SAR TEST REPORT

HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD

EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900) GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)		
FCC ID:	U3XNEON7		
Model:	NEON7	Trade Name :	EGI
Date of Issue:	Mar. 20, 2007		
Test report no.:	HCT-SAR07-0308		
Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD. SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701,KOREA TEL: +82 31 639 8518 FAX: +82 31 639 8525		
Applicant :	EGI Co.,Ltd. C-1402, Intellige, 24, Jeongja-dong, Bundang-gu, Seongnam-si, Gyeonggi-do, 463-841 Korea Tel: +82 31 605-7921 Fax: +82 31 601 8038		
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	Ki Soo Kim Report prepared by: Ki-Soo Kim Manager of Product Compliance Team		

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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. [1]

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. (c) 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.[2] The measurement procedure described in IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave[3] 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 (c) NCRP, 1986, Bethesda, MD 20814.[4] 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 (rate) of the incremental energy (dU) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dV) 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 .

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

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.[4]

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	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900) GPRS Class 12 and GPRS mode class B (GPRS and GSM, but not simultaneously)
FCC ID	HCT-SAR07-0308
Model(s)	NEON7
Trade Name	EGI
Serial Number(s)	U3XNEON720070301
Application Type	Certification
Modulation(s)	GSM850/GSM1900/DCS1800
Tx Frequency	824.20 - 848.80 MHz (GSM850) 1850.20 - 1909.80 MHz (GSM1900) 2402 - 2480 MHz (Bluetooth)
Rx Frequency	869.20 - 893.80 MHz (GSM850) 1930.20 - 1989.80 MHz (GSM1900) 2402 - 2480 MHz (Bluetooth)
FCC Classification	Licensed Portable Transmitter Held to Ear (PCE)
Production Unit or Identical Prototype	Prototype
Max SAR	0.31 W/kg GSM850 Head SAR / 0.131 W/kg GSM850 Body SAR 0.728 W/kg GSM1900 Head SAR / 0.184 W/kg GSM1900 Body SAR
Date(s) of Tests	Mar. 19, 2007 ~ Mar. 20, 2007
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 Fig.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 4 3.0GHz 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.

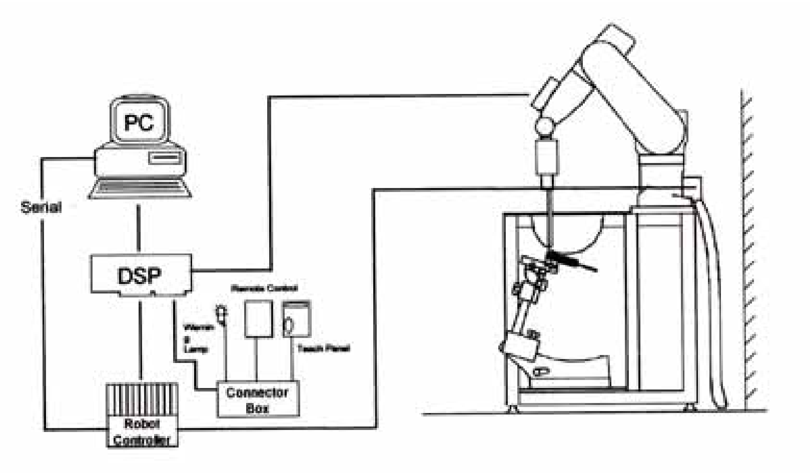

Figure 3.1 HCT SAR Lab. Test Measurement Set-up

The DAE3 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 [5].

3.2 DASY E-FIELD PROBE SYSTEM

3.2.1 ET3DV6 Probe Specification

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

Figure 3.2 Photograph of the probe and the Phantom

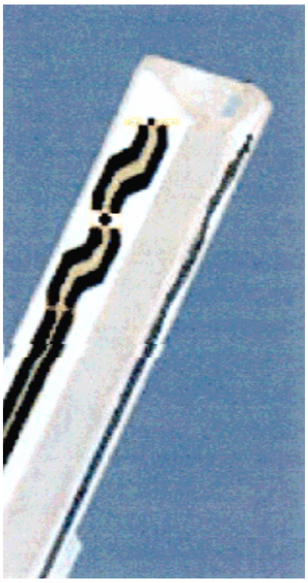

Figure 3.3 ET3DV6 E-field Probe

The SAR measurements were conducted with the dosimetric probe ET3DV6, designed in the classical triangular configuration [5] 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 mortifier 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 2 nd 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 described in [6] with an accuracy better than +/- 10%. The spherical isotropy was evaluated with the procedure described in [7] and found to be better than +/- 0.25dB. 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)

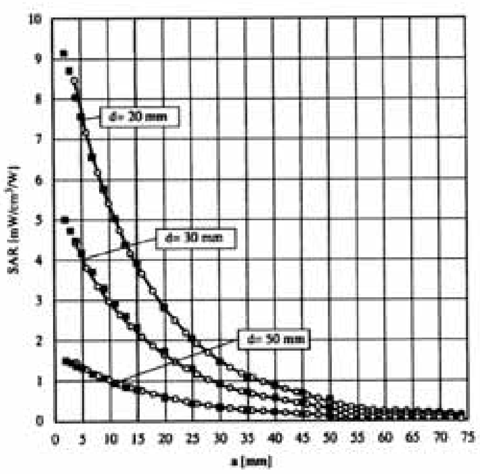

Figure 3.4 E-Field and Temperature measurements at 900 MHz[5]

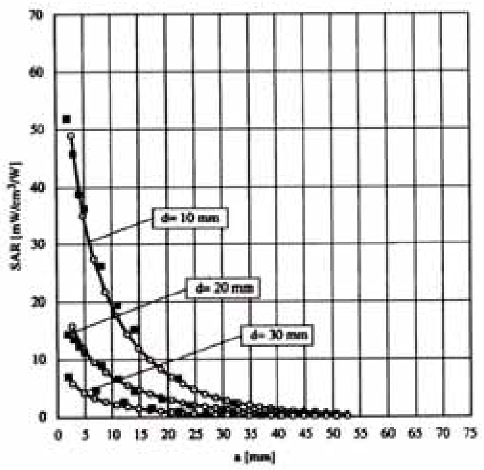

Figure 3.5 E-Field and temperature measurements at 1.8 GHz [5]

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 as [8]:

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

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

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

E-field probes:

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

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

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

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

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

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

with SAR = local specific absorption rate in W/g
E_{tot} = total field strength in V/m
σ = conductivity in [mho/m] or [Siemens/m]
ρ = equivalent tissue density in g/cm³

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

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

with P_{pwe} = equivalent power density of a plane wave in W/cm²
E_{tot} = total electric field strength in V/m

3.4 SAM Phantom

The SAM Phantom is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90% of all users [9][10]. 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	Volume Approx. 30 liters
Dimensions	810 x 1000 x 500 mm (H x L x W)

3.5 Device Holder for Transmitters

In combination with the SAM Phantom V4.0, 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 [10]. To produce the Worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.

Fig. 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 [11].

Ingredients (%by weight)	Frequency (MHz)									
	450		835		915		1900		2450	
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
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
Staubli	Teach Pendant (Joystick)	D221340.01	N/A	N/A	N/A
HP	Pavilion t000_puffer	KRJ51201TV	N/A	N/A	N/A
SPEAG	SAM Phantom	-	N/A	N/A	N/A
SPEAG	Light Alignment Sensor	265	N/A	N/A	N/A
SPEAG	DAE3V1	466	01/25/07	Annual	01/25/08
SPEAG	DAE3V1	447	11/17/06	Annual	11/17/07
SPEAG	E-Field Probe ET3DV6	1609	03/23/06	Annual	03/23/07
SPEAG	E-Field Probe ET3DV6	1798	08/25/06	Annual	08/25/07
SPEAG	Validation Dipole D835V2	441	08/14/06	Annual	08/14/07
SPEAG	Validation Dipole D900V2	121	02/19/07	Annual	02/19/08
SPEAG	Validation Dipole D1800V2	2d007	08/16/06	Annual	08/16/07
SPEAG	Validation Dipole D1900V2	5d032	02/20/07	Annual	02/20/08
SPEAG	Validation Dipole D2450V2	743	01/17/07	Annual	01/17/08
Agilent	Power Meter(F) E4419B	MY40330223	11/08/06	Annual	11/08/07
Agilent	Power Sensor(G) 8481	MY41090870	11/21/06	Annual	11/21/07
HP	Signal Generator 8664A	3744A02069	04/11/06	Annual	04/11/07
EM POWER	Power Amp BBS3Q7ELU	1013-D/C-0127	04/05/06	Annual	04/05/07
HP	Network Analyzer 8753ES	JP39240221	04/06/06	Annual	04/06/07
HP	Dielectric Probe Kit 85070C	00721521	N/A	N/A	N/A
HP	Dual Directional Coupler 778D	16072	11/09/06	Annual	11/09/07
R&S	Base Station CMU200	838207/050	11/14/06	Annual	11/14/07
Agilent	Base Station E5515C	US41070189	05/03/06	Annual	05/03/07
Tescom	Bluetooth TC-3000	3000A490112	01/24/07	Annual	01/24/08

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 3.9mm 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 2.7mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. The extrapolation was based on a least square algorithm [13]. 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 (1g or 10g) 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) [13][14]. 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.

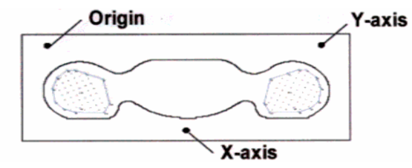

Fig. 4.1 SAR Measurement Point in Area Scan

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 SC-2 P1528 illustration below.

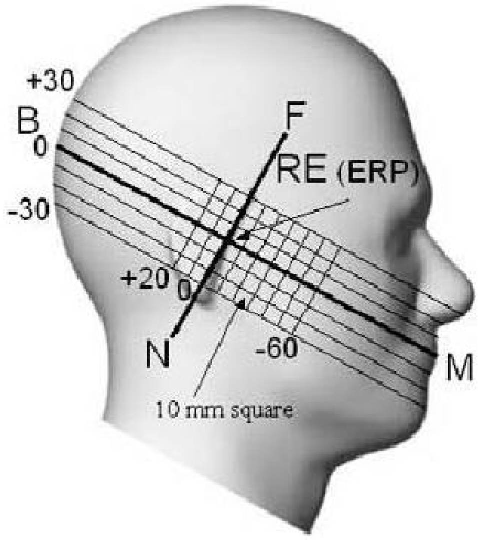

Figure 5.1 Side view of the phantom

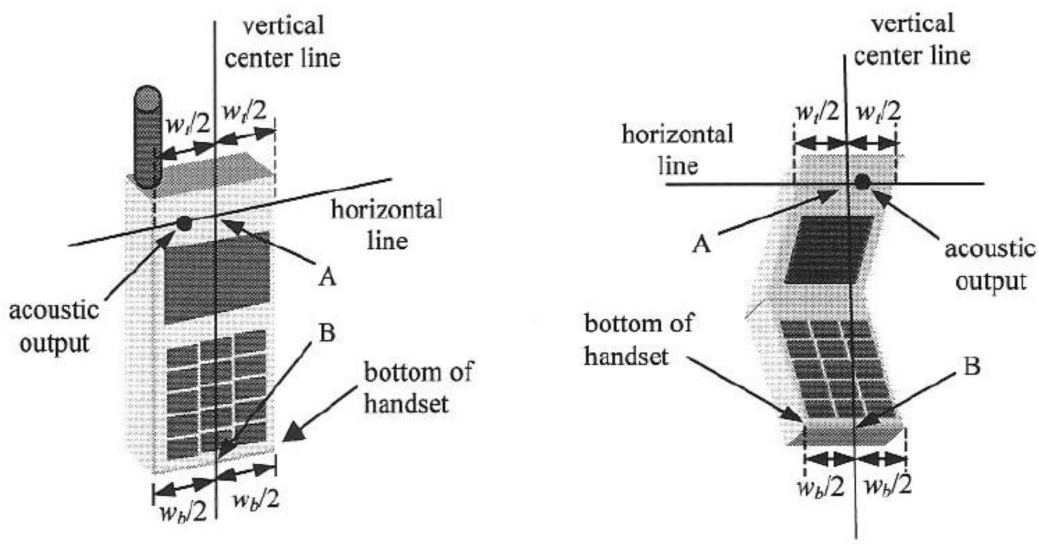

Figure 5.2 Handset vertical and horizontal reference lines

5.2 Body Holster/Belt Clip Configurations

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

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

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

Since this EUT does not supply any body worn accessory to the end user a distance of 1.5 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 % [16].

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 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 ± 2dB can be expected.[3]

According to CENELEC [17], 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	11	Normal	2.00	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						Total		65.69	
Device Positioning	1.77	Normal	1.00	1	1	1.77	3.13	3.13	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						Total		24.43	
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	∞
						Total		12.63	
Combined standard uncertainty	10.14					**Total**		102.74	
Expanded uncertainty =(confidence interval of 95.45 %)	**20.3**	**± 20.3 % (Coverage Factor of *k* = 2)**							

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 gram 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 grams 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	Mar.19, 2007	Head	21.4	ε r	41.5	41.1	- 0.96	± 5 %
				σ	0.90	0.876	- 2.67	± 5 %
835	Mar.19, 2007	Body	21.4	ε r	55.2	53.4	- 3.26	± 5 %
				σ	0.97	0.99	+ 2.06	± 5 %
1900	Mar.20, 2007	Head	21.6	ε r	40.0	39.3	- 1.75	± 5 %
				σ	1.40	1.45	+ 3.57	± 5 %
1900	Mar.20, 2007	Body	21.6	ε r	53.3	52.0	- 2.44	± 5 %
				σ	1.52	1.56	+ 2.63	± 5 %

8.2 System Validation

Prior to assessment, the system is verified to the ±10% of the specifications at 835 MHz / 1900MHz by using the system validation kit. (Graphic Plots Attached)

Freq. [MHz]	Date	Liquid	Liquid Temp [°C]	SAR Average	Target Value (IEEE 1528) (mW/g)	Measured Value (mW/g)	Deviation [%]	Limit [%]
835 MHz	Mar.19, 2007	Head	21.4	1 g	9.5	9.43	- 0.74	± 10 %
1900 MHz	Mar.20, 2007	Head	21.6	1 g	39.7	40.90	+ 3.02	± 10 %

* Input Power: 1 W

9. SAR TEST DATA SUMMARY

9.1 Measurement Results (GSM850 Head SAR Touch)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Ant. Position	SAR(mW/g)
MHz	Channel.		Begin	End				
824.2	128 (Low)	GSM850	32.47	32.54	Standard	Left Ear	Intenna	0.261
836.6	190 (Mid)	GSM850	32.76	32.81	Standard	Left Ear	Intenna	0.246
848.8	251 (High)	GSM850	32.70	32.77	Standard	Left Ear	Intenna	0.249
824.2	128 (Low)	GSM850	32.51	32.63	Standard	Right Ear	Intenna	0.310
836.6	190 (Mid)	GSM850	32.81	32.81	Standard	Right Ear	Intenna	0.281
848.8	251 (High)	GSM850	32.70	32.73	Standard	Right Ear	Intenna	0.282
824.2	128 (Low)	GSM850	32.50	32.52	Standard	Right Ear	Intenna	*0.297
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 ± 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 Highest SAR value measurement in this band repeated with *Bluetooth.

9.2 Measurement Results (GSM850 Head SAR Tilt)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Ant. Position	SAR(mW/g)
MHz	Channel.		Begin	End				
836.6	190 (Mid)	GSM850	32.76	32.80	Standard	Left Tilt 15°	Intenna	0.085
836.6	190 (Mid)	GSM850	32.83	32.83	Standard	Right Tilt 15°	Intenna	0.095
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 ± 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, 2002), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

9.3 Measurement Results (GSM1900 Head SAR Touch)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Ant. Position	SAR(mW/g)
MHz	Channel.		Begin	End				
1850.2	512 (Low)	GSM1900	29.38	29.26	Standard	Left Ear	Intenna	0.691
1880.0	661 (Mid)	GSM1900	29.28	29.28	Standard	Left Ear	Intenna	0.728
1909.8	810 (High)	GSM1900	29.17	29.23	Standard	Left Ear	Intenna	0.621
1850.2	512 (Low)	GSM1900	29.38	29.32	Standard	Right Ear	Intenna	0.665
1880.0	661 (Mid)	GSM1900	29.28	29.13	Standard	Right Ear	Intenna	0.655
1909.8	810 (High)	GSM1900	29.18	29.27	Standard	Right Ear	Intenna	0.672
1880.0	661 (Mid)	GSM1900	29.28	29.17	Standard	Left Ear	Intenna	*0.644
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 ± 0.2cm.
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. Highest SAR value measurement in this band repeated with *Bluetooth.

9.4 Measurement Results (GSM1900 Head SAR Tilt)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Ant. Position	SAR(mW/g)
MHz	Channel.		Begin	End				
1880.0	661 (Mid)	GSM1900	29.28	29.35	Standard	Left Tilt 15°	Intenna	0.337
1880.0	661 (Mid)	GSM1900	29.28	29.30	Standard	Right Tilt 15°	Intenna	0.421
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 ± 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, 2002), if the SAR measured at the middle channel for each test configuration (Left, right, cheek/touch, tilt/ear, extended and retracted) is at least 3.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).

9.5 Measurement Results (GSM850 Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Ant. Position	SAR(mW/g)
MHz	Channel.		Begin	End				
836.6	190 (Mid)	GSM850	32.77	32.81	Standard	1.5 cm without Holster	Intenna	0.131
836.6	190 (Mid)	GSM850	32.82	32.82	Standard	1.5 cm without Holster	Intenna	*0.115
836.6	190 (Mid)	GSM850	32.84	32.85	Standard	1.5 cm without Holster	Intenna	**0.104
836.6	190 (Mid)	GSM850	32.78	32.80	Standard	1.5 cm without Holster	Intenna	***0.0845
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 ± 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, 2002), 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 Highest SAR value measurement in this band repeated with *Bluetooth/ **GPRS/***Front.

9.6 Measurement Results (GSM1900 Body SAR)

Frequency		Modulation	Conducted Power (dBm)		Battery	Phantom Position	Ant. Position	SAR(mW/g)
MHz	Channel.		Begin	End				
1880.0	661 (Mid)	GSM1900	29.28	29.28	Standard	1.5 cm without Holster	Intenna	0.184
1880.0	661 (Mid)	GSM1900	29.28	29.27	Standard	1.5 cm without Holster	Intenna	*0.16
1880.0	661 (Mid)	GSM1900	29.28	29.27	Standard	1.5 cm without Holster	Intenna	**0.131
1880.0	661 (Mid)	GSM1900	29.28	29.40	Standard	1.5 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 ± 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, 2002), 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 Highest SAR value measurement in this band repeated with *Bluetooth/ **GPRS /***Front.

10. 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:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007

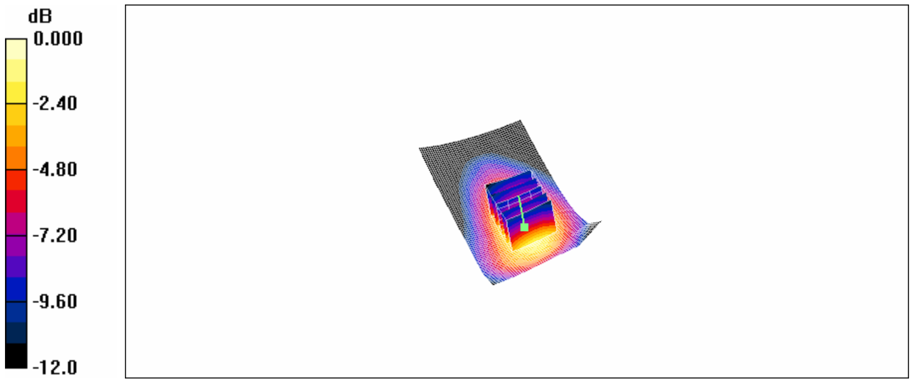
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 825 MHz; σ = 0.865 mho/m; ε_r = 41.2; ρ = 1000 kg/m^3
Phantom section: Left Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.85, 6.85, 6.85); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

Left touch 128/Area Scan (51x81x1): Measurement grid: dx = 15 mm, dy = 15 mm
Maximum value of SAR (interpolated) = 0.291 mW/g

Left touch 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx = 8 mm, dy =8 mm, dz = 5 mm
Reference Value = 17.4 V/m; Power Drift = 0.069 dB
Peak SAR (extrapolated) = 0.419 W/kg
SAR(1 g) = 0.261 mW/g; SAR(10 g) = 0.163 mW/g
Maximum value of SAR (measured) = 0.287 mW/g



0 dB = 0.287mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.878 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Left Section ;Measurement SW: DASY4, V4.6 Build 23

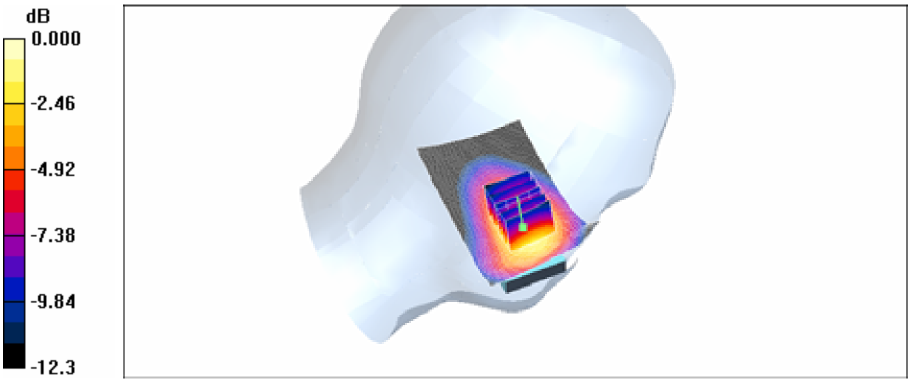
DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.85, 6.85, 6.85); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

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

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.267 mW/g

Left touch 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx = 8 mm, dy = 8 mm, dz = 5 mm
Reference Value = 17.0 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 0.399 W/kg
SAR(1 g) = 0.246 mW/g; SAR(10 g) = 0.153 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.273 mW/g



0 dB = 0.273mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900) GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007

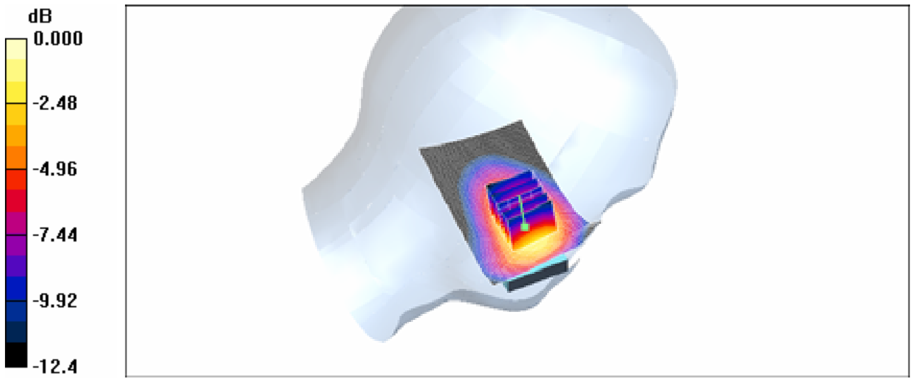
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 850 MHz; σ = 0.891 mho/m; ε_r = 41; ρ = 1000 kg/m^3
Phantom section: Left Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.85, 6.85, 6.85); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

Left touch 251/Area Scan (51x81x1): Measurement grid: dx = 15 mm, dy = 15 mm
Maximum value of SAR (interpolated) = 0.277 mW/g

Left touch 251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx = 8 mm, dy = 8 mm, dz = 5 mm
Reference Value = 16.6 V/m; Power Drift = 0.072 dB
Peak SAR (extrapolated) = 0.401 W/kg
SAR(1 g) = 0.249 mW/g; SAR(10 g) = 0.154 mW/g
Maximum value of SAR (measured) = 0.277 mW/g



0 dB = 0.277mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900) GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007

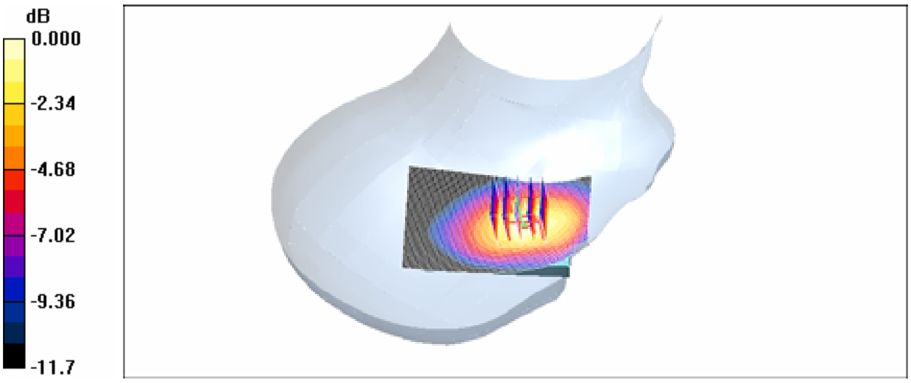
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 825 MHz; σ = 0.865 mho/m; ε_r = 41.2; ρ = 1000 kg/m^3
Phantom section: Right Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.85, 6.85, 6.85); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

Right touch 128/Area Scan (51x81x1): Measurement grid: dx = 15 mm, dy = 15 mm
Maximum value of SAR (interpolated) = 0.326 mW/g

Right touch 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx = 8 mm, dy = 8 mm, dz = 5 mm
Reference Value = 19.6 V/m; Power Drift = -0.161 dB
Peak SAR (extrapolated) = 0.504 W/kg
SAR(1 g) = 0.310 mW/g; SAR(10 g) = 0.189 mW/g
Maximum value of SAR (measured) = 0.337 mW/g



0 dB = 0.337mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.878 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Right Section ;Measurement SW: DASY4, V4.6 Build 23

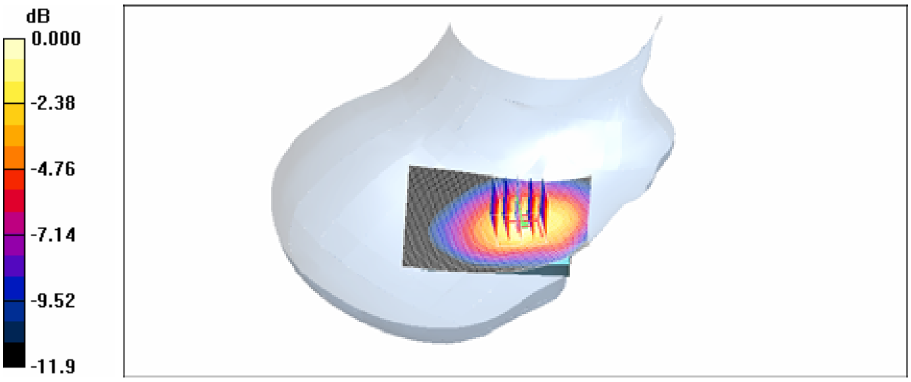
DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.85, 6.85, 6.85); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

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

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.287 mW/g

Right touch 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx = 8 mm, dy = 8 mm, dz = 5 mm
Reference Value = 17.9 V/m; Power Drift = 0.050 dB
Peak SAR (extrapolated) = 0.466 W/kg
SAR(1 g) = 0.281 mW/g; SAR(10 g) = 0.170 mW/g

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



0 dB = 0.309mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007

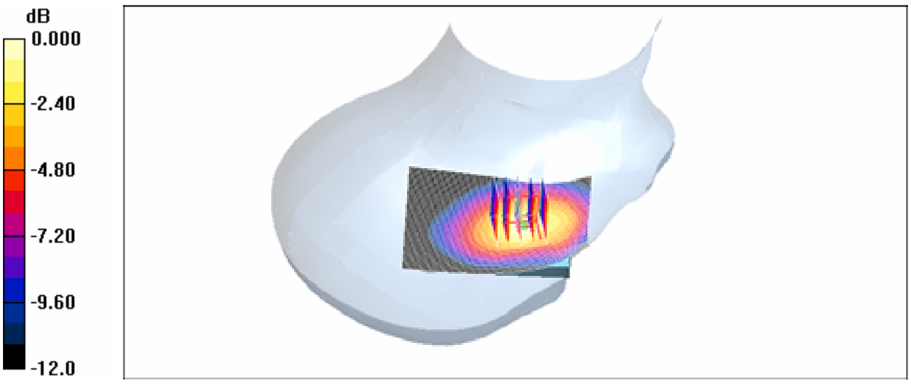
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 850 MHz; σ = 0.891 mho/m; ε_r = 41; ρ = 1000 kg/m^3
Phantom section: Right Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.85, 6.85, 6.85); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

Right touch 251/Area Scan (51x81x1): Measurement grid: dx = 15 mm, dy = 15 mm
Maximum value of SAR (interpolated) = 0.292 mW/g

Right touch 251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx = 8 mm, dy = 8 mm, dz = 5 mm
Reference Value = 17.8 V/m; Power Drift = 0.027 dB
Peak SAR (extrapolated) = 0.467 W/kg
SAR(1 g) = 0.282 mW/g; SAR(10 g) = 0.169 mW/g
Maximum value of SAR (measured) = 0.314 mW/g



0 dB = 0.314mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007
Option	Bluetooth

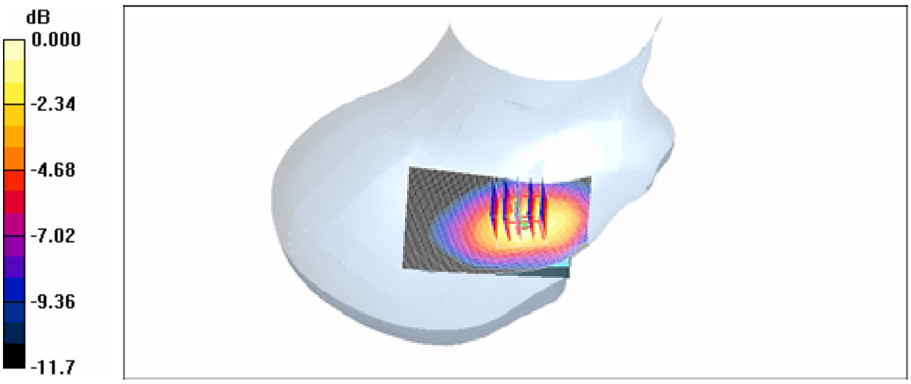
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 825 MHz; σ = 0.865 mho/m; ε_r = 41.2; ρ = 1000 kg/m^3
Phantom section: Right Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.85, 6.85, 6.85); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

Right touch 128/Area Scan (51x81x1): Measurement grid: dx=15 mm, dy = 15mm
Maximum value of SAR (interpolated) = 0.312 mW/g

Right touch 128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx = 8 mm, dy = 8 mm, dz = 5mm
Reference Value = 19.1 V/m; Power Drift = -0.121 dB
Peak SAR (extrapolated) = 0.488 W/kg
SAR(1 g) = 0.297 mW/g; SAR(10 g) = 0.182 mW/g
Maximum value of SAR (measured) = 0.325 mW/g



0 dB = 0.325mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.878 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Left Section ;Measurement SW: DASY4, V4.6 Build 23

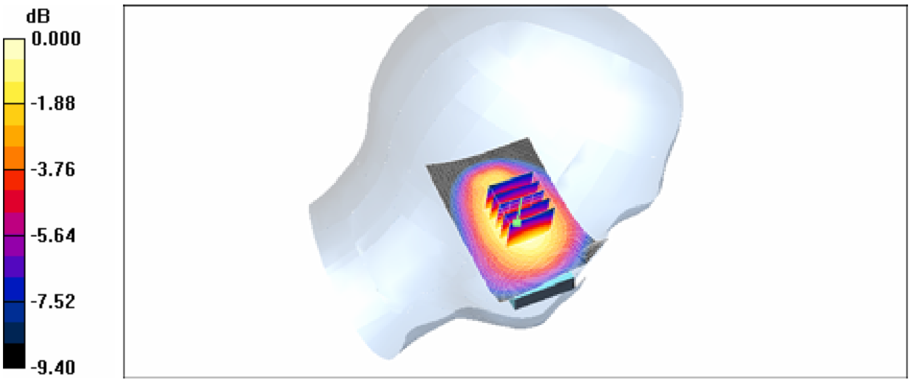
DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.85, 6.85, 6.85); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

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) = 0.090 mW/g

Left tilt 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.56 V/m; Power Drift = 0.041 dB
Peak SAR (extrapolated) = 0.113 W/kg
SAR(1 g) = 0.085 mW/g; SAR(10 g) = 0.061 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.091 mW/g



0 dB = 0.091mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900) GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.878 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Right Section ;Measurement SW: DASY4, V4.6 Build 23

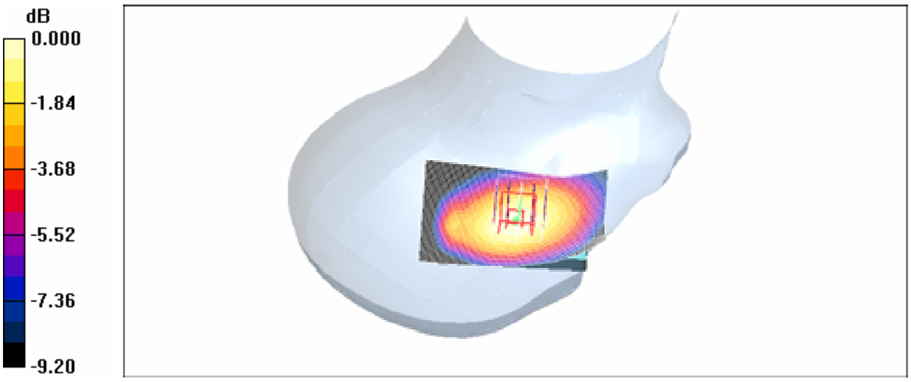
DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.85, 6.85, 6.85); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

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) = 0.101 mW/g

Right tilt 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.32 V/m; Power Drift = -0.039 dB
Peak SAR (extrapolated) = 0.123 W/kg
SAR(1 g) = 0.095 mW/g; SAR(10 g) = 0.068 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.100 mW/g



0 dB = 0.100mW/g

Test Laboratory: HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type: Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.6 ℃
Ambient Temperature: 21.8 ℃
Test Date: Mar.20, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.4 mho/m; ε_r = 39.5; ρ = 1000 kg/m^3
Phantom section: Left Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(5.16, 5.16, 5.16); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

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

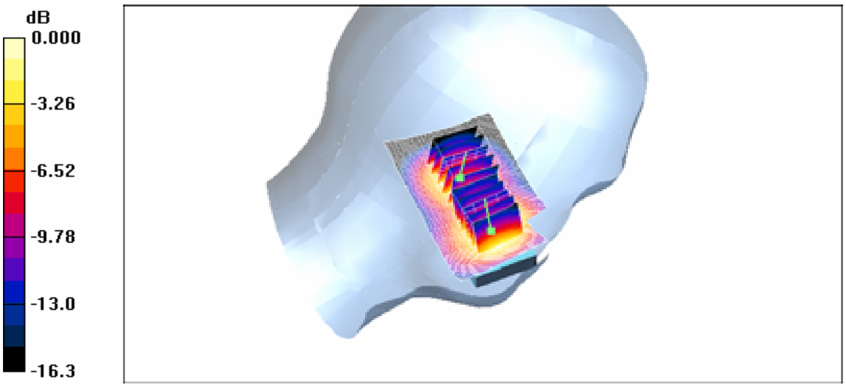
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.805 mW/g

Left touch 512/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.6 V/m; Power Drift = -0.119 dB
Peak SAR (extrapolated) = 0.668 W/kg
SAR(1 g) = 0.477 mW/g; SAR(10 g) = 0.295 mW/g

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

Left touch 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.6 V/m; Power Drift = -0.119 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.691 mW/g; SAR(10 g) = 0.411 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.763 mW/g



0 dB = 0.763mW/g

Test Laboratory: HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type: Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.6 ℃
Ambient Temperature: 21.8 ℃
Test Date: Mar.20, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

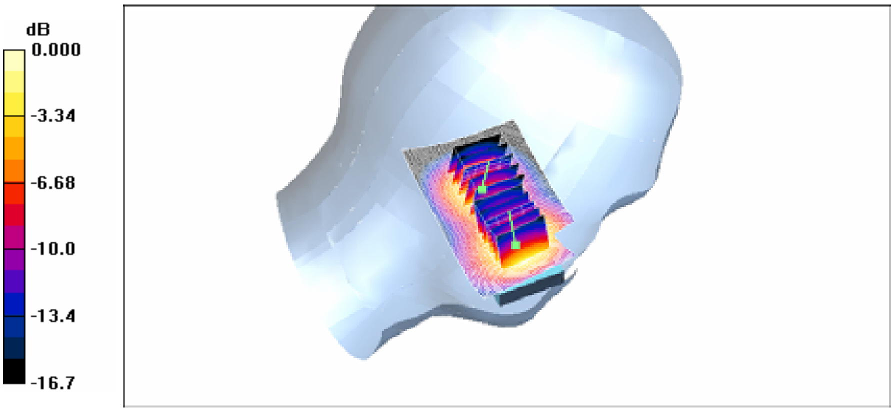
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.42 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3
Phantom section: Left Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(5.16, 5.16, 5.16); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.852 mW/g

Left touch 661/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.8 V/m; Power Drift = -0.003 dB
Peak SAR (extrapolated) = 0.648 W/kg
SAR(1 g) = 0.453 mW/g; SAR(10 g) = 0.277 mW/g
Maximum value of SAR (measured) = 0.496 mW/g

Left touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.8 V/m; Power Drift = -0.003 dB
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.728 mW/g; SAR(10 g) = 0.425 mW/g
Maximum value of SAR (measured) = 0.805 mW/g



0 dB = 0.805mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.6 ℃
Ambient Temperature:	21.8 ℃
Test Date:	Mar.20, 2007

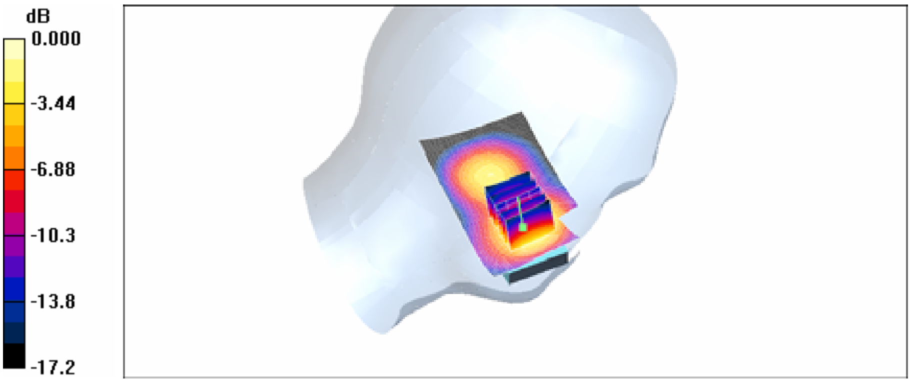
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.46 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3
Phantom section: Left Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(5.16, 5.16, 5.16); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 810/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.727 mW/g

Left touch 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.7 V/m; Power Drift = -0.068 dB
Peak SAR (extrapolated) = 0.997 W/kg
SAR(1 g) = 0.621 mW/g; SAR(10 g) = 0.357 mW/g
Maximum value of SAR (measured) = 0.687 mW/g



0 dB = 0.687mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.6 ℃
Ambient Temperature:	21.8 ℃
Test Date:	Mar.20, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.4 mho/m; ε_r = 39.5; ρ = 1000 kg/m^3
Phantom section: Right Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(5.16, 5.16, 5.16); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

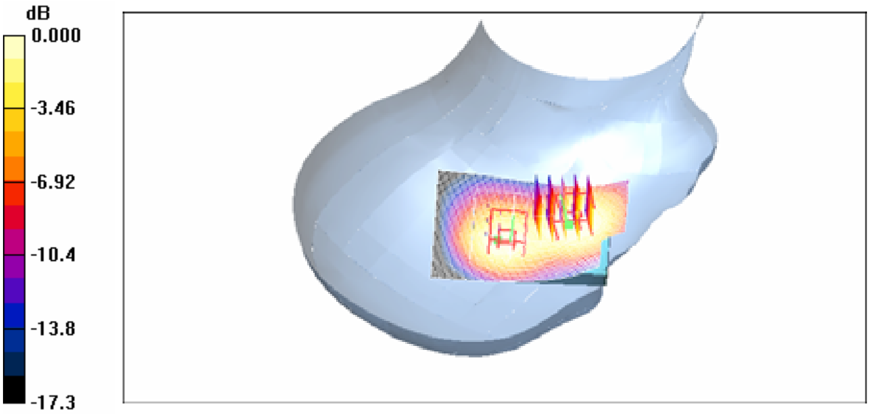
Right touch 512/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.762 mW/g

Right touch 512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.8 V/m; Power Drift = -0.056 dB
Peak SAR (extrapolated) = 0.958 W/kg
SAR(1 g) = 0.665 mW/g; SAR(10 g) = 0.404 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
aximum value of SAR (measured) = 0.717 mW/g
Right touch 512/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.8 V/m; Power Drift = -0.056 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.718 mW/g; SAR(10 g) = 0.429 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.776 mW/g



0 dB = 0.776mW/g

Test Laboratory: HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type: Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.6 ℃
Ambient Temperature: 21.8 ℃
Test Date: Mar.20, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

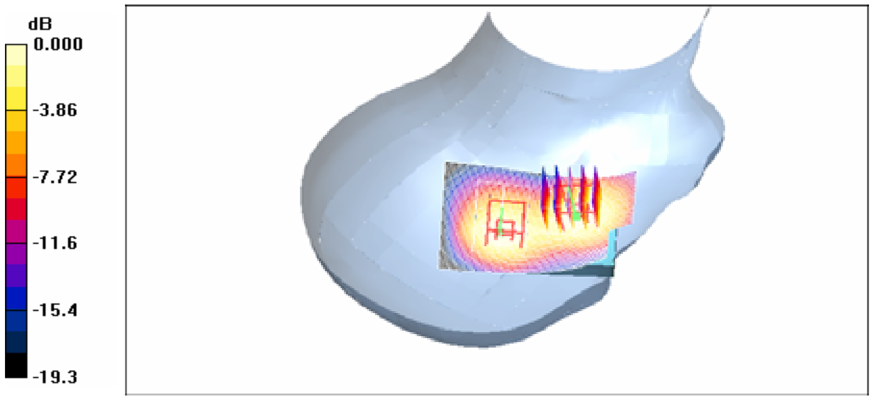
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.42 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3
Phantom section: Right Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(5.16, 5.16, 5.16); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.810 mW/g

Right touch 661/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.3 V/m; Power Drift = -0.153 dB
Peak SAR (extrapolated) = 0.978 W/kg
SAR(1 g) = 0.623 mW/g; SAR(10 g) = 0.368 mW/g
Maximum value of SAR (measured) = 0.668 mW/g

Right touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.3 V/m; Power Drift = -0.153 dB
Peak SAR (extrapolated) = 0.975 W/kg
SAR(1 g) = 0.655 mW/g; SAR(10 g) = 0.388 mW/g
Maximum value of SAR (measured) = 0.710 mW/g



0 dB = 0.710mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900) GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.6 ℃
Ambient Temperature:	21.8 ℃
Test Date:	Mar.20, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

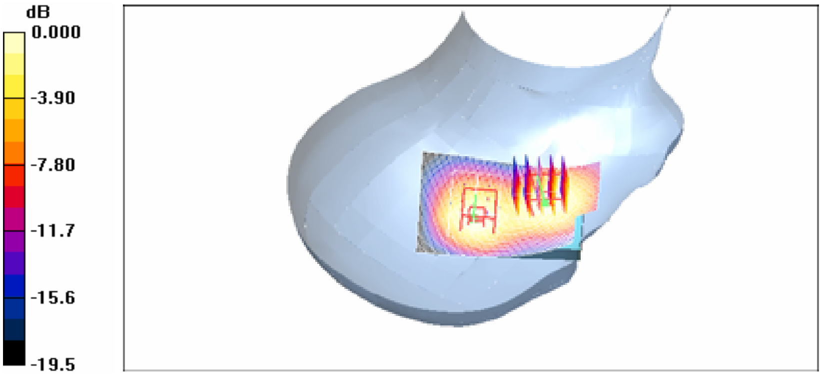
Communication System: GSM 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.46 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3
Phantom section: Right Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(5.16, 5.16, 5.16); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right touch 810/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.807 mW/g

Right touch 810/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.1 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.645 mW/g; SAR(10 g) = 0.380 mW/g
Maximum value of SAR (measured) = 0.697 mW/g

Right touch 810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.1 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.672 mW/g; SAR(10 g) = 0.396 mW/g
Maximum value of SAR (measured) = 0.737 mW/g



0 dB = 0.737mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900) GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.6 ℃
Ambient Temperature:	21.8 ℃
Test Date:	Mar.20, 2007
Option	Bluetooth

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

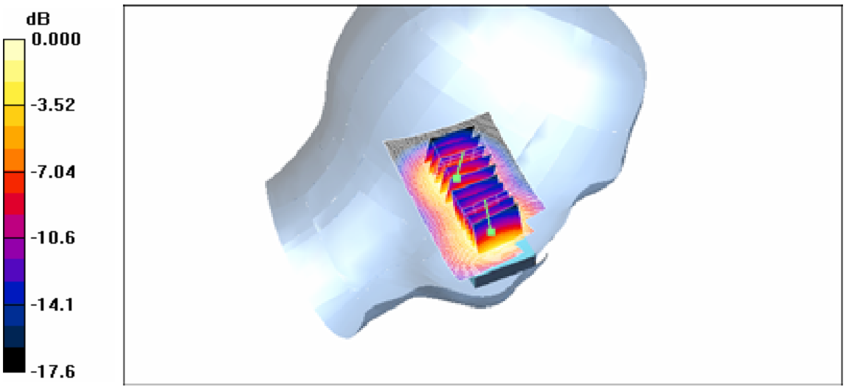
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.42 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3
Phantom section: Left Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(5.16, 5.16, 5.16); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.742 mW/g

Left touch 661/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.7 V/m; Power Drift = -0.107 dB
Peak SAR (extrapolated) = 0.760 W/kg
SAR(1 g) = 0.529 mW/g; SAR(10 g) = 0.322 mW/g
Maximum value of SAR (measured) = 0.568 mW/g

Left touch 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.7 V/m; Power Drift = -0.107 dB
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.644 mW/g; SAR(10 g) = 0.376 mW/g
Maximum value of SAR (measured) = 0.704 mW/g



0 dB = 0.704mW/g

Test Laboratory: HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type: Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.6 ℃
Ambient Temperature: 21.8 ℃
Test Date: Mar.20, 2007

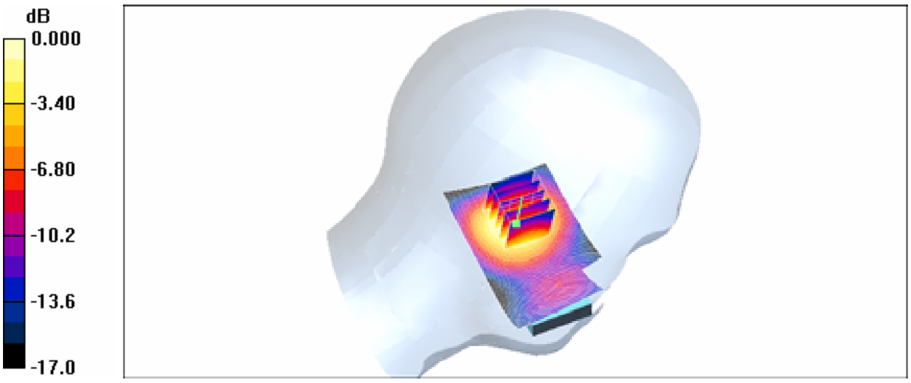
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.42 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3
Phantom section: Left Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(5.16, 5.16, 5.16); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left tilt 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.403 mW/g

Left tilt 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.52 V/m; Power Drift = 0.069 dB
Peak SAR (extrapolated) = 0.494 W/kg
SAR(1 g) = 0.337 mW/g; SAR(10 g) = 0.206 mW/g
Maximum value of SAR (measured) = 0.365 mW/g



0 dB = 0.365mW/g

Test Laboratory: HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type: Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.6 ℃
Ambient Temperature: 21.8 ℃
Test Date: Mar.20, 2007

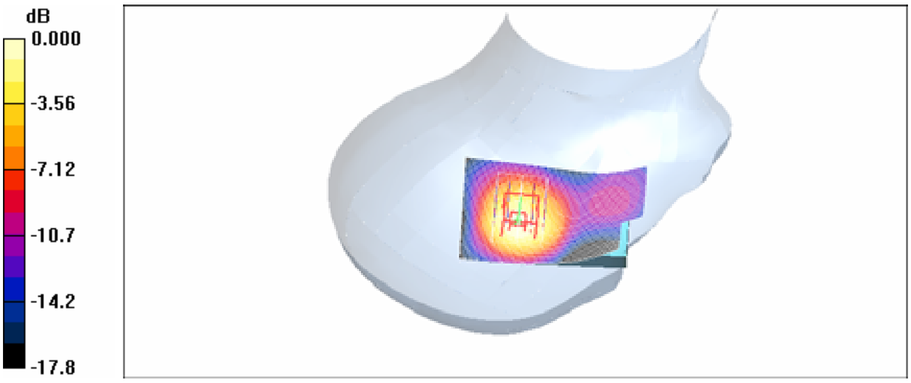
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.42 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3
Phantom section: Right Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(5.16, 5.16, 5.16); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

Right tilt 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.495 mW/g

Right tilt 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.04 V/m; Power Drift = 0.023 dB
Peak SAR (extrapolated) = 0.650 W/kg
SAR(1 g) = 0.421 mW/g; SAR(10 g) = 0.249 mW/g
Maximum value of SAR (measured) = 0.462 mW/g



0 dB = 0.462mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900) GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.991 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ;Measurement SW: DASY4, V4.6 Build 23

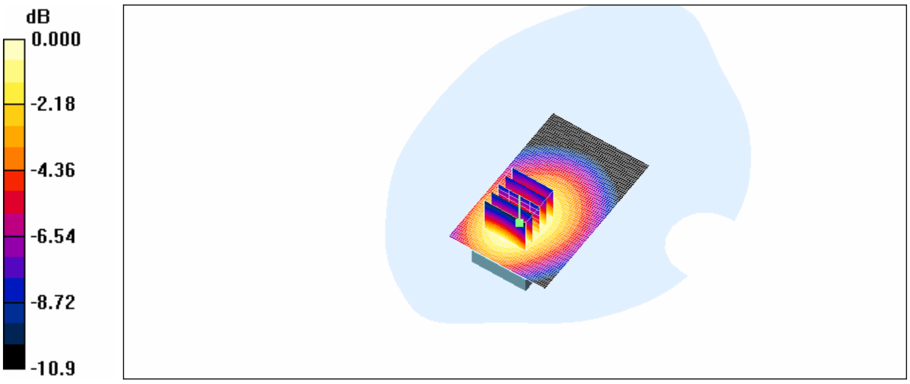
DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.42, 6.42, 6.42); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

GSM850 Body 190/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.143 mW/g

GSM850 Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.88 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 0.181 W/kg
SAR(1 g) = 0.131 mW/g; SAR(10 g) = 0.091 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.140 mW/g



0 dB = 0.140mW/g

Test Laboratory: HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type: Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Mar.19, 2007
Option Bluetooth

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.991 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ;Measurement SW: DASY4, V4.6 Build 23

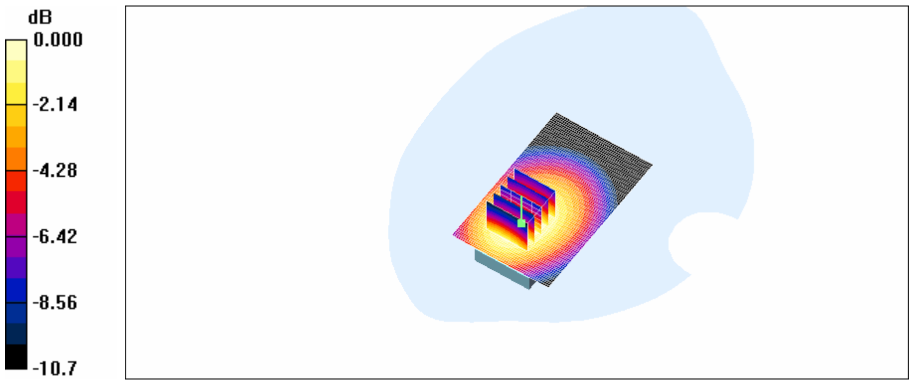
DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.42, 6.42, 6.42); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

GSM850 Body 190/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.126 mW/g

GSM850 Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.31 V/m; Power Drift = 0.098 dB
Peak SAR (extrapolated) = 0.155 W/kg
SAR(1 g) = 0.115 mW/g; SAR(10 g) = 0.081 mW/g

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



0 dB = 0.121mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007
Option	GPRS

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:2
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.991 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ;Measurement SW: DASY4, V4.6 Build 23

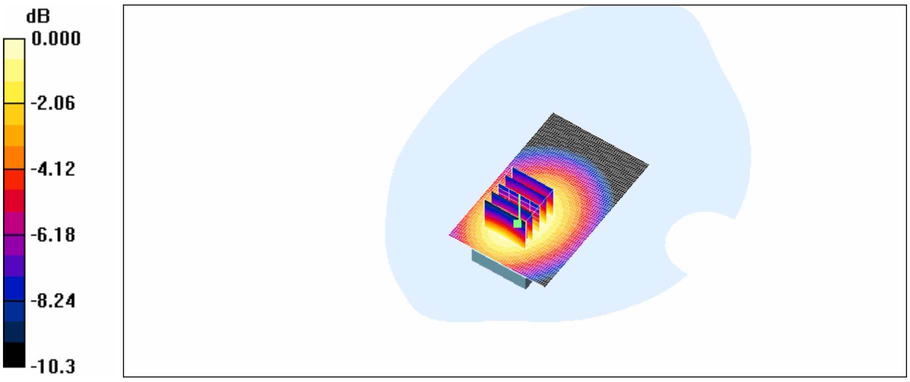
DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.42, 6.42, 6.42); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

GSM850 Body 190/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.113 mW/g

GSM850 Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.28 V/m; Power Drift = -0.004 dB
Peak SAR (extrapolated) = 0.138 W/kg
SAR(1 g) = 0.104 mW/g; SAR(10 g) = 0.073 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.111 mW/g



0 dB = 0.111mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900) GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007
Option	Front

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.991 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ;Measurement SW: DASY4, V4.6 Build 23

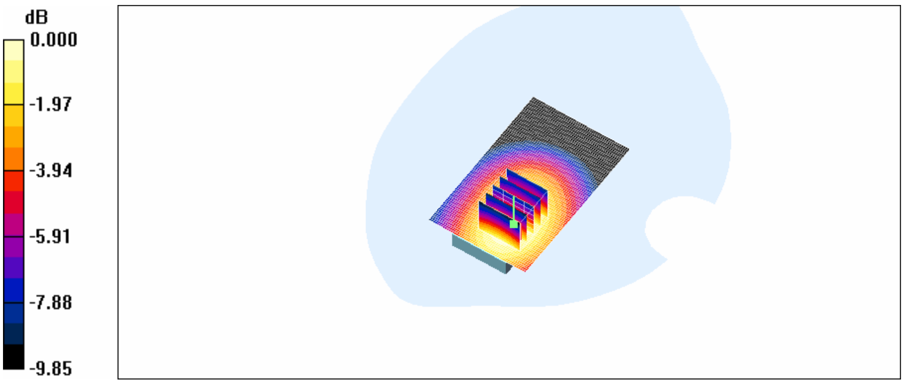
DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.42, 6.42, 6.42); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

GSM850 Body 190/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.093 mW/g

GSM850 Body 190/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.25 V/m; Power Drift = -0.130 dB
Peak SAR (extrapolated) = 0.115 W/kg
SAR(1 g) = 0.085 mW/g; SAR(10 g) = 0.059 mW/g

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



0 dB = 0.090mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.6 ℃
Ambient Temperature:	21.8 ℃
Test Date:	Mar.20, 2007

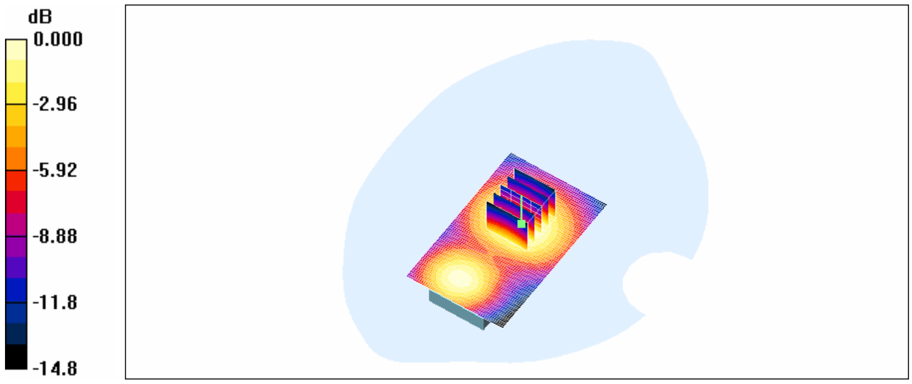
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(4.63, 4.63, 4.63); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

GSM1900 Body 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.210 mW/g

GSM1900 Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = -0.002 dB
Peak SAR (extrapolated) = 0.276 W/kg
SAR(1 g) = 0.184 mW/g; SAR(10 g) = 0.114 mW/g
Maximum value of SAR (measured) = 0.199 mW/g



0 dB = 0.199mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.6 ℃
Ambient Temperature:	21.8 ℃
Test Date:	Mar.20, 2007
Option	Bluetooth

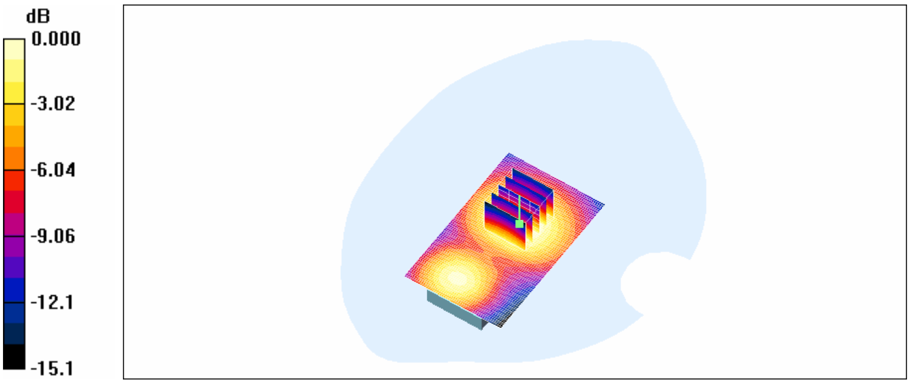
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(4.63, 4.63, 4.63); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

GSM1900 Body 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.183 mW/g

GSM1900 Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.1 V/m; Power Drift = -0.011 dB
Peak SAR (extrapolated) = 0.238 W/kg
SAR(1 g) = 0.160 mW/g; SAR(10 g) = 0.100 mW/g
Maximum value of SAR (measured) = 0.173 mW/g



0 dB = 0.173mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900) GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.6 ℃
Ambient Temperature:	21.8 ℃
Test Date:	Mar.20, 2007
Option	GPRS

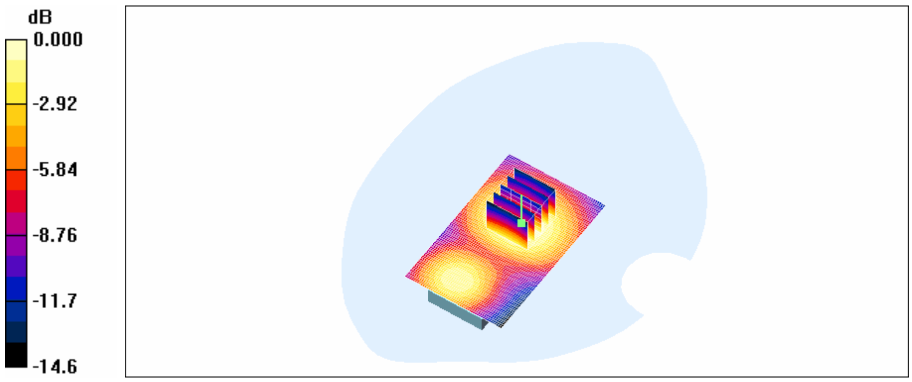
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(4.63, 4.63, 4.63); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

GSM1900 Body 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.147 mW/g

GSM1900 Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.28 V/m; Power Drift = -0.013 dB
Peak SAR (extrapolated) = 0.195 W/kg
SAR(1 g) = 0.131 mW/g; SAR(10 g) = 0.083 mW/g
Maximum value of SAR (measured) = 0.142 mW/g



0 dB = 0.142mW/g

Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900) GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.6 ℃
Ambient Temperature:	21.8 ℃
Test Date:	Mar.20, 2007
Option	Front

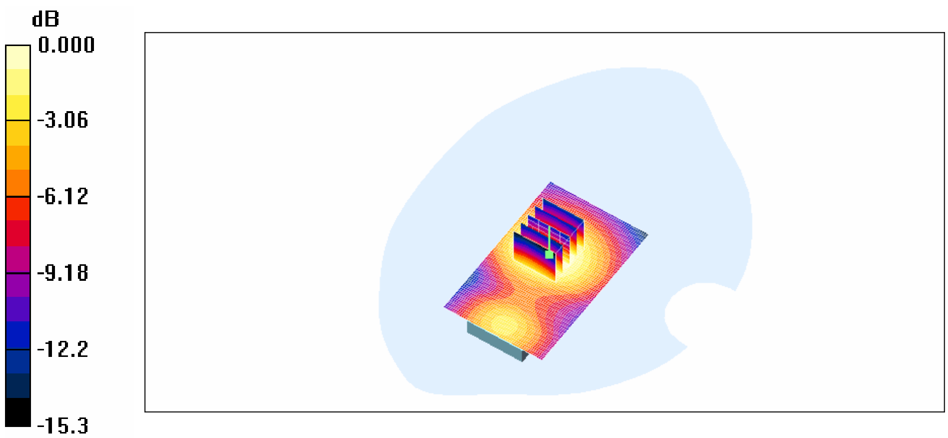
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(4.63, 4.63, 4.63); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

GSM1900 Body 661/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.155 mW/g

GSM1900 Body 661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.82 V/m; Power Drift = 0.149 dB
Peak SAR (extrapolated) = 0.210 W/kg
SAR(1 g) = 0.139 mW/g; SAR(10 g) = 0.087 mW/g
Maximum value of SAR (measured) = 0.147 mW/g



0 dB = 0.147mW/g

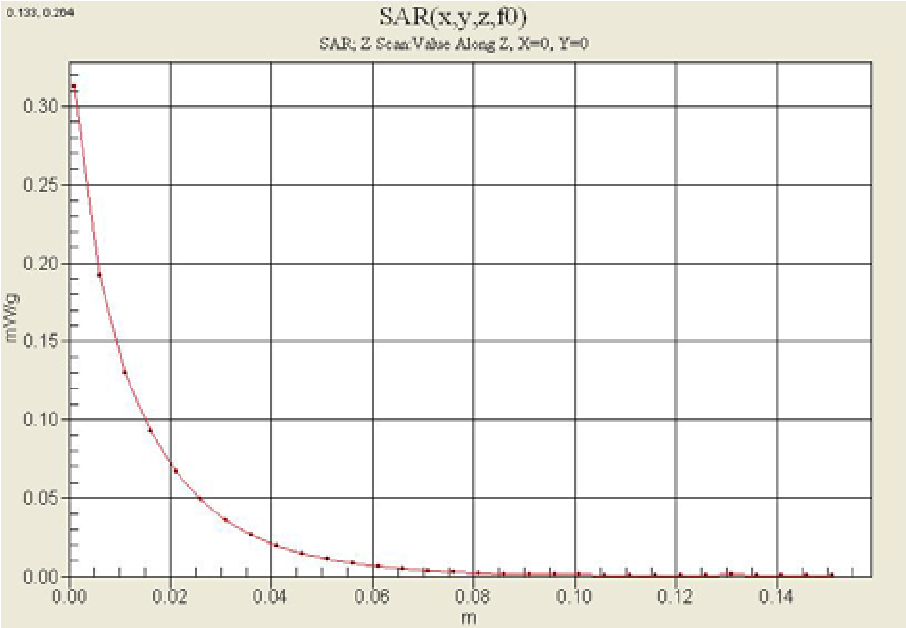
Test Laboratory: HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type: Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature: 21.4 ℃
Ambient Temperature: 21.6 ℃
Test Date: Mar.19, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 825 MHz; σ = 0.865 mho/m; ε_r = 41.2; ρ = 1000 kg/m^3
Phantom section: Right Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.85, 6.85, 6.85); Calibrated: 2006-03-23
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

Right touch 128/Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.313 mW/g



Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.4 ℃
Ambient Temperature:	21.6 ℃
Test Date:	Mar.19, 2007

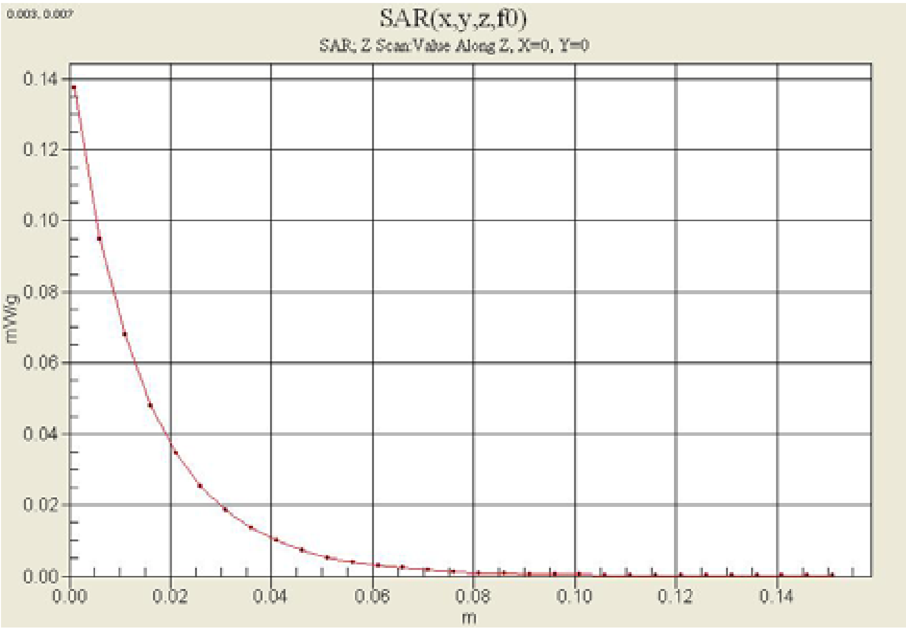
DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 836.6 MHz; σ = 0.991 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Phantom section: Flat Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.42, 6.42, 6.42); Calibrated: 2006-03-23
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

GSM850 Body 190/Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.137 mW/g



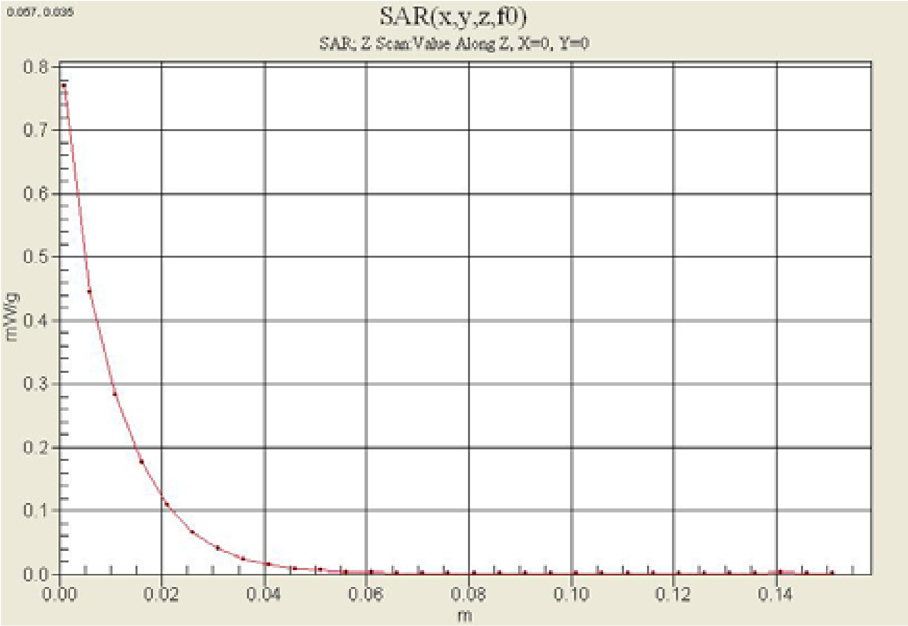
Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900) GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.6 ℃
Ambient Temperature:	21.8 ℃
Test Date:	Mar.20, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.42 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3
Phantom section: Left Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(5.16, 5.16, 5.16); Calibrated: 2006-03-23
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

Left touch 661/Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.771 mW/g



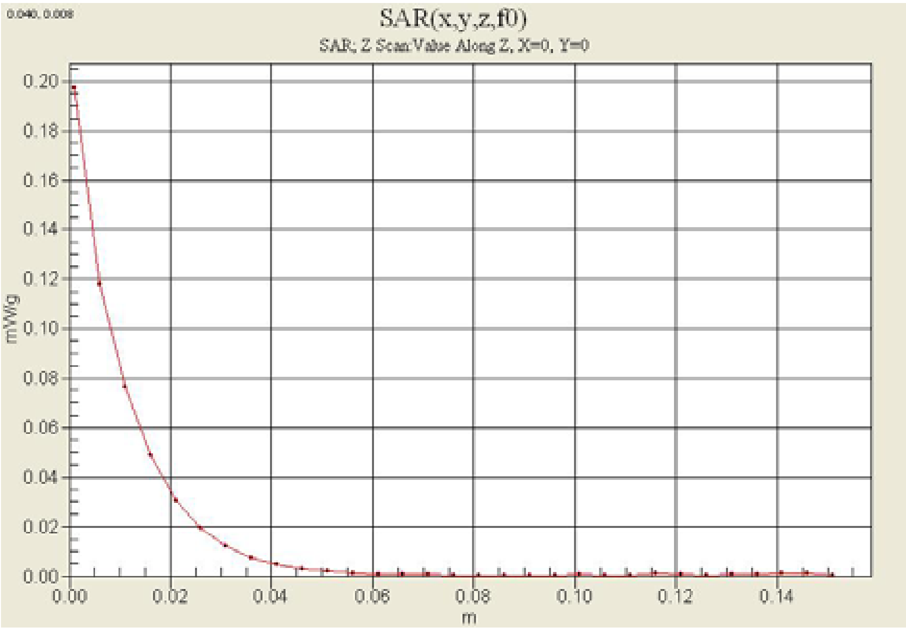
Test Laboratory:	HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD
EUT Type:	Tri-Band GSM Phone with Bluetooth (GSM850/ DCS1800/ PCS1900)
	GPRS Class 12 and GPRS mode class B(GPRS and GSM, but not simultaneously)
Liquid Temperature:	21.6 ℃
Ambient Temperature:	21.8 ℃
Test Date:	Mar.20, 2007

DUT: NEON7; Type: BAR; Serial: #1
Program Name: NEON7

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 52.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(4.63, 4.63, 4.63); Calibrated: 2006-03-23
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

GSM1900 Body 661/Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 0.197 mW/g



Attachment 2. – Dipole Validation Plots

■ Validation Data (835 MHz Head)

Test Laboratory: HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD

Input Power: 1W (30dBm)

Liquid Temp: 21.4 ℃

Test Date: Mar.19, 2007

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

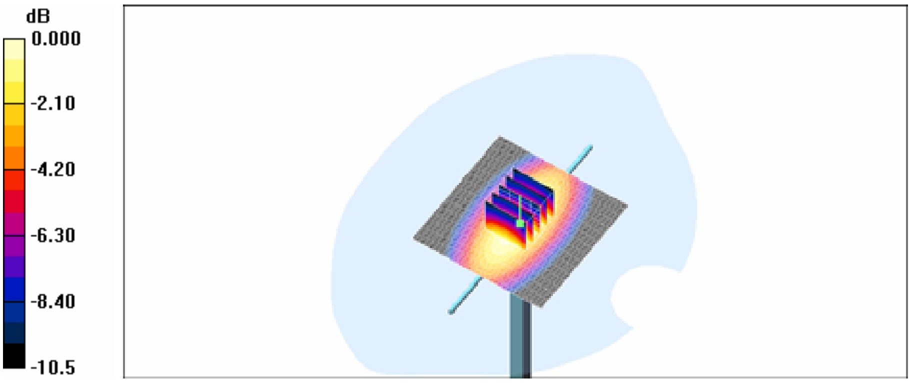
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium parameters used: f = 835 MHz; σ = 0.876 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(6.85, 6.85, 6.85); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 835/900 MHz; Type: SAM

Validatoin 835 MHz/Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 10.3 mW/g

Validatoin 835 MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 111.9 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 13.9 W/kg
SAR(1 g) = 9.43 mW/g; SAR(10 g) = 6.17 mW/g
Maximum value of SAR (measured) = 10.3 mW/g



0 dB = 10.3mW/g

■ Validation Data (1900 MHz Head)

Test Laboratory: HYUNDAI CALIBRATION & CERTIFICATION TECHNOLOGIES CO., LTD

Input Power 1W (30dBm)

Liquid Temp: 21.6

Test Date: Mar.20, 2007

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

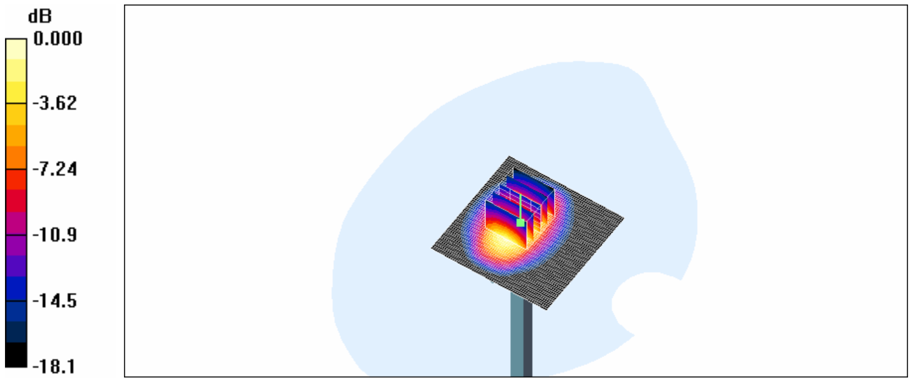
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.45 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3
Phantom section: Flat Section ;Measurement SW: DASY4, V4.6 Build 23

DASY4 Configuration:
- Probe: ET3DV6 - SN1609; ConvF(5.16, 5.16, 5.16); Calibrated: 2006-03-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn466; Calibrated: 2007-01-25
- Phantom: SAM 1800/1900 MHz; Type: SAM

Validation 1900MHz/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 49.8 mW/g

Validation 1900MHz/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 177.3 V/m; Power Drift = -0.008 dB
Peak SAR (extrapolated) = 72.6 W/kg
SAR(1 g) = 40.9 mW/g; SAR(10 g) = 21.5 mW/g
Maximum value of SAR (measured) = 45.4 mW/g



0 dB = 45.4mW/g

■ Dielectric Parameter (835 MHz Head)

Title	NEON7
SubTitle	GSM850(Head)
Test Date	Mar.19, 2007

Frequency	e'	e''
800000000	41.5439	18.8737
805000000	41.4386	18.8441
810000000	41.3701	18.8267
815000000	41.3127	18.8066
820000000	41.2581	18.8127
825000000	41.2299	18.8539
830000000	41.1481	18.8305
835000000	41.1371	18.8508
840000000	41.0837	18.9035
845000000	41.1061	18.8516
850000000	41.0381	18.8460
855000000	40.9900	18.9070
860000000	40.9634	18.8591
865000000	40.9493	18.8895
870000000	40.9091	18.8967
875000000	40.8961	18.8556
880000000	40.7876	18.8475
885000000	40.7048	18.8374
890000000	40.6356	18.8187
895000000	40.6135	18.7718
900000000	40.4995	18.7128

■ Dielectric Parameter (835 MHz Body)

Title	NEON7
SubTitle	GSM850(Body)
Test Date	Mar.19, 2007

Frequency	e'	e''
800000000	53.7467	21.4011
805000000	53.7146	21.3879
810000000	53.6598	21.3716
815000000	53.6425	21.3310
820000000	53.5500	21.3285
825000000	53.4904	21.3202
830000000	53.4586	21.3242
835000000	53.4056	21.2973
840000000	53.3502	21.2606
845000000	53.3799	21.2151
850000000	53.3138	21.2047
855000000	53.3086	21.1504
860000000	53.2741	21.1612
865000000	53.2087	21.1726
870000000	53.1761	21.0970
875000000	53.1181	21.1221
880000000	53.1033	21.0619
885000000	53.0776	21.0273
890000000	53.0177	21.0112
895000000	53.0040	21.0039
900000000	52.9385	20.9956

■ Dielectric Parameter (1900 MHz Head)

Title	NEON7
SubTitle	GSM1900(Head)
Test Date	Mar.20, 2007

Frequency	e'	e''
1800000000	39.7845	13.4846
1810000000	39.7629	13.5022
1820000000	39.7203	13.5234
1830000000	39.6421	13.5092
1840000000	39.5992	13.5552
1850000000	39.5287	13.5643
1860000000	39.4540	13.5884
1870000000	39.4129	13.6308
1880000000	39.3840	13.6238
1890000000	39.3291	13.6543
1900000000	39.3009	13.7156
1910000000	39.3122	13.7339
1920000000	39.2520	13.7503
1930000000	39.2146	13.7818
1940000000	39.1820	13.7779
1950000000	39.1252	13.8077
1960000000	39.0618	13.8301
1970000000	39.0187	13.8456
1980000000	38.9627	13.8844
1990000000	38.9187	13.8688
2000000000	38.8963	13.9238

■ Dielectric Parameter (1900 MHz Body)

Title	NEON7
SubTitle	GSM1900(Body)
Test Date	Mar.20, 2007

Frequency	e'	e''
1800000000	52.3608	14.4673
181000000090	52.2901	14.5100
182000000090	52.2647	14.5904
183000000089	52.2142	14.6346
184000000089	52.1910	14.6954
185000000089	52.2221	14.7704
186000000089	52.1798	14.7505
187000000088	52.1042	14.7893
188000000088	52.0876	14.7908
189000000088	52.0395	14.7955
190000000088	51.9743	14.8194
191000000087	51.8896	14.8436
192000000087	51.8312	14.8987
193000000087	51.7787	14.9383
194000000087	51.7523	14.9689
195000000086	51.7587	15.0021
196000000086	51.6943	15.0575
197000000086	51.7117	15.1022
198000000086	51.6991	15.1319
199000000085	51.6685	15.1175
200000000085	51.6451	85.4507

Attachment 3. – Probe Calibration Data

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

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **H-CT (Dymstec)**

Certificate No: **ET3-1609_Mar06**

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1609
Calibration procedure(s)	QA CAL-01.v5 and QA CAL-12.v4 Calibration procedure for dosimetric E-field probes
Calibration date:	March 23, 2006
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 E4419B	GB41293874	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41495277	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41498087	3-May-05 (METAS, No. 251-00466)	May-06
Reference 3 dB Attenuator	SN: S5054 (3c)	11-Aug-05 (METAS, No. 251-00499)	Aug-06
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-05 (METAS, No. 251-00467)	May-06
Reference 30 dB Attenuator	SN: S5129 (30b)	11-Aug-05 (METAS, No. 251-00500)	Aug-06
Reference Probe ES3DV2	SN: 3013	2-Jan-06 (SPEAG, No. ES3-3013_Jan06)	Jan-07
DAE4	SN: 654	2-Feb-06 (SPEAG, No. DAE4-654_Feb06)	Feb-07

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-05)	In house check: Nov 06

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

Issued: March 23, 2006

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Certificate No: ET3-1609_Mar06 Page 1 of 9

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	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) 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

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.

Certificate No: ET3-1609_Mar06 Page 2 of 9

Probe ET3DV6

SN:1609

Manufactured:	July 27, 2001
Last calibrated:	September 22, 2004
Recalibrated:	March 23, 2006

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1609 March 23, 2006

DASY - Parameters of Probe: ET3DV6 SN:1609

Sensitivity in Free Space[A]

NormX	**1.88** ± 10.1%	$\mu V/(V/m)^2$
NormY	**1.84** ± 10.1%	$\mu V/(V/m)^2$
NormZ	**1.84** ± 10.1%	$\mu V/(V/m)^2$

Diode Compression[B]

DCP X	**95** mV
DCP Y	**95** mV
DCP Z	**95** mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL **900 MHz** **Typical SAR gradient: 5 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	8.3	4.4
SAR_{be} [%]	With Correction Algorithm	0.1	0.1

TSL **1750 MHz** **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	6.2	3.1
SAR_{be} [%]	With Correction Algorithm	0.2	0.2

Sensor Offset

Probe Tip to Sensor Center **2.7** mm

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

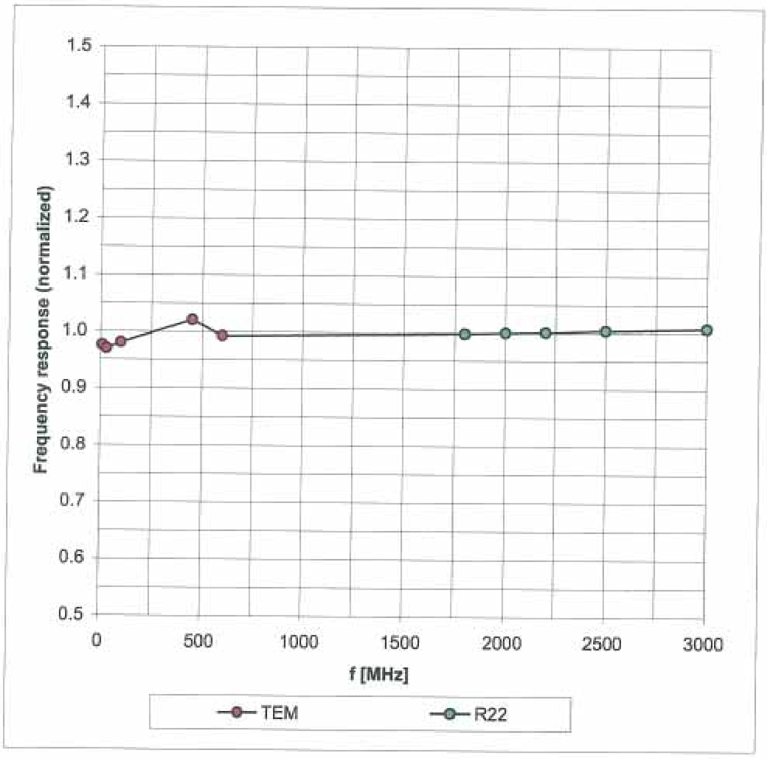
[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).
[B] Numerical linearization parameter: uncertainty not required.

Certificate No: ET3-1609_Mar06 Page 4 of 9

ET3DV6 SN:1609 March 23, 2006

Frequency Response of E-Field

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

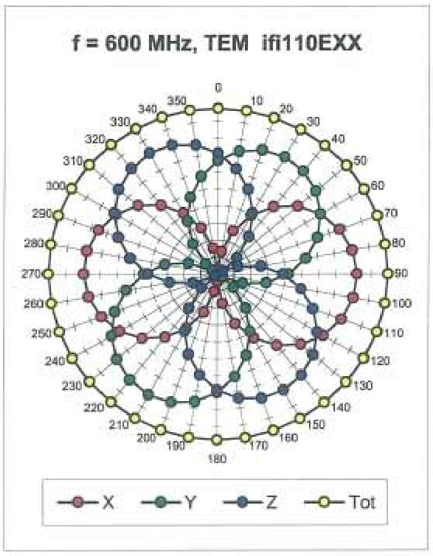


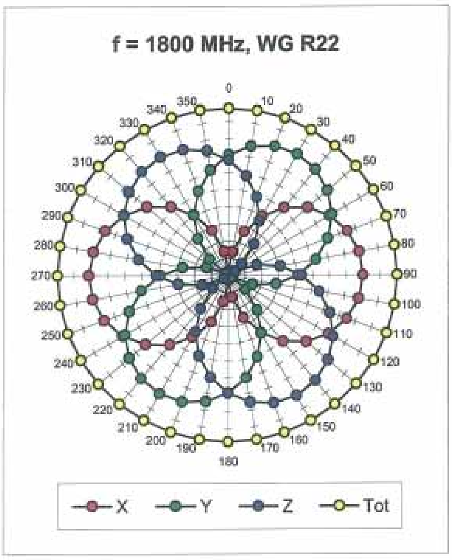
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

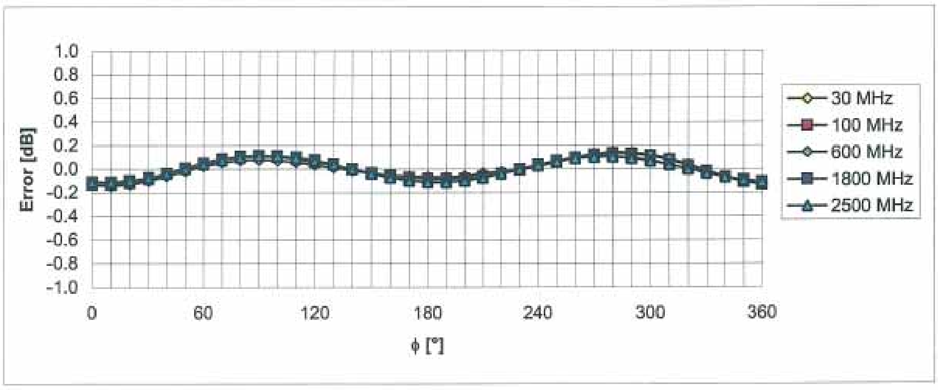
Certificate No: ET3-1609_Mar06 Page 5 of 9

ET3DV6 SN:1609 March 23, 2006

Receiving Pattern (ϕ), $\vartheta = 0°$





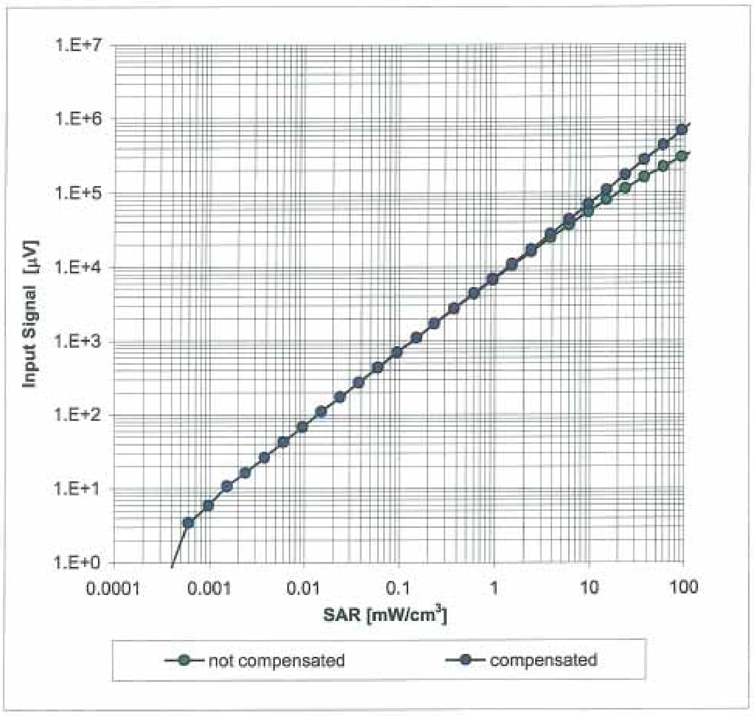


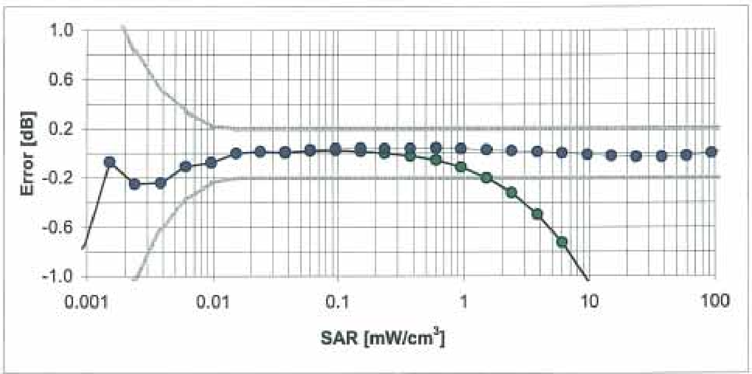
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

ET3DV6 SN:1609 March 23, 2006

Dynamic Range f(SAR_{head})

(Waveguide R22, f = 1800 MHz)



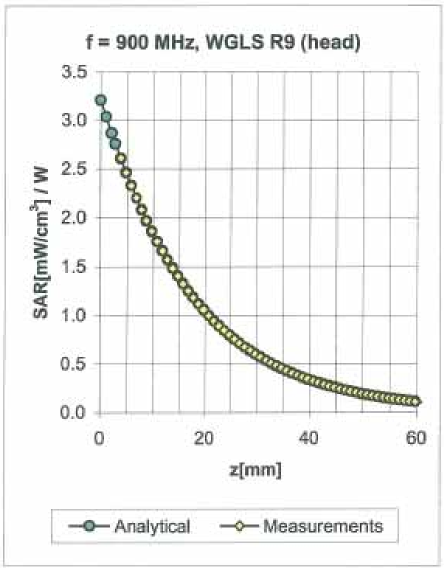


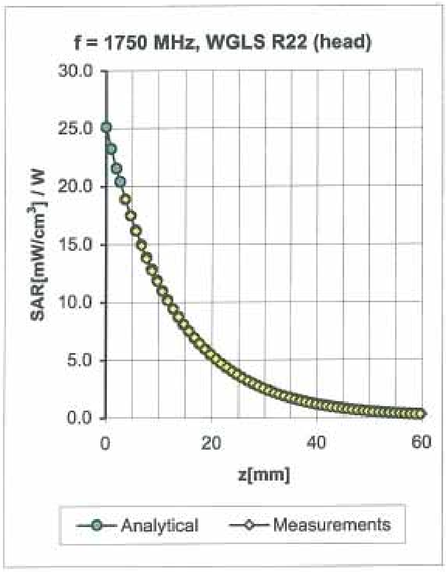
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: ET3-1609_Mar06 Page 7 of 9

ET3DV6 SN:1609 March 23, 2006

Conversion Factor Assessment





f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
450	± 50 / ± 100	Head	43.5 ± 5%	0.87 ± 5%	0.27	3.19	6.82	± 13.3% (k=2)
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.57	1.83	6.85	± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.59	1.81	6.53	± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.48	2.69	5.46	± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.52	2.45	5.16	± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.52	2.43	5.08	± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.60	2.30	4.50	± 11.8% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.24	4.02	7.32	± 13.3% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.47	2.06	6.42	± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.53	2.59	4.80	± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.70	2.19	4.63	± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.62	2.21	4.17	± 11.8% (k=2)

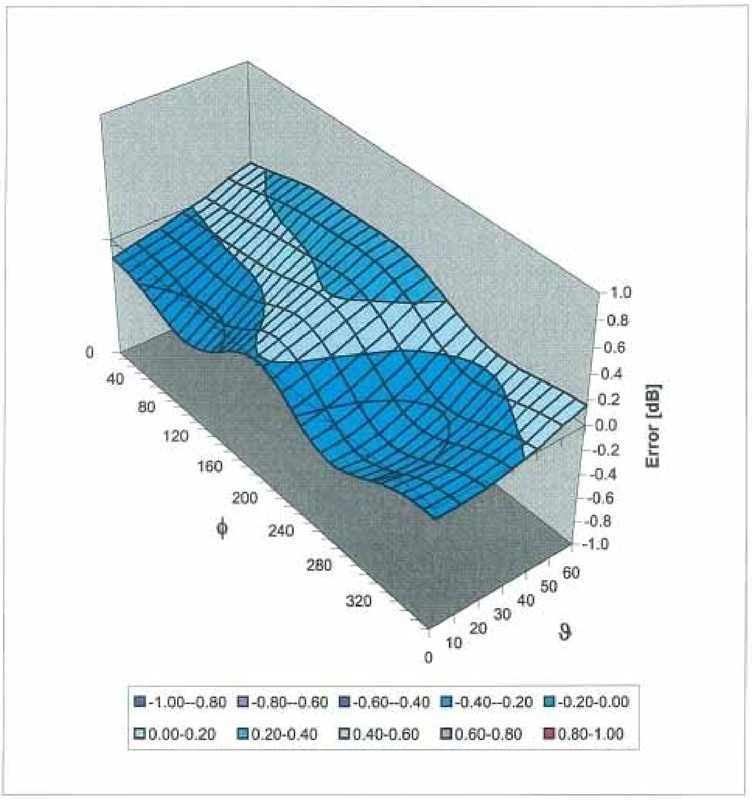
[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

Certificate No: ET3-1609_Mar06 Page 8 of 9

ET3DV6 SN:1609 March 23, 2006

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



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

Certificate No: ET3-1609_Mar06 Page 9 of 9

Attachment 4. – Dipole Calibration Data

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

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **H-CT (Dymstec)**

Certificate No: **D835V2-441_Aug06**

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 441
Calibration procedure(s)	QA CAL-05.v6 Calibration procedure for dipole validation kits
Calibration date:	August 14, 2006
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-05 (METAS, No. 251-00516)	Oct-06
Power sensor HP 8481A	US37292783	04-Oct-05 (METAS, No. 251-00516)	Oct-06
Reference 20 dB Attenuator	SN: 5086 (20g)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference Probe ET3DV6	SN 1507	28-Oct-05 (SPEAG, No. ET3-1507_Oct05)	Oct-06
DAE4	SN 601	15-Dec-05 (SPEAG, No. DAE4-601_Dec05)	Dec-06

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-05)	In house check: Oct-07
RF generator Agilent E4421B	MY41000675	11-May-05 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Nov-05)	In house check: Nov-06

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

Issued: August 17, 2006

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Certificate No: D835V2-441_Aug06 Page 1 of 6

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) 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 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.

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.1 Ω - 6.7 jΩ
Return Loss	- 23.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.376 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

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.1 Ω - 6.7 jΩ
Return Loss	- 23.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.376 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: 14.08.2006 13:00:04

Test Laboratory: SPEAG, Zurich, Switzerland

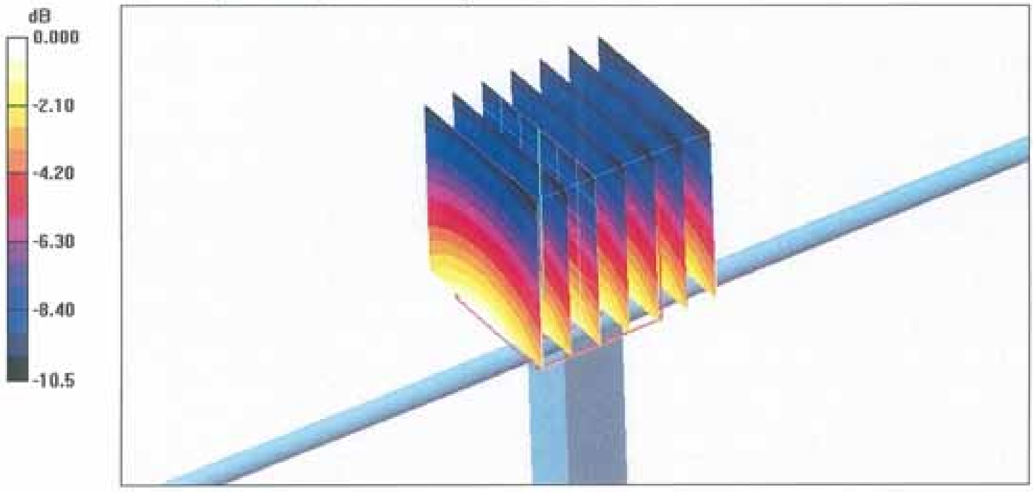
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 441

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL900;
Medium parameters used: f = 835 MHz; σ = 0.9 mho/m; ε_r = 42.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(6.09, 6.09, 6.09); Calibrated: 28.10.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.4 V/m; Power Drift = -0.067 dB
Peak SAR (extrapolated) = 3.50 W/kg
SAR(1 g) = 2.35 mW/g; SAR(10 g) = 1.53 mW/g
Maximum value of SAR (measured) = 2.53 mW/g



0 dB = 2.53mW/g

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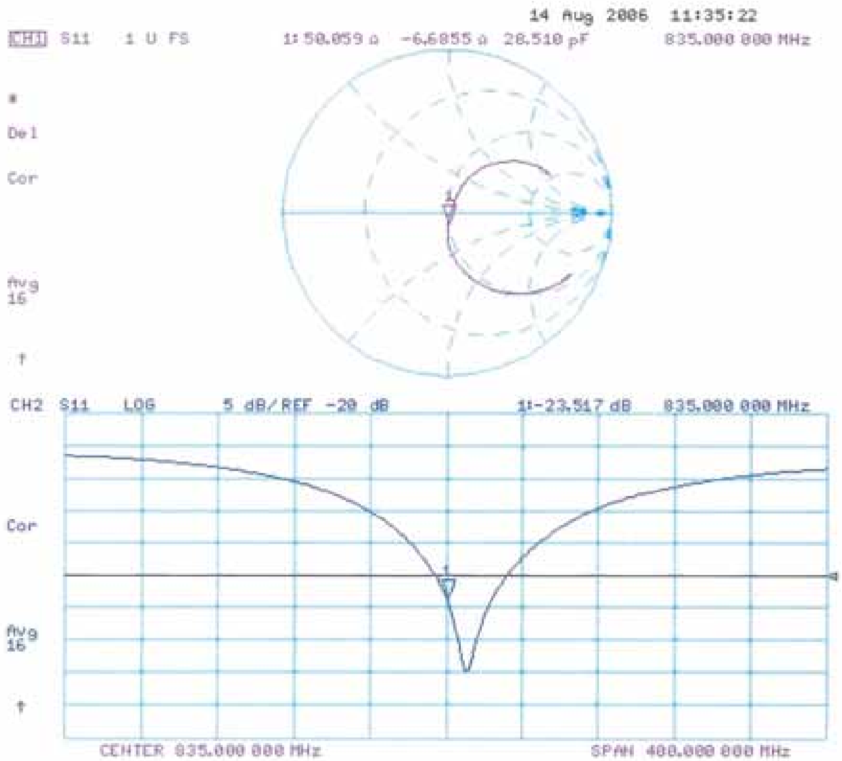
Impedance Measurement Plot for Head TSL



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

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Accreditation No.: **SCS 108**

Client **H-CT (Dymstec)**

Certificate No: **D1900V2-5d032_Feb07**

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d032
Calibration procedure(s)	QA CAL-05.v6 Calibration procedure for dipole validation kits
Calibration date:	February 20, 2007
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	03-Oct-06 (METAS, No. 217-00608)	Oct-07
Power sensor HP 8481A	US37292783	03-Oct-06 (METAS, No. 217-00608)	Oct-07
Reference 20 dB Attenuator	SN: 5086 (20g)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference Probe ET3DV6	SN: 1507	19-Oct-06 (SPEAG, No. ET3-1507_Oct06)	Oct-07
DAE4	SN 601	30-Jan-07 (SPEAG, No. DAE4-601_Jan07)	Jan-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-05)	In house check: Oct-07
RF generator Agilent E4421B	MY41000675	11-May-05 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

	Name	Function	Signature
Calibrated by:	Mike Meili	Laboratory Technician	M.Meili
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 21, 2007

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

Certificate No: D1900V2-5d032_Jan07 Page 1 of 6

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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 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 %	1.43 mho/m ± 6 %
Head TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	condition	
SAR measured	250 mW input power	9.55 mW / g
SAR normalized	normalized to 1W	38.2 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**37.2 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.03 mW / g
SAR normalized	normalized to 1W	20.1mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**19.8 mW / g ± 16.5 % (k=2)**

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

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.5 Ω + 3.3 jΩ
Return Loss	- 26.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.192 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: 20.02.2007 14:35:32

Test Laboratory: SPEAG, Zurich, Switzerland

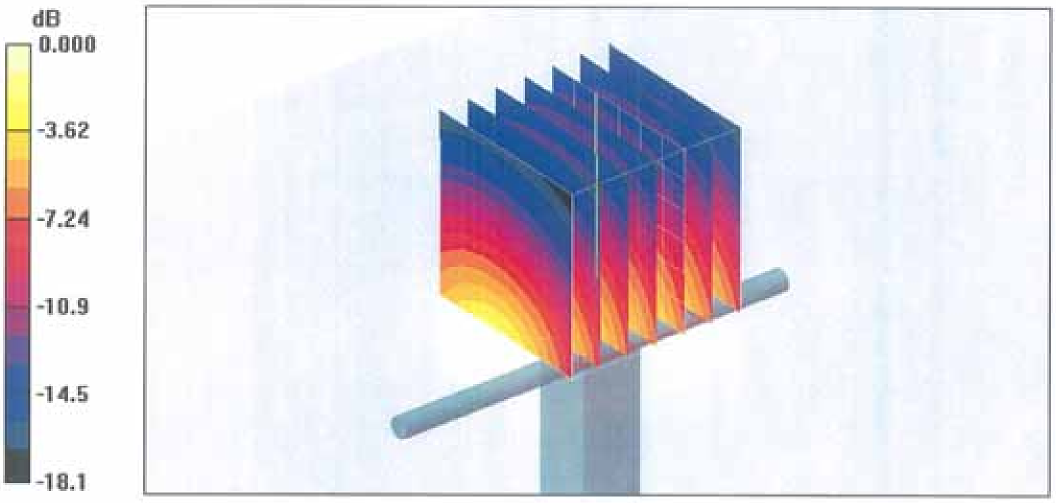
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d032

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL U10 BB;
Medium parameters used: f = 1900 MHz; σ = 1.43 mho/m; ε_r = 38.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.97, 4.97, 4.97); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.3 V/m; Power Drift = 0.006 dB
Peak SAR (extrapolated) = 16.4 W/kg
SAR(1 g) = 9.55 mW/g; SAR(10 g) = 5.03 mW/g
Maximum value of SAR (measured) = 10.5 mW/g



0 dB = 10.5mW/g

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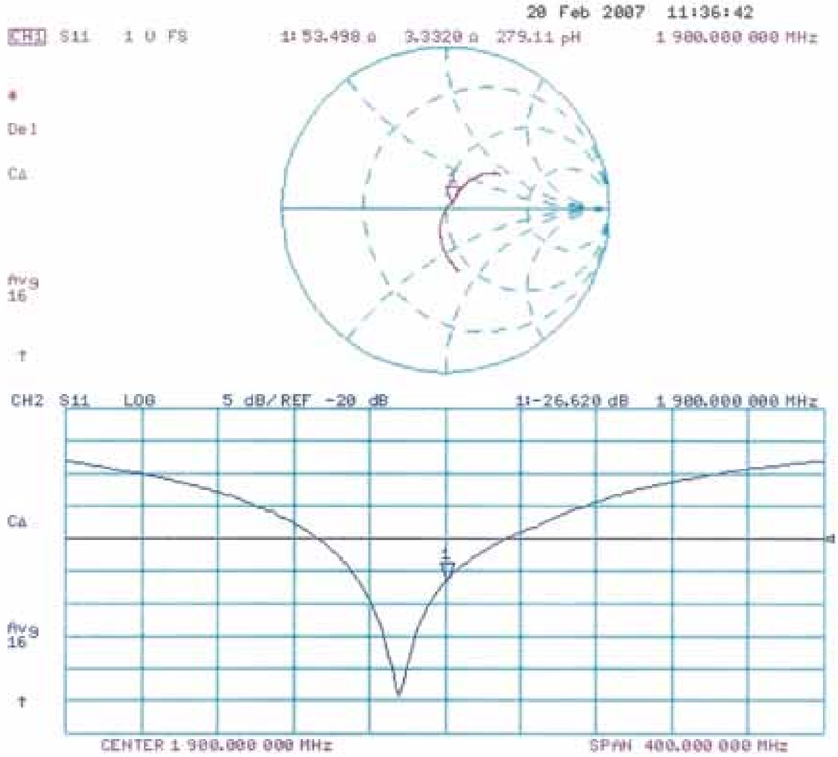
Impedance Measurement Plot for Head TSL



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