

SAR TEST REPORT

HCT CO., LTD

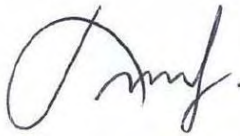
EUT Type:	Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)		
FCC ID:	BEJGD900		
Model:	GD900	Trade Name	LG
Date of Issue:	May.06, 2009		
Test report No.:	HCT-IA0902-2701		
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Testing has been carried out in accordance with:	47CFR §2.1093 FCC OET Bulletin 65(Edition 97-01), Supplement C (Edition 01-01) ANSI/ IEEE C95.1 – 2005 IEEE 1528-2003		
Test result:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		
Signature	 Report prepared by : Sun-Hee Kim Test Engineer of SAR Part  Approved by : Jae-Sang So Manager of SAR Part		

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1. INTRODUCTION

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

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-2005 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. The measurement procedure described in IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86 NCRP, 1986, Bethesda, MD 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards.

SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative of the incremental electromagnetic energy (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 Phone with Bluetooth and WLAN GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
FCC ID	BEJGD900
Model(s)	GD900
Trade Name	LG
Serial Number(s)	#1
Application Type	Certification
Modulation(s)	GSM850/GSM1900
Tx Frequency	824.20 - 848.80 MHz (GSM850) 1 850.20 – 1 909.80 MHz (GSM1900) 2 412- 2 462 MHz (DSSS/ OFDM)
Rx Frequency	869.20 - 893.80 MHz (GSM850) 1 930.20 – 1 989.80 MHz (GSM1900) 2 412- 2 462 MHz (DSSS/ OFDM)
FCC Classification	Licensed Portable Transmitter Held to Ear (PCE)
Production Unit or Identical Prototype	Prototype
Max SAR	0.327 W/kg GSM850 Head SAR / 0.625 W/kg GSM850 Body SAR 1.12 W/kg GSM1900 Head SAR / 0.470 W/kg GSM1900 Body SAR 0.000536 W/kg Wi-Fi 802.11b /0.014 W/kg Wi-Fi 802.11g
Date(s) of Tests	Apr. 28, 2009 ~ Apr. 30, 2009/ Mar. 15, 2009
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.

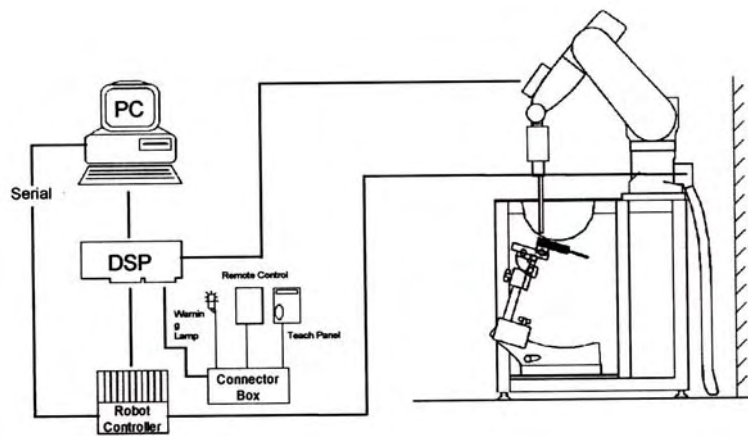


Figure 3.1 HCT SAR Lab. Test Measurement Set-up

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 DASY 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)

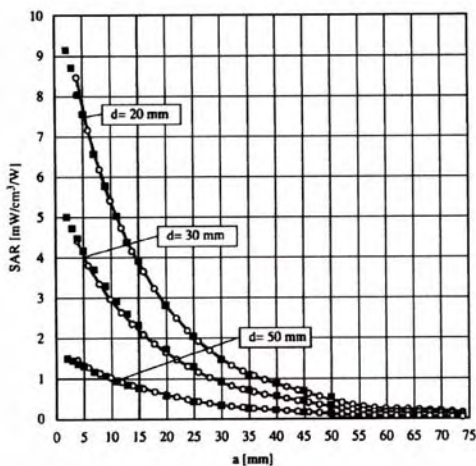


Figure 3.4 E-Field and Temperature measurements at 900 MHz

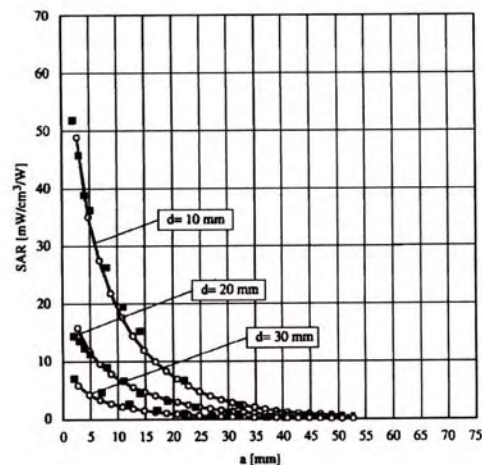


Figure 3.5 E-Field and temperature measurements at 1.8 GHz

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.

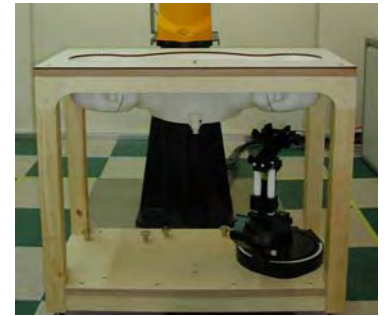


Figure 3.6 SAM Phantom

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 produced infinite number of configurations. To produce the Worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.



Figure 3.7 Device Holder

3.6 Brain & Muscle Simulating Mixture Characterization

The brain and muscle mixtures consist of a viscous gel using hydrox-ethyl cellulose (HEC) gelling agent and saline solution (see Table 3.1). Preservation with a 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. Hartsgrove.

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

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

Table 3.1 Composition of the Tissue Equivalent Matter

3.7 SAR TEST EQUIPMENT

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
Staubli	Robot RX90L	F01/5K09A1/A/01	N/A	N/A	N/A
Staubli	Robot ControllerCS7MB	F99/5A82A1/C/01	N/A	N/A	N/A
HP	Pavilion t000_puffer	KRJ51201TV	N/A	N/A	N/A
SPEAG	Light Alignment Sensor	265	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D221340.01	N/A	N/A	N/A
SPEAG	DAE4	869	Sept. 03, 2008	Annual	Sept. 03, 2009
SPEAG	E-Field Probe ET3DV6	1609	Mar. 17, 2009	Annual	Mar. 17, 2010
SPEAG	E-Field Probe ES3DV3	3161	Apr. 7, 2008	Annual	Apr. 7, 2009
SPEAG	Validation Dipole D450V2	1007	July 15, 2008	Biennial	July 15, 2010
SPEAG	Validation Dipole D835V2	441	May 19, 2008	Biennial	May 19, 2010
SPEAG	Validation Dipole D900V2	130	Aug. 25, 2008	Biennial	Aug. 25, 2010
SPEAG	Validation Dipole D1800V2	2d007	May 20, 2008	Biennial	May 20, 2010
SPEAG	Validation Dipole D1900V2	5d032	July 22, 2008	Biennial	July 22, 2010
SPEAG	Validation Dipole D2450V2	743	Aug. 27, 2008	Biennial	Aug. 27, 2010
Agilent	Power Meter(F) E4419B	MY41291386	Nov. 05, 2008	Annual	Nov. 05, 2009
Agilent	Power Sensor(G) 8481	MY41090870	Nov. 05, 2008	Annual	Nov. 05, 2009
HP	Dielectric Probe Kit 85070C	00721521	N/A	N/A	N/A
HP	Dual Directional Coupler	16072	Nov. 05, 2008	Annual	Nov. 05, 2009
R&S	Base Station CMU200	110740	July 26, 2008	Annual	July 26, 2009
Agilent	Base Station E5515C	GB44400269	Feb. 10, 2009	Annual	Feb. 10, 2010
HP	Signal Generator E4438C	MY42082646	Dec. 24, 2008	Annual	Dec. 24, 2009
HP	Network Analyzer 8753C	3310J01394	Dec. 04, 2008	Annual	Dec. 04, 2009
EM POWER	Power Amp BBS3Q7ELU	1009D/C0028	Nov. 05, 2008	Annual	Nov. 05, 2009
Tescom	TC-3000/ Bluetooth	3000A490112	Jan. 09, 2009	Annual	Jan. 09, 2010

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.

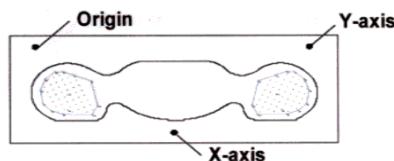


Figure 4.1 SAR Measurement Point in Area Scan

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.

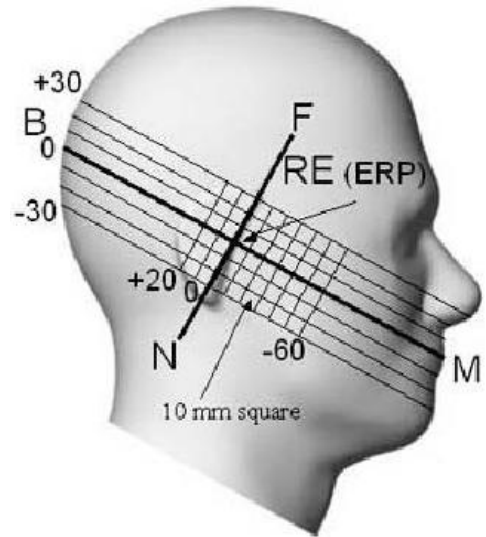


Figure 5.1 Side view of the phantom

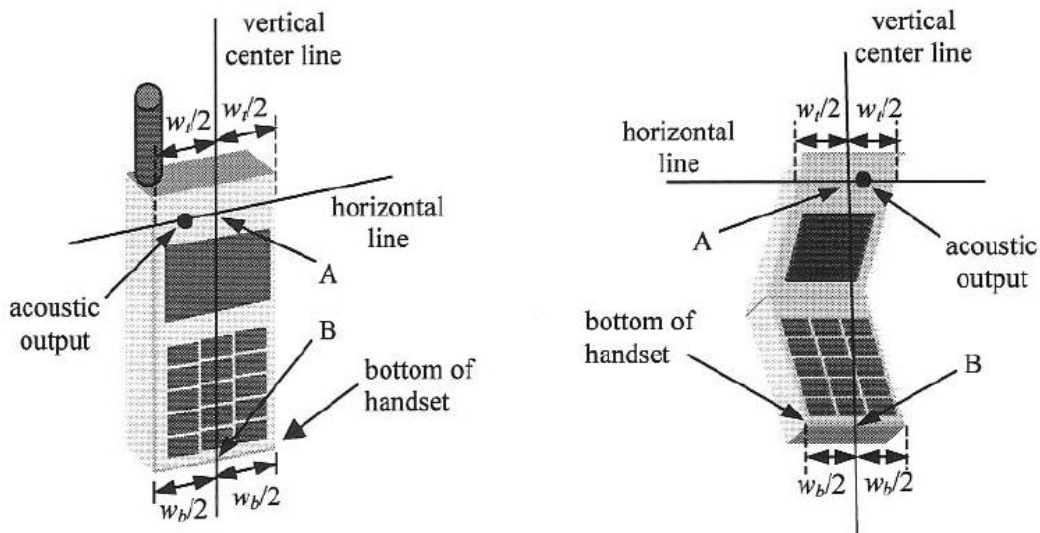


Figure 5.2 Handset vertical and horizontal reference lines

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

Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environmental. However, we estimate the measurement uncertainties in SAR to be less than 15 % - 25 %.

According to ANSI/IEEE C95.3, the overall uncertainties are difficult to assess and will vary with the type of meter and usage situation. However, accuracy's of 1 dB to ± 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies (shorter wavelengths), or areas where large reflecting objects are present. Under optimum measurement conditions, SAR measurement uncertainties of at least ± 2 dB can be expected.

According to CENELEC, typical worst-case uncertainty of field measurements is 5 dB. For well-defined modulation characteristics the uncertainty can be reduced to ± 3 dB.

Error Description	Uncertainty value [%]	Probability Distribution	Divisor	ci	ci ²	Standard Uncertainty [%]	Stand Uncert ²	(Stand Uncert ²) X (ci ²)	Vi & Ve//
1. Measurement System									
Probe Calibration	5.5	Normal	1.00	1	1	5.50	30.25	30.25	∞
Axial Isotropy	4.7	Rectangular	1.73	0.7	0.49	2.71	7.36	3.61	∞
Hemispherical Isotropy	9.6	Rectangular	1.73	0.7	0.49	5.54	30.72	15.05	∞
Linearity	4.7	Rectangular	1.73	1	1	2.71	7.36	7.36	∞
System Detection limits	1.0	Rectangular	1.73	1	1	0.58	0.33	0.33	∞
Boundary effect	1.0	Rectangular	1.73	1	1	0.58	0.33	0.33	∞
Response time	0.8	Rectangular	1.73	1	1	0.46	0.21	0.21	∞
RF Ambient conditions	3.0	Rectangular	1.73	1	1	1.73	3.00	3.00	∞
Readout Electronics	0.3	Normal	1.00	1	1	0.30	0.09	0.09	∞
Integration time	2.6	Rectangular	1.73	1	1	1.50	2.25	2.25	∞
Probe positioner	0.4	Rectangular	1.73	1	1	0.23	0.05	0.05	∞
Probe positioning	2.9	Rectangular	1.73	1	1	1.67	2.80	2.80	∞
Maximum SAR evaluation	1.0	Rectangular	1.73	1	1	0.58	0.33	0.33	∞
2. Test Sample Related							Sub Total	65.69	
Device Positioning	1.8	Normal	1.00	1	1	1.81	3.28	3.28	9
Device Holder	3.6	Normal	1.00	1	1	3.60	12.96	12.96	∞
Power Drift	5.0	Rectangular	1.73	1	1	2.89	8.33	8.33	∞
3. Phantom and Setup							Sub Total	24.57	
Phantom Uncertainty	4.0	Rectangular	1.73	1	1	2.31	5.33	5.33	∞
Liquid conductivity (target)	5.0	Rectangular	1.73	0.5	0.25	2.89	8.33	2.08	∞
Liquid conductivity (measurement error)	2.5	Normal	1.00	0.5	0.25	2.50	6.25	1.56	∞
Liquid permittivity (target)	5.0	Rectangular	1.73	0.5	0.25	2.89	8.33	2.08	∞
Liquid permittivity (measurement error)	2.5	Normal	1.00	0.5	0.25	2.50	6.25	1.56	∞
							Sub Total	12.63	
Combined standard uncertainty [%]						10.14		102.88	-
Expanded uncertainty [k=2, approximately confidence level 95 %]						± 20.28 %			

Table 6.1 Breakdown of Errors

7. ANSI/ IEEE C95.1 - 2005 RF EXPOSURE LIMITS

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

Table 7.1 Safety Limits for Partial Body Exposure

NOTES:

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

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

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

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

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

8. SYSTEM VERIFICATION

8.1 Tissue Verification

Freq. [MHz]	Date	Liquid	Liquid Temp.[°C]	Parameters	Target Value	Measured Value	Deviation [%]	Limit [%]
835	Apr.28, 2009	Head	21.2	ϵ_r	41.5	42.6	+ 2.65	± 5
				σ	0.90	0.866	- 3.77	± 5
835	Apr.28, 2009	Body	21.2	ϵ_r	55.2	54.02	- 2.14	± 5
				σ	0.97	0.99	+ 2.06	± 5
1 900	Apr.29, 2009	Head	21.2	ϵ_r	40.0	39.2	- 2.00	± 5
				σ	1.40	1.42	+ 1.43	± 5
1 900	Apr.29, 2009	Body	21.2	ϵ_r	53.3	51.79	- 2.83	± 5
				σ	1.52	1.52	0.00	± 5
2 450	Mar.15, 2009	Head	21.3	ϵ_r	39.2	39.9	+ 1.79	± 5
				σ	1.80	1.87	+ 3.38	± 5
2 450	Mar.15, 2009	Body	21.1	ϵ_r	52.7	51.85	- 1.61	± 5
				σ	1.95	1.93	- 1.03	± 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	Apr.28, 2009	Head	21.2	1 g	9.17	0.932	+ 1.64	$\pm 10\%$
1 900	Apr.29, 2009	Head	21.2	1 g	37.7	3.83	+ 1.59	$\pm 10\%$
2 450	Mar.15, 2009	Head	21.1	1 g	52.4	5.34	+ 1.91	$\pm 10\%$

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	Unknown			+
	5.620	124				✓
	5.640	128				+
	5.660	132				+
	5.680	136				✓
	5.700	140				+
	5.745	149		✓		✓
UNII or §15.247	5.765	153	152 (5.76 GHz)		+	+
	5.785	157		✓		+
	5.805	161	160 (5.80 GHz)		+	✓
	§15.247	5.825	165	✓		

802.11 Test Channels per FCC Requirements

10. RF CONDUCTED POWER

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

10.1 Procedures Used to Establish RF Signal for SAR

The handset was placed into a simulated call using a base station simulator in a shielded chamber. Such test signals offer a consistent means for testing SAR and are recommended for evaluation SAR[4] SAR measurements were taken with a fully charged battery. In order to verify that the device was tested and maintained at full power, this was configured with the base station simulator. The SAR measurement Software calculates a reference point at the start and end of the test to check for power drifts. If conducted Power deviations of more than 5 % occurred, the tests were repeated.

Band	Channel	Voice	GPRS Data				EDGE Data			
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)	EDGE 1 TX Slot (dBm)	EDGE 2 TX Slot (dBm)	EDGE 3 TX Slot (dBm)	EDGE 4 TX Slot (dBm)
GSM 850	128	32.45	32.41	32.30	32.22	32.17	26.27	26.51	26.89	27.20
	190	32.26	32.26	32.20	32.12	32.03	26.13	26.36	26.68	27.06
	251	32.13	32.12	32.03	31.96	31.90	26.21	26.49	26.77	27.00
GSM 1900	512	29.54	29.41	29.32	29.21	29.09	25.06	25.14	25.42	25.54
	661	29.43	29.29	29.13	29.05	28.98	24.91	24.98	25.30	25.43
	810	29.34	29.22	29.14	29.03	28.94	24.92	24.89	25.18	25.48

Table 10.1 GSM Conducted output powers

Band	Channel	Mbps			
		1	2	5.5	11
IEEE 802.11b	1	17.20	17.38	20.75	20.33
	6	19.06	19.21	21.71	22.21
	11	17.51	17.49	22.15	20.55

Table 10.2 IEEE 802.11b Conducted output power

Band	Channel	Mbps							
		6	9	12	18	24	36	48	54
IEEE 802.11g	1	19.83	19.45	19.85	20.09	20.43	20.35	20.20	20.66
	6	23.10	22.90	22.83	22.85	23.37	23.09	21.57	23.23
	11	21.71	21.49	21.51	21.60	21.95	21.98	21.83	21.08

Table 10.3 IEEE 802.11g 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. 10.1 Output Power Thresholds for Unlicensed Transmitters

	Individual Transmitter	Simultaneous Transmission
Licensed Transmitters	<u>Routine evaluation required</u>	SAR not required: <u>Unlicensed only</u> - when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas Licensed & Unlicensed - when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas - when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3 SAR required: Licensed & Unlicensed antenna pairs with SAR to peak location separation ratio ≥ 0.3 ; test is only required for the configuration that results in the highest SAR in stand-alone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply
Unlicensed Transmitters	<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. 10.2 SAR Evaluation Requirements for Cellphones with Multiple Transmitters

FCC ID: BEJGD900

BT Max. RF output power: 4.55 dBm = 2.85 mW

Antenna separation distance between Main and BT/ WLAN: 8.0 cm

WLAN Max. RF output power: 802.11b: 22.21 dBm, 802.11g: 23.37 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 5.0 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. The summation of Main and WLAN is $(1.12 + 0.014) = 1.134 < 1.6$ mW/g. Therefore a simultaneous SAR evaluation is not required.

12. SAR TEST DATA SUMMARY

12.1 Measurement Results (GSM850 Head SAR Touch Slide up)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
836.6	190 (Mid)	GSM850	32.26	32.32	Standard	Left Ear	Intenna	0.327
836.6	190 (Mid)	GSM850	32.26	32.29	Standard	Right Ear	Intenna	0.243
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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 Slide up)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
836.6	190 (Mid)	GSM850	32.26	32.20	Standard	Left Tilt 15°	Intenna	0.283
836.6	190 (Mid)	GSM850	32.26	32.34	Standard	Right Tilt 15°	Intenna	0.199
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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 (GSM850 Head SAR Touch Slide Down)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
836.6	190 (Mid)	GSM850	32.26	32.32	Standard	Left Ear	Intenna	0.302
836.6	190 (Mid)	GSM850	32.26	32.44	Standard	Right Ear	Intenna	0.289
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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 (GSM850 Head SAR Tilt Slide Down)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
836.6	190 (Mid)	GSM850	32.26	32.26	Standard	Left Tilt 15°	Intenna	0.297
836.6	190 (Mid)	GSM850	32.26	32.16	Standard	Right Tilt 15°	Intenna	0.291
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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).

12.5 Measurement Results (GSM1900 Head SAR Touch Slide up)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 850.2	512 (Low)	GSM1900	29.54	29.55	Standard	Left Ear	Intenna	0.893
1 880.0	661 (Mid)	GSM1900	29.43	29.46	Standard	Left Ear	Intenna	0.839
1 909.8	810 (High)	GSM1900	29.34	29.39	Standard	Left Ear	Intenna	0.852
1 850.2	512 (Low)	GSM1900	29.54	29.55	Standard	Right Ear	Intenna	1.00
1 880.0	661 (Mid)	GSM1900	29.43	29.53	Standard	Right Ear	Intenna	0.904
1 909.8	810 (High)	GSM1900	29.34	29.39	Standard	Right Ear	Intenna	0.892
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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

12.6 Measurement Results (GSM1900 Head SAR Tilt Slide up)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 850.2	512 (Low)	GSM1900	29.54	29.51	Standard	Left Tilt 15°	Intenna	1.06
1 880.0	661 (Mid)	GSM1900	29.43	29.41	Standard	Left Tilt 15°	Intenna	0.947
1 909.8	810 (High)	GSM1900	29.34	29.21	Standard	Left Tilt 15°	Intenna	0.967
1 850.2	512 (Low)	GSM1900	29.54	29.52	Standard	Right Tilt 15°	Intenna	1.12
1 880.0	661 (Mid)	GSM1900	29.43	29.48	Standard	Right Tilt 15°	Intenna	1.03
1 909.8	810 (High)	GSM1900	29.34	29.35	Standard	Right Tilt 15°	Intenna	0.984
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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

12.7 Measurement Results (GSM1900 Head SAR Touch Slide Down)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 850.2	512 (Low)	GSM1900	29.54	29.49	Standard	Left Ear	Intenna	0.930
1 880.0	661 (Mid)	GSM1900	29.43	29.50	Standard	Left Ear	Intenna	0.873
1 909.8	810 (High)	GSM1900	29.34	29.17	Standard	Left Ear	Intenna	0.835
1 850.2	512 (Low)	GSM1900	29.54	29.42	Standard	Right Ear	Intenna	1.02
1 880.0	661 (Mid)	GSM1900	29.43	29.47	Standard	Right Ear	Intenna	0.906
1 909.8	810 (High)	GSM1900	29.34	29.39	Standard	Right Ear	Intenna	0.866
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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

12.8 Measurement Results (GSM1900 Head SAR Tilt Slide Down)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 850.2	512 (Low)	GSM1900	29.54	29.53	Standard	Left Tilt 15°	Intenna	1.07
1 880.0	661 (Mid)	GSM1900	29.43	29.48	Standard	Left Tilt 15°	Intenna	1.02
1 909.8	810 (High)	GSM1900	29.34	29.43	Standard	Left Tilt 15°	Intenna	0.971
1 850.2	512 (Low)	GSM1900	29.54	29.45	Standard	Right Tilt 15°	Intenna	1.06
1 880.0	661 (Mid)	GSM1900	29.43	29.38	Standard	Right Tilt 15°	Intenna	1.01
1 909.8	810 (High)	GSM1900	29.34	29.36	Standard	Right Tilt 15°	Intenna	0.958
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Head 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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

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 1Tx	32.26	32.31	Rear	2.0 cm without Holster	Intenna	0.187
836.6	190 (Mid)	GPRS 2Tx	32.20	32.21	Rear	2.0 cm without Holster	Intenna	0.369
836.6	190 (Mid)	GPRS 3Tx	32.12	32.18	Rear	2.0 cm without Holster	Intenna	0.536
836.6	190 (Mid)	GPRS 4Tx	32.03	32.08	Rear	2.0 cm without Holster	Intenna	0.625
836.6	190 (Mid)	GPRS 4Tx	32.03	32.20	Front	2.0 cm without Holster	Intenna	0.373
836.6	190 (Mid)	GSM850	32.26	32.10	Rear	2.0 cm without Holster	Intenna	0.184
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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.
- 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).

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 1Tx	29.29	29.33	Rear	2.0 cm without Holster	Intenna	0.123
1 880.0	661 (Mid)	GPRS 2Tx	29.13	29.04	Rear	2.0 cm without Holster	Intenna	0.244
1 880.0	661 (Mid)	GPRS 3Tx	29.05	29.02	Rear	2.0 cm without Holster	Intenna	0.360
1 880.0	661 (Mid)	GPRS 4Tx	28.98	28.93	Rear	2.0 cm without Holster	Intenna	0.470
1 880.0	661 (Mid)	GPRS 4Tx	28.98	28.92	Front	2.0 cm without Holster	Intenna	0.334
1 880.0	661 (Mid)	GSM1900	29.43	29.53	Rear	2.0 cm without Holster	Intenna	0.127
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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.
- 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).

12.11 Measurement Results (802.11b/g Module Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Configuration	Separation Distance	Data Rate	SAR(mW/g)
MHz	Channel		Begin	End				
2 437	6 (Mid)	802.11b	22.21	22.21	Rear	2 cm	11 Mbps	0.000536
2 437	6 (Mid)	802.11g	23.37	23.28	Rear	2 cm	24 Mbps	0.014
2 437	6 (Mid)	802.11g	23.37	23.32	Front	2 cm	24 Mbps	0.0047
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						Body 1.6 W/kg (mW/g) Averaged over 1 gram		

NOTES:

- 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 with Charger ☐ 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 2005.

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

14. REFERENCES

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Attachment 1. – SAR Test Plots

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.868 \text{ mho/m}$; $\epsilon_r = 42.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.25, 6.25, 6.25); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Left touch 190/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Maximum value of SAR (interpolated) = 0.326 mW/g

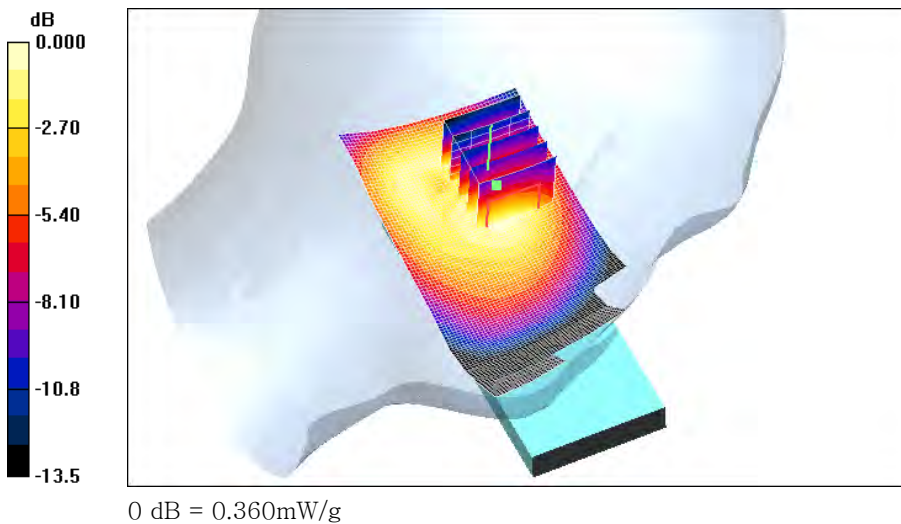
Left touch 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.9 V/m; Power Drift = 0.055 dB

Peak SAR (extrapolated) = 0.670 W/kg

SAR(1 g) = 0.327 mW/g; SAR(10 g) = 0.197 mW/g

Maximum value of SAR (measured) = 0.360 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.868 \text{ mho/m}$; $\epsilon_r = 42.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.25, 6.25, 6.25); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Right touch 190/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

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

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

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

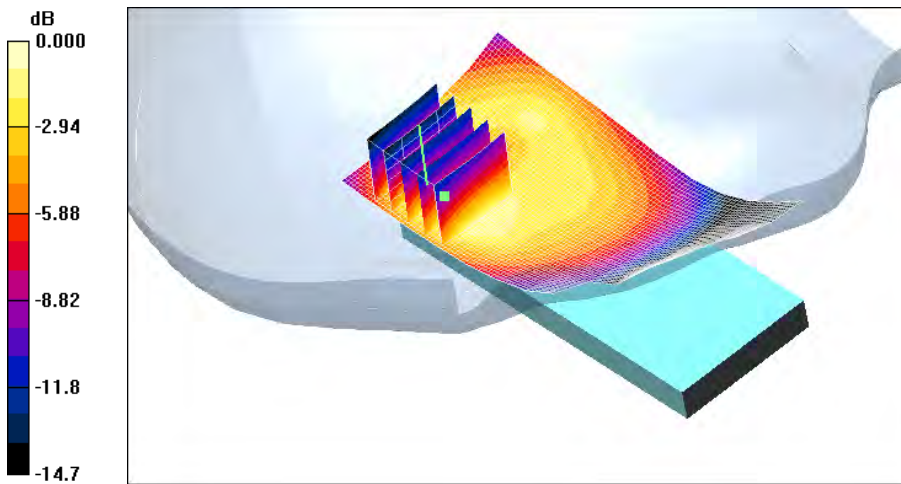
Reference Value = 12.3 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 0.466 W/kg

SAR(1 g) = 0.243 mW/g; SAR(10 g) = 0.139 mW/g

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

Maximum value of SAR (measured) = 0.276 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.868 \text{ mho/m}$; $\epsilon_r = 42.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.25, 6.25, 6.25); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Left tilt 190/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Maximum value of SAR (interpolated) = 0.266 mW/g

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

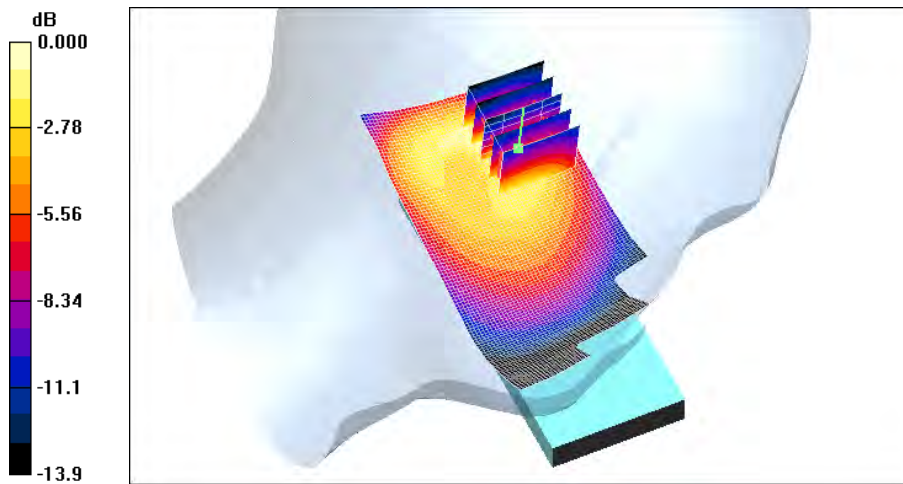
Reference Value = 12.6 V/m; Power Drift = -0.060 dB

Peak SAR (extrapolated) = 0.672 W/kg

SAR(1 g) = 0.283 mW/g; SAR(10 g) = 0.146 mW/g

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

Maximum value of SAR (measured) = 0.312 mW/g



Test Laboratory: HCT CO., LTD

EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)

Liquid Temperature: 21.2 °C

Ambient Temperature: 21.4 °C

Test Date: Apr.28, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.868 \text{ mho/m}$; $\epsilon_r = 42.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.25, 6.25, 6.25); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Right tilt 190/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$ [Info: Interpolated medium parameters used for SAR evaluation.](#)

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

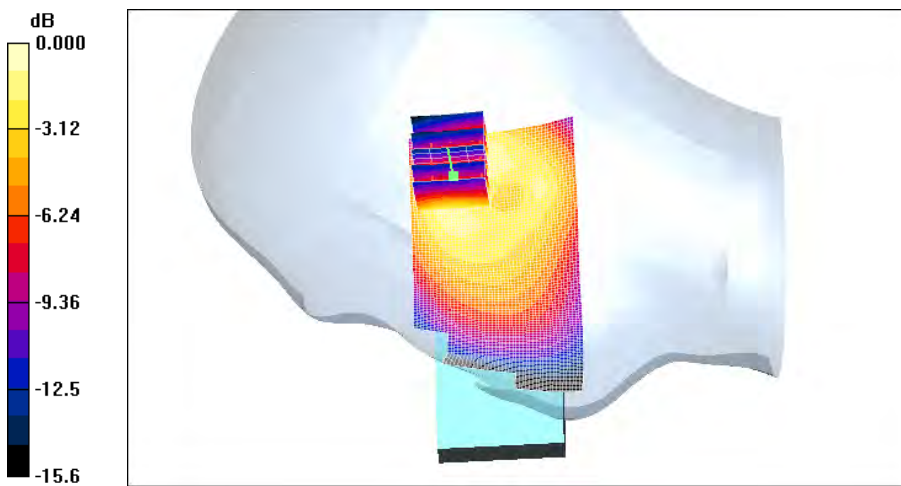
Right tilt 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.6 V/m; Power Drift = -0.082 dB

Peak SAR (extrapolated) = 0.399 W/kg

SAR(1 g) = 0.199 mW/g; SAR(10 g) = 0.109 mW/g[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.227 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.868 \text{ mho/m}$; $\epsilon_r = 42.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.25, 6.25, 6.25); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Left touch190/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.313 mW/g

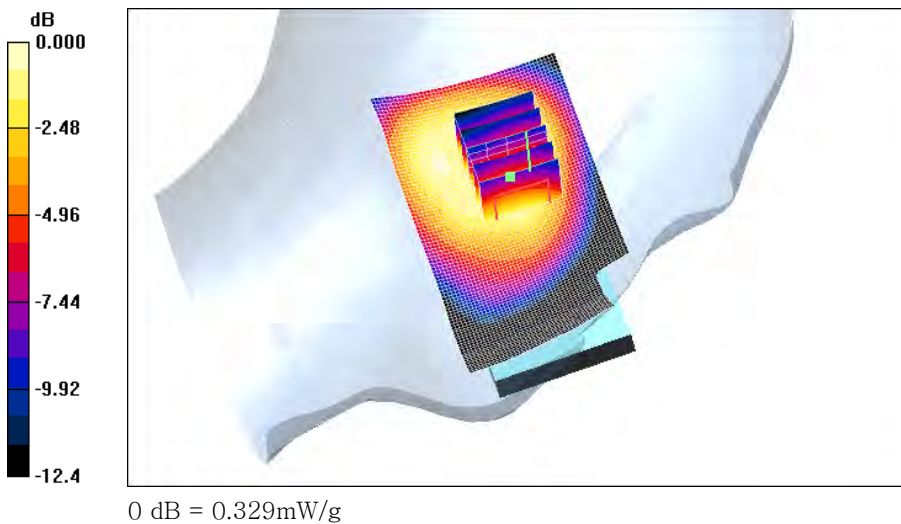
Left touch190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.5 V/m; Power Drift = 0.060 dB

Peak SAR (extrapolated) = 0.538 W/kg

SAR(1 g) = 0.302 mW/g; SAR(10 g) = 0.193 mW/g

Maximum value of SAR (measured) = 0.329 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.868 \text{ mho/m}$; $\epsilon_r = 42.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.25, 6.25, 6.25); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Right touch 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) = 0.338 mW/g

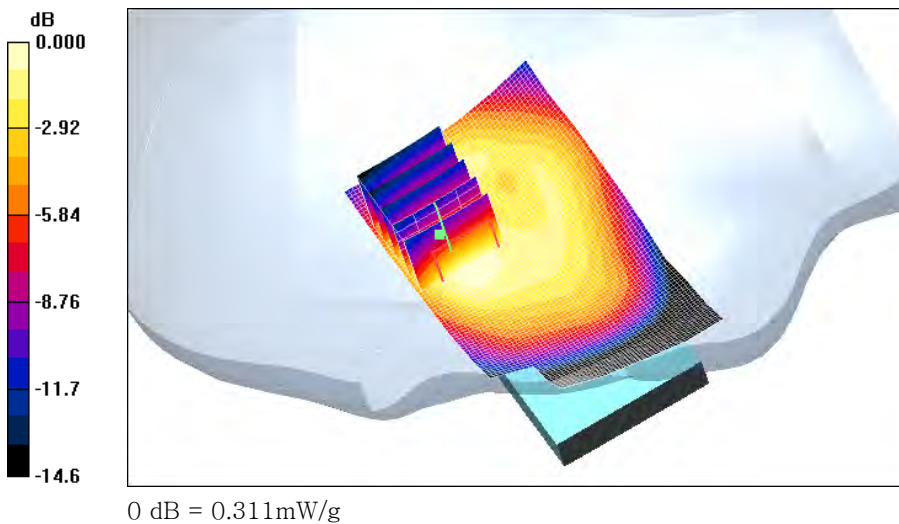
Right touch 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.5 V/m; Power Drift = 0.177 dB

Peak SAR (extrapolated) = 0.522 W/kg

SAR(1 g) = 0.289 mW/g; SAR(10 g) = 0.175 mW/g

Maximum value of SAR (measured) = 0.311 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.868 \text{ mho/m}$; $\epsilon_r = 42.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.25, 6.25, 6.25); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Left tilt190/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) = 0.313 mW/g

Left tilt190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

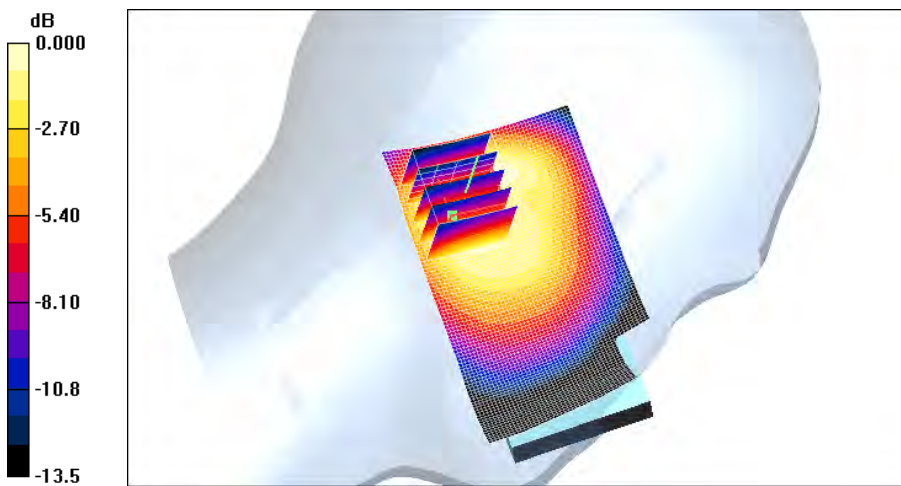
Reference Value = 15.1 V/m; Power Drift = -0.005 dB

Peak SAR (extrapolated) = 0.511 W/kg

SAR(1 g) = 0.297 mW/g; SAR(10 g) = 0.178 mW/g

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

Maximum value of SAR (measured) = 0.320 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.868 \text{ mho/m}$; $\epsilon_r = 42.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.25, 6.25, 6.25); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; 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) = 0.311 mW/g

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

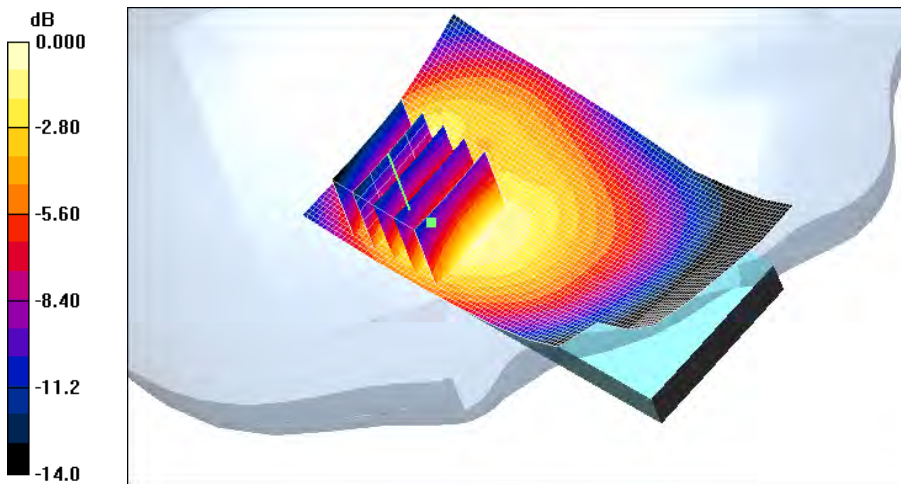
Reference Value = 15.0 V/m; Power Drift = -0.104 dB

Peak SAR (extrapolated) = 0.541 W/kg

SAR(1 g) = 0.291 mW/g; SAR(10 g) = 0.174 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 0.317 mW/g



0 dB = 0.317mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left touch 512/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Maximum value of SAR (interpolated) = 1.02 mW/g

Left touch 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

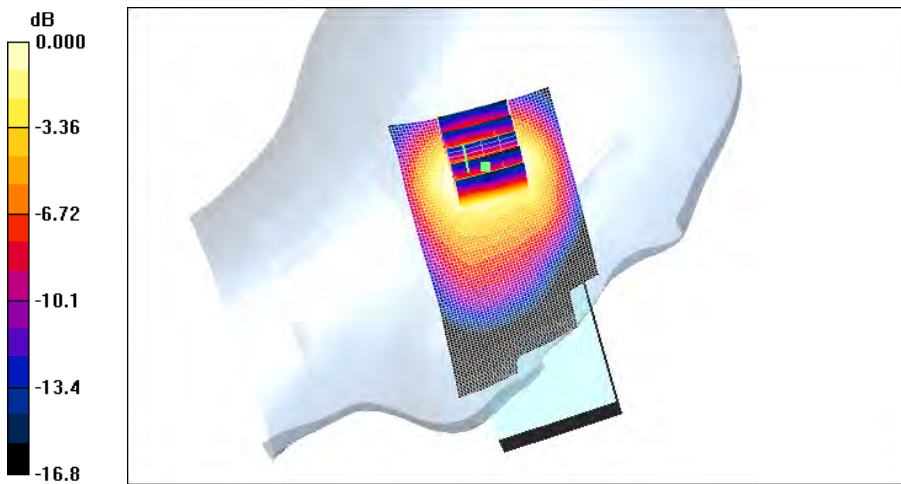
Reference Value = 27.5 V/m; Power Drift = 0.008 dB

Peak SAR (extrapolated) = 1.62 W/kg

SAR(1 g) = 0.893 mW/g; SAR(10 g) = 0.519 mW/g

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

Maximum value of SAR (measured) = 0.970 mW/g



0 dB = 0.970mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.2$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left touch 661/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.966 mW/g

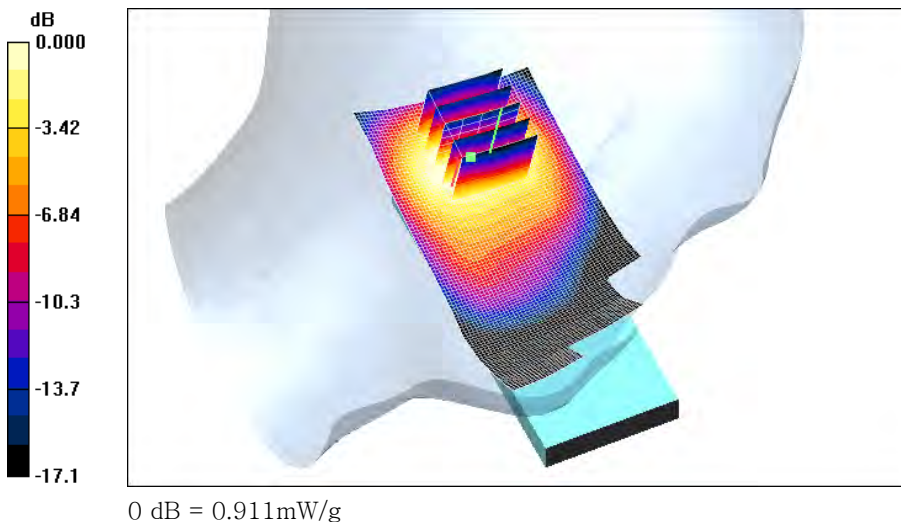
Left touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.5 V/m; Power Drift = 0.026 dB

Peak SAR (extrapolated) = 1.51 W/kg

SAR(1 g) = 0.839 mW/g; SAR(10 g) = 0.480 mW/g

Maximum value of SAR (measured) = 0.911 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left touch 810/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.975 mW/g

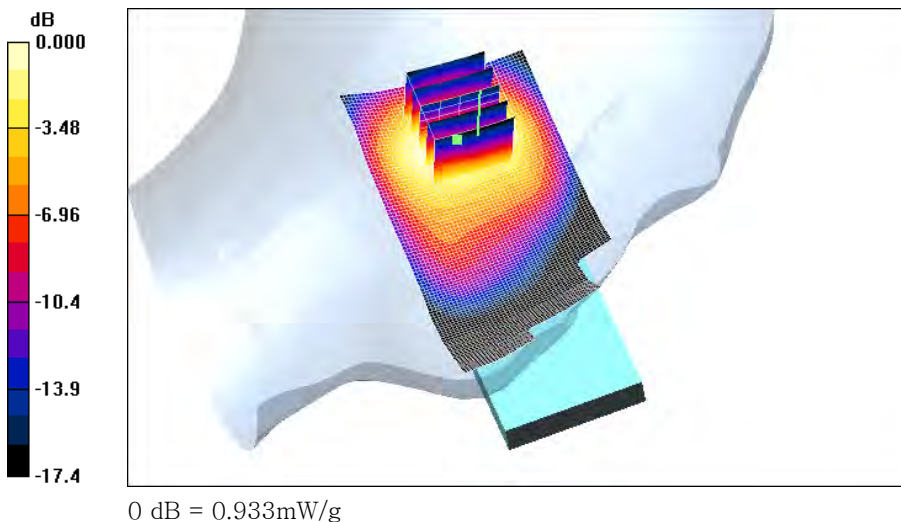
Left touch 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.5 V/m; Power Drift = 0.053 dB

Peak SAR (extrapolated) = 1.53 W/kg

SAR(1 g) = 0.852 mW/g; SAR(10 g) = 0.481 mW/g

Maximum value of SAR (measured) = 0.933 mW/g



Test Laboratory: HCT CO., LTD

EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)

Liquid Temperature: 21.2 °C

Ambient Temperature: 21.4 °C

Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right touch 512/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.18 mW/g

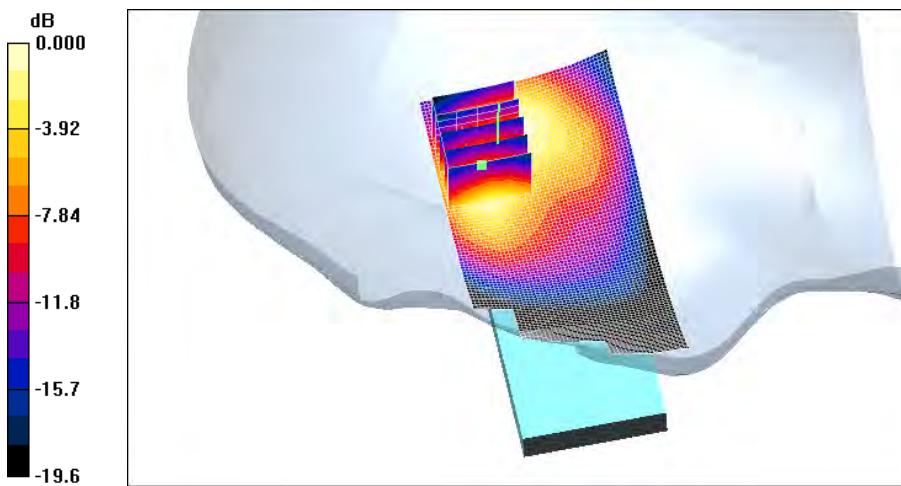
Right touch 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.6 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 1.84 W/kg

SAR(1 g) = 1 mW/g; SAR(10 g) = 0.547 mW/g[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.08 mW/g



Test Laboratory: HCT CO., LTD

EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)

Liquid Temperature: 21.2 °C

Ambient Temperature: 21.4 °C

Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.2$; $\rho = 1000$ kg/m³

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right touch 661/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.06 mW/g

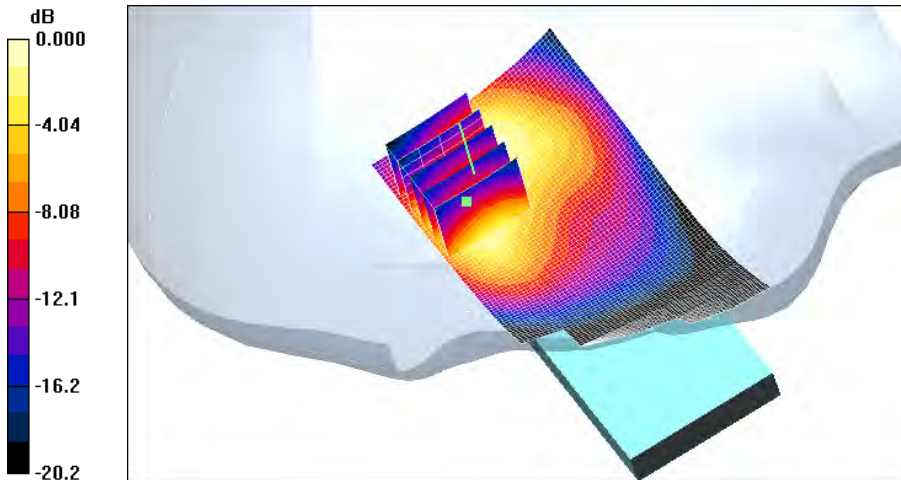
Right touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.4 V/m; Power Drift = 0.098 dB

Peak SAR (extrapolated) = 1.65 W/kg

SAR(1 g) = 0.904 mW/g; SAR(10 g) = 0.491 mW/g

Maximum value of SAR (measured) = 1.00 mW/g



0 dB = 1.00mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right touch 810/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.01 mW/g

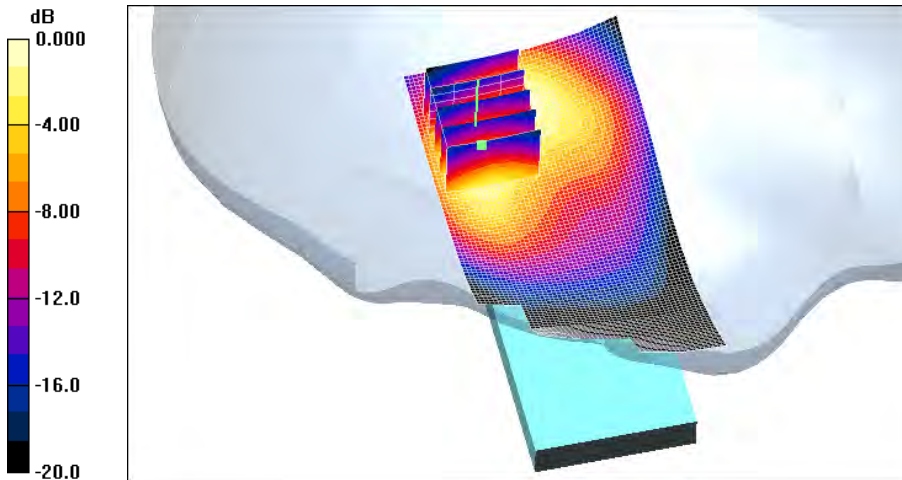
Right touch 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.1 V/m; Power Drift = 0.048 dB

Peak SAR (extrapolated) = 1.62 W/kg

SAR(1 g) = 0.892 mW/g; SAR(10 g) = 0.485 mW/g

Maximum value of SAR (measured) = 0.973 mW/g



0 dB = 0.973mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left tilt 512/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Maximum value of SAR (interpolated) = 1.24 mW/g

Left tilt 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

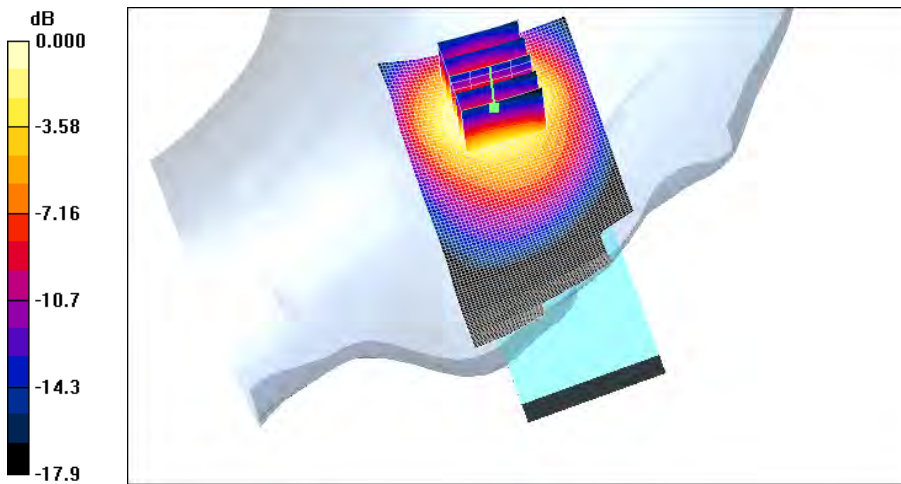
Reference Value = 30.9 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 1.67 W/kg

SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.610 mW/g

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

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



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.2$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left tilt 661/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.09 mW/g

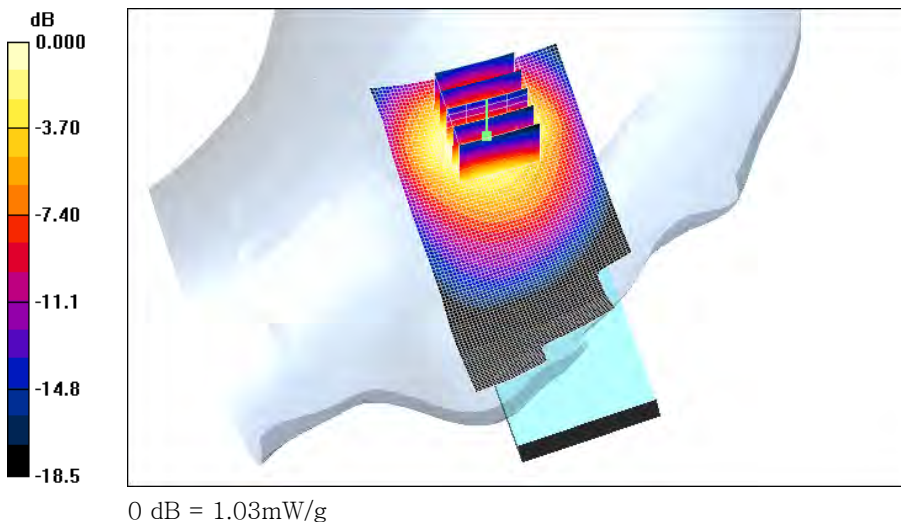
Left tilt 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.5 V/m; Power Drift = -0.020 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 0.947 mW/g; SAR(10 g) = 0.535 mW/g

Maximum value of SAR (measured) = 1.03 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left tilt 810/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.11 mW/g

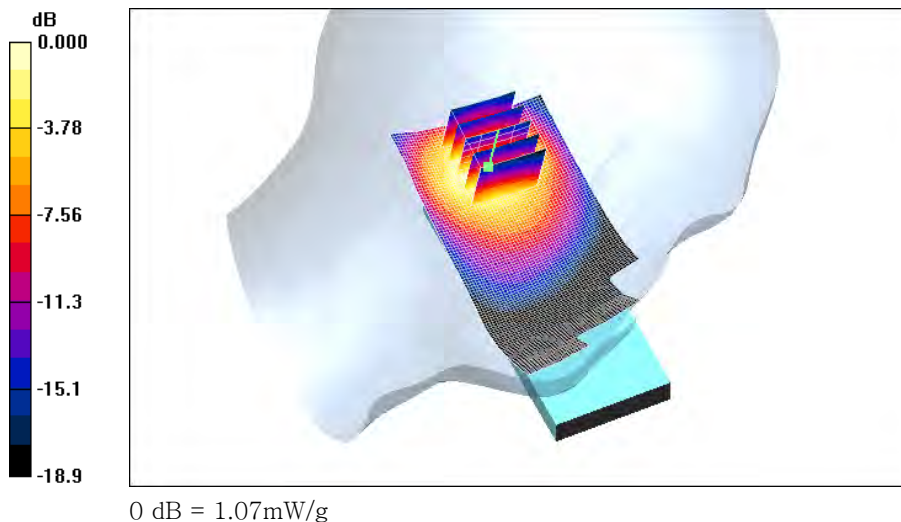
Left tilt 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.3 V/m; Power Drift = -0.133 dB

Peak SAR (extrapolated) = 1.59 W/kg

SAR(1 g) = 0.967 mW/g; SAR(10 g) = 0.538 mW/g

Maximum value of SAR (measured) = 1.07 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right tilt 512/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Maximum value of SAR (interpolated) = 1.31 mW/g

Right tilt 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

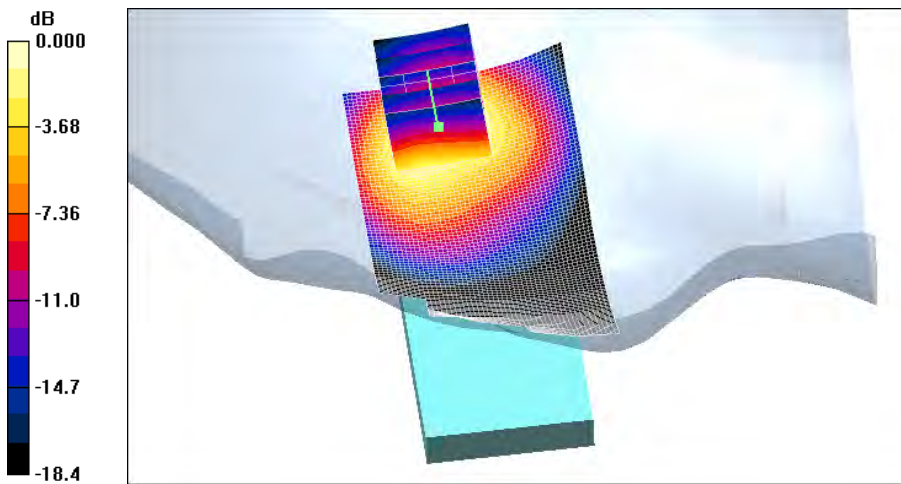
Reference Value = 29.3 V/m; Power Drift = -0.016 dB

Peak SAR (extrapolated) = 1.82 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.631 mW/g

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

Maximum value of SAR (measured) = 1.25 mW/g



0 dB = 1.25mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.2$; $\rho = 1000$ kg/m³
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right tilt 661/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.19 mW/g

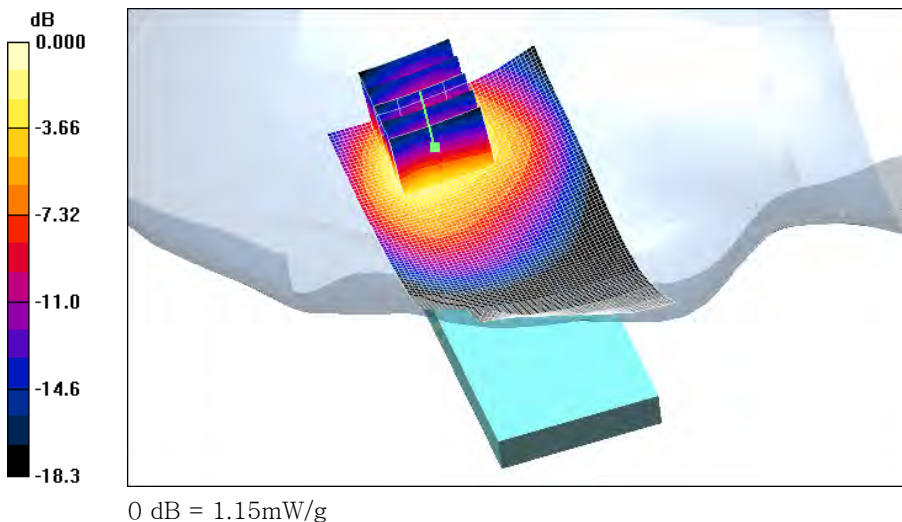
Right tilt 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.5 V/m; Power Drift = 0.054 dB

Peak SAR (extrapolated) = 1.67 W/kg

SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.563 mW/g

Maximum value of SAR (measured) = 1.15 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right tilt 810/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.14 mW/g

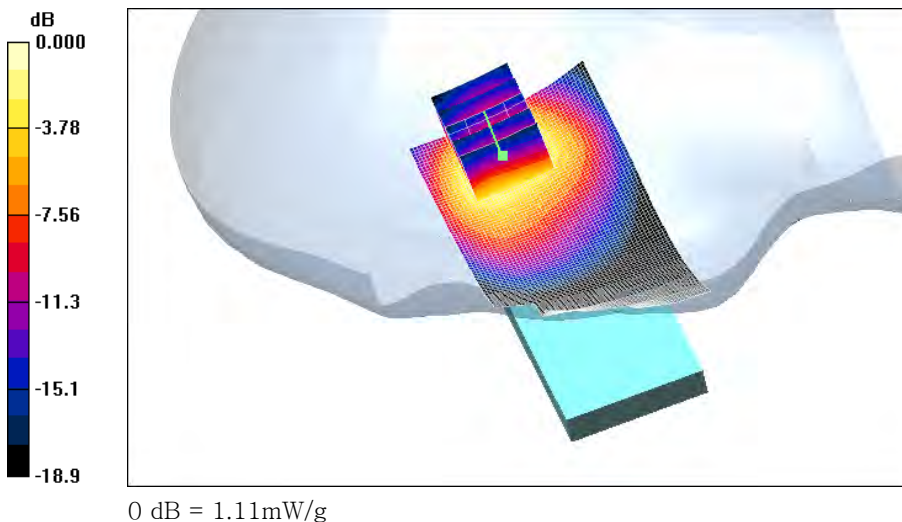
Right tilt 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.9 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 0.984 mW/g; SAR(10 g) = 0.534 mW/g

Maximum value of SAR (measured) = 1.11 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left touch 512/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) = 1.07 mW/g

Left touch 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

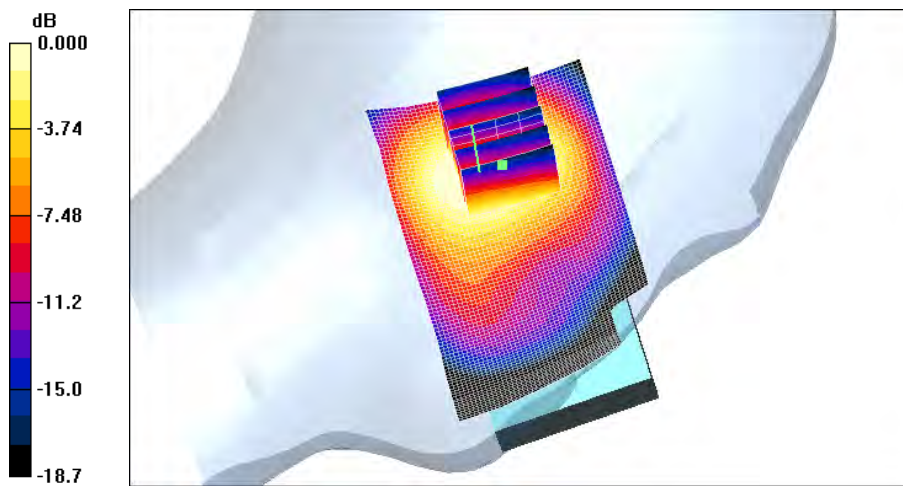
Reference Value = 28.4 V/m; Power Drift = -0.053 dB

Peak SAR (extrapolated) = 1.62 W/kg

SAR(1 g) = 0.930 mW/g; SAR(10 g) = 0.538 mW/g

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

Maximum value of SAR (measured) = 0.998 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.2$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left touch 661/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.03 mW/g

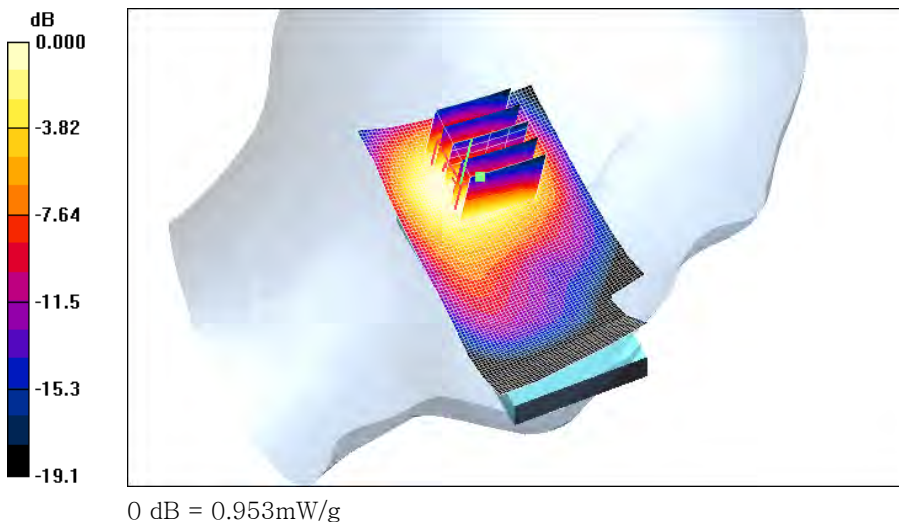
Left touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.2 V/m; Power Drift = 0.072 dB

Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 0.873 mW/g; SAR(10 g) = 0.502 mW/g

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



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left touch 810/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.972 mW/g

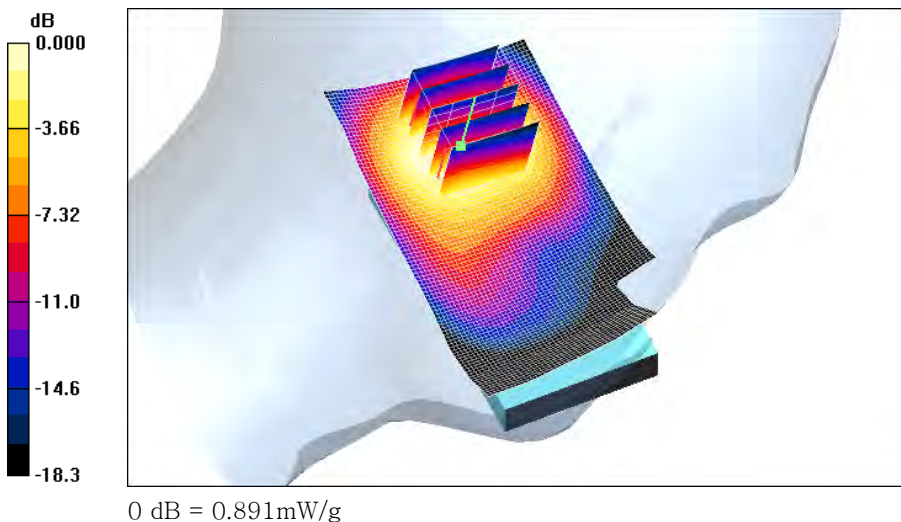
Left touch 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.1 V/m; Power Drift = -0.171 dB

Peak SAR (extrapolated) = 1.37 W/kg

SAR(1 g) = 0.835 mW/g; SAR(10 g) = 0.473 mW/g

Maximum value of SAR (measured) = 0.891 mW/g



Test Laboratory: HCT CO., LTD

EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)

Liquid Temperature: 21.2 °C

Ambient Temperature: 21.4 °C

Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right touch 512/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) = 1.33 mW/g

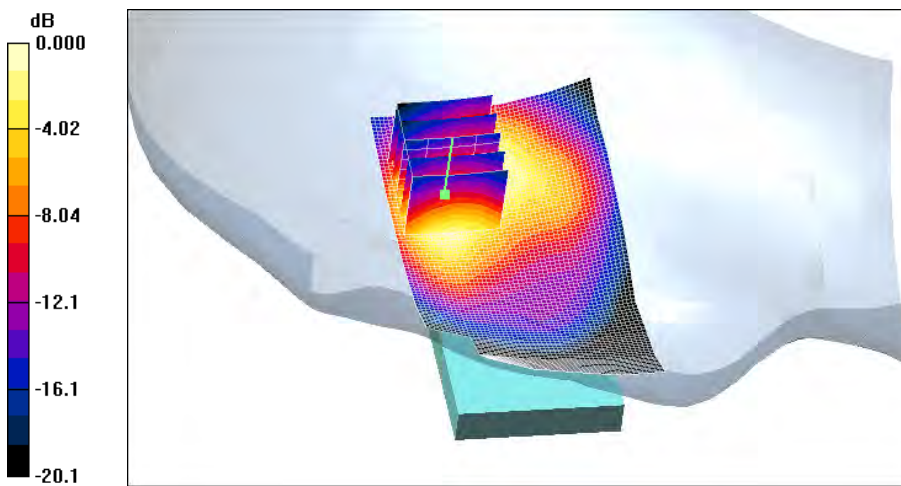
Right touch 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 26.1 V/m; Power Drift = -0.122 dB

Peak SAR (extrapolated) = 1.84 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.565 mW/g[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.12 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
 GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.39 \text{ mho/m}$; $\epsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right touch 661/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

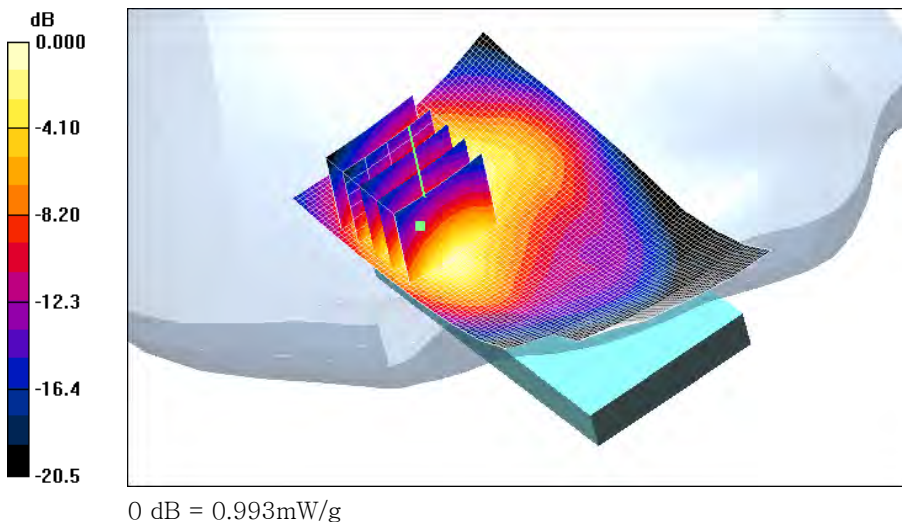
Right touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 25.0 V/m; Power Drift = 0.035 dB

Peak SAR (extrapolated) = 1.66 W/kg

SAR(1 g) = 0.906 mW/g; SAR(10 g) = 0.502 mW/g

Maximum value of SAR (measured) = 0.993 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right touch 810/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.07 mW/g

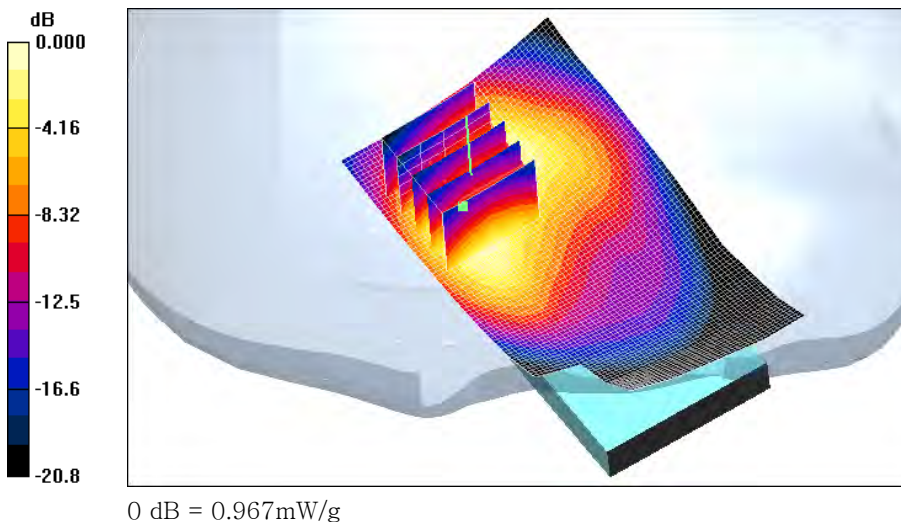
Right touch 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.9 V/m; Power Drift = 0.046 dB

Peak SAR (extrapolated) = 1.54 W/kg

SAR(1 g) = 0.866 mW/g; SAR(10 g) = 0.477 mW/g

Maximum value of SAR (measured) = 0.967 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left tilt 512/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) = 1.28 mW/g

Left tilt 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

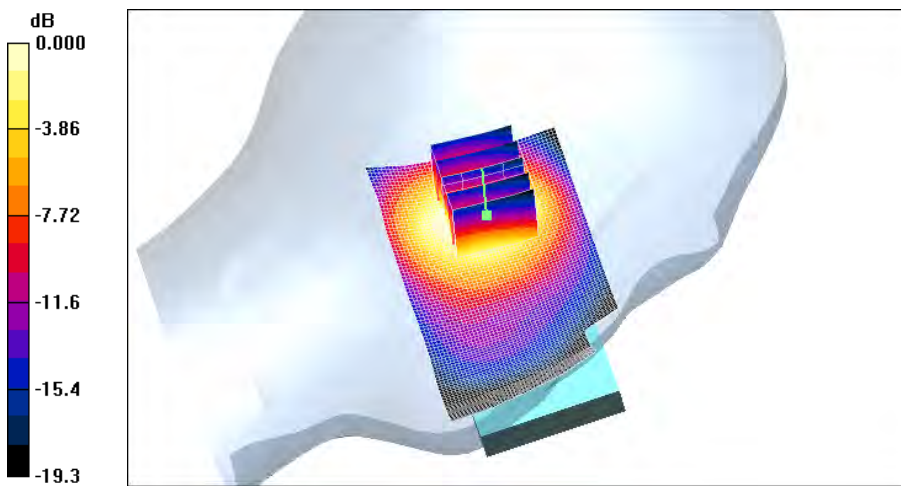
Reference Value = 31.0 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 1.82 W/kg

SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.613 mW/g

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

Maximum value of SAR (measured) = 1.15 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.39 \text{ mho/m}$; $\epsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left tilt 661/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

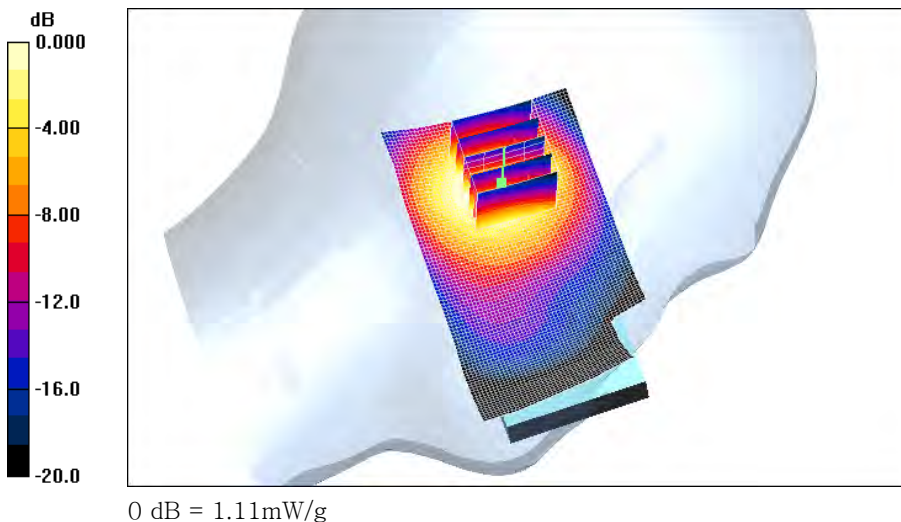
Left tilt 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 29.8 V/m; Power Drift = 0.053 dB

Peak SAR (extrapolated) = 1.71 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.576 mW/g

Maximum value of SAR (measured) = 1.11 mW/g



Test Laboratory: HCT CO., LTD

EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)

Liquid Temperature: 21.2 °C

Ambient Temperature: 21.4 °C

Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left tilt 810/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

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

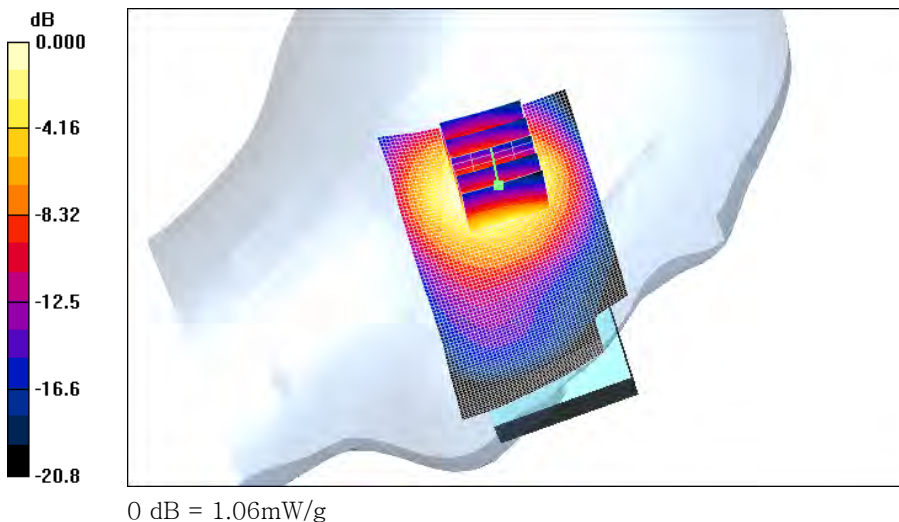
Left tilt 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.0 V/m; Power Drift = 0.091 dB

Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 0.971 mW/g; SAR(10 g) = 0.539 mW/g

Maximum value of SAR (measured) = 1.06 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right tilt 512/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.28 mW/g

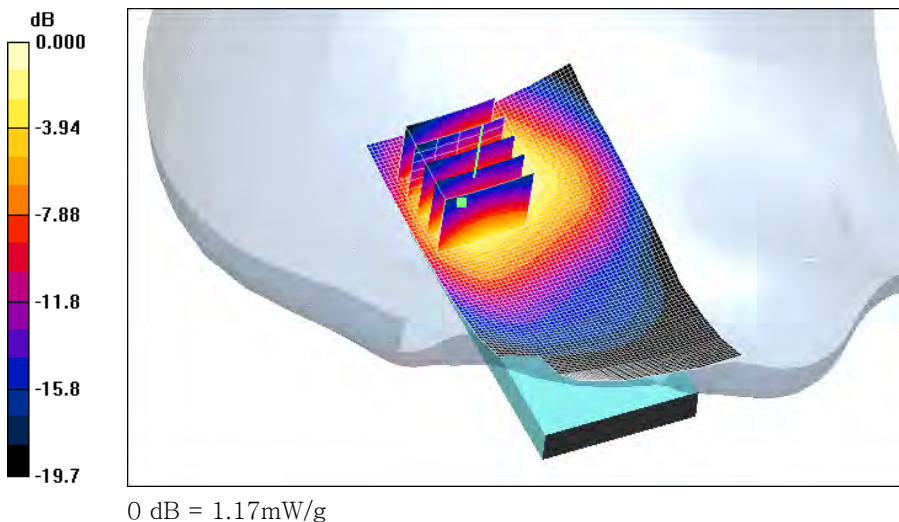
Right tilt 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.5 V/m; Power Drift = -0.090 dB

Peak SAR (extrapolated) = 1.81 W/kg

SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.597 mW/g

Maximum value of SAR (measured) = 1.17 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
 GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.39 \text{ mho/m}$; $\epsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right tilt 661/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.18 mW/g

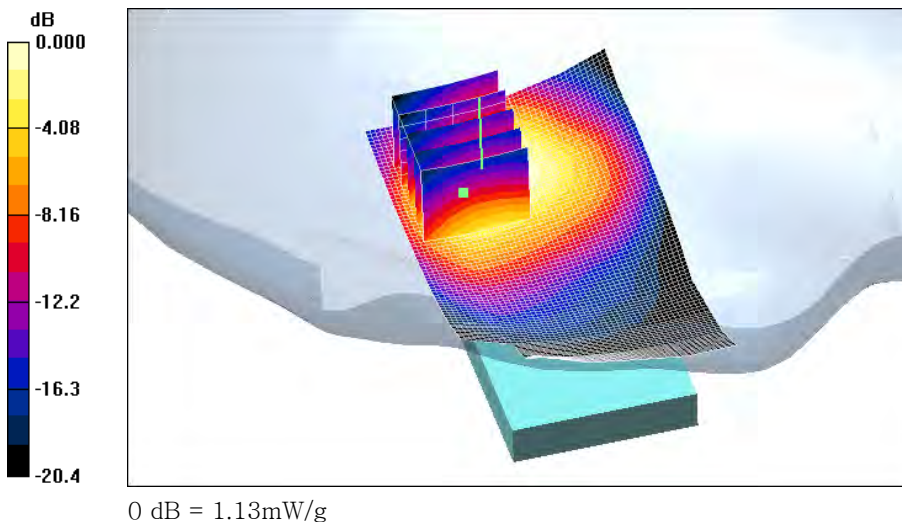
Right tilt 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.1 V/m; Power Drift = -0.048 dB

Peak SAR (extrapolated) = 1.71 W/kg

SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.558 mW/g

Maximum value of SAR (measured) = 1.13 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1910$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³
Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right tilt 810/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.05 mW/g

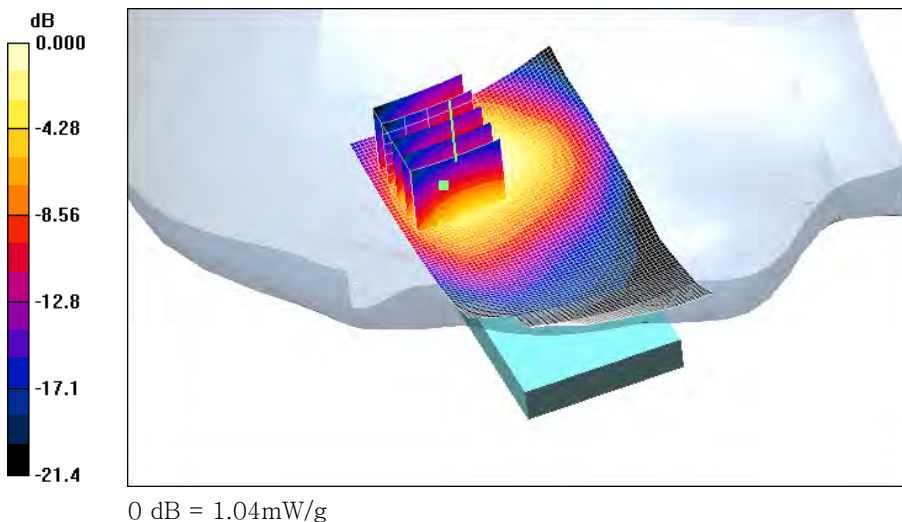
Right tilt 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.1 V/m; Power Drift = 0.016 dB

Peak SAR (extrapolated) = 1.60 W/kg

SAR(1 g) = 0.958 mW/g; SAR(10 g) = 0.514 mW/g

Maximum value of SAR (measured) = 1.04 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.991 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.08, 6.08, 6.08); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM850 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) = 0.198 mW/g

GSM850 Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

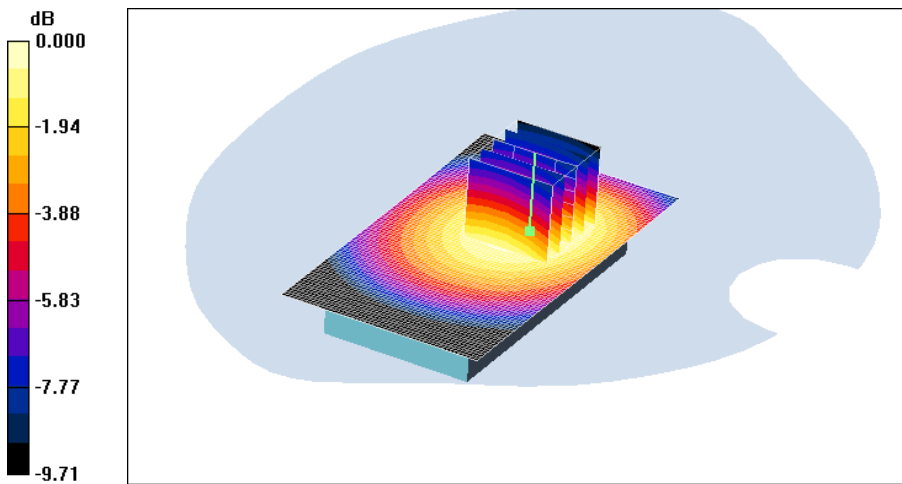
Reference Value = 11.5 V/m; Power Drift = 0.048 dB

Peak SAR (extrapolated) = 0.247 W/kg

SAR(1 g) = 0.187 mW/g; SAR(10 g) = 0.135 mW/g

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

Maximum value of SAR (measured) = 0.199 mW/g



0 dB = 0.199mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:4.15
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.991 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.08, 6.08, 6.08); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM850 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) = 0.385 mW/g

GSM850 Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

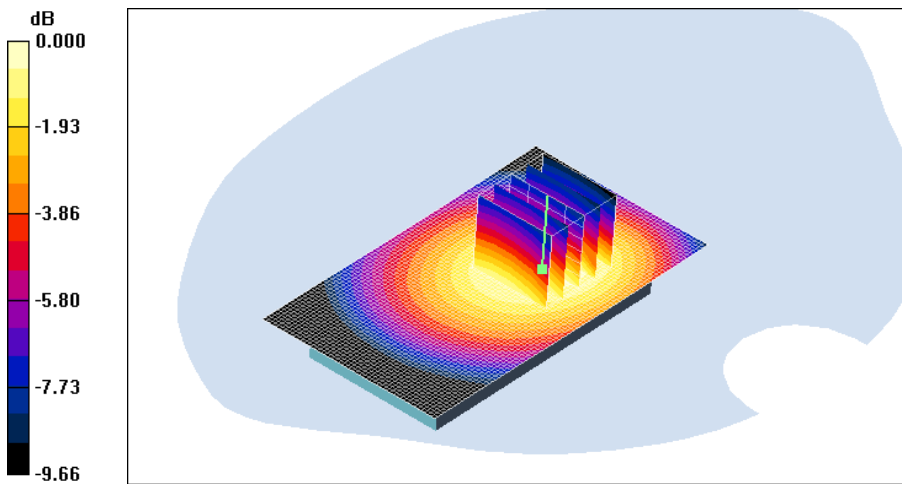
Reference Value = 16.1 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 0.498 W/kg

SAR(1 g) = 0.369 mW/g; SAR(10 g) = 0.265 mW/g

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

Maximum value of SAR (measured) = 0.391 mW/g



0 dB = 0.391mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:2.77
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.991 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.08, 6.08, 6.08); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM850 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) = 0.581 mW/g

GSM850 Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

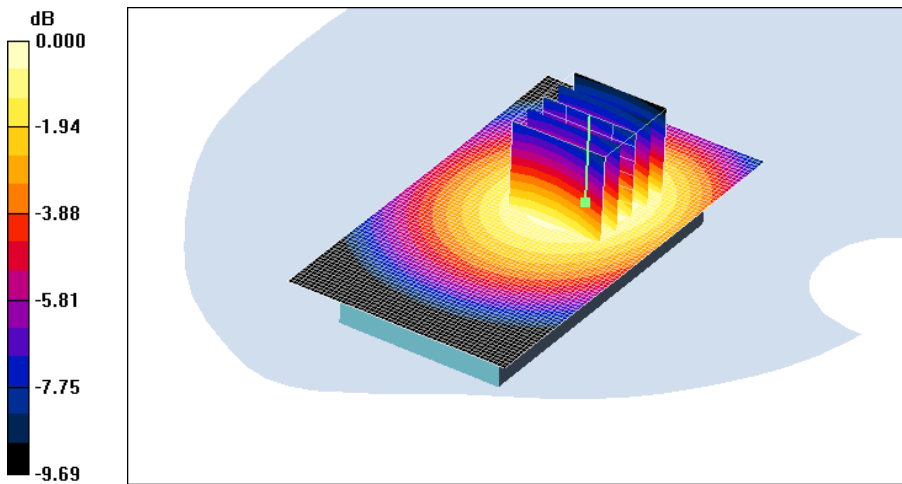
Reference Value = 20.1 V/m; Power Drift = 0.060 dB

Peak SAR (extrapolated) = 0.722 W/kg

SAR(1 g) = 0.536 mW/g; SAR(10 g) = 0.385 mW/g

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

Maximum value of SAR (measured) = 0.571 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:2.075
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.991 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.08, 6.08, 6.08); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM850 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) = 0.669 mW/g

GSM850 Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

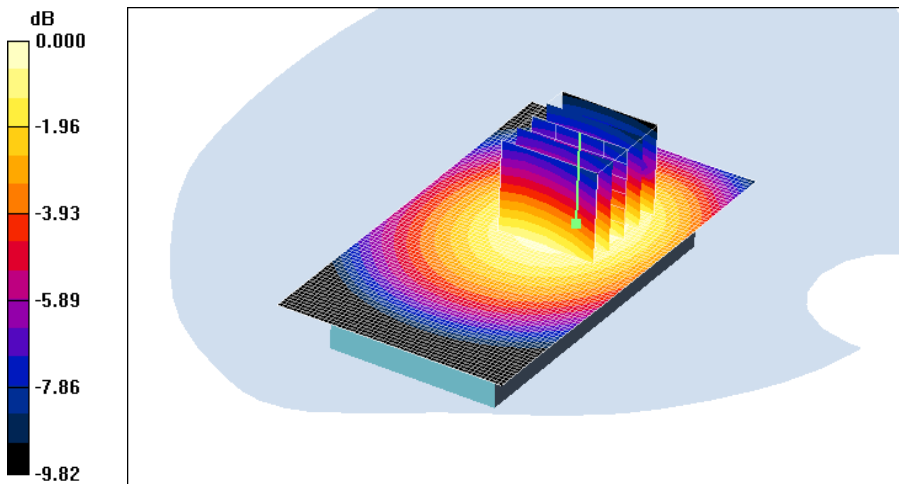
Reference Value = 21.3 V/m; Power Drift = 0.051 dB

Peak SAR (extrapolated) = 0.839 W/kg

SAR(1 g) = 0.625 mW/g; SAR(10 g) = 0.449 mW/g

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

Maximum value of SAR (measured) = 0.665 mW/g



0 dB = 0.665mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:2.075
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.991 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.08, 6.08, 6.08); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM850 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) = 0.410 mW/g

GSM850 Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

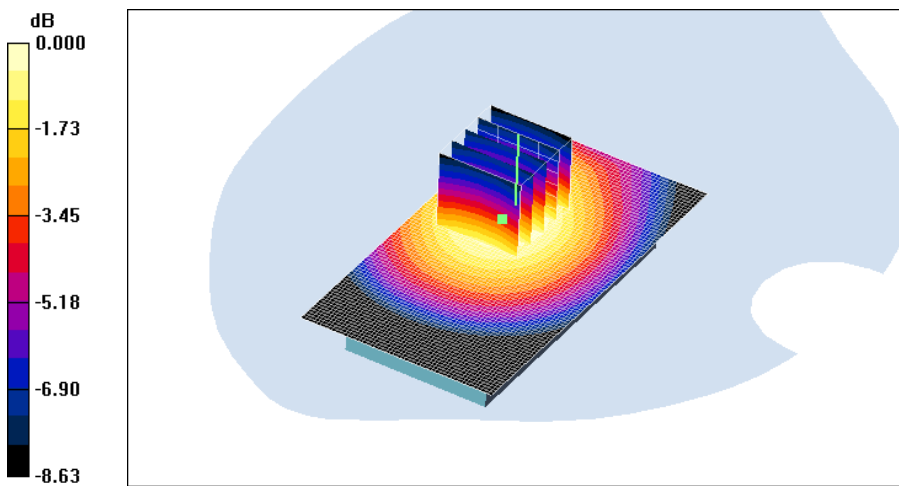
Reference Value = 16.9 V/m; Power Drift = 0.171 dB

Peak SAR (extrapolated) = 0.490 W/kg

SAR(1 g) = 0.373 mW/g; SAR(10 g) = 0.271 mW/g

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

Maximum value of SAR (measured) = 0.393 mW/g



0 dB = 0.393mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.28, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.991 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.08, 6.08, 6.08); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM850 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) = 0.192 mW/g

GSM850 Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

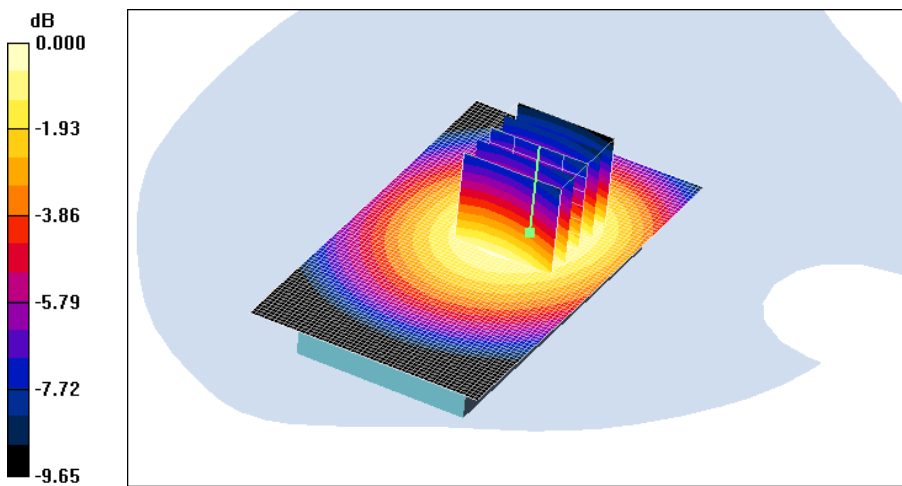
Reference Value = 11.5 V/m; Power Drift = -0.164 dB

Peak SAR (extrapolated) = 0.245 W/kg

SAR(1 g) = 0.184 mW/g; SAR(10 g) = 0.133 mW/g

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

Maximum value of SAR (measured) = 0.195 mW/g



0 dB = 0.195mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.5 \text{ mho/m}$; $\epsilon_r = 52$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.61, 4.61, 4.61); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Body 661/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.135 mW/g

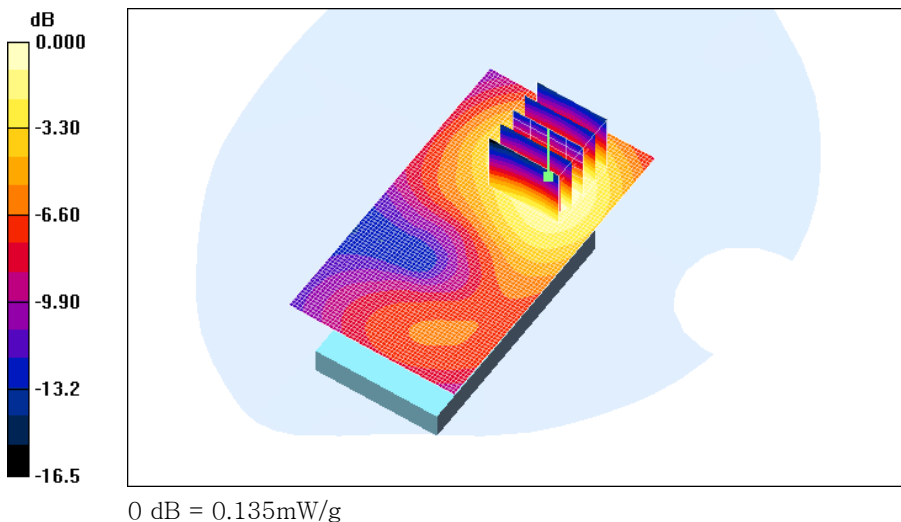
Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.67 V/m; Power Drift = 0.044 dB

Peak SAR (extrapolated) = 0.157 W/kg

SAR(1 g) = 0.123 mW/g; SAR(10 g) = 0.077 mW/g

Maximum value of SAR (measured) = 0.135 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:4.15
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.5 \text{ mho/m}$; $\epsilon_r = 52$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.61, 4.61, 4.61); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Body 661/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.266 mW/g

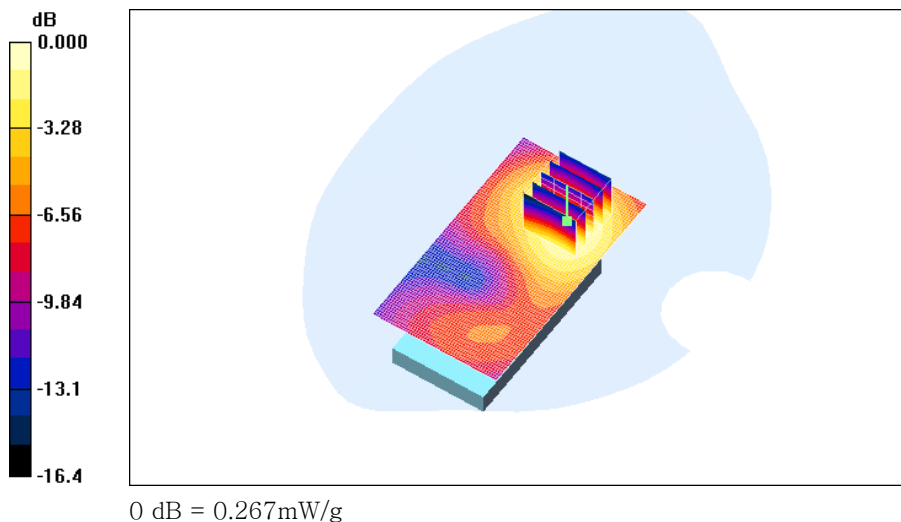
Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 13.7 V/m; Power Drift = -0.092 dB

Peak SAR (extrapolated) = 0.310 W/kg

SAR(1 g) = 0.244 mW/g; SAR(10 g) = 0.152 mW/g

Maximum value of SAR (measured) = 0.267 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2.77
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.61, 4.61, 4.61); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Body 661/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

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

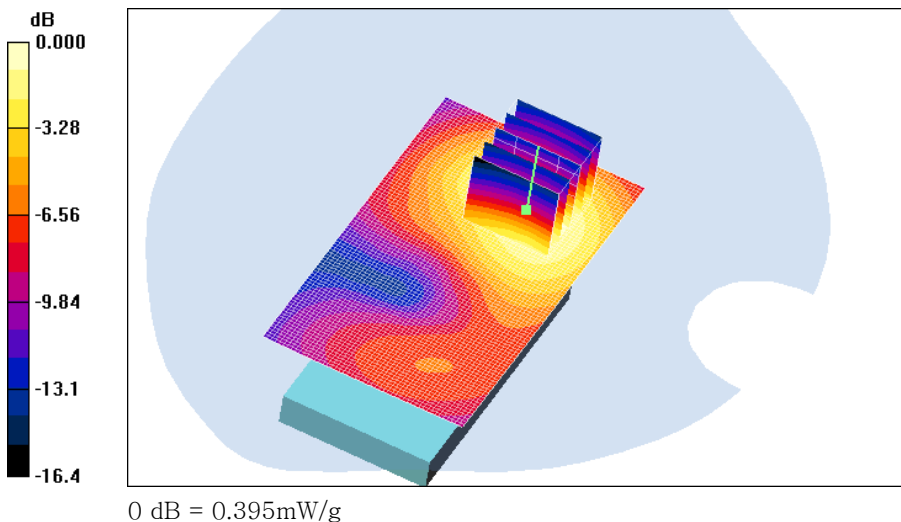
Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.5 V/m; Power Drift = -0.027 dB

Peak SAR (extrapolated) = 0.459 W/kg

SAR(1 g) = 0.360 mW/g; SAR(10 g) = 0.224 mW/g

Maximum value of SAR (measured) = 0.395 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2.075
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.61, 4.61, 4.61); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Body 661/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.508 mW/g

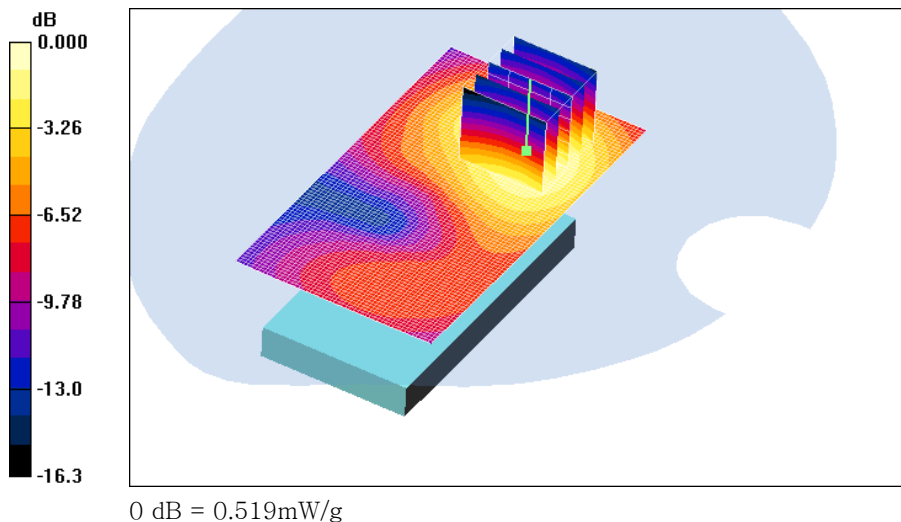
Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.9 V/m; Power Drift = -0.052 dB

Peak SAR (extrapolated) = 0.605 W/kg

SAR(1 g) = 0.470 mW/g; SAR(10 g) = 0.292 mW/g

Maximum value of SAR (measured) = 0.519 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2.075
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.61, 4.61, 4.61); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Body 661/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.378 mW/g

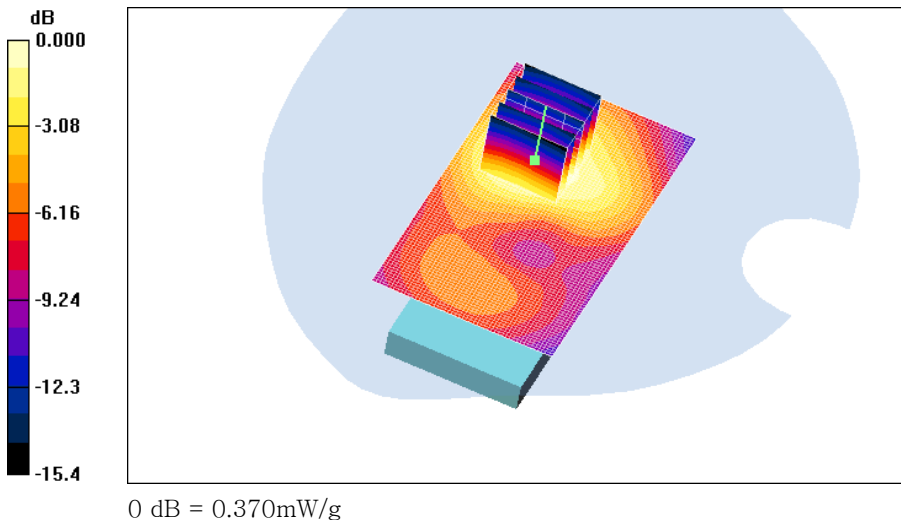
Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.1 V/m; Power Drift = -0.057 dB

Peak SAR (extrapolated) = 0.418 W/kg

SAR(1 g) = 0.334 mW/g; SAR(10 g) = 0.210 mW/g

Maximum value of SAR (measured) = 0.370 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.5 \text{ mho/m}$; $\epsilon_r = 52$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.61, 4.61, 4.61); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Body 661/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.132 mW/g

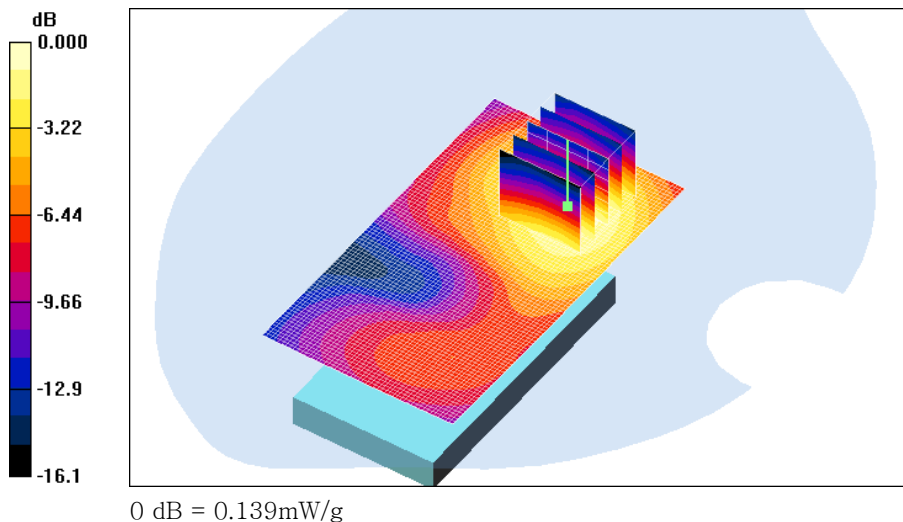
Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 9.23 V/m; Power Drift = 0.098 dB

Peak SAR (extrapolated) = 0.161 W/kg

SAR(1 g) = 0.127 mW/g; SAR(10 g) = 0.079 mW/g

Maximum value of SAR (measured) = 0.139 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Mar. 15, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.91$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.15, 4.15, 4.15); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: SAM 1800/1900 MHz; Type: SAM

802.11b WiFi 6/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.007 mW/g

802.11b WiFi 6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

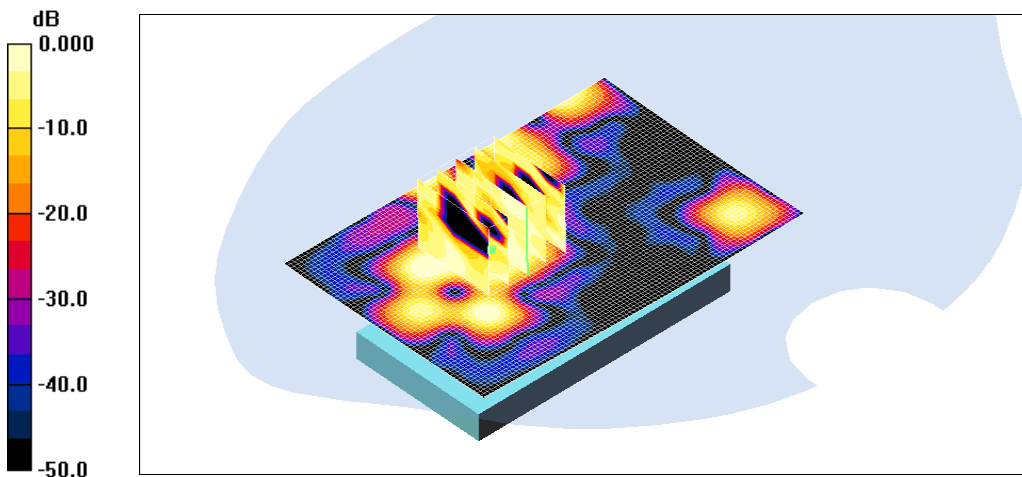
Reference Value = 0.332 V/m; Power Drift = 0.001dB

Peak SAR (extrapolated) = 0.004 W/kg

SAR(1 g) = 0.000536 mW/g; SAR(10 g) = 6.57e-005 mW/g

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

Maximum value of SAR (measured) = 0.002 mW/g



0 dB = 0.002mW/g

Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Mar. 15, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.91 \text{ mho/m}$; $\epsilon_r = 51.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ES3DV3 - SN3161; ConvF(4.15, 4.15, 4.15); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: SAM 1800/1900 MHz; Type: SAM

802.11g WiFi 6/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.022 mW/g

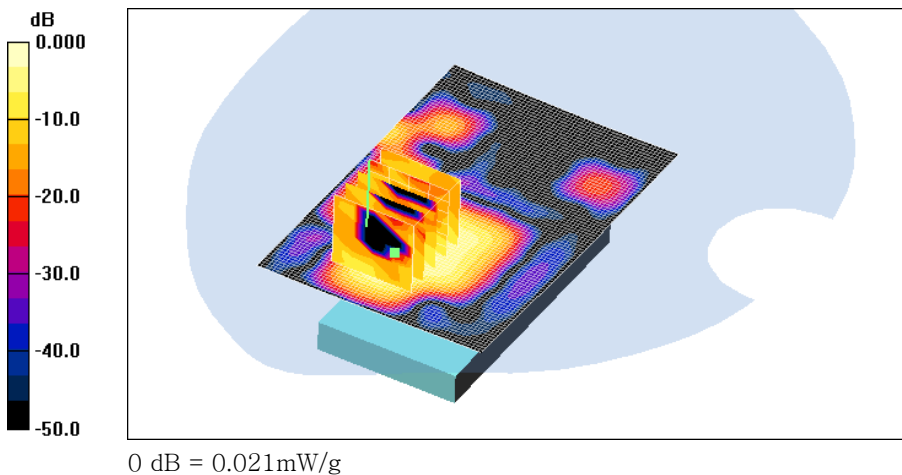
802.11g WiFi 6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 0.384 V/m; Power Drift = -0.031 dB

Peak SAR (extrapolated) = 0.087 W/kg

SAR(1 g) = 0.014 mW/g; SAR(10 g) = 0.00586 mW/g

Maximum value of SAR (measured) = 0.021 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Mar. 15, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: 2450MHz FCC; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2437 \text{ MHz}$; $\sigma = 1.91 \text{ mho/m}$; $\epsilon_r = 51.9$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ES3DV3 - SN3161; ConvF(4.15, 4.15, 4.15); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: SAM 1800/1900 MHz; Type: SAM

802.11g WiFi 6/Area Scan (61x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Maximum value of SAR (interpolated) = 0.009 mW/g

802.11g WiFi 6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

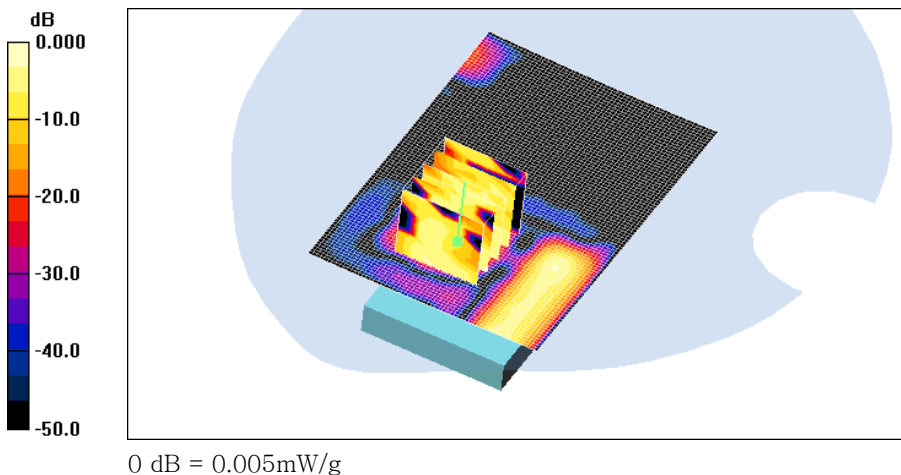
Reference Value = 0.114 V/m; Power Drift = 0.005 dB

Peak SAR (extrapolated) = 0.011 W/kg

SAR(1 g) = 0.00474 mW/g; SAR(10 g) = 0.00181 mW/g

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

Maximum value of SAR (measured) = 0.005 mW/g



Test Laboratory: HCT CO., LTD

EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)

Liquid Temperature: 21.2 °C

Ambient Temperature: 21.4 °C

Test Date: Apr.28, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.868$ mho/m; $\epsilon_r = 42.6$; $\rho = 1000$ kg/m³

Phantom section: Left Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.25, 6.25, 6.25); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Left touch 190/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.326 mW/g

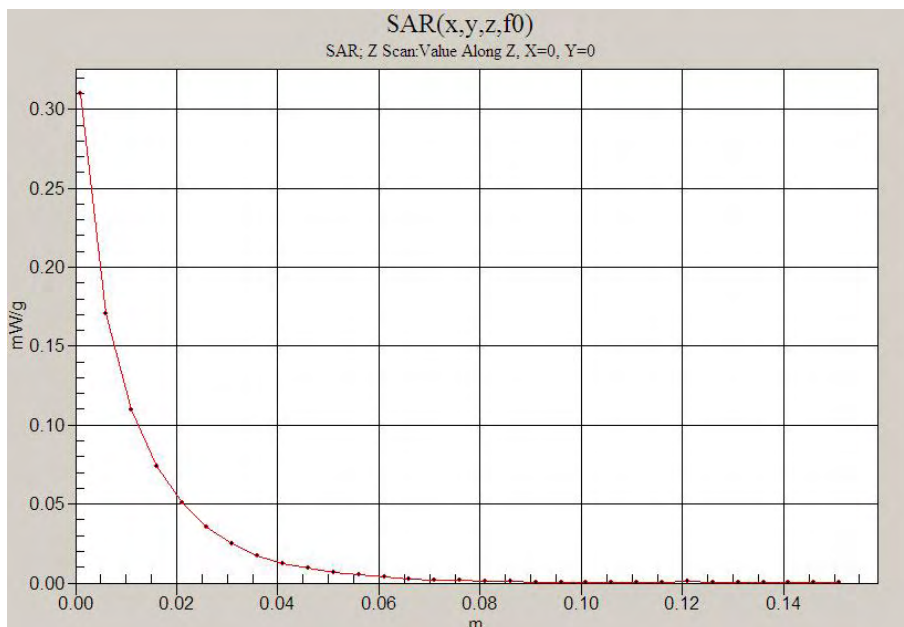
Left touch 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.9 V/m; Power Drift = 0.055 dB

Peak SAR (extrapolated) = 0.670 W/kg

SAR(1 g) = 0.327 mW/g; SAR(10 g) = 0.197 mW/g

Maximum value of SAR (measured) = 0.360 mW/g



Test Laboratory: HCT CO., LTD
 EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
 GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
 Liquid Temperature: 21.2 °C
 Ambient Temperature: 21.4 °C
 Test Date: Apr.28, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:2.075
 Medium parameters used (interpolated): $f = 836.6 \text{ MHz}$; $\sigma = 0.991 \text{ mho/m}$; $\epsilon_r = 54$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(6.08, 6.08, 6.08); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM850 Body 190/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 0.669 mW/g

GSM850 Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

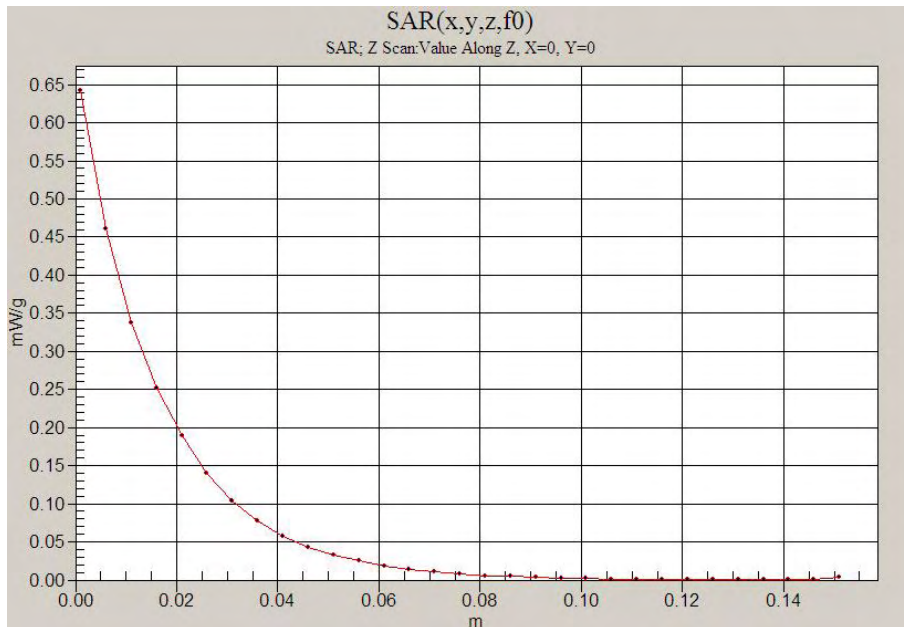
Reference Value = 21.3 V/m; Power Drift = 0.051 dB

Peak SAR (extrapolated) = 0.839 W/kg

SAR(1 g) = 0.625 mW/g; SAR(10 g) = 0.449 mW/g

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

Maximum value of SAR (measured) = 0.665 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide up; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.36$ mho/m; $\epsilon_r = 39.2$; $\rho = 1000$ kg/m³

Phantom section: Right Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right tilt 512/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

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

Maximum value of SAR (interpolated) = 1.31 mW/g

Right tilt 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

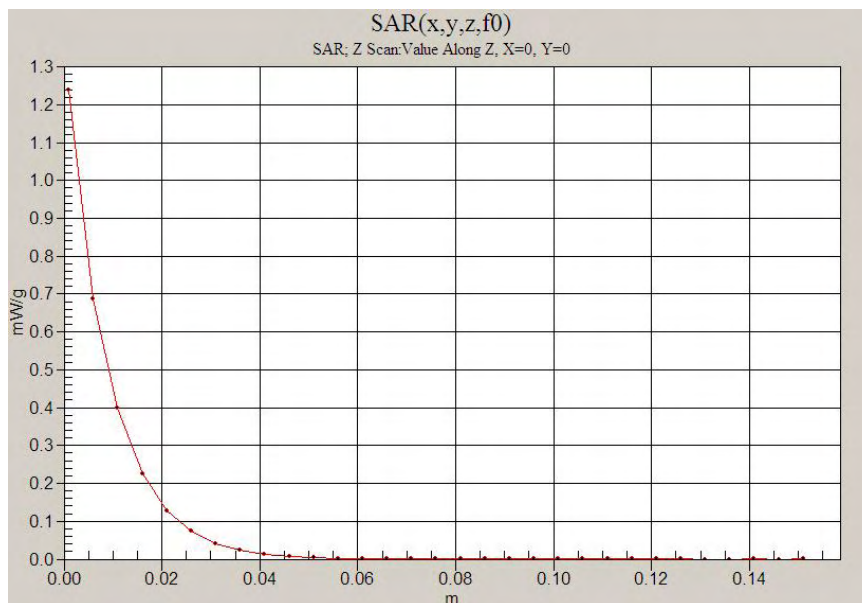
Reference Value = 29.3 V/m; Power Drift = -0.016 dB

Peak SAR (extrapolated) = 1.82 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.631 mW/g

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

Maximum value of SAR (measured) = 1.25 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.2 °C
Ambient Temperature: 21.4 °C
Test Date: Apr.29, 2009

DUT: GD900; Type: Slide down; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:2.075
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 52$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(4.61, 4.61, 4.61); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Body 661/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.508 mW/g

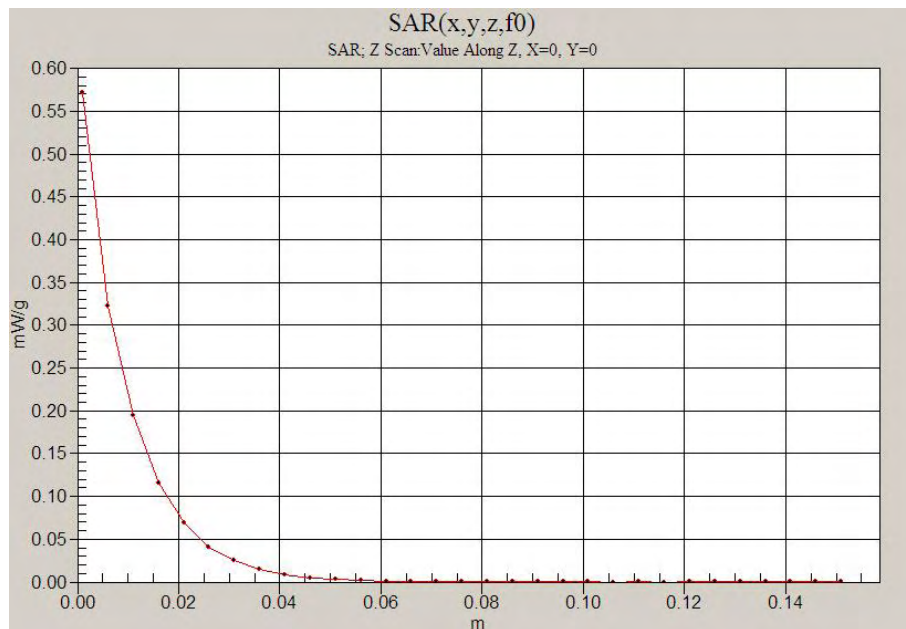
Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.9 V/m; Power Drift = -0.052 dB

Peak SAR (extrapolated) = 0.605 W/kg

SAR(1 g) = 0.470 mW/g; SAR(10 g) = 0.292 mW/g

Maximum value of SAR (measured) = 0.519 mW/g



Test Laboratory: HCT CO., LTD
EUT Type: Cellular/PCS GSM/EDGE Phone with Bluetooth and WLAN
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.1 °C
Ambient Temperature: 21.3 °C
Test Date: Mar. 15, 2009

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

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 2450$ MHz; $\sigma = 1.87$ mho/m; $\epsilon_r = 39.9$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ES3DV3 - SN3161; ConvF(4.47, 4.47, 4.47); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Validation 2450MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 6.65 mW/g

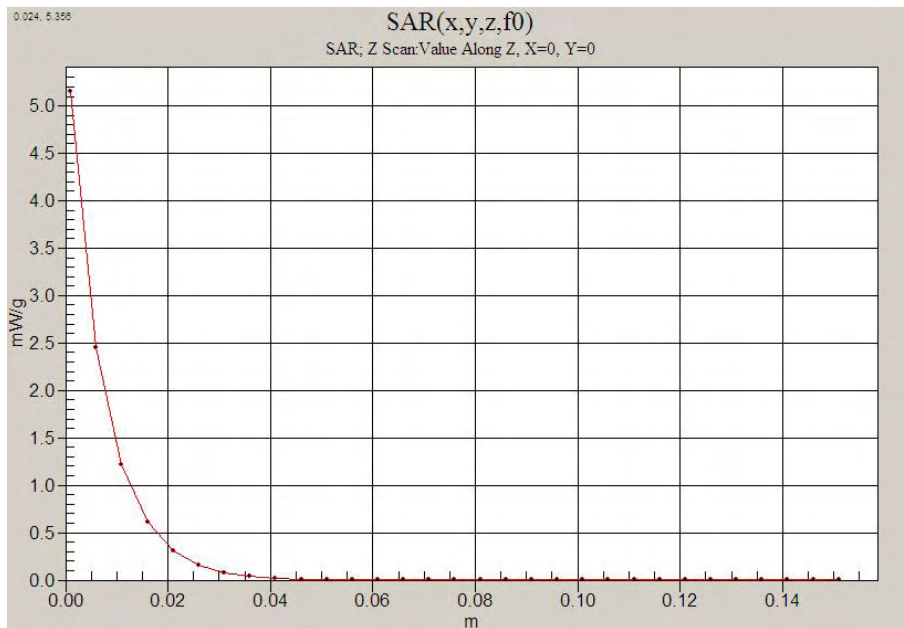
Validation 2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 50.7 V/m; Power Drift = -0.110 dB

Peak SAR (extrapolated) = 11.8 W/kg

SAR(1 g) = 5.34 mW/g; SAR(10 g) = 2.4 mW/g

Maximum value of SAR (measured) = 5.88 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: 21.2 °C
Test Date: Apr.28, 2009

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

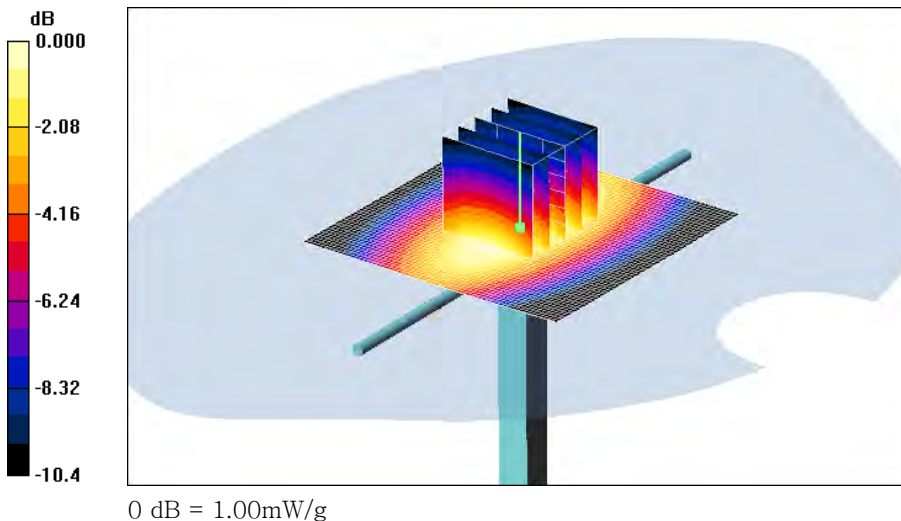
Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.866 \text{ mho/m}$; $\epsilon_r = 42.6$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 – SN1609; ConvF(6.25, 6.25, 6.25); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: SAM 835/900 MHz; Type: SAM

Validation 835MHz/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
Maximum value of SAR (interpolated) = 0.998 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 = 35.1 V/m; Power Drift = -0.020 dB
Peak SAR (extrapolated) = 1.39 W/kg
SAR(1 g) = 0.932 mW/g; SAR(10 g) = 0.612 mW/g
Maximum value of SAR (measured) = 1.00 mW/g



■ Validation Data (1900 MHz Head)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.2 °C

Test Date: Apr.29, 2009

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

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.42 \text{ mho/m}$; $\epsilon_r = 39.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ET3DV6 - SN1609; ConvF(5.12, 5.12, 5.12); Calibrated: 2009-03-17
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: SAM 1800/1900 MHz; Type: SAM

Dipole 1900MHz Validation/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 4.59 mW/g

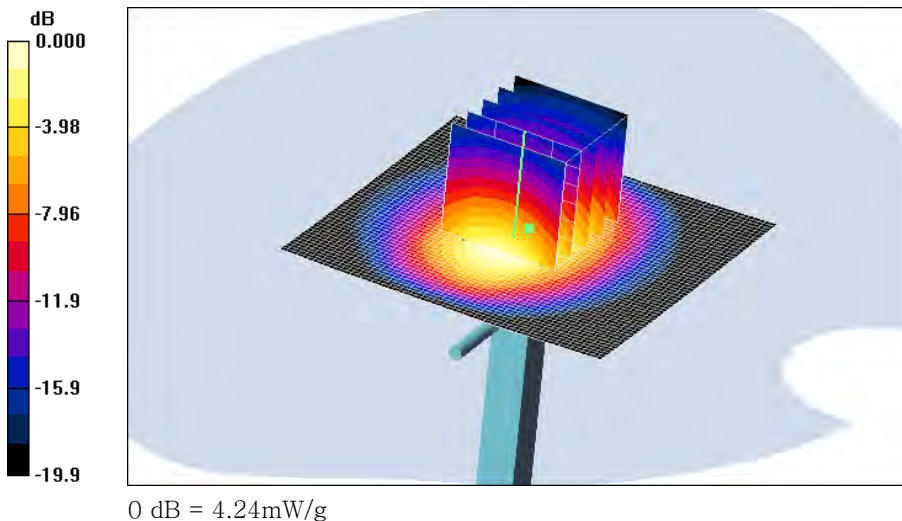
Dipole 1900MHz Validation/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 58.0 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 6.64 W/kg

SAR(1 g) = 3.83 mW/g; SAR(10 g) = 1.99 mW/g

Maximum value of SAR (measured) = 4.24 mW/g



■ Validation Data (2450 MHz Head)

Test Laboratory: HCT CO., LTD
Input Power 100 mW (20 dBm)
Liquid Temp: 21.1 °C
Test Date: Mar.15, 2009

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

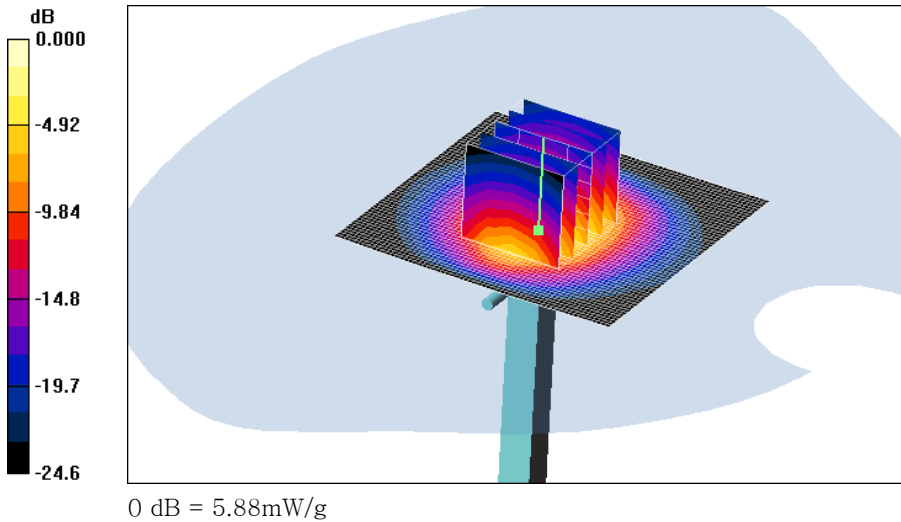
Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 2450$ MHz; $\sigma = 1.87$ mho/m; $\epsilon_r = 39.9$; $\rho = 1000$ kg/m³
Phantom section: Flat Section ; Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:

- Probe: ES3DV3 – SN3161; ConvF(4.47, 4.47, 4.47); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Validation 2450MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 6.65 mW/g

Validation 2450MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.7 V/m; Power Drift = -0.110 dB
Peak SAR (extrapolated) = 11.8 W/kg
SAR(1 g) = 5.34 mW/g; SAR(10 g) = 2.4 mW/g
Maximum value of SAR (measured) = 5.88 mW/g



■ Dielectric Parameter (835 MHz Head)

Title GD900
SubTitle CDMA835(Head)
Test Date Apr.28, 2009

Frequency	e'	e''
800000000	43.1200	18.7575
805000000	43.0995	18.7334
810000000	42.9693	18.6810
815000000	42.9185	18.7144
820000000	42.8159	18.6930
825000000	42.7800	18.6955
830000000	42.7002	18.6895
835000000	42.6007	18.6475
840000000	42.5434	18.6567
845000000	42.5023	18.6821
850000000	42.4199	18.6158
855000000	42.3541	18.6383
860000000	42.2885	18.6402
865000000	42.2267	18.6513
870000000	42.1428	18.6183
875000000	42.1100	18.6515
880000000	42.0457	18.5932
885000000	41.9491	18.6255
890000000	41.9121	18.6349
895000000	41.8765	18.6140
900000000	41.7787	18.5974

■ Dielectric Parameter (835 MHz Body)

Title GD900
 SubTitle CDMA835(Body)
 Test Date Apr.28, 2009

Frequency	e'	e''
800000000	54.3630	21.4529
805000000	54.3574	21.3938
810000000	54.2695	21.4039
815000000	54.2127	21.3863
820000000	54.1380	21.4089
825000000	54.0666	21.3746
830000000	54.0036	21.3600
835000000	54.0160	21.3071
840000000	53.9562	21.2808
845000000	53.8721	21.2749
850000000	53.8444	21.2701
855000000	53.8163	21.2329
860000000	53.7026	21.1957
865000000	53.6611	21.1751
870000000	53.5812	21.1639
875000000	53.5293	21.1104
880000000	53.4710	21.1078
885000000	53.4471	21.0815
890000000	53.3551	21.0132
895000000	53.3046	21.0766
900000000	53.3044	21.0103

■ Dielectric Parameter (1900 MHz Head)

Title GD900
 SubTitle PCS1900(Head)
 Test Date Apr.29, 2009

Frequency	e'	e''
1800000000	39.7676	13.1054
1810000000	39.6581	13.0959
1820000000	39.5485	13.1234
1830000000	39.4207	13.1626
1840000000	39.2978	13.2264
1850000000	39.2244	13.2364
1860000000	39.1831	13.2479
1870000000	39.1506	13.2957
1880000000	39.1521	13.3341
1890000000	39.1557	13.3739
1900000000	39.1615	13.4060
1910000000	39.1351	13.3904
1920000000	39.0597	13.4121
1930000000	38.9720	13.4538
1940000000	38.8343	13.4519
1950000000	38.7210	13.4673
1960000000	38.5904	13.5034
1970000000	38.5225	13.5665
1980000000	38.4916	13.6262
1990000000	38.5265	13.6516
2000000000	38.5176	13.6794

■ Dielectric Parameter (1900 MHz Body)

Title GD900
 SubTitle PCS1900(Body)
 Test Date Apr.29, 2009

Frequency	e'	e''
1850000000	52.1817	14.2727
1855000000	52.1525	14.2882
1860000000	52.1375	14.2949
1865000000	52.1208	14.3317
1870000000	52.0384	14.3585
1875000000	51.9990	14.3439
1880000000	51.9881	14.3368
1885000000	51.9258	14.3038
1890000000	51.8637	14.3388
1895000000	51.8154	14.3688
1900000000	51.7915	14.3774
1905000000	51.7326	14.4102
1910000000	51.7450	14.4900
1915000000	51.7435	14.5180
1920000000	51.7551	14.5914
1925000000	51.7576	14.6265
1930000000	51.8003	14.6537
1935000000	51.8532	14.6642
1940000000	51.8298	14.7121
1945000000	51.8980	14.7224
1950000000	51.9270	14.6898

■ Dielectric Parameter (2450 MHz Head)

Title GD900
 SubTitle 2450 MHz (Head)
 Test Date Mar.15, 2009

Frequency	e'	e''
2400000000	40.1107	13.4698
2405000000	40.1005	13.4706
2410000000	40.0437	13.4830
2415000000	40.0398	13.4840
2420000000	40.0398	13.5189
2425000000	39.9885	13.5468
2430000000	39.9901	13.5632
2435000000	39.9553	13.6027
2440000000	39.9629	13.6025
2445000000	39.9112	13.6514
2450000000	39.9193	13.6935
2455000000	39.9000	13.6715
2460000000	39.8663	13.6878
2465000000	39.8643	13.7304
2470000000	39.8065	13.7254
2475000000	39.7648	13.7349
2480000000	39.7628	13.7379
2485000000	39.6978	13.7399
2490000000	39.7102	13.7587
2495000000	39.6903	13.7920
2500000000	39.7022	13.8225

■ Dielectric Parameter (2450 MHz Body)

Title GD900
SubTitle 2450 MHz (Body)
Test Date Mar.15, 2009

Frequency	e'	e''
2400000000	52.1253	13.9245
2405000000	52.0864	13.9236
2410000000	52.0803	13.9605
2415000000	52.0344	13.9388
2420000000	52.0125	13.9772
2425000000	51.9805	14.0135
2430000000	51.9467	14.0449
2435000000	51.9169	14.0939
2440000000	51.9013	14.1213
2445000000	51.8483	14.1366
2450000000	51.8464	14.2034
2455000000	51.8358	14.2514
2460000000	51.7987	14.3223
2465000000	51.8134	14.3950
2470000000	51.7617	14.4362
2475000000	51.7529	14.4223
2480000000	51.7617	14.4919
2485000000	51.7317	14.5021
2490000000	51.7209	14.5179
2495000000	51.7234	14.5203
2500000000	51.7153	14.5405

Attachment 3. – Probe Calibration Data

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



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

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

Accreditation No.: SCS 108

Client **HCT (Dymstec)**

Certificate No: **ET3-1609_Mar09**

CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1609**

Calibration procedure(s) **QA CAL-01.v6, QA CAL-12.v5 and QA CAL-23.v3
Calibration procedure for dosimetric E-field probes**

Calibration date: **March 17, 2009**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	1-Jul-08 (No. 217-00865)	Jul-09
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	1-Jul-08 (No. 217-00866)	Jul-09
Reference Probe ES3DV2	SN: 3013	2-Jan-09 (No. ES3-3013_Jan09)	Jan-10
DAE4	SN: 660	9-Sep-08 (No. DAE4-660_Sep08)	Sep-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

	Name	Function	Signature
Calibrated by:	Marcel Fehr	Laboratory Technician	

	Name	Function	Signature
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 17, 2009

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: ET3-1609_Mar09

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



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

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

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
Polarization ϕ	ϕ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}:** Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}:** DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters:** Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy):** in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset:** The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

ET3DV6 SN:1609

March 17, 2009

Probe ET3DV6

SN:1609

Manufactured:	July 21, 2001
Last calibrated:	August 30, 2007
Recalibrated:	March 17, 2009

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ET3-1609_Mar09

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ET3DV6 SN:1609

March 17, 2009

DASY - Parameters of Probe: ET3DV6 SN:1609

Sensitivity in Free Space^A

Diode Compression^B

NormX	1.97 ± 10.1%	$\mu V/(V/m)^2$	DCP X	93 mV
NormY	1.87 ± 10.1%	$\mu V/(V/m)^2$	DCP Y	90 mV
NormZ	1.82 ± 10.1%	$\mu V/(V/m)^2$	DCP Z	93 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL 900 MHz Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	11.4	7.0
SAR _{be} [%]	With Correction Algorithm	0.9	0.5

TSL 1750 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	13.8	9.5
SAR _{be} [%]	With Correction Algorithm	0.9	0.6

Sensor Offset

Probe Tip to Sensor Center 2.7 mm

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 6).

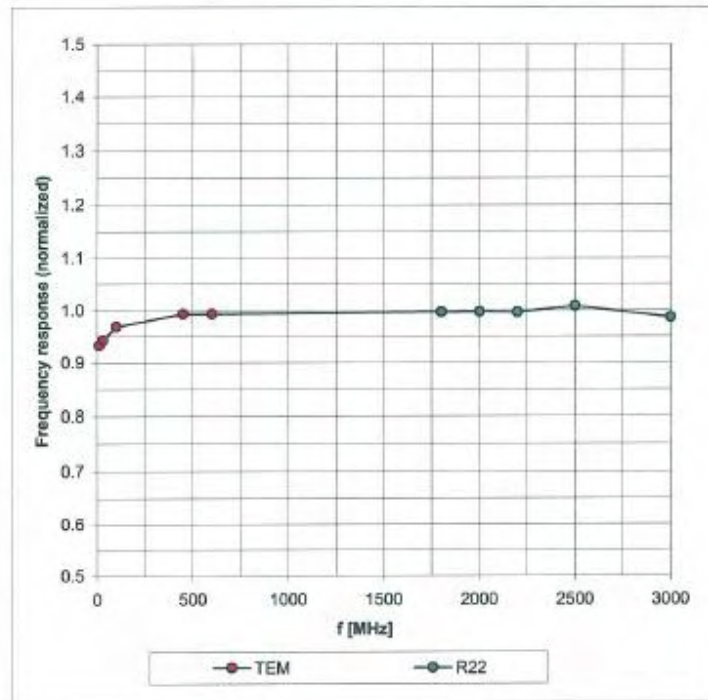
^B Numerical linearization parameter: uncertainty not required

ET3DV6 SN:1609

March 17, 2009

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)

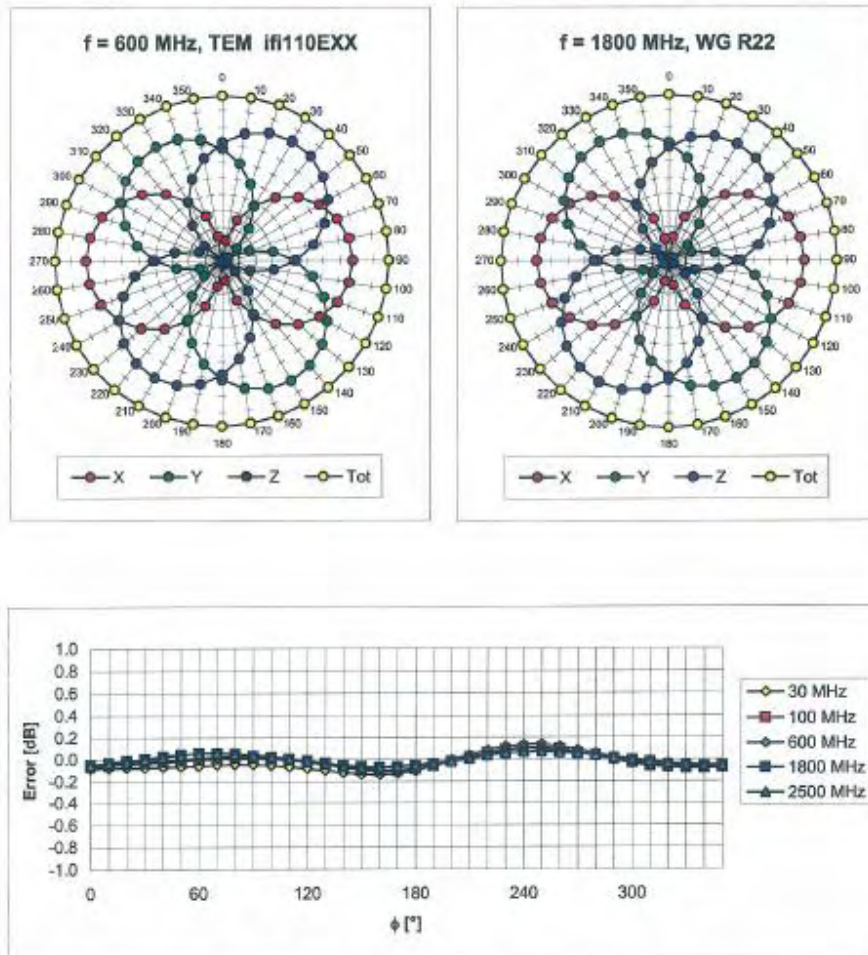


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

ET3DV6 SN:1609

March 17, 2009

Receiving Pattern (ϕ), $\theta = 0^\circ$



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

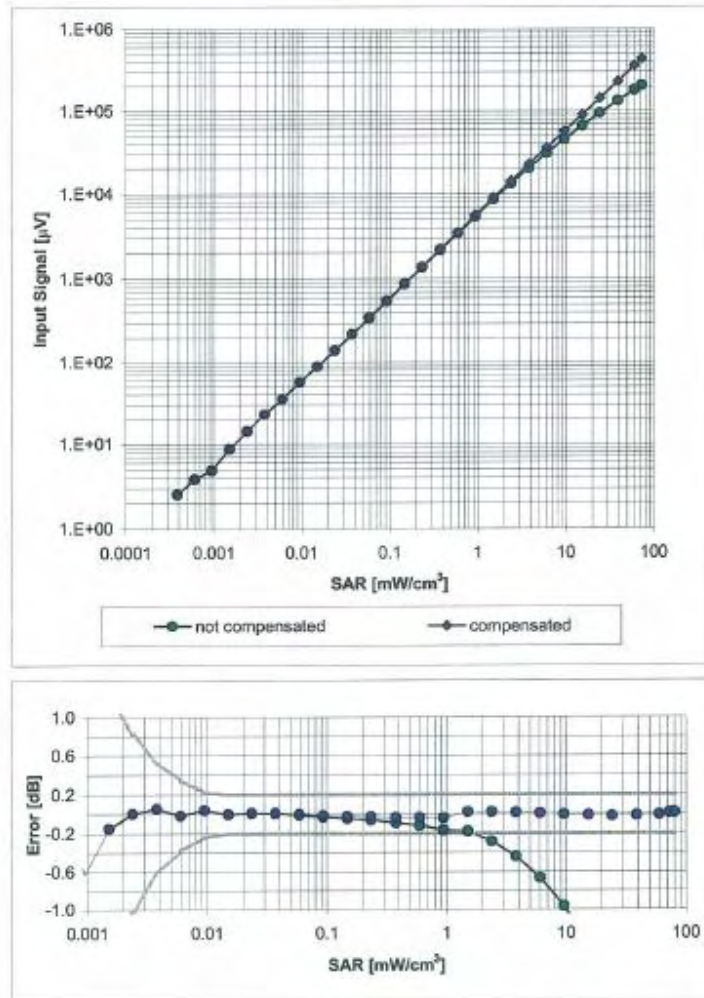
Certificate No: ET3-1609_Mar09

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ET3DV6 SN:1609

March 17, 2009

Dynamic Range f(SAR_{head})
(Waveguide R22, f = 1800 MHz)

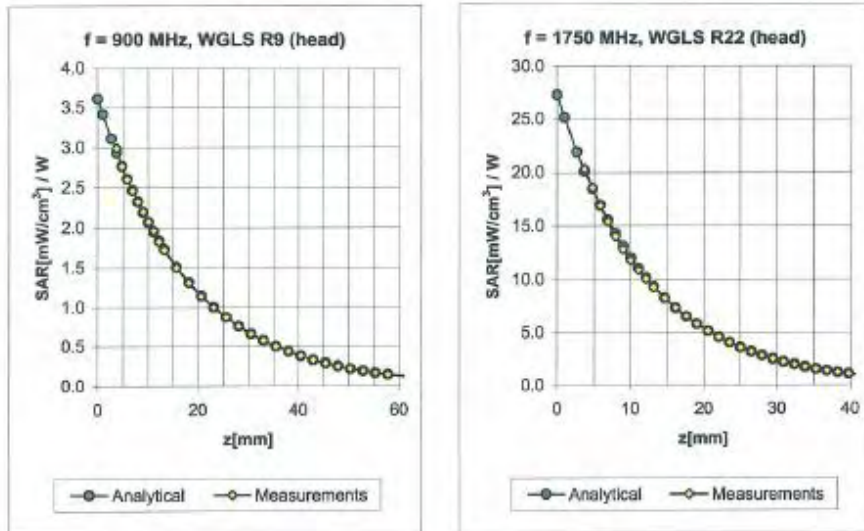


Uncertainty of Linearity Assessment: $\pm 0.6\%$ (k=2)

ET3DV6 SN:1609

March 17, 2009

Conversion Factor Assessment



f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
450	± 50 / ± 100	Head	43.5 ± 5%	0.87 ± 5%	0.38	1.91	6.91 ± 13.3% (k=2)
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.25	2.80	6.25 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.25	2.80	6.11 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.39	3.57	5.39 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.50	2.75	5.12 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.55	2.52	5.01 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.99	1.76	4.54 ± 11.0% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.30	1.92	7.48 ± 13.3% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.25	2.85	6.08 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.77	3.05	4.89 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.99	2.60	4.61 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.99	1.78	4.00 ± 11.0% (k=2)

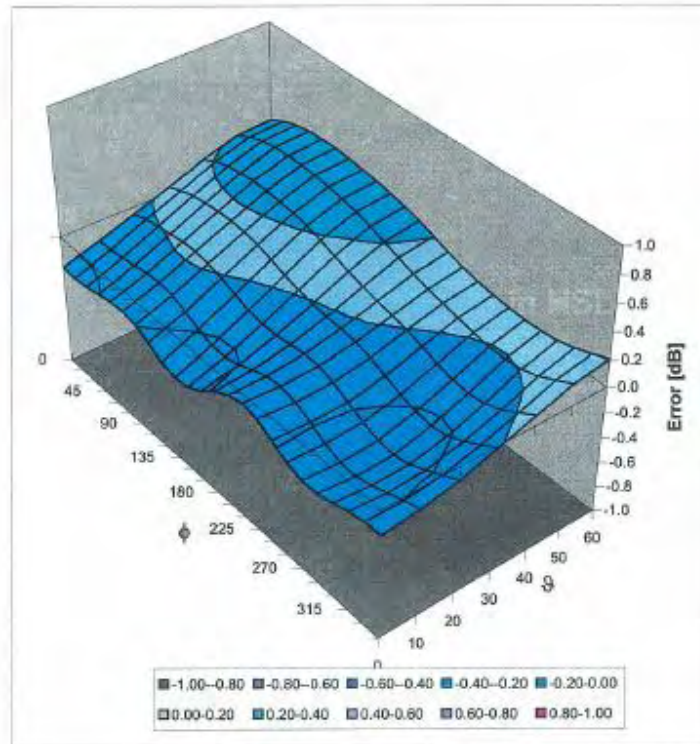
^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ET3DV6 SN:1609

March 17, 2009

Deviation from Isotropy in HSL

Error (ϕ , θ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

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Accreditation No.: **SCS 108**

Client **H-CT (Dymstec)**

Certificate No: **ES3-3161_Apr08**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3161**

Calibration procedure(s) **QA CAL-01.v6 and QA CAL-23.v3**
Calibration procedure for dosimetric E-field probes

Calibration date: **April 7, 2008**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 654	20-Apr-07 (No. DAE4-654_Apr07)	Apr-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: April 7, 2008

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Certificate No: **ES3-3161_Apr08**

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
Polarization ϕ	ϕ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}:** Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below ConvF).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}:** DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters:** Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy):** in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset:** The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

ES3DV3 SN:3161

April 7, 2008

Probe ES3DV3

SN:3161

Manufactured: October 8, 2007
Calibrated: April 7, 2008

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ES3-3161_Apr08

Page 3 of 9

ES3DV3 SN:3161

April 7, 2008

DASY - Parameters of Probe: ES3DV3 SN:3161

Sensitivity in Free Space^A

Diode Compression^B

NormX	1.09 ± 10.1%	$\mu V/(V/m)^2$	DCP X	90 mV
NormY	1.26 ± 10.1%	$\mu V/(V/m)^2$	DCP Y	92 mV
NormZ	0.94 ± 10.1%	$\mu V/(V/m)^2$	DCP Z	94 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL 900 MHz Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance	3.0 mm	4.0 mm
SAR _{be} [%] Without Correction Algorithm	9.7	5.5
SAR _{be} [%] With Correction Algorithm	0.8	0.5

TSL 1810 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance	3.0 mm	4.0 mm
SAR _{be} [%] Without Correction Algorithm	10.8	6.5
SAR _{be} [%] With Correction Algorithm	0.9	0.8

Sensor Offset

Probe Tip to Sensor Center 2.0 mm

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 8).

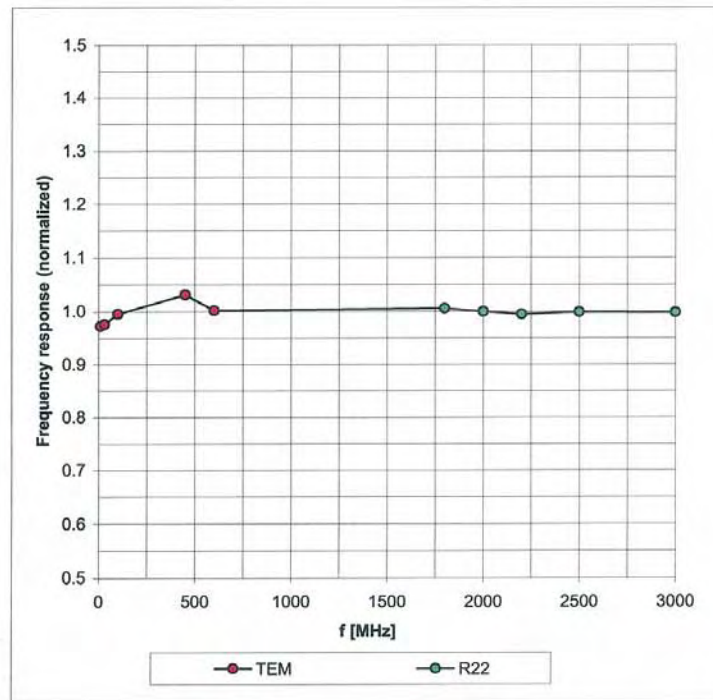
^B Numerical linearization parameter: uncertainty not required.

ES3DV3 SN:3161

April 7, 2008

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)

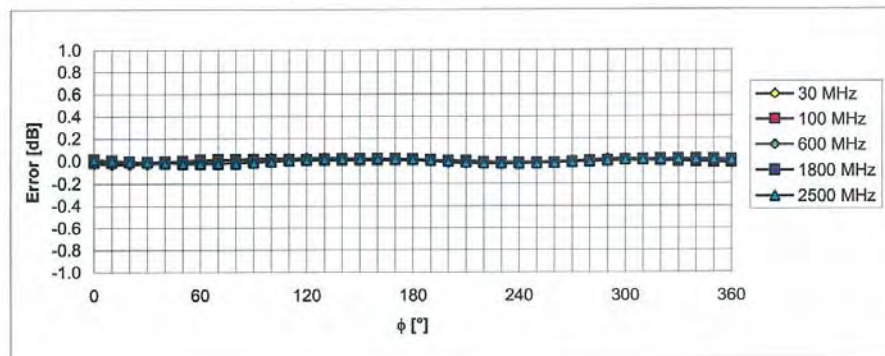
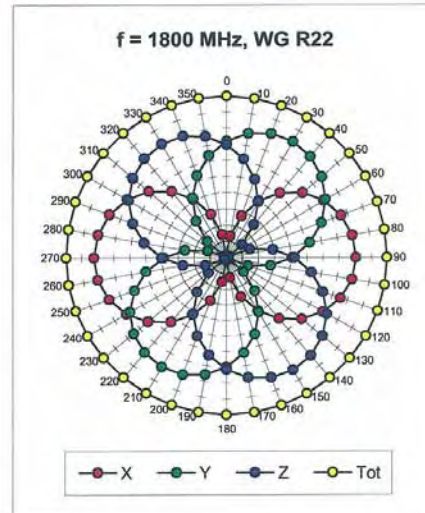
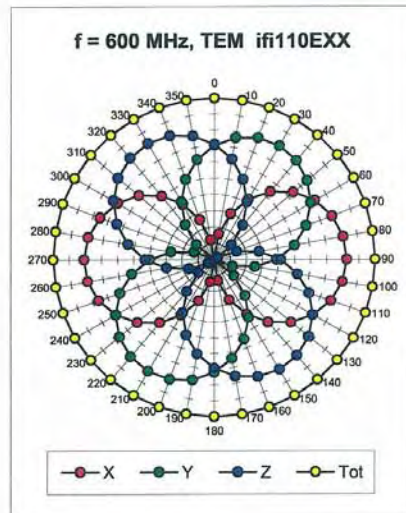


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

ES3DV3 SN:3161

April 7, 2008

Receiving Pattern (ϕ), $\theta = 0^\circ$

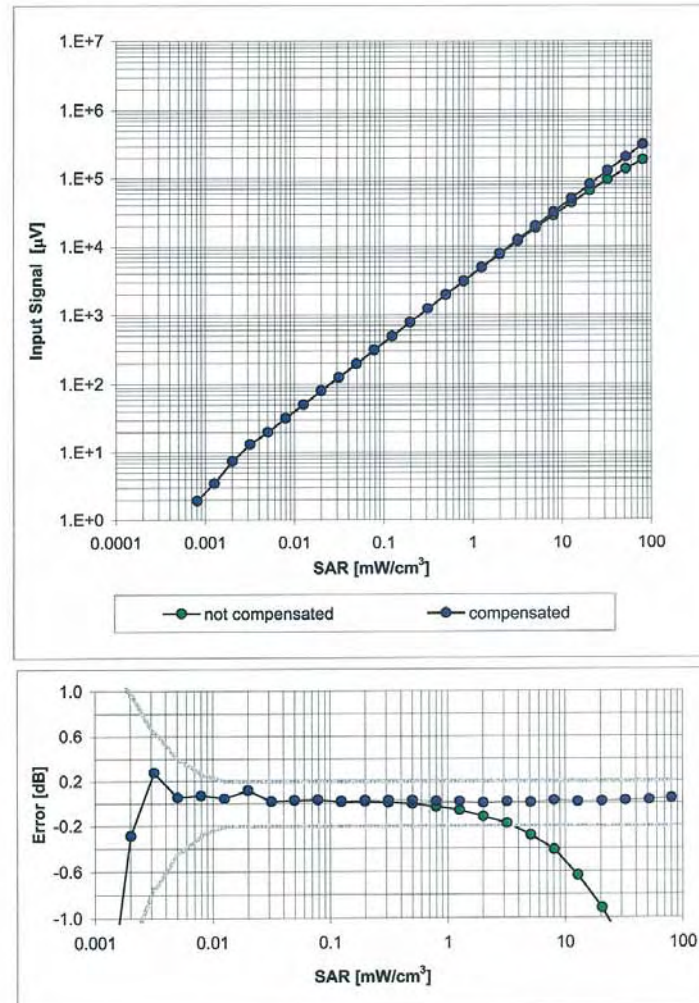


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

ES3DV3 SN:3161

April 7, 2008

Dynamic Range $f(\text{SAR}_{\text{head}})$
(Waveguide R22, $f = 1800 \text{ MHz}$)

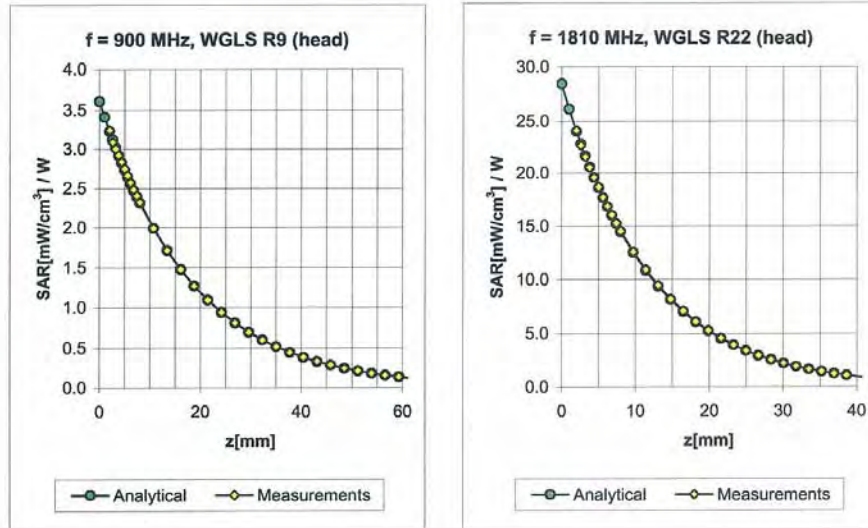


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

ES3DV3 SN:3161

April 7, 2008

Conversion Factor Assessment



f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	1.00	1.12	6.07	± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.86	1.19	5.04	± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.76	1.26	4.77	± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.70	1.32	4.47	± 11.0% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	1.00	1.17	5.63	± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.81	1.22	5.07	± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.74	1.31	4.68	± 11.0% (k=2)
2300	± 50 / ± 100	Body	52.8 ± 5%	1.85 ± 5%	0.56	1.65	4.32	± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.60	1.52	4.15	± 11.0% (k=2)
2600	± 50 / ± 100	Body	52.5 ± 5%	2.16 ± 5%	0.61	1.50	3.97	± 11.0% (k=2)

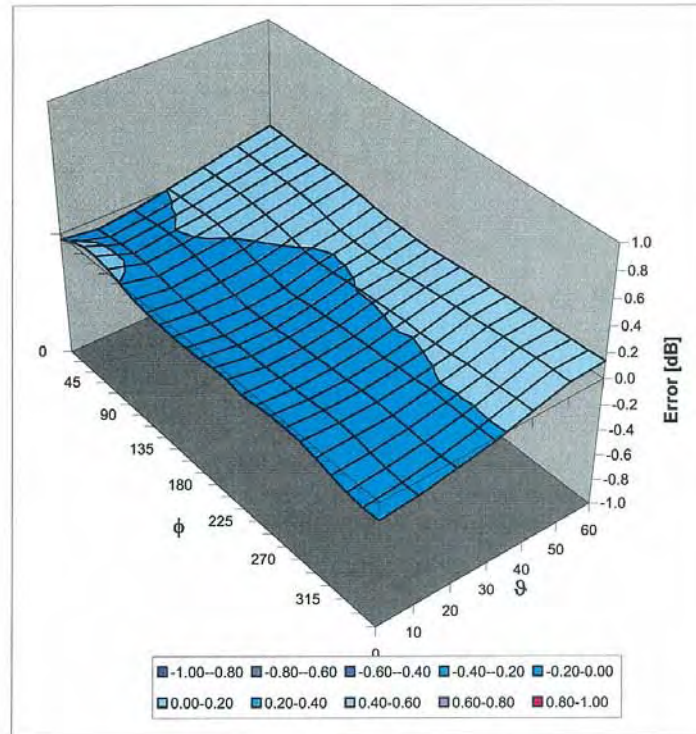
^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ES3DV3 SN:3161

April 7, 2008

Deviation from Isotropy in HSL

Error (ϕ , θ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

Attachment 4. – Dipole Calibration Data

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Accreditation No.: **SCS 108**

Client: **HCT (Dymstec)**

Certificate No: **D835V2-441_May08**

CALIBRATION CERTIFICATE

Object: **D835V2 - SN: 441**

Calibration procedure(s): **QA CAL-05.v7**
Calibration procedure for dipole validation kits

Calibration date: **May 19, 2008**

Condition of the calibrated item: **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	07-Aug-07 (METAS, No. 217-00718)	Aug-08
Type-N mismatch combination	SN: 5047.2 / 06327	08-Aug-07 (No. 217-00721)	Aug-08
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	04-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

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

Issued: May 20, 2008

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Accreditation No.: **SCS 108**

Glossary:

TSL tissue simulating liquid
ConvF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result..

Measurement Conditions

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

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	41.1 $\pm$ 6 %	0.91 mho/m $\pm$ 6 %
Head TSL temperature during test	(21.5 $\pm$ 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.32 mW / g
SAR normalized	normalized to 1W	9.28 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	9.17 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.53 mW / g
SAR normalized	normalized to 1W	6.12 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	6.07 mW / g $\pm$ 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.4 Ω - 7.6 $j\Omega$
Return Loss	-22.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.377 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 09, 2001

DASY4 Validation Report for Head TSL

Date/Time: 19.05.2008 12:17:50

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL 900 MHz;

Medium parameters used: $f = 835$ MHz; $\sigma = 0.909$ mho/m; $\epsilon_r = 41.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.97, 5.97, 5.97); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin=250mW; dip=15mm; dist=3.4mm/Zoom Scan (7x7x7)/Cube 0:

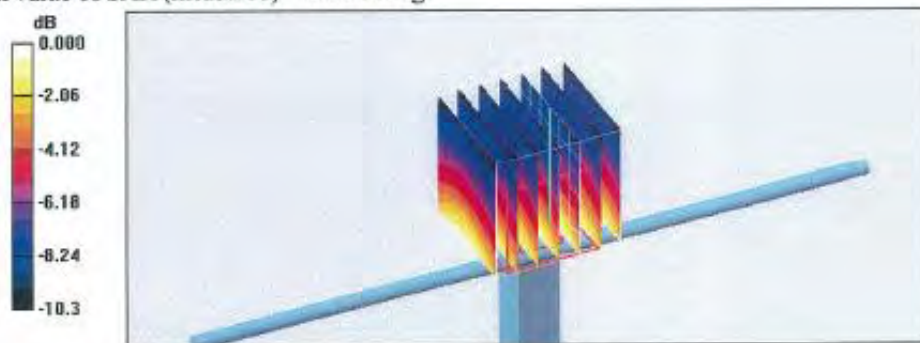
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.1 V/m; Power Drift = -0.008 dB

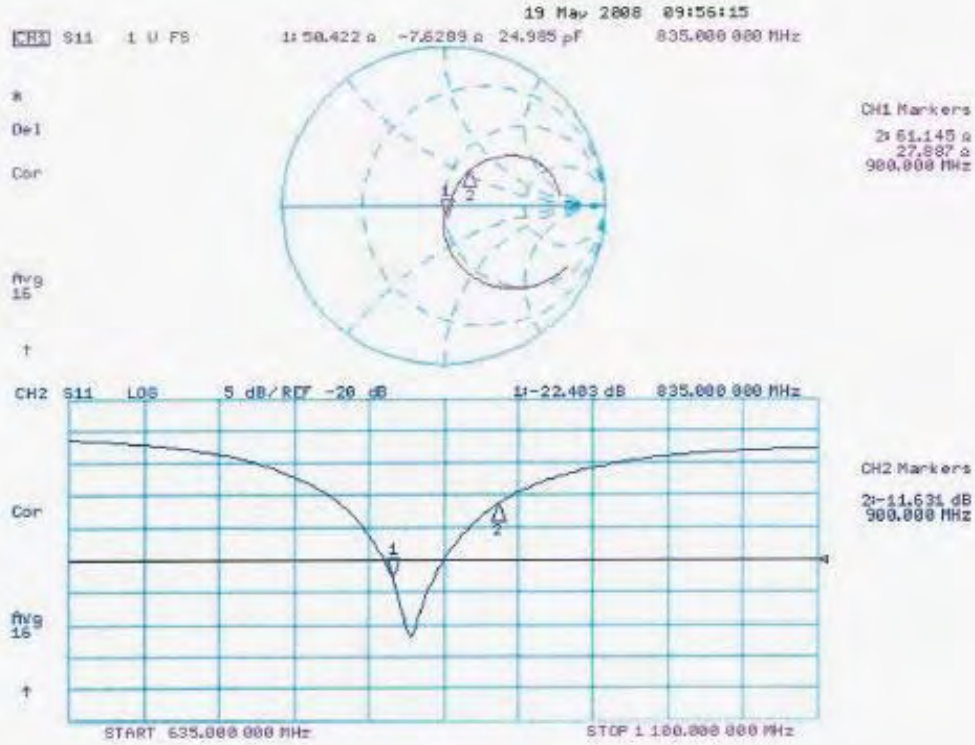
Peak SAR (extrapolated) = 3.38 W/kg

SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.53 mW/g

Maximum value of SAR (measured) = 2.62 mW/g



Impedance Measurement Plot for Head TSL



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Accreditation No.: SCS 108

Client **H-CT (Dymstec)**

Certificate No: D1900V2-5d032-Jul08

CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d032**

Calibration procedure(s) **QA CAL-05.v7
Calibration procedure for dipole validation kits**

Calibration date: **July 22, 2008**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	01-Jul-08 (No. 217-00864)	Jul-09
Type-N mismatch combination	SN: 5047.2 / 06327	01-Jul-08 (No. 217-00867)	Jul-09
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 22, 2008

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Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
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- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

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

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	38.8 $\pm$ 6 %	1.47 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.0 $\pm$ 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	9.82 mW / g
SAR normalized	normalized to 1W	39.3 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	37.7 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.05 mW / g
SAR normalized	normalized to 1W	20.2 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	19.7 mW / g $\pm$ 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix**Antenna Parameters with Head TSL**

Impedance, transformed to feed point	53.5 Ω + 4.9 j Ω
Return Loss	- 24.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.185 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	March 17, 2003

DASY4 Validation Report for Head TSL

Date/Time: 22.07.2008 10:06:43

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL U10 BB;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.9, 4.9, 4.9); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Pin = 250 mW; dip = 10 mm, scan at 3.4mm/Zoom Scan (dist=3.4mm, probe 0deg)

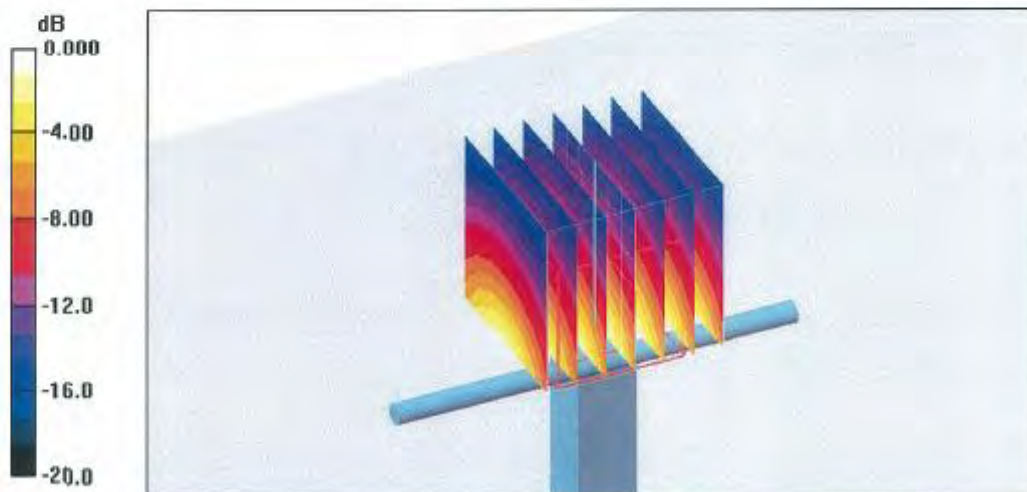
(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.2 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 18.2 W/kg

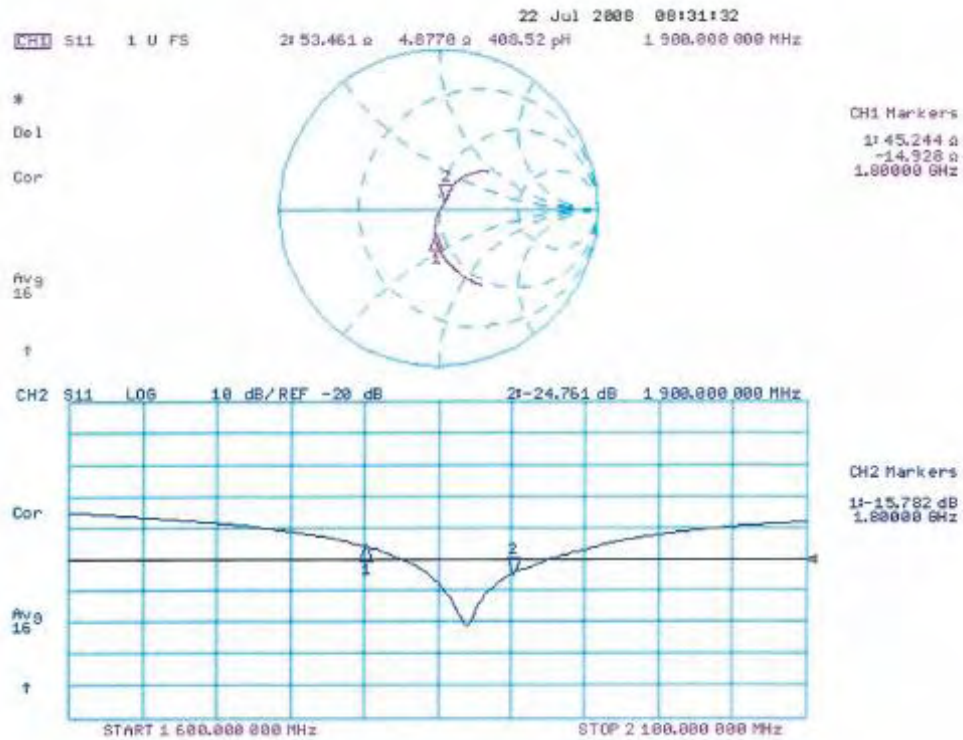
SAR(1 g) = 9.82 mW/g; SAR(10 g) = 5.05 mW/g

Maximum value of SAR (measured) = 11.9 mW/g



0 dB = 11.9mW/g

Impedance Measurement Plot for Head TSL



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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **H-CT (Dymstec)**

Certificate No: **D2450V2-743_Aug08**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 743**

Calibration procedure(s) **QA CAL-05.v7
Calibration procedure for dipole validation kits**

Calibration date: **August 27, 2008**

Condition of the calibrated item **In Tolerance**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: S5086 (20g)	01-Jul-08 (No. 217-00864)	Jul-09
Type-N mismatch combination	SN: 5047.2 / 06327	01-Jul-08 (No. 217-00867)	Jul-09
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: August 27, 2008

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: D2450V2-743_Aug08

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

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

DASY Version	DASY5	V5.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	38.1 $\pm$ 6 %	1.80 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.0 $\pm$ 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.3 mW / g
SAR normalized	normalized to 1W	53.2 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	52.4 mW / g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.17 mW / g
SAR normalized	normalized to 1W	24.7 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	24.4 mW / g $\pm$ 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Appendix**Antenna Parameters with Head TSL**

Impedance, transformed to feed point	53.8 Ω + 3.8 j Ω
Return Loss	- 25.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.162 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 01, 2003

DASY5 Validation Report for Head TSL

Date/Time: 27.08.2008 11:29:32

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN743

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL U10 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.8$ mho/m; $\epsilon_r = 38.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.4, 4.4, 4.4); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

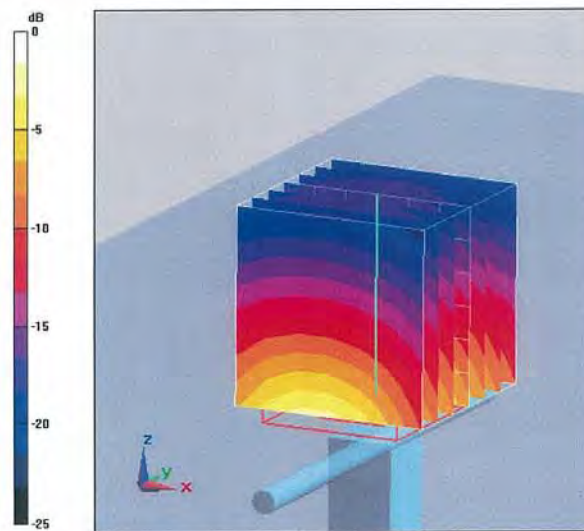
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.6 V/m; Power Drift = 0.054 dB

Peak SAR (extrapolated) = 28.2 W/kg

SAR(1 g) = 13.3 mW/g; SAR(10 g) = 6.17 mW/g

Maximum value of SAR (measured) = 16 mW/g



0 dB = 16mW/g

Impedance Measurement Plot for Head TSL

