TEST REPORT

Equipment Under Test:	**HSDPA USB Modem**
Market name:	**K3520-Z**
FCC ID	**Q78- K3520-Z**
Hardware Version:	**W1XA**
Software Version:	**M6281A-KLVC-4.0.9530T**
Applicant:	**ZTE CORPORATION**
Address of Applicant:	**ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District,Shenzhen, Guangdong, 518057, P.R.China**
Date of Receipt:	**2008.08.26**
Date of Test:	**2008.08.28 ~2008.09.10**
Date of Issue:	**2008.09.10**

CNAS 检 测 CNAS L1486

CTIA Authorized Test Lab
LAB CODE 20050309-01

GCF Global Certification Forum

Tested by : Will Ni **Date :** **2008.09.10**

Approved by : Zhiang Shen **Date :** **2008.09.10**

Contents

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Change History

Version	Change contents	Author	Date
V1.0	First Edition	Will Ni	2008-9-4
V1.1	Add single point SAR test	Will Ni	2008-9-10

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Standards:

The Equipment under Test (EUT) has been tested at SGS's (own or subcontracted) laboratories. The following table summarizes the specific reference documents such as harmonized standards or test specifications which were used for testing as SGS's (own or subcontracted) laboratories.

Identity	Document Title	Version
FCC OET Bulletin 65 supplement C	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields	
IEEE1528	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques	2003

In the configuration tested, the EUT complied with the standards specified above.

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS-CSTC Shanghai GSM Lab or testing done by SGS-CSTC Shanghai GSM Lab must approve SGS Shanghai GSM Lab in connection with distribution or use of the product described in this report in writing.

1. General Information

1.1 Test Laboratory

GSM Laboratory

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1.2 Details of Applicant

Name: ZTE CORPORATION

Address: ZTE Plaza, Keji Road South, Hi-Tech Industrial Park,Nanshan District,Shenzhen, Guangdong, 518057, P.R.China

Contact Person: Li Dezi

1.3 Description of EUT(s)

Brand name	ZTE	
Market Name	K3520-Z	
Status of Product	Production	
Hardware Version	W1XA	
Software Version	M6281A-KLVC-4.0.9530T	
Serial No.	IMEI: 354783020000785	
Battery Type	USB /No Battery	
Antenna Type	Inner Antenna	
Operation Mode	GSM/GPRS/EGDE	
Modulation Mode	GMSK/8PSK	
Frequency range	GSM850	Tx: 824~849 MHz
		Rx: 869~894 MHz
	PCS1900	Tx: 1850~1910 MHz
		Rx: 1930~1990 MHz
Nominal Maximum RF Conducted Power/MS Power Class	GSM850:GMSK/33.0dBm;8PSK/27.0dBm PCS1900: GMSK/30.0dBm;8PSK/26.0dBm	

1.4 Test Environment

Ambient temperature: 22.0° C

Tissue Simulating Liquid: 22.0° C

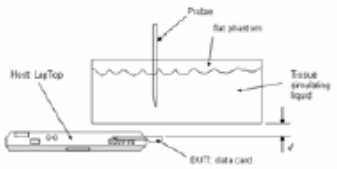
Relative Humidity: 45%~55%

1.5 Operation Configuration

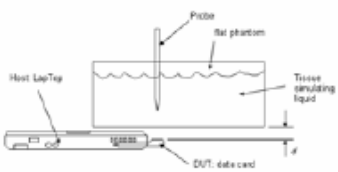
For DUT

Configuration 1: GSM 850, Body Worn P1&P2&P3&P4&P5 with Separation Distance 0.5cm

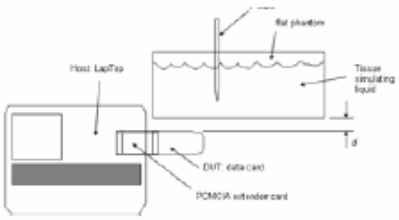
Configuration 2: PCS 1900, Body Worn P1&P2&P3&P4&P5 with Separation Distance 0.5cm



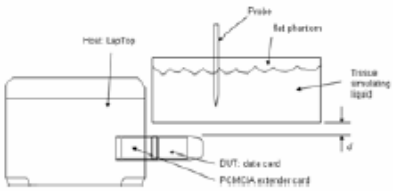
position 1



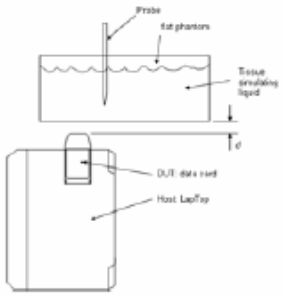
position 2



position 3



position 4

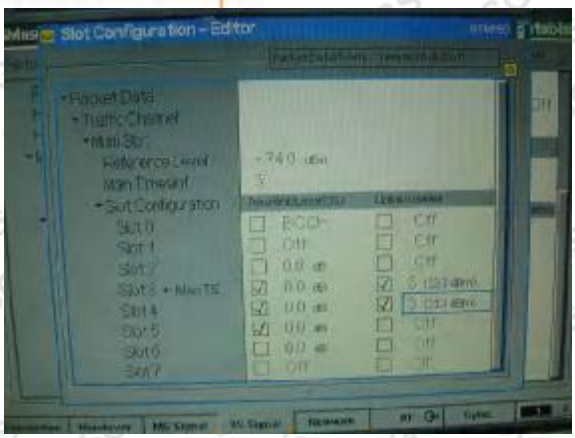


position 5

Note: A USB cable was used during the tests in accordance with FCC guidance

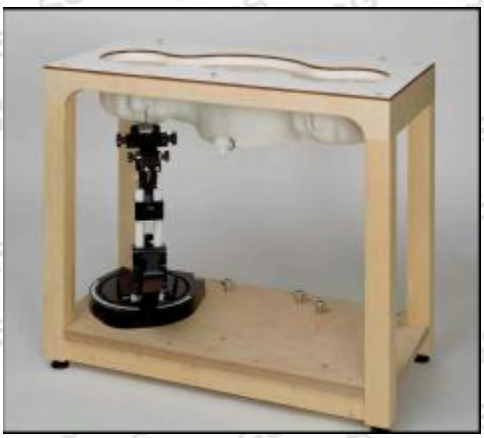
For SS

In GPRS mode



In EGDE 8PSK mode

1.6 SAM Twin Phantom



The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear

region where shell thickness increases to 6mm). It has three measurement areas:

- Left hand
- Right hand
- Flat phantom

A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. Free space scans of devices on the cover are possible.

On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

Phantom specification:

Construction:	The shell corresponds to the specifications of Specific Anthropomorphic Mannequin(SAM) Phantom defined in IEEE 1528-2003,EN 50361:2001 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.
Shell Thickness	2±0.2mm
Filling Volume	Approx.25 liters
Dimensions	Height: 850mm Length: 1000mm Width: 500mm

1.7 Device Holder for Transmitters

The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source in 5mm distance, a positioning uncertainty of ±0.5mm would produce a SAR uncertainty of ±20%. An accurate device positioning is therefore crucial for accurate and repeatable measurements. The positions, in which the devices must be measured, are defined by the standards.

The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centers for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.

The DASY device holder has been made out of low-loss POM material having the following dielectric

parameters: relative permittivity "=3 and loss tangent _=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

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1.8 Description of Test Position

1.8.1SAM Phantom Shape

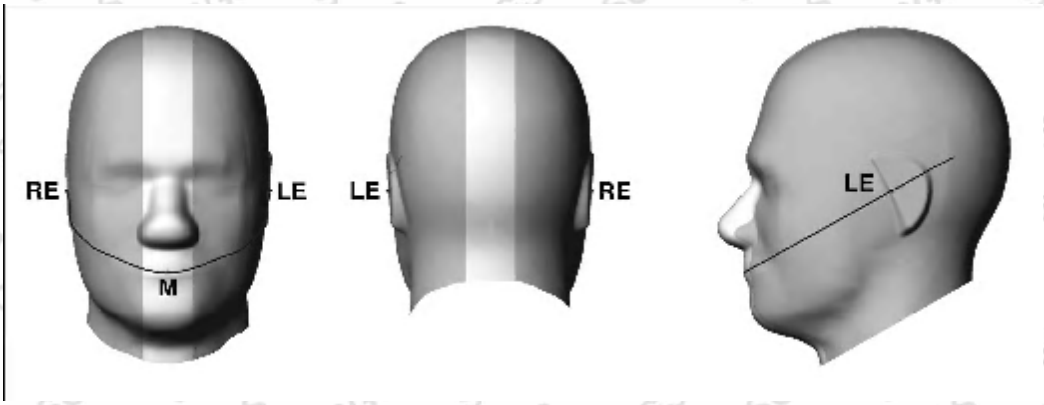

Figure1—front, back, and side views of SAM (model for the phantom shell). Full-head model is for illustration purposes only—procedures in this recommended practice are intended primarily for the phantom setup of Figure 2. Note: The center strip including the nose region has a different thickness tolerance.

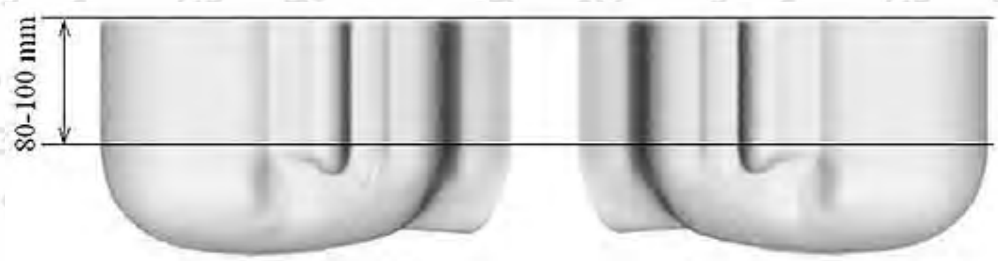

Figure 2—Sagittally bisected phantom with extended perimeter (shown placed on its side as used for SAR measurements)

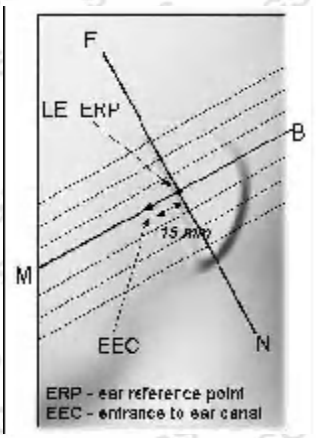

Figure 3—Close-up side view of phantom showing the ear region, N-F and B-M lines, and seven cross-sectional plane locations

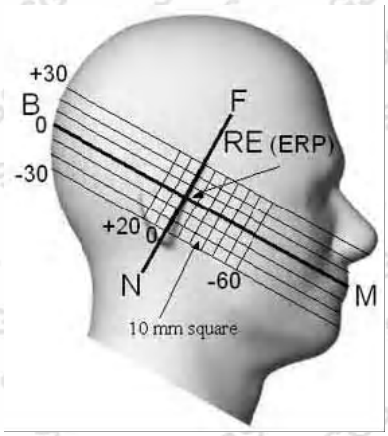

Figure 4—Side view of the phantom showing relevant markings and seven cross-sectional plane locations

1.8.2 The following pictures present the different DUT constructions.

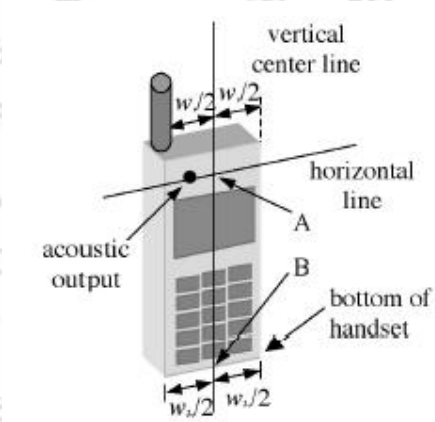

Figure 5a—Handset vertical and horizontal reference lines—"fixed case"

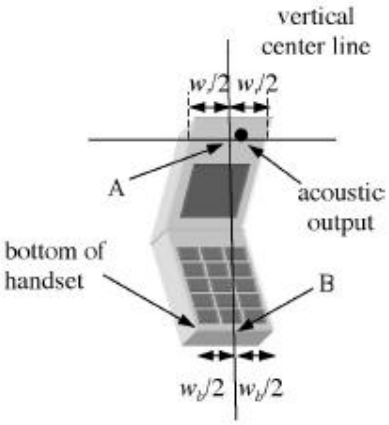

Figure 5b—Handset vertical and horizontal reference lines—"clam-shell case"

1.8.3 Definition of the "cheek" position:

a) Position the device with the vertical centre line of the body of the device and the horizontal line crossing the centre of the ear piece in a plane parallel to the sagittal plane of the phantom ("initial position" see Figure 6). While maintaining the device in this plane, align the vertical centre line with the reference plane containing the three ear and mouth reference points (M, RE and LE) and align the centre of the ear piece with the line RE-LE;

b) Translate the mobile phone box towards the phantom with the ear piece aligned with the line LE-RE until the phone touches the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the box until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.

1.8.4 Definition of the "tilted" position:

a) Position the device in the "cheek" position described above;

b) While maintaining the device in the reference plane described above and pivoting against the ear, move it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.

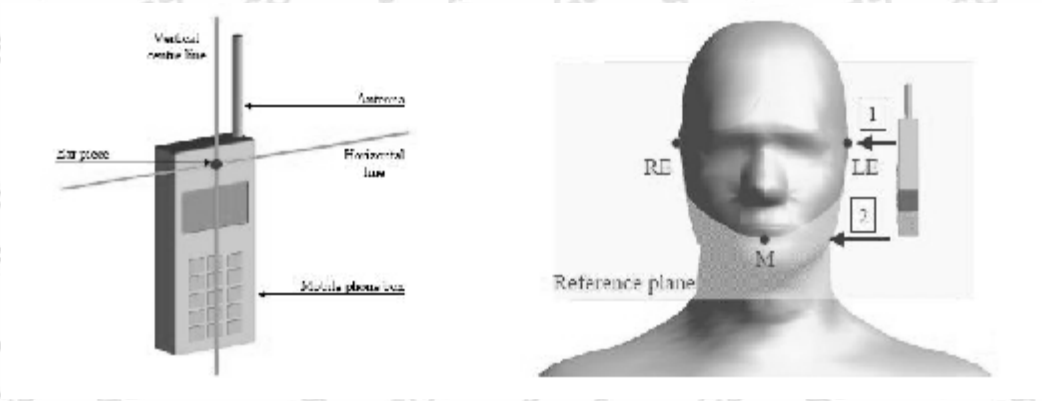

Figure 6 - Definition of the reference lines and points, on the phone and on the phantom and initial position

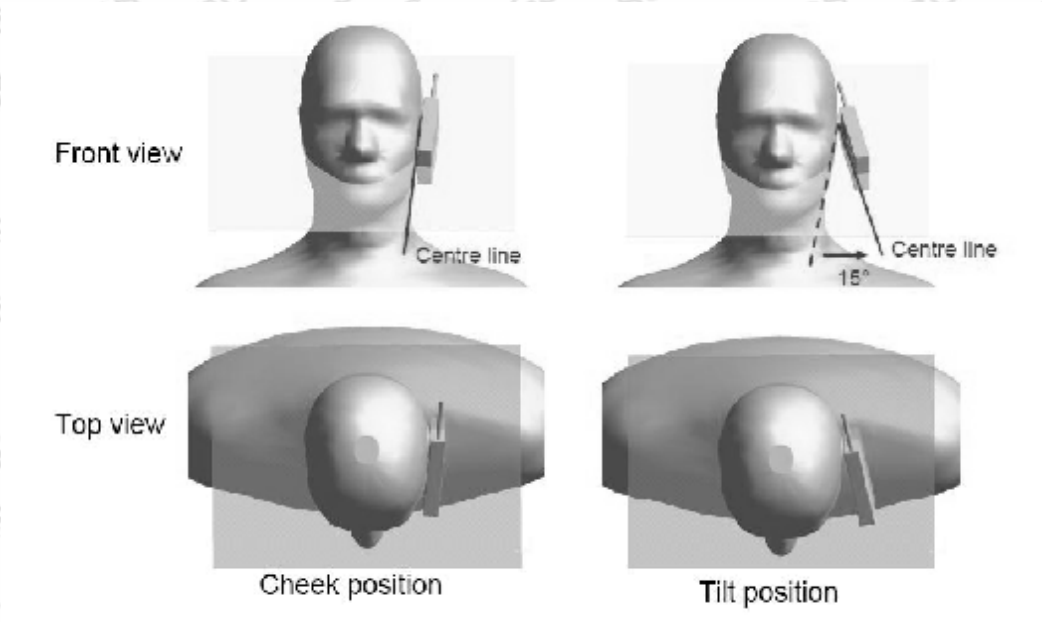

Figure 7 -"Cheek" and "tilt" positions of the mobile phone on the left side

1.9 Recipes for Tissue Simulating Liquid

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

Ingredient	835MHz	1900MHz
Water	40.29%	55.24%
Sugar	57.90%	-

Salt (NaCl)	1.38%	0.31%
DGBE	-	44.45%
Preventol	0.18%	-
HEC	0.24%	-
Relative Permittivity	41.5	40.0
Conductivity (S/m)	0.90	1.40

Table 1: Composition of the Brain Tissue Equivalent Matter

Ingredient	**835MHz**	**1900MHz**
Water	50.75%	70.17%
Sugar	48.21%	-
Salt (NaCl)	0.94%	0.39%
DGBE	-	29.44%
Preventol	0.10%	-
HEC	0.00	-
Relative Permittivity	55.2	53.3
Conductivity (S/m)	0.97	1.52

Table 2: Composition of the Body Tissue Equivalent Matter

1.10 Measurement procedure

Step 1: Power reference measurement

The SAR measurement was taken at a selected spatial reference point to monitor power variations during testing. This fixed location point was measured and used as a reference value.

Step 2: *Area scan*

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 20mm*20mm.Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: *Zoom scan*

Around this point, a volume of 30mm*30mm*34mm (fine resolution volume scan, zoom scan) was assessed by measuring 7*7*7 points. On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the center of the dipoles is 2.1mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification) The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluated the points between the surface and the probe tip. 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 volume was integrated with the trapezoidal algorithm. One thousand points (10*10*10) were interpolated to calculate the average. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Power reference measurement (drift)

The SAR value at the same location as in step 1 was again measured. (If the value changed by more than 5%, the evaluation is repeated.)

1.11 The SAR Measurement System

A photograph of the SAR measurement System is given in Fig. a.

This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (Speag Dasy 4 professional system). A Model ES3DV3 3088 E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ ($|Ei|^2$)/ ρ where σ and ρ are the conductivity and mass density of the tissue-simulant.

The DASY4 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software. An arm extension for accommodation the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.

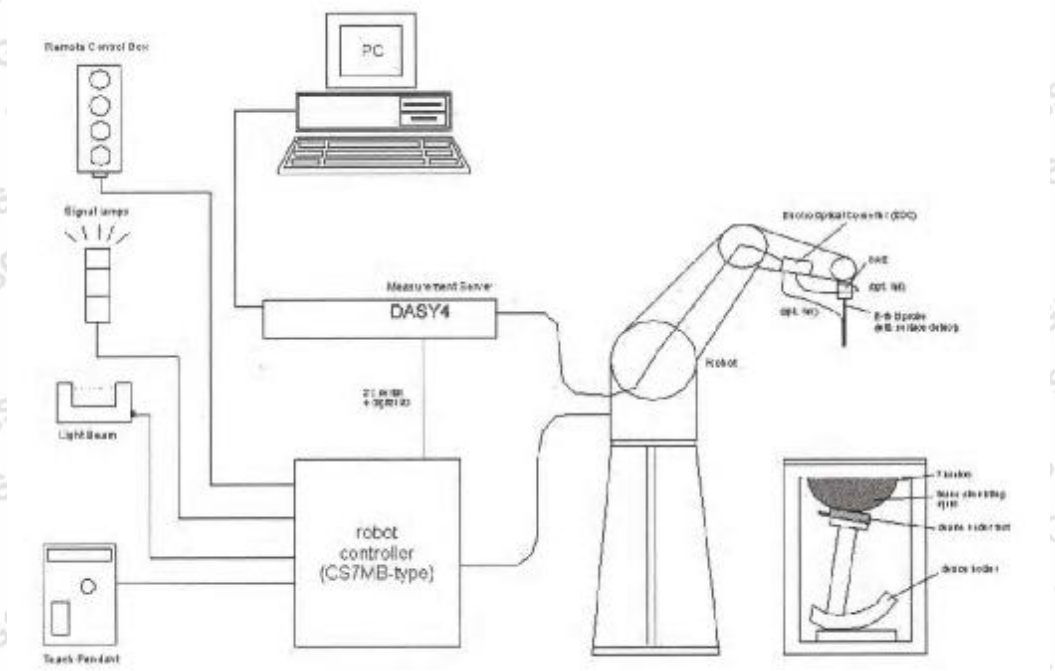

Fig. a SAR System Configuration

- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000.
- DASY4 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and body-worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validating the proper functioning of the system.

1.12 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. These tests were done at 900&1900MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1 (SAR values are normalized to 1W forward power delivered to the dipole). During the tests, the ambient temperature of the laboratory was in the range 22°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

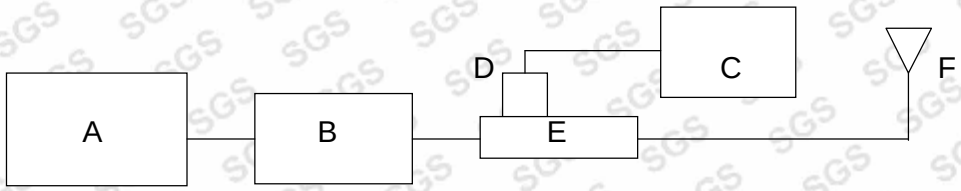

Fig. b the microwave circuit arrangement used for SAR system verification

A. Agilent Model E4438C Signal Generator

B. Mini-Circuit Model ZHL-42 Preamplifier

C. Agilent Model E4416A Power Meter

D. Agilent Model 8481H Power Sensor

E. HT CP6100 20N Dual directional coupler

F. Reference dipole antenna

Validation Kit	Frequency MHz	Target SAR 1g (250mW)	10% Limit Range	Measured SAR 1g	Measured Date
D900V2 184	900 Body	**2.9**	**2.61~3.19**	2.77	2008-08-28
				2.65	2008-08-29
D1900V2 5d028	1900 Body	**9.34**	**8.41~10.27**	9.21	2008-08-28
				9.79	2008-08-29
				9.42	2008-09-10

Table 1. Result System Validation

1.13 Tissue Simulant Fluid for the Frequency Band 835MHZ and 1900MHz

The dielectric properties for this body-simulant fluid were measured by using the HP Model 85070D Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjunction with Agilent E5071B Network Analyzer (300 KHz-8500 MHz). The Conductivity (σ) and Permittivity (ρ) are listed in Table 1.For the SAR measurement given in this report. The temperature variation of the Tissue Simulant Fluid was 22°C.

Frequency (MHz)	Tissue Type	Limit/Measured	Permittivity (ρ)	Conductivity (σ)	Simulated Tissue Temp (°C)
835	Body	**Recommended Limit**	**55.2±5%**	**0.97±5%**	**20-24**
		Measured, 2008-08-28	55.52	0.971	21.2
		Measured, 2008-08-29	55.52	0.971	21.6
1900	Body	**Recommended Limit**	**53.3±5%**	**1.52±5%**	**20-24**
		Measured, 2008-08-28	51.74	1.57	22.1
		Measured, 2008-08-29	51.71	1.572	22.4
		Measured, 2008-09-10	51.69	1.574	22.3

Table 2. Dielectric parameters for the Frequency Band 835&1900MHZ

1.14 Test Standards and Limits

Standards:

According to FCC 47 CFR §2.1093(d) the limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3KHz to 300GHz," ANSI/IEEE C95.1-1992, Copyright 1992 by the Institute of Electrical & Electronics Engineers, Inc., New York, New York 10071.

Human Exposure	Uncontrolled Environment General Population
Spatial Peak SAR (Brain)	1.60 mW/g (averaged over a mass of 1g)

Table 3. RF Exposure Limits

Notes:

1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.

2. Summary of Results

GSM850

850	Test Configuration		SAR, Averaged over 1g(W/kg)			Temperature	Verdict
	Channel/Power(dBm)		Low/32.6	Middle/32.4	High/32.2	(℃)	
Body	P1	GPRS	--	0.729	--	22	Pass
		EGPRS	--	0.492	--	22	Pass
	P2	GPRS	0.667	0.810	0.801	22	Pass
		EGPRS	--	0.572 Max Power Drift -0.359	--	22	Pass
	P3	GPRS	--	0.409	--	22	Pass
		EGPRS	--	--	--	22	Pass
	P4	GPRS	--	0.334	--	22	Pass
		EGPRS	--	--	--	22	Pass
	P5	GPRS	--	0.111	--	22	Pass
		EGPRS	--	--	--	22	Pass

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PCS1900

1900	Test Configuration		SAR, Averaged over 1g(W/kg)			Temperature	Verdict
	Channel/Power(dBm)		Low/28.7	Middle/29.0	High/29.2	(℃)	
Body	P1	GPRS	--	0.726	--	22	Pass
		EGPRS	1.02	1.02	0.677	22	Pass
	P2	GPRS	--	0.678	--	22	Pass
		EGPRS	1.13	1.19	1.08	22	Pass
	P3	GPRS	--	0.428	--	22	Pass
		EGPRS	--	--	--	22	Pass
	P4	GPRS	--	0.503	--	22	Pass
		EGPRS	--	--	--	22	Pass
	P5	GPRS	--	0.112	--	22	Pass
		EGPRS	--	--	--	22	Pass

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Maximum Values

Frequency Band(MHz)	EUT position	Output Power (dBm)	1g Average (W/Kg)	Power Drift (dB)	Temperature (℃)	Verdict
GSM850	Body Worn, GPRS, Mid Channel, 0.5cm,P2	32.4	0.810	0.078	22	PASS
PCS1900	Body Worn, EGPRS, Mid Channel, 0.5cm,P2	29.0	1.19	-0.292	22	PASS

Note:

1. In GSM850 band, the low, middle and high channels are CH128/824.2MHz, CH189/836.4MHz and CH251/848.8MHz separately.
2. In PCS1900 band, the low, middle and high channels are CH512/1805.2MHz, CH661/1880.0MHz and CH810/1909.8MHz separately.
3. ES3DV3 Probe Tip diameter is 3.9 mm and distance from probe tip to dipole centers is 2.0 mm. The additional tests were manually performed according to FCC KDB 447498 and single point SAR values are recorded as shown in table below.

Single Point SAR with Highest SAR Configuration

Frequency Band(MHz)	EUT position		Distance separation between DUT and Flat Phantom				
			5mm	10mm	15mm	20mm	25mm
PCS1900	Body Worn/EGPRS/ Mid Channel/P2	E Field (V/m)	29.59	21.02	13.89	--	--
		SAR (W/Kg)	1.36	0.685	0.299	--	--

Full averaged SAR is evaluated at the separation distance of 10mm and the value is 0.600W/Kg which locate in page 57

3. Instruments List

Instrument	Model	Serial number	NO.	Date of last Calibration
Desktop PC	COMPAQ EVO	N/A	GSM-SAR-025	N/A
Dasy 4 software	V 4.7 build 44	N/A	GSM-SAR-001	N/A
Probe	ES3DV3	3088	GSM-SAR-034	2008.1.18
DAE	DAE3	569	GSM-SAR-023	2007.11.19
900MHz system validation dipole	D900V2	184	GSM-SAR-017	2007.12.21
1900MHz system validation dipole	D1900V2	5d028	GSM-SAR-020	2007.12.21
Phantom	SAM 12	TP-1283	GSM-SAR-005	N/A
Robot	RX90L	F03/5V32A1/A01	GSM-SAR-006	N/A
Dielectric probe kit	85070D	US01440168	GSM-SAR-016	2007.12.18
Agilent network analyzer	E5071B	MY42100549	GSM-SAR-007	2007.12.18
Agilent signal generator	E4438	14438CATO-19719	GSM-SAR-008	2007.12.18
Mini-Circuits preamplifier	ZHL-42	D041905	GSM-SAR-033	2007.12.18
Agilent power meter	E4416A	GB41292095	GSM-SAR-010	2007.12.18
Agilent power sensor	8481H	MY41091234	GSM-SAR-011	2007.12.18
HT CP6100 20N Coupling	6100	SCP301480120	GSM-SAR-012	2007.12.18
R&S Universal radio communication tester	CMU200	103633	GSM-AUD-002	2007.12.18

4. Measurements

GSM850

4.1 GSM850-Body-Worn-GPRS-Middle-P1

Date/Time: 2008-8-28 20:56:54

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-GMSK-Mid P1

DUT: K3520; Type: Body; Serial: 20080805

Communication System: GSM850-GPRS Mode; Frequency: 836.4 MHz;Duty Cycle: 1:4

Medium: HSL850-Body Medium parameters used: f = 836.4 MHz; σ = 0.949 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.81, 5.81, 5.81); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P 1/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.827 mW/g

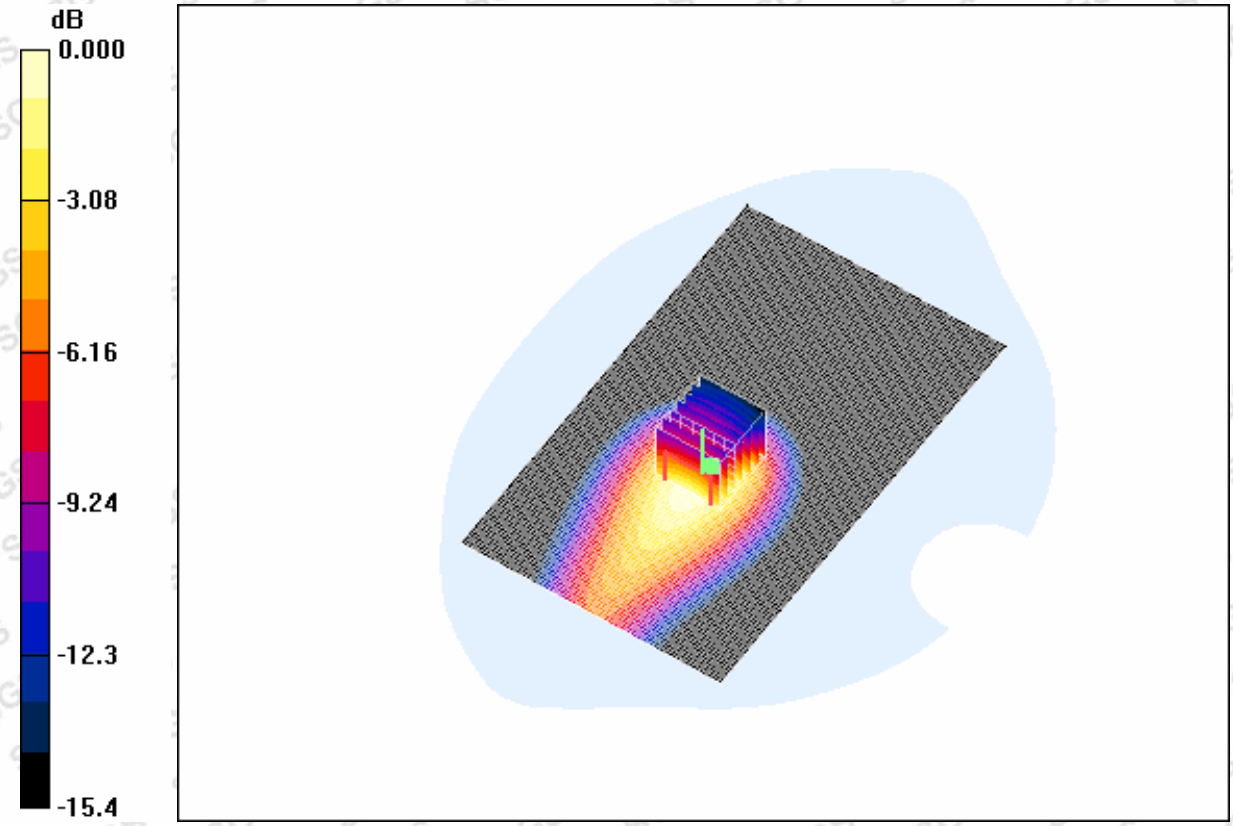
Body Worn - Middle P 1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.6 V/m; Power Drift = -0.045 dB

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.729 mW/g; SAR(10 g) = 0.446 mW/g

Maximum value of SAR (measured) = 0.794 mW/g



0 dB = 0.794mW/g

4.2 GSM850-Body-Worn-GPRS-Middle-P2

Date/Time: 2008-8-28 22:18:41

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-GMSK-Mid P2

DUT: K3520; Type: Body; Serial: 20080805

Communication System: GSM850-GPRS Mode; Frequency: 836.4 MHz;Duty Cycle: 1:4

Medium: HSL850-Body Medium parameters used: f = 836.4 MHz; σ = 0.949 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.81, 5.81, 5.81); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.902 mW/g

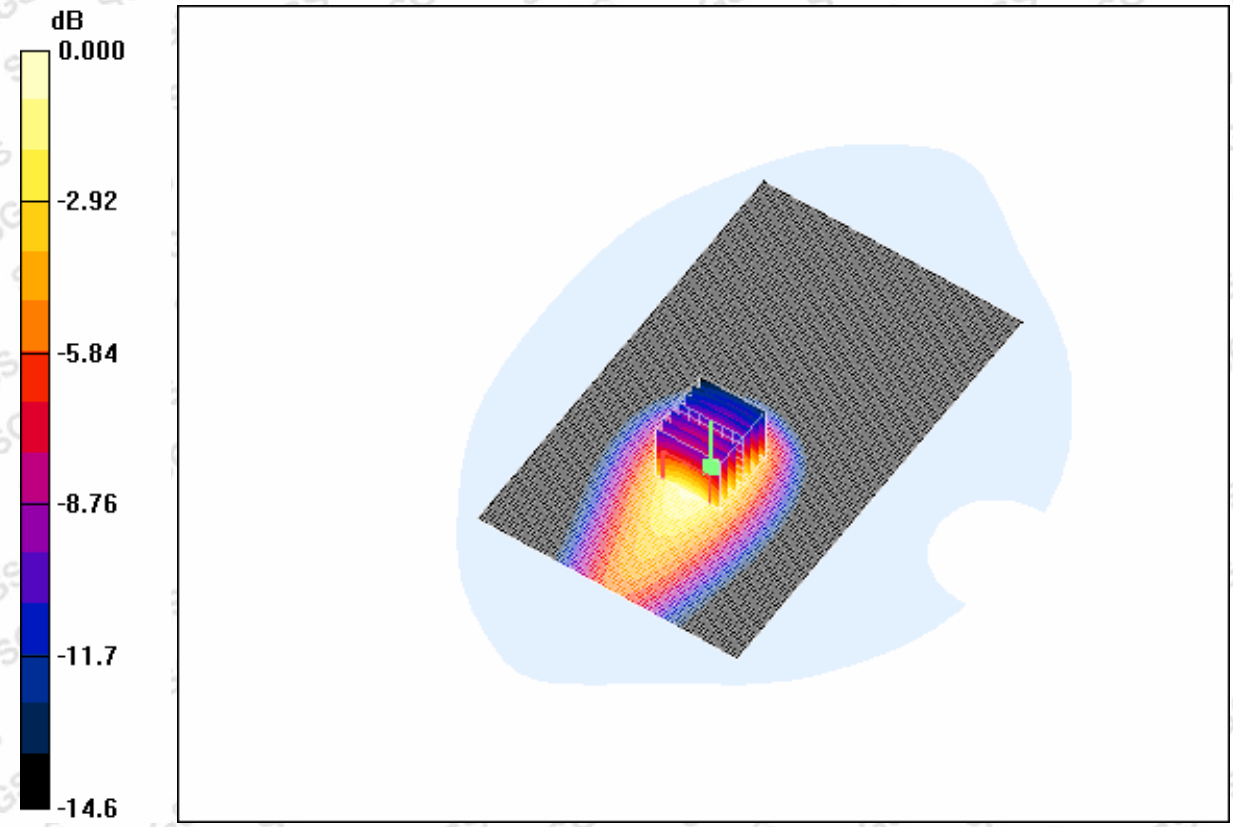
Body Worn - Middle P2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.4 V/m; Power Drift = 0.078 dB

Peak SAR (extrapolated) = 1.37 W/kg

SAR(1 g) = 0.810 mW/g; SAR(10 g) = 0.501 mW/g

Maximum value of SAR (measured) = 0.887 mW/g



0 dB = 0.887mW/g

4.3 GSM850-Body-Worn- GPRS -Middle-P3

Date/Time: 2008-8-28 22:47:23

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-GMSK-Mid P3

DUT: K3520; Type: Body; Serial: 20080805

Communication System: GSM850-GPRS Mode; Frequency: 836.4 MHz;Duty Cycle: 1:4

Medium: HSL850-Body Medium parameters used: f = 836.4 MHz; σ = 0.949 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.81, 5.81, 5.81); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P3/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.526 mW/g

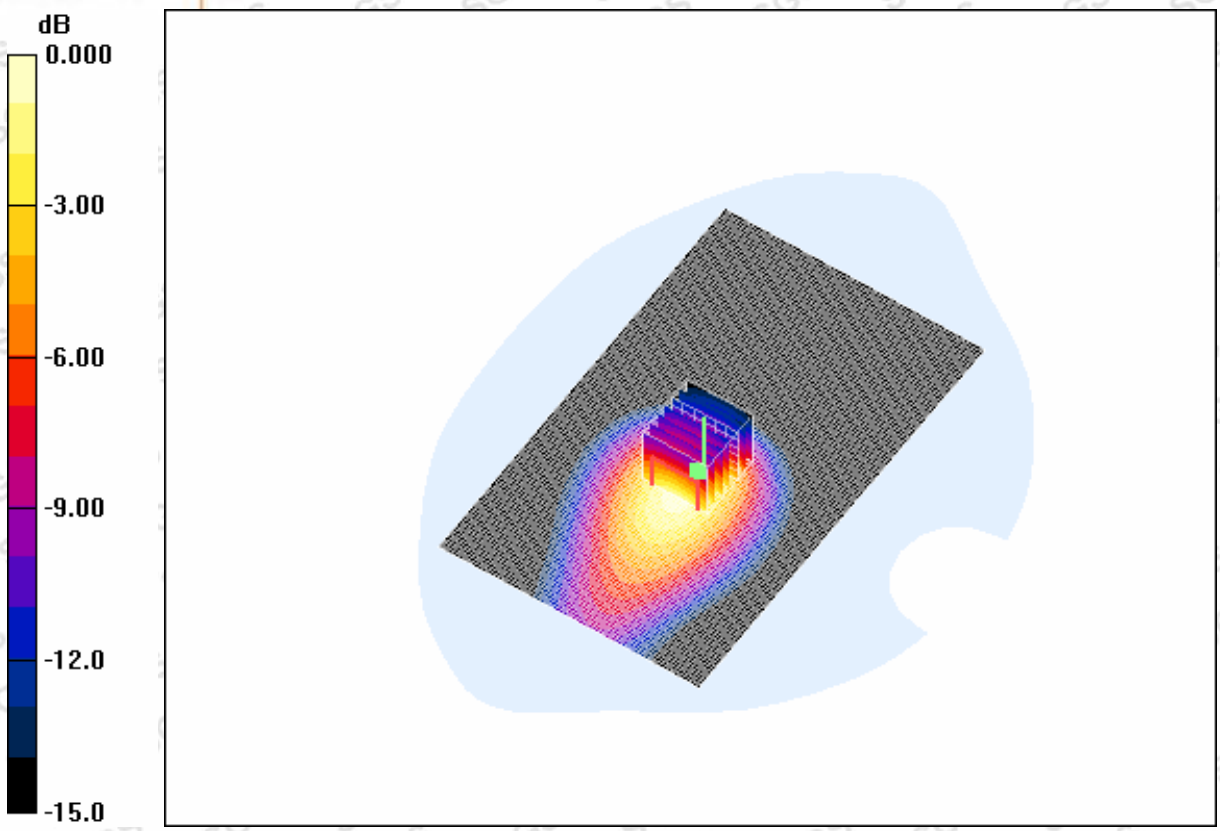
Body Worn - Middle P3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.2 V/m; Power Drift = 0.247 dB

Peak SAR (extrapolated) = 0.860 W/kg

SAR(1 g) = 0.409 mW/g; SAR(10 g) = 0.251 mW/g

Maximum value of SAR (measured) = 0.461 mW/g



0 dB = 0.461mW/g

4.4 GSM850-Body-Worn- GPRS -Middle-P4

Date/Time: 2008-8-29 14:48:58

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-GMSK-Mid P4

DUT: K3520; Type: Body; Serial: 20080805

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中国•上海•宜山路 889 号 3 号楼 9 层 邮编：200233 t (86 -21) 61402666*2736 f (86 -21) 54500149 e sgs.china@sgs.com

Communication System: GSM850-GPRS Mode; Frequency: 836.4 MHz;Duty Cycle: 1:4

Medium: HSL850-Body Medium parameters used: f = 836.4 MHz; σ = 0.949 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.81, 5.81, 5.81); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P4/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.419 mW/g

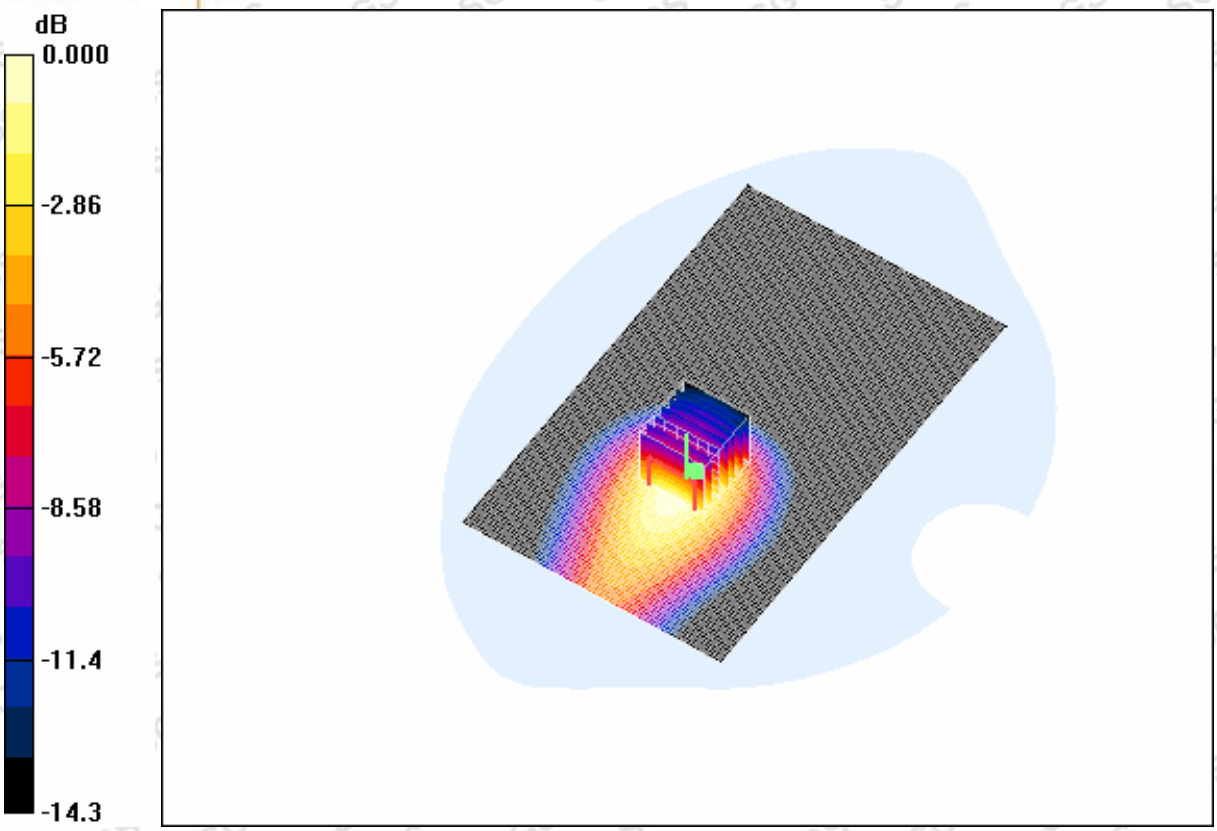
Body Worn - Middle P4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.85 V/m; Power Drift = 0.058 dB

Peak SAR (extrapolated) = 0.630 W/kg

SAR(1 g) = 0.334 mW/g; SAR(10 g) = 0.208 mW/g

Maximum value of SAR (measured) = 0.364 mW/g



0 dB = 0.364mW/g

4.5 GSM850-Body-Worn- GPRS -Middle-P5

Date/Time: 2008-8-28 23:42:52

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-GMSK-Mid P5

DUT: K3520; Type: Body; Serial: 20080805

Communication System: GSM850-GPRS Mode; Frequency: 836.4 MHz;Duty Cycle: 1:4

Medium: HSL850-Body Medium parameters used: f = 836.4 MHz; σ = 0.949 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.81, 5.81, 5.81); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P5/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.090 mW/g

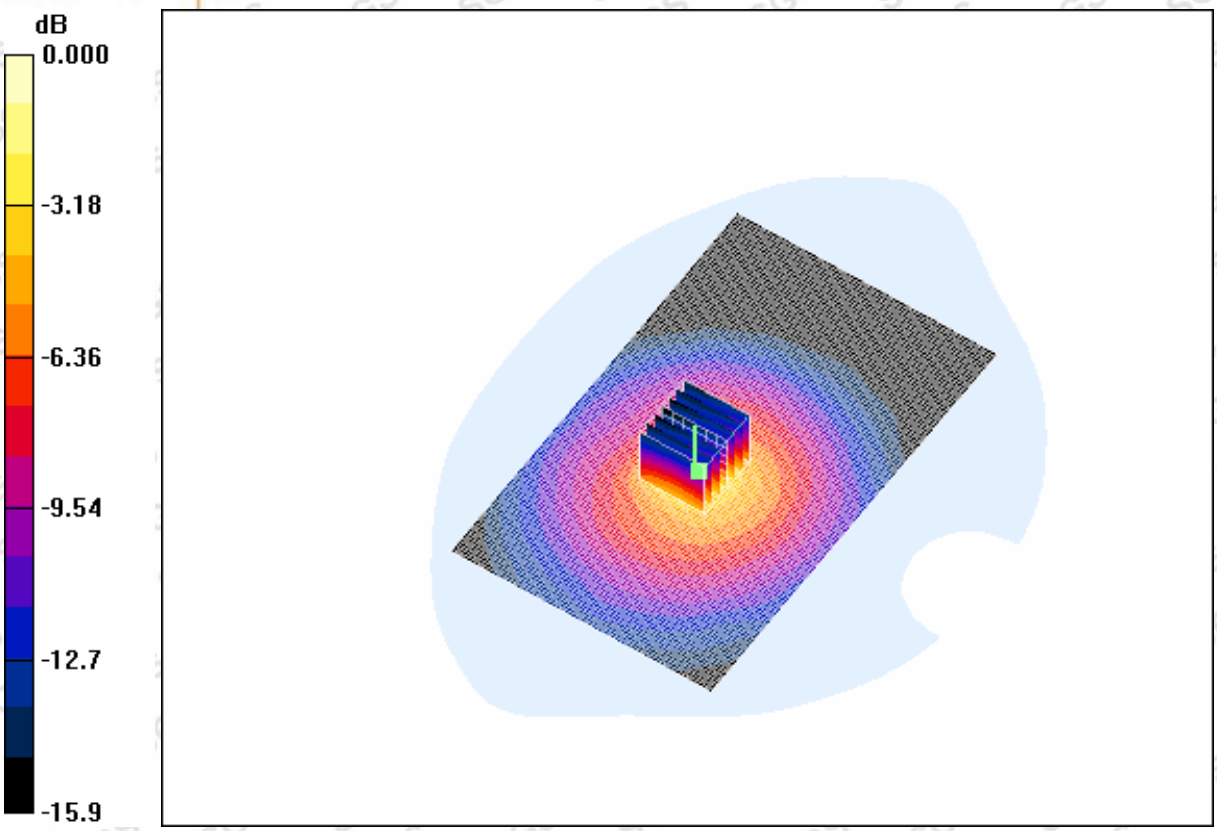
Body Worn - Middle P5/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.49 V/m; Power Drift = -0.050 dB

Peak SAR (extrapolated) = 0.288 W/kg

SAR(1 g) = 0.111 mW/g; SAR(10 g) = 0.051 mW/g

Maximum value of SAR (measured) = 0.124 mW/g



0 dB = 0.124mW/g

4.6 GSM850-Body-Worn-EGPRS-Middle-P1

Date/Time: 2008-8-29 20:13:15

Test Laboratory: SGS-GSM

GSM850-Body-Worn-EGPRS-8PSK-Mid P1

DUT: K3520; Type: Body; Serial: 20080805

Communication System: GSM850-EGPRS Mode; Frequency: 836.4 MHz;Duty Cycle: 1:2

Medium: HSL850-Body Medium parameters used: f = 836.4 MHz; σ = 0.949 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.81, 5.81, 5.81); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P1/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.552 mW/g

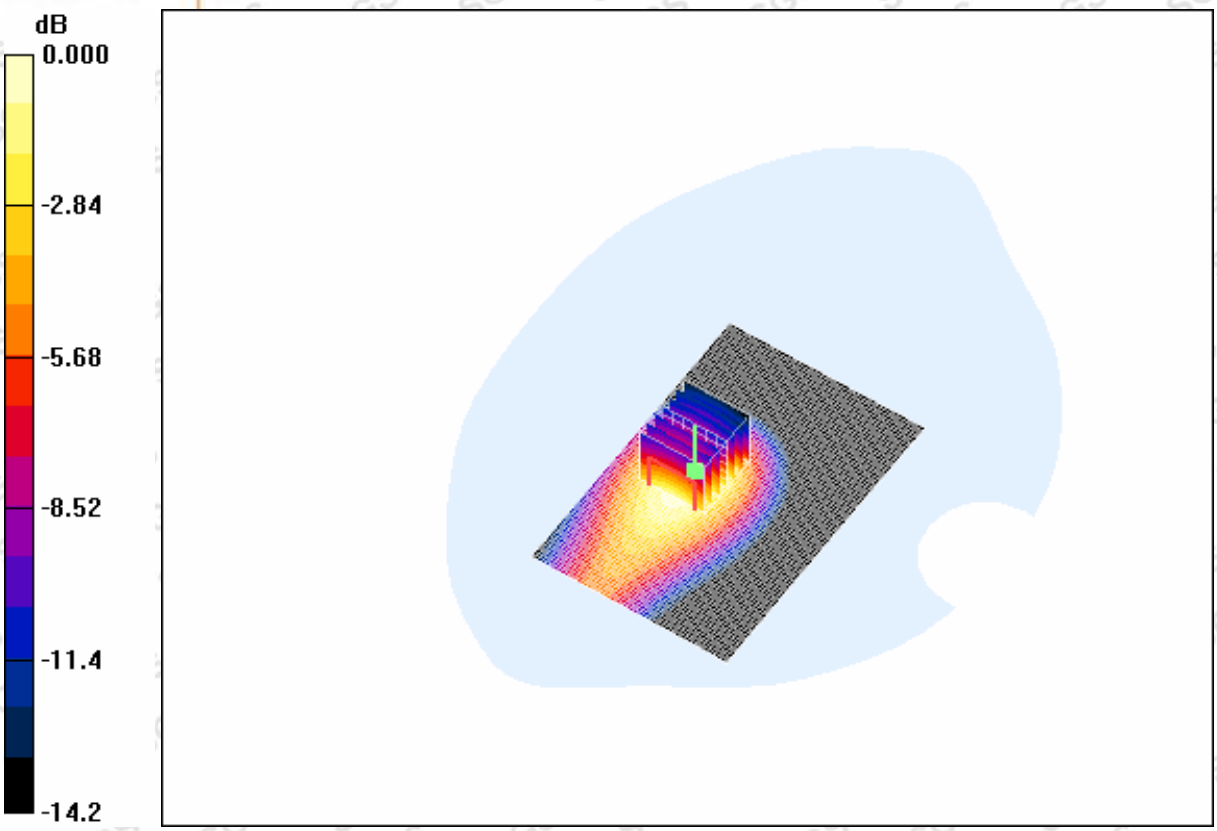
Body Worn - Middle P1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.33 V/m; Power Drift = -0.141 dB

Peak SAR (extrapolated) = 0.769 W/kg

SAR(1 g) = 0.492 mW/g; SAR(10 g) = 0.305 mW/g

Maximum value of SAR (measured) = 0.535 mW/g



0 dB = 0.535mW/g

4.7 GSM850-Body-Worn-EGPRS-Middle-P2

Date/Time: 2008-8-29 19:52:50

Test Laboratory: SGS-GSM

GSM850-Body-Worn-EGPRS-8PSK-Mid P2

DUT: K3520; Type: Body; Serial: 20080805

Communication System: GSM850-EGPRS Mode; Frequency: 836.4 MHz;Duty Cycle: 1:2

Medium: HSL850-Body Medium parameters used: f = 836.4 MHz; σ = 0.949 mho/m; ε_r = 55.5; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.81, 5.81, 5.81); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P 2/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.685 mW/g

Body Worn - Middle P 2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.59 V/m; Power Drift = -0.359 dB

Peak SAR (extrapolated) = 1.00 W/kg

SAR(1 g) = 0.572 mW/g; SAR(10 g) = 0.354 mW/g

Maximum value of SAR (measured) = 0.624 mW/g

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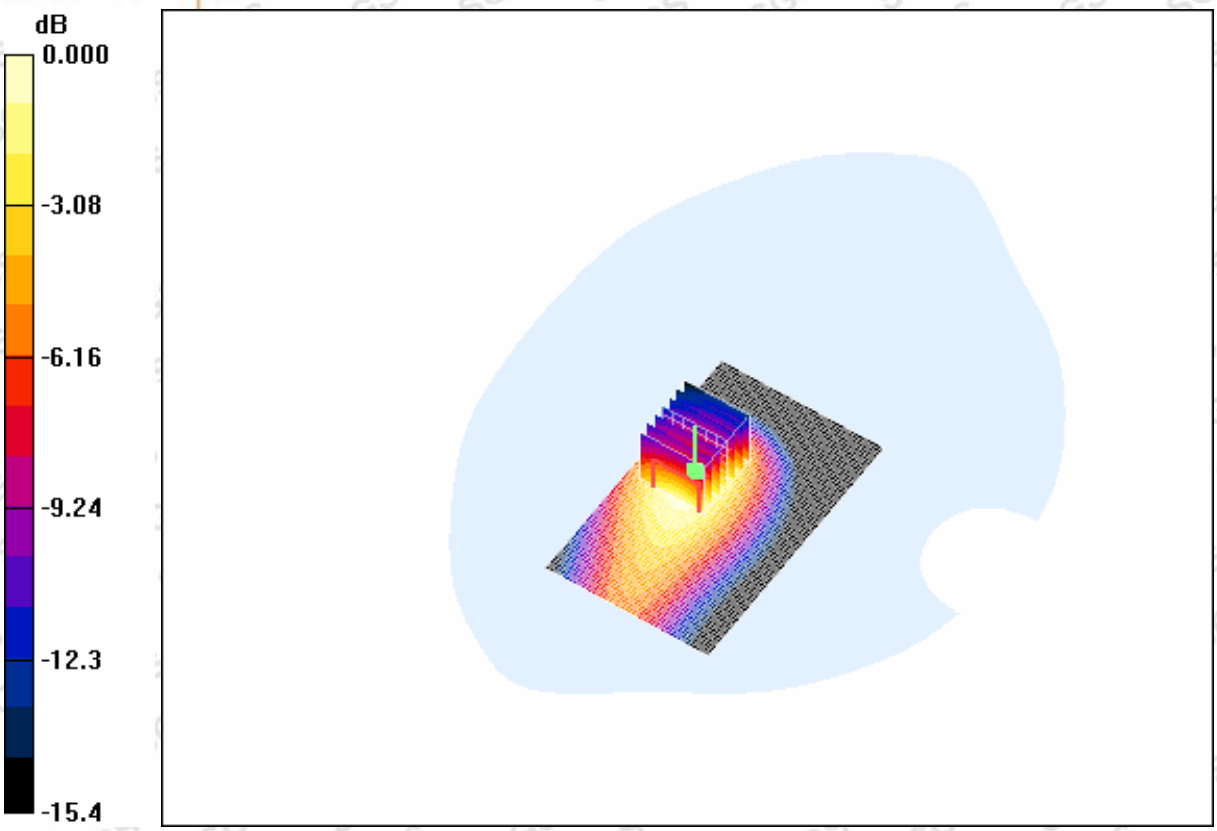

0 dB = 0.624mW/g

4.8 GSM850-Body-Worn-EGPRS-Middle-P3

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Blank

4.9 GSM850-Body-Worn-EGPRS-Middle-P4

…

Blank

4.10 GSM850-Body-Worn-EGPRS-Middle-P5

…

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4.11 GSM850-Body-Worn-GPRS-Worstcase-Low

Date/Time: 2008-8-28 21:24:48

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-GMSK-Low P2

DUT: K3520; Type: Body; Serial: 20080805

Communication System: GSM850-GPRS Mode; Frequency: 824.2 MHz;Duty Cycle: 1:4

Medium: HSL850-Body Medium parameters used: f = 824.2 MHz; σ = 0.93 mho/m; ε_r = 55.7; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.81, 5.81, 5.81); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Low P2/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.752 mW/g

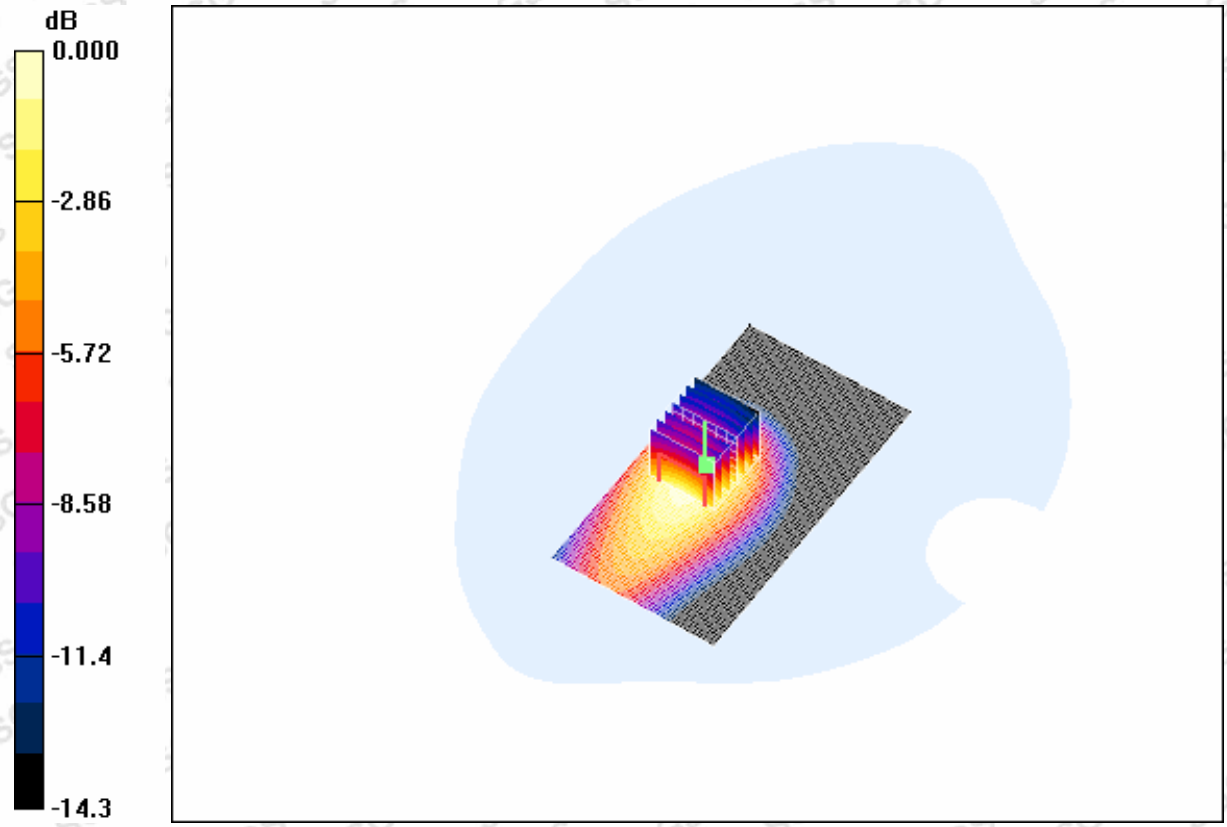
Body Worn - Low P2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.69 V/m; Power Drift = 0.108 dB

Peak SAR (extrapolated) = 1.04 W/kg

SAR(1 g) = 0.667 mW/g; SAR(10 g) = 0.417 mW/g

Maximum value of SAR (measured) = 0.729 mW/g



0 dB = 0.729mW/g

4.12GSM850-Body-Worn- GPRS-Worstcase-High

Date/Time: 2008-8-28 21:44:48

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-GMSK-High P2

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Shanghai Branch GSM Laboratory
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中国•上海•宜山路 889 号 3 号楼 9 层 邮编：200233 t (86 -21) 61402666*2736 f (86 -21) 54500149 e sgs.china@sgs.com

DUT: K3520; Type: Body; Serial: 20080805

Communication System: GSM850-GPRS Mode; Frequency: 848.8 MHz;Duty Cycle: 1:4

Medium: HSL850-Body Medium parameters used: f = 848.8 MHz; σ = 0.966 mho/m; ε_r = 55.3; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.81, 5.81, 5.81); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - High P2/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.905 mW/g

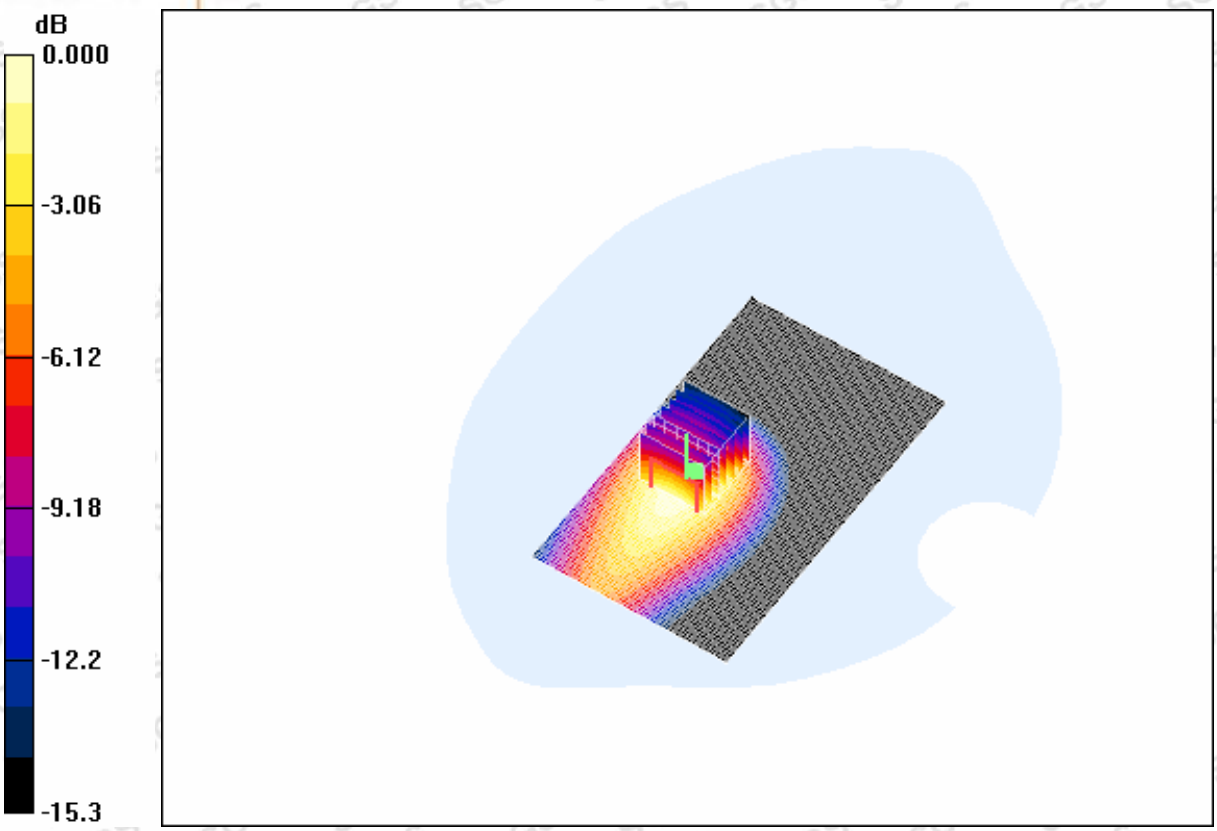
Body Worn - High P2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.68 V/m; Power Drift = 0.083 dB

Peak SAR (extrapolated) = 1.26 W/kg

SAR(1 g) = 0.801 mW/g; SAR(10 g) = 0.493 mW/g

Maximum value of SAR (measured) = 0.871 mW/g



0 dB = 0.871mW/g

GSM850-Body-Worn-EGPRS-Worstcase-Low

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GSM850-Body-Worn- EGPRS-Worstcase-High

…

Blank

GSM1900

4.13 GSM1900-Body-Worn-GPRS-Middle-P1

Date/Time: 2008-8-28 11:59:32

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-GMSK-Mid-P1

DUT: K3520; Type: Body; Serial: 20080805

Communication System: PCS1900-GPRS Mode; Frequency: 1880 MHz;Duty Cycle: 1:4

Medium: HSL1900_Body Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle p1/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.812 mW/g

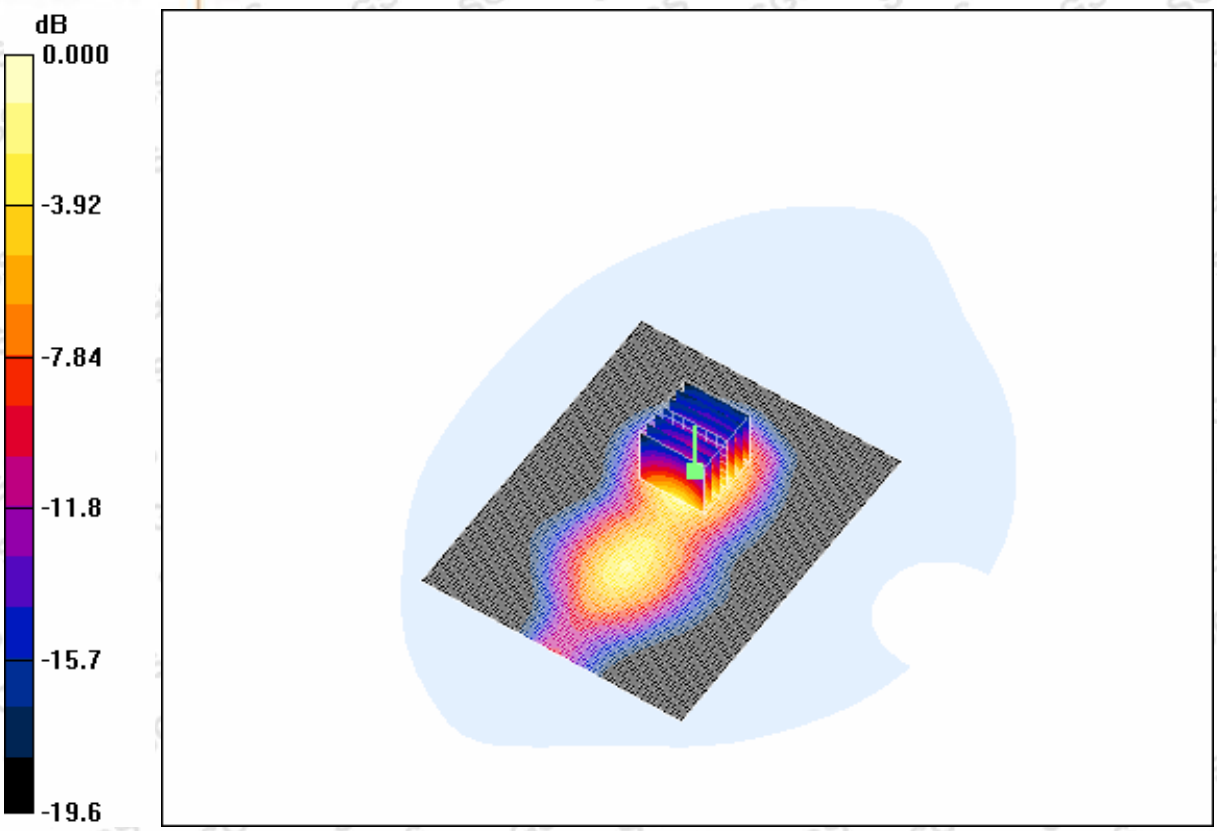
Body Worn - Middle p1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.9 V/m; Power Drift = -0.168 dB

Peak SAR (extrapolated) = 1.49 W/kg

SAR(1 g) = 0.726 mW/g; SAR(10 g) = 0.363 mW/g

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



0 dB = 0.813mW/g

4.14GSM1900-Body-Worn-GPRS-Middle-P2

Date/Time: 2008-8-28 12:22:11

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-GMSK-Mid-P2

DUT: K3520; Type: Body; Serial: 20080805

Communication System: PCS1900-GPRS Mode; Frequency: 1880 MHz;Duty Cycle: 1:4

Medium: HSL1900_Body Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle p2/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.763 mW/g

Body Worn - Middle p2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.3 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 1.30 W/kg

SAR(1 g) = 0.678 mW/g; SAR(10 g) = 0.343 mW/g

Maximum value of SAR (measured) = 0.749 mW/g

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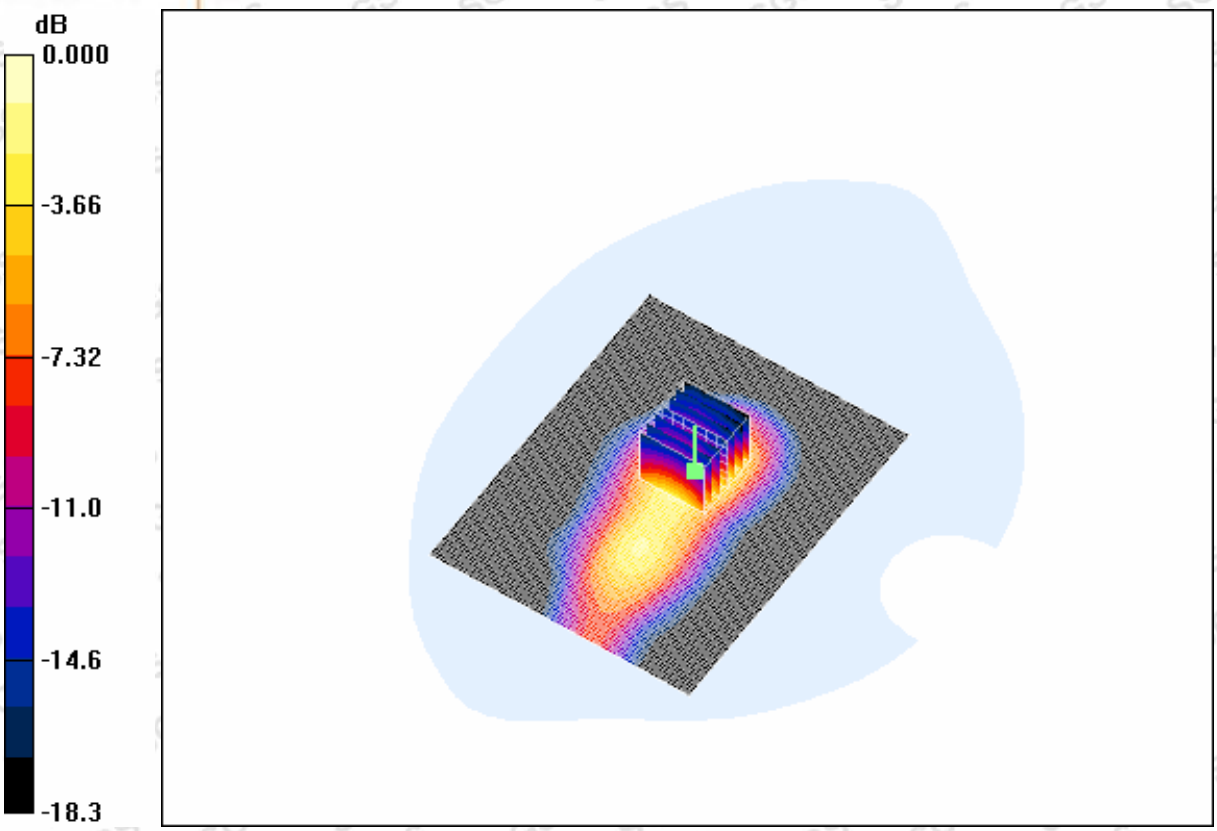


0 dB = 0.749mW/g

4.15GSM1900-Body-Worn-GPRS-Middle-P3

Date/Time: 2008-8-28 14:58:53

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-GMSK-Mid-P3

DUT: K3520; Type: Body; Serial: 20080805

Communication System: PCS1900-GPRS Mode; Frequency: 1880 MHz;Duty Cycle: 1:4

Medium: HSL1900_Body Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle p3/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.443 mW/g

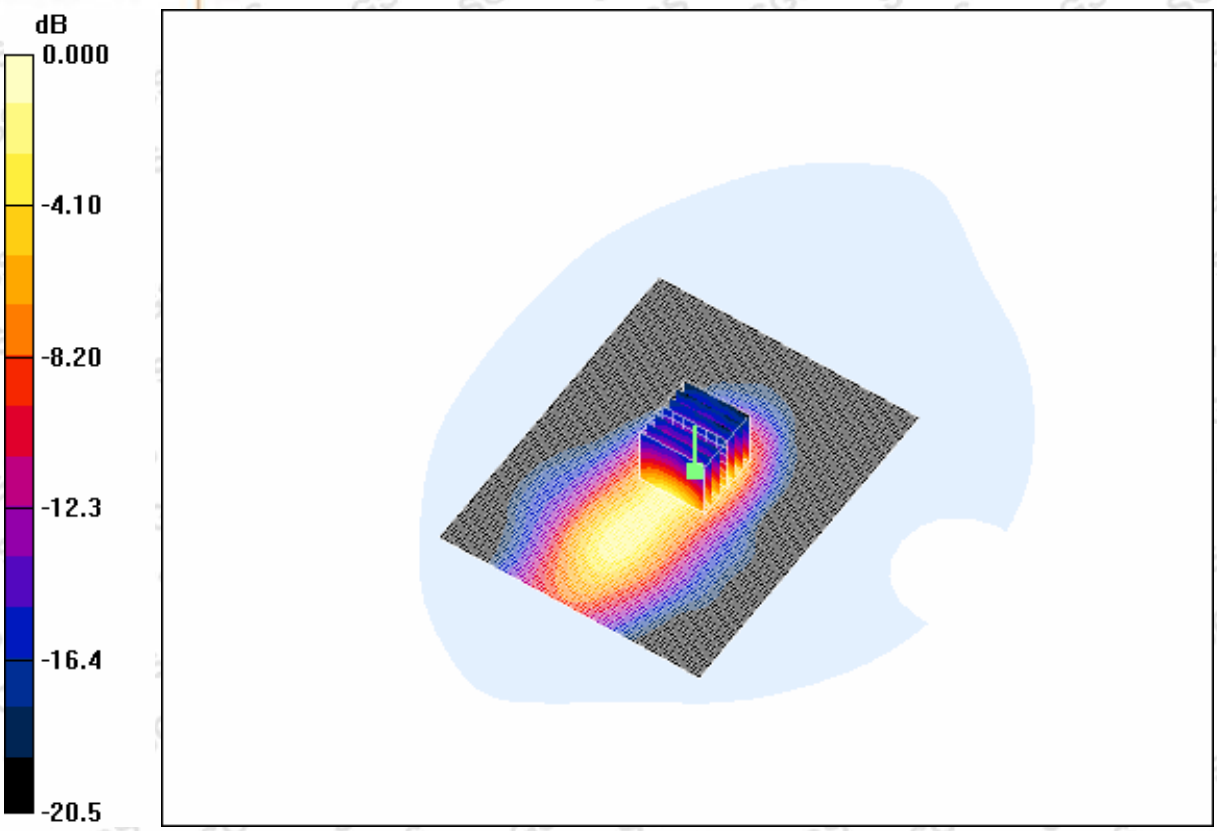
Body Worn - Middle p3/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 9.33 V/m; Power Drift = 0.101 dB

Peak SAR (extrapolated) = 0.958 W/kg

SAR(1 g) = 0.428 mW/g; SAR(10 g) = 0.201 mW/g

Maximum value of SAR (measured) = 0.488 mW/g



0 dB = 0.488mW/g

4.16GSM1900-Body-Worn-GPRS-Middle-P4

Date/Time: 2008-8-28 16:20:10

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-GMSK-Mid-P4

DUT: K3520; Type: Body; Serial: 20080805

Communication System: PCS1900-GPRS Mode; Frequency: 1880 MHz;Duty Cycle: 1:4

Medium: HSL1900_Body Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle p4/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.580 mW/g

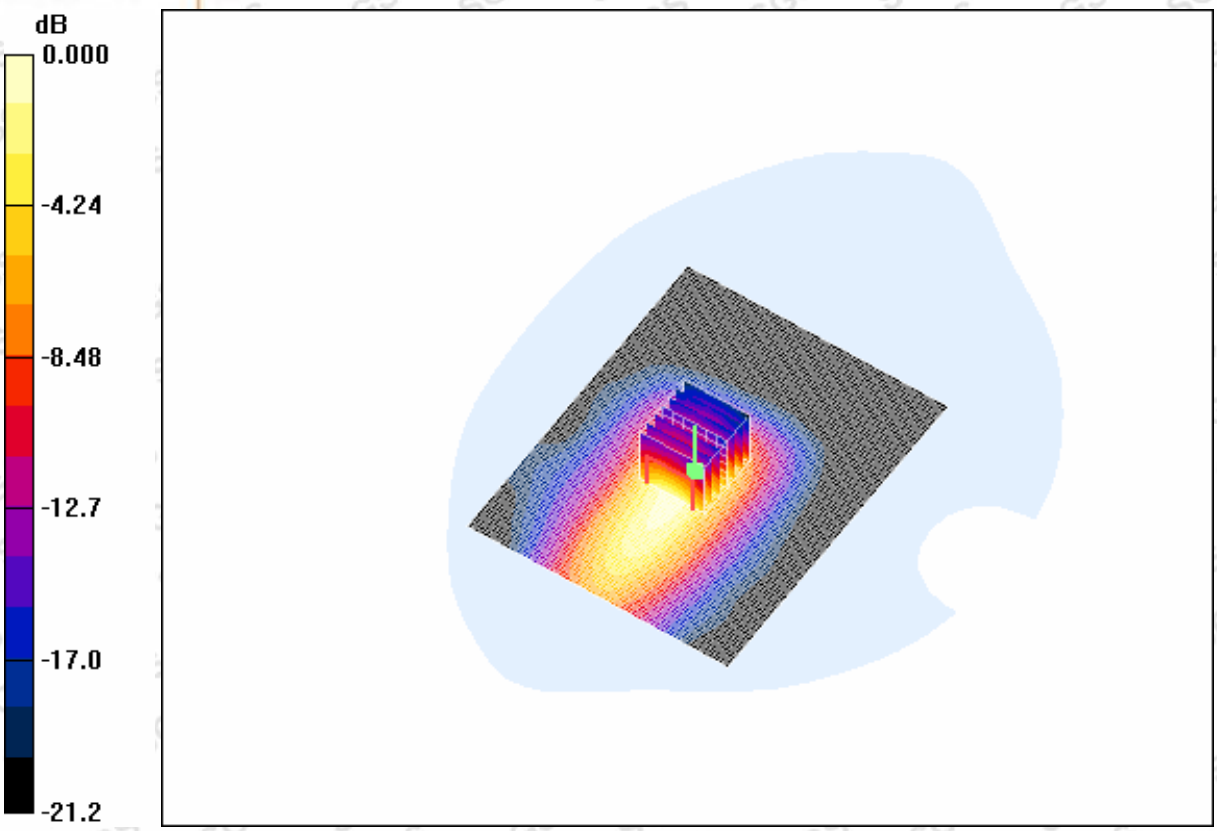
Body Worn - Middle p4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.26 V/m; Power Drift = -0.019 dB

Peak SAR (extrapolated) = 0.958 W/kg

SAR(1 g) = 0.503 mW/g; SAR(10 g) = 0.265 mW/g

Maximum value of SAR (measured) = 0.555 mW/g



0 dB = 0.555mW/g

4.17 GSM1900-Body-Worn- GPRS -Middle-P5

Date/Time: 2008-8-28 16:48:04

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-GMSK-Mid-P5

DUT: K3520; Type: Body; Serial: 20080805

Communication System: PCS1900-GPRS Mode; Frequency: 1880 MHz;Duty Cycle: 1:4

Medium: HSL1900_Body Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle p5/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.120 mW/g

Body Worn - Middle p5/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.32 V/m; Power Drift = 0.130 dB

Peak SAR (extrapolated) = 0.251 W/kg

SAR(1 g) = 0.112 mW/g; SAR(10 g) = 0.054 mW/g

Maximum value of SAR (measured) = 0.127 mW/g

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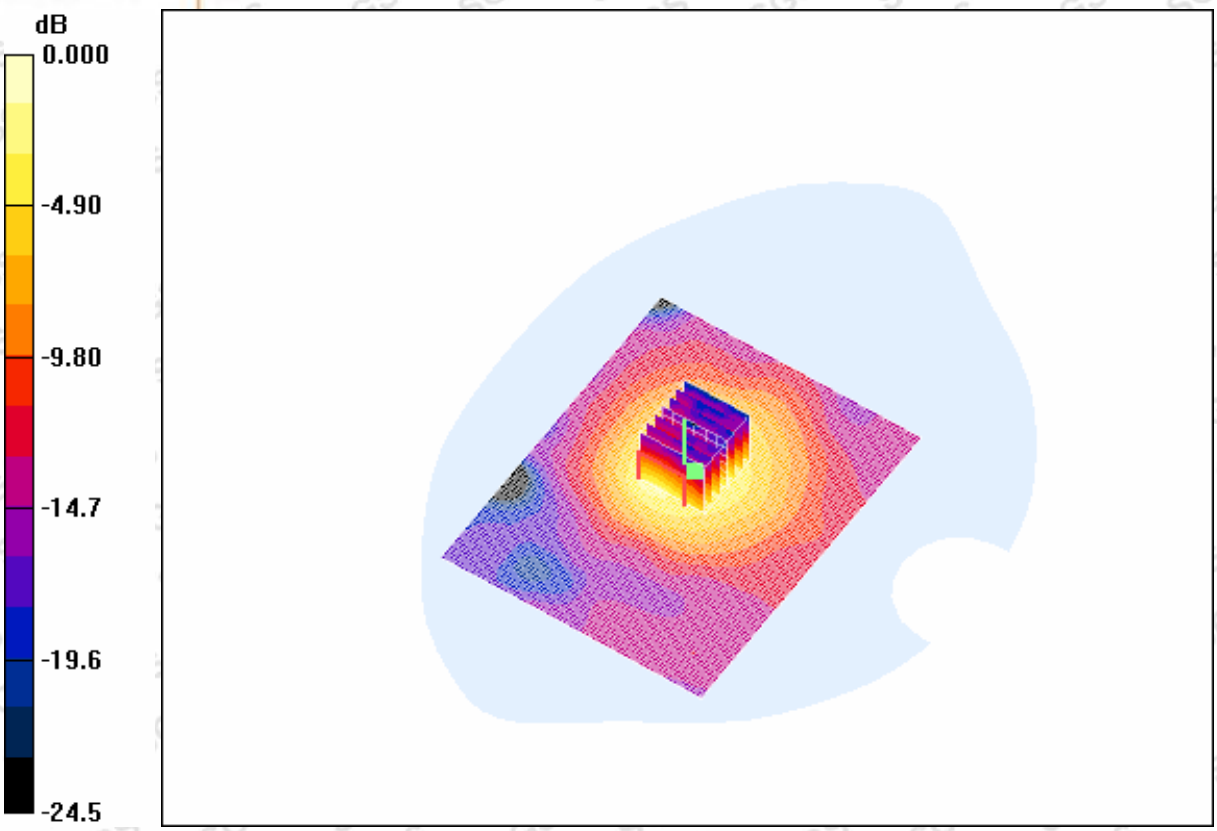


0 dB = 0.127mW/g

4.18 GSM1900-Body-Worn-EGPRS-Middle-P1

Date/Time: 2008-8-29 22:38:19

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-EGPRS-8PSK-Mid p 1

DUT: K3520; Type: Body; Serial: 20080805

Communication System: PCS1900-EGPRS Mode; Frequency: 1880 MHz;Duty Cycle: 1:2

Medium: HSL1900_Body Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle p1/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

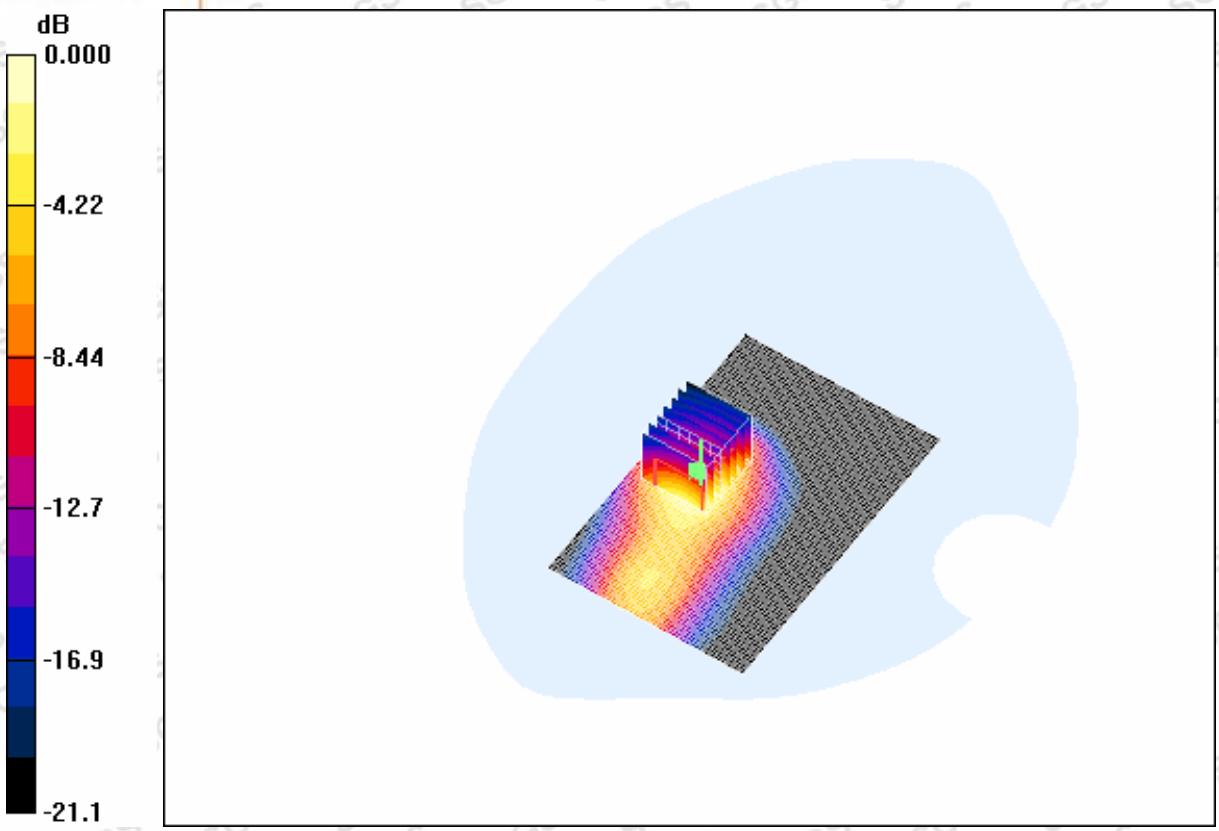
Body Worn - Middle p1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.91 V/m; Power Drift = -0.067 dB

Peak SAR (extrapolated) = 1.98 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.521 mW/g

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



0 dB = 1.12mW/g

4.19 GSM1900-Body-Worn-EGPRS-Middle-P2

Date/Time: 2008-8-29 22:14:33

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-EGPRS-8PSK-Mid p 2

DUT: K3520; Type: Body; Serial: 20080805

Communication System: PCS1900-EGPRS Mode; Frequency: 1880 MHz;Duty Cycle: 1:2

Medium: HSL1900_Body Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle p2-2/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.50 mW/g

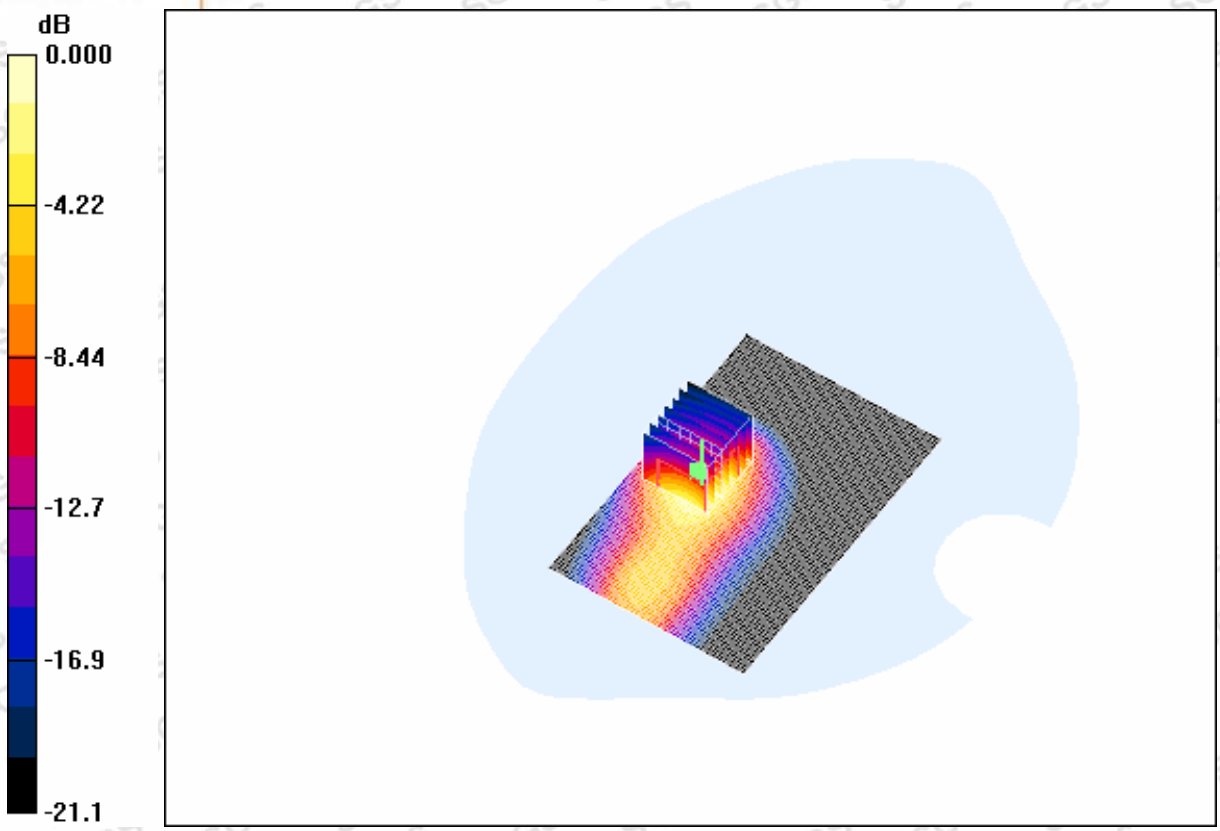
Body Worn - Middle p2-2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.14 V/m; Power Drift = -0.292 dB

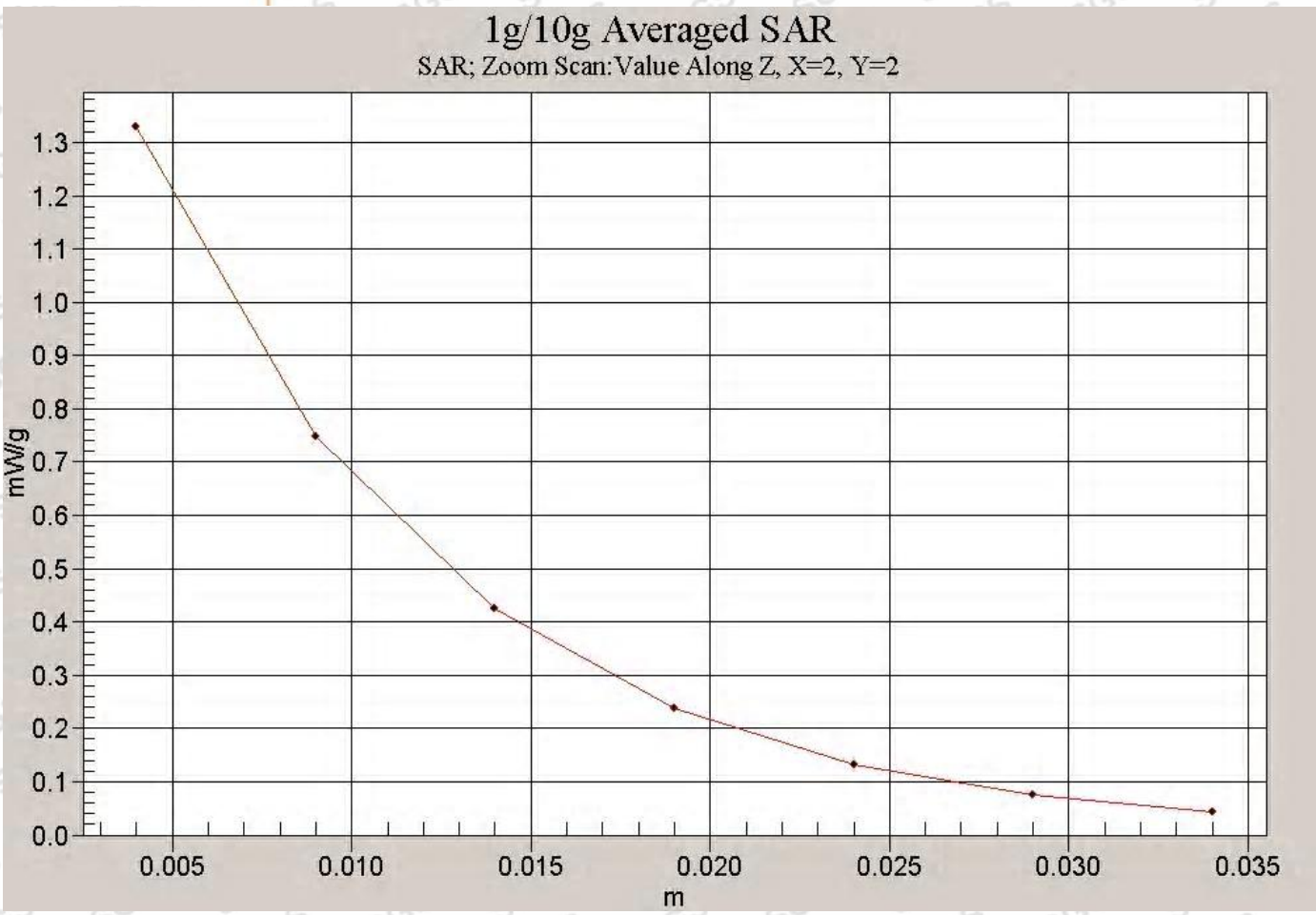
Peak SAR (extrapolated) = 2.31 W/kg

SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.600 mW/g

Maximum value of SAR (measured) = 1.33 mW/g



0 dB = 1.33mW/g



GSM1900-Body-Worn-EGPRS-Middle-P2-1cm

Date/Time: 2008-9-10 23:10:58

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-EGPRS-Mid-P2-1cm

DUT: K3520; Type: Body; Serial: 20080805

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Communication System: PCS1900-EGPRS Mode; Frequency: 1880 MHz;Duty Cycle: 1:2

Medium: HSL1900_Body Medium parameters used: f = 1880 MHz; σ = 1.55 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle p2 Xmm 4/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.671 mW/g

Body Worn - Middle p2 Xmm 4/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.7 V/m; Power Drift = -0.084 dB

Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.600 mW/g; SAR(10 g) = 0.317 mW/g

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

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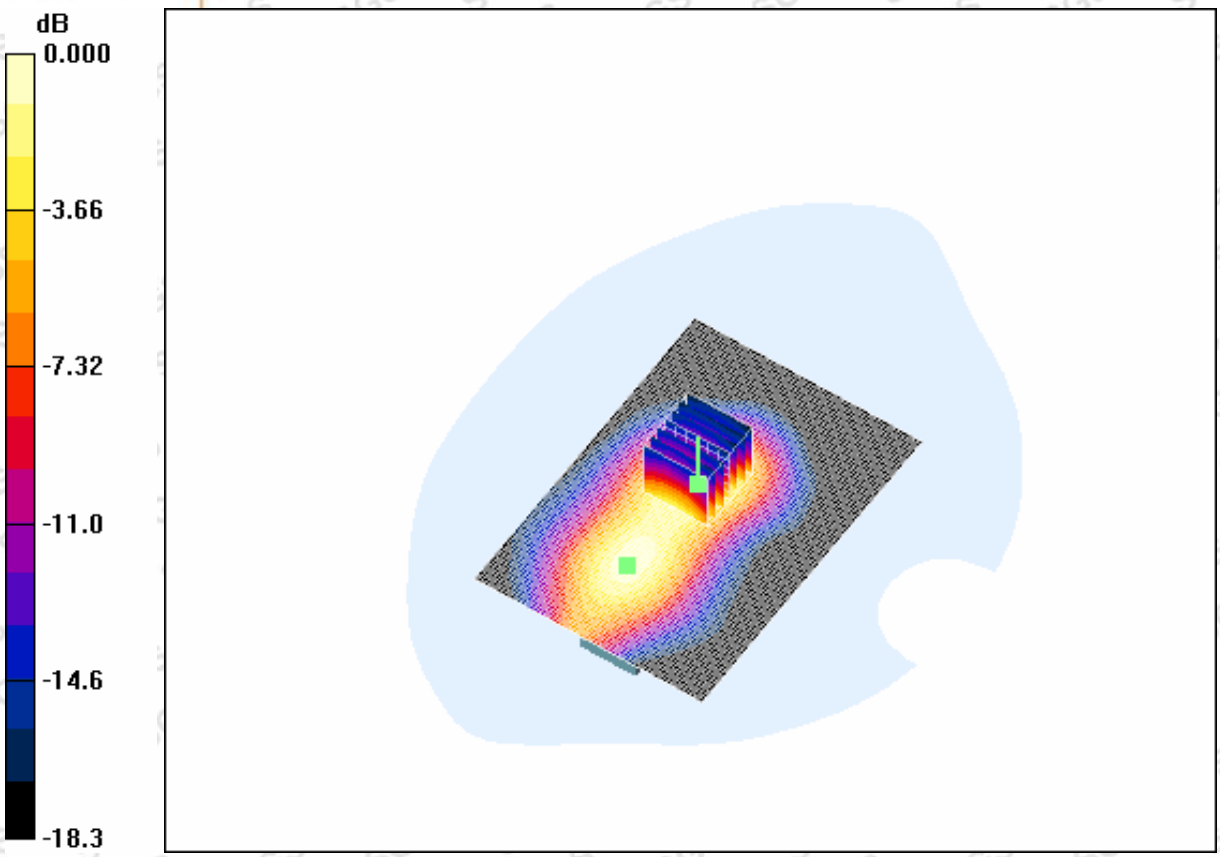


0 dB = 0.669mW/g

4.20 GSM1900-Body-Worn-EGPRS-Middle-P3

…

Blank

4.21 GSM1900-Body-Worn-EGPRS-Middle-P4

…

Blank

4.22 GSM1900-Body-Worn-EGPRS-Middle-P5

…

Blank

4.23 GSM1900-Body-Worn-EGPRS-Worstcase-Low-P1

Date/Time: 2008-8-28 18:03:03

Test Laboratory: SGS-GSM

GSM1900-Body-Worn--EGPRS-Low-P1

DUT: K3520; Type: Body; Serial: 20080805

Communication System: PCS1900-EGPRS Mode; Frequency: 1850.2 MHz;Duty Cycle: 1:2

Medium: HSL1900_Body Medium parameters used: f = 1850.2 MHz; σ = 1.51 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Low P1/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

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

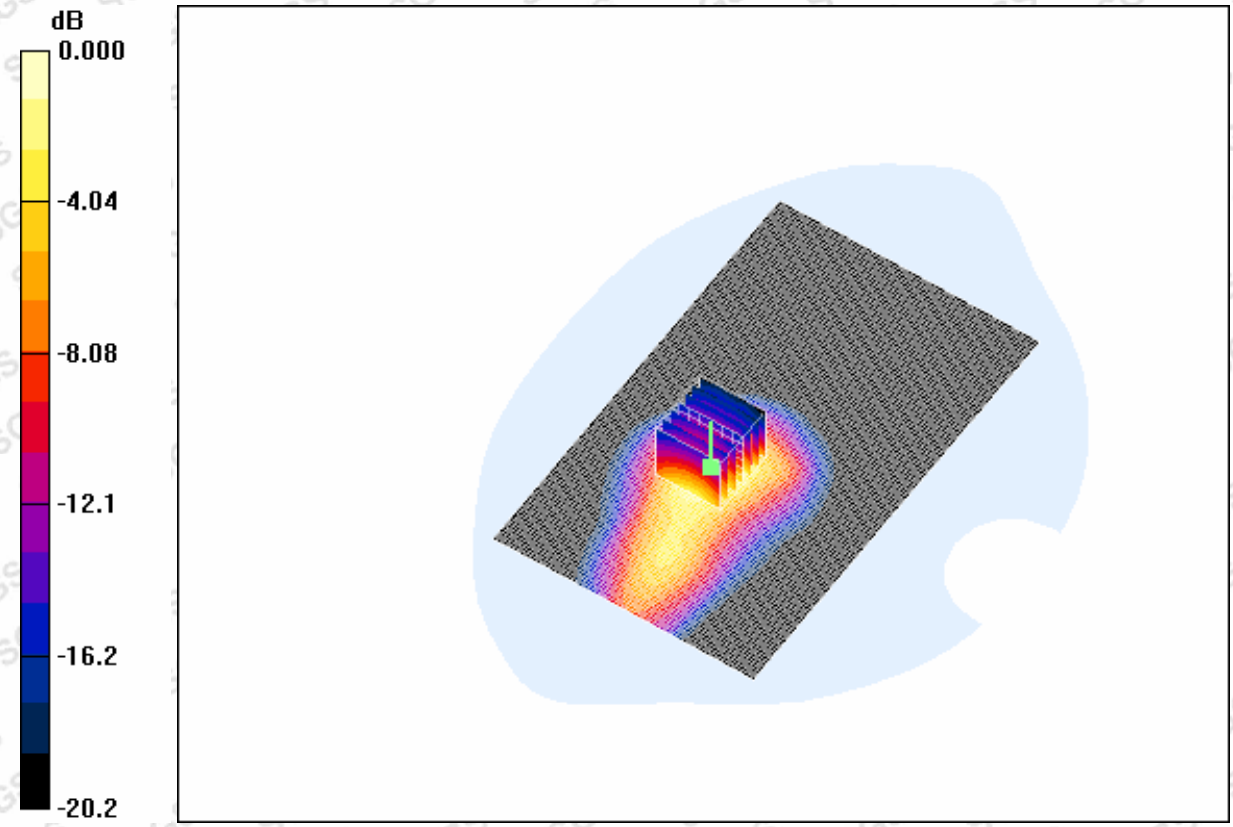
Body Worn - Low P1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.35 V/m; Power Drift = -0.31 dB

Peak SAR (extrapolated) = 1.91 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.514 mW/g

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



0 dB = 1.15mW/g

4.24GSM1900-Body-Worn- EGPRS- Worstcase-High-P1

Date/Time: 2008-8-28 19:03:25

Test Laboratory: SGS-GSM

GSM1900-Body-Worn--EGPRS-High-P1

DUT: K3520; Type: Body; Serial: 20080805

Communication System: PCS1900-EGPRS Mode; Frequency: 1909.8 MHz;Duty Cycle: 1:2

Medium: HSL1900_Body Medium parameters used: f = 1909.8 MHz; σ = 1.58 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - High P1/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.780 mW/g

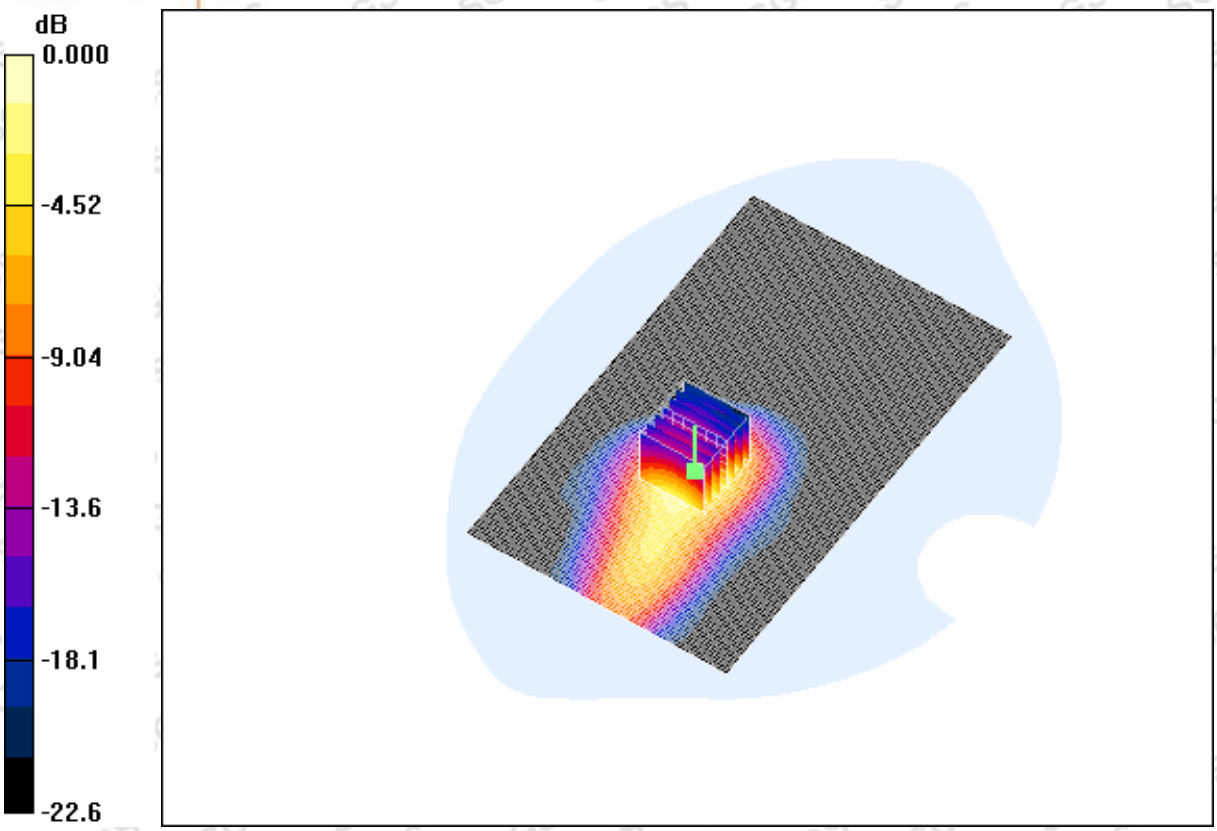
Body Worn - High P1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.50 V/m; Power Drift = -0.045 dB

Peak SAR (extrapolated) = 1.31 W/kg

SAR(1 g) = 0.677 mW/g; SAR(10 g) = 0.331 mW/g

Maximum value of SAR (measured) = 0.764 mW/g



0 dB = 0.764mW/g

GSM1900-Body-Worn- EGPRS- Worstcase-Low-P2

Date/Time: 2008-8-29 23:42:48

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-EGPRS-8PSK-Low p 2

DUT: K3520; Type: Body; Serial: 20080805

Communication System: PCS1900-EGPRS Mode; Frequency: 1850.2 MHz;Duty Cycle: 1:2

Medium: HSL1900_Body Medium parameters used: f = 1850.2 MHz; σ = 1.51 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Low P2/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.35 mW/g

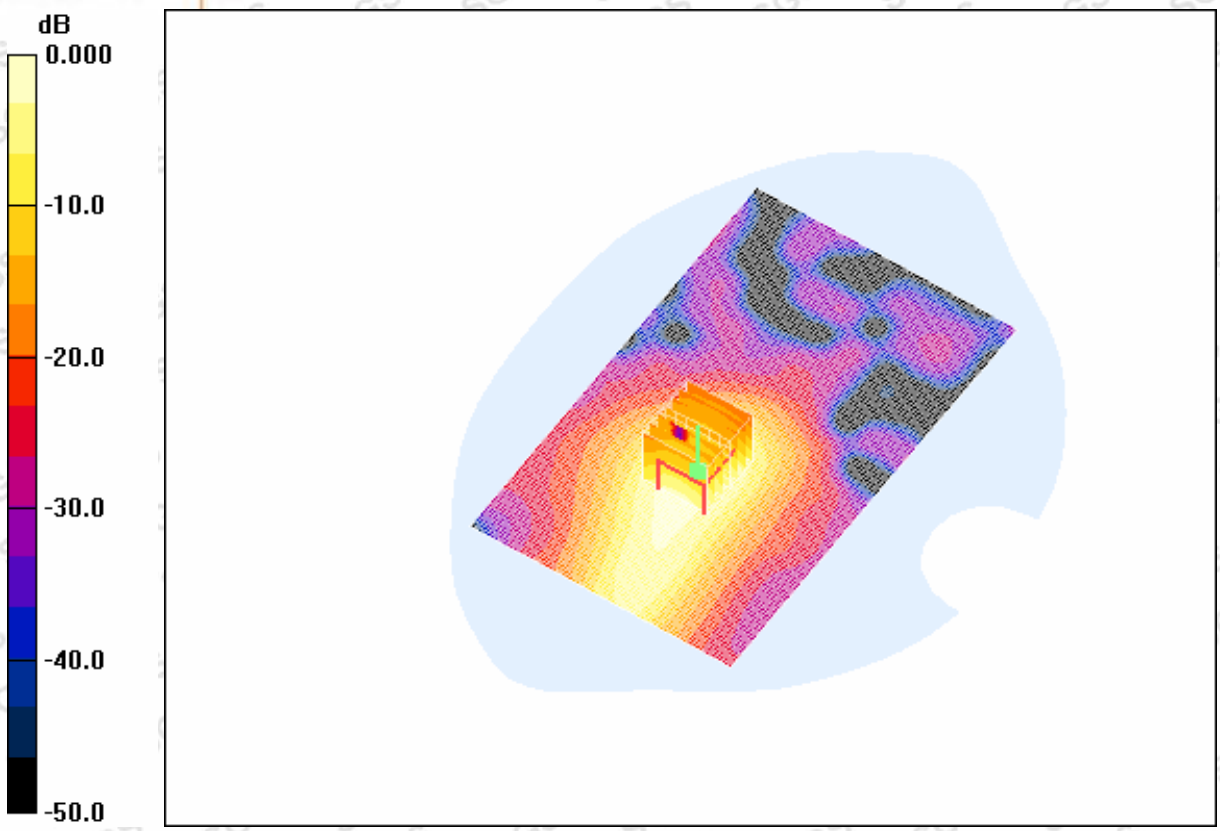
Body Worn - Low P2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.51 V/m; Power Drift = 0.232 dB

Peak SAR (extrapolated) = 2.79 W/kg

SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.534 mW/g

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



0 dB = 1.31mW/g

GSM1900-Body-Worn- EGPRS- Worstcase-High-P2

Date/Time: 2008-8-30 0:09:16

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-EGPRS-8PSK-High p 2

DUT: K3520; Type: Body; Serial: 20080805

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Communication System: PCS1900-EGPRS Mode; Frequency: 1909.8 MHz;Duty Cycle: 1:2

Medium: HSL1900_Body Medium parameters used: f = 1909.8 MHz; σ = 1.58 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - High P2/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.56 mW/g

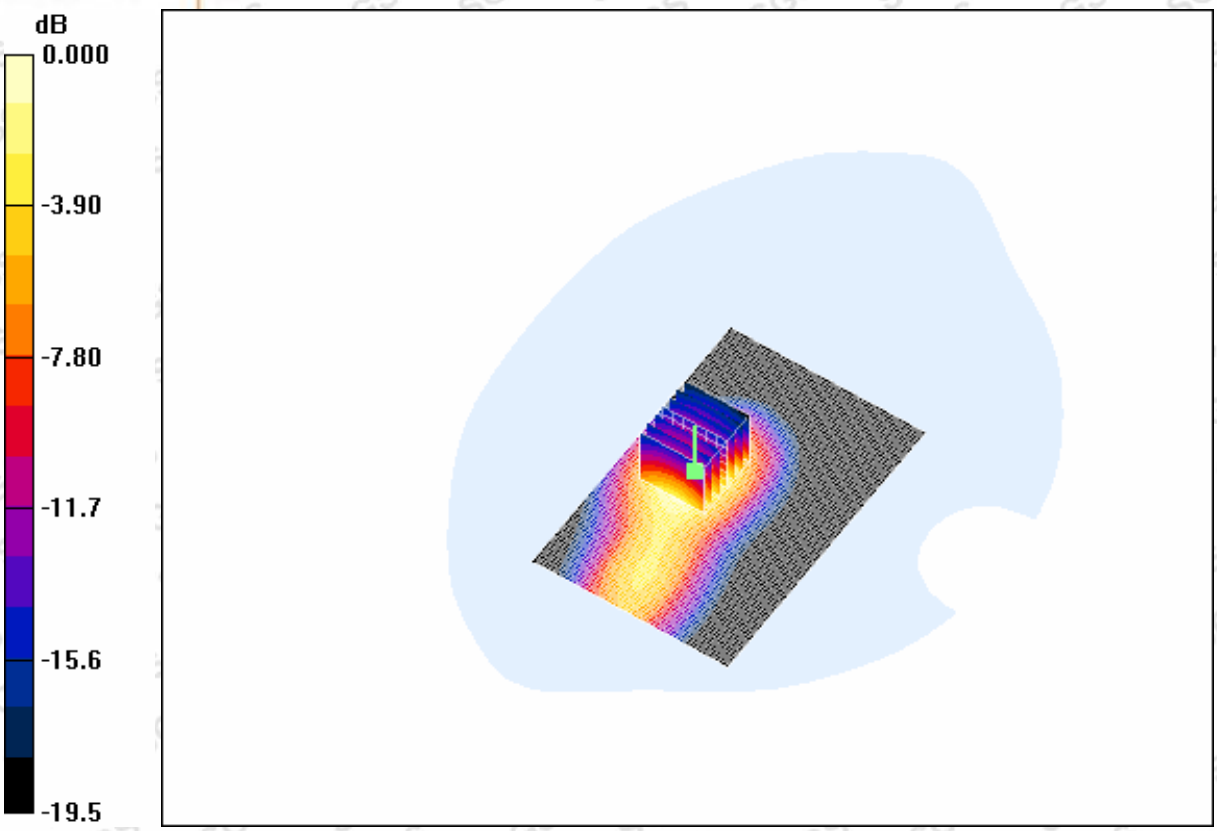
Body Worn - High P2/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.66 V/m; Power Drift = -0.140 dB

Peak SAR (extrapolated) = 1.98 W/kg

SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.557 mW/g

Maximum value of SAR (measured) = 1.21 mW/g



0 dB = 1.21mW/g

System Performance Check

System Validation for 900MHz-Body-Worn-20080828

Date/Time: 2008-8-28 20:45:08

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D900-Body-0828

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:184

Communication System: CW; Frequency: 900 MHz;Duty Cycle: 1:1

Medium: HSL900-Body Medium parameters used: f = 900 MHz; σ = 1.02 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.81, 5.81, 5.81); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

d=15mm, Pin=250mW/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.96 mW/g

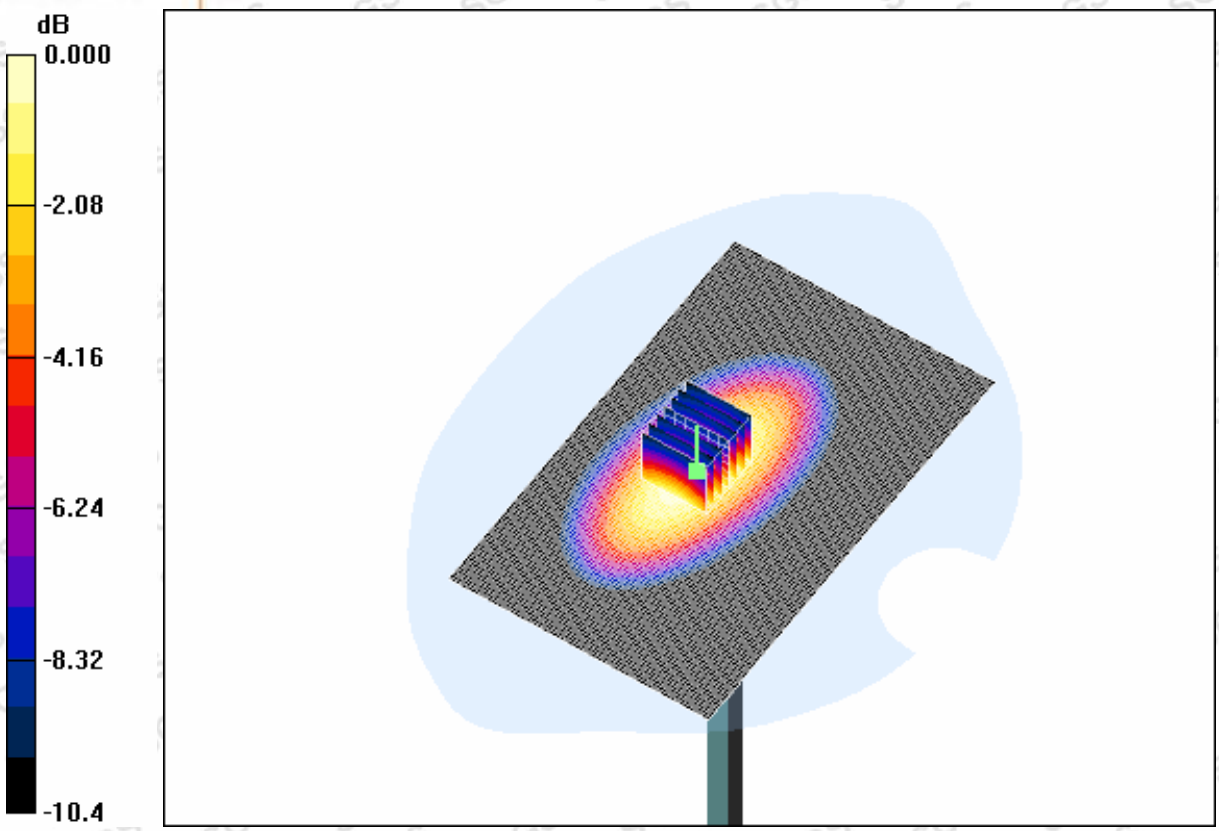
d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 49.3 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 4.05 W/kg

SAR(1 g) = 2.77 mW/g; SAR(10 g) = 1.83 mW/g

Maximum value of SAR (measured) = 2.98 mW/g



0 dB = 2.98mW/g

System Validation for 900MHz-Body-Worn-20080829

Date/Time: 2008-8-29 9:04:12

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D900-Body-0829

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:184

SGS-CSTC Standards Technical Services, Co, Ltd.
Shanghai Branch GSM Laboratory
9/F, 3rd Building, No. 889, Yishan Road, Shanghai, China 200233 t (86 -21) 61402666*2736 f (86 -21) 54500149 www.cn.sgs.com
中国•上海•宜山路 889 号 3 号楼 9 层 邮编：200233 t (86 -21) 61402666*2736 f (86 -21) 54500149 e sgs.china@sgs.com

Communication System: CW; Frequency: 900 MHz;Duty Cycle: 1:1

Medium: HSL900-Body Medium parameters used: f = 900 MHz; σ = 1.02 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.81, 5.81, 5.81); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

d=15mm, Pin=250mW/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.87 mW/g

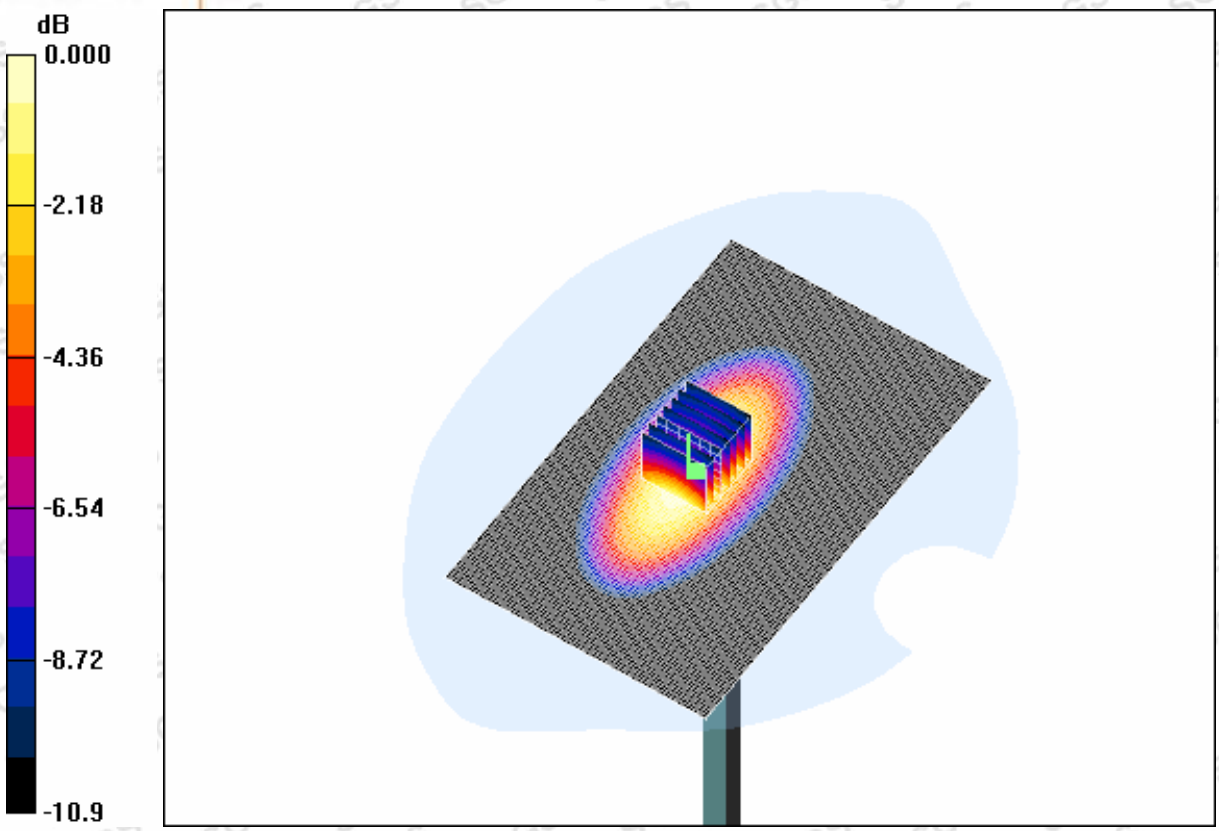
d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 46.8 V/m; Power Drift = -0.055 dB

Peak SAR (extrapolated) = 3.99 W/kg

SAR(1 g) = 2.65 mW/g; SAR(10 g) = 1.7 mW/g

Maximum value of SAR (measured) = 2.86 mW/g



0 dB = 2.86mW/g

System Validation for 1900MHz-Body-Worn-20080829

Date/Time: 2008-8-29 21:39:16

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D1900-Body-0829-2

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d028

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

Medium: HSL1900_Body Medium parameters used: f = 1900 MHz; σ = 1.57 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

d=10mm, Pin=250mW/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.3 mW/g

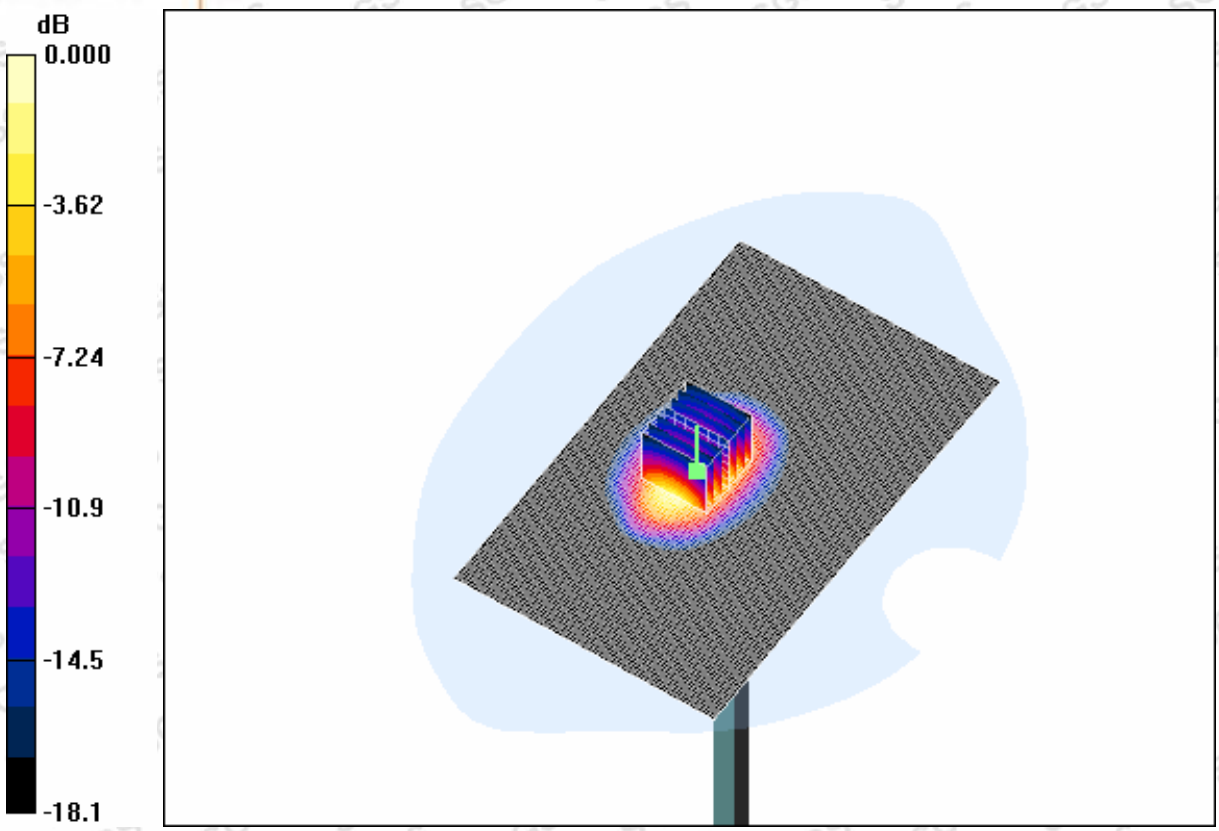
d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 51.7 V/m; Power Drift = 0.134 dB

Peak SAR (extrapolated) = 19.0 W/kg

SAR(1 g) = 9.79 mW/g; SAR(10 g) = 4.91 mW/g

Maximum value of SAR (measured) = 11.1 mW/g



0 dB = 11.1mW/g

System Validation for 1900MHz-Body-Worn-20080828

Date/Time: 2008-8-28 9:19:47

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D1900-Body-0828

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d028

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

Medium: HSL1900_Body Medium parameters used: f = 1900 MHz; σ = 1.57 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

d=10mm, Pin=250mW 3/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 10.4 mW/g

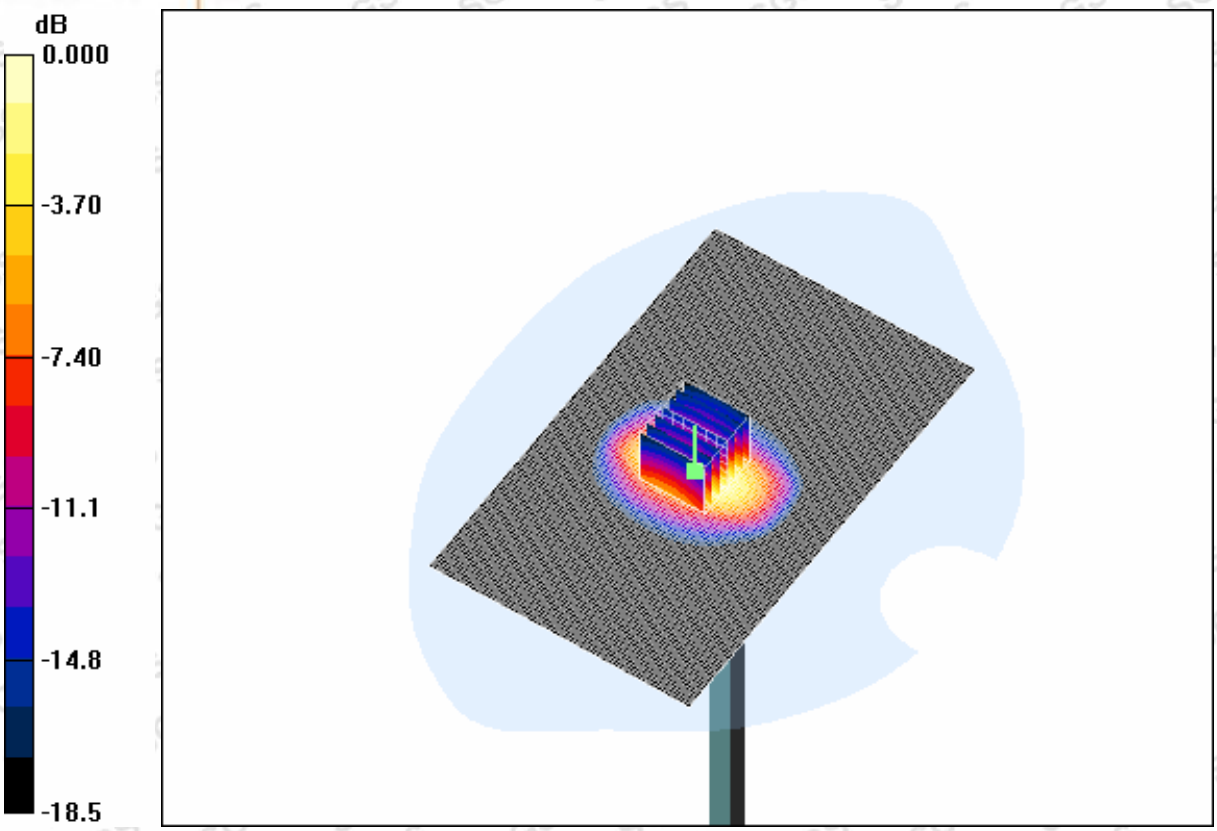
d=10mm, Pin=250mW 3/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 70.3 V/m; Power Drift = -0.038 dB

Peak SAR (extrapolated) = 17.8 W/kg

SAR(1 g) = 9.21 mW/g; SAR(10 g) = 4.62 mW/g

Maximum value of SAR (measured) = 10.4 mW/g



0 dB = 10.4mW/g

System Validation for 1900MHz-Body-Worn-20080910

Date/Time: 2008-9-9 19:57:44

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D1900-Body-0910

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d028

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

Medium: HSL1900_Body Medium parameters used: f = 1900 MHz; σ = 1.59 mho/m; ε_r = 50.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.6, 4.6, 4.6); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

d=10mm, Pin=250mW 2/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.1 mW/g

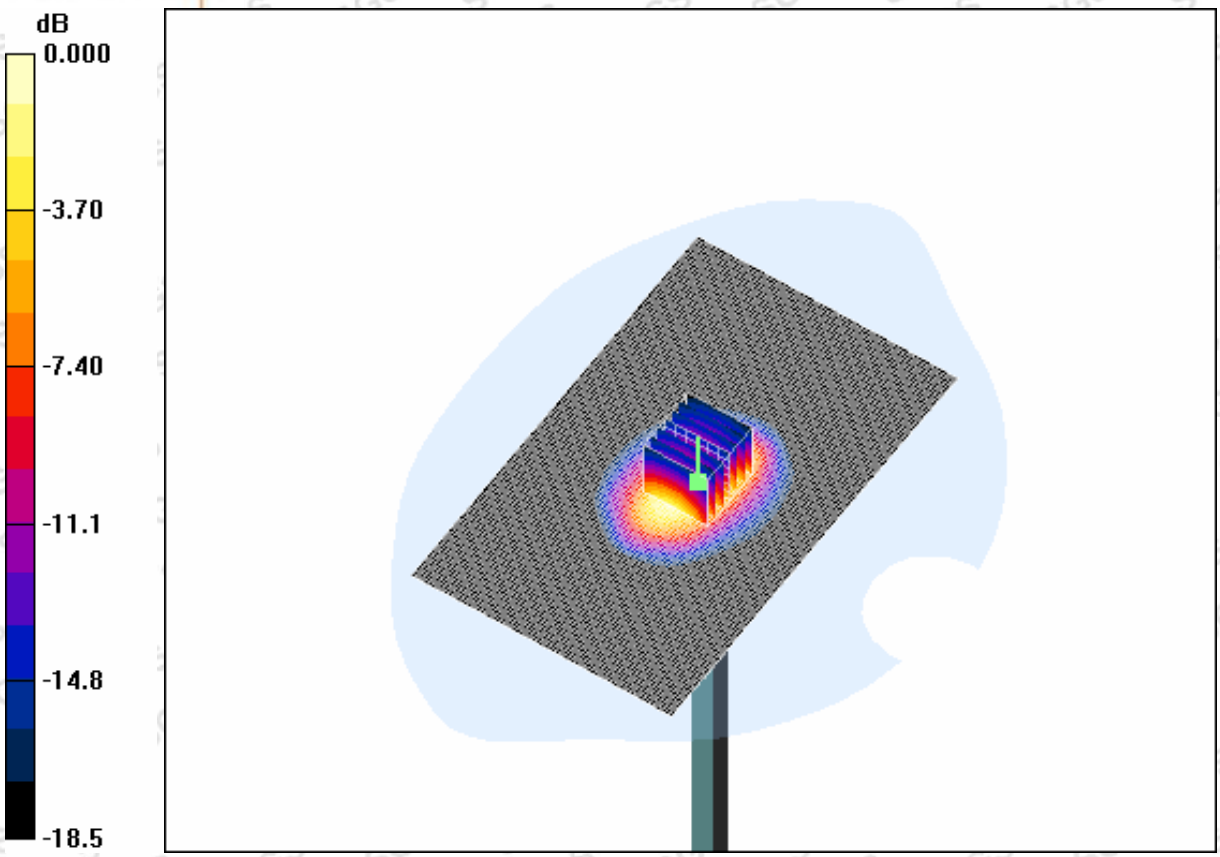
d=10mm, Pin=250mW 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 79.1 V/m; Power Drift = -0.025 dB

Peak SAR (extrapolated) = 18.4 W/kg

SAR(1 g) = 9.42 mW/g; SAR(10 g) = 4.72 mW/g

Maximum value of SAR (measured) = 10.7 mW/g



0 dB = 10.7mW/g

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中国•上海•宜山路 889 号 3 号楼 9 层 邮编：200233 t (86 -21) 61402666*2736 f (86 -21) 54500149 e sgs.china@sgs.com

Appendix

1. Photographs of Test Setup

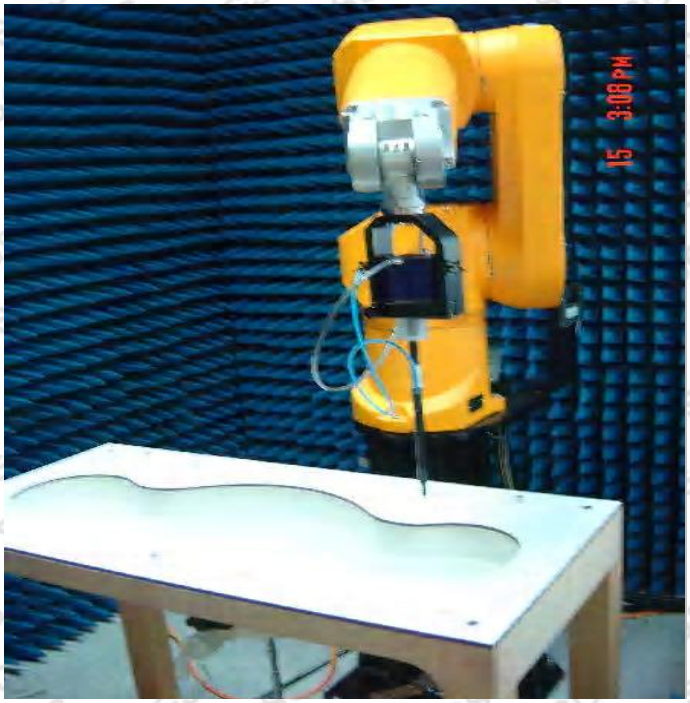


Fig.1 Photograph of the SAR measurement System

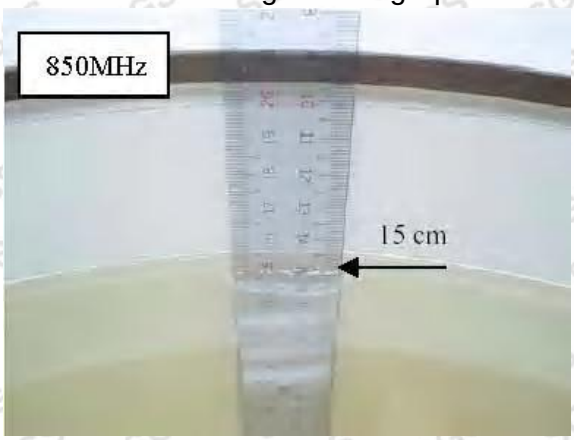


Fig.2 Photograph of the Tissue Simulant Fluid Liquid depth 15cm for Body Worn

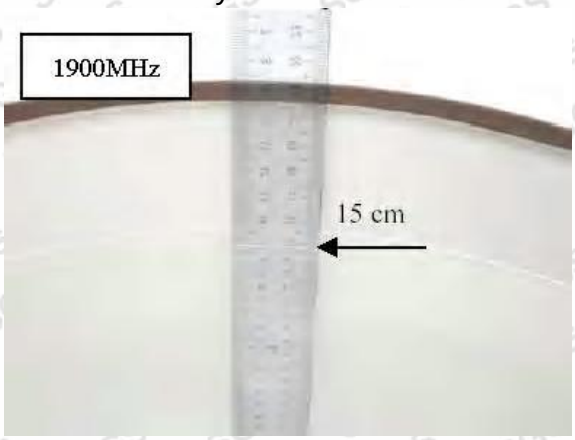
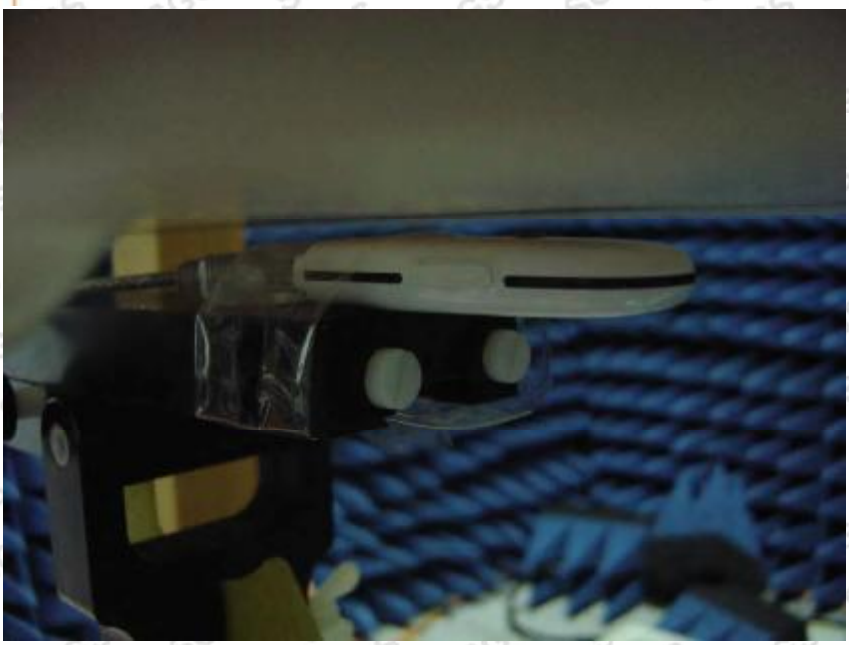
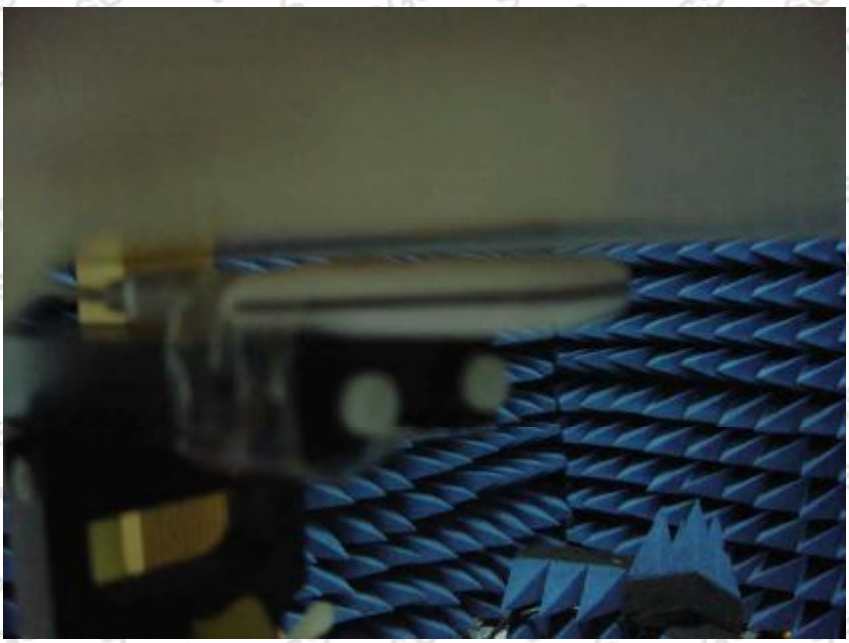


Fig.3 Photograph of the Tissue Simulant Fluid Fluid Liquid depth 15cm for Body Worn



P1



P2

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Shanghai Branch GSM Laboratory
9/F, 3rd Building, No. 889, Yishan Road, Shanghai, China 200233 t (86 -21) 61402666*2736 f (86 -21) 54500149 www.cn.sgs.com
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P3

P4

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中国•上海•宜山路 889 号 3 号楼 9 层 邮编：200233 t (86 -21) 61402666*2736 f (86 -21) 54500149 e sgs.china@sgs.com

P5

Fig.4 Photograph of the BodyWorn status(P1~P5)

2. Photographs of the EUT

Fig.5 Front View Fig.6 Back View

3. Probe Calibration certificate

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

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

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

Accreditation No.: SCS 108

Client SGS China (Auden)

Certificate No: ES3-3088_Jan08

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3088
Calibration procedure(s)	QA CAL-01.v8 Calibration procedure for dosimetric E-field probes
Calibration date:	January 18, 2008
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41495277	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41498087	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Reference 3 dB Attenuator	SN: S5054 (3c)	6-Aug-07 (METAS, No. 217-00718)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-07 (METAS, No. 217-00671)	Mar-08
Reference 30 dB Attenuator	SN: S5129 (30b)	6-Aug-07 (METAS, No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (SPEAG, No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 654	20-Apr-07 (SPEAG, No. DAE4-654_Apr07)	Apr-08

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

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

Issued: January 18, 2008

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

Certificate No: ES3-3088_Jan08 Page 1 of 9

Probe ES3DV3

SN:3088

Manufactured:	July 20, 2005
Last calibrated:	December 12, 2006
Recalibrated:	January 18, 2008

Calibrated for DASY Systems

(Note: not compatible with DASY2 system!)

ES3DV3 SN:3088 January 18, 2008

DASY - Parameters of Probe: ES3DV3 SN:3088

Sensitivity in Free Space[A]

NormX	1.31 ± 10.1%	μV/(V/m)^2	DCP X	92 mV
NormY	1.26 ± 10.1%	μV/(V/m)^2	DCP Y	93 mV
NormZ	1.24 ± 10.1%	μV/(V/m)^2	DCP Z	93 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL 900 MHz Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
SAR_{be} [%]	Without Correction Algorithm	11.0	6.8
SAR_{be} [%]	With Correction Algorithm	0.9	0.4

TSL 1750 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
SAR_{be} [%]	Without Correction Algorithm	9.6	5.1
SAR_{be} [%]	With Correction Algorithm	0.7	0.9

Sensor Offset

Probe Tip to Sensor Center	2.0 mm

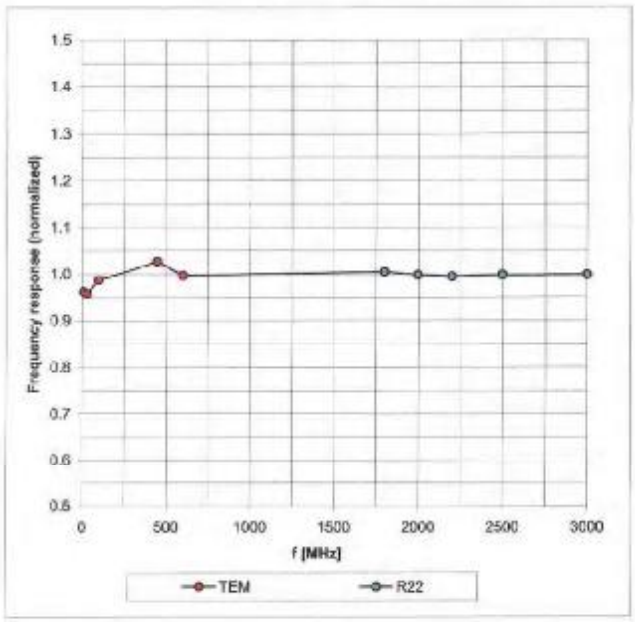
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX, Y, Z do not affect the E^2-field uncertainty inside TSL (see Page 6).
[B] Numerical linearization parameter: uncertainty not required.

ES3DV3 SN:3088 January 18, 2008

Frequency Response of E-Field

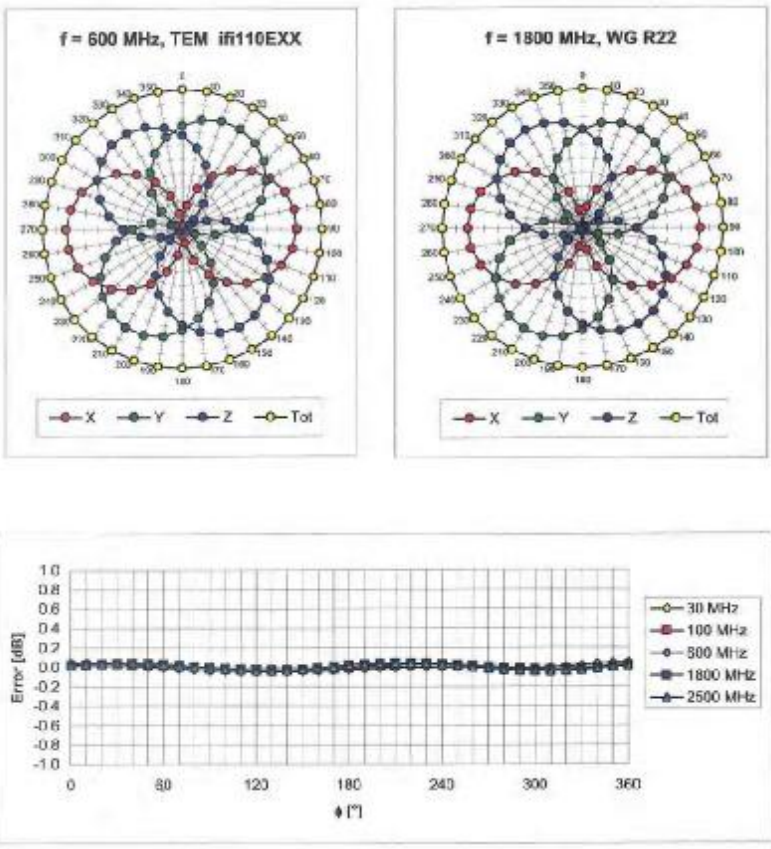
(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

ES3DV3 SN:3088 January 18, 2008

Receiving Pattern (ϕ), ϑ = 0°



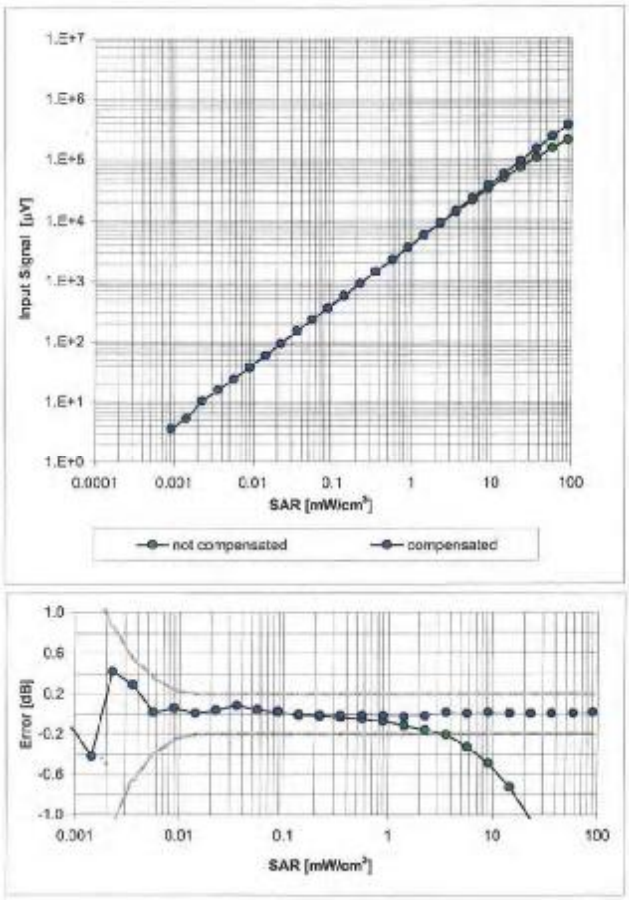
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Certificate No: ES3-3088_Jan08 Page 6 of 9

ES3DV3 SN:3088 January 18, 2008

Dynamic Range f(SAR_{head})

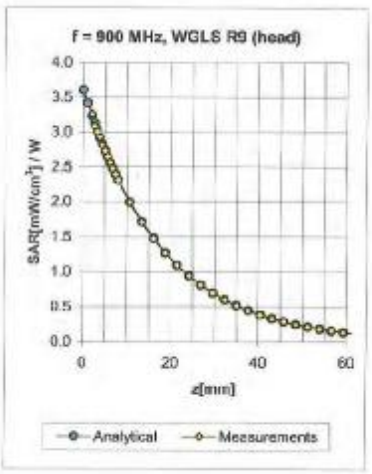
(Waveguide R22, f = 1800 MHz)

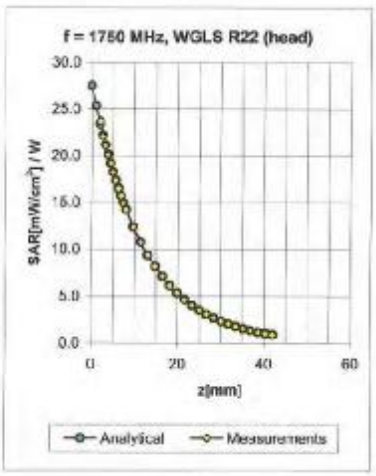


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

ES3DV3 SN:3088 January 18, 2008

Conversion Factor Assessment





f [MHz]	Validity [MHz]^{C}	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.90	1.23	6.15 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.93	1.16	5.04 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.73	1.35	4.84 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.70	1.39	4.53 ± 11.8% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.95	1.14	5.81 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.90	1.17	4.92 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.84	1.23	4.60 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.84	1.17	4.13 ± 11.8% (k=2)

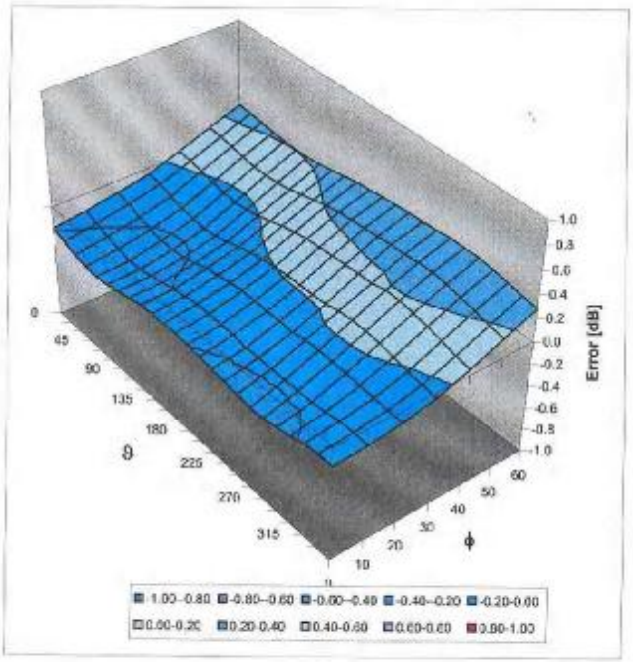
[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

Certificate No: ES3-3088_Jan08 Page 8 of 9

ES3DV3 SN:3088 January 18, 2008

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



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

Certificate No: ES3-3088_Jan08 Page 9 of 9

4. DAE Calibration certification

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

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

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

Accreditation No.: SCS 108

Client SGS – CSTC (MTT)

Certificate No: DAE3-569_Nov07

CALIBRATION CERTIFICATE

Object	DAE3 - SD 000 D03 AA - SN: 569
Calibration procedure(s)	QA CAL-06.v12 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	November 19, 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
Fluke Process Calibrator Type 702	SN: 6295803	04-Oct-07 (Elcal AG, No: 6467)	Oct-08
Keithley Multimeter Type 2001	SN: 0810278	03-Oct-07 (Elcal AG, No: 6465)	Oct-08
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	25-Jun-07 (SPEAG, in house check)	In house check Jun-08

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: November 19, 2007

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

Certificate No. DAE3-569_Nov07 Page 1 of 5

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.776 ± 0.1% (k=2)	404.362 ± 0.1% (k=2)	404.137 ± 0.1% (k=2)
Low Range	3.94862 ± 0.7% (k=2)	3.94274 ± 0.7% (k=2)	3.94290 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	265 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Input (μV)	Reading (μV)	Error (%)
Channel X	+ Input	200000	199999.4	0.00
Channel X	+ Input	20000	20003.10	0.02
Channel X	- Input	20000	-19998.40	-0.01
Channel Y	+ Input	200000	199999.8	0.00
Channel Y	+ Input	20000	20000.56	0.00
Channel Y	- Input	20000	-20003.76	0.02
Channel Z	+ Input	200000	199999.7	0.00
Channel Z	+ Input	20000	19999.91	0.00
Channel Z	- Input	20000	-20001.93	0.01

Low Range		Input (μV)	Reading (μV)	Error (%)
Channel X	+ Input	2000	2000	0.00
Channel X	+ Input	200	199.91	-0.05
Channel X	- Input	200	-200.13	0.06
Channel Y	+ Input	2000	2000	0.00
Channel Y	+ Input	200	198.90	-0.55
Channel Y	- Input	200	-200.33	0.17
Channel Z	+ Input	2000	2000	0.00
Channel Z	+ Input	200	198.87	-0.56
Channel Z	- Input	200	-200.97	0.48

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	-5.51	-5.11
	- 200	9.14	5.16
Channel Y	200	7.38	7.24
	- 200	-8.13	-8.74
Channel Z	200	-5.41	-5.65
	- 200	4.80	4.15

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	1.82	0.97
Channel Y	200	0.44	-	3.38
Channel Z	200	-0.57	-0.43	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	16395	15475
Channel Y	15747	15647
Channel Z	16314	16212

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	-0.02	-0.85	1.22	0.32
Channel Y	-0.62	-1.53	0.45	0.30
Channel Z	-0.95	-2.89	-0.14	0.35

6. Input Offset Current

Nominal input circuitry offset current on all channels: <25fA

7. Input Resistance

	Zeroing (MOhm)	Measuring (MOhm)
Channel X	0.2000	199.3
Channel Y	0.2000	203.2
Channel Z	0.2001	204.8

8. Low Battery Alarm Voltage (verified during pre test)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (verified during pre test)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.0	+6	+14
Supply (- Vcc)	-0.01	-8	-9

7. Dipole Calibration certification

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

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

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

Accreditation No.: SCS 108

Client: SGS China (Auden)

Certificate No: D900V2-184_Dec07

CALIBRATION CERTIFICATE

Object	D900V2 - SN: 184
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	December 21, 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	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference 10 dB Attenuator	SN: 5047.2 (10r)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference Probe ET3DV6 (HF)	SN 1507	26-Oct-07 (SPEAG, No. ET3-1507_Oct07)	Oct-08
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-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

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

Issued: December 21, 2007

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

Certificate No: D900V2-184_Dec07 Page 1 of 9

Measurement Conditions

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

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.97 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.5 ± 6 %	0.98 mho/m ± 6 %
Head TSL temperature during test	(22.1 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.73 mW / g
SAR normalized	normalized to 1W	10.9 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**11.0 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.75 mW / g
SAR normalized	normalized to 1W	7.00 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**7.05 mW /g ± 16.5 % (k=2)**

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

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.0	1.05 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.2 ± 6 %	1.06 mho/m ± 6 %
Body TSL temperature during test	(22.6 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.90 mW / g
SAR normalized	normalized to 1W	11.6 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**11.4 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.87 mW / g
SAR normalized	normalized to 1W	7.48 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**7.40 mW /g ± 16.5 % (k=2)**

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

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.8 Ω - 7.5 jΩ
Return Loss	- 22.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.3 Ω - 9.4 jΩ
Return Loss	- 19.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.411 ns

After long term usa 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	April 1, 2003

DASY4 Validation Report for Head TSL

Date/Time: 21.12.2007 14:51:24

Test Laboratory: SPEAG, Zurich, Switzerland

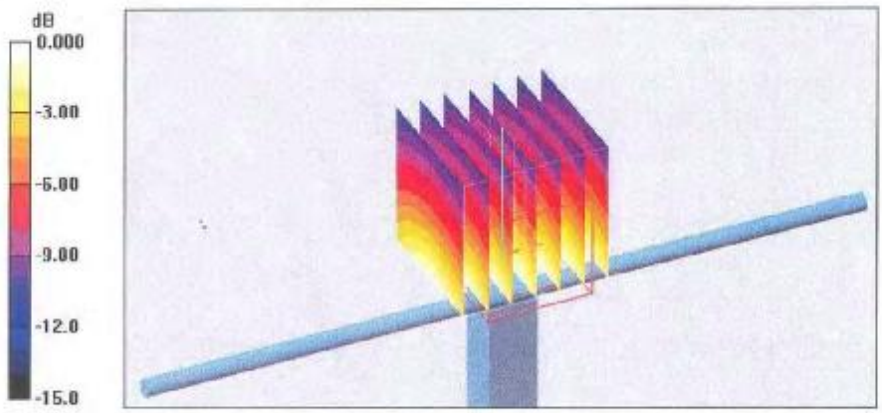
DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:184

Communication System: CW; Frequency: 900 MHz; Duty Cycle: 1:1
Medium: HSL 900 MHz;
Medium parameters used: f = 900 MHz; σ = 0.98 mho/m; ε_r = 42.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(5.93, 5.93, 5.93); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.0..2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

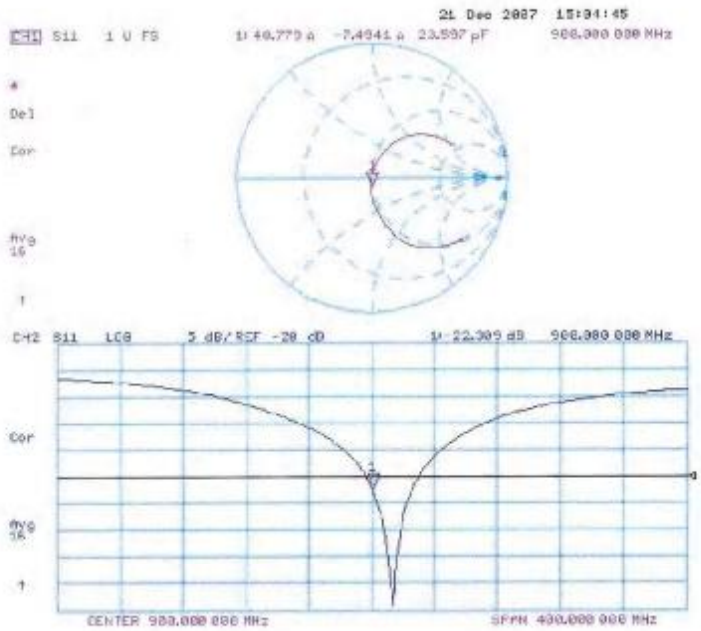
Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.9 V/m; Power Drift = -0.012 dB
Peak SAR (extrapolated) = 4.06 W/kg
SAR(1 g) = 2.73 mW/g; SAR(10 g) = 1.75 mW/g
Maximum value of SAR (measured) = 2.95 mW/g



0 dB = 2.95mW/g

Certificate No: D900V2-184_Dec07 Page 6 of 9

Impedance Measurement Plot for Head TSL



DASY4 Validation Report for Body TSL

Date/Time: 21.12.2007 15:46:31

Test Laboratory: SPEAG, Zurich, Switzerland

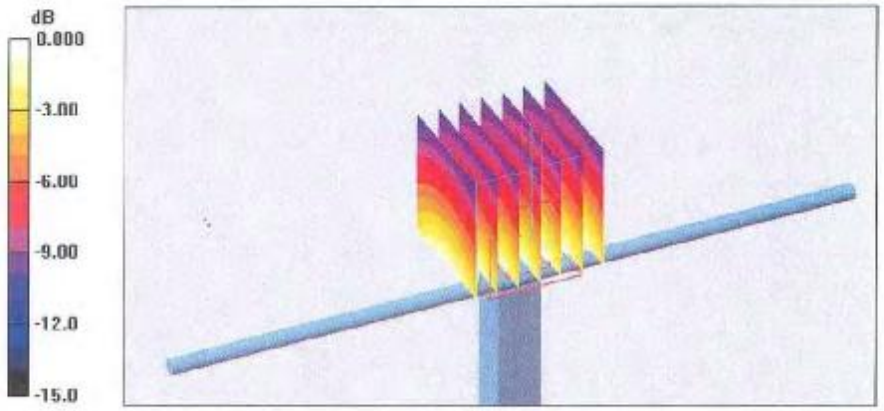
DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:184

Communication System: CW; Frequency: 900 MHz; Duty Cycle: 1:1
Medium: MSL900;
Medium parameters used: f = 900 MHz; σ = 1.06 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

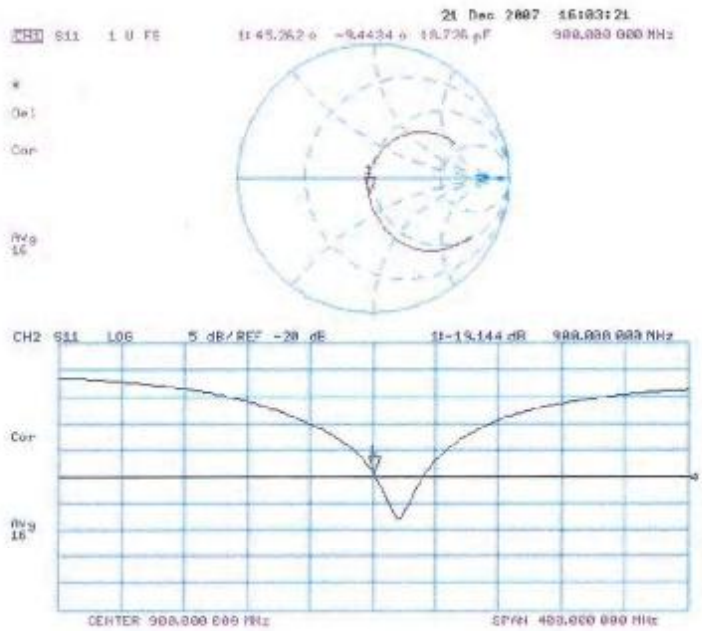
- Probe: ET3DV6 - SN1507 (HF); ConvF(5.57, 5.57, 5.57); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin=250mW/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.9 V/m; Power Drift = 0.008 dB
Peak SAR (extrapolated) = 4.23 W/kg
SAR(1 g) = 2.9 mW/g; SAR(10 g) = 1.87 mW/g
Maximum value of SAR (measured) = 3.16 mW/g



0 dB = 3.16mW/g

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client: SGS China (Auden)

Certificate No: D1900V2-5d028_Dec07

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d028
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date	December 21, 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	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference 10 dB Attenuator	SN: 5047.2 (10r)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference Probe ET3DV6 (HF)	SN: 1507	26-Oct-07 (SPEAG, No. ET3-1507_Oct07)	Oct-08
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-07)	In house check: Oct-08
RF generator R&S SMT-06	100005	4-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

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

Issued: December 31, 2007

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Certificate No: D1900V2-5d028_Dec07 Page 1 of 9

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Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4 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	39.0 ± 6 %	1.46 mho/m ± 6 %
Head TSL temperature during test	(21.5 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	9.82 mW / g
SAR normalized	normalized to 1W	39.3 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**37.9 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.14 mW / g
SAR normalized	normalized to 1W	20.6 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**20.2 mW / g ± 16.5 % (k=2)**

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

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.5 ± 6 %	1.54 mho/m ± 6 %
Body TSL temperature during test	(21.5 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.34 mW / g
SAR normalized	normalized to 1W	37.4 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**37.2 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.97 mW / g
SAR normalized	normalized to 1W	19.9 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**19.8 mW / g ± 16.5 % (k=2)**

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

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.7 Ω + 5.2 jΩ
Return Loss	- 24.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.5 Ω + 3.4 jΩ
Return Loss	- 29.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.198 ns

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 17, 2002

DASY4 Validation Report for Head TSL

Date/Time: 21.12.2007 09:54:50

Test Laboratory: SPEAG, Zurich, Switzerland

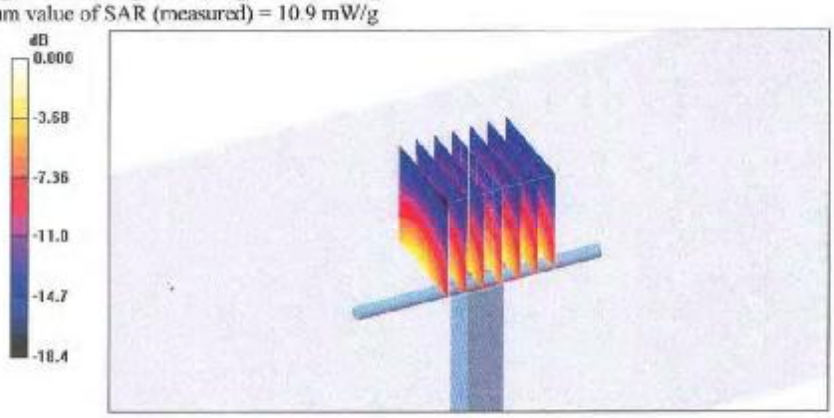
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d028

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL U10 BB;
Medium parameters used: f = 1900 MHz; σ = 1.46 mho/m; ε_r = 39; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.86, 4.86, 4.86); Calibrated: 26.10.2007
- 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 55; Postprocessing SW: SEMCAD, V1.8 Build 172

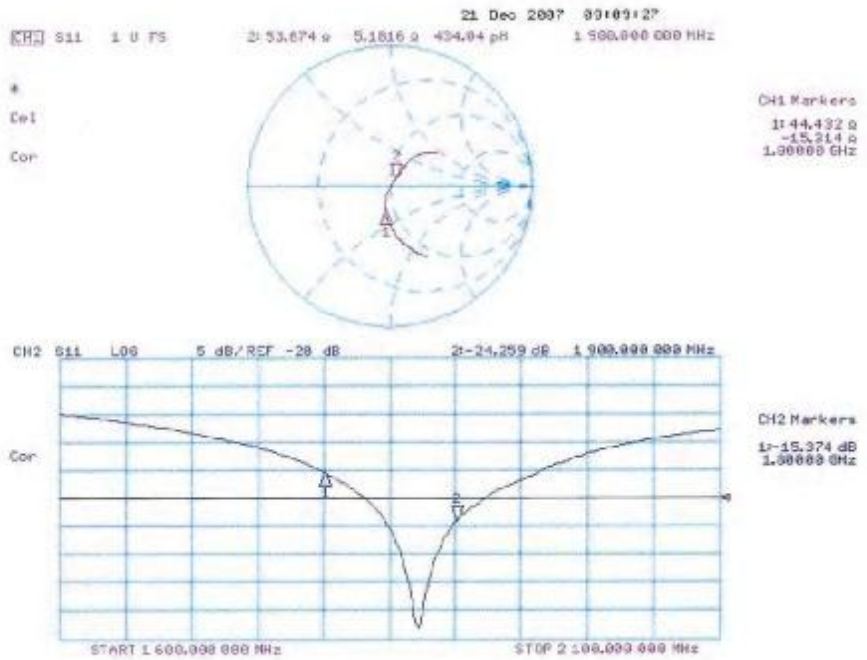
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.9 V/m; Power Drift = 0.010 dB
Peak SAR (extrapolated) = 17.2 W/kg
SAR(1 g) = 9.82 mW/g; SAR(10 g) = 5.14 mW/g
Maximum value of SAR (measured) = 10.9 mW/g



0 dB = 10.9mW/g

Certificate No: D1900V2-5d028_Dec07 Page 6 of 9

Impedance Measurement Plot for Head TSL



DASY4 Validation Report for Body TSL

Date/Time: 21.12.2007 11:05:06

Test Laboratory: SPEAG, Zurich, Switzerland

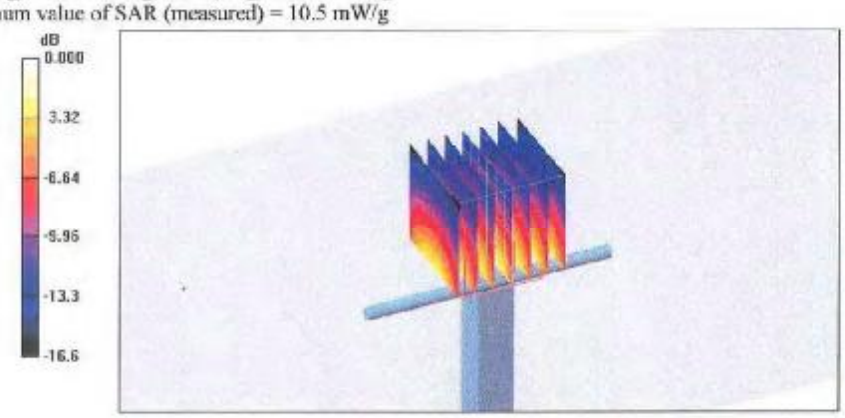
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d028

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: MSL U10 BB;
Medium parameters used: f = 1900 MHz; σ = 1.54 mho/m; ε_r = 53.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.48, 4.48, 4.48); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

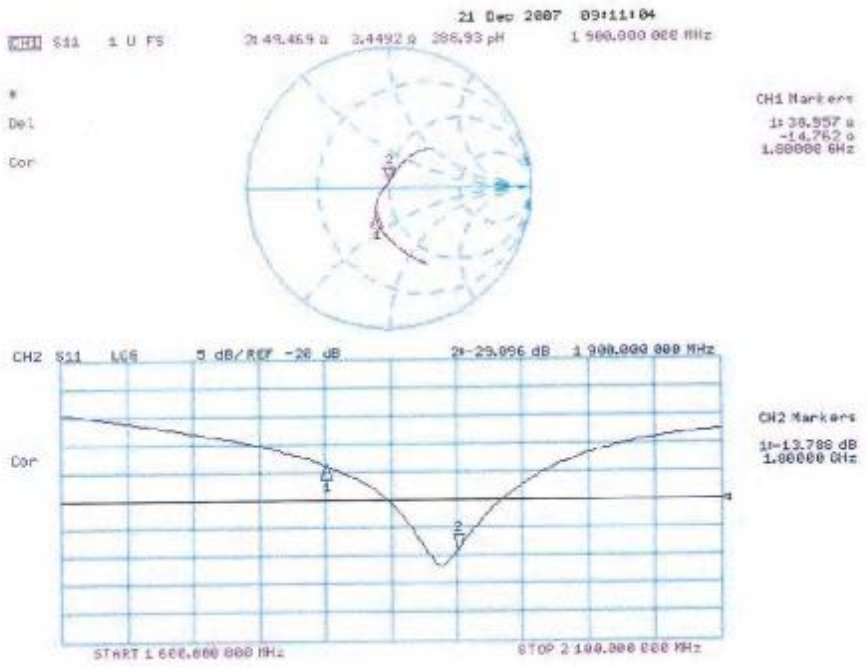
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.3 V/m; Power Drift = -0.044 dB
Peak SAR (extrapolated) = 16.0 W/kg
SAR(1 g) = 9.34 mW/g; SAR(10 g) = 4.97 mW/g
Maximum value of SAR (measured) = 10.5 mW/g



0 dB = 10.5mW/g

Certificate No: D1900V2-5d028_Dec07 Page 8 of 9

Impedance Measurement Plot for Body TSL



Certificate No: D1900V2-5d028_Dec07 Page 9 of 9

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8. Uncertainty analysis

Error Description	Tol. (± %)	Prob. dist.	Div.	(c_i) (1g)	(c_i) (10g)	Std. unc. (± %) (1g)	Std. unc. (± %) (10g)	(v_i)
Measurement System								
Probe Calibration	4.8	N	1	1	1	4.8	4.8	∞
Axial Isotropy	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
Hemispherical Isotropy	0	R	$\sqrt{3}$	1	1	0	0	∞
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 Limit	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Readout Electronics	1.0	N	1	1	1	1.0	1.0	∞
Response Time	0	R	$\sqrt{3}$	1	1	0	0	∞
Integration Time	0	R	$\sqrt{3}$	1	1	0	0	∞
RF Ambient Conditions	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	∞
Algorithms for Max. SAR Eval.	1.0	R	$\sqrt{3}$	1	1	0.6	0.6	∞
Dipole								
Dipole Axis to Liquid Distance	2.0	R	$\sqrt{3}$	1	1	1.2	1.2	∞
Input power and SAR drift meas.	4.7	R	$\sqrt{3}$	1	1	2.7	2.7	∞
Phantom and Tissue Param.								
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 Stdandard Uncertainty						8.4	8.1	∞
Coverage Factor for 95%		kp=2						
Expanded Uncertainty						16.8	16.2	

Dasy4 Uncertainty Budget

9. Phantom description

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Certificate of conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 CA
Series No	TP-1150 and higher
Manufacturer / Origin	Untersee Composites Hauptstr. 69 CH-8559 Fruthwilen Switzerland

Tests

The series production process used allows the limitation to test of first articles. Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series units (called samples).

Test	Requirement	Details	Units tested
Shape	Compliance with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness	Compliant with the requirements according to the standards	2mm +/- 0.2mm in specific areas	First article, Samples
Material parameters	Dielectric parameters for required frequencies	200 MHz – 3 GHz Relative permittivity < 5 Loss tangent < 0.05.	Material sample TP 104-5
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards	Liquid type HSL 1800 and others according to the standard.	Pre-series, First article

Standards

[1] CENELEC EN 50361
[2] IEEE P1528-200x draft 6.5
[3] IEC PT 62209 draft 0.9
(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standard [1] and draft standards [2] and [3].

Date 28.02.2002

Signature / Stamp

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Doc No 841 – QD 000 P40 CA – B Page 1 (1)

10. CNAS Certificate

China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(No. CNAS L1486)

China National Accreditation Service for Conformity Assessment has accredited

SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch GSM Laboratory

7/9/10F, 3rd Building, No.889, Yishan Road, Shanghai, China

to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories(CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

The scope of accreditation is detailed in the attached schedule bearing the same accreditation number as above. The schedule forms an integral part of this certificate.

Date of Issue: 2007-06-28

Date of Expiry: 2009-06-14

Date of Initial Accreditation: 2004-06-15

Signed on behalf of China National Accreditation Service for Conformity Assessment

China National Accreditation Service for Conformity Assessment(CNAS) is authorized by Certification and Accreditation Administration of the People's Republic of China (CNCA) to operate the national accreditation systems for conformity assessment. CNAS is the signatory to International Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (ILAC-MRA), and the signatory to Asia Pacific Laboratory Accreditation Cooperation Multilateral Recognition Arrangement (APLAC-MRA).

End of Report