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**BA/SEM/BGLINS Robert Carr**

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**LD/SEMC/BGLI/NC Peter Lindeborg**

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**01/02/08****Company Internal  
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**File****Report issued by Accredited SAR Laboratory****For****PY7A1032052 (Z555a)****Date of test:** 16,21,22,29 January 2008**Laboratory:** Sony Ericsson SAR Test Laboratory  
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+46462126180*Peter Lindeborg***Statement of Compliance**

Sony Ericsson Mobile Communications AB declares under its sole responsibility that the product

**Sony Ericsson Type : AAB-1032052-BV; FCC ID : PY7A1032052; IC:4170B-A1032052**

To which this declaration relates, is in conformity with the appropriate RF exposure standards recommendations and guidelines. It also declares that the product was tested in accordance with the appropriate measurement standards, guidelines and recommended practices. Any deviations from these standards, guidelines and recommended practices are noted below:

(None)

This laboratory is accredited to ISO/IEC 17025 (SWEDAC accreditation no. 1847).



Laboratories are accredited by the Swedish Board for Accreditation and Conformity Assessment (SWEDAC) under the terms of Swedish legislation. The accredited laboratory activities meet the requirements in SS-EN ISO/IEC 17025 (2005). This report may not be reproduced other than in full, except with the prior written approval of the issuing laboratory. The results and statements contained herein relate only to the items tested. The names of individuals involved may be mentioned only in connection with the statements or results from this report.

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## 1 Introduction

In this test report, compliance of the Sony Ericsson PY7A1032052 (Z555a) portable telephone with RF safety guidelines is demonstrated. The applicable RF safety guidelines and the SAR measurement specifications used for the test are described in the *SAR Measurement Specifications of Wireless Handsets* [1].

## 2 Device Under Test

### 2.1 Samples

For the purpose of the test two different color samples were used to maximise the SAR value across the different frequency bands.

### 2.2 Antenna Description

|                      |                 |      |
|----------------------|-----------------|------|
| <b>Type</b>          | Built in        |      |
| <b>Location</b>      | Bottom of phone |      |
| <b>Dimensions</b>    | Max length      | 11mm |
|                      | Max width       | 44mm |
| <b>Configuration</b> | Semi-PIFA       |      |



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## 2.3 Device description

|                                    |                                   |         |         |                         |         |         |
|------------------------------------|-----------------------------------|---------|---------|-------------------------|---------|---------|
| Device model                       | PY7A1032052                       |         |         |                         |         |         |
| Market name                        | Z555a                             |         |         |                         |         |         |
| Serial numbers (EUT #)             | CB510VZPPS (#10204)               |         |         | CB510VYH1K (#10203)     |         |         |
| Mode                               | GSM 850                           |         |         | GSM 1900                |         |         |
| Crest factor                       | 8.3                               |         |         | 8.3                     |         |         |
| Multiple access scheme             | TDMA                              |         |         | TDMA                    |         |         |
| Maximum output power setting [dBm] | Ch. 128                           | Ch. 190 | Ch. 251 | Ch. 512                 | Ch. 661 | Ch. 810 |
|                                    | 33.4                              | 33.5    | 33.5    | 30.5                    | 30.5    | 30.5    |
| Factory tolerance in power setting | ±0.5 dB                           |         |         | ±0.5 dB                 |         |         |
| Maximum peak output power [dBm]    | 33.5                              | 33.5    | 33.5    | 30.5                    | 30.5    | 30.5    |
| Mode                               | GSM850 – GPRS/EDGE 2Tx            |         |         | GSM1900 – GPRS/EDGE 2Tx |         |         |
| Crest factor                       | 4.15                              |         |         | 4.15                    |         |         |
| Multiple access scheme             | TDMA                              |         |         | TDMA                    |         |         |
| Maximum output power setting [dBm] | Ch. 128                           | Ch. 190 | Ch. 251 | Ch. 512                 | Ch. 661 | Ch. 810 |
|                                    | 33.4                              | 33.5    | 33.5    | 30.5                    | 30.5    | 30.5    |
| Factory tolerance in power setting | ±0.5 dB                           |         |         | ±0.5 dB                 |         |         |
| Maximum peak output power [dBm]    | 33.5                              | 33.5    | 33.5    | 30.5                    | 30.5    | 30.5    |
| Transmitting frequency range [MHz] | 824.2 - 848.8                     |         |         | 1850.2 - 1909.8         |         |         |
| GPRS Multislot class               | 10                                |         |         |                         |         |         |
| GPRS Capability class              | B                                 |         |         |                         |         |         |
| Prototype or production unit       | Preproduction (HW:AP2)            |         |         |                         |         |         |
| Device category                    | Portable                          |         |         |                         |         |         |
| RF exposure environment            | General population / uncontrolled |         |         |                         |         |         |

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### **3 Test equipment**

#### **3.1 Dosimetric system**

SAR measurements were made using the DASY4 professional system (software version 4.7, Built 44) with SAM twin phantom, manufactured by Schmid & Partner Engineering AG (SPEAG). The list of calibrated equipment is given below.

| <b>Description</b>             | <b>Serial Number</b> | <b>Due Date</b> |
|--------------------------------|----------------------|-----------------|
| DASY4 DAE3                     | 448                  | 15-11-2008      |
| E-field probe ET3DV6           | 1610                 | 14-11-2008      |
| Dipole Validation Kit, D835V2  | 442                  | 06-12-2008      |
| Dipole Validation Kit, D1900V2 | 539                  | 12-12-2008      |

#### **3.2 Additional equipment**

| <b>Description</b>             | <b>Inventory Number</b> | <b>Due Date</b> |
|--------------------------------|-------------------------|-----------------|
| Signal generator R&S SMY 02    | 3.094                   | 24-04-08        |
| Directional coupler HP778D     | 15.233                  | None            |
| Power meter R&S NRVD           | 4.073                   | 24-04-08        |
| Power sensor R&S NRV-Z5        | 4.074                   | 24-04-08        |
| Power sensor R&S NRV-Z5        | 4.076                   | 24-04-08        |
| Network analyzer Agilent 8719D | 2.022                   | 23-04-08        |
| Dielectric probe kit HP8507C   | 14.046                  | Self Cal        |
| R&S CMU200                     | 20011497                | 08-05-08        |

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## 4 Electrical parameters on the tissue simulating liquid

Prior to conducting SAR measurements, the relative permittivity,  $\epsilon_r$ , and the conductivity,  $\sigma$ , of the tissue simulating liquids were measured with the dielectric probe kit. These values are shown in the table below. The mass density,  $\rho$ , entered into the DASY software is also given. Recommended parameters for permittivity  $\epsilon_r$ , conductivity  $\sigma$  and mass density  $\rho$  are also shown.

| f<br>[MHz] | Tissue<br>type | Measured / Recommended | Dielectric Parameters |                | Density                     |
|------------|----------------|------------------------|-----------------------|----------------|-----------------------------|
|            |                |                        | $\epsilon_r$          | $\sigma$ [S/m] | $\rho$ [g/cm <sup>3</sup> ] |
| 850        | Head           | Measured, 16-01-08     | 39.66                 | 0.87           | 1.00                        |
|            |                | Recommended            | 41.50                 | 0.90           | 1.00                        |
|            | Body           | Measured, 21-01-08     | 55.14                 | 0.97           | 1.00                        |
|            |                | Recommended            | 55.20                 | 0.97           | 1.00                        |
| 1900       | Head           | Measured, 22-01-08     | 39.46                 | 1.47           | 1.00                        |
|            |                | Recommended            | 40.00                 | 1.40           | 1.00                        |
|            | Body           | Measured, 29-01-08     | 50.97                 | 1.59           | 1.00                        |
|            |                | Recommended            | 53.30                 | 1.52           | 1.00                        |

## 5 System accuracy verification

A system accuracy verification of the DASY4 was performed using the dipole validation kit listed in section 3.1. The system verification test was conducted on the same day as the measurement of the DUT. The measurements were made at an ambient temperature of 22-24.3°C and humidity 30-40.3%. The obtained results are displayed in the table below.

RF noise had been measured in the liquid when all RF equipment in lab was switched off. Measured value was 0.00000289 mW/g in 1g mass.

| f<br>[MHz] | Tissue<br>type | Measured / Reference | SAR [W/kg]<br>1g / 10g | Dielectric<br>Parameters |                | Density                     | Liquid<br>T[°C] |
|------------|----------------|----------------------|------------------------|--------------------------|----------------|-----------------------------|-----------------|
|            |                |                      |                        | $\epsilon_r$             | $\sigma$ [S/m] | $\rho$ [g/cm <sup>3</sup> ] |                 |
| 850        | Head           | Measured, 16-01-08   | 9.2 / 6.1              | 39.66                    | 0.87           | 1.00                        | 22.1            |
|            |                | Reference            | 9.4 / 6.2              | 41.50                    | 0.90           | 1.00                        | 22.0            |
|            | Body           | Measured, 21-01-08   | 9.5 / 6.3              | 55.14                    | 0.97           | 1.00                        | 21.9            |
|            |                | Reference            | 9.7 / 6.5              | 55.20                    | 0.97           | 1.00                        | 22.0            |
| 1900       | Head           | Measured, 22-01-08   | 39.0 / 20.1            | 39.46                    | 1.47           | 1.00                        | 22.0            |
|            |                | Reference            | 35.9 / 19.1            | 40.00                    | 1.40           | 1.00                        | 22.0            |
|            | Body           | Measured, 29-01-08   | 40.4 / 21              | 50.97                    | 1.59           | 1.00                        | 21.7            |
|            |                | Reference            | 37.0 / 19.8            | 53.30                    | 1.52           | 1.00                        | 22.0            |



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## 6 SAR measurement uncertainty

### *DASY4 SAR measurement uncertainty evaluation for Sony Ericsson PY7A1032052 phone According to IEEE 1528*

| Uncertainty Component                      | Uncer. (%) | Prob Dist. | Div. | C <sub>i</sub> | 1g mass |
|--------------------------------------------|------------|------------|------|----------------|---------|
| <b>Measurement System</b>                  |            |            |      |                |         |
| Probe Calibration                          | ±5.9       | N          | 1    | 1              | ±5.9    |
| Axial Isotropy                             | ±4.7       | R          | √3   | 0.7            | ±1.9    |
| Spherical Isotropy                         | ±9.6       | R          | √3   | 0.7            | ±3.9    |
| Boundary effect                            | ±1.0       | R          | √3   | 1              | ±0.6    |
| Probe linearity                            | ±4.7       | R          | √3   | 1              | ±2.7    |
| Detection limit                            | ±1.0       | R          | √3   | 1              | ±0.6    |
| Readout electronics                        | ±0.3       | N          | 1    | 1              | ±0.3    |
| Response time                              | ±0.8       | R          | √3   | 1              | ±0.5    |
| Integration time                           | ±2.6       | R          | √3   | 1              | ±1.5    |
| RF Ambient Conditions                      | ±3.0       | R          | √3   | 1              | ±1.7    |
| Mech. Constraints of robot                 | ±0.4       | R          | √3   | 1              | ±0.2    |
| Probe positioning                          | ±2.9       | R          | √3   | 1              | ±1.7    |
| Extrap, interpolation and integration      | ±1.0       | R          | √3   | 1              | ±0.6    |
| Measurement System Uncertainty             |            |            |      |                | ±8.4    |
| <b>Test Sample Related</b>                 |            |            |      |                |         |
| Device positioning                         | ±3.5       | N          | 1    | 1              | ±3.5    |
| Device holder uncertainty                  | ±3.5       | N          | 1    | 1              | ±3.5    |
| Power drift                                | ±5.0       | R          | √3   | 1              | ±2.9    |
| Test Sample Related Uncertainty            |            |            |      |                | ±5.5    |
| <b>Phantom and Tissue Parameters</b>       |            |            |      |                |         |
| Phantom uncertainty                        | ±4.0       | R          | √3   | 1              | ±2.3    |
| Liquid conductivity (measured)             | ±2.5       | R          | 1    | 0.64           | ±1.6    |
| Liquid conductivity (target)               | ±5.0       | R          | √3   | 0.64           | ±1.8    |
| Liquid Permittivity (measured)             | ±2.5       | R          | 1    | 0.6            | ±1.5    |
| Liquid Permittivity (target)               | ±5.0       | R          | √3   | 0.6            | ±1.7    |
| Phantom and Tissue Parameters Uncertainty  |            |            |      |                | ±4.1    |
| <b>Combined standard uncertainty</b>       |            |            |      |                | ±10.8   |
| <b>Extended standard uncertainty (k=2)</b> |            |            |      |                | ±21.6   |

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## 7 Test results

The measured 1-gram averaged SAR values of the device towards the head and body are provided in Table 1 and Table 2. The ambient humidity and temperature of test facility were (30-40.3) % and (22-24.3) °C respectively. The depth of the head and body tissue simulating liquids were greater than 15.5cm. A base station simulator was used to control the device during the SAR measurements. The phone was supplied with a fully-charged battery for each measurement. For head measurement, the device was tested on the right-hand phantom and the left-hand phantom in two different phones position, cheek (touch) and tilt (cheek + 15deg). For all modes, the device was tested at the lowest, middle and highest frequencies in the transmission band.

For body measurement the DUT was tested with the antenna (back) and display (front) towards the phantom flat section with 15 mm distance in both speech and data mode. Available data modes were GPRS and EDGE. The device was tested at the lowest, middle and highest frequencies in the transmission band. For portable hands free (PHF) usage the Sony Ericsson head set HPB-60 was connected to the DUT, and for Bluetooth calls the DUT was paired with Sony Ericsson HBH-DS970.

| Band     | Channel | Power [dBm] | Position | Liquid T [°C] | Measured SAR [W/kg] |                    |
|----------|---------|-------------|----------|---------------|---------------------|--------------------|
|          |         |             |          |               | Left-hand 1g mass   | Right-hand 1g mass |
| GSM 850  | 128     | 33.4        | Cheek    | 22.1          | 0.58                | 0.48               |
|          |         |             | Tilt     | -             | -                   | -                  |
|          | 190     | 33.5        | Cheek    | 22.1          | 0.67                | 0.55               |
|          |         |             | Tilt     | 22.1          | 0.25                | 0.23               |
|          | 251     | 33.5        | Cheek    | 22.1          | 0.65                | 0.53               |
|          |         |             | Tilt     | -             | -                   | -                  |
| GSM 1900 | 512     | 30.5        | Cheek    | 22.0          | 0.24                | 0.35               |
|          |         |             | Tilt     | -             | -                   | -                  |
|          | 661     | 30.5        | Cheek    | 22.0          | 0.29                | 0.38               |
|          |         |             | Tilt     | 22.0          | 0.06                | 0.11               |
|          | 810     | 30.5        | Cheek    | 22.0          | 0.27                | 0.35               |
|          |         |             | Tilt     | --            | -                   | -                  |

**Table1: Head SAR measurement results for Sony Ericsson PY7A1032052 telephone at highest possible output power.**



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| Band     | Channel | Power [dBm] | Position / Mode | Liquid T [°C] | Measured SAR 1g mass [W/kg] |
|----------|---------|-------------|-----------------|---------------|-----------------------------|
| GSM 850  | 128     | 33.4        | Back GPRS       | 21.9          | 0.63                        |
|          |         |             | Front GPRS      | 21.9          | 0.27                        |
|          |         | 27.4        | Back EDGE       | 21.9          | 0.16                        |
|          |         | 33.4        | Back Bluetooth  | 21.9          | 0.33                        |
|          |         |             | Back PHF        | 21.9          | 0.29                        |
|          | 190     | 33.5        | Back GPRS       | 21.9          | 0.51                        |
|          |         | 33.5        | Back Bluetooth  | 21.9          | 0.27                        |
|          | 251     | 33.5        | Back GPRS       | 21.9          | 0.43                        |
|          |         | 33.5        | Back Bluetooth  | 21.9          | 0.23                        |
| GSM 1900 | 512     | 30.5        | Back GPRS       | 21.4          | 0.88                        |
|          |         |             | Front GPRS      | 21.4          | 0.26                        |
|          |         | 27.0        | Back EDGE       | 21.4          | 0.30                        |
|          |         | 30.5        | Back Bluetooth  | 21.4          | 0.46                        |
|          |         |             | Back PHF        | 21.4          | 0.54                        |
|          | 661     | 30.5        | Back GPRS       | 21.4          | 0.80                        |
|          |         | 30.5        | Back Bluetooth  | 21.4          | 0.42                        |
|          | 810     | 30.5        | Back GPRS       | 21.4          | 0.66                        |
|          |         | 30.5        | Back Bluetooth  | 21.4          | 0.35                        |

Table2: Body SAR measurement results for Sony Ericsson PY7A1032052 telephone at highest possible output power.

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[1] R.Plicanic, "SAR Measurement Specification of Wireless Handsets", Sony Ericsson SAR Test Laboratory internal document GUG/N 03:141

[2] FCC, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields: Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radio Frequency Emissions," Supplement C (Edition 01-01) to OET Bulletin 65 (Edition 97- 01).

[3] IEEE, "Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques," Std 1528-2003, June, 2003.

[4] IEC, "Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz," Std. 62209-1, February, 2005.

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## 9 Appendix

### 9.1 Photographs of the device under test



Front & Back



Sides



Back side with battery



Top and Bottom



Samples Front



Samples Back

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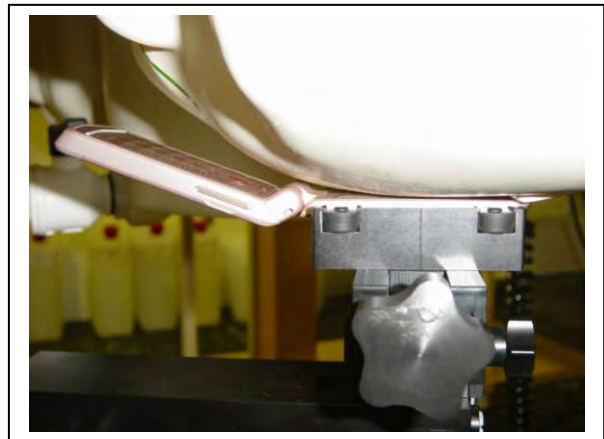
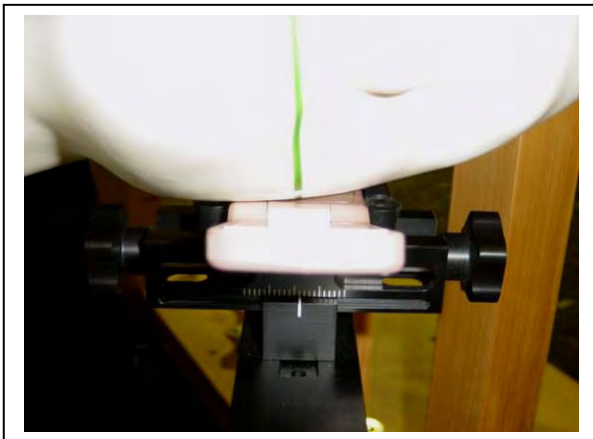
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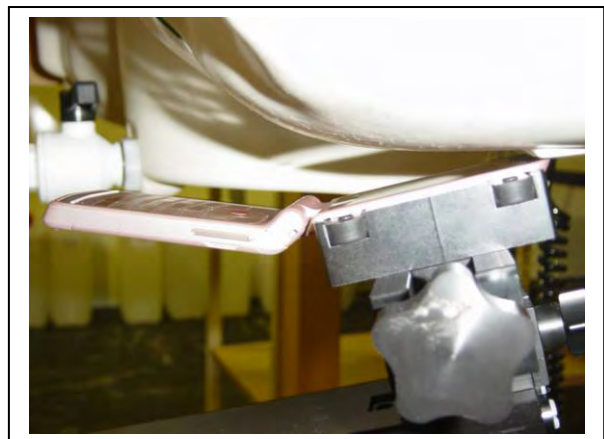
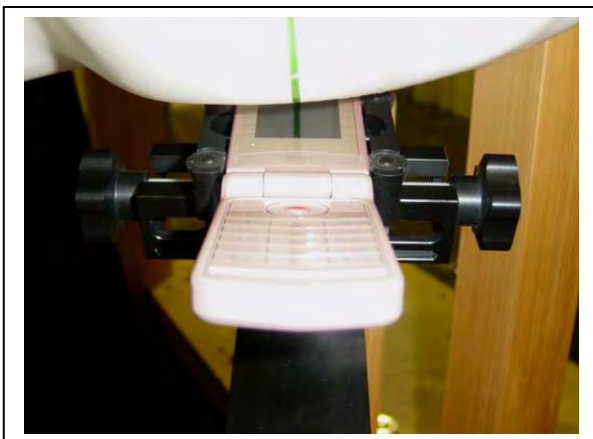
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## 9.2 Device position on SAM Twin Phantom



Device position against the head: Cheek (touch) phone position



Device position against the head: Tilt (cheek+15deg) phone position

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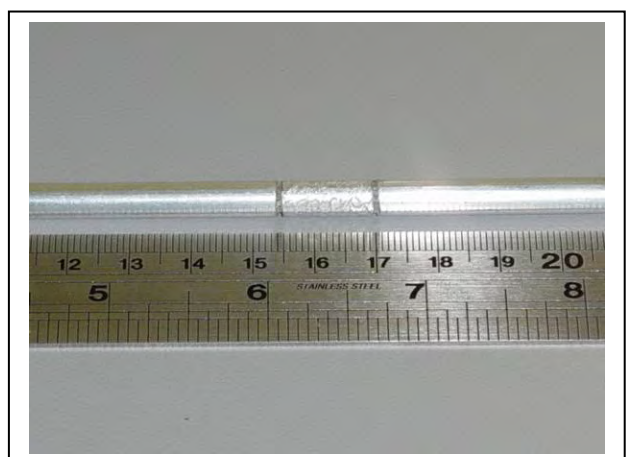
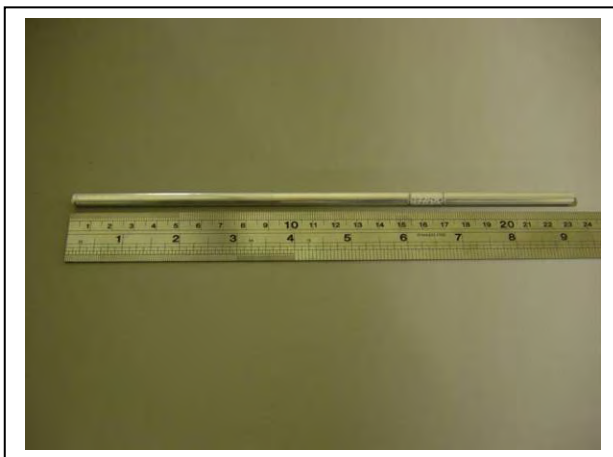
Reference

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**Device position against the body: 15mm distance from Phantom.**

### 9.3 Photographs of TSL Fluid Depths



**Pictures to show depth gauge used for measuring TSL depth.  
Note: The low end of the scale is a depth of 15.5 cm.**

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Date

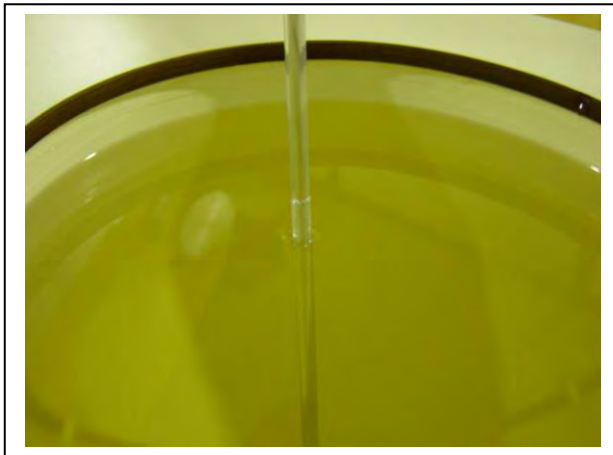
**31/01/08**

Rev

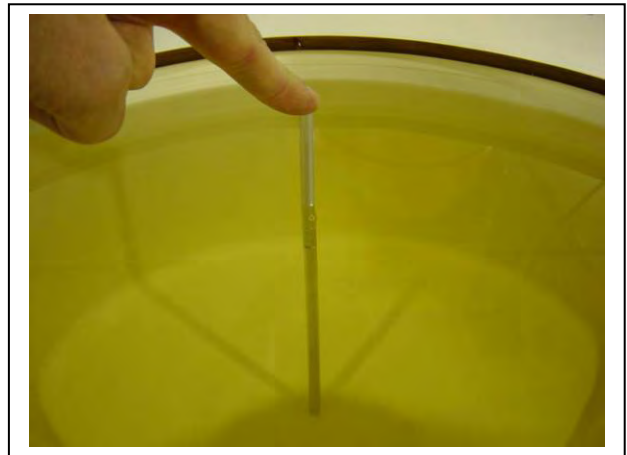
**A**

Reference

**File**



**850 Head**



**850 Body**



**1900 Head**



**1900 Body**

**Pictures showing Phantom fluid depths.**

Company Internal  
REPORT

Prepared (also subject responsible if other)

BA/SEM/BGLINS Robert Carr

Approved

LD/SEMC/BGLI/NC Peter Lindeborg

Checked

01/02/08

No.

BGLI08:071.

Date

31/01/08

Rev

A

Reference

File

## 10 Attachments

- Measurement plots and system validation
- Dipole calibration

Date/Time: 1/22/2008 12:12:11 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Validation-D1900-22-01-08****DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:539**

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

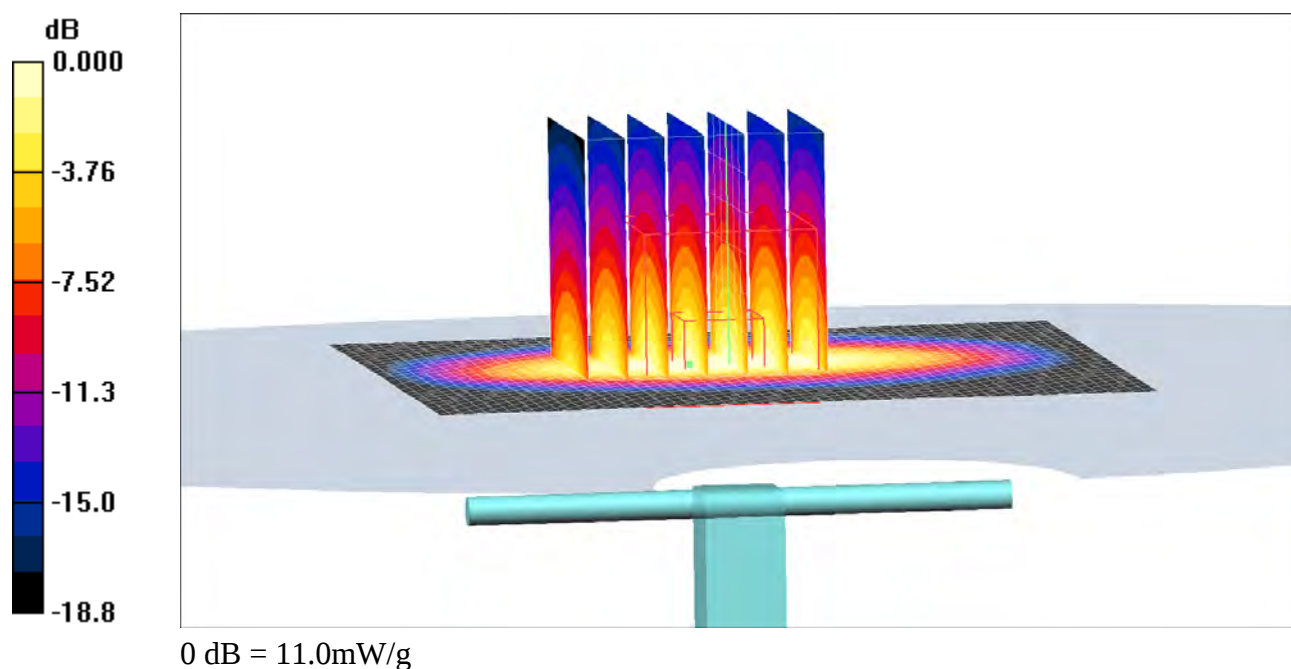
Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 39.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.18, 5.18, 5.18); Calibrated: 11/14/2007
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn448; Calibrated: 15/11/2007
  - Phantom: SAM-1; Type: SAM; Serial: 1437
  - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- d=10mm, Pin=250mW/Area Scan (61x61x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 11.9 mW/g
- d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  
dx=5mm, dy=5mm, dz=5mm  
Reference Value = 88.4 V/m; Power Drift = 0.129 dB  
Peak SAR (extrapolated) = 18.4 W/kg  
**SAR(1 g) = 9.74 mW/g; SAR(10 g) = 5.03 mW/g**  
Maximum value of SAR (measured) = 11.0 mW/g



Date/Time: 1/29/2008 1:58:08 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Validation-D1900-29-01-08-Body****DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:539**

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

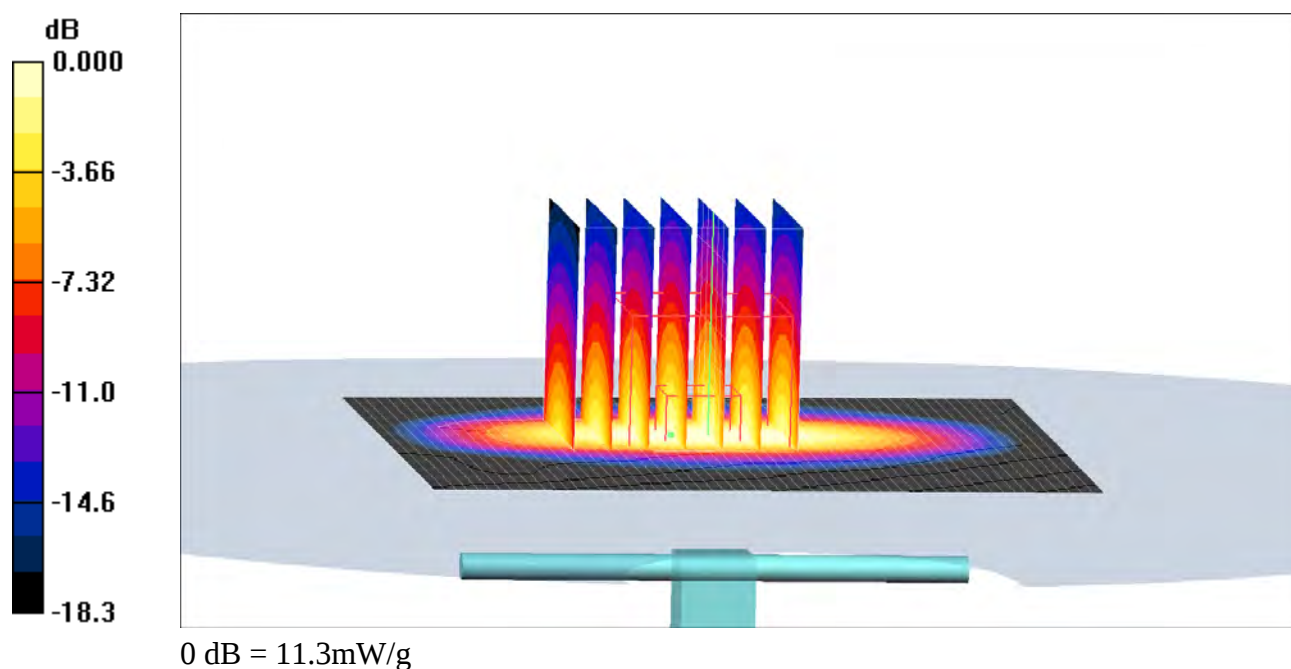
Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.59$  mho/m;  $\epsilon_r = 51$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.68, 4.68, 4.68); Calibrated: 11/14/2007
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn448; Calibrated: 15/11/2007
  - Phantom: SAM-3; Type: SAM; Serial: 1436
  - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- d=10mm, Pin=250mW/Area Scan (61x61x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 12.8 mW/g
- d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:  
dx=5mm, dy=5mm, dz=5mm  
Reference Value = 86.4 V/m; Power Drift = 0.101 dB  
Peak SAR (extrapolated) = 18.5 W/kg  
**SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.24 mW/g**  
Maximum value of SAR (measured) = 11.3 mW/g



Date/Time: 1/22/2008 4:40:37 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-RightHandSide-GSM1900-Tilt-Middle****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: DCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

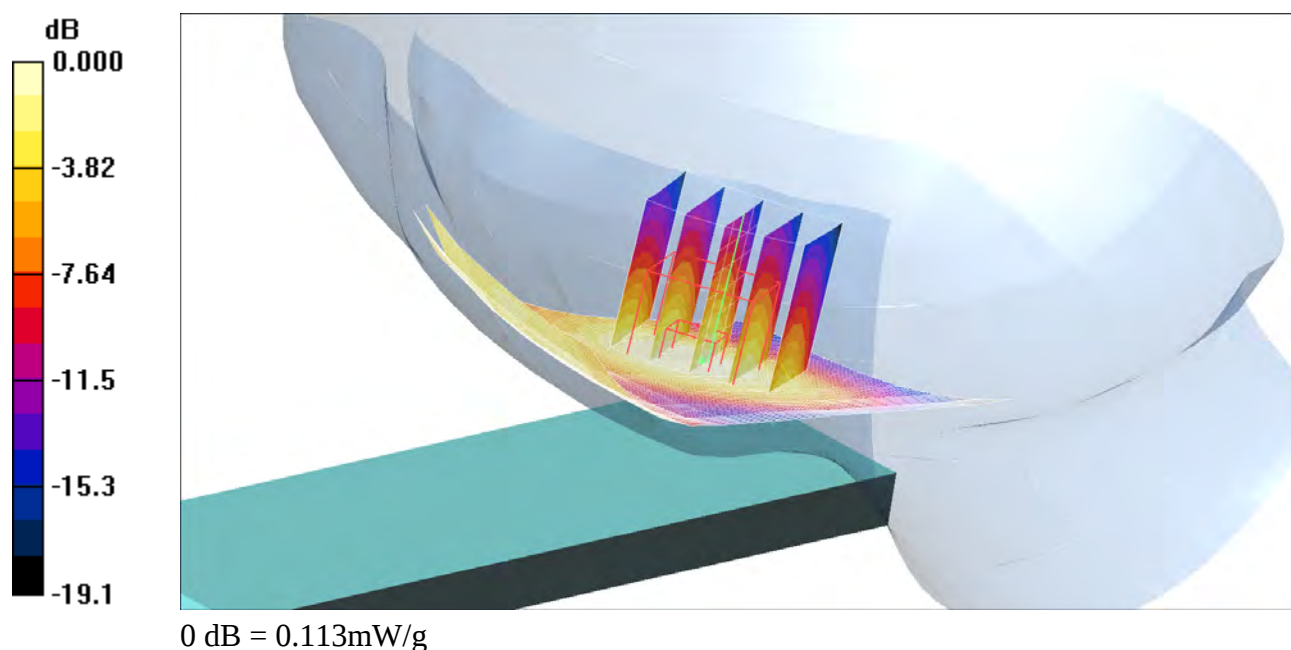
Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.45$  mho/m;  $\epsilon_r = 39.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.18, 5.18, 5.18); Calibrated: 11/14/2007
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn448; Calibrated: 15/11/2007
  - Phantom: SAM-1; Type: SAM; Serial: 1437
  - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- Tilt position - Middle/Area Scan (71x131x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.118 mW/g
- Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  
dx=8mm, dy=8mm, dz=5mm  
Reference Value = 6.39 V/m; Power Drift = 0.107 dB  
Peak SAR (extrapolated) = 0.176 W/kg  
**SAR(1 g) = 0.107 mW/g; SAR(10 g) = 0.063 mW/g**  
Maximum value of SAR (measured) = 0.113 mW/g



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Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-RightHandSide-GSM1900-Touch-High****DUT: Magdalena; Type: DUT; Serial: #10203**

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

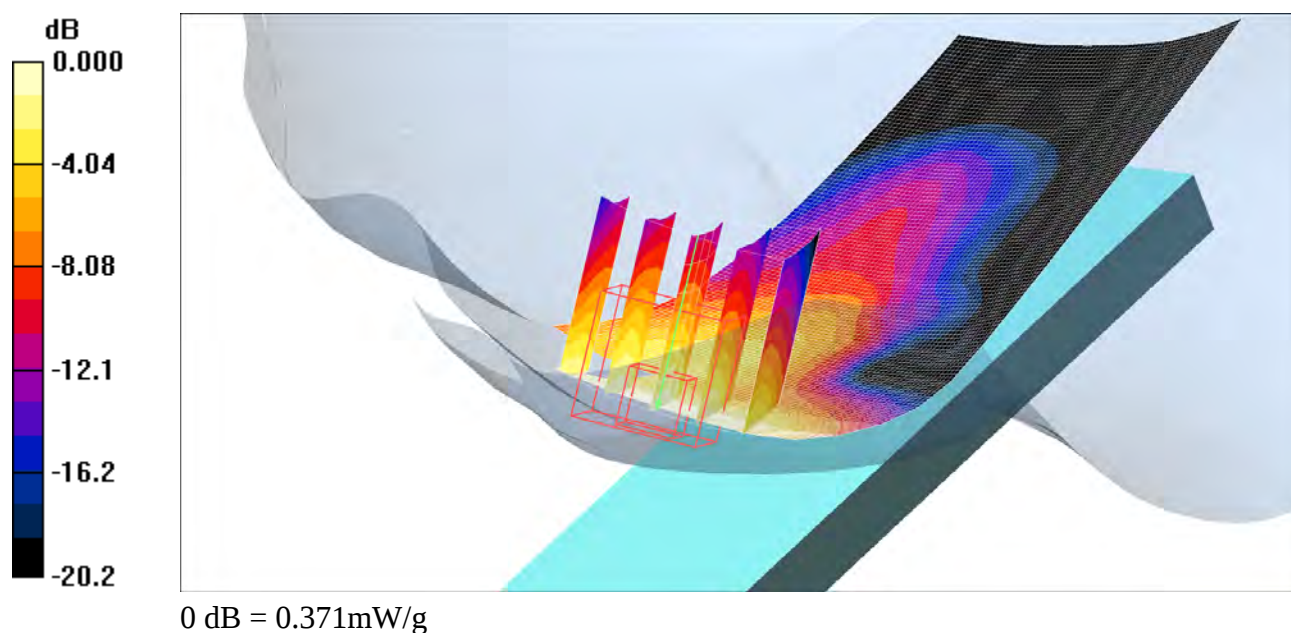
Medium parameters used:  $f = 1909.8 \text{ MHz}$ ;  $\sigma = 1.49 \text{ mho/m}$ ;  $\epsilon_r = 39.4$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.18, 5.18, 5.18); Calibrated: 11/14/2007
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn448; Calibrated: 15/11/2007
  - Phantom: SAM-1; Type: SAM; Serial: 1437
  - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- Touch Position - High/Area Scan (71x131x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$   
Maximum value of SAR (interpolated) =  $0.380 \text{ mW/g}$
- Touch Position - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  
 $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
Reference Value =  $2.17 \text{ V/m}$ ; Power Drift =  $-0.143 \text{ dB}$   
Peak SAR (extrapolated) =  $0.543 \text{ W/kg}$   
**SAR(1 g) =  $0.352 \text{ mW/g}$ ; SAR(10 g) =  $0.221 \text{ mW/g}$**   
Maximum value of SAR (measured) =  $0.371 \text{ mW/g}$



Date/Time: 1/22/2008 4:03:17 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-RightHandSide-GSM1900-Touch-Low****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: DCS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

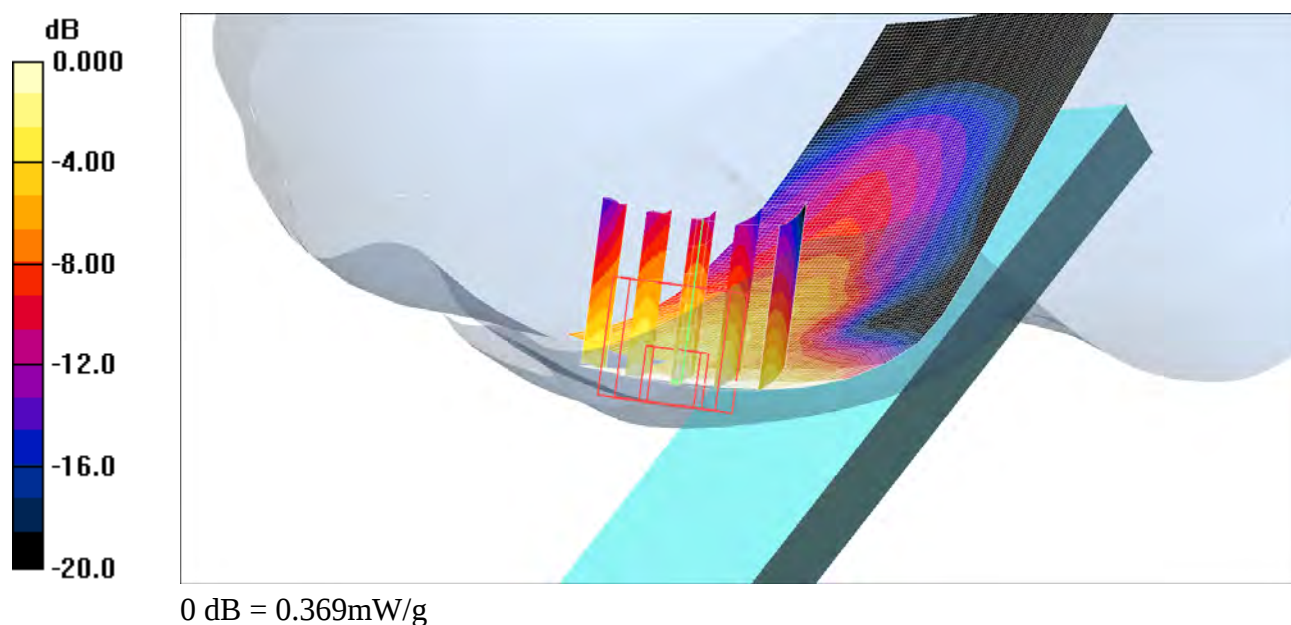
Medium parameters used:  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.42 \text{ mho/m}$ ;  $\epsilon_r = 39.6$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.18, 5.18, 5.18); Calibrated: 11/14/2007
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn448; Calibrated: 15/11/2007
  - Phantom: SAM-1; Type: SAM; Serial: 1437
  - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- Touch Position- Low/Area Scan (71x131x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$   
Maximum value of SAR (interpolated) =  $0.365 \text{ mW/g}$
- Touch Position- Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  
 $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
Reference Value =  $2.56 \text{ V/m}$ ; Power Drift =  $0.144 \text{ dB}$   
Peak SAR (extrapolated) =  $0.538 \text{ W/kg}$   
**SAR(1 g) =  $0.349 \text{ mW/g}$ ; SAR(10 g) =  $0.217 \text{ mW/g}$**   
Maximum value of SAR (measured) =  $0.369 \text{ mW/g}$



Date/Time: 1/22/2008 3:44:55 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-RightHandSide-GSM1900-Touch-Middle****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: DCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.45$  mho/m;  $\epsilon_r = 39.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.18, 5.18, 5.18); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch position - Middle/Area Scan (71x131x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.405 mW/g

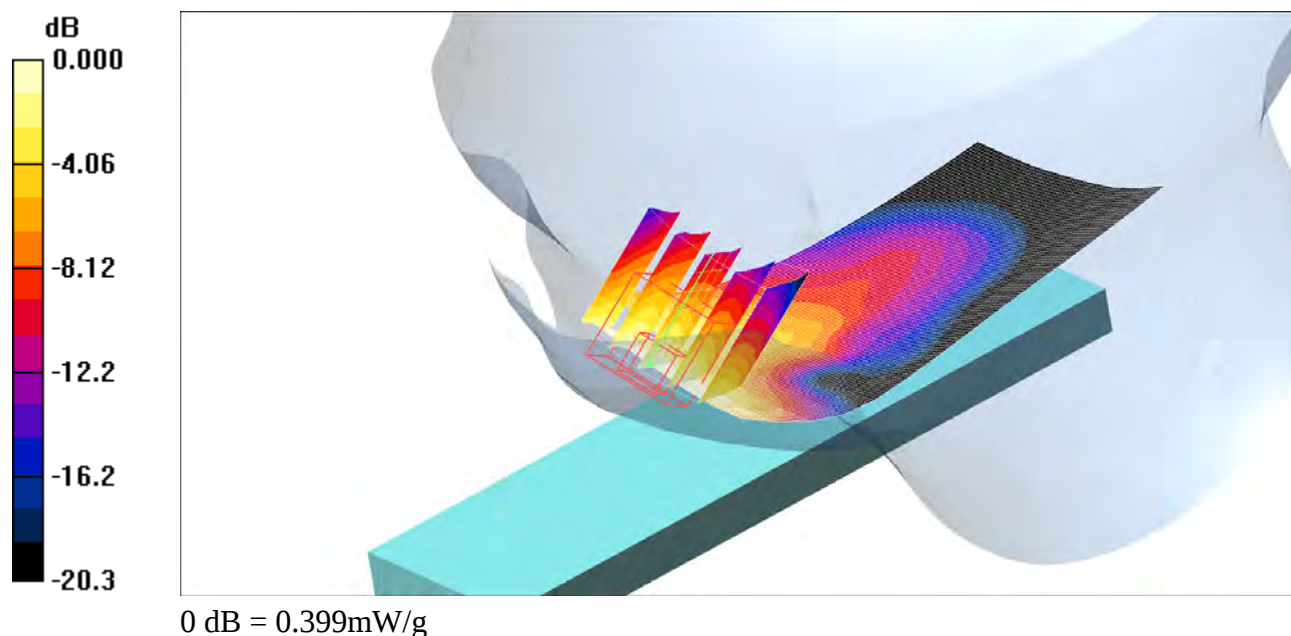
**Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.83 V/m; Power Drift = -0.137 dB

Peak SAR (extrapolated) = 0.587 W/kg

**SAR(1 g) = 0.377 mW/g; SAR(10 g) = 0.236 mW/g**

Maximum value of SAR (measured) = 0.399 mW/g



Date/Time: 1/22/2008 2:01:52 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-LeftHandSide-GSM1900-Tilt-Middle****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: DCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

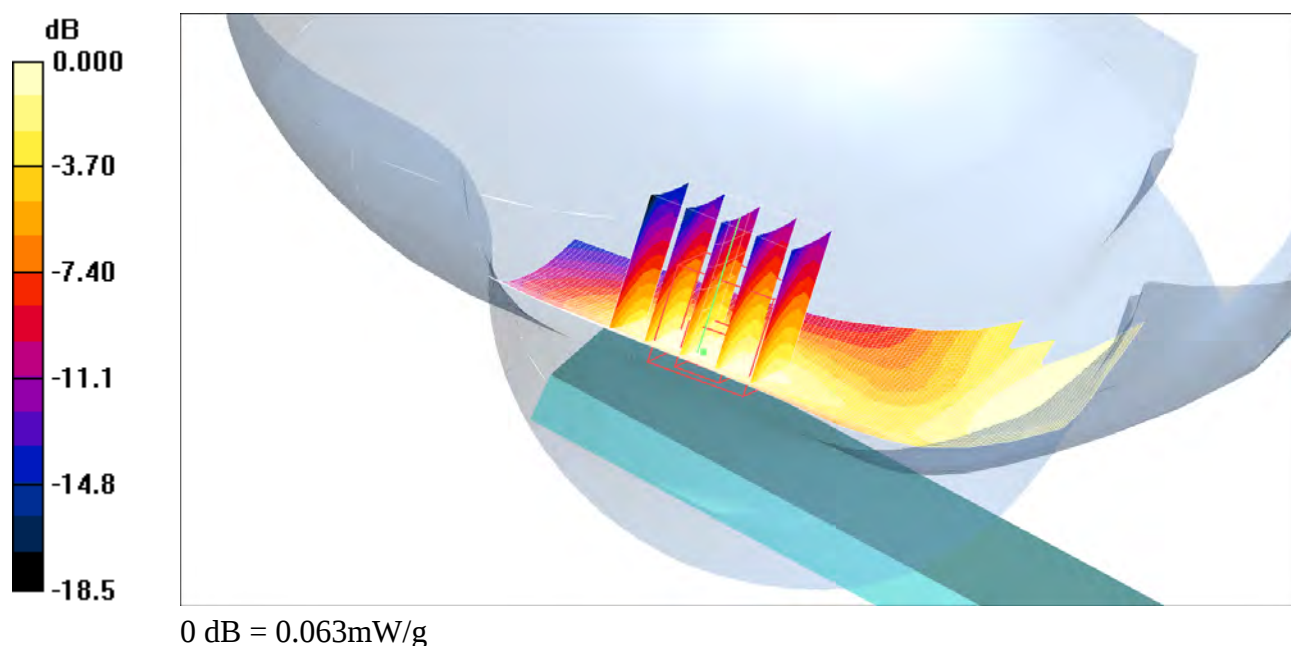
Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.45 \text{ mho/m}$ ;  $\epsilon_r = 39.5$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.18, 5.18, 5.18); Calibrated: 11/14/2007
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn448; Calibrated: 15/11/2007
  - Phantom: SAM-1; Type: SAM; Serial: 1437
  - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- Tilt position - Middle/Area Scan (71x131x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$   
Maximum value of SAR (interpolated) =  $0.065 \text{ mW/g}$
- Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  
 $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
Reference Value =  $4.80 \text{ V/m}$ ; Power Drift =  $0.017 \text{ dB}$   
Peak SAR (extrapolated) =  $0.094 \text{ W/kg}$   
**SAR(1 g) =  $0.059 \text{ mW/g}$ ; SAR(10 g) =  $0.036 \text{ mW/g}$**   
Maximum value of SAR (measured) =  $0.063 \text{ mW/g}$



Date/Time: 1/22/2008 2:59:58 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-LeftHandSide-GSM1900-Touch-High****DUT: Magdalena; Type: DUT; Serial: #10203**

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

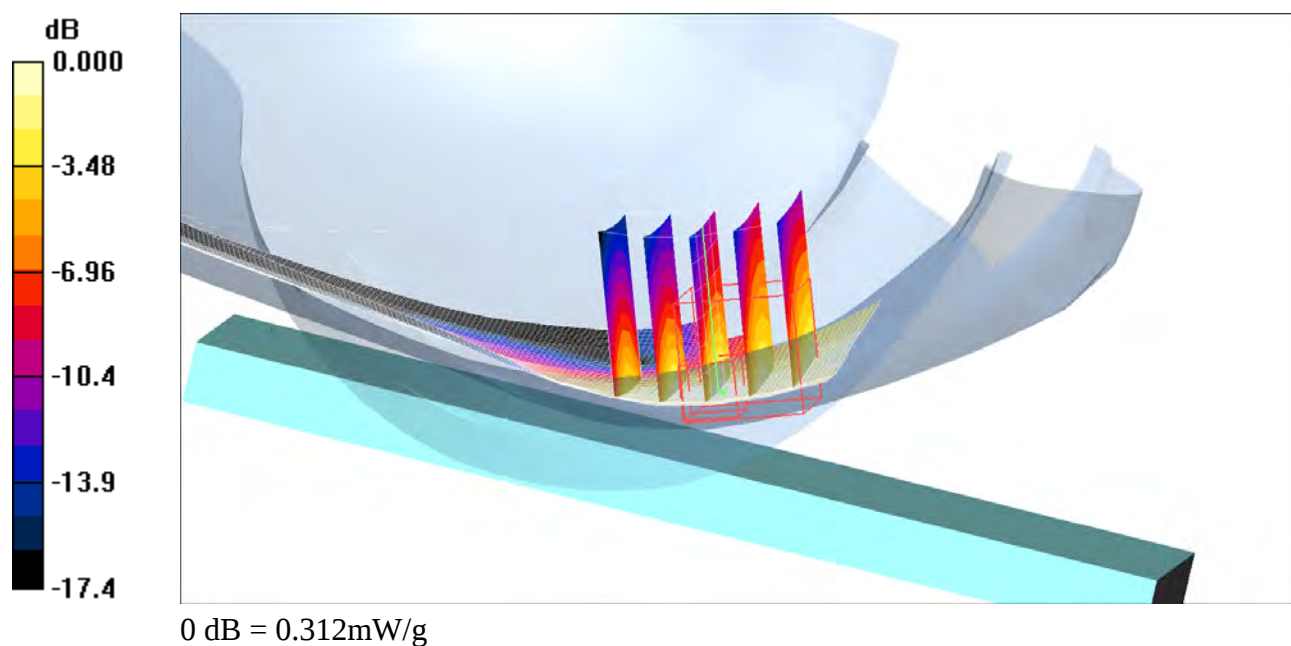
Medium parameters used:  $f = 1909.8 \text{ MHz}$ ;  $\sigma = 1.49 \text{ mho/m}$ ;  $\epsilon_r = 39.4$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.18, 5.18, 5.18); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - High/Area Scan (71x131x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$ Maximum value of SAR (interpolated) =  $0.300 \text{ mW/g}$ **Touch - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ Reference Value =  $2.15 \text{ V/m}$ ; Power Drift =  $0.141 \text{ dB}$ Peak SAR (extrapolated) =  $0.506 \text{ W/kg}$ **SAR(1 g) =  $0.272 \text{ mW/g}$ ; SAR(10 g) =  $0.155 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.312 \text{ mW/g}$ 

Date/Time: 1/22/2008 2:40:26 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-LeftHandSide-GSM1900-Touch-Low****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: DCS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

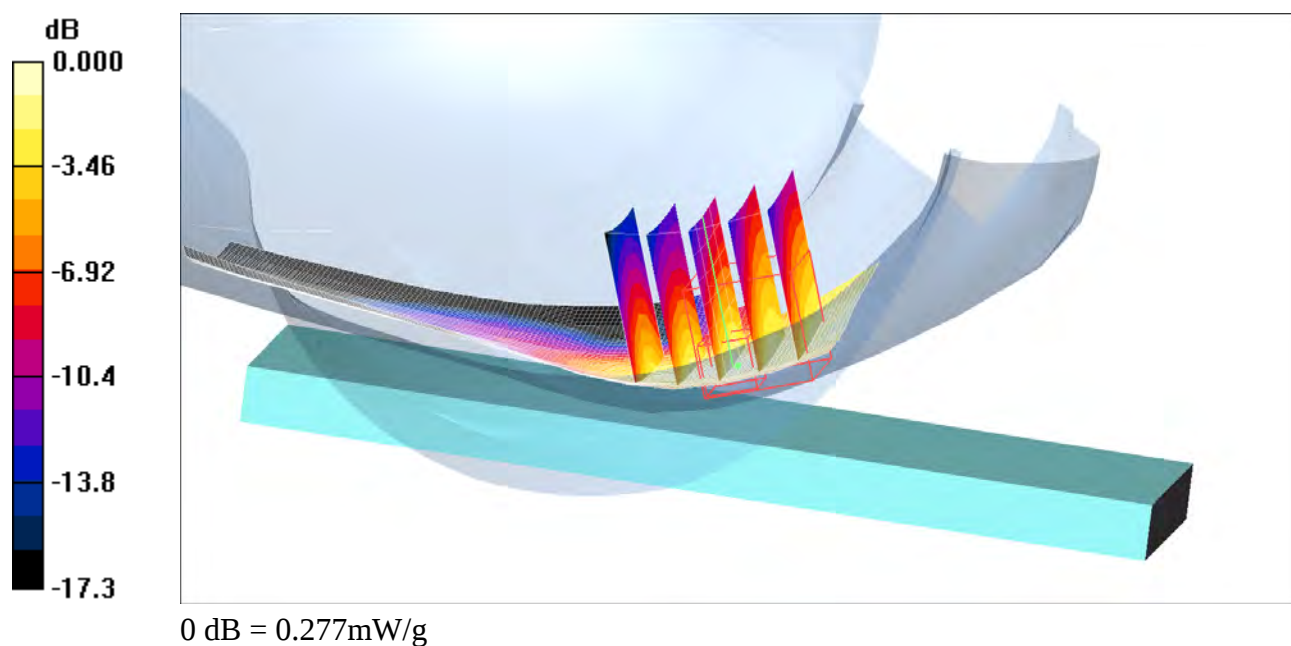
Medium parameters used:  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.42 \text{ mho/m}$ ;  $\epsilon_r = 39.6$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.18, 5.18, 5.18); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - Low/Area Scan (71x131x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$ Maximum value of SAR (interpolated) =  $0.266 \text{ mW/g}$ **Touch - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ Reference Value =  $2.33 \text{ V/m}$ ; Power Drift =  $-0.052 \text{ dB}$ Peak SAR (extrapolated) =  $0.435 \text{ W/kg}$ **SAR(1 g) =  $0.241 \text{ mW/g}$ ; SAR(10 g) =  $0.141 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.277 \text{ mW/g}$ 

Date/Time: 1/22/2008 1:25:59 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-LeftHandSide-GSM1900-Touch-Middle****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: DCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.45$  mho/m;  $\epsilon_r = 39.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.18, 5.18, 5.18); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch position - Middle/Area Scan (71x131x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.321 mW/g

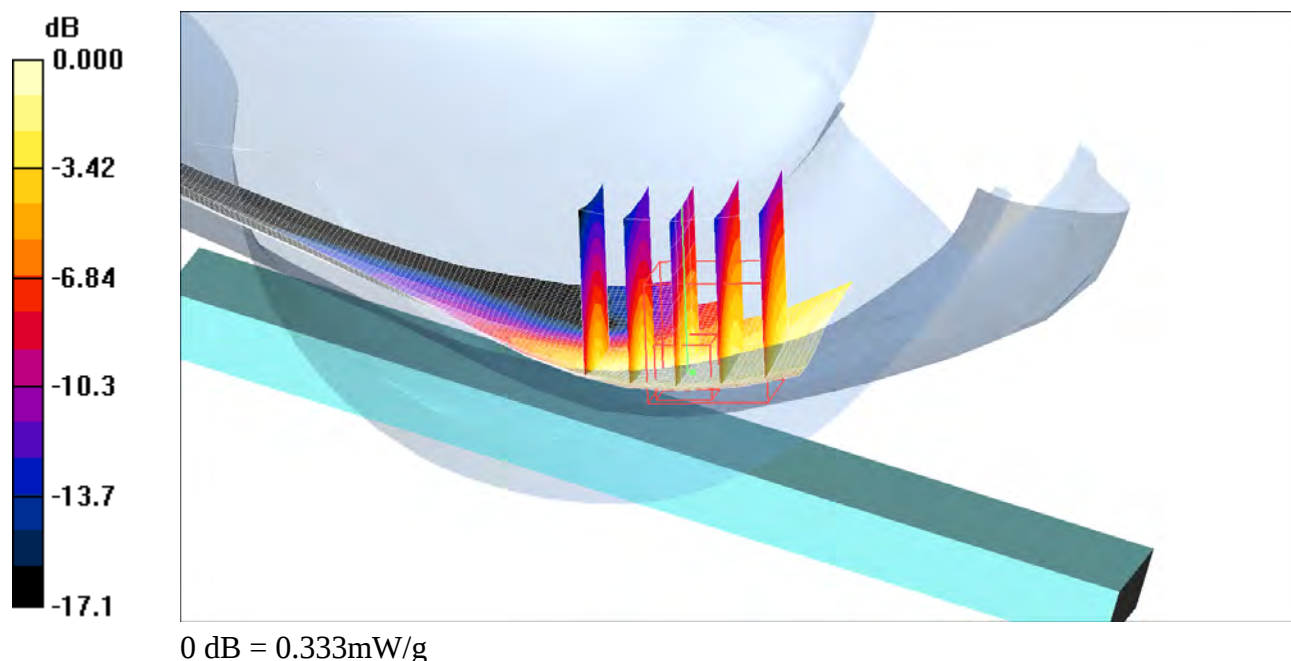
**Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.74 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 0.533 W/kg

**SAR(1 g) = 0.289 mW/g; SAR(10 g) = 0.166 mW/g**

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



Date/Time: 1/29/2008 4:51:36 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-1900Bluetooth-High****DUT: Magdalena; Type: DUT; Serial: #10203**

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

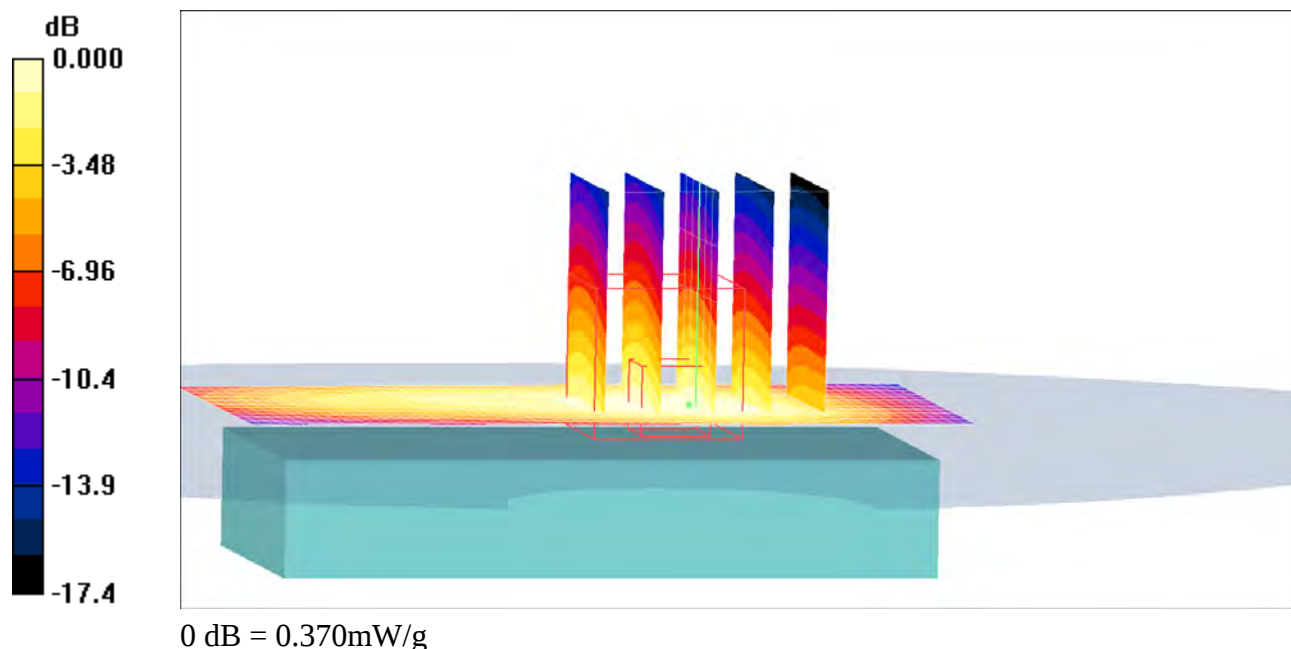
Medium parameters used:  $f = 1909.8 \text{ MHz}$ ;  $\sigma = 1.61 \text{ mho/m}$ ;  $\epsilon_r = 51$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.68, 4.68, 4.68); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body 3/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.373 \text{ mW/g}$ **Body 3/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $13.7 \text{ V/m}$ ; Power Drift =  $-0.022 \text{ dB}$ Peak SAR (extrapolated) =  $0.563 \text{ W/kg}$ **SAR(1 g) =  $0.346 \text{ mW/g}$ ; SAR(10 g) =  $0.209 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.370 \text{ mW/g}$ 

Date/Time: 1/29/2008 4:26:49 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-1900Bluetooth-Low****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: DCS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

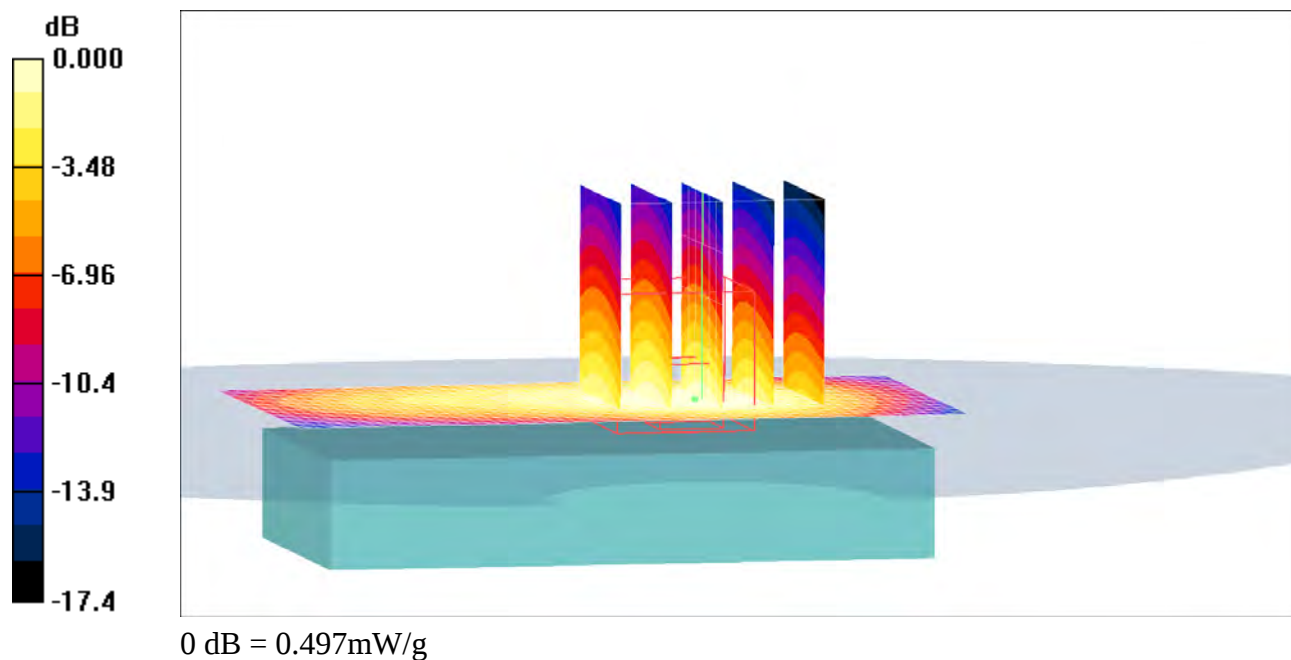
Medium parameters used:  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.54 \text{ mho/m}$ ;  $\epsilon_r = 51.1$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.68, 4.68, 4.68); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.494 \text{ mW/g}$ **Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $16.0 \text{ V/m}$ ; Power Drift =  $-0.005 \text{ dB}$ Peak SAR (extrapolated) =  $0.729 \text{ W/kg}$ **SAR(1 g) =  $0.462 \text{ mW/g}$ ; SAR(10 g) =  $0.283 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.497 \text{ mW/g}$ 

Date/Time: 1/29/2008 4:39:48 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-1900Bluetooth-Middle****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: DCS 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.57$  mho/m;  $\epsilon_r = 51$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.68, 4.68, 4.68); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body 2/Area Scan (41x71x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.452 mW/g

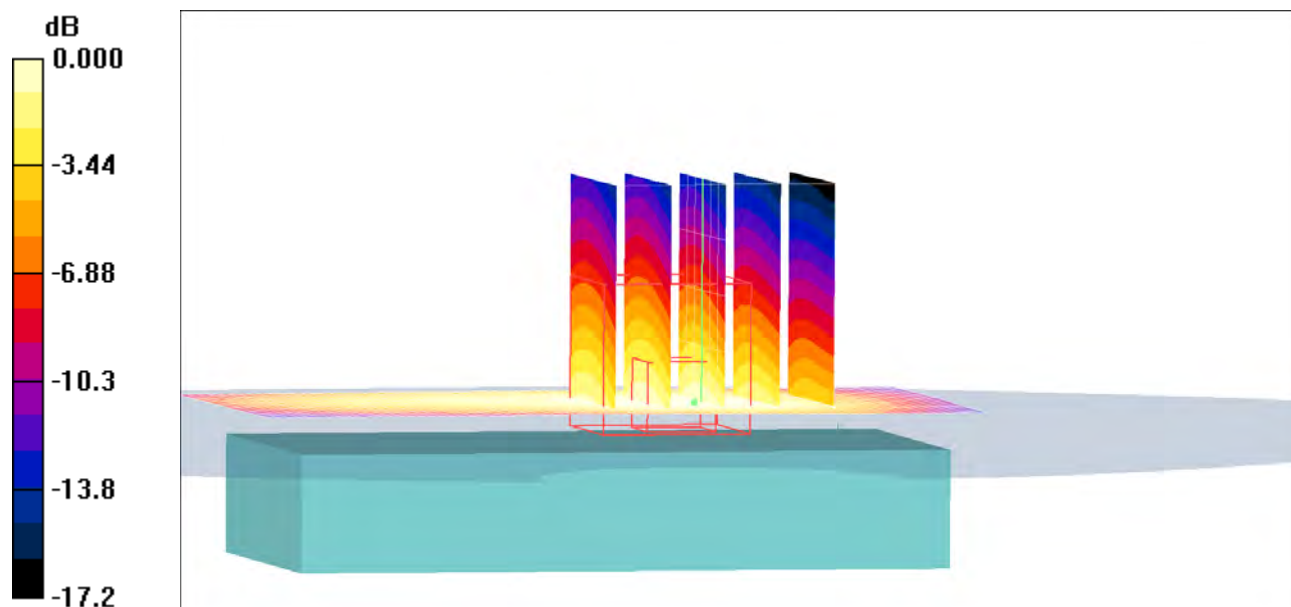
**Body 2/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 15.3 V/m; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 0.665 W/kg

**SAR(1 g) = 0.418 mW/g; SAR(10 g) = 0.255 mW/g**

Maximum value of SAR (measured) = 0.443 mW/g



0 dB = 0.443mW/g

Date/Time: 1/29/2008 4:04:41 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-1900EDGE-Low****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: GPRS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4.15

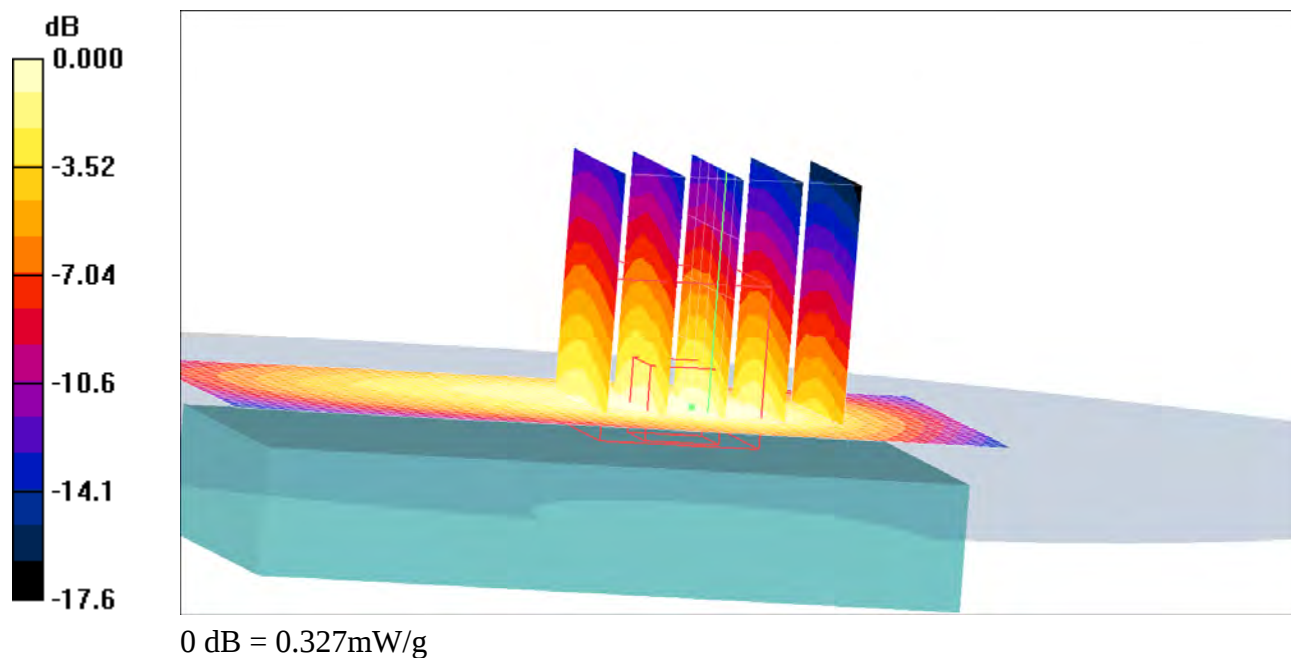
Medium parameters used:  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.54 \text{ mho/m}$ ;  $\epsilon_r = 51.1$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.68, 4.68, 4.68); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.316 \text{ mW/g}$ **Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $12.7 \text{ V/m}$ ; Power Drift =  $0.014 \text{ dB}$ Peak SAR (extrapolated) =  $0.504 \text{ W/kg}$ **SAR(1 g) =  $0.304 \text{ mW/g}$ ; SAR(10 g) =  $0.187 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.327 \text{ mW/g}$ 

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Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-1900-Front-To-Phantom-Low****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: GPRS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4.15

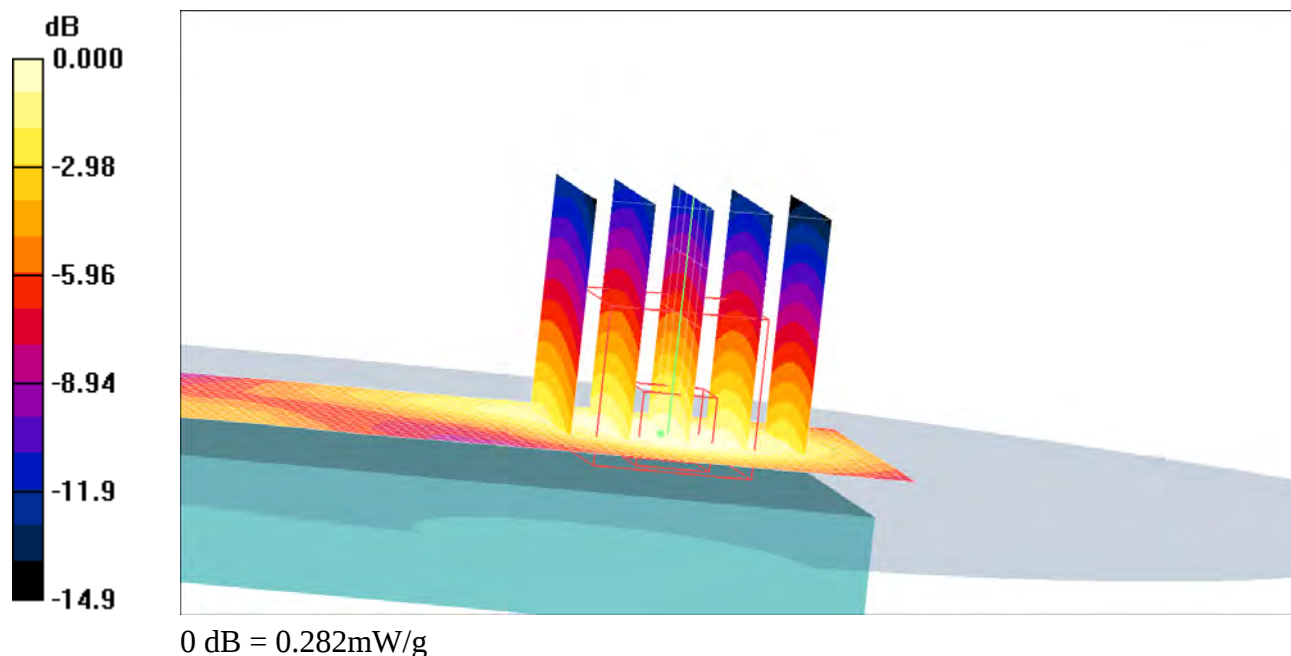
Medium parameters used:  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.54 \text{ mho/m}$ ;  $\epsilon_r = 51.1$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.68, 4.68, 4.68); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.288 \text{ mW/g}$ **Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $9.00 \text{ V/m}$ ; Power Drift =  $-0.042 \text{ dB}$ Peak SAR (extrapolated) =  $0.400 \text{ W/kg}$ **SAR(1 g) =  $0.262 \text{ mW/g}$ ; SAR(10 g) =  $0.165 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.282 \text{ mW/g}$ 

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Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-1900GPRS-High****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: GPRS 1900; Frequency: 1909.8 MHz; Duty Cycle: 1:4.15

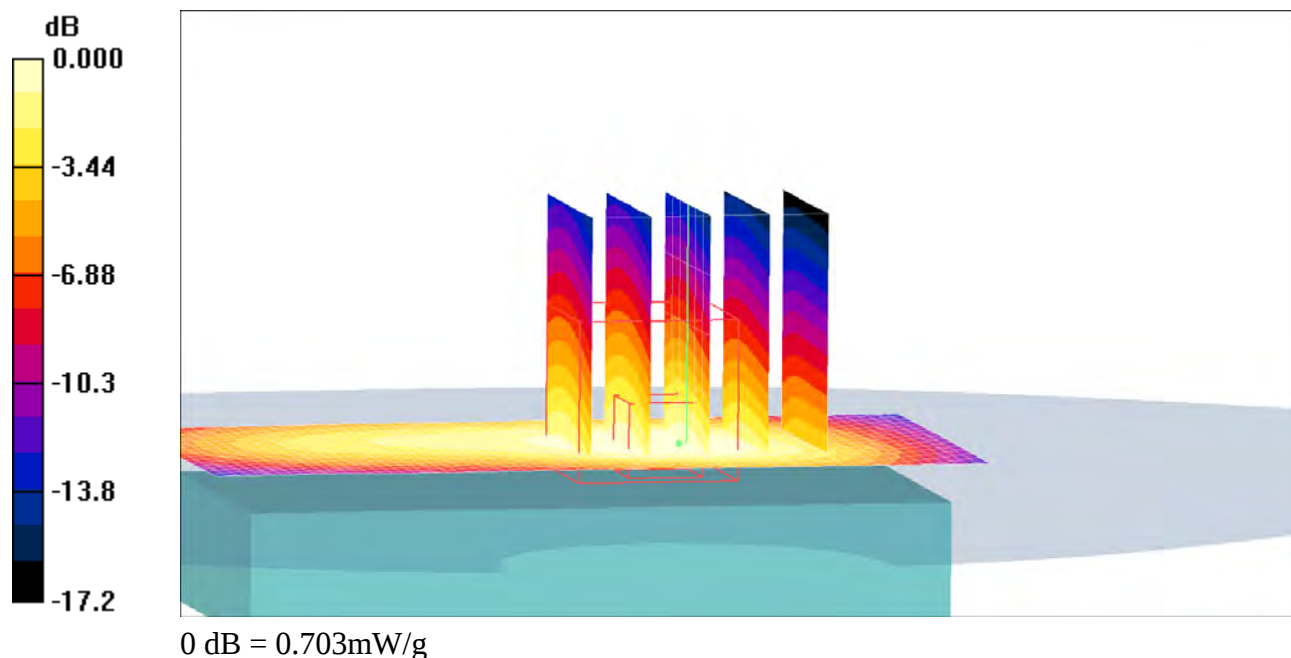
Medium parameters used:  $f = 1909.8 \text{ MHz}$ ;  $\sigma = 1.61 \text{ mho/m}$ ;  $\epsilon_r = 51$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.68, 4.68, 4.68); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body 3/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.710 \text{ mW/g}$ **Body 3/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $19.3 \text{ V/m}$ ; Power Drift =  $-0.052 \text{ dB}$ Peak SAR (extrapolated) =  $1.07 \text{ W/kg}$ **SAR(1 g) =  $0.660 \text{ mW/g}$ ; SAR(10 g) =  $0.401 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.703 \text{ mW/g}$ 

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Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-1900GPRS-Low****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: GPRS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4.15

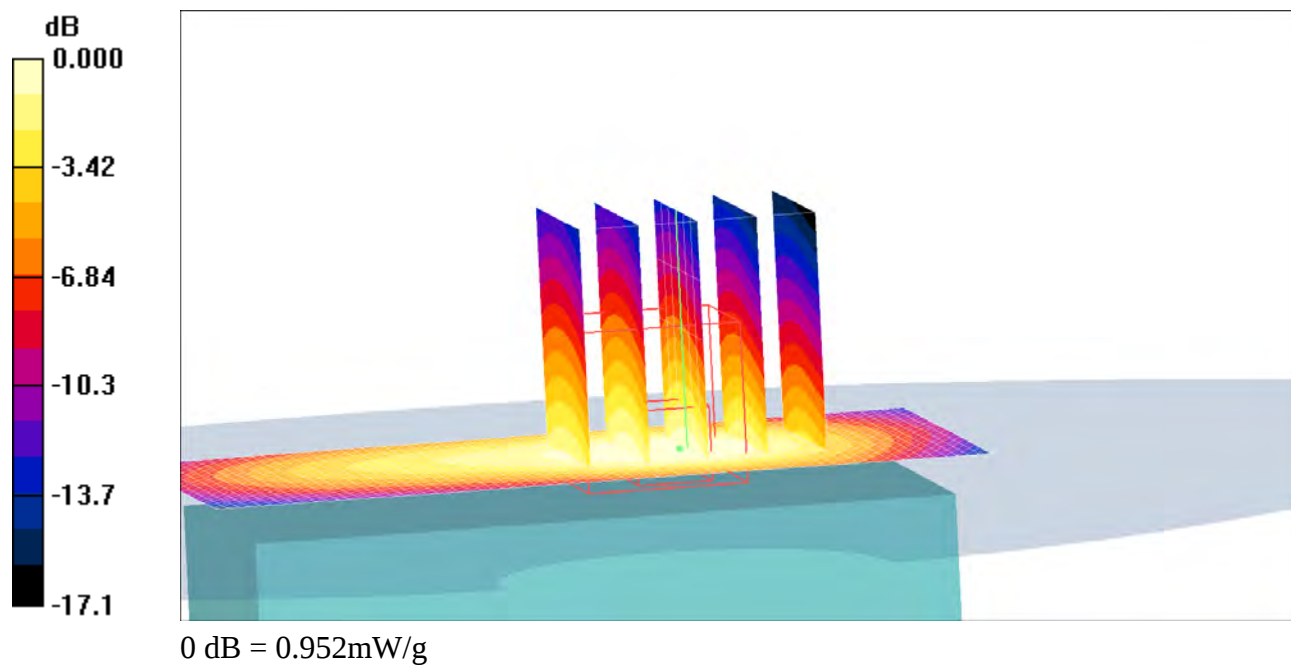
Medium parameters used:  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.54 \text{ mho/m}$ ;  $\epsilon_r = 51.1$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.68, 4.68, 4.68); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.973 \text{ mW/g}$ **Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $22.5 \text{ V/m}$ ; Power Drift =  $-0.085 \text{ dB}$ Peak SAR (extrapolated) =  $1.37 \text{ W/kg}$ **SAR(1 g) =  $0.883 \text{ mW/g}$ ; SAR(10 g) =  $0.546 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.952 \text{ mW/g}$ 

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Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-1900GPRS-Middle****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: GPRS 1900; Frequency: 1880 MHz; Duty Cycle: 1:4.15

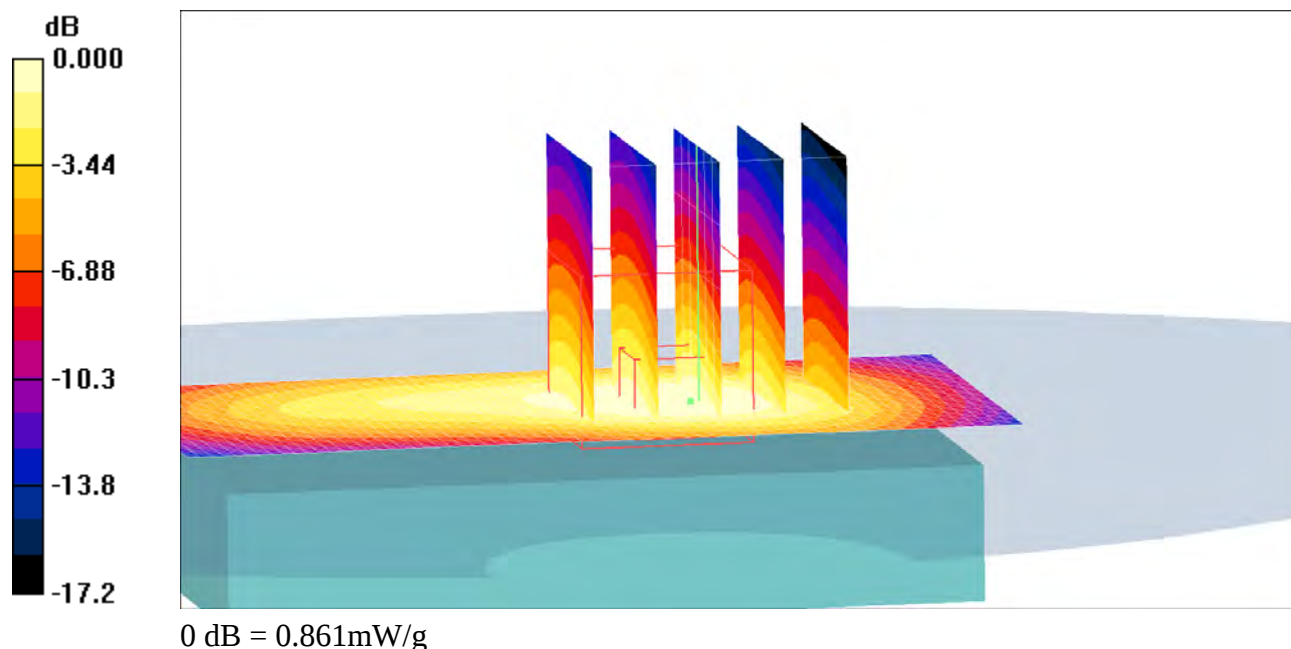
Medium parameters used:  $f = 1880 \text{ MHz}$ ;  $\sigma = 1.57 \text{ mho/m}$ ;  $\epsilon_r = 51$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.68, 4.68, 4.68); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body 2/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.880 \text{ mW/g}$ **Body 2/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $21.6 \text{ V/m}$ ; Power Drift =  $-0.134 \text{ dB}$ Peak SAR (extrapolated) =  $1.28 \text{ W/kg}$ **SAR(1 g) =  $0.802 \text{ mW/g}$ ; SAR(10 g) =  $0.491 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.861 \text{ mW/g}$ 

Date/Time: 1/29/2008 5:11:00 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-1900PHF-Low****DUT: Magdalena; Type: DUT; Serial: #10203**

Communication System: DCS 1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

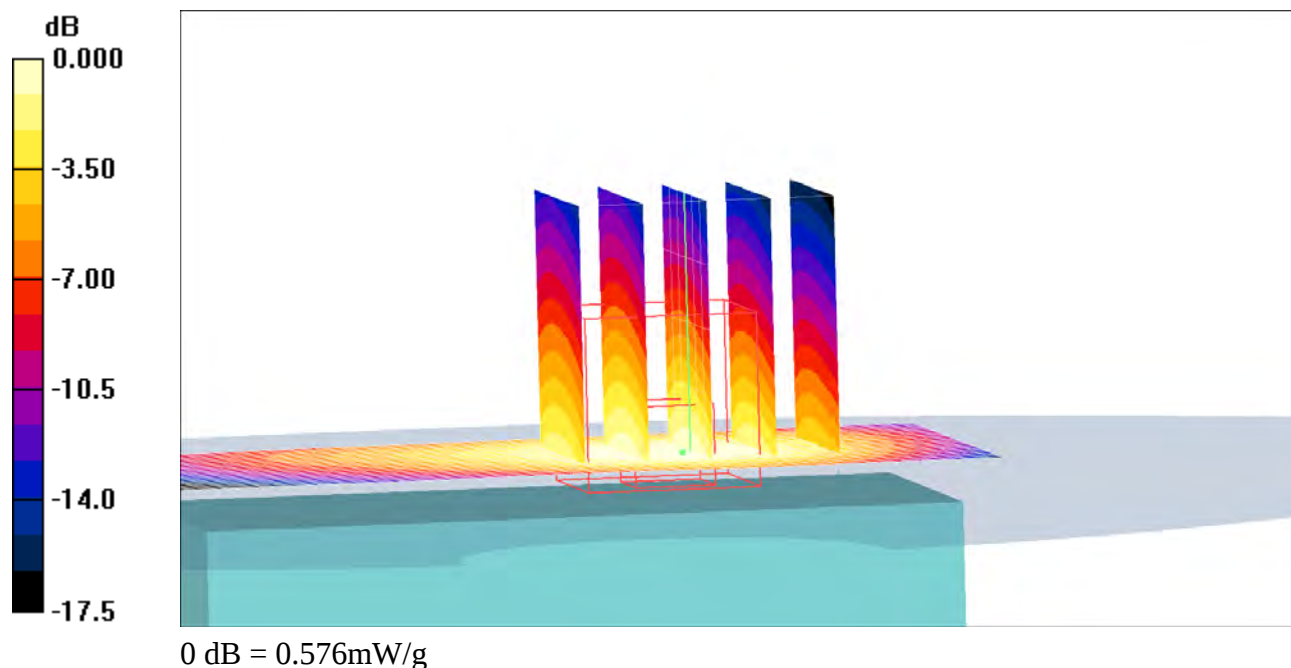
Medium parameters used:  $f = 1850.2 \text{ MHz}$ ;  $\sigma = 1.54 \text{ mho/m}$ ;  $\epsilon_r = 51.1$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.68, 4.68, 4.68); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.600 \text{ mW/g}$ **Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $15.4 \text{ V/m}$ ; Power Drift =  $-0.039 \text{ dB}$ Peak SAR (extrapolated) =  $0.867 \text{ W/kg}$ **SAR(1 g) =  $0.540 \text{ mW/g}$ ; SAR(10 g) =  $0.323 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.576 \text{ mW/g}$ 

Date/Time: 1/16/2008 11:47:42 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**SystemPerformanceCheck-D850-16-01-08****DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:442**

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

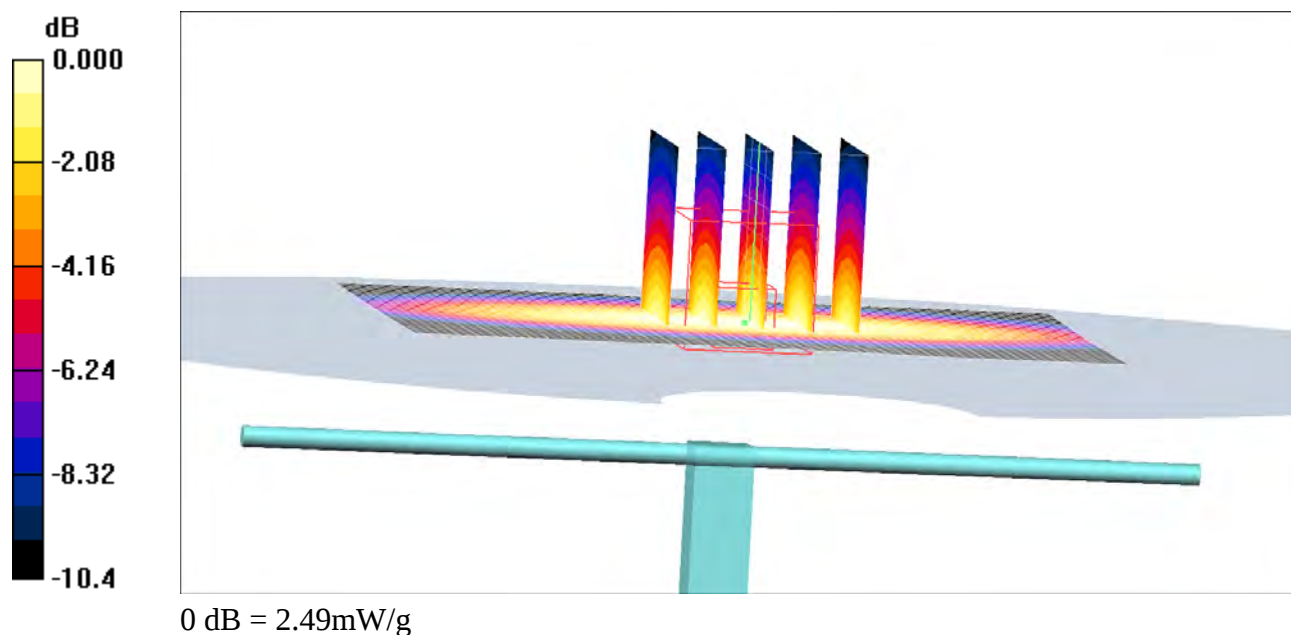
Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.86 \text{ mho/m}$ ;  $\epsilon_r = 39.7$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.69, 6.69, 6.69); Calibrated: 11/14/2007
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn448; Calibrated: 15/11/2007
  - Phantom: SAM-2; Type: SAM; Serial: 1025
  - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- d=15mm, Pin=250mW/Area Scan (61x81x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$   
Maximum value of SAR (interpolated) =  $2.47 \text{ mW/g}$
- d=15mm, Pin=250mW/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid:  
 $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$   
Reference Value =  $55.9 \text{ V/m}$ ; Power Drift =  $0.034 \text{ dB}$   
Peak SAR (extrapolated) =  $3.22 \text{ W/kg}$   
**SAR(1 g) =  $2.3 \text{ mW/g}$ ; SAR(10 g) =  $1.53 \text{ mW/g}$**   
Maximum value of SAR (measured) =  $2.49 \text{ mW/g}$



Date/Time: 1/21/2008 9:50:49 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**SystemPerformanceCheck-D850-21-01-08-Body****DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:442**

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

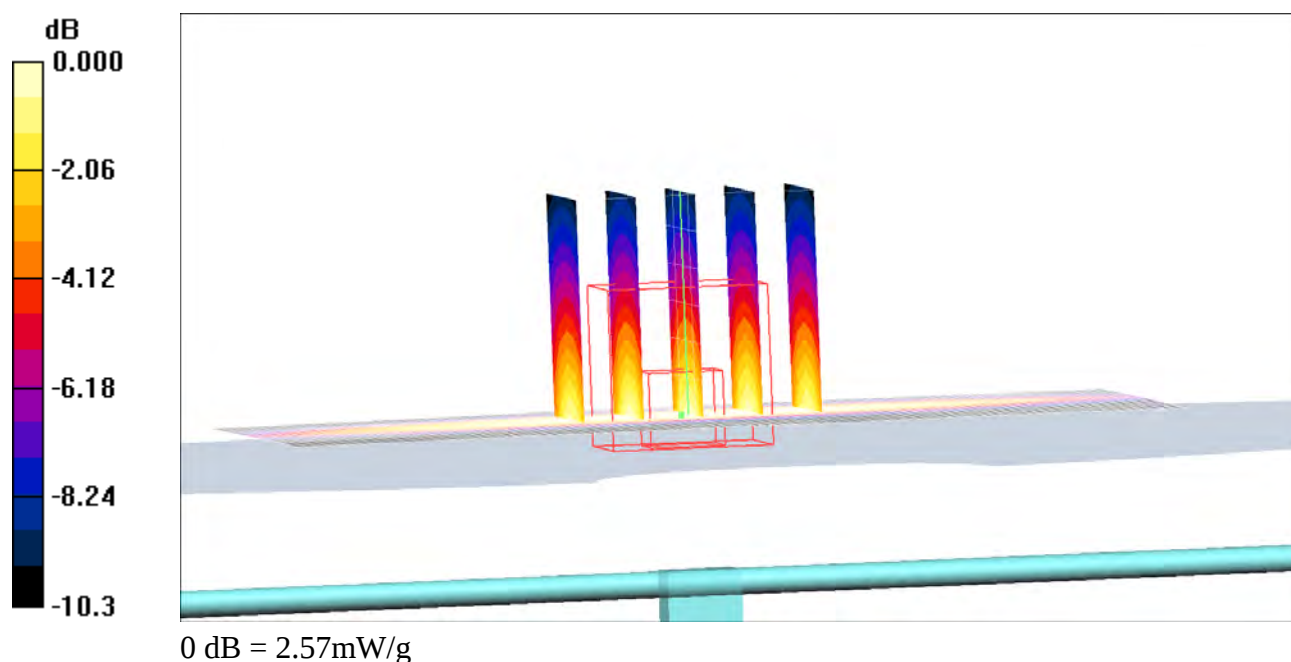
Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.98 \text{ mho/m}$ ;  $\epsilon_r = 55.1$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.39, 6.39, 6.39); Calibrated: 11/14/2007
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn448; Calibrated: 15/11/2007
  - Phantom: SAM-3; Type: SAM; Serial: 1436
  - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- d=15mm, Pin=250mW/Area Scan (61x81x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 2.56 mW/g
- d=15mm, Pin=250mW/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid:  
dx=8mm, dy=8mm, dz=5mm  
Reference Value = 53.7 V/m; Power Drift = 0.017 dB  
Peak SAR (extrapolated) = 3.24 W/kg  
**SAR(1 g) = 2.37 mW/g; SAR(10 g) = 1.57 mW/g**  
Maximum value of SAR (measured) = 2.57 mW/g



Date/Time: 1/21/2008 1:52:06 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-850Bluetooth-High****DUT: Magdalena; Type: DUT; Serial: #10204**

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

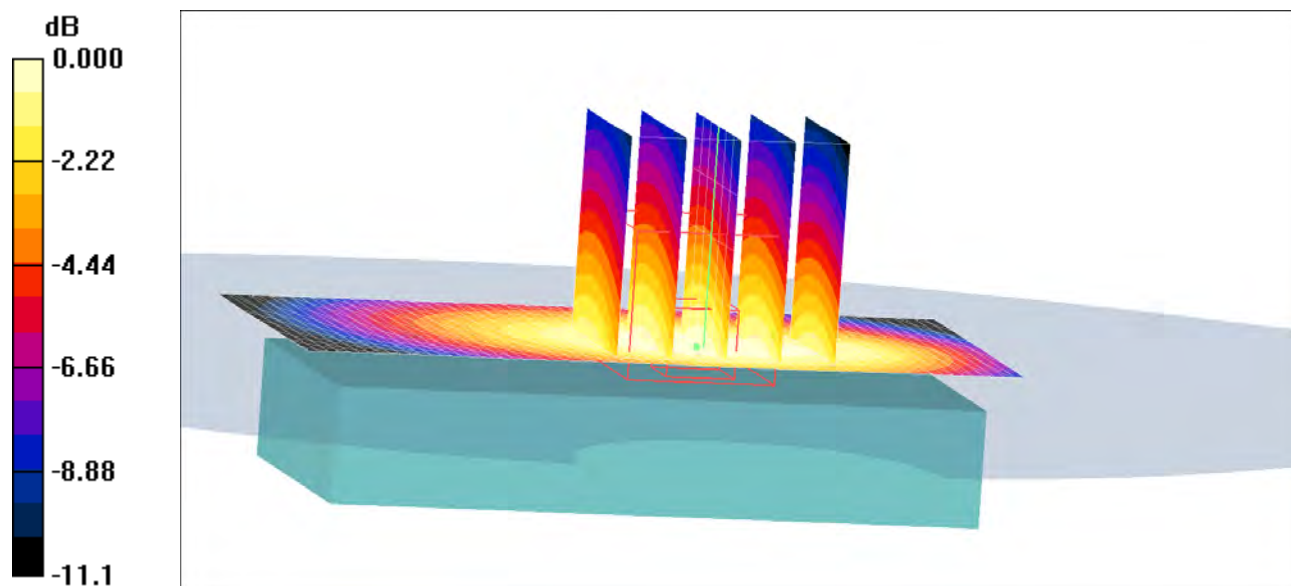
Medium parameters used:  $f = 848.8 \text{ MHz}$ ;  $\sigma = 1 \text{ mho/m}$ ;  $\epsilon_r = 55$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.39, 6.39, 6.39); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body 3/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.247 \text{ mW/g}$ **Body 3/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $15.6 \text{ V/m}$ ; Power Drift =  $-0.049 \text{ dB}$ Peak SAR (extrapolated) =  $0.306 \text{ W/kg}$ **SAR(1 g) =  $0.232 \text{ mW/g}$ ; SAR(10 g) =  $0.164 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.247 \text{ mW/g}$ 0 dB =  $0.247 \text{ mW/g}$

Date/Time: 1/21/2008 12:55:32 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-850Bluetooth-Low****DUT: Magdalena; Type: DUT; Serial: #10204**

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

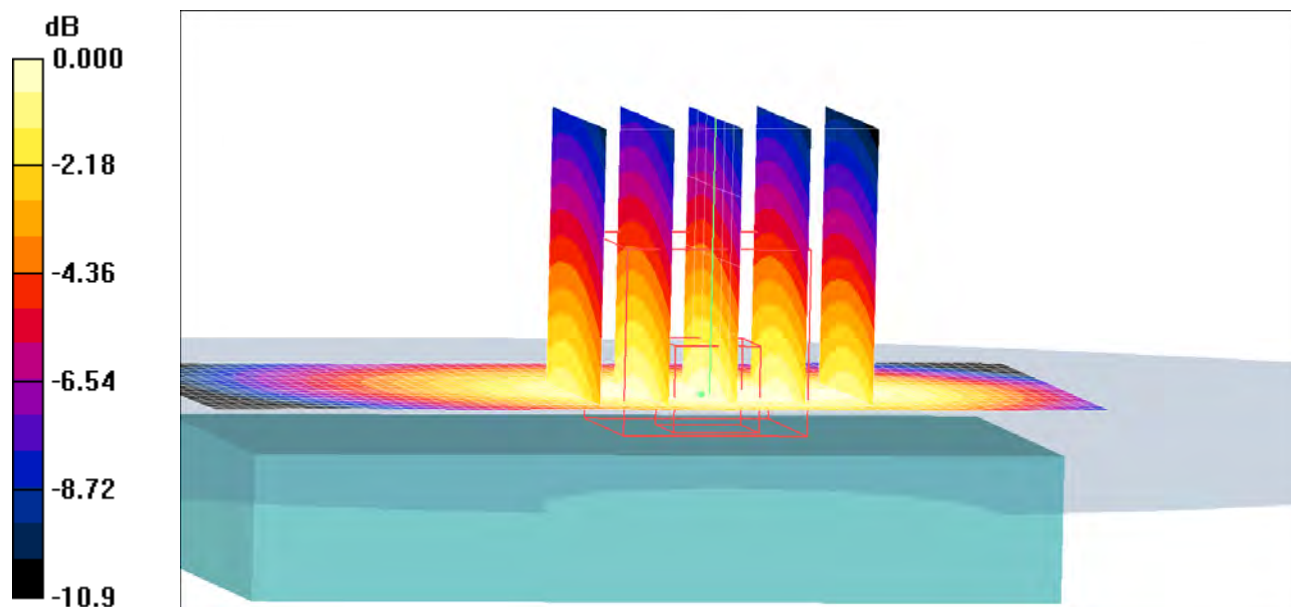
Medium parameters used:  $f = 824.2 \text{ MHz}$ ;  $\sigma = 0.97 \text{ mho/m}$ ;  $\epsilon_r = 55.3$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.39, 6.39, 6.39); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.355 \text{ mW/g}$ **Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $19.0 \text{ V/m}$ ; Power Drift =  $-0.162 \text{ dB}$ Peak SAR (extrapolated) =  $0.436 \text{ W/kg}$ **SAR(1 g) =  $0.333 \text{ mW/g}$ ; SAR(10 g) =  $0.236 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.355 \text{ mW/g}$ 0 dB =  $0.355 \text{ mW/g}$

Date/Time: 1/21/2008 1:38:32 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-850Bluetooth-Middle****DUT: Magdalena; Type: DUT; Serial: #10204**

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

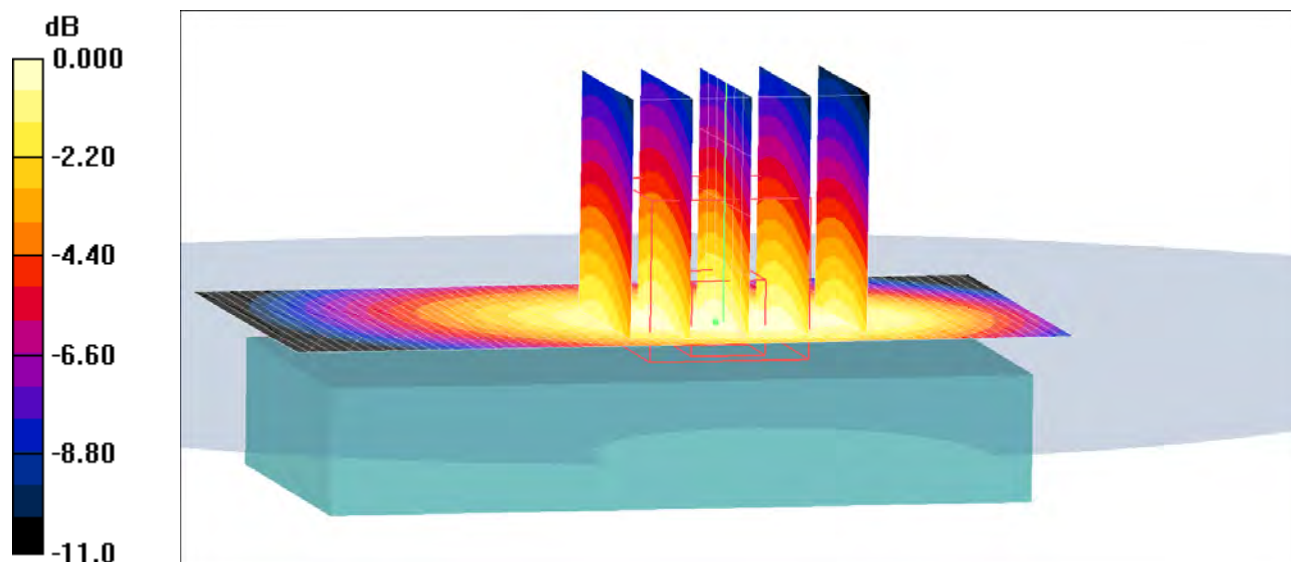
Medium parameters used:  $f = 836.6 \text{ MHz}$ ;  $\sigma = 0.99 \text{ mho/m}$ ;  $\epsilon_r = 54.1$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.39, 6.39, 6.39); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body 2/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.281 \text{ mW/g}$ **Body 2/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $16.7 \text{ V/m}$ ; Power Drift =  $-0.042 \text{ dB}$ Peak SAR (extrapolated) =  $0.351 \text{ W/kg}$ **SAR(1 g) =  $0.265 \text{ mW/g}$ ; SAR(10 g) =  $0.188 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.284 \text{ mW/g}$ 0 dB =  $0.284 \text{ mW/g}$

Date/Time: 1/21/2008 11:36:35 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-850EDGE-Low****DUT: Magdalena; Type: DUT; Serial: #10204**

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:4.15

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.97$  mho/m;  $\epsilon_r = 55.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.39, 6.39, 6.39); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body/Area Scan (41x71x1):** Measurement grid: dx=15mm, dy=15mm

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

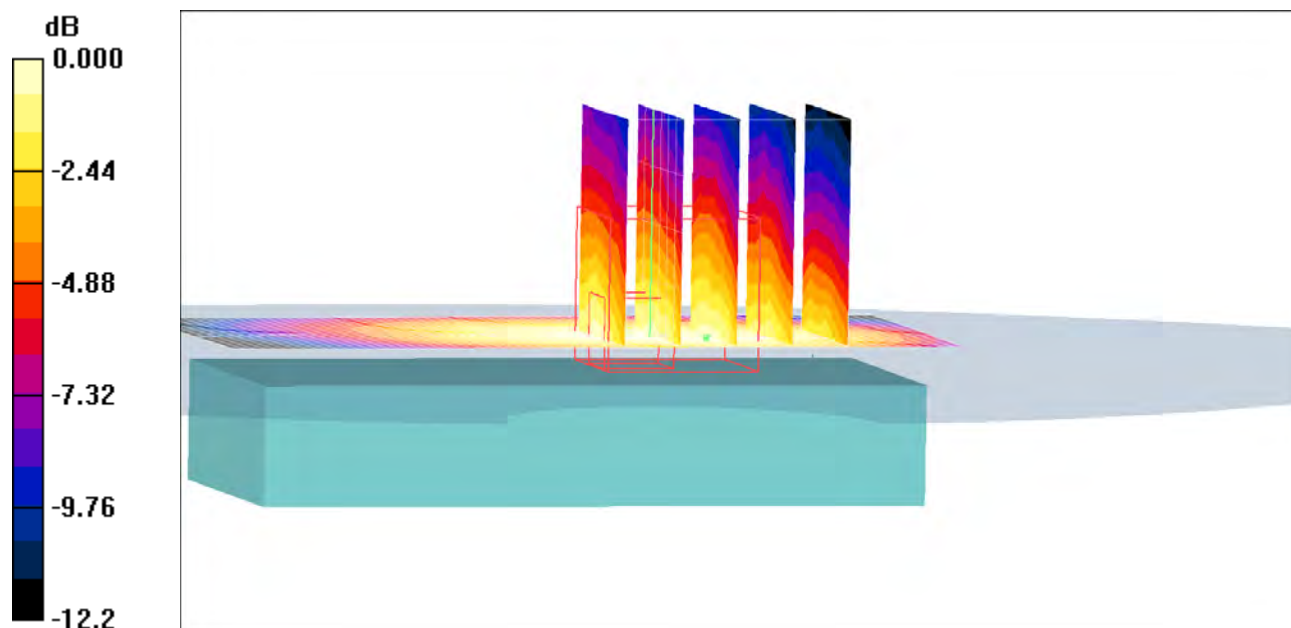
**Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 12.5 V/m; Power Drift = -0.009 dB

Peak SAR (extrapolated) = 0.228 W/kg

**SAR(1 g) = 0.160 mW/g; SAR(10 g) = 0.112 mW/g**

Maximum value of SAR (measured) = 0.178 mW/g



Date/Time: 1/21/2008 3:18:06 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-850-Front-to-Phantom-Low****DUT: Magdalena; Type: DUT; Serial: #10204**

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:4.15

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.97$  mho/m;  $\epsilon_r = 55.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.39, 6.39, 6.39); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body/Area Scan (41x71x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.292 mW/g

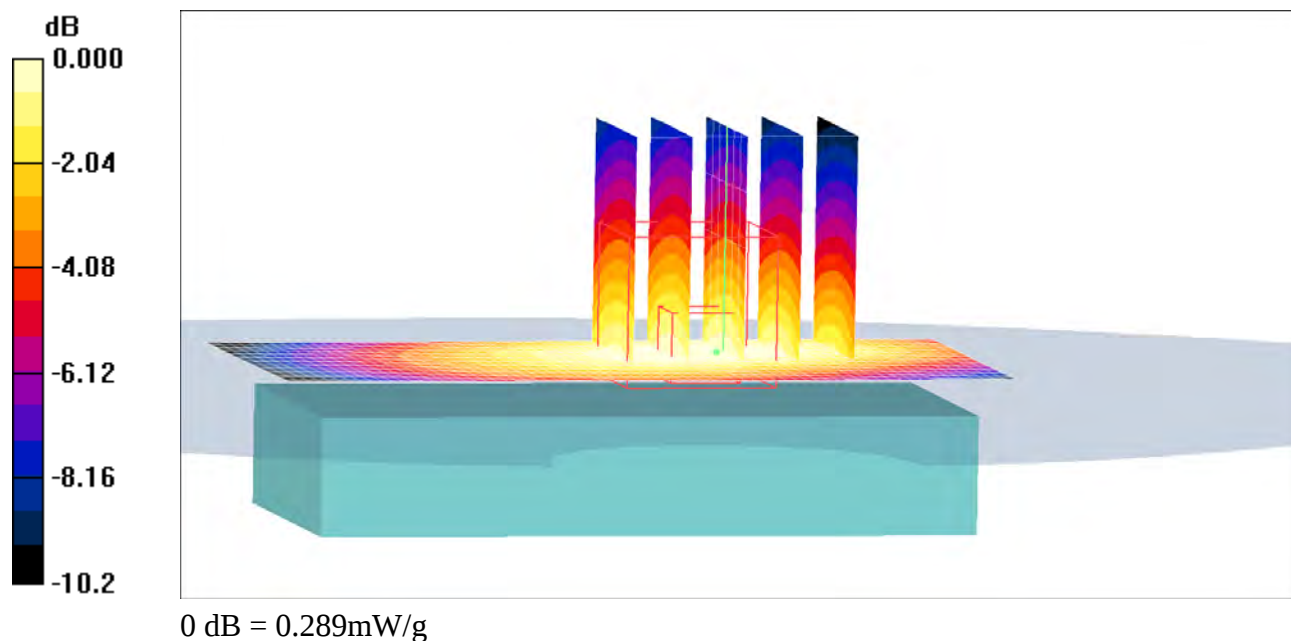
**Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 16.3 V/m; Power Drift = -0.074 dB

Peak SAR (extrapolated) = 0.351 W/kg

**SAR(1 g) = 0.273 mW/g; SAR(10 g) = 0.199 mW/g**

Maximum value of SAR (measured) = 0.289 mW/g



Date/Time: 1/21/2008 11:19:19 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-850GPRS-High****DUT: Magdalena; Type: DUT; Serial: #10204**

Communication System: GSM 850; Frequency: 848.8 MHz; Duty Cycle: 1:4.15

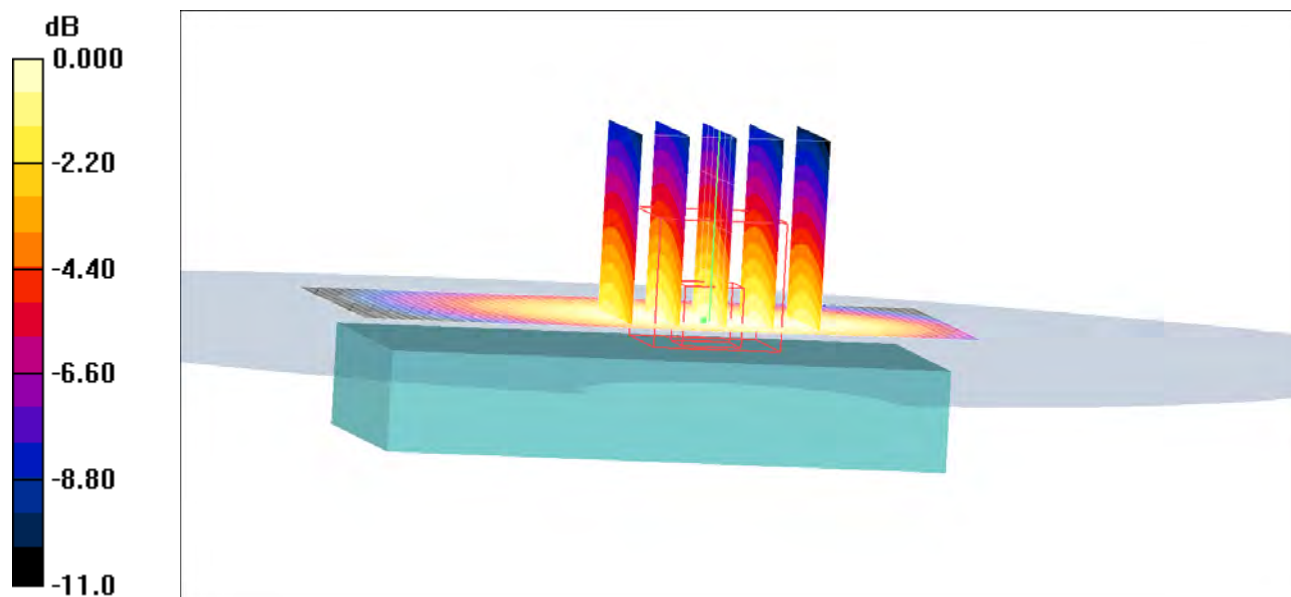
Medium parameters used:  $f = 848.8 \text{ MHz}$ ;  $\sigma = 1 \text{ mho/m}$ ;  $\epsilon_r = 55$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.39, 6.39, 6.39); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body 3/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.455 \text{ mW/g}$ **Body 3/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $21.1 \text{ V/m}$ ; Power Drift =  $-0.143 \text{ dB}$ Peak SAR (extrapolated) =  $0.567 \text{ W/kg}$ **SAR(1 g) =  $0.430 \text{ mW/g}$ ; SAR(10 g) =  $0.304 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.460 \text{ mW/g}$ 0 dB =  $0.460 \text{ mW/g}$

Date/Time: 1/21/2008 10:31:13 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-850GPRS-Low****DUT: Magdalena; Type: DUT; Serial: #10204**

Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:4.15

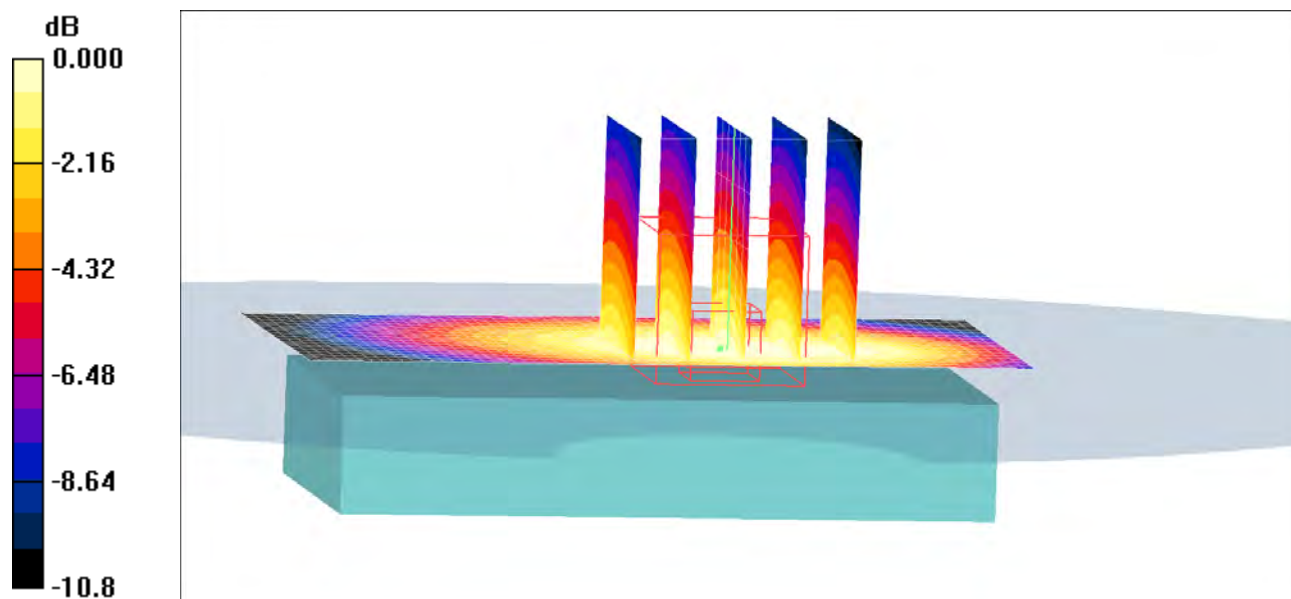
Medium parameters used:  $f = 824.2 \text{ MHz}$ ;  $\sigma = 0.97 \text{ mho/m}$ ;  $\epsilon_r = 55.3$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.39, 6.39, 6.39); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.670 \text{ mW/g}$ **Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $25.9 \text{ V/m}$ ; Power Drift =  $-0.161 \text{ dB}$ Peak SAR (extrapolated) =  $0.827 \text{ W/kg}$ **SAR(1 g) =  $0.631 \text{ mW/g}$ ; SAR(10 g) =  $0.448 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.676 \text{ mW/g}$ 0 dB =  $0.676 \text{ mW/g}$

Date/Time: 1/21/2008 10:46:25 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-850GPRS-Middle****DUT: Magdalena; Type: DUT; Serial: #10204**

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

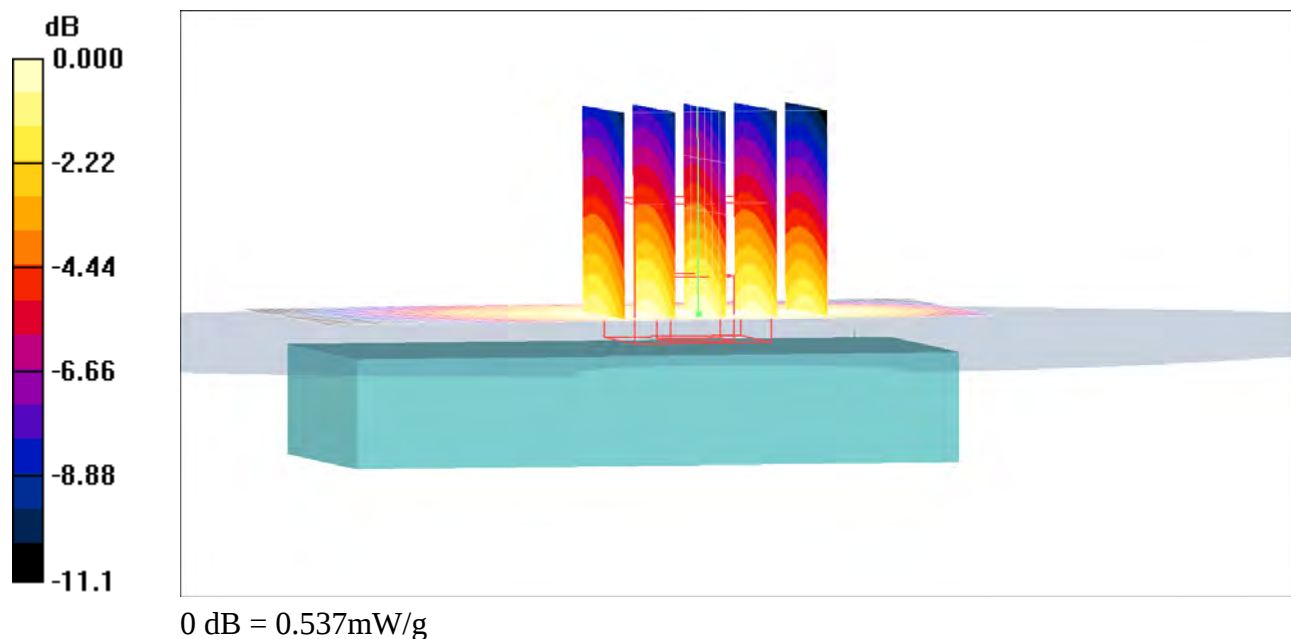
Medium parameters used:  $f = 836.6 \text{ MHz}$ ;  $\sigma = 0.99 \text{ mho/m}$ ;  $\epsilon_r = 54.1$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.39, 6.39, 6.39); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body 2/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.541 \text{ mW/g}$ **Body 2/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $22.9 \text{ V/m}$ ; Power Drift =  $-0.143 \text{ dB}$ Peak SAR (extrapolated) =  $0.662 \text{ W/kg}$ **SAR(1 g) =  $0.507 \text{ mW/g}$ ; SAR(10 g) =  $0.360 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.537 \text{ mW/g}$ 

Date/Time: 1/21/2008 2:20:54 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Magdalena-850PHF-Low****DUT: Magdalena; Type: DUT; Serial: #10204**

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

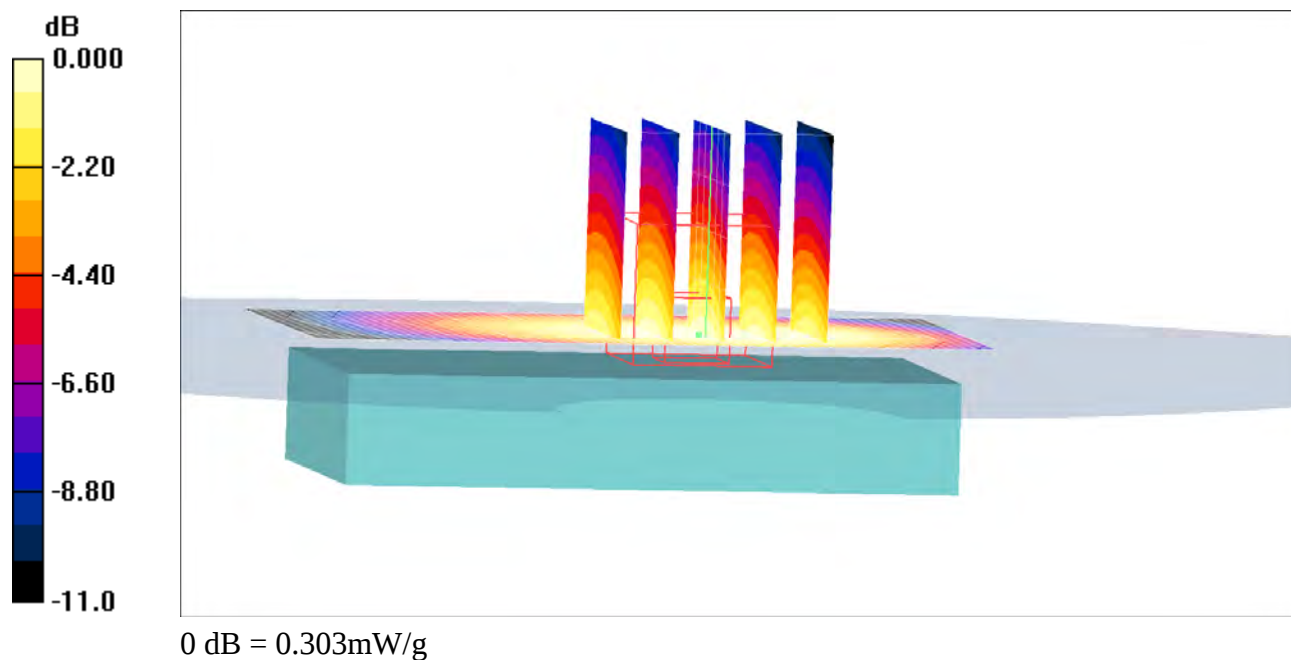
Medium parameters used:  $f = 824.2 \text{ MHz}$ ;  $\sigma = 0.97 \text{ mho/m}$ ;  $\epsilon_r = 55.3$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.39, 6.39, 6.39); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body/Area Scan (41x71x1):** Measurement grid:  $dx=15\text{mm}$ ,  $dy=15\text{mm}$ Maximum value of SAR (interpolated) =  $0.299 \text{ mW/g}$ **Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid:  $dx=5\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=8\text{mm}$ Reference Value =  $17.5 \text{ V/m}$ ; Power Drift =  $-0.090 \text{ dB}$ Peak SAR (extrapolated) =  $0.376 \text{ W/kg}$ **SAR(1 g) =  $0.285 \text{ mW/g}$ ; SAR(10 g) =  $0.203 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.303 \text{ mW/g}$ 

Date/Time: 1/16/2008 1:52:11 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-LeftHandSide-GSM850-Tilt-Middle****DUT: Magdalena; Type: DUT; Serial: #10204**

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

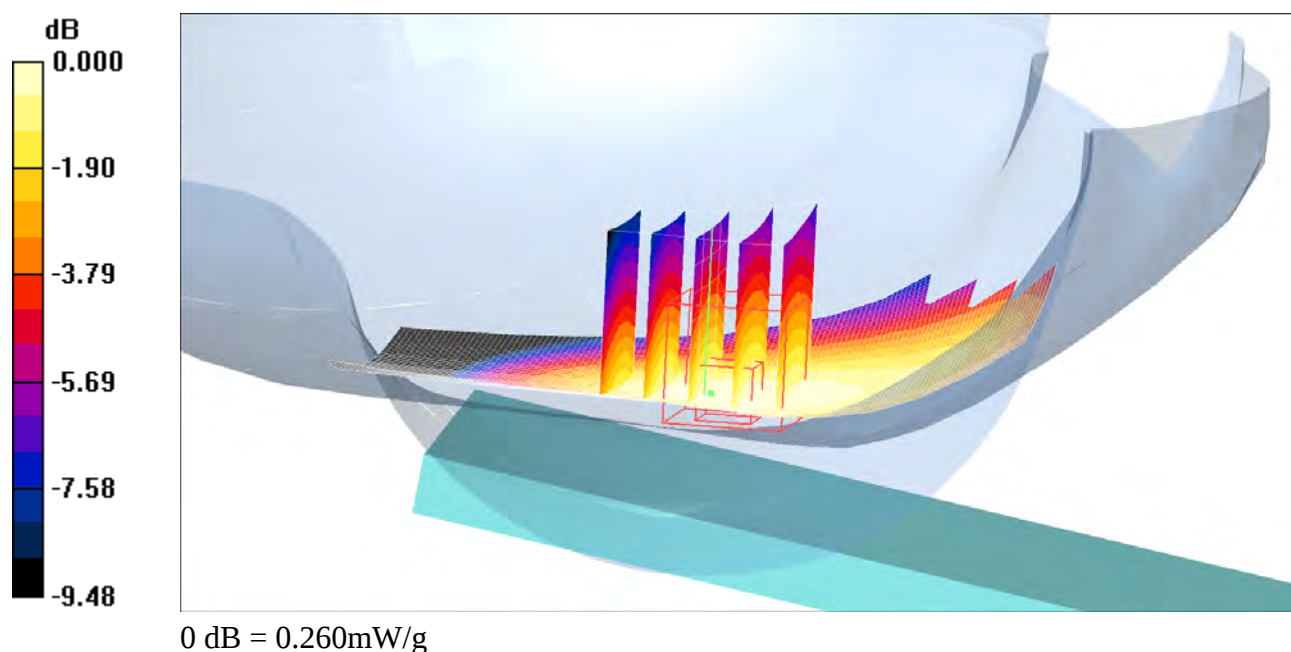
Medium parameters used:  $f = 836.6$  MHz;  $\sigma = 0.86$  mho/m;  $\epsilon_r = 39.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.69, 6.69, 6.69); Calibrated: 11/14/2007
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn448; Calibrated: 15/11/2007
  - Phantom: SAM-2; Type: SAM; Serial: 1025
  - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- Tilt position - Middle/Area Scan (71x131x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.262 mW/g
- Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  
dx=8mm, dy=8mm, dz=5mm  
Reference Value = 10.5 V/m; Power Drift = -0.037 dB  
Peak SAR (extrapolated) = 0.299 W/kg  
**SAR(1 g) = 0.248 mW/g; SAR(10 g) = 0.187 mW/g**  
Maximum value of SAR (measured) = 0.260 mW/g



Date/Time: 1/16/2008 2:39:34 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-LeftHandSide-GSM850-Touch-High****DUT: Magdalena; Type: DUT; Serial: #10204**

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

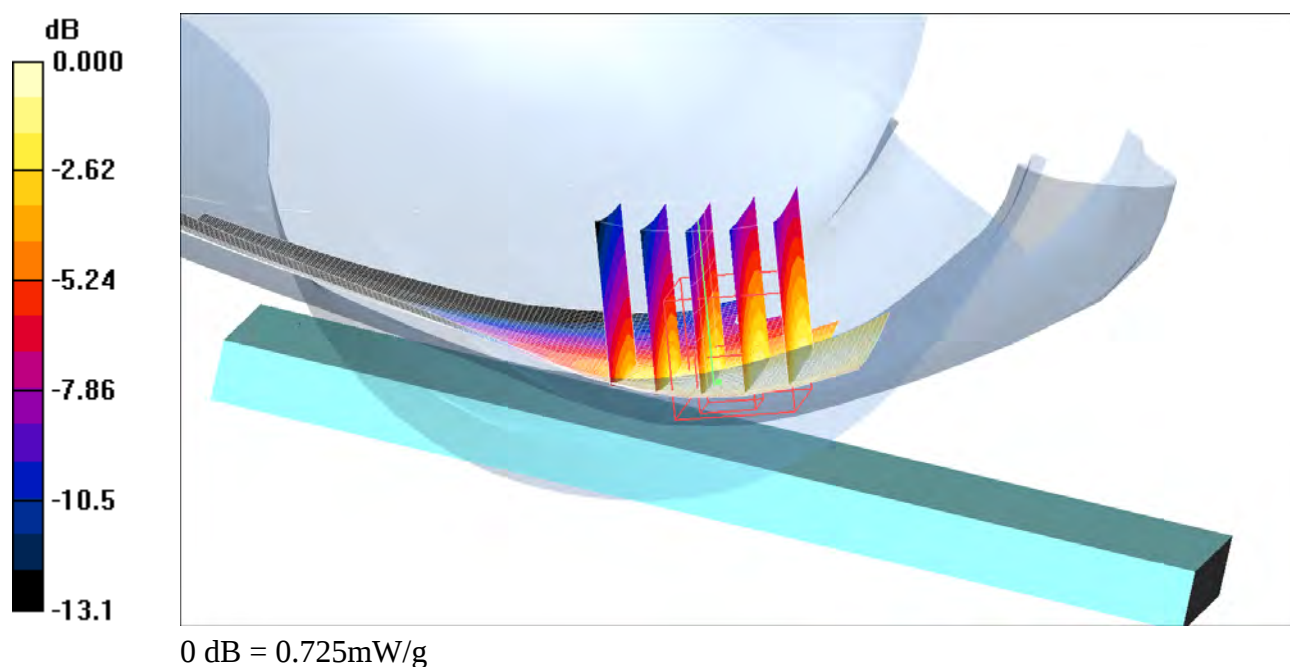
Medium parameters used:  $f = 848.8 \text{ MHz}$ ;  $\sigma = 0.87 \text{ mho/m}$ ;  $\epsilon_r = 39.5$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.69, 6.69, 6.69); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - High/Area Scan (71x131x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$ Maximum value of SAR (interpolated) =  $0.712 \text{ mW/g}$ **Touch - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ Reference Value =  $4.68 \text{ V/m}$ ; Power Drift =  $-0.055 \text{ dB}$ Peak SAR (extrapolated) =  $1.10 \text{ W/kg}$ **SAR(1 g) =  $0.652 \text{ mW/g}$ ; SAR(10 g) =  $0.424 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.725 \text{ mW/g}$ 

Date/Time: 1/16/2008 2:16:37 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-LeftHandSide-GSM850-Touch-Low****DUT: Magdalena; Type: DUT; Serial: #10204**

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

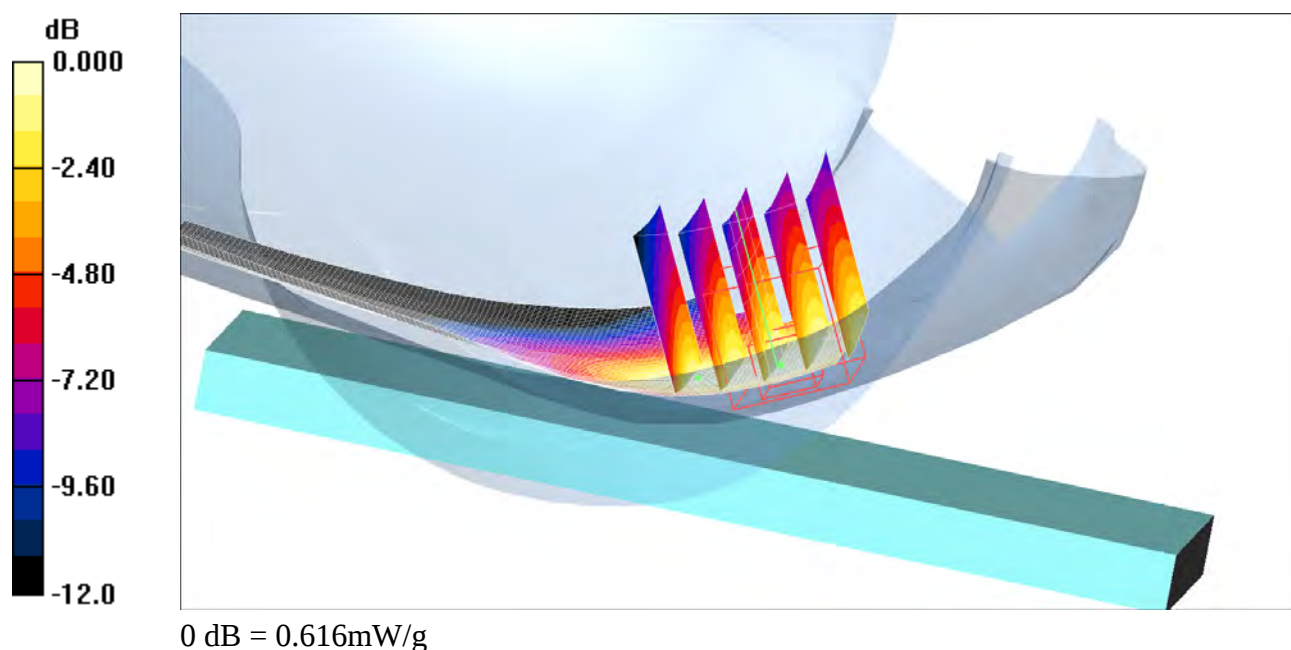
Medium parameters used:  $f = 824.2 \text{ MHz}$ ;  $\sigma = 0.85 \text{ mho/m}$ ;  $\epsilon_r = 39.8$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.69, 6.69, 6.69); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - Low/Area Scan (71x131x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$ Maximum value of SAR (interpolated) =  $0.628 \text{ mW/g}$ **Touch - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ Reference Value =  $4.13 \text{ V/m}$ ; Power Drift =  $-0.105 \text{ dB}$ Peak SAR (extrapolated) =  $1.00 \text{ W/kg}$ **SAR(1 g) =  $0.576 \text{ mW/g}$ ; SAR(10 g) =  $0.401 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.616 \text{ mW/g}$ 

Date/Time: 1/16/2008 1:29:42 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-LeftHandSide-GSM850-Touch-Middle****DUT: Magdalena; Type: DUT; Serial: #10204**

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

Medium parameters used:  $f = 836.6$  MHz;  $\sigma = 0.86$  mho/m;  $\epsilon_r = 39.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.69, 6.69, 6.69); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch position - Middle/Area Scan (71x131x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.734 mW/g

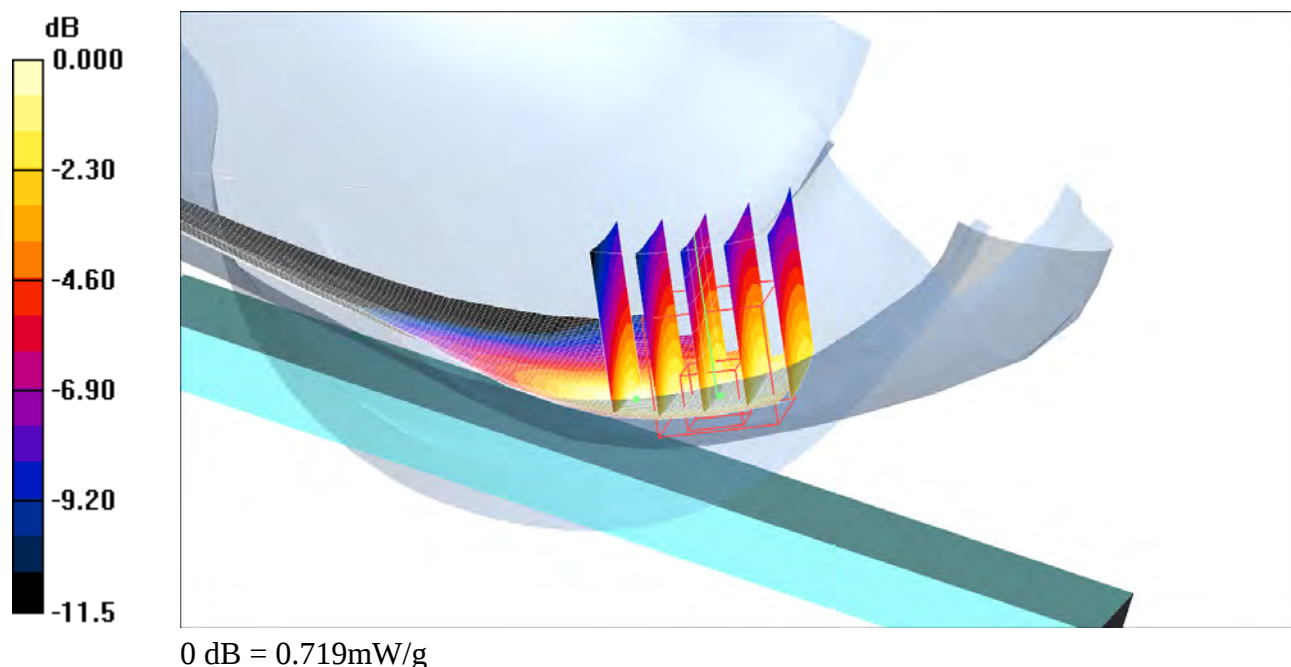
**Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.34 V/m; Power Drift = -0.018 dB

Peak SAR (extrapolated) = 1.13 W/kg

**SAR(1 g) = 0.672 mW/g; SAR(10 g) = 0.467 mW/g**

Maximum value of SAR (measured) = 0.719 mW/g



Date/Time: 1/16/2008 3:28:35 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-RightHandSide-GSM850-Tilt-Middle****DUT: Magdalena; Type: DUT; Serial: #10204**

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

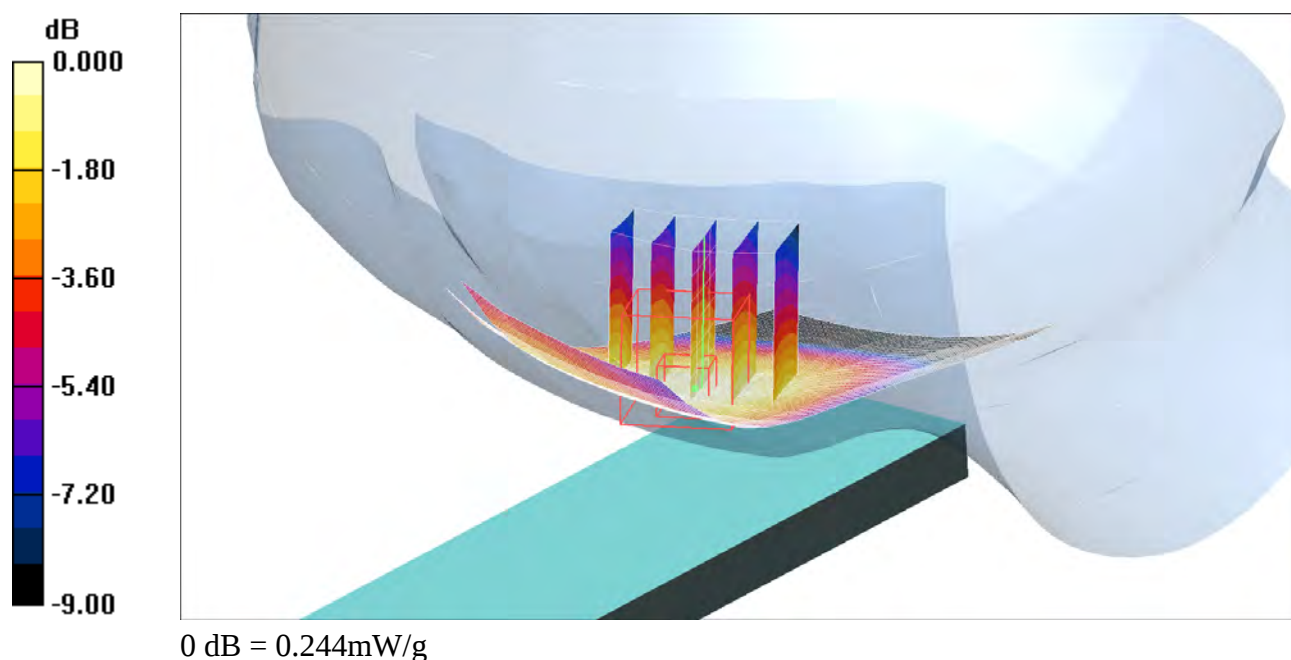
Medium parameters used:  $f = 836.6$  MHz;  $\sigma = 0.86$  mho/m;  $\epsilon_r = 39.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.69, 6.69, 6.69); Calibrated: 11/14/2007
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn448; Calibrated: 15/11/2007
  - Phantom: SAM-2; Type: SAM; Serial: 1025
  - Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- Tilt position - Middle/Area Scan (71x131x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.248 mW/g
- Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  
dx=8mm, dy=8mm, dz=5mm  
Reference Value = 11.2 V/m; Power Drift = -0.068 dB  
Peak SAR (extrapolated) = 0.276 W/kg  
**SAR(1 g) = 0.233 mW/g; SAR(10 g) = 0.178 mW/g**  
Maximum value of SAR (measured) = 0.244 mW/g



Date/Time: 1/16/2008 4:55:05 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-RightHandSide-GSM850-Touch-High****DUT: Magdalena; Type: DUT; Serial: #10204**

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

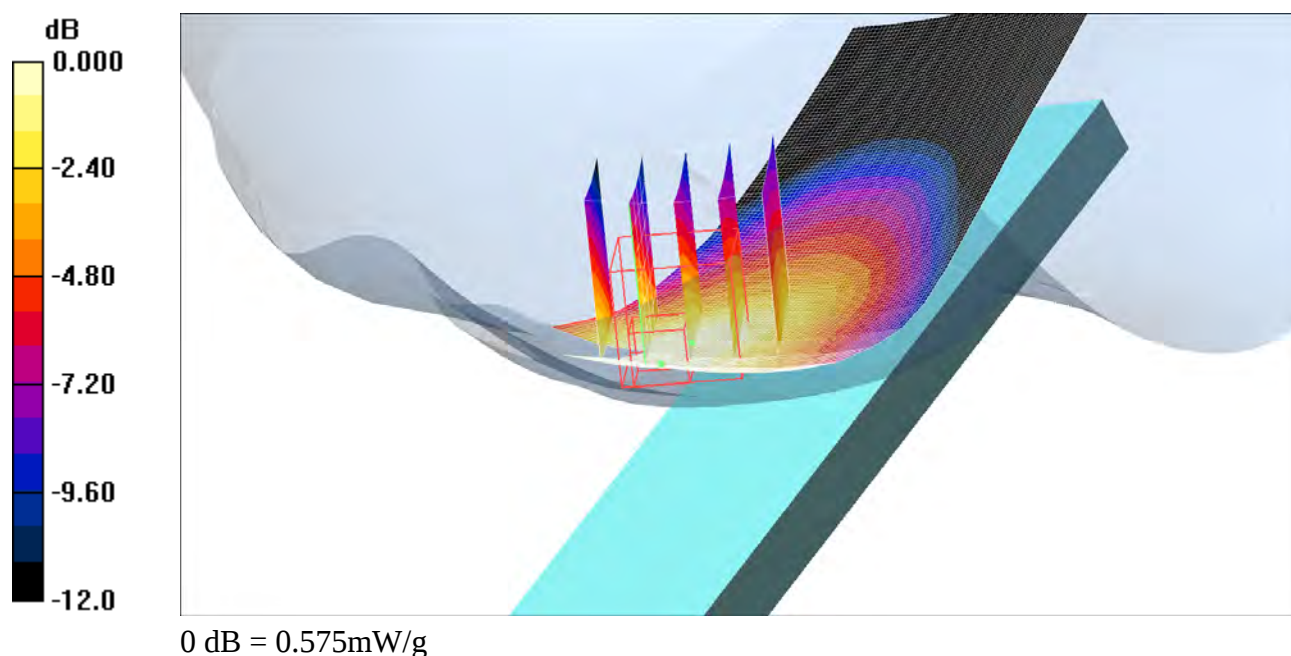
Medium parameters used:  $f = 848.8 \text{ MHz}$ ;  $\sigma = 0.87 \text{ mho/m}$ ;  $\epsilon_r = 39.5$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.69, 6.69, 6.69); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - High/Area Scan (71x131x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$ Maximum value of SAR (interpolated) =  $0.573 \text{ mW/g}$ **Touch - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ Reference Value =  $5.44 \text{ V/m}$ ; Power Drift =  $0.048 \text{ dB}$ Peak SAR (extrapolated) =  $0.765 \text{ W/kg}$ **SAR(1 g) =  $0.533 \text{ mW/g}$ ; SAR(10 g) =  $0.366 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.575 \text{ mW/g}$ 

Date/Time: 1/16/2008 4:35:07 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-RightHandSide-GSM850-Touch-Low****DUT: Magdalena; Type: DUT; Serial: #10204**

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

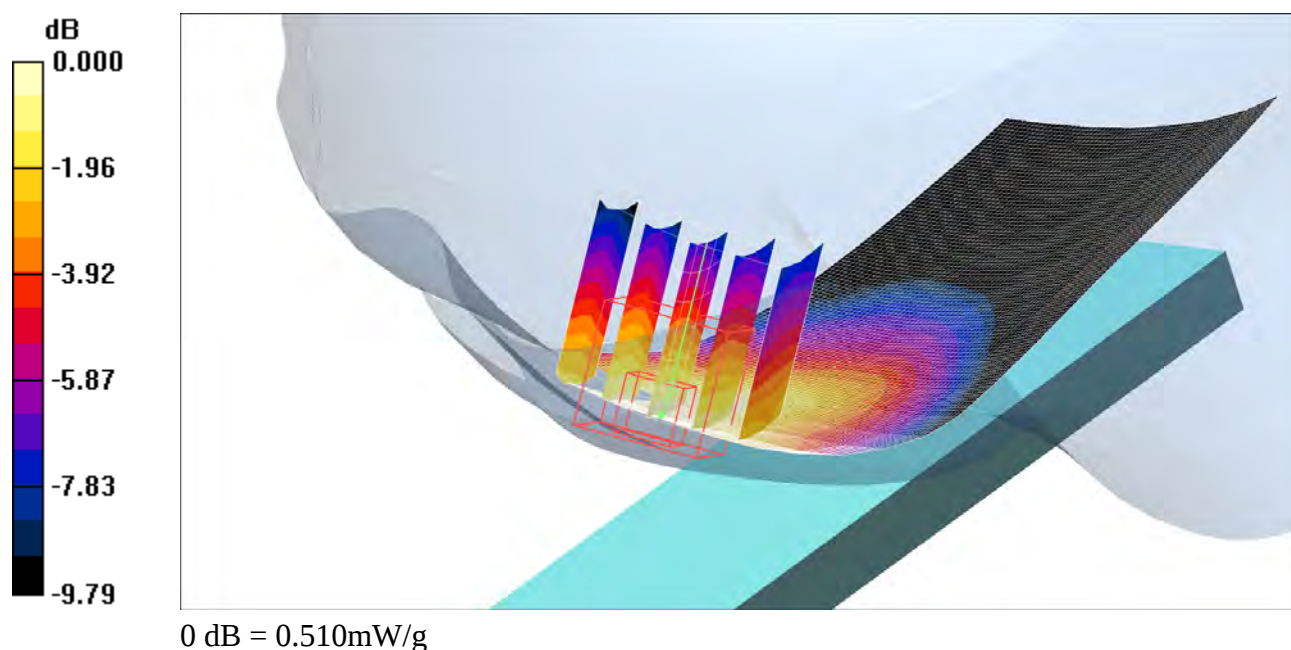
Medium parameters used:  $f = 824.2 \text{ MHz}$ ;  $\sigma = 0.85 \text{ mho/m}$ ;  $\epsilon_r = 39.8$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.69, 6.69, 6.69); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - Low/Area Scan (71x131x1):** Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$ Maximum value of SAR (interpolated) =  $0.510 \text{ mW/g}$ **Touch - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  $dx=8\text{mm}$ ,  $dy=8\text{mm}$ ,  $dz=5\text{mm}$ Reference Value =  $4.77 \text{ V/m}$ ; Power Drift =  $-0.111 \text{ dB}$ Peak SAR (extrapolated) =  $0.603 \text{ W/kg}$ **SAR(1 g) =  $0.480 \text{ mW/g}$ ; SAR(10 g) =  $0.352 \text{ mW/g}$** Maximum value of SAR (measured) =  $0.510 \text{ mW/g}$ 

Date/Time: 1/16/2008 3:08:29 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Magdalena-RightHandSide-GSM850-Touch-Middle****DUT: Magdalena; Type: DUT; Serial: #10204**

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

Medium parameters used:  $f = 836.6$  MHz;  $\sigma = 0.86$  mho/m;  $\epsilon_r = 39.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(6.69, 6.69, 6.69); Calibrated: 11/14/2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn448; Calibrated: 15/11/2007
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch position - Middle/Area Scan (71x131x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.594 mW/g

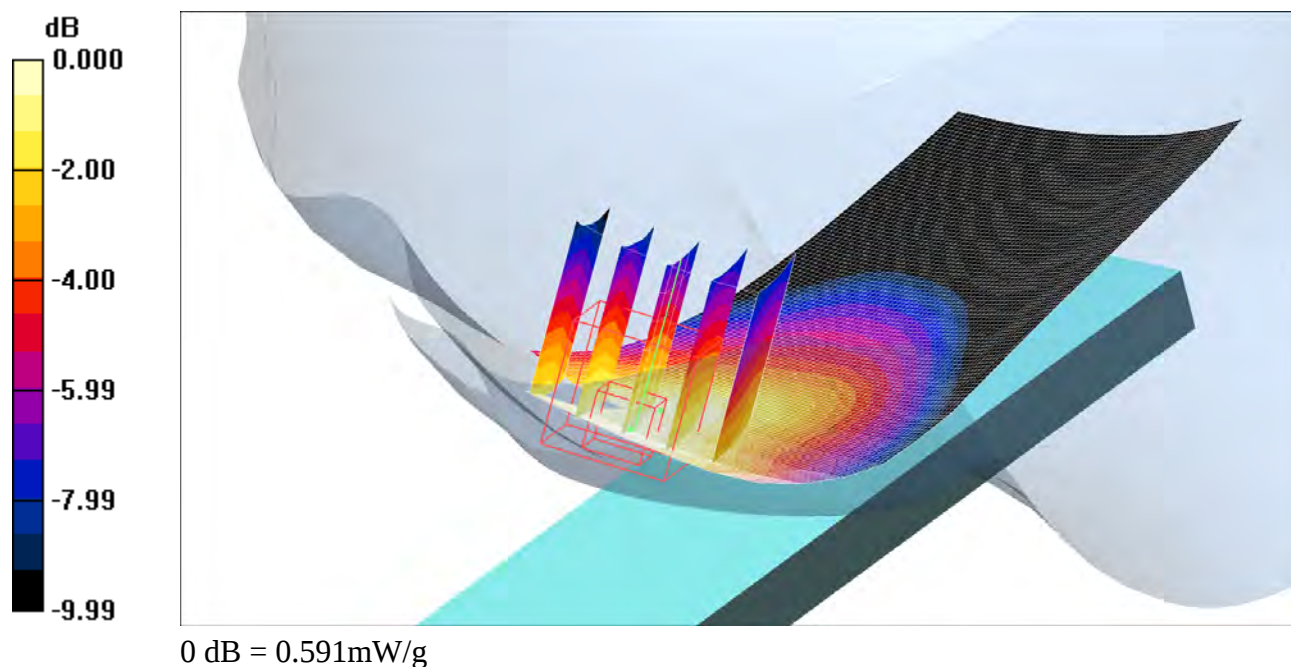
**Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.49 V/m; Power Drift = -0.075 dB

Peak SAR (extrapolated) = 0.756 W/kg

**SAR(1 g) = 0.554 mW/g; SAR(10 g) = 0.403 mW/g**

Maximum value of SAR (measured) = 0.591 mW/g





Accredited by the Swiss Federal Office of Metrology and Accreditation  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Ericsson UK**

Certificate No: **D1900V2-539\_Dec06**

## CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 539**

Calibration procedure(s) **QA CAL-05.v6  
Calibration procedure for dipole validation kits**

Calibration date: **December 12, 2006**

Condition of the calibrated item **In Tolerance**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #             | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |
|-----------------------------|------------------|-------------------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704       | 03-Oct-06 (METAS, No. 217-00608)          | Oct-07                 |
| Power sensor HP 8481A       | US37292783       | 03-Oct-06 (METAS, No. 217-00608)          | Oct-07                 |
| Reference 20 dB Attenuator  | SN: 5086 (20g)   | 10-Aug-06 (METAS, No 217-00591)           | Aug-07                 |
| Reference 10 dB Attenuator  | SN: 5047.2 (10r) | 10-Aug-06 (METAS, No 217-00591)           | Aug-07                 |
| Reference Probe ET3DV6      | SN: 1507         | 19-Oct-06 (SPEAG, No. ET3-1507_Oct06)     | Oct-07                 |
| Reference Probe ES3DV3      | SN: 3025         | 19-Oct-06 (SPEAG, No. ES3-3025_Oct06)     | Oct-07                 |
| DAE4                        | SN: 601          | 15-Dec-05 (SPEAG, No. DAE4-601_Dec05)     | Dec-06                 |
| Secondary Standards         | ID #             | Check Date (in house)                     | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317       | 18-Oct-02 (SPEAG, in house check Oct-05)  | In house check: Oct-07 |
| RF generator Agilent E4421B | MY41000675       | 11-May-05 (SPEAG, in house check Nov-05)  | In house check: Nov-07 |
| Network Analyzer HP 8753E   | US37390585 S4206 | 18-Oct-01 (SPEAG, in house check Oct-06)  | In house check: Oct-07 |

Calibrated by: **Mike Moll** **Mike Moll** **Laboratory Technician** **M. Moll**

Approved by: **Katja Pokovic** **Katja Pokovic** **Technical Manager**

Issued: December 13, 2006

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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

### Glossary:

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

### Calibration is Performed According to the Following Standards:

- 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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

### Additional Documentation:

- DASY4 System Handbook

### Methods Applied and Interpretation of Parameters:

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

## Measurement Conditions

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

|                                     |                           |             |
|-------------------------------------|---------------------------|-------------|
| <b>DASY Version</b>                 | DASY4                     | V4.7        |
| <b>Extrapolation</b>                | Advanced Extrapolation    |             |
| <b>Phantom</b>                      | Modular Flat Phantom V5.0 |             |
| <b>Distance Dipole Center - TSL</b> | 10 mm                     | with Spacer |
| <b>Area Scan Resolution</b>         | dx, dy = 15 mm            |             |
| <b>Zoom Scan Resolution</b>         | dx, dy, dz = 5 mm         |             |
| <b>Frequency</b>                    | 1900 MHz $\pm$ 1 MHz      |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                         | Temperature         | Permittivity   | Conductivity         |
|-----------------------------------------|---------------------|----------------|----------------------|
| <b>Nominal Head TSL parameters</b>      | 22.0 °C             | 40.0           | 1.40 mho/m           |
| <b>Measured Head TSL parameters</b>     | (22.0 $\pm$ 0.2) °C | 38.4 $\pm$ 6 % | 1.40 mho/m $\pm$ 6 % |
| <b>Head TSL temperature during test</b> | (21.2 $\pm$ 0.2) °C | ---            | ---                  |

## SAR result with Head TSL

|                                                             |                    |                                                  |
|-------------------------------------------------------------|--------------------|--------------------------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Head TSL</b> | condition          |                                                  |
| SAR measured                                                | 250 mW input power | 9.18 mW / g                                      |
| SAR normalized                                              | normalized to 1W   | 36.7 mW / g                                      |
| SAR for nominal Head TSL parameters <sup>1</sup>            | normalized to 1W   | <b>35.9 mW / g <math>\pm</math> 17.0 % (k=2)</b> |

|                                                               |                    |                                                  |
|---------------------------------------------------------------|--------------------|--------------------------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Head TSL</b> | Condition          |                                                  |
| SAR measured                                                  | 250 mW input power | 4.85 mW / g                                      |
| SAR normalized                                                | normalized to 1W   | 19.4 mW / g                                      |
| SAR for nominal Head TSL parameters <sup>1</sup>              | normalized to 1W   | <b>19.1 mW / g <math>\pm</math> 16.5 % (k=2)</b> |

<sup>1</sup> Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

## Body TSL parameters

The following parameters and calculations were applied.

|                                  | Temperature     | Permittivity | Conductivity     |
|----------------------------------|-----------------|--------------|------------------|
| Nominal Body TSL parameters      | 22.0 °C         | 53.3         | 1.52 mho/m       |
| Measured Body TSL parameters     | (22.0 ± 0.2) °C | 51.8 ± 6 %   | 1.54 mho/m ± 6 % |
| Body TSL temperature during test | (21.6 ± 0.2) °C | —            | —                |

## SAR result with Body TSL

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL | Condition          |                                   |
|-------------------------------------------------------|--------------------|-----------------------------------|
| SAR measured                                          | 250 mW input power | 9.49 mW / g                       |
| SAR normalized                                        | normalized to 1W   | 38.0 mW / g                       |
| SAR for nominal Body TSL parameters <sup>2</sup>      | normalized to 1W   | <b>37.0 mW / g ± 17.0 % (k=2)</b> |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL | condition          |                                   |
|---------------------------------------------------------|--------------------|-----------------------------------|
| SAR measured                                            | 250 mW input power | 5.05 mW / g                       |
| SAR normalized                                          | normalized to 1W   | 20.2 mW / g                       |
| SAR for nominal Body TSL parameters <sup>2</sup>        | normalized to 1W   | <b>19.8 mW / g ± 16.5 % (k=2)</b> |

---

<sup>2</sup> Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

## Appendix

### Antenna Parameters with Head TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $54.1 \Omega + 0.9 j\Omega$ |
| Return Loss                          | - 27.9 dB                   |

### Antenna Parameters with Body TSL

|                                      |                             |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $49.0 \Omega + 2.7 j\Omega$ |
| Return Loss                          | - 30.7 dB                   |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.200 ns |
|----------------------------------|----------|

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

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

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

### Additional EUT Data

|                 |               |
|-----------------|---------------|
| Manufactured by | SPEAG         |
| Manufactured on | July 26, 2001 |

## DASY4 Validation Report for Head TSL

Date/Time: 11.12.2006 17:13:38

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:539**

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

Medium: HSL U10 BB;

Medium parameters used:  $f = 1900 \text{ MHz}$ ;  $\sigma = 1.4 \text{ mho/m}$ ;  $\epsilon_r = 38.4$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

### DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.97, 4.97, 4.97); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

**Pin = 250 mW; d = 10 mm/Area Scan (101x101x1):**

Measurement grid:  $dx=10\text{mm}$ ,  $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 10.3 mW/g

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

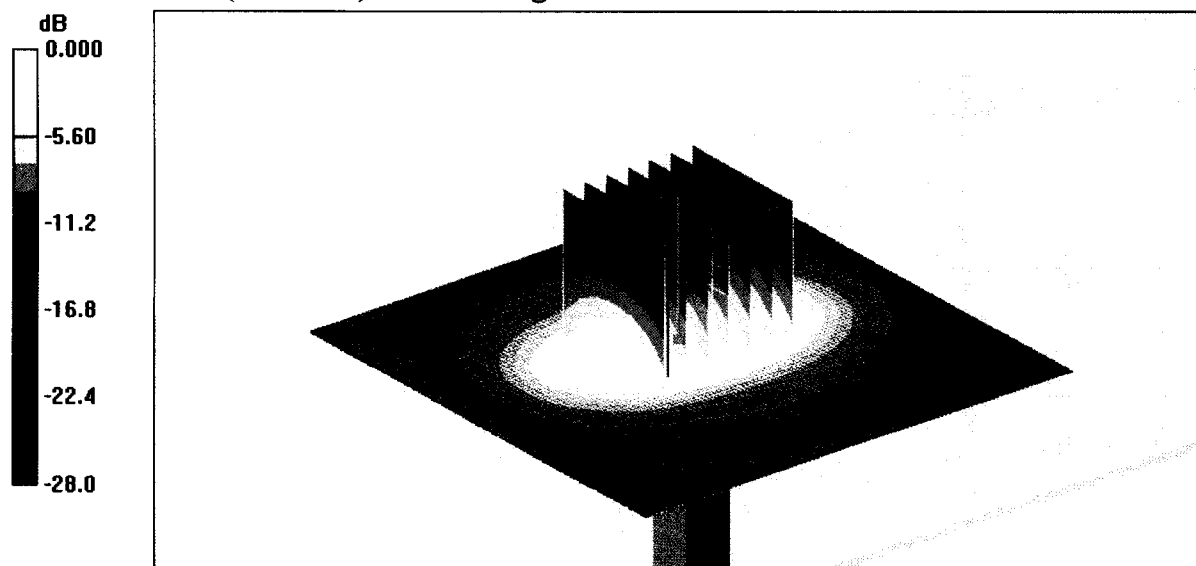
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 86.4 V/m; Power Drift = 0.045 dB

Peak SAR (extrapolated) = 15.7 W/kg

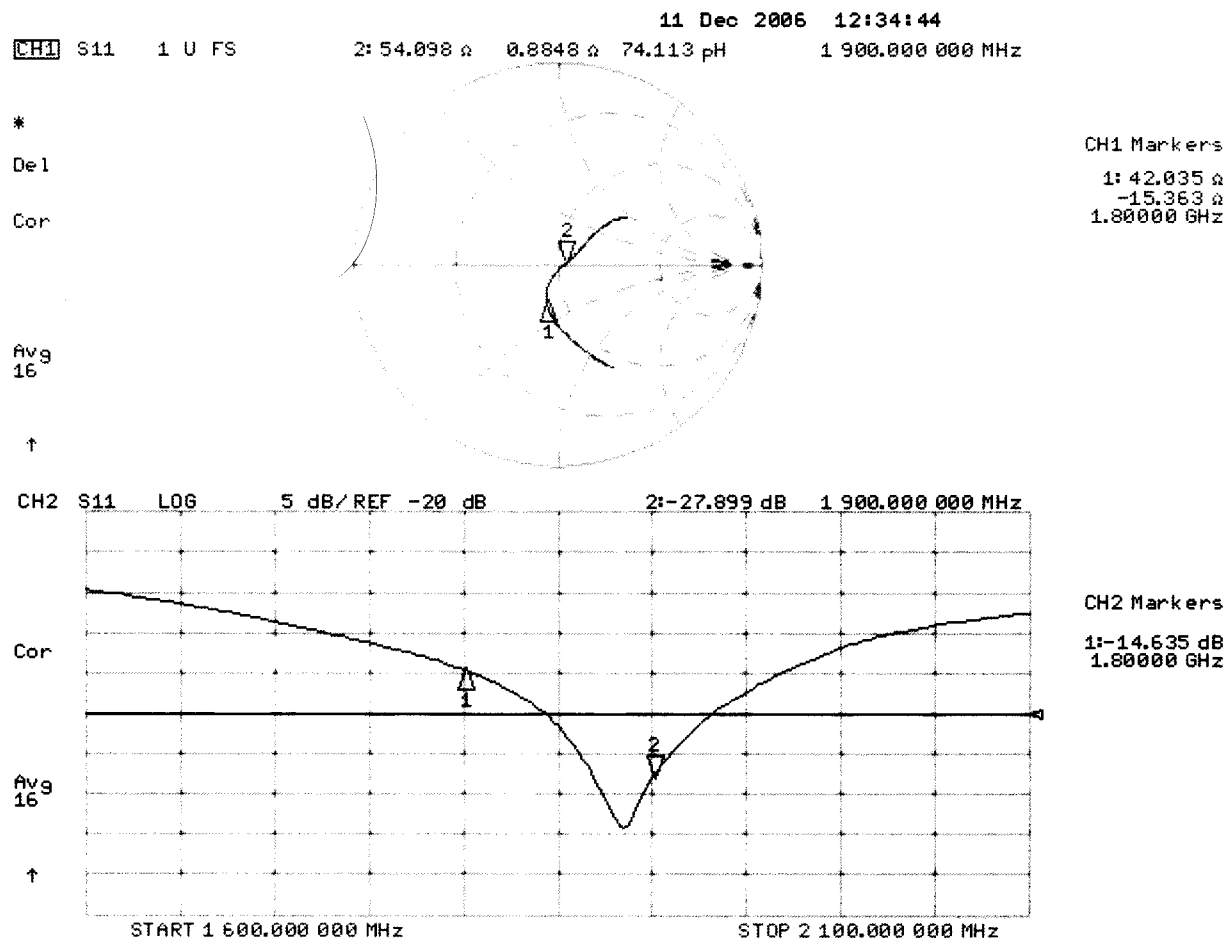
**SAR(1 g) = 9.18 mW/g; SAR(10 g) = 4.85 mW/g**

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



0 dB = 10.5mW/g

Impedance Measurement Plot for Head TSL



## DASY4 Validation Report for Body TSL

Date/Time: 12.12.2006 15:22:28

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:539**

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

Medium: MSL U10 BB;

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 51.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

### DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.43, 4.43, 4.43); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 171

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

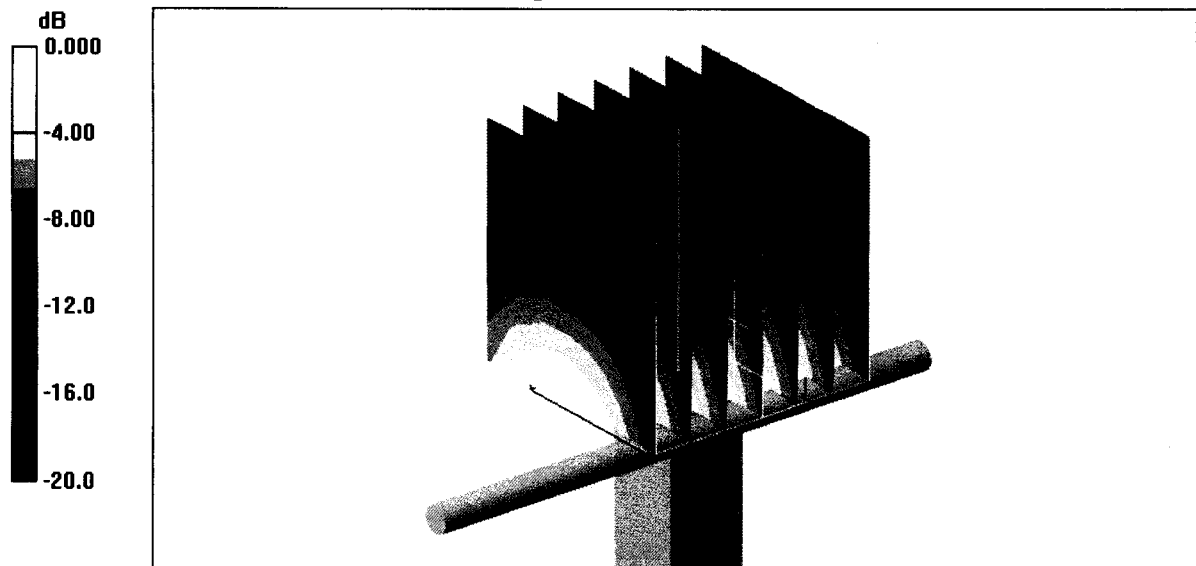
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.4 V/m; Power Drift = -0.001 dB

Peak SAR (extrapolated) = 15.8 W/kg

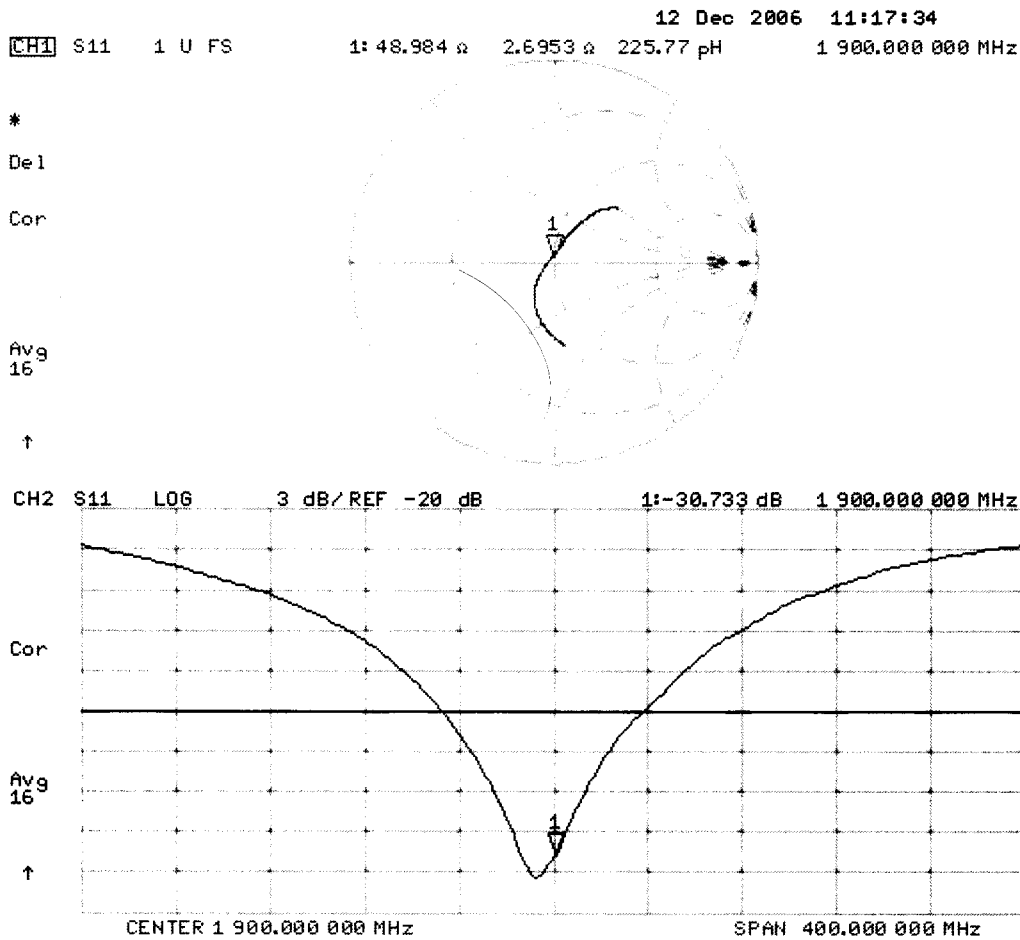
**SAR(1 g) = 9.49 mW/g; SAR(10 g) = 5.05 mW/g**

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



0 dB = 10.5mW/g

Impedance Measurement Plot for Body TSL





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Accreditation No.: **SCS 108**

Client **Ericsson UK**

Certificate No: **D835V2-442\_Dec06**

## CALIBRATION CERTIFICATE

Object **D835V2 - SN: 442**

Calibration procedure(s) **QA CAL-05.v6  
Calibration procedure for dipole validation kits**

Calibration date: **December 06, 2006**

Condition of the calibrated item **In Tolerance**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID #             | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |
|-----------------------------|------------------|-------------------------------------------|------------------------|
| Power meter EPM-442A        | GB37480704       | 03-Oct-06 (METAS, No. 217-00608)          | Oct-07                 |
| Power sensor HP 8481A       | US37292783       | 03-Oct-06 (METAS, No. 217-00608)          | Oct-07                 |
| Reference 20 dB Attenuator  | SN: 5086 (20g)   | 10-Aug-06 (METAS, No 217-00591)           | Aug-07                 |
| Reference 10 dB Attenuator  | SN: 5047.2 (10r) | 10-Aug-06 (METAS, No 217-00591)           | Aug-07                 |
| Reference Probe ET3DV6 (HF) | SN 1507          | 19-Oct-06 (SPEAG, No. ET3-1507_Oct06)     | Oct-07                 |
| DAE4                        | SN 601           | 15-Dec-05 (SPEAG, No. DAE4-601_Dec05)     | Dec-06                 |
| Secondary Standards         | ID #             | Check Date (in house)                     | Scheduled Check        |
| Power sensor HP 8481A       | MY41092317       | 18-Oct-02 (SPEAG, in house check Oct-05)  | In house check: Oct-07 |
| RF generator Agilent E4421B | MY41000675       | 11-May-05 (SPEAG, in house check Nov-05)  | In house check: Nov-07 |
| Network Analyzer HP 8753E   | US37390585 S4206 | 18-Oct-01 (SPEAG, in house check Oct-06)  | In house check: Oct-07 |

|                |                                |                                   |               |
|----------------|--------------------------------|-----------------------------------|---------------|
| Calibrated by: | Name<br><b>Claudio Leubler</b> | Function<br>Laboratory Technician | Signature<br> |
| Approved by:   | Name<br><b>Katja Pokovic</b>   | Technical Manager                 |               |

Issued: December 8, 2006

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



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Accreditation No.: **SCS 108**

**Glossary:**

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

**Calibration is Performed According to the Following Standards:**

- 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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

**Additional Documentation:**

- DASY4 System Handbook

**Methods Applied and Interpretation of Parameters:**

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

## Measurement Conditions

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

|                              |                           |             |
|------------------------------|---------------------------|-------------|
| DASY Version                 | DASY4                     | V4.7        |
| Extrapolation                | Advanced Extrapolation    |             |
| Phantom                      | Modular Flat Phantom V4.9 |             |
| Distance Dipole Center - TSL | 15 mm                     | with Spacer |
| Zoom Scan Resolution         | dx, dy, dz = 5 mm         |             |
| Frequency                    | 835 MHz $\pm$ 1 MHz       |             |

## Head TSL parameters

The following parameters and calculations were applied.

|                                  | Temperature         | Permittivity   | Conductivity         |
|----------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters      | 22.0 °C             | 41.5           | 0.90 mho/m           |
| Measured Head TSL parameters     | (22.0 $\pm$ 0.2) °C | 41.7 $\pm$ 6 % | 0.90 mho/m $\pm$ 6 % |
| Head TSL temperature during test | (22.8 $\pm$ 0.2) °C | —              | —                    |

## SAR result with Head TSL

| SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL | Condition          |                                                  |
|-------------------------------------------------------|--------------------|--------------------------------------------------|
| SAR measured                                          | 250 mW input power | 2.35 mW / g                                      |
| SAR normalized                                        | normalized to 1W   | 9.40 mW / g                                      |
| SAR for nominal Head TSL parameters <sup>1</sup>      | normalized to 1W   | <b>9.43 mW / g <math>\pm</math> 17.0 % (k=2)</b> |

| SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL | condition          |                                                  |
|---------------------------------------------------------|--------------------|--------------------------------------------------|
| SAR measured                                            | 250 mW input power | 1.54 mW / g                                      |
| SAR normalized                                          | normalized to 1W   | 6.16 mW / g                                      |
| SAR for nominal Head TSL parameters <sup>1</sup>        | normalized to 1W   | <b>6.17 mW / g <math>\pm</math> 16.5 % (k=2)</b> |

<sup>1</sup> Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

## Body TSL parameters

The following parameters and calculations were applied.

|                                  | Temperature     | Permittivity | Conductivity     |
|----------------------------------|-----------------|--------------|------------------|
| Nominal Body TSL parameters      | 22.0 °C         | 55.2         | 0.97 mho/m       |
| Measured Body TSL parameters     | (22.0 ± 0.2) °C | 54.1 ± 6 %   | 1.00 mho/m ± 6 % |
| Body TSL temperature during test | (22.0 ± 0.2) °C | —            | —                |

## SAR result with Body TSL

|                                                             |                    |                                   |
|-------------------------------------------------------------|--------------------|-----------------------------------|
| <b>SAR averaged over 1 cm<sup>3</sup> (1 g) of Body TSL</b> | condition          |                                   |
| SAR measured                                                | 250 mW input power | 2.51 mW / g                       |
| SAR normalized                                              | normalized to 1W   | 10.0 mW / g                       |
| SAR for nominal Body TSL parameters <sup>2</sup>            | normalized to 1W   | <b>9.70 mW / g ± 17.0 % (k=2)</b> |

|                                                               |                    |                                   |
|---------------------------------------------------------------|--------------------|-----------------------------------|
| <b>SAR averaged over 10 cm<sup>3</sup> (10 g) of Body TSL</b> | condition          |                                   |
| SAR measured                                                  | 250 mW input power | 1.67 mW / g                       |
| SAR normalized                                                | normalized to 1W   | 6.68 mW / g                       |
| SAR for nominal Body TSL parameters <sup>2</sup>              | normalized to 1W   | <b>6.51 mW / g ± 16.5 % (k=2)</b> |
|                                                               |                    |                                   |

---

<sup>2</sup> Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

## Appendix

### Antenna Parameters with Head TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 50.3 $\Omega$ - 7.5 j $\Omega$ |
| Return Loss                          | - 22.5 dB                      |

### Antenna Parameters with Body TSL

|                                      |                                |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 46.2 $\Omega$ - 9.7 j $\Omega$ |
| Return Loss                          | - 19.4 dB                      |

### General Antenna Parameters and Design

|                                  |          |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.390 ns |
|----------------------------------|----------|

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

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

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

### Additional EUT Data

|                 |               |
|-----------------|---------------|
| Manufactured by | SPEAG         |
| Manufactured on | July 26, 2001 |

## DASY4 Validation Report for Head TSL

Date/Time: 05.12.2006 12:25:28

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 442**

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

Medium: HSL 900 MHz;

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.902 \text{ mho/m}$ ;  $\epsilon_r = 42$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

### DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(6.09, 6.09, 6.09); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 46; Postprocessing SW: SEMCAD, V1.8 Build 171

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

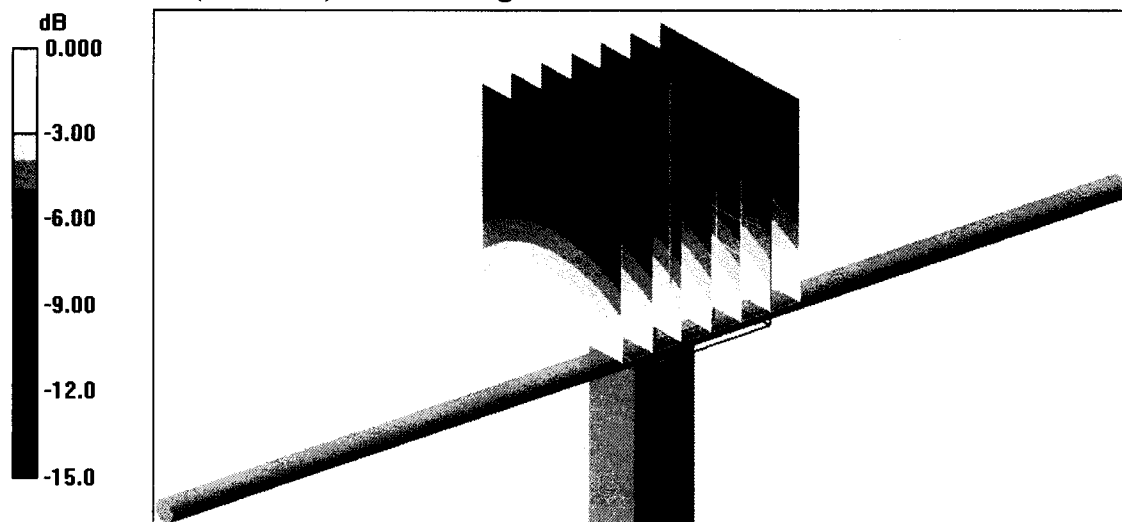
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 55.5 V/m; Power Drift = -0.017 dB

Peak SAR (extrapolated) = 3.40 W/kg

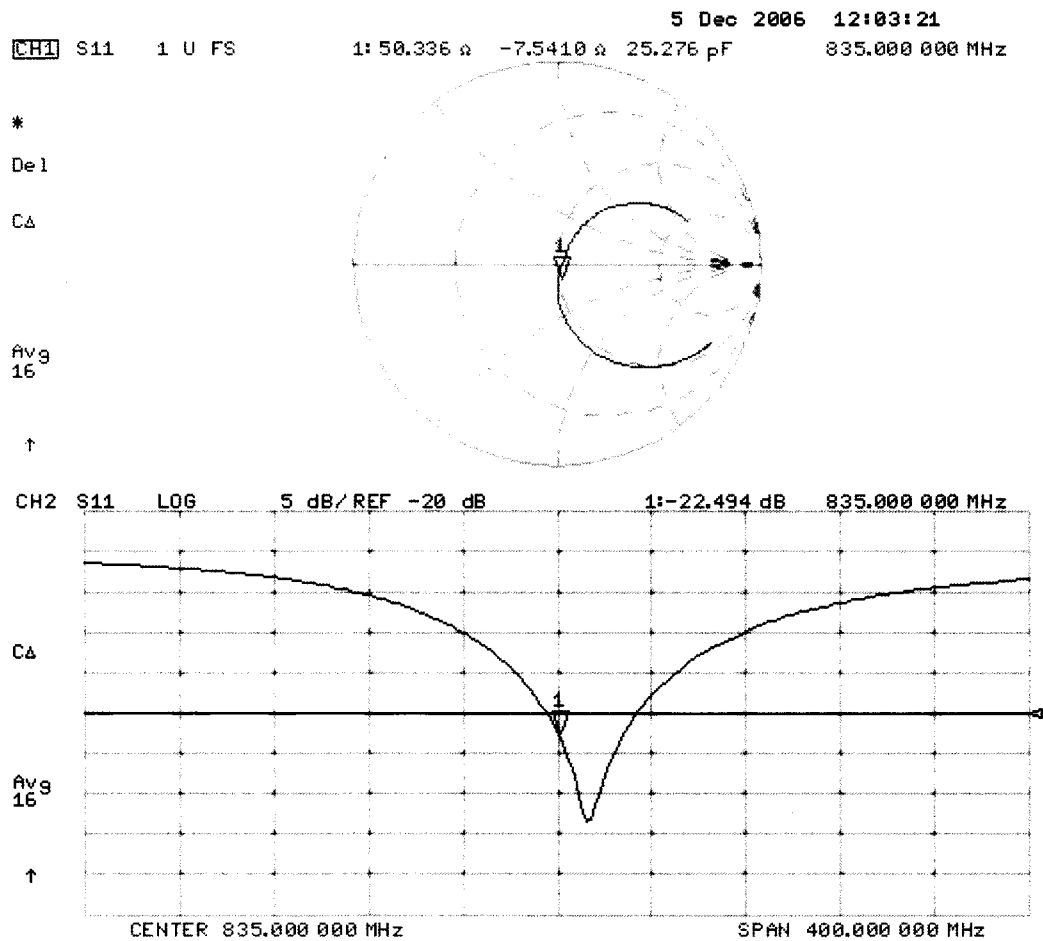
**SAR(1 g) = 2.35 mW/g; SAR(10 g) = 1.54 mW/g**

Maximum value of SAR (measured) = 2.55 mW/g



0 dB = 2.55mW/g

Impedance Measurement Plot for Head TSL



## DASY4 Validation Report for Body TSL

Date/Time: 06.12.2006 13:07:13

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:442**

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

Medium: MSL900;

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 1 \text{ mho/m}$ ;  $\epsilon_r = 54.1$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

### DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(5.75, 5.75, 5.75); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 46; Postprocessing SW: SEMCAD, V1.8 Build 171

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

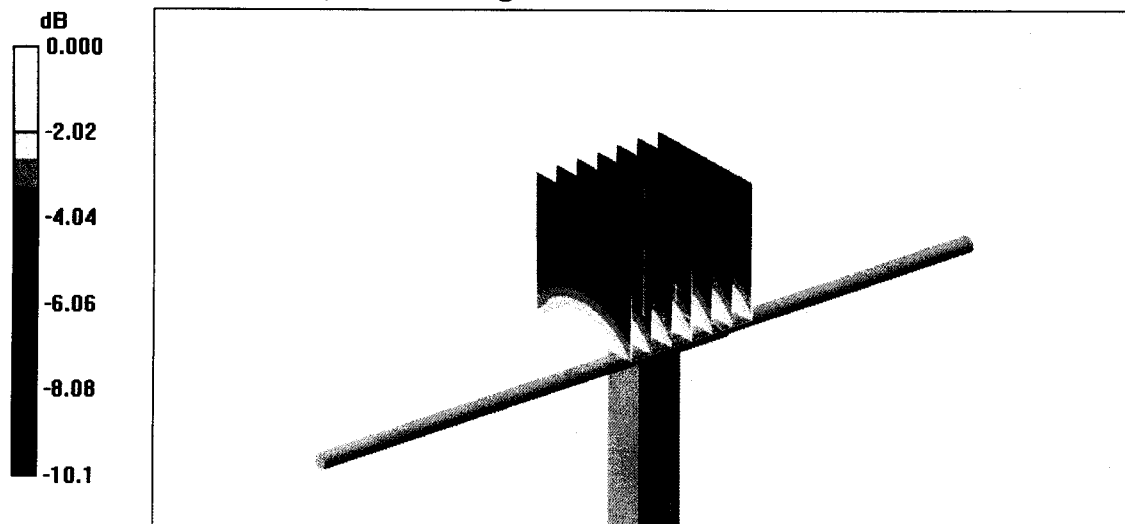
Measurement grid:  $dx=5\text{mm}$ ,  $dy=5\text{mm}$ ,  $dz=5\text{mm}$

Reference Value = 54.7 V/m; Power Drift = -0.002 dB

Peak SAR (extrapolated) = 3.49 W/kg

**SAR(1 g) = 2.51 mW/g; SAR(10 g) = 1.67 mW/g**

Maximum value of SAR (measured) = 2.72 mW/g



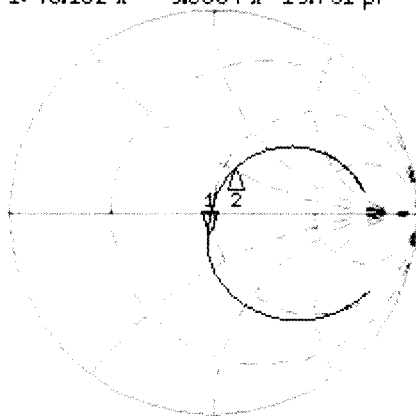
0 dB = 2.72mW/g

Impedance Measurement Plot for Body TSL

6 Dec 2006 10:32:17  
[CH1] S11 1 U FS 1: 46.182  $\Omega$  -9.6504  $\Omega$  19.751 pF 835.000 000 MHz

\*  
Del  
Cor

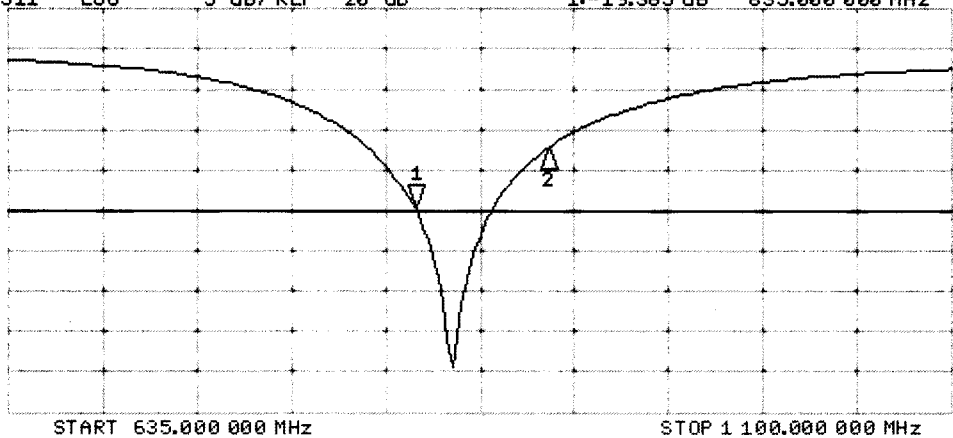
Avg  
16  
↑



CH1 Markers  
2: 55.250  $\Omega$   
25.500  $\Omega$   
900.000 MHz

CH2 S11 LOG 5 dB/REF -20 dB 1:-19.385 dB 835.000 000 MHz

Cor  
Avg  
16  
↑



CH2 Markers  
2:-12.379 dB  
900.000 MHz



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Accreditation No.: **SCS 108**

Client **Sony Electronics UK**

Certificate No: **DAE3-448\_Nov07**

## CALIBRATION CERTIFICATE

Object **DAE3 - SD 000 D03 AE - SN: 448**

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

Calibration date: **November 15, 2007**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

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

|                |                                  |                               |               |
|----------------|----------------------------------|-------------------------------|---------------|
| Calibrated by: | Name<br><b>Dominique Steffen</b> | Function<br><b>Technician</b> | Signature<br> |
| Approved by:   | <b>Fin Bornholt</b>              | <b>R&amp;D Director</b>       |               |

Issued: November 15, 2007

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## Glossary

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

## Methods Applied and Interpretation of Parameters

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

## DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 $\mu$ V , full range = -100...+300 mV

Low Range: 1LSB = 61nV , full range = -1.....+3mV

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

| Calibration Factors | X                        | Y                        | Z                        |
|---------------------|--------------------------|--------------------------|--------------------------|
| High Range          | 403.816 $\pm$ 0.1% (k=2) | 404.070 $\pm$ 0.1% (k=2) | 403.834 $\pm$ 0.1% (k=2) |
| Low Range           | 3.95937 $\pm$ 0.7% (k=2) | 3.96143 $\pm$ 0.7% (k=2) | 3.93067 $\pm$ 0.7% (k=2) |

## Connector Angle

|                                           |                 |
|-------------------------------------------|-----------------|
| Connector Angle to be used in DASY system | 277 ° $\pm$ 1 ° |
|-------------------------------------------|-----------------|

## Appendix

### 1. DC Voltage Linearity

| High Range        | Input ( $\mu\text{V}$ ) | Reading ( $\mu\text{V}$ ) | Error (%) |
|-------------------|-------------------------|---------------------------|-----------|
| Channel X + Input | 200000                  | 200000.1                  | 0.00      |
| Channel X + Input | 20000                   | 20008.04                  | 0.04      |
| Channel X - Input | 20000                   | -20002.96                 | 0.01      |
| Channel Y + Input | 200000                  | 199999.5                  | 0.00      |
| Channel Y + Input | 20000                   | 20005.57                  | 0.03      |
| Channel Y - Input | 20000                   | -20005.68                 | 0.03      |
| Channel Z + Input | 200000                  | 199999.3                  | 0.00      |
| Channel Z + Input | 20000                   | 20006.62                  | 0.03      |
| Channel Z - Input | 20000                   | -20004.64                 | 0.02      |

| Low Range         | Input ( $\mu\text{V}$ ) | Reading ( $\mu\text{V}$ ) | Error (%) |
|-------------------|-------------------------|---------------------------|-----------|
| Channel X + Input | 2000                    | 1999.9                    | 0.00      |
| Channel X + Input | 200                     | 201.18                    | 0.59      |
| Channel X - Input | 200                     | -199.65                   | -0.17     |
| Channel Y + Input | 2000                    | 2000                      | 0.00      |
| Channel Y + Input | 200                     | 199.43                    | -0.28     |
| Channel Y - Input | 200                     | -200.60                   | 0.30      |
| Channel Z + Input | 2000                    | 2000.1                    | 0.00      |
| Channel Z + Input | 200                     | 199.20                    | -0.40     |
| Channel Z - Input | 200                     | -200.60                   | 0.30      |

### 2. Common mode sensitivity

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

|           | Common mode Input Voltage (mV) | High Range Average Reading ( $\mu\text{V}$ ) | Low Range Average Reading ( $\mu\text{V}$ ) |
|-----------|--------------------------------|----------------------------------------------|---------------------------------------------|
| Channel X | 200                            | 10.80                                        | 9.16                                        |
|           | - 200                          | -8.06                                        | -8.82                                       |
| Channel Y | 200                            | -9.03                                        | -8.67                                       |
|           | - 200                          | 7.38                                         | 7.30                                        |
| Channel Z | 200                            | 11.34                                        | 10.22                                       |
|           | - 200                          | -11.97                                       | -11.93                                      |

### 3. Channel separation

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

|           | Input Voltage (mV) | Channel X ( $\mu\text{V}$ ) | Channel Y ( $\mu\text{V}$ ) | Channel Z ( $\mu\text{V}$ ) |
|-----------|--------------------|-----------------------------|-----------------------------|-----------------------------|
| Channel X | 200                | -                           | 1.80                        | 0.18                        |
| Channel Y | 200                | 0.22                        | -                           | 3.40                        |
| Channel Z | 200                | -2.84                       | -0.85                       | -                           |

#### 4. AD-Converter Values with inputs shorted

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

|           | High Range (LSB) | Low Range (LSB) |
|-----------|------------------|-----------------|
| Channel X | 16252            | 17093           |
| Channel Y | 16361            | 17876           |
| Channel Z | 16104            | 15739           |

#### 5. Input Offset Measurement

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

Input 10M $\Omega$

|           | Average ( $\mu$ V) | min. Offset ( $\mu$ V) | max. Offset ( $\mu$ V) | Std. Deviation ( $\mu$ V) |
|-----------|--------------------|------------------------|------------------------|---------------------------|
| Channel X | 0.19               | -1.33                  | 1.54                   | 0.41                      |
| Channel Y | -0.76              | -2.61                  | 0.61                   | 0.29                      |
| Channel Z | -0.83              | -2.27                  | 0.40                   | 0.38                      |

#### 6. Input Offset Current

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

#### 7. Input Resistance

|           | Zeroing (MOhm) | Measuring (MOhm) |
|-----------|----------------|------------------|
| Channel X | 0.2000         | 199.7            |
| Channel Y | 0.1999         | 200.9            |
| Channel Z | 0.1999         | 201.1            |

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

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

#### 9. Power Consumption (verified during pre test)

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



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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client

Sony Electronics Inc.

## CALIBRATION CERTIFICATE

Object

ET3DV6 - SN:1610

Calibration procedure(s)

GR CAL-01-V6

Calibration procedure: EMI 61020-1:2005

Calibration date:

November 14, 2007

Condition of the calibrated item

In Tolerance

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

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID #            | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration  |
|----------------------------|-----------------|-------------------------------------------|------------------------|
| Power meter E4419B         | GB41293874      | 29-Mar-07 (METAS, No. 217-00670)          | Mar-08                 |
| Power sensor E4412A        | MY41495277      | 29-Mar-07 (METAS, No. 217-00670)          | Mar-08                 |
| Power sensor E4412A        | MY41498087      | 29-Mar-07 (METAS, No. 217-00670)          | Mar-08                 |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 8-Aug-07 (METAS, No. 217-00719)           | Aug-08                 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 29-Mar-07 (METAS, No. 217-00671)          | Mar-08                 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 8-Aug-07 (METAS, No. 217-00720)           | Aug-08                 |
| Reference Probe ES3DV2     | SN: 3013        | 4-Jan-07 (SPEAG, No. ES3-3013_Jan07)      | Jan-08                 |
| DAE4                       | SN: 654         | 20-Apr-07 (SPEAG, No. DAE4-654_Apr07)     | Apr-08                 |
| Secondary Standards        | ID #            | Check Date (in house)                     | Scheduled Check        |
| RF generator HP 8648C      | US3642U01700    | 4-Aug-99 (SPEAG, in house check Oct-07)   | In house check: Oct-09 |
| Network Analyzer HP 8753E  | US37390585      | 18-Oct-01 (SPEAG, in house check Oct-07)  | In house check: Oct-08 |

|                | Name          | Function          | Signature |
|----------------|---------------|-------------------|-----------|
| Calibrated by: | Klaus Finkler | Technical Manager |           |
| Approved by:   | Nikola Kuster | Quality Manager   |           |

Issued: November 14, 2007

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Accreditation No.: **SCS 108**

### Glossary:

|                          |                                                                                                                                                      |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                      | tissue simulating liquid                                                                                                                             |
| NORM <sub>x,y,z</sub>    | sensitivity in free space                                                                                                                            |
| ConF                     | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                           |
| DCP                      | diode compression point                                                                                                                              |
| Polarization $\phi$      | $\phi$ rotation around probe axis                                                                                                                    |
| Polarization $\vartheta$ | $\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis |

### Calibration is Performed According to the Following Standards:

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

### Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>:** Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not effect the E<sup>2</sup>-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)<sub>x,y,z</sub> = NORM<sub>x,y,z</sub> \* 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<sub>x,y,z</sub>:** DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters:** Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* *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  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy):** in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset:** The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

# Probe ET3DV6

## SN:1610

|                  |                   |
|------------------|-------------------|
| Manufactured:    | July 27, 2001     |
| Last calibrated: | November 17, 2006 |
| Recalibrated:    | November 14, 2007 |

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

## DASY - Parameters of Probe: ET3DV6 SN:1610

### Sensitivity in Free Space<sup>A</sup>

|       |                     |                              |
|-------|---------------------|------------------------------|
| NormX | <b>1.73</b> ± 10.1% | $\mu\text{V}/(\text{V/m})^2$ |
| NormY | <b>1.70</b> ± 10.1% | $\mu\text{V}/(\text{V/m})^2$ |
| NormZ | <b>1.74</b> ± 10.1% | $\mu\text{V}/(\text{V/m})^2$ |

### Diode Compression<sup>B</sup>

|       |              |
|-------|--------------|
| DCP X | <b>93</b> mV |
| DCP Y | <b>95</b> mV |
| DCP Z | <b>92</b> mV |

### Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

### Boundary Effect

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

|                                           |                              |               |               |
|-------------------------------------------|------------------------------|---------------|---------------|
| Sensor Center to Phantom Surface Distance |                              | <b>3.7 mm</b> | <b>4.7 mm</b> |
| SAR <sub>be</sub> [%]                     | Without Correction Algorithm | 10.3          | 6.1           |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 1.6           | 0.7           |

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

|                                           |                              |               |               |
|-------------------------------------------|------------------------------|---------------|---------------|
| Sensor Center to Phantom Surface Distance |                              | <b>3.7 mm</b> | <b>4.7 mm</b> |
| SAR <sub>be</sub> [%]                     | Without Correction Algorithm | 9.9           | 6.1           |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 0.0           | 0.8           |

### Sensor Offset

Probe Tip to Sensor Center                      **2.7 mm**

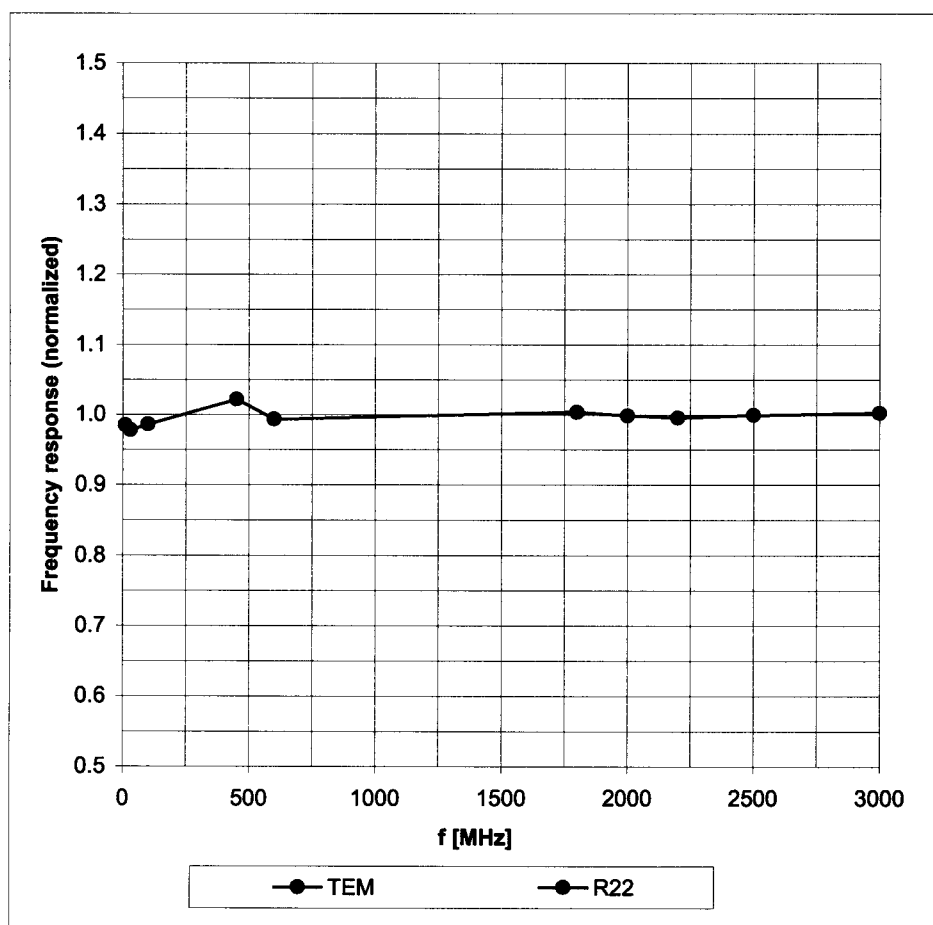
**The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.**

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).

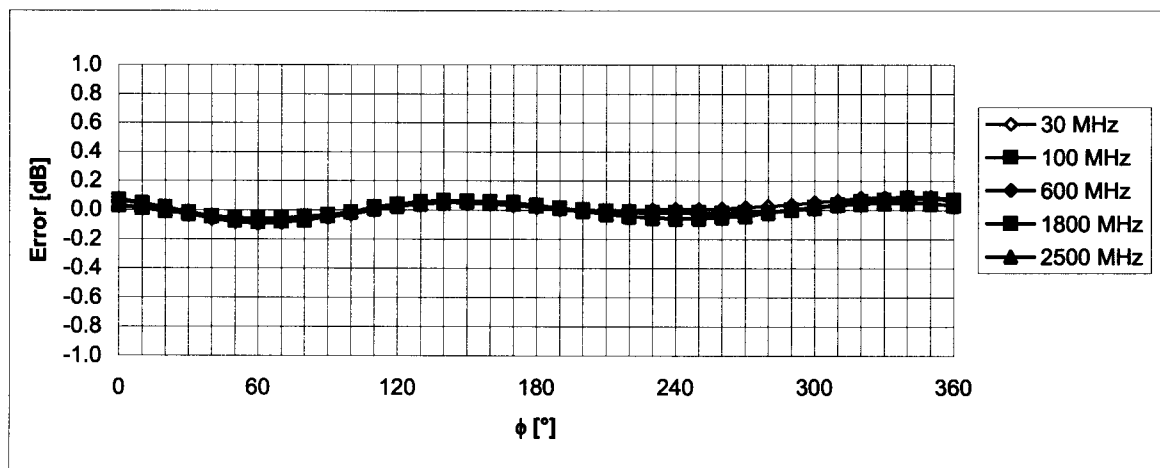
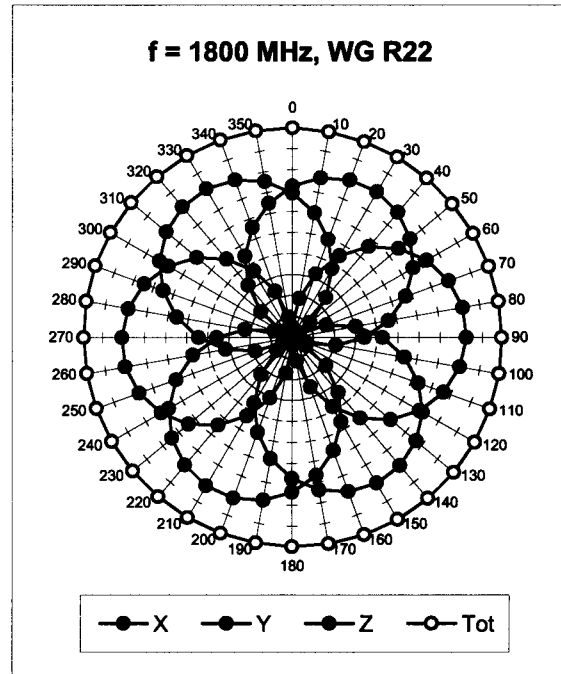
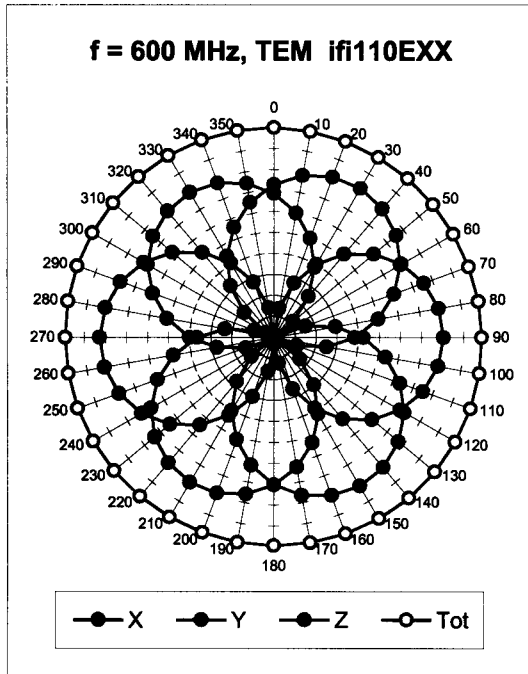
<sup>B</sup> Numerical linearization parameter: uncertainty not required.

## Frequency Response of E-Field

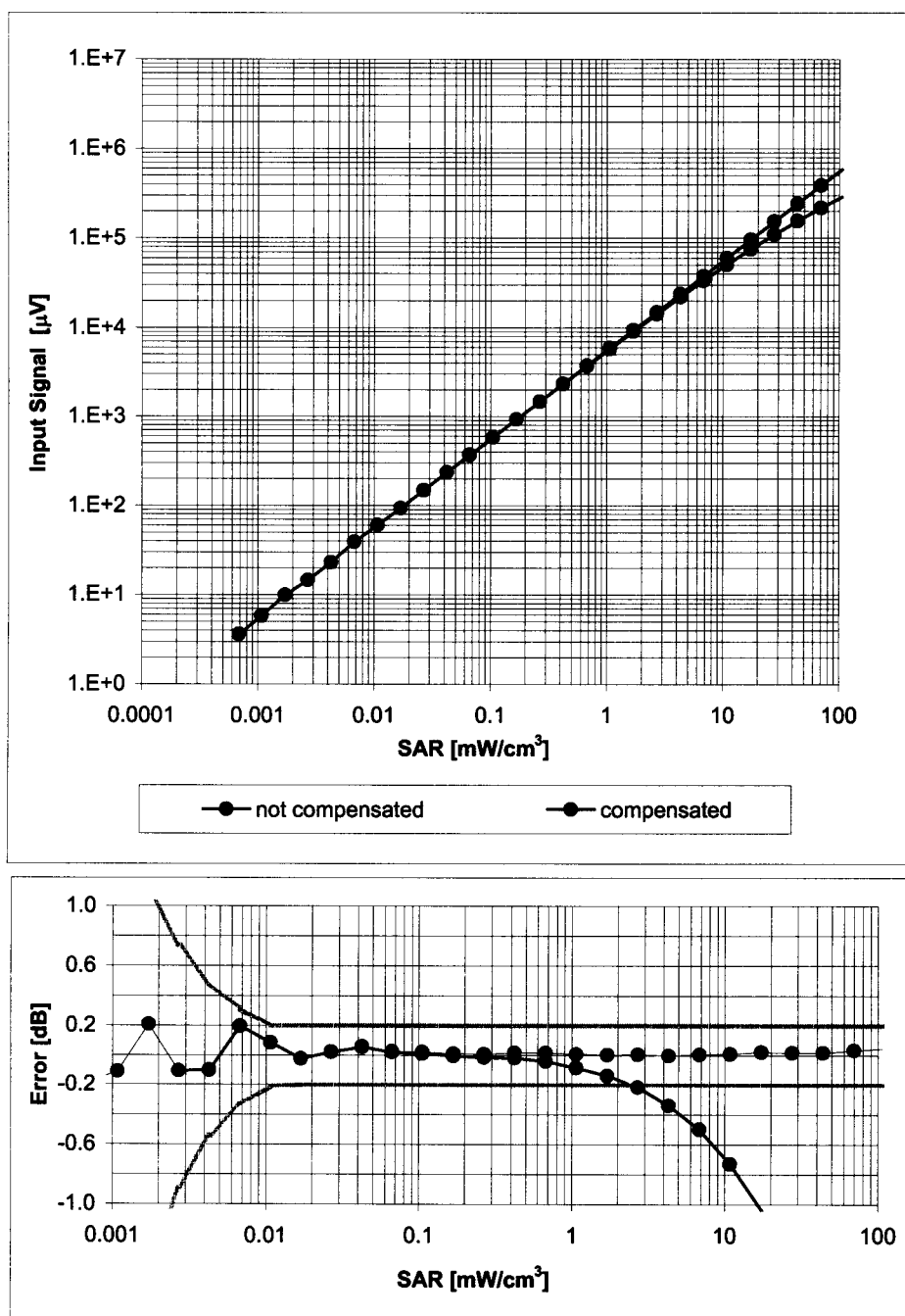
(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

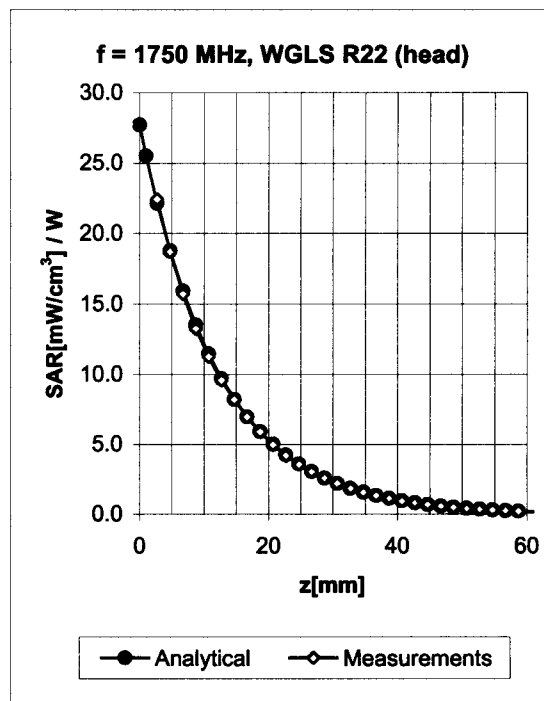
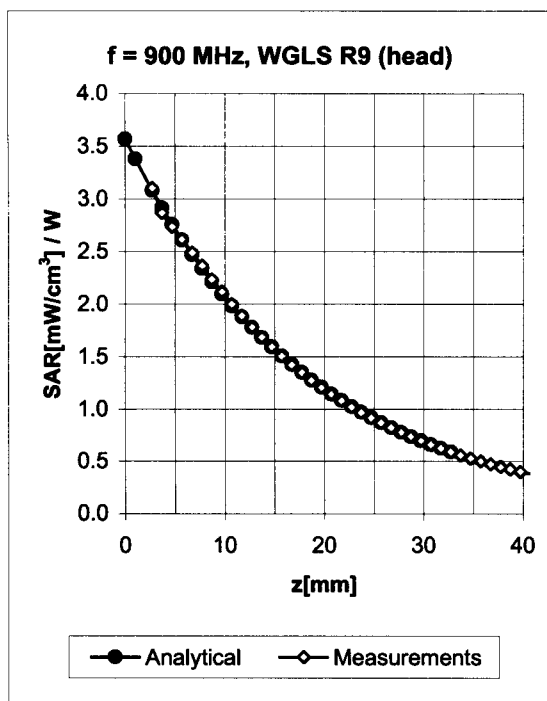
**Receiving Pattern ( $\phi$ ),  $\vartheta = 0^\circ$** **Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  (k=2)**

# Dynamic Range $f(\text{SAR}_{\text{head}})$ (Waveguide R22, $f = 1800 \text{ MHz}$ )



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

## Conversion Factor Assessment

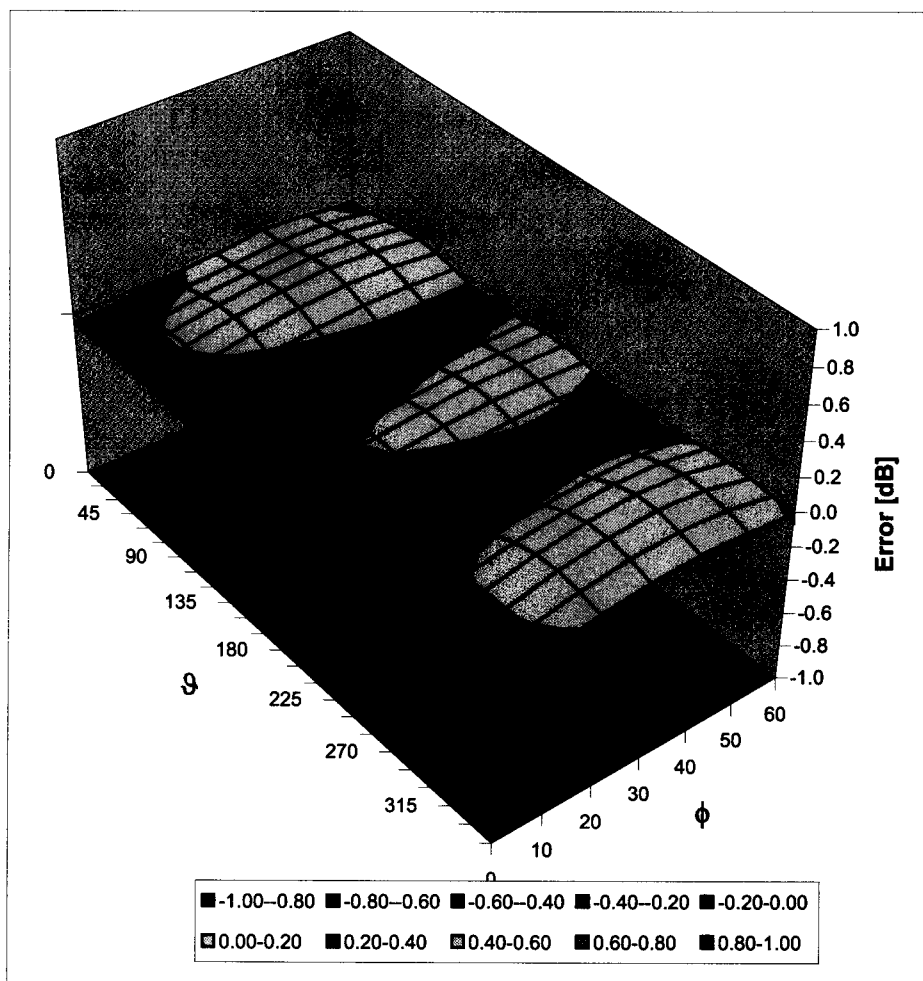


| f [MHz] | Validity [MHz] <sup>c</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 835     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.90 ± 5%    | 0.76  | 1.87  | 6.69 ± 11.0% (k=2) |
| 900     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.97 ± 5%    | 0.73  | 1.94  | 6.59 ± 11.0% (k=2) |
| 1750    | ± 50 / ± 100                | Head | 40.1 ± 5%    | 1.37 ± 5%    | 0.81  | 1.69  | 5.35 ± 11.0% (k=2) |
| 1900    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.87  | 1.65  | 5.18 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Head | 39.2 ± 5%    | 1.80 ± 5%    | 0.78  | 1.91  | 4.70 ± 11.8% (k=2) |
|         |                             |      |              |              |       |       |                    |
| 835     | ± 50 / ± 100                | Body | 55.2 ± 5%    | 0.97 ± 5%    | 0.76  | 1.93  | 6.39 ± 11.0% (k=2) |
| 900     | ± 50 / ± 100                | Body | 55.0 ± 5%    | 1.05 ± 5%    | 0.66  | 2.00  | 6.07 ± 11.0% (k=2) |
| 1750    | ± 50 / ± 100                | Body | 53.4 ± 5%    | 1.49 ± 5%    | 0.77  | 1.94  | 4.89 ± 11.0% (k=2) |
| 1900    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.74  | 1.99  | 4.68 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Body | 52.7 ± 5%    | 1.95 ± 5%    | 0.90  | 1.73  | 4.09 ± 11.8% (k=2) |

<sup>c</sup> 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.

## Deviation from Isotropy in HSL

Error ( $\phi$ ,  $\vartheta$ ),  $f = 900$  MHz



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