Sony Ericsson

Company Internal
REPORT

Prepared (also subject responsible if other)		No.		
LD/SEMC/BGLIM *Ramadan Plicanic*		*BGLI08:004*		
Approved	Checked	Date	Rev	Reference
LD/SEMC/BGLIMC *Peter Lindeborg*	*080108*	*080104*	A	File

Report issued by Accredited SAR Laboratory

For

PY7A1042041 (W380a)

Date of test: *09, 15, 16 and 19 November 2007*

Laboratory:
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Statement of Compliance
Sony Ericsson Mobile Communications AB declares under its sole responsibility that the product

Sony Ericsson Type AAB-1032051-BV; FCC ID: PY7A1032051; IC:4170B-A1032051

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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1 Table of contents

2 Introduction

In this test report, compliance of the Sony Ericsson PY7A1032051 (W380a) 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, Rear, on the bottom	
Dimensions	Max length	42mm
	Max width	11mm
Configuration	PIFA	

3.2 Device description

Device model	**PY7A1032051(w380a)**					
Serial number	**CB510TJQGP (#9522)**					
Mode	**GSM 850**			**GSM1900**		
Crest Factor	**8.3**			**8.3**		
Multiple Access Scheme	**TDMA**			**TDMA**		
Output Power (dBm)	**Ch128**	**Ch190**	**Ch251**	**Ch512**	**Ch661**	**Ch810**
	33.5	**33.6**	**33.6**	**30.5**	**30.7**	**30.3**
Factory Tolerance in Power Setting	**±0.5dB**			**±0.5dB**		
Maximum Peak Output Power (dBm)	**33.5**	**33.5**	**33.5**	**30.5**	**30.5**	**30.5**
Transmitting Frequency Range(MHz)	**824.2-848.8**			**1850.2 – 1909.8**		
Prototype or Production Unit	**Preproduction HW FP2**					
Device Category	**Portable**					
RF exposure environment	**General population / uncontrolled**					
Mode	**GPRS/EDGE**			**GPRS/EDGE**		
Crest Factor	**4.15**			**4.15**		
Output Power (dBm)	**Ch128**	**Ch190**	**Ch251**	**Ch128**	**Ch190**	**Ch25**
	33.5/27.9	**33.6/27.8**	**33.6/27.6**	**30.5/27.0**	**30.7/27.2**	**30.3/27.1**
Factory Tolerance in Power Setting	**±0.5dB**			**±0.5dB**		
Maximum Peak Output Power (dBm)	**33.5/27.5**	**33.5/27.5**	**33.5/27.5**	**30.5/27.0**	**30.5/27.0**	**30.5/27.0**
GPRS Multislot class	**10**			**10**		
GPRS capability class	**B**			**B**		

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4 Test equipment

4.1 Dosimetric system

SAR measurements were made using the DASY4 professional system (software version 4.7, Build 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	640	01 2008
E-field probe ES3DV6	3062	01 2008
Dipole Validation Kit, D835V2	4d039	05 2008
Dipole Validation Kit, D1900V2	5d073	05 2008

4.2 Additional equipment

Description	***Inventory Number***	***Due Date***
Signal generator ESG-D4000A	INV 462935	032008
Directional coupler HP778D	INV 2903	032008
Power meter R&S NRVD	INV 20007668	032008
Power sensor R&S NRV-Z5	INV 20007670	032008
Power sensor R&S NRV-Z5	INV 20007671	032008
Termination 65N50-0-11	INV 2903	032008
Network analyzer HP8753C	INV421671	032008
S-parameter test set HP85047A	INV 421670	032008
Dielectric probe kit HP85070D	INV 20000053	Self cal

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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)
850	Head	**Measured, 09 November 2007**	40.6	0.87	1.00
		Recommended	41.5	0.90	1.00
	Body	**Measured, 19 November 2007**	55.0	0.98	1.00
		Recommended	55.2	0.97	1.00
1900	Head	**Measured, 15 November 2007**	38.6	1.47	1.00
		Recommended	40.0	1.40	1.00
	Body	**Measured, 16 November 2007**	52.0	1.58	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 kits listed in section 3.1. Measurement made in ambient temperature (23.1-22.5) °C and humidity (30.1-31) %. 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 0.000029mW/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)	
850	Head	**Measured, 09 Nov. 2007**	9.27/6.08	40.6	0.87	1.00	21.7
		Reference	9.29/6.03	41.5	0.90	1.00	22.0
	Body	**Measured, 19 Nov. 2007**	9.45/6.22	55.0	0.98	1.00	21.1
		Reference	9.66/6.31	55.2	0.97	1.00	22.0
1900	Head	**Measured, 15 Nov. 2007**	41.1/20.9	38.6	1.47	1.00	21.9
		Reference	38.2/20.3	40.0	1.40	1.00	22.0
	Body	**Measured, 16 Nov. 2007**	41.2/21.2	52.0	1.58	1.00	22.4
		Reference	41.9/22.2	53.3	1.52	1.00	22.0

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7 SAR measurement uncertainty

SAR measurement uncertainty evaluation for Sonyericsson PY7A1032051 (W380a) 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	±1.0
Linearity	±4.7	R	√3	1	±2.7
System Detection Limits	±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
Probe Positioner	±0.4	R	√3	1	±0.2
Probe Positioning	±2.9	R	√3	1	±1.7
Max. SAR Evaluation	±1.0	R	√3	1	±0.6
Measurement System Uncertainty					***±8.4***
Test Sample Related					
Device positioning	±2.9	N	1	1	±2.9
Device holder uncertainty	±3.6	N	1	1	±3.6
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 (measurement)	±2.5	N	1	0.64	±1.6
Liquid conductivity (target)	±5.0	R	√3	0.64	±1.8
Liquid Permittivity (measurement)	±2.5	N	1	0.6	±1.5
Liquid Permittivity (target)	±5.0	R	√3	0.6	±1.7
Phantom and Tissue Parameters Uncertainty					***±4.0***
Combined standard uncertainty					***±10.8***
Extended standard uncertainty (k=2)					***±21.6***

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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 30.1%-31% and 21.1°C–22.2°C respectively. The depth of tissue simulating liquid for head and body were 15.9cm and 15.8cm. 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 speech mode. The device was tested at the lowest, middle and highest frequencies in the transmit band. For Hands free used Sony Ericsson head set HPH-60 or for BT portable hands free HBH-610a

Mode	Channel	Power (dB)	Phone Position	Liquid t (°C)	SAR (W/kg)	
					Right-hand	Left-hand
					1g mass	1g mass
1900 GSM Head	512	30.5	Cheek	22.7	**0.67**	0.56
			Tilt	22.7	-	-
	661	30.7	Cheek	22.7	0.60	0.53
			Tilt	22.7	0.10	0.09
	810	30.3	Cheek	22.7	0.39	0.35
			Tilt	22.7	-	-
850 GSM Head	128	33.5	Cheek	21.7	0.61	0.66
			Tilt	21.7	-	-
	189	33.6	Cheek	21.7	**0.70**	0.63
			Tilt	21.7	0.23	0.19
	251	33.6	Cheek	21.7	0.49	0.61
			Tilt	21.7	-	-

Table1: SAR measurement result for Sony Ericsson PY7A1032051 (W380a) 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	30.5	Antenna to phantom BT HBH-610a	22.4	0.55
		30.5	Antenna to phantom GPRS2TX	22.4	**1.13**
		30.5	Front to phantom GPRS2TX	22.4	0.54
		30.5	Antenna to phantom PHF HPH-60	22.4	0.61
		27.0	Antenna to phantom EDGE2Tx	22.4	0.20
	661	30.7	Antenna to phantom PHF HPH-60	22.4	0.43
		30.7	Antenna to phantom GPRS2TX	22.4	0.79
	810	30.3	Antenna to phantom PHF HPH-60	22.4	0.26
		30.3	Antenna to phantom GPRS2TX	22.4	0.49
GSM 850 Body	128	33.5	Antenna to phantom BT HBH-610a	21.1	0.47
		33.5	Antenna to phantom GPRS2TX	21.1	**0.99**
		33.5	Front to phantom GPRS2TX	21.1	0.60
		33.5	Antenna to phantom PHF HPH-60	21.1	0.46
		27.9	Antenna to phantom EDGE2Tx	21.1	0.22
	190	33.6	Antenna to phantom BT HBH-610a	21.1	0.36
		33.6	Antenna to phantom GPRS2TX	21.1	0.74
	251	33.6	Antenna to phantom BT HBH-610a	21.1	0.29
		33.6	Antenna to phantom GPRS2TX	21.1	0.56

Table2: SAR measurement result for Sony Ericsson PY7A1032051 (W380a) 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] Basic standard for the Measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300MHz-3GHz), European Standard EN 50361, July 2001

[3] 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).

[4] 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

System Connector

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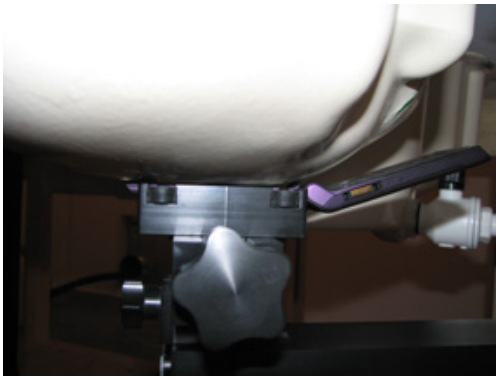
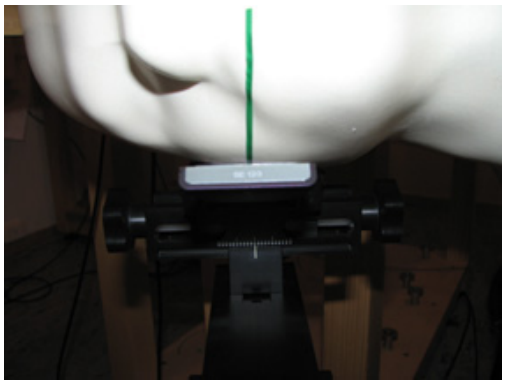
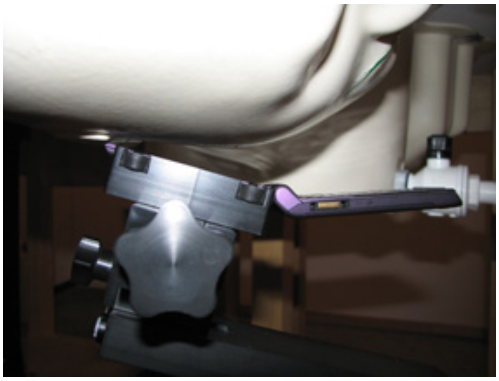
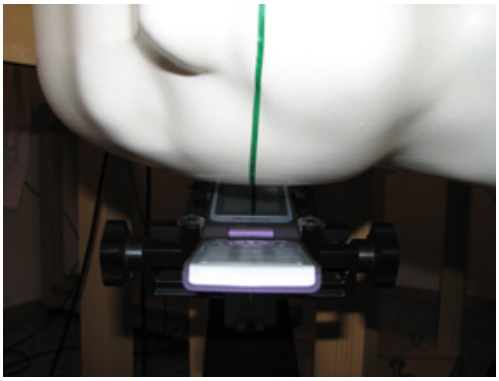
10.2 Device position on SAM Twins Phantom





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





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

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

10.3 Attachment

- Probe & Dipole Calibration
- Measurement plots and system validation
- Annex

Date/Time: 2007-11-09 09:29:14

Test Laboratory: Sony Ericsson Mobile Communications

SystemPerformanceCheck_Head_071109_RP

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

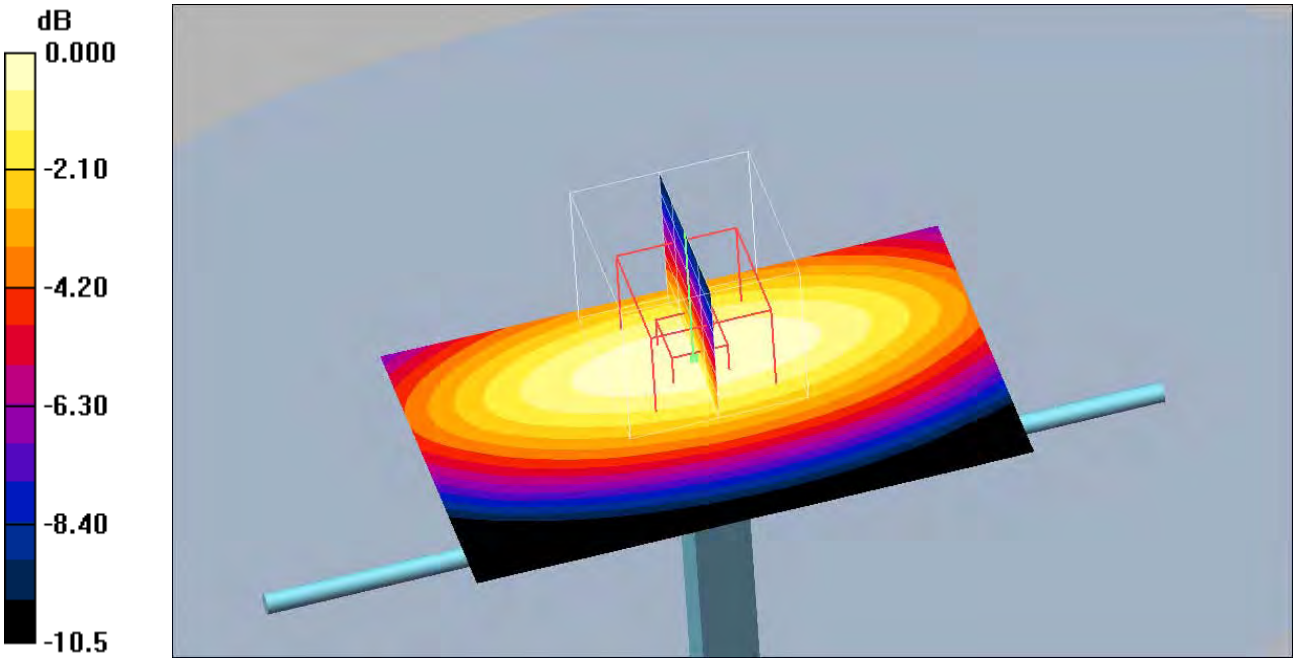
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.87 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(6.06, 6.06, 6.06); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 6; Type: SAM; Serial: 1351
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

d=15mm, Pin=100mW/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.01 mW/g

d=15mm, Pin=100mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.6 V/m; Power Drift = -0.205 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.927 mW/g; SAR(10 g) = 0.608 mW/g
Maximum value of SAR (measured) = 1.00 mW/g



0 dB = 1.00mW/g

Date/Time: 2007-11-19 09:59:30

Test Laboratory: Sony Ericsson Mobile Communications

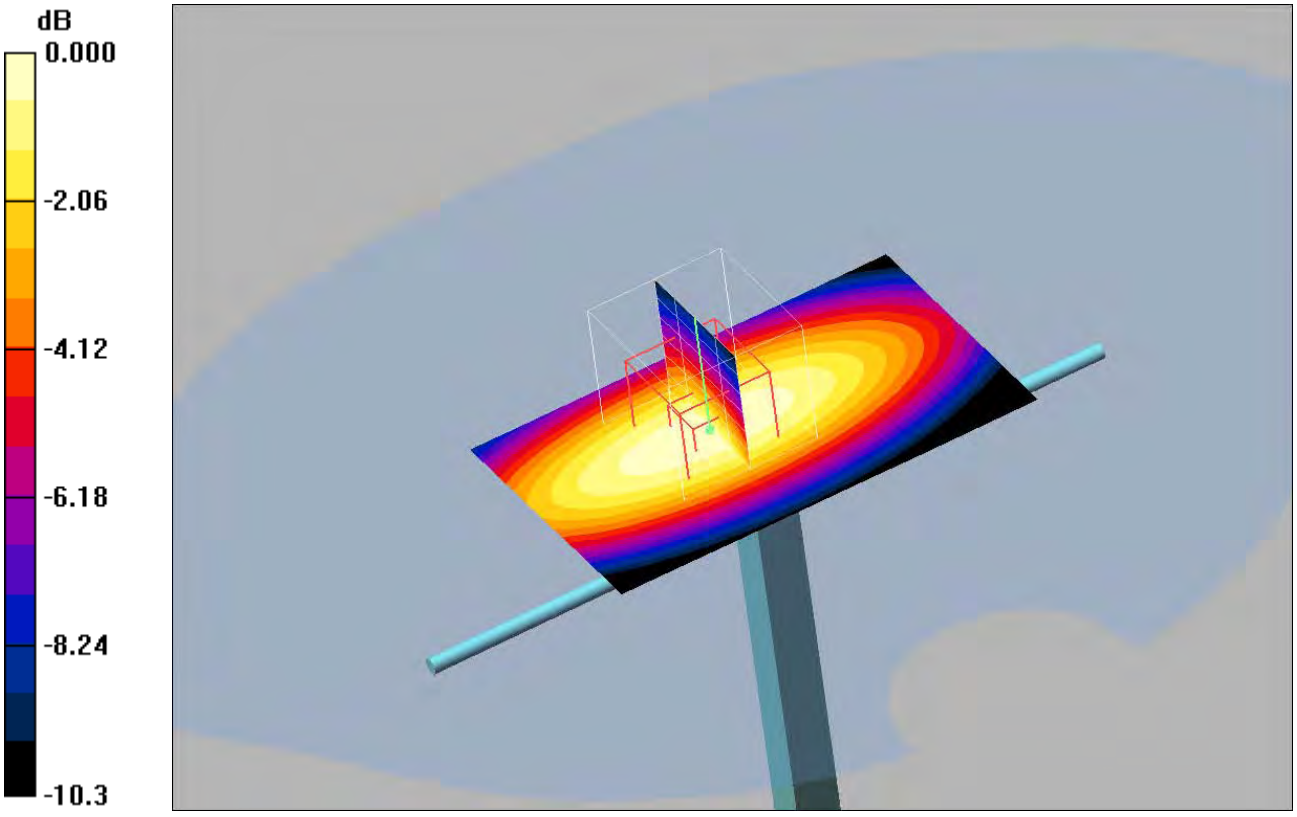
SystemPerformanceCheck_Body_071119_RP

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

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium parameters used: f = 835 MHz; σ = 0.98 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(6.13, 6.13, 6.13); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171
  d=15mm, Pin=100mW/Area Scan (61x101x1): Measurement grid: dx=10mm, dy=10mm
  Maximum value of SAR (interpolated) = 1.01 mW/g
  d=15mm, Pin=100mW/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
  Reference Value = 31.6 V/m; Power Drift = -0.043 dB
  Peak SAR (extrapolated) = 1.37 W/kg
  SAR(1 g) = 0.945 mW/g; SAR(10 g) = 0.622 mW/g
  Maximum value of SAR (measured) = 1.02 mW/g



0 dB = 1.02mW/g

Date/Time: 2007-11-15 08:58:09

Test Laboratory: Sony Ericsson Mobile Communications

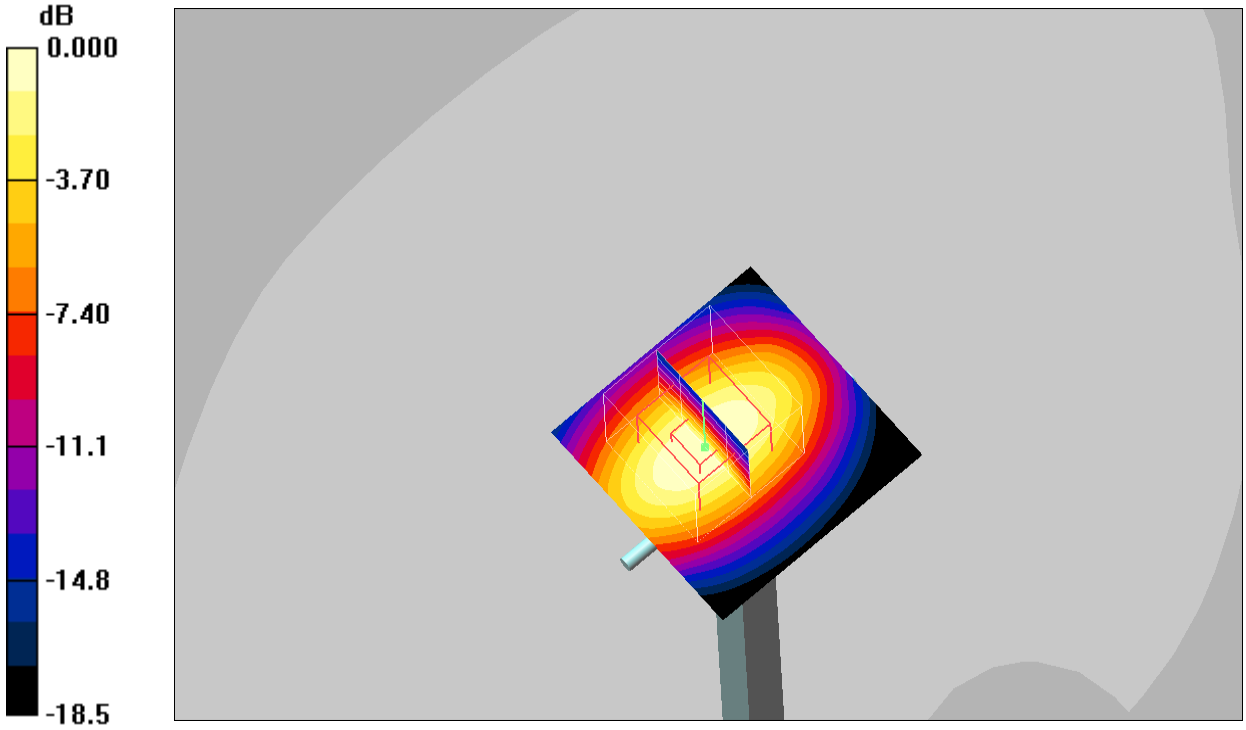
Verification_1900MHz_Head_071115_RP

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d073

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.47 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(4.73, 4.73, 4.73); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171
  Flat, Pin=100mW, d=10mm/Area Scan (61x61x1): Measurement grid: dx=10mm, dy=10mm
  Maximum value of SAR (interpolated) = 4.78 mW/g
  Flat, Pin=100mW, d=10mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
  Reference Value = 52.5 V/m; Power Drift = -0.071 dB
  Peak SAR (extrapolated) = 7.76 W/kg
  SAR(1 g) = 4.11 mW/g; SAR(10 g) = 2.09 mW/g
  Maximum value of SAR (measured) = 4.62 mW/g



0 dB = 4.62mW/g

Date/Time: 2007-11-16 08:16:27

Test Laboratory: Sony Ericsson Mobile Communications

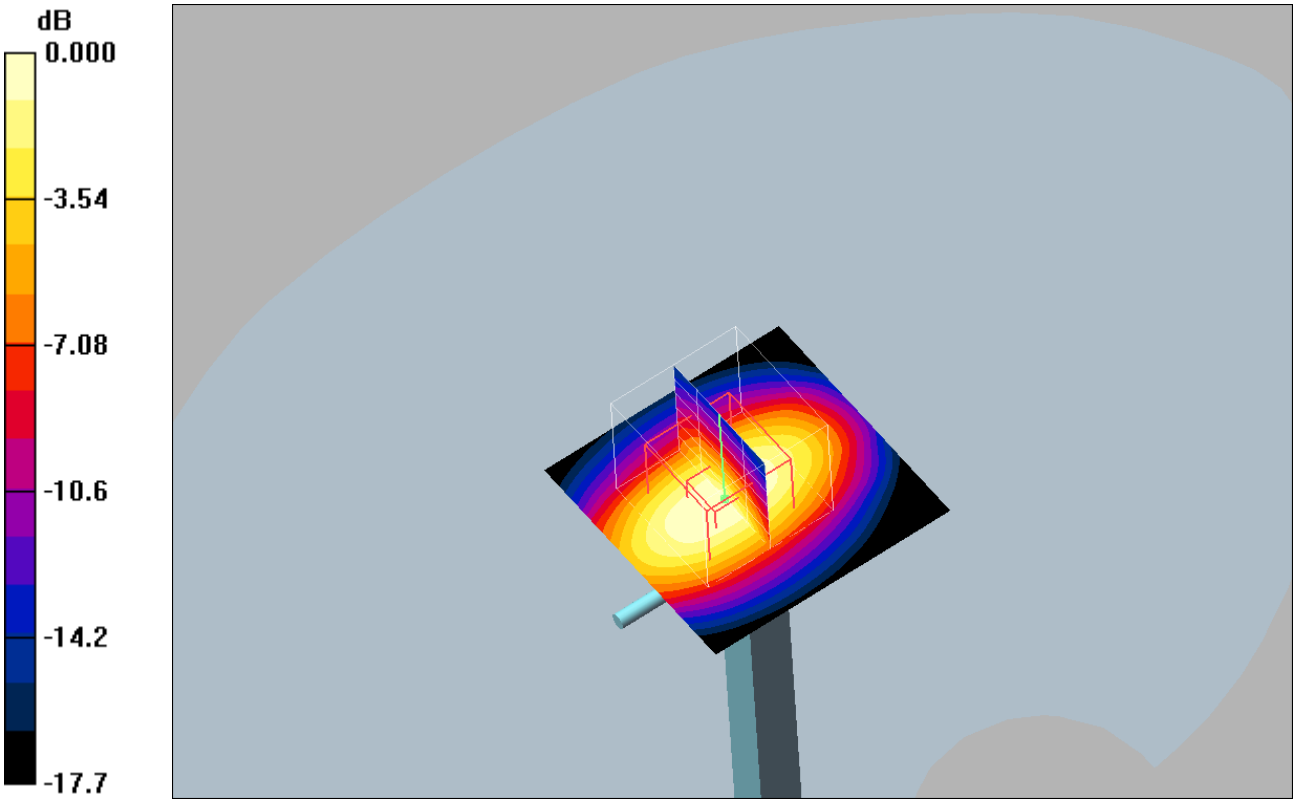
Verification_1900MHz_Body_071116_RP

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d073

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.58 mho/m; ε_r = 52; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(4.53, 4.53, 4.53); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171
  Flat, Pin=100mW, d=10mm/Area Scan (61x61x1): Measurement grid: dx=10mm, dy=10mm
  Maximum value of SAR (interpolated) = 4.85 mW/g
  Flat, Pin=100mW, d=10mm/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
  Reference Value = 53.5 V/m; Power Drift = -0.045 dB
  Peak SAR (extrapolated) = 7.57 W/kg
  SAR(1 g) = 4.12 mW/g; SAR(10 g) = 2.12 mW/g
  Maximum value of SAR (measured) = 4.65 mW/g



0 dB = 4.65mW/g

Date/Time: 2007-11-09 10:07:42

Test Laboratory: Sony Ericsson Mobile Communications

ch190_RC_071109_RP

DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

Communication System: GSM835MHz; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.87 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Right Section

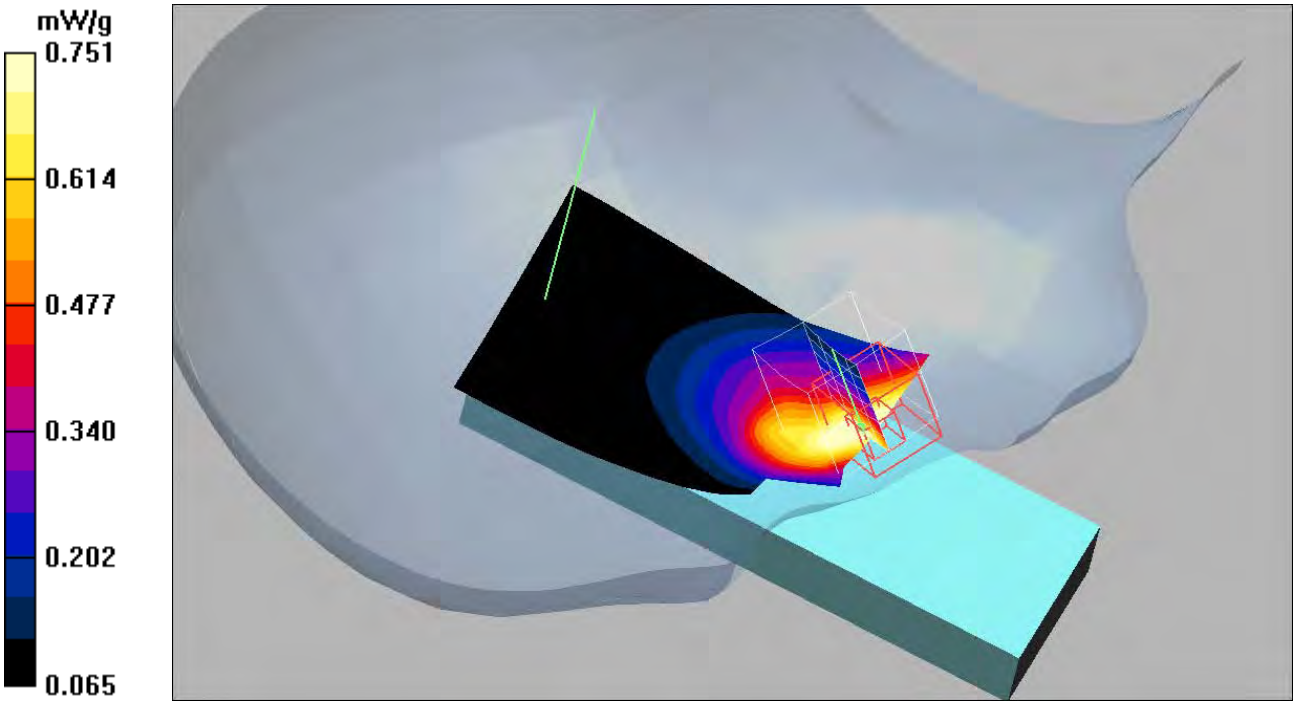
DASY4 Configuration:

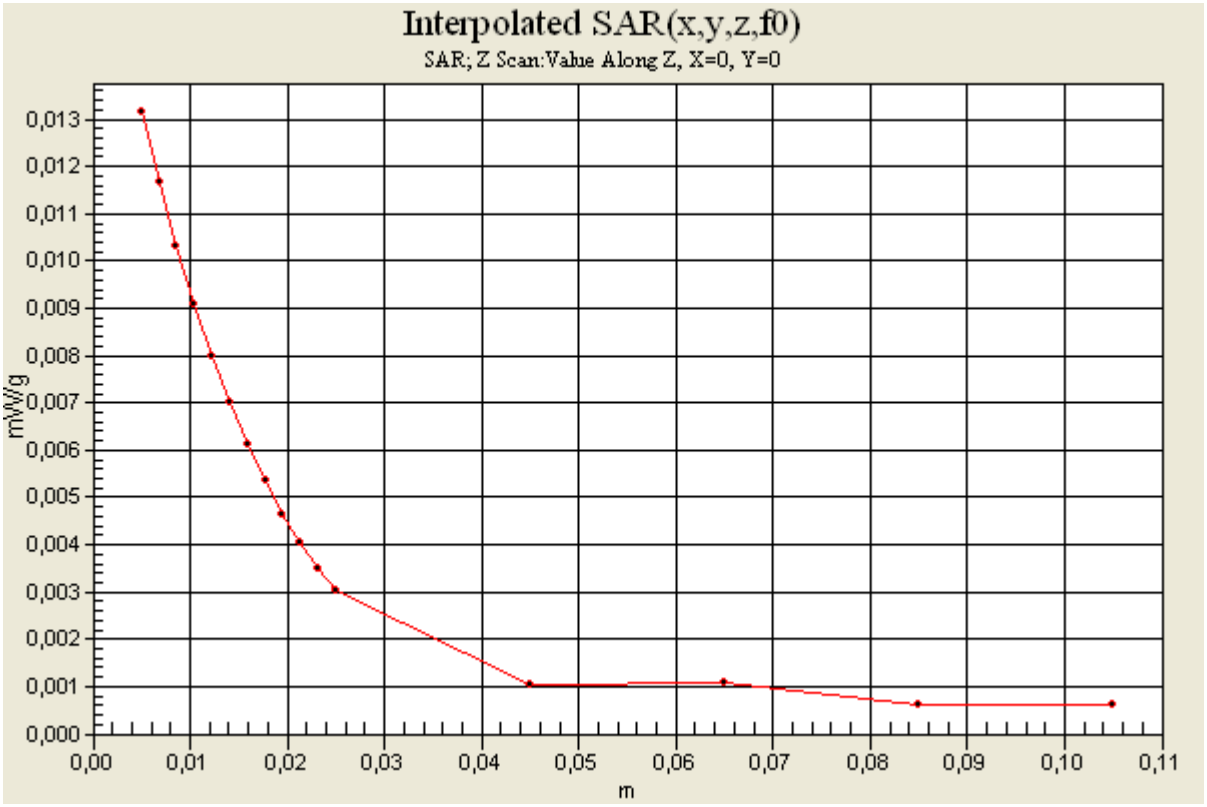
- Probe: ES3DV3 - SN3062; ConvF(6.06, 6.06, 6.06); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 6; Type: SAM; Serial: 1351
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Right Cheek/Area Scan (71x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.756 mW/g

Right Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.71 V/m; Power Drift = -0.042 dB
Peak SAR (extrapolated) = 0.897 W/kg
SAR(1 g) = 0.704 mW/g; SAR(10 g) = 0.508 mW/g
Maximum value of SAR (measured) = 0.751 mW/g

Right Cheek/Z Scan (1x1x16): Measurement grid: dx=20mm, dy=20mm, dz=20mm
Maximum value of SAR (interpolated) = 0.013 mW/g




Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0,013
0,012
0,011
0,010
0,009
0,008
0,007
0,006
0,005
0,004
0,003
0,002
0,001
0,000
0,00
0,01
0,02
0,03
0,04
0,05
0,06
0,07
0,08
0,09
0,10
0,11
m

Date/Time: 2007-11-09 14:05:26

Test Laboratory: Sony Ericsson Mobile Communications

ch190_LT_071109_RP

DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

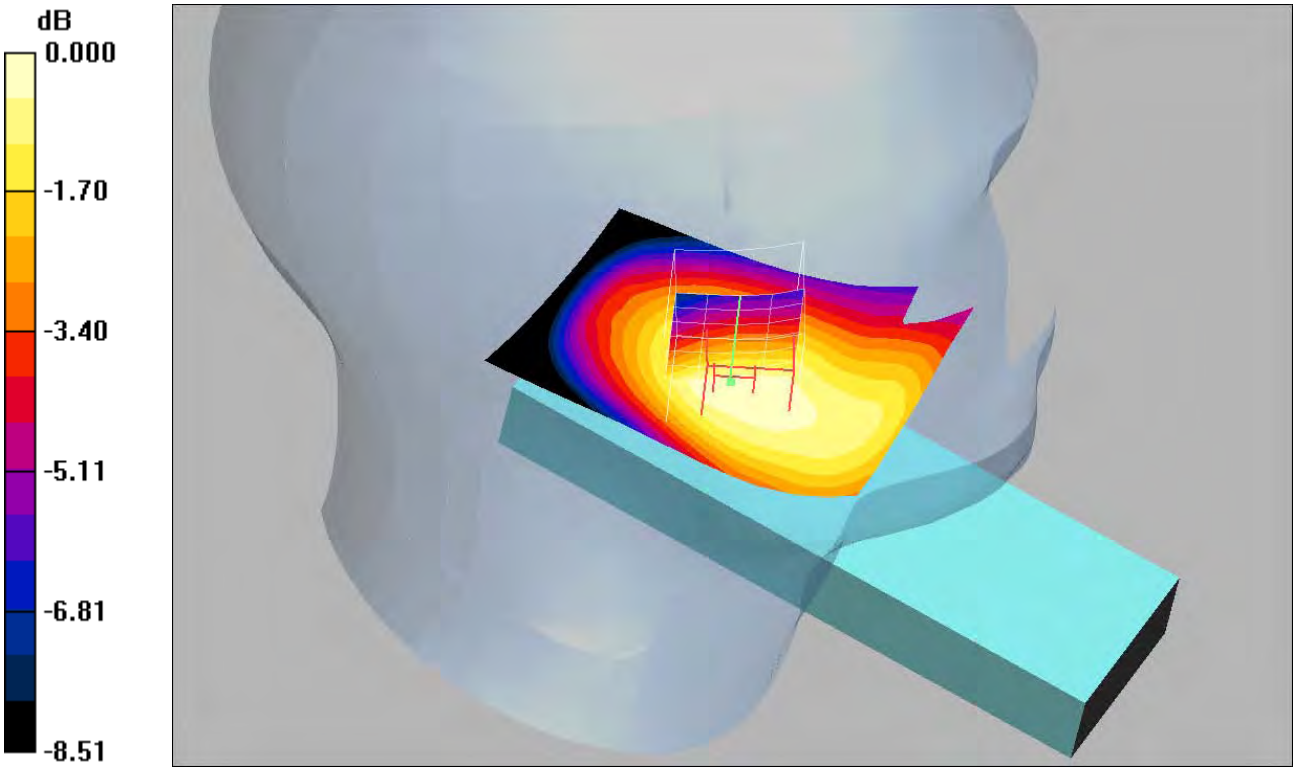
Communication System: GSM835MHz; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.87 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(6.06, 6.06, 6.06); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 6; Type: SAM; Serial: 1351
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Left Tilt/Area Scan (71x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.205 mW/g

Left Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.41 V/m; Power Drift = 0.069 dB
Peak SAR (extrapolated) = 0.238 W/kg
SAR(1 g) = 0.190 mW/g; SAR(10 g) = 0.143 mW/g
Maximum value of SAR (measured) = 0.201 mW/g



0 dB = 0.201mW/g

Date/Time: 2007-11-09 14:53:59

Test Laboratory: Sony Ericsson Mobile Communications

ch190_LC_071109_RP

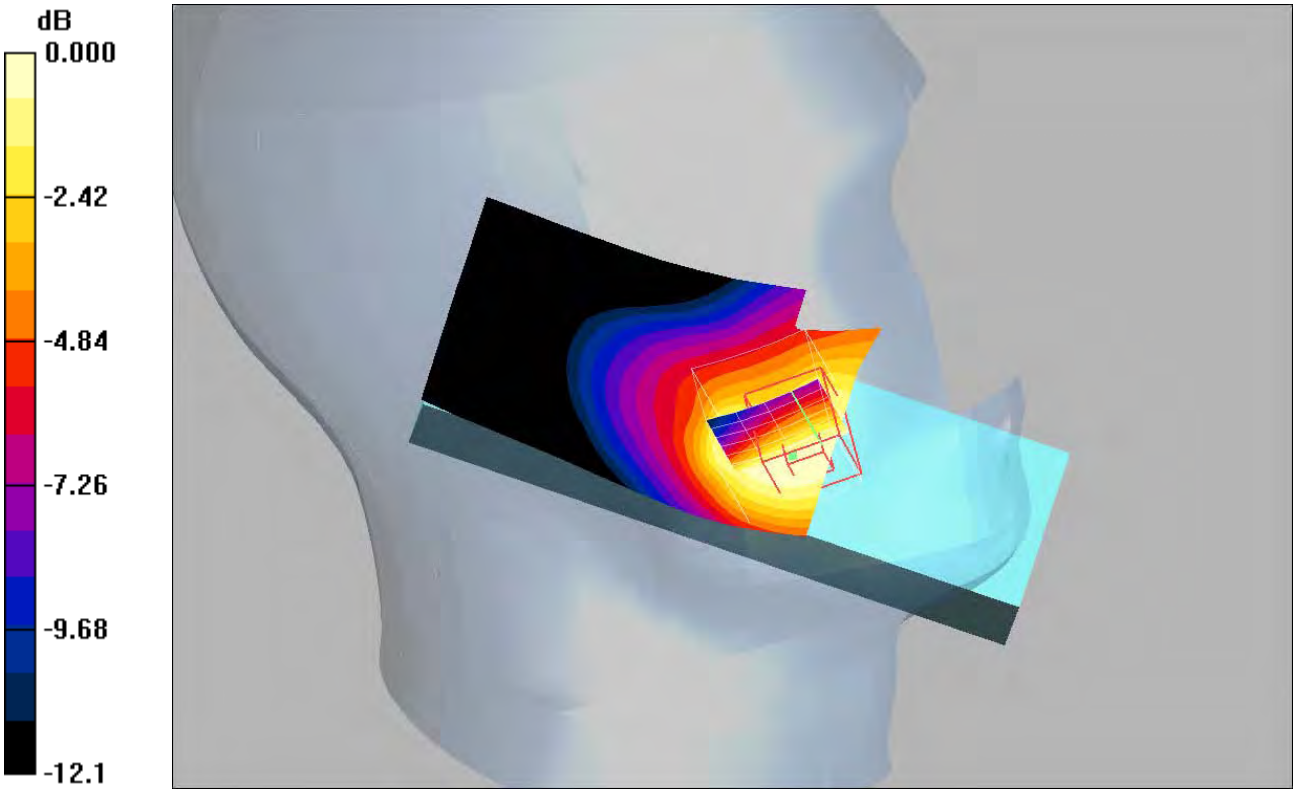
DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

Communication System: GSM835MHz; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.87 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(6.06, 6.06, 6.06); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 6; Type: SAM; Serial: 1351
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Left Cheek/Area Scan (71x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.684 mW/g
Left Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.99 V/m; Power Drift = 0.035 dB
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.628 mW/g; SAR(10 g) = 0.439 mW/g
Maximum value of SAR (measured) = 0.665 mW/g



0 dB = 0.665mW/g

Date/Time: 2007-11-09 10:28:26

Test Laboratory: Sony Ericsson Mobile Communications

ch190_RT_071109_RP

DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

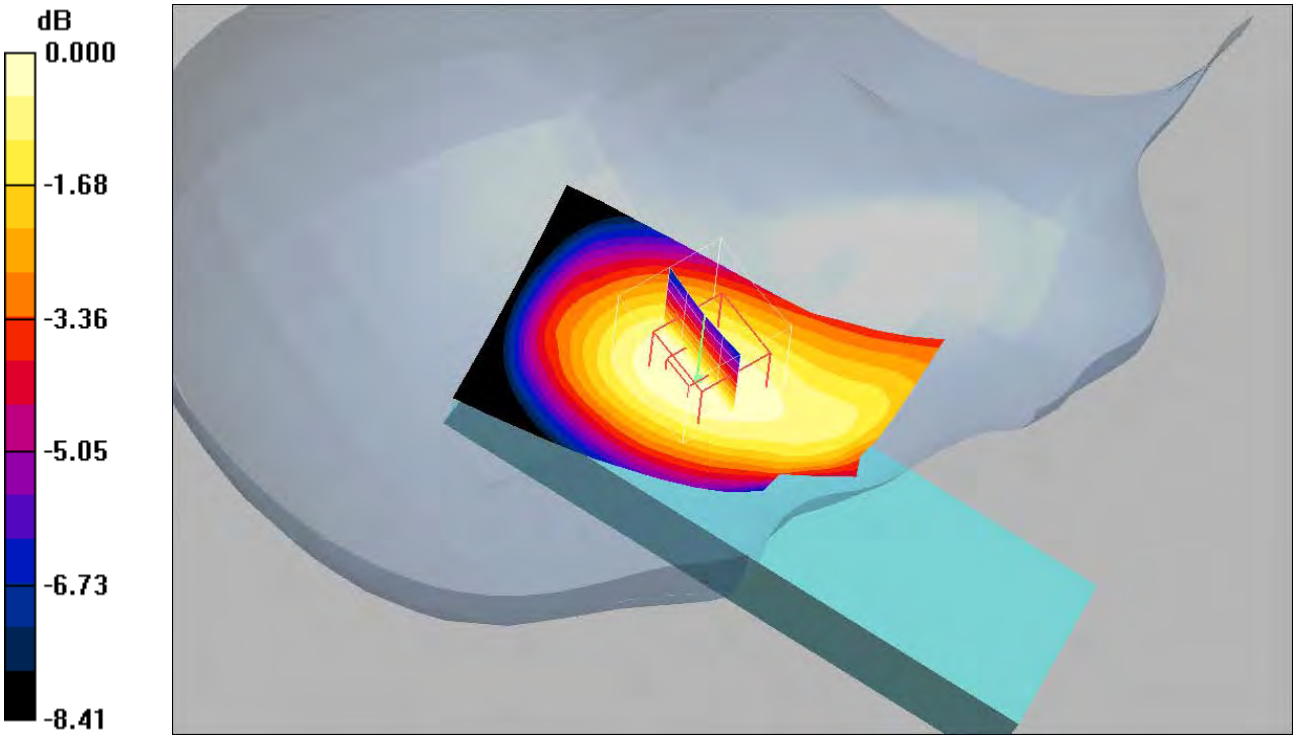
Communication System: GSM835MHz; Frequency: 836.6 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 836.6 MHz; σ = 0.87 mho/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(6.06, 6.06, 6.06); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 6; Type: SAM; Serial: 1351
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Right Tilt/Area Scan (71x111x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.247 mW/g

Right Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.2 V/m; Power Drift = -0.045 dB
Peak SAR (extrapolated) = 0.288 W/kg
SAR(1 g) = 0.232 mW/g; SAR(10 g) = 0.177 mW/g
Maximum value of SAR (measured) = 0.244 mW/g



0 dB = 0.244mW/g

Date/Time: 2007-11-19 10:54:51

Test Laboratory: Sony Ericsson Mobile Communications

ch128_GPRS2Slot_Data_071119_RP

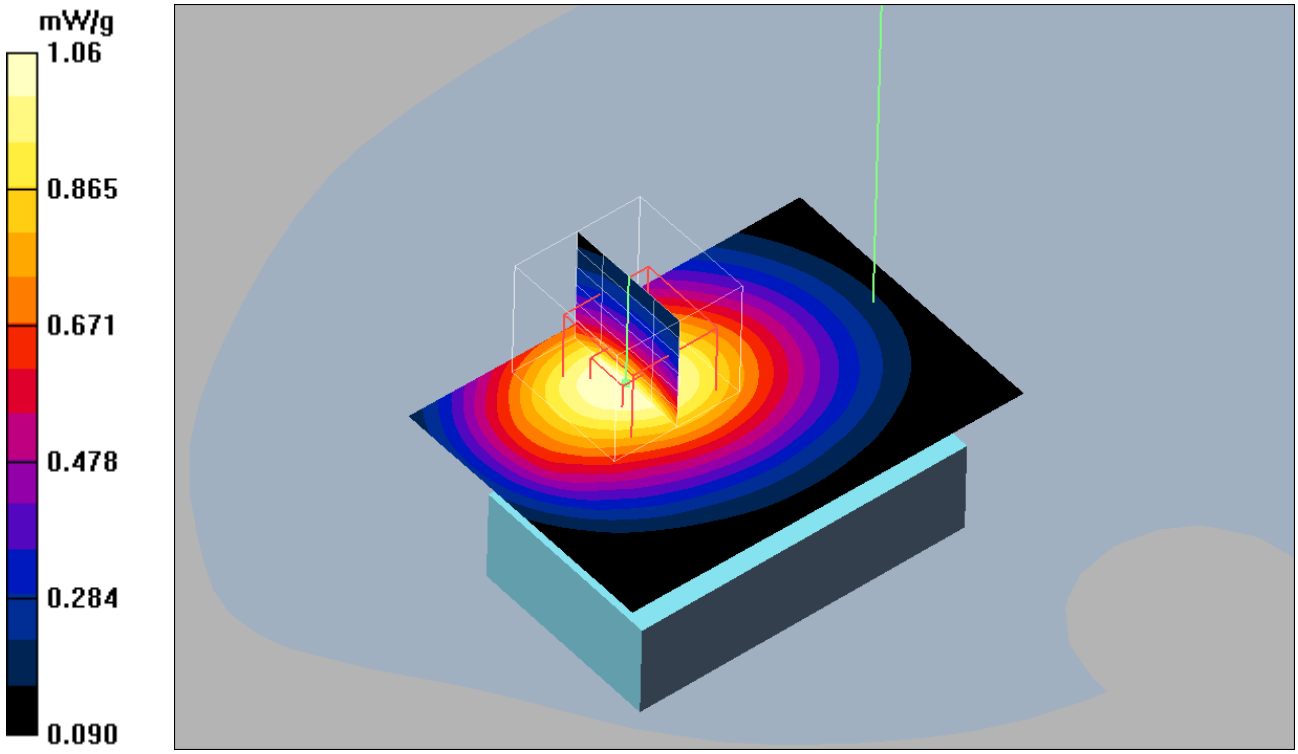
DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

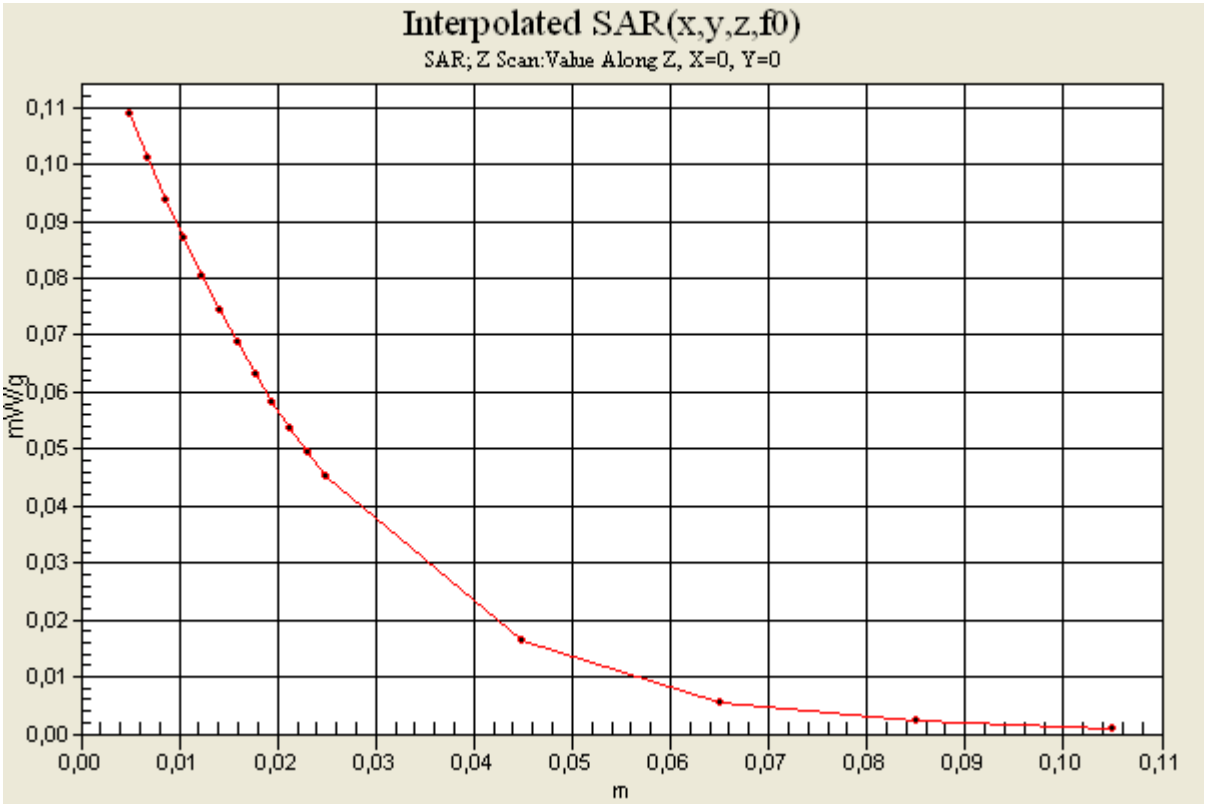
Communication System: GSM835MHz_GPRS2Slots; Frequency: 824.2 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 824.2 MHz; σ = 0.97 mho/m; ε_r = 55.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(6.13, 6.13, 6.13); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Flat, 15mm, Data/Area Scan (71x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.08 mW/g
Flat, 15mm, Data/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.7 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.988 mW/g; SAR(10 g) = 0.695 mW/g
Maximum value of SAR (measured) = 1.06 mW/g
Flat, 15mm, Data/Z Scan (1x1x16): Measurement grid: dx=20mm, dy=20mm, dz=20mm
Maximum value of SAR (interpolated) = 0.109 mW/g




Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0,11
0,10
0,09
0,08
0,07
0,06
0,05
0,04
0,03
0,02
0,01
0,00
0,00
0,01
0,02
0,03
0,04
0,05
0,06
0,07
0,08
0,09
0,10
0,11
m

Date/Time: 2007-11-19 14:08:44

Test Laboratory: Sony Ericsson Mobile Communications

ch128_EDGE2Slot_Data_071119_RP

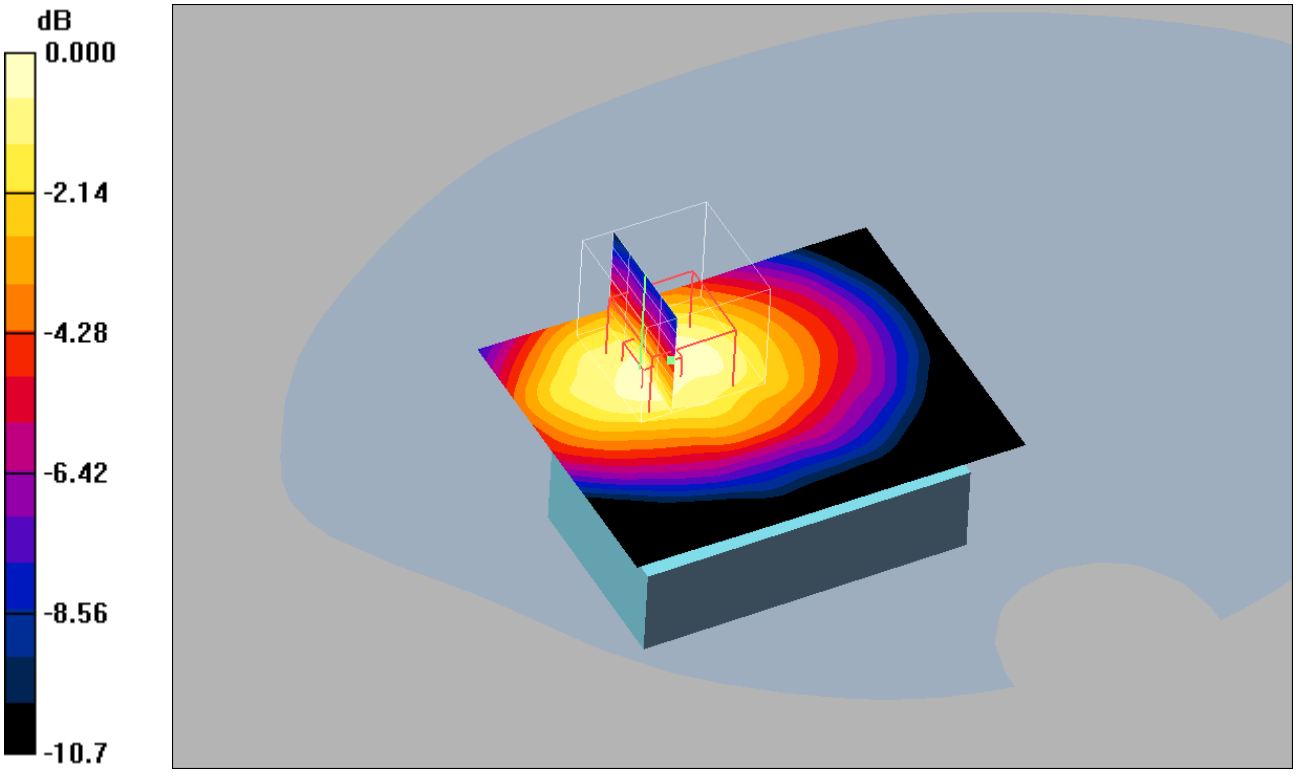
DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

Communication System: GSM835MHz_GPRS2Slots; Frequency: 824.2 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 824.2 MHz; σ = 0.97 mho/m; ε_r = 55.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(6.13, 6.13, 6.13); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Flat, 15mm, Data/Area Scan (81x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.237 mW/g
Flat, 15mm, Data/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.74 V/m; Power Drift = 0.423 dB
Peak SAR (extrapolated) = 0.306 W/kg
SAR(1 g) = 0.216 mW/g; SAR(10 g) = 0.148 mW/g
Maximum value of SAR (measured) = 0.242 mW/g



0 dB = 0.242mW/g

Date/Time: 2007-11-19 14:55:31

Test Laboratory: Sony Ericsson Mobile Communications

ch128_BT_Speech_071119_RP

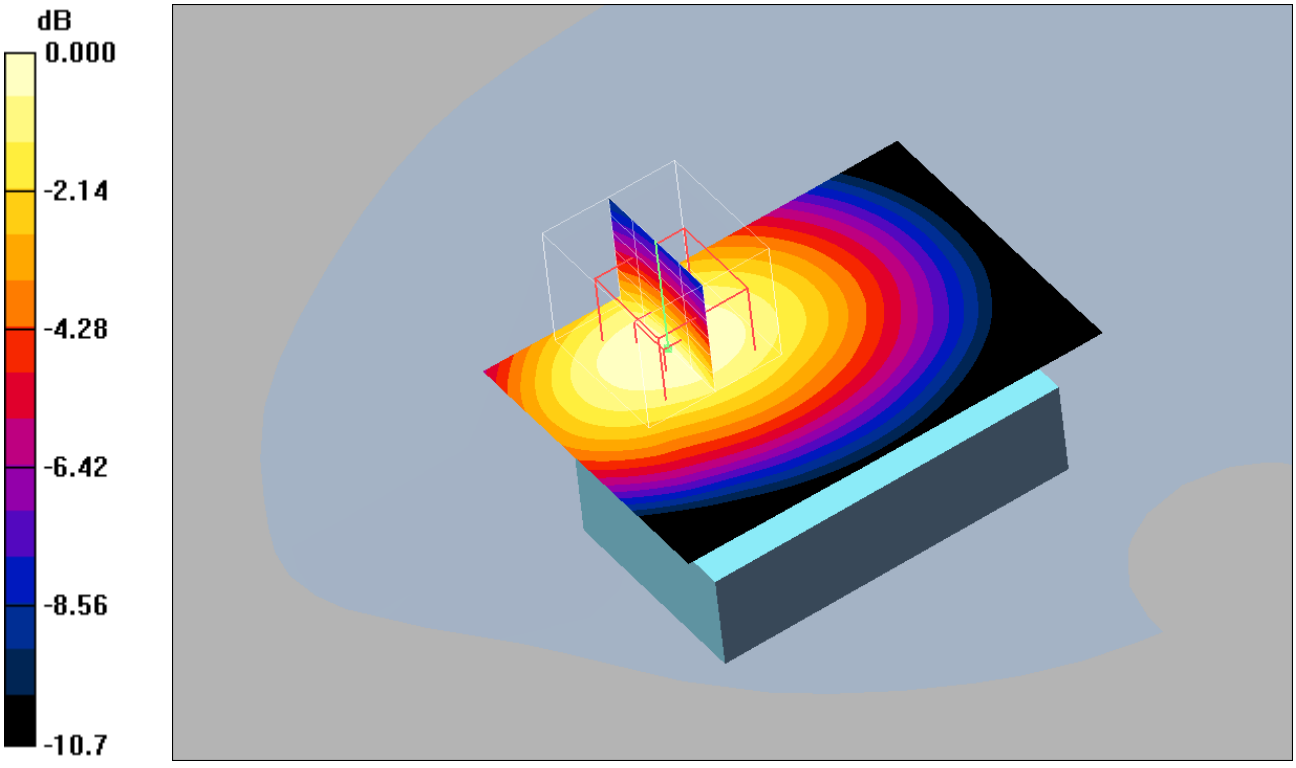
DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

Communication System: GSM835MHz; Frequency: 824.2 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 824.2 MHz; σ = 0.97 mho/m; ε_r = 55.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(6.13, 6.13, 6.13); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Flat, 15mm, Speech/Area Scan (71x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.512 mW/g
Flat, 15mm, Speech/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.25 V/m; Power Drift = -0.011 dB
Peak SAR (extrapolated) = 0.655 W/kg
SAR(1 g) = 0.473 mW/g; SAR(10 g) = 0.327 mW/g
Maximum value of SAR (measured) = 0.508 mW/g



0 dB = 0.508mW/g

Date/Time: 2007-11-19 12:36:14

Test Laboratory: Sony Ericsson Mobile Communications

ch128_GPRS2Slot_Rear_Data_071119_RP

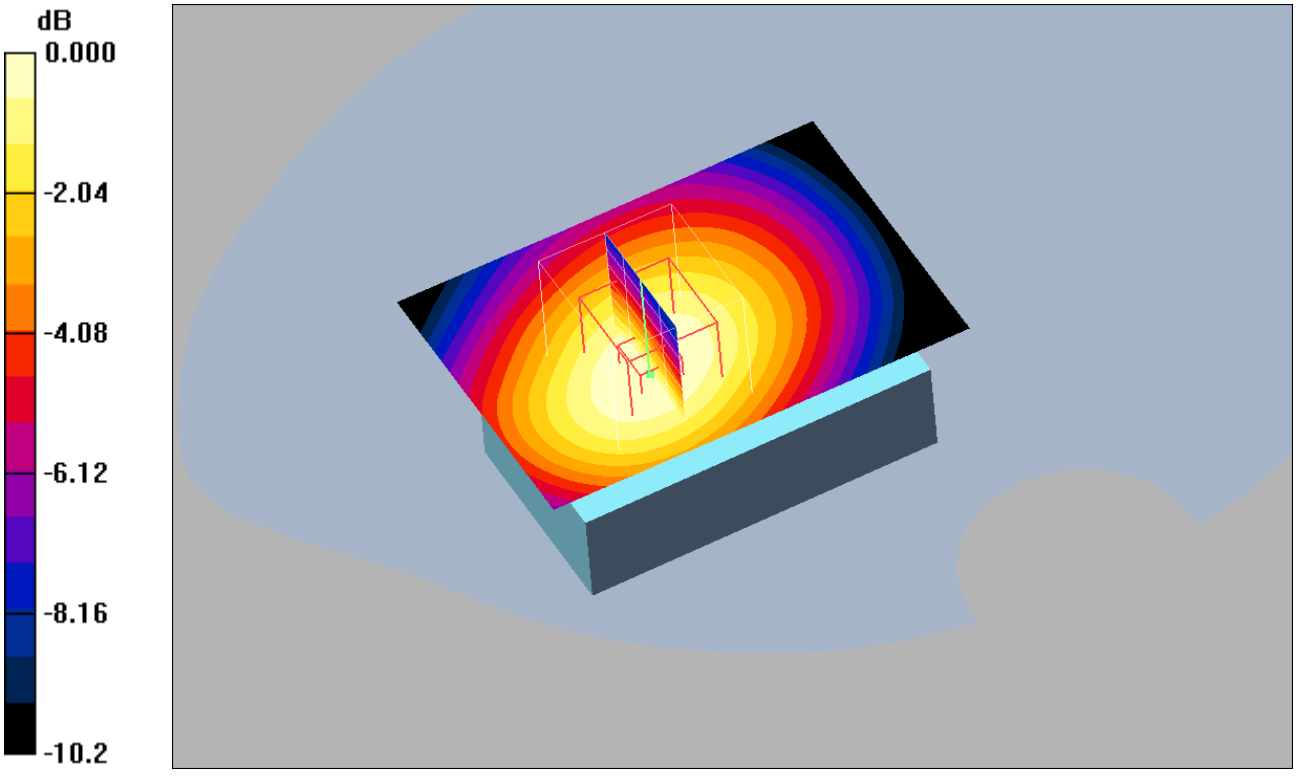
DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

Communication System: GSM835MHz_GPRS2Slots; Frequency: 824.2 MHz;Duty Cycle: 1:4.15
Medium parameters used: f = 824.2 MHz; σ = 0.97 mho/m; ε_r = 55.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(6.13, 6.13, 6.13); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Flat, 15mm, Data/Area Scan (71x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.641 mW/g
Flat, 15mm, Data/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.9 V/m; Power Drift = -0.053 dB
Peak SAR (extrapolated) = 0.793 W/kg
SAR(1 g) = 0.589 mW/g; SAR(10 g) = 0.415 mW/g
Maximum value of SAR (measured) = 0.625 mW/g



0 dB = 0.625mW/g

Date/Time: 2007-11-15 11:59:04

Test Laboratory: Sony Ericsson Mobile Communications

ch661_LT_071115_RP

DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

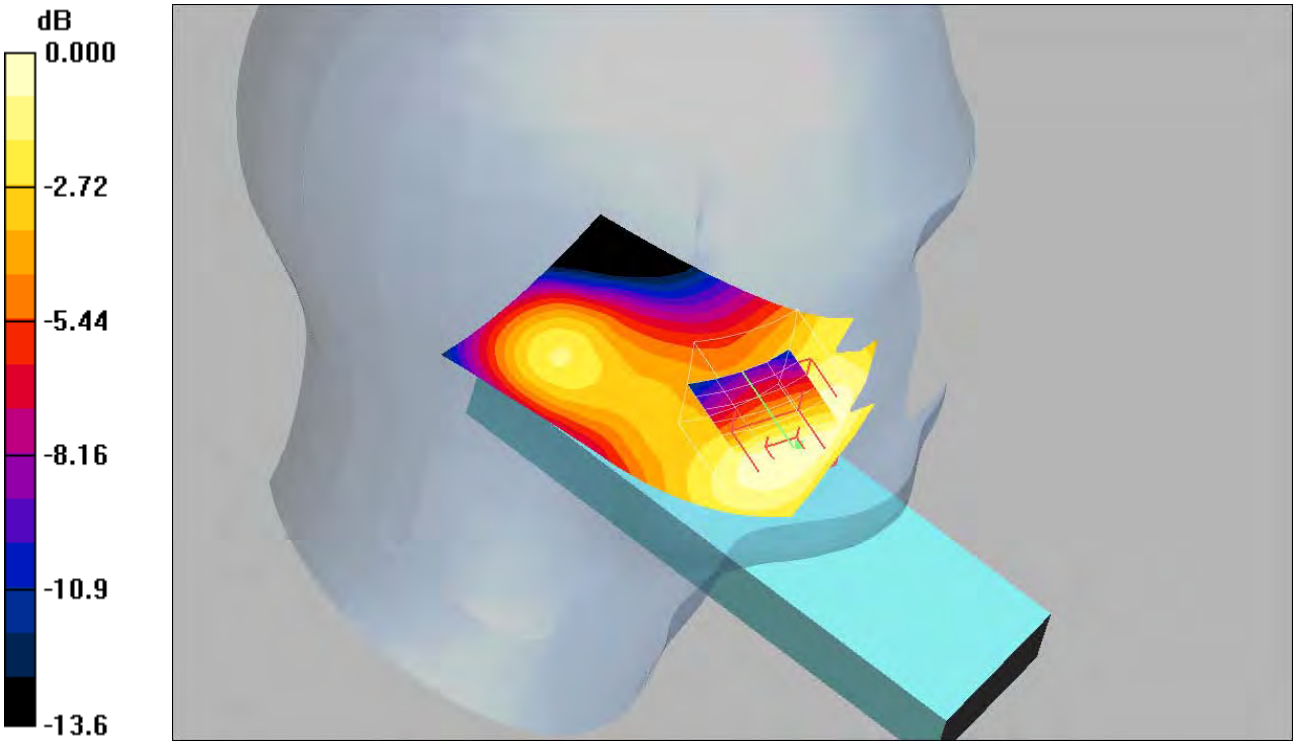
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.46 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(4.73, 4.73, 4.73); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Left Tilt/Area Scan (71x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.094 mW/g

Left Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.90 V/m; Power Drift = -0.067 dB
Peak SAR (extrapolated) = 0.131 W/kg
SAR(1 g) = 0.089 mW/g; SAR(10 g) = 0.061 mW/g
Maximum value of SAR (measured) = 0.095 mW/g



0 dB = 0.095mW/g

Date/Time: 2007-11-15 10:59:03

Test Laboratory: Sony Ericsson Mobile Communications

ch512_RC_071115_RP

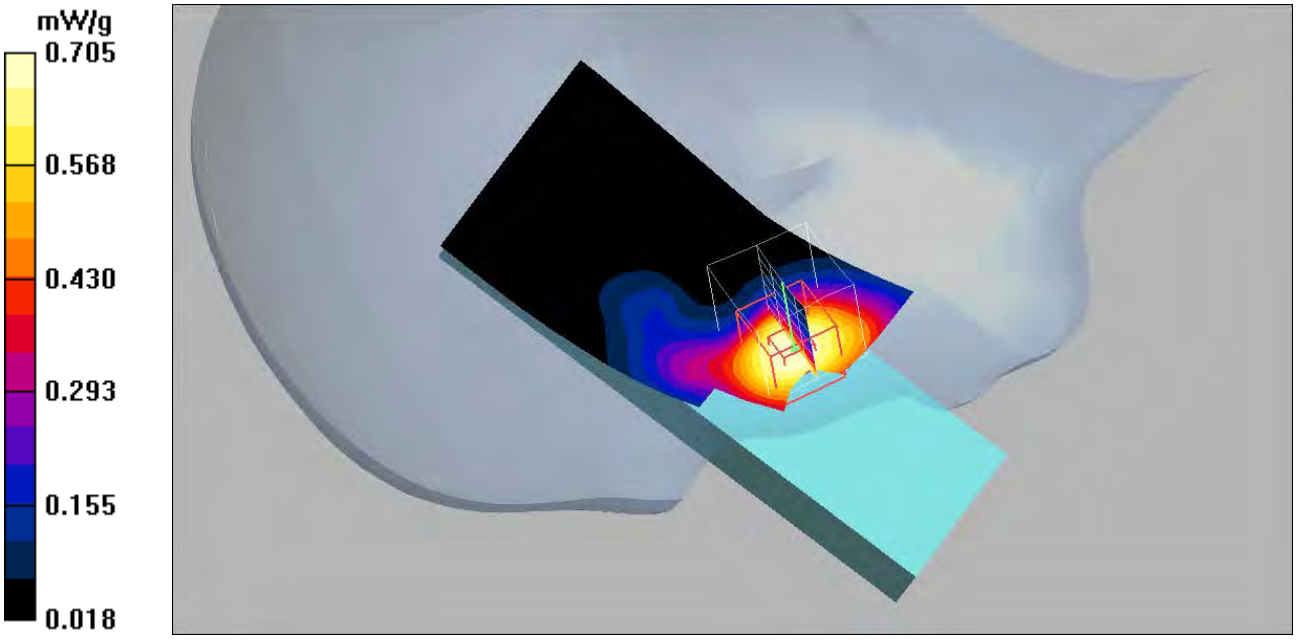
DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.42 mho/m; ε_r = 38.8; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(4.73, 4.73, 4.73); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Right Cheek/Area Scan (71x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.721 mW/g
Right Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.64 V/m; Power Drift = 0.116 dB
Peak SAR (extrapolated) = 0.941 W/kg
SAR(1 g) = 0.665 mW/g; SAR(10 g) = 0.438 mW/g
Maximum value of SAR (measured) = 0.705 mW/g



Date/Time: 2007-11-15 12:25:45

Test Laboratory: Sony Ericsson Mobile Communications

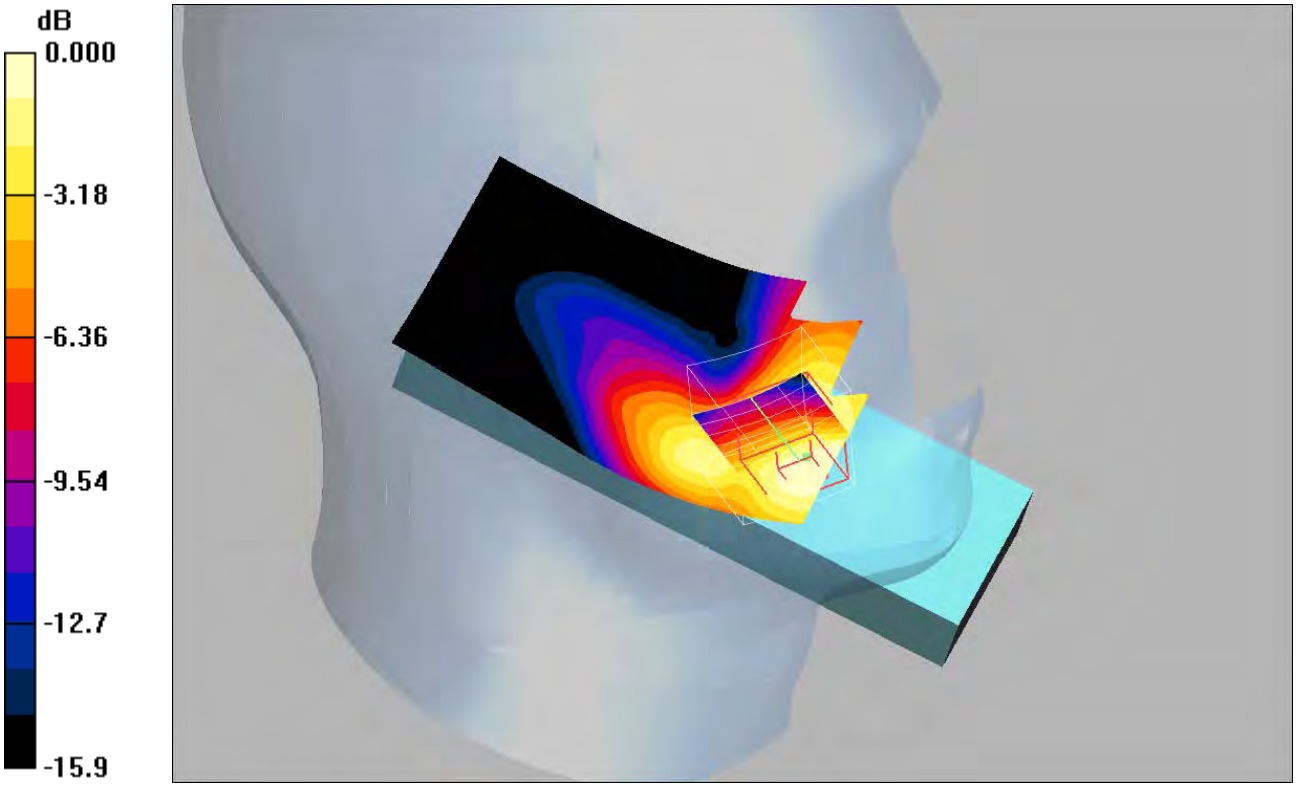
ch512_LC_071115_RP

DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.42 mho/m; ε_r = 38.8; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(4.73, 4.73, 4.73); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171
  Left Cheek/Area Scan (71x121x1): Measurement grid: dx=10mm, dy=10mm
  Maximum value of SAR (interpolated) = 0.610 mW/g
  Left Cheek/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
  Reference Value = 2.57 V/m; Power Drift = -0.065 dB
  Peak SAR (extrapolated) = 0.863 W/kg
  SAR(1 g) = 0.560 mW/g; SAR(10 g) = 0.351 mW/g.
  Maximum value of SAR (measured) = 0.609 mW/g



0 dB = 0.609mW/g

Date/Time: 2007-11-15 09:44:07

Test Laboratory: Sony Ericsson Mobile Communications

ch661_RT_071115_RP

DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.46 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Phantom section: Right Section

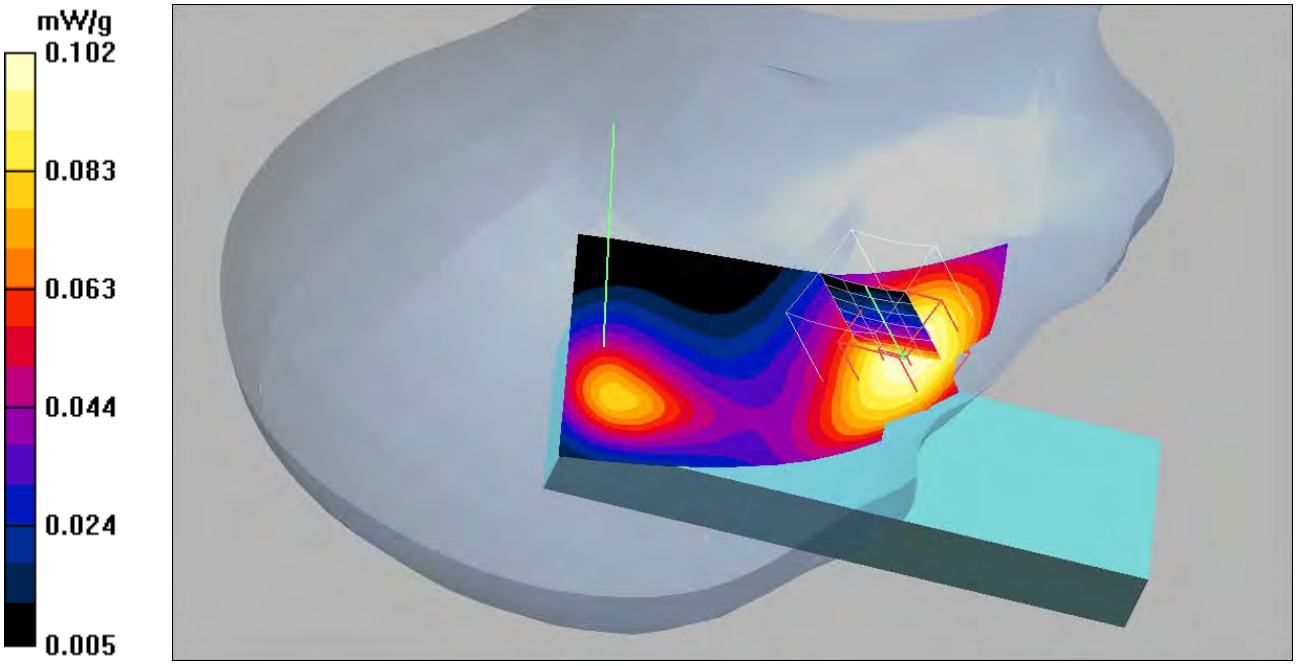
DASY4 Configuration:

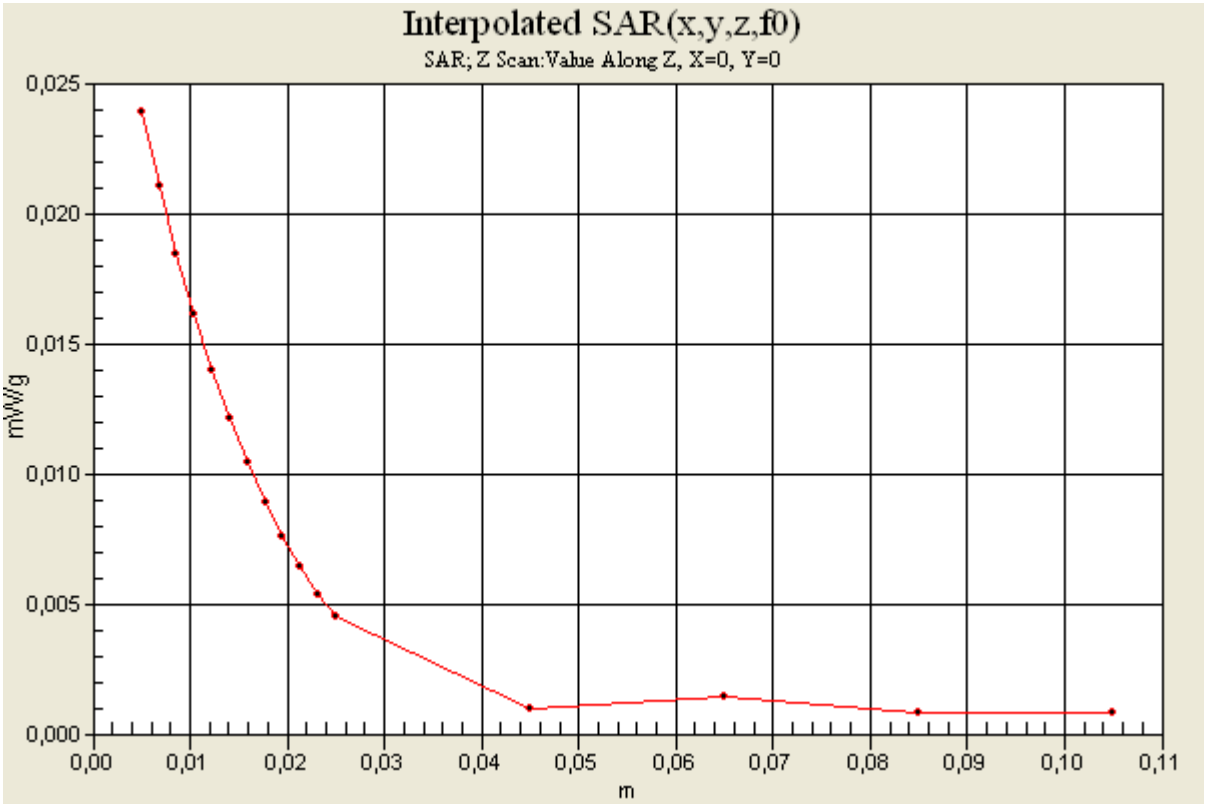
- Probe: ES3DV3 - SN3062; ConvF(4.73, 4.73, 4.73); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Right Tilt/Area Scan (71x121x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.103 mW/g

Right Tilt/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.37 V/m; Power Drift = 0.012 dB
Peak SAR (extrapolated) = 0.142 W/kg
SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.064 mW/g
Maximum value of SAR (measured) = 0.102 mW/g

Right Tilt/Z Scan (1x1x16): Measurement grid: dx=20mm, dy=20mm, dz=20mm
Maximum value of SAR (interpolated) = 0.024 mW/g




Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0,025
0,020
0,015
0,010
0,005
0,000
0,00
0,01
0,02
0,03
0,04
0,05
0,06
0,07
0,08
0,09
0,10
0,11
m

Date/Time: 2007-11-16 10:18:53

Test Laboratory: Sony Ericsson Mobile Communications

ch512_GPRS2Slot_Data_Rear_071116_RP

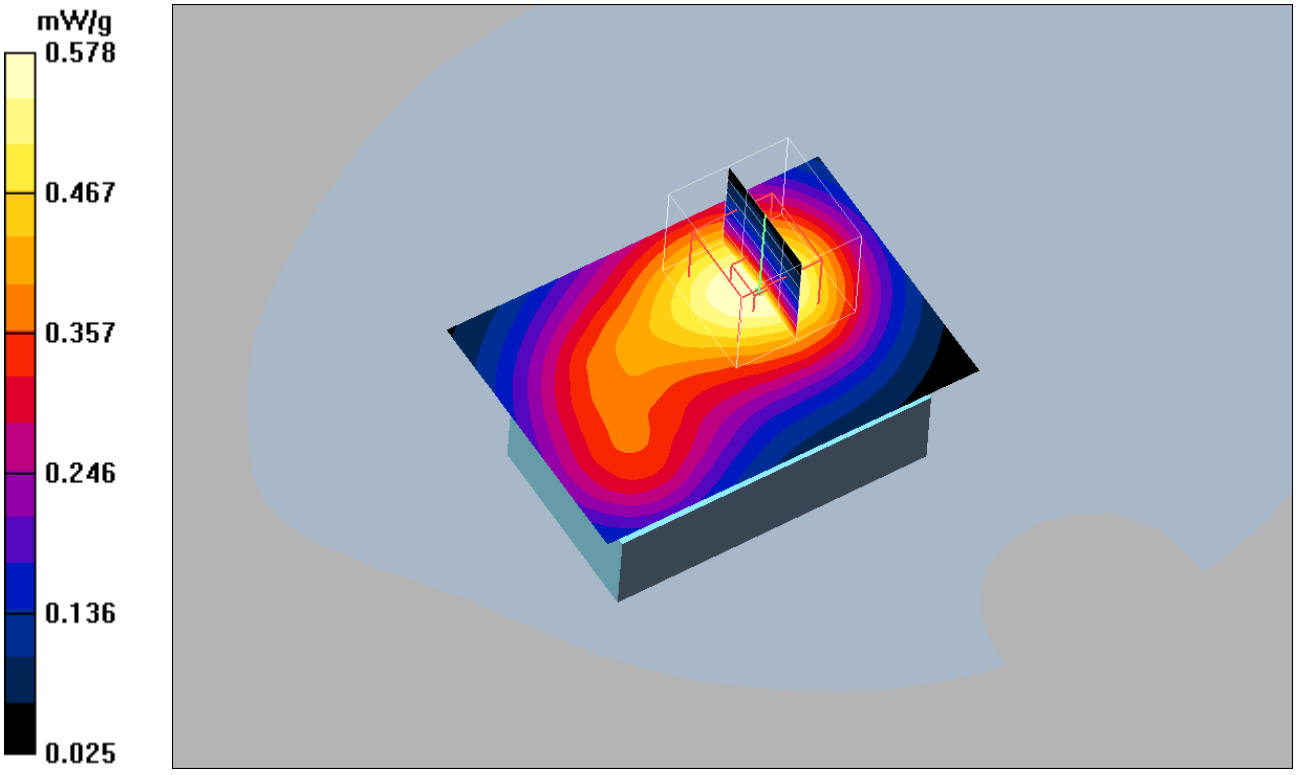
DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

Communication System: GSM1900_GPRS; Frequency: 1850.2 MHz;Duty Cycle: 1:4.15
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.5 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(4.53, 4.53, 4.53); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Flat, 15mm, Data/Area Scan (71x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.593 mW/g
Flat, 15mm, Data/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = 0.038 dB
Peak SAR (extrapolated) = 0.802 W/kg
SAR(1 g) = 0.538 mW/g; SAR(10 g) = 0.349 mW/g
Maximum value of SAR (measured) = 0.578 mW/g



Date/Time: 2007-11-16 10:56:53

Test Laboratory: Sony Ericsson Mobile Communications

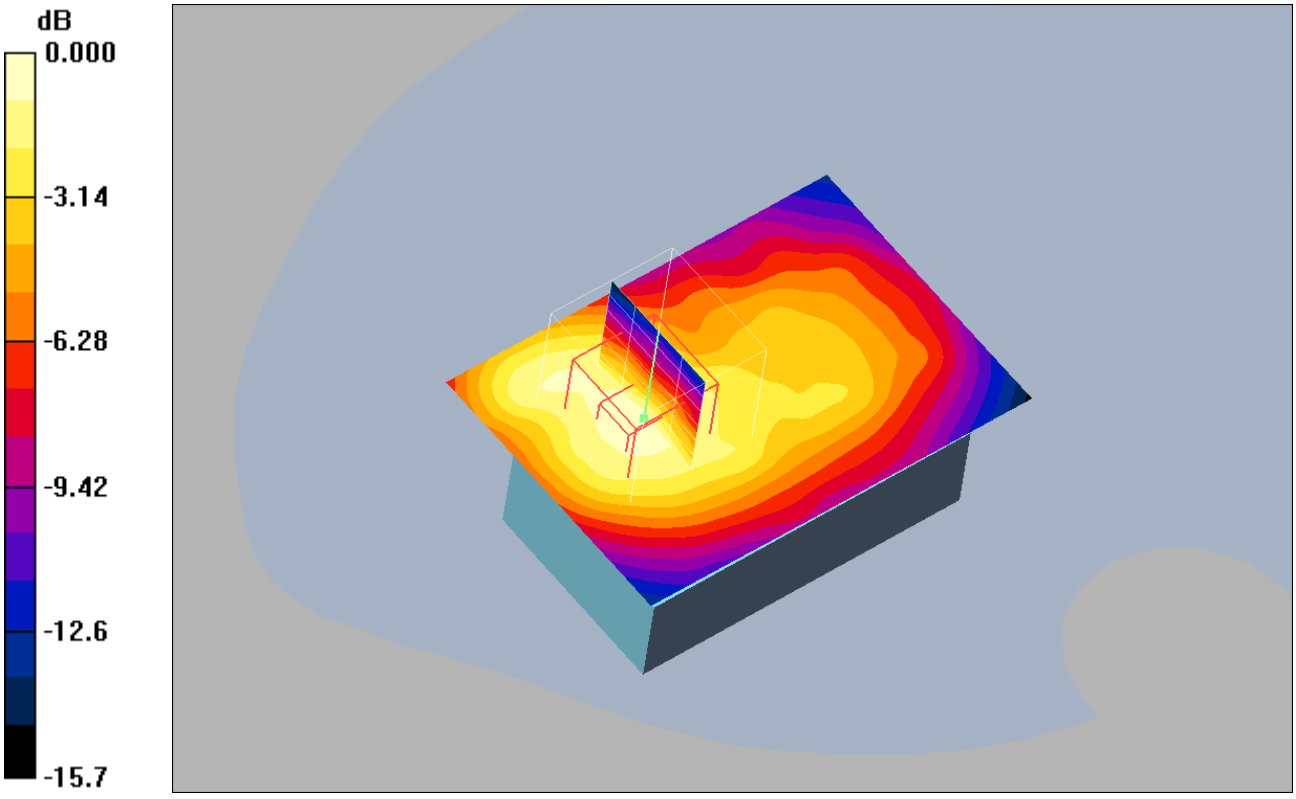
ch512_GPRS2Slot_Data_EDGE_071116_RP

DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

Communication System: GSM1900_GPRS; Frequency: 1850.2 MHz;Duty Cycle: 1:4.15
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.5 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(4.53, 4.53, 4.53); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171
  Flat, 15mm, Data/Area Scan (71x101x1): Measurement grid: dx=10mm, dy=10mm
  Maximum value of SAR (interpolated) = 0.216 mW/g
  Flat, 15mm, Data/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
  Reference Value = 5.87 V/m; Power Drift = 0.000 dB
  Peak SAR (extrapolated) = 0.332 W/kg
  SAR(1 g) = 0.196 mW/g; SAR(10 g) = 0.113 mW/g
  Maximum value of SAR (measured) = 0.215 mW/g



0 dB = 0.215mW/g

Date/Time: 2007-11-16 08:54:18

Test Laboratory: Sony Ericsson Mobile Communications

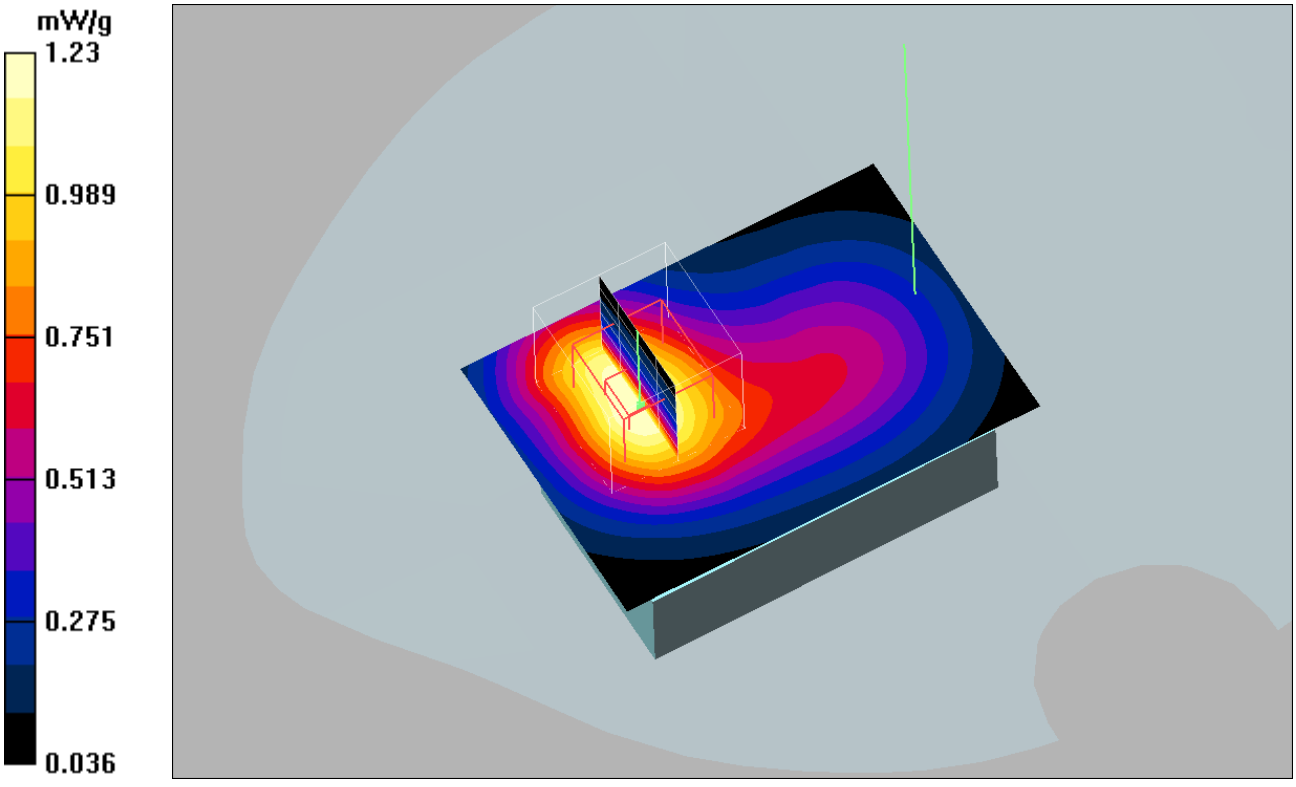
ch512_GPRS2Slot_Data_071116_RP

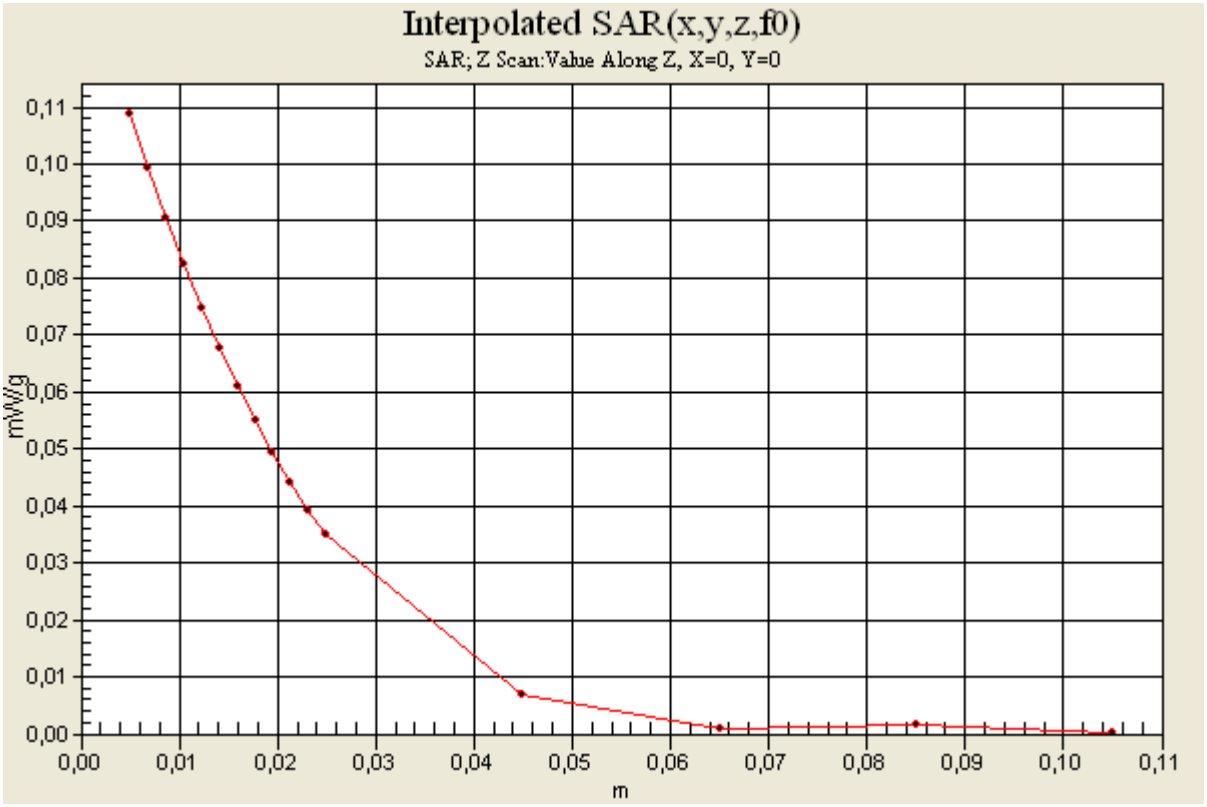
DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

Communication System: GSM1900_GPRS; Frequency: 1850.2 MHz;Duty Cycle: 1:4.15
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.5 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(4.53, 4.53, 4.53); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171
  Flat, 15mm, Data/Area Scan (71x101x1): Measurement grid: dx=10mm, dy=10mm
  Maximum value of SAR (interpolated) = 1.27 mW/g
  Flat, 15mm, Data/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
  Reference Value = 14.9 V/m; Power Drift = -0.105 dB
  Peak SAR (extrapolated) = 1.86 W/kg
  SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.678 mW/g
  Maximum value of SAR (measured) = 1.23 mW/g
  Flat, 15mm, Data/Z Scan (1x1x16): Measurement grid: dx=20mm, dy=20mm, dz=20mm
  Maximum value of SAR (interpolated) = 0.109 mW/g




Interpolated SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0,11
0,10
0,09
0,08
0,07
0,06
0,05
0,04
0,03
0,02
0,01
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0,08
0,09
0,10
0,11
m

Date/Time: 2007-11-16 11:44:30

Test Laboratory: Sony Ericsson Mobile Communications

ch512_PHF_Speech_071116_RP

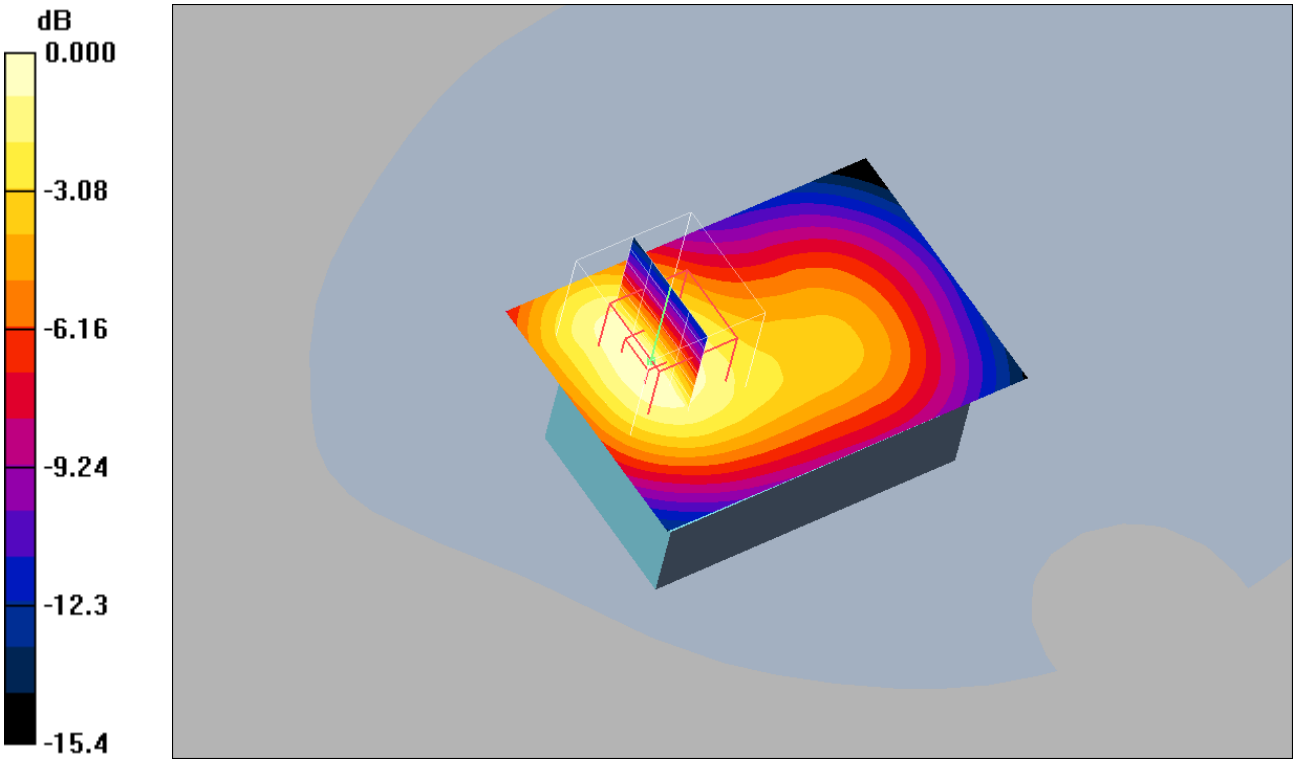
DUT: PY7A1032051 (W380a); Type: GSM; Serial: #9522

Communication System: GSM 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.5 mho/m; ε_r = 51.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3062; ConvF(4.53, 4.53, 4.53); Calibrated: 2007-01-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn640; Calibrated: 2007-01-19
- Phantom: SAM 5; Type: SAM; Serial: 1352
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 171

Flat, 15mm, Speech/Area Scan (71x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.681 mW/g
Flat, 15mm, Speech/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.32 V/m; Power Drift = 0.050 dB
Peak SAR (extrapolated) = 0.994 W/kg
SAR(1 g) = 0.611 mW/g; SAR(10 g) = 0.365 mW/g
Maximum value of SAR (measured) = 0.669 mW/g



0 dB = 0.669mW/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: D835V2-4d039_May06

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d039
Calibration procedure(s)	QA CAL-05.v6 Calibration procedure for dipole validation kits
Calibration date:	May 31, 2006
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-05 (METAS, No. 251-00516)	Oct-06
Power sensor HP 8481A	US37292783	04-Oct-05 (METAS, No. 251-00516)	Oct-06
Reference 20 dB Attenuator	SN: 5086 (20g)	11-Aug-05 (METAS, No 251-00498)	Aug-06
Reference 10 dB Attenuator	SN: 5047.2 (10r)	11-Aug-05 (METAS, No 251-00498)	Aug-06
Reference Probe ET3DV6	SN 1507	28-Oct-05 (SPEAG, No. ET3-1507_Oct05)	Oct-06
DAE4	SN 601	15-Dec-05 (SPEAG, No. DAE4-601_Dec05)	Dec-06

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

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

Issued: June 1, 2006

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003

b) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

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

Head TSL parameters

The following parameters and calculations were applied.

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

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	condition	
SAR measured	250 mW input power	2.31 mW / g
SAR normalized	normalized to 1W	9.24 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**9.29 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.50 mW / g
SAR normalized	normalized to 1W	6.00 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**6.03 mW / g ± 16.5 % (k=2)**

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

Body TSL parameters

The following parameters and calculations were applied.

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

SAR result with Body TSL

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

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

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

Appendix

Antenna Parameters with Head TSL

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

Antenna Parameters with Body TSL

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

General Antenna Parameters and Design

Electrical Delay (one direction)	1.382 ns

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

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

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	September 20, 2005

DASY4 Validation Report for Head TSL

Date/Time: 31.05.2006 10:59:32

Test Laboratory: SPEAG, Zurich, Switzerland

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

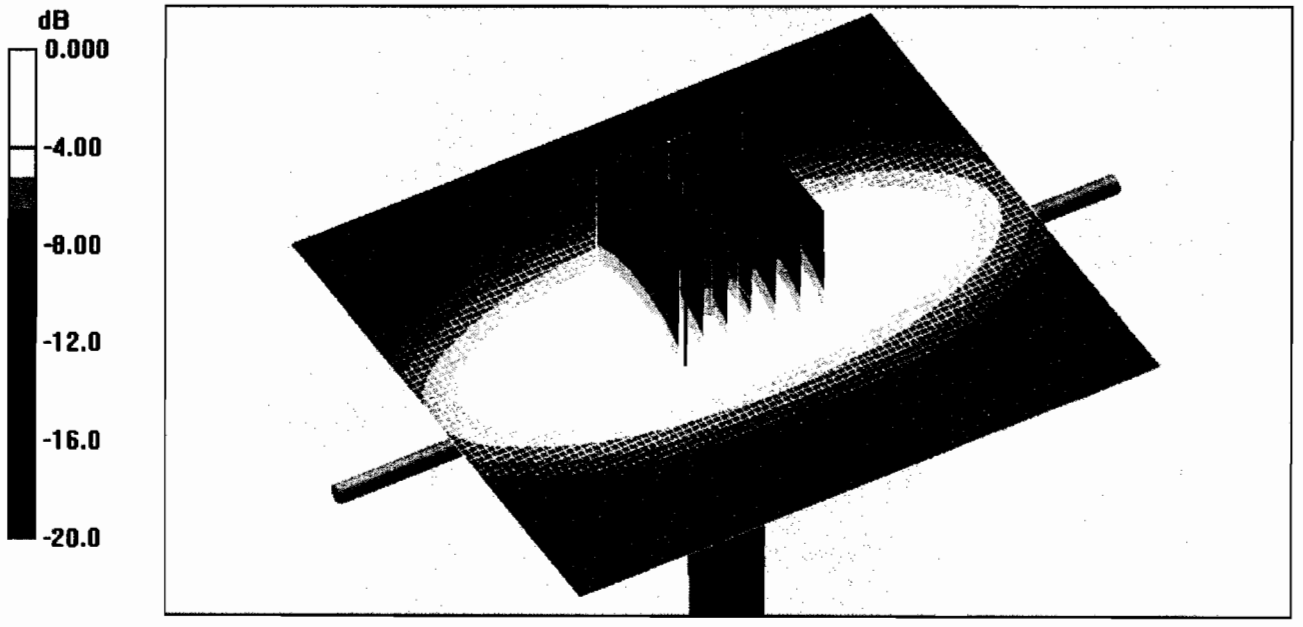
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: HSL U10 BB_060425;
Medium parameters used: f = 835 MHz; σ = 0.912 mho/m; ε_r = 41.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

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

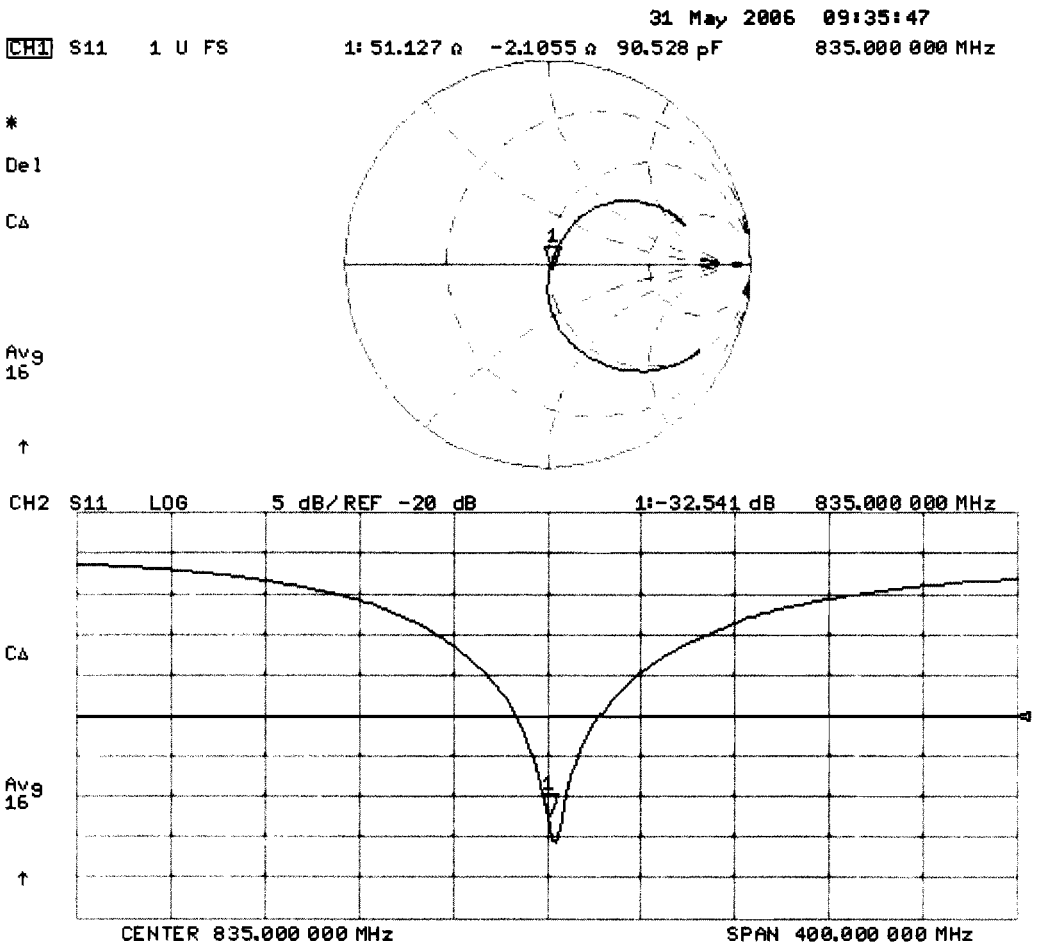
Pin = 250 mW; d = 10 mm/Area Scan (71x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.44 mW/g

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.1 V/m; Power Drift = 0.031 dB
Peak SAR (extrapolated) = 3.48 W/kg
SAR(1 g) = 2.31 mW/g; SAR(10 g) = 1.5 mW/g
Maximum value of SAR (measured) = 2.48 mW/g



0 dB = 2.48mW/g

Impedance Measurement Plot for Head TSL



DASY4 Validation Report for Body TSL

Date/Time: 31.05.2006 13:23:15

Test Laboratory: SPEAG, Zurich, Switzerland

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

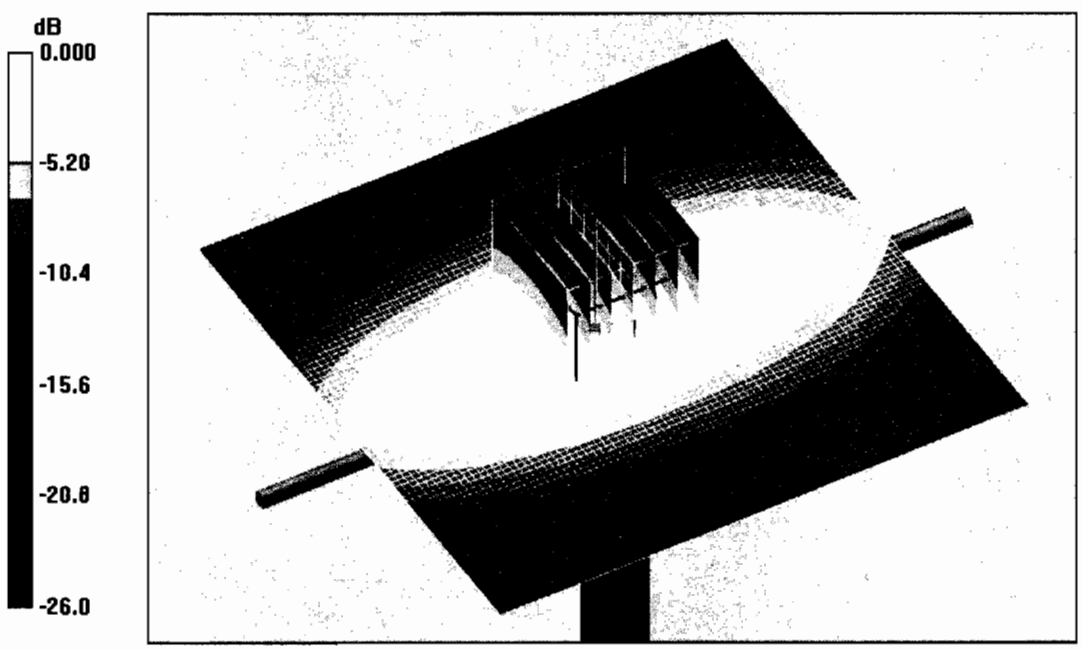
Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL U10 BB;
Medium parameters used: f = 835 MHz; σ = 0.997 mho/m; ε_r = 56.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

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

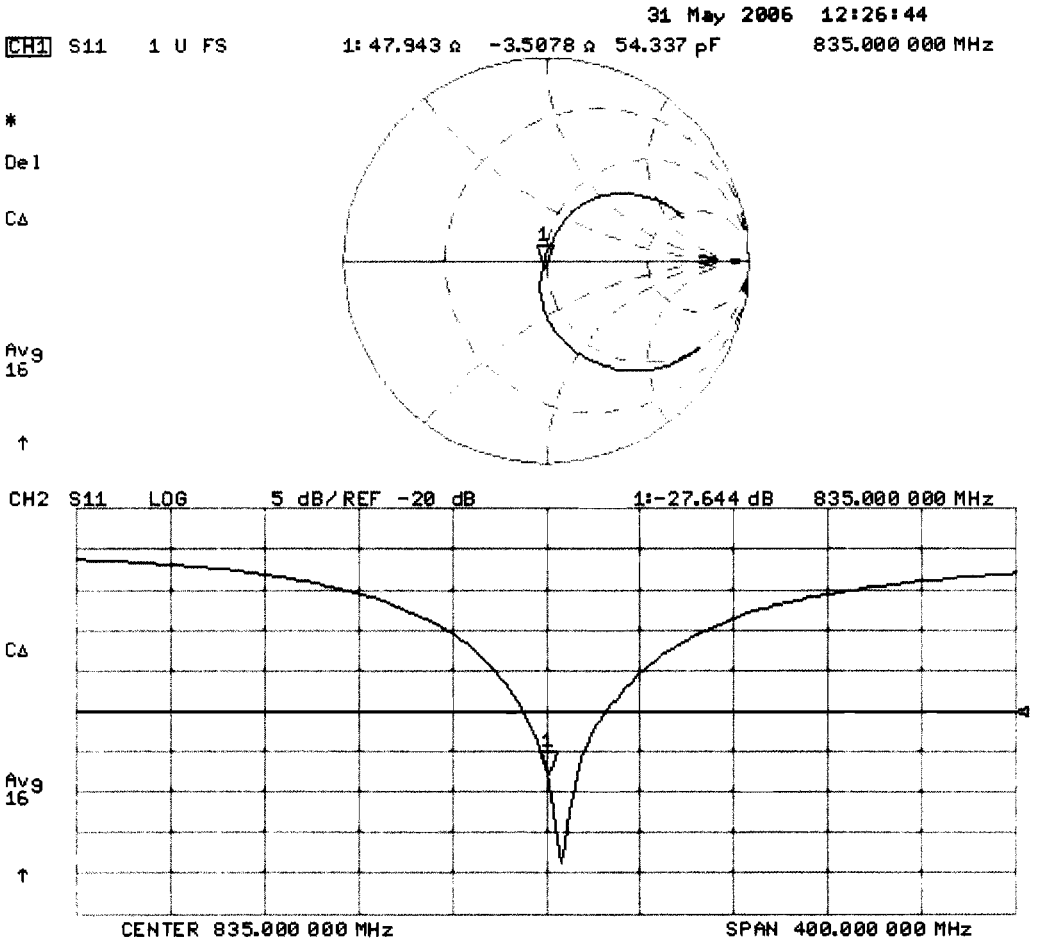
Pin = 250 mW; d = 15 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.59 mW/g

Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.1 V/m; Power Drift = -0.014 dB
Peak SAR (extrapolated) = 3.45 W/kg
SAR(1 g) = 2.39 mW/g; SAR(10 g) = 1.56 mW/g
Maximum value of SAR (measured) = 2.58 mW/g



0 dB = 2.58mW/g

Impedance Measurement Plot Body TSL



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: D1900V2-5d073_May06

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d073
Calibration procedure(s)	QA CAL-05.v6 Calibration procedure for dipole validation kits
Calibration date:	May 31, 2006
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-05 (METAS, No. 251-00516)	Oct-06
Power sensor HP 8481A	US37292783	04-Oct-05 (METAS, No. 251-00516)	Oct-06
Reference 20 dB Attenuator	SN: 5086 (20g)	11-Aug-05 (METAS, No 251-00498)	Aug-06
Reference 10 dB Attenuator	SN: 5047.2 (10r)	11-Aug-05 (METAS, No 251-00498)	Aug-06
Reference Probe ET3DV6	SN: 1507	28-Oct-05 (SPEAG, No. ET3-1507_Oct05)	Oct-06
DAE4	SN: 601	15-Dec-05 (SPEAG, No. DAE4-601_Dec05)	Dec-06

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

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

Issued: June 1, 2006

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003

b) CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

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

Measurement Conditions

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

DASY Version	DASY4	V4.6
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom 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	39.4 ± 6 %	1.41 mho/m ± 6 %
Head TSL temperature during test	(22.8 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	condition	
SAR measured	250 mW input power	9.67 mW / g
SAR normalized	normalized to 1W	38.7 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**38.2 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.11 mW / g
SAR normalized	normalized to 1W	20.4 mW / g
SAR for nominal Head TSL parameters [1]	normalized to 1W	**20.3 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	54.7 ± 6 %	1.54 mho/m ± 6 %
Body TSL temperature during test	(22.7 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.4 mW / g
SAR normalized	normalized to 1W	41.6 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**41.9 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.50 mW / g
SAR normalized	normalized to 1W	22.0 mW / g
SAR for nominal Body TSL parameters [2]	normalized to 1W	**22.2 mW / g ± 16.5 % (k=2)**

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

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.6 Ω + 5.7 jΩ
Return Loss	- 24.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.9 Ω + 6.4 jΩ
Return Loss	- 23.7 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.192 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	January 24, 2006

DASY4 Validation Report for Head TSL

Date/Time: 31.05.2006 11:49:47

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d073

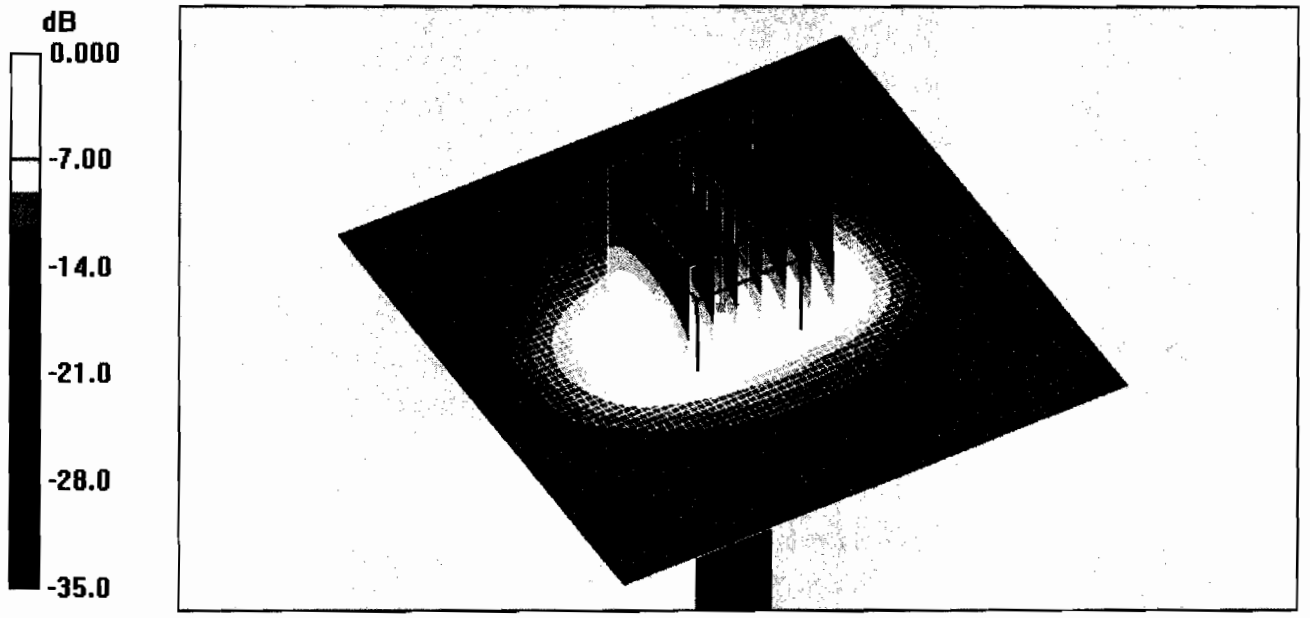
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL U10 BB;
Medium parameters used: f = 1900 MHz; σ = 1.41 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.74, 4.74, 4.74); Calibrated: 28.10.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

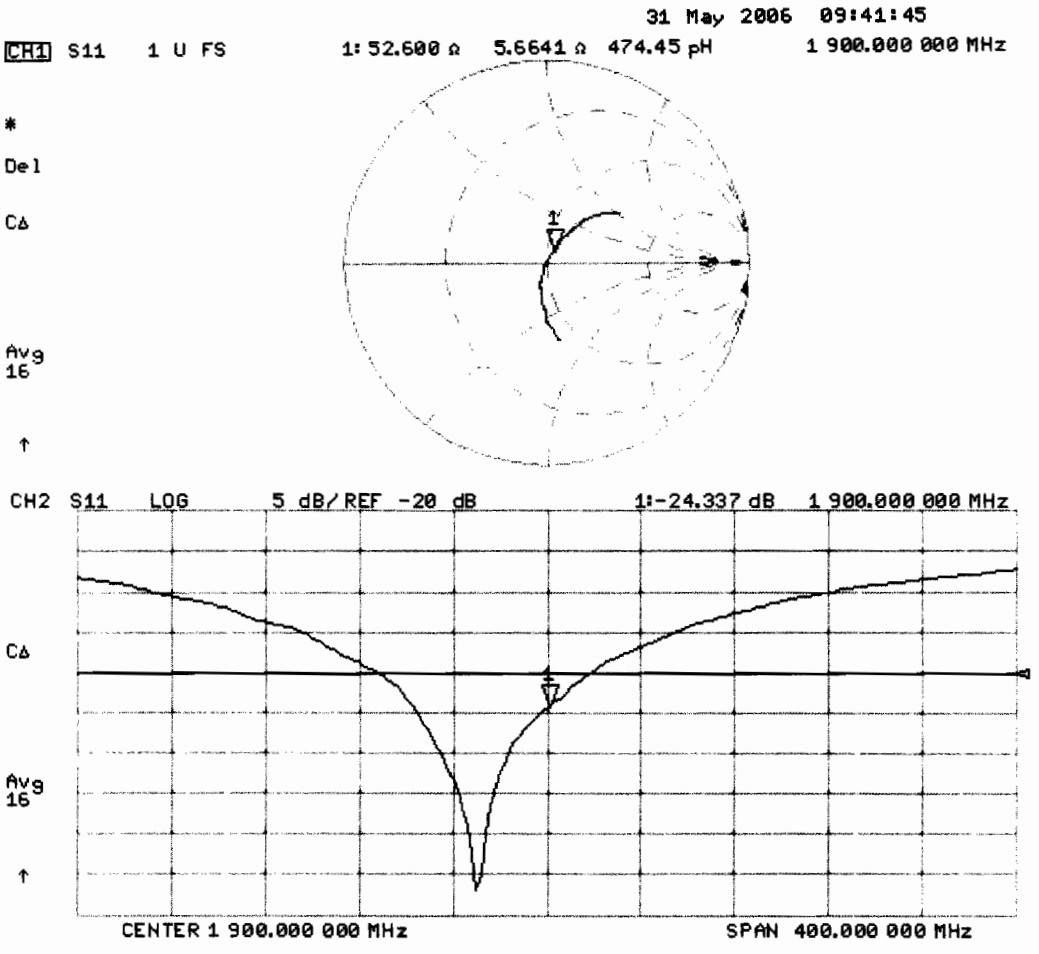
Pin = 250 mW; d = 10 mm/Area Scan (71x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 11.6 mW/g

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.1 V/m; Power Drift = -0.023 dB
Peak SAR (extrapolated) = 16.6 W/kg
SAR(1 g) = 9.67 mW/g; SAR(10 g) = 5.11 mW/g
Maximum value of SAR (measured) = 10.9 mW/g



0 dB = 10.9mW/g

Impedance Measurement Plot for Head TSL



DASY4 Validation Report for Body TSL

Date/Time: 31.05.2006 14:35:04

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d073

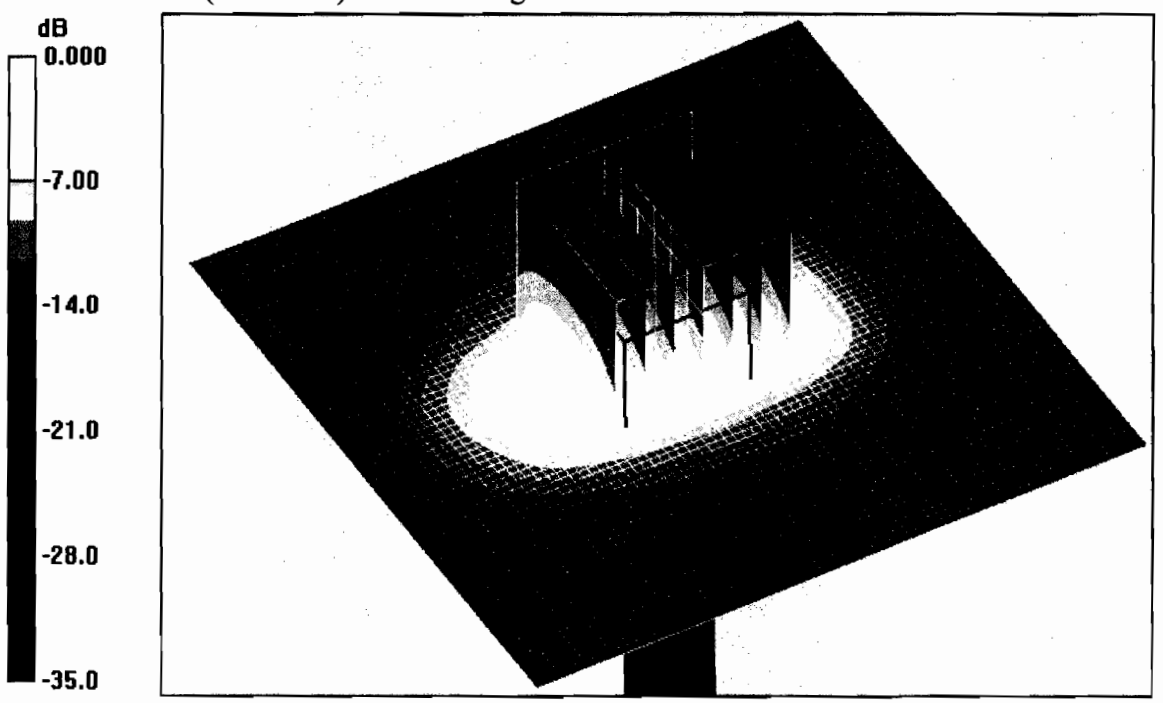
Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL U10;
Medium parameters used: f = 1900 MHz; σ = 1.54 mho/m; ε_r = 54.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.3, 4.3, 4.3); Calibrated: 28.10.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

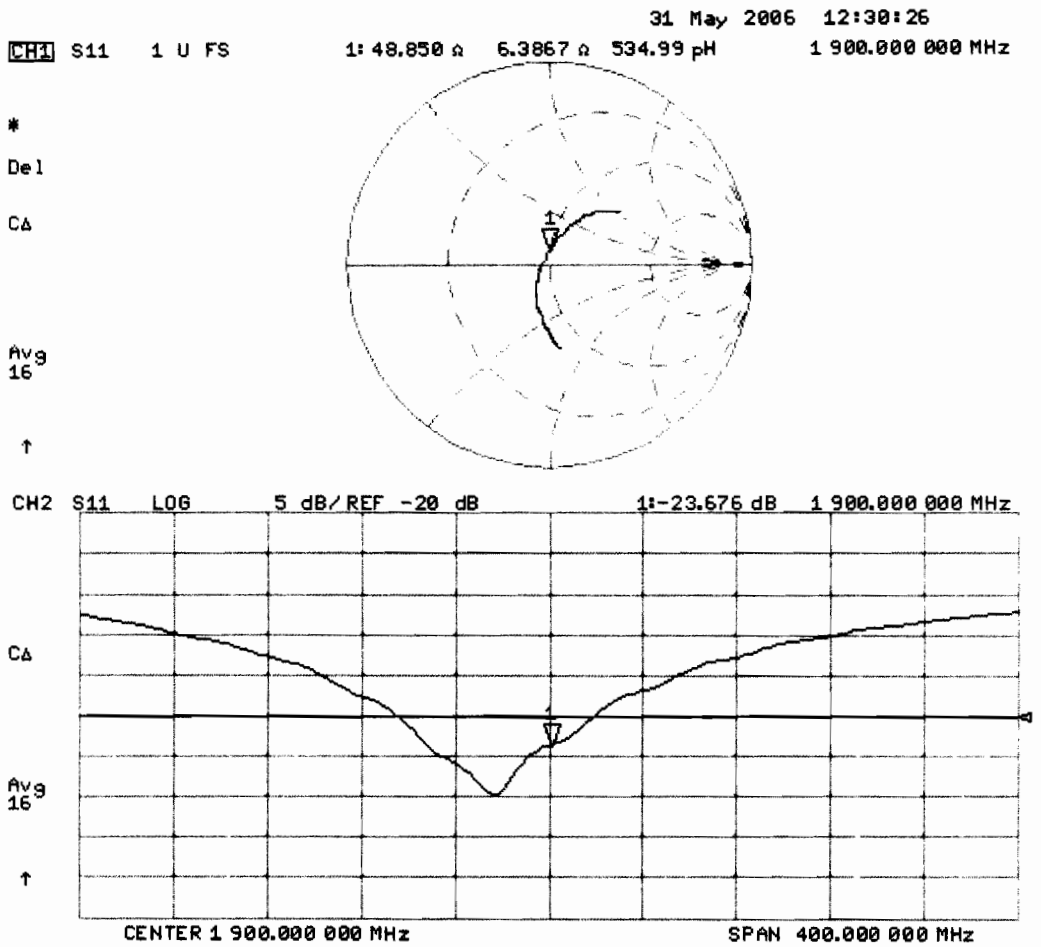
Pin = 250 mW; d = 10 mm/Area Scan (71x71x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.6 mW/g

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.4 V/m; Power Drift = -0.045 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.5 mW/g
Maximum value of SAR (measured) = 11.7 mW/g



0 dB = 11.7mW/g

Impedance Measurement Plot for Body TSL



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: ES3-3062_Jan07

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN: 3062
Calibration procedure(s)	QA CAL-01.v5 Calibration procedure for dosimetric E-field probes
Calibration date:	January 16, 2007
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41495277	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41498087	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-06 (METAS, No. 217-00592)	Aug-07
Reference 20 dB Attenuator	SN: S5086 (20b)	4-Apr-06 (METAS, No. 251-00558)	Apr-07
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-06 (METAS, No. 217-00593)	Aug-07
Reference Probe ES3DV2	SN: 3013	4-Jan-07 (SPEAG, No. ES3-3013_Jan07)	Jan-08
DAE4	SN: 654	21-Jun-06 (SPEAG, No. DAE4-654_Jun06)	Jun-07

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: January 16, 2007

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 ES3DV3

SN:3062

Manufactured:	January 30, 2004
Last calibrated:	January 20, 2006
Recalibrated:	January 16, 2007

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ES3DV3 SN:3062

Sensitivity in Free Space[A]

Diode Compression[B]

NormX	**1.18** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**95** mV
NormY	**1.19** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**96** mV
NormZ	**1.10** ± 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		**3.0 mm**	**4.0 mm**
SAR_{be} [%]	Without Correction Algorithm	3.2	1.2
SAR_{be} [%]	With Correction Algorithm	0.0	0.7

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

Sensor Center to Phantom Surface Distance		**3.0 mm**	**4.0 mm**
SAR_{be} [%]	Without Correction Algorithm	4.0	1.9
SAR_{be} [%]	With Correction Algorithm	0.2	0.2

Sensor Offset

Probe Tip to Sensor Center	**2.0** mm

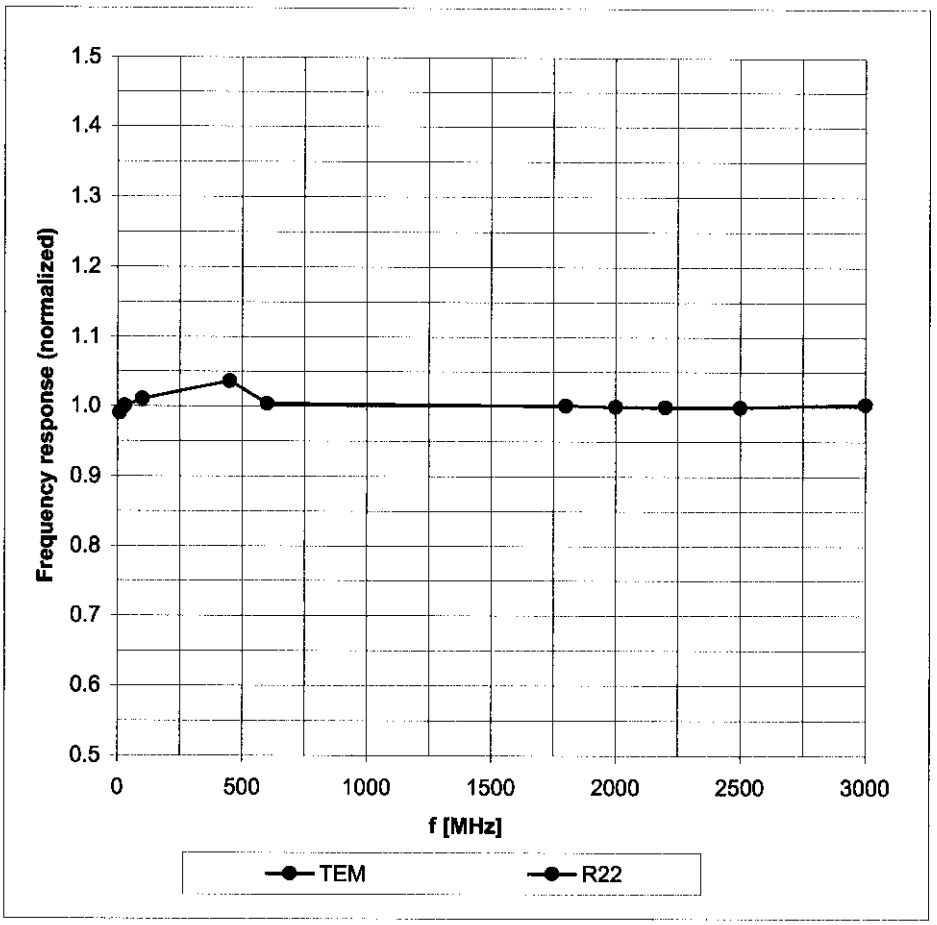
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[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.

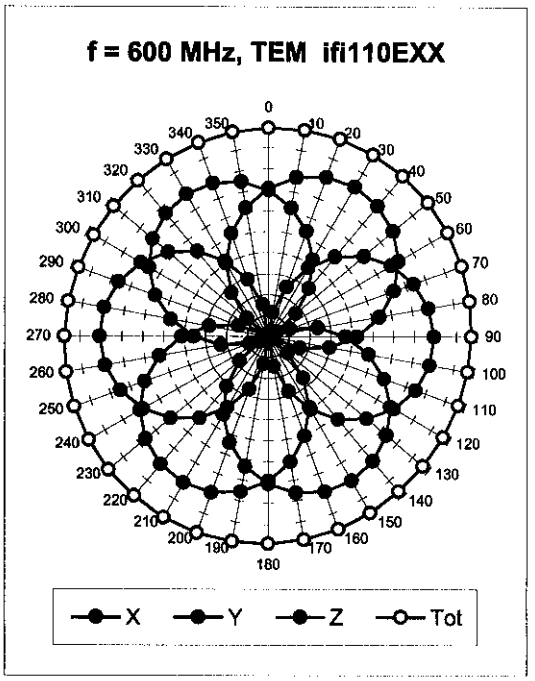
Frequency Response of E-Field

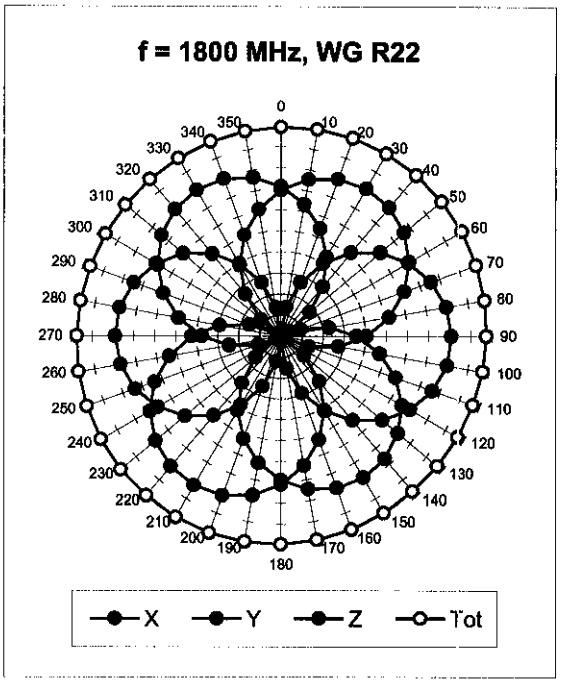
(TEM-Cell:ifi110 EXX, Waveguide: R22)

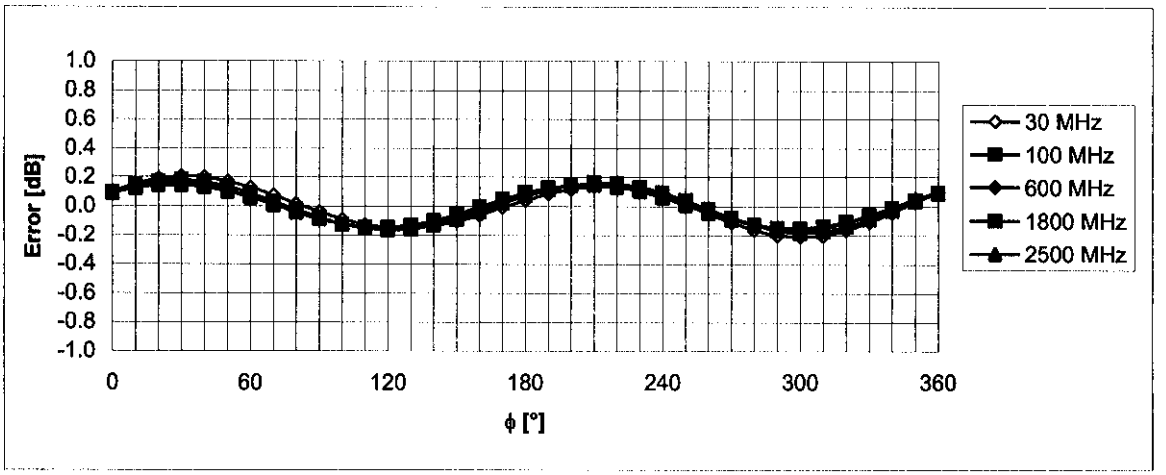


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



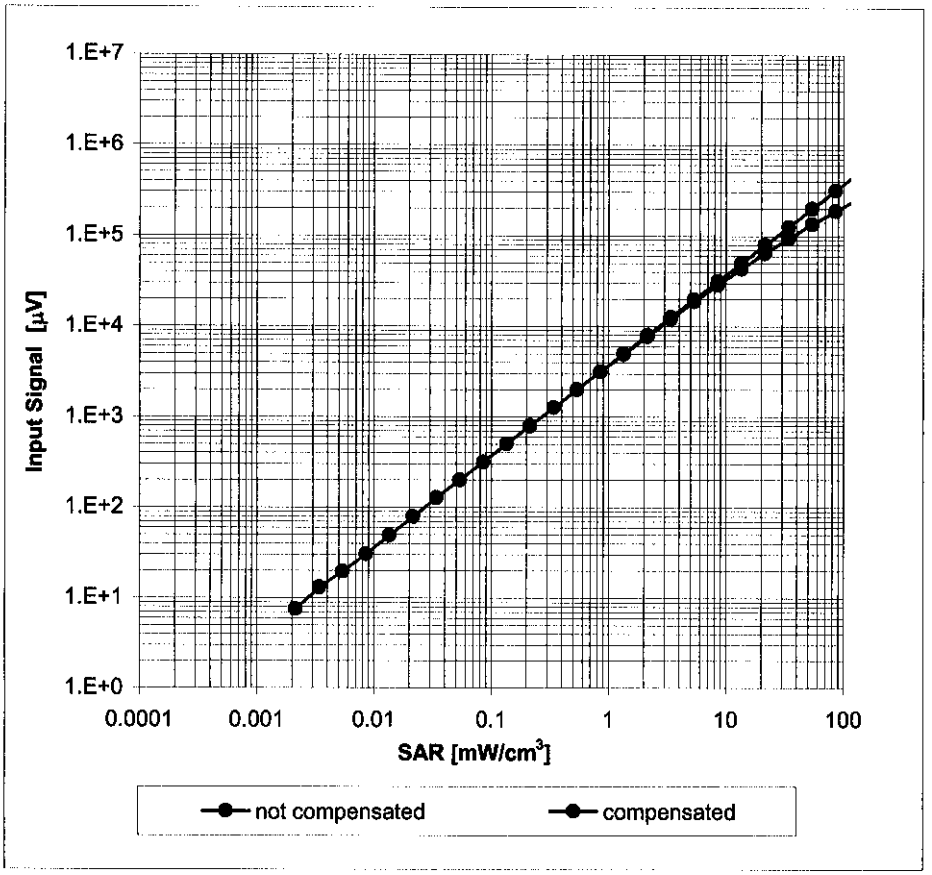


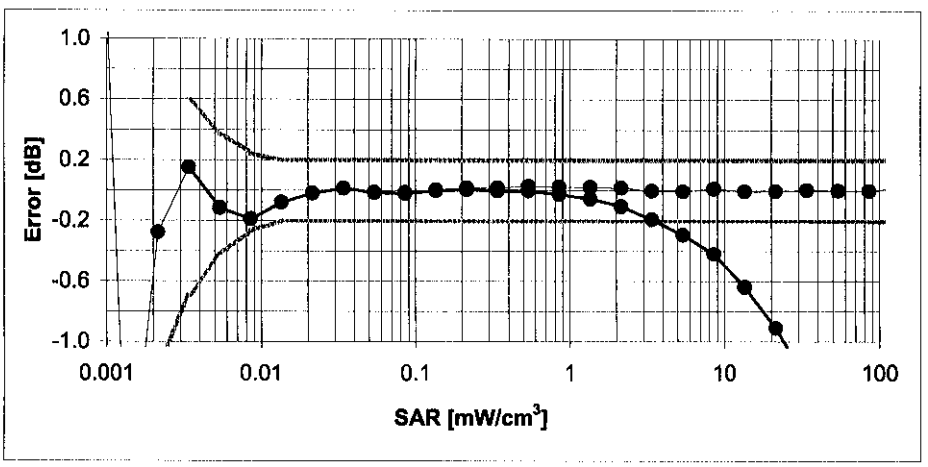


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

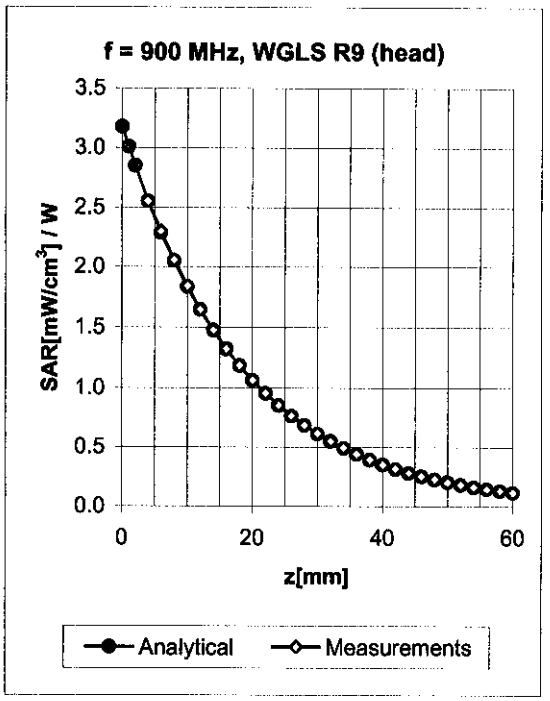
(Waveguide R22, f = 1800 MHz)

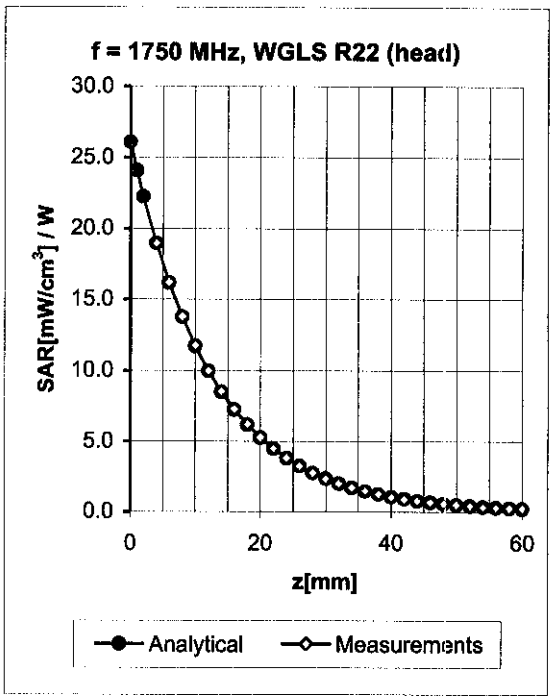




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



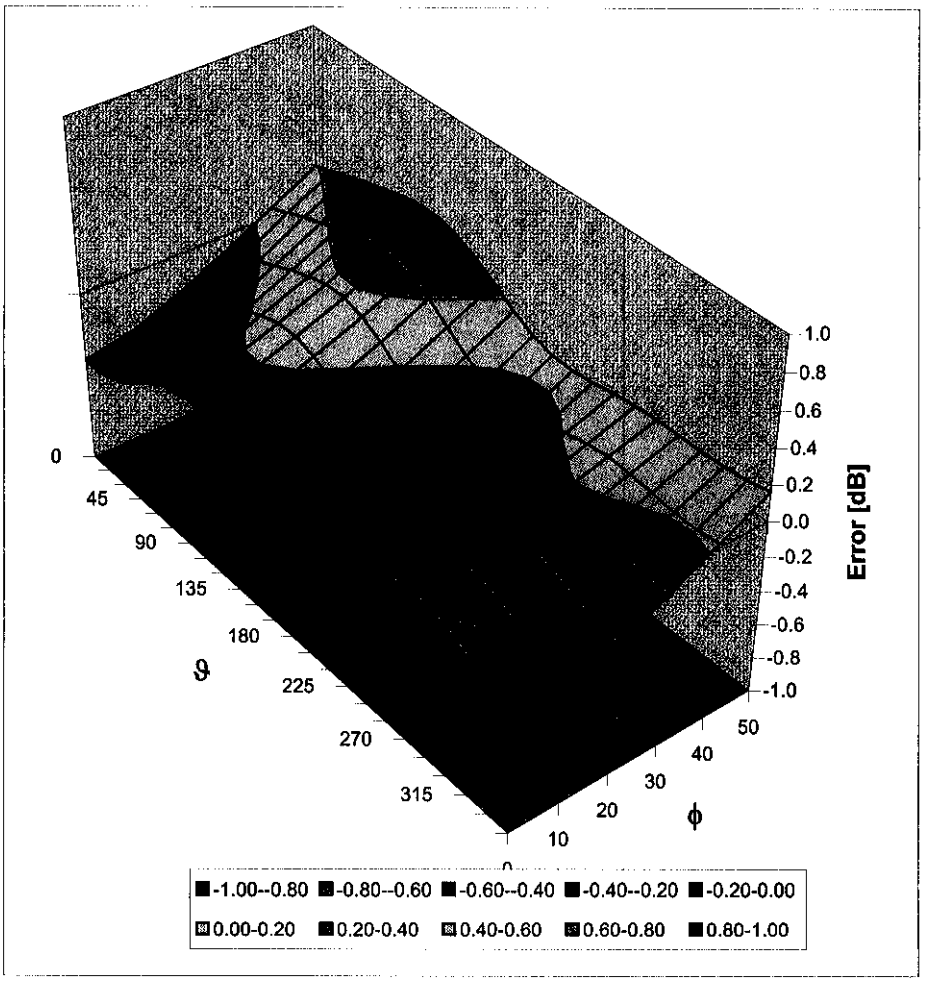


f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	1.00	1.11	6.06 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	1.00	1.15	5.99 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.85	1.21	4.84 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.86	1.19	4.73 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.67	1.40	4.34 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.98	1.15	6.13 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	1.00	1.14	5.84 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.80	1.29	4.72 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.71	1.35	4.53 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.86	1.10	4.09 ± 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)