

TEST REPORT

Equipment Under Test:	WCDMA/GPRS Dual Band Mobile Phone
Market name:	F188
FCC ID	Q78-ZTEF188
Hardware Version:	P622C1-2.0.0
Software Version:	GEN_ZX_P622C1V1.0.0B06
Applicant:	ZTE CORPORATION
Address of Applicant:	ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, 518057, P.R.China
Date of Receipt:	2008.06.19
Date of Test:	2008.06.19 ~2008.09.03
Date of Issue:	2008.09.03



Tested by :

Will Ni

Date : 2008.09.03

Approved by :

Zhang Yuan

Date : 2008.09.03

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Change History

Version	Change contents	Author	Date
V1.0	The first edition.	Will Ni	Jul/17 2008
V1.1	Add Bluetooth Part.	Will Ni	Sep/3 2008

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Standards:

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

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

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

Remarks:

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

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

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1. General Information

1.1 Test Laboratory

GSM Laboratory

SGS-CSTC Standards Technical Services Co., Ltd Shanghai Branch
 9F, the 3rd Building, No.889, Yishan Rd, Xuhui District, Shanghai, China
Zip code: 200233

Telephone: +86 (0) 21 6495 1616
Fax: +86 (0) 21 5450 0149
Internet: <http://www.cn.sgs.com>

1.2 Details of Applicant

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

Address:

Contact Person: Li Dezi

1.3 Description of EUT(s)

Brand name	ZTE	
Market Name	WCDMA /GPRS Dual Band Mobile Phone	
Status of Product	Production	
Hardware Version	P622C1-2.0.0	
Software Version	GEN_ZX_P622C1V1.0.0B06	
Serial No.	IMEI:004400152020002	
Battery Type	Li-on	
Antenna Type	Inner Antenna	
Operation Mode	GSM/GPRS/EGDE/WCDMA/HSDPA	
Modulation Mode	GMSK/8PSK/QPSK	
Frequency range	GSM850	Tx: 824~849 MHz
		Rx: 869~894 MHz
	PCS1900	Tx: 1850~1910 MHz
		Rx: 1930~1990 MHz

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	WCDMA FDD Band II	Tx: 1850~1910 MHz Rx: 1930~1990 MHz
	WCDMA FDD Band V	Tx: 824~849 MHz Rx: 869~894MHz
Nominal Maximum RF Conducted Power	GSM850:33.0dBm PCS1900:30.0dBm, WCDMA1900: 24.0dBm WCDMA850: 24.0dBm	

1.4 Test Environment

Ambient temperature: 22.0° C

Tissue Simulating Liquid: 22.0° C

Relative Humidity: 45%~55%

1.5 Operation Configuration

For DUT

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

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

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

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

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

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

Configuration 7: WCDMA 850, LeftHandSide Cheek & 15° Tilt Position

Configuration 8: WCDMA 850, RightHandSide Cheek & 15° Tilt Position

Configuration 9: WCDMA 850, BodyWorn (1.5cm between EUT and phantom)

Configuration 10: WCDMA 1900, LeftHandSide Cheek & 15° Tilt Position

Configuration 11: WCDMA 1900, RightHandSide Cheek & 15° Tilt Position

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SHGSM

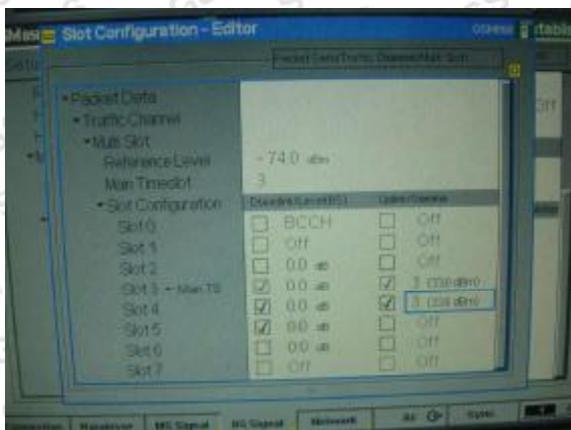
Configuration 12: WCDMA 1900, BodyWorn (1.5cm between EUT and phantom)

Configuration 13: Additional test due to antenna near mouth, BodyWorn
 (0.5cm between EUT Top and phantom, Head Tissue Liquid)

Configuration 14: Additional test to Verify Bluetooth Transmitter
 (LeftHandSide & RightHandSide Cheek & BodyWorn Touch)

For SS

In GPRS mode



In EGDE 8PSK mode

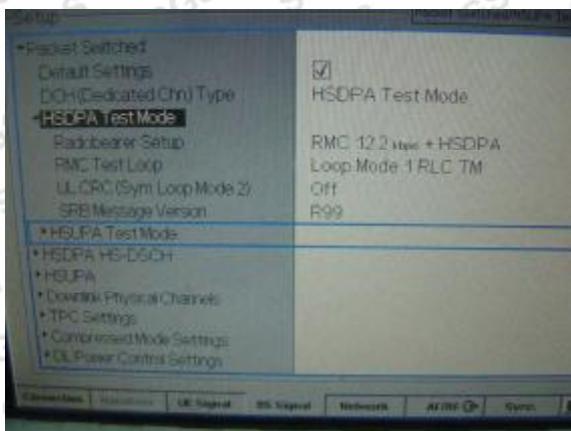


In WCDMA mode (All TPC set to 1)

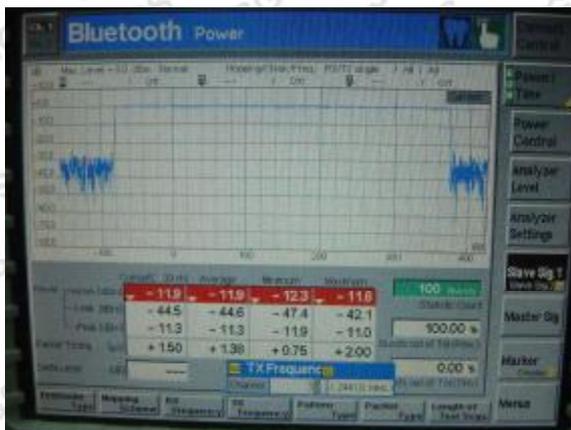
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In HSDPA mode



In Bluetooth mode (Loopback test/ Hopping off)



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SHGSM

1.6 SAM Twin Phantom



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

- Left hand
- Right hand
- Flat phantom

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

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

Phantom specification:

Construction:	The shell corresponds to the specifications of Specific Anthropomorphic Mannequin(SAM) Phantom defined in IEEE 1528-2003,EN 50361:2001 and IEC 62209.It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid.
Shell Thickness	2±0.2mm
Filling Volume	Approx.25 liters
Dimensions	Height: 850mm Length: 1000mm Width: 500mm

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1.7 Device Holder for Transmitters



The SAR in the phantom is approximately inversely proportional to the square of the distance between the source and the liquid surface. For a source in 5mm distance, a positioning uncertainty of $\pm 0.5\text{mm}$ would produce a SAR uncertainty of $\pm 20\%$. 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 $\epsilon_r=3$ and loss tangent $\tan \delta=0.02$. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

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1.8 Description of Test Position

1.8.1 SAM Phantom Shape

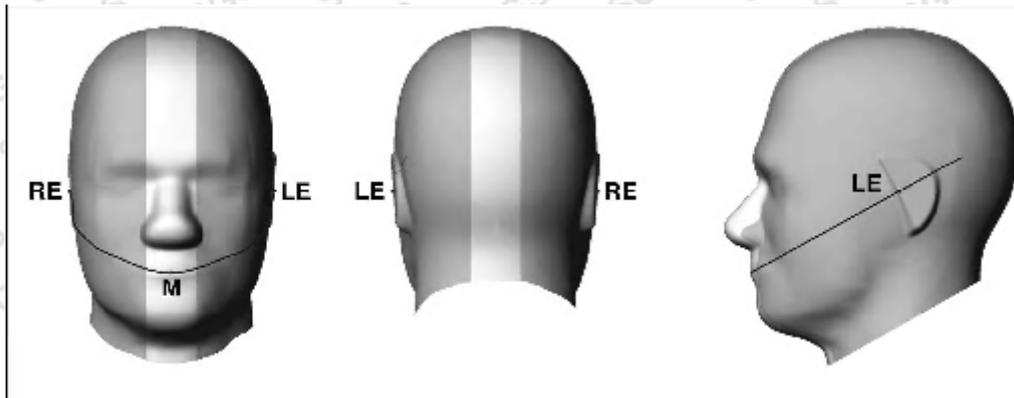


Figure 1—front, back, and side views of SAM (model for the phantom shell). Full-head model is for illustration purposes only—procedures in this recommended practice are intended primarily for the phantom setup of Figure 2. Note: The center strip including the nose region has a different thickness tolerance.

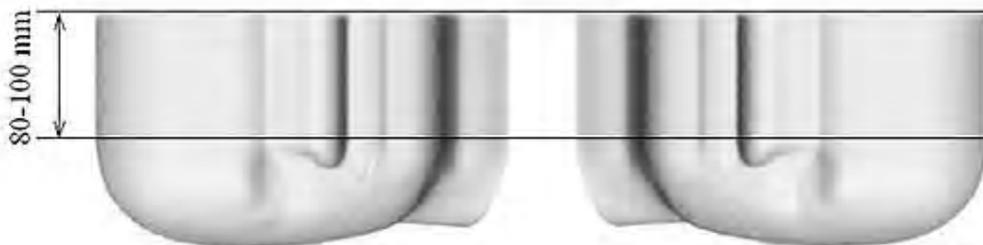


Figure 2—Sagittally bisected phantom with extended perimeter (shown placed on its side as used for SAR measurements)

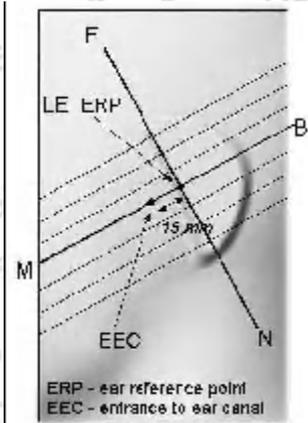


Figure 3—Close-up side view of phantom showing the ear region, N-F and B-M lines, and seven cross-sectional plane locations

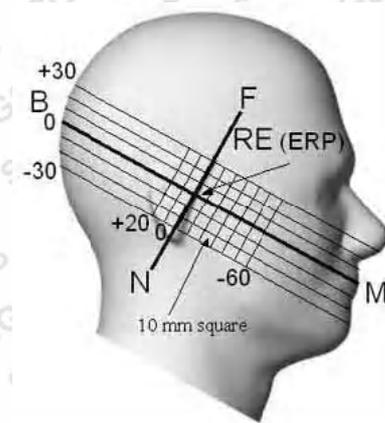


Figure 4—Side view of the phantom showing relevant markings and seven cross-sectional plane locations

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1.8.2 The following pictures present the different DUT constructions.

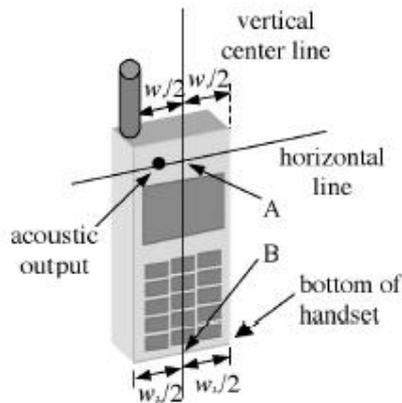


Figure 5a—Handset vertical and horizontal reference lines—“fixed case”

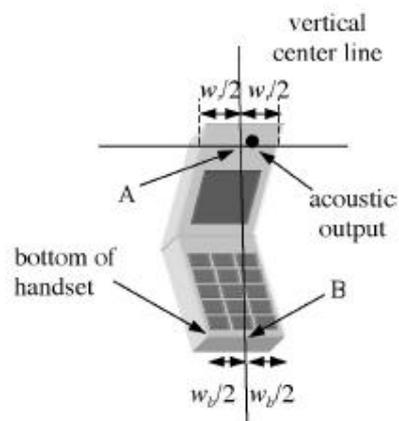


Figure 5b—Handset vertical and horizontal reference lines—“clam-shell case”

1.8.3 Definition of the “cheek” position:

- Position the device with the vertical centre line of the body of the device and the horizontal line crossing the centre of the ear piece in a plane parallel to the sagittal plane of the phantom (“initial position” see Figure 6). While maintaining the device in this plane, align the vertical centre line with the reference plane containing the three ear and mouth reference points (M, RE and LE) and align the centre of the ear piece with the line RE-LE;
- Translate the mobile phone box towards the phantom with the ear piece aligned with the line LE-RE until the phone touches the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the box until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.

1.8.4 Definition of the “tilted” position:

- Position the device in the “cheek” position described above;
- 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.

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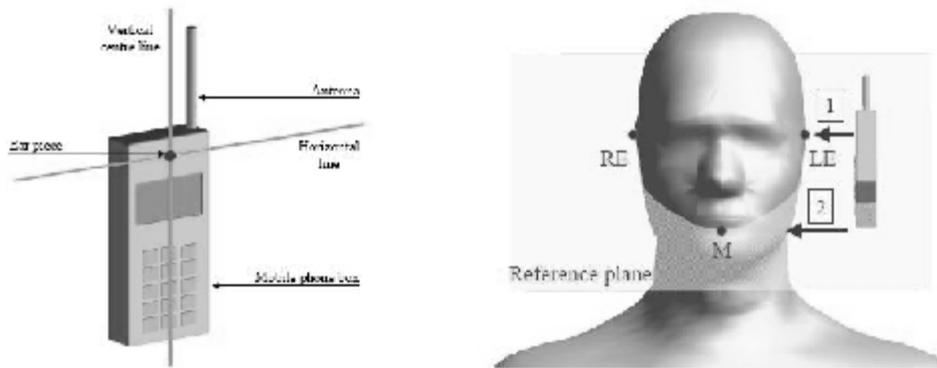


Figure 6 - Definition of the reference lines and points, on the phone and on the phantom and initial position

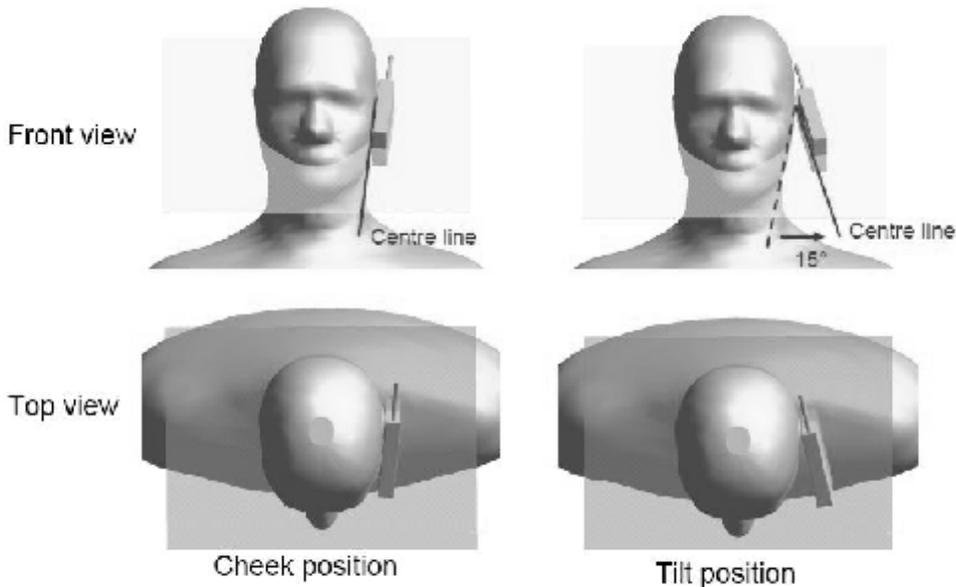


Figure 7 -“Cheek” and “tilt” positions of the mobile phone on the left side

1.9 Recipes for Tissue Simulating Liquid

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

Ingredient	835MHz	1900MHz	2450 MHz
Water	40.29%	55.24%	55.00
Sugar	57.90%	-	-

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Salt (NaCl)	1.38%	0.31%	-
DGBE	-	44.45%	45.00
Preventol	0.18%	-	-
HEC	0.24%	-	-
Relative Permittivity	41.5	40.0	39.2
Conductivity (S/m)	0.90	1.40	1.80

Table 1: Composition of the Brain Tissue Equivalent Matter

Ingredient	835MHz	1900MHz	2450 MHz
Water	50.75%	70.17%	68.64
Sugar	48.21%	-	-
Salt (NaCl)	0.94%	0.39%	-
DGBE	-	29.44%	31.37
Preventol	0.10%	-	-
HEC	0.00	-	-
Relative Permittivity	55.2	53.3	52.7
Conductivity (S/m)	0.97	1.52	1.95

Table 2: Composition of the Body Tissue Equivalent Matter

1.10 Measurement procedure

Step 1: Power reference measurement

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

Step 2: Area scan

The SAR distribution at the exposed side of the head was measured at a distance of 3.9mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 20mm*20mm. Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: Zoom scan

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

The data at the surface was extrapolated, since the center of the dipoles is 2.1mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification) The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes.

This polynomial was then used to evaluate the points between the surface and the probe tip. The maximum interpolated value was searched with a straight-forward algorithm. Around this

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maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points (10*10*10) were interpolated to calculate the average. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Power reference measurement (drift)

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

1.11 The SAR Measurement System

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

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

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

- Y 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).
- Y A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- Y 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.
- Y 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.

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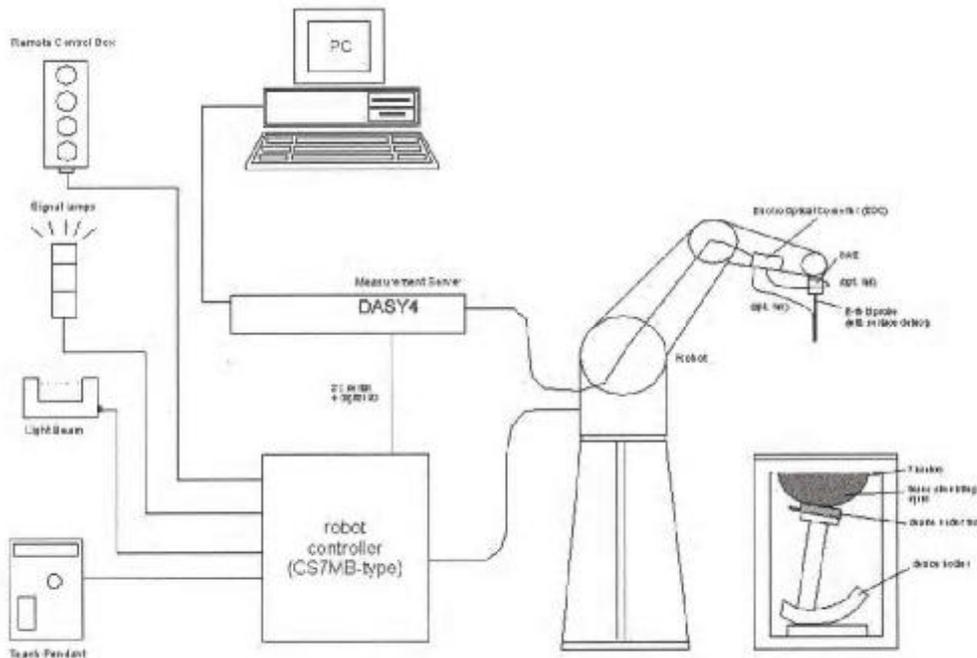


Fig. a SAR System Configuration

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

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1.12 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. These tests were done at 900&1900&2450MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1 (SAR values are normalized to 1W forward power delivered to the dipole). During the tests, the ambient temperature of the laboratory was in the range 22°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

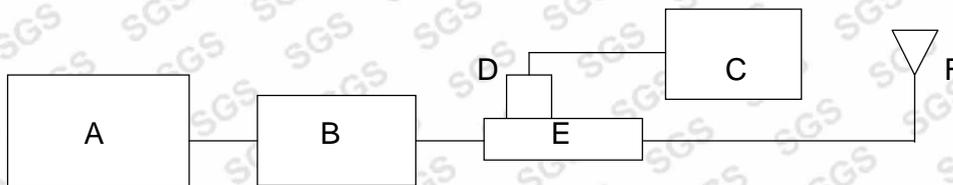


Fig. b the microwave circuit arrangement used for SAR system verification

- A. Agilent Model E4438C Signal Generator
- B. Mini-Circuit Model ZHL-42 Preamplifier
- C. Agilent Model E4416A Power Meter
- D. Agilent Model 8481H Power Sensor
- E. HT CP6100 20N Dual directional coupler
- F. Reference dipole antenna

Validation Kit	Frequency MHz	Target SAR 1g (250mW)	10% Limit Range	Measured SAR 1g	Measured Date
D900V2 184	900 Body	2.9	2.61~3.19	2.75	2008-06-20
	900 Head	2.73	2.46~3.00	2.72	2008-06-23
				2.74	2008-07-14

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D1900V2 5d028	1900 Body	9.34	8.41~10.27	9.25	2008-06-19
	1900 Head	9.57	8.61~10.53	9.59 9.61	2008-06-27 2008-07-15
D2450V2 733	2450 Body	13.8	12.42~15.18	14.5	2008-09-03
	2450 Head	14.1	12.96~15.51	15.2	2008-09-03

Table 1. Result System Validation

1.13 Tissue Simulant Fluid for the Frequency Band 850MHZ and 1800MHZ

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

Frequency (MHz)	Tissue Type	Limit/Measured	Permittivity (ρ)	Conductivity (σ)	Simulated Tissue Temp (°C)
900	Body	Recommended Limit	55.0±5%	1.05±5%	20-24
		Measured, 2008-06-20	53.12	1.034	21.2
	Head	Recommended Limit	42.0±5%	0.99±5%	20-24
		Measured, 2008-06-23	42.08	0.942	22.5
1900	Body	Recommended Limit	53.3±5%	1.52±5%	20-24
		Measured, 2008-06-19	51.62	1.56	22.1
	Head	Recommended Limit	40.0±5%	1.38±5%	20-24
		Measured, 2008-06-27	41.21	1.415	22.6
2450	Body	Recommended Limit	52.7±5%	1.95±5%	20-24
		Measured, 2008-09-03	50.81	2.04	22.1
	Head	Recommended Limit	39.2±5%	1.80±5%	20-24
		Measured, 2008-09-03	38.6	1.88	22.1

Table 2. Dielectric parameters for the Frequency Band 850&1900&2450MHZ

1.14 Test Standards and Limits

Standards:

According to FCC 47 CFR §2.1093(d) the limits to be used for evaluation are based generally on This Test Report is issued by the Company subject to its General Conditions of Service printed overleaf or attached. Said Conditions are also available upon request or are accessible at www.sgs.com. Attention is drawn to the limitations of liability, indemnification and jurisdictional policies defined therein. The result shown in this Test Report refer only to the sample(s) tested unless otherwise stated and such sample(s) are retained for 30 days only. This Test Report shall be reproduced except in full, without written approval of the Company.

criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3KHz to 300GHz," ANSI/IEEE C95.1-1992, Copyright 1992 by the Institute of Electrical & Electronics Engineers, Inc., New York, New York 10071.

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

Table 3. RF Exposure Limits

Notes:

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

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2. Summary of Results

GSM850

Mode	Test Configuration		SAR, Averaged over 1g (W/kg)			Temperature (°C)	Verdict
	Channel/Power(dBm)		Low/31.1	Middle/31.2	High/31.4		
GSM850	Left	Cheek	--	0.096	--	22	Pass
		Tilt	--	0.058	--	22	Pass
	Right	Cheek	--	0.095	--	22	Pass
		Tilt	--	0.048	--	22	Pass
	Body	GPRS	--	0.312	--	22	Pass
	Flat Head	0.5cm	--	0.134	--	22	Pass

PCS1900

Mode	Test Configuration		SAR, Averaged over 1g (W/kg)			Temperature (°C)	Verdict
	Channel/Power(dBm)		Low/28.2	Middle/28.3	High/28.0		
GSM1900	Left	Cheek	--	0.555	--	22	Pass
		Tilt	--	0.104	--	22	Pass
	Right	Cheek	--	0.411	--	22	Pass
		Tilt	--	0.092	--	22	Pass
	Body	GPRS	--	0.175	--	22	Pass
	Flat Head	0.5cm	0.852	0.723	0.572	22	Pass
With BT active		0.852	--	--	22	Pass	

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WCDMA850

Mode	Test Configuration		SAR, Averaged over 1g (W/kg)			Temperature (°C)	Verdict
	Channel/Power(dBm)		Low/22.3	Middle/22.5	High/22.3		
FDD V	Left	Cheek	--	0.184	--	22	Pass
		Tilt	--	0.113	--	22	Pass
	Right	Cheek	--	0.189	--	22	Pass
		Tilt	--	0.107	--	22	Pass
	Body	WCDMA	--	0.269	--	22	Pass
	Flat Head	0.5cm	--	0.235	--	22	Pass

WCDMA1900

Mode	Test Configuration		SAR, Averaged over 1g (W/kg)			Temperature (°C)	Verdict
	Channel/Power(dBm)		Low/21.3	Middle/21.7	High/21.4		
FDD II	Left	Cheek	0.457	0.704	0.802	22	Pass
		Tilt	--	0.176	--	22	Pass
		With Bluetooth	--	--	0.754	22	Pass
	Right	Cheek	0.476	0.789	0.837	22	Pass
		Tilt	--	0.152	--	22	Pass
		With Bluetooth	--	--	0.850	22	Pass
	Body	WCDMA	--	0.364	--	22	Pass
		HSDPA	--	0.416	--	22	Pass
	Flat Head	0.5cm	0.732	1.14	1.26	22	Pass
		With BT active	--	--	1.2	22	Pass

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Bluetooth

Mode	Test Configuration		SAR, Averaged over 1g (W/kg)			Temperature (°C)	Verdict
2450MHz	Left	Cheek	--	0.0030	--	22	Pass
	Right	Cheek	--	0.0033	--	22	Pass
	Body	Touch	--	0.014	--	22	Pass

Maximum Values

Frequency Band (MHz)	EUT position	Conducted Output Power (dBm)	1g Average (W/kg)	Power Drift(dB)	Amb. Temp (°C)	Verdict
850	GSM850/Body/GPRS / Mid Channel/1.5cm	31.2	0.312	-0.029	22	PASS
	GSM850/Body/WCDMA / Mid Channel/1.5cm	22.5	0.269	0.226	22	PASS
1900	GSM1900/Flat Head / Low Channel /0.5cm	28.2	0.852	-0.050	22	PASS
	WCDMA1900/Flat Head / High Channel /0.5cm	21.4	1.26	-0.024	22	PASS

Note:

- In GSM850 band, the low, middle and high channels are CH128/824.2MHz, CH189/836.4MHz and CH251/848.8MHz separately.
- In PCS1900 band, the low, middle and high channels are CH512/1805.2MHz, CH661/1880.0MHz and CH810/1909.8MHz separately.
- In WCDMA Band II, the low, middle and high channels are CH12/1852.4MHz, CH9400/1880.0MHz and CH9538/1907.6MHz separately.
- In WCDMA Band V, the low, middle and high channels are CH4132/826.4MHz, CH4182/836.4MHz and CH4233/846.6MHz separately.
- For all the tests, the maximum absolute value of the power drift which is under the WCDMA1900-Right-Cheek-Middle configuration is 0.394dB.
- "Flat Head" is referring to the additional tests which verify the mouth region due to antenna located in the bottom of the handset. See figure 9.
- The Bluetooth (Class 2) nominal maximum output power is 2.5dBm which is under the power threshold in 2.4GHz.

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3. Instruments List

Instrument	Model	Serial number	NO.	Date of last Calibration
Desktop PC	COMPAQ EVO	N/A	GSM-SAR-025	N/A
Dasy 4 software	V 4.7 build 44	N/A	GSM-SAR-001	N/A
Probe	ES3DV3	3088	GSM-SAR-034	2008.1.18
DAE	DAE3	569	GSM-SAR-023	2007.11.19
900MHz system validation dipole	D900V2	184	GSM-SAR-017	2007.12.21
1900MHz system validation dipole	D1900V2	5d028	GSM-SAR-020	2007.12.21
2450MHz system validation dipole	D2450V2		GSM-SAR-027	2007.12.21
Phantom	SAM 12	TP-1283	GSM-SAR-005	N/A
Robot	RX90L	F03/5V32A1/A01	GSM-SAR-006	N/A
Dielectric probe kit	85070D	US01440168	GSM-SAR-016	2007.12.18
Agilent network analyzer	E5071B	MY42100549	GSM-SAR-007	2007.12.18
Agilent signal generator	E4438	14438CATO-19719	GSM-SAR-008	2007.12.18
Mini-Circuits preamplifier	ZHL-42	D041905	GSM-SAR-033	2007.12.18
Agilent power meter	E4416A	GB41292095	GSM-SAR-010	2007.12.18
Agilent power sensor	8481H	MY41091234	GSM-SAR-011	2007.12.18
HT CP6100 20N Coupling	6100	SCP301480120	GSM-SAR-012	2007.12.18
R&S Universal radio communication tester	CMU200	103633	GSM-AUD-002	2007.12.18

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4. Measurements

GSM850

4.1 GSM850-Lefthandside-Cheek-Mid

Date/Time: 2008-6-23 18:41:58

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-GSM--Check--Mid

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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

Medium: HSL850-Head Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.905$ mho/m; $\epsilon_r = 42.8$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.103 mW/g

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

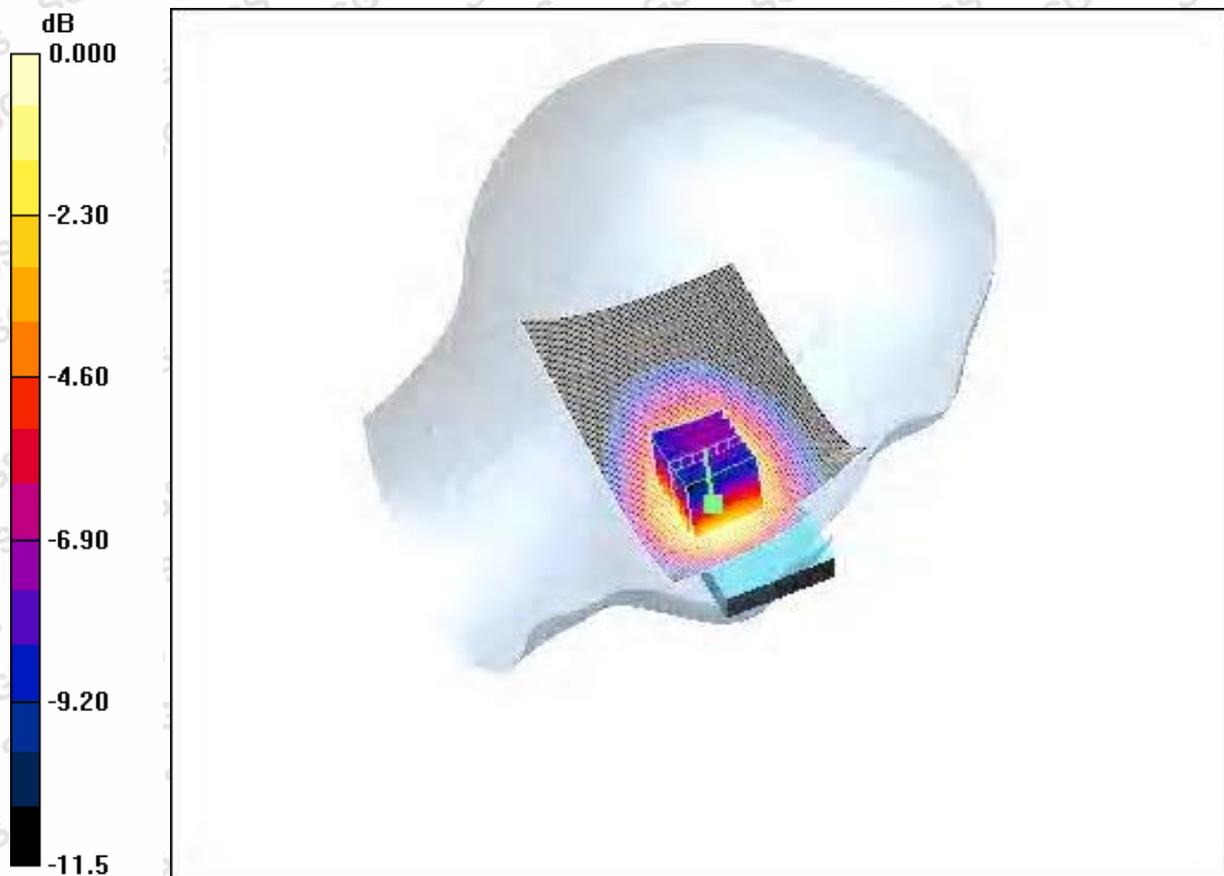
dz=5mm

Reference Value = 3.78 V/m; Power Drift = -0.012 dB

Peak SAR (extrapolated) = 0.144 W/kg

SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.066 mW/g

Maximum value of SAR (measured) = 0.104 mW/g



0 dB = 0.104mW/g

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4.2 GSM850-LeftHandSide-Tilt-Mid

Date/Time: 2008-6-23 20:11:36

Test Laboratory: SGS-GSM

GSM850-LeftHandSide-GSM--Tilt--Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL850-Head Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.905$ mho/m; $\epsilon_r = 42.8$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Tilt position - Mid BYD/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.062 mW/g

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

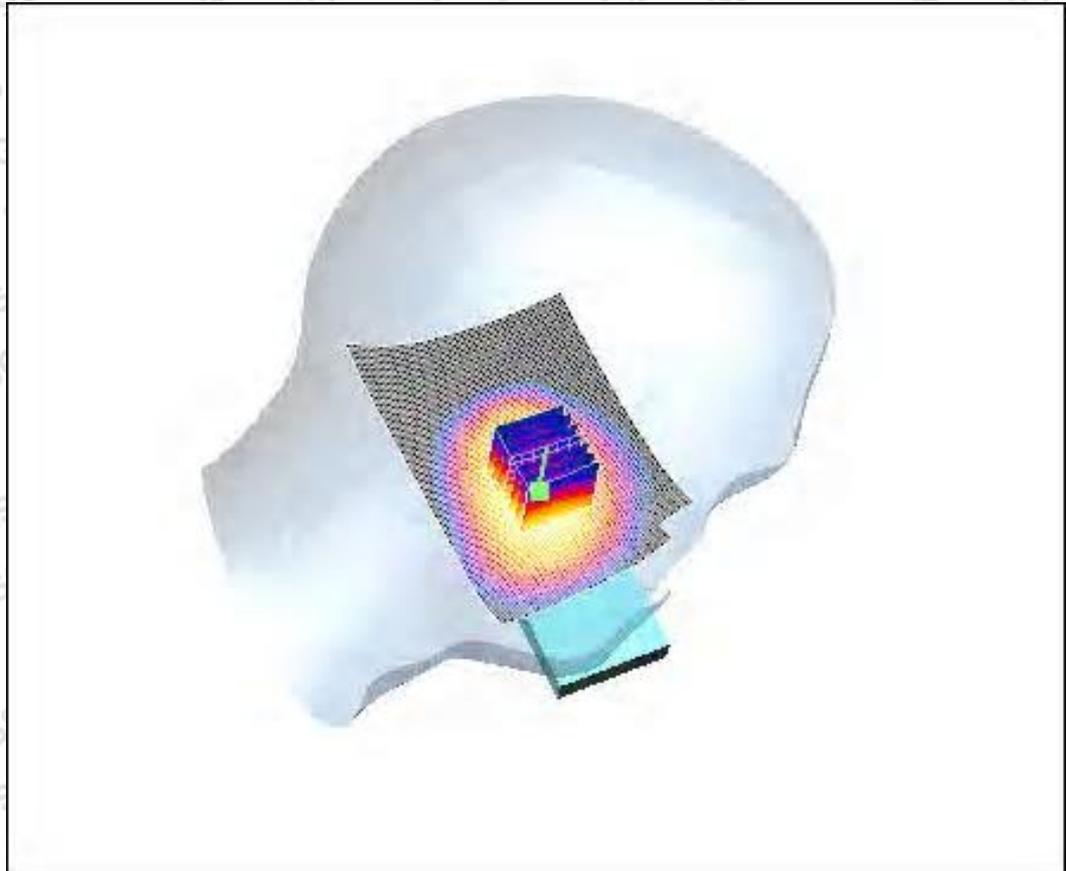
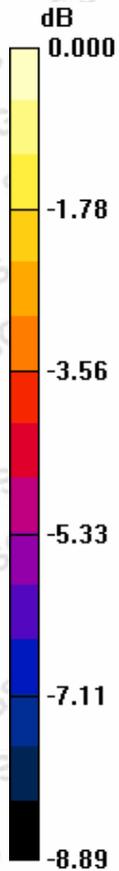
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Reference Value = 6.63 V/m; Power Drift = 0.101 dB

Peak SAR (extrapolated) = 0.075 W/kg

SAR(1 g) = 0.058 mW/g; SAR(10 g) = 0.042 mW/g

Maximum value of SAR (measured) = 0.062 mW/g



0 dB = 0.062mW/g

4.3 GSM850-Lefthandside-Worstcase-Low

Blank

4.4 GSM850-Lefthandside-Worstcase-High

Blank

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4.5 GSM850-Lefthandside-Worstcase-Low+BT

Blank

4.6 GSM850-Righthandside-Cheek-Mid

Date/Time: 2008-6-24 10:27:17

Test Laboratory: SGS-GSM

GSM850-RightHandSide-GSM--Check--Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL850-Head Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.905$ mho/m; $\epsilon_r = 42.8$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.102 mW/g

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

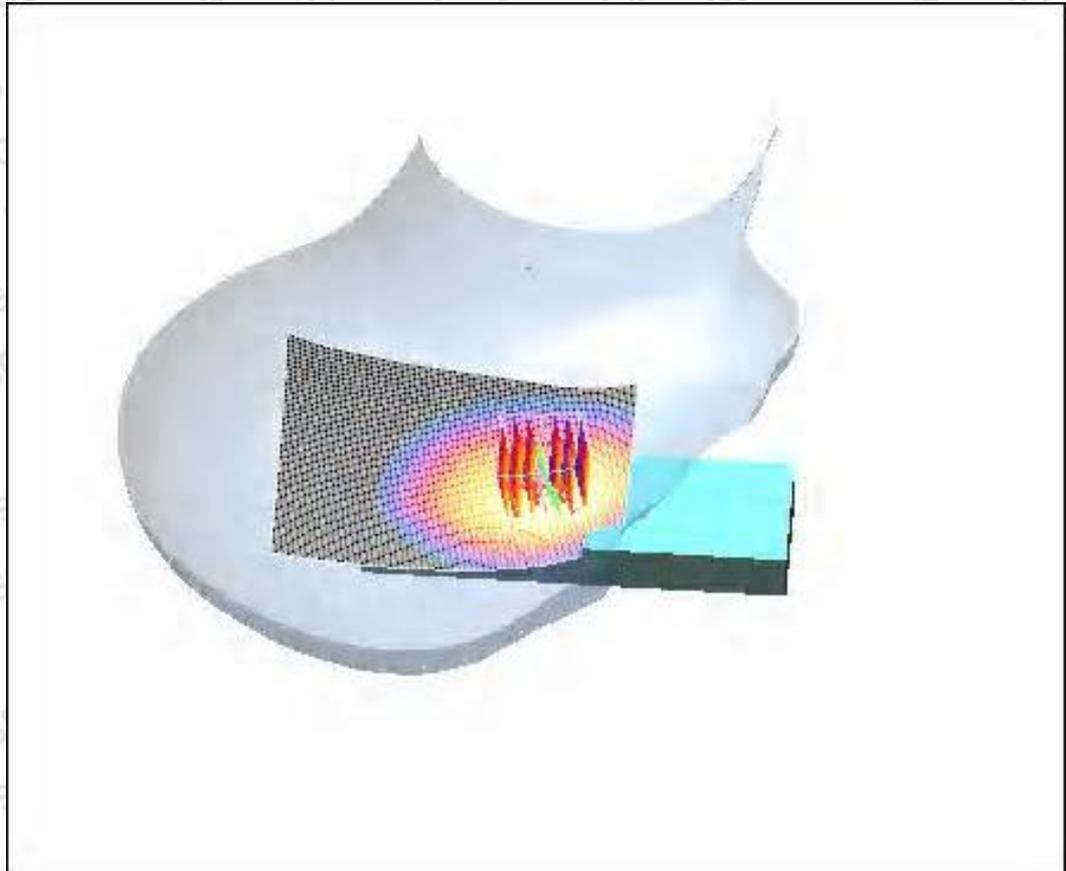
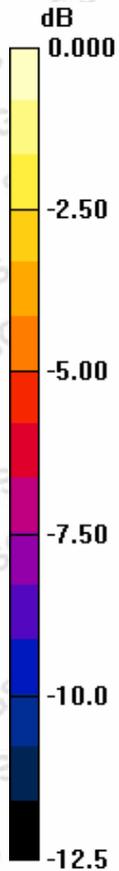
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Reference Value = 3.58 V/m; Power Drift = 0.285 dB

Peak SAR (extrapolated) = 0.126 W/kg

SAR(1 g) = 0.095 mW/g; SAR(10 g) = 0.067 mW/g

Maximum value of SAR (measured) = 0.102 mW/g



0 dB = 0.102mW/g

4.7 GSM850-Righthandside-Tilt-Mid

Date/Time: 2008-6-24 13:18:07

Test Laboratory: SGS-GSM

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GSM850-RightHandSide-GSM--Tilt--Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL850-Head Medium parameters used: $f = 836.4 \text{ MHz}$; $\sigma = 0.905 \text{ mho/m}$; $\epsilon_r = 42.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.051 mW/g

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

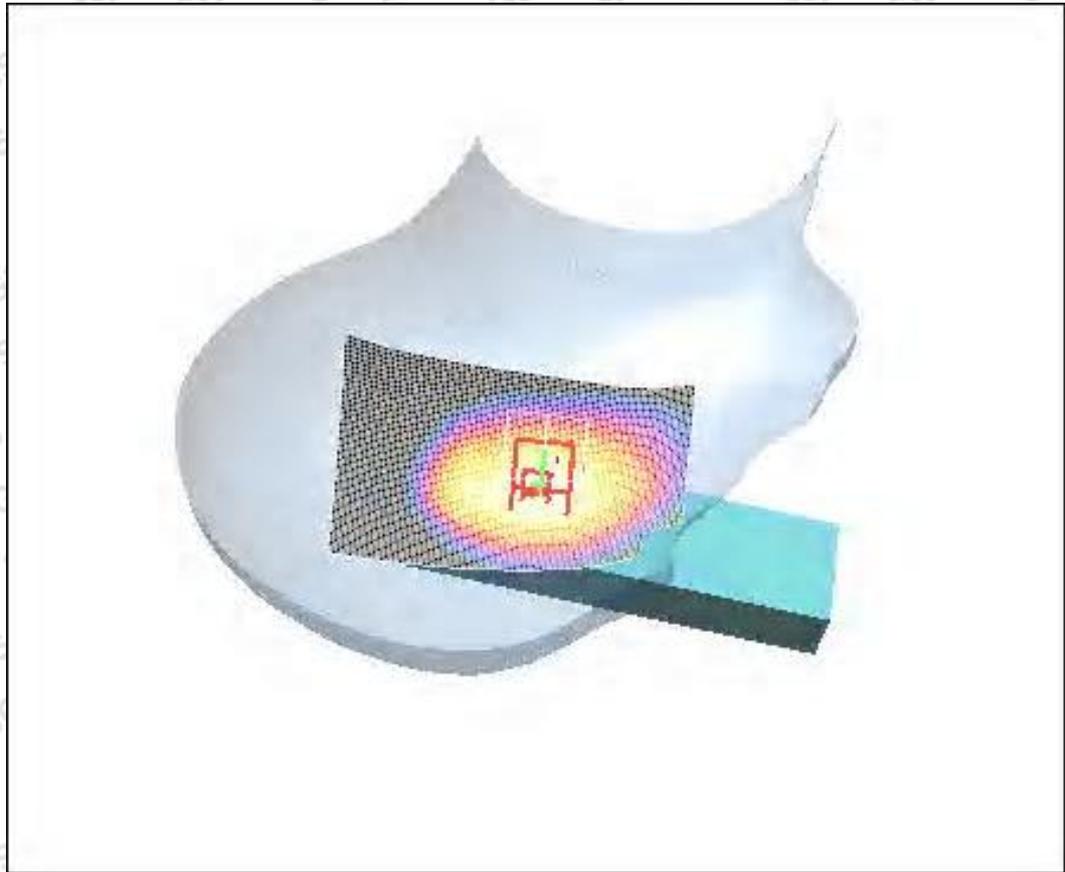
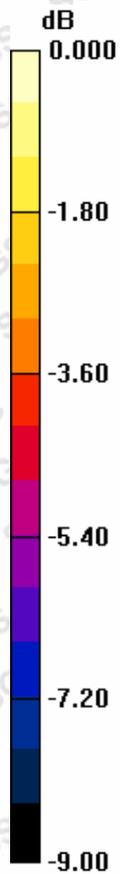
Reference Value = 5.88 V/m; Power Drift = 0.008 dB

Peak SAR (extrapolated) = 0.062 W/kg

SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.035 mW/g

Maximum value of SAR (measured) = 0.051 mW/g

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0 dB = 0.051mW/g

4.8 GSM850-Righthandside-Worstcase-Low

Blank

4.9 GSM850-Righthandside-Worstcase-High

Blank

4.10 GSM850-Righthandside-Worstcase-Low+BT

Blank

4.11 GSM850-Body worm-GPRS-Mid

Date/Time: 2008-6-20 15:08:42

Test Laboratory: SGS-GSM

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GSM850-Body-Worn--GPRS--Mid-1.5cm

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL 850_Body Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

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

Body Worn - Middle 2/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.307 mW/g

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

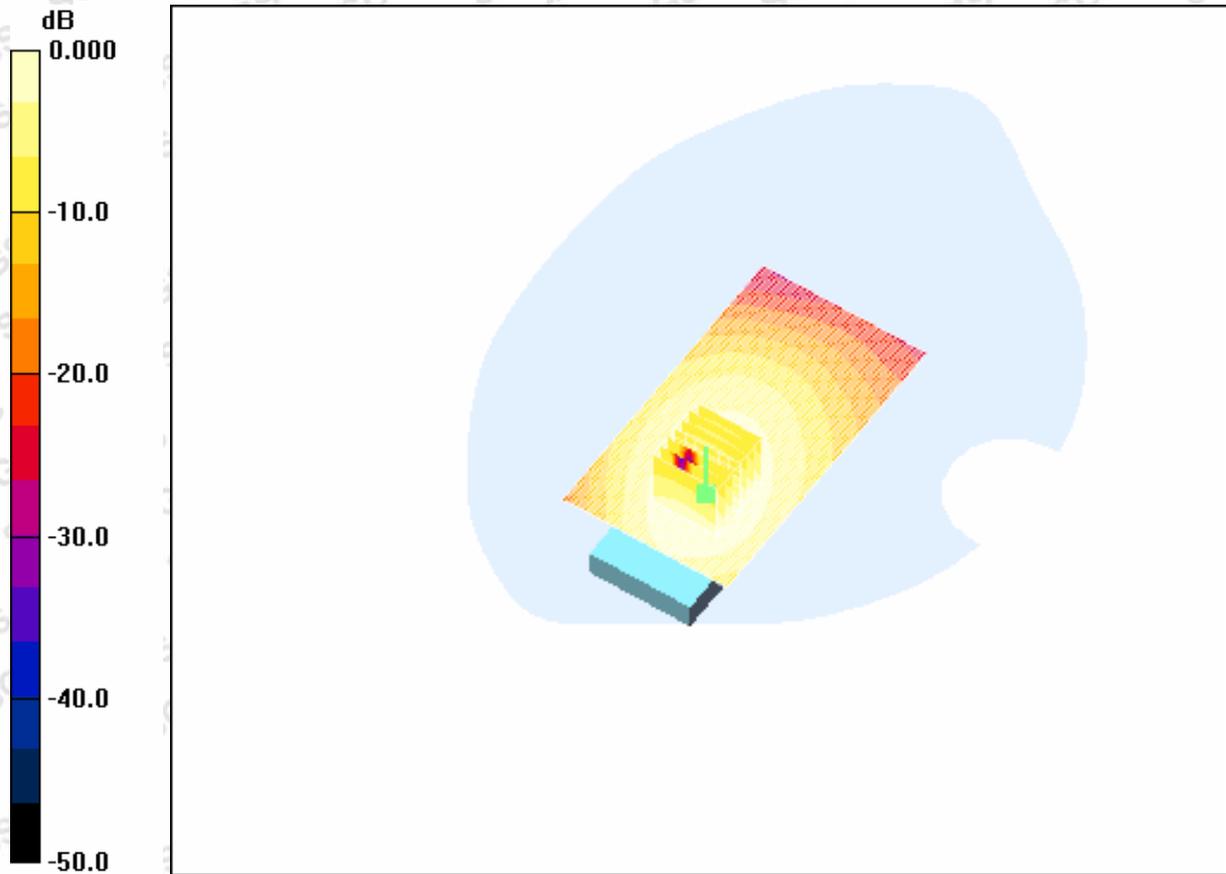
Reference Value = 5.66 V/m; Power Drift = -0.029 dB

Peak SAR (extrapolated) = 0.682 W/kg

SAR(1 g) = 0.312 mW/g; SAR(10 g) = 0.188 mW/g

Maximum value of SAR (measured) = 0.302 mW/g

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0 dB = 0.302mW/g

4.12 GSM850-Body worm-EGPRS-Mid

Blank

4.13 GSM850-Body worm- Worstcase-Low

Blank

4.14 GSM850-Body worm- Worstcase-High

Blank

4.15 GSM850-Body worm- Worstcase-Low+BT

Blank

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GSM1900

4.16 GSM1900-Lefthandside-Cheek-Mid

Date/Time: 2008-6-27 8:42:51

Test Laboratory: SGS-GSM

PCS1900-LeftHandSide-GSM--Check-Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL1900_Head Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 39$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

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

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

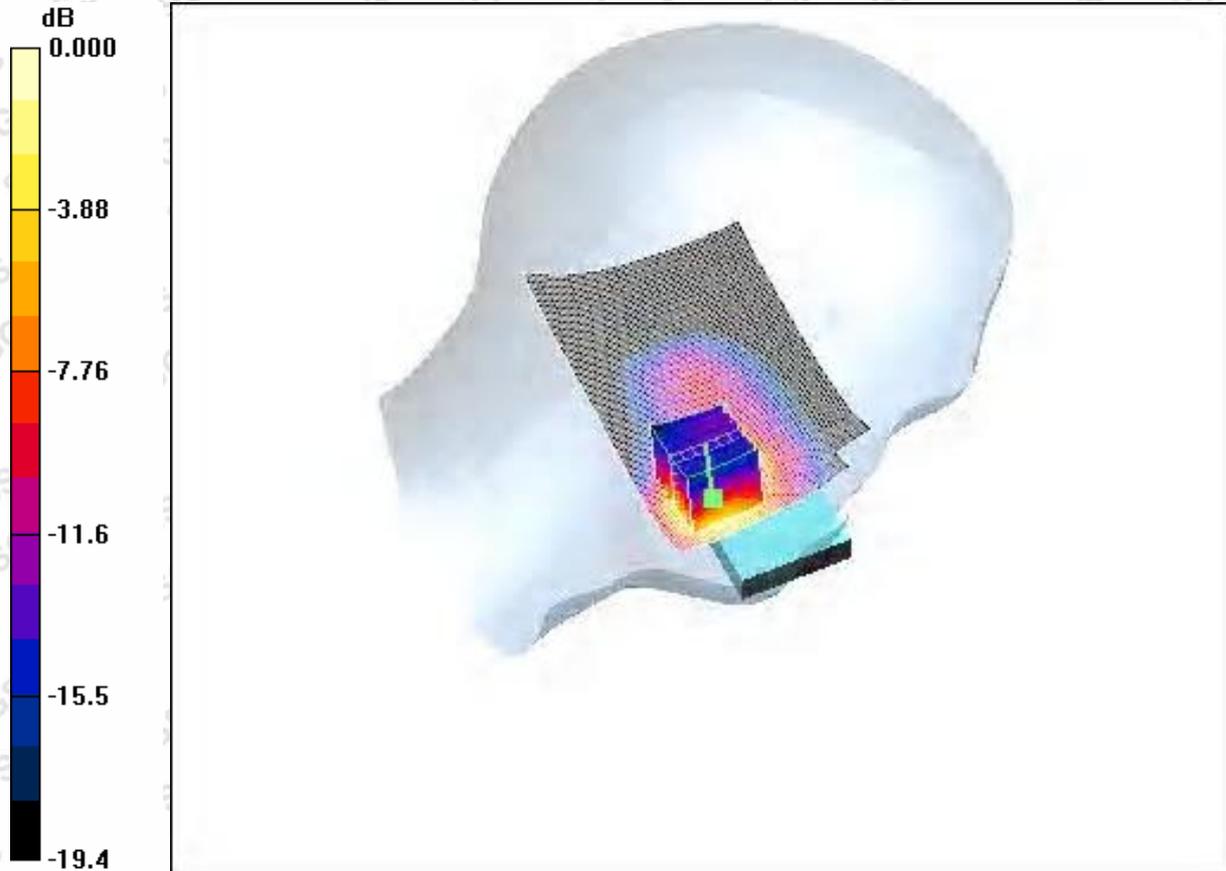
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Reference Value = 5.36 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 1.01 W/kg

SAR(1 g) = 0.555 mW/g; SAR(10 g) = 0.283 mW/g

Maximum value of SAR (measured) = 0.629 mW/g



0 dB = 0.629mW/g

4.17 GSM1900-Lefthandside-Tilt-Mid

Date/Time: 2008-6-27 10:30:20

Test Laboratory: SGS-GSM

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SHGSM
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PCS1900-LeftHandSide-GSM--Tilt--Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL1900_Head Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

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

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

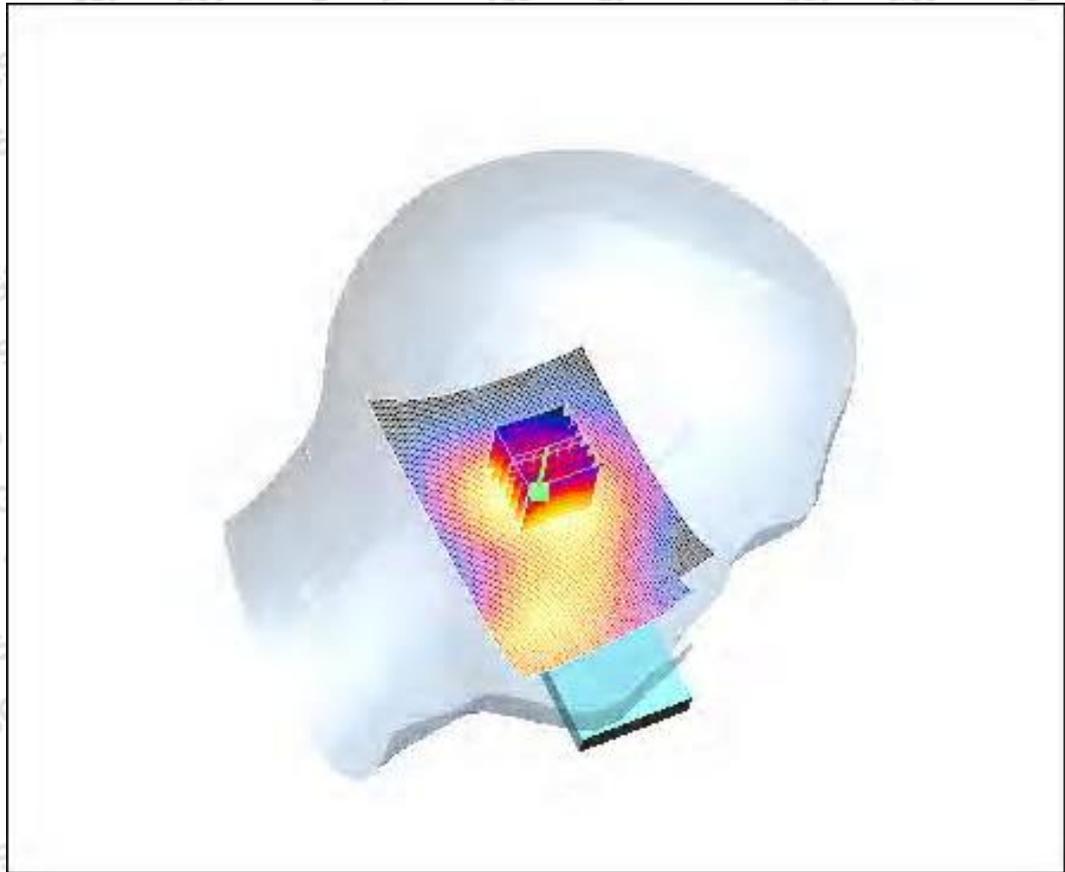
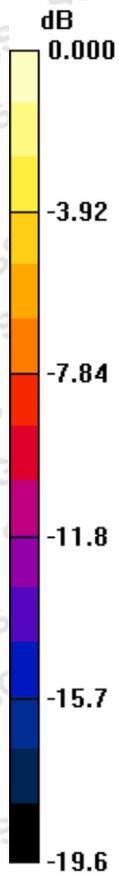
Reference Value = 8.65 V/m; Power Drift = 0.047 dB

Peak SAR (extrapolated) = 0.162 W/kg

SAR(1 g) = 0.104 mW/g; SAR(10 g) = 0.061 mW/g

Maximum value of SAR (measured) = 0.114 mW/g

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0 dB = 0.114mW/g

4.18 GSM1900-Lefthandside-Worstcase-Low

Blank

4.19 GSM1900-Lefthandside-Worstcase-High

Blank

4.20 GSM1900-Lefthandside-Worstcase-Low+BT

Blank

4.21 GSM1900-Righthandside-Cheek-Mid

Date/Time: 2008-6-27 10:55:42

Test Laboratory: SGS-GSM

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PCS1900-RightHandSide--GSM-Check--Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL1900_Head Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.471 mW/g

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

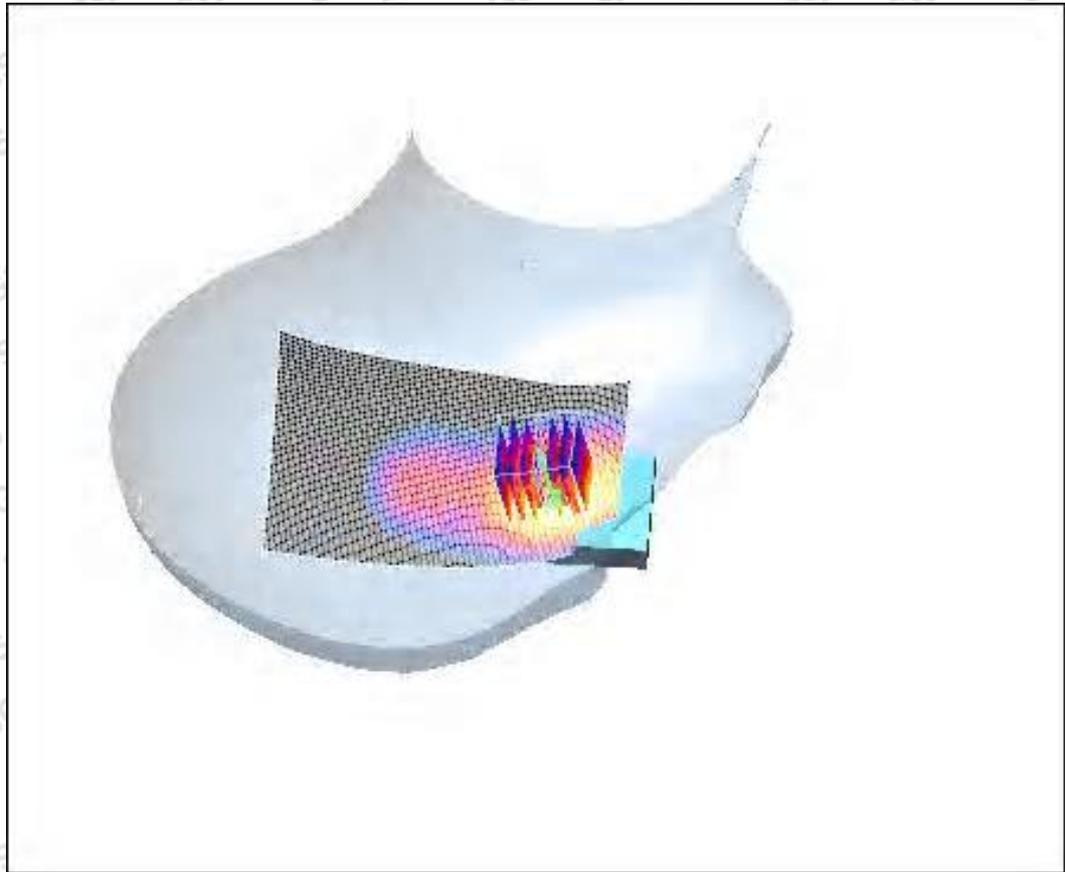
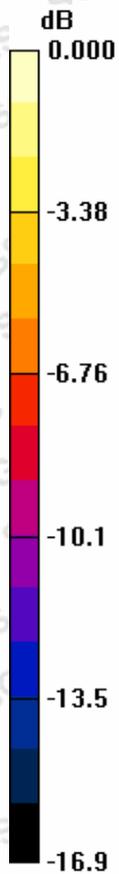
Reference Value = 5.56 V/m; Power Drift = 0.115 dB

Peak SAR (extrapolated) = 0.631 W/kg

SAR(1 g) = 0.411 mW/g; SAR(10 g) = 0.238 mW/g

Maximum value of SAR (measured) = 0.450 mW/g

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0 dB = 0.450mW/g

4.22 GSM1900-Righthandside-Tilt-Mid

Date/Time: 2008-6-27 12:44:32

Test Laboratory: SGS-GSM

PCS1900-RightHandSide--GSM-Tilt--Mid

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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SHGSM

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

Medium: HSL1900_Head Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Tilt position - Middle BYD/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.115 mW/g

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

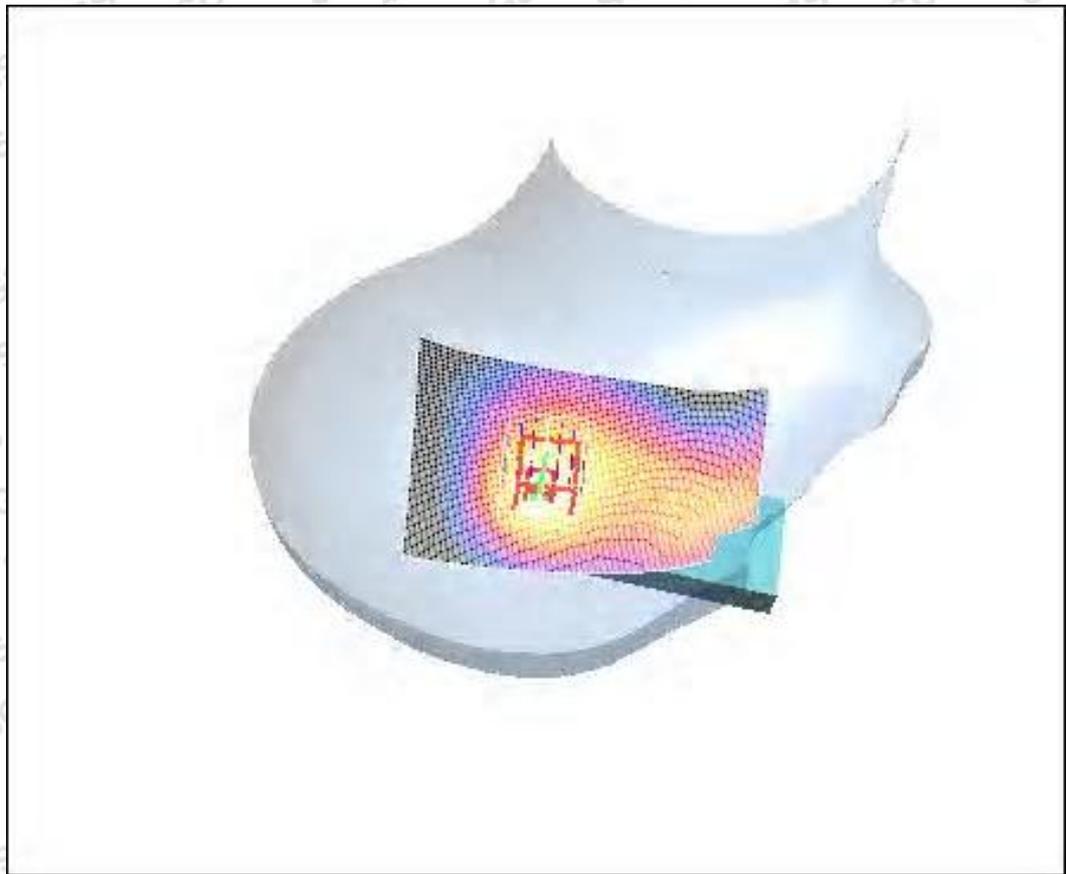
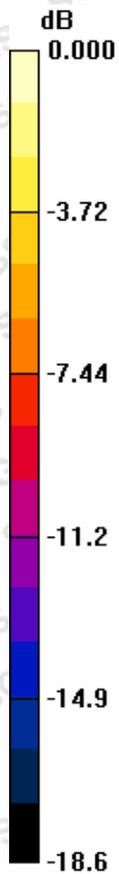
Reference Value = 8.15 V/m; Power Drift = 0.059 dB

Peak SAR (extrapolated) = 0.139 W/kg

SAR(1 g) = 0.092 mW/g; SAR(10 g) = 0.054 mW/g

Maximum value of SAR (measured) = 0.101 mW/g

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0 dB = 0.101mW/g

4.23 GSM1900-Righthandside-Worstcase-Low

Blank

4.24 GSM1900-Righthandside-Worstcase-High

Blank

4.25 GSM1900-Righthandside-Worstcase-Low+BT

Blank

4.26 GSM1900-Body worm-GPRS-Mid

Date/Time: 2008-6-19 20:37:15

Test Laboratory: SGS-GSM

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PCS1900-Body-Worn--GPRS--Mid-1.5cm

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL1900_Body Medium parameters used: $f = 1880$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 51.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

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

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

Maximum value of SAR (interpolated) = 0.165 mW/g

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

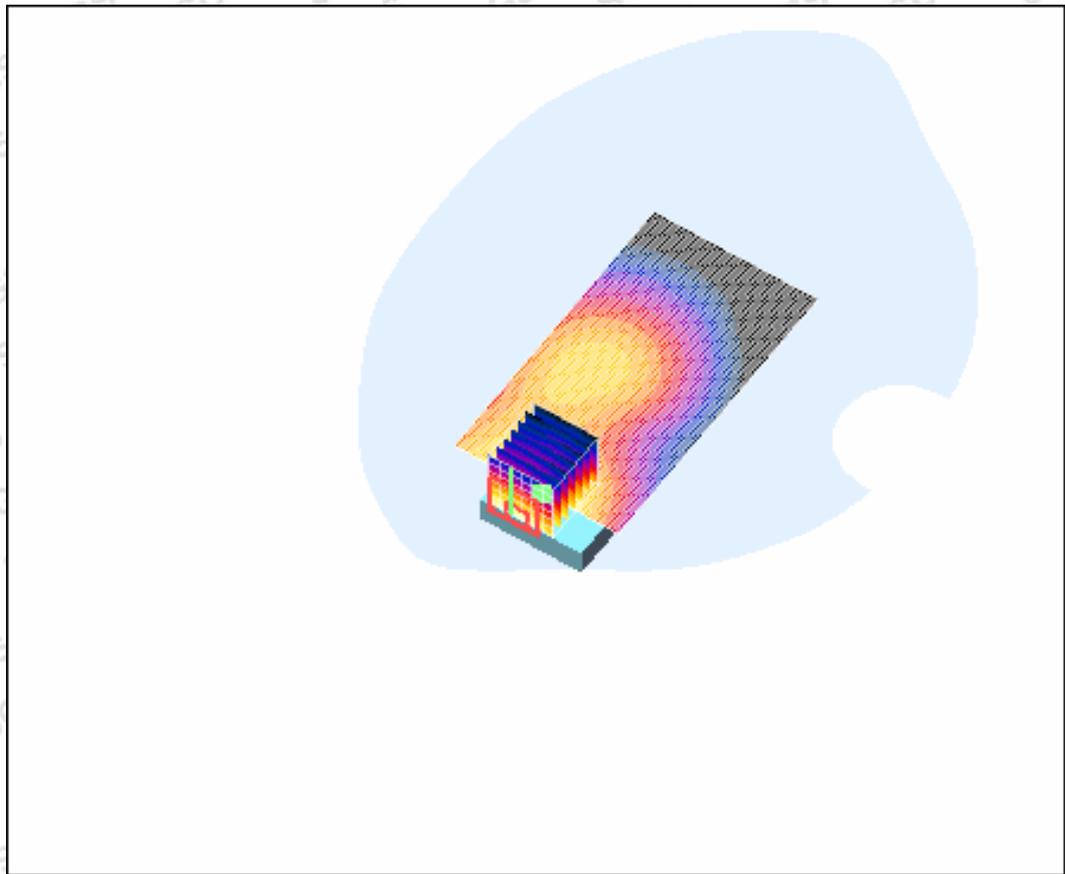
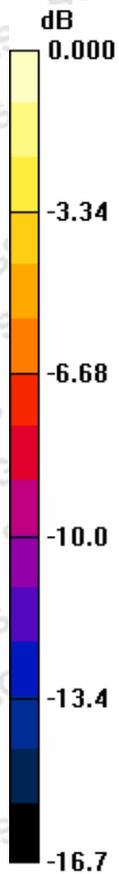
Reference Value = 3.28 V/m; Power Drift = 0.140 dB

Peak SAR (extrapolated) = 0.297 W/kg

SAR(1 g) = 0.175 mW/g; SAR(10 g) = 0.100 mW/g

Maximum value of SAR (measured) = 0.196 mW/g

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0 dB = 0.196mW/g

4.27 GSM1900-Body worm-EGPRS-Mid

Blank

4.28 GSM1900-Body worm- Worstcase-Low

Blank

4.29 GSM1900-Body worm- Worstcase-High

Blank

4.30 GSM1900-Body worm- Worstcase-Low+BT

Blank

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WCDMA850

4.31 WCDMA850-Lefthandside-Cheek-Mid

Date/Time: 2008-6-23 21:20:44

Test Laboratory: SGS-GSM

W850-LeftHandSide-Voice-Check-Mid

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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

Medium: HSL850-Head Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.905$ mho/m; $\epsilon_r = 42.8$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.207 mW/g

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

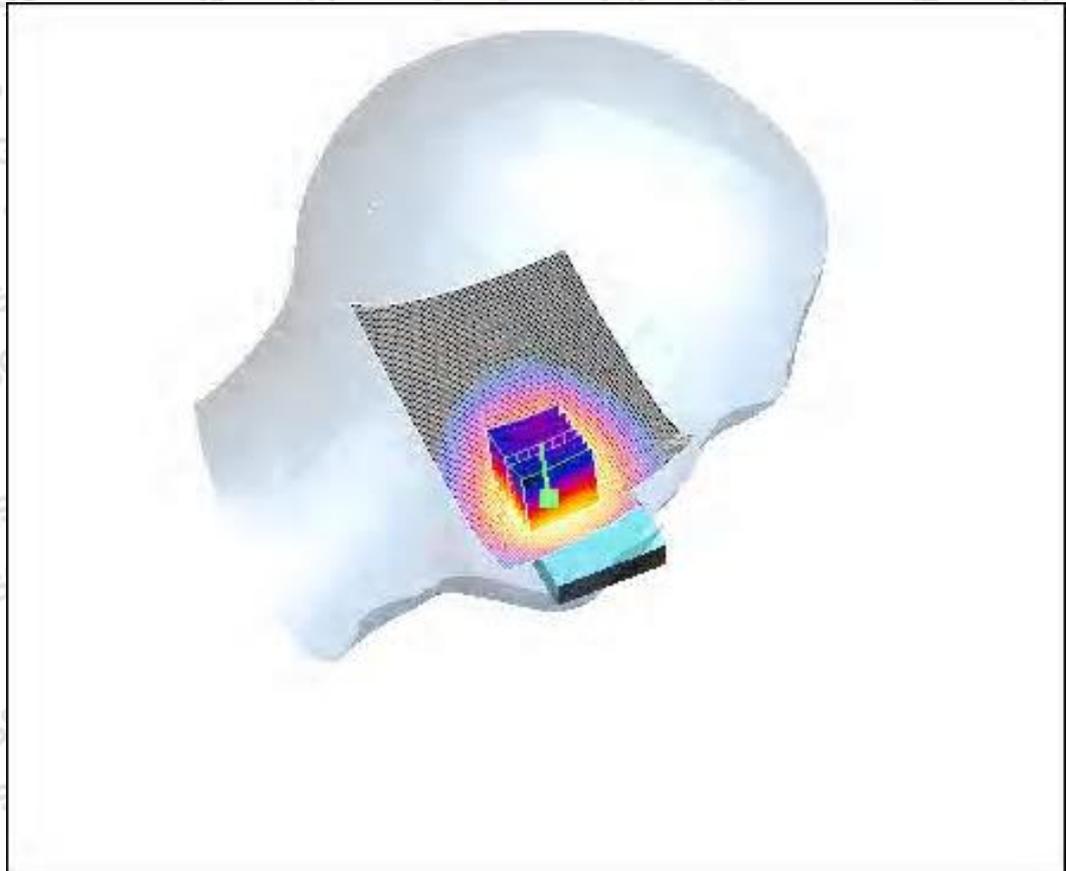
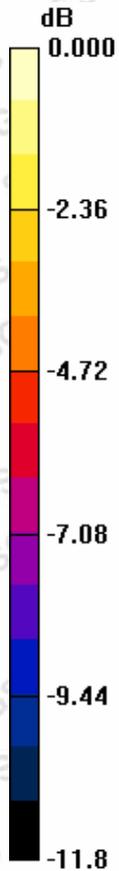
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Reference Value = 3.97 V/m; Power Drift = -0.223 dB

Peak SAR (extrapolated) = 0.267 W/kg

SAR(1 g) = 0.184 mW/g; SAR(10 g) = 0.123 mW/g

Maximum value of SAR (measured) = 0.200 mW/g



0 dB = 0.200mW/g

4.32 WCDMA850-Lefthandside-Tilt-Mid

Date/Time: 2008-6-23 21:46:33

Test Laboratory: SGS-GSM

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SHGSM
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W850-LeftHandSide-Voice-Tilt-Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL850-Head Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.905$ mho/m; $\epsilon_r = 42.8$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

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

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

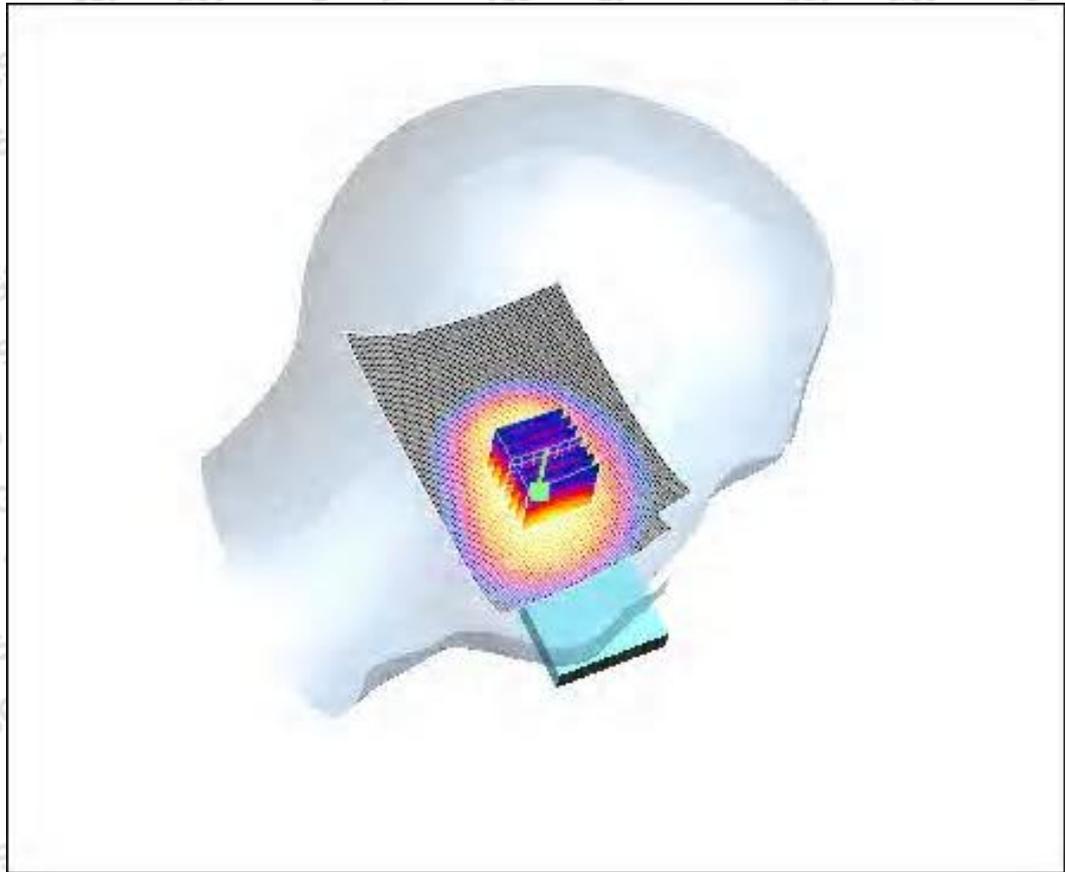
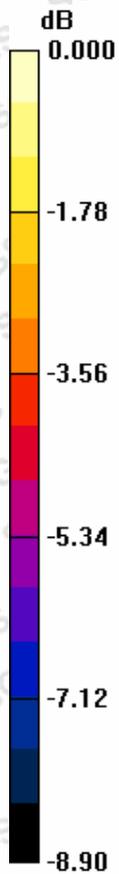
Reference Value = 8.98 V/m; Power Drift = -0.096 dB

Peak SAR (extrapolated) = 0.145 W/kg

SAR(1 g) = 0.113 mW/g; SAR(10 g) = 0.082 mW/g

Maximum value of SAR (measured) = 0.121 mW/g

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0 dB = 0.121mW/g

4.33 WCDMA850-Lefthandside-Worstcase-Low

Blank

4.34 WCDMA850-Lefthandside-Worstcase-High

Blank

4.35 WCDMA850-Lefthandside-Worstcase-Low+BT

Blank

4.36 WCDMA850-Righthandside-Cheek-Mid

Date/Time: 2008-6-23 23:03:02

Test Laboratory: SGS-GSM

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W850-RightHandSide-Voice--Check-Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL850-Head Medium parameters used: $f = 836.4 \text{ MHz}$; $\sigma = 0.905 \text{ mho/m}$; $\epsilon_r = 42.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Cheek position - Middle/Area Scan (61x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.208 mW/g

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

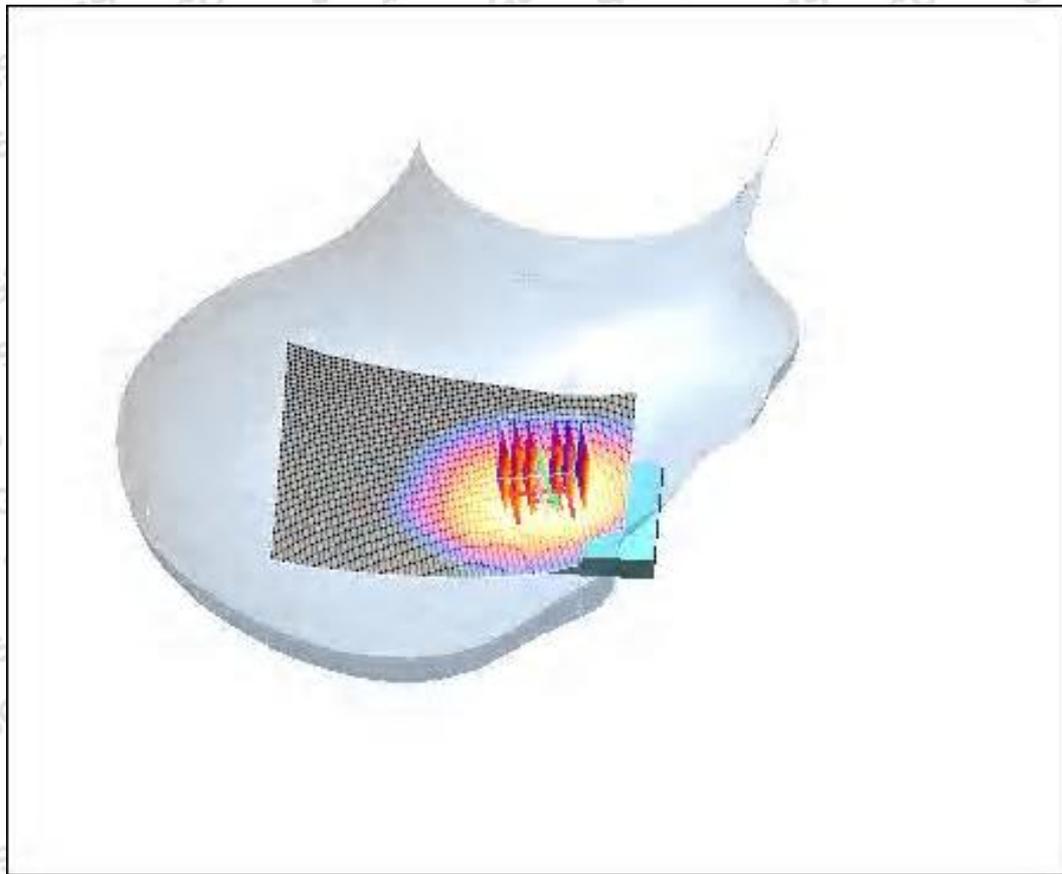
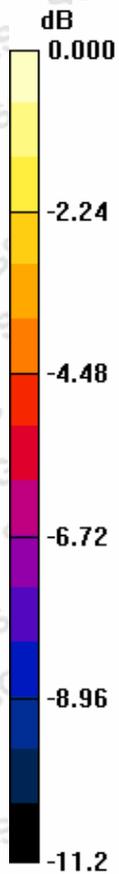
Reference Value = 4.54 V/m; Power Drift = 0.210 dB

Peak SAR (extrapolated) = 0.246 W/kg

SAR(1 g) = 0.189 mW/g; SAR(10 g) = 0.134 mW/g

Maximum value of SAR (measured) = 0.201 mW/g

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0 dB = 0.201mW/g

4.37 WCDMA850-Righthandside-Tilt-Mid

Date/Time: 2008-6-23 23:26:59

Test Laboratory: SGS-GSM

W850-RightHandSide-Voice--Tilt--Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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SHGSM

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

Medium: HSL850-Head Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.905$ mho/m; $\epsilon_r = 42.8$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.114 mW/g

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

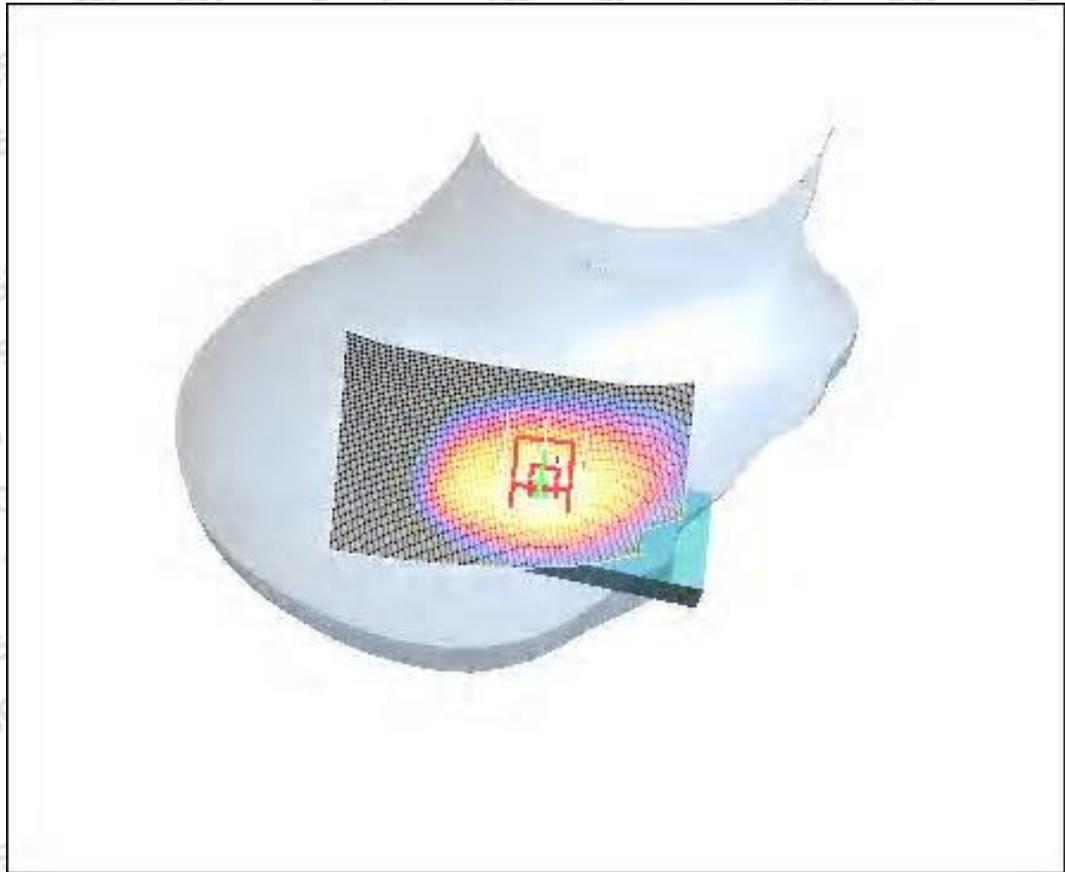
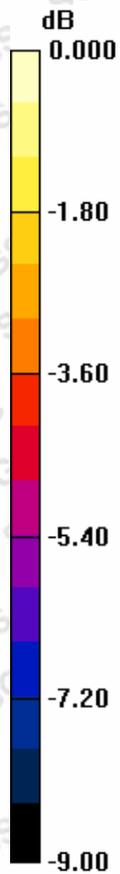
Reference Value = 8.45 V/m; Power Drift = 0.262 dB

Peak SAR (extrapolated) = 0.137 W/kg

SAR(1 g) = 0.107 mW/g; SAR(10 g) = 0.078 mW/g

Maximum value of SAR (measured) = 0.115 mW/g

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0 dB = 0.115mW/g

4.38 WCDMA850-Righthandside-Worstcase-Low

Blank

4.39 WCDMA850-Righthandside-Worstcase-High

Blank

4.40 WCDMA850-Righthandside-Worstcase-Low+BT

Blank

4.41 WCDMA850-Body worm -Mid

Date/Time: 2008-6-20 16:13:40

Test Laboratory: SGS-GSM

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W850-Body-Worn-Voice--Mid-1.5cm

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL 850_Body Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

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

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

Maximum value of SAR (interpolated) = 0.287 mW/g

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

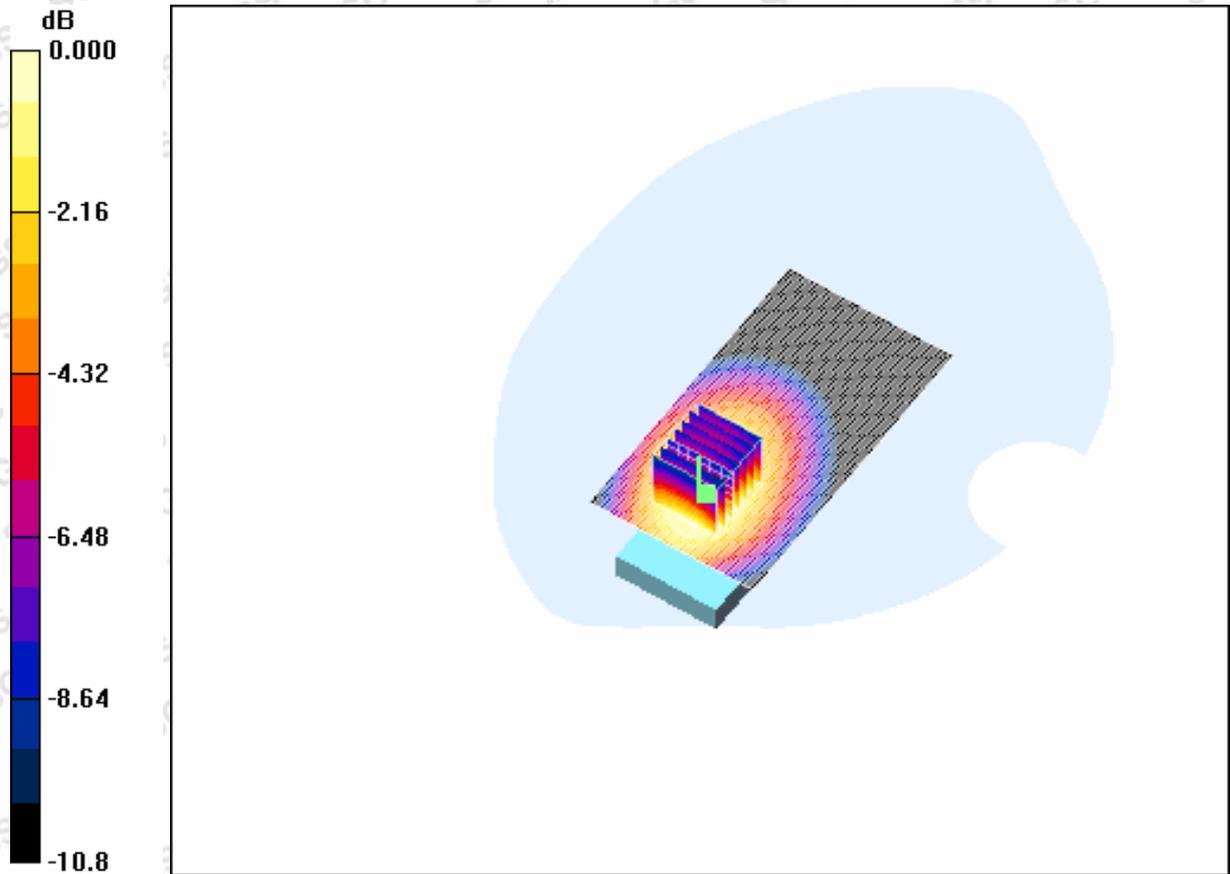
Reference Value = 4.61 V/m; Power Drift = 0.226 dB

Peak SAR (extrapolated) = 0.362 W/kg

SAR(1 g) = 0.269 mW/g; SAR(10 g) = 0.189 mW/g

Maximum value of SAR (measured) = 0.286 mW/g

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0 dB = 0.286mW/g

4.42 WCDMA850-Body worm-HSDPA-Mid

Blank

4.43 WCDMA850-Body worm- Worstcase-Low

Blank

4.44 WCDMA850-Body worm- Worstcase-High

Blank

4.45 WCDMA850-Body worm- Worstcase-Low+BT

Blank

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SHGSM

WCDMA1900

4.46 WCDMA1900-LeftHandside-Cheek-Mid

Date/Time: 2008-6-27 17:29:42

Test Laboratory: SGS-GSM

W1900-LeftHandSide-Voice-Check--Mid

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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

Medium: HSL1900_Head Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.815 mW/g

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

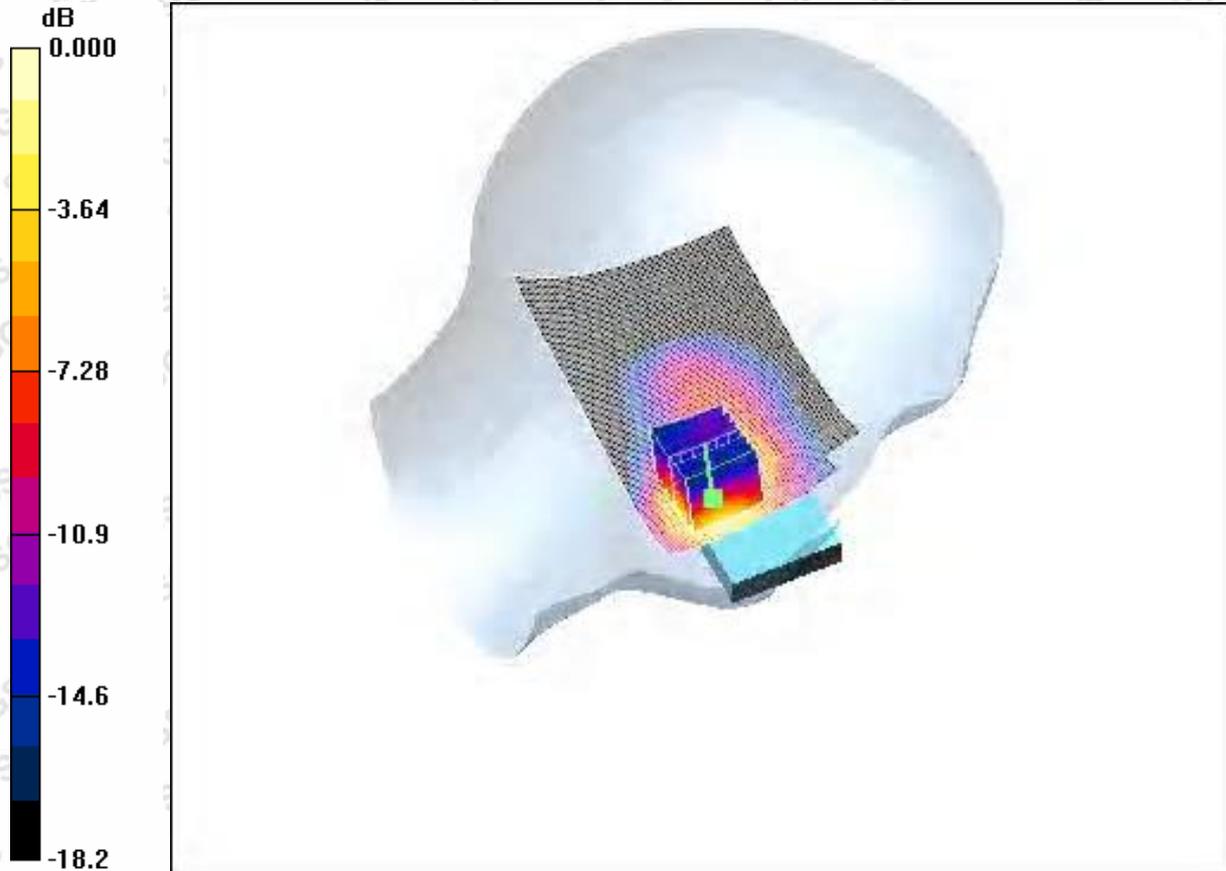
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Reference Value = 6.68 V/m; Power Drift = 0.006 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.704 mW/g; SAR(10 g) = 0.375 mW/g

Maximum value of SAR (measured) = 0.782 mW/g



0 dB = 0.782mW/g

4.47 WCDMA1900-Lefthandside-Tilt-Mid

Date/Time: 2008-6-27 17:58:33

Test Laboratory: SGS-GSM

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W1900-LeftHandSide-Voice--Tilt--Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL1900_Head Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.225 mW/g

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

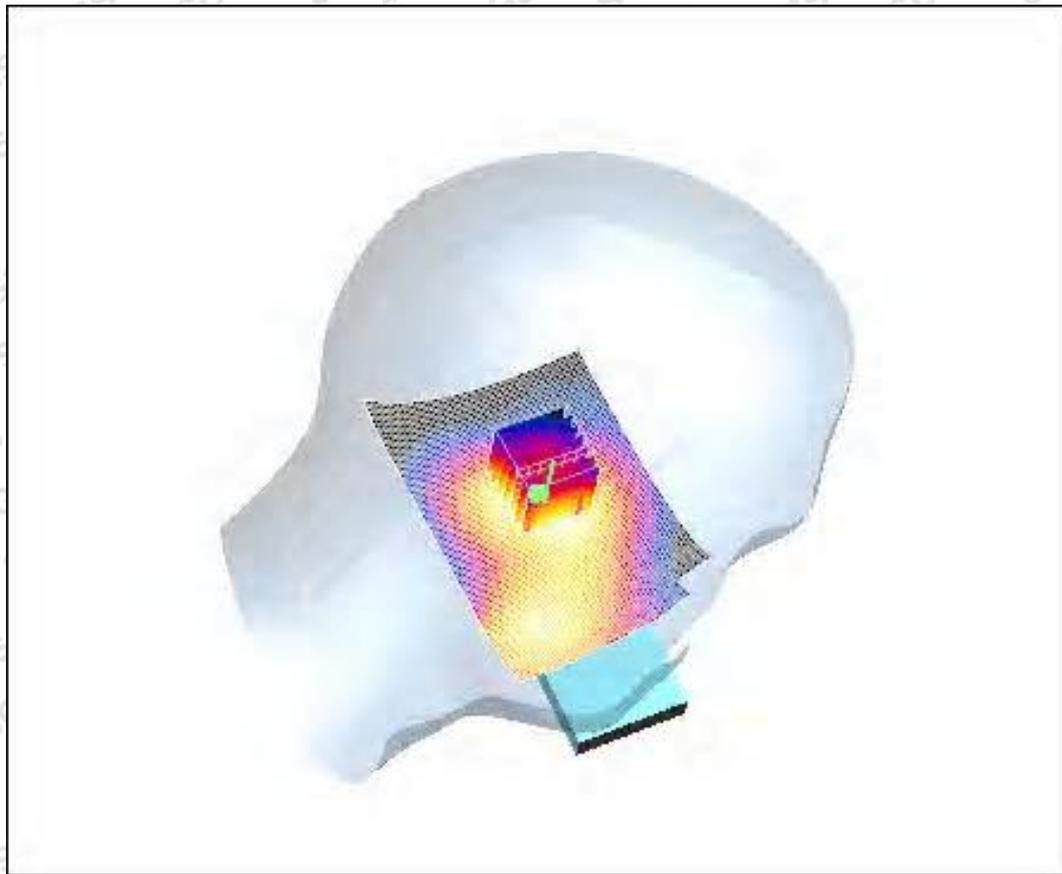
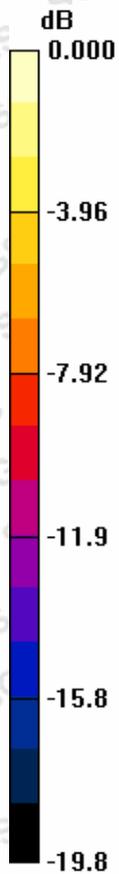
Reference Value = 11.3 V/m; Power Drift = -0.302 dB

Peak SAR (extrapolated) = 0.276 W/kg

SAR(1 g) = 0.176 mW/g; SAR(10 g) = 0.105 mW/g

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

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0 dB = 0.192mW/g

4.48 WCDMA1900-LeftHandSide-Worstcase-Low

Date/Time: 2008-6-27 16:42:54

Test Laboratory: SGS-GSM

W1900-LeftHandSide-Voice-Check--Low

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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SHGSM

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

Medium: HSL1900_Head Medium parameters used (interpolated): $f = 1852.5$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.520 mW/g

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

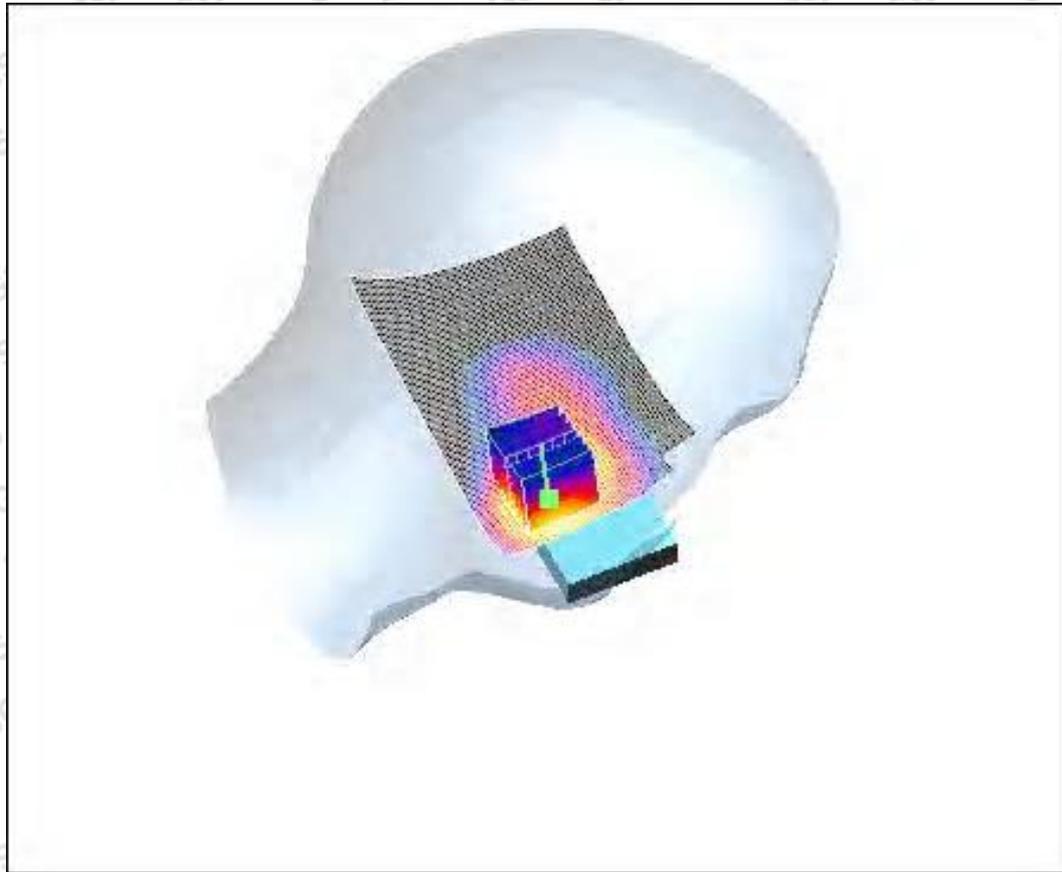
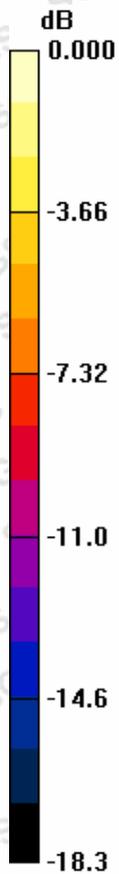
Reference Value = 5.20 V/m; Power Drift = -0.115 dB

Peak SAR (extrapolated) = 0.803 W/kg

SAR(1 g) = 0.457 mW/g; SAR(10 g) = 0.241 mW/g

Maximum value of SAR (measured) = 0.515 mW/g

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0 dB = 0.515mW/g

4.49 WCDMA1900-LeftHandSide-Worstcase-High

Date/Time: 2008-6-27 17:05:46

Test Laboratory: SGS-GSM

W1900-LeftHandSide-Voice-Check--High

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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SHGSM

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

Medium: HSL1900_Head Medium parameters used: $f = 1907.6$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Cheek position - High 2/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.916 mW/g

Cheek position - High 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

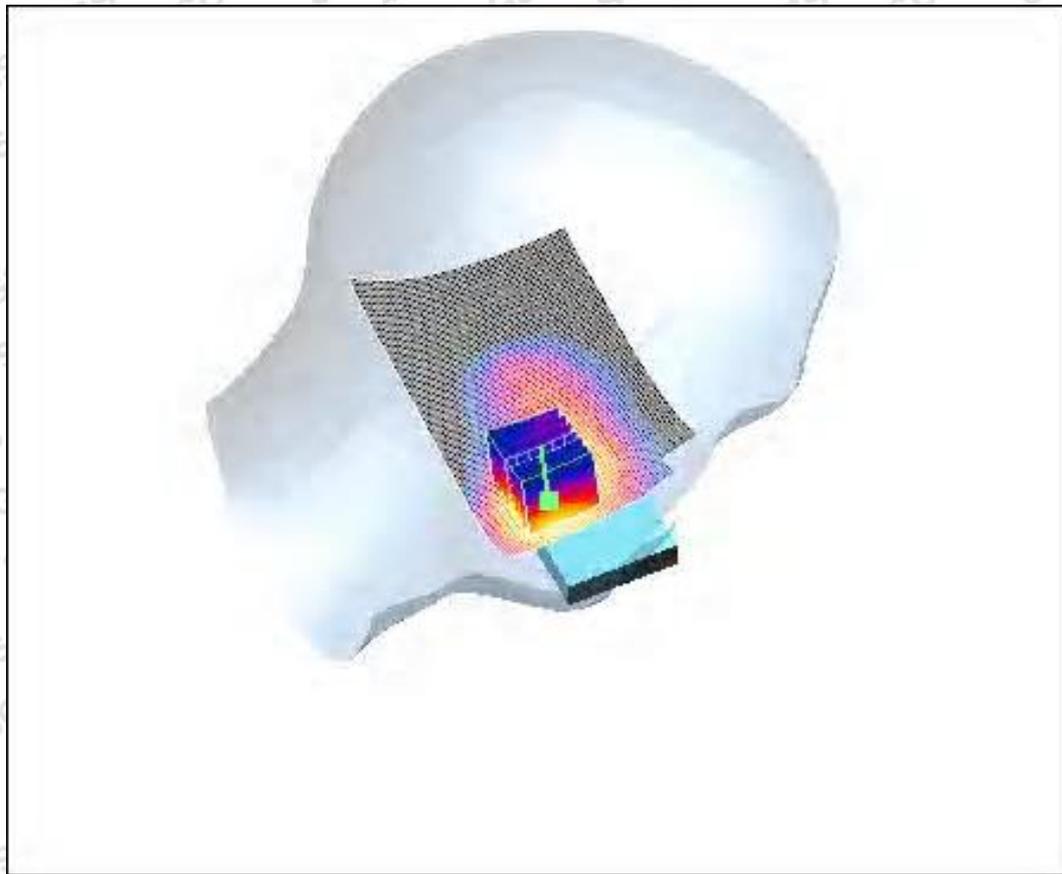
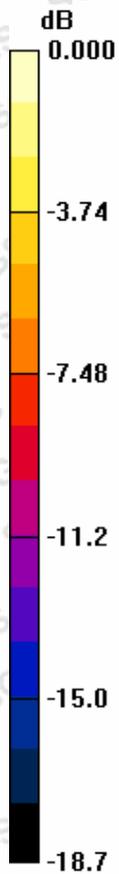
Reference Value = 7.01 V/m; Power Drift = 0.060 dB

Peak SAR (extrapolated) = 1.40 W/kg

SAR(1 g) = 0.802 mW/g; SAR(10 g) = 0.423 mW/g

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

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0 dB = 0.902mW/g

4.50 WCDMA1900-LeftHandSide-Worstcase-High+BT

Date/Time: 2008-6-27 18:23:12

Test Laboratory: SGS-GSM

W1900-LeftHandSide-Voice-Check--High+BT

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL1900_Head Medium parameters used: $f = 1907.6$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.880 mW/g

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

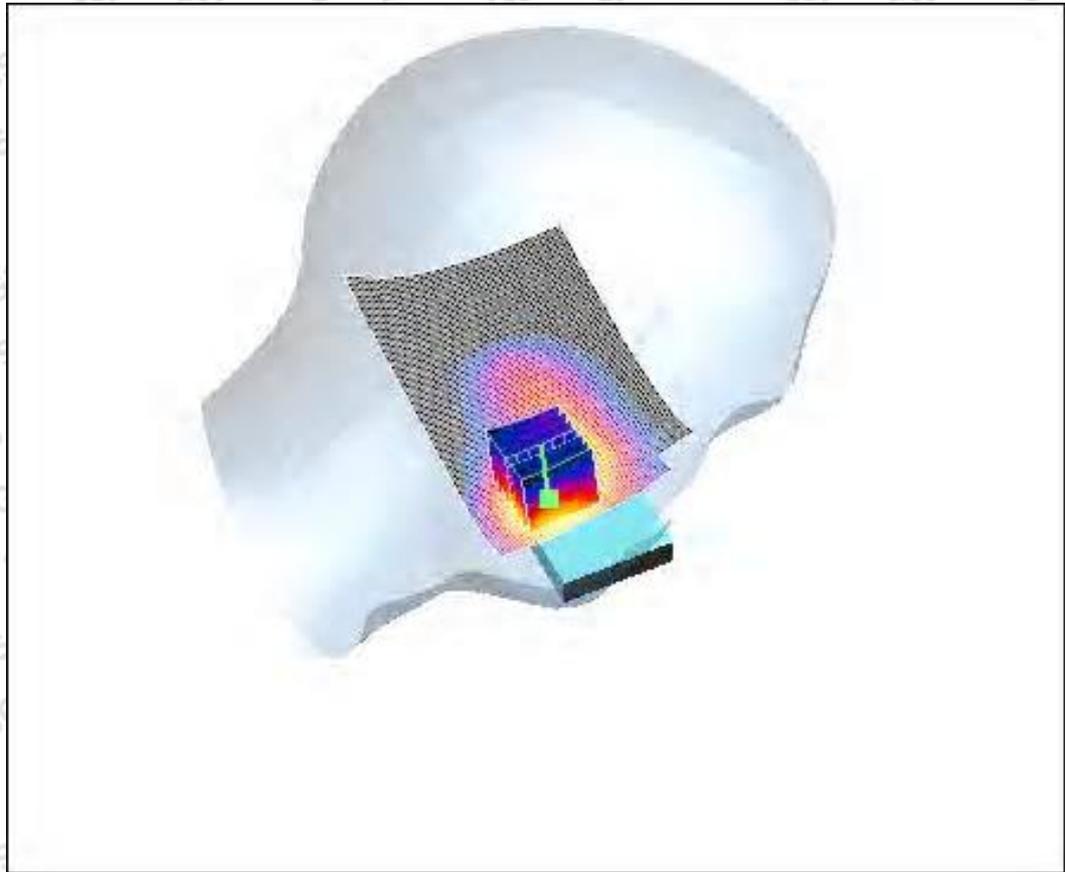
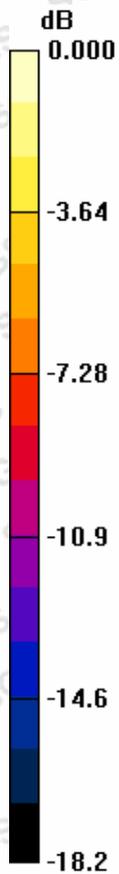
Reference Value = 6.89 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 1.31 W/kg

SAR(1 g) = 0.754 mW/g; SAR(10 g) = 0.397 mW/g

Maximum value of SAR (measured) = 0.855 mW/g

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0 dB = 0.855mW/g

4.51 WCDMA1900-Righthandside-Cheek-Mid

Date/Time: 2008-6-27 13:22:00

Test Laboratory: SGS-GSM

W1900-RightHandSide-Voice--Check--Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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SHGSM

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

Medium: HSL1900_Head Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.940 mW/g

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

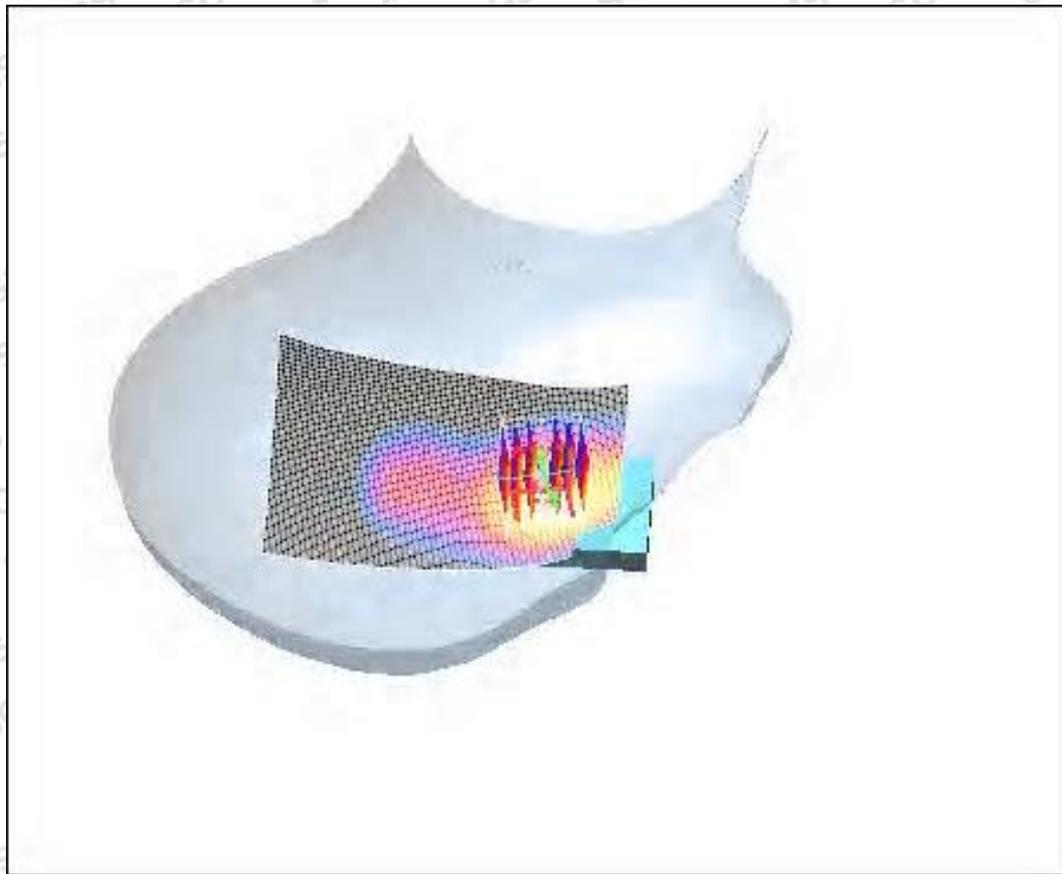
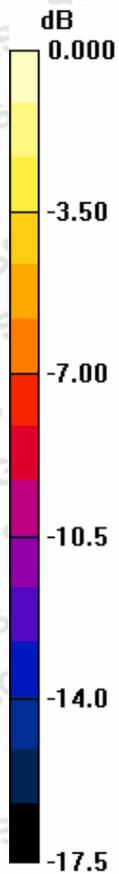
Reference Value = 8.61 V/m; Power Drift = -0.394 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.789 mW/g; SAR(10 g) = 0.451 mW/g

Maximum value of SAR (measured) = 0.862 mW/g

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0 dB = 0.862mW/g

4.52 WCDMA1900-Righthandside-Tilt-Mid

Date/Time: 2008-6-27 14:42:48

Test Laboratory: SGS-GSM

W1900-RightHandSide-Voice--Tilt--Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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SHGSM

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

Medium: HSL1900_Head Medium parameters used: $f = 1880$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.184 mW/g

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

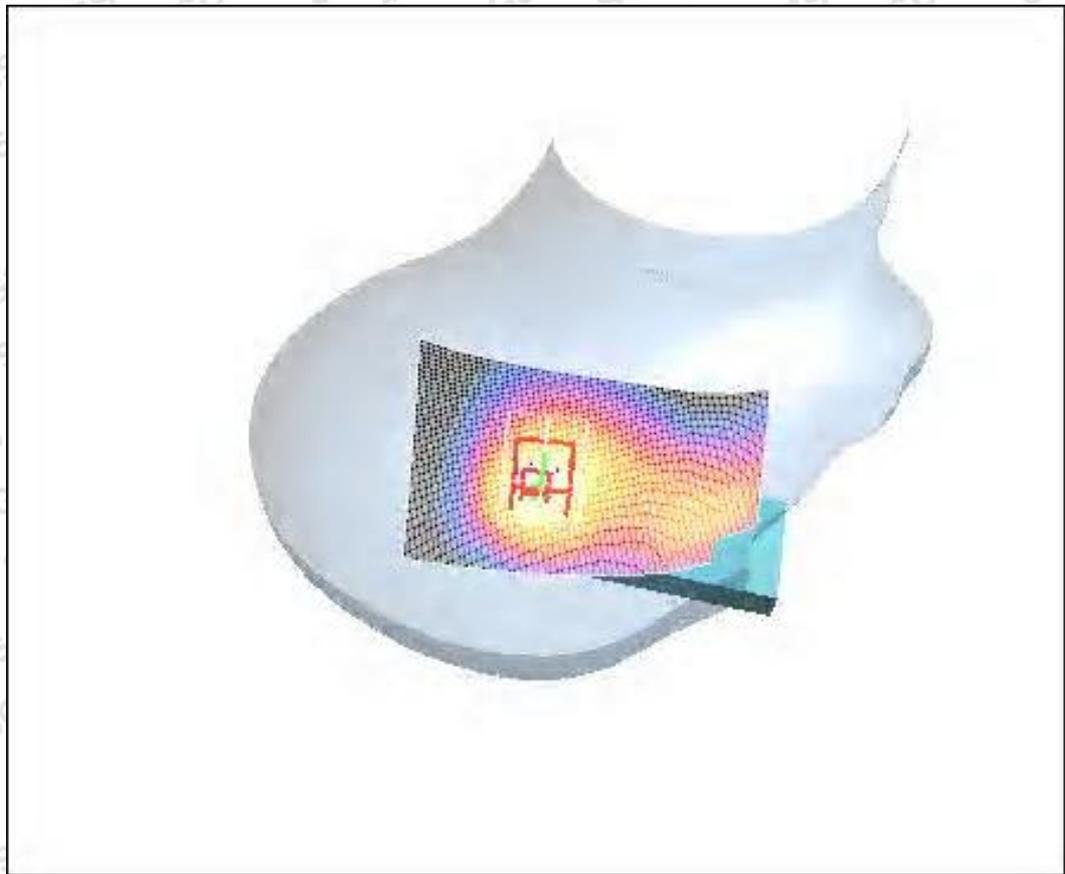
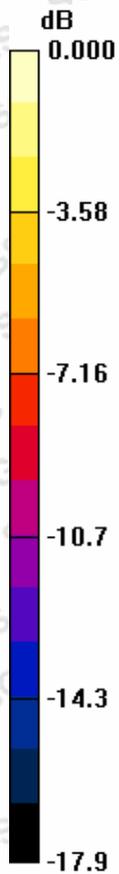
Reference Value = 10.8 V/m; Power Drift = 0.034 dB

Peak SAR (extrapolated) = 0.235 W/kg

SAR(1 g) = 0.152 mW/g; SAR(10 g) = 0.089 mW/g

Maximum value of SAR (measured) = 0.167 mW/g

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0 dB = 0.167mW/g

4.53 WCDMA1900-Righthandside-Worstcase-Low

Date/Time: 2008-6-27 14:16:21

Test Laboratory: SGS-GSM

W1900-RightHandSide-Voice--Check--Low

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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SHGSM

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

Medium: HSL1900_Head Medium parameters used (interpolated): $f = 1852.5$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 39.1$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.566 mW/g

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

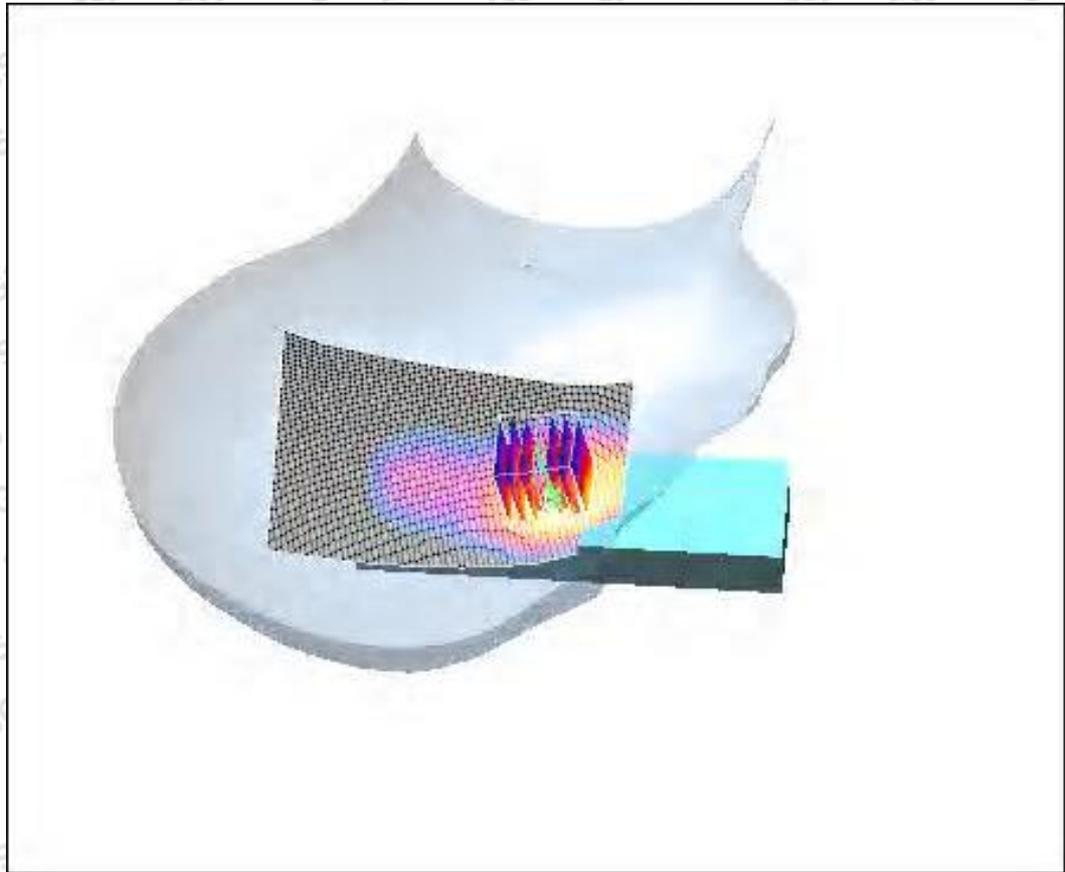
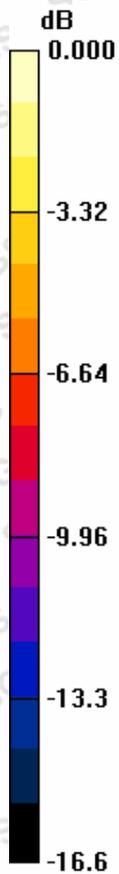
Reference Value = 5.84 V/m; Power Drift = 0.211 dB

Peak SAR (extrapolated) = 0.743 W/kg

SAR(1 g) = 0.476 mW/g; SAR(10 g) = 0.272 mW/g

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

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0 dB = 0.526mW/g

4.54 WCDMA1900-Righthandside-Worstcase-High

Date/Time: 2008-6-27 13:45:52

Test Laboratory: SGS-GSM

W1900-RightHandSide-Voice--Check--High

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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SHGSM

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

Medium: HSL1900_Head Medium parameters used: $f = 1907.6$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

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

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

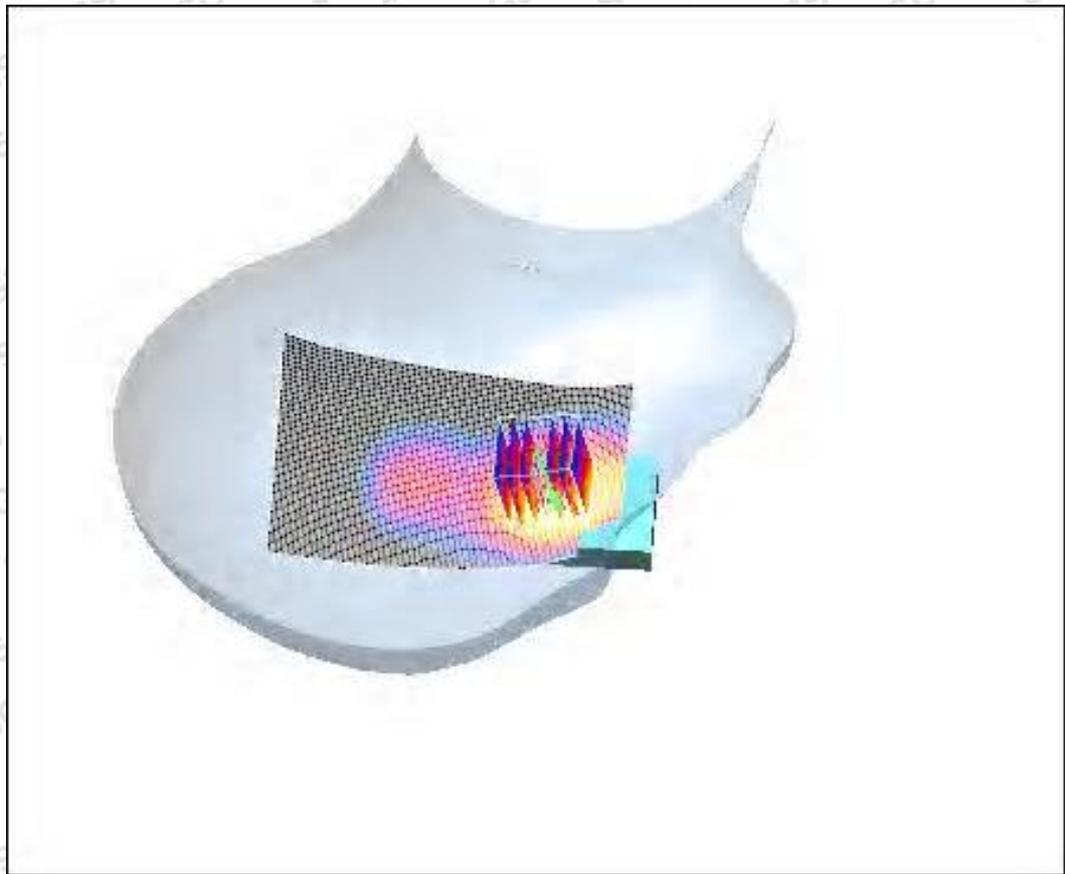
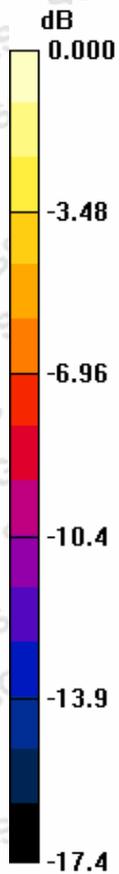
Reference Value = 8.59 V/m; Power Drift = 0.034 dB

Peak SAR (extrapolated) = 1.30 W/kg

SAR(1 g) = 0.837 mW/g; SAR(10 g) = 0.485 mW/g

Maximum value of SAR (measured) = 0.914 mW/g

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0 dB = 0.914mW/g

4.55 WCDMA1900-Righthandside-Worstcase-High+BT

Date/Time: 2008-6-27 15:37:07

Test Laboratory: SGS-GSM

W1900-RightHandSide-Voice--Check--High+BT

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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SHGSM

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

Medium: HSL1900_Head Medium parameters used: $f = 1907.6$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Cheek position - High bt 2/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

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

Cheek position - High bt 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm,
dz=5mm

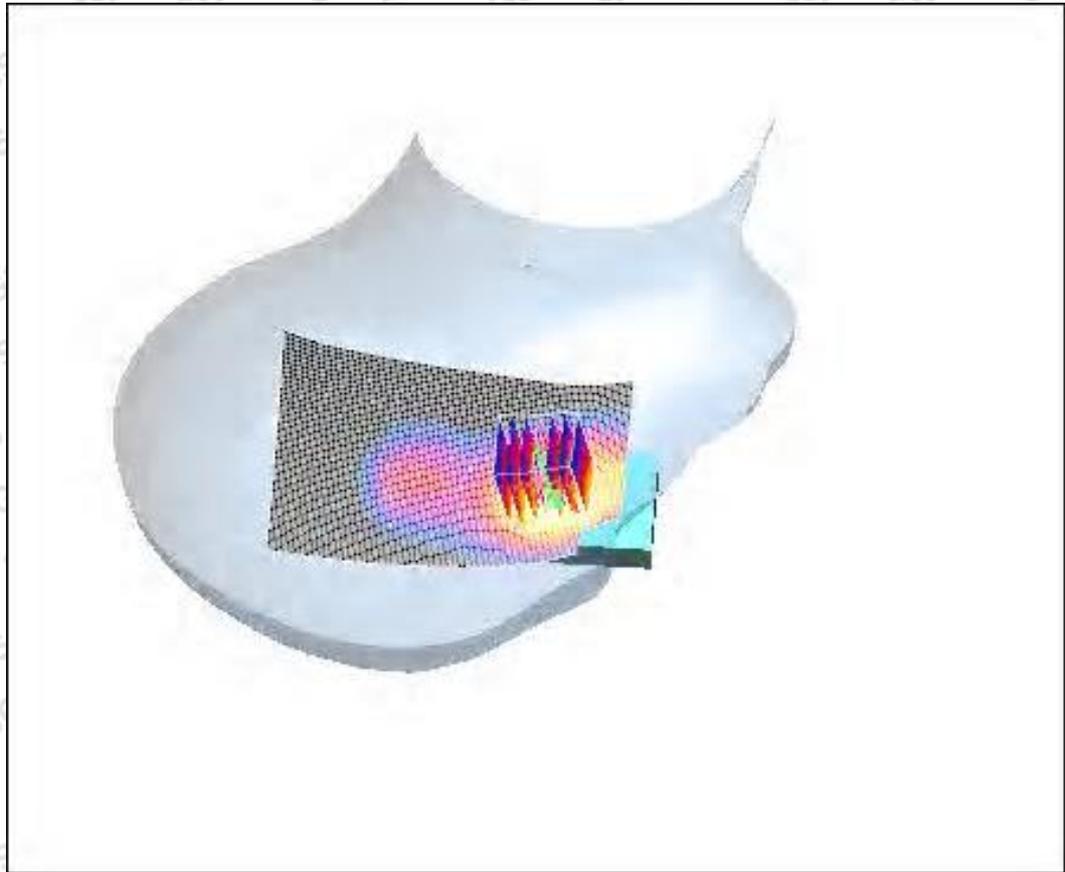
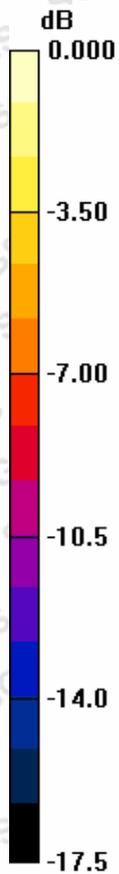
Reference Value = 8.62 V/m; Power Drift = -0.030 dB

Peak SAR (extrapolated) = 1.36 W/kg

SAR(1 g) = 0.850 mW/g; SAR(10 g) = 0.489 mW/g

Maximum value of SAR (measured) = 0.944 mW/g

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0 dB = 0.944mW/g

4.56 WCDMA1900-Body worm -Mid

Date/Time: 2008-6-20 10:37:37

Test Laboratory: SGS-GSM

W1900-Body-Worn-Voice-Mid-1.5cm

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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SHGSM

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

Medium: HSL1900-Body Medium parameters used: $f = 1880$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

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

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

Maximum value of SAR (interpolated) = 0.383 mW/g

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

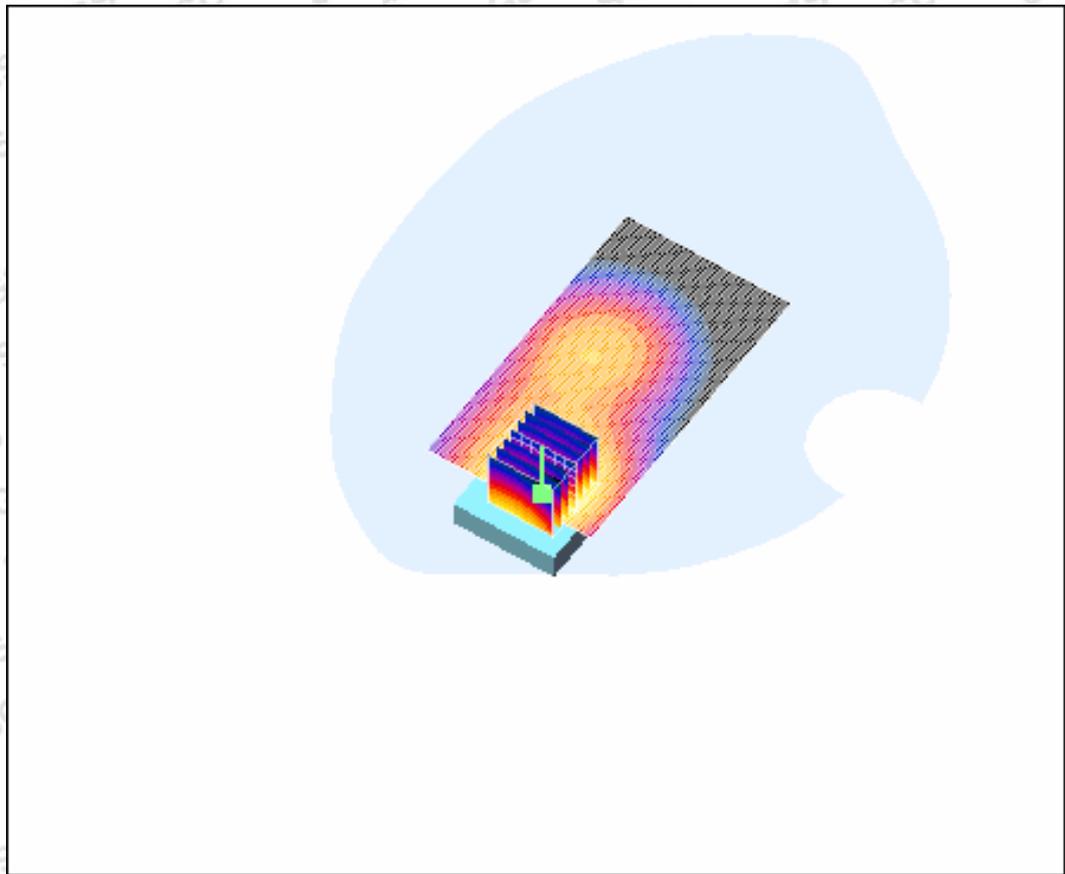
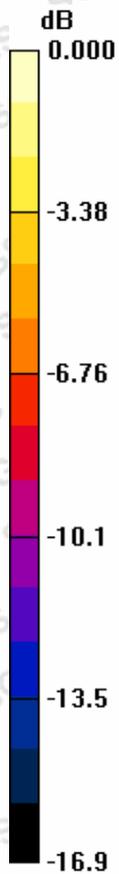
Reference Value = 5.93 V/m; Power Drift = -0.275 dB

Peak SAR (extrapolated) = 0.645 W/kg

SAR(1 g) = 0.364 mW/g; SAR(10 g) = 0.206 mW/g

Maximum value of SAR (measured) = 0.398 mW/g

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0 dB = 0.398mW/g

4.57 WCDMA1900-Body worm-HSDPA-Mid

Date/Time: 2008-6-20 11:58:38

Test Laboratory: SGS-GSM

W1900-Body-Worn-HSDPA-Mid-1.5cm

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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SHGSM

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

Medium: HSL1900-Body Medium parameters used: $f = 1880$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

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

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

Maximum value of SAR (interpolated) = 0.477 mW/g

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

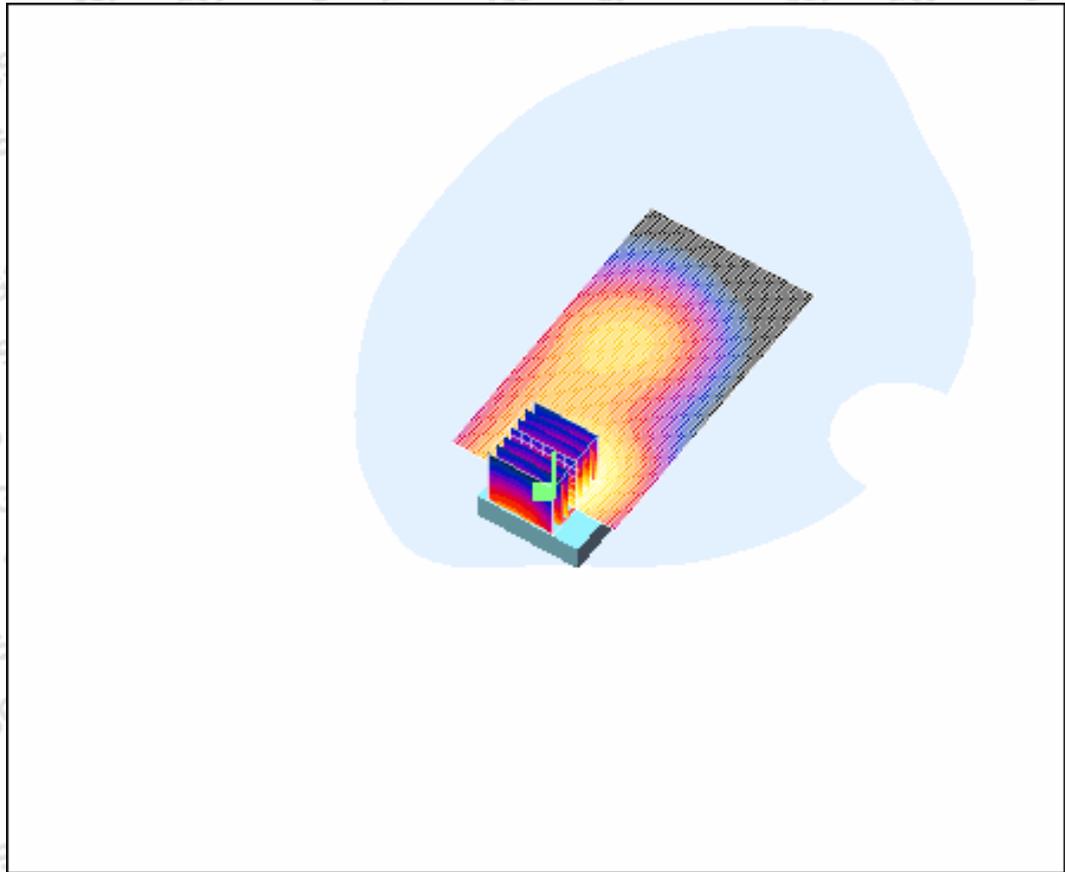
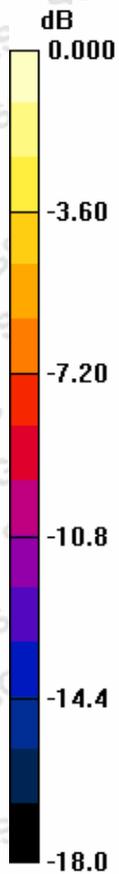
Reference Value = 6.77 V/m; Power Drift = -0.188 dB

Peak SAR (extrapolated) = 0.748 W/kg

SAR(1 g) = 0.416 mW/g; SAR(10 g) = 0.227 mW/g

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

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0 dB = 0.454mW/g

4.58 WCDMA1900-Body worm- Worstcase-Low

Blank

4.59 WCDMA1900-Body worm- Worstcase-High

Blank

4.60 WCDMA1900-Body worm- Worstcase-Low+BT

Blank

Addition for antenna near mouth

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4.61 GSM850-Head worm- Mid-Flat phantom 0.5cm

Date/Time: 2008-7-14 9:58:36

Test Laboratory: SGS-GSM

g850-Head-Worn-Mid-0.5cm

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: HSL850-Head Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.905$ mho/m; $\epsilon_r = 42.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle 2/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.142 mW/g

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

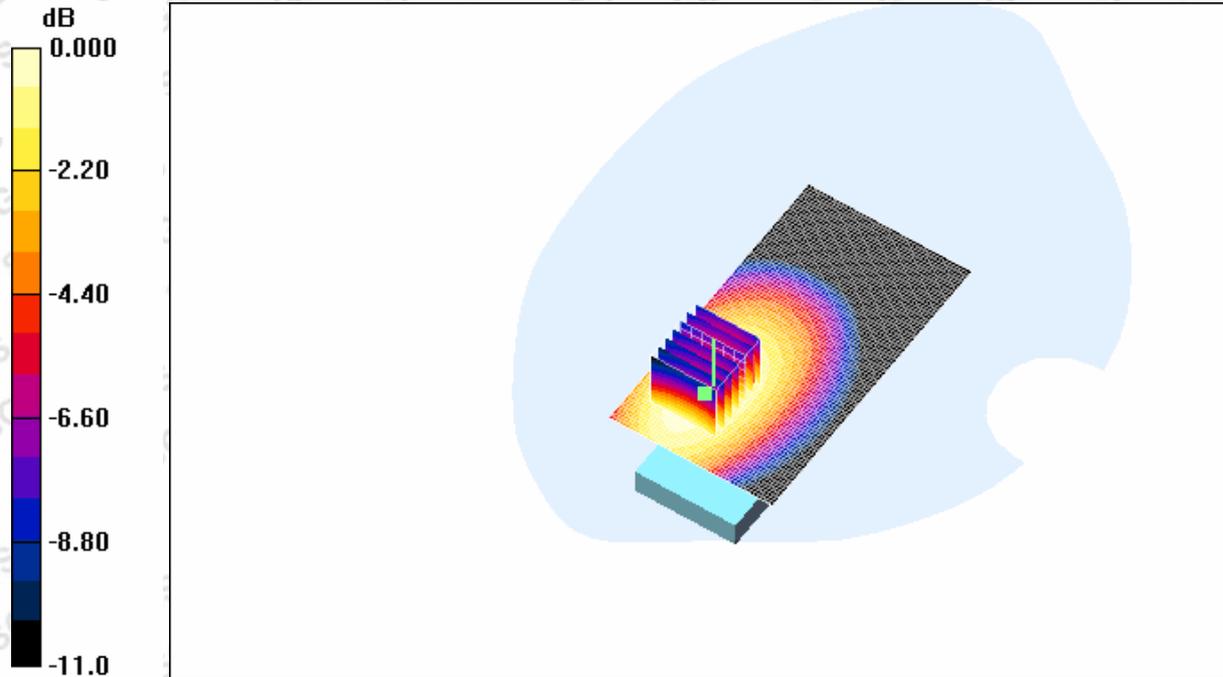
Reference Value = 4.08 V/m; Power Drift = 0.091 dB

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Peak SAR (extrapolated) = 0.177 W/kg

SAR(1 g) = 0.134 mW/g; SAR(10 g) = 0.096 mW/g

Maximum value of SAR (measured) = 0.142 mW/g



0 dB = 0.142mW/g

4.62 WCDMA850-Head worm- Mid-Flat phantom 0.5cm

Date/Time: 2008-7-14 10:42:49

Test Laboratory: SGS-GSM

W850-Head-Worn-Mid-0.5cm-2

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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SHGSM

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

Medium: HSL850-Head Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.905$ mho/m; $\epsilon_r = 42.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.254 mW/g

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

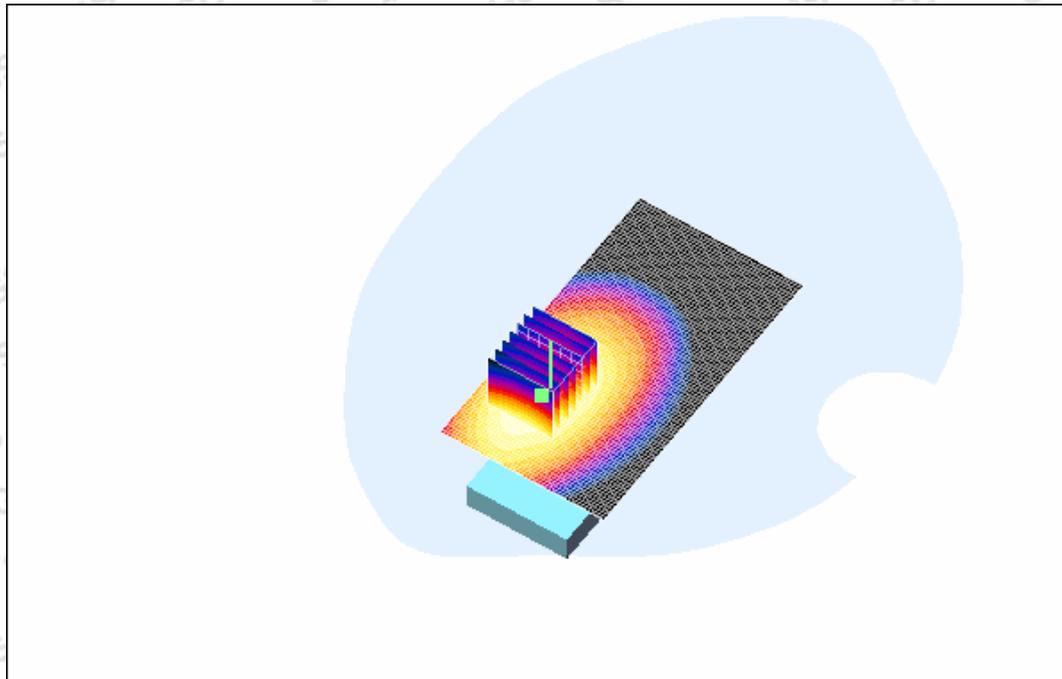
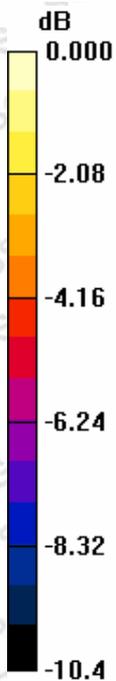
Reference Value = 6.15 V/m; Power Drift = 0.124 dB

Peak SAR (extrapolated) = 0.312 W/kg

SAR(1 g) = 0.235 mW/g; SAR(10 g) = 0.168 mW/g

Maximum value of SAR (measured) = 0.250 mW/g

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0 dB = 0.250mW/g

4.63 WCDMA1900-Head worm- Mid-Flat phantom 0.5cm

Date/Time: 2008-7-15 17:00:35

Test Laboratory: SGS-GSM

W1900 -Head-Worn-Mid-0.5cm

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: 1900-Head Medium parameters used: $f = 1880$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 41.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 1.39 mW/g

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

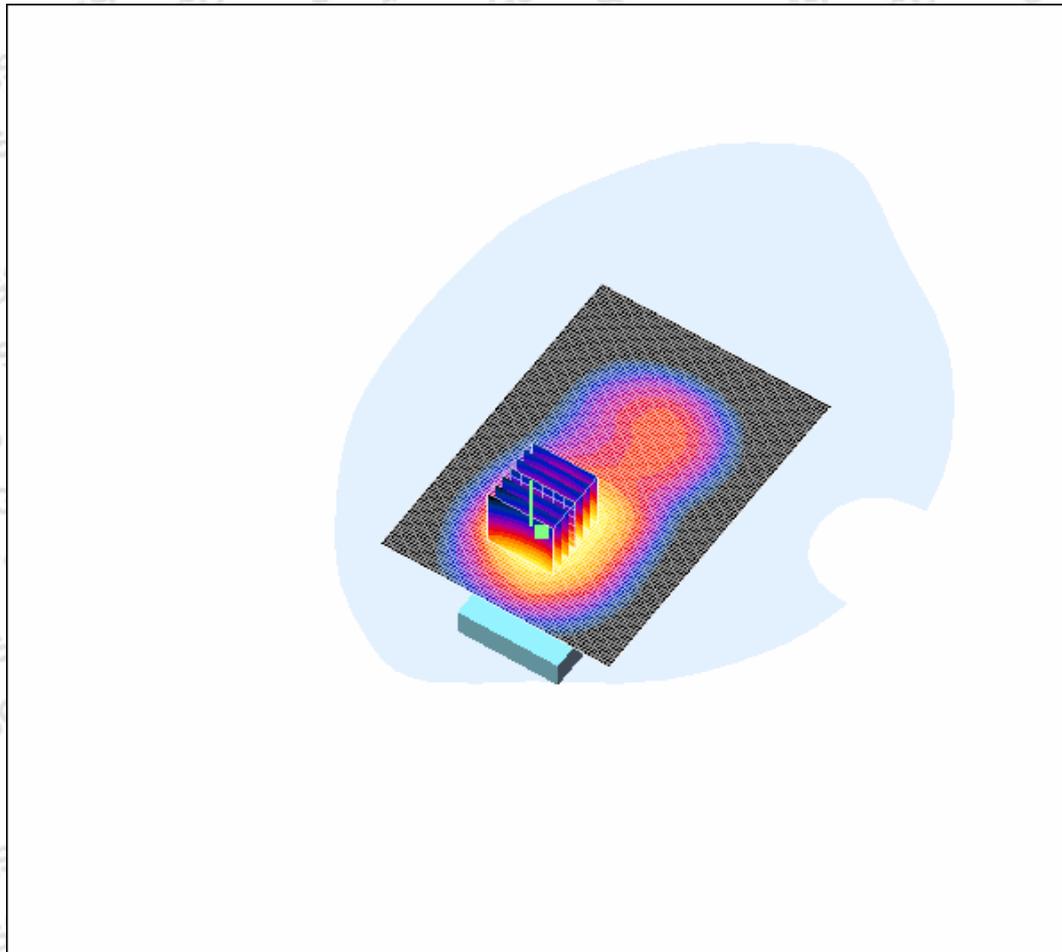
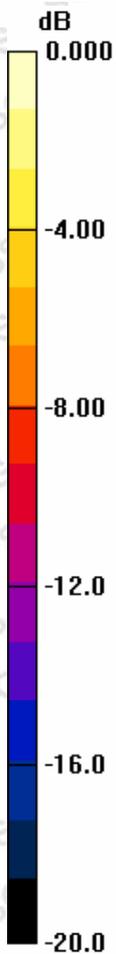
Reference Value = 11.3 V/m; Power Drift = 0.021 dB

Peak SAR (extrapolated) = 2.31 W/kg

SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.081 mW/g

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

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0 dB = 1.25mW/g

4.64 WCDMA1900-Head worm- Low-Flat phantom 0.5cm

Date/Time: 2008-7-15 16:34:16

Test Laboratory: SGS-GSM

W1900 -Head-Worn-Low-0.5cm

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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SHGSM

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

Medium: 1900-Head Medium parameters used (interpolated): $f = 1852.5$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 41.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Low/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.923 mW/g

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

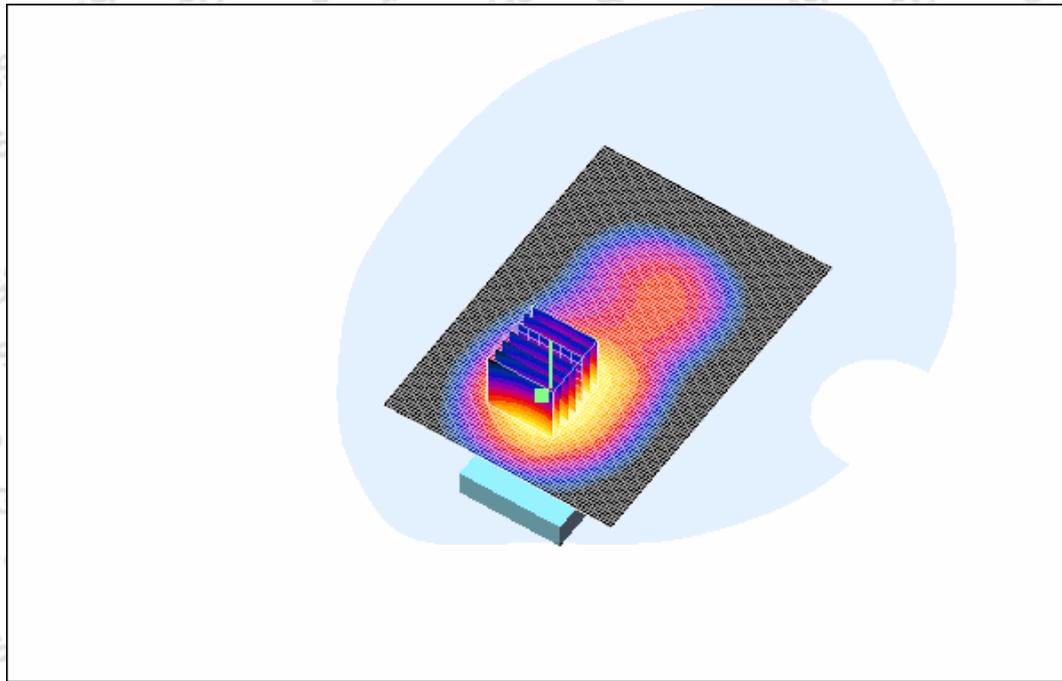
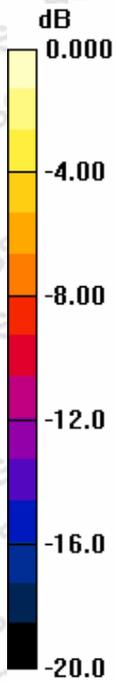
Reference Value = 8.93 V/m; Power Drift = -0.097 dB

Peak SAR (extrapolated) = 1.46 W/kg

SAR(1 g) = 0.732 mW/g; SAR(10 g) = 0.374 mW/g

Maximum value of SAR (measured) = 0.803 mW/g

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0 dB = 0.803mW/g

4.65 WCDMA1900-Head worm- High-Flat phantom 0.5cm

Date/Time: 2008-7-15 15:43:07

Test Laboratory: SGS-GSM

W1900 -Head-Worn-High-0.5cm

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: 1900-Head Medium parameters used: $f = 1907.6 \text{ MHz}$; $\sigma = 1.38 \text{ mho/m}$; $\epsilon_r = 41.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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SHGSM

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn -High/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.55 mW/g

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

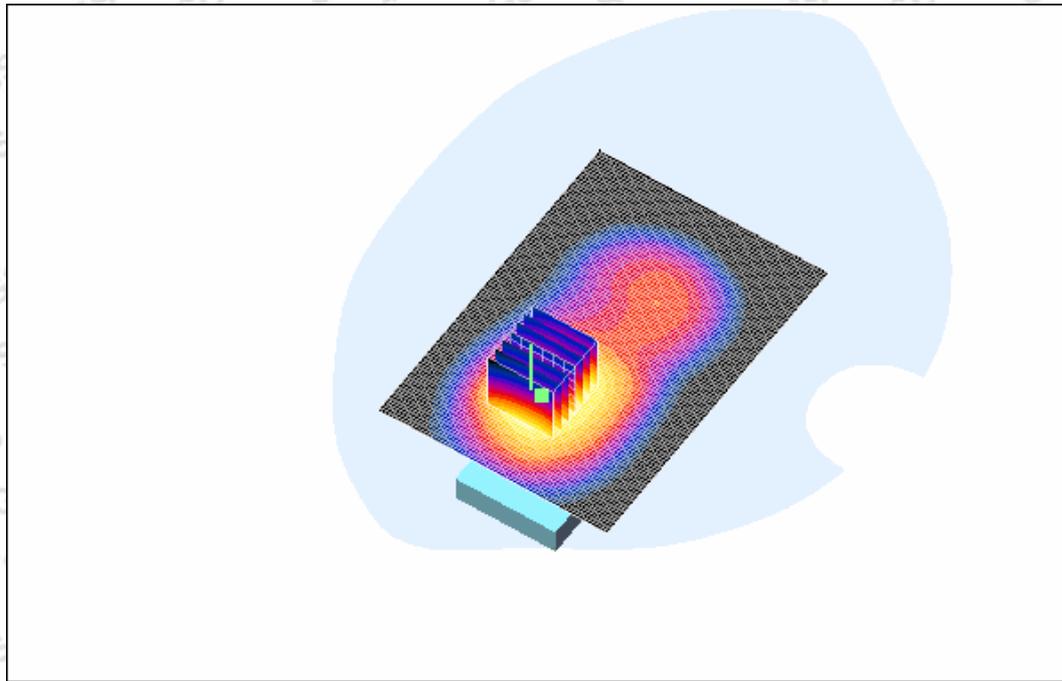
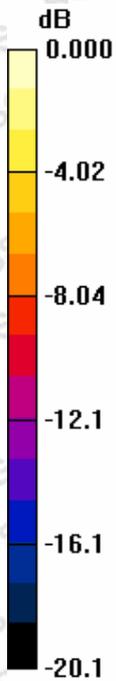
Reference Value = 12.5 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 2.56 W/kg

SAR(1 g) = 1.26 mW/g; SAR(10 g) = 0.638 mW/g

Maximum value of SAR (measured) = 1.39 mW/g

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0 dB = 1.39mW/g

4.66 WCDMA1900-Head worm- High-Flat phantom 0.5cm +BT

Date/Time: 2008-7-15 9:10:44

Test Laboratory: SGS-GSM

Head-Worn-W1900 -0.5cm-High-BT

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: 1900-Head Medium parameters used: $f = 1907.6 \text{ MHz}$; $\sigma = 1.38 \text{ mho/m}$; $\epsilon_r = 41.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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SHGSM

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 1.36 mW/g

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

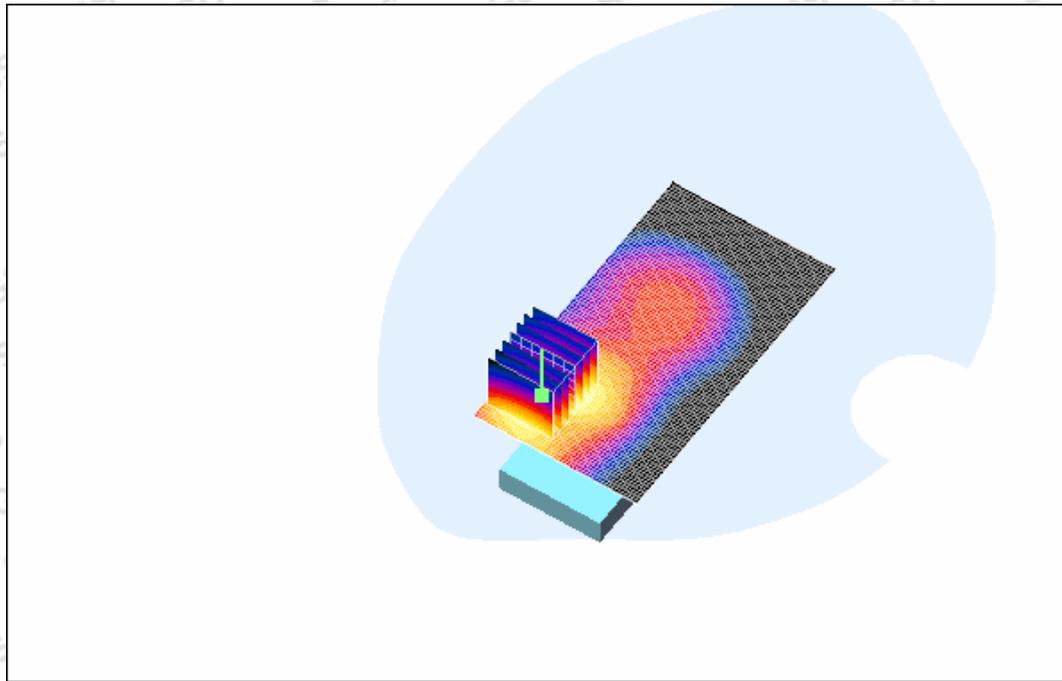
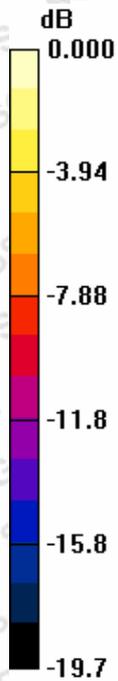
Reference Value = 9.39 V/m; Power Drift = -0.181 dB

Peak SAR (extrapolated) = 2.42 W/kg

SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.111 mW/g

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

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0 dB = 1.35mW/g

4.67 GSM1900-Head worm- Mid-Flat phantom 0.5cm

Date/Time: 2008-7-15 10:48:57

Test Laboratory: SGS-GSM

PCS1900 Head-Worm-Mid-0.5cm

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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

Medium: 1900-Head Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.37 \text{ mho/m}$; $\epsilon_r = 41.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.836 mW/g

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

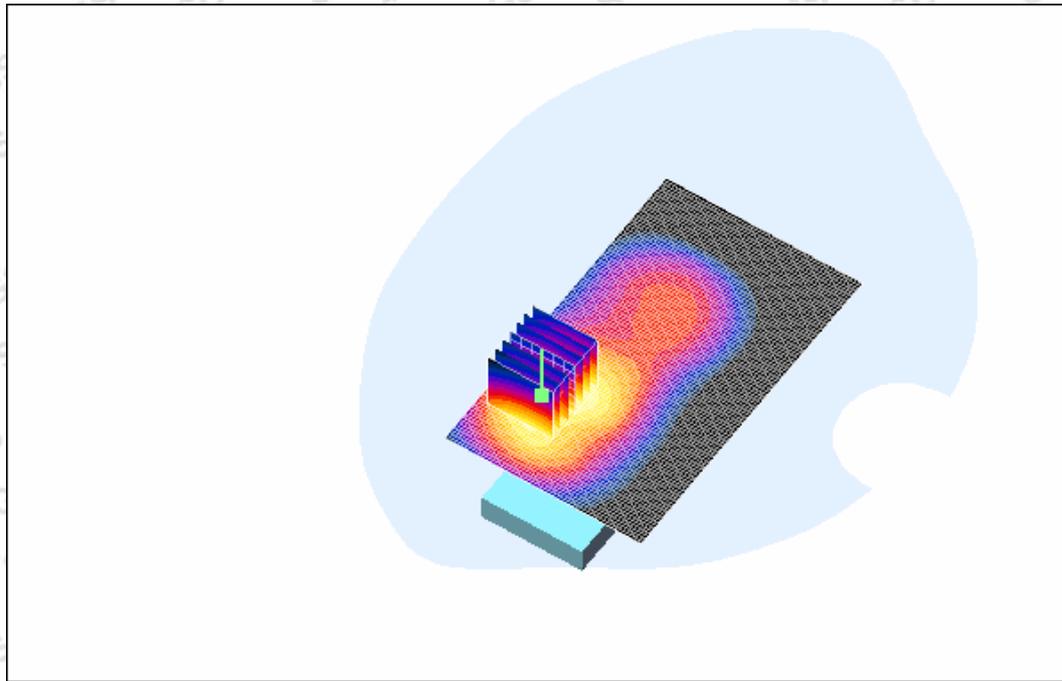
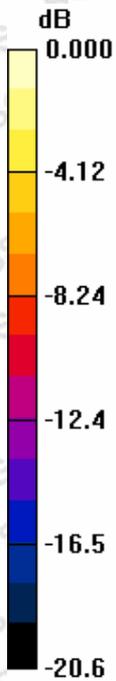
Reference Value = 9.41 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 0.723 mW/g; SAR(10 g) = 0.363 mW/g

Maximum value of SAR (measured) = 0.817 mW/g

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0 dB = 0.817mW/g

4.68 GSM1900-Head worm- Low-Flat phantom 0.5cm

Date/Time: 2008-7-15 11:11:04

Test Laboratory: SGS-GSM

PCS1900 Head-Worn-Low-0.5cm

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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

Medium: 1900-Head Medium parameters used: $f = 1850.2 \text{ MHz}$; $\sigma = 1.34 \text{ mho/m}$; $\epsilon_r = 41.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Low/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.948 mW/g

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

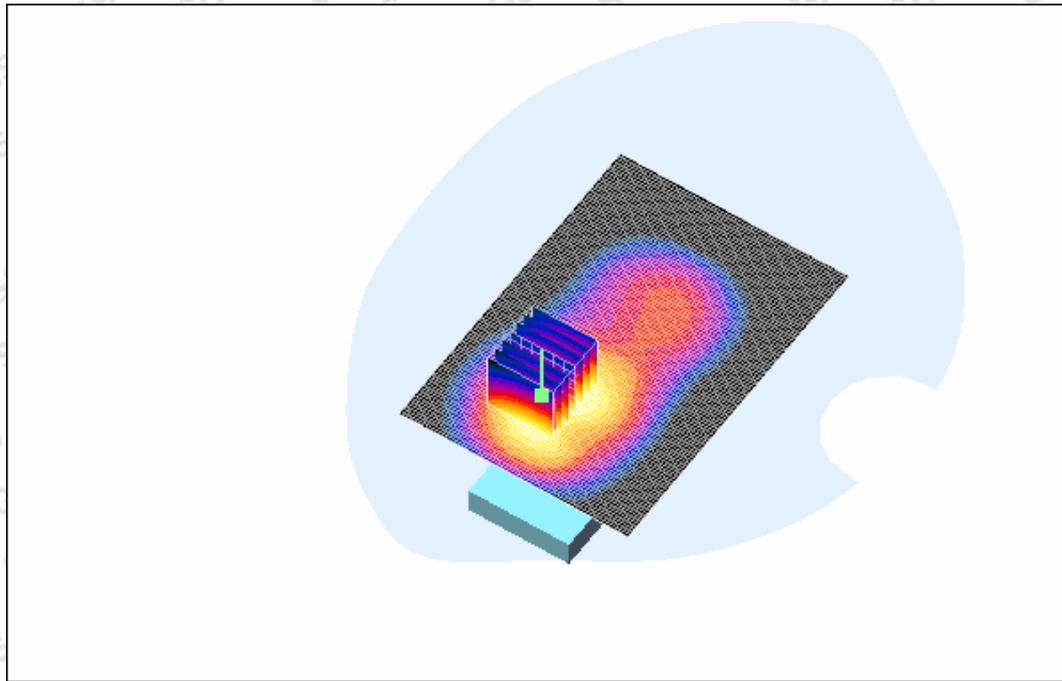
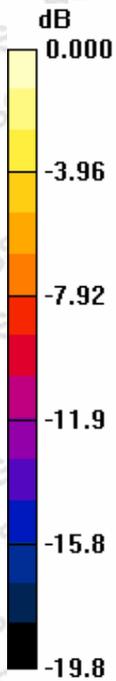
Reference Value = 10.3 V/m; Power Drift = -0.050 dB

Peak SAR (extrapolated) = 1.72 W/kg

SAR(1 g) = 0.852 mW/g; SAR(10 g) = 0.434 mW/g

Maximum value of SAR (measured) = 0.961 mW/g

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0 dB = 0.961mW/g

4.69 GSM1900-Head worm- High-Flat phantom 0.5cm

Date/Time: 2008-7-15 11:33:09

Test Laboratory: SGS-GSM

PCS1900-Head-Worn-High-0.5cm

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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

Medium: 1900-Head Medium parameters used: $f = 1909.8 \text{ MHz}$; $\sigma = 1.39 \text{ mho/m}$; $\epsilon_r = 41.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn -High/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.646 mW/g

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

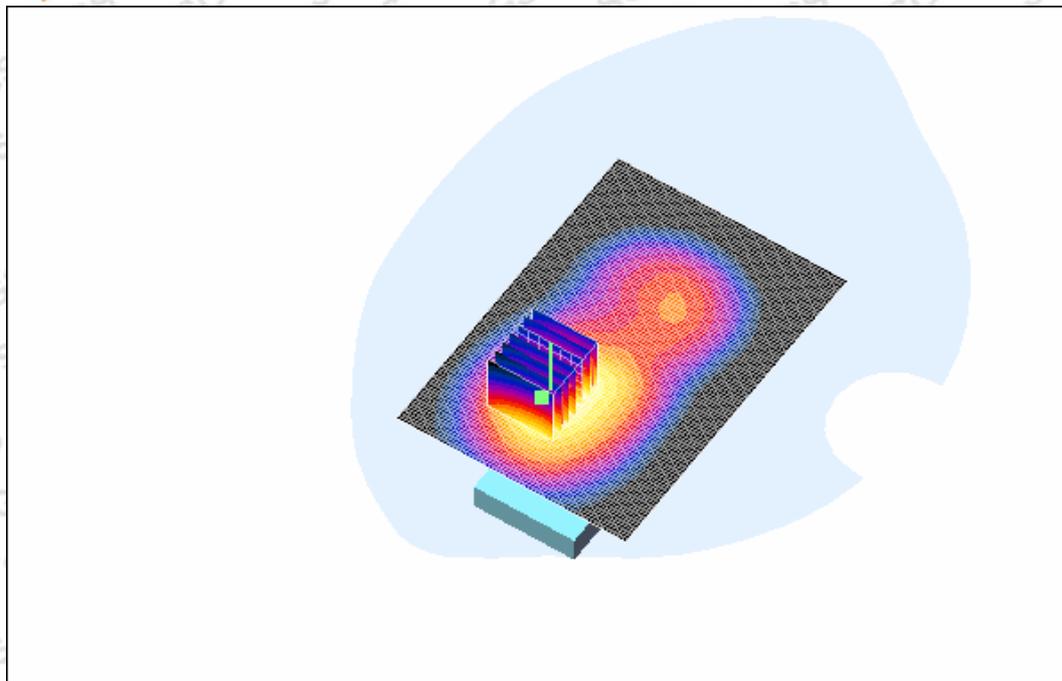
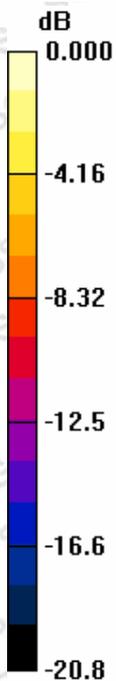
Reference Value = 8.42 V/m; Power Drift = 0.051 dB

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.572 mW/g; SAR(10 g) = 0.289 mW/g

Maximum value of SAR (measured) = 0.640 mW/g

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0 dB = 0.640mW/g

4.70 GSM1900-Head worm- Low-Flat phantom 0.5cm +BT

Date/Time: 2008-7-15 12:59:26

Test Laboratory: SGS-GSM

PCS1900-Head-Worn-Low-0.5cm-BT

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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

Medium: 1900-Head Medium parameters used: $f = 1850.2$ MHz; $\sigma = 1.34$ mho/m; $\epsilon_r = 41.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Low BT/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.995 mW/g

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

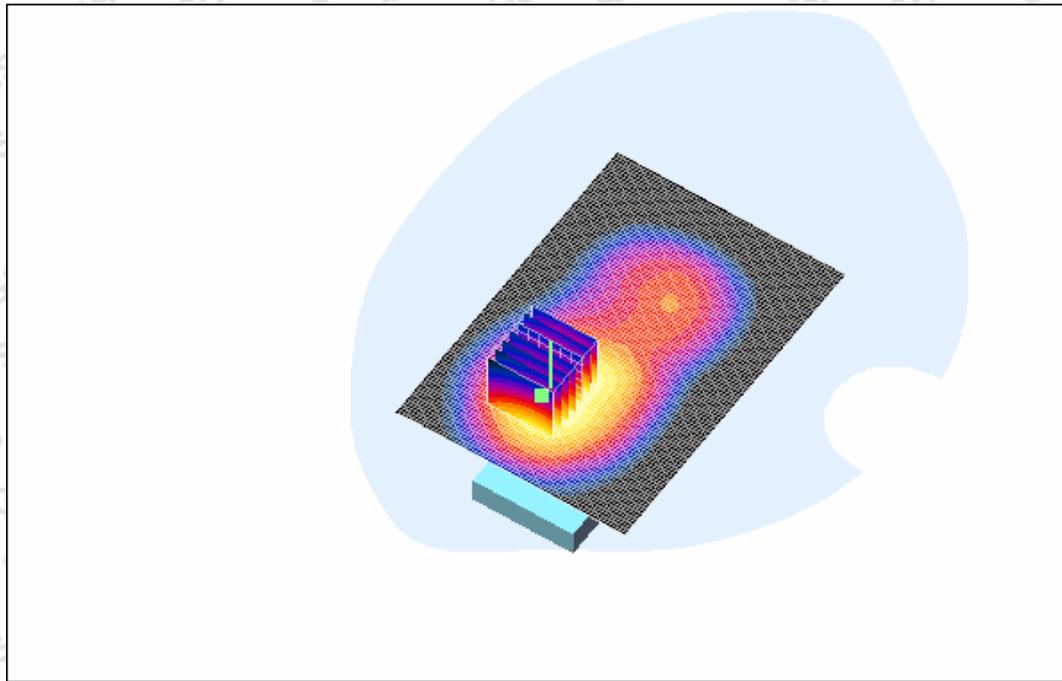
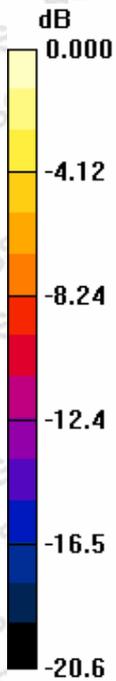
Reference Value = 10.3 V/m; Power Drift = -0.027 dB

Peak SAR (extrapolated) = 1.69 W/kg

SAR(1 g) = 0.852 mW/g; SAR(10 g) = 0.437 mW/g

Maximum value of SAR (measured) = 0.950 mW/g

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0 dB = 0.950mW/g

Addition for Bluetooth Stand-alone

4.71 Bluetooth-Left Hand side-Cheek- Mid

Date/Time: 2008-9-3 13:51:49

Test Laboratory: SGS-GSM

Bluetooth-LeftHandSide-Cheek-Mid

DUT: KZ016AC01; Type: BODY; Serial: 01146700000220-2

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Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1

Medium: HSL2450-Head Medium parameters used: $f = 2441$ MHz; $\sigma = 1.88$ mho/m; $\epsilon_r = 38.6$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.53, 4.53, 4.53); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.003 mW/g

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

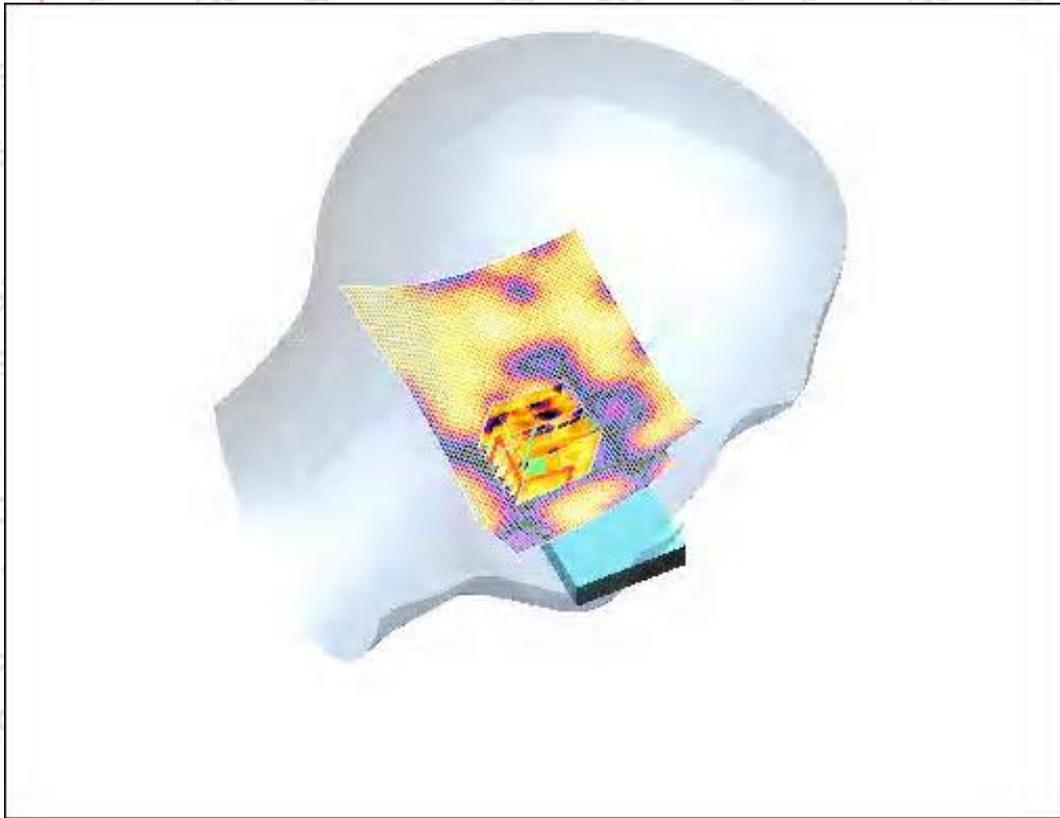
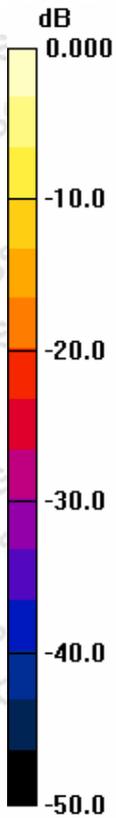
Reference Value = 0.728 V/m; Power Drift = 0.37 dB

Peak SAR (extrapolated) = 0.010 W/kg

SAR(1 g) = 0.00296 mW/g; SAR(10 g) = 0.00122 mW/g

Maximum value of SAR (measured) = 0.004 mW/g

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0 dB = 0.004mW/g

4.72 Bluetooth-Right Hand side-Cheek- Mid

Date/Time: 2008-9-3 11:48:23

Test Laboratory: SGS-GSM

Bluetooth-RightHandSide-Cheek-Mid

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1

Medium: HSL2450-Head Medium parameters used: $f = 2441$ MHz; $\sigma = 1.88$ mho/m; $\epsilon_r = 38.6$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.53, 4.53, 4.53); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 0.004 mW/g

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

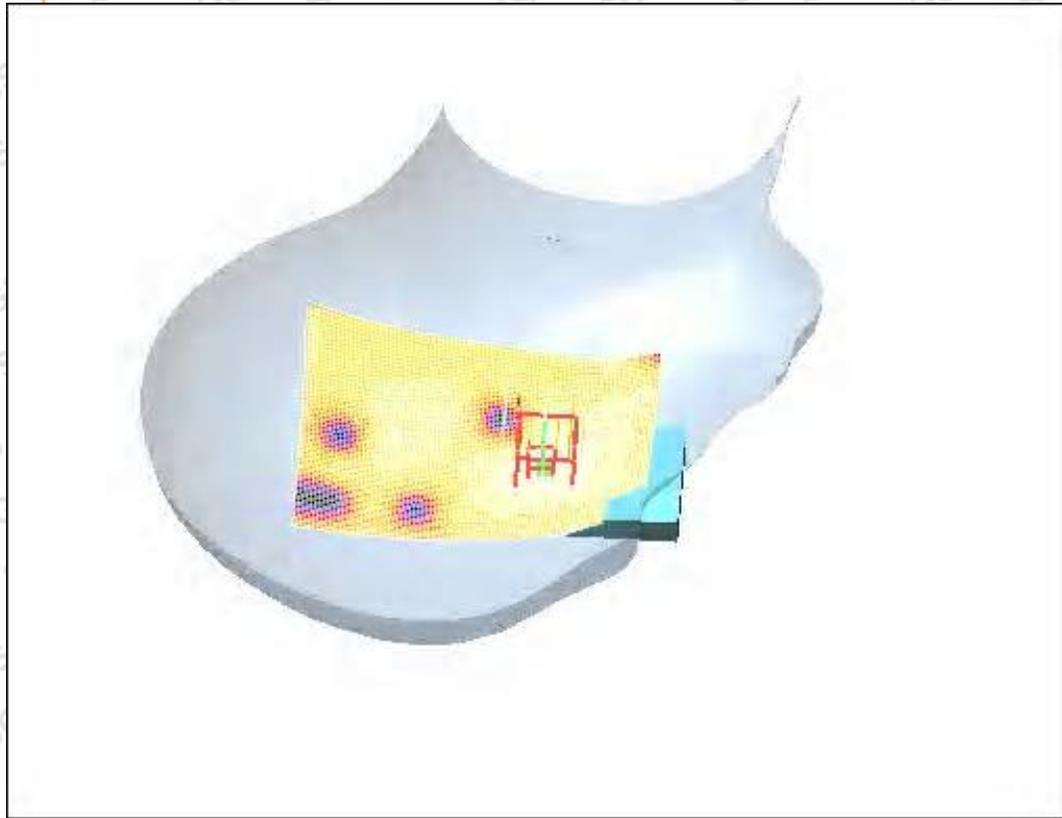
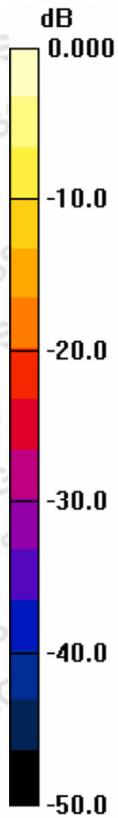
Reference Value = 0.852 V/m; Power Drift = 0.390 dB

Peak SAR (extrapolated) = 0.006 W/kg

SAR(1 g) = 0.00325 mW/g; SAR(10 g) = 0.00173 mW/g

Maximum value of SAR (measured) = 0.004 mW/g

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0 dB = 0.004mW/g

4.73 Bluetooth-Body worn-Touch- Mid

Date/Time: 2008-9-3 16:59:20

Test Laboratory: SGS-GSM

Bluetooth-Body-Worn-Mid-Touch

DUT: KZ016AC01; Type: BODY; Serial: 0114670000220-2

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Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1

Medium: HSL2450-Body Medium parameters used: $f = 2441$ MHz; $\sigma = 2.16$ mho/m; $\epsilon_r = 50.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.13, 4.13, 4.13); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

Body Worn - Middle1/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.031 mW/g

Body Worn - Middle1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

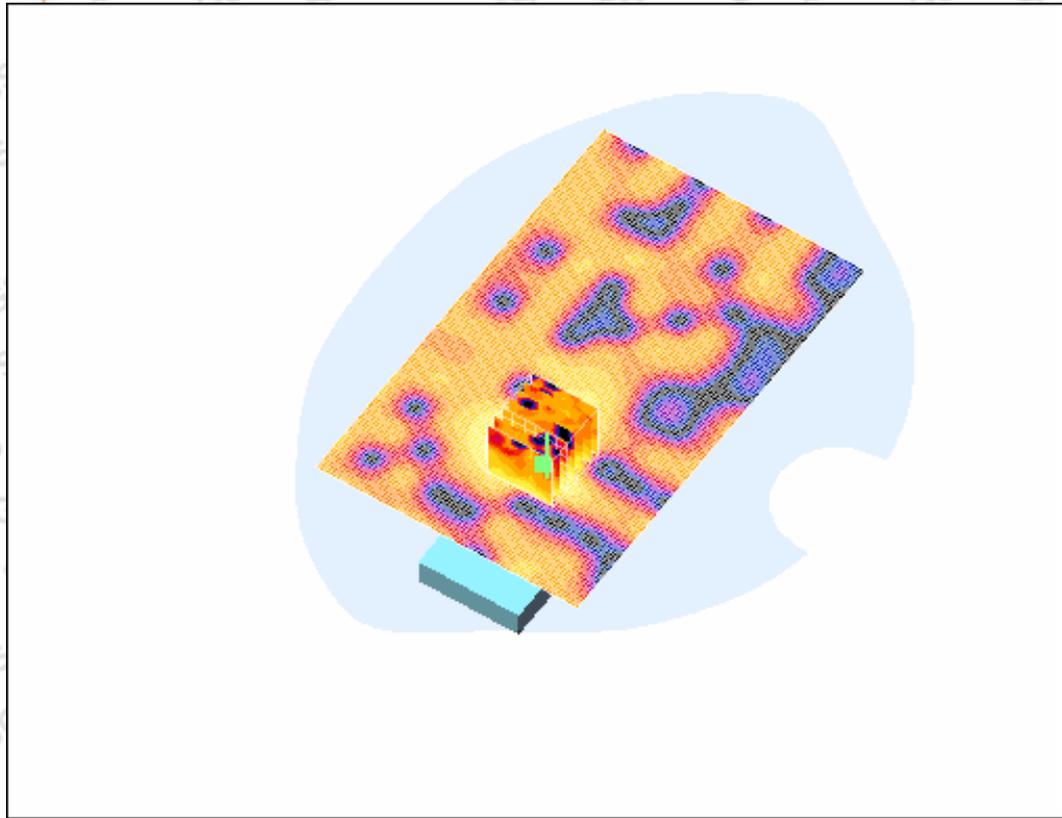
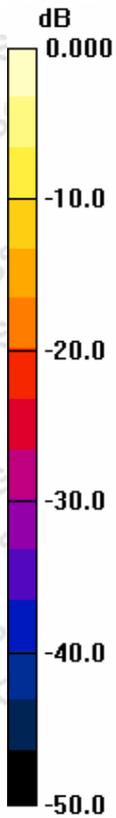
Reference Value = 0.462 V/m; Power Drift = -0.212 dB

Peak SAR (extrapolated) = 0.093 W/kg

SAR(1 g) = 0.014 mW/g; SAR(10 g) = 0.00573 mW/g

Maximum value of SAR (measured) = 0.018 mW/g

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0 dB = 0.018mW/g

System Validation

4.74 System Performance Cheek-GSM900-Body-0620

Date/Time: 2008-6-20 7:36:19

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D900-Body

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

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

Medium: HSL900-Body Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 1.03 \text{ mho/m}$; $\epsilon_r = 53$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

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

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

Maximum value of SAR (interpolated) = 2.92 mW/g

d=15mm, Pin=250mW 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

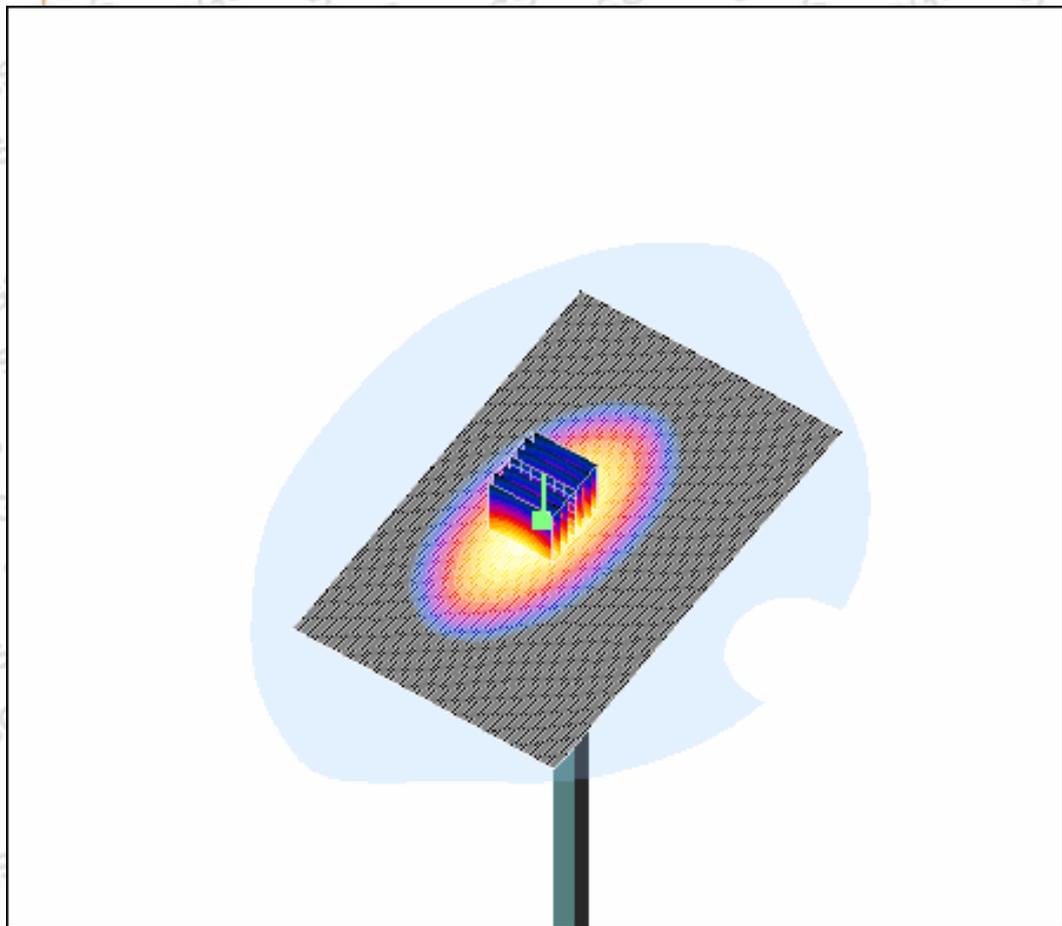
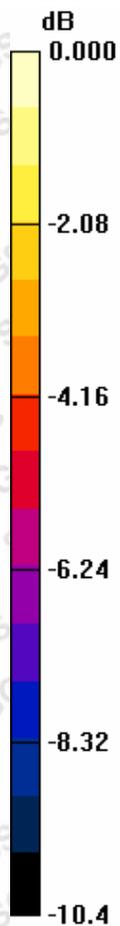
Reference Value = 48.9 V/m; Power Drift = 0.029 dB

Peak SAR (extrapolated) = 4.02 W/kg

SAR(1 g) = 2.75 mW/g; SAR(10 g) = 1.82 mW/g

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

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0 dB = 2.97mW/g

4.75 System Performance Check-GSM900-Head-0623

Date/Time: 2008-6-23 17:55:09

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D900-Head

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

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

Medium: GSM900-Head Medium parameters used: $f = 900$ MHz; $\sigma = 0.942$ mho/m; $\epsilon_r = 42.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 2.91 mW/g

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

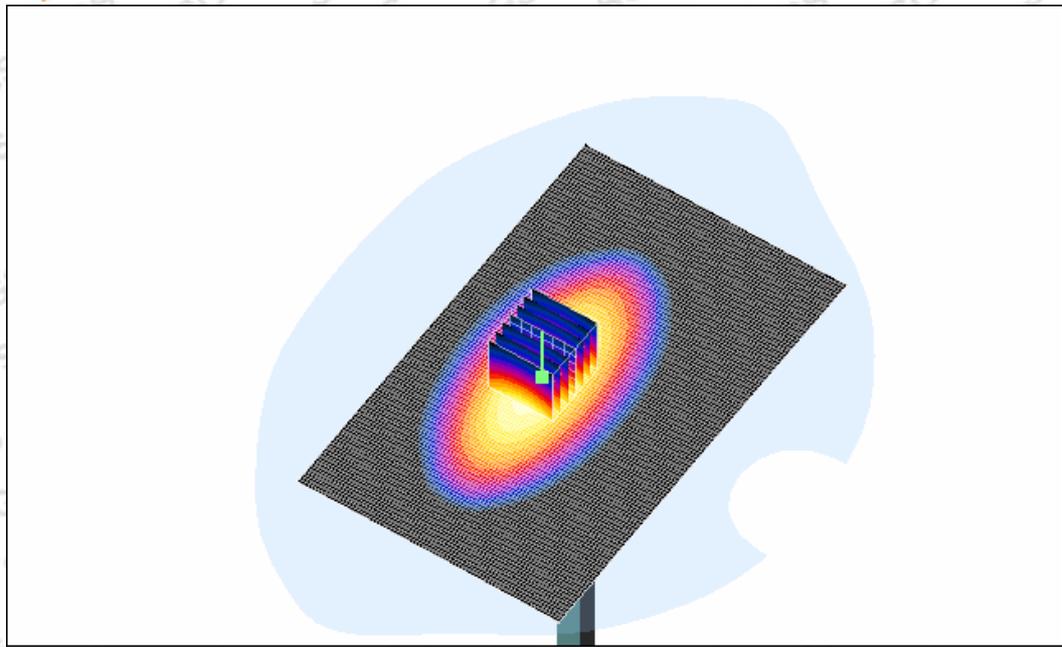
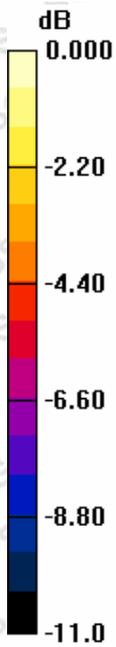
Reference Value = 49.5 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 4.09 W/kg

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

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

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0 dB = 2.95mW/g

4.76 System Performance Cheek-GSM900-Head-0714

Date/Time: 2008-7-14 16:28:34

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D900-Head

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

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

Medium: GSM900-Head Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 0.942 \text{ mho/m}$; $\epsilon_r = 42.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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SHGSM

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(6.15, 6.15, 6.15); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

Maximum value of SAR (interpolated) = 2.93 mW/g

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

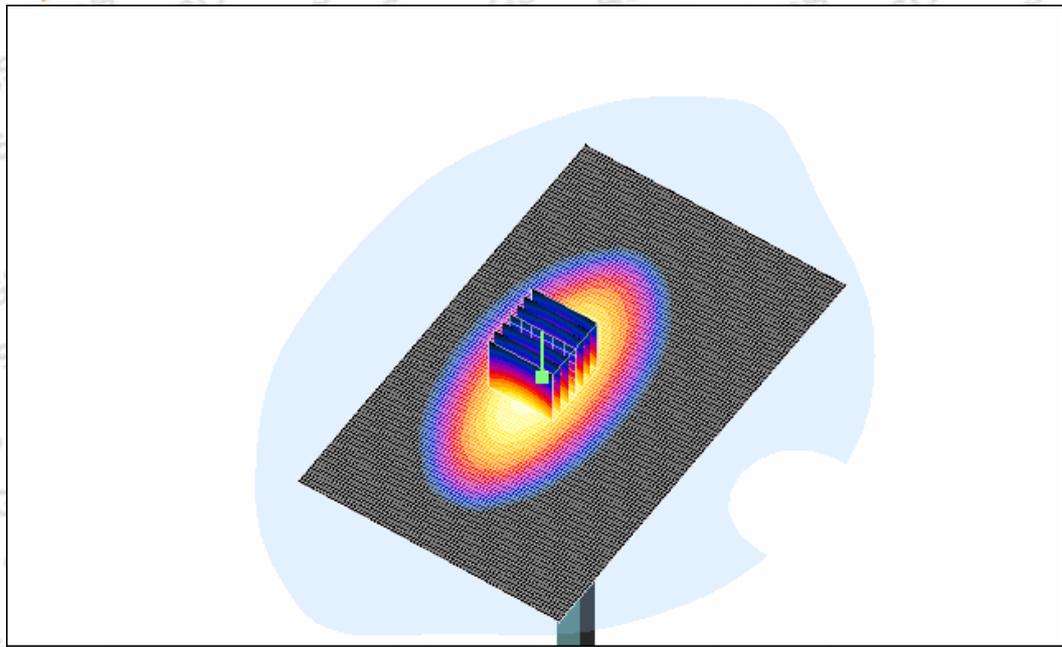
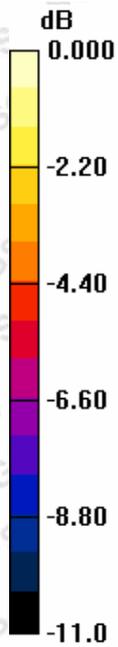
Reference Value = 49.6 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 4.12 W/kg

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

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

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0 dB = 2.97mW/g

4.77 System Performance Cheek-GSM1900-Body-0619

Date/Time: 2008-6-19 18:21:58

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D1900-Body

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

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

Medium: HSL1900_Body Medium parameters used: $f = 1900$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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SHGSM

DASY4 Configuration:

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

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

Maximum value of SAR (interpolated) = 10.8 mW/g

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

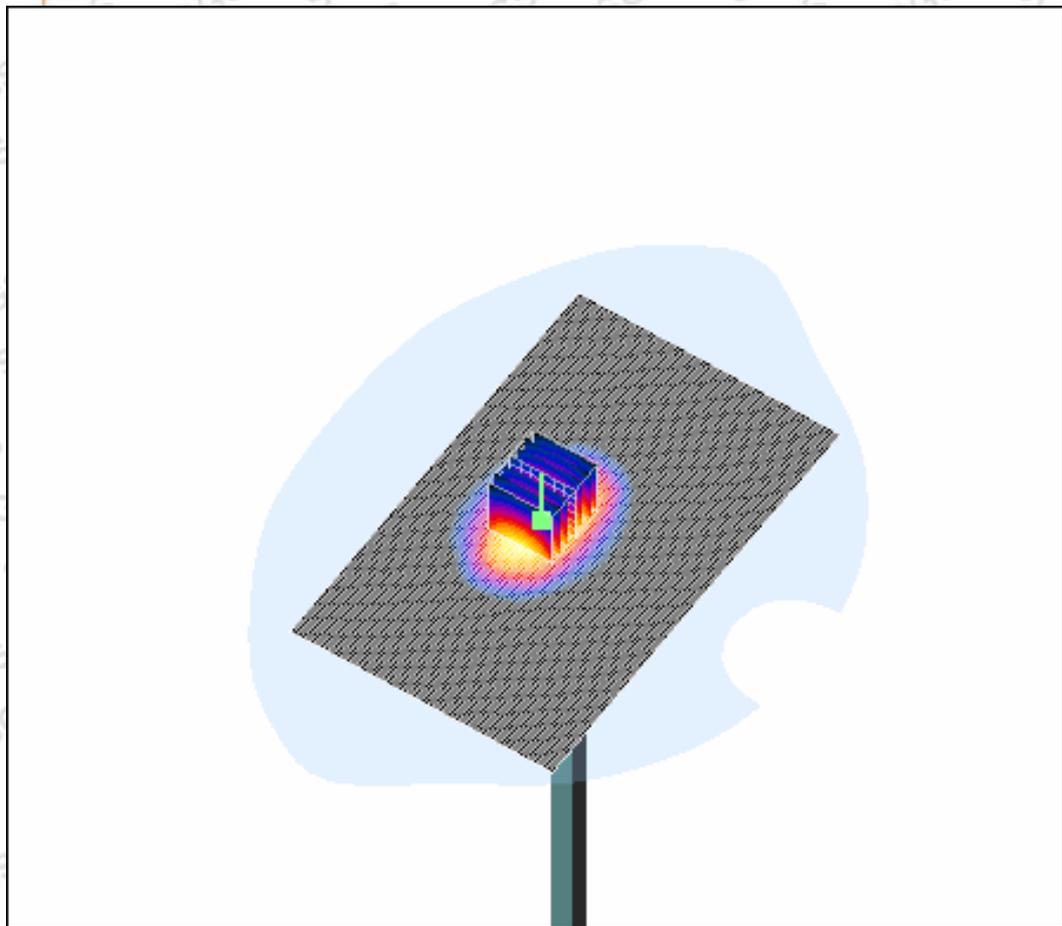
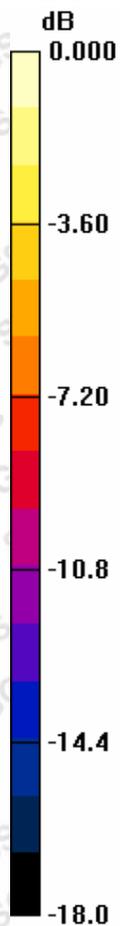
Reference Value = 57.5 V/m; Power Drift = 0.019 dB

Peak SAR (extrapolated) = 17.9 W/kg

SAR(1 g) = 9.25 mW/g; SAR(10 g) = 4.63 mW/g

Maximum value of SAR (measured) = 10.5 mW/g

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0 dB = 10.5mW/g

4.78 System Performance Check-GSM1900-Head-0627

Date/Time: 2008-6-27 8:06:17

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D1900-Head

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

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

Medium: 1900-Head Medium parameters used: $f = 1900$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

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

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

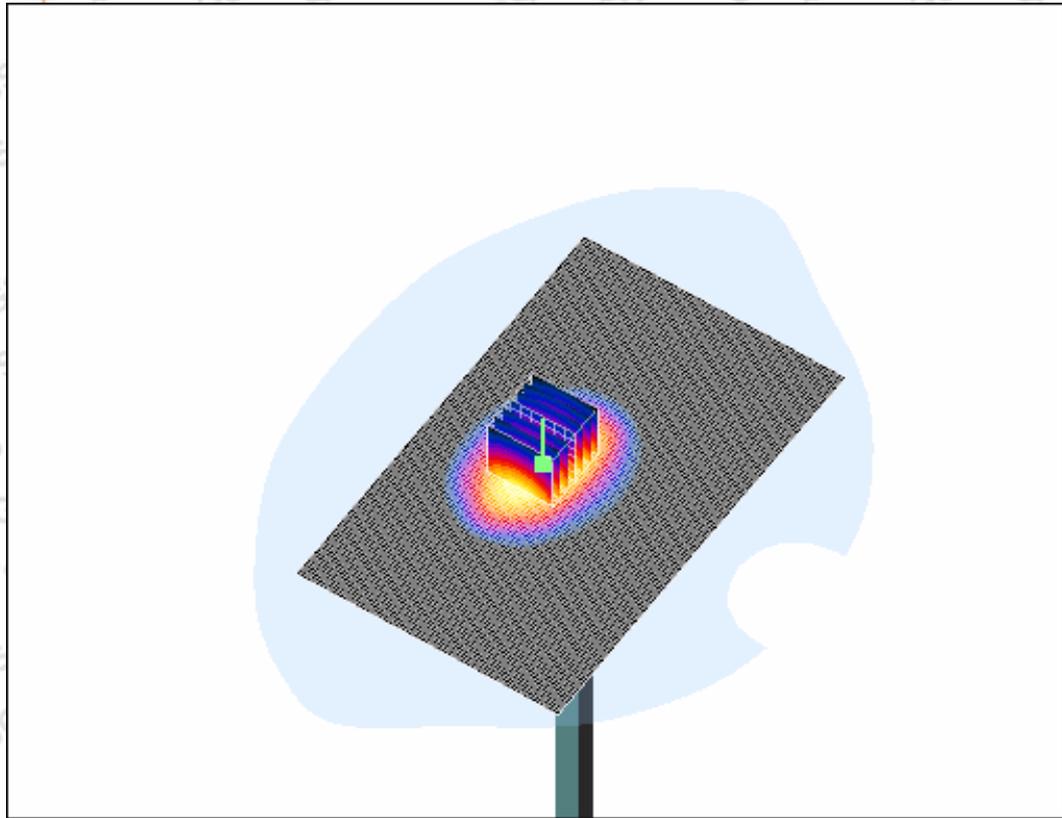
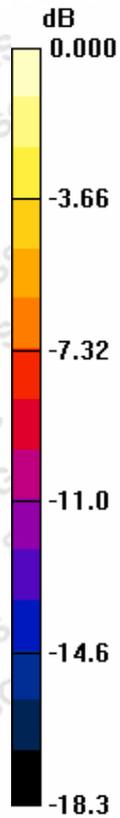
Reference Value = 60.4 V/m; Power Drift = 0.047 dB

Peak SAR (extrapolated) = 18.5 W/kg

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

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

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0 dB = 10.9mW/g

4.79 System Performance Cheek-GSM1900-Head-0715

Date/Time: 2008-7-15 13:38:31

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D1900-Head

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

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

Medium: 1900-Head Medium parameters used: $f = 1900$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.84, 4.84, 4.84); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

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

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

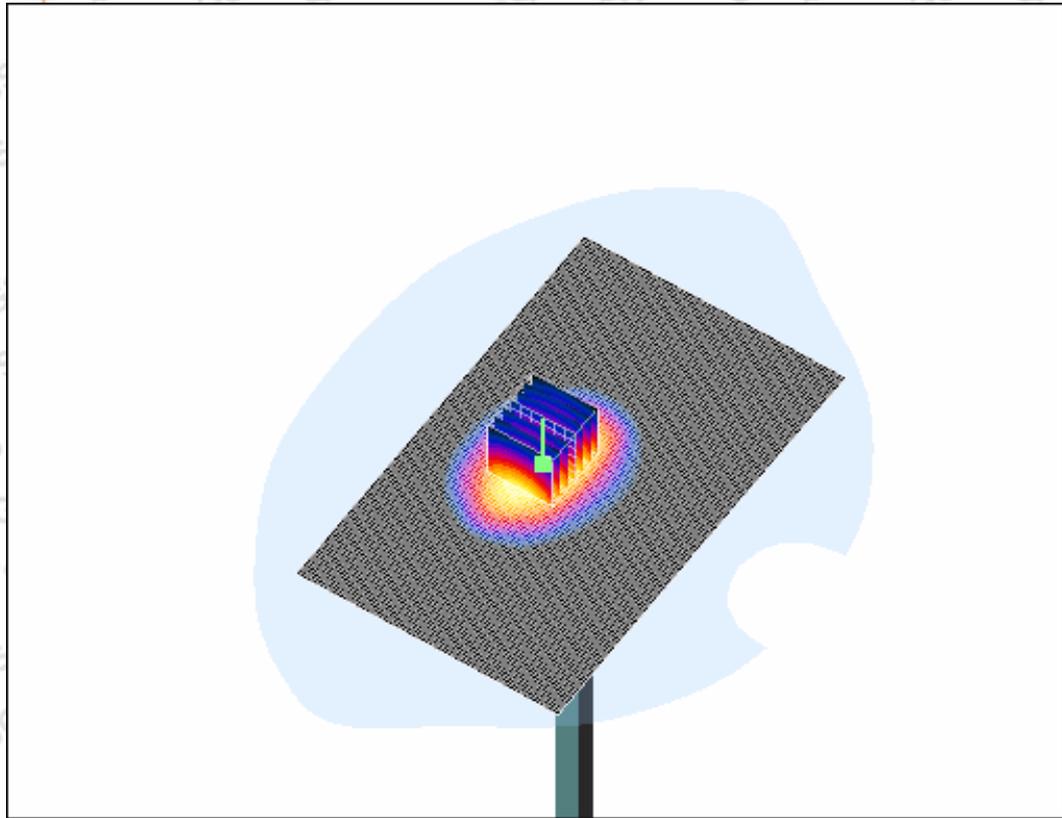
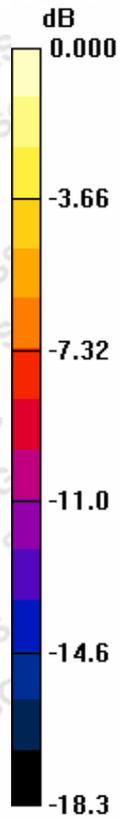
Reference Value = 60.8 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 18.5 W/kg

SAR(1 g) = 9.61 mW/g; SAR(10 g) = 4.85 mW/g

Maximum value of SAR (measured) = 10.8 mW/g

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0 dB = 10.8mW/g

4.80 System Performance Cheek-Bluetooth-Body-0903

Date/Time: 2008-9-3 16:04:10

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D2450-Body

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:733

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Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL2450-Body Medium parameters used: $f = 2450$ MHz; $\sigma = 2.04$ mho/m; $\epsilon_r = 50.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.13, 4.13, 4.13); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

d=10mm, Pin=250mW 3.4/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 16.9 mW/g

d=10mm, Pin=250mW 3.4/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm,
dz=5mm

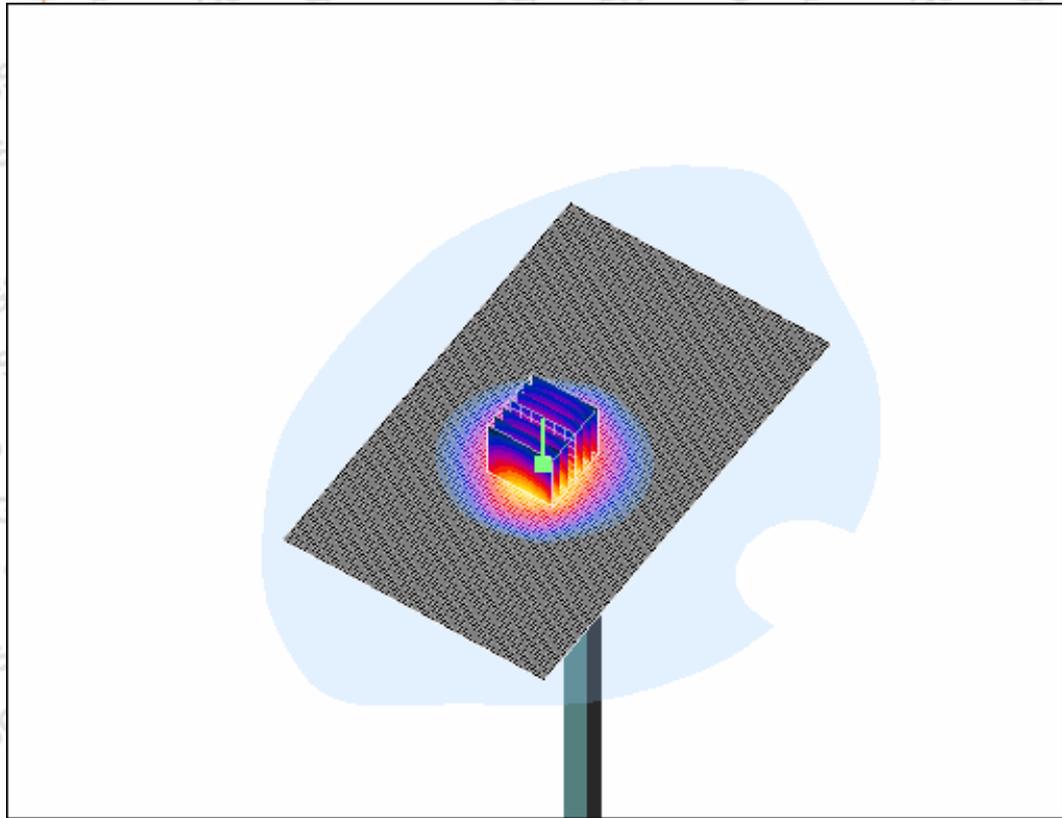
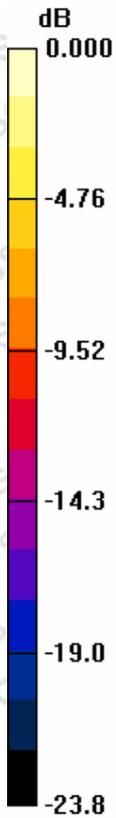
Reference Value = 42.3 V/m; Power Drift = 0.038 dB

Peak SAR (extrapolated) = 32.6 W/kg

SAR(1 g) = 14.5 mW/g; SAR(10 g) = 6.42 mW/g

Maximum value of SAR (measured) = 16.5 mW/g

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0 dB = 16.5mW/g

4.80 System Performance Cheek-Bluetooth-Head-0903

Date/Time: 2008-9-3 11:02:35

Test Laboratory: SGS-GSM

SystemPerformanceCheck-D2450-Head

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:733

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Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL2450-Head Medium parameters used: $f = 2450$ MHz; $\sigma = 1.92$ mho/m; $\epsilon_r = 38.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3088; ConvF(4.53, 4.53, 4.53); Calibrated: 2008-1-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn569; Calibrated: 2007-11-19
- Phantom: SAM 12; Type: SAM V4.0; Serial: TP-1283
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

d=10mm, Pin=250mW 4/Area Scan (81x131x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 17.4 mW/g

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

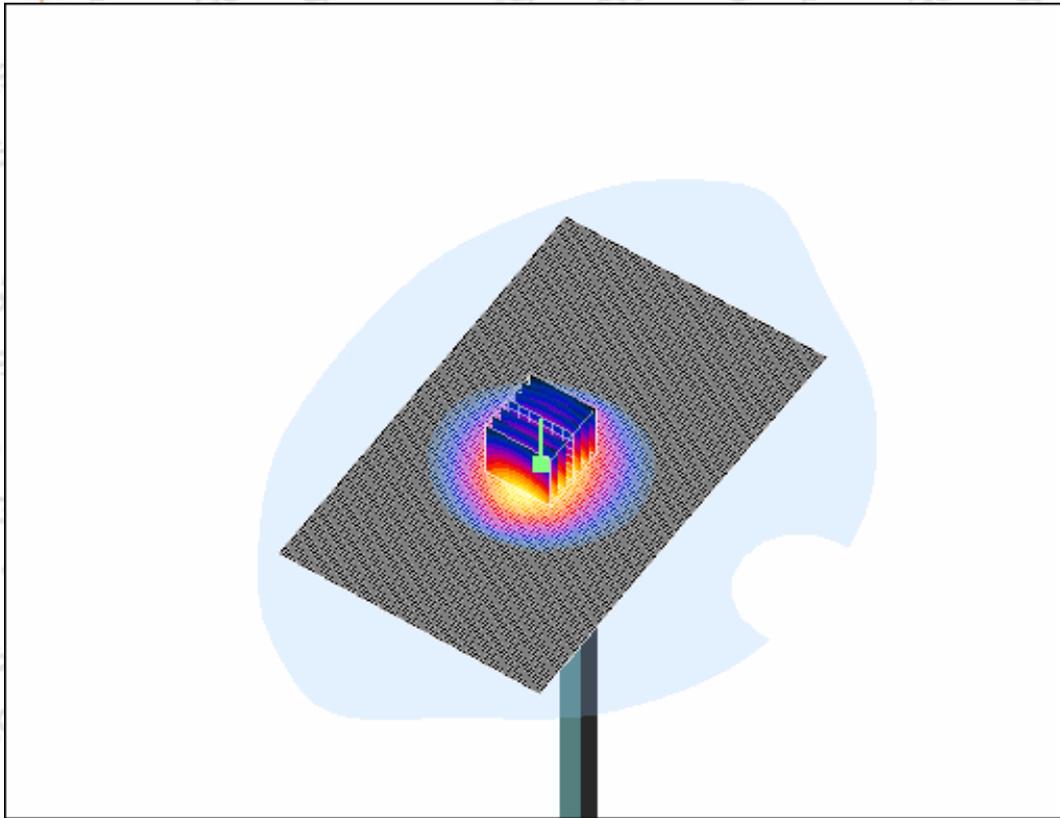
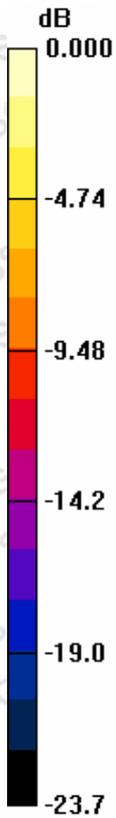
Reference Value = 51.2 V/m; Power Drift = 0.029 dB

Peak SAR (extrapolated) = 34.1 W/kg

SAR(1 g) = 15.2 mW/g; SAR(10 g) = 6.76 mW/g

Maximum value of SAR (measured) = 17.4 mW/g

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0 dB = 17.4mW/g

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SHGSM

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

9/F, 3rd Building, No. 889, Yishan Road, Shanghai, China 200233
 中国·上海·宜山路 889 号 3 号楼 9 层 邮编: 200233

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 t (86-21) 61402666*2736

f (86-21) 54500149
 f (86-21) 54500149

www.cn.sgs.com
 e sgs.china@sgs.com

Appendix

1. Photographs of Test Setup

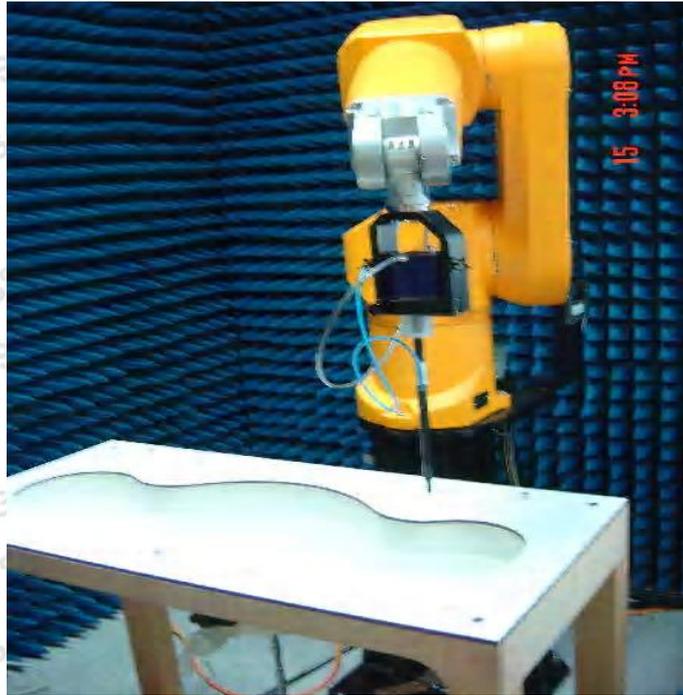
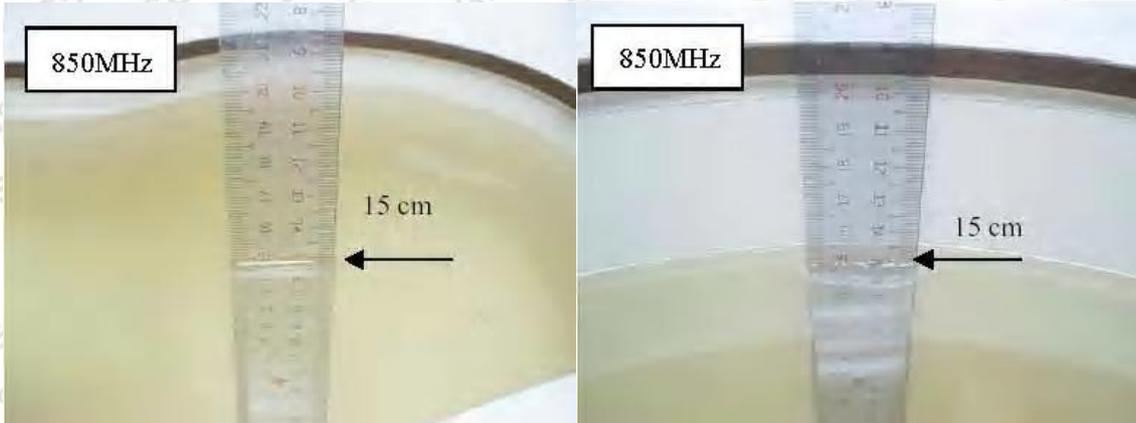


Fig.1 Photograph of the SAR measurement System



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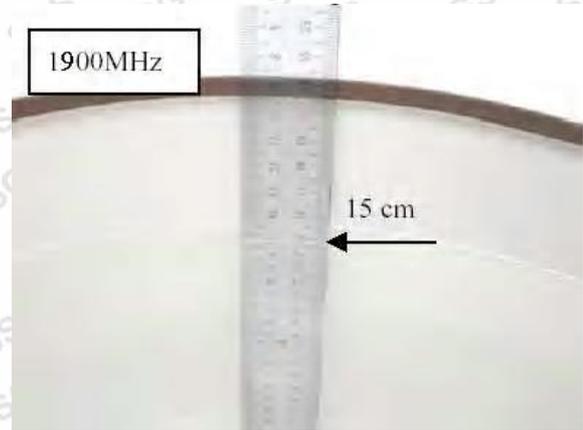
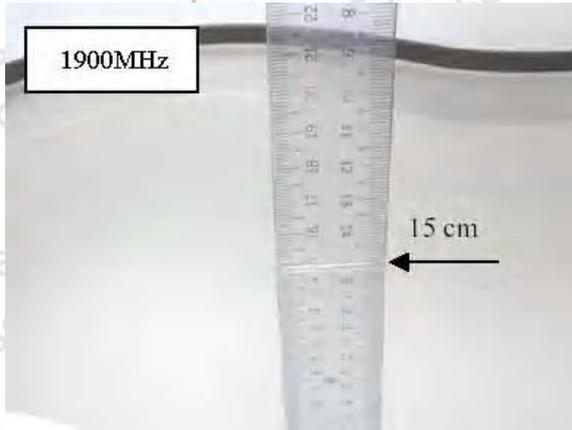


Fig.2 Photograph of the Tissue Simulant Liquid depth 15cm for Left-Head Side

Fig.3 Photograph of the Tissue Simulant Fluid Liquid depth 15cm for Right-Head Side



Fig.4 Photograph of the Left Cheek status

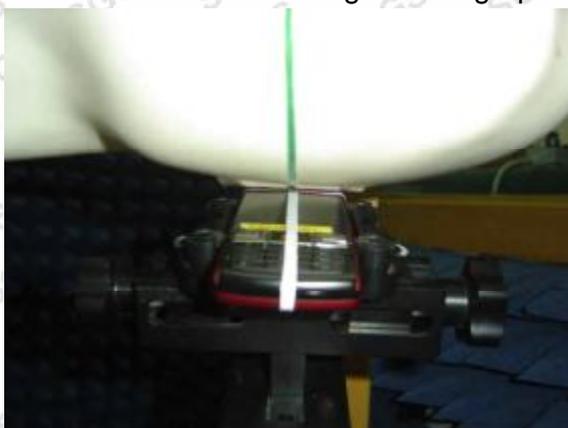


Fig.5 Photograph of the Left Tilted status

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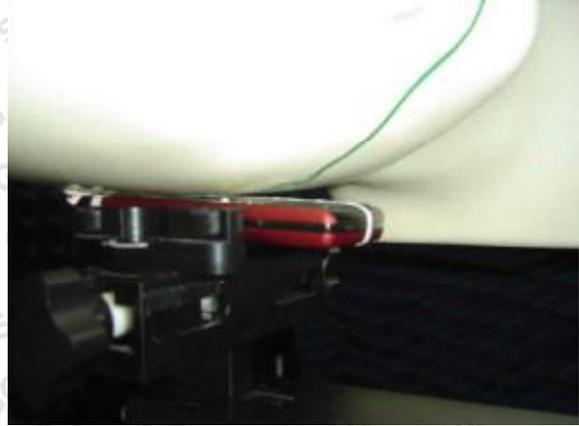
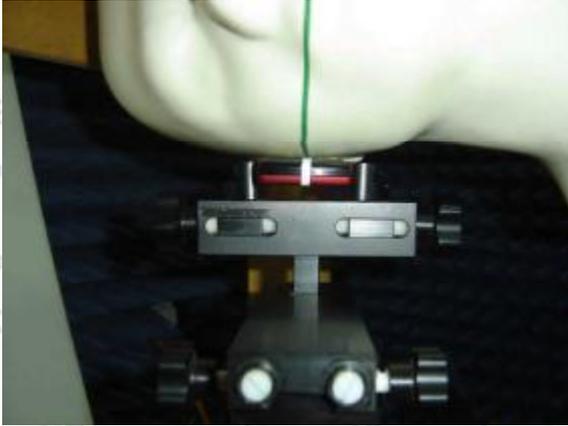


Fig.6 Photograph of the Right Cheek status

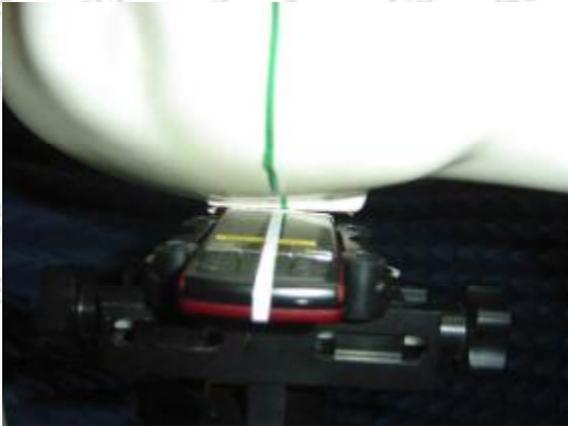


Fig.7 Photograph of the Right Tilted status



Fig.8 Photograph of the BodyWorn status

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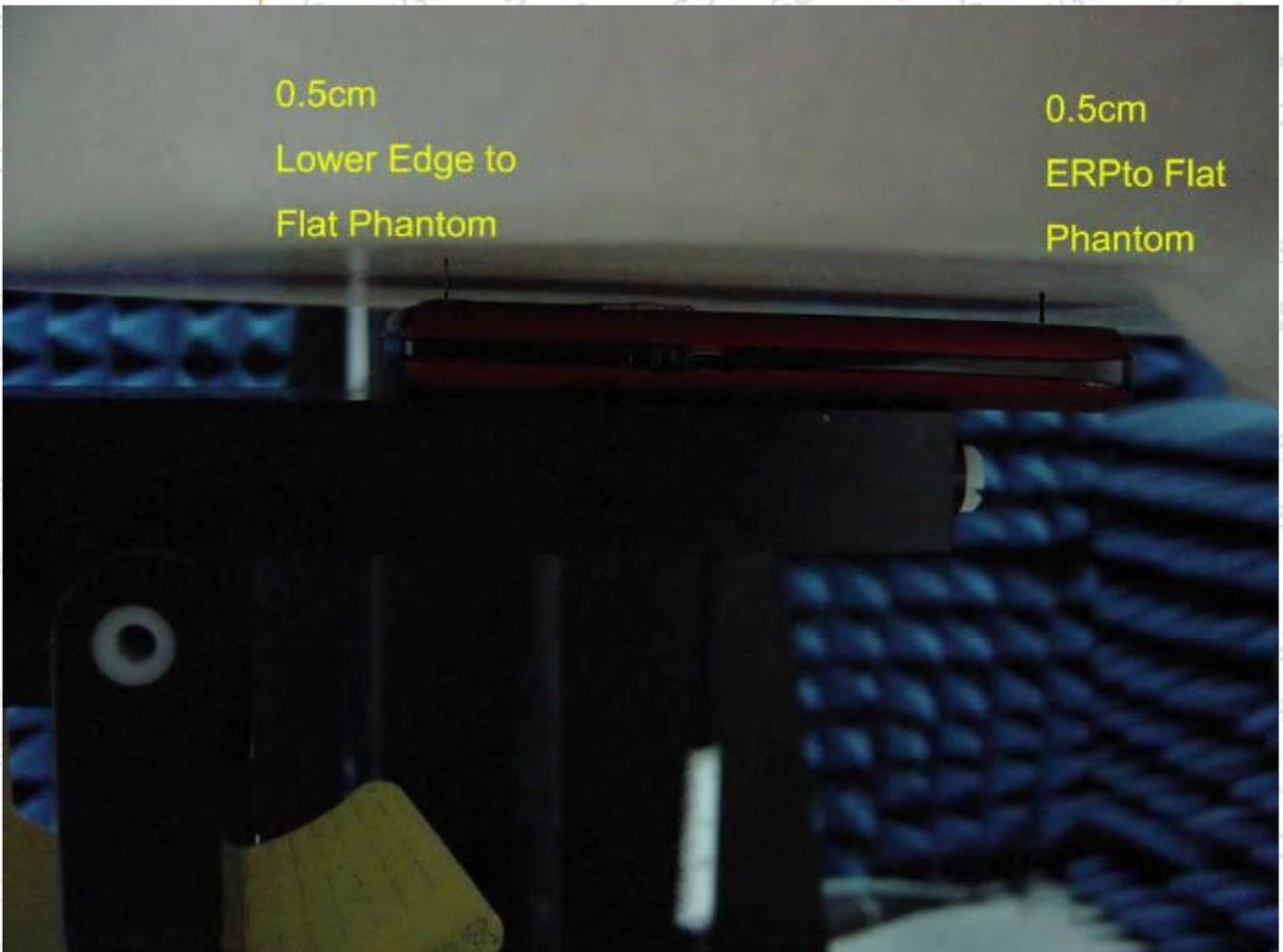


Fig.9 Photograph of the Flat Head status

2. Photographs of the EUT

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Fig.10 Front View



Fig.11 Back View

3. Photographs of the Accessories



Fig.12 Battery



Fig.13 Charger

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Fig.14 Headset

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4. Probe Calibration certificate

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

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

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

Accreditation No.: **SCS 108**

Client: **SGS China (Auden)**

Certificate No: **ES3-3088_Jan08**

CALIBRATION CERTIFICATE

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

This calibration certificate documents the traceability to national standards, which realize the physical units of measurement (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&PE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GD41293874	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41495277	25-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41480087	25-Mar-07 (METAS, No. 217-00670)	Mar-08
Reference 3 dB Attenuator	SN: S5054 (3a)	8-Aug-07 (METAS, No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-07 (METAS, No. 217-00671)	Mar-08
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (METAS, No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (SPEAG, No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 854	20-Apr-07 (SPEAG, No. DAE4-684_Apr07)	Apr-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HF 6648C	US3642101700	4-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-08
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

Calibrated by:

Name: **Kata Pokovic**
 Function: **Technical Manager**

Signature:

Approved by:

Name: **Nels Kuster**
 Function: **Quality Manager**

Signature:

Issued: January 18, 2008

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

Certificate No: ES3-3088_Jan08

Page 1 of 9

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SHGSM

ES3DV3 SN:3088

January 18, 2008

Probe ES3DV3

SN:3088

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

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ESS-3068_Jan08

Page 3 of 9

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ES3DV3 SN:3088

January 18, 2008

DASY - Parameters of Probe: ES3DV3 SN:3088

Sensitivity in Free Space^A

NormX	1.31 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$
NormY	1.26 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.24 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression^B

DCP X	92 mV
DCP Y	93 mV
DCP Z	93 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL	900 MHz	Typical SAR gradient: 5 % per mm	
	Sensor Center to Phantom Surface Distance	3.0 mm	4.0 mm
	SAR _{iso} [%] Without Correction Algorithm	11.0	6.8
	SAR _{iso} [%] With Correction Algorithm	0.9	0.4

TSL	1750 MHz	Typical SAR gradient: 10 % per mm	
	Sensor Center to Phantom Surface Distance	3.0 mm	4.0 mm
	SAR _{iso} [%] Without Correction Algorithm	9.6	5.1
	SAR _{iso} [%] With Correction Algorithm	0.7	0.0

Sensor Offset

Probe Tip to Sensor Center	2.0 mm
----------------------------	--------

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

^A The uncertainties of NormX, Y, Z do not affect the E² field uncertainty inside TSL (see Page 6).
^B Numerical linearization parameter: uncertainty not required.

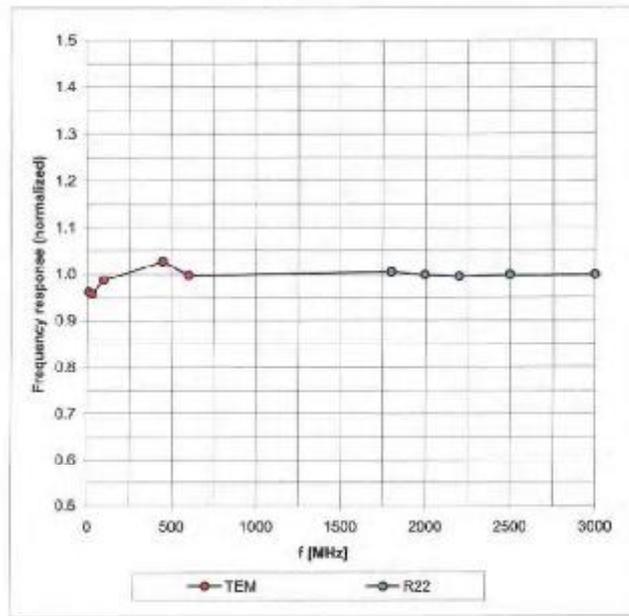
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ES3DV3 SN:3088

January 18, 2008

Frequency Response of E-Field

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



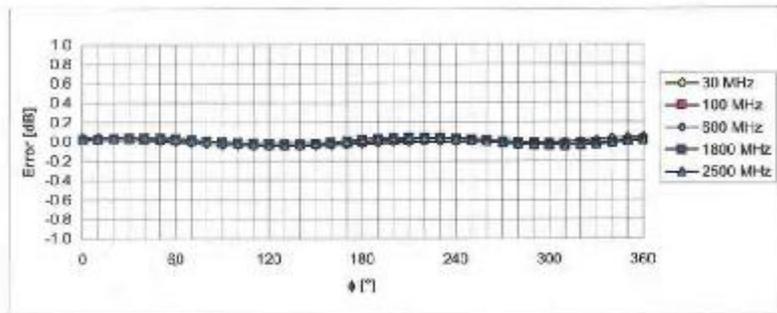
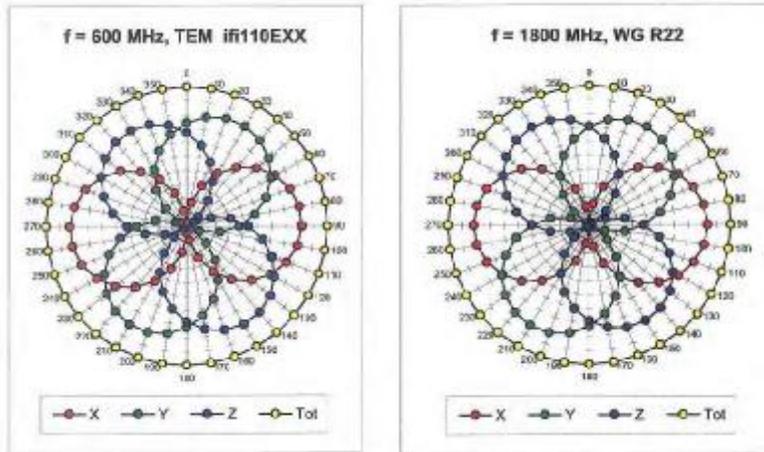
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

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ES3DV3 SN:3088

January 18, 2008

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



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

Certificate No: ES3-3088_Jan08

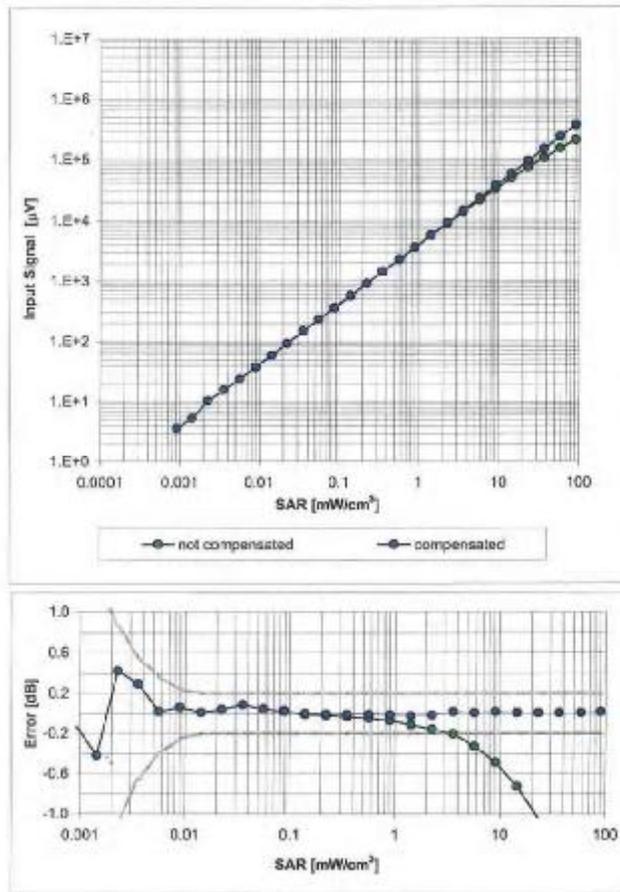
Page 6 of 9

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ES3DV3 SN:3088

January 18, 2008

Dynamic Range f(SAR_{head})
 (Waveguide R22, f = 1800 MHz)



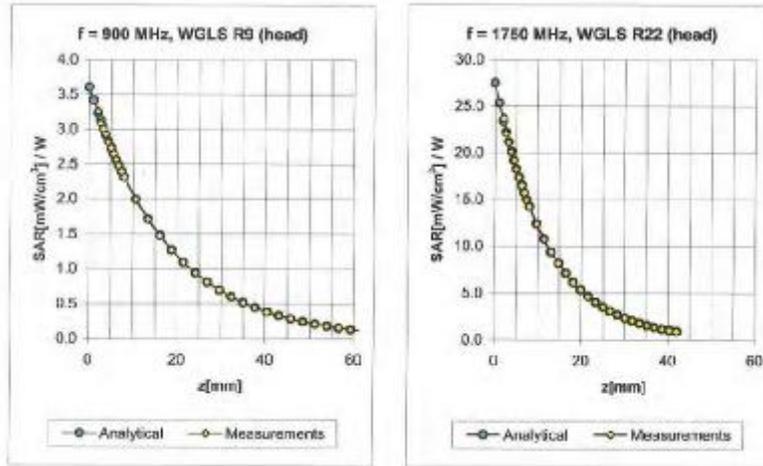
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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ES3DV3 SN:3088

January 18, 2008

Conversion Factor Assessment



f [MHz]	Validity [MHz] ²	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.90	1.23	6.15 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.93	1.18	5.04 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.73	1.35	4.84 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	38.2 ± 5%	1.83 ± 5%	0.70	1.39	4.53 ± 11.8% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.95	1.14	5.81 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.90	1.17	4.92 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.84	1.23	4.60 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.84	1.17	4.13 ± 11.8% (k=2)

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

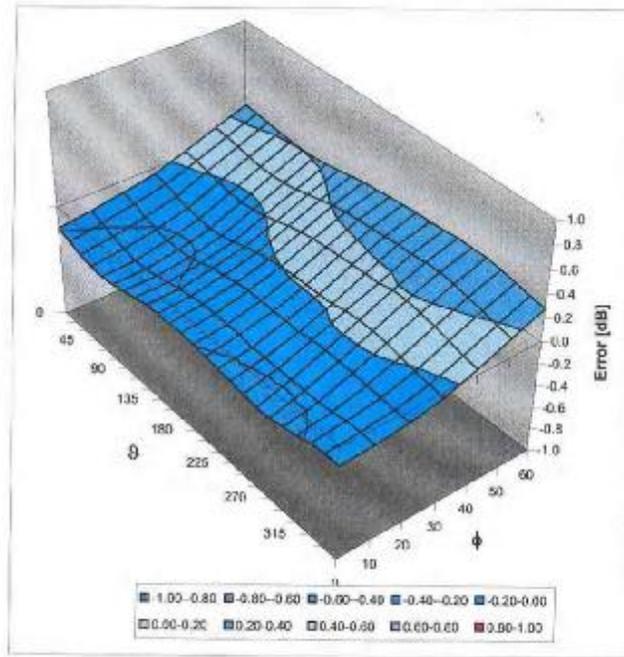
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ES3DV3 SN:3088

January 18, 2008

Deviation from Isotropy in HSL** Error (ϕ , θ), $f = 900$ MHz



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

Certificate No: ES3-3088_Jan08

Page 8 of 9

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5. DAE Calibration certification

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



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

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

Accreditation No.: **SCS 108**

Client **SGS - CSTC (MTT)**

Certificate No: **DAE3-569_Nov07**

CALIBRATION CERTIFICATE

Object: **DAE3 - SD 000 D03 AA - SN: 569**

Calibration procedure(s): **QA CAL-06.v12
 Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **November 19, 2007**

Condition of the calibrated item: **In Tolerance**

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

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

Calibration Equipment used (M&PE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Fuke Process Calibrator Type 702	SN: 6295803	04-Oct-07 (EICAL AG, No: 6467)	Oct-08
Kathley Multimeter Type 2001	SN: 0810278	03-Oct-07 (EICAL AG, No: 6465)	Oct-08
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V1.1	SE UMS 006 AB 1004	25-Jun-07 (SPEAG, in house check)	In house check Jun-08

	Name	Function	Signature
Calibrated by:	Dominique Steffen	Technician	
Approved by:	F. Bombolt	R&D Director	

Issued: November 19, 2007

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Certificate No. **DAE3-569_Nov07**

Page 1 of 5

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SHGSM

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 Shanghai Branch GSM Laboratory

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 中国·上海·宜山路 889 号 3 号楼 9 层 邮编: 200233

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 t (86 -21) 61402666*2736 f (86 -21) 54500149

www.cn.sgs.com
 e sgs.china@sgs.com

DC Voltage Measurement

A/D - Converter Resolution nominal
 High Range: 1LSB = 6.1 μ V, full range = -100...+300 mV
 Low Range: 1LSB = 61nV, full range = -1.....+3mV
 DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

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

Connector Angle

Connector Angle to be used in DASY system	265 $^{\circ}$ \pm 1 $^{\circ}$
---	-----------------------------------

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Appendix

1. DC Voltage Linearity

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

Low Range	Input (μV)	Reading (μV)	Error (%)
Channel X + Input	2000	2000	0.00
Channel X + Input	200	199.91	-0.05
Channel X - Input	200	-200.13	0.06
Channel Y + Input	2000	2000	0.00
Channel Y + Input	200	199.90	-0.55
Channel Y - Input	200	-200.33	0.17
Channel Z + Input	2000	2000	0.00
Channel Z + Input	200	199.87	-0.56
Channel Z - Input	200	-200.97	0.48

2. Common mode sensitivity

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

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

3. Channel separation

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

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

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4. AD-Converter Values with inputs shorted

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

	High Range (LSB)	Low Range (LSB)
Channel X	16395	15475
Channel Y	15747	16647
Channel Z	16314	16212

5. Input Offset Measurement

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

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

6. Input Offset Current

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

7. Input Resistance

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

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

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

9. Power Consumption (verified during pre test)

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

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7. Dipole Calibration certification

**Calibration Laboratory of
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 Engineering AG**
 Zaughausstrasse 43, 8004 Zurich, Switzerland



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

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

Accreditation No.: **SCS 108**

Client: **SGS China (Auden)**

Certificate No.: **D900V2-184_Dec07**

CALIBRATION CERTIFICATE

Object: **D900V2 - SN: 184**

Calibration procedure(s): **QA CAL-05.v7
 Calibration procedure for dipole validation kits**

Calibration date: **December 21, 2007**

Condition of the calibrated item: **In Tolerance**

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

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

Calibration Equipment used (M&E critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Power sensor HP 8481A	US37252783	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference 10 dB Attenuator	SN: 5047.2 (10r)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference Probe ET3DV6 (HF)	SN 1507	25-Oct-07 (SPEAG, No. ET3-1507_Out07)	Oct-08
DAE4	SN 601	30-Jan-07 (SPEAG, No. DAE4-601_Jan07)	Jan-08
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41002317	18-Oct-02 (SPEAG, in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-09 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

Calibrated by:	Name	Function	Signature
	Mika Mell	Laboratory Technician	
Approved by:	Name	Function	Signature
	Katja Pokovic	Technical Manager	

Issued: December 21, 2007

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

Certificate No: D900V2-184_Dec07

Page 1 of 9

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Measurement Conditions

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

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

Head TSL parameters

The following parameters and calculations were applied.

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

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.73 mW / g
SAR normalized	normalized to 1W	10.9 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	11.0 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.76 mW / g
SAR normalized	normalized to 1W	7.00 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	7.05 mW / g ± 15.5 % (k=2)

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

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Body TSL parameters

The following parameters and calculations were applied.

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

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.90 mW / g
SAR normalized	normalized to 1W	11.6 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	11.4 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.87 mW / g
SAR normalized	normalized to 1W	7.48 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	7.46 mW / g ± 18.5 % (k=2)

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

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.8 Ω - 7.5 $\mu\Omega$
Return Loss	- 22.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.3 Ω - 9.4 $\mu\Omega$
Return Loss	- 19.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.411 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	April 1, 2003

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DASY4 Validation Report for Head TSL

Date/Time: 21.12.2007 14:51:24

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: HSL 900 MHz;

Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 42.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(5.93, 5.93, 5.93); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn60(); Calibrated: 30.01.2007
- Phantom: Flat Phantom 4.9L; Type: QD00P49AA
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

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

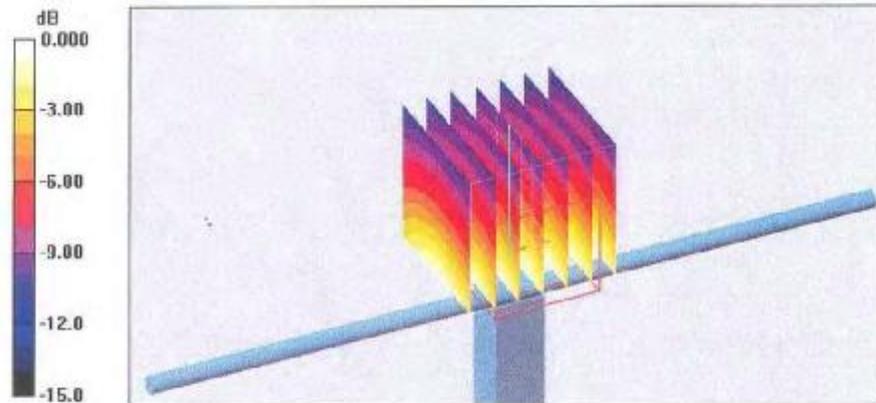
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.9 V/m; Power Drift = -0.012 dB

Peak SAR (extrapolated) = 4.06 W/kg

SAR(1 g) = 2.73 mW/g; SAR(10 g) = 1.75 mW/g

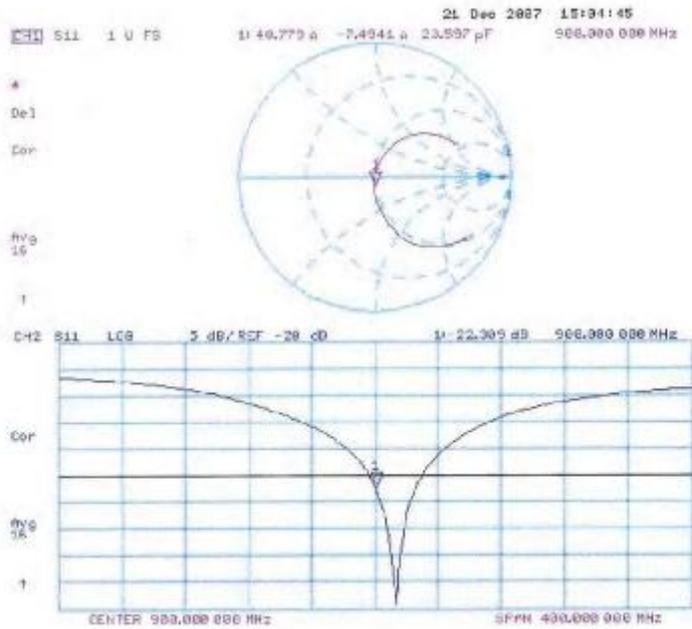
Maximum value of SAR (measured) = 2.95 mW/g



0 dB = 2.95 mW/g

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Impedance Measurement Plot for Head TSL



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DASY4 Validation Report for Body TSL

Date/Time: 21.12.2007 15:46:31

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: MSL900;

Medium parameters used: $f = 900$ MHz; $\sigma = 1.06$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

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

Pin=250mW/Zoom Scan (7x7x7)/Cube 0:

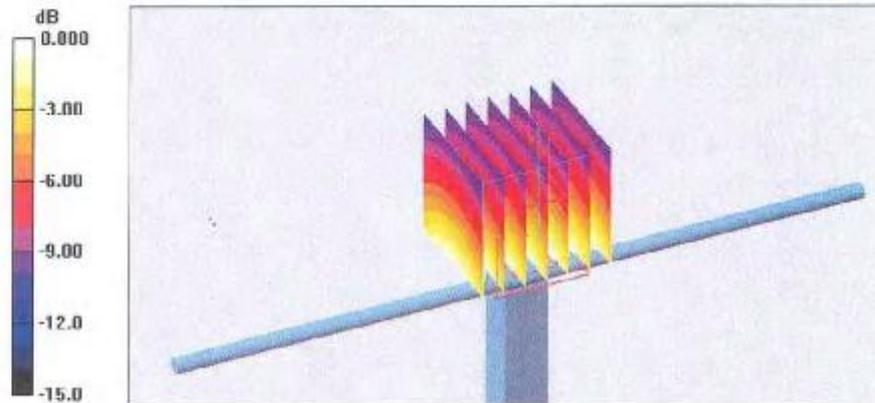
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.9 V/m; Power Drift = 0.008 dB

Peak SAR (extrapolated) = 4.23 W/kg

SAR(1 g) = 2.9 mW/g; SAR(10 g) = 1.87 mW/g

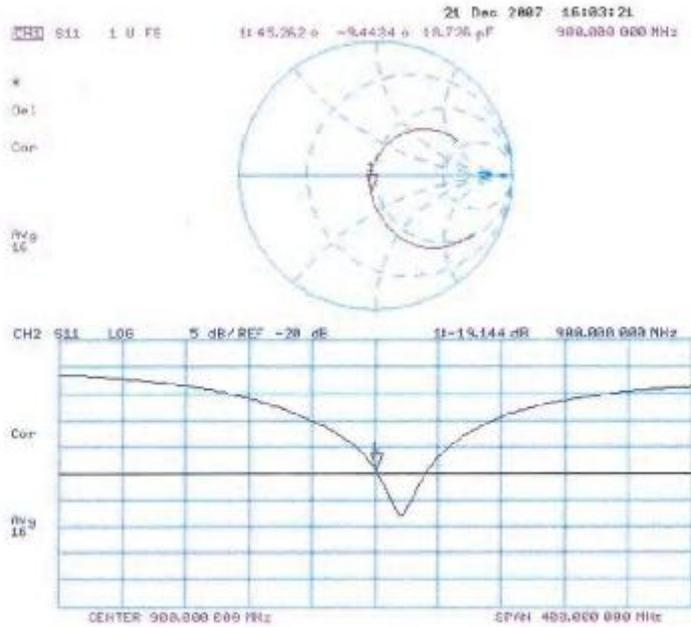
Maximum value of SAR (measured) = 3.16 mW/g



0 dB ≈ 3.16mW/g

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Impedance Measurement Plot for Body TSL



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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client: **SGS China (Auden)**

Certificate No: **D1900V2-5d028_Dec07**

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d028		
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits		
Calibration date:	December 21, 2007		
Condition of the calibrated item	In Tolerance		
<p>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.</p> <p>All calibrations have been conducted in the closed laboratory facility; environment temperature (22 ± 3 °C and humidity < 70%).</p> <p>Calibration Equipment used (MSTE critical for calibration)</p>			
Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GBS748C704	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Power sensor HP 8481A	JS37292783	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: E086 (20g)	07-Aug-07 (METAS, No. 217-00718)	Aug-08
Reference 10 dB Attenuator	SN: 5047.2 (10r)	07-Aug-07 (METAS, No. 217-00718)	Aug-08
Reference Probe ET3DWB (HF)	SN: 1507	26-Oct-07 (SPEAG, No. ET3-1507_Oct07)	Oct-08
DAE4	SN 601	30-Jan-07 (SPEAG, No. DAE4-601_Jan07)	Jan-08
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-07)	In house check: Oct-08
RF generator R&S SMT-06	100005	4-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US27390565 S4206	16-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08
Calibrated by:	Name: Claudio Leubler	Function: Laboratory Technician	Signature:
Approved by:	Name: Katja Polzovic	Function: Technical Manager	Signature:
			Issued: December 31, 2007
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

Certificate No: D1900V2-5d028_Dec07

Page 1 of 9

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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

- d) DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

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

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Measurement Conditions

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

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V9.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.0 ± 6 %	1.46 mho/m ± 6 %
Head TSL temperature during test	(21.5 ± 0.2) °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	9.02 mW / g
SAR normalized	normalized to 1W	39.3 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	37.9 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.14 mW / g
SAR normalized	normalized to 1W	20.6 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	20.2 mW / g ± 16.5 % (k=2)

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

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Body TSL parameters

The following parameters and calculations were applied.

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

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.34 mW / g
SAR normalized	normalized to 1W	37.4 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	37.2 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.97 mW / g
SAR normalized	normalized to 1W	19.9 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	19.8 mW / g ± 16.5 % (k=2)

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

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Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53,7 Ω + 5,2 jΩ
Return Loss	-24,3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49,5 Ω + 3,4 jΩ
Return Loss	-29,1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1,198 ns
----------------------------------	----------

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 17, 2002

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DASY4 Validation Report for Head TSL

Date/Time: 21.12.2007 09:54:50

Test Laboratory: SPEAG, Zurich, Switzerland

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

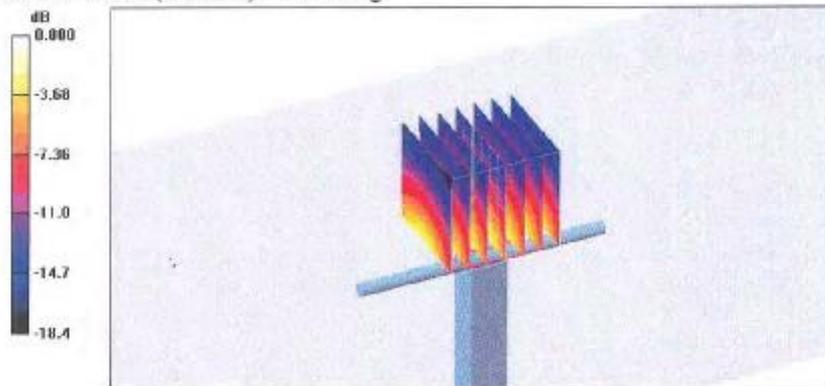
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
 Medium: HSL U10 BB;
 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.46$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvP(4.86, 4.86, 4.86); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAF4 Sn501; Calibration: 30.01.2007
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

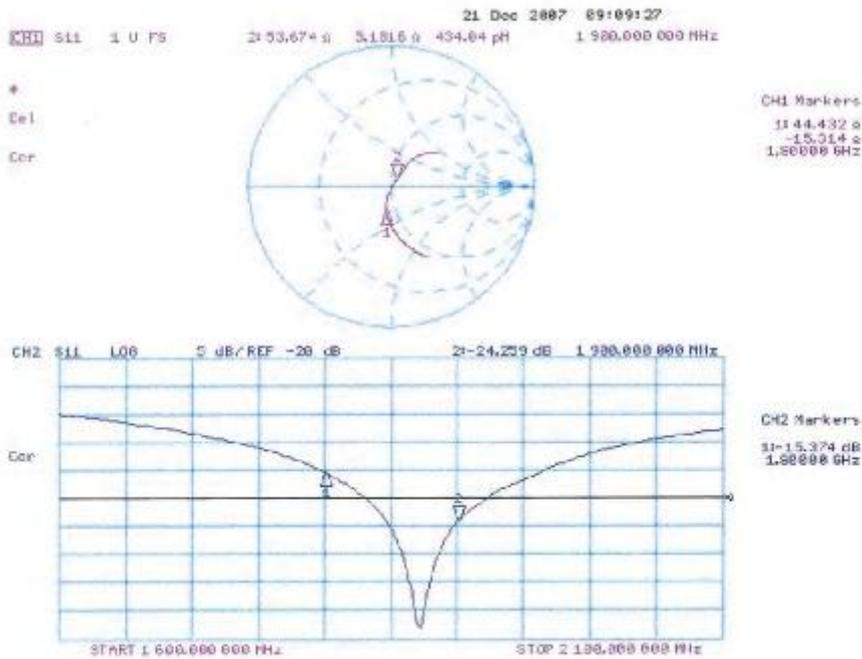
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

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



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Impedance Measurement Plot for Head TSL



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DASY4 Validation Report for Body TSL

Date/Time: 21.12.2007 11:05:06

Test Laboratory: SPEAG, Zurich, Switzerland

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

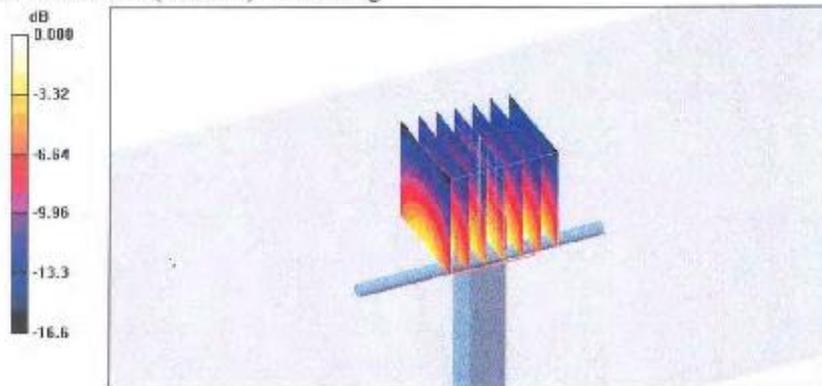
Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
 Medium: MSL U10 BB;
 Medium parameters used: $f = 1900$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53.6$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section
 Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV5 - SN1507 (HF); ConvF(4.48, 4.48, 4.48); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAF4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

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

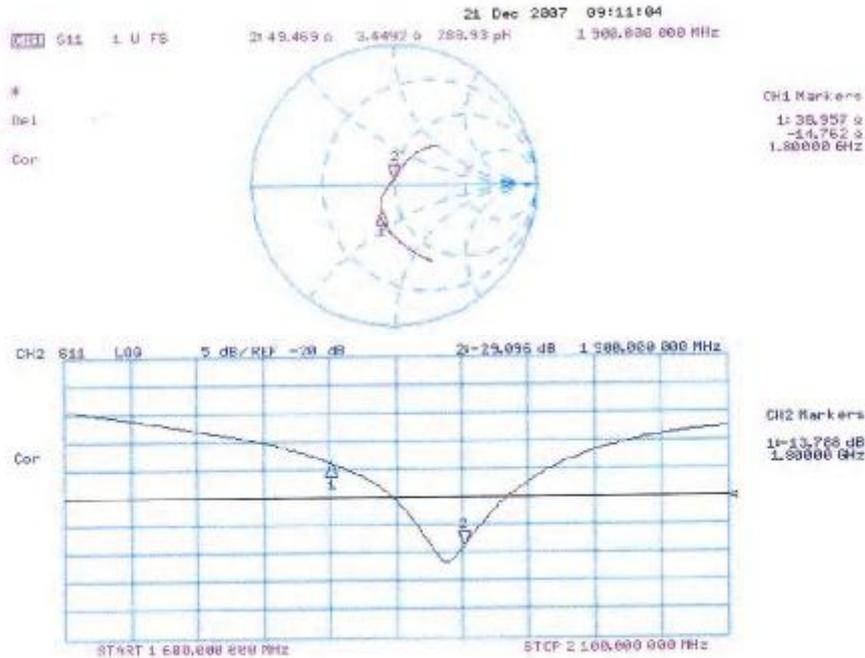
Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 89.3 V/m; Power Drift = -0.044 dB
 Peak SAR (extrapolated) = 16.0 W/kg
SAR(1 g) = 9.34 mW/g; SAR(10 g) = 4.97 mW/g
 Maximum value of SAR (measured) = 10.5 mW/g



0 dB = 10.5mW/g

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Impedance Measurement Plot for Body TSL



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**Calibration Laboratory of
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 Engineering AG**
 Zeughausstrasse 43, 8004 Zurich, Switzerland



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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **SGS China (Auden)**

Certificate No: **D2450V2-733_Dec07**

CALIBRATION CERTIFICATE

Object: **D2450V2 - SN: 733**

Calibration procedure(s): **QA CAL-05.v7
 Calibration procedure for dipole validation kits**

Calibration date: **December 20, 2007**

Condition of the calibrated item: **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37490704	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference 10 dB Attenuator	SN: 5047.2 (10r)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference Probe ES3DV2	SN: 3025	26-Oct-07 (SPEAG, No. ES3-3025_Oct07)	Oct-08
DAE4	SN: 601	30-Jan-07 (SPEAG, No. DAE4-601_Jan07)	Jan-08

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

Calibrated by: **Mike Meili** (Name), **Laboratory Technician** (Function), *[Signature]* (Signature)

Approved by: **Katja Pokovic** (Name), **Technical Manager** (Function), *[Signature]* (Signature)

Issued: December 20, 2007

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

- d) DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.2 ± 6 %	1.82 mho/m ± 6 %
Head TSL temperature during test	(21.0 ± 0.2) °C	-----	-----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	14.1 mW / g
SAR normalized	normalized to 1W	56.4 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	55.4 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.47 mW / g
SAR normalized	normalized to 1W	25.9 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	25.6 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	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.7 ± 6 %	1.98 mho/m ± 6 %
Body TSL temperature during test	(21.5 ± 0.2) °C	-----	-----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	250 mW input power	13.8 mW / g
SAR normalized	normalized to 1W	55.2 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	54.8 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.40 mW / g
SAR normalized	normalized to 1W	25.6 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	25.5 mW / g ± 16.5 % (k=2)

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

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.7 Ω + 3.6 jΩ
Return Loss	- 26.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.5 Ω + 5.1 jΩ
Return Loss	- 25.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.150 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	May 07, 2003

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DASY4 Validation Report for Head TSL

Date/Time: 18.12.2007 12:59:43

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN733

Communication System: CW-2450; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL U10 BB;

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.81$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025 (HF); ConvF(4.41, 4.41, 4.41); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

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

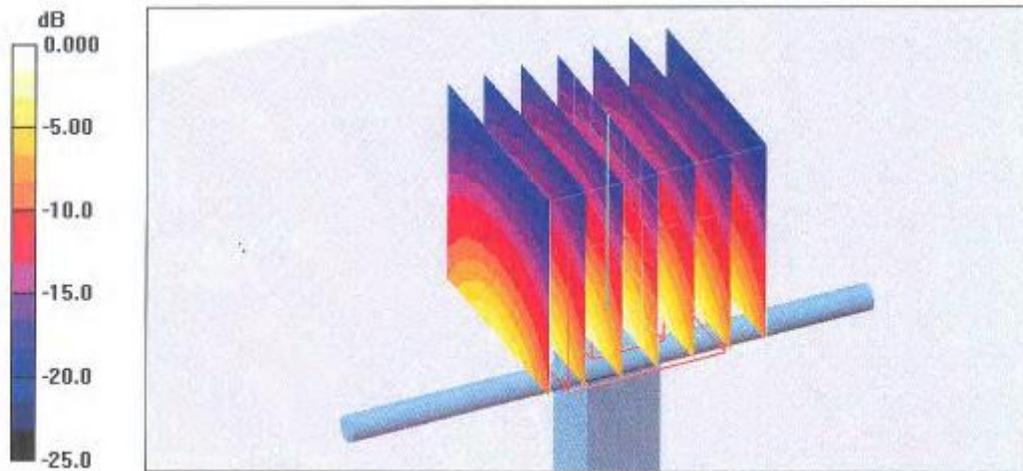
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 94.7 V/m; Power Drift = 0.006 dB

Peak SAR (extrapolated) = 30.4 W/kg

SAR(1 g) = 14.1 mW/g; SAR(10 g) = 6.47 mW/g

Maximum value of SAR (measured) = 16.0 mW/g



0 dB \hat{E} 16.0mW/g

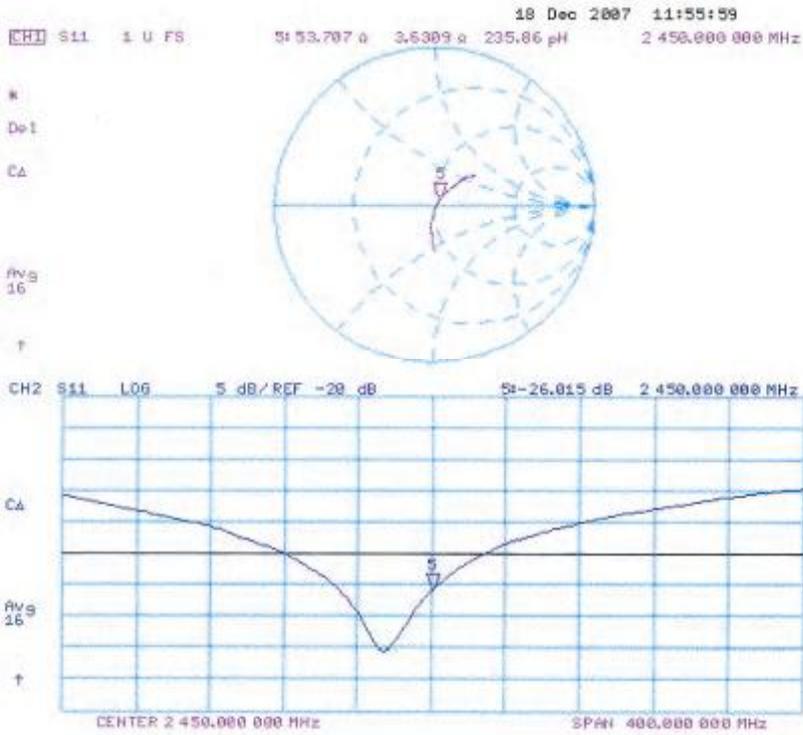
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Impedance Measurement Plot for Head TSL



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DASY4 Validation Report for Body TSL

Date/Time: 20.12.2007 11:33:28

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN733

Communication System: CW-2450; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: MSL U10 BB;

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.99$ mho/m; $\epsilon_r = 52.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025 (HF); ConvF(4.02, 4.02, 4.02); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

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

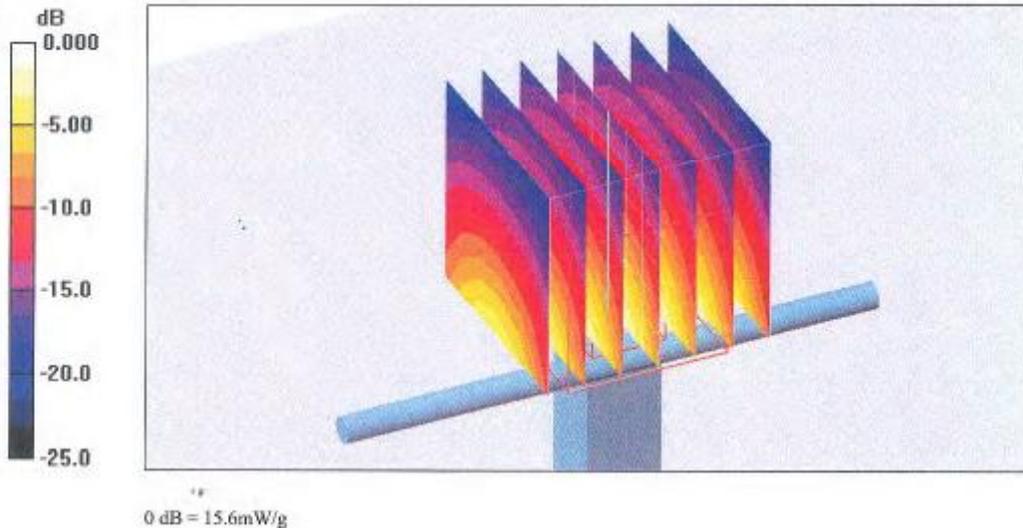
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.3 V/m; Power Drift = 0.039 dB

Peak SAR (extrapolated) = 28.7 W/kg

SAR(1 g) = 13.8 mW/g; SAR(10 g) = 6.4 mW/g

Maximum value of SAR (measured) = 15.6 mW/g



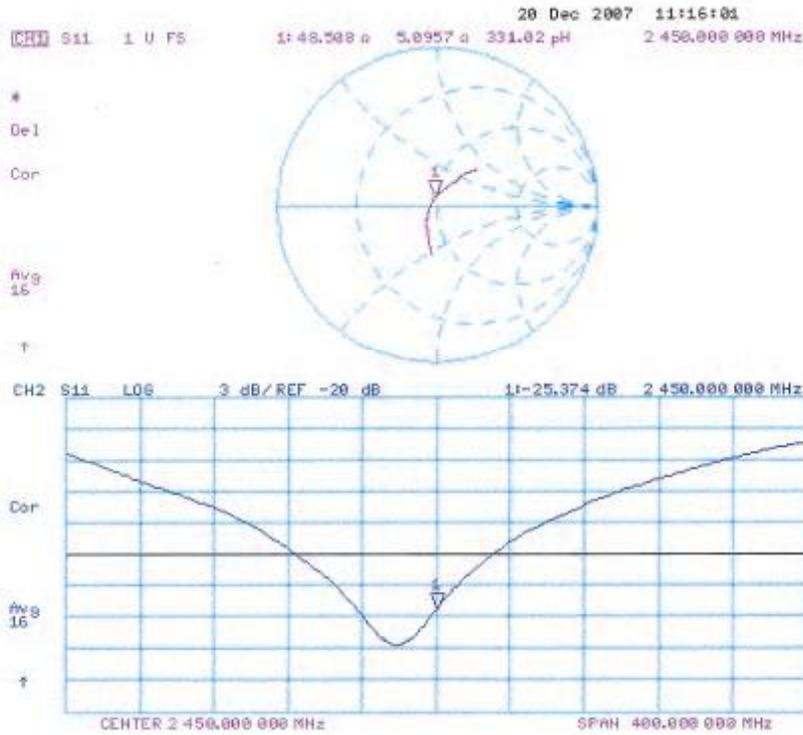
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Impedance Measurement Plot for Body TSL



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8. Uncertainty analysis

Error Description	Tol. (± %)	Prob. dist.	Div.	(c _i) (1g)	(c _i) (10g)	Std. unc. (± %) (1g) (10g)		(v _i)
Measurement System								
Probe Calibration	4.8	N	1	1	1	4.8	4.8	∞
Axial Isotropy	4.7	R	√3	1	1	2.7	2.7	∞
Hemispherical Isotropy	0	R	√3	1	1	0	0	∞
Boundary Effects	1.0	R	√3	1	1	0.6	0.6	∞
Linearity	4.7	R	√3	1	1	2.7	2.7	∞
System Detection Limit	1.0	R	√3	1	1	0.6	0.6	∞
Readout Electronics	1.0	N	1	1	1	1.0	1.0	∞
Response Time	0	R	√3	1	1	0	0	∞
Integration Time	0	R	√3	1	1	0	0	∞
RF Ambient Conditions	3.0	R	√3	1	1	1.7	1.7	∞
Probe Positioner	0.4	R	√3	1	1	0.2	0.2	∞
Probe Positioning	2.9	R	√3	1	1	1.7	1.7	∞
Algorithms for Max. SAR Eval.	1.0	R	√3	1	1	0.6	0.6	∞
Dipole								
Dipole Axis to Liquid Distance	2.0	R	√3	1	1	1.2	1.2	∞
Input power and SAR drift meas.	4.7	R	√3	1	1	2.7	2.7	∞
Phantom and Tissue Param.								
Phantom Uncertainty	4.0	R	√3	1	1	2.3	2.3	∞
Liquid Conductivity (target)	5.0	R.	√3	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (meas.)	2.5	N	1	0.64	0.43	1.6	1.1	∞
Liquid Permittivity (target)	5.0	R	√3	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (meas.)	2.5	N	1	0.6	0.49	1.5	1.2	∞
Combined Standard Uncertainty						8.4	8.1	∞
Coverage Factor for 95%		kp=2						
Expanded Uncertainty						16.8	16.2	

Dasy4 Uncertainty Budget

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9. Phantom description

Schmid & Partner Engineering AG

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

Certificate of conformity / First Article Inspection

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

Tests

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

Test	Requirement	Details	Units tested
Shape	Compliance with the geometry according to the CAD model.	IT1S CAD File (*)	First article, Samples
Material thickness	Compliant with the requirements according to the standards	2mm +/- 0.2mm in specific areas	First article, Samples
Material parameters	Dielectric parameters for required frequencies	200 MHz - 3 GHz Relative permittivity < 5 Loss tangent < 0.05.	Material sample TP 104-5
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards	Liquid type HSL 1800 and others according to the standard.	Pre-series, First article

Standards

- [1] CENELEC EN 50361
- [2] IEEE P1528-200x draft 6.5
- [3] IEC PT 62209 draft 0.9
- (*) The IT1S CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

Conformity

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

Date 28.02.2002

Signature / Stamp

F. Bernhardt

**Schmid & Partner
 Engineering AG**

Zaugghausstrasse 43, CH-8004 Zurich
 Tel. +41 1 245 97 00, Fax +41 1 245 97 79

Volker Kopp

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End of Report

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