

Prepared (also subject responsible if other)

LD/SEMC/BGLIVM *Magnus Söderman*

Approved

LD/SEMC/BGLIVMC *Peter Lindeborg*

Checked

080523

Company Internal
REPORT

No.

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Report issued by Accredited SAR Laboratory**for****PY7A1022141 (C902c)****Date of test:** 6th - 19th of May, 2008**Laboratory:** Sony Ericsson SAR Test Laboratory
Sony Ericsson Mobile Communications AB
Nya Vattentornet
SE-221 82 LUND, Sweden**Testing Engineer:** Magnus Söderman
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+46-46-2127229**Testing Approval:** Peter Lindeborg
peter.lindeborg@sonyericsson.com
+46-46-2126180**Statement of Compliance**

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

Sony Ericsson Type AAB-1022141-BV; FCC ID PY7A1022141; IC 4170B-A1022141

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.

Sony Ericsson encourages all feedback, both positive and negative, on this report.

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1 Introduction

In this test report, compliance of the Sony Ericsson PY7A1022141 (C902c) 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 Customer details

| | |
|----------------------|---|
| Company Name: | Sony Ericsson Mobile Communications AB |
| Address: | Nya Vattentorget S-221 88 Lund Sweden |
| Contact Name: | Gustav Wingren |

3 Device Under Test

3.1 Antenna Description

| | | |
|----------------------|------------------|-------|
| Type | Internal antenna | |
| Location | At the bottom | |
| Dimensions | Max length | 15 mm |
| | Max width | 43 mm |
| Configuration | Semi-PIFA | |



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3.2 Device Description

| | | | | | | |
|--|-----------------------------------|------|------|---------------|------|------|
| Device model | AAB-1022141-BV | | | | | |
| Market name | C902c | | | | | |
| Serial number (EUT #) | CB5A0P5YA5 (#11696) | | | | | |
| Mode | GSM 1900 | | | GSM 850 | | |
| Crest factor | 8.3 | | | 8.3 | | |
| Multiple access scheme | TDMA | | | TDMA | | |
| Channel No. | 512 | 512 | 661 | 128 | 190 | 251 |
| Maximum output power setting¹ [dBm] | 29.0 | 29.0 | 29.0 | 32.1 | 32.1 | 32.1 |
| Factory tolerance in power setting¹ | ±0.5 dB | | | ±0.5 dB | | |
| Maximum peak output power¹ [dBm] | 29.5 | 29.5 | 29.5 | 32.6 | 32.6 | 32.6 |
| Data mode | GPRS | | | GPRS | | |
| Crest factor | 4.15 | | | 4.15 | | |
| Maximum output power setting¹ [dBm] | 27.0 | 27.0 | 27.0 | 30.5 | 30.5 | 30.5 |
| Factory tolerance in power setting¹ | ±0.5 dB | | | ±0.5 dB | | |
| Maximum peak output power¹ [dBm] | 27.5 | 27.5 | 27.5 | 31.0 | 31.0 | 31.0 |
| Data mode | EDGE | | | EDGE | | |
| Crest factor | 4.15 | | | 4.15 | | |
| Maximum output power setting¹ [dBm] | 26.5 | 26.5 | 26.5 | 27.5 | 27.5 | 27.5 |
| Factory tolerance in power setting¹ | ±0.5 dB | | | ±0.5 dB | | |
| Maximum peak output power¹ [dBm] | 27.0 | 27.0 | 27.0 | 28.0 | 28.0 | 28.0 |
| Transmitting frequency range [MHz] | 1850.2 - 1909.8 | | | 824.2 - 848.8 | | |
| GPRS Multislot class | 10 | | | | | |
| EDGE class | 10 | | | | | |
| GPRS Capability class | B | | | | | |
| Prototype or production unit | Preproduction | | | | | |
| Hardware version | AP2 | | | | | |
| Software version | R3BA007 | | | | | |
| Device category | Portable | | | | | |
| RF exposure environment | General population / uncontrolled | | | | | |
| Bluetooth max. conducted output power¹ [dBm] | 4.0 | | | | | |

¹ Output power values were supplied by the customer.

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4 Test equipment

4.1 Dosimetric system

SAR measurements were made using the DASY4 professional system (software version 4.7, Build 71) with SAM twin phantom, manufactured by Schmid & Partner Engineering AG (SPEAG). The list of calibrated equipment is given below.

| Description | Serial Number | Due Date |
|--------------------------------|---------------|----------|
| DASY4 DAE3 | 419 | 2009-03 |
| E-field probe ET3DV6 | 1569 | 2009-01 |
| Dipole Validation Kit, D835V2 | 484 | 2009-01 |
| Dipole Validation Kit, D1900V2 | 5d002 | 2009-01 |

4.2 Additional equipment

| Description | Inventory Number | Due Date |
|-------------------------------|------------------|----------|
| Signal generator R&S | INV 20007667 | 2009-03 |
| Directional coupler | S/N 062 | 2009-03 |
| Power meter R&S NRVD | INV 20007669 | 2009-03 |
| Power sensor R&S NRV-Z5 | INV 20007672 | 2009-03 |
| Power sensor R&S NRV-Z5 | INV 20007673 | 2009-03 |
| Network analyzer HP8753C | INV 421671 | 2009-03 |
| S-parameter test set HP85047A | INV 421670 | 2009-03 |
| Dielectric probe kit HP8507D | INV 20000053 | N/A |
| Base station simulator CMU200 | INV 20002149 | 2009-03 |
| Thermometer Fluke 51 | INV 2071 | 2009-03 |

5 Electrical parameters on the tissue simulating liquid

Prior to conducting SAR measurements, the relative permittivity, ϵ_r , and the conductivity σ , of the tissue simulating liquids were measured with the dielectric probe kit. These values are shown in the table below. The mass density, ρ , entered into the DASY4 software is also given. Recommended limits for permittivity ϵ_r , conductivity σ and mass density ρ are also shown.

| f [MHz] | Tissue type | Measured / Recommended | Dielectric Parameters | | Density |
|---------|-------------|------------------------|-----------------------|----------------|-----------------------------|
| | | | ϵ_r | σ [S/m] | ρ [g/cm ³] |
| 835 | Head | Measured, 2008-05-06 | 40.1 | 0.86 | 1.00 |
| | | Recommended | 41.5 | 0.9 | 1.00 |
| 835 | Body | Measured, 2008-05-07 | 40.1 | 0.86 | 1.00 |
| | | Recommended | 55.2 | 0.97 | 1.00 |
| 835 | Body | Measured, 2008-05-12 | 53.8 | 0.98 | 1.00 |
| | | Recommended | 55.2 | 0.97 | 1.00 |
| 835 | Body | Measured, 2008-05-09 | 53.5 | 0.97 | 1.00 |
| | | Recommended | 55.2 | 0.97 | 1.00 |
| 1900 | Head | Measured, 2008-05-15 | 39.3 | 1.47 | 1.00 |
| | | Recommended | 40.0 | 1.4 | 1.00 |
| 1900 | Body | Measured, 2008-05-19 | 50.9 | 1.57 | 1.00 |
| | | Recommended | 53.3 | 1.52 | 1.00 |

6 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 20-24 °C and humidity 25-50 %. The obtained results are displayed in the table below.

RF noise had been measured in liquid when all RF equipment in lab was switched off. Measured value was 0.0002 mW/g in 1g mass.

| f [MHz] | Tissue type | Measured / Reference | SAR [W/kg] 1g / 10g | Dielectric Parameters | | Density | Liquid T [°C] |
|---------|-------------|----------------------|------------------------|-----------------------|----------------|-----------------------------|---------------|
| | | | | ϵ_r | σ [S/m] | ρ [g/cm ³] | |
| 835 | Head | Measured, 2008-05-06 | 8.88 / 5.92 | 40.1 | 0.86 | 1.00 | 21.7 |
| | | Reference | 9.68 / 6.38 | 41.5 | 0.9 | 1.00 | 22.0 |
| 835 | Body | Measured, 2008-05-07 | 9.20 / 6.00 | 40.1 | 0.86 | 1.00 | 21.7 |
| | | Reference | 9.48 / 6.29 | 55.2 | 0.97 | 1.00 | 22.0 |
| 835 | Body | Measured, 2008-05-12 | 9.84 / 6.29 | 53.8 | 0.98 | 1.00 | 22.3 |
| | | Reference | 9.48 / 6.29 | 55.2 | 0.97 | 1.00 | 22.0 |
| 835 | Body | Measured, 2008-05-09 | 9.48 / 6.29 | 53.5 | 0.97 | 1.00 | 22.1 |
| | | Reference | 9.48 / 6.29 | 55.2 | 0.97 | 1.00 | 22.0 |
| 1900 | Head | Measured, 2008-05-15 | 39.8 / 20.8 | 39.3 | 1.47 | 1.00 | 21.1 |
| | | Reference | 37.4 / 19.8 | 40.0 | 1.4 | 1.00 | 22.0 |
| 1900 | Body | Measured, 2008-05-19 | 41.2 / 21.6 | 50.9 | 1.57 | 1.00 | 21.9 |
| | | Reference | 38.6 / 20.6 | 53.3 | 1.52 | 1.00 | 22.0 |

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7 SAR measurement uncertainty

SAR measurement uncertainty evaluation for Sony Ericsson PY7A1022141 (C902c) phone According to IEEE 1528

| Uncertainty Component | Uncer. (%) | Prob Dist. | Div. | C _i | 1g mass |
|--|------------|------------|------|----------------|---------|
| Measurement System | | | | | |
| 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 |
| <i>Measurement System Uncertainty</i> | | | | | ±8.4 |
| Test Sample Related | | | | | |
| 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 |
| <i>Test Sample Related Uncertainty</i> | | | | | ±5.5 |
| Phantom and Tissue Parameters | | | | | |
| 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 |
| <i>Phantom and Tissue Parameters Uncertainty</i> | | | | | ±4.1 |
| Combined standard uncertainty | | | | | ±10.8 |
| Extended standard uncertainty (k=2) | | | | | ±21.6 |

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8 Test results

The ambient humidity and temperature of test facility were 25-50% and 20-24°C respectively. A base station simulator was used to control the device during the SAR measurement. The DUT was supplied with a fully charged battery for each measurement.

For head measurement, the DUT was tested on the right-hand side, and the left-hand side of the phantom in two phone positions, cheek (touch) and tilt (cheek + 15°). The DUT was tested at the lowest, middle and highest frequencies in the transmission band. The measured 1-gram averaged SAR values of the DUT towards the head are provided in Table 1.

For body measurement the DUT was tested with the back(antenna) and front(display) towards the phantom flat section with 15 mm distance in both speech and data mode. For all modes, 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 (BT) the DUT was paired with Sony Ericsson HBH-60. The measured 1-gram averaged SAR values of the DUT towards the body are provided in Table 2.

| Band | Channel | Measured output power ² [dBm] | Position | Liquid T [°C] | Measured SAR [W/kg] | |
|--------------------|---------|--|--------------------|---------------|---------------------|-------------------|
| | | | | | Right-hand 1g mass | Left-hand 1g mass |
| GSM 850 | 128 | 32.5 | Cheek | 21.7 | 0.90 | 0.92 |
| | | | Cheek ³ | 21.7 | 0.79 | 0.80 |
| | 190 | 32.4 | Cheek | 21.7 | 1.03 | 0.99 |
| | | | Cheek ³ | 21.7 | 0.90 | 0.93 |
| | | | Tilt | 21.7 | 0.36 | 0.44 |
| | 251 | 32.5 | Cheek | 21.7 | 1.17 | 1.11 |
| Cheek ³ | | | 21.7 | 1.03 | 1.06 | |
| GSM 1900 | 512 | 29.5 | Cheek | 21.1 | 1.06 | 0.80 |
| | | | Cheek ³ | 21.1 | 1.01 | 0.79 |
| | 661 | 29.5 | Cheek | 21.1 | 1.10 | 0.85 |
| | | | Cheek ³ | 21.1 | 1.06 | 0.83 |
| | | | Tilt | 21.1 | 0.49 | 0.40 |
| | 810 | 29.4 | Tilt ³ | 21.1 | 0.38 | 0.34 |
| | | | Cheek | 21.1 | 1.13 | 0.91 |
| | | | Cheek ³ | 21.1 | 1.07 | 0.86 |

Table 1: SAR measurement result for Sony Ericsson PY7A1022141 telephone at highest possible output power. Measured towards the head.

² Measured output power values were provided by the customer.

³ Tested with the camera cover extracted.

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| Band | Channel | Measured output power ⁴ [dBm] | Position / Mode | Liquid T [°C] | Measured SAR [W/kg] 1g mass |
|------------|---------|--|-----------------|---------------|-----------------------------|
| GSM 850 | 128 | 30.9 | Back / GPRS | 22.6 | 1.19 |
| | | 32.5 | Back / BT | 22.6 | 0.87 |
| | | | Back / PHF | 22.6 | 0.73 |
| | 190 | 30.8 | Back / GPRS | 22.6 | 1.28 |
| | | 27.9 | Back / EDGE | 22.6 | 0.51 |
| | | | Back / BT | 22.6 | 1.00 |
| | 251 | 32.4 | Back / PHF | 22.6 | 0.82 |
| | | | Back / GPRS | 22.7 | 1.23 |
| | | 30.9 | Back / BT | 22.6 | 1.03 |
| Back / PHF | | | 22.6 | 0.89 | |
| GSM 1900 | 512 | 27.5 | Back / GPRS | 21.9 | 0.56 |
| | | 29.5 | Back / BT | 21.9 | 0.41 |
| | 661 | 27.4 | Back / GPRS | 21.9 | 0.59 |
| | | 29.5 | Back / BT | 21.9 | 0.45 |
| | 810 | 27.5 | Back / GPRS | 21.9 | 0.61 |
| | | 29.4 | Back / BT | 21.9 | 0.46 |
| | | 27.5 | Front / GPRS | 21.9 | 0.41 |
| | | 29.4 | Back / PHF | 21.9 | 0.30 |
| | | 27.0 | Back / EDGE | 21.9 | 0.42 |

Table 2: SAR measurement result for Sony Ericsson PY7A1022141 telephone at highest possible output power. Measured towards the body.

⁴ Measured output power values were provided by the customer.



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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 62209-1. "Procedure to measure the Specific Absorption Rate (SAR) for hand-held mobile wireless devices in the frequency range of 300 MHz to 3 GHz". February 2005.

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10 Appendix

10.1 Photographs of the device under test



Battery and cover removed



Front side



Camera cover extracted



Rear side



Right hand side



Left hand side with system connector

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10.2 Device position at SAM Twin Phantom



DUT position towards the head: Cheek (touch) position



DUT position towards the head: Tilt (touch + 15°) position



DUT tilt position towards the head with camera cover extracted

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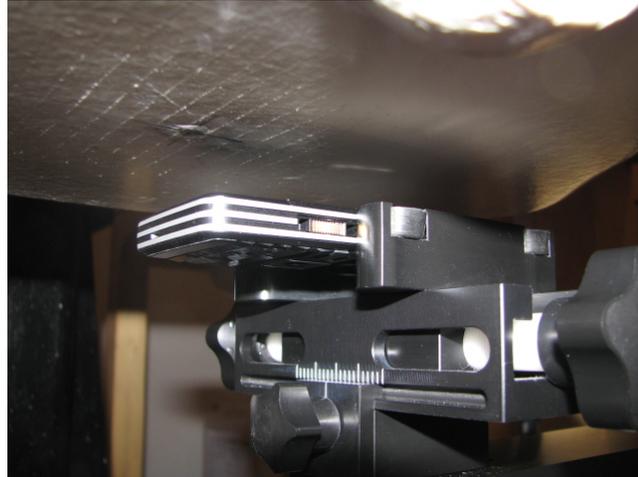
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DUT in body position with 15 mm distance

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10.3 Attachments

- System validation
- Measurement plots for head and body position
- Probe calibration
- Dipole calibration

Test Laboratory: Sony Ericsson Mobile Communications AB**Perf_835_1****DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:484**

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

Medium parameters used: $f = 835$ MHz; $\sigma = 0.864$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.71, 6.71, 6.71); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 1; Type: Twin SAM; Serial: TP-1144
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Dipole/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.36 mW/g

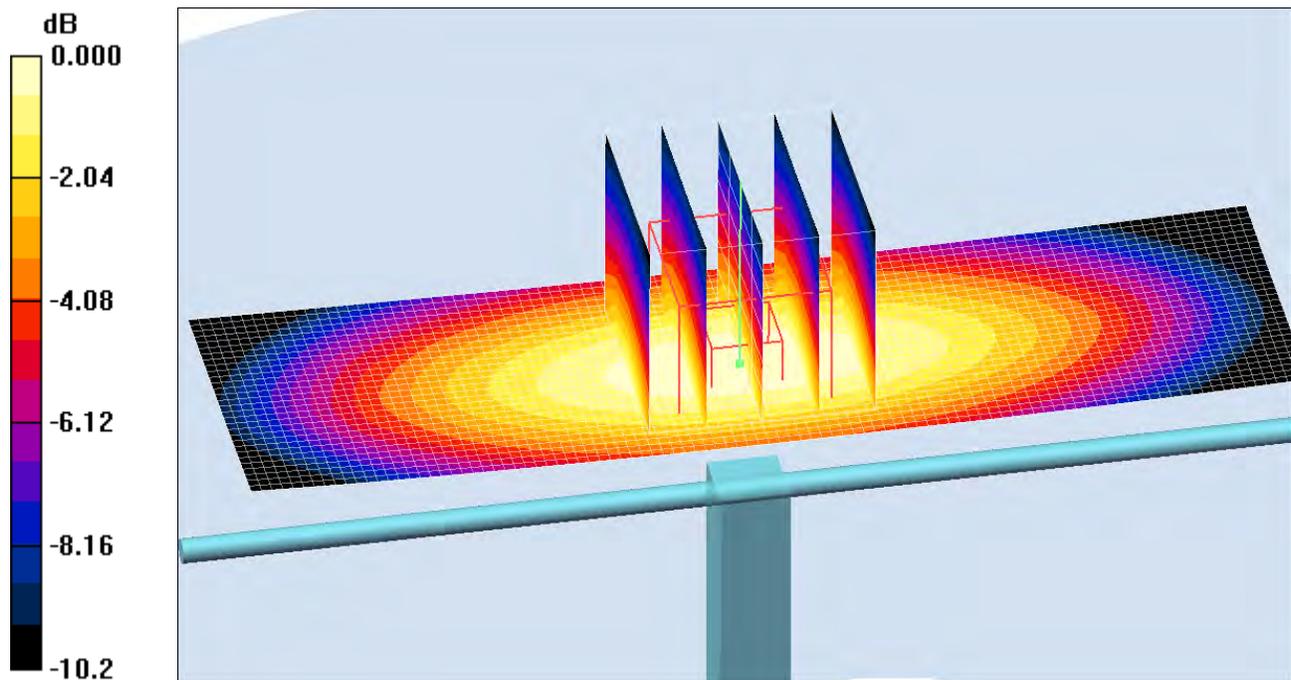
Dipole/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 55.3 V/m; Power Drift = -0.002 dB

Peak SAR (extrapolated) = 3.06 W/kg

SAR(1 g) = 2.22 mW/g; SAR(10 g) = 1.48 mW/g

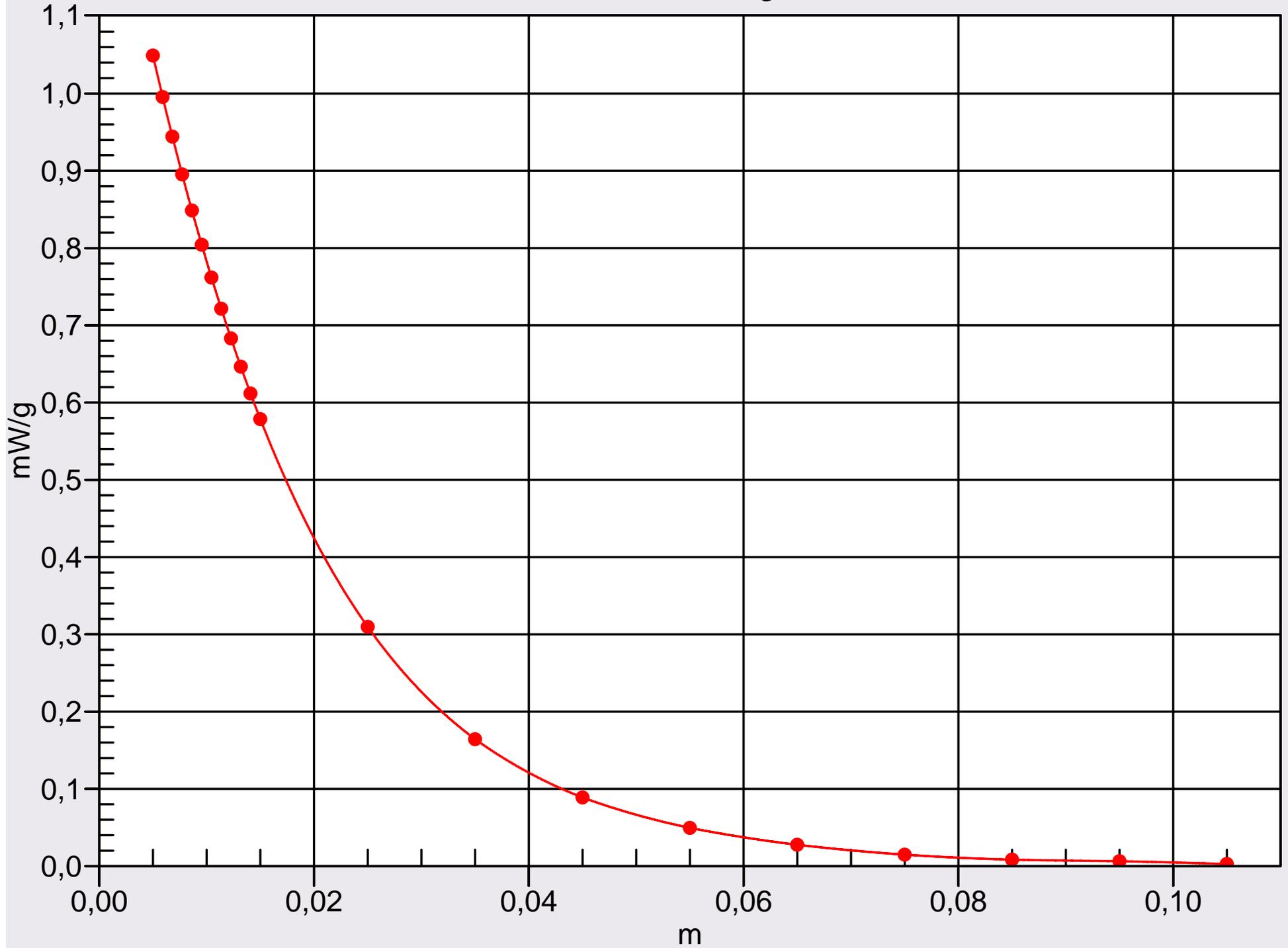
Maximum value of SAR (measured) = 2.40 mW/g



0 dB = 2.40mW/g

Interpolated SAR(x,y,z,f0)

MSL835; Z Scan: Value Along Z, X=0, Y=0



Test Laboratory: Sony Ericsson Mobile Communications AB**Perf_835_2****DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:484**

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

Medium parameters used: $f = 835$ MHz; $\sigma = 0.864$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.71, 6.71, 6.71); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 1; Type: Twin SAM; Serial: TP-1144
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Dipole/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.46 mW/g

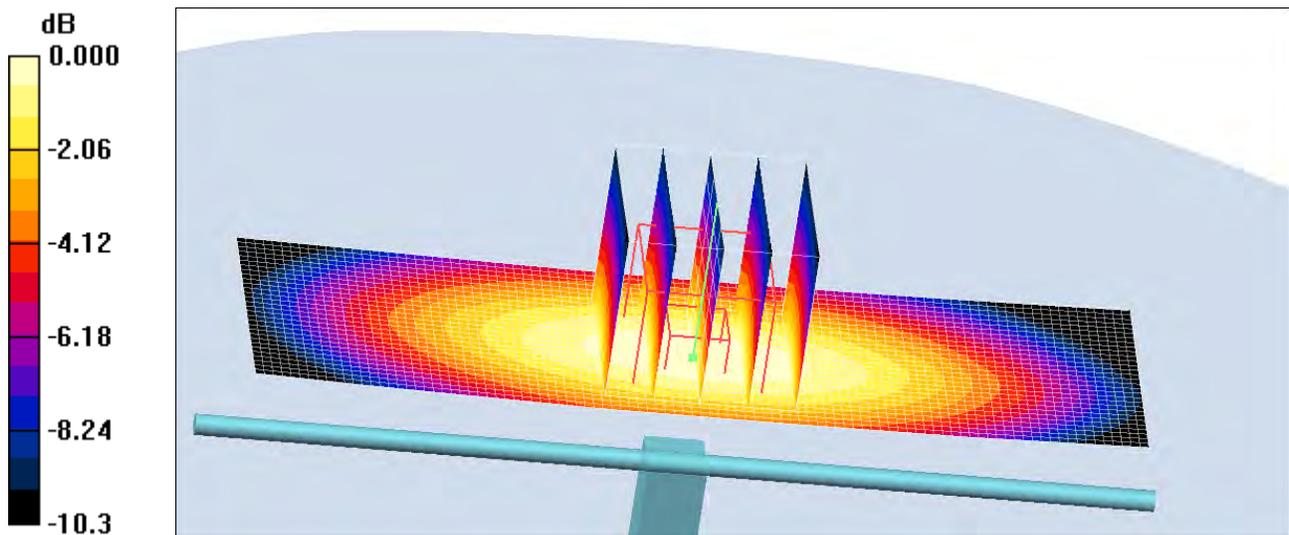
Dipole/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 57.2 V/m; Power Drift = -0.140 dB

Peak SAR (extrapolated) = 3.22 W/kg

SAR(1 g) = 2.33 mW/g; SAR(10 g) = 1.55 mW/g

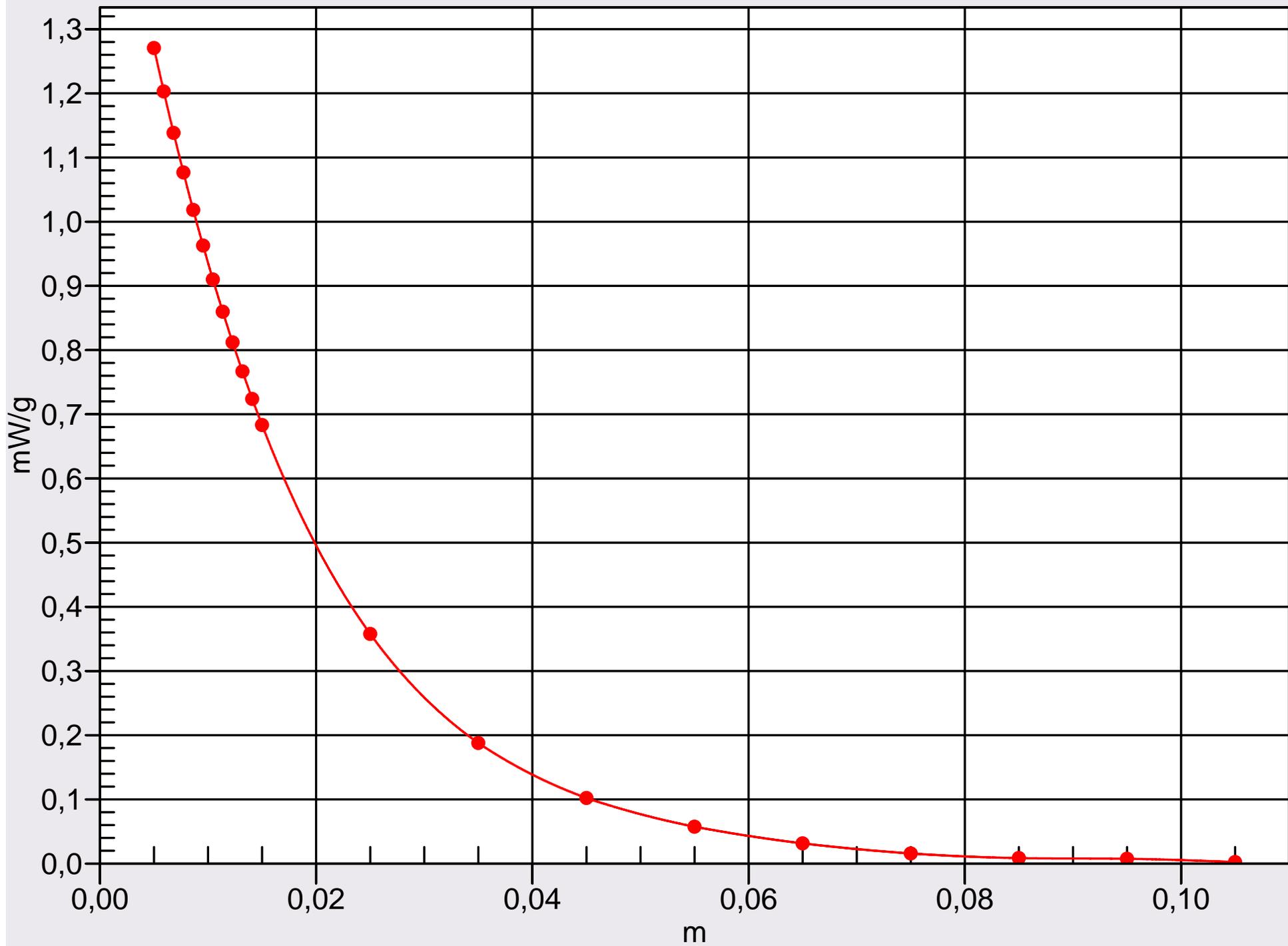
Maximum value of SAR (measured) = 2.51 mW/g



0 dB = 2.51mW/g

Interpolated SAR(x,y,z,f0)

HSL850; Z Scan: Value Along Z, X=0, Y=0



Test Laboratory: Sony Ericsson Mobile Communications AB**Perf_835_3****DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:484**

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

Medium parameters used: $f = 835$ MHz; $\sigma = 0.972$ mho/m; $\epsilon_r = 53.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.54, 6.54, 6.54); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Perf835/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.63 mW/g

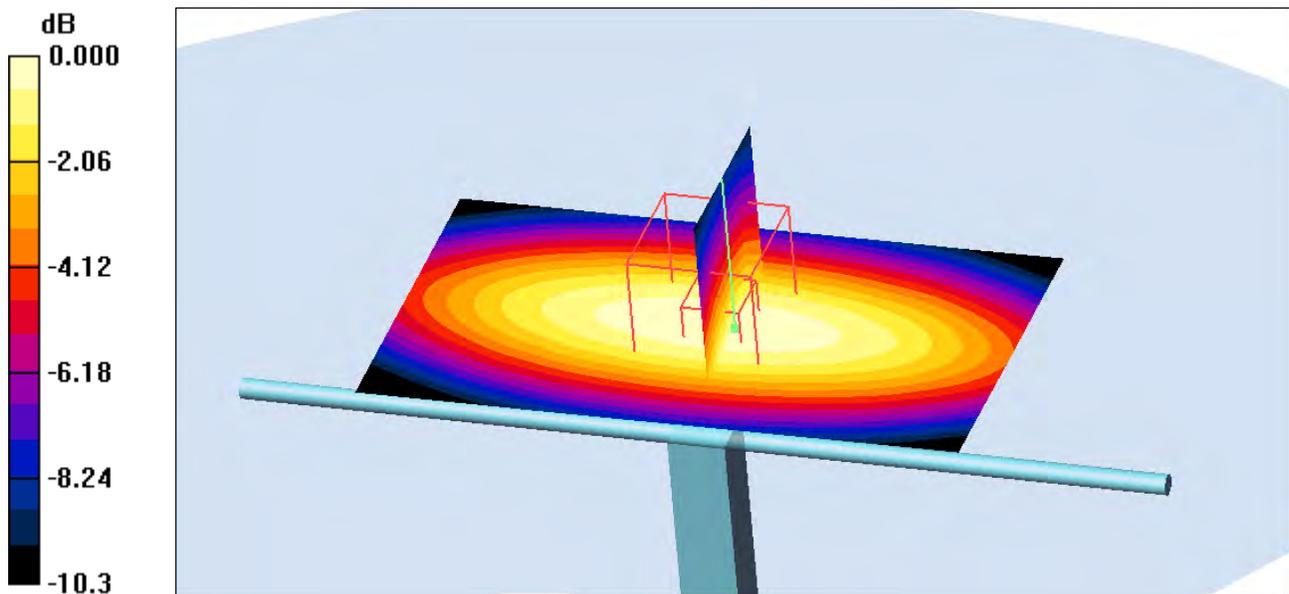
Perf835/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 54.2 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 3.37 W/kg

SAR(1 g) = 2.44 mW/g; SAR(10 g) = 1.62 mW/g

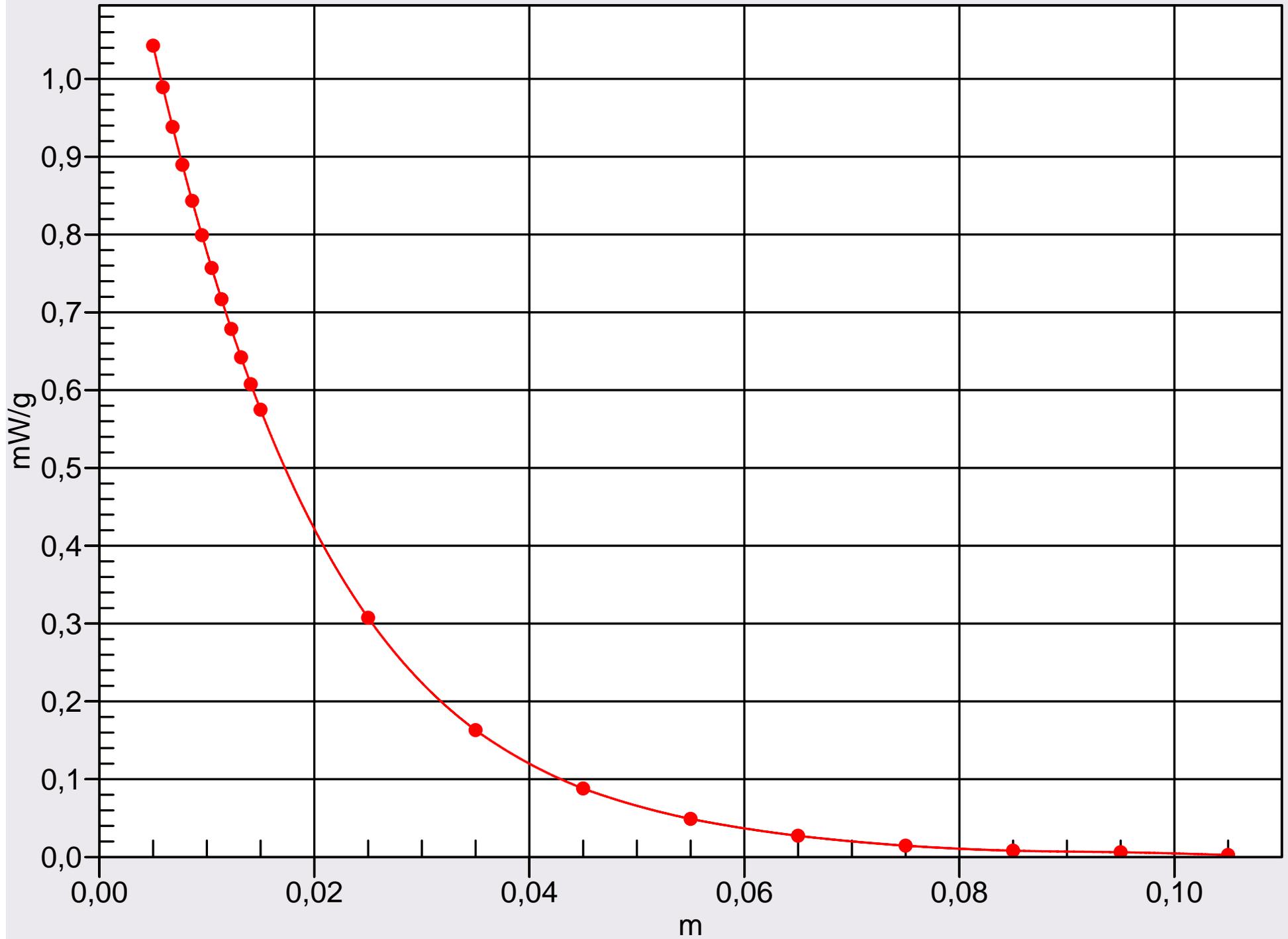
Maximum value of SAR (measured) = 2.65 mW/g



0 dB = 2.65mW/g

Interpolated SAR(x,y,z,f0)

MSL850; Z Scan: Value Along Z, X=0, Y=0



Test Laboratory: Sony Ericsson Mobile Communications AB**Perf_835_4****DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:484**

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

Medium parameters used: $f = 835$ MHz; $\sigma = 0.981$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.54, 6.54, 6.54); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Perf835/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.66 mW/g

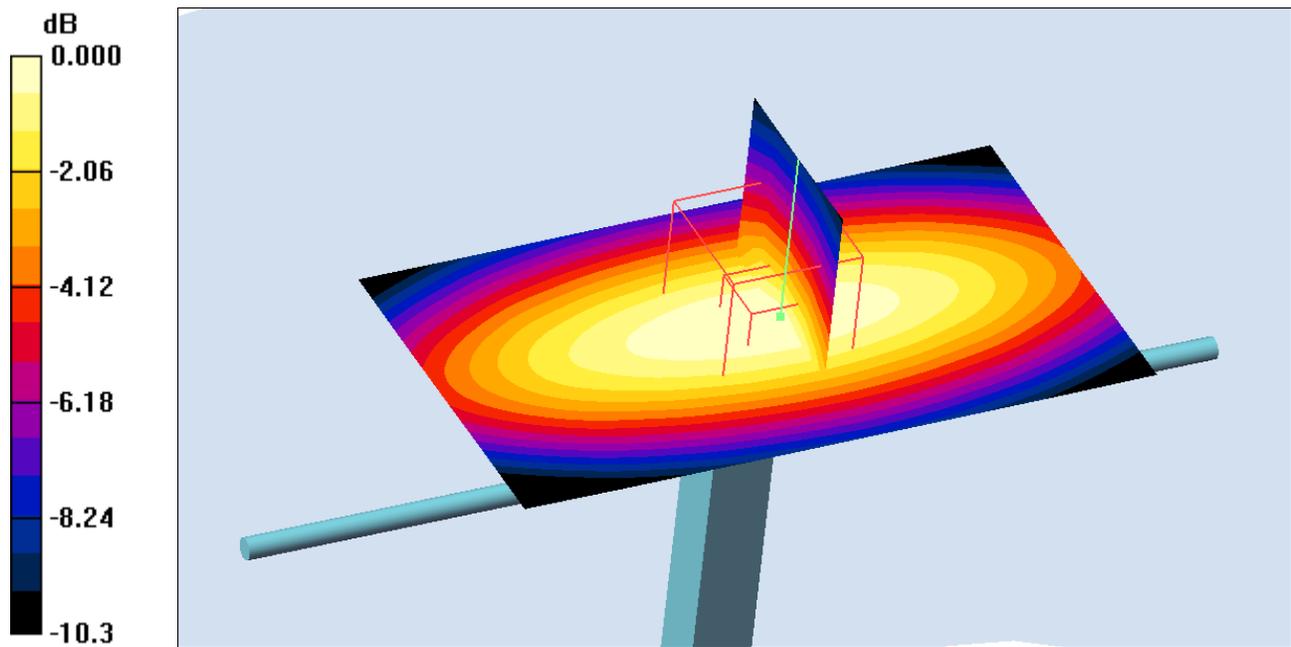
Perf835/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 54.2 V/m; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 3.39 W/kg

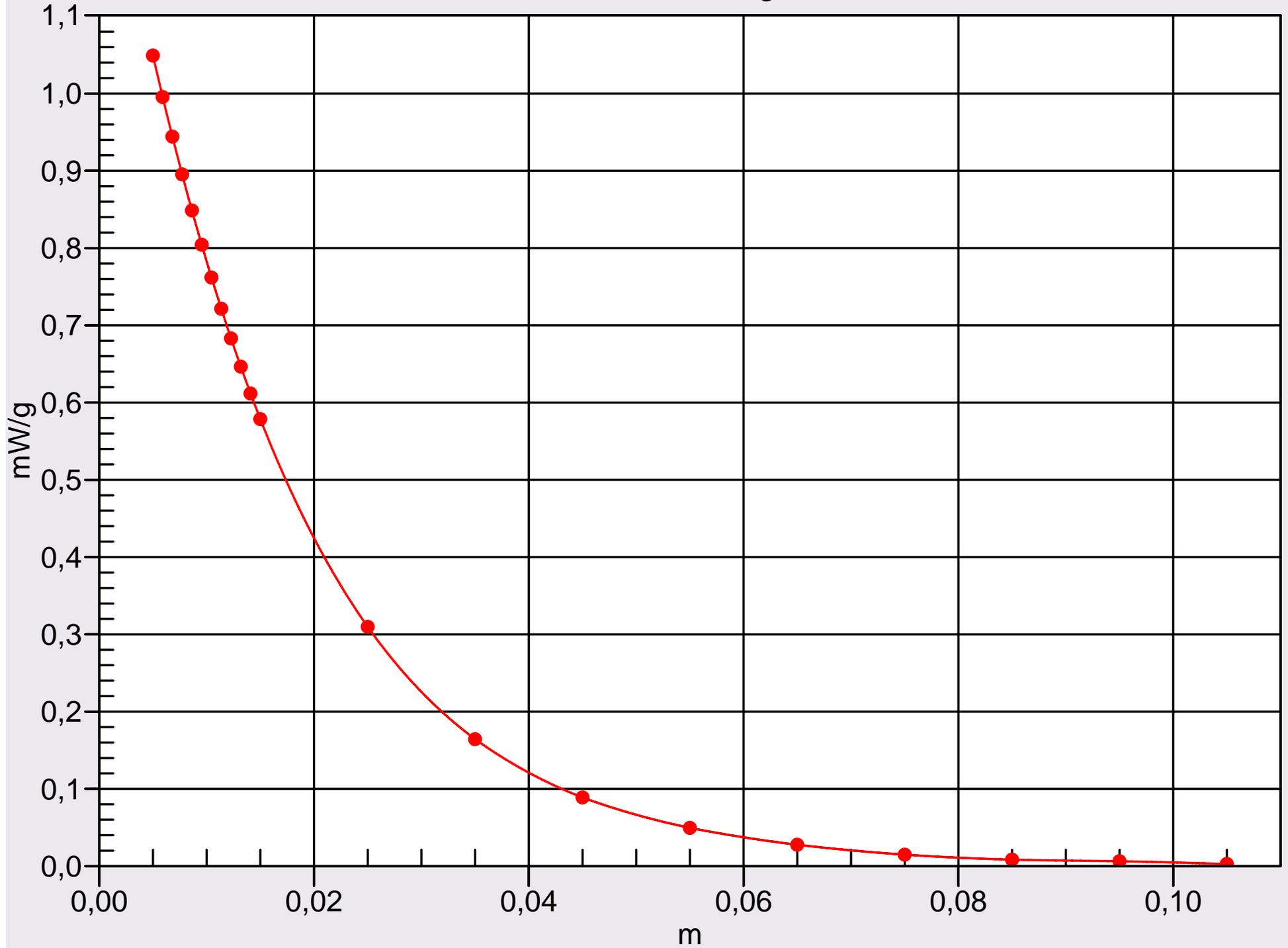
SAR(1 g) = 2.46 mW/g; SAR(10 g) = 1.64 mW/g

Maximum value of SAR (measured) = 2.66 mW/g



Interpolated SAR(x,y,z,f0)

MSL835; Z Scan: Value Along Z, X=0, Y=0



Test Laboratory: Sony Ericsson Mobile Communications AB**Perf_1900_1****DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d002**

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

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 39.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(5.13, 5.13, 5.13); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Perf check 1900/Area Scan (41x41x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.6 mW/g

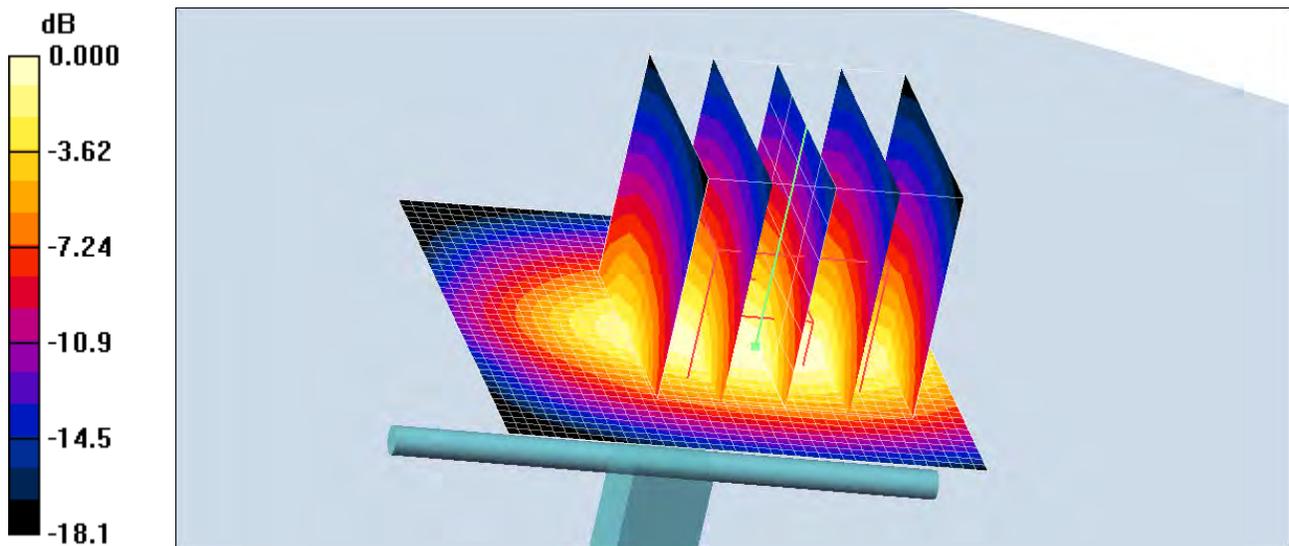
Perf check 1900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 88.2 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 17.4 W/kg

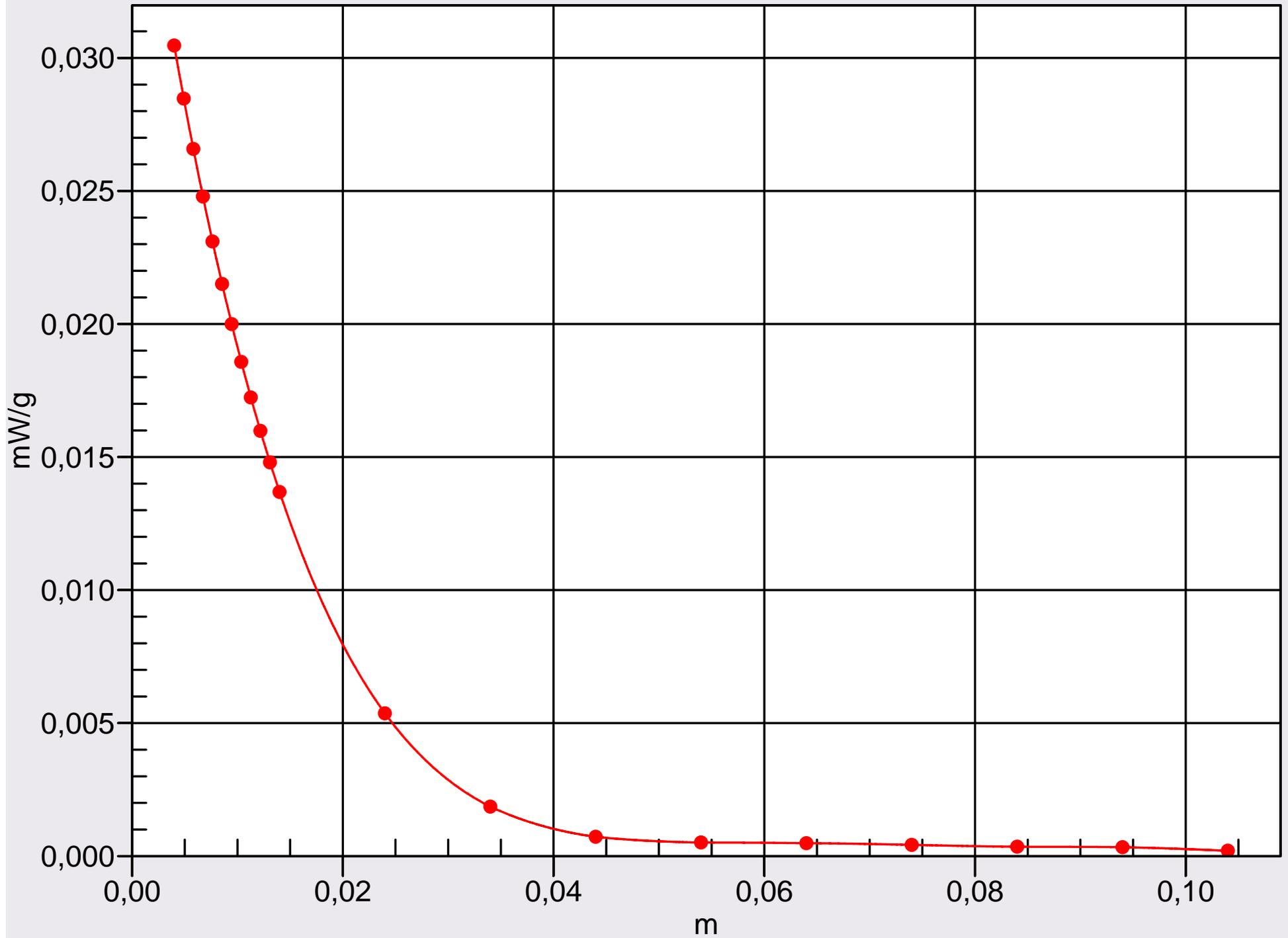
SAR(1 g) = 9.96 mW/g; SAR(10 g) = 5.2 mW/g

Maximum value of SAR (measured) = 11.3 mW/g



0 dB = 11.3mW/g

Interpolated SAR(x,y,z,f0)
HSL1900; Z Scan: Value Along Z, X=0, Y=0



Test Laboratory: Sony Ericsson Mobile Communications AB**Perf_1900_2****DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d002**

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

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.57$ mho/m; $\epsilon_r = 50.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(4.68, 4.68, 4.68); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Perf check 1900/Area Scan (41x41x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 12.0 mW/g

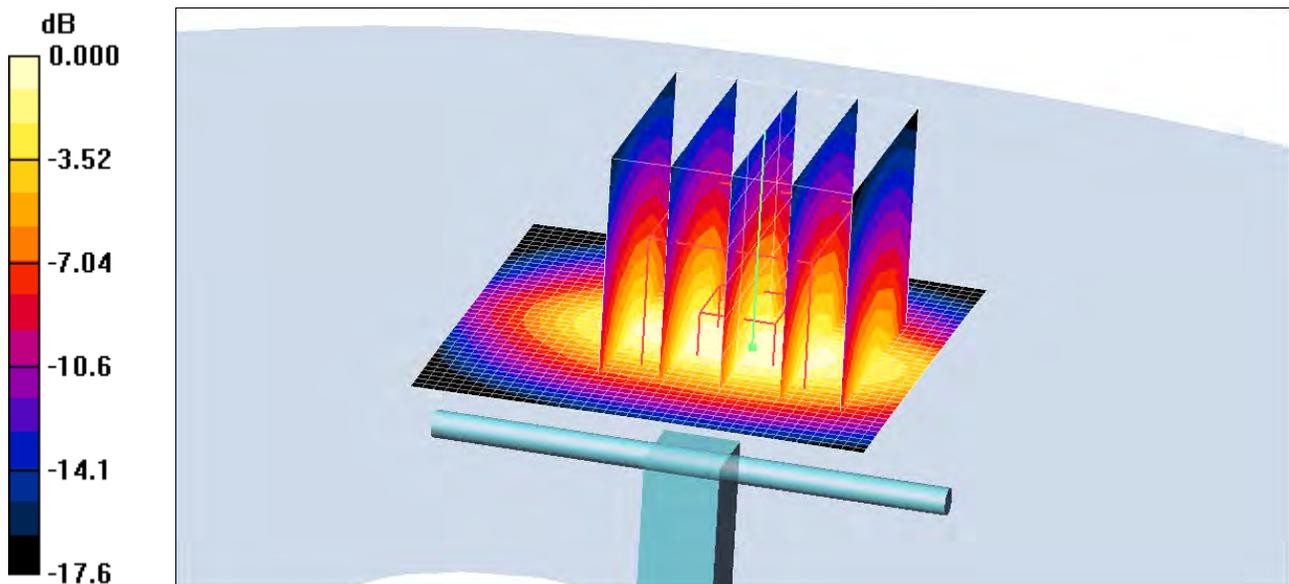
Perf check 1900/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 87.7 V/m; Power Drift = -0.010 dB

Peak SAR (extrapolated) = 18.4 W/kg

SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.4 mW/g

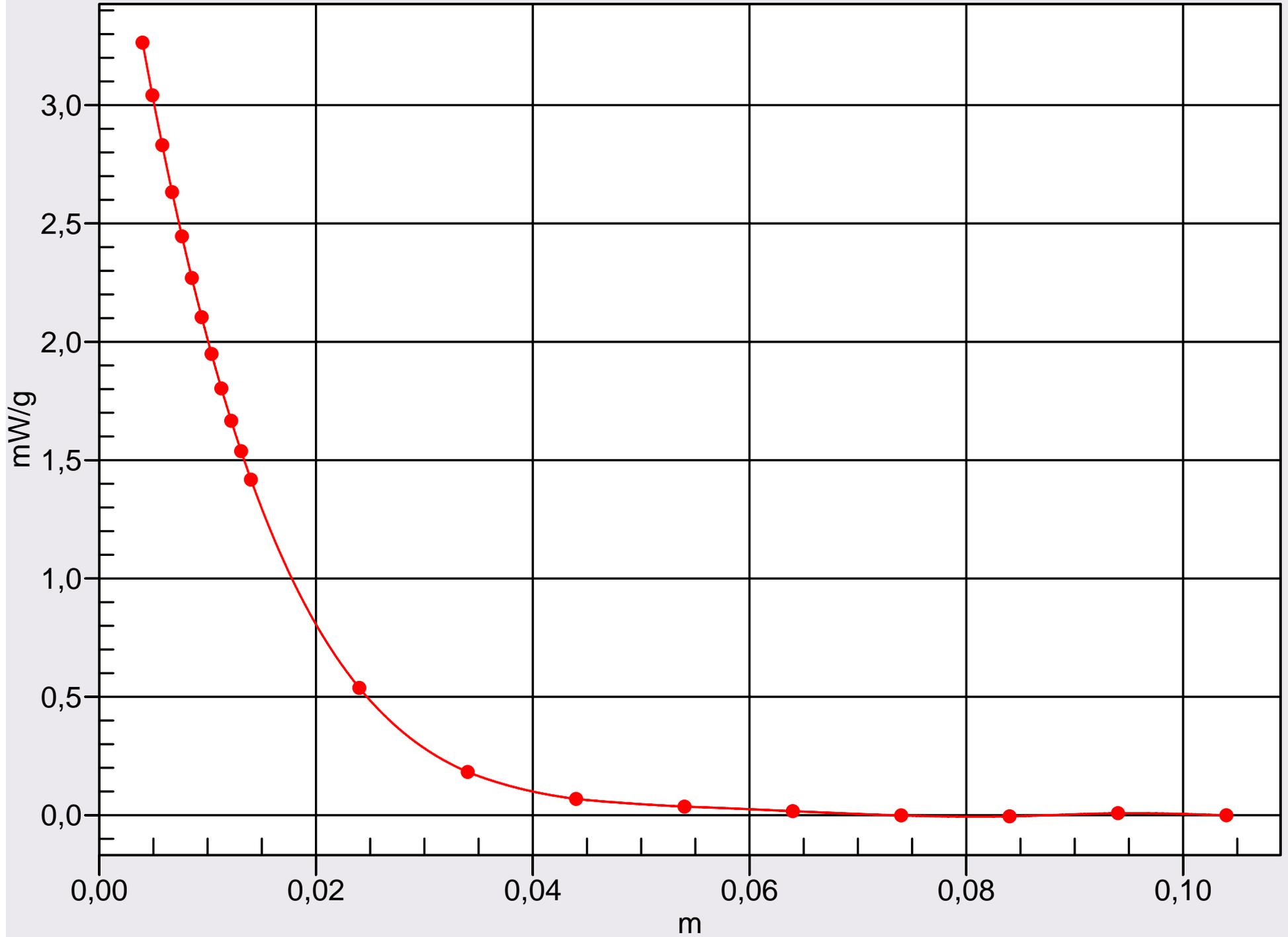
Maximum value of SAR (measured) = 11.6 mW/g



0 dB = 11.6mW/g

Interpolated SAR(x,y,z,f0)

MSL1900; Z Scan: Value Along Z, X=0, Y=0



Test Laboratory: Sony Ericsson Mobile Communications AB**Body_835GPRS_2****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

Communication System: GSM835MHz_GPRS2Slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.983$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³Medium parameters used: $\sigma = 0.981093$ mho/m, $\epsilon_r = 53.832$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.54, 6.54, 6.54); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

GPRS Mid/Area Scan (41x121x1): Measurement grid: dx=15mm, dy=10mm

Maximum value of SAR (interpolated) = 1.38 mW/g

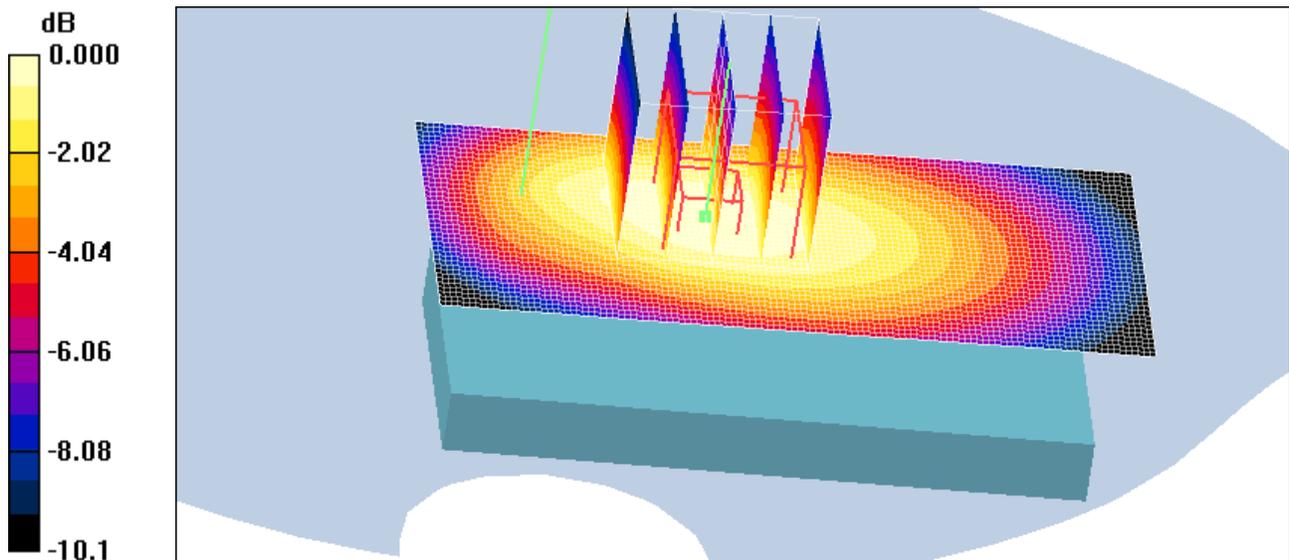
GPRS Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.9 V/m; Power Drift = -0.115 dB

Peak SAR (extrapolated) = 1.59 W/kg

SAR(1 g) = 1.28 mW/g; SAR(10 g) = 0.926 mW/g

Maximum value of SAR (measured) = 1.37 mW/g



0 dB = 1.37mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Body_835GPRS_2****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

Communication System: GSM835MHz_GPRS2Slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15
 Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.983$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.54, 6.54, 6.54); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

EDGE Mid/Area Scan (41x121x1): Measurement grid: dx=15mm, dy=10mm

Maximum value of SAR (interpolated) = 0.555 mW/g

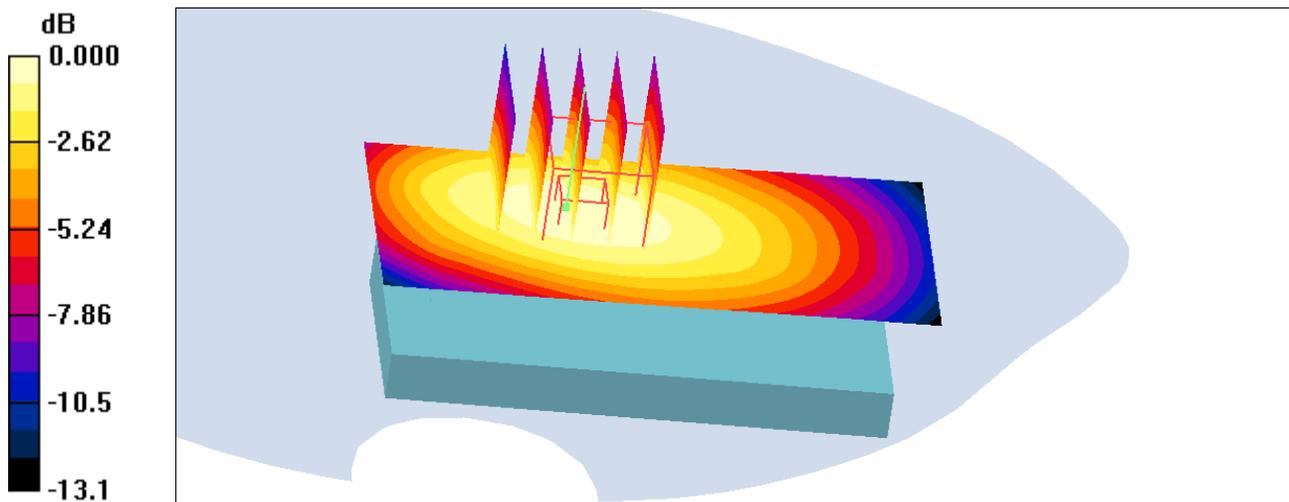
EDGE Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.0 V/m; Power Drift = -0.049 dB

Peak SAR (extrapolated) = 0.649 W/kg

SAR(1 g) = 0.508 mW/g; SAR(10 g) = 0.372 mW/g

Maximum value of SAR (measured) = 0.548 mW/g



0 dB = 0.555mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Body_835****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

Communication System: GSM835MHz; Frequency: 848.8 MHz;Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.996$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.54, 6.54, 6.54); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

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

Reference Value = 24.8 V/m; Power Drift = -0.117 dB

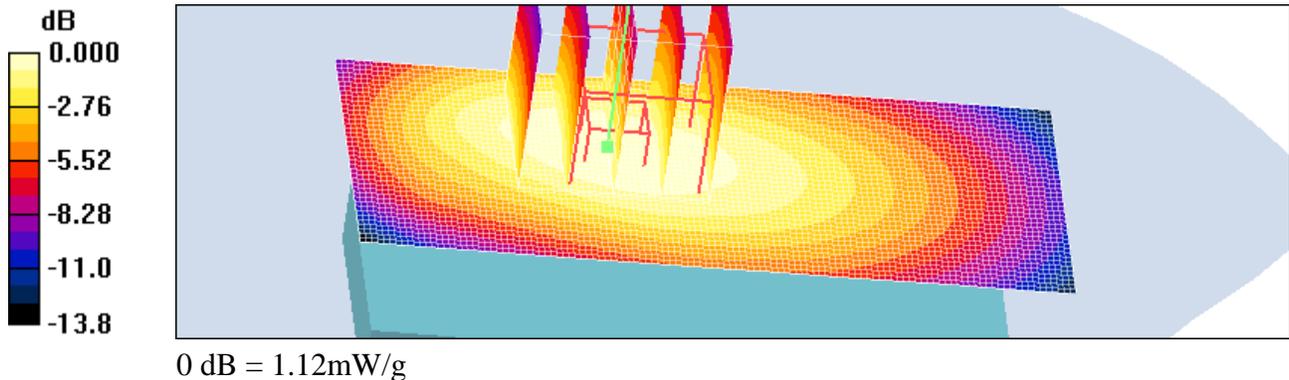
Peak SAR (extrapolated) = 1.32 W/kg

SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.738 mW/g

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

BT Hi/Area Scan (41x121x1): Measurement grid: dx=15mm, dy=10mm

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



Test Laboratory: Sony Ericsson Mobile Communications AB**Body_835****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

Communication System: GSM835MHz; Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.996$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.54, 6.54, 6.54); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

BT Hi Frontside/Display/Area Scan (41x121x1): Measurement grid: dx=15mm, dy=10mm
Maximum value of SAR (interpolated) = 0.900 mW/g

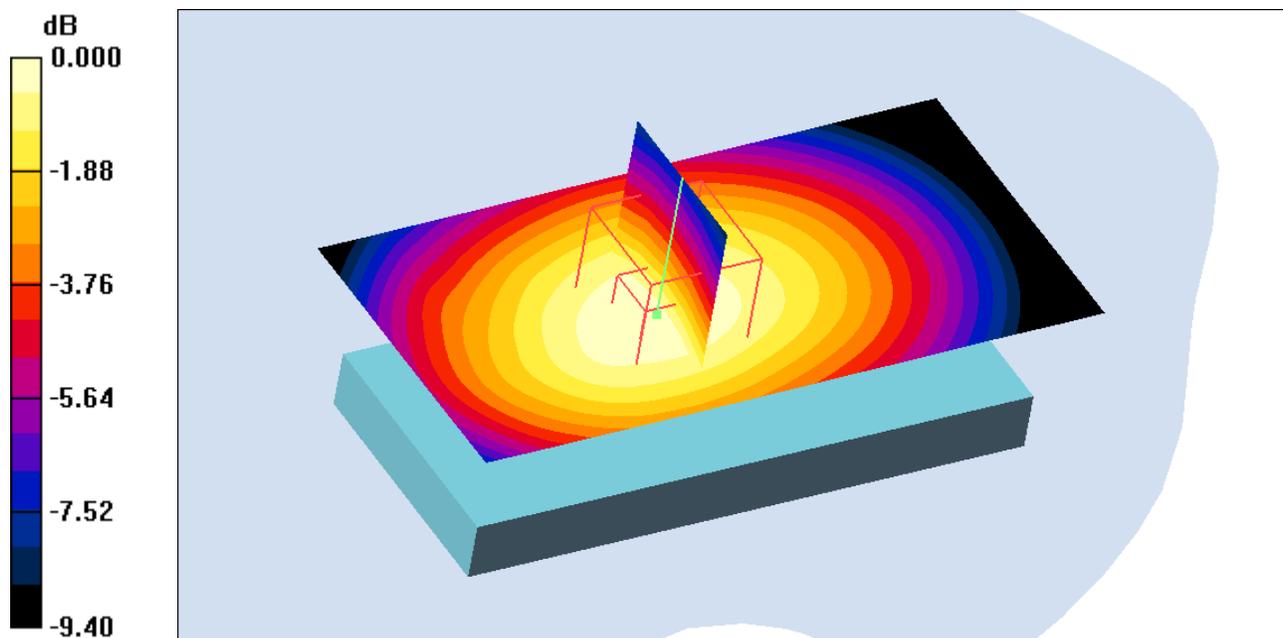
BT Hi Frontside/Display/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 23.1 V/m; Power Drift = -0.044 dB

Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.852 mW/g; SAR(10 g) = 0.618 mW/g

Maximum value of SAR (measured) = 0.908 mW/g



0 dB = 0.908mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Body_835****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

Communication System: GSM835MHz; Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.996$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.54, 6.54, 6.54); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection) Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

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

Reference Value = 16.9 V/m; Power Drift = -0.023 dB

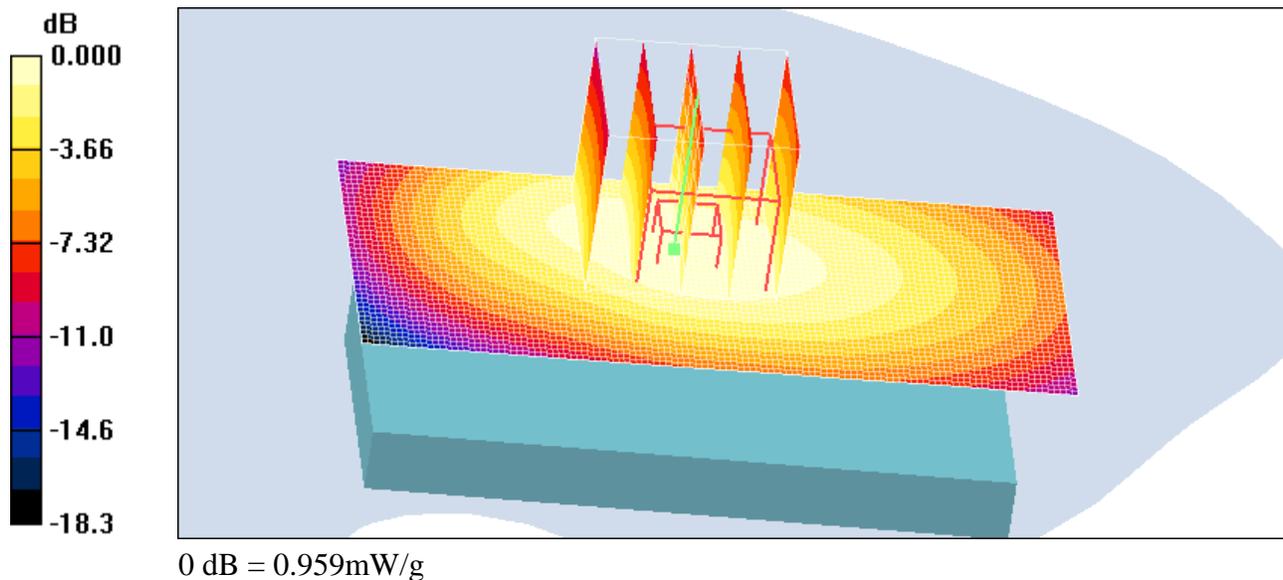
Peak SAR (extrapolated) = 1.12 W/kg

SAR(1 g) = 0.891 mW/g; SAR(10 g) = 0.641 mW/g

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

PHF Hi/Area Scan (41x121x1): Measurement grid: dx=15mm, dy=10mm

Maximum value of SAR (interpolated) = 0.959 mW/g



Test Laboratory: Sony Ericsson Mobile Communications AB**Left_850****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

Communication System: GSM835MHz; Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.876$ mho/m; $\epsilon_r = 39.9$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.71, 6.71, 6.71); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 1; Type: Twin SAM; Serial: TP-1144
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

High Cheek/Area Scan (81x41x1): Measurement grid: dx=15mm, dy=15mm

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

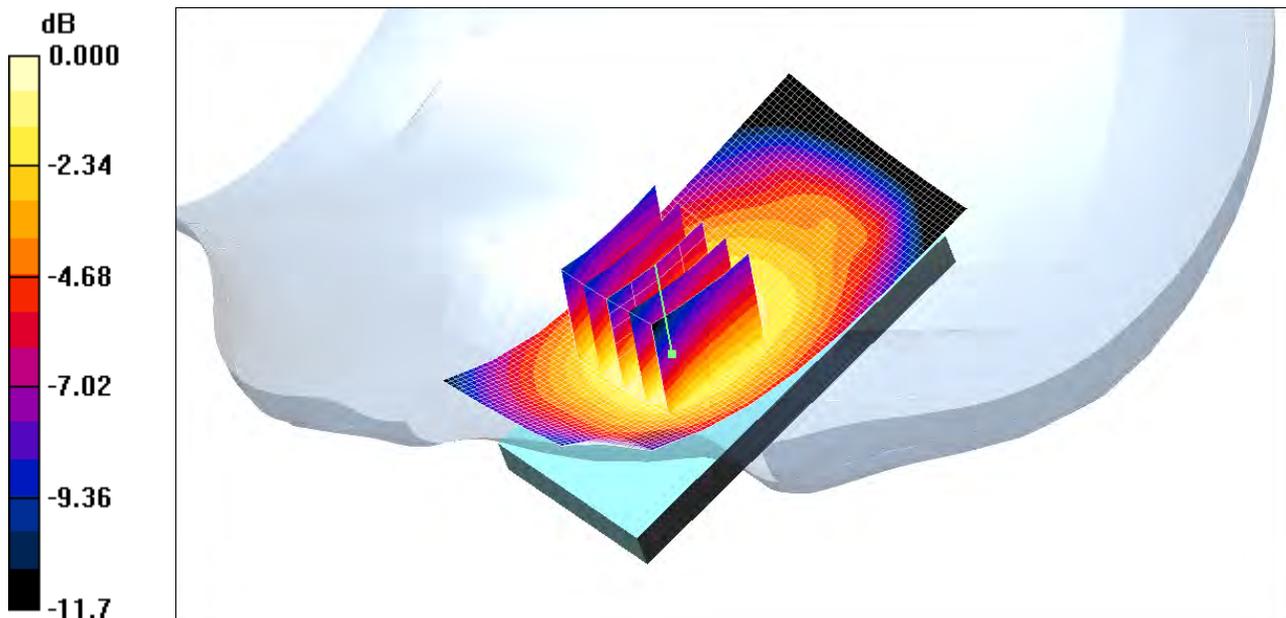
High Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 37.5 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 1.44 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.787 mW/g

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



0 dB = 1.21mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Left_850****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

Communication System: GSM835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.865$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.71, 6.71, 6.71); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 1; Type: Twin SAM; Serial: TP-1144
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Mid Tilt/Area Scan (81x41x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.460 mW/g

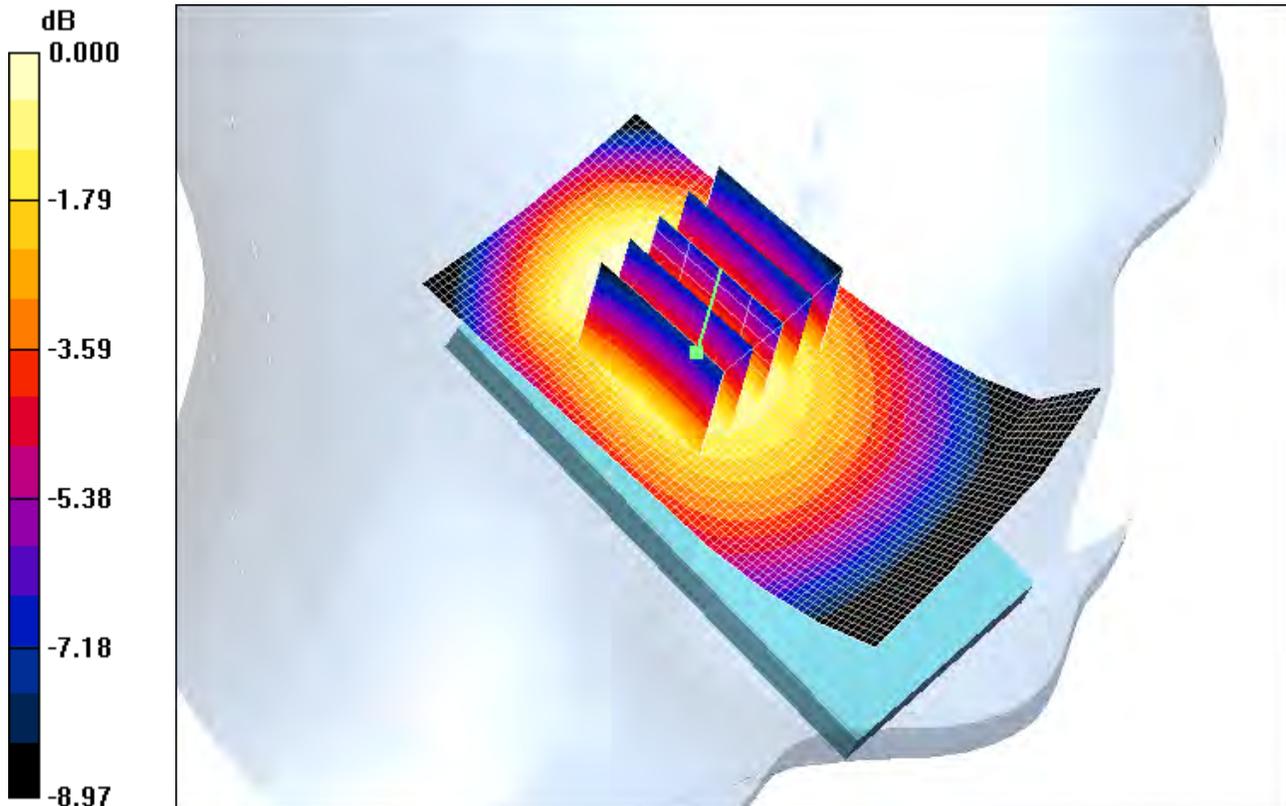
Mid Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.6 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 0.542 W/kg

SAR(1 g) = 0.435 mW/g; SAR(10 g) = 0.319 mW/g

Maximum value of SAR (measured) = 0.460 mW/g



0 dB = 0.460mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Right_850****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

Communication System: GSM835MHz; Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.876$ mho/m; $\epsilon_r = 39.9$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.71, 6.71, 6.71); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 1; Type: Twin SAM; Serial: TP-1144
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

High Cheek/Area Scan 2 (81x41x1): Measurement grid: dx=15mm, dy=15mm

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

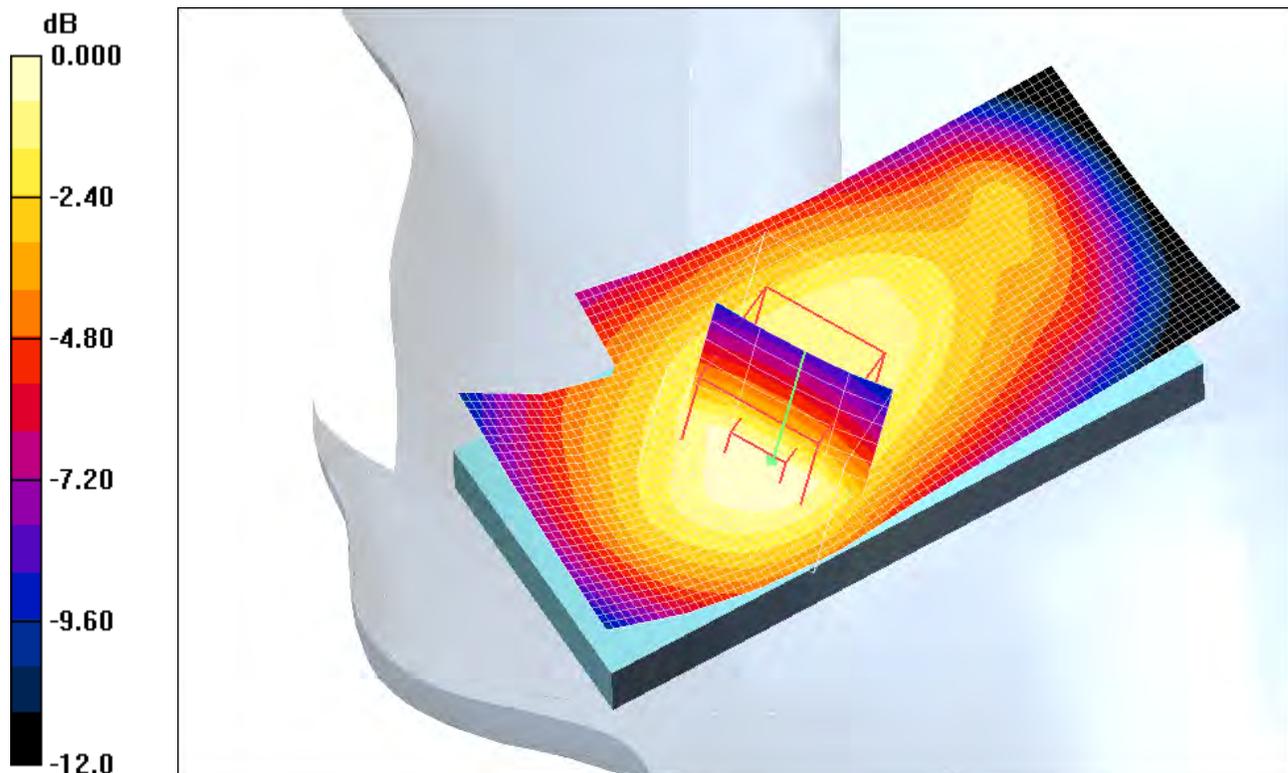
High Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 37.6 V/m; Power Drift = -0.027 dB

Peak SAR (extrapolated) = 1.69 W/kg

SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.803 mW/g

Maximum value of SAR (measured) = 1.23 mW/g



0 dB = 1.23mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Right_850****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

Communication System: GSM835MHz; Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.865$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.71, 6.71, 6.71); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 1; Type: Twin SAM; Serial: TP-1144
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Mid Tilt/Area Scan (81x41x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 17.5 V/m; Power Drift = -0.016 dB

Peak SAR (extrapolated) = 0.691 W/kg

SAR(1 g) = 0.363 mW/g; SAR(10 g) = 0.254 mW/g

Maximum value of SAR (measured) = 0.422 mW/g

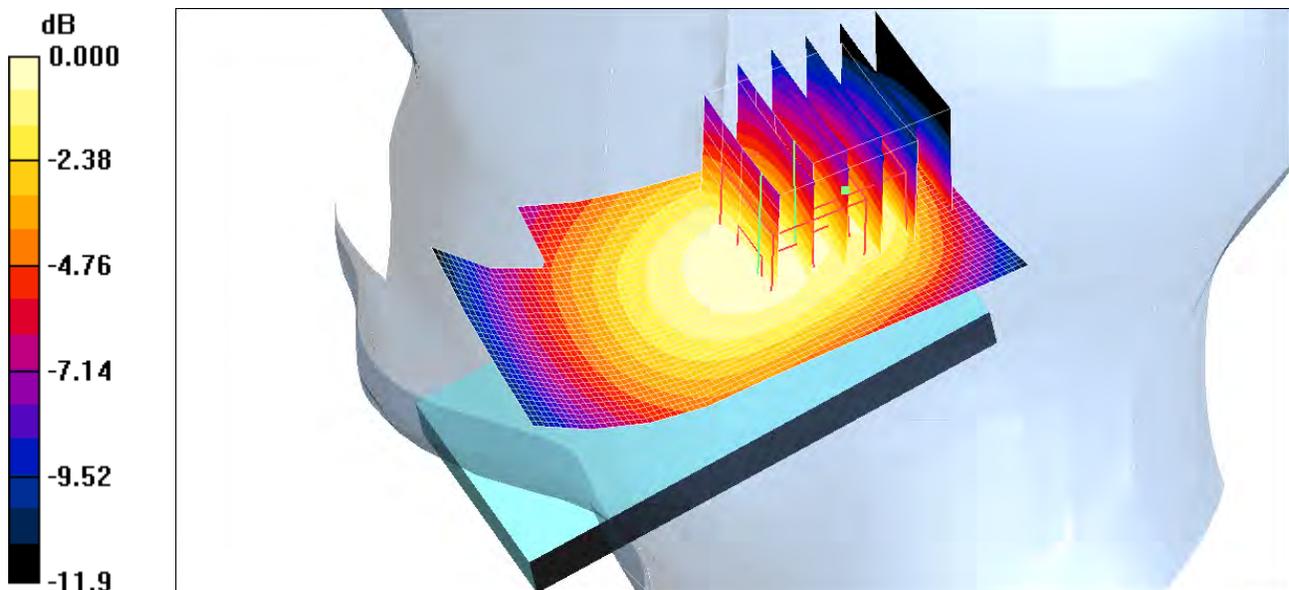
Mid Tilt/Zoom Scan 2 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.5 V/m; Power Drift = -0.016 dB

Peak SAR (extrapolated) = 0.546 W/kg

SAR(1 g) = 0.417 mW/g; SAR(10 g) = 0.293 mW/g

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



0 dB = 0.442mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Left_1900****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 39.2$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(5.13, 5.13, 5.13); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Hi touch/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.05 mW/g

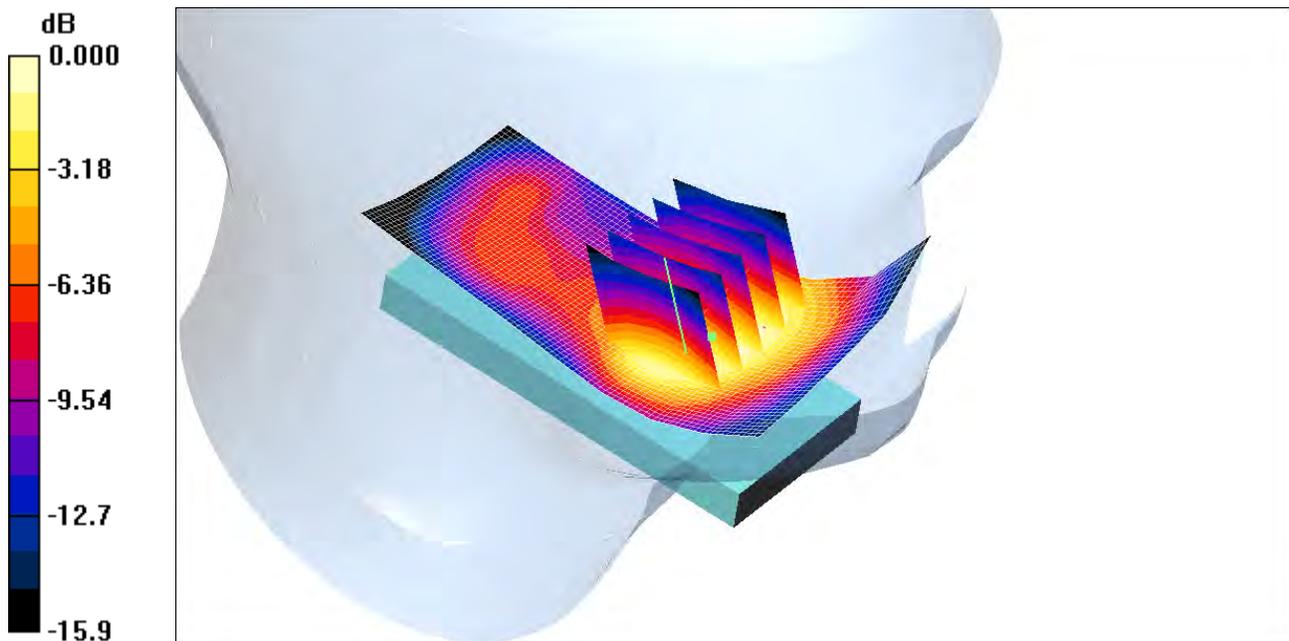
Hi touch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.2 V/m; Power Drift = 0.083 dB

Peak SAR (extrapolated) = 1.32 W/kg

SAR(1 g) = 0.906 mW/g; SAR(10 g) = 0.567 mW/g

Maximum value of SAR (measured) = 0.976 mW/g



0 dB = 0.976mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Left_1900****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 39.3$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(5.13, 5.13, 5.13); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Mid Tilt/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.479 mW/g

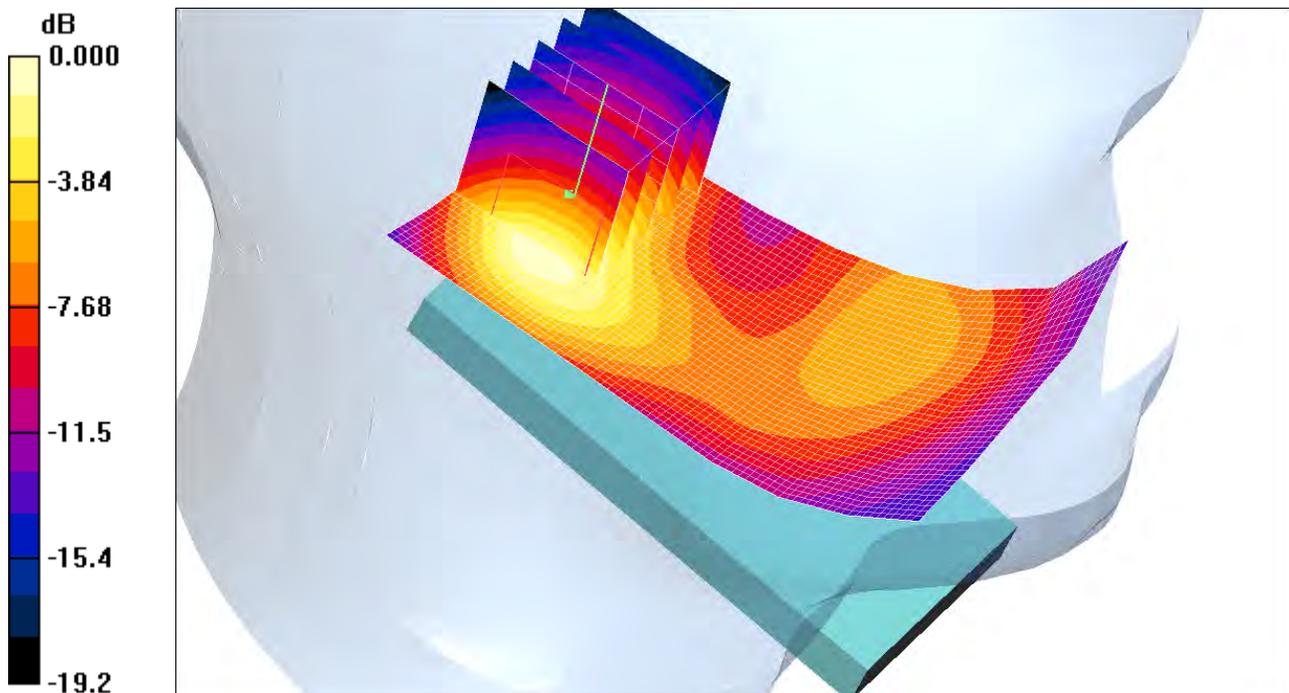
Mid Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.08 V/m; Power Drift = -0.004 dB

Peak SAR (extrapolated) = 0.624 W/kg

SAR(1 g) = 0.398 mW/g; SAR(10 g) = 0.229 mW/g

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



0 dB = 0.445mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Right_1900****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 39.2$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(5.13, 5.13, 5.13); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

High Touch/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

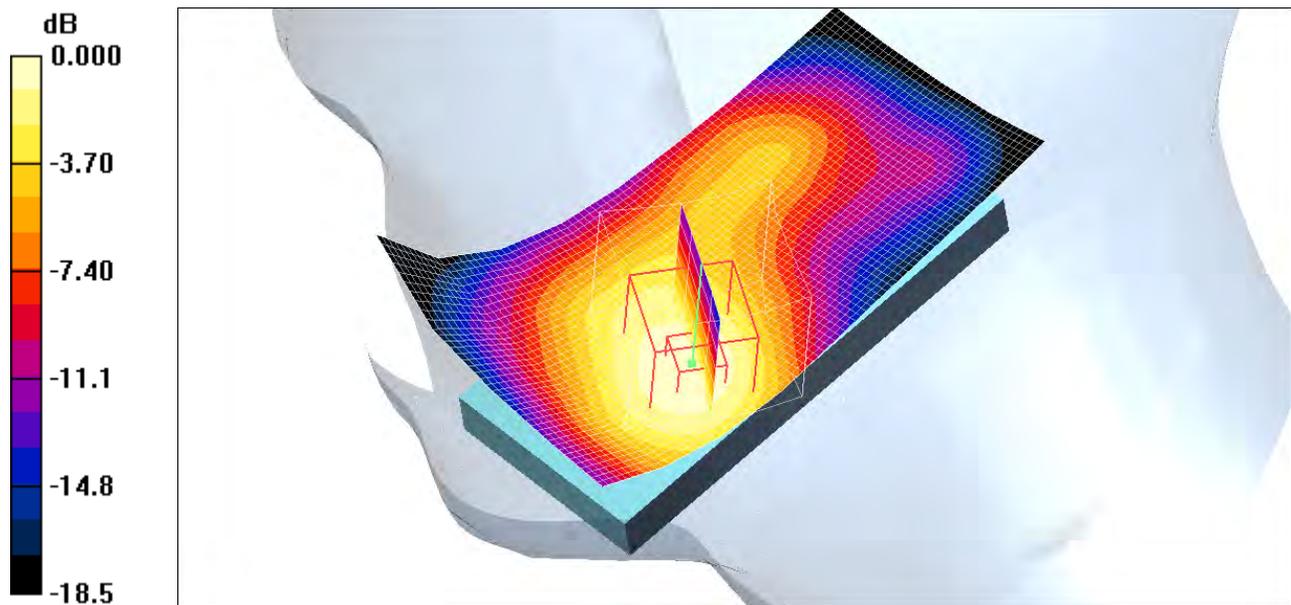
High Touch/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.7 V/m; Power Drift = -0.038 dB

Peak SAR (extrapolated) = 1.80 W/kg

SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.658 mW/g

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



0 dB = 1.25mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Right_1900****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 39.3$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(5.13, 5.13, 5.13); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Mid Tilt/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.567 mW/g

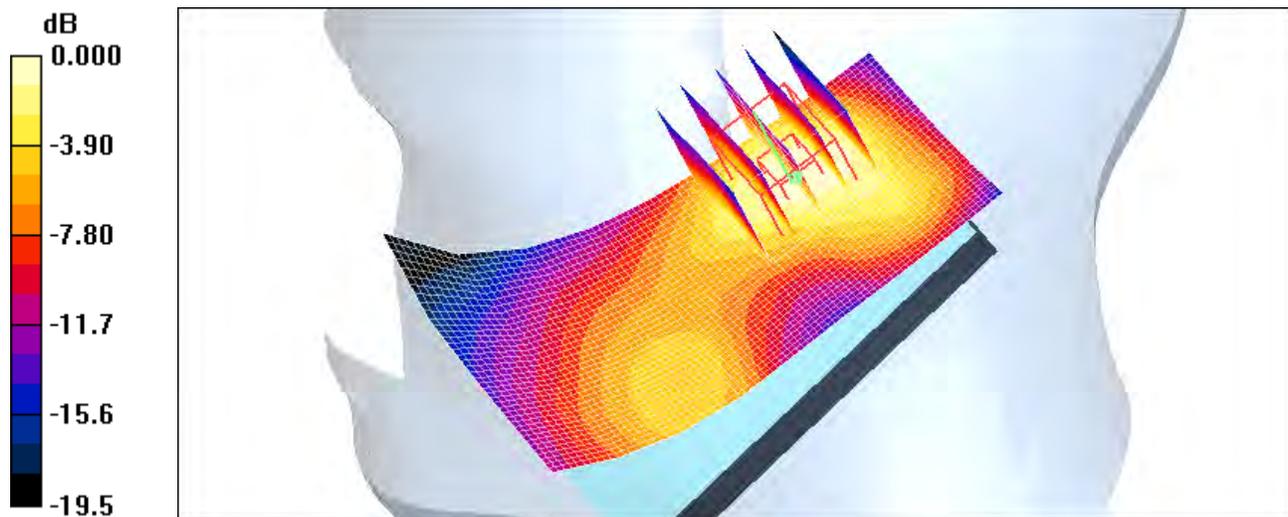
Mid Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.0 V/m; Power Drift = -0.059 dB

Peak SAR (extrapolated) = 0.798 W/kg

SAR(1 g) = 0.494 mW/g; SAR(10 g) = 0.278 mW/g

Maximum value of SAR (measured) = 0.551 mW/g



0 dB = 0.551mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Body_1900****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 50.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(4.68, 4.68, 4.68); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

BT hi/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.528 mW/g

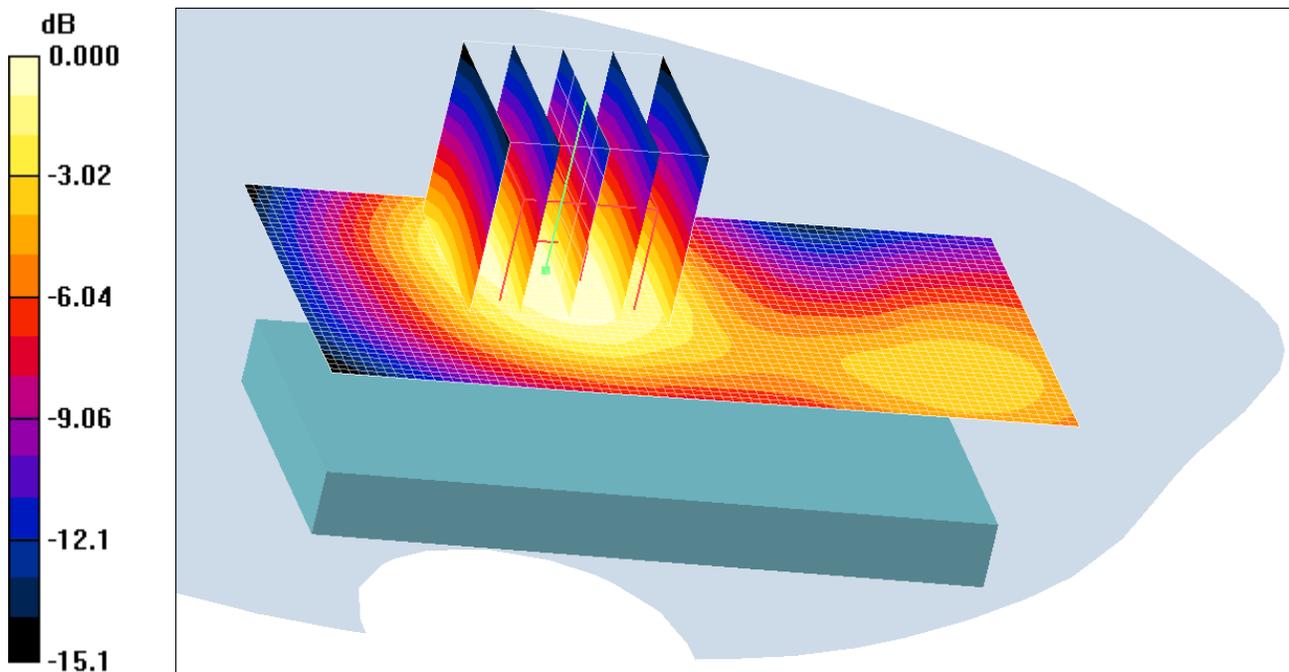
BT hi/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.15 V/m; Power Drift = 0.022 dB

Peak SAR (extrapolated) = 0.780 W/kg

SAR(1 g) = 0.463 mW/g; SAR(10 g) = 0.280 mW/g

Maximum value of SAR (measured) = 0.491 mW/g



0 dB = 0.491mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Body_1900****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 50.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(4.68, 4.68, 4.68); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

PHF High/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.359 mW/g

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

Reference Value = 12.1 V/m; Power Drift = -0.106 dB

Peak SAR (extrapolated) = 0.556 W/kg

SAR(1 g) = 0.307 mW/g; SAR(10 g) = 0.185 mW/g

Maximum value of SAR (measured) = 0.322 mW/g

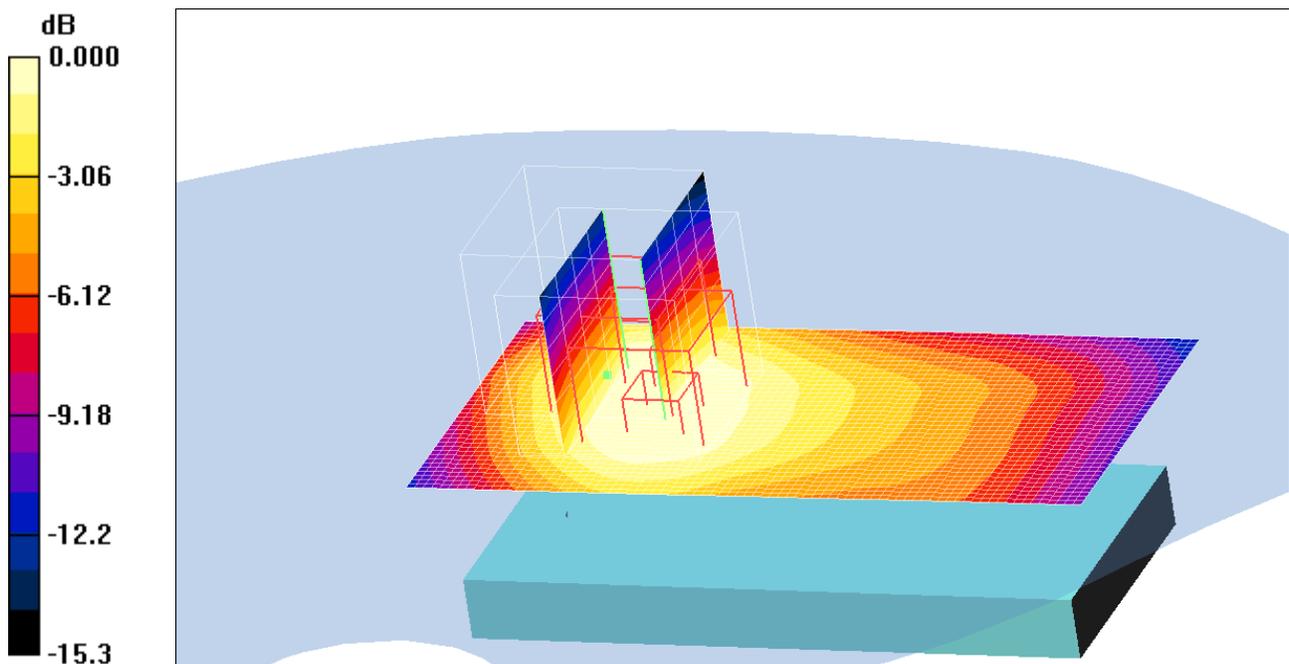
PHF High/Zoom Scan 2 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.1 V/m; Power Drift = -0.106 dB

Peak SAR (extrapolated) = 0.537 W/kg

SAR(1 g) = 0.297 mW/g; SAR(10 g) = 0.188 mW/g

Maximum value of SAR (measured) = 0.326 mW/g



0 dB = 0.326mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Body_1900GPRS****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

Communication System: GSM1900_GPRS; Frequency: 1909.8 MHz; Duty Cycle: 1:4.15

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 50.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(4.68, 4.68, 4.68); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

GPRS hi/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.694 mW/g

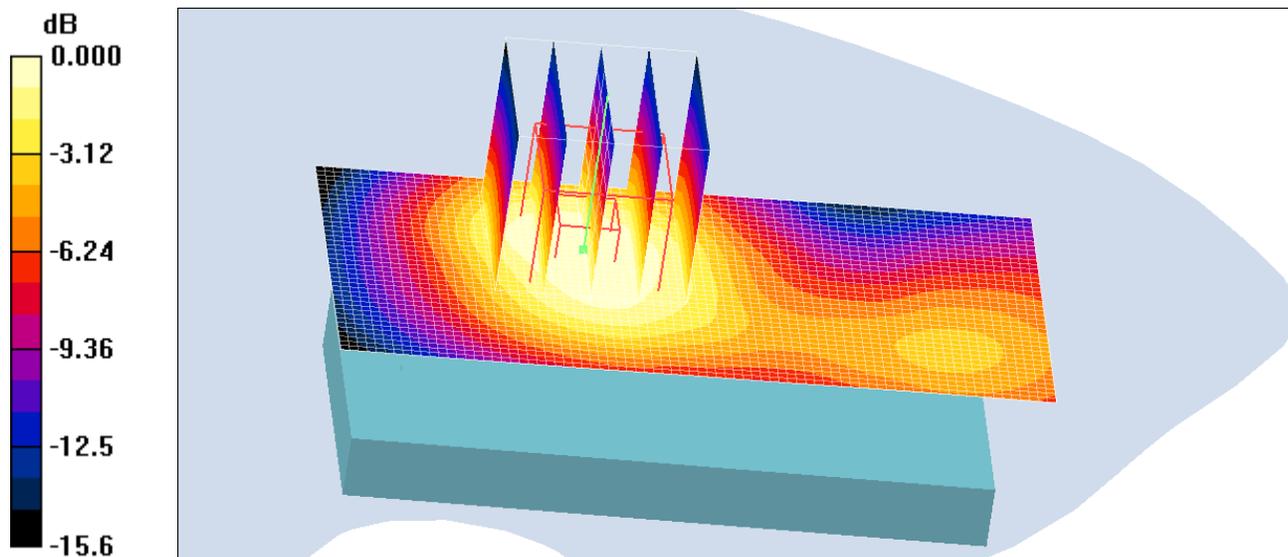
GPRS hi/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.90 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.613 mW/g; SAR(10 g) = 0.373 mW/g

Maximum value of SAR (measured) = 0.658 mW/g



0 dB = 0.658mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB**Body_1900GPRS****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

Communication System: GSM1900_GPRS; Frequency: 1909.8 MHz; Duty Cycle: 1:4.15

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 50.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(4.68, 4.68, 4.68); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

GPRS hi Frontside/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.456 mW/g

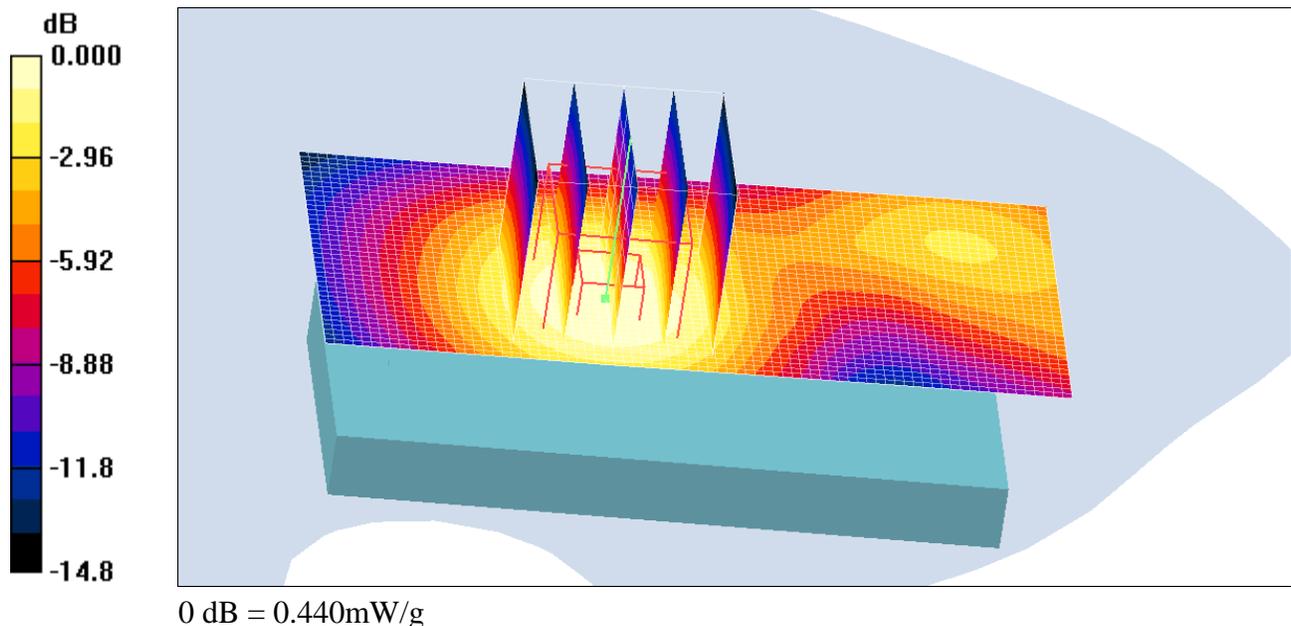
GPRS hi Frontside/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.27 V/m; Power Drift = -0.070 dB

Peak SAR (extrapolated) = 0.658 W/kg

SAR(1 g) = 0.410 mW/g; SAR(10 g) = 0.252 mW/g

Maximum value of SAR (measured) = 0.440 mW/g



Test Laboratory: Sony Ericsson Mobile Communications AB**Body_1900GPRS****DUT: Martha; Type: AAB-1022141-BV; Serial: CB5A0P5YA5**

Communication System: GSM1900_GPRS; Frequency: 1909.8 MHz; Duty Cycle: 1:4.15

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 50.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(4.68, 4.68, 4.68); Calibrated: 2008-01-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2008-03-05
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

EDGE Hi/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.474 mW/g

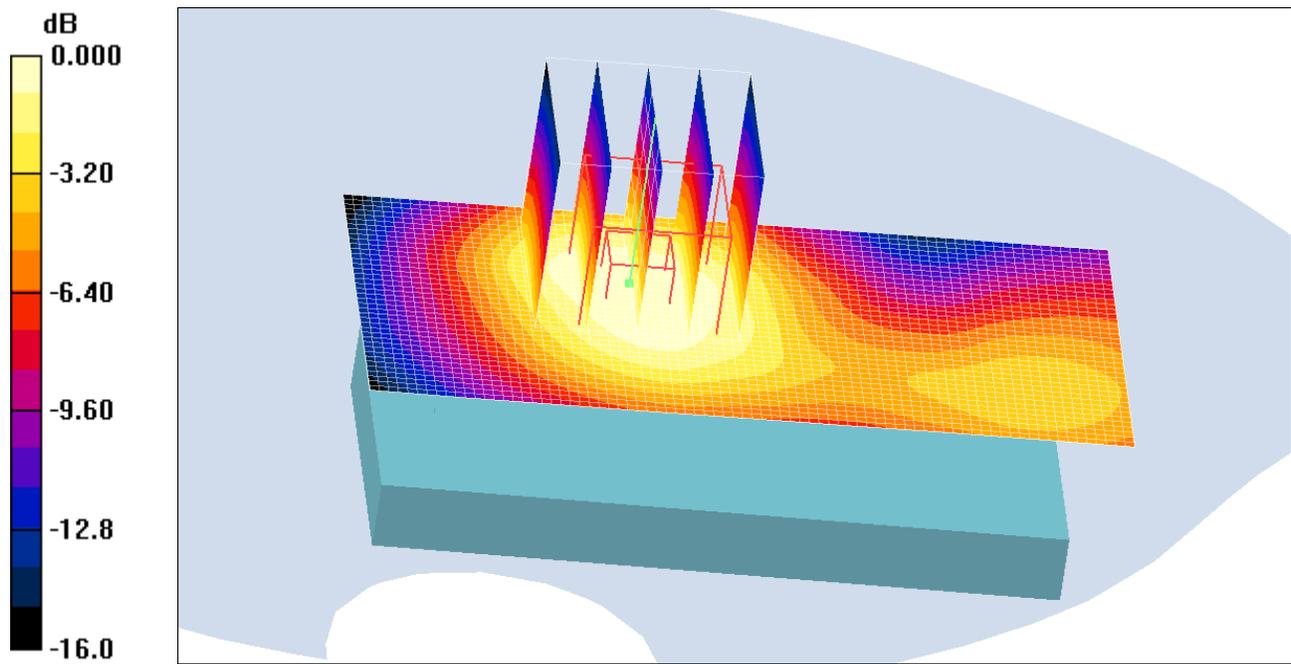
EDGE Hi/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.47 V/m; Power Drift = 0.016 dB

Peak SAR (extrapolated) = 0.709 W/kg

SAR(1 g) = 0.420 mW/g; SAR(10 g) = 0.254 mW/g

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



0 dB = 0.450mW/g



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Sony Ericsson Lund**

Certificate No: **D835V2-484_Jan07**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 484**

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

Calibration date: **January 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 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|-----------------------------|------------------|---|-----------------------|
| Power meter EPM-442A | GB37480704 | 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 907 | 20-Jul-06 (SPEAG, No. DAE4-907_Jul06) | Jul-07 |

| 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: **Marcel Fehr** (Name) **Laboratory Technician** (Function)  (Signature)

Approved by: **Kata Polovic** (Name) **Technical Manager** (Function)  (Signature)

Issued: January 16, 2007

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:

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- b) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- d) DASY4 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 ± 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Head TSL parameters | 22.0 °C | 41.5 | 0.90 mho/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 40.2 ± 6 % | 0.88 mho/m ± 6 % |
| Head TSL temperature during test | (22.1 ± 0.2) °C | --- | --- |

SAR result with Head TSL

| SAR averaged over 1 cm³ (1 g) of Head TSL | Condition | |
|---|--------------------|-----------------------------------|
| SAR measured | 250 mW input power | 2.31 mW / g |
| SAR normalized | normalized to 1W | 9.24 mW / g |
| SAR for nominal Head TSL parameters ¹ | normalized to 1W | 9.20 mW / g ± 17.0 % (k=2) |

| SAR averaged over 10 cm³ (10 g) of Head TSL | condition | |
|---|--------------------|-----------------------------------|
| SAR measured | 250 mW input power | 1.51 mW / g |
| SAR normalized | normalized to 1W | 6.04 mW / g |
| SAR for nominal Head TSL parameters ¹ | normalized to 1W | 6.00 mW / g ± 16.5 % (k=2) |

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

Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|----------------------------------|-----------------|--------------|------------------|
| Nominal Body TSL parameters | 22.0 °C | 55.2 | 0.97 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 54.1 ± 6 % | 1.01 mho/m ± 6 % |
| Body TSL temperature during test | (21.9 ± 0.2) °C | --- | --- |

SAR result with Body TSL

| SAR averaged over 1 cm ³ (1 g) of Body TSL | condition | |
|---|--------------------|----------------------------|
| SAR measured | 250 mW input power | 2.47 mW / g |
| SAR normalized | normalized to 1W | 9.88 mW / g |
| SAR for nominal Body TSL parameters ² | normalized to 1W | 9.48 mW / g ± 17.0 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|----------------------------|
| SAR measured | 250 mW input power | 1.62 mW / g |
| SAR normalized | normalized to 1W | 6.48 mW / g |
| SAR for nominal Body TSL parameters ² | normalized to 1W | 6.29 mW / g ± 16.5 % (k=2) |
| | | |

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

Appendix

Antenna Parameters with Head TSL

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 52.4 Ω - 3.2 j Ω |
| Return Loss | - 28.1 dB |

Antenna Parameters with Body TSL

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 48.2 Ω - 4.8 j Ω |
| Return Loss | - 25.6 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.395 ns |
|----------------------------------|----------|

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

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

Additional EUT Data

| | |
|-----------------|----------------|
| Manufactured by | SPEAG |
| Manufactured on | April 23, 2003 |

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 484

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

Medium: HSL 900 MHz;

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.88 \text{ mho/m}$; $\epsilon_r = 40.3$; $\rho = 1000 \text{ kg/m}^3$

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 Sn907; Calibrated: 20.07.2006
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

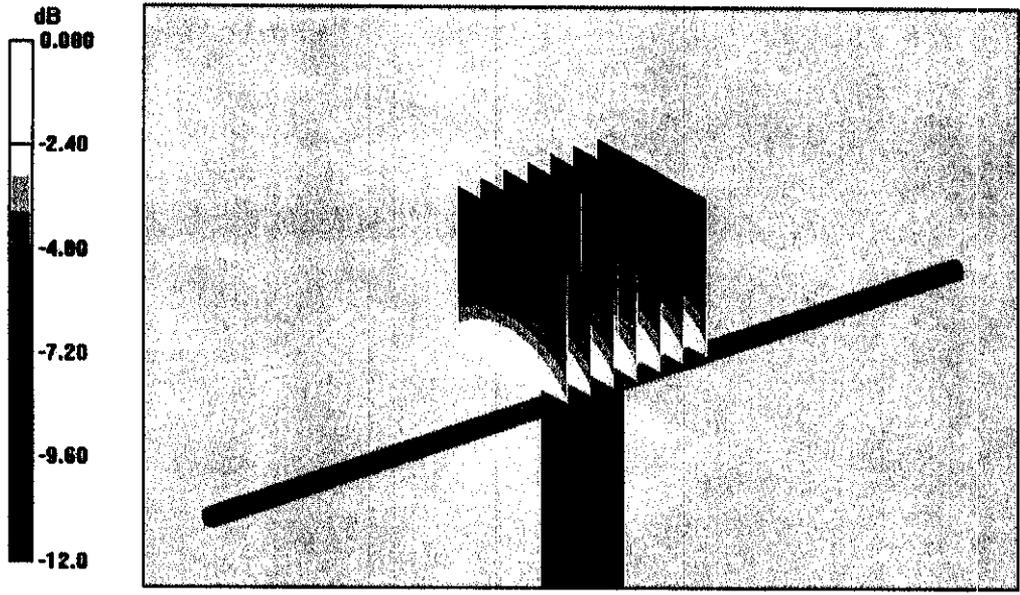
Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.7 V/m; Power Drift = -0.006 dB

Peak SAR (extrapolated) = 3.40 W/kg

SAR(1 g) = 2.31 mW/g; SAR(10 g) = 1.51 mW/g

Maximum value of SAR (measured) = 2.47 mW/g



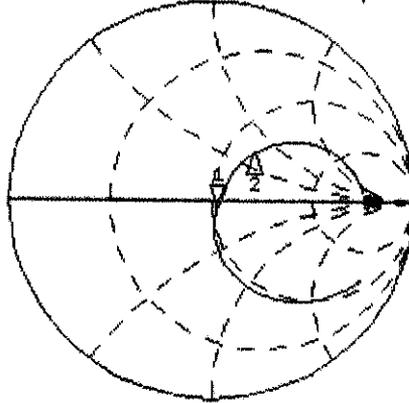
0 dB = 2.47mW/g

Impedance Measurement Plot for Head TSL

8 Jan 2007 11:17:02

CH1 S11 1 U FS 1i 52.436 Ω -3.2129 Ω 59.325 pF 835.000 000 MHz

*
Del
Cor



CH1 Markers
1: 65.203 Ω
2: 33.645 Ω
900.000 MHz

Avg
16

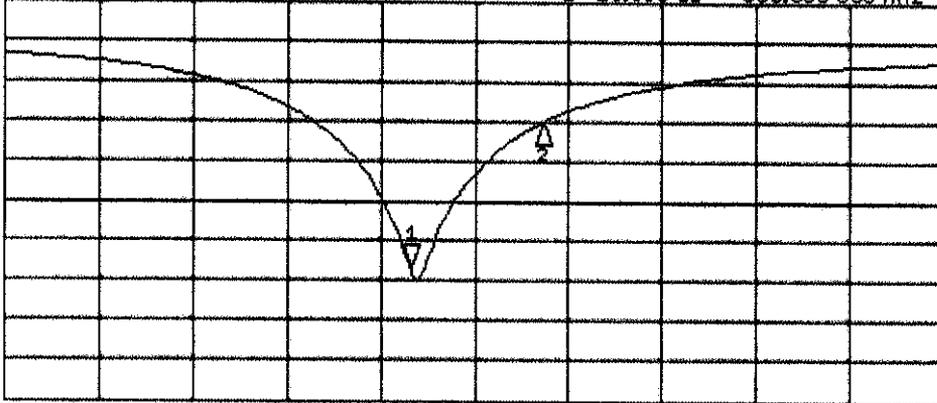
↑

CH2 S11 L00 5 dB/REF -20 dB 1i -28.095 dB 835.000 000 MHz

Cor

Avg
16

↑



CH2 Markers
1: -10.240 dB
900.000 MHz

START 635.000 000 MHz

STOP 1 100.000 000 MHz

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:484

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

Medium: MSL900;

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 1.01 \text{ mho/m}$; $\epsilon_r = 54.1$; $\rho = 1000 \text{ kg/m}^3$

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 Sn907; Calibrated: 20.07.2006
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

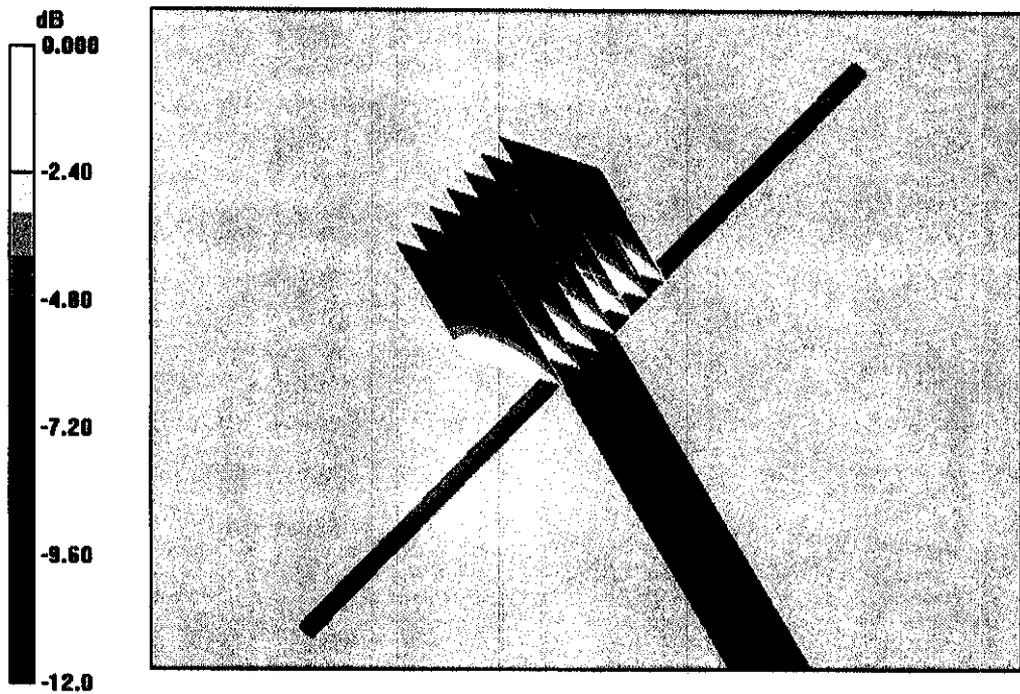
Unnamed procedure/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 53.8 V/m; Power Drift = 0.018 dB

Peak SAR (extrapolated) = 3.55 W/kg

SAR(1 g) = 2.47 mW/g; SAR(10 g) = 1.62 mW/g

Maximum value of SAR (measured) = 2.66 mW/g



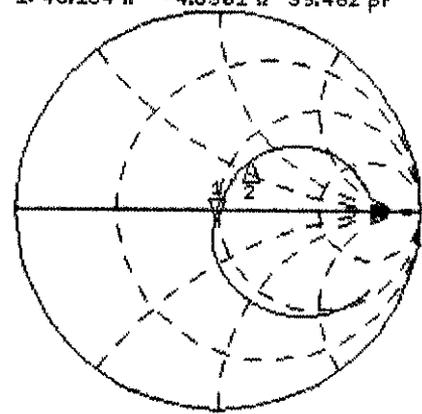
0 dB = 2.66mW/g

Impedance Measurement Plot for Body TSL

15 Jan 2007 13:01:41

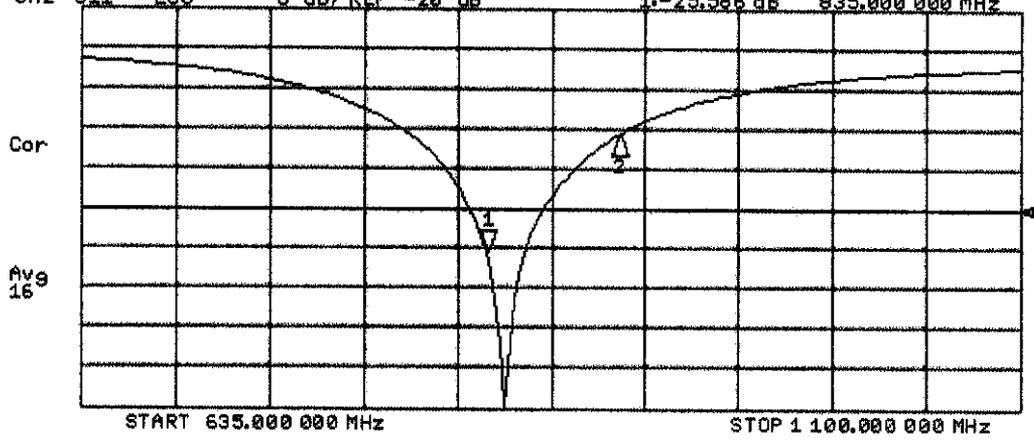
CH1 S11 1 U FS 1: 48.154 Ω -4.8201 Ω 39.462 pF 835.000 000 MHz

*
De1
Cor
Avg
16



CH1 Markers
2: 58.496 Ω
31.262 Ω
900.000 MHz

CH2 S11 LOG 5 dB/REF -20 dB 1: -25.586 dB 835.000 000 MHz



CH2 Markers
2: -10.845 dB
900.000 MHz

START 635.000 000 MHz STOP 1 1000.000 000 MHz



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Accreditation No.: **SCS 108**

Client **Sony Ericsson Lund**

Certificate No. **D1900V2-5d002_Jan07**

CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d002**

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

Calibration date: **January 16, 2007**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|----------------------------|------------------|---|-----------------------|
| Power meter EPM-442A | 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 907 | 20-Jul-06 (SPEAG, No. DAE4-907_Jul06) | Jul-07 |

| 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: Marcel Fahr, Function: Laboratory Technician, Signature: [Signature]**

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

Issued: January 17, 2007

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

- 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 V5.0 | |
| Distance Dipole Center - TSL | 10 mm | with Spacer |
| Zoom Scan Resolution | dx, dy, dz = 5 mm | |
| Frequency | 1900 MHz \pm 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|---------------------|----------------|----------------------|
| Nominal Head TSL parameters | 22.0 °C | 40.0 | 1.40 mho/m |
| Measured Head TSL parameters | (22.0 \pm 0.2) °C | 38.8 \pm 6 % | 1.43 mho/m \pm 6 % |
| Head TSL temperature during test | (22.0 \pm 0.2) °C | --- | --- |

SAR result with Head TSL

| SAR averaged over 1 cm³ (1 g) of Head TSL | condition | |
|---|--------------------|--|
| SAR measured | 250 mW input power | 9.61 mW / g |
| SAR normalized | normalized to 1W | 38.4 mW / g |
| SAR for nominal Head TSL parameters ¹ | normalized to 1W | 37.4 mW / g \pm 17.0 % (k=2) |

| SAR averaged over 10 cm³ (10 g) of Head TSL | Condition | |
|---|--------------------|--|
| SAR measured | 250 mW input power | 5.04 mW / g |
| SAR normalized | normalized to 1W | 20.2 mW / g |
| SAR for nominal Head TSL parameters ¹ | normalized to 1W | 19.8 mW / g \pm 16.5 % (k=2) |

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

Body TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Body TSL parameters | 22.0 °C | 53.3 | 1.52 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 51.9 ± 6 % | 1.55 mho/m ± 6 % |
| Body TSL temperature during test | (21.1 ± 0.2) °C | --- | --- |

SAR result with Body TSL

| SAR averaged over 1 cm³ (1 g) of Body TSL | Condition | |
|---|--------------------|-----------------------------------|
| SAR measured | 250 mW input power | 9.94 mW / g |
| SAR normalized | normalized to 1W | 39.8 mW / g |
| SAR for nominal Body TSL parameters ² | normalized to 1W | 38.6 mW / g ± 17.0 % (k=2) |

| SAR averaged over 10 cm³ (10 g) of Body TSL | condition | |
|---|--------------------|-----------------------------------|
| SAR measured | 250 mW input power | 5.24 mW / g |
| SAR normalized | normalized to 1W | 21.0 mW / g |
| SAR for nominal Body TSL parameters ² | normalized to 1W | 20.6 mW / g ± 16.5 % (k=2) |

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

Appendix

Antenna Parameters with Head TSL

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 51.8 Ω - 0.3 j Ω |
| Return Loss | - 34.9 dB |

Antenna Parameters with Body TSL

| | |
|--------------------------------------|--------------------------------|
| Impedance, transformed to feed point | 48.2 Ω + 2.3 j Ω |
| Return Loss | - 30.5 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.177 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 | February 14, 2002 |

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d002

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

Medium: HSL U10 BB;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 38.8$; $\rho = 1000$ kg/m³

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 Sn907; Calibrated: 20.07.2006
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

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

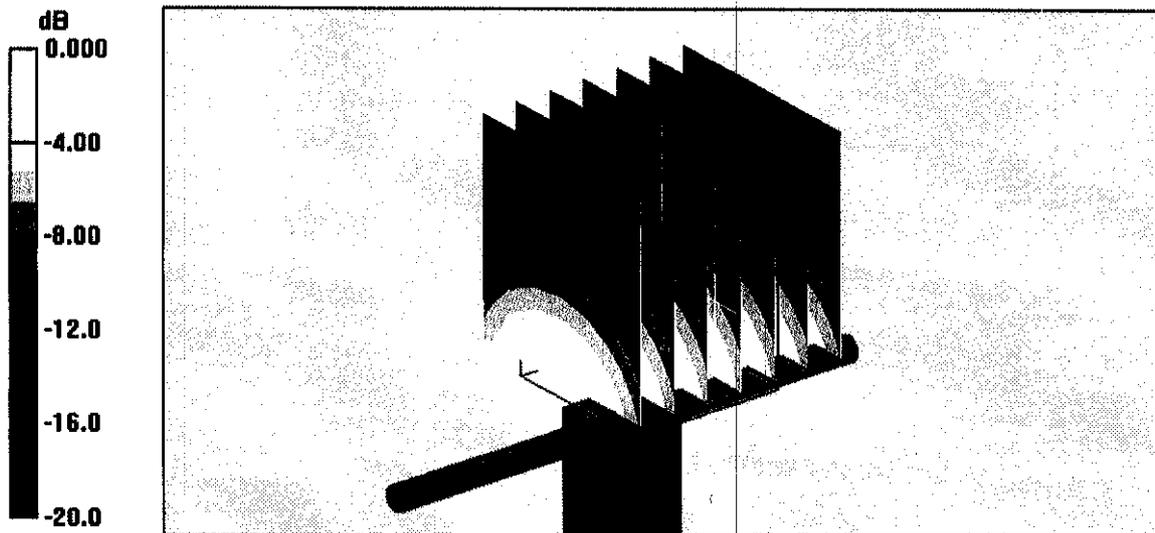
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.7 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 17.0 W/kg

SAR(1 g) = 9.61 mW/g; SAR(10 g) = 5.04 mW/g

Maximum value of SAR (measured) = 11.0 mW/g



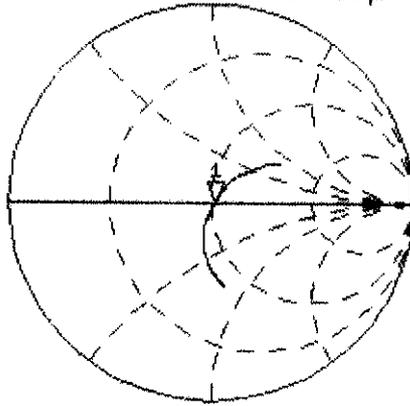
0 dB = 11.0mW/g

Impedance Measurement Plot for Head TSL

9 Jan 2007 11:53:45

CH1 S11 1 U FS 1: 51.803 Ω -298.83 m Ω 280.31 pF 1 900.000 000 MHz

*
De1
CA



Avg
16

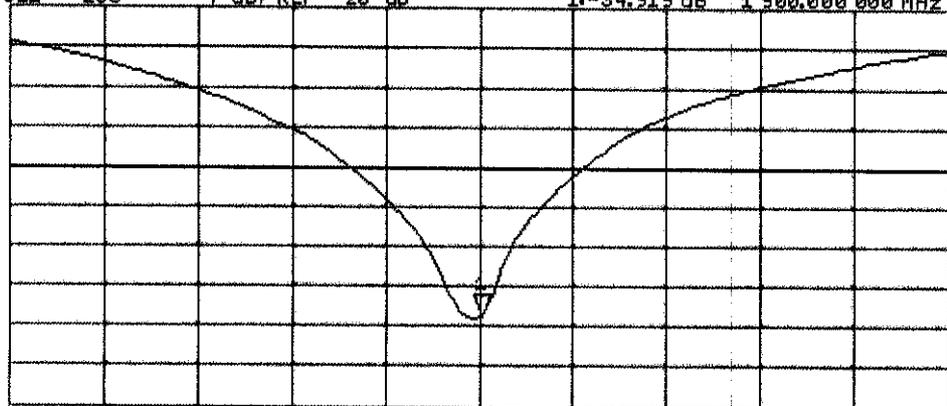
↑

CH2 S11 LOG 4 dB/REF -20 dB 1: -34.919 dB 1 900.000 000 MHz

CA

Avg
16

↑



CENTER 1 900.000 000 MHz

SPAN 400.000 000 MHz

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d002

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

Medium: MSL U10 BB;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

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 Sn907; Calibrated: 20.07.2006
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm 2/Zoom Scan (7x7x7)/Cube 0:

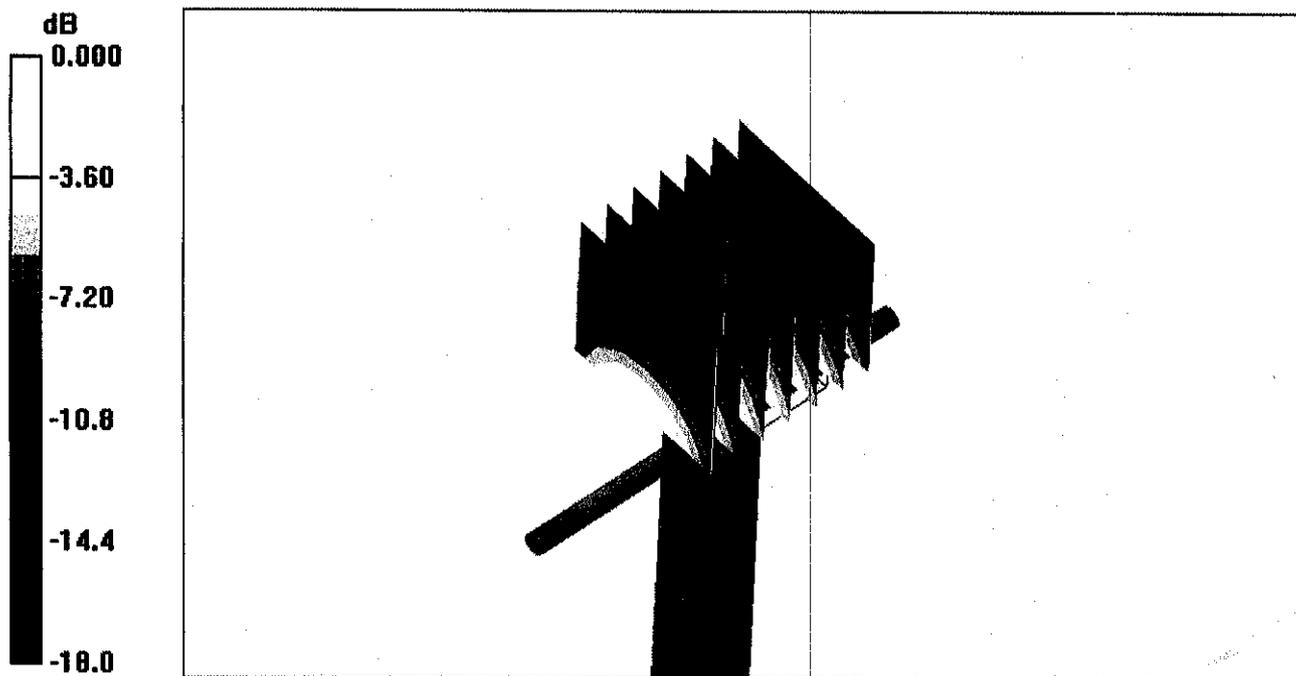
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 85.8 V/m; Power Drift = 0.053 dB

Peak SAR (extrapolated) = 17.0 W/kg

SAR(1 g) = 9.94 mW/g; SAR(10 g) = 5.24 mW/g

Maximum value of SAR (measured) = 11.3 mW/g

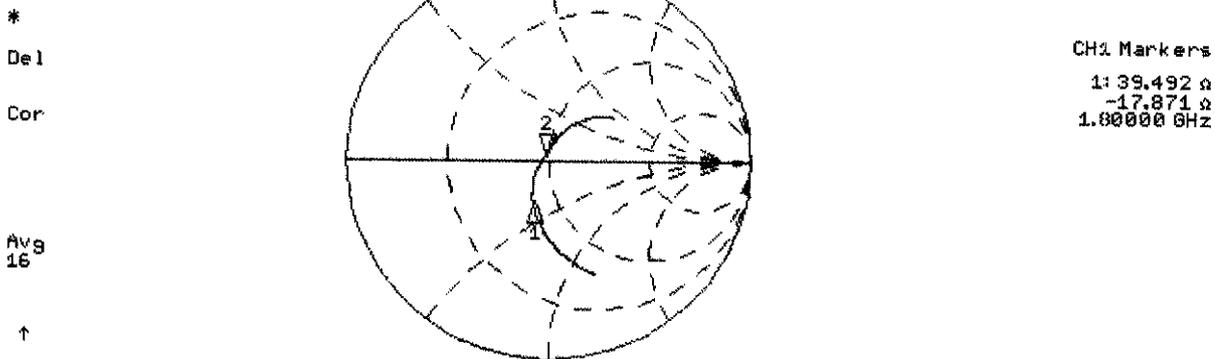


0 dB = 11.3mW/g

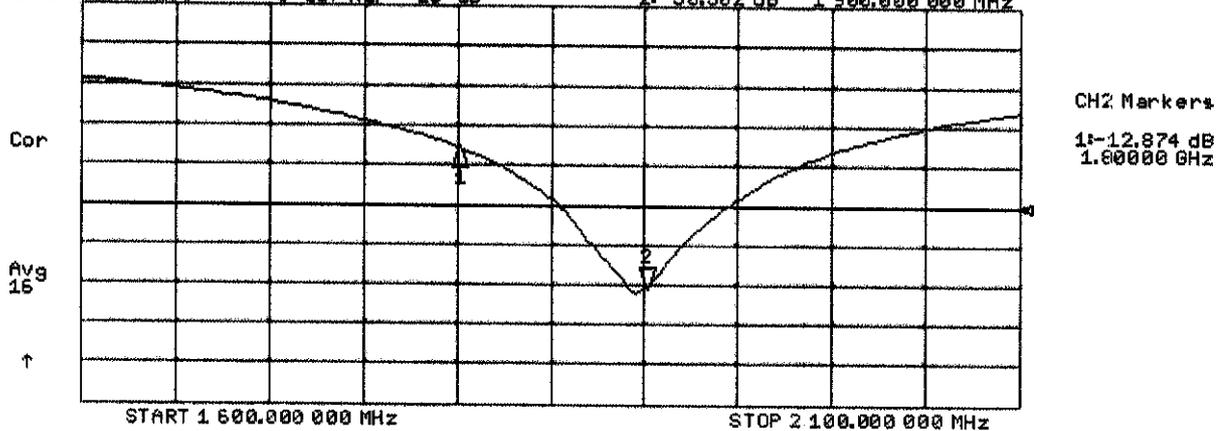
Impedance Measurement Plot for Body TSL

16 Jan 2007 12:04:42

CH1 S11 1 U FS 2: 48.154 Ω 2.2793 Ω 190.93 pF 1 900.000 000 MHz



CH2 S11 LOG 5 dB/REF -20 dB 2: -30.502 dB 1 900.000 000 MHz





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Sony Ericsson Lund**

CALIBRATION CERTIFICATE

Object **ES3DV2 - SN 1008**

Calibration procedure(s) **QA CAL-01-06
Calibration procedure for electronic calibration**

Calibration date: **January 23, 2008**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (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 | 2-Jan-08 (SPEAG, No. ES3-3013_Jan08) | Jan-09 |
| 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: | Karla Pöschel | Calibration Manager | |
| Approved by: | Markus Müller | Quality Manager | |

Issued: January 23, 2008

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z}** = NORM_{x,y,z} * *frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep (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_{x,y,z} * *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ET3DV6

SN:1569

| | |
|------------------|------------------|
| Manufactured: | May 19, 2001 |
| Last calibrated: | January 16, 2007 |
| Recalibrated: | January 23, 2008 |

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1569

Sensitivity in Free Space^A

| | | |
|-------|---------------------|-------------------------------------|
| NormX | 1.84 ± 10.1% | $\mu\text{V}/(\text{V}/\text{m})^2$ |
| NormY | 2.10 ± 10.1% | $\mu\text{V}/(\text{V}/\text{m})^2$ |
| NormZ | 1.96 ± 10.1% | $\mu\text{V}/(\text{V}/\text{m})^2$ |

Diode Compression^B

| | |
|-------|--------------|
| DCP X | 95 mV |
| DCP Y | 94 mV |
| DCP Z | 93 mV |

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

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

| | | | |
|---|------------------------------|---------------|---------------|
| Sensor Center to Phantom Surface Distance | | 3.7 mm | 4.7 mm |
| SAR _{be} [%] | Without Correction Algorithm | 9.6 | 6.1 |
| SAR _{be} [%] | With Correction Algorithm | 0.8 | 0.6 |

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

| | | | |
|---|------------------------------|---------------|---------------|
| Sensor Center to Phantom Surface Distance | | 3.7 mm | 4.7 mm |
| SAR _{be} [%] | Without Correction Algorithm | 11.6 | 7.3 |
| SAR _{be} [%] | With Correction Algorithm | 0.7 | 0.6 |

Sensor Offset

Probe Tip to Sensor Center **2.7 mm**

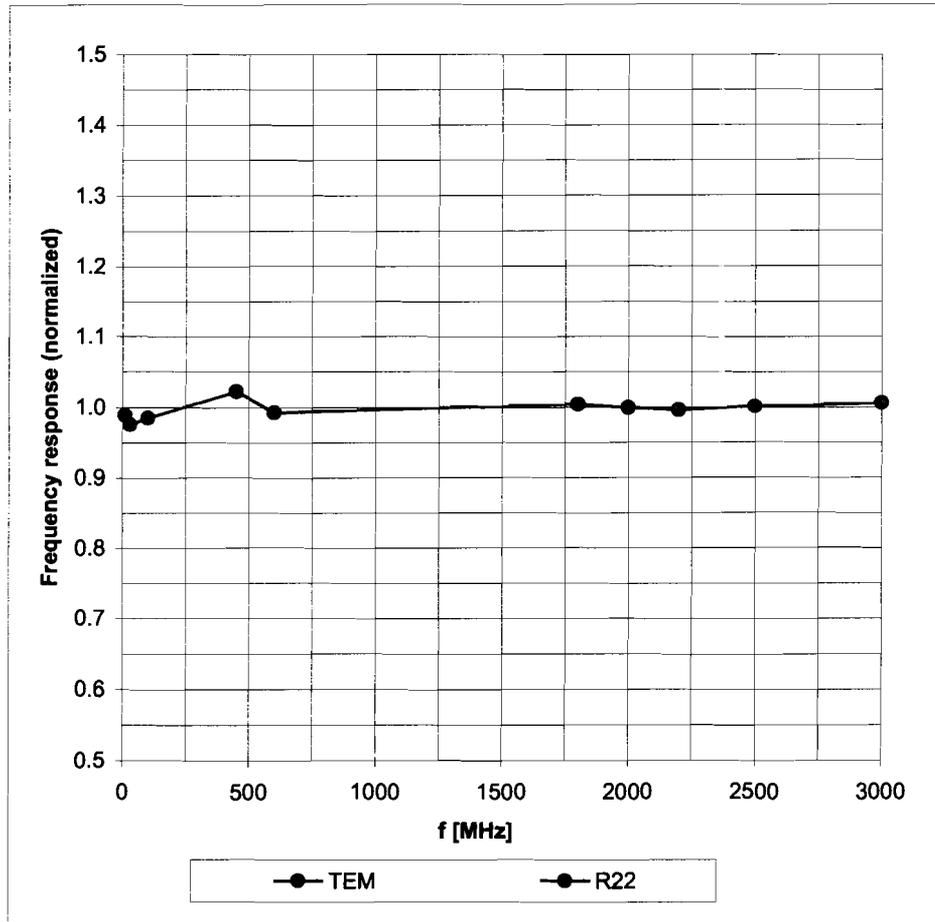
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 8).

^B Numerical linearization parameter: uncertainty not required.

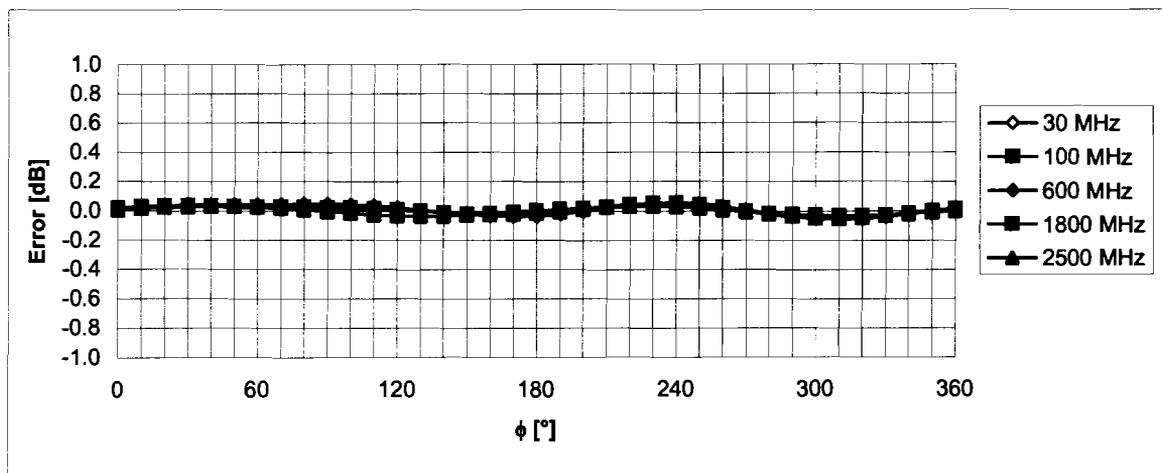
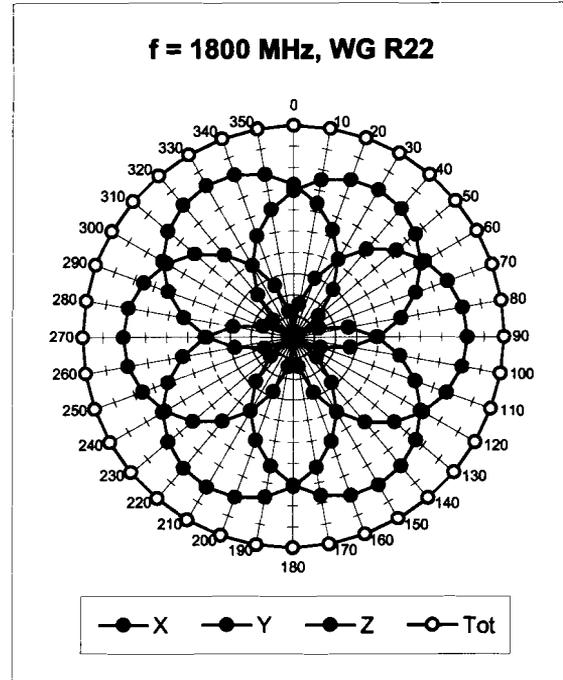
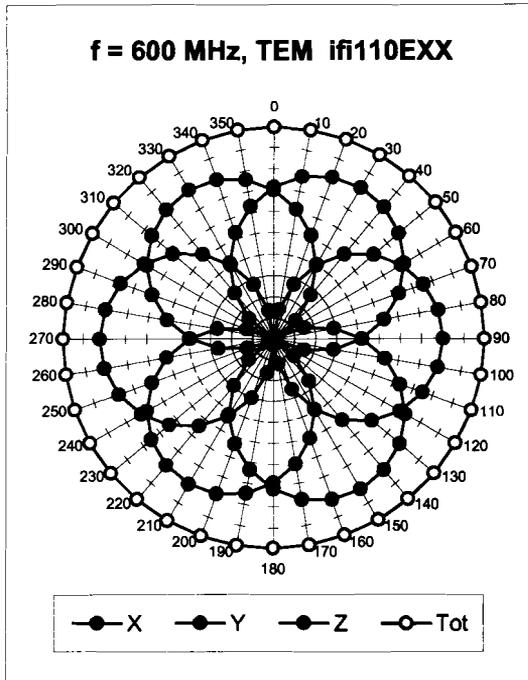
Frequency Response of E-Field

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



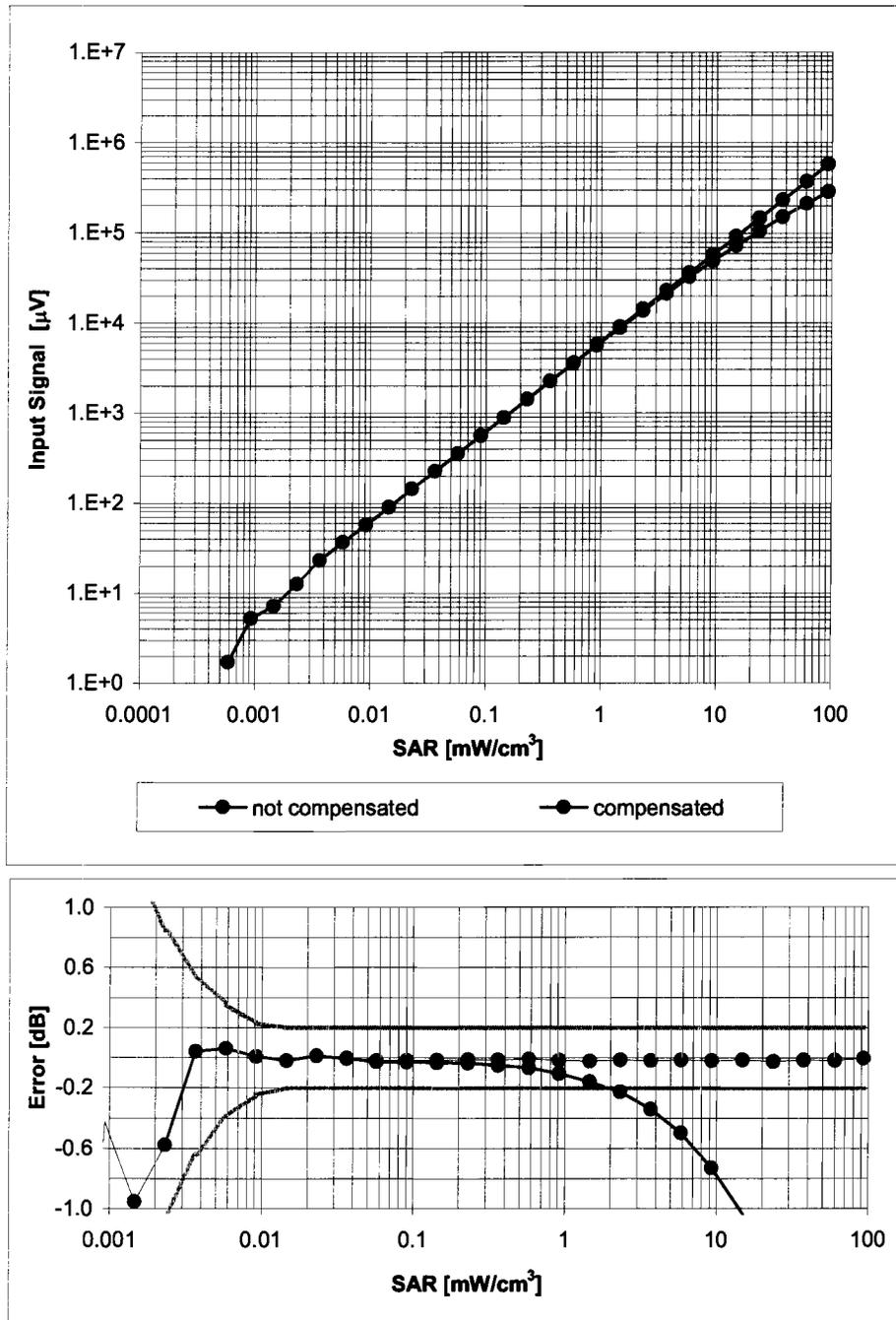
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

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



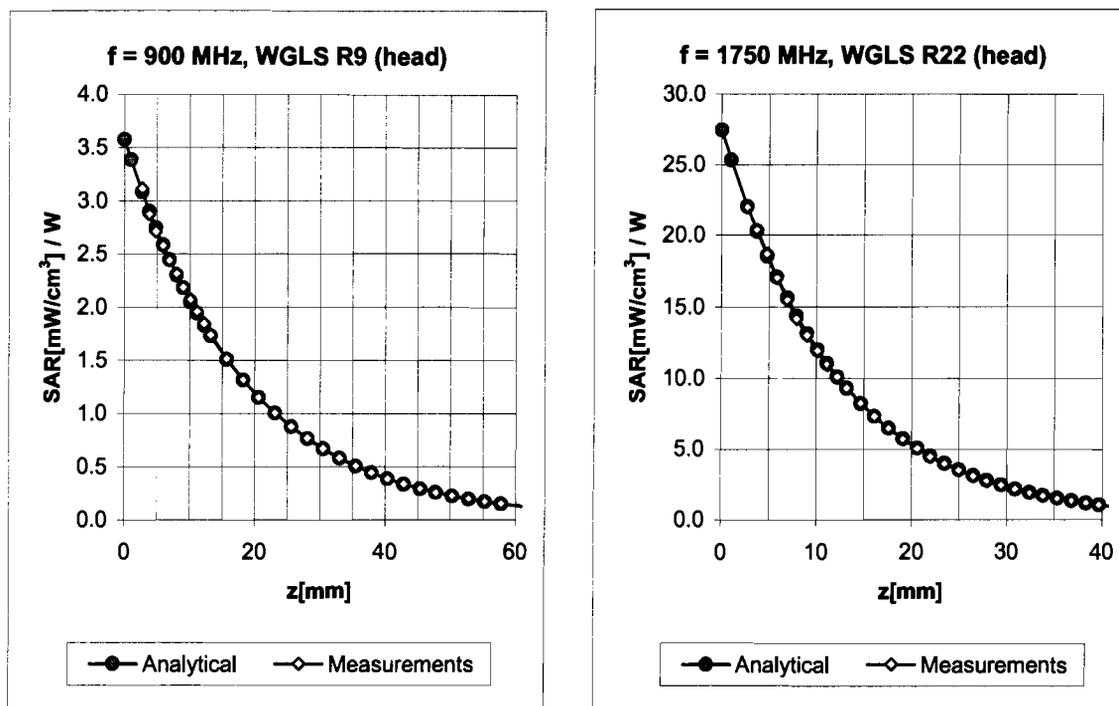
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

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

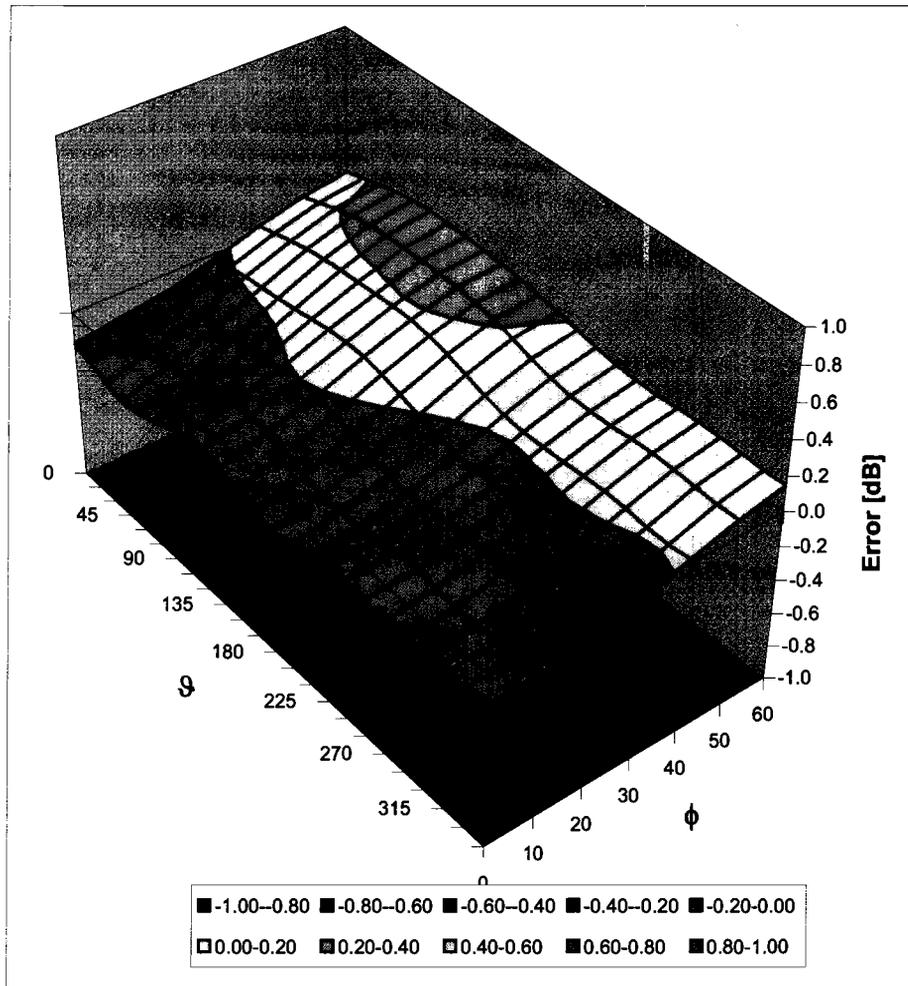


| f [MHz] | Validity [MHz] ^c | TSL | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 835 | ± 50 / ± 100 | Head | 41.5 ± 5% | 0.90 ± 5% | 0.37 | 2.70 | 6.71 ± 11.0% (k=2) |
| 900 | ± 50 / ± 100 | Head | 41.5 ± 5% | 0.97 ± 5% | 0.33 | 3.13 | 6.55 ± 11.0% (k=2) |
| 1750 | ± 50 / ± 100 | Head | 40.1 ± 5% | 1.37 ± 5% | 0.36 | 3.31 | 5.26 ± 11.0% (k=2) |
| 1900 | ± 50 / ± 100 | Head | 40.0 ± 5% | 1.40 ± 5% | 0.39 | 3.02 | 5.13 ± 11.0% (k=2) |
| 2450 | ± 50 / ± 100 | Head | 39.2 ± 5% | 1.80 ± 5% | 0.50 | 2.04 | 4.52 ± 11.8% (k=2) |
| 835 | ± 50 / ± 100 | Body | 55.2 ± 5% | 0.97 ± 5% | 0.47 | 2.30 | 6.54 ± 11.0% (k=2) |
| 900 | ± 50 / ± 100 | Body | 55.0 ± 5% | 1.05 ± 5% | 0.38 | 2.67 | 6.26 ± 11.0% (k=2) |
| 1750 | ± 50 / ± 100 | Body | 53.4 ± 5% | 1.49 ± 5% | 0.35 | 4.19 | 4.87 ± 11.0% (k=2) |
| 1900 | ± 50 / ± 100 | Body | 53.3 ± 5% | 1.52 ± 5% | 0.38 | 3.00 | 4.68 ± 11.0% (k=2) |
| 2450 | ± 50 / ± 100 | Body | 52.7 ± 5% | 1.95 ± 5% | 0.46 | 2.02 | 3.88 ± 11.8% (k=2) |

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

Deviation from Isotropy in HSL

Error (ϕ, ϑ), $f = 900$ MHz



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