TESTING
CNAS L1486

SAR TEST REPORT

Report No.: GSM11019863S02

According to IEEE1528-2003

For

ZTE CORPORATION

Market Name: MF636

Final Hardware Version: P673M2-2.0.0

Final Software Version: BD_P673M2V1.0.1B03

Prepared by Project Leader: Ken Wang **Date:** 2009-05-28

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Approved by Lab Manager: **Date:** 2009-05-28

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Change History

Version	Change Contents	Author	Date
V1.0	First edition	Ken Wang	2009-05-28

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Standards

The Equipment under Test (EUT) has been tested at SGS's (own or subcontracted) laboratories according to IEEE 1528-2003.

The following table summarizes the specific reference documents such as harmonized standards or test specifications which were used for testing as SGS's (own or subcontracted) laboratories.

Identity	Document Title	Version
IEEE1528	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques	2003
Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97-01)	Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions	2001
KDB 447498	Mobile and Portable Device RF Exposure Procedure and Equipment Authorization Policies	-

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 should be approved by SGS Shanghai GSM Lab in connection with distribution or use of the product described in this report in writing.

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1. General Information

1.1 Testing Laboratory

1.1.1 Responsible Testing Laboratory

Wireless Telecommunications Laboratory **SGS-CSTC Standards Technical Services Co., Ltd Shanghai Branch**	
Address:	9F, 3rd Building, No.889, Yishan Rd, Xuhui District, Shanghai, China 200233
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1.1.2 Testing Locations

Wireless Telecommunications Laboratory SGS-CSTC Standards Technical Services Co., Ltd Shanghai Branch	
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Internet:	http://www.cn.sgs.com
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Email:	zhiang.yuan@sgs.com

1.1.3 SGS Wireless Shanghai, Personnel

Project Management Team

Surname	Forename
Cai	Cai
Lisa	Song
Anya	Xu
James	Xia

Test Engineer

Surname	Forename
Ken	Wang
Zenger	Zhang
Roger	Ruan

1.2 Testing Environments

Ambient Temperature:	20~24°C
Relative Humidity:	25~60%

1.3 Client information

1.3.1 Details of Applicant

Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District,Shenzhen, Guangdong, 518057, P.R.China
Telephone	Li Dezi
Fax	86-21-50801070
Contact	86-21-68895196
Email	li.dz@zte.com.cn

1.3.2 Details of Manufacture

Company Name	ZTE CORPORATION
Address	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District,Shenzhen, Guangdong, 518057, P.R.China
Telephone	Li Dezi
Fax	86-21-50801070
Contact	86-21-68895196
Email	li.dz@zte.com.cn

1.4 Equipment Under Test (EUT) and Accessories

1.4.1 Description of EUT(s)

Product Name	HSUPA USB Modem
Brand Name	ZTE
Model Name	MF636
Marketing Name	MF636
Final Hardware Version	P673M2-2.0.0
Final Software Version	BD_P673M2V1.0.1B03
Normal Voltage	5V
Low Voltage	4.5V

High Voltage	5.5V	
Battery Type	N/A	
Antenna Type	Inner Antenna	
	GSM 850	Tx: 824~849MHz
		Rx: 869~894MHz
	PCS 1900	Tx: 1850~1910MHz
		Rx: 1930~1990MHz
	FDD II	Tx: 1850~1910MHz
		Rx: 1930~1990MHz
	FDD V	Tx: 824~849MHz
		Rx: 869~894MHz
Modulation Mode	GMSK, 8PSK, QPSK, 16QAM	
GPRS Multislot Class	Class 10	
EGPRS Multislot Class	Class 12	
GSM Power Class	GSM 850	4
	PCS 1900	1
8PSK Power Class	GSM 900	E2
	DCS 1800	E2
	GSM 850	E2
	PCS 1900	E2
UMTS Power Class	FDD II	3
	FDD V	3

1.4.2 Internal Identification of EUT(s)

Sample No.	S/N or IMEI	Hardware Status	Software Status
KZ014AT01	004401780160442	P673M2-2.0.0	BD_P673M2V1.0.1B03
Date Initial Sample Received		2009-05-20	
Testing Start Date		2009-05-22	
Testing End Date		2009-05-27	

1.4.3 Internal Identification of Accessories

Sample No.	Descriptions	S/N or IMEI
N/A	Battery	N/A
N/A	Charger	N/A
N/A	RF Cable	N/A

1.5 Operation Configuration

Configuration 1: GSM 850, BodyWorn P1&P2&P3&P4&P5

Configuration 2: PCS1900, BodyWorn P1&P2&P3&P4&P5

Configuration 3: UMTS FDD II, BodyWorn P1&P2&P3&P4&P5

Configuration 4: UMTS FDD V, BodyWorn P1&P2&P3&P4&P5

Note:

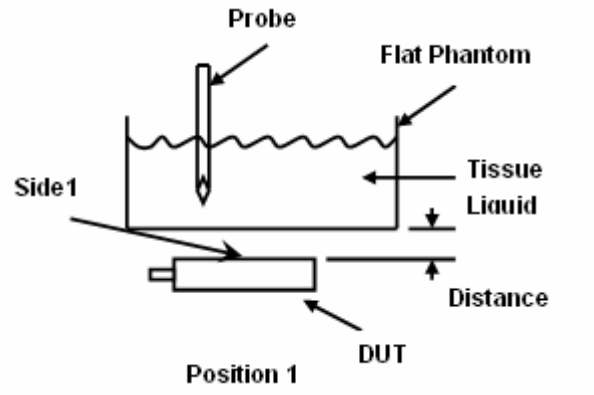
(1) position 1-P1, position 2-P2, position 3-P3, position 4-P4, position 5-P5

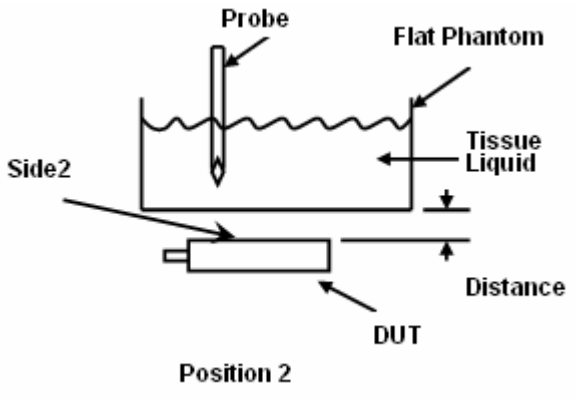
(2) An IBM laptop (T41) was used in configuration P2&P5

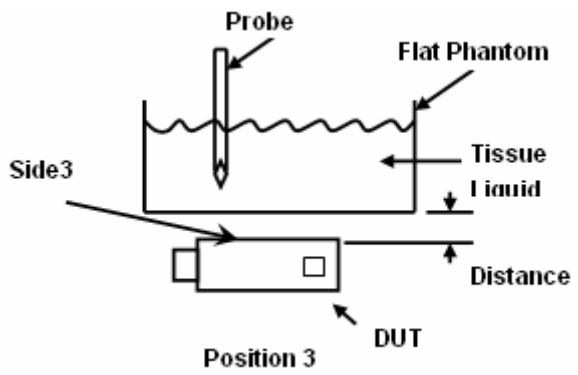
(3) A short USB cable was used in configuration P1&P3&P4

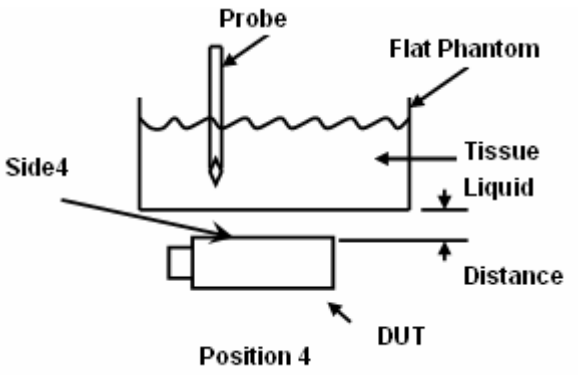
(4) Distance separation for each position

P1=P2=P3=P4=P5=5mm









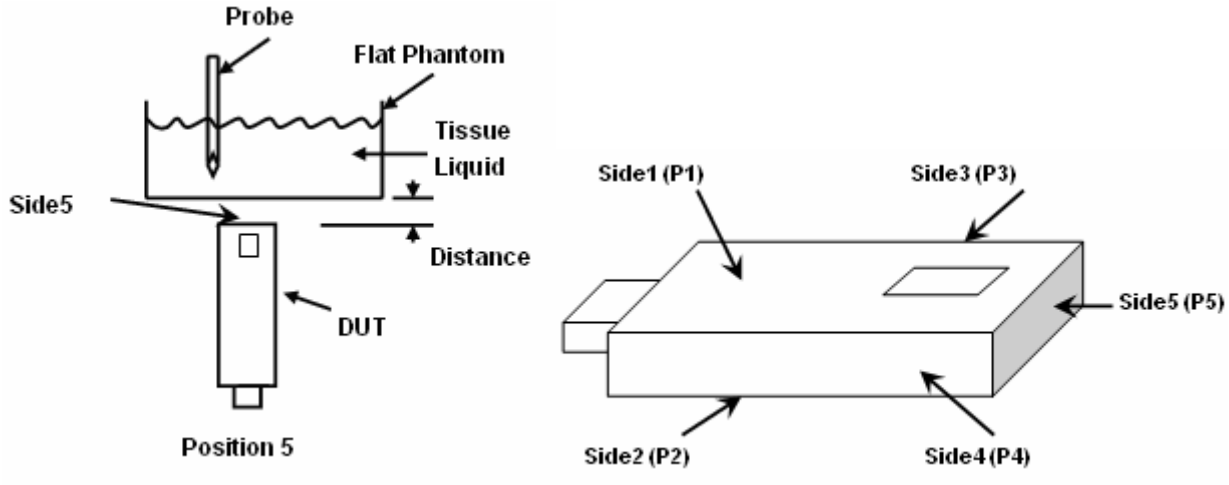


Figure 1-1 Operation configuration for EUT positions

For SS

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

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

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

1.6 Measurement procedure

Step 1: Power reference measurement

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

Step 2: *Area scan*

The SAR distribution at the exposed side of the head was measured at a distance of 4 mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 10mm*10mm.Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: *Zoom scan*

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

The data at the surface was extrapolated, since the center of the dipoles is 2.0mm away from the

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tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification) The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluated the points between the surface and the probe tip. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points (10*10*10) were interpolated to calculate the average. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Power reference measurement (drift)

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

1.7 Test Limits

According to 47 CFR §2.1091: 2001, 47 CFR §2.1093: 2001, IEEE Std C95.1-2005, 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 C95.1-2005.

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

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.

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2. Summary of Results

2.1 Measurement of RF conducted Power

Unit: dBm

Mode		GPRS				EGPRS								GSM
		1	2	3	4	1		2		3		4		
Band	Channel					GMSK	8PSK	GMSK	8PSK	GMSK	8PSK	GMSK	8PSK	
850	128	33.8	30.4	--	--	33.8	25.8	30.3	24.2	29.0	22.2	28.1	21.3	-
	189	33.9	30.2	--	--	33.9	25.8	30.2	24.2	29.0	22.2	28.1	21.3	-
	251	33.8	29.9	--	--	33.8	25.6	29.9	24.0	28.8	22.0	28.0	21.2	-
1900	512	28.1	27.6	--	--	28.1	25.6	27.6	23.6	25.6	21.6	24.6	20.6	-
	661	28.2	27.6	--	--	28.1	25.7	27.6	23.7	25.6	21.7	24.6	20.7	-
	810	28.1	27.5	--	--	28.0	25.6	27.6	23.6	25.6	21.6	24.6	20.6	-

Mode		HSUPA					WCDMA
Subtests		1	2	3	4	5	
Band	Channel						
II	12	20.0	18.6	19.5	18.5	20.2	21.0
	9400	20.0	18.7	19.6	18.4	20.6	21.0
	9538	20.6	18.7	19.5	18.6	19.9	21.5
V	4132	21.3	18.5	20.0	18.8	21.2	21.7
	4182	21.2	19.2	20.4	18.7	21.1	21.8
	4233	20.8	19.1	20.2	18.7	21.1	21.8

2.2 Measurement of SAR average value

GSM850

Band	EUT Position	Test Configurations	Averaged SAR over 1g (W/kg)			Temp. (℃)	Verdict
			CH128	CH189	CH251		
			824.2MHz	836.4MHz	848.8MHz		
GSM850	P1	GPRS 1TS	-	0.291	-	22	Pass
	P2	GPRS 1TS	1.14	1.13	1.01	22	Pass

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		GPRS 2TS	-	0.986	-	22	Pass
		EGPRS 1TS	-	1.12		22	Pass
		EGPRS 2TS	-	0.966	-	22	Pass
		EGPRS 3TS	-	1.03	-	22	Pass
		EGPRS 4TS	-	1.07	-	22	Pass
		Worst with SD	1.13	-	-	22	Pass
	P3	GPRS 1TS	-	0.223	-	22	Pass
	P4	GPRS 1TS	-	0.107	-	22	Pass
	P5	GPRS 1TS	-	0.126	-	22	Pass

PCS1900

Band	EUT Position	Test Configurations	Averaged SAR over 1g (W/kg)			Temp. (℃)	Verdict
			CH512	CH661	CH810		
			1850.2MHz	1880.0MHz	1909.8MHz		
PCS1900	P1	GPRS 2TS	-	0.684	-	22	Pass
	P2	GPRS 1TS	-	-	-	22	Pass
		GPRS 2TS	1.09	1.02	0.930	22	Pass
		EGPRS 1TS	-	0.590	-	22	Pass
		EGPRS 2TS	-	1.01	-	22	Pass
		EGPRS 3TS	-	0.951	-	22	Pass
		EGPRS 4TS	-	0.988	-	22	Pass
		Worst with SD	1.1	-	-	22	Pass
	P3	GPRS 2TS	-	0.346	-	22	Pass
	P4	GPRS 2TS	-	0.562	-	22	Pass
	P5	GPRS 2TS	-	0.213	-	22	Pass

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UMTS FDD II

Band	EUT Position	Test Configurations	Averaged SAR over 1g (W/kg)			Temp. (℃)	Verdict
			CH12	CH9400	CH9538		
			1852.4MHz	1880.0MHz	1907.6MHz		
UMTS FDD II	P1	WCDMA	-	0.634	-	22	Pass
	P2	WCDMA	0.710	0.897	-0.610	22	Pass
		HSPA	-	0.683	-	22	Pass
		Worst with SD	-	0.892	-	22	Pass
	P3	WCDMA	-	0.351	-	22	Pass
	P4	WCDMA	-	0.532	-	22	Pass
	P5	WCDMA	-	0.194	-	22	Pass

UMTS FDD V

Band	EUT Position	Test Configurations	Averaged SAR over 1g (W/kg)			Temp. (℃)	Verdict
			CH4132	CH4182	CH4233		
			826.4MHz	836.4MHz	846.6MHz		
UMTS FDD V	P1	WCDMA	-	0.159	-	22	Pass
	P2	WCDMA	-	0.524	-	22	Pass
		HSPA	-	0.512	-	22	Pass
		Worst with SD	-	0.555	-	22	Pass
	P3	WCDMA	-	0.118	-	22	Pass
	P4	WCDMA	-	0.170	-	22	Pass
	P5	WCDMA	-	0.060	-	22	Pass

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2.3 Maximum SAR average value

Band	EUT Position	Conducted Power (dBm)	SAR, Averaged over 1g (W/Kg)	Power Drift (dB)	Temp (℃)	Verdict
GSM850	BodyWorn,GPRS,1TS,Low,P2	33.8	1.14	-0.045	22	Pass
PCS1900	BodyWorn,GPRS,2TS,Low+SD,P2	27.6	1.1	0.003	22	Pass
UMTS FDD II	BodyWorn,WCDMA,Mid,P2	21.0	0.897	0.108	22	Pass
UMTS FDD V	BodyWorn,WCDMA,Mid+SD,P2	21.8	0.555	0.098	22	Pass

Note:

1. For all the tests, the maximum absolute value of the power drift which is under the GSM850-BodyWorn-GPRS-1TS-Mid-P2 configuration is -0.362dB.
2. Test reduction has been adopted according to conducted output power and produced SAR level:

   Low and High channel SAR are optional if SAR value produced in the middle channel is 3dB lower than the applicaple SAR limit;

   In GPRS/EGPRS mode, the multislot configuration which produces highest SAR value is regard as the worst case to be measured, other multislot configurations are selectively confirmed;
3. In EGPRS mode, the test is in the GMSK modulation according to the power between GMSK and 8PSK.
4. ES3DV3 Probe Tip diameter is 4.0 mm and distance from probe tip to dipole centers is 2.0 mm. The additional tests were manually performed according to FCC KDB 447498 and single point SAR values are recorded as shown in table below.

   Single Point SAR with Highest SAR Configuration

Frequency Band(MHz)	EUT position		Distance separation between DUT and Flat Phantom				
			5mm	10mm	15mm	20mm	25mm
GSM850	Body Worn/GPRS/1TS/Low/P2	E Field (V/m)	37.31	23.86	18.72	12.42	–
		SAR (W/Kg)	1.14	0.553	0.319	0.202	–

Full averaged SAR is evaluated at the separation distance of 10mm and the value is 0.553 W/Kg in page 24.

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3. Test Equipment

3.1 SPEAG DASY4

Test Platform	SPEAG DASY4 Professional			
Location	SGS SH Lab #8			
Manufacture	SPEAG			
Description	SAR Test System (Frequency range 300MHz-3GHz) 835, 900, 1800, 1900, 2000, 2450 frequency band HAC Extension			
Software Reference	DASY4: V4.7 Build 44 SEMCAD: V1.8 Build 171			
Hardware Reference				
Equipment	Model	Serial Number	Calibration Date	Due date of calibration
Robot	RX90L	F03/5V32A1/A01	n/a	n/a
Phantom	SAM 12	TP-1283	n/a	n/a
DAE	DAE3	569	2008-12-18	2009-12-17
E-Field Probe	ES3DV3	3088	2008-12-22	2009-12-21
H-Field Probe	ER3DV6	2308	2008-07-21	2009-07-20
H-Field Probe	H3DV6	6145	2008-07-23	2009-07-22
Validation Kits	D835V2	4d070	2008-12-15	2009-12-14
Validation Kits	D900V2	184	2009-01-13	2010-01-12
Validation Kits	D1800V2	2d070	2009-01-14	2010-01-13
Validation Kits	D1900V2	5d028	2009-01-13	2010-01-12
Validation Kits	D2000V2	1017	2009-01-07	2010-01-06
Validation Kits	D2450V2	733	2009-01-12	2010-01-11
Validation Kits	CD835V3	1060	2008-07-23	2009-07-22
Validation Kits	CD1880V3	1047	2008-07-23	2009-07-22
Validation Kits	CD2450V3	1046	2008-07-23	2009-07-22
Agilent Network Analyzer	E5071B	MY42100549	2008-12-08	2009-12-07
RF Bi-Directional Coupler	ZABDC20-252H	n/a	2009-05-18	2010-05-17
Agilent Signal Generator	E4438C	14438CATO-19719	2008-12-08	2009-12-07
Mini-Circuits Preamplifier	ZHL-42	D041905	2008-12-01	2009-11-30
Agilent Power Meter	E4416A	GB41292095	2008-12-08	2009-12-07
Agilent Power Sensor	8481H	MY41091234	2008-12-08	2009-12-07
R&S Power Sensor	NRP-Z92	100025	2009-04-28	2010-04-27
R&S Universal Radio Communication Tester	CMU200	103633	2008-12-08	2009-12-07

3.2 The SAR Measurement System

A photograph of the SAR measurement System is given in Fig. 3-1.

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

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 Equivalent 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.

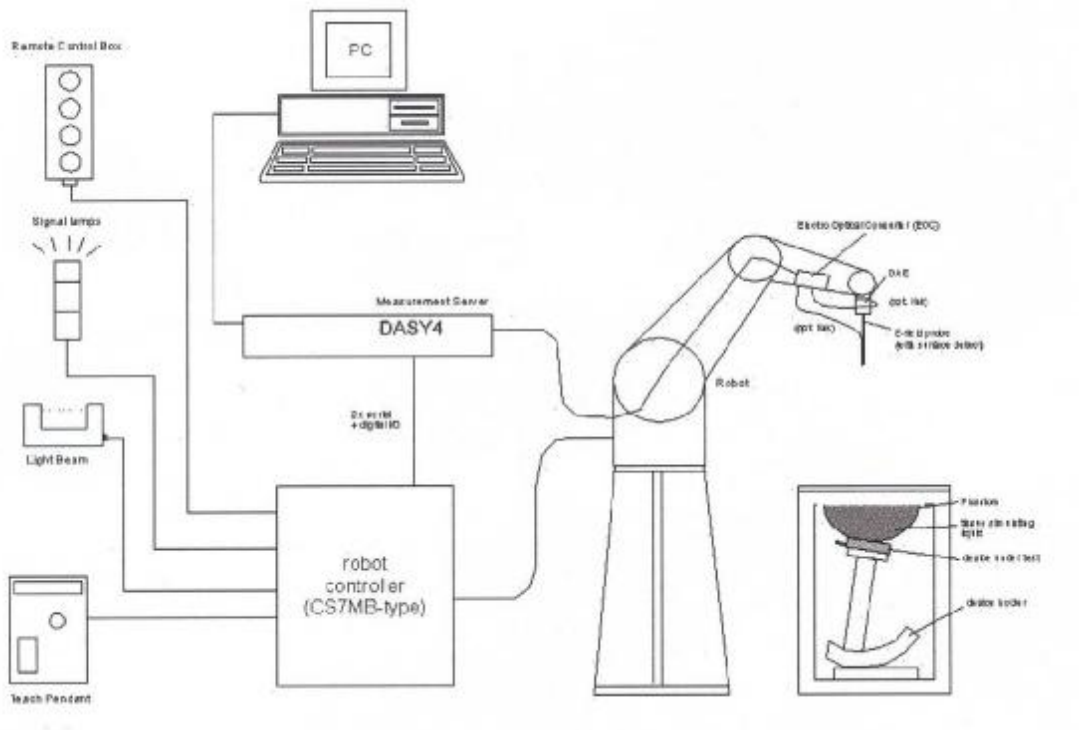

Fig. 3-1 SAR System Configuration

- 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 BodyWorn usage.
- The device holder for handheld mobile phones.
- Tissue Equivalent liquid mixed according to the given recipes.
- Validation dipole kits allowing to validating the proper functioning of the system.

3.3 Isotropic E-field Probe ES3DV3

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 900 and HSL 1810 Additional CF for other liquids and frequencies upon request
Frequency	10 MHz to 4 GHz; Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)
Dynamic Range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 4 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Dosimetry in strong gradient fields Compliance tests of mobile phones

3.4 SAM Twin Phantom

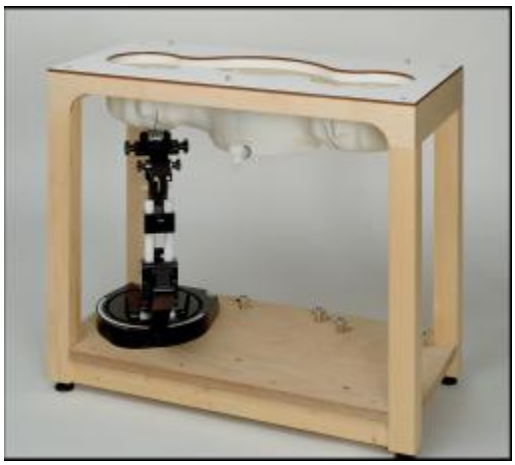

Fig. 3-2 SAM Twin Phantom

The SAM twin phantom is a fiberglass shell phantom with 2mm shell thickness (except the ear region where shell thickness increases to 6mm). It has three measurement areas:

- Left hand
- Right hand
- Flat phantom

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

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

Phantom specification:

Description	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-2003, CENELEC 50361 and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.
Shell Thickness	2±0.2mm, Center ear point: 6±0.2mm
Filling Volume	Approx.25 liters
Dimensions	Length: 1000mm, Width: 500mm, Height: 850mm

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3.5 Device Holder for Transmitters

Fig. 3-3 Device Holder for Transmitters

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

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

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

4. Measurements

4.1 GSM850-BodyWorn-GPRS-1TS-Mid-P2

Date/Time: 2009-5-26 8:34:00

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-1TS-Middle-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

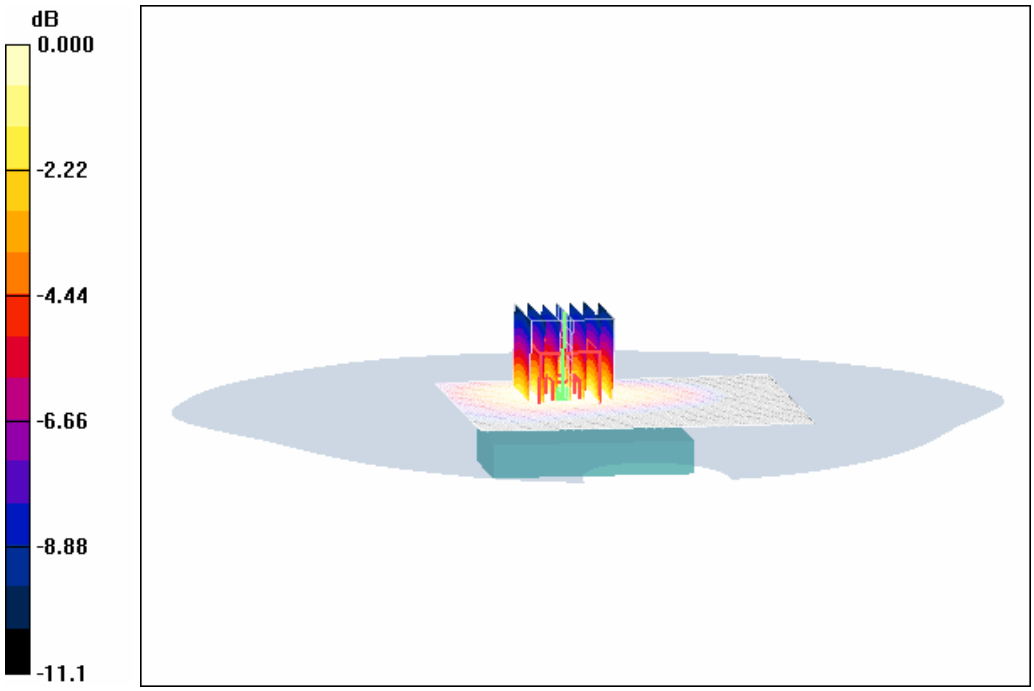
Phantom section: Flat Section

DASY4 Configuration:

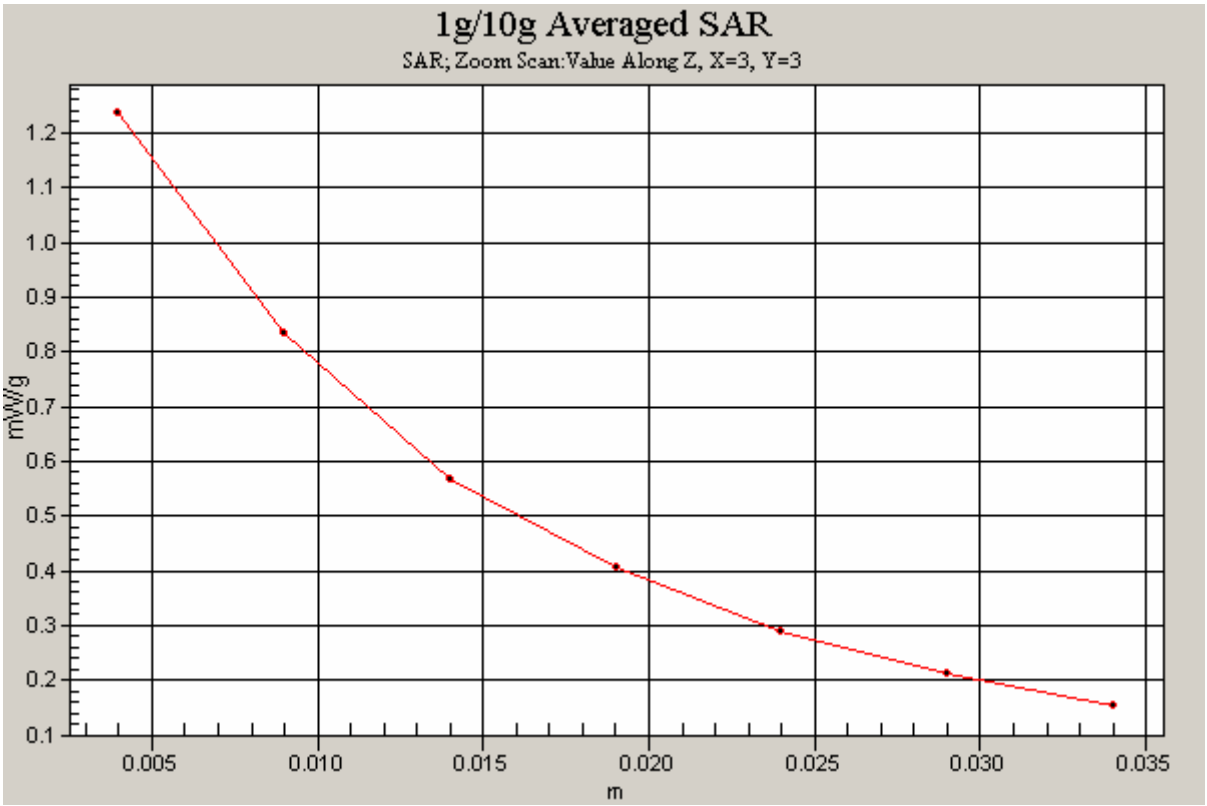
- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.23 mW/g

Body Worn - Middle P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 25.8 V/m; Power Drift = -0.362 dB
Peak SAR (extrapolated) = 1.72 W/kg
SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.726 mW/g
Maximum value of SAR (measured) = 1.23 mW/g



0 dB = 1.23mW/g



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4.2 GSM850-BodyWorn-GPRS-1TS-Mid-P2-10mm

Date/Time: 2009-5-26 13:11:58

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-1TS-Mid-P2-10mm

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - low p2 10mm/Area Scan (51x81x1): **Measurement grid: dx=15mm, dy=15mm**

Maximum value of SAR (interpolated) = 0.564 mW/g

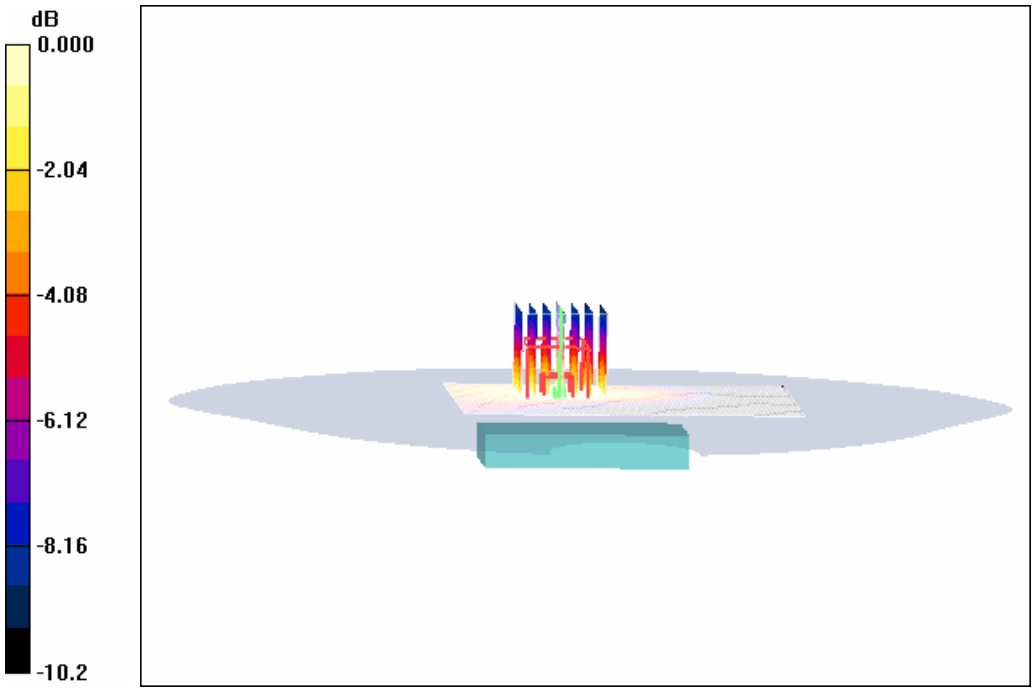
Body Worn - low p2 10mm/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 17.8 V/m; Power Drift = -0.020 dB

Peak SAR (extrapolated) = 0.803 W/kg

SAR(1 g) = 0.553 mW/g; SAR(10 g) = 0.370 mW/g

Maximum value of SAR (measured) = 0.595 mW/g



0 dB = 0.595mW/g

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4.3 GSM850-BodyWorn-GPRS-2TS-Mid-P2

Date/Time: 2009-5-25 23:43:26

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-2TS-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

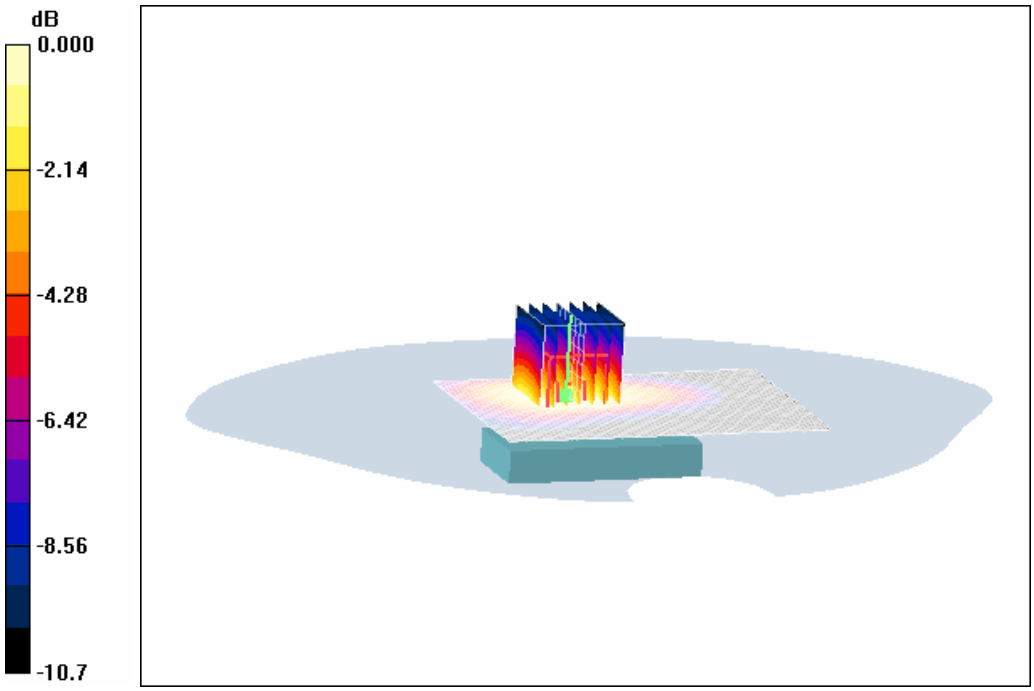
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.07 mW/g

Body Worn - Middle P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 23.7 V/m; Power Drift = -0.250 dB
Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 0.986 mW/g; SAR(10 g) = 0.635 mW/g
Maximum value of SAR (measured) = 1.07 mW/g



0 dB = 1.07mW/g

4.4 GSM850-BodyWorn-EGPRS-1TS-Mid-P2

Date/Time: 2009-5-25 22:54:43

Test Laboratory: SGS-GSM

GSM850-Body-Worn-EGPRS-1TS-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

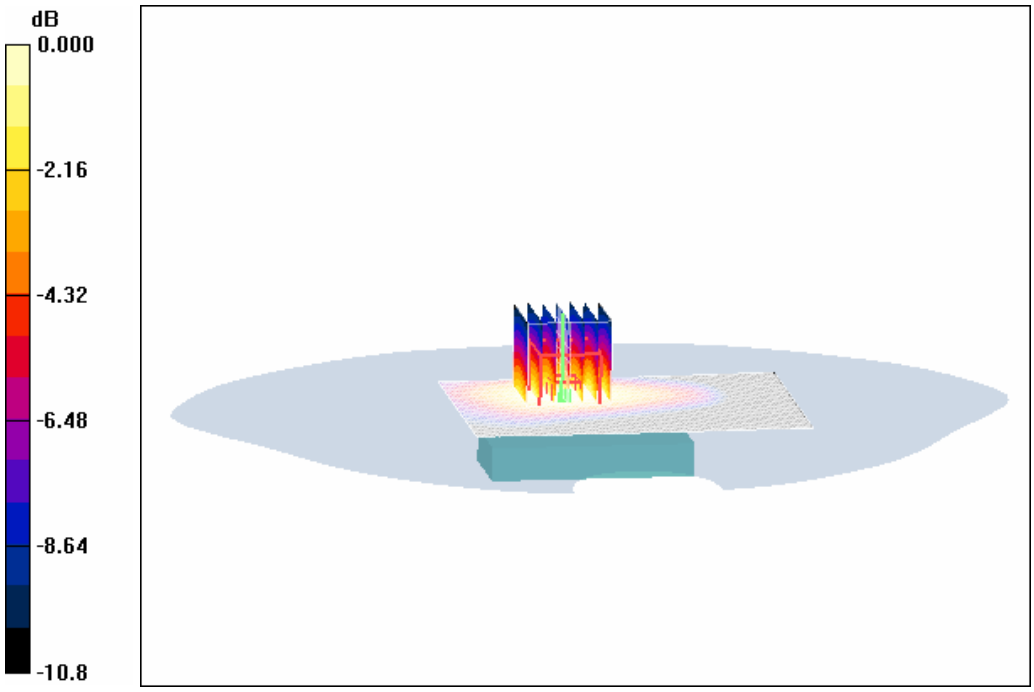
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2-1TS/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.20 mW/g

Body Worn - Middle P2-1TS/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 24.1 V/m; Power Drift = 0.215 dB
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.720 mW/g
Maximum value of SAR (measured) = 1.21 mW/g



0 dB = 1.21mW/g

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4.5 GSM850-BodyWorn-EGPRS-2TS-Mid-P2

Date/Time: 2009-5-25 21:59:09

Test Laboratory: SGS-GSM

GSM850-Body-Worn-EGPRS-2TS-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

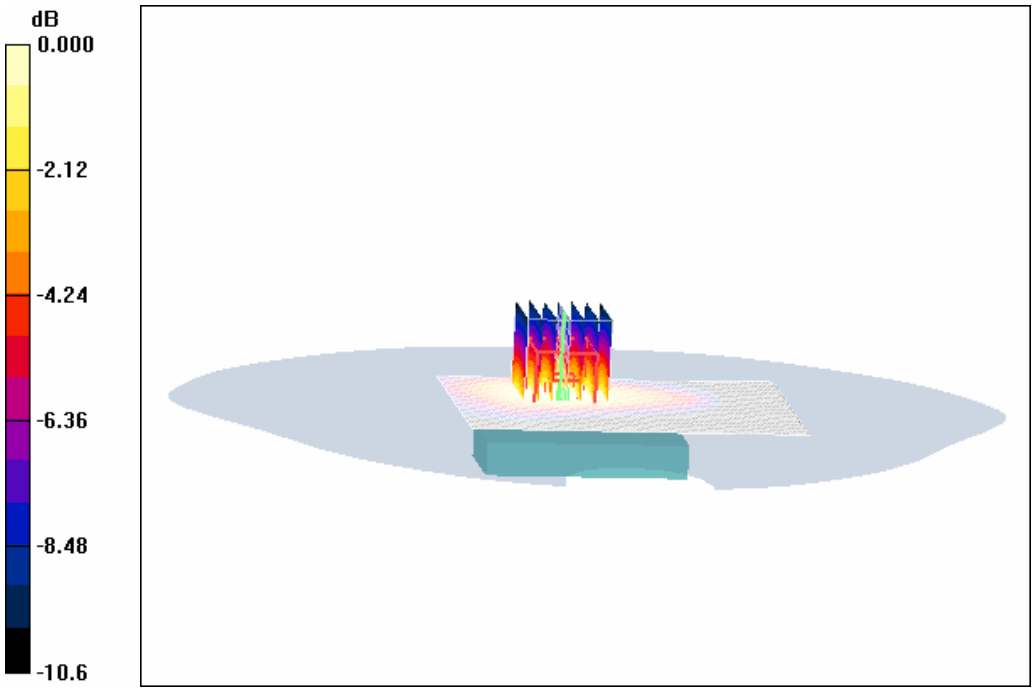
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2-2TS/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.04 mW/g

Body Worn - Middle P2-2TS/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 22.8 V/m; Power Drift = 0.016 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.966 mW/g; SAR(10 g) = 0.622 mW/g
Maximum value of SAR (measured) = 1.05 mW/g



0 dB = 1.05mW/g

4.6 GSM850-BodyWorn-EGPRS-3TS-Mid-P2

Date/Time: 2009-5-25 21:23:56

Test Laboratory: SGS-GSM

GSM850-Body-Worn-EGPRS-3TS-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: GSM850-EGPRS Mode; Frequency: 836.4 MHz;Duty Cycle: 1:2.7

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

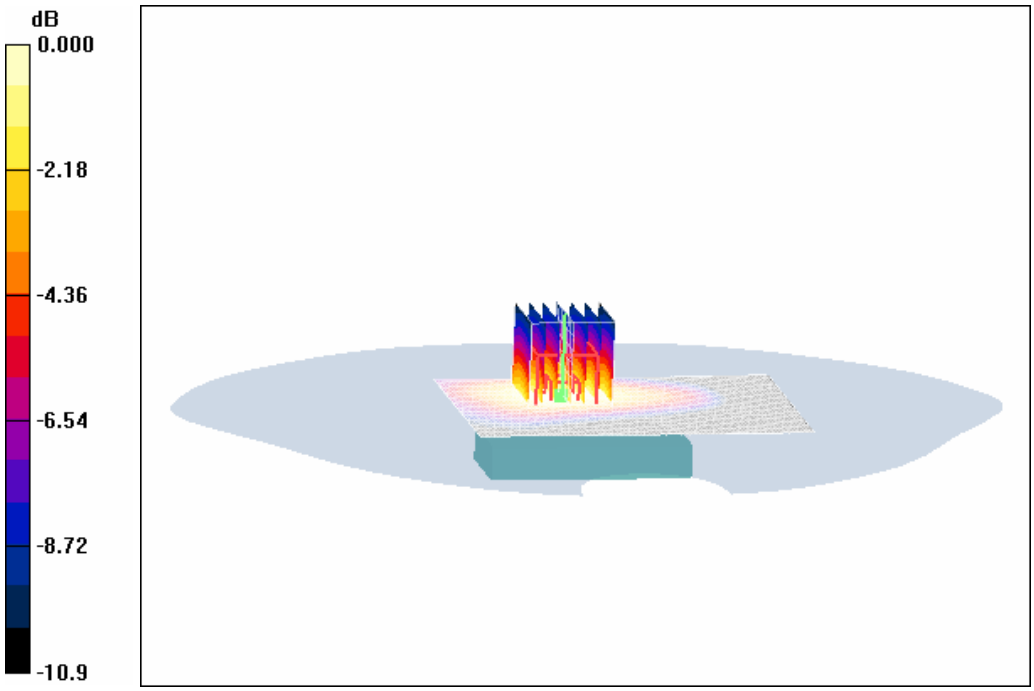
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2-3TS/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.12 mW/g

Body Worn - Middle P2-3TS/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 23.7 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 1.56 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.666 mW/g
Maximum value of SAR (measured) = 1.12 mW/g



0 dB = 1.12mW/g

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4.7 GSM850-BodyWorn-EGPRS-4TS-Mid-P2

Date/Time: 2009-5-25 20:55:51

Test Laboratory: SGS-GSM

GSM850-Body-Worn-EGPRS-4TS-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**

Maximum value of SAR (interpolated) = 1.17 mW/g

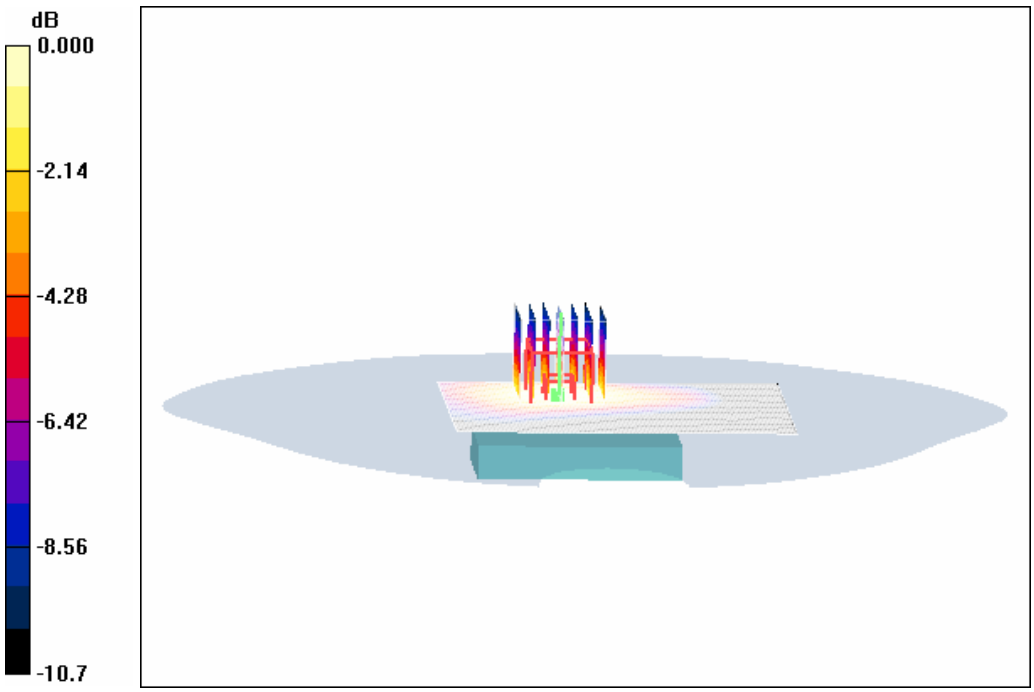
Body Worn - Middle P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 21.3 V/m; Power Drift = -0.247 dB

Peak SAR (extrapolated) = 1.61 W/kg

SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.689 mW/g

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



0 dB = 1.15mW/g

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4.8 GSM850-BodyWorn-GPRS-1TS-Mid-P1

Date/Time: 2009-5-27 21:11:16

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-1TS-Mid-P1

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P1/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**

Maximum value of SAR (interpolated) = 0.337 mW/g

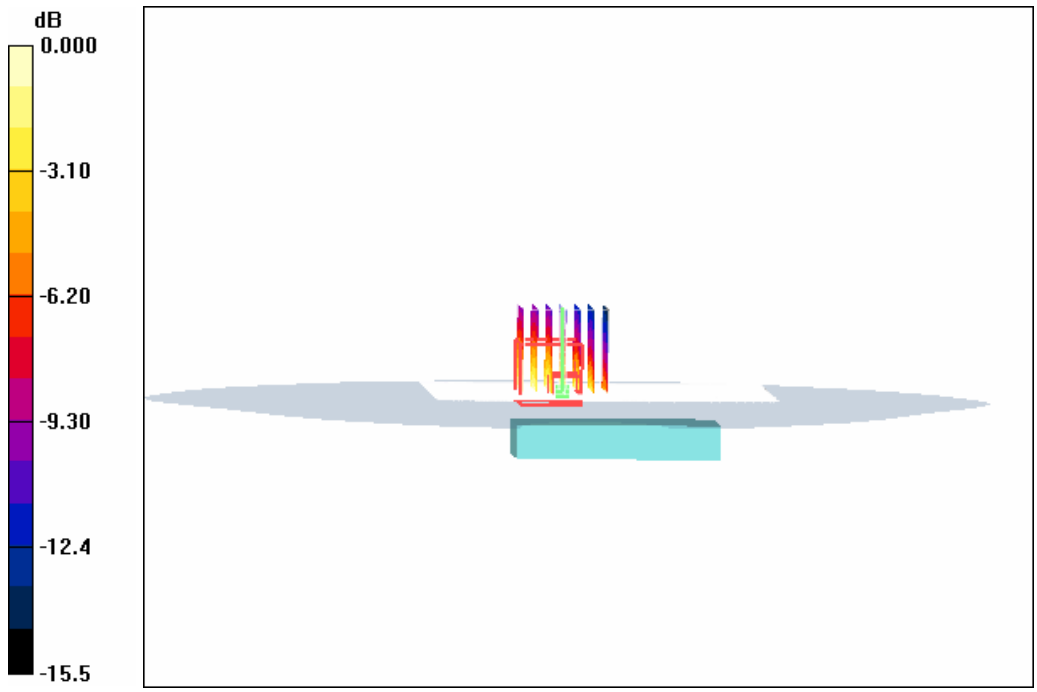
Body Worn - Middle P1/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 18.3 V/m; Power Drift = -0.018 dB

Peak SAR (extrapolated) = 0.541 W/kg

SAR(1 g) = 0.291 mW/g; SAR(10 g) = 0.182 mW/g

Maximum value of SAR (measured) = 0.314 mW/g



0 dB = 0.314mW/g

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4.9 GSM850-BodyWorn-GPRS-1TS-Mid-P3

Date/Time: 2009-5-27 18:40:05

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-1TS-Mid-P3

DUT: KZ014AT01-P3&P4; Type: Body; Serial: 004401780160442

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

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P3/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**

Maximum value of SAR (interpolated) = 0.251 mW/g

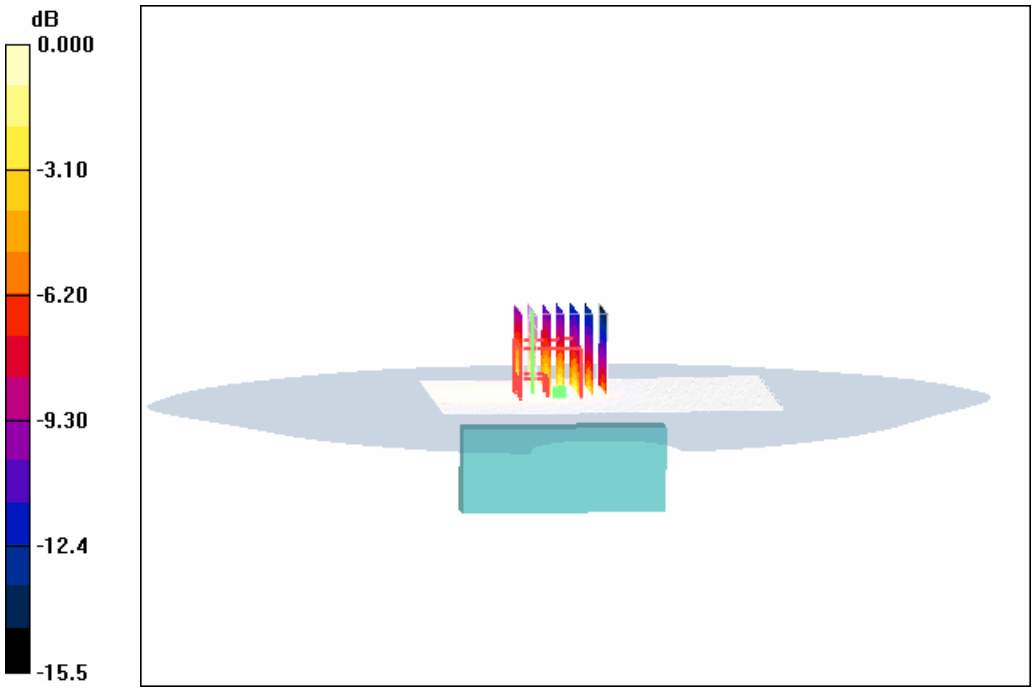
Body Worn - Middle P3/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 13.8 V/m; Power Drift = -0.246 dB

Peak SAR (extrapolated) = 0.406 W/kg

SAR(1 g) = 0.223 mW/g; SAR(10 g) = 0.135 mW/g

Maximum value of SAR (measured) = 0.243 mW/g



0 dB = 0.243mW/g

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4.10 GSM850-BodyWorn-GPRS-1TS-Mid-P4

Date/Time: 2009-5-27 20:03:37

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-1TS-Mid-P4

DUT: KZ014AT01-P3&P4; Type: Body; Serial: 004401780160442

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

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

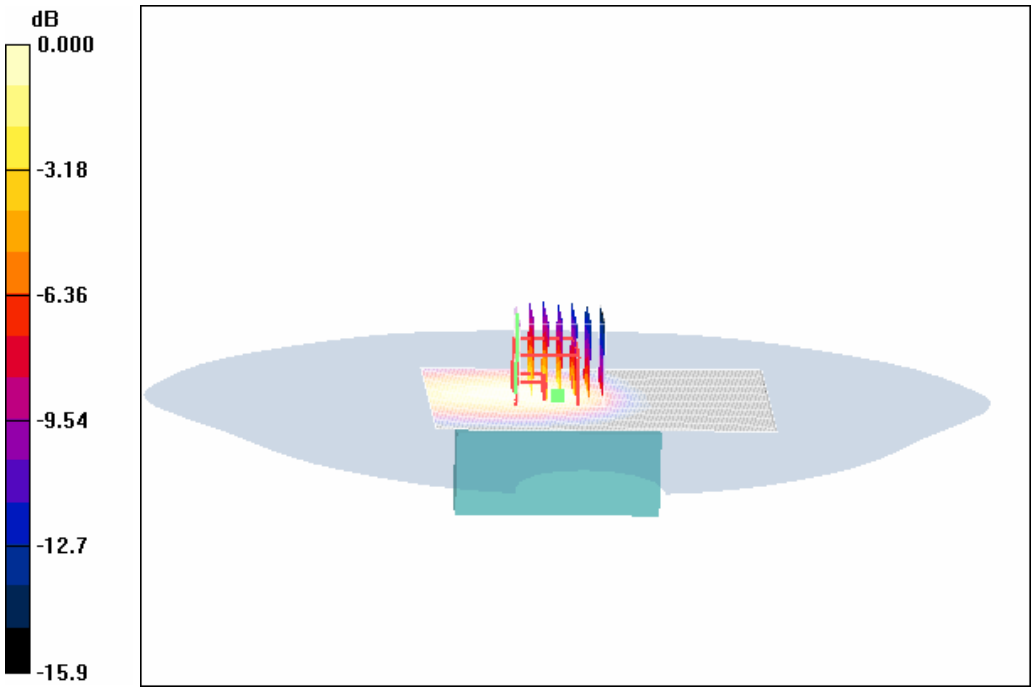
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P4/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.117 mW/g

Body Worn - Middle P4/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 9.46 V/m; Power Drift = 0.185 dB
Peak SAR (extrapolated) = 0.203 W/kg
SAR(1 g) = 0.107 mW/g; SAR(10 g) = 0.063 mW/g
Maximum value of SAR (measured) = 0.115 mW/g



0 dB = 0.115mW/g

4.11 GSM850-BodyWorn-GPRS-1TS-Mid-P5

Date/Time: 2009-5-27 22:39:50

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-1TS-Mid-P5

DUT: KZ014AT01-P5; Type: Body; Serial: 004401780160442

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

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

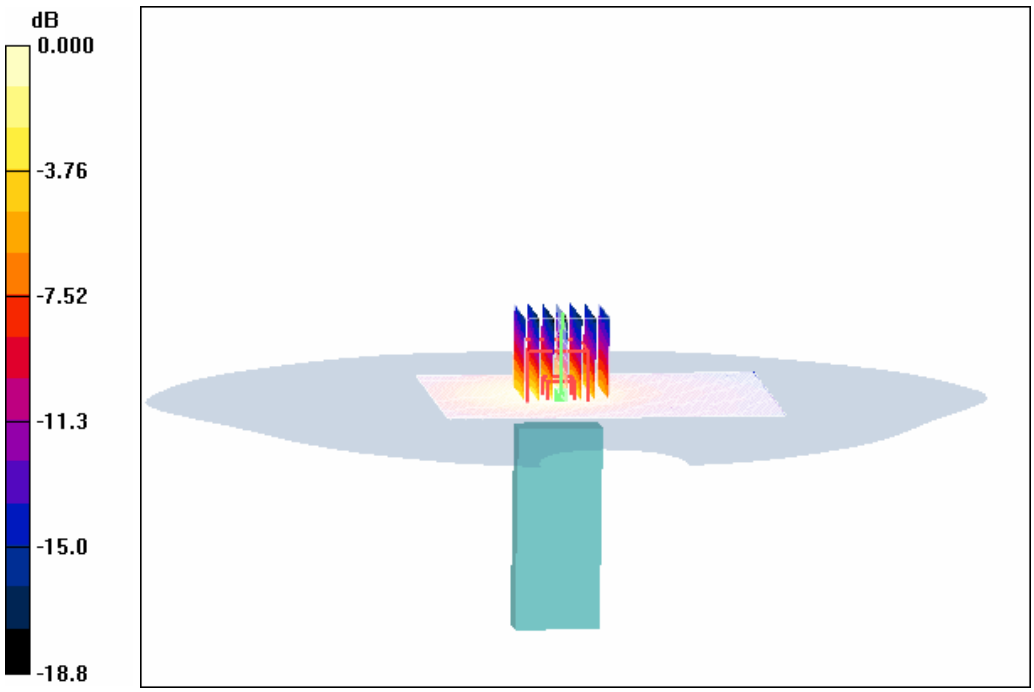
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P5/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.127 mW/g

Body Worn - Middle P5/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 11.0 V/m; Power Drift = -0.130 dB
Peak SAR (extrapolated) = 0.387 W/kg
SAR(1 g) = 0.126 mW/g; SAR(10 g) = 0.056 mW/g
Maximum value of SAR (measured) = 0.144 mW/g



0 dB = 0.144mW/g

4.12 GSM850-BodyWorn-GPRS-1TS-Low-P2

Date/Time: 2009-5-26 9:07:35

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-1TS-Low-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL835 Body Medium parameters used: f = 824.2 MHz; σ = 0.955 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3

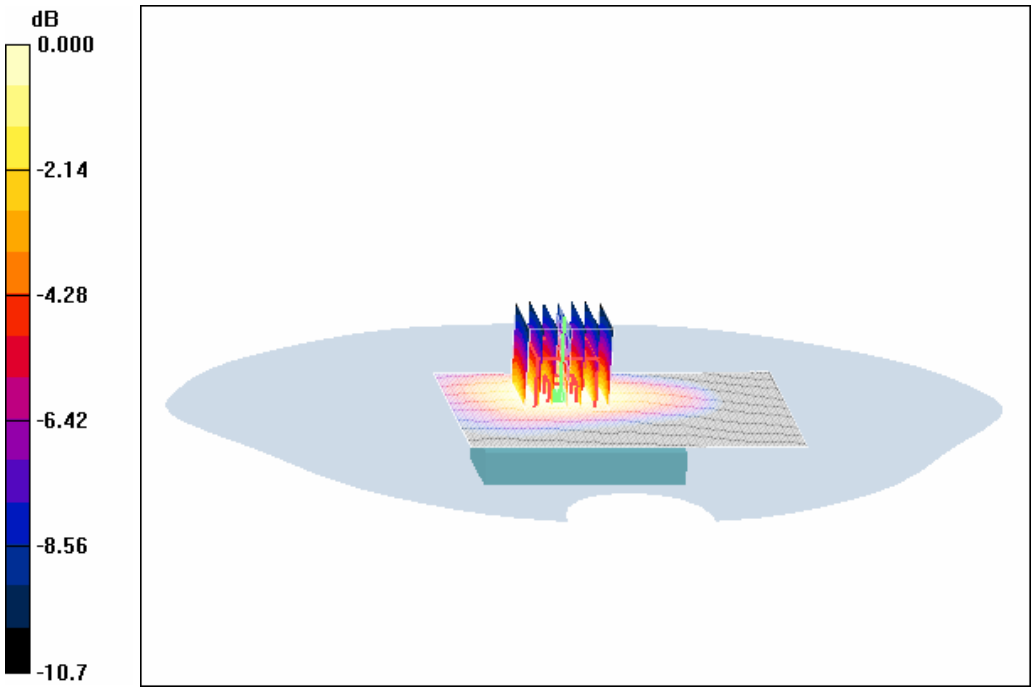
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Low P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.23 mW/g

Body Worn - Low P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 25.2 V/m; Power Drift = -0.045 dB
Peak SAR (extrapolated) = 1.72 W/kg
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.732 mW/g
Maximum value of SAR (measured) = 1.23 mW/g



0 dB = 1.23mW/g

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4.13 GSM850-BodyWorn-GPRS-1TS-High-P2

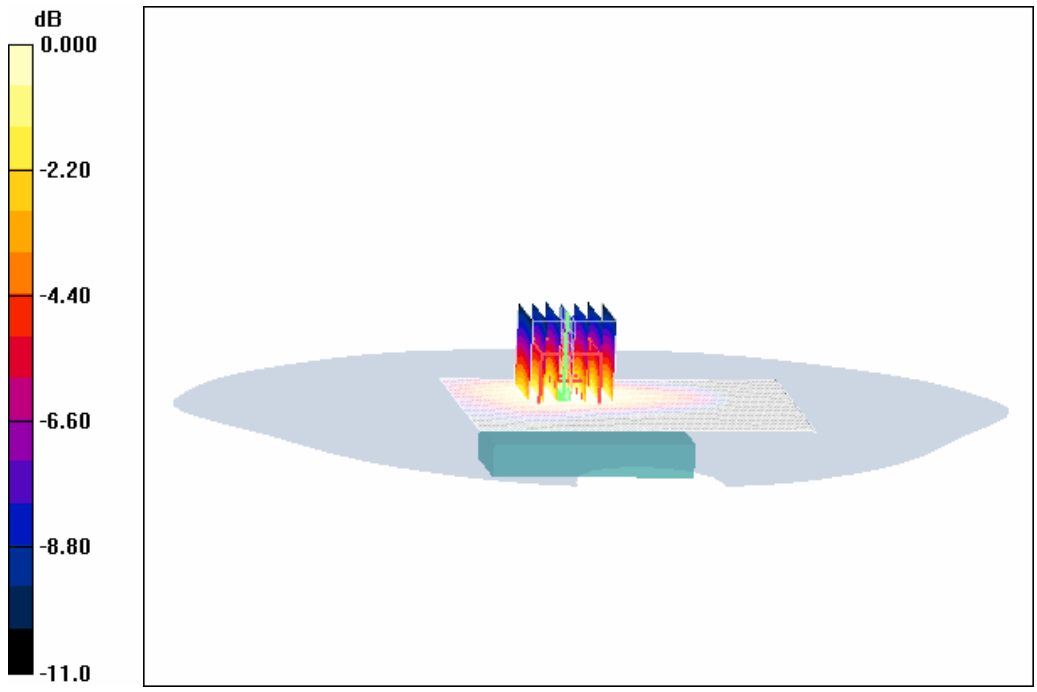
Date/Time: 2009-5-26 9:36:23

Test Laboratory: SGS-GSM
GSM850-Body-Worn-GPRS-1TS-High-P2
DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442
Communication System: GSM850-GPRS Mode; Frequency: 848.8 MHz;Duty Cycle: 1:8.3
Medium: HSL835 Body Medium parameters used: f = 848.8 MHz; σ = 0.98 mho/m; ε_r = 56.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - High P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.09 mW/g

Body Worn - High P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 23.1 V/m; Power Drift = 0.019 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.648 mW/g
Maximum value of SAR (measured) = 1.10 mW/g



0 dB = 1.10mW/g

4.14 GSM850-BodyWorn-GPRS-1TS-Low+SD-P2

Date/Time: 2009-5-26 10:19:39

Test Laboratory: SGS-GSM

GSM850-Body-Worn-GPRS-1TS-Low+SD-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL835 Body Medium parameters used: f = 824.2 MHz; σ = 0.955 mho/m; ε_r = 56.8; ρ = 1000 kg/m^3

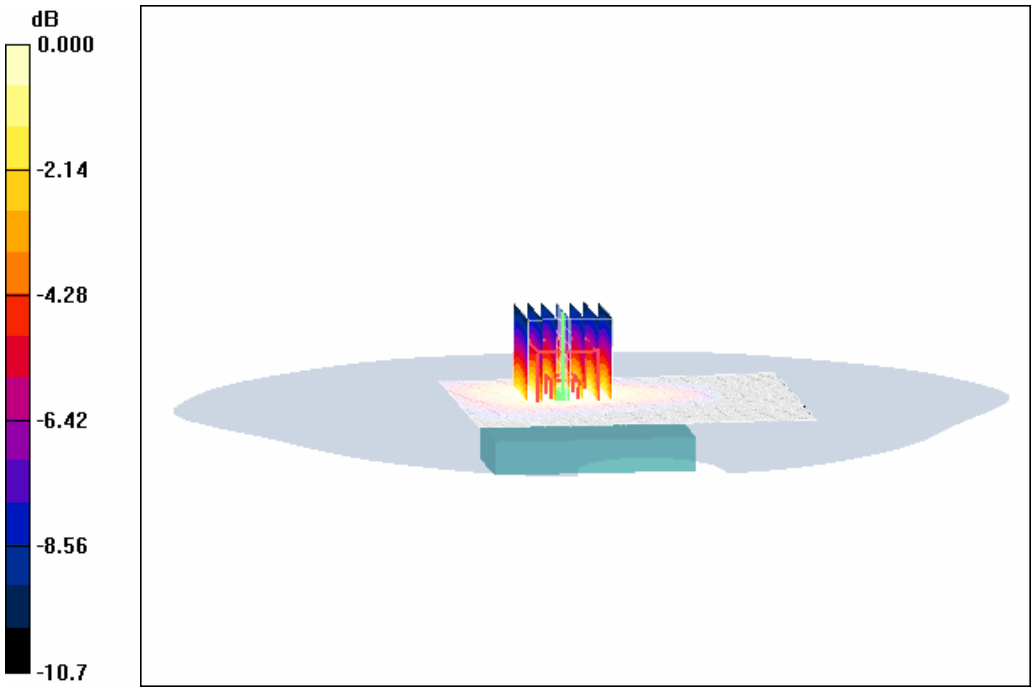
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Low P2 +sd/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.21 mW/g

Body Worn - Low P2 +sd/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 26.6 V/m; Power Drift = 0.031 dB
Peak SAR (extrapolated) = 1.72 W/kg
SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.723 mW/g
Maximum value of SAR (measured) = 1.23 mW/g



0 dB = 1.23mW/g

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4.15 PCS1900-BodyWorn-GPRS-2TS-Mid-P2

Date/Time: 2009-5-22 13:20:15

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-2TS-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3

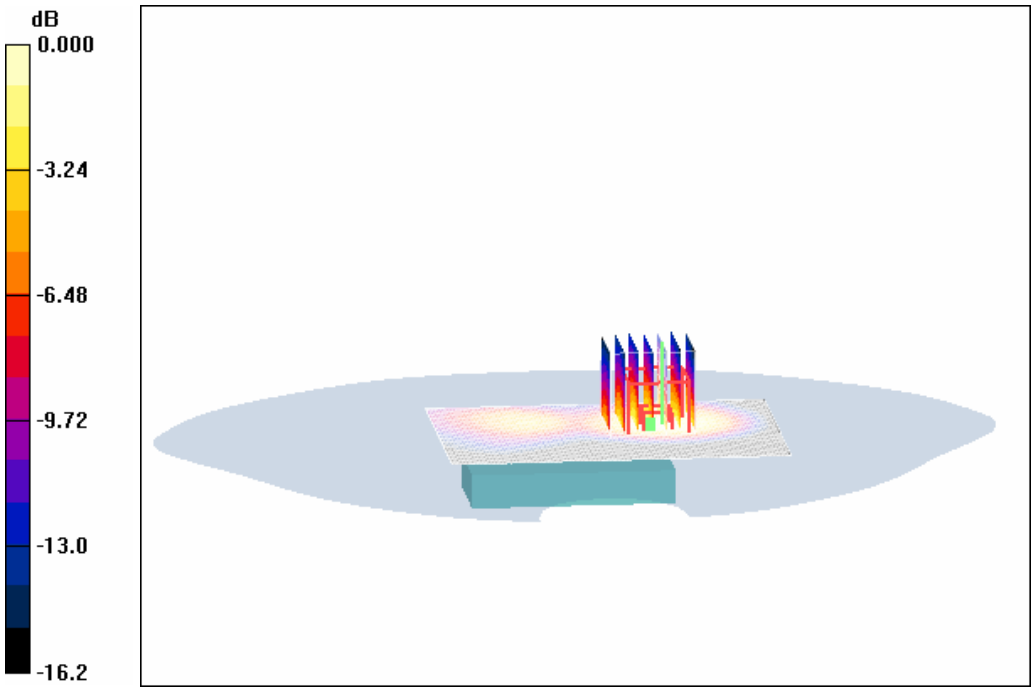
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2 2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.12 mW/g

Body Worn - Middle P2 2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 9.01 V/m; Power Drift = -0.161 dB
Peak SAR (extrapolated) = 1.96 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.544 mW/g
Maximum value of SAR (measured) = 1.13 mW/g



0 dB = 1.13mW/g

4.16 PCS1900-BodyWorn-EGPRS-1TS-Mid-P2

Date/Time: 2009-5-22 12:51:57

Test Laboratory: SGS-GSM

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

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**

Maximum value of SAR (interpolated) = 0.649 mW/g

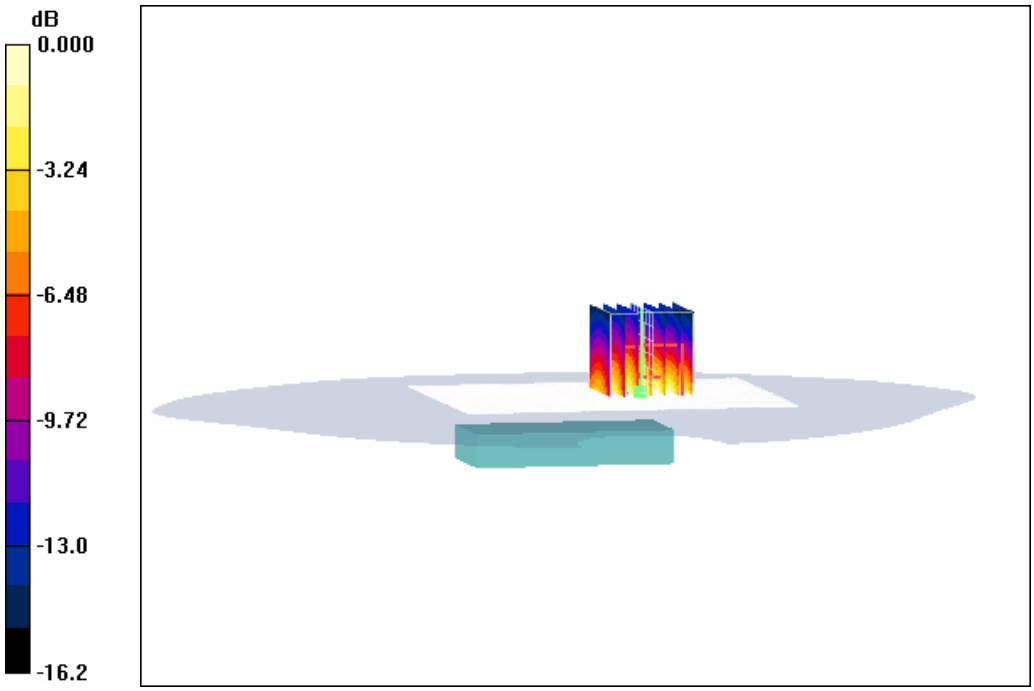
Body Worn - Middle P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 6.72 V/m; Power Drift = 0.276 dB

Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.590 mW/g; SAR(10 g) = 0.313 mW/g

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



0 dB = 0.667mW/g

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4.17 PCS1900-BodyWorn-EGPRS-2TS-Mid-P2

Date/Time: 2009-5-22 11:36:56

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-EGPRS-2TS-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**

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

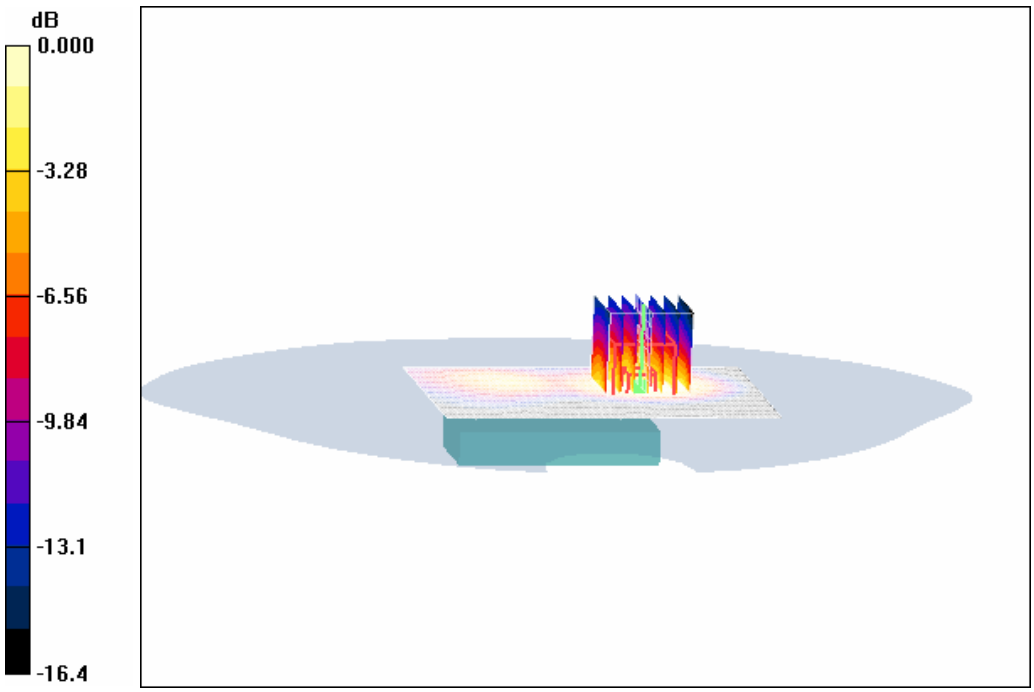
Body Worn - Middle P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 8.76 V/m; Power Drift = 0.135 dB

Peak SAR (extrapolated) = 1.90 W/kg

SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.537 mW/g

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



0 dB = 1.11mW/g

4.18 PCS1900-BodyWorn-EGPRS-3TS-Mid-P2

Date/Time: 2009-5-22 11:08:25

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-EGPRS-3TS-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: PCS1900-EGPRS Mode; Frequency: 1880 MHz;Duty Cycle: 1:2.7

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**

Maximum value of SAR (interpolated) = 1.04 mW/g

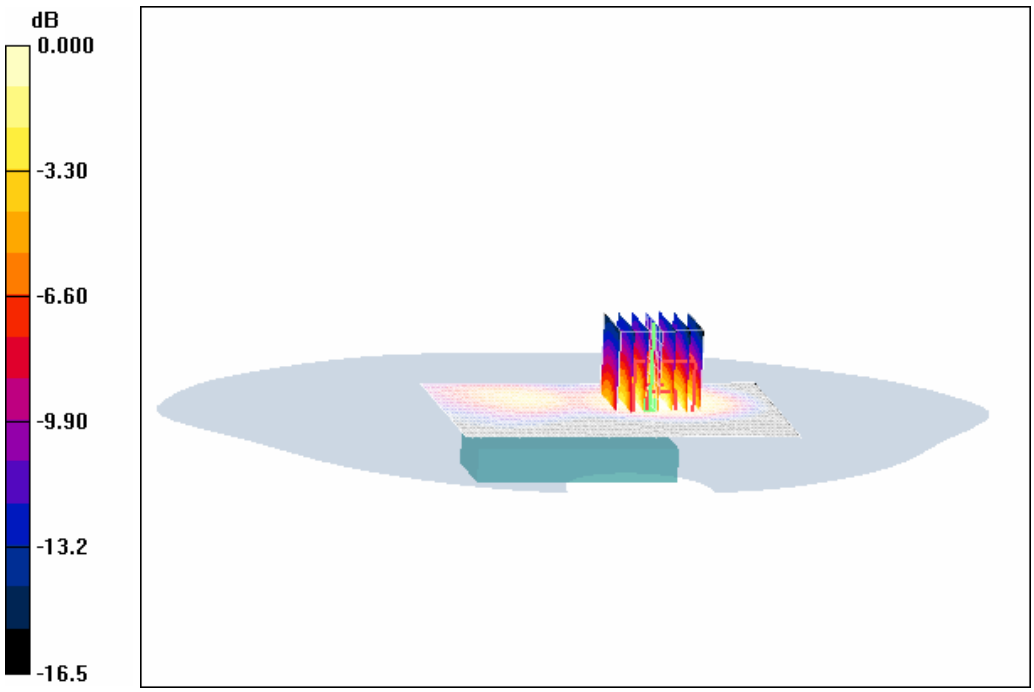
Body Worn - Middle P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 8.43 V/m; Power Drift = 0.006 dB

Peak SAR (extrapolated) = 1.82 W/kg

SAR(1 g) = 0.951 mW/g; SAR(10 g) = 0.506 mW/g

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



0 dB = 1.06mW/g

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4.19 PCS1900-BodyWorn-EGPRS-4TS-Mid-P2

Date/Time: 2009-5-22 10:33:39

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-EGPRS-4TS-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3

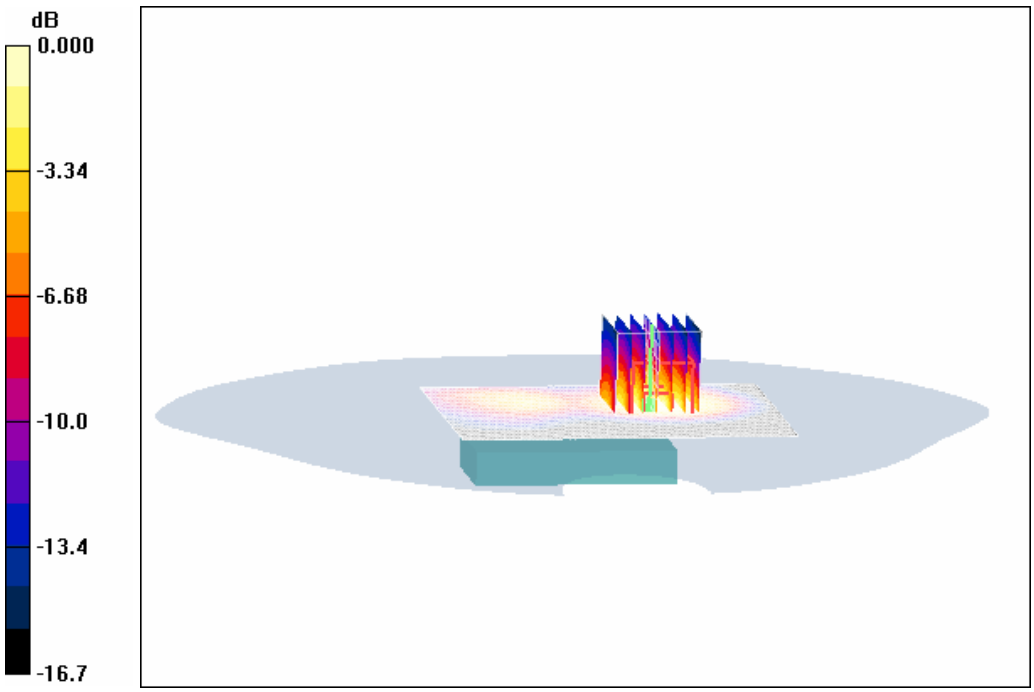
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.08 mW/g

Body Worn - Middle P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 8.71 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 1.87 W/kg
SAR(1 g) = 0.988 mW/g; SAR(10 g) = 0.525 mW/g
Maximum value of SAR (measured) = 1.11 mW/g



0 dB = 1.11mW/g

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4.20 PCS1900-BodyWorn-GPRS-2TS-Mid-P1

Date/Time: 2009-5-25 14:33:20

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-2TS-Mid-P1

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

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

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3

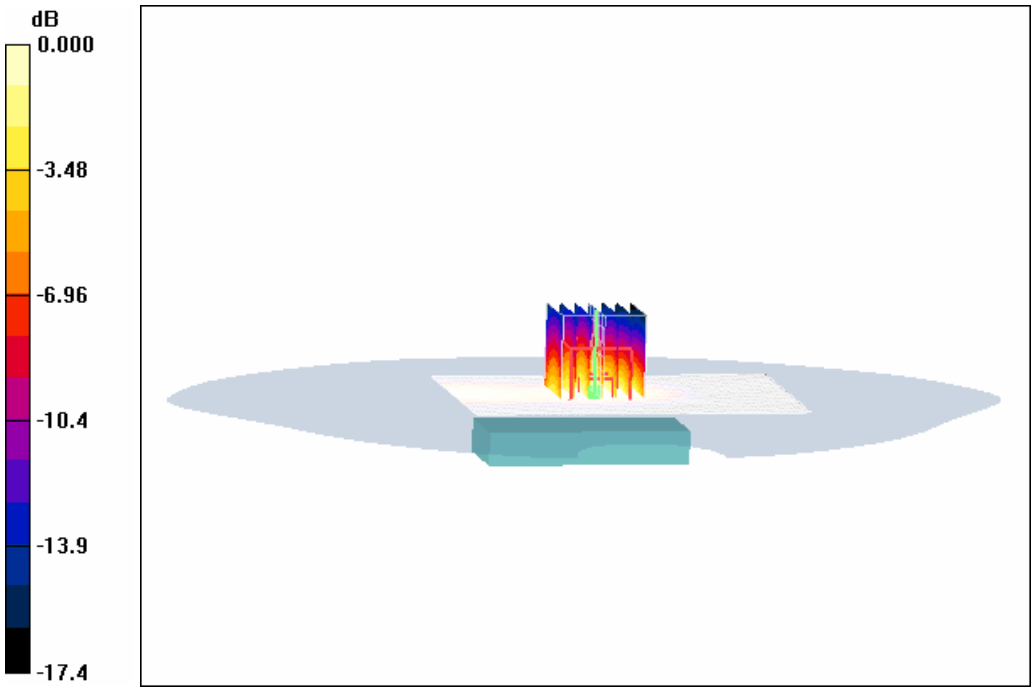
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P1/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.771 mW/g

Body Worn - Middle P1/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 22.8 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.684 mW/g; SAR(10 g) = 0.370 mW/g
Maximum value of SAR (measured) = 0.765 mW/g



0 dB = 0.765mW/g

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4.21 PCS1900-BodyWorn-GPRS-2TS-Mid-P3

Date/Time: 2009-5-25 16:32:03

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-2TS-Mid-P3

DUT: KZ014AT01-P3&P4; Type: Body; Serial: 004401780160442

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

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3

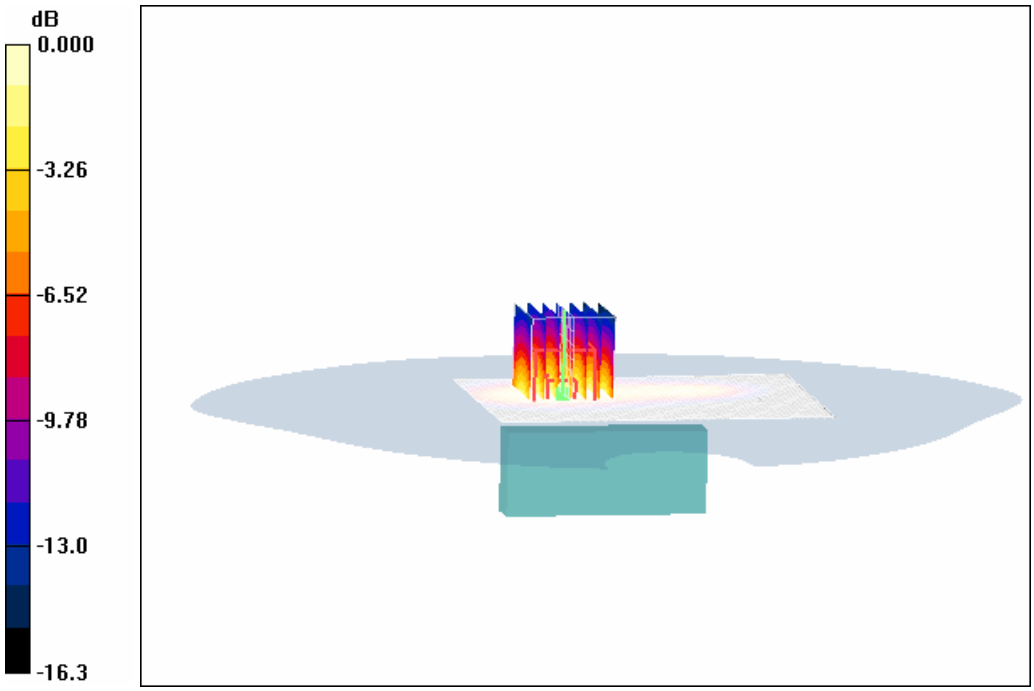
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P3/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.383 mW/g

Body Worn - Middle P3/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 9.08 V/m; Power Drift = 0.308 dB
Peak SAR (extrapolated) = 0.576 W/kg
SAR(1 g) = 0.346 mW/g; SAR(10 g) = 0.194 mW/g
Maximum value of SAR (measured) = 0.385 mW/g



0 dB = 0.385mW/g

4.22 PCS1900-BodyWorn-GPRS-2TS-Mid-P4

Date/Time: 2009-5-25 17:00:03

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-2TS-Mid-P4

DUT: KZ014AT01-P3&P4; Type: Body; Serial: 004401780160442

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

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3

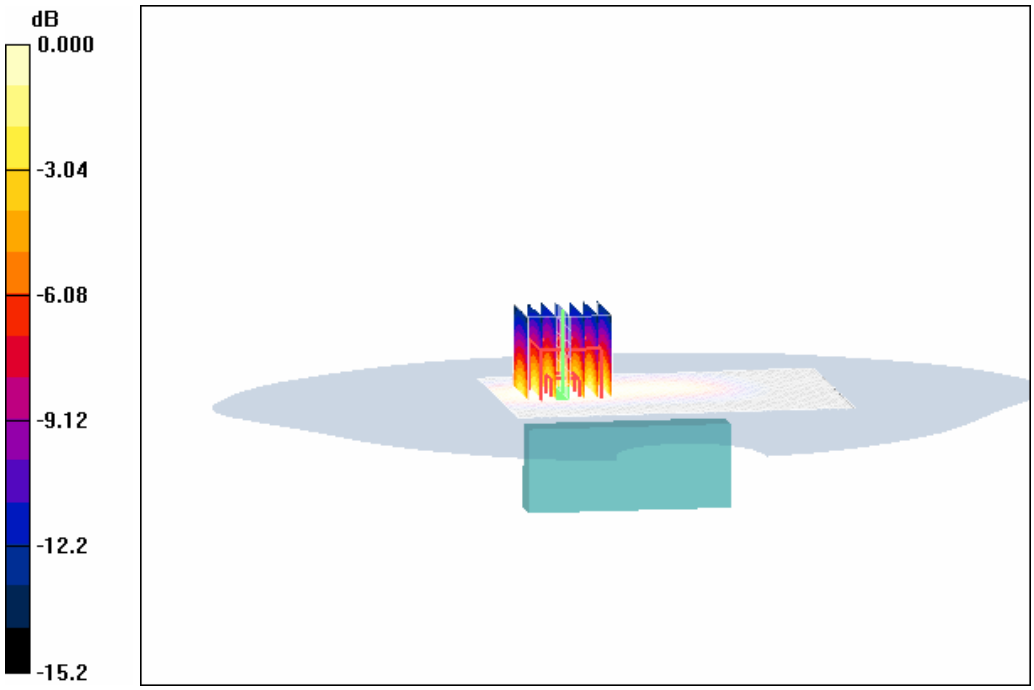
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P4/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.645 mW/g

Body Worn - Middle P4/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 14.9 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 0.940 W/kg
SAR(1 g) = 0.562 mW/g; SAR(10 g) = 0.318 mW/g
Maximum value of SAR (measured) = 0.625 mW/g



0 dB = 0.625mW/g

4.23 PCS1900-BodyWorn-GPRS-2TS-Mid-P5

Date/Time: 2009-5-25 18:42:28

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-2TS-Mid-P5

DUT: KZ014AT01-P5; Type: Body; Serial: 004401780160442

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

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P5/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**

Maximum value of SAR (interpolated) = 0.226 mW/g

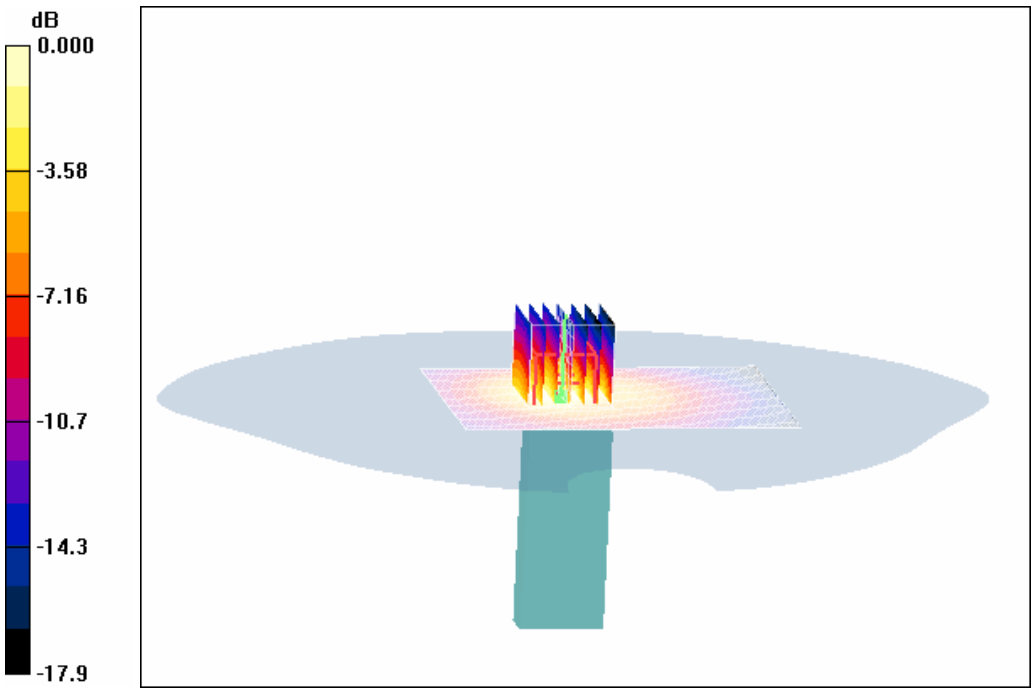
Body Worn - Middle P5/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 11.2 V/m; Power Drift = -0.020 dB

Peak SAR (extrapolated) = 0.444 W/kg

SAR(1 g) = 0.213 mW/g; SAR(10 g) = 0.109 mW/g

Maximum value of SAR (measured) = 0.248 mW/g



0 dB = 0.248mW/g

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4.24 PCS1900-BodyWorn-GPRS-2TS-Low-P2

Date/Time: 2009-5-22 14:00:44

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-2TS-Low-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: PCS1900-GPRS Mode; Frequency: 1850.2 MHz;Duty Cycle: 1:4

Medium: HSL 1900 Body Medium parameters used: f = 1850.2 MHz; σ = 1.48 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3

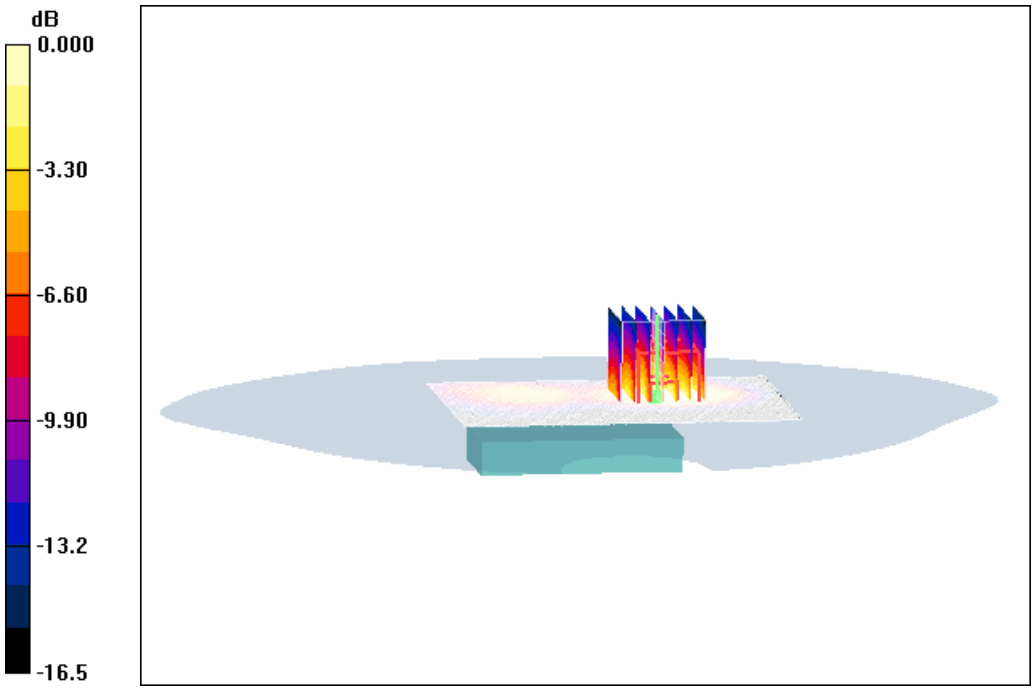
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Low/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.22 mW/g

Body Worn - Low/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 9.49 V/m; Power Drift = -0.199 dB
Peak SAR (extrapolated) = 2.11 W/kg
SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.578 mW/g
Maximum value of SAR (measured) = 1.22 mW/g



0 dB = 1.22mW/g

4.25 PCS1900-BodyWorn-GPRS-2TS-High-P2

Date/Time: 2009-5-22 14:25:34

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-2TS-High-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: PCS1900-GPRS Mode; Frequency: 1909.8 MHz;Duty Cycle: 1:4

Medium: HSL 1900 Body Medium parameters used: f = 1909.8 MHz; σ = 1.54 mho/m; ε_r = 52.7; ρ = 1000 kg/m^3

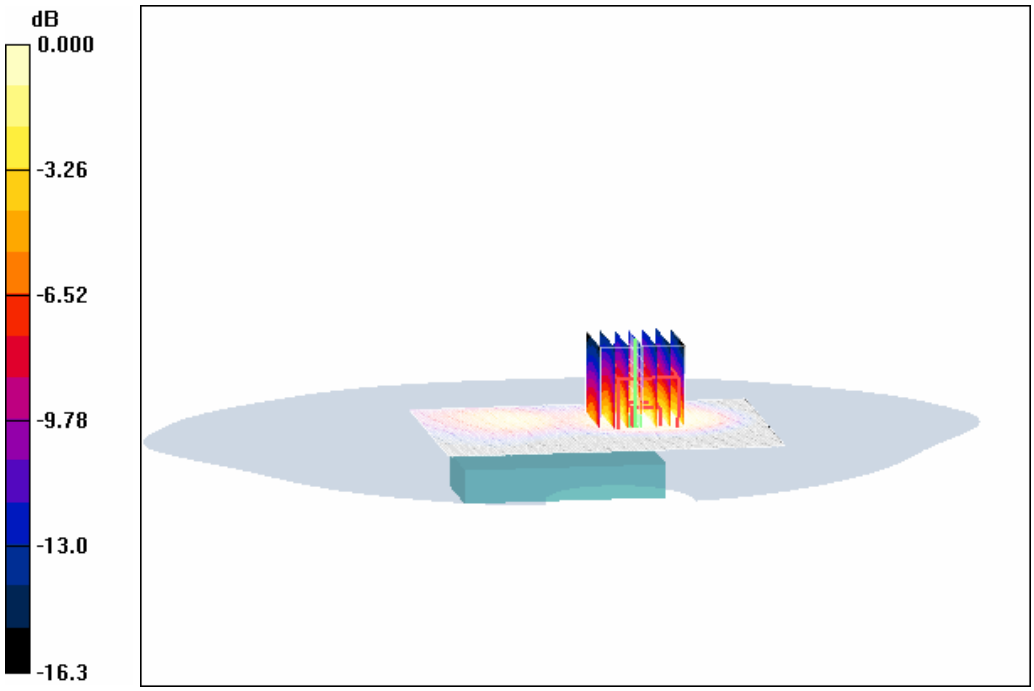
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - High/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.01 mW/g

Body Worn - High/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 8.41 V/m; Power Drift = 0.067 dB
Peak SAR (extrapolated) = 1.81 W/kg
SAR(1 g) = 0.930 mW/g; SAR(10 g) = 0.489 mW/g
Maximum value of SAR (measured) = 1.03 mW/g



0 dB = 1.03mW/g

4.26 PCS1900-BodyWorn-GPRS-2TS-Low+SD-P2

Date/Time: 2009-5-22 14:53:06

Test Laboratory: SGS-GSM

PCS1900-Body-Worn-GPRS-2TS-Low+SD-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: PCS1900-GPRS Mode; Frequency: 1850.2 MHz;Duty Cycle: 1:4

Medium: HSL 1900 Body Medium parameters used: f = 1850.2 MHz; σ = 1.48 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3

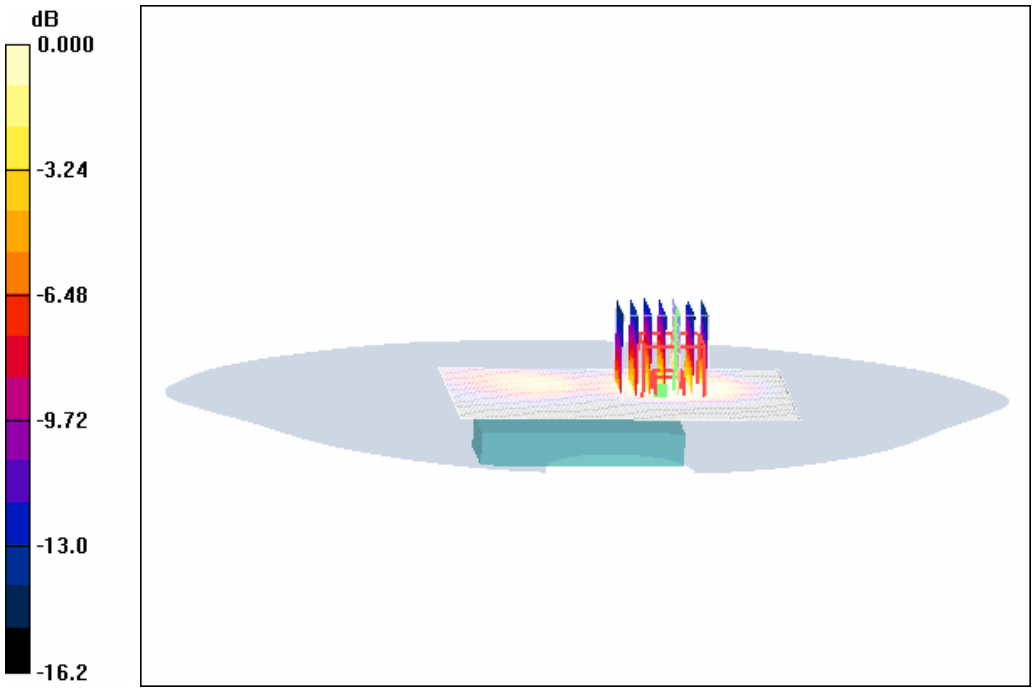
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Low +sd/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.21 mW/g

Body Worn - Low +sd/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 9.53 V/m; Power Drift = 0.003 dB
Peak SAR (extrapolated) = 2.07 W/kg
SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.588 mW/g
Maximum value of SAR (measured) = 1.24 mW/g



0 dB = 1.24mW/g

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4.27 UMTS FDD II-BodyWorn-WCDMA-Mid-P1

Date/Time: 2009-5-25 15:03:50

Test Laboratory: SGS-GSM

UMTS FDD II-Body-Worn-WCDMA-Mid-P1

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band II ; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3

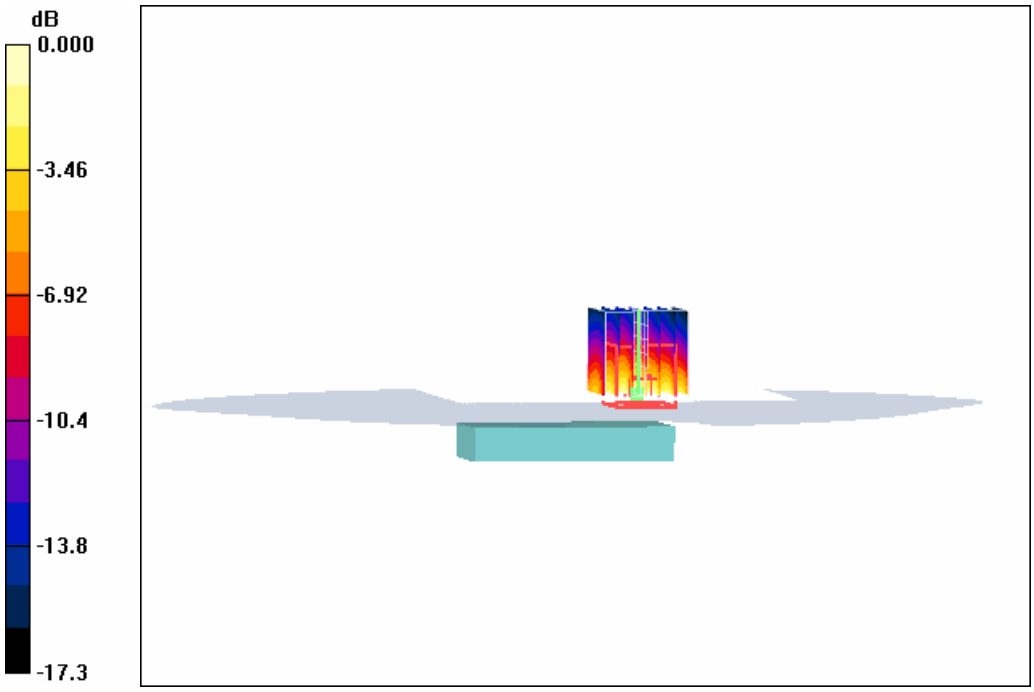
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P1/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.712 mW/g

Body Worn - Middle P1/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 21.2 V/m; Power Drift = 0.176 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.634 mW/g; SAR(10 g) = 0.342 mW/g
Maximum value of SAR (measured) = 0.709 mW/g



0 dB = 0.709mW/g

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4.28 UMTS FDD II-BodyWorn-WCDMA-Mid-P2

Date/Time: 2009-5-22 15:56:52

Test Laboratory: SGS-GSM

UMTS FDD II-Body-Worn-WCDMA-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band II ; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.8; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**

Maximum value of SAR (interpolated) = 0.966 mW/g

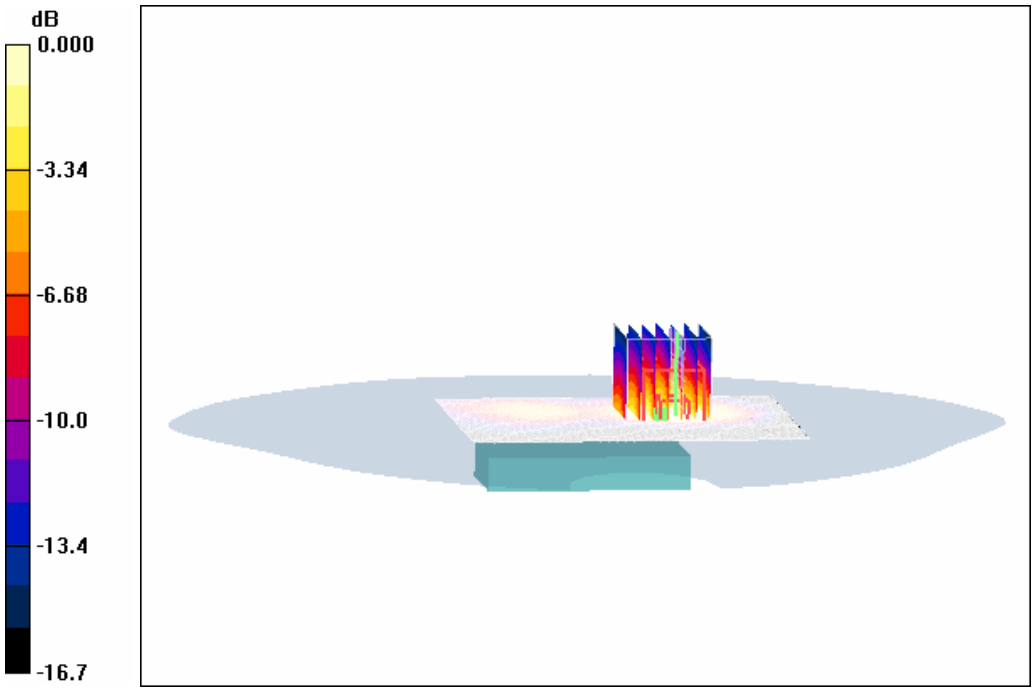
Body Worn - Middle P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 8.27 V/m; Power Drift = 0.108 dB

Peak SAR (extrapolated) = 1.75 W/kg

SAR(1 g) = 0.897 mW/g; SAR(10 g) = 0.472 mW/g

Maximum value of SAR (measured) = 1.01 mW/g



0 dB = 1.01mW/g

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4.29 UMTS FDD II-BodyWorn-WCDMA-Mid-P3

Date/Time: 2009-5-25 16:02:25

Test Laboratory: SGS-GSM

UMTS FDD II-Body-Worn-WCDMA-Mid-P3

DUT: KZ014AT01-P3&P4; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band II ; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3

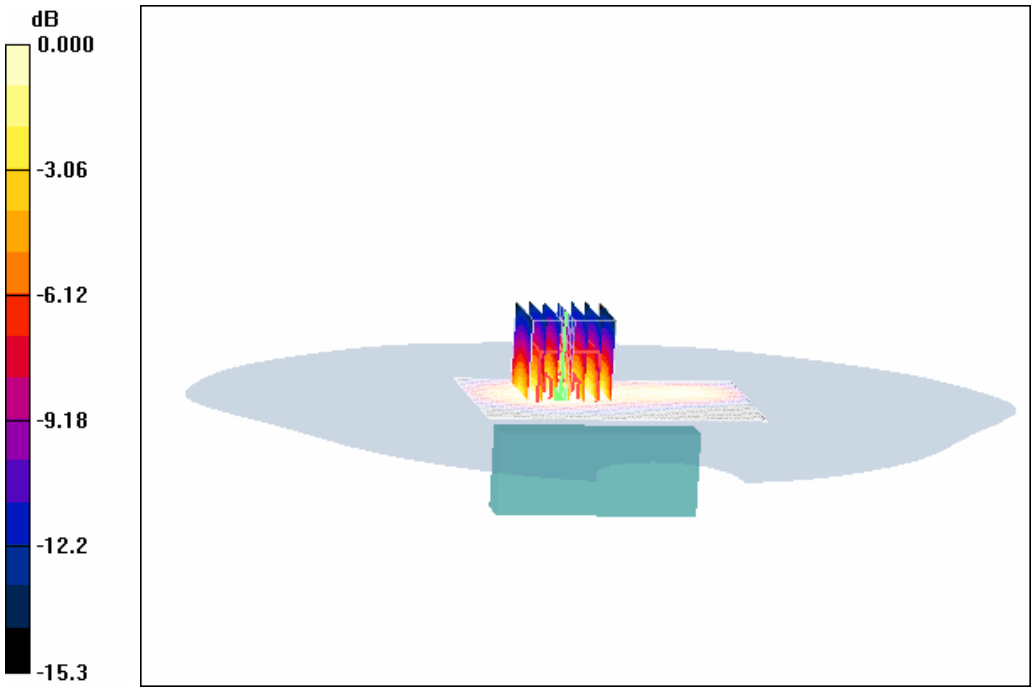
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P3/Area Scan (61x101x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.398 mW/g

Body Worn - Middle P3/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 10.8 V/m; Power Drift = 0.247 dB
Peak SAR (extrapolated) = 0.597 W/kg
SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.196 mW/g
Maximum value of SAR (measured) = 0.390 mW/g



0 dB = 0.390mW/g

4.30 UMTS FDD II-BodyWorn-WCDMA-Mid-P4

Date/Time: 2009-5-25 17:31:33

Test Laboratory: SGS-GSM

UMTS FDD II-Body-Worn-WCDMA-Mid-P4

DUT: KZ014AT01-P3&P4; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band II ; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3

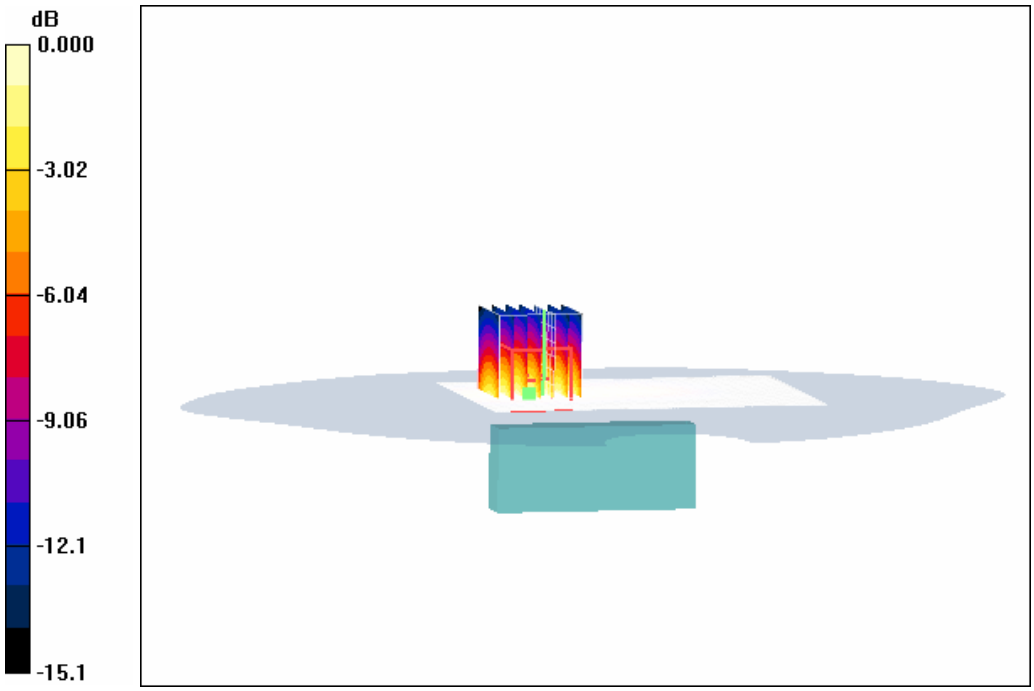
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P4/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.599 mW/g

Body Worn - Middle P4/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 15.2 V/m; Power Drift = 0.006 dB
Peak SAR (extrapolated) = 0.905 W/kg
SAR(1 g) = 0.532 mW/g; SAR(10 g) = 0.302 mW/g
Maximum value of SAR (measured) = 0.578 mW/g



0 dB = 0.578mW/g

4.31 UMTS FDD II-BodyWorn-WCDMA-Mid-P5

Date/Time: 2009-5-25 18:09:08

Test Laboratory: SGS-GSM

UMTS FDD II-Body-Worn-WCDMA-Mid-P5

DUT: KZ014AT01-P5; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band II ; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3

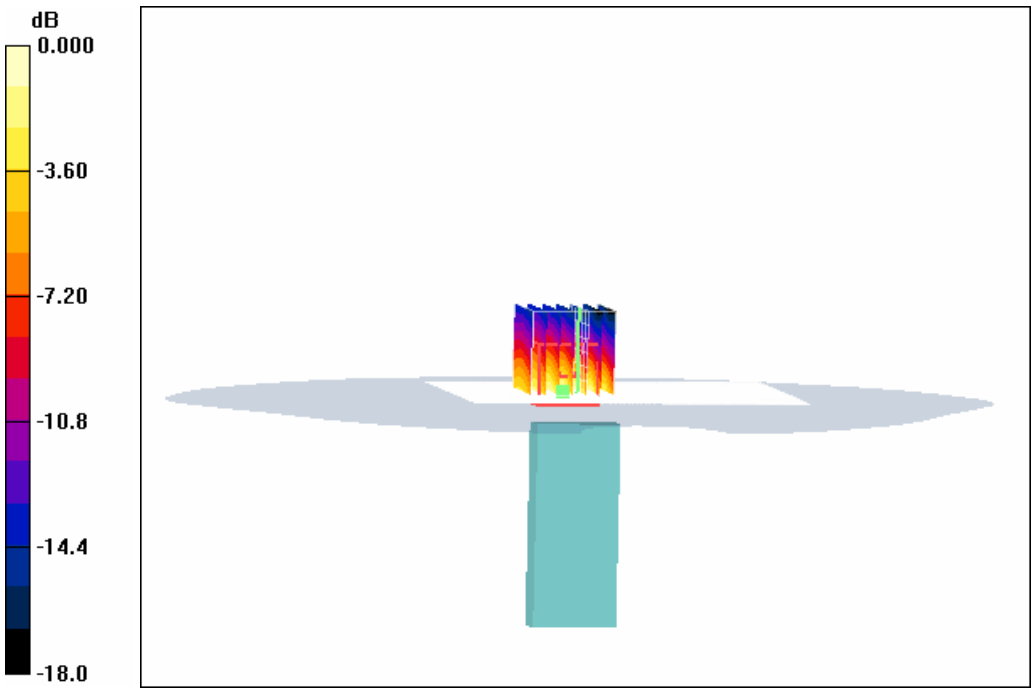
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P5/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.206 mW/g

Body Worn - Middle P5/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 10.5 V/m; Power Drift = 0.069 dB
Peak SAR (extrapolated) = 0.403 W/kg
SAR(1 g) = 0.194 mW/g; SAR(10 g) = 0.098 mW/g
Maximum value of SAR (measured) = 0.223 mW/g



0 dB = 0.223mW/g

4.32 UMTS FDD II-BodyWorn-WCDMA-Low-P2

Date/Time: 2009-5-22 16:21:58

Test Laboratory: SGS-GSM

UMTS FDD II-Body-Worn-WCDMA-Low-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band II ; Frequency: 1852.5 MHz;Duty Cycle: 1:1

Medium: HSL 1900 Body Medium parameters used (interpolated): f = 1852.5 MHz; σ = 1.48 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Low/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**

Maximum value of SAR (interpolated) = 0.761 mW/g

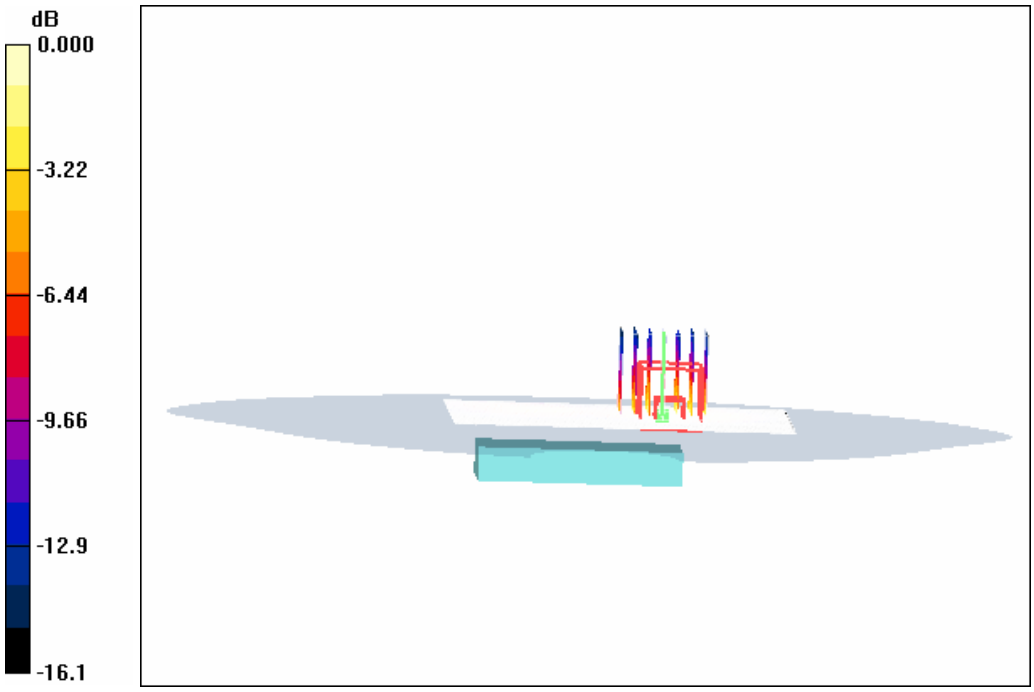
Body Worn - Low/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 6.61 V/m; Power Drift = 0.148 dB

Peak SAR (extrapolated) = 1.35 W/kg

SAR(1 g) = 0.710 mW/g; SAR(10 g) = 0.375 mW/g

Maximum value of SAR (measured) = 0.790 mW/g



0 dB = 0.790mW/g

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4.33 UMTS FDD II-BodyWorn-WCDMA-High-P2

Date/Time: 2009-5-22 16:51:58

Test Laboratory: SGS-GSM

UMTS FDD II-Body-Worn-WCDMA-High-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band II ; Frequency: 1907.6 MHz;Duty Cycle: 1:1

Medium: HSL 1900 Body Medium parameters used: f = 1907.6 MHz; σ = 1.54 mho/m; ε_r = 52.7; ρ = 1000 kg/m^3

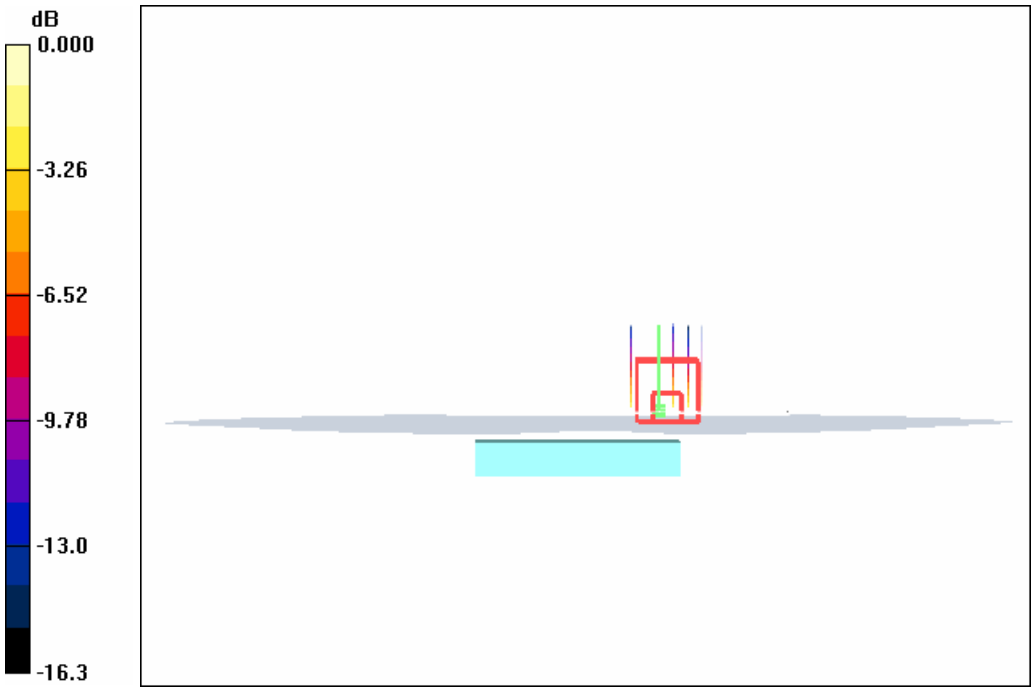
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - High/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.685 mW/g

Body Worn - High/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 6.85 V/m; Power Drift = -0.010 dB
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.610 mW/g; SAR(10 g) = 0.326 mW/g
Maximum value of SAR (measured) = 0.674 mW/g



0 dB = 0.674mW/g

4.34 UMTS FDD II-BodyWorn-WCDMA-Mid+SD-P2

Date/Time: 2009-5-25 9:47:39

Test Laboratory: SGS-GSM

UMTS FDD II-Body-Worn-WCDMA-Mid+SD-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band II ; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3

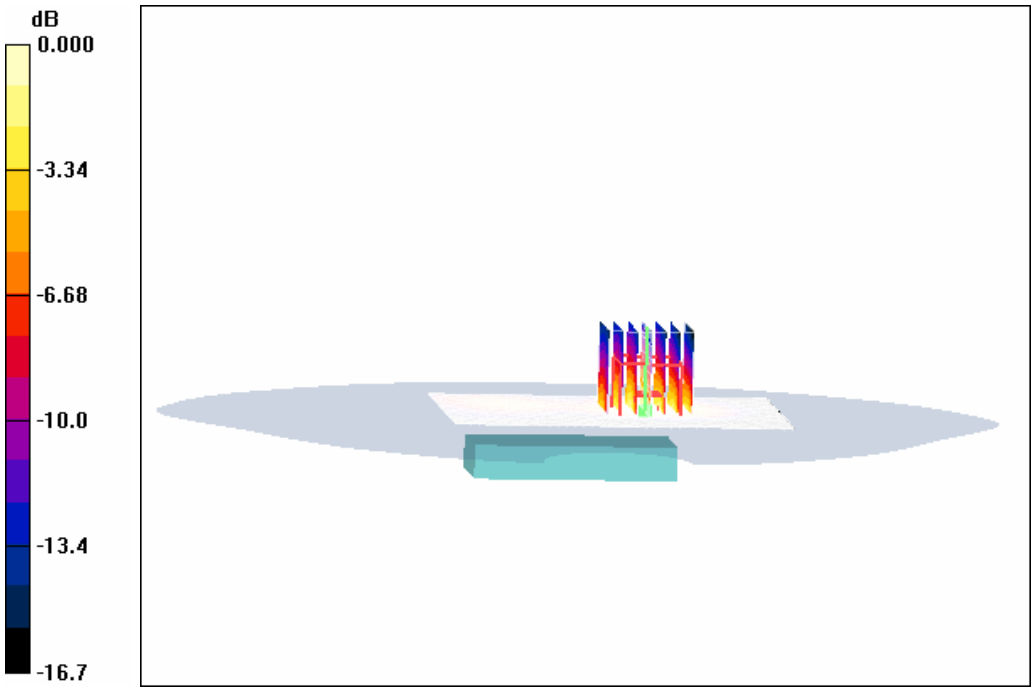
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2+SD/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 1.01 mW/g

Body Worn - Middle P2+SD/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 11.0 V/m; Power Drift = 0.314 dB
Peak SAR (extrapolated) = 1.72 W/kg
SAR(1 g) = 0.892 mW/g; SAR(10 g) = 0.475 mW/g
Maximum value of SAR (measured) = 1.03 mW/g



0 dB = 1.03mW/g

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4.35 UMTS FDD II-BodyWorn-HSPA-Mid-P2

Date/Time: 2009-5-25 10:29:27

Test Laboratory: SGS-GSM

UMTS FDD II-Body-Worn-HSPA-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band II HSPA; Frequency: 1880 MHz;Duty Cycle: 1:1

Medium: HSL 1900 Body Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**

Maximum value of SAR (interpolated) = 0.783 mW/g

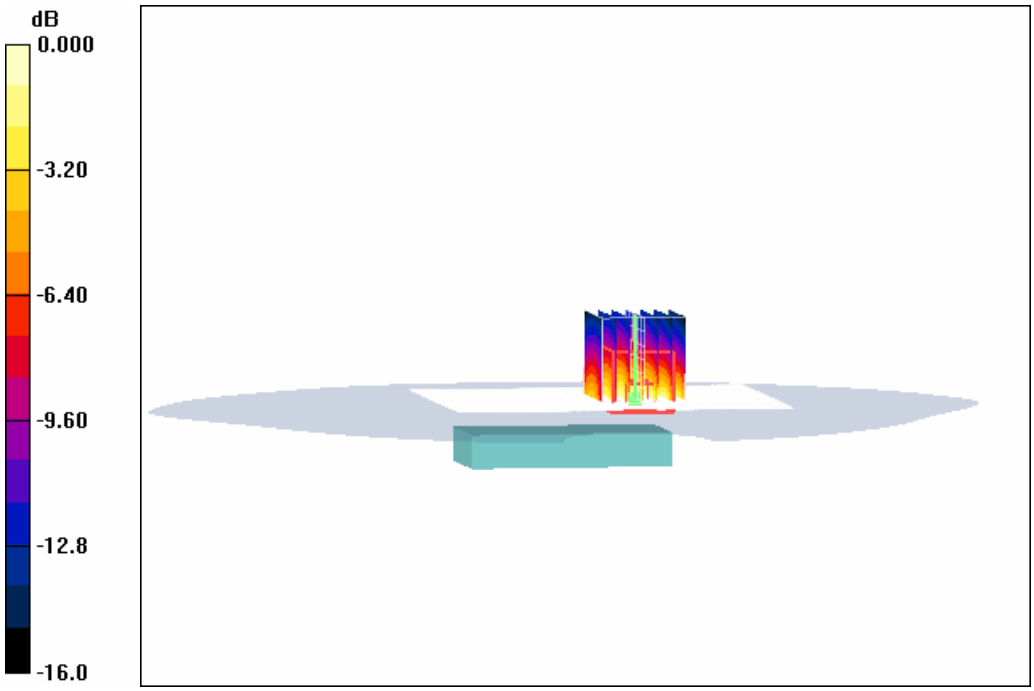
Body Worn - Middle P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 10.7 V/m; Power Drift = 0.265 dB

Peak SAR (extrapolated) = 1.31 W/kg

SAR(1 g) = 0.683 mW/g; SAR(10 g) = 0.364 mW/g

Maximum value of SAR (measured) = 0.770 mW/g



0 dB = 0.770mW/g

4.36 UMTS FDD V-BodyWorn-WCDMA-Mid-P1

Date/Time: 2009-5-27 21:55:52

Test Laboratory: SGS-GSM

UMTS FDD V-Body-Worn-WCDMA-Mid-P1

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band V ; Frequency: 836.4 MHz;Duty Cycle: 1:1

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

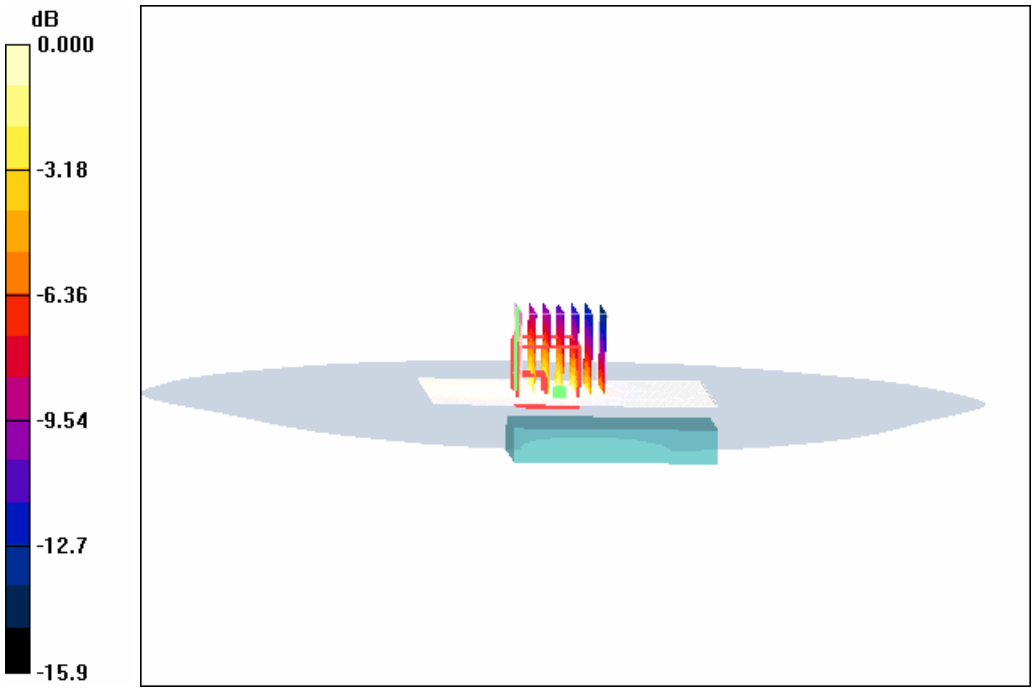
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P5/Area Scan (61x101x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.182 mW/g

Body Worn - Middle P5/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 13.1 V/m; Power Drift = 0.119 dB
Peak SAR (extrapolated) = 0.283 W/kg
SAR(1 g) = 0.159 mW/g; SAR(10 g) = 0.100 mW/g
Maximum value of SAR (measured) = 0.173 mW/g



0 dB = 0.173mW/g

4.37 UMTS FDD V-BodyWorn-WCDMA-Mid-P2

Date/Time: 2009-5-26 10:51:59

Test Laboratory: SGS-GSM

UMTS FDD V-Body-Worn-WCDMA-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band V ; Frequency: 836.4 MHz;Duty Cycle: 1:1

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**

Maximum value of SAR (interpolated) = 0.565 mW/g

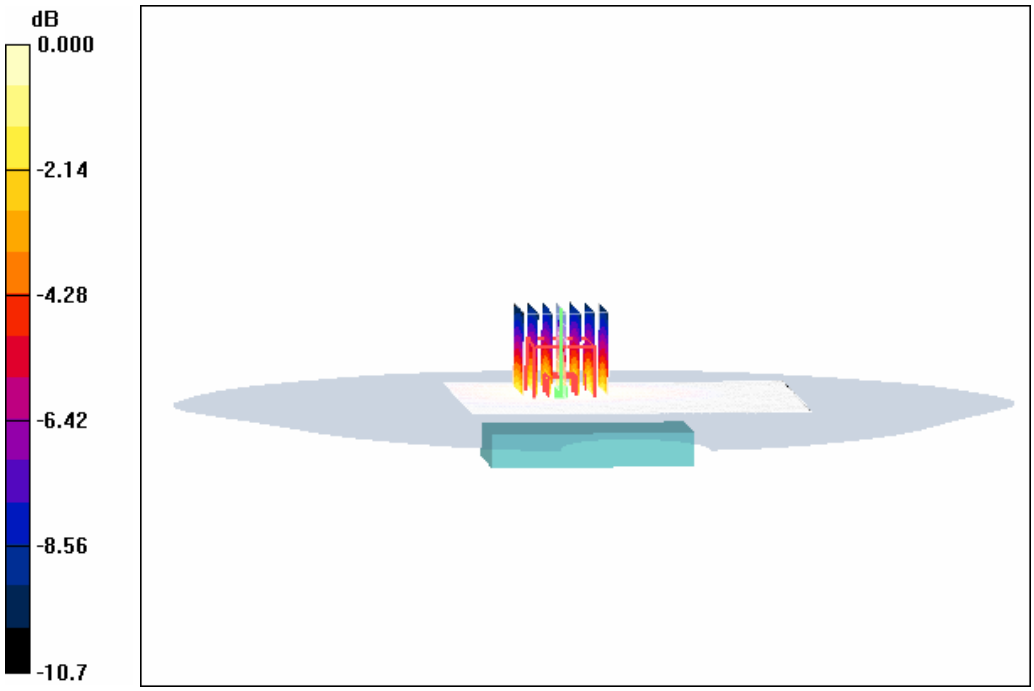
Body Worn - Middle P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 16.7 V/m; Power Drift = 0.130 dB

Peak SAR (extrapolated) = 0.797 W/kg

SAR(1 g) = 0.524 mW/g; SAR(10 g) = 0.337 mW/g

Maximum value of SAR (measured) = 0.570 mW/g



0 dB = 0.570mW/g

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4.38 UMTS FDD V-BodyWorn-WCDMA-Mid-P3

Date/Time: 2009-5-27 19:22:27

Test Laboratory: SGS-GSM

UMTS FDD V-Body-Worn-WCDMA-Mid-P3

DUT: KZ014AT01-P3&P4; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band V ; Frequency: 836.4 MHz;Duty Cycle: 1:1

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P3/Area Scan (61x101x1): **Measurement grid: dx=10mm, dy=10mm**

Maximum value of SAR (interpolated) = 0.132 mW/g

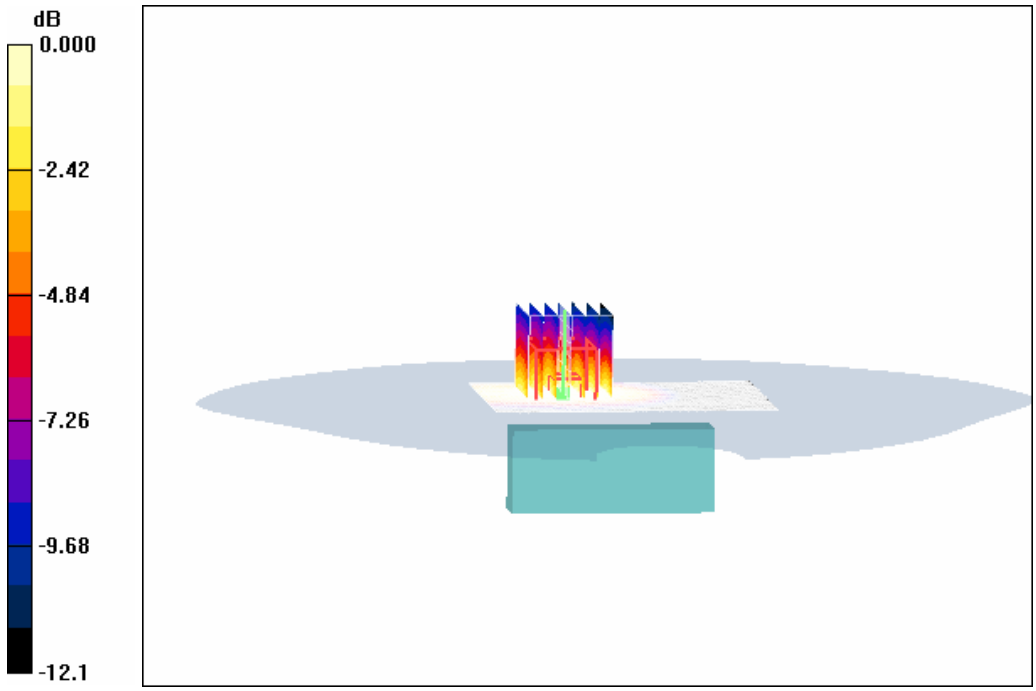
Body Worn - Middle P3/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 9.72 V/m; Power Drift = 0.236 dB

Peak SAR (extrapolated) = 0.187 W/kg

SAR(1 g) = 0.118 mW/g; SAR(10 g) = 0.076 mW/g

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



0 dB = 0.128mW/g

4.39 UMTS FDD V-BodyWorn-WCDMA-Mid-P4

Date/Time: 2009-5-27 20:36:43

Test Laboratory: SGS-GSM

UMTS FDD V-Body-Worn-WCDMA-Mid-P4

DUT: KZ014AT01-P3&P4; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band V ; Frequency: 836.4 MHz;Duty Cycle: 1:1

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P4/Area Scan (61x101x1): **Measurement grid: dx=10mm, dy=10mm**

Maximum value of SAR (interpolated) = 0.192 mW/g

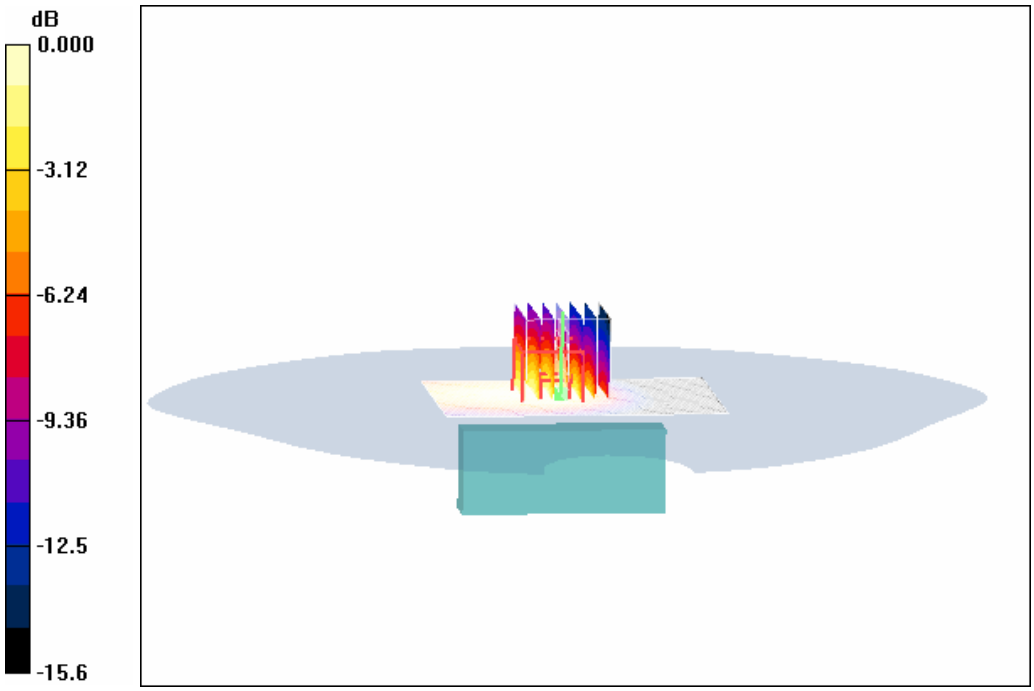
Body Worn - Middle P4/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**

Reference Value = 12.6 V/m; Power Drift = -0.015 dB

Peak SAR (extrapolated) = 0.321 W/kg

SAR(1 g) = 0.170 mW/g; SAR(10 g) = 0.102 mW/g

Maximum value of SAR (measured) = 0.186 mW/g



0 dB = 0.186mW/g

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4.40 UMTS FDD V-BodyWorn-WCDMA-Mid-P5

Date/Time: 2009-5-27 23:16:01

Test Laboratory: SGS-GSM

UMTS FDD V-Body-Worn-WCDMA-Mid-P5

DUT: KZ014AT01-P5; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band V ; Frequency: 836.4 MHz;Duty Cycle: 1:1

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

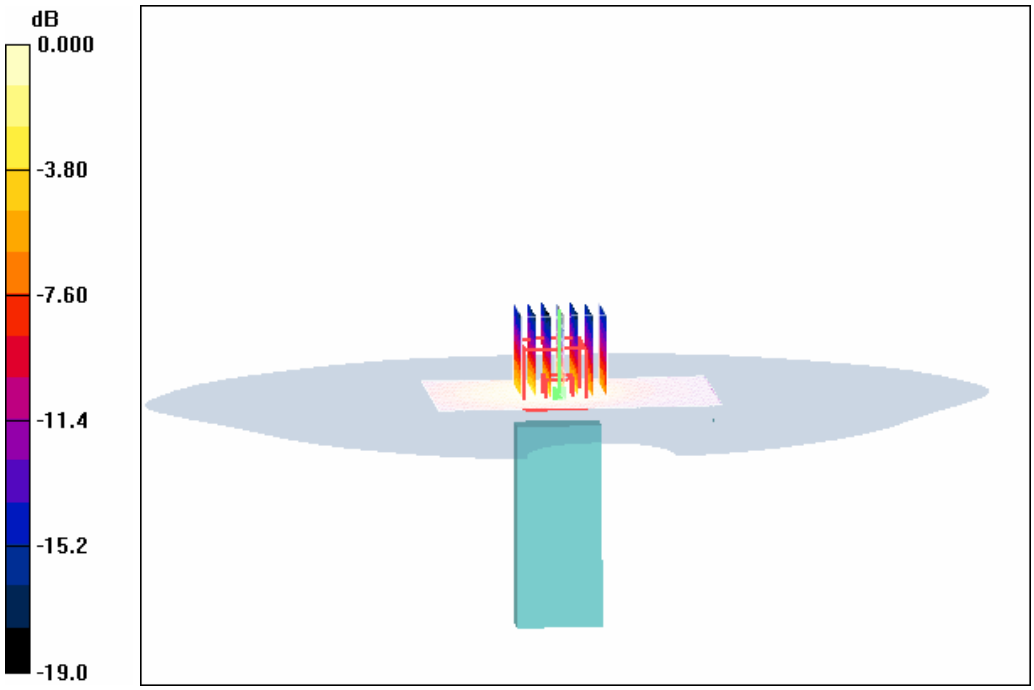
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P5/Area Scan (61x101x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.060 mW/g

Body Worn - Middle P5/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 7.39 V/m; Power Drift = 0.118 dB
Peak SAR (extrapolated) = 0.190 W/kg
SAR(1 g) = 0.060 mW/g; SAR(10 g) = 0.026 mW/g
Maximum value of SAR (measured) = 0.069 mW/g



0 dB = 0.069mW/g

4.41 UMTS FDD V-BodyWorn-WCDMA-Mid+SD-P2

Date/Time: 2009-5-26 11:22:46

Test Laboratory: SGS-GSM

UMTS FDD V-Body-Worn-WCDMA-Mid+SD-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band V ; Frequency: 836.4 MHz;Duty Cycle: 1:1

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

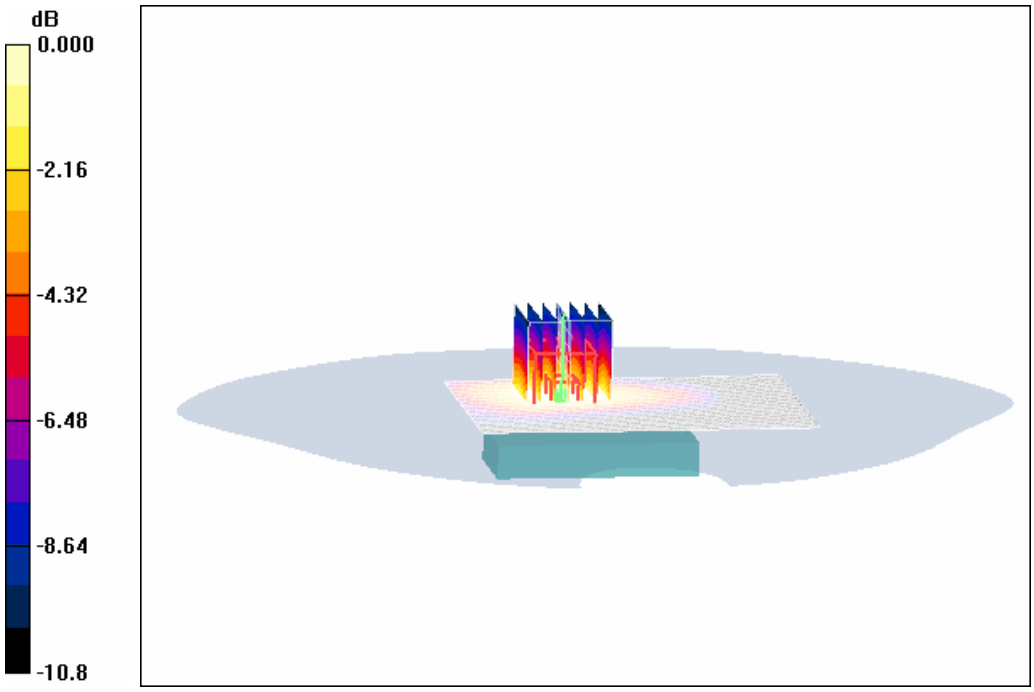
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2 +SD/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.602 mW/g

Body Worn - Middle P2 +SD/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 17.0 V/m; Power Drift = 0.098 dB
Peak SAR (extrapolated) = 0.845 W/kg
SAR(1 g) = 0.555 mW/g; SAR(10 g) = 0.357 mW/g
Maximum value of SAR (measured) = 0.602 mW/g



0 dB = 0.602mW/g

4.42 UMTS FDD V-BodyWorn-HSPA-Mid-P2

Date/Time: 2009-5-26 11:51:36

Test Laboratory: SGS-GSM

UMTS FDD V-Body-Worn-HSPA-Mid-P2

DUT: KZ014AT01-P1&P2; Type: Body; Serial: 004401780160442

Communication System: WCDMA Band V HSPA; Frequency: 836.4 MHz;Duty Cycle: 1:1

Medium: HSL835 Body Medium parameters used: f = 836.4 MHz; σ = 0.968 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3

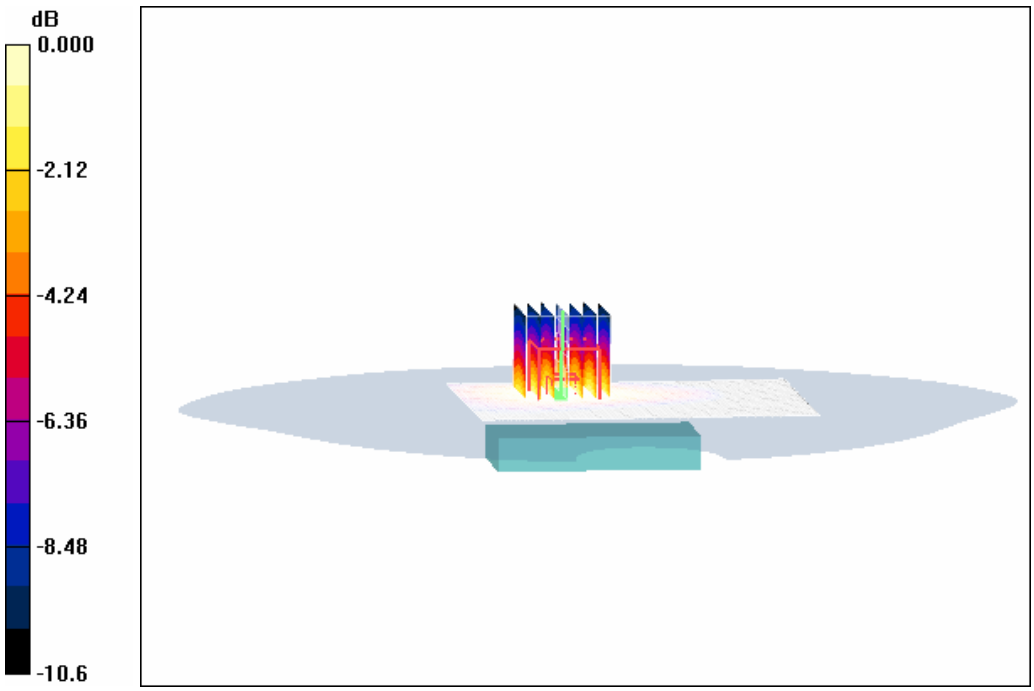
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle P2/Area Scan (81x121x1): **Measurement grid: dx=10mm, dy=10mm**
Maximum value of SAR (interpolated) = 0.550 mW/g

Body Worn - Middle P2/Zoom Scan (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 16.3 V/m; Power Drift = 0.089 dB
Peak SAR (extrapolated) = 0.782 W/kg
SAR(1 g) = 0.512 mW/g; SAR(10 g) = 0.328 mW/g
Maximum value of SAR (measured) = 0.555 mW/g



0 dB = 0.555mW/g

Annex A Photographs of Test Setup

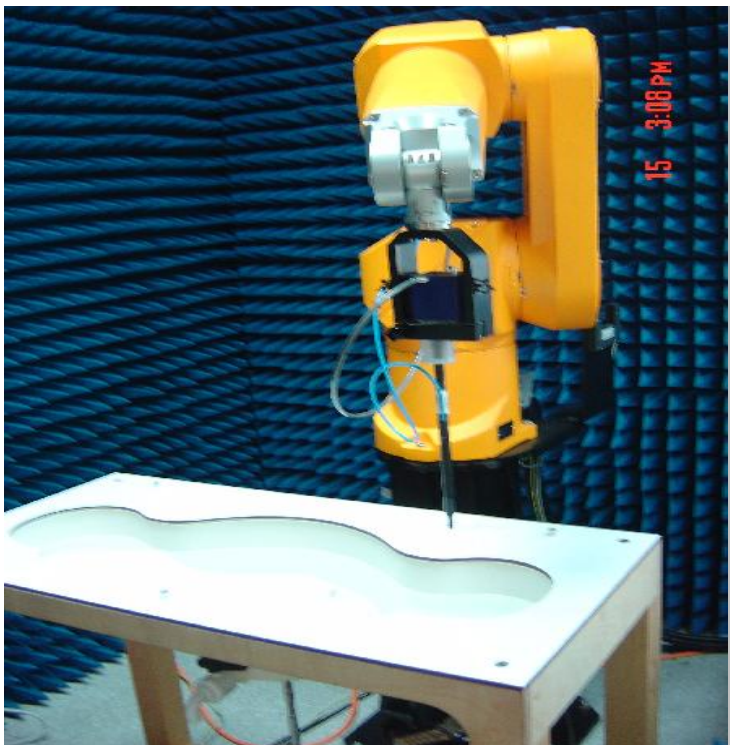


Fig.A-1 Photograph of the SAR measurement System

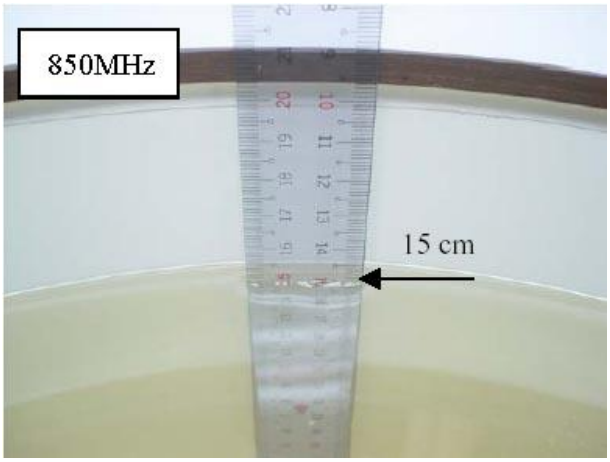


Fig.A-2 Photograph of the Tissue Equivalent Liquid depth 15cm for BodyWorn

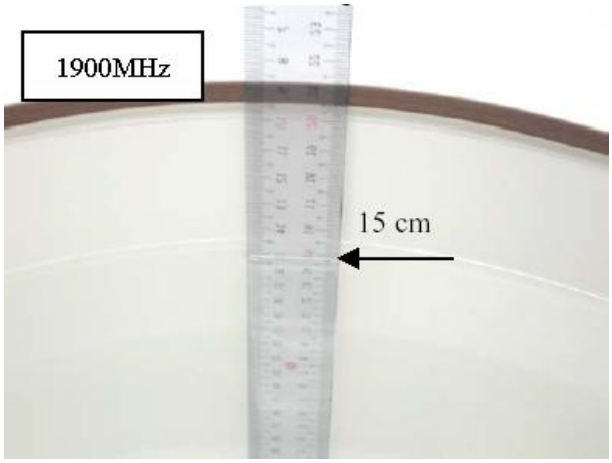


Fig.A-3 Photograph of the Tissue Equivalent Liquid depth 15cm for BodyWorn

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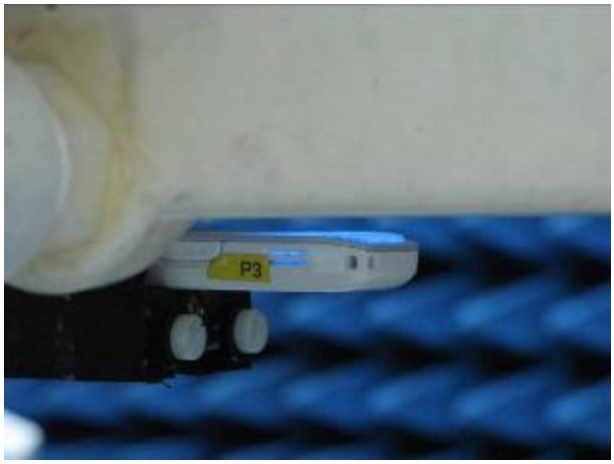

Fig.A-4a Photograph of the BodyWorn status P1

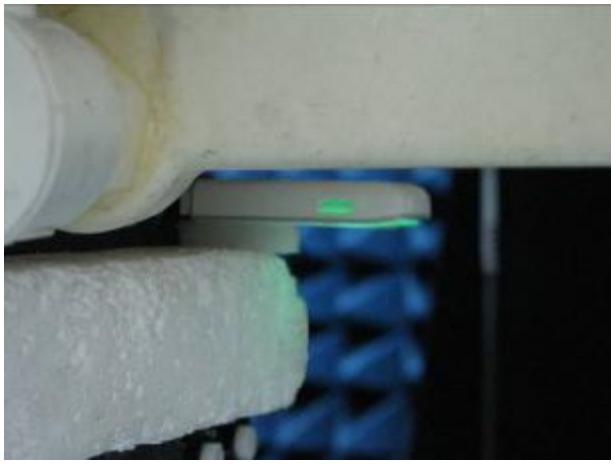

Fig.A-4b Photograph of the BodyWorn status P2

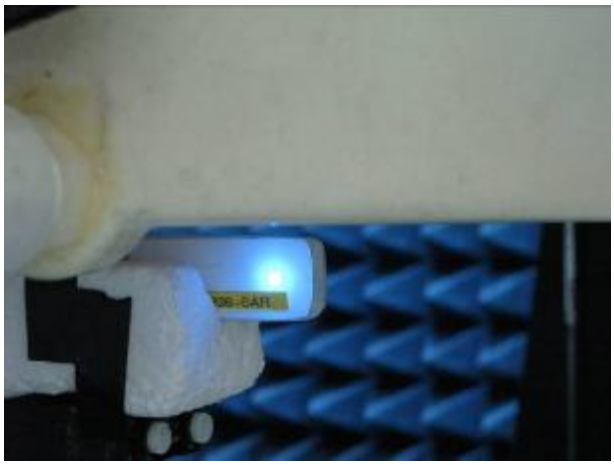

Fig.A-4c Photograph of the BodyWorn status P3

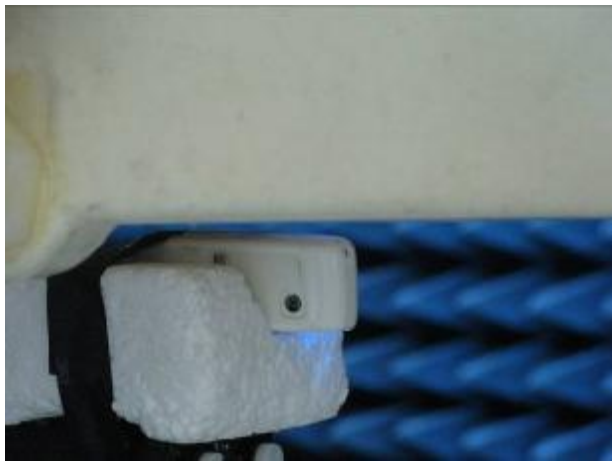

Fig.A-4d Photograph of the BodyWorn status P4

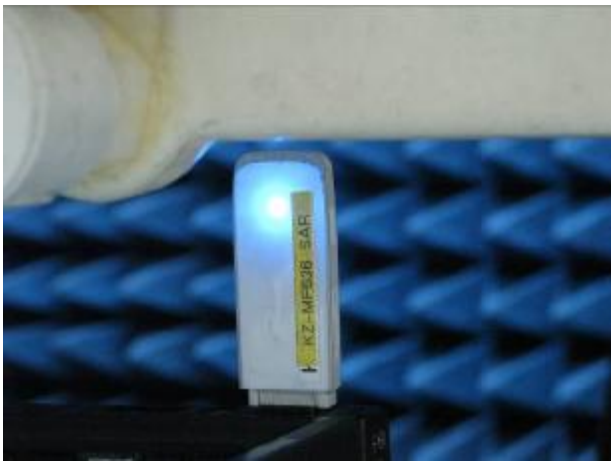

Fig.A-4e Photograph of the BodyWorn status P5

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Annex B Photographs of EUT

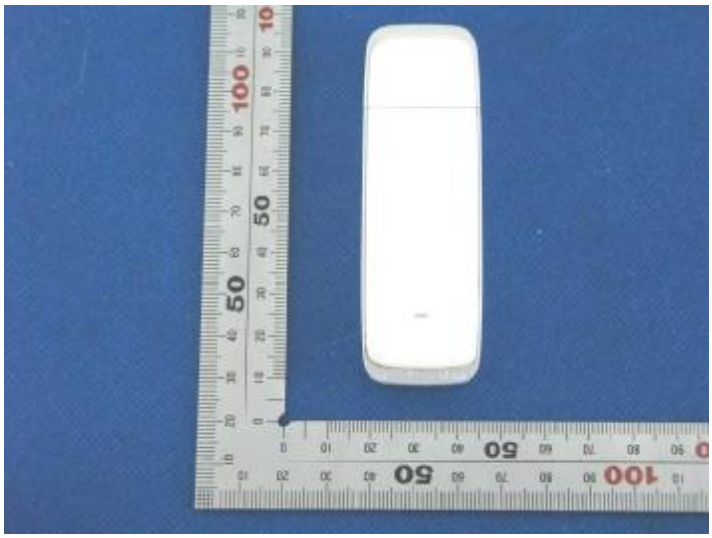

Fig.B-1 Front View

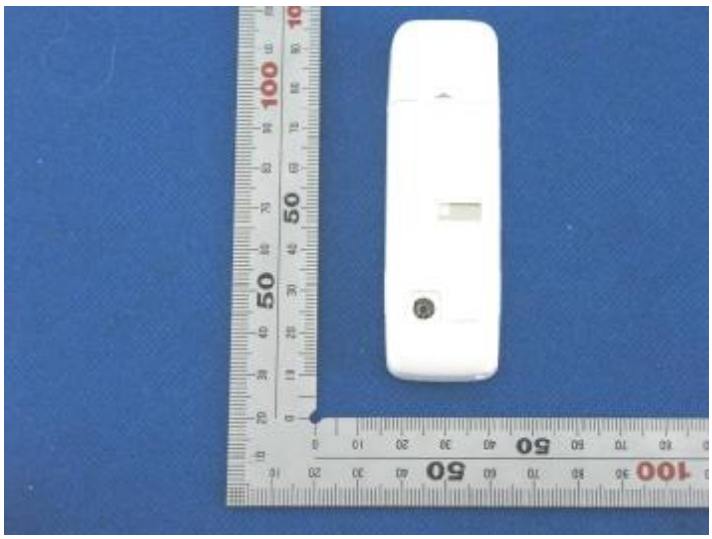

Fig.B-2 Back View

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Annex C SAR System Validation

The microwave circuit arrangement for system verification is sketched in Fig. C-1. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. These tests were done at 900&1800&2000MHz. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the table C-1 (A power level of 250mw was input to the dipole antenna). 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.

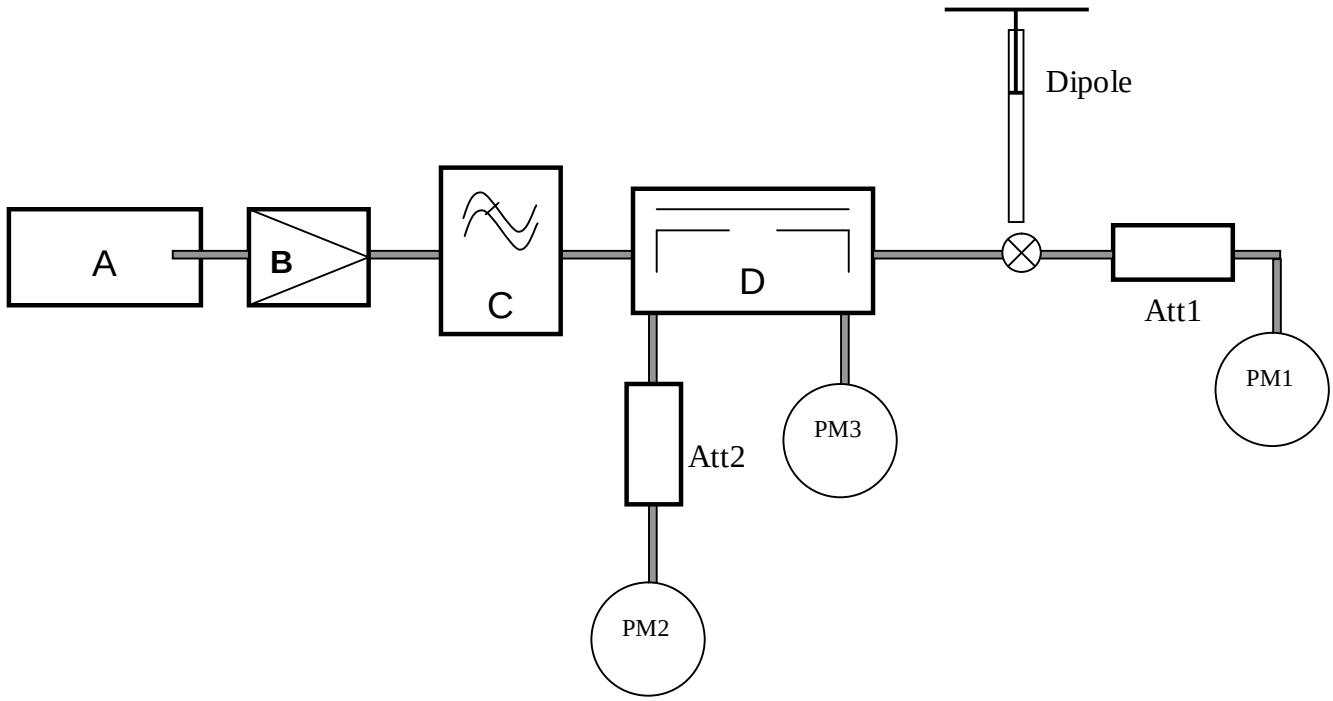

Fig. C-1 the microwave circuit arrangement used for SAR system verification

A. Agilent E4438C Signal Generator

B. Mini-Circuit ZHL-42 Preamplifier

C. Mini-Circuit VLF-2500+ Low Pass Filter

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D. Mini-Circuits ZABDC20-252H-N+ Bi-DIR Coupling

PM1. Power Sensor NRP-Z92

PM2. Agilent Model E4416A Power Meter

PM3. Power Sensor NRP-Z92

Validation Kit	Frequency (MHz)	Tissue Type	Limit/Measurement		
				1g	10g
D835V2	835	Body	**Recommended Limit**	**2.55±10%**	**1.68±10%**
			Measured, 2009-05-25	**2.54**	**1.67**
			Measured, 2009-05-27	**2.68**	**1.76**
D1900V2	1900	Body	**Recommended Limit**	**10.5±10%**	**5.57±10%**
			Measured, 2009-05-22	**10.7**	**5.62**
			Measured, 2009-05-25	**10.8**	**5.63**

Table C-1 SAR System Validation Result

Annex C.1 System Validation for 850MHz-BodyWorn-1

Date/Time: 2009-5-25 19:49:38

Test Laboratory: SGS-GSM

System-Validation-D835-Body-0525

DUT: Dipole 835MHz; Type: D835V2; Serial: D835V2 - SN:4d070

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium: HSL835 Body Medium parameters used: f = 835 MHz; σ = 0.966 mho/m; ε_r = 56.7; ρ = 1000 kg/m^3

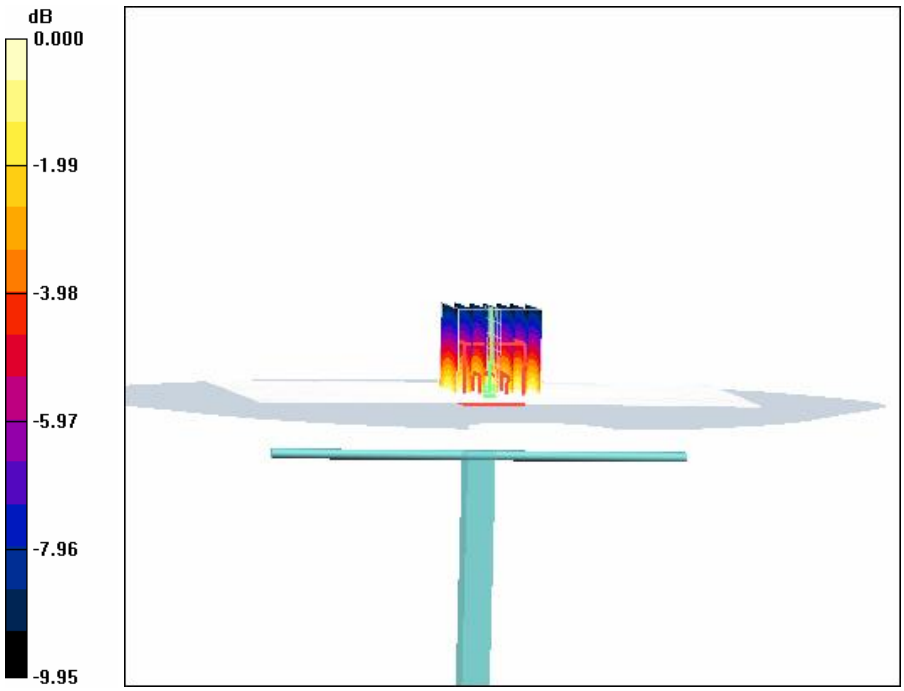
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

d=15mm, Pin=250mW/Area Scan (61x121x1): **Measurement grid: dx=15mm, dy=15mm**
Maximum value of SAR (interpolated) = 2.74 mW/g

d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 51.8 V/m; Power Drift = -0.046 dB
Peak SAR (extrapolated) = 3.77 W/kg
SAR(1 g) = 2.54 mW/g; SAR(10 g) = 1.67 mW/g
Maximum value of SAR (measured) = 2.74 mW/g



0 dB = 2.74mW/g

Annex C.2 System Validation for 850MHz-BodyWorn-2

Date/Time: 2009-5-27 17:58:12

Test Laboratory: SGS-GSM

System-Validation-D835-Body

DUT: Dipole 835MHz; Type: D835V2; Serial: D835V2 - SN:4d070

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1

Medium: HSL835 Body Medium parameters used: f = 835 MHz; σ = 0.967 mho/m; ε_r = 56.7; ρ = 1000 kg/m^3

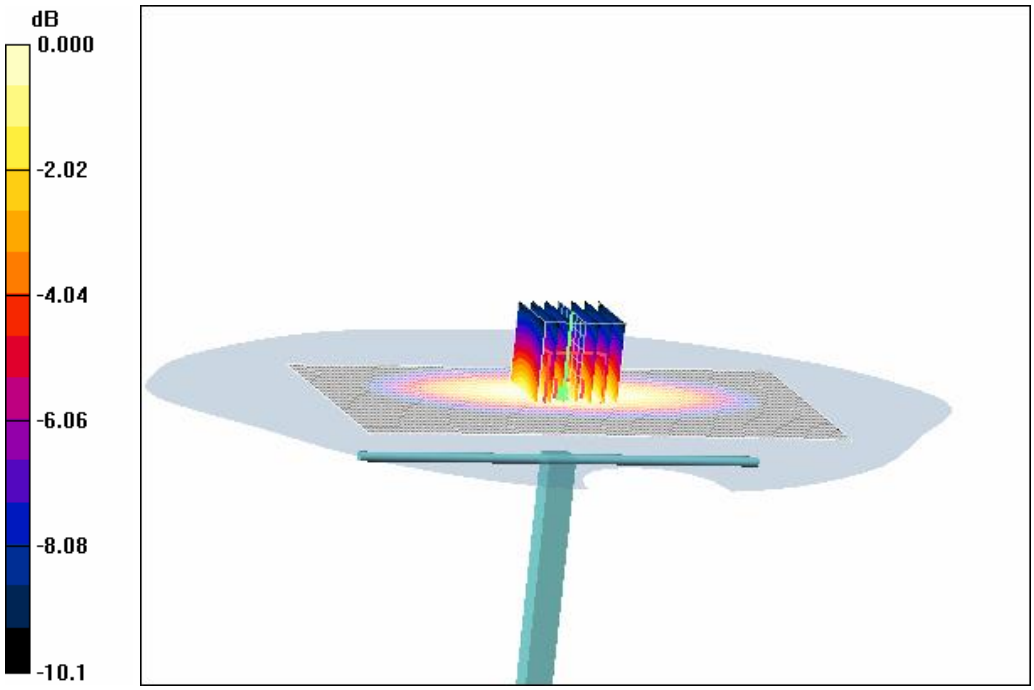
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(5.67, 5.67, 5.67); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

d=15mm, Pin=250mW/Area Scan (61x121x1): **Measurement grid: dx=15mm, dy=15mm**
Maximum value of SAR (interpolated) = 2.87 mW/g

d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 52.6 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 3.97 W/kg
SAR(1 g) = 2.68 mW/g; SAR(10 g) = 1.76 mW/g
Maximum value of SAR (measured) = 2.89 mW/g



0 dB = 2.89mW/g

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Annex C.3 System Validation for 1900MHz-BodyWorn-1

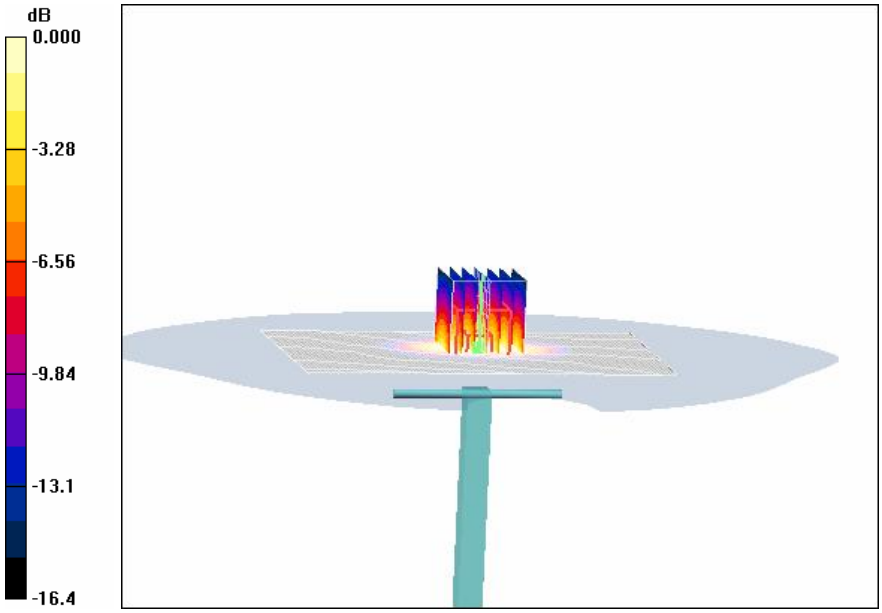
Date/Time: 2009-5-22 8:41:13

Test Laboratory: SGS-GSM
System-Validation-D1900-Body
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d028
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL 1900 Body Medium parameters used: f = 1900 MHz; σ = 1.53 mho/m; ε_r = 52.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

d=10mm, Pin=250mW/Area Scan (61x101x1): **Measurement grid: dx=15mm, dy=15mm**
Maximum value of SAR (interpolated) = 12.9 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 83.4 V/m; Power Drift = -0.159 dB
Peak SAR (extrapolated) = 19.2 W/kg
SAR(1 g) = 10.7 mW/g; SAR(10 g) = 5.62 mW/g
Maximum value of SAR (measured) = 12.1 mW/g



0 dB = 12.1mW/g

Annex C.4 System Validation for 1900MHz-BodyWorn-2

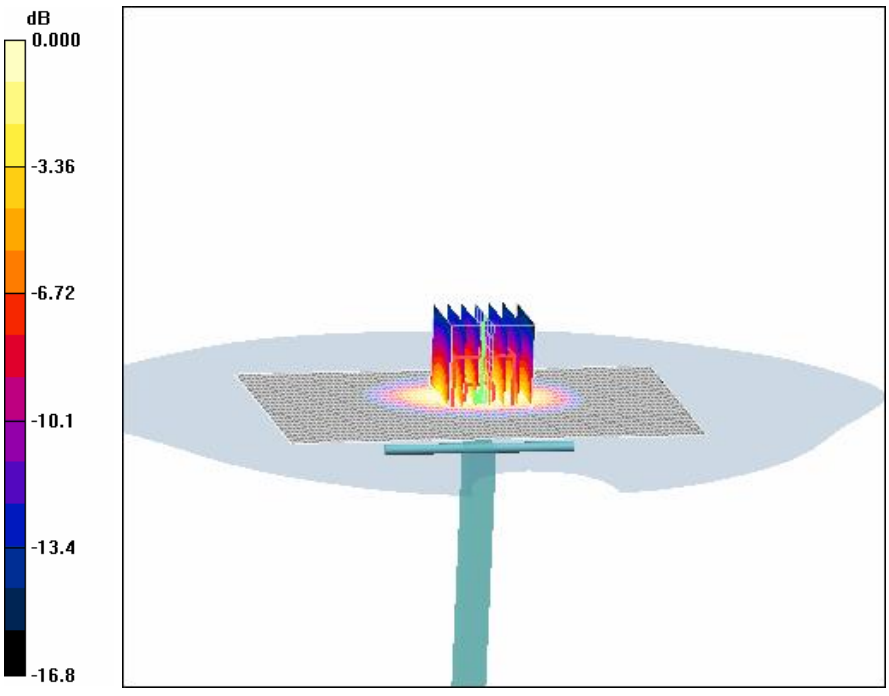
Date/Time: 2009-5-25 9:12:44

Test Laboratory: SGS-GSM
System-Validation-D1900-Body
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d028
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL 1900 Body Medium parameters used: f = 1900 MHz; σ = 1.54 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.51, 4.51, 4.51); Calibrated: 2008-12-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2008-12-18
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

d=10mm, Pin=250mW/Area Scan (61x101x1): **Measurement grid: dx=15mm, dy=15mm**
Maximum value of SAR (interpolated) = 12.8 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: **Measurement grid: dx=5mm, dy=5mm, dz=5mm**
Reference Value = 82.7 V/m; Power Drift = -0.048 dB
Peak SAR (extrapolated) = 19.5 W/kg
SAR(1 g) = 10.8 mW/g; SAR(10 g) = 5.63 mW/g
Maximum value of SAR (measured) = 12.2 mW/g



0 dB = 12.2mW/g

Annex D Description of Test Position

Annex D.1 SAM Phantom Shape

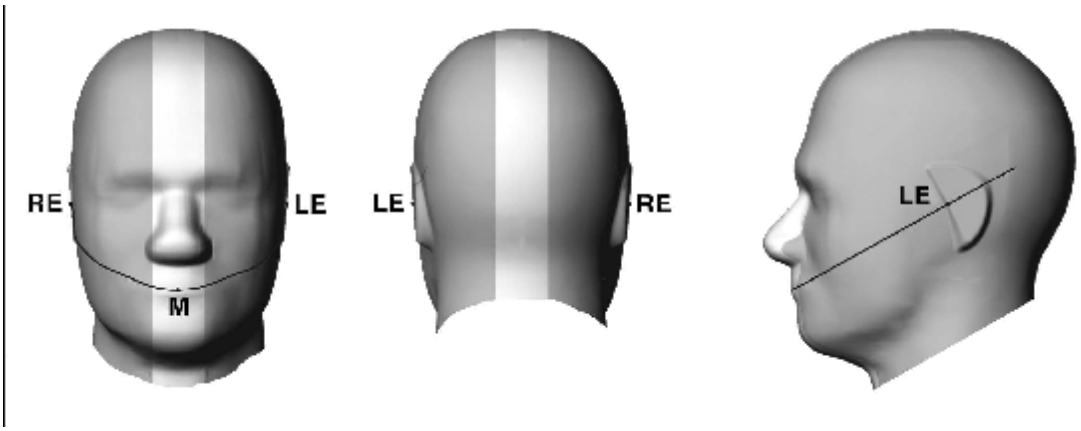


Figure D-1 front, back, and side views of SAM (model for the phantom shell). Full-head model is for illustration purposes only-procedures in this recommended practice are intended primarily for the phantom setup of Figure D-2. Note: The center strip including the nose region has a different thickness tolerance.

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

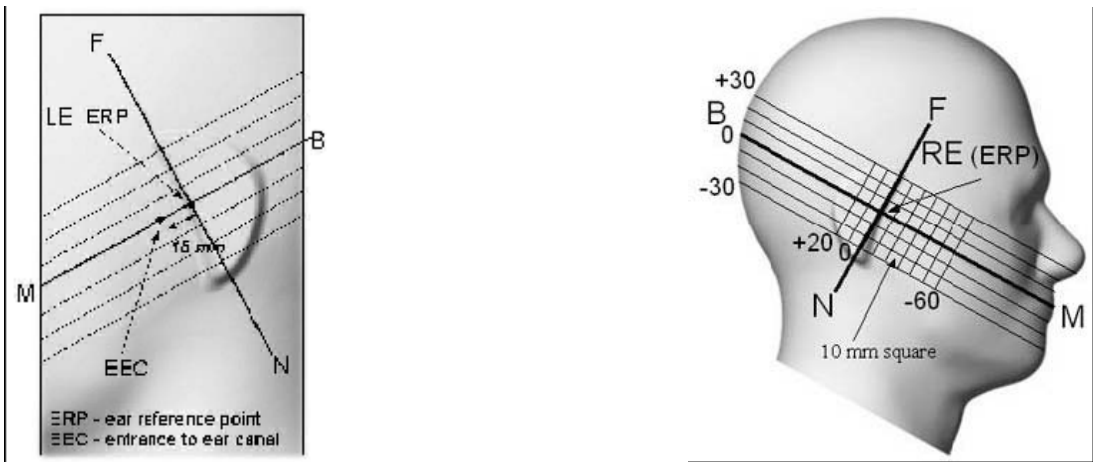


Figure D-3 Close-up side view of phantom showing the ear region, N-F and B-M lines, and seven cross-sectional plane locations

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

Annex D.2 EUT constructions

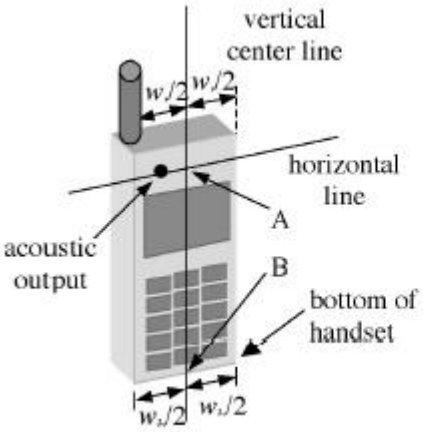


Figure D-5a Handset vertical and horizontal reference lines-"fixed case"

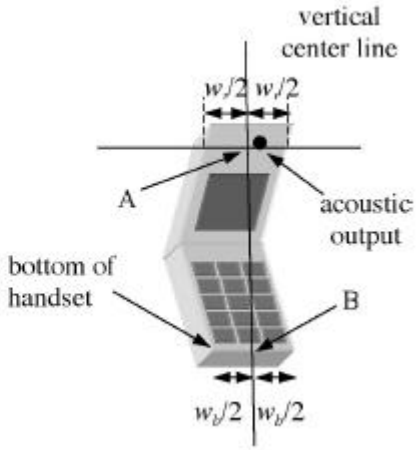


Figure D-5b Handset vertical and horizontal reference lines-"clam-shell case"

Annex D.3 Definition of the "cheek" position

a) Position the device with the vertical centre line of the body of the device and the horizontal line crossing the centre of the ear piece in a plane parallel to the sagittal plane of the phantom ("initial position" see Figure 1-7). While maintaining the device in this plane, align the vertical centre line with the reference plane containing the three ear and mouth reference points (M, RE and LE) and align the centre of the ear piece with the line RE-LE;

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

Annex D.4 Definition of the "tilted" position

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

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

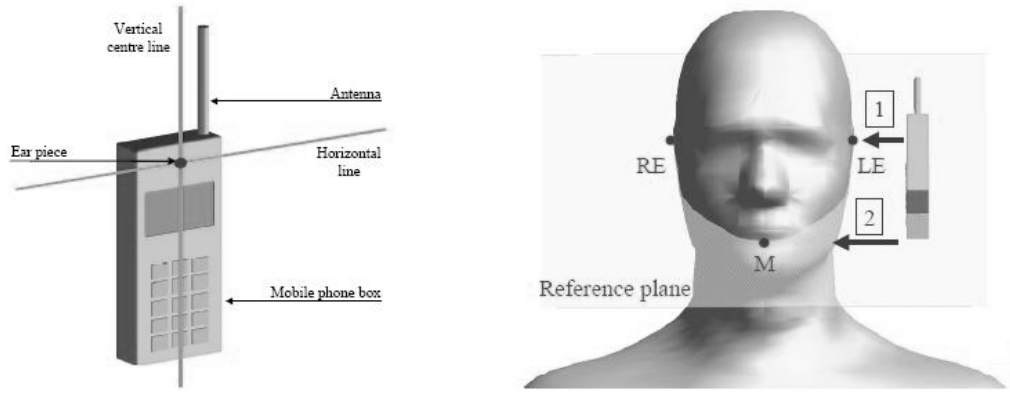


Figure D-6 Definition of the reference lines and points, on the phone and on the phantom and initial position

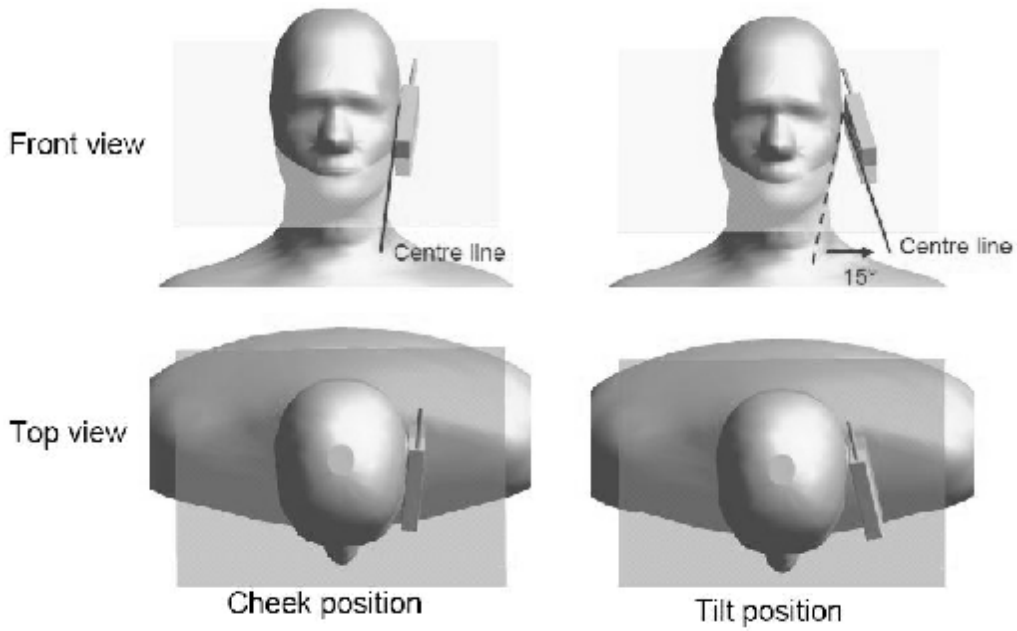


Figure D-7 "Cheek" and "tilt" positions of the mobile phone on the left side

Annex E Tissue Equivalent Liquid

Annex E.1 Recipes for Tissue Equivalent Liquid

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

Frequency (MHz)	835		900		1800-2000		2450	
Tissue Type	Head	Body	Head	Body	Head	Body	Head	Body

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Ingredient (% by weight)								
Water	40.30	50.75	40.30	50.75	55.24	70.17	55.00	68.64
Salt (NaCl)	1.38	0.94	1.38	0.94	0.31	0.39	0	0
Sucrose	57.90	48.21	57.90	48.21	0	0	0	0
HEC	0.24	0	0.24	0	0	0	0	0
Bactericide	0.18	0.10	0.10	0.10	0	0	0	0
DGBE	0	0	0	0	44.45	29.44	45.00	31.37
Measurement dielectric parameters								
Dielectric Constant	41.9	55.0	41.1	54.5	39.2	53.2	38.9	53.0
Conductivity (S/m)	0.93	0.97	1.04	1.06	1.45	1.59	1.82	1.93
Target values								
Dielectric Constant	41.5	55.2	41.5	55.0	40.0	53.3	39.2	52.7
Conductivity (S/m)	0.90	0.97	0.97	1.05	1.40	1.52	1.80	1.95
Salt: 99^{+}% Pure Sodium Chloride					Sucrose: 98^{+}% Pure Sucrose			
Water: De-ionized, 16 MΩ^{+} resistivity					HEC: Hydroxyethyl Cellulose			
DGBE: 99^{+}% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]								

Table E-1 Recipe of Tissue Equivalent Liquid

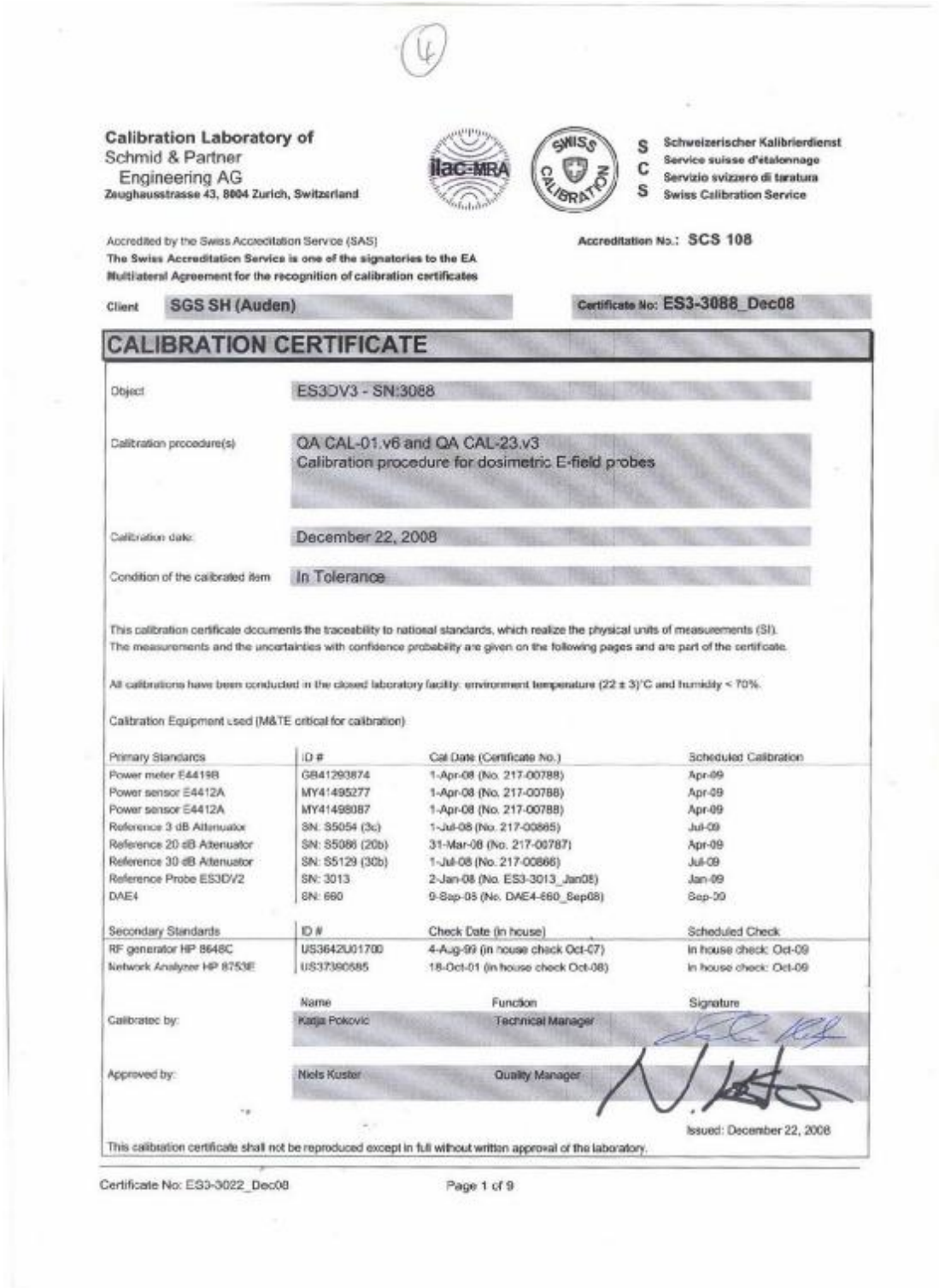
Annex E.2 Measurement for Tissue Equivalent Liquid

The dielectric properties for this Tissue Equivalent Liquids were measured by using the Agilent Model 85070D Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjunction with Agilent E5071B Network Analyzer (300 KHz-8500 MHz). The Conductivity (σ) and Permittivity (ρ) are listed in Table 1.For the SAR measurement given in this report. The temperature variation of the Tissue Equivalent Liquids was 22±2°C.

Frequency (MHz)	Tissue Type	Limit/Measured	Permittivity (ρ)	Conductivity (σ)	Temp (°C)
835	Body	**Recommended Limit**	**55.2±5%**	**0.97±5%**	**22±2**
		Measured, 2009-05-25	56.7	0.966	22.0
		Measured, 2009-05-27	56.7	0.967	21.9
1900	Body	**Recommended Limit**	**53.3±5%**	**1.52±5%**	**22±2**
		Measured, 2009-05-22	52.7	1.53	21.9
		Measured, 2009-05-25	52.3	1.54	21.8

Table E-2 Measurement result of Tissue electric parameters

Annex F Probe Calibration certificate



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Accreditation No.: SCS 108

Client SGS SH (Auden)

Certificate No: ES3-3088_Dec08

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3088
Calibration procedure(s)	QA CAL-01.v6 and QA CAL-23.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	December 22, 2008
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	1-Jul-08 (No. 217-00865)	Jul-09
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	1-Jul-08 (No. 217-00866)	Jul-09
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 660	9-Sep-08 (No. DAE4-660_Sep08)	Sep-09

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

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

Issued: December 22, 2008

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

Certificate No: ES3-3022_Dec08 Page 1 of 9

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S Swiss Calibration Service

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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
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,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., ϑ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,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*.
- *DCPx,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 ≤ 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 *NORMx,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.

Probe ES3DV3

SN:3088

Manufactured:	July 20, 2005
Last calibrated:	January 18, 2008
Recalibrated:	December 22, 2008

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

ES3DV3 SN:3088 December 22, 2008

DASY - Parameters of Probe: ES3DV3 SN:3088

Sensitivity in Free Space[A]

Diode Compression[B]

NormX	1.33 ± 10.1%	μV/(V/m)²	DCP X	92 mV
NormY	1.28 ± 10.1%	μV/(V/m)²	DCP Y	90 mV
NormZ	1.26 ± 10.1%	μV/(V/m)²	DCP Z	96 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL **900 MHz** **Typical SAR gradient: 5 % per mm**

Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
SAR_{be} [%]	Without Correction Algorithm	8.6	4.6
SAR_{be} [%]	With Correction Algorithm	0.6	0.3

TSL **1810 MHz** **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		3.0 mm	4.0 mm
SAR_{be} [%]	Without Correction Algorithm	8.8	4.9
SAR_{be} [%]	With Correction Algorithm	0.8	0.5

Sensor Offset

Probe Tip to Sensor Center	2.0 mm

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

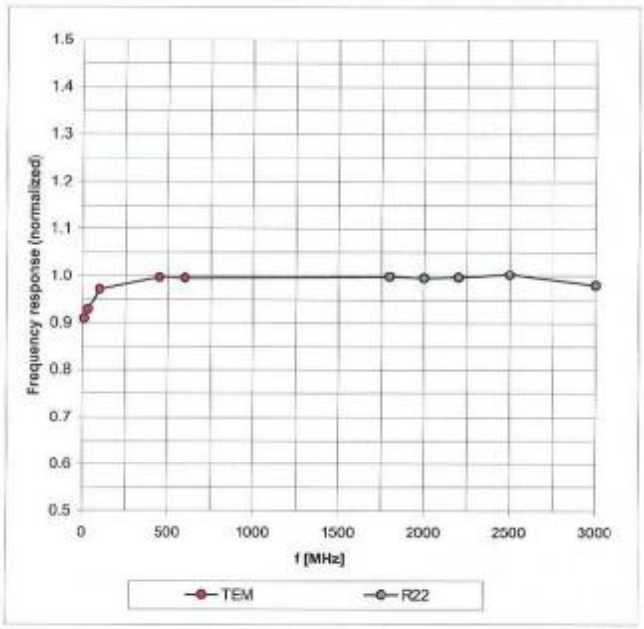
[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

ES3DV3 SN:3088 December 22, 2008

Frequency Response of E-Field

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

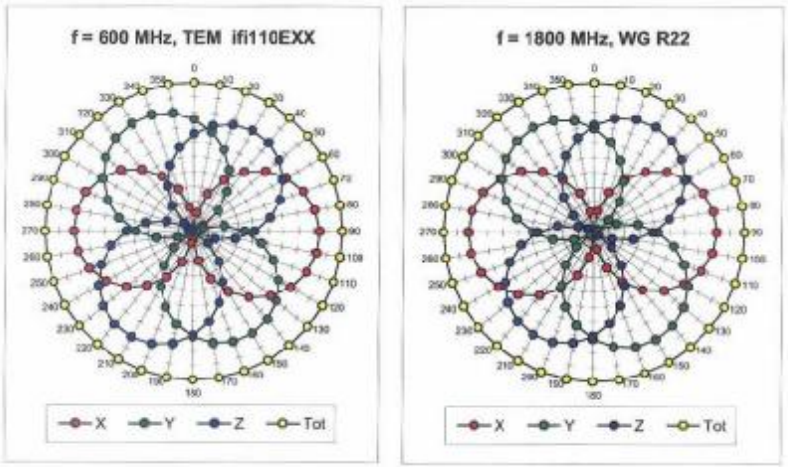


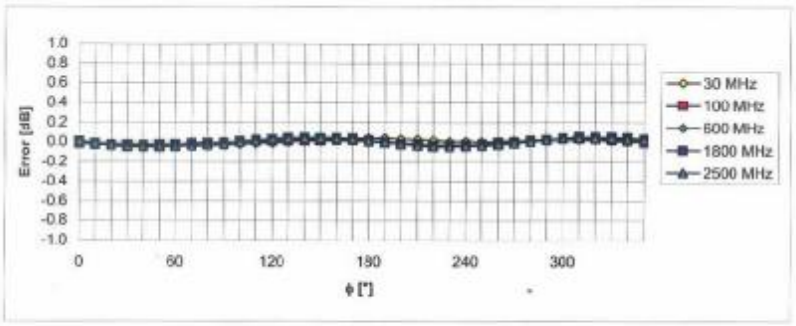
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Certificate No: ES3-3088_Dec08 Page 5 of 9

ES3DV3 SN:3088 December 22, 2008

Receiving Pattern (ϕ), ϑ = 0°





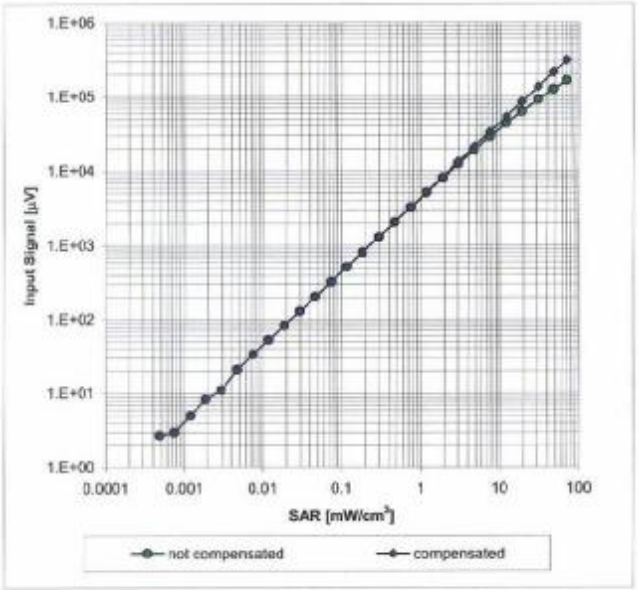
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

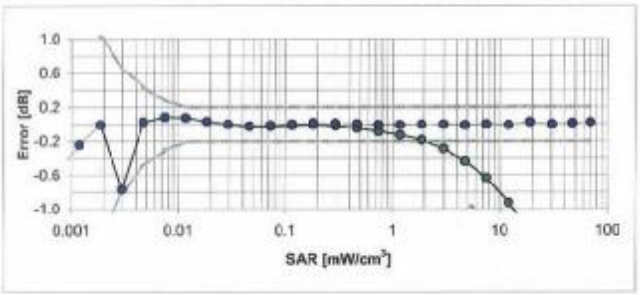
Certificate No: ES3-3088_Dec08 Page 6 of 9

ES3DV3 SN:3088 December 22, 2008

Dynamic Range f(SAR_{head})

(Waveguide R22, f = 1800 MHz)



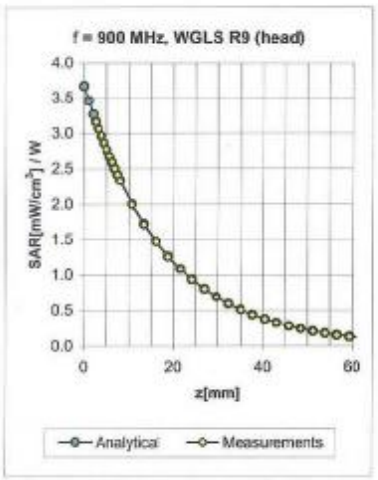


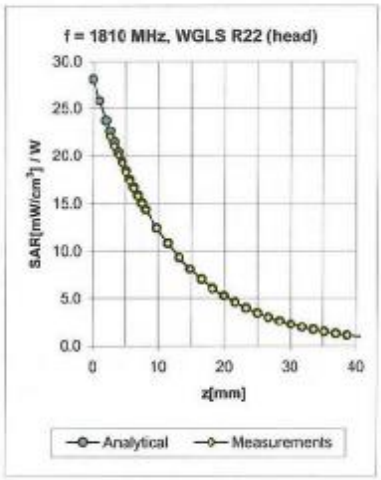
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Certificate No: ES3-3088_Dec08 Page 7 of 9

ES3DV3 SN:3088 December 22, 2008

Conversion Factor Assessment





f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.93	1.04	5.70 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.40	1.75	4.86 ± 11.0% (k=2)
1900	± 50 / ± 101	Head	40.0 ± 5%	1.40 ± 5%	0.45	1.68	4.84 ± 11.0% (k=2)
2450	± 50 / ± 106	Head	39.2 ± 5%	1.80 ± 5%	0.32	2.27	4.43 ± 11.0% (k=2)
900	± 50 / ± 114	Body	55.0 ± 5%	1.05 ± 5%	0.84	1.12	5.67 ± 11.0% (k=2)
1810	± 50 / ± 118	Body	53.3 ± 5%	1.52 ± 5%	0.42	1.64	4.69 ± 11.0% (k=2)
1900	± 50 / ± 119	Body	53.3 ± 5%	1.52 ± 5%	0.35	1.90	4.51 ± 11.0% (k=2)
2450	± 50 / ± 124	Body	52.7 ± 5%	1.95 ± 5%	0.78	1.35	4.04 ± 11.0% (k=2)

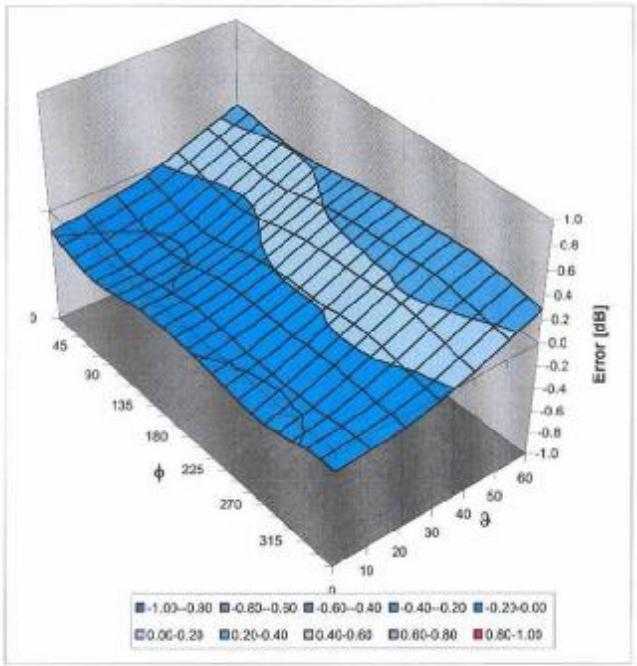
[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

Certificate No: ES3-3088_Dec08 Page 8 of 9

ES3DV3 SN:3088 December 22, 2008

Deviation from Isotropy in HSL

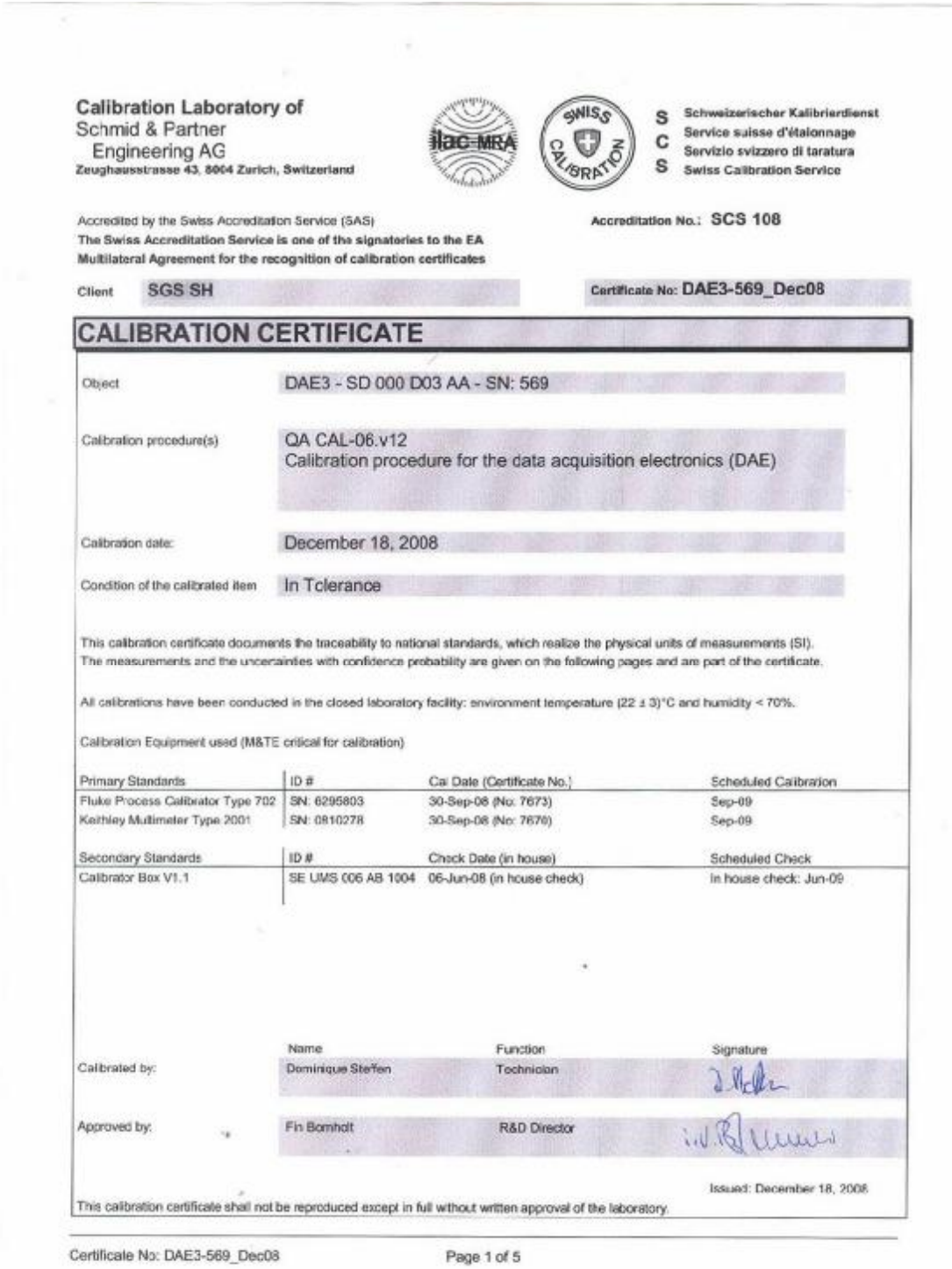
Error (ϕ, ϑ), f = 900 MHz



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

Certificate No: ES3-3088_Dec08 Page 9 of 9

Annex G DAE Calibration certification



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Accreditation No.: SCS 108

Client SGS SH

Certificate No: DAE3-569_Dec08

CALIBRATION CERTIFICATE

Object	DAE3 - SD 000 D03 AA - SN: 569
Calibration procedure(s)	QA CAL-06.v12 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	December 18, 2008
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Fluke Process Calibrator Type 702	SN: 6295803	30-Sep-08 (No: 7673)	Sep-09
Keithley Multimeter Type 2001	SN: 0810278	30-Sep-08 (No: 7676)	Sep-09
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	06-Jun-08 (in house check)	In house check: Jun-09

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

Issued: December 18, 2008

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Certificate No: DAE3-569_Dec08 Page 1 of 5

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Accreditation No.: SCS 108

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted*: Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

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

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

Calibration Factors	X	Y	Z
High Range	404.694 ± 0.1% (k=2)	404.281 ± 0.1% (k=2)	404.059 ± 0.1% (k=2)
Low Range	3.94791 ± 0.7% (k=2)	3.93457 ± 0.7% (k=2)	3.95125 ± 0.7% (k=2)

Connector Angle

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

Appendix

1. DC Voltage Linearity

High Range		Input (μV)	Reading (μV)	Error (%)
Channel X	+ Input	200000	199999.5	0.00
Channel X	+ Input	20000	20003.05	0.02
Channel X	- Input	20000	-19998.99	-0.01
Channel Y	+ Input	200000	200000.4	0.00
Channel Y	+ Input	20000	19999.72	0.00
Channel Y	- Input	20000	-20003.60	0.02
Channel Z	+ Input	200000	200000.4	0.00
Channel Z	+ Input	20000	20000.50	0.00
Channel Z	- Input	20000	-20003.55	0.02

Low Range		Input (μV)	Reading (μV)	Error (%)
Channel X	+ Input	2000	2000.1	0.00
Channel X	+ Input	200	199.98	-0.01
Channel X	- Input	200	-200.00	0.00
Channel Y	+ Input	2000	1999.9	0.00
Channel Y	+ Input	200	199.85	-0.07
Channel Y	- Input	200	-200.80	0.40
Channel Z	+ Input	2000	2000	0.00
Channel Z	+ Input	200	199.21	-0.39
Channel Z	- Input	200	-200.88	0.44

2. Common mode sensitivity

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

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	-4.64	-5.11
	- 200	6.99	5.65
Channel Y	200	7.55	7.78
	- 200	-8.54	-8.84
Channel Z	200	-5.70	-5.81
	- 200	4.16	4.30

3. Channel separation

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

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	1.75	0.93
Channel Y	200	0.50	-	3.40
Channel Z	200	-0.50	-0.14	-

4. AD-Converter Values with inputs shorted

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

	High Range (LSB)	Low Range (LSB)
Channel X	16398	15691
Channel Y	15757	15939
Channel Z	16300	16717

5. Input Offset Measurement

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

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	0.07	-1.15	1.96	0.34
Channel Y	-0.61	-1.54	0.42	0.30
Channel Z	-0.96	-2.56	0.55	0.34

6. Input Offset Current

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

7. Input Resistance

	Zeroing (MOhm)	Measuring (MOhm)
Channel X	0.1999	198.5
Channel Y	0.2000	202.4
Channel Z	0.2001	204.0

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

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

9. Power Consumption (verified during pre test)

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

Annex H Dipole Calibration certification

Annex H.1 D835V2

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

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Accreditation No.: SCS 108

Client: SGS SH (Auden)

Certificate No: D835V2-4d070_Dec08

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d070
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	December 15, 2008
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	08-Oct-08 (No. 217-00898)	Oct-09
Power sensor HP 8481A	US37292783	08-Oct-08 (No. 217-00898)	Oct-09
Reference 20 dB Attenuator	SN: 5086 (20g)	01-Jul-08 (No. 217-00864)	Jul-09
Type-N mismatch combination	SN: 5047.2 / 06327	01-Jul-08 (No. 217-00867)	Jul-09
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: December 15, 2008

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Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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S Servizio svizzero di taratura
S Swiss Calibration Service

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

Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

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

DASY Version	DASY5	V5.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.3 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature during test	(22.5 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.43 mW / g
SAR normalized	normalized to 1W	9.72 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**9.62 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.60 mW / g
SAR normalized	normalized to 1W	6.40 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**6.34 mW / g ± 16.5 % (k=2)**

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

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.7 ± 6 %	1.01 mho/m ± 6 %
Body TSL temperature during test	(21.8 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.55 mW / g
SAR normalized	normalized to 1W	10.2 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**9.89 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.69 mW / g
SAR normalized	normalized to 1W	6.72 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**6.58 mW / g ± 16.5 % (k=2)**

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

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.5 Ω -1.8 jΩ
Return Loss	- 30.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.3 Ω -3.2 jΩ
Return Loss	- 28.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.394 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 09, 2007

DASY5 Validation Report for Head TSL

Date/Time: 08.12.2008 10:31:04

Test Laboratory: SPEAG, Zurich, Switzerland

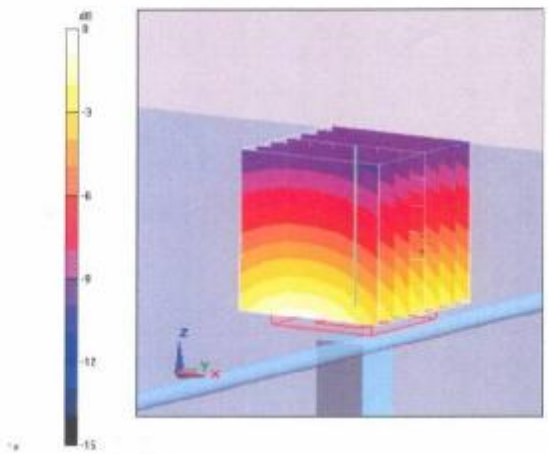
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d070

Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL 900 MHz
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 40.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.97, 5.97, 5.97); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

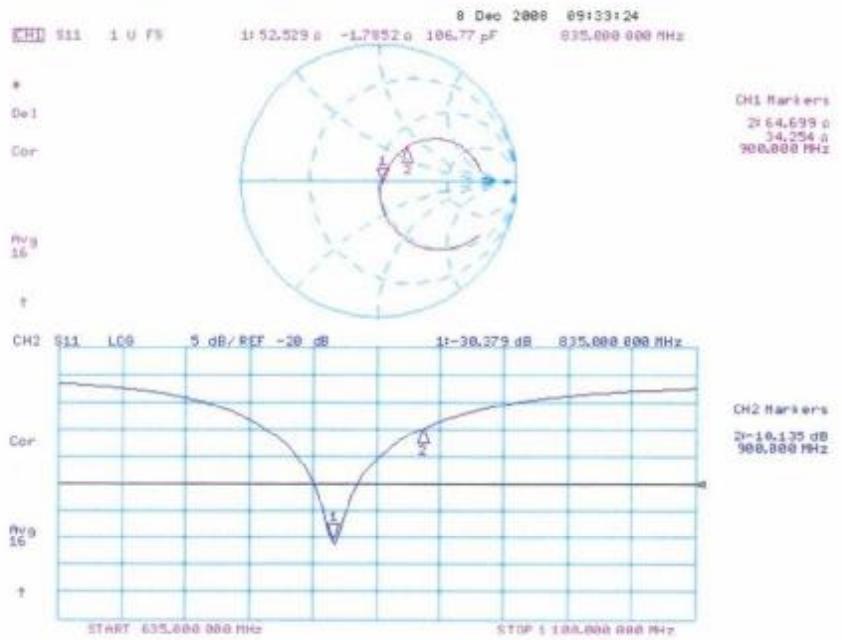
Pin=250mW; dip=15mm; dist=3.4mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.7 V/m; Power Drift = -0.000938 dB
Peak SAR (extrapolated) = 3.56 W/kg
SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.6 mW/g
Maximum value of SAR (measured) = 2.73 mW/g



0 dB = 2.73mW/g

Certificate No: D835V2-4d070_Dec08 Page 6 of 9

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 15.12.2008 11:58:06

Test Laboratory: SPEAG, Zurich, Switzerland

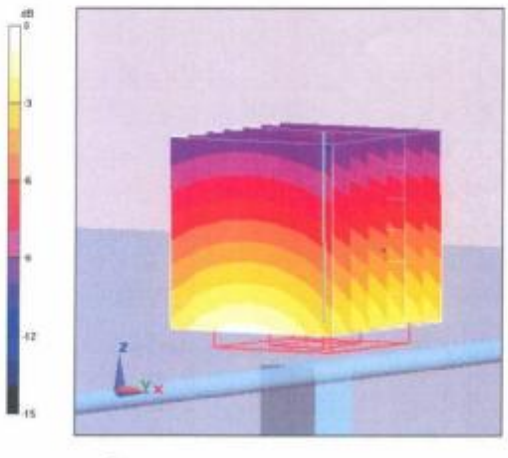
DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d070

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: MSL900
Medium parameters used: f = 835 MHz; σ = 1.01 mho/m; ε_r = 54.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.9, 5.9, 5.9); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

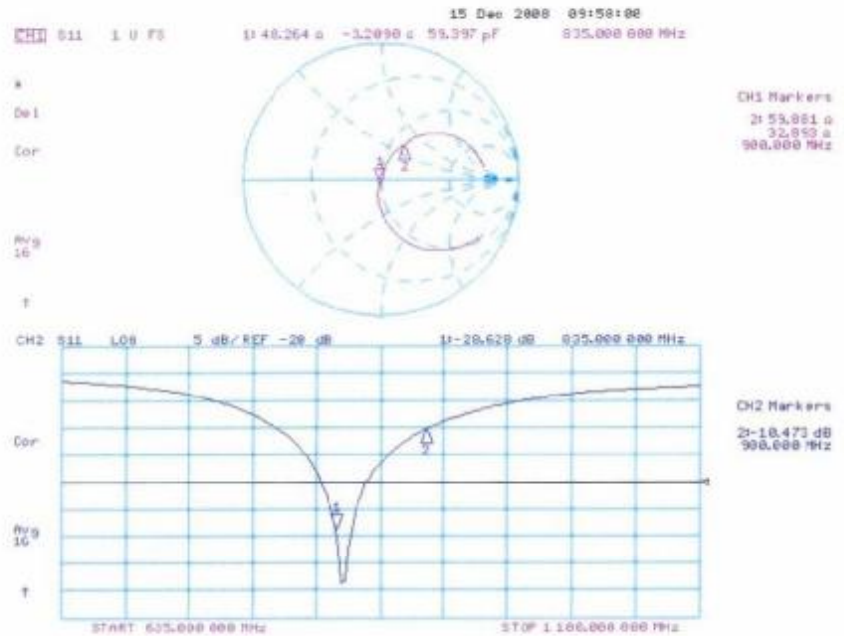
Pin = 250mW, d = 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.7 V/m; Power Drift = 0.00608 dB
Peak SAR (extrapolated) = 3.69 W/kg
SAR(1 g) = 2.55 mW/g; SAR(10 g) = 1.68 mW/g
Maximum value of SAR (measured) = 2.87 mW/g



0 dB = 2.87mW/g

Certificate No: D835V2-4d070_Dec08 Page 8 of 9

Impedance Measurement Plot for Body TSL



Annex H.2 D1900V2

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

S Schweizerischer Kalibrierdienst
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Accreditation No.: SCS 108

Client: SGS SH (Auden)

Certificate No: D1900V2-5d028-Jan09

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d028
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	January 13, 2009
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	08-Oct-08 (No. 217-00898)	Oct-09
Power sensor HP 8481A	US37292783	08-Oct-08 (No. 217-00898)	Oct-09
Reference 20 dB Attenuator	SN: 5086 (20g)	01-Jul-08 (No. 217-00864)	Jul-09
Type-N mismatch combination	SN: 5047.2 / 06327	01-Jul-08 (No. 217-00867)	Jul-09
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 13, 2009

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

Certificate No: D1900V2-5d028_Jan09 Page 1 of 9

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

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Swiss Calibration Service

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

Accreditation No.: SCS 108

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) 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
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

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

DASY Version	DASY5	V5.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.2 ± 6 %	1.47 mho/m ± 6 %
Head TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	10.3 mW / g
SAR normalized	normalized to 1W	41.2 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**39.9 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.36 mW / g
SAR normalized	normalized to 1W	21.4 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**21.1 mW / g ± 16.5 % (k=2)**

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

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.7 ± 6 %	1.57 mho/m ± 6 %
Body TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.5 mW / g
SAR normalized	normalized to 1W	42.0 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**41.5 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.57 mW / g
SAR normalized	normalized to 1W	22.3 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**22.2 mW / g ± 16.5 % (k=2)**

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

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.3 Ω + 6.3 jΩ
Return Loss	- 24.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.0 Ω + 5.9 jΩ
Return Loss	- 24.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.200 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 17, 2002

DASY5 Validation Report for Head TSL

Date/Time: 06.01.2009 14:23:04

Test Laboratory: SPEAG, Zurich, Switzerland

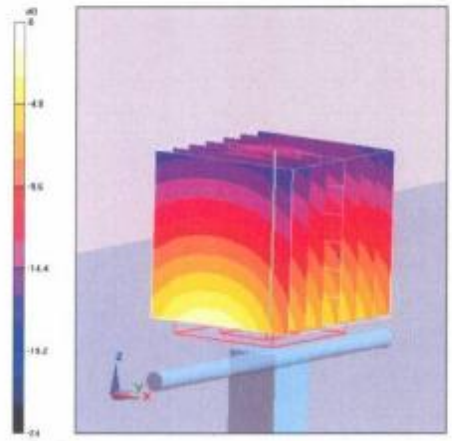
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d028

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL U10 BB
Medium parameters used: f = 1900 MHz; σ = 1.47 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.9, 4.9, 4.9); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

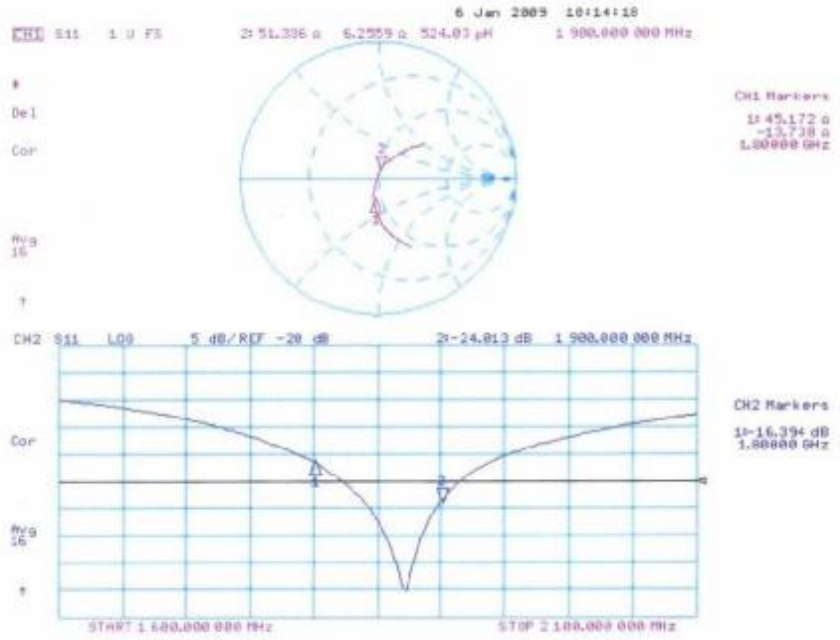
Pin = 250 mW; dip = 10 mm, scan at 3.4mm/Zoom Scan (dist=3.4mm, probe 0deg)
(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93 V/m; Power Drift = 0.045 dB
Peak SAR (extrapolated) = 19.2 W/kg
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.36 mW/g
Maximum value of SAR (measured) = 12.1 mW/g



0 dB = 12.1mW/g

Certificate No: D1900V2-5d028_Jan09 Page 6 of 9

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 13.01.2009 13:59:05

Test Laboratory: SPEAG, Zurich, Switzerland

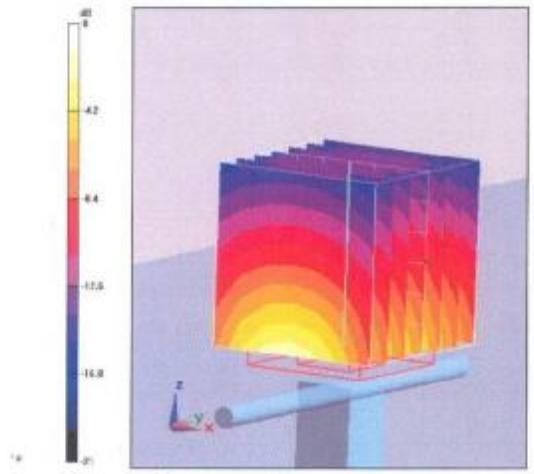
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d028

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: MSL U10 BB
Medium parameters used: f = 1900 MHz; σ = 1.57 mho/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

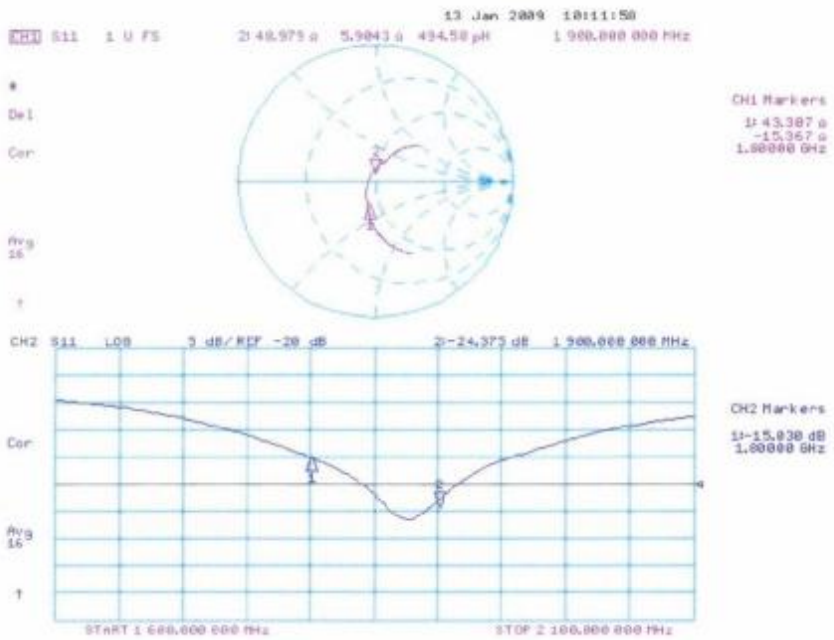
- Probe: ES3DV2 - SN3025; ConvF(4.5, 4.5, 4.5); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Pin = 250 mW; dip = 10 mm, scan at 3.4mm 2 2/Zoom Scan (dist=3.4mm, probe 0deg) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.8 V/m; Power Drift = 0.00901 dB
Peak SAR (extrapolated) = 18.5 W/kg
SAR(1 g) = 10.5 mW/g; SAR(10 g) = 5.57 mW/g
Maximum value of SAR (measured) = 12.7 mW/g



0 dB = 12.7mW/g

Impedance Measurement Plot for Body TSL



Annex I Measurement Uncertainty

a	b1	c	d	e = f(d,k)	g	i = cxg/e	k
Uncertainty Component	Section in P1528	Tol (%)	Prob . Dist.	Div.	Ci (10g)	1g ui (%)	Vi (Veff)
Probe calibration	E.2.1	6.3	N	1	1	6.3	∞
Axial isotropy	E.2.2	0.5	R	2	$(1-c_p)^{1/2}$	0.18	∞
hemispherical isotropy	E.2.2	2.6	R	2	$\sqrt{c_p}$	0.92	∞
Boundary effect	E.2.3	0.8	R	$\sqrt{3}$	1	0.46	∞
Linearity	E.2.4	0.6	R	$\sqrt{3}$	1	0.35	∞
System detection limit	E.2.5	0.25	R	$\sqrt{3}$	1	0.15	∞
Readout electronics	E.2.6	0.3	N	1	1	0.3	∞
Response time	E.2.7	0	R	$\sqrt{3}$	1	0	∞
Integration time	E.2.8	2.6	R	$\sqrt{3}$	1	1.5	∞
RF ambient Condition -Noise	E.6.1	3	R	$\sqrt{3}$	1	1.73	∞
RF ambient Condition - reflections	E.6.1	3	R	$\sqrt{3}$	1	1.73	∞
Probe positioning- mechanical tolerance	E.6.2	1.5	R	$\sqrt{3}$	1	0.87	∞
Probe positioning- with respect to phantom	E.6.3	2.9	R	$\sqrt{3}$	1	1.67	∞
Max. SAR evaluation	E.5.2	1	R	$\sqrt{3}$	1	0.58	∞
Test sample positioning	E.4.2	4	N	1	1	3.7	9
Device holder uncertainty	E.4.1	3.6	N	1	1	3.6	∞
Output power variation -SAR drift measurement	6.62	5	R	$\sqrt{3}$	1	2.89	∞
Phantom uncertainty (shape and thickness tolerances)	E.3.1	4	R	$\sqrt{3}$	1	2.31	∞
Liquid conductivity - deviation from target values	E.3.2	5	R	$\sqrt{3}$	0.43	1.85	∞
Liquid conductivity - measurement uncertainty	E.3.2	3.7	N	1	0.43	2.37	5
Liquid permittivity - deviation from target values	E.3.3	5	R	$\sqrt{3}$	0.49	1.73	∞
Liquid permittivity - measurement uncertainty	E.3.3	3.7	N	1	0.49	2.22	5
Combined standard uncertainty				RSS		10.0	430
Expanded uncertainty (95% CONFIDENCE INTERVAL)				K=2		20.0	

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

Annex J CNAS Certificate

China National Accreditation Service for Conformity Assessment

LABORATORY ACCREDITATION CERTIFICATE

(No. CNAS L1486)

China National Accreditation Service for Conformity Assessment has accredited

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

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

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

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

Date of Issue: 2007-06-28

Date of Expiry: 2009-06-14

Date of Initial Accreditation: 2004-06-15

Signed on behalf of China National Accreditation Service for Conformity Assessment

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End of Report