A Test Lab Techno Corp.

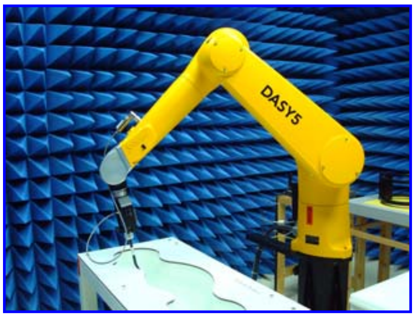
Changan Lab：No. 140 -1, Changan Street, Bade City, Taoyuan County, Taiwan R.O.C.

Tel：886-3-271-0188 / Fax：886-3-271-0190

Testing Laboratory 1330

SAR EVALUATION REPORT

Test Report No.	:	**0812FS12-01**
Applicant	:	**Inventec Corporation**
FCC ID	:	**DGIMINERVA3107**
Trade Name	:	**Inventec**
Model Number	:	**Minerva 3107**
Product Type	:	**USB Dongle**
Dates of Test	:	**Dec. 10 ~ Dec. 12, 2008 ; Mar. 11, 2009**
Test Environment	:	**Ambient Temperature： 22 ± 2˚C**
		Relative Humidity：40 - 70 %
Test Specification	:	**Standard C95.1-1999**
		2.1093;FCC/OET Bulletin 65 Supplement C [July 2001]
		IEEE Std. 1528-2003
Max. SAR	:	**0.141 W/kg Body SAR**
Test Lab	:	**Chang-an Lab**



1. The test operations have to be performed with cautious behavior, the test results are as attached.
2. The test results are under chamber environment of A Test Lab Techno Corp. A Test Lab Techno Corp. does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples.
3. The measurement report has to be written approval of A Test Lab Techno Corp. It may only be reproduced or published in full.

Country Huang **20090317**
Measurement Center Manager

Sam Chuang **20090317**
Testing Engineer

Contents

Appendix

1. Description of Equipment Under Test (EUT)

Applicant： **Inventec Corporation**
Inventec Building, No.66 Hou-Kang Street Shihlin District, Taipei 11170, Taiwan

Manufacturer	:	Inventec Corporation
Manufacturer Address	:	Inventec Building, No.66 Hou-Kang Street Shihlin District, Taipei 11170, Taiwan
Product Type	:	USB Dongle
Trade Name	:	Inventec
Model Number	:	Minerva 3107
FCC ID	:	DGIMINERVA3107
Test Device	:	Production Unit
Tx Frequency	:	824.2 - 848.8 MHz (GSM/GPRS 850) 1850.2 - 1909.8 MHz (PCS/GPRS 1900)
Max. RF Conducted Power	:	1.291 W (31.11 dBm) GSM 850 1.274 W (31.05 dBm) GPRS 850 0.859 W (29.34 dBm) PCS 1900 0.855 W (29.32 dBm) GPRS 1900
Max. SAR Measurement	:	0.141 W/kg Body SAR
HW Version	:	Minerva3107_6050A2229301_mb_x01
SW Version	:	M6246A-KPRBL-1.2.0020T
Antenna Type	:	Internal Type
Antenna Gain	:	GSM 850 : -2.02 dBi PCS 1900 : -0.59 dBi
Device Category	:	Portable
RF Exposure Environment	:	General Population / Uncontrolled
Battery Option	:	Standard
Application Type	:	Certification

This wireless portable device has been shown to be capable of compliance for localized specific absorption rate (SAR) for uncontrolled environment / general population exposure limits specified in Standard C95.1-1999 and had been tested in accordance with the measurement procedures specified in IEEE Std. 1528-2003.

Figure 1. EUT Photo

2. Introduction

The A Test Lab Techno Corp. has performed measurements of the maximum potential exposure to the user of **Inventec Corporation　Trade Name：Inventec　Model(s)：Minerva 3107.** The test procedures, as described in American National Standards, Institute C95.1 - 1999〔1〕, FCC/OET Bulletin 65 Supplement C [July 2001] were employed and they specify the maximum exposure limit of 1.6mW/g as averaged over any 1 gram of tissue for portable devices being used within 20cm between user and EUT in the uncontrolled environment. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the equipment used are included within this test report.

3. SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative (rate) of the incremental energy (dw) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body (see Figure 2).

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

Figure 2. SAR Mathematical Equation

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

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

Where：

σ = conductivity of the tissue (S/m)

ρ = mass density of the tissue (kg/m^3)

E = RMS electric field strength (V/m)

＊**Note**：

The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane〔2〕

4. SAR Measurement Setup

These measurements were performed with the automated near-field scanning system DASY5 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9m) which positions the probes with a positional repeatability of better than ±0.02mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines (length = 300mm) to the data acquisition unit.

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The Measurement Server is based on a PC/104 CPU board with a 400MHz intel ULV Celeron, 128MB chipdisk and 128MB RAM. The necessary circuits for communication with either the DAE4 (or DAE3) electronic box as well as the 16-bit AD-converter system for optical detection and digital I/O interface are contained on the DASY5 I/O-board, which is directly connected to the PC/104 bus of the CPU board. The PC consists of the Intel Core(TM)2 CPU @1.86GHz computer with Windows XP system and SAR Measurement Software DASY5, Post Processor SEMCAD, 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 converter (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the Measurement Server.

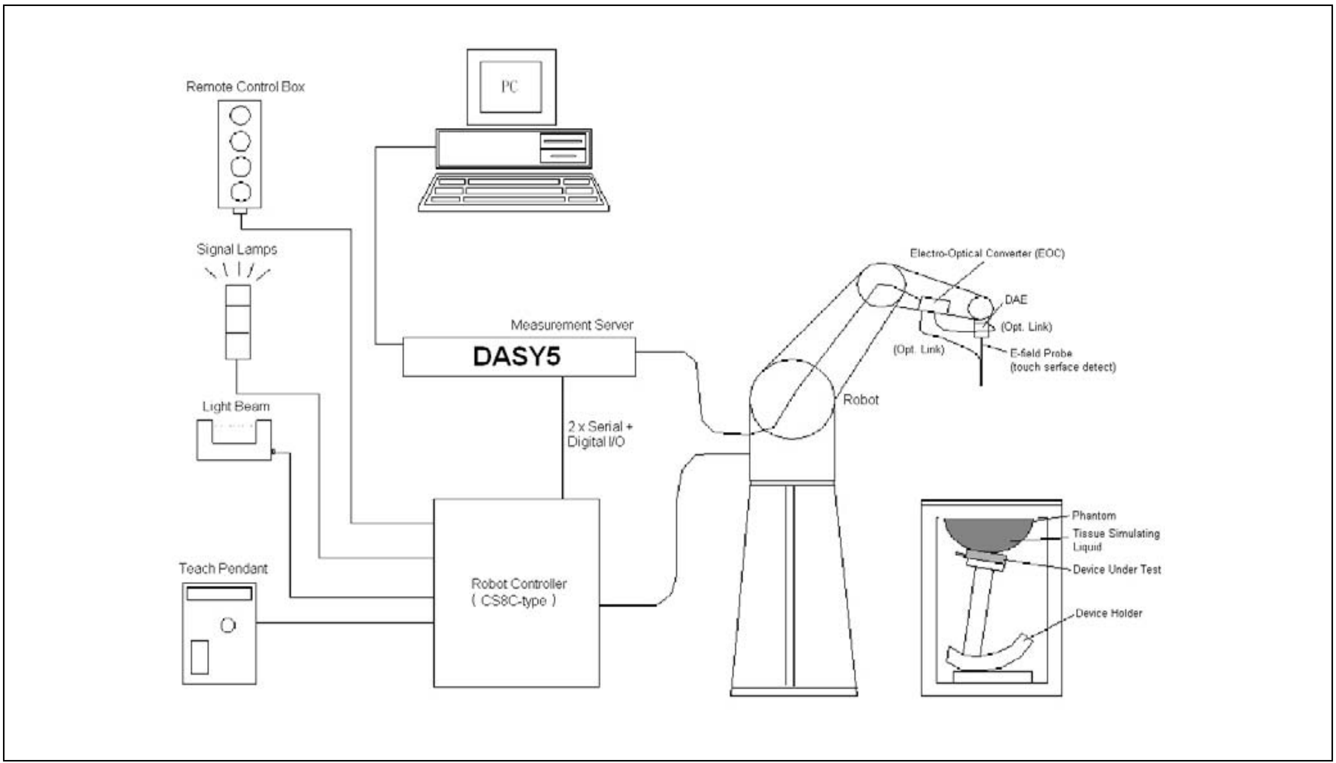


Figure 5. SAR Lab Test Measurement Setup

The DAE4 (or 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〔3〕.

5. System Components

5.1 DASY5 E-Field Probe System

The SAR measurements were conducted with the dosimetric probe ES3DV3 or ET3DV6 (manufactured by SPEAG), designed in the classical triangular configuration〔3〕and optimized for dosimetric evaluation. The probes is constructed using the thick film technique; with printed resistive lines on ceramic substrates. The probe is equipped with an optical multi-fiber 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 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 DASY5 software reads the reflection during a software approach and looks for the maximum using a 2nd order fitting. The approach is stopped when reaching the maximum.

5.1.1 E-Field Probe Specification

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection System Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.q., glycol)
Calibration	In air from 10 MHz to 6 GHz In brain and muscle simulating tissue at frequencies of 900MHz, 1800MHz, 1950MHz, 2000MHz and 2450MHz (accuracy ±8%) Calibration for other liquids and frequencies upon request
Frequency	10 MHz to > 6 GHz; Linearity: ±0.2 dB (30 MHz to 3 GHz)
Directivity	±0.3 dB in brain tissue (rotation around probe axis) ±0.5 dB in brain tissue (rotation normal probe axis)
Dynamic Range	10 μW/g to > 100mW/g; Linearity: ±0.2dB
Surface Detection	±0.2 mm repeatability in air and clear liquids over diffuse reflecting surface(EX3DV3 only)
Dimensions	Overall length: 330mm Tip length: 20mm Body diameter: 12mm Tip diameter: 2.5mm Distance from probe tip to dipole centers: 1.0mm
Application	General dosimetry up to 6GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

Figure 6.

E-field Probe

Figure 7.

Probe setup on robot

5.1.2 E-Field Probe Calibration

Each probe is calibrated according to a dosimetric assessment procedure described in〔4〕with accuracy better than ±10%. The spherical isotropy was evaluated with the procedure described in〔5〕and found to be better than ±0.25dB. The sensitivity parameters (NormX, NormY, and NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are 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 1GHz, and in a wave guide above 1GHz 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.

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

Where：

Δt = Exposure time (30 seconds),

C = Heat capacity of tissue (head or body),

ΔT = Temperature increase due to RF exposure.

Or

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

Where：

σ = Simulated tissue conductivity,

ρ = Tissue density (kg/m^3).

5.2 Data Acquisition Electronic (DAE) System

Cell Controller

Processor：	Intel Core(TM)2 CPU
Clock Speed：	@ 1.86GHz
Operating System：	Windows XP Professional

Data Converter

Features：	Signal Amplifier, multiplexer, A/D converter, and control logic
Software：	DASY5 v5.0 (Build 120) & SEMCAD X Version 13.2 Build 87
Connecting Lines：	Optical downlink for data and status info
	Optical uplink for commands and clock

5.3 Robot

Positioner：	Stäubli Unimation Corp. Robot Model: TX90XL
Repeatability：	±0.02 mm
No. of Axis：	6

5.4 Measurement Server

Processor：	PC/104 with a 400MHz intel ULV Celeron
I/O-board：	Link to DAE4(or DAE3)
	16-bit A/D converter for surface detection system
	Digital I/O interface
	Serial link to robot
	Direct emergency stop output for robot

5.5 Device Holder for Transmitters

In combination with the SAM Twin 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 repeat ably positioned according to the IEEE SCC34-SC2 and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, and 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〔6〕. To produce the worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.

Larger DUT cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values. Therefore those devices are normally only tested at the flat part of the SAM.

Figure 8. Device Holder

5.6 Phantom - SAM v4.0

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-2003, CENELEC 50361 and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.

Figure 9. SAM Twin Phantom

Shell Thickness	2 ±0.2 mm
Filling Volume	Approx. 25 liters
Dimensions	810×1000×500 mm (H×L×W)

Table 1. Specification of SAM v4.0

5.7 Data Storage and Evaluation

5.7.1 Data Storage

The DASY5 software stores the assessed data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all the necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension .DA5. The postprocessing software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of erroneous parameter settings. For example, if a measurement has been performed with an incorrect crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be reevaluated.

5.7.2 Data Evaluation

The DASY5 post processing software (SEMCAD) automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software：

Probe parameters：	- Sensitivity	Normi, ai0, ai1, ai2
	- Conversion factor	ConvFi
	- Diode compression point	dcpi
Device parameters：	- Frequency	f
	- Crest factor	cf
Media parameters：	- Conductivity	σ
	- Density	ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

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：

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

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：

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

H-field probes：
$$H_i = \sqrt{V_i} \cdot \frac{a_{i0} + a_{i1} f + a_{i2} f^2}{f}$$

with V_i = compensated signal of channel i (i = x, y, z)

$Norm_i$ = sensor sensitivity of channel i (i = x, y, z)

μ V/(V/m)^2 for E-field Probes

$ConvF$ = sensitivity enhancement in solution

a_{ij} = sensor sensitivity factors for H-field probes

f = carrier frequency [GHz]

E_i = electric field strength of channel i in V/m

Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian 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 mW/g

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

σ = conductivity in [mho/m] or [Siemens/m]

ρ = equivalent tissue density in g/cm^3

∗**Note**：that the density is set to 1, to account for actual head tissue density rather than the density of the tissue simulating liquid.

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

$$P_{pwe} = \frac{E_{tot}^2}{3770} \quad \text{or} \quad P_{pwe} = \frac{H_{tot}^2}{37.7}$$

with P_{pwe} = equivalent power density of a plane wave in mW/cm^2

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

H_{tot} = total magnetic field strength in A/m

6. Test Equipment List

Manufacturer	Name of Equipment	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
SPEAG	Dosimetric E-Filed Probe	ES3DV3	3150	Jan. 09, 2008	Jan. 09, 2009
SPEAG	900MHz System Validation Kit	D900V2	SN:073	Mar. 17, 2008	Mar. 17, 2009
SPEAG	900MHz System Validation Kit	D900V2	SN:172	Jan. 19, 2009	Jan. 19, 2010
SPEAG	1800MHz System Validation Kit	D1900V2	5d018	May. 22, 2008	May. 22, 2009
SPEAG	Data Acquisition Electronics	DAE4	779	Nov. 11, 2008	Nov. 11,, 2009
SPEAG	Device Holder	N/A	N/A	NCR	NCR
SPEAG	Phantom	SAM V4.0	TP-1150	NCR	NCR
SPEAG	Robot	Staubli TX90XL	F07/564ZA1/C/01	NCR	NCR
SPEAG	Software	DASY5 V5.0 Build 120	N/A	NCR	NCR
SPEAG	Software	SEMCAD X V13.2 Build 87	N/A	NCR	NCR
SPEAG	Measurement Server	SE UMS 011 AA	1025	NCR	NCR
Agilent	Wireless Communication Test Set	CMU200	112387	Jul. 25, 2008	Jul. 25, 2009
Agilent	Wireless Communication Test Set	E5515C	GB47020167	Apr. 17, 2008	Apr. 17, 2009
Agilent	ENA Series Network Analyzer	E5071B	MY42402996	Mar. 07, 2008	Mar. 07, 2009
Agilent	Dielectric Probe Kit	85070C	US99360094	NCR	NCR
R&S	Power Sensor	NRP-Z22	100179	May. 03, 2008	May. 03, 2009
Agilent	Signal Generator	E8257D	MY44320425	Jul. 03, 2008	Jul. 03, 2009
Agilent	Dual Directional Coupler	778D	50334	NCR	NCR
Mini-Circuits	Power Amplifier	ZHL-42W-SMA	D111103#5	NCR	NCR
Mini-Circuits	Power Amplifier	ZVE-8G-SMA	D042005 671800514	NCR	NCR

Table 2. Test Equipment List

7. Tissue Simulating Liquids

The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an 8720ES Network Analyzer.

IEEE SCC-34/SC-2 in 1528 recommended Tissue Dielectric Parameters

The head tissue dielectric parameters recommended by the IEEE SCC-34/SC-2 in 1528 have been incorporated in the following table. These head parameters are derived from planar layer models simulating the highest expected SAR for the dielectric properties and tissue thickness variations in human head. Other head and body tissue parameters that have not been specified in 1528 are derived from the tissue dielectric parameters computed from the 4-Cole-Cole equation and extrapolated according to the head parameter specified in 1528.

Target Frequency	Head		Body	
(MHz)	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 - 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5800	35.3	5.27	48.2	6.00
(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)				

Table 3. Tissue dielectric parameters for head and body phantoms

7.1 Ingredients

The following ingredients are used:

- Water: deionized water (pure H_20), resistivity ≥ 16 M Ω -as basis for the liquid
- Sugar: refied white sugar (typically 99.7 % sucrose, available as crystal sugar in food shops) -to reduce relative permittivity
- Salt: pure NaCl -to increase conductivity
- Cellulose: Hydroxyethyl-cellulose, medium viscosity (75-125 mPa.s, 2% in water, 20° C), CAS # 54290 -to increase viscosity and to keep sugar in solution.
- Preservative: Preventol D-7 Bayer AG, D-51368 Leverkusen, CAS # 55965-84-9 -to prevent the spread of bacteria and molds
- DGBE: Diethylenglycol-monobuthyl ether (DGBE), Fluka Chemie GmbH, CAS # 112-34-5 -to reduce relative permittivity

7.2 Recipes

The following tables give the recipes for tissue simulating liquids to be used in different frequency bands.

Note: The goal dielectric parameters (at 22 ℃) must be achieved within a tolerance of ±5% for ε and ±5% for σ.

Liquid type	MSL 900-B	
Ingredient	Weight (g)	Weight (%)
Water	633.91	50.75
Sugar	602.12	50.75
Cellulose	-	0.00
Salt	11.76	0.94
Preventol	1.20	0.10
Total amount	1,249.00	100.00
Goal dielectric parameters		
Frequency [MHz]	835	900
Relative Permittivity	55.2	55.0
Conductivity [S/m]	0.97	1.05

Liquid type	MSL 1950-B	
Ingredient	Weight (g)	Weight (%)
Water	697.94	69.79
DGBE	300.03	30.00
Salt	2.03	0.20
Total amount	1,000.00	100.00
Goal dielectric parameters		
Frequency [MHz]	1950	2000
Relative Permittivity	53.3	53.3
Conductivity [S/m]	1.52	1.52

7.3 Liquid Confirmation

7.3.1 Parameters

Liquid Verify								
Ambient Temperature： 22 ± 2 °C；Relative Humidity：40 -70%								
Liquid Type	**Frequency**	**Temp (°C)**	**Parameters**	**Target Value**	**Measured Value**	**Deviation (%)**	**Limit (%)**	**Measured Date**
835MHz Body	800MHz	22.0	**εr**	55.2	55.79	**1.07%**	± 5	Dec. 10, 2008
			σ	0.97	0.9255	**-4.59%**	± 5	
835MHz Body	850MHz	22.0	**εr**	55.2	55.44	**0.43%**	± 5	Dec. 10, 2008
			σ	0.97	0.9745	**0.46%**	± 5	
835MHz Body	800MHz	22.0	**εr**	55.2	55.79	**1.07%**	± 5	Dec. 12, 2008
			σ	0.97	0.9255	**-4.59%**	± 5	
835MHz Body	850MHz	22.0	**εr**	55.2	55.44	**0.43%**	± 5	Dec. 12, 2008
			σ	0.97	0.9745	**0.46%**	± 5	
900MHz Body	900MHz	22.0	**εr**	55.0	55.4	**0.73%**	± 5	Dec. 10, 2008
			σ	1.05	1.03	**-1.90%**	± 5	
900MHz Body	900MHz	22.0	**εr**	55.0	55.4	**-2.00%**	± 5	Dec. 12, 2008
			σ	1.05	1.03	**-0.95%**	± 5	
1900MHz Body	1850MHz	22.0	**εr**	53.3	51.9	**-2.63%**	± 5	Dec. 11, 2008
			σ	1.52	1.456	**-4.21%**	± 5	
1900MHz Body	1900MHz	22.0	**εr**	53.3	53.1	**-0.38%**	± 5	Dec. 11, 2008
			σ	1.52	1.50	**-1.32%**	± 5	
1900MHz Body	1950MHz	22.0	**εr**	53.3	51.64	**-3.11%**	± 5	Dec. 11, 2008
			σ	1.52	1.562	**2.76%**	± 5	

Table 4. Measured Tissue dielectric parameters for head and body phantoms

Liquid Verify

Ambient Temperature： 22 ± 2 °C；Relative Humidity：40 -70%

Liquid Type	Frequency	Temp (°C)	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)	Measured Date
835MHz Body	800MHz	22.0	εr	55.2	55.8	**1.09%**	± 5	Mar. 11, 2009
			σ	0.97	0.93	**-4.12%**	± 5	
835MHz Body	850MHz	22.0	εr	55.2	55.4	**0.36%**	± 5	Mar. 11, 2009
			σ	0.97	0.97	**0.00%**	± 5	
900MHz Body	900MHz	22.0	εr	55.0	55.0	**0.00%**	± 5	Mar. 11, 2009
			σ	1.05	1.02	**-2.86%**	± 5	
1900MHz Body	1850MHz	22.0	εr	53.3	53.13	**-0.32%**	± 5	Mar. 11, 2009
			σ	1.52	1.462	**-3.82%**	± 5	
1900MHz Body	1900MHz	22.0	εr	53.3	53.0	**-0.56%**	± 5	Mar. 11, 2009
			σ	1.52	1.50	**-1.32%**	± 5	
1900MHz Body	1950MHz	22.0	εr	53.3	52.91	**-0.73%**	± 5	Mar. 11, 2009
			σ	1.52	1.56	**2.63%**	± 5	

Table 5. Measured Tissue dielectric parameters for head and body phantoms

7.3.2 Liquid Depth

The liquid level was during measurement 15cm ±0.5cm.

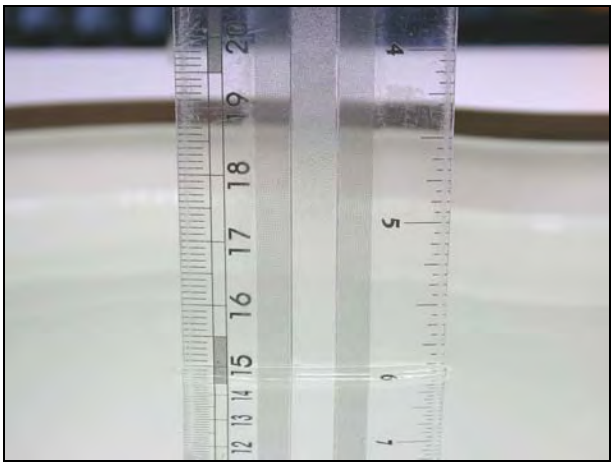


Figure 10. Head-Tissue-Simulating-Liquid

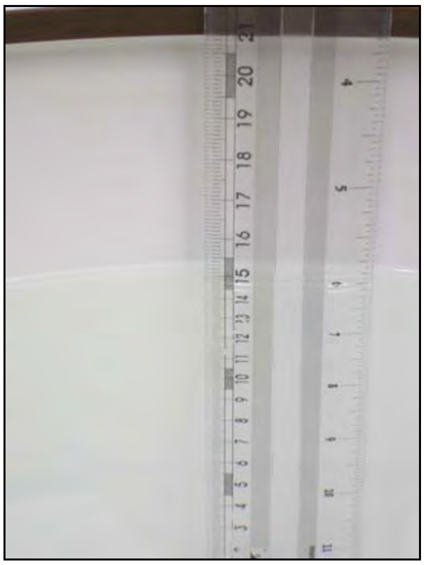


Figure 11. Body-Tissue-Simulating-Liquid

8. Measurement Process

8.1 Device and Test Conditions

The Test Device was provided by **Inventec Corporation** for this evaluation. The spatial peak SAR values were assessed for the lowest, middle and highest channels defined by **GSM/GPRS 850** (#128=824.2MHz, #190=836.6MHz, #251=848.8MHz), **PCS / GPRS 1900** (#512=1850.2MHz, #661=1880.0MHz, #810=1909.8MHz) , systems . The antenna(s), battery and accessories shall be those specified by the manufacturer. The battery shall be fully charged before each measurement and there shall be no external connections.

Band	Date Rate	CH	Conducted Power		Worst
			Before	After	
GSM850		Lowest	31.06	31.05	☐
		Middle	**31.11**	31.10	■
		Highest	31.00	30.99	☐
GPRS850	3Down 2up	Lowest	31.02	31.01	☐
		Middle	31.03	31.01	☐
		Highest	30.86	30.85	☐
	3Down 1up	Lowest	30.01	30.00	☐
		Middle	**31.05**	31.04	■
		Highest	30.88	30.86	☐
PCS1900		Lowest	28.72	28.71	☐
		Middle	**29.34**	29.33	■
		Highest	28.78	28.76	☐
GPRS1900	3Down 2up	Lowest	28.70	28.69	☐
		Middle	29.30	29.29	☐
		Highest	28.75	28.74	☐
	3Down 1up	Lowest	28.70	28.69	☐
		Middle	**29.32**	29.31	■
		Highest	28.77	28.76	☐

8.2 System Performance Check

8.2.1 Symmetric Dipoles for System Validation

Construction	Symmetrical dipole with l/4 balun enables measurement of feed point impedance with NWA matched for use near flat phantoms filled with head simulating solutions Includes distance holder and tripod adaptor Calibration Calibrated SAR value for specified position and input power at the flat phantom in head simulating solutions.
Frequency	450, 900, 1800, 1950, 2000 and 2450MHz
Return Loss	> 20 dB at specified validation position
Power Capability	> 100 W (f < 1GHz); > 40 W (f > 1GHz)
Options	Dipoles for other frequencies or solutions and other calibration conditions are available upon request
Dimensions	D450V2：dipole length 270 mm; overall height 330 mm D900V2：dipole length 149 mm; overall height 330 mm D1800V2：dipole length 72 mm; overall height 300 mm D1950V2：dipole length 62 mm; overall height 300 mm D2000V2：dipole length 65 mm; overall height 300 mm D2450V2：dipole length 51.5 mm; overall height 300 mm

Figure 12. Validation Kit

8.2.2 Validation

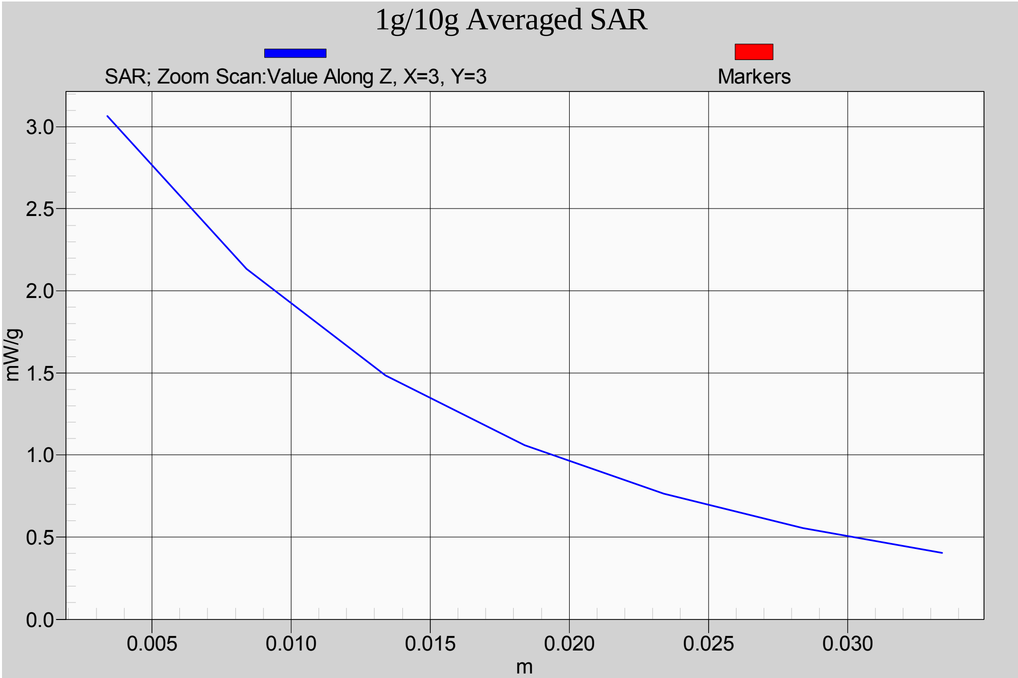
Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of ± 7%. The validation was performed at 900MHz and 1950MHz.

Validation kit	Mixture Type	SAR_{1g} [mW/g]	SAR_{10g} [mW/g]	Date of Calibration
D900V2-SN073	Body	11.28	7.28	Mar. 17, 2008
D900V2-SN172	Body	11.36	7.36	Jan. 19, 2009
D1900V2-SN5d018	Body	38.4	20.16	May. 22, 2008

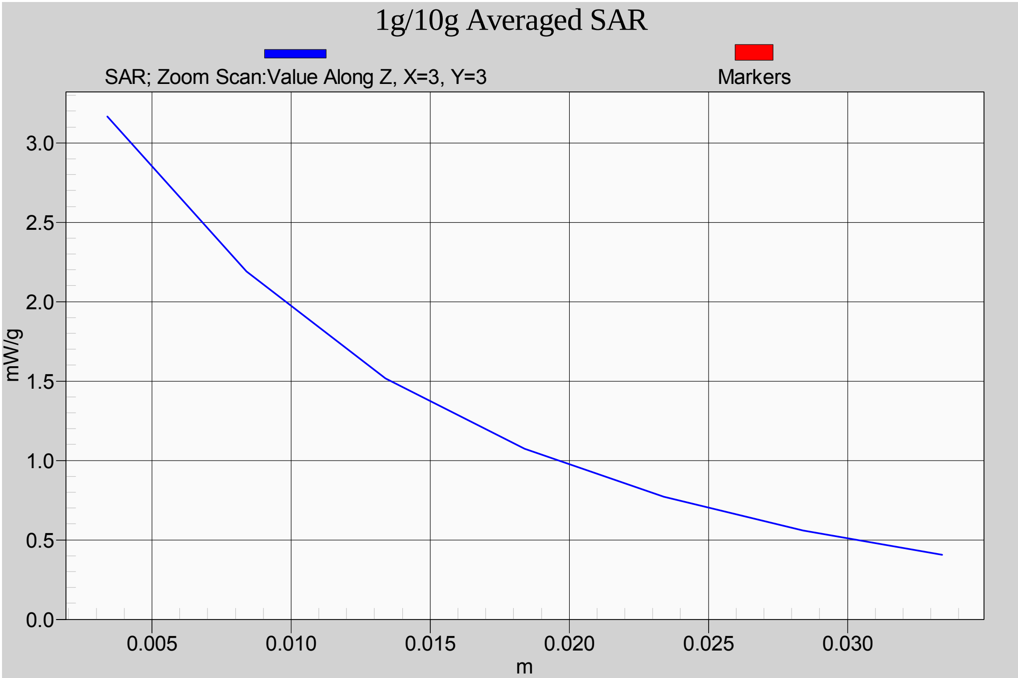
Frequency (MHz)	Power	SAR_{1g} (mW/g)	SAR_{10g} (mW/g)	Drift (dB)	Difference percentage		Date
					1g	10g	
900 (Body)	250mW	2.71	1.79	**-0.08700**	**-3.9 %**	**-1.6 %**	**Dec. 10, 2008**
	Normalize to 1 Watt	**10.84**	**7.16**				
900 (Body)	250mW	2.79	1.85	**-0.03800**	**-1.1 %**	**1.6 %**	**Dec. 12, 2008**
	Normalize to 1 Watt	**11.16**	**7.4**				
900 (Body)	250mW	2.87	1.86	**0.04300**	**1.1 %**	**1.1 %**	**Mar. 11, 2009**
	Normalize to 1 Watt	**11.48**	**7.44**				
1950 (Body)	250mW	9.82	5.12	**-0.00682**	**2.3 %**	**1.6 %**	**Dec. 12, 2008**
	Normalize to 1 Watt	**39.28**	**20.48**				
1950 (Body)	250mW	9.67	5.03	**-0.02400**	**0.7 %**	**-0.2 %**	**Mar. 11, 2009**
	Normalize to 1 Watt	**38.68**	**20.12**				

Detail results see Appendix A.

Z-axis Plot of System Performance Check

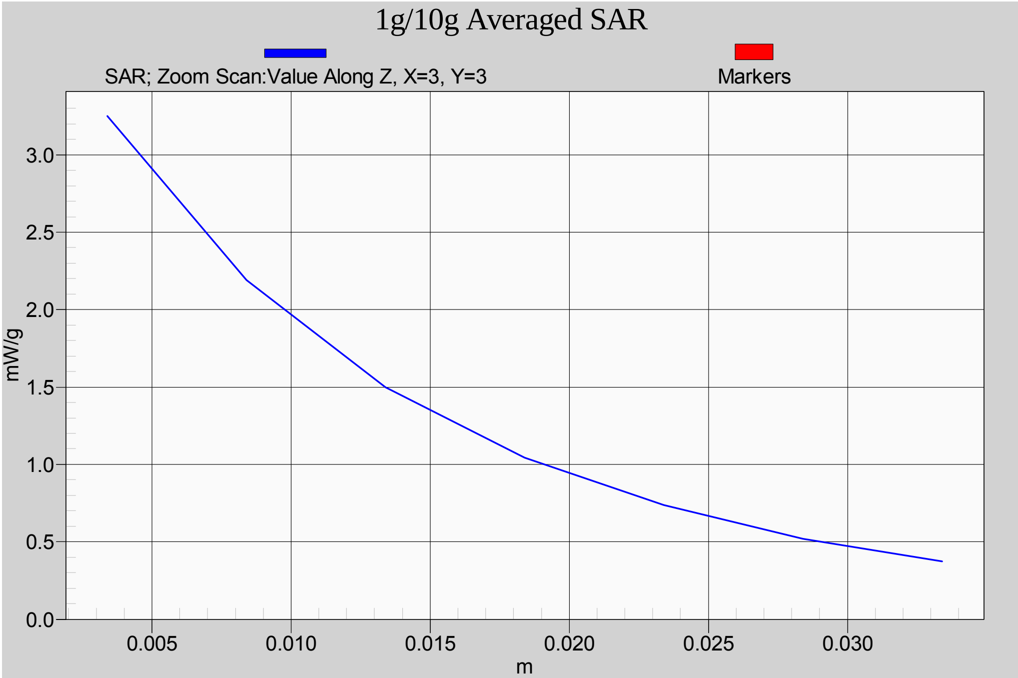


Body-Tissue-Simulating-Liquid 900MHz (2008.12.10)

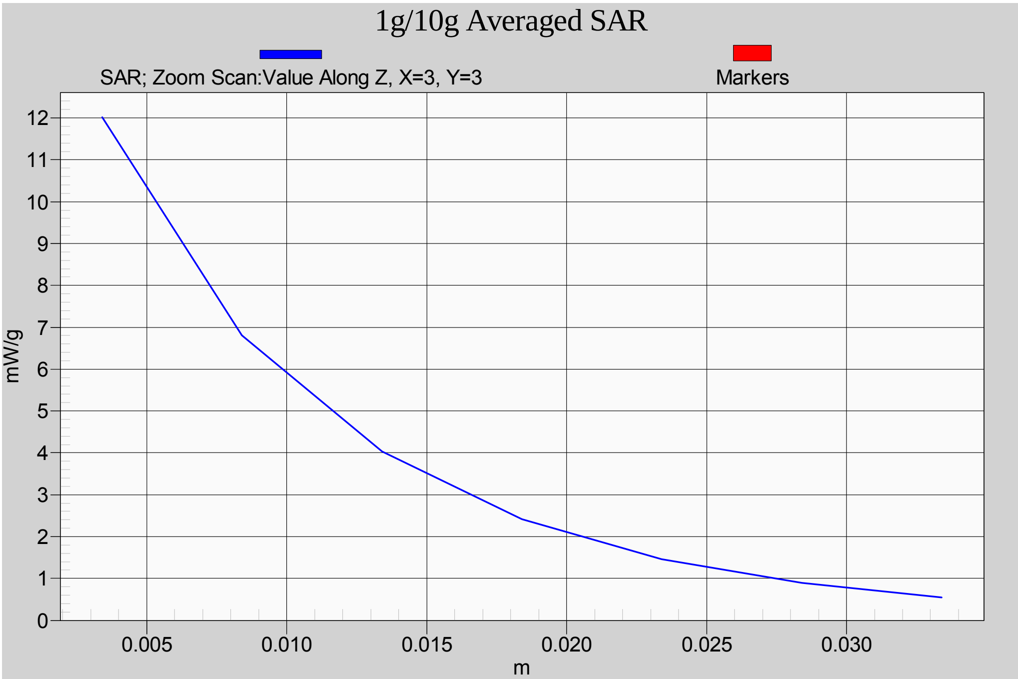


Body -Tissue-Simulating-Liquid 900MHz (2008.12.12)

Z-axis Plot of System Performance Check

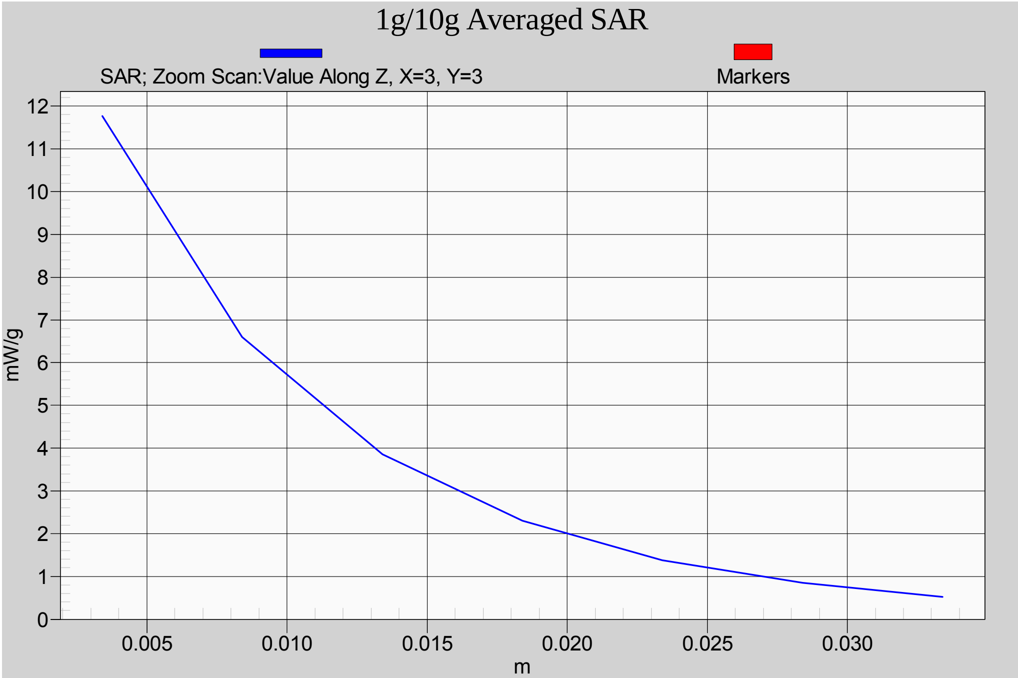


Body -Tissue-Simulating-Liquid 900MHz (2009.03.11)



Body-Tissue-Simulating-Liquid 1900MHz (2008.12.12)

Z-axis Plot of System Performance Check



Body -Tissue-Simulating-Liquid 1900MHz (2009.03.11)

8.3 Dosimetric Assessment Setup

8.3.1 Body Worn Test Position

Body-Worn Configuration

Body-worn operating configurations should be tested with the belt-clips and holsters attached to the device and positioned against a flat phantom in normal use configurations. Devices with a handset output should be tested with a handset connected to the device.

Body-worn accessories may not always be supplied or available as options for some devices that are intended to be authorized for body-worn use. A separation distance of 1.5 cm between the back of the device and a flat phantom is recommended for testing body-worn SAR compliance under such circumstances.

For this test：

□ The EUT is placed into the holster/belt clip and the holster is positioned against the surface of the phantom in a normal operating position.

■ Since this EUT doesn’t supply any body-worn accessory to the end user, for **EUT Bottom to phantom mode** the distance of **5 mm** was tested to confirm the necessary “minimum SAR separation distance”.
(＊Note：This distance includes the 5 mm phantom shell thickness.)

8.3.2 Measurement Procedures

The evaluation was performed with the following procedures：

Surface Check： A surface checks job gathers data used with optical surface detection. It determines the distance from the phantom surface where the reflection from the optical detector has its peak. Any following measurement jobs using optical surface detection will then rely on this value. The surface check performs its search a specified number of times, so that the repeatability can be verified. The probe tip distance is 1.3mm to phantom inner surface during scans.

Reference： The reference job measures the field at a specified reference position, at 4 mm from the selected section's grid reference point.

Area Scan： The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a finer measurement around the hot spot. The sophisticated interpolation routines can find the maximum locations even in relatively coarse grids. When an area scan has measured all reachable points, it computes the field maxima found in the scanned area, within a range of the global maximum. Any following zoom scan within the same procedure will then perform fine scans around these maxima. The area covered the entire dimension of the EUT and the horizontal grid spacing was 15 mm × 15 mm.

Zoom Scan： Zoom scans are used to assess the highest averaged SAR for cubic averaging volumes with 1 g and 10 g of simulated tissue. The zoom scan measures 5 x 5 x 7 points in a 32 x 32 x 30 mm cube whose base faces are centered around the maxima returned from a preceding area scan within the same procedure.

Drift： The drift job measures the field at the same location as the most recent reference job within the same procedure, with the same settings. The drift measurement gives the field difference in dB from the last reference measurement. Several drift measurements are possible for each reference measurement. This allows monitoring of the power drift of the device in the batch process. If the value changed by more than 5%, the evaluation was repeated.

8.4 Spatial Peak SAR Evaluation

The DASY5 software includes all numerical procedures necessary to evaluate the spatial peak SAR values. Based on the Draft: SCC-34, SC-2, WG-2 - Computational Dosimetry, IEEE P1529/D0.0 (Draft Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) Associated with the Use of Wireless Handsets - Computational Techniques), a new algorithm has been implemented. The spatial-peak SAR can be computed over any required mass.

The base for the evaluation is a "cube" measurement in a volume of (32×32×30)mm^3 (5×5×7 points). The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan. If the 10g cube or both cubes are not entirely inside the measured volumes, the system issues a warning regarding the evaluated spatial peak values within the Postprocessing engine (SEMCAD). This means that if the measured volume is shifted, higher values might be possible. To get the correct values you can use a finer measurement grid for the area scan. In complicated field distributions, a large grid spacing for the area scan might miss some details and give an incorrectly interpolated peak location.
The entire evaluation of the spatial peak values is performed within the Postprocessing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into three stages:

Interpolation and Extrapolation

The probe is calibrated at the center of the dipole sensors which is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated.

In DASY5, the choice of the coordinate system defining the location of the measurement points has no influence on the uncertainty of the interpolation, Maxima Search and SAR extrapolation routines. The interpolation, Maxima Search and extrapolation routines are all based on the modified Quadratic Shepard's method [7].

9. 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 ±21.9 %〔8〕.

According to Std. C95.3〔9〕, 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.

According to CENELEC〔10〕, 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	Prob. Dist.	Div.	(*ci*) 1g	(*ci*) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(*vi*) *veff*
Measurement System								
Probe Calibration	±5.9 %	N	1	1	1	±5.9 %	±5.9 %	
Axial Isotropy	±4.7 %	R		0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	$\sqrt{3}$	0.7	0.7	±3.9 %	±3.9 %	∞
Boundary Effects	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Linearity	±4.7 %	R	$\sqrt{3}$	1	1	±2.7 %	±2.7 %	∞
System Detection Limits	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Readout Electronics	±0.3 %	N	1	1	1	±0.3 %	±0.3 %	∞
Response Time	±0.8 %	R	$\sqrt{3}$	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	$\sqrt{3}$	1	1	±1.5 %	±1.5 %	∞
RF Ambient Noise	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
RF Ambient Reflections	±3.0 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.4 %	R	$\sqrt{3}$	1	1	±0.2 %	±0.2 %	∞
Probe Positioning	±2.9 %	R	$\sqrt{3}$	1	1	±1.7 %	±1.7 %	∞
Max. SAR Eval.	±1.0 %	R	$\sqrt{3}$	1	1	±0.6 %	±0.6 %	∞
Test Sample Related								
Device Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	145
Device Holder	±3.6 %	N	1	1	1	±3.6 %	±3.6 %	5
Power Drift	±5.0 %	R	$\sqrt{3}$	1	1	±2.9 %	±2.9 %	∞
Phantom and Setup								
Phantom Uncertainty	±4.0 %	R	$\sqrt{3}$	1	1	±2.3 %	2.3 %	∞
Liquid Conductivity (target)	±5.0 %	R	$\sqrt{3}$	0.64	0.43	±1.8 %	1.2 %	∞
Liquid Conductivity (meas.)	±2.5 %	N	1	0.64	0.43	±1.6 %	1.1 %	∞
Liquid Permittivity (target)	±5.0 %	R	$\sqrt{3}$	0.6	0.49	±1.7 %	1.4 %	∞
Liquid Permittivity (meas.)	±2.5 %	N	1	0.6	0.49	±1.5 %	1.2 %	∞
Combined Std. Uncertainty						**±10.9 %**	**±10.7 %**	387
Expanded STD Uncertainty						**±21.9 %**	**±21.4 %**	

Table 6. Uncertainty Budget of DASY

10. SAR Test Results Summary

10.1 GSM 850 Results _ Flat

Ambient：

Temperature (℃)： 22 ± 2 — Relative HUMIDITY (%)： 40-70

Liquid：

Mixture Type： MSL900 — Liquid Temperature (℃)： 22.0

Depth of liquid (cm)： 15

Measurement：

Crest Factor： 8.3 — Probe S/N： 3150

Frequency		Band	Power (dBm)	Phantom Position	Antenna Position	Accessory	SAR_{1g} [mW/g]	Power Drift (dB)	Remark
MHz	CH								
836.6	190	GSM 850	31.11	Horizontal Up to phantom 5mm	Internal	Notebook	0.047	-0.151	---
836.6	190	GSM 850	31.11	Horizontal Down to phantom 5mm	Internal	USB Cable	0.067	-0.095	---
836.6	190	GSM 850	31.11	Vertical Front to phantom 5mm	Internal	USB Cable	0.043	-0.090	---
836.6	190	GSM 850	31.11	Vertical Back to phantom 5mm	Internal	USB Cable	0.038	-0.169	---
836.6	190	GSM 850	31.11	Horizontal Down to phantom 10mm	Internal	USB Cable	0.056	-0.112	---
836.6	190	GSM 850	31.11	Horizontal Down to phantom 15mm	Internal	USB Cable	0.018	0.178	---
Std. C95.1-1999 - Safety Limit Spatial Peak Uncontrolled Exposure/General Population					1.6 W/kg (mW/g) Averaged over 1 gram				

Detail results see Appendix B.

Z-axis Plot of SAR Measurement

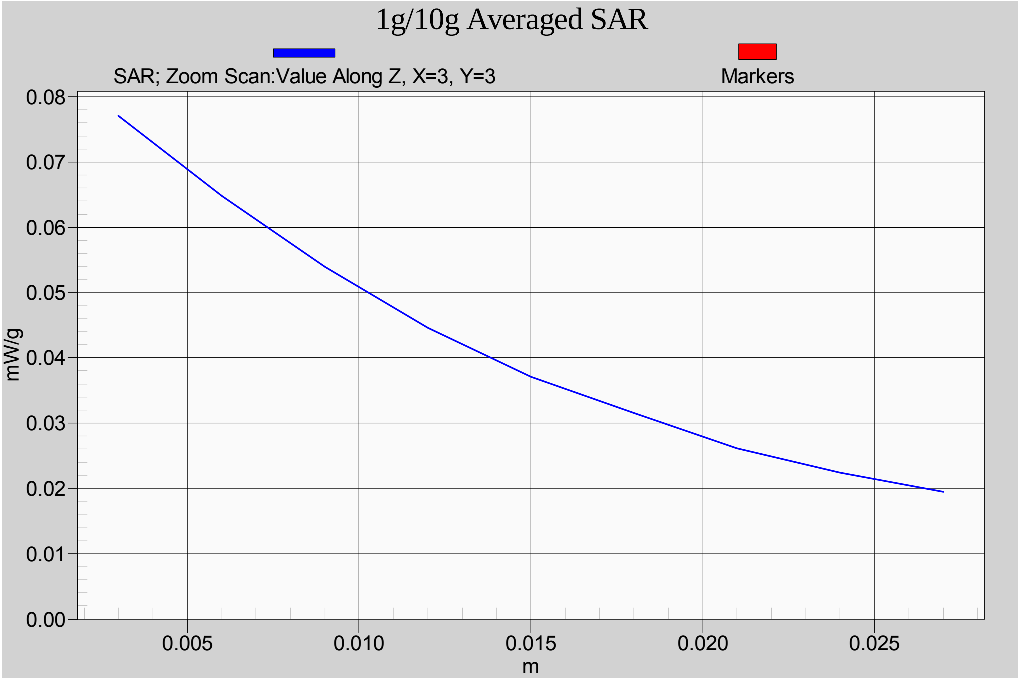


Figure 13. Z-axis Plot of Flat GSM 850 CH190_ Horizontal Down _5mm with USB Cable

10.2 GPRS 850 Results _ Flat

Ambient：

Temperature (℃)：	22 ± 2	Relative HUMIDITY (%)：	40-70

Liquid：

Mixture Type：	MSL900	Liquid Temperature (℃)：	22.0
		Depth of liquid (cm)：	15

Measurement：

Crest Factor：	8.3	Probe S/N：	3150

Frequency		Band	Power (dBm)	Phantom Position	Antenna Position	Accessory	SAR_{1g} [mW/g]	Power Drift (dB)	Remark
MHz	CH								
836.6	190	GPRS 850 3Down1Up	31.05	Horizontal Up to phantom 5mm	Internal	Notebook	0.043	0.030	---
836.6	190	GPRS 850 3Down1Up	31.05	Horizontal Down to phantom 5mm	Internal	USB Cable	0.066	0.174	---
836.6	190	GPRS 850 3Down2Up	31.03	Horizontal Down to phantom 5mm	Internal	USB Cable	0.141	-0.161	---
836.6	190	GPRS 850 3Down1Up	31.05	Vertical Front to phantom 5mm	Internal	USB Cable	0.042	-0.198	---
836.6	190	GPRS 850 3Down1Up	31.05	Vertical Back to phantom 5mm	Internal	USB Cable	0.037	-0.187	---
Std. C95.1-1999 - Safety Limit Spatial Peak Uncontrolled Exposure/General Population					1.6 W/kg (mW/g) Averaged over 1 gram				

Detail results see Appendix B.

Z-axis Plot of SAR Measurement

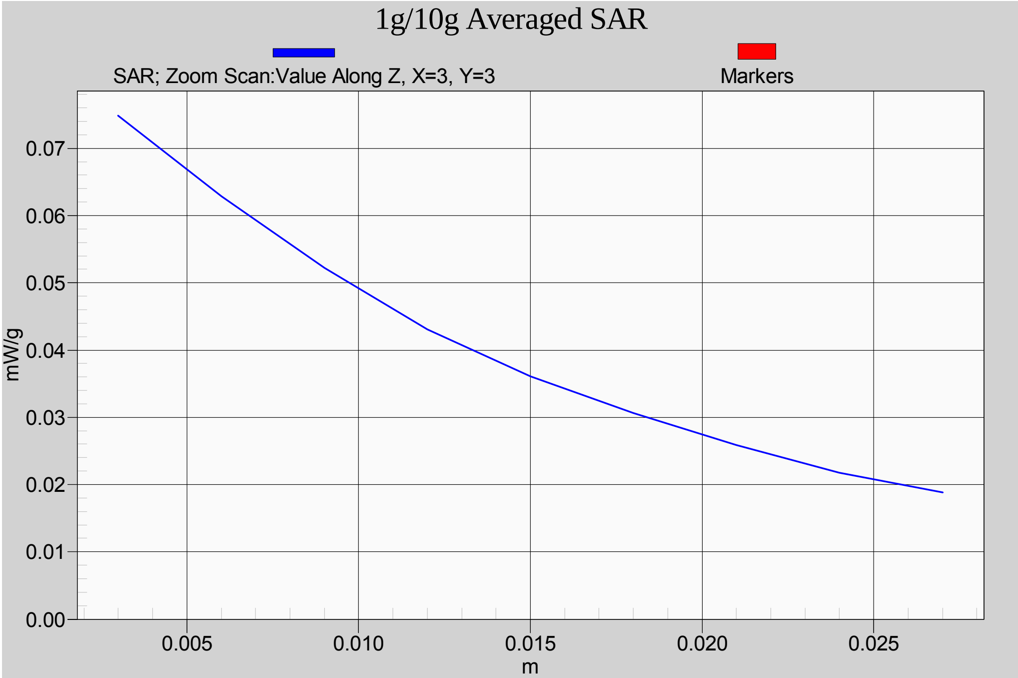


Figure 14. Z-axis Plot of Flat GPRS 850 3Down1Up CH190_Horizontal Up_5mm with USB Cable

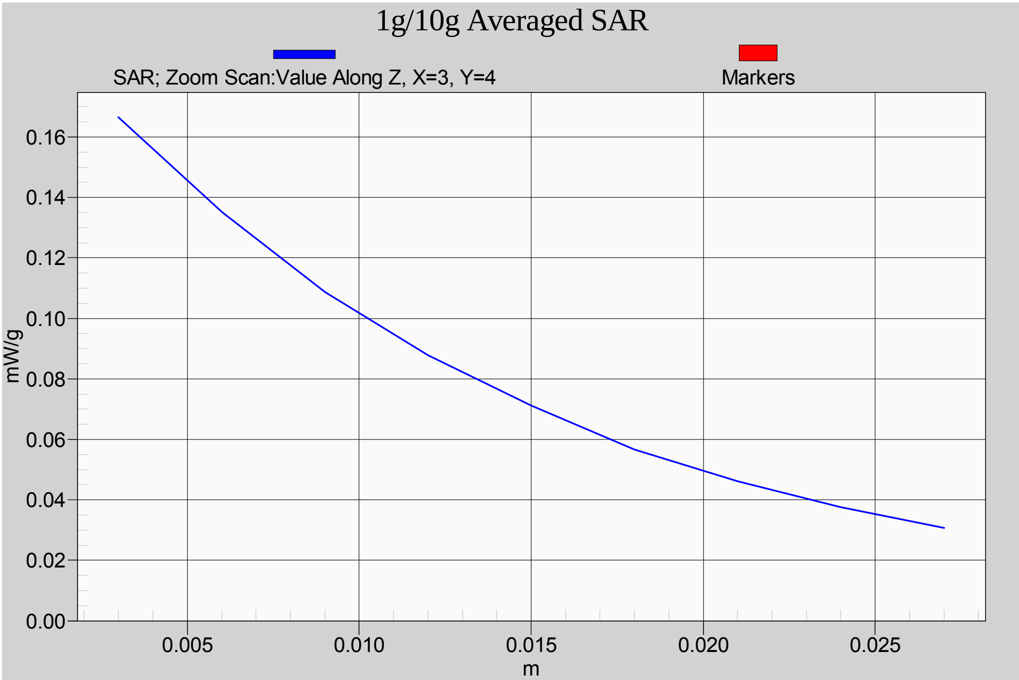


Figure 15. Z-axis Plot of Flat GPRS 850 3Down2Up CH190_Horizontal Up_5mm with USB Cable

10.3 PCS 1900 Results _ Flat

Ambient：

Temperature (℃)：	22 ± 2	Relative HUMIDITY (%)：	40-70

Liquid：

Mixture Type：	MSL1900	Liquid Temperature (℃)：	22.0
		Depth of liquid (cm)：	15

Measurement：

Crest Factor：	8.3	Probe S/N：	3150

Frequency		Band	Power (dBm)	Phantom Position	Antenna Position	Accessory	SAR_{1g} [mW/g]	Power Drift (dB)	Remark
MHz	CH								
1880.0	661	PCS 1900	31.11	Horizontal Up to phantom 5mm	Internal	N/A	0.042	0.099	---
1880.0	661	PCS 1900	31.11	Horizontal Down to phantom 5mm	Internal	N/A	0.029	-0.077	---
1880.0	661	PCS 1900	31.11	Vertical Front to phantom 5mm	Internal	N/A	0.020	0.00518	---
1880.0	661	PCS 1900	31.11	Vertical Back to phantom 5mm	Internal	N/A	0.022	0.027	---
1880.0	661	PCS 1900	31.11	Horizontal Down to phantom 10mm	Internal	N/A	0.018	-0.107	---
Std. C95.1-1999 - Safety Limit Spatial Peak Uncontrolled Exposure/General Population					1.6 W/kg (mW/g) Averaged over 1 gram				

Detail results see Appendix B.

Z-axis Plot of SAR Measurement

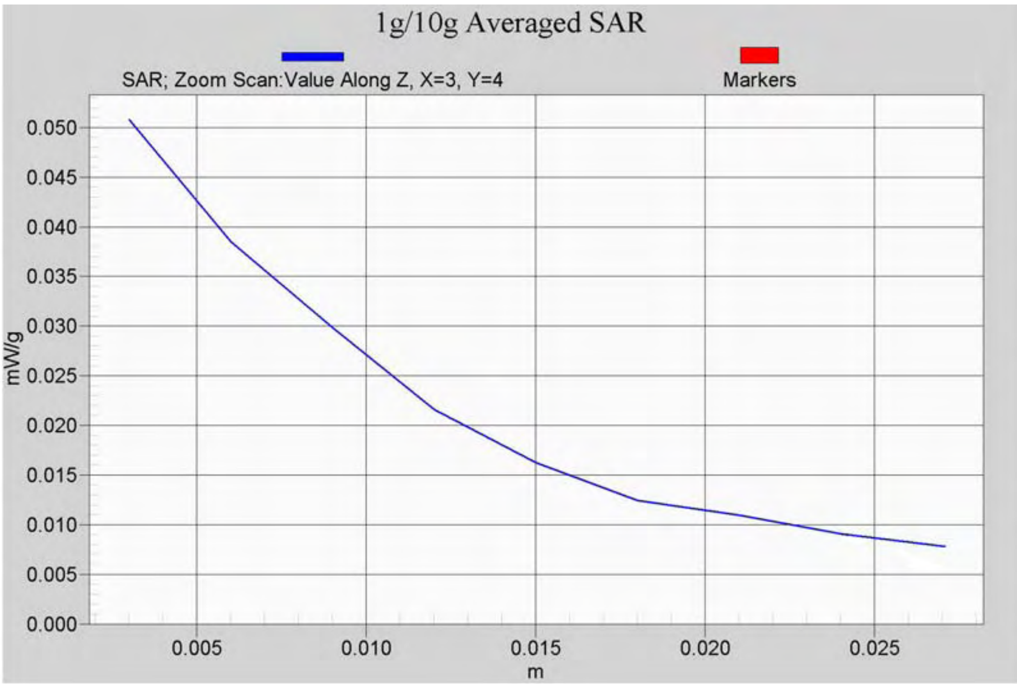


Figure 16. Z-axis Plot of Flat PCS1900 CH661_ Horizontal Up_5mm with Notebook

10.4 GPRS 1900 Results _ Flat

Ambient：

Temperature (℃)： **22 ± 2**　　Relative HUMIDITY (%)： **40-70**

Liquid：

Mixture Type： **MSL1900**　　Liquid Temperature (℃)： **22.0**

Depth of liquid (cm)： **15**

Measurement：

Crest Factor： **8.3**　　Probe S/N： **3150**

Frequency		Band	Power (dBm)	Phantom Position	Antenna Position	Accessory	SAR_{1g} [mW/g]	Power Drift (dB)	Remark
MHz	CH								
1880.0	661	GPRS 1900 3Down1Up	29.34	Horizontal Up to phantom 5mm	Internal	N/A	0.038	0.152	---
1880.0	661	GPRS 1900 3Down2Up	29.30	Horizontal Up to phantom 5mm	Internal	N/A	0.116	0.079	---
1880.0	661	GPRS 1900 3Down1Up	29.34	Horizontal Down to phantom 5mm	Internal	N/A	0.024	-0.00453	---
1880.0	661	GPRS 1900 3Down1Up	29.34	Vertical Front to phantom 5mm	Internal	N/A	0.018	0.048	---
1880.0	661	GPRS 1900 3Down1Up	29.34	Vertical Back to phantom 5mm	Internal	N/A	0.020	0.179	---
Std. C95.1-1999 - Safety Limit Spatial Peak Uncontrolled Exposure/General Population					1.6 W/kg (mW/g) Averaged over 1 gram				

Detail results see Appendix B.

Z-axis Plot of SAR Measurement

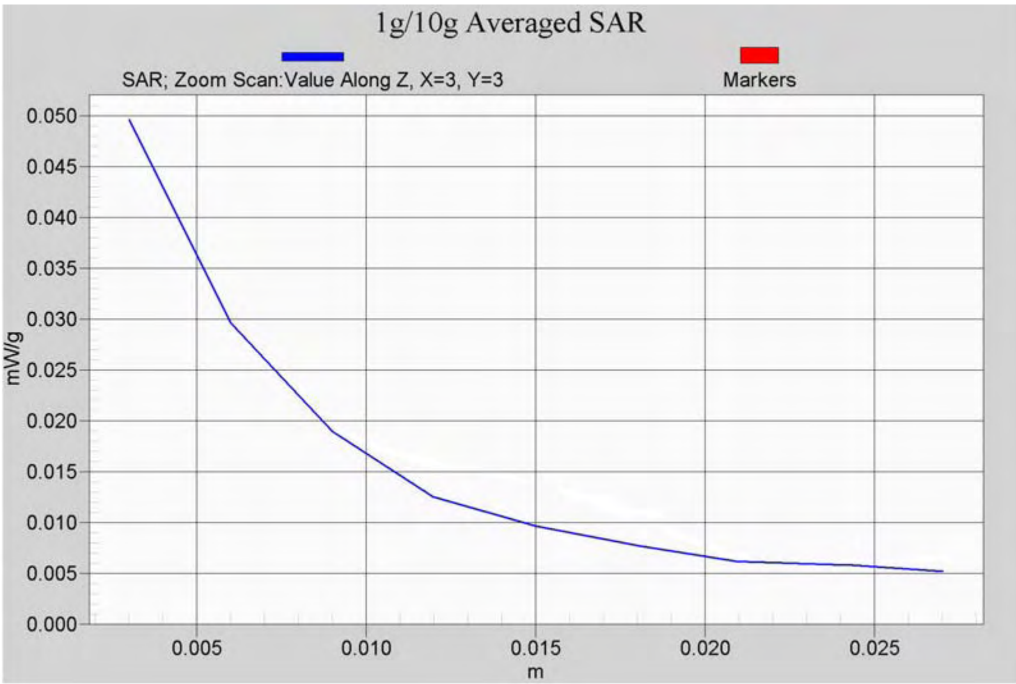


Figure 17. Z-axis Plot of Flat GPRS1900 3Down1Up CH661_ Horizontal Up_5mm with Notebook

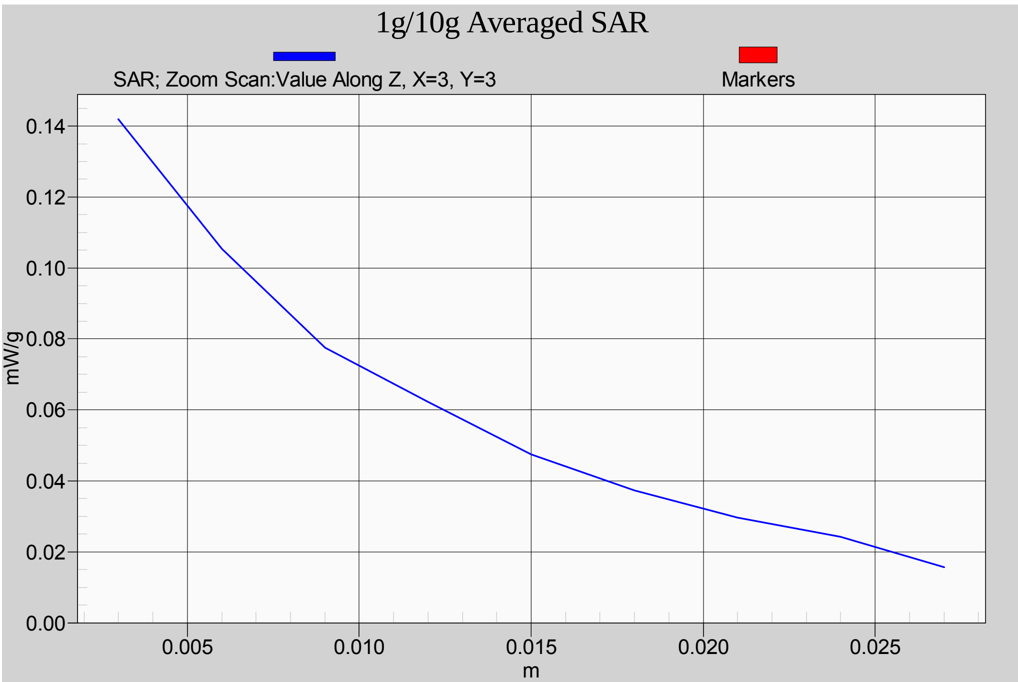


Figure 18. Z-axis Plot of Flat GPRS1900 3Down2Up CH661_ Horizontal Up_5mm with Notebook

10.5 Setup Photo

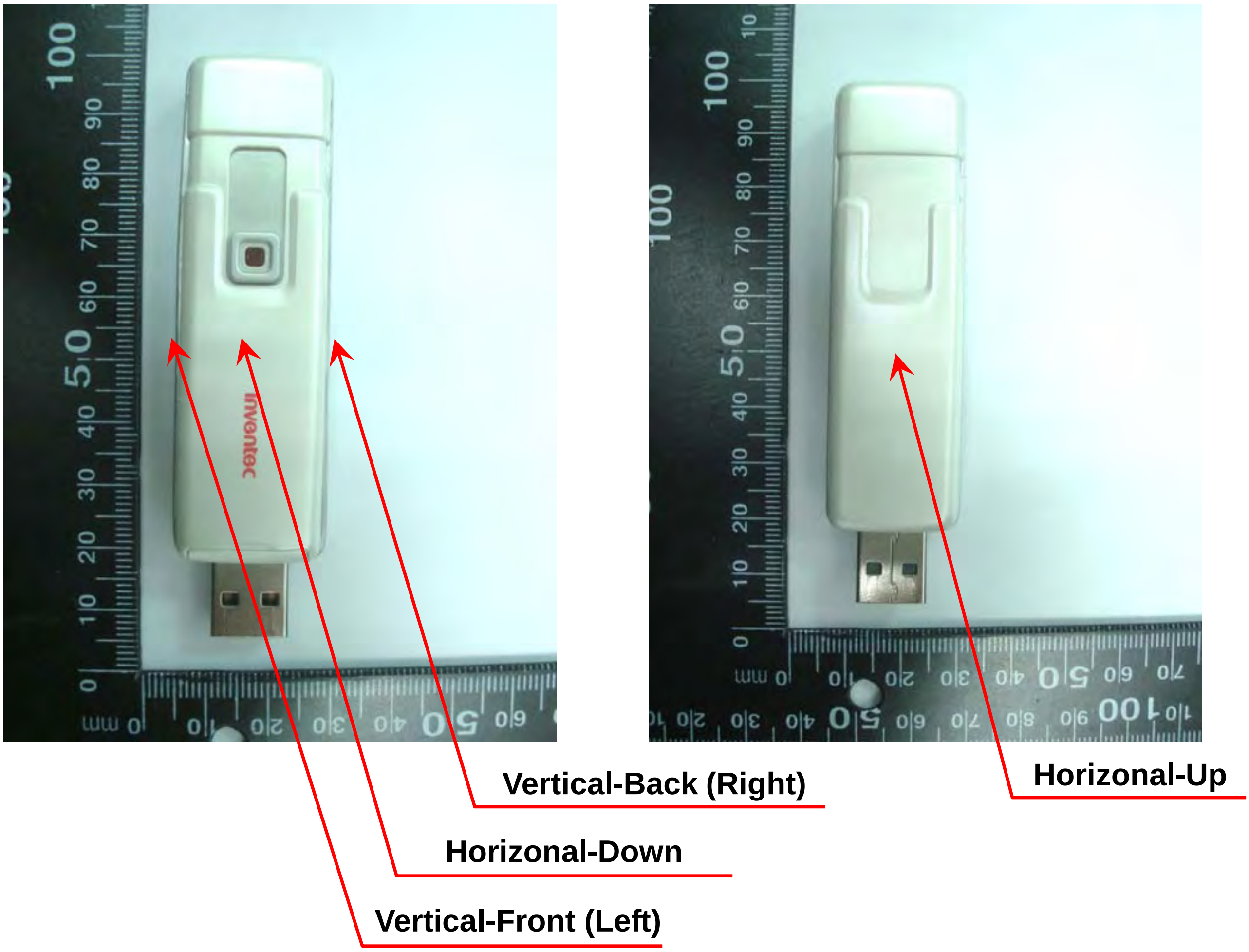


Figure 19. Body SAR Test Setup (Flat Section) _ EUT Horizontal Up

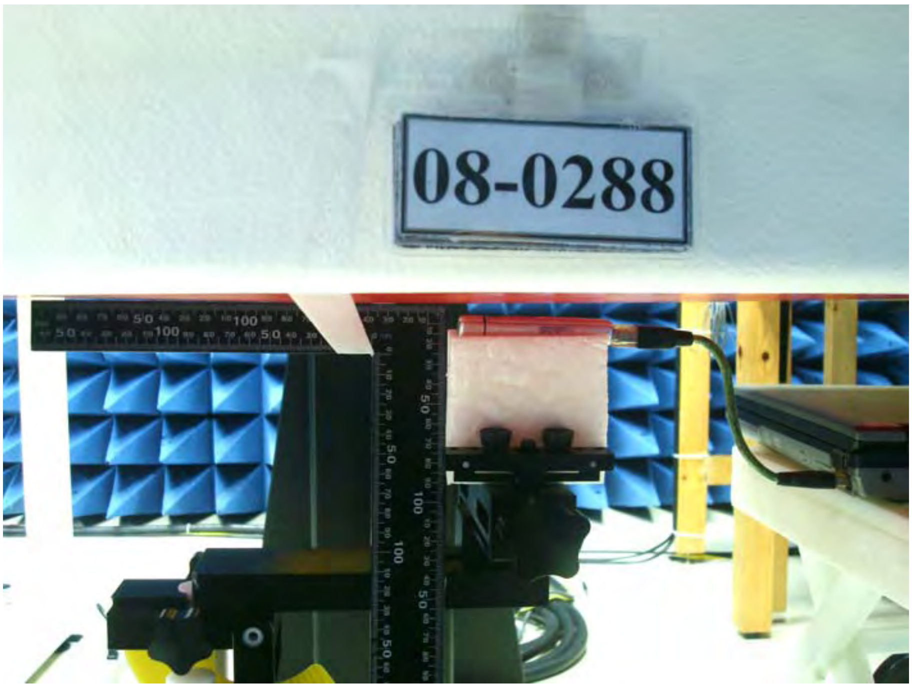


Figure 20. Body SAR Test Setup (Flat Section) _ EUT Horizontal Down with USB Cable

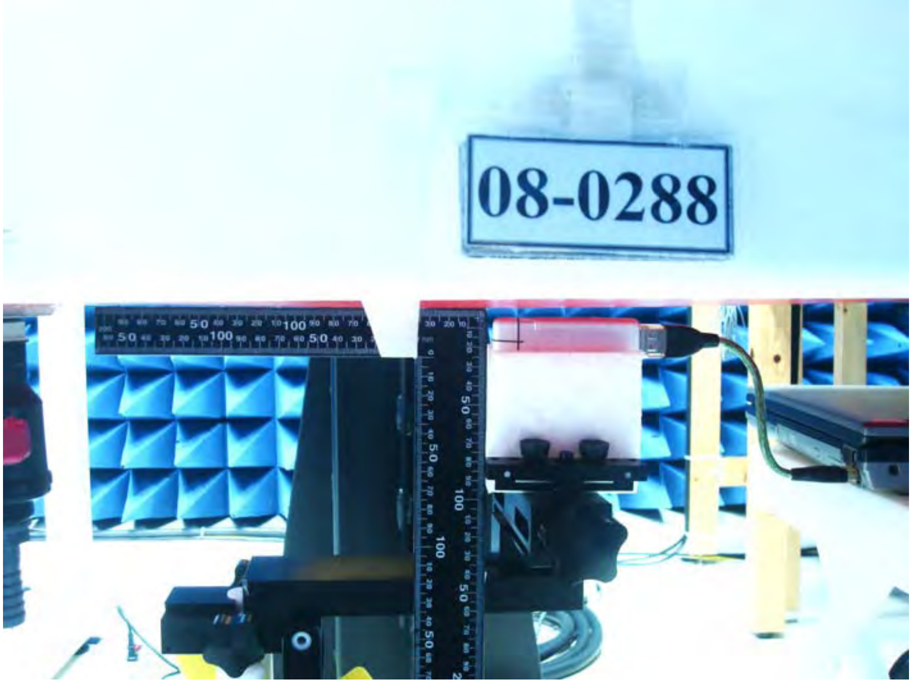


Figure 21. Body SAR Test Setup (Flat Section) _ Vertical Front with USB Cable

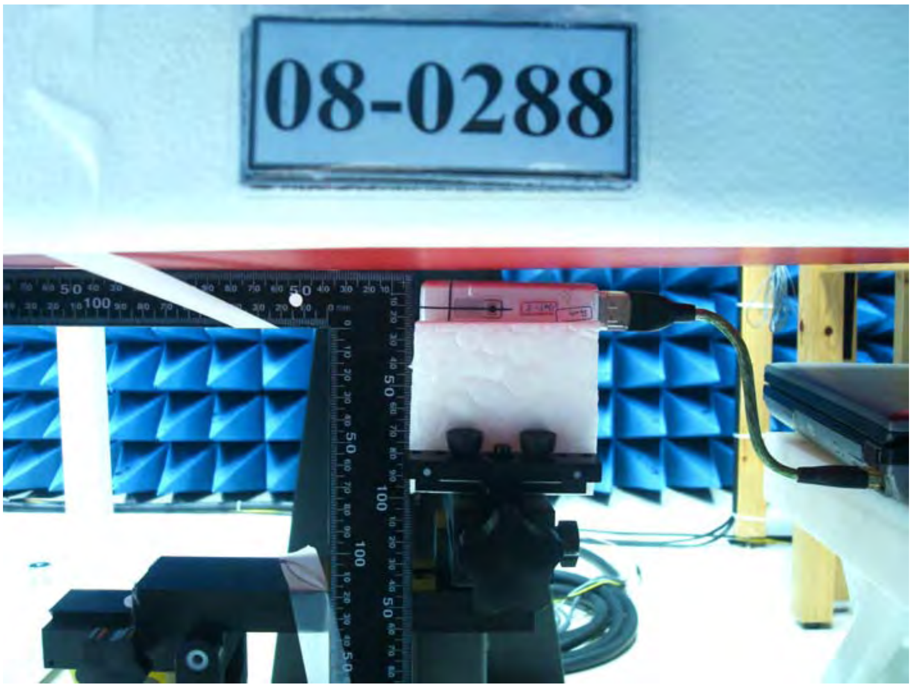


Figure 22. Body SAR Test Setup (Flat Section) _ Vertical Back with USB Cable

10.6 Std. C95.1-1999 RF Exposure Limit

Human Exposure	Population Uncontrolled Exposure (W/kg) or (mW/g)	Occupational Controlled Exposure (W/kg) or (mW/g)
Spatial Peak SAR* (head)	1.60	8.00
Spatial Peak SAR** (Whole Body)	0.08	0.40
Spatial Peak SAR*** (Partial-Body)	1.60	8.00
Spatial Peak SAR**** (Hands / Feet / Ankle / Wrist)	4.00	20.00

Table 7. 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 Average value of the SAR averaged over the partial – 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.

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

Occupational / 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).

11. Conclusion

The SAR test values found for the portable mobile phone **Inventec Corporation Trade Name：Inventec Model(s)：Minerva 3107** are below the maximum recommended level of 1.6 W/kg (mW/g).

12. References

[1] Std. C95.1-1999, "*American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300KHz to 100GHz",* New York.

[2] NCRP, National Council on Radiation Protection and Measurements, "*Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields"*, NCRP report NO. 86, 1986.

[3] T. Schmid, O. Egger, and N. Kuster, "*Automatic E-field scanning system for dosimetric assessments*", IEEE Transactions on Microwave Theory and Techniques, vol. 44, pp, 105-113, Jan. 1996.

[4] K. Poković, T. Schmid, and N. Kuster, "*Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequency*", in ICECOM'97, Dubrovnik, October 15-17, 1997, pp.120-124.

[5] K. Poković, T. Schmid, and N. Kuster, "*E-field probe with improved isotropy in brain simulating liquids*", in Proceedings of the ELMAR, Zadar, Croatia, 23-25 June, 1996, pp.172-175.

[6] N. Kuster, and Q. Balzano, "*Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300MHz"*, IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.

[7] Robert J. Renka, "*Multivariate Interpolation Of Large Sets Of Scattered Data*", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988 , pp. 139-148.

[8] N. Kuster, R. Kastle, T. Schmid, *Dosimetric evaluation of mobile communications equipment with known precision*, IEEE Transaction on Communications, vol. E80-B, no. 5, May 1997, pp. 645-652.

[9] Std. C95.3-1991, "*IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave,* New York: IEEE, Aug. 1992.

[10] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), *Human Exposure to Electromagnetic Fields High-frequency*: 10KHz-300GHz, Jan. 1995.

Appendix A - System Performance Check

See following Attached Pages for System Performance Check.

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/10/2008 10:11:24 AMDate/Time: 12/10/2008 10:20:42 AM

System Performance Check at 900MHz_20081210_Body

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:073

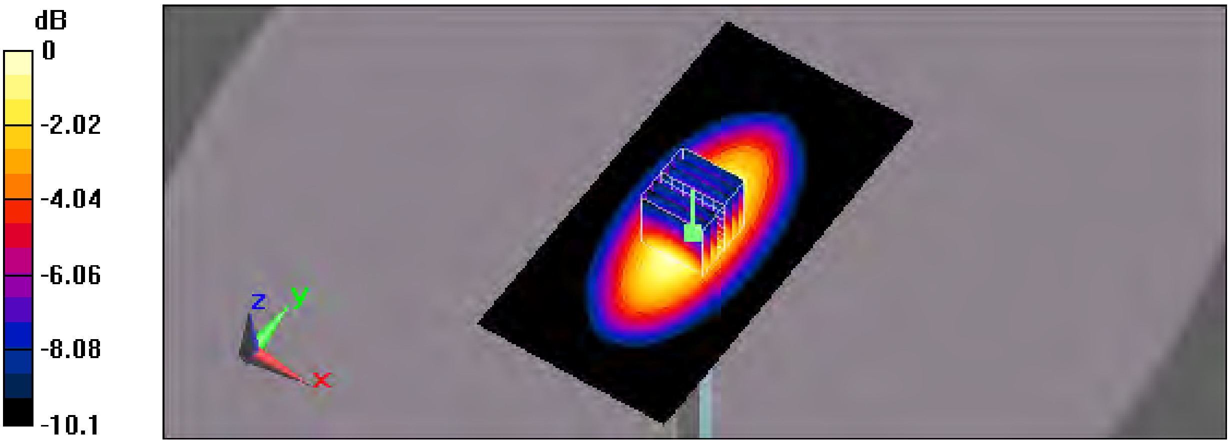
Communication System: CW; Frequency: 900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; σ = 1.03 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(6, 6, 6); Calibrated: 1/9/2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

System Performance Check at 900MHz/Area Scan (61x121x1):
Measurement grid:
dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.1 mW/g

System Performance Check at 900MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid:
dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.4 V/m; Power Drift = -0.087 dB
Peak SAR (extrapolated) = 3.88 W/kg
SAR(1 g) = 2.71 mW/g; SAR(10 g) = 1.79 mW/g
Maximum value of SAR (measured) = 3.06 mW/g



0 dB = 3.06mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/12/2008 12:20:30 AMDate/Time: 12/12/2008 12:29:22 AM

System Performance Check at 900MHz_20081211_Body

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:073

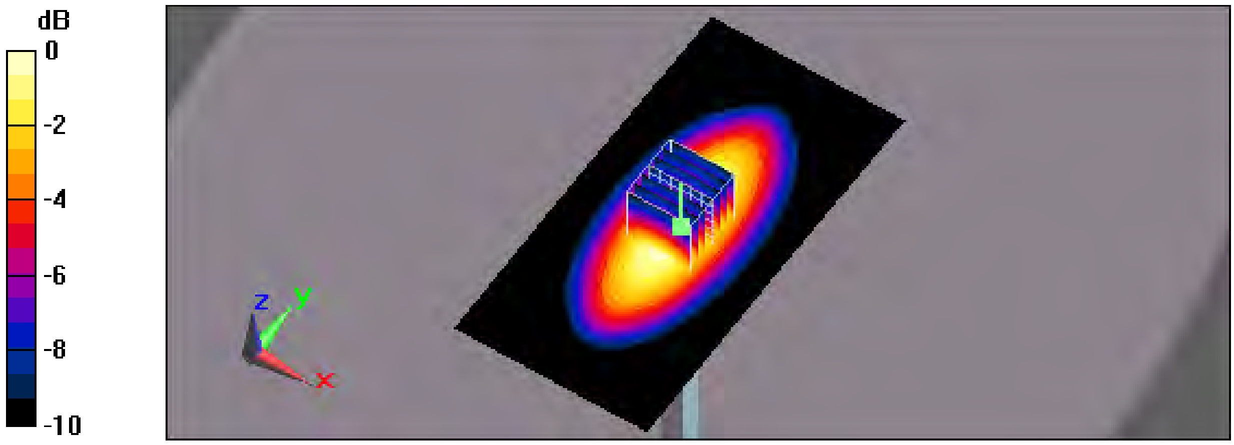
Communication System: CW; Frequency: 900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; σ = 1.03 mho/m; ε_r = 55.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(6, 6, 6); Calibrated: 1/9/2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

System Performance Check at 900MHz/Area Scan (61x121x1):
Measurement grid:
dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.15 mW/g

System Performance Check at 900MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid:
dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.8 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 4 W/kg
SAR(1 g) = 2.79 mW/g; SAR(10 g) = 1.85 mW/g
Maximum value of SAR (measured) = 3.17 mW/g



0 dB = 3.17mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 3/11/2009 6:11:42 PM

System Performance Check at 900MHz_20090311_Body

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:172

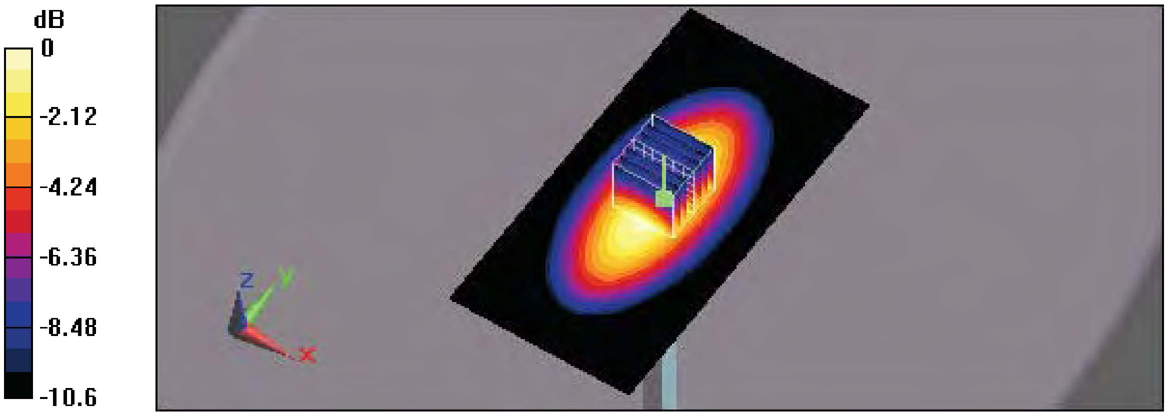
Communication System: CW; Frequency: 900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 900 MHz; σ = 1.02 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(5.91, 5.91, 5.91); Calibrated: 1/20/2009
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

System Performance Check at 900MHz/Area Scan (61x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 3.26 mW/g

System Performance Check at 900MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.2 V/m; Power Drift = 0.043 dB
Peak SAR (extrapolated) = 4.27 W/kg
SAR(1 g) = 2.87 mW/g; SAR(10 g) = 1.86 mW/g
Maximum value of SAR (measured) = 3.25 mW/g



0 dB = 3.25mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/11/2008 2:27:46 AMDate/Time: 12/11/2008 2:36:35 AM

System Performance Check at 1900MHz_20081211_Body

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d018

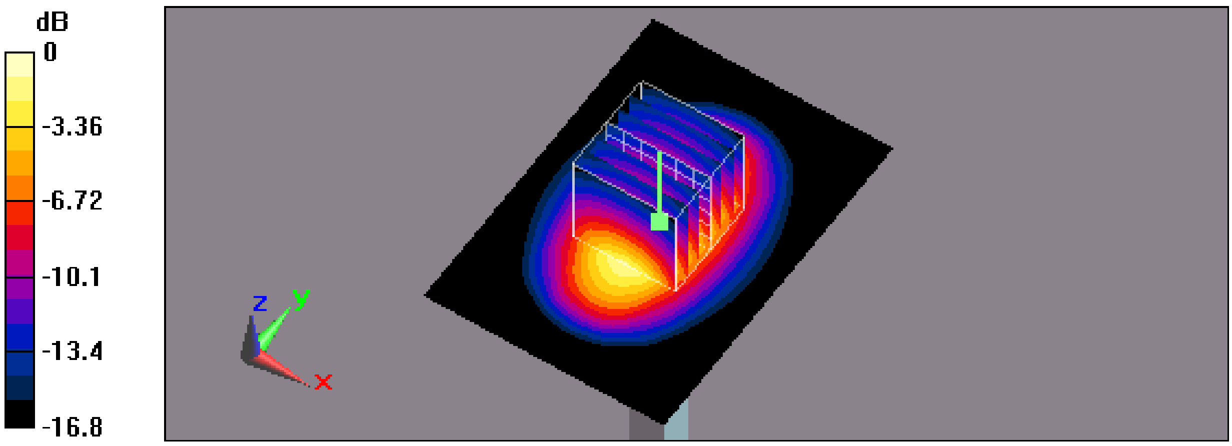
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.5 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(4.95, 4.95, 4.95); Calibrated: 1/9/2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

System Performance Check at 1900MHz/Area Scan (71x101x1):
Measurement grid:
dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 12.1 mW/g

System Performance Check at 1900MHz/Zoom Scan (7x7x7)/Cube 0:
Measurement
grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.3 V/m; Power Drift = -0.00682 dB
Peak SAR (extrapolated) = 18 W/kg
SAR(1 g) = 9.82 mW/g; SAR(10 g) = 5.12 mW/g
Maximum value of SAR (measured) = 12 mW/g



0 dB = 12mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 3/11/2009 8:11:12 PM

System Performance Check at 1900MHz_20090311_Body

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d018

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.5 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

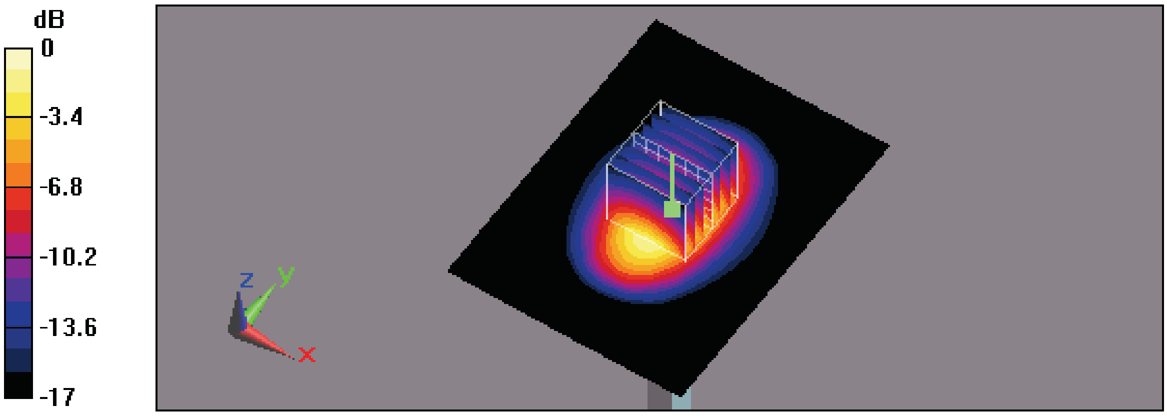
- Probe: ES3DV3 - SN3150; ConvF(4.92, 4.92, 4.92); Calibrated: 1/20/2009
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

System Performance Check at 1900MHz/Area Scan (91x121x1):

Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 12.2 mW/g

System Performance Check at 1900MHz/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.4 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 9.67 mW/g; SAR(10 g) = 5.03 mW/g
Maximum value of SAR (measured) = 11.8 mW/g



0 dB = 11.8mW/g

Appendix B - SAR Measurement Data

See following Attached Pages for SAR Measurement Data.

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/10/2008 1:48:52 PMDate/Time: 12/10/2008 1:55:38 PM

Flat_GSM 850 CH190_Horizontal Up_Open 90_5mm

DUT: Minerva3107_Horizontal Up; Type: USB Dongle; FCC ID: DGIMINERVA3107

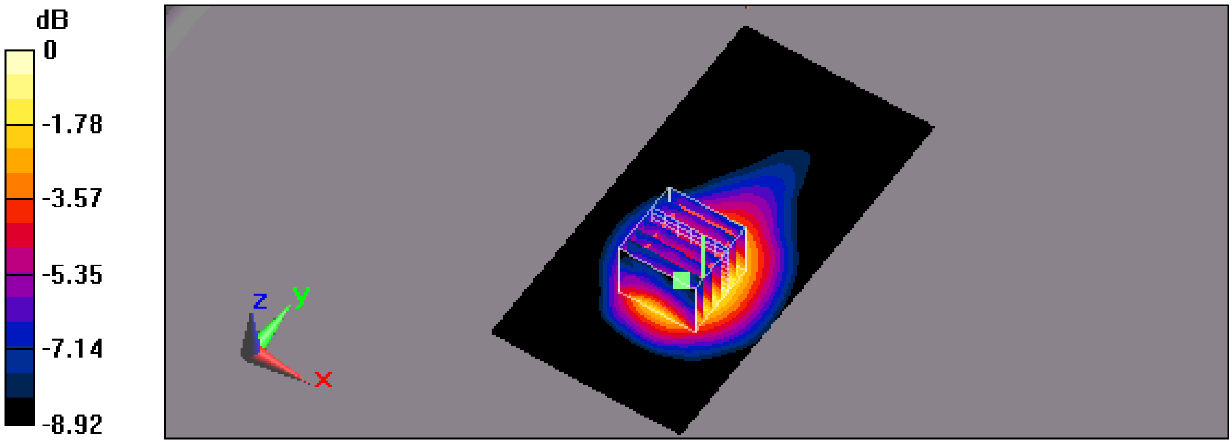
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.975 mho/m; ε_r = 56.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(6, 6, 6); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.061 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 7.86 V/m; Power Drift = -0.151 dB
Peak SAR (extrapolated) = 0.070 W/kg
SAR(1 g) = 0.047 mW/g; SAR(10 g) = 0.031 mW/g
Maximum value of SAR (measured) = 0.054 mW/g



0 dB = 0.054mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/10/2008 2:59:13 PMDate/Time: 12/10/2008 3:06:00 PM

Flat_GSM 850 CH190_Horizontal Down_5mm_with USB Cable

DUT: Minerva3107_Horizontal Down; Type: USB Dongle; FCC ID: DGIMINERVA3107

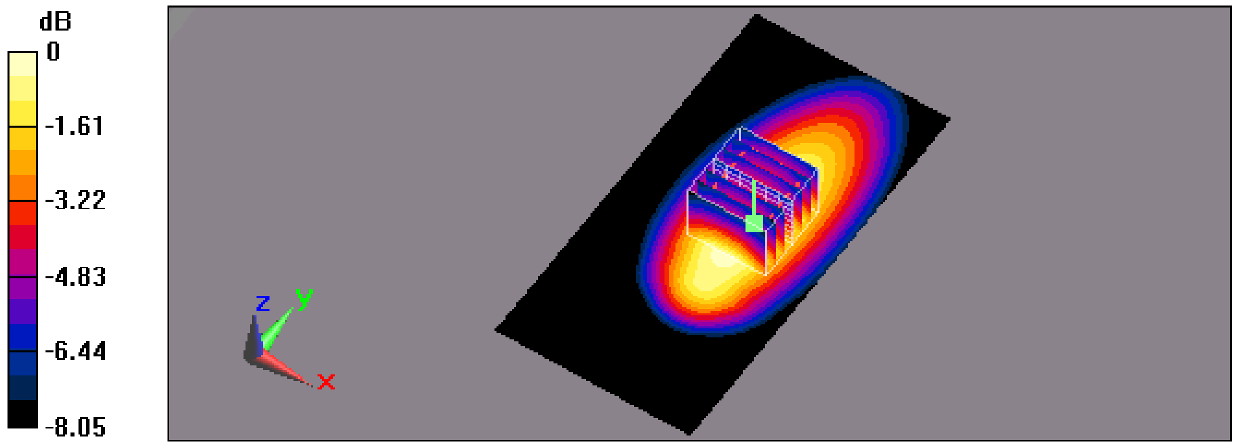
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.975 mho/m; ε_r = 56.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(6, 6, 6); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.077 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 7.46 V/m; Power Drift = -0.095 dB
Peak SAR (extrapolated) = 0.089 W/kg
SAR(1 g) = 0.067 mW/g; SAR(10 g) = 0.047 mW/g
Maximum value of SAR (measured) = 0.077 mW/g



0 dB = 0.077mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/10/2008 4:08:32 PMDate/Time: 12/10/2008 4:15:20 PM

Flat_GSM 850 CH190_Vercital Front_5mm_with USB Cable

DUT: Minerva3107_Vercital Front; Type: USB Dongle; FCC ID: DGIMINERVA3107

Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.975 mho/m; ε_r = 56.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

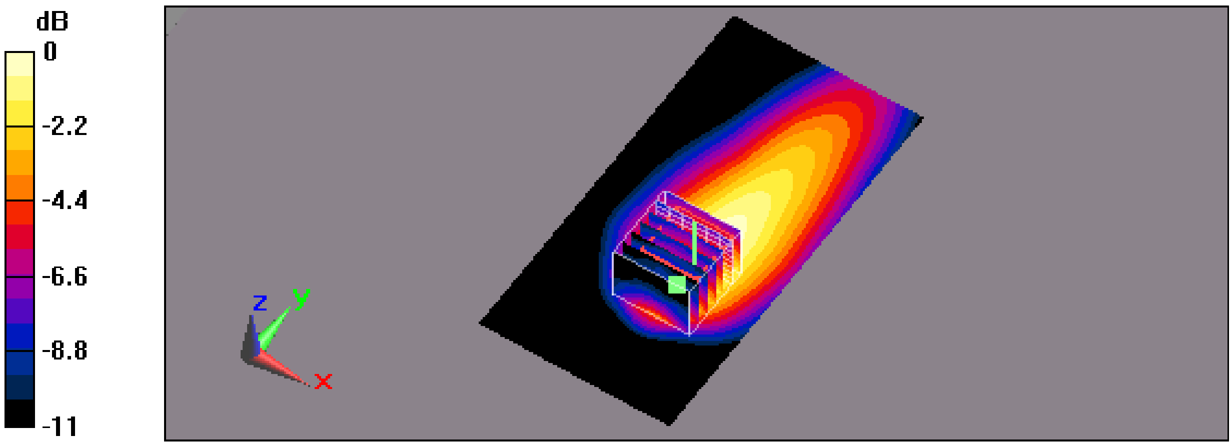
- Probe: ES3DV3 - SN3150; ConvF(6, 6, 6); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):

Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.062 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 6.97 V/m; Power Drift = -0.090 dB
Peak SAR (extrapolated) = 0.097 W/kg
SAR(1 g) = 0.043 mW/g; SAR(10 g) = 0.026 mW/g
Maximum value of SAR (measured) = 0.051 mW/g



0 dB = 0.051mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/10/2008 5:31:40 PMDate/Time: 12/10/2008 6:07:02 PM

Flat_GSM 850 CH190_Vercital Back_5mm_with USB Cable

DUT: Minerva3107_Vercital Back; Type: USB Dongle; FCC ID: DGIMINERVA3107

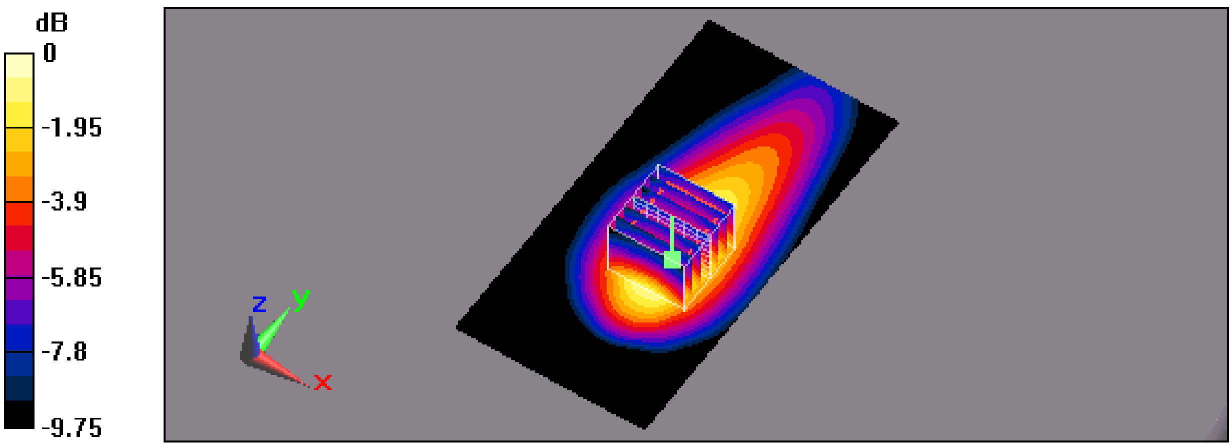
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.975 mho/m; ε_r = 56.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(6, 6, 6); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.046 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 6.56 V/m; Power Drift = -0.169 dB
Peak SAR (extrapolated) = 0.057 W/kg
SAR(1 g) = 0.038 mW/g; SAR(10 g) = 0.025 mW/g
Maximum value of SAR (measured) = 0.045 mW/g



0 dB = 0.045mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/12/2008 1:58:29 AMDate/Time: 12/12/2008 2:05:13 AM

Flat_GSM 850 CH190_Horizontal Down_10mm_with USB Cable

DUT: Minerva3107_Horizontal Down; Type: USB Dongle; FCC ID: DGIMINERVA3107

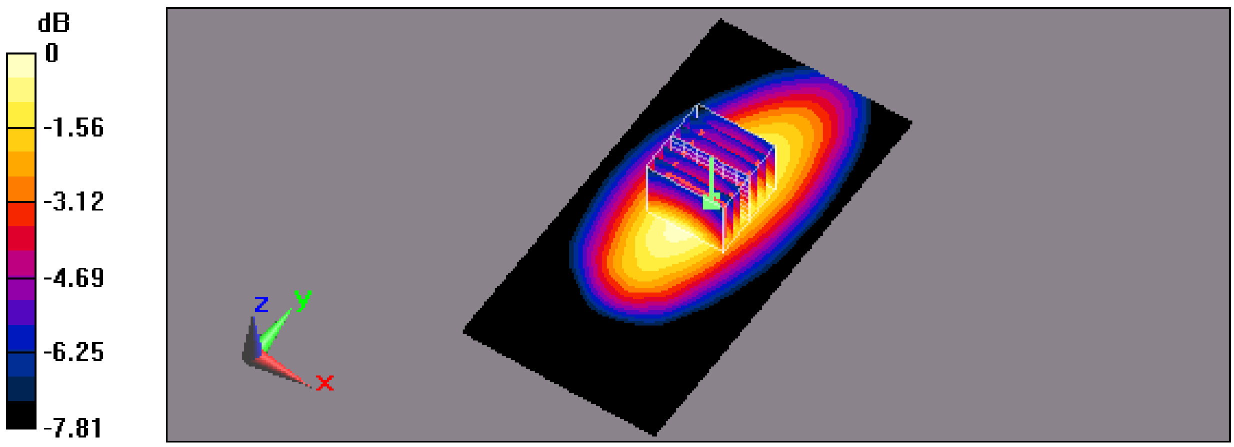
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.975 mho/m; ε_r = 56.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(6, 6, 6); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.063 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 6.35 V/m; Power Drift = -0.112 dB
Peak SAR (extrapolated) = 0.071 W/kg
SAR(1 g) = 0.056 mW/g; SAR(10 g) = 0.040 mW/g
Maximum value of SAR (measured) = 0.063 mW/g



0 dB = 0.063mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/12/2008 2:23:42 AMDate/Time: 12/12/2008 2:30:41 AM

Flat_GSM 850 CH190_Horizontal Down_15mm_with USB Cable

DUT: Minerva3107_Horizontal Down; Type: USB Dongle; FCC ID: DGIMINERVA3107

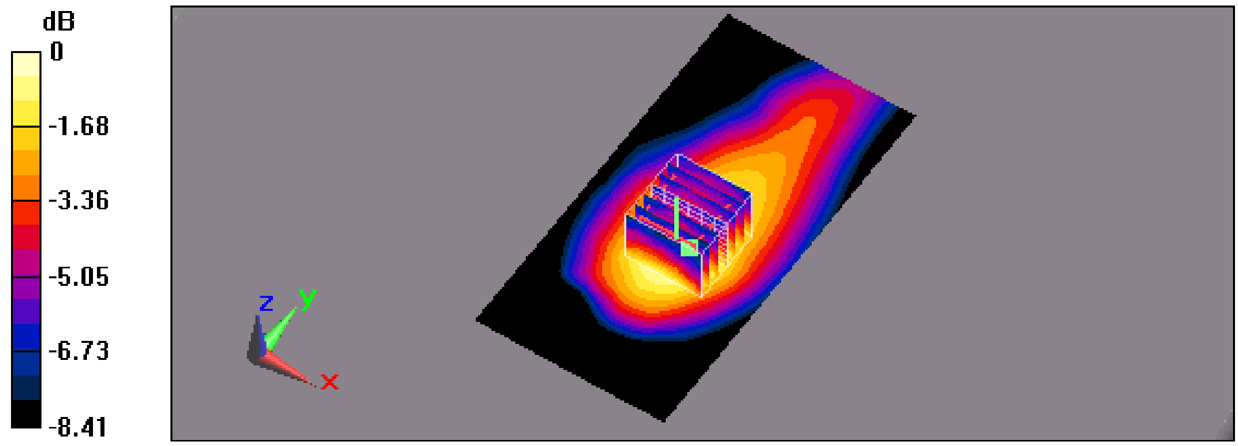
Communication System: GSM850; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; $\sigma = 0.975$ mho/m; $\varepsilon_r = 56.1$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(6, 6, 6); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.019 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 4.37 V/m; Power Drift = 0.178 dB
Peak SAR (extrapolated) = 0.025 W/kg
SAR(1 g) = 0.018 mW/g; SAR(10 g) = 0.012 mW/g
Maximum value of SAR (measured) = 0.020 mW/g



0 dB = 0.020mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/10/2008 12:09:15 PMDate/Time: 12/10/2008 12:16:02 PM

Flat_GSM 850 GPRS CH190_3Down1Up_Horizontal Up_Open 90_5mm

DUT: Minerva3107_Horizontal Up; Type: USB Dongle; FCC ID: DGIMINERVA3107

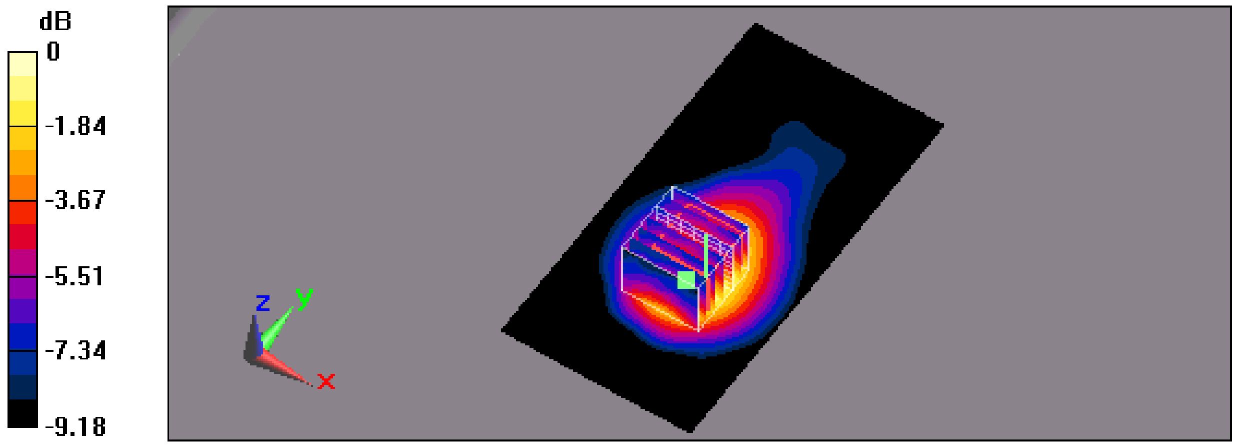
Communication System: GSM 850 GPRS(3Down, 1Up); Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.975 mho/m; ε_r = 56.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(6, 6, 6); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.059 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 7.46 V/m; Power Drift = 0.030 dB
Peak SAR (extrapolated) = 0.067 W/kg
SAR(1 g) = 0.043 mW/g; SAR(10 g) = 0.028 mW/g
Maximum value of SAR (measured) = 0.050 mW/g



0 dB = 0.050mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/10/2008 2:30:54 PMDate/Time: 12/10/2008 2:37:41 PM

Flat_GSM 850 GPRS CH190_3Down1Up_Horizontal Down_5mm_with USB Cable

DUT: Minerva3107_Horizontal Down; Type: USB Dongle; FCC ID: DGIMINERVA3107

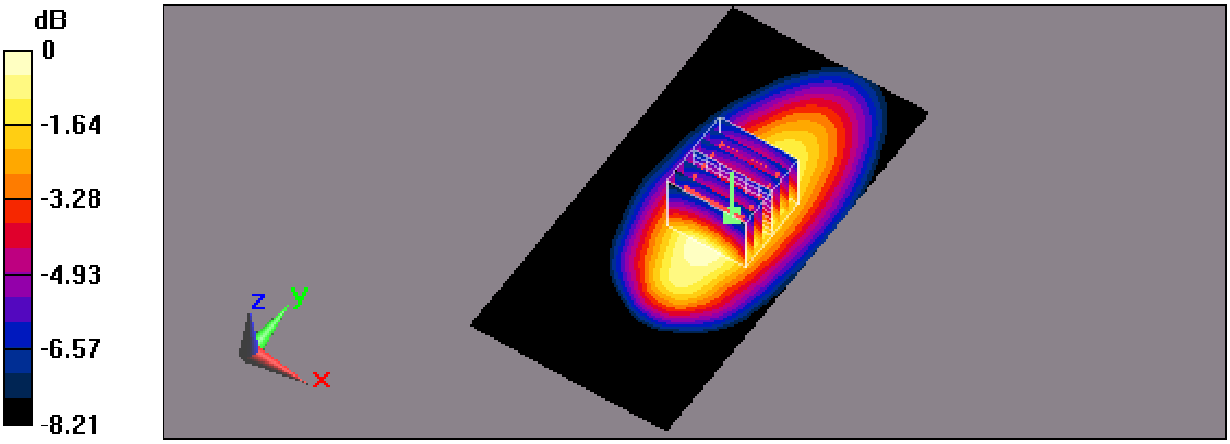
Communication System: GSM 850 GPRS(3Down, 1Up); Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.975 mho/m; ϵ_r = 56.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(6, 6, 6); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.078 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 7.58 V/m; Power Drift = 0.174 dB
Peak SAR (extrapolated) = 0.087 W/kg
SAR(1 g) = 0.066 mW/g; SAR(10 g) = 0.046 mW/g
Maximum value of SAR (measured) = 0.075 mW/g



0 dB = 0.075mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 3/11/2009 7:01:08 PM

Flat_GSM 850 GPRS CH190_3Down2Up_Horizontal Down_5mm_with USB Cable

DUT: Minerva3107_Horizontal Down; Type: USB Dongle; FCC ID: DGIMINERVA3107

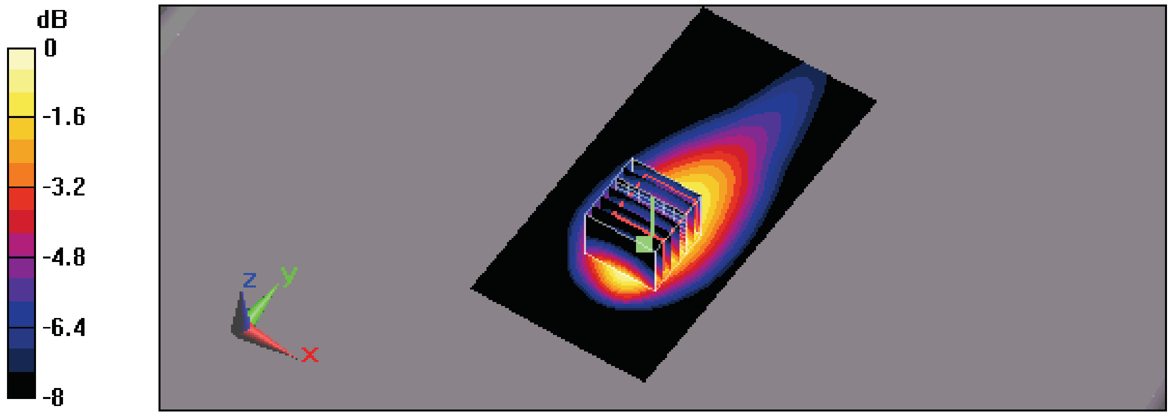
Communication System: GSM 850 GPRS(3Down, 2Up); Frequency: 836.6 MHz;Duty Cycle: 1:4.2
Medium parameters used: f = 837 MHz; σ = 0.961 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(5.91, 5.91, 5.91); Calibrated: 1/20/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.190 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 14.3V/m; Power Drift = -0.161 dB
Peak SAR (extrapolated) = 0.201 W/kg
SAR(1 g) = 0.141mW/g; SAR(10 g) = 0.092 mW/g
Maximum value of SAR (measured) = 0.167 mW/g



0 dB = 0.167mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/10/2008 3:39:41 PMDate/Time: 12/10/2008 3:46:27 PM

Flat_GSM 850 GPRS CH190_3Down1Up_Vercital Front_5mm_with USB Cable

DUT: Minerva3107_Vercital Front; Type: USB Dongle; FCC ID: DGIMINERVA3107

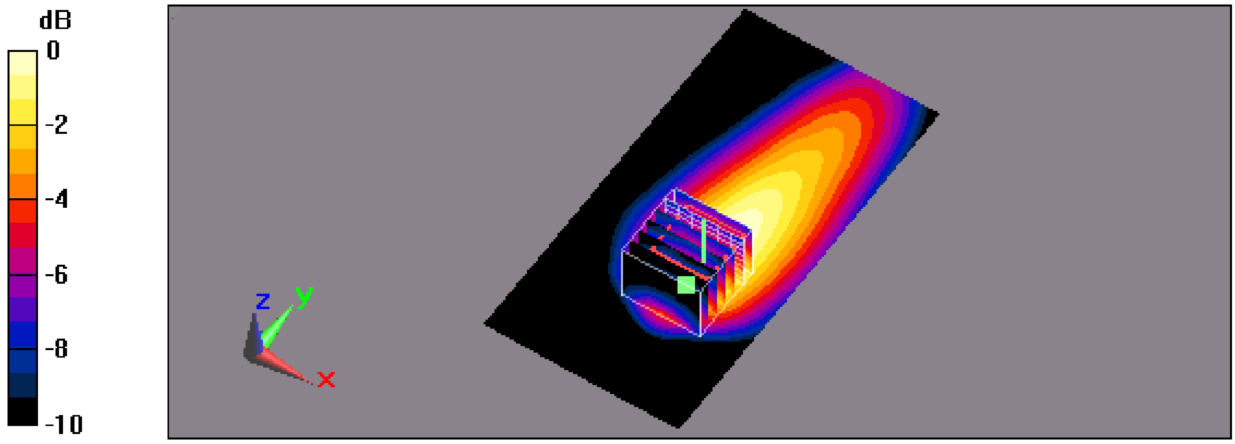
Communication System: GSM 850 GPRS(3Down, 1Up); Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.975 mho/m; ε_r = 56.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(6, 6, 6); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.061 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 6.99 V/m; Power Drift = -0.198 dB
Peak SAR (extrapolated) = 0.095 W/kg
SAR(1 g) = 0.042 mW/g; SAR(10 g) = 0.026 mW/g
Maximum value of SAR (measured) = 0.049 mW/g



0 dB = 0.049mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/10/2008 5:01:38 PMDate/Time: 12/10/2008 5:08:24 PM

Flat_GSM 850 GPRS CH190_3Down1Up_Vercital Back_5mm_with USB Cable

DUT: Minerva3107_Vercital Back; Type: USB Dongle; FCC ID: DGIMINERVA3107

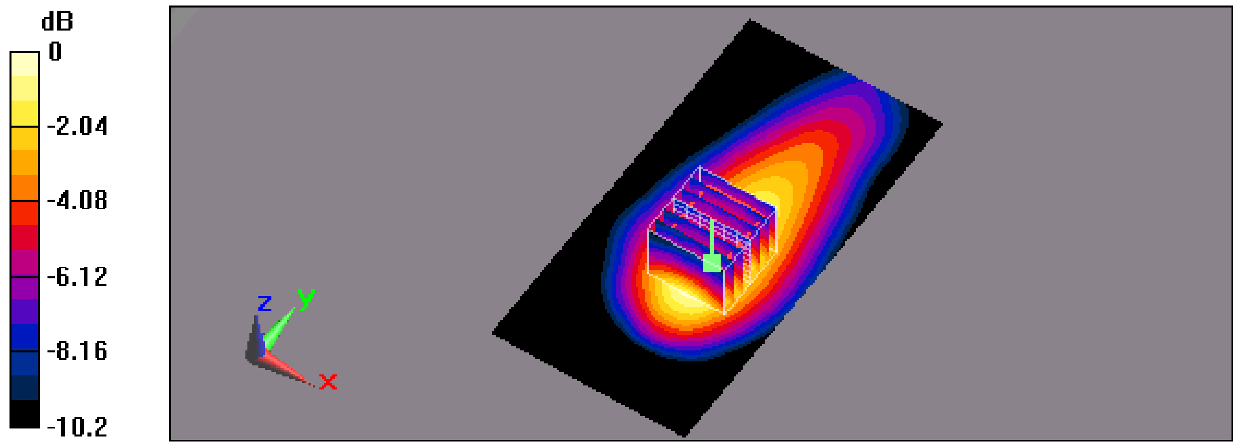
Communication System: GSM 850 GPRS(3Down, 1Up); Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.975 mho/m; ε_r = 56.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(6, 6, 6); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.045 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 6.54 V/m; Power Drift = -0.187 dB
Peak SAR (extrapolated) = 0.056 W/kg
SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.024 mW/g
Maximum value of SAR (measured) = 0.044 mW/g



0 dB = 0.044mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/11/2008 9:30:07 AMDate/Time: 12/11/2008 9:36:54 AM

Flat_PCS CH661_Horizontal Up_Open 90_5mm

DUT: Minerva3107_Horizontal Up; Type: USB Dongle; FCC ID: DGIMINERVA3107

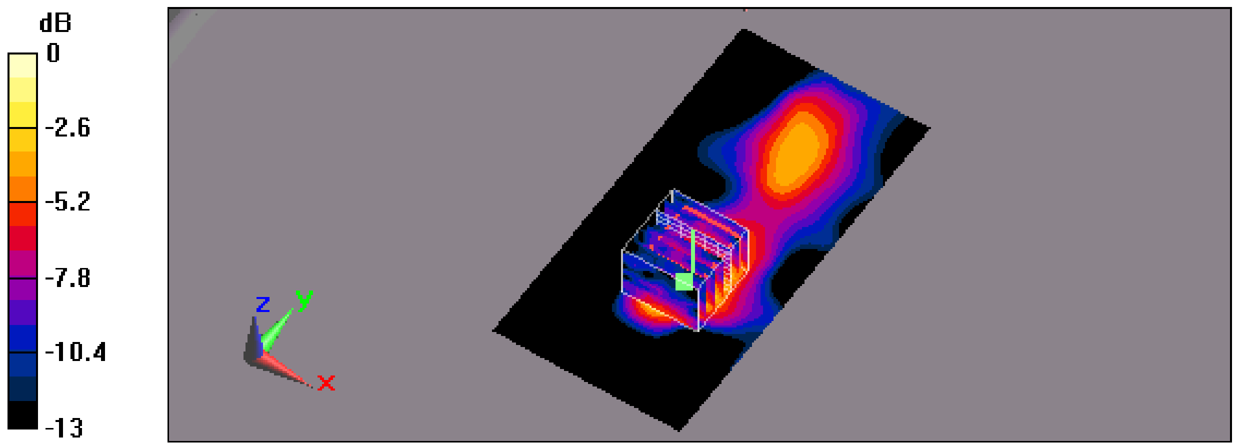
Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.48 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(4.95, 4.95, 4.95); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.062 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 5.64 V/m; Power Drift = 0.099 dB
Peak SAR (extrapolated) = 0.072 W/kg
SAR(1 g) = 0.042 mW/g; SAR(10 g) = 0.022 mW/g
Maximum value of SAR (measured) = 0.051 mW/g



0 dB = 0.051mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/11/2008 11:03:24 AMDate/Time: 12/11/2008 11:10:07 AM

Flat_PCS CH661_Horizontal Down_5mm_with USB Cable

DUT: Minerva3107_Horizontal Down; Type: USB Dongle; FCC ID: DGIMINERVA3107

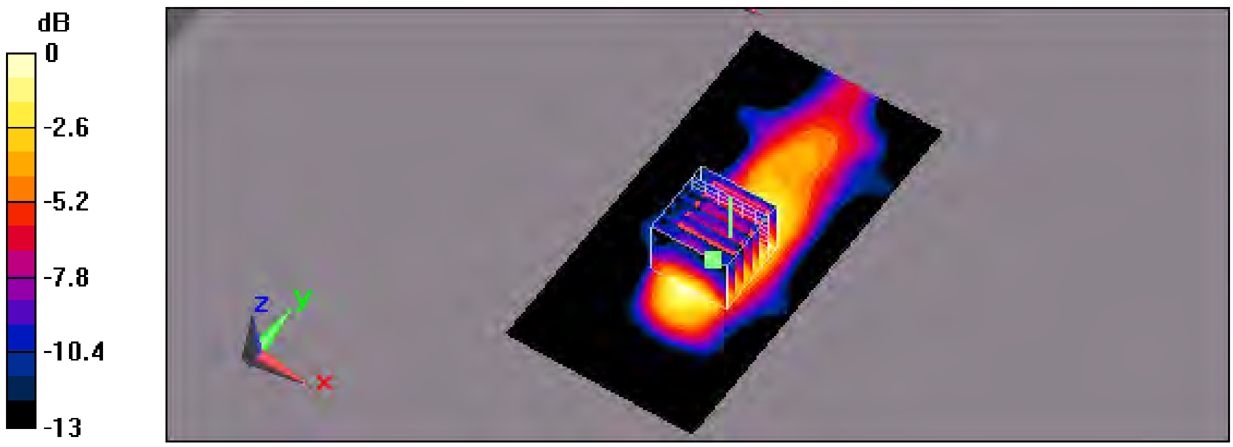
Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.48 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(4.95, 4.95, 4.95); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.035 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 4.39 V/m; Power Drift = -0.077 dB
Peak SAR (extrapolated) = 0.051 W/kg
SAR(1 g) = 0.029 mW/g; SAR(10 g) = 0.017 mW/g
Maximum value of SAR (measured) = 0.034 mW/g



0 dB = 0.034mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/11/2008 9:19:14 PMDate/Time: 12/11/2008 9:25:56 PM

Flat_PCS CH661_Vercital Back_5mm_with USB Cable

DUT: Minerva3107_Vercital Back; Type: USB Dongle; FCC ID: DGIMINERVA3107

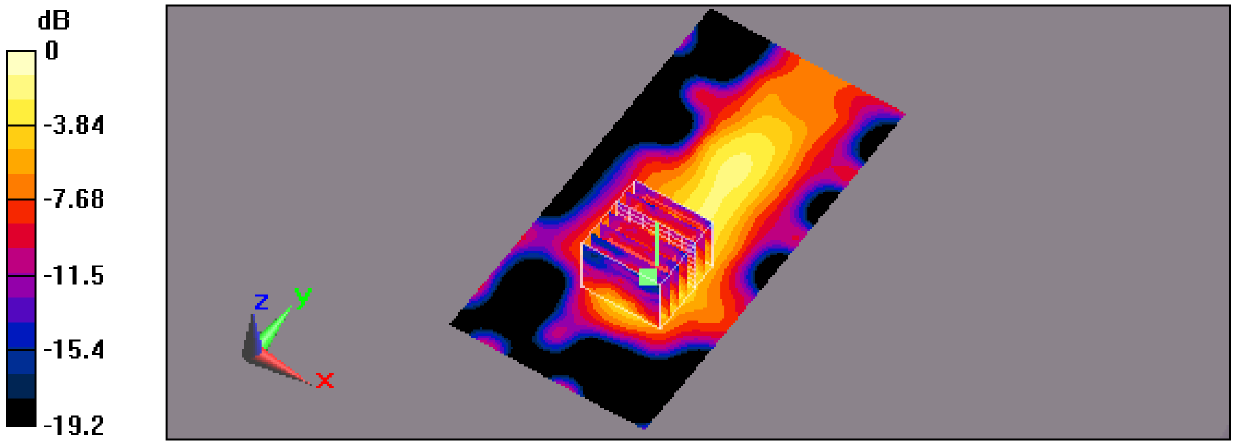
Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.48 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(4.95, 4.95, 4.95); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.027 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 4.34 V/m; Power Drift = 0.027 dB
Peak SAR (extrapolated) = 0.038 W/kg
SAR(1 g) = 0.022 mW/g; SAR(10 g) = 0.012 mW/g
Maximum value of SAR (measured) = 0.028 mW/g



0 dB = 0.028mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/11/2008 12:21:26 PMDate/Time: 12/11/2008 12:28:08 PM

Flat_PCS CH661_Vercital Front_5mm_with USB Cable

DUT: Minerva3107_Horizontal Down; Type: USB Dongle; FCC ID: DGIMINERVA3107

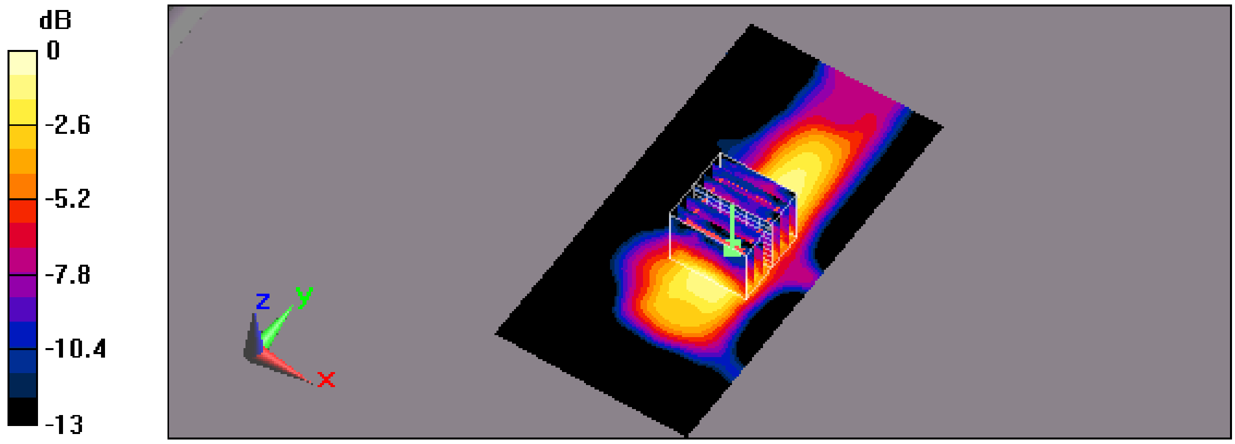
Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; $\sigma = 1.48$ mho/m; $\varepsilon_r = 53.2$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(4.95, 4.95, 4.95); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.025 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3.49 V/m; Power Drift = 0.00518 dB
Peak SAR (extrapolated) = 0.033 W/kg
SAR(1 g) = 0.020 mW/g; SAR(10 g) = 0.011 mW/g
Maximum value of SAR (measured) = 0.025 mW/g



0 dB = 0.025mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/11/2008 10:18:33 PMDate/Time: 12/11/2008 10:44:22 PM

Flat_PCS CH661_Horizontal Up_Open 90_10mm

DUT: Minerva3107_Horizontal Up; Type: USB Dongle; FCC ID: DGIMINERVA3107

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.48 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

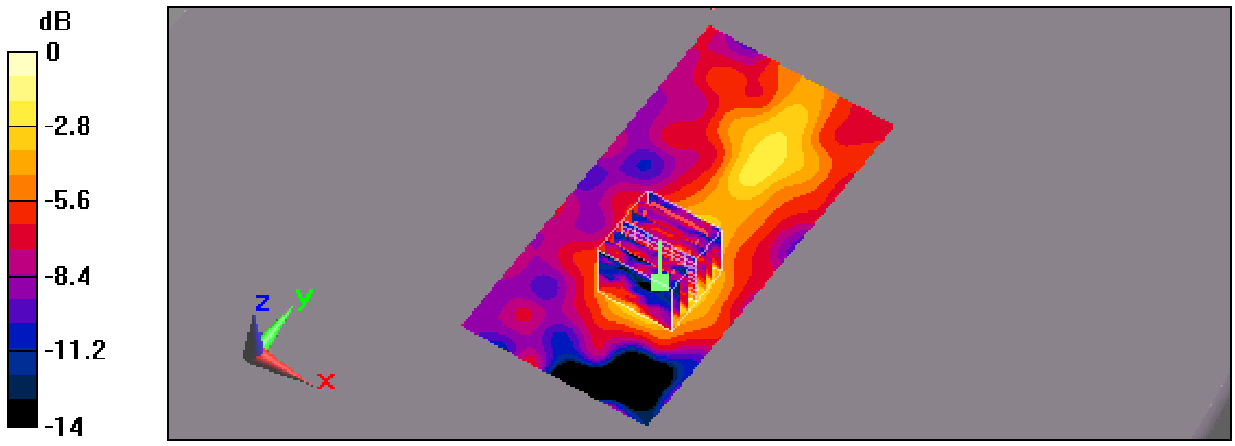
- Probe: ES3DV3 - SN3150; ConvF(4.95, 4.95, 4.95); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):

Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.026 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 4.17 V/m; Power Drift = -0.107 dB
Peak SAR (extrapolated) = 0.033 W/kg
SAR(1 g) = 0.018 mW/g; SAR(10 g) = 0.010 mW/g
Maximum value of SAR (measured) = 0.023 mW/g



0 dB = 0.023mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/11/2008 10:00:10 AMDate/Time: 12/11/2008 10:06:50 AM

Flat_PCS GPRS CH661_3Down1Up_Horizontal Up_Open 90_5mm

DUT: Minerva3107_Horizontal Up; Type: USB Dongle; FCC ID: DGIMINERVA3107

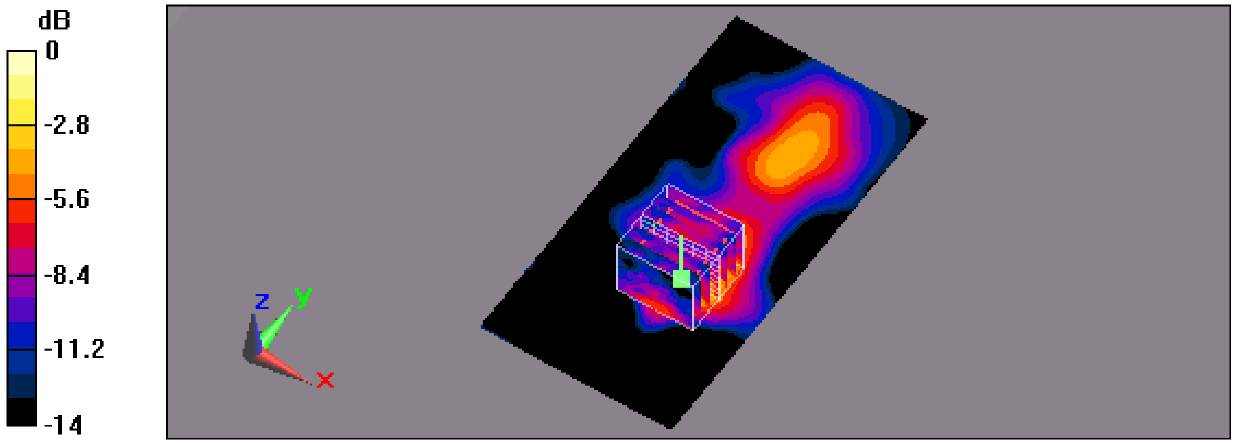
Communication System: PCS GPRS(3Down,1Up); Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.48 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(4.95, 4.95, 4.95); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.051 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 5.52 V/m; Power Drift = 0.152 dB
Peak SAR (extrapolated) = 0.069 W/kg
SAR(1 g) = 0.038 mW/g; SAR(10 g) = 0.020 mW/g
Maximum value of SAR (measured) = 0.050 mW/g



0 dB = 0.050mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 3/11/2009 10:43:41 PM

Flat_PCS GPRS CH661_3Down2Up_Horizontal Up_Open 90_5mm

DUT: Minerva3107_Horizontal Down; Type: USB Dongle; FCC ID: DGIMINERVA3107

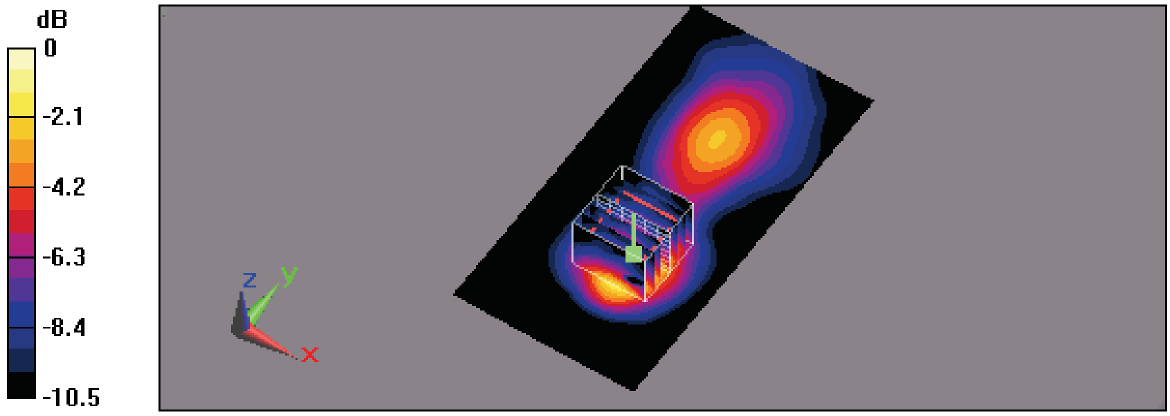
Communication System: PCS GPRS(3Down,2Up); Frequency: 1880 MHz;Duty Cycle: 1:4.2
Medium parameters used: f = 1880 MHz; σ = 1.48 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(4.92, 4.92, 4.92); Calibrated: 1/20/2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.154 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 9.76 V/m; Power Drift = 0.079 dB
Peak SAR (extrapolated) = 0.193 W/kg
SAR(1 g) = 0.116 mW/g; SAR(10 g) = 0.064 mW/g
Maximum value of SAR (measured) = 0.142 mW/g



0 dB = 0.142mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/11/2008 10:34:54 AMDate/Time: 12/11/2008 10:41:35 AM

Flat_PCS GPRS CH661_3Down1Up_Horizontal Down_5mm_with USB Cable

DUT: Minerva3107_Horizontal Down; Type: USB Dongle; FCC ID: DGIMINERVA3107

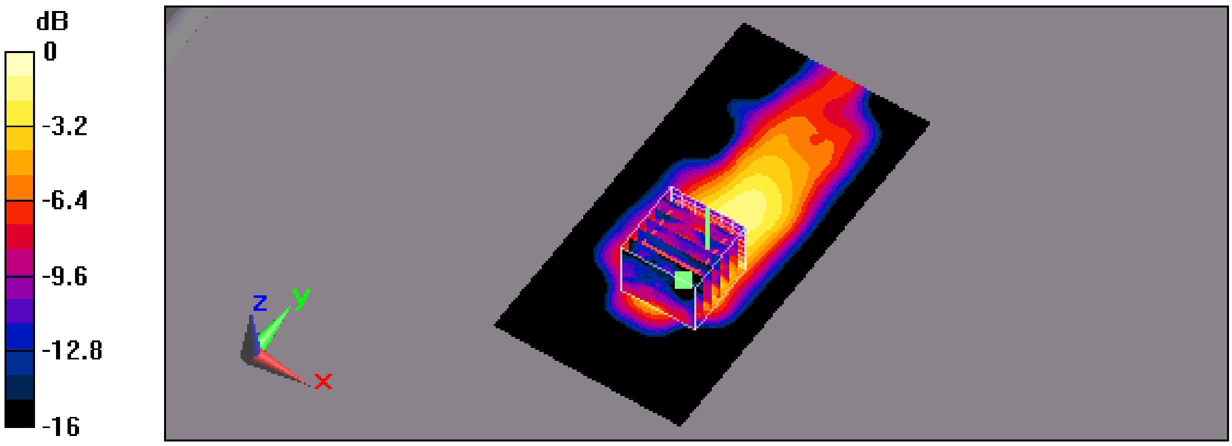
Communication System: PCS GPRS(3Down,1Up); Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.48 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(4.95, 4.95, 4.95); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.026 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3.89 V/m; Power Drift = -0.00453 dB
Peak SAR (extrapolated) = 0.050 W/kg
SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.012 mW/g
Maximum value of SAR (measured) = 0.031 mW/g



0 dB = 0.031mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/11/2008 11:48:41 AMDate/Time: 12/11/2008 11:55:24 AM

Flat_PCS GPRS CH661_3Down1Up_Vercital Front_5mm_with USB Cable

DUT: Minerva3107_Horizontal Down; Type: USB Dongle; FCC ID: DGIMINERVA3107

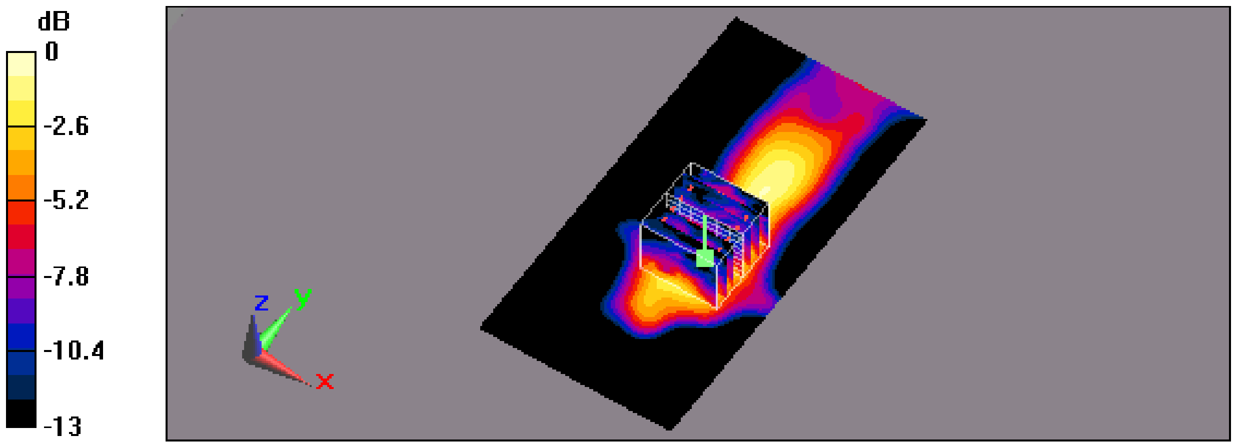
Communication System: PCS GPRS(3Down,1Up); Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.48 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(4.95, 4.95, 4.95); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.024 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 3.14 V/m; Power Drift = 0.048 dB
Peak SAR (extrapolated) = 0.050 W/kg
SAR(1 g) = 0.018 mW/g; SAR(10 g) = 0.00939 mW/g
Maximum value of SAR (measured) = 0.024 mW/g



0 dB = 0.024mW/g

Test Laboratory: A Test Lab Techno Corp.

Date/Time: 12/11/2008 9:43:44 PMDate/Time: 12/11/2008 9:50:27 PM

Flat_PCS GPRS CH661_3Down1Up_Vercital Back_5mm_with USB Cable

DUT: Minerva3107_Vercital Back; Type: USB Dongle; FCC ID: DGIMINERVA3107

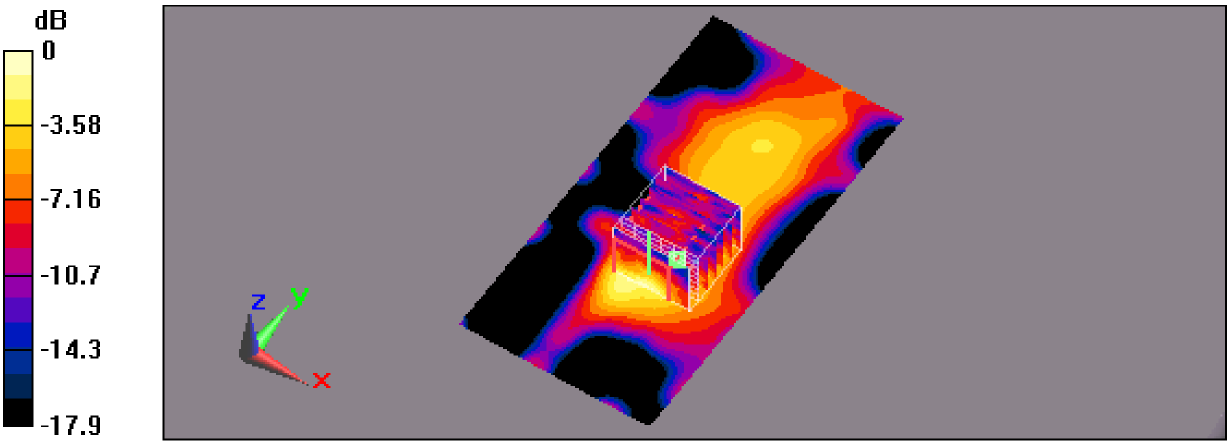
Communication System: PCS GPRS(3Down,1Up); Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.48 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV3 - SN3150; ConvF(4.95, 4.95, 4.95); Calibrated: 1/9/2008
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn779; Calibrated: 11/11/2008
- Phantom: ELI 4.0; Type: QDOVA001BB; Serial: 1036
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.2 Build 87

Flat/Area Scan (51x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.025 mW/g

Flat/Zoom Scan (7x7x9)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=3mm
Reference Value = 4.31 V/m; Power Drift = 0.179 dB
Peak SAR (extrapolated) = 0.071 W/kg
SAR(1 g) = 0.020 mW/g; SAR(10 g) = 0.011 mW/g
Maximum value of SAR (measured) = 0.025 mW/g



0 dB = 0.025mW/g

Appendix C - Calibration

All of the instruments Calibration information are listed below.

- Dipole _ D900V2 SN:073 Calibration No.D900V2-073_ Mar08
- Dipole _ D900V2 SN:172 Calibration No.D900V2-172_ Jan09
- Dipole _ D1900V2 SN: 5d018 Calibration No.D1900V5d018_May08
- Probe _ ES3DV3 SN:3150 Calibration No.ES3-3150_Jan08
- DAE _ DAE4 SN:779 Calibration No.DAE4-779_Nov08