

SAR TEST REPORT

Equipment Under Test :	GSM 850&PCS1900MHz MOBILE PHONE
Model No. :	C62Ba
Market name:	OT-E105a
FCC ID:	RAD038
Applicant :	T&A mobile phones
Address of Applicant :	3/F,B2 Block,Digital Technology Yard, Gaoxin Nan Qi Road,Nan Shan District, Shenzhen,Guangdong,P.R.China
Date of Receipt :	2006.04.21
Date of Test :	2006.04.26 – 2006.05.17
Date of Issue :	2006.05.22

Standards:

**FCC OET Bulletin 65 supplement C,
ANSI/IEEE C95.1, C95.3, IEEE 1528-2002**

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.

Tested by :

Roger Ruan

Date :

2006.05.22

Approved by :

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Date :

2006.05.22

Contents

1. General Information.....	5
1.1 Test Laboratory.....	5
1.2 Details of Applicant	5
1.3 Description of EUT(s).....	5
1.4 Test Environment	5
1.5 Operation Configuration	6
1.6 The SAR Measurement System.....	6
1.7 SAR System Verification	8
1.8 Tissue Simulant Fluid for the Frequency Band 850MHz and 1900MHZ	9
1.9 Test Standards and Limits	10
2. Summary of Results	11
3. Instruments List	13
4. Measurements	14
4.1LeftHandSide-Cheek-GSM850-Low	14
GSM850-LeftHandSide-Cheek-Low	14
4.2LeftHandSide-Cheek-GSM850-Middle.....	15
GSM850-LeftHandSide-Cheek-Mid.....	15
4.3LeftHandSide-Cheek-GSM850-High	17
GSM850-LeftHandSide-Cheek-High	17
4.4LeftHandSide-Tilt-GSM850-Low	19
GSM850-LeftHandSide-Tilt-Low	19
4.5LeftHandSide-Tilt-GSM850-Middle	21
GSM850-LeftHandSide-Tilt-Mid	21
4.6LeftHandSide-Tilt-GSM850-High.....	23
GSM850-LeftHandSide-Tilt-High.....	23
LeftHandSide-Cheek-GSM850-Low (Maximum Value).....	25
GSM850-LeftHandSide-Cheek-Low(conventional).....	25
4.7RightHandSide-Cheek-GSM850-Low	27
GSM850-RightHandSide-Cheek-Low	27
4.8RightHandSide-Cheek-GSM850-Middle	29
GSM850-RightHandSide-Cheek-Mid	29
4.9RightHandSide-Cheek-GSM850-High	31
GSM850-RightHandSide-Cheek-High	31

4.10RightHandSide-Tilt-GSM850-Low	33
GSM850-RightHandSide-Tilt-Low	33
4.11RightHandSide-Tilt-GSM850-Middle	35
GSM850-RightHandSide-Tilt-Mid	35
4.12RightHandSide-Tilt-GSM850-High	37
GSM850-RightHandSide-Tilt-High.....	37
RightHandSide-Cheek-GSM850-Low (Maximum Value)	39
GSM850-RightHandSide-Cheek-Low(conventional)	39
4.13Body-Worn-GSM850-Low	41
GSM850-Body-Worn-Low.....	41
4.14Body-Worn-GSM850-Middle	43
GSM850-Body-Worn-Mid	43
4.15Body-Worn-GSM850-High	45
GSM850-Body-Worn-High.....	45
Body-Worn-GSM850-Low (Maximum Value)	47
GSM850-Body-Worn-Low(conventional)	47
4.16LeftHandSide-Cheek-PCS1900-Low	49
PCS1900-LeftHandSide-Cheek-Low.....	49
4.17LeftHandSide-Cheek-PCS1900-Middle	51
PCS1900-LeftHandSide-Cheek-Mid	51
4.18LeftHandSide-Cheek-PCS1900-High	53
PCS1900-LeftHandSide-Cheek-High.....	53
4.19LeftHandSide-Tilt-PCS1900-Low	55
PCS1900-LeftHandSide-Tilt-Low	55
4.20LeftHandSide-Tilt-PCS1900-Middle	57
PCS1900-LeftHandSide-Tilt-Mid.....	57
4.21LeftHandSide-Tilt-PCS1900-High	59
PCS1900-LeftHandSide-Tilt-High	59
LeftHandSide-Tilt-PCS1900-Middle (Maximum Value)	61
PCS1900-LeftHandSide-Tilt-Mid(conventional)	61
4.22RightHandSide-Cheek-PCS1900-Low	63
PCS1900-RightHandSide-Cheek-Low	63
4.23RightHandSide-Cheek-PCS1900-Middle	65
PCS1900-RightHandSide-Cheek-Mid	65
4.24RightHandSide-Cheek-PCS1900-High	67

PCS1900-RightHandSide-Cheek-High.....	67
4.25RightHandSide-Tilt-PCS1900-Low	69
PCS1900-RightHandSide-Tilt-Low	69
4.26RightHandSide-Tilt-PCS1900-Middle	71
PCS1900-RightHandSide-Tilt-Mid	71
4.27RightHandSide-Tilt-PCS1900-High.....	73
PCS1900-RightHandSide-Tilt-High	73
RightHandSide-Cheek-PCS1900-Low (Maximum Value).....	74
PCS1900-RightHandSide-Cheek-Low(conventional)	74
4.28Body-Worn-PCS1900-Low	76
PCS1900-Body-Worn-Low	76
4.29Body-Worn-PCS1900-Middle	78
PCS1900-Body-Worn-Mid.....	78
4.30Body-Worn-PCS1900-High.....	79
PCS1900-Body-Worn-High.....	79
Body-Worn-PCS1900-Middle (Maximum Value)	81
PCS1900-Body-Worn-Mid(conventional)	81
Appendix	83
1. Photographs of Test Setup.....	83
2. Photographs of the EUT	86
3. Photographs of the battery.....	87
4. Photograph of the charger	87
5. Probe Calibration certificate.....	88
6. Uncertainty analysis	97
7. Phantom description	98
8. System validation from original equipment supplier	99

1. General Information

1.1 Test Laboratory

GSM Lab
 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 6495 3679
 Internet: <http://www.cn.sgs.com>

1.2 Details of Applicant

Name: T&A mobile phones
 Address: 3/F,B2 Block,Digital Technology Yard, Gaoxin Nan Qi
 Road,Nan Shan District, Shenzhen,Guangdong,P.R.China

1.3 Description of EUT(s)

Brand name	ALCATEL	
Model No.	C62Ba	
Market Name	OT-E105a	
Serial No.	IMEI: 01092300000034-0	
Battery Type	Lithium-Ion	
Antenna Type	Internal Antenna	
Operation Mode	GSM850/PCS1900	
Modulation Mode	GMSK	
Frequency range	GSM850	Tx: 824~849 MHz
		Rx: 869~894 MHz
	PCS1900	Tx: 1850~1910 MHz
		Rx: 1930~1990 MHz
Maximum RF Conducted Power	GSM850: 33dBm, PCS1900: 30dBm	

1.4 Test Environment

Ambient temperature: 22.0° C

Tissue Simulating Liquid: 22° C

Relative Humidity: 29%

1.5 Operation Configuration

Configuration 1: GSM 850, LeftHandSide Cheek & 15° Tilt Position

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

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

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

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

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

1.6 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 $SAR = \sigma (|E_i|^2) / \rho$ 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:

- Ÿ 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).
- Ÿ 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.
- Ÿ 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.
- Ÿ 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.

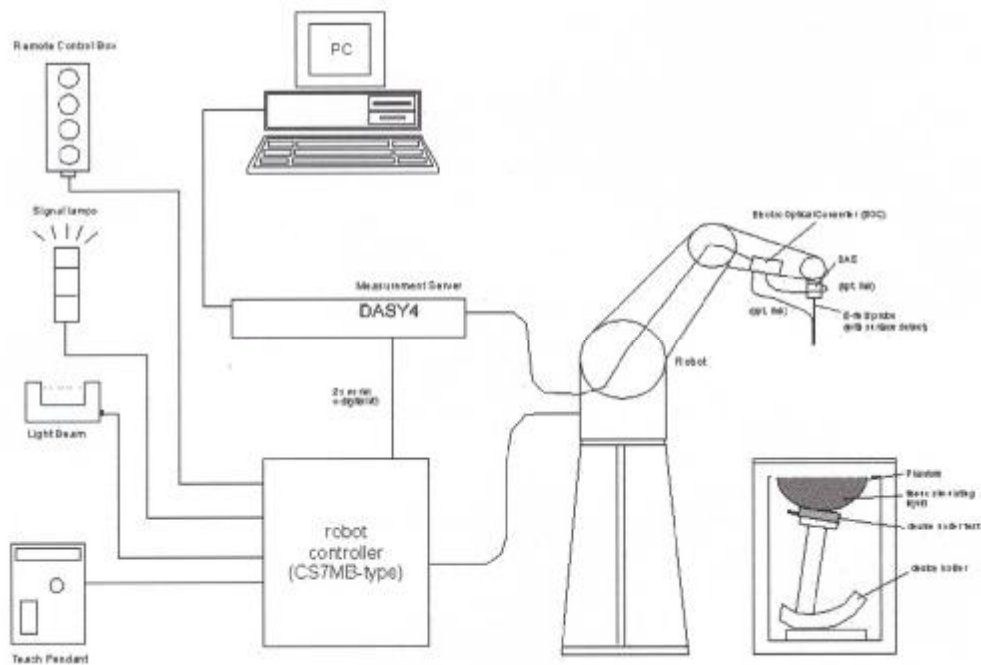


Fig. a SAR System Configuration

- 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 validate the proper functioning of the system.

1.7 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 $\pm 10\%$ from the target SAR values. These tests were done at 900MHz and 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.

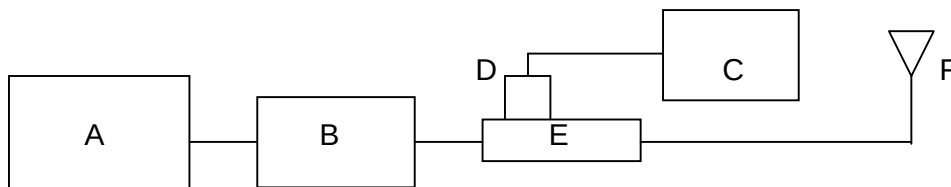


Fig. b the microwave circuit arrangement used for SAR system verification

- 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)	Target SAR 10g (250mW)	Measured SAR 1g	Measured SAR 10g	Measured Date
ES3DV3 SN3088	850 Head	2.6	1.67	2.69	1.68	2006-05-13
ES3DV3 SN3088	850 Body	2.69	1.74	2.77	1.75	2006-04-26
ES3DV3 SN3088	1900 Head	9.89	5.16	9.63	5.05	2006-05-09
ES3DV3 SN3088	1900 Body	9.81	5.22	9.62	5.14	2006-05-17

Table 1. Result System Validation

1.8 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 2. 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)
850	Head	Measured, 2006-05-13	41.67	0.877	22.5
		Recommended Limit	41.5±5%	0.97±5%	20-24
	Body	Measured, 2006-04-26	52.55	0.996	22.5
		Recommended Limit	55.0±5%	1.05±5%	20-24
1900	Head	Measured, 2006-05-09	39.53	1.443	22.3
		Recommended Limit	40.0±5%	1.40±5%	20-24
	Body	Measured, 2006-05-17	51.55	1.524	22.6
		Recommended Limit	53.3±5%	1.52±5%	20-24

Table2. Dielectric parameters for the Frequency Band 850MHz&1900MHz

1.9 Test Standards and Limits

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

Results of Fast SAR scan

Frequency Band(MHz)	EUT position	Conducted Output Power (dBm)	1g Avg. (mW/g)	Power Drift	Amb. Temp (°C)	Verdict
GSM 850	LeftHandSide Cheek, Low Channel	32.0	1.05	-0.101	22	PASS
	LeftHandSide Cheek, Mid Channel	32.0	0.877	-0.021	22	PASS
	LeftHandSide Cheek, High Channel	31.6	0.881	-0.069	22	PASS
	LeftHandSide Tilt, Low Channel	32.0	0.707	-0.072	22	PASS
	LeftHandSide Tilt, Mid Channel	32.0	0.553	-0.053	22	PASS
	LeftHandSide Tilt, High Channel	31.6	0.562	-0.021	22	PASS
	RightHandSide Cheek, Low Channel	32.0	1	0.065	22	PASS
	RightHandSide Cheek, Mid Channel	32.0	0.855	0.002	22	PASS
	RightHandSide Cheek, High Channel	31.6	0.843	0.058	22	PASS
	RightHandSide Tilt, Low Channel	32.0	0.670	0.018	22	PASS
	RightHandSide Tilt, Mid Channel	32.0	0.537	0.017	22	PASS
	RightHandSide Tilt, High Channel	31.6	0.546	-0.038	22	PASS
GSM 850	BodyWorn, Low Channel	32.0	0.613	-0.013	22	PASS
	BodyWorn, Mid Channel	32.0	0.587	0.033	22	PASS
	BodyWorn, High Channel	31.6	0.562	-0.019	22	PASS
PCS 1900	LeftHandSide Cheek, Low Channel	28.6	0.450	-0.050	22	PASS
	LeftHandSide Cheek, Mid Channel	29.1	0.449	0.052	22	PASS
	LeftHandSide Cheek, High Channel	29.2	0.311	0.053	22	PASS
	LeftHandSide Tilt, Low Channel	28.6	0.505	-0.052	22	PASS
	LeftHandSide Tilt, Mid Channel	29.1	0.513	-0.012	22	PASS
	LeftHandSide Tilt, High Channel	29.2	0.350	0.025	22	PASS
	RightHandSide Cheek, Low Channel	28.6	0.601	0.247	22	PASS

	RightHandSide Cheek, Mid Channel	29.1	0.531	0.291	22	PASS
	RightHandSide Cheek, High Channel	29.2	0.372	0.030	22	PASS
	RightHandSide Tilt, Low Channel	28.6	0.601	-0.048	22	PASS
	RightHandSide Tilt, Mid Channel	29.1	0.563	0.059	22	PASS
	RightHandSide Tilt, High Channel	29.2	0.391	0.048	22	PASS
PCS 1900	BodyWorn, Low Channel	28.6	0.372	0.001	22	PASS
	BodyWorn, Mid Channel	29.1	0.420	0.018	22	PASS
	BodyWorn, High Channel	29.2	0.340	-0.021	22	PASS

Maximum Values of 1g SAR

Frequency Band(MHz)	EUT position	Conducted Output Power (dBm)	1g Average (W/Kg)	Power Drift (dB)	Amb. Temp (°C)	Verdict
850	LeftHandSide Cheek, Low Channel	32.0	1.01	-0.002	22	PASS
	RightHandSide Cheek, Low Channel	32.0	1	-0.124	22	PASS
	BodyWorn, Low Channel	32.0	0.620	0.000	22	PASS
1900	LeftHandSide Tilt, Mid Channel	29.1	0.519	-0.020	22	PASS
	RightHandSide Cheek ,Low Channel	28.6	0.657	-0.028	22	PASS
	BodyWorn, Mid Channel	29.1	0.421	0.003	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 the Bodyworn measurements the sample was only placed with the antenna toward the phantom since this position delivers the highest SAR values.
4. For the Bodyworn measurements, the distance from the sample to the phantom is 1.5 cm.

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 4.6 build 23	N/A	GSM-SAR-001	N/A
Probe	ES3DV3	3088	GSM-SAR-034	2005.09.13
DAE	DAE3	569	GSM-SAR-023	2005.11.17
Phantom	SAM 12	TP-1283	GSM-SAR-005	N/A
Robot	RX90L	F03/5V32A1/A01	GSM-SAR-008	N/A
900MHz system validation dipole	D900V2	184	GSM-SAR-013	2005.8.22
1900MHz system validation dipole	D1900V2	5d028	GSM-SAR-020	2005.8.25
Dielectric probe kit	85070D	US01440168	GSM-SAR-016	2005.12.19
Agilent network analyzer	E5071B	MY42100549	GSM-SAR-007	2005.12.19
Agilent signal generator	E4438	14438CATO-19719	GSM-SAR-008	2005.12.19
Mini-Circuits preamplifier	ZHL-42	D041905	GSM-SAR-033	2005.05.20
Agilent power meter	E4416A	GB41292095	GSM-SAR-010	2005.12.19
Agilent power sensor	8481H	MY41091234	GSM-SAR-011	2005.12.19
HT CP6100 20N Coupling	6100	SCP301480120	GSM-SAR-012	2005.12.19
R&S Universal radio communication tester	CMU200	103633	GSM-AUD-002	2005.12.20

4. Measurements

4.1 LeftHandSide-Cheek-GSM850-Low

Date/Time: 2006-5-13 14:53:47

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-Cheek-Low

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.866$ mho/m; $\epsilon_r = 41.8$;
 $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

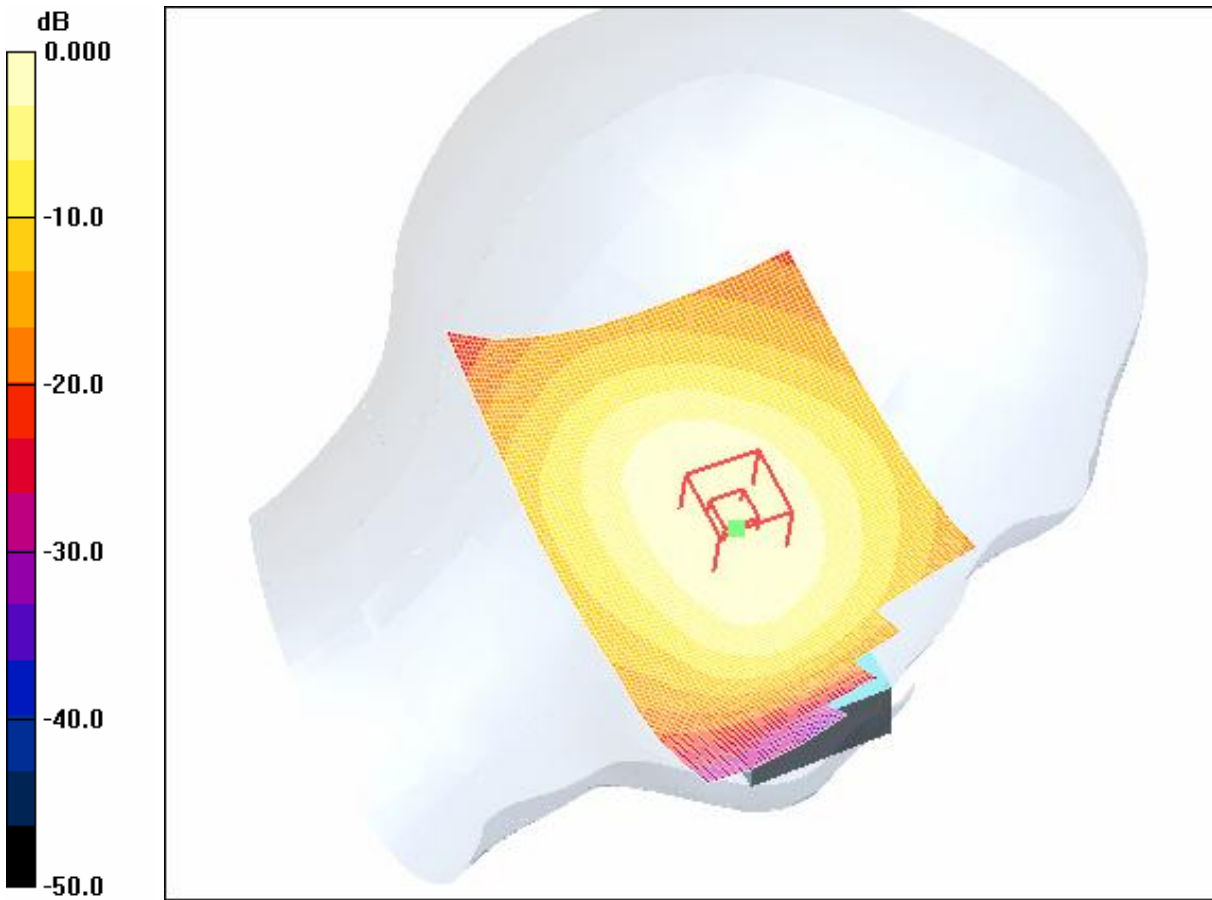
Cheek Position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 31.3 V/m; Power Drift = -0.101 dB

Motorola Fast SAR: SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.732 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.10 mW/g



0 dB = 1.10mW/g

4.2LeftHandSide-Cheek-GSM850-Middle

Date/Time: 2006-5-13 15:04:55

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-Cheek-Mid

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.878$ mho/m; $\epsilon_r = 41.7$;
 $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

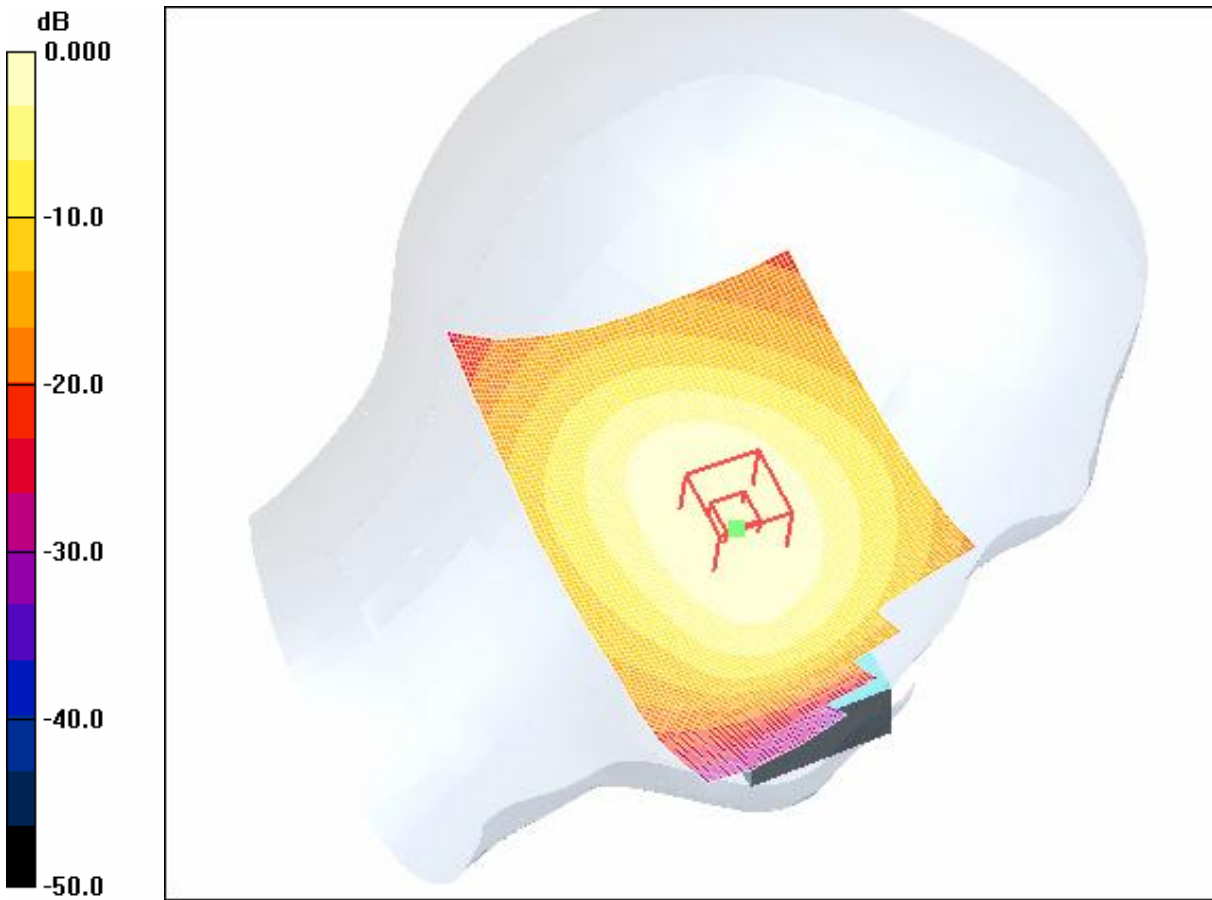
Cheek Position - Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 28.2 V/m; Power Drift = -0.021 dB

Motorola Fast SAR: SAR(1 g) = 0.877 mW/g; SAR(10 g) = 0.611 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.927 mW/g



0 dB = 0.927mW/g

4.3LeftHandSide-Cheek-GSM850-High

Date/Time: 2006-5-13 15:16:02

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-Cheek-High

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.89 \text{ mho/m}$; $\epsilon_r = 41.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

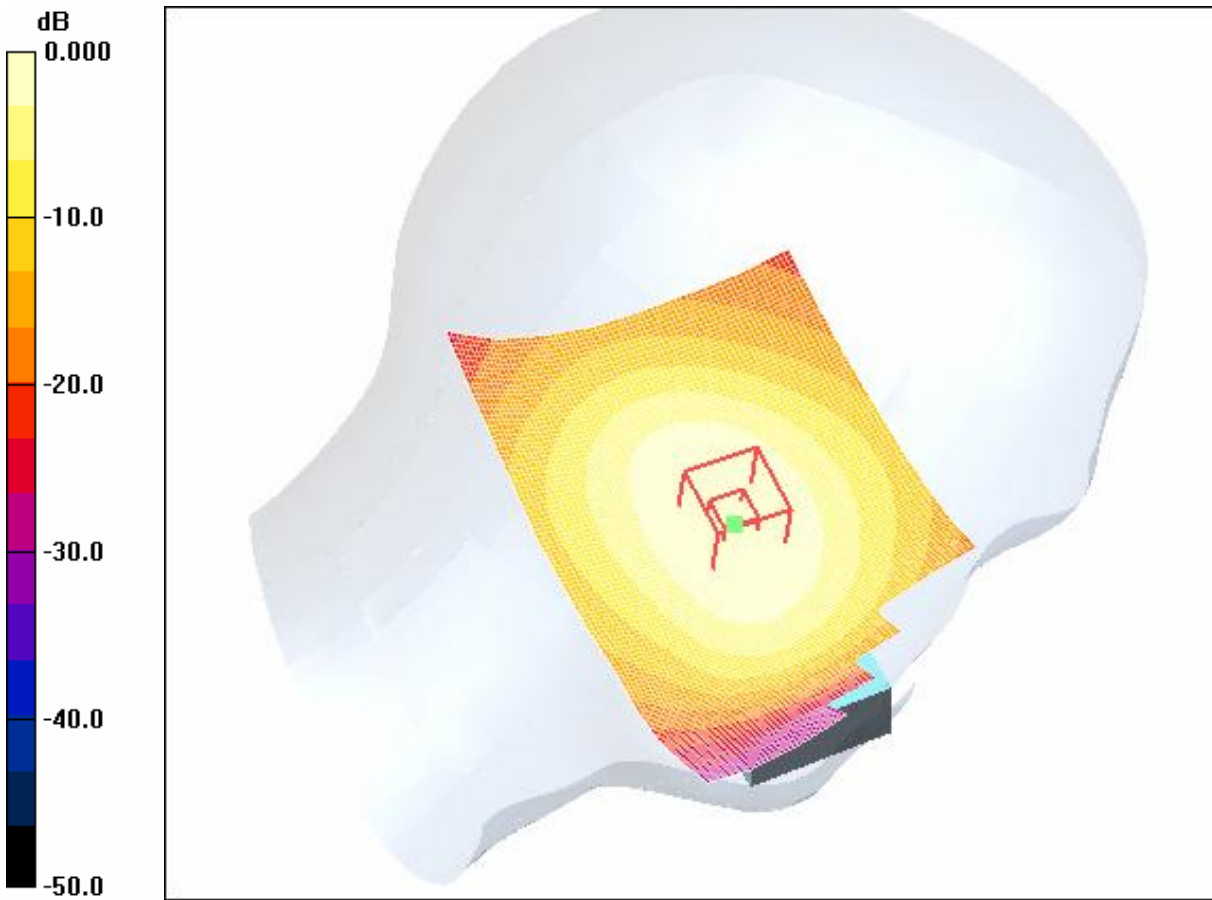
- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek Position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 28.0 V/m; Power Drift = -0.069 dB

Motorola Fast SAR: SAR(1 g) = 0.881 mW/g; SAR(10 g) = 0.612 mW/g

Maximum value of SAR (interpolated) = 0.929 mW/g



0 dB = 0.929mW/g

4.4LeftHandSide-Tilt-GSM850-Low

Date/Time: 2006-5-13 15:35:07

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-Tilt-Low

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.866$ mho/m; $\epsilon_r = 41.8$;
 $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

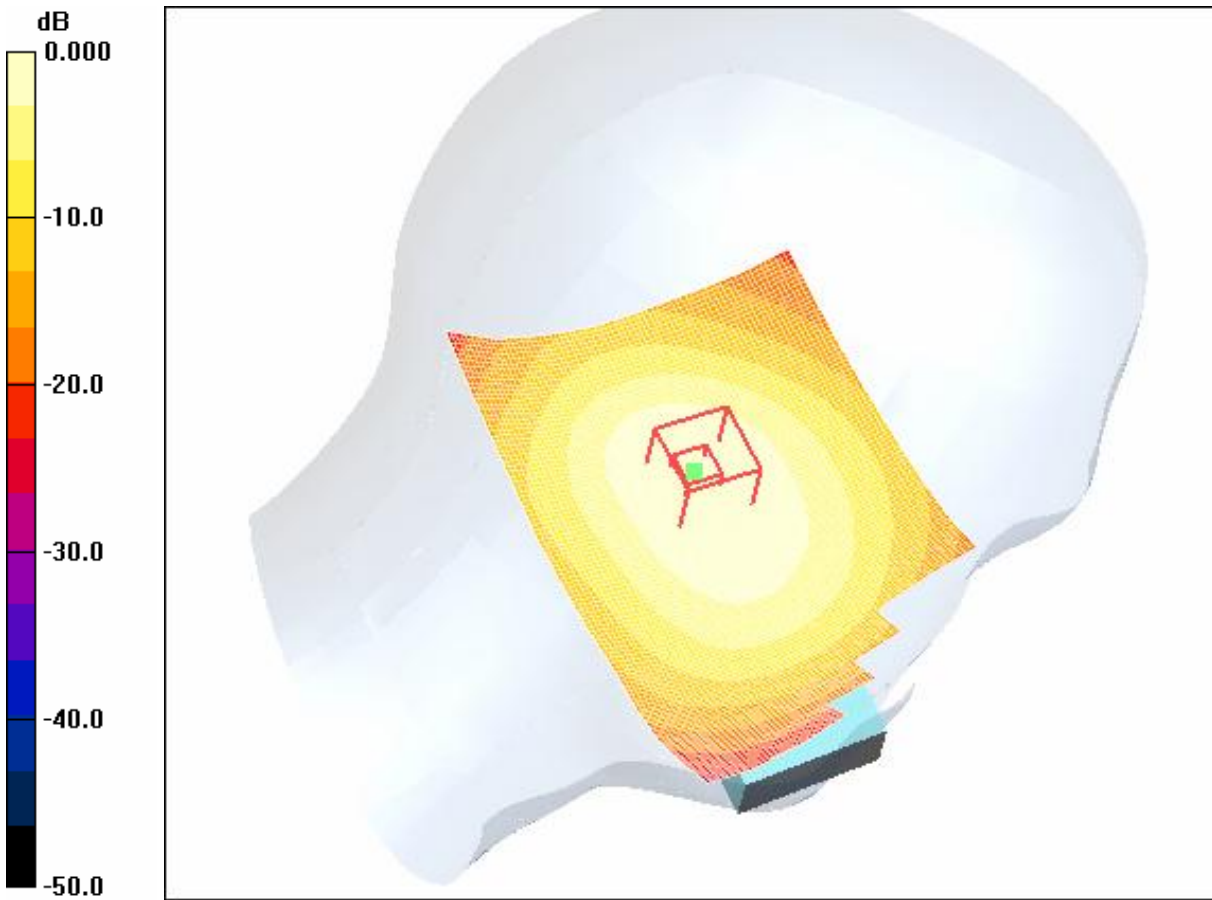
Tilt Position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 28.8 V/m; Power Drift = -0.072 dB

Motorola Fast SAR: SAR(1 g) = 0.707 mW/g; SAR(10 g) = 0.491 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.757 mW/g



0 dB = 0.757mW/g

4.5LeftHandSide-Tilt-GSM850-Middle

Date/Time: 2006-5-13 15:46:48

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-Tilt-Mid

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.878$ mho/m; $\epsilon_r = 41.7$;
 $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

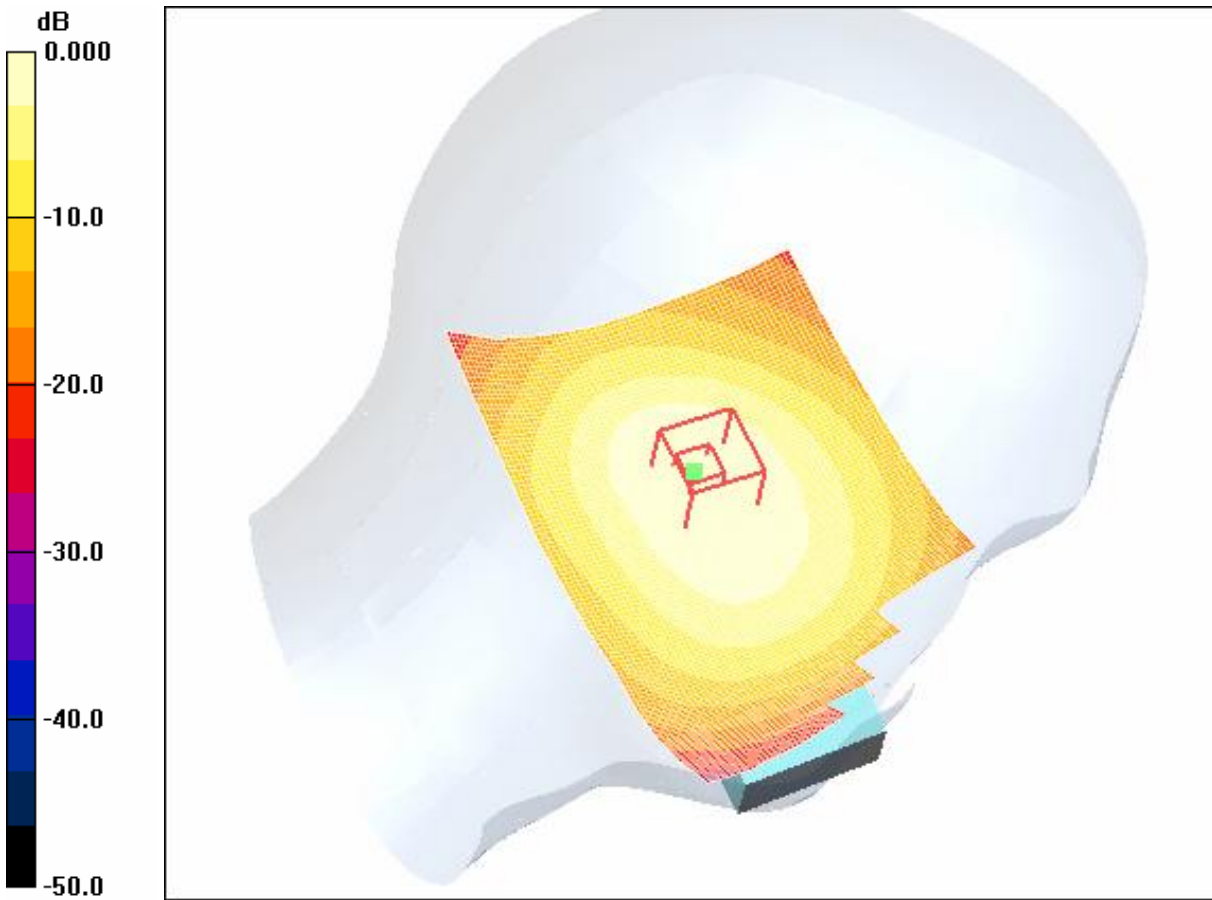
Tilt Position - Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 25.1 V/m; Power Drift = -0.053 dB

Motorola Fast SAR: SAR(1 g) = 0.553 mW/g; SAR(10 g) = 0.383 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.592 mW/g



0 dB = 0.592mW/g

4.6LeftHandSide-Tilt-GSM850-High

Date/Time: 2006-5-13 15:59:51

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-Tilt-High

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.89 \text{ mho/m}$; $\epsilon_r = 41.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

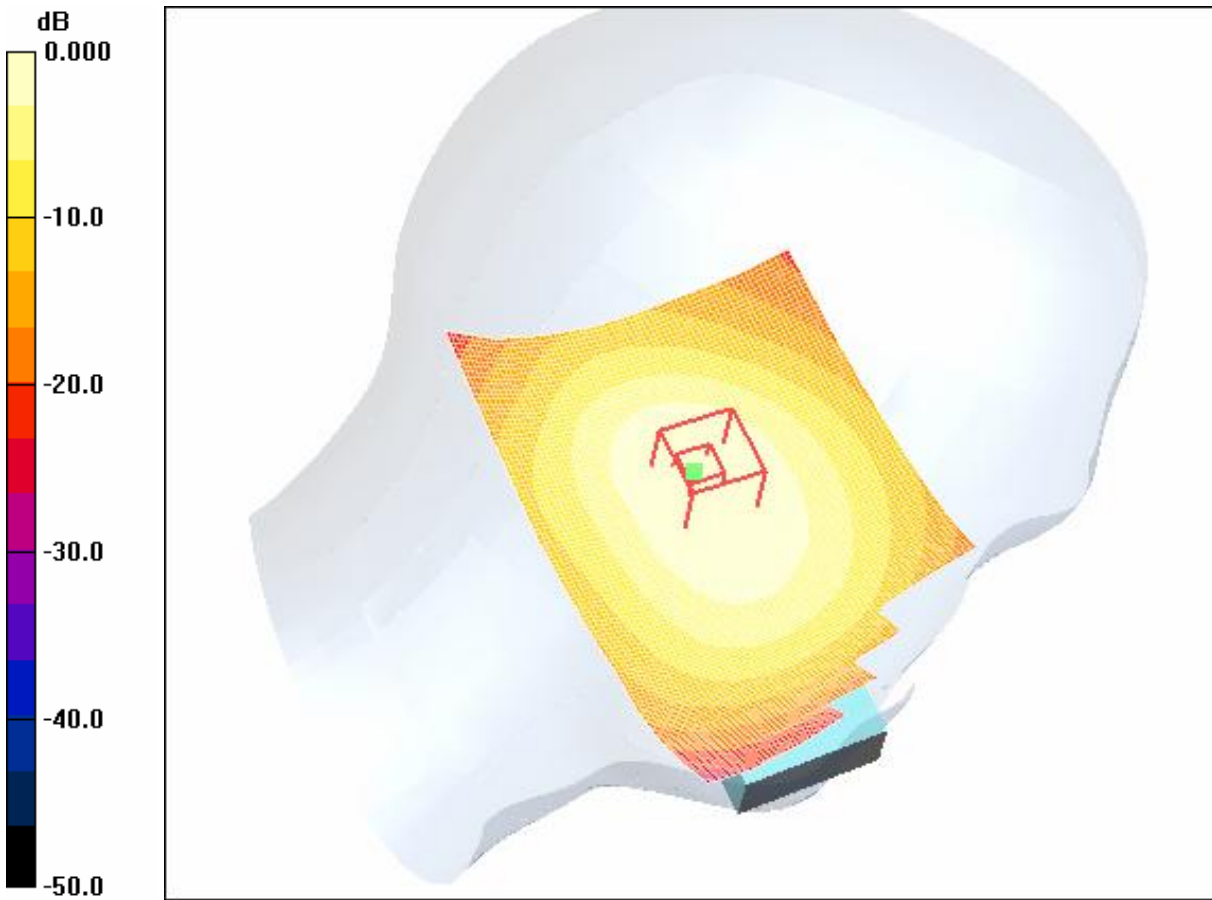
- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Tilt Position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 25.2 V/m; Power Drift = -0.021 dB

Motorola Fast SAR: SAR(1 g) = 0.562 mW/g; SAR(10 g) = 0.388 mW/g

Maximum value of SAR (interpolated) = 0.601 mW/g



0 dB = 0.601mW/g

LeftHandSide-Cheek-GSM850-Low (Maximum Value)

Date/Time: 2006-5-13 16:19:59

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-Cheek-Low(conventional)

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.866$ mho/m; $\epsilon_r = 41.8$;
 $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Maximum Position - Traditional Method/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.10 mW/g

Maximum Position - Traditional Method/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

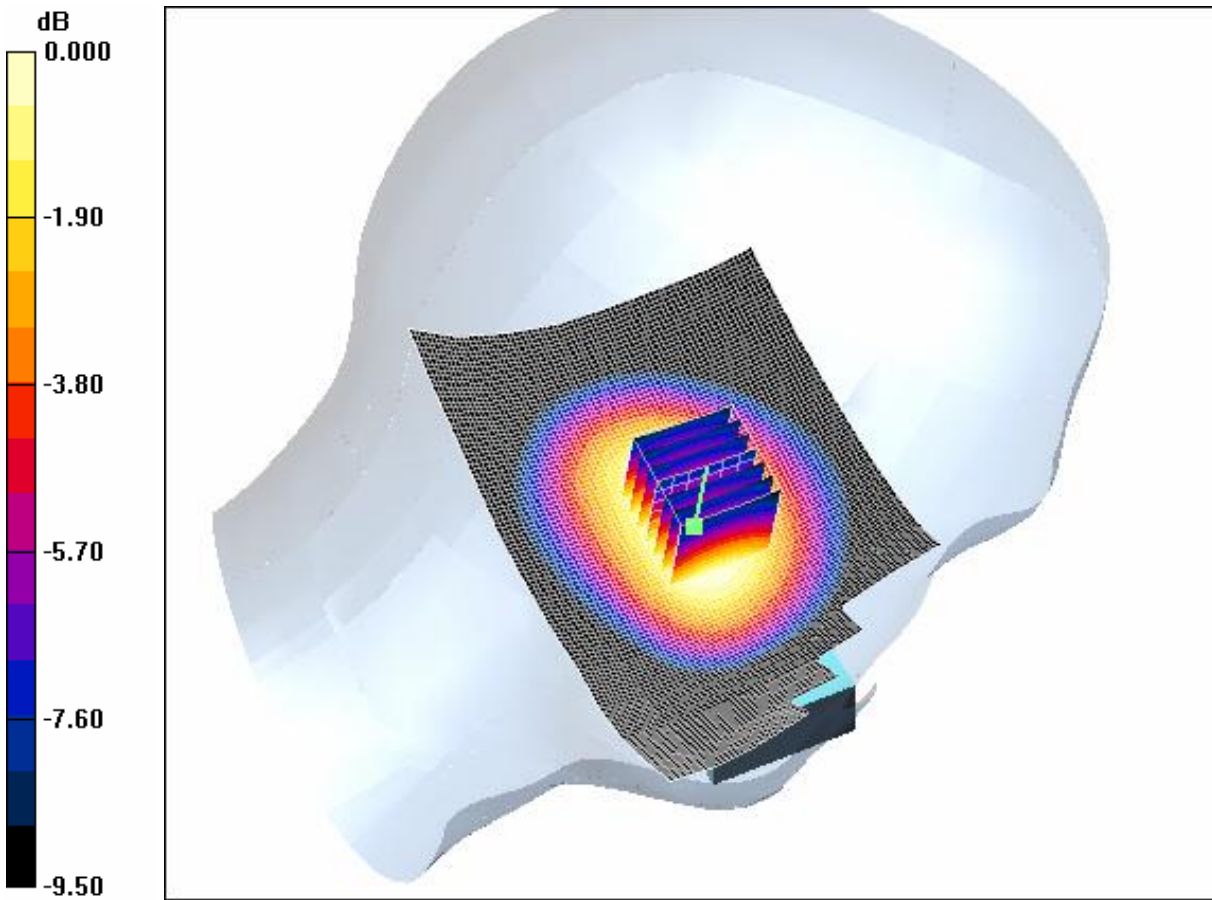
Reference Value = 30.9 V/m; Power Drift = -0.002 dB

Peak SAR (extrapolated) = 1.34 W/kg

SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.725 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.07 mW/g



0 dB = 1.07mW/g

4.7RightHandSide-Cheek-GSM850-Low

Date/Time: 2006-5-13 12:51:41

Test Laboratory: SGS-GSM

GSM850-RightHandSide-Cheek-Low

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.866$ mho/m; $\epsilon_r = 41.8$;

$\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek Position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 32.0 V/m; Power Drift = 0.065 dB

Motorola Fast SAR: SAR(1 g) = 1 mW/g; SAR(10 g) = 0.696 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.06 mW/g



0 dB = 1.06mW/g

4.8RightHandSide-Cheek-GSM850-Middle

Date/Time: 2006-5-13 13:03:05

Test Laboratory: SGS-GSM

GSM850-RightHandSide-Cheek-Mid

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.878$ mho/m; $\epsilon_r = 41.7$;
 $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek Position - Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 29.5 V/m; Power Drift = 0.002 dB

Motorola Fast SAR: SAR(1 g) = 0.855 mW/g; SAR(10 g) = 0.592 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.913 mW/g



0 dB = 0.913mW/g

4.9RightHandSide-Cheek-GSM850-High

Date/Time: 2006-5-13 13:17:42

Test Laboratory: SGS-GSM

GSM850-RightHandSide-Cheek-High

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.89 \text{ mho/m}$; $\epsilon_r = 41.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek Position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 29.0 V/m; Power Drift = 0.058 dB

Motorola Fast SAR: SAR(1 g) = 0.843 mW/g; SAR(10 g) = 0.582 mW/g

Maximum value of SAR (interpolated) = 0.900 mW/g



0 dB = 0.900mW/g

4.10RightHandSide-Tilt-GSM850-Low

Date/Time: 2006-5-13 13:31:23

Test Laboratory: SGS-GSM

GSM850-RightHandSide-Tilt-Low

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.866$ mho/m; $\epsilon_r = 41.8$;
 $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

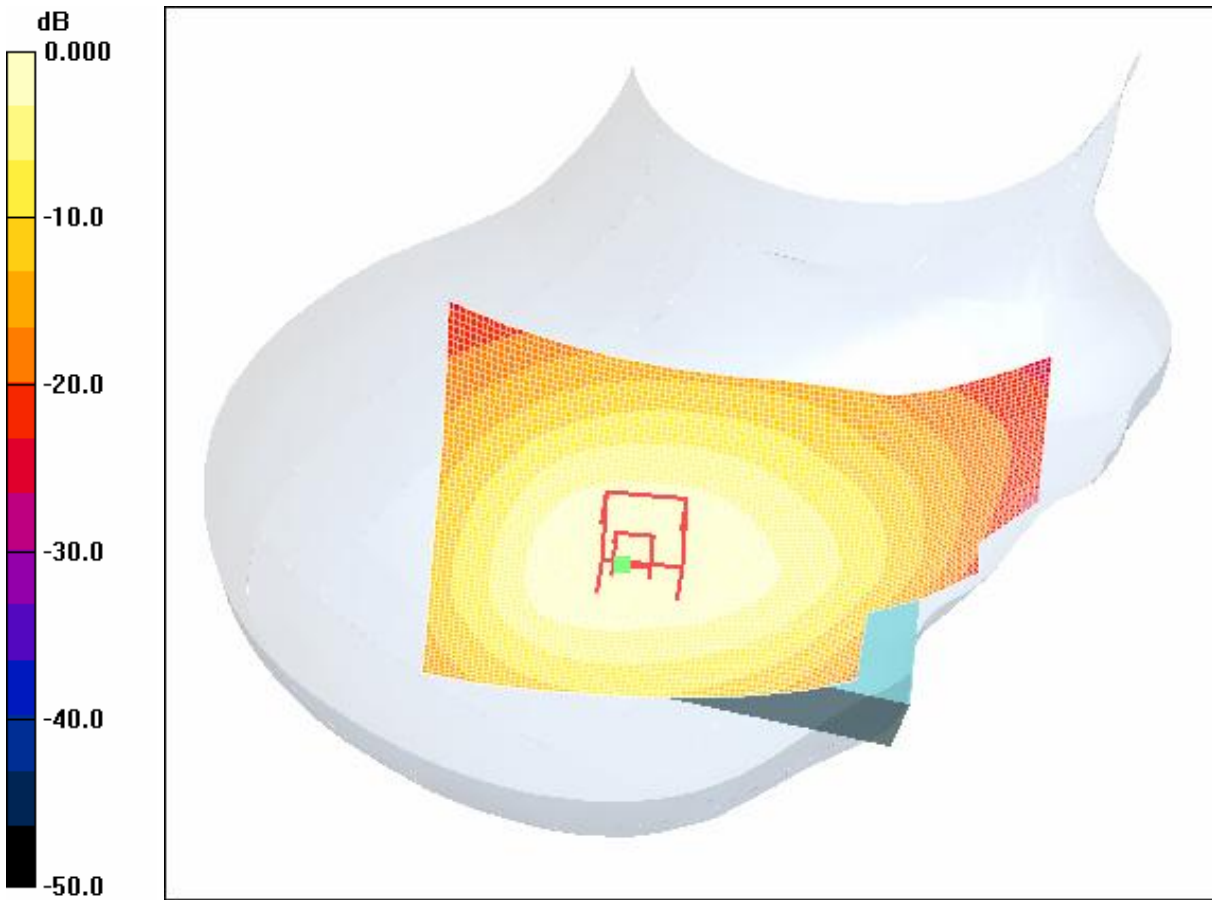
Tilt position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 28.3 V/m; Power Drift = 0.018 dB

Motorola Fast SAR: SAR(1 g) = 0.670 mW/g; SAR(10 g) = 0.462 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.718 mW/g



0 dB = 0.718mW/g

4.11RightHandSide-Tilt-GSM850-Middle

Date/Time: 2006-5-13 13:42:54

Test Laboratory: SGS-GSM

GSM850-RightHandSide-Tilt-Mid

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.878$ mho/m; $\epsilon_r = 41.7$;
 $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

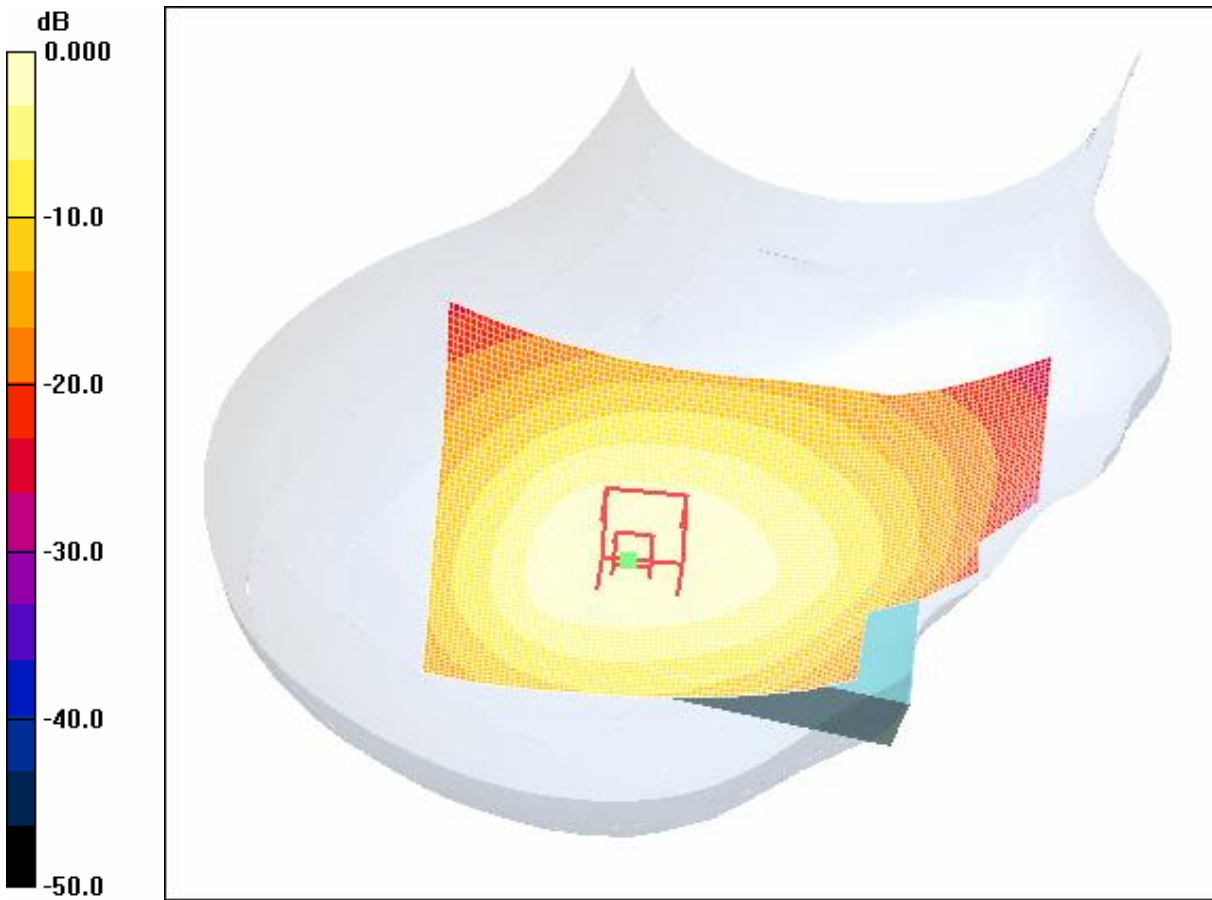
Tilt position -Middle/Area Scan (71x111x1); Measurement grid: dx=15mm, dy=15mm

Reference Value = 25.2 V/m; Power Drift = 0.017 dB

Motorola Fast SAR: SAR(1 g) = 0.537 mW/g; SAR(10 g) = 0.369 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.575 mW/g



0 dB = 0.575mW/g

4.12 RightHandSide-Tilt-GSM850-High

Date/Time: 2006-5-13 13:55:19

Test Laboratory: SGS-GSM

GSM850-RightHandSide-Tilt-High

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.89 \text{ mho/m}$; $\epsilon_r = 41.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

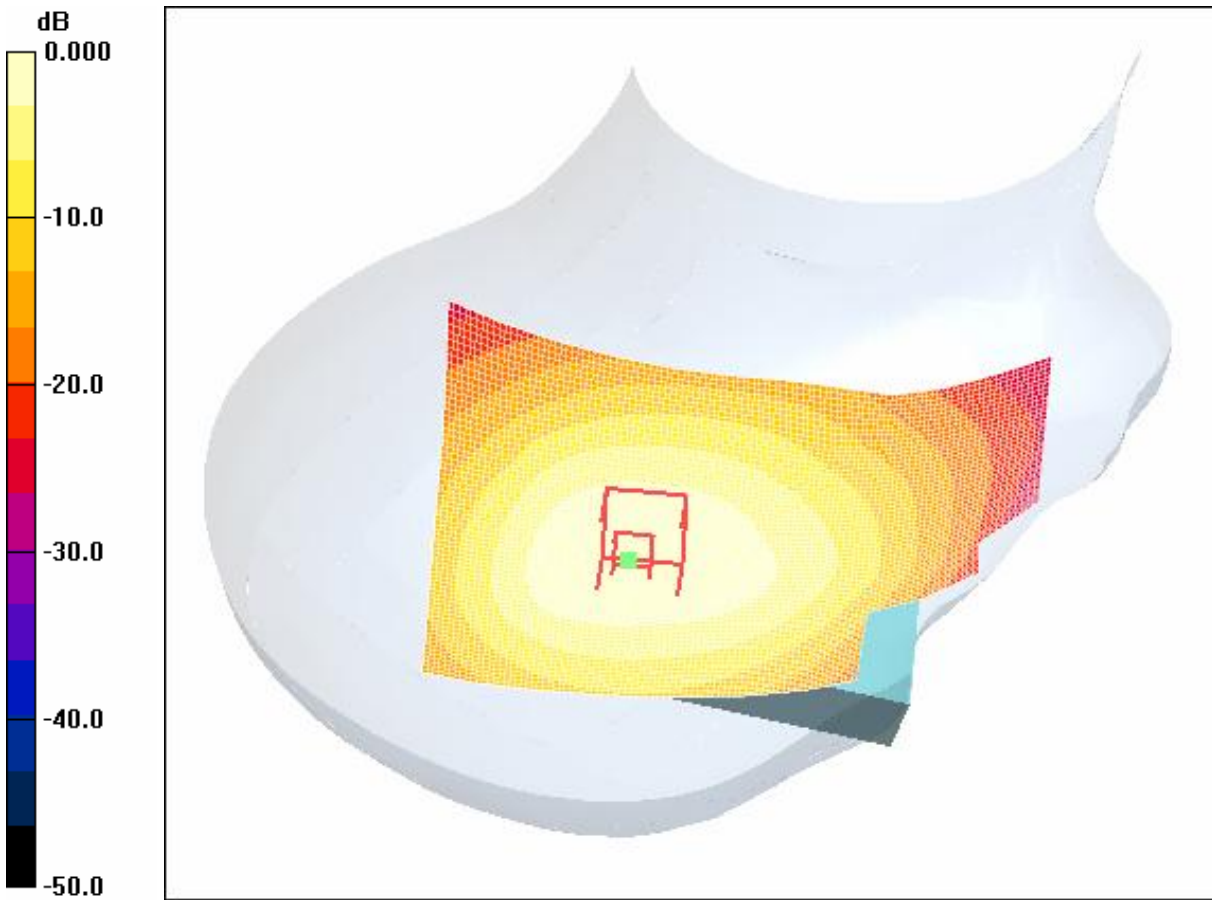
- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Tilt position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 25.1 V/m; Power Drift = -0.038 dB

Motorola Fast SAR: SAR(1 g) = 0.546 mW/g; SAR(10 g) = 0.374 mW/g

Maximum value of SAR (interpolated) = 0.586 mW/g



0 dB = 0.586mW/g

RightHandSide-Cheek-GSM850-Low (Maximum Value)

Date/Time: 2006-5-13 14:20:17

Test Laboratory: SGS-GSM

GSM850-RightHandSide-Cheek-Low(conventional)

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL850 Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.866$ mho/m; $\epsilon_r = 41.8$;

$\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.91, 5.91, 5.91); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Maximum Position - Traditional Method/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.11 mW/g

Maximum Position - Traditional Method/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

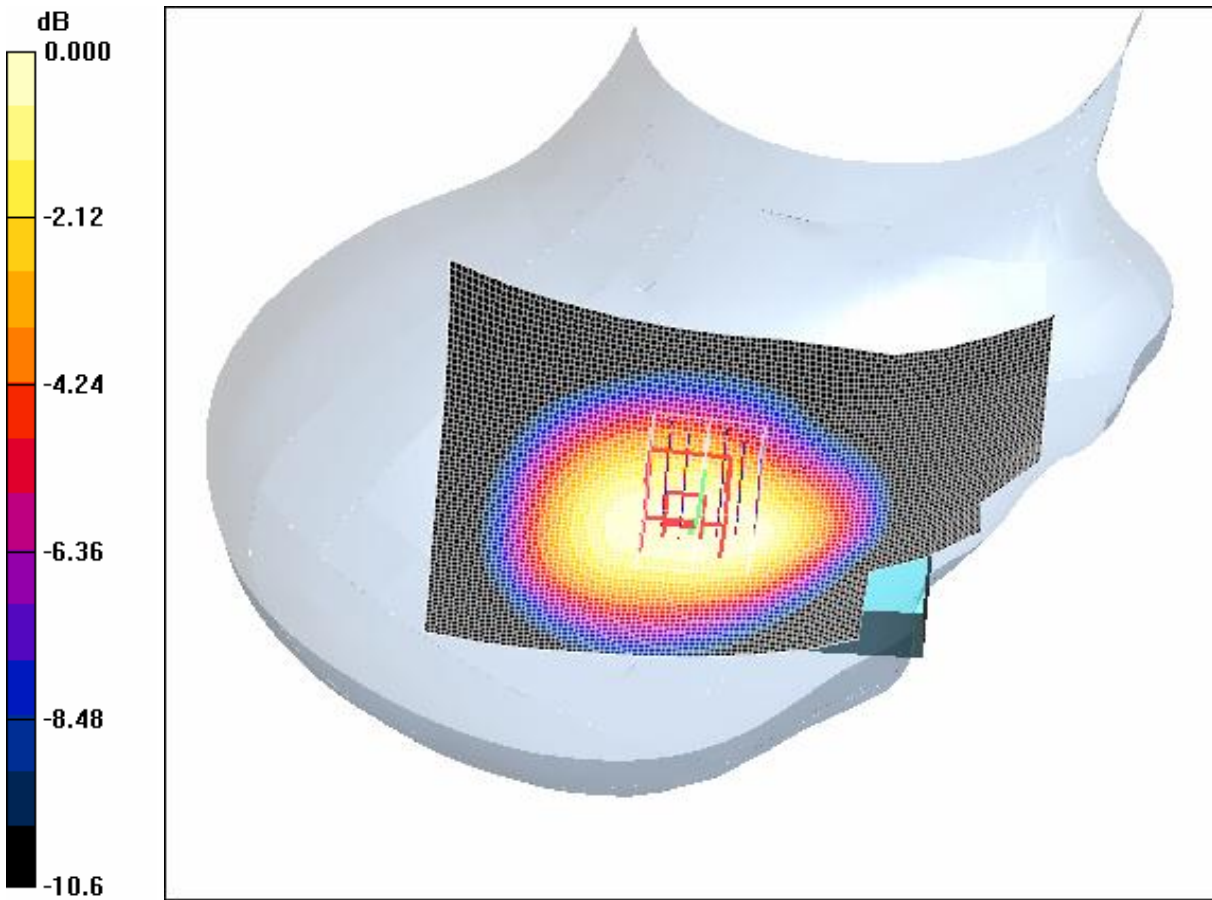
Reference Value = 32.8 V/m; Power Drift = -0.124 dB

Peak SAR (extrapolated) = 1.33 W/kg

SAR(1 g) = 1 mW/g; SAR(10 g) = 0.714 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.06 mW/g



0 dB = 1.06mW/g

4.13Body-Worn-GSM850-Low

Date/Time: 2006-4-26 11:20:24

Test Laboratory: SGS-GSM

GSM850-Body-Worn-Low

DUT: GSM60055D; Type: Body; Serial: 01092300000034-0

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

Medium: HSL850-Body Medium parameters used: $f = 824.2$ MHz; $\sigma = 0.984$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

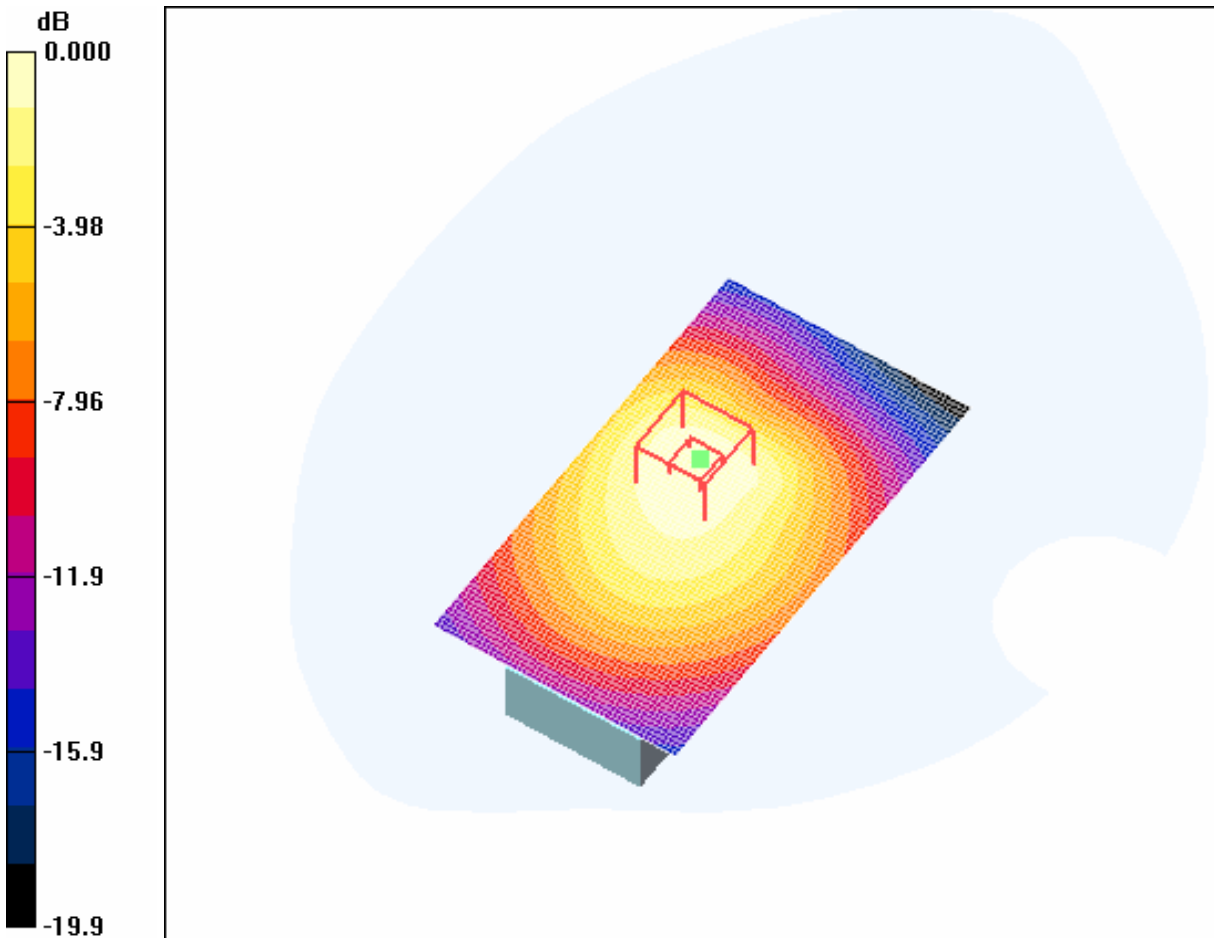
- Probe: ES3DV3 - SN3088; ConvF(5.83, 5.83, 5.83); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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

Reference Value = 15.4 V/m; Power Drift = -0.013 dB

Motorola Fast SAR: SAR(1 g) = 0.613 mW/g; SAR(10 g) = 0.424 mW/g

Maximum value of SAR (interpolated) = 0.659 mW/g



0 dB = 0.659mW/g

4.14 Body-Worn-GSM850-Middle

Date/Time: 2006-4-26 11:27:53

Test Laboratory: SGS-GSM

GSM850-Body-Worn-Mid

DUT: GSM60055D; Type: Body; Serial: 01092300000034-0

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

Medium: HSL850-Body Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.998$ mho/m; $\epsilon_r = 52.5$; $\rho =$

1000 kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

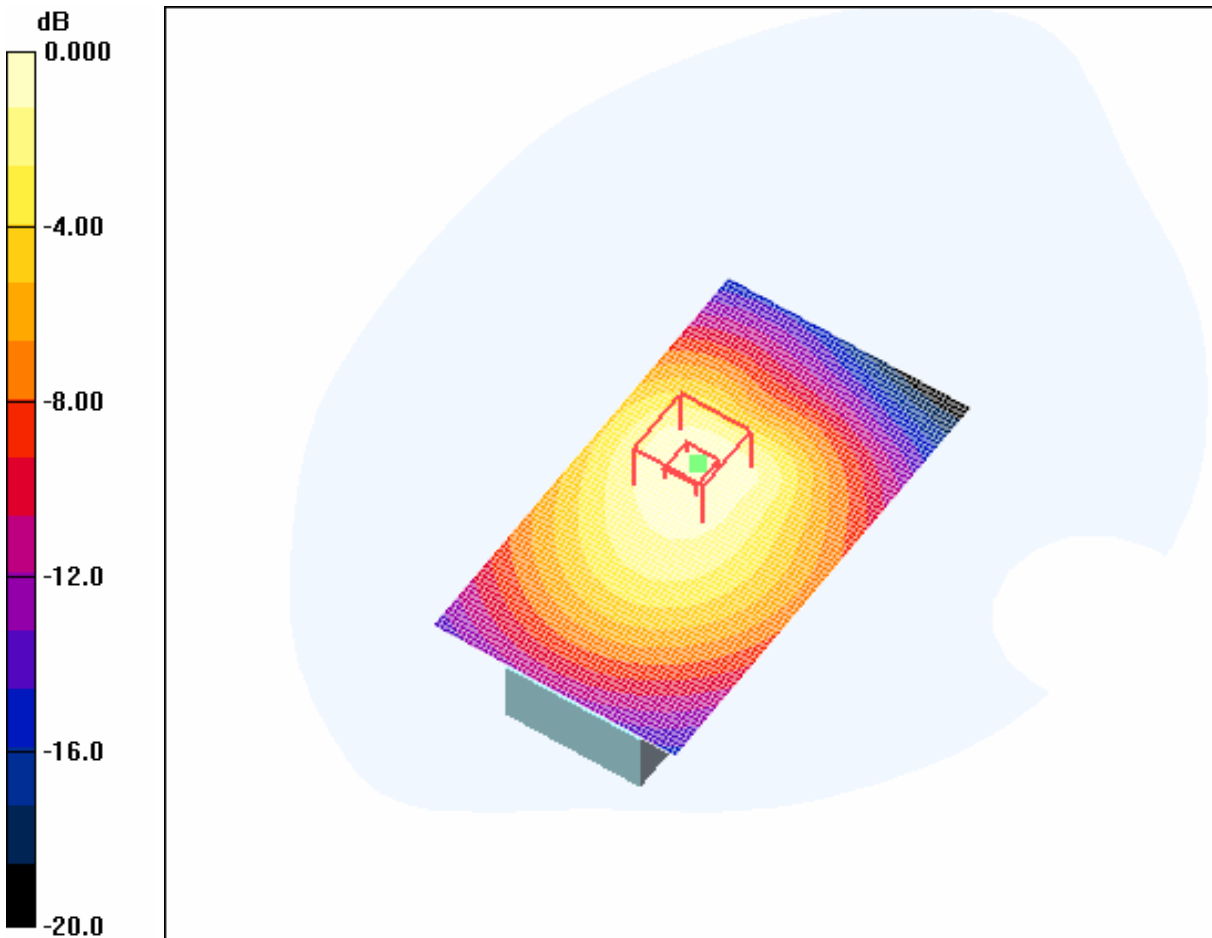
- Probe: ES3DV3 - SN3088; ConvF(5.83, 5.83, 5.83); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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

Reference Value = 14.7 V/m; Power Drift = 0.033 dB

Motorola Fast SAR: SAR(1 g) = 0.587 mW/g; SAR(10 g) = 0.404 mW/g

Maximum value of SAR (interpolated) = 0.625 mW/g



0 dB = 0.625mW/g

4.15Body-Worn-GSM850-High

Date/Time: 2006-4-26 11:56:32

Test Laboratory: SGS-GSM

GSM850-Body-Worn-High

DUT: GSM60055D; Type: Body; Serial: 01092300000034-0

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

Medium: HSL850-Body Medium parameters used: $f = 848.8$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 52.5$; $\rho =$

1000 kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

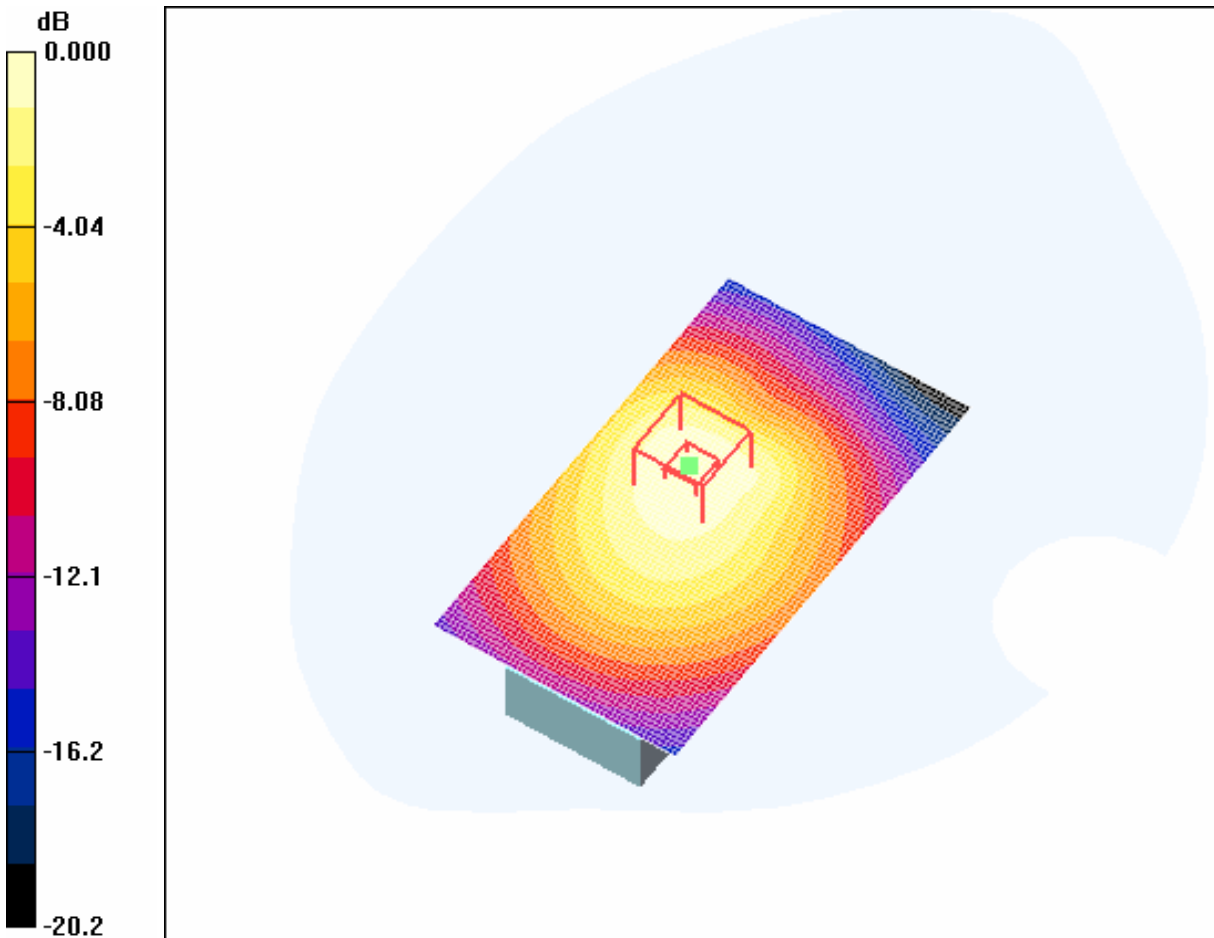
- Probe: ES3DV3 - SN3088; ConvF(5.83, 5.83, 5.83); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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

Reference Value = 14.2 V/m; Power Drift = -0.019 dB

Motorola Fast SAR: SAR(1 g) = 0.562 mW/g; SAR(10 g) = 0.387 mW/g

Maximum value of SAR (interpolated) = 0.598 mW/g



0 dB = 0.598mW/g

Body-Worn-GSM850-Low (Maximum Value)

Date/Time: 2006-4-26 12:09:51

Test Laboratory: SGS-GSM

GSM850-Body-Worn-Low(conventional)

DUT: GSM60055D; Type: Body; Serial: 01092300000034-0

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

Medium: HSL850-Body Medium parameters used: $f = 824.2$ MHz; $\sigma = 0.984$ mho/m; $\epsilon_r = 52.6$; $\rho =$

1000 kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.83, 5.83, 5.83); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Maximum Position - Tadtional Method/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.648 mW/g

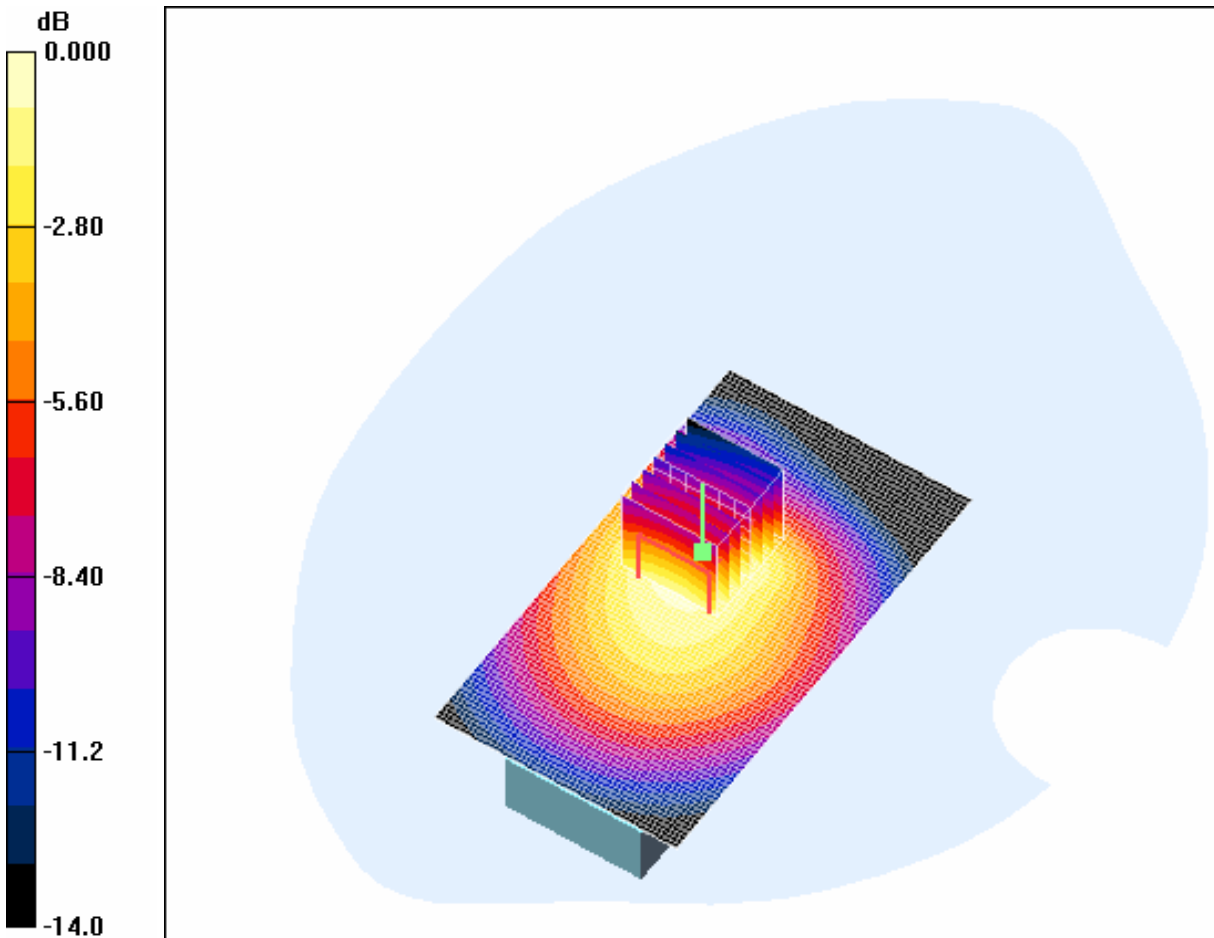
Maximum Position - Tadtional Method/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 15.3 V/m; Power Drift = 0.000 dB

Peak SAR (extrapolated) = 0.910 W/kg

SAR(1 g) = 0.620 mW/g; SAR(10 g) = 0.416 mW/g

Maximum value of SAR (measured) = 0.666 mW/g



0 dB = 0.666mW/g

4.16LeftHandSide-Cheek-PCS1900-Low

Date/Time: 2006-5-9 10:08:13

Test Laboratory: SGS-GSM

PCS1900-LeftHandSide-Cheek-Low

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1850.2 \text{ MHz}$; $\sigma = 1.41 \text{ mho/m}$; $\epsilon_r =$

39.7; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

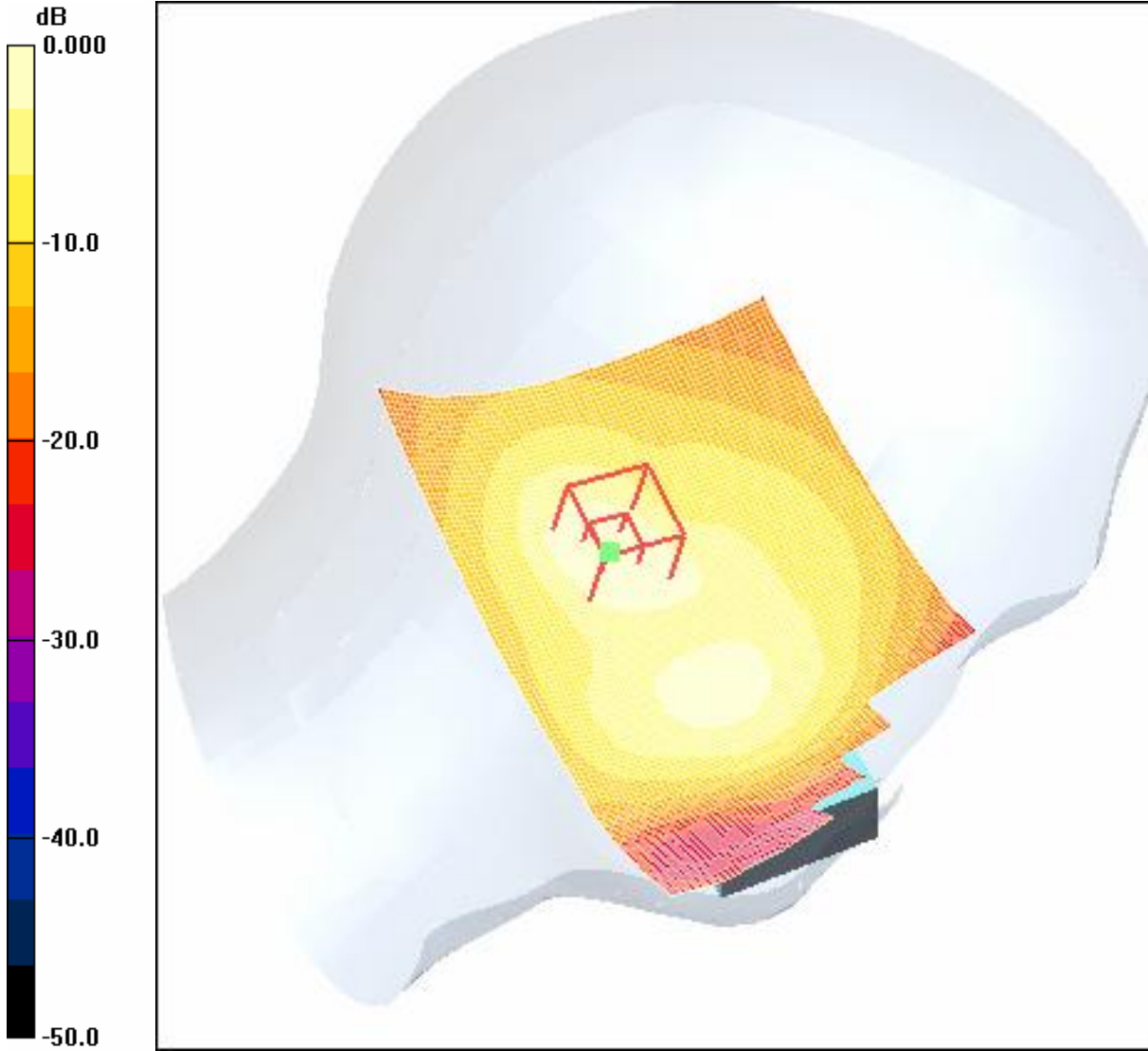
- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek Position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 15.4 V/m; Power Drift = -0.050 dB

Motorola Fast SAR: SAR(1 g) = 0.450 mW/g; SAR(10 g) = 0.248 mW/g

Maximum value of SAR (interpolated) = 0.534 mW/g



0 dB = 0.534mW/g

4.17LeftHandSide-Cheek-PCS1900-Middle

Date/Time: 2006-5-9 10:24:41

Test Laboratory: SGS-GSM

PCS1900-LeftHandSide-Cheek-Mid

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.44 \text{ mho/m}$; $\epsilon_r = 39.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DASYS4 (High Precision Assessment)

DASYS4 Configuration:

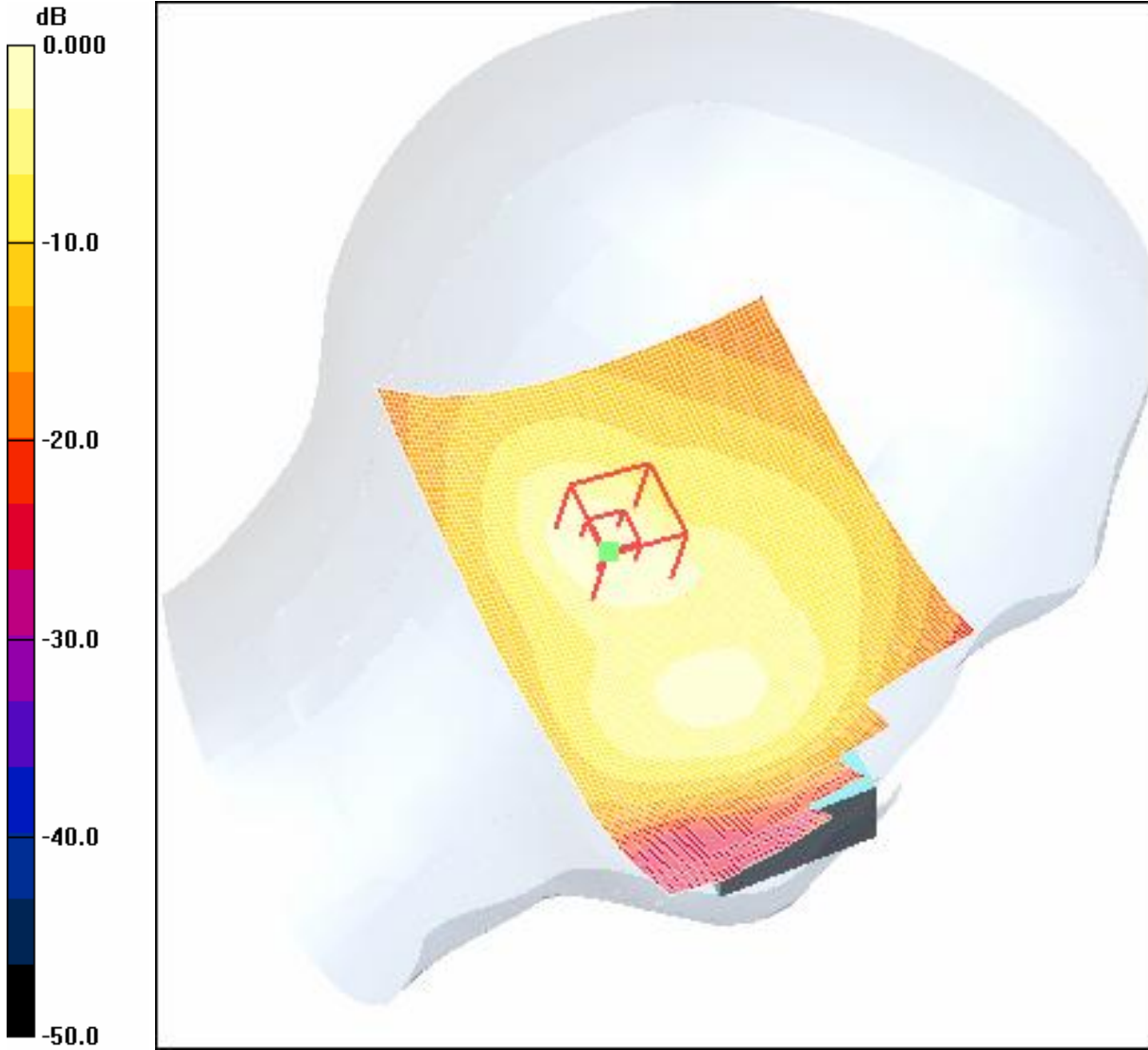
- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASYS4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek Position - Middle/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Reference Value = 15.0 V/m; Power Drift = 0.052 dB

Motorola Fast SAR: $\text{SAR}(1 \text{ g}) = 0.449 \text{ mW/g}$; $\text{SAR}(10 \text{ g}) = 0.244 \text{ mW/g}$

Maximum value of SAR (interpolated) = 0.533 mW/g



0 dB = 0.533mW/g

4.18LeftHandSide-Cheek-PCS1900-High

Date/Time: 2006-5-9 10:39:54

Test Laboratory: SGS-GSM

PCS1900-LeftHandSide-Cheek-High

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1909.8 \text{ MHz}$; $\sigma = 1.46 \text{ mho/m}$; $\epsilon_r = 39.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DASYS4 (High Precision Assessment)

DASYS4 Configuration:

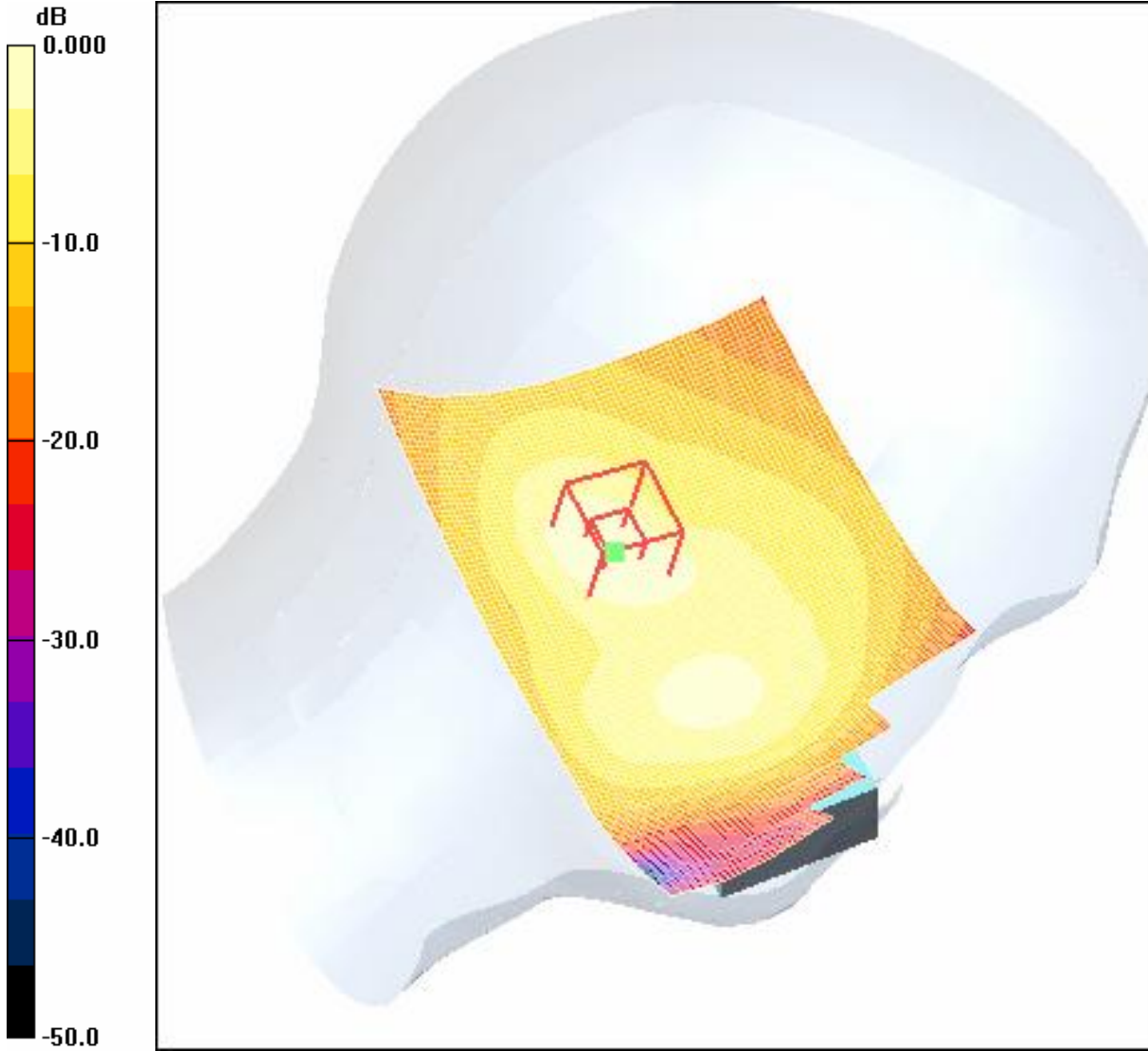
- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASYS4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek Position - High/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Reference Value = 12.6 V/m; Power Drift = 0.053 dB

Motorola Fast SAR: $\text{SAR}(1 \text{ g}) = 0.311 \text{ mW/g}$; $\text{SAR}(10 \text{ g}) = 0.168 \text{ mW/g}$

Maximum value of SAR (interpolated) = 0.368 mW/g



0 dB = 0.368mW/g

4.19LeftHandSide-Tilt-PCS1900-Low

Date/Time: 2006-5-9 10:52:49

Test Laboratory: SGS-GSM

PCS1900-LeftHandSide-Tilt-Low

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1850.2 \text{ MHz}$; $\sigma = 1.41 \text{ mho/m}$; $\epsilon_r = 39.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DAS4 Configuration:

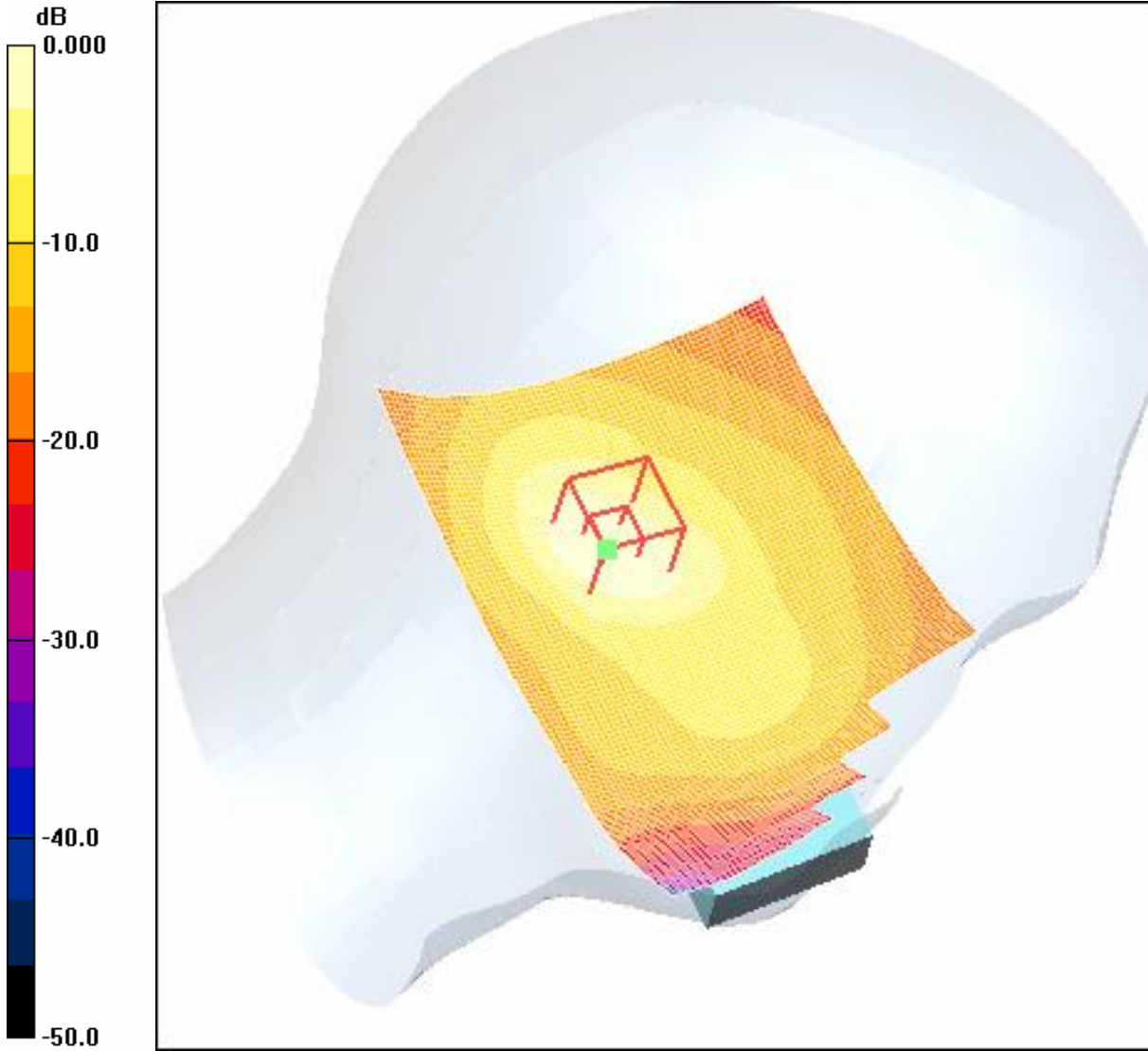
- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DAS4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Tilt Position - Low/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Reference Value = 16.7 V/m ; Power Drift = -0.052 dB

Motorola Fast SAR: $\text{SAR}(1 \text{ g}) = 0.505 \text{ mW/g}$; $\text{SAR}(10 \text{ g}) = 0.272 \text{ mW/g}$

Maximum value of SAR (interpolated) = 0.589 mW/g



0 dB = 0.589mW/g

4.20LeftHandSide-Tilt-PCS1900-Middle

Date/Time: 2006-5-9 11:05:10

Test Laboratory: SGS-GSM

PCS1900-LeftHandSide-Tilt-Mid

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.44 \text{ mho/m}$; $\epsilon_r = 39.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

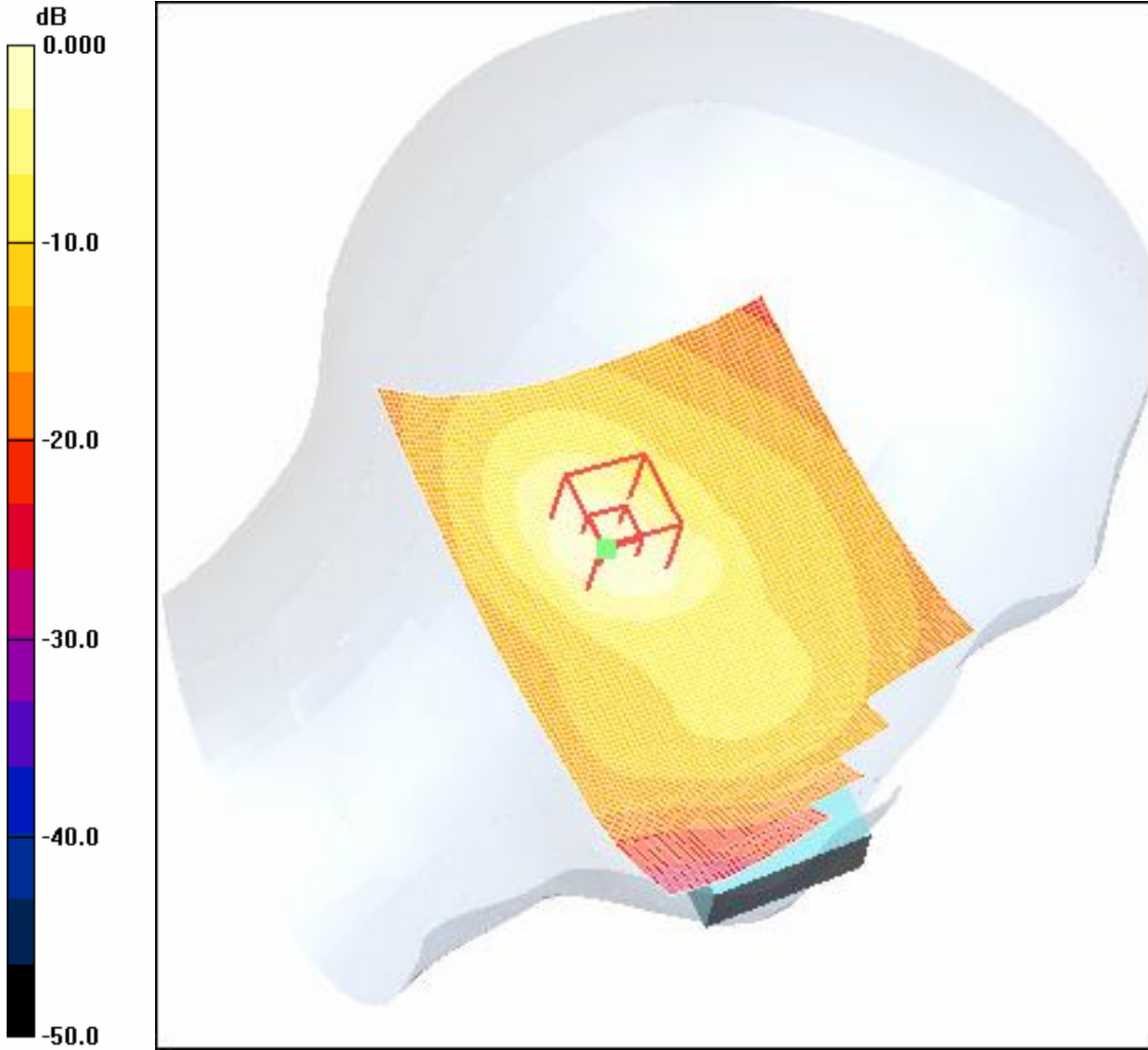
- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Tilt Position - Middle/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Reference Value = 16.5 V/m ; Power Drift = -0.012 dB

Motorola Fast SAR: $\text{SAR}(1 \text{ g}) = 0.513 \text{ mW/g}$; $\text{SAR}(10 \text{ g}) = 0.272 \text{ mW/g}$

Maximum value of SAR (interpolated) = 0.603 mW/g



0 dB = 0.603mW/g

4.21LeftHandSide-Tilt-PCS1900-High

Date/Time: 2006-5-9 11:17:09

Test Laboratory: SGS-GSM

PCS1900-LeftHandSide-Tilt-High

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1909.8 \text{ MHz}$; $\sigma = 1.46 \text{ mho/m}$; $\epsilon_r = 39.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

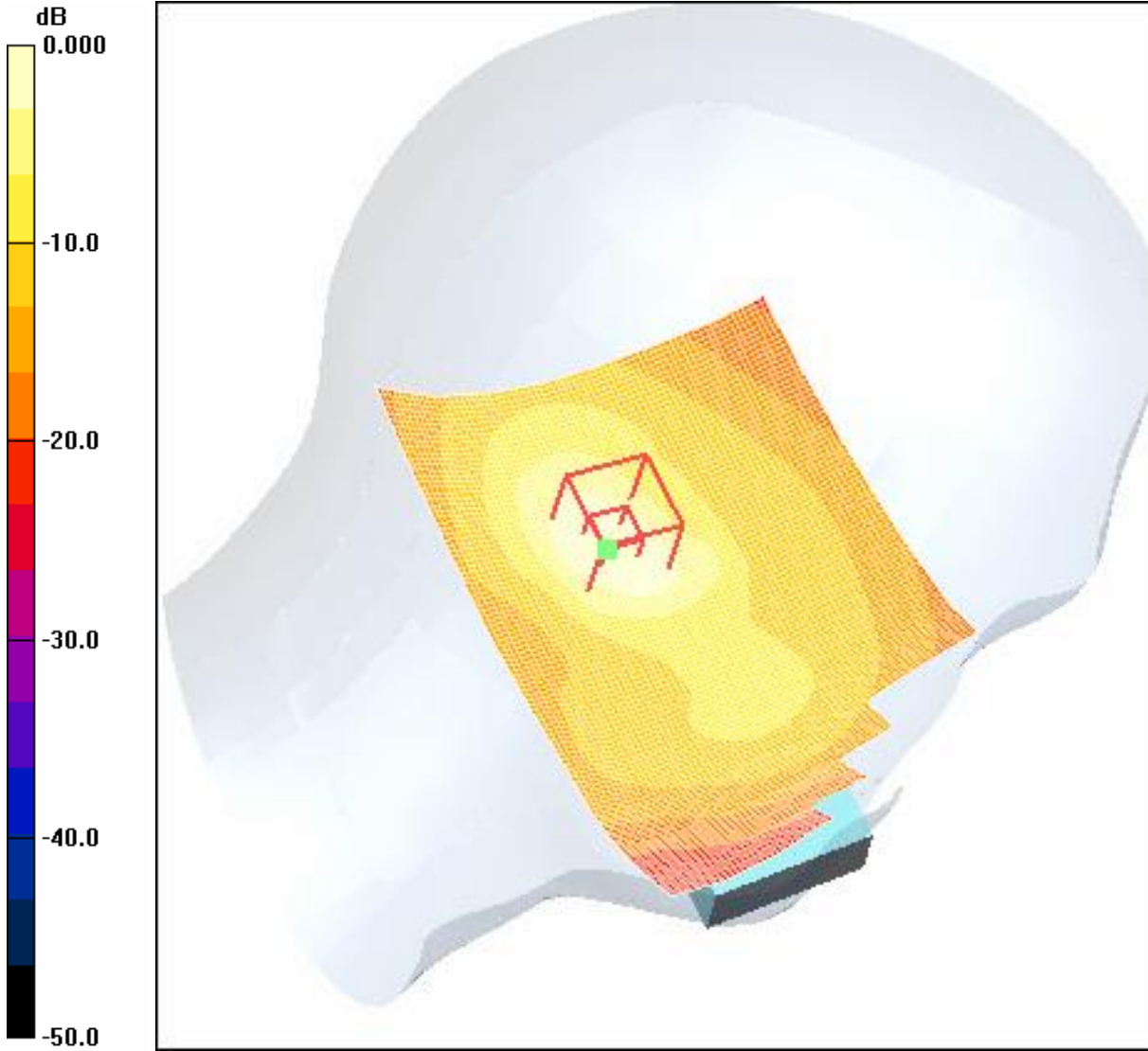
- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Tilt Position - High/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Reference Value = 13.5 V/m; Power Drift = 0.025 dB

Motorola Fast SAR: $\text{SAR}(1 \text{ g}) = 0.350 \text{ mW/g}$; $\text{SAR}(10 \text{ g}) = 0.182 \text{ mW/g}$

Maximum value of SAR (interpolated) = 0.413 mW/g



0 dB = 0.413mW/g

LeftHandSide-Tilt-PCS1900-Middle (Maximum Value)

Date/Time: 2006-5-9 11:35:38

Test Laboratory: SGS-GSM

PCS1900-LeftHandSide-Tilt-Mid(conventional)

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.44 \text{ mho/m}$; $\epsilon_r = 39.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Maximum Position - Traditional Method/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.602 mW/g

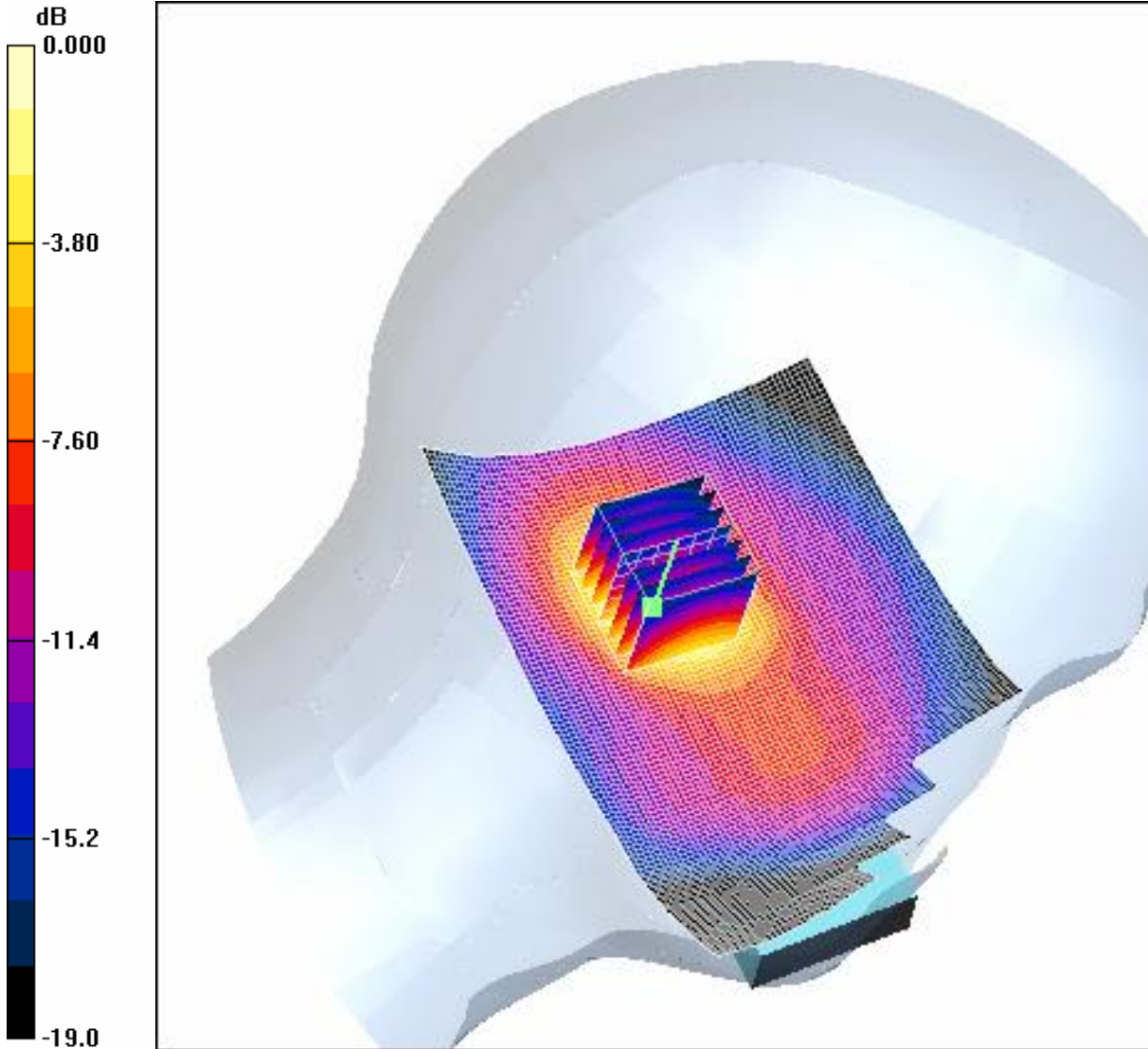
Maximum Position - Traditional Method/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 16.6 V/m; Power Drift = -0.020 dB

Peak SAR (extrapolated) = 0.927 W/kg

SAR(1 g) = 0.519 mW/g; SAR(10 g) = 0.269 mW/g

Maximum value of SAR (measured) = 0.577 mW/g



0 dB = 0.577mW/g

4.22RightHandSide-Cheek-PCS1900-Low

Date/Time: 2006-5-9 12:22:09

Test Laboratory: SGS-GSM

PCS1900-RightHandSide-Cheek-Low

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1850.2 \text{ MHz}$; $\sigma = 1.41 \text{ mho/m}$; $\epsilon_r = 39.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DAS4 Configuration:

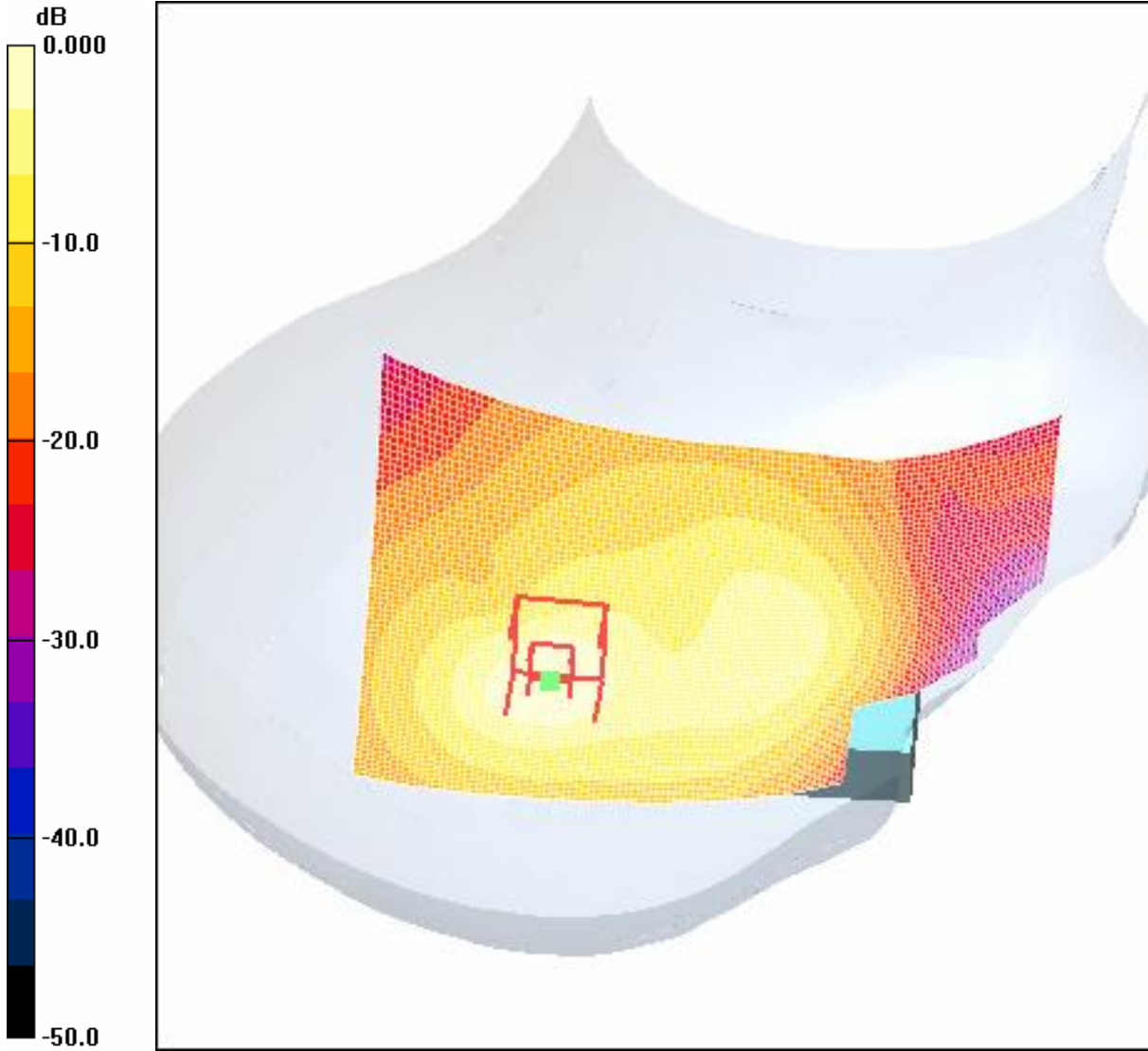
- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DAS4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek Position - Low/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Reference Value = 17.7 V/m; Power Drift = 0.247 dB

Motorola Fast SAR: $\text{SAR}(1 \text{ g}) = 0.601 \text{ mW/g}$; $\text{SAR}(10 \text{ g}) = 0.317 \text{ mW/g}$

Maximum value of SAR (interpolated) = 0.722 mW/g



0 dB = 0.722mW/g

4.23RightHandSide-Cheek-PCS1900-Middle

Date/Time: 2006-5-9 12:36:14

Test Laboratory: SGS-GSM

PCS1900-RightHandSide-Cheek-Mid

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1880$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.9$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

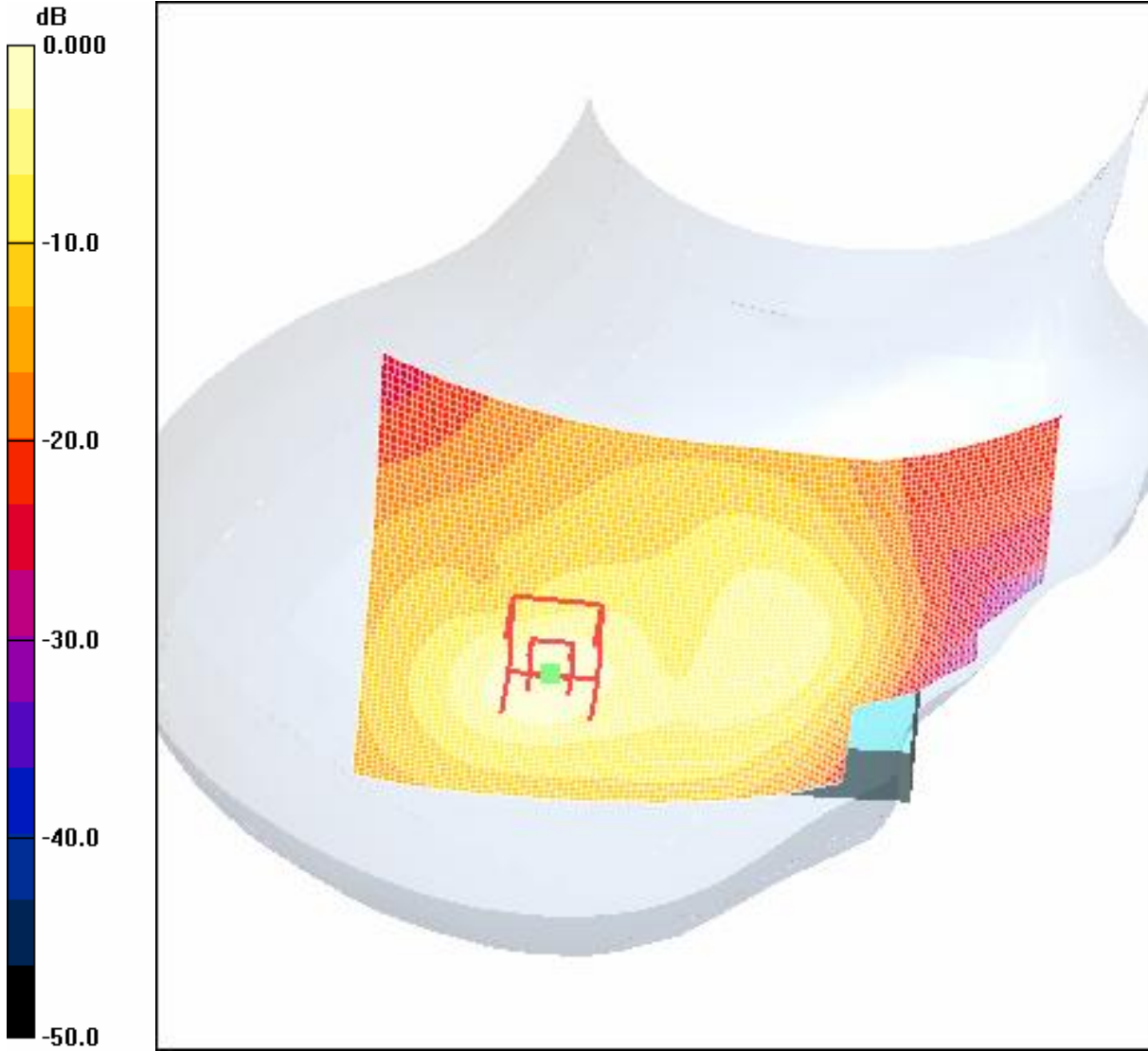
- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek Position - Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 17.0 V/m; Power Drift = 0.291 dB

Motorola Fast SAR: SAR(1 g) = 0.531 mW/g; SAR(10 g) = 0.277 mW/g

Maximum value of SAR (interpolated) = 0.641 mW/g



0 dB = 0.641mW/g

4.24RightHandSide-Cheek-PCS1900-High

Date/Time: 2006-5-9 13:02:02

Test Laboratory: SGS-GSM

PCS1900-RightHandSide-Cheek-High

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1909.8 \text{ MHz}$; $\sigma = 1.46 \text{ mho/m}$; $\epsilon_r = 39.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

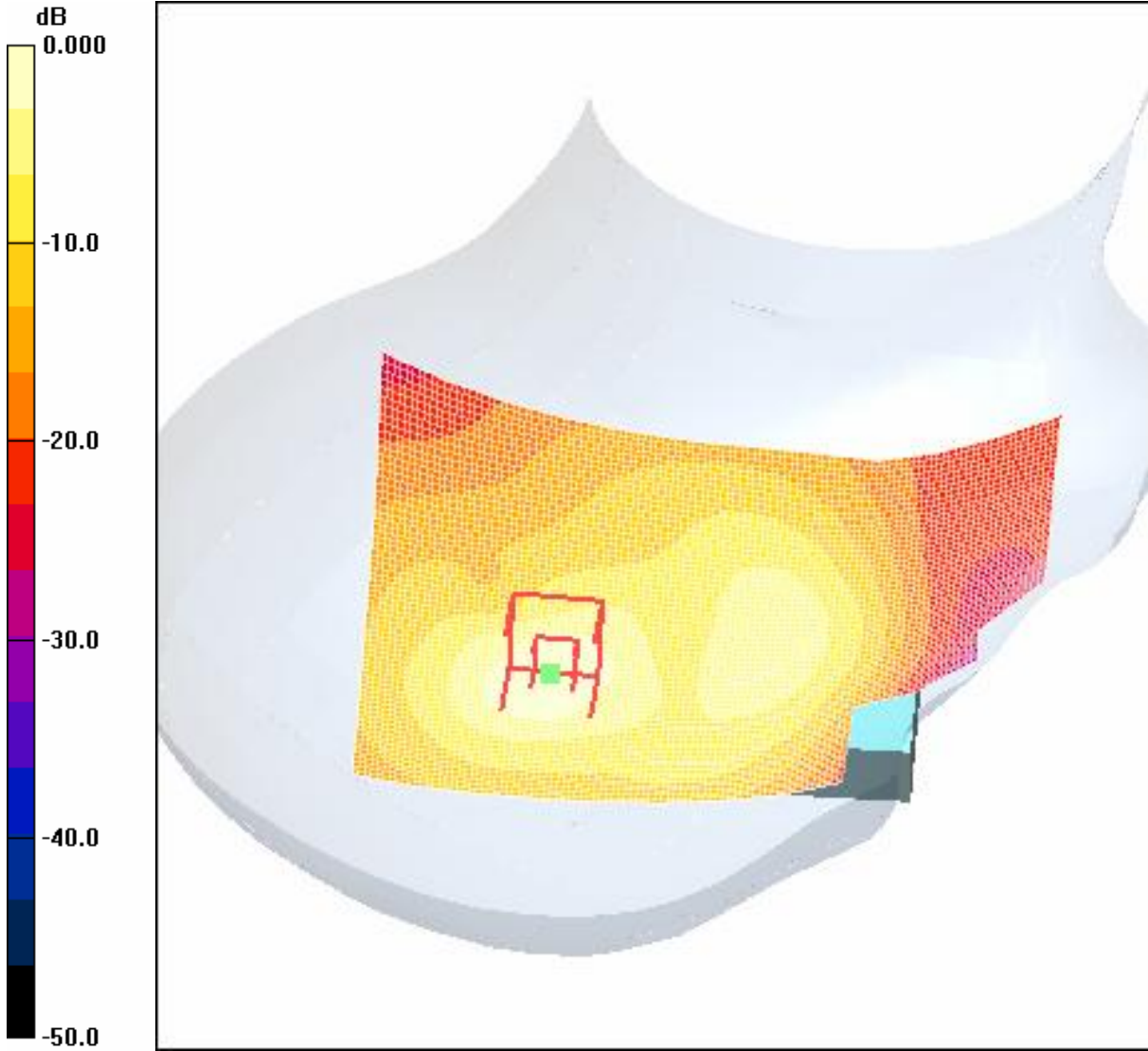
- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek Position - High/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Reference Value = 14.6 V/m; Power Drift = 0.030 dB

Motorola Fast SAR: $\text{SAR}(1 \text{ g}) = 0.372 \text{ mW/g}$; $\text{SAR}(10 \text{ g}) = 0.191 \text{ mW/g}$

Maximum value of SAR (interpolated) = 0.452 mW/g



0 dB = 0.452mW/g

4.25RightHandSide-Tilt-PCS1900-Low

Date/Time: 2006-5-9 13:16:49

Test Laboratory: SGS-GSM

PCS1900-RightHandSide-Tilt-Low

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1850.2 \text{ MHz}$; $\sigma = 1.41 \text{ mho/m}$; $\epsilon_r = 39.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DAS4 Configuration:

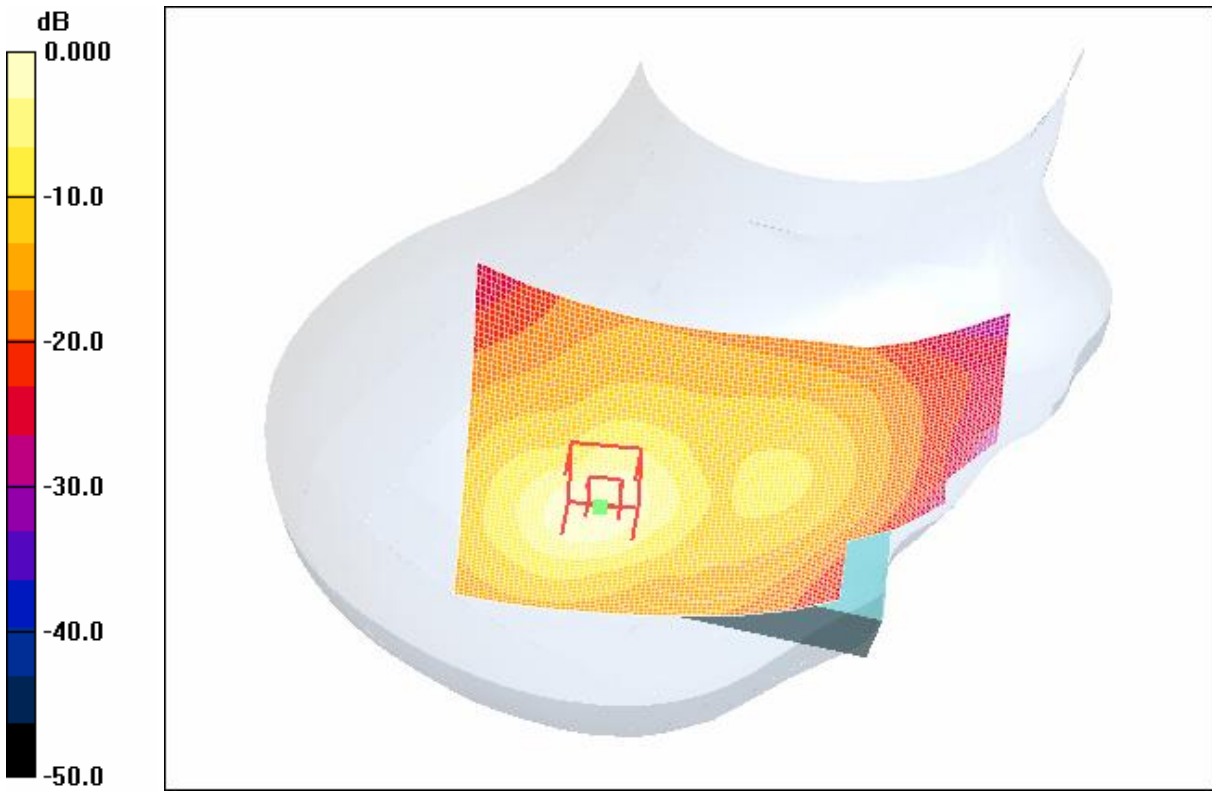
- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DAS4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Tilt position - Low/Area Scan (71x111x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Reference Value = 20.5 V/m; Power Drift = -0.048 dB

Motorola Fast SAR: $\text{SAR}(1 \text{ g}) = 0.601 \text{ mW/g}$; $\text{SAR}(10 \text{ g}) = 0.310 \text{ mW/g}$

Maximum value of SAR (interpolated) = 0.707 mW/g



0 dB = 0.707mW/g

4.26RightHandSide-Tilt-PCS1900-Middle

Date/Time: 2006-5-9 13:30:43

Test Laboratory: SGS-GSM

PCS1900-RightHandSide-Tilt-Mid

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.44 \text{ mho/m}$; $\epsilon_r = 39.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Tilt position -Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 19.4 V/m; Power Drift = 0.059 dB

Motorola Fast SAR: SAR(1 g) = 0.563 mW/g; SAR(10 g) = 0.286 mW/g

Maximum value of SAR (interpolated) = 0.667 mW/g



0 dB = 0.667mW/g

4.27RightHandSide-Tilt-PCS1900-High

Date/Time: 2006-5-9 13:42:54

Test Laboratory: SGS-GSM

PCS1900-RightHandSide-Tilt-High

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1909.8 \text{ MHz}$; $\sigma = 1.46 \text{ mho/m}$; $\epsilon_r = 39.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

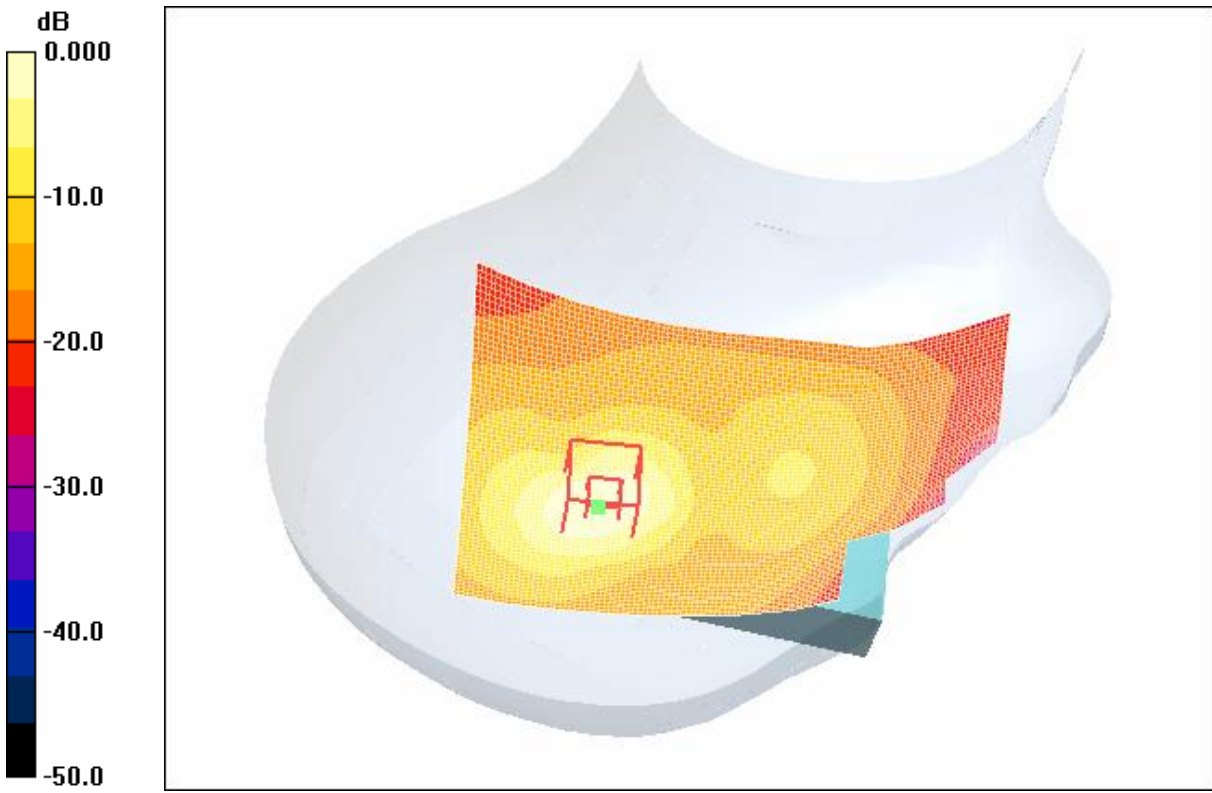
- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Tilt position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Reference Value = 16.1 V/m; Power Drift = 0.048 dB

Motorola Fast SAR: SAR(1 g) = 0.391 mW/g; SAR(10 g) = 0.195 mW/g

Maximum value of SAR (interpolated) = 0.464 mW/g



0 dB = 0.464mW/g

RightHandSide-Cheek-PCS1900-Low (Maximum Value)

Date/Time: 2006-5-9 14:02:00

Test Laboratory: SGS-GSM

PCS1900-RightHandSide-Cheek-Low(conventional)

DUT: GSM60055D; Type: Head; Serial: 01092300000034-0

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

Medium: HSL1800-2000MHz[Head] Medium parameters used: $f = 1850.2$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.93, 4.93, 4.93); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Maximum Position - Traditional Method/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.716 mW/g

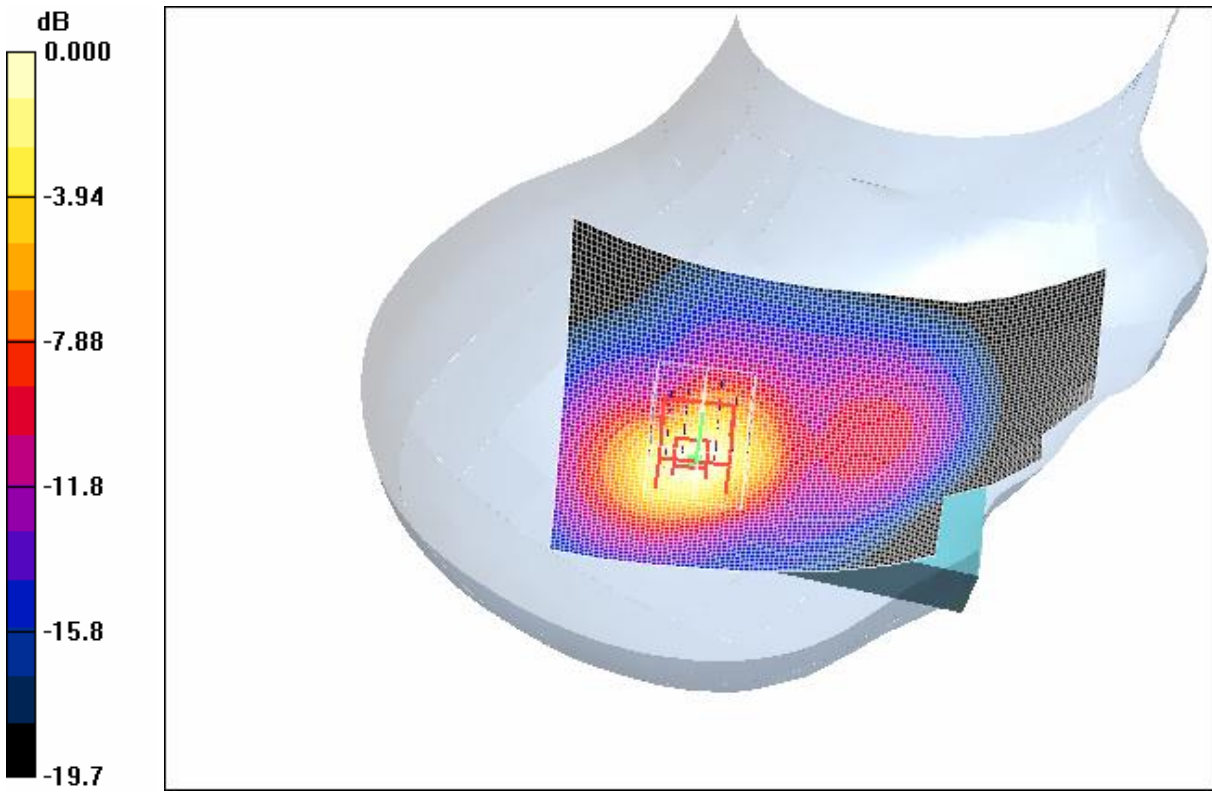
Maximum Position - Traditional Method/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.6 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 1.21 W/kg

SAR(1 g) = 0.657 mW/g; SAR(10 g) = 0.332 mW/g

Maximum value of SAR (measured) = 0.739 mW/g



0 dB = 0.739mW/g

4.28Body-Worn-PCS1900-Low

Date/Time: 2006-5-17 10:26:24

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-Low

DUT: GSM60055D; Type: Body; Serial: 01092300000034-0

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

Medium: HSL1900-Body Medium parameters used: $f = 1850.2$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

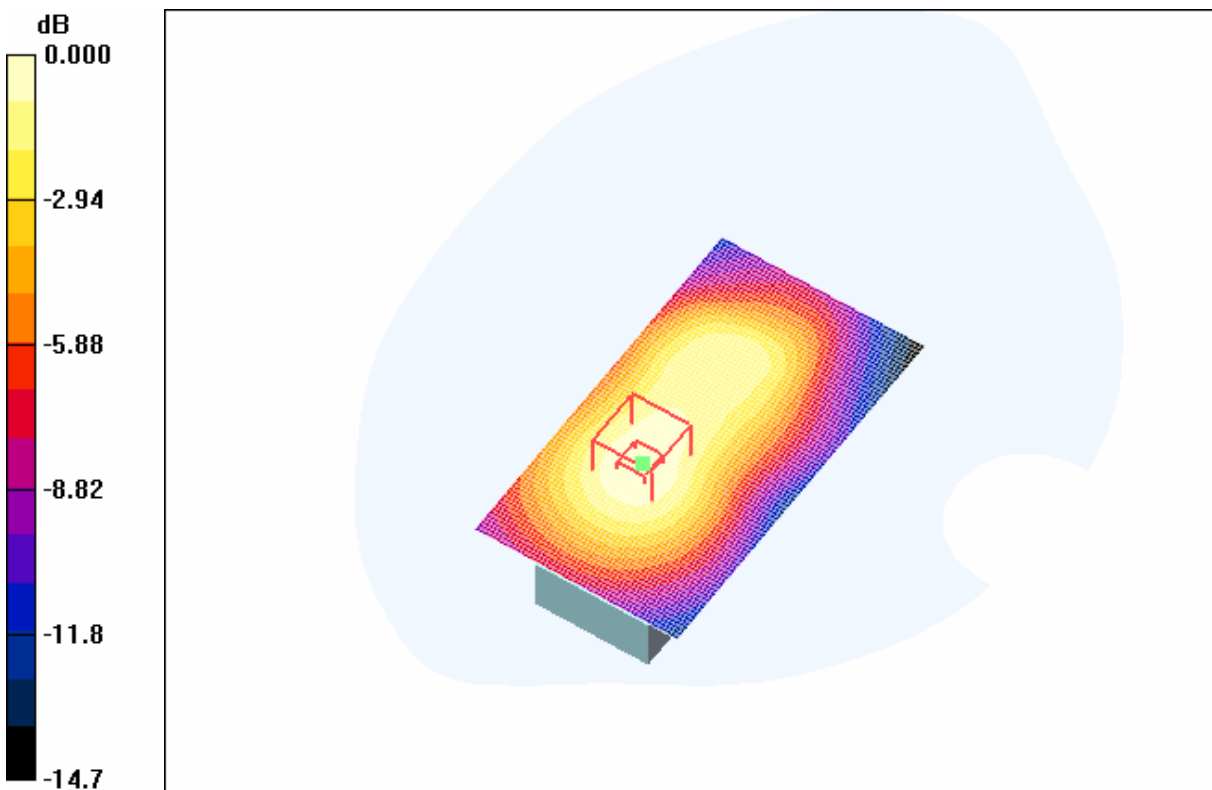
- Probe: ES3DV3 - SN3088; ConvF(4.53, 4.53, 4.53); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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

Reference Value = 14.5 V/m; Power Drift = 0.001 dB

Motorola Fast SAR: SAR(1 g) = 0.372 mW/g; SAR(10 g) = 0.227 mW/g

Maximum value of SAR (interpolated) = 0.405 mW/g



0 dB = 0.405mW/g

4.29Body-Worn-PCS1900-Middle

Date/Time: 2006-5-17 10:34:58

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-Mid

DUT: GSM60055D; Type: Body; Serial: 01092300000034-0

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

Medium: HSL1900-Body Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 51.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

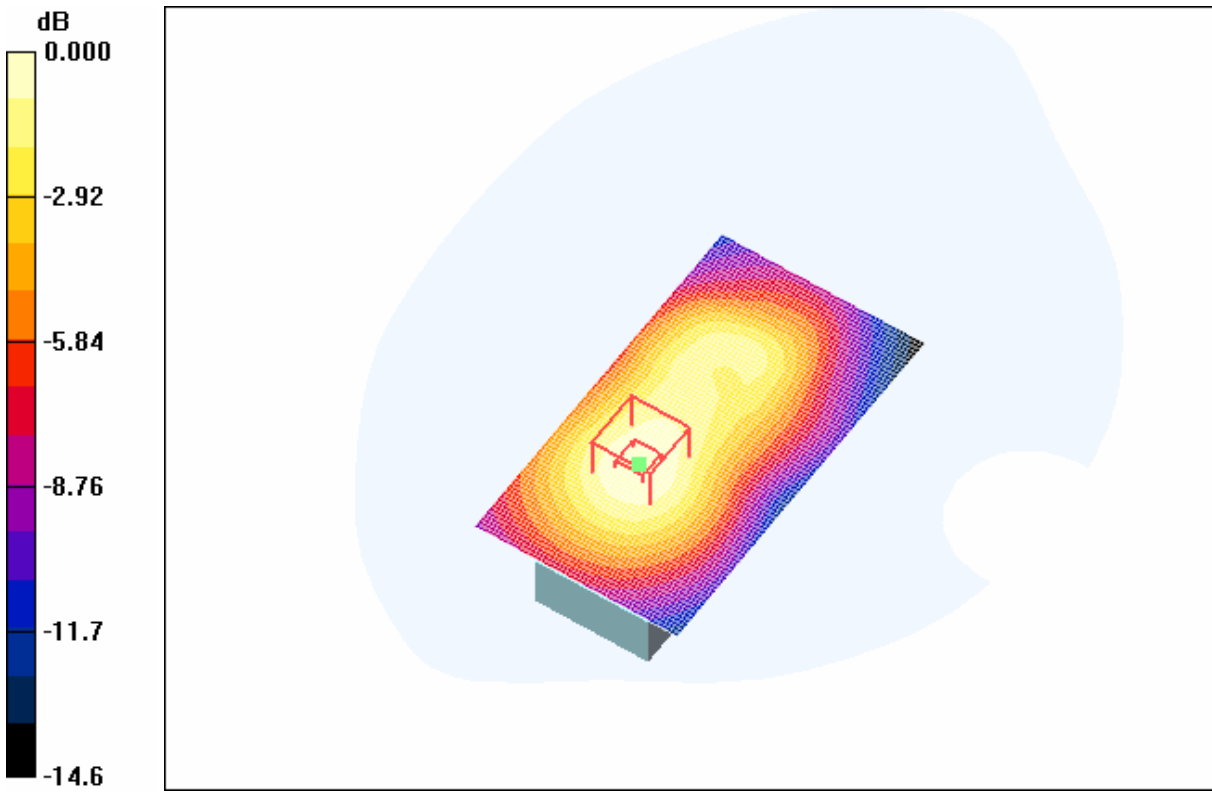
- Probe: ES3DV3 - SN3088; ConvF(4.53, 4.53, 4.53); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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

Reference Value = 14.9 V/m; Power Drift = 0.018 dB

Motorola Fast SAR: SAR(1 g) = 0.420 mW/g; SAR(10 g) = 0.254 mW/g

Maximum value of SAR (interpolated) = 0.457 mW/g



0 dB = 0.457mW/g

4.30Body-Worn-PCS1900-High

Date/Time: 2006-5-17 10:42:26

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-High

DUT: GSM60055D; Type: Body; Serial: 01092300000034-0

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

Medium: HSL1900-Body Medium parameters used: $f = 1909.8 \text{ MHz}$; $\sigma = 1.55 \text{ mho/m}$; $\epsilon_r = 51.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

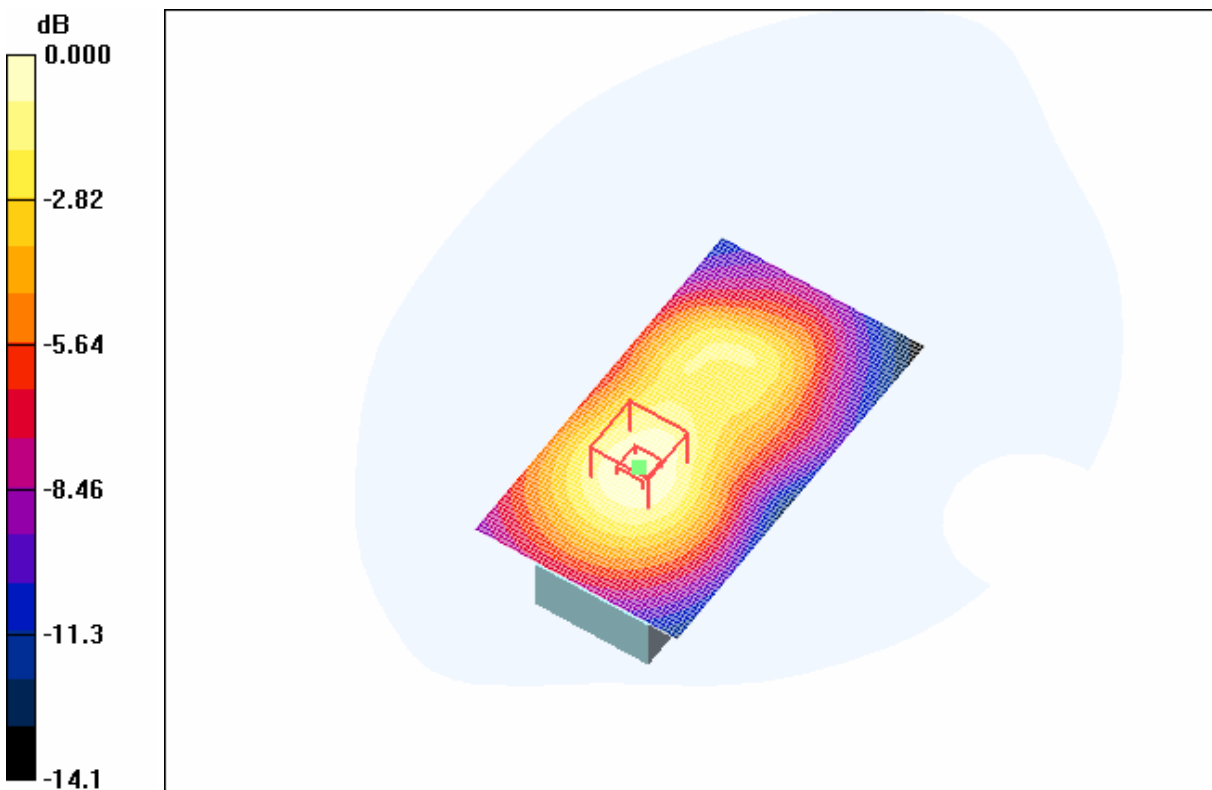
- Probe: ES3DV3 - SN3088; ConvF(4.53, 4.53, 4.53); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

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

Reference Value = 12.8 V/m; Power Drift = -0.021 dB

Motorola Fast SAR: SAR(1 g) = 0.340 mW/g; SAR(10 g) = 0.205 mW/g

Maximum value of SAR (interpolated) = 0.369 mW/g



0 dB = 0.369mW/g

Body-Worn-PCS1900-Middle (Maximum Value)

Date/Time: 2006-5-17 11:02:23

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-Mid(conventional)

DUT: GSM60055D; Type: Body; Serial: 01092300000034-0

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

Medium: HSL1900-Body Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 51.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.53, 4.53, 4.53); Calibrated: 2005-9-13
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2005-11-17
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Maximum Position - Tadtional Method/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.458 mW/g

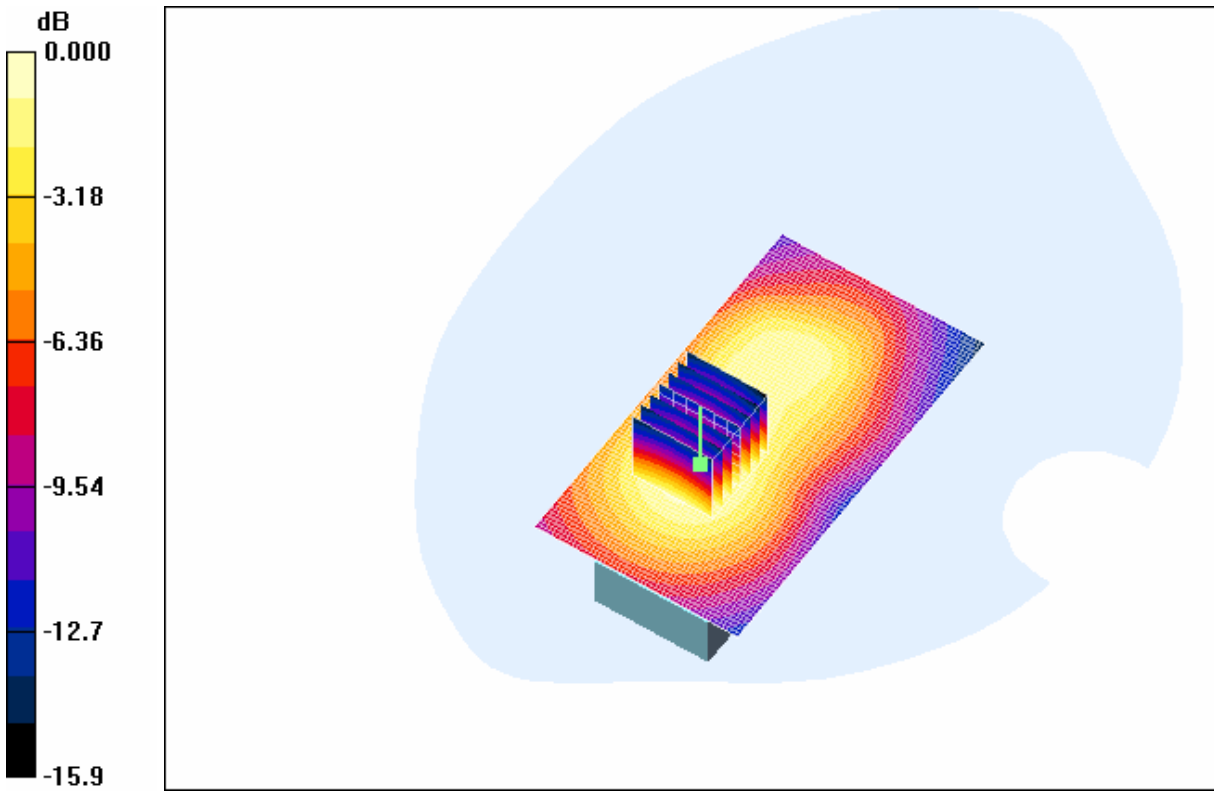
Maximum Position - Tadtional Method/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 14.9 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 0.653 W/kg

SAR(1 g) = 0.421 mW/g; SAR(10 g) = 0.257 mW/g

Maximum value of SAR (measured) = 0.454 mW/g



0 dB = 0.454mW/g

Appendix

1. Photographs of Test Setup

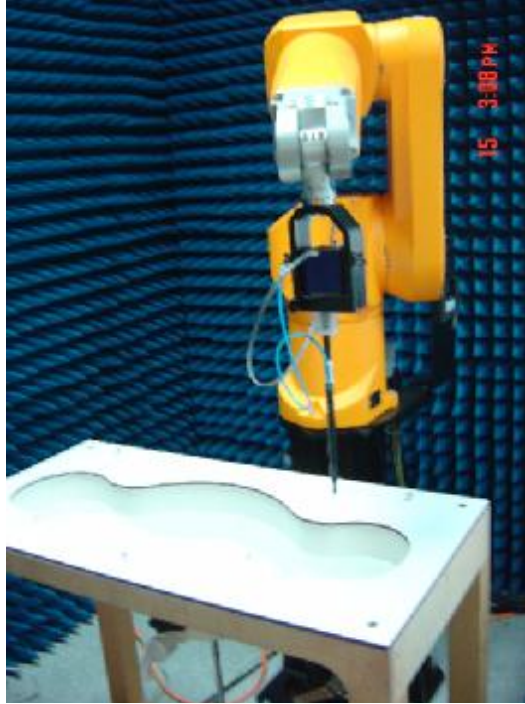


Fig.1 Photograph of the SAR measurement System

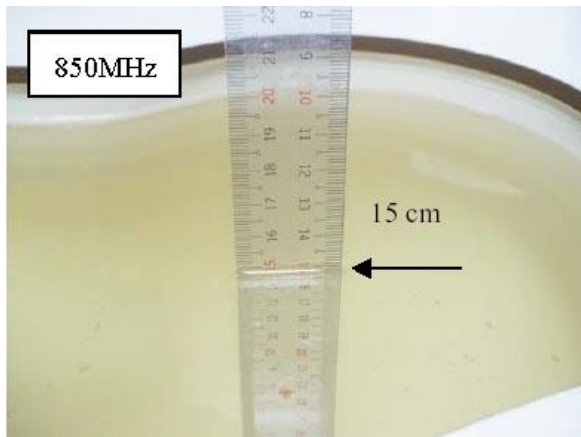


Fig.2 Photograph of the Tissue Simulant
Fluid Fluid Liquid depth 15cm
for Left-Head Side

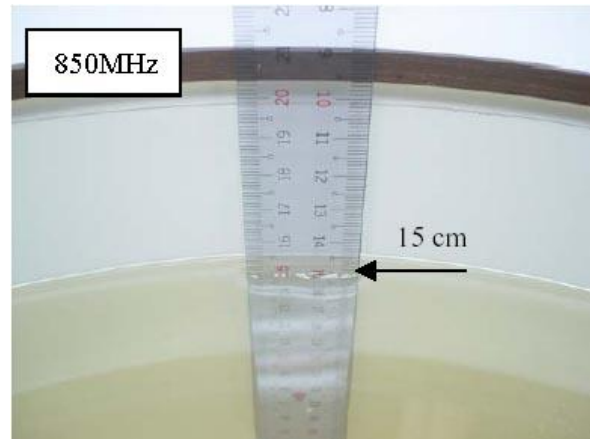


Fig.3 Photograph of the Tissue Simulant
Liquid depth 15cm for Body-Worn

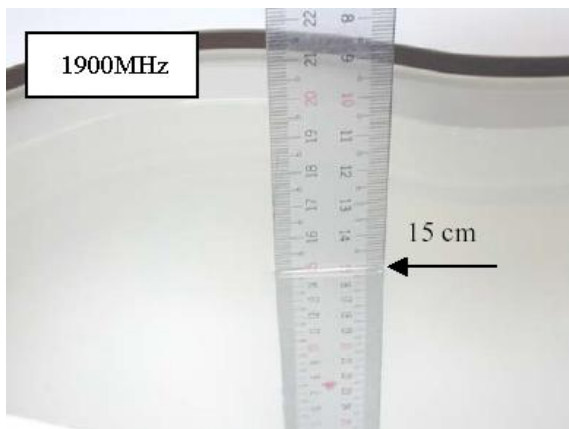


Fig.4 Photograph of the Tissue Simulant
Fluid Liquid depth 15cm
for Right-Head Side

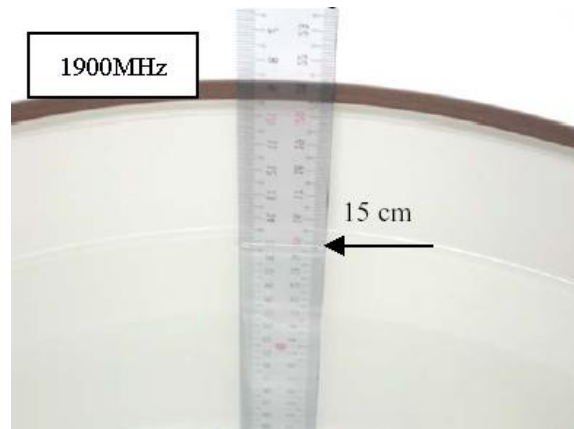


Fig.5 Photograph of the Tissue Simulant
Liquid depth 15cm for Body-Worn

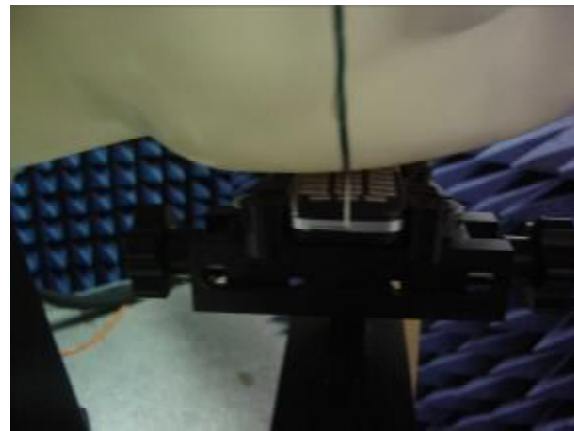


Fig.6 Photograph of the Left Hand Side Cheek status

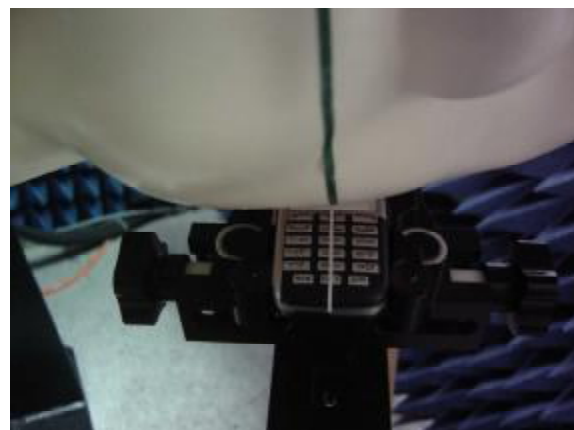


Fig.7 Photograph of the Left Hand Side Tilt status

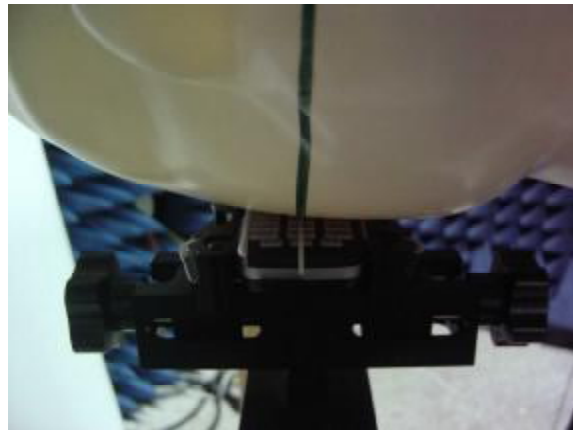
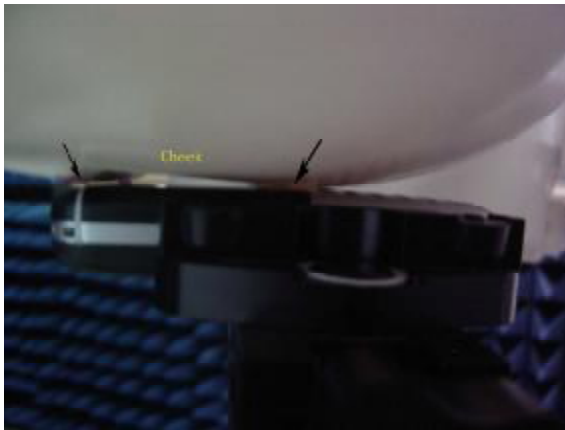


Fig.8 Photograph of the Right Hand Side Cheek status



Fig.9 Photograph of the Right Hand Side Tilt status

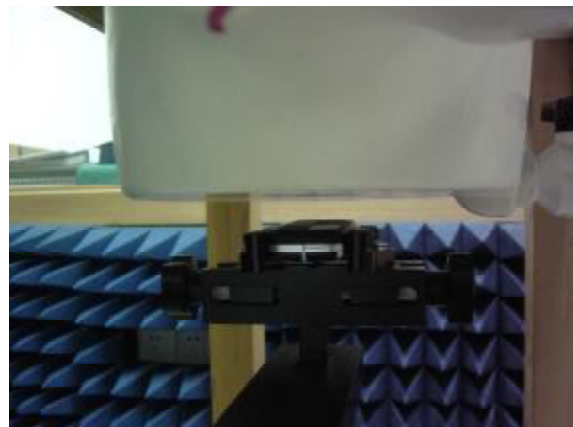
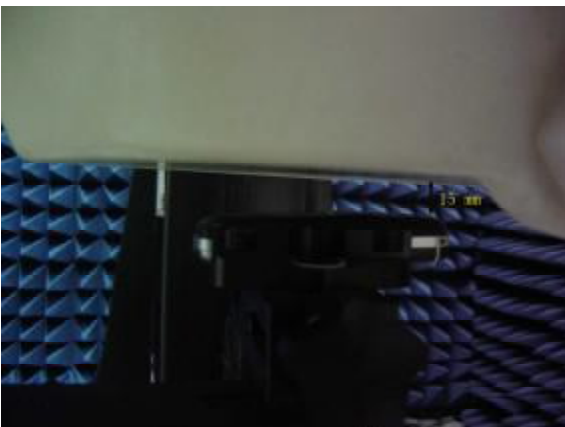


Fig.10 Photograph of the BodyWorn status

2. Photographs of the EUT



Fig.11 Front View



Fig.12 Back View

3. Photographs of the battery



Fig.13 Front view of battery



Fig.14 Back view of battery

4. Photograph of the charger



Fig.15 Charger

5. 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 Federal Office of Metrology and Accreditation
 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-CSTX (MTT)**

Certificate No: **ES3-3088_Sep05**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3088**

Calibration procedure(s) **QA CAL-01.v5**
Calibration procedure for dosimetric E-field probes

Calibration date: **September 13, 2005**

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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41495277	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41498087	3-May-05 (METAS, No. 251-00466)	May-06
Reference 3 dB Attenuator	SN: S5054 (3c)	11-Aug-05 (METAS, No. 251-00499)	Aug-06
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-05 (METAS, No. 251-00467)	May-06
Reference 30 dB Attenuator	SN: S5129 (30b)	11-Aug-05 (METAS, No. 251-00500)	Aug-06
Reference Probe ES3DV2	SN: 3013	7-Jan-05 (SPEAG, No. ES3-3013_Jan05)	Jan-06
DAE4	SN: 654	29-Nov-04 (SPEAG, No. DAE4-654_Nov04)	Nov-05

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-06 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753C	US37390585	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov-05

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 15, 2005

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

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 Federal Office of Metrology and Accreditation
 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
NORM _{x,y,z}	sensitivity in free space
ConF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- 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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z}** = NORM_{x,y,z} * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

ES3DV3 SN:3088

September 13, 2005

Probe ES3DV3

SN:3088

Manufactured:

July 20, 2005

Calibrated:

September 13, 2005

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ES3DV3 SN:3088

September 13, 2005

DASY - Parameters of Probe: ES3DV3 SN:3088**Sensitivity in Free Space^A****Diode Compression^B**

NormX	1.32 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP X	95 mV
NormY	1.24 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Y	95 mV
NormZ	1.23 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Z	95 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL	900 MHz	Typical SAR gradient: 5 % per mm		
	Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
	SAR _{iso} [%] Without Correction Algorithm		5.8	2.7
	SAR _{iso} [%] With Correction Algorithm		0.0	0.1
TSL	1750 MHz	Typical SAR gradient: 10 % per mm		
	Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
	SAR _{iso} [%] Without Correction Algorithm		7.6	4.5
	SAR _{iso} [%] With Correction Algorithm		0.1	0.2

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 E²-field uncertainty inside TSL (see Page 8).

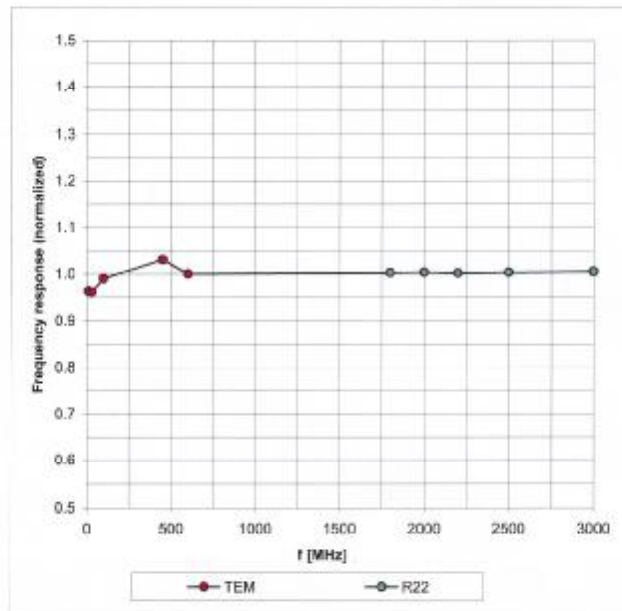
^B Numerical linearization parameter: uncertainty not required.

ES3DV3 SN:3088

September 13, 2005

Frequency Response of E-Field

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

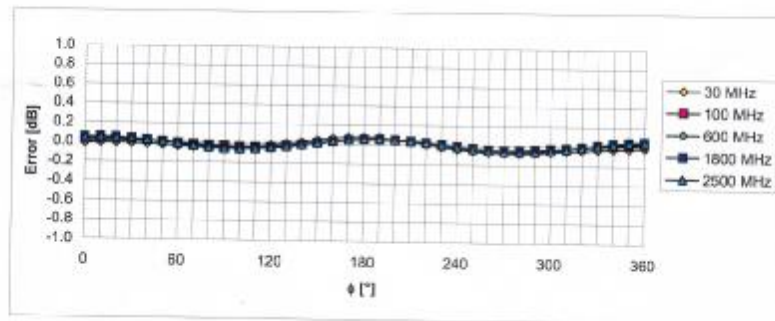
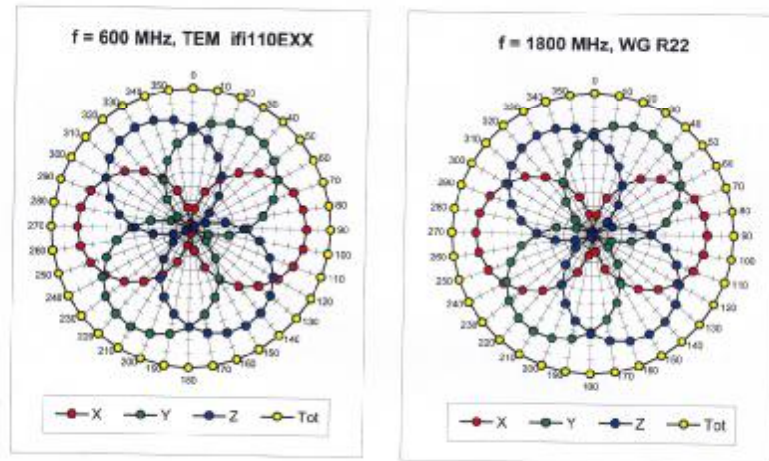


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

ES3DV3 SN:3088

September 13, 2005

Receiving Pattern (ϕ), $\theta = 0^\circ$

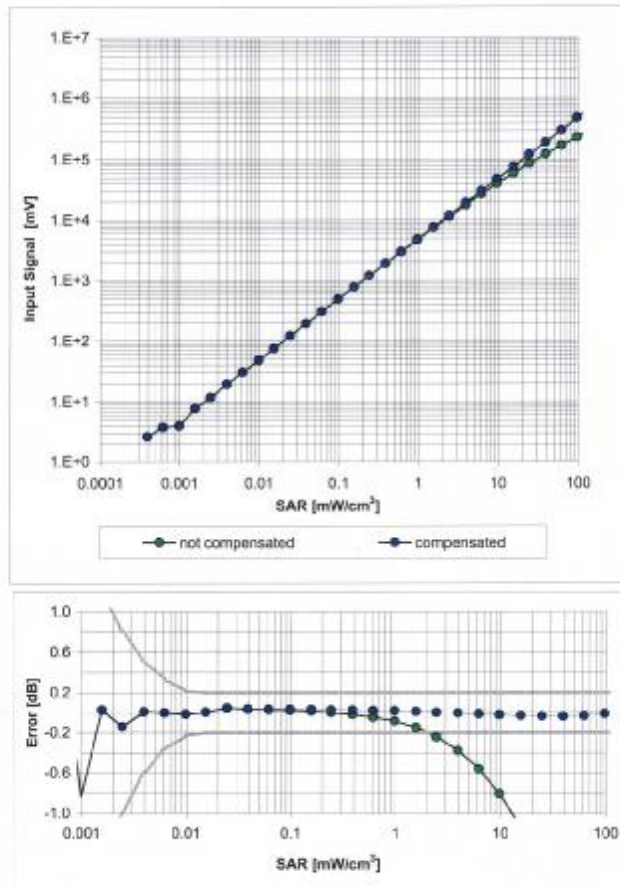


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

ES3DV3 SN:3088

September 13, 2005

Dynamic Range $f(\text{SAR}_{\text{head}})$ (Waveguide R22, $f = 1800 \text{ MHz}$)

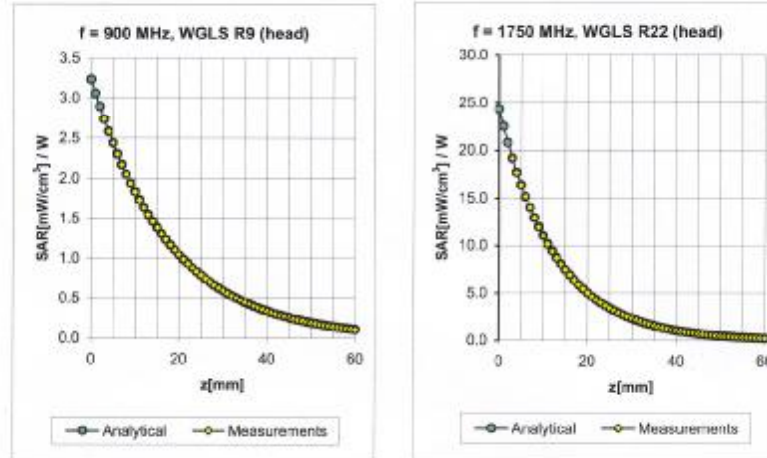


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

ES3DV3 SN:3088

September 13, 2005

Conversion Factor Assessment



f [MHz]	Validity [MHz] ^o	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.47	1.40	5.91 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.24	2.39	4.97 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.27	2.28	4.93 ± 11.0% (k=2)
2000	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.25	2.34	4.87 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.61	1.25	5.83 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.28	2.53	4.61 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.28	2.57	4.53 ± 11.0% (k=2)
2000	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.32	2.11	4.47 ± 11.0% (k=2)

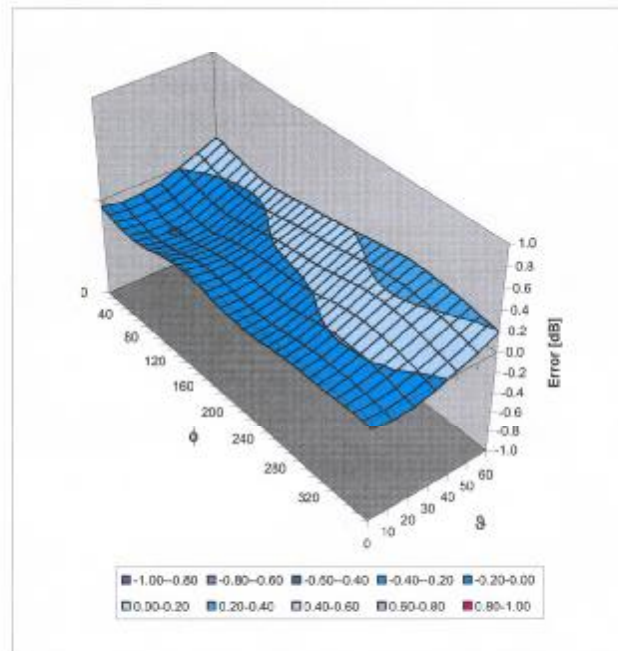
^o The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ES3DV3 SN:3088

September 13, 2005

Deviation from Isotropy in HSL

Error (ϕ , θ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

6. Uncertainty analysis

Error Description	Tol. (± %)	Prob. dist.	Div.	(<i>c</i> _i) (1g)	(<i>c</i> _i) (10g)	Std. unc. (± %)		(<i>v</i> _i)
Measurement System								
Probe Calibration	4.8	N	1	1	1	4.8	4.8	∞
Axial Isotropy	4.7	R	√3	1	1	2.7	2.7	∞
Hemispherical Isotropy	0	R	√3	1	1	0	0	∞
Boundary Effects	1.0	R	√3	1	1	0.6	0.6	∞
Linearity	4.7	R	√3	1	1	2.7	2.7	∞
System Detection Limit	1.0	R	√3	1	1	0.6	0.6	∞
Readout Electronics	1.0	N	1	1	1	1.0	1.0	∞
Response Time	0	R	√3	1	1	0	0	∞
Integration Time	0	R	√3	1	1	0	0	∞
RF Ambient Conditions	3.0	R	√3	1	1	1.7	1.7	∞
Probe Positioner	0.4	R	√3	1	1	0.2	0.2	∞
Probe Positioning	2.9	R	√3	1	1	1.7	1.7	∞
Algorithms for Max. SAR Eval.	1.0	R	√3	1	1	0.6	0.6	∞
Dipole								
Dipole Axis to Liquid Distance	2.0	R	√3	1	1	1.2	1.2	∞
Input power and SAR drift meas.	4.7	R	√3	1	1	2.7	2.7	∞
Phantom and Tissue Param.								
Phantom Uncertainty	4.0	R	√3	1	1	2.3	2.3	∞
Liquid Conductivity (target)	5.0	R.	√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	√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 Standard Uncertainty						8.4	8.1	∞
Coverage Factor for 95%		kp=2						
Expanded Uncertainty						16.8	16.2	

Dasy4 Uncertainty Budget

7. 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 Fruttwilen 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.	ITIS 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 ITIS 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

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

8. System validation from original equipment supplier

DASY4 Validation Report for Head TSL

Date/Time: 19.08.2005 14:48:37

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: HSL 900 MHz;

Medium parameters used: $f = 900$ MHz; $\sigma = 0.96$ mho/m; $\epsilon_r = 42.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(5.95, 5.95, 5.95); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA
- Measurement SW: DASY4, V4.6 Build 9; Postprocessing SW: SEMCAD, V1.8 Build 151

Pin = 250 mW; d = 15 mm/Area Scan (81x81x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.81 mW/g

Pin = 250 mW; d = 15 mm/Zoom Scan 2 (7x7x7)/Cube 0:

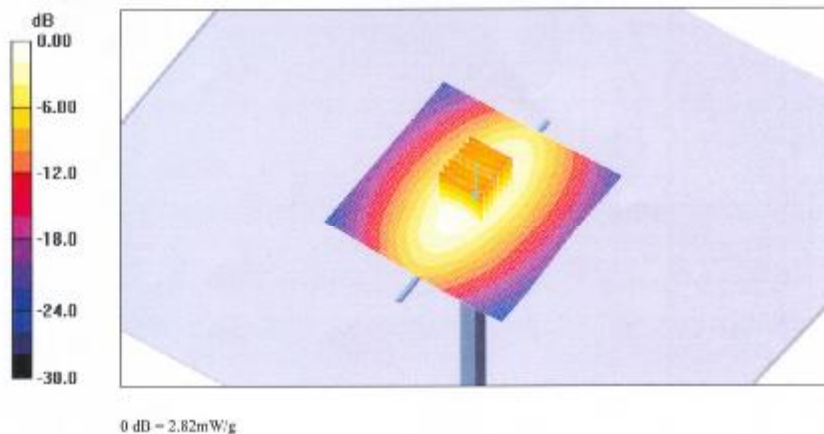
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.9 V/m; Power Drift = -0.018 dB

Peak SAR (extrapolated) = 3.84 W/kg

SAR(1 g) = 2.6 mW/g; SAR(10 g) = 1.67 mW/g

Maximum value of SAR (measured) = 2.82 mW/g



DASY4 Validation Report for Body TSL

Date/Time: 22.08.2005 16:14:01

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: MSL 900 MHz;

Medium parameters used: $f = 900$ MHz; $\sigma = 1.07$ mho/m; $\epsilon_r = 54.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(5.77, 5.77, 5.77); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA
- Measurement SW: DASY4, V4.6 Build 9; Postprocessing SW: SEMCAD, V1.8 Build 151

 $P_{in} = 250$ mW; $d = 15$ mm 2/Area Scan (81x81x1):Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 2.94 mW/g

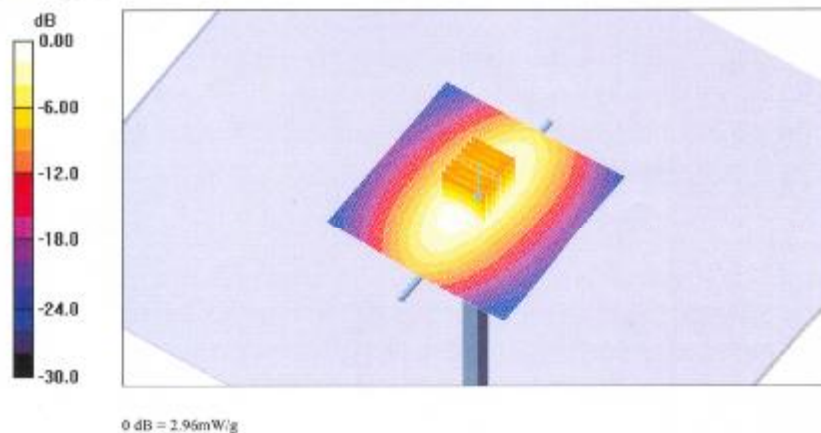
 $P_{in} = 250$ mW; $d = 15$ mm 2/Zoom Scan (7x7x7)/Cube 0:Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 55.3 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 3.90 W/kg

SAR(1 g) = 2.69 mW/g; SAR(10 g) = 1.74 mW/g

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



DASY4 Validation Report for Head TSL

Date/Time: 25.08.2005 17:04:02

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: HSL 1900 MHz;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.96, 4.96, 4.96); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 5.0 (front); Type: QD00P50AA
- Measurement SW: DASY4, V4.6 Build 9; Postprocessing SW: SEMCAD, V1.8 Build 151

Pin = 250 mW; d = 10 mm/Area Scan (61x81x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.8 mW/g

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

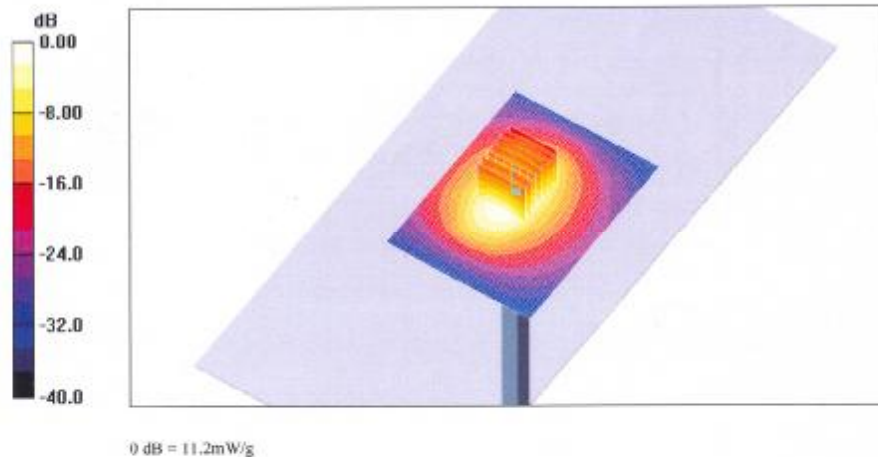
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.5 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 17.2 W/kg

SAR(1 g) = 9.89 mW/g; SAR(10 g) = 5.16 mW/g

Maximum value of SAR (measured) = 11.2 mW/g



DASY4 Validation Report for Body TSL

Date/Time: 26.08.2005 15:32:29

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: MSL 1900 MHz;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.6$ mho/m; $\epsilon_r = 53.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.43, 4.43, 4.43); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA
- Measurement SW: DASY4, V4.6 Build 9; Postprocessing SW: SEMCAD, V1.8 Build 151

Pin = 250 mW; d = 10 mm 2/Area Scan (81x81x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.2 mW/g

Pin = 250 mW; d = 10 mm 2/Zoom Scan (7x7x7)/Cube 0:

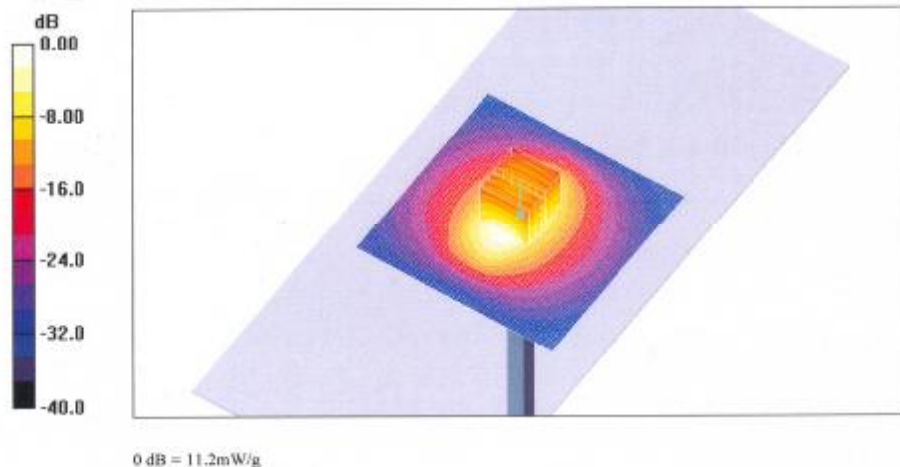
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 86.7 V/m; Power Drift = -0.025 dB

Peak SAR (extrapolated) = 16.4 W/kg

SAR(1 g) = 9.81 mW/g; SAR(10 g) = 5.22 mW/g

Maximum value of SAR (measured) = 11.2 mW/g

**The end**