



Company Internal REPORT

Prepared (also subject responsible if other)

BA/SEM/BGLINS Robert Carr

Approved

LD/SEMC/BGLI/NC Peter Lindeborg

Checked

PL

No.

BGLI07:625.

Date

211107

Rev

A

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File

Report issued by Accredited SAR Laboratory

For

PY7A3052071 (K660)

Date of test: 13, 14, 15 November 2007

Laboratory: Sony Ericsson SAR Test Laboratory
Sony Ericsson Mobile Communications AB
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Statement of Compliance

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

Sony Ericsson Type : AAD-3052071-BV; FCC ID : PY7A3052071; IC:4170B-A3052071

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 PY7A3052071 (K660) 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 Antenna Description

<b>Type</b>	Built in	
<b>Location</b>	Top Rear of phone	
<b>Dimensions</b>	Max length	20mm
	Max width	40mm
	Max height	7mm
<b>Configuration</b>	PIFA	

### 2.2 Device description

<b>Device model</b>	PY7A3052071					
<b>Market name</b>	K660					
<b>Serial numbers (EUT #)</b>	BX9003ZVGW (#9532)					
<b>Mode</b>	GSM 850			GSM 1900		
<b>Crest factor</b>	8.3			8.3		
<b>Multiple access scheme</b>	TDMA			TDMA		
<b>Maximum output power setting [dBm]</b>	Ch. 128	Ch. 190	Ch. 251	Ch. 512	Ch. 661	Ch. 810
	32.7	32.7	32.8	30.6	30.7	30.6
<b>Factory tolerance in power setting</b>	±0.5 dB			±0.5 dB		
<b>Maximum peak output power [dBm]</b>	32.7	32.7	32.7	30.7	30.7	30.7
<b>Mode</b>	GSM850 – GPRS/EDGE 2Tx			GSM1900 – GPRS/EDGE 2Tx		
<b>Crest factor</b>	4.15			4.15		
<b>Multiple access scheme</b>	TDMA			TDMA		
<b>Maximum output power setting [dBm]</b>	Ch. 128	Ch. 190	Ch. 251	Ch. 512	Ch. 661	Ch. 810
	31	31.1	31.1	28.4	28.3	28.4
<b>Factory tolerance in power setting</b>	±0.5 dB			±0.5 dB		
<b>Maximum peak output power [dBm]</b>	31.0	31.0	31.0	28.5	28.5	28.5
<b>Transmitting frequency range [MHz]</b>	824.2 - 848.8			1850.2 - 1909.8		
<b>GPRS Multislot class</b>	10					
<b>GPRS Capability class</b>	B					
<b>Prototype or production unit</b>	Preproduction (HW:AP1)					
<b>Device category</b>	Portable					
<b>RF exposure environment</b>	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	449	07-12-2007
E-field probe ET3DV6	1611	12-12-2007
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	20011270	13-12-07

## 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 [MHz]	Tissue type	Measured / Recommended	Dielectric Parameters		Density
			$\epsilon_r$	$\sigma$ [S/m]	$\rho$ [g/cm <sup>3</sup> ]
850	Head	Measured, 13-11-07	40.1	0.87	1.00
		Recommended	41.5	0.9	1.00
	Body	Measured, 13-11-07	55	0.98	1.00
		Recommended	55.2	0.97	1.00
1900	Head	Measured, 14-11-07	38.3	1.47	1.00
		Recommended	40	1.4	1.00
	Body	Measured, 15-11-07	50.8	1.59	1.00
		Recommended	53.3	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 21.5-23°C and humidity 24-32%. 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 [MHz]	Tissue type	Measured / Reference	SAR [W/kg] 1g / 10g	Dielectric Parameters		Density	Liquid T [°C]
				$\epsilon_r$	$\sigma$ [S/m]	$\rho$ [g/cm <sup>3</sup> ]	
850	Head	Measured, 13-11-07	9.5 / 6.2	40.1	0.87	1.00	21.5
		Reference	9.4 / 6.2	41.5	0.9	1.00	22.0
	Body	Measured, 13-11-07	9.3 / 6.2	55	0.98	1.00	21.5
		Reference	9.7 / 6.5	55.2	0.97	1.00	22.0
1900	Head	Measured, 14-11-07	38.3 / 20.1	38.3	1.47	1.00	21.6
		Reference	35.9 / 19.1	40	1.4	1.00	22.0
	Body	Measured, 15-11-07	39.5 / 21	50.8	1.59	1.00	21.4
		Reference	37 / 19.8	53.3	1.52	1.00	22.0



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## 6 SAR measurement uncertainty

### *DASY4 SAR measurement uncertainty evaluation for Sony Ericsson PY7A3052071 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
<i>Measurement System Uncertainty</i>					±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
<i>Test Sample Related Uncertainty</i>					±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
<i>Phantom and Tissue Parameters Uncertainty</i>					±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 (24-32) % and (21.5–23) °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 or 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-60.

Band	Channel	Power [dBm]	Position	Liquid T [°C]	Measured SAR [W/kg]	
					Left-hand 1g mass	Right-hand 1g mass
GSM 850	128	32.7	Cheek	21.5	0.76	0.86
			Tilt	-	-	-
	190	32.7	Cheek	21.5	1.18	1.24
			Tilt	21.5	0.75	0.71
	251	32.8	Cheek	21.5	1.13	1.13
			Tilt	-	-	-
GSM 1900	512	30.6	Cheek	21.6	1.15	0.81
			Tilt	21.6	1.1	0.93
	661	30.7	Cheek	21.6	1.02	0.74
			Tilt	21.6	0.96	0.78
	810	30.6	Cheek	21.6	0.68	0.52
			Tilt	21.6	0.62	0.53

**Table1: Head SAR measurement results for Sony Ericsson PY7A3052071 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	31	Back GPRS	21.5	1.46
			Front GPRS	21.5	0.76
		27.1	Back EDGE	21.5	0.6
		32.7	Back Bluetooth	21.5	1.0
	Back PHF		21.5	0.7	
	190	31.1	Back GPRS	21.5	1.23
			Back Bluetooth	21.5	0.93
	251	31.1	Back GPRS	21.5	1.1
32.8			Back Bluetooth	21.5	0.82
GSM 1900	512	28.4	Back GPRS	21.4	1.1
			Front GPRS	21.4	0.36
		25.8	Back EDGE	21.4	0.56
		30.6	Back Bluetooth	21.4	0.88
	Back PHF		21.4	0.71	
	661	28.3	Back GPRS	21.4	0.93
			Back Bluetooth	21.4	0.71
	810	28.4	Back GPRS	21.4	0.65
30.6			Back Bluetooth	21.4	0.49

**Table2: Body SAR measurement results for Sony Ericsson PY7A3052071 telephone at highest possible output power.**




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## 8 References

[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**

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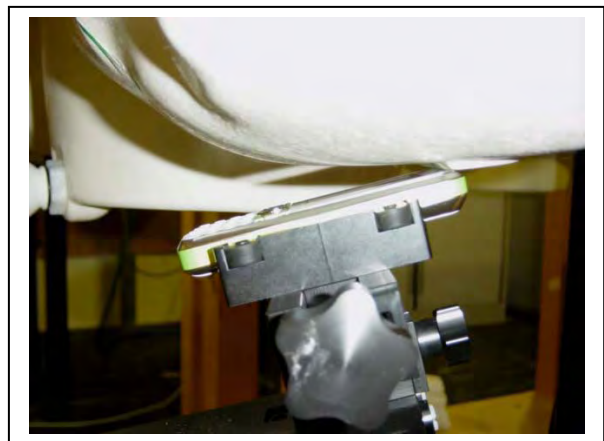
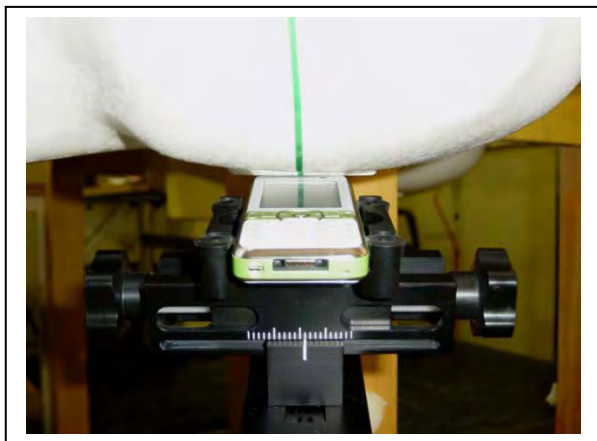
Reference

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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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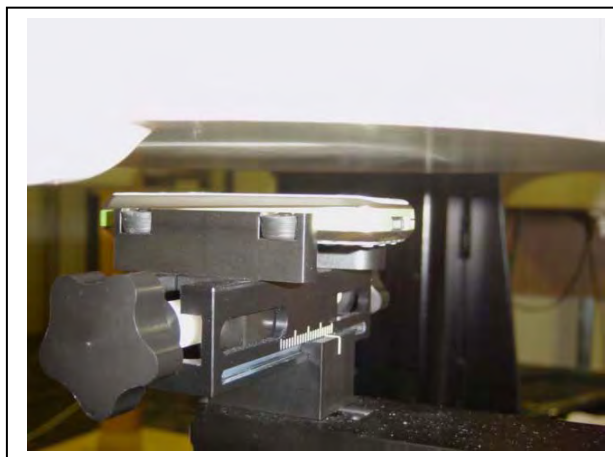
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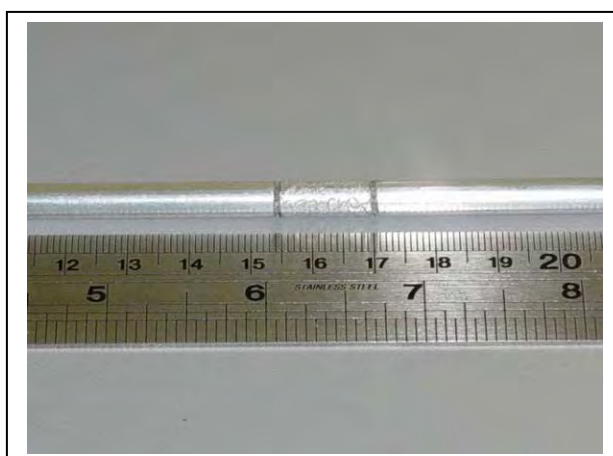
Reference

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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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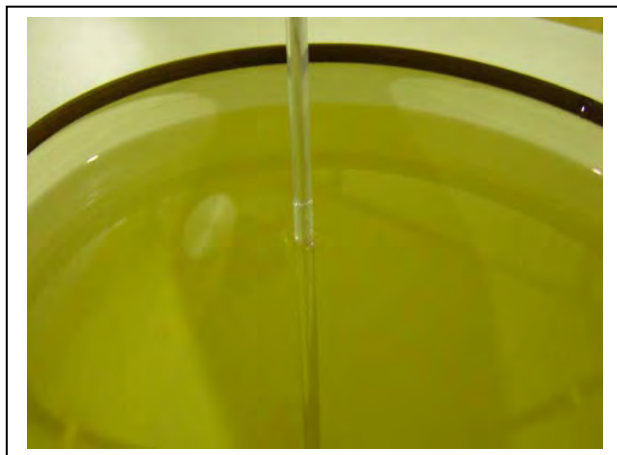
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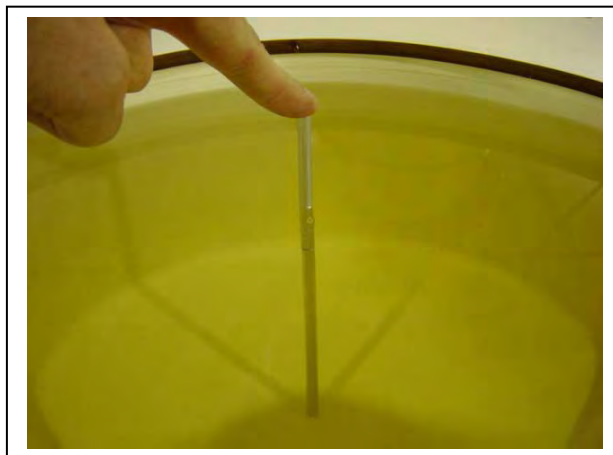
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Reference

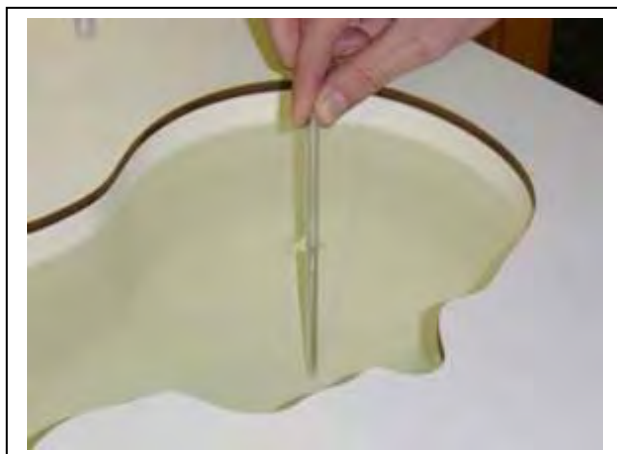
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**850 Head**



**850 Body**



**1900 Head**



**1900 Body**

**Pictures showing Phantom fluid depths.**

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**File****10 Attachments**

- Measurement plots and system validation
- Dipole calibration

Date/Time: 11/13/2007 10:07:02 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**SystemPerformanceCheck-D850-13-11-07-Head****DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:442**

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

Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.87$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.66, 6.66, 6.66); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DAS4, 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) = 2.54 mW/g

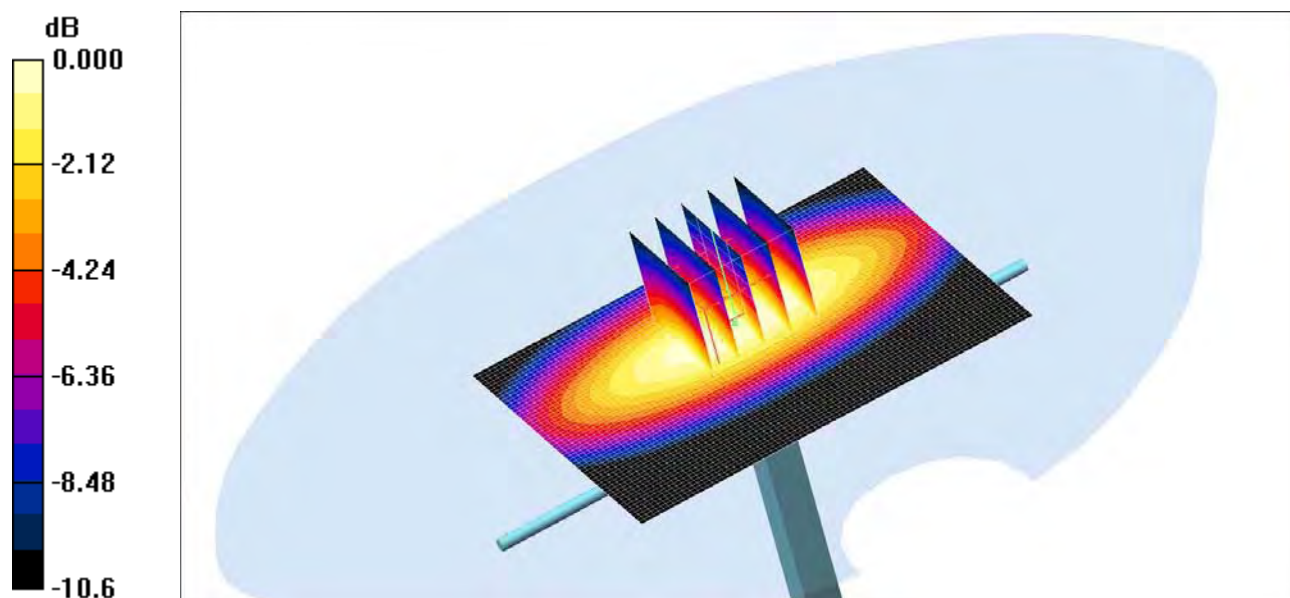
**d=15mm, Pin=250mW/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 53.1 V/m; Power Drift = 0.082 dB

Peak SAR (extrapolated) = 3.47 W/kg

**SAR(1 g) = 2.37 mW/g; SAR(10 g) = 1.56 mW/g**

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



0 dB = 2.55mW/g

Date/Time: 11/13/2007 1:52:46 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**SystemPerformanceCheck-D850-Body-13-11-07****DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:442**

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

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.98 \text{ mho/m}$ ;  $\epsilon_r = 55$ ;  $\rho = 1000 \text{ kg/m}^3$ 

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.73, 6.73, 6.73); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, 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) = 2.51 mW/g

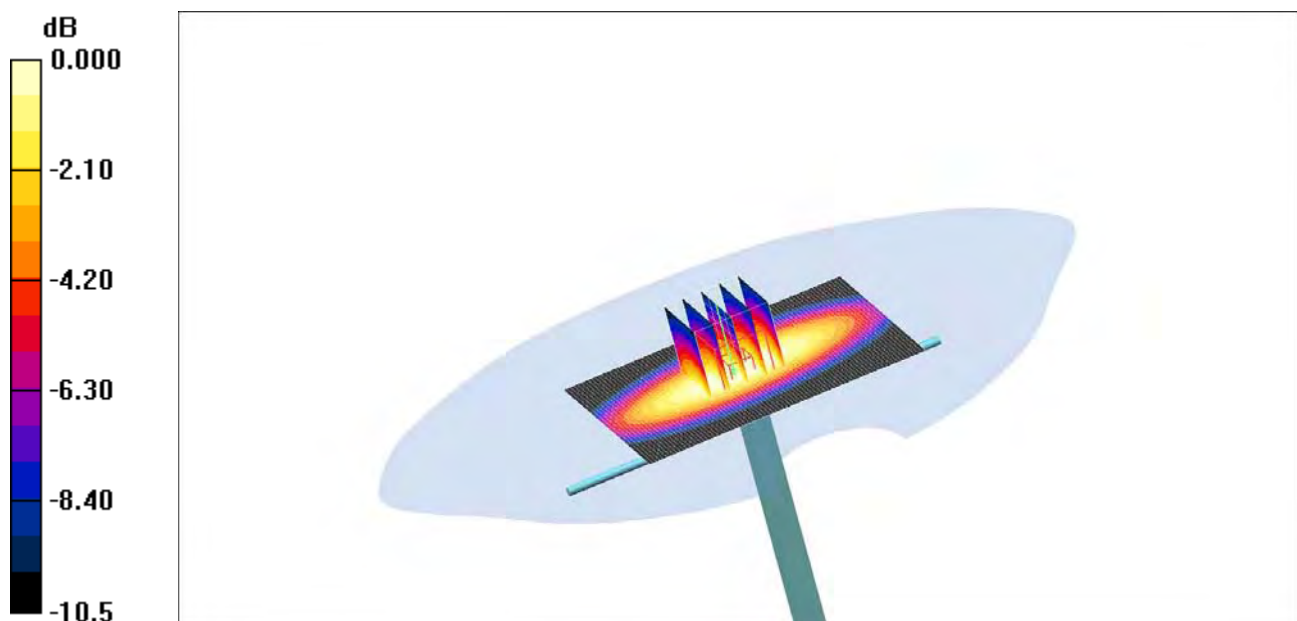
**d=15mm, Pin=250mW/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 51.5 V/m; Power Drift = 0.023 dB

Peak SAR (extrapolated) = 3.31 W/kg

**SAR(1 g) = 2.33 mW/g; SAR(10 g) = 1.54 mW/g**

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



0 dB = 2.51mW/g





Date/Time: 11/13/2007 10:51:37 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-LeftHandSide-GSM850-Tilt-Middle****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 836.6$  MHz;  $\sigma = 0.87$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.66, 6.66, 6.66); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Tilt position - Middle/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.804 mW/g

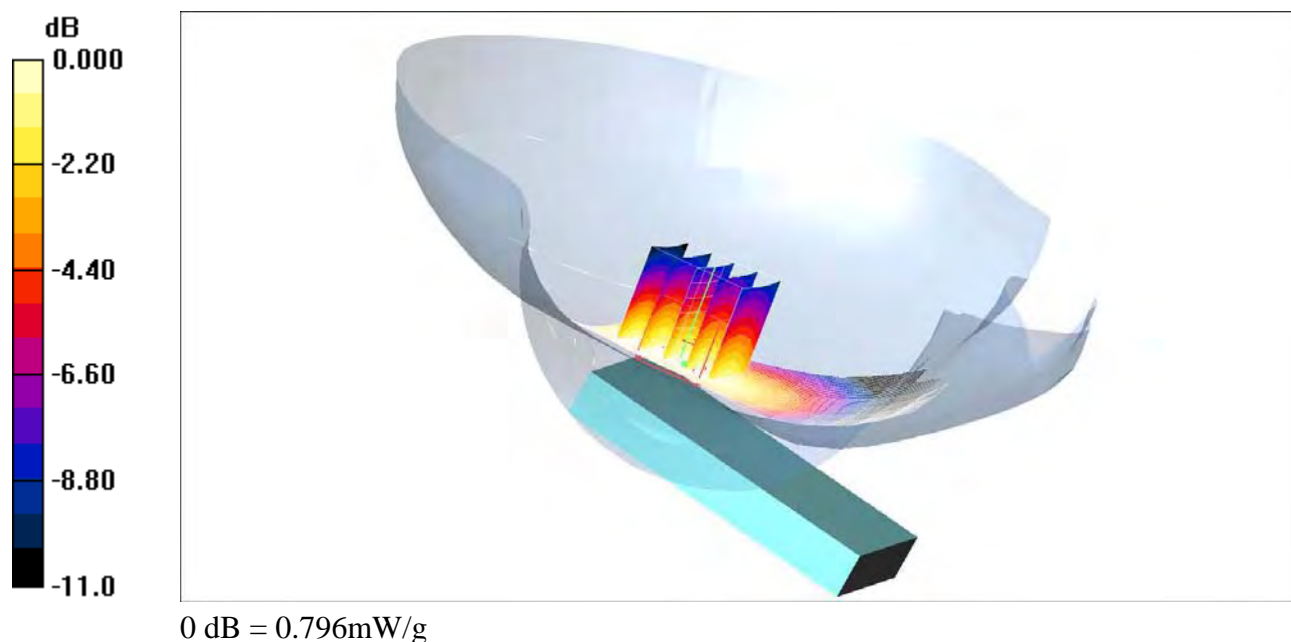
**Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.9 V/m; Power Drift = -0.055 dB

Peak SAR (extrapolated) = 1.00 W/kg

**SAR(1 g) = 0.746 mW/g; SAR(10 g) = 0.517 mW/g**

Maximum value of SAR (measured) = 0.796 mW/g



Date/Time: 11/13/2007 11:30:17 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-LeftHandSide-GSM850-Touch-High****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 848.8$  MHz;  $\sigma = 0.88$  mho/m;  $\epsilon_r = 39.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.66, 6.66, 6.66); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - High/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

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

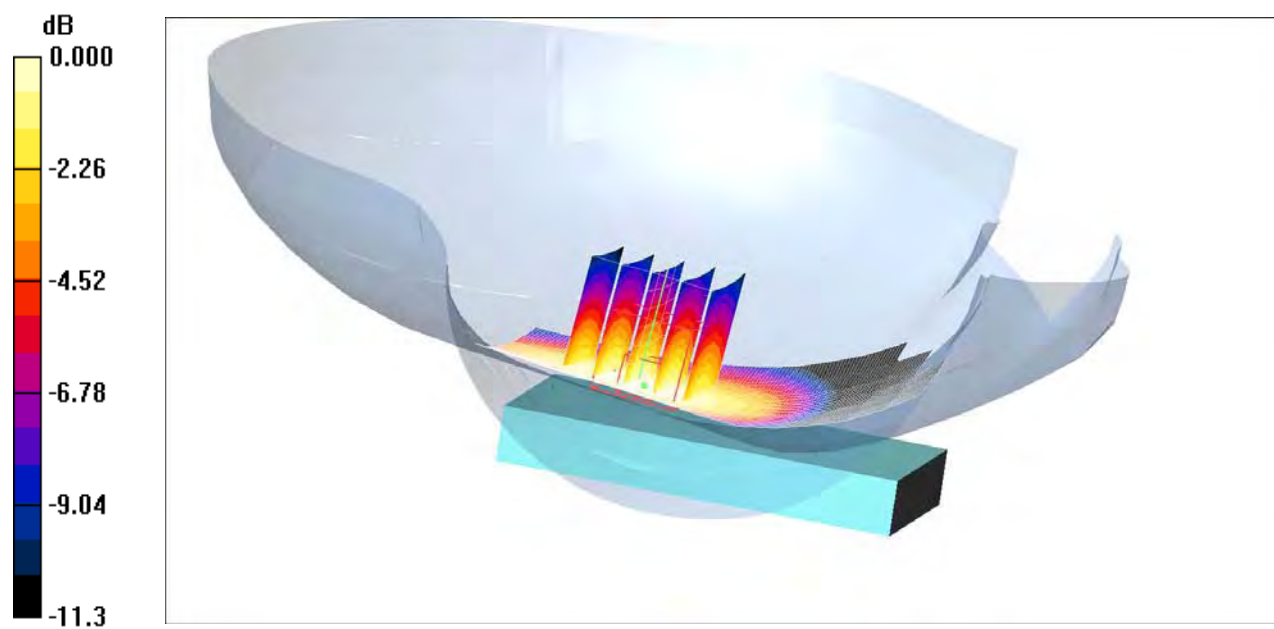
**Touch - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 31.1 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 1.53 W/kg

**SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.778 mW/g**

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



0 dB = 1.22mW/g

Date/Time: 11/13/2007 11:12:12 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-LeftHandSide-GSM850-Touch-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.86$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.66, 6.66, 6.66); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - Low/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.824 mW/g

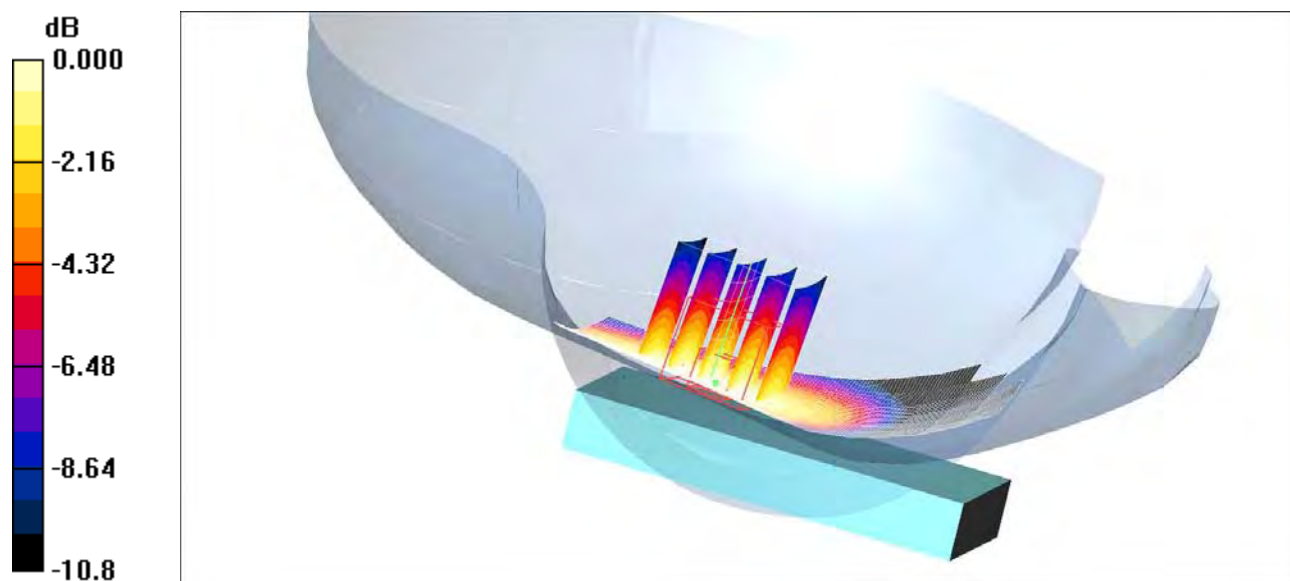
**Touch - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.3 V/m; Power Drift = -0.003 dB

Peak SAR (extrapolated) = 1.02 W/kg

**SAR(1 g) = 0.761 mW/g; SAR(10 g) = 0.529 mW/g**

Maximum value of SAR (measured) = 0.809 mW/g



0 dB = 0.809mW/g

Date/Time: 11/13/2007 10:35:39 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-LeftHandSide-GSM850-Touch-Middle****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 836.6$  MHz;  $\sigma = 0.87$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.66, 6.66, 6.66); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch position - Middle/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.27 mW/g

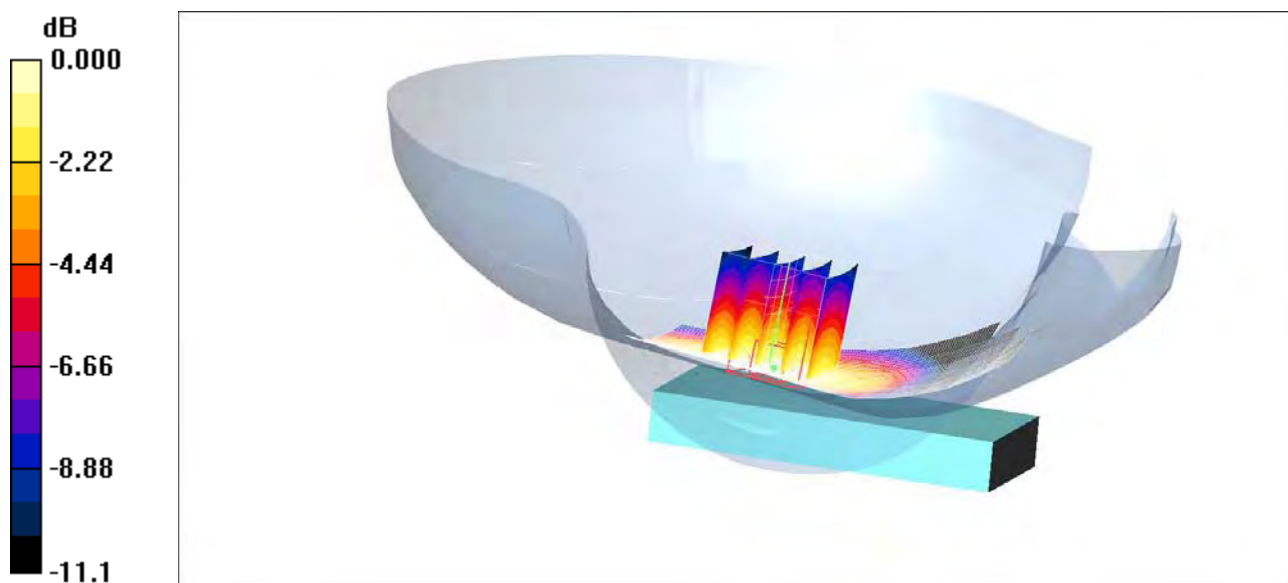
**Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 32.3 V/m; Power Drift = -0.017 dB

Peak SAR (extrapolated) = 1.60 W/kg

**SAR(1 g) = 1.18 mW/g; SAR(10 g) = 0.815 mW/g**

Maximum value of SAR (measured) = 1.27 mW/g



Date/Time: 11/13/2007 12:14:50 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-RightHandSide-GSM850-Tilt-Middle****DUT: Chen; Type: DUT; Serial: #9532**

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

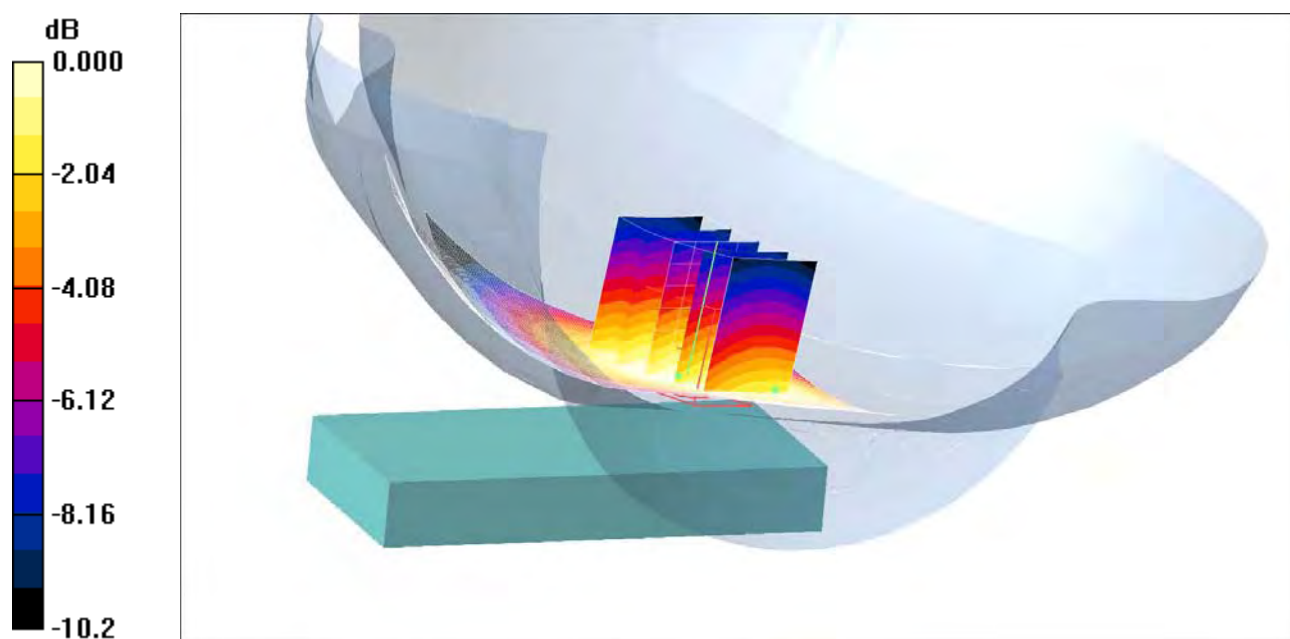
Medium parameters used:  $f = 836.6$  MHz;  $\sigma = 0.87$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.66, 6.66, 6.66); Calibrated: 12/12/2006
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn449; Calibrated: 12/7/2006
  - Phantom: SAM-2; Type: SAM; Serial: 1025
  - Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- Tilt position - Middle/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.771 mW/g
- Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  
dx=8mm, dy=8mm, dz=5mm  
Reference Value = 27.5 V/m; Power Drift = -0.071 dB  
Peak SAR (extrapolated) = 0.947 W/kg  
**SAR(1 g) = 0.714 mW/g; SAR(10 g) = 0.503 mW/g**  
Maximum value of SAR (measured) = 0.760 mW/g



0 dB = 0.760mW/g

Date/Time: 11/13/2007 12:58:05 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-RightHandSide-GSM850-Touch-High****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 848.8$  MHz;  $\sigma = 0.88$  mho/m;  $\epsilon_r = 39.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.66, 6.66, 6.66); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - High/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

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

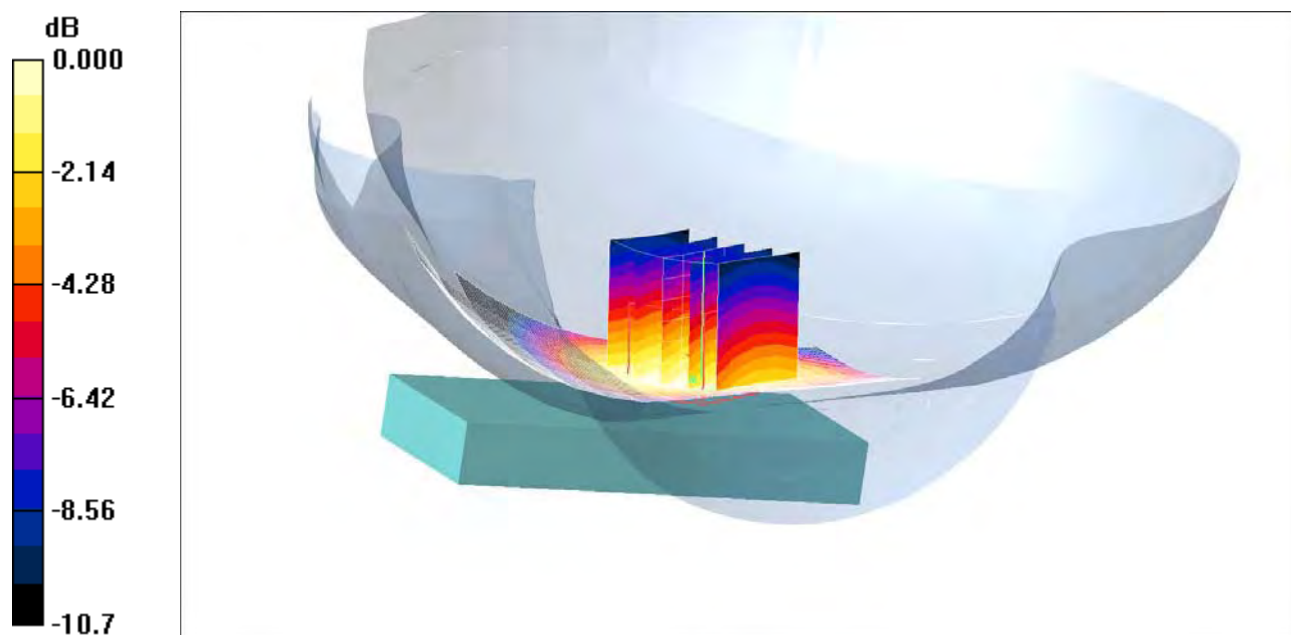
**Touch - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.8 V/m; Power Drift = 0.080 dB

Peak SAR (extrapolated) = 1.50 W/kg

**SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.782 mW/g**

Maximum value of SAR (measured) = 1.20 mW/g



0 dB = 1.20mW/g

Date/Time: 11/13/2007 12:41:41 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-RightHandSide-GSM850-Touch-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.86$  mho/m;  $\epsilon_r = 40.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.66, 6.66, 6.66); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - Low/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.928 mW/g

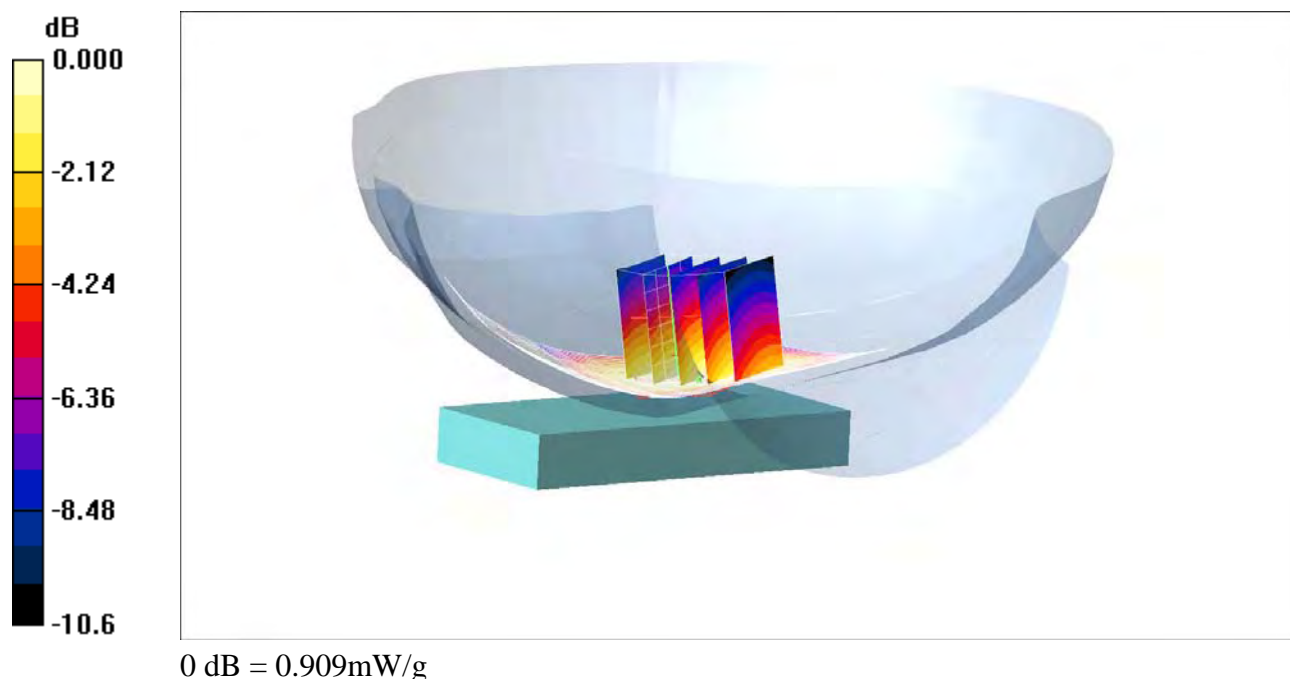
**Touch - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.1 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 1.15 W/kg

**SAR(1 g) = 0.864 mW/g; SAR(10 g) = 0.601 mW/g**

Maximum value of SAR (measured) = 0.909 mW/g





Date/Time: 11/13/2007 11:57:04 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-RightHandSide-GSM850-Touch-Middle****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 836.6$  MHz;  $\sigma = 0.87$  mho/m;  $\epsilon_r = 40.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.66, 6.66, 6.66); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-2; Type: SAM; Serial: 1025
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch position - Middle/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

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

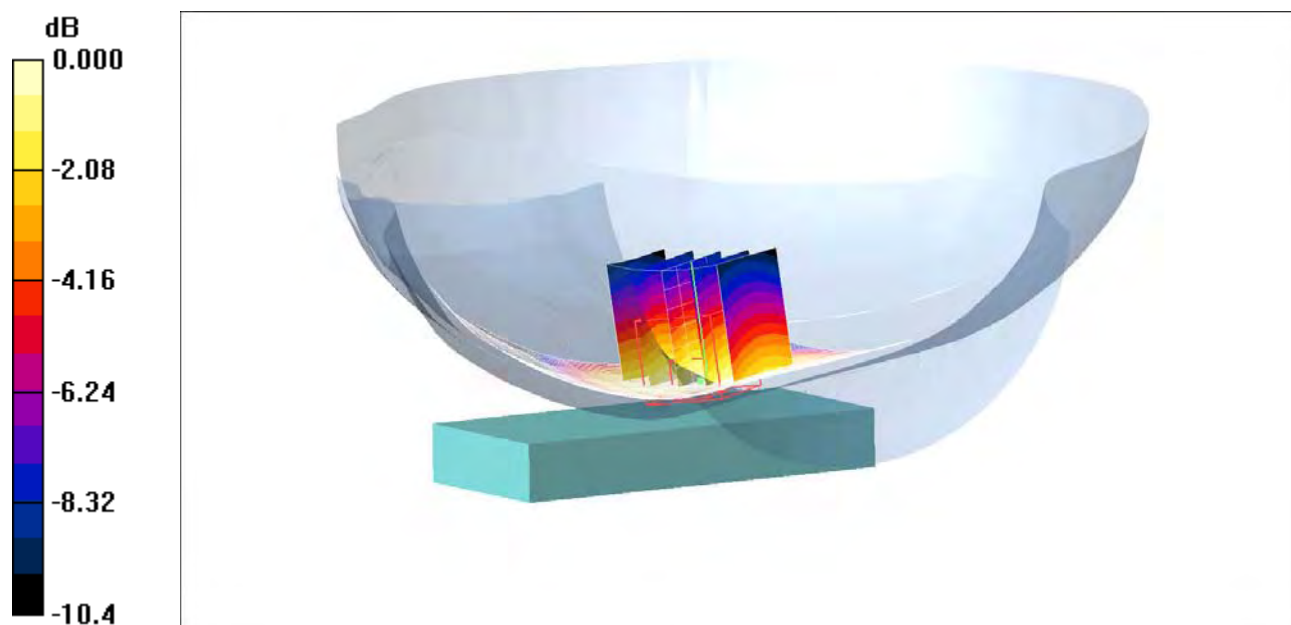
**Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.9 V/m; Power Drift = -0.061 dB

Peak SAR (extrapolated) = 1.65 W/kg

**SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.867 mW/g**

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



0 dB = 1.33mW/g

Date/Time: 11/13/2007 4:23:22 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-850Bluetooth-High****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 848.8$  MHz;  $\sigma = 0.99$  mho/m;  $\epsilon_r = 54.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.73, 6.73, 6.73); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- 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 (41x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.875 mW/g

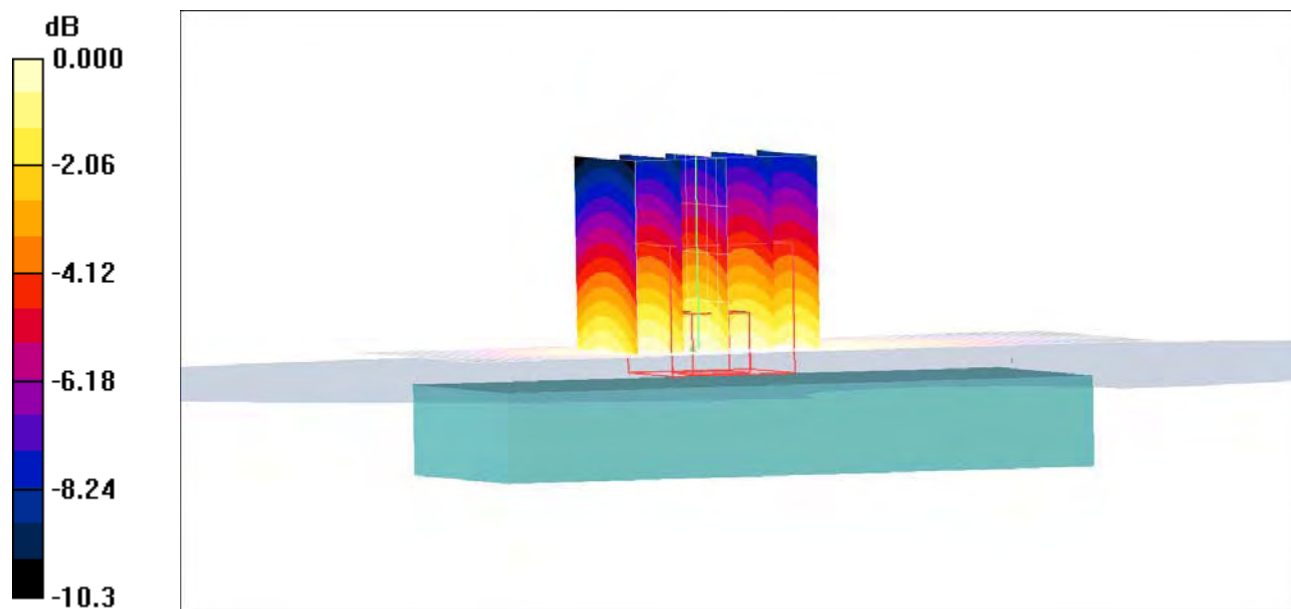
**Body 3/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 29.8 V/m; Power Drift = 0.021 dB

Peak SAR (extrapolated) = 1.08 W/kg

**SAR(1 g) = 0.820 mW/g; SAR(10 g) = 0.594 mW/g**

Maximum value of SAR (measured) = 0.859 mW/g



0 dB = 0.859mW/g

Date/Time: 11/13/2007 3:58:28 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-850Bluetooth-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.97$  mho/m;  $\epsilon_r = 55.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.73, 6.73, 6.73); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

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

Maximum value of SAR (interpolated) = 1.06 mW/g

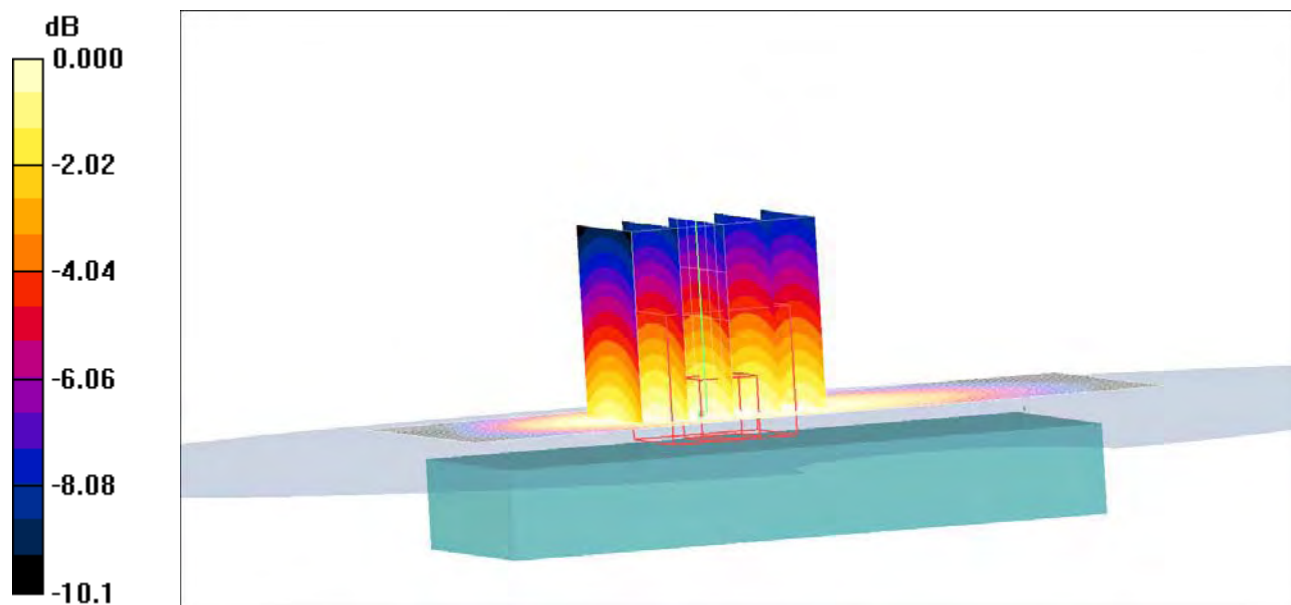
**Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 33.0 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 1.29 W/kg

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

Maximum value of SAR (measured) = 1.06 mW/g



0 dB = 1.06mW/g

Date/Time: 11/13/2007 4:11:28 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-850Bluetooth-Middle****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 836.6$  MHz;  $\sigma = 0.98$  mho/m;  $\epsilon_r = 55$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.73, 6.73, 6.73); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body 2/Area Scan (41x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.999 mW/g

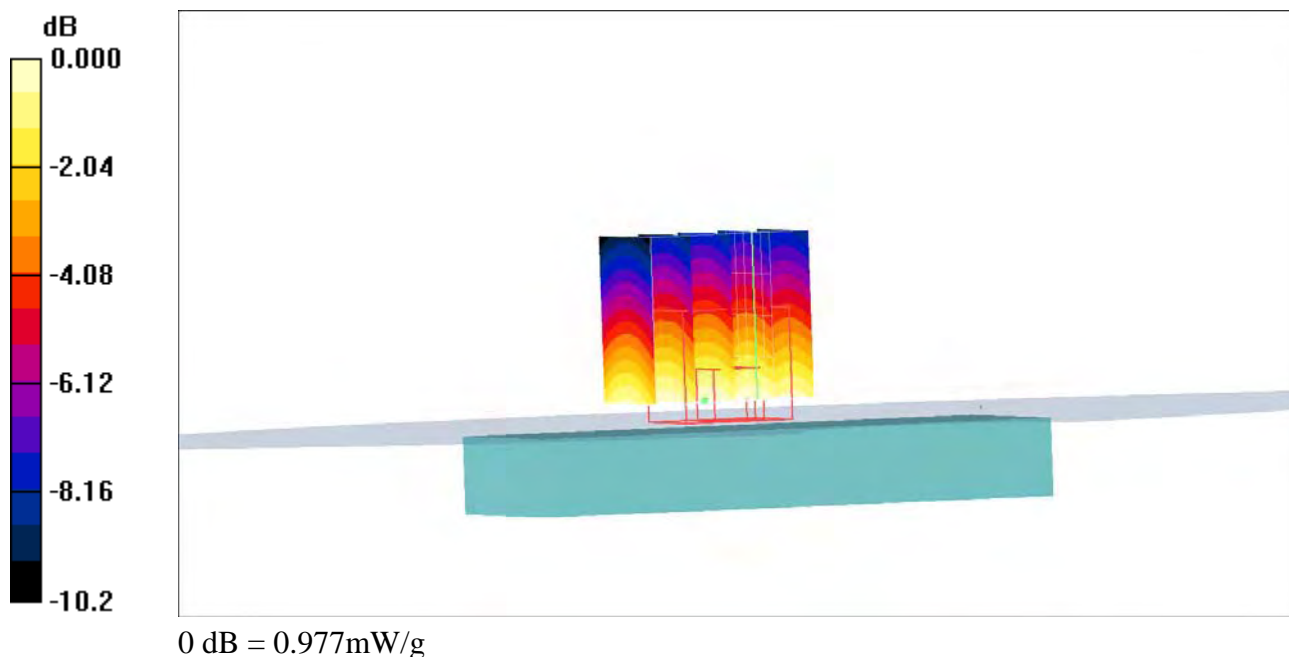
**Body 2/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 32.1 V/m; Power Drift = -0.044 dB

Peak SAR (extrapolated) = 1.22 W/kg

**SAR(1 g) = 0.933 mW/g; SAR(10 g) = 0.681 mW/g**

Maximum value of SAR (measured) = 0.977 mW/g



Date/Time: 11/13/2007 3:02:32 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-850EDGE-Low****DUT: Chen; Type: DUT; Serial: #9532**

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;  $\epsilon_r = 55.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.73, 6.73, 6.73); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

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

Maximum value of SAR (interpolated) = 0.669 mW/g

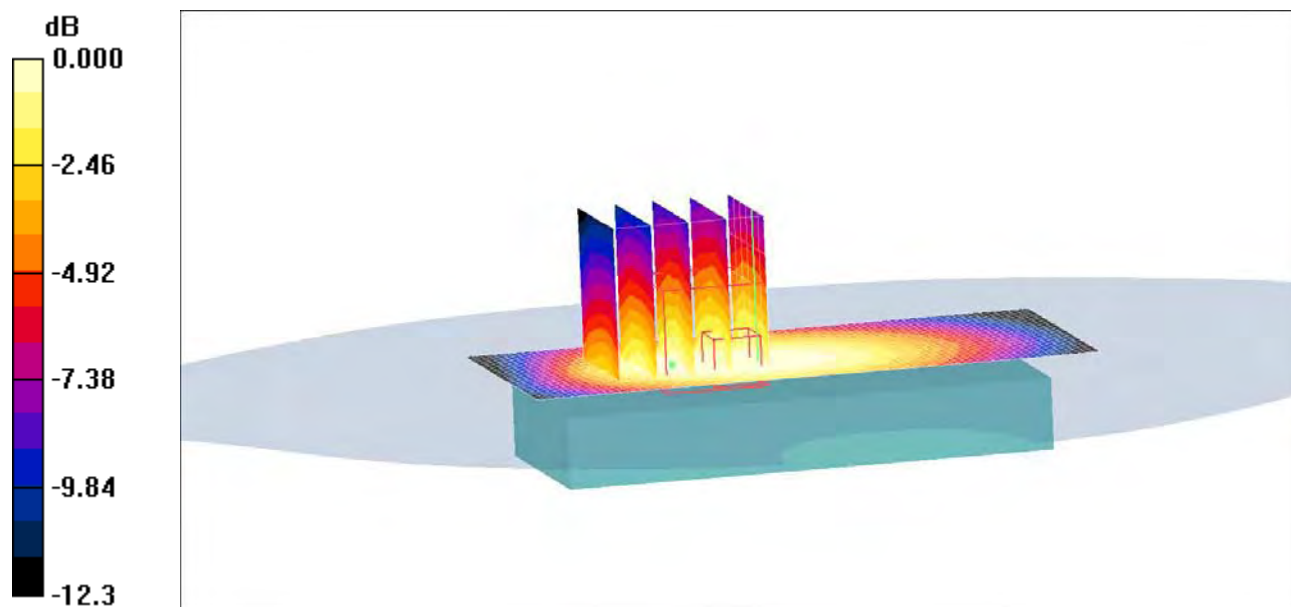
**Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 26.1 V/m; Power Drift = -0.021 dB

Peak SAR (extrapolated) = 0.805 W/kg

**SAR(1 g) = 0.604 mW/g; SAR(10 g) = 0.434 mW/g**

Maximum value of SAR (measured) = 0.649 mW/g



0 dB = 0.649mW/g

Date/Time: 11/13/2007 2:47:50 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-850GPRS-High****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 848.8$  MHz;  $\sigma = 0.99$  mho/m;  $\epsilon_r = 54.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.73, 6.73, 6.73); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- 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 (41x81x1):** Measurement grid: dx=15mm, dy=15mm

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

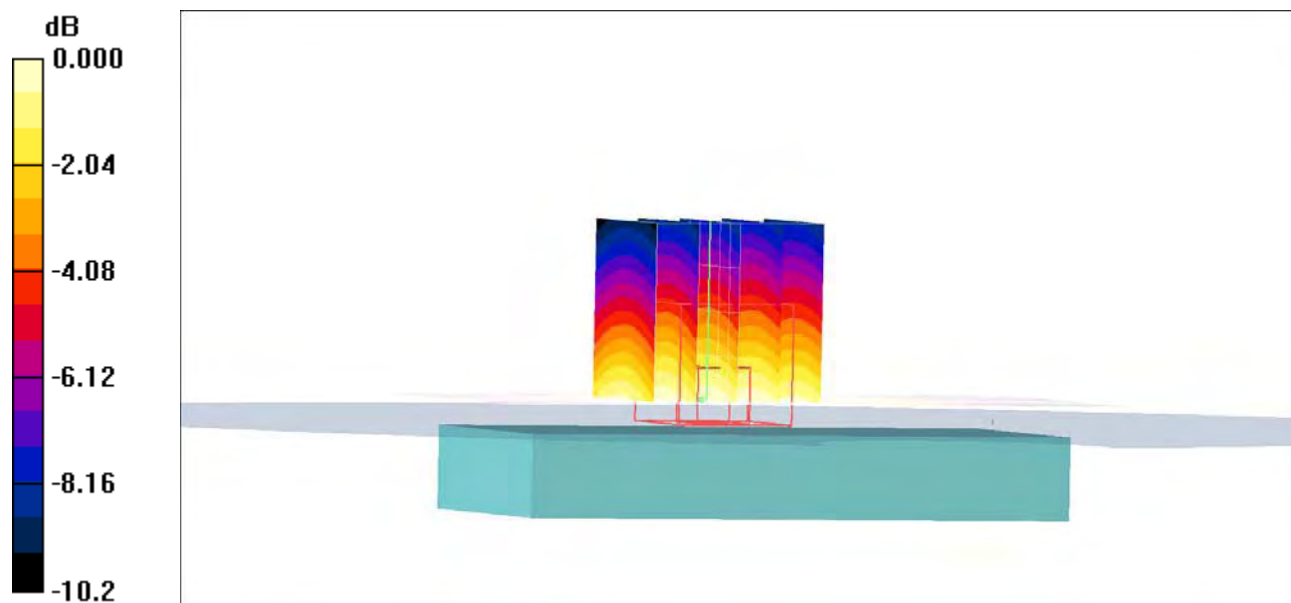
**Body 3/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 33.8 V/m; Power Drift = 0.008 dB

Peak SAR (extrapolated) = 1.37 W/kg

**SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.764 mW/g**

Maximum value of SAR (measured) = 1.11 mW/g



0 dB = 1.11mW/g

Date/Time: 11/13/2007 2:21:21 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-850GPRS-Low****DUT: Chen; Type: DUT; Serial: #9532**

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;  $\epsilon_r = 55.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.73, 6.73, 6.73); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

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

Maximum value of SAR (interpolated) = 1.57 mW/g

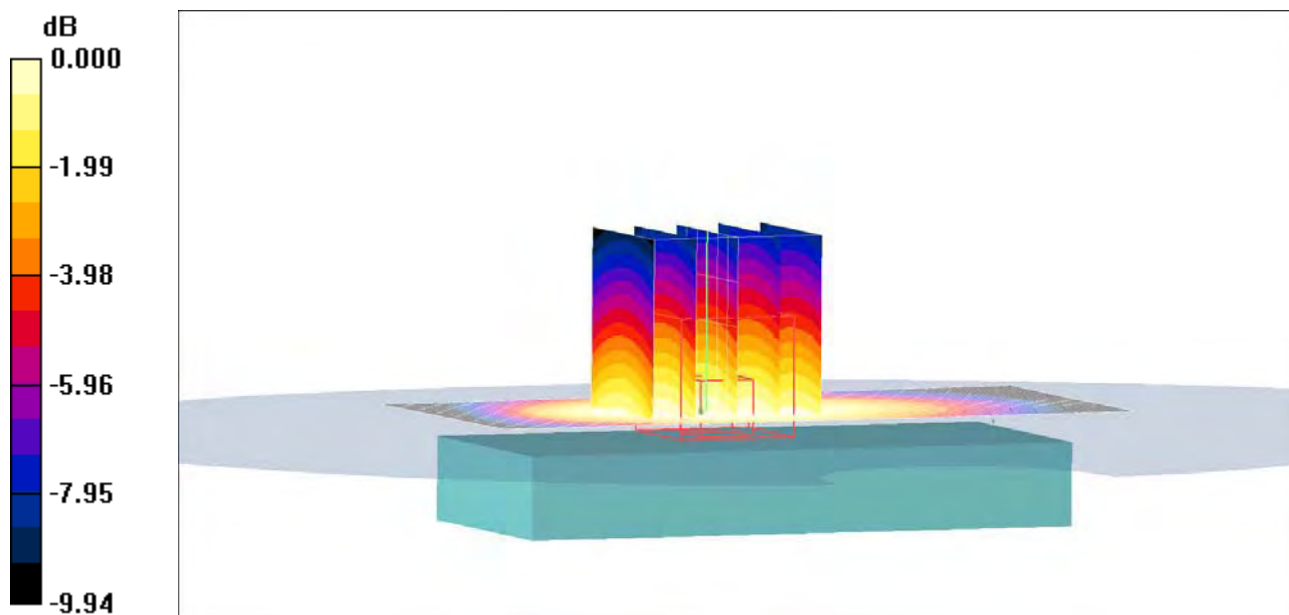
**Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 40.5 V/m; Power Drift = -0.121 dB

Peak SAR (extrapolated) = 1.88 W/kg

**SAR(1 g) = 1.46 mW/g; SAR(10 g) = 1.06 mW/g**

Maximum value of SAR (measured) = 1.53 mW/g



Date/Time: 11/13/2007 2:34:09 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-850GPRS-Middle****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 836.6$  MHz;  $\sigma = 0.98$  mho/m;  $\epsilon_r = 55$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.73, 6.73, 6.73); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body 2/Area Scan (41x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.31 mW/g

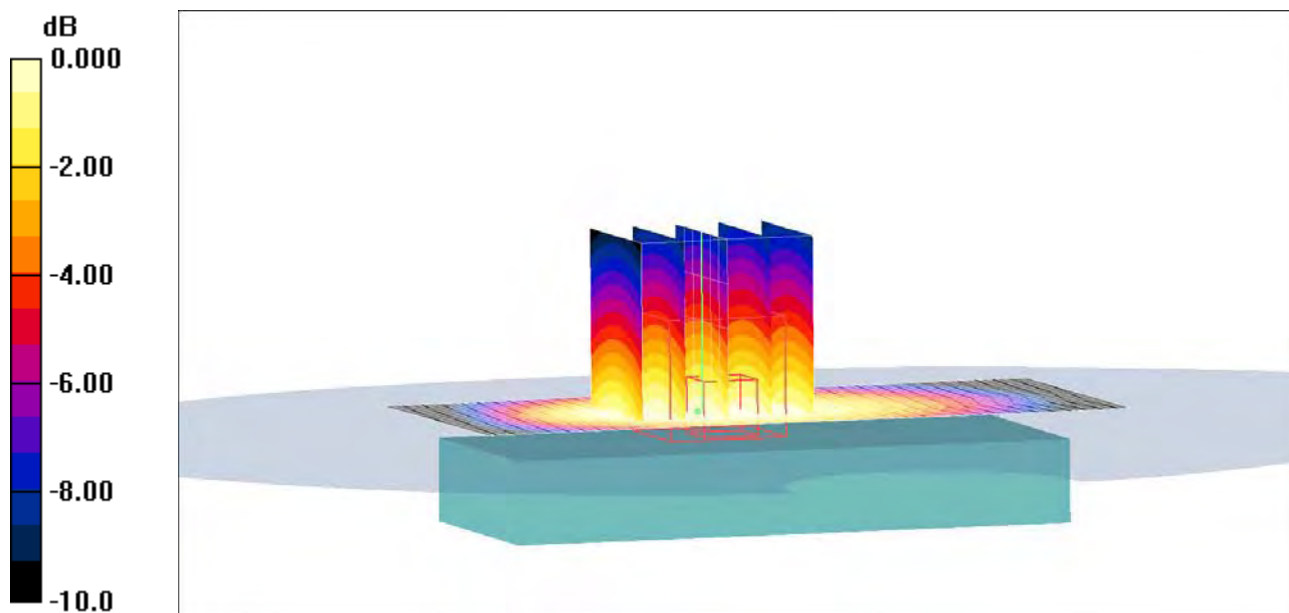
**Body 2/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 36.5 V/m; Power Drift = 0.022 dB

Peak SAR (extrapolated) = 1.60 W/kg

**SAR(1 g) = 1.23 mW/g; SAR(10 g) = 0.900 mW/g**

Maximum value of SAR (measured) = 1.30 mW/g



0 dB = 1.30mW/g



Date/Time: 11/13/2007 4:41:47 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-850PHF-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 824.2$  MHz;  $\sigma = 0.97$  mho/m;  $\epsilon_r = 55.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.73, 6.73, 6.73); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

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

Maximum value of SAR (interpolated) = 0.764 mW/g

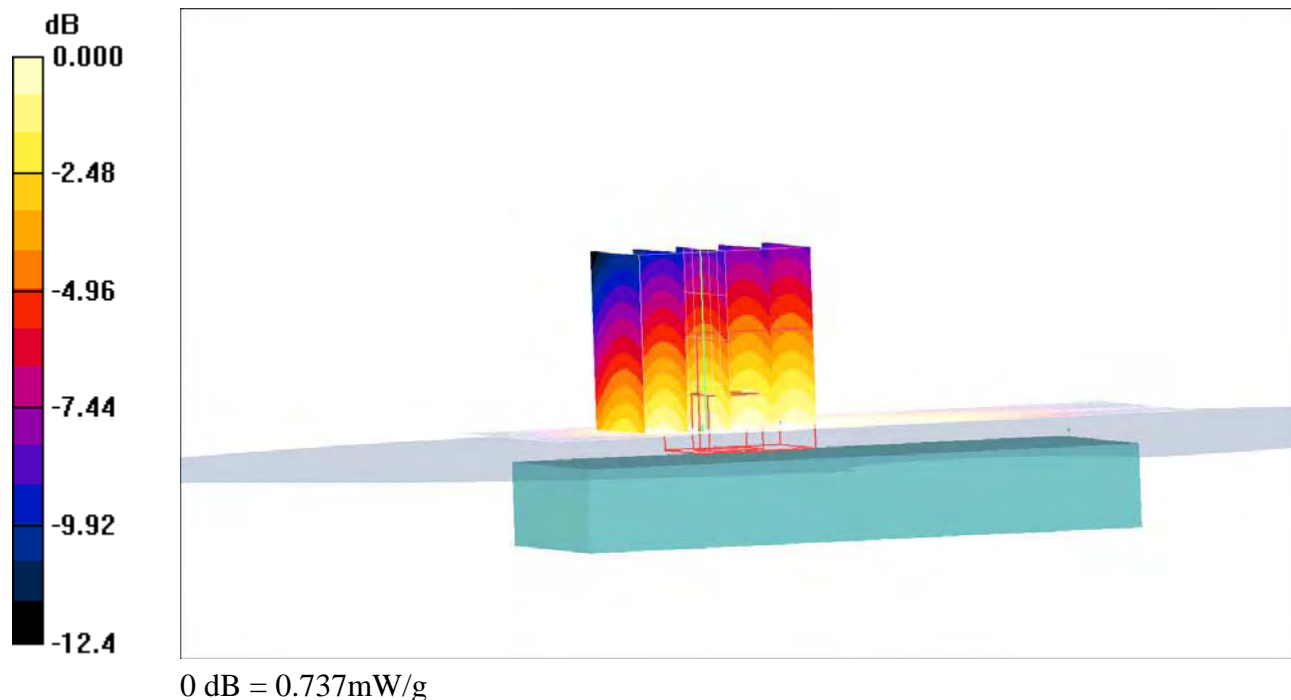
**Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 27.4 V/m; Power Drift = -0.131 dB

Peak SAR (extrapolated) = 0.917 W/kg

**SAR(1 g) = 0.695 mW/g; SAR(10 g) = 0.502 mW/g**

Maximum value of SAR (measured) = 0.737 mW/g



Date/Time: 11/13/2007 3:38:28 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Front-to-Phantom-Flat15mm-Chen-850GPRS-Low****DUT: Chen; Type: DUT; Serial: #9532**

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;  $\epsilon_r = 55.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(6.73, 6.73, 6.73); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Front to Phantom/Area Scan (41x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.793 mW/g

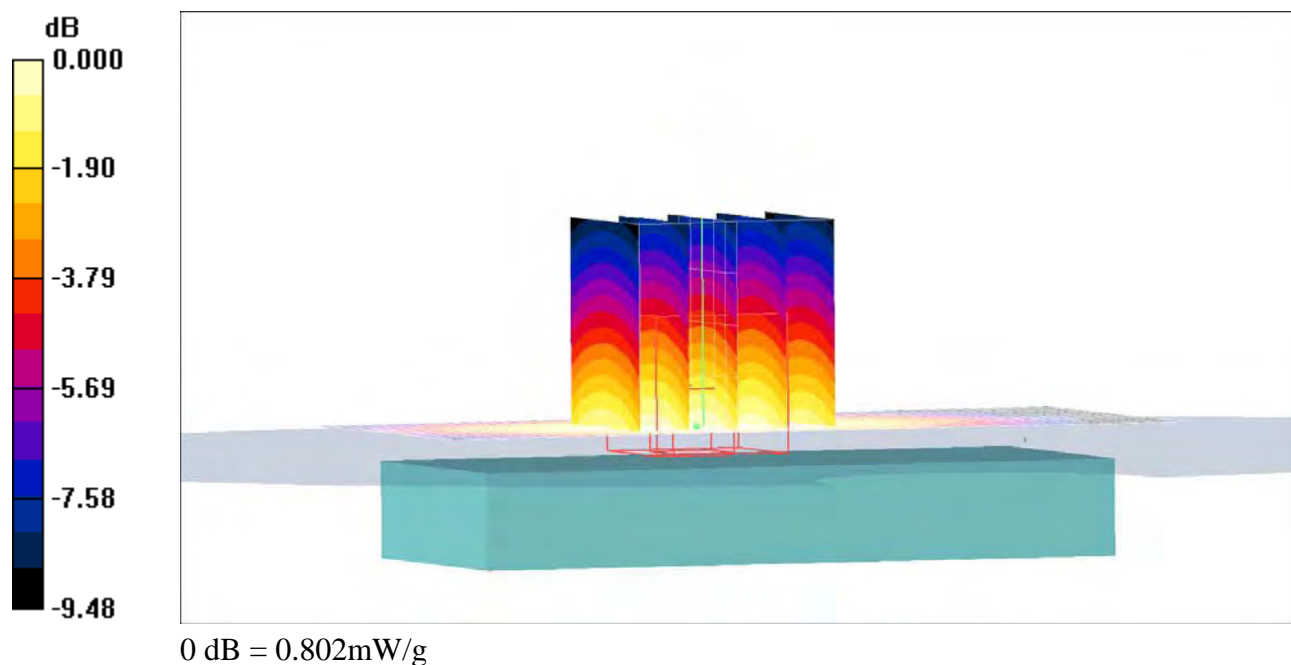
**Front to Phantom/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 28.5 V/m; Power Drift = -0.022 dB

Peak SAR (extrapolated) = 0.978 W/kg

**SAR(1 g) = 0.756 mW/g; SAR(10 g) = 0.547 mW/g**

Maximum value of SAR (measured) = 0.802 mW/g



Date/Time: 11/14/2007 10:32:26 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Validation-D1900-14-11-07-Head****DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:539**

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

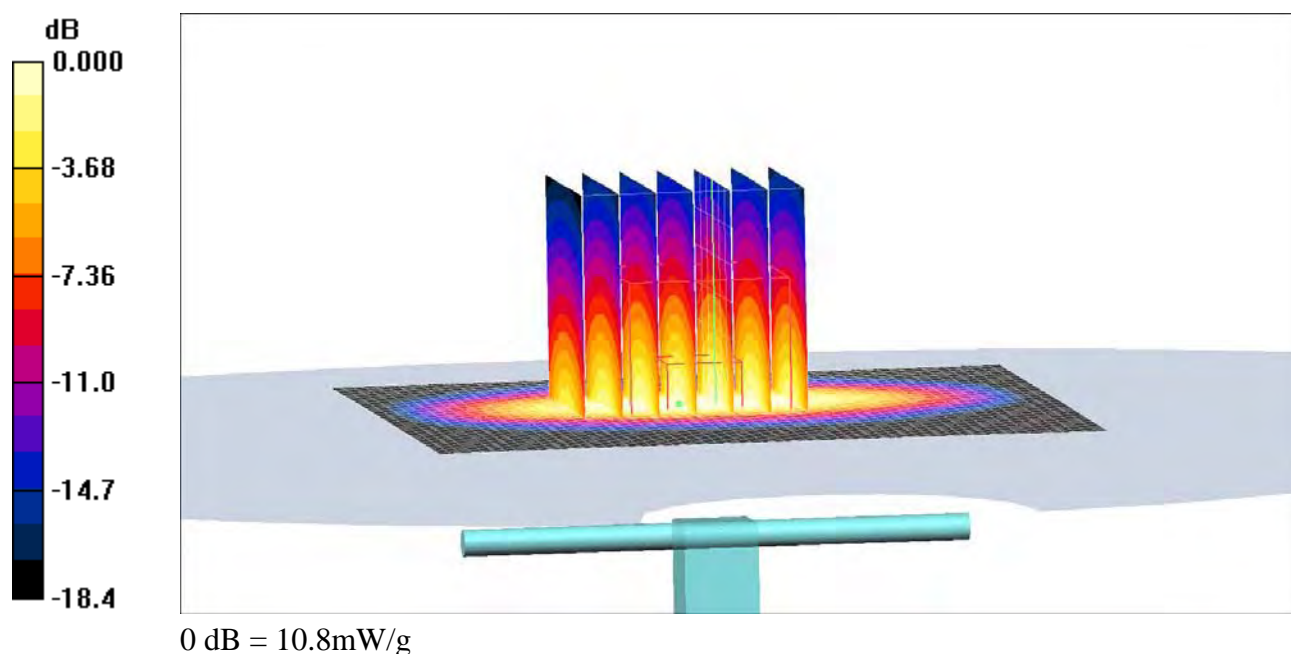
Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.47$  mho/m;  $\epsilon_r = 38.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn449; Calibrated: 12/7/2006
  - Phantom: SAM-1; Type: SAM; Serial: 1437
  - Measurement SW: DAS4, 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 = 90.3 V/m; Power Drift = 0.056 dB  
Peak SAR (extrapolated) = 16.6 W/kg  
**SAR(1 g) = 9.57 mW/g; SAR(10 g) = 5.02 mW/g**  
Maximum value of SAR (measured) = 10.8 mW/g



Date/Time: 11/15/2007 11:09:25 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Validation-D1900-Body-15-11-07****DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:539**

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

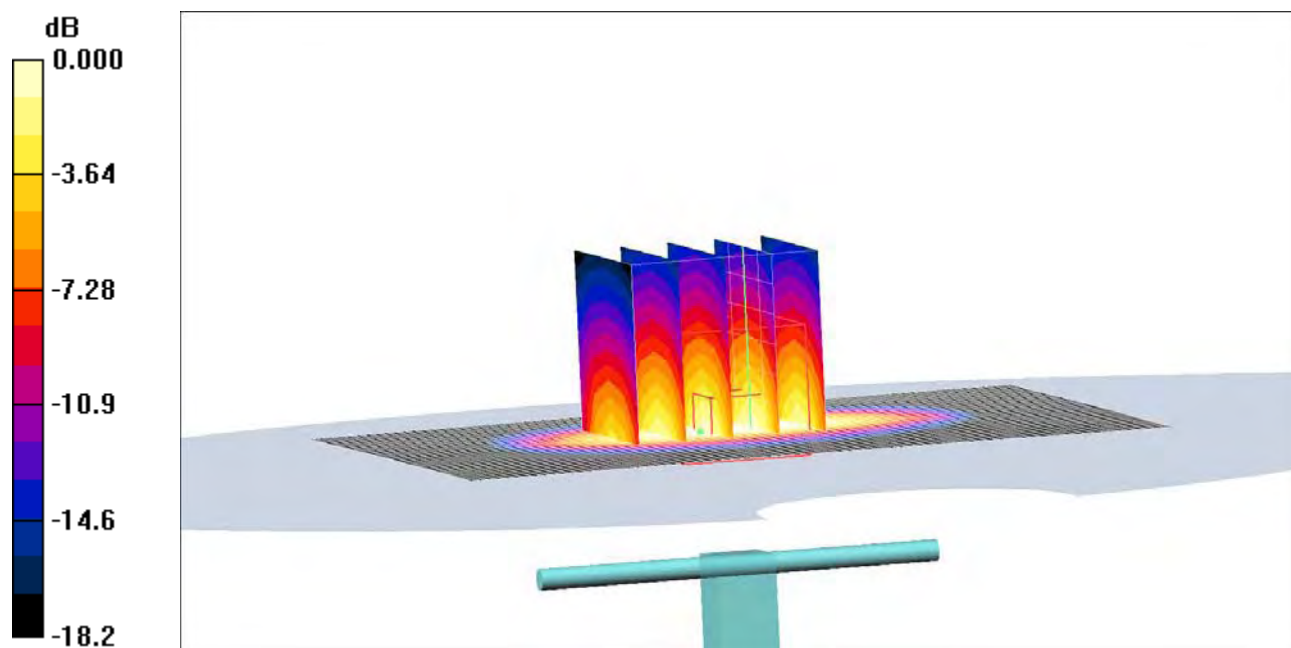
Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.59$  mho/m;  $\epsilon_r = 50.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(4.61, 4.61, 4.61); Calibrated: 12/12/2006
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn449; Calibrated: 12/7/2006
  - Phantom: SAM-3; Type: SAM; Serial: 1436
  - Measurement SW: DAS4, 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) = 11.7 mW/g
- d=15mm, Pin=250mW/Zoom Scan (7x7x7) (5x5x7)/Cube 0:** Measurement grid:  
dx=8mm, dy=8mm, dz=5mm  
Reference Value = 89.4 V/m; Power Drift = 0.041 dB  
Peak SAR (extrapolated) = 16.3 W/kg  
**SAR(1 g) = 9.87 mW/g; SAR(10 g) = 5.25 mW/g**  
Maximum value of SAR (measured) = 11.0 mW/g



0 dB = 11.0mW/g

Date/Time: 11/14/2007 1:18:54 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-LeftHandSide-GSM1900-Tilt-High****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1909.8$  MHz;  $\sigma = 1.48$  mho/m;  $\epsilon_r = 38.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Tilt position - High/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm  
 Maximum value of SAR (interpolated) = 0.706 mW/g

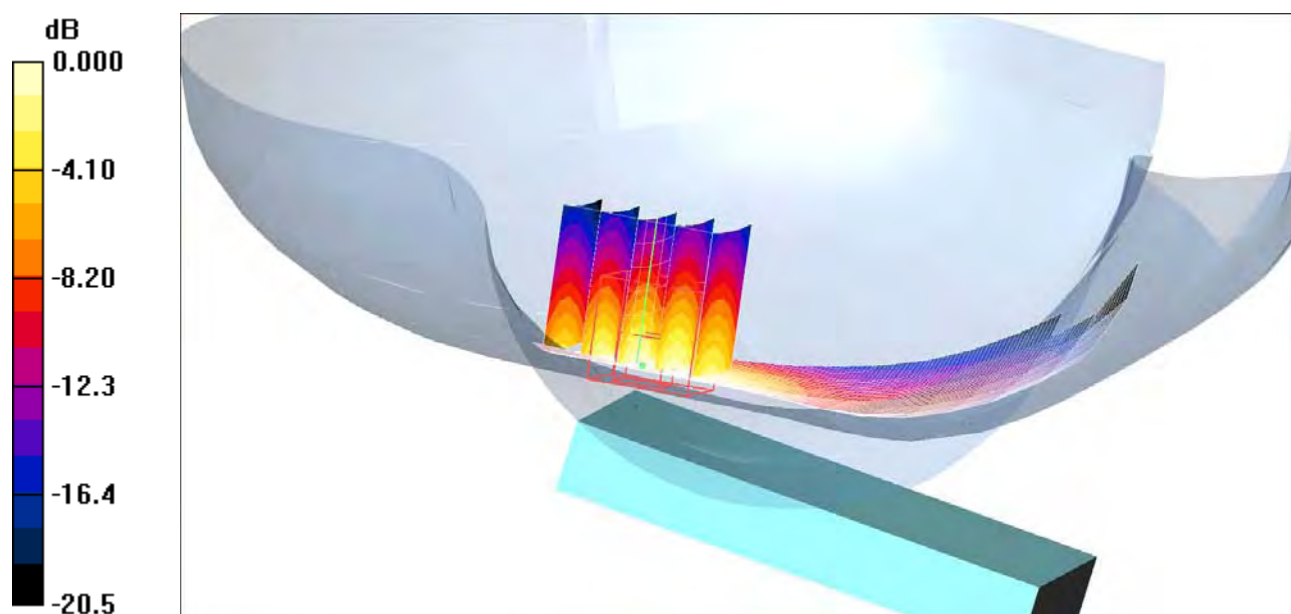
**Tilt position - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 22.5 V/m; Power Drift = -0.062 dB

Peak SAR (extrapolated) = 1.08 W/kg

**SAR(1 g) = 0.621 mW/g; SAR(10 g) = 0.340 mW/g**

Maximum value of SAR (measured) = 0.679 mW/g



0 dB = 0.679mW/g

Date/Time: 11/14/2007 1:36:52 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-LeftHandSide-GSM1900-Tilt-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.42$  mho/m;  $\epsilon_r = 38.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Tilt position - Low/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm  
 Maximum value of SAR (interpolated) = 1.26 mW/g

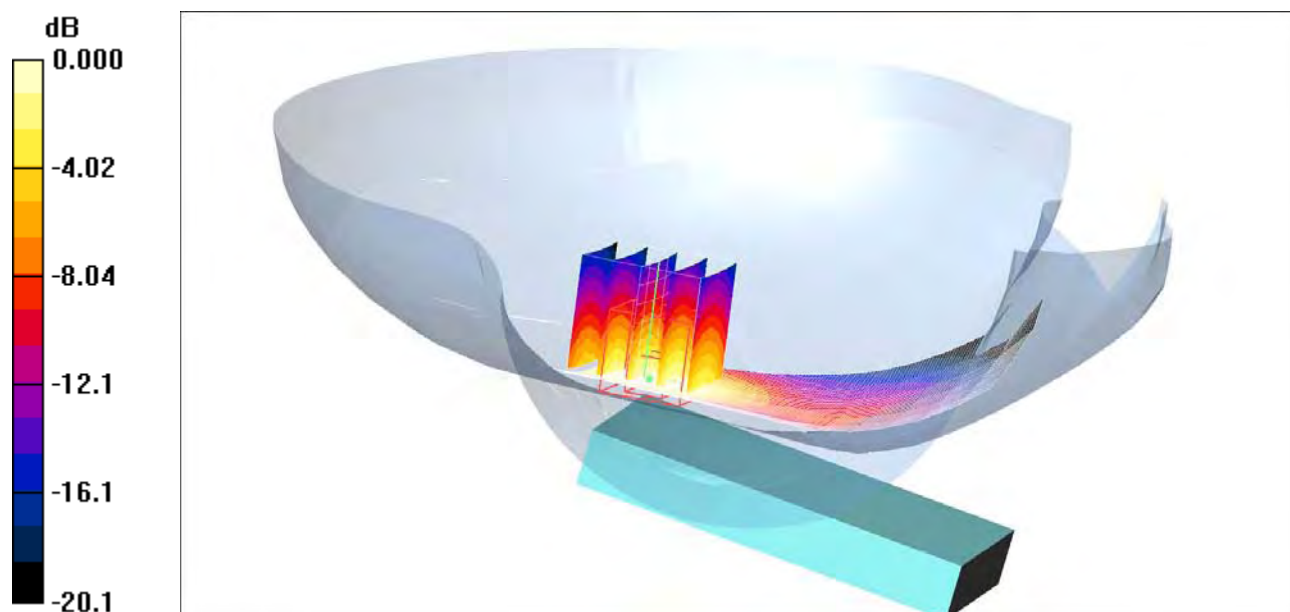
**Tilt position - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.4 V/m; Power Drift = -0.085 dB

Peak SAR (extrapolated) = 1.87 W/kg

**SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.601 mW/g**

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



0 dB = 1.21mW/g

Date/Time: 11/14/2007 11:52:57 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-LeftHandSide-GSM1900-Tilt-Middle****DUT: Chen; Type: DUT; Serial: #9532**

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

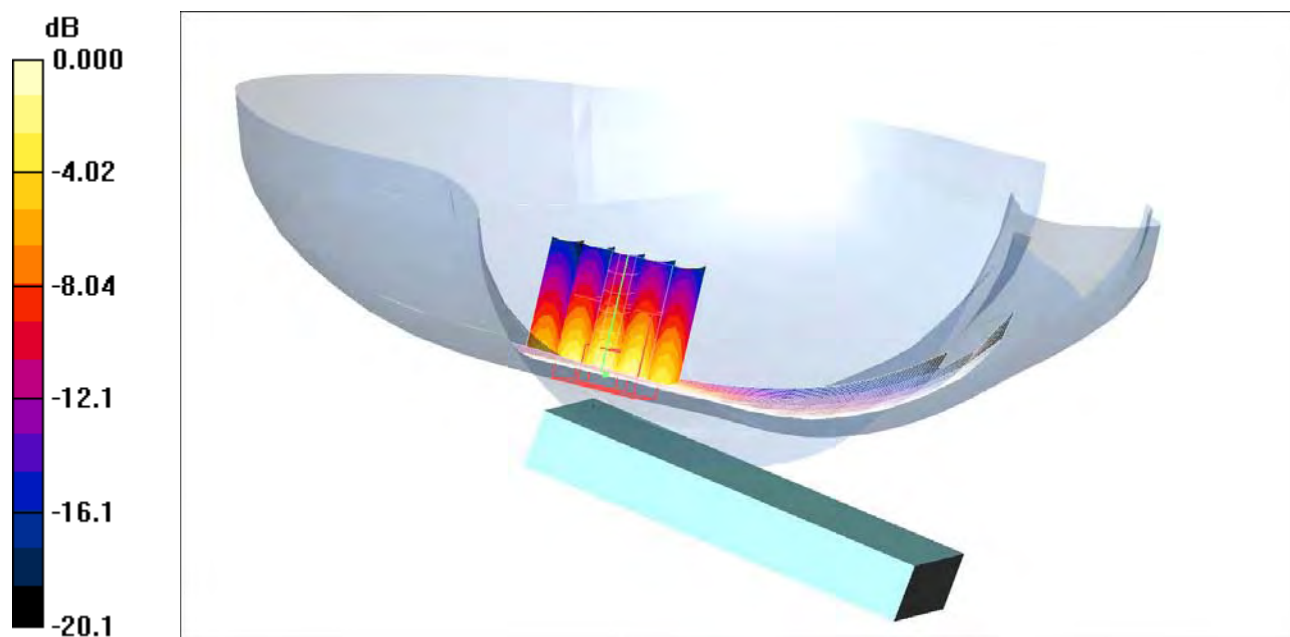
Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.45$  mho/m;  $\epsilon_r = 38.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn449; Calibrated: 12/7/2006
  - Phantom: SAM-1; Type: SAM; Serial: 1437
  - Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- Tilt position - Middle/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 1.10 mW/g
- Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  
dx=8mm, dy=8mm, dz=5mm  
Reference Value = 28.2 V/m; Power Drift = -0.058 dB  
Peak SAR (extrapolated) = 1.65 W/kg  
**SAR(1 g) = 0.958 mW/g; SAR(10 g) = 0.522 mW/g**  
Maximum value of SAR (measured) = 1.06 mW/g



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Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-LeftHandSide-GSM1900-Touch-High****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1909.8$  MHz;  $\sigma = 1.48$  mho/m;  $\epsilon_r = 38.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - High/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.759 mW/g

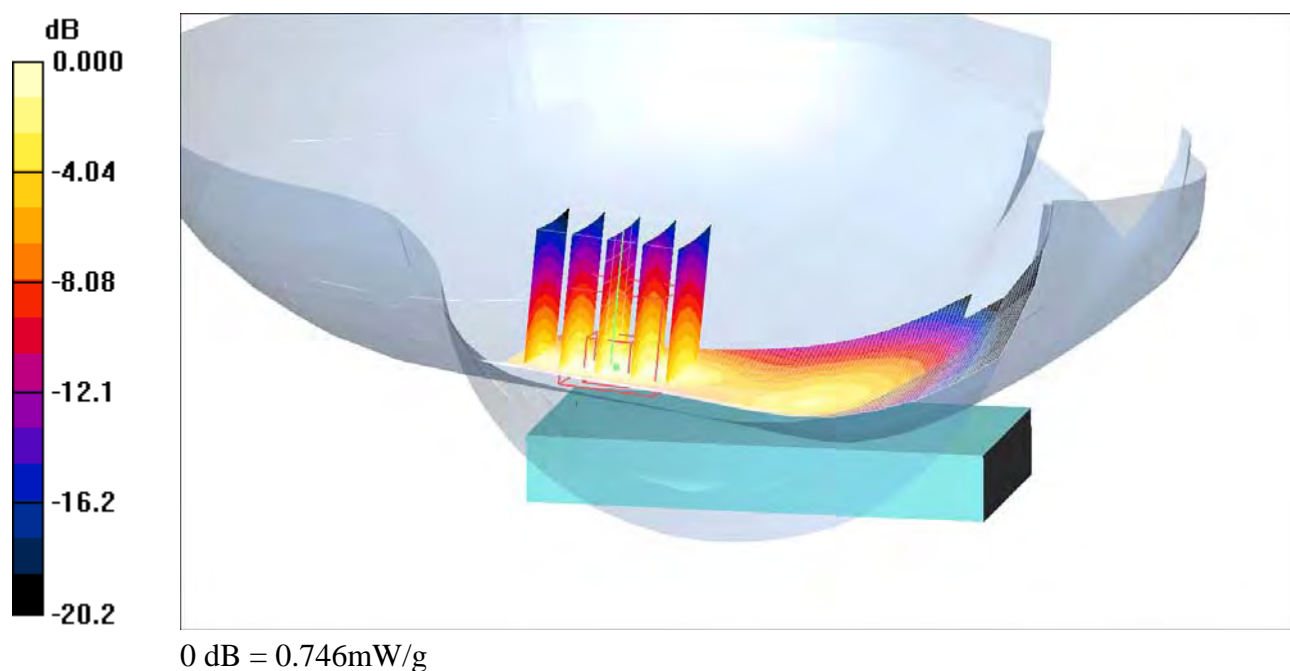
**Touch - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.5 V/m; Power Drift = -0.002 dB

Peak SAR (extrapolated) = 1.16 W/kg

**SAR(1 g) = 0.679 mW/g; SAR(10 g) = 0.377 mW/g**

Maximum value of SAR (measured) = 0.746 mW/g





Date/Time: 11/14/2007 12:44:03 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-LeftHandSide-GSM1900-Touch-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.42$  mho/m;  $\epsilon_r = 38.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - Low/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 1.32 mW/g

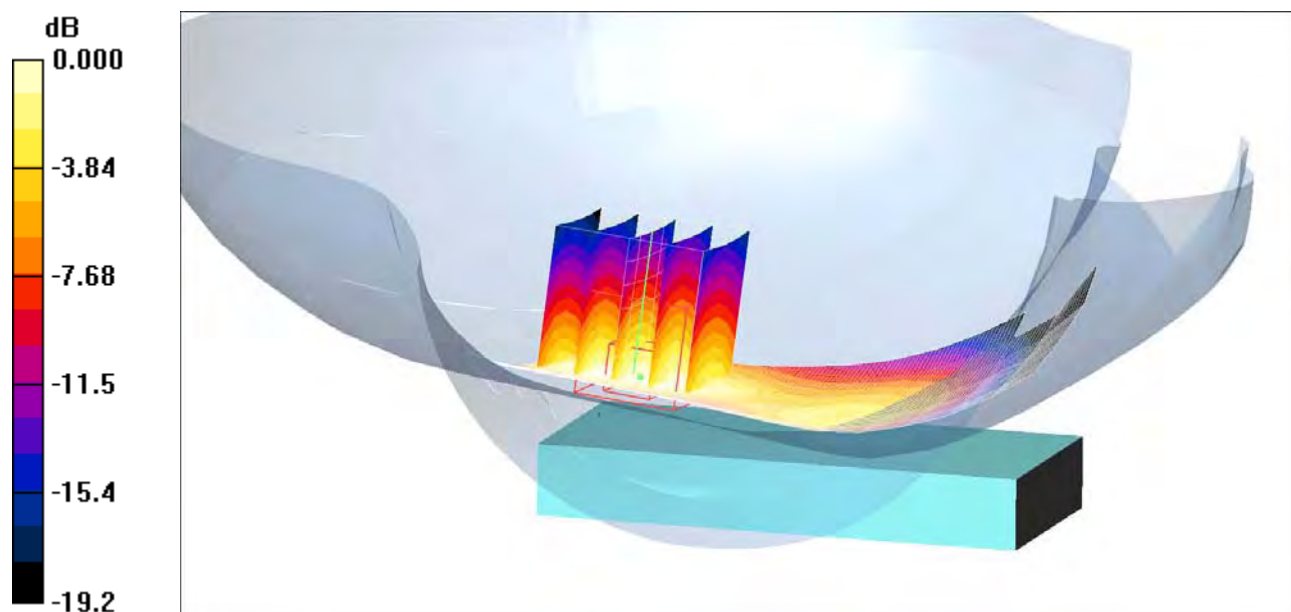
**Touch - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.6 V/m; Power Drift = -0.028 dB

Peak SAR (extrapolated) = 1.95 W/kg

**SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.641 mW/g**

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



0 dB = 1.25mW/g

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Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-LeftHandSide-GSM1900-Touch-Middle****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.45$  mho/m;  $\epsilon_r = 38.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch position - Middle/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

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

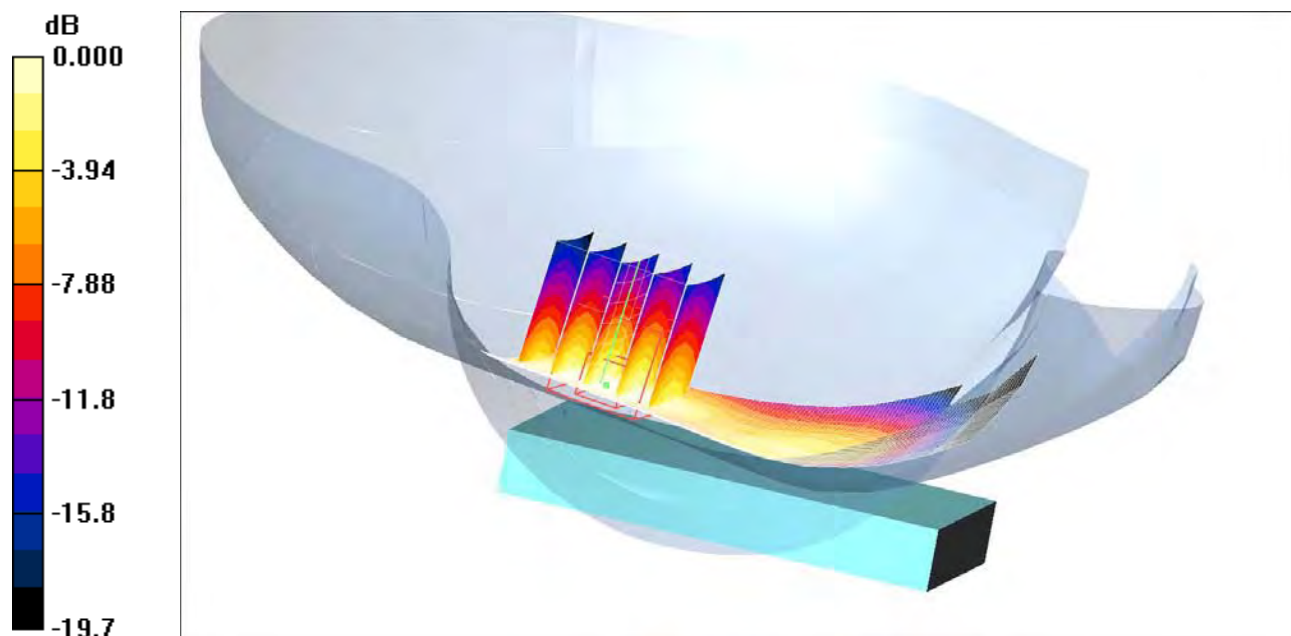
**Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.7 V/m; Power Drift = -0.150 dB

Peak SAR (extrapolated) = 1.72 W/kg

**SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.563 mW/g**

Maximum value of SAR (measured) = 1.11 mW/g



0 dB = 1.11mW/g

Date/Time: 11/14/2007 3:10:04 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-RightHandSide-GSM1900-Tilt-High****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1909.8$  MHz;  $\sigma = 1.48$  mho/m;  $\epsilon_r = 38.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Tilt position - High/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm  
 Maximum value of SAR (interpolated) = 0.586 mW/g

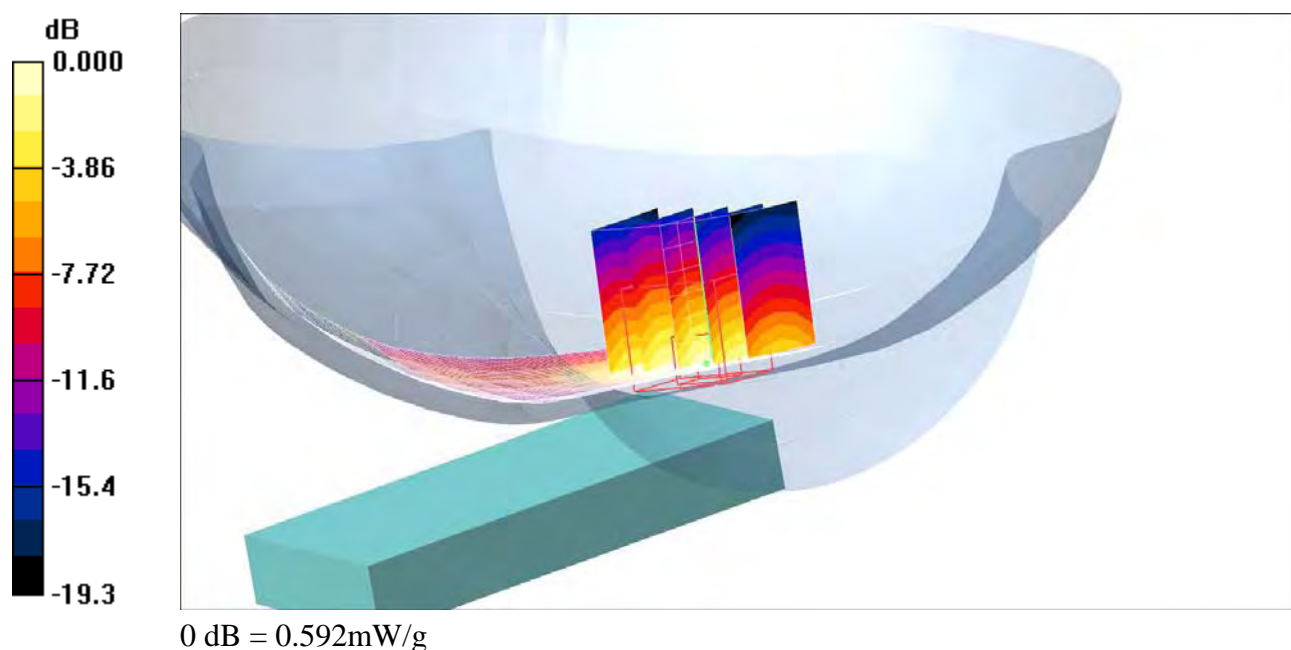
**Tilt position - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.9 V/m; Power Drift = 0.059 dB

Peak SAR (extrapolated) = 0.897 W/kg

**SAR(1 g) = 0.530 mW/g; SAR(10 g) = 0.291 mW/g**

Maximum value of SAR (measured) = 0.592 mW/g



Date/Time: 11/14/2007 2:52:33 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-RightHandSide-GSM1900-Tilt-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.42$  mho/m;  $\epsilon_r = 38.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Tilt position - Low/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm  
 Maximum value of SAR (interpolated) = 1.05 mW/g

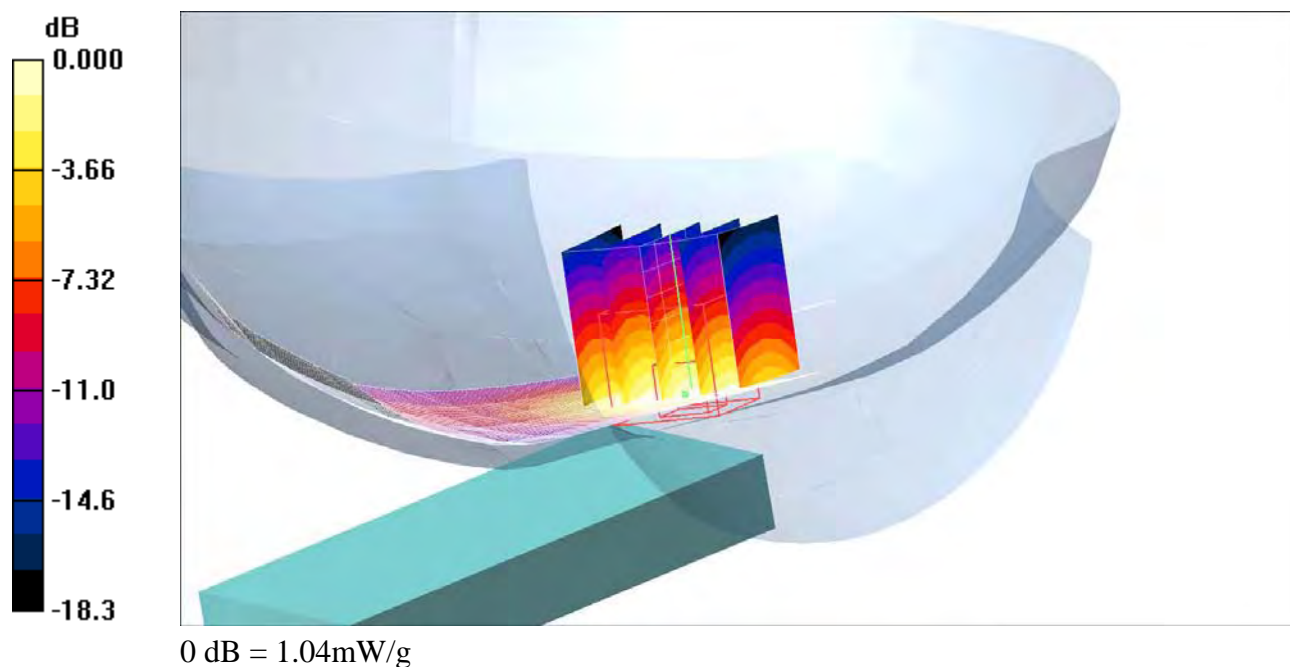
**Tilt position - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.6 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 1.52 W/kg

**SAR(1 g) = 0.928 mW/g; SAR(10 g) = 0.513 mW/g**

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



Date/Time: 11/14/2007 2:23:42 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-RightHandSide-GSM1900-Tilt-Middle****DUT: Chen; Type: DUT; Serial: #9532**

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

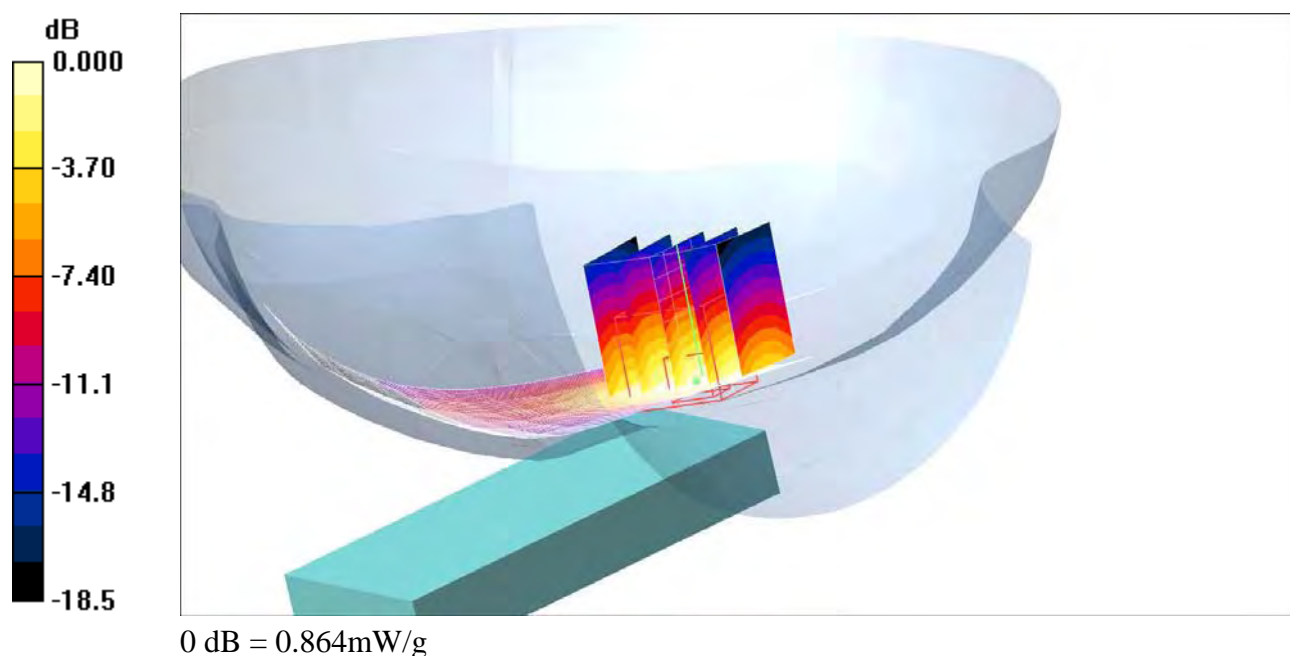
Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.45$  mho/m;  $\epsilon_r = 38.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
  - Sensor-Surface: 4mm (Mechanical Surface Detection)
  - Electronics: DAE3 Sn449; Calibrated: 12/7/2006
  - Phantom: SAM-1; Type: SAM; Serial: 1437
  - Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172
- Tilt position - Middle/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (interpolated) = 0.877 mW/g
- Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  
dx=8mm, dy=8mm, dz=5mm  
Reference Value = 24.7 V/m; Power Drift = -0.130 dB  
Peak SAR (extrapolated) = 1.30 W/kg  
**SAR(1 g) = 0.780 mW/g; SAR(10 g) = 0.433 mW/g**  
Maximum value of SAR (measured) = 0.864 mW/g



Date/Time: 11/14/2007 3:47:41 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-RightHandSide-GSM1900-Touch-High****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1909.8$  MHz;  $\sigma = 1.48$  mho/m;  $\epsilon_r = 38.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - High/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.563 mW/g

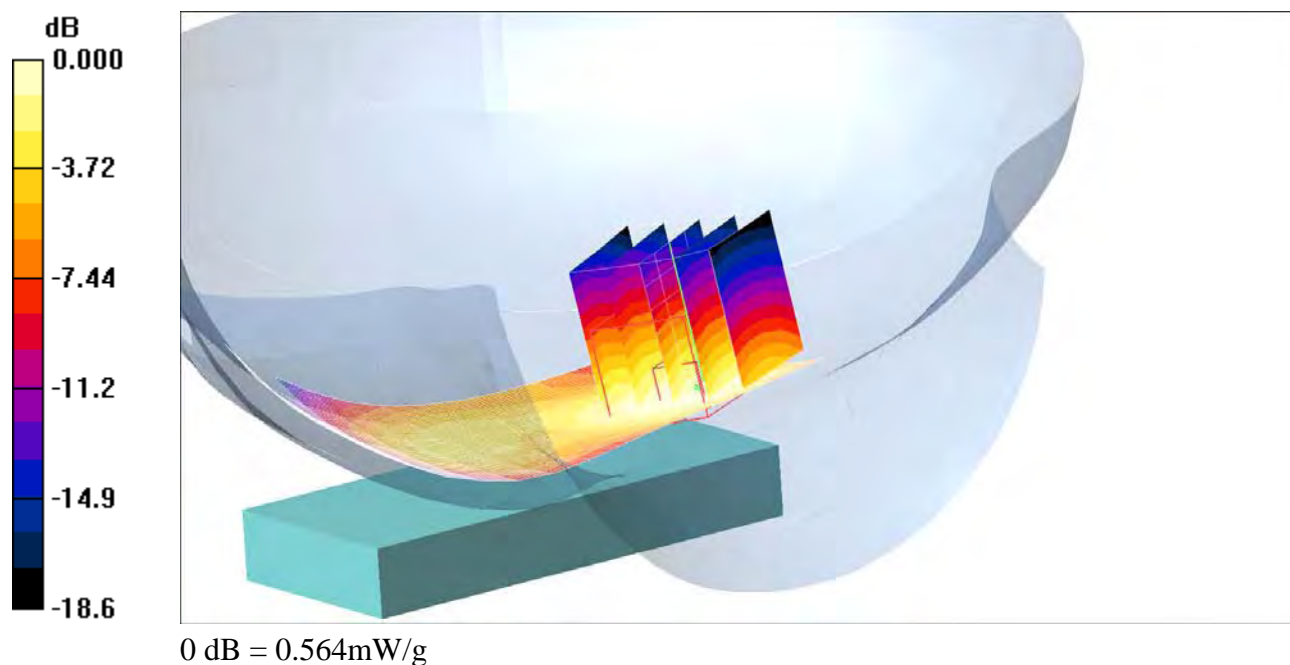
**Touch - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.6 V/m; Power Drift = 0.295 dB

Peak SAR (extrapolated) = 0.841 W/kg

**SAR(1 g) = 0.515 mW/g; SAR(10 g) = 0.301 mW/g**

Maximum value of SAR (measured) = 0.564 mW/g



Date/Time: 11/14/2007 3:29:48 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-RightHandSide-GSM1900-Touch-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.42$  mho/m;  $\epsilon_r = 38.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch - Low/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.887 mW/g

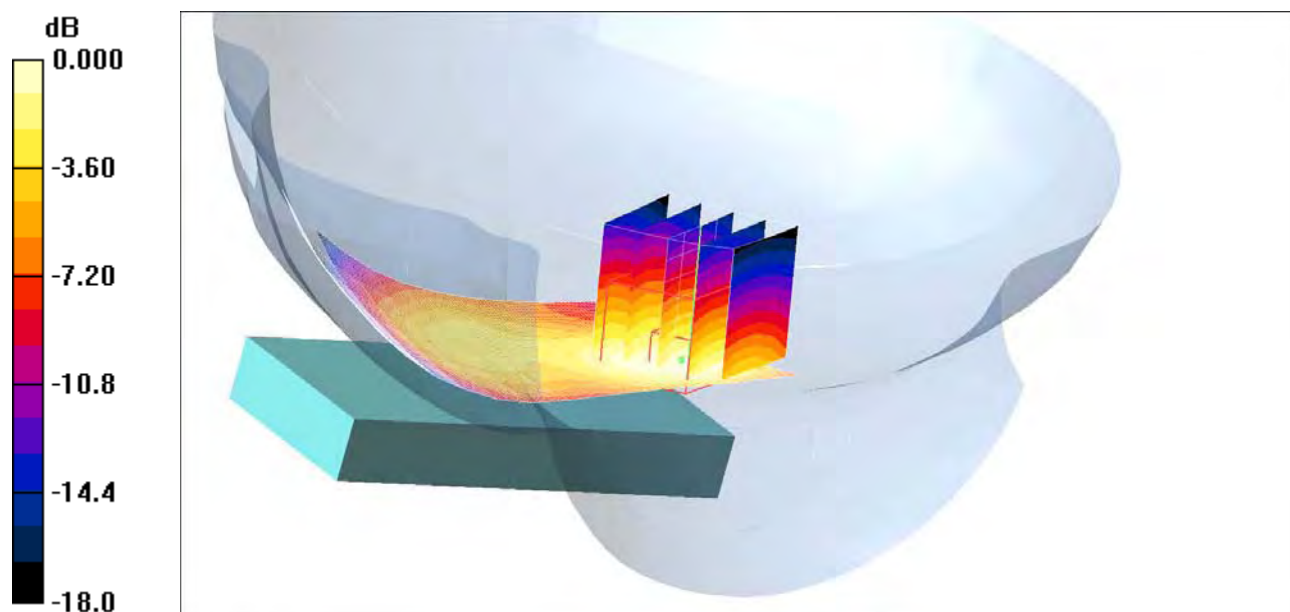
**Touch - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.6 V/m; Power Drift = -0.096 dB

Peak SAR (extrapolated) = 1.30 W/kg

**SAR(1 g) = 0.806 mW/g; SAR(10 g) = 0.472 mW/g**

Maximum value of SAR (measured) = 0.882 mW/g



0 dB = 0.882mW/g

Date/Time: 11/14/2007 2:04:59 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Chen-RightHandSide-GSM1900-Touch-Middle****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.45$  mho/m;  $\epsilon_r = 38.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(5.14, 5.14, 5.14); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Touch position - Middle/Area Scan (61x121x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.822 mW/g

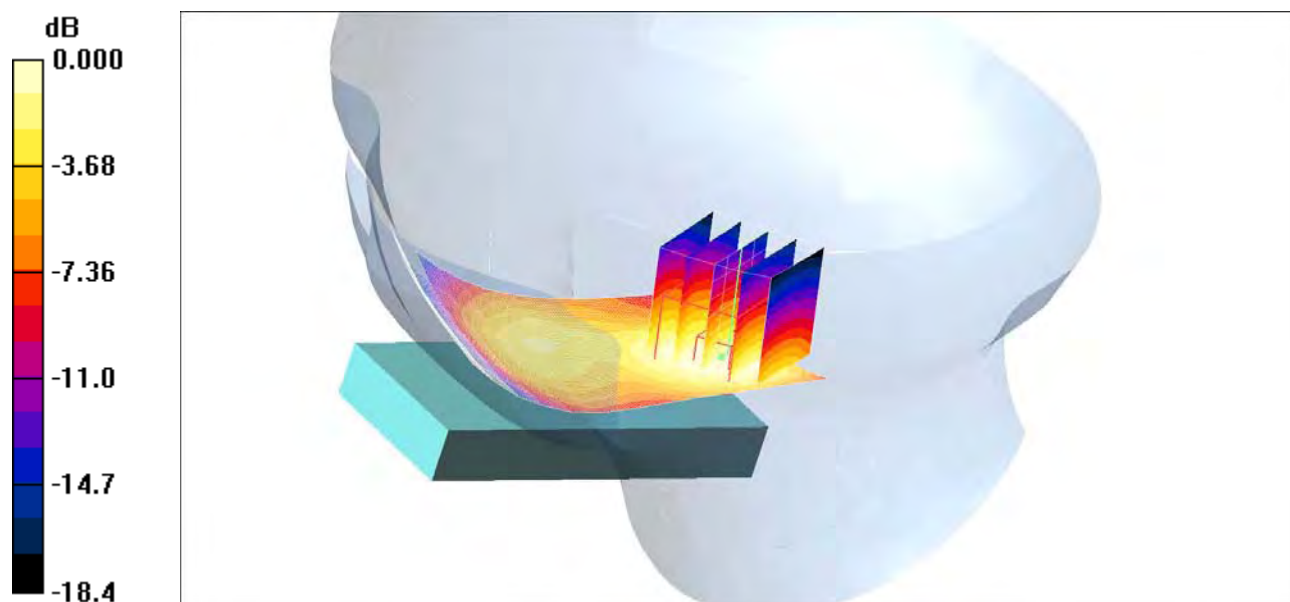
**Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 23.5 V/m; Power Drift = -0.048 dB

Peak SAR (extrapolated) = 1.20 W/kg

**SAR(1 g) = 0.743 mW/g; SAR(10 g) = 0.434 mW/g**

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



0 dB = 0.817mW/g



Date/Time: 11/15/2007 2:32:59 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-1900Bluetooth-High****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1909.8$  MHz;  $\sigma = 1.61$  mho/m;  $\epsilon_r = 50.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(4.61, 4.61, 4.61); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- 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 (41x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.540 mW/g

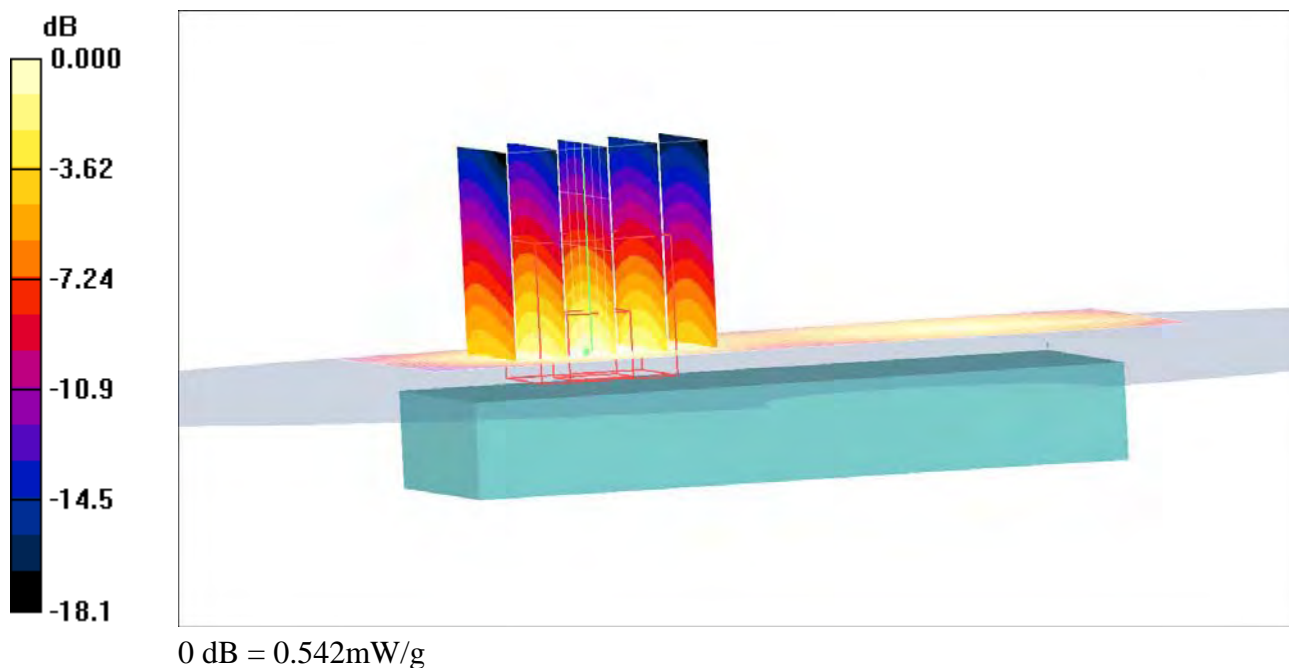
**Body 3/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 10.6 V/m; Power Drift = -0.010 dB

Peak SAR (extrapolated) = 0.825 W/kg

**SAR(1 g) = 0.490 mW/g; SAR(10 g) = 0.275 mW/g**

Maximum value of SAR (measured) = 0.542 mW/g



Date/Time: 11/15/2007 2:21:07 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-1900Bluetooth-Middle****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.57$  mho/m;  $\epsilon_r = 50.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(4.61, 4.61, 4.61); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body 2/Area Scan (41x81x1):** Measurement grid: dx=15mm, dy=15mm

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

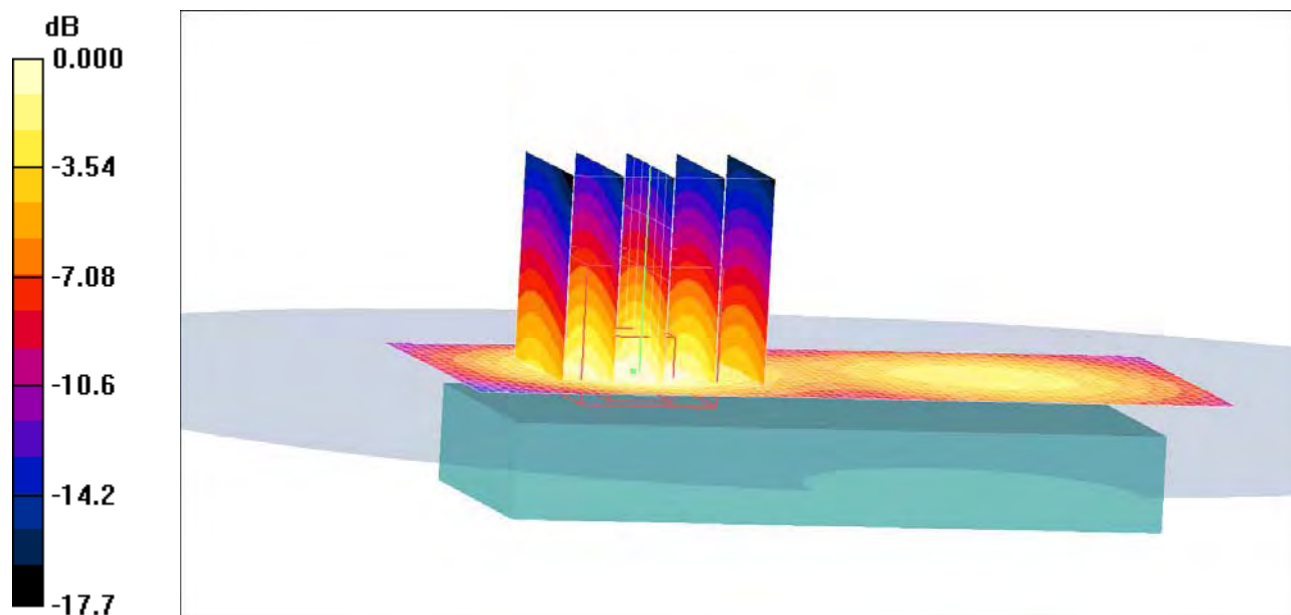
**Body 2/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 13.4 V/m; Power Drift = 0.023 dB

Peak SAR (extrapolated) = 1.17 W/kg

**SAR(1 g) = 0.705 mW/g; SAR(10 g) = 0.398 mW/g**

Maximum value of SAR (measured) = 0.783 mW/g



0 dB = 0.783mW/g

Date/Time: 11/15/2007 2:08:44 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-1900Bluetooth-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 51$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(4.61, 4.61, 4.61); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

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

Maximum value of SAR (interpolated) = 0.984 mW/g

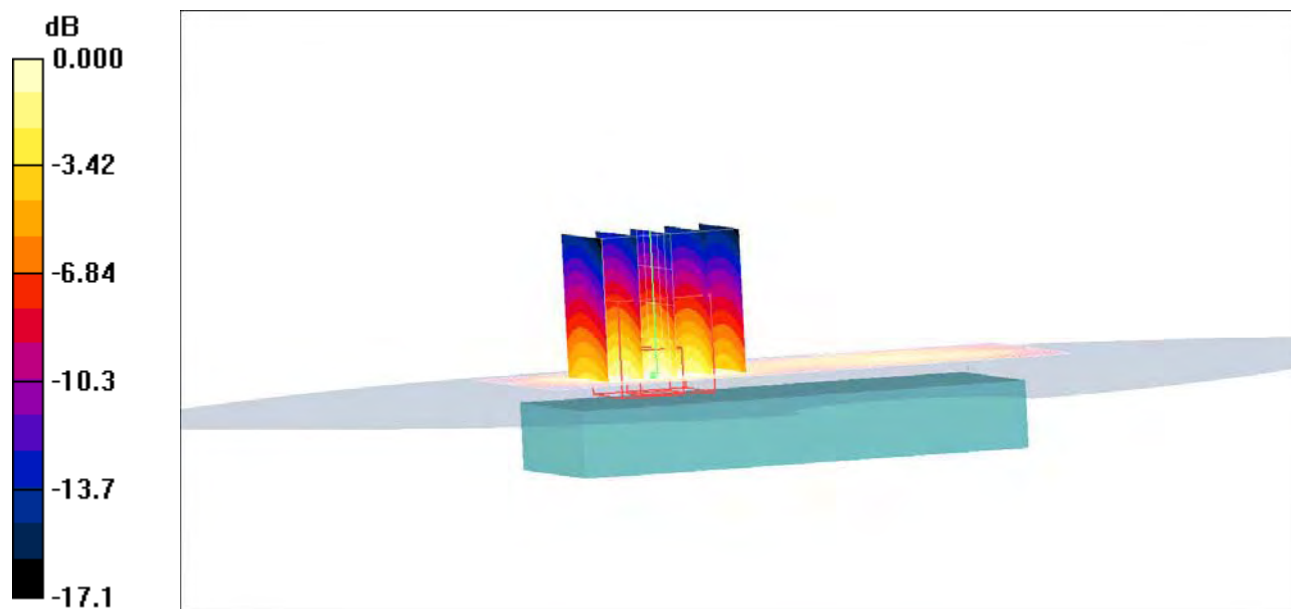
**Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 14.7 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 1.41 W/kg

**SAR(1 g) = 0.882 mW/g; SAR(10 g) = 0.507 mW/g**

Maximum value of SAR (measured) = 0.974 mW/g



Date/Time: 11/15/2007 1:52:33 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-1900EDGE-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 51$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DAS4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(4.61, 4.61, 4.61); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

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

Maximum value of SAR (interpolated) = 0.632 mW/g

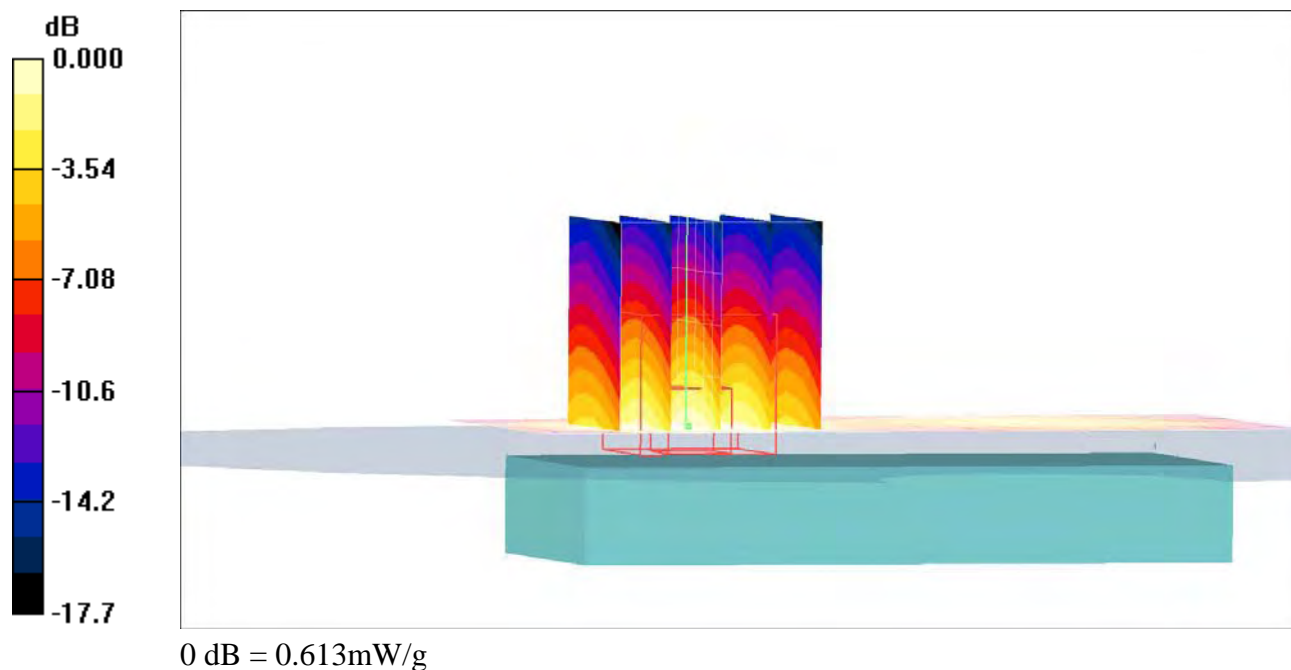
**Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 12.0 V/m; Power Drift = -0.035 dB

Peak SAR (extrapolated) = 0.896 W/kg

**SAR(1 g) = 0.561 mW/g; SAR(10 g) = 0.325 mW/g**

Maximum value of SAR (measured) = 0.613 mW/g



Date/Time: 11/15/2007 1:22:18 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-1900GPRS-High****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1909.8$  MHz;  $\sigma = 1.61$  mho/m;  $\epsilon_r = 50.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(4.61, 4.61, 4.61); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- 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 (41x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.741 mW/g

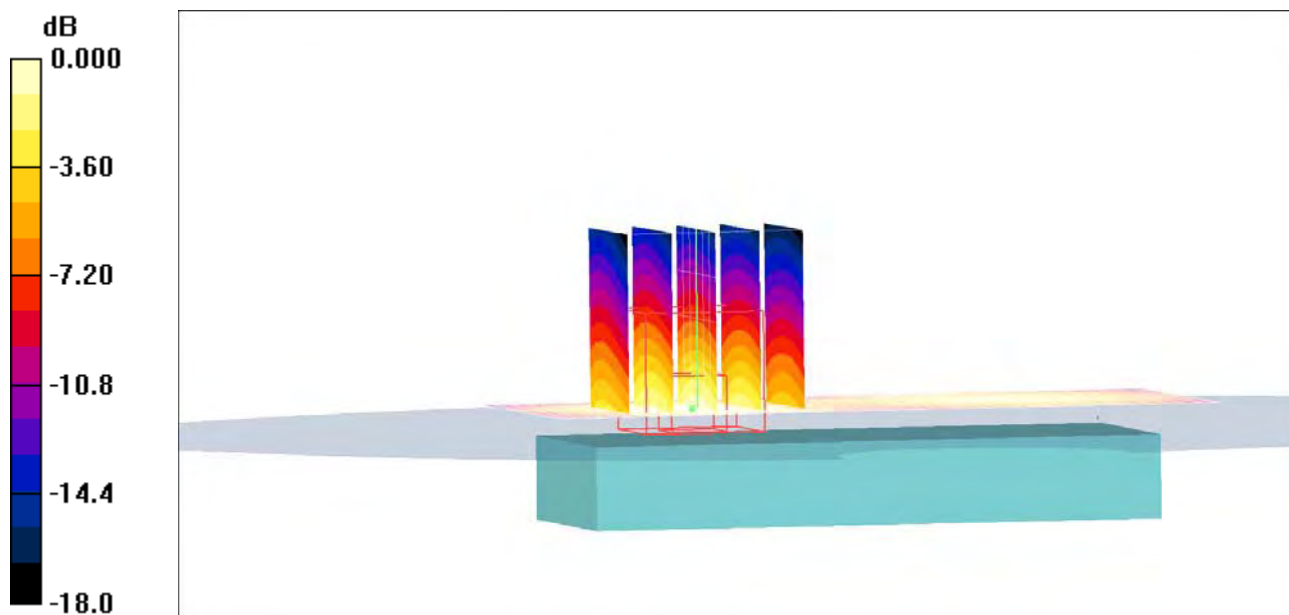
**Body 3/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 12.5 V/m; Power Drift = 0.056 dB

Peak SAR (extrapolated) = 1.10 W/kg

**SAR(1 g) = 0.653 mW/g; SAR(10 g) = 0.365 mW/g**

Maximum value of SAR (measured) = 0.731 mW/g



0 dB = 0.731mW/g

Date/Time: 11/15/2007 11:47:04 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-1900GPRS-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 51$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(4.61, 4.61, 4.61); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

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

Maximum value of SAR (interpolated) = 1.27 mW/g

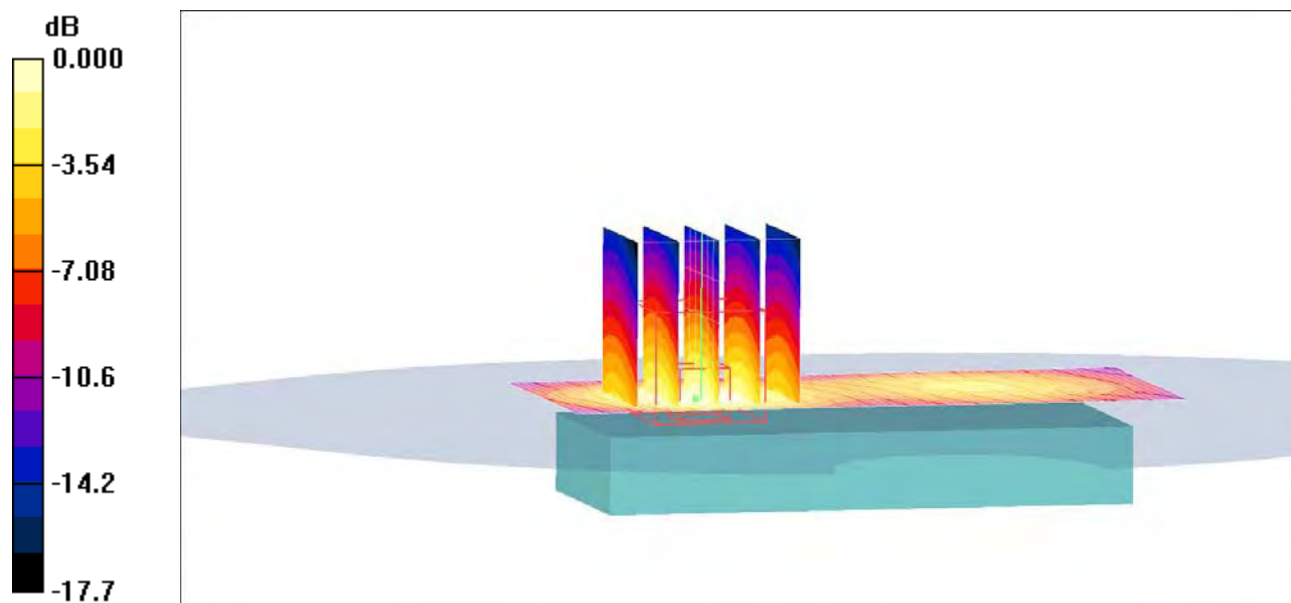
**Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 16.9 V/m; Power Drift = -0.135 dB

Peak SAR (extrapolated) = 1.77 W/kg

**SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.633 mW/g**

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



0 dB = 1.22mW/g

Date/Time: 11/15/2007 1:07:22 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-1900GPRS-Middle****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.57$  mho/m;  $\epsilon_r = 50.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(4.61, 4.61, 4.61); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body 2/Area Scan (41x81x1):** Measurement grid: dx=15mm, dy=15mm

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

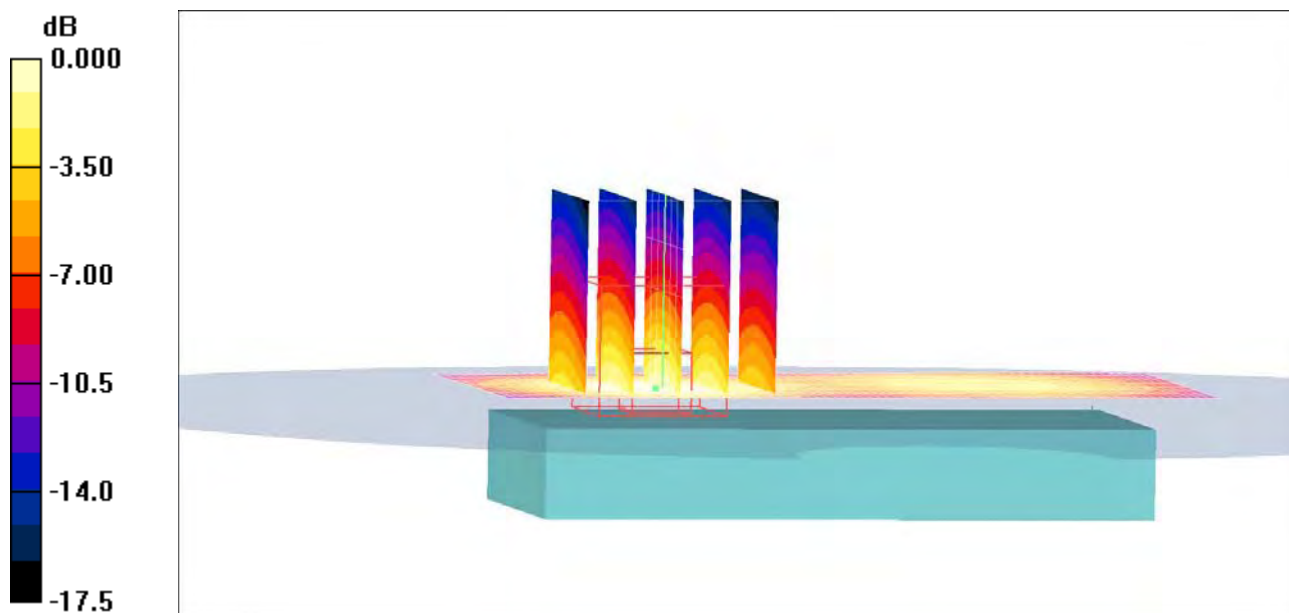
**Body 2/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 16.2 V/m; Power Drift = -0.115 dB

Peak SAR (extrapolated) = 1.53 W/kg

**SAR(1 g) = 0.928 mW/g; SAR(10 g) = 0.527 mW/g**

Maximum value of SAR (measured) = 1.03 mW/g



0 dB = 1.03mW/g

Date/Time: 11/15/2007 2:49:02 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Flat15mm-Chen-1900PHF-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 51$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(4.61, 4.61, 4.61); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

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

Maximum value of SAR (interpolated) = 0.791 mW/g

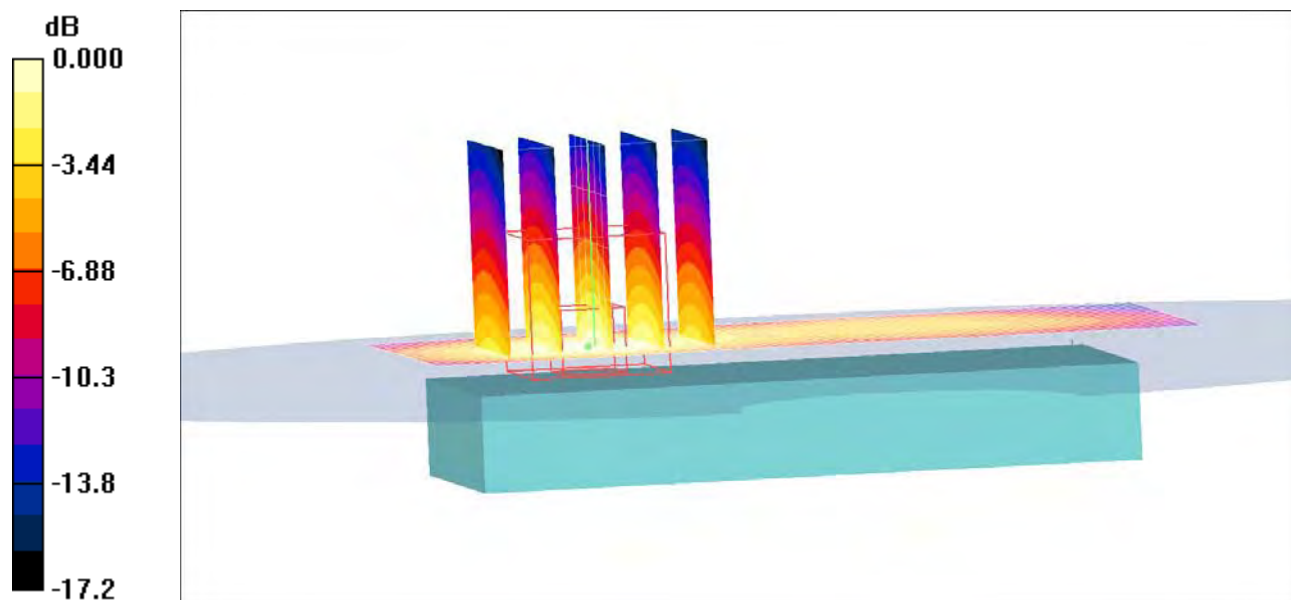
**Body/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 15.6 V/m; Power Drift = -0.041 dB

Peak SAR (extrapolated) = 1.14 W/kg

**SAR(1 g) = 0.709 mW/g; SAR(10 g) = 0.413 mW/g**

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



0 dB = 0.782mW/g



Date/Time: 11/15/2007 3:39:26 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

**Body-Front-To-Phantom-Flat15mm-Chen-1900GPRS-Low****DUT: Chen; Type: DUT; Serial: #9532**

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

Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 51$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DAS4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1611; ConvF(4.61, 4.61, 4.61); Calibrated: 12/12/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DAS4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

**Body Front to Phantom/Area Scan (41x81x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.408 mW/g

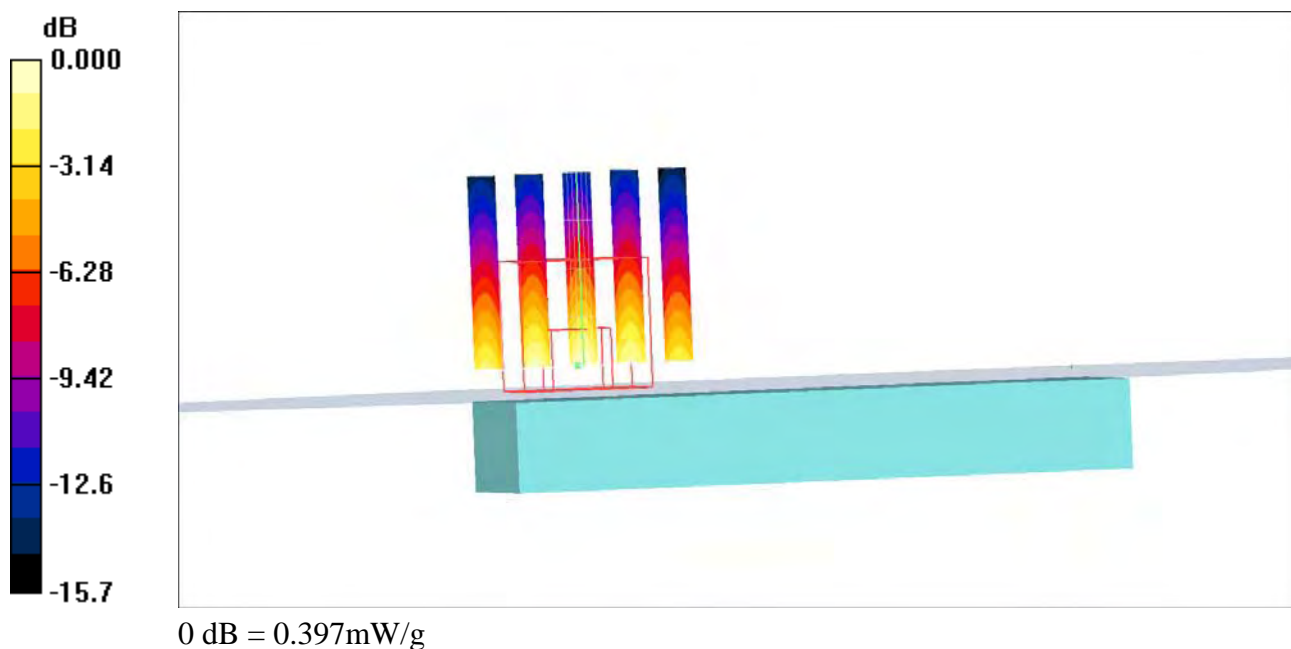
**Body Front to Phantom/Zoom Scan (7x5x5)/Cube 0:** Measurement grid: dx=5mm, dy=8mm, dz=8mm

Reference Value = 8.91 V/m; Power Drift = -0.174 dB

Peak SAR (extrapolated) = 0.552 W/kg

**SAR(1 g) = 0.362 mW/g; SAR(10 g) = 0.221 mW/g**

Maximum value of SAR (measured) = 0.397 mW/g





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Multilateral Agreement for the recognition of calibration certificates

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 ± 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 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 <b>Claudio Leubler</b>	Function Laboratory Technician	Signature 
Approved by:	Name <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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The Swiss Accreditation Service is one of the signatories to the EA  
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 V4.9	
<b>Distance Dipole Center - TSL</b>	15 mm	with Spacer
<b>Zoom Scan Resolution</b>	dx, dy, dz = 5 mm	
<b>Frequency</b>	835 MHz ± 1 MHz	

## Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
<b>Nominal Head TSL parameters</b>	22.0 °C	41.5	0.90 mho/m
<b>Measured Head TSL parameters</b>	(22.0 ± 0.2) °C	41.7 ± 6 %	0.90 mho/m ± 6 %
<b>Head TSL temperature during test</b>	(22.8 ± 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	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 ± 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	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 ± 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

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	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	9.70 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	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	6.51 mW / g ± 16.5 % (k=2)

<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:**

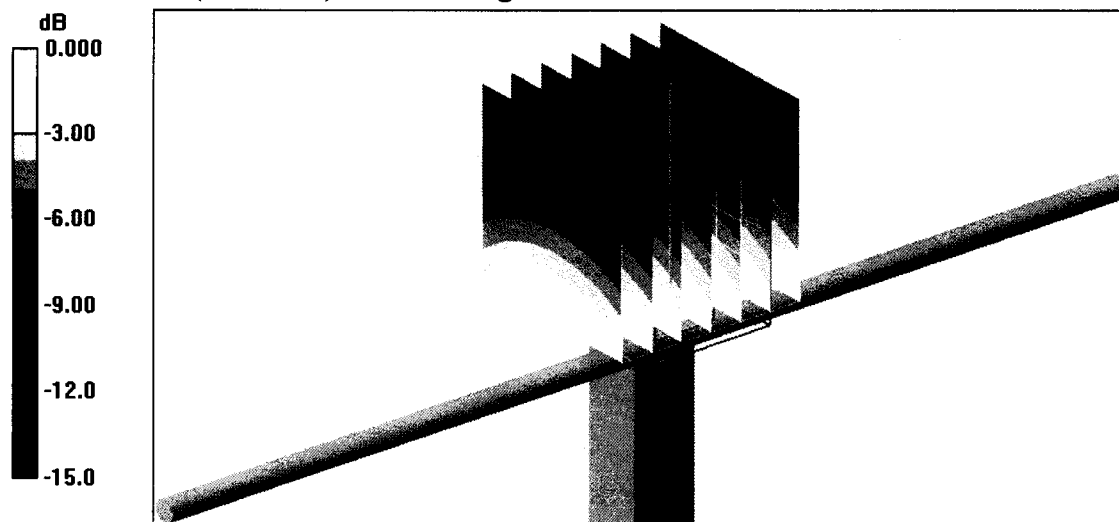
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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



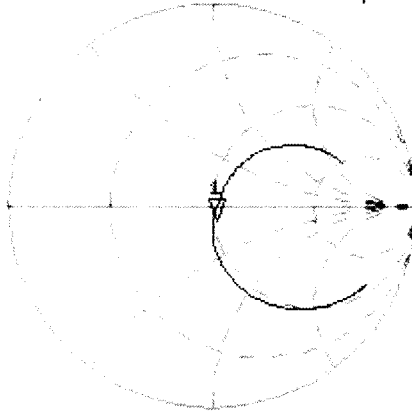
0 dB = 2.55mW/g

# Impedance Measurement Plot for Head TSL

5 Dec 2006 12:03:21

CH1 S11 1 U FS 1: 50.336  $\Omega$  -7.5410  $\Omega$  25.276 pF 835.000 000 MHz

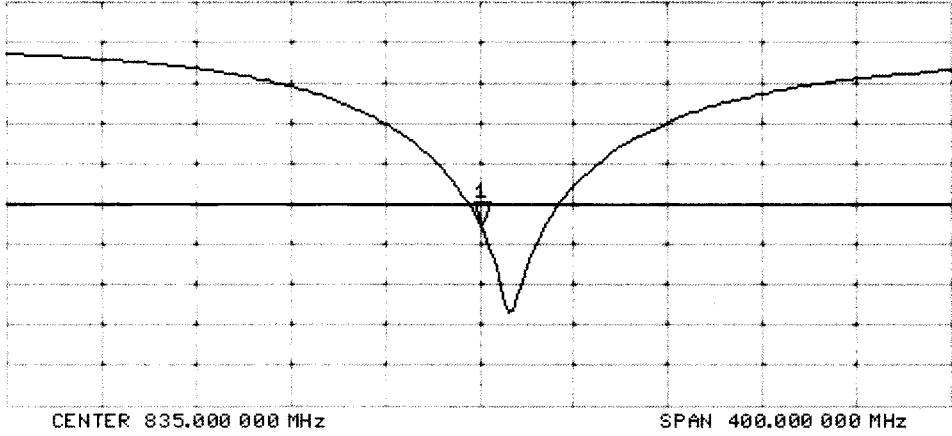
\*  
Del  
CA



Avg  
16  
↑

CH2 S11 LOG 5 dB/REF -20 dB 1:-22.494 dB 835.000 000 MHz

CA  
Avg  
16  
↑





## 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:**

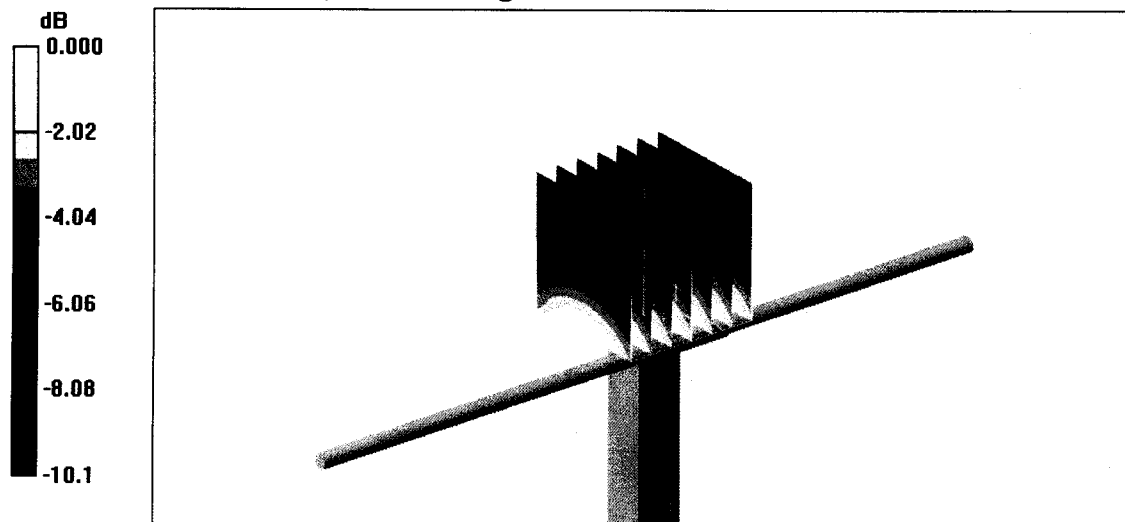
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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



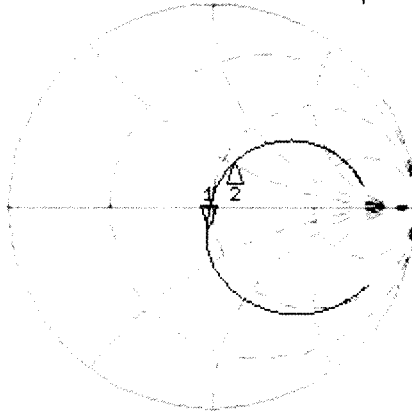
0 dB = 2.72mW/g

# 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

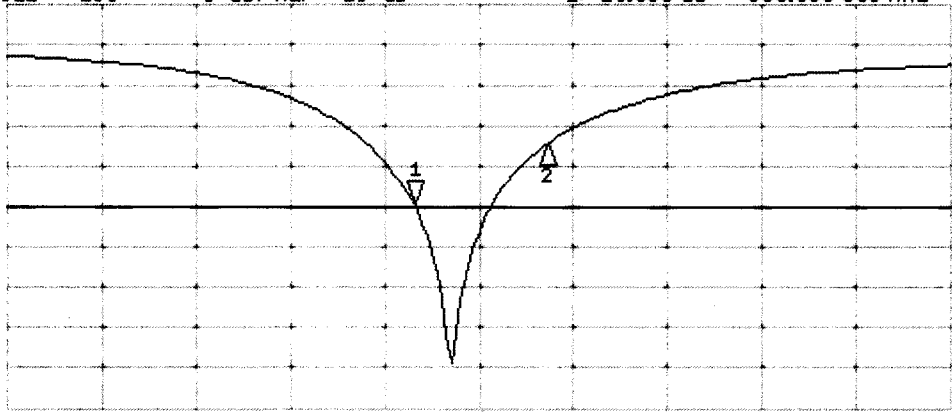


CH1 Markers  
2: 55.250  $\Omega$   
25.500  $\Omega$   
900.000 MHz

Avg  
16  
↑

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

Cor



CH2 Markers  
2: -12.379 dB  
-19.385 dB  
900.000 MHz

Avg  
16  
↑

START 635.000 000 MHz

STOP 1 1100.000 000 MHz



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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 ± 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: 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 Mell** (Name), **Laboratory Technician** (Function), *M. Mell* (Signature)

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

Issued: December 13, 2006

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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.

<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 ± 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 ± 0.2) °C	38.4 ± 6 %	1.40 mho/m ± 6 %
<b>Head TSL temperature during test</b>	(21.2 ± 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 ± 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 ± 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:  $f = 1900$  MHz;  $\sigma = 1.4$  mho/m;  $\epsilon_r = 38.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

## DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.97, 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=10mm, dy=10mm

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

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

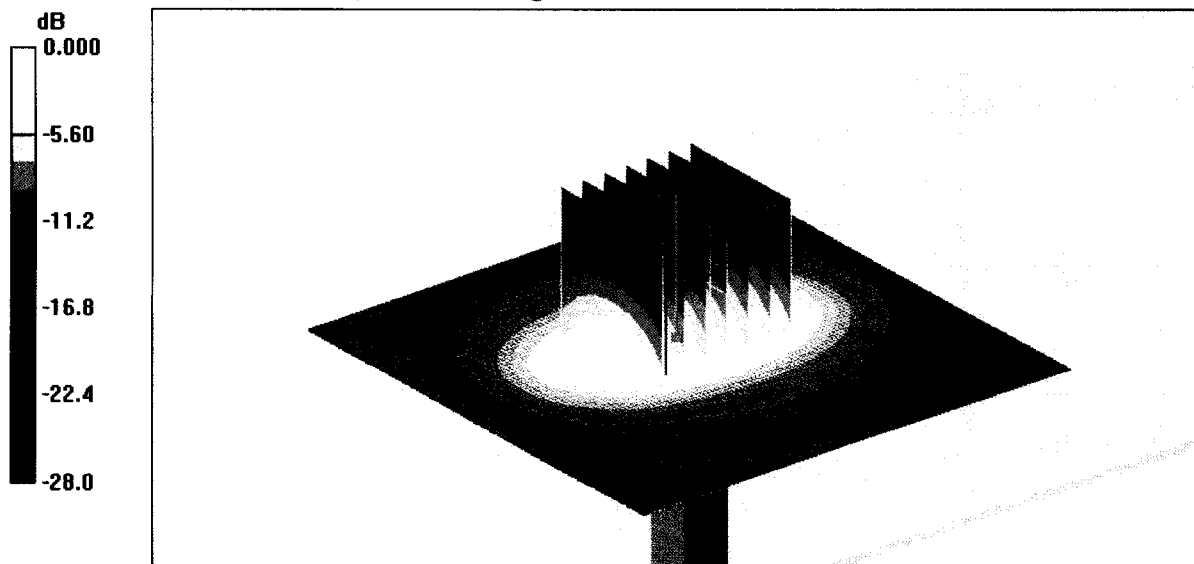
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

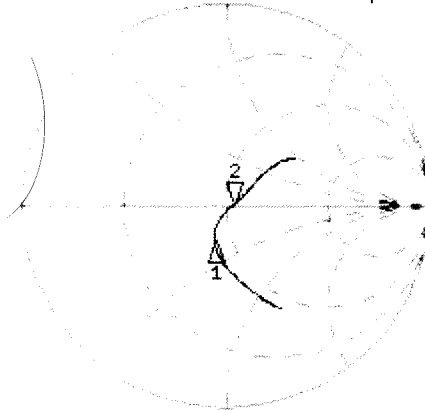


# Impedance Measurement Plot for Head TSL

11 Dec 2006 12:34:44

CH1 S11 1 U FS 2: 54.098  $\Omega$  0.8848  $\Omega$  74.113  $\mu\text{H}$  1 900.000 000 MHz

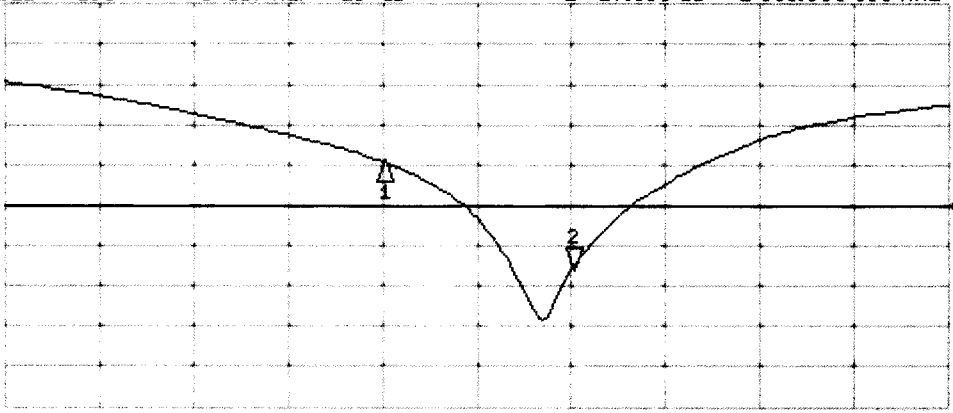
\*  
Del  
Cor  
Avg  
16  
↑



CH1 Markers  
1: 42.035  $\Omega$   
-15.363  $\Omega$   
1.80000 GHz

CH2 S11 LOG 5 dB/REF -20 dB 2: -27.899 dB 1 900.000 000 MHz

Cor  
Avg  
16  
↑



CH2 Markers  
1: -14.635 dB  
1.80000 GHz

## 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:**

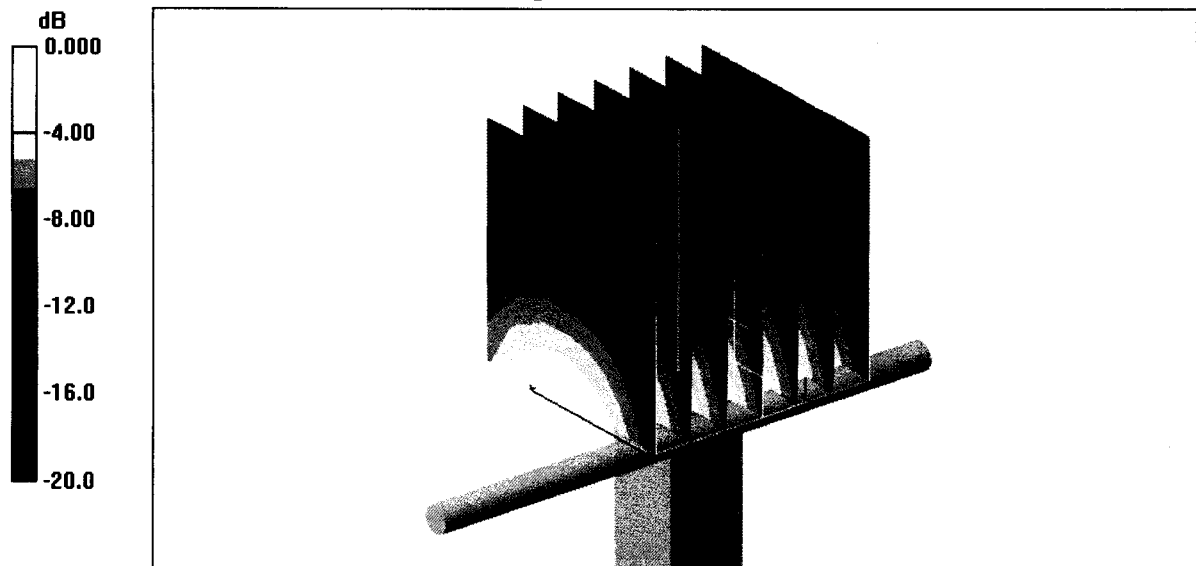
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

12 Dec 2006 11:17:34

[CH1] S11 1 U FS 1: 48.984  $\Omega$  2.6953  $\Omega$  225.77 pF 1 900.000 000 MHz

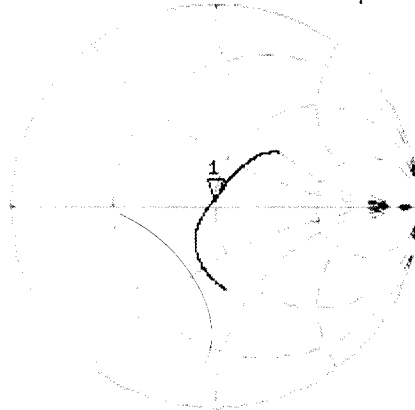
\*

Del

Cor

Avg  
16

↑

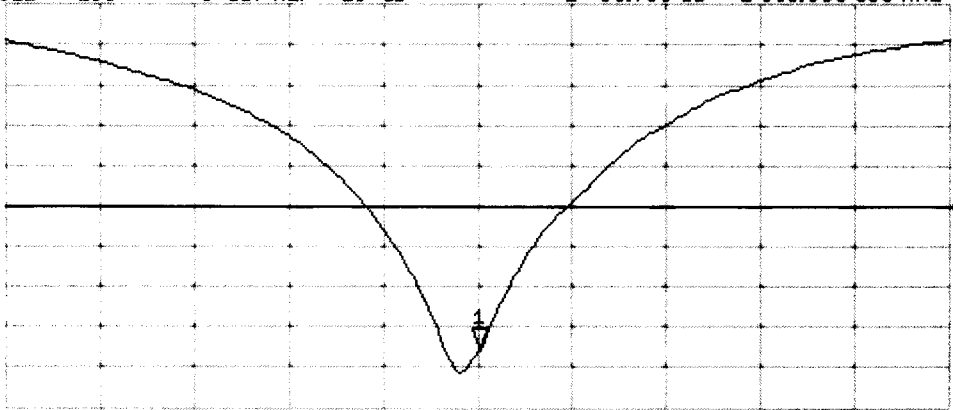


CH2 S11 LOG 3 dB/REF -20 dB 1:-30.733 dB 1 900.000 000 MHz

Cor

Avg  
16

↑



CENTER 1 900.000 000 MHz

SPAN 400.000 000 MHz



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Accreditation No.: **SCS 108**

Client **Ericsson UK**

Certificate No: **DAE3-449\_Dec06**

## CALIBRATION CERTIFICATE

Object **DAE3 - SD 000 D03 AA - SN: 449**

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

Calibration date: **December 7, 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 ( $22 \pm 3$ )°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	13-Oct-06 (Elcal AG, No: 5492)	Oct-07
Keithley Multimeter Type 2001	SN: 0810278	03-Oct-06 (Elcal AG, No: 5478)	Oct-07
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V1.1	SE UMS 006 AB 1002	15-Jun-06 (SPEAG, in house check)	In house check Jun-07

Calibrated by: **Name**  
**Eric Hainfeld**

**Function**  
**Technician**

**Signature**

Approved by: **Fin Bornholt**

**R&D Director**

Issued: December 7, 2006

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Accreditation No.: **SCS 108**

## 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	404.876 $\pm$ 0.1% (k=2)	404.953 $\pm$ 0.1% (k=2)	404.526 $\pm$ 0.1% (k=2)
Low Range	3.92993 $\pm$ 0.7% (k=2)	3.94909 $\pm$ 0.7% (k=2)	3.95026 $\pm$ 0.7% (k=2)

## Connector Angle

Connector Angle to be used in DASY system	233 $^{\circ}$ $\pm$ 1 $^{\circ}$
-------------------------------------------	-----------------------------------

## Appendix

### 1. DC Voltage Linearity

High Range		Input ( $\mu\text{V}$ )	Reading ( $\mu\text{V}$ )	Error (%)
Channel X	+ Input	200000	200000.4	0.00
Channel X	+ Input	20000	20005.80	0.03
Channel X	- Input	20000	-20004.71	0.02
Channel Y	+ Input	200000	200000.3	0.00
Channel Y	+ Input	20000	20006.70	0.03
Channel Y	- Input	20000	-20007.29	0.04
Channel Z	+ Input	200000	199999.6	0.00
Channel Z	+ Input	20000	20006.56	0.03
Channel Z	- Input	20000	-20004.53	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	200.30	0.15
Channel X	- Input	200	-200.64	0.32
Channel Y	+ Input	2000	1999.9	0.00
Channel Y	+ Input	200	199.35	-0.32
Channel Y	- Input	200	-200.98	0.49
Channel Z	+ Input	2000	2000	0.00
Channel Z	+ Input	200	199.06	-0.47
Channel Z	- Input	200	-201.32	0.66

### 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	4.70	4.07
	- 200	-3.36	-3.93
Channel Y	200	4.96	4.71
	- 200	-7.46	-6.50
Channel Z	200	0.56	0.15
	- 200	-1.90	-2.04

### 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	-	1.52	0.15
Channel Y	200	0.08	-	2.85
Channel Z	200	1.11	0.46	-

#### 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	16040	16629
Channel Y	15892	16768
Channel Z	16272	16701

#### 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	-1.01	-3.43	0.84	0.37
Channel Y	-1.41	-2.65	-0.22	0.34
Channel Z	-1.24	-1.89	-0.08	0.28

#### 6. Input Offset Current

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

#### 7. Input Resistance

	Zeroing (MOhm)	Measuring (MOhm)
Channel X	0.2001	200.2
Channel Y	0.2001	200.3
Channel Z	0.2000	201.9

#### 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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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. **ET3-1611\_Dec06**

## CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1611**

Calibration procedure(s) **QA CAL-01.v5  
Calibration procedure for dosimetric E-field probes**

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 ± 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	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41495277	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41498087	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-06 (METAS, No. 217-00592)	Aug-07
Reference 20 dB Attenuator	SN: S5086 (20b)	4-Apr-06 (METAS, No. 251-00558)	Apr-07
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-06 (METAS, No. 217-00593)	Aug-07
Reference Probe ES3DV2	SN: 3013	2-Jan-06 (SPEAG, No. ES3-3013_Jan06)	Jan-07
DAE4	SN: 654	21-Jun-06 (SPEAG, No. DAE4-654_Jun06)	Jun-07
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality 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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Accreditation No.: **SCS 108**

### Glossary:

TSL	tissue simulating liquid
NORM <sub>x,y,z</sub>	sensitivity in free space
ConvF	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
- 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

### 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:1611

Manufactured:	July 27, 2001
Last calibrated:	August 26, 2005
Recalibrated:	December 12, 2006

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

**DASY - Parameters of Probe: ET3DV6 SN:1611****Sensitivity in Free Space<sup>A</sup>**

NormX	1.67 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$
NormY	1.91 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.84 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$

**Diode Compression<sup>B</sup>**

DCP X	96 mV
DCP Y	97 mV
DCP Z	91 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	5.3	2.4
SAR <sub>be</sub> [%]	With Correction Algorithm	0.1	0.2

**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	12.3	8.4
SAR <sub>be</sub> [%]	With Correction Algorithm	0.7	0.2

**Sensor Offset**

Probe Tip to Sensor Center                      **2.7 mm**

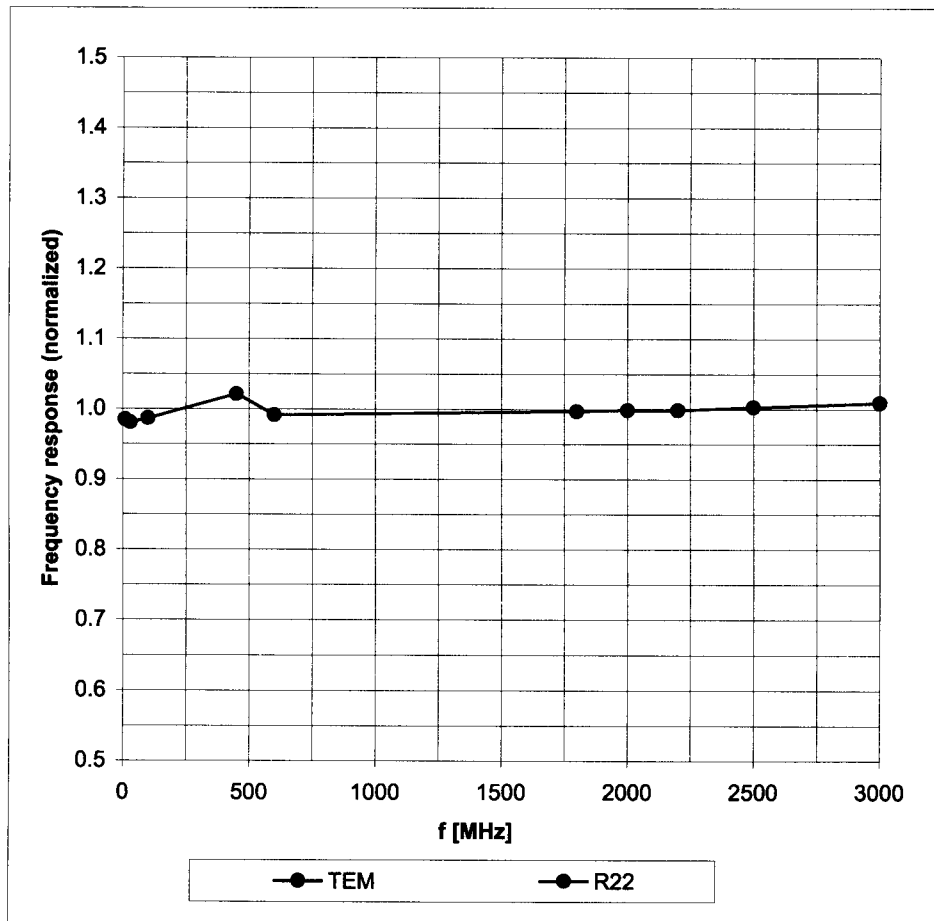
**The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.**

<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.

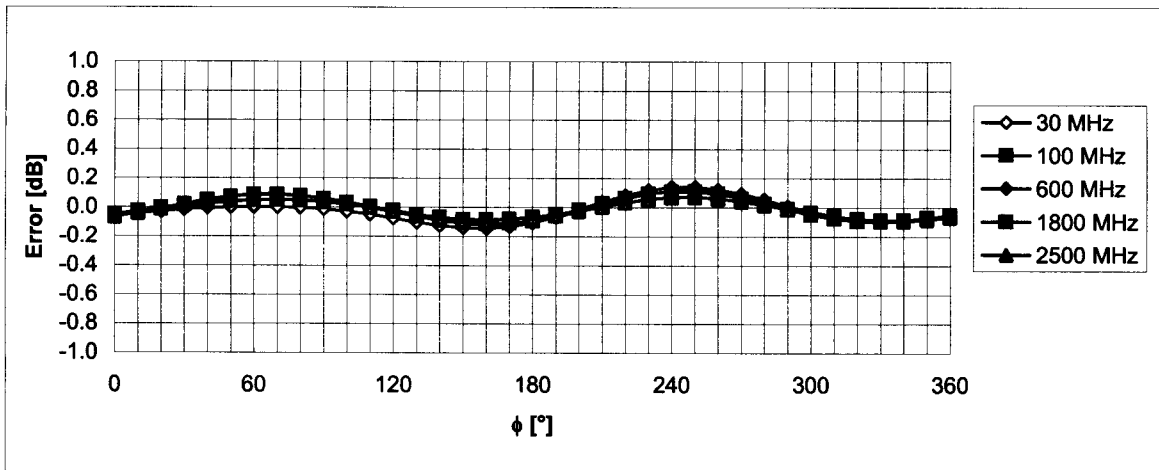
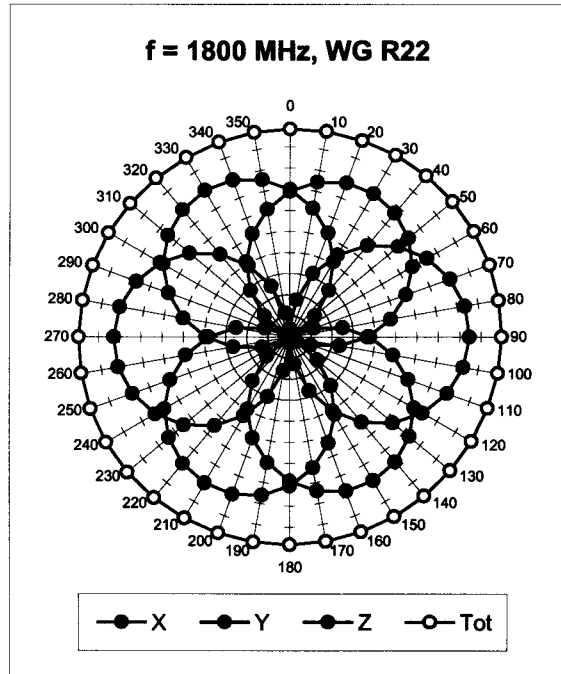
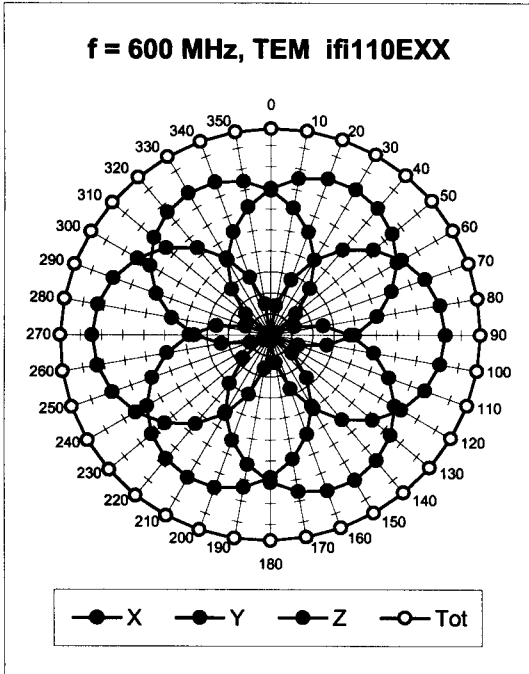
# Frequency Response of E-Field

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



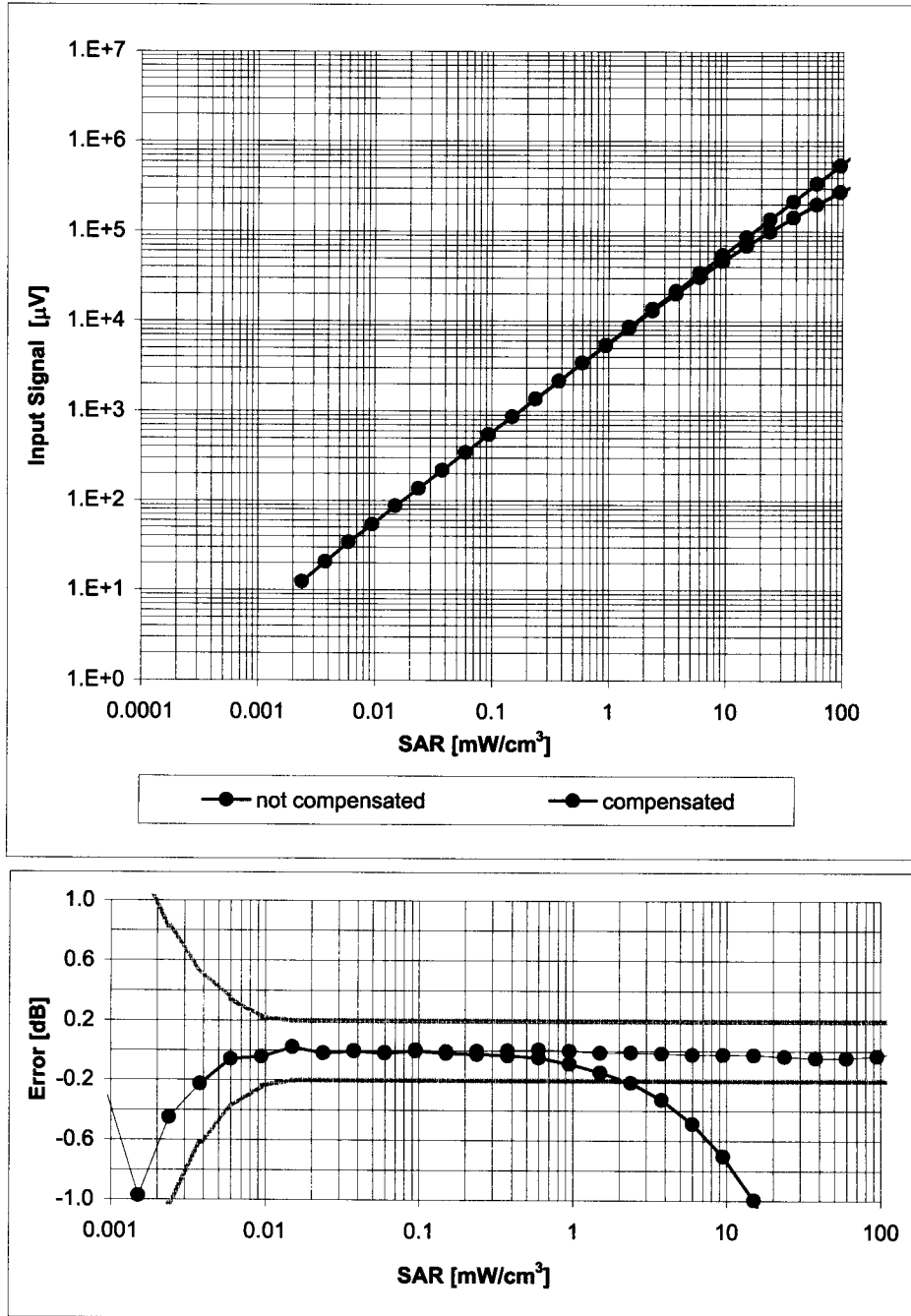
Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  (k=2)

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



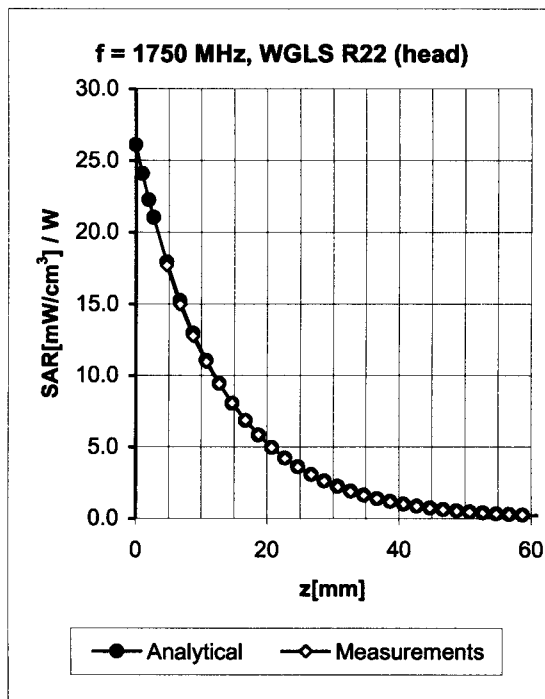
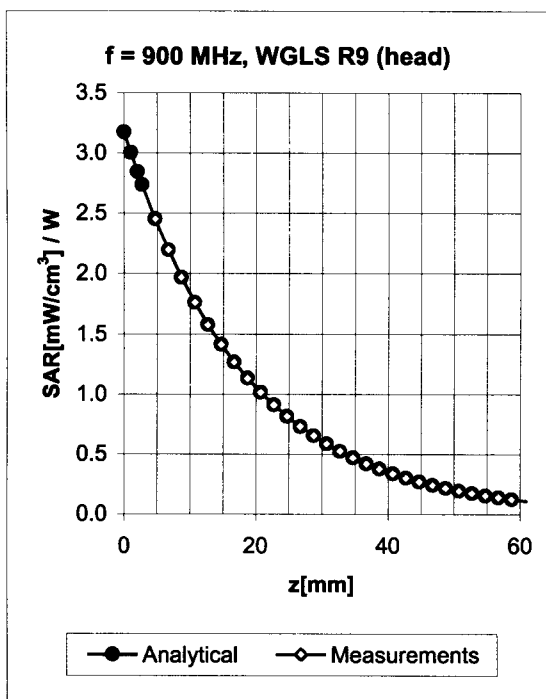
Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

### 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



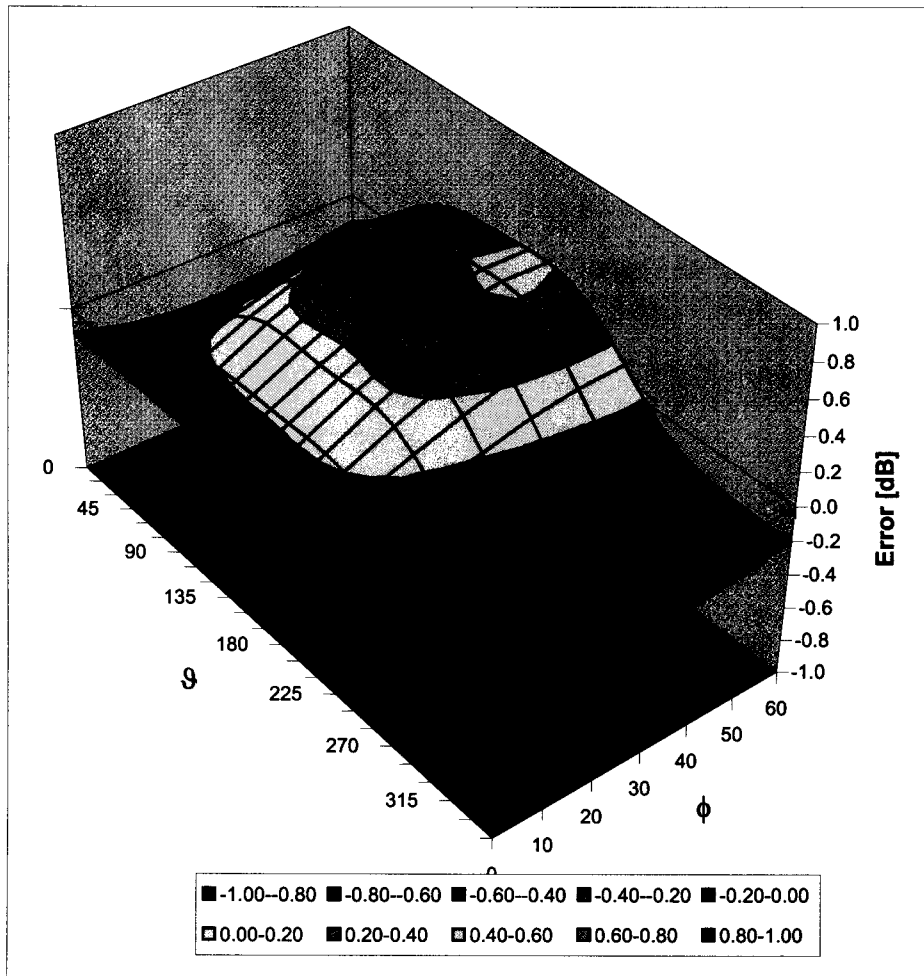
f [MHz]	Validity [MHz] <sup>c</sup>	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.34	2.38	6.66 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.34	2.45	6.55 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.48	2.62	5.38 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.49	2.78	5.14 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.70	1.86	4.61 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.30	2.89	6.73 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.32	2.89	6.48 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.62	2.73	4.79 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.64	2.68	4.61 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.63	2.11	4.32 ± 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:  $\pm 2.6\%$  ( $k=2$ )