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LD/SEMC/BGLIM Magnus Söderman

Approved

LD/SEMC/BGLIMC Peter Lindeborg

Checked

071015

Company Internal
REPORT

No.

BGLI07:541

Date

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Report issued by Accredited SAR Laboratory

for

PY7A1052061 (K858c)

Date of test: September 25th - October 9th , 2007

Laboratory: Sony Ericsson SAR Test Laboratory
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Statement of Compliance

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

Sony Ericsson Type AAC-1052061-BV; FCC ID PY7A1052061; IC 4170B-A1052061

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).



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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 PY7A1052061 (K858c) 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

Type	Internal antenna	
Location	At top of rear side	
Dimensions	Max length	29 mm
	Max width	41 mm
Configuration	Capacitive feed with parasitic element	

2.2 Device description

Device model	PY7A1052061					
Market name	K858c					
Serial numbers (EUT #)	CB510Q1AJM (#9100)					
Mode	GSM 850			GSM 1900		
Crest factor	8.3			8.3		
Multiple access scheme	TDMA			TDMA		
Maximum output power setting [dBm]	Ch. 128	Ch. 190	Ch. 251	Ch. 512	Ch. 661	Ch. 810
	32.1	32.1	32.1	30.0	30.0	30.0
Factory tolerance in power setting	±0.5 dB			±0.5 dB		
Maximum peak output power [dBm]	32.6	32.6	32.6	30.5	30.5	30.5
Mode	GSM 850 - GPRS 2Tx			GSM 1900 - GPRS 2Tx		
Crest factor	4.15			4.15		
Multiple access scheme	TDMA			TDMA		
Maximum output power setting [dBm]	Ch. 128	Ch. 190	Ch. 251	Ch. 512	Ch. 661	Ch. 810
	30.5	30.5	30.5	27.0	27.0	27.0
Factory tolerance in power setting	±0.5 dB			±0.5 dB		
Maximum peak output power [dBm]	31.0	31.0	31.0	27.5	27.5	27.5
Transmitting frequency range [MHz]	824.2 - 848.8			1850.2 - 1909.8		
GPRS Multislot class	10					
GPRS Capability class	B					
Prototype or production unit	Preproduction (HW:FP2.1)					
Device category	Portable					
RF exposure environment	General population / uncontrolled					

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3 Test equipment

3.1 Dosimetric system

SAR measurements were made using the DASY4 professional system (software version 4.7, Build 55) with SAM twin phantom, manufactured by Schmid & Partner Engineering AG (SPEAG). The list of calibrated equipment is given below.

Description	Serial Number	Due Date
DASY4 DAE3	419	2008-01
E-field probe ET3DV6	1569	2008-01
Dipole Validation Kit, D1900V2	5d002	2009-01
Dipole Validation Kit, D835V2	484	2009-01
Dipole Validation Kit, D835V2	4d039	2008-03

3.2 Additional equipment

Description	Inventory Number	Due Date
Signal generator R&S	INV 20007667	2008-03
Directional coupler	S/N 062	2008-03
Power meter R&S NRVD	INV 20007669	2008-03
Power sensor R&S NRV-Z5	INV 20007672	2008-03
Power sensor R&S NRV-Z5	INV 20007673	2008-03
Network analyzer HP8753C	INV 421671	2008-03
S-parameter test set HP85047A	INV 421670	2008-03
Dielectric probe kit HP8507D	INV 20000053	N/A
Base station simulator CMU	INV 20002149	2008-03
Thermometer Fluke 51	INV 2071	2008-03

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4 Electrical parameters on the tissue simulating liquid

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

f [MHz]	Tissue type	Measured / Recommended	Dielectric Parameters		Density
			ϵ_r	σ [S/m]	ρ [g/cm ³]
850	Head	Measured, 07-09-28	40.1	0.87	1.00
		Recommended	41.5	0.9	1.00
	Body	Measured, 07-10-09	54.5	0.98	1.00
		Recommended	55.2	0.97	1.00
1900	Head	Measured, 07-09-25	38.6	1.46	1.00
		Recommended	40	1.4	1.00
	Body	Measured, 07-09-27	52.1	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 21-22°C and humidity 30-50%. The obtained results are displayed in the table below.

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

f [MHz]	Tissue type	Measured / Reference	SAR [W/kg] 1g / 10g	Dielectric Parameters		Density	Liquid T [°C]
				ϵ_r	σ [S/m]	ρ [g/cm ³]	
850	Head	Measured, 07-09-28	9.52 / 6.24	40.1	0.87	1.00	21.6
		Reference	9.29 / 6.03	41.5	0.9	1.00	22.0
	Body	Measured, 07-10-09	9.40 / 6.20	54.5	0.98	1.00	22.0
		Reference	9.48 / 6.29	55.2	0.97	1.00	22.0
1900	Head	Measured, 07-09-25	39.4 / 20.6	38.6	1.46	1.00	22.0
		Reference	37.4 / 19.8	40	1.4	1.00	22.0
	Body	Measured, 07-09-27	38.8 / 20.6	52.1	1.59	1.00	21.7
		Reference	38.6 / 20.6	53.3	1.52	1.00	22.0

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6 SAR measurement uncertainty

SAR measurement uncertainty evaluation for Sony Ericsson PY7A1052061 (K858c) phone According to IEEE 1528

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

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7 Test results

The measured 1-gram averaged SAR values of the DUT towards the head are provided in Table 1. The ambient humidity and temperature of test facility were 30-50% and 21-22°C respectively. A base station simulator was used to control the device during the SAR measurement. The DUT was supplied with a fully charged battery for each measurement.

For head measurement, the DUT was tested on the right-hand side, and the left-hand side of the phantom in two phone positions, cheek (touch) and tilt (cheek + 15°). The DUT was tested at the lowest, middle and highest frequencies in the transmission band.

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]	
					Right-hand 1g mass	Left-hand 1g mass
GSM 850	128	32.4	Cheek	21.6	0.87	1.00
			Tilt	-	-	-
	190	32.5	Cheek	21.6	1.02	1.07
			Tilt	21.6	0.66	0.64
	251	32.5	Cheek	21.6	1.10	1.14
			Tilt	-	-	-
GSM 1900	512	30.3	Cheek	22.0	1.17	0.81
			Tilt	22.0	1.12	0.96
	661	30.4	Cheek	22.0	1.07	0.81
			Tilt	22.0	1.05	0.92
	810	30.4	Cheek	22.0	0.90	0.65
			Tilt	22.0	0.88	0.81

Table 1: SAR measurement result for Sony Ericsson PY7A1052061 telephone at highest possible output power. Measured towards the head.



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Band	Channel	Power [dBm]	Position / Mode	Liquid T [°C]	Measured SAR 1g mass [W/kg]
GSM 850	512	30.9	Back GPRS	22.0	1.27
			Front GPRS	22.0	0.71
		27.1	Back EDGE	22.0	0.55
		32.4	Back Bluetooth	22.0	0.91
			Back PHF	22.0	0.53
	661	30.9	Back GPRS	22.0	1.19
			Back Bluetooth	22.0	0.92
	810	30.9	Back GPRS	22.0	1.02
			Back Bluetooth	22.0	0.85
	GSM 1900	512	27.4	Back GPRS	21.7
Back EDGE				21.7	0.80
30.3			Back Bluetooth	21.7	1.18
			Back PHF	21.7	1.12
			Front PHF	21.7	0.23
661		27.4	Back GPRS	21.7	1.07
			Back Bluetooth	21.7	1.19
810		27.4	Back GPRS	21.7	1.02
			Back Bluetooth	21.7	1.04

Table 2: SAR measurement result for Sony Ericsson PY7A1052061 telephone at highest possible output power. Measured towards the body.

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

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9 Appendix

9.1 Photographs of the device under test



Front side with battery



Rear side



Right side with buttons



Left side



Top with power button



System connector

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9.2 Device position at SAM Twin Phantom



DUT position towards the head: Cheek (touch) position



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



DUT in body position with 15 mm distance

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9.3 Attachments

- Measurement plots and system validation
- Dipole calibration

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Perf1900H.da4](#)

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

Program Name: Performance Check

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

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(5.33, 5.33, 5.33); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2007-03-08
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

System Performance Check/Area Scan (41x41x1): Measurement grid: dx=15mm, dy=15mm

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

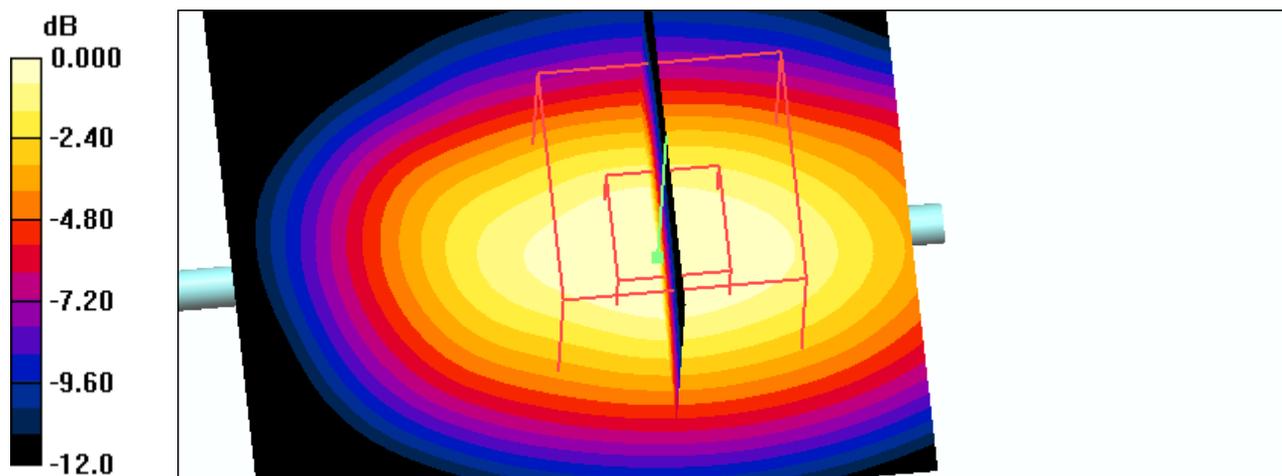
System Performance Check/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 77.1 V/m; Power Drift = 0.083 dB

Peak SAR (extrapolated) = 17.1 W/kg

SAR(1 g) = 9.85 mW/g; SAR(10 g) = 5.15 mW/g

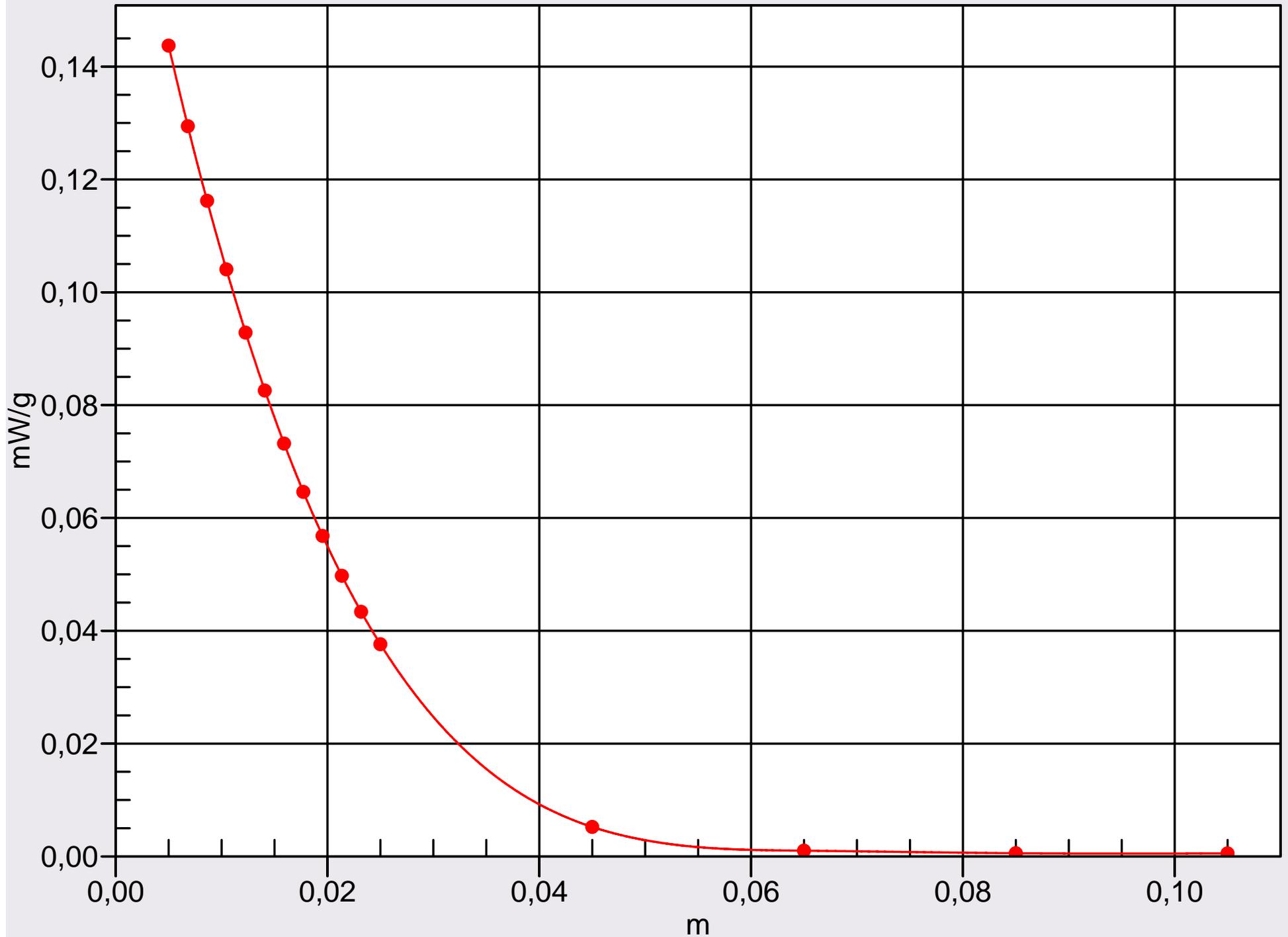
Maximum value of SAR (measured) = 11.0 mW/g



0 dB = 11.0mW/g

Interpolated SAR(x,y,z,f0)

HSL1900; Z Scan: Value Along Z, X=0, Y=0



Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Left1900.da4](#)

DUT: AAD-3252011-BV (Lin); Type: Quad Band; Serial: CB510Q1AJM
Program Name: Left Hand Side

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 38.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(5.33, 5.33, 5.33); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2007-03-08
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position Mid/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
 Maximum value of SAR (interpolated) = 0.881 mW/g

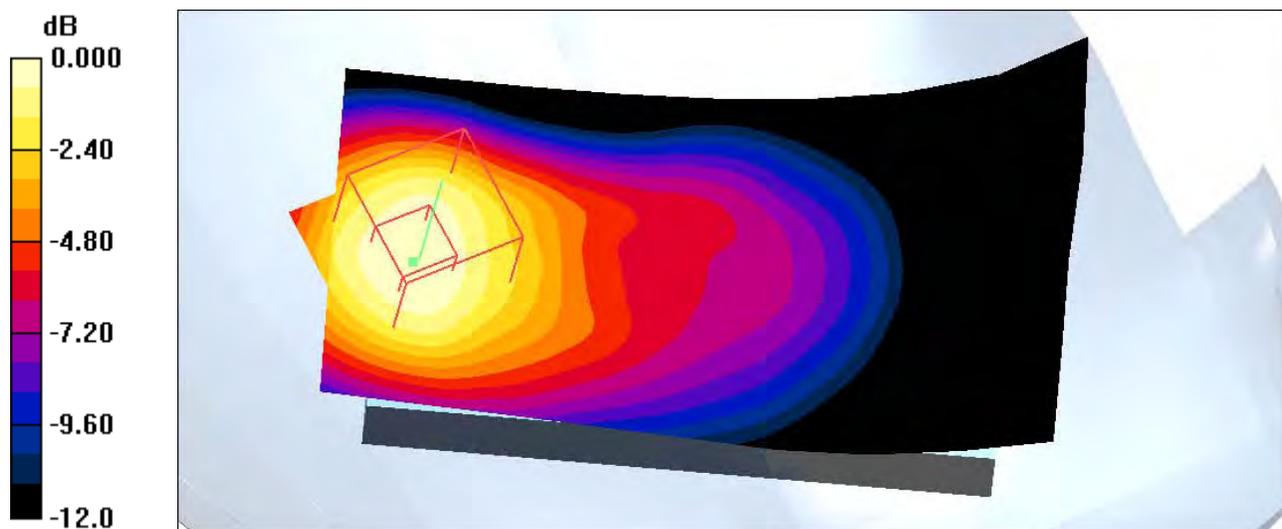
Cheek position Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.1 V/m; Power Drift = -0.077 dB

Peak SAR (extrapolated) = 1.32 W/kg

SAR(1 g) = 0.814 mW/g; SAR(10 g) = 0.470 mW/g

Maximum value of SAR (measured) = 0.895 mW/g



Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Left1900.da4](#)

DUT: AAD-3252011-BV (Lin); Type: Quad Band; Serial: CB510Q1AJM
Program Name: Left Hand Side

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.8$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(5.33, 5.33, 5.33); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2007-03-08
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

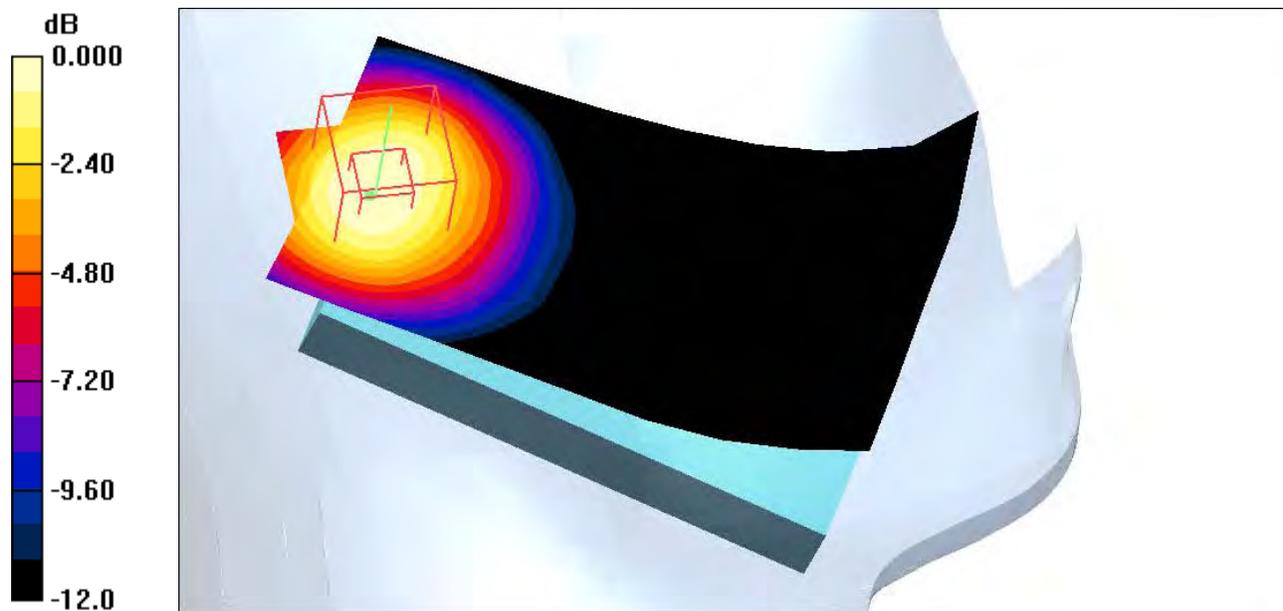
Tilt position Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.2 V/m; Power Drift = -0.046 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 0.956 mW/g; SAR(10 g) = 0.546 mW/g

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



0 dB = 1.05mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Right1900.da4](#)

DUT: AAD-3252011-BV (Lin); Type: Quad Band; Serial: CB510Q1AJM

Program Name: Right Hand Side

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.8$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(5.33, 5.33, 5.33); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2007-03-08
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position Low/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

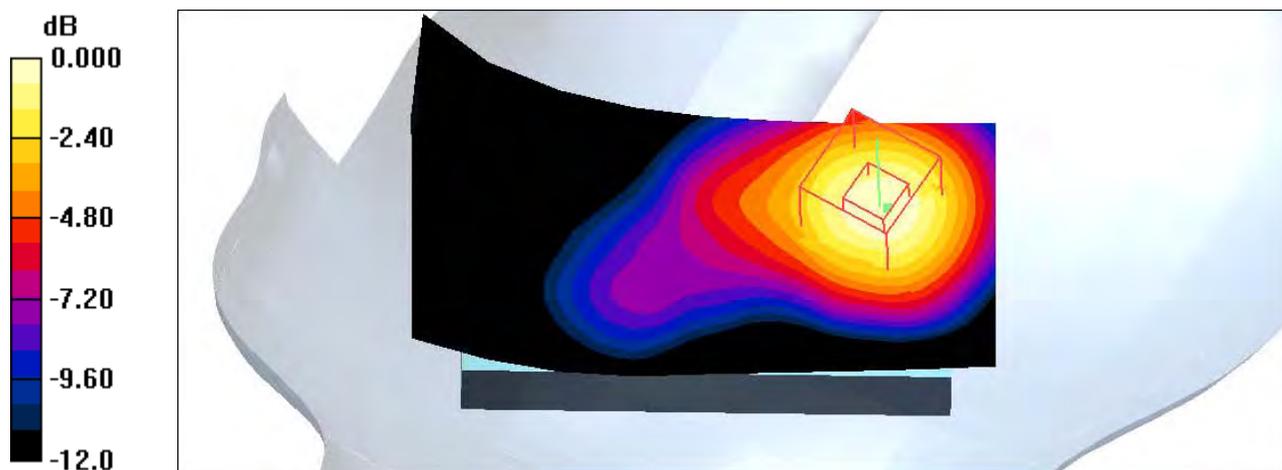
Cheek position Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.2 V/m; Power Drift = -0.117 dB

Peak SAR (extrapolated) = 2.14 W/kg

SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.630 mW/g

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



0 dB = 1.31mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Right1900.da4](#)

DUT: AAD-3252011-BV (Lin); Type: Quad Band; Serial: CB510Q1AJM
Program Name: Right Hand Side

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.8$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(5.33, 5.33, 5.33); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2007-03-08
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

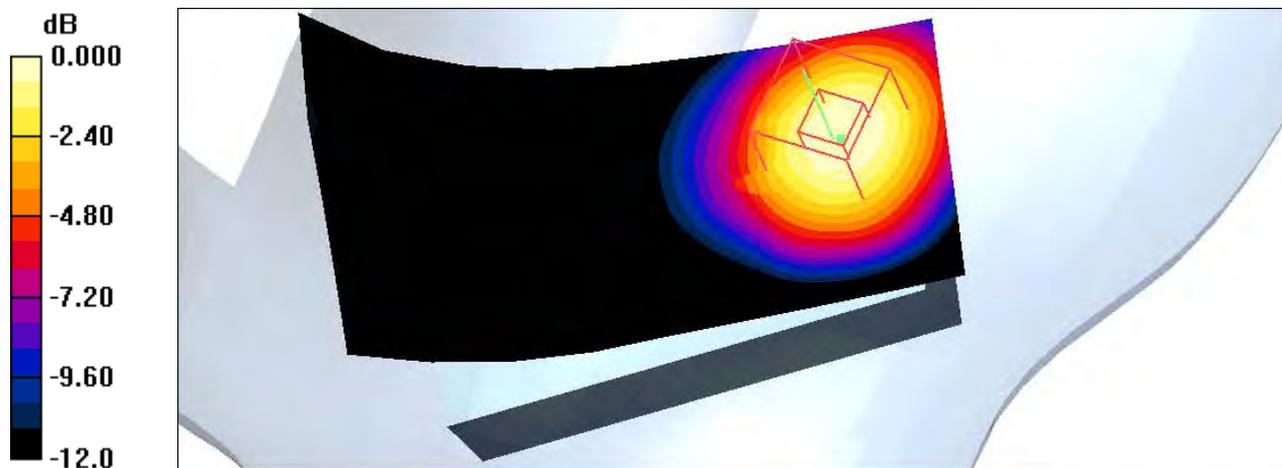
Tilt position Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.1 V/m; Power Drift = -0.056 dB

Peak SAR (extrapolated) = 1.99 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.608 mW/g

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



0 dB = 1.23mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Perf1900B.da4](#)

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

Program Name: Unnamed Program

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

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 52.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(4.79, 4.79, 4.79); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2007-03-08
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Performance Check/Area Scan (41x41x1): Measurement grid: dx=15mm, dy=15mm

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

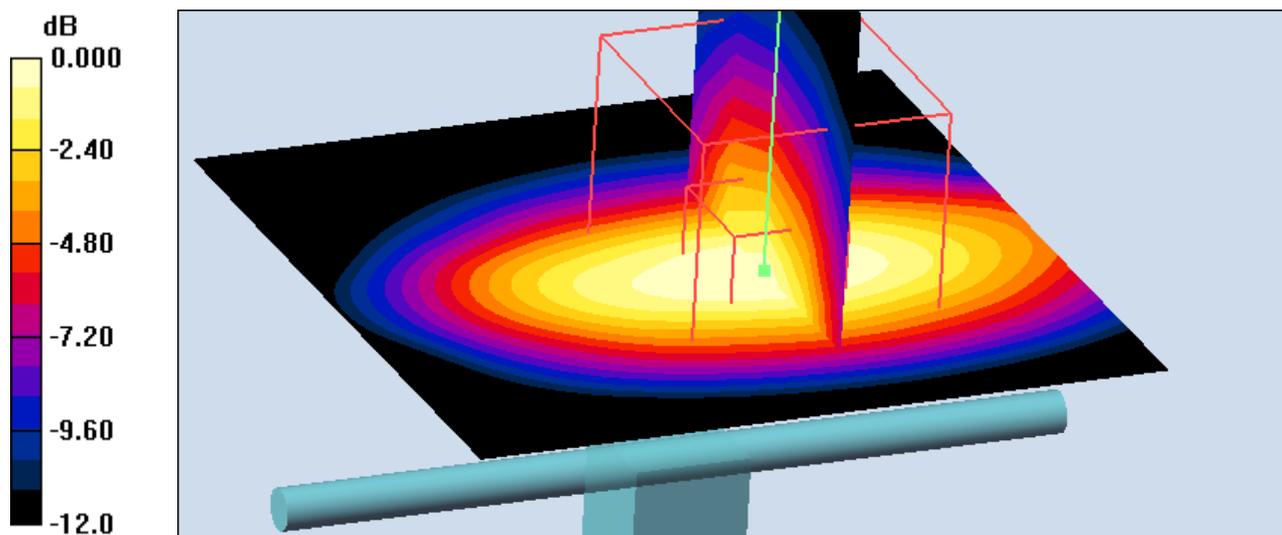
Performance Check/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 84.1 V/m; Power Drift = 0.044 dB

Peak SAR (extrapolated) = 16.3 W/kg

SAR(1 g) = 9.7 mW/g; SAR(10 g) = 5.15 mW/g

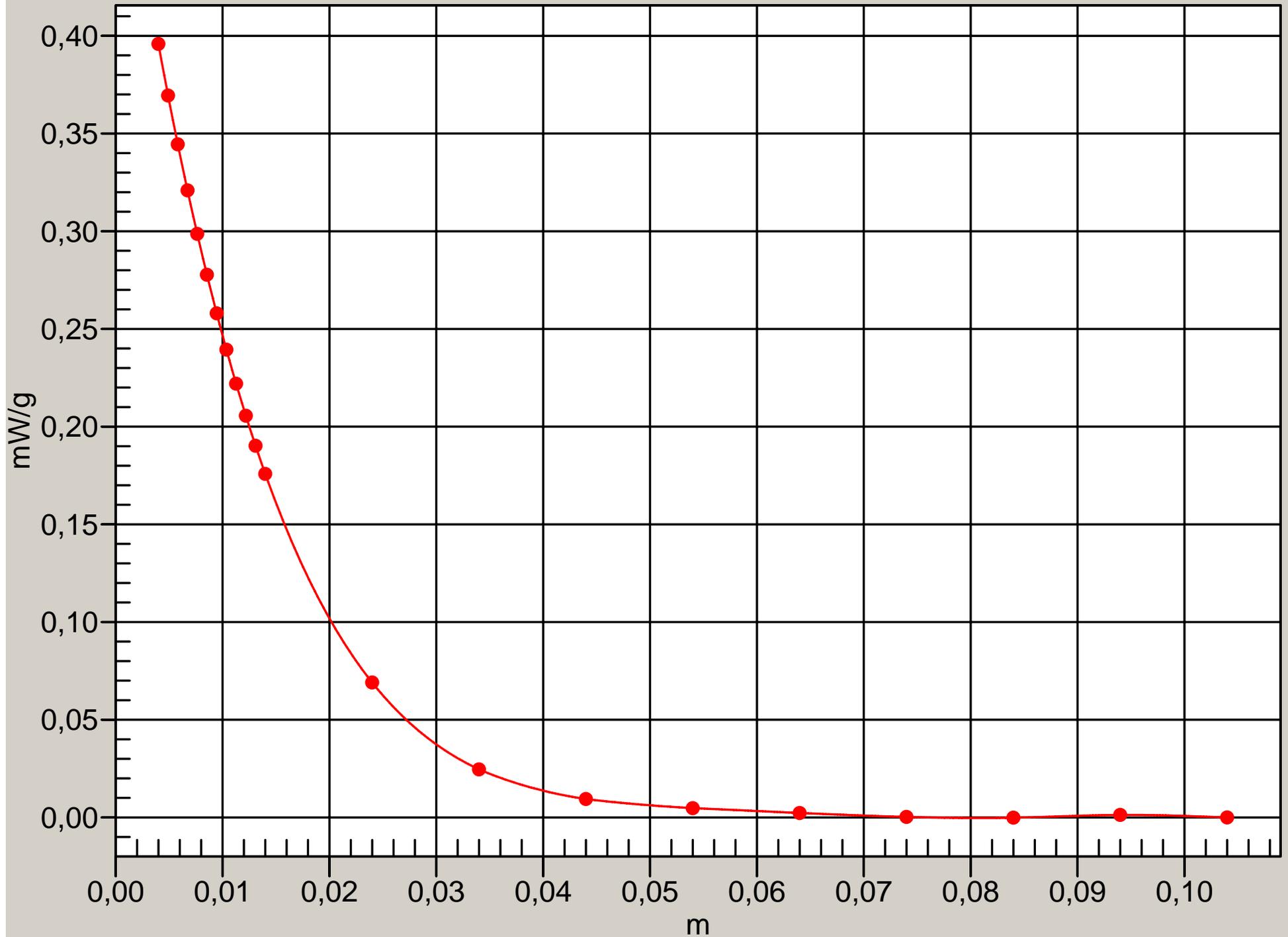
Maximum value of SAR (measured) = 11.0 mW/g



0 dB = 11.0mW/g

Interpolated SAR(x,y,z,f0)

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



Date/Time: 2007-09-27 15:14:49

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Body1900_Data.da4](#)**DUT: AAC-1052061-BV (Lin); Type: Four GSM-bands; Serial: CB510Q1AJM****Program Name: Body d=15mm**

Communication System: GSM1900_GPRS; Frequency: 1850.2 MHz; Duty Cycle: 1:4.15

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(4.79, 4.79, 4.79); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

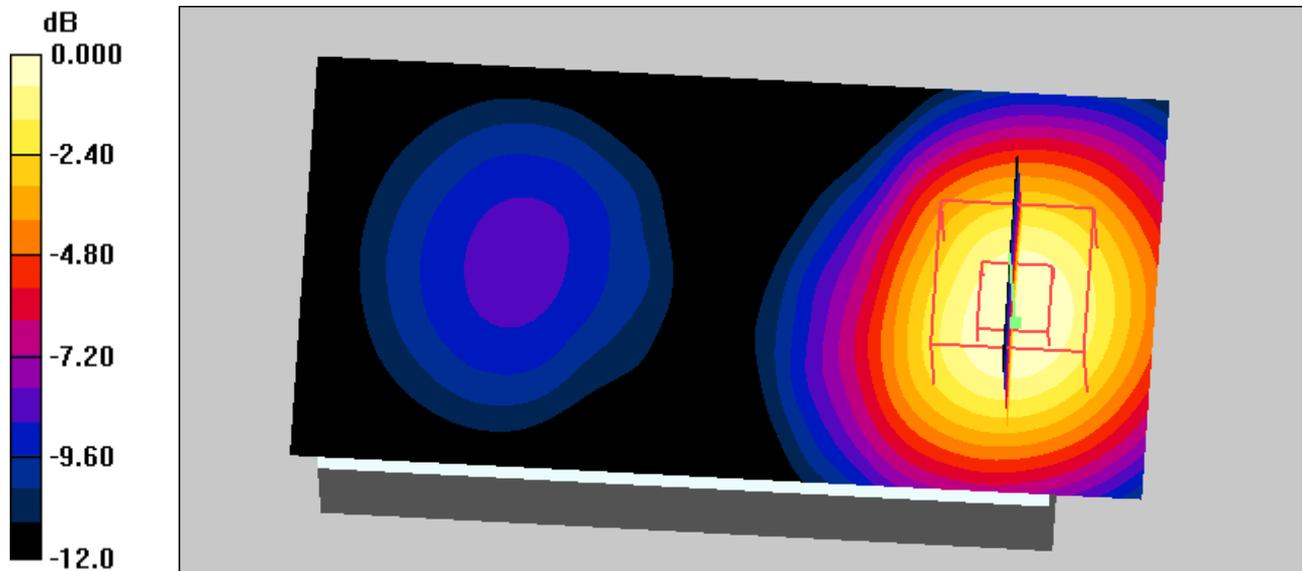
GPRS Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.5 V/m; Power Drift = -0.066 dB

Peak SAR (extrapolated) = 1.80 W/kg

SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.678 mW/g

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



0 dB = 1.30mW/g

Date/Time: 2007-09-27 15:51:27

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Body1900_Data.da4](#)**DUT: AAC-1052061-BV (Lin); Type: Four GSM-bands; Serial: CB510Q1AJM****Program Name: Body d=15mm**

Communication System: GSM1900_GPRS; Frequency: 1850.2 MHz; Duty Cycle: 1:4.15

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(4.79, 4.79, 4.79); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.916 mW/g

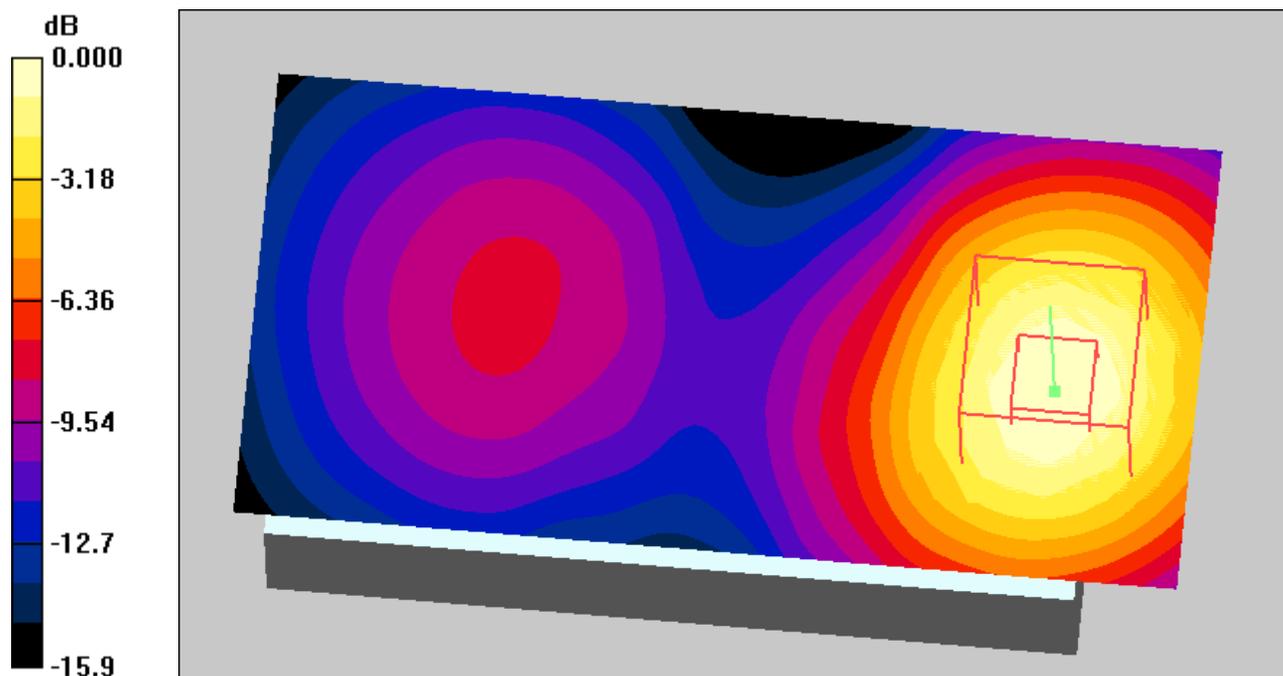
EDGE Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.9 V/m; Power Drift = -0.145 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.800 mW/g; SAR(10 g) = 0.467 mW/g

Maximum value of SAR (measured) = 0.889 mW/g



0 dB = 0.889mW/g

Date/Time: 2007-09-27 16:24:47

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Body1900_Speech.da4](#)

DUT: AAC-1052061-BV (Lin); Type: Four GSM-bands; Serial: CB510Q1AJM
Program Name: Body d=15mm

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(4.79, 4.79, 4.79); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

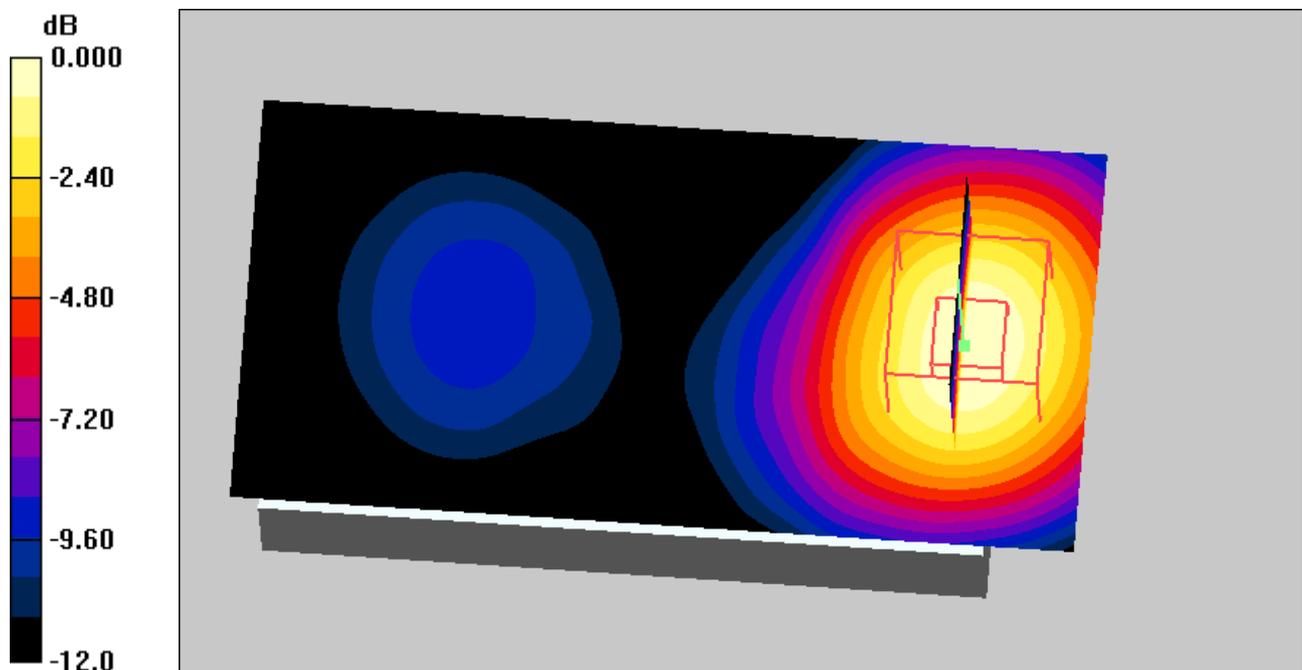
BT Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.8 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 1.91 W/kg

SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.682 mW/g

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



0 dB = 1.32mW/g

Date/Time: 2007-09-27 17:14:39

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Body1900_Speech.da4](#)**DUT: AAC-1052061-BV (Lin); Type: Four GSM-bands; Serial: CB510Q1AJM****Program Name: Body d=15mm**

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(4.79, 4.79, 4.79); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

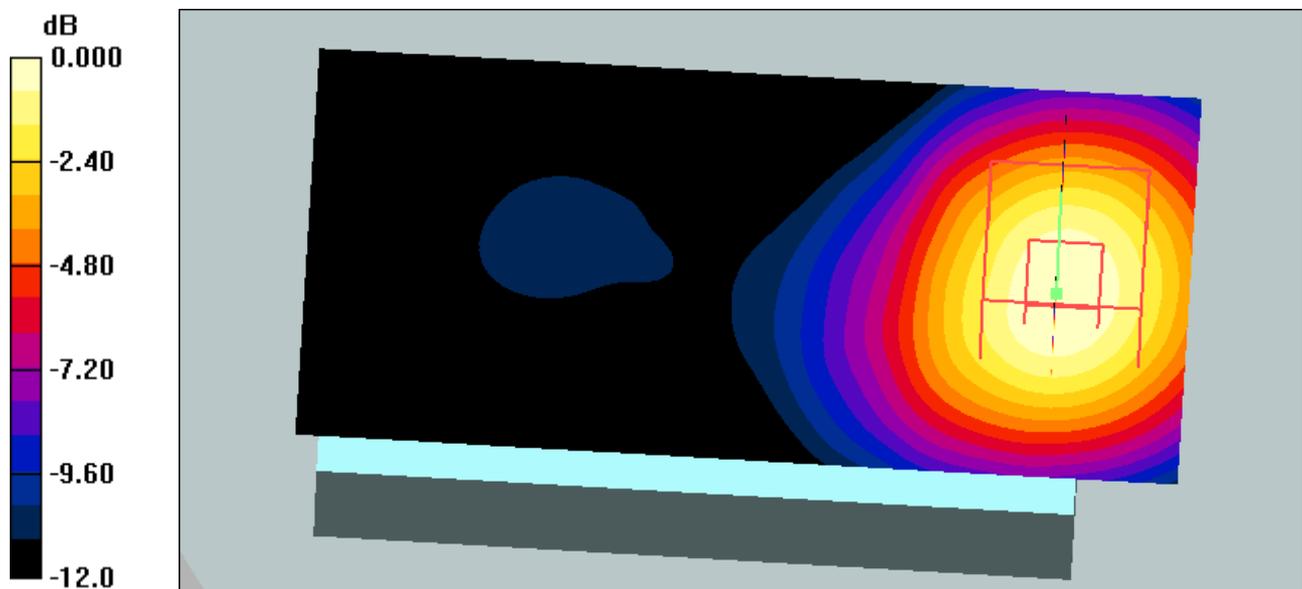
PHF low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 29.2 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 1.73 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.647 mW/g

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



0 dB = 1.23mW/g

Date/Time: 2007-09-27 17:29:35

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Body1900_Speech.da4](#)**DUT: AAC-1052061-BV (Lin); Type: Four GSM-bands; Serial: CB510Q1AJM****Program Name: Body d=15mm**

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

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(4.79, 4.79, 4.79); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

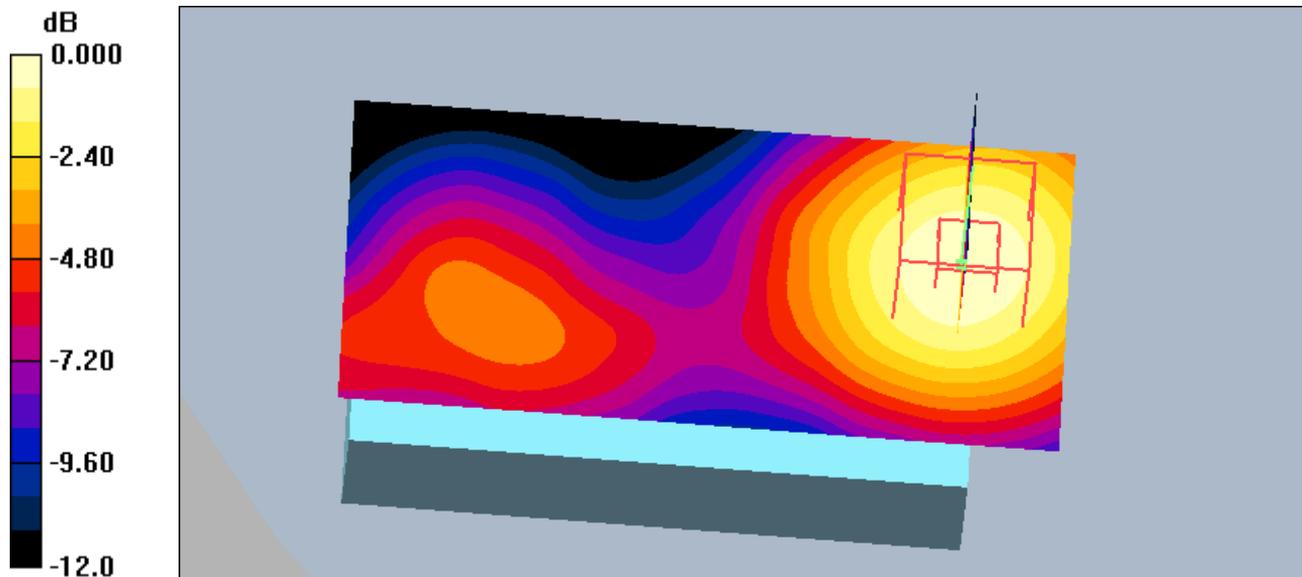
PHF low Frontside/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.2 V/m; Power Drift = -0.034 dB

Peak SAR (extrapolated) = 0.357 W/kg

SAR(1 g) = 0.231 mW/g; SAR(10 g) = 0.143 mW/g

Maximum value of SAR (measured) = 0.251 mW/g



0 dB = 0.251mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Perf835H.da4](#)

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d039

Program Name: Check 835

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

Medium parameters used (interpolated): $f = 835$ MHz; $\sigma = 0.867$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.89, 6.89, 6.89); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2007-03-08
- Phantom: SAM 1; Type: Twin SAM; Serial: TP-1144
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Performance Check/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.52 mW/g

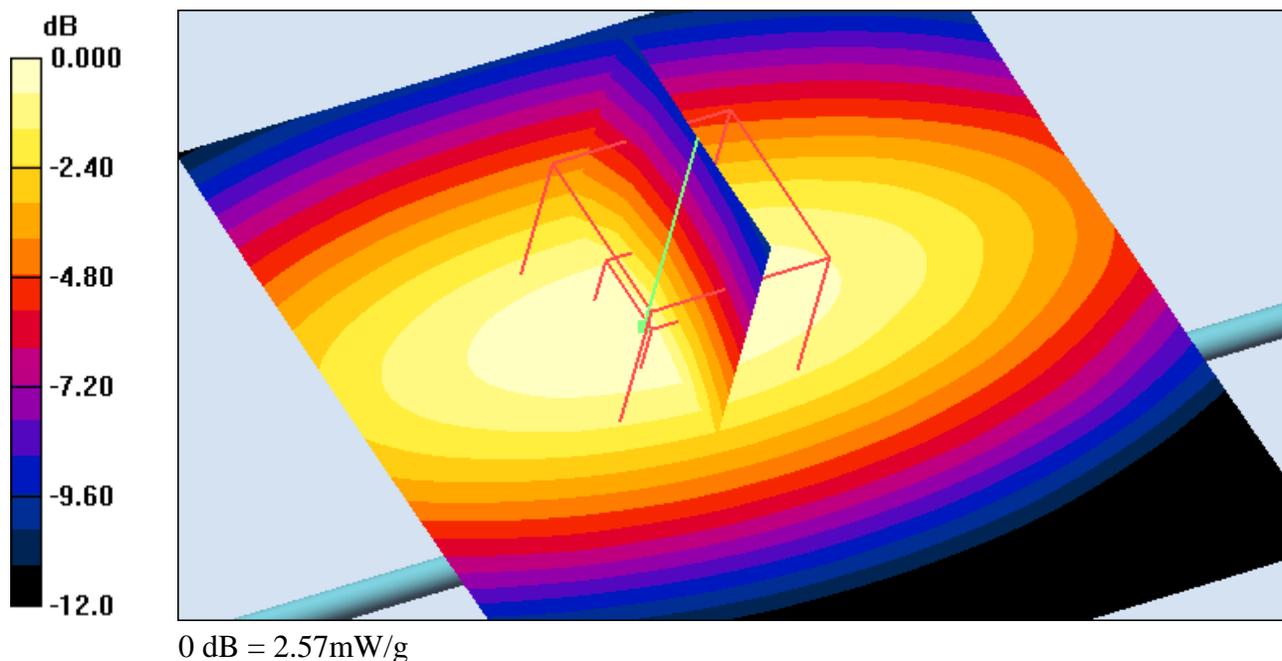
Performance Check/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 51.1 V/m; Power Drift = 0.001 dB

Peak SAR (extrapolated) = 3.52 W/kg

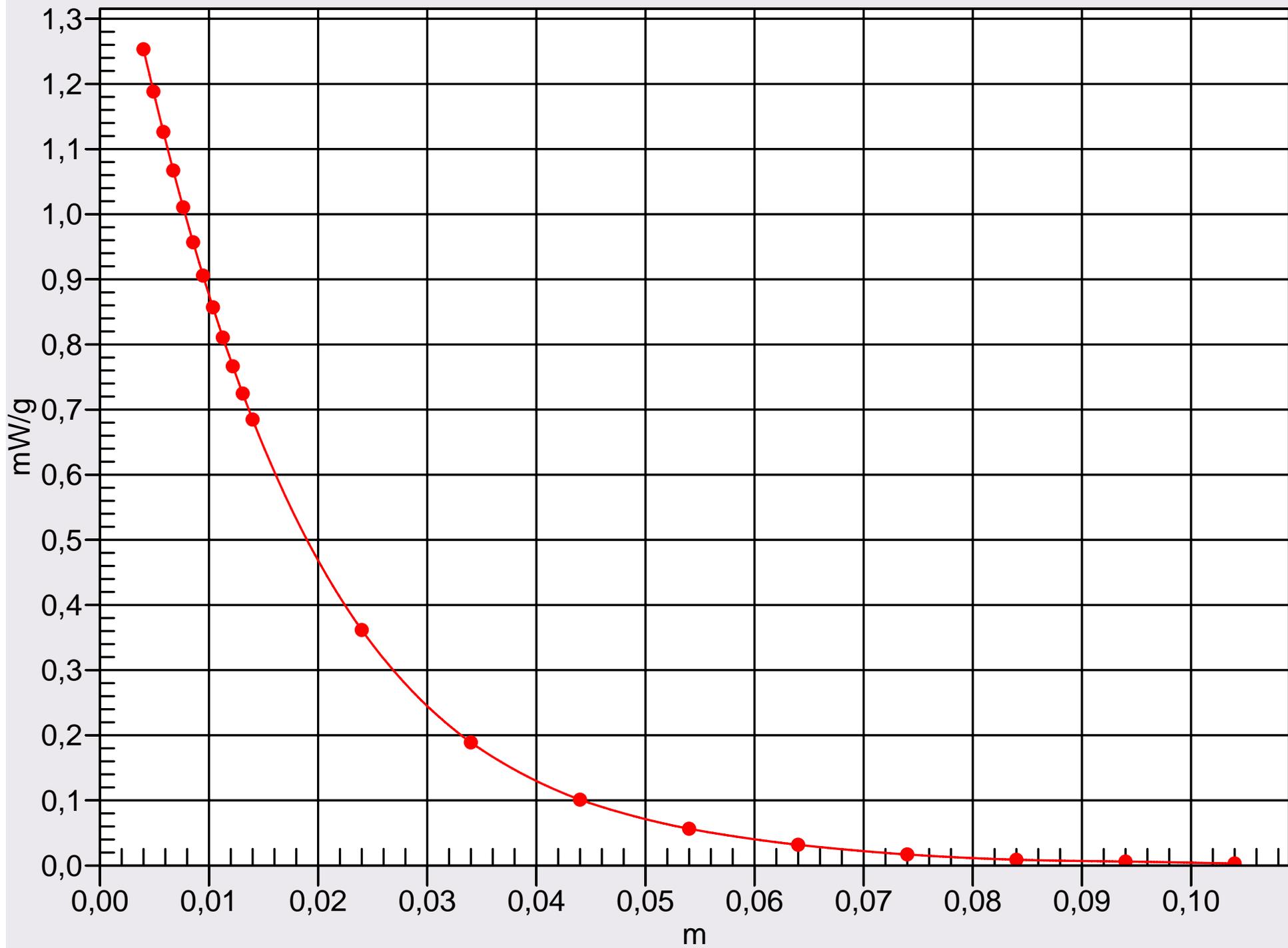
SAR(1 g) = 2.38 mW/g; SAR(10 g) = 1.56 mW/g

Maximum value of SAR (measured) = 2.57 mW/g



Interpolated SAR(x,y,z,f0)

HSL835; Z Scan: Value Along Z, X=0, Y=0



Date/Time: 2007-09-28 15:07:17

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Left835.da4](#)**DUT: AAC-1052061-BV (Lin); Type: Four GSM-bands; Serial: CB510Q1AJM****Program Name: Left Hand Side**

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

Medium parameters used (interpolated): $f = 848.8$ MHz; $\sigma = 0.879$ mho/m; $\epsilon_r = 39.9$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.89, 6.89, 6.89); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 1; Type: Twin SAM; Serial: TP-1144

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Touch position - High/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

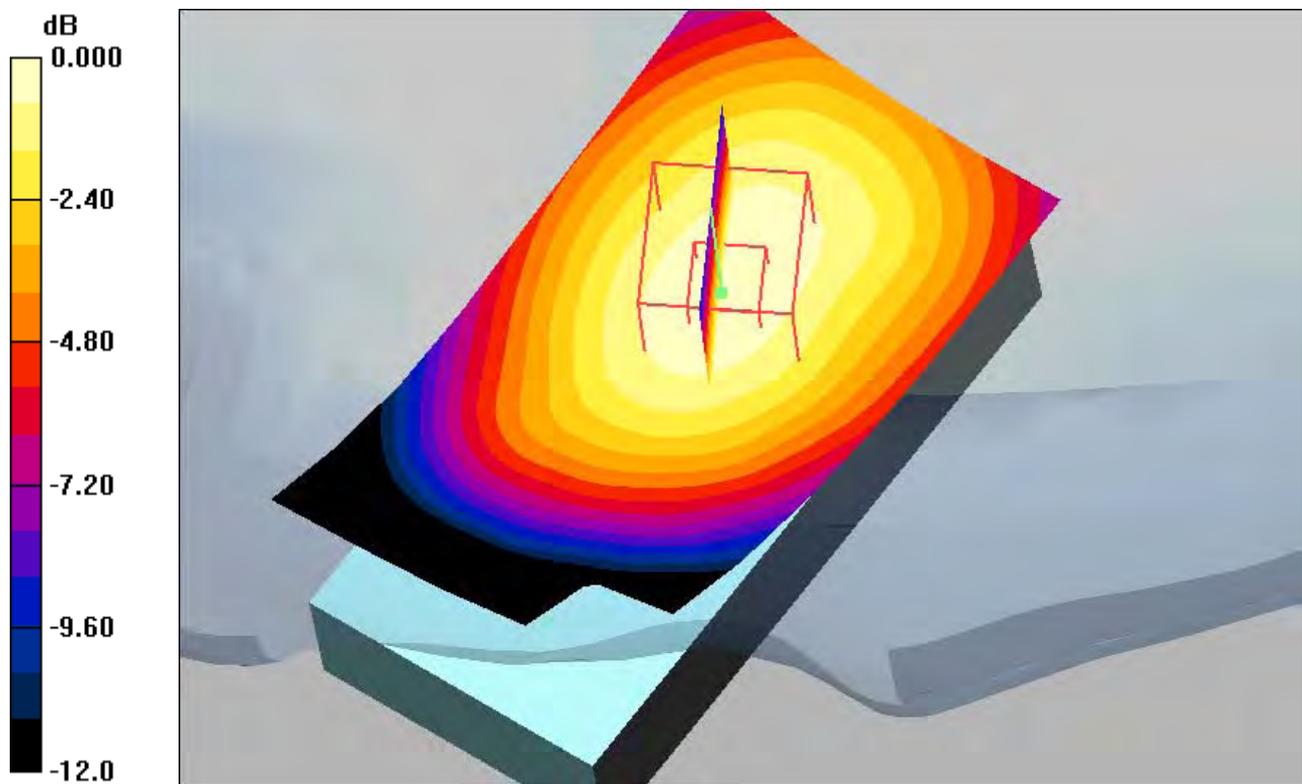
Touch position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 33.9 V/m; Power Drift = -0.051 dB

Peak SAR (extrapolated) = 1.58 W/kg

SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.778 mW/g

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



0 dB = 1.20mW/g

Date/Time: 2007-09-28 13:04:29

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Left835.da4](#)**DUT: AAC-1052061-BV (Lin); Type: Four GSM-bands; Serial: CB510Q1AJM****Program Name: Left Hand Side**

Communication System: GSM835MHz; Frequency: 836.4 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.868$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.89, 6.89, 6.89); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 1; Type: Twin SAM; Serial: TP-1144

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Tilt position - Mid/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

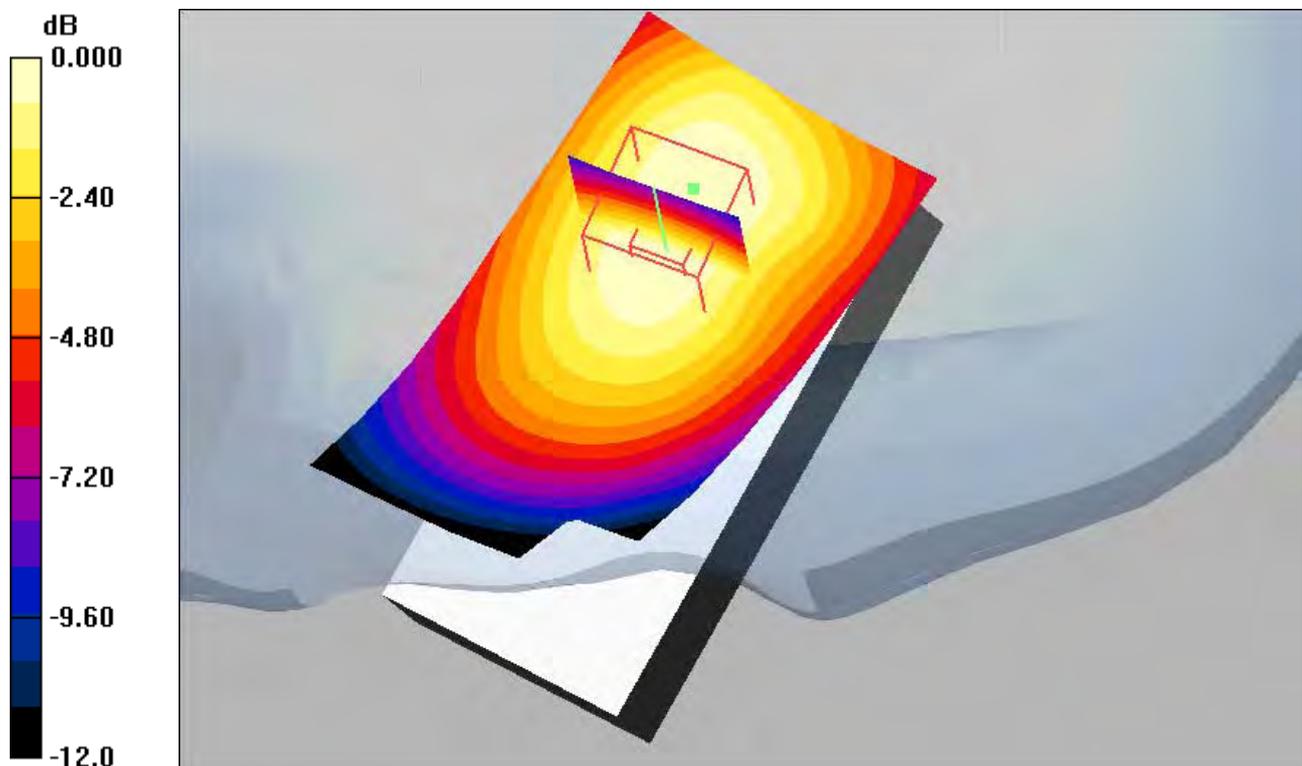
Tilt position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.2 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 1.11 W/kg

SAR(1 g) = 0.636 mW/g; SAR(10 g) = 0.442 mW/g

Maximum value of SAR (measured) = 0.677 mW/g



0 dB = 0.677mW/g

Date/Time: 2007-09-28 14:45:21

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Right835.da4](#)

DUT: AAC-1052061-BV (Lin); Type: Four GSM-bands; Serial: CB510Q1AJM
Program Name: Right Hand Side

Communication System: GSM835MHz; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.861$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.89, 6.89, 6.89); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 1; Type: Twin SAM; Serial: TP-1144

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Touch position - Low/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

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

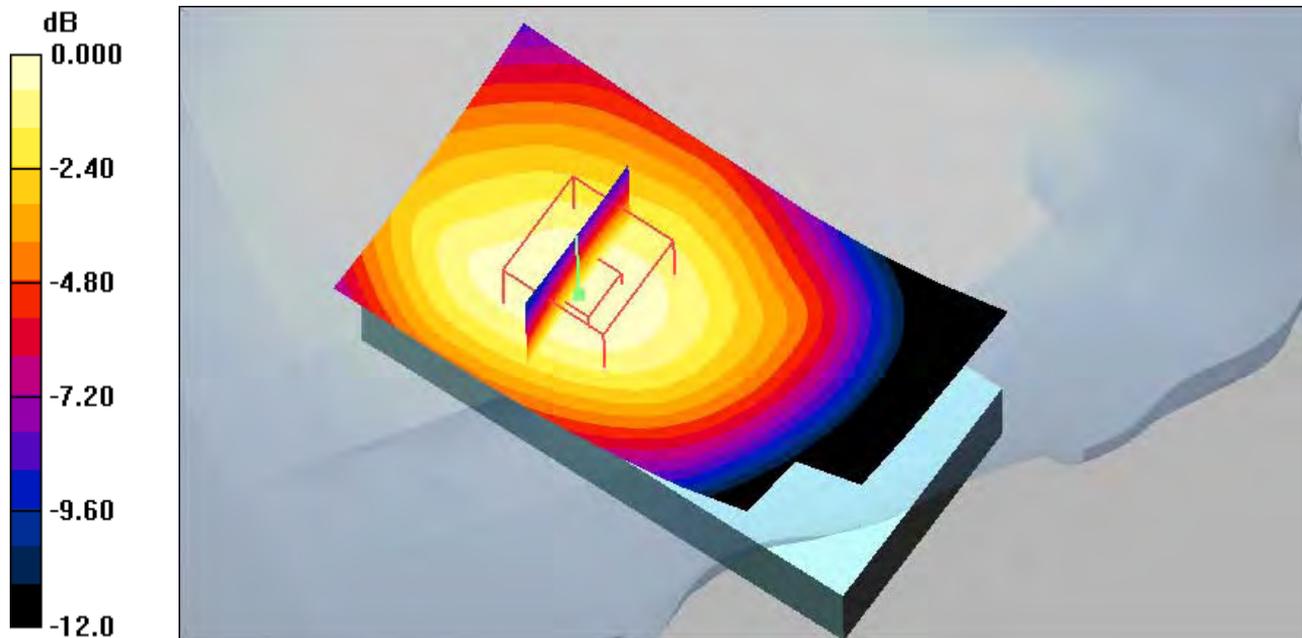
Touch position - Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 28.3 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.869 mW/g; SAR(10 g) = 0.587 mW/g

Maximum value of SAR (measured) = 0.929 mW/g



0 dB = 0.929mW/g

Date/Time: 2007-09-28 14:02:25

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Right835.da4](#)

DUT: AAC-1052061-BV (Lin); Type: Four GSM-bands; Serial: CB510Q1AJM
Program Name: Right Hand Side

Communication System: GSM835MHz; Frequency: 836.4 MHz; Duty Cycle: 1:8.3

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.868$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.89, 6.89, 6.89); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 1; Type: Twin SAM; Serial: TP-1144

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Tilt position - Mid/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.700 mW/g

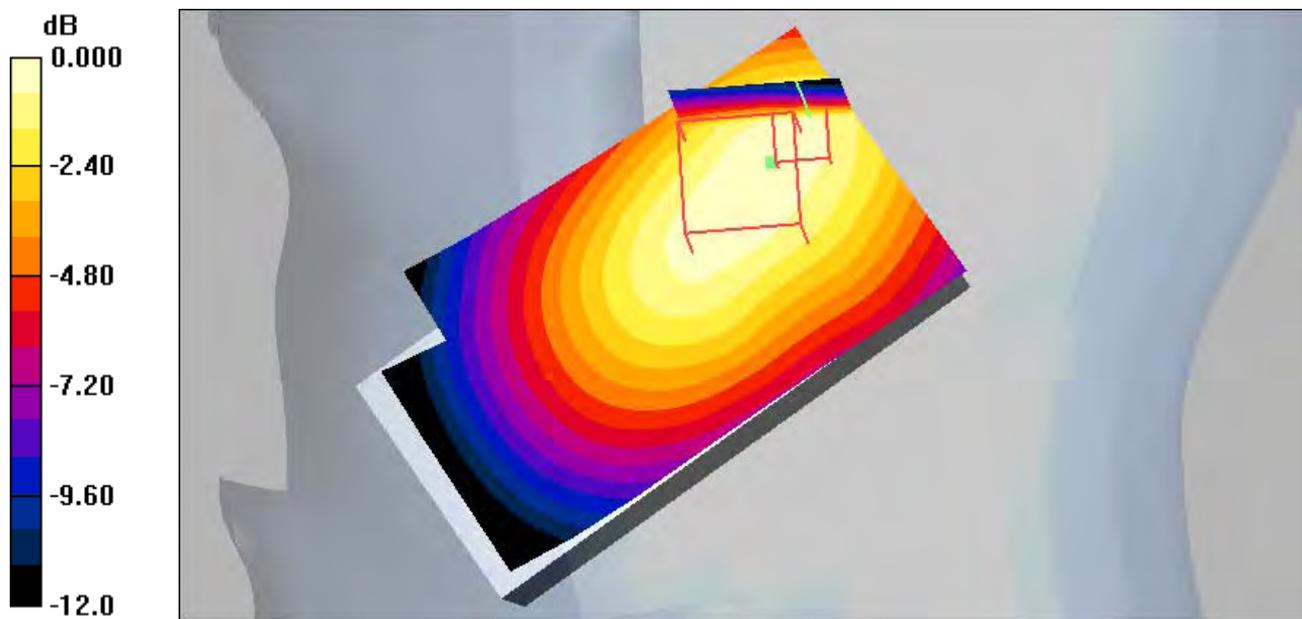
Tilt position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.4 V/m; Power Drift = -0.039 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.657 mW/g; SAR(10 g) = 0.416 mW/g

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



0 dB = 0.694mW/g

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Perf835B.da4](#)

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

Program Name: System Performance Check at 835 MHz

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

Medium parameters used: $f = 835$ MHz; $\sigma = 0.967$ mho/m; $\epsilon_r = 54.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.94, 6.94, 6.94); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn419; Calibrated: 2007-03-08
- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

d=15mm, Pin=250 mW/Area Scan (41x61x1): Measurement grid: dx=15mm, dy=15mm

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

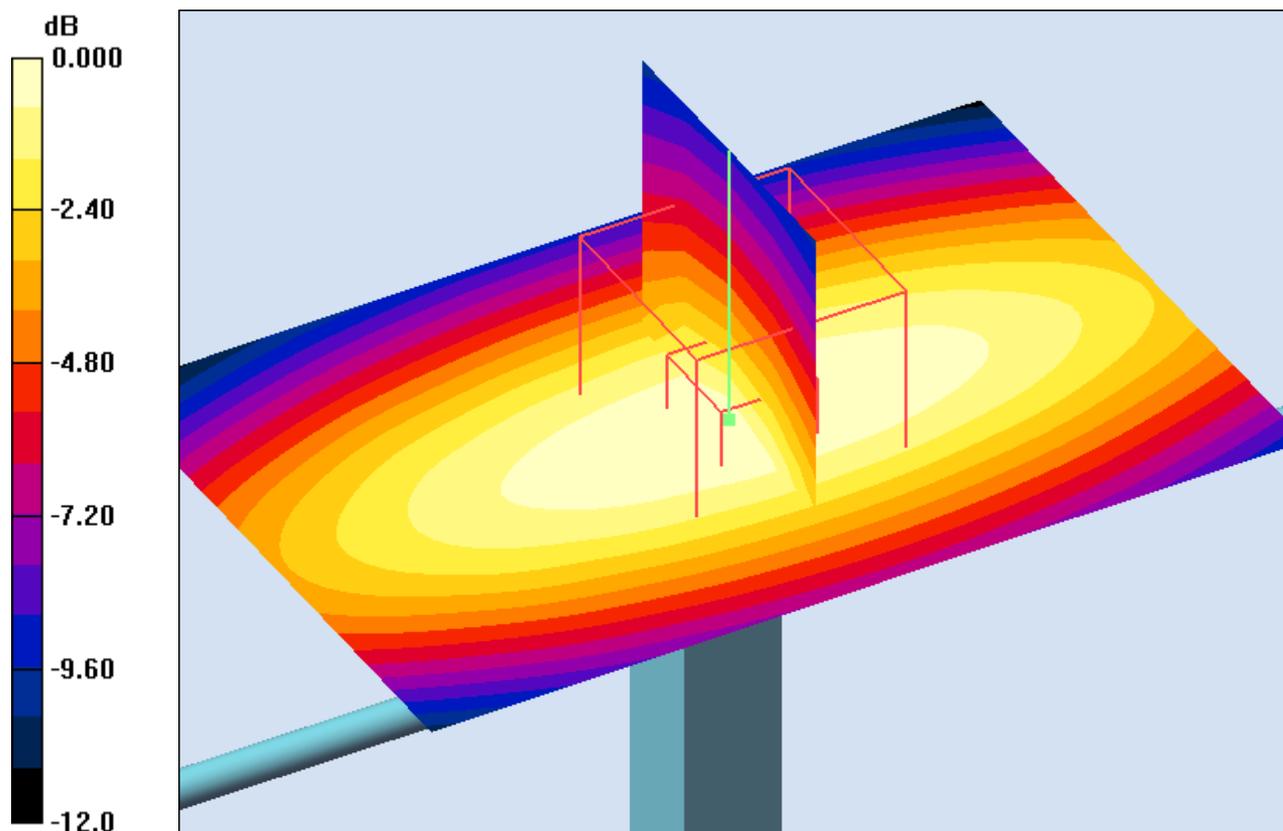
d=15mm, Pin=250 mW/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 53.1 V/m; Power Drift = -0.084 dB

Peak SAR (extrapolated) = 3.42 W/kg

SAR(1 g) = 2.35 mW/g; SAR(10 g) = 1.55 mW/g

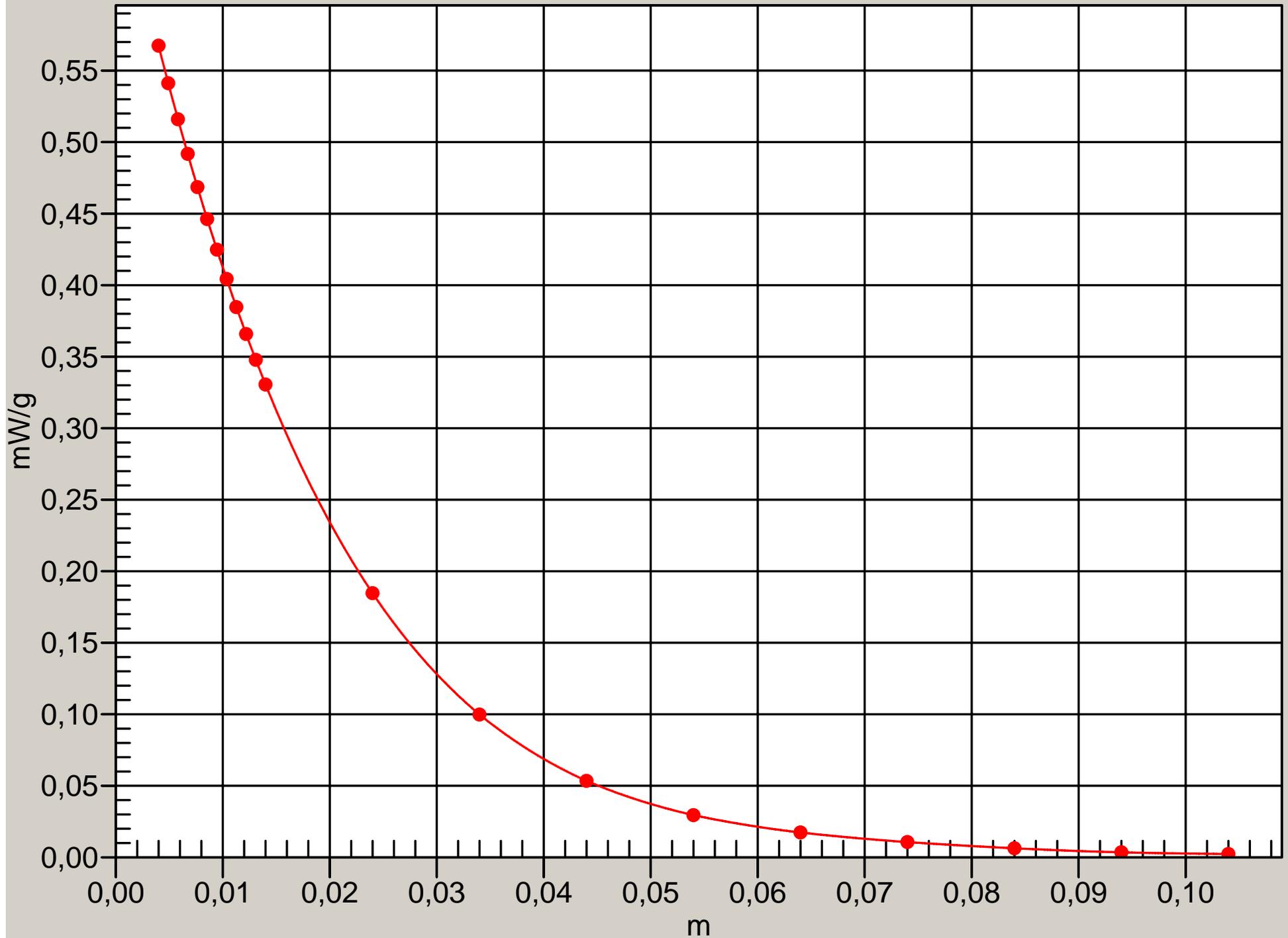
Maximum value of SAR (measured) = 2.54 mW/g



0 dB = 2.54mW/g

Interpolated SAR(x,y,z,f0)

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



Date/Time: 2007-10-09 10:49:01

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Body850_Data.da4](#)**DUT: AAC-1052061-BV (Lin); Type: 4 Band GSM Serial: CB510Q1AJM****Program Name: Data mode**

Communication System: GSM835MHz_GPRS2Slots; Frequency: 824.2 MHz;Duty Cycle: 1:4.15

Medium parameters used: $f = 825$ MHz; $\sigma = 0.958$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.94, 6.94, 6.94); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 1.34 mW/g

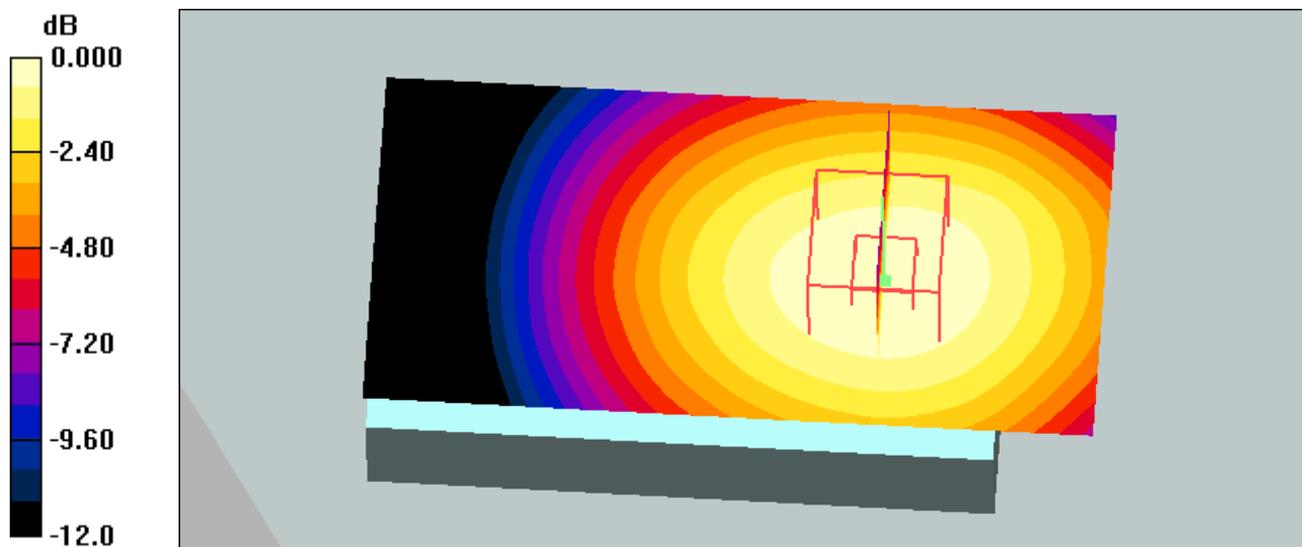
GPRS low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 37.2 V/m; Power Drift = -0.036 dB

Peak SAR (extrapolated) = 1.66 W/kg

SAR(1 g) = 1.27 mW/g; SAR(10 g) = 0.922 mW/g

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



0 dB = 1.35mW/g

Date/Time: 2007-10-09 12:29:52

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Body850_Data.da4](#)**DUT: AAC-1052061-BV (Lin); Type: 4-band GSM; Serial: CB510Q1AJM****Program Name: Data**

Communication System: GSM835MHz_GPRS2Slots; Frequency: 824.2 MHz;Duty Cycle: 1:4.15

Medium parameters used: $f = 825$ MHz; $\sigma = 0.958$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.94, 6.94, 6.94); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.570 mW/g

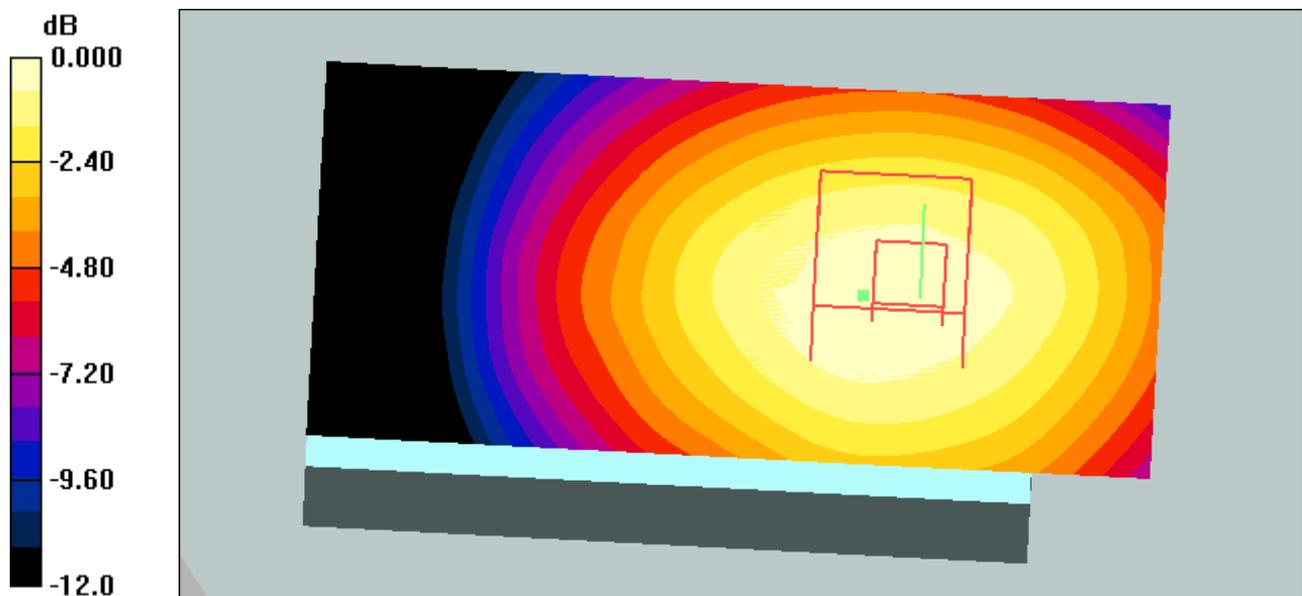
EDGE/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 23.5 V/m; Power Drift = -0.006 dB

Peak SAR (extrapolated) = 0.722 W/kg

SAR(1 g) = 0.551 mW/g; SAR(10 g) = 0.393 mW/g

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



0 dB = 0.592mW/g

Date/Time: 2007-10-09 11:29:47

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Body850_Data.da4](#)**DUT: AAC-1052061-BV (Lin); Type: 4-band GSM; Serial: CB510Q1AJM****Program Name: Data**

Communication System: GSM835MHz_GPRS2Slots; Frequency: 824.2 MHz; Duty Cycle: 1:4.15

Medium parameters used: $f = 825 \text{ MHz}$; $\sigma = 0.958 \text{ mho/m}$; $\epsilon_r = 54.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.94, 6.94, 6.94); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

GPRS low FrontSide/Area Scan (41x81x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

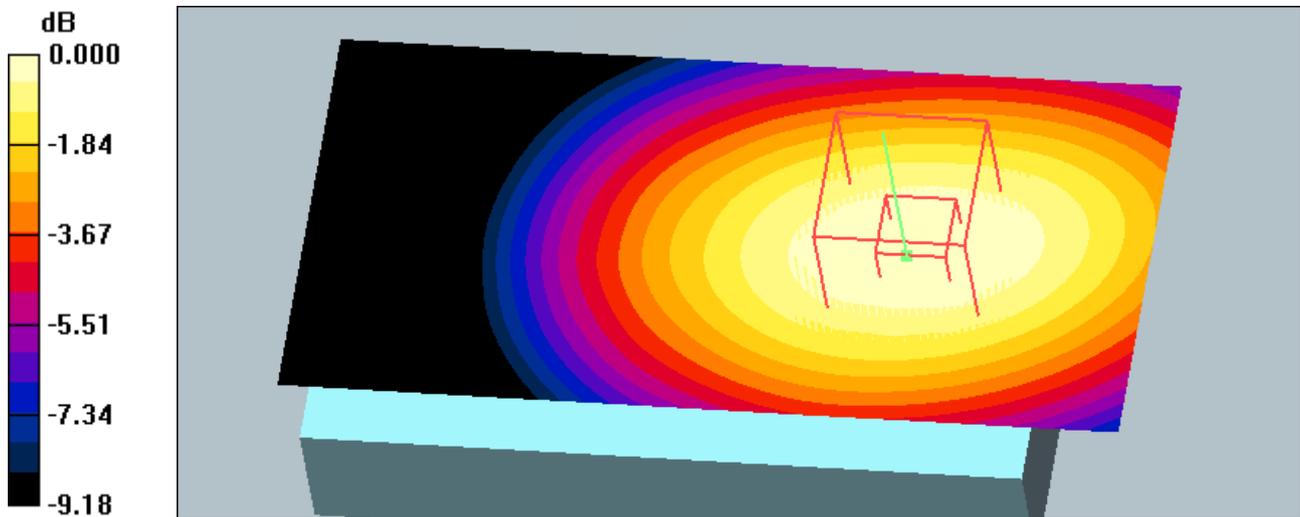
GPRS low FrontSide/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 28.8 V/m; Power Drift = -0.083 dB

Peak SAR (extrapolated) = 0.924 W/kg

SAR(1 g) = 0.714 mW/g; SAR(10 g) = 0.514 mW/g

Maximum value of SAR (measured) = 0.756 mW/g



0 dB = 0.756mW/g

Date/Time: 2007-10-09 13:37:05

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Body850_Speech.da4](#)**DUT: AAC-1052061-BV (Lin); Type: 4-band GSM; Serial: CB510Q1AJM****Program Name: Speech**

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

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.969$ mho/m; $\epsilon_r = 54.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.94, 6.94, 6.94); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.970 mW/g

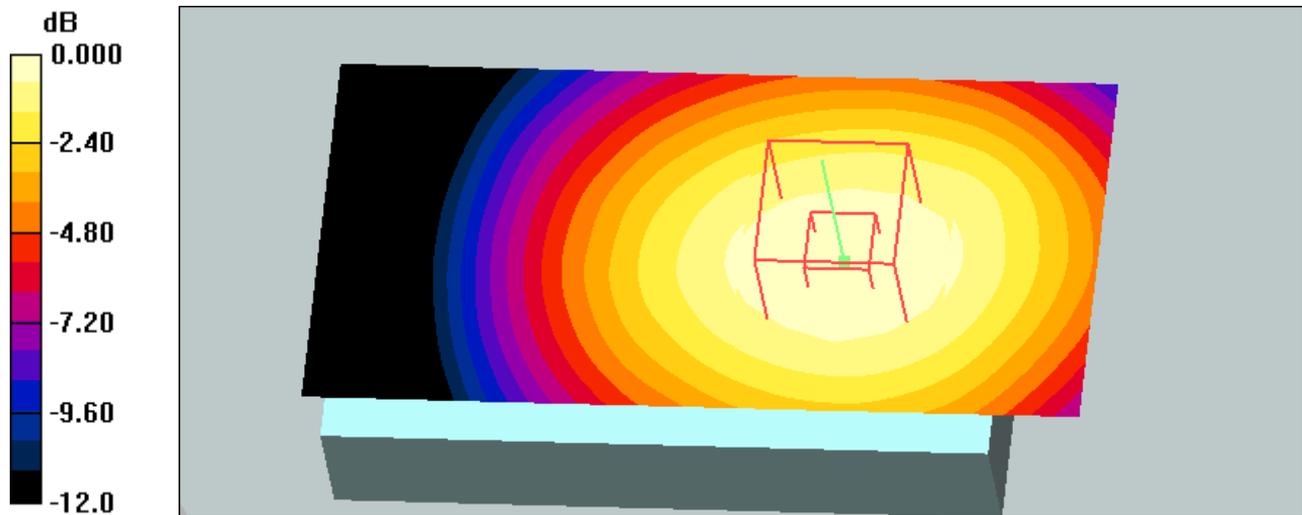
BT mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.6 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 1.21 W/kg

SAR(1 g) = 0.919 mW/g; SAR(10 g) = 0.662 mW/g

Maximum value of SAR (measured) = 0.972 mW/g



0 dB = 0.972mW/g

Date/Time: 2007-10-09 14:08:03

Test Laboratory: Sony Ericsson Mobile Communications AB

File Name: [Body850_Speech.da4](#)**DUT: AAC-1052061-BV (Lin); Type: 4-band GSM; Serial: CB510Q1AJM****Program Name: Speech**

Communication System: GSM835MHz; Frequency: 824.2 MHz; Duty Cycle: 1:8.3

Medium parameters used: $f = 825$ MHz; $\sigma = 0.958$ mho/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1569; ConvF(6.94, 6.94, 6.94); Calibrated: 2007-01-16

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE3 Sn419; Calibrated: 2007-03-08

- Phantom: SAM 2; Type: SAM QD 000 P40 CB; Serial: TP-1396

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.557 mW/g

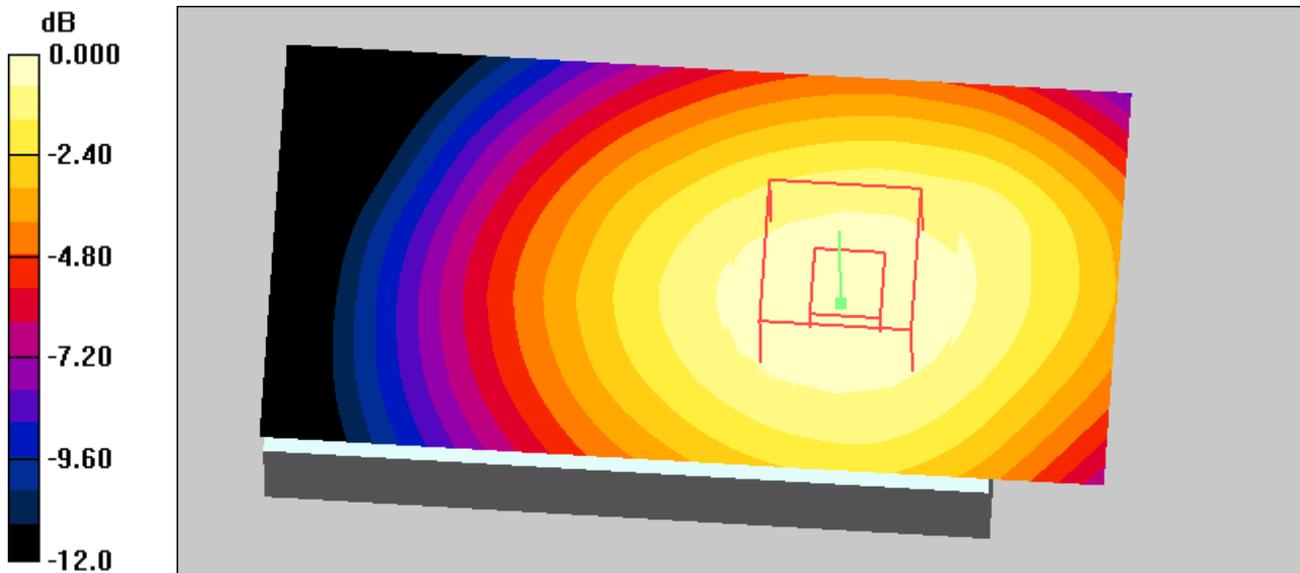
PHF low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 23.6 V/m; Power Drift = -0.044 dB

Peak SAR (extrapolated) = 0.695 W/kg

SAR(1 g) = 0.531 mW/g; SAR(10 g) = 0.381 mW/g

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



0 dB = 0.563mW/g



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Accreditation No.: **SCS 108**

Client **Sony Ericsson Lund**

Certificate No. **D1900V2-5d002_Jan07**

CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d002**

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

Calibration date: **January 16, 2007**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	03-Oct-06 (METAS, No. 217-00608)	Oct-07
Power sensor HP 8481A	US37292783	03-Oct-06 (METAS, No. 217-00608)	Oct-07
Reference 20 dB Attenuator	SN: 5086 (20g)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference Probe ET3DV6	SN: 1507	19-Oct-06 (SPEAG, No. ET3-1507_Oct06)	Oct-07
Reference Probe ES3DV3	SN: 3025	19-Oct-06 (SPEAG, No. ES3-3025_Oct06)	Oct-07
DAE4	SN 907	20-Jul-06 (SPEAG, No. DAE4-907_Jul06)	Jul-07

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-05)	In house check: Oct-07
RF generator Agilent E4421B	MY41000675	11-May-05 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

Calibrated by: **Name: Marcel Fahr, Function: Laboratory Technician, Signature: [Signature]**

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

Issued: January 17, 2007

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

- DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

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

Head TSL parameters

The following parameters and calculations were applied.

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

SAR result with Head TSL

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

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

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

Body TSL parameters

The following parameters and calculations were applied.

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

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.94 mW / g
SAR normalized	normalized to 1W	39.8 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	38.6 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.24 mW / g
SAR normalized	normalized to 1W	21.0 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	20.6 mW / g ± 16.5 % (k=2)

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

Appendix

Antenna Parameters with Head TSL

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

Antenna Parameters with Body TSL

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

General Antenna Parameters and Design

Electrical Delay (one direction)	1.177 ns
----------------------------------	----------

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

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	February 14, 2002

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: HSL U10 BB;

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

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.97, 4.97, 4.97); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn907; Calibrated: 20.07.2006
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

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

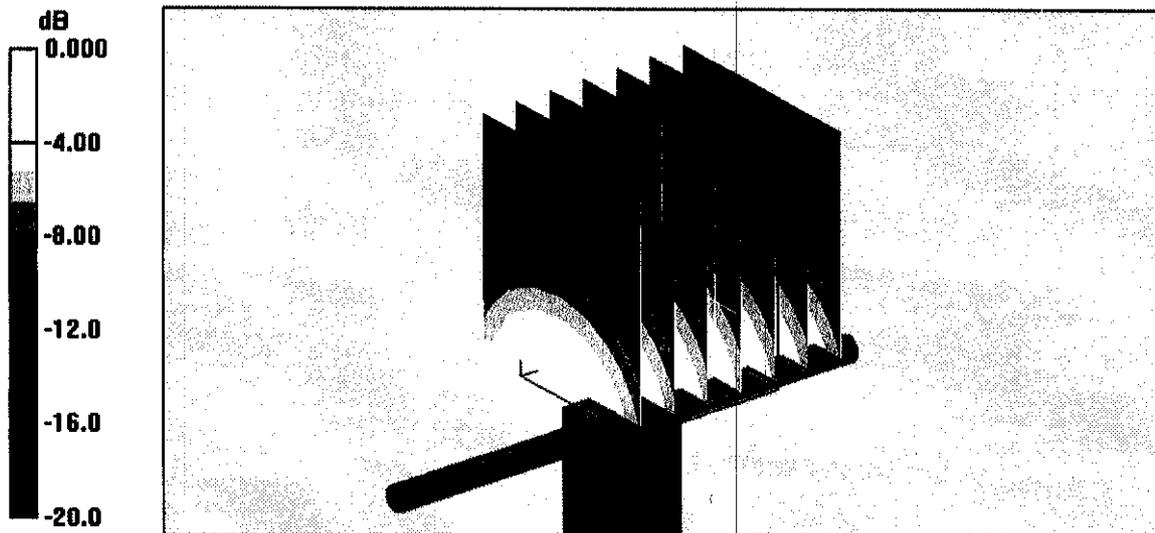
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

Peak SAR (extrapolated) = 17.0 W/kg

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

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



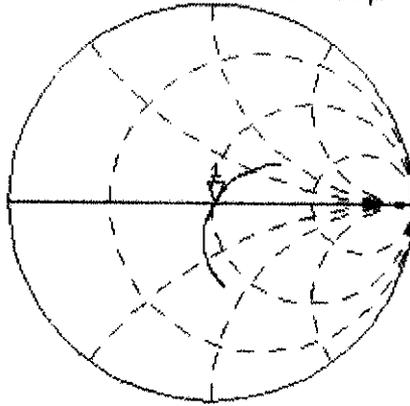
0 dB = 11.0mW/g

Impedance Measurement Plot for Head TSL

9 Jan 2007 11:53:45

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

*
De1
CA



Avg
16

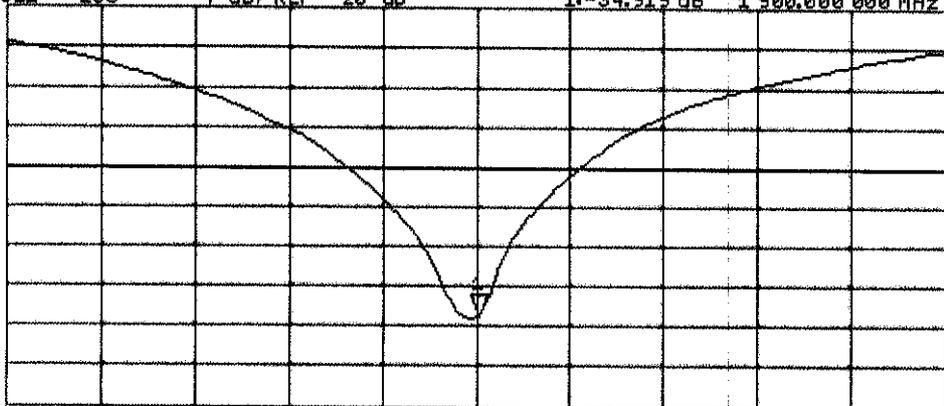
↑

CH2 S11 LOG 4 dB/REF -20 dB 11-34.919 dB 1 900.000 000 MHz

CA

Avg
16

↑



CENTER 1 900.000 000 MHz

SPAN 400.000 000 MHz

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: MSL U10 BB;

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

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.43, 4.43, 4.43); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn907; Calibrated: 20.07.2006
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

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

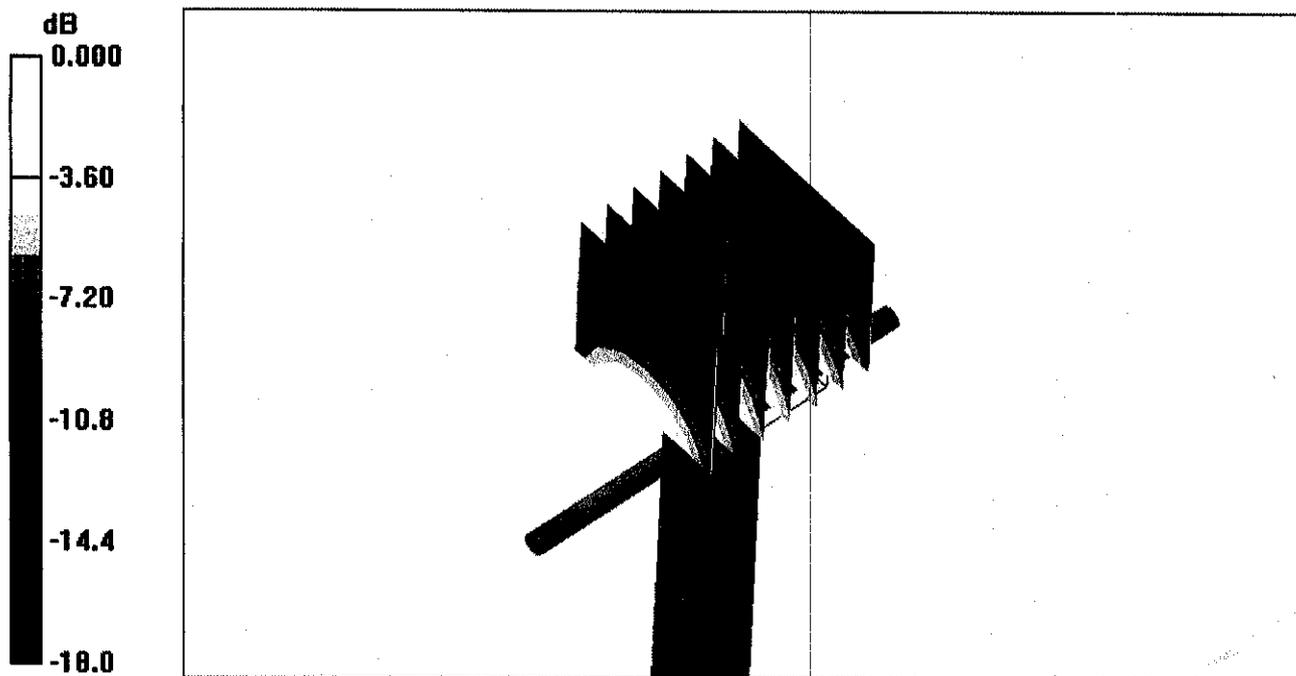
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

Peak SAR (extrapolated) = 17.0 W/kg

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

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

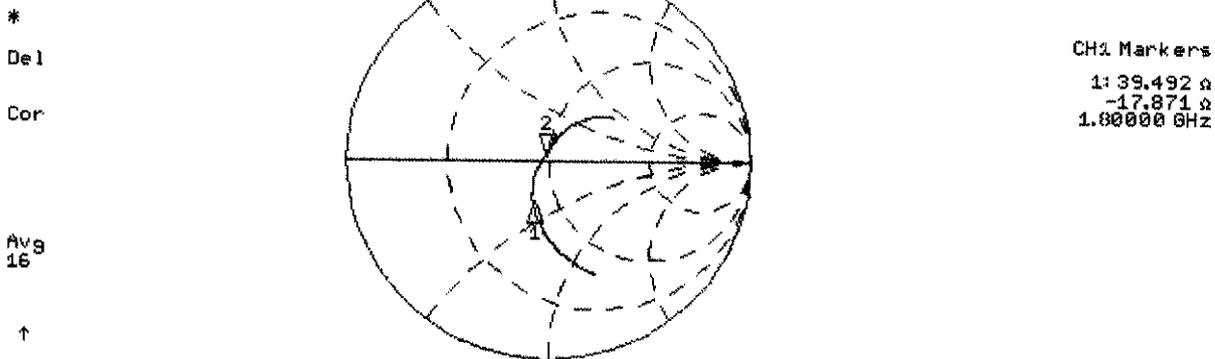


0 dB = 11.3mW/g

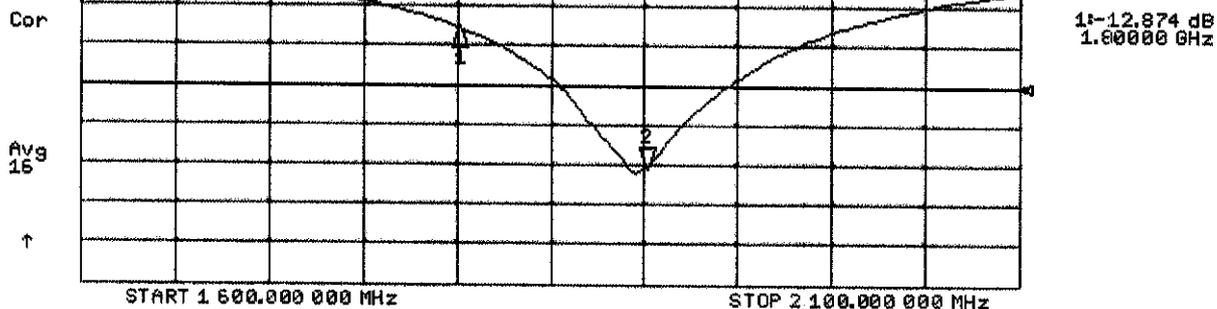
Impedance Measurement Plot for Body TSL

16 Jan 2007 12:04:42

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



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





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Accreditation No.: **SCS 108**

Client **Sony Ericsson Lund**

Certificate No: **D835V2-4d039_May06**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 4d039**

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

Calibration date: **May 31, 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	04-Oct-05 (METAS, No. 251-00516)	Oct-06
Power sensor HP 8481A	US37292783	04-Oct-05 (METAS, No. 251-00516)	Oct-06
Reference 20 dB Attenuator	SN: 5086 (20g)	11-Aug-05 (METAS, No 251-00498)	Aug-06
Reference 10 dB Attenuator	SN: 5047.2 (10r)	11-Aug-05 (METAS, No 251-00498)	Aug-06
Reference Probe ET3DV6	SN 1507	28-Oct-05 (SPEAG, No. ET3-1507_Oct05)	Oct-06
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 Nov-05)	In house check: Nov-06

Calibrated by: **Mike Meili** Name: **Mike Meili** Function: **Laboratory Technician**

Signature: *M. Meili*

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

Signature: *Katja Pokovic*

Issued: June 1, 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:

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

Additional Documentation:

- d) DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY4	V4.6
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Area Scan resolution	dx, dy = 15 mm	
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz \pm 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	41.9 \pm 6 %	0.90 mho/m \pm 6 %
Head TSL temperature during test	(23.0 \pm 0.2) °C	---	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	2.31 mW / g
SAR normalized	normalized to 1W	9.24 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	9.29 mW / g \pm 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.50 mW / g
SAR normalized	normalized to 1W	6.00 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	6.03 mW / g \pm 16.5 % (k=2)

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

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	56.8 ± 6 %	0.98 mho/m ± 6 %
Body TSL temperature during test	(23.2 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	250 mW input power	2.39 mW / g
SAR normalized	normalized to 1W	9.56 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	9.66 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.56 mW / g
SAR normalized	normalized to 1W	6.24 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	6.31 mW / g ± 16.5 % (k=2)

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

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.1 Ω - 2.1 j Ω
Return Loss	- 32.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.9 Ω - 3.5 j Ω
Return Loss	- 27.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.382 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	September 20, 2005

DASY4 Validation Report for Head TSL

Date/Time: 31.05.2006 10:59:32

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d039

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

Medium: HSL U10 BB_060425;

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.912 \text{ mho/m}$; $\epsilon_r = 41.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(6.09, 6.09, 6.09); Calibrated: 28.10.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

Pin = 250 mW; d = 10 mm/Area Scan (71x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.44 mW/g

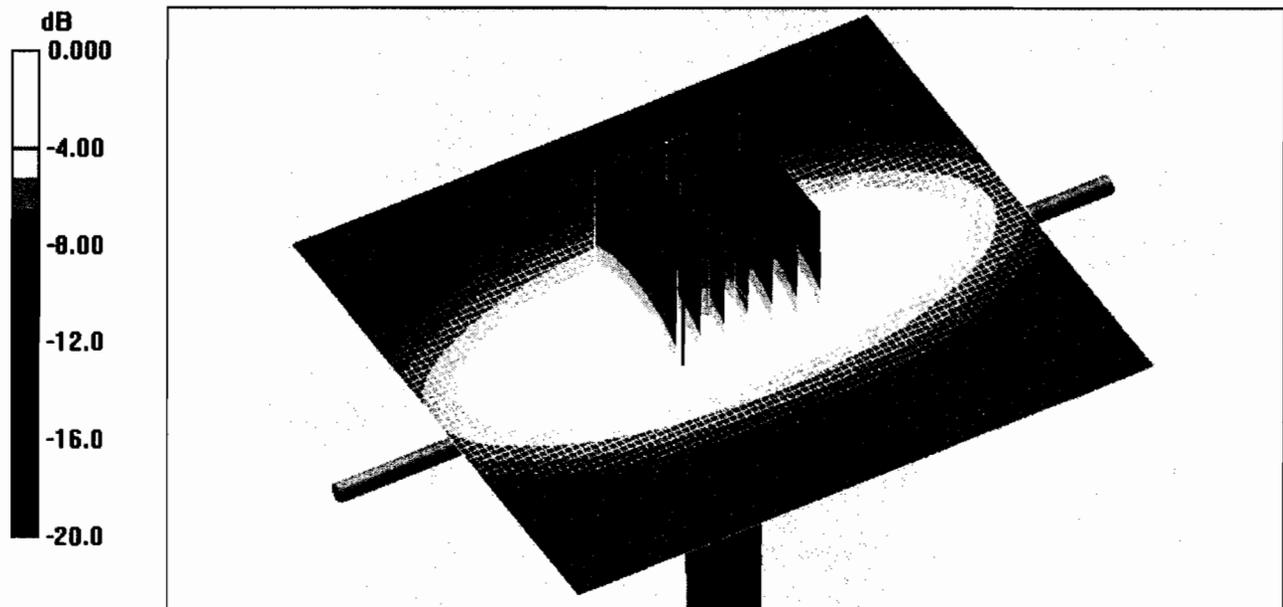
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.1 V/m; Power Drift = 0.031 dB

Peak SAR (extrapolated) = 3.48 W/kg

SAR(1 g) = 2.31 mW/g; SAR(10 g) = 1.5 mW/g

Maximum value of SAR (measured) = 2.48 mW/g



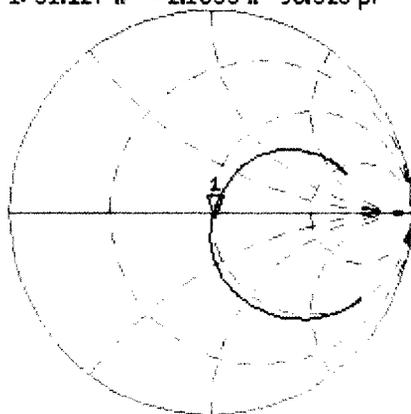
0 dB = 2.48mW/g

Impedance Measurement Plot for Head TSL

31 May 2006 09:35:47

CH1 S11 1 U FS 1: 51.127 Ω -2.1055 Ω 90.528 pF 835.000 000 MHz

*
Del
CA

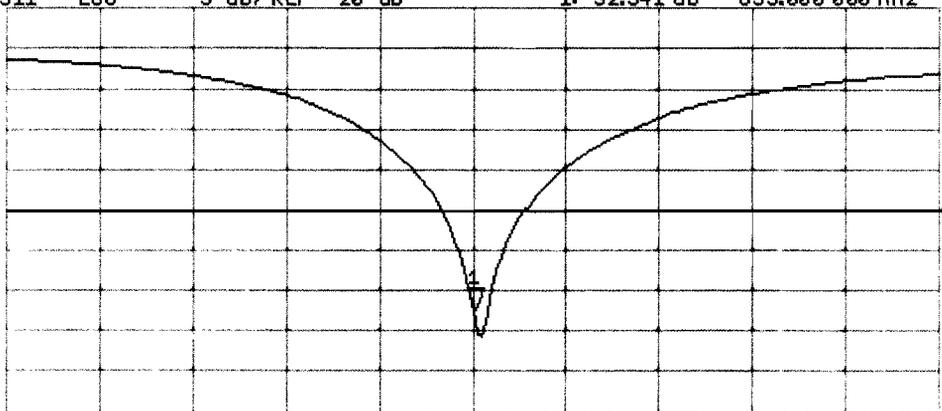


Avg
16
↑

CH2 S11 LOG 5 dB/REF -20 dB 1: -32.541 dB 835.000 000 MHz

CA

Avg
16
↑



CENTER 835.000 000 MHz

SPAN 400.000 000 MHz

DASY4 Validation Report for Body TSL

Date/Time: 31.05.2006 13:23:15

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d039

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

Medium: MSL U10 BB;

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.997 \text{ mho/m}$; $\epsilon_r = 56.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(5.84, 5.84, 5.84); Calibrated: 28.10.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

Pin = 250 mW; d = 15 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.59 mW/g

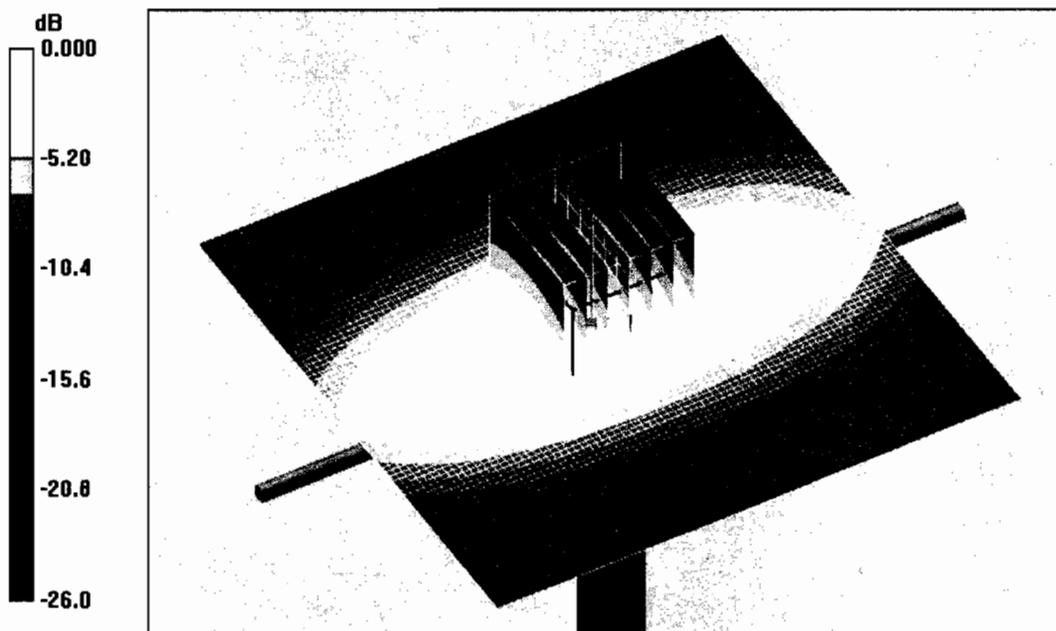
Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.1 V/m; Power Drift = -0.014 dB

Peak SAR (extrapolated) = 3.45 W/kg

SAR(1 g) = 2.39 mW/g; SAR(10 g) = 1.56 mW/g

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



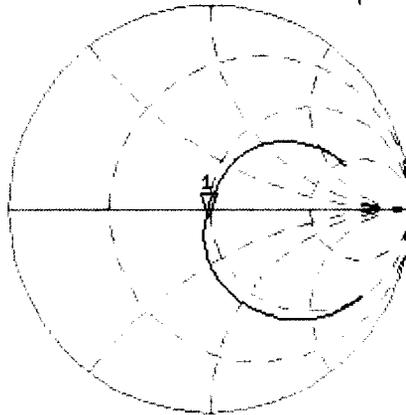
0 dB = 2.58mW/g

Impedance Measurement Plot Body TSL

31 May 2006 12:26:44

CH1 S11 1 U FS 1: 47.943 Ω -3.5078 Ω 54.337 pF 835.000 000 MHz

*
De1
CA



Avg
16

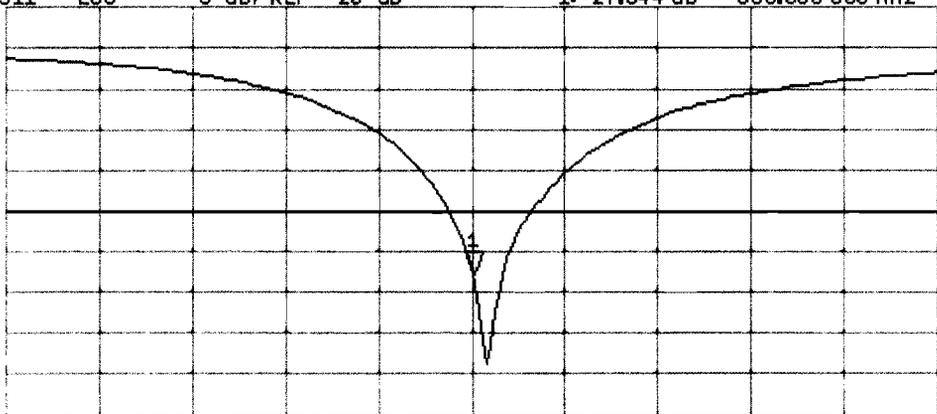
↑

CH2 S11 LOG 5 dB/REF -20 dB 1:-27.644 dB 835.000 000 MHz

CA

Avg
16

↑



CENTER 835.000 000 MHz

SPAN 400.000 000 MHz



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Accreditation No.: **SCS 108**

Client **Sony Ericsson Lund**

Certificate No: **D835V2-484_Jan07**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 484**

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

Calibration date: **January 15, 2007**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	03-Oct-06 (METAS, No. 217-00608)	Oct-07
Power sensor HP 8481A	US37292783	03-Oct-06 (METAS, No. 217-00608)	Oct-07
Reference 20 dB Attenuator	SN: 5086 (20g)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference Probe ET3DV6 (HF)	SN 1507	19-Oct-06 (SPEAG, No. ET3-1507_Oct06)	Oct-07
DAE4	SN 907	20-Jul-06 (SPEAG, No. DAE4-907_Jul06)	Jul-07

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-05)	In house check: Oct-07
RF generator Agilent E4421B	MY41000675	11-May-05 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

Calibrated by: **Marcel Fehr** (Name) **Laboratory Technician** (Function)  (Signature)

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

Issued: January 16, 2007

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

- d) DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

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

Head TSL parameters

The following parameters and calculations were applied.

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

SAR result with Head TSL

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

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

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

Body TSL parameters

The following parameters and calculations were applied.

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

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	condition	
SAR measured	250 mW input power	2.47 mW / g
SAR normalized	normalized to 1W	9.88 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	9.48 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.62 mW / g
SAR normalized	normalized to 1W	6.48 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	6.29 mW / g ± 16.5 % (k=2)

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

Appendix

Antenna Parameters with Head TSL

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

Antenna Parameters with Body TSL

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

General Antenna Parameters and Design

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

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	April 23, 2003

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: HSL 900 MHz;

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

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(6.09, 6.09, 6.09); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn907; Calibrated: 20.07.2006
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

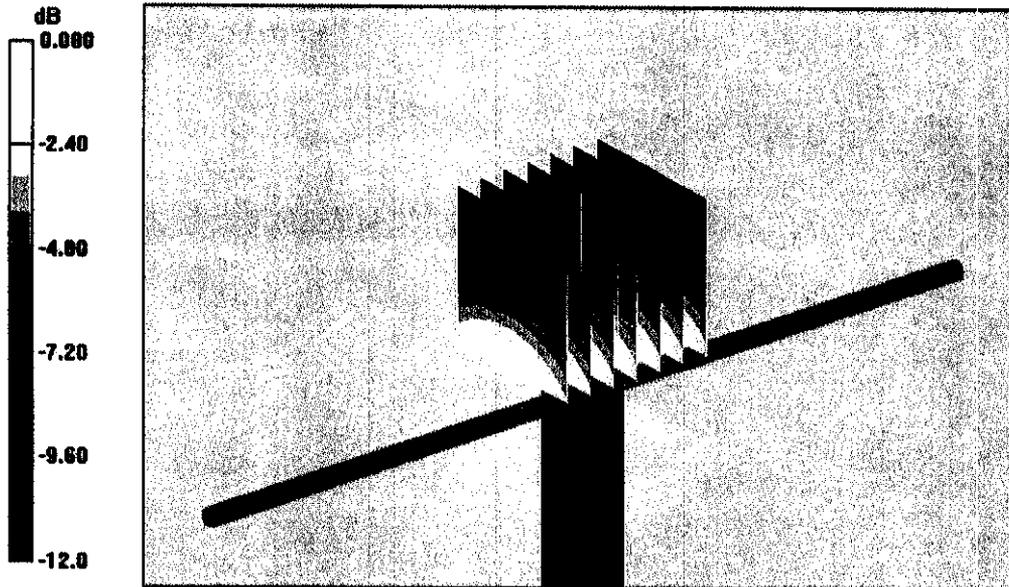
Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

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

Peak SAR (extrapolated) = 3.40 W/kg

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

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



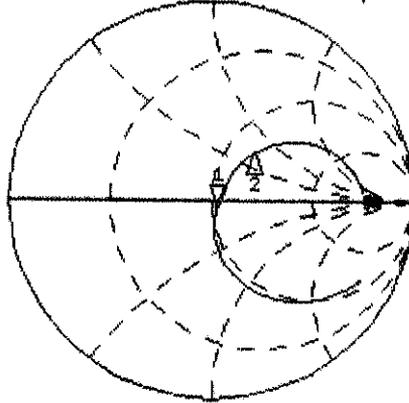
0 dB = 2.47mW/g

Impedance Measurement Plot for Head TSL

8 Jan 2007 11:17:02

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

*
Del
Cor



CH1 Markers
2i 65.203 Ω
33.645 Ω
900.000 MHz

Avg
16

↑

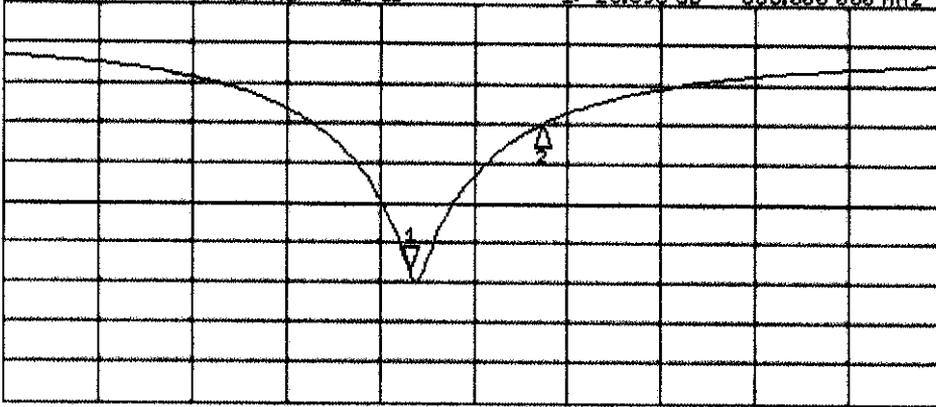
CH2 S11 L00 5 dB/REF -20 dB 1i -28.095 dB 835.000 000 MHz

Cor

CH2 Markers
2i -10.240 dB
900.000 MHz

Avg
16

↑



START 635.000 000 MHz

STOP 1 100.000 000 MHz

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: MSL900;

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

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(5.75, 5.75, 5.75); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn907; Calibrated: 20.07.2006
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

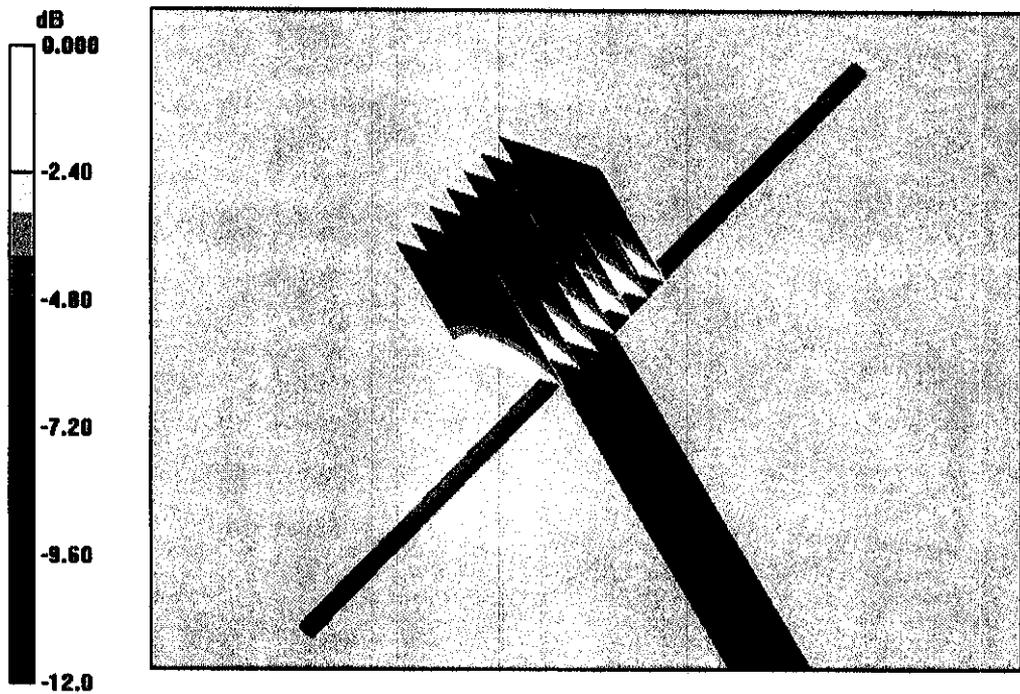
Unnamed procedure/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

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

Peak SAR (extrapolated) = 3.55 W/kg

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

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



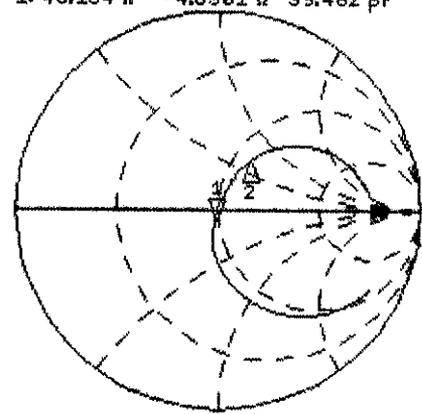
0 dB = 2.66mW/g

Impedance Measurement Plot for Body TSL

15 Jan 2007 13:01:41

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

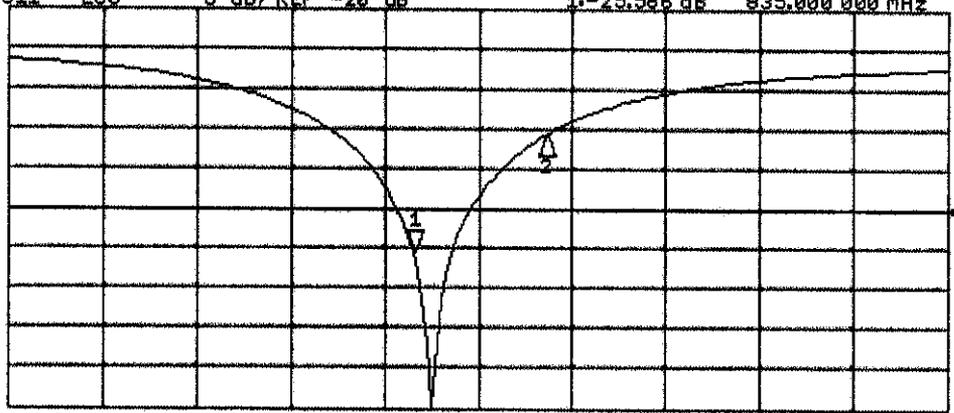
*
De1
Cor
Avg
16



CH1 Markers
2: 58.496 Ω
31.262 Ω
900.000 MHz

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

Cor
Avg
16



CH2 Markers
2: -10.845 dB
900.000 MHz

START 635.000 000 MHz STOP 1 1000.000 000 MHz



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Accreditation No.: **SCS 108**

Client: **Sony Ericsson Ltd**

Certificate No: **ET3-1569_Jan07**

CALIBRATION CERTIFICATE

Object: **ET3DV6 - SN: 1569**

Calibration procedure(s): **QA-CAL-01-V5
Calibration procedure for dosimetric E-field probes**

Calibration date: **January 16, 2007**

Condition of the calibrated item: **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter 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	4-Jan-07 (SPEAG, No. ES3-3013_Jan07)	Jan-08
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:	Niala Kuster	Quality Manager	

Issued: January 16, 2007

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Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- 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_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z}** = NORM_{x,y,z} * *frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ET3DV6

SN:1569

Manufactured:	May 19, 2001
Last calibrated:	March 16, 2006
Recalibrated:	January 16, 2007

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1569**Sensitivity in Free Space^A**

NormX	1.79 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$
NormY	2.08 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.91 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression^B

DCP X	95 mV
DCP Y	95 mV
DCP Z	93 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

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

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	7.2	3.9
SAR _{be} [%]	With Correction Algorithm	0.1	0.1

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

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	6.2	3.7
SAR _{be} [%]	With Correction Algorithm	0.1	0.3

Sensor Offset

Probe Tip to Sensor Center **2.7 mm**

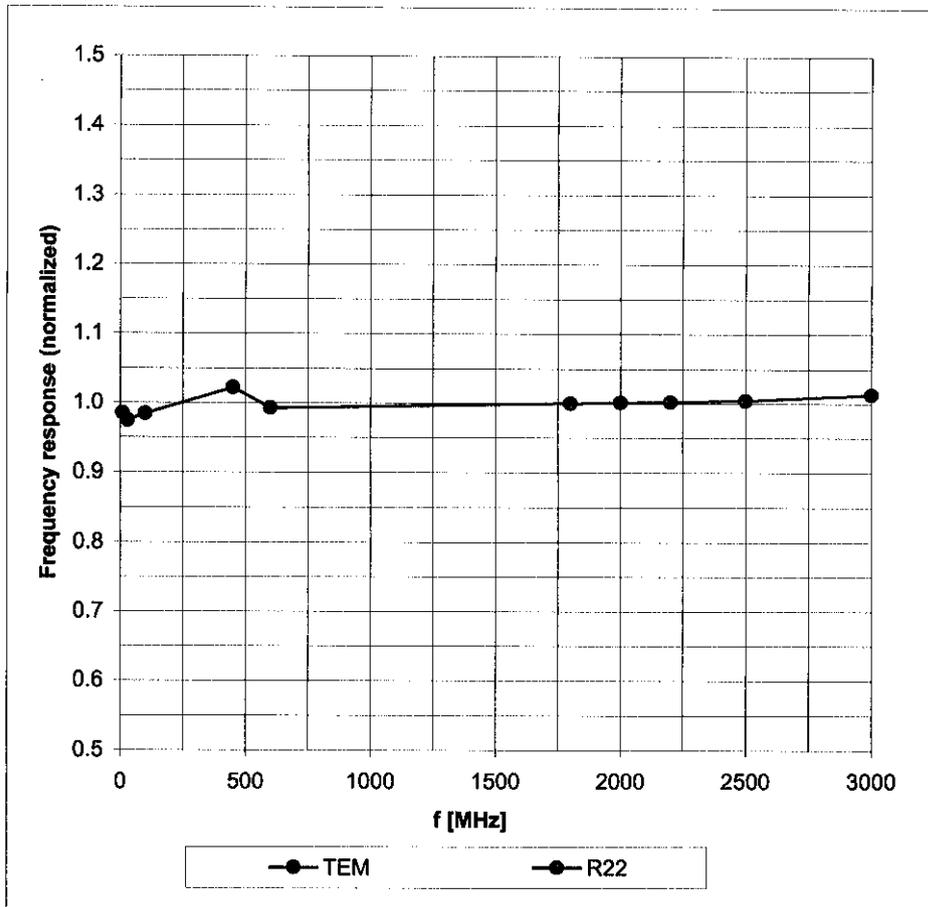
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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

^B Numerical linearization parameter: uncertainty not required.

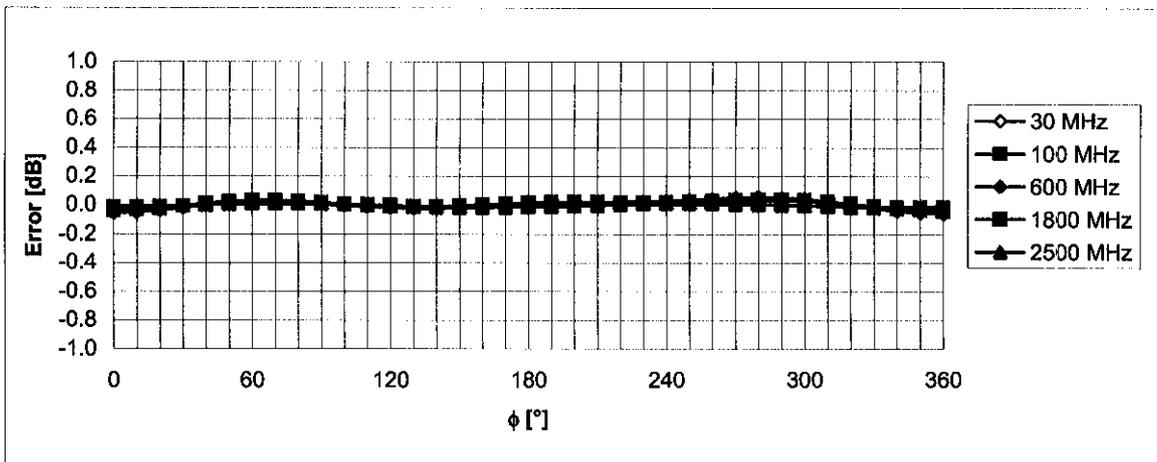
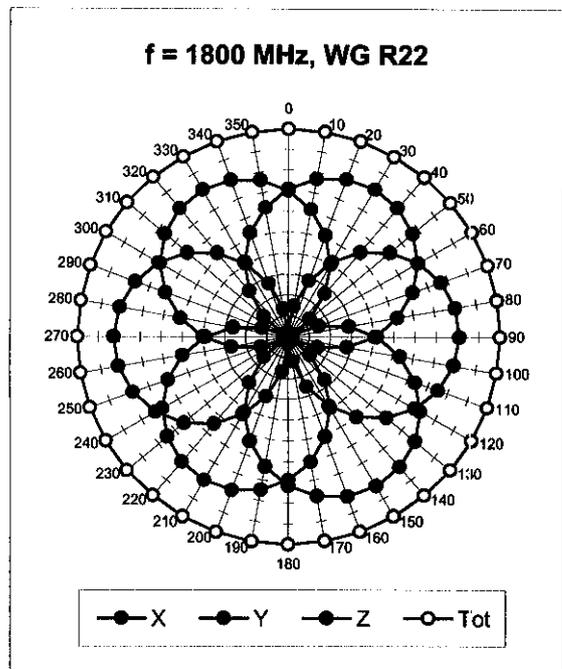
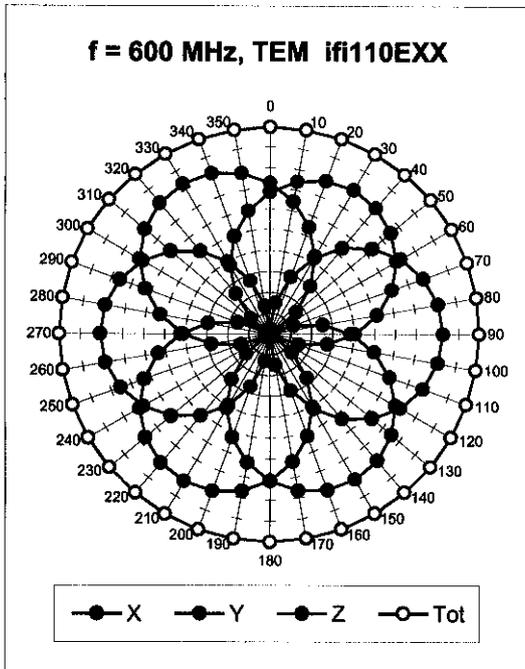
Frequency Response of E-Field

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



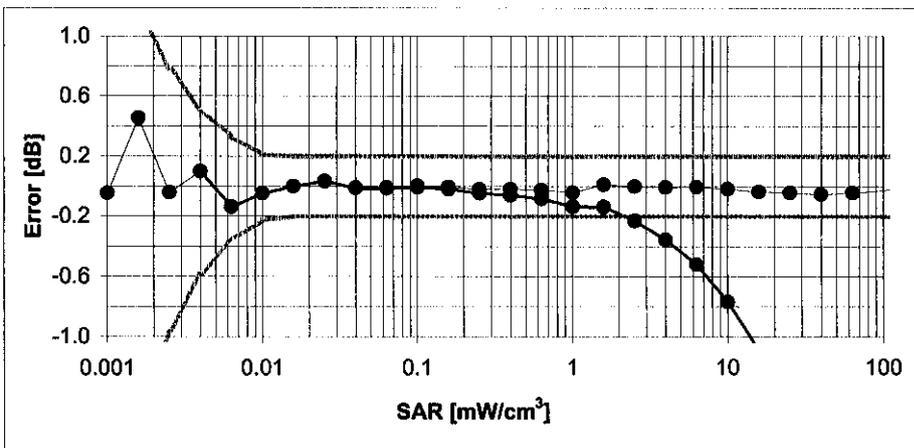
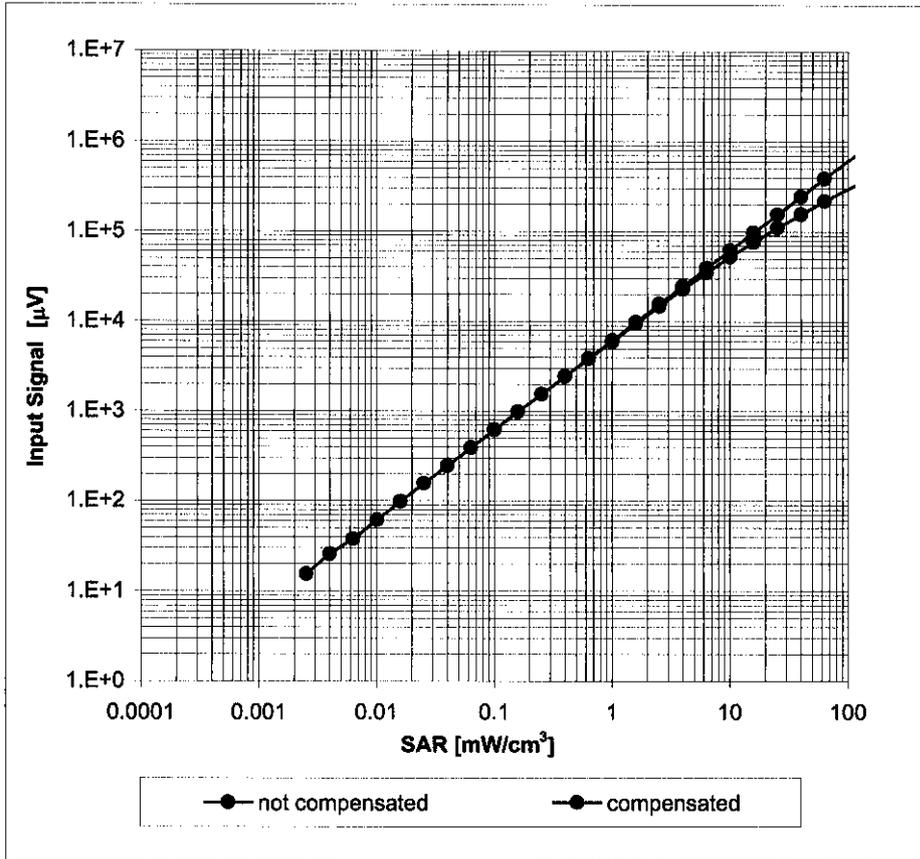
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

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



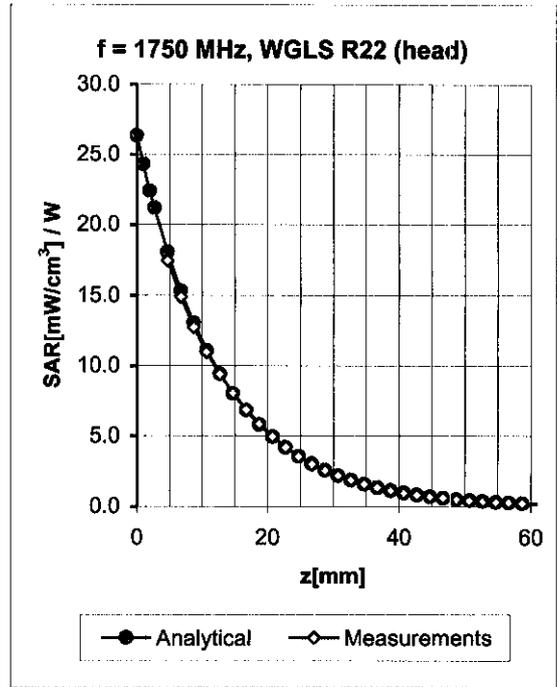
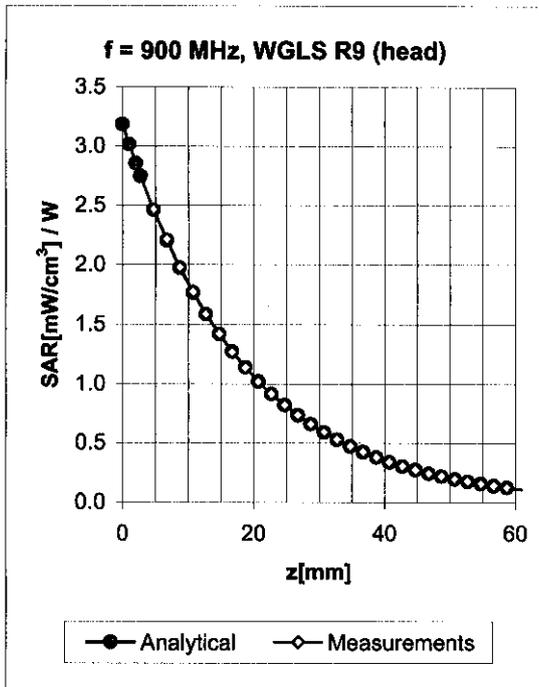
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

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



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

Conversion Factor Assessment

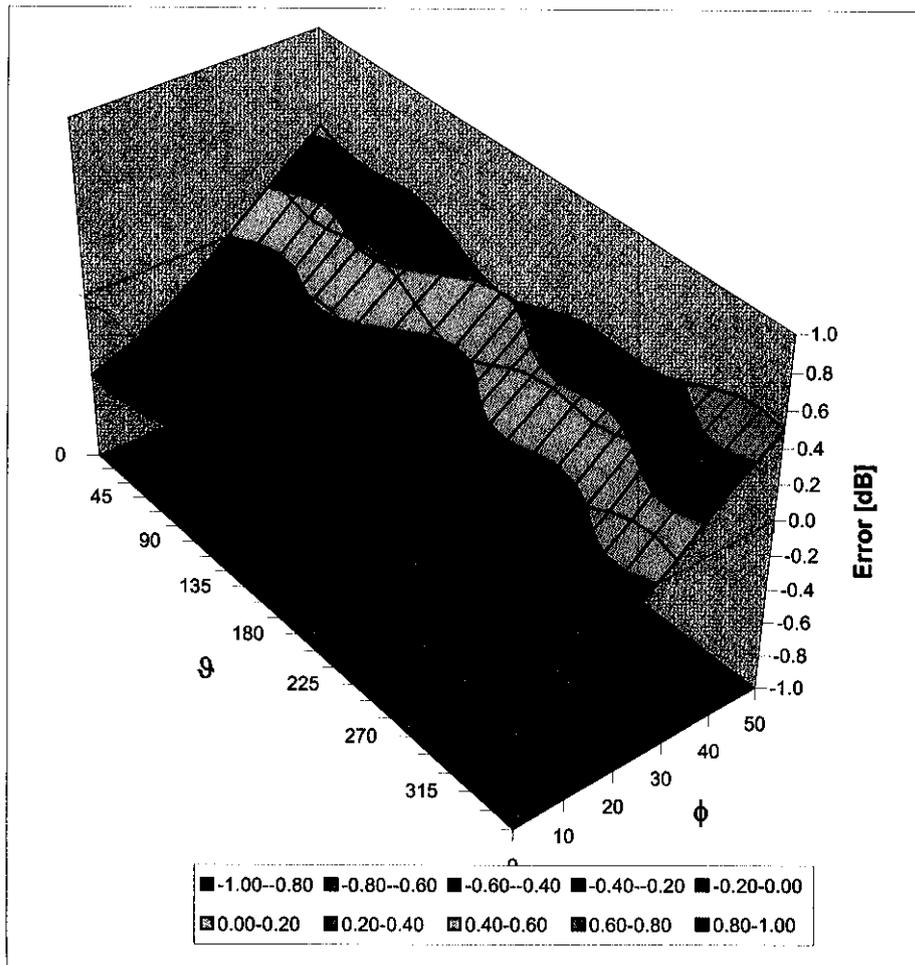


f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.27	2.56	6.89 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.28	2.66	6.85 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.44	2.88	5.47 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.48	2.69	5.33 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.51	2.39	4.72 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.25	2.73	6.94 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.28	2.77	6.57 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.52	2.90	4.96 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.62	2.56	4.79 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.52	1.97	4.17 ± 11.8% (k=2)

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

Deviation from Isotropy in HSL

Error (ϕ , ϑ), $f = 900$ MHz



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