

SAR TEST REPORT

HCT CO., LTD

EUT Type:	Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)	
FCC ID:	BEJP970	
Model:	LG-P970	
Additional Model:	P970	
Date of Issue:	Jan.10, 2011	
Test report No.:	HCTA1101FS02	
Test Laboratory:	HCT CO., LTD. SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA TEL: +82 31 639 8565 FAX: +82 31 639 8525	
Applicant :	LG Electronics, Inc. 60-39, Gasan-Dong, Gumchon-Gu, Seoul 153-023, Korea Tel: +82-2-2033-1113 Fax: +82-2-2033-1222	
Testing has been carried out in accordance with:	RSS-102 Issue 4; Health Canada Safety Code 6 47CFR §2.1093 FCC OET Bulletin 65(Edition 97-01), Supplement C (Edition 01-01) ANSI/ IEEE C95.1 – 1992 IEEE 1528-2003	
Test result:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.	
Signature	 Report prepared by : Young-Soo Jang Test Engineer of SAR Part	 Approved by : Jae-Sang So Manager of SAR Part

Table of Contents

1. INTRODUCTION	3
2. DESCRIPTION OF DEVICE	4
3. DESCRIPTION OF TEST EQUIPMENT	5
4. SAR MEASUREMENT PROCEDURE	1 2
5. DESCRIPTION OF TEST POSITION	1 3
5.1 HEAD POSITION	1 3
5.2 Body Holster/Belt Clip Configurations	1 4
6. MEASUREMENT UNCERTAINTY	1 5
7. ANSI/ IEEE C95.1 - 1992 RF EXPOSURE LIMITS	1 6
8. SYSTEM VERIFICATION	1 7
8.1 Tissue Verification	1 7
8.2 System Validation	1 7
9. TEST CONFIGURATIONS	1 8
10. RF CONDUCTED POWER	1 9
10.1 Procedures Used to Establish RF Signal for SAR	1 9
10.2 SAR Measurement Conditions for UMTS	1 9
11. SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas	2 2
12. SAR TEST DATA SUMMARY	2 3
12.1 Measurement Results (GSM850 Head SAR Touch)	2 3
12.2 Measurement Results (GSM850 Head SAR Tilt)	2 4
12.3 Measurement Results (GSM1900 Head SAR Touch)	2 5
12.4 Measurement Results (GSM1900 Head SAR Tilt)	2 6
12.5 Measurement Results (WCDMA1900 Head SAR Touch)	2 7
12.6 Measurement Results (WCDMA1900 Head SAR Tilt)	2 8
12.7 Measurement Results (802.11b/g/n Module Head SAR Touch)	2 9
12.8 Measurement Results (802.11b/g/n Module Head SAR Tilt)	3 0
12.9 Measurement Results (GSM850 Body SAR)	3 1
12.10 Measurement Results (GSM1900 Body SAR)	3 2
12.11 Measurement Results (WCDMA1900 Body SAR)	3 3
12.12 Measurement Results (802.11b/g/n Module Body SAR)	3 4
13. CONCLUSION	3 5
14. REFERENCES	3 6
Attachment 1. – SAR Test Plots	3 7
Attachment 2. – Dipole Validation Plots	7 7
Attachment 3. – Probe Calibration Data	5 7
Attachment 4. – Dipole Calibration Data	5 7

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 (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) of a given density (ρ). 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/EDGE and WCDMA Phone with Bluetooth & WLAN GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)		
FCC ID:	BEJP970		
Model:	LG-P970		
Additional Model:	P970		
Trade Name	LG	Serial Number(s)	#1
Application Type	Certification		
Mode(s) of Operation	GSM850/GSM1900/ WCDMA1900/802.11b/g/n		
Tx Frequency	824.20 - 848.80 MHz (GSM850) 1 850.20 – 1 909.80 MHz (GSM1900) 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) 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	0.317 W/kg GSM850 Head SAR / 0.507 W/kg GSM850 Body SAR 0.773 W/kg GSM1900 Head SAR / 0.246 W/kg GSM1900 Body SAR 1.18 W/kg WCDMA1900 Head SAR / 0.483 W/kg WCDMA1900 Body SAR 0.661 W/kg Wi-Fi 802.11b Head SAR/ 0.098 W/kg Wi-Fi 802.11b Body SAR		
Date(s) of Tests	Jan. 6, 2011~ Jan. 7, 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.

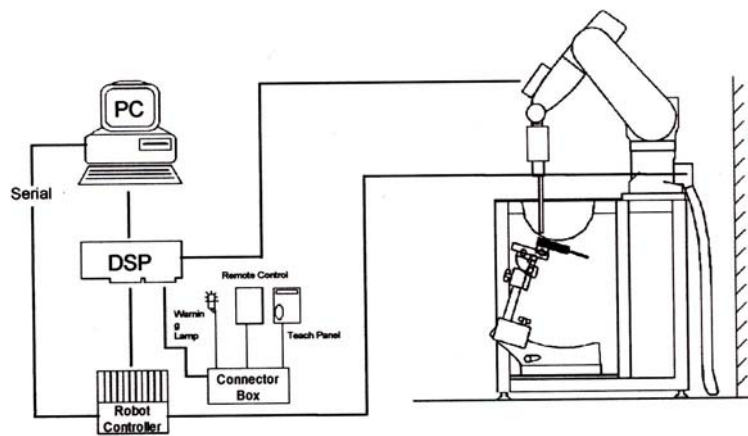


Figure 3.1 HCT SAR Lab. Test Measurement Set-up

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 μ W/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

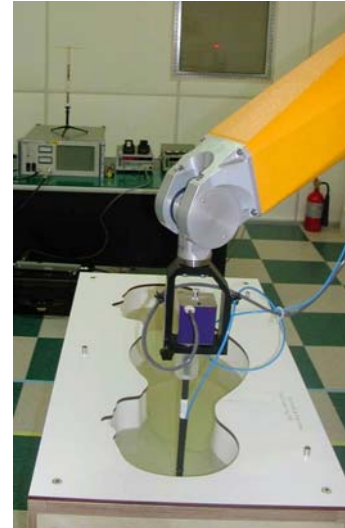


Figure 3.2 Photograph of the probe and the Phantom

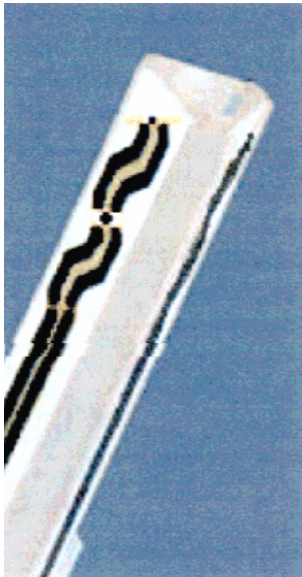


Figure 3.3 ET3DV6 E-field Probe

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 $\pm 10\%$. 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 below 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/cm³ for brain tissue)

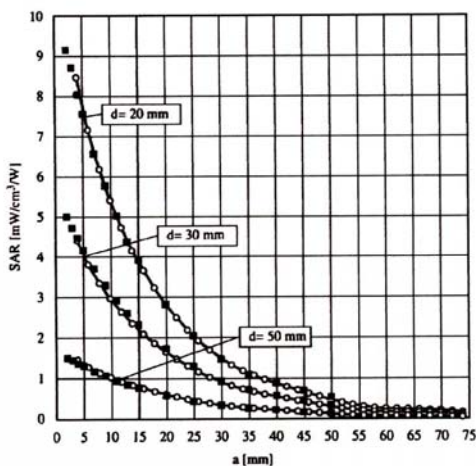


Figure 3.4 E-Field and Temperature measurements at 900 MHz

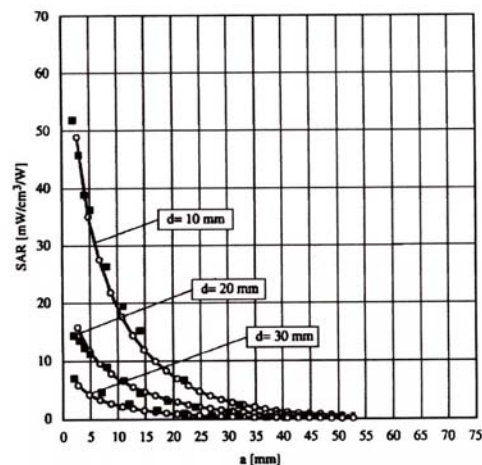


Figure 3.5 E-Field and temperature measurements at 1.8 GHz

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/cm³

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/cm²
 E_{tot} = total electric field strength in V/m

3.4 SAM Phantom

The SAM Phantom is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90 % of all users. 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 the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot.

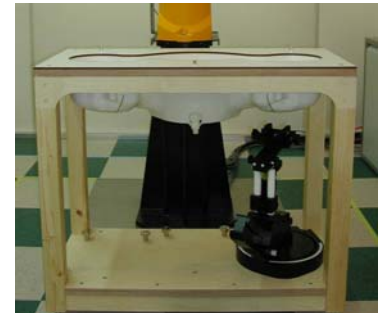


Figure 3.6 SAM Phantom

Shell Thickness	2.0 mm
Filling Volume	about 30 L
Dimensions	810 mm x 1 000 mm x 500 mm (H x 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 repeatably 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 produce 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 bactericide 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. Hartsgrrove.

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	DAE3	446	Sep. 21, 2010	Annual	Sep. 21, 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, 2010	Annual	Feb. 10, 2011
HP	Signal Generator E4438C	MY42082646	Nov. 11,2010	Annual	Nov. 11, 2011
HP	Network Analyzer 8753ES	MY4000025	Sep. 02, 2010	Annual	Sep. 02, 2011

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.

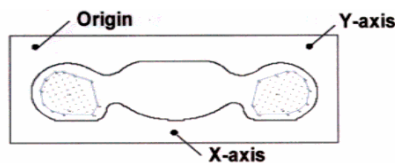


Figure 4.1 SAR Measurement Point in Area Scan

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 15° or until the device antenna touch the phantom. Please refer to IEEE 1528-2003 illustration below.

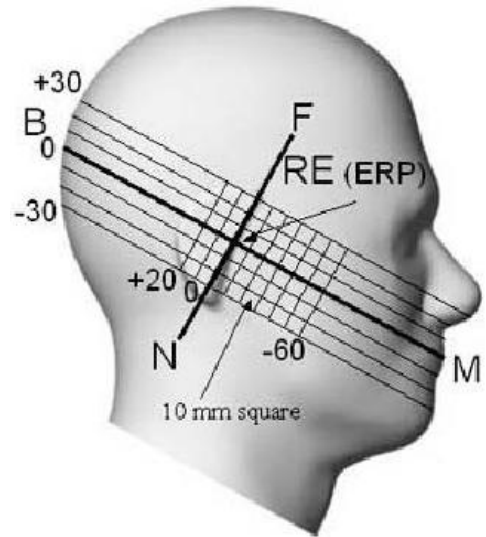


Figure 5.1 Side view of the phantom

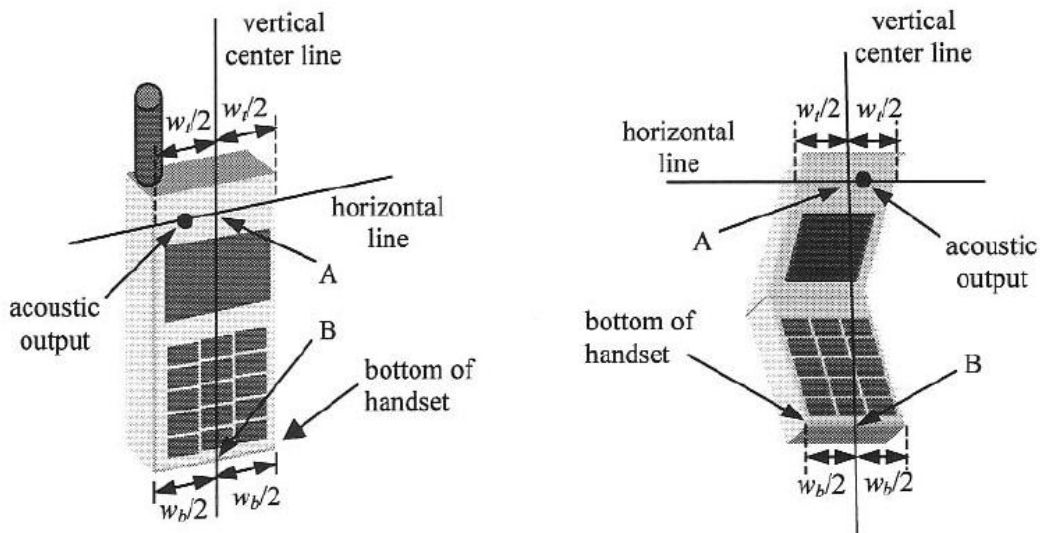


Figure 5.2 Handset vertical and horizontal reference lines

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 2.0 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 ($\pm$ %)	Prob. dist.	Div.	C_i	Standard Uncertainty ($\pm$ %)	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 Permittivity(target)	5.00	R	1.73	0.6	1.73	∞
Liquid Permittivity(meas.)	5.02	N	1	0.6	3.01	9
Combine 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 - 1992 RF EXPOSURE LIMITS

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

Table 7.1 Safety Limits for Partial Body Exposure

NOTES:

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

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

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

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

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

8. SYSTEM VERIFICATION

8.1 Tissue Verification

Freq. [MHz]	Date	Liquid	Liquid Temp.[°C]	Parameters	Target Value	Measured Value	Deviation [%]	Limit [%]
835	Jan. 6, 2011	Head	21.1	ϵ_r	41.5	43.1	+ 3.86	± 5
				σ	0.90	0.924	+ 2.67	± 5
835	Jan. 6, 2011	Body	21.1	ϵ_r	55.2	56.80	+ 2.90	± 5
				σ	0.97	0.97	0.00	± 5
1 900	Jan. 7, 2011	Head	21.2	ϵ_r	40.0	40.9	+ 2.25	± 5
				σ	1.40	1.4	0.00	± 5
1 900	Jan. 7, 2011	Body	21.2	ϵ_r	53.3	51.9	- 2.63	± 5
				σ	1.52	1.54	+ 1.32	± 5
2450	Jan. 7, 2011	Head	21.2	ϵ_r	39.2	38.5	- 1.79	± 5
				σ	1.80	1.87	+ 3.89	± 5
2 450	Jan. 7, 2011	Body	21.2	ϵ_r	52.7	51.72	- 1.86	± 5
				σ	1.95	1.91	- 2.05	± 5

8.2 System Validation

Prior to assessment, the system is verified to the $\pm 10\%$ 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	Jan. 6, 2011	Head	21.1	1 g	9.66	0.97	+ 0.41	± 10
1 900	Jan. 7, 2011	Head	21.2	1 g	39.9	4.04	+ 1.25	± 10
2 450	Jan. 7, 2011	Head	21.2	1 g	54	5.35	- 0.93	± 10

9. TEST CONFIGURATIONS

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

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

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

Mode	GHz	Channel	Turbo Channel	"Default Test Channels"		
				§15.247 802.11b	802.11g	UNII
802.11 b/g	2.412	1		✓	▽	
	2.437	6	6	✓	▽	
	2.462	11		✓	▽	
802.11a	5.18	36				✓
	5.20	40	42 (5.21 GHz)			*
	5.22	44				*
	5.24	48				✓
	5.26	52	50 (5.25 GHz)			✓
	5.28	56				*
	5.30	60	58 (5.29 GHz)			*
	5.32	64				✓
	5.500	100				*
	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				*
	5.745	149		✓		✓
	5.765	153	152 (5.76 GHz)		*	*
UNII or §15.247	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 than 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 $\leq 75\%$ 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 $\leq 75\%$ 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	$\beta_{hs}^{(1)}$	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 $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$.

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 $\beta_c = 11/15$ and $\beta_d = 15/15$.

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 $\leq 75\%$ 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	$\beta_{hs}^{(1)}$	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	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	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 $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. 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 $\beta_c = 10/15$ and $\beta_d = 15/15$.
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 $\beta_c = 14/15$ and $\beta_d = 15/15$.
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	GPRS	GPRS	GPRS	GPRS	EDGE	EDGE	EDGE	EDGE
		(dBm)	1 TX Slot (dBm)	2 TX Slot (dBm)	3 TX Slot (dBm)	4 TX Slot (dBm)	1 TX Slot (dBm)	2 TX Slot (dBm)	3 TX Slot (dBm)	4 TX Slot (dBm)
GSM 850	128	32.75	32.74	32.73	32.44	31.39	27.53	27.53	26.63	25.49
	190	32.71	32.70	32.70	32.41	31.38	27.53	27.53	26.63	25.40
	251	32.76	32.76	32.76	32.47	31.40	27.51	27.49	26.62	25.40
GSM 1900	512	30.18	30.18	30.18	29.90	28.76	26.84	26.84	26.07	24.93
	661	30.19	30.19	30.19	29.91	28.77	26.82	26.82	26.03	24.90
	810	30.17	30.17	30.17	29.89	28.73	26.79	26.79	25.95	24.89

Table 1. GSM Conducted output powers

3GPP Release Version	Mode	3GPP 34.121	PCS Band [dBm]			MPR
		Subtest	UL9262	UL 9400	UL 9538	
99	WCDMA	12.2 kbps RMC	23.08	23.07	22.94	-
5	HSDPA	Subtest 1	23.02	23.00	22.81	0
5		Subtest 2	23.00	22.97	22.79	0
5		Subtest 3	22.65	22.54	22.45	0.5
5		Subtest 4	22.60	22.51	22.40	0.5
6	HSUPA	Subtest 1	23.08	23.07	22.91	0
6		Subtest 2	21.50	21.48	21.44	2
6		Subtest 3	22.16	22.11	21.99	1
6		Subtest 4	21.60	21.59	21.47	2
6		Subtest 5	22.86	23.06	23.04	0

Table 2. WCDMA Conducted output powers

Band	Channel	Mbps			
		1	2	5.5	11
IEEE 802.11b	1	18.29	18.39	18.28	18.21
	6	18.48	18.63	18.46	18.40
	11	18.61	18.72	18.56	18.44

Table 10.3 IEEE 802.11b Conducted output power

Band	Channel	Mbps							
		6	9	12	18	24	36	48	54
IEEE 802.11g	1	10.67	10.59	10.41	10.30	10.22	9.91	9.57	9.36
	6	10.79	10.71	10.63	10.47	10.18	10.02	9.69	9.59
	11	10.76	10.68	10.57	10.38	10.43	10.29	10.08	9.87

Table 10.4 IEEE 802.11g Conducted output power

Band	Channel	Mbps							
		6.5	13	20	26	39	52	58	65
IEEE 802.11n (HT-20)	1	10.55	10.68	10.45	10.18	9.89	9.56	9.45	9.27
	6	10.57	10.86	10.63	10.37	10.04	9.76	9.59	9.48
	11	10.76	10.67	10.31	10.22	9.89	9.47	9.42	9.66

Table 10.5 IEEE 802.11n Conducted output power

11. SAR Evaluation Considerations for Handsets with Multiple Transmitters and Antennas

11.1 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. 11.1 Output Power Thresholds for Unlicensed Transmitters

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	<u>Routine evaluation required</u>	<u>SAR not required:</u> <u>Unlicensed only</u> - when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas <u>Licensed & Unlicensed</u> - 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 <u>SAR required:</u> <u>Licensed & Unlicensed</u> 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 <u>Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply</u>
Unlicensed Transmitters	<u>When there is no simultaneous transmission –</u> - output ≤ 60 f: SAR not required - output > 60 f: stand-alone SAR required <u>When there is simultaneous transmission –</u> <u>Stand-alone SAR not required when</u> - output $\leq 2 \cdot P_{Ref}$ and antenna is ≥ 5.0 cm from other antennas - output $\leq P_{Ref}$ and antenna is ≥ 2.5 cm from other antennas - output $\leq P_{Ref}$ and antenna is < 2.5 cm from other antennas, each with either output power $\leq P_{Ref}$ or 1-g SAR < 1.2 W/kg <u>Otherwise stand-alone SAR is required</u> <u>When stand-alone SAR is required</u> - 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	<u>Flat phantom SAR required</u> - 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. 11.2 SAR Evaluation Requirements for Cellphones with Multiple Transmitters

FCC ID: BEJP970 / BT Max. RF output power: -0.42 dBm (0.91 mW)

Antenna separation distance between Main and BT/ WLAN: 11 cm

WLAN Max. RF output power: Wi-Fi 802.11b(18.72 dBm) / Wi-Fi 802.11g (10.79 dBm) / Wi-Fi 802.11n (10.76 dBm)

Because the conducted output power level of the BT transmitter is less than $2 \cdot P_{Ref}$, 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. Based on the output power and antenna separation distance, a stand-alone WLAN SAR test is required.

12. SAR TEST DATA SUMMARY

12.1 Measurement Results (GSM850 Head SAR Touch)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
836.6	190 (Mid)	GSM850	32.71	32.69	Standard	Left Ear	Intenna	0.279
836.6	190 (Mid)	GSM850	32.71	32.64	Standard	Right Ear	Intenna	0.317
ANSI/ IEEE C95.1 - 1992– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm $\pm$ 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
- Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

12.2 Measurement Results (GSM850 Head SAR Tilt)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
836.6	190 (Mid)	GSM850	32.71	32.70	Standard	Left Tilt 15°	Intenna	0.164
836.6	190 (Mid)	GSM850	32.71	32.71	Standard	Right Tilt 15°	Intenna	0.199
ANSI/ IEEE C95.1 - 1992- Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
- Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

12.3 Measurement Results (GSM1900 Head SAR Touch)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 880.0	661 (Mid)	GSM1900	30.19	30.10	Standard	Left Ear	Intenna	0.773
1 880.0	661 (Mid)	GSM1900	30.19	30.14	Standard	Right Ear	Intenna	0.513
ANSI/ IEEE C95.1 - 1992– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm $\pm$ 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
- Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

12.4 Measurement Results (GSM1900 Head SAR Tilt)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 880.0	661 (Mid)	GSM1900	30.19	30.12	Standard	Left Tilt 15°	Intenna	0.322
1 880.0	661 (Mid)	GSM1900	30.19	30.15	Standard	Right Tilt 15°	Intenna	0.314
ANSI/ IEEE C95.1 - 1992- Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm $\pm$ 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
- Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

12.5 Measurement Results (WCDMA1900 Head SAR Touch)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 852.4	9262 (Low)	WCDMA1900	23.08	22.90	Standard	Left Ear	Intenna	1.05
1 880.0	9400 (Mid)	WCDMA1900	23.07	22.96	Standard	Left Ear	Intenna	1.18
1 907.6	9538 (High)	WCDMA1900	22.94	22.86	Standard	Left Ear	Intenna	1.10
1 852.4	9262 (Low)	WCDMA1900	23.08	23.06	Standard	Right Ear	Intenna	0.875
1 880.0	9400 (Mid)	WCDMA1900	23.07	23.08	Standard	Right Ear	Intenna	0.845
1 907.6	9538 (High)	WCDMA1900	22.94	22.84	Standard	Right Ear	Intenna	0.841
ANSI/ IEEE C95.1 - 1992- Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm $\pm$ 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
- WCDMA Mode was tested under RMC 12.2 kbps and HSPA Inactive.

12.6 Measurement Results (WCDMA1900 Head SAR Tilt)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 880.0	9400 (Mid)	WCDMA1900	23.07	22.97	Standard	Left Ear	Intenna	0.534
1 880.0	9400 (Mid)	WCDMA1900	23.07	23.06	Standard	Right Ear	Intenna	0.539
ANSI/ IEEE C95.1 - 1992- Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm $\pm$ 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
- 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).
- WCDMA Mode was tested under RMC 12.2 kbps and HSPA Inactive.

12.7 Measurement Results (802.11b/g/n Module Head SAR Touch)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Data Rate	SAR(mW/g)
MHz	Channel		Begin	End				
2 412	1 (Mid)	802.11b	18.29	18.29	Standard	Left Ear	1 Mbps	0.661
2 412	1 (Mid)	802.11b	18.29	18.27	Standard	Right Ear	1 Mbps	0.216
ANSI/ IEEE C95.1 - 1992- Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm $\pm$ 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☒ Manual Test cord ☐ Base Station Simulator
- IEEE 802.11g (including 802.11 n) 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.

12.8 Measurement Results (802.11b/g/n Module Head SAR Tilt)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Data Rate	SAR(mW/g)
MHz	Channel		Begin	End				
2 412	1 (Mid)	802.11b	18.29	18.34	Standard	Left Tilt 15°	1 Mbps	0.368
2 412	1 (Mid)	802.11b	18.29	18.34	Standard	Right Tilt 15°	1 Mbps	0.129
ANSI/ IEEE C95.1 - 1992- Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☒ Manual Test cord ☐ Base Station Simulator
- IEEE 802.11g (including 802.11 n) 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.

12.9 Measurement Results (GSM850 Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Configuration	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
836.6	190 (Mid)	GPRS 4Tx	31.38	31.39	Rear	2.0 cm without Holster	Intenna	0.446
836.6	190 (Mid)	GPRS 3Tx	32.41	32.35	Rear	2.0 cm without Holster	Intenna	0.507
836.6	190 (Mid)	GPRS 2Tx	32.70	32.63	Rear	2.0 cm without Holster	Intenna	0.450
836.6	190 (Mid)	GPRS 1Tx	32.70	32.62	Rear	2.0 cm without Holster	Intenna	0.369
836.6	190 (Mid)	GSM850	32.71	32.69	Rear	2.0 cm without Holster	Intenna	0.385
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:

- 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].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
- Both side of the phone were tested and the worst-case side is reported.
- Test Configuration ☐ With Holster ☒ Without Holster
- HEADSET was connected.
- Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

12.10 Measurement Results (GSM1900 Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Configuration	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 880.0	661 (Mid)	GPRS 4Tx	31.38	31.42	Rear	2.0 cm without Holster	Intenna	0.228
1 880.0	661 (Mid)	GPRS 3Tx	32.41	32.45	Rear	2.0 cm without Holster	Intenna	0.232
1 880.0	661 (Mid)	GPRS 2Tx	32.70	32.77	Rear	2.0 cm without Holster	Intenna	0.224
1 880.0	661 (Mid)	GPRS 1Tx	32.70	32.68	Rear	2.0 cm without Holster	Intenna	0.234
1 880.0	661 (Mid)	GSM1900	32.71	32.77	Rear	2.0 cm without Holster	Intenna	0.246
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:

- 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].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
- Both side of the phone were tested and the worst-case side is reported.
- Test Configuration ☐ With Holster ☒ Without Holster
- HEADSET was connected.
- Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

12.11 Measurement Results (WCDMA1900 Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Configuration	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 880.0	9400 (Mid)	WCDMA1900	23.07	23.05	Rear	2.0 cm without Holster	Intenna	0.483
ANSI/ IEEE C95.1 - 1992– Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg (mW/g) Averaged over 1 gram		

- 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].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm $\pm$ 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
- HEADSET was connected.
- Test Configuration ☐ With Holster ☒ Without Holster
- 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).
- WCDMA Mode was tested under RMC 12.2 kbps and HSPA Inactive.

12.12 Measurement Results (802.11b/g/n Module 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	18.61	18.74	Rear	2.0 cm	1 Mbps	0.098
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:

- 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].
- All modes of operation were investigated and the worst-case are reported.
- Measured Depth of Simulating Tissue is 15.0 cm $\pm$ 0.2 cm.
- Tissue parameters and temperatures are listed on the SAR plot.
- Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
- Test Signal Call Mode ☒ Manual Test code ☐ Base Station Simulator

13. CONCLUSION

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

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

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Attachment 1. – SAR Test Plots

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Jan. 6, 2010

DUT: LG-P970; 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; $\sigma = 0.925$ mho/m; $\epsilon_r = 43$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 190/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.288 mW/g

Left touch 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

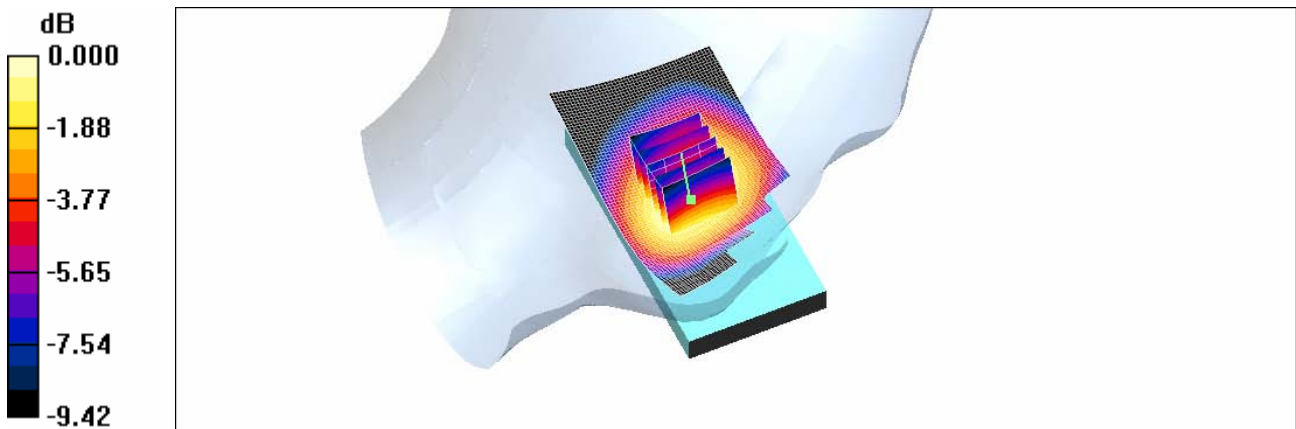
Reference Value = 6.44 V/m; Power Drift = -0.017 dB

Peak SAR (extrapolated) = 0.346 W/kg

SAR(1 g) = 0.279 mW/g; SAR(10 g) = 0.207 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.298 mW/g



0 dB = 0.298mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Jan. 6, 2010

DUT: LG-P970; 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; $\sigma = 0.925$ mho/m; $\epsilon_r = 43$; $\rho = 1000$ kg/m³
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 190/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.338 mW/g

Right touch 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

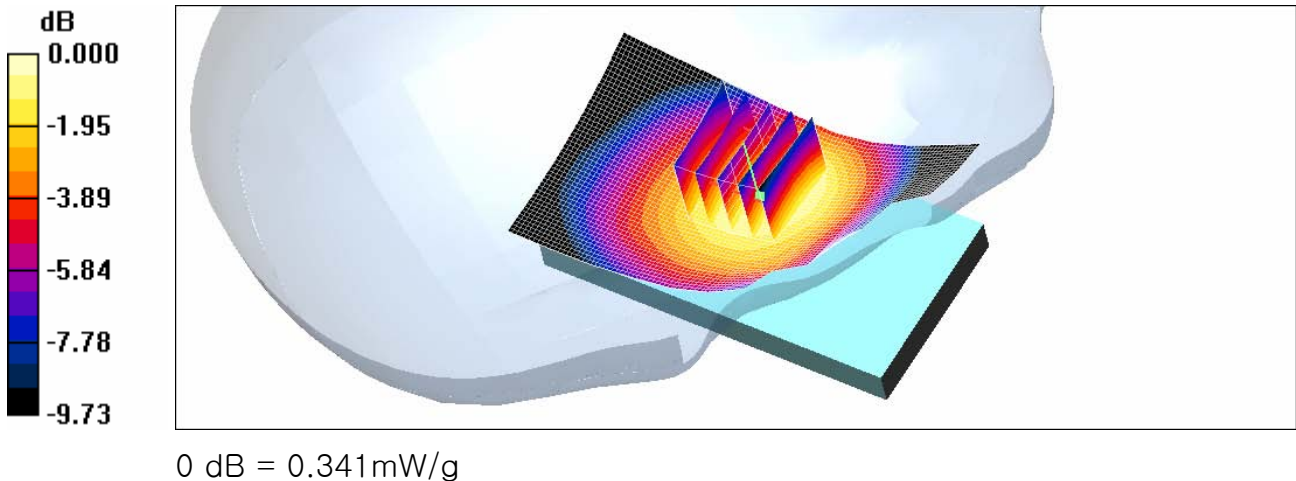
Reference Value = 8.08 V/m; Power Drift = -0.067 dB

Peak SAR (extrapolated) = 0.403 W/kg

SAR(1 g) = 0.317 mW/g; SAR(10 g) = 0.233 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.341 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Jan. 6, 2010

DUT: LG-P970; 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; $\sigma = 0.925$ mho/m; $\epsilon_r = 43$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left tilt 190/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.168 mW/g

Left tilt 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

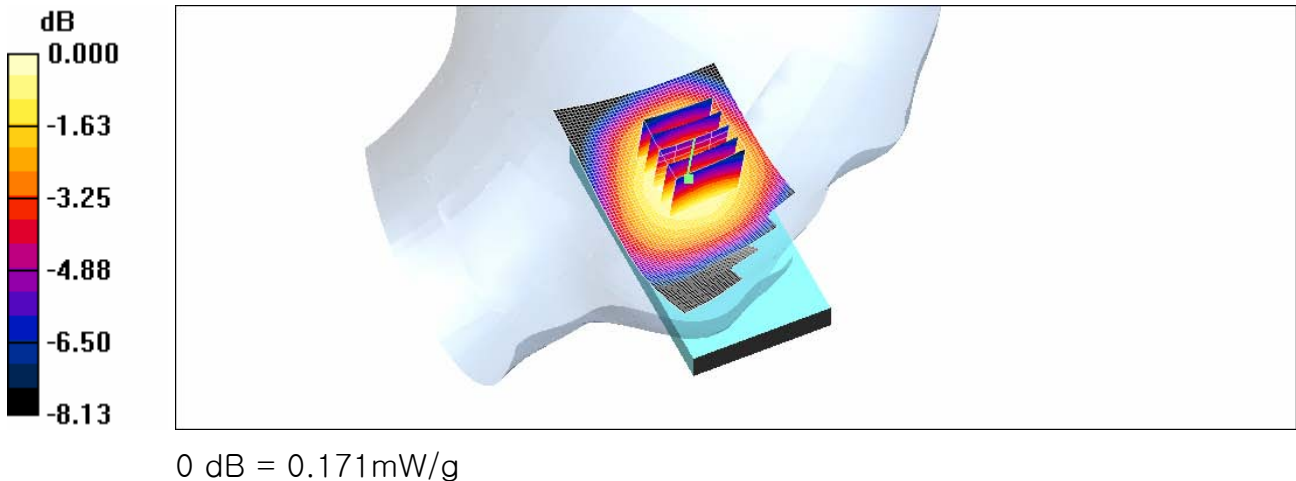
Reference Value = 9.75 V/m; Power Drift = -0.012 dB

Peak SAR (extrapolated) = 0.193 W/kg

SAR(1 g) = 0.164 mW/g; SAR(10 g) = 0.128 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.171 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Jan. 6, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.925 \text{ mho/m}$; $\epsilon_r = 43$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right tilt 190/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.204 mW/g

Right tilt 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

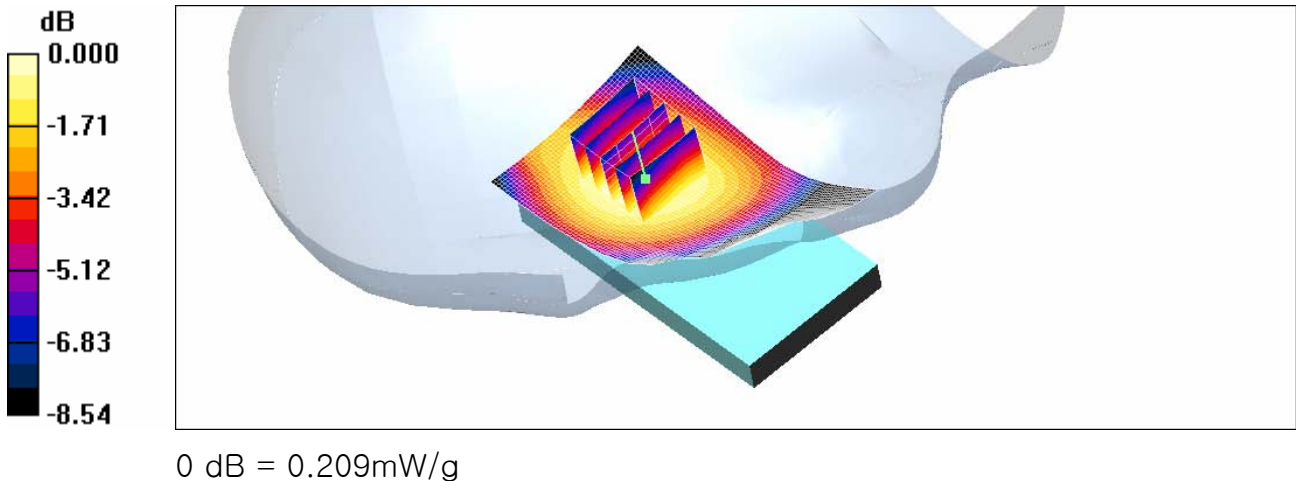
Reference Value = 13.1 V/m; Power Drift = -0.001 dB

Peak SAR (extrapolated) = 0.239 W/kg

SAR(1 g) = 0.199 mW/g; SAR(10 g) = 0.153 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.209 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

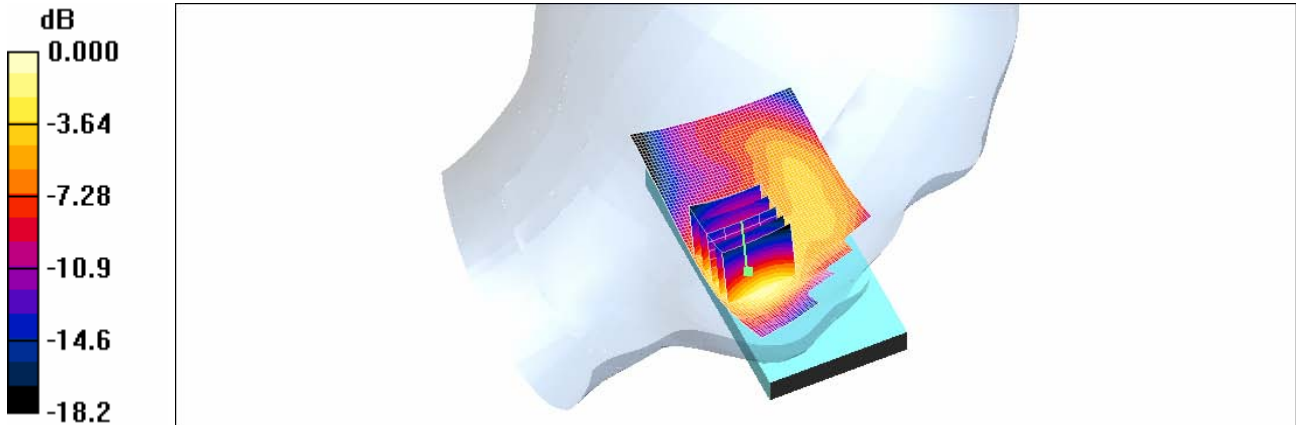
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.38 \text{ mho/m}$; $\epsilon_r = 41$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8
Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 661/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.895 mW/g

Left touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 10.1 V/m; Power Drift = -0.087 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.773 mW/g; SAR(10 g) = 0.442 mW/g
Maximum value of SAR (measured) = 0.861 mW/g



0 dB = 0.861mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

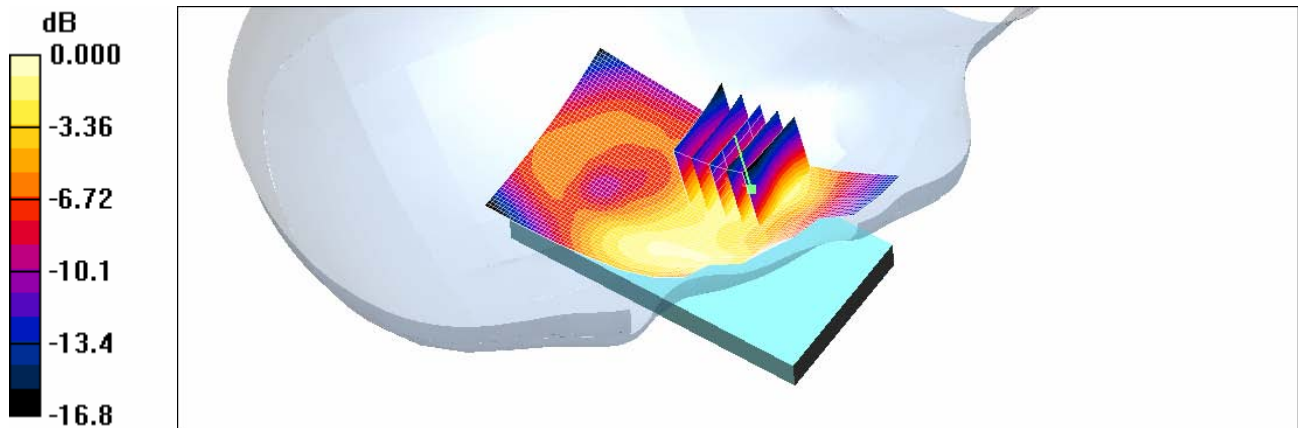
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.38 \text{ mho/m}$; $\epsilon_r = 41$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 661/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.581 mW/g

Right touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 11.3 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 0.774 W/kg
SAR(1 g) = 0.513 mW/g; SAR(10 g) = 0.303 mW/g
Maximum value of SAR (measured) = 0.564 mW/g



0 dB = 0.564mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

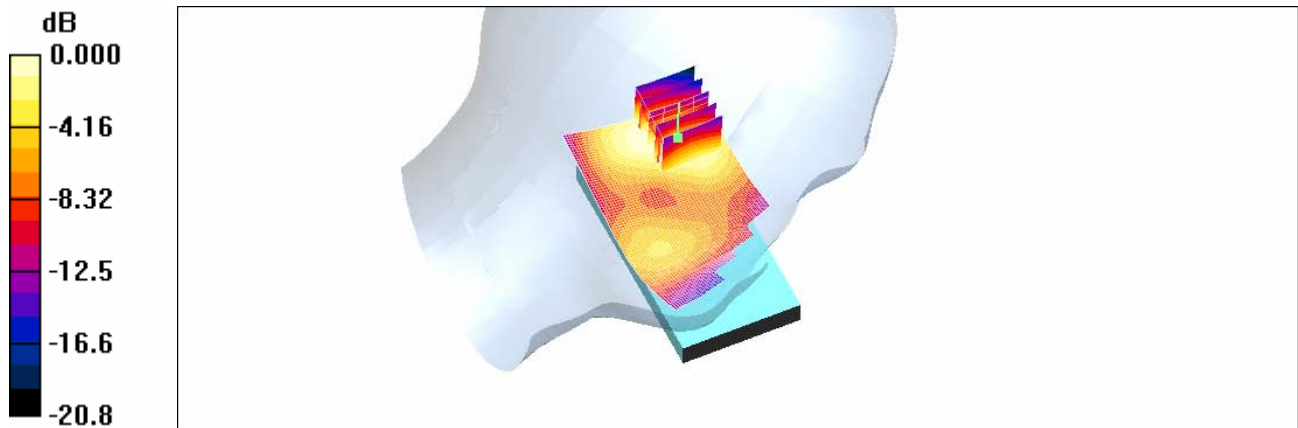
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.38 \text{ mho/m}$; $\epsilon_r = 41$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8
Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left tilt 661/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.367 mW/g

Left tilt 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 15.9 V/m; Power Drift = -0.070 dB
Peak SAR (extrapolated) = 0.491 W/kg
SAR(1 g) = 0.322 mW/g; SAR(10 g) = 0.197 mW/g
Maximum value of SAR (measured) = 0.350 mW/g



0 dB = 0.350mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

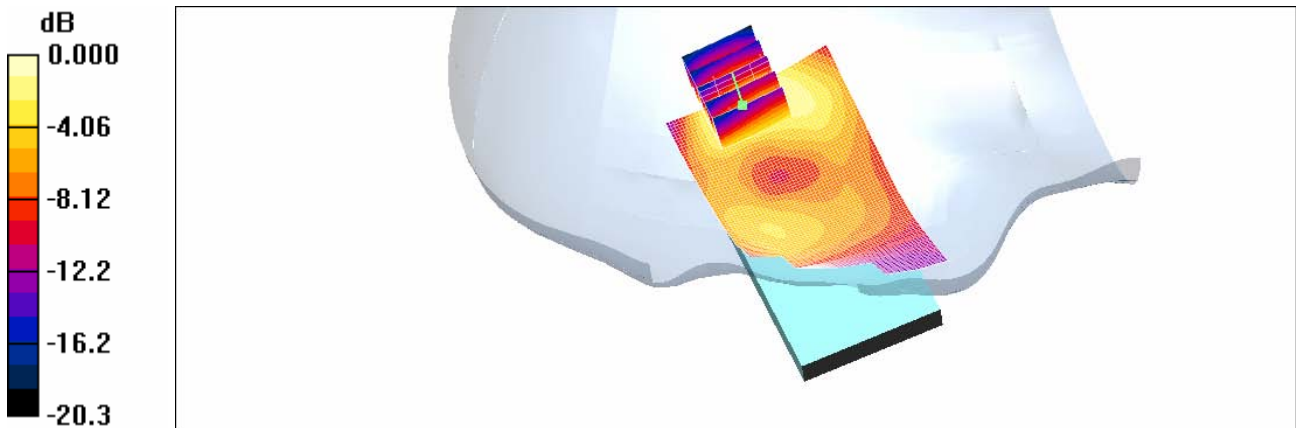
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.38 \text{ mho/m}$; $\epsilon_r = 41$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right tilt 661/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.365 mW/g

Right tilt 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 16.4 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 0.505 W/kg
SAR(1 g) = 0.314 mW/g; SAR(10 g) = 0.177 mW/g
Maximum value of SAR (measured) = 0.353 mW/g



0 dB = 0.353mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.36$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 9262/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.22 mW/g

Left touch 9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

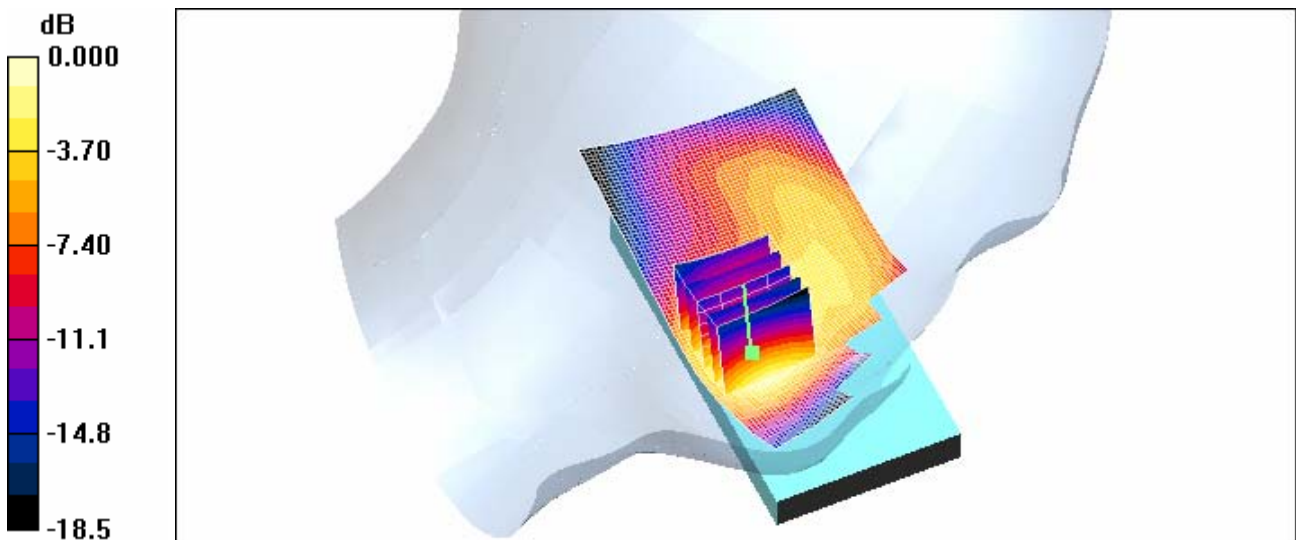
Reference Value = 12.1 V/m; Power Drift = -0.176 dB

Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.612 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.16 mW/g



0 dB = 1.16mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

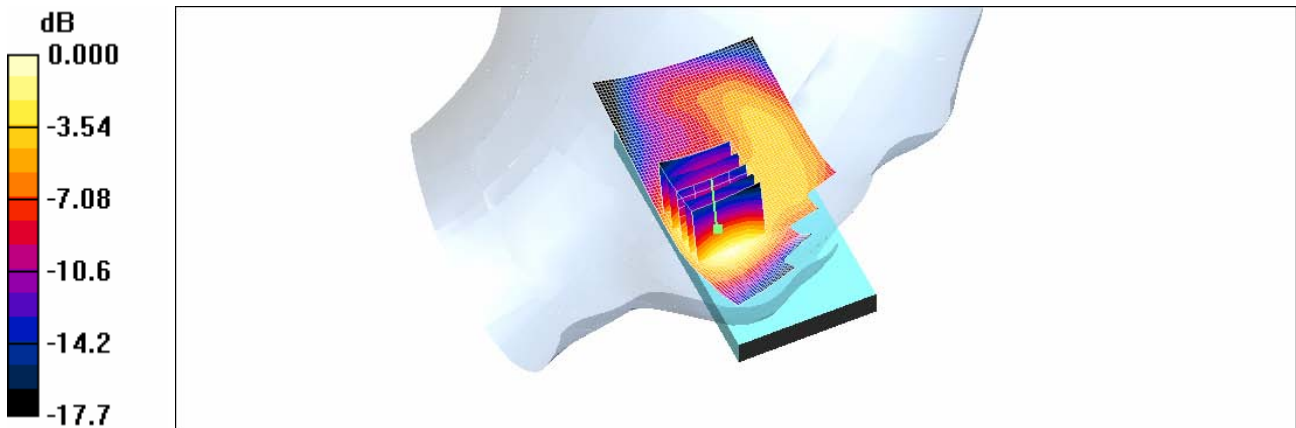
Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8
Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 9400/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.40 mW/g

Left touch 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.5 V/m; Power Drift = -0.111 dB
Peak SAR (extrapolated) = 1.81 W/kg
SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.696 mW/g
Maximum value of SAR (measured) = 1.29 mW/g



0 dB = 1.29mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1907.6 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 9538/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.26 mW/g

Left touch 9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

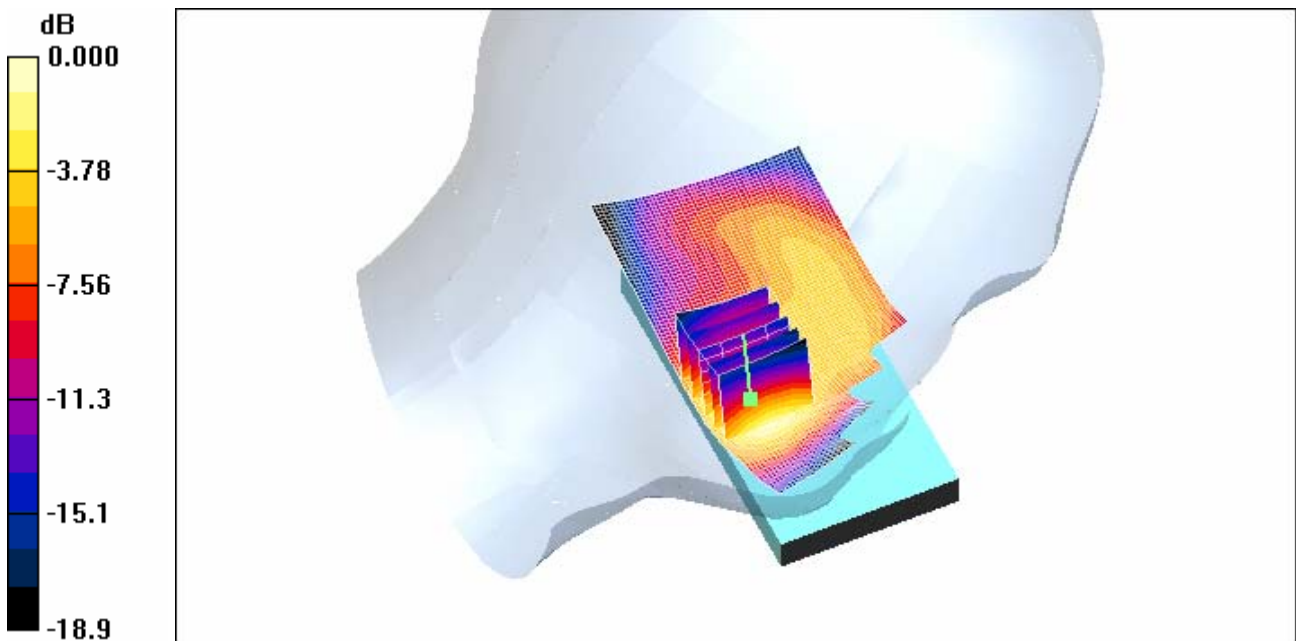
Reference Value = 12.8 V/m; Power Drift = -0.083 dB

Peak SAR (extrapolated) = 1.76 W/kg

SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.633 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.23 mW/g



0 dB = 1.23mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 1852.4$ MHz; $\sigma = 1.36$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

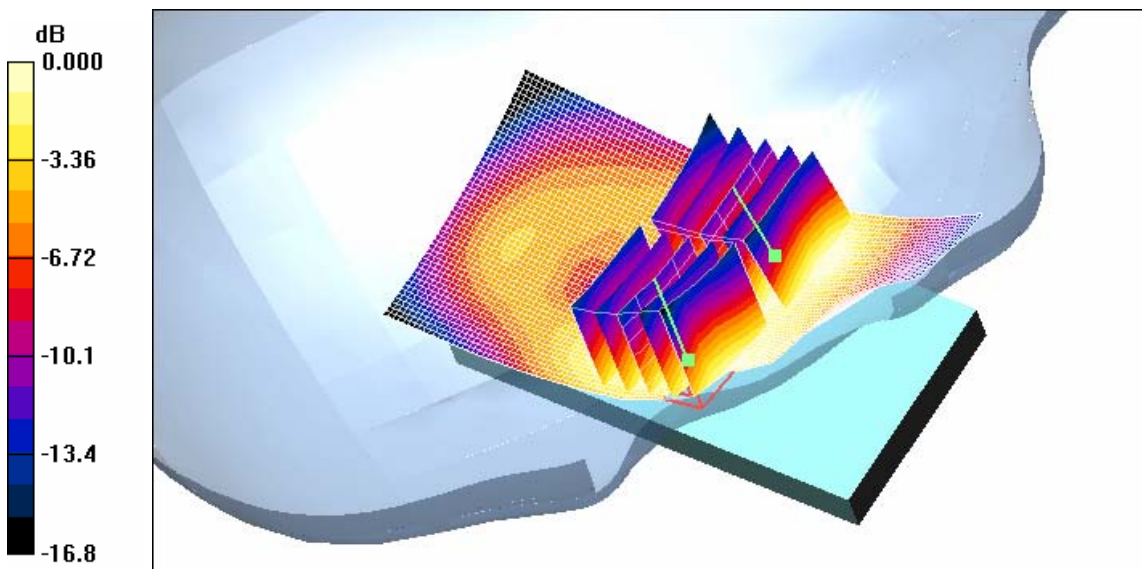
Right touch 9262/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.980 mW/g

Right touch 9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.8 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.875 mW/g; SAR(10 g) = 0.525 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.953 mW/g

Right touch 9262/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.8 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.701 mW/g; SAR(10 g) = 0.438 mW/g
Maximum value of SAR (measured) = 0.757 mW/g



0 dB = 0.757mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

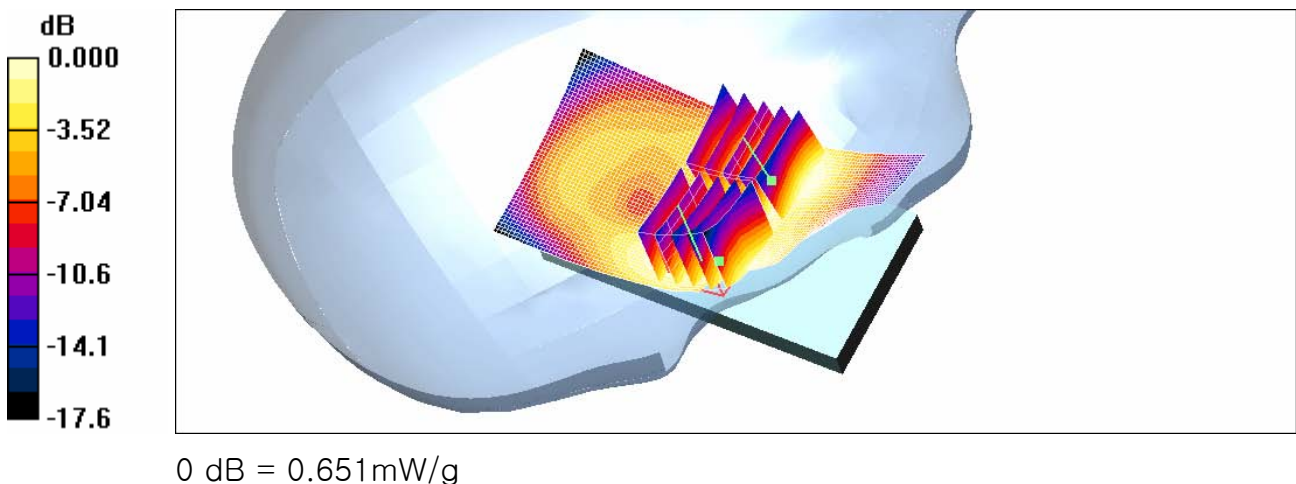
DASY4 Configuration:

- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 9400/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.957 mW/g

Right touch 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.8 V/m; Power Drift = 0.006 dB
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.845 mW/g; SAR(10 g) = 0.504 mW/g
Maximum value of SAR (measured) = 0.927 mW/g

Right touch 9400/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.8 V/m; Power Drift = 0.006 dB
Peak SAR (extrapolated) = 0.913 W/kg
SAR(1 g) = 0.602 mW/g; SAR(10 g) = 0.380 mW/g
Maximum value of SAR (measured) = 0.651 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
 GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

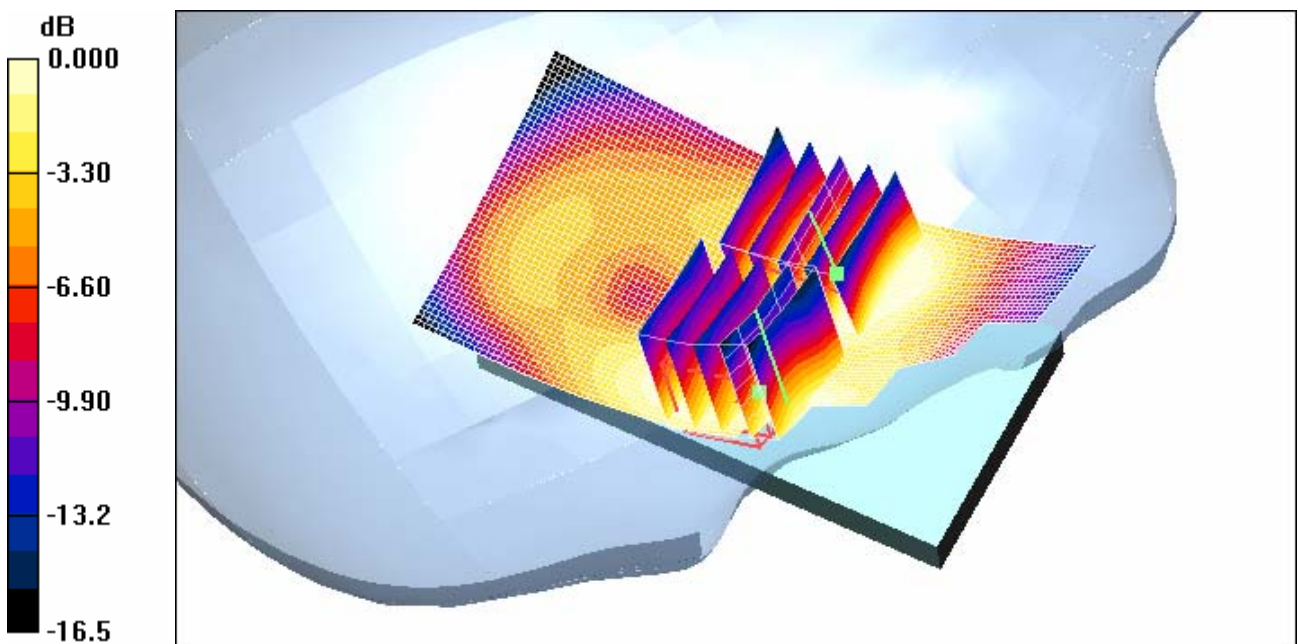
Communication System: WCDMA1900; Frequency: 1907.6 MHz; Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 1907.6 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.9$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing 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: DAE3 Sn446; Calibrated: 2010-09-21
 - Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 9538/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 0.950 mW/g

Right touch 9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 14.1 V/m; Power Drift = -0.105 dB
 Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.841 mW/g; SAR(10 g) = 0.489 mW/g
 Maximum value of SAR (measured) = 0.922 mW/g

Right touch 9538/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 14.1 V/m; Power Drift = -0.105 dB
 Peak SAR (extrapolated) = 0.877 W/kg
SAR(1 g) = 0.560 mW/g; SAR(10 g) = 0.345 mW/g
 Maximum value of SAR (measured) = 0.598 mW/g



0 dB = 0.598mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

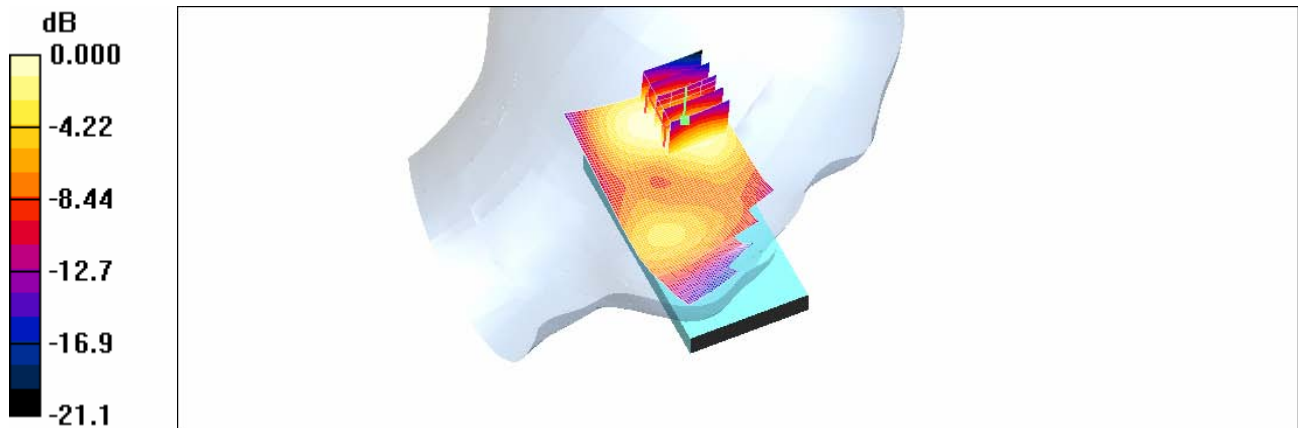
Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.38 \text{ mho/m}$; $\epsilon_r = 41$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8
Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left tilt 9400/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.658 mW/g

Left tilt 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 20.5 V/m; Power Drift = -0.103 dB
Peak SAR (extrapolated) = 0.859 W/kg
SAR(1 g) = 0.534 mW/g; SAR(10 g) = 0.323 mW/g
Maximum value of SAR (measured) = 0.558 mW/g



0 dB = 0.558mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

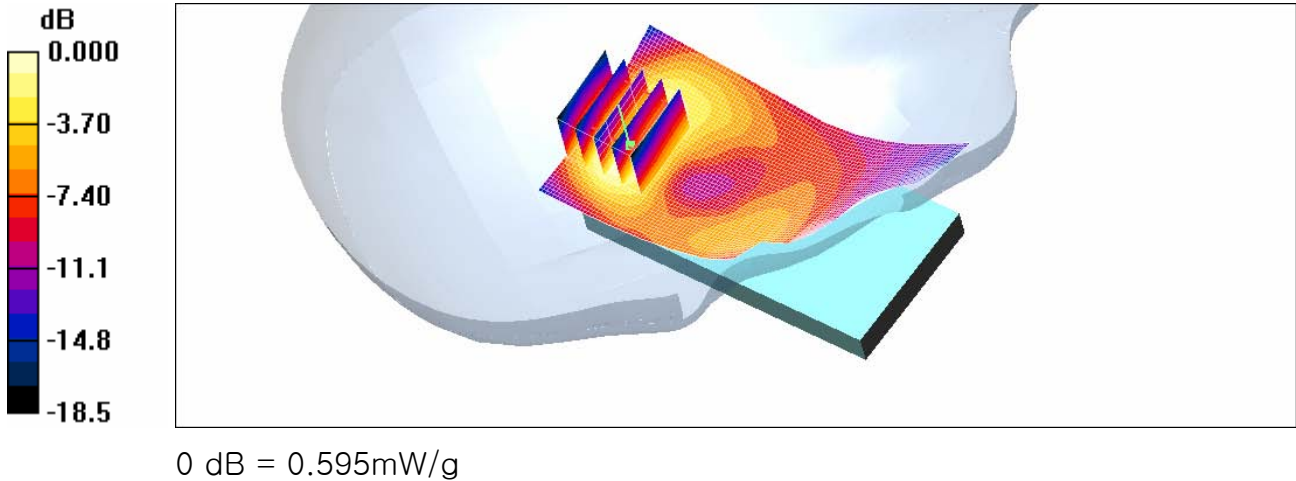
Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right tilt 9400/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.634 mW/g

Right tilt 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.9 V/m; Power Drift = -0.014 dB
Peak SAR (extrapolated) = 0.850 W/kg
SAR(1 g) = 0.539 mW/g; SAR(10 g) = 0.303 mW/g
Maximum value of SAR (measured) = 0.595 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.82$ mho/m; $\epsilon_r = 38.7$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 1/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.674 mW/g

Left touch 1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

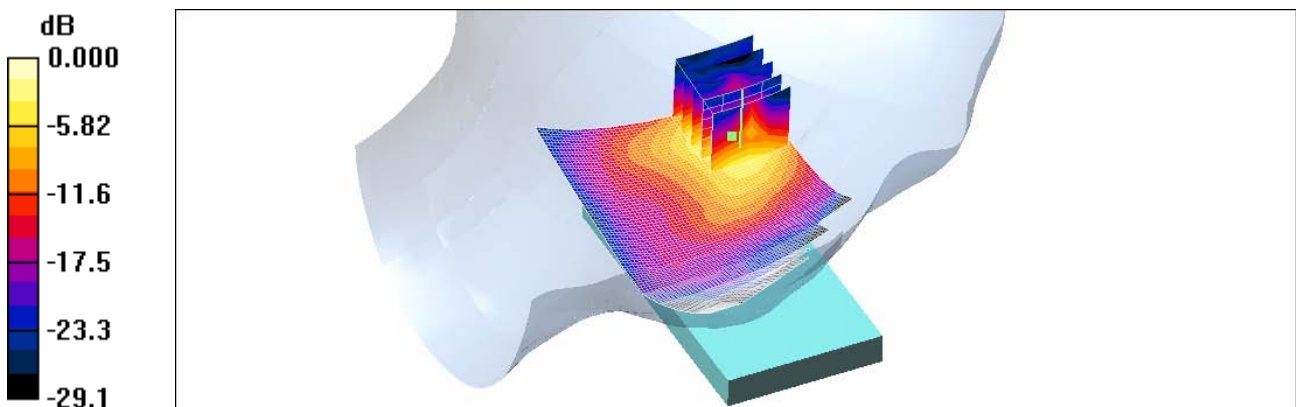
Reference Value = 8.25 V/m; Power Drift = -0.002 dB

Peak SAR (extrapolated) = 2.06 W/kg

SAR(1 g) = 0.661 mW/g; SAR(10 g) = 0.258 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.813 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2412 \text{ MHz}$; $\sigma = 1.82 \text{ mho/m}$; $\epsilon_r = 38.7$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 1/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.255 mW/g

Right touch 1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

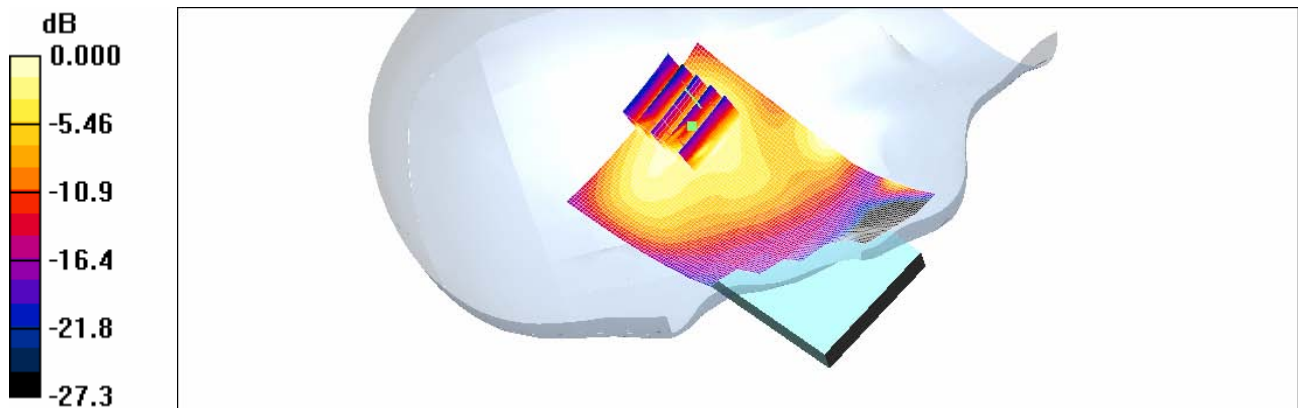
Reference Value = 9.68 V/m; Power Drift = -0.017 dB

Peak SAR (extrapolated) = 0.496 W/kg

SAR(1 g) = 0.216 mW/g; SAR(10 g) = 0.108 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.219 mW/g



0 dB = 0.219mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.82$ mho/m; $\epsilon_r = 38.7$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left tilt 1/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.380 mW/g

Left tilt 1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

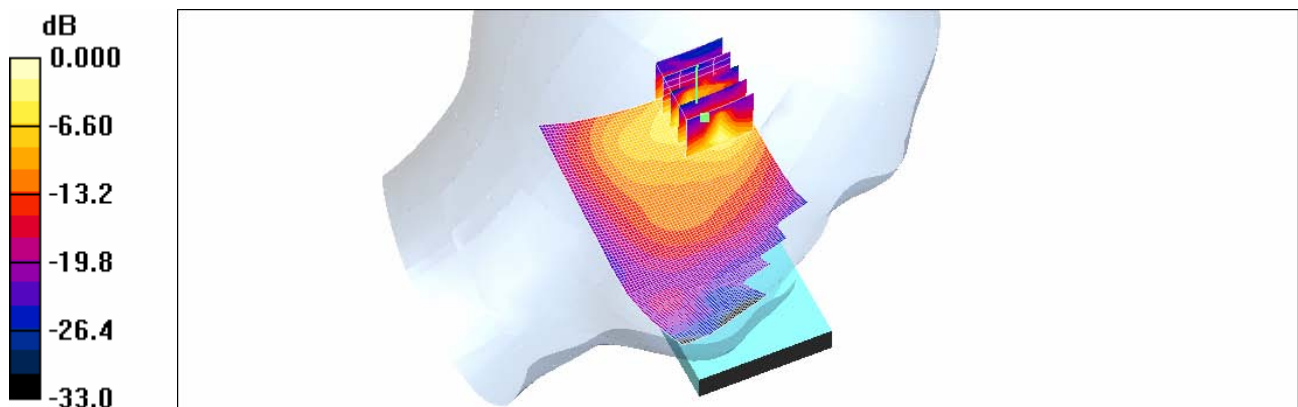
Reference Value = 7.92 V/m; Power Drift = 0.251 dB

Peak SAR (extrapolated) = 0.814 W/kg

SAR(1 g) = 0.368 mW/g; SAR(10 g) = 0.158 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.547 mW/g



0 dB = 0.547mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.82$ mho/m; $\epsilon_r = 38.7$; $\rho = 1000$ kg/m³
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right tilt 1/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.294 mW/g

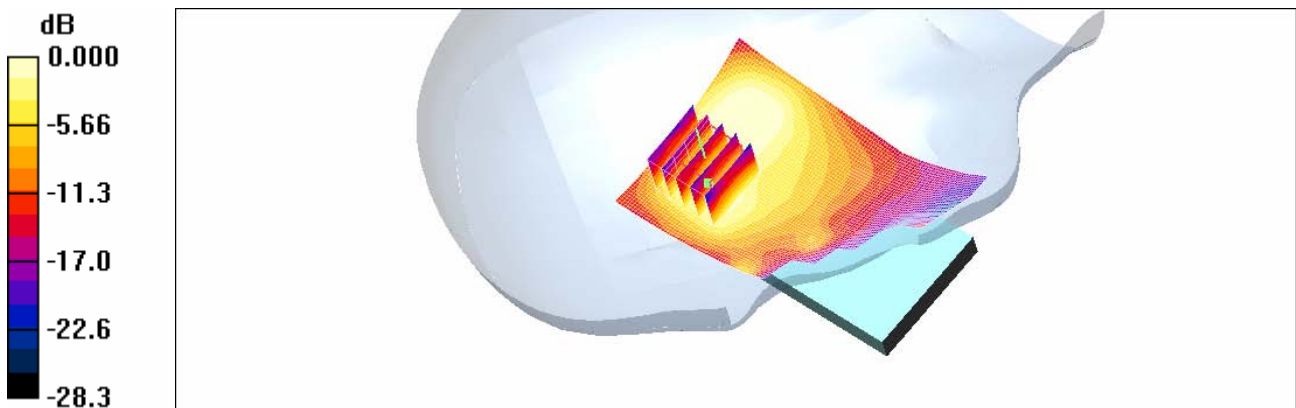
Right tilt 1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.48 V/m; Power Drift = 0.045 dB

Peak SAR (extrapolated) = 0.250 W/kg

SAR(1 g) = 0.129 mW/g; SAR(10 g) = 0.068 mW/g

Maximum value of SAR (measured) = 0.134 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Jan. 6, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:2.075
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.982 \text{ mho/m}$; $\epsilon_r = 56.8$; $\rho = 1000 \text{ kg/m}^3$
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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body 190/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.480 mW/g

Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

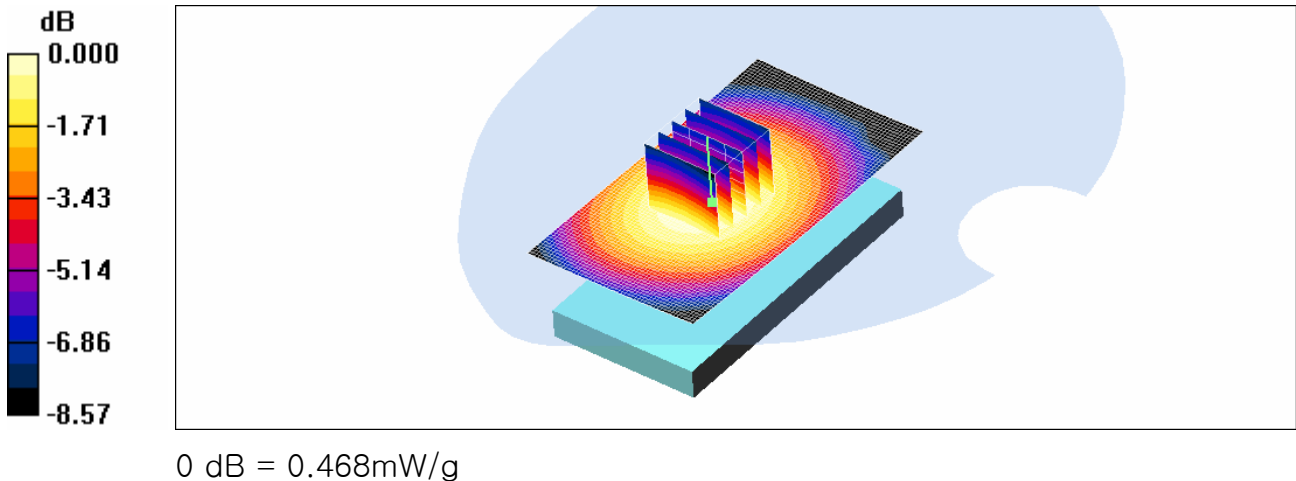
Reference Value = 13.1 V/m; Power Drift = 0.005 dB

Peak SAR (extrapolated) = 0.540 W/kg

SAR(1 g) = 0.446 mW/g; SAR(10 g) = 0.337 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.468 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Jan. 6, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:2.77
Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.982$ mho/m; $\epsilon_r = 56.8$; $\rho = 1000$ kg/m³
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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body 190/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.544 mW/g

Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

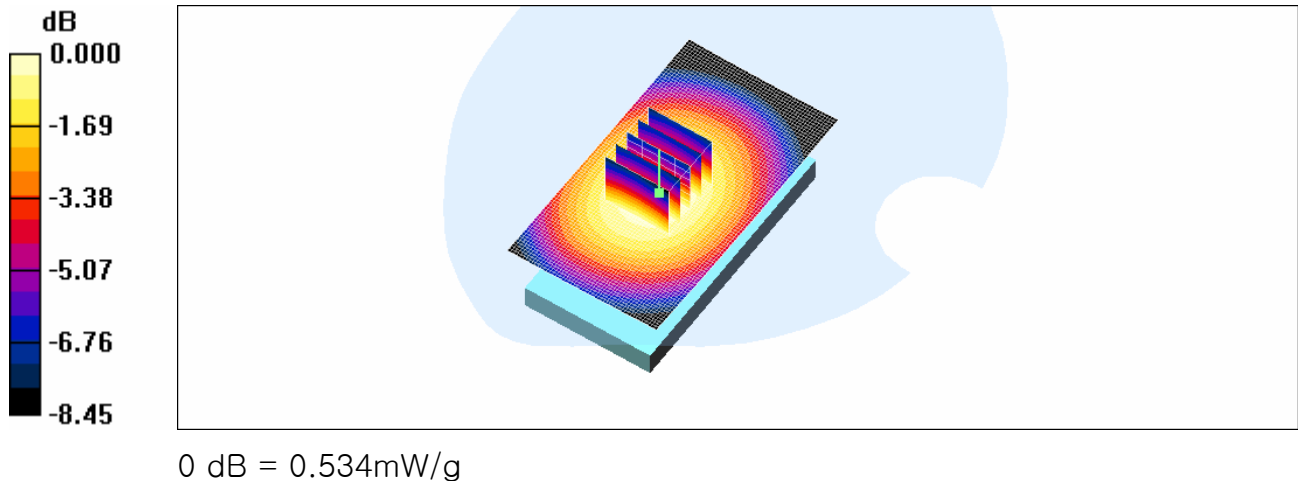
Reference Value = 14.0 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 0.622 W/kg

SAR(1 g) = 0.507 mW/g; SAR(10 g) = 0.382 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.534 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
 GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
 Liquid Temperature: 21.1 °C
 Ambient Temperature: 21.3 °C
 Test Date: Jan. 6, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:4.15
 Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.982 \text{ mho/m}$; $\epsilon_r = 56.8$; $\rho = 1000 \text{ kg/m}^3$
 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: DAE3 Sn446; Calibrated: 2010-09-21
 - Phantom: SAM 1800/1900 MHz; Type: SAM

Body 190/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.480 mW/g

Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

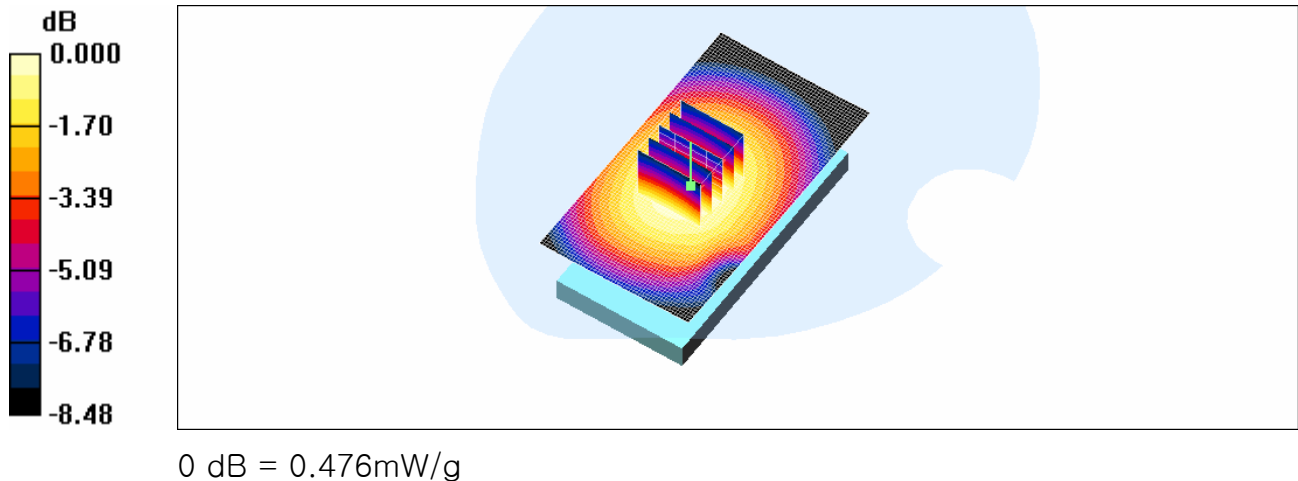
Reference Value = 13.1 V/m; Power Drift = -0.073 dB

Peak SAR (extrapolated) = 0.554 W/kg

SAR(1 g) = 0.450 mW/g; SAR(10 g) = 0.337 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.476 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Jan. 6, 2010

DUT: LG-P970; 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; $\sigma = 0.982$ mho/m; $\epsilon_r = 56.8$; $\rho = 1000$ kg/m³
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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body 190/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.396 mW/g

Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

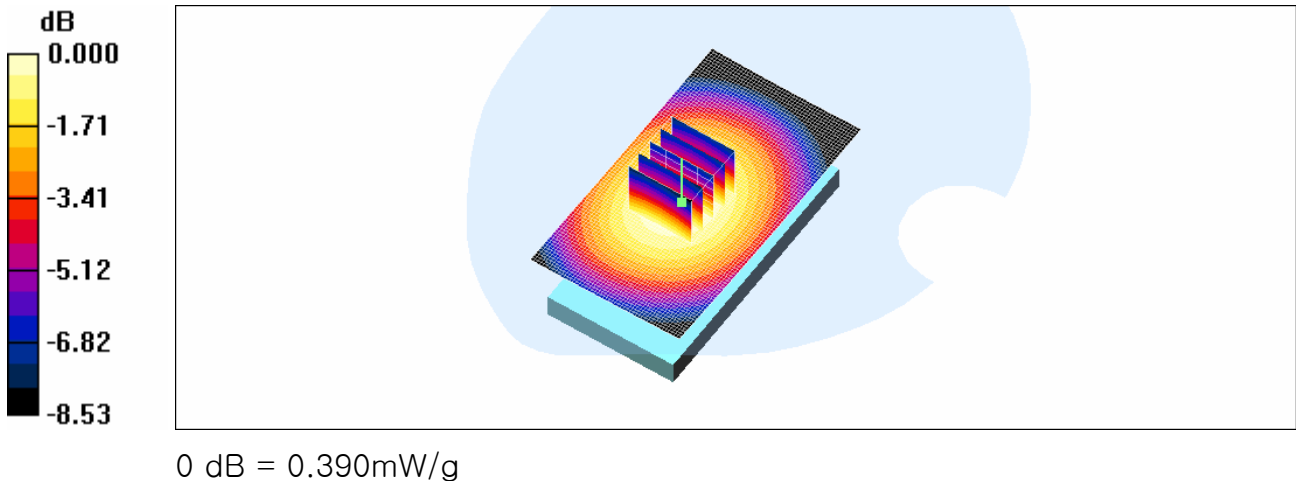
Reference Value = 12.0 V/m; Power Drift = -0.080 dB

Peak SAR (extrapolated) = 0.450 W/kg

SAR(1 g) = 0.369 mW/g; SAR(10 g) = 0.277 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.390 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Jan. 6, 2010

DUT: LG-P970; 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; $\sigma = 0.982$ mho/m; $\epsilon_r = 56.8$; $\rho = 1000$ kg/m³
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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body 190/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.415 mW/g

Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

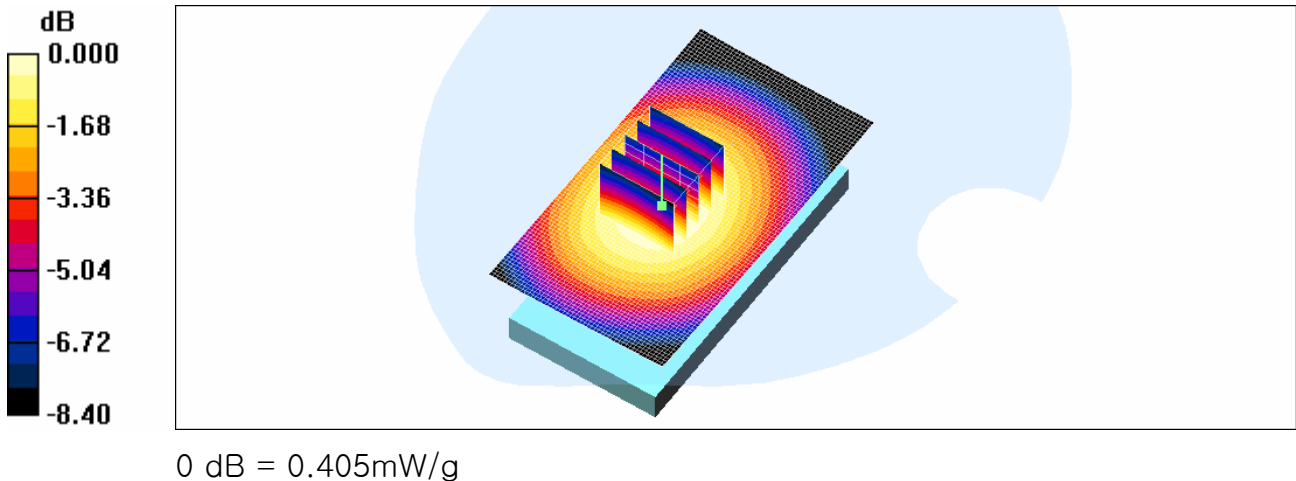
Reference Value = 12.1 V/m; Power Drift = -0.021 dB

Peak SAR (extrapolated) = 0.471 W/kg

SAR(1 g) = 0.385 mW/g; SAR(10 g) = 0.289 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.405 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

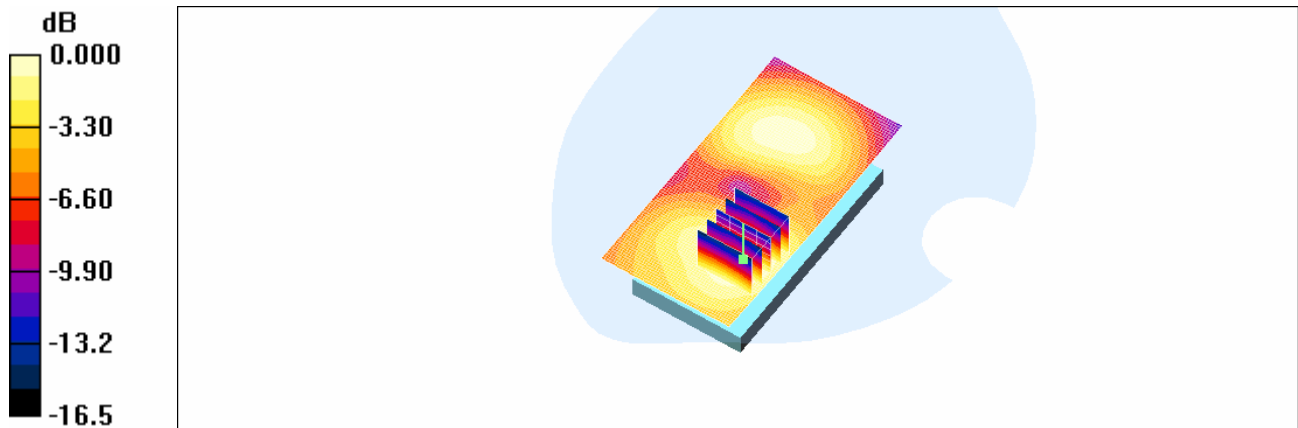
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2.075
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body 661/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.262 mW/g

Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 13.0 V/m; Power Drift = 0.044 dB
Peak SAR (extrapolated) = 0.310 W/kg
SAR(1 g) = 0.228 mW/g; SAR(10 g) = 0.143 mW/g
Maximum value of SAR (measured) = 0.249 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

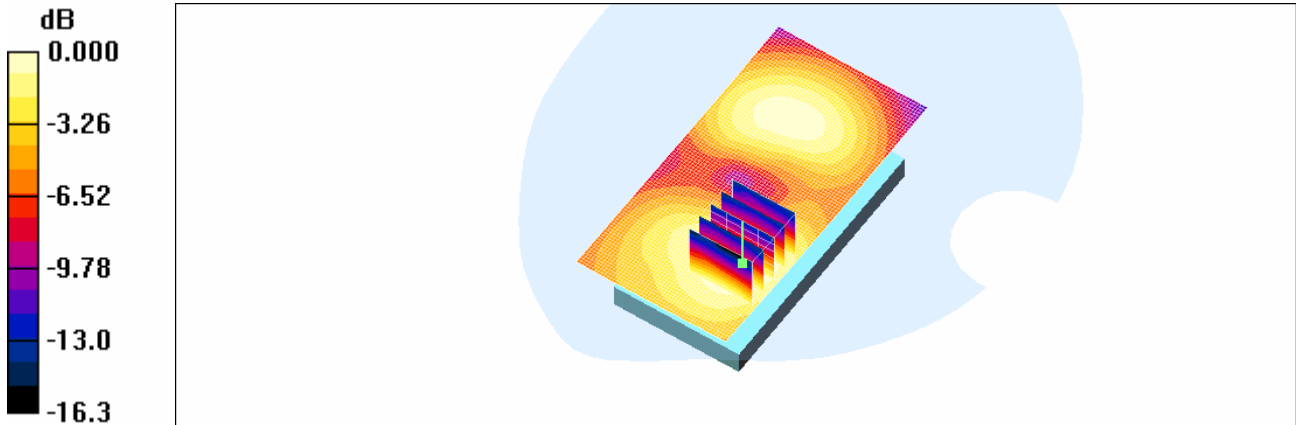
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2.77
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body 661/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.269 mW/g

Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 13.1 V/m; Power Drift = 0.036 dB
Peak SAR (extrapolated) = 0.320 W/kg
SAR(1 g) = 0.232 mW/g; SAR(10 g) = 0.145 mW/g
Maximum value of SAR (measured) = 0.255 mW/g



0 dB = 0.255mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

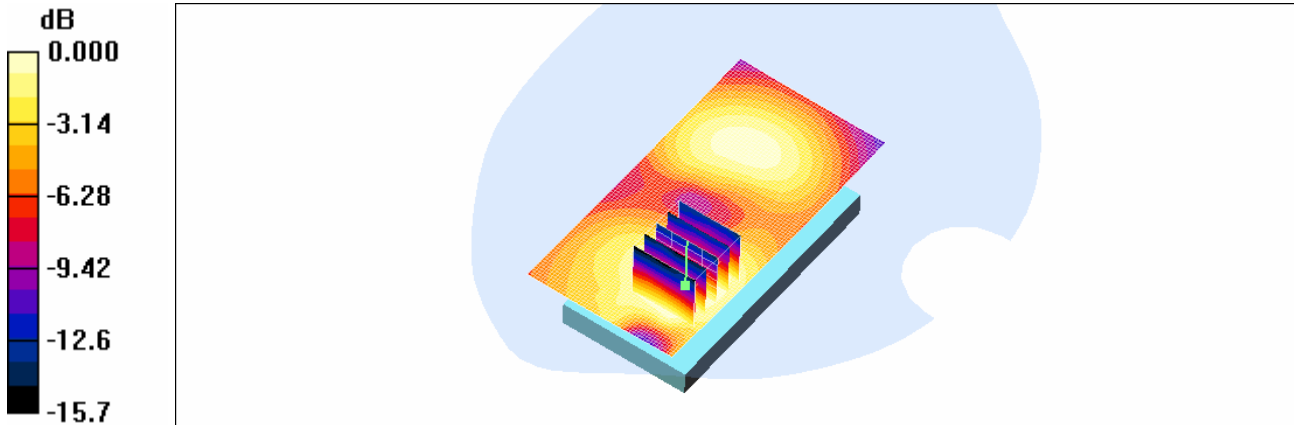
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:4.15
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body 661/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.258 mW/g

Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 12.8 V/m; Power Drift = 0.073 dB
Peak SAR (extrapolated) = 0.307 W/kg
SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.141 mW/g
Maximum value of SAR (measured) = 0.243 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

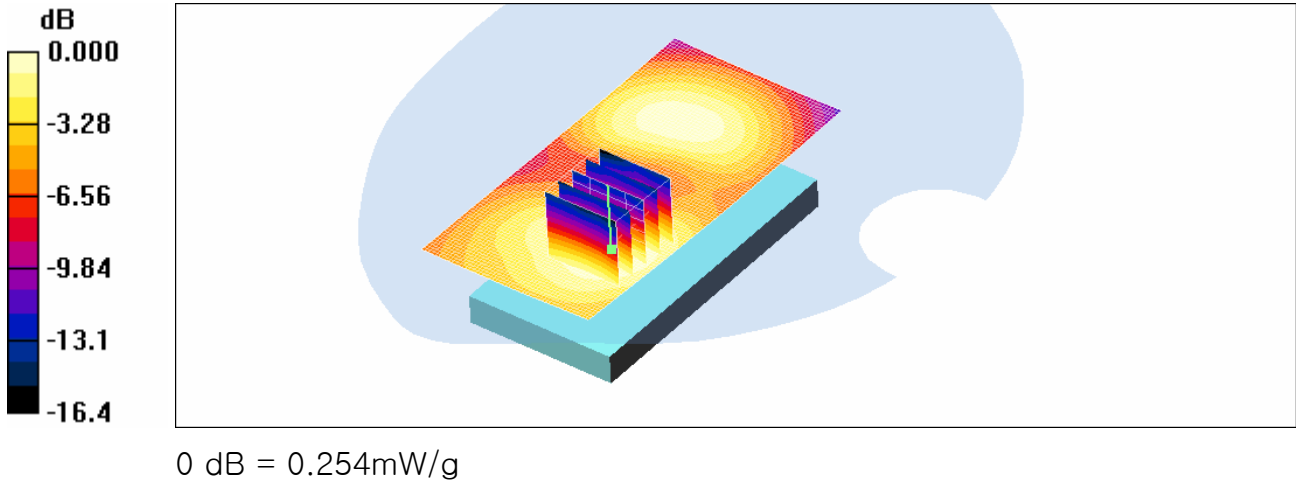
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body 661/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.271 mW/g

Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 13.2 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 0.314 W/kg
SAR(1 g) = 0.234 mW/g; SAR(10 g) = 0.148 mW/g
Maximum value of SAR (measured) = 0.254 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

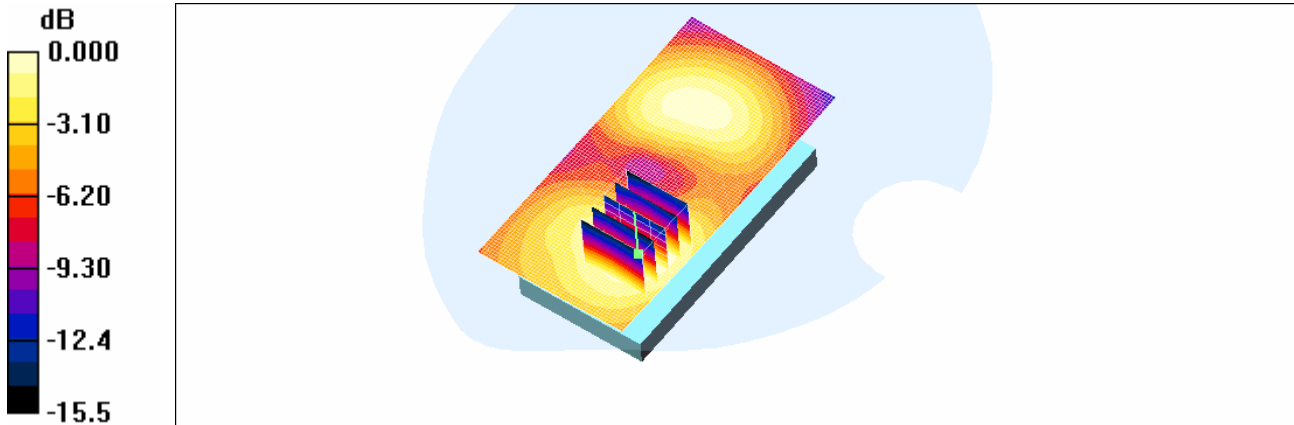
Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body 661/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.283 mW/g

Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 13.4 V/m; Power Drift = 0.055 dB
Peak SAR (extrapolated) = 0.341 W/kg
SAR(1 g) = 0.246 mW/g; SAR(10 g) = 0.154 mW/g
Maximum value of SAR (measured) = 0.271 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
 GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Jan. 7, 2010

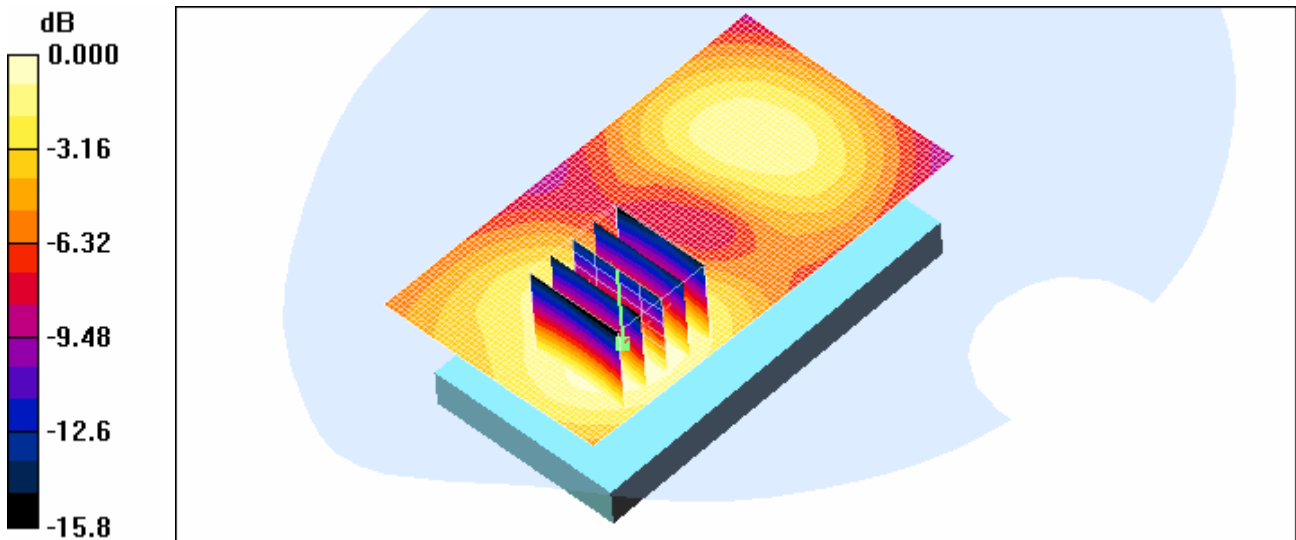
DUT: LG-P970; Type: bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8
 Build 184

DASY4 Configuration:
 - Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE3 Sn446; Calibrated: 2010-09-21
 - Phantom: SAM 1800/1900 MHz; Type: SAM

Body 9400/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.555 mW/g

Body 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 17.3 V/m; Power Drift = -0.021 dB
 Peak SAR (extrapolated) = 0.669 W/kg
SAR(1 g) = 0.483 mW/g; SAR(10 g) = 0.298 mW/g
 Maximum value of SAR (measured) = 0.528 mW/g



0 dB = 0.528mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2462 \text{ MHz}$; $\sigma = 1.97 \text{ mho/m}$; $\epsilon_r = 51.5$; $\rho = 1000 \text{ kg/m}^3$
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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

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

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.107 mW/g

Body 11/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

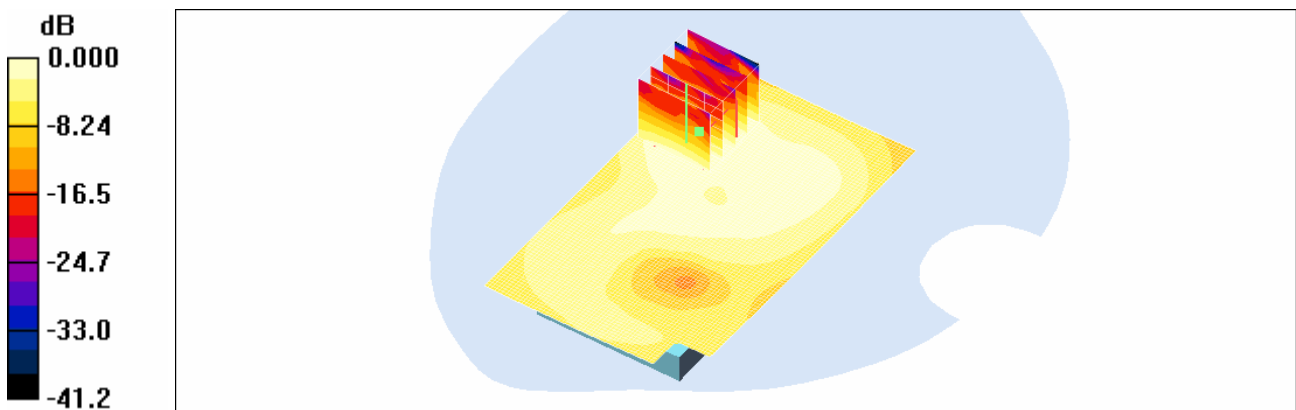
Reference Value = 5.98 V/m; Power Drift = 0.132 dB

Peak SAR (extrapolated) = 0.234 W/kg

SAR(1 g) = 0.098 mW/g; SAR(10 g) = 0.049 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.101 mW/g



0 dB = 0.101mW/g

Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
 GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
 Liquid Temperature: 21.1 °C
 Ambient Temperature: 21.3 °C
 Test Date: Jan. 6, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
 Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.925 \text{ mho/m}$; $\epsilon_r = 43$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
 - Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 190/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.338 mW/g

Right touch 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

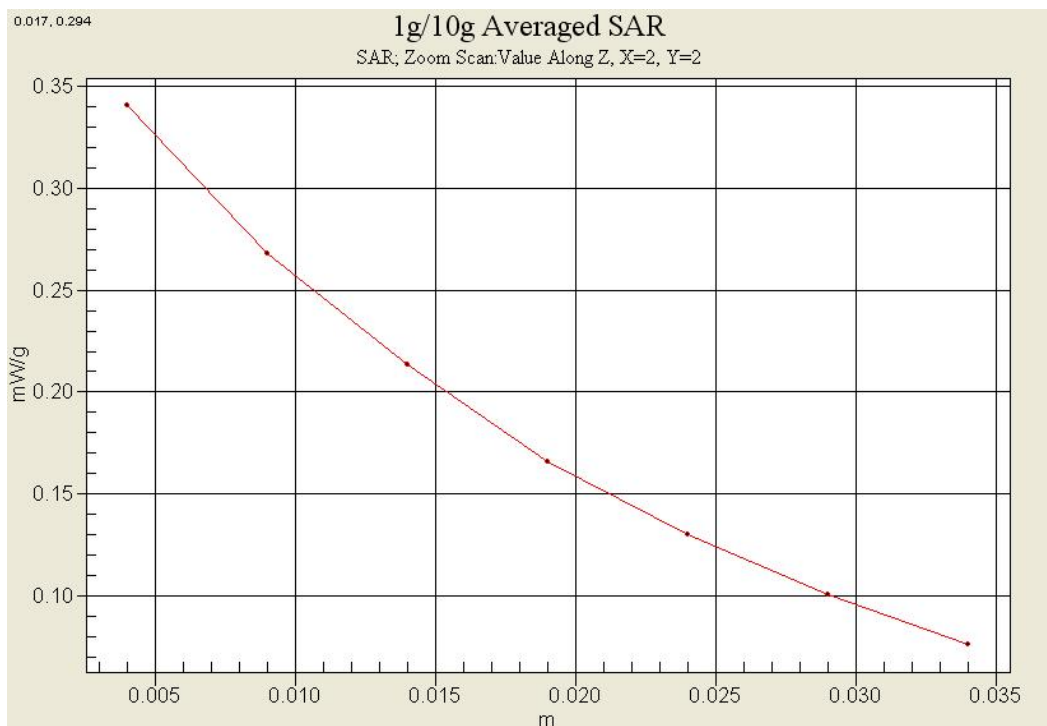
Reference Value = 8.08 V/m; Power Drift = -0.067 dB

Peak SAR (extrapolated) = 0.403 W/kg

SAR(1 g) = 0.317 mW/g; SAR(10 g) = 0.233 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.341 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Jan. 6, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:2.77
Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.982$ mho/m; $\epsilon_r = 56.8$; $\rho = 1000$ kg/m³
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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Body 190/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.544 mW/g

Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

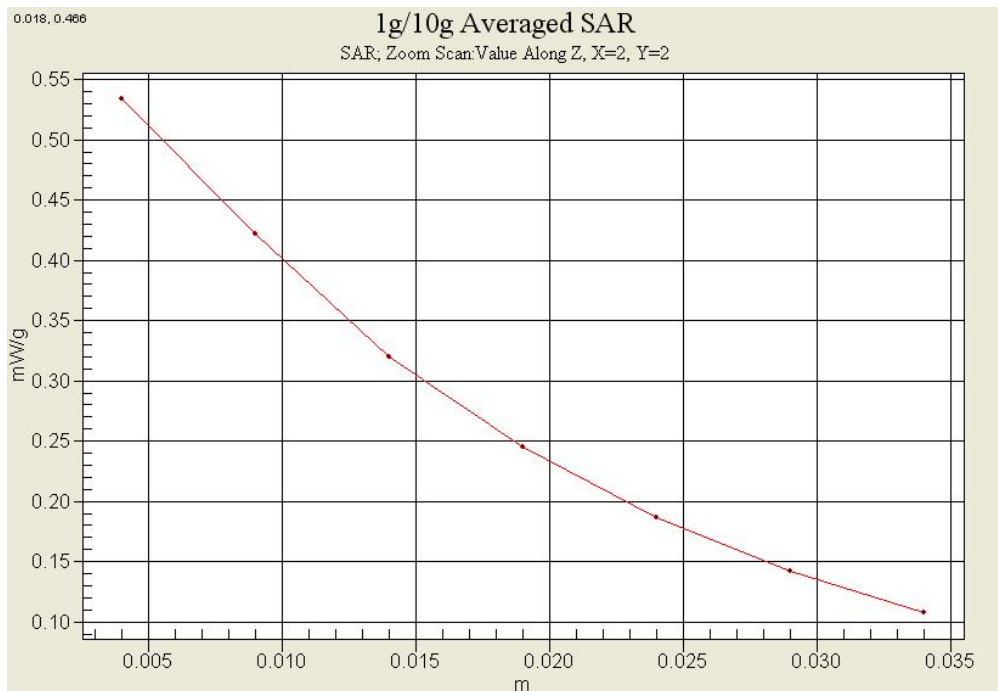
Reference Value = 14.0 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 0.622 W/kg

SAR(1 g) = 0.507 mW/g; SAR(10 g) = 0.382 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.534 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.38 \text{ mho/m}$; $\epsilon_r = 41$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 661/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.895 mW/g

Left touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 10.1 V/m; Power Drift = -0.087 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.773 mW/g; SAR(10 g) = 0.442 mW/g
Maximum value of SAR (measured) = 0.861 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
 GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Jan. 7, 2010

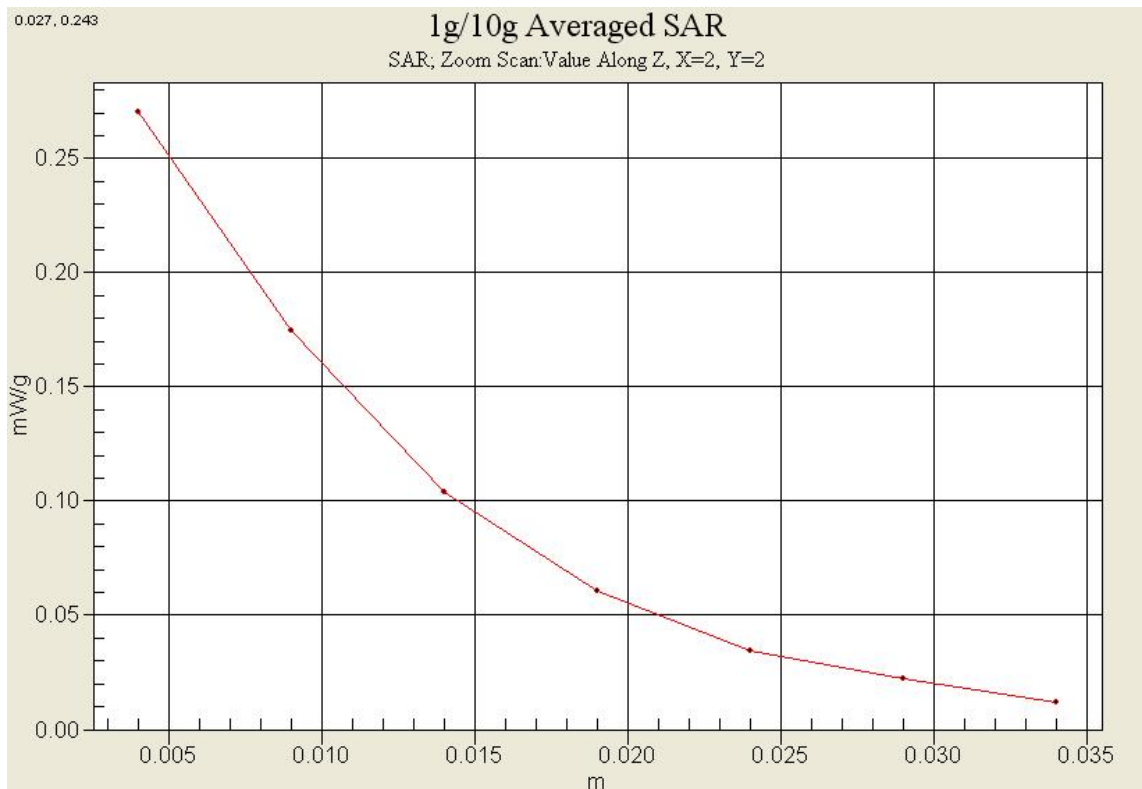
DUT: LG-P970; Type: bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
 - Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE3 Sn446; Calibrated: 2010-09-21
 - Phantom: SAM 1800/1900 MHz; Type: SAM

Body 661/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.283 mW/g

Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 13.4 V/m; Power Drift = 0.055 dB
 Peak SAR (extrapolated) = 0.341 W/kg
SAR(1 g) = 0.246 mW/g; SAR(10 g) = 0.154 mW/g
 Maximum value of SAR (measured) = 0.271 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 9400/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.40 mW/g

Left touch 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.5 V/m; Power Drift = -0.111 dB
Peak SAR (extrapolated) = 1.81 W/kg
SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.696 mW/g
Maximum value of SAR (measured) = 1.29 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
 GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Jan. 7, 2010

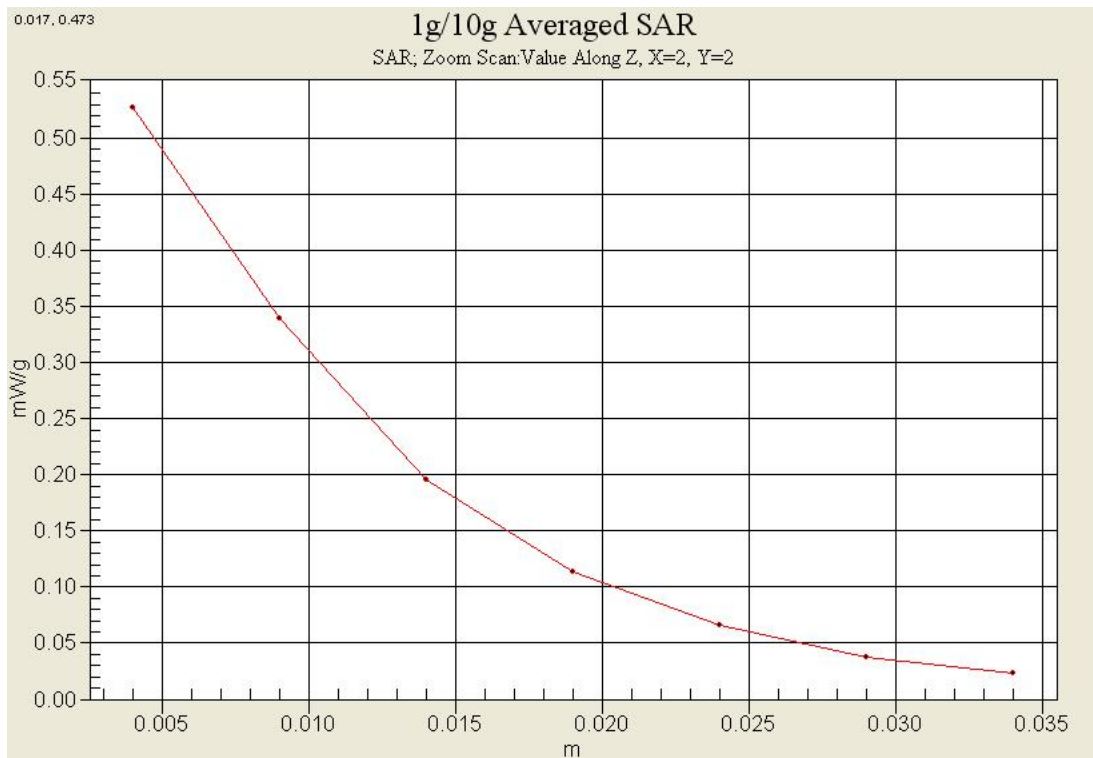
DUT: LG-P970; Type: bar; Serial: #1

Communication System: WCDMA1900; Frequency: 1880 MHz;Duty Cycle: 1:1
 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:
 - Probe: ET3DV6 - SN1630; ConvF(4.55, 4.55, 4.55); Calibrated: 2010-05-25
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE3 Sn446; Calibrated: 2010-09-21
 - Phantom: SAM 1800/1900 MHz; Type: SAM

Body 9400/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.555 mW/g

Body 9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
 Reference Value = 17.3 V/m; Power Drift = -0.021 dB
 Peak SAR (extrapolated) = 0.669 W/kg
SAR(1 g) = 0.483 mW/g; SAR(10 g) = 0.298 mW/g
 Maximum value of SAR (measured) = 0.528 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2412$ MHz; $\sigma = 1.82$ mho/m; $\epsilon_r = 38.7$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 71; 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: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 1/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.674 mW/g

Left touch 1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

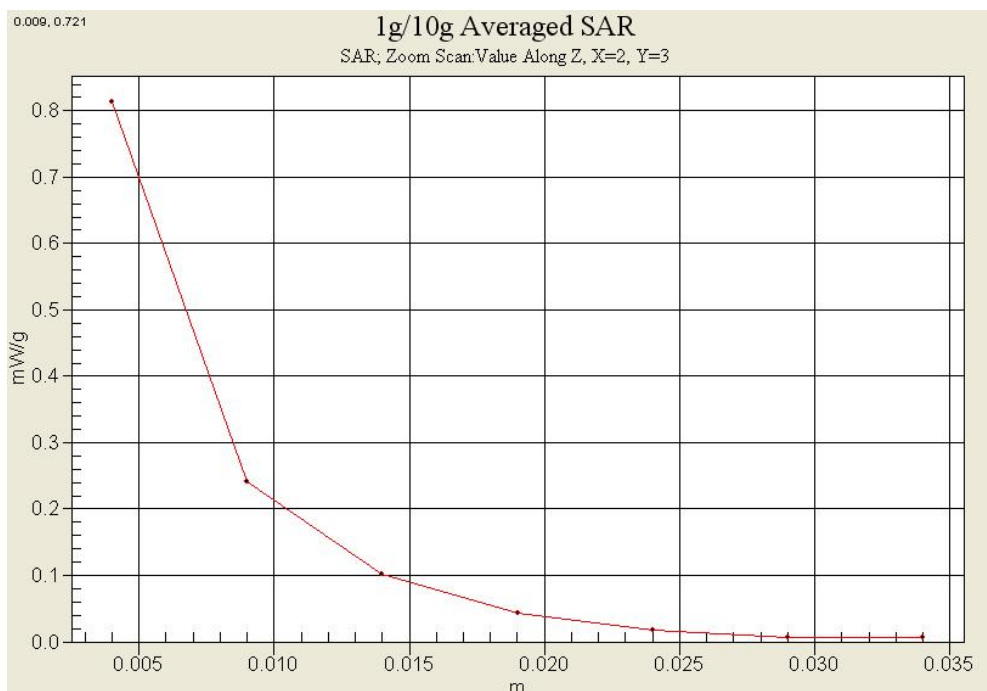
Reference Value = 8.25 V/m; Power Drift = -0.002 dB

Peak SAR (extrapolated) = 2.06 W/kg

SAR(1 g) = 0.661 mW/g; SAR(10 g) = 0.258 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.813 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS GSM/EDGE and WCDMA Phone with Bluetooth & WLAN
 GPRS Class12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Jan. 7, 2010

DUT: LG-P970; Type: bar; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2462 MHz;Duty Cycle: 1:1
 Medium parameters used (interpolated): $f = 2462 \text{ MHz}$; $\sigma = 1.97 \text{ mho/m}$; $\epsilon_r = 51.5$; $\rho = 1000 \text{ kg/m}^3$
 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: DAE3 Sn446; Calibrated: 2010-09-21
 - Phantom: SAM 1800/1900 MHz; Type: SAM

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

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.107 mW/g

Body 11/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

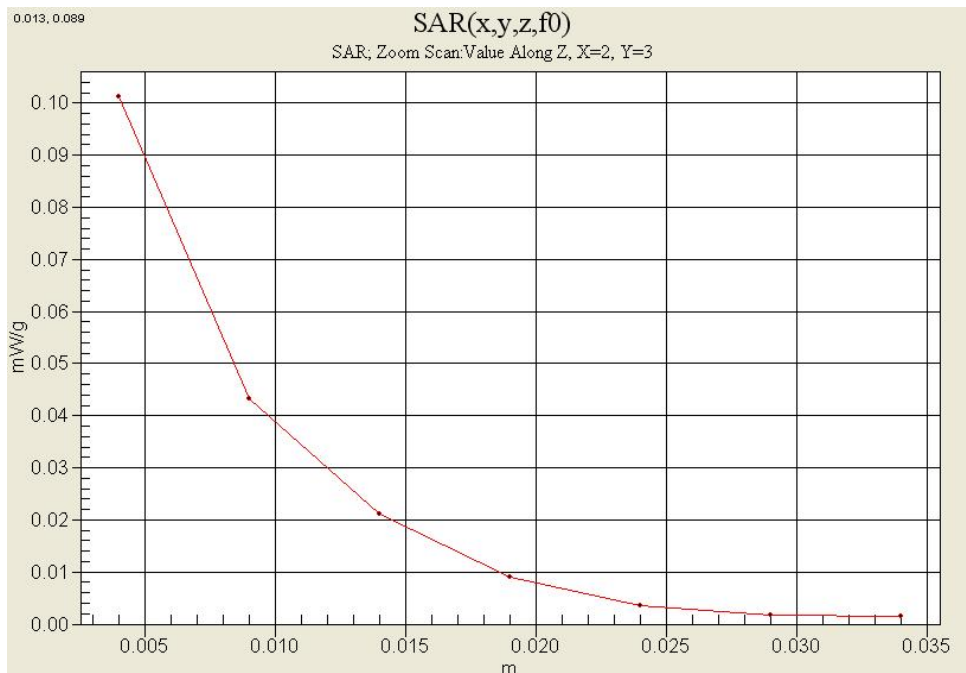
Reference Value = 5.98 V/m; Power Drift = 0.132 dB

Peak SAR (extrapolated) = 0.234 W/kg

SAR(1 g) = 0.098 mW/g; SAR(10 g) = 0.049 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.101 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 °C
Test Date: Jan.6, 2011

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

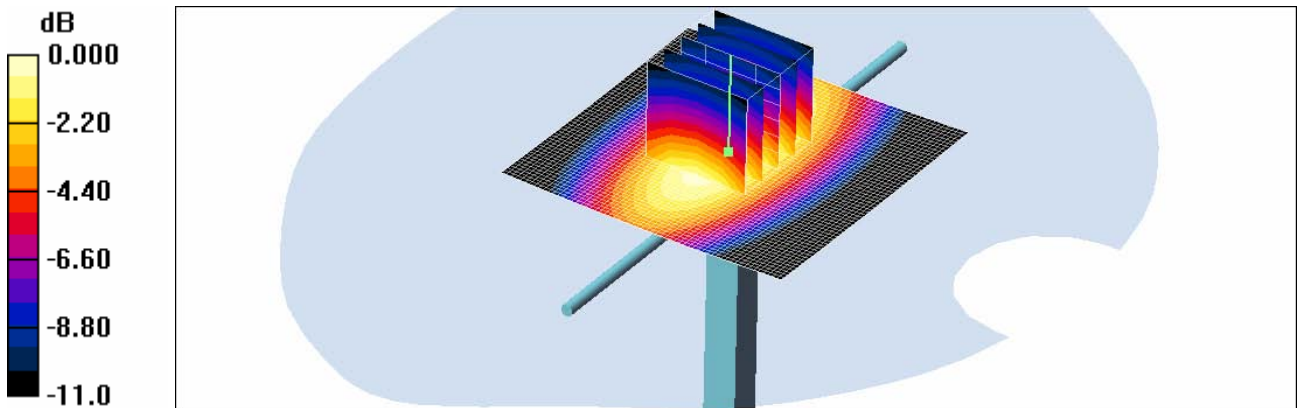
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.924 \text{ mho/m}$; $\epsilon_r = 43.1$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 – SN1630; ConvF(6.25, 6.25, 6.25); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 1800/1900 MHz; Type: SAM

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

Validation 835MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 34.8 V/m; Power Drift = 0.005 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.970 mW/g; SAR(10 g) = 0.624 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: 21.2 °C
Test Date: Jan.7, 2011

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

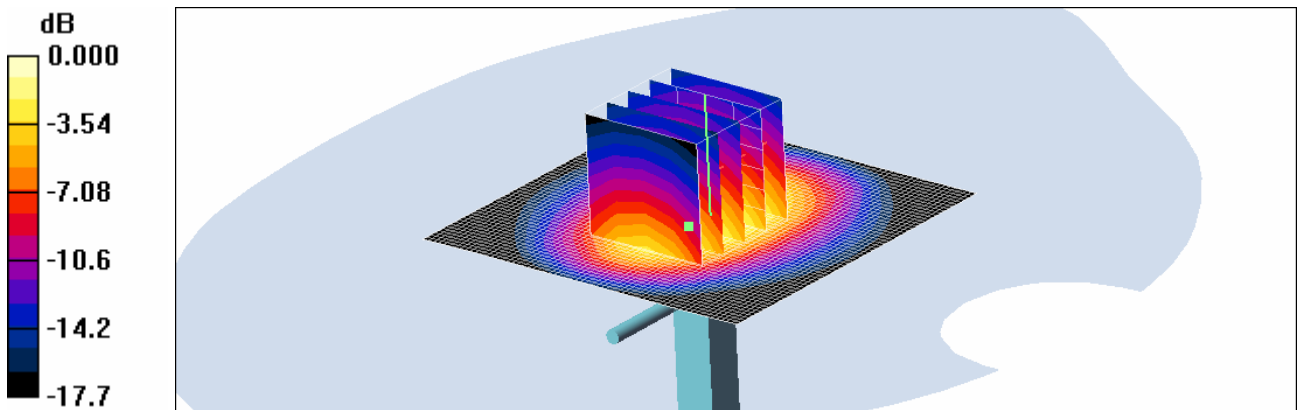
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 – SN1630; ConvF(5.12, 5.12, 5.12); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn446; Calibrated: 2010-09-21
- Phantom: SAM 835/900 MHz; Type: SAM

Dipole 1900MHz Validation/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.54 mW/g

Dipole 1900MHz Validation/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 60.0 V/m; Power Drift = -0.012 dB
Peak SAR (extrapolated) = 6.81 W/kg
SAR(1 g) = 4.04 mW/g; SAR(10 g) = 2.26 mW/g
Maximum value of SAR (measured) = 4.46 mW/g



0 dB = 4.46mW/g

■ Validation Data (2450 MHz Head)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.2 °C
Test Date: Jan.7, 2011

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

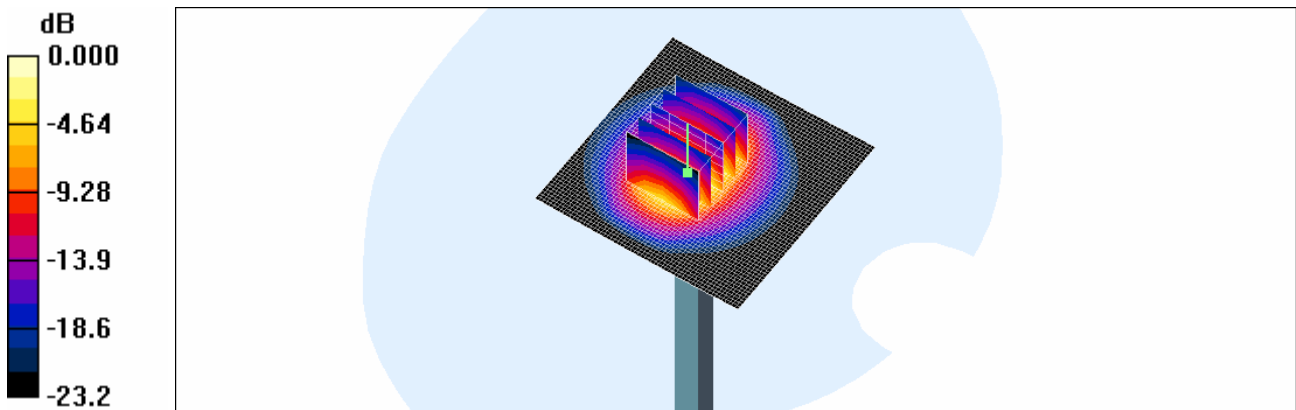
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.87 \text{ mho/m}$; $\epsilon_r = 38.5$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

DASY4 Configuration:

- Probe: ET3DV6 – SN1630; ConvF(4.58, 4.58, 4.58); Calibrated: 2010-05-25
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: SAM 1800/1900 MHz; Type: SAM

Validation 2450MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 6.49 mW/g

Validation 2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 58.9 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 12.6 W/kg
SAR(1 g) = 5.35 mW/g; SAR(10 g) = 2.44 mW/g
Maximum value of SAR (measured) = 5.83 mW/g



0 dB = 5.83mW/g

■ Dielectric Parameter (835 MHz Head)

Title LG-P970
SubTitle GSM850(Head)
Test Date Jan. 6, 2011

Frequency	e'	e''
800000000.0000	43.5156	20.0141
805000000.0000	43.4399	19.9637
810000000.0000	43.3669	19.9596
815000000.0000	43.2960	19.9466
820000000.0000	43.2176	19.9330
825000000.0000	43.1663	19.9005
830000000.0000	43.1033	19.8982
835000000.0000	43.0557	19.8900
840000000.0000	42.9834	19.8594
845000000.0000	42.9487	19.8671
850000000.0000	42.8882	19.8693
855000000.0000	42.8606	19.8499
860000000.0000	42.8067	19.8336
865000000.0000	42.7709	19.8385
870000000.0000	42.7203	19.8537
875000000.0000	42.7088	19.7883
880000000.0000	42.6138	19.7791
885000000.0000	42.5729	19.7631
890000000.0000	42.5115	19.7525
895000000.0000	42.4653	19.7474
900000000.0000	42.4016	19.7267

■ Dielectric Parameter (835 MHz Body)

Title LG-P970
SubTitle GSM850(Body)
Test Date Jan. 6, 2011

Frequency	e'	e''
800000000.0000	57.0203	21.2974
805000000.0000	56.9780	21.2831
810000000.0000	56.9694	21.2601
815000000.0000	56.9379	21.2265
820000000.0000	56.9248	21.1741
825000000.0000	56.8970	21.1848
830000000.0000	56.8551	21.1259
835000000.0000	56.8074	21.1116
840000000.0000	56.7907	21.0939
845000000.0000	56.7127	21.0612
850000000.0000	56.7087	20.9739
855000000.0000	56.6229	21.0097
860000000.0000	56.5095	20.9233
865000000.0000	56.4743	20.9090
870000000.0000	56.3580	20.8442
875000000.0000	56.3343	20.8376
880000000.0000	56.2294	20.7727
885000000.0000	56.1650	20.7599
890000000.0000	56.1231	20.7607
895000000.0000	56.0433	20.7317
900000000.0000	56.0417	20.7442

■ Dielectric Parameter (1900 MHz Head)

Title LG-P970
SubTitle WCDMA1900(Head)
Test Date Jan. 7, 2011

Frequency	e'	e''
1800000000.0000	41.3820	12.9649
1810000000.0000	41.3297	13.0018
1820000000.0000	41.3183	13.0523
1830000000.0000	41.3158	13.1000
1840000000.0000	41.2570	13.1625
1850000000.0000	41.2182	13.1784
1860000000.0000	41.1544	13.1773
1870000000.0000	41.1209	13.2206
1880000000.0000	41.0437	13.1957
1890000000.0000	40.9823	13.2246
1900000000.0000	40.9183	13.2342
1910000000.0000	40.8679	13.2262
1920000000.0000	40.8600	13.2531
1930000000.0000	40.8281	13.2871
1940000000.0000	40.8089	13.3335
1950000000.0000	40.8172	13.3699
1960000000.0000	40.8340	13.3823
1970000000.0000	40.8377	13.4303
1980000000.0000	40.7990	13.4628
1990000000.0000	40.7520	13.5370
2000000000.0000	40.7065	13.5179

■ Dielectric Parameter (1900 MHz Body)

Title LG-P970
SubTitle WCDMA1900(Body)
Test Date Jan. 7, 2011

Frequency	e'	e''
1850000000.0000	52.3653	14.5700
1855000000.0000	52.3312	14.5710
1860000000.0000	52.3222	14.5754
1865000000.0000	52.3036	14.6460
1870000000.0000	52.2378	14.6177
1875000000.0000	52.2171	14.6398
1880000000.0000	52.1664	14.6276
1885000000.0000	52.1263	14.6026
1890000000.0000	52.0436	14.6302
1895000000.0000	51.9963	14.6445
1900000000.0000	51.9839	14.6492
1905000000.0000	51.9381	14.7201
1910000000.0000	51.9190	14.7562
1915000000.0000	51.8994	14.8109
1920000000.0000	51.9292	14.8641
1925000000.0000	51.9483	14.9126
1930000000.0000	51.9595	14.9358
1935000000.0000	52.0052	14.9490
1940000000.0000	51.9698	14.9752
1945000000.0000	52.0474	14.9946
1950000000.0000	52.0756	14.9911

■ Dielectric Parameter (2450 MHz Head)

Title LG-P970
SubTitle WCDMA1900(Body)
Test Date Jan. 7, 2011

Frequency	e'	e''
2400000000.0000	38.7468	13.5394
2405000000.0000	38.7091	13.5647
2410000000.0000	38.7064	13.5894
2415000000.0000	38.6026	13.5970
2420000000.0000	38.6047	13.6776
2425000000.0000	38.5617	13.6635
2430000000.0000	38.5539	13.6809
2435000000.0000	38.5508	13.6837
2440000000.0000	38.5113	13.7308
2445000000.0000	38.5135	13.7121
2450000000.0000	38.5279	13.7458
2455000000.0000	38.5592	13.7604
2460000000.0000	38.5548	13.7656
2465000000.0000	38.5724	13.7894
2470000000.0000	38.6006	13.7963
2475000000.0000	38.5844	13.8324
2480000000.0000	38.5921	13.8007
2485000000.0000	38.5627	13.8129
2490000000.0000	38.5805	13.8579
2495000000.0000	38.5653	13.8423
2500000000.0000	38.5440	13.8621

■ Dielectric Parameter (2450 MHz Body)

Title LG-P970
SubTitle WCDMA1900(Body)
Test Date Jan. 7, 2011

Frequency	e'	e''
2400000000.0000	51.9317	13.7779
2405000000.0000	51.9444	13.7502
2410000000.0000	51.8744	13.7781
2415000000.0000	51.8411	13.8082
2420000000.0000	51.8241	13.8332
2425000000.0000	51.7849	13.8639
2430000000.0000	51.7855	13.9080
2435000000.0000	51.7533	13.9229
2440000000.0000	51.7509	13.9787
2445000000.0000	51.7036	14.0282
2450000000.0000	51.7265	14.0707
2455000000.0000	51.7318	14.1137
2460000000.0000	51.7268	14.1247
2465000000.0000	51.7294	14.1940
2470000000.0000	51.6793	14.1957
2475000000.0000	51.7113	14.2197
2480000000.0000	51.7282	14.2785
2485000000.0000	51.6763	14.2983
2490000000.0000	51.6931	14.3007
2495000000.0000	51.6882	14.3241
2500000000.0000	51.6858	14.3404