDMA850	23.55	23.58	Rear	1.0 cm	0.821
836.6	4183 (Mid)	WCDMA850	23.63	23.65	Front	1.0 cm	0.613
836.6	4183 (Mid)	WCDMA850	23.63	23.54	Left	1.0 cm	0.523
836.6	4183 (Mid)	WCDMA850	23.63	23.61	Right	1.0 cm	0.704
836.6	4183 (Mid)	WCDMA850	23.63	23.55	Bottom	1.0 cm	0.077
ANSI/ IEEE C95.1 - 2005– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Body 1.6 W/kg (mW/g)** Averaged over 1 gram	

1 The test data reported are the worst-case SAR value with the antenna-head 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 Both side of the phone were tested and the worst-case side is reported.
8 Test Configuration ☐ With Holster ☒ Without Holster
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).
10 WCDMA Mode was tested under RMC 12.2 kbps and HSPA Inactive.

13.9 Measurement Results (WCDMA1900 Hotspot Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Configuration	Separation Distance	SAR(mW/g)
MHz	Channel		Begin	End			
1 880.0	9400 (Mid)	WCDMA1900	22.46	22.45	Rear	1.0 cm	0.554
1 880.0	9400 (Mid)	WCDMA1900	22.46	22.49	Front	1.0 cm	0.688
1 880.0	9400 (Mid)	WCDMA1900	22.46	22.47	Left	1.0 cm	0.386
1 880.0	9400 (Mid)	WCDMA1900	22.46	22.30	Right	1.0 cm	0.260
1 880.0	9400 (Mid)	WCDMA1900	22.46	22.42	Bottom	1.0 cm	0.654
ANSI/ IEEE C95.1 - 2005– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Body 1.6 W/kg (mW/g)** Averaged over 1 gram	

1 The test data reported are the worst-case SAR value with the antenna-head 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 Test Configuration ☐ With Holster ☒ Without Holster
8 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).
9 WCDMA Mode was tested under RMC 12.2 kbps and HSPA Inactive.

13.10 Measurement Results (802.11b/g/n Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Configuration	Separation Distance	Data Rate	SAR(mW/g)
MHz	Channel		Begin	End				
2 462	11 (High)	802.11b	15.43	15.44	Rear	1.0 cm	1 Mbps	0.226
2 462	11 (High)	802.11b	15.43	15.49	Front	1.0 cm	1 Mbps	0.198
2 462	11 (High)	802.11b	15.43	15.27	Left	1.0 cm	1 Mbps	0.236
2 462	11 (High)	802.11b	15.43	15.60	Top	1.0 cm	1 Mbps	0.157
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-head 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.

14. CONCLUSION

The SAR measurement indicates that the EUT complies with the RF radiation exposure limits of the ANSI/ IEEE C95.1 2005.

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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Attachment 1. – SAR Test Plots

Test Laboratory: HCT CO., LTD

EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN

GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)

Liquid Temperature: 21.1 ℃

Ambient Temperature: 21.3 ℃

Test Date: Apr. 4, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.892 mho/m; ε_r = 41.4; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

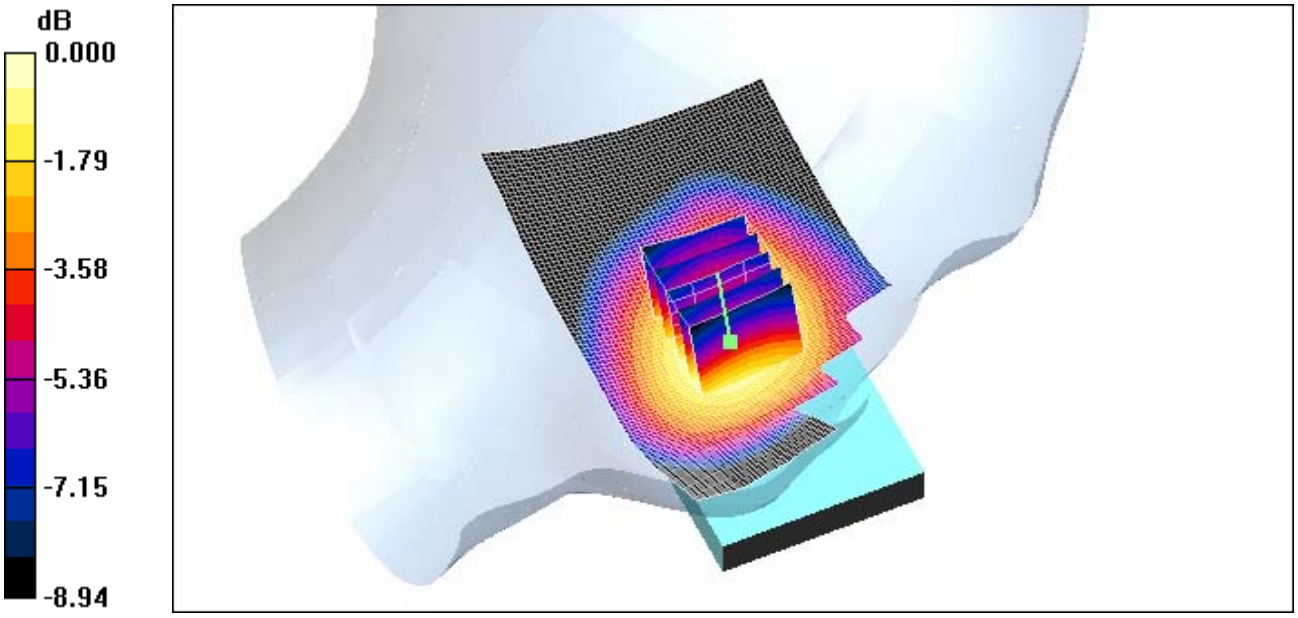
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.25, 6.25, 6.25); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Left touch 190ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.397 mW/g

Left touch 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.58 V/m; Power Drift = -0.149 dB
Peak SAR (extrapolated) = 0.460 W/kg
SAR(1 g) = 0.374 mW/g; SAR(10 g) = 0.275 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.398 mW/g



0 dB = 0.398mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.892 mho/m; ε_r = 41.4; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

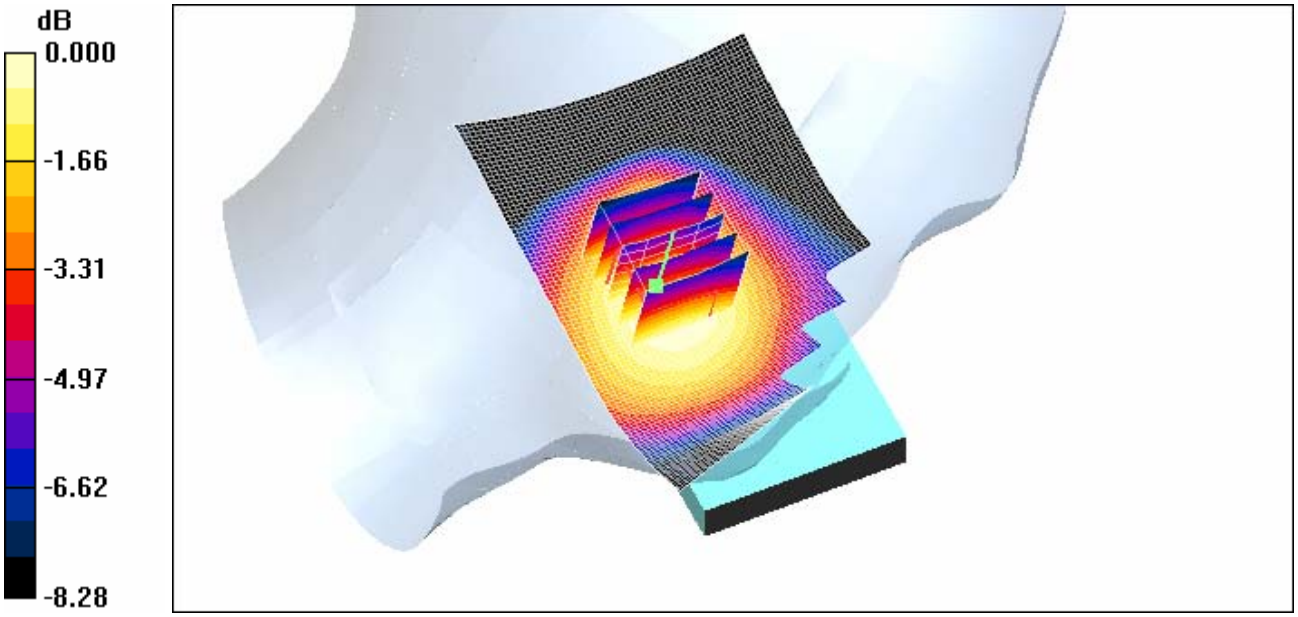
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.25, 6.25, 6.25); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Left tilt 190ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.280 mW/g

Left tilt 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.98 V/m; Power Drift = -0.019 dB
Peak SAR (extrapolated) = 0.310 W/kg
SAR(1 g) = 0.265 mW/g; SAR(10 g) = 0.206 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.276 mW/g



0 dB = 0.276mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.892 mho/m; ε_r = 41.4; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

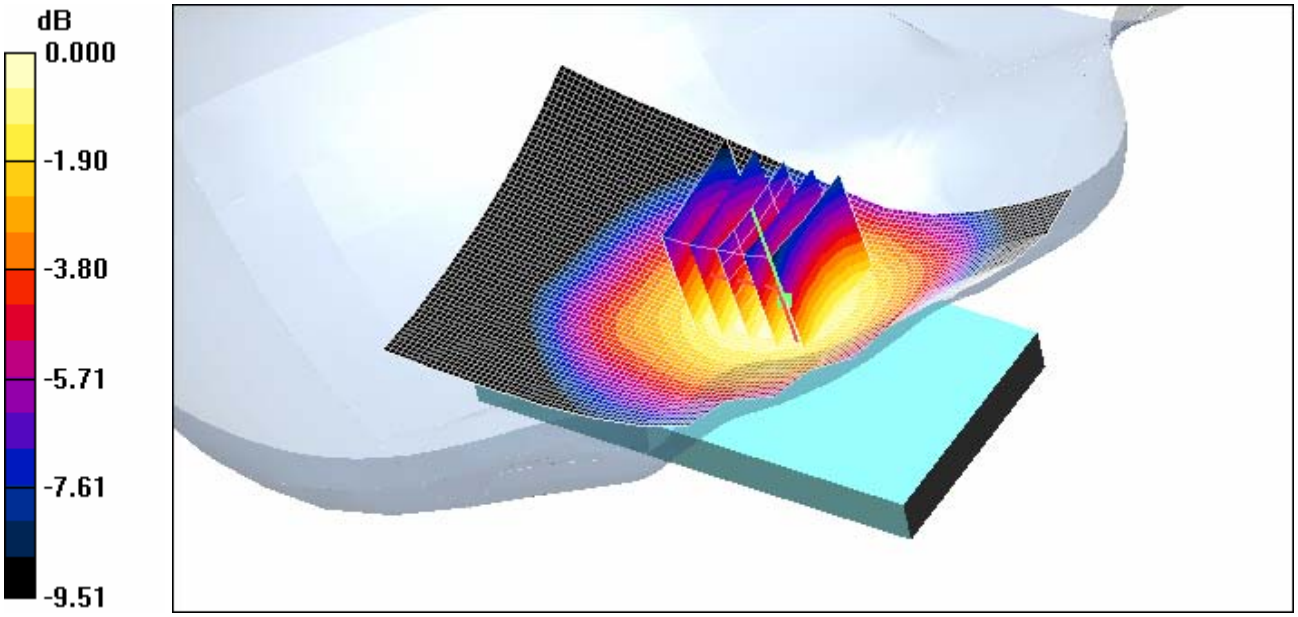
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.25, 6.25, 6.25); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Right touch 190ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.458 mW/g

Right touch 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.66 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 0.543 W/kg
SAR(1 g) = 0.434 mW/g; SAR(10 g) = 0.323 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.455 mW/g



0 dB = 0.455mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.892 mho/m; ε_r = 41.4; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

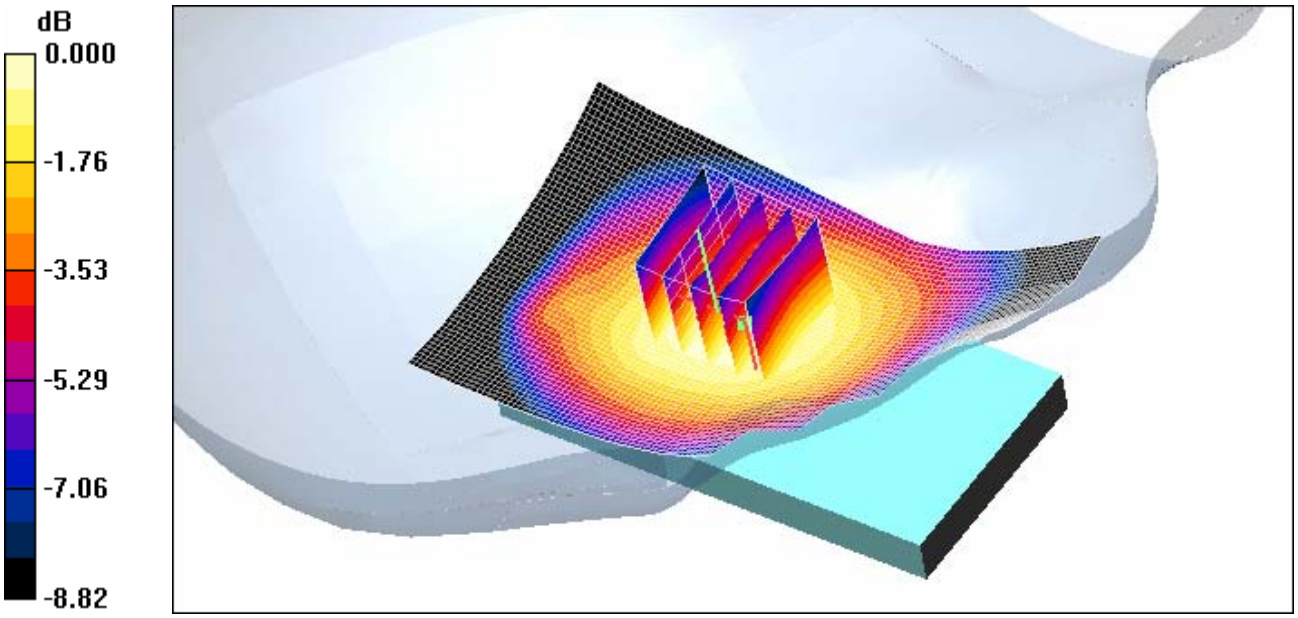
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.25, 6.25, 6.25); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Right tilt 190ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.264 mW/g

Right tilt 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 0.310 W/kg
SAR(1 g) = 0.259 mW/g; SAR(10 g) = 0.200 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.268 mW/g



0 dB = 0.268mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011

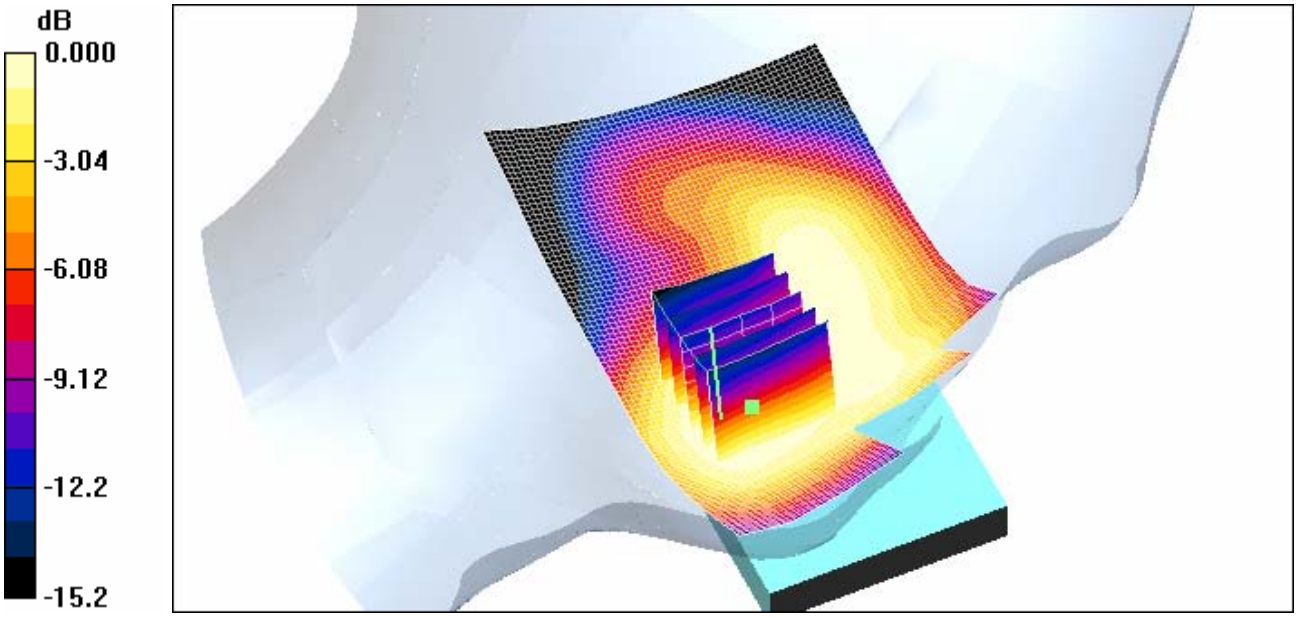
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.38 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 661ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.299 mW/g

Left touch 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.94 V/m; Power Drift = -0.050 dB
Peak SAR (extrapolated) = 0.391 W/kg
SAR(1 g) = 0.256 mW/g; SAR(10 g) = 0.161 mW/g
Maximum value of SAR (measured) = 0.277 mW/g



0 dB = 0.277mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011

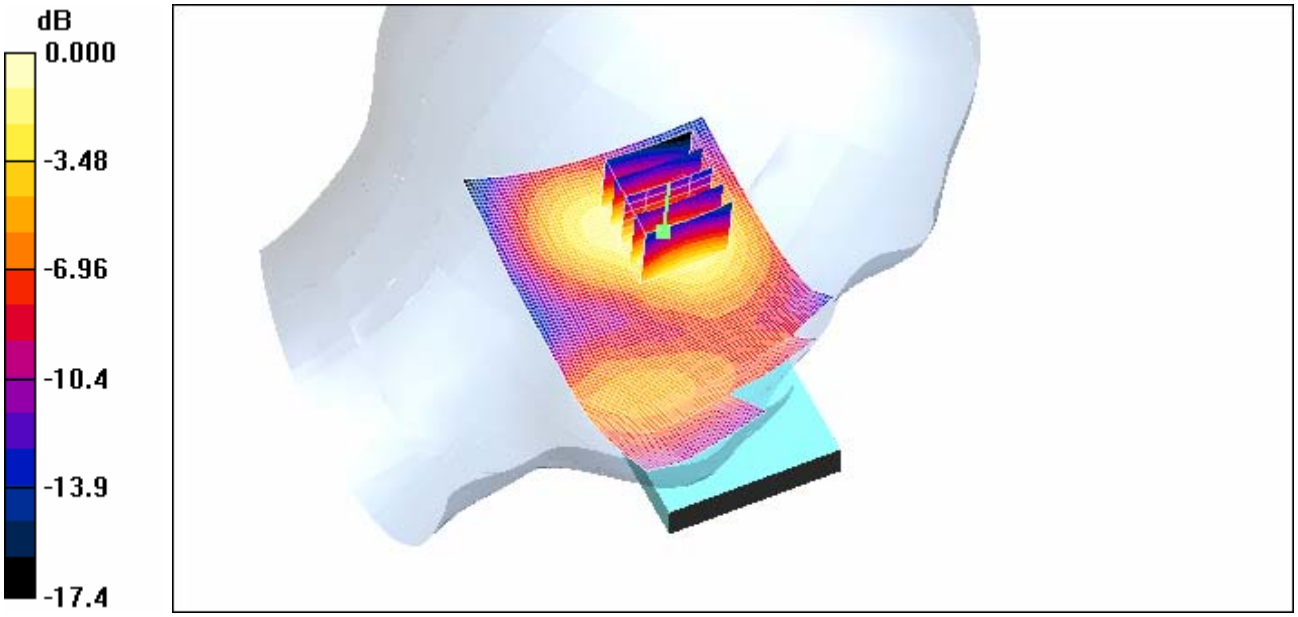
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.38 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left tilt 661ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.218 mW/g

Left tilt 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.93 V/m; Power Drift = -0.045 dB
Peak SAR (extrapolated) = 0.279 W/kg
SAR(1 g) = 0.194 mW/g; SAR(10 g) = 0.118 mW/g
Maximum value of SAR (measured) = 0.214 mW/g



0 dB = 0.214mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011

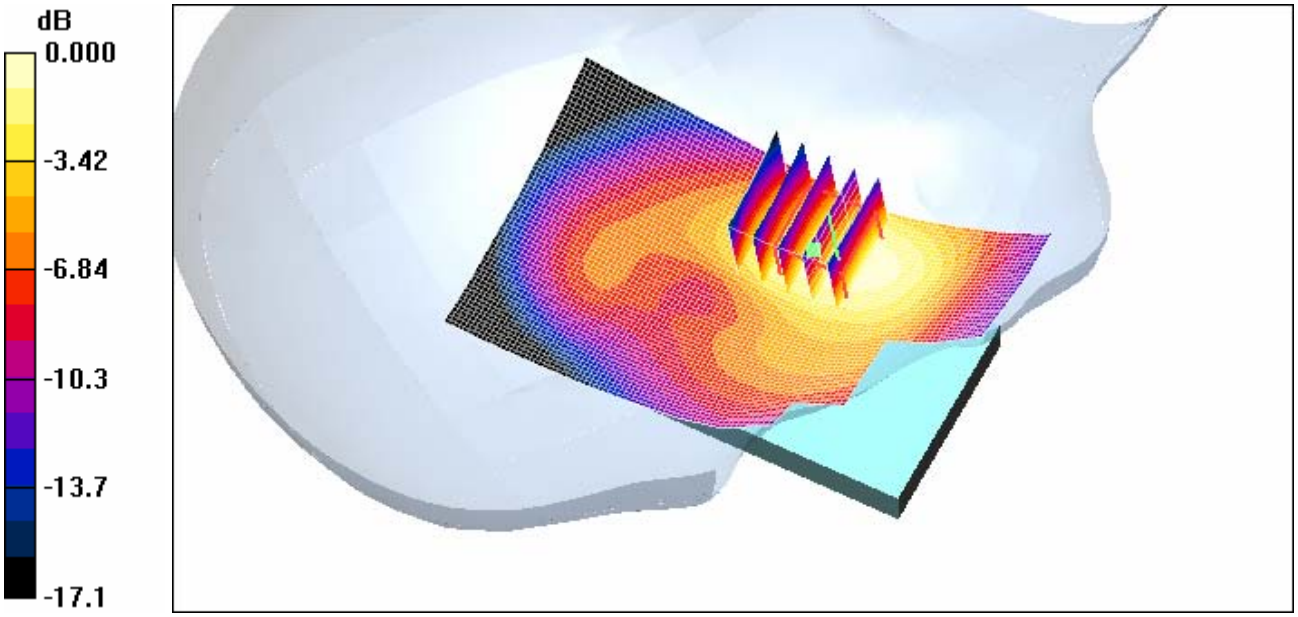
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.38 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 661ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.417 mW/g

Right touch 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.10 V/m; Power Drift = 0.095 dB
Peak SAR (extrapolated) = 0.584 W/kg
SAR(1 g) = 0.383 mW/g; SAR(10 g) = 0.232 mW/g
Maximum value of SAR (measured) = 0.411 mW/g



0 dB = 0.411mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Apr. 5, 2011

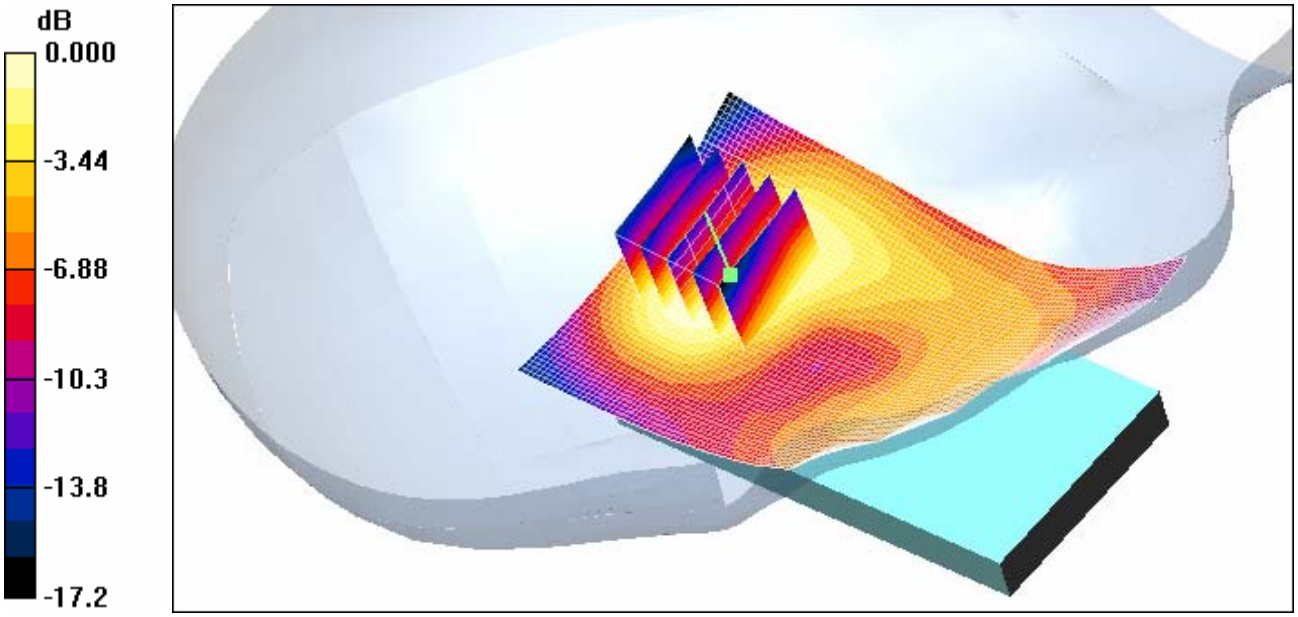
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.38 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right tilt 661ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.188 mW/g

Right tilt 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.3 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 0.250 W/kg
SAR(1 g) = 0.165 mW/g; SAR(10 g) = 0.099 mW/g
Maximum value of SAR (measured) = 0.173 mW/g



0 dB = 0.173mW/g

Test Laboratory: HCT CO., LTD

EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN

GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)

Liquid Temperature: 21.1 ℃

Ambient Temperature: 21.3 ℃

Test Date: Apr. 4, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.892 mho/m; ε_r = 41.4; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

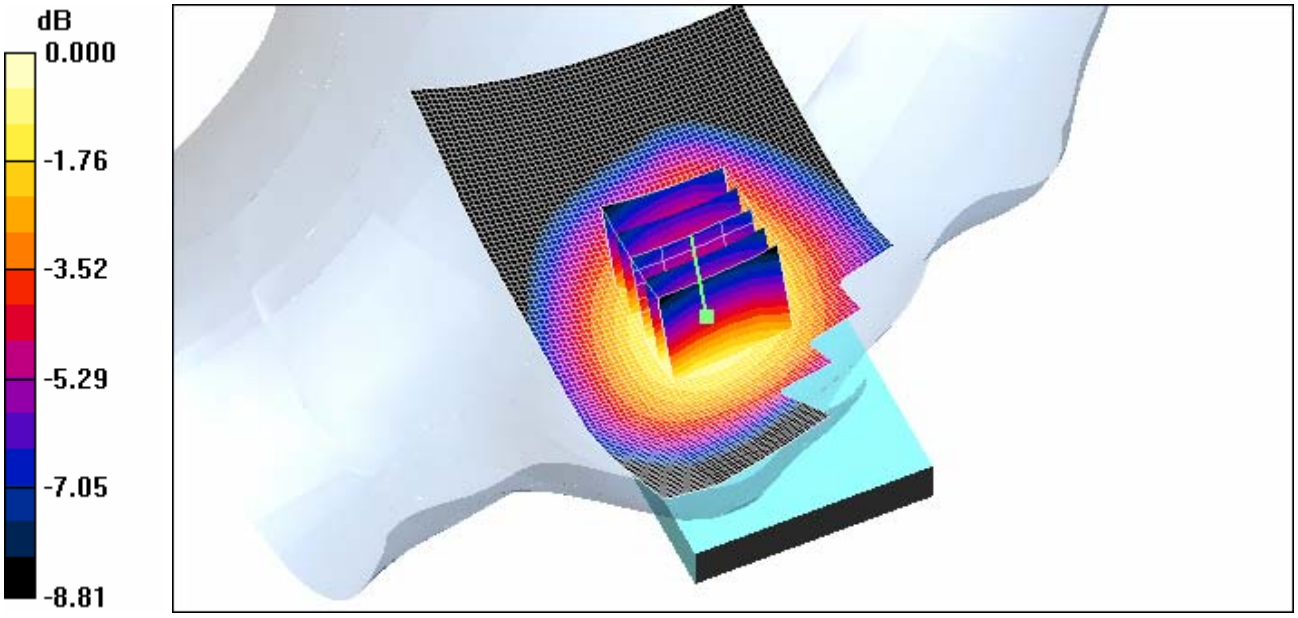
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.25, 6.25, 6.25); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Left touch 4183ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.465 mW/g

Left touch 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.44 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 0.544 W/kg
SAR(1 g) = 0.442 mW/g; SAR(10 g) = 0.328 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.472 mW/g



0 dB = 0.472mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 ℃
Ambient Temperature: 21.3 ℃
Test Date: Apr. 4, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.892 mho/m; ε_r = 41.4; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

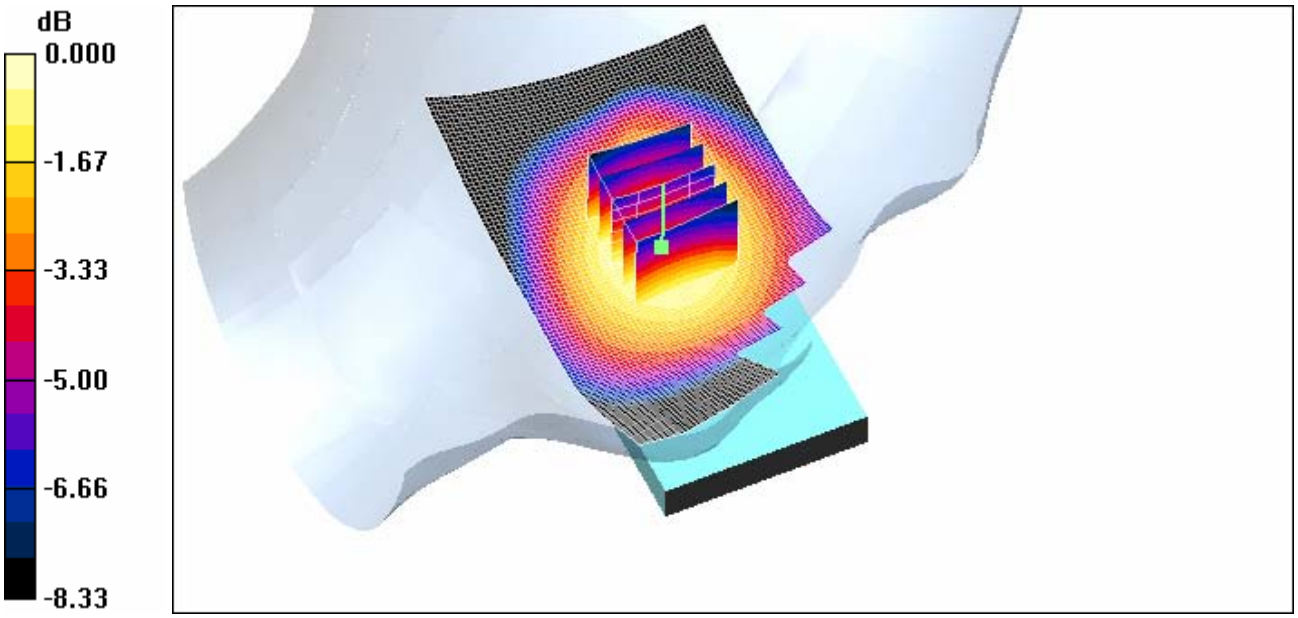
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.25, 6.25, 6.25); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Left tilt 4183ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.313 mW/g

Left tilt 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = -0.110 dB
Peak SAR (extrapolated) = 0.356 W/kg
SAR(1 g) = 0.302 mW/g; SAR(10 g) = 0.233 mW/g

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



0 dB = 0.316mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 ℃
Ambient Temperature: 21.3 ℃
Test Date: Apr. 4, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.892 mho/m; ε_r = 41.4; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

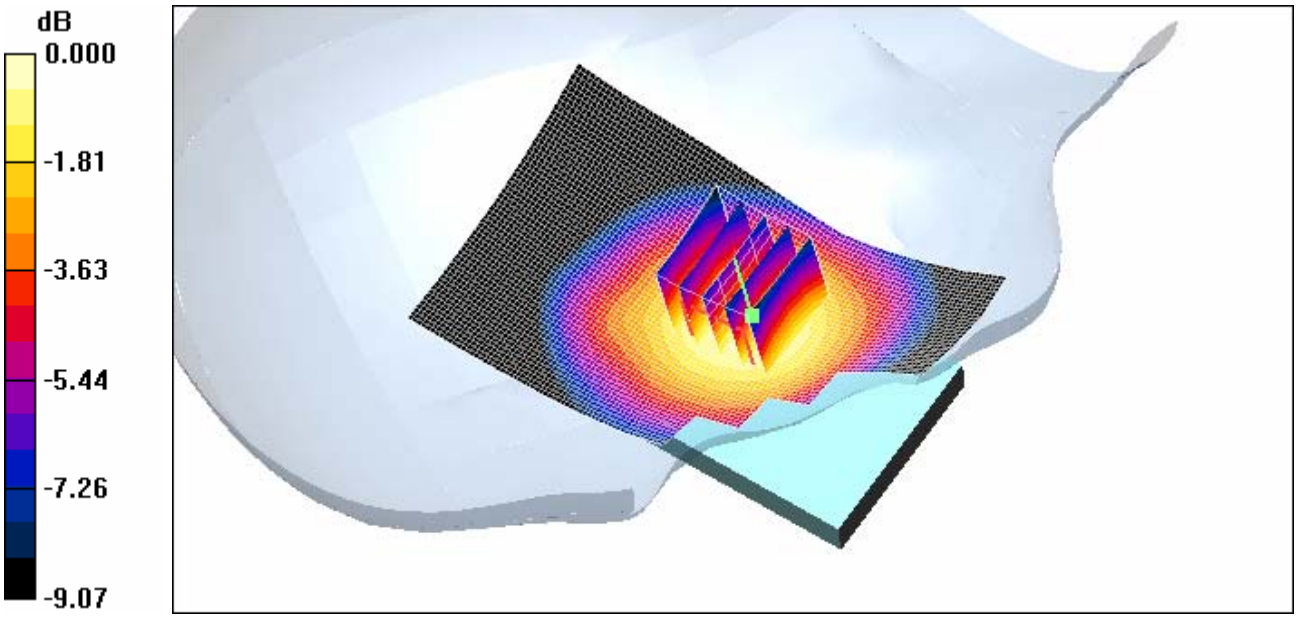
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.25, 6.25, 6.25); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Right touch 4183ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.517 mW/g

Right touch 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.70 V/m; Power Drift = -0.033 dB
Peak SAR (extrapolated) = 0.612 W/kg
SAR(1 g) = 0.497 mW/g; SAR(10 g) = 0.371 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.526 mW/g



0 dB = 0.526mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 ℃
Ambient Temperature: 21.3 ℃
Test Date: Apr. 4, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.892 mho/m; ε_r = 41.4; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

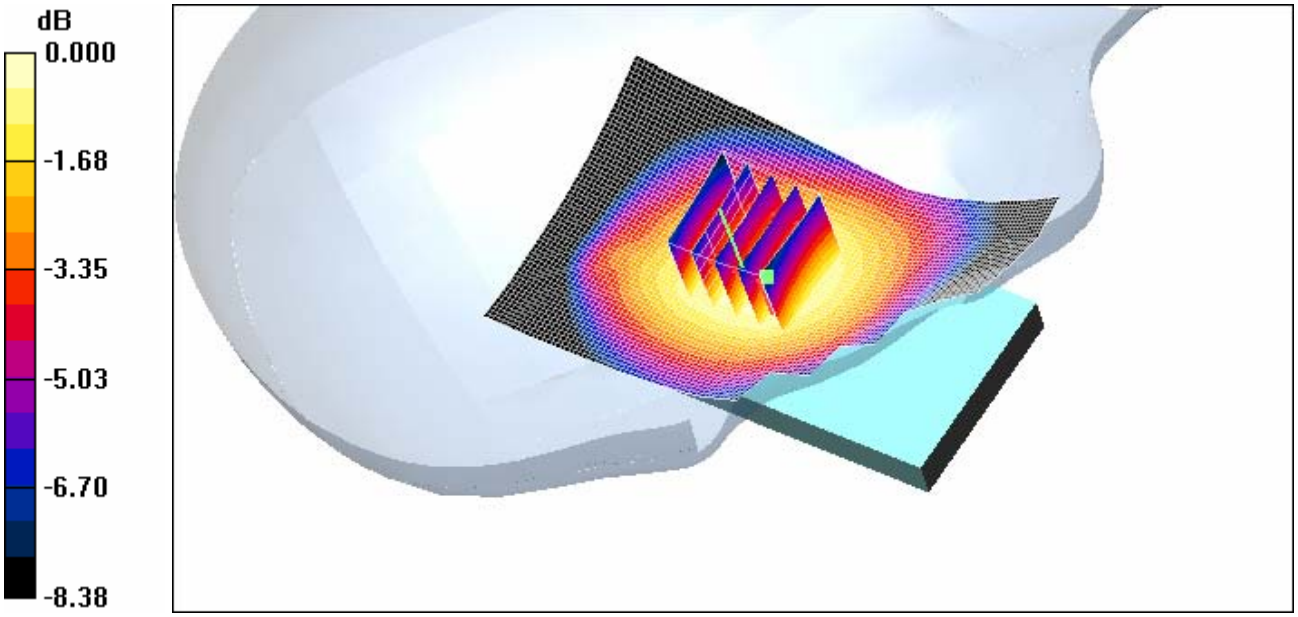
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.25, 6.25, 6.25); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Right tilt 4183ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.307 mW/g

Right tilt 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.9 V/m; Power Drift = -0.060 dB
Peak SAR (extrapolated) = 0.351 W/kg
SAR(1 g) = 0.300 mW/g; SAR(10 g) = 0.232 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.313 mW/g



0 dB = 0.313mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011

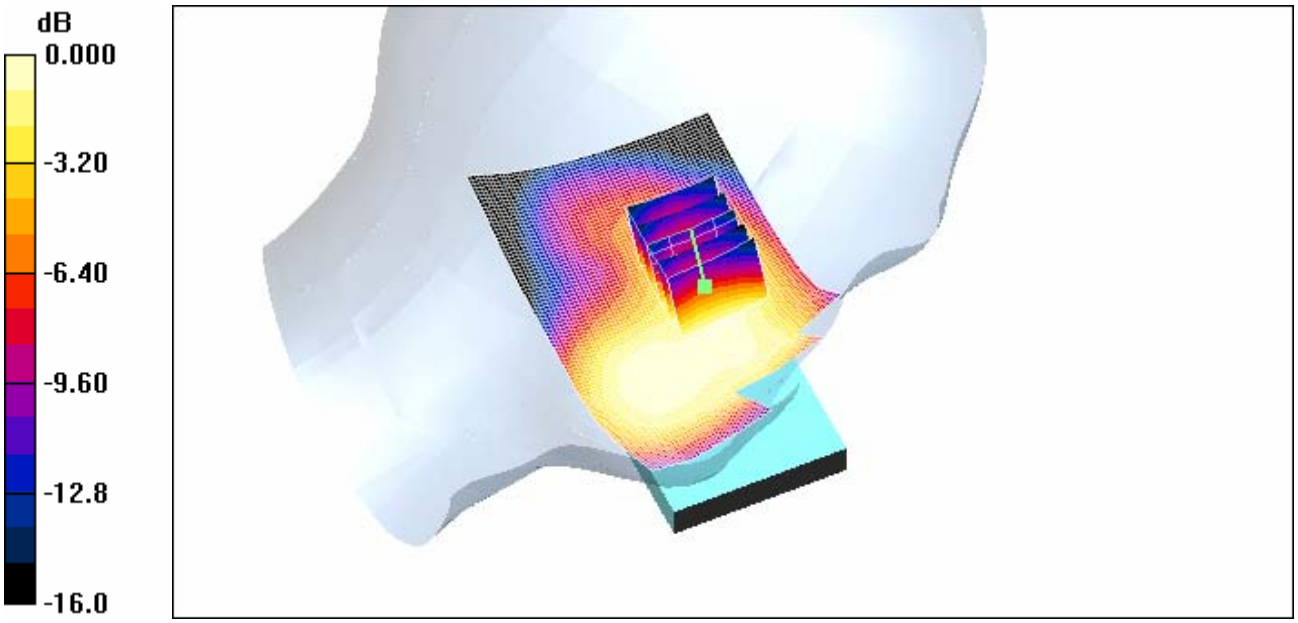
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.38 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 9400ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.391 mW/g

Left touch 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.27 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 0.532 W/kg
SAR(1 g) = 0.355 mW/g; SAR(10 g) = 0.216 mW/g
Maximum value of SAR (measured) = 0.381 mW/g



0 dB = 0.381mW/g

Test Laboratory: HCT CO., LTD

EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN

GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)

Liquid Temperature: 21.4 ℃

Ambient Temperature: 21.6 ℃

Test Date: Apr. 5, 2011

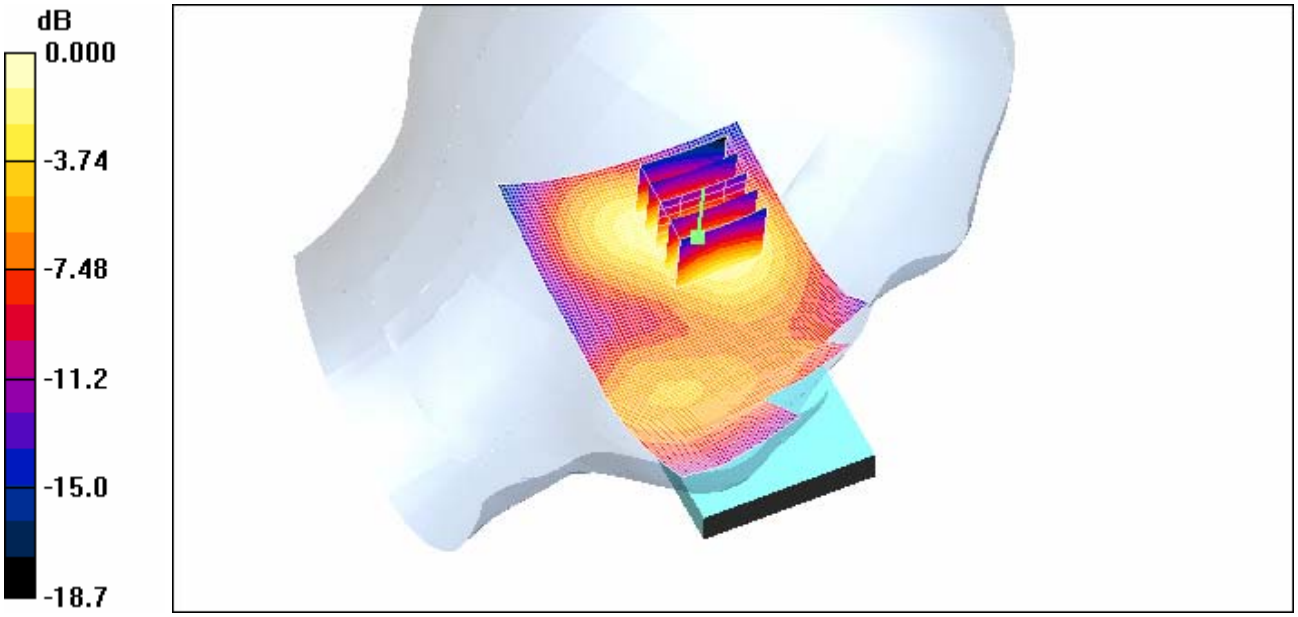
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.38 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left tilt 9400/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.273 mW/g

Left tilt 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.3 V/m; Power Drift = -0.080 dB
Peak SAR (extrapolated) = 0.354 W/kg
SAR(1 g) = 0.242 mW/g; SAR(10 g) = 0.146 mW/g
Maximum value of SAR (measured) = 0.266 mW/g



0 dB = 0.266mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011

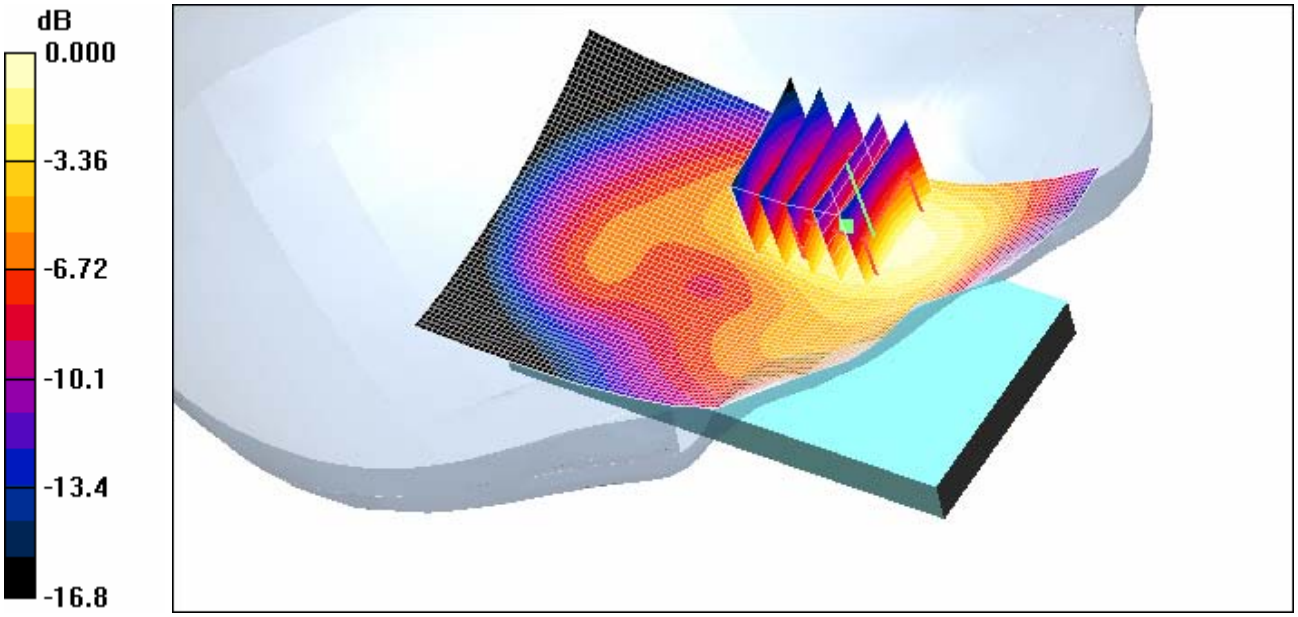
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.38 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 9400ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.493 mW/g

Right touch 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.54 V/m; Power Drift = -0.012 dB
Peak SAR (extrapolated) = 0.677 W/kg
SAR(1 g) = 0.445 mW/g; SAR(10 g) = 0.270 mW/g
Maximum value of SAR (measured) = 0.481 mW/g



0 dB = 0.481mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Apr. 5, 2011

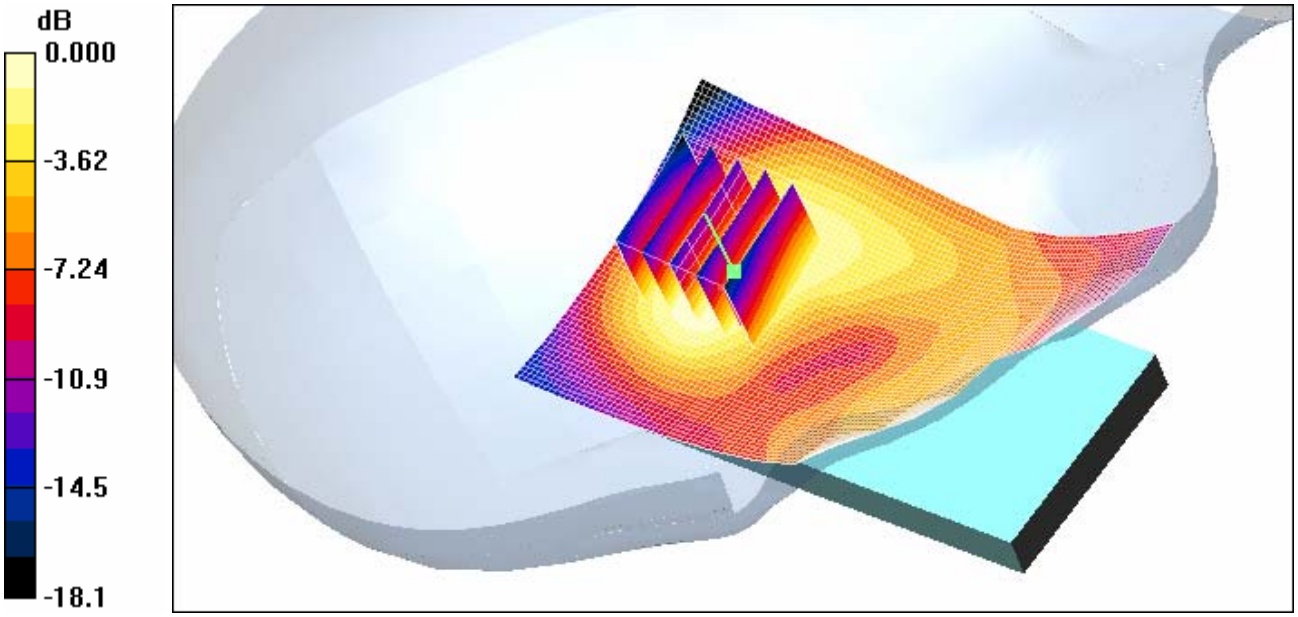
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.38 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right tilt 9400ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.226 mW/g

Right tilt 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.8 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.296 W/kg
SAR(1 g) = 0.199 mW/g; SAR(10 g) = 0.120 mW/g
Maximum value of SAR (measured) = 0.214 mW/g



0 dB = 0.214mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 6, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2462 MHz; σ = 1.86 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

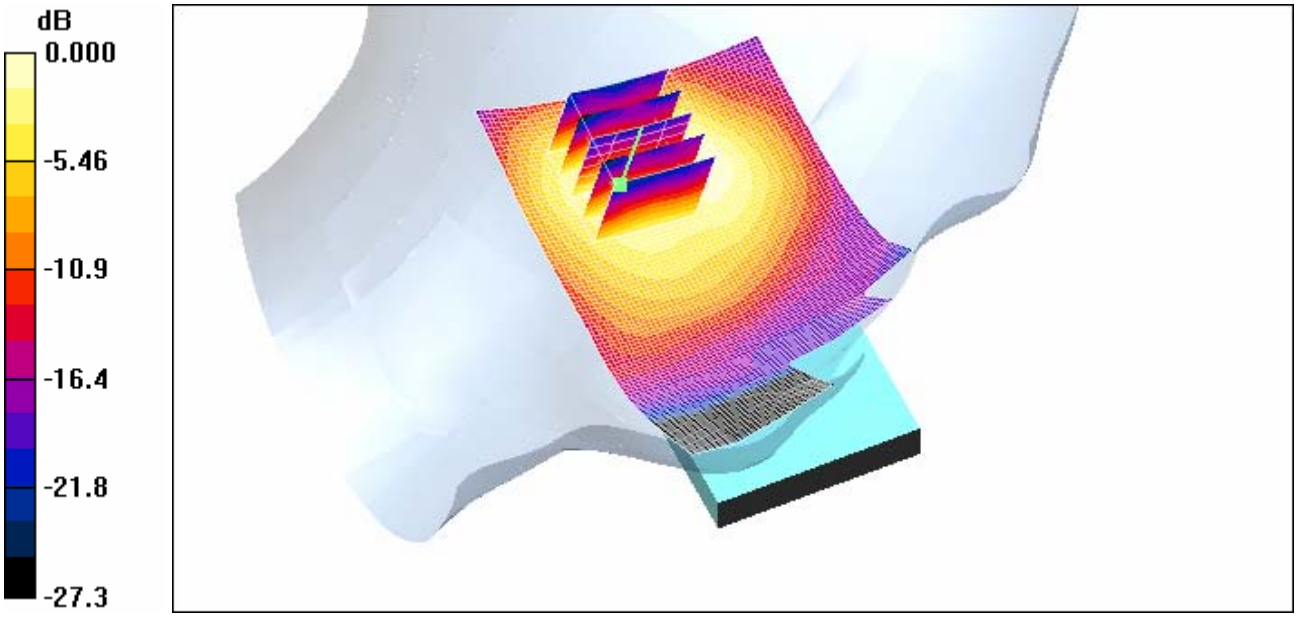
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.58, 4.58, 4.58); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 11/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.415 mW/g

Left touch 11/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.66 V/m; Power Drift = -0.099 dB
Peak SAR (extrapolated) = 0.758 W/kg
SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.168 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.388 mW/g



0 dB = 0.388mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Apr. 6, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2462 MHz; σ = 1.86 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

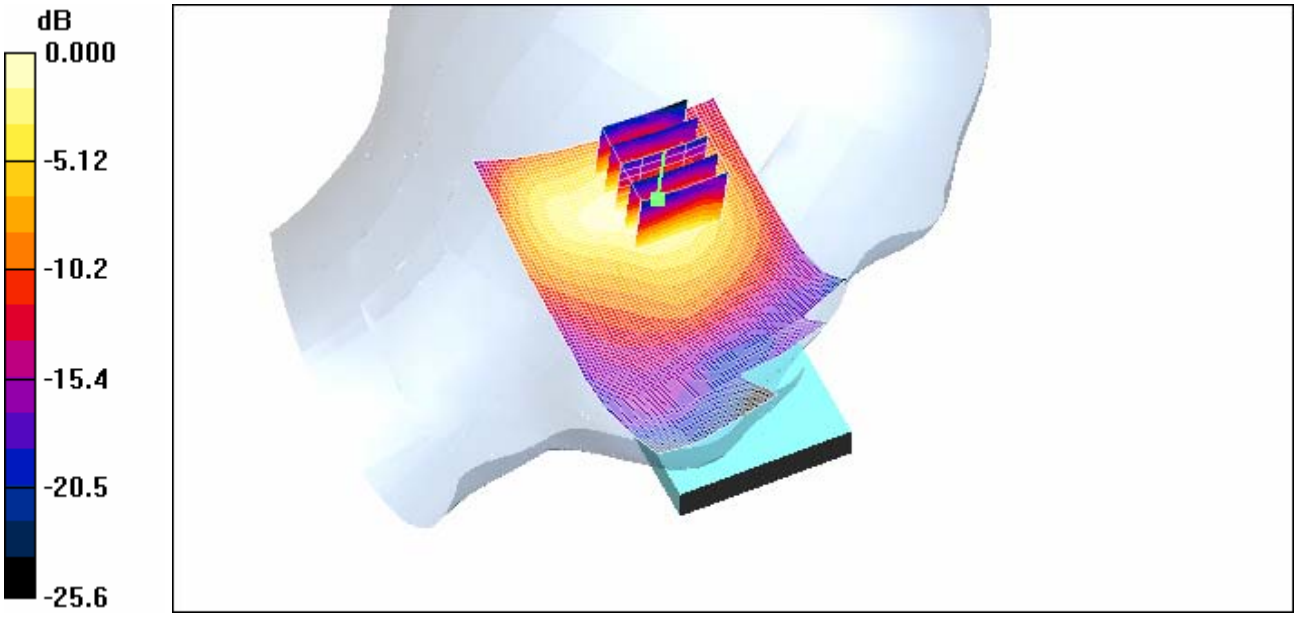
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.58, 4.58, 4.58); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left tilt 11/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.284 mW/g

Left tilt 11/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.04 V/m; Power Drift = -0.098 dB
Peak SAR (extrapolated) = 0.540 W/kg
SAR(1 g) = 0.239 mW/g; SAR(10 g) = 0.116 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.251 mW/g



0 dB = 0.251mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 6, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2462 MHz; σ = 1.86 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

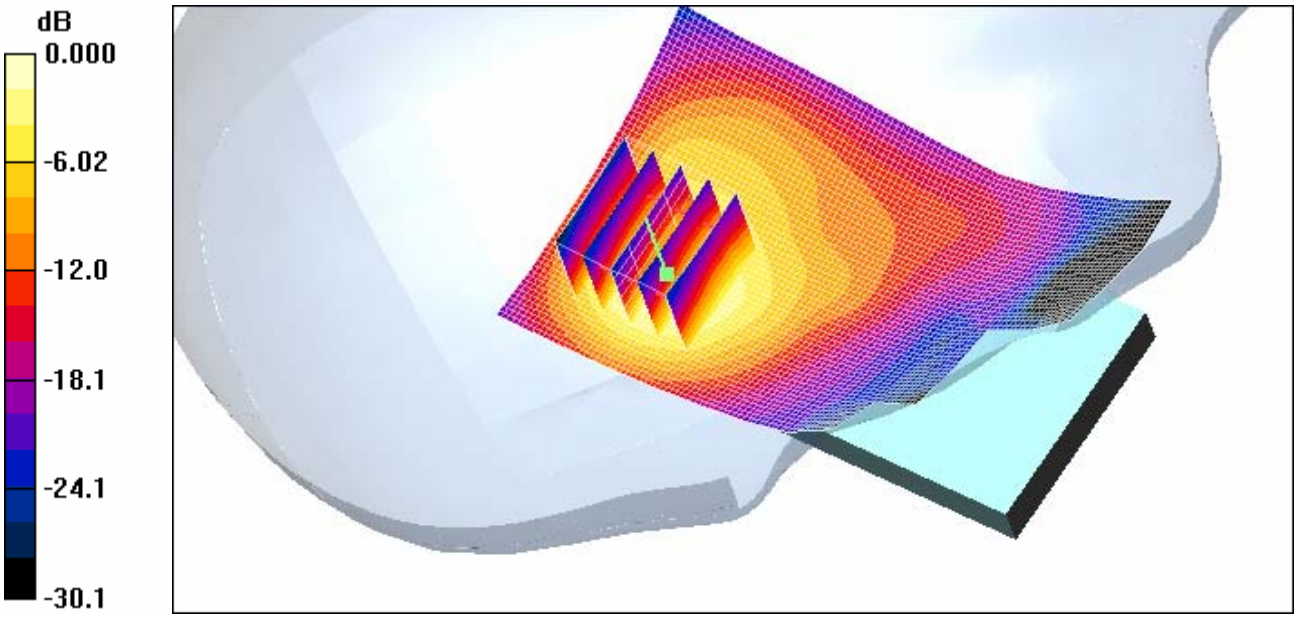
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.58, 4.58, 4.58); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 11/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.759 mW/g

Right touch 11/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.88 V/m; Power Drift = -0.144 dB
Peak SAR (extrapolated) = 1.88 W/kg
SAR(1 g) = 0.693 mW/g; SAR(10 g) = 0.305 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.716 mW/g



0 dB = 0.716mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 6, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2462 MHz; σ = 1.86 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

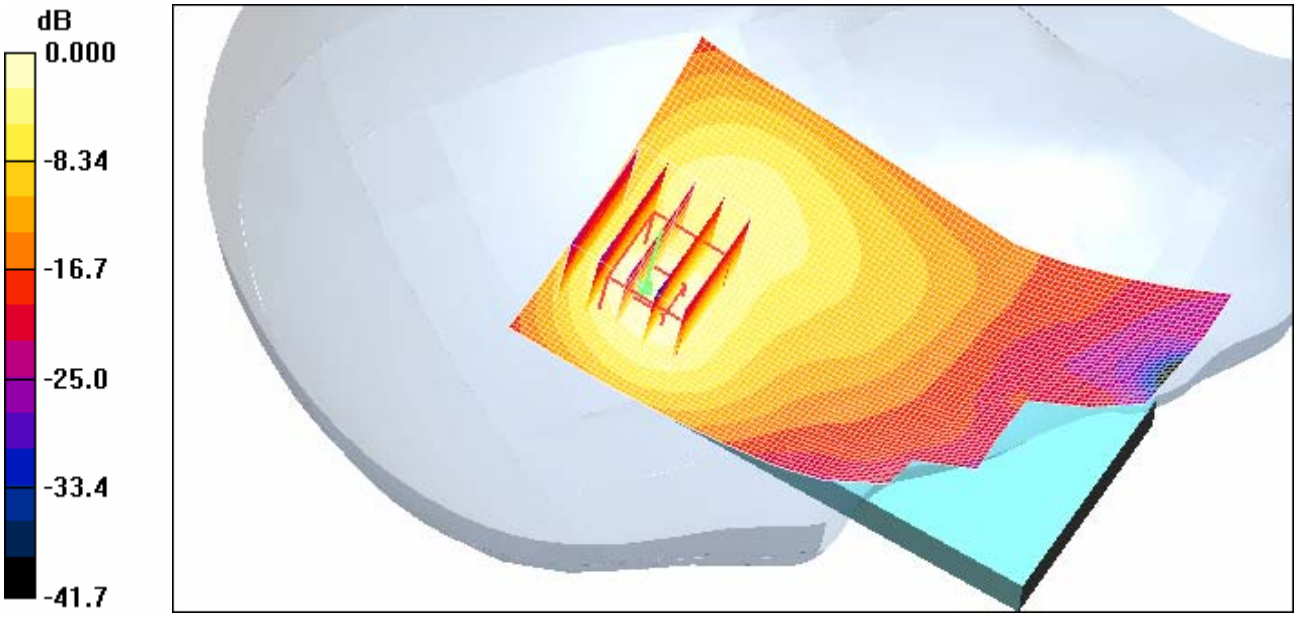
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.58, 4.58, 4.58); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right tilt11/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.421 mW/g

Right tilt11/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.87 V/m; Power Drift = -0.120 dB
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.381 mW/g; SAR(10 g) = 0.165 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.407 mW/g



0 dB = 0.407mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	back

DUT: LG-P990h; Type: bar; Serial: #1

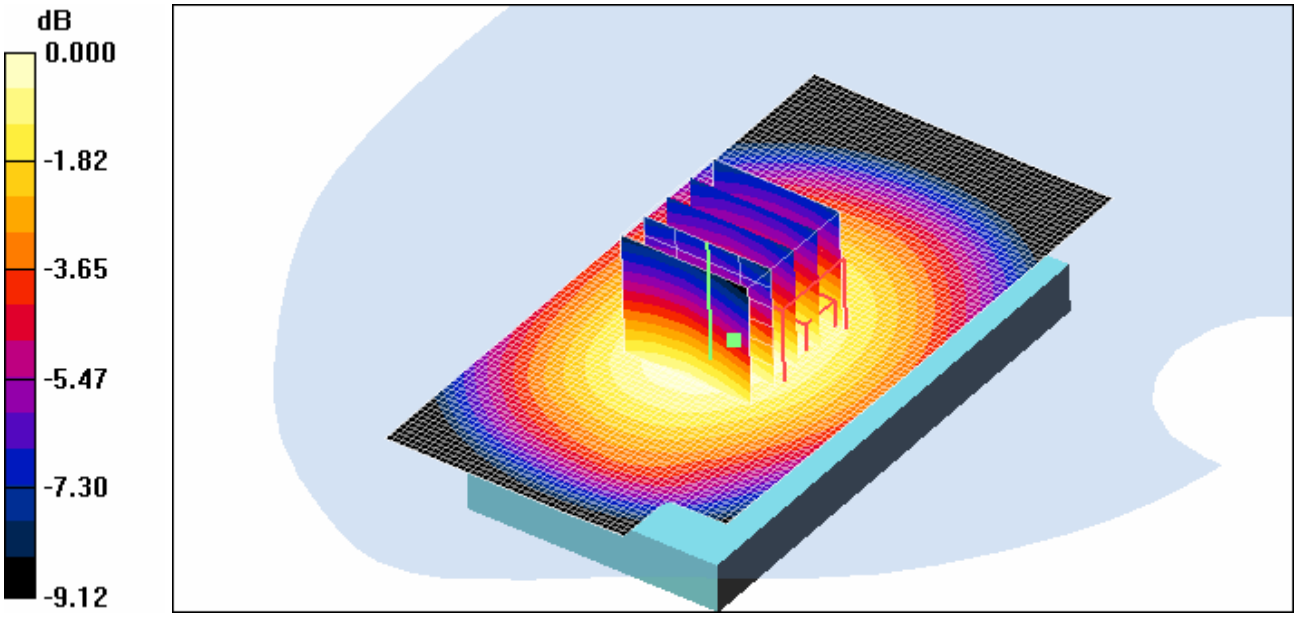
Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.982 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Back 190ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.791 mW/g

Body Back 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.9 V/m; Power Drift = 0.104 dB
Peak SAR (extrapolated) = 0.929 W/kg
SAR(1 g) = 0.715 mW/g; SAR(10 g) = 0.510 mW/g
Maximum value of SAR (measured) = 0.785 mW/g



0 dB = 0.785mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Front

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.982 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

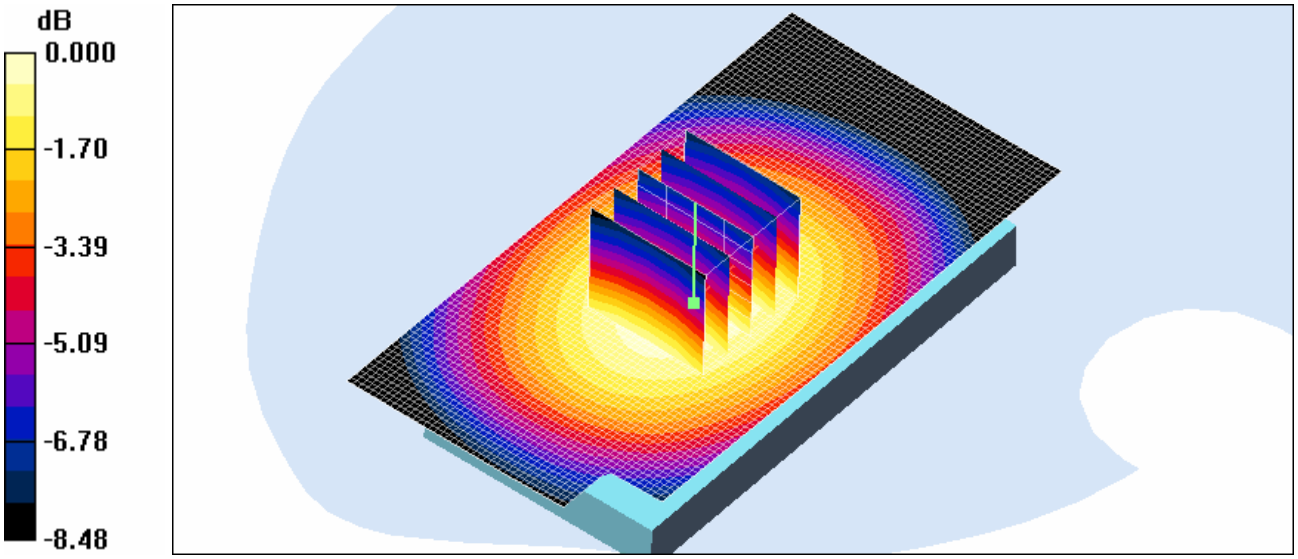
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Front 190ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.586 mW/g

Body Front 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.7 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 0.685 W/kg
SAR(1 g) = 0.559 mW/g; SAR(10 g) = 0.420 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.589 mW/g



0 dB = 0.589mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Left

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.982 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

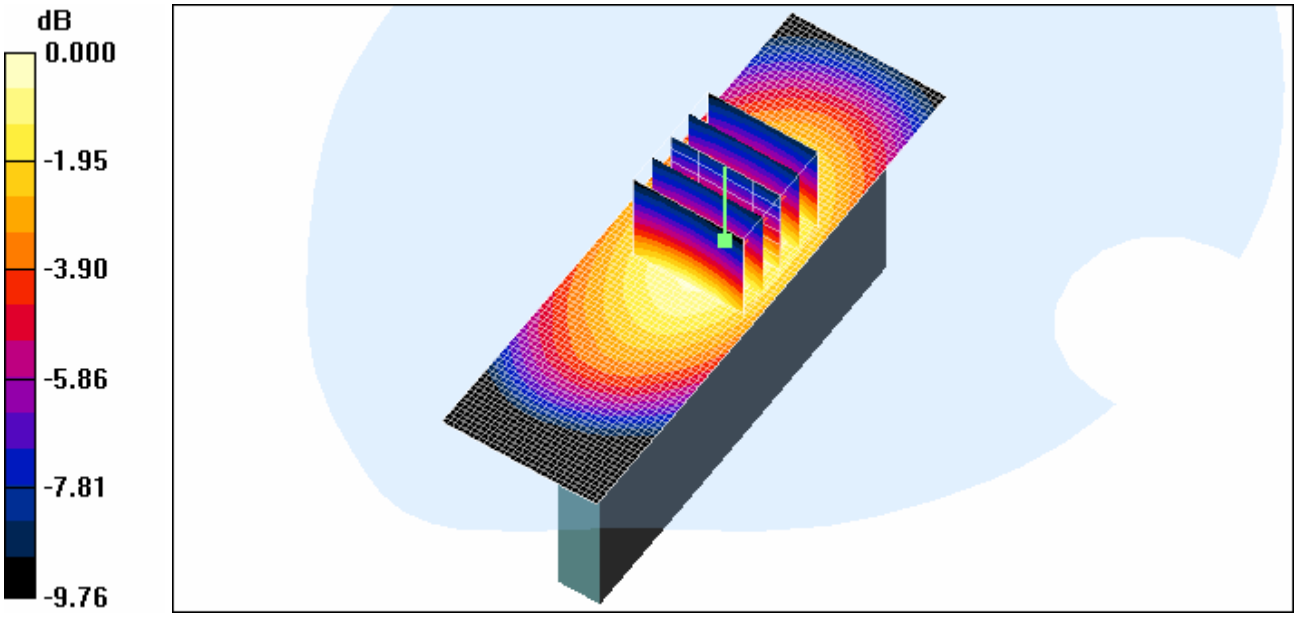
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Edge A 190ch/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.590 mW/g

Body Edge A 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.8 V/m; Power Drift = 0.091 dB
Peak SAR (extrapolated) = 0.778 W/kg
SAR(1 g) = 0.561 mW/g; SAR(10 g) = 0.385 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.603 mW/g



0 dB = 0.603mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Right

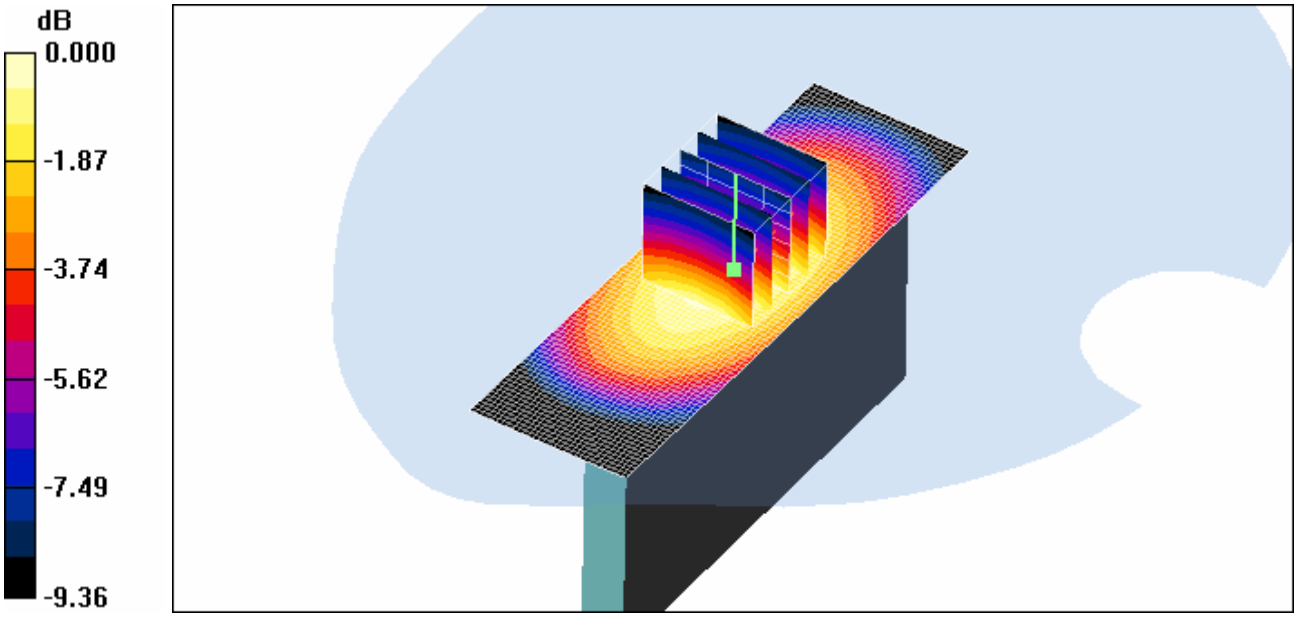
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:2.075
Medium parameters used: f = 825 MHz; σ = 0.972 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Edge B 128ch/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.751 mW/g

Body Edge B 128ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.6 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 0.976 W/kg
SAR(1 g) = 0.713 mW/g; SAR(10 g) = 0.495 mW/g
Maximum value of SAR (measured) = 0.765 mW/g



0 dB = 0.765mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Right

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.982 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

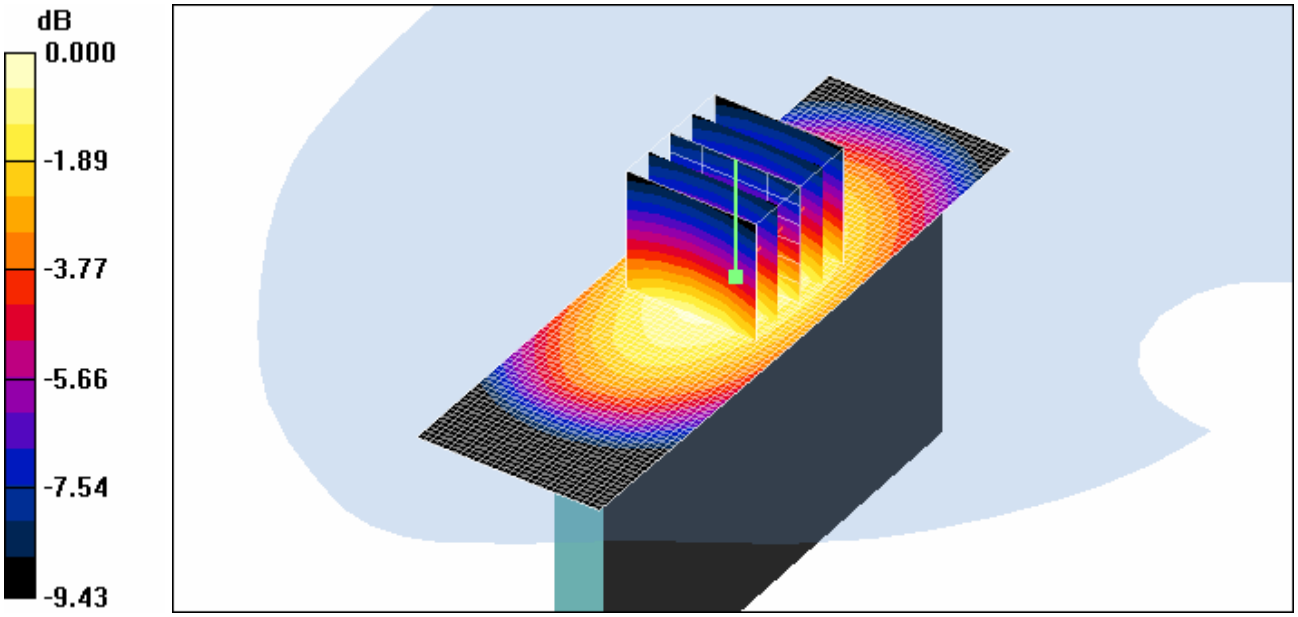
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Edge B 190ch/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.867 mW/g

Body Edge B 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.1 V/m; Power Drift = 0.022 dB
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.826 mW/g; SAR(10 g) = 0.571 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.886 mW/g



0 dB = 0.886mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Right

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 848.8 MHz;Duty Cycle: 1:2.075
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.991 mho/m; ε_r = 56.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

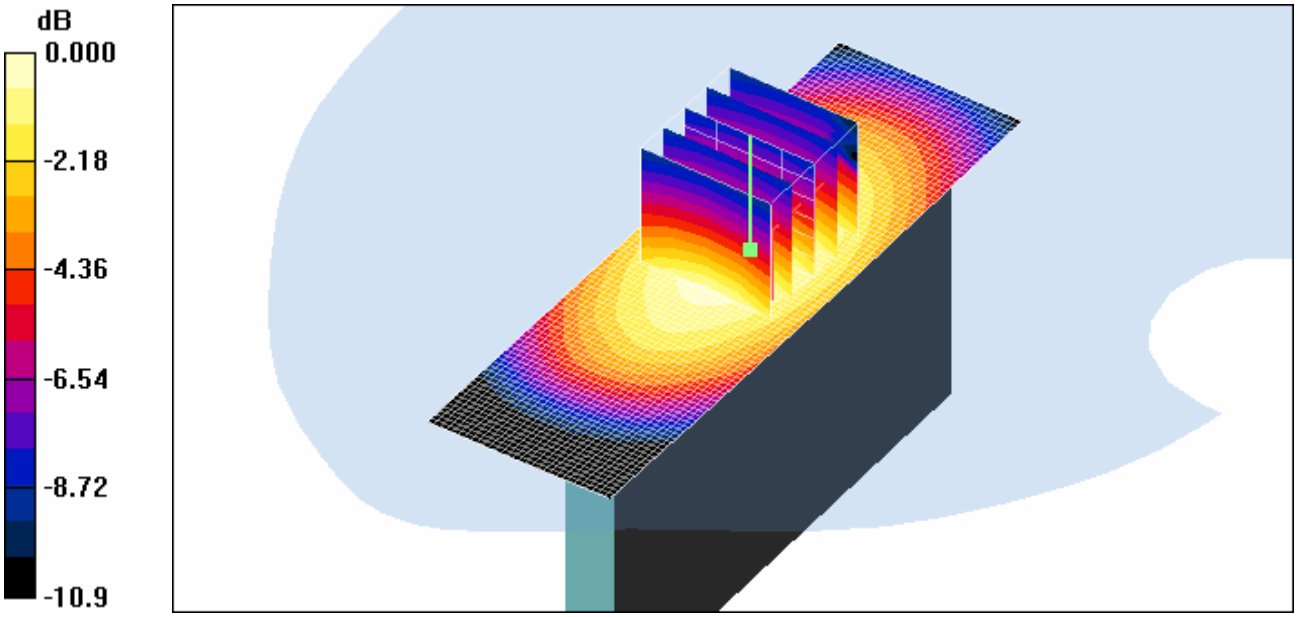
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Edge B 251ch/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.957 mW/g

Body Edge B 251ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.4 V/m; Power Drift = -0.043 dB
Peak SAR (extrapolated) = 1.24 W/kg
SAR(1 g) = 0.902 mW/g; SAR(10 g) = 0.624 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.960 mW/g



0 dB = 0.960mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Bottom

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:2.075
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.982 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

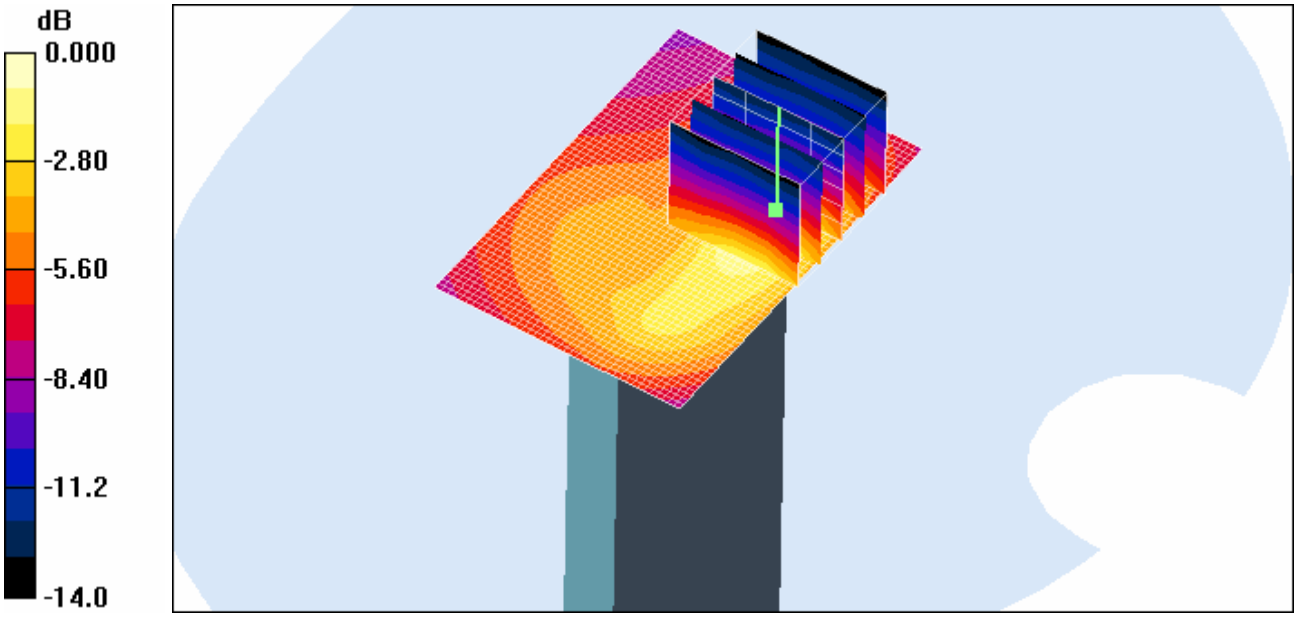
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Bottom 190ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.180 mW/g

Body Bottom 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.9 V/m; Power Drift = -0.088 dB
Peak SAR (extrapolated) = 0.345 W/kg
SAR(1 g) = 0.147 mW/g; SAR(10 g) = 0.076 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.165 mW/g



0 dB = 0.165mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011
Option	Rear

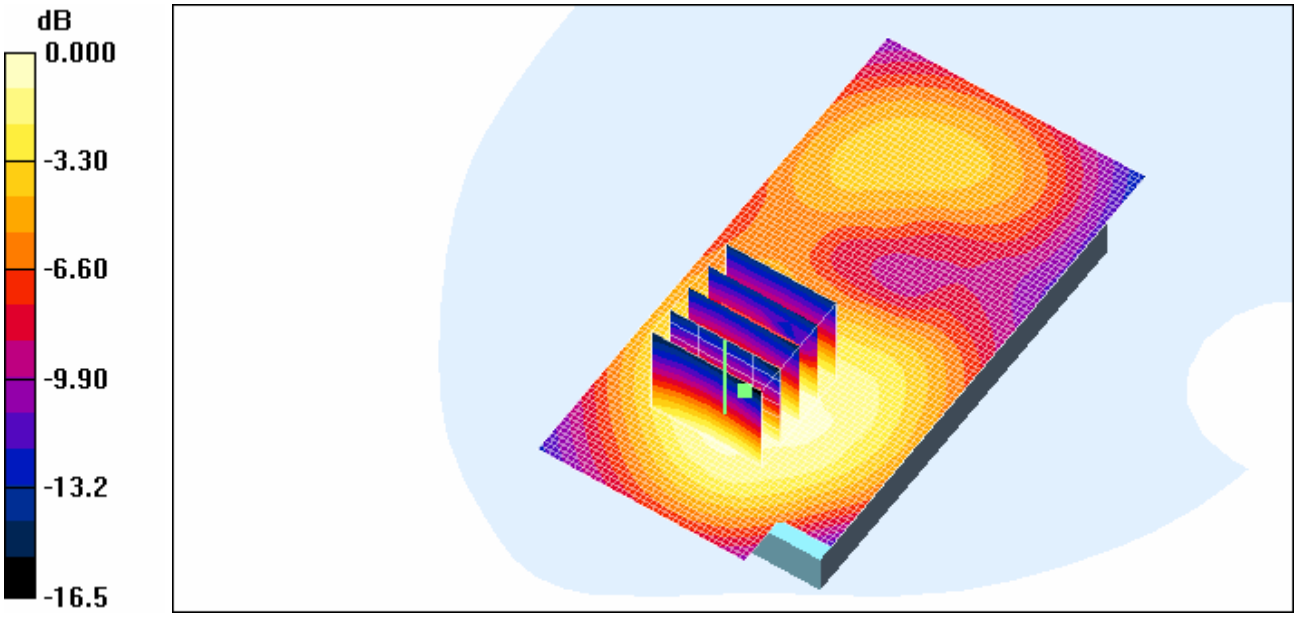
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Rear 661ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.525 mW/g

Body Rear 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.4 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 0.681 W/kg
SAR(1 g) = 0.472 mW/g; SAR(10 g) = 0.286 mW/g
Maximum value of SAR (measured) = 0.514 mW/g



0 dB = 0.514mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011
Option	Front

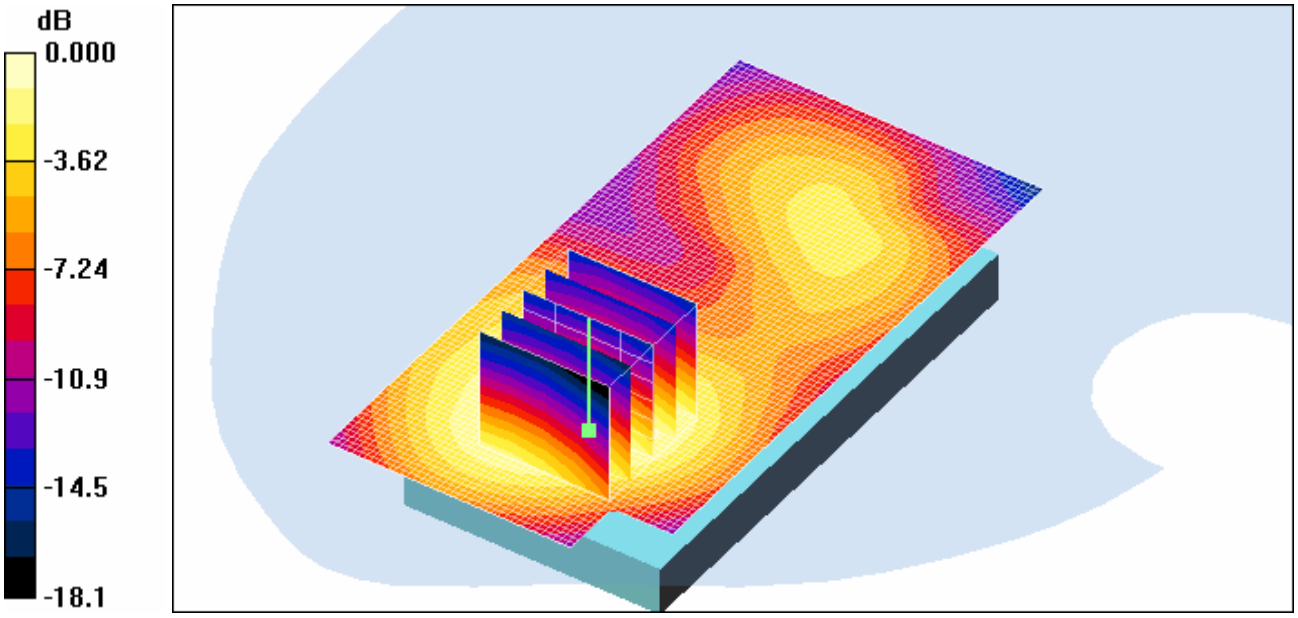
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Front 661ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.543 mW/g

Body Front 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.8 V/m; Power Drift = -0.085 dB
Peak SAR (extrapolated) = 0.671 W/kg
SAR(1 g) = 0.477 mW/g; SAR(10 g) = 0.290 mW/g
Maximum value of SAR (measured) = 0.521 mW/g



0 dB = 0.521mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011
Option	Left

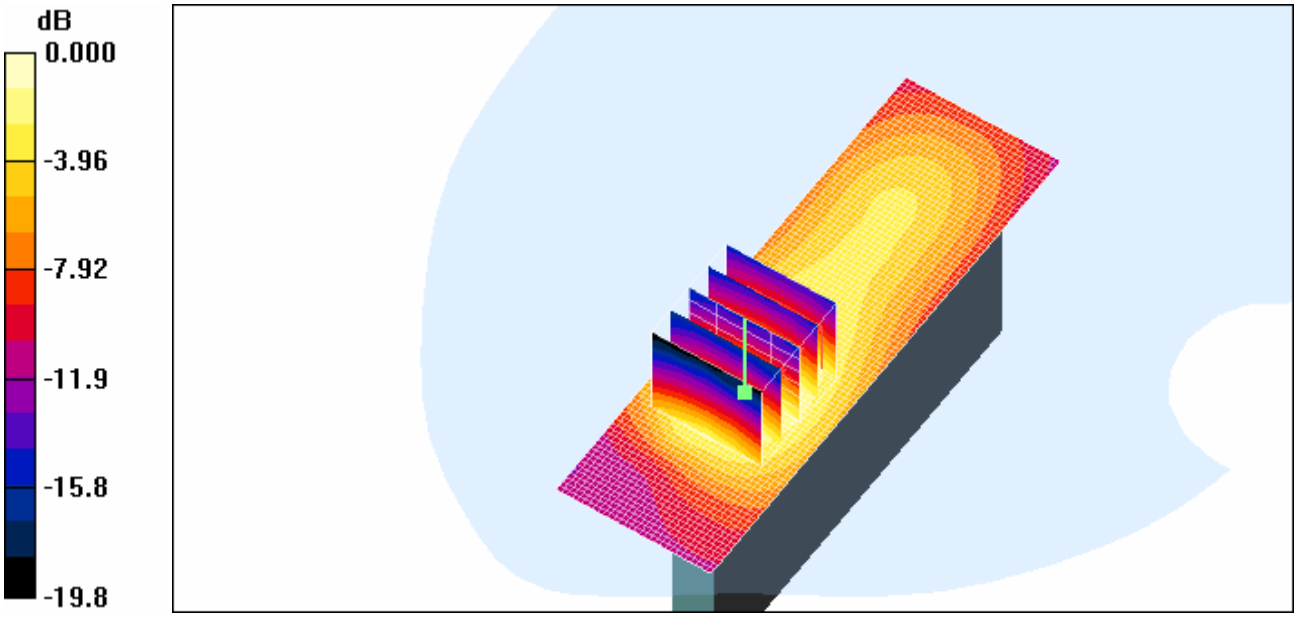
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Edge A 661ch/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.399 mW/g

Body Edge A 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = 0.108 dB
Peak SAR (extrapolated) = 0.424 W/kg
SAR(1 g) = 0.307 mW/g; SAR(10 g) = 0.177 mW/g
Maximum value of SAR (measured) = 0.347 mW/g



0 dB = 0.347mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011
Option	Right

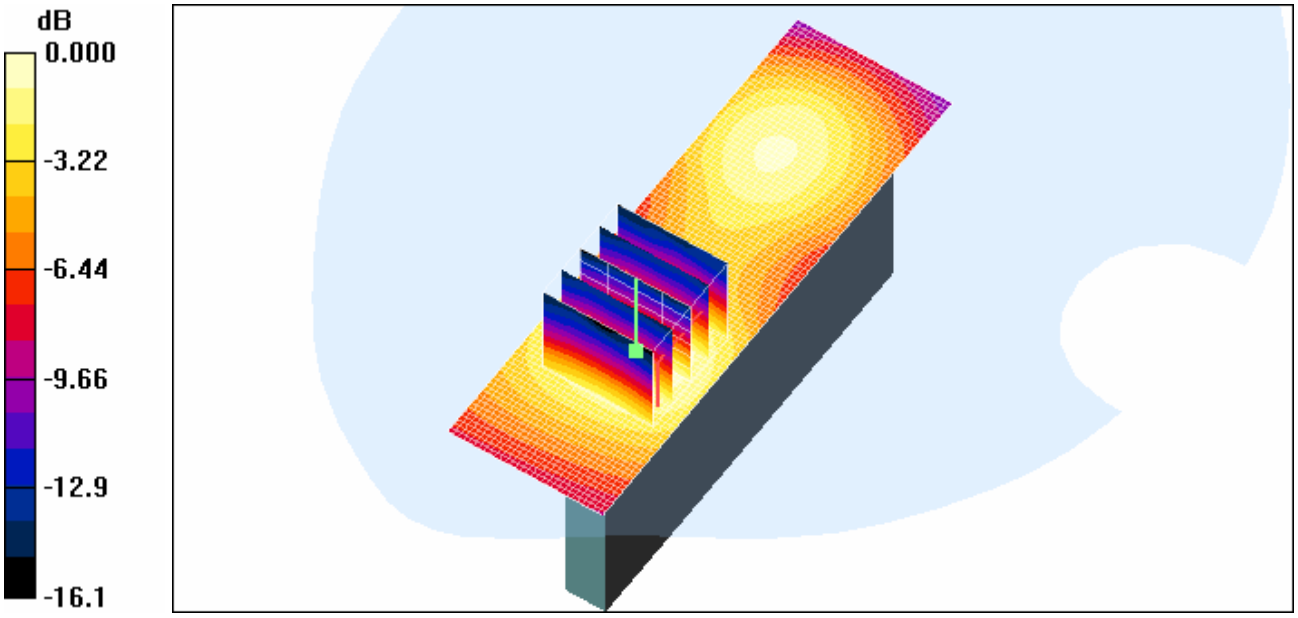
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Edge B 661ch/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.241 mW/g

Body Edge B 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.1 V/m; Power Drift = -0.008 dB
Peak SAR (extrapolated) = 0.316 W/kg
SAR(1 g) = 0.216 mW/g; SAR(10 g) = 0.128 mW/g
Maximum value of SAR (measured) = 0.236 mW/g



0 dB = 0.236mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011
Option	Bottom

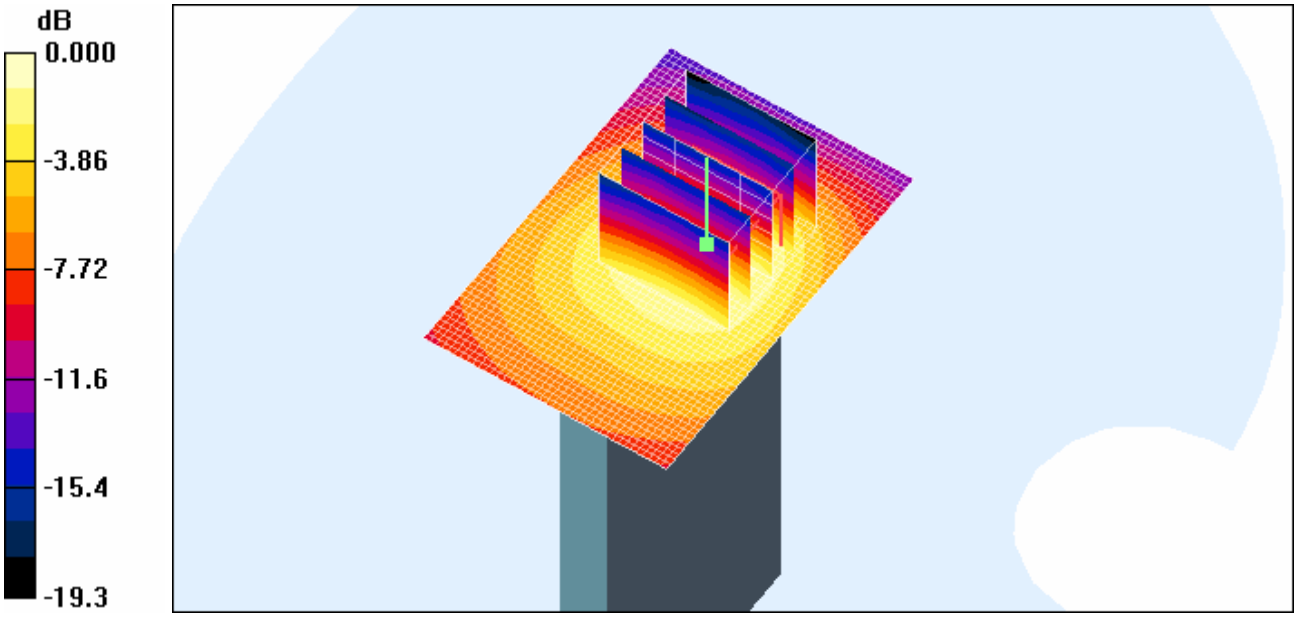
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Edge C 661ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.432 mW/g

Body Edge C 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.1 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 0.589 W/kg
SAR(1 g) = 0.374 mW/g; SAR(10 g) = 0.209 mW/g
Maximum value of SAR (measured) = 0.417 mW/g



0 dB = 0.417mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Back

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 826.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.974 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

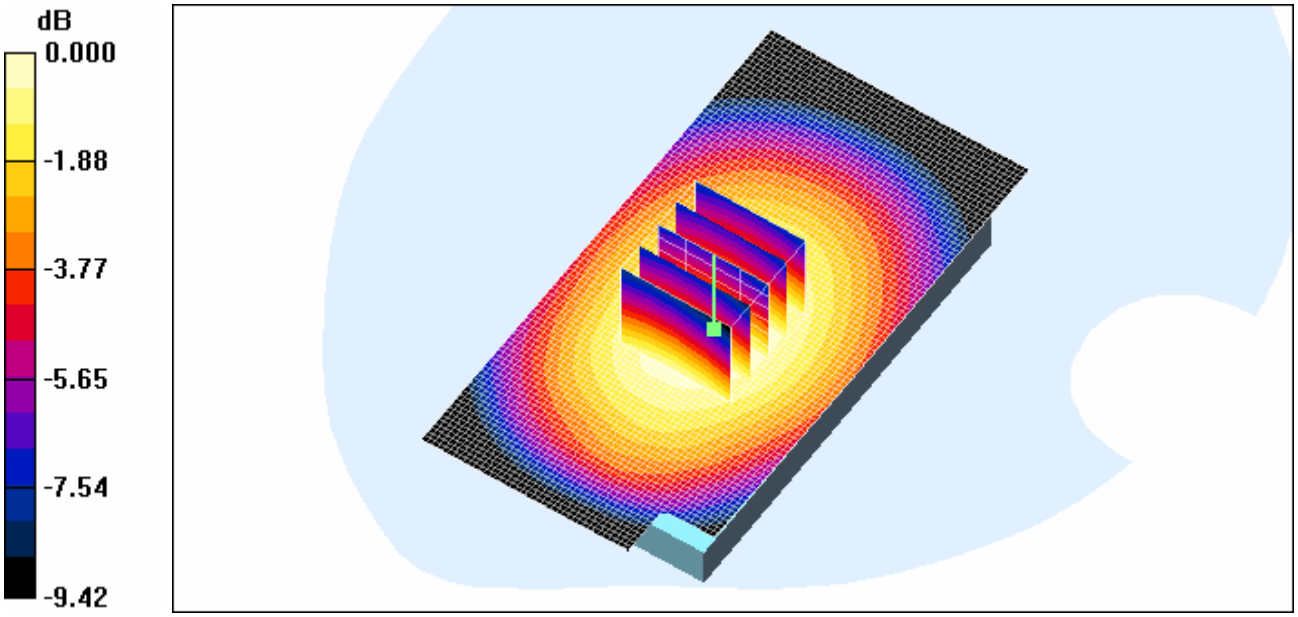
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Back 4132ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.752 mW/g

Body Back 4132ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.8 V/m; Power Drift = -0.066 dB
Peak SAR (extrapolated) = 0.863 W/kg
SAR(1 g) = 0.699 mW/g; SAR(10 g) = 0.523 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.740 mW/g



0 dB = 0.740mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Back

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.982 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

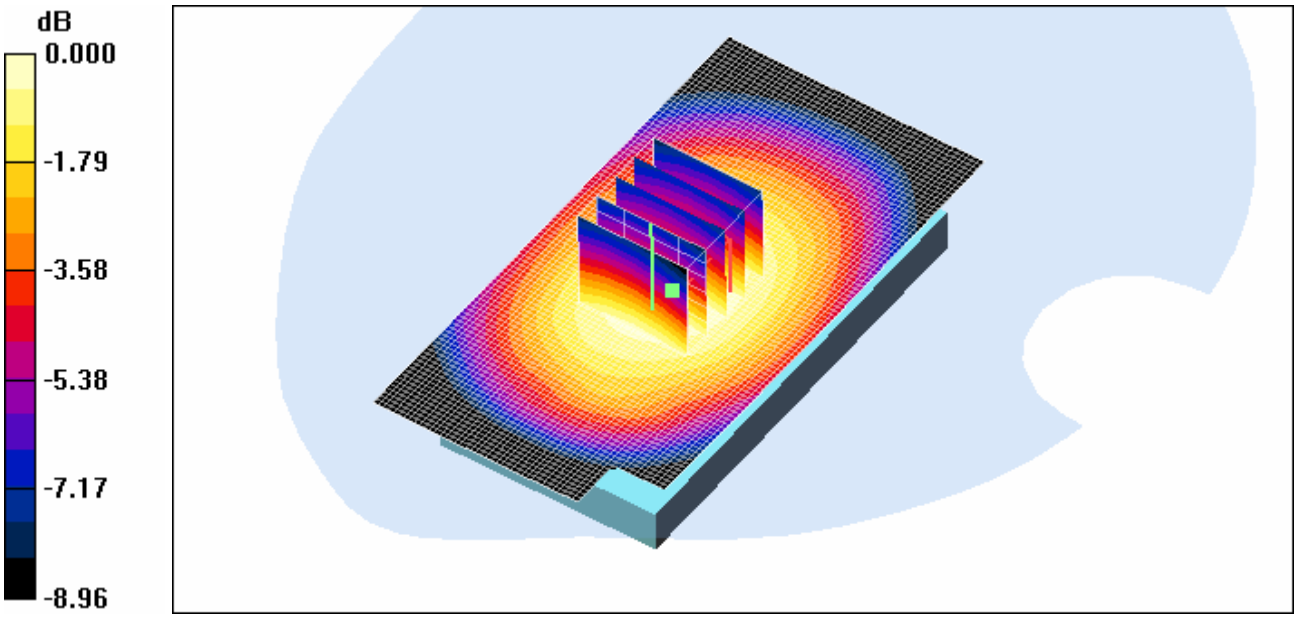
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Back 4183ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.898 mW/g

Body Back 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.1 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.847 mW/g; SAR(10 g) = 0.633 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.892 mW/g



0 dB = 0.892mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Back

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 846.4 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 846.4 MHz; σ = 0.99 mho/m; ε_r = 56.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

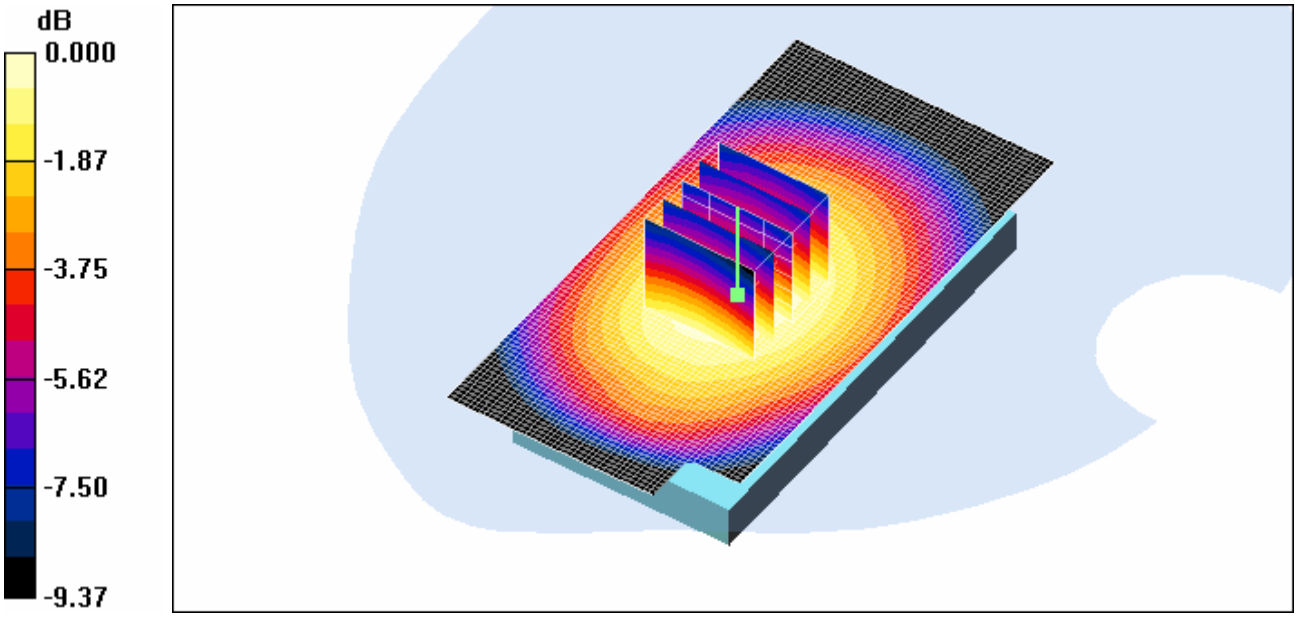
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Back 4233ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.854 mW/g

Body Back 4233ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.1 V/m; Power Drift = 0.025 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.821 mW/g; SAR(10 g) = 0.611 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.867 mW/g



0 dB = 0.867mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Front

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.982 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

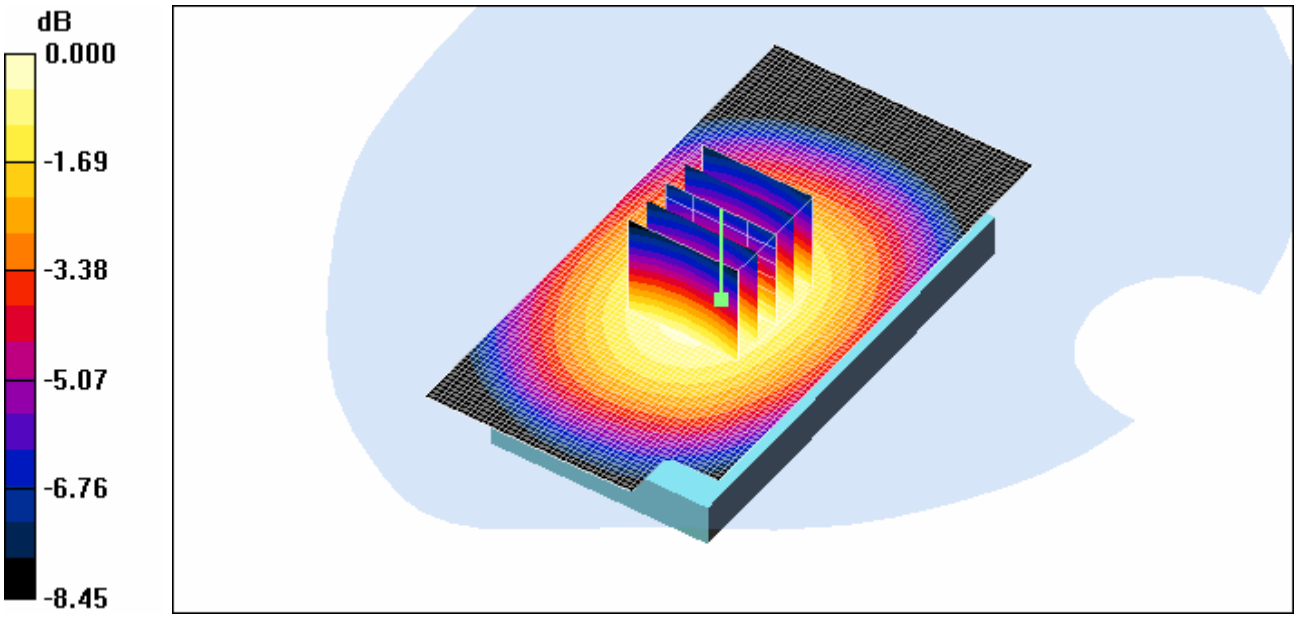
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Front 4183ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.631 mW/g

Body Front 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.5 V/m; Power Drift = 0.024 dB
Peak SAR (extrapolated) = 0.749 W/kg
SAR(1 g) = 0.613 mW/g; SAR(10 g) = 0.462 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.646 mW/g



0 dB = 0.646mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Left

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.982 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

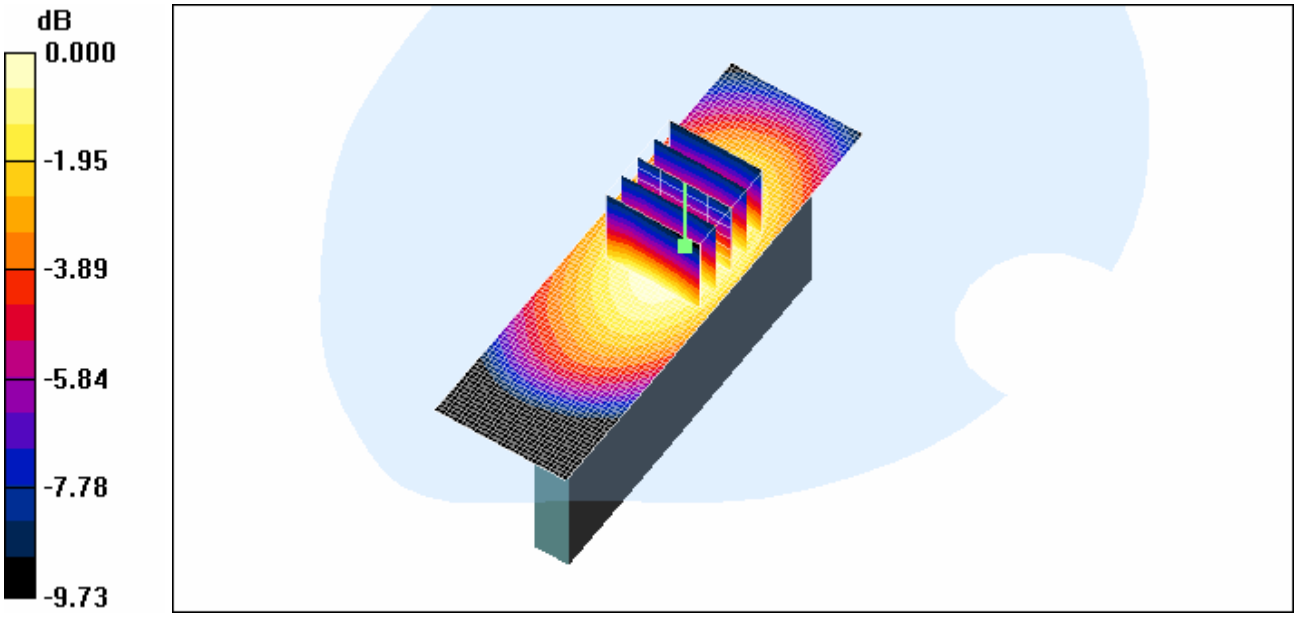
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Edge A 4183ch/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.599 mW/g

Body Edge A 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.2 V/m; Power Drift = -0.088 dB
Peak SAR (extrapolated) = 0.715 W/kg
SAR(1 g) = 0.523 mW/g; SAR(10 g) = 0.361 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.558 mW/g



0 dB = 0.558mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Right

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.982 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

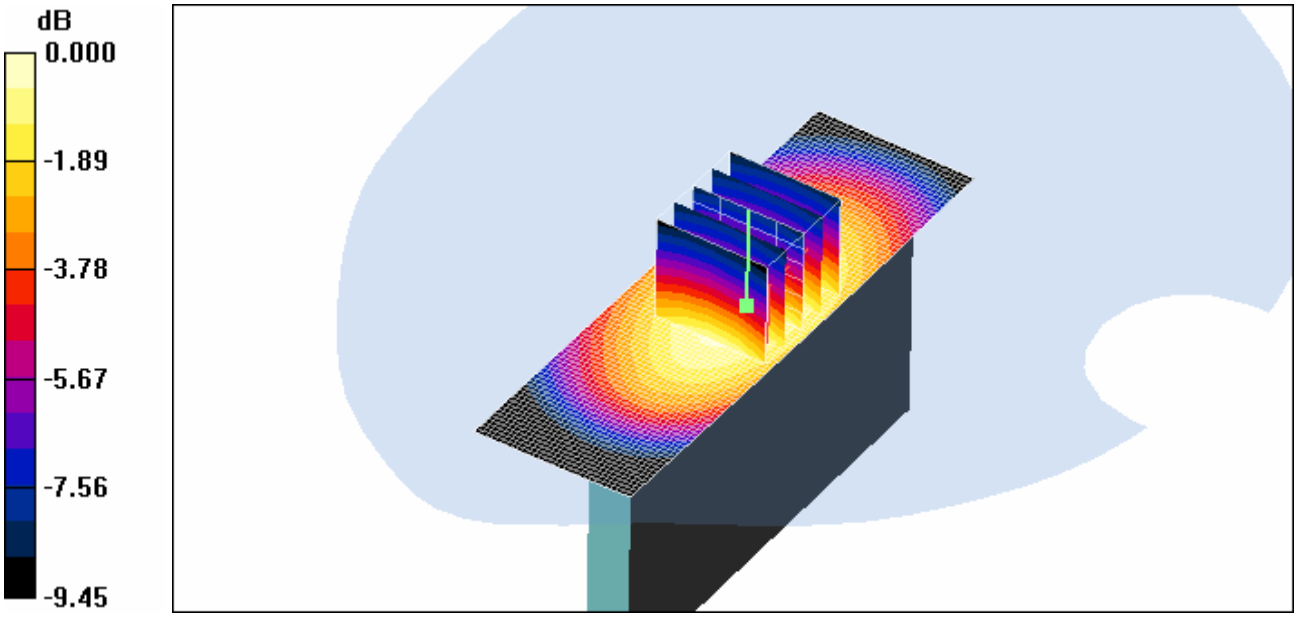
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Edge B 4183ch/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.752 mW/g

Body Edge B 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.4 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 0.949 W/kg
SAR(1 g) = 0.704 mW/g; SAR(10 g) = 0.493 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.754 mW/g



0 dB = 0.754mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Bottom

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.982 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

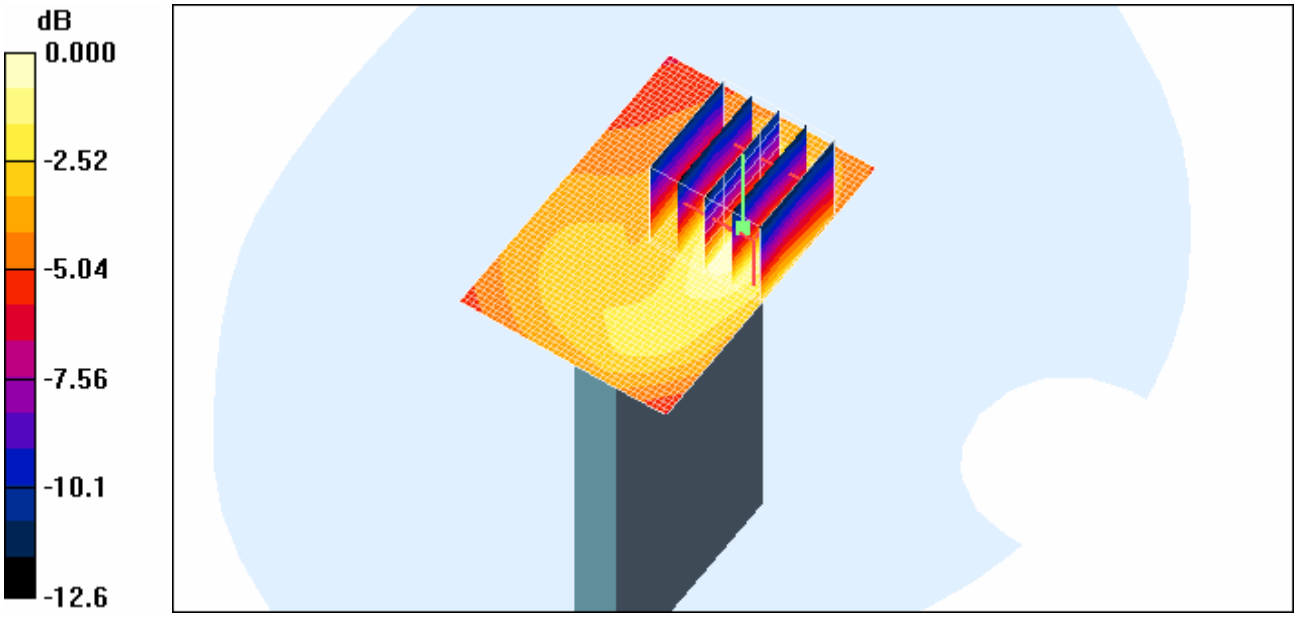
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Edge C 4183ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.090 mW/g

Body Edge C 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.09 V/m; Power Drift = -0.077 dB
Peak SAR (extrapolated) = 0.148 W/kg
SAR(1 g) = 0.077 mW/g; SAR(10 g) = 0.045 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.085 mW/g



0 dB = 0.085mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011
Option	Back

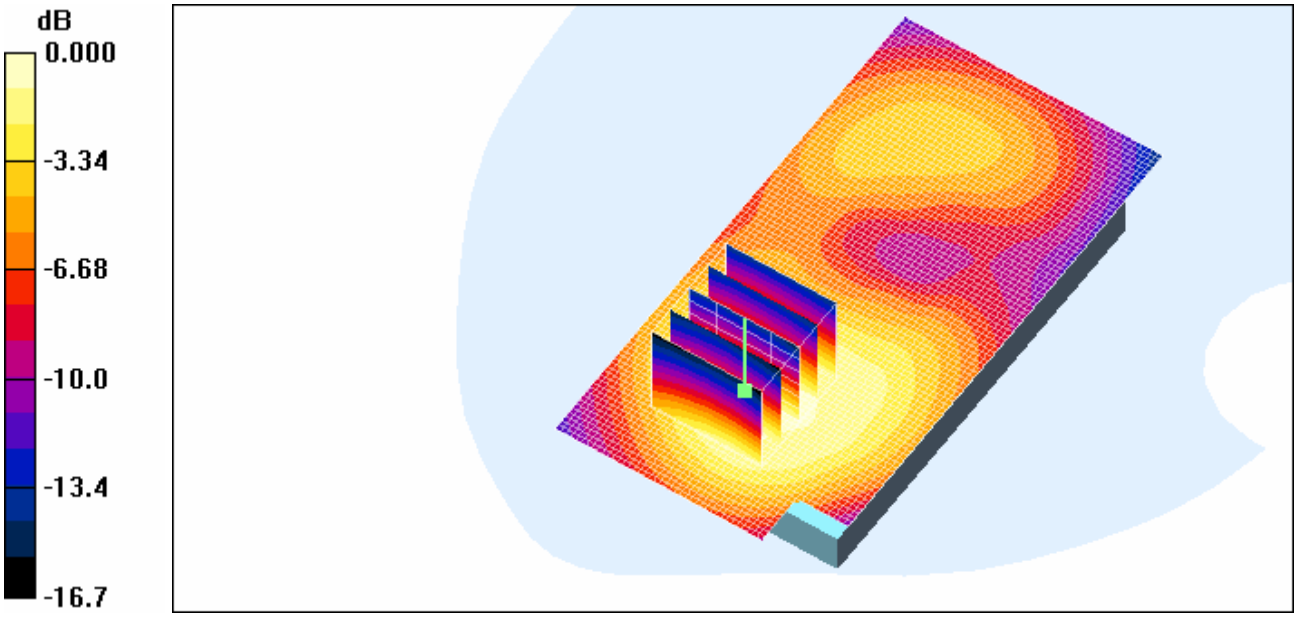
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Back 9400ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.614 mW/g

Body Back 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.7 V/m; Power Drift = -0.011 dB
Peak SAR (extrapolated) = 0.791 W/kg
SAR(1 g) = 0.554 mW/g; SAR(10 g) = 0.338 mW/g
Maximum value of SAR (measured) = 0.611 mW/g



0 dB = 0.611mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011
Option	Front

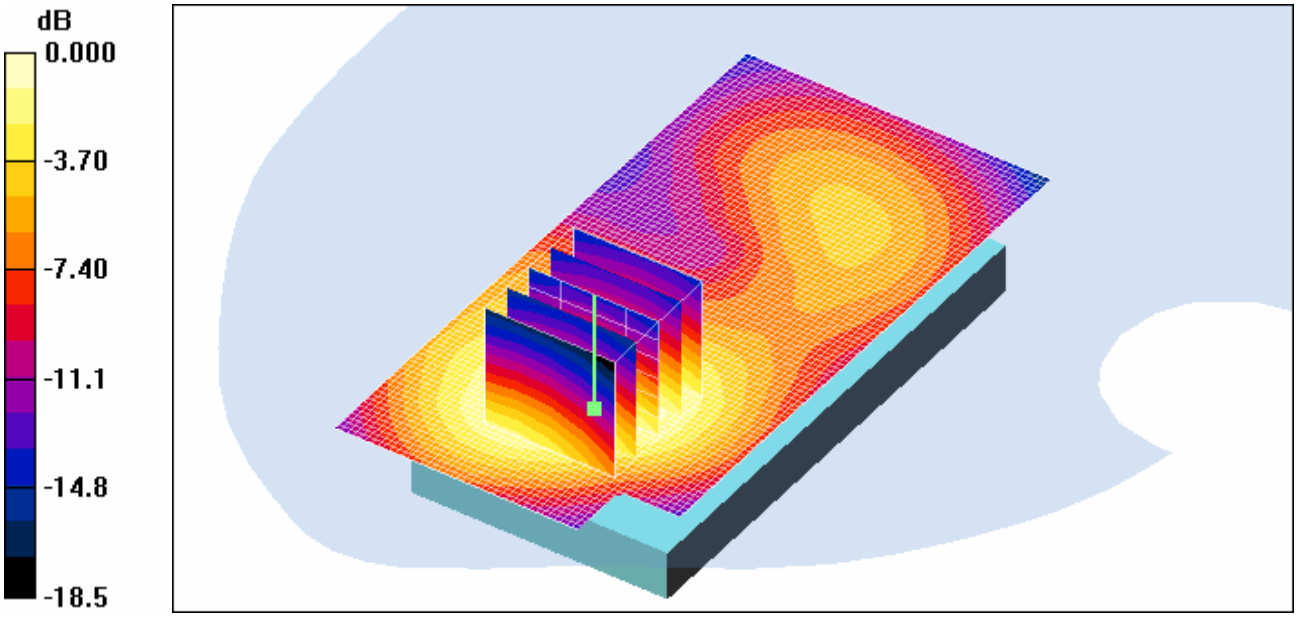
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Front 9400ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.770 mW/g

Body Front 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = 0.029 dB
Peak SAR (extrapolated) = 0.965 W/kg
SAR(1 g) = 0.688 mW/g; SAR(10 g) = 0.412 mW/g
Maximum value of SAR (measured) = 0.762 mW/g



0 dB = 0.762mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011
Option	Left

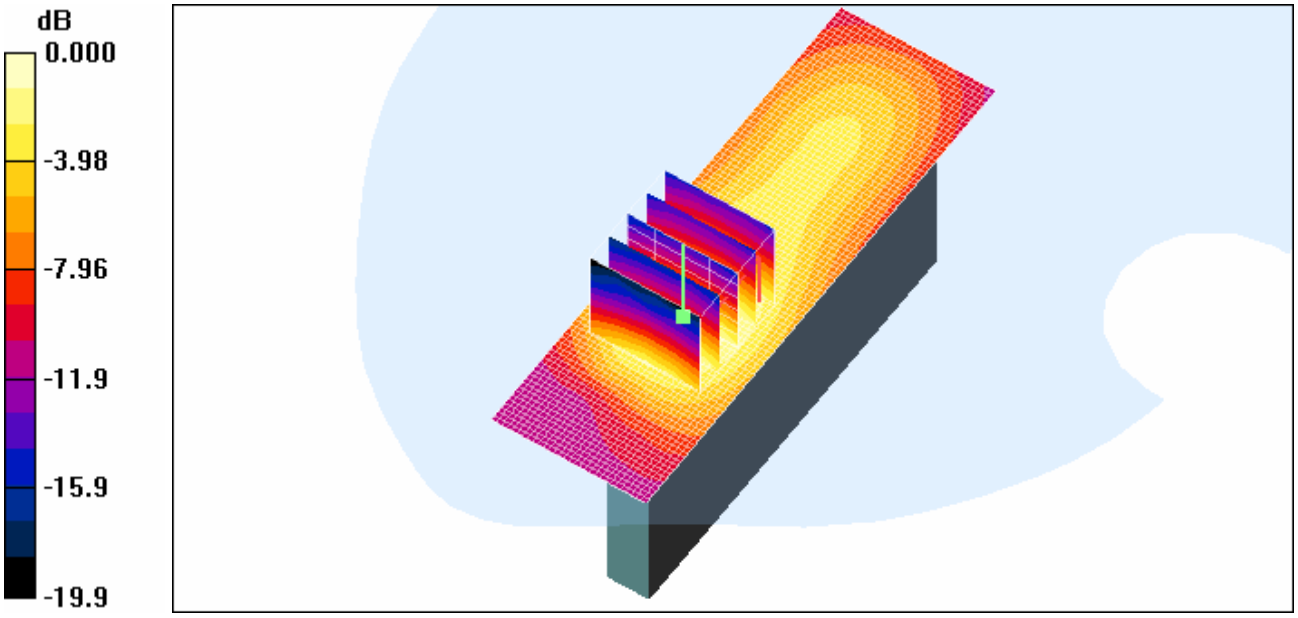
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Edge A 9400/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.501 mW/g

Body Edge A 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.5 V/m; Power Drift = 0.014 dB
Peak SAR (extrapolated) = 0.575 W/kg
SAR(1 g) = 0.386 mW/g; SAR(10 g) = 0.223 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 GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011
Option	Right

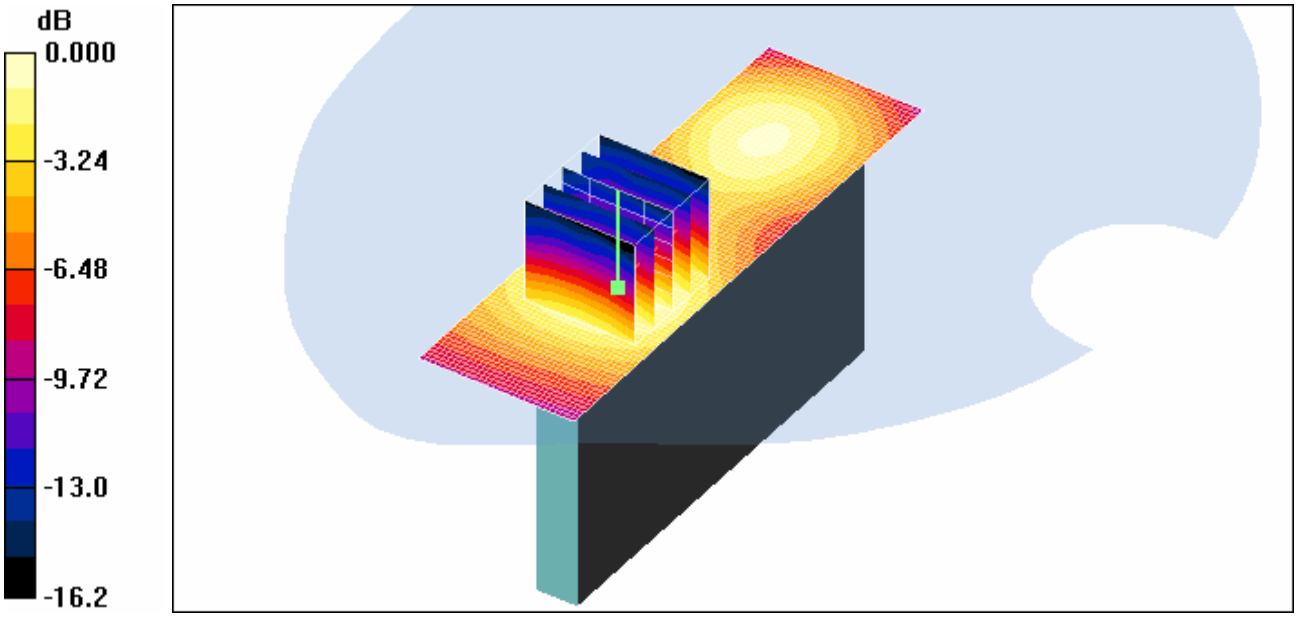
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Edge B 9400/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.298 mW/g

Body Edge B 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.3 V/m; Power Drift = -0.157 dB
Peak SAR (extrapolated) = 0.384 W/kg
SAR(1 g) = 0.260 mW/g; SAR(10 g) = 0.153 mW/g
Maximum value of SAR (measured) = 0.288 mW/g



0 dB = 0.288mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011
Option	Bottom

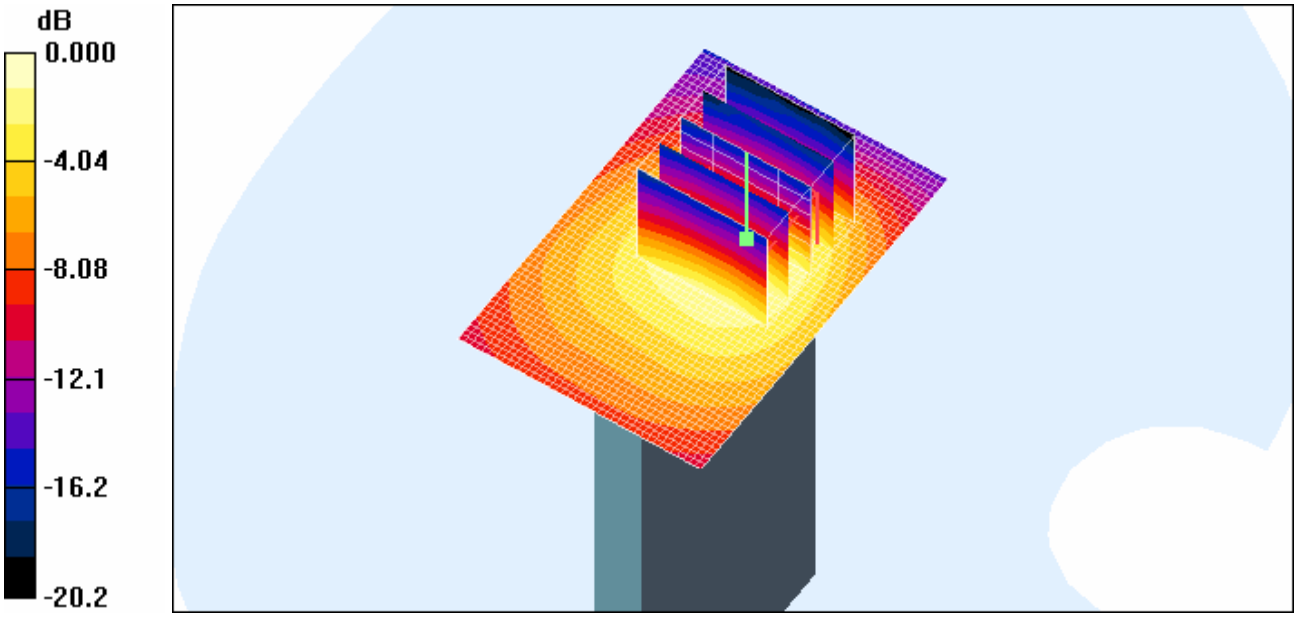
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Edge C 9400ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.792 mW/g

Body Edge C 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.1 V/m; Power Drift = -0.043 dB
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.654 mW/g; SAR(10 g) = 0.353 mW/g
Maximum value of SAR (measured) = 0.727 mW/g



0 dB = 0.727mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 6, 2011
Option	Back

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2462 MHz; σ = 1.94 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

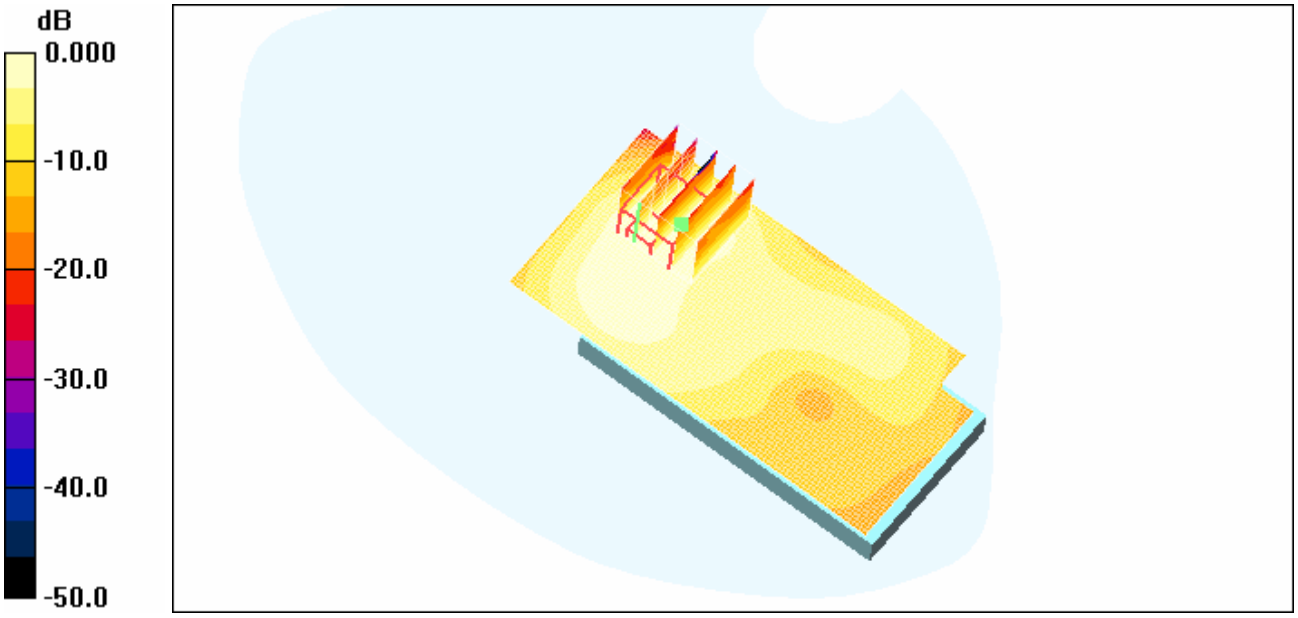
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.15, 4.15, 4.15); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Back 11ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.237 mW/g

Body Back 11ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.5 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 0.578 W/kg
SAR(1 g) = 0.226 mW/g; SAR(10 g) = 0.107 mW/g

Maximum value of SAR (measured) = 0.248 mW/g



0 dB = 0.248mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 6, 2011
Option	Front

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2462 MHz; σ = 1.94 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

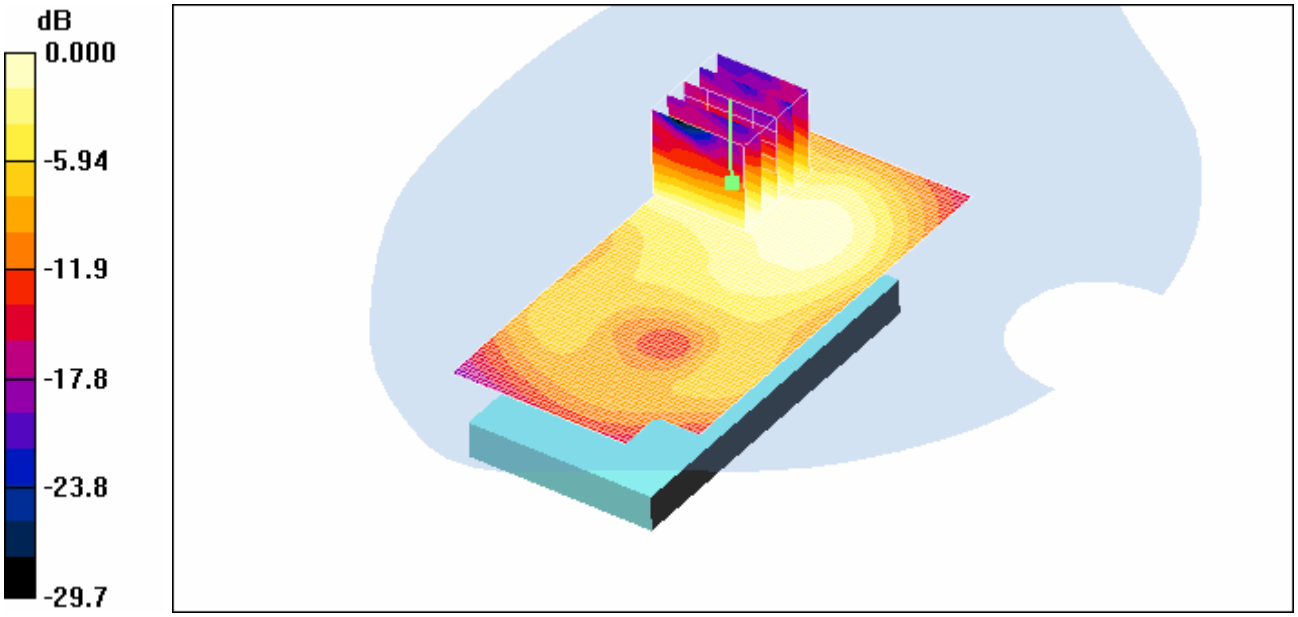
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.15, 4.15, 4.15); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Front 11ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

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

Body Front 11ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.93 V/m; Power Drift = 0.061 dB
Peak SAR (extrapolated) = 0.475 W/kg
SAR(1 g) = 0.198 mW/g; SAR(10 g) = 0.098 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.209 mW/g



0 dB = 0.209mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 6, 2011
Option	Left

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2462 MHz; σ = 1.94 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

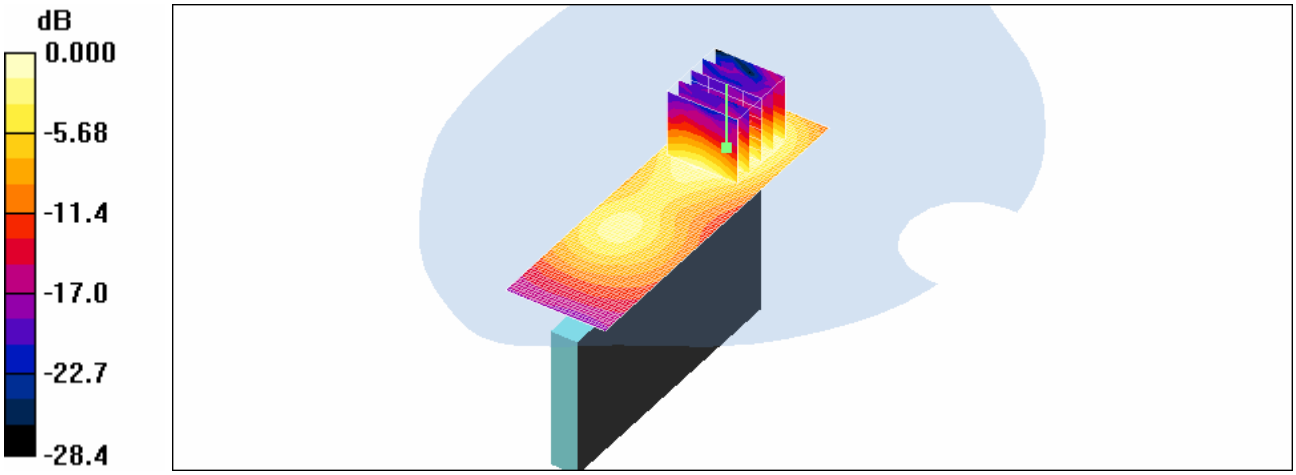
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.15, 4.15, 4.15); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body 11/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.250 mW/g

Body 11/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.4 V/m; Power Drift = -0.156 dB
Peak SAR (extrapolated) = 0.623 W/kg
SAR(1 g) = 0.236 mW/g; SAR(10 g) = 0.110 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 GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 6, 2011
Option	Top

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2462 MHz; σ = 1.94 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

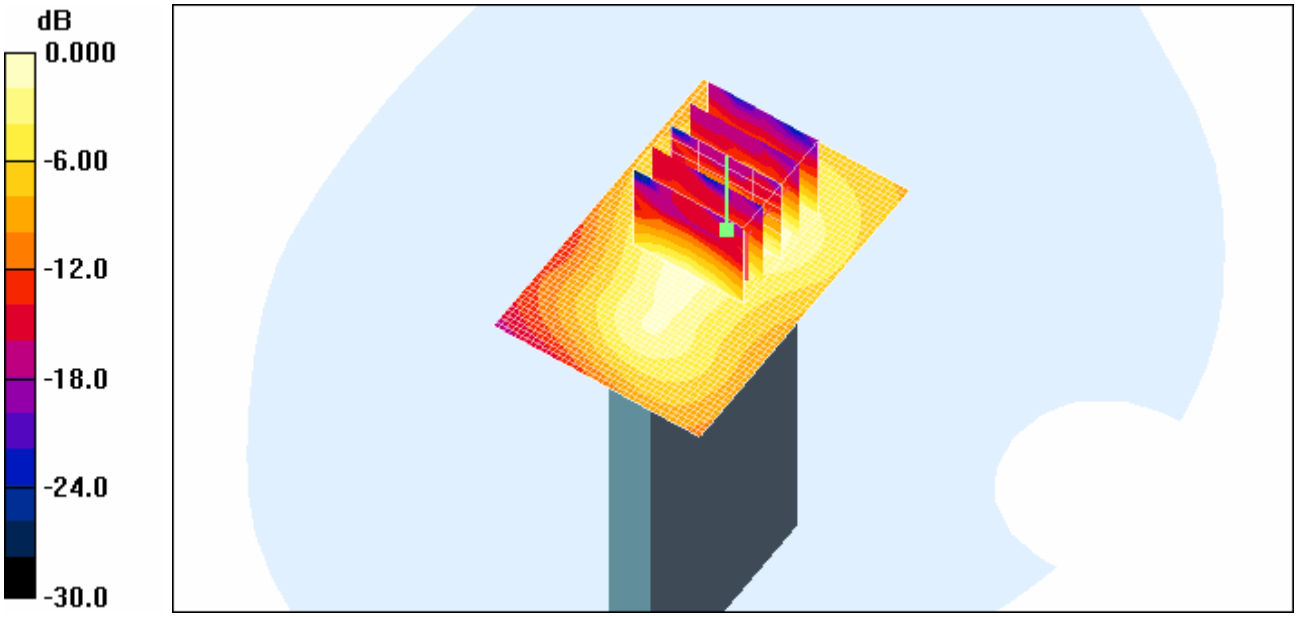
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.15, 4.15, 4.15); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Edge D 11ch/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.174 mW/g

Body Edge D 11ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.72 V/m; Power Drift = 0.174 dB
Peak SAR (extrapolated) = 0.340 W/kg
SAR(1 g) = 0.157 mW/g; SAR(10 g) = 0.077 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.171 mW/g



0 dB = 0.171mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.892 mho/m; ε_r = 41.4; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

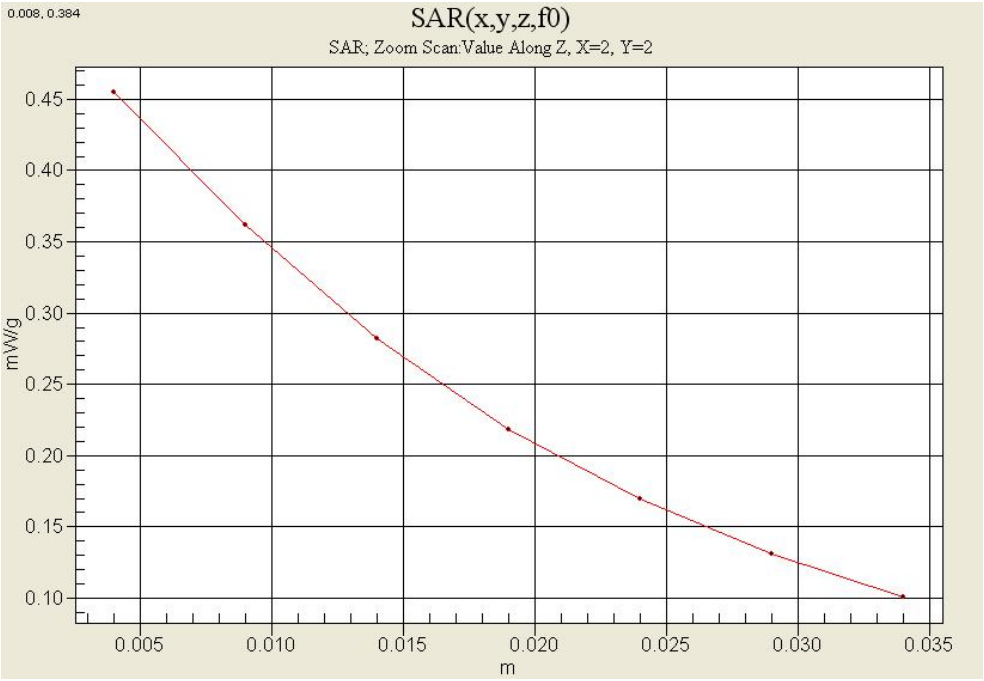
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.25, 6.25, 6.25); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Right touch 190ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.458 mW/g

Right touch 190ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.66 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 0.543 W/kg
SAR(1 g) = 0.434 mW/g; SAR(10 g) = 0.323 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.455 mW/g



Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Right

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 848.8 MHz;Duty Cycle: 1:2.075
Medium parameters used (interpolated): f = 848.8 MHz; σ = 0.991 mho/m; ε_r = 56.7; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Edge B 251ch/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.957 mW/g

Body Edge B 251ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.4 V/m; Power Drift = -0.043 dB
Peak SAR (extrapolated) = 1.24 W/kg
SAR(1 g) = 0.902 mW/g; SAR(10 g) = 0.624 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.960 mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.38 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 661ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.417 mW/g

Right touch 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.10 V/m; Power Drift = 0.095 dB
Peak SAR (extrapolated) = 0.584 W/kg
SAR(1 g) = 0.383 mW/g; SAR(10 g) = 0.232 mW/g
Maximum value of SAR (measured) = 0.411 mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011
Option	Front

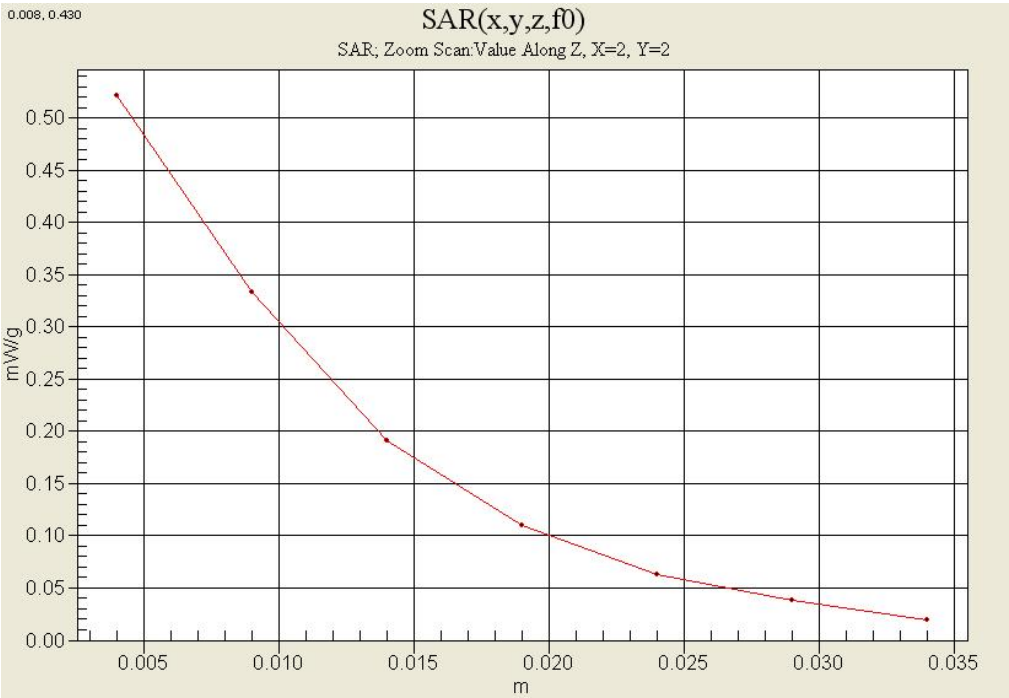
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2.075
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Front 661ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.543 mW/g

Body Front 661ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.8 V/m; Power Drift = -0.085 dB
Peak SAR (extrapolated) = 0.671 W/kg
SAR(1 g) = 0.477 mW/g; SAR(10 g) = 0.290 mW/g
Maximum value of SAR (measured) = 0.521 mW/g



Test Laboratory: HCT CO., LTD

EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN

GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)

Liquid Temperature: 21.1 ℃

Ambient Temperature: 21.3 ℃

Test Date: Apr. 4, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.892 mho/m; ε_r = 41.4; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.25, 6.25, 6.25); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Right touch 4183ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.517 mW/g

Right touch 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.70 V/m; Power Drift = -0.033 dB
Peak SAR (extrapolated) = 0.612 W/kg
SAR(1 g) = 0.497 mW/g; SAR(10 g) = 0.371 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.526 mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.1 ℃
Ambient Temperature:	21.3 ℃
Test Date:	Apr. 4, 2011
Option	Back

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA850; Frequency: 836.6 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.982 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

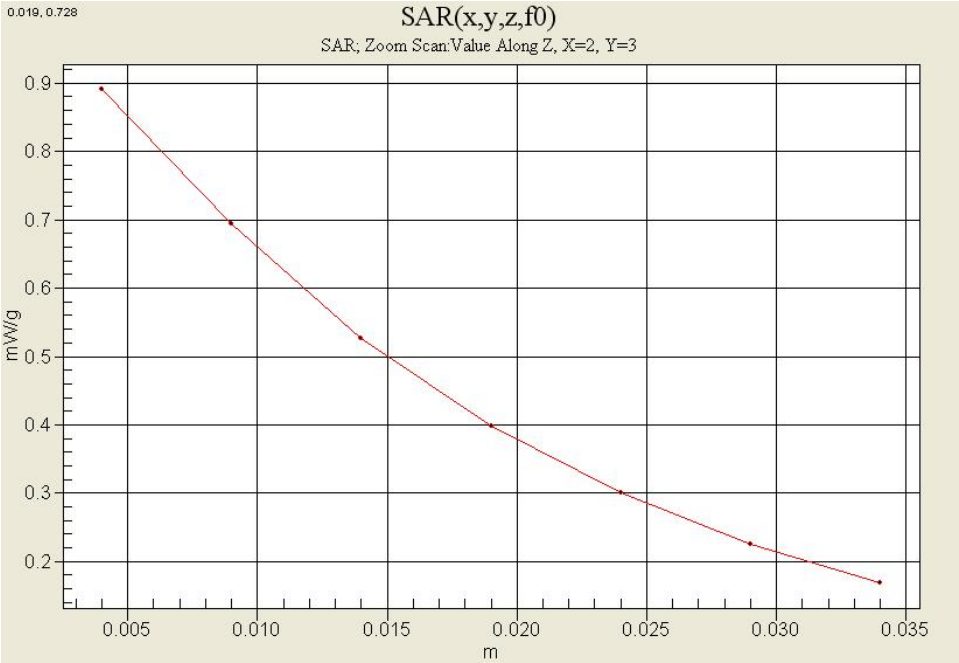
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: 835/900 Phamtom ; Type: SAM

Body Back 4183ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.898 mW/g

Body Back 4183ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.1 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 1.05 W/kg
SAR(1 g) = 0.847 mW/g; SAR(10 g) = 0.633 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.892 mW/g



Test Laboratory: HCT CO., LTD

EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN

GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)

Liquid Temperature: 21.4 ℃

Ambient Temperature: 21.6 ℃

Test Date: Apr. 5, 2011

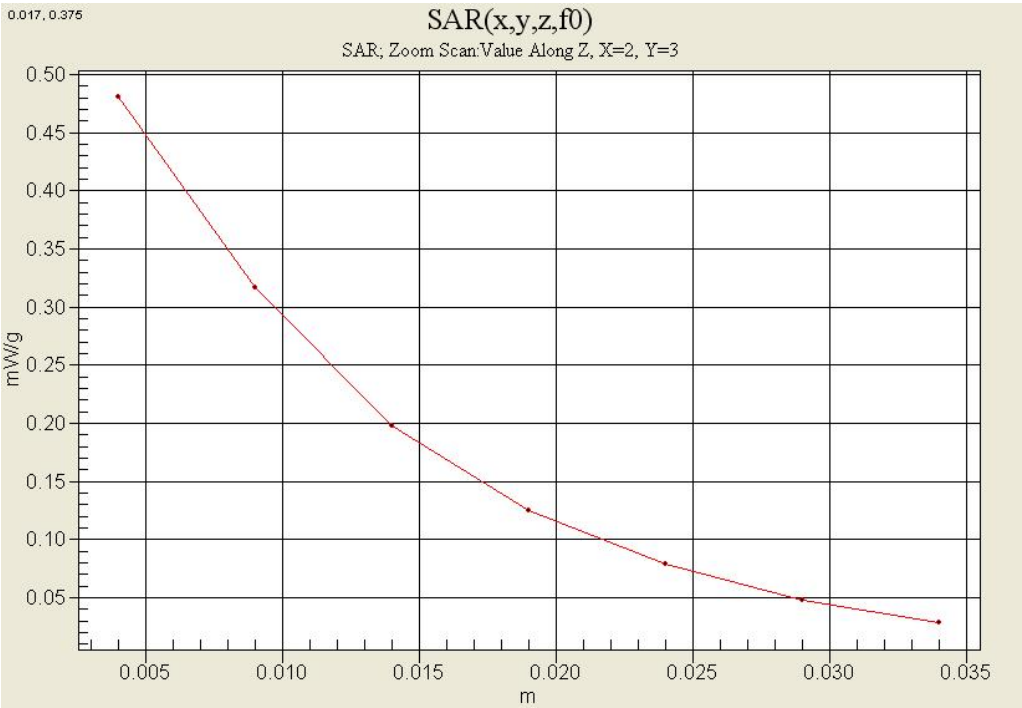
DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.38 mho/m; ε_r = 41.7; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 9400ch/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.493 mW/g

Right touch 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.54 V/m; Power Drift = -0.012 dB
Peak SAR (extrapolated) = 0.677 W/kg
SAR(1 g) = 0.445 mW/g; SAR(10 g) = 0.270 mW/g
Maximum value of SAR (measured) = 0.481 mW/g



Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 5, 2011
Option	Front

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: WCDMA1900(FCC); Frequency: 1880 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body Front 9400ch/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.770 mW/g

Body Front 9400ch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = 0.029 dB
Peak SAR (extrapolated) = 0.965 W/kg
SAR(1 g) = 0.688 mW/g; SAR(10 g) = 0.412 mW/g
Maximum value of SAR (measured) = 0.762 mW/g

Test Laboratory: HCT CO., LTD

EUT Type: Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN

GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)

Liquid Temperature: 21.4 ℃

Ambient Temperature: 21.6 ℃

Test Date: Apr. 6, 2011

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2462 MHz; σ = 1.86 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

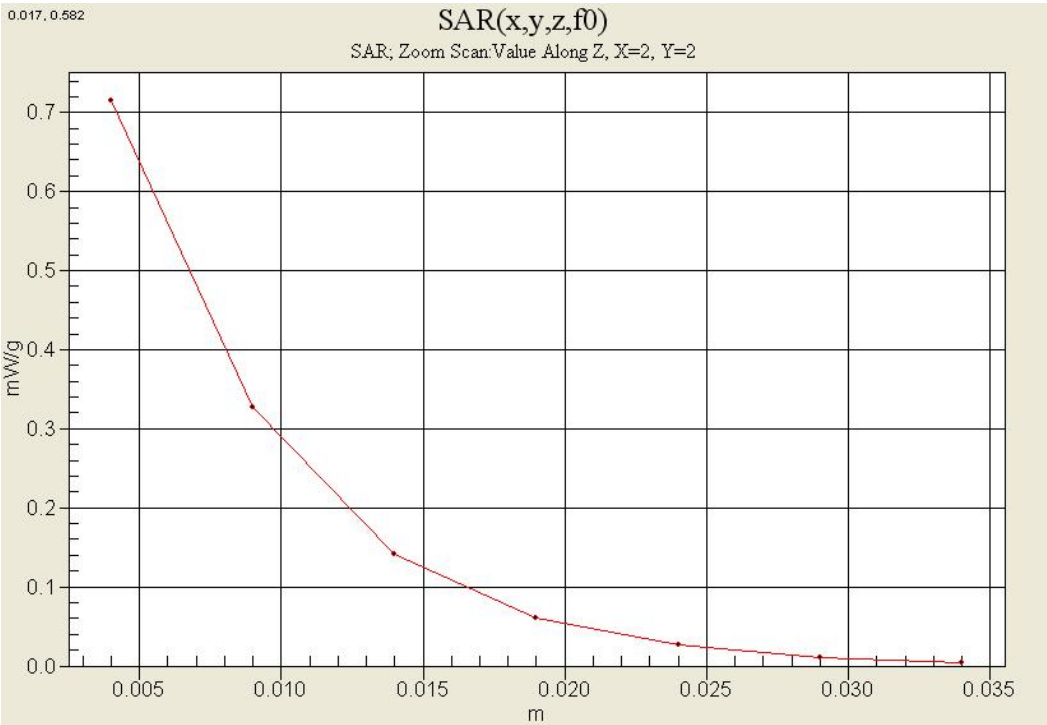
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.58, 4.58, 4.58); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 11/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.759 mW/g

Right touch 11/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.88 V/m; Power Drift = -0.144 dB
Peak SAR (extrapolated) = 1.88 W/kg
SAR(1 g) = 0.693 mW/g; SAR(10 g) = 0.305 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.716 mW/g



Test Laboratory:	HCT CO., LTD
EUT Type:	Cellular/PCS GSM/GPRS/EDGE/WCDMA/HSPA Phone with BT & WLAN
	GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Apr. 6, 2011
Option	Left

DUT: LG-P990h; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 2462 MHz; σ = 1.94 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

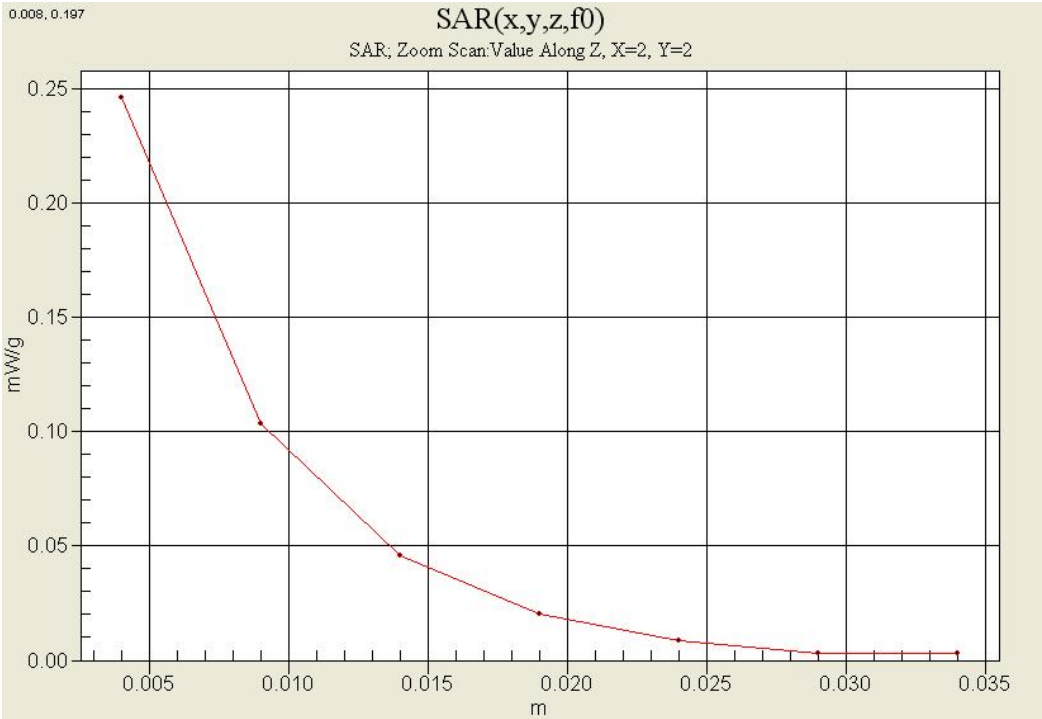
DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.15, 4.15, 4.15); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body 11/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.250 mW/g

Body 11/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.4 V/m; Power Drift = -0.156 dB
Peak SAR (extrapolated) = 0.623 W/kg
SAR(1 g) = 0.236 mW/g; SAR(10 g) = 0.110 mW/g

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



Attachment 2. – Dipole Validation Plots

■ Validation Data (835 MHz Head)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.1 ℃

Test Date: Apr. 4, 2011

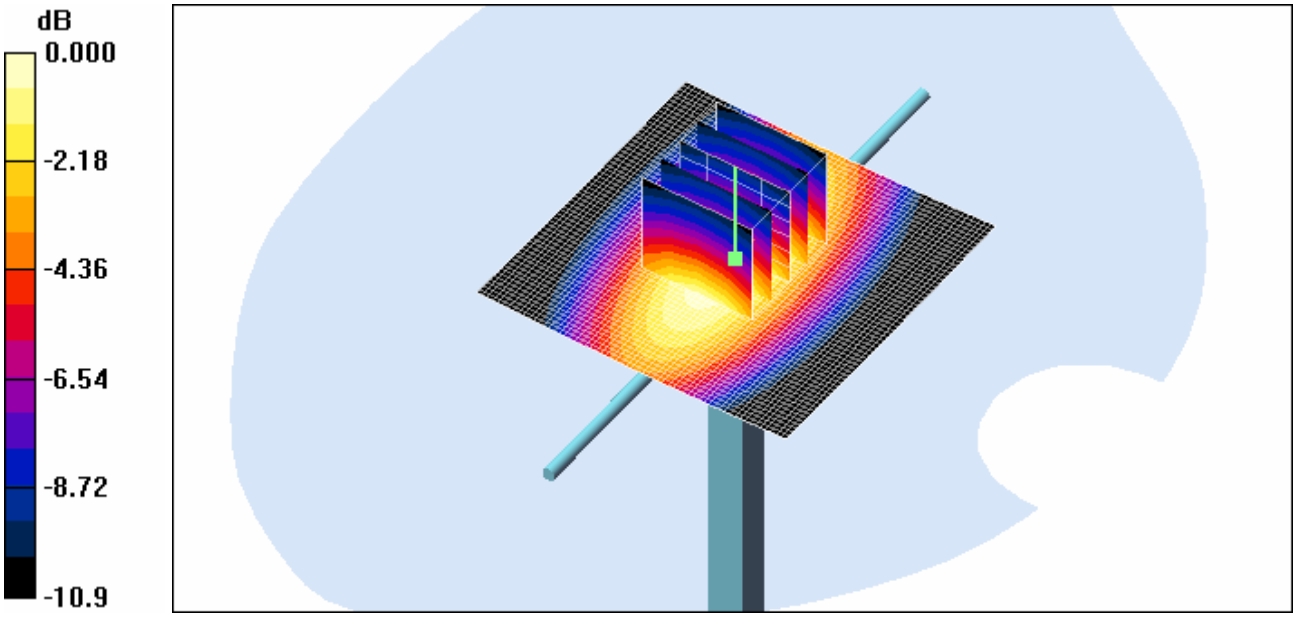
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 – SN:441

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.5; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.25, 6.25, 6.25); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Validation 835MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.06 mW/g

Validation 835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 35.8 V/m; Power Drift = -0.018 dB
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.966 mW/g; SAR(10 g) = 0.622 mW/g
Maximum value of SAR (measured) = 1.05 mW/g



0 dB = 1.05mW/g

■ Validation Data (1900 MHz Head)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.4 ℃

Test Date: Apr. 5, 2011

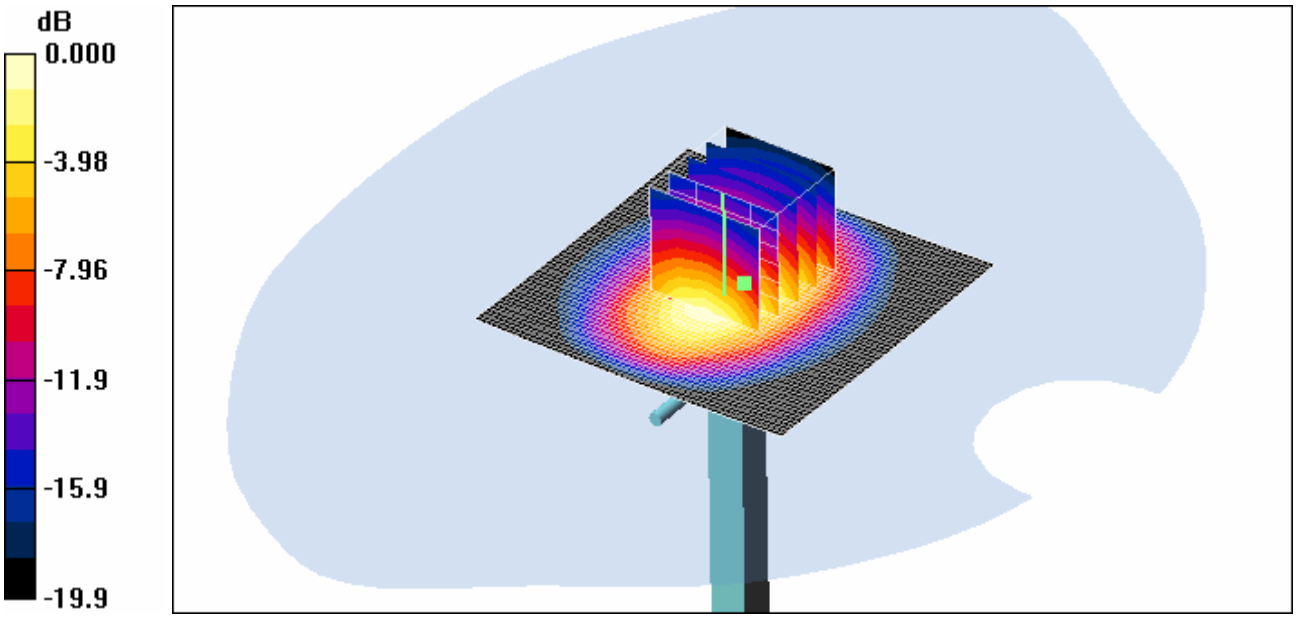
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 – SN:5d032

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.4 mho/m; ε_r = 41.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Dipole 1900MHz Validation/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.88 mW/g

Dipole 1900MHz Validation/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 60.7 V/m; Power Drift = -0.054 dB
Peak SAR (extrapolated) = 7.37 W/kg
SAR(1 g) = 4.12 mW/g; SAR(10 g) = 2.13 mW/g
Maximum value of SAR (measured) = 4.60 mW/g



0 dB = 4.60mW/g

■ Validation Data (2450 MHz Head)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.4 ℃

Test Date: Apr. 6, 2011

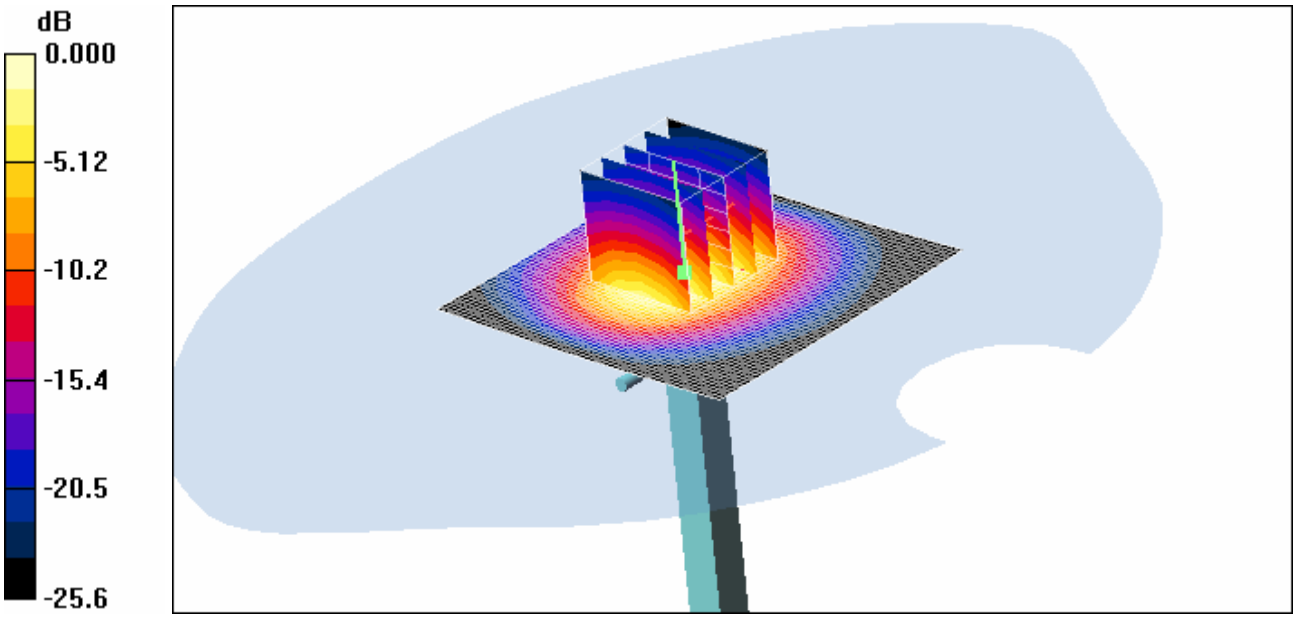
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 – SN:743

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.84 mho/m; ε_r = 39.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 – SN1630; ConvF(4.58, 4.58, 4.58); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Validation 2450MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 6.56 mW/g

Validation 2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 58.7 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 12.3 W/kg
SAR(1 g) = 5.36 mW/g; SAR(10 g) = 2.42 mW/g
Maximum value of SAR (measured) = 5.91 mW/g



0 dB = 5.91mW/g

■ Validation Data (835 MHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.1 ℃

Test Date: Apr. 4, 2011

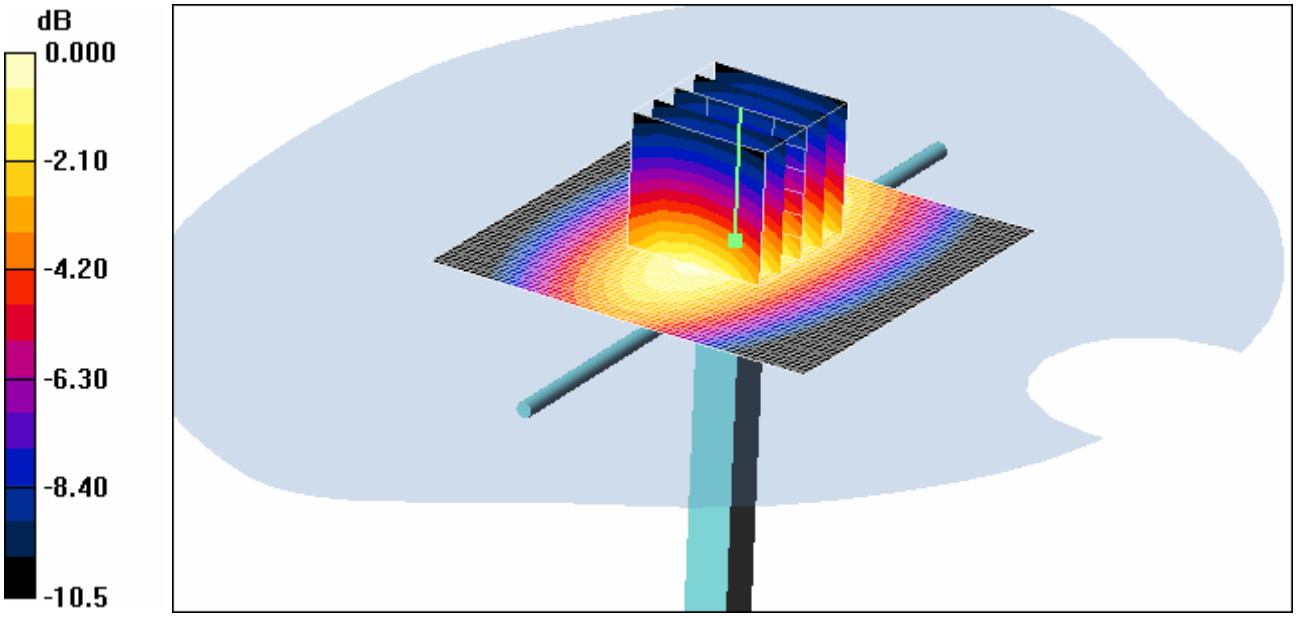
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 – SN:441

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.981 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(6.17, 6.17, 6.17); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 835/900 MHz; Type: SAM

Validation 835MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.10 mW/g

Validation 835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.8 V/m; Power Drift = -0.052 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.668 mW/g
Maximum value of SAR (measured) = 1.10 mW/g



0 dB = 1.10mW/g

■ Validation Data (1900 MHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.4 ℃

Test Date: Apr. 5, 2011

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

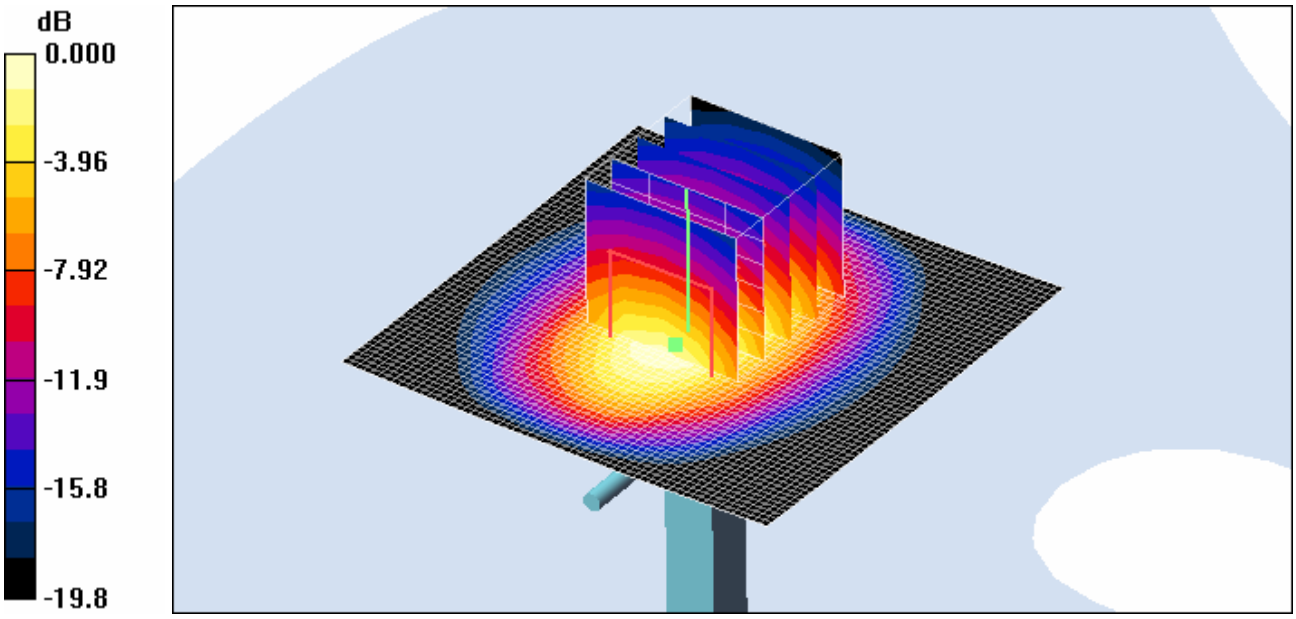
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.49 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 – SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Dipole 1900MHz Validation/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 5.06 mW/g

Dipole 1900MHz Validation/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 63.5 V/m; Power Drift = -0.193 dB
Peak SAR (extrapolated) = 6.75 W/kg
SAR(1 g) = 4.28 mW/g; SAR(10 g) = 2.27 mW/g

Maximum value of SAR (measured) = 4.87 mW/g



0 dB = 4.87mW/g

■ Validation Data (2450 MHz Body)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.4 ℃

Test Date: Apr. 6, 2011

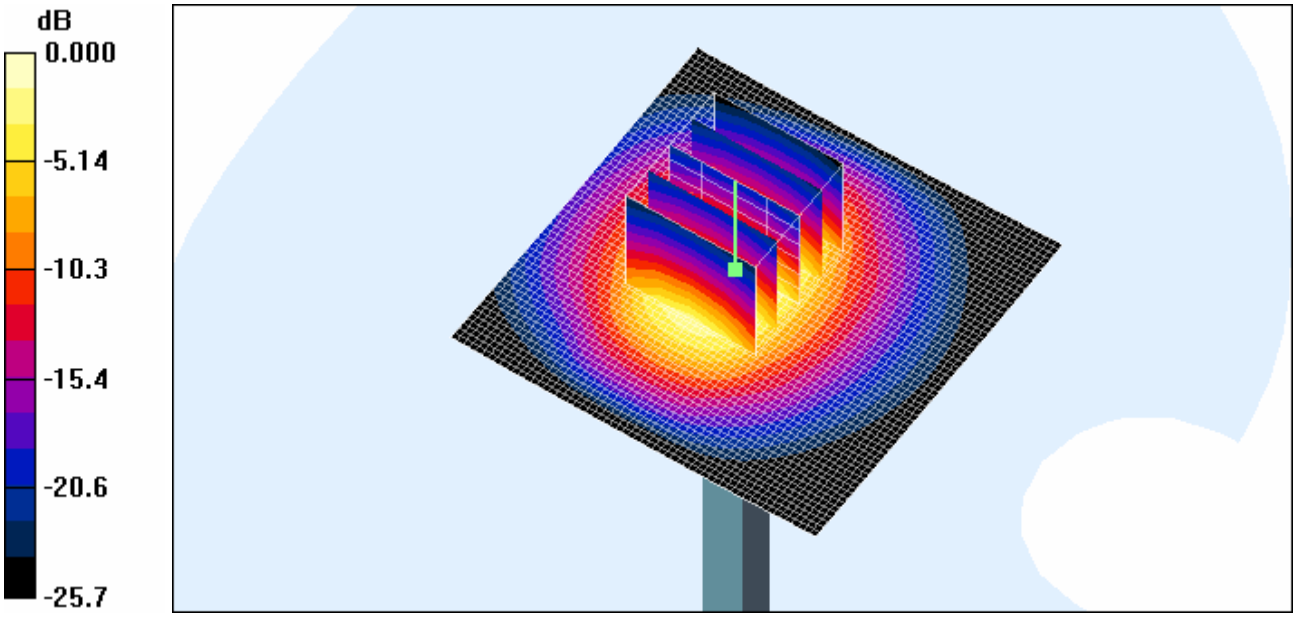
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 – SN:743

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.93 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
- Probe: ET3DV6 - SN1630; ConvF(4.15, 4.15, 4.15); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2009-09-18
- Phantom: SAM 1800/1900 MHz; Type: SAM

Validation 2450MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 6.34 mW/g

Validation 2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 55.8 V/m; Power Drift = 0.004 dB
Peak SAR (extrapolated) = 12.8 W/kg
SAR(1 g) = 5.3 mW/g; SAR(10 g) = 2.36 mW/g
Maximum value of SAR (measured) = 5.83 mW/g



0 dB = 5.83mW/g

■ Dielectric Parameter (835 MHz Head)

Title LG-P990h
SubTitle GSM850(Head)
Test Date Apr. 4, 2011

Frequency	e'	e''
800000000.0000	41.8224	19.2224
805000000.0000	41.7671	19.2200
810000000.0000	41.7146	19.1846
815000000.0000	41.6258	19.1704
820000000.0000	41.5920	19.1575
825000000.0000	41.5419	19.1599
830000000.0000	41.4718	19.1626
835000000.0000	41.4543	19.1613
840000000.0000	41.4125	19.1458
845000000.0000	41.3356	19.1509
850000000.0000	41.2860	19.1381
855000000.0000	41.2372	19.1253
860000000.0000	41.2068	19.1382
865000000.0000	41.1475	19.1185
870000000.0000	41.1193	19.1155
875000000.0000	41.0770	19.0965
880000000.0000	41.0234	19.0709
885000000.0000	40.9576	19.0692
890000000.0000	40.8893	19.0386
895000000.0000	40.8520	19.0093
900000000.0000	40.7777	18.9863

■ Dielectric Parameter (835 MHz Body)

Title LG-P990h
SubTitle GSM850(Body)
Test Date Apr. 4, 2011

Frequency	e'	e''
800000000.0000	57.0121	21.2646
805000000.0000	56.9593	21.2654
810000000.0000	56.9611	21.2276
815000000.0000	56.9464	21.2082
820000000.0000	56.9447	21.1770
825000000.0000	56.9114	21.1860
830000000.0000	56.8508	21.1510
835000000.0000	56.8643	21.1163
840000000.0000	56.7929	21.0656
845000000.0000	56.6948	21.0533
850000000.0000	56.6855	20.9646
855000000.0000	56.6084	21.0000
860000000.0000	56.5623	20.9377
865000000.0000	56.4862	20.8755
870000000.0000	56.3619	20.8509
875000000.0000	56.3188	20.7804
880000000.0000	56.2407	20.7618
885000000.0000	56.1656	20.7684
890000000.0000	56.1415	20.7324
895000000.0000	56.0407	20.7420
900000000.0000	56.0135	20.7261

■ Dielectric Parameter (1900 MHz Head)

Title LG-P990h

SubTitle WCDMA1900(Head)

Test Date Apr. 5, 2011

Frequency	e'	e''
1800000000.0000	41.9596	12.9097
1810000000.0000	41.9311	12.9380
1820000000.0000	41.9104	13.0044
1830000000.0000	41.9158	13.0472
1840000000.0000	41.9063	13.0933
1850000000.0000	41.8693	13.0959
1860000000.0000	41.8057	13.1441
1870000000.0000	41.7797	13.1458
1880000000.0000	41.6697	13.1708
1890000000.0000	41.6402	13.1997
1900000000.0000	41.5644	13.2481
1910000000.0000	41.5307	13.2803
1920000000.0000	41.4519	13.2889
1930000000.0000	41.4178	13.3428
1940000000.0000	41.4468	13.3592
1950000000.0000	41.4363	13.3695
1960000000.0000	41.4301	13.3887
1970000000.0000	41.4448	13.4232
1980000000.0000	41.3812	13.4347
1990000000.0000	41.3555	13.4556
2000000000.0000	41.2935	13.4786

■ Dielectric Parameter (1900 MHz Body)

Title LG-P990h

SubTitle WCDMA1900(Body)

Test Date Apr. 5, 2011

Frequency	e'	e''
1850000000.0000	53.6653	13.9943
1855000000.0000	53.6866	13.9658
1860000000.0000	53.6973	14.0232
1865000000.0000	53.6660	14.0410
1870000000.0000	53.6427	14.0471
1875000000.0000	53.6041	14.0728
1880000000.0000	53.5949	14.0955
1885000000.0000	53.5438	14.0957
1890000000.0000	53.5198	14.1131
1895000000.0000	53.4570	14.1157
1900000000.0000	53.4563	14.1312
1905000000.0000	53.3986	14.1687
1910000000.0000	53.3914	14.2034
1915000000.0000	53.3259	14.2000
1920000000.0000	53.3301	14.2598
1925000000.0000	53.3164	14.2728
1930000000.0000	53.2713	14.2893
1935000000.0000	53.3061	14.3108
1940000000.0000	53.2965	14.3437
1945000000.0000	53.2850	14.3802
1950000000.0000	53.2992	14.3845

■ Dielectric Parameter (2 450 MHz Head)

Title LG-P990h

SubTitle 2450MHz (Head)

Test Date Apr. 6, 2011

Frequency	e'	e''
2400000000.0000	39.9477	13.3988
2405000000.0000	39.9386	13.3877
2410000000.0000	39.9067	13.3961
2415000000.0000	39.8232	13.4035
2420000000.0000	39.7975	13.4153
2425000000.0000	39.7497	13.4011
2430000000.0000	39.7436	13.4415
2435000000.0000	39.7013	13.4595
2440000000.0000	39.6804	13.4790
2445000000.0000	39.6307	13.4811
2450000000.0000	39.6072	13.5002
2455000000.0000	39.6293	13.5390
2460000000.0000	39.5999	13.5606
2465000000.0000	39.5805	13.5706
2470000000.0000	39.5472	13.5901
2475000000.0000	39.5148	13.5976
2480000000.0000	39.4703	13.6102
2485000000.0000	39.3416	13.5842
2490000000.0000	39.3126	13.5752
2495000000.0000	39.2068	13.5329
2500000000.0000	39.0677	13.4839

■ Dielectric Parameter (2450 MHz Body)

Title LG-P990h

SubTitle 2450MHz (Body)

Test Date Apr. 6, 2011

Frequency	e'	e''
2400000000.0000	52.1334	13.9069
2405000000.0000	52.1370	13.8864
2410000000.0000	52.0795	13.9242
2415000000.0000	52.0345	13.9388
2420000000.0000	52.0102	13.9576
2425000000.0000	51.9804	13.9837
2430000000.0000	51.9394	13.9829
2435000000.0000	51.9141	14.0413
2440000000.0000	51.8890	14.0732
2445000000.0000	51.8609	14.1169
2450000000.0000	51.8529	14.1349
2455000000.0000	51.8469	14.1922
2460000000.0000	51.8417	14.1882
2465000000.0000	51.8214	14.2190
2470000000.0000	51.8086	14.2553
2475000000.0000	51.7851	14.2830
2480000000.0000	51.8069	14.3278
2485000000.0000	51.7541	14.3410
2490000000.0000	51.7928	14.3717
2495000000.0000	51.7876	14.3802
2500000000.0000	51.7895	14.3908