Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
BA/SEM/BGLINS *Jon Kenny*		*BGLI07:575*		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGLI/NC Peter Lindeborg	*071026*	*071025*	A	File

Report issued by Accredited SAR Laboratory

For

PY7A1022131 (K530c)

Date of test: 22, 23 October 2007

Laboratory:
Sony Ericsson SAR Test Laboratory
Sony Ericsson Mobile Communications AB
Maplewood, Chineham Business Park
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Statement of Compliance
Sony Ericsson Mobile Communications AB declares under its sole responsibility that the product

Sony Ericsson Type : AAB-1022131-BV; FCC ID : PY7A1022131; IC:4170B-A1022131

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)

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Table of contents

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1 Introduction

In this test report, compliance of the Sony Ericsson PY7A1022131 (K530c) 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	Built in	
Location	Rear at the top of the phone	
Dimensions	Max length	40mm
	Max width	20mm
	Max height	7.5mm
Configuration	PIFA	

2.2 Device description

Device model	PY7A1022131 (K530c)	
Serial number	CB5A0FKKD7 (#9277)	
Mode	GSM1900	GPRS1900 2TX
Multiple Access Scheme	TDMA	TDMA
Output Power Setting (dBm)	fl fm fh 29.7 29.7 29.7	fl fm fh 28.5 28.6 28.6
Factory Tolerance in Power Setting (dB)	±0.5	±0.5
Maximum Peak Output Power (dBm) 1524 production data limits	fl fm fh 29.7 29.7 29.7	fl fm fh 28.5 28.5 28.5
Crest Factor	8	4
Transmitting Frequency Range(MHz)	1850.2 – 1909.8	1850.2 – 1909.8
Prototype or Production Unit	Pre-Production HW -FG	
Device Category	Portable	
RF exposure environment	General population / uncontrolled	

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.

Description	***Serial Number***	***Due Date***
DASY4 DAE3	449	07-12-2007
E-field probe ET3DV6	1610	17-11-2007
Dipole Validation Kit, D1900V2	539	12-12-2008

3.2 Additional equipment

Description	***Inventory Number***	***Due Date***
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	20010943	06-11-07

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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 DASY software is also given. Recommended parameters for permittivity ε_r, conductivity σ and mass density ρ are also shown.

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters		Density
			ε_r	σ (S/m)	ρ (g/cm³)
1900	**Head**	**Measured, 22/10/2007**	38.2	1.47	1.00
		Recommended	40.0	1.40	1.00
1900	**Body**	**Measured, 23/10/2007**	54.1	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 kits listed in section 3.1. The dipole was supplied with 24dBm power at 1900MHz. The system verification test was conducted on the same day as the measurement of the DUT. Measurements were made at an ambient temperature of 21 °C and a humidity of (28-32) %. 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)	Liquid	Measured / Reference	SAR (W/kg) 1g	Dielectric Parameters			Liquid t(°C)
				ε_r	σ (S/m)	ρ (g/cm³)	
1900	**Head**	**Measured, 22/10/2007**	37.7	38.2	1.47	1.00	21.3
		Reference	35.9	40.0	1.40	1.00	21.2
1900	**Body**	**Measured, 23/10/2007**	38.9	54.1	1.59	1.00	21.6
		Reference	37.0	53.3	1.52	1.00	21.6

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6 SAR measurement uncertainty

DASY4 SAR measurement uncertainty evaluation for Sony Ericsson PY7A1022131 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***

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 (28-32) % and (22–23) °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 measurements the phone was tested in speech and data mode when the phone's antenna (Back) was towards the flat section of the phantom, with a 15mm separation distance. For speech mode a Sony Ericsson portable hands free HBH-DS970 was used.

Mode	Channel	Power (dBm)	Phone Position	Liquid t (°C)	SAR (W/kg)	
					Right-hand	Left-hand
					1g mass	1g mass
1900 GSM	512	29.7	**Cheek**	21.3	-	0.72
			Tilt	21.3	0.67	0.75
	661	29.7	**Cheek**	21.3	0.72	0.97
			Tilt	21.3	0.85	1.03
	810	29.7	**Cheek**	21.3	-	1.16
			Tilt	21.3	0.95	1.14

Table1: Head SAR measurement results for Sony Ericsson PY7A1022131 telephone at highest possible output power.

Mode	Channel	Power (dBm)	Phone Position	Liquid t (°C)	SAR (W/kg) in 1 g mass
1900 GSM	512	29.7	**Antenna to phantom, speech BT**	21.6	0.44
		28.5	**Antenna to phantom, data GPRS 2Sl**	21.6	0.67
	661	29.7	**Antenna to phantom, speech BT**	21.6	0.48
		28.6	**Antenna to phantom, data GPRS 2Sl**	21.6	0.79
	810	29.7	**Antenna to phantom, speech BT**	21.6	0.55
		29.7	**Antenna to phantom, speech PHF**	21.6	0.55
		28.6	**Antenna to phantom, data GPRS 2Sl**	21.6	0.93
		28.6	**Antenna Face down, data GPRS 2Sl**	21.6	0.33

Table2: Body SAR measurement results for Sony Ericsson PY7A1022131 telephone at highest possible output power.

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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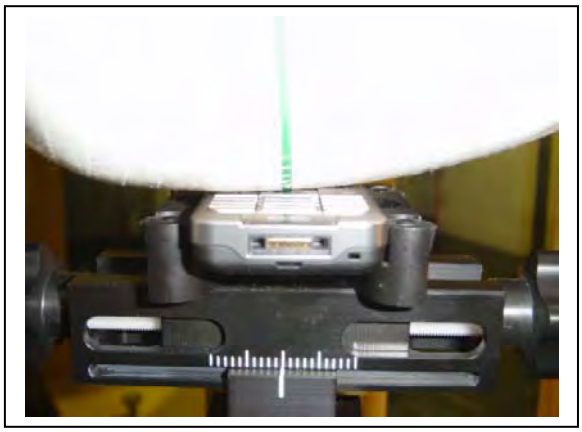
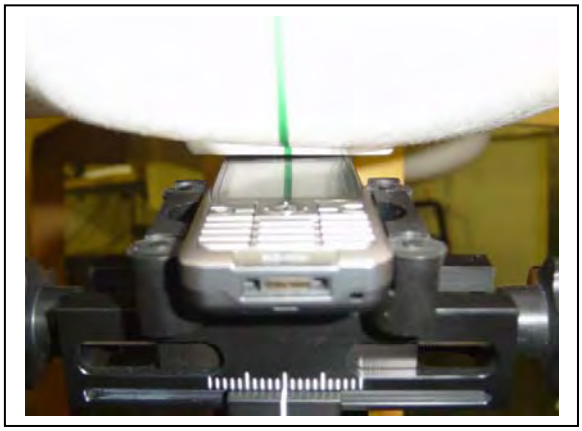
9.2 Device position on SAM Twin Phantom



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



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

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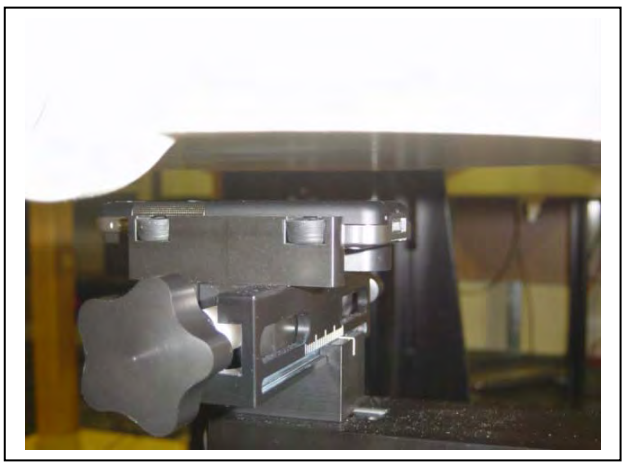
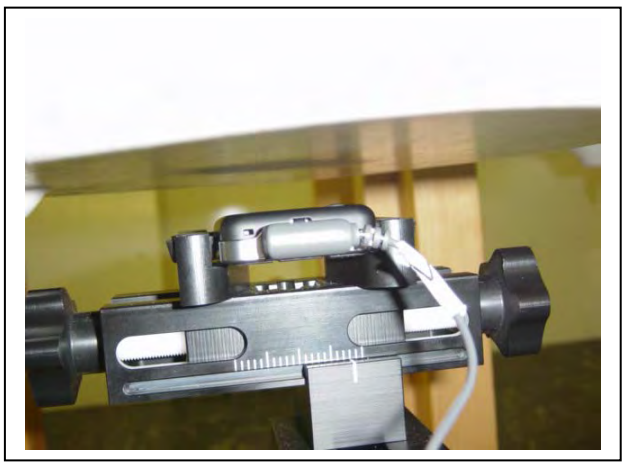
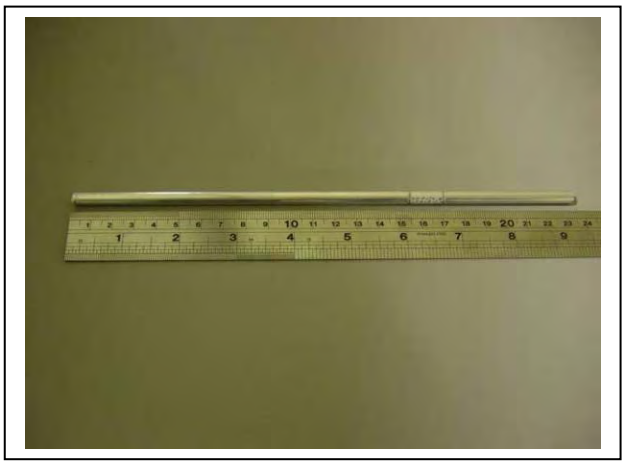
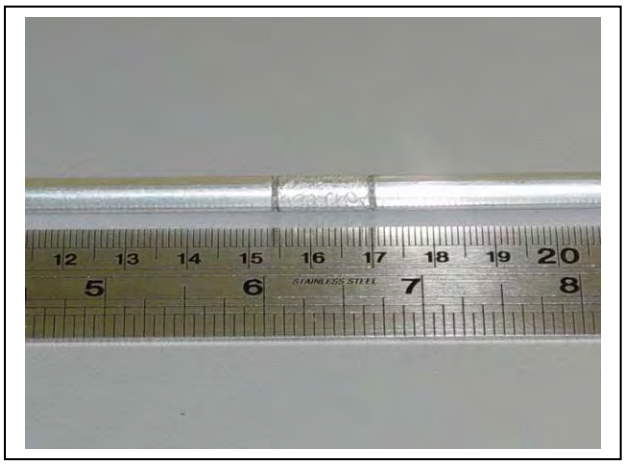




Device position against the body: 15mm distance from Phantom.

9.3 Photographs of TSL Fluid Depths





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

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Date
071025

Rev
A

Reference
File

1900 Head

1900 Body

Pictures showing Phantom fluid depths.

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9.4 Attachments

- Measurement plots and system validation
- Dipole calibration

Date/Time: 10/22/2007 1:47:57 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicolGPRS-LeftHandSide-GSM1900_Tilt_High

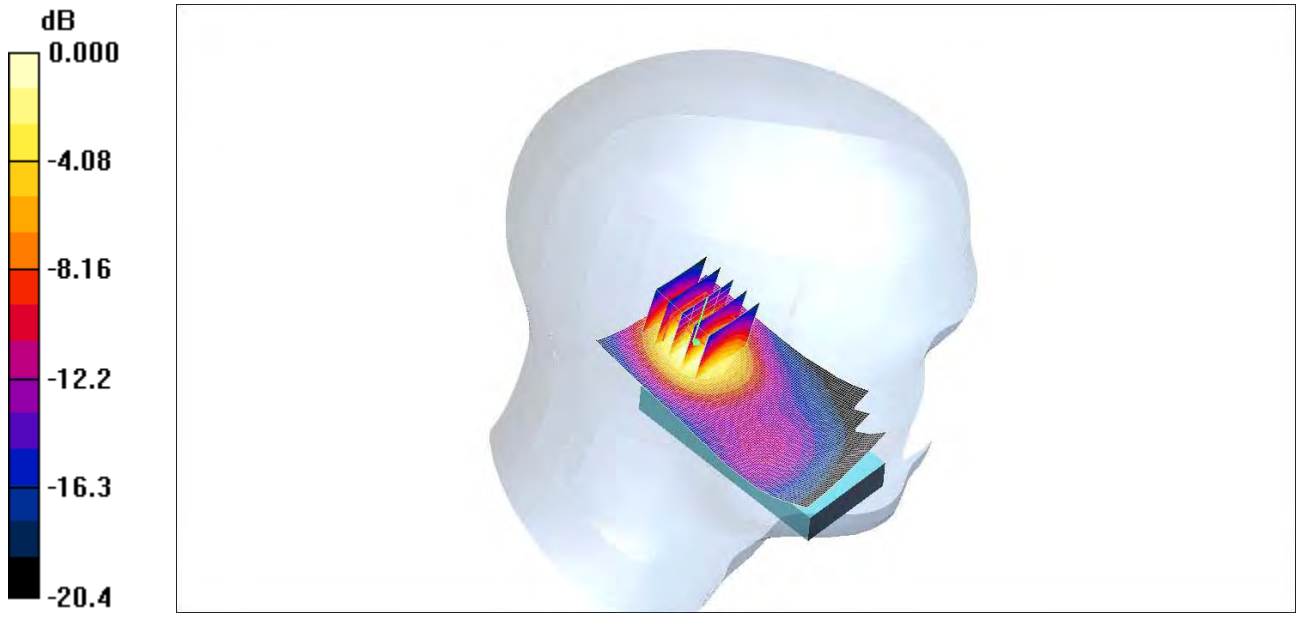
DUT: Nicole; Type: DUT; Serial: #9277

Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1909.8 MHz; σ = 1.48 mho/m; ε_r = 38.1; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.23, 5.23, 5.23); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Tilt position - High/Area Scan (71x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.28 mW/g
Tilt position - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.9 V/m; Power Drift = -0.084 dB
Peak SAR (extrapolated) = 2.05 W/kg
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.594 mW/g
Maximum value of SAR (measured) = 1.25 mW/g



0 dB = 1.25mW/g

Date/Time: 10/22/2007 1:23:24 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicolGPRS-LeftHandSide-GSM1900_Tilt_Low

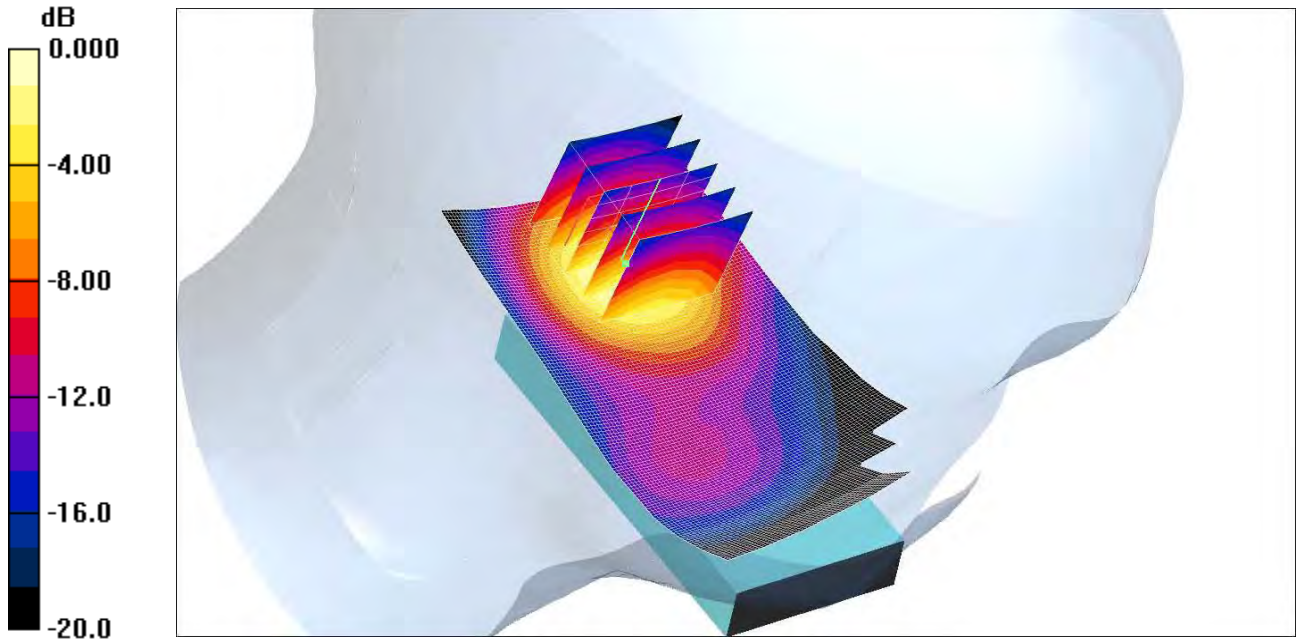
DUT: Nicole; Type: DUT; Serial: #9277

Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1850.2 MHz; σ = 1.42 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.23, 5.23, 5.23); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Tilt position - Low/Area Scan (71x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.848 mW/g
Tilt position - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.5 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.749 mW/g; SAR(10 g) = 0.394 mW/g
Maximum value of SAR (measured) = 0.820 mW/g



0 dB = 0.820mW/g

Date/Time: 10/22/2007 1:00:34 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicolGPRS-LeftHandSide-GSM1900_Tilt_Middle

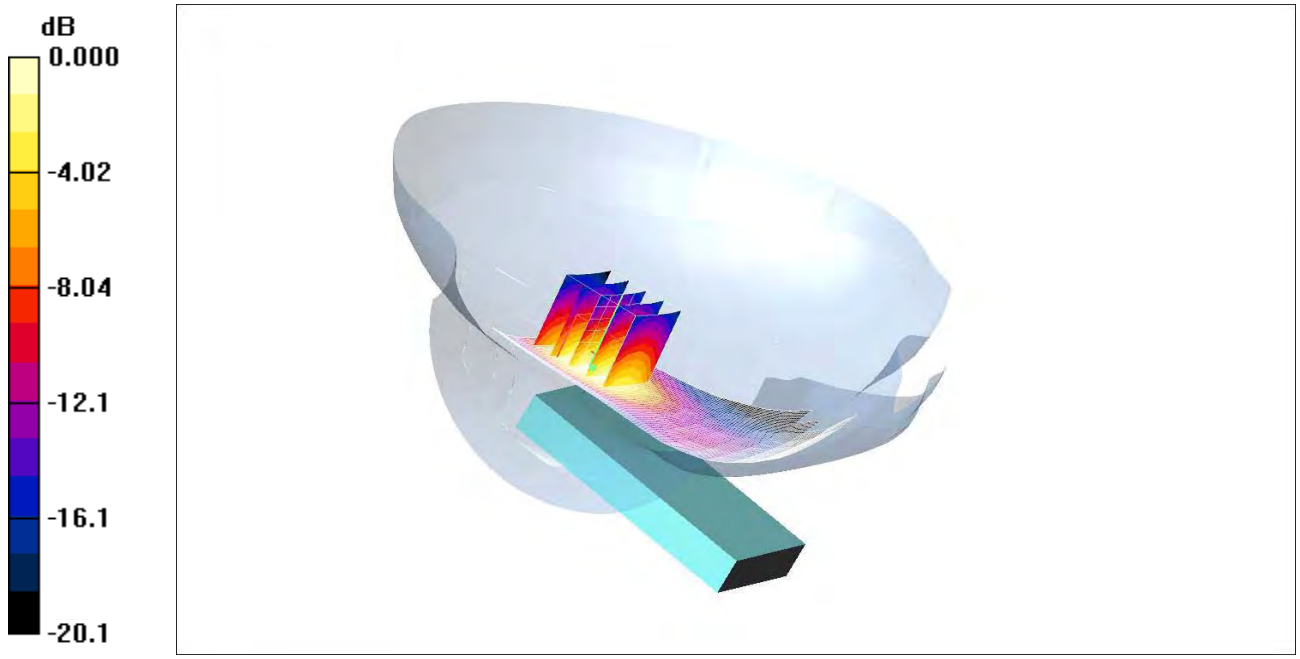
DUT: Nicole; Type: DUT; Serial: #9277

Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.23, 5.23, 5.23); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Tilt position - Middle/Area Scan (71x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.17 mW/g
Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 28.6 V/m; Power Drift = 0.013 dB
Peak SAR (extrapolated) = 1.80 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.541 mW/g
Maximum value of SAR (measured) = 1.12 mW/g



0 dB = 1.12mW/g

Date/Time: 10/22/2007 2:05:41 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicolGPRS-LeftHandSide-GSM1900_Touch_High

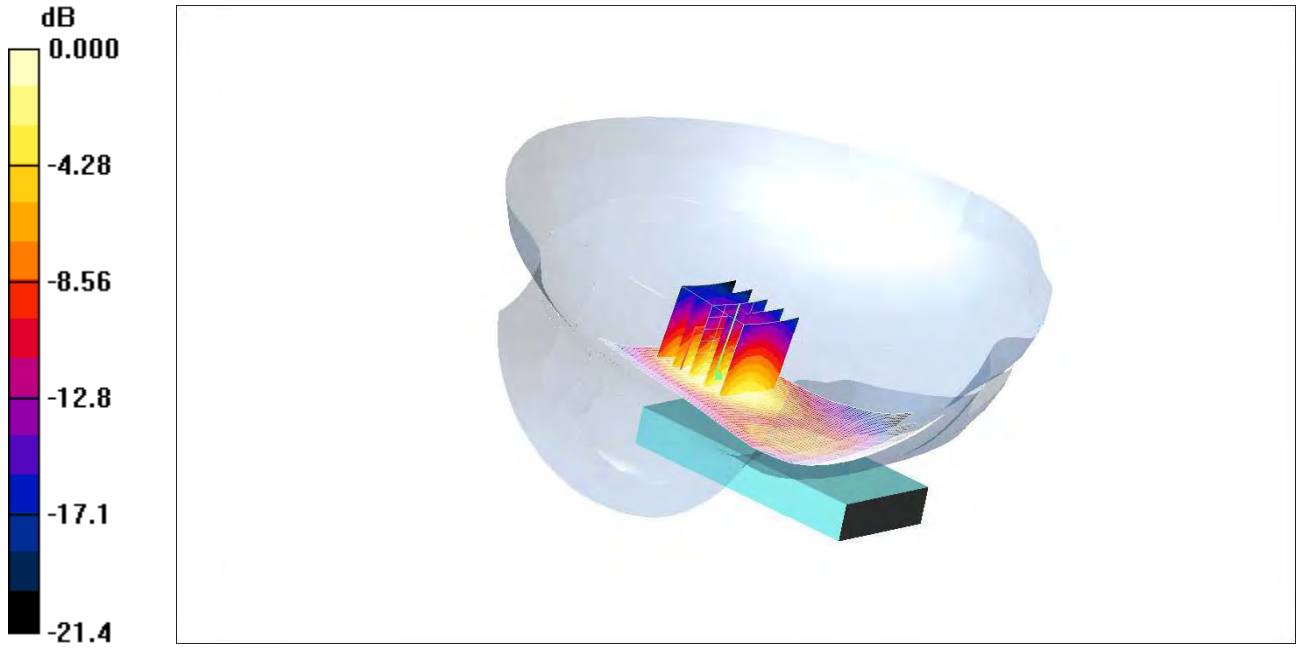
DUT: Nicole; Type: DUT; Serial: #9277

Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1909.8 MHz; σ = 1.48 mho/m; ε_r = 38.1; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.23, 5.23, 5.23); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Touch position - High/Area Scan (71x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.32 mW/g
Touch position - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.7 V/m; Power Drift = -0.010 dB
Peak SAR (extrapolated) = 2.07 W/kg
SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.605 mW/g
Maximum value of SAR (measured) = 1.32 mW/g



0 dB = 1.32mW/g

Date/Time: 10/22/2007 2:22:58 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicolGPRS-LeftHandSide-GSM1900_Touch_Low

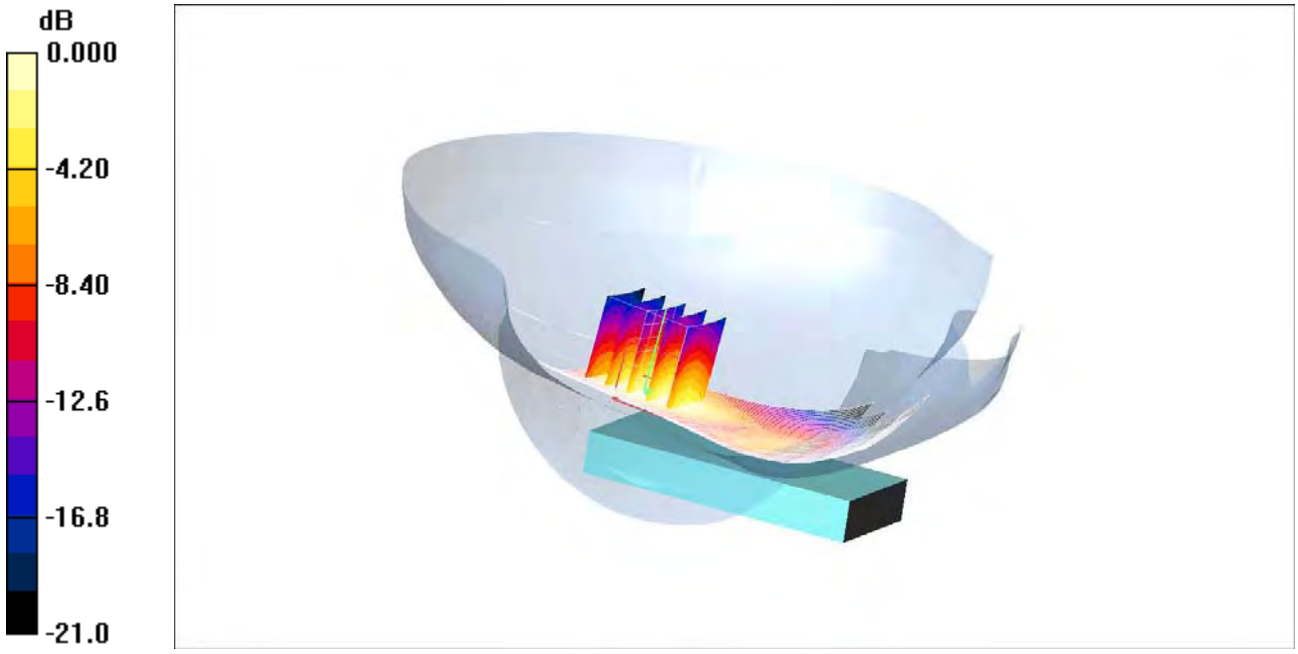
DUT: Nicole; Type: DUT; Serial: #9277

Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1850.2 MHz; σ = 1.42 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.23, 5.23, 5.23); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Touch position - Low/Area Scan (71x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.820 mW/g
Touch position - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.0 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 0.723 mW/g; SAR(10 g) = 0.382 mW/g
Maximum value of SAR (measured) = 0.815 mW/g



0 dB = 0.815mW/g

Date/Time: 10/22/2007 12:41:20 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicoleGPRS-LeftHandSide-GSM1900_Touch_Middle

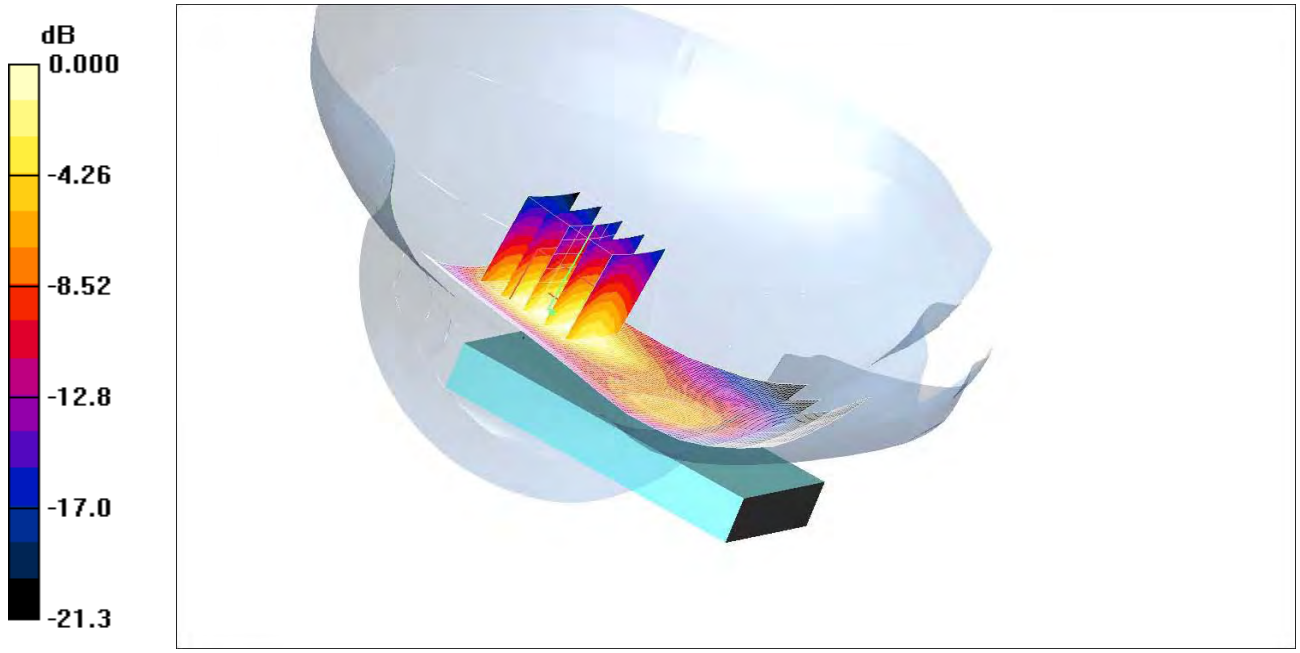
DUT: Nicole; Type: DUT; Serial: #9277

Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Left Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.23, 5.23, 5.23); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Touch position - Middle/Area Scan (71x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.11 mW/g
Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.2 V/m; Power Drift = 0.069 dB
Peak SAR (extrapolated) = 1.71 W/kg
SAR(1 g) = 0.974 mW/g; SAR(10 g) = 0.514 mW/g
Maximum value of SAR (measured) = 1.11 mW/g



0 dB = 1.11mW/g

Date/Time: 10/22/2007 12:03:53 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

Validation-D1900-22-10-07_Nicole

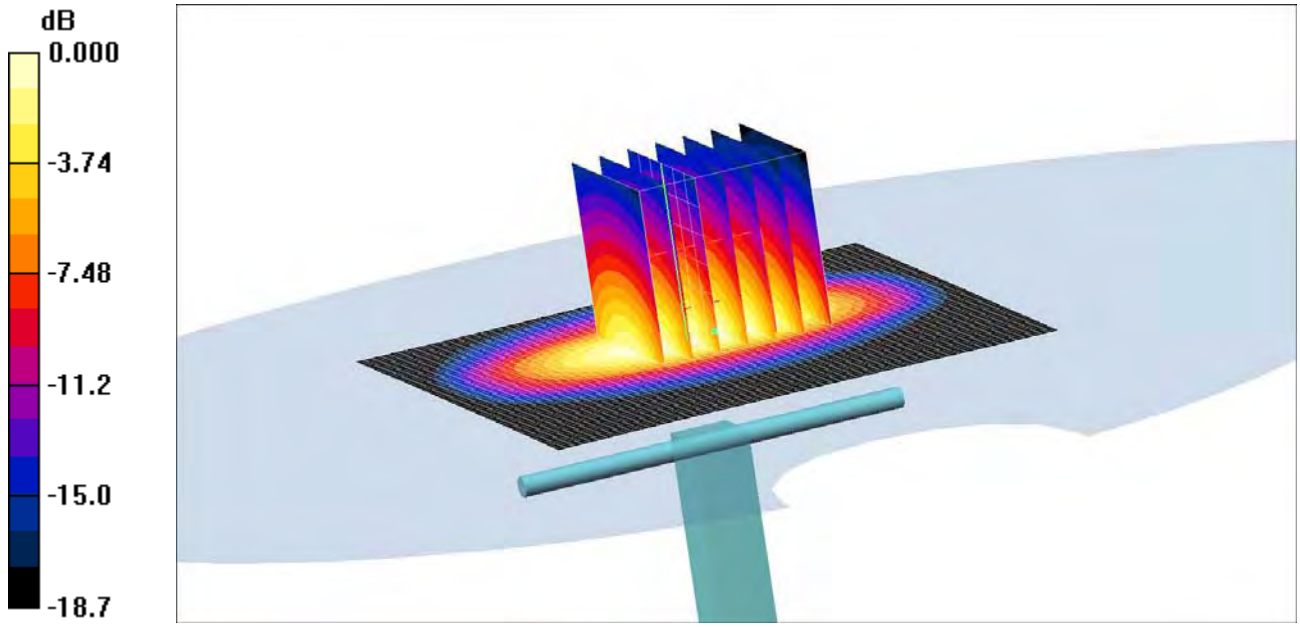
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:539

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.47 mho/m; ε_r = 38.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.23, 5.23, 5.23); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=10mm, Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 11.6 mW/g
d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 87.9 V/m; Power Drift = 0.047 dB
Peak SAR (extrapolated) = 16.1 W/kg
SAR(1 g) = 9.42 mW/g; SAR(10 g) = 4.95 mW/g
Maximum value of SAR (measured) = 10.6 mW/g



0 dB = 10.6mW/g

Date/Time: 10/23/2007 11:52:41 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicoleGPRS-Body15mm-Bluetooth-GSM1900-Body-High

DUT: Nicole; Type: DUT; Serial: #9277

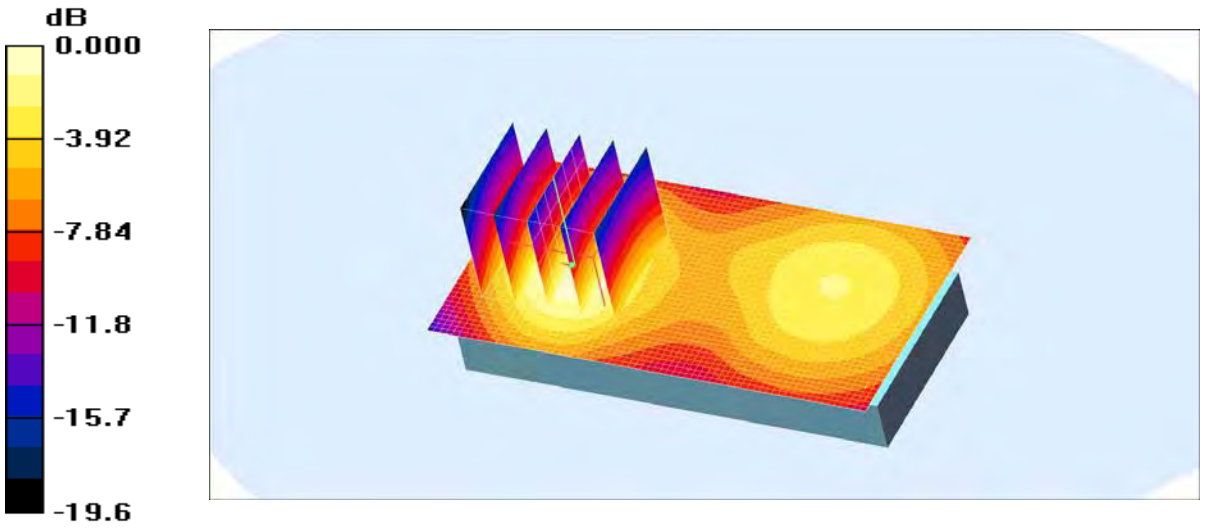
Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1909.8 MHz; σ = 1.61 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.71, 4.71, 4.71); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body 3/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.606 mW/g

Body 3/Zoom Scan (7x5x5)/Cube 0: Measurement grid: dx=5mm, dy=8mm, dz=8mm
Reference Value = 10.7 V/m; Power Drift = 0.002 dB
Peak SAR (extrapolated) = 0.931 W/kg
SAR(1 g) = 0.549 mW/g; SAR(10 g) = 0.304 mW/g
Maximum value of SAR (measured) = 0.612 mW/g



0 dB = 0.612mW/g

Date/Time: 10/23/2007 11:30:22 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicoleGPRS-Body15mm-Bluetooth-GSM1900-Body-Low

DUT: Nicole; Type:DUT; Serial: #9277

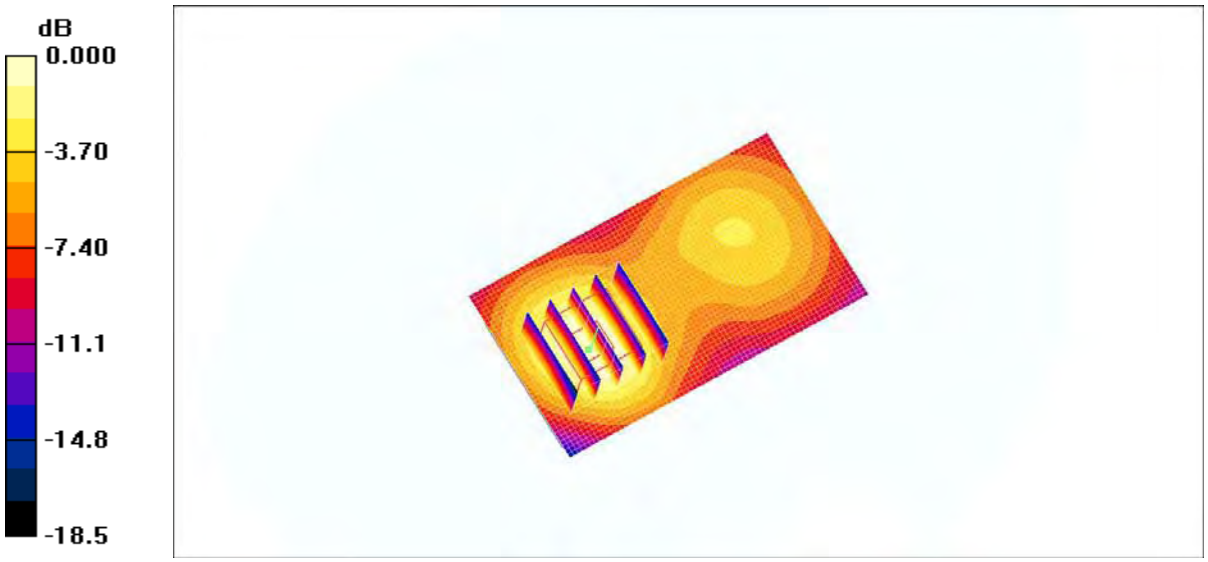
Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1850.2 MHz; σ = 1.54 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.71, 4.71, 4.71); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.486 mW/g

Body/Zoom Scan (7x5x5)/Cube 0: Measurement grid: dx=5mm, dy=8mm, dz=8mm
Reference Value = 9.81 V/m; Power Drift = -0.002 dB
Peak SAR (extrapolated) = 0.713 W/kg
SAR(1 g) = 0.437 mW/g; SAR(10 g) = 0.248 mW/g
Maximum value of SAR (measured) = 0.486 mW/g



0 dB = 0.486mW/g

Date/Time: 10/23/2007 11:41:42 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicoleGPRS-Body15mm-Bluetooth-GSM1900-Body-Middle

DUT: Nicole; Type: DUT; Serial: #9277

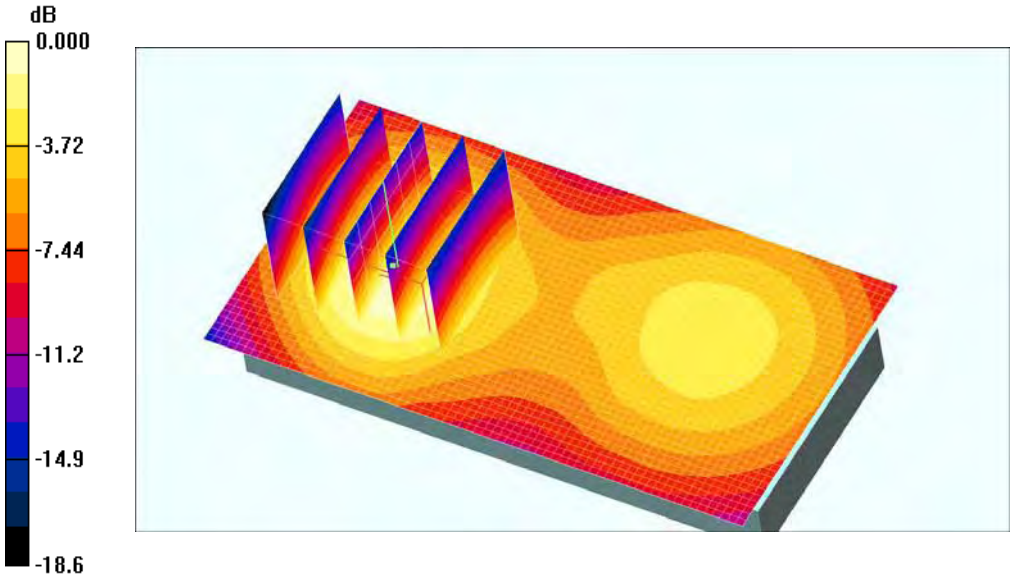
Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.57 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.71, 4.71, 4.71); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body 2/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.519 mW/g

Body 2/Zoom Scan (7x5x5)/Cube 0: Measurement grid: dx=5mm, dy=8mm, dz=8mm
Reference Value = 10.7 V/m; Power Drift = -0.008 dB
Peak SAR (extrapolated) = 0.793 W/kg
SAR(1 g) = 0.475 mW/g; SAR(10 g) = 0.266 mW/g
Maximum value of SAR (measured) = 0.529 mW/g



0 dB = 0.529mW/g

Date/Time: 10/23/2007 11:08:42 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicoleGPRS-Body15mm-GPRS-GSM1900G-GPRS-AntennaFaceDown-High

DUT: Nicole; Type: DUT; Serial: #9277

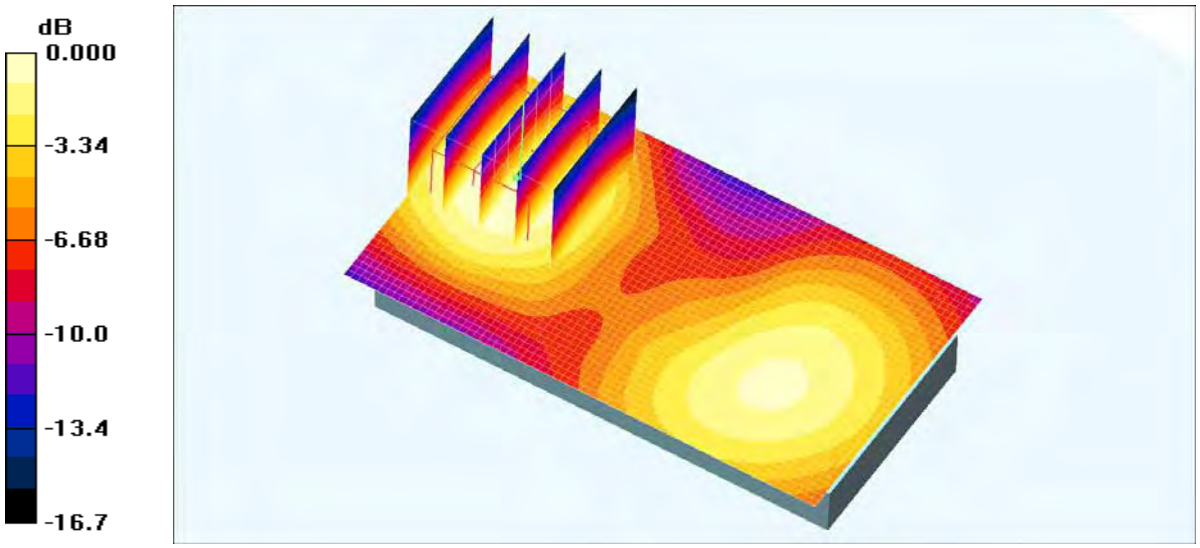
Communication System: GPRS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1909.8 MHz; σ = 1.61 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.71, 4.71, 4.71); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Front to Phantom/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.386 mW/g

Body Front to Phantom/Zoom Scan (7x5x5)/Cube 0: Measurement grid: dx=5mm, dy=8mm, dz=8mm
Reference Value = 7.38 V/m; Power Drift = -0.034 dB
Peak SAR (extrapolated) = 0.519 W/kg
SAR(1 g) = 0.331 mW/g; SAR(10 g) = 0.199 mW/g
Maximum value of SAR (measured) = 0.360 mW/g



0 dB = 0.360mW/g

Date/Time: 10/23/2007 10:55:06 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicoleGPRS-Body15mm-GPRS-GSM1900G-GPRS-High

DUT: Nicole; Type: DUT; Serial: #9277

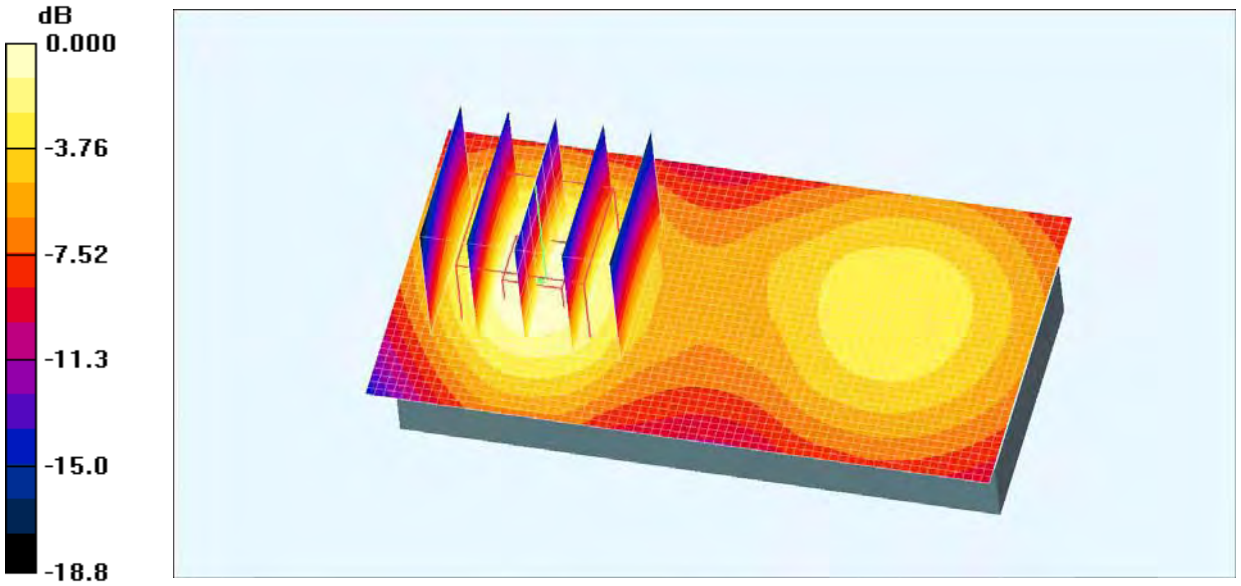
Communication System: GPRS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1909.8 MHz; σ = 1.61 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.71, 4.71, 4.71); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body 3/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.03 mW/g

Body 3/Zoom Scan (7x5x5)/Cube 0: Measurement grid: dx=5mm, dy=8mm, dz=8mm
Reference Value = 13.9 V/m; Power Drift = 0.003 dB
Peak SAR (extrapolated) = 1.58 W/kg
SAR(1 g) = 0.931 mW/g; SAR(10 g) = 0.512 mW/g
Maximum value of SAR (measured) = 1.04 mW/g



0 dB = 1.04mW/g

Date/Time: 10/23/2007 10:28:39 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicoleGPRS-Body15mm-GPRS-GSM1900G-GPRS-Low

DUT: Nicole; Type: DUT; Serial:#9277

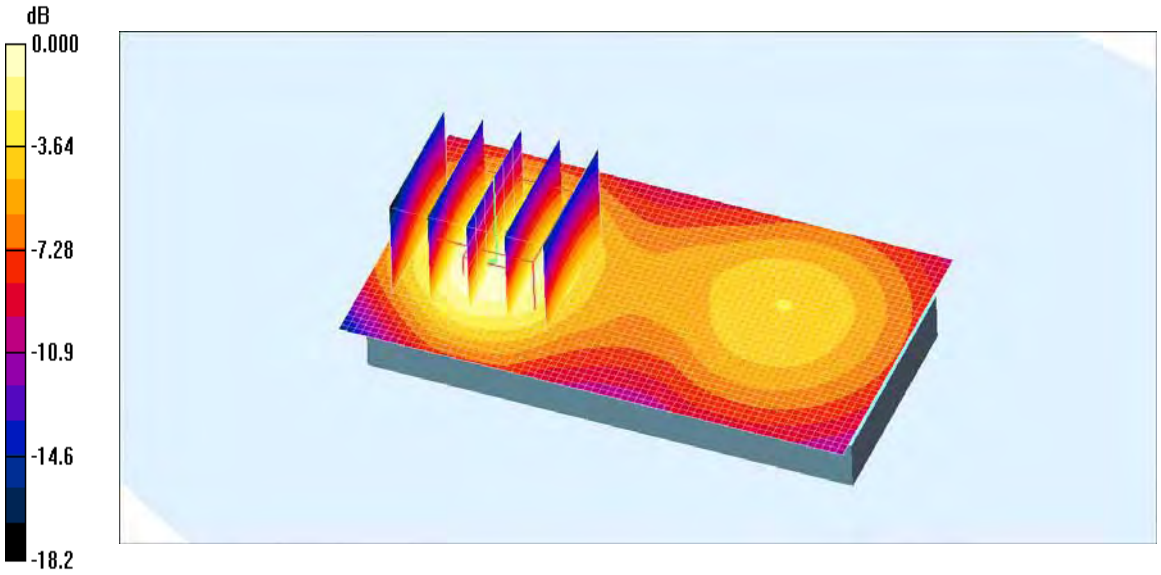
Communication System: GPRS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1850.2 MHz; σ = 1.54 mho/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.71, 4.71, 4.71); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.743 mW/g

Body/Zoom Scan (7x5x5)/Cube 0: Measurement grid: dx=5mm, dy=8mm, dz=8mm
Reference Value = 12.0 V/m; Power Drift = 0.092 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.671 mW/g; SAR(10 g) = 0.381 mW/g
Maximum value of SAR (measured) = 0.747 mW/g



0 dB = 0.747mW/g

Date/Time: 10/23/2007 10:42:27 AM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicoleGPRS-Body15mm-GPRS-GSM1900G-GPRS-Middle

DUT: Nicole; Type: DUT; Serial: #9277

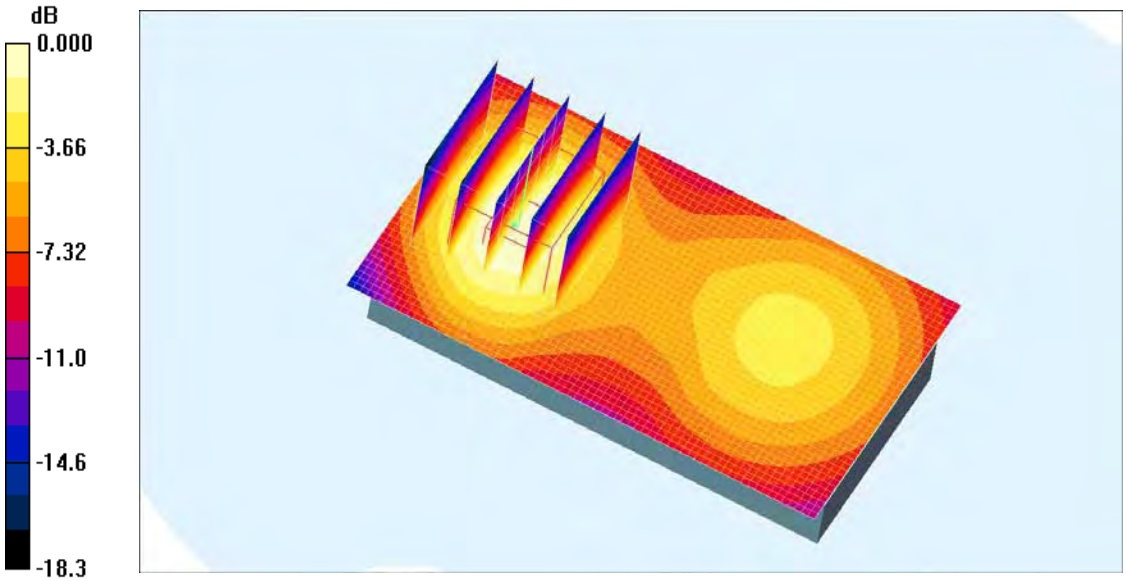
Communication System: GPRS 1900; Frequency: 1880 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1880 MHz; σ = 1.57 mho/m; ε_r = 54.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.71, 4.71, 4.71); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body 2/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.834 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 = 0.326 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.794 mW/g; SAR(10 g) = 0.445 mW/g
Maximum value of SAR (measured) = 0.876 mW/g



0 dB = 0.876mW/g

Date/Time: 10/23/2007 12:08:28 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicoleGPRS-Body15mm-PHF-GSM1900-PHF-High

DUT: Nicole; Type: DUT; Serial:#9277

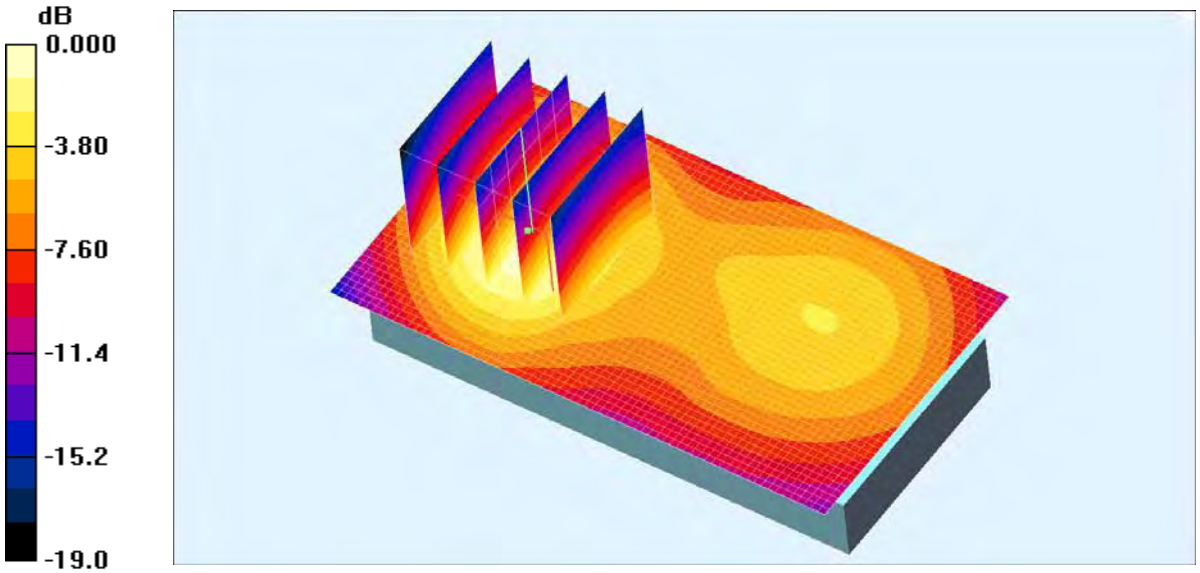
Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1909.8 MHz; σ = 1.61 mho/m; ε_r = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(4.71, 4.71, 4.71); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-3; Type: SAM; Serial: 1436
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.595 mW/g

Body/Zoom Scan (7x5x5)/Cube 0: Measurement grid: dx=5mm, dy=8mm, dz=8mm
Reference Value = 11.2 V/m; Power Drift = 0.001 dB
Peak SAR (extrapolated) = 0.943 W/kg
SAR(1 g) = 0.551 mW/g; SAR(10 g) = 0.307 mW/g
Maximum value of SAR (measured) = 0.617 mW/g



0 dB = 0.617mW/g

Date/Time: 10/22/2007 3:59:54 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicolGPRS-RightHandSide-GSM1900-Tilt-High

DUT: Nicole; Type: DUT; Serial: #9277

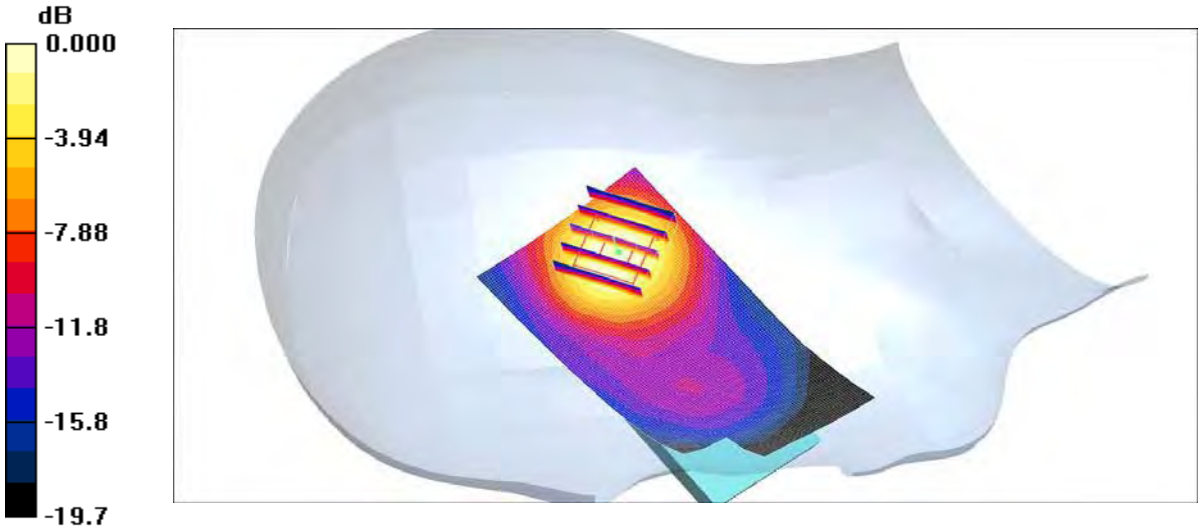
Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1909.8 MHz; σ = 1.48 mho/m; ε_r = 38.1; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.23, 5.23, 5.23); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Tilt position - High/Area Scan (71x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.12 mW/g

Tilt position - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.6 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 1.61 W/kg
SAR(1 g) = 0.952 mW/g; SAR(10 g) = 0.504 mW/g
Maximum value of SAR (measured) = 1.06 mW/g



0 dB = 1.06mW/g

Date/Time: 10/22/2007 3:40:23 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicolGPRS-RightHandSide-GSM1900-Tilt-Low

DUT: Nicole; Type: DUT; Serial: #9277

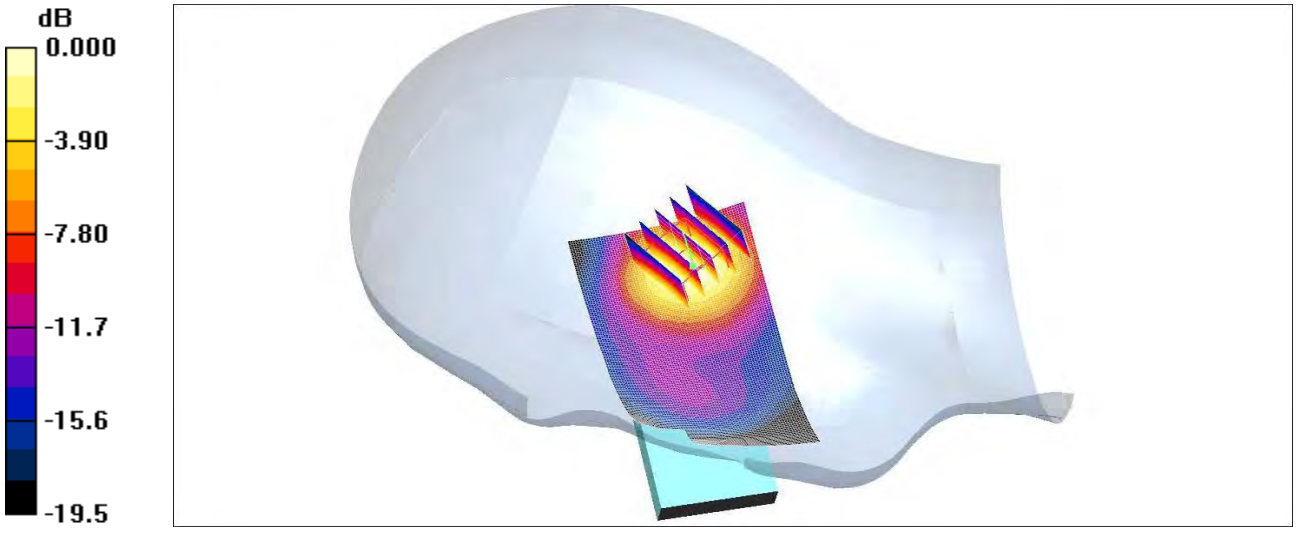
Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1850.2 MHz; σ = 1.42 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.23, 5.23, 5.23); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Tilt position - Low/Area Scan (71x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.776 mW/g

Tilt position - Low/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.7 V/m; Power Drift = 0.012 dB
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.673 mW/g; SAR(10 g) = 0.361 mW/g
Maximum value of SAR (measured) = 0.759 mW/g



0 dB = 0.759mW/g

Date/Time: 10/22/2007 3:14:32 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicolGPRS-RightHandSide-GSM1900-Tilt-Middle

DUT: Nicole; Type: DUT; Serial: #9277

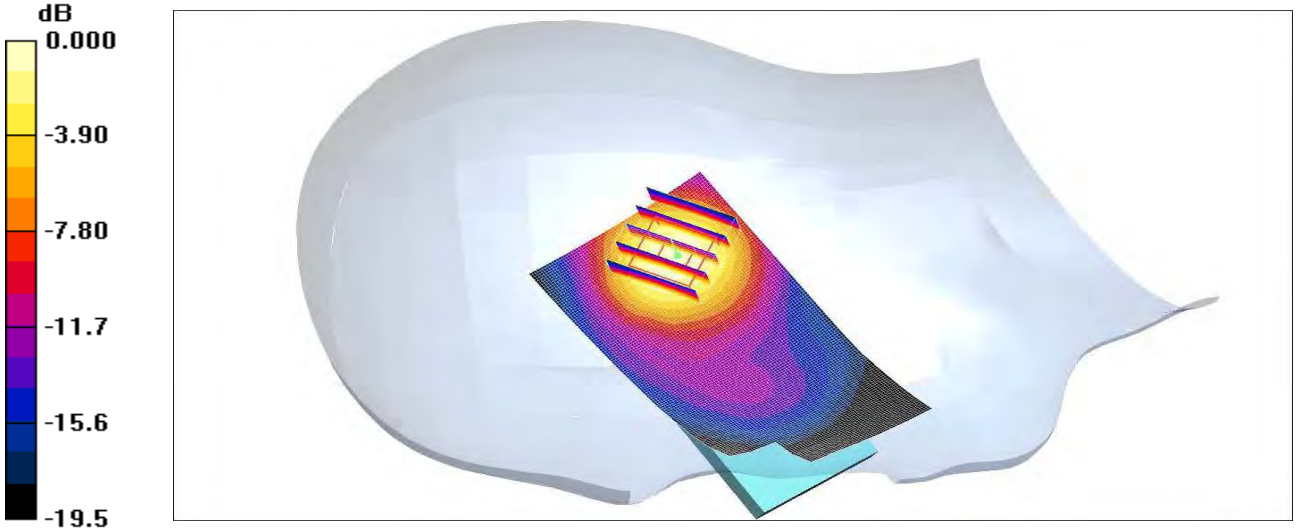
Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.23, 5.23, 5.23); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Tilt position - Middle/Area Scan (71x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.980 mW/g

Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 24.2 V/m; Power Drift = 0.026 dB
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 0.854 mW/g; SAR(10 g) = 0.455 mW/g
Maximum value of SAR (measured) = 0.962 mW/g



0 dB = 0.962mW/g

Date/Time: 10/22/2007 2:53:48 PM

Test Laboratory: Sony Ericsson Mobile Communications International AB

NicolGPRS-RightHandSide-GSM1900-Touch-Middle

DUT: Nicole; Type: DUT; Serial: #9277

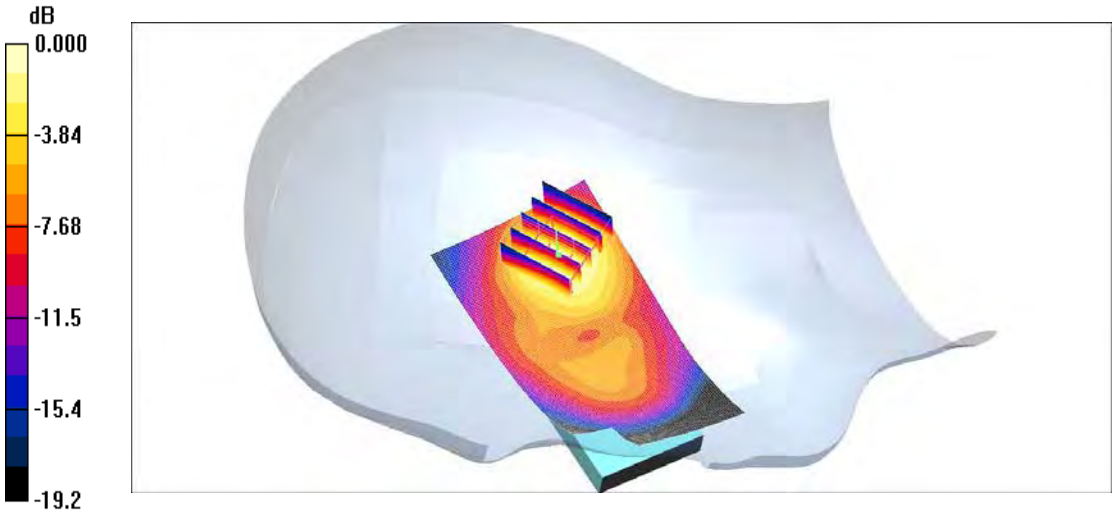
Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.45 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Right Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1610; ConvF(5.23, 5.23, 5.23); Calibrated: 11/17/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn449; Calibrated: 12/7/2006
- Phantom: SAM-1; Type: SAM; Serial: 1437
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Touch position - Middle/Area Scan (71x131x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.829 mW/g

Touch position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.5 V/m; Power Drift = -0.013 dB
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.722 mW/g; SAR(10 g) = 0.400 mW/g
Maximum value of SAR (measured) = 0.805 mW/g



0 dB = 0.805mW/g

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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 ± 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

	Name	Function	Signature
Calibrated by:	Eric Hainfeld	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: December 7, 2006

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 =	6.1μV ,	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 ± 0.1% (k=2)	404.953 ± 0.1% (k=2)	404.526 ± 0.1% (k=2)
Low Range	3.92993 ± 0.7% (k=2)	3.94909 ± 0.7% (k=2)	3.95026 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	233 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Input (μV)	Reading (μV)	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 (μV)	Reading (μV)	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 (μV)	Low Range Average Reading (μV)
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 (μV)	Channel Y (μV)	Channel Z (μV)
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 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
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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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

	Name	Function	Signature
Calibrated by:	Mike Meili	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

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:

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 V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Area Scan Resolution	dx, dy = 15 mm	
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 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 ± 0.2) °C	38.4 ± 6 %	1.40 mho/m ± 6 %
Head TSL temperature during test	(21.2 ± 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	9.18 mW / g
SAR normalized	normalized to 1W	36.7 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**35.9 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	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 [1]	normalized to 1W	**19.1 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	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 cm³ (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 [2]	normalized to 1W	**37.0 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (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 [2]	normalized to 1W	**19.8 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	54.1 Ω + 0.9 jΩ
Return Loss	- 27.9 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.0 Ω + 2.7 jΩ
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; σ = 1.4 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

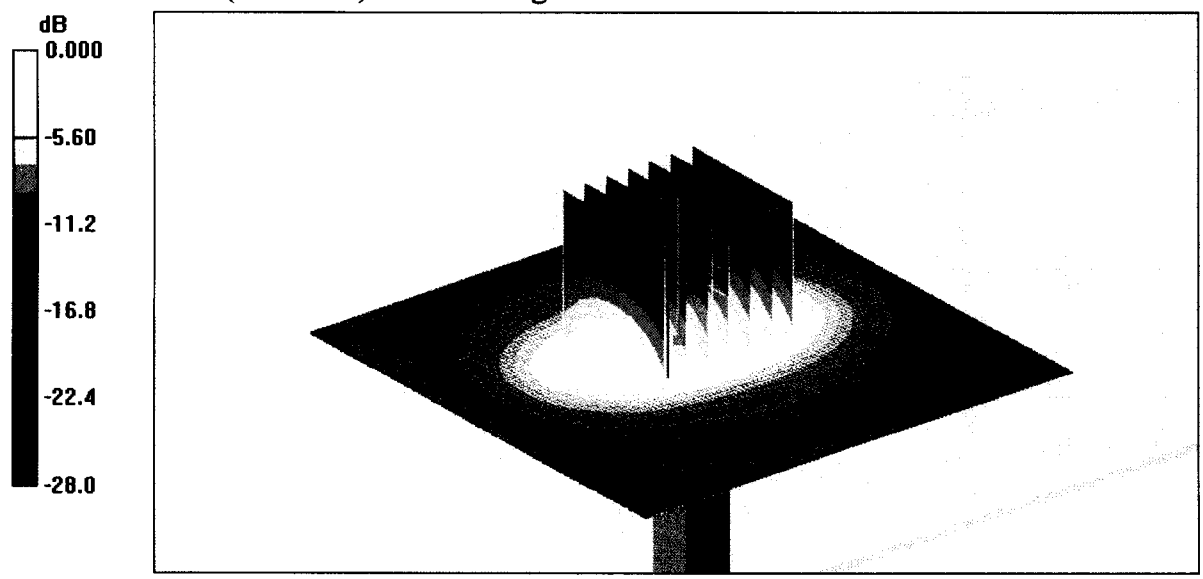
- Probe: ET3DV6 - SN1507 (HF); ConvF(4.97, 4.97, 4.97); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD,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

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

Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 10.3 mW/g

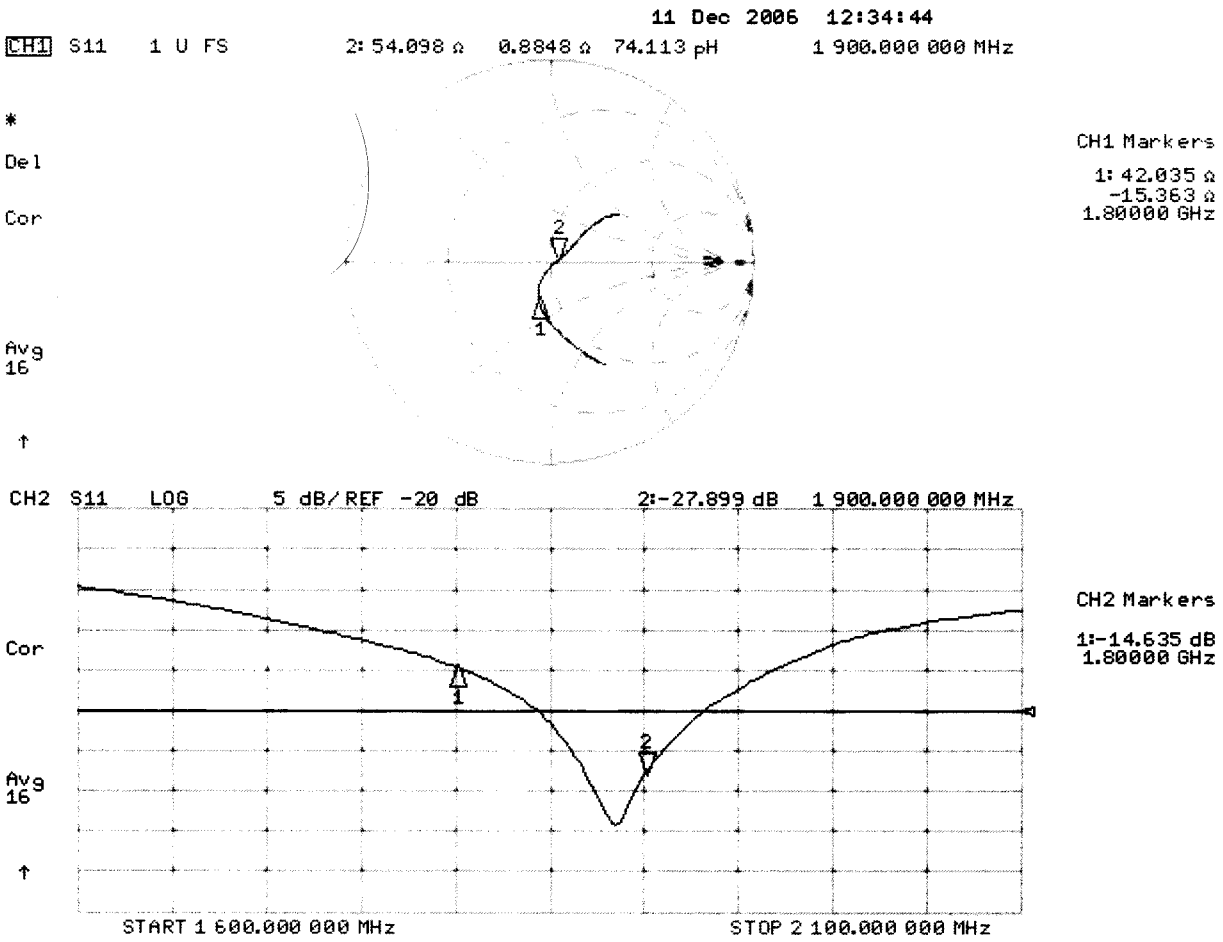
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

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



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

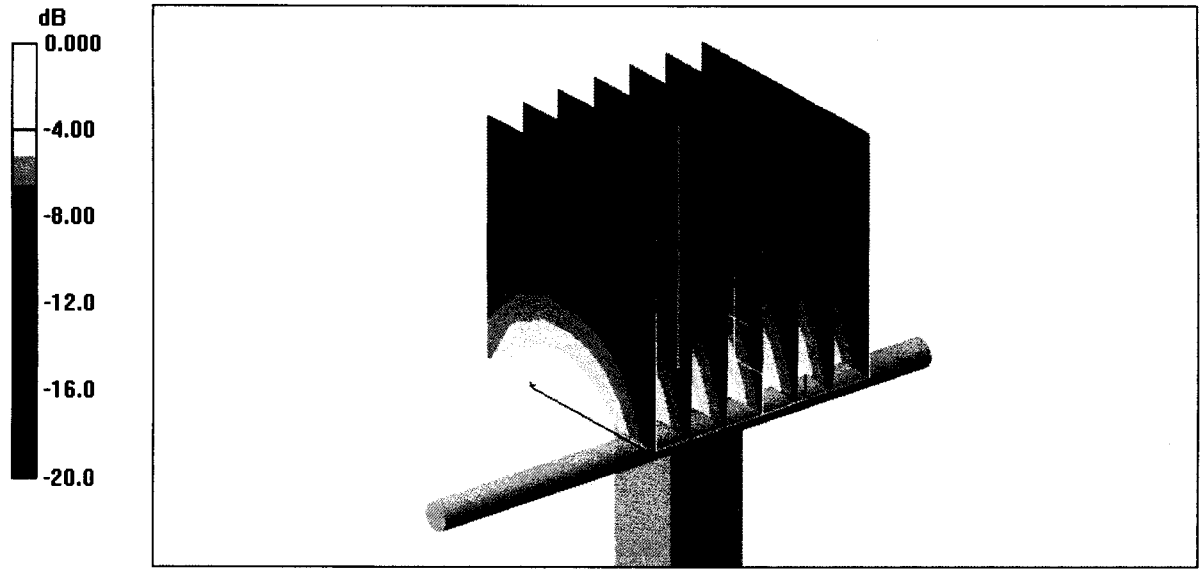
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL U10 BB;
Medium parameters used: f = 1900 MHz; σ = 1.54 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

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

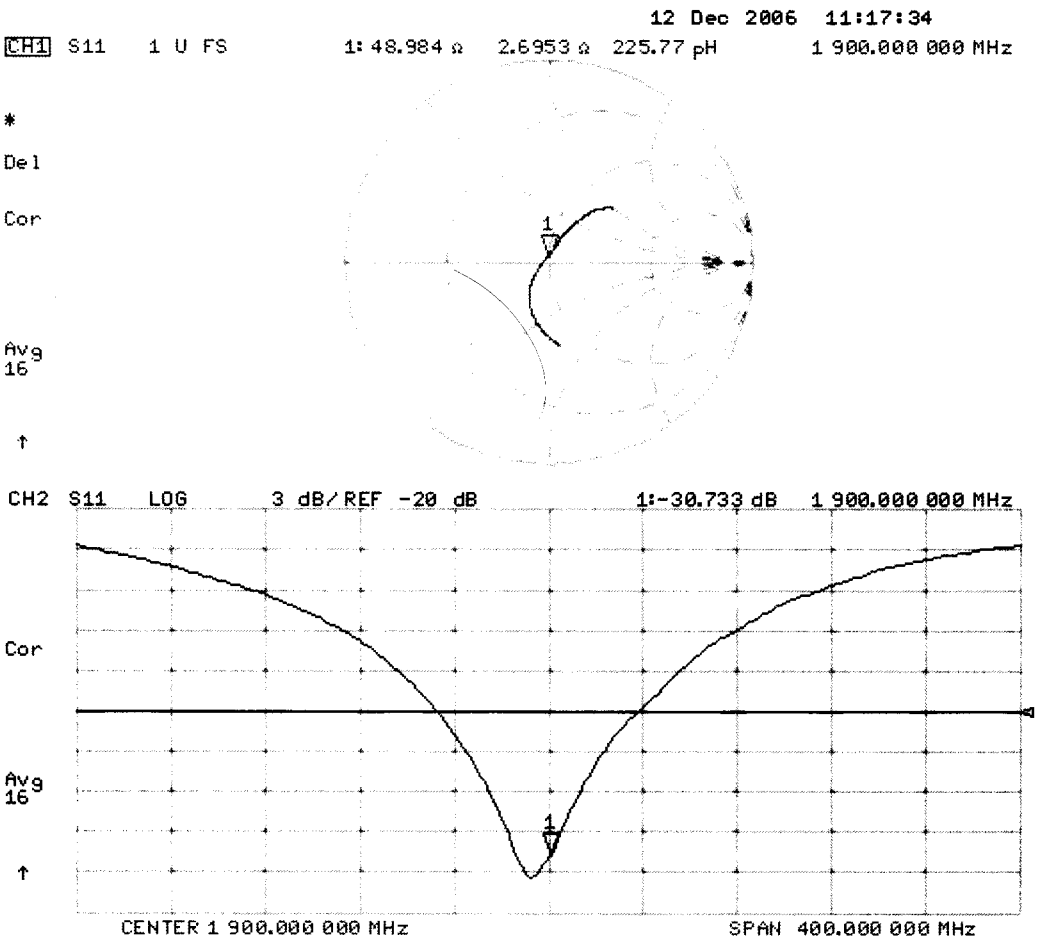
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.4 V/m; Power Drift = -0.001 dB
Peak SAR (extrapolated) = 15.8 W/kg
SAR(1 g) = 9.49 mW/g; SAR(10 g) = 5.05 mW/g
Maximum value of SAR (measured) = 10.5 mW/g



0 dB = 10.5mW/g

Impedance Measurement Plot for Body TSL



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Client Ericsson UK

Certificate No: ET3-1610_Nov06

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1610
Calibration procedure(s)	QA CAL-01.v6 Calibration procedure for dosimetric E-field probes
Calibration date:	November 17, 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: November 17, 2006

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Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,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:

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

Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,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*.
- *DCPx,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 *NORMx,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:1610

Manufactured:	July 27, 2001
Last calibrated:	June 13, 2005
Recalibrated:	November 17, 2006

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1610

Sensitivity in Free Space[A]

Diode Compression[B]

NormX	**1.75** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**93** mV
NormY	**1.71** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**97** mV
NormZ	**1.73** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**95** 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	8.8	4.8
SAR_{be} [%]	With Correction Algorithm	0.1	0.2

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	12.3	8.3
SAR_{be} [%]	With Correction Algorithm	1.0	0.2

Sensor Offset

Probe Tip to Sensor Center	**2.7** mm

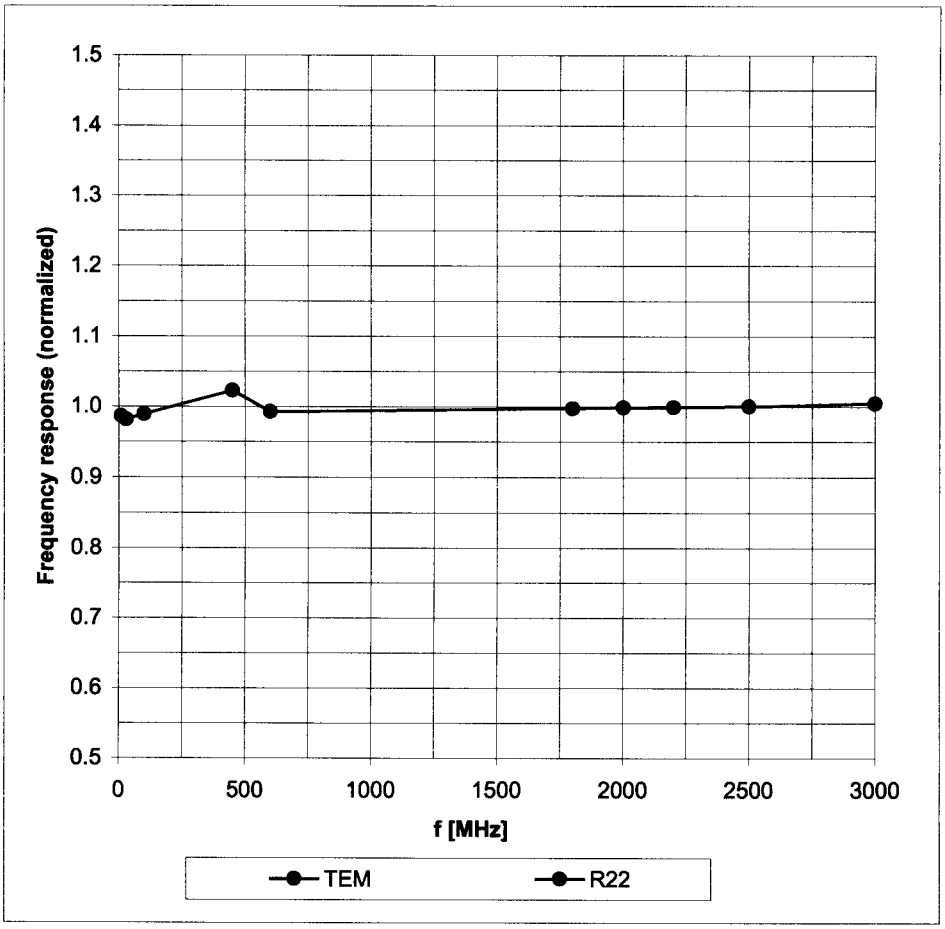
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

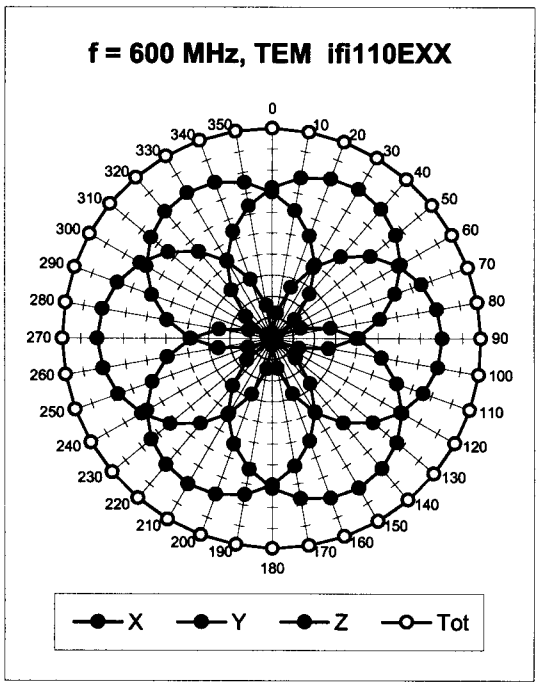
Frequency Response of E-Field

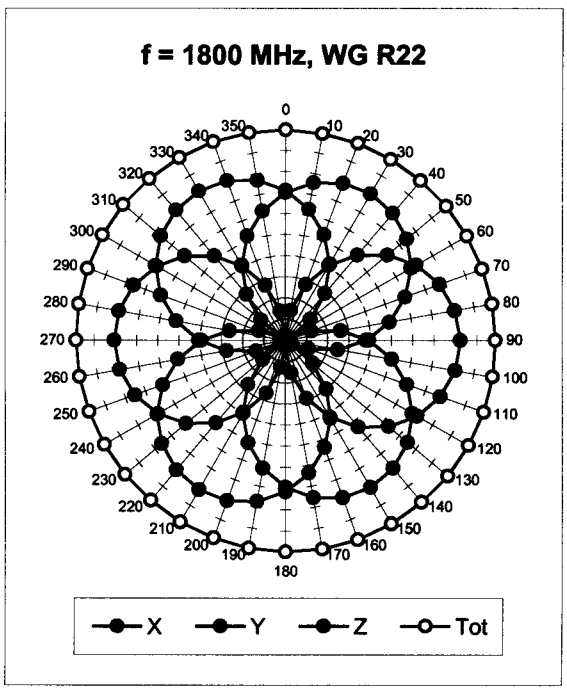
(TEM-Cell:ifi110 EXX, Waveguide: R22)

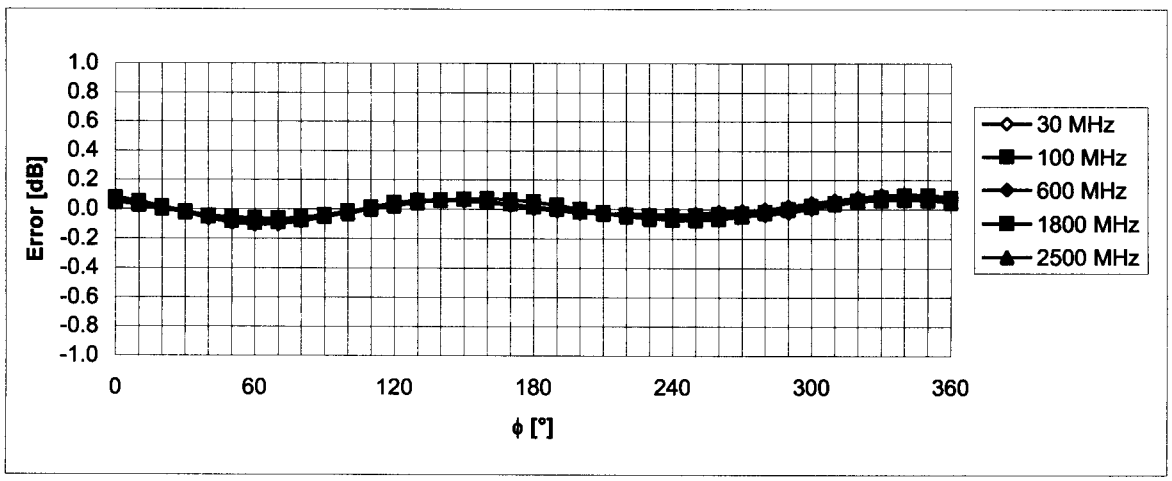


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



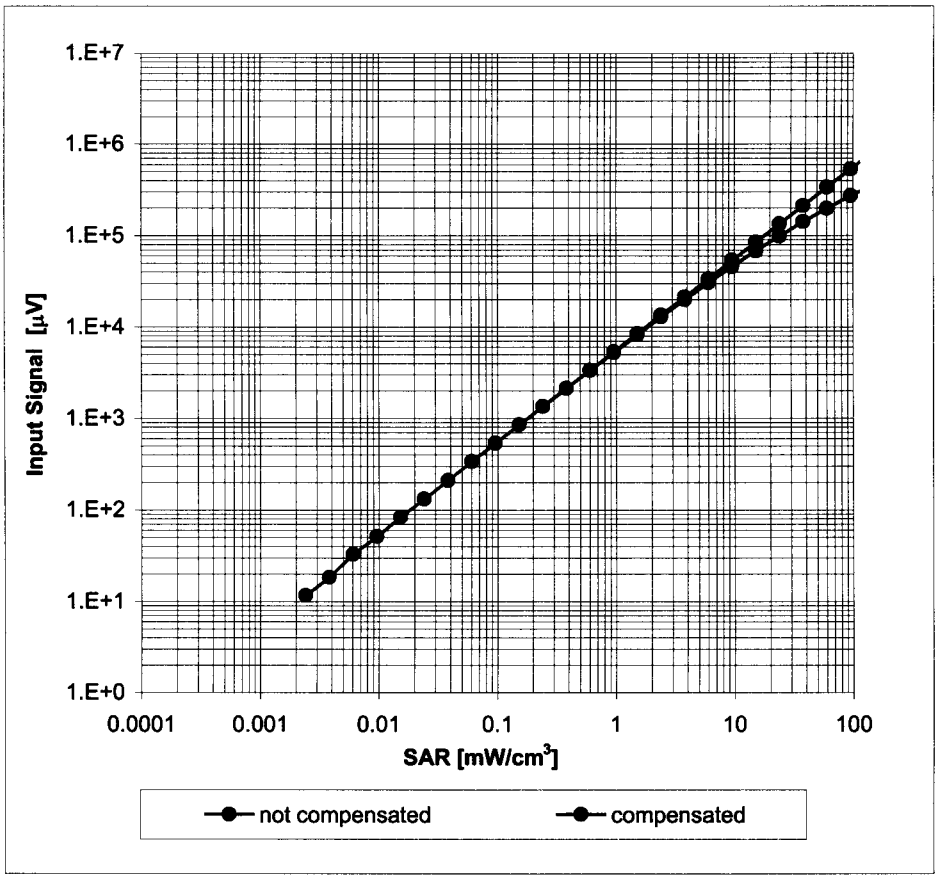


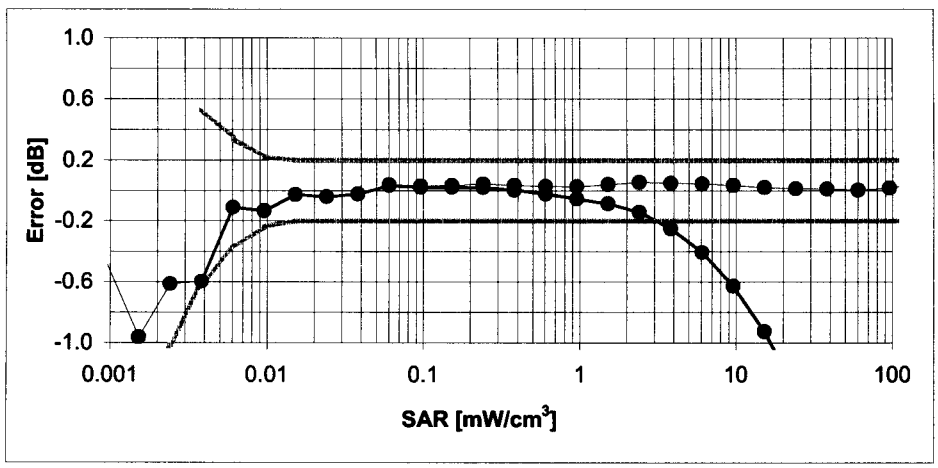


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

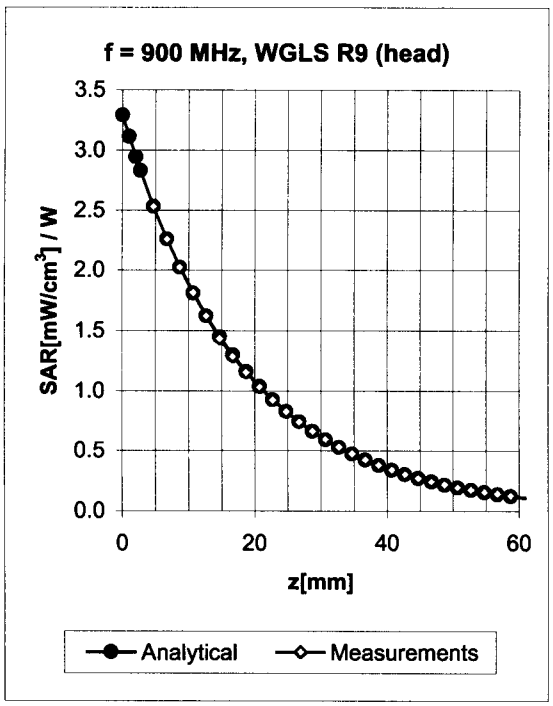
(Waveguide R22, f = 1800 MHz)

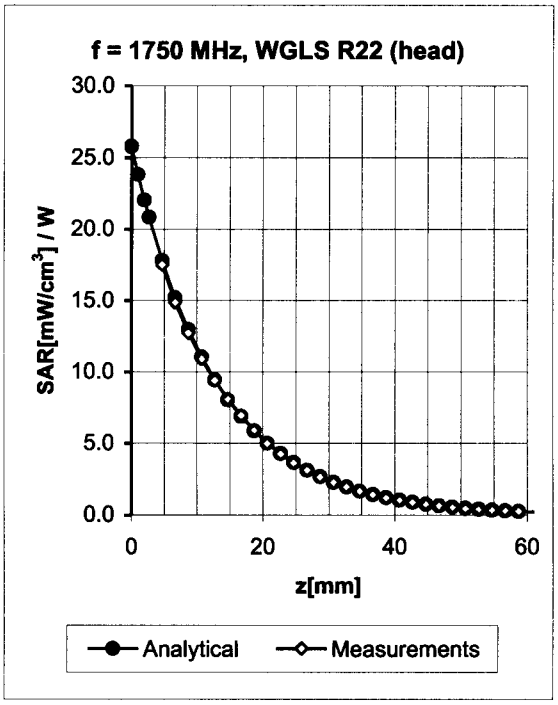




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



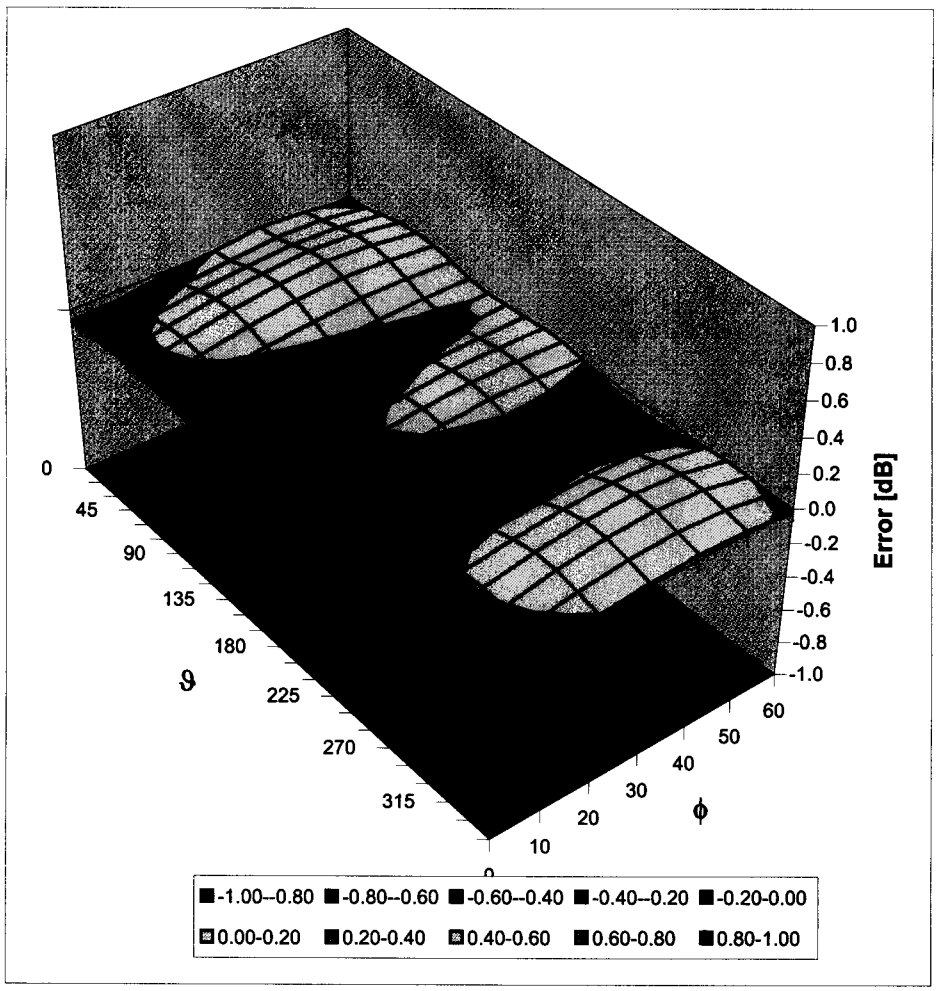


f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.28	2.61	6.68 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.26	2.83	6.52 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.57	2.47	5.42 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.58	2.62	5.23 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.70	2.07	4.73 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.31	2.72	6.21 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.30	2.79	6.11 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.54	2.90	4.86 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.70	2.43	4.71 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.73	1.79	4.19 ± 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: ± 2.6% (k=2)