

SAR TEST REPORT

The following samples were submitted and identified on behalf of the client as:

Product Name	ARGON MINI
Marketing Name	MOTOSMART
Brand Name	Motorola
Type Name	MOD11
Model No.	XT389 (GPPD:3345)
Company Name	Motorola Mobility Inc.
Company Address	9 F., No.9, Songgao Rd., Taipei 110, Taiwan, R.O.C.
Standards	OET 65 supplement C,IEEE /ANSI C95.1 , C95.3, IEEE 1528
FCC ID	IHDT56NN3
Date of Receipt	Feb. 24, 2012
Date of Test(s)	Mar. 03, 2012 ~ May 08, 2012
Date of Issue	Jun 07, 2012

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 Taiwan Electronic & Communication Laboratory or testing done by SGS Taiwan Electronic & Communication Laboratory in connection with distribution or use of the product described in this report must be approved by SGS Taiwan Electronic & Communication Laboratory in writing.

Signed for on the behalf of SGS

Supervisor

Ricky Huang

Ricky Huang

Date: Jun 07, 2012

Supervisor

Nick Hsu

Nick Hsu

Date: Jun 07, 2012

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Version

Report Number	Revision	Date	Memo
ES/2012/20009	00	2012/03/27	Initial creation of test report.
ES/2012/20009	01	2012/04/30	Modified EUT information at 1&4
ES/2012/20009	02	2012/05/11	Modified WLAN SAR result
ES/2012/20009	03	2012/06/07	Modified FCC ID

This test report contains a reference to the previous version test report that it replaces.

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1. General Information

1.1 Testing Laboratory

SGS Taiwan Ltd. Electronics & Communication Laboratory	
134, Wu Kung Road, Wuku industrial zone	
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Telephone	+886-2-2299-3279
Fax	+886-2-2298-0488
Internet	http://www.tw.sgs.com/

1.2 Details of Applicant

Company Name	Motorola Mobility Inc.
Company Address	9 F., No.9, Songgao Rd., Taipei 110, Taiwan, R.O.C.
Contact Person	Charlene Tsai
Telephone	+886-2-8726-2815
Fax	+886-2-8788-3008

1.3 Description of EUT

Product Name	ARGON MINI		
Marketing Name	MOTOSMART		
Brand Name	Motorola		
Type Name	MOD11		
Model No.	XT389 (GPPD:3345)		
IMEI Code	359500040014959		
FCC ID	IHDT56NN3		
Mode of Operation	<input checked="" type="checkbox"/> GSM <input checked="" type="checkbox"/> GPRS <input checked="" type="checkbox"/> WCDMA <input checked="" type="checkbox"/> HSDPA <input checked="" type="checkbox"/> HSUPA <input checked="" type="checkbox"/> WLAN802.11 b/g/n(<input checked="" type="checkbox"/> 20M) band		
Definition	Production unit		
Duty Cycle	GSM	1/8.3	
	GPRS	1/4.1	
	WCDMA	1	
	WLAN 802.11 b/g/n(20M)	1	

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TX Frequency Range (MHz)	GSM850		824.2	—	848.8
	GSM1900		1850.2	—	1909.8
	WLAN 802.11 b/g/n (20M)		2412	—	2462
Channel Number (ARFCN)	GSM850		128	—	251
	GSM1900		512	—	810
	WLAN 802.11 b/g/ n(20M)		1	—	11
VOIP Function	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO				
Max. SAR Measured(1 g) (Unit: mW/g)	Head	GSM850	1.29	<input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 251 Channel	
		GSM1900	0.403	<input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 810 Channel	
		WLAN802.11 b	0.193	<input type="checkbox"/> Left <input checked="" type="checkbox"/> Right <input checked="" type="checkbox"/> Cheek <input type="checkbox"/> Tilt 11 Channel with Memory card	
	Hotspot mode	GSM850	1.27	<input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Bottom <input type="checkbox"/> Right <input type="checkbox"/> Left 251 Channel	
		GSM1900	1.23	<input type="checkbox"/> Front <input type="checkbox"/> Back <input checked="" type="checkbox"/> Bottom <input type="checkbox"/> Right <input type="checkbox"/> Left 810 Channel	
		WLAN802.11 b	0.076	<input type="checkbox"/> Front <input checked="" type="checkbox"/> Back <input type="checkbox"/> Top <input type="checkbox"/> Right <input type="checkbox"/> Left 11 Channel	

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#. GSM/GPRS conducted power table:

EUT mode	Frequency (MHz)	CH	Burst average power		Source-based time average power	
			Peak(dBm)	Avg.(dBm)	Peak(dBm)	Avg.(dBm)
GSM 850	824.2	128	33.00	32.80	23.97	23.77
	836.6	190	33.00	32.80	23.97	23.77
	848.8	251	33.00	32.80	23.97	23.77
The division factor compared to the number of TX time slot						
Division factor			1 TX time slot			
			-9.03			

Burst average power						
			1Dn1UP		1Dn2UP	
EUT mode	Frequency (MHz)	CH	Peak (dBm)	Avg. (dBm)	Peak (dBm)	Avg. (dBm)
GPRS 850	824.2	128	33.00	32.80	32.30	32.20
	836.6	190	33.00	32.80	32.20	32.10
	848.8	251	33.00	32.80	32.10	32.00
Source-based time average power						
GPRS 850	824.2	128	23.97	23.77	26.28	26.18
	836.6	190	23.97	23.77	26.18	26.08
	848.8	251	23.97	23.77	26.08	25.98
The division factor compared to the number of TX time slot						
Division factor			1 TX time slot		2 TX time slot	
			-9.03		-6.02	

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EUT mode	Frequency (MHz)	CH	Burst average power		Source-based time average power	
			Peak(dBm)	Avg.(dBm)	Peak(dBm)	Avg.(dBm)
GSM 1900	1850.2	512	30.00	29.90	20.97	20.87
	1880	661	30.00	29.90	20.97	20.87
	1909.8	810	30.00	29.90	20.97	20.87
The division factor compared to the number of TX time slot						
Division factor			1 TX time slot			
			-9.03			

Burst average power						
EUT mode	Frequency (MHz)	CH	1Dn1UP		1Dn2UP	
			Peak (dBm)	Avg. (dBm)	Peak (dBm)	Avg. (dBm)
GPRS 1900	1850.2	512	29.90	29.80	29.00	28.80
	1880	661	29.90	29.80	29.00	28.80
	1909.8	810	30.00	29.90	29.00	28.80
Source-based time average power						
GPRS 1900	1850.2	512	20.87	20.77	22.98	22.78
	1880	661	20.87	20.77	22.98	22.78
	1909.8	810	20.97	20.87	22.98	22.78
The division factor compared to the number of TX time slot						
Division factor			1 TX time slot		2 TX time slot	
			-9.03		-6.02	

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#. WLAN802.11 b/g/n (20M) conducted power table:

		Peak power	Average power
WLAN 802.11 b	2412	19.73	17.22
	2437	20.00	17.36
	2462	19.89	17.59
WLAN 802.11 g	2412	16.95	13.62
	2437	17.12	13.64
	2462	17.01	13.45
WLAN 802.11 n (20M)	2412	14.94	11.58
	2437	15.67	12.14
	2462	15.45	12.60

#. Bluetooth conducted power table:

Channel	Peak Power	
	BDR	EDR
2402	6.69	6.15
2441	6.62	6.07
2480	7.15	6.67

1.4 Test Environment

 Ambient Temperature : $22 \pm 2^{\circ}$ C

 Tissue Simulating Liquid: $22 \pm 2^{\circ}$ C

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1.5 Operation Description

General:

1. The EUT is controlled by using a Radio Communication Tester (R&S CMU200), and the communication between the EUT and the tester is established by air link.
2. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s). The EUT is set to maximum power level during all tests, and at the beginning of each test the battery is fully charged.
3. During the SAR testing, the DASY4/DASY5 system checks power drift by comparing the e-field strength of one specific location measured at the beginning with that measured at the end of the SAR testing.
4. Testing Head SAR at lowest, middle and highest channel for all bands with LET/LEC/RET/REC conditions.
5. Testing body-worn SAR by separating **10mm**.
 - #. The SAR testing for portable devices with wireless router capability is referred as test guidance of **KDB 941225 D06** (SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities).
 - #. The following procedures are applicable when the overall device length and width are ≥ 9 cm x 5 cm respectively. A test separation of 10 mm is required. SAR must be measured for all sides and surfaces with a transmitting antenna located within 25 mm from that surface or edge, for the data modes, wireless technologies and frequency bands supporting hotspot mode.

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Test configurations:

- (1) Front side
- (2) Back side
- (3) Top side. (WWAN antenna to edge distance >25mm_No SAR)
- (4) Bottom side. (WLAN antenna to edge distance >25mm_No SAR)
- (5) Right side.
- (6) Left side.

SAR evaluation considerations for handsets with multiple transmitters:

6. When the maximum transmitter and antenna output power are $\leq 60/f(\text{GHz})$ (mW) SAR evaluation is typically not required for FCC or TCB approval
(BT power=7.15dBm)
7. According to **KDB248227**-SAR is not required for 802.11 g/HT20/HT40 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.
8. Using **KDB941225 D01** to exclude SAR test requirements for HSPA modes due to the maximum average output power of HSPA active is less than 1/4 dB higher than that measured without HSPA using 12.2kbps RMC
9. For Head, The highest 1-g SAR for WLAN is 0.193 W/kg and the highest 1-g SAR for WWAN is 1.29W/kg. The sum of 1-g for simultaneous transmitting WLAN and WWAN antenna pair is $0.193+1.29 = 1.483$ W/kg.
10. For Body, The highest 1-g SAR for WLAN is 0.076 W/kg and the highest 1-g SAR for WWAN is 1.27W/kg. The sum of 1-g for simultaneous transmitting WLAN and WWAN antenna pair is $0.076+1.27 = 1.346$ W/kg.

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11. Both Head & Body, **which lower than the limit 1.6W/kg**. According to **KDB648474/KDB447498** Simultaneous SAR evaluation is not required.
12. WLAN / WWAN – Antenna separation > 5cm, Sum of SAR is less than 1.6W/kg, hence no simultaneous SAR is needed.
13. According KDB941225 D03 and KDB941225 D04 to exclude SAR test requirements for EDGE modes due to the source-based time-averaged output power for edge mode is lower than that in the GPRS mode.

Additional configuration(Head):

14. For highest SAR configuration in this band repeated with external Memory card inside.

Additional configuration(Body):

15. For highest SAR configuration in this band repeated with external Memory card inside.
16. For highest SAR configuration in this band repeated with Headset.

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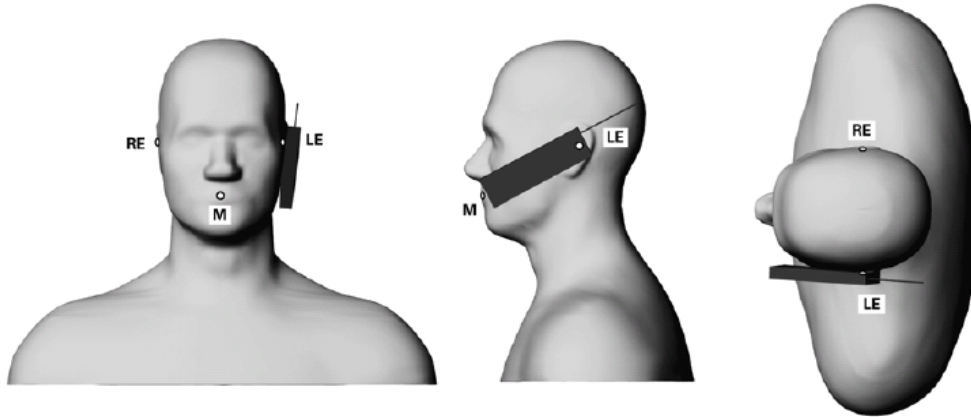
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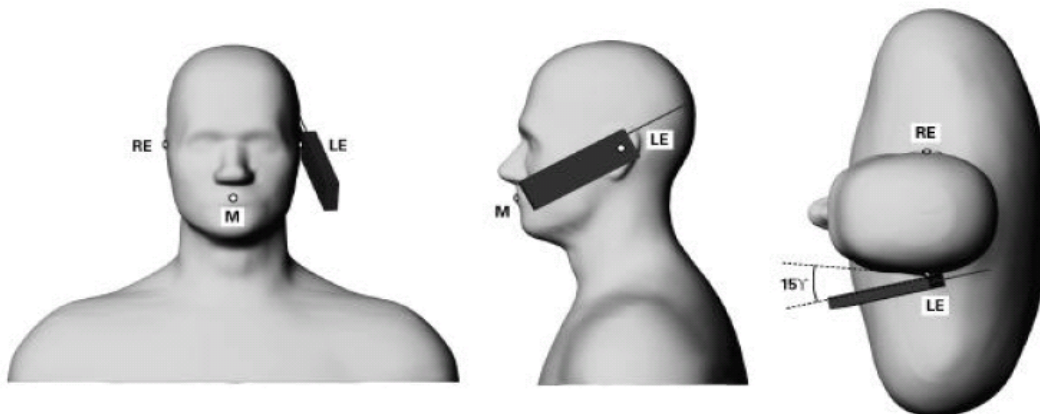
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1.6 Positioning Procedure



Phone position 1, "cheek" or "touch" position. The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.



Phone position 2, "tilted position." The reference points for the right ear (RE), left ear (LE) and mouth (M), which define the reference plane for phone positioning.

Cheek/Touch Position:

The handset was brought toward the mouth of the head phantom by pivoting against the ear reference point until any point of the mouthpiece or keypad touched the phantom.

Ear/Tilt Position:

With the phone aligned in the Cheek/Touch position, the handset was tilted away from the mouth with respect to the test device reference point by 15 degrees.

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1.7 Evaluation Procedures

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. The extraction of the measured data (grid and values) from the Zoom Scan.
2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters).
3. The generation of a high-resolution mesh within the measured volume.
4. The interpolation of all measured values from the measurement grid to the high-resolution grid.
5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface.
6. The calculation of the averaged SAR within masses of 1g and 10g.

The probe is calibrated at the center of the dipole sensors that is located 1 to 2.7mm away from the probe tip. During measurements, the probe stops shortly above the phantom surface, depending on the probe and the surface detecting system. Both distances are included as parameters in the probe configuration file. The software always knows exactly how far away the measured point is from the surface. As the probe cannot directly measure at the surface, the values between the deepest measured point and the surface must be extrapolated. The angle between the probe axis and the surface normal line is less than 30 degree.

In the Area Scan, the gradient of the interpolation function is evaluated to find all the extreme of the SAR distribution. The uncertainty on the locations of the extreme is less than 1/20 of the grid size. Only local maximum within -2 dB of the global maximum are searched and passed for the Cube Scan measurement. In the Cube Scan, the interpolation function is used to extrapolate the Peak SAR from the lowest measurement points to the inner phantom surface (the extrapolation distance). The uncertainty increases with the extrapolation distance. To keep the uncertainty within 1% for the 1 g and 10 g cubes, the extrapolation distance should not be larger than 5mm.

The maximum search is automatically performed after each area scan measurement. It

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is based on splines in two or three dimensions. The procedure can find the maximum for most SAR distributions even with relatively large grid spacing. After the area scanning measurement, the probe is automatically moved to a position at the interpolated maximum. The following scan can directly use this position for reference, e.g., for a finer resolution grid or the cube evaluations. The 1g and 10g peak evaluations are only available for the predefined cube 7x7x7 scans.

The routines are verified and optimized for the grid dimensions used in these cube measurements. The measured volume of 30x30x30mm contains about 30g of tissue. The first procedure is an extrapolation (incl. Boundary correction) to get the points between the lowest measured plane and the surface. The next step uses 3D interpolation to get all points within the measured volume. In the last step, a 1g cube is placed numerically into the volume and its averaged SAR is calculated. This cube is the moved around until the highest averaged SAR is found.

If the highest SAR is found at the edge of the measured volume, the system will issue a warning: higher SAR values might be found outside of the measured volume. In that case the cube measurement can be repeated, using the new interpolated maximum as the center.

1.8 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 & DASY 5 professional system). A Model ES3DV3/EX3DV4 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.

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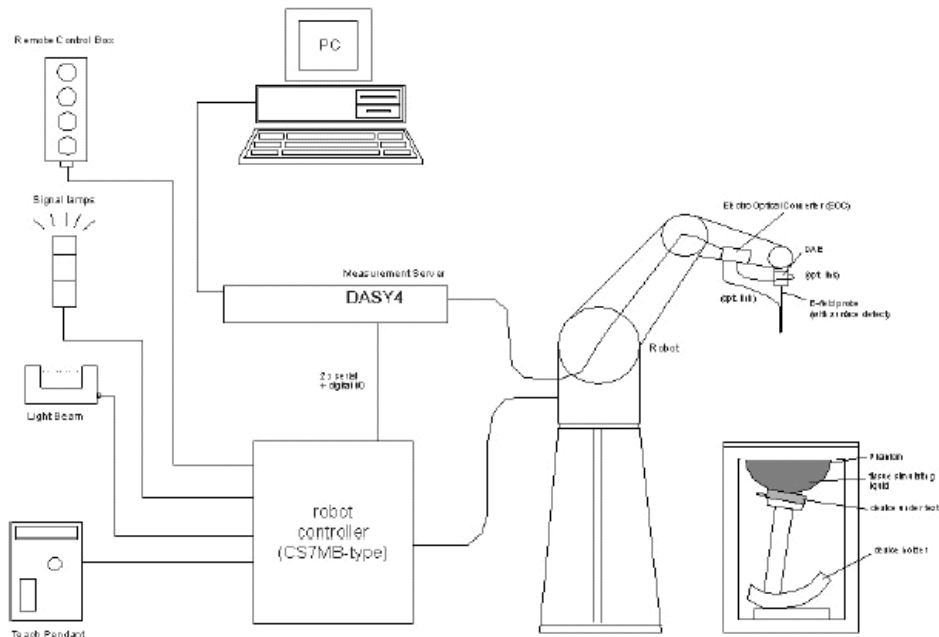


Fig.a The block diagram of SAR system

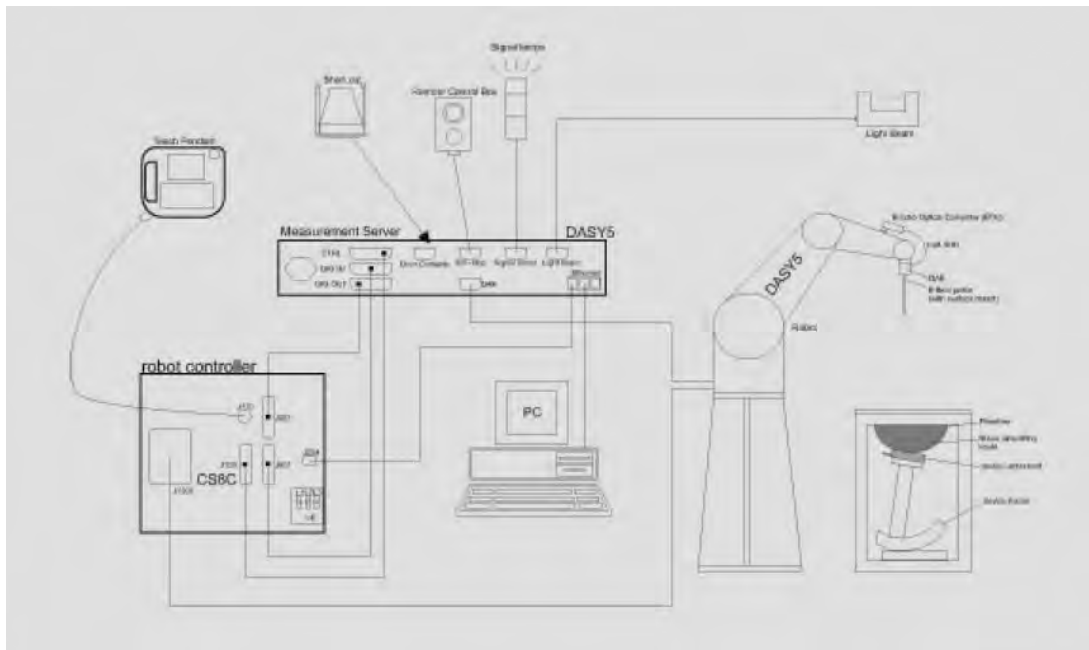


Fig.a-1 The block diagram of SAR system

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The DASY4 / DASY5 system for performing compliance tests consists of the following items:

- A standard high precision 6-axis robot (Staubli RX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
- A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 2000 or Windows XP.
- DASY4 / DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validate the proper functioning of the system.


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1.9 System Components

ES3DV3/EX3DV4 E-Field Probe

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL835/1900/2450MHz Additional CF for other liquids and frequencies upon request	
		ES3DV3/EX3DV4 E-Field Probe
Frequency	10 MHz to > 6 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB (noise: typically < 1 μ W/g)	
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%.	

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SAM PHANTOM V4.0C

Construction:	<p>The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-200X, CENELEC 50361 and IEC 62209.</p> <p>It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.</p>	
Shell Thickness:	2 ± 0.2 mm	
Filling Volume:	Approx. 25 liters	
Dimensions:	Height: 251 mm; Length: 1000 mm; Width: 500 mm	

DEVICE HOLDER

Construction	<p>In combination with the Twin SAM Phantom V4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).</p>	 <p style="text-align: center;">Device Holder</p>
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1.10 SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig. b. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within $\pm 5\%$ from the target SAR values.

These tests were done at 835/1900/2450 MHz. 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. During the tests, the ambient temperature of the laboratory was in the range 22.1°C , the relative humidity was in the range 62% 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.

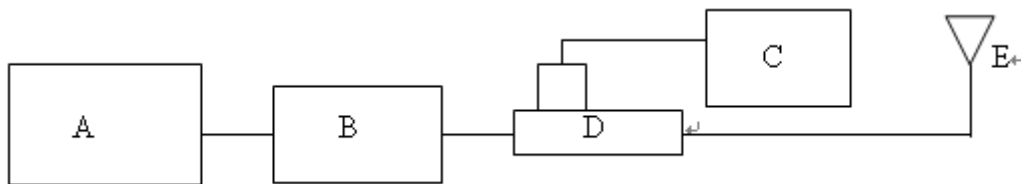
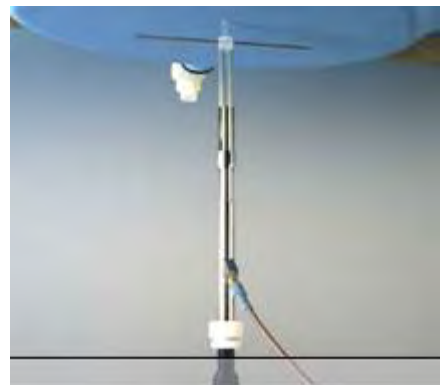


Fig.b The block diagram of system verification

- A. Signal Generator
- B. Amplifier
- C. Power Meter
- D. Dual directional Coupling
- E. Reference dipole antenna



Photograph of the dipole Antenna

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Validation Kit	S/N	Frequency (MHz)		Target SAR (1g) (Pin=250mW) (mW/g)	Measured SAR (1g)(mW/g)	Measured Date
D835V2	4d063	835	Head	2.31	2.27	Mar. 03, 2012
			Body	2.43	2.39	Mar. 03, 2012
D1900V2	5d027	1900	Head	10.1	10.6	Mar. 03, 2012
			Body	9.93	10.4	Mar. 03, 2012
D2450V2	869	2450	Head	13.8	13.3	May. 08, 2012
			Body	13	12.7	May. 08, 2012

Table 1. System validation (follow manufacture target value)

1.11 Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this Head-simulant fluid were measured by using the Agilent Model 85070D Dielectric Probe (rates frequency band 200 MHz to 20 GHz) in conjunction with HP E5071C/8753D Network Analyzer (30 KHz-6000MHz).

All dielectric parameters of tissue simulates were measured within 24 hours of SAR measurements. The depth of the tissue simulant in the flat section of the phantom was $15\text{cm} \pm 5\text{mm}$ during all tests. (Appendix Fig .2)

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Frequency (MHz)	Tissue type	Dielectric Parameters		Recommended Limits	Measured	Measurement date		
835	Head	ρ	Verification		38.38-42.42	42	Mar. 3, 2012	
			GSM 850	CH (L)		42.1		
				CH (M)		41.9		
				CH (H)		41.8		
		σ (S/m)	Verification			0.84-0.92		0.882
			GSM 850	CH (L)				0.86
				CH (M)				0.886
	CH (H)	0.911						
	Simulated Tissue Temp.(°C)		20-24	21.7				
	Body	ρ	Verification		51.21-56.60	52.3		
			GSM 850	CH (L)		52.4		
				CH (M)		52.2		
				CH (H)		52.1		
		σ (S/m)	Verification			0.95-1.05		0.97
GSM 850			CH (L)	0.959				
			CH (M)	0.972				
	CH (H)	0.984						
Simulated Tissue Temp.(°C)		20-24	21.7					
1900	Head	ρ	Verification		37.05-40.95	39.4	Mar. 3, 2012	
			GSM 1900	CH (L)		39.7		
				CH (M)		39.5		
				CH (H)		39.4		
		σ (S/m)	Verification		1.34-1.48	1.47		
			GSM 1900	CH (L)		1.36		
				CH (M)		1.44		
				CH (H)		1.47		
		Simulated Tissue Temp.(°C)		20-24	21.7			

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1900	Body	ρ	Verification		48.55-53.66	49.2	Mar. 3, 2012
			GSM 1900	CH (L)		49.5	
				CH (M)		49.3	
				CH (H)		49.2	
		σ (S/m)	Verification		1.44-1.60	1.59	
			GSM 1900	CH (L)		1.49	
				CH (M)		1.56	
				CH (H)		1.59	
		Simulated Tissue Temp.(°C)		20-24	21.7		
		2450	Head	ρ	Verification		
WLAN b	CH (L)				38.344		
	CH (M)				38.221		
	CH (H)				38.297		
σ (S/m)	Verification			1.76-1.94	1.802		
	WLAN b				CH (L)	1.769	
					CH (M)	1.788	
					CH (H)	1.805	
Simulated Tissue Temp.(°C)			20-24	21.7			
Body	ρ		Verification		49.02-54.18	51.375	May. 8, 2012
			WLAN b	CH (L)		51.437	
				CH (M)		51.33	
				CH (H)		51.311	
	σ (S/m)		Verification		1.89-2.09	2.01	
		WLAN b	CH (L)	1.947			
			CH (M)	1.982			
			CH (H)	2.023			
Simulated Tissue Temp.(°C)		20-24	21.7				

Table 2. Dielectric Parameters of Tissue Simulant Fluid

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The composition of the tissue simulating liquid:

Frequency (MHz)	Mode	Ingredient						Total amount
		DGMBE	Water	Salt	Preventol D-7	Cellulose	Sugar	
850	Head	—	532.63	18.29	2.40	3.20	765.49	1.0L(Kg)
	Body	—	633.91	11.76	1.20	—	602.12	1.0L(Kg)
1900	Head	445.08	554.12	0.80	—	—	—	1.0L(Kg)
	Body	300.03	697.94	2.03	—	—	—	1.0L(Kg)
2450	Head	450.00	550.00	—	—	—	—	1.0L(Kg)
	Body	313.65	686.35	—	—	—	—	1.0L(Kg)

Table 3. Recipes for tissue simulating liquid (Unit: g)

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1.12 Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE C95.1-1992, Copyright 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017.

These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter.

Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

(1) Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over an 10 grams of tissue (defined as a tissue volume in the shape of a cube).

Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety

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program in a work environment.

(2) Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube).

Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube).

General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure.

Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.(Table .6)

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR (Brain)	1.60 m W/g	8.00 m W/g
Spatial Average SAR (Whole Body)	0.08 m W/g	0.40 m W/g
Spatial Peak SAR (Hands/Feet/Ankle/Wrist)	4.00 m W/g	20.00 m W/g

Table 4. RF exposure limits

Notes:

1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

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2. Summary of Results

GSM 850 MHz

Band	Mode	EUT Position	Test Configuration	Averaged SAR over 1g /10g (W/kg)			SAR Limit 1g (W/kg)
				CH 128	CH 190	CH 251	
				824.20 MHz	836.60 MHz	848.80 MHz	
GSM850	GSM	Right	Cheek	1.11 / 0.761	1.18 / 0.824	1.29 / 0.911	1.6
			-with Memory card	—	—	1.16 / 0.824	1.6
			Tilt	—	0.341 / 0.252	—	1.6
		Left	Cheek	—	0.785 / 0.562	—	1.6
			Tilt	—	0.307 / 0.228	—	1.6
			Front	0.979 / 0.718	1.07 / 0.796	1.12 / 0.840	1.6
	GPRS	Hotspot mode	Back	1.07 / 0.774	1.19 / 0.875	1.27 / 0.917	1.6
			-with Headset	—	—	0.992 / 0.733	1.6
			-with Memory card	—	—	1.04 / 0.774	1.6
			Bottom	—	0.109 / 0.063	—	1.6
			Right	—	0.541 / 0.366	—	1.6
			Left	—	0.500 / 0.330	—	1.6

According KDB941225 D03 and KDB941225 D04 to exclude SAR test requirements for EDGE modes due to the source-based time-averaged output power for edge mode is lower than that in the GPRS mode.

According to KDB447498 the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required.

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PCS 1900 MHz

Band	Mode	EUT Position	Test Configuration	Averaged SAR over 1g / 10g (W/kg)			SAR Limit 1g (W/kg)
				CH 512	CH 661	CH 810	
				1850.20 MHz	1800.00 MHz	1909.80 MHz	
PCS 1900	GSM	Right	Cheek	0.372 / 0.234	0.391 / 0.240	0.403 / 0.242	1.6
			Tilt	—	0.090 / 0.055	—	1.6
		Left	Cheek	—	0.315 / 0.195	—	1.6
			Tilt	—	0.135 / 0.084	—	1.6
	GPRS	Hotspot	Front	—	0.567 / 0.324	—	1.6
			Back	0.972 / 0.539	1.02 / 0.597	1.08 / 0.644	1.6
			Bottom	0.970 / 0.523	1.13 / 0.622	1.23 / 0.644	1.6
			Right	—	0.107 / 0.064	—	1.6
			Left	—	0.096 / 0.054	—	1.6

- # KDB941225 D03 and KDB941225 D04 to exclude SAR test requirements for EDGE modes due to the source-based time-averaged output power for edge mode is lower than that in the GPRS mode.
- # According to KDB447498 the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required.

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WLAN802.11 b

Band	EUT Position	Test Configuration	Averaged SAR over 1g / 10g (W/kg)			SAR Limit 1g (W/kg)
			CH 1	CH 6	CH 11	
			2412 MHz	2437 MHz	2462 MHz	
WLAN 802.11 b	Right	Cheek	0.171/0.085	0.188/0.089	0.192/0.085	1.6
		- With Bluetooth	—	—	0.182/0.083	1.6
		- With Memory card	—	—	0.193/0.085	1.6
		Tilt	—	0.106/0.054	—	1.6
	Left	Cheek	—	0.117/0.061	—	1.6
		Tilt	—	0.092/0.048	—	1.6
	Hotspot	Front	—	0.053/0.031	—	1.6
		Back	0.062/0.036	0.067/0.040	0.076/0.045	1.6
		- With Headset	—	—	0.067/0.036	1.6
		- With Bluetooth	—	—	0.059/0.035	1.6
		- With Memory card	—	—	0.075/0.038	1.6
		Top	—	0.055/0.031	—	1.6
		Right	—	0.017/ 0.00965	—	1.6
	Left	—	0.043/0.021	—	1.6	

Using KDB248227-SAR is not required for 802.11 g/HT20 channels when the maximum average output power is less than 1/4 dB higher than that measured on the corresponding 802.11b channels.

According to KDB447498 the 1-g SAR for the highest output channel is less than 0.8 W/kg, where the transmission band corresponding to all channels is ≤ 100 MHz, testing for the other channels is not required.

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3. Instruments List

Device	Manufacturer	Type	Serial number	Date of last calibration	Date of last calibration
Dosimetric E-Field Probe	Schmid & Partner Engineering AG	ES3DV3	3172	Aug.23.2011	Aug.22.2012
		EX3DV4	3831	Jan.04.2012	Jan.03.2013
835/1900/2450 MHz System Validation Dipole	Schmid & Partner Engineering AG	D835V2	4d063	May 25.2011	May 24.2012
		D1900V2	5d027	Apr.19.2011	Apr.18.2012
		D2450V2	869	Jul.15.2011	Jul.14.2012
Data acquisition Electronics	Schmid & Partner Engineering AG	DAE4	547	Aug.29.2011	Aug.28.2012
			1260	Aug.22.2011	Aug.21.2012
Software	Schmid & Partner Engineering AG	DASY 4 V4.7 /Dasy 5 V52.8.1	N/A	Calibration not required	Calibration not required
Phantom	Schmid & Partner Engineering AG	SAM	N/A	Calibration not required	Calibration not required
Network Analyzer	HP	E5071C	MY46108212	Mar.21.2011	Mar.20.2012
		8753D	3410A05547	Mar.15.2012	Mar.14.2013
Dielectric Probe Kit	HP	85070D	US01440168	Calibration not required	Calibration not required
Dual-directional coupler	Agilent	772D	MY46151242	Jul.07.2011	Jul.06.2012
		778D	MY48220468	May 29.2011	May 28.2012
RF Signal Generator	Agilent	N5181A	MY50141235	Jan.06.2012	Jan.05.2013
USB Power Sensor	Agilent	U2001B	MY48100169	Apr.30.2011	Apr.29.2012
Power meter	Agilent	E4417A	MY51410006	Oct.24.2011	Oct.23.2012
Radio Communication Test	R&S	CMU200	113505	May 31.2011	May 30.2012

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4. Measurements

Date: 2012/3/3

RE Cheek_CH128

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium: Head 850 MHz Medium parameters used (interpolated): $f = 824.2 \text{ MHz}$; $\sigma = 0.86 \text{ mho/m}$; $\epsilon_r = 42.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.33 mW/g

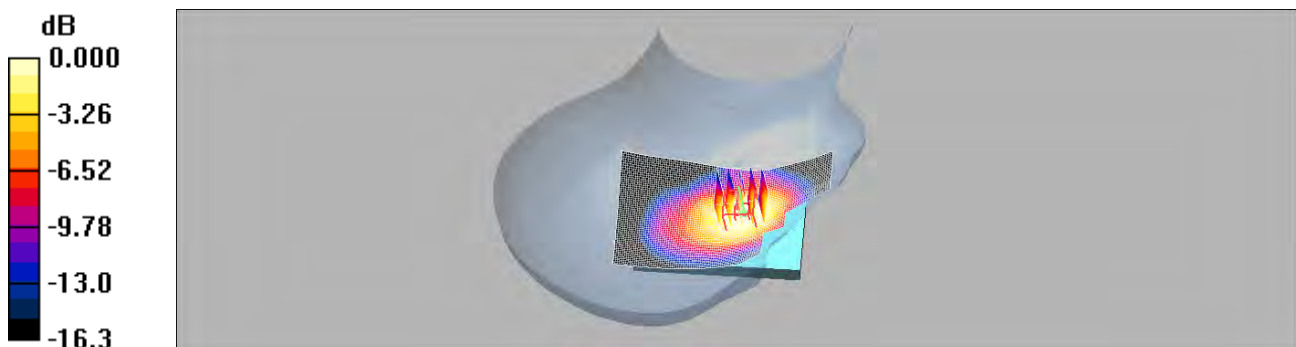
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.26 V/m; Power Drift = -0.049 dB

Peak SAR (extrapolated) = 1.57 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.761 mW/g

Maximum value of SAR (measured) = 1.21 mW/g



0 dB = 1.21mW/g

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RE Cheek_CH190

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: Head 850 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.886 \text{ mho/m}$; $\epsilon_r = 41.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.44 mW/g

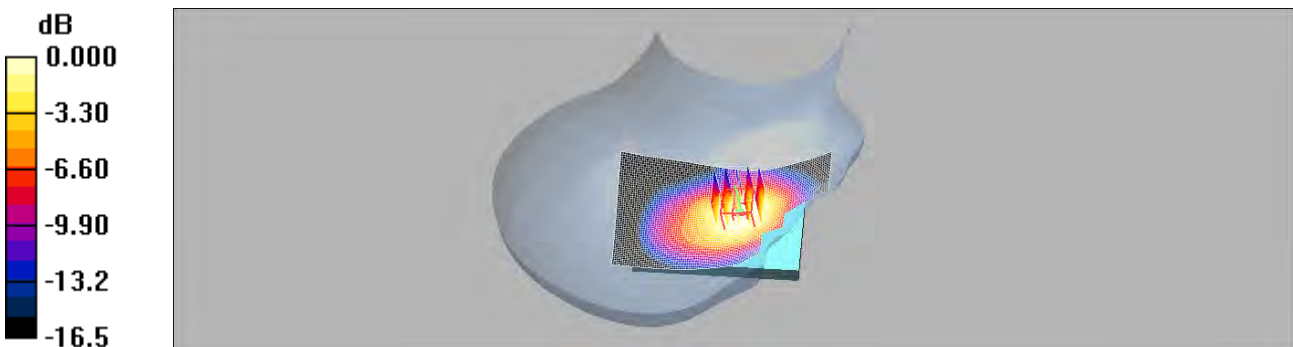
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.55 V/m; Power Drift = -0.143 dB

Peak SAR (extrapolated) = 1.73 W/kg

SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.824 mW/g

Maximum value of SAR (measured) = 1.29 mW/g



0 dB = 1.29mW/g

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RE Cheek_CH251

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium: Head 850 MHz Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.911 \text{ mho/m}$; $\epsilon_r = 41.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

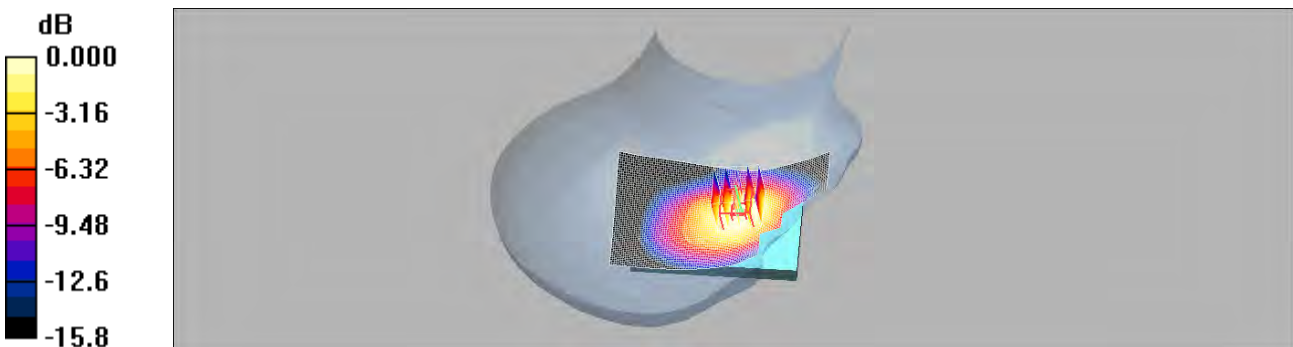
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 7.82 V/m; Power Drift = -0.039 dB

Peak SAR (extrapolated) = 1.88 W/kg

SAR(1 g) = 1.29 mW/g; SAR(10 g) = 0.911 mW/g

Maximum value of SAR (measured) = 1.41 mW/g

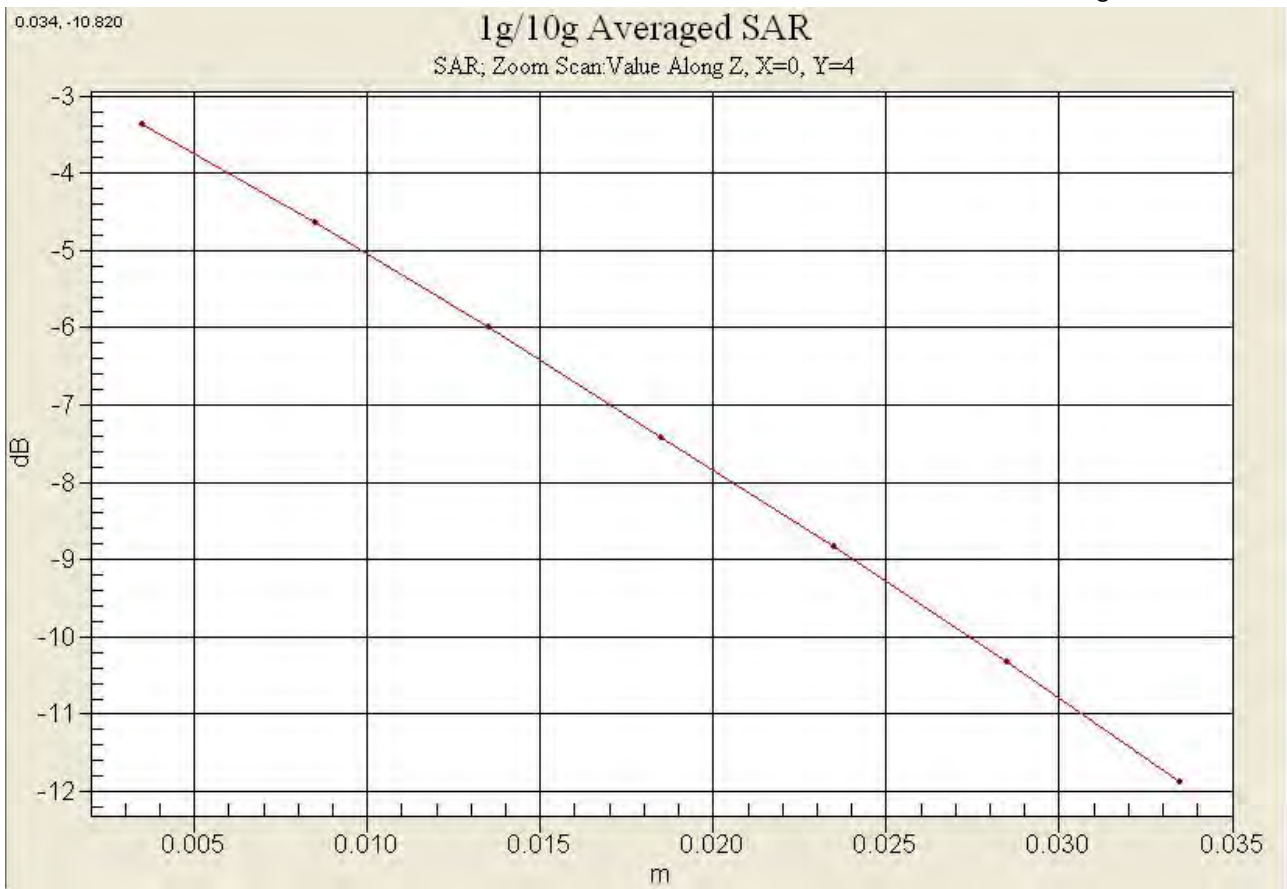


0 dB = 1.41mW/g

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RE Cheek_CH251_repeated with memory card

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium: Head 850 MHz Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.911 \text{ mho/m}$; $\epsilon_r = 41.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.40 mW/g

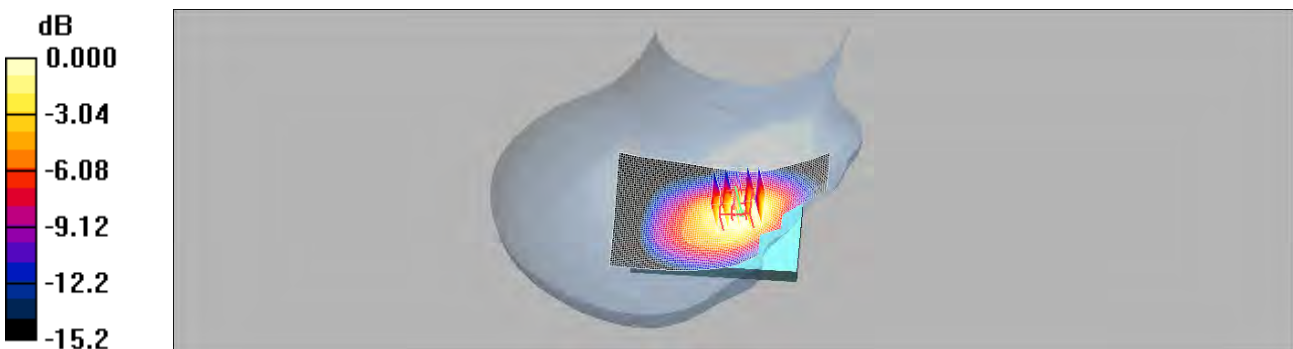
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.98 V/m; Power Drift = -0.005 dB

Peak SAR (extrapolated) = 1.71 W/kg

SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.824 mW/g

Maximum value of SAR (measured) = 1.26 mW/g



0 dB = 1.26mW/g

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RE Tilt_CH190

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: Head 850 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.886 \text{ mho/m}$; $\epsilon_r = 41.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.375 mW/g

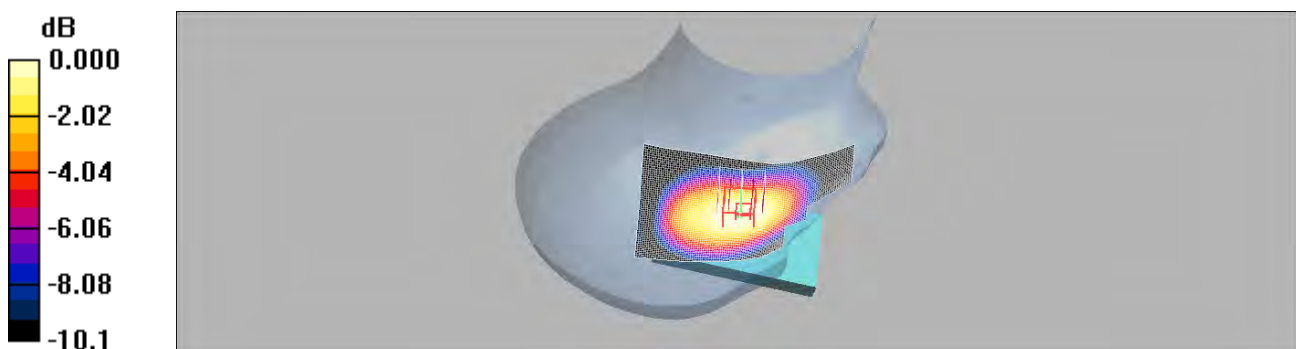
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.2 V/m; Power Drift = -0.094 dB

Peak SAR (extrapolated) = 0.420 W/kg

SAR(1 g) = 0.341 mW/g; SAR(10 g) = 0.252 mW/g

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



0 dB = 0.368mW/g

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LE Cheek_CH190

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: Head 850 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.886 \text{ mho/m}$; $\epsilon_r = 41.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

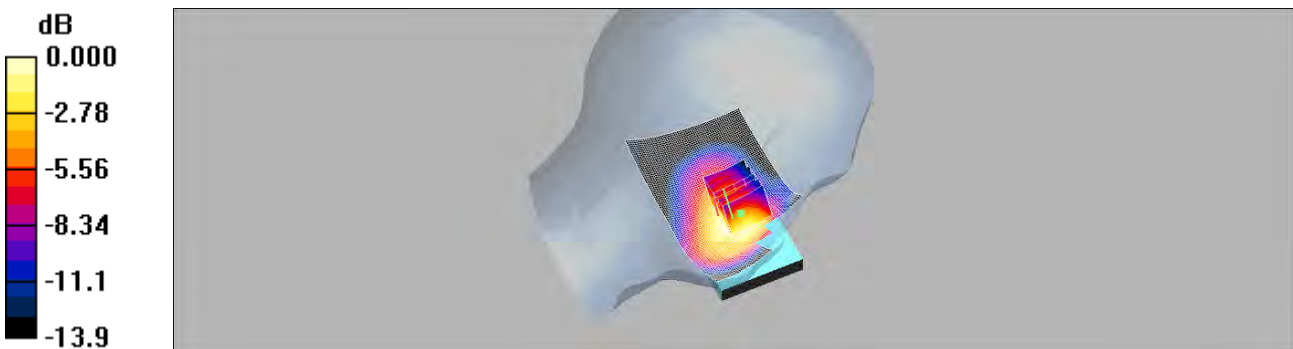
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.02 V/m; Power Drift = -0.073 dB

Peak SAR (extrapolated) = 0.965 W/kg

SAR(1 g) = 0.785 mW/g; SAR(10 g) = 0.562 mW/g

Maximum value of SAR (measured) = 0.828 mW/g



0 dB = 0.828mW/g

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LE Tilt_CH190

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: Head 850 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.886 \text{ mho/m}$; $\epsilon_r = 41.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.340 mW/g

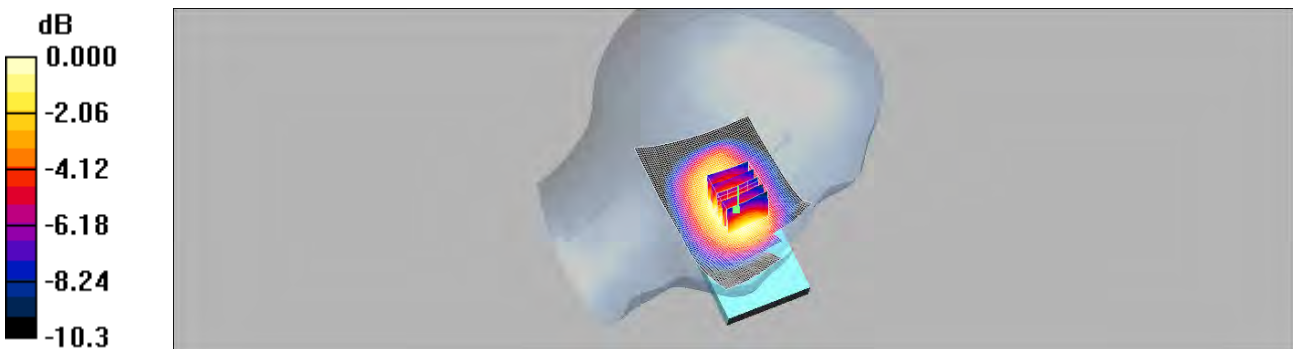
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 12.1 V/m; Power Drift = -0.148 dB

Peak SAR (extrapolated) = 0.381 W/kg

SAR(1 g) = 0.307 mW/g; SAR(10 g) = 0.228 mW/g

Maximum value of SAR (measured) = 0.332 mW/g



0 dB = 0.332mW/g

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GPRS 850_CH128_Front side

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:4.1

Medium: Muscle 900 MHz Medium parameters used (interpolated): $f = 824.2 \text{ MHz}$; $\sigma = 0.959 \text{ mho/m}$; $\epsilon_r = 52.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

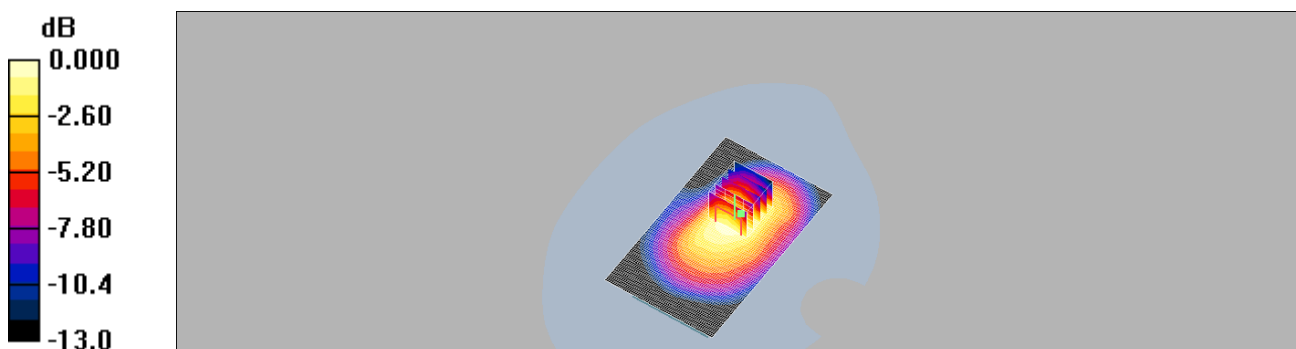
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 28.7 V/m; Power Drift = -0.161 dB

Peak SAR (extrapolated) = 1.20 W/kg

SAR(1 g) = 0.979 mW/g; SAR(10 g) = 0.718 mW/g

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



0 dB = 1.04mW/g

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GPRS 850_CH190_Front side

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:4.1

Medium: Muscle 900 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.972 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.19 mW/g

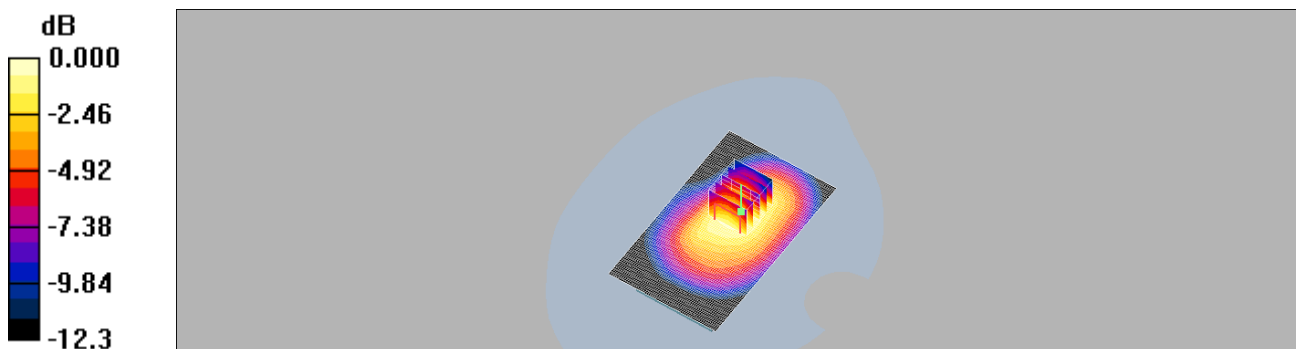
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 29.7 V/m; Power Drift = 0.136 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.796 mW/g

Maximum value of SAR (measured) = 1.18 mW/g



0 dB = 1.18mW/g

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GPRS 850_CH251_Front side

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:4.1

Medium: Muscle 900 MHz Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.984 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.18 mW/g

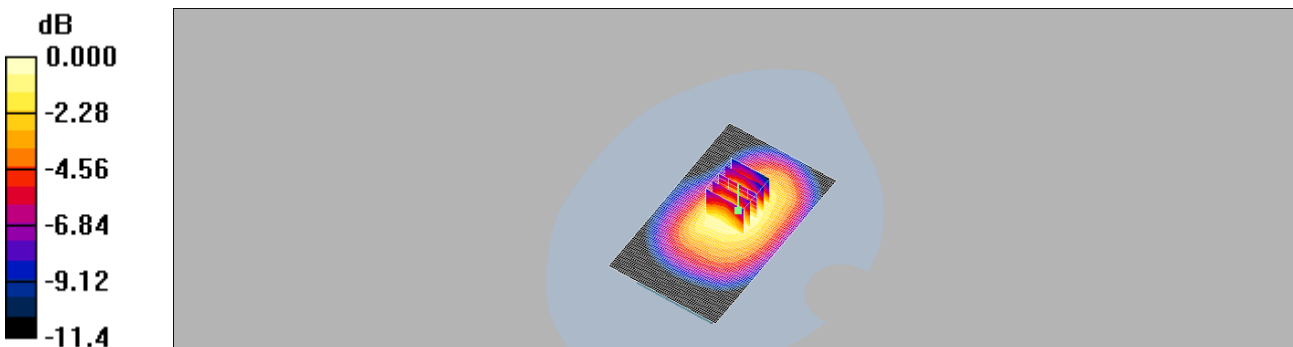
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 30.9 V/m; Power Drift = 0.180 dB

Peak SAR (extrapolated) = 1.39 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.840 mW/g

Maximum value of SAR (measured) = 1.22 mW/g



0 dB = 1.22mW/g

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GPRS 850_CH128_Back side

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:4.1

Medium: Muscle 900 MHz Medium parameters used (interpolated): $f = 824.2 \text{ MHz}$; $\sigma = 0.959 \text{ mho/m}$; $\epsilon_r = 52.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.21 mW/g

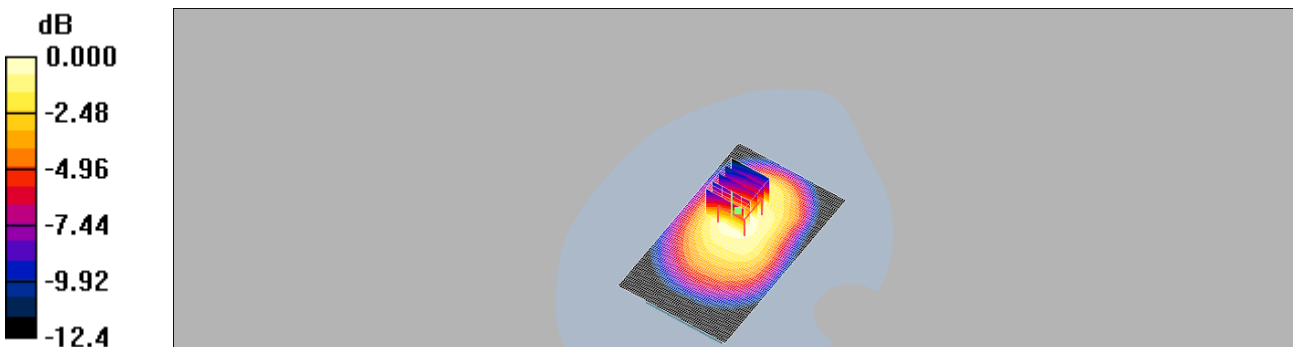
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 30.4 V/m; Power Drift = -0.038 dB

Peak SAR (extrapolated) = 1.54 W/kg

SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.774 mW/g

Maximum value of SAR (measured) = 1.19 mW/g



0 dB = 1.19mW/g

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GPRS 850_CH190_Back side

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:4.1

Medium: Muscle 900 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.972 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

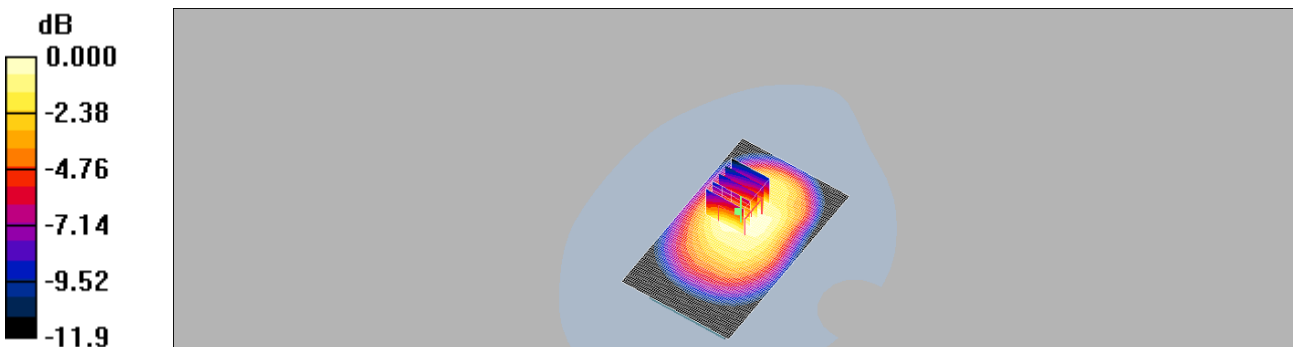
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 32.4 V/m; Power Drift = -0.110 dB

Peak SAR (extrapolated) = 1.70 W/kg

SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.875 mW/g

Maximum value of SAR (measured) = 1.29 mW/g



0 dB = 1.29mW/g

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GPRS 850_CH251_Back side

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:4.1

Medium: Muscle 900 MHz Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.984 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

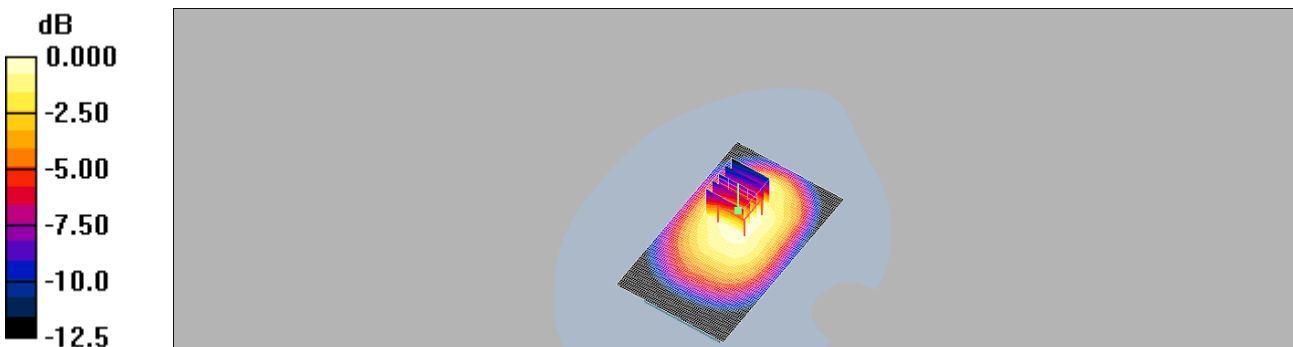
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 33.5 V/m; Power Drift = -0.131 dB

Peak SAR (extrapolated) = 1.76 W/kg

SAR(1 g) = 1.27 mW/g; SAR(10 g) = 0.917 mW/g

Maximum value of SAR (measured) = 1.40 mW/g



0 dB = 1.40mW/g

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GPRS 850_CH251_Back side_repeated with Headset

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:4.1

Medium: Muscle 900 MHz Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.984 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

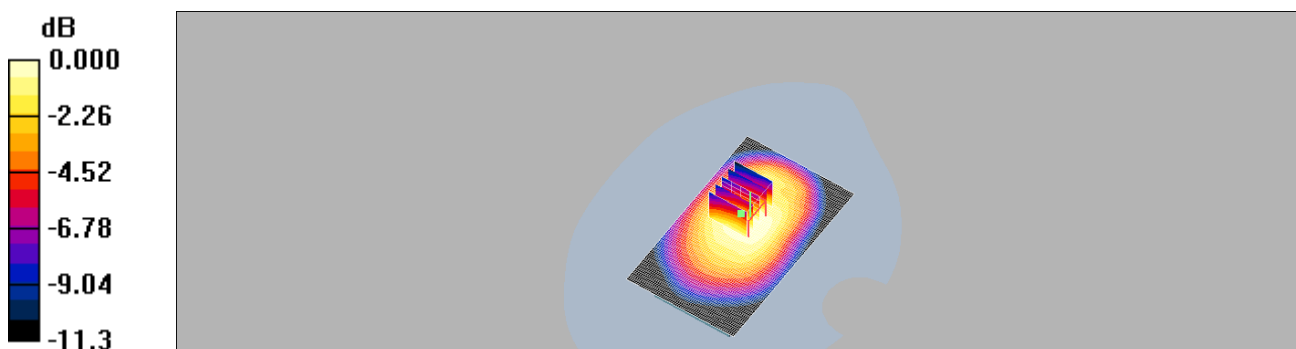
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 29.9 V/m; Power Drift = -0.142 dB

Peak SAR (extrapolated) = 1.31 W/kg

SAR(1 g) = 0.992 mW/g; SAR(10 g) = 0.733 mW/g

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



0 dB = 1.07mW/g

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GPRS 850_CH251_Back side_repeated with memory card

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:4.1

Medium: Muscle 900 MHz Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.984 \text{ mho/m}$; $\epsilon_r = 52.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.18 mW/g

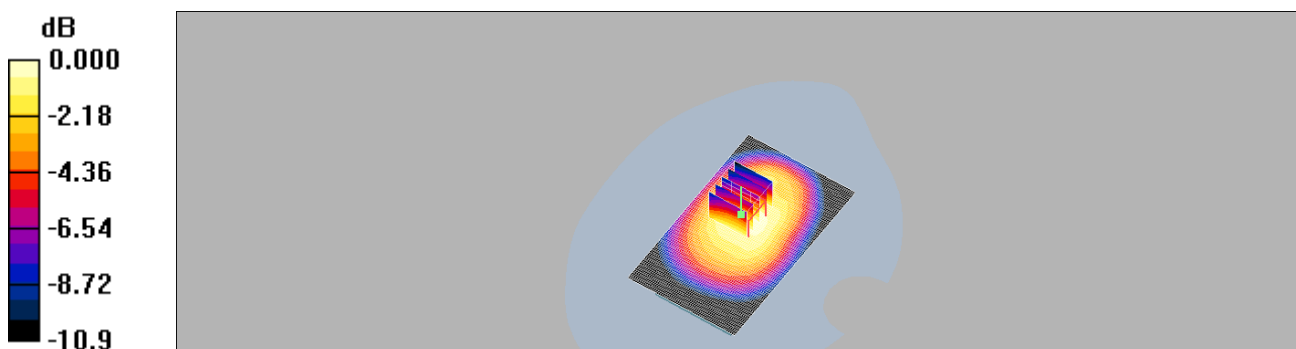
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 30.9 V/m; Power Drift = 0.187 dB

Peak SAR (extrapolated) = 1.54 W/kg

SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.774 mW/g

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



0 dB = 1.17mW/g

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GPRS850_CH190_Bottom side

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: Muscle 900 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.972 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

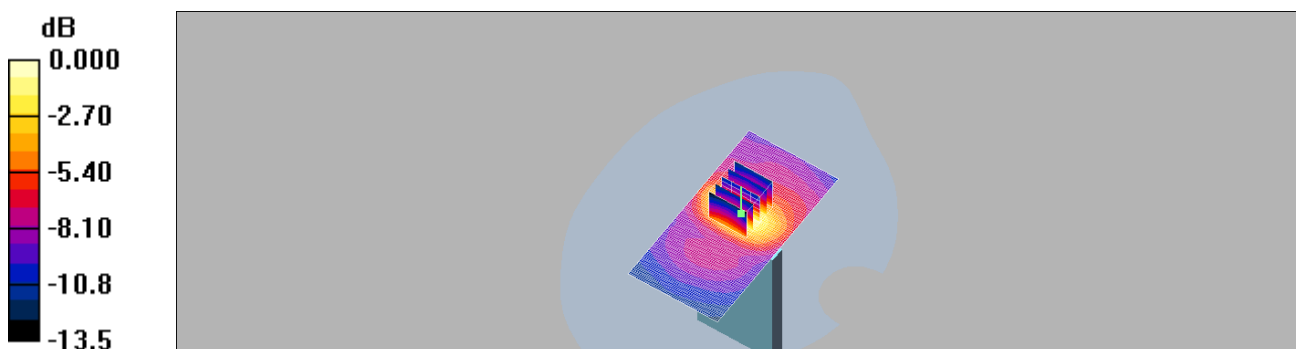
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 7.79 V/m; Power Drift = 0.192 dB

Peak SAR (extrapolated) = 0.181 W/kg

SAR(1 g) = 0.109 mW/g; SAR(10 g) = 0.063 mW/g

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



0 dB = 0.127mW/g

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GPRS850_CH190_Right side

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:4.1

Medium: Muscle 900 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.972 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.605 mW/g

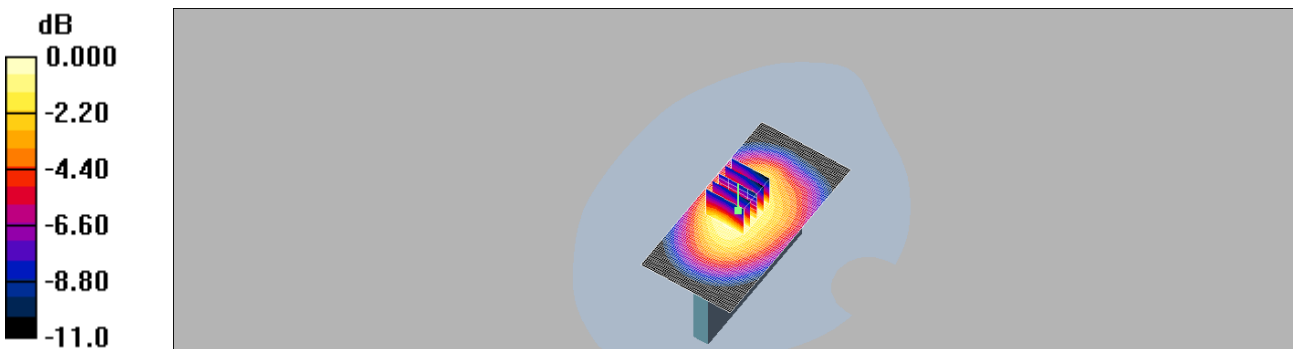
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 21.8 V/m; Power Drift = 0.035 dB

Peak SAR (extrapolated) = 0.835 W/kg

SAR(1 g) = 0.541 mW/g; SAR(10 g) = 0.366 mW/g

Maximum value of SAR (measured) = 0.608 mW/g



0 dB = 0.608mW/g

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GPRS850_CH190_Left side

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:4.1

Medium: Muscle 900 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.972 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.544 mW/g

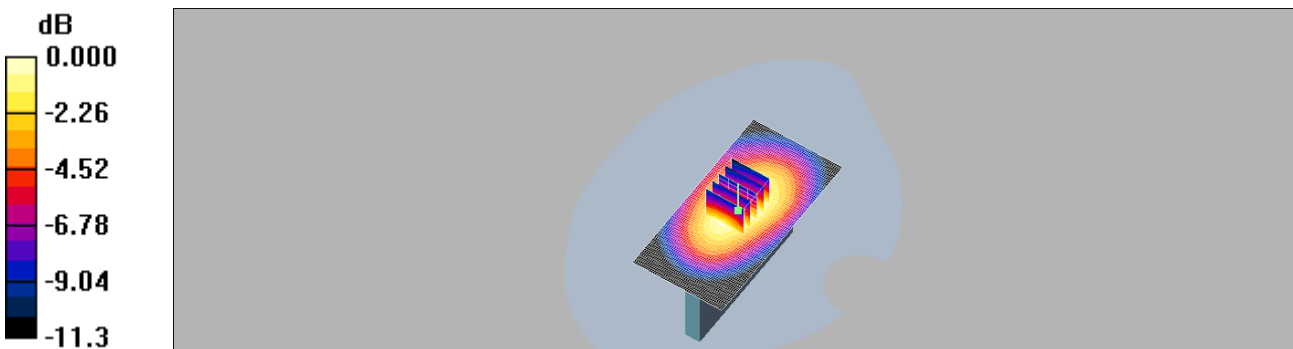
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.8 V/m; Power Drift = 0.112 dB

Peak SAR (extrapolated) = 0.742 W/kg

SAR(1 g) = 0.500 mW/g; SAR(10 g) = 0.330 mW/g

Maximum value of SAR (measured) = 0.571 mW/g



0 dB = 0.571mW/g

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RE Cheek_CH512

Communication System: GSM1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3
 Medium: Head 1900 MHz Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.36 \text{ mho/m}$; $\epsilon_r = 39.7$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.435 mW/g

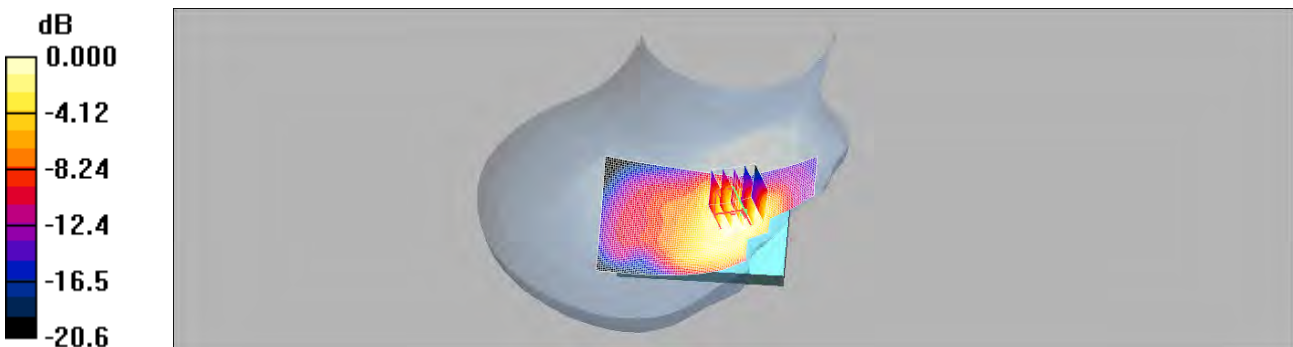
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.94 V/m; Power Drift = 0.119 dB

Peak SAR (extrapolated) = 0.546 W/kg

SAR(1 g) = 0.372 mW/g; SAR(10 g) = 0.234 mW/g

Maximum value of SAR (measured) = 0.410 mW/g



0 dB = 0.410mW/g

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RE Cheek_CH661

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: Head 1900 MHz Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.44 \text{ mho/m}$; $\epsilon_r = 39.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.459 mW/g

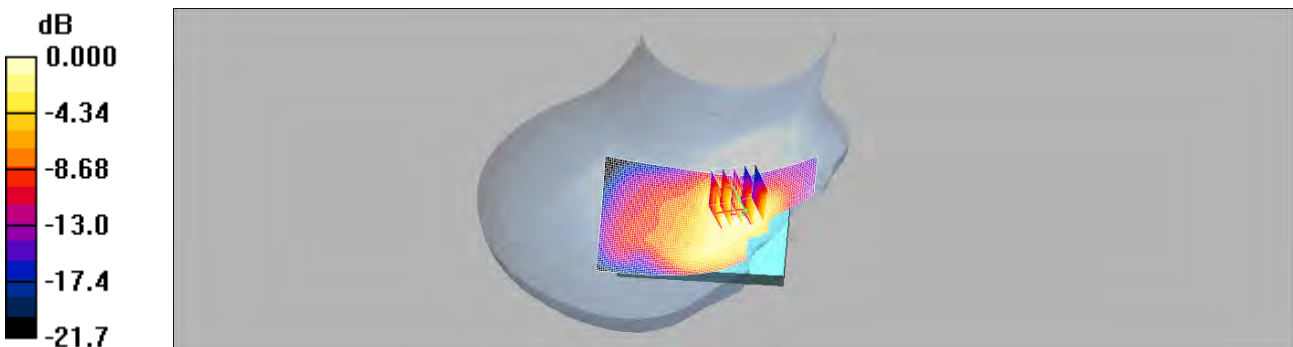
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 4.62 V/m; Power Drift = 0.197 dB

Peak SAR (extrapolated) = 0.594 W/kg

SAR(1 g) = 0.391 mW/g; SAR(10 g) = 0.240 mW/g

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



0 dB = 0.442mW/g

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RE Cheek_CH810

Communication System: GSM1900; Frequency: 1909.8 MHz; Duty Cycle: 1:8.3
 Medium: Head 1900 MHz Medium parameters used: $f = 1910 \text{ MHz}$; $\sigma = 1.47 \text{ mho/m}$; $\epsilon_r = 39.4$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.465 mW/g

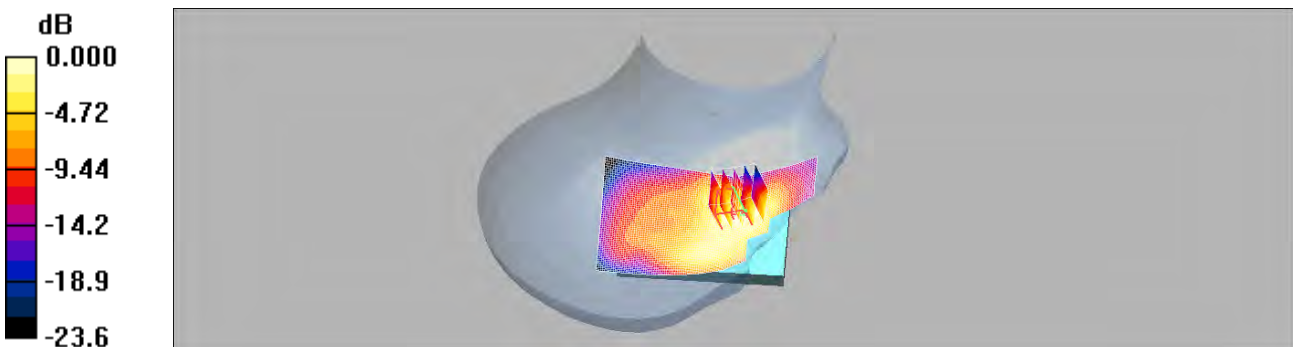
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 5.17 V/m; Power Drift = 0.117 dB

Peak SAR (extrapolated) = 0.617 W/kg

SAR(1 g) = 0.403 mW/g; SAR(10 g) = 0.242 mW/g

Maximum value of SAR (measured) = 0.465 mW/g



0 dB = 0.465mW/g

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RE Tilt_CH661

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: Head 1900 MHz Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.44 \text{ mho/m}$; $\epsilon_r = 39.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.118 mW/g

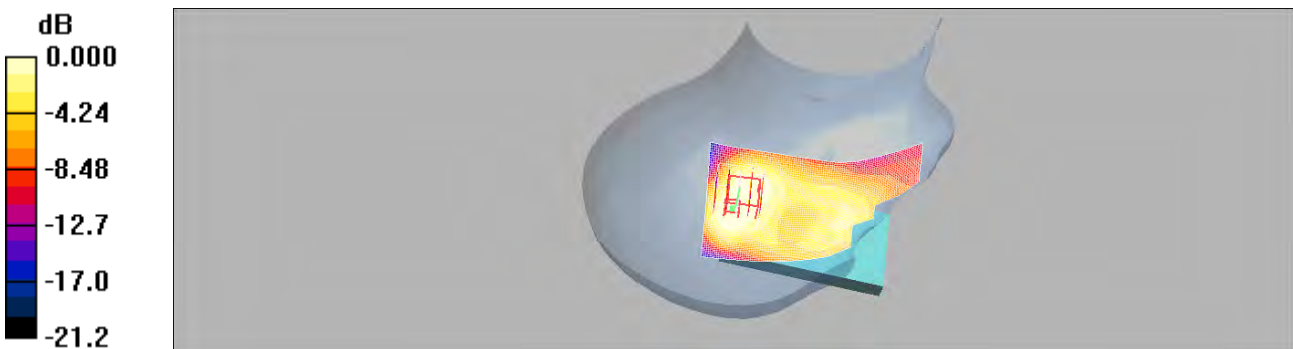
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 8.14 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 0.152 W/kg

SAR(1 g) = 0.090 mW/g; SAR(10 g) = 0.055 mW/g

Maximum value of SAR (measured) = 0.100 mW/g



0 dB = 0.100mW/g

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LE Cheek_CH661

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: Head 1900 MHz Medium parameters used: $f = 1880$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

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

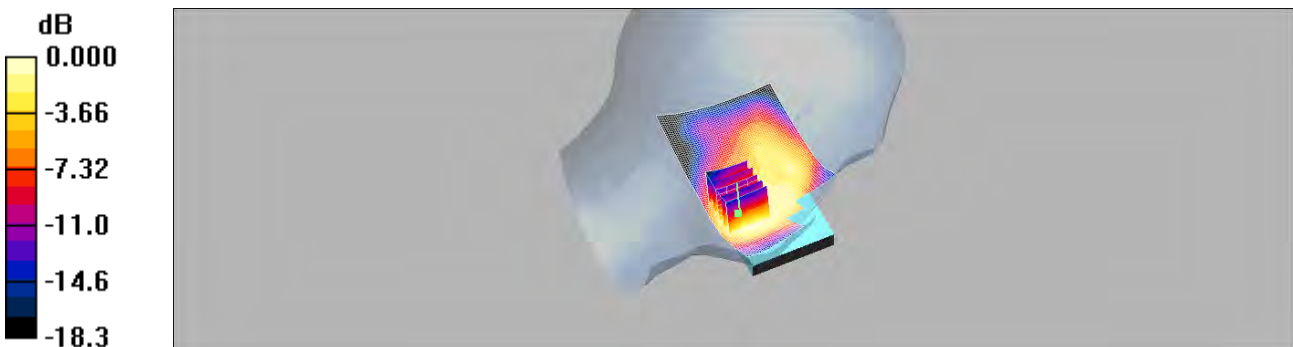
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.84 V/m; Power Drift = 0.103 dB

Peak SAR (extrapolated) = 0.514 W/kg

SAR(1 g) = 0.315 mW/g; SAR(10 g) = 0.195 mW/g

Maximum value of SAR (measured) = 0.355 mW/g



0 dB = 0.355mW/g

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LE Tilt_CH661

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: Head 1900 MHz Medium parameters used: $f = 1880$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Head/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.158 mW/g

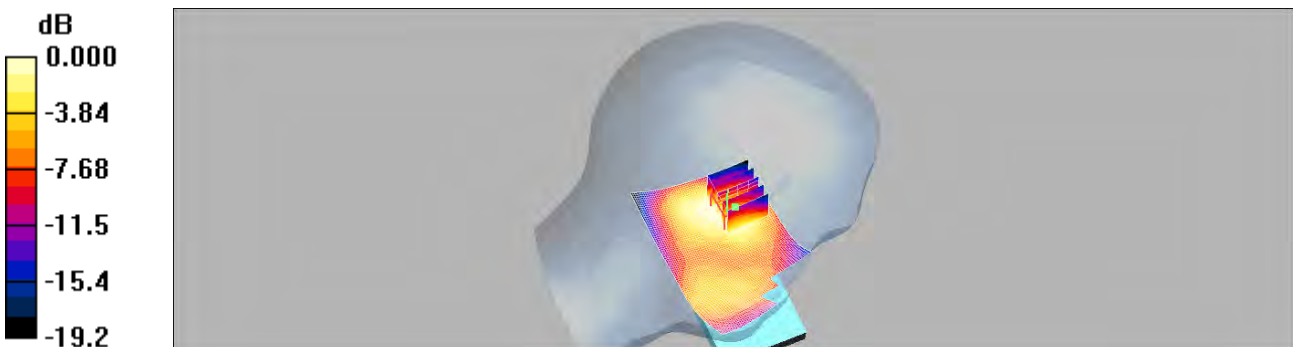
Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.37 V/m; Power Drift = 0.019 dB

Peak SAR (extrapolated) = 0.203 W/kg

SAR(1 g) = 0.135 mW/g; SAR(10 g) = 0.084 mW/g

Maximum value of SAR (measured) = 0.153 mW/g



0 dB = 0.153mW/g

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GPRS 1900_CH661_Front side

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:4.1

Medium: M1800 & 1900 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 49.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.638 mW/g

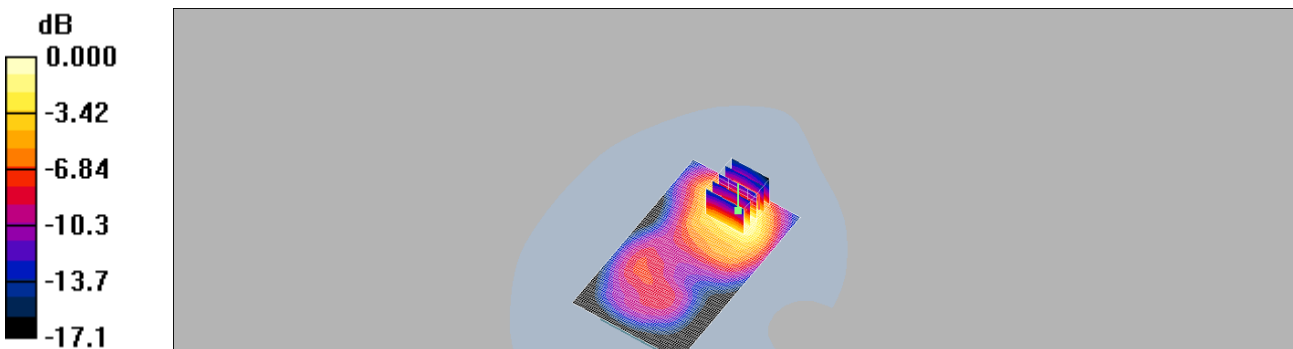
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 6.21 V/m; Power Drift = 0.126 dB

Peak SAR (extrapolated) = 0.987 W/kg

SAR(1 g) = 0.567 mW/g; SAR(10 g) = 0.324 mW/g

Maximum value of SAR (measured) = 0.670 mW/g



0 dB = 0.670mW/g

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GPRS 1900_CH512_Back side

Communication System: GSM1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4.1
 Medium: M1800 & 1900 Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 49.5$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.16 mW/g

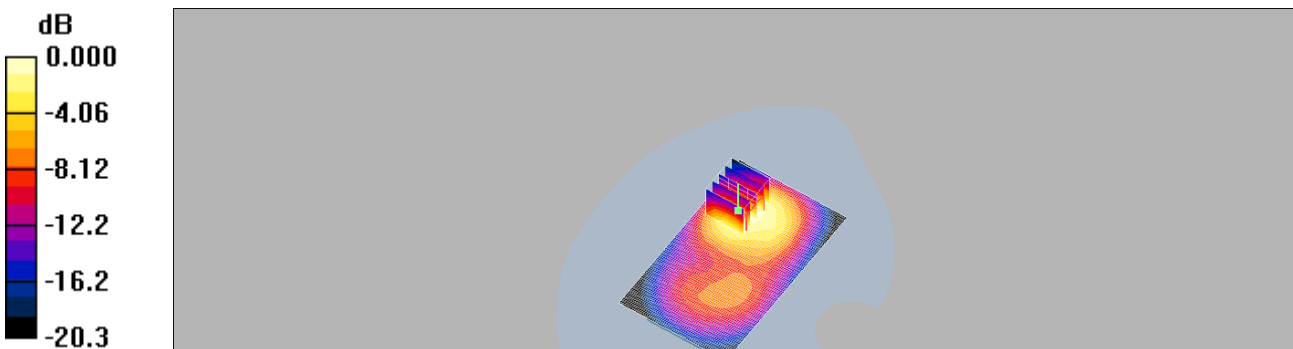
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.2 V/m; Power Drift = -0.154 dB

Peak SAR (extrapolated) = 1.70 W/kg

SAR(1 g) = 0.972 mW/g; SAR(10 g) = 0.539 mW/g

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



0 dB = 1.17mW/g

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GPRS 1900_CH661_Back side

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:4.1

Medium: M1800 & 1900 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 49.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.21 mW/g

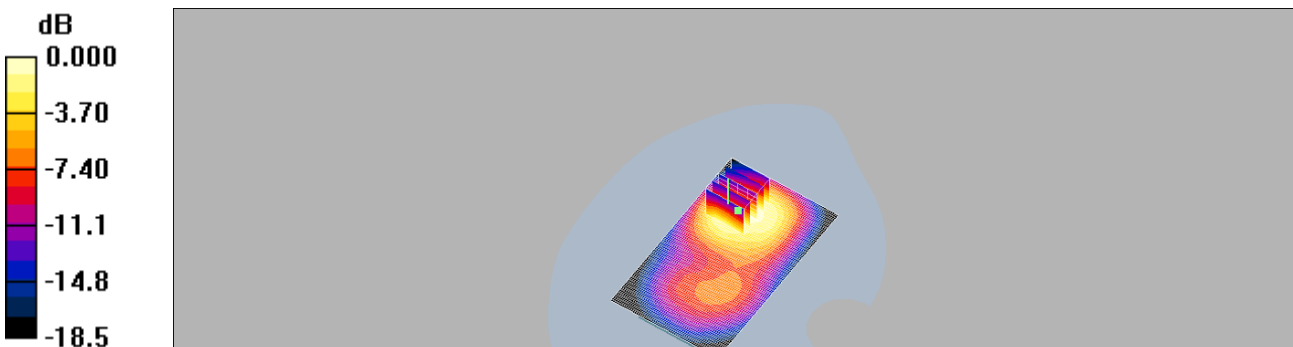
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 10.9 V/m; Power Drift = 0.068 dB

Peak SAR (extrapolated) = 1.69 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.597 mW/g

Maximum value of SAR (measured) = 1.12 mW/g



0 dB = 1.12mW/g

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GPRS 1900_CH810_Back side

Communication System: GSM1900; Frequency: 1909.8 MHz; Duty Cycle: 1:4.1

Medium: M1800 & 1900 Medium parameters used: $f = 1910 \text{ MHz}$; $\sigma = 1.59 \text{ mho/m}$; $\epsilon_r = 49.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (61x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

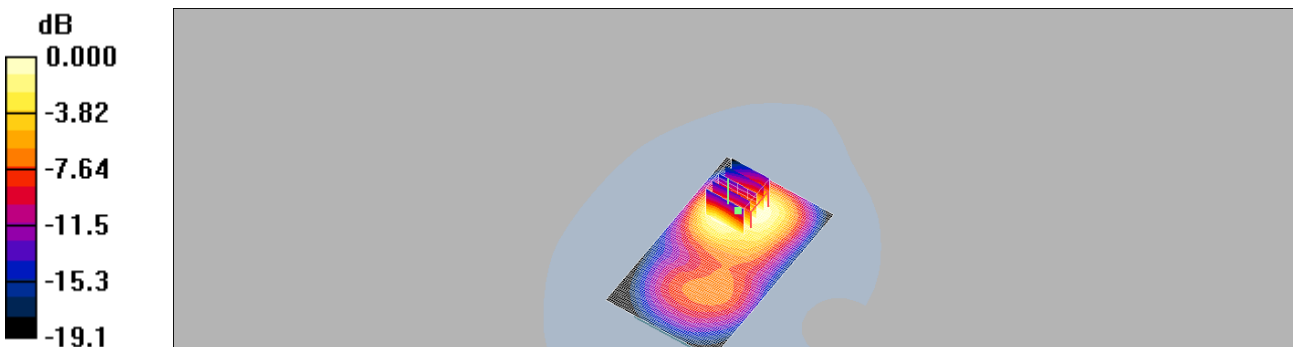
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 11.5 V/m; Power Drift = -0.005 dB

Peak SAR (extrapolated) = 1.89 W/kg

SAR(1 g) = 1.08 mW/g; SAR(10 g) = 0.644 mW/g

Maximum value of SAR (measured) = 1.26 mW/g



0 dB = 1.26mW/g

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GPRS1900_CH512_Bottom side

Communication System: GSM1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4.1
 Medium: M1800 & 1900 Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 49.5$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

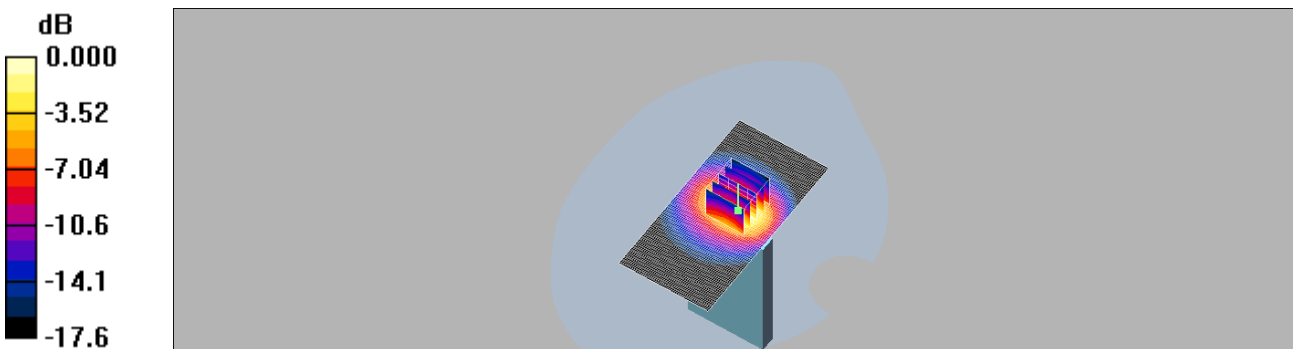
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 21.2 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 1.68 W/kg

SAR(1 g) = 0.970 mW/g; SAR(10 g) = 0.523 mW/g

Maximum value of SAR (measured) = 1.16 mW/g



0 dB = 1.16mW/g

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GPRS1900_CH661_Bottom side

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:4.1

Medium: M1800 & 1900 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 49.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.42 mW/g

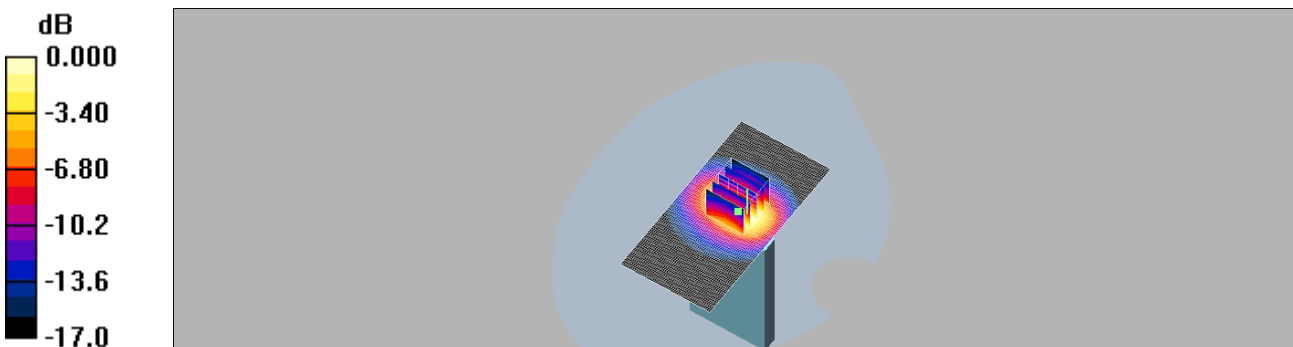
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.7 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 1.80 W/kg

SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.622 mW/g

Maximum value of SAR (measured) = 1.28 mW/g



0 dB = 1.28mW/g

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GPRS1900_CH810_Bottom side

Communication System: GSM1900; Frequency: 1909.8 MHz; Duty Cycle: 1:4.1

Medium: M1800 & 1900 Medium parameters used: $f = 1910 \text{ MHz}$; $\sigma = 1.59 \text{ mho/m}$; $\epsilon_r = 49.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.52 mW/g

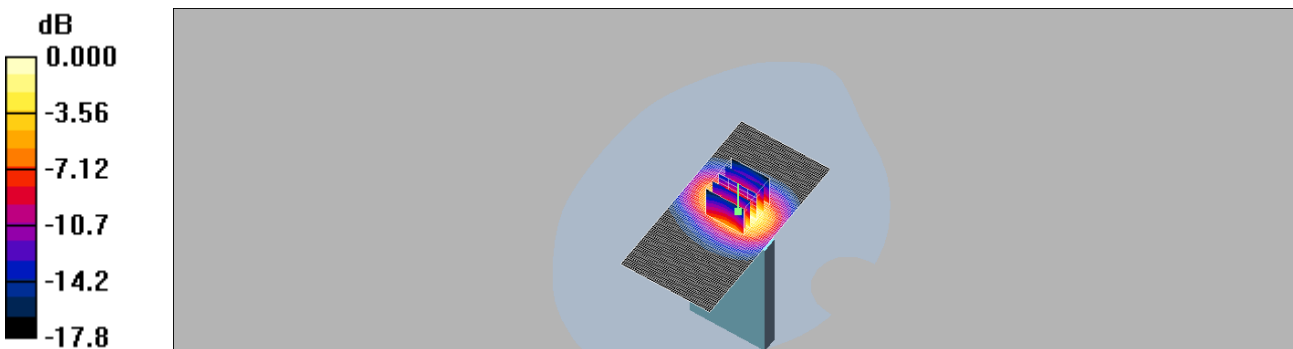
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 22.7 V/m; Power Drift = -0.062 dB

Peak SAR (extrapolated) = 2.25 W/kg

SAR(1 g) = 1.23 mW/g; SAR(10 g) = 0.644 mW/g

Maximum value of SAR (measured) = 1.45 mW/g



0 dB = 1.45mW/g

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GPRS1900_CH661_Right side

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:4.1

Medium: M1800 & 1900 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 49.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.130 mW/g

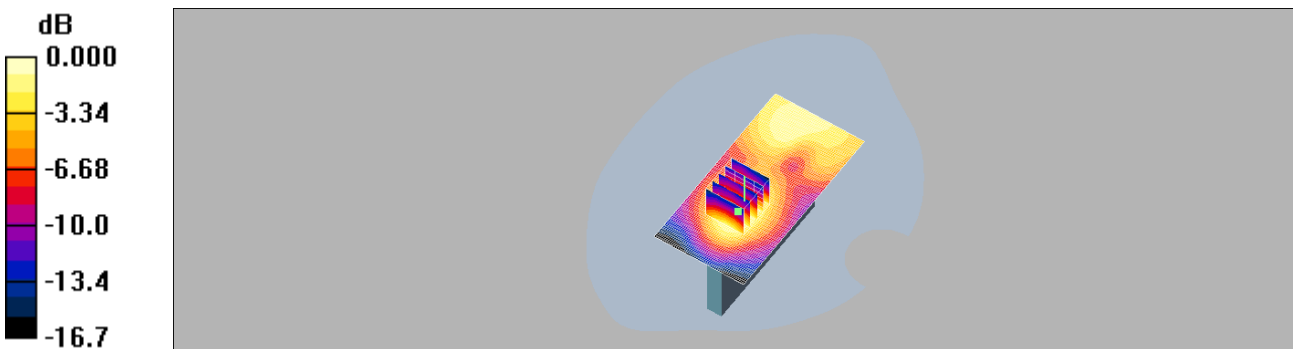
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 6.49 V/m; Power Drift = -0.020 dB

Peak SAR (extrapolated) = 0.178 W/kg

SAR(1 g) = 0.107 mW/g; SAR(10 g) = 0.064 mW/g

Maximum value of SAR (measured) = 0.123 mW/g



0 dB = 0.123mW/g

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GPRS1900_CH661_Left side

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:4.1

Medium: M1800 & 1900 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.56 \text{ mho/m}$; $\epsilon_r = 49.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

BODY/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

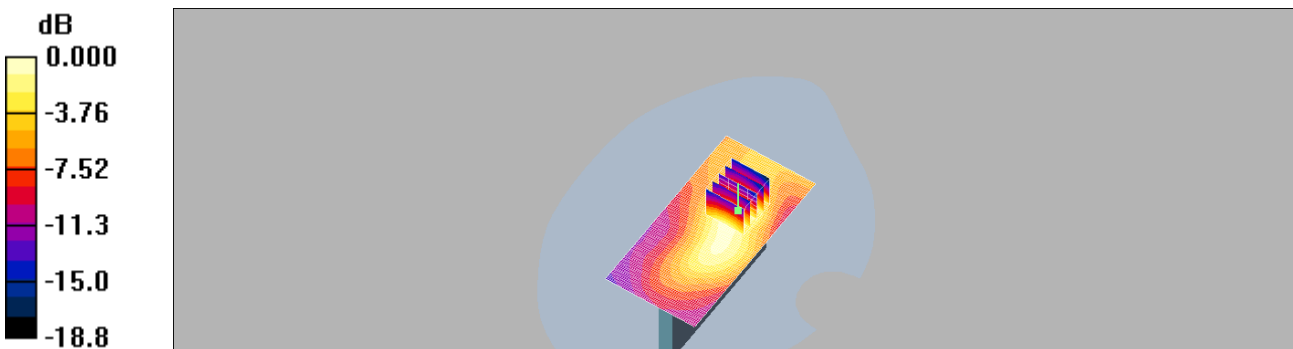
BODY/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 6.82 V/m; Power Drift = -0.186 dB

Peak SAR (extrapolated) = 0.183 W/kg

SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.054 mW/g

Maximum value of SAR (measured) = 0.111 mW/g



0 dB = 0.111mW/g

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Re Cheek_WLAN802.11 b_CH1

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2412 MHz;

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.769$ mho/m; $\epsilon_r = 38.344$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.84, 6.84, 6.84); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.237 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

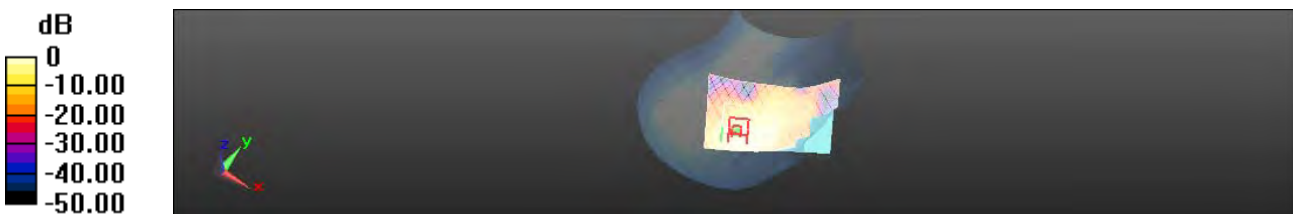
dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.737 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.411 mW/g

SAR(1 g) = 0.171 mW/g; SAR(10 g) = 0.085 mW/g

Maximum value of SAR (measured) = 0.277 mW/g



0 dB = 0.237 mW/g = -12.52 dB mW/g

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Re Cheek_WLAN802.11 b_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2437 MHz;

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.788$ mho/m; $\epsilon_r = 38.221$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.84, 6.84, 6.84); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

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

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

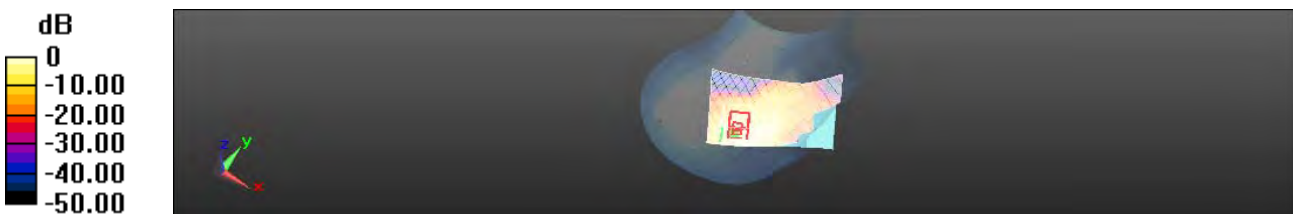
dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.582 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.463 mW/g

SAR(1 g) = 0.188 mW/g; SAR(10 g) = 0.089 mW/g

Maximum value of SAR (measured) = 0.331 mW/g



0 dB = 0.287 mW/g = -10.85 dB mW/g

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Member of SGS Group

Re Cheek_WLAN802.11 b_CH11

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2462 MHz;

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.805$ mho/m; $\epsilon_r = 38.297$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.84, 6.84, 6.84); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.252 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

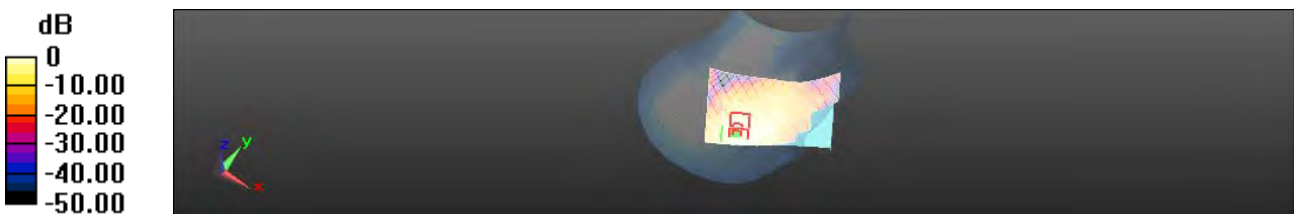
dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.519 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.488 mW/g

SAR(1 g) = 0.192 mW/g; SAR(10 g) = 0.085 mW/g

Maximum value of SAR (measured) = 0.333 mW/g



0 dB = 0.252 mW/g = -11.96 dB mW/g

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Re Cheek_WLAN802.11 b_CH11_repeated with Bluetooth active

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2462 MHz;

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.805$ mho/m; $\epsilon_r = 38.297$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.84, 6.84, 6.84); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.209 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

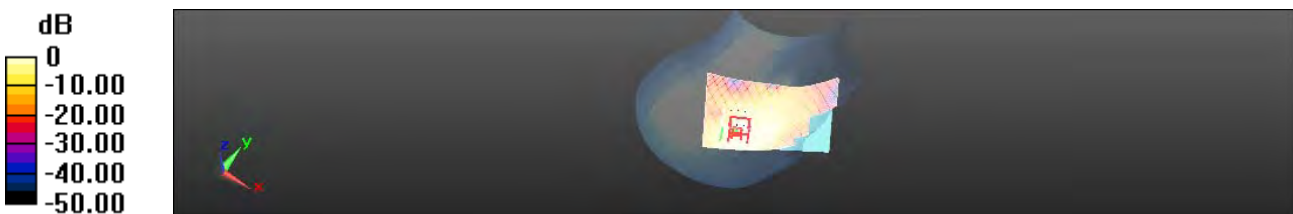
dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.323 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.456 mW/g

SAR(1 g) = 0.182 mW/g; SAR(10 g) = 0.083 mW/g

Maximum value of SAR (measured) = 0.313 mW/g



0 dB = 0.209 mW/g = -13.58 dB mW/g

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Re Cheek_WLAN802.11 b_CH11_repeated with memory card

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2462 MHz;

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.805$ mho/m; $\epsilon_r = 38.297$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.84, 6.84, 6.84); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.256 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

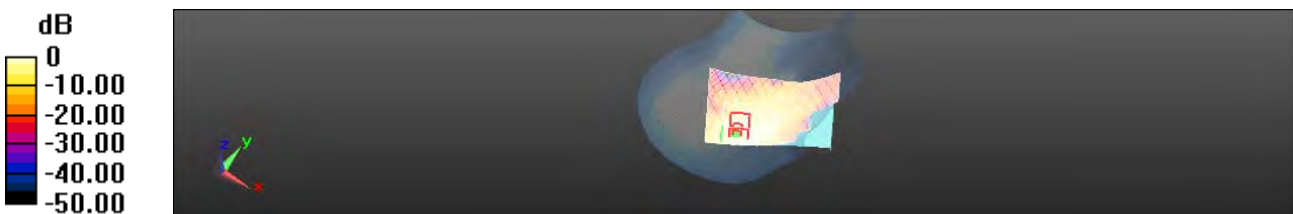
dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.381 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.488 mW/g

SAR(1 g) = 0.193 mW/g; SAR(10 g) = 0.085 mW/g

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



0 dB = 0.256 mW/g = -11.85 dB mW/g

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Re Tilt_WLAN802.11 b_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2437 MHz;

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.788$ mho/m; $\epsilon_r = 38.221$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.84, 6.84, 6.84); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.205 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

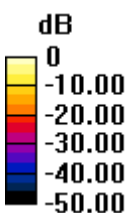
dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.784 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.278 mW/g

SAR(1 g) = 0.106 mW/g; SAR(10 g) = 0.054 mW/g

Maximum value of SAR (measured) = 0.203 mW/g



0 dB = 0.205 mW/g = -13.76 dB mW/g

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Le Cheek_WLAN802.11 b_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2437 MHz;

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.788$ mho/m; $\epsilon_r = 38.221$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.84, 6.84, 6.84); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.193 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

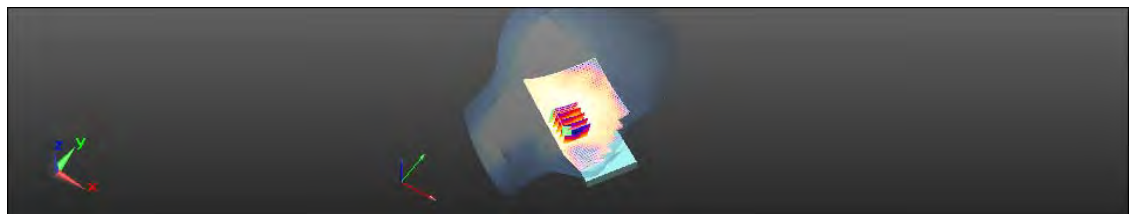
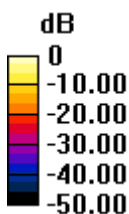
dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.751 V/m; Power Drift = 0.15 dB

Peak SAR (extrapolated) = 0.252 mW/g

SAR(1 g) = 0.117 mW/g; SAR(10 g) = 0.061 mW/g

Maximum value of SAR (measured) = 0.171 mW/g



0 dB = 0.193 mW/g = -14.29 dB mW/g

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Le Tilt_WLAN802.11 b_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2437 MHz;

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.788$ mho/m; $\epsilon_r = 38.221$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.84, 6.84, 6.84); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

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

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

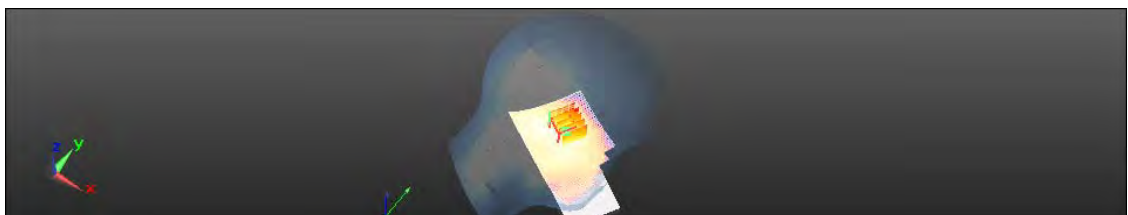
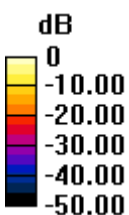
dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.471 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.170 mW/g

SAR(1 g) = 0.092 mW/g; SAR(10 g) = 0.048 mW/g

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



0 dB = 0.120 mW/g = -18.42 dB mW/g

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Body_WLAN802.11 b_Front side_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2437 MHz;

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.982$ mho/m; $\epsilon_r = 51.33$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.82, 6.82, 6.82); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0731 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

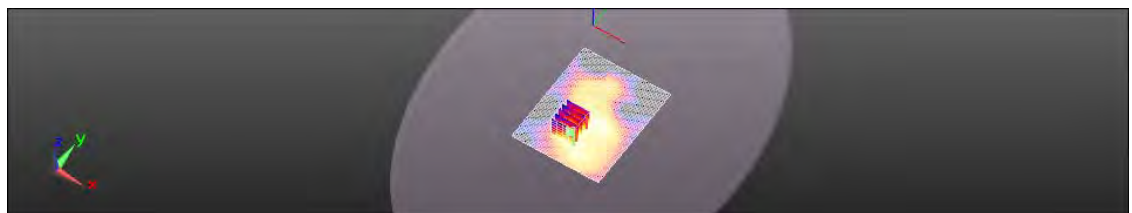
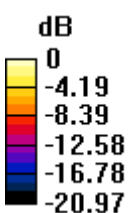
dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.014 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.094 mW/g

SAR(1 g) = 0.053 mW/g; SAR(10 g) = 0.031 mW/g

Maximum value of SAR (measured) = 0.0706 mW/g



0 dB = 0.0706 mW/g = -23.02 dB mW/g

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Body_WLAN802.11 b_Back side_CH1

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2412 MHz;

Medium parameters used: $f = 2412$ MHz; $\sigma = 1.947$ mho/m; $\epsilon_r = 51.437$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.82, 6.82, 6.82); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0848 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

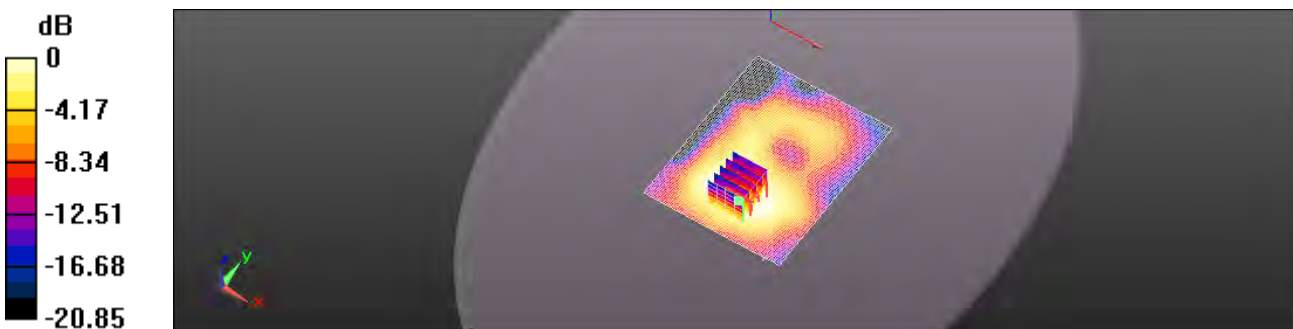
dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.345 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.108 mW/g

SAR(1 g) = 0.062 mW/g; SAR(10 g) = 0.036 mW/g

Maximum value of SAR (measured) = 0.0828 mW/g



0 dB = 0.0828 mW/g = -21.64 dB mW/g

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Body_WLAN802.11 b_Back side_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2437 MHz;

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.982$ mho/m; $\epsilon_r = 51.33$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.82, 6.82, 6.82); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0965 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

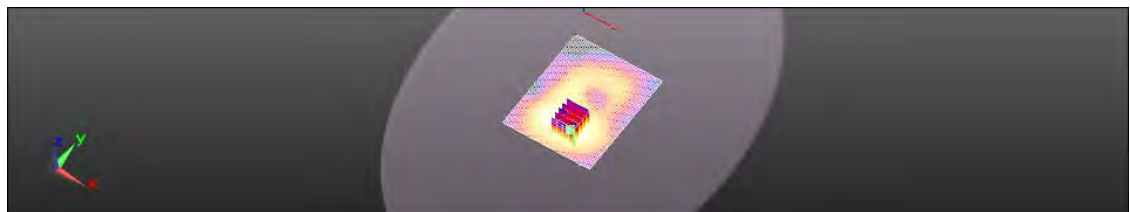
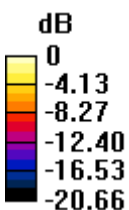
dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.619 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.118 mW/g

SAR(1 g) = 0.067 mW/g; SAR(10 g) = 0.040 mW/g

Maximum value of SAR (measured) = 0.0887 mW/g



0 dB = 0.0887 mW/g = -21.04 dB mW/g

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Body_WLAN802.11 b_Back side_CH11

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2462 MHz;

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.023$ mho/m; $\epsilon_r = 51.311$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.82, 6.82, 6.82); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm

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

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

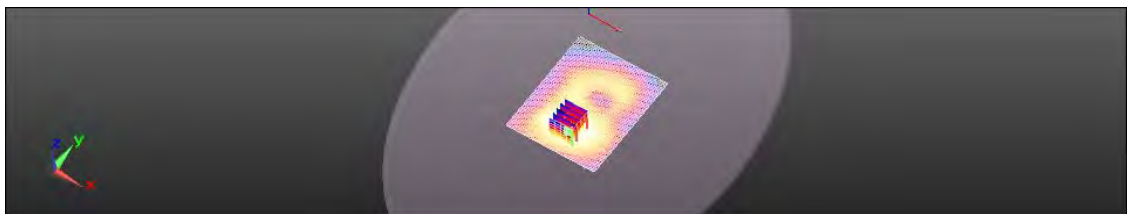
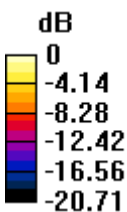
dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.604 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.143 mW/g

SAR(1 g) = 0.076 mW/g; SAR(10 g) = 0.045 mW/g

Maximum value of SAR (measured) = 0.107 mW/g



0 dB = 0.107 mW/g = -19.41 dB mW/g

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Body_WLAN802.11 b_Back side_CH11_repeated with Headset

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2462 MHz;

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.023$ mho/m; $\epsilon_r = 51.311$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.82, 6.82, 6.82); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0838 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

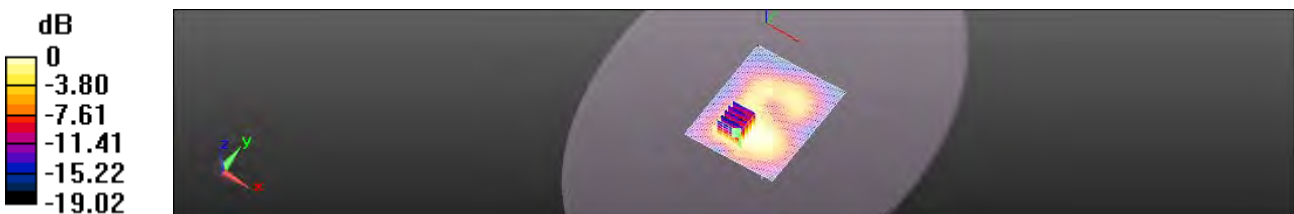
dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.132 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.140 mW/g

SAR(1 g) = 0.067 mW/g; SAR(10 g) = 0.036 mW/g

Maximum value of SAR (measured) = 0.0779 mW/g



0 dB = 0.0838 mW/g = -21.54 dB mW/g

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Body_WLAN802.11 b_Back side_CH11_repeated with Bluetooth active

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2462 MHz;

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.023$ mho/m; $\epsilon_r = 51.311$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.82, 6.82, 6.82); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0731 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

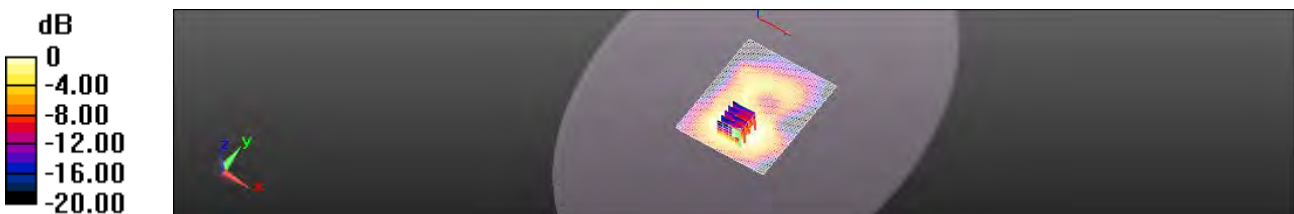
dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.960 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.105 mW/g

SAR(1 g) = 0.059 mW/g; SAR(10 g) = 0.035 mW/g

Maximum value of SAR (measured) = 0.0688 mW/g



0 dB = 0.0688 mW/g = -23.25 dB mW/g

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Body_WLAN802.11 b_Back side_CH11_repeated with memory card

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2462 MHz;

Medium parameters used: $f = 2462$ MHz; $\sigma = 2.023$ mho/m; $\epsilon_r = 51.311$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.82, 6.82, 6.82); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (81x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0863 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

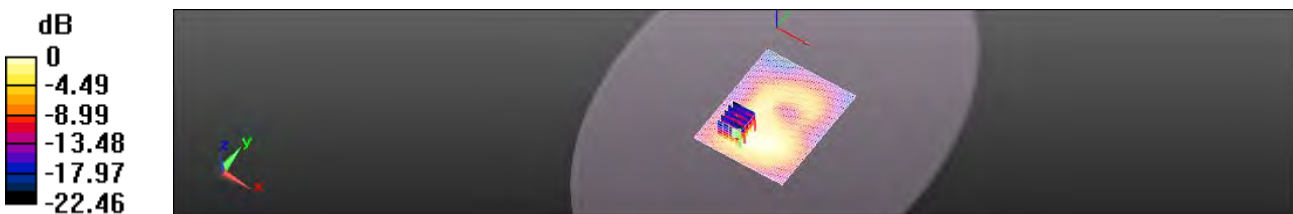
dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.364 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.164 mW/g

SAR(1 g) = 0.075 mW/g; SAR(10 g) = 0.038 mW/g

Maximum value of SAR (measured) = 0.0940 mW/g



0 dB = 0.0940 mW/g = -20.54 dB mW/g

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Body_WLAN802.11 b_Top side_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2437 MHz;

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.982$ mho/m; $\epsilon_r = 51.33$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.82, 6.82, 6.82); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0781 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

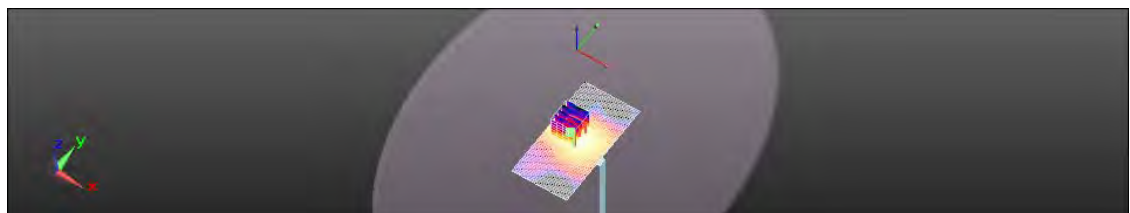
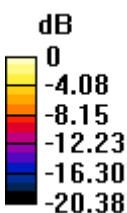
dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.117 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.101 mW/g

SAR(1 g) = 0.055 mW/g; SAR(10 g) = 0.031 mW/g

Maximum value of SAR (measured) = 0.0743 mW/g



0 dB = 0.0743 mW/g = -22.58 dB mW/g

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Body_WLAN802.11 b_Right side_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2437 MHz;

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.982$ mho/m; $\epsilon_r = 51.33$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.82, 6.82, 6.82); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0218 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.973 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.096 mW/g

SAR(1 g) = 0.017 mW/g; SAR(10 g) = 0.00965 mW/g

Maximum value of SAR (measured) = 0.0276 mW/g



0 dB = 0.0276 mW/g = -31.18 dB mW/g

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Body_WLAN802.11 b_Left side_CH6

Communication System: WLAN(2.45G); Communication System Band: WLAN802.11 b_FCC;
Frequency: 2437 MHz;

Medium parameters used: $f = 2437$ MHz; $\sigma = 1.982$ mho/m; $\epsilon_r = 51.33$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.82, 6.82, 6.82); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Head/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.0638 mW/g

Configuration/Head/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

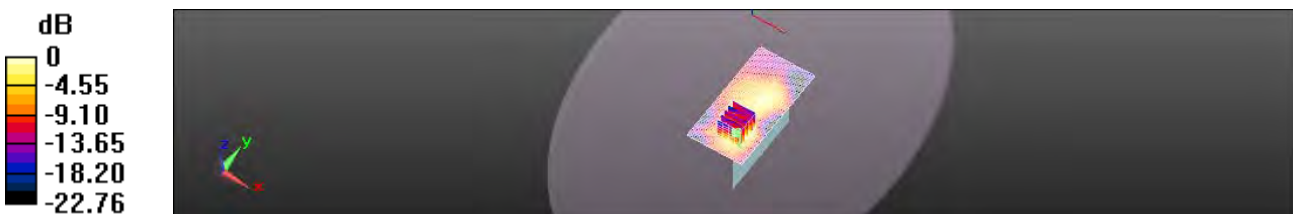
dx=8mm, dy=8mm, dz=5mm

Reference Value = 3.149 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.087 mW/g

SAR(1 g) = 0.043 mW/g; SAR(10 g) = 0.021 mW/g

Maximum value of SAR (measured) = 0.0593 mW/g



0 dB = 0.0593 mW/g = -24.54 dB mW/g

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5. System Verification

Date: 2012/3/3

DUT: Dipole 835 MHz; (Head)

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

Medium: Head 900 MHz Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.882 \text{ mho/m}$; $\epsilon_r = 42$;
 $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 2.89 mW/g

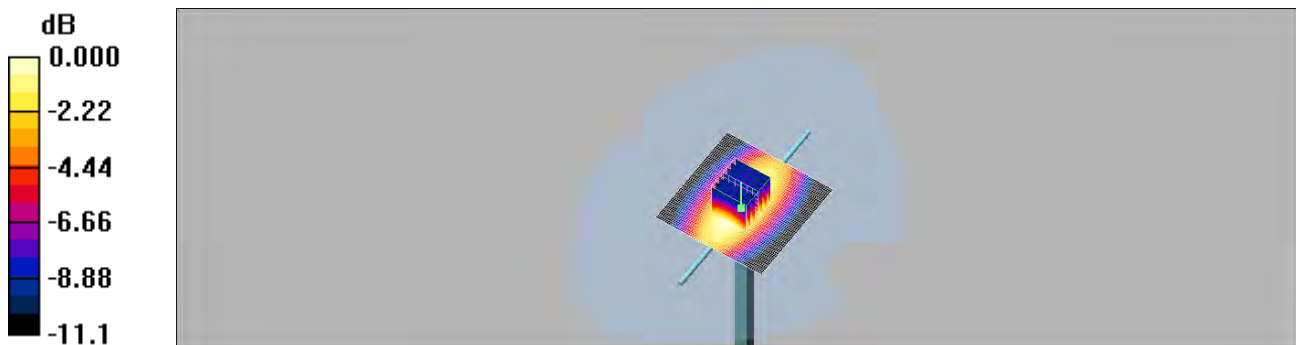
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 51.3 V/m; Power Drift = 0.014 dB

Peak SAR (extrapolated) = 3.53 W/kg

SAR(1 g) = 2.27 mW/g; SAR(10 g) = 1.46 mW/g

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



0 dB = 2.91mW/g

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DUT: Dipole 835 MHz; (Body)

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

Medium: Muscle 900 MHz Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.97 \text{ mho/m}$; $\epsilon_r = 52.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.83, 5.83, 5.83); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (61x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.59 mW/g

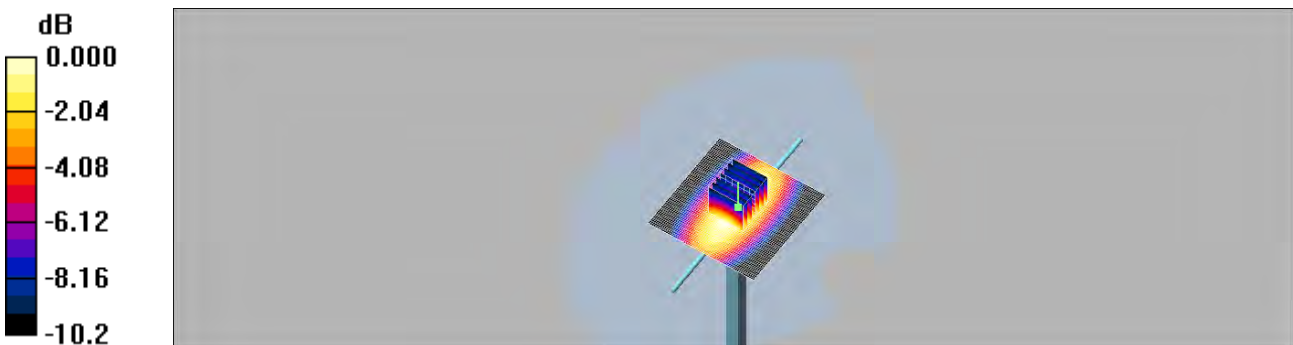
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 51.5 V/m; Power Drift = 0.015 dB

Peak SAR (extrapolated) = 3.62 W/kg

SAR(1 g) = 2.39 mW/g; SAR(10 g) = 1.62 mW/g

Maximum value of SAR (measured) = 2.58 mW/g



0 dB = 2.58mW/g

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DUT: Dipole 1900 MHz; (Head)

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
 Medium: Head 1900MHz Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.47 \text{ mho/m}$; $\epsilon_r = 39.4$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.78, 4.78, 4.78); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mw/Area Scan (51x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 13.3 mW/g

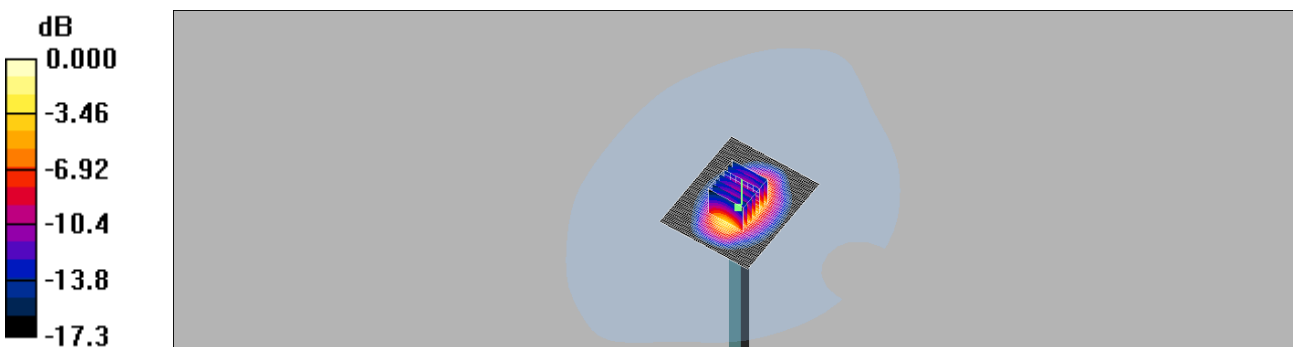
Pin=250mw/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 84.8 V/m; Power Drift = -0.114 dB

Peak SAR (extrapolated) = 18.6 W/kg

SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.62 mW/g

Maximum value of SAR (measured) = 14.6 mW/g



0 dB = 14.6mW/g

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DUT: Dipole 1900 MHz; (Body)

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

Medium: M1800 & 1900 Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.59 \text{ mho/m}$; $\epsilon_r = 49.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.38, 4.38, 4.38); Calibrated: 2011/8/23
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2011/8/29
- Phantom: SAM1; Type: SAM 4.0; Serial: TP:1419
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=250mW/Area Scan (51x61x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 13.9 mW/g

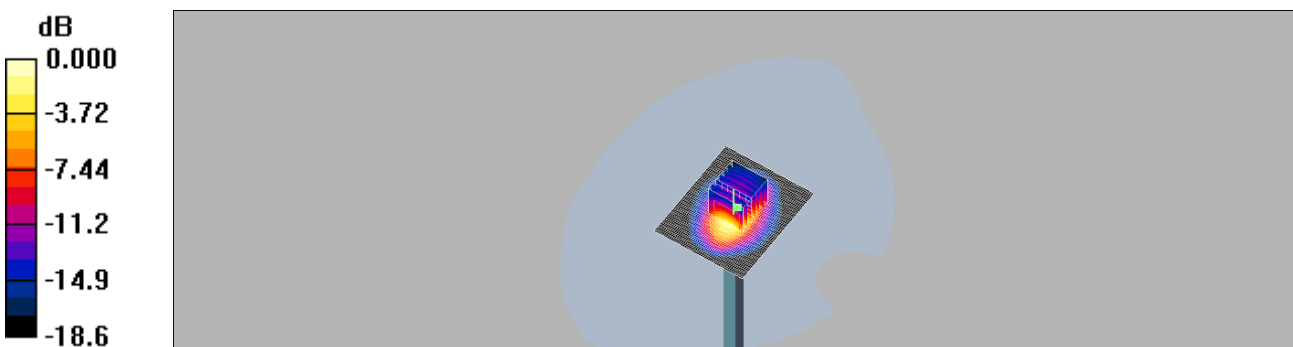
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 84.8 V/m; Power Drift = -0.086 dB

Peak SAR (extrapolated) = 19.4 W/kg

SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.4 mW/g

Maximum value of SAR (measured) = 15.1 mW/g



0 dB = 15.1mW/g

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DUT: Dipole 2450 MHz; (Head)

Communication System: CW; Communication System Band: D2450 (2450.0 MHz);

Frequency: 2450 MHz;

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.802$ mho/m; $\epsilon_r = 38.196$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.84, 6.84, 6.84); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Head; Type: SAM;
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Pin=250mW/Area Scan (41x61x1): Measurement grid:

$dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 17.3 mW/g

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

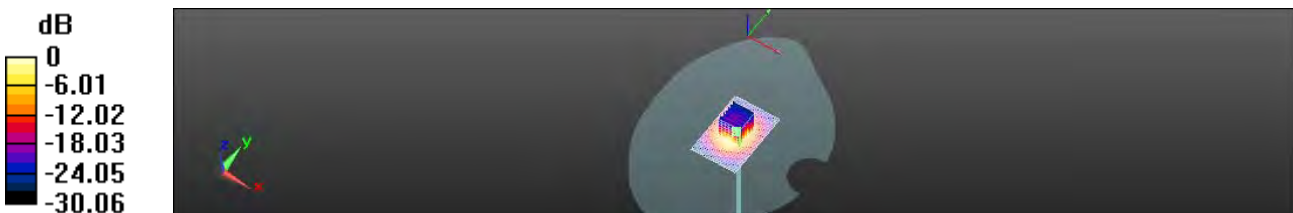
grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 93.226 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 28.276 mW/g

SAR(1 g) = 13.3 mW/g; SAR(10 g) = 6.13 mW/g

Maximum value of SAR (measured) = 16.4 mW/g



0 dB = 17.3 mW/g = 24.75 dB mW/g

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DUT: Dipole 2450 MHz;(Body)

Communication System: CW; Communication System Band: D2450 (2450.0 MHz);

Frequency: 2450 MHz;

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 2.01 \text{ mho/m}$; $\epsilon_r = 51.375$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3831; ConvF(6.82, 6.82, 6.82); Calibrated: 2012/1/4;
- Sensor-Surface: 2mm (Mechanical Surface Detection),
- Electronics: DAE4 Sn1260; Calibrated: 2011/8/22
- Phantom: Body; Type: QDOVA002AA; Serial: TP:xxxx
- DASY52 52.8.1(838); SEMCAD X 14.6.5(6469)

Configuration/Pin=250mW/Area Scan (41x61x1): Measurement grid:

$dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 15.1 mW/g

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

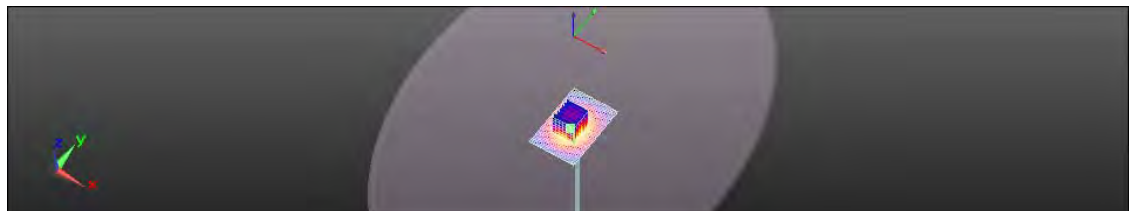
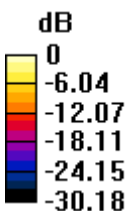
grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 86.053 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 26.802 mW/g

SAR(1 g) = 12.7 mW/g; SAR(10 g) = 5.78 mW/g

Maximum value of SAR (measured) = 15.6 mW/g



0 dB = 15.1 mW/g = 23.57 dB mW/g

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6. DAE & Probe Calibration Certificate

**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-TW**

Certificate No: **DAE4-547_Aug11**

CALIBRATION CERTIFICATE

Object: **DAE4 - SD 000 D04 BJ - SN: 547**

Calibration procedure(s): **QA CAL-06 v23
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **August 29, 2011**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-10 (No:10376)	Sep-11
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V1.1	SE UMS 006 AB 1004	08-Jun-11 (in house check)	In house check: Jun-12

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

Issued: August 29, 2011

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

Certificate No: DAE4-547_Aug11

Page 1 of 5

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **SGS (Auden)**

Certificate No: DAE4-1260_Aug11

CALIBRATION CERTIFICATE

Object: DAE4 - SD.000.D04.BJ - SN: 1260

Calibration procedure(s): QA CAL-06.v23
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: August 22, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-10 (No:10376)	Sep-11
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V1.1	SE UMS 006 AB 1004	08-Jun-11 (in house check)	In house check: Jun-12

Calibrated by: Name: Eric Hainfeld, Function: Technician, Signature: [Signature]

Approved by: Name: Fin Bomholt, Function: R&D Director, Signature: [Signature]

Issued: August 22, 2011

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Accreditation No.: SCS 108

Client **SGS-TW (Auden)**

Certificate No: **ES3-3172_Aug11**

CALIBRATION CERTIFICATE

Object: **ES3DV3 - SN:3172**

Calibration procedure(s): **QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4**
 Calibration procedure for dosimetric E-field probes

Calibration date: **August 23, 2011**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

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

Issued: August 23, 2011

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Calibration Laboratory of
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Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

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

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ES3DV3 – SN:3172

August 23, 2011

Probe ES3DV3

SN:3172

Manufactured: January 23, 2008

Calibrated: August 23, 2011

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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Member of SGS Group

ES3DV3- SN:3172

August 23, 2011

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3172

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	1.38	1.15	0.97	$\pm 10.1 \%$
DCP (mV) ^B	100.5	105.1	95.2	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc ^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	117.7	$\pm 2.7 \%$
			Y	0.00	0.00	1.00	110.5	
			Z	0.00	0.00	1.00	93.7	

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 Norm X,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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ES3DV3- SN:3172

August 23, 2011

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3172

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.06	6.06	6.06	1.00	1.00	± 12.0 %
835	41.5	0.90	5.83	5.83	5.83	1.00	1.00	± 12.0 %
900	41.5	0.97	5.77	5.77	5.77	1.00	1.00	± 12.0 %
1750	40.1	1.37	4.94	4.94	4.94	0.95	1.09	± 12.0 %
1900	40.0	1.40	4.78	4.78	4.78	0.95	1.12	± 12.0 %
2000	40.0	1.40	4.77	4.77	4.77	0.97	1.08	± 12.0 %
2300	39.5	1.67	4.50	4.50	4.50	0.76	1.24	± 12.0 %
2450	39.2	1.80	4.17	4.17	4.17	0.80	1.19	± 12.0 %
2600	39.0	1.96	4.11	4.11	4.11	0.64	1.46	± 12.0 %

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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ES3DV3-SN:3172

August 23, 2011

DASY/EASY - Parameters of Probe: ES3DV3- SN:3172

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	5.89	5.89	5.89	1.00	1.00	± 12.0 %
835	55.2	0.97	5.83	5.83	5.83	1.00	1.00	± 12.0 %
900	55.0	1.05	5.72	5.72	5.72	1.00	1.00	± 12.0 %
1750	53.4	1.49	4.60	4.60	4.60	0.88	1.25	± 12.0 %
1900	53.3	1.52	4.38	4.38	4.38	0.78	1.34	± 12.0 %
2000	53.3	1.52	4.46	4.46	4.46	0.77	1.32	± 12.0 %
2300	52.9	1.81	4.18	4.18	4.18	1.00	1.05	± 12.0 %
2450	52.7	1.95	3.99	3.99	3.99	1.00	1.00	± 12.0 %
2600	52.5	2.16	3.90	3.90	3.90	1.00	1.00	± 12.0 %

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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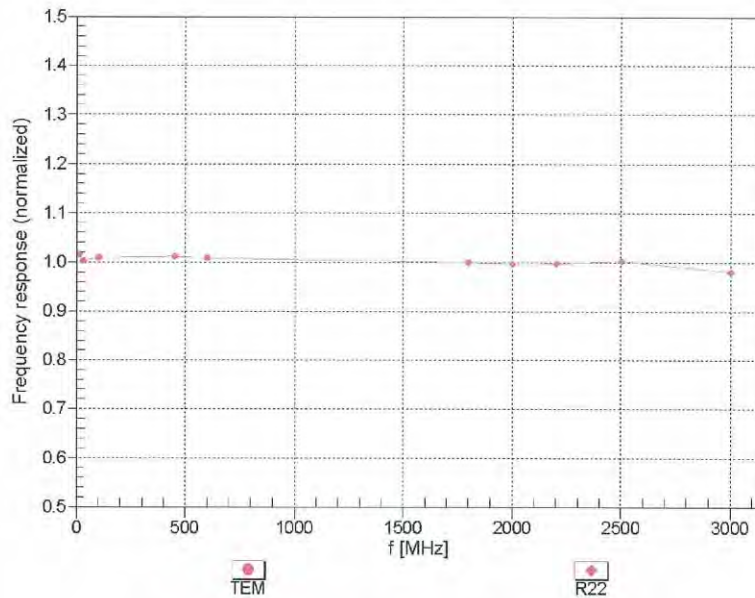
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ES3DV3-SN:3172

August 23, 2011

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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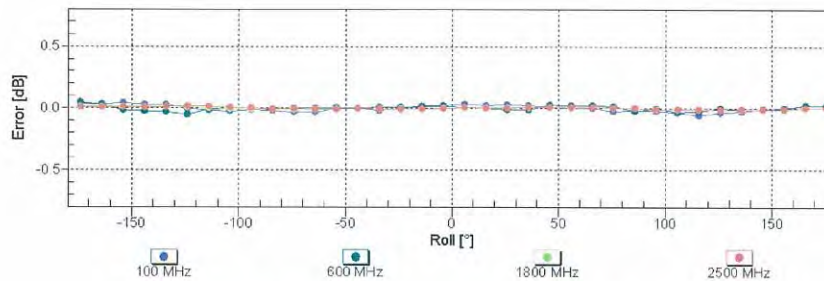
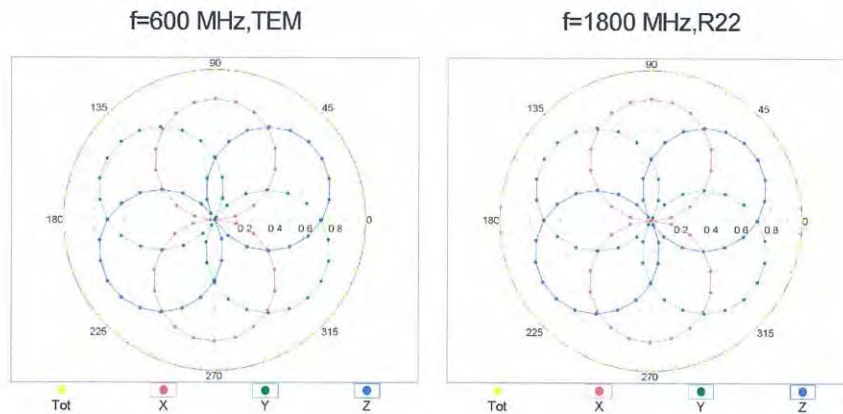
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ES3DV3- SN:3172

August 23, 2011

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



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

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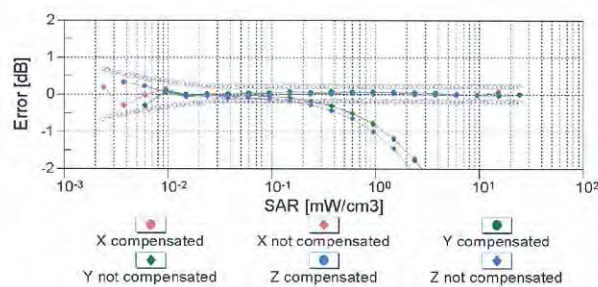
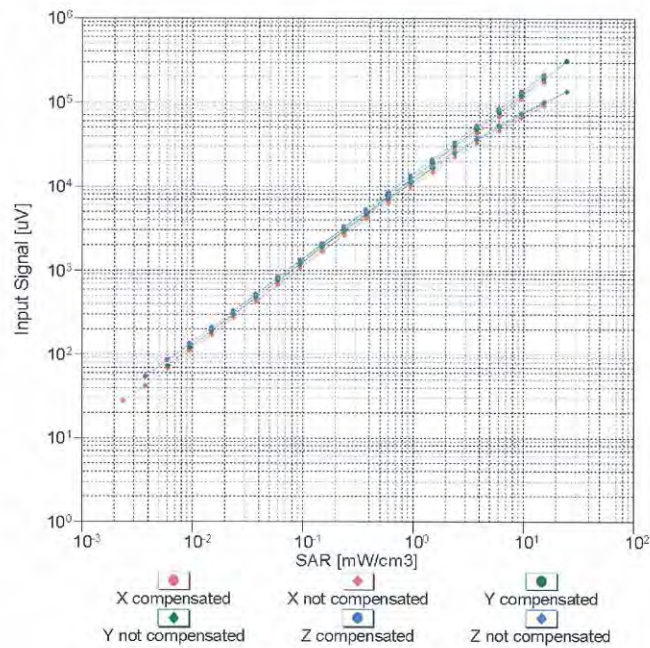
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ES3DV3- SN:3172

August 23, 2011

Dynamic Range $f(SAR_{head})$ (TEM cell , $f = 900$ MHz)



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

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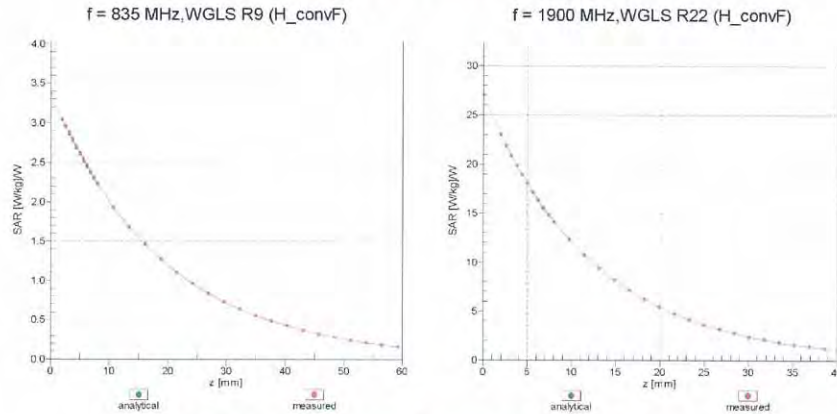
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ES3DV3-SN:3172

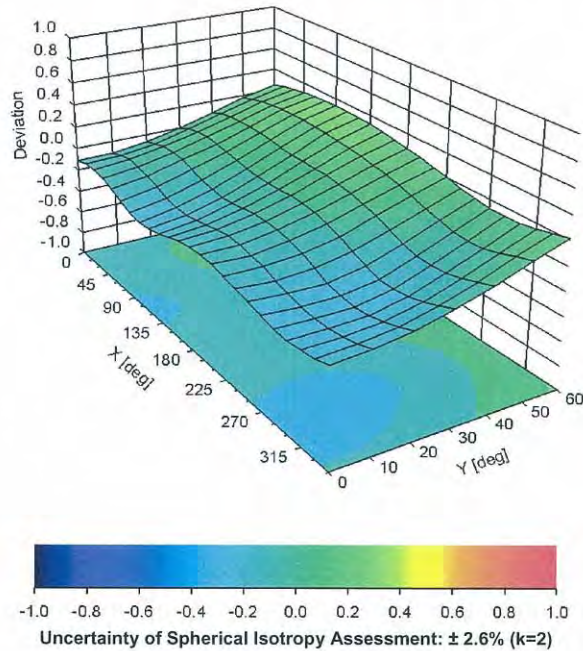
August 23, 2011

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, θ), f = 900 MHz



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ES3DV3- SN:3172

August 23, 2011

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3172

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	4 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm

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Accreditation No.: **SCS 108**

Client **SGS-TW (Auden)**

Certificate No: **EX3-3831_Jan12**

CALIBRATION CERTIFICATE

Object: **EX3DV4 - SN:3831**

Calibration procedure(s): **QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes**

Calibration date: **January 4, 2012**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

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

Issued: January 5, 2012

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Calibration Laboratory of
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Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

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

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EX3DV4 – SN:3831

January 4, 2012

Probe EX3DV4

SN:3831

Manufactured: September 6, 2011

Calibrated: January 4, 2012

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

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EX3DV4-SN:3831

January 4, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.44	0.41	0.43	± 10.1 %
DCP (mV) ^B	101.7	101.4	99.5	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc ^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	111.7	±3.0 %
			Y	0.00	0.00	1.00	96.2	
			Z	0.00	0.00	1.00	106.7	

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 Pages 5 and 6).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

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EX3DV4- SN:3831

January 4, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	9.32	9.32	9.32	0.44	0.84	± 12.0 %
835	41.5	0.90	8.82	8.82	8.82	0.19	1.48	± 12.0 %
900	41.5	0.97	8.71	8.71	8.71	0.22	1.38	± 12.0 %
1750	40.1	1.37	8.03	8.03	8.03	0.39	0.81	± 12.0 %
1900	40.0	1.40	7.76	7.76	7.76	0.44	0.77	± 12.0 %
2000	40.0	1.40	7.65	7.65	7.65	0.61	0.63	± 12.0 %
2300	39.5	1.67	7.44	7.44	7.44	0.41	0.83	± 12.0 %
2450	39.2	1.80	6.84	6.84	6.84	0.49	0.73	± 12.0 %
2600	39.0	1.96	6.67	6.67	6.67	0.33	0.96	± 12.0 %
5200	36.0	4.66	4.64	4.64	4.64	0.42	1.80	± 13.1 %
5300	35.9	4.76	4.37	4.37	4.37	0.44	1.80	± 13.1 %
5600	35.5	5.07	4.10	4.10	4.10	0.48	1.80	± 13.1 %
5800	35.3	5.27	4.12	4.12	4.12	0.45	1.80	± 13.1 %

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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EX3DV4- SN:3831

January 4, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3831

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	9.24	9.24	9.24	0.23	1.25	± 12.0 %
835	55.2	0.97	9.02	9.02	9.02	0.28	1.13	± 12.0 %
900	55.0	1.05	8.93	8.93	8.93	0.25	1.28	± 12.0 %
1750	53.4	1.49	7.67	7.67	7.67	0.38	0.87	± 12.0 %
1900	53.3	1.52	7.25	7.25	7.25	0.57	0.70	± 12.0 %
2000	53.3	1.52	7.31	7.31	7.31	0.27	1.09	± 12.0 %
2300	52.9	1.81	7.26	7.26	7.26	0.71	0.66	± 12.0 %
2450	52.7	1.95	6.82	6.82	6.82	0.74	0.62	± 12.0 %
2600	52.5	2.16	6.63	6.63	6.63	0.80	0.50	± 12.0 %
5200	49.0	5.30	4.12	4.12	4.12	0.50	1.90	± 13.1 %
5300	48.9	5.42	3.92	3.92	3.92	0.50	1.90	± 13.1 %
5600	48.5	5.77	3.30	3.30	3.30	0.65	1.90	± 13.1 %
5800	48.2	6.00	3.77	3.77	3.77	0.60	1.90	± 13.1 %

^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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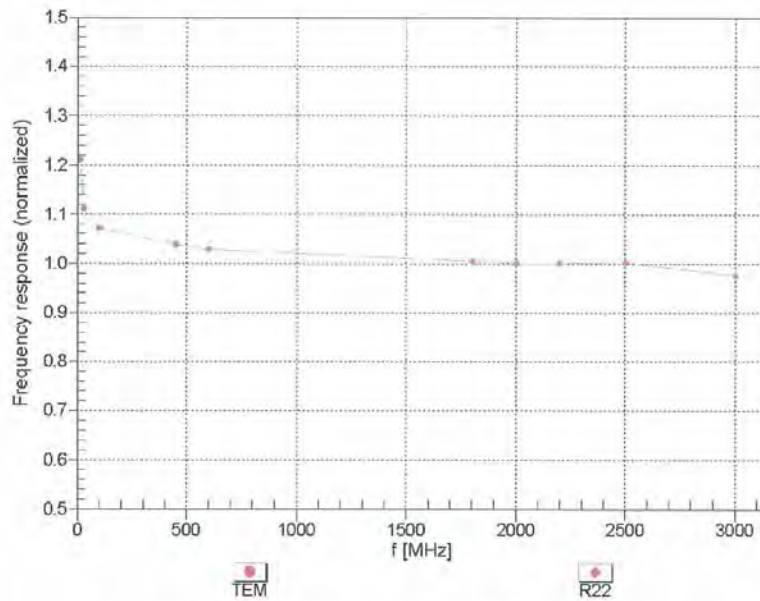
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January 4, 2012

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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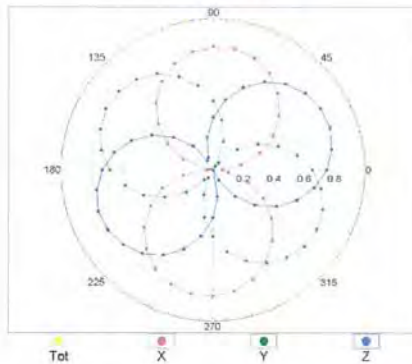
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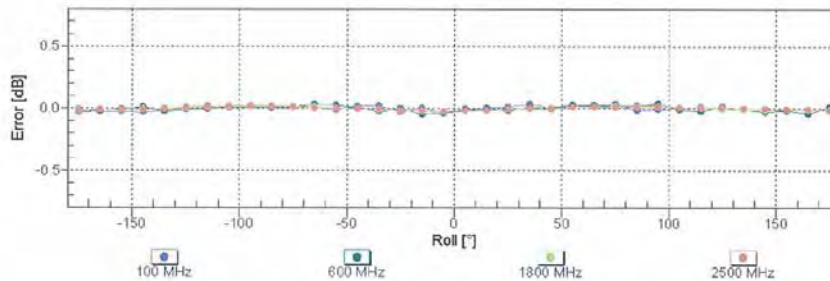
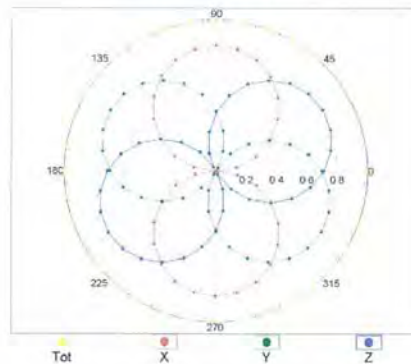
January 4, 2012

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

f=600 MHz,TEM



f=1800 MHz,R22



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

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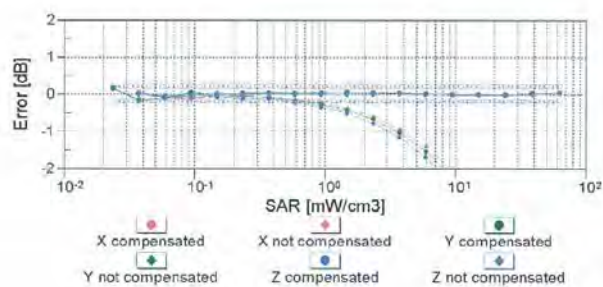
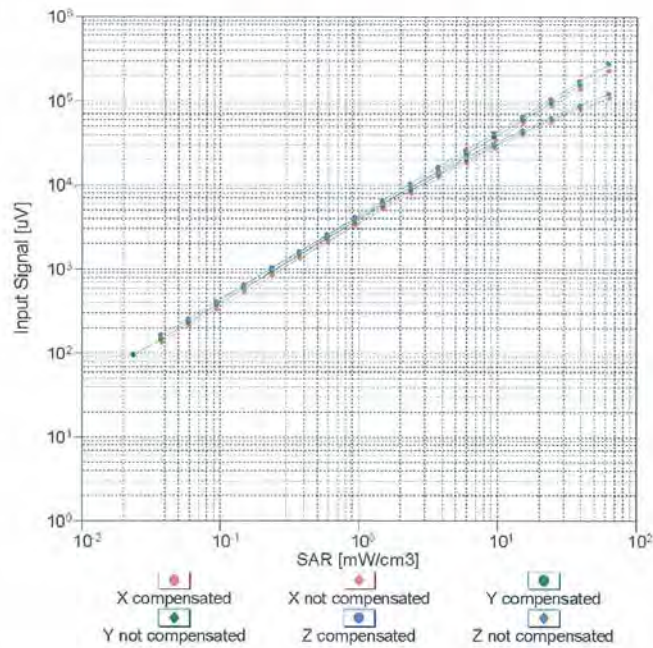
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January 4, 2012

Dynamic Range f(SAR_{head}) (TEM cell , f = 900 MHz)



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

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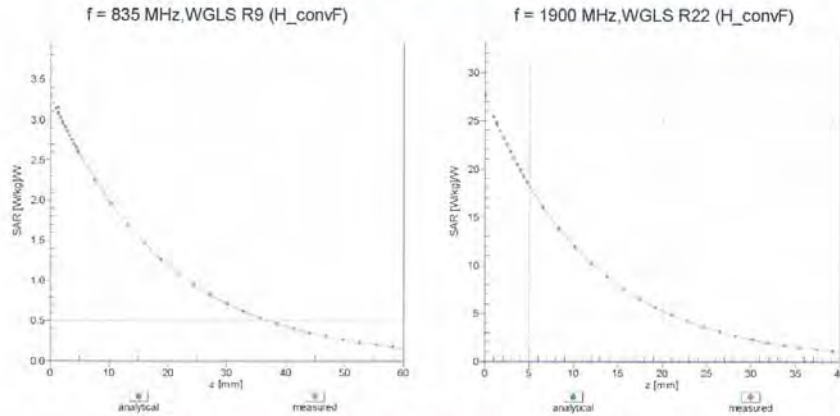
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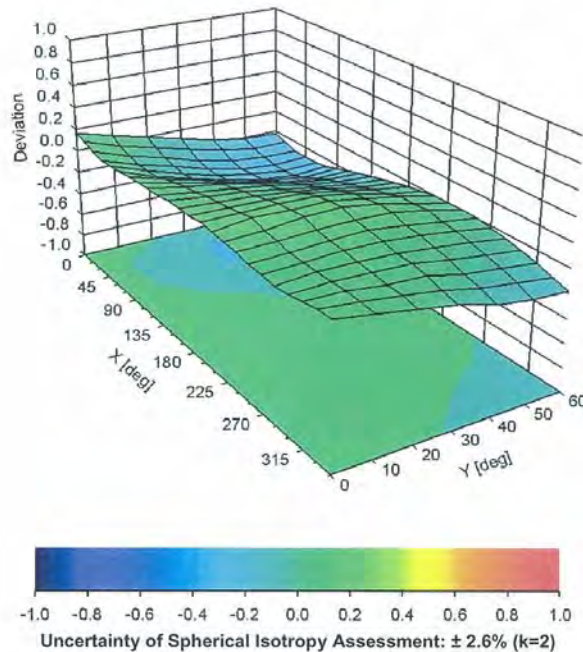
EX3DV4-SN:3831

January 4, 2012

Conversion Factor Assessment



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



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7. Uncertainty Budget

Measurement Uncertainty evaluation template for DUT SAR test

IEEE 1528

A	c	D	e	f	g	$h=c * f / e$	$i=c * g / e$	k
Source of Uncertainty	Tolerance/ Uncertainty %	Probability Distribution	Div	c_i (1g)	c_i (10g)	Standard uncertainty	Standard uncertainty	v_i , or V_{eff}
Measurement system								
Probe calibration (Frequency below 2GHz)	6.0%	N	1	1	1	6.0%	6.0%	∞
<i>Isotropy, Axial</i>	4.7%	R	$\sqrt{3}$	1	1	2.7%	2.7%	∞
<i>Isotropy, Hemispherical</i>	9.6%	R	$\sqrt{3}$	1	1	5.5%	5.5%	∞
Boundary Effect	1.0%	R	$\sqrt{3}$	1	1	0.6%	0.6%	∞
Linearity	4.7%	R	$\sqrt{3}$	1	1	2.7%	2.7%	∞
Detection Limits	1.0%	R	$\sqrt{3}$	1	1	0.6%	0.6%	∞
Readout Electronics	0.3%	N	1	1	1	0.3%	0.3%	∞
Response time	0.8%	R	$\sqrt{3}$	1	1	0.5%	0.5%	∞
Integration Time	2.6%	R	$\sqrt{3}$	1	1	1.5%	1.5%	∞
<i>Measurement drift (class A evaluation)</i>	1.8%	R	$\sqrt{3}$	1	1	1.0%	1.0%	∞
RF ambient condition - noise	3.0%	R	$\sqrt{3}$	1	1	1.7%	1.7%	∞
RF ambient conditions -reflections	3.0%	R	$\sqrt{3}$	1	1	1.7%	1.7%	∞
Probe positioner Mechanical restrictions	0.4%	R	$\sqrt{3}$	1	1	0.2%	0.2%	∞
Probe Positioning with respect to phantom	2.9%	R	$\sqrt{3}$	1	1	1.7%	1.7%	∞
Post-processing	1.0%	R	$\sqrt{3}$	1	1	0.6%	0.6%	∞
Max SAR Eval	1.0%	R	$\sqrt{3}$	1	1	0.6%	0.6%	∞
Test Sample related								
Test sample	2.9%	N	1	1	1	2.9%	2.9%	M-1
Device Holder Uncertainty	3.6%	N	1	1	1	3.6%	3.6%	M-1
Drift of output power	5.0%	R	$\sqrt{3}$	1	1	2.9%	2.9%	∞
Phantom and Setup								
Phantom Uncertainty	4.0%	R	$\sqrt{3}$	1	1	2.3%	2.3%	∞
Liquid conductivity(meas.) Max at 1900 band	4.6%	N	1	0.64	0.43	2.9%	2.0%	M
Liquid permittivity(meas.) Max at 835 band	2.2%	N	1	0.6	0.49	1.3%	1.1%	M
Combined standard uncertainty		RSS				11.9%	11.6%	
Expart uncertainty (95% confidence interval), K=2						23.7%	23.3%	

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8. Phantom Description

Scheidt & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland Phone +41 1 245 9700, Fax +41 1 245 9779 info@speg.com, http://www.speg.com		s p e e g	
Certificate of Conformity / First Article Inspection			
Item	SAM Twin Phantom V4.0		
Type No	QD 000 P40 C		
Series No	TP-1150 and higher		
Manufacturer	SPEAG Zeughausstrasse 43 CH-8004 Zurich 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 items (called samples) or are tested at each item.			
Test	Requirement	Details	Units tested
Dimensions	Compliant with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness of shell	Compliant with the requirements according to the standards	2mm +/- 0.2mm in flat and specific areas of head section	First article, Samples, TP-1314 ff.
Material thickness at ERP	Compliant with the requirements according to the standards	6mm +/- 0.2mm at ERP	First article, All items
Material parameters	Dielectric parameters for required frequencies	300 MHz – 6 GHz: Relative permittivity < 5, Loss tangent < 0.05	Material samples
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards if handled and cleaned according to the instructions. Observe technical Note for material compatibility.	DEGMBE based simulating liquids	Pre-series, First article, Material samples
Sagging	Compliant with the requirements according to the standards. Sagging of the flat section when filled with tissue simulating liquid.	< 1% typical < 0.8% if filled with 156mm of HSL900 and without DUT below	Prototypes, Sample testing
Standards [1] CENELEC EN 50361 [2] IEEE Std 1528-2003 [3] IEC 62209 Part 1 [4] FCC OET Bulletin 65, Supplement C, Edition 01-01 (*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of the other documents.			
Conformity Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standards [1] to [4].			
Date	07.07.2005	s p e e g	
Signature / Stamp		Scheidt & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland Phone +41 1 245 9700, Fax +41 1 245 9779 info@speg.com, http://www.speg.com	
Doc No	861 - QD 000 P40 C - F	Page	(1)

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9. System Validation from Original Equipment Supplier

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-TW (Auden)

Certificate No: D835V2-4d063_May11

CALIBRATION CERTIFICATE

Object: D835V2 - SN: 4d063

Calibration procedure(s): QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: May 25, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4208	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

Calibrated by: Name: Claudio Leubler, Function: Laboratory Technician, Signature: [Signature]

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

Issued: May 25, 2011

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

Certificate No: D835V2-4d063_May11

Page 1 of 8

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台灣檢驗科技股份有限公司

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Member of SGS Group

DASY5 Validation Report for Head TSL

Date: 25.05.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d063

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

Medium: HSL900

Medium parameters used: $f = 835$ MHz; $\sigma = 0.88$ mho/m; $\epsilon_r = 40.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Cube 0:

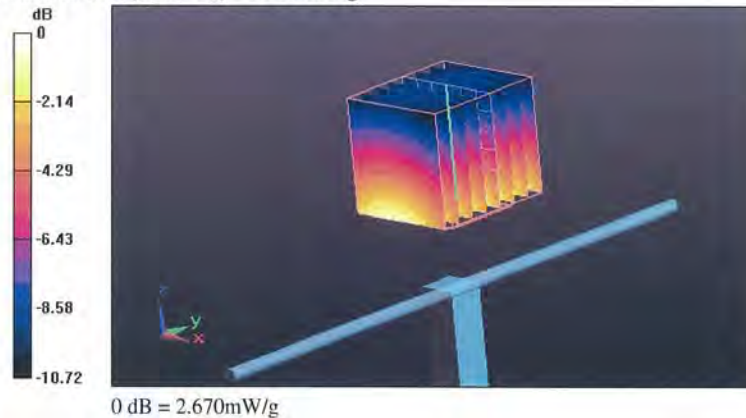
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.554 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 3.427 W/kg

SAR(1 g) = 2.31 mW/g; SAR(10 g) = 1.52 mW/g

Maximum value of SAR (measured) = 2.669 mW/g



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DASY5 Validation Report for Body TSL

Date: 25.05.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d063

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

Medium: MSL900

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 1 \text{ mho/m}$; $\epsilon_r = 53.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.4 Build (2829)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Cube 0:

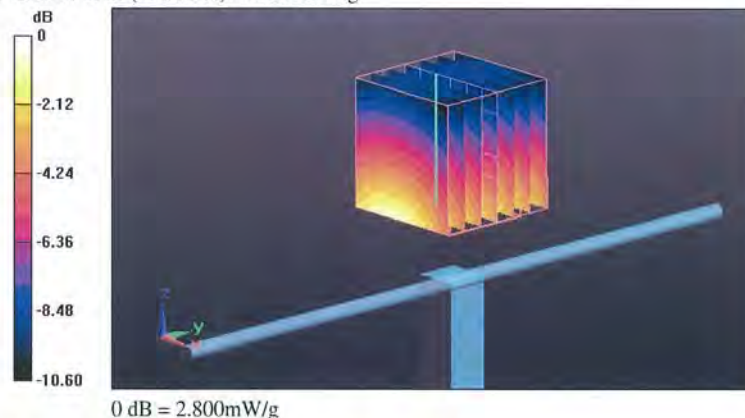
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 54.297 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 3.530 W/kg

SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.6 mW/g

Maximum value of SAR (measured) = 2.804 mW/g



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Schmid & Partner
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 Zeughausstrasse 43, 8004 Zurich, Switzerland



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 The Swiss Accreditation Service is one of the signatories to the EA
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **SGS TW (Auden)**

Certificate No: D1900V2-5d027_Apr11

CALIBRATION CERTIFICATE

Object: D1900V2 - SN: 5d027
 Calibration procedure(s): QA CAL-05.v8
 Calibration procedure for dipole validation kits
 Calibration date: April 19, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	29-Mar-11 (No. 217-01368)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

Calibrated by: Name: Claudio Leubler, Function: Laboratory Technician, Signature: [Signature]
 Approved by: Name: Katja Pokovic, Function: Technical Manager, Signature: [Signature]

Issued: April 19, 2011

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DASY5 Validation Report for Head TSL

Date/Time: 18.04.2011 15:27:22

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d027

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

Medium: HSL U12 BB

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2829)

Pin=250 mW, Cube 0:

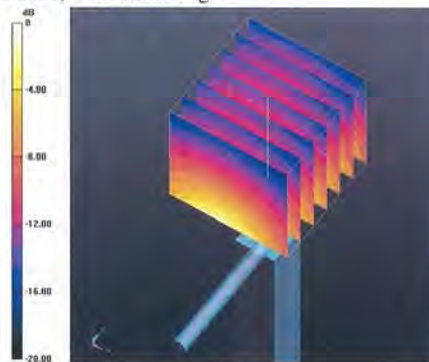
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.235 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 18.650 W/kg

SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.26 mW/g

Maximum value of SAR (measured) = 12.424 mW/g



DASY5 Validation Report for Body TSL

Date/Time: 19.04.2011 12:53:51

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d027

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

Medium: MSL U12 BB

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.52 \text{ mho/m}$; $\epsilon_r = 51.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.6.2 Build (424)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2829)

Pin=250 mW, Cube 0:

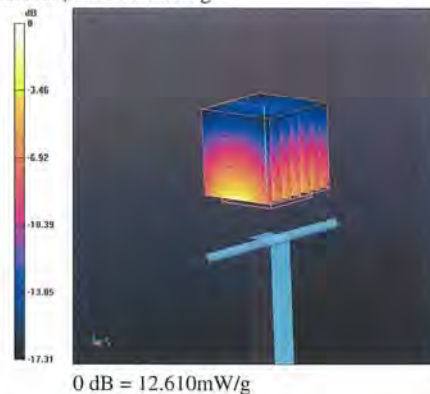
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 96.170 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 17.156 W/kg

SAR(1 g) = 9.93 mW/g; SAR(10 g) = 5.18 mW/g

Maximum value of SAR (measured) = 12.615 mW/g



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Accreditation No.: **SCS 108**

Client **Auden**

Certificate No: **D2450V2-869_Jul11**

CALIBRATION CERTIFICATE

Object: **D2450V2 - SN: 869**

Calibration procedure(s): **QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **July 15, 2011**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

Calibrated by:	Name Dimce Iliev	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature

Issued: July 15, 2011

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DASY5 Validation Report for Head TSL

Date: 15.07.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 869

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.85$ mho/m; $\epsilon_r = 38.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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

Reference Value = 102.1 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 28.552 W/kg

SAR(1 g) = 13.8 mW/g; SAR(10 g) = 6.41 mW/g

Maximum value of SAR (measured) = 17.844 mW/g



Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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DASY5 Validation Report for Body TSL

Date: 15.07.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 869

Communication System: CW; Frequency: 2450 MHz

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.99$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.26, 4.26, 4.26); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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

Reference Value = 95.707 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 26.507 W/kg

SAR(1 g) = 13 mW/g; SAR(10 g) = 6.02 mW/g

Maximum value of SAR (measured) = 16.958 mW/g



End of 1st part of report

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