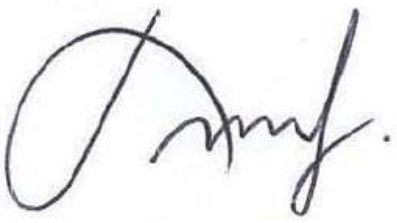
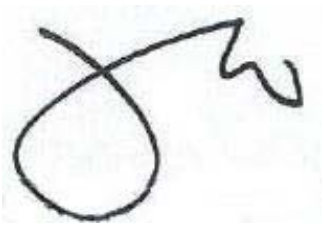
SAR TEST REPORT

HCT CO., LTD

EUT Type:	GSM Phone 850/1800/1900 & B/T GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)		
FCC ID:	WJG-S11		
Model:	SGP400	Trade Name	SODIFF BMT
Date of Issue:	Sept. 30, 2008		
Test report No.:	HCT-IA0809-2202		
Test Laboratory:	**HCT CO., LTD.** SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA TEL: +82 31 639 8565 FAX: +82 31 639 8525		
Applicant :	**SODIFF BMT CO., LTD** 678-7, ChangMan-Ri, Gwang Tan-Myun, Paju-City, Gyeonggi-Do, Korea Tel: +82-70-7096-7032 Fax: +82-31-441-0171		
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 : Nam-Wook Kang Manager of SAR Part		

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1. INTRODUCTION

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

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

SAR Definition

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

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

Figure 2. SAR Mathematical Equation

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

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

where:

σ	=	conductivity of the tissue-simulant material (S/m)
ρ	=	mass density of the tissue-simulant material (kg/m^3)
E	=	Total RMS electric field strength (V/m)

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

2. DESCRIPTION OF DEVICE

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

EUT Type	GSM Phone 850/1800/1900 & B/T GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
FCC ID	WJG-S11
Model(s)	SGP400
Trade Name	SODIFF BMT
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)
Rx Frequency	869.20 - 893.80 MHz (GSM850) 1 930.20 – 1 989.80 MHz (GSM1900)
FCC Classification	Licensed Portable Transmitter Held to Ear (PCE)
Production Unit or Identical Prototype	Prototype
Max SAR	0.927 W/kg GSM850 Head SAR / 1.31 W/kg GSM850 Body SAR 1.12 W/kg GSM1900 Head SAR / 0.589 W/kg GSM1900 Body SAR
Date(s) of Tests	Sept. 25, 2008 ~ Sept. 26, 2008
Antenna Type	Intenna

3. DESCRIPTION OF TEST EQUIPMENT

3.1 SAR MEASUREMENT SETUP

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

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

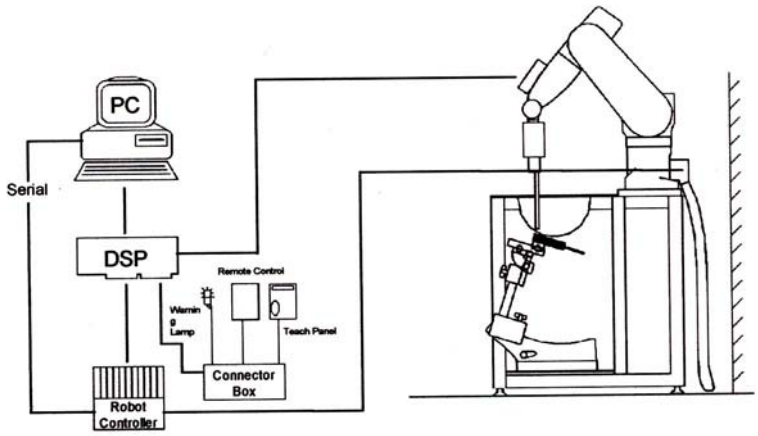

Figure 3.1 HCT SAR Lab. Test Measurement Set-up

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

3.2 DASY4 E-FIELD PROBE SYSTEM

3.2.1 ES3DV3 Probe Specification

Construction	Symmetrical design with triangular core Interleaved sensors
	Built-in shielding against static charges
	PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Basic Broad Band Calibration in air
	Conversion Factors (CF) for HSL 900 and HSL 1810
	Additional CF for other liquids and frequencies upon request
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis)
	± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm)
	Tip diameter: 3.9 mm (Body: 12 mm)
	Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz
	Dosimetry in strong gradient fields
	Compliance tests of mobile phones

Figure 4.1 Photograph of the probe and the Phantom

Figure 4.2 ES3DV3 E-field Probe

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

3.3 PROBE CALIBRATION PROCESS

3.3.1 E-Probe Calibration

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

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

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

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

where:

Δt = exposure time (30 seconds),

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

ΔT = temperature increase due to RF exposure.

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

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

where:

σ = simulated tissue conductivity,

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

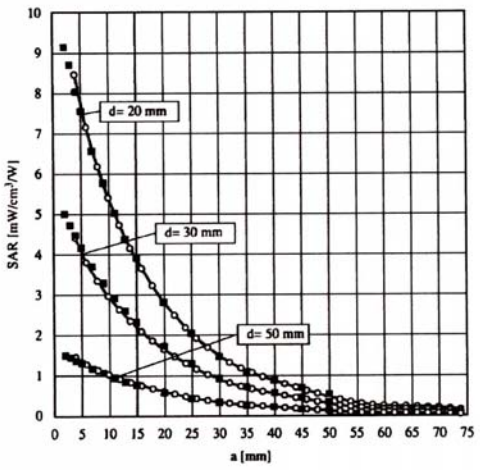

Figure 3.4 E-Field and Temperature measurements at 900 MHz

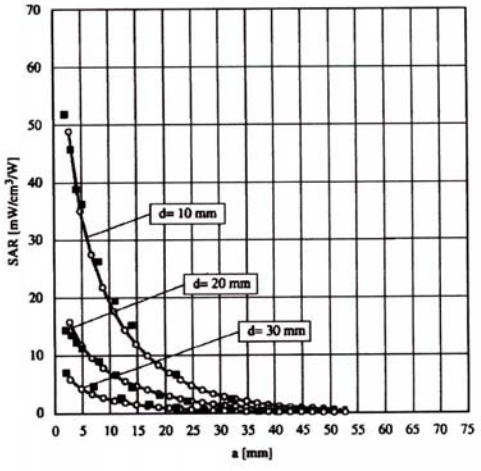

Figure 3.5 E-Field and temperature measurements at 1.8 GHz

3.3.2 Data Extrapolation

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

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

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

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

E-field probes:

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

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

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

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

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

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

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

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

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

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

3.4 SAM Phantom

The 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.

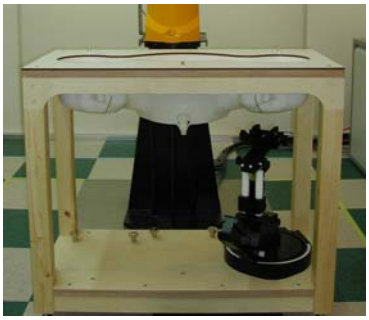

Figure 3.6 SAM Phantom

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 repeatable positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

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

Figure 3.7 Device Holder

3.6 Brain & Muscle Simulating Mixture Characterization

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

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

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

Table 3.1 Composition of the Tissue Equivalent Matter

3.7 SAR TEST EQUIPMENT

Manufacturer	Type / Model	S/N	Calib. Date	Calib.Interval	Calib.Due
SPEAG	SAM Phantom	-	N/A	N/A	N/A
Staubli	Robot RX90L	F01/5K09A1/A/01	N/A	N/A	N/A
Staubli	Robot ControllerCS7MB	F99/5A82A1/C/01	N/A	N/A	N/A
HP	Pavilion t000_puffer	KRJ51201TV	N/A	N/A	N/A
SPEAG	Light Alignment Sensor	265	N/A	N/A	N/A
Staubli	Teach Pendant (Joystick)	D221340.01	N/A	N/A	N/A
SPEAG	DAE4V1	869	Sept. 3, 2008	Annual	Sept. 3, 2009
SPEAG	E-Field Probe ES3DV3	3161	April 7, 2008	Annual	April 7, 2009
SPEAG	Validation Dipole D835V2	441	May 19, 2008	Annual	May 19, 2009
SPEAG	Validation Dipole D900V2	130	Aug. 25, 2008	Annual	Aug. 25, 2009
SPEAG	Validation Dipole D1900V2	5d032	July 22, 2008	Annual	July 22, 2009
Agilent	Power Meter(F) E4419B	MY41291386	Nov.05, 2007	Annual	Nov.05, 2008
Agilent	Power Sensor(G) 8481	MY41090870	Nov.05, 2007	Annual	Nov.05, 2008
HP	Dielectric Probe Kit 85070C	00721521	N/A	N/A	N/A
HP	Dual Directional Coupler	16072	Nov. 05, 2007	Annual	Nov. 05, 2008
R&S	Base Station CMU200	838207/050	Nov. 05, 2007	Annual	Nov. 05, 2008
Agilent	Base Station E5515C	GB44400269	Feb.10, 2008	Annual	Feb.10, 2009
HP	Signal Generator E4438C	MY42082646	Dec.24, 2007	Annual	Dec.24, 2008
HP	Network Analyzer 8753ES	JP39240221	Apr.11, 2008	Annual	Apr.11, 2009
EM POWER	Power Amp BBS3Q7ELU	1013-D/C-0127	Apr.12, 2008	Annual	Apr.12, 2009
Tescom	TC-3000/ Bluetooth	3000A4900112	Jan.11, 2008	Annual	Jan.11, 2009

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 34 mm was assessed by measuring 5 x 5 x 7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

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

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

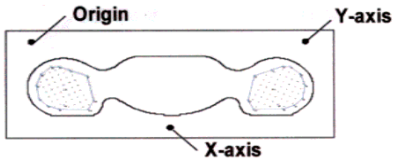

Figure 4.1 SAR Measurement Point in Area Scan

5. DESCRIPTION OF TEST POSITION

5.1 HEAD POSITION

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

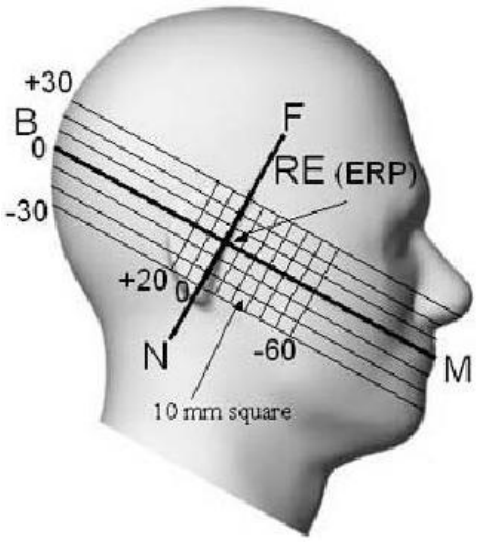

Figure 5.1 Side view of the phantom

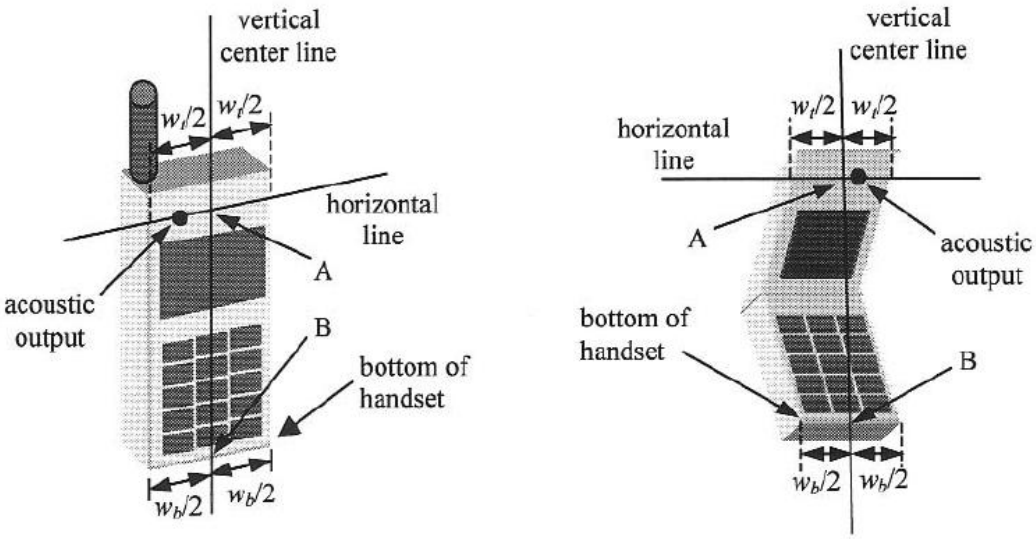

Figure 5.2 Handset vertical and horizontal reference lines

5.2 Body Holster/Belt Clip Configurations

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

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

Body-worn accessories may not always be supplied or available as options for some Devices intended to be authorized for body-worn use. In this case, a test configuration with a Septaration 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 & Veff
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 positionering	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	Sept.25, 2008	Head	21.3	ε r	41.5	40.9	- 1.45	± 5
				σ	0.90	0.875	- 2.78	± 5
835	Sept. 25, 2008	Body	21.3	ε r	55.2	55.8	+ 1.09	± 5
				σ	0.97	0.99	+ 2.06	± 5
1 900	Sept.26, 2008	Head	21.2	ε r	40.0	40	0.00	± 5
				σ	1.40	1.4	0.00	± 5
1 900	Sept.26, 2008	Body	21.2	ε r	53.3	53.9	+ 1.13	± 5
				σ	1.52	1.54	+ 1.32	± 5

8.2 System Validation

Prior to assessment, the system is verified to the ± 10 % of the specifications at 835 MHz/1 900 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	Sept.25, 2008	Head	21.3	1 g	9.17	0.926	+ 0.98	± 10
1 900	Sept.26, 2008	Head	21.2	1 g	37.7	3.82	+ 1.33	± 10

9. RF CONDUCTED POWER

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

9.1 Procedures Used to Establish RF Signal for SAR

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

Band	Channel	Voice	GPRS Data			
		GSM (dBm)	GPRS 1 TX Slot (dBm)	GPRS 2 TX Slot (dBm)	GPRS 3 TX Slot (dBm)	GPRS 4 TX Slot (dBm)
GSM 850	128	32.13	32.12	32.11	32.09	32.05
	190	32.26	32.20	32.18	32.15	32.13
	251	32.36	32.31	32.29	32.26	32.22
GSM 1900	512	29.59	29.60	29.59	29.58	29.56
	661	29.54	29.52	29.52	29.51	29.50
	810	29.56	29.54	29.54	29.52	29.50

Table 9.1 GSM Conducted output powers

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

10.1 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	Routine evaluation required	SAR not required: Unlicensed only o when stand-alone 1-g SAR is not required and antenna is ≥ 5 cm from other antennas Licensed & Unlicensed o when the sum of the 1-g SAR is < 1.6 W/kg for all simultaneous transmitting antennas o when SAR to peak location separation ratio of simultaneous transmitting antenna pair is < 0.3 SAR required: Licensed & Unlicensed antenna pairs with SAR to peak location separation ratio ≥ 0.3; test is only required for the configuration that results in the highest SAR in stand-alone configuration for each wireless mode and exposure condition Note: simultaneous transmission exposure conditions for head and body can be different for different style phones; therefore, different test requirements may apply
Unlicensed Transmitters	When there is no simultaneous transmission – o output ≤ 60/f: SAR not required o output > 60/f: stand-alone SAR required When there is simultaneous transmission – Stand-alone SAR not required when o output ≤ 2·P_{Ref} and antenna is ≥ 5.0 cm from other antennas o output ≤ P_{Ref} and antenna is ≥ 2.5 cm from other antennas o output ≤ P_{Ref} and antenna is < 2.5 cm from other antennas, each with either output power ≤ P_{Ref} or 1-g SAR < 1.2 W/kg Otherwise stand-alone SAR is required When stand-alone SAR is required o test SAR on highest output channel for each wireless mode and exposure condition o if SAR for highest output channel is > 50% of SAR limit, evaluate all channels according to normal procedures	
Jaw, Mouth and Nose	Flat phantom SAR required o 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 o 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 : WJG-S11
BT Max. RF output power: - 3.69 dBm(0.43 mW)
Antenna Separation distance: 6.4 cm

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

11. SAR TEST DATA SUMMARY

11.1 Measurement Results (GSM850 Head SAR Touch)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
824.2	128 (Low)	GSM850	32.13	32.10	Standard	Left Ear	Intenna	0.848
836.6	190 (Mid)	GSM850	32.26	32.19	Standard	Left Ear	Intenna	0.796
848.8	251 (High)	GSM850	32.36	32.35	Standard	Left Ear	Intenna	0.705
824.2	128 (Low)	GSM850	32.13	32.15	Standard	Right Ear	Intenna	0.927
836.6	190 (Mid)	GSM850	32.26	32.24	Standard	Right Ear	Intenna	0.881
848.8	251 (High)	GSM850	32.36	32.38	Standard	Right Ear	Intenna	0.784
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Head 1.6 W/kg (mW/g)** Averaged over 1 gram		

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator

11.2 Measurement Results (GSM850 Head SAR Tilt)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
836.6	190 (Mid)	GSM850	32.26	32.21	Standard	Left Tilt 15°	Intenna	0.594
836.6	190 (Mid)	GSM850	32.26	32.28	Standard	Right Tilt 15°	Intenna	0.707
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Head 1.6 W/kg (mW/g)** Averaged over 1 gram		

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].

2 All modes of operation were investigated and the worst-case are reported.

3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.

4 Tissue parameters and temperatures are listed on the SAR plot.

5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.

6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator

7 Justification for reduced test configurations: per FCC/OET Supplement C (July, 2001), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

11.3 Measurement Results (GSM1900 Head SAR Touch)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 850.2	512 (Low)	GSM1900	29.59	29.61	Standard	Left Ear	Intenna	0.769
1 880.0	661 (Mid)	GSM1900	29.54	29.55	Standard	Left Ear	Intenna	0.777
1 909.8	810 (High)	GSM1900	29.56	29.52	Standard	Left Ear	Intenna	0.730
1 850.2	512 (Low)	GSM1900	29.59	29.60	Standard	Right Ear	Intenna	1.12
1 880.0	661 (Mid)	GSM1900	29.54	29.45	Standard	Right Ear	Intenna	1.09
1 909.8	810 (High)	GSM1900	29.56	29.55	Standard	Right Ear	Intenna	1.01
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Head 1.6 W/kg (mW/g) **Averaged over 1 gram		

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator

11.4 Measurement Results (GSM1900 Head SAR Tilt)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 850.2	512 (Low)	GSM1900	29.59	29.44	Standard	Left Tilt 15°	Intenna	0.853
1 880.0	661 (Mid)	GSM1900	29.54	29.53	Standard	Left Tilt 15°	Intenna	0.810
1 909.8	810 (High)	GSM1900	29.56	29.56	Standard	Left Tilt 15°	Intenna	0.756
1 850.2	512 (Low)	GSM1900	29.59	29.60	Standard	Right Tilt 15°	Intenna	0.985
1 880.0	661 (Mid)	GSM1900	29.54	29.55	Standard	Right Tilt 15°	Intenna	0.963
1 909.8	810 (High)	GSM1900	29.56	29.54	Standard	Right Tilt 15°	Intenna	0.887
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Head 1.6 W/kg (mW/g) Averaged over 1 gram**		

NOTES:

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

11.5 Measurement Results (GSM850 Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Configuration	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
824.2	128 (Low)	GPRS 4TX	32.05	32.06	Rear	2.0 cm without Holster	Intenna	1.31
824.2	128 (Low)	GPRS 4TX	32.05	32.10	Front	2.0 cm without Holster	Intenna	1.00
824.2	128 (Low)	GSM850	32.13	32.11	Rear	2.0 cm without Holster	Intenna	0.334
836.6	190 (Mid)	GPRS 4TX	32.13	31.94	Rear	2.0 cm without Holster	Intenna	1.24
848.8	251 (High)	GPRS 4TX	32.22	32.25	Rear	2.0 cm without Holster	Intenna	1.08
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Body 1.6 W/kg (mW/g) **Averaged over 1 gram		

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 Both side of the phone were tested and the worst-case side is reported.
8 HEADSET was connected.
9 Test Configuration ☐ With Holster ☒ Without Holster

11.6 Measurement Results (GSM1900 Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Configuration	Phantom Position	Antenna Type	SAR(mW/g)
MHz	Channel		Begin	End				
1 880.0	661 (Mid)	GPRS 4TX	29.50	29.45	Rear	2.0 cm without Holster	Intenna	0.589
1 880.0	661 (Mid)	GPRS 4TX	29.50	29.45	Front	2.0 cm without Holster	Intenna	0.456
1 880.0	661 (Mid)	GSM1900	29.54	29.63	Rear	2.0 cm without Holster	Intenna	0.139
ANSI/ IEEE C95.1 2005 – Safety Limit Spatial Peak Uncontrolled Exposure/ General Population						**Body 1.6 W/kg (mW/g)** Averaged over 1 gram		

NOTES:

1 The test data reported are the worst-case SAR value with the antenna-head position set in a typical configuration. Test procedures used are according to FCC/OET Bulletin 65, Supplement C [July 2001].
2 All modes of operation were investigated and the worst-case are reported.
3 Measured Depth of Simulating Tissue is 15.0 cm ± 0.2 cm.
4 Tissue parameters and temperatures are listed on the SAR plot.
5 Battery Type ☒ Standard ☐ Extended ☐ Slim
Batteries are fully charged for all readings.
6 Test Signal Call Mode ☐ Manual Test cord ☒ Base Station Simulator
7 Both side of the phone were tested and the worst-case side is reported.
8 HEADSET was connected.
9 Test Configuration ☐ With Holster ☒ Without Holster
10 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. CONCLUSION

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

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

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Attachment 1. – SAR Test Plots

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

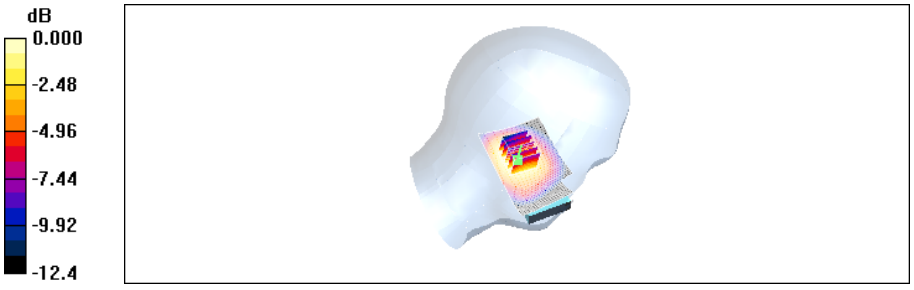
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 825 MHz; σ = 0.864 mho/m; ε_r = 41; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(6.07, 6.07, 6.07); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Left touch 128/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.897 mW/g

Left touch 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.9 V/m; Power Drift = -0.034 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.848 mW/g; SAR(10 g) = 0.593 mW/g
Maximum value of SAR (measured) = 0.908 mW/g



0 dB = 0.908mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.877 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

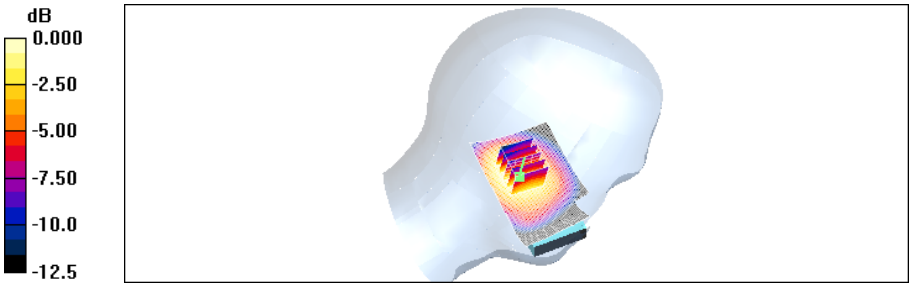
DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(6.07, 6.07, 6.07); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Left touch 190/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.858 mW/g

Left touch 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.1 V/m; Power Drift = -0.071 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.796 mW/g; SAR(10 g) = 0.558 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.853 mW/g



0 dB = 0.853mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

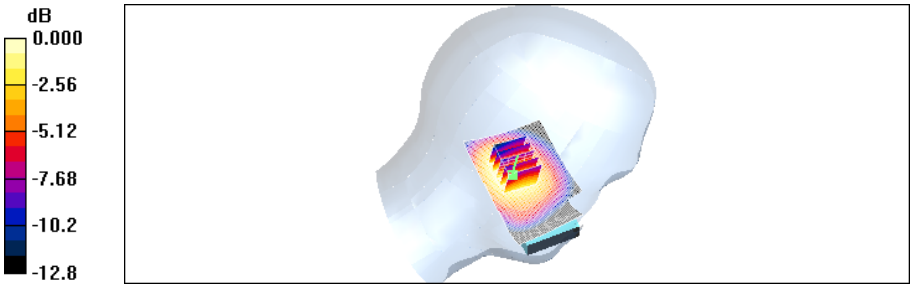
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 849.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 850 MHz; σ = 0.89 mho/m; ε_r = 40.7; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(6.07, 6.07, 6.07); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Left touch 251/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.743 mW/g

Left touch 251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.0 V/m; Power Drift = -0.007 dB
Peak SAR (extrapolated) = 0.977 W/kg
SAR(1 g) = 0.705 mW/g; SAR(10 g) = 0.489 mW/g
Maximum value of SAR (measured) = 0.756 mW/g



0 dB = 0.756mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

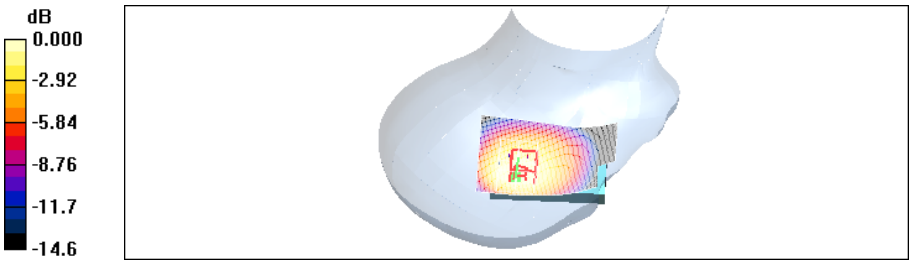
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 825 MHz; σ = 0.864 mho/m; ε_r = 41; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(6.07, 6.07, 6.07); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Right touch 128/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.01 mW/g

Right touch 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.1 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.927 mW/g; SAR(10 g) = 0.621 mW/g
Maximum value of SAR (measured) = 0.986 mW/g



0 dB = 0.986mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.877 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

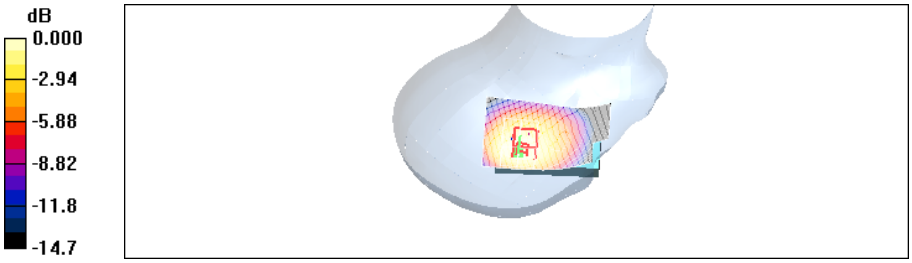
DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(6.07, 6.07, 6.07); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Right touch 190/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.963 mW/g

Right touch 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.8 V/m; Power Drift = -0.025 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.881 mW/g; SAR(10 g) = 0.587 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.933 mW/g



0 dB = 0.933mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

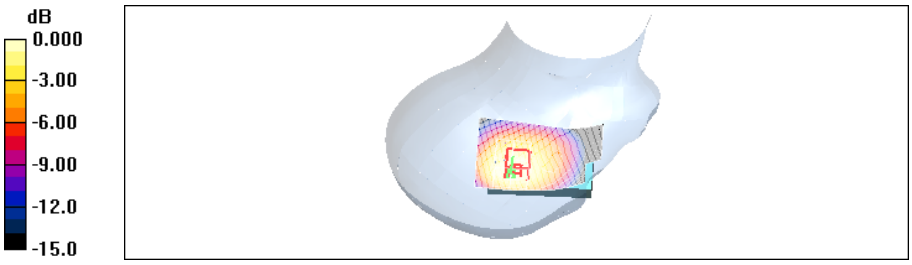
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 849.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 850 MHz; σ = 0.89 mho/m; ε_r = 40.7; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(6.07, 6.07, 6.07); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Right touch 251/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.853 mW/g

Right touch 251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.1 V/m; Power Drift = 0.022 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.784 mW/g; SAR(10 g) = 0.518 mW/g
Maximum value of SAR (measured) = 0.838 mW/g



0 dB = 0.838mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.877 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

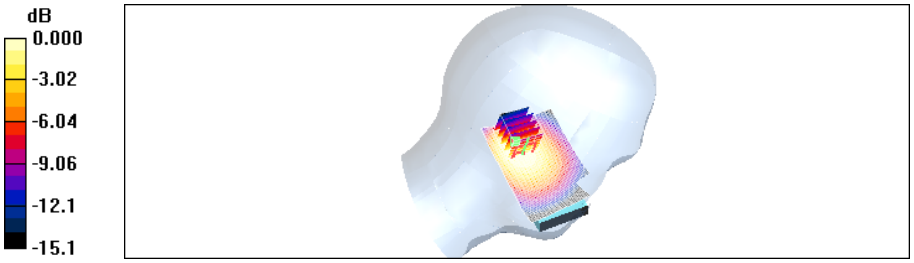
DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(6.07, 6.07, 6.07); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Left tilt 190/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.677 mW/g

Left tilt 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.5 V/m; Power Drift = -0.048 dB
Peak SAR (extrapolated) = 0.892 W/kg
SAR(1 g) = 0.594 mW/g; SAR(10 g) = 0.393 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.654 mW/g



0 dB = 0.654mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.877 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

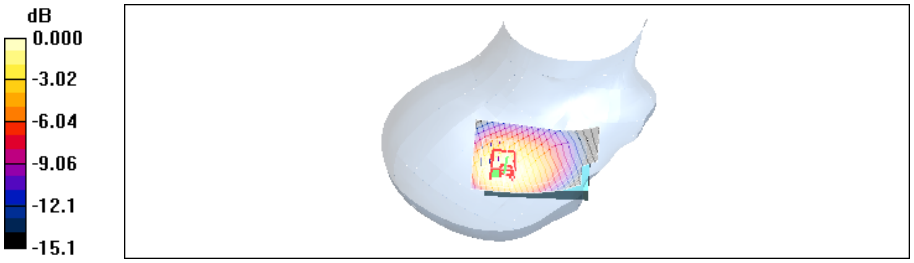
DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(6.07, 6.07, 6.07); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Right tilt 190/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.811 mW/g

Right tilt 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.7 V/m; Power Drift = 0.023 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.707 mW/g; SAR(10 g) = 0.462 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.765 mW/g



0 dB = 0.765mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.33 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left touch 512/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

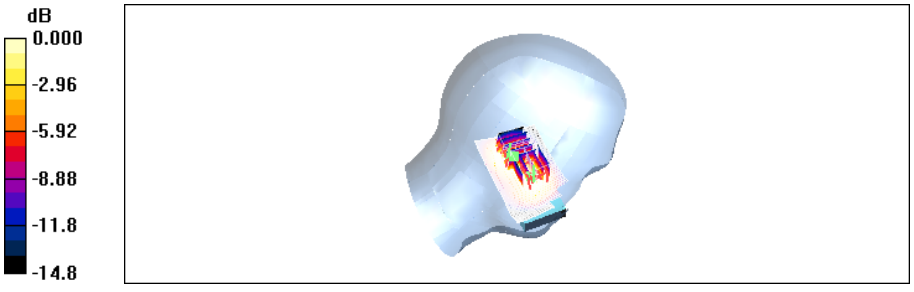
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.842 mW/g

Left touch 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.0 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.769 mW/g; SAR(10 g) = 0.454 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.828 mW/g

Left touch 512/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.0 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 0.876 W/kg
SAR(1 g) = 0.600 mW/g; SAR(10 g) = 0.378 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.629 mW/g



0 dB = 0.629mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

DUT: SGP400; Type: Bar; Serial: #1

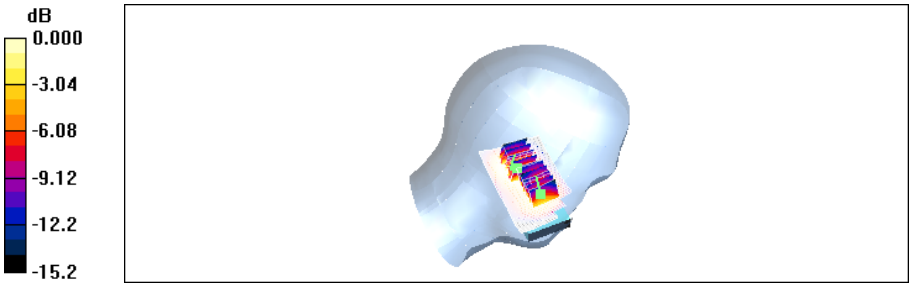
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left touch 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.845 mW/g

Left touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.4 V/m; Power Drift = 0.014 dB
Peak SAR (extrapolated) = 1.30 W/kg
SAR(1 g) = 0.777 mW/g; SAR(10 g) = 0.452 mW/g
Maximum value of SAR (measured) = 0.837 mW/g

Left touch 661/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.4 V/m; Power Drift = 0.014 dB
Peak SAR (extrapolated) = 0.789 W/kg
SAR(1 g) = 0.543 mW/g; SAR(10 g) = 0.343 mW/g
Maximum value of SAR (measured) = 0.578 mW/g



0 dB = 0.578mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

DUT: SGP400; Type: Bar; Serial: #1

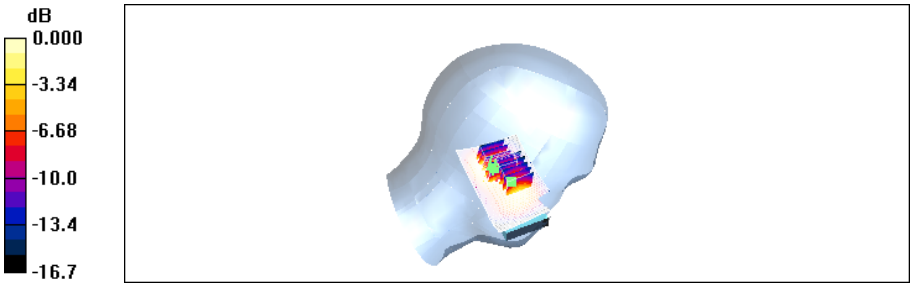
Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.41 mho/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left touch 810/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.798 mW/g

Left touch 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.9 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 1.20 W/kg
SAR(1 g) = 0.730 mW/g; SAR(10 g) = 0.425 mW/g
Maximum value of SAR (measured) = 0.767 mW/g

Left touch 810/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.9 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.507 mW/g; SAR(10 g) = 0.315 mW/g
Maximum value of SAR (measured) = 0.679 mW/g



0 dB = 0.679mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.33 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

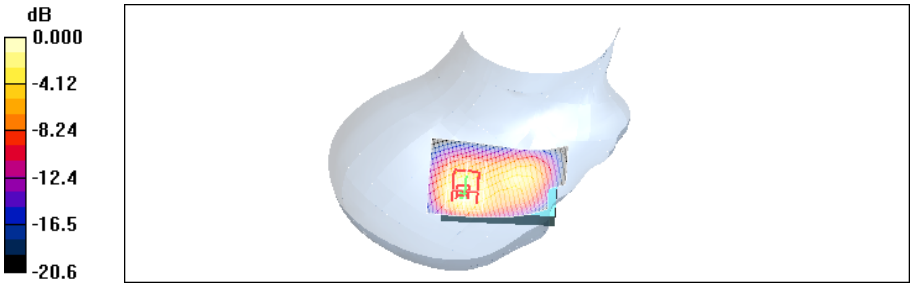
DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right touch 512/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.22 mW/g

Right touch 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.3 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 2.03 W/kg
SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.589 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.24 mW/g



0 dB = 1.24mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

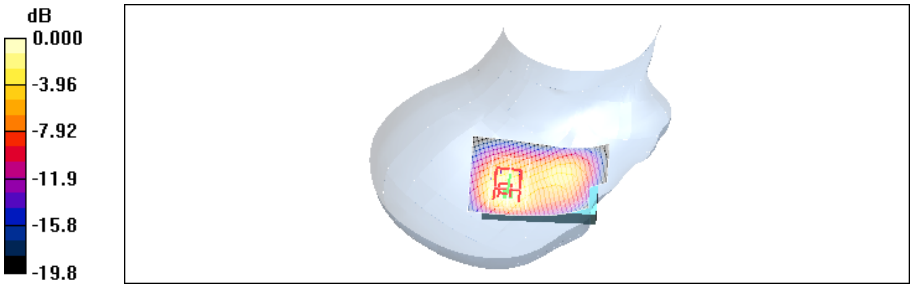
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right touch 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.22 mW/g

Right touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.5 V/m; Power Drift = -0.091 dB
Peak SAR (extrapolated) = 1.96 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.578 mW/g
Maximum value of SAR (measured) = 1.17 mW/g



0 dB = 1.17mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

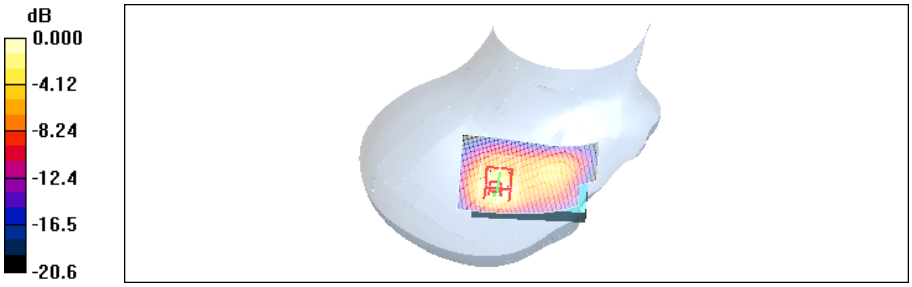
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.41 mho/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right touch 810/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.14 mW/g

Right touch 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.8 V/m; Power Drift = -0.012 dB
Peak SAR (extrapolated) = 1.83 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.531 mW/g
Maximum value of SAR (measured) = 1.11 mW/g



0 dB = 1.11mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.33 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

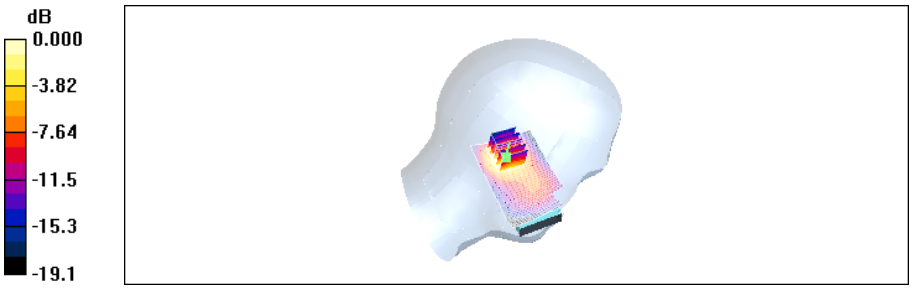
DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left tilt 512/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.962 mW/g

Left tilt 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.5 V/m; Power Drift = -0.154 dB
Peak SAR (extrapolated) = 1.42 W/kg
SAR(1 g) = 0.853 mW/g; SAR(10 g) = 0.481 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.935 mW/g



0 dB = 0.935mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

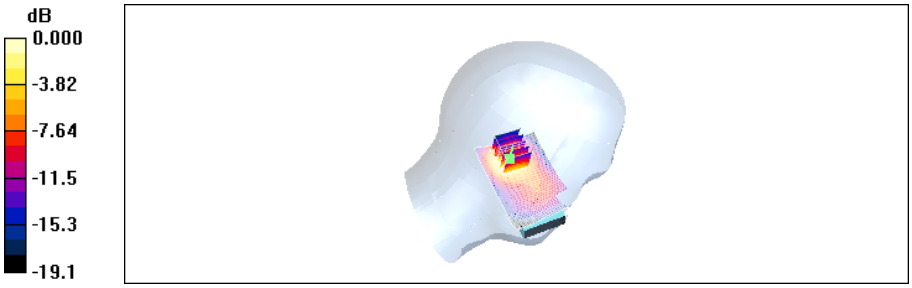
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left tilt 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Left tilt 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.9 V/m; Power Drift = -0.013 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.810 mW/g; SAR(10 g) = 0.453 mW/g
Maximum value of SAR (interpolated) = 0.920 mW/g
Maximum value of SAR (measured) = 0.887 mW/g



0 dB = 0.887mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

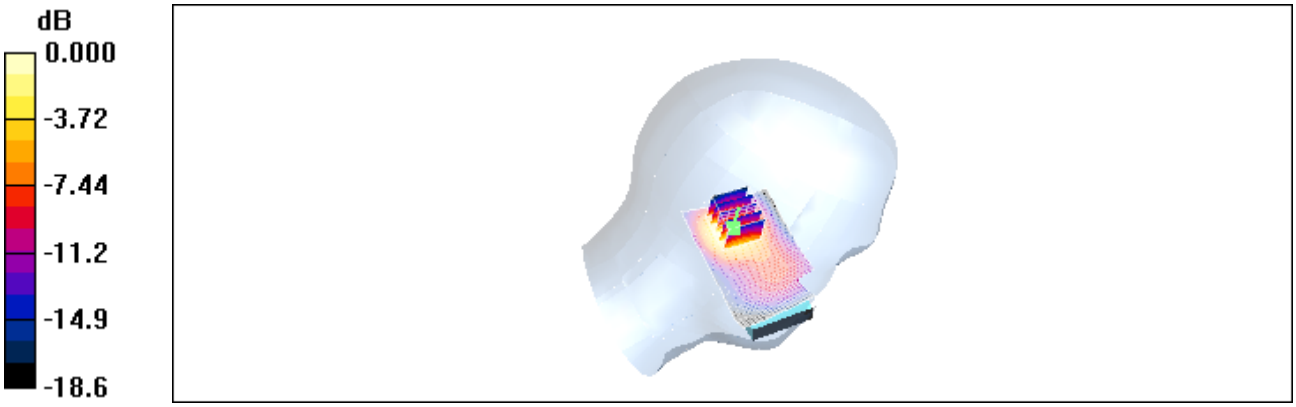
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.41 mho/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Left Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Left tilt 810/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.845 mW/g

Left tilt 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.8 V/m; Power Drift = -0.002 dB
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.756 mW/g; SAR(10 g) = 0.420 mW/g
Maximum value of SAR (measured) = 0.836 mW/g



0 dB = 0.836mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.33 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

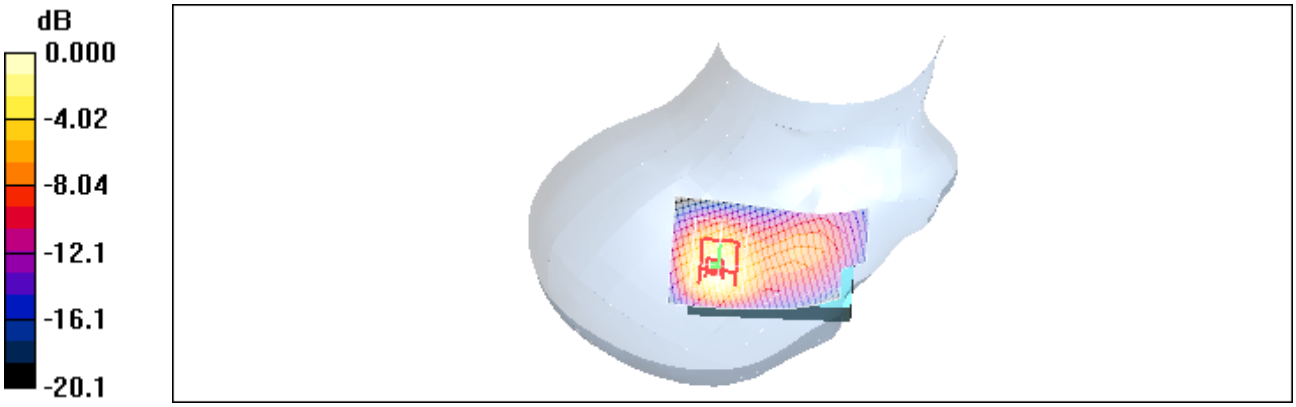
DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right tilt 512/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.04 mW/g

Right tilt 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.5 V/m; Power Drift = 0.012 dB
Peak SAR (extrapolated) = 1.80 W/kg
SAR(1 g) = 0.985 mW/g; SAR(10 g) = 0.516 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.06 mW/g



0 dB = 1.06mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

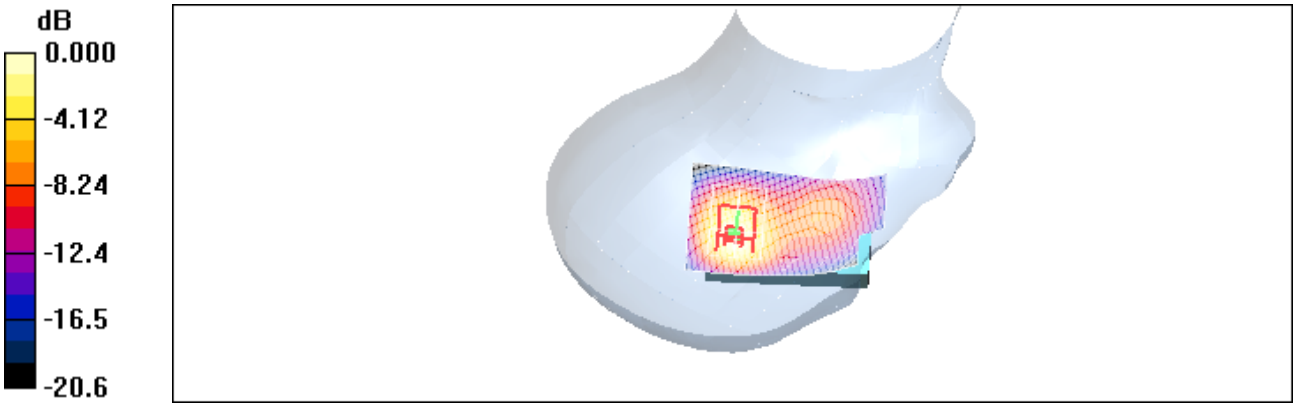
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.37 mho/m; ε_r = 40.1; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right tilt 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.02 mW/g

Right tilt 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.8 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 1.76 W/kg
SAR(1 g) = 0.963 mW/g; SAR(10 g) = 0.503 mW/g
Maximum value of SAR (measured) = 1.04 mW/g



0 dB = 1.04mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

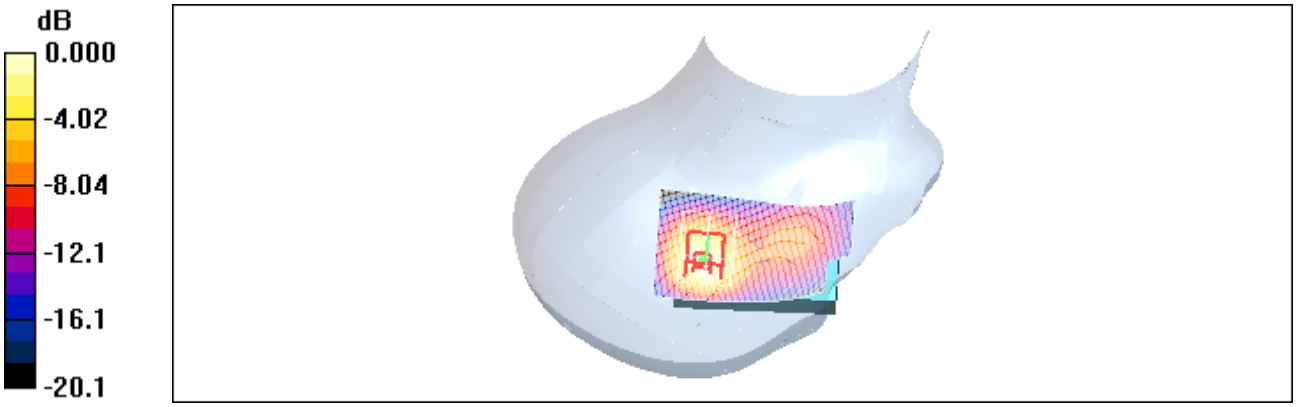
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.41 mho/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right tilt 810/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.947 mW/g

Right tilt 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.3 V/m; Power Drift = -0.022 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 0.887 mW/g; SAR(10 g) = 0.463 mW/g
Maximum value of SAR (measured) = 0.939 mW/g



0 dB = 0.939mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

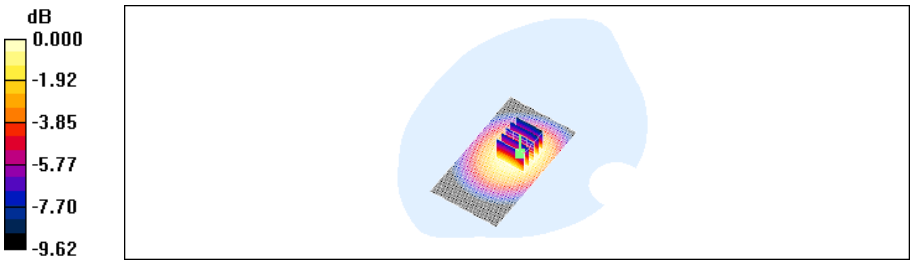
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:2
Medium parameters used: f = 825 MHz; σ = 0.982 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 – SN3161; ConvF(5.63, 5.63, 5.63); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM850 Body 128/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.39 mW/g

GSM850 Body 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.0 V/m; Power Drift = 0.006 dB
Peak SAR (extrapolated) = 1.72 W/kg
SAR(1 g) = 1.31 mW/g; SAR(10 g) = 0.943 mW/g
Maximum value of SAR (measured) = 1.39 mW/g



0 dB = 1.39mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008
Configuration	Front

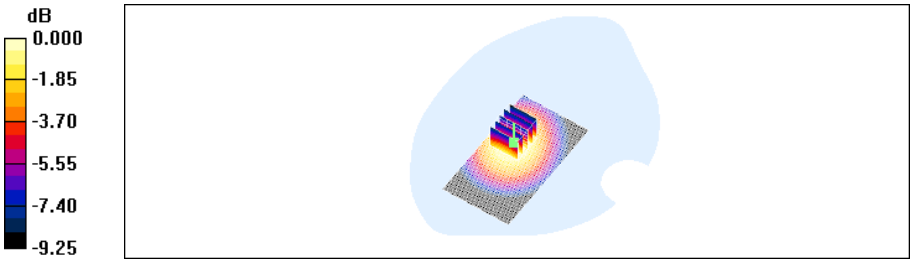
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:2
Medium parameters used: f = 825 MHz; σ = 0.982 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(5.63, 5.63, 5.63); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM850 Body 128/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.08 mW/g

GSM850 Body 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.2 V/m; Power Drift = 0.046 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 1 mW/g; SAR(10 g) = 0.717 mW/g
Maximum value of SAR (measured) = 1.07 mW/g



0 dB = 1.07mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008
Configuration	GSM

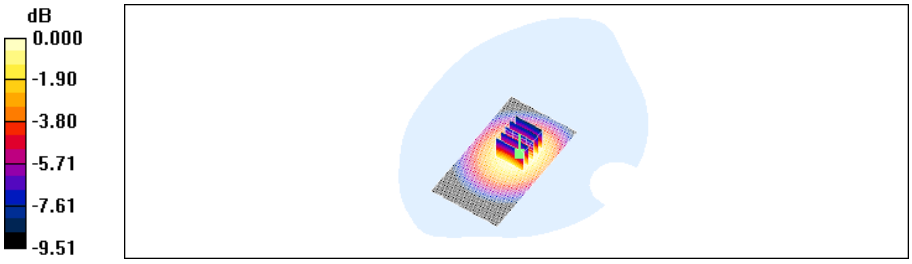
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 825 MHz; σ = 0.982 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(5.63, 5.63, 5.63); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM850 Body 128/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.356 mW/g

GSM850 Body 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.3 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 0.437 W/kg
SAR(1 g) = 0.334 mW/g; SAR(10 g) = 0.240 mW/g
Maximum value of SAR (measured) = 0.355 mW/g



0 dB = 0.355mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:2
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.994 mho/m; ε_r = 55.8; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

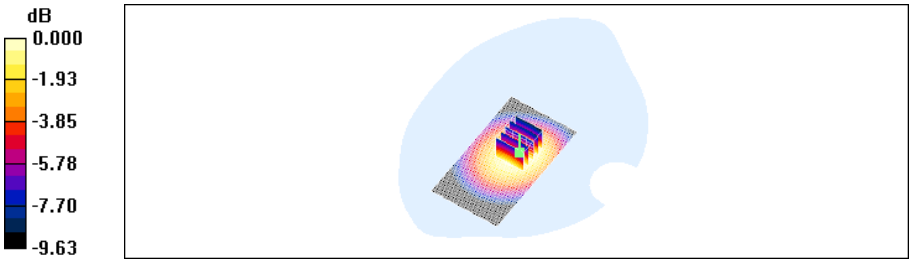
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(5.63, 5.63, 5.63); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

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) = 1.33 mW/g

GSM850 Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.6 V/m; Power Drift = -0.195 dB
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.889 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.31 mW/g



0 dB = 1.31mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

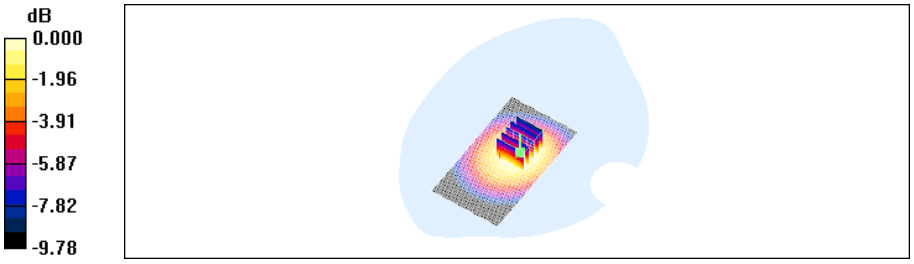
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 849.8 MHz;Duty Cycle: 1:2
Medium parameters used: f = 850 MHz; σ = 1.01 mho/m; ε_r = 55.6; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(5.63, 5.63, 5.63); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM850 Body 251/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.14 mW/g

GSM850 Body 251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.9 V/m; Power Drift = 0.026 dB
Peak SAR (extrapolated) = 1.41 W/kg
SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.776 mW/g
Maximum value of SAR (measured) = 1.14 mW/g



0 dB = 1.14mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

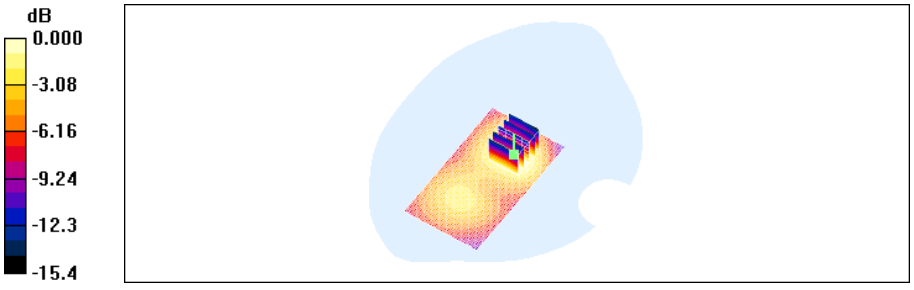
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 54; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.68, 4.68, 4.68); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

GSM1900 Body 661/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.631 mW/g

GSM1900 Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.0 V/m; Power Drift = -0.048 dB
Peak SAR (extrapolated) = 0.940 W/kg
SAR(1 g) = 0.589 mW/g; SAR(10 g) = 0.359 mW/g
Maximum value of SAR (measured) = 0.636 mW/g



0 dB = 0.636mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008
Configuration	Front

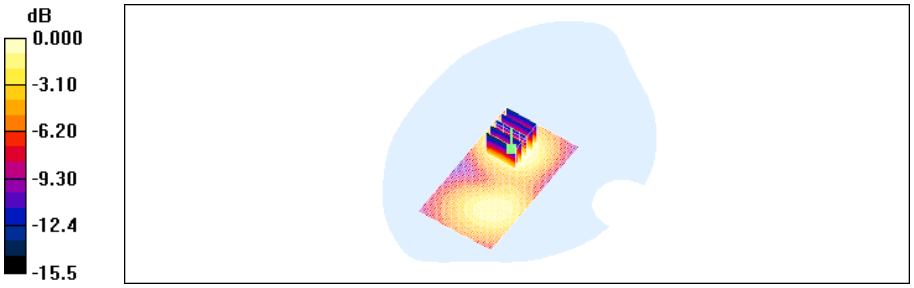
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 54; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.68, 4.68, 4.68); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

GSM1900 Body 661/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.500 mW/g

GSM1900 Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.4 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 0.729 W/kg
SAR(1 g) = 0.456 mW/g; SAR(10 g) = 0.279 mW/g
Maximum value of SAR (measured) = 0.488 mW/g



0 dB = 0.488mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008
Configuration	GSM

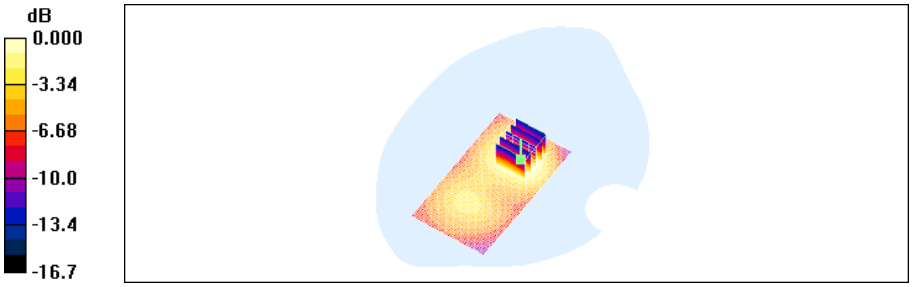
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 54; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.68, 4.68, 4.68); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

GSM1900 Body 661/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.149 mW/g

GSM1900 Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.70 V/m; Power Drift = 0.092 dB
Peak SAR (extrapolated) = 0.228 W/kg
SAR(1 g) = 0.139 mW/g; SAR(10 g) = 0.084 mW/g
Maximum value of SAR (measured) = 0.149 mW/g



0 dB = 0.149mW/g

Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

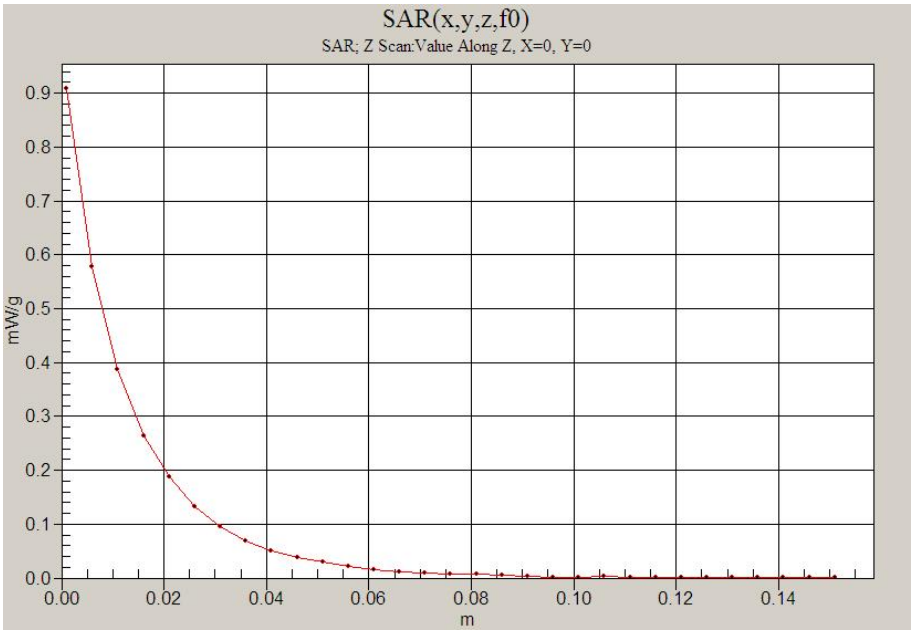
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 825 MHz; σ = 0.864 mho/m; ε_r = 41; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(6.07, 6.07, 6.07); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Right touch 128/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.01 mW/g

Right touch 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.1 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.927 mW/g; SAR(10 g) = 0.621 mW/g
Maximum value of SAR (measured) = 0.986 mW/g



Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.3 ℃
Ambient Temperature:	21.5 ℃
Test Date:	Sept.25, 2008

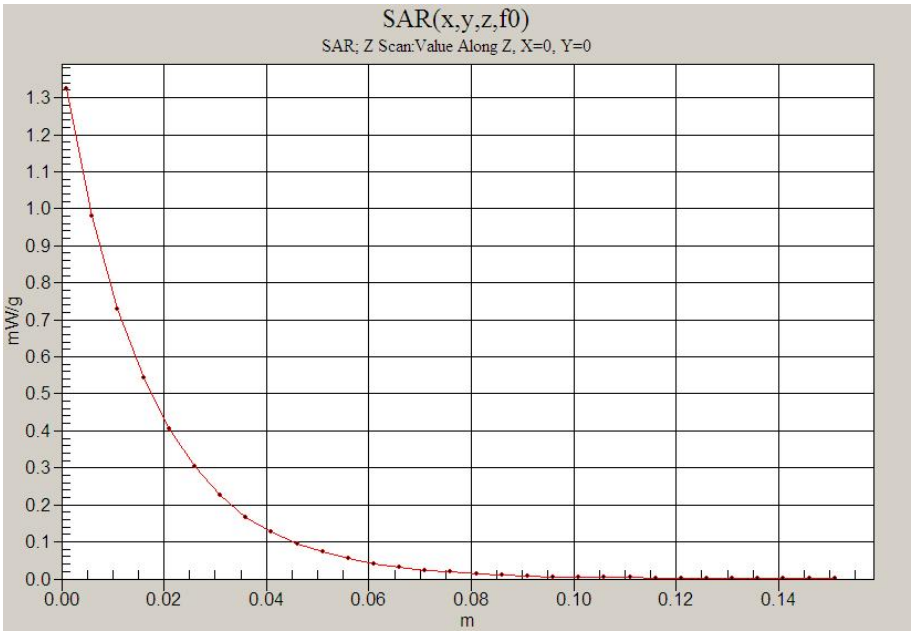
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:2
Medium parameters used: f = 825 MHz; σ = 0.982 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(5.63, 5.63, 5.63); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

GSM850 Body 128/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.39 mW/g

GSM850 Body 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.0 V/m; Power Drift = 0.006 dB
Peak SAR (extrapolated) = 1.72 W/kg
SAR(1 g) = 1.31 mW/g; SAR(10 g) = 0.943 mW/g
Maximum value of SAR (measured) = 1.39 mW/g



Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.33 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Right Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

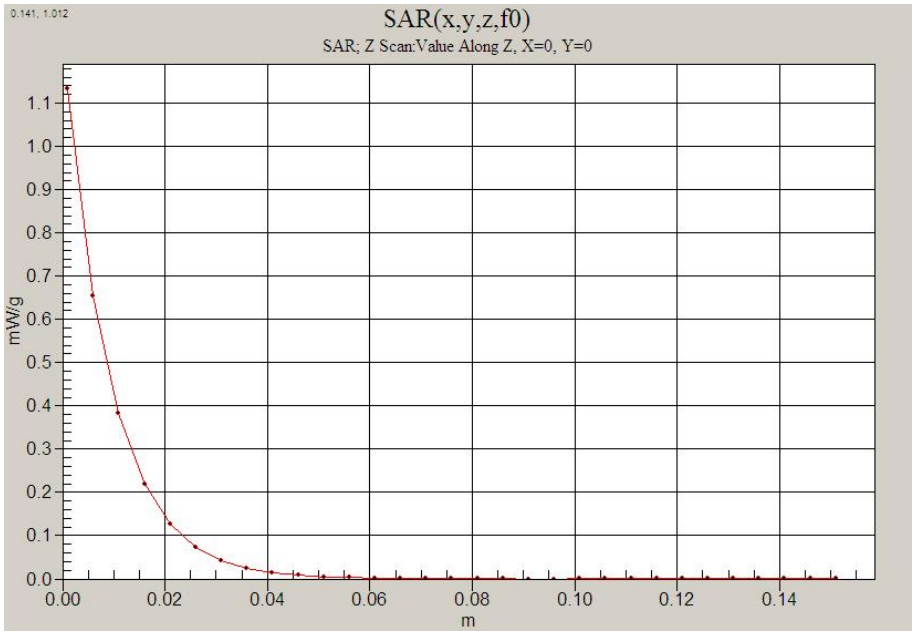
DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Right touch 512/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.22 mW/g

Right touch 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.3 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 2.03 W/kg
SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.589 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.24 mW/g



Test Laboratory:	HCT CO., LTD
EUT Type:	GSM Phone 850/1800/1900 & B/T
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.2 ℃
Ambient Temperature:	21.4 ℃
Test Date:	Sept.26, 2008

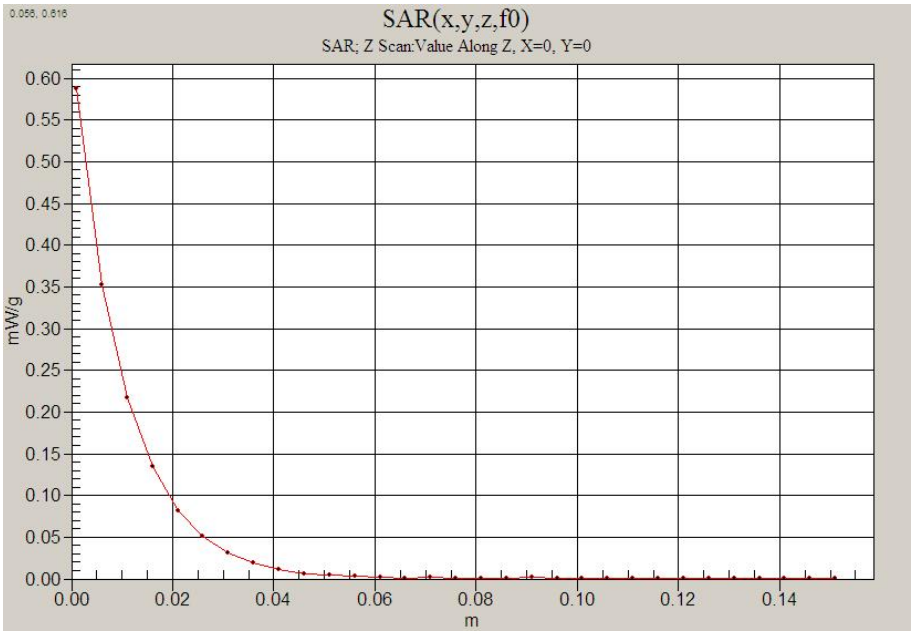
DUT: SGP400; Type: Bar; Serial: #1

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium parameters used: f = 1880 MHz; σ = 1.53 mho/m; ε_r = 54; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(4.68, 4.68, 4.68); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

GSM1900 Body 661/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.631 mW/g

GSM1900 Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.0 V/m; Power Drift = -0.048 dB
Peak SAR (extrapolated) = 0.940 W/kg
SAR(1 g) = 0.589 mW/g; SAR(10 g) = 0.359 mW/g
Maximum value of SAR (measured) = 0.636 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: 21.3 ℃

Test Date: Sept.25, 2008

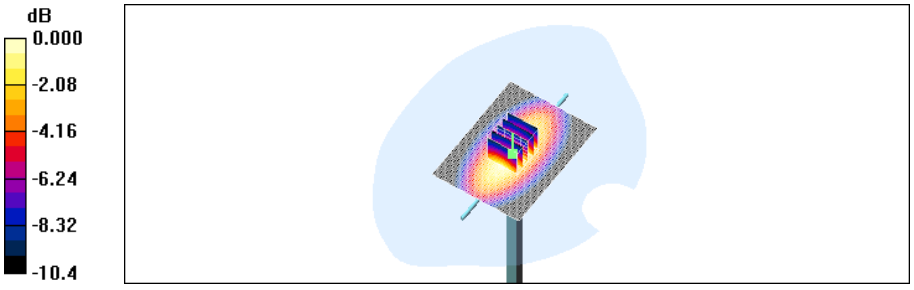
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:441

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.875 mho/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(6.07, 6.07, 6.07); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 835/900 Phantom ; Type: SAM

Validation 835 MHz/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.00 mW/g

Validation 835 MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 34.3 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.926 mW/g; SAR(10 g) = 0.607 mW/g
Maximum value of SAR (measured) = 1.01 mW/g



0 dB = 1.01mW/g

■ Validation Data (1900 MHz Head)

Test Laboratory: HCT CO., LTD

Input Power 100 mW (20 dBm)

Liquid Temp: 21.2 ℃

Test Date: Sept.26, 2008

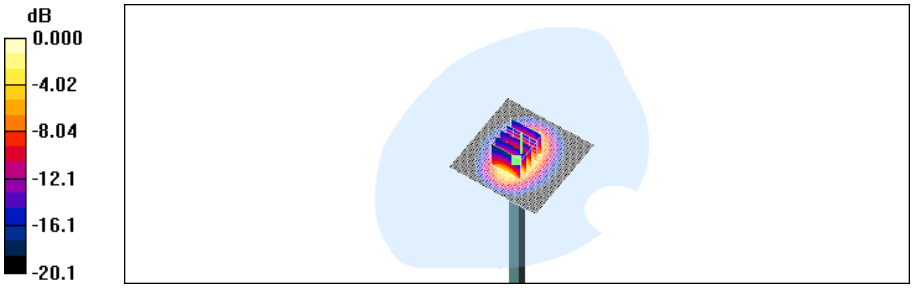
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d032

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.4 mho/m; ε_r = 40; ρ = 1000 kg/m^3
Phantom section: Flat Section ; Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 176

DASY4 Configuration:
- Probe: ES3DV3 - SN3161; ConvF(5.04, 5.04, 5.04); Calibrated: 2008-04-07
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn869; Calibrated: 2008-09-03
- Phantom: 1800/1900 Phantom; Type: SAM

Validation 1900MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 4.52 mW/g

Validation 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 53.9 V/m; Power Drift = 0.000 dB
Peak SAR (extrapolated) = 7.48 W/kg
SAR(1 g) = 3.82 mW/g; SAR(10 g) = 1.94 mW/g
Maximum value of SAR (measured) = 4.19 mW/g



0 dB = 4.19mW/g

■ Dielectric Parameter (835 MHz Head)

Title	SGP400
SubTitle	GSM850(Head)
Test Date	Sept.25, 2008

Frequency	e'	e''
800000000	41.4326	18.9035
805000000	41.3581	18.8658
810000000	41.2874	18.8383
815000000	41.1409	18.8425
820000000	41.1115	18.8208
825000000	41.0313	18.8237
830000000	40.9955	18.8304
835000000	40.8945	18.8446
840000000	40.8122	18.8642
845000000	40.7573	18.8659
850000000	40.6996	18.8170
855000000	40.6403	18.8513
860000000	40.6078	18.8318
865000000	40.5163	18.7987
870000000	40.4586	18.8276
875000000	40.4465	18.7828
880000000	40.3633	18.7688
885000000	40.3603	18.7870
890000000	40.2795	18.7231
895000000	40.2161	18.6995
900000000	40.1771	18.6889

■ Dielectric Parameter (835 MHz Body)

Title	SGP400
SubTitle	GSM850(Body)
Test Date	Sept.25, 2008

Frequency	e'	e''
800000000	56.3198	21.5167
805000000	56.2326	21.4625
810000000	56.1510	21.4353
815000000	56.1031	21.4188
820000000	55.9957	21.3909
825000000	55.9324	21.3864
830000000	55.8391	21.3879
835000000	55.7929	21.3773
840000000	55.6889	21.3281
845000000	55.6735	21.3340
850000000	55.6287	21.3181
855000000	55.5709	21.2800
860000000	55.5383	21.2762
865000000	55.4737	21.2848
870000000	55.3779	21.2518
875000000	55.3354	21.2415
880000000	55.3641	21.2192
885000000	55.2772	21.2000
890000000	55.2254	21.1725
895000000	55.1509	21.1386
900000000	55.1191	21.0775

■ Dielectric Parameter (1900 MHz Head)

Title	SGP400
SubTitle	GSM1900(Head)
Test Date	Sept.26, 2008

Frequency	e'	e''
1850000000	40.1877	12.9585
1855000000	40.1545	12.9855
1860000000	40.1573	13.0165
1865000000	40.1524	13.0254
1870000000	40.0986	13.0325
1875000000	40.1082	13.0770
1880000000	40.0668	13.0884
1885000000	40.0602	13.1252
1890000000	40.0463	13.1458
1895000000	40.0359	13.1940
1900000000	40.0088	13.2022
1905000000	39.9923	13.2215
1910000000	39.9642	13.2364
1915000000	39.9300	13.2822
1920000000	39.8999	13.2747
1925000000	39.9022	13.3025
1930000000	39.8789	13.2730
1935000000	39.8266	13.3160
1940000000	39.7925	13.3412
1945000000	39.7622	13.3402
1950000000	39.7376	13.3741

■ Dielectric Parameter (1900 MHz Body)

Title	SGP400
SubTitle	GSM1900(Body)
Test Date	Sept.26, 2008

Frequency	e'	e''
1850000000	53.9687	14.5563
1855000000	53.9663	14.6052
1860000000	54.0086	14.6093
1865000000	54.0115	14.6385
1870000000	54.0241	14.6253
1875000000	54.0150	14.6284
1880000000	54.0099	14.6352
1885000000	53.9833	14.6028
1890000000	53.9471	14.5833
1895000000	53.9079	14.6038
1900000000	53.8997	14.6174
1905000000	53.8221	14.6079
1910000000	53.7831	14.5956
1915000000	53.7355	14.6286
1920000000	53.6903	14.6595
1925000000	53.6570	14.6868
1930000000	53.6129	14.7023
1935000000	53.5693	14.7177
1940000000	53.5743	14.7678
1945000000	53.5603	14.8400
1950000000	53.5798	14.8578

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 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

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
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,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., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep (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 ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ES3DV3

SN:3161

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

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

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%	μV/(V/m)^2	DCP X	**90** mV
NormY	**1.26** ± 10.1%	μV/(V/m)^2	DCP Y	**92** mV
NormZ	**0.94** ± 10.1%	μV/(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%.

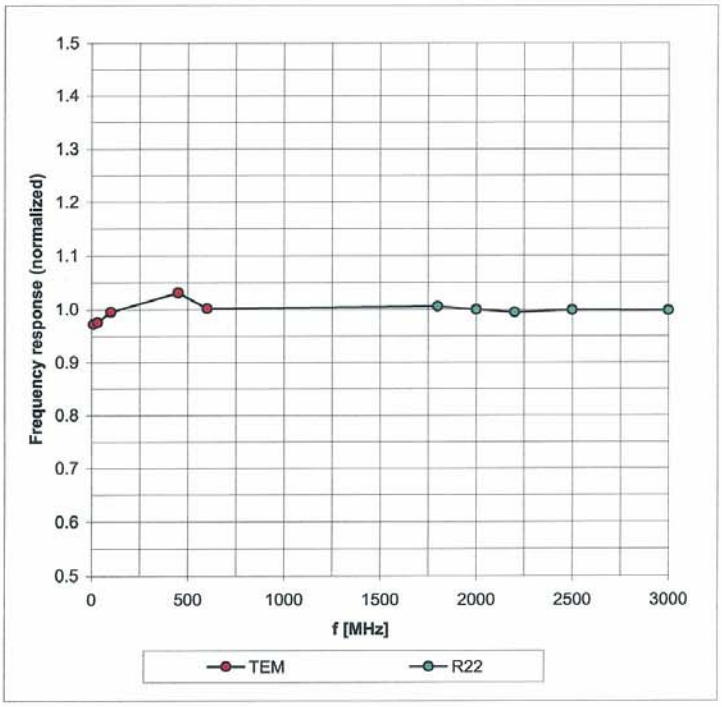
[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

ES3DV3 SN:3161 April 7, 2008

Frequency Response of E-Field

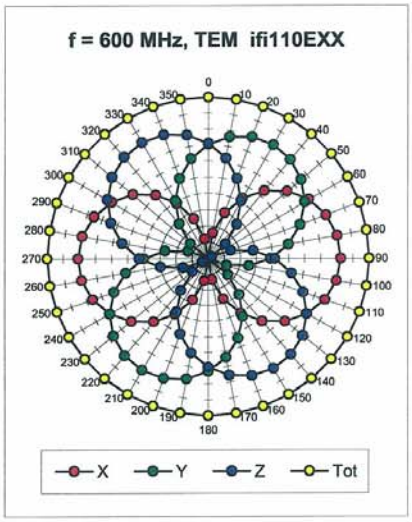
(TEM-Cell:ifi110 EXX, Waveguide: R22)

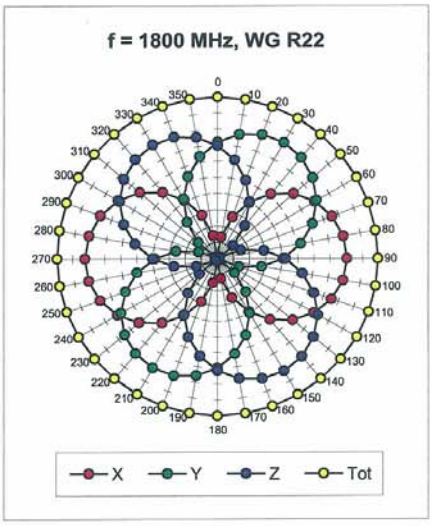


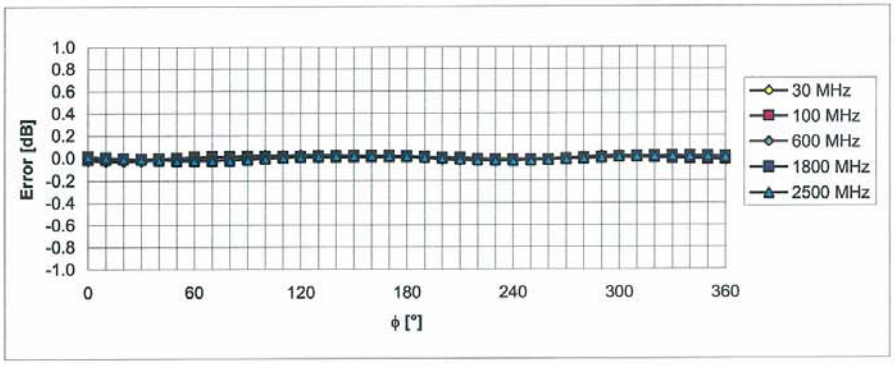
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

ES3DV3 SN:3161 **April 7, 2008**

Receiving Pattern (ϕ), ϑ = 0°







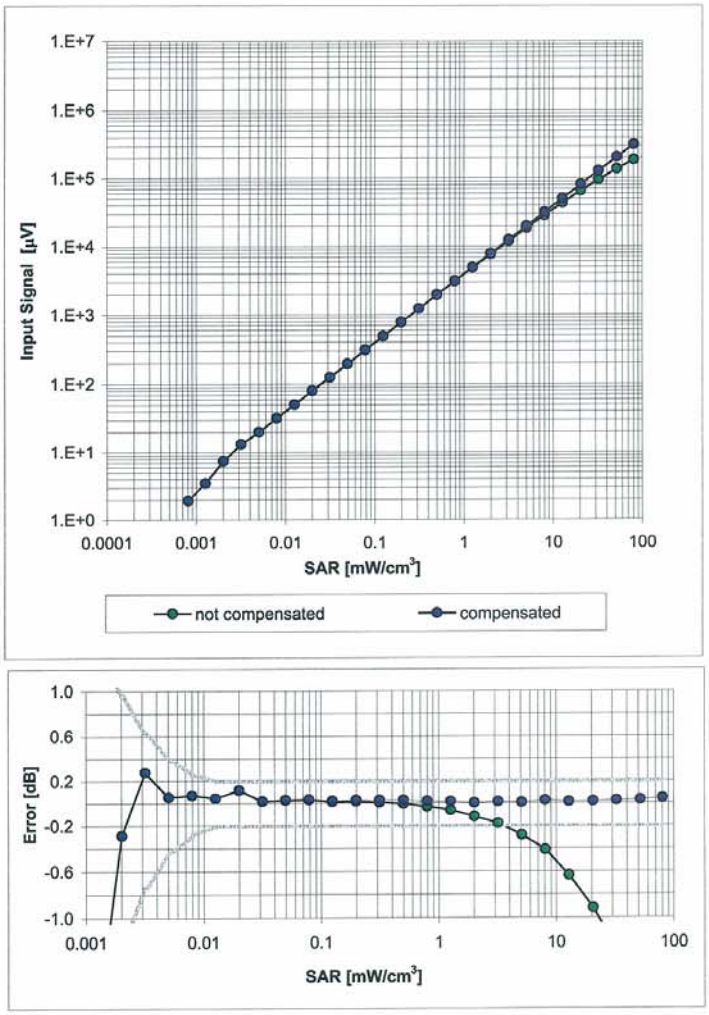
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Certificate No: ES3-3161_Apr08 Page 6 of 9

ES3DV3 SN:3161 **April 7, 2008**

Dynamic Range f(SAR_{head})

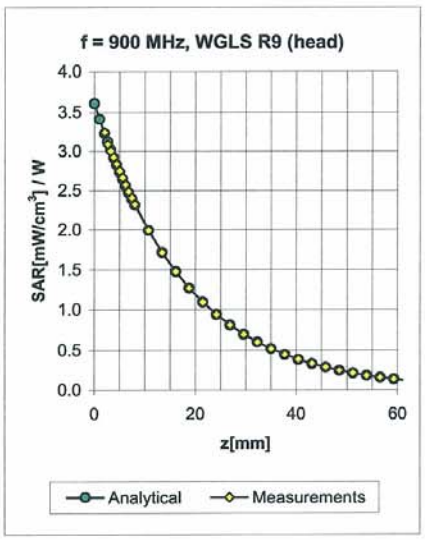
(Waveguide R22, f = 1800 MHz)

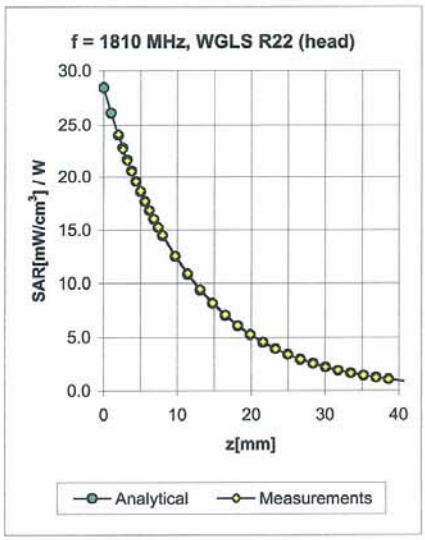


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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)

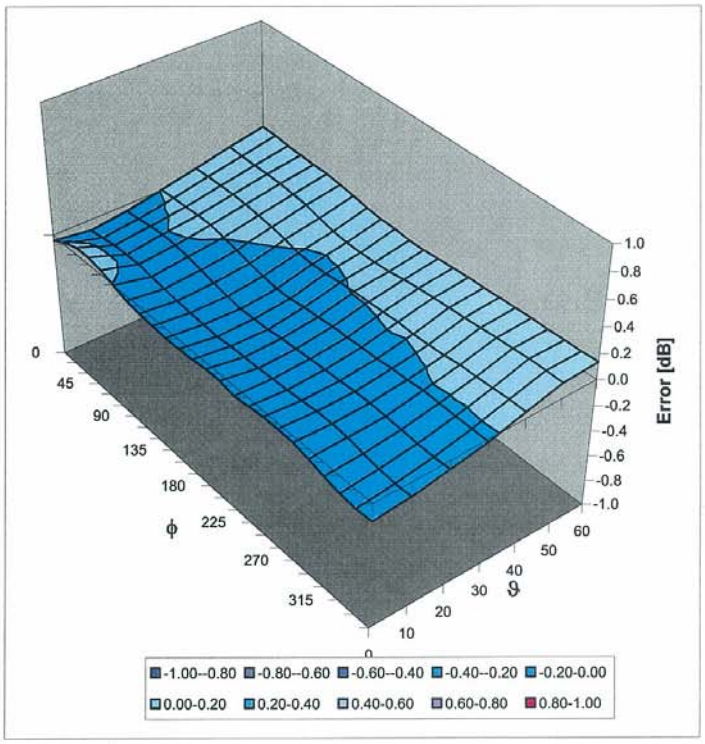
[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

Certificate No: ES3-3161_Apr08 Page 8 of 9

ES3DV3 SN:3161 **April 7, 2008**

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Attachment 4. – Dipole Calibration Data

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Zeughausstrasse 43, 8004 Zurich, Switzerland

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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

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

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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 ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.1 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature during test	(21.5 ± 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 ± 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 ± 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 jΩ
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

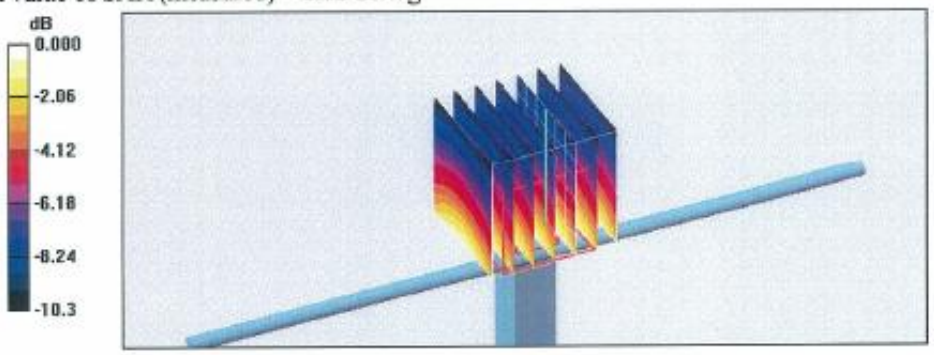
Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL 900 MHz;
Medium parameters used: f = 835 MHz; σ = 0.909 mho/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

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

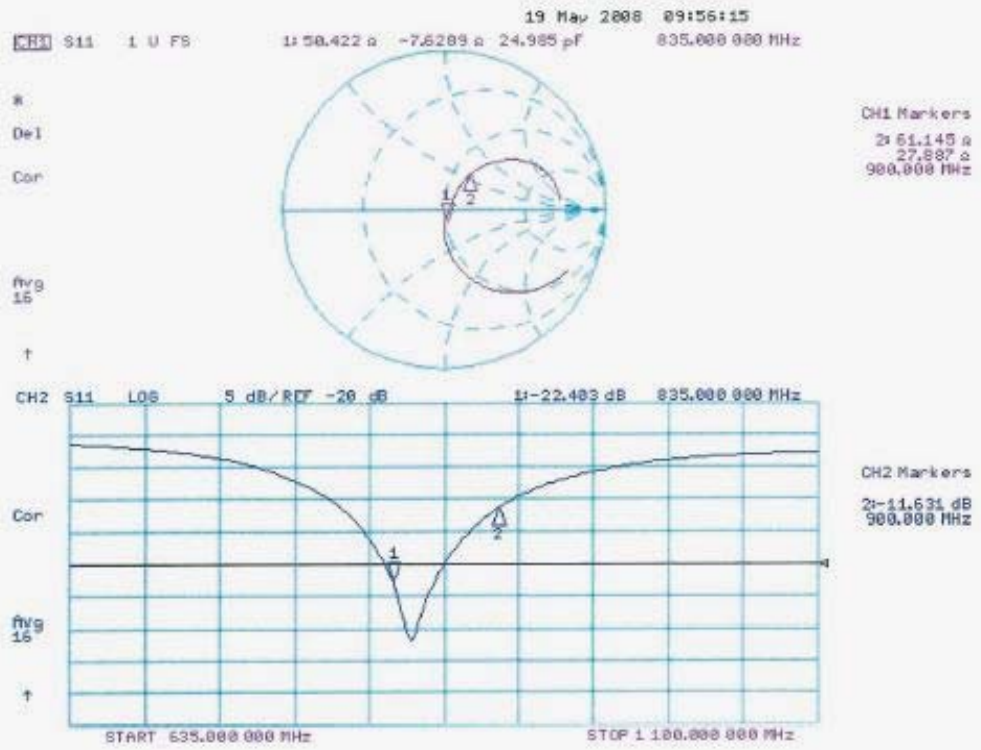
Pin=250mW; dip=15mm; dist=3.4mm/Zoom Scan (7x7x7)/Cube 0:

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



0 dB = 2.62mW/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-05 (No. 217-00664)	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

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

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) 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
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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 ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.8 ± 6 %	1.47 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 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	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 ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (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 ± 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 jΩ
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

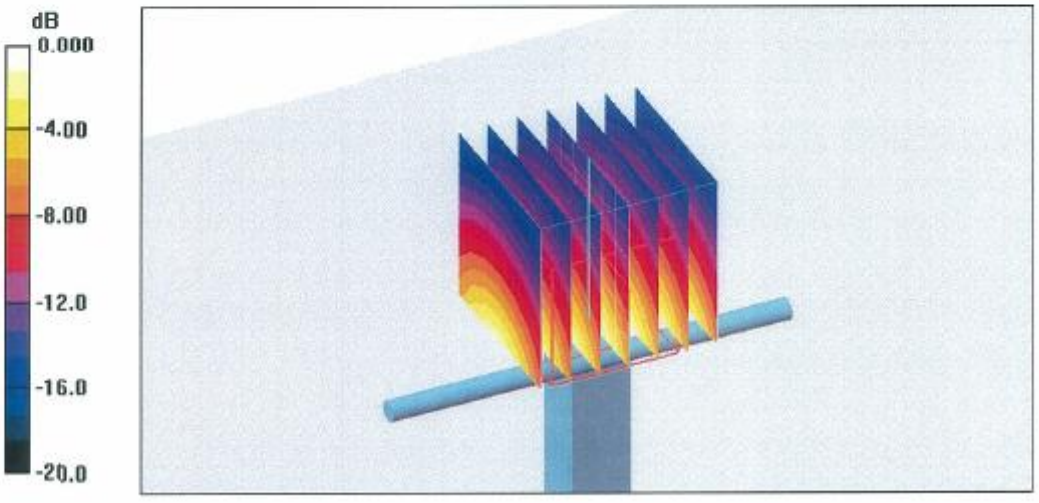
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d032

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL U10 BB;
Medium parameters used: f = 1900 MHz; σ = 1.47 mho/m; ε_r = 38.8; ρ = 1000 kg/m^3
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