TEST REPORT

Equipment Under Test:	GSM Mobile Phone
Market name:	COSUN2100
FCC ID	WMCCOSUN2100QX
Hardware Version:	V2.0
Software Version:	X700_011_CE
Applicant:	HUIZHOU QIAOXING TELECOMMUNICATION INDUSTRY CO.,LTD
Address of Applicant:	QIAOXING SCIENCE AND TECHNOLOGY INDUSTRIAL PARK,TANGQUAN HUIZHOU CITY GUANGDONG PROVINCE,CHINA
Date of Receipt:	2008.08.15
Date of Test:	2008.08.20~2008.08.22
Date of Issue:	2008.09.11

CNAS 检 测 CNAS L1486

CTIA Authorized Test Lab
LAB CODE 20050309-01

GCF Global Certification Forum

Tested by : Will Ni **Date :** **2008.09.11**

Approved by : Zhiang Yuan **Date :** **2008.09.11**

Contents

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

Change History

Version	Change contents	Author	Date
V1.0	The first edition.	Will Ni	Aug 26 2008

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

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
SGS-CSTC Standards Technical Services Co., Ltd Shanghai Branch
9F,the 3rd Building, No.889, Yishan Rd, Xuhui District, Shanghai, China
Zip code: 200233
Telephone: +86 (0) 21 6495 1616
Fax: +86 (0) 21 5450 0149
Internet: http://www.cn.sgs.com

1.2 Details of Applicant

Name: HUIZHOU QIAOXING TELECOMMUNICATION INDUSTRY CO.,LTD
Address: QIAOXING SCIENCE AND TECHNOLOGY INDUSTRIAL PARK,TANGQUAN HUIZHOU CITY,GUANGDONG PROVINCE,CHINA
Contact Person: Camellia

1.3 Description of EUT(s)

Brand name	COSUN	
Market Name	COSUN2100	
Status of Product	Production	
Hardware Version	V2.0	
Software Version	X700_011_CE	
Serial No.	IMEI: 358157020000005	
Battery Type	Li-on	
Antenna Type	Inner Antenna	
Operation Mode	GSM	
Modulation Mode	GMSK	
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	GSM850:33.0dBm PCS1900:30.0dBm,	

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, LeftHandSide Cheek & 15° Tilt Position

Configuration 2: GSM 850, RightHandSide Cheek & 15° Tilt Position

Configuration 3: GSM 850, BodyWorn (1.5cm between EUT and phantom)

Configuration 4: PCS 1900, LeftHandSide Cheek & 15° Tilt Position

Configuration 5: PCS 1900, RightHandSide Cheek & 15° Tilt Position

Configuration 6: PCS 1900, BodyWorn (1.5cm between EUT and phantom)

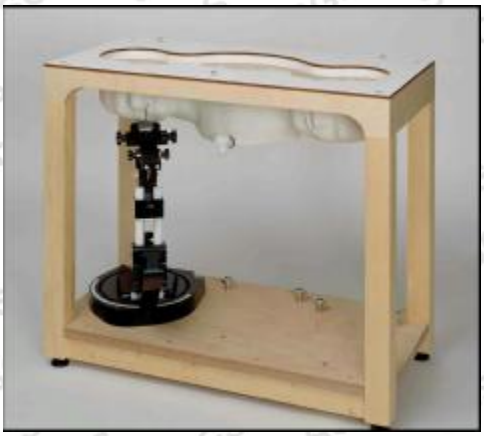
For SS

The device was put into operation by using CMU200 radio tester through air link.

The device output power was set to maximum power level for each test.

The measurements were performed on lowest, middle and highest channels.

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.

1.8 Description of Test Position

1.8.1SAM Phantom Shape

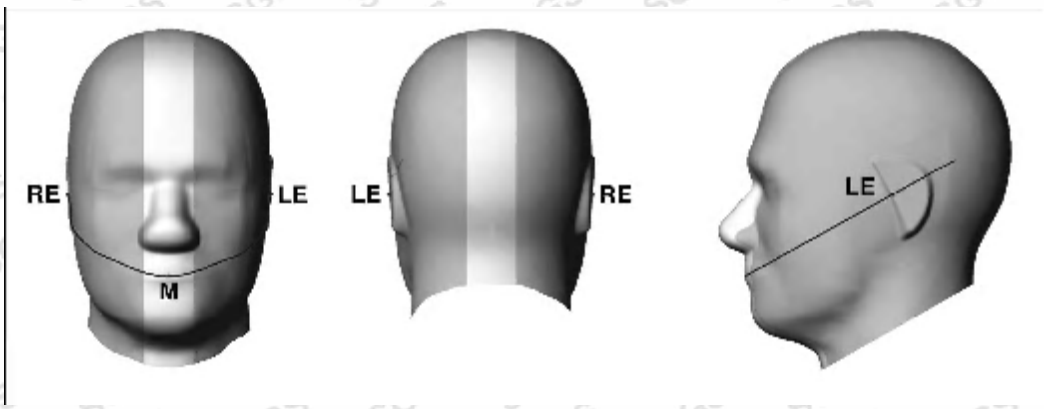


Figure1—front, back, and side views of SAM (model for the phantom shell). Full-head model is for illustration purposes only—procedures in this recommended practice are intended primarily for the phantom setup of Figure 2. Note: The center strip including the nose region has a different thickness tolerance.

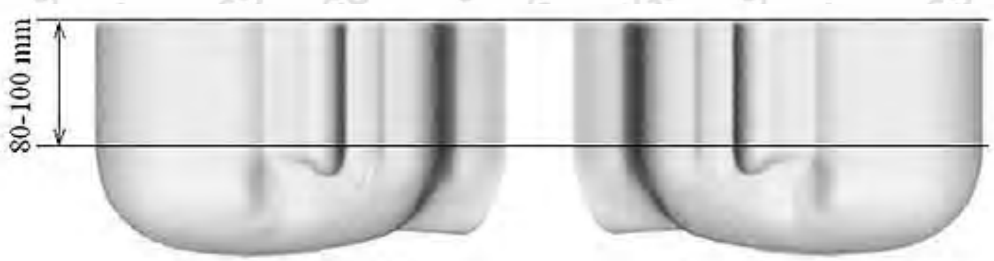


Figure 2—Sagittally bisected phantom with extended perimeter (shown placed on its side as used for SAR measurements)

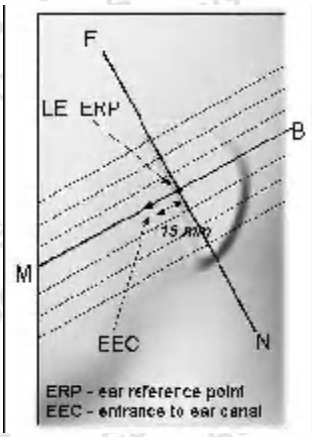


Figure 3—Close-up side view of phantom N-F and B-M lines, and seven cross-sectional plane locations

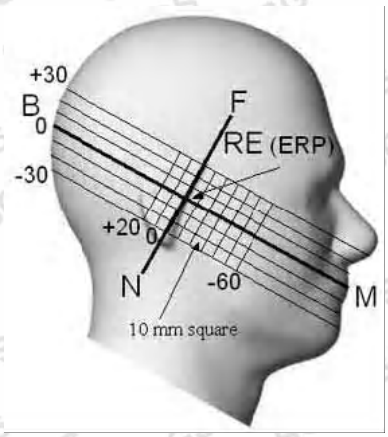


Figure 4—Side view of the phantom showing showing the ear region, relevant markings and seven cross-sectional plane locations

1.8.2 The following pictures present the different DUT constructions.

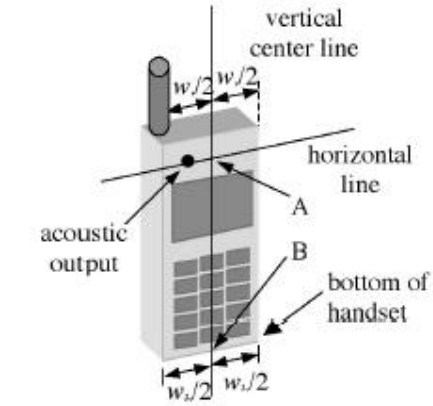


Figure 5a—Handset vertical and horizontal reference lines—"fixed case"

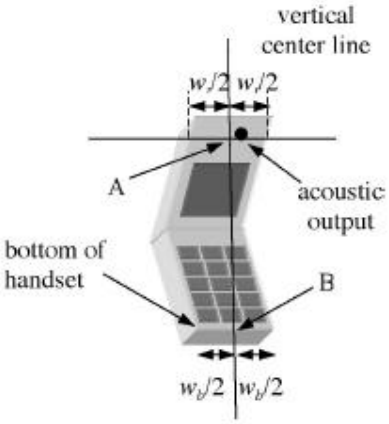


Figure 5b—Handset vertical and horizontal reference lines—"clam-shell case"

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.

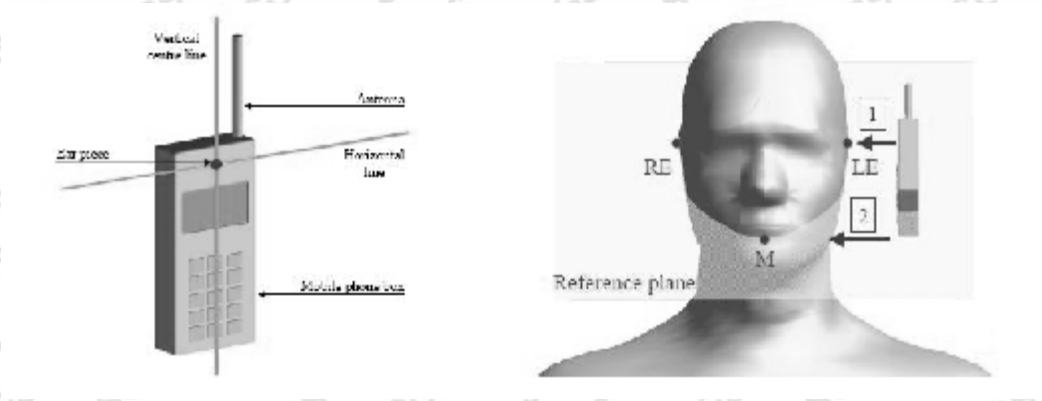


Figure 6 - Definition of the reference lines and points, on the phone and on the phantom and initial position

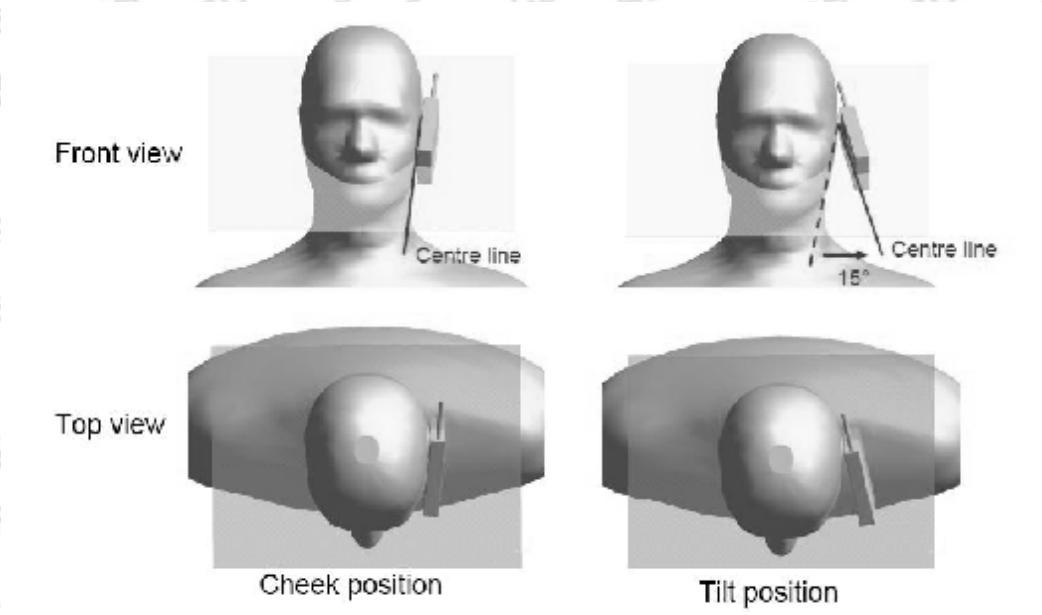


Figure 7 -"Cheek" and "tilt" positions of the mobile phone on the left side

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.

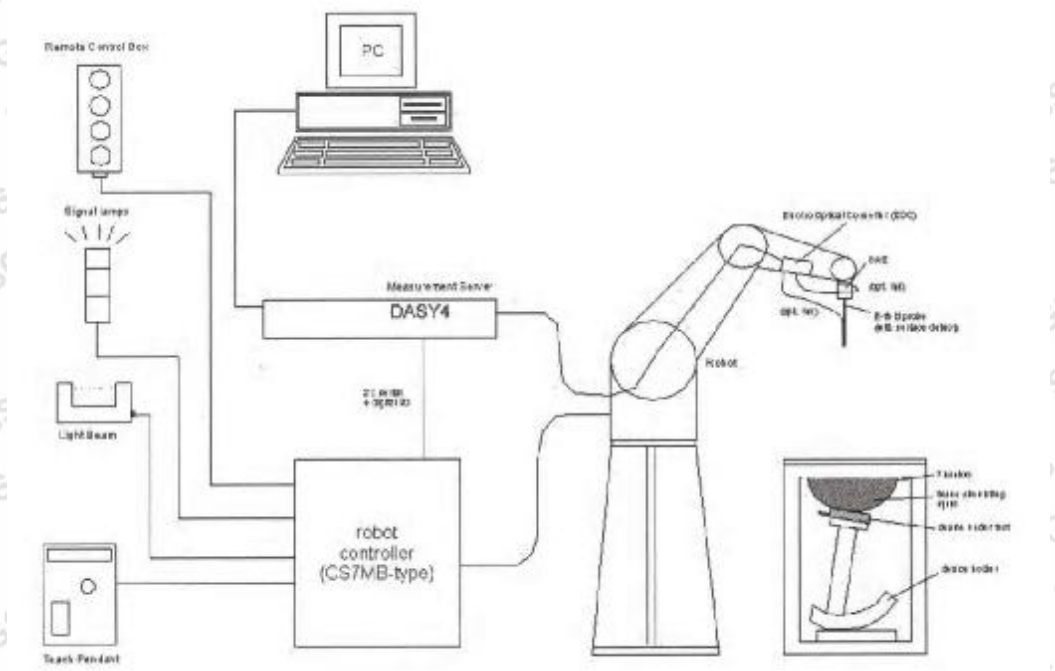


Fig. a SAR System Configuration

- 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.

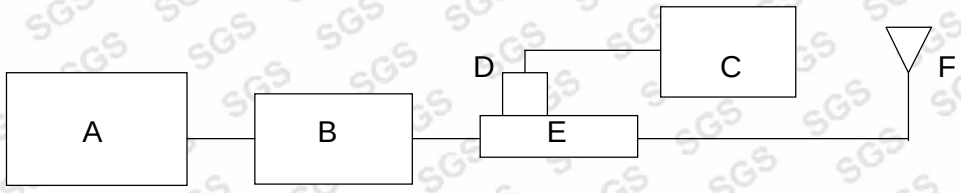


Fig. b the microwave circuit arrangement used for SAR system verification

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)	Limit +/-10%	Measured SAR 1g	Measured Date
D900V2 184	900 Body	**2.9**	**2.61~3.19**	2.81	2008-08-22
	900 Head	**2.73**	**2.46~3.00**	2.74	2008-08-20
				2.72	2008-08-21
D1900V2 5d028	1900 Body	**9.34**	**8.41~10.27**	9.36	2008-08-22
	1900 Head	**9.57**	**8.61~10.53**	9.59	2008-08-20

Table 1. Result System Validation

1.13 Tissue Simulant Fluid for the Frequency Band 850MHZ 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)
900	Body	**Recommended Limit**	**55.0±5%**	**1.05±5%**	**20-24**
		Measured, 2008-08-22	54.01	1.040	21.2
	Head	**Recommended Limit**	**42.0±5%**	**0.99±5%**	**20-24**
		Measured, 2008-08-20	42.1	0.942	22.5
		Measured, 2008-08-21	42.3	0.952	22.0
1900	Body	**Recommended Limit**	**53.3±5%**	**1.52±5%**	**20-24**
		Measured, 2008-08-22	51.60	1.56	22.1
	Head	**Recommended Limit**	**40.0±5%**	**1.38±5%**	**20-24**
		Measured, 2008-08-20	38.60	1.44	22.6

Table 2. Dielectric parameters for the Frequency Band 850&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

Conducted Power

Band/Power (dBm)	Low	Middle	High
850	32.1	31.9	31.8
1900	29.2	29.3	29.3

GSM850

Mode	Test Configuration		SAR, Averaged over 1g (W/kg)			Temperature	Verdict
	Channel		Low	Middle	High	(℃)	
GSM850	Left	Cheek	0.204	0.312	0.454	22	Pass
		Tilt	--	0.150	--	22	Pass
	Right	Cheek	0.192	0.299	0.452	22	Pass
		Tilt	--	0.141	--	22	Pass
	Body	1.5cm	0.406	0.562	0.765	22	Pass

PCS1900

Mode	Test Configuration		SAR, Averaged over 1g (W/kg)			Temperature	Verdict
	Channel		Low	Middle	High	(℃)	
GSM1900	Left	Cheek	0.075	0.065	0.070	22	Pass
		Tilt	--	0.056	--	22	Pass
	Right	Cheek	0.113	0.100	0.112	22	Pass
		Tilt	--	0.082	--	22	Pass
	Body	1.5cm	0.077	0.071	0.079	22	Pass

Maximum Values

Frequency Band (MHz)	EUT position	Conducted Output Power (dBm)	1g Average (W/kg)	Power Drift(dB)	Amb. Temp (℃)	Verdict
850	GSM850/Body High Channel/1.5cm	31.8	0.765	0.099	22	PASS
1900	GSM1900/Righthandside/Cheek Low Channel	29.2	0.113	0.008	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. For all the tests, the maximum absolute value of the power drift which is under the GSM1900-Lefthandside-Cheek-Low configuration is 0.316dB.

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-Lefthandside-Cheek-Mid

Date/Time: 2008-8-21 9:26:05

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-Cheek-Mid

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: GSM850-GSM Mode; Frequency: 836.4 MHz;Duty Cycle: 1:8.3

Medium: HSL850-Head Medium parameters used: f = 836.4 MHz; σ = 0.885 mho/m; ε_r = 42.8; ρ = 1000 kg/m^3

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); 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

Cheek position - Mid/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.346 mW/g

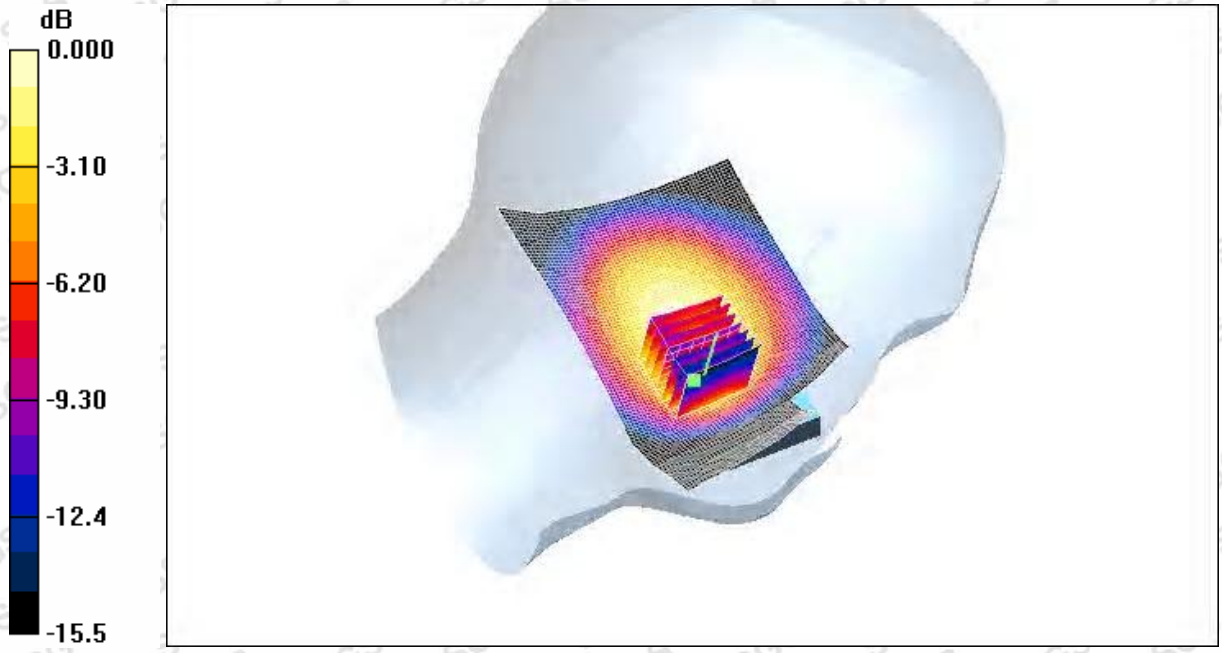
Cheek position - Mid/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.2 V/m; Power Drift = -0.005 dB

Peak SAR (extrapolated) = 0.514 W/kg

SAR(1 g) = 0.312 mW/g; SAR(10 g) = 0.204 mW/g.

Maximum value of SAR (measured) = 0.356 mW/g



0 dB = 0.356mW/g

4.2 GSM850-Lefthandside-Tilt-Mid

Date/Time: 2008-8-21 9:02:44

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-Tilt-Mid

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: GSM850-GSM Mode; Frequency: 836.4 MHz;Duty Cycle: 1:8.3

Medium: HSL850-Head Medium parameters used: f = 836.4 MHz; σ = 0.885 mho/m; ε_r = 42.8; ρ = 1000 kg/m^3

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); 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

Tilt position - Mid/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.161 mW/g

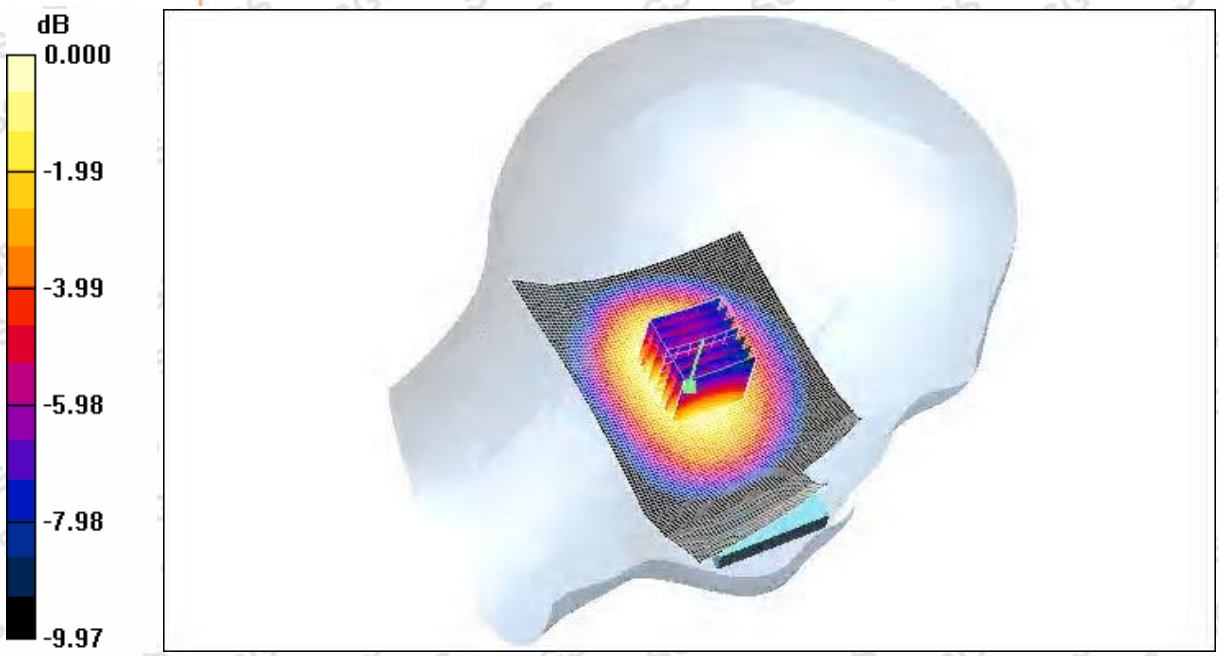
Tilt position - Mid/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.3 V/m; Power Drift = -0.114 dB

Peak SAR (extrapolated) = 0.196 W/kg

SAR(1 g) = 0.150 mW/g; SAR(10 g) = 0.107 mW/g

Maximum value of SAR (measured) = 0.159 mW/g



0 dB = 0.159mW/g

4.3 GSM850-Lefthandside-Worstcase-Low

Date/Time: 2008-8-21 10:14:53

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-Cheek-Low

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: GSM850-GSM Mode; Frequency: 824.2 MHz;Duty Cycle: 1:8.3

Medium: HSL850-Head Medium parameters used: f = 824.2 MHz; σ = 0.873 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); 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

Cheek position - Low/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.218 mW/g

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

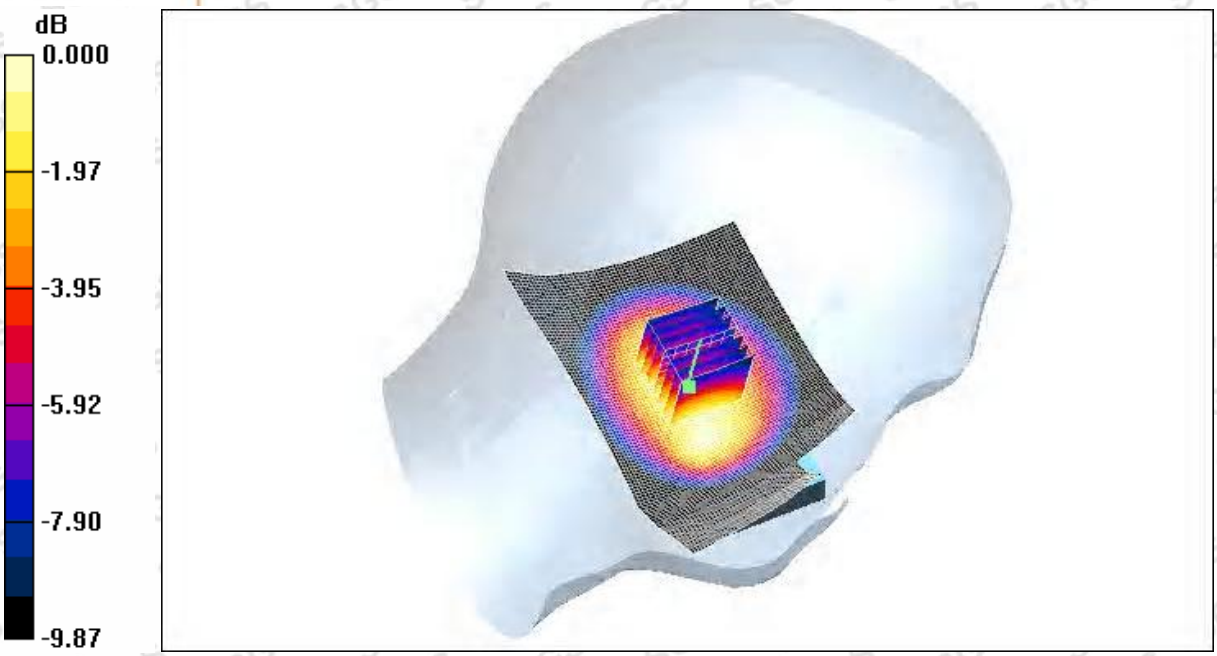
Reference Value = 12.8 V/m; Power Drift = 0.140 dB

Peak SAR (extrapolated) = 0.268 W/kg

SAR(1 g) = 0.204 mW/g; SAR(10 g) = 0.145 mW/g

Maximum value of SAR (measured) = 0.216 mW/g

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



0 dB = 0.216mW/g

4.4 GSM850-Lefthandside-Worstcase-High

Date/Time: 2008-8-21 10:37:48

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-Cheek-High

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: GSM850-GSM Mode; Frequency: 848.8 MHz;Duty Cycle: 1:8.3

Medium: HSL850-Head Medium parameters used: f = 848.8 MHz; σ = 0.896 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); 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

Cheek position - High /Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

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

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

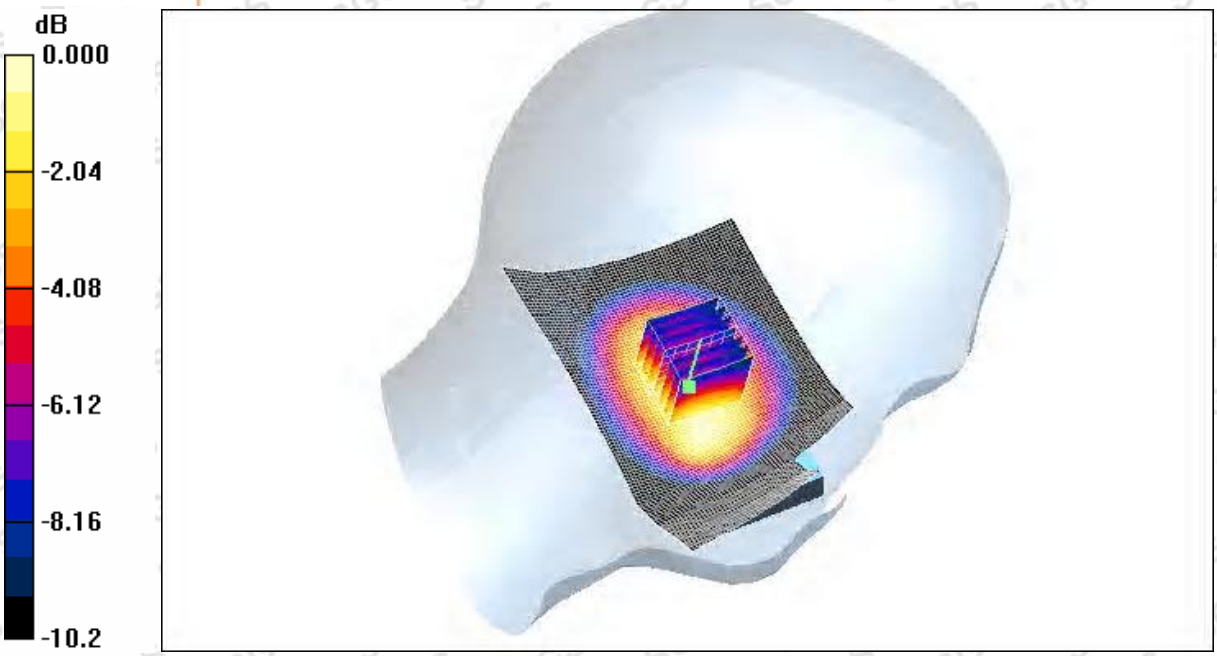
Reference Value = 18.9 V/m; Power Drift = -0.049 dB

Peak SAR (extrapolated) = 0.601 W/kg

SAR(1 g) = 0.454 mW/g; SAR(10 g) = 0.319 mW/g

Maximum value of SAR (measured) = 0.487 mW/g

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



0 dB = 0.487mW/g

4.5 GSM850-Righthandside-Cheek-Mid

Date/Time: 2008-8-20 14:41:38

Test Laboratory: SGS-GSM

GSM850-RightHandSide-Cheek-Mid

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: GSM850-GSM Mode; Frequency: 836.4 MHz;Duty Cycle: 1:8.3

Medium: HSL850-Head Medium parameters used: f = 836.4 MHz; σ = 0.885 mho/m; ε_r = 42.8; ρ = 1000 kg/m^3

Phantom section: Right Section

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

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); 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

Cheek position - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.316 mW/g

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

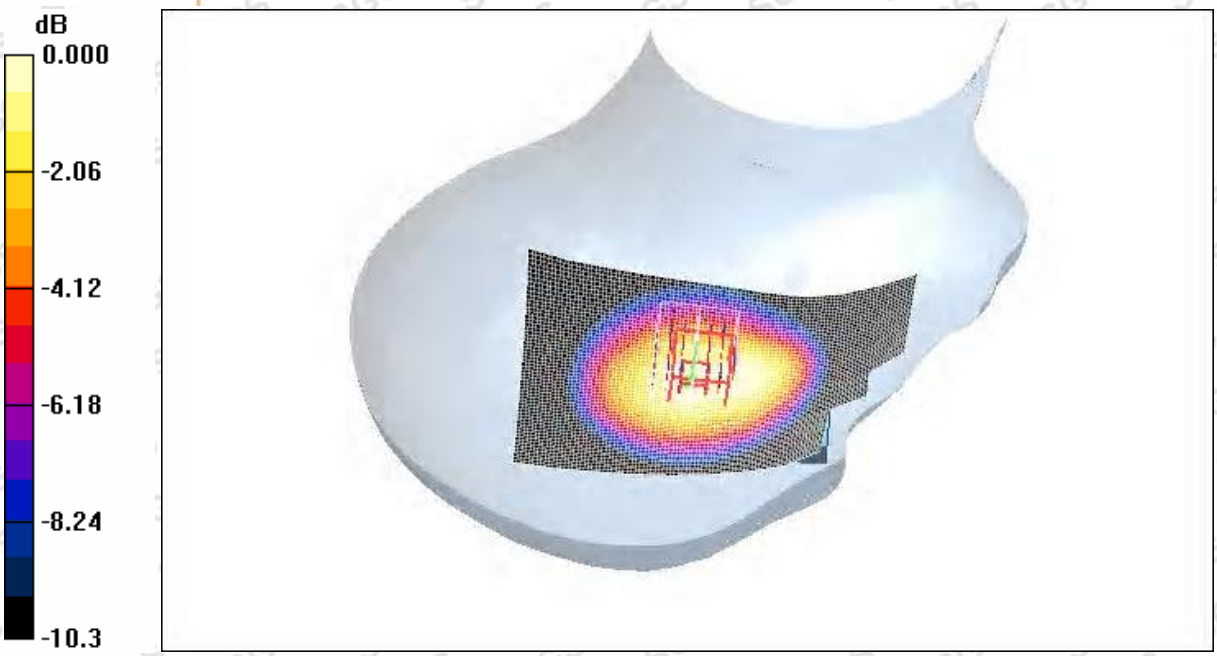
Reference Value = 14.5 V/m; Power Drift = -0.070 dB

Peak SAR (extrapolated) = 0.400 W/kg

SAR(1 g) = 0.299 mW/g; SAR(10 g) = 0.209 mW/g

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

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



0 dB = 0.320mW/g

4.6 GSM850-Righthandside-Tilt-Mid

Date/Time: 2008-8-20 16:31:07

Test Laboratory: SGS-GSM

GSM850-RightHandSide-Tilt-Mid

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: GSM850-GSM Mode; Frequency: 836.4 MHz;Duty Cycle: 1:8.3

Medium: HSL850-Head Medium parameters used: f = 836.4 MHz; σ = 0.885 mho/m; ε_r = 42.8; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); 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

Tilt position - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.152 mW/g

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

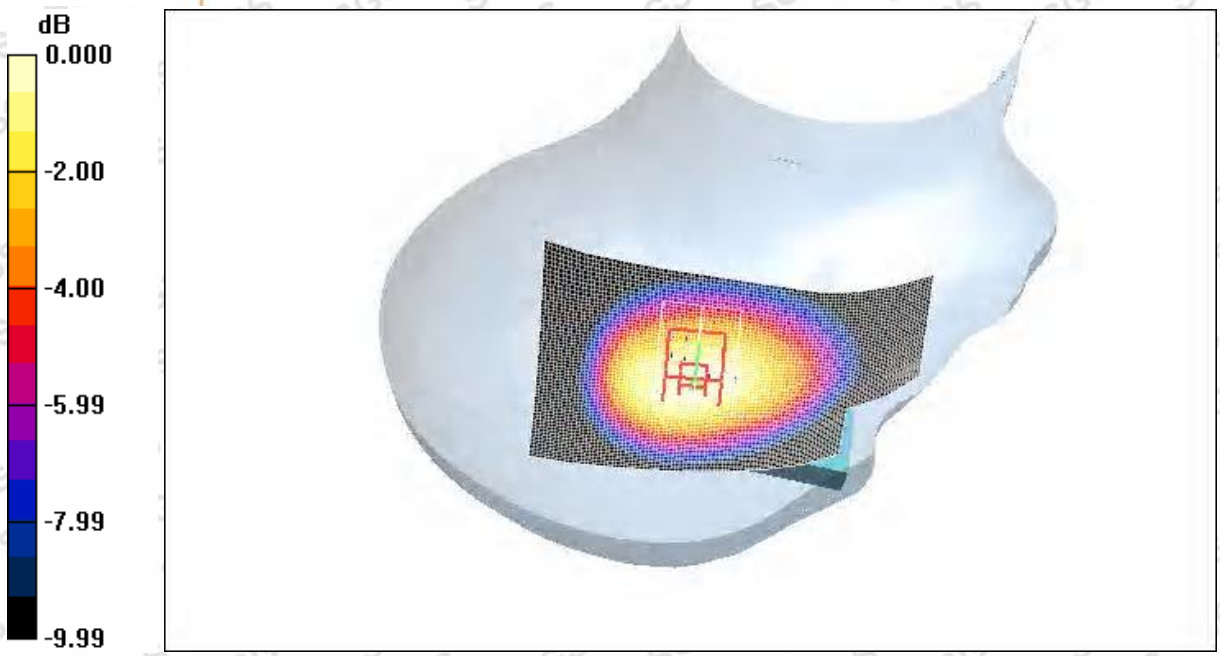
Reference Value = 12.1 V/m; Power Drift = -0.062 dB

Peak SAR (extrapolated) = 0.187 W/kg

SAR(1 g) = 0.141 mW/g; SAR(10 g) = 0.100 mW/g

Maximum value of SAR (measured) = 0.150 mW/g

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



0 dB = 0.150mW/g

4.7 GSM850-Righthandside-Worstcase-Low

Date/Time: 2008-8-20 16:08:36

Test Laboratory: SGS-GSM

GSM850-RightHandSide-Cheek-Low

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: GSM850-GSM Mode; Frequency: 824.2 MHz;Duty Cycle: 1:8.3

Medium: HSL850-Head Medium parameters used: f = 824.2 MHz; σ = 0.873 mho/m; ε_r = 42.9; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); 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

Cheek position - Low /Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.206 mW/g

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

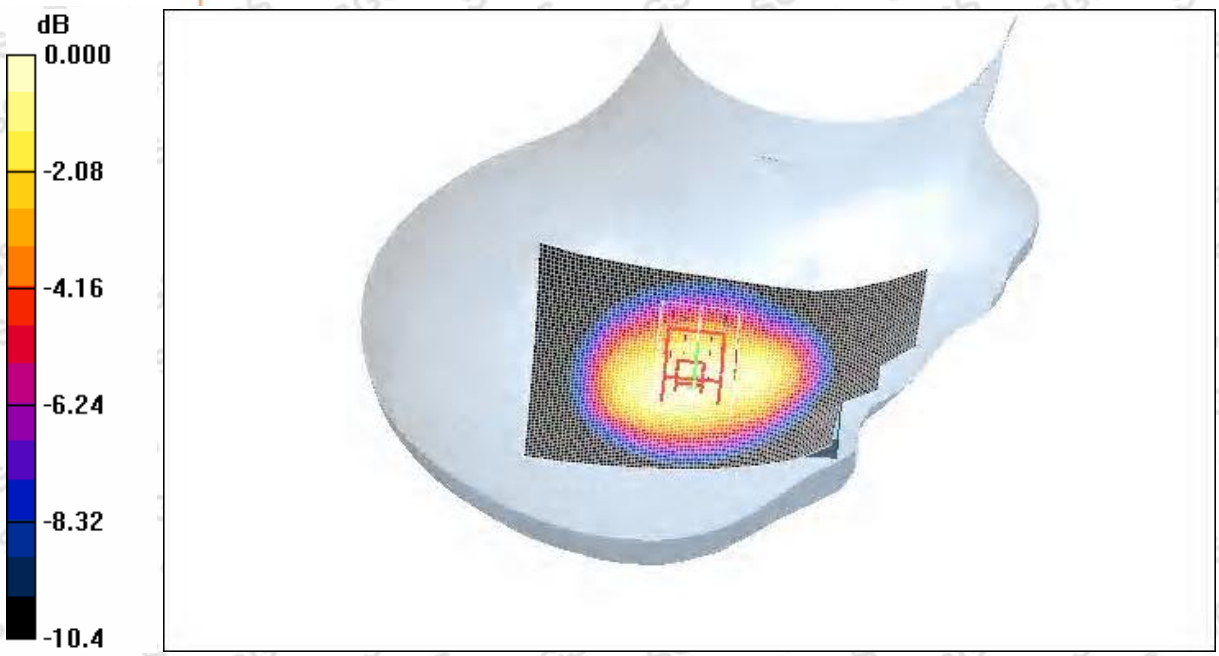
Reference Value = 12.8 V/m; Power Drift = -0.020 dB

Peak SAR (extrapolated) = 0.259 W/kg

SAR(1 g) = 0.192 mW/g; SAR(10 g) = 0.135 mW/g

Maximum value of SAR (measured) = 0.206 mW/g

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



0 dB = 0.206mW/g

4.8 GSM850-Righthandside-Worstcase-High

Date/Time: 2008-8-20 15:29:52

Test Laboratory: SGS-GSM

GSM850-RightHandSide-Cheek-High

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: GSM850-GSM Mode; Frequency: 848.8 MHz;Duty Cycle: 1:8.3

Medium: HSL850-Head Medium parameters used: f = 848.8 MHz; σ = 0.896 mho/m; ε_r = 42.7; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); 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

Cheek position - High/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.472 mW/g

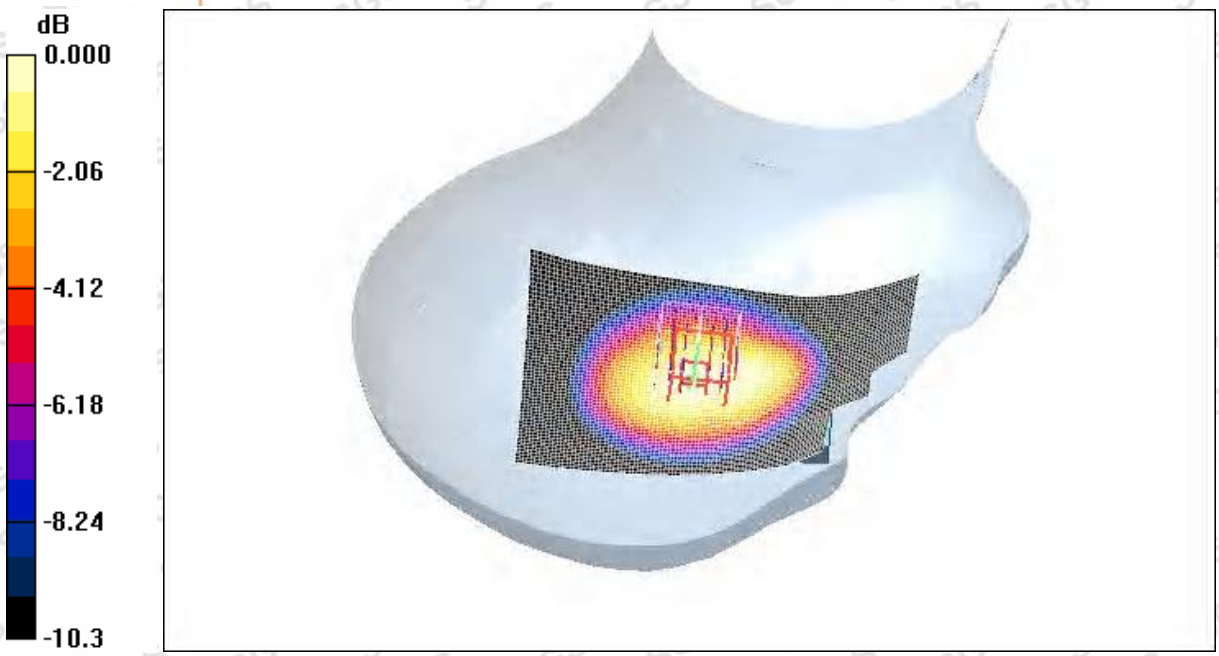
Cheek position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.0 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 0.607 W/kg

SAR(1 g) = 0.452 mW/g; SAR(10 g) = 0.315 mW/g

Maximum value of SAR (measured) = 0.485 mW/g



0 dB = 0.485mW/g

4.9 GSM850-Body worm-GSM-Mid

Date/Time: 2008-8-22 13:12:57

Test Laboratory: SGS-GSM

GSM850-Body-Worn-Mid-1.5cm

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: GSM850-GSM Mode; Frequency: 836.4 MHz;Duty Cycle: 1:8.3

Medium: HSL850-Body Medium parameters used: f = 836.4 MHz; σ = 0.989 mho/m; ε_r = 55.8; 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 /Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.607 mW/g

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

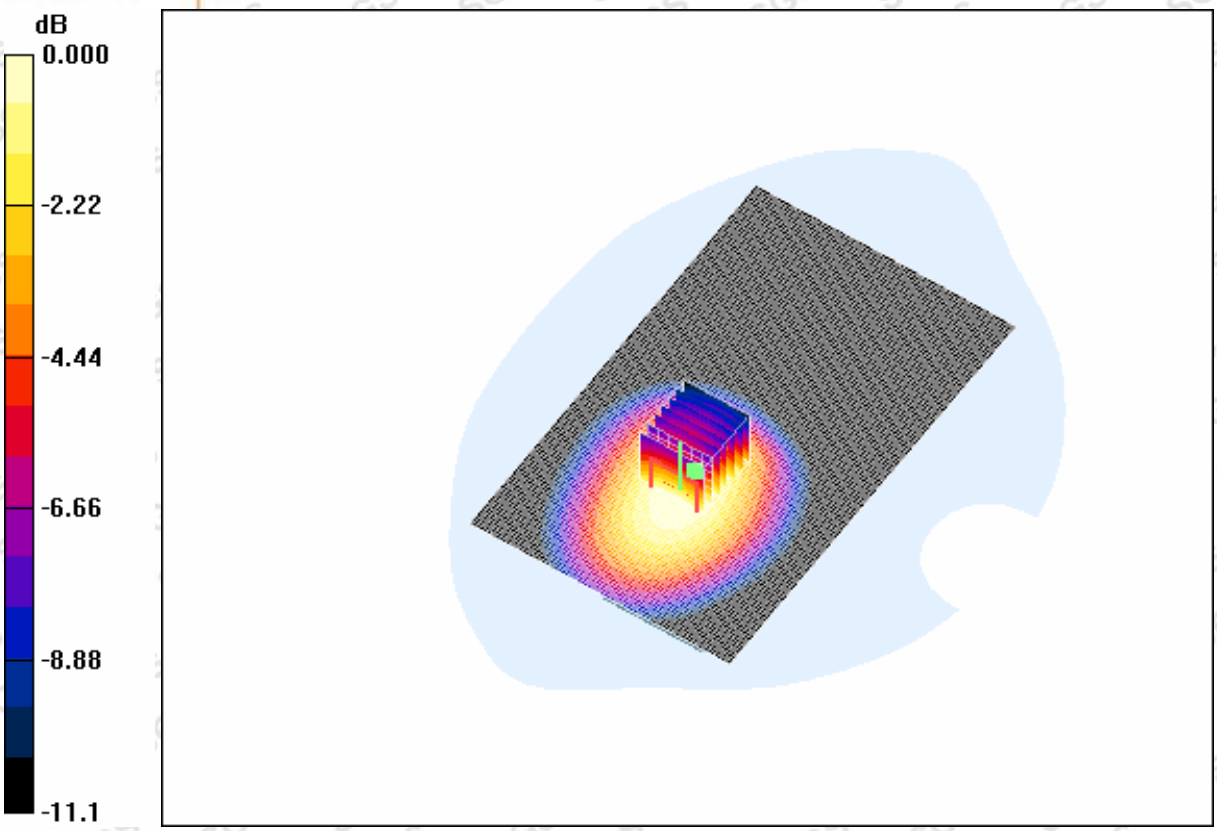
Reference Value = 10.5 V/m; Power Drift = -0.017 dB

Peak SAR (extrapolated) = 0.746 W/kg

SAR(1 g) = 0.562 mW/g; SAR(10 g) = 0.403 mW/g

Maximum value of SAR (measured) = 0.593 mW/g

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



0 dB = 0.593mW/g

4.10 GSM850-Body worm-GSM-Low

Date/Time: 2008-8-22 14:12:49

Test Laboratory: SGS-GSM

GSM850-Body-Worn-Low-1.5cm

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: GSM850-GSM Mode; Frequency: 824.2 MHz;Duty Cycle: 1:8.3

Medium: HSL850-Body Medium parameters used: f = 824.2 MHz; σ = 0.977 mho/m; ε_r = 56; 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 /Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.442 mW/g

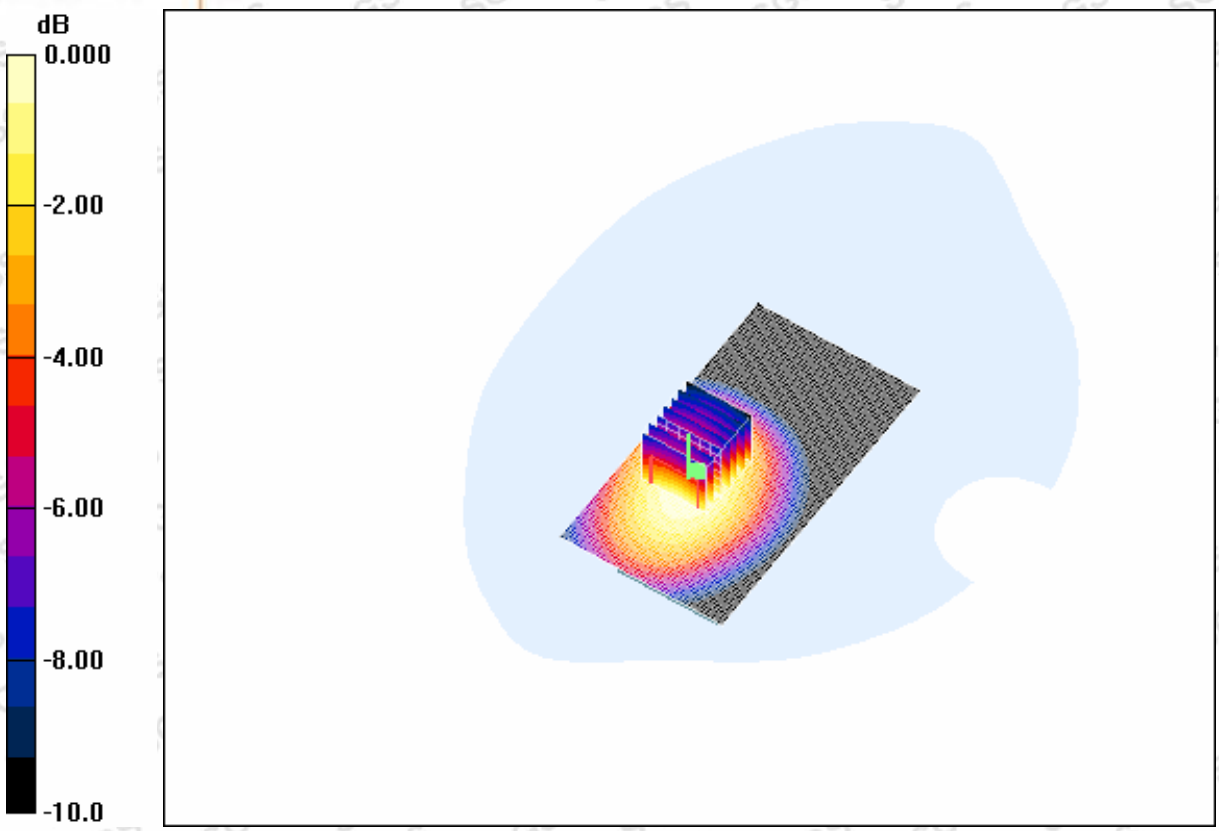
Body Worn - Low /Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.44 V/m; Power Drift = 0.079 dB

Peak SAR (extrapolated) = 0.533 W/kg

SAR(1 g) = 0.406 mW/g; SAR(10 g) = 0.295 mW/g

Maximum value of SAR (measured) = 0.430 mW/g



0 dB = 0.430mW/g

4.11 GSM850-Body worm-GSM-High

Date/Time: 2008-8-22 13:52:58

Test Laboratory: SGS-GSM

GSM850-Body-Worn-High-1.5cm

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: GSM850-GSM Mode; Frequency: 848.8 MHz;Duty Cycle: 1:8.3

Medium: HSL850-Body Medium parameters used: f = 848.8 MHz; σ = 1 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 - High /Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.819 mW/g

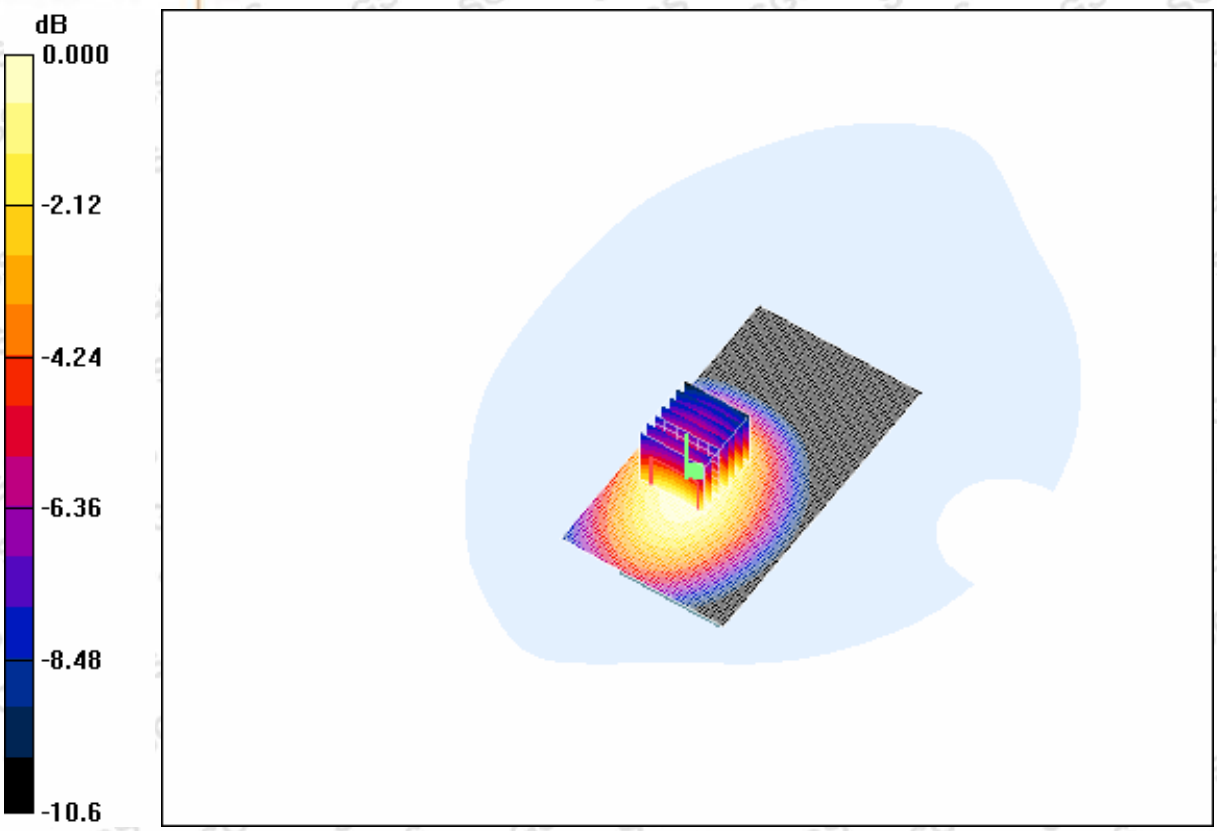
Body Worn - High /Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.43 V/m; Power Drift = 0.099 dB

Peak SAR (extrapolated) = 1.00 W/kg

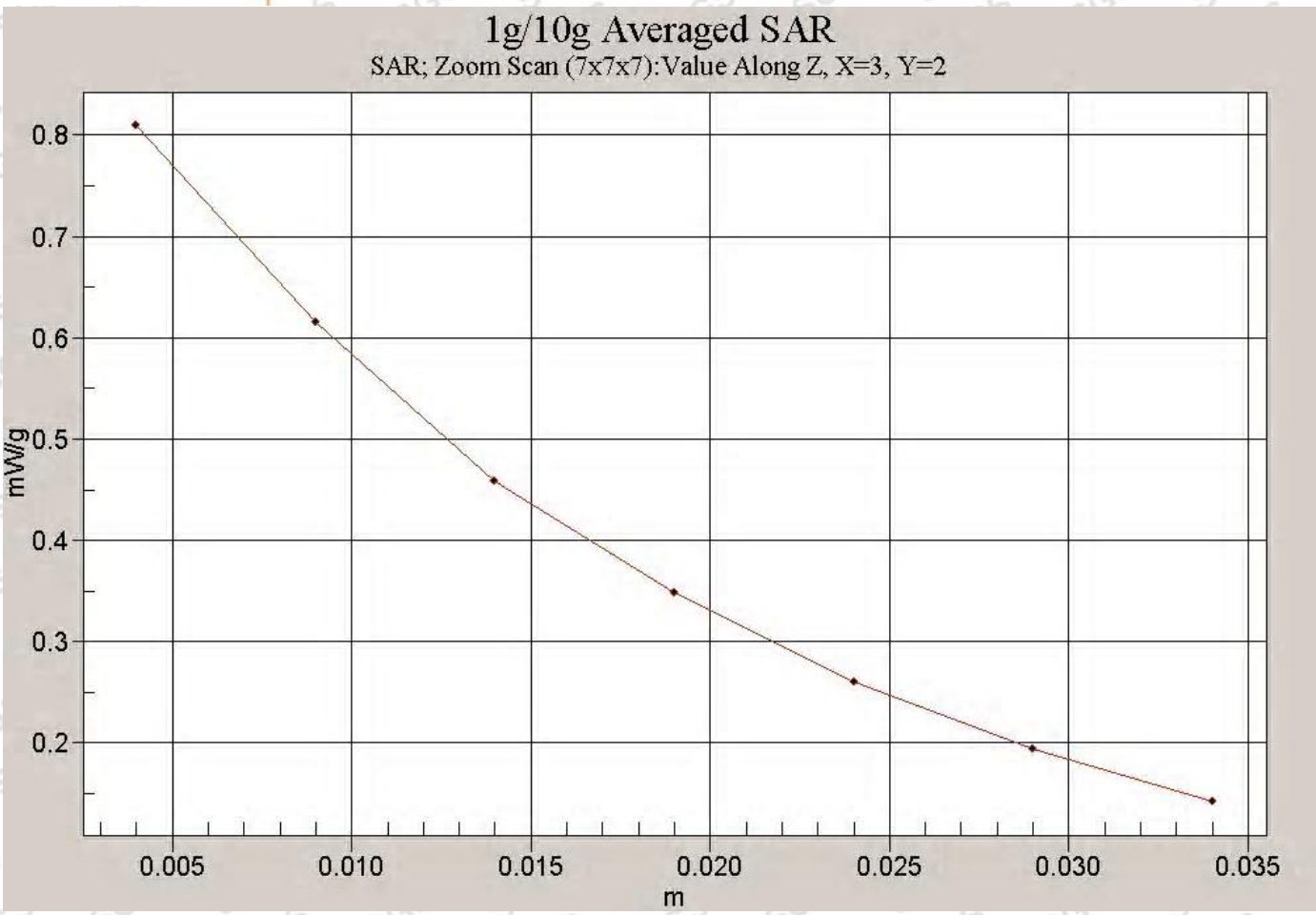
SAR(1 g) = 0.765 mW/g; SAR(10 g) = 0.551 mW/g

Maximum value of SAR (measured) = 0.809 mW/g



0 dB = 0.809mW/g

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



GSM1900

4.12 GSM1900-Lefthandside-Cheek-Mid

Date/Time: 2008-8-20 10:54:23

Test Laboratory: SGS-GSM

GSM1900-LeftHandSide-Cheek-Mid

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: PCS1900-GSM Mode; Frequency: 1880 MHz;Duty Cycle: 1:8.3

Medium: HSL1900_Head Medium parameters used: f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); 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

Cheek position - Middle /Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.072 mW/g

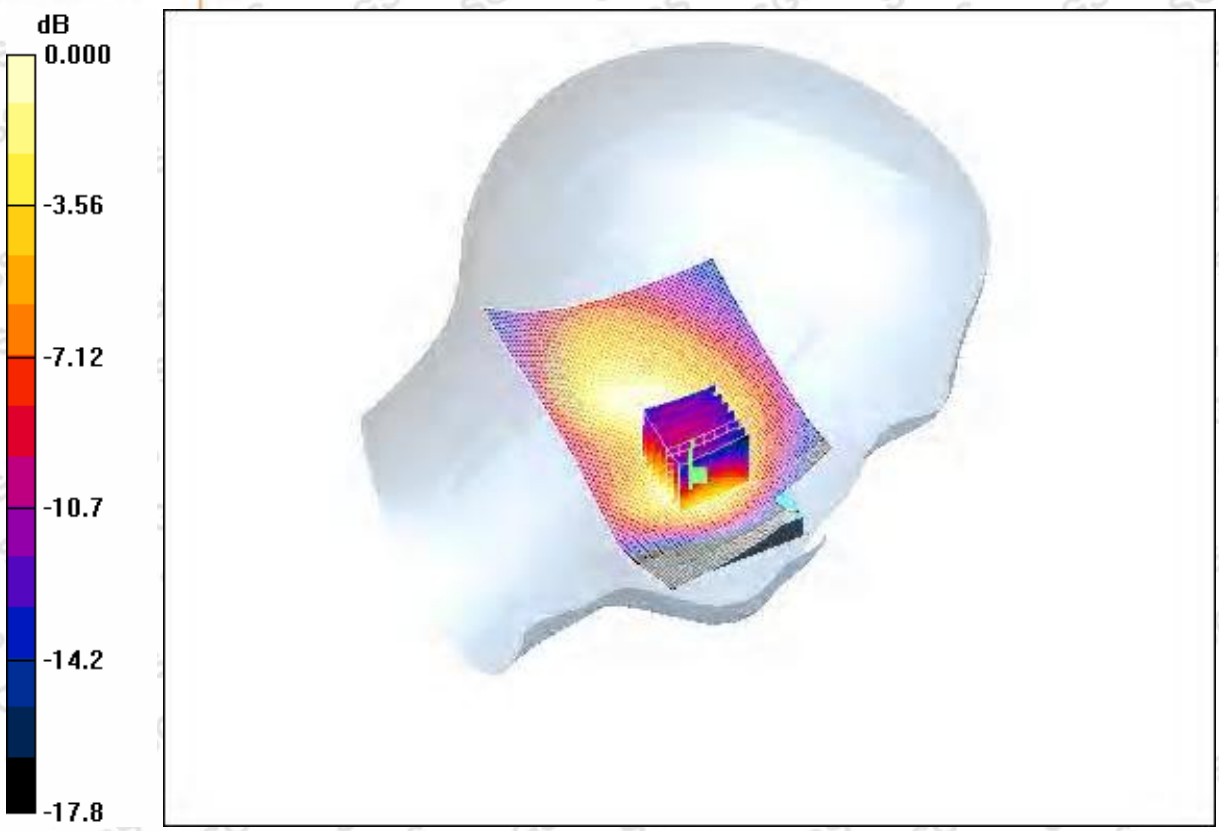
Cheek position - Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.00 V/m; Power Drift = 0.231 dB

Peak SAR (extrapolated) = 0.095 W/kg

SAR(1 g) = 0.065 mW/g; SAR(10 g) = 0.039 mW/g

Maximum value of SAR (measured) = 0.069 mW/g



0 dB = 0.069mW/g

4.13 GSM1900-Lefthandside-Tilt-Mid

Date/Time: 2008-8-20 9:26:45

Test Laboratory: SGS-GSM

GSM1900-LeftHandSide-Tilt-Mid

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: PCS1900-GSM Mode; Frequency: 1880 MHz;Duty Cycle: 1:8.3

Medium: HSL1900_Head Medium parameters used: f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); 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

Tilt position - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.060 mW/g

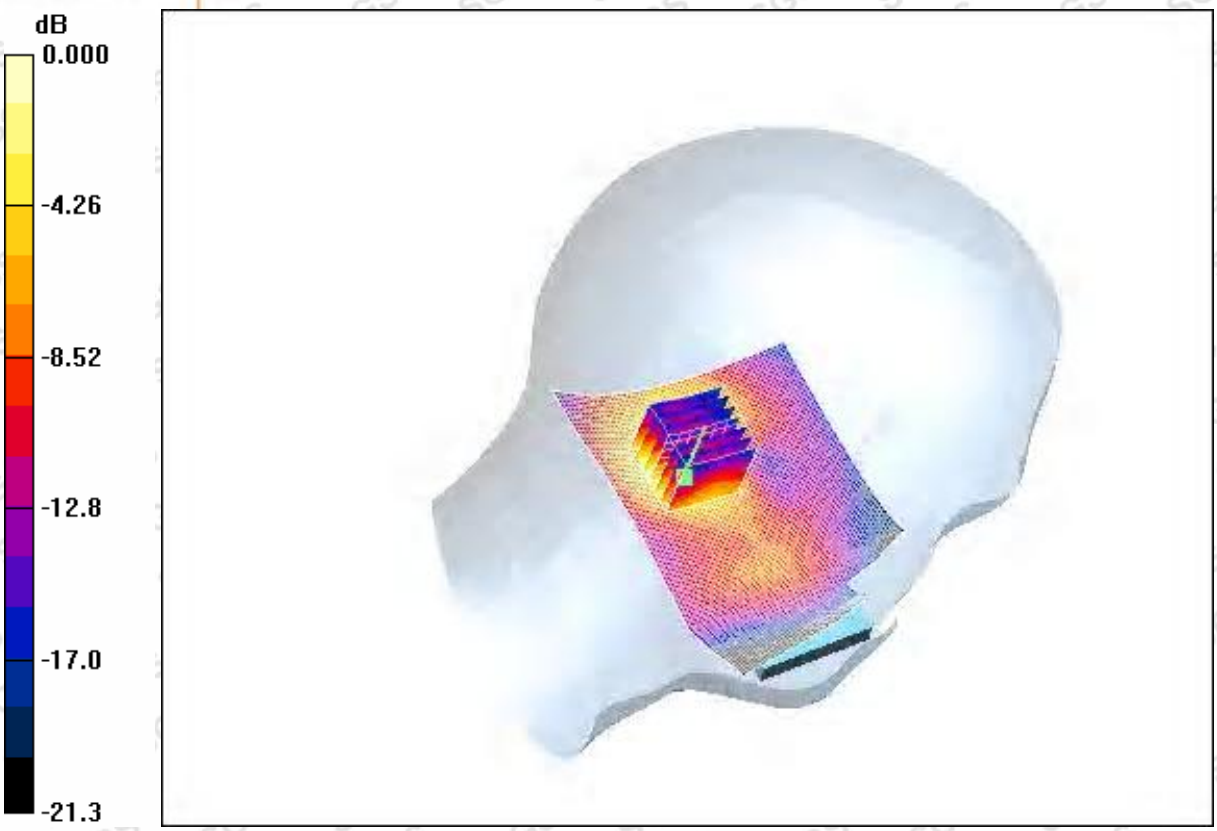
Tilt position - Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.85 V/m; Power Drift = -0.056 dB

Peak SAR (extrapolated) = 0.103 W/kg

SAR(1 g) = 0.056 mW/g; SAR(10 g) = 0.028 mW/g

Maximum value of SAR (measured) = 0.063 mW/g



0 dB = 0.063mW/g

4.14 GSM1900-Lefthandside-Worstcase-Low

Date/Time: 2008-8-20 9:50:08

Test Laboratory: SGS-GSM

GSM1900-LeftHandSide-Cheek-Low

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: PCS1900-GSM Mode; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3

Medium: HSL1900_Head Medium parameters used: f = 1850.2 MHz; σ = 1.41 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); 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

Cheek position - Low/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.081 mW/g

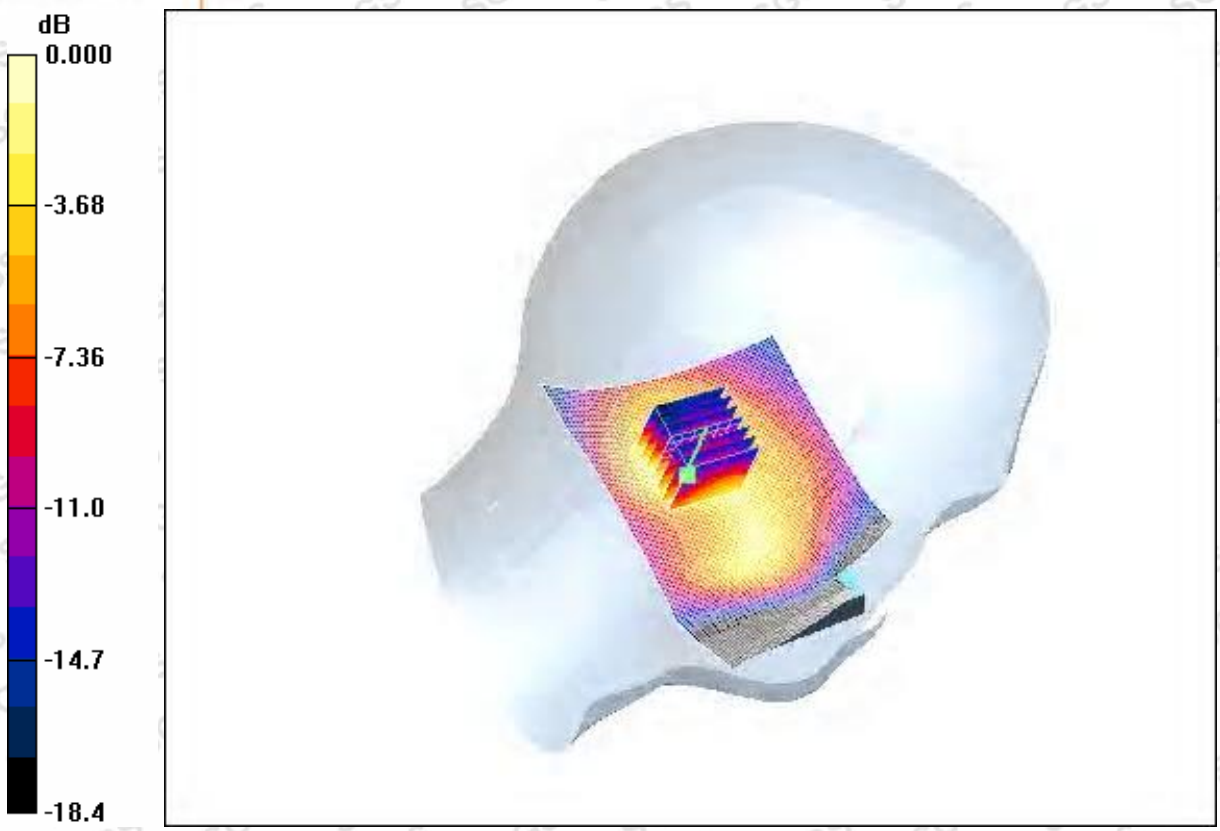
Cheek position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 4.98 V/m; Power Drift = 0.316 dB

Peak SAR (extrapolated) = 0.136 W/kg

SAR(1 g) = 0.075 mW/g; SAR(10 g) = 0.041 mW/g

Maximum value of SAR (measured) = 0.084 mW/g



0 dB = 0.084mW/g

4.15 GSM1900-Lefthandside-Worstcase-High

Date/Time: 2008-8-20 10:31:48

Test Laboratory: SGS-GSM

GSM1900-LeftHandSide-Cheek-High

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: PCS1900-GSM Mode; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3

Medium: HSL1900_Head Medium parameters used (extrapolated): f = 1909.8 MHz; σ = 1.47 mho/m; ε_r = 40; ρ = 1000 kg/m^3

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); 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

Cheek position - High/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.076 mW/g

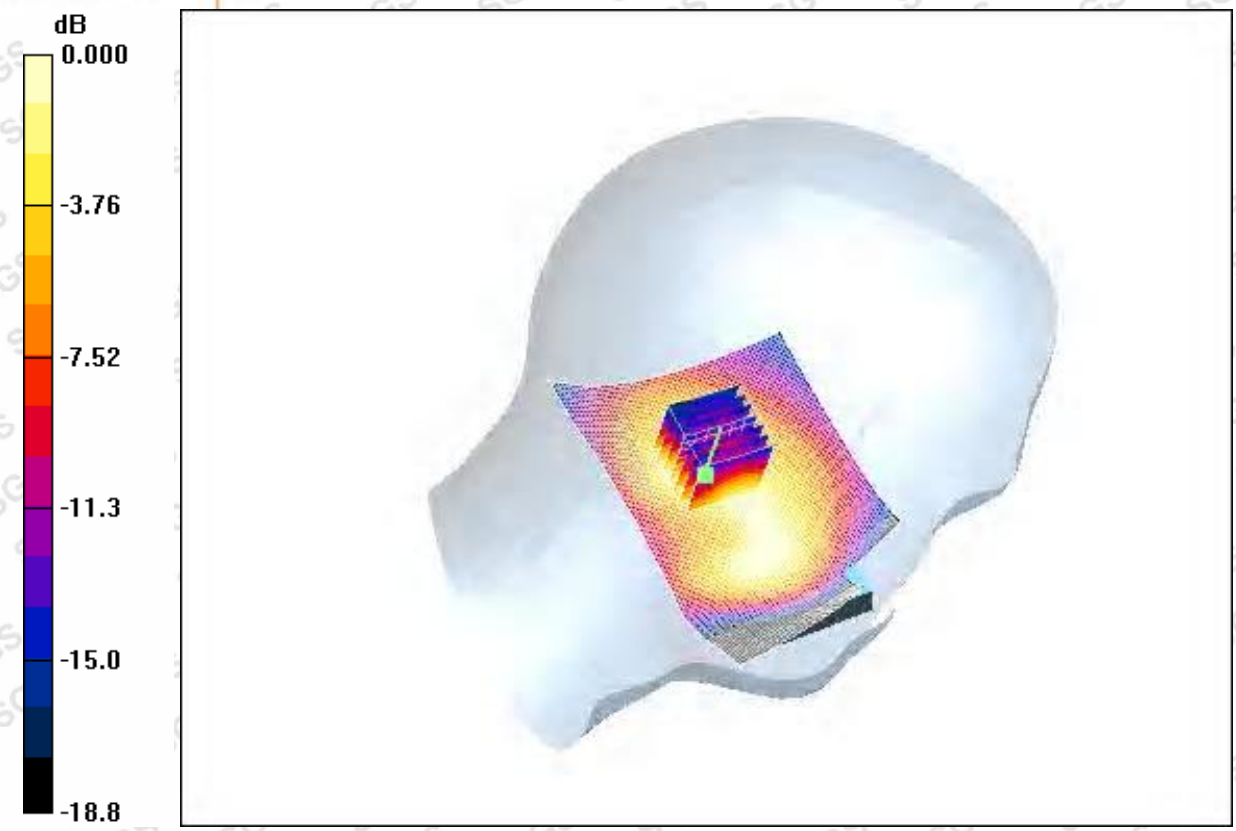
Cheek position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.06 V/m; Power Drift = 0.008 dB

Peak SAR (extrapolated) = 0.117 W/kg

SAR(1 g) = 0.070 mW/g; SAR(10 g) = 0.040 mW/g

Maximum value of SAR (measured) = 0.077 mW/g



0 dB = 0.077mW/g

4.16 GSM1900-Righthandside-Cheek-Mid

Date/Time: 2008-8-20 11:46:45

Test Laboratory: SGS-GSM

GSM1900-RightHandSide-Cheek-Mid

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: PCS1900-GSM Mode; Frequency: 1880 MHz;Duty Cycle: 1:8.3

Medium: HSL1900_Head Medium parameters used: f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); 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

Cheek position - Middle /Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.113 mW/g

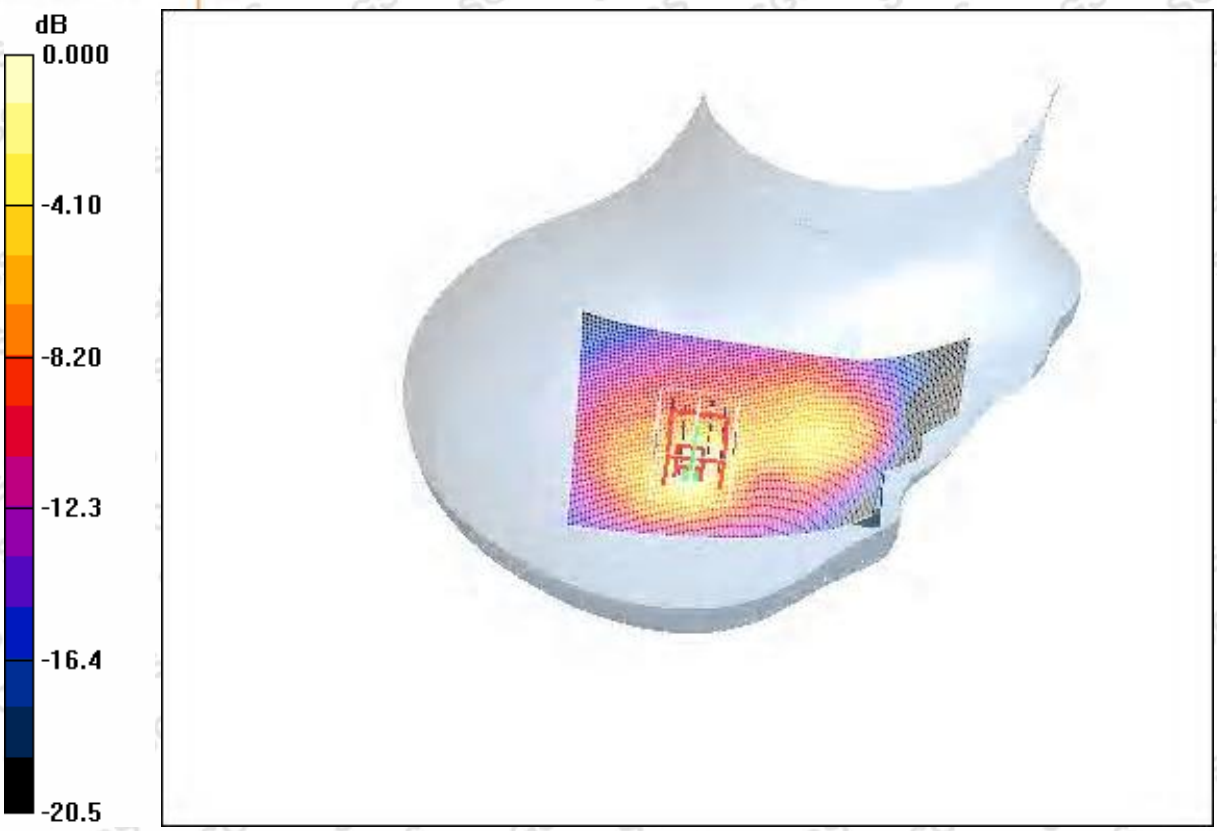
Cheek position - Middle /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.73 V/m; Power Drift = 0.065 dB

Peak SAR (extrapolated) = 0.222 W/kg

SAR(1 g) = 0.100 mW/g; SAR(10 g) = 0.048 mW/g

Maximum value of SAR (measured) = 0.112 mW/g



0 dB = 0.112mW/g

4.17 GSM1900-Righthandside-Tilt-Mid

Date/Time: 2008-8-20 13:38:22

Test Laboratory: SGS-GSM

GSM1900-RightHandSide-Tilt-Mid

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: PCS1900-GSM Mode; Frequency: 1880 MHz;Duty Cycle: 1:8.3

Medium: HSL1900_Head Medium parameters used: f = 1880 MHz; σ = 1.44 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); 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

Tilt position - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.093 mW/g

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

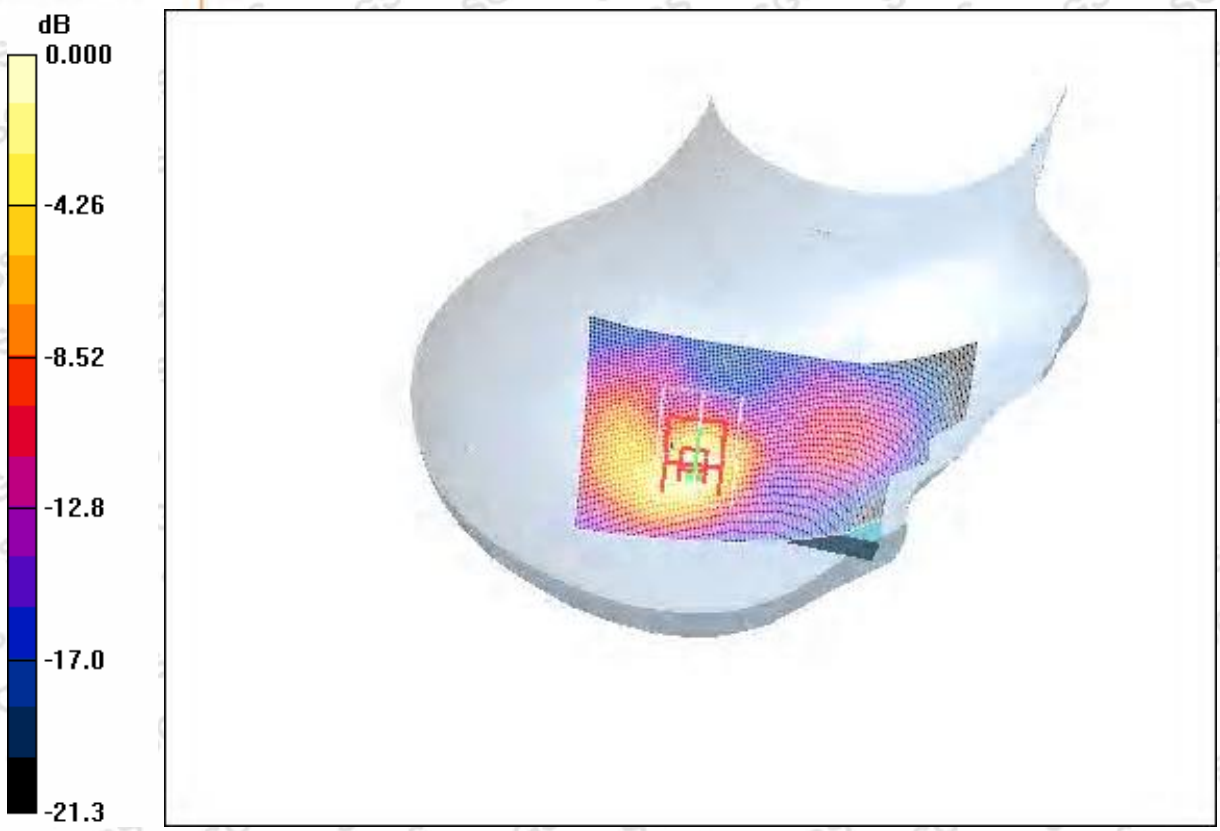
Reference Value = 5.16 V/m; Power Drift = 0.045 dB

Peak SAR (extrapolated) = 0.176 W/kg

SAR(1 g) = 0.082 mW/g; SAR(10 g) = 0.038 mW/g

Maximum value of SAR (measured) = 0.094 mW/g

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



0 dB = 0.094mW/g

4.18 GSM1900-Righthandside-Worstcase-Low

Date/Time: 2008-8-20 12:51:24

Test Laboratory: SGS-GSM

GSM1900-RightHandSide-Cheek-Low

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: PCS1900-GSM Mode; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3

Medium: HSL1900_Head Medium parameters used: f = 1850.2 MHz; σ = 1.41 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); 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

Cheek position - Low/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.122 mW/g

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

Reference Value = 6.04 V/m; Power Drift = 0.008 dB

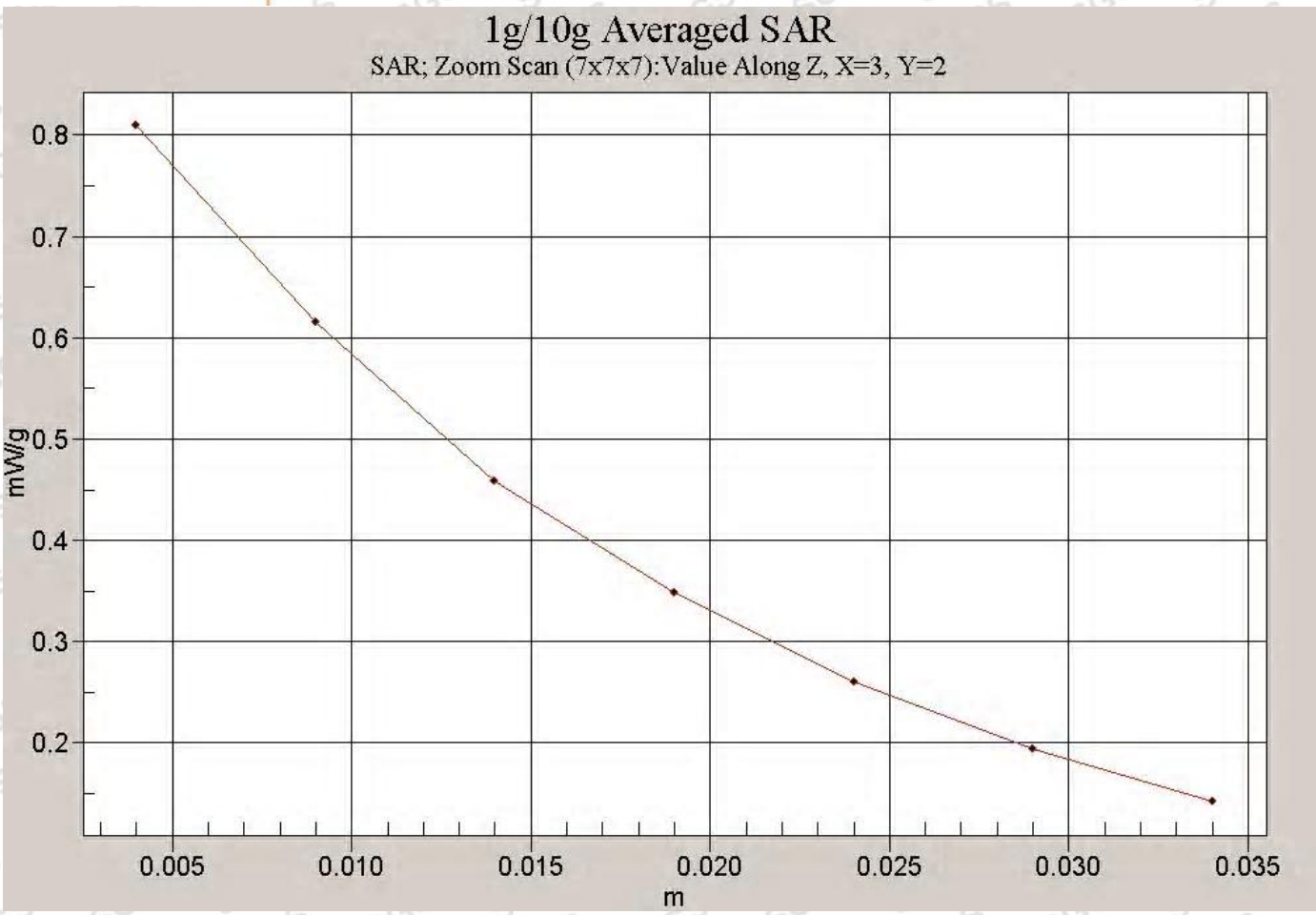
Peak SAR (extrapolated) = 0.247 W/kg

SAR(1 g) = 0.113 mW/g; SAR(10 g) = 0.054 mW/g

Maximum value of SAR (measured) = 0.128 mW/g

0 dB = 0.128mW/g

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



4.19 GSM1900-Righthandside-Worstcase-High

Date/Time: 2008-8-20 13:15:36

Test Laboratory: SGS-GSM

GSM1900-RightHandSide-Cheek-High

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: PCS1900-GSM Mode; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3

Medium: HSL1900_Head Medium parameters used (extrapolated): f = 1909.8 MHz; σ = 1.47 mho/m; ε_r = 40; ρ = 1000 kg/m^3

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); 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

Cheek position - High/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.122 mW/g

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

Reference Value = 6.14 V/m; Power Drift = 0.143 dB

Peak SAR (extrapolated) = 0.249 W/kg

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

Maximum value of SAR (measured) = 0.128 mW/g

0 dB = 0.128mW/g

4.20 GSM1900-Body worm-GSM-Mid

Date/Time: 2008-8-22 15:45:12

Test Laboratory: SGS-GSM

GSM1900-Body-Worn-Mid-1.5cm

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

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: PCS1900-GSM Mode; Frequency: 1880 MHz;Duty Cycle: 1:8.3

Medium: HSL1900-Body Medium parameters used: f = 1880 MHz; σ = 1.62 mho/m; ε_r = 51.1; 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/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.077 mW/g

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

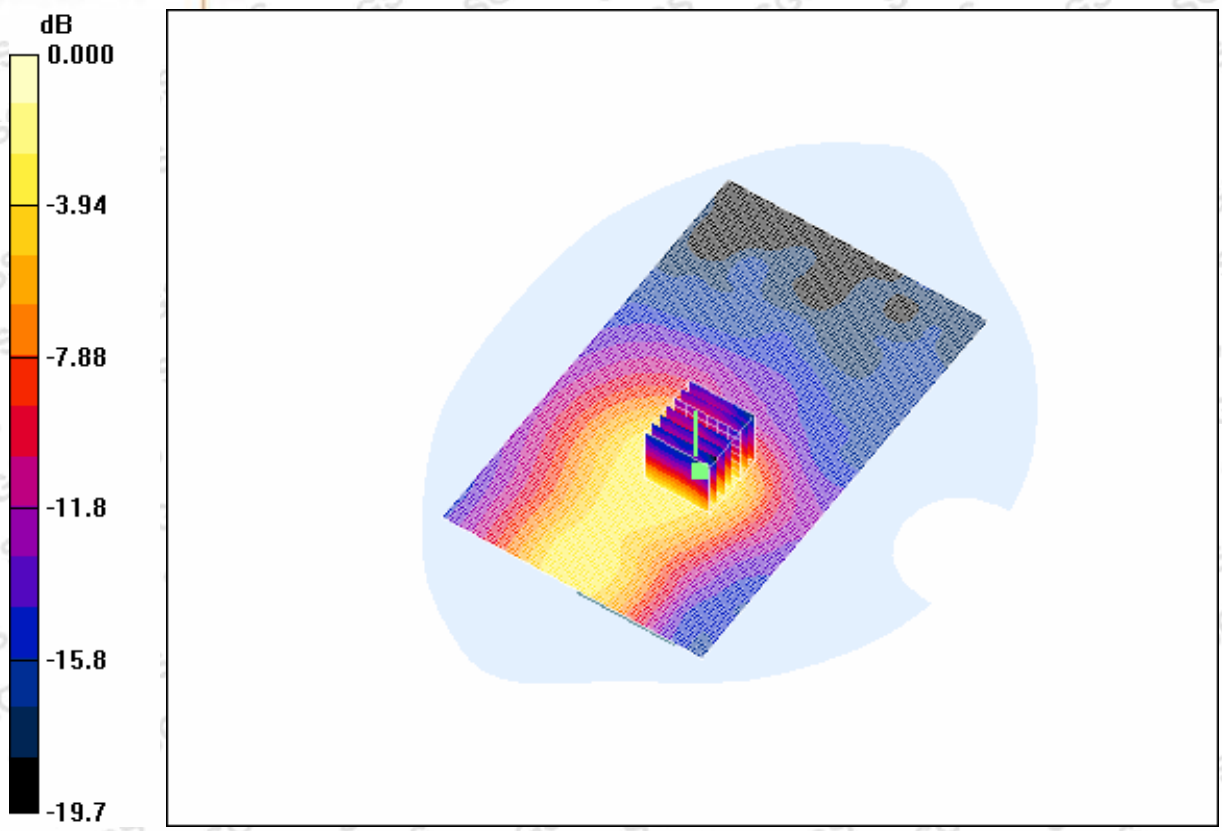
Reference Value = 2.13 V/m; Power Drift = -0.106 dB

Peak SAR (extrapolated) = 0.127 W/kg

SAR(1 g) = 0.071 mW/g; SAR(10 g) = 0.037 mW/g

Maximum value of SAR (measured) = 0.082 mW/g

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



0 dB = 0.082mW/g

4.21 GSM1900-Body worm-GSM-Low

Date/Time: 2008-8-22 16:11:14

Test Laboratory: SGS-GSM

GSM1900-Body-Worn-Low-1.5cm

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: PCS1900-GSM Mode; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3

Medium: HSL1900-Body Medium parameters used: f = 1850.2 MHz; σ = 1.59 mho/m; ε_r = 51.2; 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/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.086 mW/g

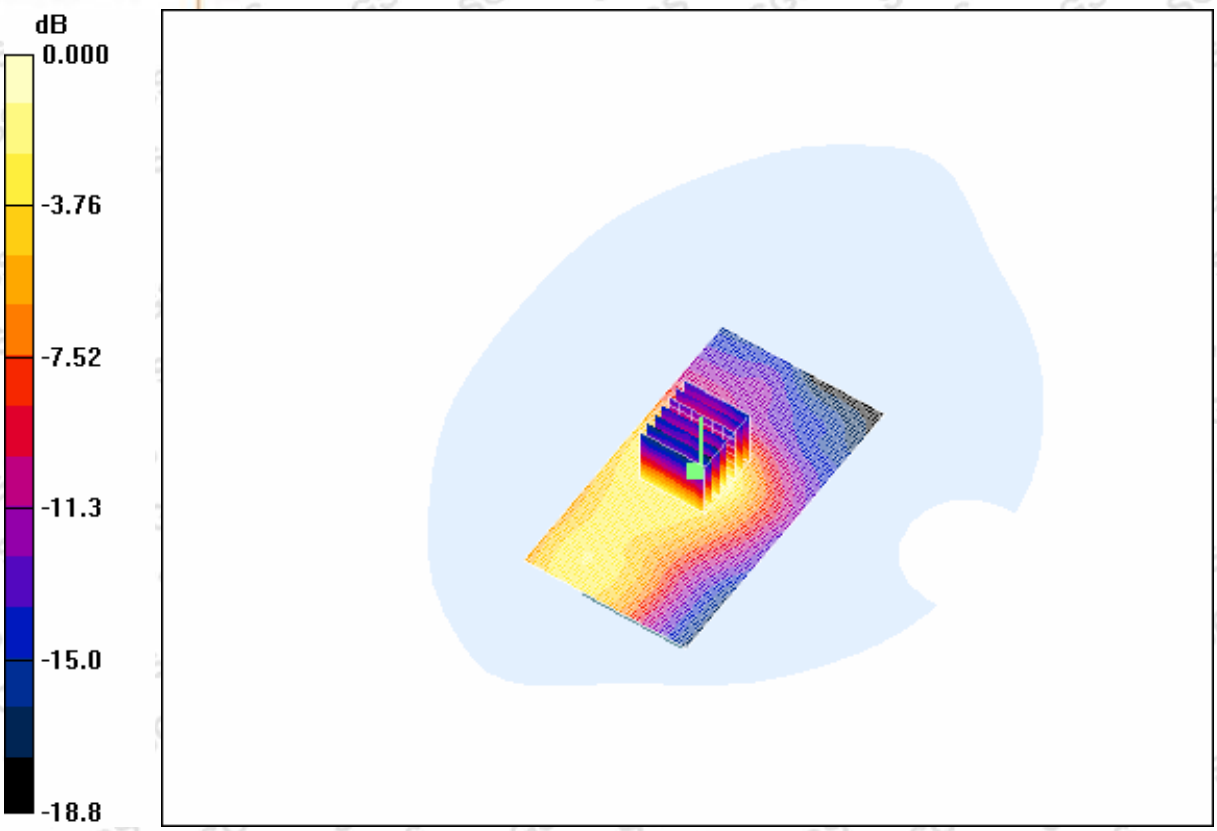
Body Worn - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.05 V/m; Power Drift = 0.055 dB

Peak SAR (extrapolated) = 0.139 W/kg

SAR(1 g) = 0.077 mW/g; SAR(10 g) = 0.040 mW/g

Maximum value of SAR (measured) = 0.088 mW/g



0 dB = 0.088mW/g

4.22 GSM1900-Body worm-GSM-High

Date/Time: 2008-8-22 16:30:23

Test Laboratory: SGS-GSM

GSM1900-Body-Worn-High-1.5cm

DUT: L6001AN01; Type: Head; Serial: 78787545444444318

Communication System: PCS1900-GSM Mode; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3

Medium: HSL1900-Body Medium parameters used: f = 1909.8 MHz; σ = 1.65 mho/m; ε_r = 51; 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/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

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

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

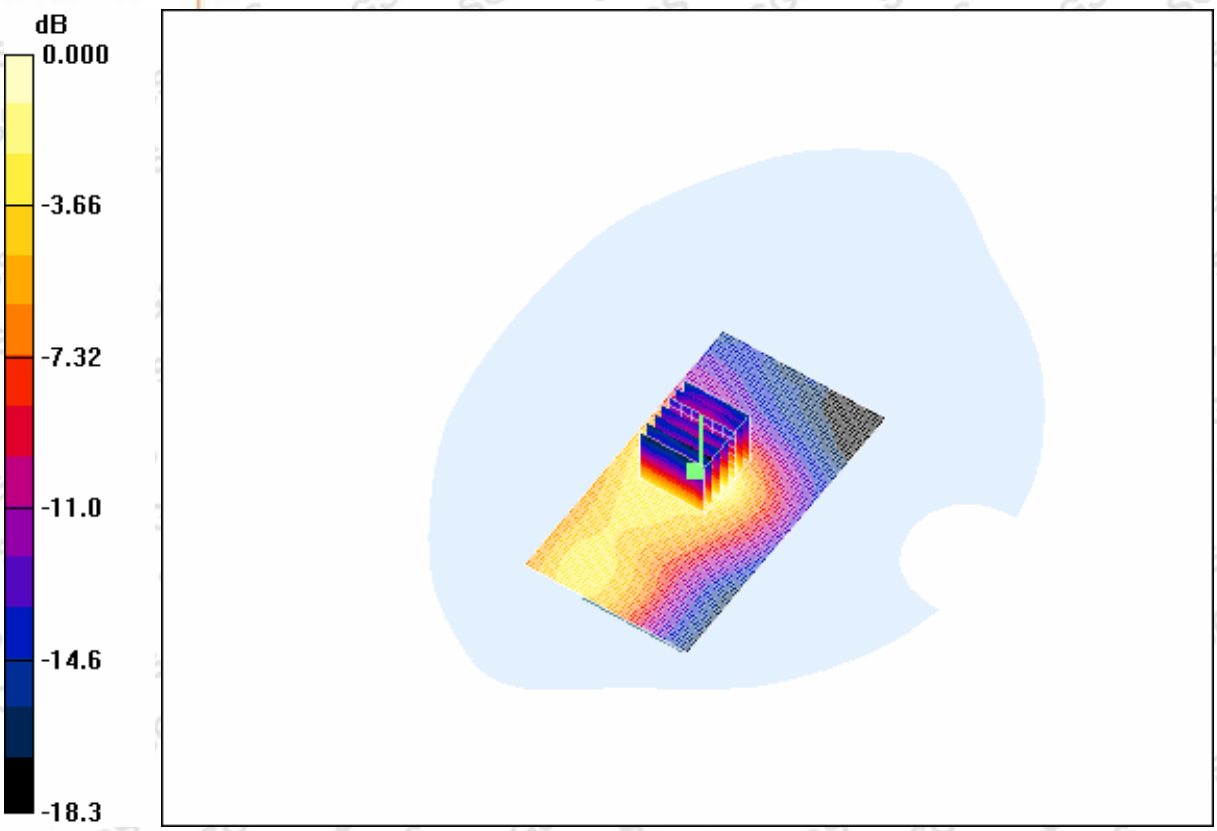
Reference Value = 2.00 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 0.145 W/kg

SAR(1 g) = 0.079 mW/g; SAR(10 g) = 0.041 mW/g

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

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



0 dB = 0.090mW/g

System Performance Check

System Validation for 900MHz-Head-1

Date/Time: 2008-8-20 8:58:34

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D900-Head

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: GSM900-Head Medium parameters used: f = 900 MHz; σ = 0.942 mho/m; ε_r = 42.1; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); 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) = 2.93 mW/g

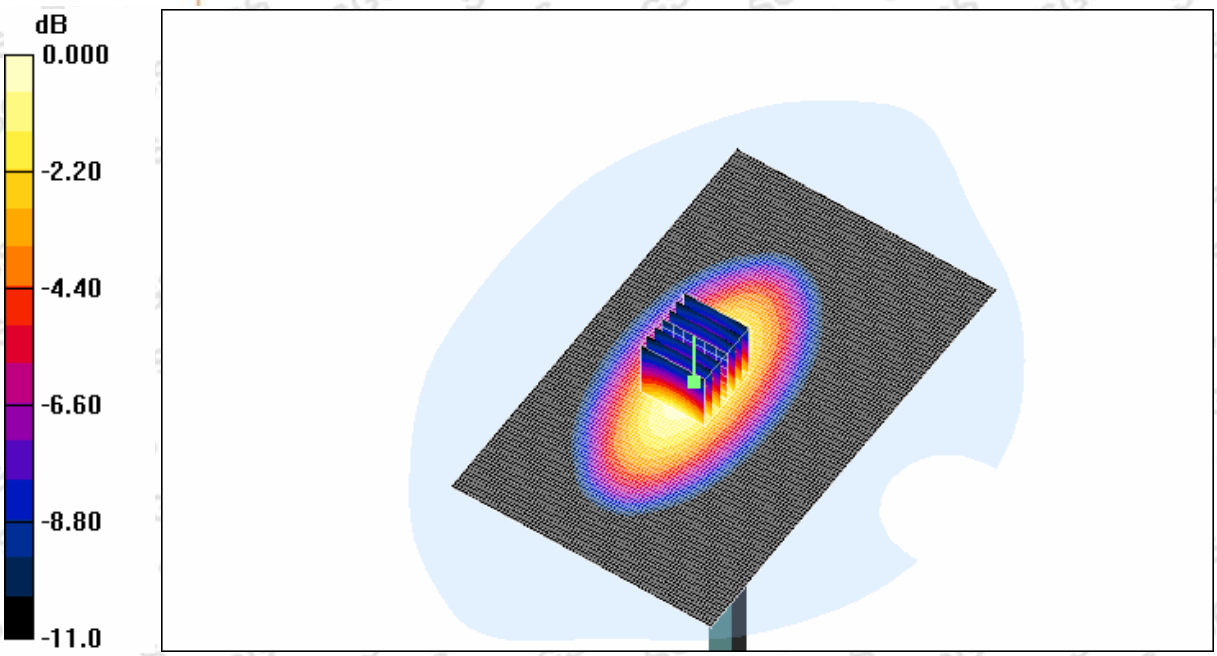
d=15mm, Pin=250mW /Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 49.6 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 4.12 W/kg

SAR(1 g) = 2.74 mW/g; SAR(10 g) = 1.76 mW/g

Maximum value of SAR (measured) = 2.97 mW/g



0 dB = 2.97mW/g

System Validation for 900MHz-Head-2

Date/Time: 2008-8-21 9:05:09

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D900-Head

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

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

Medium: GSM900-Head Medium parameters used: f = 900 MHz; σ = 0.952 mho/m; ε_r = 42.3; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); 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) = 2.91 mW/g

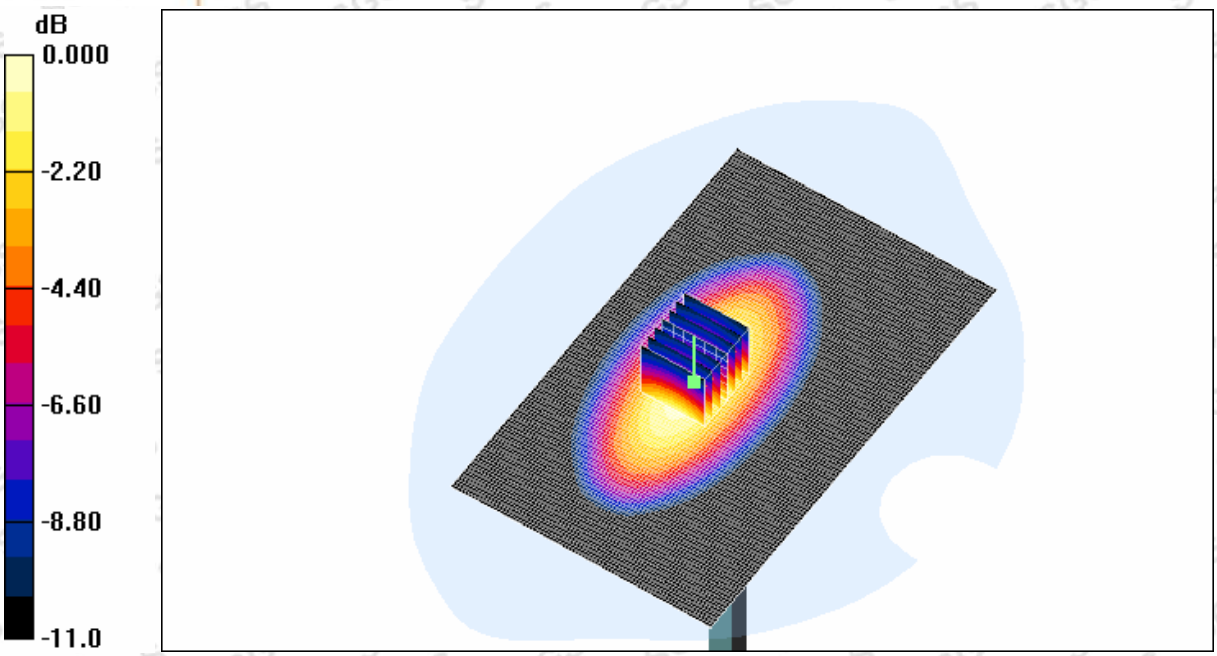
d=15mm, Pin=250mW /Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 49.5 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 4.09 W/kg

SAR(1 g) = 2.72 mW/g; SAR(10 g) = 1.75 mW/g

Maximum value of SAR (measured) = 2.95 mW/g



0 dB = 2.95mW/g

System Validation for 1900MHz-Head

Date/Time: 2008-8-20 9:06:17

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D1900-Head

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

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

Medium: 1900-Head Medium parameters used: f = 1900 MHz; σ = 1.44 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); 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) = 10.9 mW/g

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

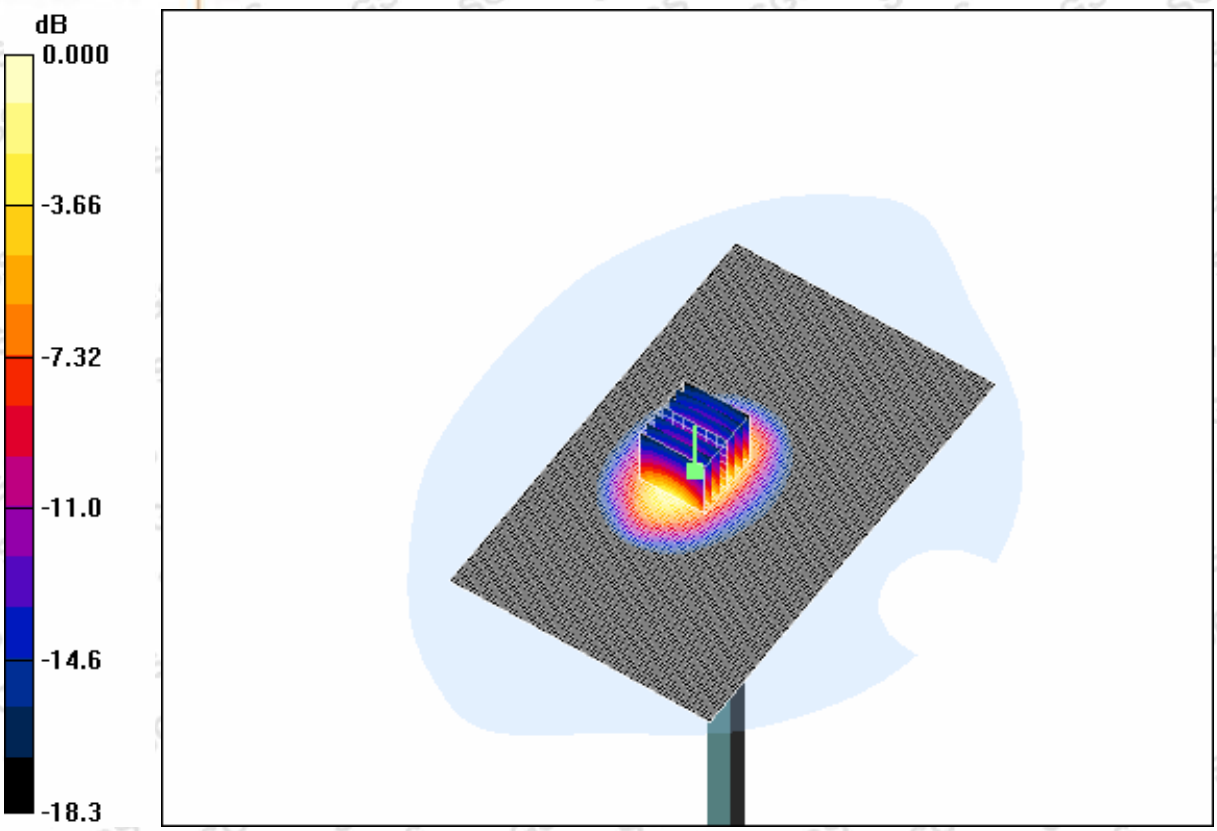
Reference Value = 60.4 V/m; Power Drift = 0.047 dB

Peak SAR (extrapolated) = 18.5 W/kg

SAR(1 g) = 9.59 mW/g; SAR(10 g) = 4.84 mW/g

Maximum value of SAR (measured) = 10.9 mW/g

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



0 dB = 10.9mW/g

System Validation for 900MHz-Body

Date/Time: 2008-8-22 10:35:08

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D900-Body

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 = 1.04 mho/m; ε_r = 54.1; 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-128
- 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) = 3.00 mW/g

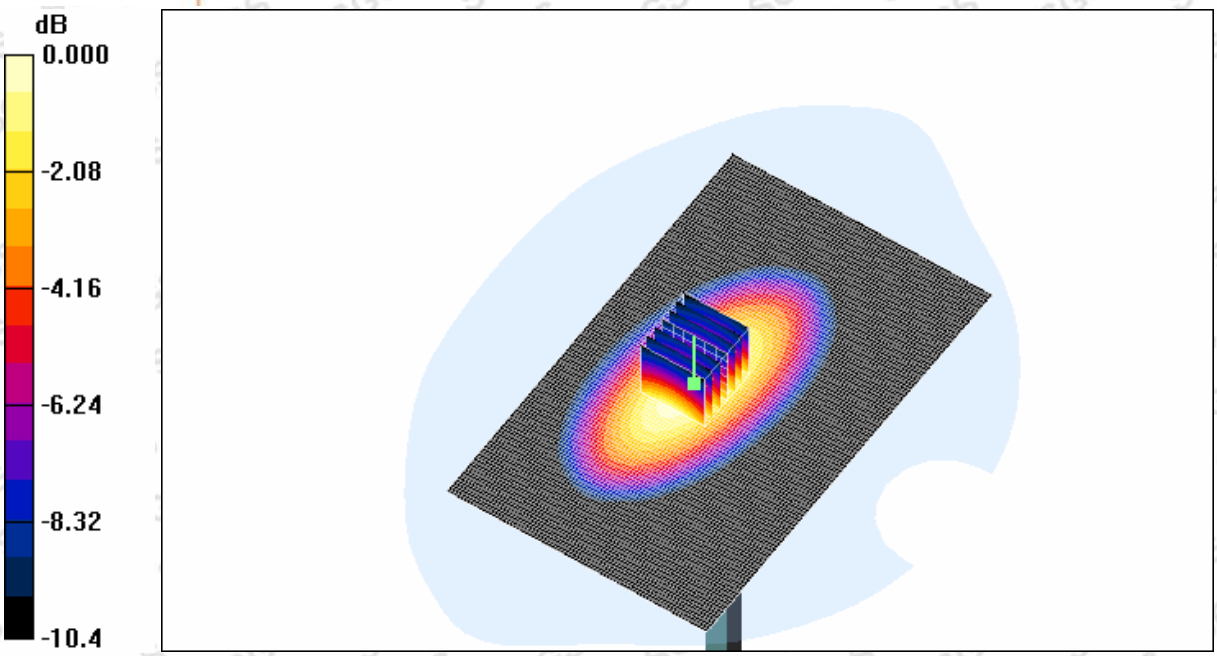
d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

Peak SAR (extrapolated) = 4.12 W/kg

SAR(1 g) = 2.81 mW/g; SAR(10 g) = 1.86 mW/g

Maximum value of SAR (measured) = 3.02 mW/g



0 dB = 3.02mW/g

System Validation for 1900MHz-Body

Date/Time: 2008-8-22 15:00:09

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D1900-Body

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 = 1.56 mho/m; ε_r = 51.6; 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 4/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

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

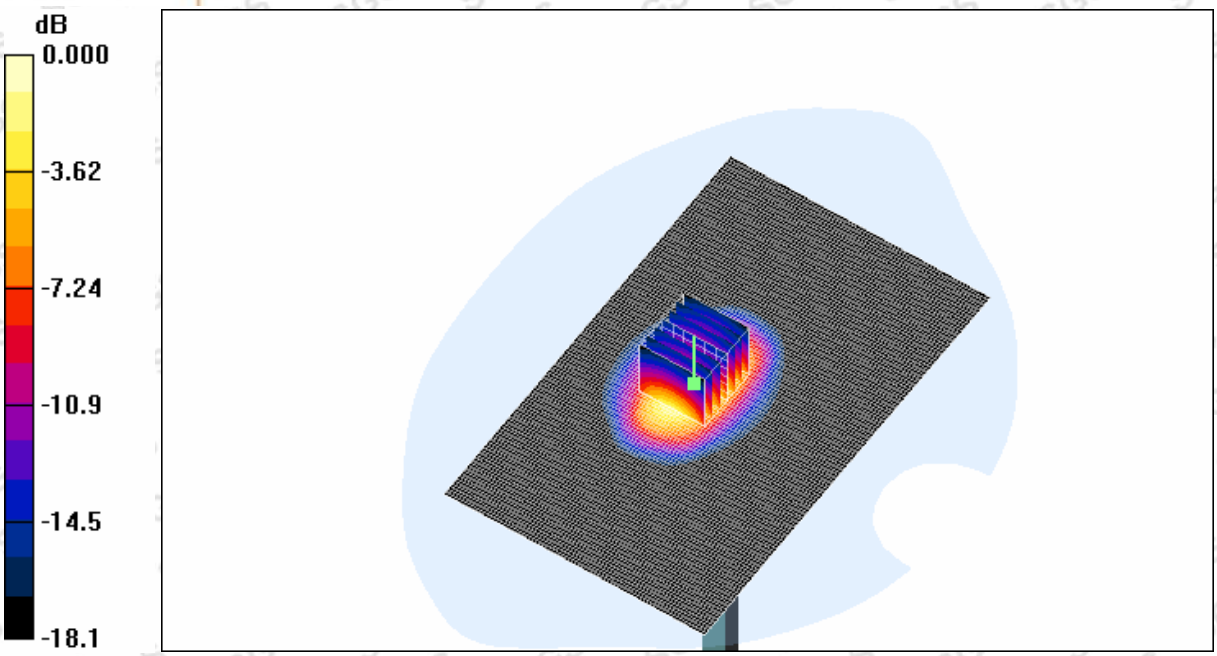
d=10mm, Pin=250mW 4/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 58.3 V/m; Power Drift = -0.089 dB

Peak SAR (extrapolated) = 18.1 W/kg

SAR(1 g) = 9.36 mW/g; SAR(10 g) = 4.68 mW/g

Maximum value of SAR (measured) = 10.6 mW/g



0 dB = 10.6mW/g

Appendix

1. Photographs of Test Setup

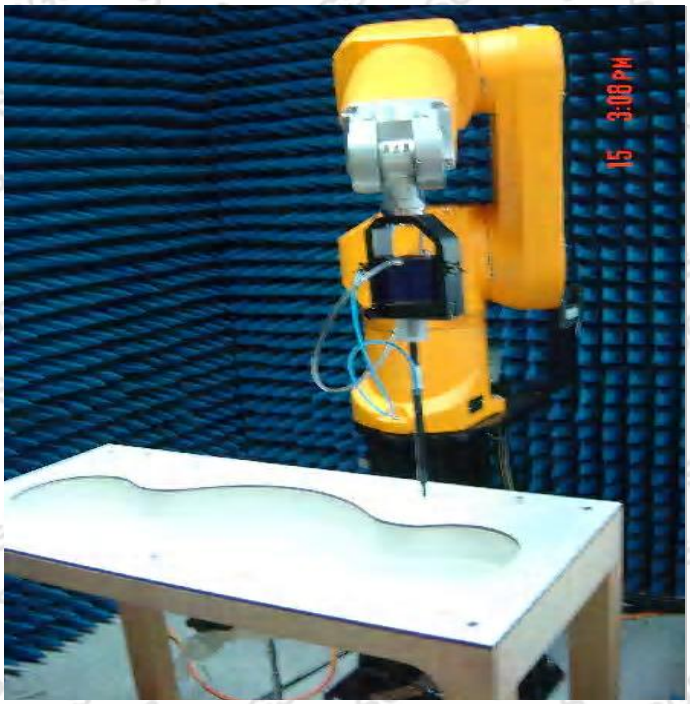
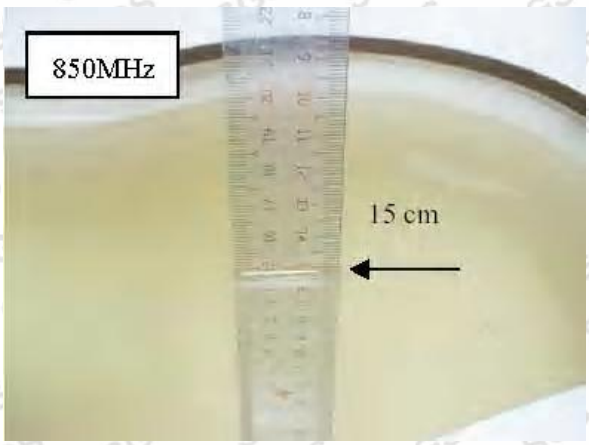
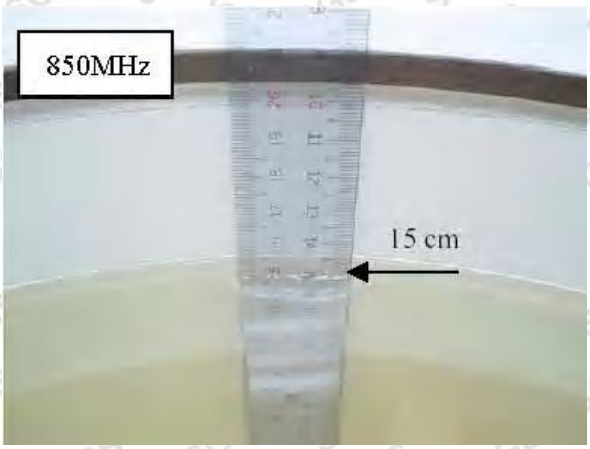


Fig.1 Photograph of the SAR measurement System





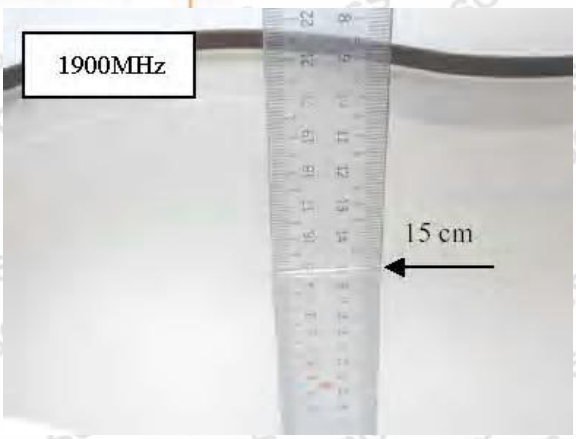


Fig.2 Photograph of the Tissue Simulant Liquid depth 15cm for Head Side

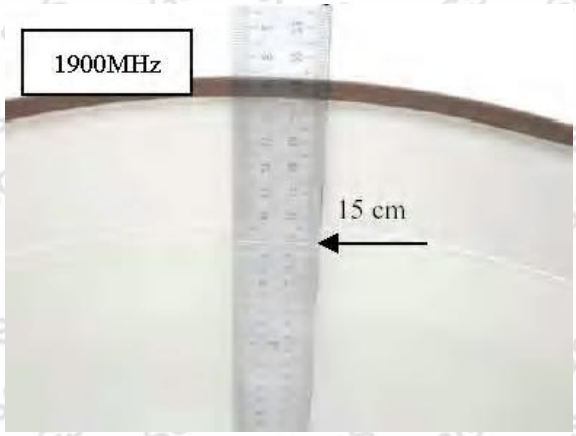


Fig.3 Photograph of the Tissue Simulant Fluid Fluid Liquid depth 15cm for Body worn

Fig.4 Photograph of the Left Cheek status

Fig.5 Photograph of the Left Tilted status

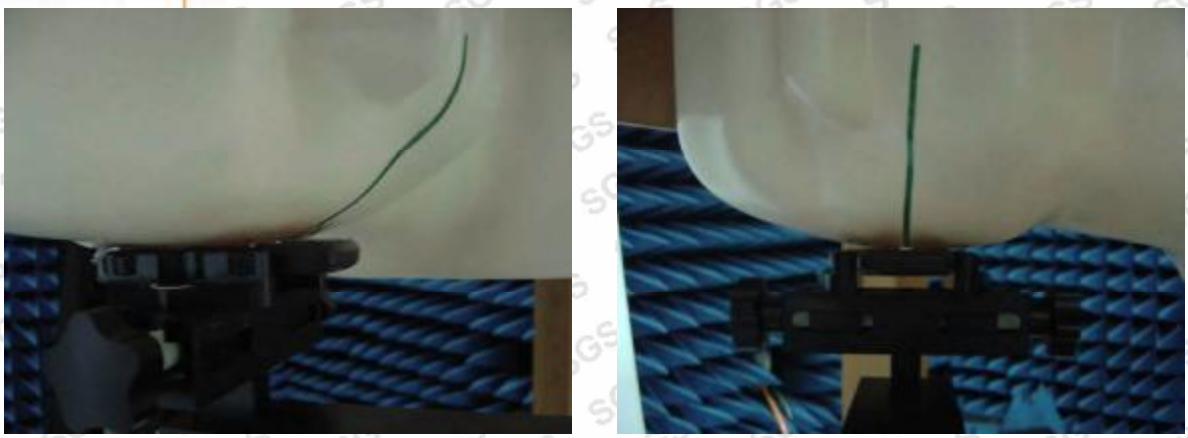


Fig.6 Photograph of the Right Cheek status

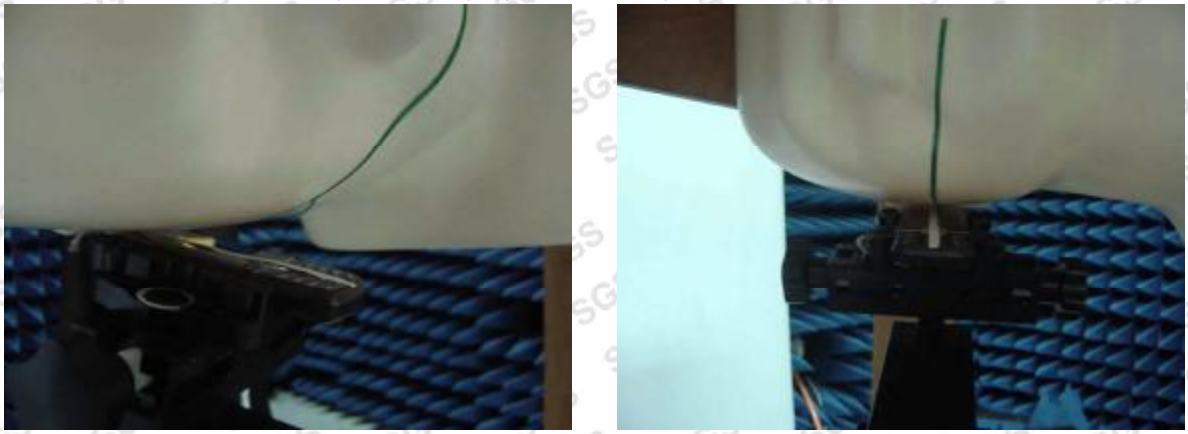


Fig.7 Photograph of the Right Tilted status

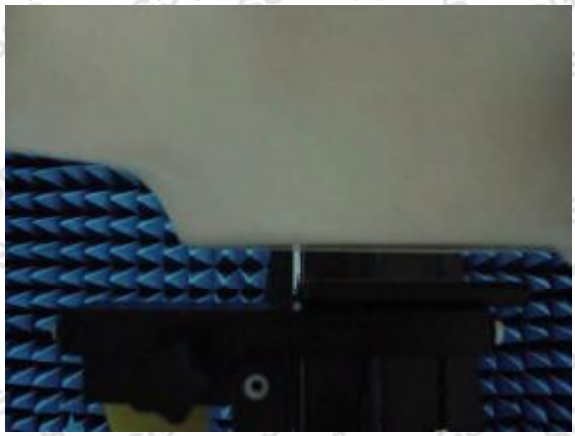


Fig.8 Photograph of the BodyWorn status

2. Photographs of the EUT

Fig.9 Front View

Fig.10 Back Vie

3. Photographs of the Accessories

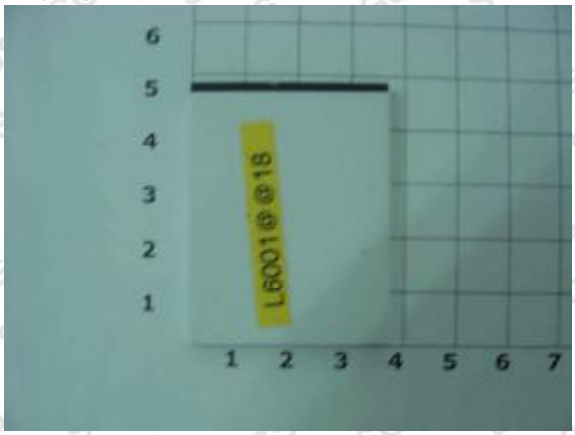


Fig.11 Battery

Fig.12 Charger

4. 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	0.0

Sensor Offset

Probe Tip to Sensor Center	2.0 mm

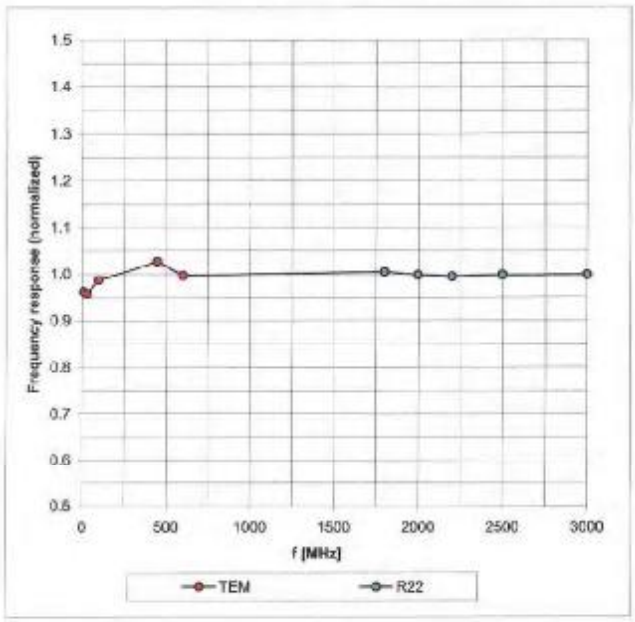
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[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

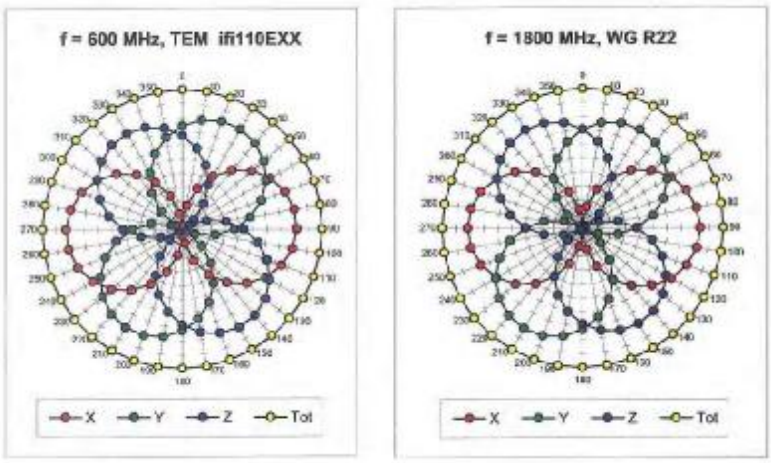
(TEM-Cell:ifi110 EXX, Waveguide: R22)

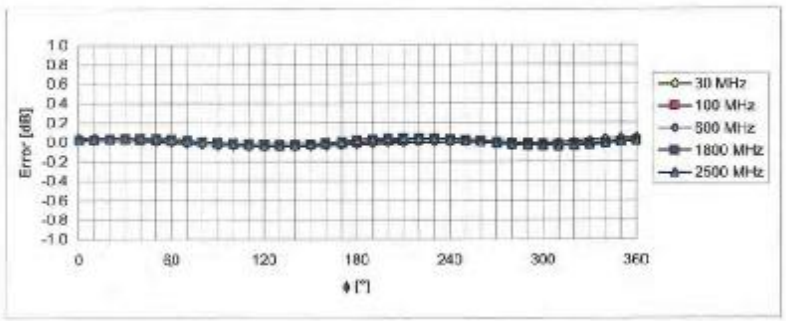


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

ES3DV3 SN:3088 January 18, 2008

Receiving Pattern (ϕ), ϑ = 0°





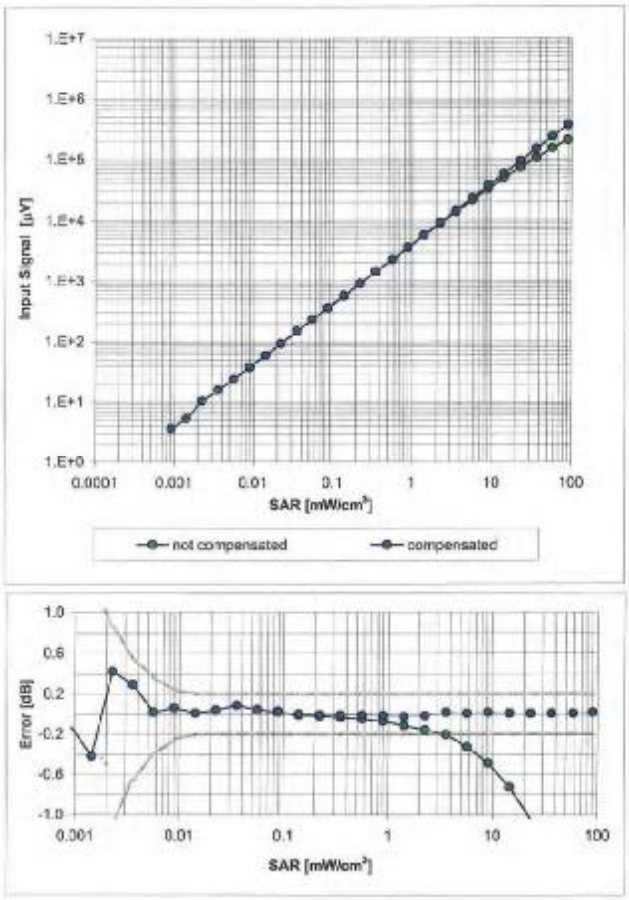
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

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)

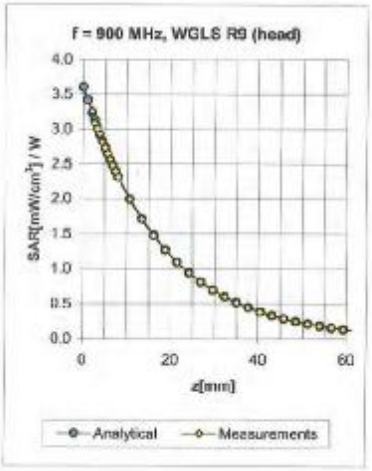


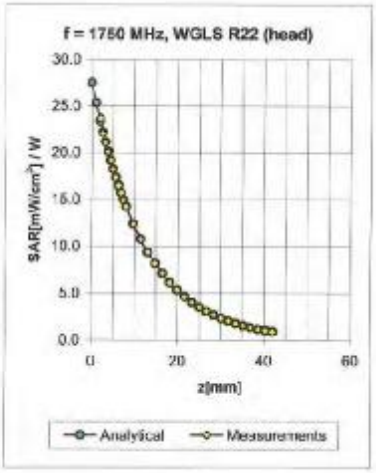
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: ES3-3088_Jan08 Page 7 of 9

ES3DV3 SN:3088 January 18, 2008

Conversion Factor Assessment





f [MHz]	Validity [MHz]°	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)

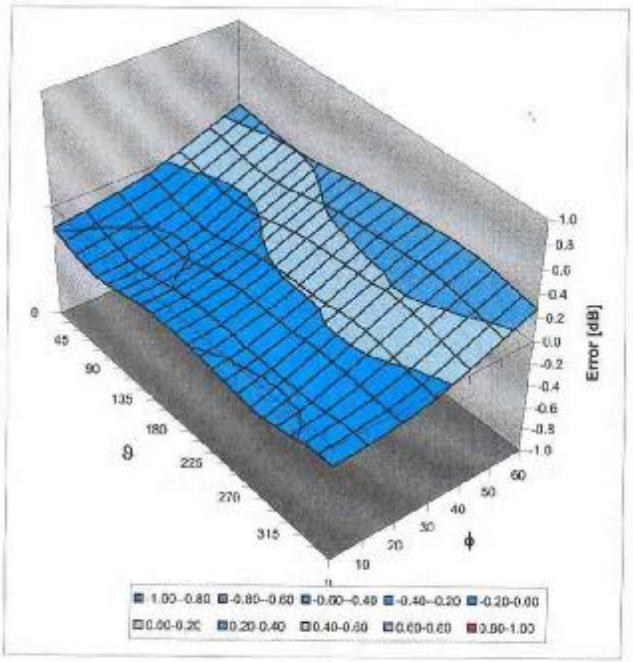
° The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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

5. 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

6. 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

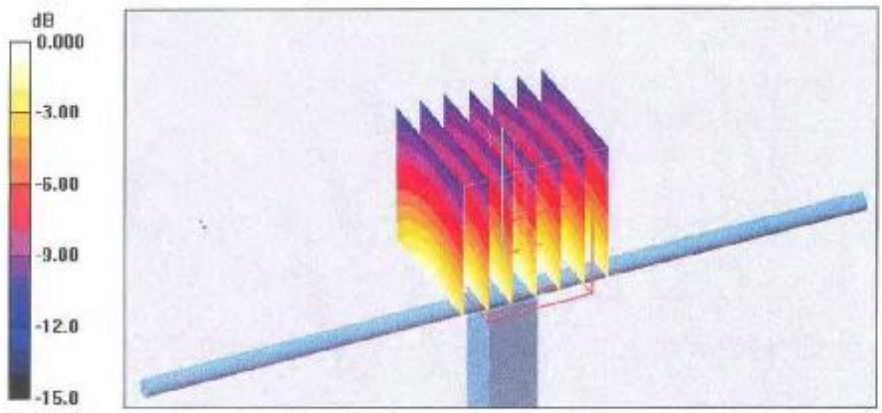
DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:184

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:

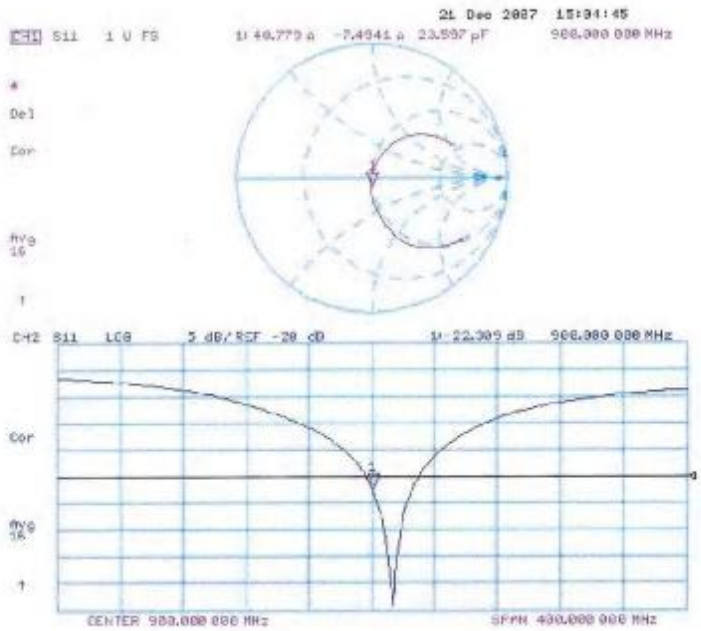
- Probe: ET3DV6 - SN1507 (HF); ConvF(5.93, 5.93, 5.93); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.0[illegible].2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD,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

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

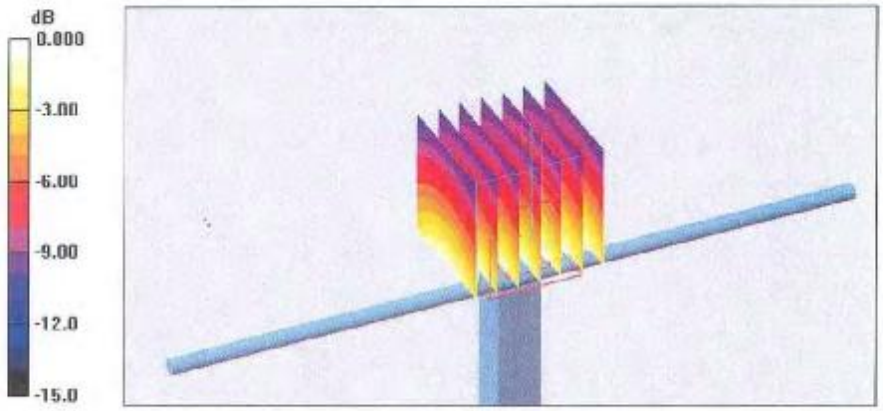
DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:184

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:

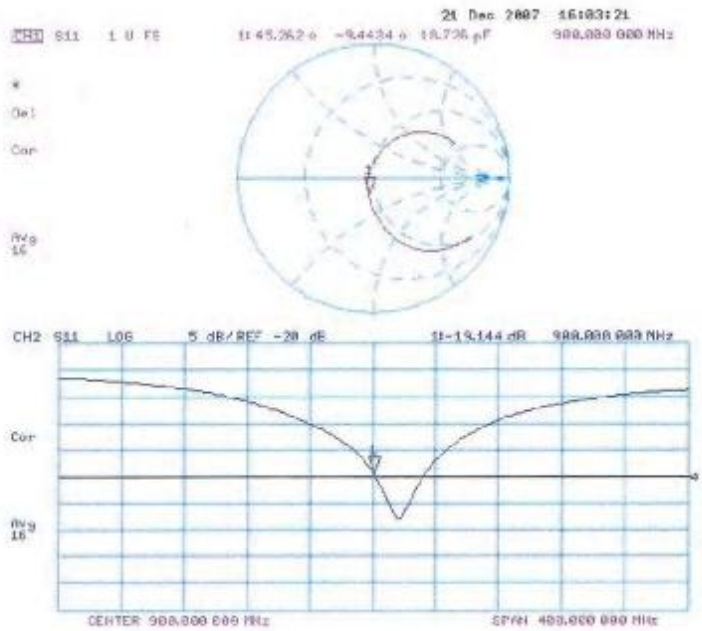
- Probe: ET3DV6 - SN1507 (HF); ConvF(5.57, 5.57, 5.57); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8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



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

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: 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

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

Certificate No: D1900V2-5d028_Dec07 Page 1 of 9

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

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

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

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
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

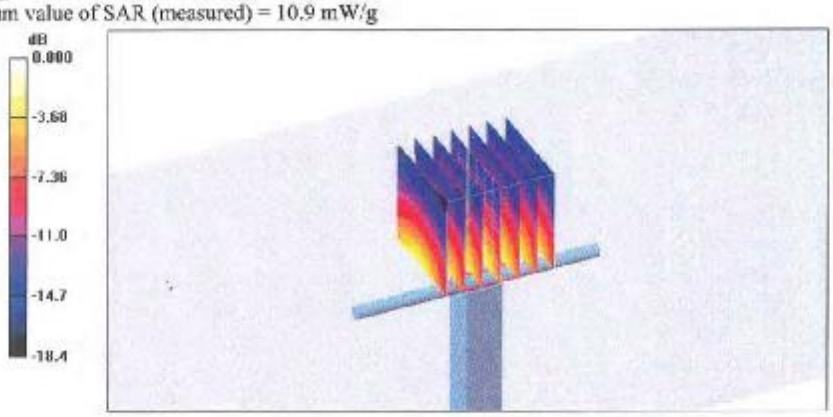
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d028

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:

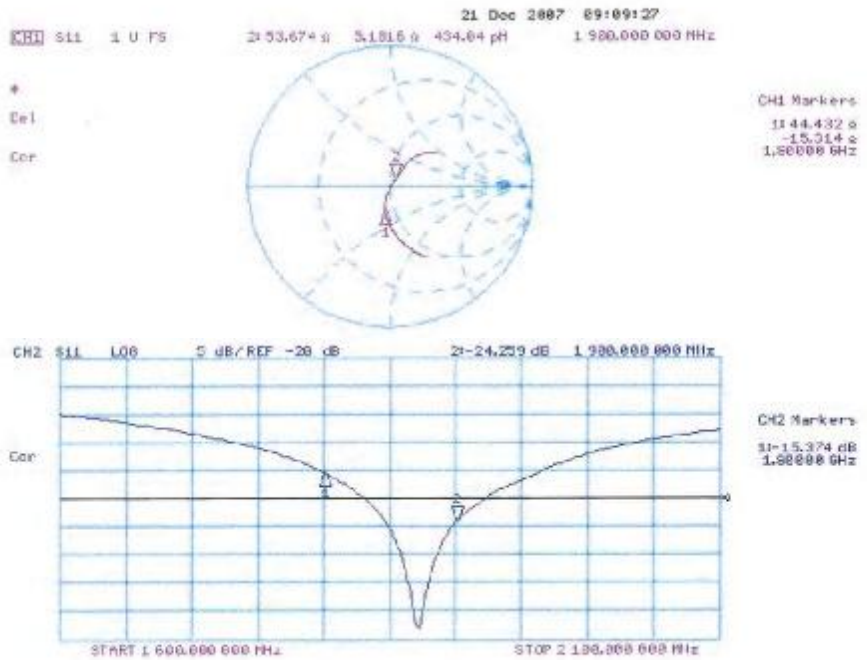
- Probe: ET3DV6 - SN1507 (HF); ConvF(4.86, 4.86, 4.86); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn501; Calibrated: 30.01.2007
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, 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

Impedance Measurement Plot for Head TSL



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

DASY4 Validation Report for Body TSL

Date/Time: 21.12.2007 11:05:06

Test Laboratory: SPEAG, Zurich, Switzerland

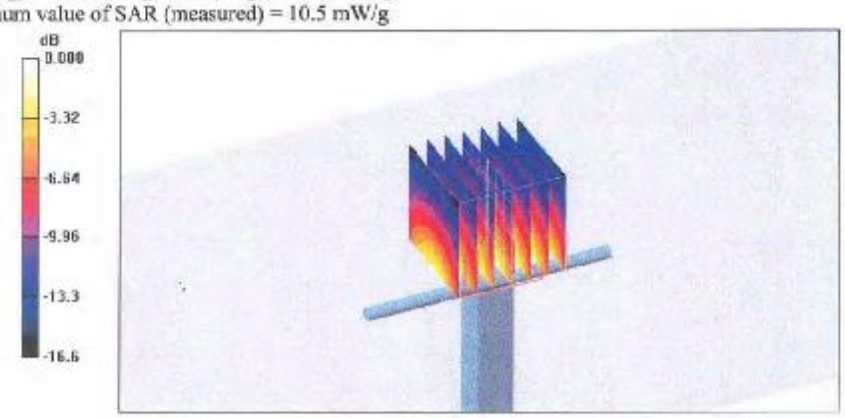
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d028

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

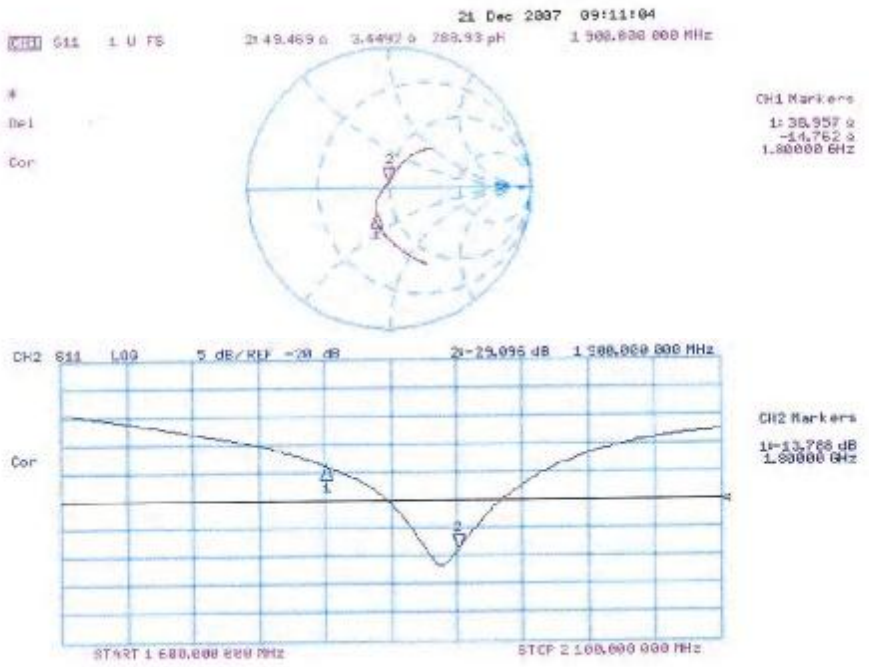
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.3 V/m; Power Drift = -0.044 dB
Peak SAR (extrapolated) = 16.0 W/kg
SAR(1 g) = 9.34 mW/g; SAR(10 g) = 4.97 mW/g
Maximum value of SAR (measured) = 10.5 mW/g



0 dB = 10.5mW/g

Certificate No: D1900V2-5d028_Dec07 Page 8 of 9

Impedance Measurement Plot for Body TSL



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

7. 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

8. 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

Schmid & Partner Engineering AG
Zeughausstrasse 43, CH-8004 Zurich
Tel. +41 1 245 97 00, Fax +41 1 245 97 79

F. Bomholt

Doc No 881 – QD 000 P40 CA – B Page 1 (1)

9. 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