

SAR TEST REPORT

Equipment Under Test	Tablet Device
Model Number	SGPT113JP/S / SGPT114JP/S
Mode of Operation	GSM\GPRS\EGPRS\WCDMA\HSDPA\HSUPA\WLAN802.11 b/g/n(20M) band
Company Name	Sony Corporation
Company Address	1-7-1 Konan Minato-Ku, Tokyo, 108-0075 Japan
Date of Receipt	2011.03.24
Date of Test(s)	2011.03.29~2011.04.07
Date of Issue	2011.05.16

Standards:

**FCC OET 65 supplement C,
IEEE /ANSI C95.1 , C95.3, IEEE 1528,
RSS-102**

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.

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Tested by : Ricky Huang Date : 2011.05.16
Asst. Supervisor

Approved by : Nick Hsu Date : 2011.05.16
Supervisor

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Version

Version No.	Date	Description
1.0	Apr.14, 2011	Initial issue of report
1.1	Apr.16, 2011	1 st modification
1.2	Apr.26, 2011	2 nd modification
1.3	May.01, 2011	3 rd modification
1.4	May.03, 2011	4 th modification
1.5	May.04, 2011	5 th modification
1.6	May.16, 2011	6 th modification

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1. General Information

1.1 Testing Laboratory

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

1.2 Details of Applicant

Name	Sony Corporation
Address	1-7-1 Konan Minato-Ku, Tokyo, 108-0075 Japan
Contact Person	Ryui Tatsumi
Tel	(81)3-6747-1585
Email address	Ryui.Tatsumi@jp.sony.com

1.3 Description of EUT

EUT Name	Tablet Device
Model Number	SGPT113JP/S / SGPT114JP/S
Brand Name	SONY
TAC code	35775504
FCC ID	AK8SGPT113JP
IC ID	409B-SGPT113JP
Definition	Production unit

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Mode of Operation	GSM\GPRS\EGPRS\WCDMA\HSDPA\HSUPA\WLAN802.11 b/g/n(20M) band				
Duty Cycle	GPRS(EGPRS)		WCDMA		WLAN
	1/4 (multi class 10)		1		1
TX Frequency range (MHz)	GPRS 850	GPRS 1900	WCDMA B2	WCDMA B5	WLAN 802.11 b/g/n
	824.2	1850.2	1852.4	826.4	2412
	- 848.8	- 1909.8	- 1907.6	- 846.6	- 2462
Channel Number (ARFCN)	GPRS850	GPRS1900	WCDMA B2	WCDMA B5	WLAN 802.11 b/g/n
	128-251	512-810	9262-9538	4132-4233	1-11
Max. SAR Measured (1g)	GRPS 850				
	0.760W/kg (At GPRS 850_ CH128_ Lap-held mode)				
	GRRS 1900				
	1.05W/kg (At GPRS 1900_ CH512_ Lap-held mode)				
	WCDMA B2				
	1.11W/kg (At WCDMA B2_ CH9262_ Lap-held mode)				
	WCDMA B5				
	0.987W/kg (At WCDMA B5_ CH4233_ Lap-held mode)				
	WLAN802.11 b				
0.218W/kg (At WLAN802.11 b_ CH6_ Primary Portrait mode)					

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#. Conducted power table:

Mode\ARFCN	GSM 850 (Average)			GSM 1900 (Average)		
	128	190	251	512	661	810
GPRS 10	30	30.1	30.3	28.5	28.4	28.4

Mode	Subtest	WCDMA Band II Channel			WCDMA Band V Channel		
		9262	9400	9538	4132	4183	4233
Rel99	R99	23.12	23.06	22.9	24.25	24.18	24.2
Rel6 HSDPA	1	23.29	22.95	22.76	24.04	24.04	24.32
	2	23	22.92	22.75	24.18	24.07	24.07
	3	22.81	22.5	22.23	23.58	23.56	23.83
	4	22.88	22.51	22.35	23.63	23.6	23.89
Rel6 HSUPA	1	23.04	23.04	22.84	24.21	24.11	24.12
	2	21.09	21.11	20.88	22.27	22.19	22.16
	3	22.1	22.06	21.92	23.25	23.17	23.2
	4	21.22	21.16	20.92	22.32	22.25	22.24
	5	22.93	22.9	22.75	24.07	23.94	24.01

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

Fre.(MHz)	11b		11g		11n	
	Peak	Average	Peak	Average	Peak	Average
2412	15.31	12.92	20.42	10.89	19.74	10.68
2437	15.75	13.34	19.87	10.77	19.21	10.65
2462	15.30	12.91	19.80	10.63	19.13	10.55

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1.4 Test Environment

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

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

1.5 Operation description

Use chipset specific software to control the EUT, and makes it transmit in maximum power. Measurements are performed respectively on the lowest, middle and highest channels of the operating band(s).

The test configuration tested at the low, middle and high frequency channels, and then test of set in highest power. Finally, we will test it by dividing into 5 configurations:

WWAN:

Configuration 1: Lap-held mode.

Configuration 2: Secondary portrait mode.

Configuration 3: Secondary landscape mode. (SW Disabled, so SAR test is not required)

Configuration 4: Primary Landscape mode. (Antenna to user distance is 155.2mm)

(No need SAR testing due to the distance between antenna and Primary Landscape of the device is bigger than 5 cm referred as the KDB447498)

Configuration 5: Primary portrait mode. (Antenna to user distance is 142.1mm)

(No need SAR testing due to the distance between antenna and Primary portrait of the device is bigger than 5 cm referred as the KDB447498)

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WLAN:

Configuration 1: Lap-held mode.

Configuration 2: Secondary portrait mode. (Antenna to user distance is 230.7mm)
(No need SAR testing due to the distance between antenna and Secondary portrait of the device is bigger than 5 cm referred as the KDB447498)

Configuration 3: Secondary landscape mode. (SW Disabled, so SAR test is not required)

Configuration 4: Primary Landscape mode. (Antenna to user distance is 72.3mm)
(No need SAR testing due to the distance between antenna and Primary Landscape of the device is bigger than 5cm referred as the KDB447498)

Configuration 5: Primary portrait mode.

#. When the maximum transmitter and antenna output power are $\leq 60/f(\text{GHz})$ (mW)
SAR evaluation is not required for FCC or TCB approval. (BT power=-1.92dBm)

#. The highest 1-g SAR for WLAN is 0.218 W/kg and the highest 1-g SAR for WWAN is 1.11W/kg. The sum of 1-g for simultaneous transmitting WLAN and WWAN antenna pair is $0.218+1.11 = 1.328$ W/kg < 1.6 W/kg. According to **KDB648474/KDB447498 /KDB248227/KDB941225** Simultaneous SAR evaluation is not required.

#. According to **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.

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1.6 The SAR Measurement System

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

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

- A standard high precision 6-axis robot (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.

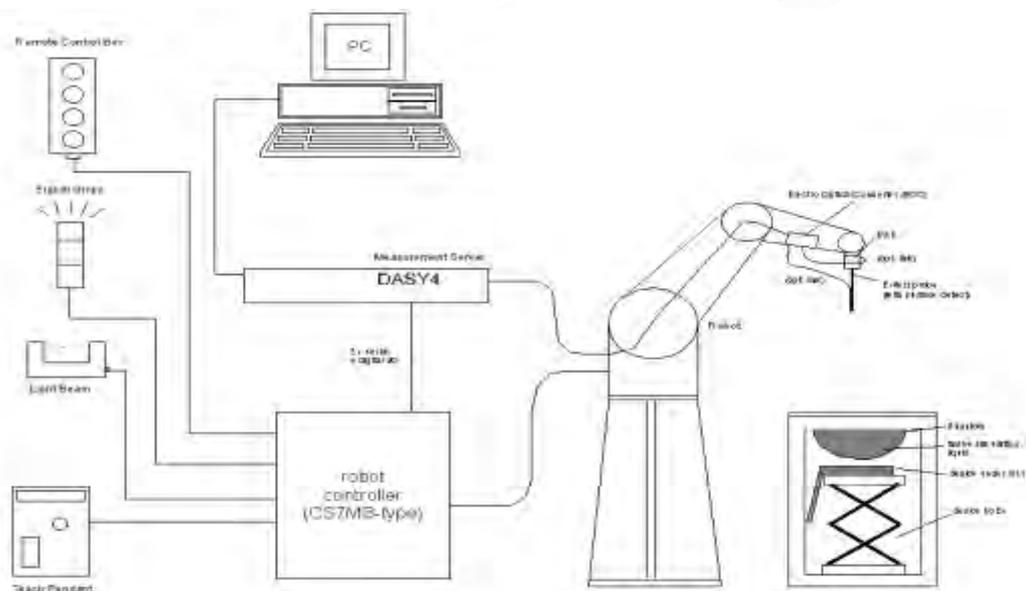


Fig.a The block diagram of SAR system

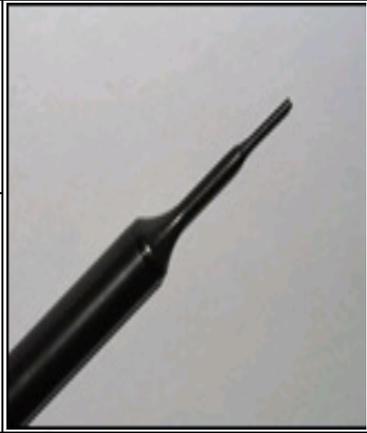
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- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement 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 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.

1.7 System Components

ES3DV3 E-Field Probe

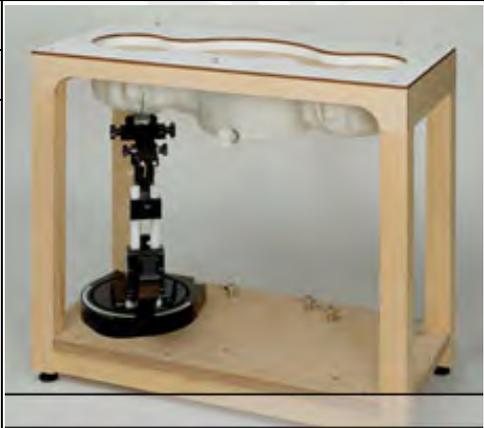
Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)	
Calibration	Basic Broad Band Calibration in air Conversion Factors (CF) for HSL835/1900/2450 MHz Additional CF for other liquids and frequencies upon request	
Frequency	10 MHz to > 4 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)	

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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%.

SAM PHANTOM V4.0C

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

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DEVICE HOLDER

<p>Construction</p>	<p>The device holder (Supporter) for Notebook is made by POM (polyoxymethylene resin) , which is non-metal and non-conductive. The height can be adjusted to fit varies kind of notebooks.</p>	 <p style="text-align: center;">Device Holder</p>
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1.8 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 +/- 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 (SAR values are normalized to 1W forward power delivered to the dipole). During the tests, the ambient temperature of the laboratory was in the range 22.1°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.

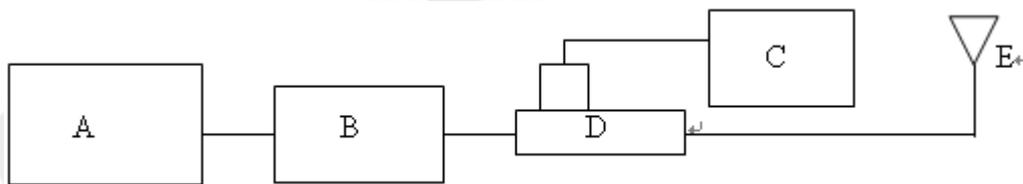
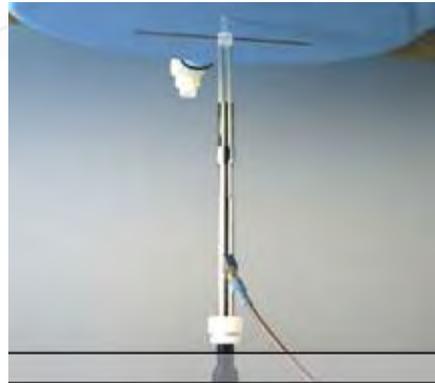


Fig.b The block diagram of system verification

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- A. Agilent Model 8648D Signal Generator
- B. Mini circuits Model ZHL-42 Amplifier
- C. Agilent Model ML2495A Power Meter
- D. Agilent Model 778D/777D Dual directional coupling
- E. Reference dipole antenna



Photograph of the dipole Antenna

Validation Kit	Frequency Hz	Target SAR (1g) (Pin=250mW)	Measured SAR (1g)	Measured Date
D835V2 S/N: 4d063	850 MHz (Body)	2.53 m W/g	2.55 m W/g	2011-03-29
D1900V2 S/N: 5d027	1900 MHz (Body)	10.1m W/g	9.99 m W/g	2011-04-05
D2450V2 S/N: 727	2450 MHz (Body)	13.4m W/g	13.8 mW/g	2011-04-07

Table 2. Results of system validation

1.9 Tissue Simulant Fluid for the Frequency Band

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

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. (Fig .2)

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Frequency (MHz)	Tissue type	Measurement date/ Limits	Dielectric Parameters		
			ρ	σ (S/m)	Simulated Tissue Temperature(° C)
850	Body	Measured, 2011.03.29	53.3	0.978	21.7
		Recommended Limits	51.49-56.91	0.93-1.03	20-24
1900	Body	Measured, 2011.04.05	52.5	1.59	21.7
		Recommended Limits	52.06-57.54	1.45-1.61	20-24
2450	Body	Measured, 2011.04.07	52.4	2.01	21.7
		Recommended Limits	51.49-56.91	1.91-2.11	20-24

Table 3. Dielectric Parameters of Tissue Simulant Fluid

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The composition of the body tissue simulating liquid is:

Ingredient	850MHz (Body)	1900MHz (Body)	2450MHz (Body)
DGMBE	X	300.67g	301.7ml
Water	631.68 g	716.56 g	698.3ml
Salt	11.72 g	4.0 g	X
Preventol D-7	1.2 g	X	X
Cellulose	X	X	X
Sugar	600 g	X	X
Total amount	1 L (1.0kg)	1 L (1.0kg)	1 L (1.0kg)

Table 3. Recipes for tissue simulating liquid

1.10 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

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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 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 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.

1.11 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

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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).
- (2) 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 program in a work environment.
- (3) 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 .4)

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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

GPRS850

Lap-held mode.						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850MHz	128	824.2	30dBm	0.760	22.1	21.7
	190	836.6	30.1dBm	0.754	22.1	21.7
	251	848.8	30.3dBm	0.723	22.1	21.7
Secondary portrait mode.						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850MHz	128	824.2	30dBm	0.550	22.1	21.7
	190	836.6	30.1dBm	0.548	22.1	21.7
	251	848.8	30.3dBm	0.433	22.1	21.7

GPRS1900

Lap-held mode.						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
1900MHz	512	1850.2	28.5dBm	1.05	22.1	21.7
	661	1880	28.4dBm	0.797	22.1	21.7
	810	1909.8	28.4dBm	0.637	22.1	21.7
Secondary portrait mode.						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
1900MHz	512	1850.2	28.5dBm	0.281	22.1	21.7
	661	1880	28.4dBm	0.355	22.1	21.7
	810	1909.8	28.4dBm	0.345	22.1	21.7

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WCDMA B2

Lap-held mode.						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
1900MHz	9262	1852.4	23.12dBm	1.11	22.1	21.7
	9400	1880.0	23.06dBm	0.973	22.1	21.7
	9538	1907.6	22.9dBm	0.889	22.1	21.7
Secondary portrait mode.						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
1900MHz	9262	1852.4	23.12dBm	0.343	22.1	21.7
	9400	1880.0	23.06dBm	0.395	22.1	21.7
	9538	1907.6	22.9dBm	0.443	22.1	21.7

WCDMA B5

Lap-held mode.						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850MHz	4132	826.4	24.25dBm	0.851	22.1	21.7
	4183	836.6	24.18dBm	0.876	22.1	21.7
	4233	846.6	24.2dBm	0.987	22.1	21.7
Secondary portrait mode.						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
850MHz	4132	826.4	24.25dBm	0.456	22.1	21.7
	4183	836.6	24.18dBm	0.412	22.1	21.7
	4233	846.6	24.2dBm	0.5	22.1	21.7

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WLAN802.11 b

Lap-held mode.						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
2450MHz	1	2412	12.92dBm	0.085	22.1	21.7
	6	2437	13.34dBm	0.131	22.1	21.7
	11	2462	12.91dBm	0.088	22.1	21.7
Primary portrait mode.						
Frequency	Channel	MHz	Conducted Output Power (Average)	Measured(W/kg) 1g	Amb. Temp[°C]	Liquid Temp[°C]
2450MHz	1	2412	12.92dBm	0.138	22.1	21.7
	6	2437	13.34dBm	0.218	22.1	21.7
	11	2462	12.91dBm	0.151	22.1	21.7

#. According to **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.

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3. Instruments List

Manufacturer	Device	Type	Serial number	Date of last calibration
Schmid & Partner Engineering AG	Dosimetric E-Field Probe	ES3DV3	3172	May.21.2010
Schmid & Partner Engineering AG	835/1900/2450 MHz System Validation Dipole	D835V2	4d063	May.21.2010
		D1900V2	5d027	Apr.28.2010
		D2450V2	727	Apr.29.2010
Schmid & Partner Engineering AG	Data acquisition Electronics	DAE4	547	Aug.18.2010
Schmid & Partner Engineering AG	Software	DASY 4 V4.7 Build 80	N/A	Calibration not required
Schmid & Partner Engineering AG	Phantom	SAM	N/A	Calibration not required
HP	Network Analyzer	8753D	3410A05547	Mar.16.2011
HP	Dielectric Probe Kit	85070D	US01440168	Calibration not required
Agilent	Dual-directional coupler	777D	50114	Aug.25.2010
		778D	50313	Aug.25.2010
Agilent	RF Signal Generator	8648D	3847M00432	Jun.04.2010
Agilent	Power Sensor	U2001B	MY48100169	Apr.30.2010
R&S	Radio Communication Test	CMU200	109326	Apr.01.2011
Agilent	Radio Communication Test	E5515C	GB44051912	Jul.27.2010

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4. Measurements

Date: 2011/3/29

Lap-held_GPRS850_CH128

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:4
 Medium: Muscle 900 MHz Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.967$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (111x171x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.844 mW/g

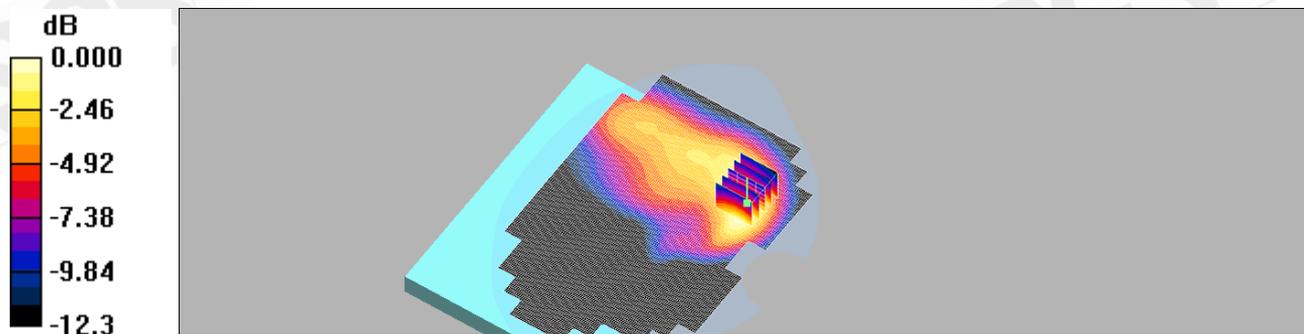
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.7 V/m; Power Drift = 0.075 dB

Peak SAR (extrapolated) = 1.16 W/kg

SAR(1 g) = 0.760 mW/g; SAR(10 g) = 0.495 mW/g

Maximum value of SAR (measured) = 0.820 mW/g



0 dB = 0.820mW/g

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Lap-held_GPRS850_CH190

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:4
 Medium: Muscle 900 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 53.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (111x171x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.845 mW/g

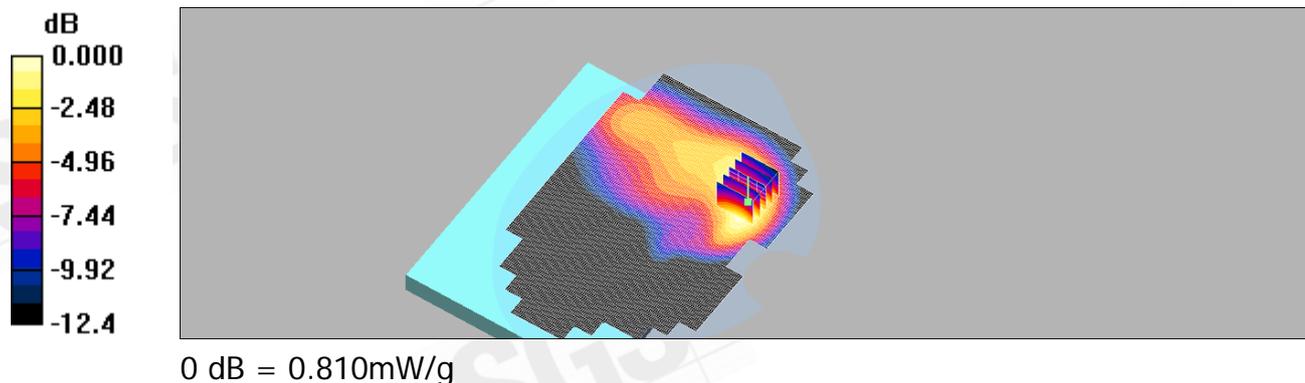
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 12.4 V/m; Power Drift = -0.040 dB

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.754 mW/g; SAR(10 g) = 0.492 mW/g

Maximum value of SAR (measured) = 0.810 mW/g



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Lap-held_GPRS850_CH251

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:4
 Medium: Muscle 900 MHz Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.992 \text{ mho/m}$; $\epsilon_r = 53.1$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (111x171x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.802 mW/g

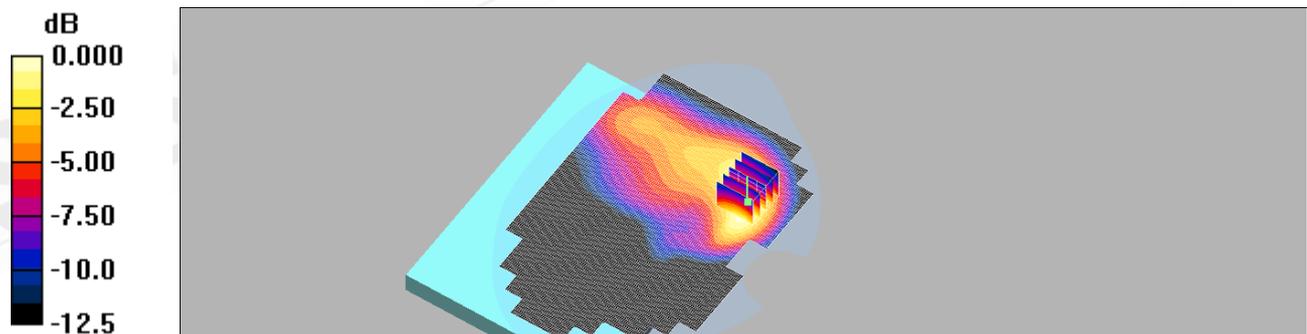
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 11.7 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 1.10 W/kg

SAR(1 g) = 0.723 mW/g; SAR(10 g) = 0.470 mW/g

Maximum value of SAR (measured) = 0.785 mW/g



0 dB = 0.785mW/g

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Secondary Portrait_GPRS850_CH128

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:4
 Medium: Muscle 900 MHz Medium parameters used (interpolated): $f = 824.2 \text{ MHz}$; $\sigma = 0.967 \text{ mho/m}$; $\epsilon_r = 53.4$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (51x131x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.615 mW/g

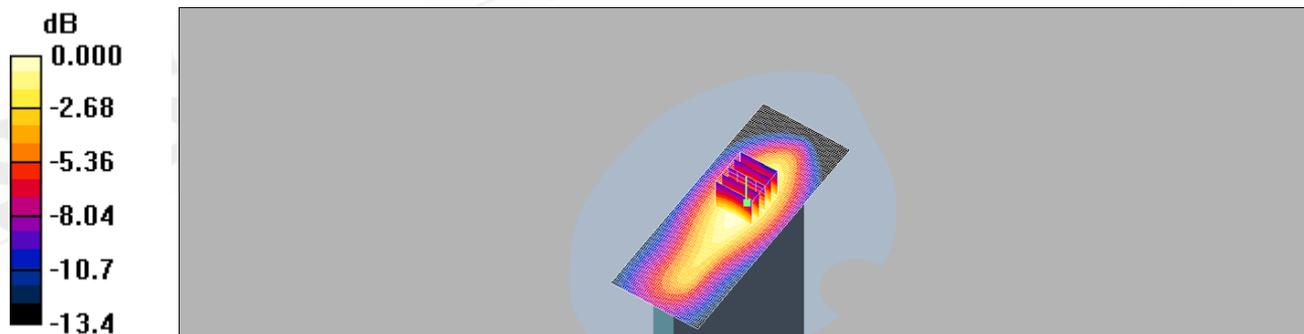
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 23.4 V/m; Power Drift = 0.082 dB

Peak SAR (extrapolated) = 0.819 W/kg

SAR(1 g) = 0.550 mW/g; SAR(10 g) = 0.361 mW/g

Maximum value of SAR (measured) = 0.599 mW/g



0 dB = 0.599mW/g

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Secondary Portrait_GPRS850_CH190

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:4
 Medium: Muscle 900 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 53.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (51x131x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.597 mW/g

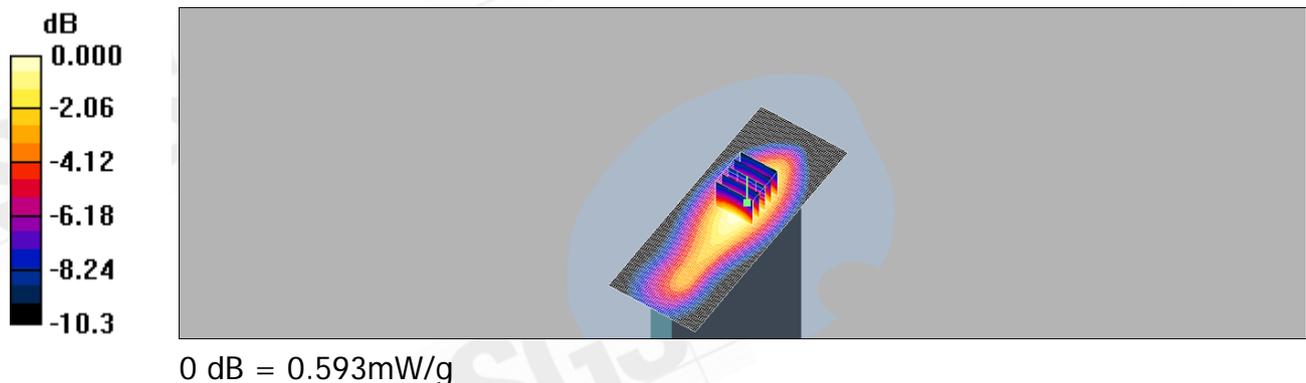
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 22.8 V/m; Power Drift = 0.042 dB

Peak SAR (extrapolated) = 0.820 W/kg

SAR(1 g) = 0.548 mW/g; SAR(10 g) = 0.360 mW/g

Maximum value of SAR (measured) = 0.593 mW/g



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Secondary Portrait_GPRS850_CH251

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:4

Medium: Muscle 900 MHz Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.992 \text{ mho/m}$; $\epsilon_r = 53.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (51x131x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.468 mW/g

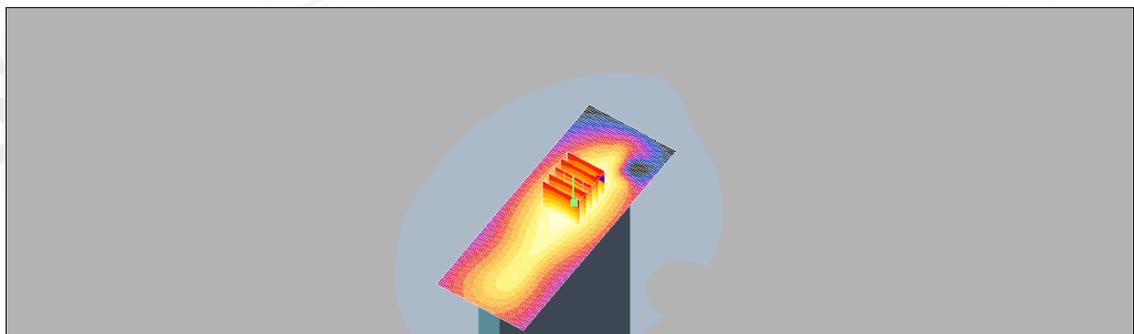
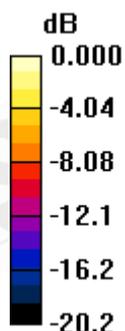
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 20.0 V/m; Power Drift = -0.032 dB

Peak SAR (extrapolated) = 0.658 W/kg

SAR(1 g) = 0.433 mW/g; SAR(10 g) = 0.283 mW/g

Maximum value of SAR (measured) = 0.472 mW/g



0 dB = 0.472mW/g

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Lap-held_GPRS1900_CH512

Communication System: GSM1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4
 Medium: M1800 & 1900 Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.57 \text{ mho/m}$; $\epsilon_r = 52.6$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.45, 4.45, 4.45); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (111x171x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 1.13 mW/g

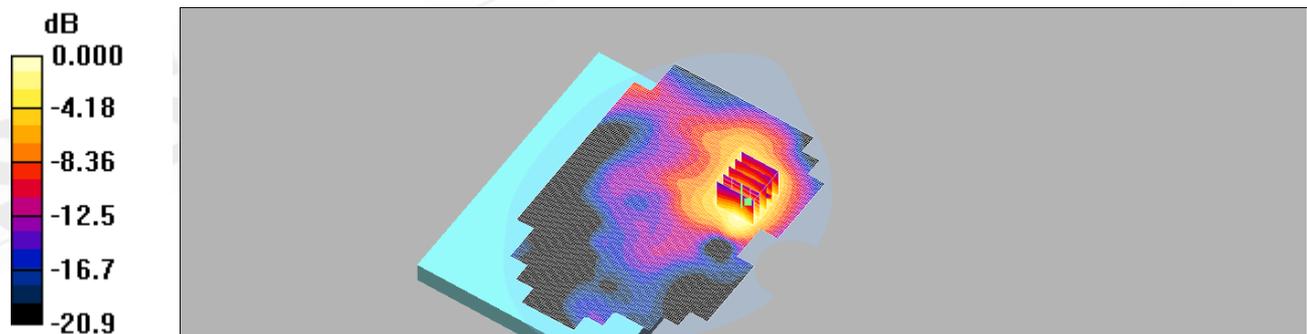
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 8.83 V/m; Power Drift = -0.149 dB

Peak SAR (extrapolated) = 1.92 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.619 mW/g

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



0 dB = 1.15mW/g

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Lap-held_GPRS1900_CH661

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:4
 Medium: M1800 & 1900 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.58 \text{ mho/m}$; $\epsilon_r = 52.5$;
 $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.45, 4.45, 4.45); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (111x171x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.877 mW/g

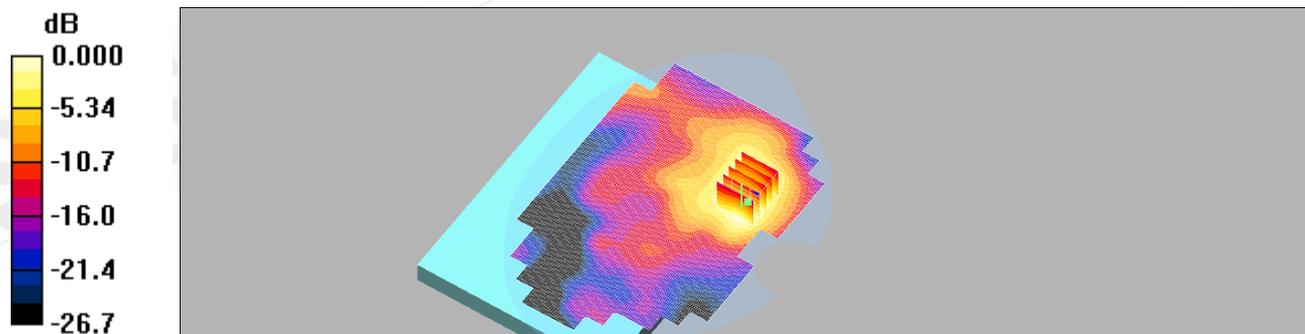
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 8.28 V/m; Power Drift = 0.008 dB

Peak SAR (extrapolated) = 1.29 W/kg

SAR(1 g) = 0.797 mW/g; SAR(10 g) = 0.485 mW/g

Maximum value of SAR (measured) = 0.861 mW/g



0 dB = 0.861mW/g

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Lap-held_GPRS1900_CH810

Communication System: GSM1900; Frequency: 1909.8 MHz; Duty Cycle: 1:4
 Medium: M1800 & 1900 Medium parameters used: $f = 1910$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 52.4$;
 $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.45, 4.45, 4.45); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (111x171x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 0.701 mW/g

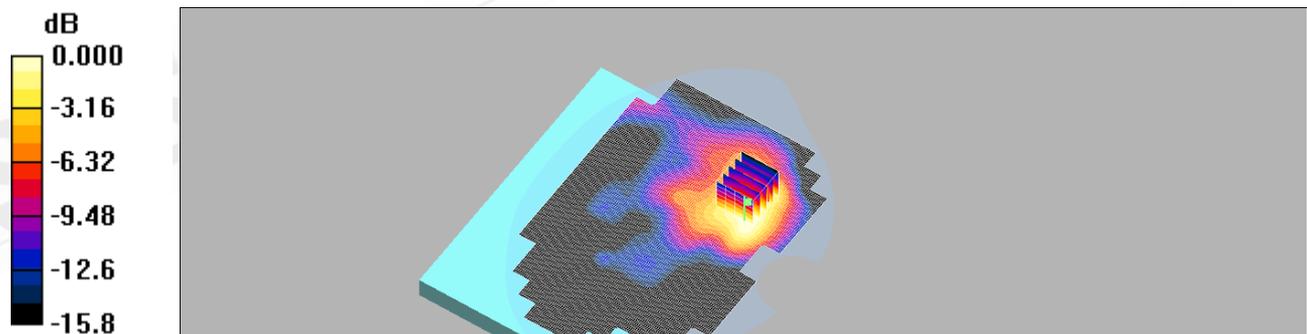
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm,
 dz=5mm

Reference Value = 7.74 V/m; Power Drift = -0.105 dB

Peak SAR (extrapolated) = 1.00 W/kg

SAR(1 g) = 0.637 mW/g; SAR(10 g) = 0.402 mW/g

Maximum value of SAR (measured) = 0.688 mW/g



0 dB = 0.688mW/g

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Secondary Portrait_GPRS1900_CH512

Communication System: GSM1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4
 Medium: M1800 & 1900 Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.57 \text{ mho/m}$; $\epsilon_r = 52.6$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.45, 4.45, 4.45); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (51x131x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.329 mW/g

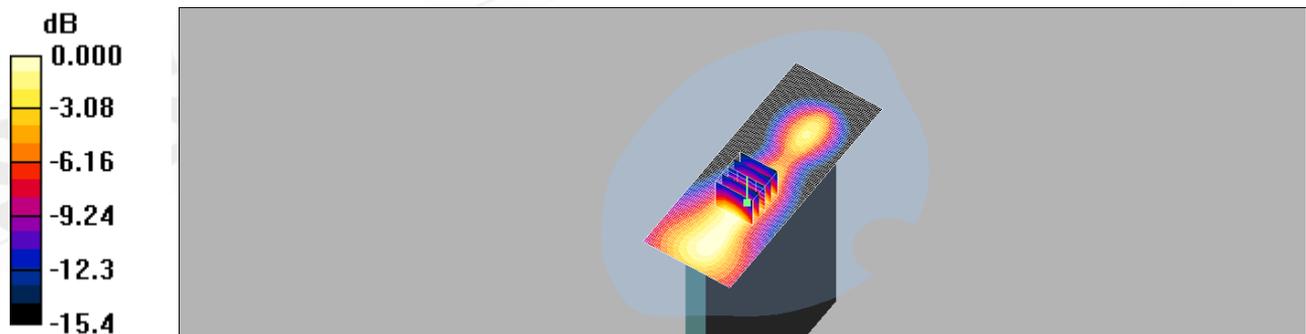
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 11.3 V/m ; Power Drift = 0.015 dB

Peak SAR (extrapolated) = 0.462 W/kg

SAR(1 g) = 0.281 mW/g ; SAR(10 g) = 0.160 mW/g

Maximum value of SAR (measured) = 0.315 mW/g



0 dB = 0.315 mW/g

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Secondary Portrait_GPRS1900_CH661

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:4
 Medium: M1800 & 1900 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.58 \text{ mho/m}$; $\epsilon_r = 52.5$;
 $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.45, 4.45, 4.45); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (51x131x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.361 mW/g

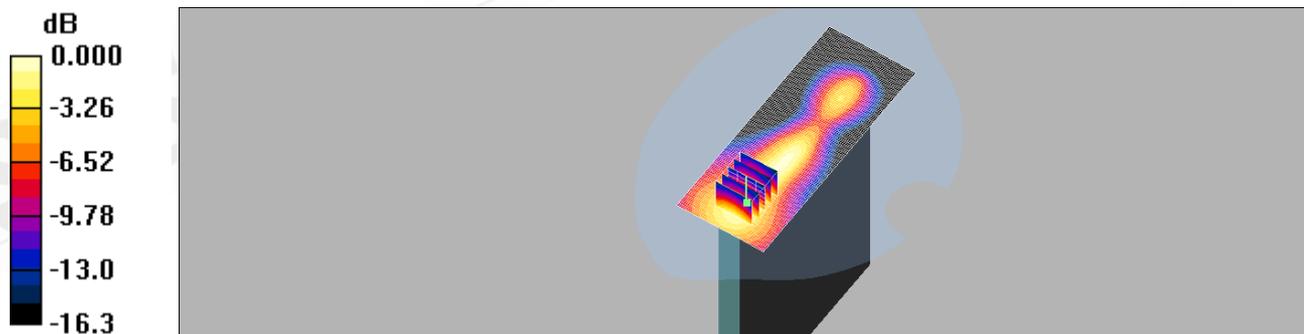
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 12.0 V/m; Power Drift = -0.142 dB

Peak SAR (extrapolated) = 0.581 W/kg

SAR(1 g) = 0.355 mW/g; SAR(10 g) = 0.200 mW/g

Maximum value of SAR (measured) = 0.400 mW/g



0 dB = 0.400mW/g

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Secondary Portrait_GPRS1900_CH810

Communication System: GSM1900; Frequency: 1909.8 MHz; Duty Cycle: 1:4
 Medium: M1800 & 1900 Medium parameters used: $f = 1910 \text{ MHz}$; $\sigma = 1.59 \text{ mho/m}$; $\epsilon_r = 52.4$;
 $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.45, 4.45, 4.45); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (51x131x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.365 mW/g

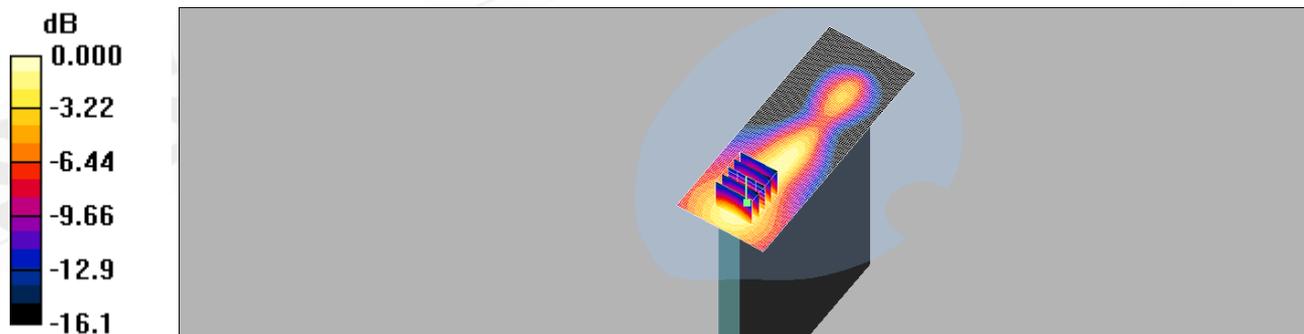
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 11.5 V/m; Power Drift = -0.168 dB

Peak SAR (extrapolated) = 0.559 W/kg

SAR(1 g) = 0.345 mW/g; SAR(10 g) = 0.196 mW/g

Maximum value of SAR (measured) = 0.394 mW/g



0 dB = 0.394mW/g

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Lap-held_WCDMA B2_CH9262

Communication System: WCDMA BAND2; Frequency: 1852.4 MHz; Duty Cycle: 1:1
 Medium: M1800 & 1900 Medium parameters used (interpolated): $f = 1852.4 \text{ MHz}$; $\sigma = 1.57 \text{ mho/m}$; $\epsilon_r = 52.6$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.45, 4.45, 4.45); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (111x171x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 1.19 mW/g

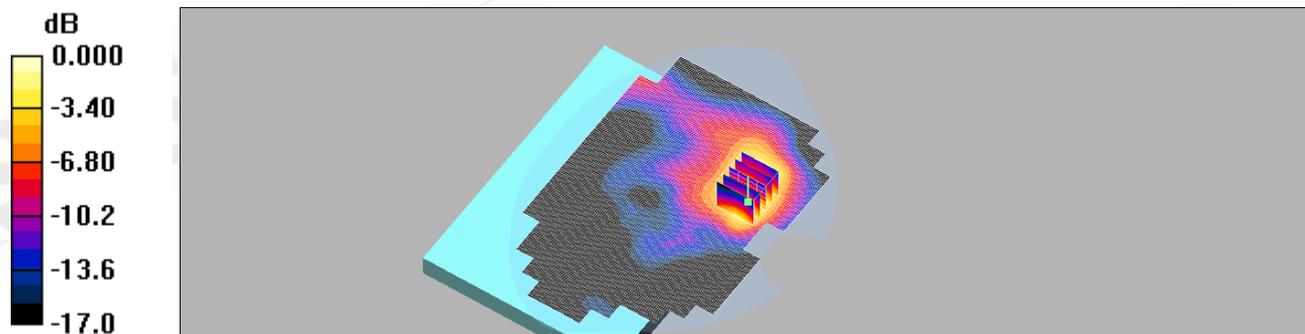
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 8.17 V/m; Power Drift = 0.158 dB

Peak SAR (extrapolated) = 1.83 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.655 mW/g

Maximum value of SAR (measured) = 1.24 mW/g



0 dB = 1.24mW/g

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Lap-held_WCDMA B2_CH9400

Communication System: WCDMA BAND2; Frequency: 1880 MHz; Duty Cycle: 1:1
 Medium: M1800 & 1900 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.58 \text{ mho/m}$; $\epsilon_r = 52.5$;
 $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.45, 4.45, 4.45); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (111x171x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 1.05 mW/g

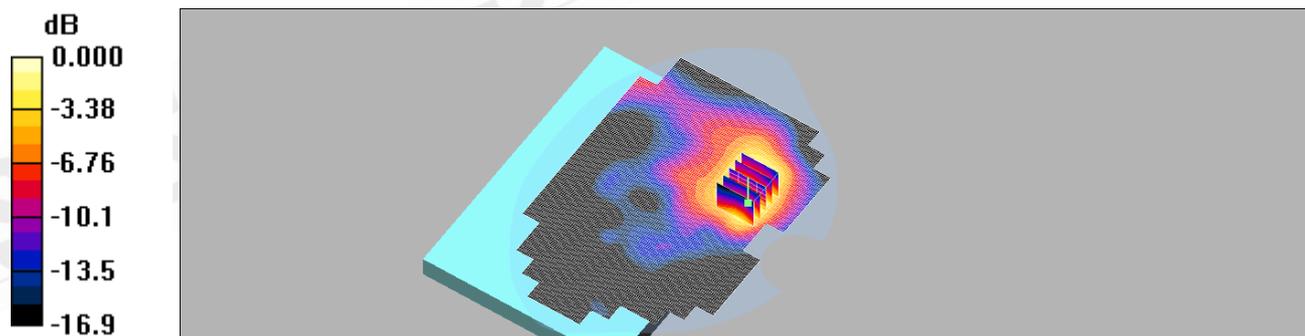
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 8.71 V/m; Power Drift = 0.046 dB

Peak SAR (extrapolated) = 1.59 W/kg

SAR(1 g) = 0.973 mW/g; SAR(10 g) = 0.585 mW/g

Maximum value of SAR (measured) = 1.08 mW/g



0 dB = 1.08mW/g

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Lap-held_WCDMA B2_CH9538

Communication System: WCDMA BAND2; Frequency: 1907.6 MHz; Duty Cycle: 1:1
 Medium: M1800 & 1900 Medium parameters used: $f = 1908$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 52.4$;
 $\rho = 1000$ kg/m³
 Phantom section: Flat Section

body/Area Scan (111x171x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.941 mW/g

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

Reference Value = 7.08 V/m; Power Drift = 0.139 dB

Peak SAR (extrapolated) = 1.40 W/kg

SAR(1 g) = 0.883 mW/g; SAR(10 g) = 0.554 mW/g

Maximum value of SAR (measured) = 0.946 mW/g

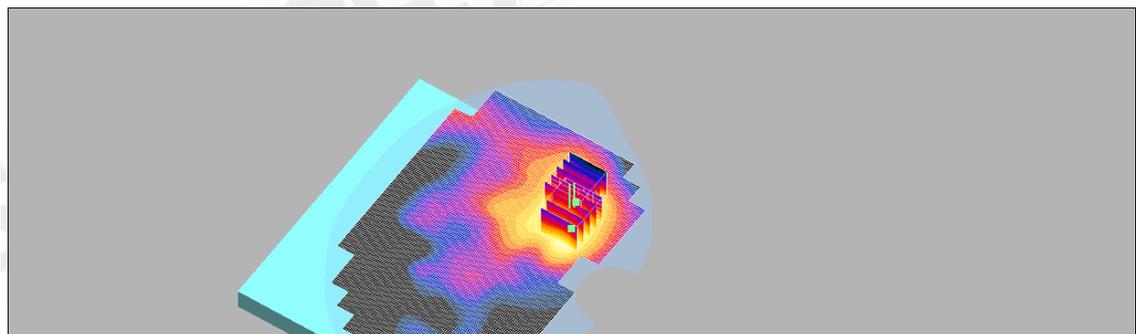
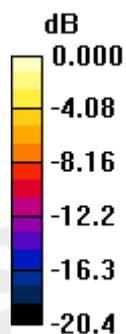
body/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.08 V/m; Power Drift = 0.139 dB

Peak SAR (extrapolated) = 1.46 W/kg

SAR(1 g) = 0.889 mW/g; SAR(10 g) = 0.539 mW/g

Maximum value of SAR (measured) = 0.951 mW/g



0 dB = 0.951mW/g

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Secondary Portrait_WCDMA B2_CH9262

Communication System: WCDMA BAND2; Frequency: 1852.4 MHz; Duty Cycle: 1:1
 Medium: M1800 & 1900 Medium parameters used (interpolated): $f = 1852.4 \text{ MHz}$; $\sigma = 1.57 \text{ mho/m}$; $\epsilon_r = 52.6$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.45, 4.45, 4.45); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (61x141x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.382 mW/g

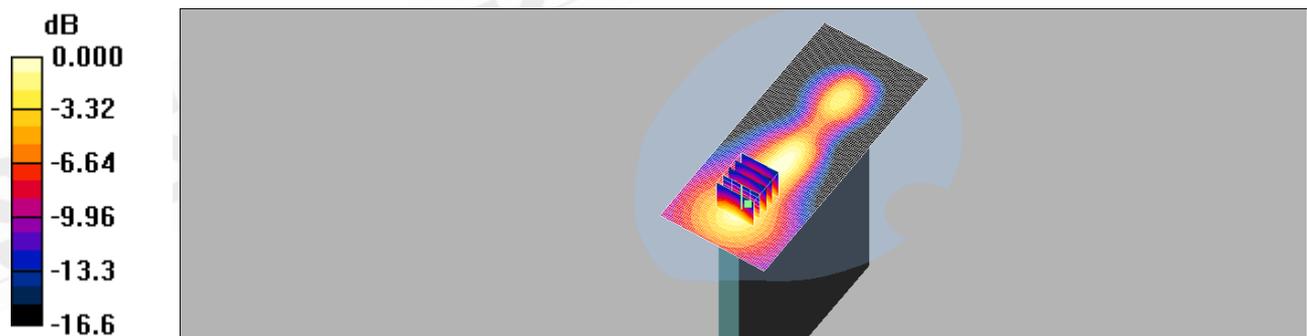
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 11.8 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 0.561 W/kg

SAR(1 g) = 0.343 mW/g; SAR(10 g) = 0.192 mW/g

Maximum value of SAR (measured) = 0.386 mW/g



0 dB = 0.386mW/g

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Secondary Portrait_WCDMA B2_CH9400

Communication System: WCDMA BAND2; Frequency: 1880 MHz; Duty Cycle: 1:1
 Medium: M1800 & 1900 Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.58 \text{ mho/m}$; $\epsilon_r = 52.5$;
 $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.45, 4.45, 4.45); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (61x141x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.432 mW/g

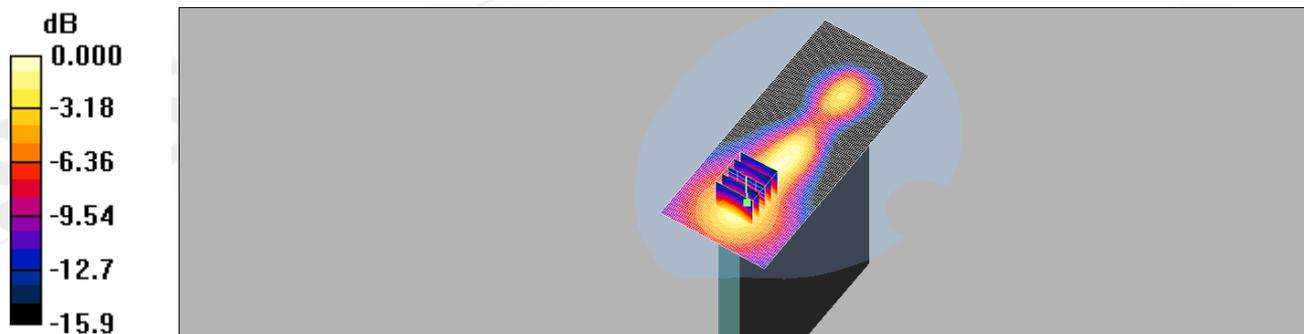
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 12.5 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 0.646 W/kg

SAR(1 g) = 0.395 mW/g; SAR(10 g) = 0.221 mW/g

Maximum value of SAR (measured) = 0.445 mW/g



0 dB = 0.445mW/g

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Secondary Portrait_WCDMA B2_CH9538

Communication System: WCDMA BAND2; Frequency: 1907.6 MHz; Duty Cycle: 1:1
 Medium: M1800 & 1900 Medium parameters used: $f = 1908$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 52.4$;
 $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.45, 4.45, 4.45); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (61x141x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 0.495 mW/g

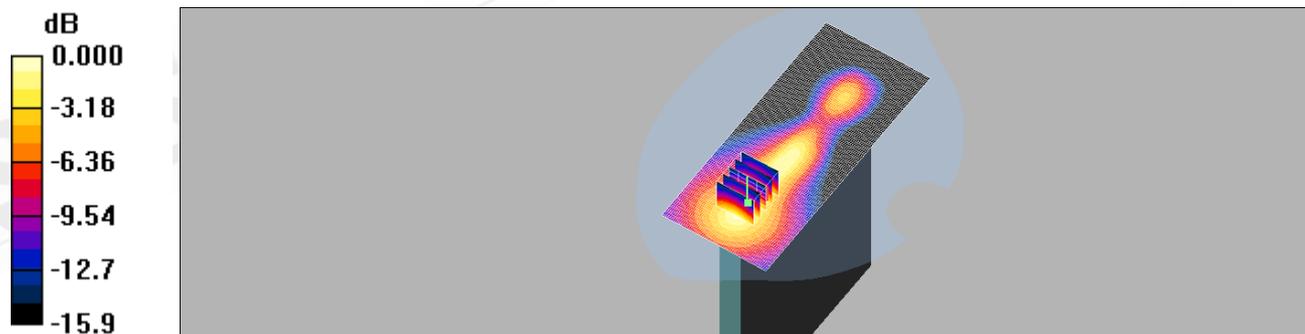
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.8 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 0.727 W/kg

SAR(1 g) = 0.443 mW/g; SAR(10 g) = 0.248 mW/g

Maximum value of SAR (measured) = 0.492 mW/g



0 dB = 0.492mW/g

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Lap-held_WCDMA B5_CH4132

Communication System: WCDMA BAND5; Frequency: 826.4 MHz; Duty Cycle: 1:1
 Medium: Muscle 900 MHz Medium parameters used (interpolated): $f = 826.4 \text{ MHz}$; $\sigma = 0.97 \text{ mho/m}$; $\epsilon_r = 53.4$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (111x171x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.945 mW/g

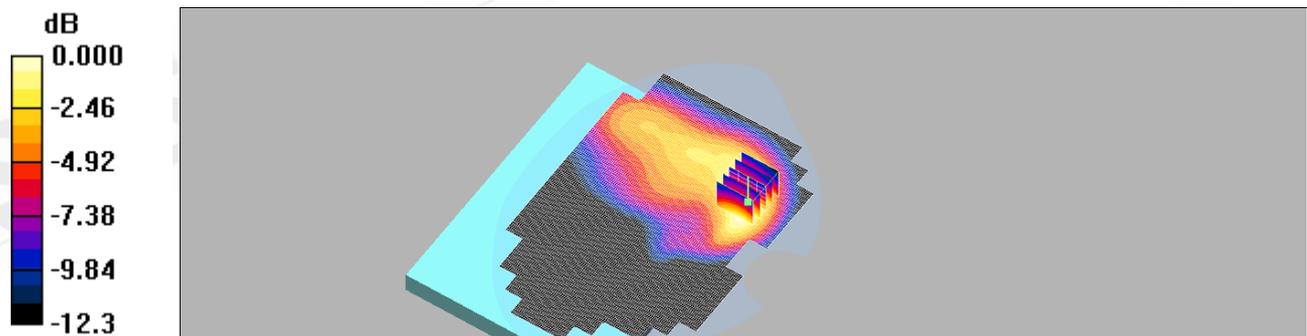
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 13.4 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 1.30 W/kg

SAR(1 g) = 0.851 mW/g; SAR(10 g) = 0.555 mW/g

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



0 dB = 0.914mW/g

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Lap-held_WCDMA B5_CH4183

Communication System: WCDMA BAND5; Frequency: 836.6 MHz; Duty Cycle: 1:1
 Medium: Muscle 900 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 53.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (111x171x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.967 mW/g

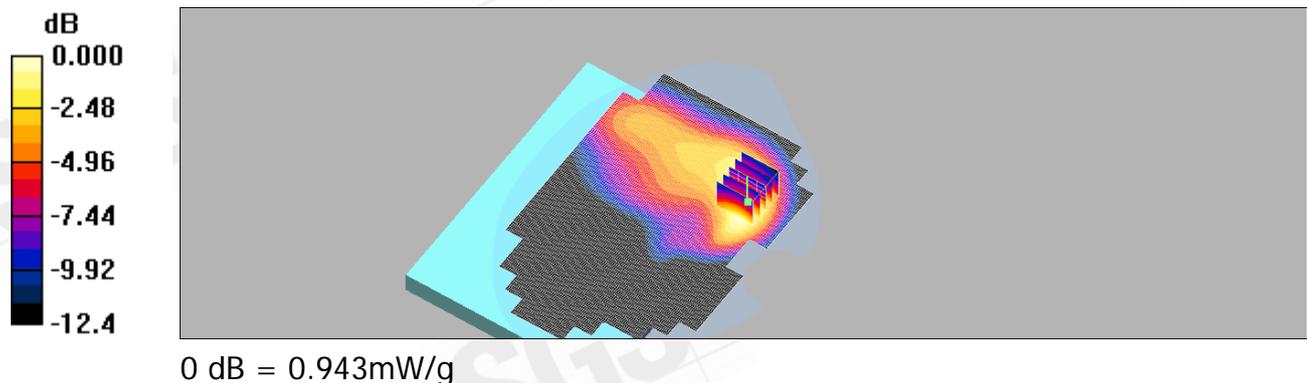
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 13.2 V/m; Power Drift = 0.045 dB

Peak SAR (extrapolated) = 1.34 W/kg

SAR(1 g) = 0.876 mW/g; SAR(10 g) = 0.571 mW/g

Maximum value of SAR (measured) = 0.943 mW/g



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Lap-held_WCDMA B5_CH4233

Communication System: WCDMA BAND5; Frequency: 846.6 MHz; Duty Cycle: 1:1
 Medium: Muscle 900 MHz Medium parameters used: $f = 847 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 53.1$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (111x171x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 1.08 mW/g

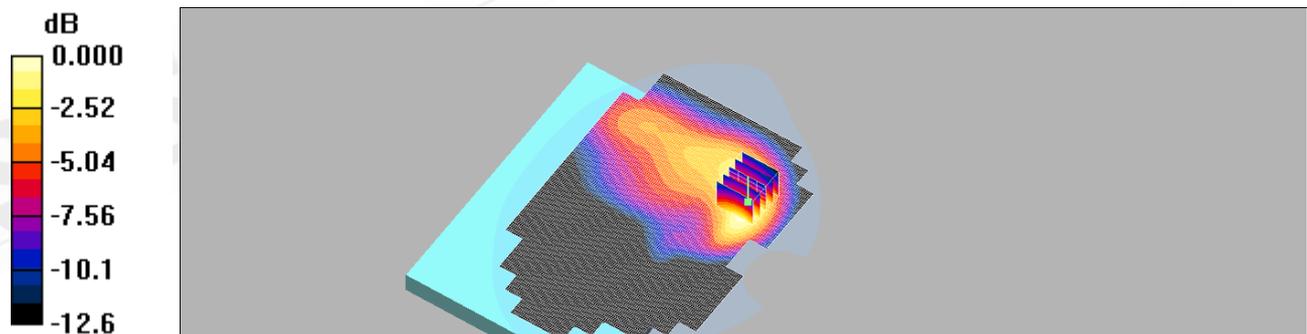
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 13.6 V/m; Power Drift = 0.053 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 0.987 mW/g; SAR(10 g) = 0.639 mW/g

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



0 dB = 1.07mW/g

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Secondary Portrait_WCDMA B5_CH4132

Communication System: WCDMA BAND5; Frequency: 826.4 MHz; Duty Cycle: 1:1
 Medium: Muscle 900 MHz Medium parameters used (interpolated): $f = 826.4 \text{ MHz}$; $\sigma = 0.97 \text{ mho/m}$; $\epsilon_r = 53.4$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (51x131x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.495 mW/g

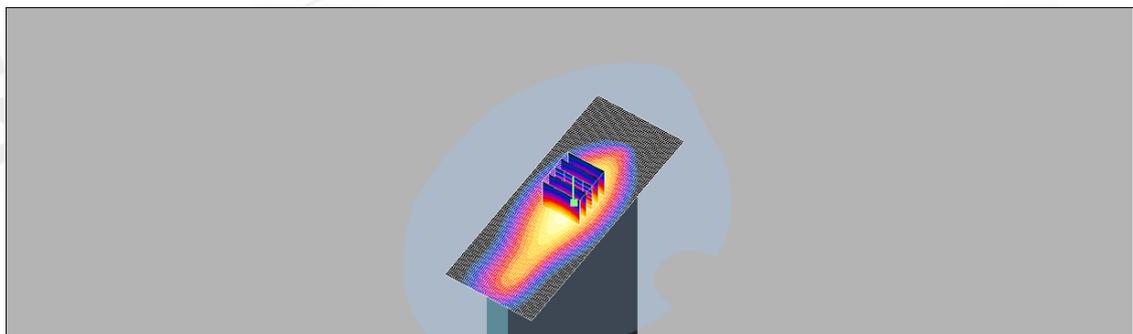
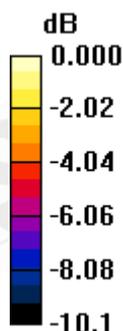
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 22.1 V/m; Power Drift = 0.011 dB

Peak SAR (extrapolated) = 0.679 W/kg

SAR(1 g) = 0.456 mW/g; SAR(10 g) = 0.300 mW/g

Maximum value of SAR (measured) = 0.492 mW/g



0 dB = 0.492mW/g

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Secondary Portrait_WCDMA B5_CH4183

Communication System: WCDMA BAND5; Frequency: 836.6 MHz; Duty Cycle: 1:1
 Medium: Muscle 900 MHz Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 53.2$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (51x131x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.449 mW/g

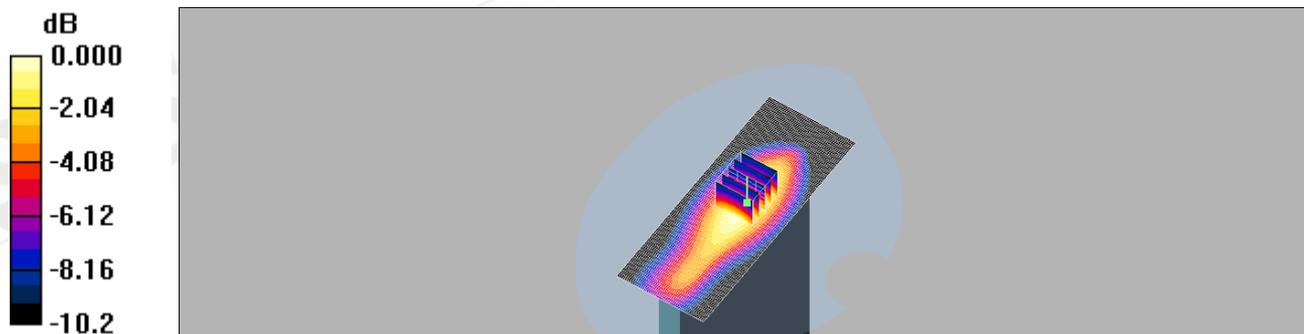
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 20.9 V/m; Power Drift = -0.021 dB

Peak SAR (extrapolated) = 0.616 W/kg

SAR(1 g) = 0.412 mW/g; SAR(10 g) = 0.271 mW/g

Maximum value of SAR (measured) = 0.447 mW/g



0 dB = 0.447mW/g

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Secondary Portrait_WCDMA B5_CH4233

Communication System: WCDMA BAND5; Frequency: 846.6 MHz; Duty Cycle: 1:1
 Medium: Muscle 900 MHz Medium parameters used: $f = 847 \text{ MHz}$; $\sigma = 0.99 \text{ mho/m}$; $\epsilon_r = 53.1$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (51x131x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.543 mW/g

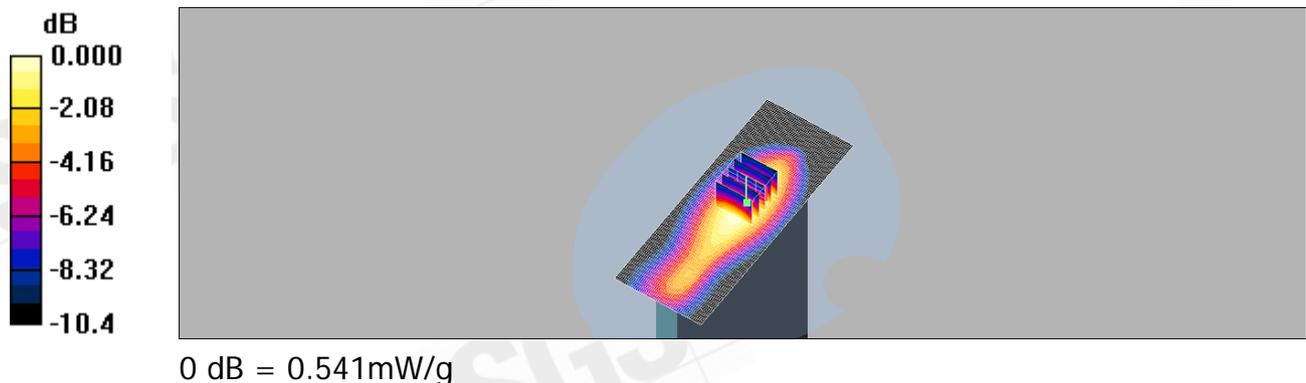
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 22.7 V/m; Power Drift = 0.031 dB

Peak SAR (extrapolated) = 0.750 W/kg

SAR(1 g) = 0.500 mW/g; SAR(10 g) = 0.327 mW/g

Maximum value of SAR (measured) = 0.541 mW/g



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Lap-held_WLAN802.11 b_CH1

Communication System: Wireless LAN; Frequency: 2412 MHz; Duty Cycle: 1:1
 Medium: Muscle 2450 Medium parameters used: $f = 2412 \text{ MHz}$; $\sigma = 1.95 \text{ mho/m}$; $\epsilon_r = 52.5$;
 $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.11, 4.11, 4.11); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (121x181x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.099 mW/g

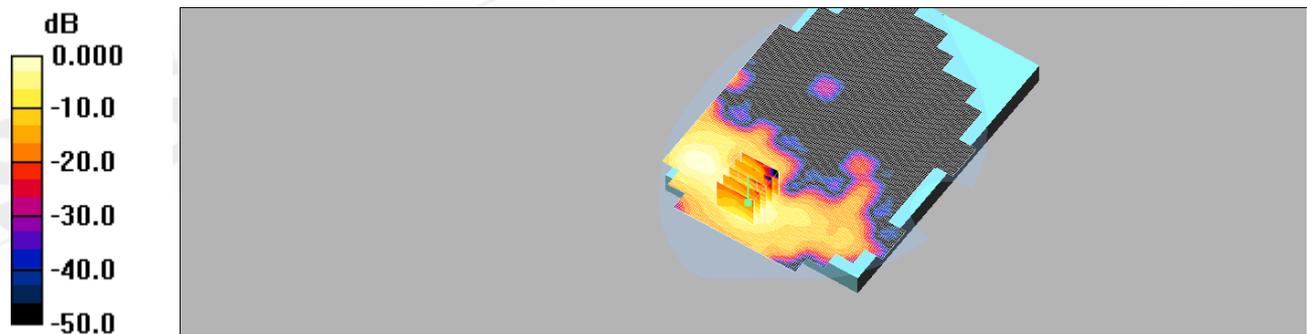
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 0.175 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 0.192 W/kg

SAR(1 g) = 0.085 mW/g; SAR(10 g) = 0.040 mW/g

Maximum value of SAR (measured) = 0.097 mW/g



0 dB = 0.097mW/g

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Lap-held_WLAN802.11 b_CH6

Communication System: Wireless LAN; Frequency: 2437 MHz; Duty Cycle: 1:1
 Medium: Muscle 2450 Medium parameters used: $f = 2437 \text{ MHz}$; $\sigma = 1.99 \text{ mho/m}$; $\epsilon_r = 52.4$;
 $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.11, 4.11, 4.11); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (121x181x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.160 mW/g

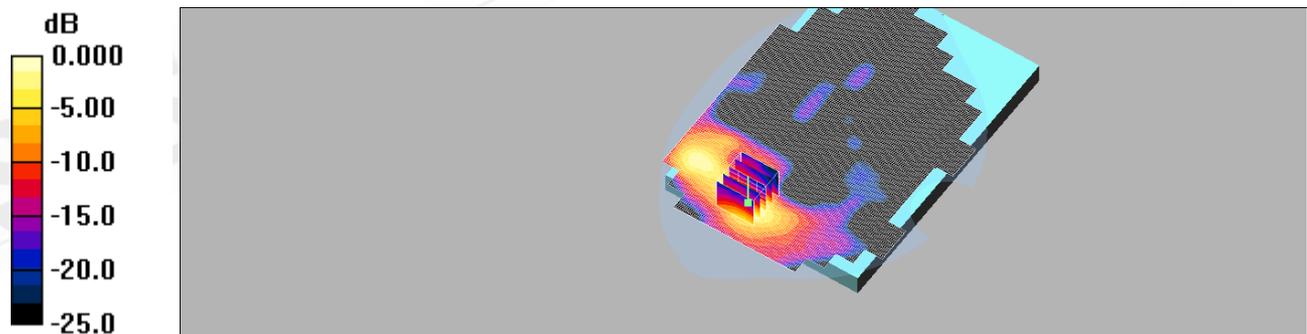
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 0.097 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.289 W/kg

SAR(1 g) = 0.131 mW/g; SAR(10 g) = 0.062 mW/g

Maximum value of SAR (measured) = 0.149 mW/g



0 dB = 0.149mW/g

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Lap-held_WLAN802.11 b_CH11

Communication System: Wireless LAN; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium: Muscle 2450 Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 2.02 \text{ mho/m}$; $\epsilon_r = 52.3$;
 $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.11, 4.11, 4.11); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (121x181x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.108 mW/g

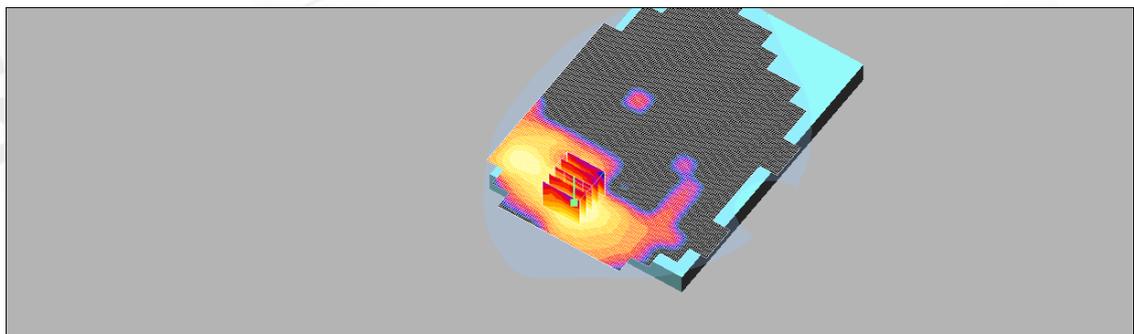
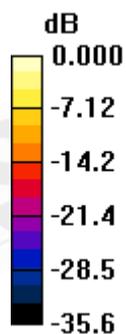
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 0.134 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 0.196 W/kg

SAR(1 g) = 0.088 mW/g; SAR(10 g) = 0.041 mW/g

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



0 dB = 0.101mW/g

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Primary Portrait_WLAN802.11 b_CH1

Communication System: Wireless LAN; Frequency: 2412 MHz; Duty Cycle: 1:1
 Medium: Muscle 2450 Medium parameters used: $f = 2412 \text{ MHz}$; $\sigma = 1.95 \text{ mho/m}$; $\epsilon_r = 52.5$;
 $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.11, 4.11, 4.11); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (51x131x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.159 mW/g

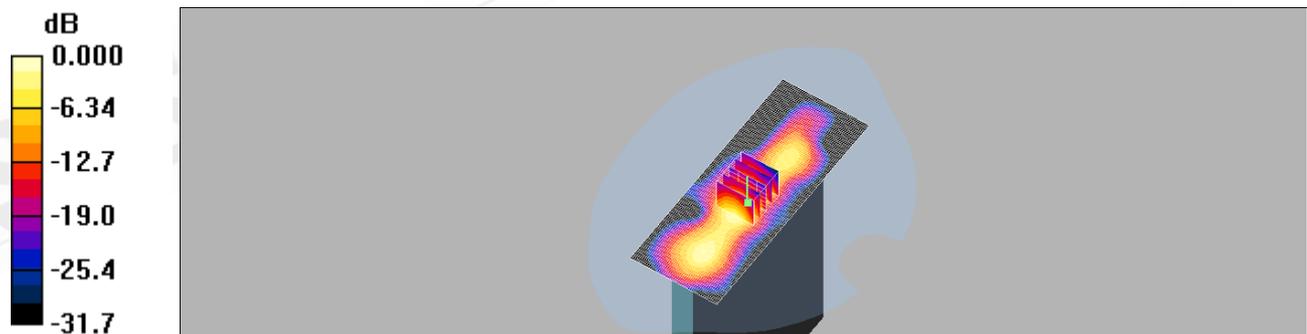
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 8.00 V/m; Power Drift = 0.065 dB

Peak SAR (extrapolated) = 0.328 W/kg

SAR(1 g) = 0.138 mW/g; SAR(10 g) = 0.058 mW/g

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



0 dB = 0.186mW/g

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Primary Portrait_WLAN802.11 b_CH6

Communication System: Wireless LAN; Frequency: 2437 MHz; Duty Cycle: 1:1
 Medium: Muscle 2450 Medium parameters used: $f = 2437 \text{ MHz}$; $\sigma = 1.99 \text{ mho/m}$; $\epsilon_r = 52.4$;
 $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.11, 4.11, 4.11); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (51x131x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.251 mW/g

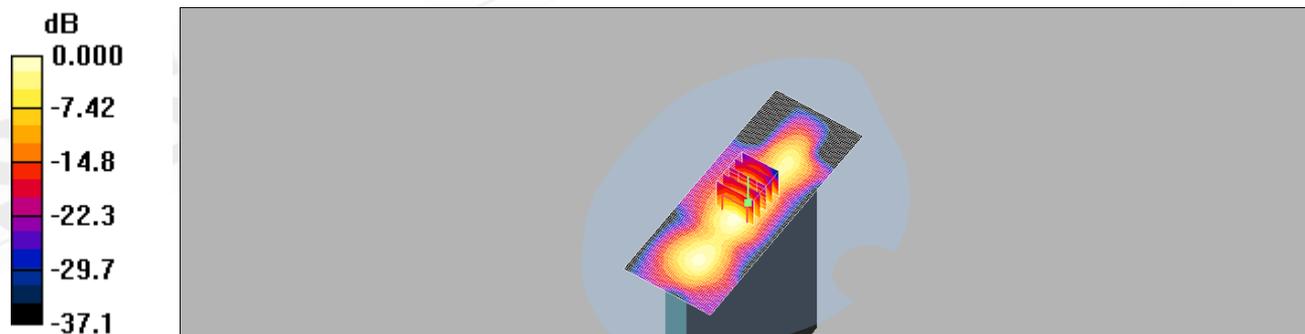
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 10.3 V/m; Power Drift = 0.006 dB

Peak SAR (extrapolated) = 0.521 W/kg

SAR(1 g) = 0.218 mW/g; SAR(10 g) = 0.090 mW/g

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



0 dB = 0.277mW/g

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Primary Portrait_WLAN802.11 b_CH11

Communication System: Wireless LAN; Frequency: 2462 MHz; Duty Cycle: 1:1
 Medium: Muscle 2450 Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 2.02 \text{ mho/m}$; $\epsilon_r = 52.3$;
 $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.11, 4.11, 4.11); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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 (51x131x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$
 Maximum value of SAR (interpolated) = 0.158 mW/g

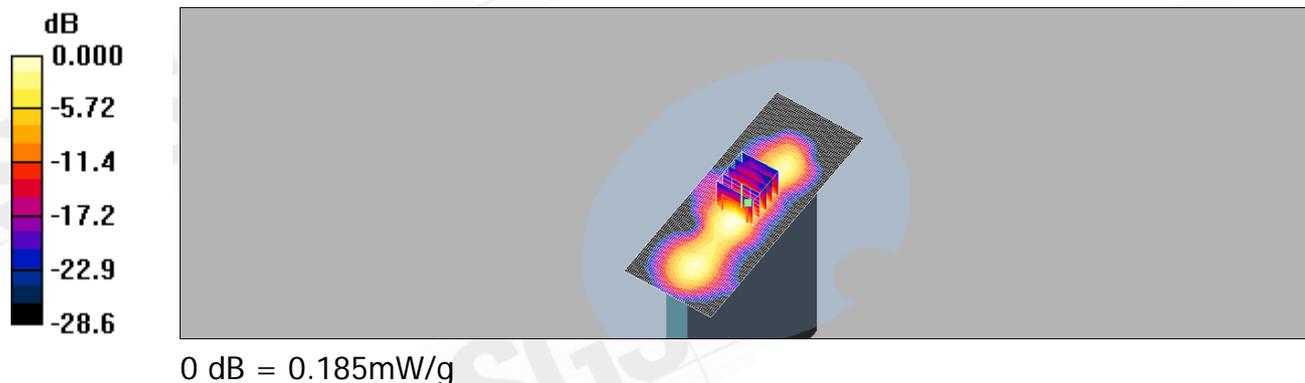
body/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$,
 $dz=5\text{mm}$

Reference Value = 7.71 V/m; Power Drift = -0.002 dB

Peak SAR (extrapolated) = 0.362 W/kg

SAR(1 g) = 0.151 mW/g; SAR(10 g) = 0.062 mW/g

Maximum value of SAR (measured) = 0.185 mW/g



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5. SAR System Performance Verification

Date: 2011/3/29

DUT: Dipole 835 MHz;

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

Medium: Muscle 900 MHz Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.978 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(5.84, 5.84, 5.84); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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) = 2.74 mW/g

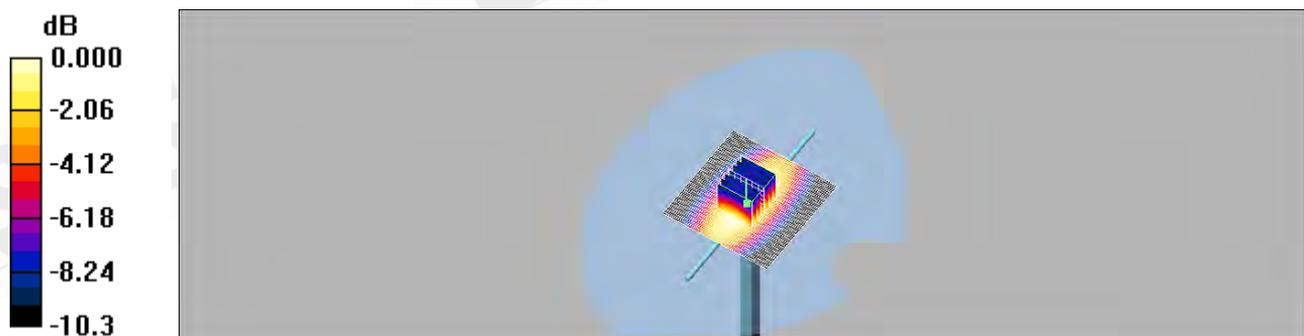
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 53.6 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 3.74 W/kg

SAR(1 g) = 2.55 mW/g; SAR(10 g) = 1.66 mW/g

Maximum value of SAR (measured) = 2.73 mW/g



0 dB = 2.73mW/g

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DUT: Dipole 1900 MHz;

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

Medium: M1800 & 1900 Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.59 \text{ mho/m}$; $\epsilon_r = 52.5$;
 $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.45, 4.45, 4.45); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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) = 13.1 mW/g

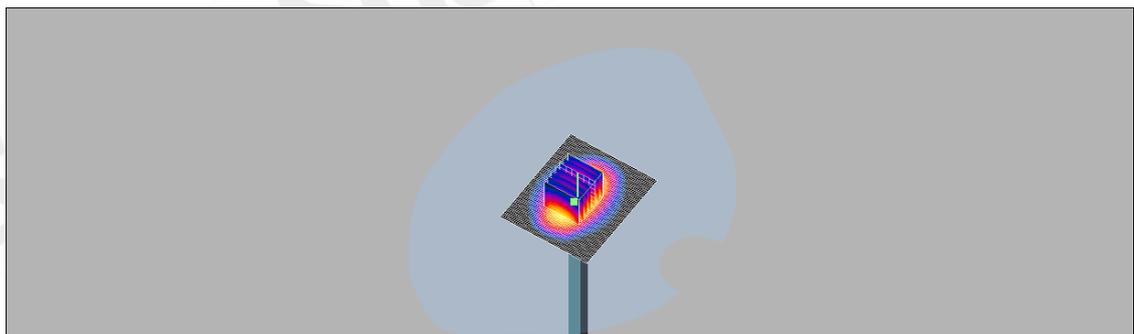
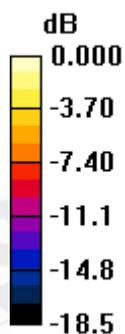
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 86.7 V/m; Power Drift = -0.005 dB

Peak SAR (extrapolated) = 18.1 W/kg

SAR(1 g) = 9.99 mW/g; SAR(10 g) = 5.13 mW/g

Maximum value of SAR (measured) = 11.5 mW/g



0 dB = 11.5mW/g

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DUT: Dipole 2450 MHz;

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

 Medium: M 2450 Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 2.01 \text{ mho/m}$; $\epsilon_r = 52.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3172; ConvF(4.11, 4.11, 4.11); Calibrated: 2010/5/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn547; Calibrated: 2010/8/18
- 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) = 19.6 mW/g

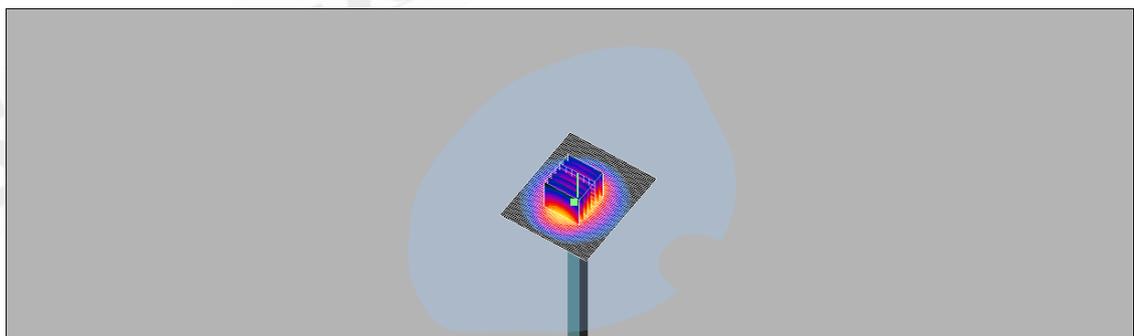
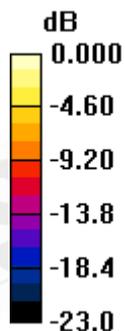
Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 89.9 V/m; Power Drift = 0.005 dB

Peak SAR (extrapolated) = 30.3 W/kg

SAR(1 g) = 13.8 mW/g; SAR(10 g) = 6.38 mW/g

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



0 dB = 16.0mW/g

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6. DAE & Probe Calibration certificate

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



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Accreditation No.: **SCS 108**

Client **SGS-TW**

Certificate No: **DAE4-547_Aug10**

CALIBRATION CERTIFICATE

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

Calibration procedure(s): **QA CAL-06.v22
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **August 18, 2010**

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	1-Oct-09 (No: 9055)	Oct-10
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V1.1	SE UMS 006 AB 1004	07-Jun-10 (in house check)	In house check: Jun-11

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

Issued: August 18, 2010

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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: **ES3-3172_May10**

CALIBRATION CERTIFICATE

Object: **ES3DV3 - SN:3172**

Calibration procedure(s): **QA CAL-01.v6, QA CAL-14.v3, QA CAL-23.v3 and QA CAL-25.v2
Calibration procedure for dosimetric E-field probes**

Calibration date: **May 21, 2010**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11
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-09)	In house check: Oct10

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

Issued: May 22, 2010

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Certificate No: ES3-3172_May10

Page 1 of 11

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Accreditation No.: **SCS 108**

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., θ = 0 is normal to probe axis

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- **NORM_{x,y,z}**: Assessed for E-field polarization θ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below *ConvF*).
- **NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- **DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- **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 ≤ 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

May 21, 2010

Probe ES3DV3

SN:3172

Manufactured:	January 23, 2008
Last calibrated:	May 27, 2009
Recalibrated:	May 21, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

Certificate No: ES3-3172_May10

Page 3 of 11

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ES3DV3 SN:3172

May 21, 2010

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	1.37	1.19	0.97	± 10.1%
DCP (mV) ^B	93.9	92.5	93.2	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc ^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	300.0	± 1.5%
			Y	0.00	0.00	1.00	300.0	
			Z	0.00	0.00	1.00	300.0	

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 maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

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ES3DV3 SN:3172

May 21, 2010

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

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz] ^c	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	5.85	5.85	5.85	0.76	1.14 ± 11.0%
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	5.75	5.75	5.75	0.87	1.08 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	5.04	5.04	5.04	0.31	1.82 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.89	4.89	4.89	0.50	1.46 ± 11.0%
2000	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.73	4.73	4.73	0.49	1.44 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.32	4.32	4.32	0.42	1.70 ± 11.0%

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

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ES3DV3 SN:3172

May 21, 2010

DASY/EASY - Parameters of Probe: ES3DV3 SN:3172
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz] ^c	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	5.84	5.84	5.84	0.81	1.19 ± 11.0%
900	± 50 / ± 100	55.0 ± 5%	1.05 ± 5%	5.75	5.75	5.75	0.73	1.24 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	4.63	4.63	4.63	0.39	1.75 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.45	4.45	4.45	0.32	2.36 ± 11.0%
2000	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.47	4.47	4.47	0.32	2.44 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.11	4.11	4.11	0.82	1.17 ± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	3.99	3.99	3.99	0.95	1.09 ± 11.0%
3500	± 50 / ± 100	51.3 ± 5%	3.31 ± 5%	3.28	3.28	3.28	1.00	1.28 ± 13.1%

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

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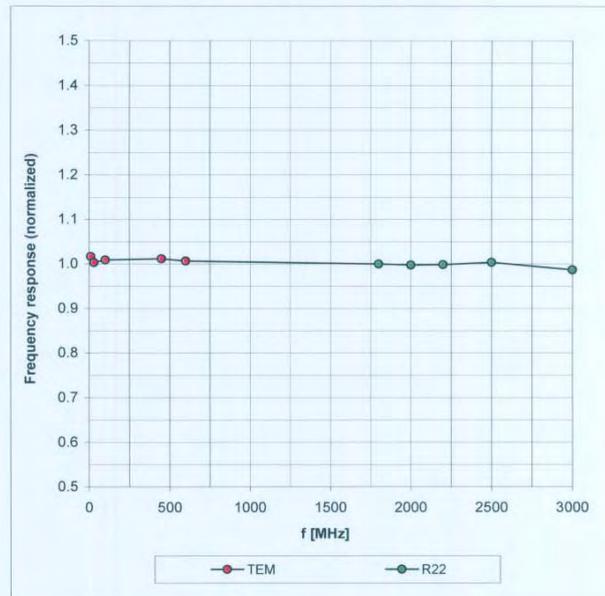
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ES3DV3 SN:3172

May 21, 2010

Frequency Response of E-Field

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



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

Certificate No: ES3-3172_May10

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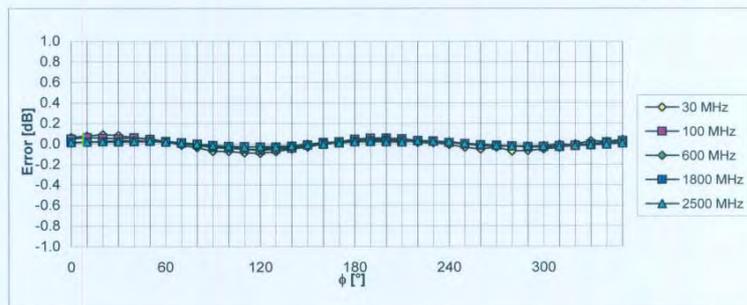
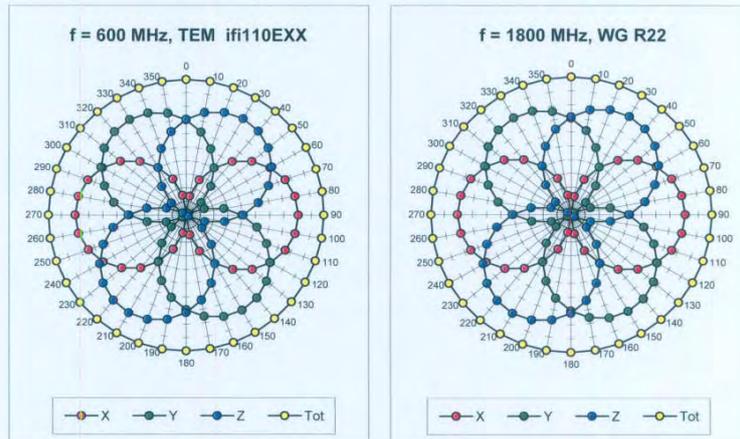
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ES3DV3 SN:3172

May 21, 2010

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



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

Certificate No: ES3-3172_May10

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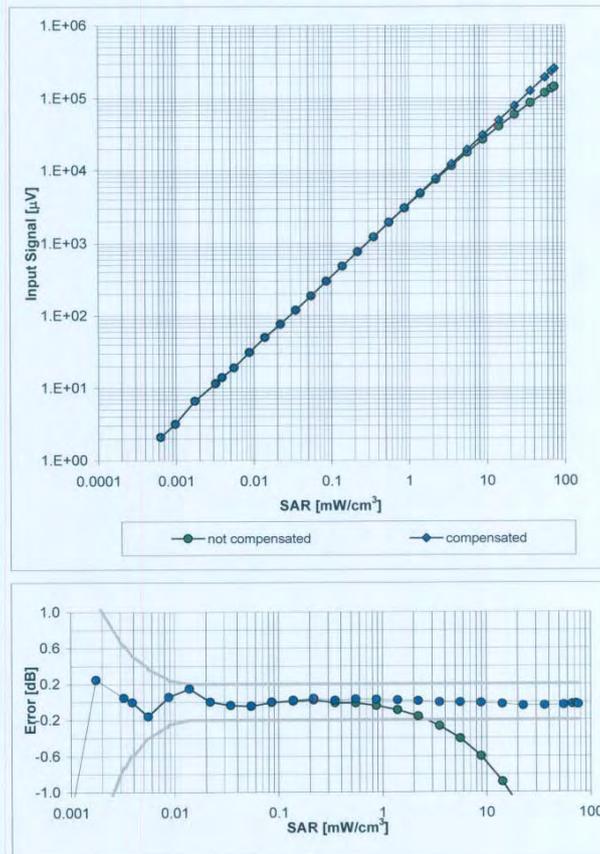
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ES3DV3 SN:3172

May 21, 2010

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



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

Certificate No: ES3-3172_May10

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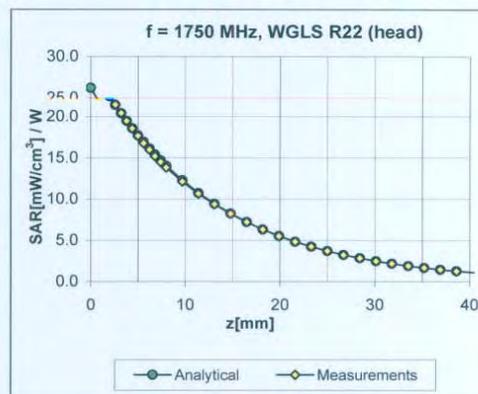
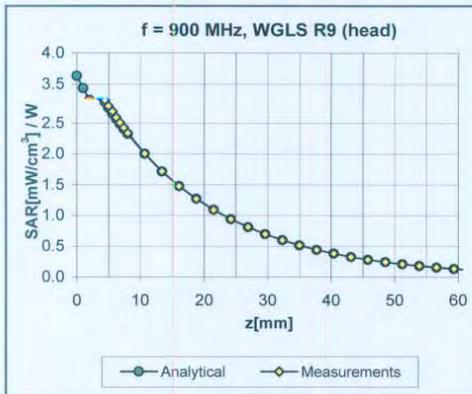
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ES3DV3 SN:3172

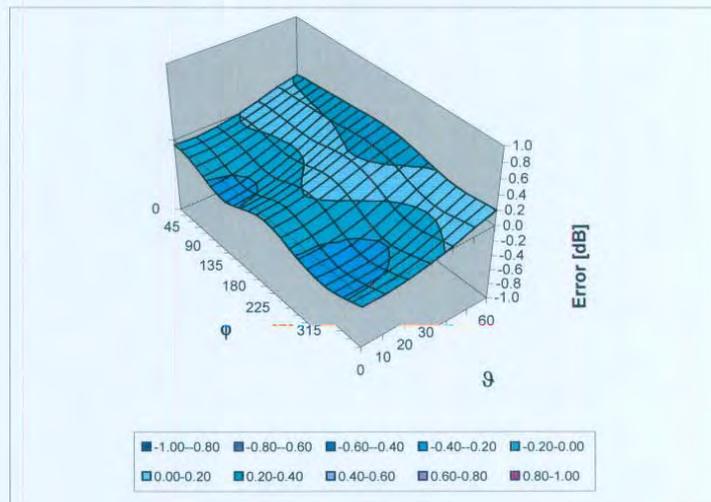
May 21, 2010

Conversion Factor Assessment



Deviation from Isotropy in HSI

Error (ϕ, θ), f = 900 MHz



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

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ES3DV3 SN:3172

May 21, 2010

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	4.0 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

Certificate No: ES3-3172_May10

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7. Uncertainty Budget

DASY4 Uncertainty Budget According to IEEE P1528 [1]								
Error Description	Uncertainty value	Prob. Dist.	Div.	(c_1) 1g	(c_1) 10g	Std. Unc. (1g)	Std. Unc. (10g)	(v_1) v_{eff}
Measurement System								
Probe Calibration	±4.8 %	N	1	1	1	±4.8 %	±4.8 %	∞
Axial Isotropy	±4.7 %	R	√3	0.7	0.7	±1.9 %	±1.9 %	∞
Hemispherical Isotropy	±9.6 %	R	√3	0.7	0.7	±3.9 %	±3.9 %	∞
Boundary Effects	±1.0 %	R	√3	1	1	±0.6 %	±0.6 %	∞
Linearity	±4.7 %	R	√3	1	1	±2.7 %	±2.7 %	∞
System Detection Limits	±1.0 %	R	√3	1	1	±0.6 %	±0.6 %	∞
Readout Electronics	±1.0 %	N	1	1	1	±1.0 %	±1.0 %	∞
Response Time	±0.8 %	R	√3	1	1	±0.5 %	±0.5 %	∞
Integration Time	±2.6 %	R	√3	1	1	±1.5 %	±1.5 %	∞
RF Ambient Conditions	±3.0 %	R	√3	1	1	±1.7 %	±1.7 %	∞
Probe Positioner	±0.4 %	R	√3	1	1	±0.2 %	±0.2 %	∞
Probe Positioning	±2.9 %	R	√3	1	1	±1.7 %	±1.7 %	∞
Max. SAR Eval.	±1.0 %	R	√3	1	1	±0.6 %	±0.6 %	∞
Test Sample Related								
Device Positioning	±2.9 %	N	1	1	1	±2.9 %	±2.9 %	875
Device Holder	±3.6 %	N	1	1	1	±3.6 %	±3.6 %	5
Power Drift	±5.0 %	R	√3	1	1	±2.9 %	±2.9 %	∞
Phantom and Setup								
Phantom Uncertainty	±4.0 %	R	√3	1	1	±2.3 %	±2.3 %	∞
Liquid Conductivity (target)	±5.0 %	R	√3	0.64	0.43	±1.8 %	±1.2 %	∞
Liquid Conductivity (meas.)	±2.5 %	N	1	0.64	0.43	±1.6 %	±1.1 %	∞
Liquid Permittivity (target)	±5.0 %	R	√3	0.6	0.49	±1.7 %	±1.4 %	∞
Liquid Permittivity (meas.)	±2.5 %	N	1	0.6	0.49	±1.5 %	±1.2 %	∞
Combined Std. Uncertainty						±10.3 %	±10.0 %	331
Expanded STD Uncertainty						±20.6 %	±20.1 %	

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8. Phantom Description

Schmid & Partner Engineering AG		s p e a g	
Zeughausstrasse 43, 8004 Zurich, Switzerland Phone +41 1 245 9700, Fax +41 1 245 9779 info@speag.com, http://www.speag.com			
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 155mm 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	07.07.2006	s p e a g	
Signature / Stamp		Schmid & Partner Engineering AG Zeughausstrasse 43, 8004 Zurich, Switzerland Phone +41 1 245 9700, Fax +41 1 245 9779 info@speag.com, http://www.speag.com	
Doc No : 551 - QD 000 P40 C - 7		Page : 1 (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
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 (Auden)**

Certificate No: **D835V2-4d063_May10**

CALIBRATION CERTIFICATE

Object: **D835V2 - SN: 4d063**

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

Calibration date: **May 21, 2010**

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-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	02-Mar-10 (No. DAE4-601_Mar10)	Mar-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-09)	In house check: Oct-10

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

Issued: May 26, 2010

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

Certificate No: D835V2-4d063_May10

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DASY5 Validation Report for Body

Date/Time: 20.05.2010 10:45:06

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: $f = 835 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 54.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.86, 5.86, 5.86); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Pin250 mW/d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement

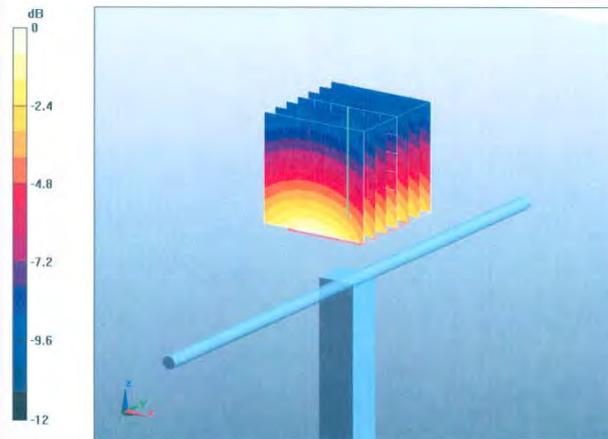
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.5 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 3.71 W/kg

SAR(1 g) = 2.53 mW/g; SAR(10 g) = 1.66 mW/g

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



0 dB = 2.94mW/g

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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **SGS-TW (Auden)**

Certificate No: **D1900V2-5d027_Apr10**

CALIBRATION CERTIFICATE

Object: **D1900V2 - SN: 5d027**

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

Calibration date: **April 28, 2010**

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-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	26-Jun-09 (No. ES3-3205_Jun09)	Jun-10
DAE4	SN: 601	02-Mar-10 (No. DAE4-601_Mar10)	Mar-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-09)	In house check: Oct-10

Calibrated by: **Name: Dimce Iliev, Function: Laboratory Technician, Signature: [Signature]**

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

Issued: April 29, 2010

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

Certificate No: D1900V2-5d027_Apr10

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DASY5 Validation Report for Body

Date/Time: 28.04.2010 15:11:22

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: MSL U11 BB

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.53 \text{ mho/m}$; $\epsilon_r = 54.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD00P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 57

Pin250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement

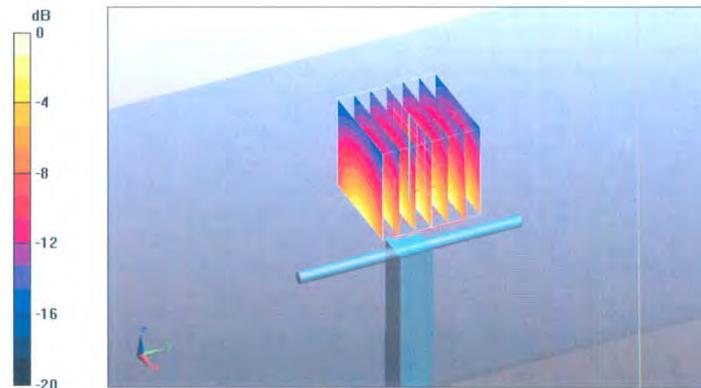
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.2 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 17.1 W/kg

SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.36 mW/g

Maximum value of SAR (measured) = 12.7 mW/g



0 dB = 12.7mW/g

**Calibration Laboratory of
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **SGS-TW (Auden)**

Certificate No: **D2450V2-727_Apr10**

CALIBRATION CERTIFICATE

Object: **D2450V2 - SN: 727**

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

Calibration date: **April 29, 2010**

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-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	26-Jun-09 (No. ES3-3205_Jun09)	Jun-10
DAE4	SN: 601	02-Mar-10 (No. DAE4-601_Mar10)	Mar-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-09)	In house check: Oct-10

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

Issued: April 29, 2010

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DASY5 Validation Report for Body

Date/Time: 29.04.2010 14:57:43

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:727

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

Medium: MSL U11 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 2$ mho/m; $\epsilon_r = 54.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.31, 4.31, 4.31); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 57

Pin250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement

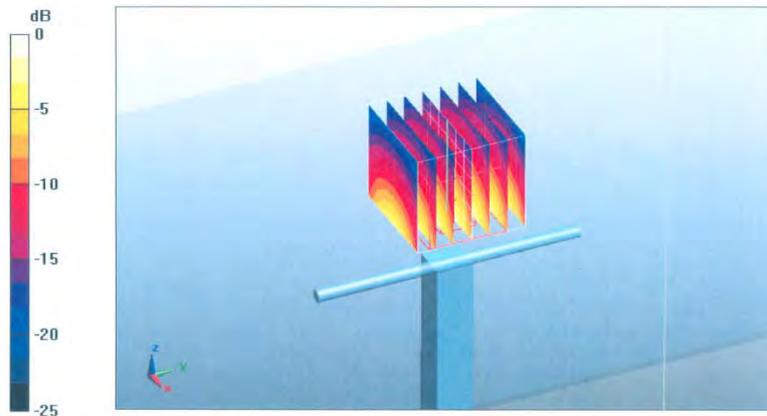
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.1 V/m; Power Drift = 0.00929 dB

Peak SAR (extrapolated) = 27.7 W/kg

SAR(1 g) = 13.4 mW/g; SAR(10 g) = 6.23 mW/g

Maximum value of SAR (measured) = 17.6 mW/g



0 dB = 17.6mW/g

End of 1st part of report

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