Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
LD/SEMC/BGLIM *Hamid Kami Shirazi*		*BGLI07:184*		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGLIM/C *Peter Lindeborg*	*070528*	*070525*	A	File

Report issued by Accredited SAR Laboratory

For

PY7A3022091 (K530i)

Date of test: *23, 24 May 2007*

Laboratory:
SAR Test Laboratory
Sony Ericsson Mobile Communications AB
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Testing Approval
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Sign

Statement of Compliance

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

Sony Ericsson Type AAD-3022091-BV; FCC ID: PY7A3022091; IC:4170A-3022091

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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LD/SEMC/BGLI/NMC *Peter Lindeborg*	*070528*	*070525*	A	File

1 Table of contents

2 Introduction

In this test report, compliance of the Sony Ericsson PY7A3022091 (K530i) 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].

3 Device under Test

3.1 Antenna Description

Type	Internal antenna	
Location	Inside, Back, at the top	
Dimensions	Max length	32mm
	Max width	24mm
Configuration	PIFA	

3.2 Device description

Device model	**PY7A3022091(K530i)**		
Serial number	**CB5AB92YV#7629**		
Mode	**GSM1900**		
Crest Factor	**8.3**		
Multiple Access Scheme	**TDMA**		
Maximum Output Power Setting (dBm)	**Ch512**	**Ch661**	**Ch810**
	29.2	**29.2**	**29.2**
Factory Tolerance in Power Setting	**±0.5dB**		
Maximum Peak Output Power (dBm)	**29.7**	**29.7**	**29.7**
Data and connectivity	**GPRS Class: 10 Capability Class: B**		
Maximum Output Power Setting (dBm)	**Ch512**	**Ch661**	**Ch810**
	28.0	**28.0**	**28.0**
Factory Tolerance in Power Setting	**±0.5dB**		
Maximum Peak Output Power (dBm)	**28.5**	**28.5**	**28.5**
Transmitting Frequency Range(MHz)	**1850.2 – 1909.8**		
Prototype or Production Unit	**Preproduction (HW-EP2.1)**		
Device Category	**Portable**		
RF exposure environment	**General population / uncontrolled**		

4 Test equipment

4.1 Dosimetric system

SAR measurements were made using the DASY4 professional system (software version 4.7, Build 53) with SAM twin phantom, manufactured by Schmid & Partner Engineering AG (SPEAG). The list of calibrated equipment is given below.

Description	***Serial Number***	***Due Date***
DASY DAE V1	428	18 Jan. 2008
E-field probe ETDV6	1815	16 Jan. 2008
Dipole Validation Kit, D1900V2	5d073	31 May 2008

4.2 Additional equipment

Description	***Inventory Number***	***Due Date***
Signal generator R&S SML03	INV 20007667	24 Mars. 2008
Power meter R&S NRVZ	INV 20007669	23 Mars. 2008
Power sensor R&S NRV-Z5	INV 20007672	23 Mars. 2008
Power sensor R&S NRV-Z5	INV 20007673	23 Mars. 2008
Network analyzer HP8753C	INV421671	23 Mars. 2008
S-parameter test set HP85047A	INV 421670	23 Mars. 2008
Directional Coupler	S/N 062	23 Mars. 2008
Dielectric probe kit HP8507D	INV 200 000 53	Self calibrated
CMU200	INV 20002149	23 Mars. 2008

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5 Electrical parameters on the tissue simulating liquid

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

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters		
			ε_r	σ (S/m)	ρ (g/cm³)
1900	Head	**Measured, 22/May/2007**	38.2	1.45	1.00
		Recommended	40.0	1.40	1.00
	Body	**Measured, 23/May/2007**	51.2	1.54	1.00
		Recommended	53.3	1.52	1.00

6 System accuracy verification

A system accuracy verification of the DASY4 was performed using the dipole validation kit listed in section 3.1. Measurement made in ambient temperature (22-23) °C and humidity (40-45) %. The obtained results are displayed in the table below.

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

f (MHz)	Tissue type	Measured / Reference	SAR (W/kg) 1g/10g	Dielectric Parameters			Liquid t(°C)
				ε_r	σ (S/m)	ρ (g/cm³)	
1900	Head	**Measured, 22/May/2007**	39.2/20.5	38.2	1.45	1.00	22
		Reference	38.2/20.3	39.4	1.41	1.00	22
	Body	**Measured, 23/May/2007**	38.9/20.8	51.2	1.54	1.00	22
		Reference	41.9/22.2	54.7	1.54	1.00	22

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Approved	Checked	Date	Rev	Reference
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7 SAR measurement uncertainty

SAR measurement uncertainty evaluation for Sonyericsson PY7A3022061 (K810) phone

Uncertainty Component	Uncer. (%)	Prob Dist.	Div.	C_i	GSM 1900-Head	GSM 1900-Body
Measurement System						
Probe Calibration	±5.9	N	1	1	±5.9	±5.9
Axial Isotropy	±4.7	R	√3	0.7	±1.9	±1.9
Spherical Isotropy	±9.6	R	√3	0.7	±3.9	±3.9
Boundary effect	±1.0	R	√3	1	±0.6	±0.6
Probe linearity	±4.7	R	√3	1	±2.7	±2.7
Detection limit	±1.0	R	√3	1	±0.6	±0.6
Readout electronics	±0.3	N	1	1	±0.3	±0.3
Response time	±0.8	R	√3	1	±0.5	±0.5
Integration time	±2.6	R	√3	1	±1.5	±1.5
RF Ambient Conditions	±3.0	R	√3	1	±1.7	±1.7
Mech. Constraints of robot	±0.4	R	√3	1	±0.2	±0.2
Probe positioning	±2.9	R	√3	1	±1.7	±1.7
Extrap, interpolation and integration	±1.0	R	√3	1	±0.6	±0.6
Measurement System Uncertainty					***±8.4***	***±8.4***
Test Sample Related						
Device positioning	±2.9	N	1	1	±3.5	±3.5
Device holder uncertainty	±3.6	N	1	1	±3.5	±3.5
Power drift	±(1.6/1.7)	R	√3	1	±0.9	±1.0
Test Sample Related Uncertainty					***±5.0***	***±5.0***
Phantom and Tissue Parameters						
Phantom uncertainty	±4.0	R	√3	1	±2.3	±2.3
Liquid conductivity (measurement)	±(3.6/1.3)	R	1	0.64	±2.3	±0.8
Liquid conductivity (target)	±5.0	R	√3	0.64	±1.8	±1.8
Liquid Permittivity (measurement)	±(4.5/3.9)	R	1	0.6	±2.7	±2.3
Liquid Permittivity (target)	±5.0	R	√3	0.6	±1.7	±1.7
Phantom and Tissue Parameters Uncertainty					***±4.9***	***±4.2***
Combined standard uncertainty					***±10.9***	***±10.6***
Extended standard uncertainty (k=2)					***±21.8***	***±21.2***

8 Test results

The measured 1-gram averaged SAR values of the device against head and body are provided in tables1 and 2. The ambient humidity and temperature of test facility were 40%-45% and 22°C–23°C respectively. The depth of tissue simulating liquid for head and body are 15.3cm and 15.2cm. A base station simulator was used to control the device during the SAR measurement. The phone was supplied with full-charged battery for each measurement.

For head measurement, the device was tested on the right-hand phantom (corresponding to the right side of the head) and the left-hand phantom in two phone position, cheek (touch) and tilt (cheek + 15deg).

For body measurement phone was tested on the antenna (back) and front against flat section of phantom with 15mm distance in both speech and data (GPRS) mode. For all modes, the device was tested at the lowest, middle and highest frequencies in the transmit band. For hands free used Sony Ericsson head set (HPB-60) and for Bluetooth phone was pared with Sony Ericsson HBH-610 Bluetooth accessory and measured on worst case speech mode and for body.

Mode	Channel	Power (dB)	Phone Position	Liquid t (°C)	SAR (W/kg)	
					Right-hand	Left-hand
					1g mass	1g mass
1900 GSM Head	512	29.5	Cheek	22±0.4	0.45	-
			Tilt	22±0.4	-	0.60
	661	29.7	Cheek	22±0.4	0.62	0.84
			Tilt	22±0.4	0.81	0.88
	810	29.7	Cheek	22±0.4	0.88	1.09
			Tilt	22±0.4	**1.12**	**1.12**

Table1: SAR measurement result for Sony Ericsson PY7A3022091 (K530i) telephone at highest possible output power. The phone has measured against head.

Mode	Channel	Power (dBm)	Phone Position	Liquid t (°C)	SAR (W/kg) in 1 g mass
GSM 1900 Body	512	29.5	Antenna to phantom BT	22±0.2	0.31
		28.5	Antenna to phantom GPRS2TX	22±0.2	0.45
	661	28.5	Antenna to phantom BT	22±0.2	0.41
		29.7	Antenna to phantom GPRS2TX	22±0.2	0.66
	810	29.7	Antenna to phantom BT	22±0.2	0.53
		28.5	Antenna to phantom GPRS2TX	22±0.2	**0.82**
		28.5	Front to phantom GPRS2TX	22±0.2	0,32
		29.7	Antenna to phantom PHF	22±0.2	0.58

Table2: SAR measurement result for Sony Ericsson PY7A3022091 (K530i) telephone at highest possible output power. The phone has measured against the Body.

9 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.

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10 Appendix

10.1 Photographs of the device under test

Front & Back side

Back with Battery

Down Connector

Sides

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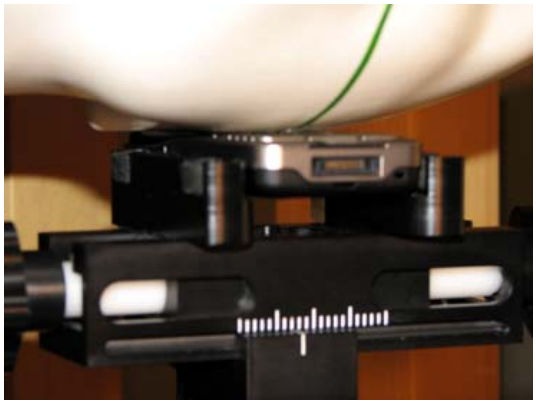
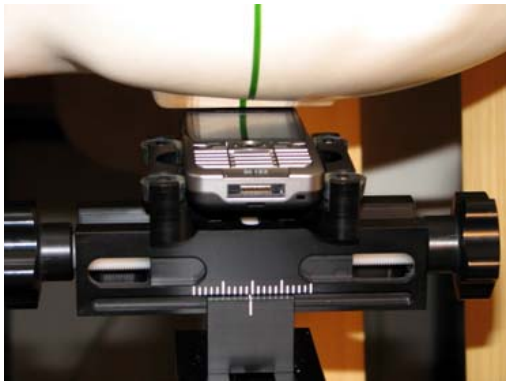
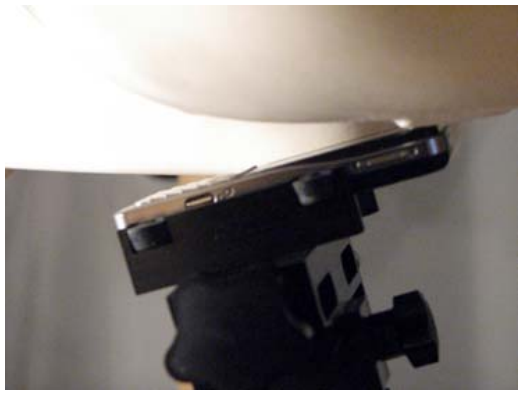
LD/SEMC/BGLI/NMC *Peter Lindeborg*	*070528*	*070525*	A	File

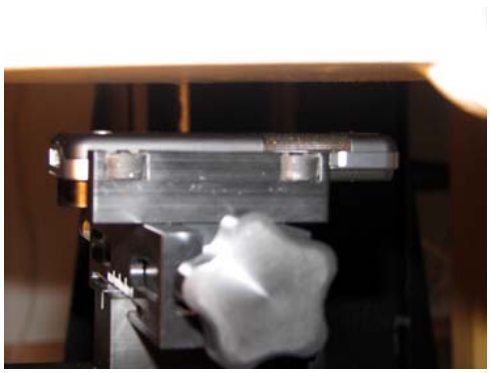
10.2 Device position on SAM Twins Phantom

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

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




Device position against the body: Phone on 15mm distance against Phantom

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LD/SEMC/BGLI/NMC *Peter Lindeborg*	*070528*	*070525*	A	File

10.3 Attachment

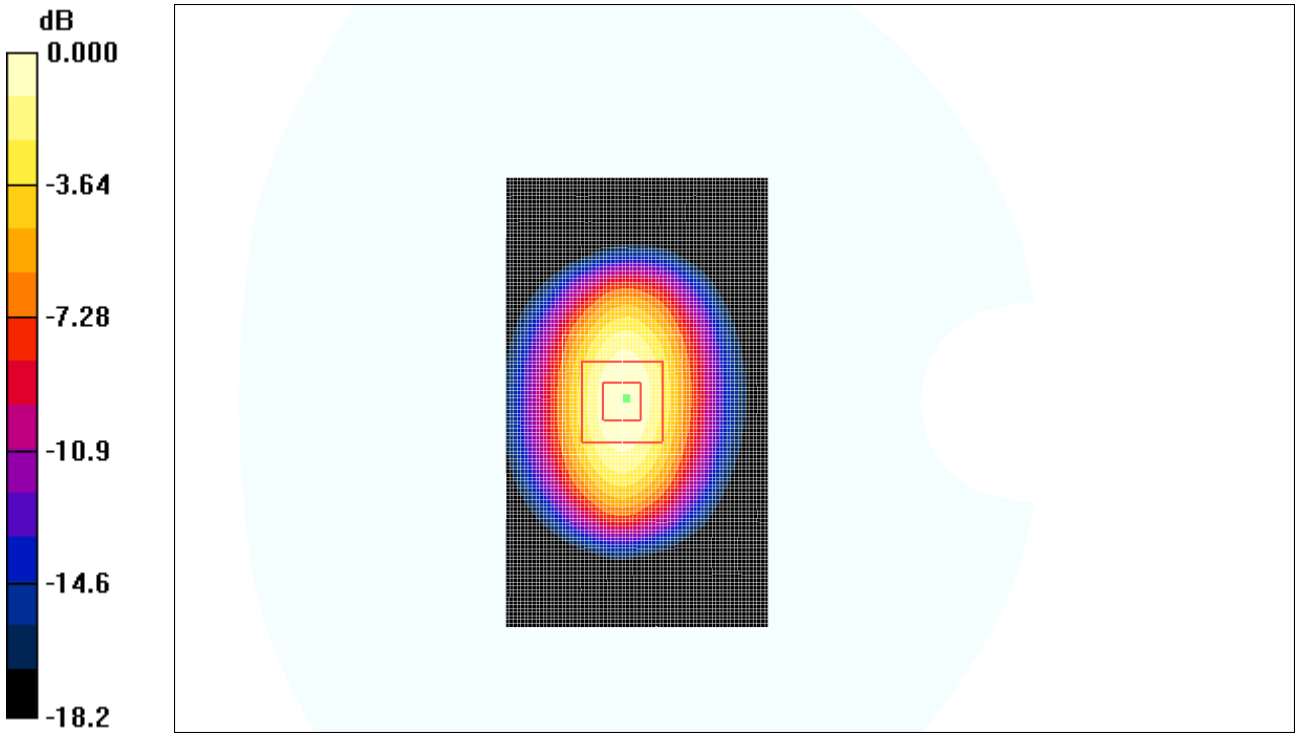
- Probe & Dipole Calibration
- Measurement plots and system validation

Date/Time: 2007-05-22 08:28:13

Test Laboratory: Sony Ericsson Mobile Communications AB
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: SN:5d073
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.45 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1815; ConvF(5.21, 5.21, 5.21); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn428; Calibrated: 2007-01-18
- Phantom: SAM 4; Type: SAM; Serial: 1053
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=10mm, Pin=100mW 2/Area Scan (71x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 4.46 mW/g
d=10mm, Pin=100mW 2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 56.5 V/m; Power Drift = 0.076 dB
Peak SAR (extrapolated) = 6.72 W/kg
SAR(1 g) = 3.92 mW/g; SAR(10 g) = 2.05 mW/g
Maximum value of SAR (measured) = 4.41 mW/g



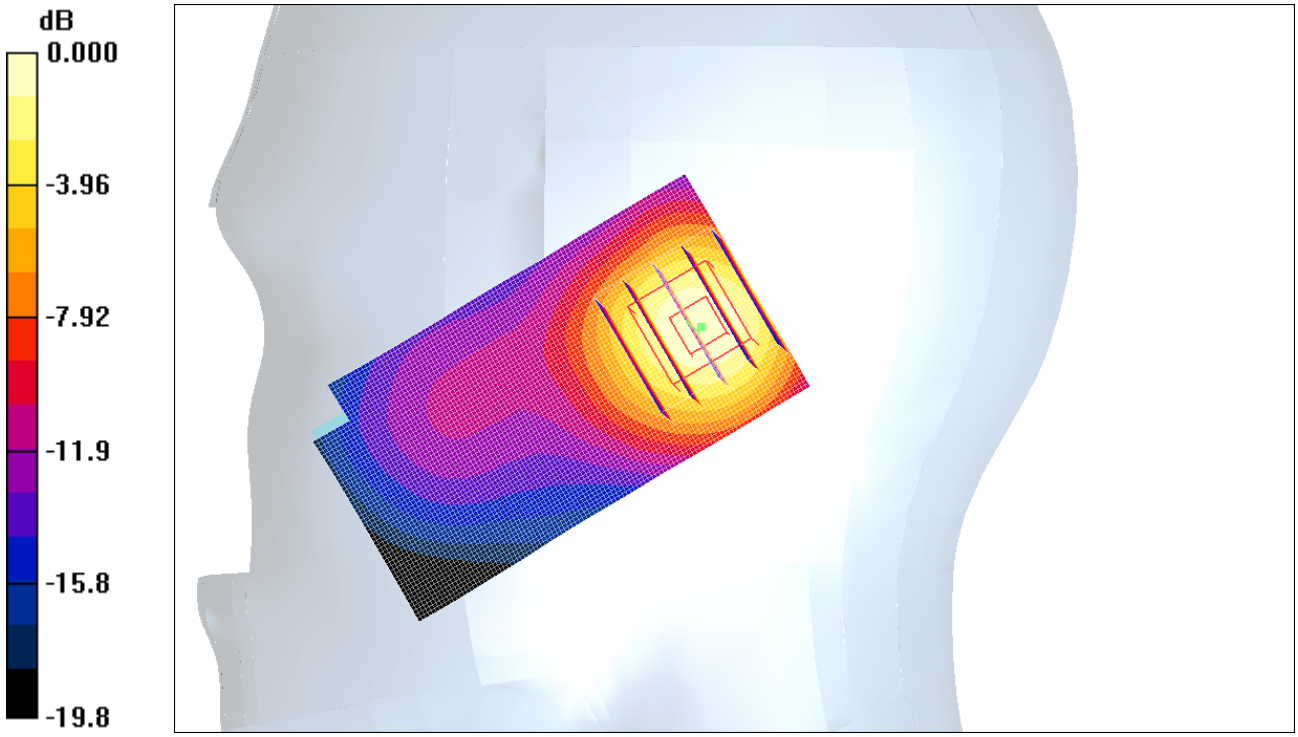
0 dB = 4.41mW/g

Date/Time: 2007-05-22 10:01:17

Test Laboratory: Sony Ericsson Mobile Communications AB
DUT: #7629; Type: PY7A3022091; Serial: CB5A0B92YV
Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.46 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1815; ConvF(5.21, 5.21, 5.21); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn428; Calibrated: 2007-01-18
- Phantom: SAM 4; Type: SAM; Serial: 1053
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Tilt position - High/Area Scan (61x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.29 mW/g
Tilt position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 30.3 V/m; Power Drift = -0.068 dB
Peak SAR (extrapolated) = 1.89 W/kg
SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.603 mW/g
Maximum value of SAR (measured) = 1.26 mW/g



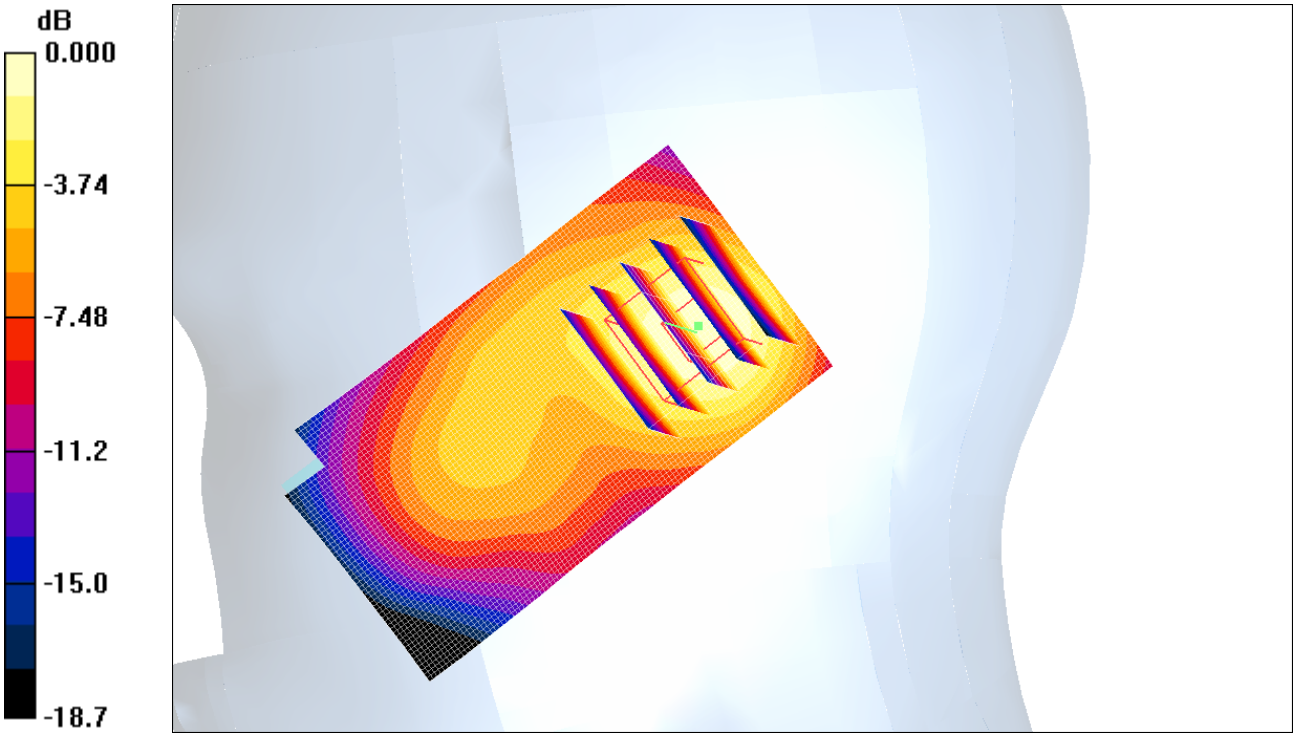
0 dB = 1.26mW/g

Date/Time: 2007-05-22 09:43:31

Test Laboratory: Sony Ericsson Mobile Communications AB
DUT: #7629; Type: PY7A3022091; Serial: CB5A0B92YV
Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.46 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1815; ConvF(5.21, 5.21, 5.21); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn428; Calibrated: 2007-01-18
- Phantom: SAM 4; Type: SAM; Serial: 1053
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Touch position - High/Area Scan (61x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.969 mW/g
Touch position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.5 V/m; Power Drift = -0.062 dB
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.878 mW/g; SAR(10 g) = 0.499 mW/g
Maximum value of SAR (measured) = 0.966 mW/g



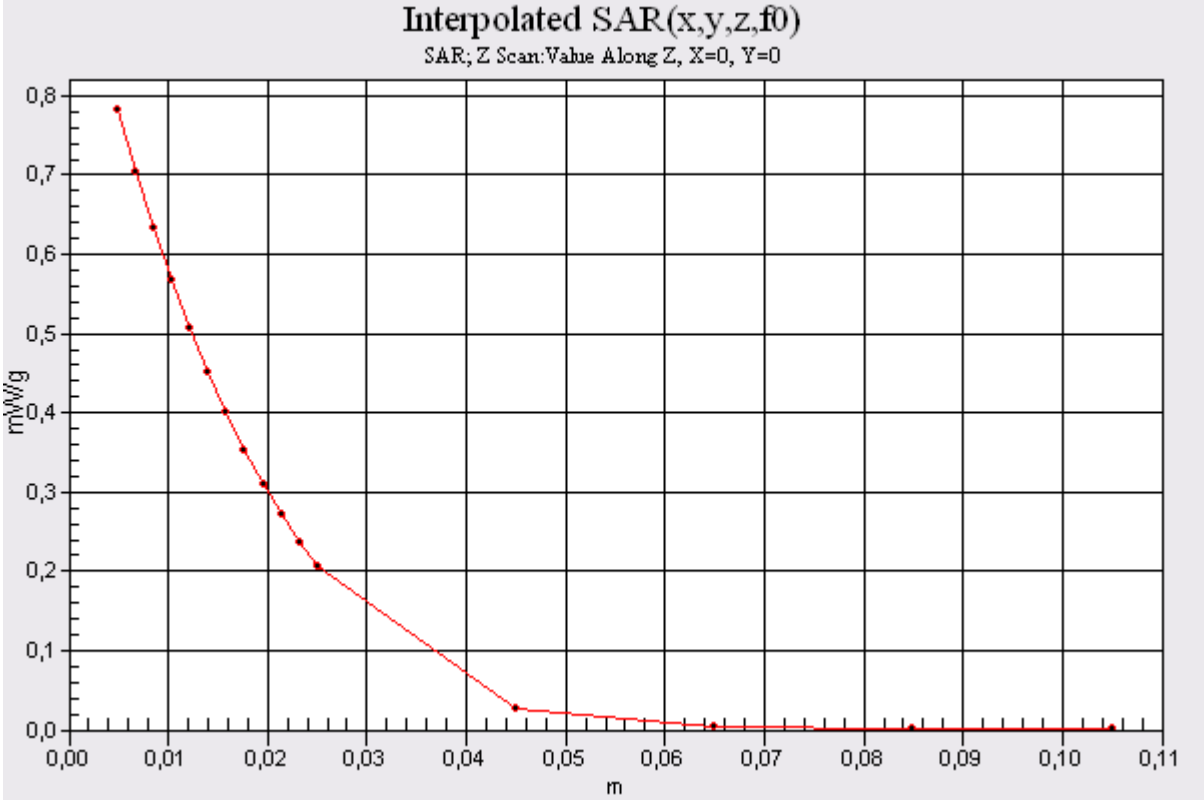
0 dB = 0.966mW/g

Date/Time: 2007-05-22 08:44:05

Test Laboratory: Sony Ericsson Mobile Communications AB
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: SN:5d073
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.45 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1815; ConvF(5.21, 5.21, 5.21); Calibrated: 2007-01-16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn428; Calibrated: 2007-01-18
- Phantom: SAM 4; Type: SAM; Serial: 1053
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=10mm, Pin=100mW 2/Z Scan (1x1x16): Measurement grid: dx=20mm, dy=20mm, dz=20mm
Maximum value of SAR (interpolated) = 0.782 mW/g



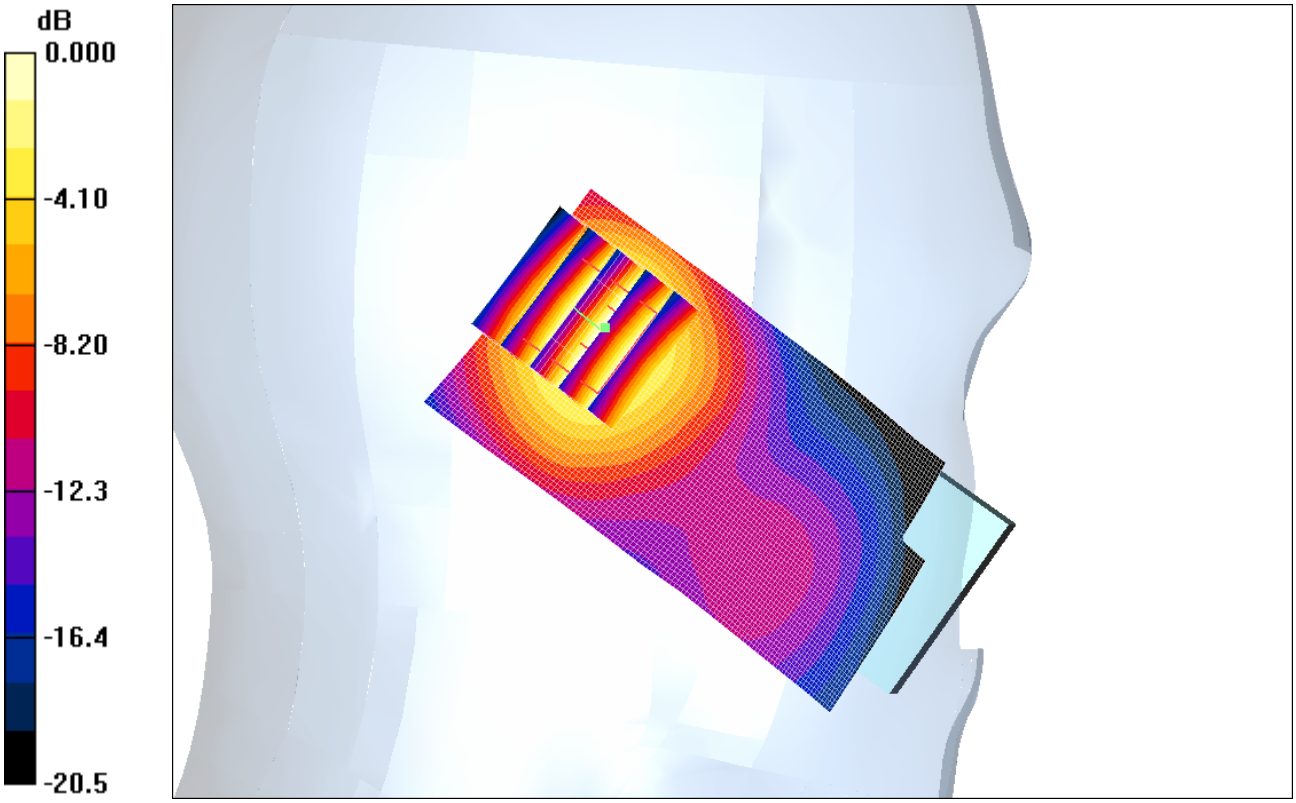
Date/Time: 2007-05-22 10:54:34

Test Laboratory: Sony Ericsson Mobile Communications AB
DUT: #7629; Type: PY7A3022091; Serial: CB5A0B92YV
Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.46 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1815; ConvF(5.21, 5.21, 5.21); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn428; Calibrated: 2007-01-18
- Phantom: SAM 4; Type: SAM; Serial: 1053
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

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

Tilt position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.1 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 2.03 W/kg
SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.589 mW/g
Maximum value of SAR (measured) = 1.26 mW/g



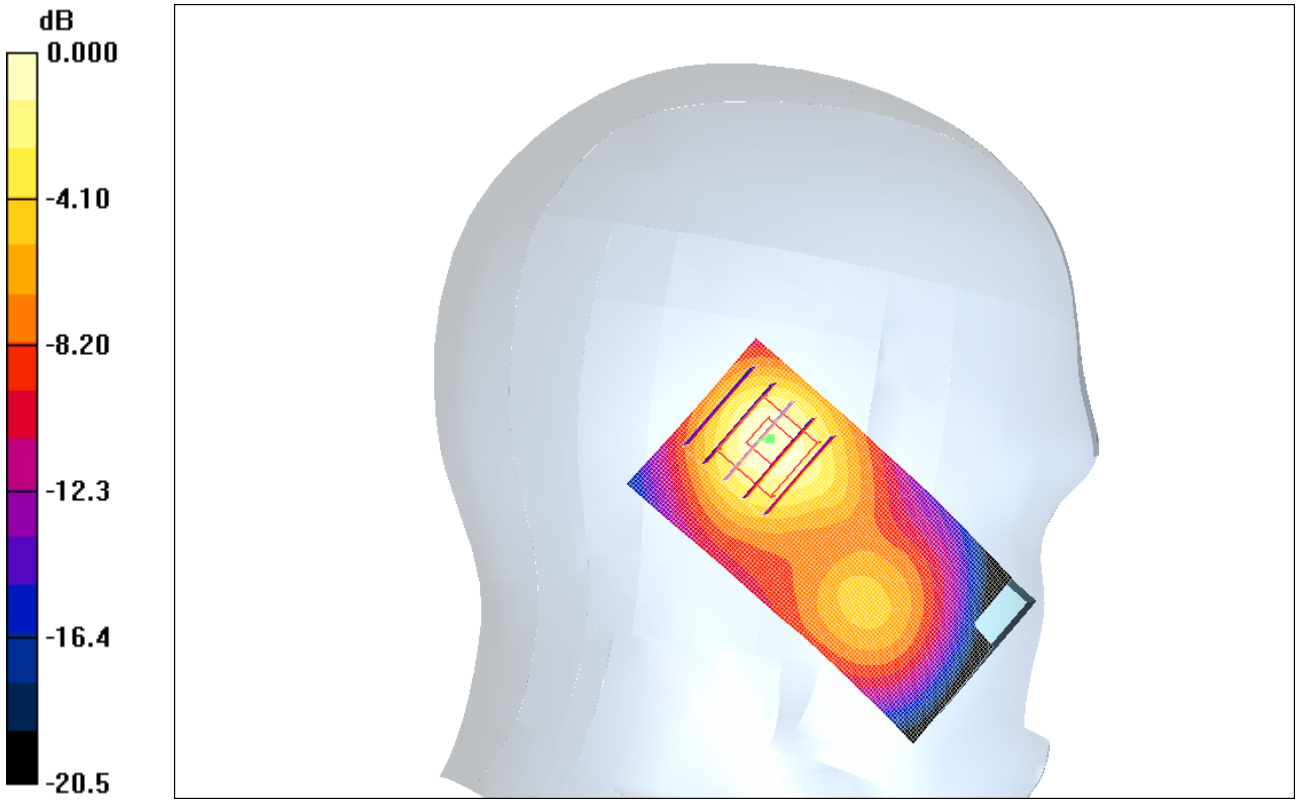
0 dB = 1.26mW/g

Date/Time: 2007-05-22 10:37:42

Test Laboratory: Sony Ericsson Mobile Communications AB
DUT: #7629; Type: PY7A3022091; Serial: CB5A0B92YV
Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.46 mho/m; ε_r = 38.2; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1815; ConvF(5.21, 5.21, 5.21); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn428; Calibrated: 2007-01-18
- Phantom: SAM 4; Type: SAM; Serial: 1053
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Touch position - High/Area Scan (61x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.26 mW/g
Touch position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 26.1 V/m; Power Drift = 0.004 dB
Peak SAR (extrapolated) = 1.90 W/kg
SAR(1 g) = 1.06 mW/g; SAR(10 g) = 0.568 mW/g
Maximum value of SAR (measured) = 1.18 mW/g



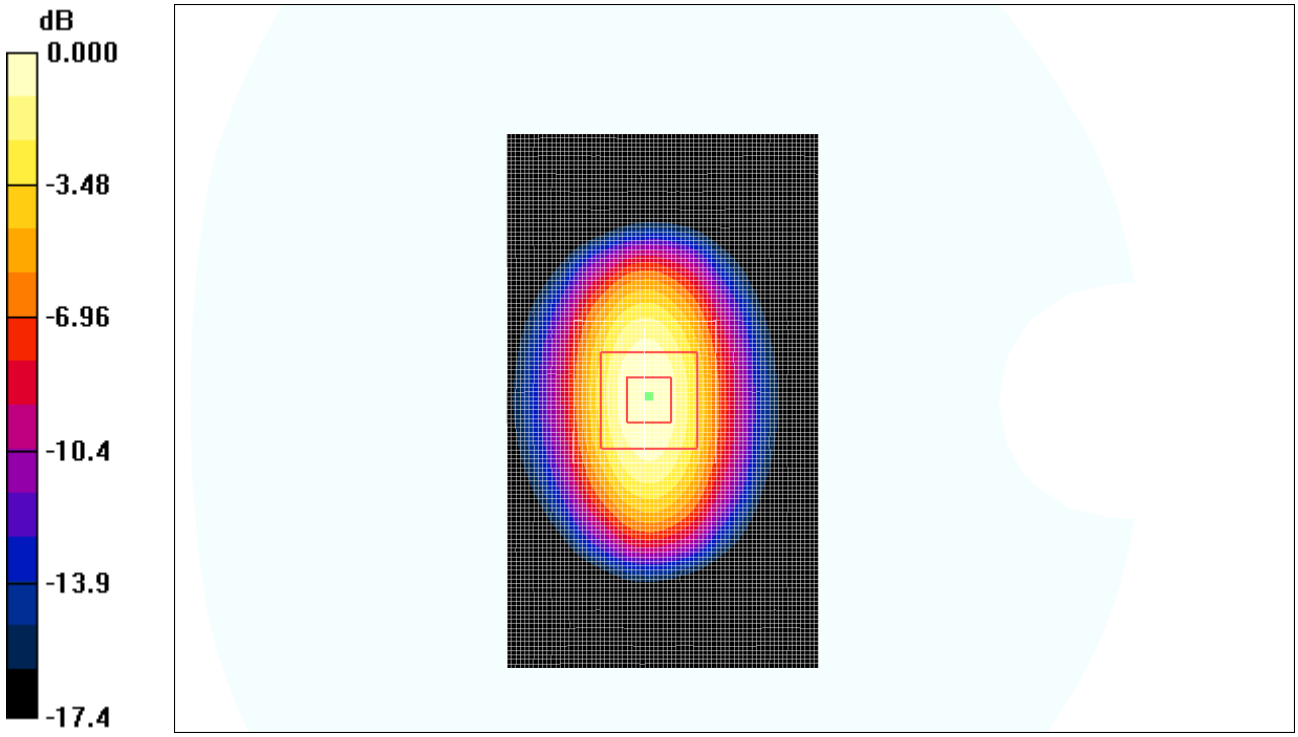
0 dB = 1.18mW/g

Date/Time: 2007-05-23 13:16:46

Test Laboratory: Sony Ericsson Mobile Communications AB
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: SN:5d073
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.54 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1815; ConvF(4.75, 4.75, 4.75); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn428; Calibrated: 2007-01-18
- Phantom: SAM 4; Type: SAM; Serial: 1053
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=10mm, Pin=100mW 2/Area Scan (71x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 4.42 mW/g
d=10mm, Pin=100mW 2/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 55.1 V/m; Power Drift = 0.086 dB
Peak SAR (extrapolated) = 6.49 W/kg
SAR(1 g) = 3.89 mW/g; SAR(10 g) = 2.08 mW/g
Maximum value of SAR (measured) = 4.37 mW/g



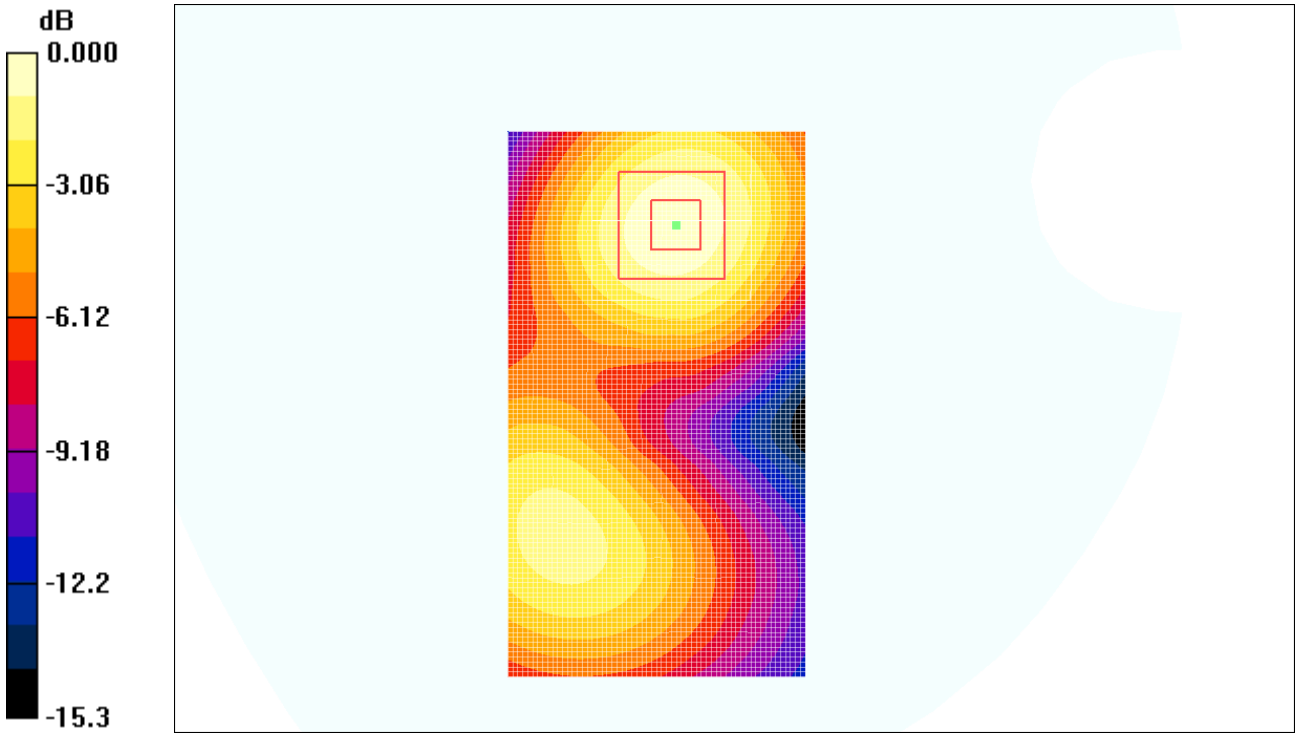
0 dB = 4.37mW/g

Date/Time: 2007-05-23 09:28:04

Test Laboratory: Sony Ericsson Mobile Communications AB
DUT: #7629; Type: PY7A3022091; Serial: CB5A0B92YV
Communication System: GSM1900 GPRS2TX; Frequency: 1909.8 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1910 MHz; σ = 1.54 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1815; ConvF(4.75, 4.75, 4.75); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn428; Calibrated: 2007-01-18
- Phantom: SAM 4; Type: SAM; Serial: 1053
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=15mm,Front,High;GPRS2TX/Area Scan (61x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.331 mW/g
d=15mm,Front,High;GPRS2TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.1 V/m; Power Drift = 0.129 dB
Peak SAR (extrapolated) = 0.486 W/kg
SAR(1 g) = 0.316 mW/g; SAR(10 g) = 0.192 mW/g
Maximum value of SAR (measured) = 0.345 mW/g



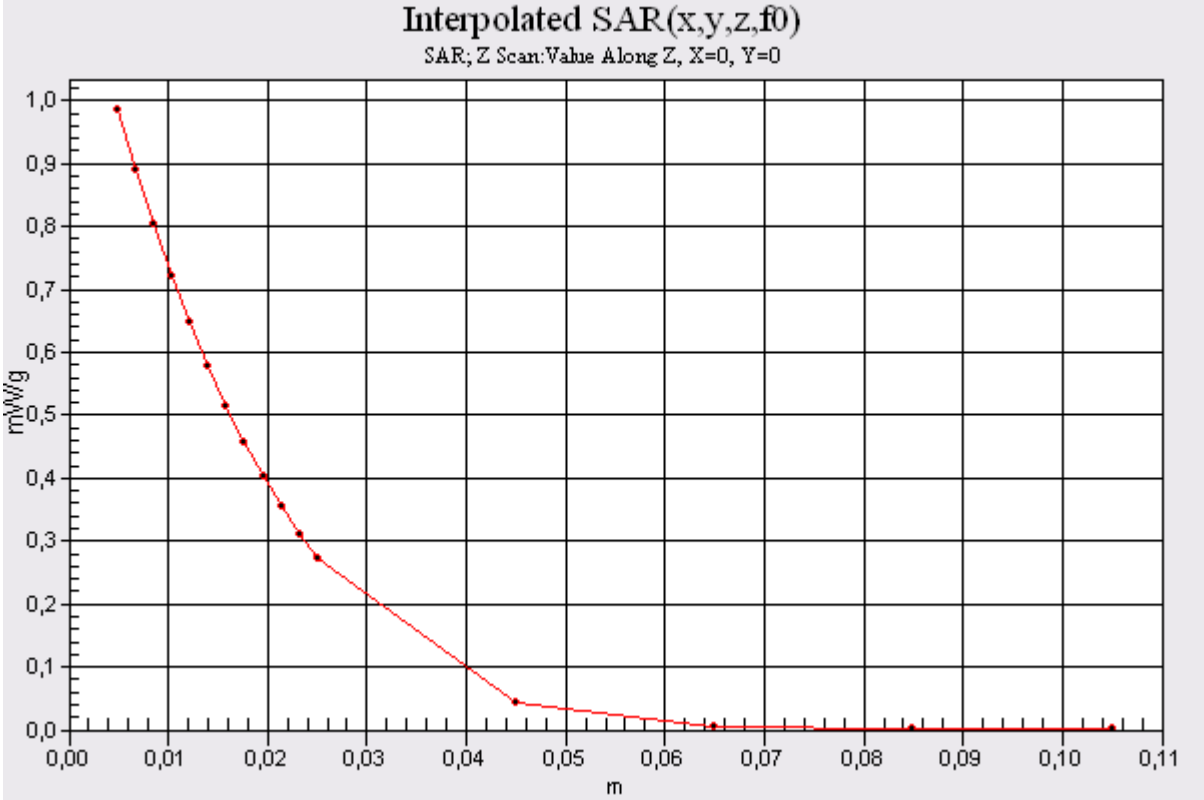
0 dB = 0.345mW/g

Date/Time: 2007-05-23 13:32:55

Test Laboratory: Sony Ericsson Mobile Communications AB
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: SN:5d073
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.54 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1815; ConvF(4.75, 4.75, 4.75); Calibrated: 2007-01-16
- Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE3 Sn428; Calibrated: 2007-01-18
- Phantom: SAM 4; Type: SAM; Serial: 1053
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=10mm, Pin=100mW 2/Z Scan (1x1x16): Measurement grid: dx=20mm, dy=20mm, dz=20mm
Maximum value of SAR (interpolated) = 0.985 mW/g

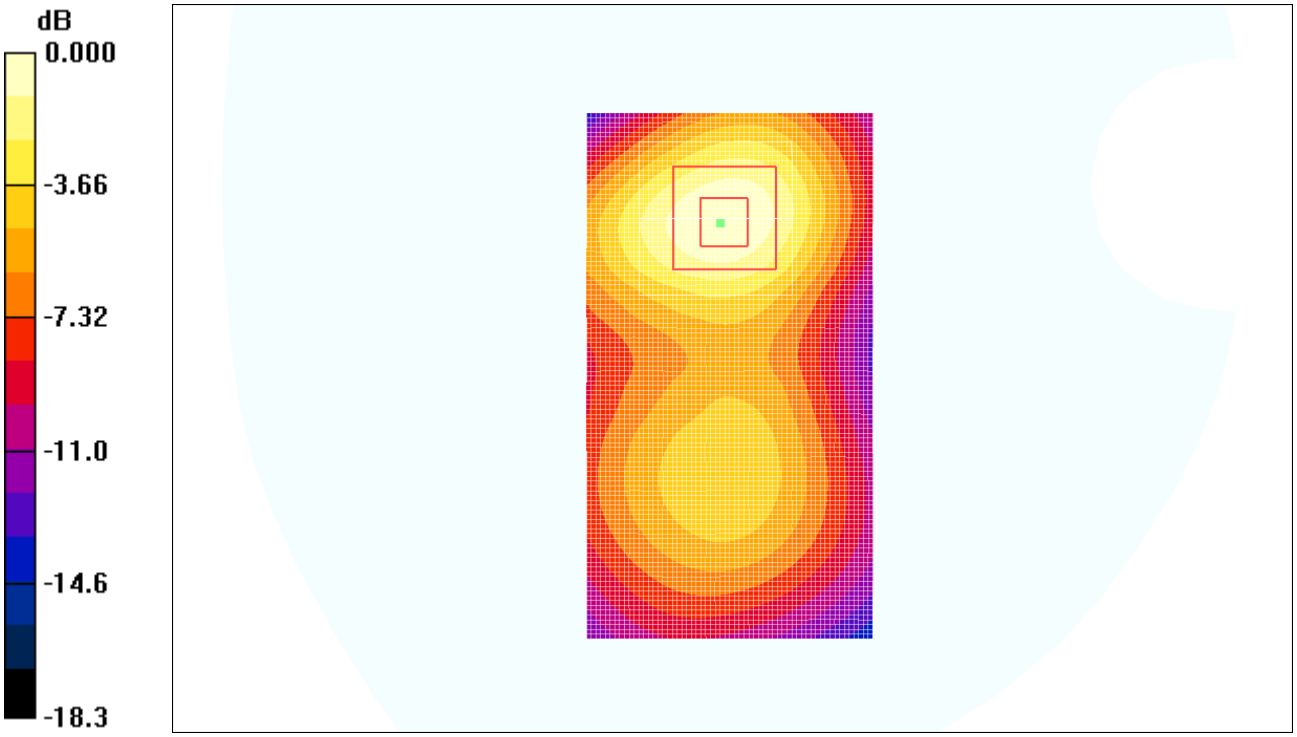


Date/Time: 2007-05-23 14:47:07

Test Laboratory: Sony Ericsson Mobile Communications AB
DUT: #7629; Type: PY7A3022091; Serial: CB5A0B92YV
Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1910 MHz; σ = 1.54 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1815; ConvF(4.75, 4.75, 4.75); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn428; Calibrated: 2007-01-18
- Phantom: SAM 4; Type: SAM; Serial: 1053
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=15mm,Back,High ,Speech;PHF/Area Scan (61x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.644 mW/g
d=15mm,Back,High ,Speech;PHF/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 19.7 V/m; Power Drift = -0.035 dB
Peak SAR (extrapolated) = 0.968 W/kg
SAR(1 g) = 0.577 mW/g; SAR(10 g) = 0.324 mW/g
Maximum value of SAR (measured) = 0.636 mW/g



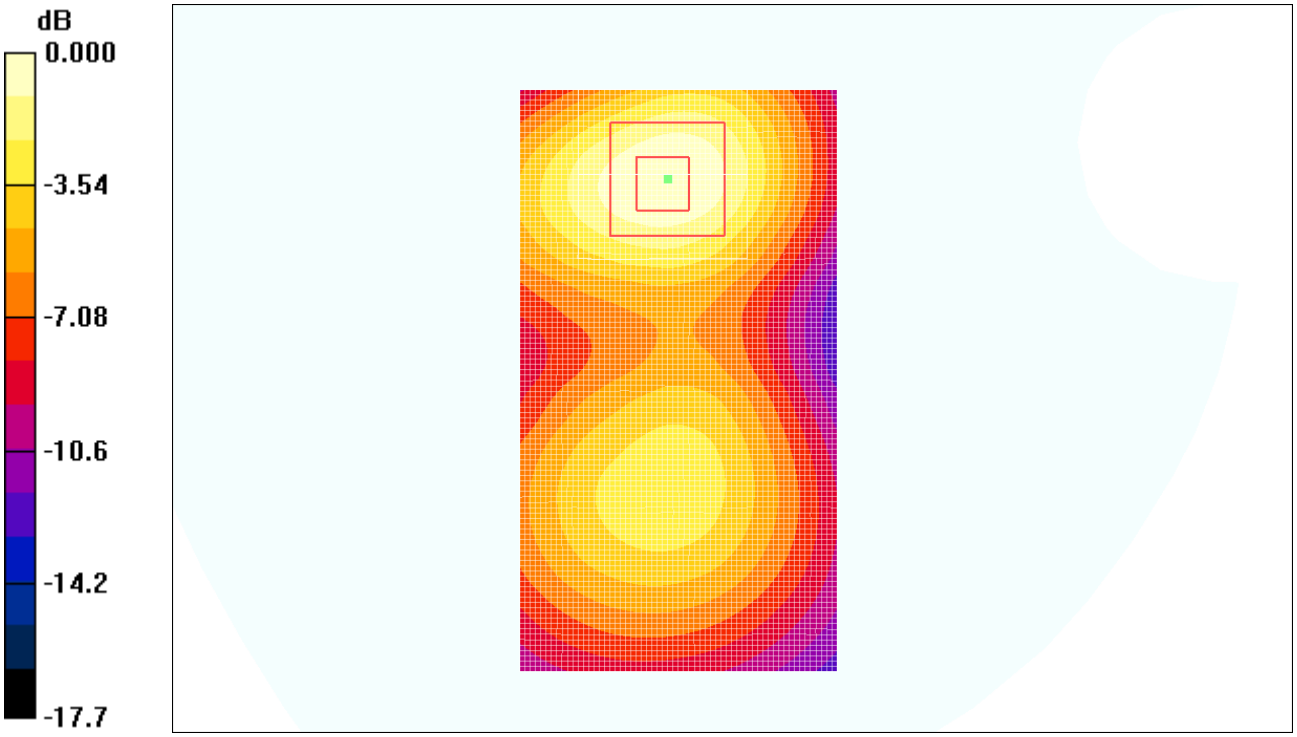
0 dB = 0.636mW/g

Date/Time: 2007-05-23 15:52:39

Test Laboratory: Sony Ericsson Mobile Communications AB
DUT: #7629; Type: PY7A3022091; Serial: CB5A0B92YV
Communication System: GSM1900 GPRS2TX; Frequency: 1909.8 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 1910 MHz; σ = 1.54 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1815; ConvF(4.75, 4.75, 4.75); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn428; Calibrated: 2007-01-18
- Phantom: SAM 4; Type: SAM; Serial: 1053
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=15mm,Back,High;GPRS2TX/Area Scan (61x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.923 mW/g
d=15mm,Back,High;GPRS2TX/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.8 V/m; Power Drift = -0.073 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.824 mW/g; SAR(10 g) = 0.469 mW/g
Maximum value of SAR (measured) = 0.905 mW/g



0 dB = 0.905mW/g

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

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

Accreditation No.: SCS 108

Client Sony Ericsson Lund

Certificate No: ET3-1815_Jan07

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN: 1815
Calibration procedure(s)	QA CAL-01.v6 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:	Niels Kuster	Quality Manager	

Issued: January 16, 2007

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
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Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

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:1815

Manufactured:	February 27, 2004
Last calibrated:	January 20, 2006
Recalibrated:	January 16, 2007

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1815

Sensitivity in Free Space[A]

Diode Compression[B]

NormX	**1.93** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**90** mV
NormY	**1.97** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**93** mV
NormZ	**2.07** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**96** 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	5.0	2.3
SAR_{be} [%]	With Correction Algorithm	0.0	0.0

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	6.8	3.9
SAR_{be} [%]	With Correction Algorithm	0.1	0.3

Sensor Offset

Probe Tip to Sensor Center	**2.7** mm

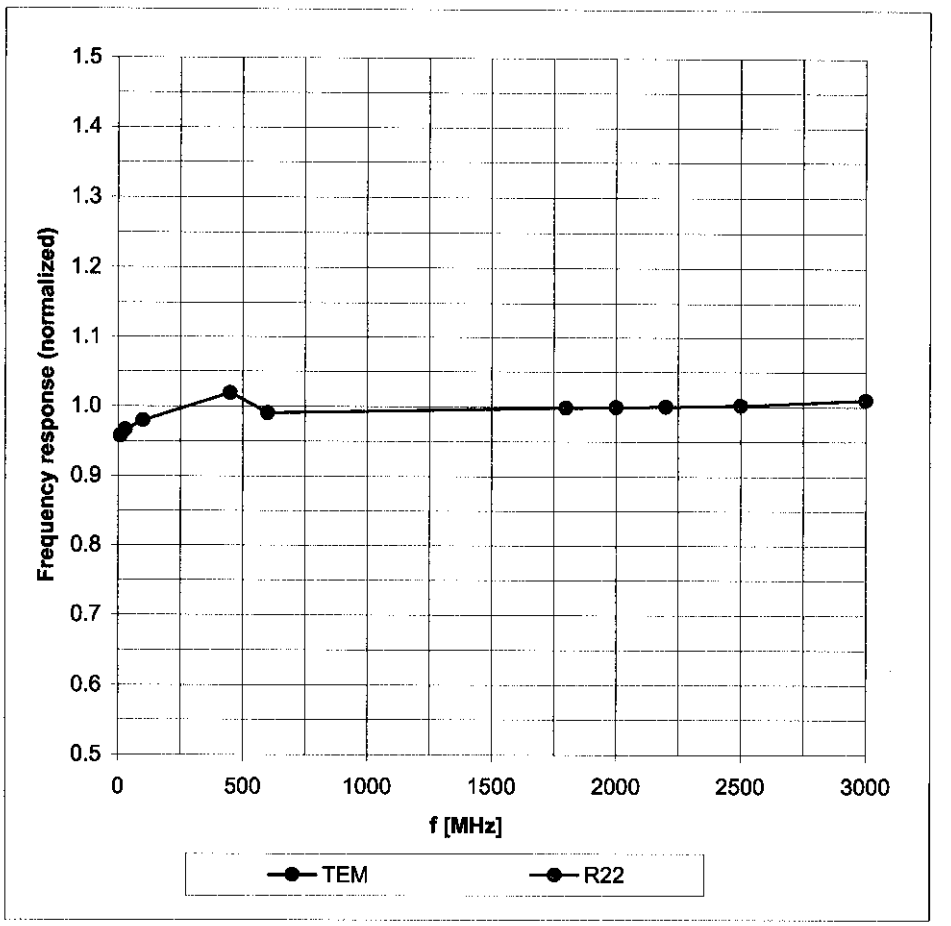
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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

[B] Numerical linearization parameter: uncertainty not required.

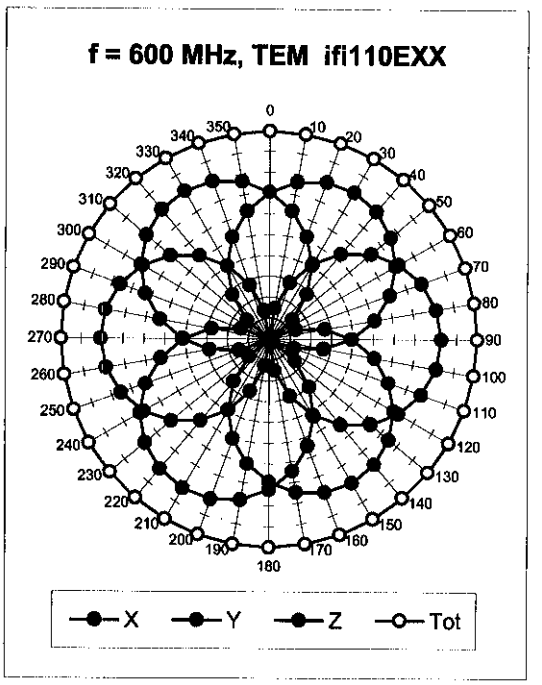
Frequency Response of E-Field

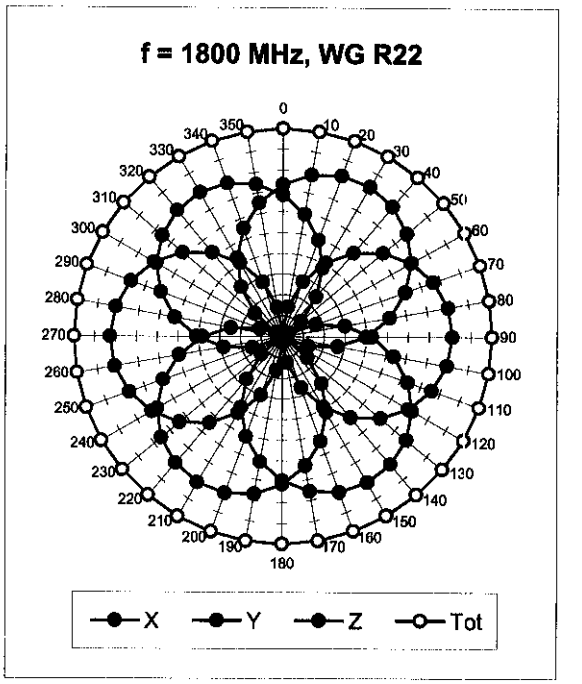
(TEM-Cell:ifi110 EXX, Waveguide: R22)

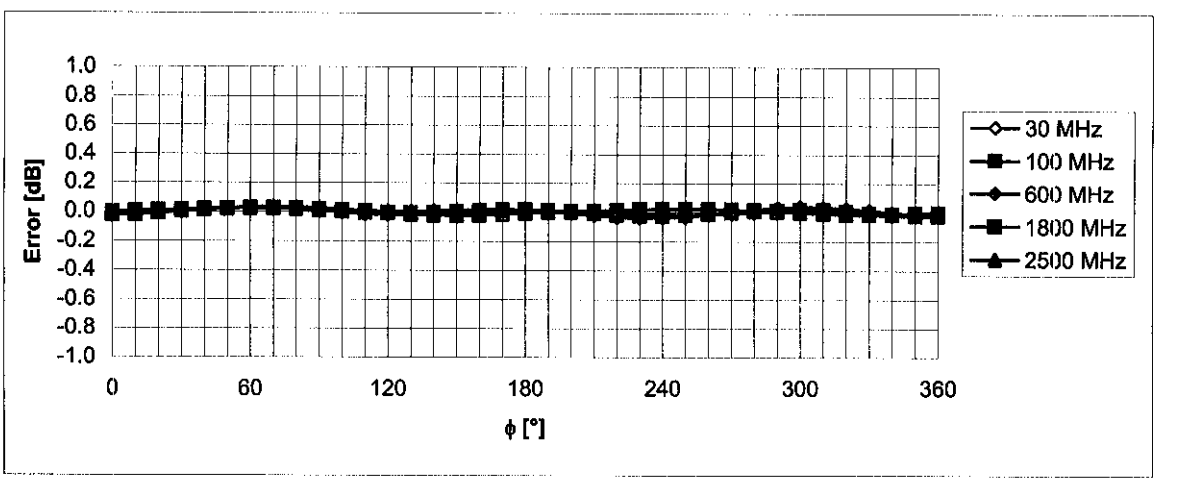


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



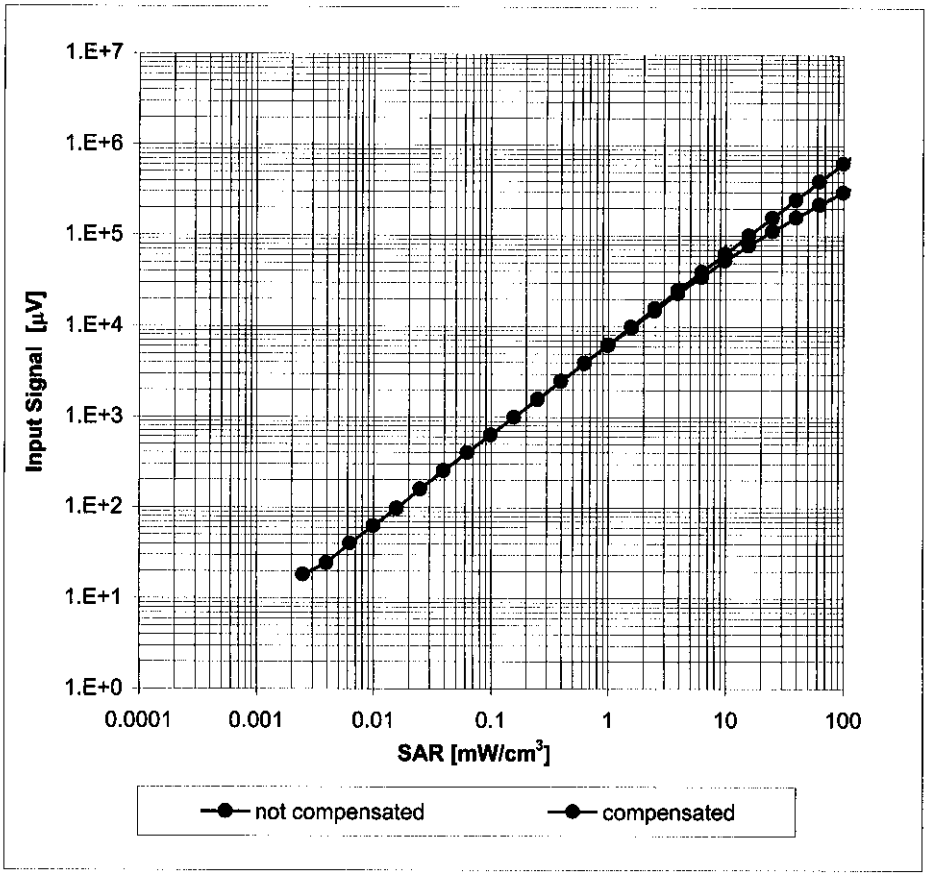


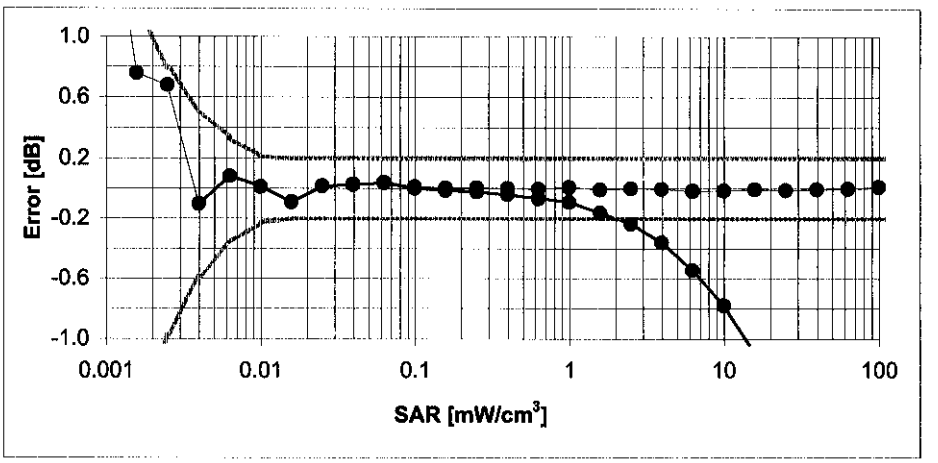


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

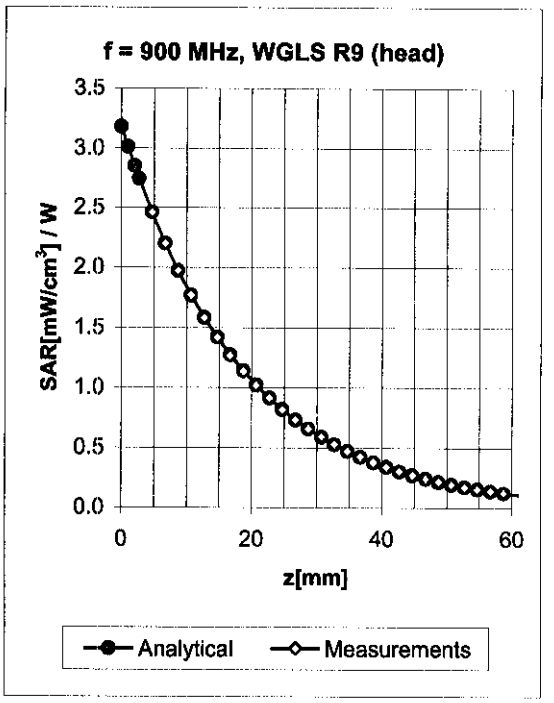
(Waveguide R22, f = 1800 MHz)

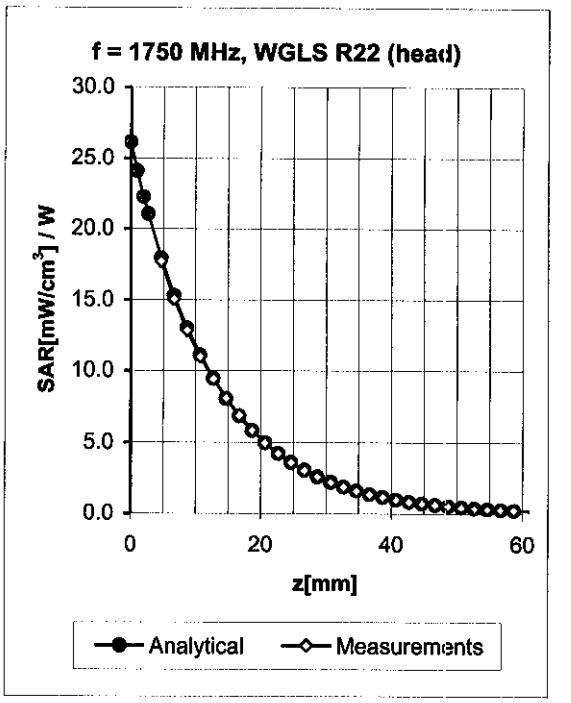




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



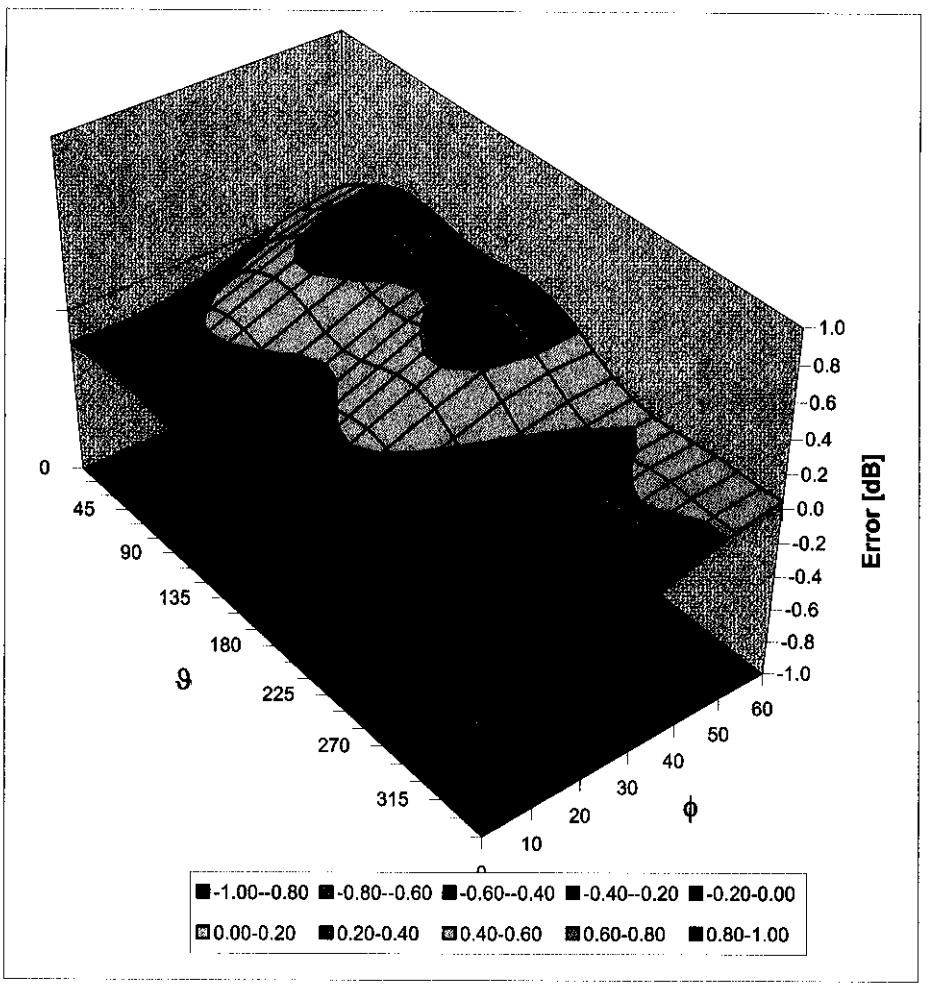


f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.27	2.57	6.79 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.28	2.64	6.73 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.48	2.54	5.36 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.52	2.59	5.21 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.65	2.05	4.71 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.25	2.85	6.86 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.28	2.87	6.50 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.50	2.87	4.97 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.65	2.45	4.75 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.66	1.82	4.16 ± 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)