SAR TEST REPORT

Eequipment Under Test :	**GSM 850&PCS 1900MHz MOBILE PHONE**
FCC ID :	**RAD020**
Model No. :	**VLE5**
Market Name :	**OT-E252a**
Applicant :	**TCL&Alcatel Mobile Phones**
Address of Applicant :	**30/F, Times Square, 500 Zhangyang RD. Shanghai 200122, P.R.China**
Date of Receipt :	**2005.06.15**
Date of Test :	**2005.06.21~2005.06.29**
Date of Issue :	**2005.07.18**

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 :		Date :	**2005.07.18**
Approved by :		Date :	**2005.07.18**

Contents

1. General Information

1.1 Test Laboratory

GSM Lab
SGS-CSTC Standards Technical Services Co.Ltd Shanghai Branch
9F,the 3rd Building, No.899, 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: TCL&Alcatel Mobile Phones
Address: 30/F, Times Square, 500 Zhangyang RD. Shanghai 200122, P.R.China

1.3 Description of EUT(s)

Brand name	**Alcatel**	
Model No.	**VLE5**	
Market Name	**OT-E252a**	
Serial No.	**IMEI:004400035066020100**	
Battery Type	**Lithium-Ion, 4.2Volt**	
Provider of Battery	**BYD**	
Antenna Type	**Internal antenna**	
Operation Mode	**GSM850/PCS1900**	
Modulation Mode	**GMSK**	
Frequency range	**GSM850**	**Tx: 824~849 MHz**
		Rx: 869~894 MHz
	GSM1900	**Tx: 1850~1910 MHz**

		Rx: 1930~1990 MHz
Maximum RF Conducted Power	**GSM850: 33dBm, GSM1900: 30dBm**	

1.4 Test Environment

Ambient temperature: 22.0° C

Tissue Simulating Liquid: 22.0° C

Relative Humidity: 32%

1.5 Operation Configuration

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: GSM 1900, LeftHandSide Cheek & 15° Tilt Position

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

Configuration 6: GSM 1900, BodyWorn (1.5cm 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 ET3DV6 1774 E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= $\sigma (|Ei|^2)/ \rho$ 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:

- 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.

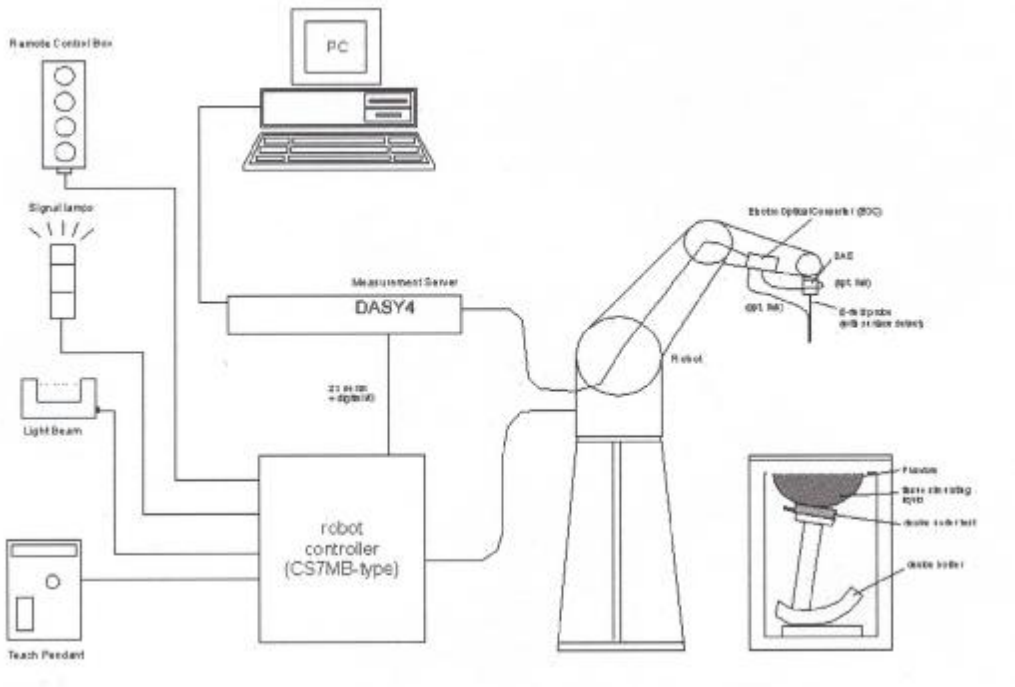


Fig. a SAR System Configuration

- 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 or Windows XP.

- 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 +/- 10% from the target SAR values. These tests were done at 850MHz 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.

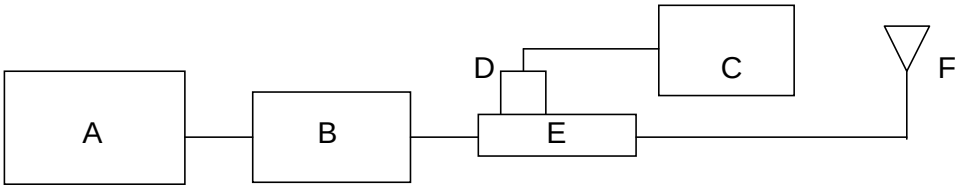


Fig. b the microwave circuit arrangement used for SAR system verification

A. Agilent Model E4438C Signal Generator
B. Agilent Model 8449B 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	Target SAR 1g (250mW)	Target SAR 10g (250mW)	Measured SAR 1g	Measured SAR 10g	Measured Date
ET3DV6 SN1774	900M Head	2.69	1.73	2.55	1.49	2005.06.21
ET3DV6 SN1774	900M Head	2.69	1.73	2.48	1.44	2005.06.22
ET3DV6 SN1774	900M Body	2.75	1.77	2.59	1.53	2005.06.22
ET3DV6 SN1774	900M Body	2.75	1.77	2.72	1.69	2005.06.23
ET3DV6 SN1774	1900M Head	10.4	5.35	10.27	5.23	2005.06.28
ET3DV6 SN1774	1900M Head	10.4	5.35	10.32	5.22	2005.06.29
ET3DV6 SN1774	1900M Body	10.52	5.53	10.59	5.61	2005.06.28

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, 2005-06-21	41.54	0.8912	22
		Measured, 2005-06-22	41.54	0.8908	22.5
		Recommended Limit	41.5±5%	0.90±10%	20-24
850	Body	Measured, 2005-06-22	52.48	1.015	22
		Measured, 2005-06-23	52.48	1.013	22
		Recommended Limit	55.2±5%	0.97±10%	20-24
1900	Head	Measured, 2005-06-28	40.07	1.458	22
		Measured, 2005-06-29	40.07	1.457	21.8
		Recommended Limit	40.0±5%	1.40±10%	20-24
1900	Body	Measured, 2005-06-28	51.48	1.544	22.1
		Recommended Limit	53.3±5%	1.52±10%	20-24

Table 2. 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 evalutation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specifice absorption rate (SAR) in Section 4.2 of “IEEE Standard for Safty Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3KHz to 300GHz,” ANSI/IEEE C95.1-1992, Conpyright 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

Frequency Band	EUT position	Conducted Output Power (Average)	1g Average (mW/g)	Power Drift (dB)	Amb. Temp (℃)	Verdict
850 MHz	LeftHandSide Cheek, Low Channel	33.0	1.02	-0.2	22	**PASS**
	LeftHandSide Cheek, Mid Channel	33.0	1.04	-0.004	22	**PASS**
	LeftHandSide Cheek, High Channel	32.9	1.01	-0.03	22	**PASS**
	LeftHandSide Tilt, Low Channel	33.0	0.629	-0.03	22	**PASS**
	LeftHandSide Tilt, Mid Channel	33.0	0.659	-0.02	22	**PASS**
	LeftHandSide Tilt, High Channel	32.9	0.614	-0.01	22	**PASS**
	RightHandSide Cheek, Low Channel	33.0	0.933	-0.03	22	**PASS**
	RightHandSide Cheek, Mid Channel	33.0	0.934	-0.1	22	**PASS**
	RightHandSide Cheek, High Channel	32.9	0.887	-0.03	22	**PASS**
	RightHandSide Tilt, Low Channel	33.0	0.655	-0.04	22	**PASS**
	RightHandSide Tilt, Mid Channel	33.0	0.629	-0.07	22	**PASS**
	RightHandSide Tilt, High Channel	32.9	0.596	0.008	22	**PASS**
	BodyWorn, Low Channel	33.0	1.05	-0.03	22	**PASS**
	BodyWorn, Mid Channel	33.0	1.02	-0.2	22	**PASS**
	BodyWorn, High Channel	32.9	1.07	-0.3	22	**PASS**
1900 MHz	LeftHandSide Cheek, Low Channel	29.4	0.246	0.03	22	**PASS**
	LeftHandSide Cheek, Mid Channel	29.3	0.304	0.1	22	**PASS**
	LeftHandSide Cheek, High Channel	29.2	0.288	0.04	22	**PASS**
	LeftHandSide Tilt, Low Channel	29.4	0.465	-0.05	22	**PASS**
	LeftHandSide Tilt, Mid Channel	29.3	0.579	-0.07	22	**PASS**
	LeftHandSide Tilt, High Channel	29.2	0.552	-0.2	22	**PASS**

	RightHandSide Cheek, Low Channel	29.4	0.336	-0.04	22	**PASS**
	RightHandSide Cheek, Mid Channel	29.3	0.452	-0.001	22	**PASS**
	RightHandSide Cheek, High Channel	29.2	0.454	0.04	22	**PASS**
	RightHandSide Tilt, Low Channel	29.4	0.544	-0.02	22	**PASS**
	RightHandSide Tilt, Mid Channel	29.3	0.671	0.03	22	**PASS**
	RightHandSide Tilt, High Channel	29.2	0.642	-0.04	22	**PASS**
	BodyWorn, Low Channel	29.4	0.192	0.5	22	**PASS**
	BodyWorn, Mid Channel	29.3	0.298	-0.03	22	**PASS**
	BodyWorn, High Channel	29.2	0.378	-0.05	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 GSM1900 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.

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 4.1 build 47	N/A	GSM-SAR-001	N/A
Probe	ET3DV6	1774	GSM-SAR-021	2004.10.26
DAE	DAE3	569	GSM-SAR-023	2005.3.20
Phantom	SAM	N/A	GSM-SAR-005	N/A
Robot	RX90L	N/A	GSM-SAR-008	N/A
900MHz system validation dipole	D900V2	184	GSM-SAR-013	2005.3.20
1900MHz system validation dipole	D1900V2	5d028	GSM-SAR-020	2005.3.20
Dielectric probe kit	85070D	US01440168	GSM-SAR-016	2004.12.20
Agilent network analyzer	E5071B	MY42100549	GSM-SAR-007	2004.12.20
Agilent signal generator	E4438	14438CATO-19719	GSM-SAR-008	2004.12.20
Agilent preamplifier	8449B	3008A01921	GSM-SAR-009	2004.12.20
Agilent power meter	E4416A	GB41292095	GSM-SAR-010	2004.12.20
Agilent power sensor	8481h	MY41091234	GSM-SAR-011	2004.12.20
HT CP6100 20N Coupling	6100	SCP301480120	GSM-SAR-012	2004.12.20
R&S Universal radio communication tester	CMU200	103633	GSM-AUD-002	2004.12.20

4. Measurements

4.1 FCC-OET65-LeftHandSide-Cheek-GSM850-Low

Date/Time: 06/21/05 12:05:08

Test Laboratory: SGS-GSM
File Name: FCC-OET65-LeftHandSide-Cheek-GSM850.da4

FCC-OET65-LeftHandSide-Cheek-GSM850-Low

DUT: GSM50049; Type: Head; Serial: 20050620
Program: Compliance Testing: EN 50361 Protocol Left-Hand Side)

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: HSL850 (σ = 0.865816 mho/m, ε_r = 41.8373, ρ = 1000 kg/m^3)
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

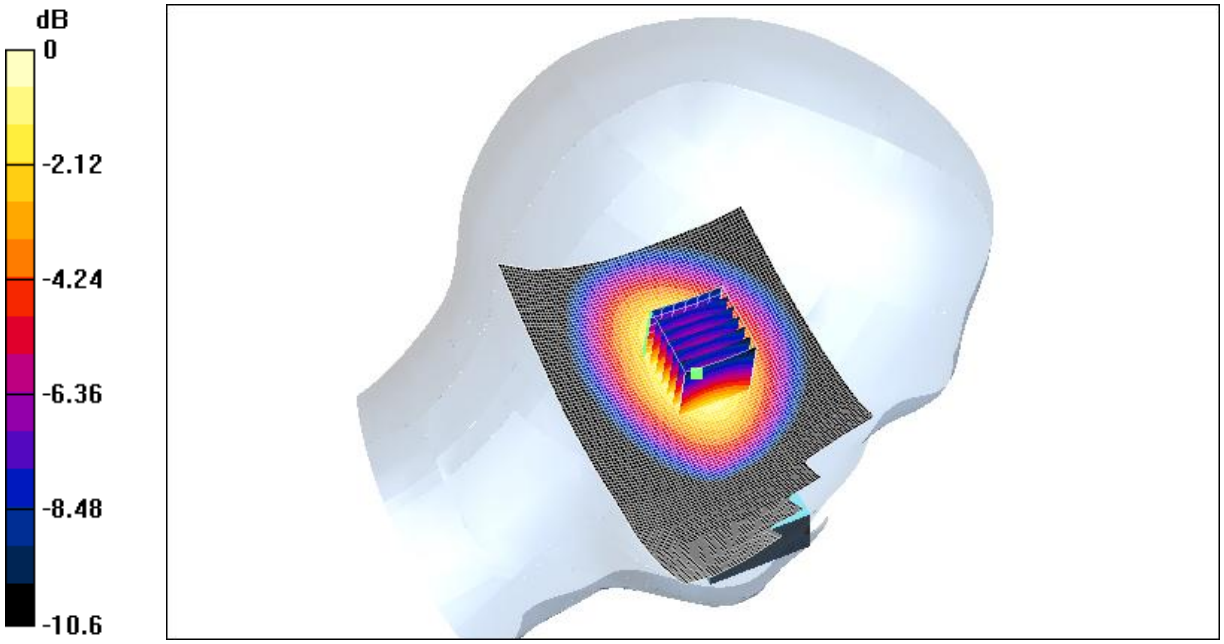
DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.96, 6.96, 6.96); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Cheek position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 32.8 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 1.1 mW/g

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

Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.683 mW/g
Reference Value = 32.8 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 1.08 mW/g



0 dB = 1.08mW/g

4.2 FCC-OET65-LeftHandSide-Cheek-GSM850-Mid

Date/Time: 06/21/05 12:05:08

Test Laboratory: SGS-GSM
File Name: FCC-OET65-LeftHandSide-Cheek-GSM850.da4

FCC-OET65-LeftHandSide-Cheek-GSM850-Mid

DUT: GSM50049; Type: Head; Serial: 20050620
Program: Compliance Testing: EN 50361 Protocol Left-Hand Side)

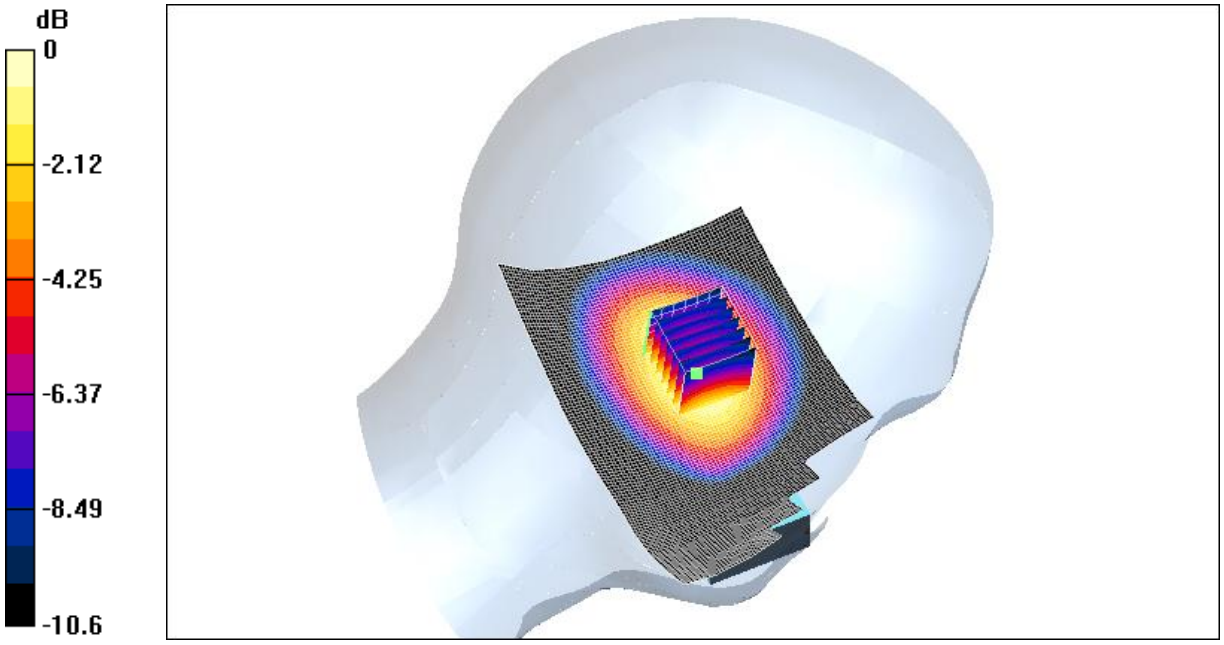
Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:8.3
Medium: HSL850 (σ = 0.8773 mho/m, ε_r = 41.699, ρ = 1000 kg/m^3)
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.96, 6.96, 6.96); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Cheek position - Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 32.3 V/m
Power Drift = -0.004 dB
Maximum value of SAR = 1.1 mW/g

Cheek position - Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.48 W/kg
SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.696 mW/g
Reference Value = 32.3 V/m
Power Drift = -0.004 dB
Maximum value of SAR = 1.1 mW/g



0 dB = 1.1mW/g

4.3 FCC-OET65-LeftHandSide-Cheek-GSM850-High

Date/Time: 06/21/05 12:05:08

Test Laboratory: SGS-GSM
File Name: FCC-OET65-LeftHandSide-Cheek-GSM850.da4

FCC-OET65-LeftHandSide-Cheek-GSM850-High

DUT: GSM50049; Type: Head; Serial: 20050620
Program: Compliance Testing: EN 50361 Protocol Left-Hand Side)

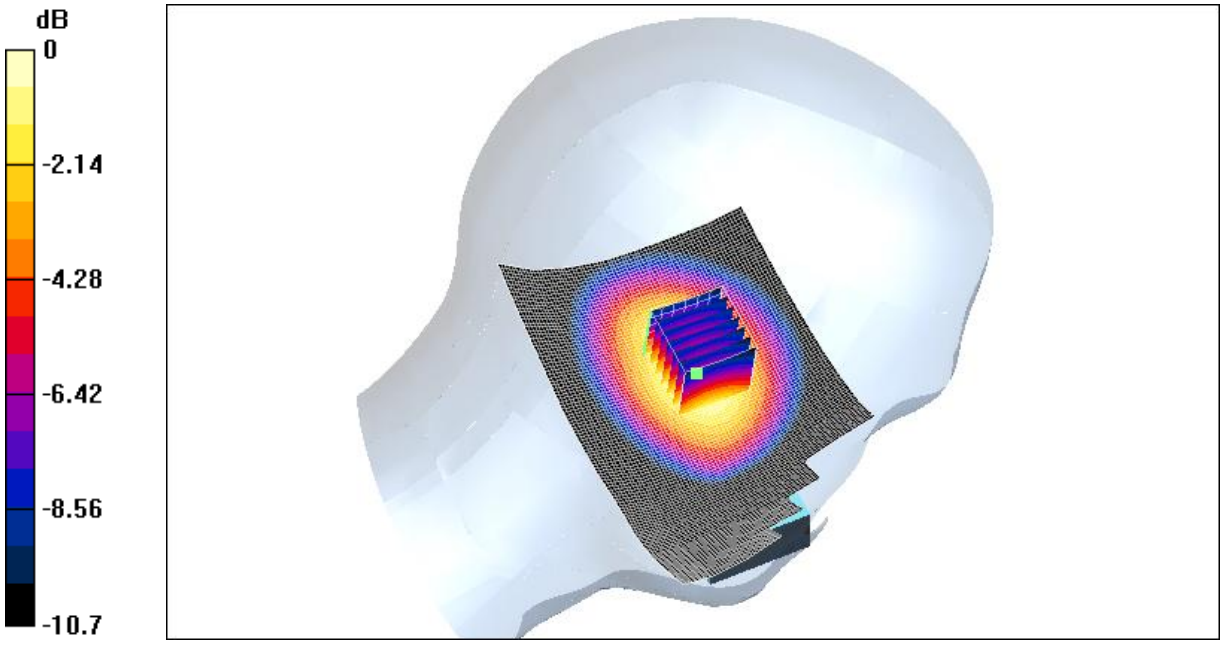
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: HSL850 (σ = 0.889355 mho/m, ε_r = 41.5624, ρ = 1000 kg/m^3)
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.96, 6.96, 6.96); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Cheek position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 31.5 V/m
Power Drift = -0.03 dB
Maximum value of SAR = 1.08 mW/g

Cheek position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.673 mW/g
Reference Value = 31.5 V/m
Power Drift = -0.03 dB
Maximum value of SAR = 1.07 mW/g



0 dB = 1.07mW/g

4.4 FCC-OET65-LeftHandSide-Tilt-GSM850-Low

Date/Time: 06/21/05 14:31:02

Test Laboratory: SGS-GSM
File Name: FCC-OET65-LeftHandSide-Tilt-GSM850.da4

FCC-OET65-LeftHandSide-Tilt-GSM850-Low

DUT: GSM50049; Type: Head; Serial: 20050620
Program: Compliance Testing: EN 50361 Protocol Left-Hand Side)

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: HSL850 (σ = 0.865816 mho/m, ε_r = 41.8373, ρ = 1000 kg/m^3)
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.96, 6.96, 6.96); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

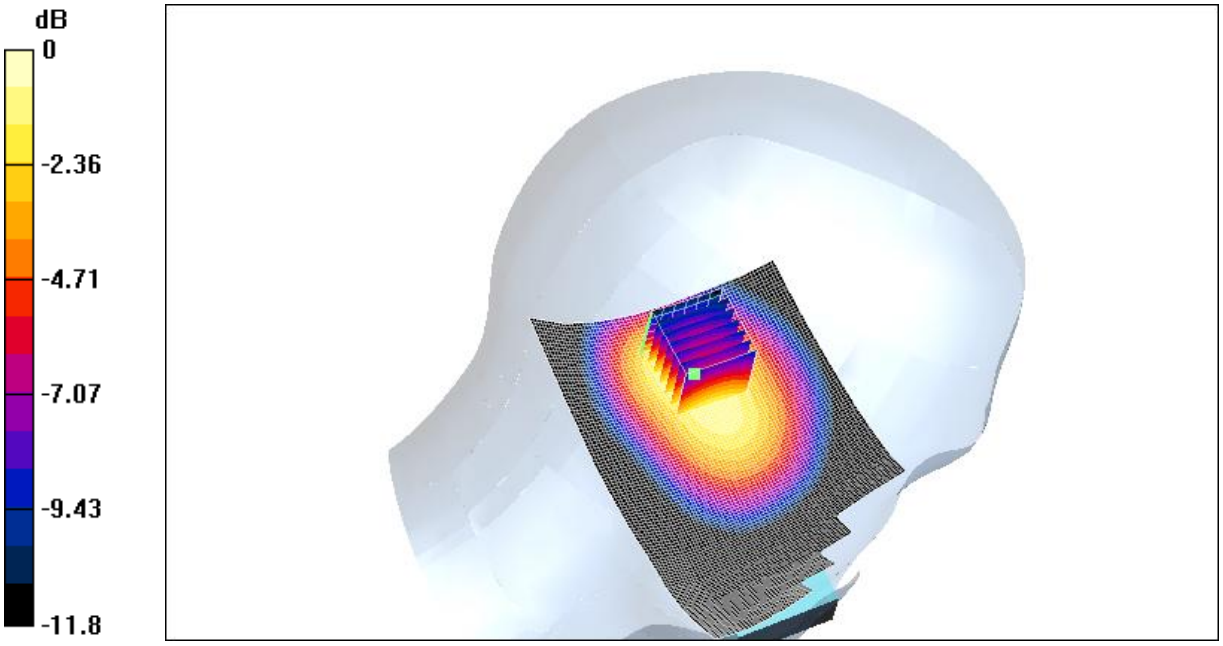
Tilt position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 25.7 V/m
Power Drift = -0.03 dB
Maximum value of SAR = 0.685 mW/g

Tilt position - Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.925 W/kg
SAR(1 g) = 0.629 mW/g; SAR(10 g) = 0.413 mW/g

Reference Value = 25.7 V/m

Power Drift = -0.03 dB

Maximum value of SAR = 0.68 mW/g



0 dB = 0.68mW/g

4.5 FCC-OET65-LeftHandSide-Tilt-GSM850-Mid

Date/Time: 06/21/05 14:31:02

Test Laboratory: SGS-GSM

File Name: FCC-OET65-LeftHandSide-Tilt-GSM850.da4

FCC-OET65-LeftHandSide-Tilt-GSM850-Mid

DUT: GSM50049; Type: Head; Serial: 20050620

Program: Compliance Testing: EN 50361 Protocol Left-Hand Side)

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

Medium: HSL850 (σ = 0.8773 mho/m, ε_r = 41.699, ρ = 1000 kg/m^3)

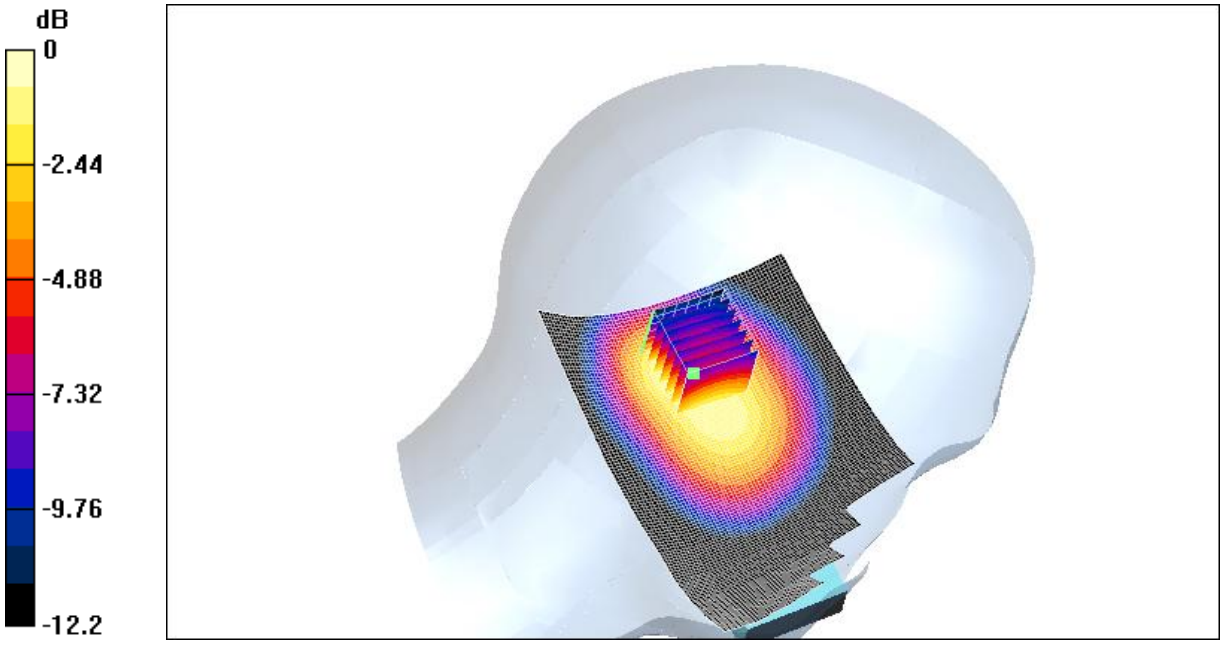
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.96, 6.96, 6.96); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilt position - Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 27 V/m
Power Drift = -0.02 dB
Maximum value of SAR = 0.73 mW/g

Tilt position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.985 W/kg
SAR(1 g) = 0.659 mW/g; SAR(10 g) = 0.434 mW/g
Reference Value = 27 V/m
Power Drift = -0.02 dB
Maximum value of SAR = 0.709 mW/g



0 dB = 0.709mW/g

4.6 FCC-OET65-LeftHandSide-Tilt-GSM850-High

Date/Time: 06/21/05 14:31:02

Test Laboratory: SGS-GSM
File Name: FCC-OET65-LeftHandSide-Tilt-GSM850.da4

FCC-OET65-LeftHandSide-Tilt-GSM850-High

DUT: GSM50049; Type: Head; Serial: 20050620
Program: Compliance Testing: EN 50361 Protocol Left-Hand Side)

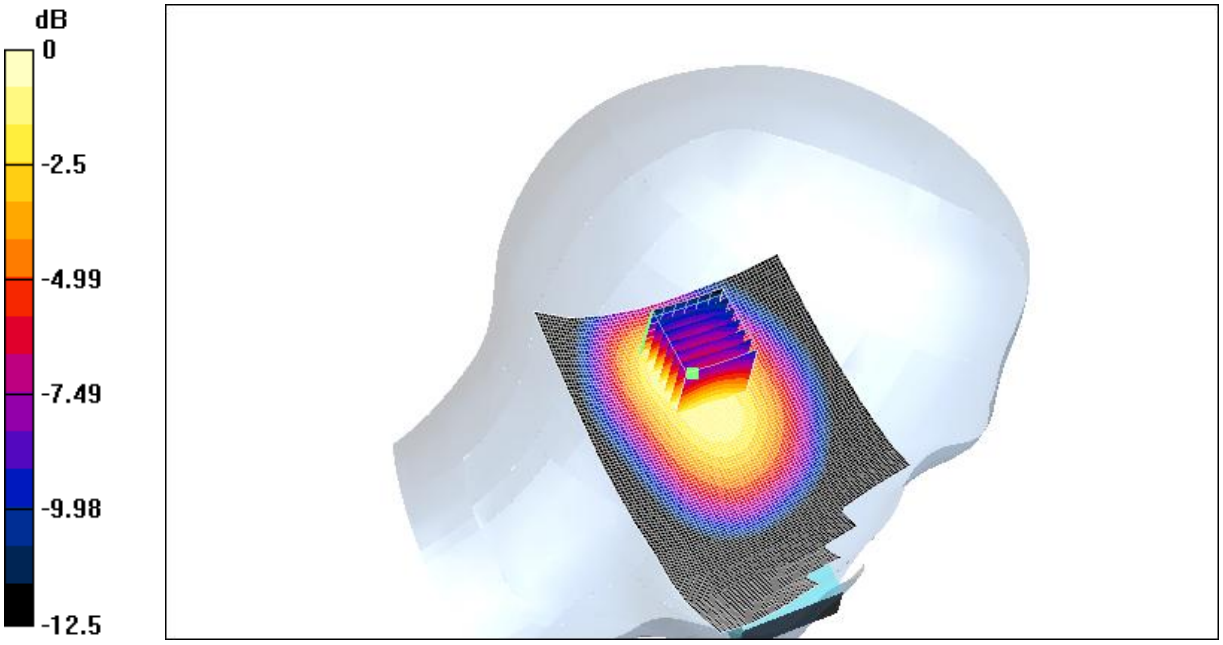
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: HSL850 (σ = 0.889355 mho/m, ε_r = 41.5624, ρ = 1000 kg/m^3)
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.96, 6.96, 6.96); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilt position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 25.9 V/m
Power Drift = -0.01 dB
Maximum value of SAR = 0.675 mW/g

Tilt position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.921 W/kg
SAR(1 g) = 0.614 mW/g; SAR(10 g) = 0.4 mW/g
Reference Value = 25.9 V/m
Power Drift = -0.01 dB
Maximum value of SAR = 0.664 mW/g



0 dB = 0.664mW/g

4.7 FCC-OET65-RightHandSide-Cheek-GSM850-Low

Date/Time: 06/21/05 16:22:12

Test Laboratory: SGS-GSM
File Name: FCC-OET65-RightHandSide-Cheek-GSM850.da4

FCC-OET65-RightHandSide-Cheek-GSM850-Low

DUT: GSM50049; Type: Head; Serial: 20050620
Program: Compliance Testing: EN 50361 Protocol Right-Hand Side)

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: HSL850 (σ = 0.865816 mho/m, ε_r = 41.8373, ρ = 1000 kg/m^3)
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

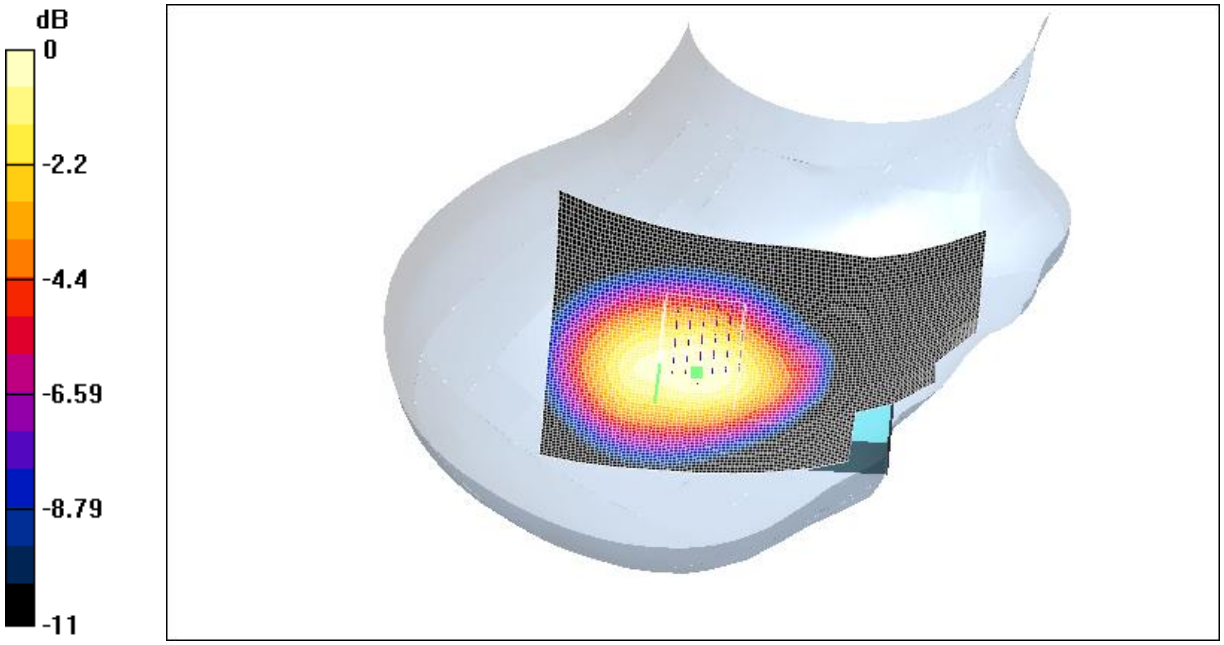
- Probe: ET3DV6 - SN1774; ConvF(6.96, 6.96, 6.96); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Cheek position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 33.5 V/m
Power Drift = -0.03 dB
Maximum value of SAR = 1.02 mW/g

Cheek position - Low/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.3 W/kg
SAR(1 g) = 0.933 mW/g; SAR(10 g) = 0.639 mW/g
Reference Value = 33.5 V/m

Power Drift = -0.03 dB

Maximum value of SAR = 0.994 mW/g



0 dB = 0.994mW/g

4.8 FCC-OET65-RightHandSide-Cheek-GSM850-Mid

Date/Time: 06/21/05 16:22:12

Test Laboratory: SGS-GSM

File Name: FCC-OET65-RightHandSide-Cheek-GSM850.da4

FCC-OET65-RightHandSide-Cheek-GSM850-Mid

DUT: GSM50049; Type: Head; Serial: 20050620

Program: Compliance Testing: EN 50361 Protocol Right-Hand Side)

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

Medium: HSL850 (σ = 0.8773 mho/m, ε_r = 41.699, ρ = 1000 kg/m^3)

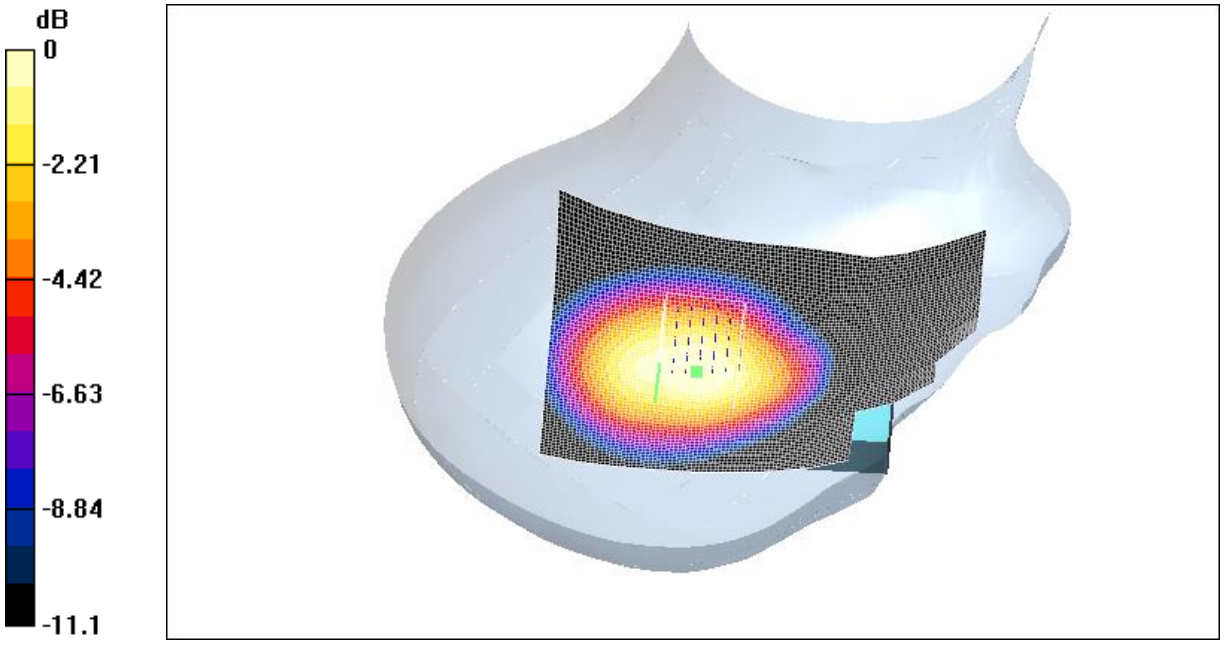
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.96, 6.96, 6.96); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Cheek position - Mid/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 33.5 V/m
Power Drift = -0.1 dB
Maximum value of SAR = 1.04 mW/g

Cheek position - Mid/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.934 mW/g; SAR(10 g) = 0.641 mW/g
Reference Value = 33.5 V/m
Power Drift = -0.1 dB
Maximum value of SAR = 0.99 mW/g



0 dB = 0.99mW/g

4.9 FCC-OET65-RightHandSide-Cheek-GSM850-High

Date/Time: 06/21/05 16:22:12

Test Laboratory: SGS-GSM
File Name: FCC-OET65-RightHandSide-Cheek-GSM850.da4

FCC-OET65-RightHandSide-Cheek-GSM850-High

DUT: GSM50049; Type: Head; Serial: 20050620
Program: Compliance Testing: EN 50361 Protocol Right-Hand Side)

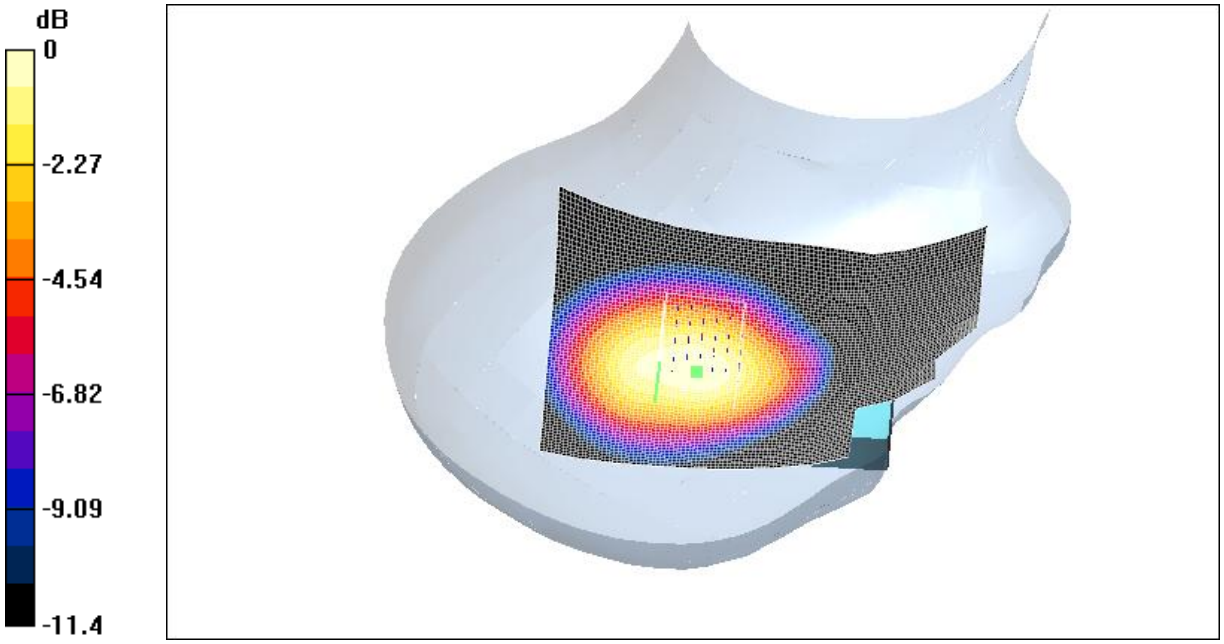
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: HSL850 (σ = 0.889355 mho/m, ε_r = 41.5624, ρ = 1000 kg/m^3)
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.96, 6.96, 6.96); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Cheek position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 32.3 V/m
Power Drift = -0.03 dB
Maximum value of SAR = 0.972 mW/g

Cheek position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.887 mW/g; SAR(10 g) = 0.603 mW/g
Reference Value = 32.3 V/m
Power Drift = -0.03 dB
Maximum value of SAR = 0.95 mW/g



0 dB = 0.95mW/g

4.10 FCC-OET65-RightHandSide-Tilt-GSM850-Low

Date/Time: 06/21/05 17:26:23

Test Laboratory: SGS-GSM
File Name: FCC-OET65-RightHandSide-Tilt-GSM850.da4

FCC-OET65-RightHandSide-Tilt-GSM850-Low

DUT: GSM50049; Type: Head; Serial: 20050620
Program: Compliance Testing: EN 50361 Protocol Right-Hand Side)

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: HSL850 (σ = 0.865816 mho/m, ε_r = 41.8373, ρ = 1000 kg/m^3)
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.96, 6.96, 6.96); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

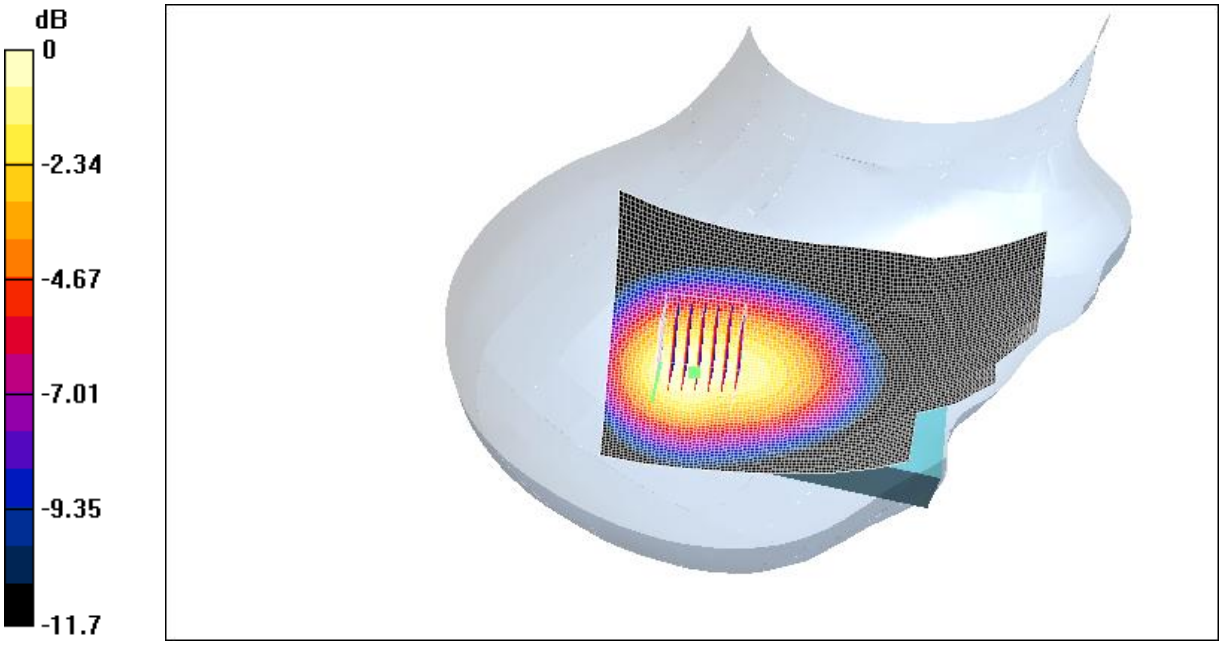
Tilt position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 27.1 V/m
Power Drift = -0.04 dB
Maximum value of SAR = 0.714 mW/g

Tilt position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.655 mW/g; SAR(10 g) = 0.428 mW/g

Reference Value = 27.1 V/m

Power Drift = -0.04 dB

Maximum value of SAR = 0.698 mW/g



0 dB = 0.698mW/g

4.11 FCC-OET65-RightHandSide-Tilt-GSM850-Mid

Date/Time: 06/22/05 10:00:19

Test Laboratory: SGS-GSM

File Name: FCC-OET65-RightHandSide-Tilt-GSM850.da4

FCC-OET65-RightHandSide-Tilt-GSM850-Mid

DUT: GSM50049; Type: Head; Serial: 20050620

Program: Compliance Testing: EN 50361 Protocol Right-Hand Side)

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

Medium: HSL850 (σ = 0.8773 mho/m, ε_r = 41.699, ρ = 1000 kg/m^3)

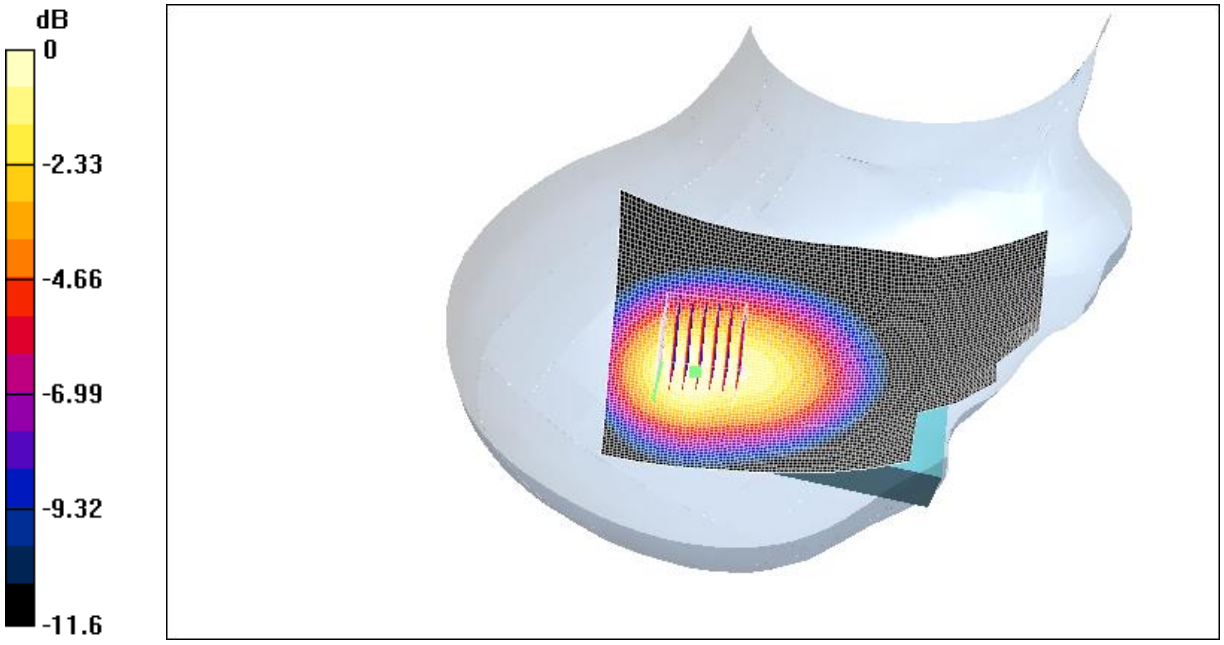
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.96, 6.96, 6.96); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilt position - Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 27.2 V/m
Power Drift = -0.07 dB
Maximum value of SAR = 0.693 mW/g

Tilt position - Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.936 W/kg
SAR(1 g) = 0.629 mW/g; SAR(10 g) = 0.417 mW/g
Reference Value = 27.2 V/m
Power Drift = -0.07 dB
Maximum value of SAR = 0.67 mW/g



0 dB = 0.67mW/g

4.12 FCC-OET65-RightHandSide-Tilt-GSM850-High

Date/Time: 06/22/05 10:00:19

Test Laboratory: SGS-GSM
File Name: FCC-OET65-RightHandSide-Tilt-GSM850.da4

FCC-OET65-RightHandSide-Tilt-GSM850-High

DUT: GSM50049; Type: Head; Serial: 20050620
Program: Compliance Testing: EN 50361 Protocol Right-Hand Side)

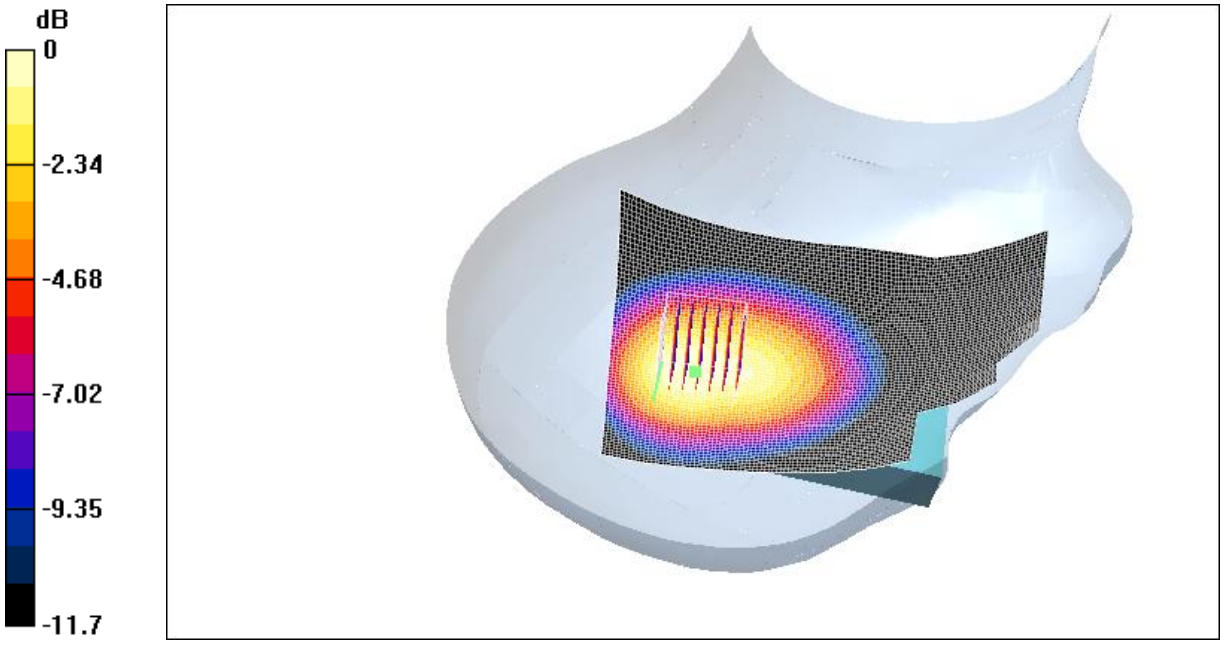
Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: HSL850 (σ = 0.889355 mho/m, ε_r = 41.5624, ρ = 1000 kg/m^3)
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.96, 6.96, 6.96); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilt position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 25.9 V/m
Power Drift = 0.008 dB
Maximum value of SAR = 0.654 mW/g

Tilt position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.892 W/kg
SAR(1 g) = 0.596 mW/g; SAR(10 g) = 0.395 mW/g
Reference Value = 25.9 V/m
Power Drift = 0.008 dB
Maximum value of SAR = 0.631 mW/g



0 dB = 0.631mW/g

4.13 FCC-OET65-Body-Worn-GSM850-Low

Date/Time: 06/23/05 10:39:09

Test Laboratory: SGS-GSM
File Name: FCC-OET65-Body-Worn-GSM850-2.da4

FCC-OET65-Body-Worn-GSM850-Low

DUT: GSM50049; Type: Body; Serial: 20050620
Program: Compliance Testing: FCC OET65 Protocol (Body Worn)

Communication System: GSM850; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium: HSL850-Body (σ = 0.982648 mho/m, ε_r = 52.6441, ρ = 1000 kg/m^3)
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

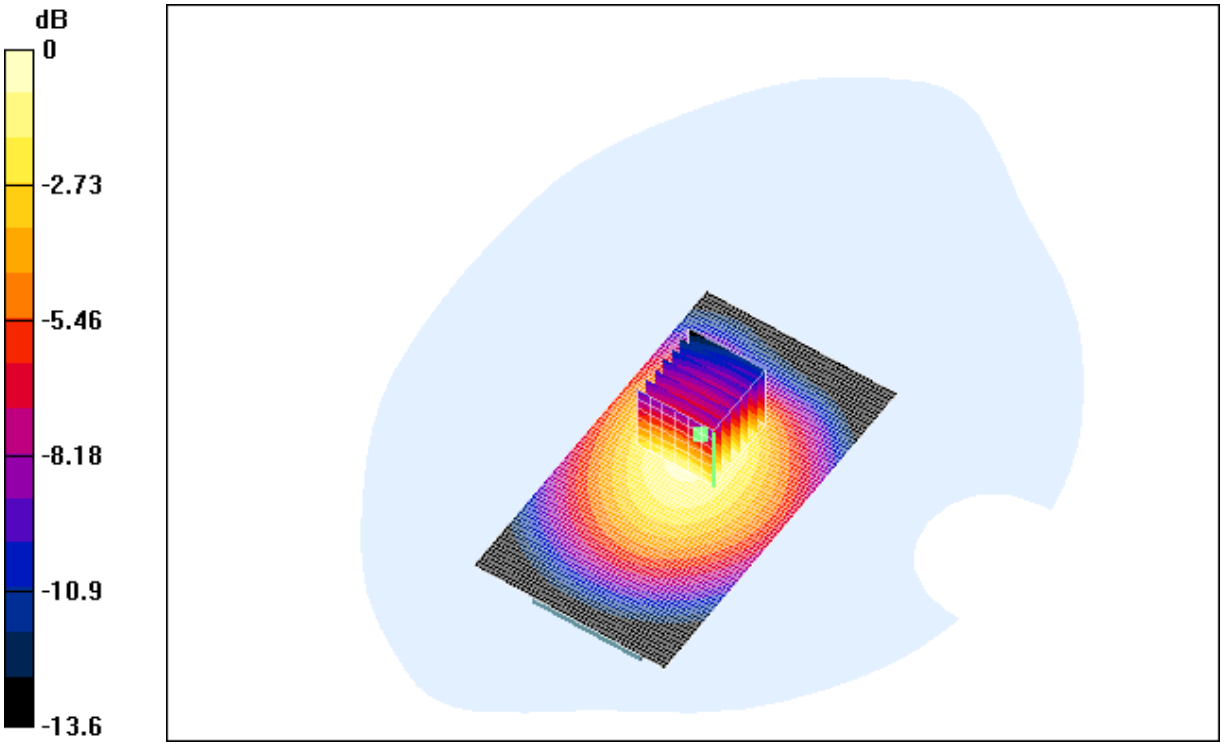
DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.65, 6.65, 6.65); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Body Worn - Low/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 26.9 V/m
Power Drift = -0.03 dB
Maximum value of SAR = 1.2 mW/g

Body Worn - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.61 W/kg
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.691 mW/g
Reference Value = 26.9 V/m
Power Drift = -0.03 dB

Maximum value of SAR = 1.12 mW/g



0 dB = 1.12mW/g

4.14 FCC-OET65-Body-Worn-GSM850-Mid

Date/Time: 06/23/05 09:36:08

Test Laboratory: SGS-GSM
File Name: FCC-OET65-Body-Worn-GSM850.da4

FCC-OET65-Body-Worn-GSM850-Mid

DUT: GSM50049; Type: Body; Serial: 20050620
Program: Compliance Testing: FCC OET65 Protocol (Body Worn)

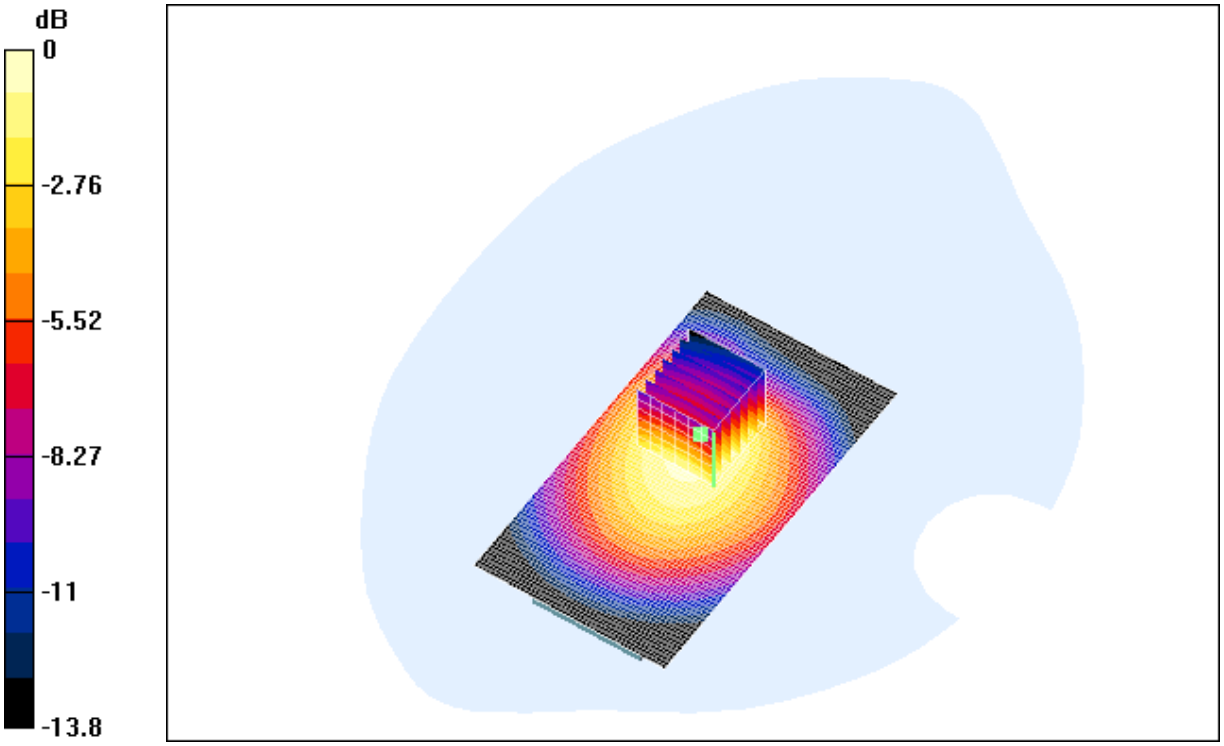
Communication System: GSM850; Frequency: 836.4 MHz;Duty Cycle: 1:8.3
Medium: HSL850-Body (σ = 0.99717 mho/m, ε_r = 52.5261, ρ = 1000 kg/m^3)
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.65, 6.65, 6.65); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Body Worn - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 25.9 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 1.16 mW/g

Body Worn - Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.53 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.669 mW/g
Reference Value = 25.9 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 1.09 mW/g



0 dB = 1.09mW/g

4.15 FCC-OET65-Body-Worn-GSM850-High

Date/Time: 06/22/05 17:10:25

Test Laboratory: SGS-GSM
File Name: FCC-OET65-Body-Worn-GSM850.da4

FCC-OET65-Body-Worn-GSM850-High

DUT: GSM50049; Type: Body; Serial: 20050620
Program: Compliance Testing: FCC OET65 Protocol (Body Worn)

Communication System: GSM850; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: HSL850-Body (σ = 1.01257 mho/m, ε_r = 52.4876, ρ = 1000 kg/m^3)

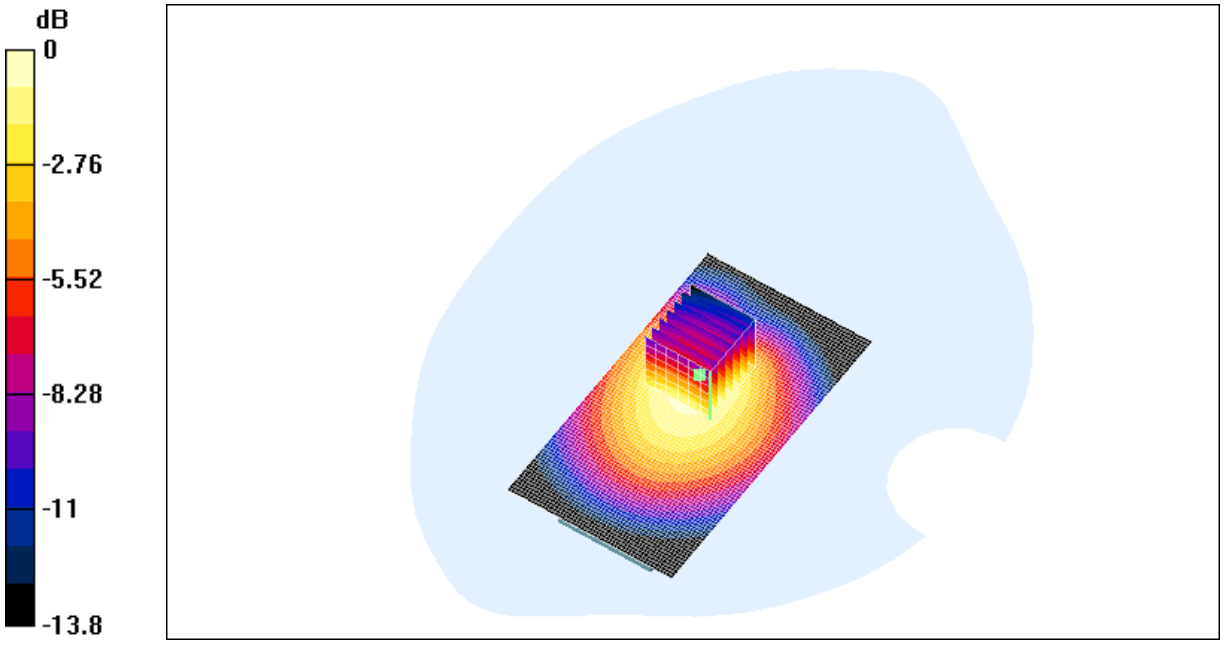
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(6.65, 6.65, 6.65); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Body Worn - High/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 26.2 V/m
Power Drift = -0.3 dB
Maximum value of SAR = 1.22 mW/g

Body Worn - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.63 W/kg
SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.701 mW/g
Reference Value = 26.2 V/m
Power Drift = -0.3 dB
Maximum value of SAR = 1.15 mW/g



0 dB = 1.15mW/g

4.16 FCC-OET65-LeftHandSide-Cheek-GSM1900-Low

Date/Time: 06/28/05 16:39:44

Test Laboratory: SGS-GSM
File Name: FCC-OET65-LeftHandSide-Cheek-GSM1900.da4

FCC-OET65-LeftHandSide-Cheek-GSM1900-Low

DUT: GSM50049; Type: Head; Serial: 20050627
Program: Compliance Testing: EN 50361 Protocol Left-Hand Side)

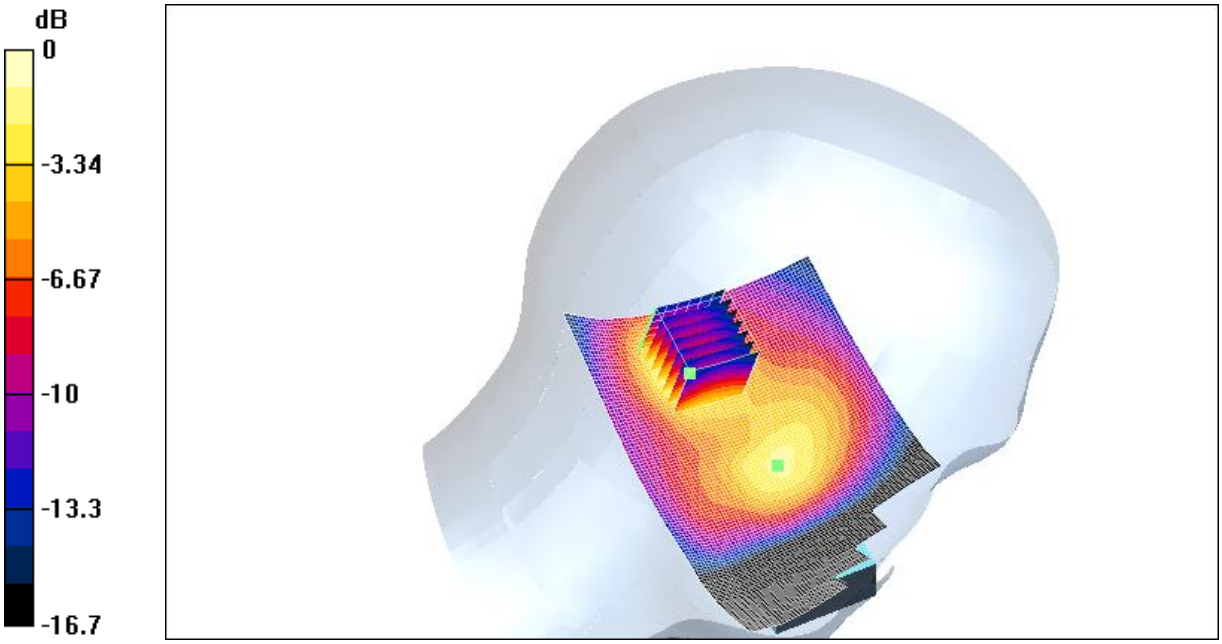
Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: HSL1900 (σ = 1.41808 mho/m, ε_r = 40.5312, ρ = 1000 kg/m^3)
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(5.25, 5.25, 5.25); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Cheek position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 9.37 V/m
Power Drift = 0.03 dB
Maximum value of SAR = 0.272 mW/g

Cheek position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.372 W/kg
SAR(1 g) = 0.246 mW/g; SAR(10 g) = 0.138 mW/g
Reference Value = 9.37 V/m
Power Drift = 0.03 dB
Maximum value of SAR = 0.269 mW/g



0 dB = 0.269mW/g

4.17 FCC-OET65-LeftHandSide-Cheek-GSM1900-Mid

Date/Time: 06/28/05 16:39:44

Test Laboratory: SGS-GSM
File Name: FCC-OET65-LeftHandSide-Cheek-GSM1900.da4

FCC-OET65-LeftHandSide-Cheek-GSM1900-Mid

DUT: GSM50049; Type: Head; Serial: 20050627
Program: Compliance Testing: EN 50361 Protocol Left-Hand Side)

Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: HSL1900 (σ = 1.44443 mho/m, ε_r = 40.3239, ρ = 1000 kg/m^3)
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(5.25, 5.25, 5.25); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

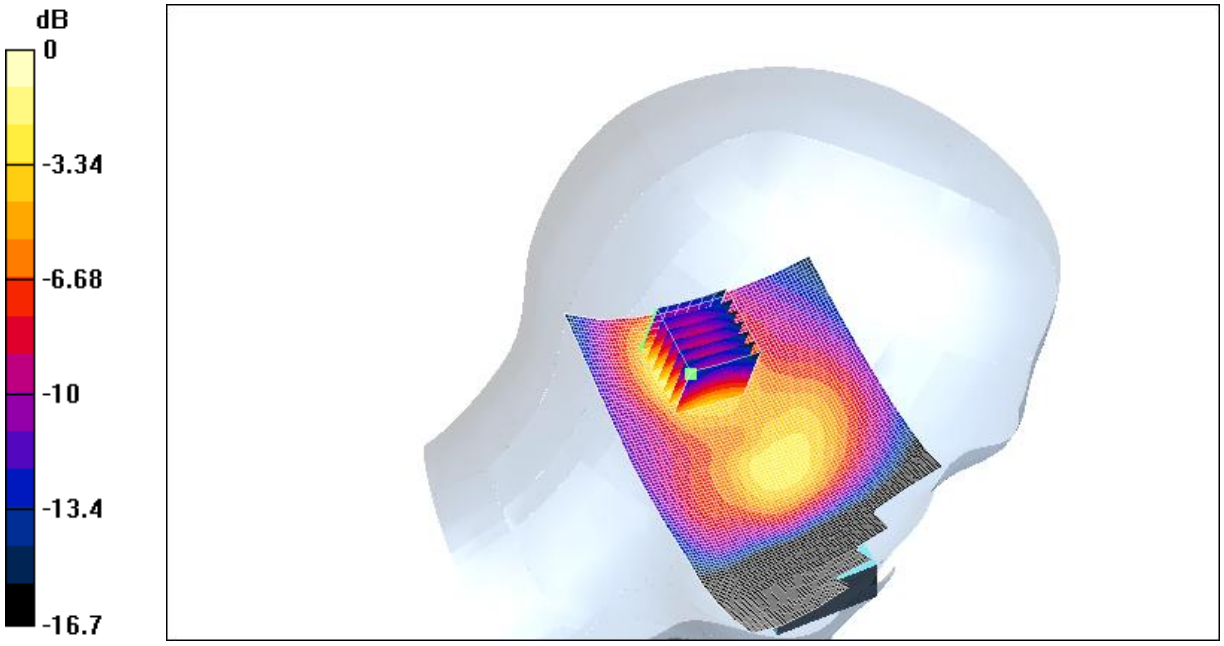
Cheek position - Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 9.88 V/m
Power Drift = 0.1 dB
Maximum value of SAR = 0.338 mW/g

Cheek position - Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.461 W/kg
SAR(1 g) = 0.304 mW/g; SAR(10 g) = 0.17 mW/g

Reference Value = 9.88 V/m

Power Drift = 0.1 dB

Maximum value of SAR = 0.336 mW/g



0 dB = 0.336mW/g

4.18 FCC-OET65-LeftHandSide-Cheek-GSM1900-High

Date/Time: 06/28/05 16:39:44

Test Laboratory: SGS-GSM

File Name: FCC-OET65-LeftHandSide-Cheek-GSM1900.da4

FCC-OET65-LeftHandSide-Cheek-GSM1900-High

DUT: GSM50049; Type: Head; Serial: 20050627

Program: Compliance Testing: EN 50361 Protocol Left-Hand Side)

Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3

Medium: HSL1900 (σ = 1.46824 mho/m, ε_r = 39.9929, ρ = 1000 kg/m^3)

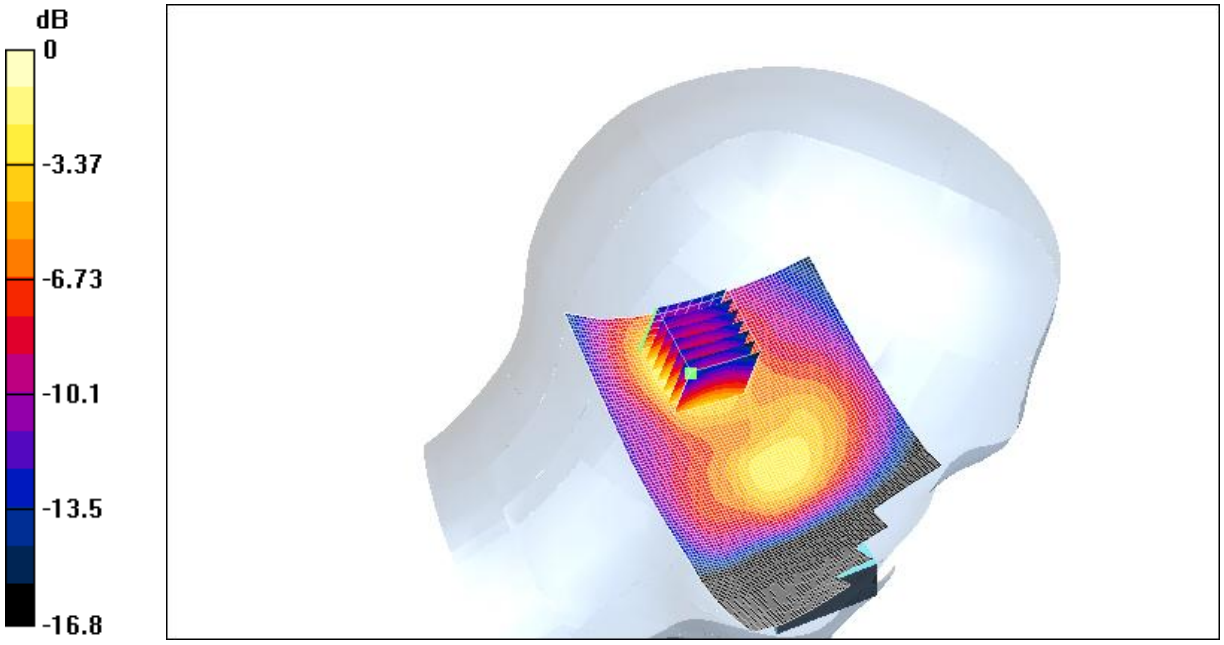
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(5.25, 5.25, 5.25); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Cheek position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 9.35 V/m
Power Drift = 0.04 dB
Maximum value of SAR = 0.326 mW/g

Cheek position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.437 W/kg
SAR(1 g) = 0.288 mW/g; SAR(10 g) = 0.161 mW/g
Reference Value = 9.35 V/m
Power Drift = 0.04 dB
Maximum value of SAR = 0.319 mW/g



0 dB = 0.319mW/g

4.19 FCC-OET65-LeftHandSide-Tilt-GSM1900-Low

Date/Time: 06/29/05 10:57:26

Test Laboratory: SGS-GSM
File Name: FCC-OET65-LeftHandSide-Tilt-GSM1900.da4

FCC-OET65-LeftHandSide-Tilt-GSM1900-Low

DUT: GSM50049; Type: Head; Serial: 20050627
Program: Compliance Testing: EN 50361 Protocol Left-Hand Side)

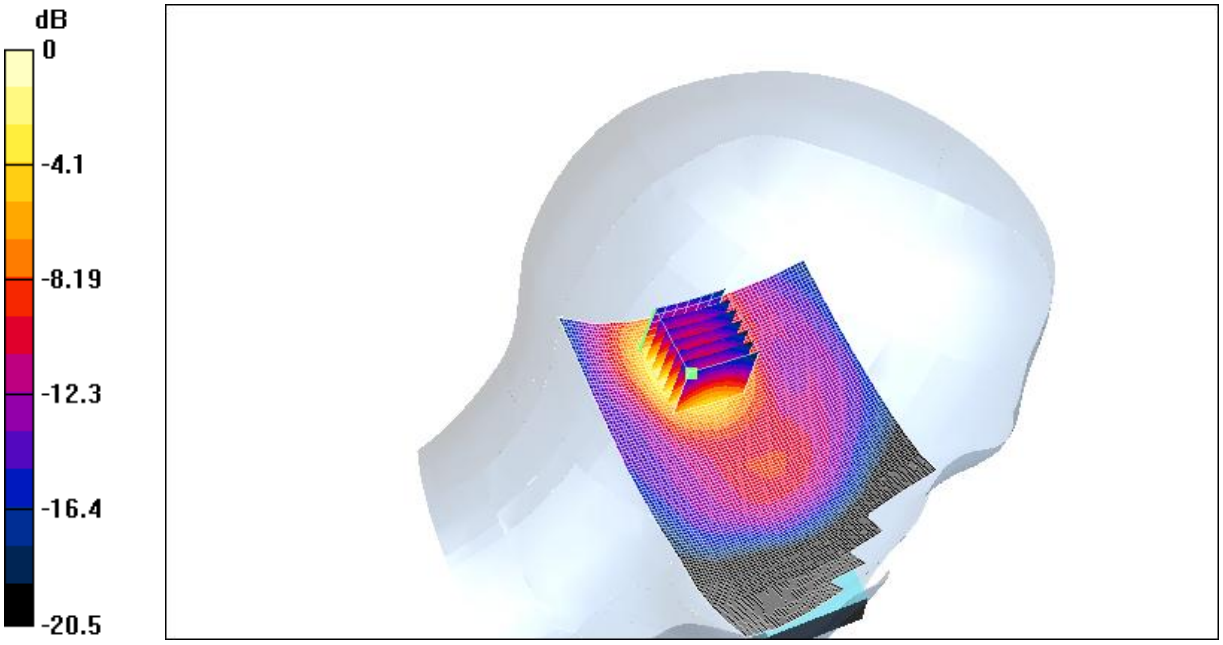
Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: HSL1900 (σ = 1.41808 mho/m, ε_r = 40.5312, ρ = 1000 kg/m^3)
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(5.25, 5.25, 5.25); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilt position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 11.1 V/m
Power Drift = -0.05 dB
Maximum value of SAR = 0.525 mW/g

Tilt position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.772 W/kg
SAR(1 g) = 0.465 mW/g; SAR(10 g) = 0.242 mW/g
Reference Value = 11.1 V/m
Power Drift = -0.05 dB
Maximum value of SAR = 0.518 mW/g



0 dB = 0.518mW/g

4.20 FCC-OET65-LeftHandSide-Tilt-GSM1900-Mid

Date/Time: 06/29/05 10:57:26

Test Laboratory: SGS-GSM
File Name: FCC-OET65-LeftHandSide-Tilt-GSM1900.da4

FCC-OET65-LeftHandSide-Tilt-GSM1900-Mid

DUT: GSM50049; Type: Head; Serial: 20050627
Program: Compliance Testing: EN 50361 Protocol Left-Hand Side)

Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: HSL1900 (σ = 1.44443 mho/m, ε_r = 40.3239, ρ = 1000 kg/m^3)
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

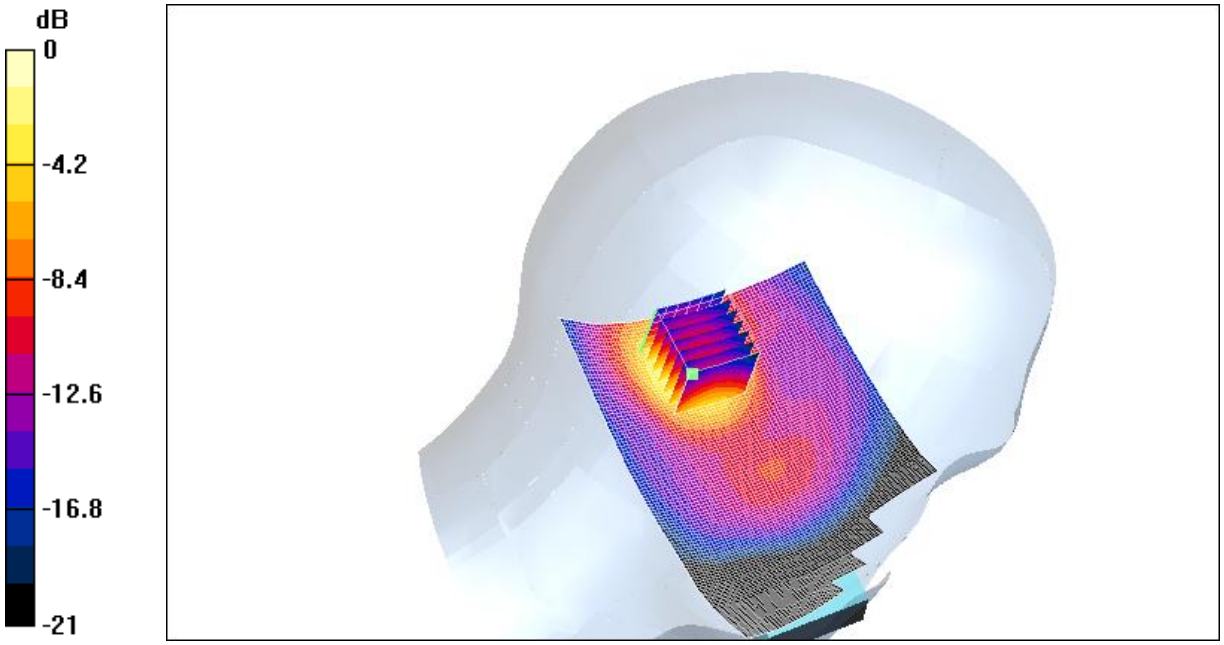
- Probe: ET3DV6 - SN1774; ConvF(5.25, 5.25, 5.25); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilt position - Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 12 V/m
Power Drift = -0.07 dB
Maximum value of SAR = 0.649 mW/g

Tilt position - Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.978 W/kg
SAR(1 g) = 0.579 mW/g; SAR(10 g) = 0.297 mW/g
Reference Value = 12 V/m

Power Drift = -0.07 dB

Maximum value of SAR = 0.645 mW/g



0 dB = 0.645mW/g

4.21 FCC-OET65-LeftHandSide-Tilt-GSM1900-High

Date/Time: 06/29/05 10:57:26

Test Laboratory: SGS-GSM

File Name: FCC-OET65-LeftHandSide-Tilt-GSM1900.da4

FCC-OET65-LeftHandSide-Tilt-GSM1900-High

DUT: GSM50049; Type: Head; Serial: 20050627

Program: Compliance Testing: EN 50361 Protocol Left-Hand Side)

Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3

Medium: HSL1900 (σ = 1.46824 mho/m, ε_r = 39.9929, ρ = 1000 kg/m^3)

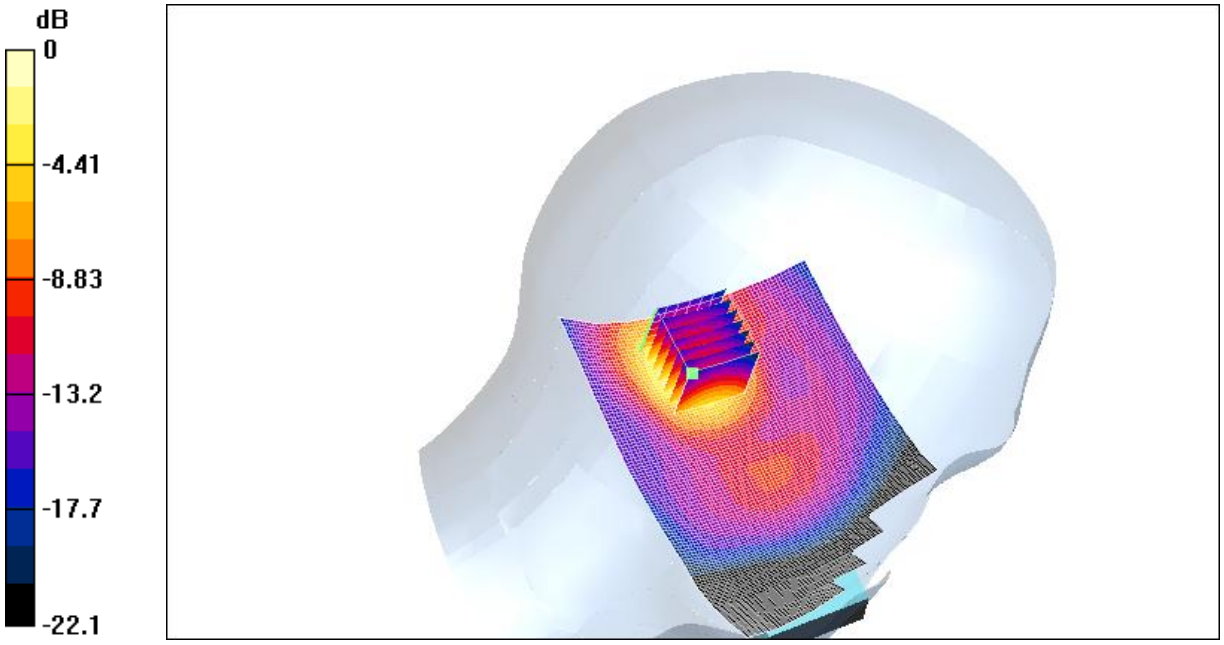
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(5.25, 5.25, 5.25); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilt position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 11.6 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 0.635 mW/g

Tilt position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.951 W/kg
SAR(1 g) = 0.552 mW/g; SAR(10 g) = 0.28 mW/g
Reference Value = 11.6 V/m
Power Drift = -0.2 dB
Maximum value of SAR = 0.614 mW/g



0 dB = 0.614mW/g

4.22 FCC-OET65-RightHandSide-Cheek-GSM1900-Low

Date/Time: 06/29/05 13:39:34

Test Laboratory: SGS-GSM
File Name: FCC-OET65-RightHandSide-Cheek-GSM1900.da4

FCC-OET65-RightHandSide-Cheek-GSM1900-Low

DUT: GSM50049; Type: Head; Serial: 20050627
Program: Compliance Testing: EN 50361 Protocol Right-Hand Side)

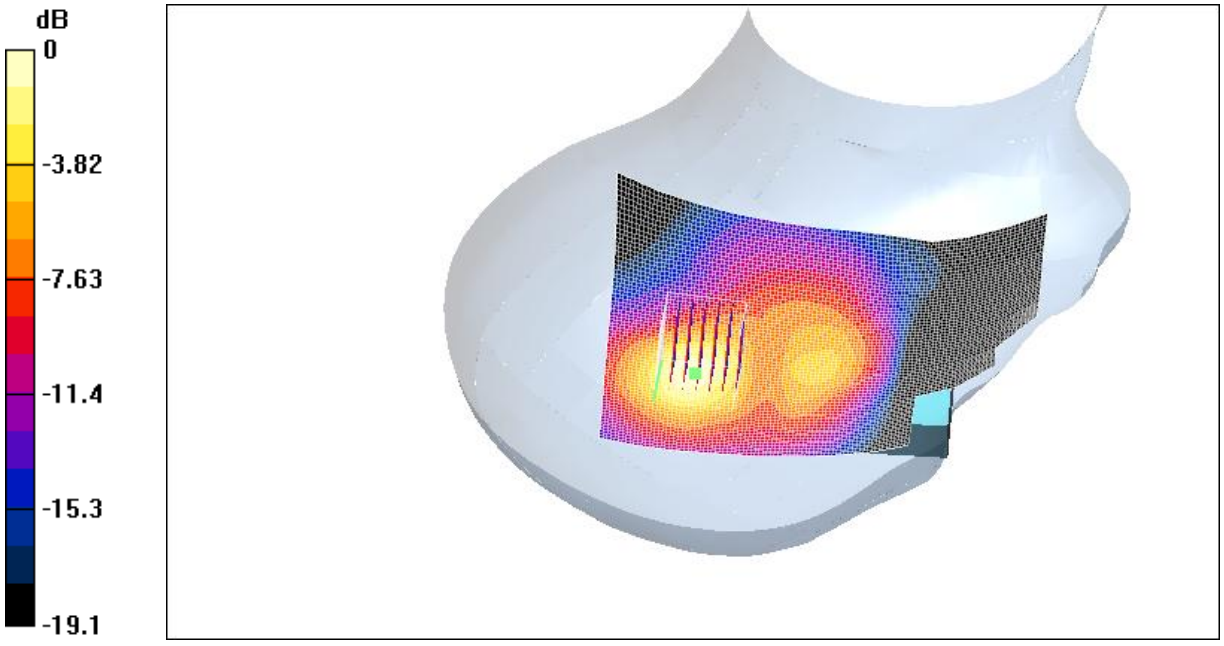
Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: HSL1900 (σ = 1.41808 mho/m, ε_r = 40.5312, ρ = 1000 kg/m^3)
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(5.25, 5.25, 5.25); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Cheek position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 12.2 V/m
Power Drift = -0.04 dB
Maximum value of SAR = 0.355 mW/g

Cheek position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.568 W/kg
SAR(1 g) = 0.336 mW/g; SAR(10 g) = 0.174 mW/g
Reference Value = 12.2 V/m
Power Drift = -0.04 dB
Maximum value of SAR = 0.378 mW/g



0 dB = 0.378mW/g

4.23 FCC-OET65-RightHandSide-Cheek-GSM1900-Mid

Date/Time: 06/29/05 13:39:34

Test Laboratory: SGS-GSM
File Name: FCC-OET65-RightHandSide-Cheek-GSM1900.da4

FCC-OET65-RightHandSide-Cheek-GSM1900-Mid

DUT: GSM50049; Type: Head; Serial: 20050627
Program: Compliance Testing: EN 50361 Protocol Right-Hand Side)

Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: HSL1900 (σ = 1.44443 mho/m, ε_r = 40.3239, ρ = 1000 kg/m^3)
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(5.25, 5.25, 5.25); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

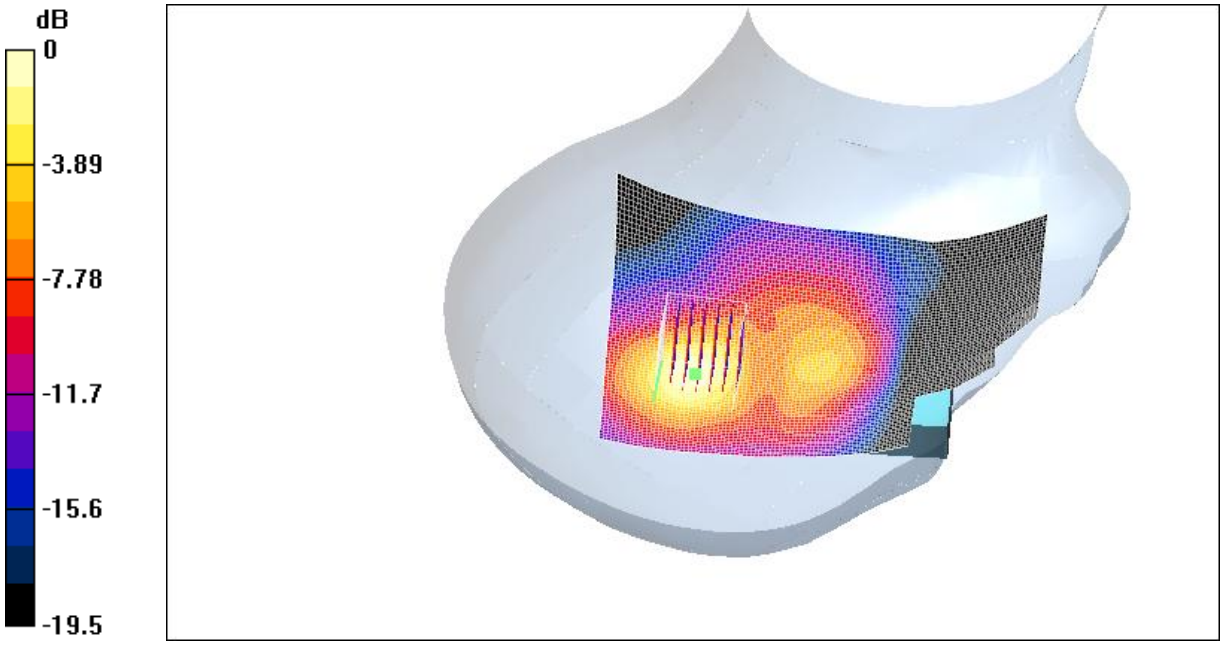
Cheek position - Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 13.8 V/m
Power Drift = -0.001 dB
Maximum value of SAR = 0.481 mW/g

Cheek position - Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.771 W/kg
SAR(1 g) = 0.452 mW/g; SAR(10 g) = 0.232 mW/g

Reference Value = 13.8 V/m

Power Drift = -0.001 dB

Maximum value of SAR = 0.502 mW/g



0 dB = 0.502mW/g

4.24 FCC-OET65-RightHandSide-Cheek-GSM1900-High

Date/Time: 06/29/05 13:39:34

Test Laboratory: SGS-GSM

File Name: FCC-OET65-RightHandSide-Cheek-GSM1900.da4

FCC-OET65-RightHandSide-Cheek-GSM1900-High

DUT: GSM50049; Type: Head; Serial: 20050627

Program: Compliance Testing: EN 50361 Protocol Right-Hand Side)

Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3

Medium: HSL1900 (σ = 1.46824 mho/m, ε_r = 39.9929, ρ = 1000 kg/m^3)

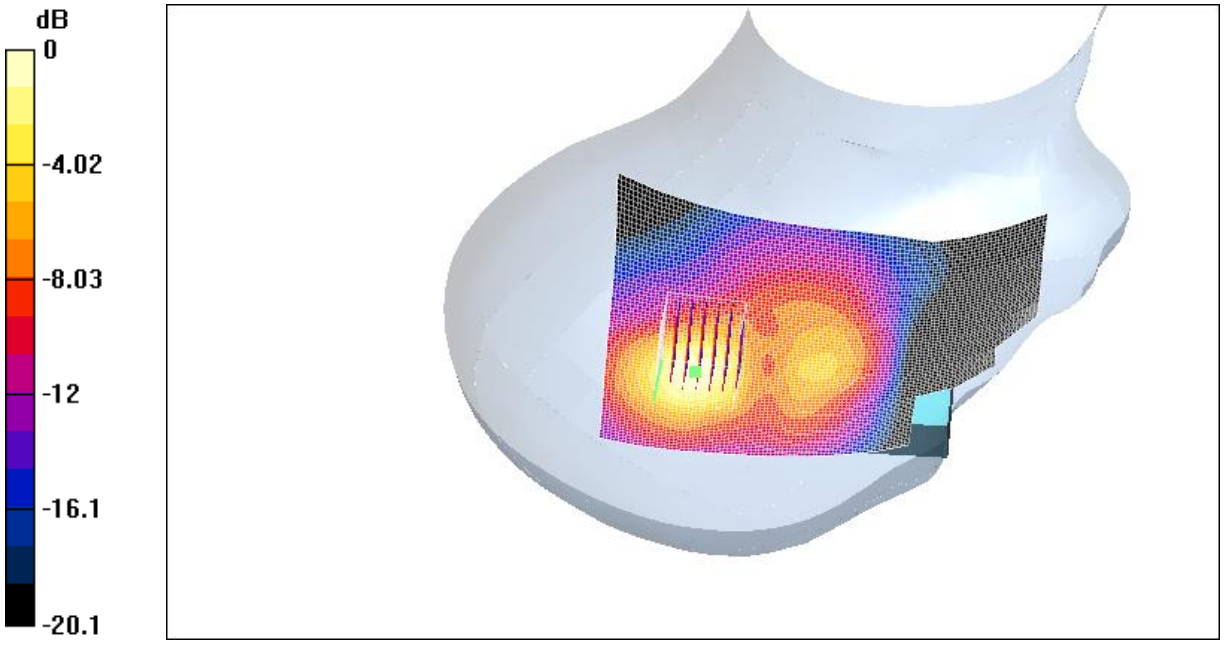
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(5.25, 5.25, 5.25); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Cheek position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 13.8 V/m
Power Drift = 0.04 dB
Maximum value of SAR = 0.492 mW/g

Cheek position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.789 W/kg
SAR(1 g) = 0.454 mW/g; SAR(10 g) = 0.229 mW/g
Reference Value = 13.8 V/m
Power Drift = 0.04 dB
Maximum value of SAR = 0.511 mW/g



0 dB = 0.511mW/g

4.25 FCC-OET65-RightHandSide-Tilt-GSM1900-Low

Date/Time: 06/29/05 16:30:10

Test Laboratory: SGS-GSM
File Name: FCC-OET65-RightHandSide-Tilt-GSM1900.da4

FCC-OET65-RightHandSide-Tilt-GSM1900-Low

DUT: GSM50049; Type: Head; Serial: 20050627
Program: Compliance Testing: EN 50361 Protocol Right-Hand Side)

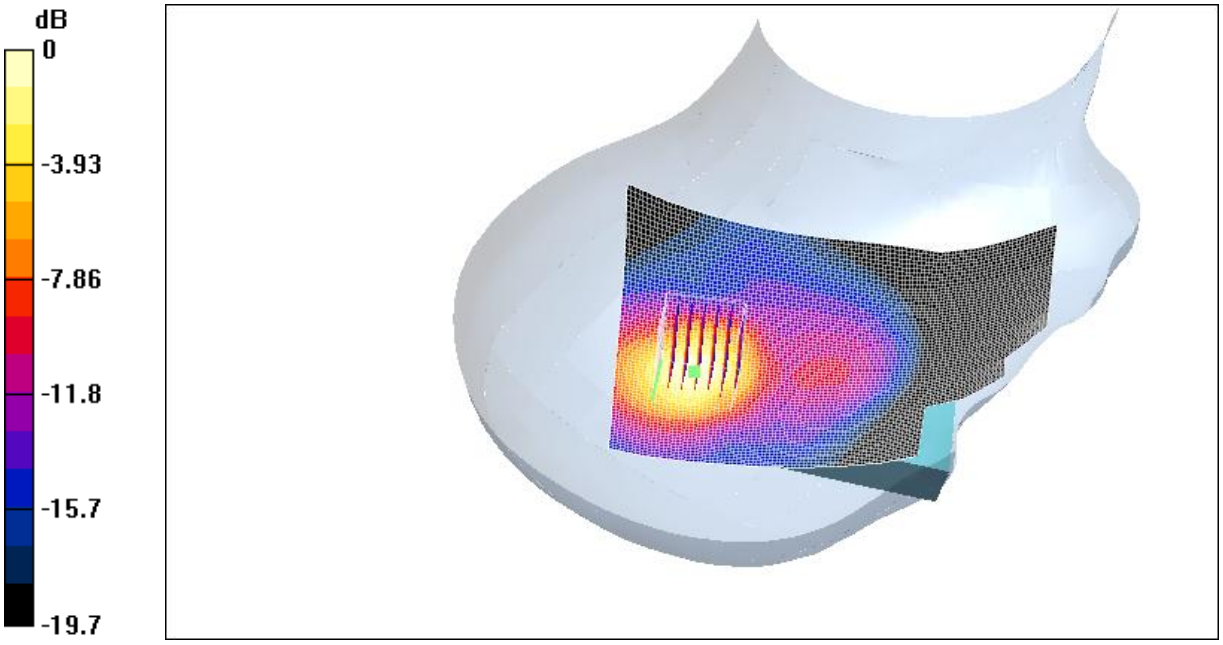
Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: HSL1900 (σ = 1.41808 mho/m, ε_r = 40.5312, ρ = 1000 kg/m^3)
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(5.25, 5.25, 5.25); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilt position - Low/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 14.4 V/m
Power Drift = -0.02 dB
Maximum value of SAR = 0.588 mW/g

Tilt position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.96 W/kg
SAR(1 g) = 0.544 mW/g; SAR(10 g) = 0.279 mW/g
Reference Value = 14.4 V/m
Power Drift = -0.02 dB
Maximum value of SAR = 0.603 mW/g



0 dB = 0.603mW/g

4.26 FCC-OET65-RightHandSide-Tilt-GSM1900-Mid

Date/Time: 06/29/05 16:30:10

Test Laboratory: SGS-GSM
File Name: FCC-OET65-RightHandSide-Tilt-GSM1900.da4

FCC-OET65-RightHandSide-Tilt-GSM1900-Mid

DUT: GSM50049; Type: Head; Serial: 20050627
Program: Compliance Testing: EN 50361 Protocol Right-Hand Side)

Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: HSL1900 (σ = 1.44443 mho/m, ε_r = 40.3239, ρ = 1000 kg/m^3)
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

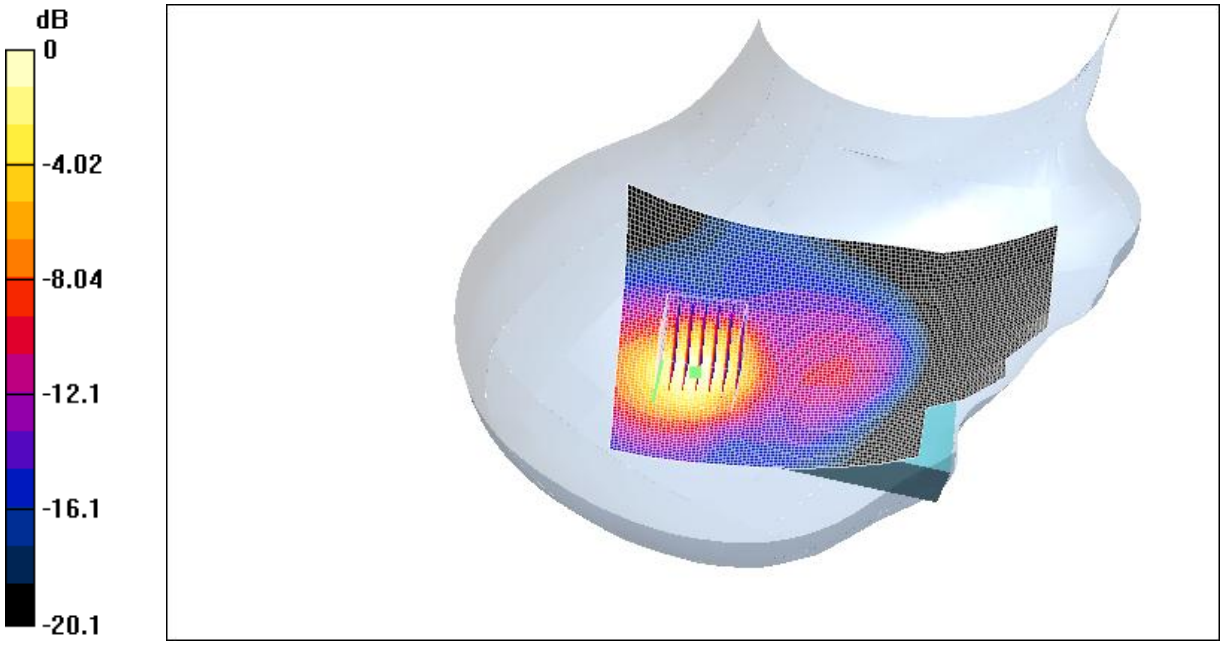
- Probe: ET3DV6 - SN1774; ConvF(5.25, 5.25, 5.25); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilt position - Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 15.4 V/m
Power Drift = 0.03 dB
Maximum value of SAR = 0.728 mW/g

Tilt position - Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.671 mW/g; SAR(10 g) = 0.338 mW/g
Reference Value = 15.4 V/m

Power Drift = 0.03 dB

Maximum value of SAR = 0.749 mW/g



0 dB = 0.749mW/g

4.27 FCC-OET65-RightHandSide-Tilt-GSM1900-High

Date/Time: 06/29/05 16:30:10

Test Laboratory: SGS-GSM

File Name: FCC-OET65-RightHandSide-Tilt-GSM1900.da4

FCC-OET65-RightHandSide-Tilt-GSM1900-High

DUT: GSM50049; Type: Head; Serial: 20050627

Program: Compliance Testing: EN 50361 Protocol Right-Hand Side)

Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3

Medium: HSL1900 (σ = 1.46824 mho/m, ε_r = 39.9929, ρ = 1000 kg/m^3)

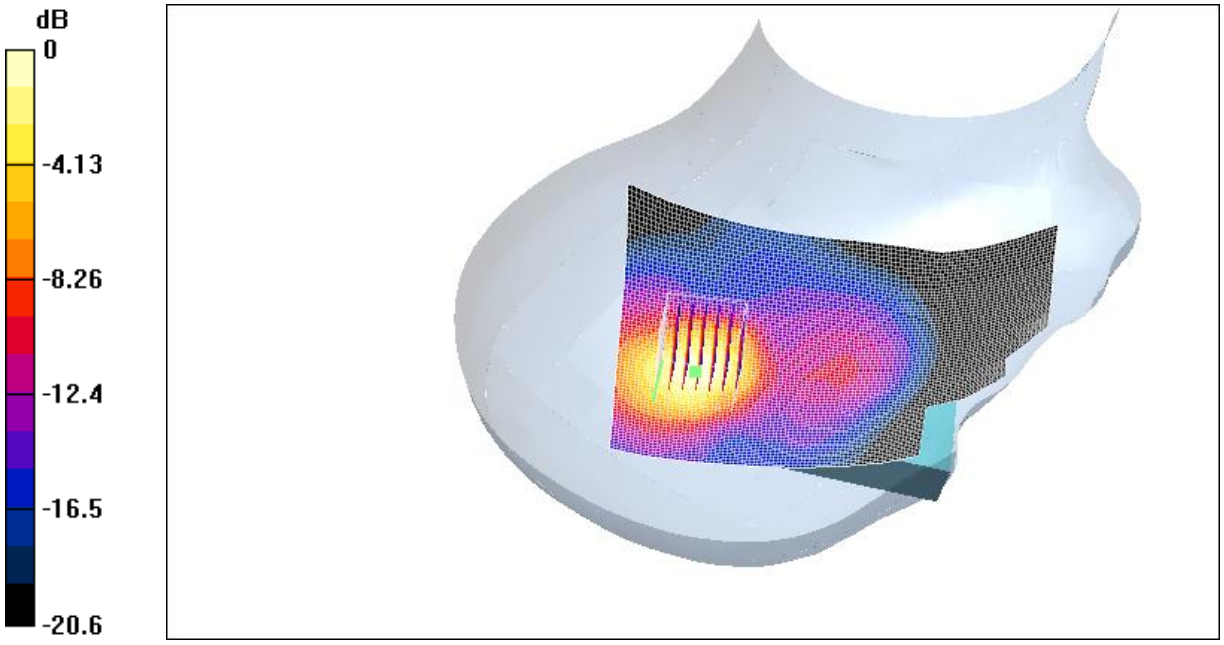
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(5.25, 5.25, 5.25); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Tilt position - High/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 15.1 V/m
Power Drift = -0.04 dB
Maximum value of SAR = 0.705 mW/g

Tilt position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 1.14 W/kg
SAR(1 g) = 0.642 mW/g; SAR(10 g) = 0.324 mW/g
Reference Value = 15.1 V/m
Power Drift = -0.04 dB
Maximum value of SAR = 0.709 mW/g



0 dB = 0.709mW/g

4.28 FCC-OET65-Body-Worn-GSM1900-Low

Date/Time: 06/28/05 13:48:22

Test Laboratory: SGS-GSM
File Name: FCC-OET65-Body-Worn-GSM1900.da4

FCC-OET65-Body-Worn-GSM1900-Low

DUT: GSM50049; Type: Body; Serial: 20050627
Program: Compliance Testing: FCC OET65 Protocol (Body Worn)

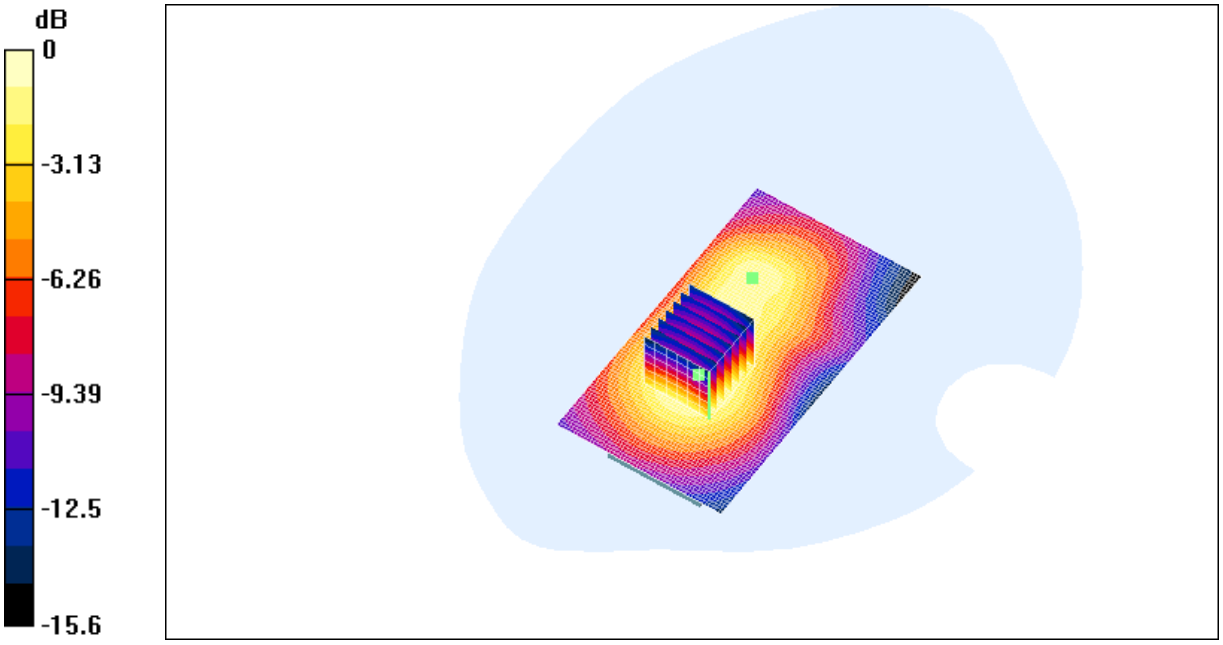
Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: HSL1900 (σ = 1.48803 mho/m, ε_r = 51.6495, ρ = 1000 kg/m^3)
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(4.66, 4.66, 4.66); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Body Worn - Low/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 10.9 V/m
Power Drift = 0.5 dB
Maximum value of SAR = 0.208 mW/g

Body Worn - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.287 W/kg
SAR(1 g) = 0.192 mW/g; SAR(10 g) = 0.118 mW/g
Reference Value = 10.9 V/m
Power Drift = 0.5 dB
Maximum value of SAR = 0.204 mW/g



0 dB = 0.204mW/g

4.29 FCC-OET65-Body-Worn-GSM1900-Mid

Date/Time: 06/28/05 13:48:22

Test Laboratory: SGS-GSM
File Name: FCC-OET65-Body-Worn-GSM1900.da4

FCC-OET65-Body-Worn-GSM1900-Mid

DUT: GSM50049; Type: Body; Serial: 20050627
Program: Compliance Testing: FCC OET65 Protocol (Body Worn)

Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: HSL1900 (σ = 1.52127 mho/m, ε_r = 51.5237, ρ = 1000 kg/m^3)
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

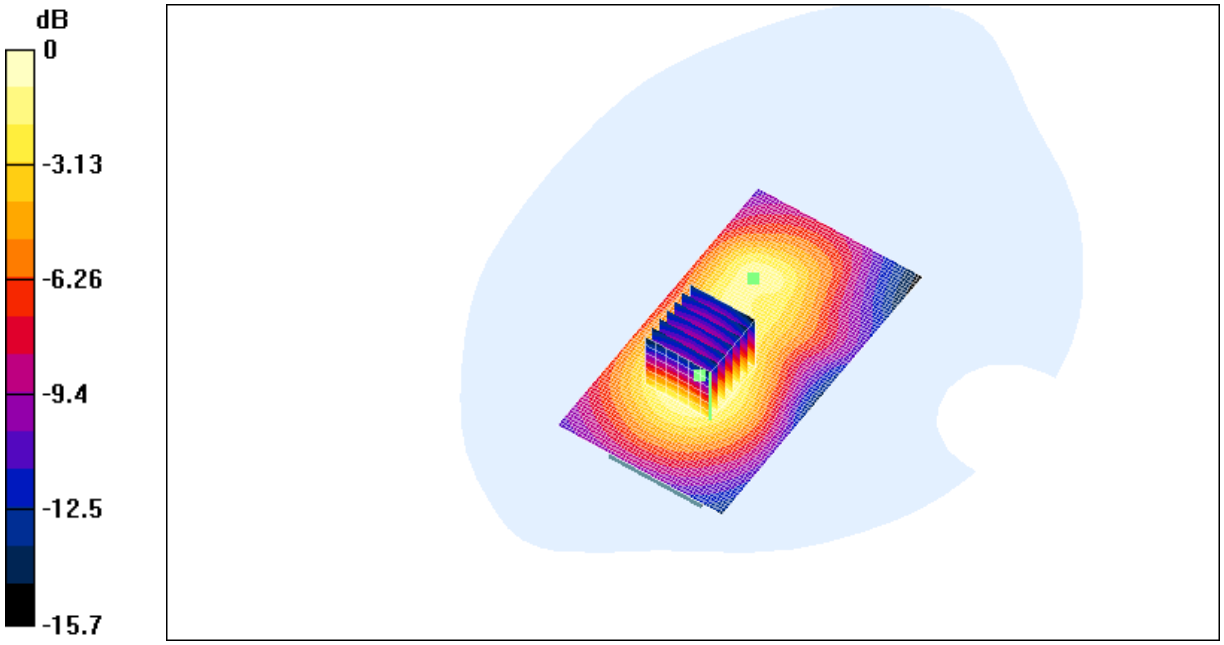
- Probe: ET3DV6 - SN1774; ConvF(4.66, 4.66, 4.66); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Body Worn - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 12.4 V/m
Power Drift = -0.03 dB
Maximum value of SAR = 0.325 mW/g

Body Worn - Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.446 W/kg
SAR(1 g) = 0.298 mW/g; SAR(10 g) = 0.183 mW/g
Reference Value = 12.4 V/m

Power Drift = -0.03 dB

Maximum value of SAR = 0.321 mW/g



0 dB = 0.321mW/g

4.30 FCC-OET65-Body-Worn-GSM1900-High

Date/Time: 06/28/05 13:48:22

Test Laboratory: SGS-GSM

File Name: FCC-OET65-Body-Worn-GSM1900.da4

FCC-OET65-Body-Worn-GSM1900-High

DUT: GSM50049; Type: Body; Serial: 20050627

Program: Compliance Testing: FCC OET65 Protocol (Body Worn)

Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3

Medium: HSL1900 (σ = 1.55344 mho/m, ε_r = 51.4693, ρ = 1000 kg/m^3)

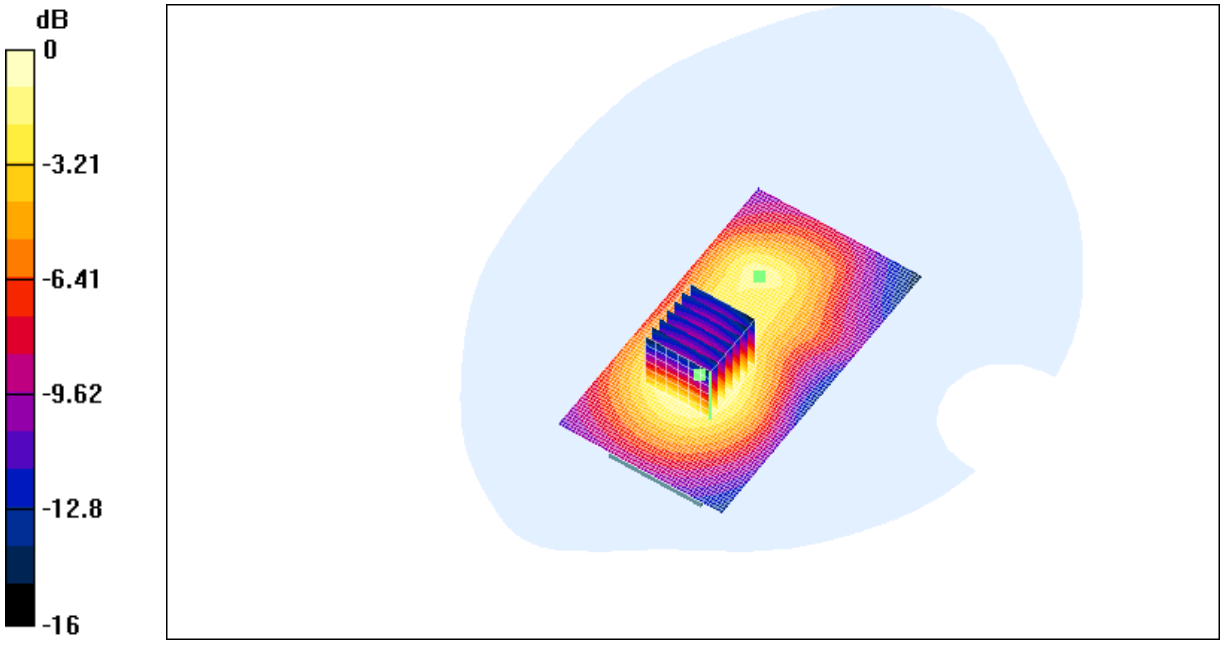
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1774; ConvF(4.66, 4.66, 4.66); Calibrated: 2004-10-26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2003-6-4
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 115

Body Worn - High/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 12.2 V/m
Power Drift = -0.05 dB
Maximum value of SAR = 0.419 mW/g

Body Worn - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 0.579 W/kg
SAR(1 g) = 0.378 mW/g; SAR(10 g) = 0.23 mW/g
Reference Value = 12.2 V/m
Power Drift = -0.05 dB
Maximum value of SAR = 0.406 mW/g



0 dB = 0.406mW/g

Appendix

1. Photographs of Test Setup

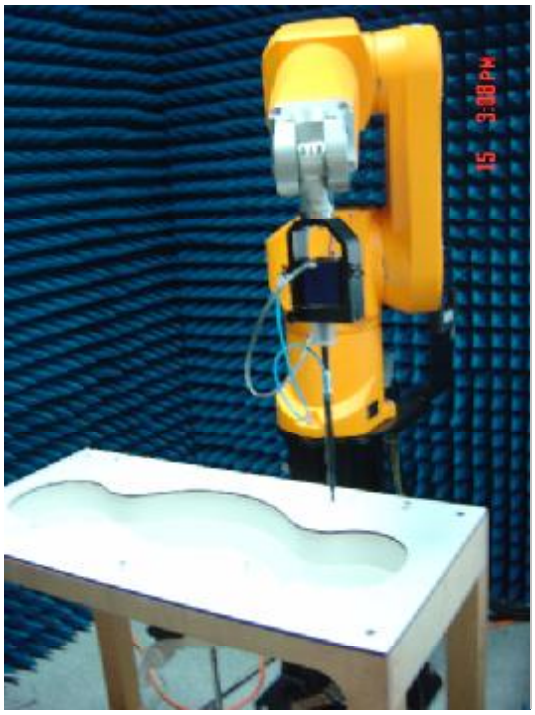


Fig.1 Photograph of the SAR measurement System

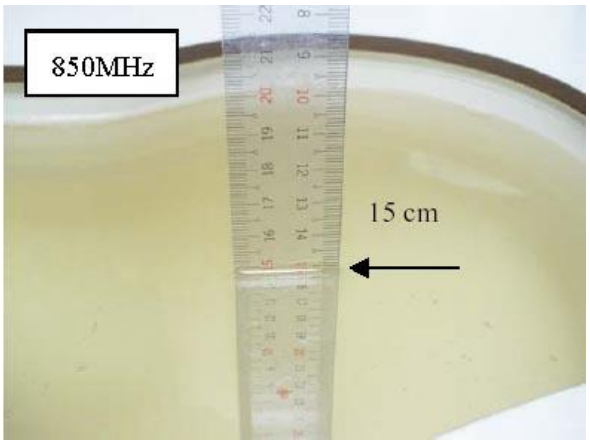


Fig.2 Photograph of the Tissue Simulant Fluid Fluid Liquid depth 15cm for Left-Head Side

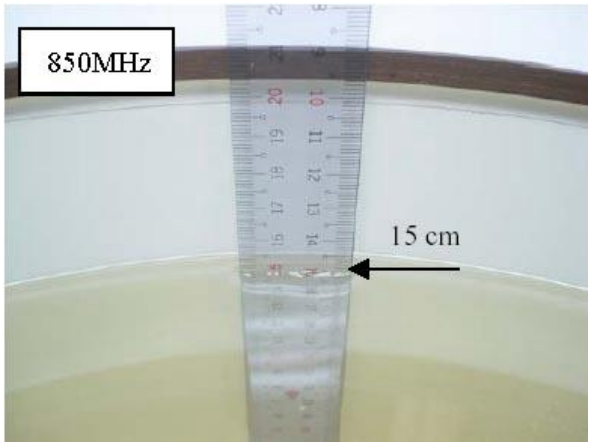


Fig.3 Photograph of the Tissue Simulant Liquid depth 15cm for Body-Worn

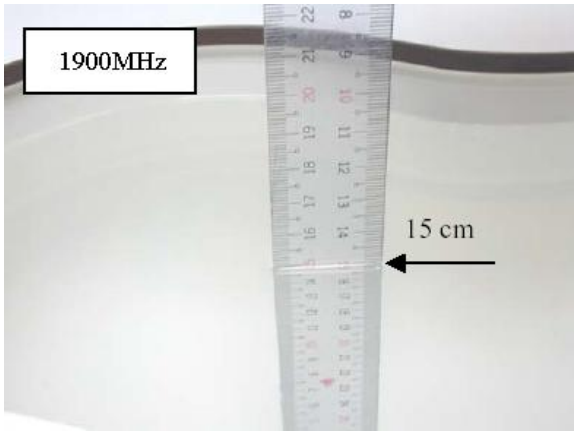


Fig.4 Photograph of the Tissue Simulant Fluid Fluid Liquid depth 15cm for Right-Head Side

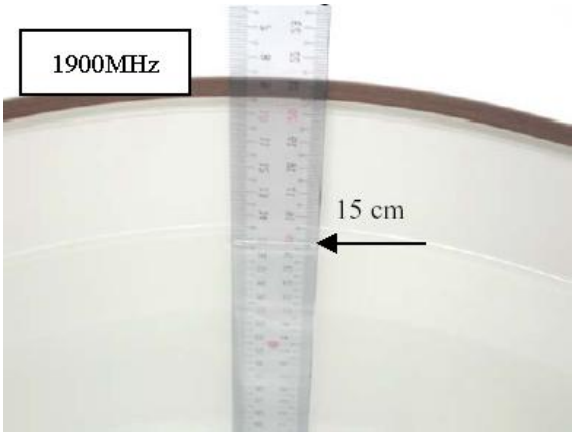


Fig.5 Photograph of the Tissue Simulant Liquid depth 15cm for Body-Worn

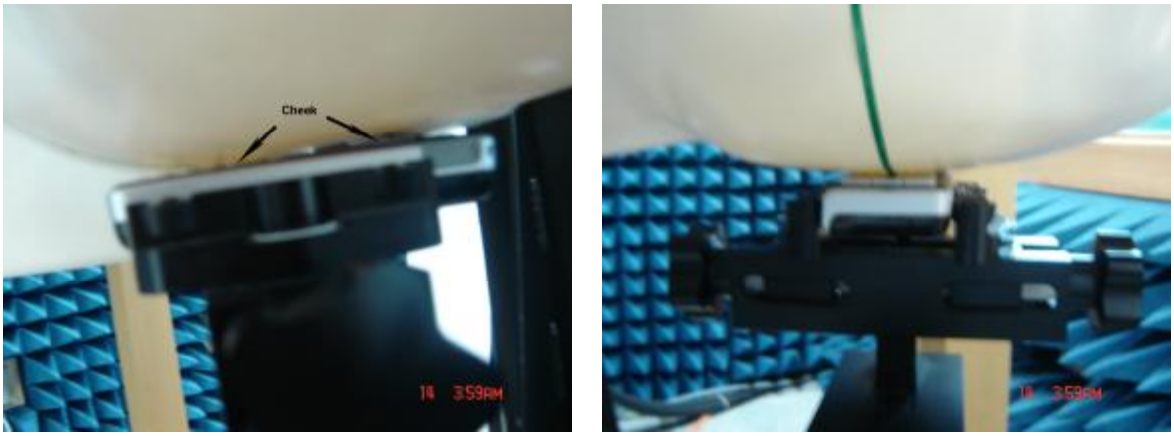


Fig.6 Photograph of the Left Hand Side Cheek status

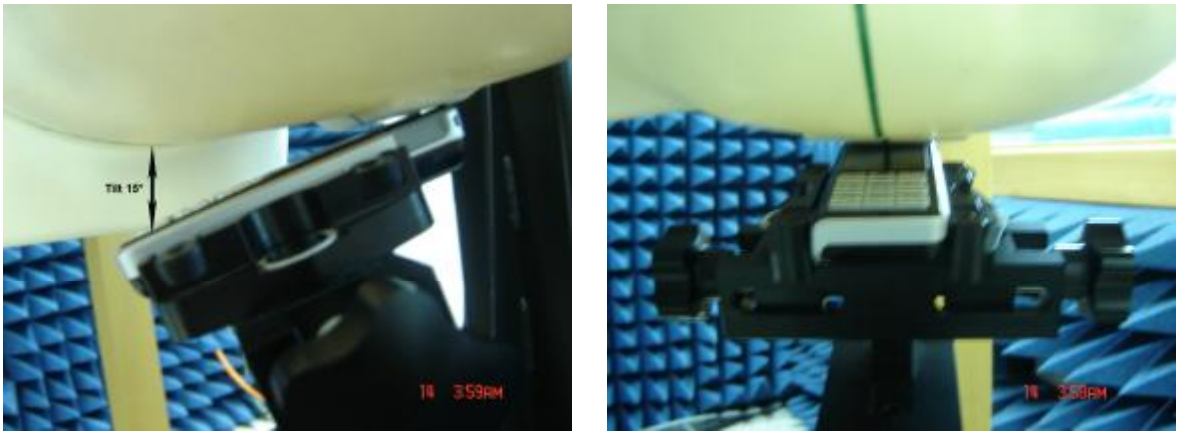
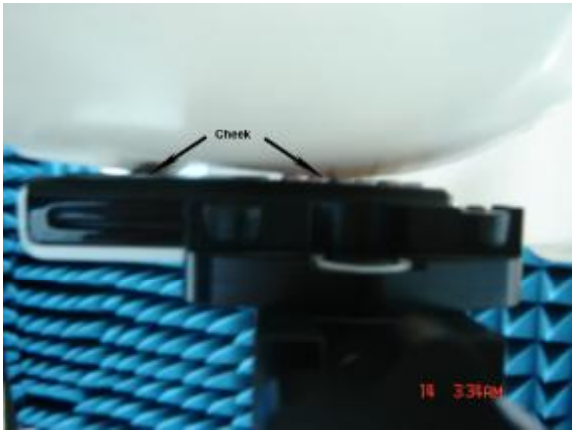


Fig.7 Photograph of the Left Hand Side Tilt status



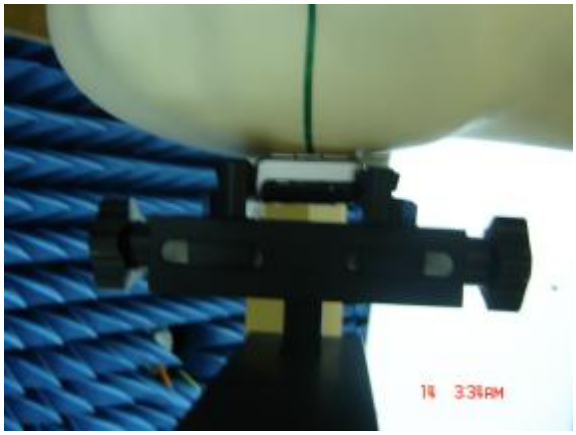


Fig.8 Photograph of the Right Hand Side Cheek status

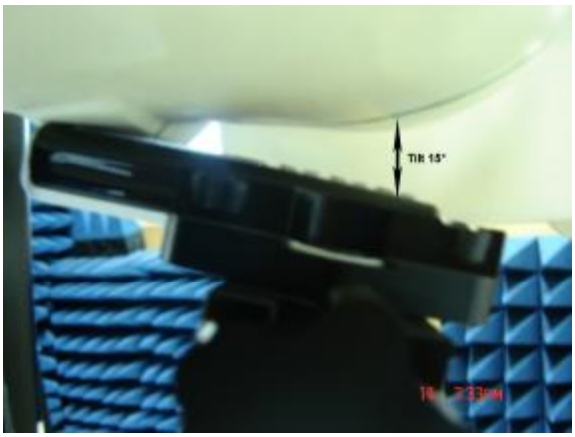


Fig.9 Photograph of the Right Hand Side Tilt status

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

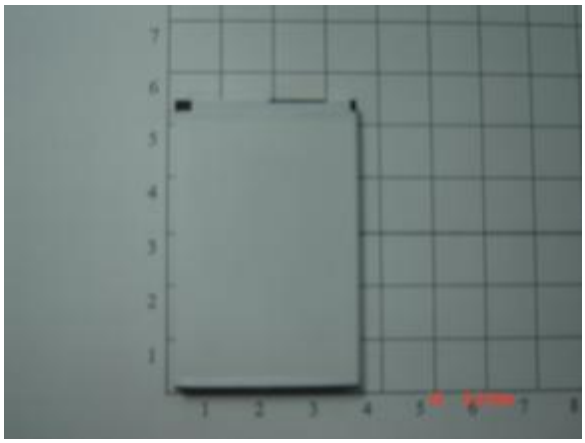


Fig.14 Back view of battery

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 China (Auden)

Certificate No: ET3-1774_Oct04

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1774
Calibration procedure(s)	QA CAL-01.v5 Calibration procedure for dosimetric E-field probes
Calibration date:	October 26, 2004
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	5-May-04 (METAS, No. 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No. 251-00388)	May-05
Reference 3 dB Attenuator	SN: S5054 (3c)	3-Apr-03 (METAS, No. 251-00403)	Aug-05
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-04 (METAS, No. 251-00389)	May-05
Reference 30 dB Attenuator	SN: S5129 (30b)	3-Apr-03 (METAS, No. 251-00404)	Aug-05
Reference Probe ES3DV2	SN:3013	8-Jan-04 (SPEAG, No. ES3-3013_Jan04)	Jan-05
DAE4	SN: 617	26-May-04 (SPEAG, No. DAE4-617_May04)	May-05

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-03)	In house check: Nov 04

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

Issued: October 28, 2004

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

Probe ET3DV6

SN:1774

Manufactured:	April 15, 2003
Last calibrated:	May 23, 2003
Repaired:	October 18, 2004
Recalibrated:	October 26, 2004

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1774 **October 26, 2004**

DASY - Parameters of Probe: ET3DV6 SN:1774

Sensitivity in Free Space[A] Diode Compression[B]

NormX	**1.92** ± 9.9%	$\mu V/(V/m)^2$	DCP X	**93** mV
NormY	**1.80** ± 9.9%	$\mu V/(V/m)^2$	DCP Y	**93** mV
NormZ	**1.72** ± 9.9%	$\mu V/(V/m)^2$	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		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	8.8	4.6
SAR_{be} [%]	With Correction Algorithm	0.7	0.1

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

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	12.5	8.3
SAR_{be} [%]	With Correction Algorithm	0.7	0.1

Sensor Offset

Probe Tip to Sensor Center	**2.7** mm

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

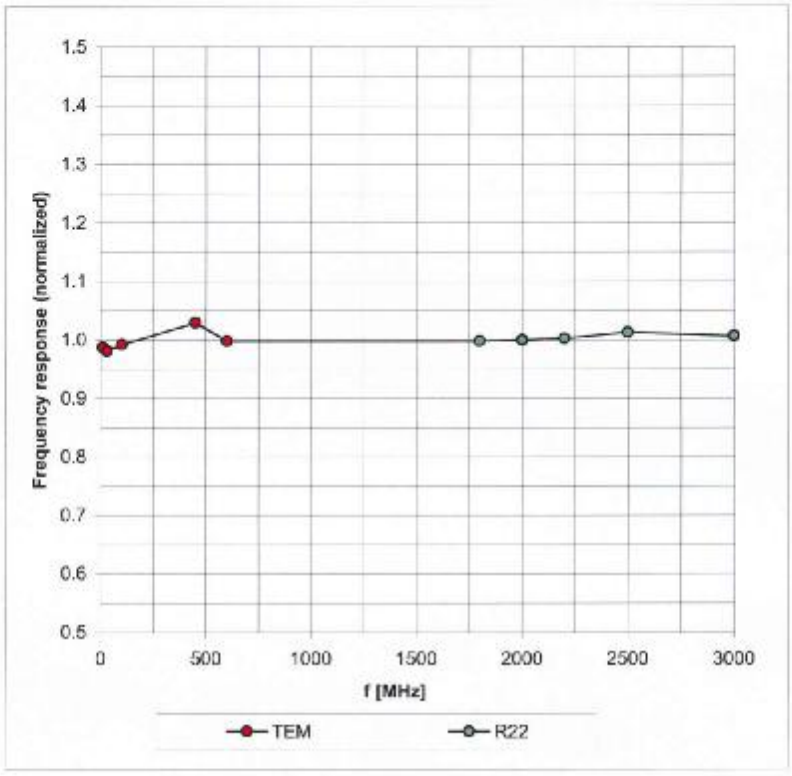
[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

ET3DV6 SN:1774 October 26, 2004

Frequency Response of E-Field

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

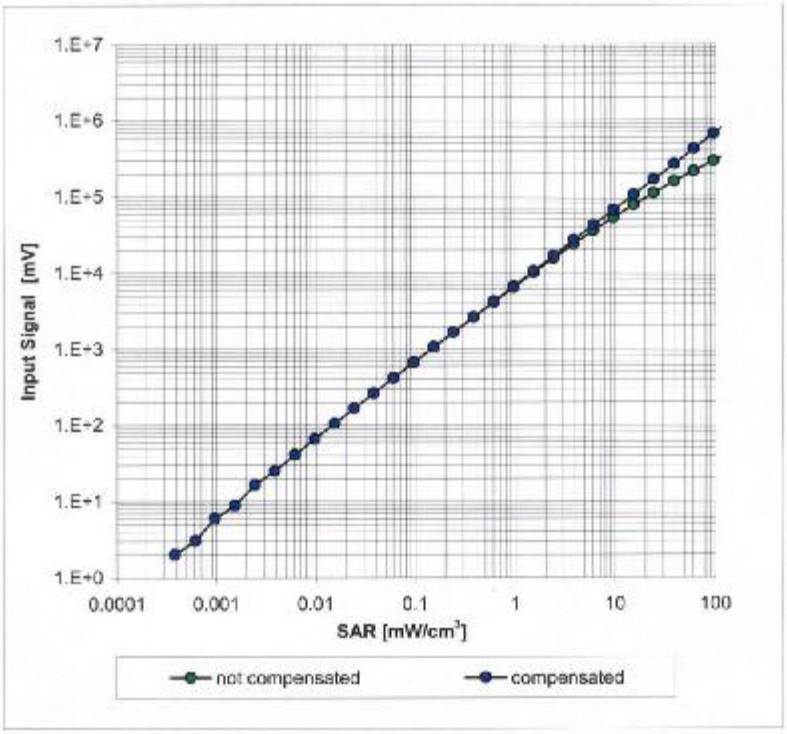


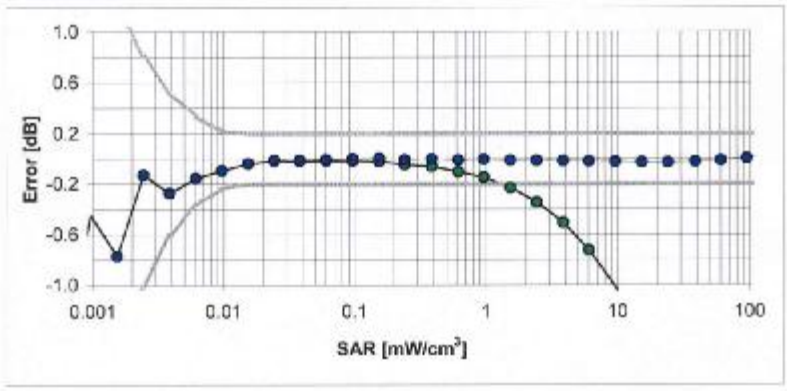
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

ET3DV6 SN:1774 **October 26, 2004**

Dynamic Range f(SAR_{head})

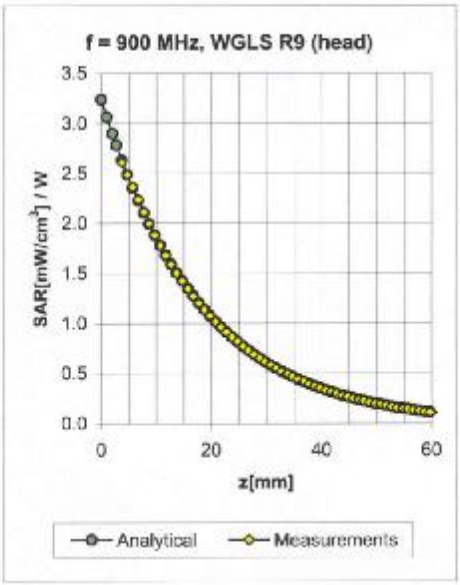
(Waveguide R22, f = 1800 MHz)

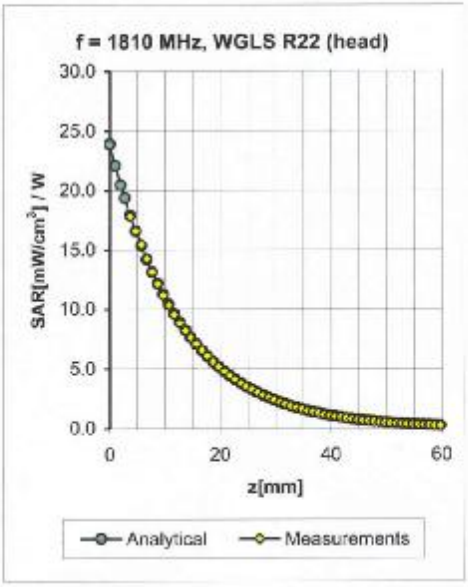




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment





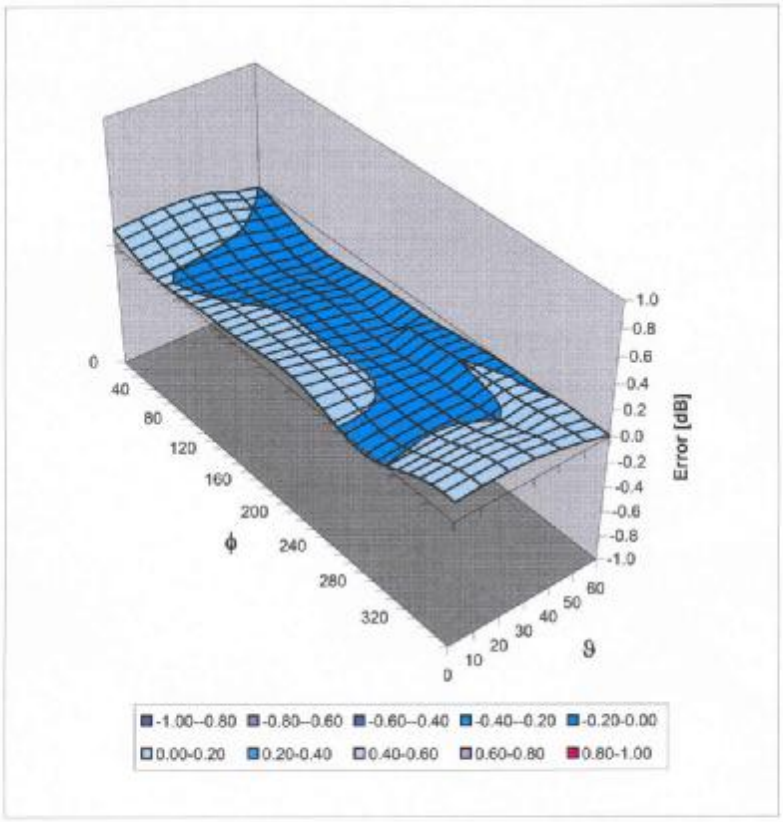
f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	1.13	1.42	6.98 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	1.09	1.46	6.61 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.58	2.31	5.48 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.54	2.52	5.25 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.63	2.30	4.70 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.96	1.58	6.65 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	1.00	1.57	6.36 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.52	2.81	4.79 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.52	2.98	4.66 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.62	2.18	4.35 ± 11.8% (k=2)

[C] The validity of ± 100 MHz only applies for DASY 4.3 B17 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.

ET3DV6 SN:1774 October 26, 2004

Deviation from Isotropy in HSL

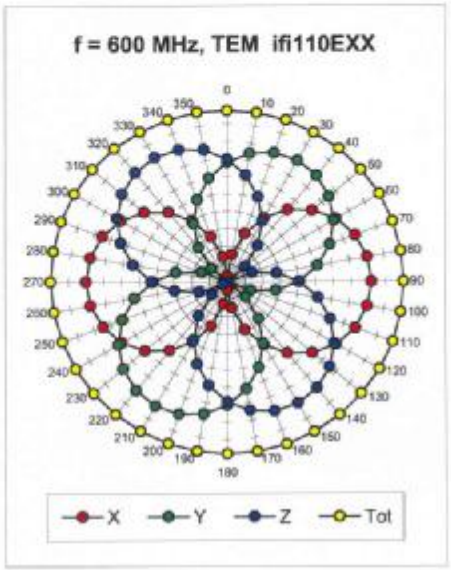
Error (ϕ, ϑ), f = 900 MHz

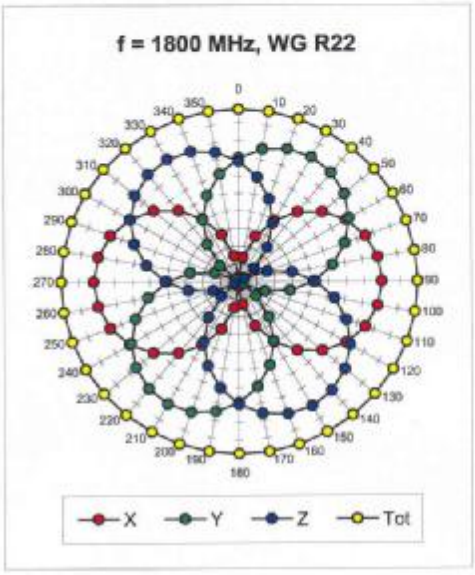


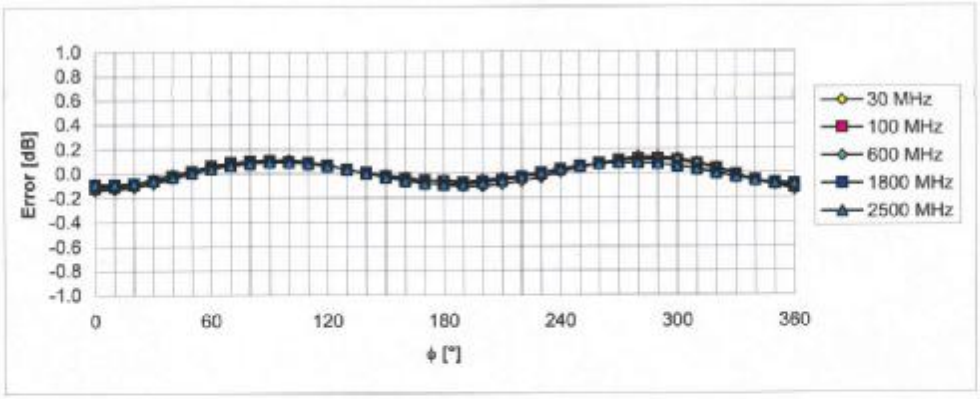
Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

ET3DV6 SN:1774 October 26, 2004

Receiving Pattern (ϕ), ϑ = 0°







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

6. Uncertainty analysis

Error Description	Tol. (± %)	Prob. dist.	Div.	(c_i) (1g)	(c_i) (10g)	Std. unc. (± %) (1g)	(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

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 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.	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

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)

The end