

SAR Compliance Test Report

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Testing laboratory:	TCC Nokia Salo Laboratory P.O.Box 86 Joensuunkatu 7H / Kiila 1B FIN-24101 SALO, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 45220	Client:	Nokia Corporation P.O. Box 50 Elektroniikkatie 10 FIN-90571 OULU, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 47222
Responsible test engineer:	Janne Hirsimäki	Product contact person:	Jorma Hanni
Measurements made by:	Ari Orte, Janne Hirsimäki, Virpi Tuominen		
Tested device:	RM-230		
FCC ID:	LJPRM-230	IC:	661E-RM230
Supplement reports:	Salo_SAR_0702_01		
Testing has been carried out in accordance with:	47CFR §2.1093 Radiofrequency Radiation Exposure Evaluation: Portable Devices FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01) Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields RSS-102 Evaluation Procedure for Mobile and Portable Radio Transmitters with Respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields IEEE 1528 - 2003 IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Technique		
Documentation:	The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test results:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		

Date and signatures:

For the contents:

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2006-12-27 to 2007-01-05
SN, HW and SW numbers of tested device	SN: 004400/95/169013/8, HW: 0501, SW: 02.00.2, DUT: 11664
Batteries used in testing	BP-5M, DUT: 11661, 11662, 11669, 11670
Headsets used in testing	HS-44 + AD-44, DUT: 11666 + 11665
Other accessories used in testing	-
State of sample	Prototype unit
Notes	-

1.2 Maximum Results

The maximum measured SAR values for Head configuration and Body Worn configuration are given in section 1.2.1 and 1.2.2 respectively. The device conforms to the requirements of the standard(s) when the maximum measured SAR value is less than or equal to the limit.

1.2.1 Head Configuration

Mode	Ch / f (MHz)	Radiated power	Position	Measured SAR value (1g avg)	Scaled* SAR value (1g avg)	SAR limit (1g avg)	Result
3-slot GPRS850	251 / 848.8	23.8 dBm ERP	Left Cheek	0.907 W/kg	1.02 W/kg	1.6 W/kg	PASSED
2-slot GPRS1900	661 / 1880	31.2 dBm EIRP	Left Cheek	0.859 W/kg	0.96 W/kg	1.6 W/kg	PASSED

1.2.2 Body Worn Configuration

Mode	Ch / f (MHz)	Radiated power	Separation distance	Measured SAR value (1g avg)	Scaled* SAR value (1g avg)	SAR limit (1g avg)	Result
3-slot GPRS850	251 / 848.8	23.8 dBm ERP	2.2 cm	1.19 W/kg	1.33 W/kg	1.6 W/kg	PASSED
2-slot GPRS1900	661 / 1880	31.2 dBm EIRP	2.2 cm	0.576 W/kg	0.65 W/kg	1.6 W/kg	PASSED

*SAR values are scaled up by 12% to cover measurement drift.

1.2.3 Maximum Drift

Maximum drift covered by 12% scaling up of the SAR values	Maximum drift during measurements
0.5dB	0.38 dB

1.2.4 Measurement Uncertainty

Expanded Uncertainty (k=2) 95%	± 25.8%
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2. DESCRIPTION OF THE DEVICE UNDER TEST

Device category	Portable
Exposure environment	General population / uncontrolled

Modes and Bands of Operation	GSM	GPRS	EGPRS	BT
	850 / 1900	850 / 1900	850 / 1900	
Modulation Mode	GMSK	GMSK	GMSK / 8PSK	GFSK
Duty Cycle	1/8	1/8 to 3/8	1/8 to 3/8	
Transmitter Frequency Range (MHz)	824 - 849 1850 - 1910	824 - 849 1850 - 1910	824 - 849 1850 - 1910	2402-2480

Outside of USA and Canada, the transmitter of the device is capable of operating also in 900 / 1800 / 2100 MHz bands, which are not part of this filing.

This device has Push to Talk/Dual Transfer Mode capability for use at the ear. Therefore, SAR for multi slot GPRS mode was evaluated against the head profile of the phantom.

2.1 Description of the Antenna

The device has an internal antenna.

3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	21.0 to 22.5
Ambient humidity (RH %):	35 to 50

3.2 Test Signal, Frequencies and Output Power

The device was put into operation by using a call tester. Communication between the device and the call tester was established by air link.

The device output power was set to maximum power level for all tests; a fully charged battery was used for every test sequence.

In all operating bands the measurements were performed on lowest, middle and highest channels.

The radiated output power of the device was measured by a separate test laboratory on the same unit(s) as used for SAR testing.

4. DESCRIPTION OF THE TEST EQUIPMENT

4.1 Measurement System and Components

The measurements were performed using an automated near-field scanning system, DASY4, manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland. The SAR extrapolation algorithm used in all measurements was the 'advanced extrapolation' algorithm.

The following table lists calibration dates of SPEAG components:

Test Equipment	Serial Number	Calibration interval	Calibration expiry
DAE 4	538	12 months	2007-05
DAE 4	555	12 months	2007-02
E-field Probe ET3DV6	1396	12 months	2007-01
E-field Probe ET3DV6	1766	12 months	2007-05
Dipole Validation Kit, D835V2	480	24 months	2007-02
Dipole Validation Kit, D900V2	056	24 months	2008-02
Dipole Validation Kit, D1900V2	5d013	24 months	2008-07
DASY4 software	Version 4.7	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration interval	Calibration expiry
Signal Generator	SML03	101265	12 months	2007-07
Amplifier	ZHL-42 (SMA)	N072095-5	12 months	2007-07
Power Meter	NRVS	849305/028	12 months	2007-07
Power Sensor	NRV-Z32	839176/020	12 months	2007-07
Call Tester	CMU 200	101111	-	-
Call Tester	CMU 200	103293	-	-
Call Tester	CMU 200	100084	-	-
Vector Network Analyzer	8753E	US38432928	12 months	2007-07
Dielectric Probe Kit	85070B	US33020420	-	-

4.1.1 Isotropic E-field Probe Type ET3DV6

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., butyl diglycol)
Calibration	Calibration certificate in Appendix C
Frequency	10 MHz to 3 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Optical Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application	General dosimetry up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

4.2 Phantoms

The phantom used for all tests i.e. for both system checks and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The phantom conforms to the requirements of IEEE 1528 - 2003.

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

The SPEAG device holder (see Section 5.1) was used to position the device in all tests whilst a tripod was used to position the validation dipoles against the flat section of phantom.

4.3 Tissue Simulants

Recommended values for the dielectric parameters of the tissue simulants are given in IEEE 1528 - 2003 and FCC Supplement C to OET Bulletin 65. All tests were carried out using simulants

whose dielectric parameters were within $\pm 5\%$ of the recommended values. All tests were carried out within 24 hours of measuring the dielectric parameters.

The depth of the tissue simulant was 15.0 ± 0.5 cm measured from the ear reference point during system checking and device measurements.

4.3.1 Tissue Simulant Recipes

The following recipe(s) were used for Head and Body tissue stimulant(s):

800MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	51.50	69.25
Tween 20	47.35	30.00
Salt	1.15	0.75

1900MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	54.50	70.25
Tween 20	45.23	29.41
Salt	0.27	0.34

4.3.2 System Checking

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyser. A system check measurement was made following the determination of the dielectric parameters of the simulant, using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom. The system checking results (dielectric parameters and SAR values) are given in the table below.

System checking, head tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ϵ_r	σ [S/m]	
835	Reference result	2.25	42.2	0.91	
	$\pm 10\%$ window	2.02 – 2.48			
	2007-01-03	2.14	40.3	0.88	21.0
	2007-01-04	2.36	41.2	0.90	21.0
900	Reference result	2.71	42.0	0.97	
	$\pm 10\%$ window	2.44 – 2.98			
	2007-01-05	2.59	40.2	0.93	21.0
1900	Reference result	9.69	39.3	1.44	
	$\pm 10\%$ window	8.72 – 10.66			
	2006-12-27	9.44	40.6	1.44	21.0

System checking, body tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ϵ_r	σ [S/m]	
835	Reference result	2.39	54.9	1.01	
	$\pm 10\%$ window	2.15 – 2.63			
	2007-01-05	2.40	56.2	0.97	21.0
1900	Reference result	10.1	52.3	1.57	
	$\pm 10\%$ window	9.1 – 11.1			
	2007-01-02	9.80	53.9	1.53	21.0

Plots of the system checking scans are given in Appendix A.

4.3.3 Tissue Simulants used in the Measurements

Head tissue simulant measurements

<i>f</i> [MHz]	Description	Dielectric Parameters		Temp [°C]
		ϵ_r	σ [S/m]	
836	Recommended value	41.5	0.90	
	± 5% window	39.4 – 43.6	0.86 – 0.95	
	2007-01-03	40.3	0.88	21.0
	2007-01-04	41.2	0.91	21.0
	2007-01-05	40.7	0.89	21.0
1880	Recommended value	40.0	1.40	
	± 5% window	38.0 – 42.0	1.33 – 1.47	
	2006-12-27	40.7	1.42	21.0

Body tissue simulant measurements

<i>f</i> [MHz]	Description	Dielectric Parameters		Temp [°C]
		ϵ_r	σ [S/m]	
836	Recommended value	55.2	0.97	
	± 5% window	52.4 – 58.0	0.92 – 1.02	
	2007-01-04	56.3	0.98	21.0
	2007-01-05	56.3	0.97	21.0
1880	Recommended value	53.3	1.52	
	± 5% window	50.6 – 56.0	1.44 – 1.60	
	2007-01-02	53.9	1.51	21.0

5. DESCRIPTION OF THE TEST PROCEDURE

5.1 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the Dasy system.



Device holder supplied by SPEAG

A Nokia designed spacer (illustrated below) was used to position the device within the SPEAG holder. The spacer positions the device so that the holder has minimal effect on the test results but still holds the device securely. The spacer was removed before the tests.



Nokia spacer

5.2 Test Positions

5.2.1 Against Phantom Head

Measurements were made in “cheek” and “tilt” positions on both the left hand and right hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 - 2003 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

5.2.2 Body Worn Configuration

The device was placed in the SPEAG holder using the Nokia spacer and placed below the flat section of the phantom. The distance between the device and the phantom was kept at the separation distance indicated in the photo given in report number Salo_SAR_0702_01 using a separate flat spacer that was removed before the start of the measurements. The device was oriented with its antenna facing the phantom since this orientation gives higher results.

5.3 Scan Procedures

First, area scans were used for determination of the field distribution. Next, a zoom scan, a minimum of 5x5x7 points covering a volume of at least 30x30x30mm, was performed around the highest E-field value to determine the averaged SAR value. Drift was determined by measuring the same point at the start of the area scan and again at the end of the zoom scan.

5.4 SAR Averaging Methods

The maximum SAR value was averaged over a cube of tissue using interpolation and extrapolation.

The interpolation, extrapolation and maximum search routines within Dasy4 are all based on the modified Quadratic Shepard's method (Robert J. Renka, "Multivariate Interpolation Of Large Sets Of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148).

The interpolation scheme combines a least-square fitted function method with a weighted average method. A trivariate 3-D / bivariate 2-D quadratic function is computed for each measurement point and fitted to neighbouring points by a least-square method. For the zoom scan, inverse distance weighting is incorporated to fit distant points more accurately. The interpolating function is finally calculated as a weighted average of the quadratics.

In the zoom scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

6. MEASUREMENT UNCERTAINTY

Table 6.1 – Measurement uncertainty evaluation

Uncertainty Component	Section in IEEE 1528	Tol. (%)	Prob Dist	Div	C_i	$C_i \cdot u_i$ (%)	v_i
Measurement System							
Probe Calibration	E2.1	±5.9	N	1	1	±5.9	∞
Axial Isotropy	E2.2	±4.7	R	√3	$(1-c_p)^{1/2}$	±1.9	∞
Hemispherical Isotropy	E2.2	±9.6	R	√3	$(c_p)^{1/2}$	±3.9	∞
Boundary Effect	E2.3	±1.0	R	√3	1	±0.6	∞
Linearity	E2.4	±4.7	R	√3	1	±2.7	∞
System Detection Limits	E2.5	±1.0	R	√3	1	±0.6	∞
Readout Electronics	E2.6	±1.0	N	1	1	±1.0	∞
Response Time	E2.7	±0.8	R	√3	1	±0.5	∞
Integration Time	E2.8	±2.6	R	√3	1	±1.5	∞
RF Ambient Conditions - Noise	E6.1	±3.0	R	√3	1	±1.7	∞
RF Ambient Conditions - Reflections	E6.1	±3.0	R	√3	1	±1.7	∞
Probe Positioner Mechanical Tolerance	E6.2	±0.4	R	√3	1	±0.2	∞
Probe Positioning with respect to Phantom Shell	E6.3	±2.9	R	√3	1	±1.7	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E5	±3.9	R	√3	1	±2.3	∞
Test sample Related							
Test Sample Positioning	E4.2	±6.0	N	1	1	±6.0	11
Device Holder Uncertainty	E4.1	±5.0	N	1	1	±5.0	7
Output Power Variation - SAR drift measurement	6.6.3	±0.0	R	√3	1	±0.0	∞
Phantom and Tissue Parameters							
Phantom Uncertainty (shape and thickness tolerances)	E3.1	±4.0	R	√3	1	±2.3	∞
Conductivity Target - tolerance	E3.2	±5.0	R	√3	0.64	±1.8	∞
Conductivity - measurement uncertainty	E3.3	±5.5	N	1	0.64	±3.5	5
Permittivity Target - tolerance	E3.2	±5.0	R	√3	0.6	±1.7	∞
Permittivity - measurement uncertainty	E3.3	±2.9	N	1	0.6	±1.7	5
Combined Standard Uncertainty			RSS			±12.9	116
Coverage Factor for 95%			k=2				
Expanded Uncertainty						±25.8	

7. RESULTS

The measured Head SAR values for the test device are tabulated below:

850MHz Head SAR results

Swivel option	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz
GSM	Power		28.2 dBm	27.7 dBm	27.4 dBm
Not swivelled	Left	Cheek	-	0.398	-
2-slot GPRS	Power		28.5 dBm	28.2 dBm	28.1 dBm
Not swivelled	Left	Cheek	-	0.761	-
3-slot GPRS	Power		24.0 dBm	24.6 dBm	23.8 dBm
Not swivelled	Left	Cheek	0.717	0.802	0.894
		Tilt	-	0.537	-
	Right	Cheek	-	0.789	-
		Tilt	-	0.503	-
3-slot GPRS Swivelled 180°	Left Cheek		0.689	0.848	0.907
3-slot 8PSK EGPRS	Power		20.7 dBm	21.3 dBm	19.3 dBm
Swivelled 180°	Left	Cheek	-	-	0.189
3-slot GPRS Swivelled 180°	Left Cheek, BT active		-	-	0.887

1900MHz Head SAR results

Swivel option	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
GSM	Power		32.9 dBm	31.2 dBm	32.8 dBm
Not swivelled	Left	Cheek	-	0.480	-
2-slot GPRS	Power		32.3 dBm	31.2 dBm	32.4 dBm
Not swivelled	Left	Cheek	0.569	0.859	0.678
		Tilt	-	0.644	-
	Right	Cheek	-	0.483	-
		Tilt	-	0.532	-
3-slot GPRS	Power		32.7 dBm	31.4 dBm	32.4 dBm
Not swivelled	Left	Cheek	-	0.755	-
2-slot GPRS Swivelled 180°	Left Cheek		-	0.754	-
2-slot 8PSK EGPRS	Power		30.2 dBm	28.5 dBm	30.3 dBm
Not swivelled	Left	Cheek	-	0.206	-
2-slot GPRS Not swivelled	Left Cheek, BT active		-	0.676	-

The measured Body SAR values for the test device are tabulated below:

850MHz Body SAR results

Swivel option	Test configuration	SAR, averaged over 1g (W/kg)		
		Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz
3-slot GPRS	Power	24.0 dBm	24.6 dBm	23.8 dBm
Not swivelled	Without headset	0.721	0.864	1.03
	Headset HS-44 + AD-44	0.372	0.479	0.531
Swivelled 180°	Without headset	0.745	0.823	1.04
Swivelled 180°	Without headset, BT active	-	-	1.19

1900MHz Body SAR results

Swivel option	Test configuration	SAR, averaged over 1g (W/kg)		
		Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
2-slot GPRS	Power	32.3 dBm	31.2 dBm	32.4 dBm
Not swivelled	Without headset	0.554	0.567	0.501
	Headset HS-44 + AD-44	0.515	0.503	0.447
Swivelled 180°	Without headset	-	0.576	-
Swivelled 180°	Without headset, BT active	-	0.556	-

Plots of the Measurement scans are given in Appendix B.

APPENDIX A: SYSTEM CHECKING SCANS

Date/Time: 2007-01-03 09:13:31

Test Laboratory: TCC Nokia

Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL800; Medium Notes: 20.8C

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.878 \text{ mho/m}$; $\epsilon_r = 40.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.42, 6.42, 6.42); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 2.31 mW/g

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

Reference Value = 53.0 V/m

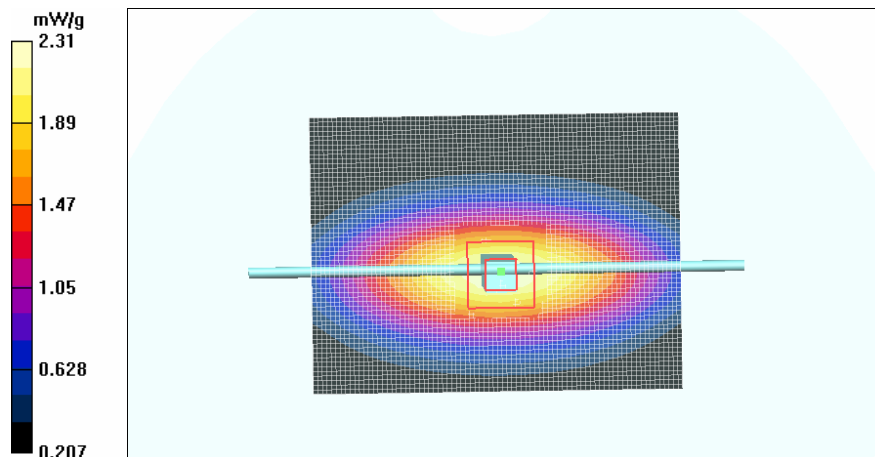
Peak SAR (extrapolated) = 3.21 W/kg

SAR(1 g) = 2.14 mW/g

SAR(10 g) = 1.4 mW/g

Power Drift = -0.065 dB

Maximum value of SAR (measured) = 2.31 mW/g



Date/Time: 2007-01-04 12:16:39

Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL900; Medium Notes: 19.8C
Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.904 \text{ mho/m}$; $\epsilon_r = 41.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.42, 6.42, 6.42); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.53 mW/g

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

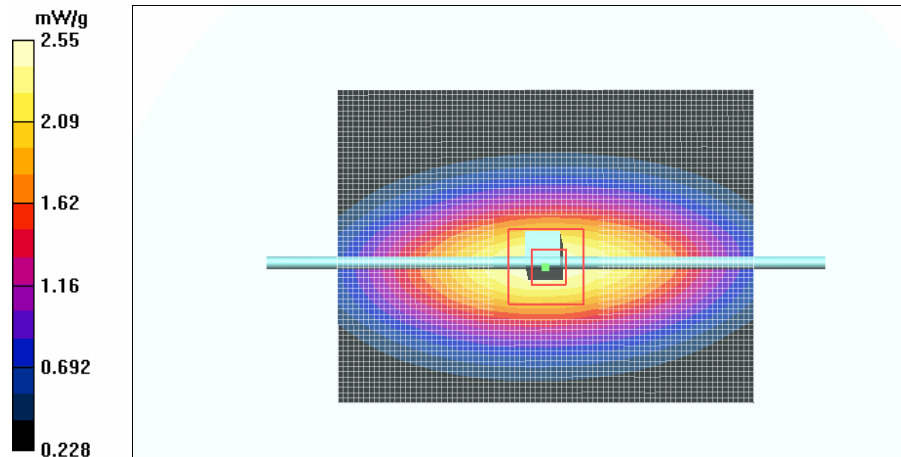
Reference Value = 54.6 V/m
Peak SAR (extrapolated) = 3.56 W/kg

SAR(1 g) = 2.36 mW/g

SAR(10 g) = 1.54 mW/g

Power Drift = 0.021 dB

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



Date/Time: 2007-01-05 14:44:43

Test Laboratory: TCC Nokia
Type: D900V2; Serial: SN:056

Communication System: CW
Frequency: 900 MHz; Duty Cycle: 1:1
Medium: HSL900; Medium Notes: 21.5C
Medium parameters used: $f = 900 \text{ MHz}$; $\sigma = 0.934 \text{ mho/m}$; $\epsilon_r = 40.2$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.25, 6.25, 6.25); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.78 mW/g

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

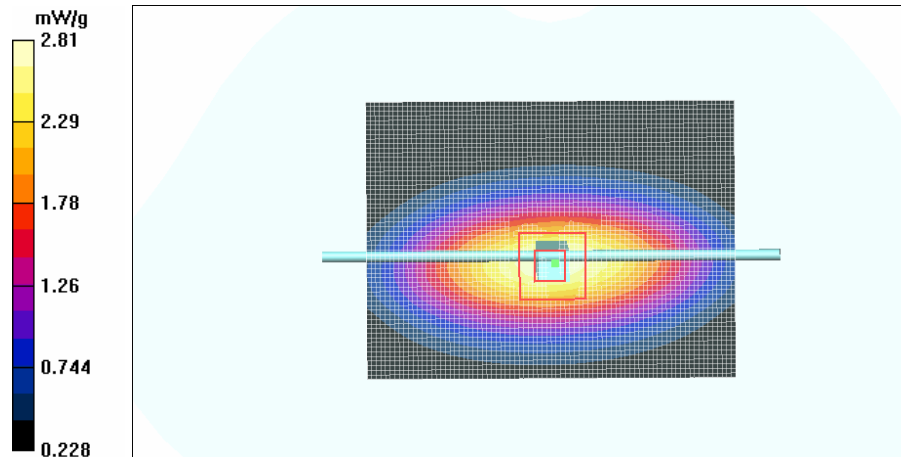
Reference Value = 56.5 V/m
Peak SAR (extrapolated) = 3.92 W/kg

SAR(1 g) = 2.59 mW/g

SAR(10 g) = 1.67 mW/g

Power Drift = -0.076 dB

Maximum value of SAR (measured) = 2.81 mW/g



Date/Time: 2006-12-27 11:19:52

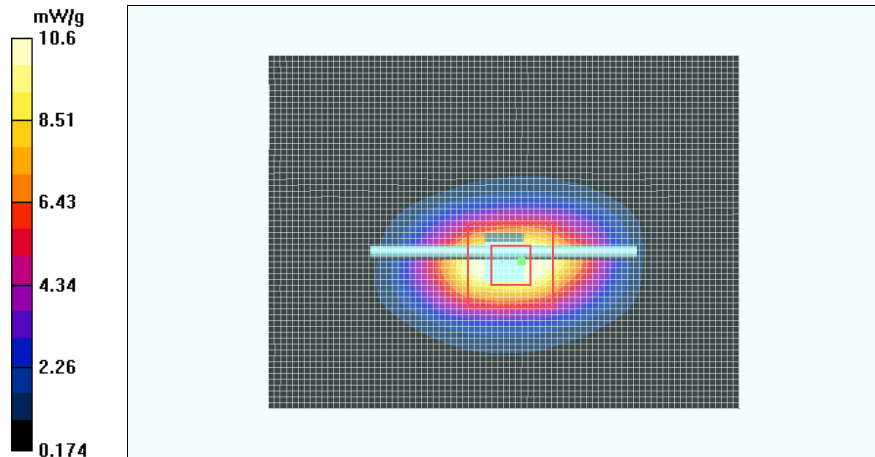
Test Laboratory: TCC Nokia
Type: D1900V2; Serial: D1900V2 - SN:5d013

Communication System: CW
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL1900; Medium Notes: 20.0C
Medium parameters used: $f = 1900$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 40.6$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(5.37, 5.37, 5.37); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 11.5 mW/g

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.1 V/m
Peak SAR (extrapolated) = 16.4 W/kg
SAR(1 g) = 9.44 mW/g
SAR(10 g) = 4.94 mW/g
Power Drift = -0.006 dB
Maximum value of SAR (measured) = 10.6 mW/g



Date/Time: 2007-01-05 08:51:14

Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t=21.2C
Medium parameters used: f = 835 MHz; σ = 0.97 mho/m; ϵ_r = 56.2; ρ = 1000 kg/m³
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; Probe Notes:
- ConvF(6.2, 6.2, 6.2); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.55 mW/g

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

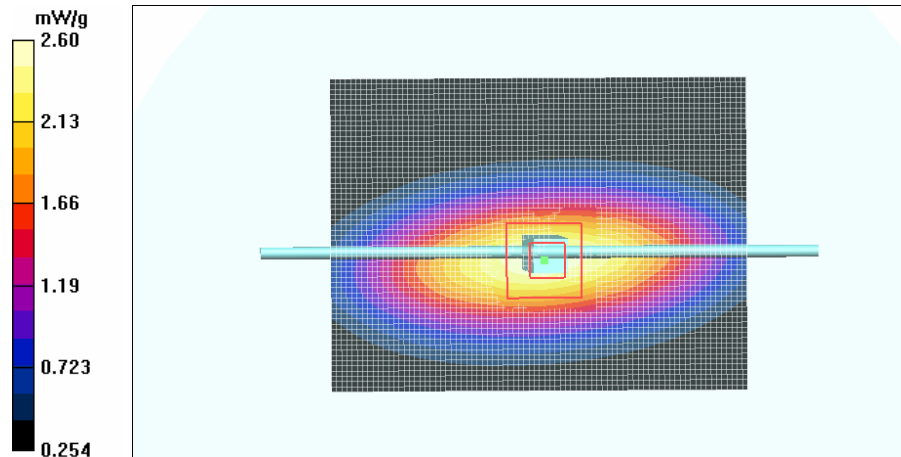
Reference Value = 53.3 V/m
Peak SAR (extrapolated) = 3.49 W/kg

SAR(1 g) = 2.4 mW/g

SAR(10 g) = 1.58 mW/g

Power Drift = -0.045 dB

Maximum value of SAR (measured) = 2.60 mW/g



Date/Time: 2007-01-02 10:00:46

Test Laboratory: TCC Nokia

Type: D1900V2; Serial: D1900V2 - SN:5d013

Communication System: CW

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: BSL1900; Medium Notes: 20.3C

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 53.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(4.58, 4.58, 4.58); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 12.1 mW/g

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

Reference Value = 88.1 V/m

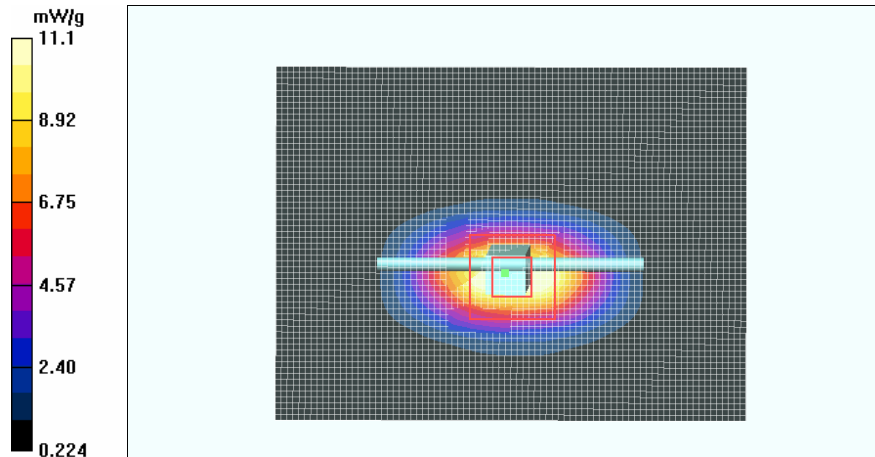
Peak SAR (extrapolated) = 16.4 W/kg

SAR(1 g) = 9.8 mW/g

SAR(10 g) = 5.23 mW/g

Power Drift = 0.026 dB

Maximum value of SAR (measured) = 11.1 mW/g



APPENDIX B: MEASUREMENT SCANS

Date/Time: 2007-01-03 10:07:05

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: HSL800; Medium Notes: 20.8C

Medium parameters used: $f = 837 \text{ MHz}$; $\sigma = 0.879 \text{ mho/m}$; $\epsilon_r = 40.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.42, 6.42, 6.42); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

Cheek position, middle/Area Scan (41x81x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.431 mW/g

Cheek position, middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 16.1 V/m

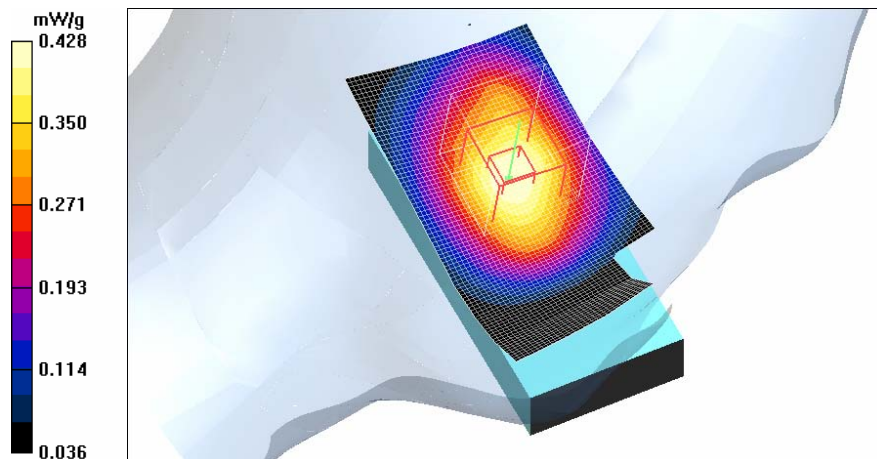
Peak SAR (extrapolated) = 0.554 W/kg

SAR(1 g) = 0.398 mW/g

SAR(10 g) = 0.274 mW/g

Power Drift = -0.192 dB

Maximum value of SAR (measured) = 0.428 mW/g



Date/Time: 2007-01-03 10:50:50

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: HSL800; Medium Notes: 20.8C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.879$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.42, 6.42, 6.42); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

Maximum value of SAR (interpolated) = 0.837 mW/g

Cheek position, middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 23.1 V/m

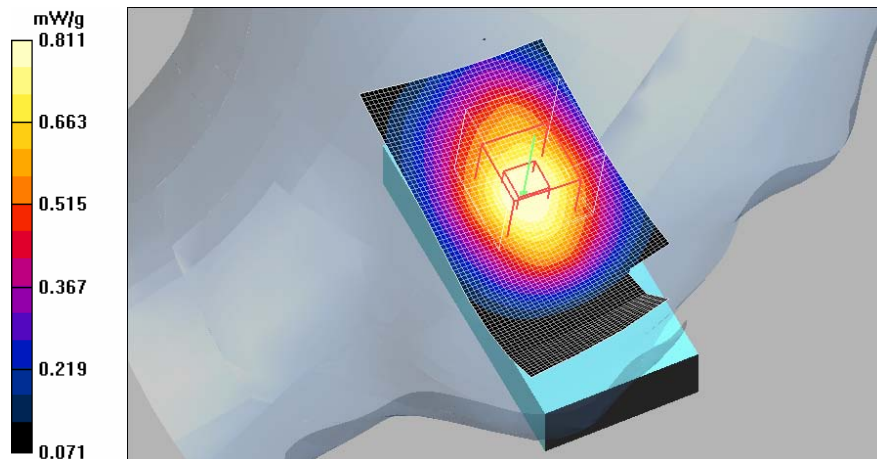
Peak SAR (extrapolated) = 1.04 W/kg

SAR(1 g) = 0.761 mW/g

SAR(10 g) = 0.529 mW/g

Power Drift = -0.156 dB

Maximum value of SAR (measured) = 0.811 mW/g



Date/Time: 2007-01-03 15:03:07

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: HSL800; Medium Notes: 20.3C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.888$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.42, 6.42, 6.42); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

Maximum value of SAR (interpolated) = 0.954 mW/g

Cheek position, high/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 25.0 V/m

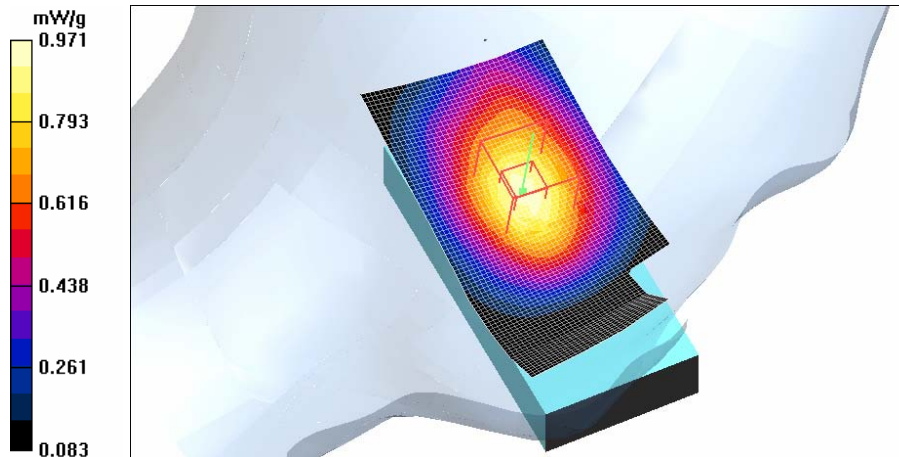
Peak SAR (extrapolated) = 1.22 W/kg

SAR(1 g) = 0.894 mW/g

SAR(10 g) = 0.607 mW/g

Power Drift = -0.202 dB

Maximum value of SAR (measured) = 0.971 mW/g



Date/Time: 2007-01-03 12:47:59

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 3-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:2.8

Medium: HSL800; Medium Notes: 20.5C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.879$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.42, 6.42, 6.42); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

Maximum value of SAR (interpolated) = 0.579 mW/g

Tilt position, middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 25.2 V/m

Peak SAR (extrapolated) = 0.725 W/kg

SAR(1 g) = 0.537 mW/g

SAR(10 g) = 0.374 mW/g

Power Drift = -0.338 dB

Maximum value of SAR (measured) = 0.573 mW/g

Tilt position, Middle/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 25.2 V/m

Peak SAR (extrapolated) = 0.916 W/kg

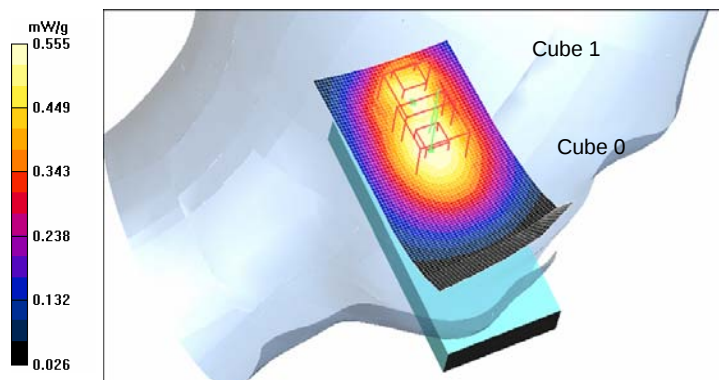
SAR(1 g) = 0.501 mW/g

SAR(10 g) = 0.332 mW/g

Power Drift = -0.338 dB

Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube. This cube might not incorporate the absolute averaged SAR. Please consider a refinement of the Area Scan measurement.

Maximum value of SAR (measured) = 0.555 mW/g



Date/Time: 2007-01-03 13:20:50

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 3-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:2.8

Medium: HSL800; Medium Notes: 20.8C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.879$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.42, 6.42, 6.42); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

Maximum value of SAR (interpolated) = 0.863 mW/g

Cheek position, middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 23.8 V/m

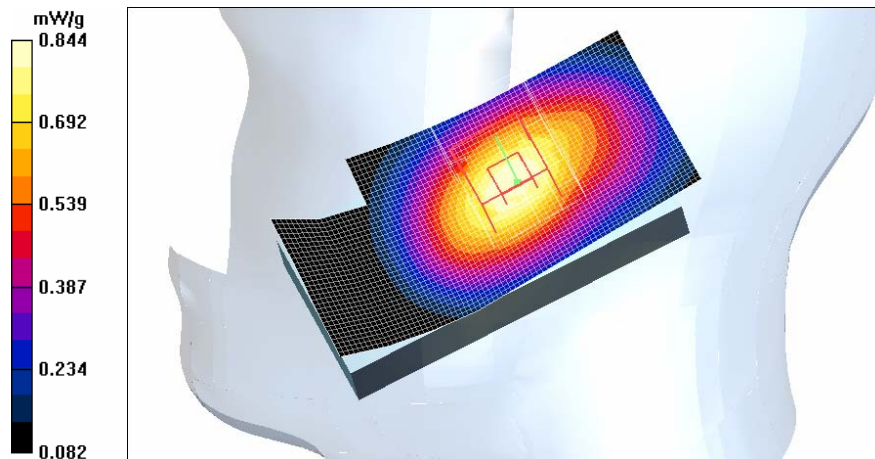
Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.789 mW/g

SAR(10 g) = 0.545 mW/g

Power Drift = -0.201 dB

Maximum value of SAR (measured) = 0.844 mW/g



Date/Time: 2007-01-03 13:42:52

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 3-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:2.8

Medium: HSL800; Medium Notes: 20.8C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.879$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.42, 6.42, 6.42); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

Maximum value of SAR (interpolated) = 0.541 mW/g

Tilt position, middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 23.8 V/m

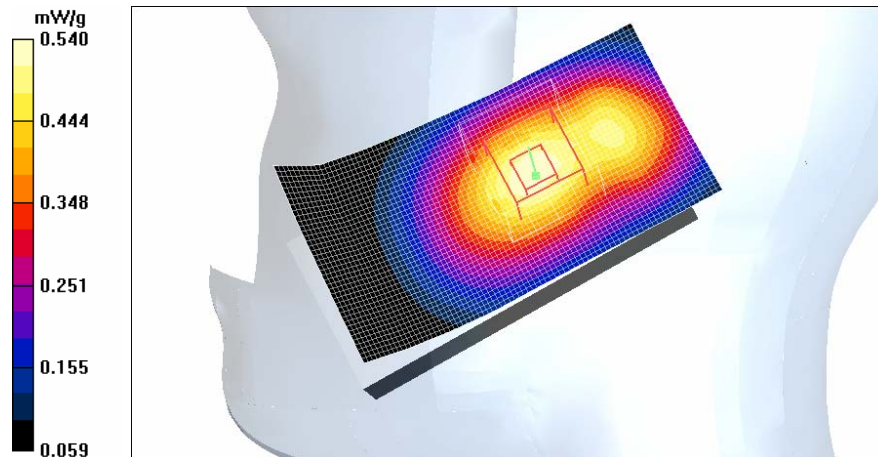
Peak SAR (extrapolated) = 0.680 W/kg

SAR(1 g) = 0.503 mW/g

SAR(10 g) = 0.353 mW/g

Power Drift = -0.123 dB

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



Date/Time: 2007-01-03 15:24:13

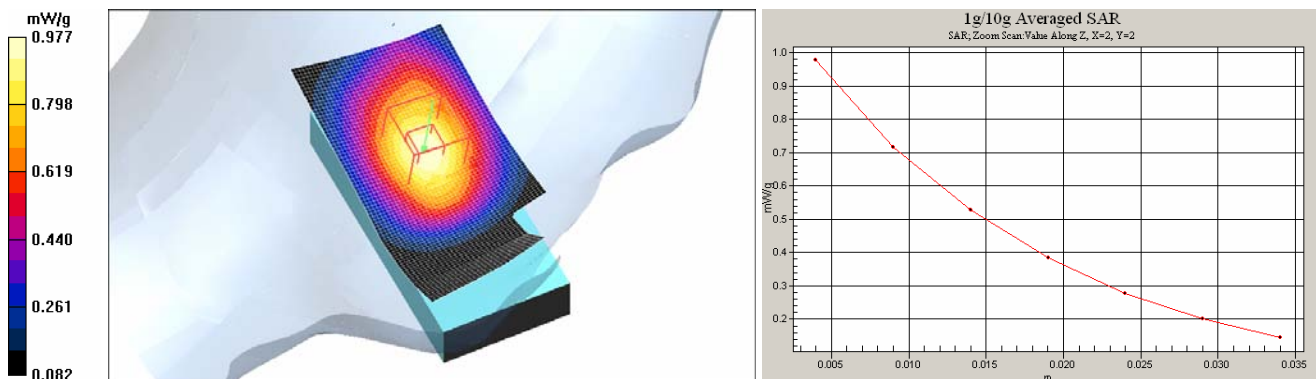
Test Laboratory: TCC Nokia
Type: RM-230; Serial: 004400/95/169013/8

Communication System: 3-slot GPRS850
Frequency: 848.8 MHz; Duty Cycle: 1:2.8
Medium: HSL800; Medium Notes: 20.3C
Medium parameters used: $f = 849$ MHz; $\sigma = 0.888$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.42, 6.42, 6.42); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

Cheek position, high, swivelled/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.983 mW/g

Cheek position, high, swivelled/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 25.4 V/m
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.907 mW/g
SAR(10 g) = 0.625 mW/g
Power Drift = -0.195 dB
Maximum value of SAR (measured) = 0.977 mW/g



Date/Time: 2007-01-04 13:05:35

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 3-slot 8PSK EGPRS850

Frequency: 849 MHz; Duty Cycle: 1:2.8

Medium: HSL900; Medium Notes: 19.3C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.914$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.42, 6.42, 6.42); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

Maximum value of SAR (interpolated) = 0.219 mW/g

Cheek position, high, swivelled/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 11.7 V/m

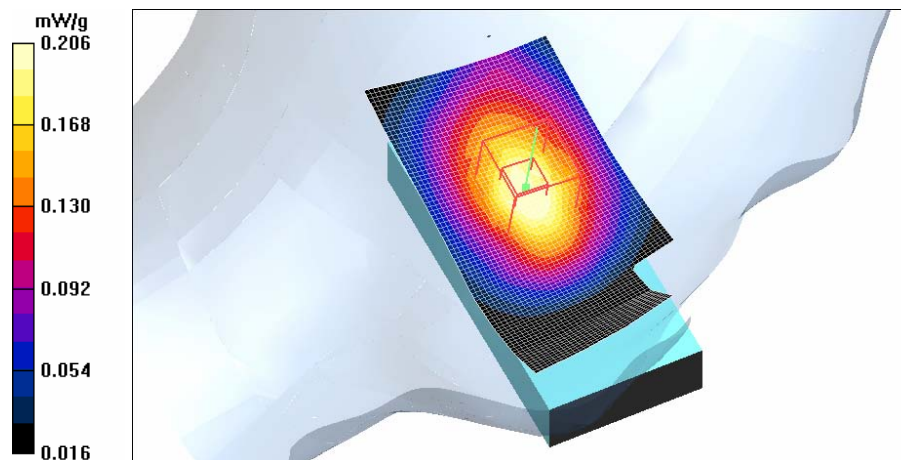
Peak SAR (extrapolated) = 0.271 W/kg

SAR(1 g) = 0.189 mW/g

SAR(10 g) = 0.127 mW/g

Power Drift = -0.046 dB

Maximum value of SAR (measured) = 0.206 mW/g



Date/Time: 2006-12-27 12:18:44

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: HSL1900; Medium Notes: 20.0C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(5.37, 5.37, 5.37); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

Maximum value of SAR (interpolated) = 0.572 mW/g

Cheek position, Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 14.5 V/m

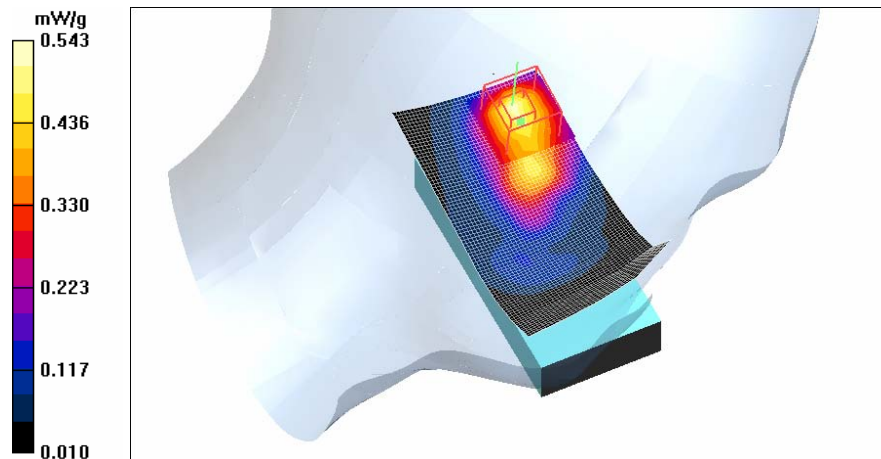
Peak SAR (extrapolated) = 0.909 W/kg

SAR(1 g) = 0.480 mW/g

SAR(10 g) = 0.258 mW/g

Power Drift = -0.089 dB

Maximum value of SAR (measured) = 0.543 mW/g



Date/Time: 2006-12-27 13:43:20

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: 20.0C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(5.37, 5.37, 5.37); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

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

Cheek position, Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 19.3 V/m

Peak SAR (extrapolated) = 1.57 W/kg

SAR(1 g) = 0.859 mW/g

SAR(10 g) = 0.461 mW/g

Power Drift = -0.289 dB

Maximum value of SAR (measured) = 0.946 mW/g

Cheek position, Middle/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 19.3 V/m

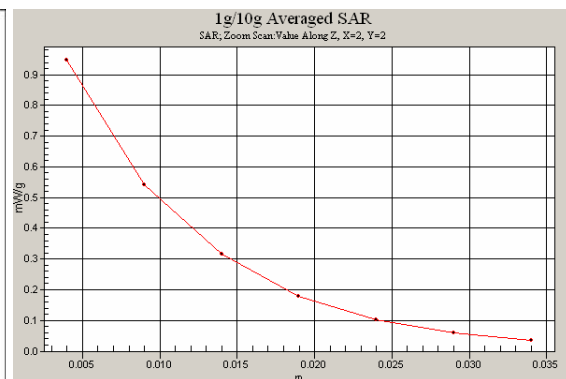
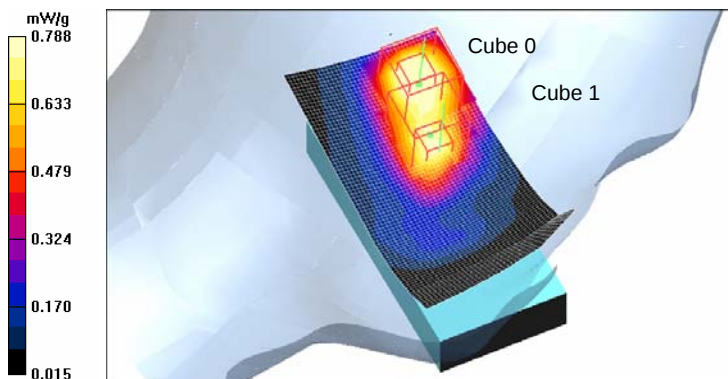
Peak SAR (extrapolated) = 1.11 W/kg

SAR(1 g) = 0.716 mW/g

SAR(10 g) = 0.426 mW/g

Power Drift = -0.289 dB

Maximum value of SAR (measured) = 0.788 mW/g



SAR Report

Salo_SAR_0652_04

Applicant: Nokia Corporation

Type: RM-230

Copyright © 2007 TCC Nokia

Date/Time: 2006-12-27 14:51:12

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: 19.6C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(5.37, 5.37, 5.37); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

Maximum value of SAR (interpolated) = 0.734 mW/g

Tilt position, Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 21.1 V/m

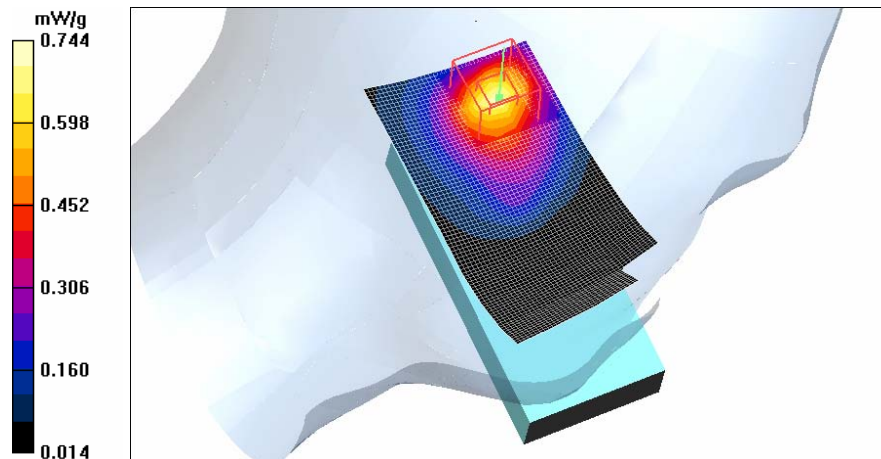
Peak SAR (extrapolated) = 1.18 W/kg

SAR(1 g) = 0.644 mW/g

SAR(10 g) = 0.343 mW/g

Power Drift = -0.114 dB

Maximum value of SAR (measured) = 0.744 mW/g



Date/Time: 2006-12-27 15:40:41

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: 19.8C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(5.37, 5.37, 5.37); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

Maximum value of SAR (interpolated) = 0.568 mW/g

Cheek position, Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 17.7 V/m

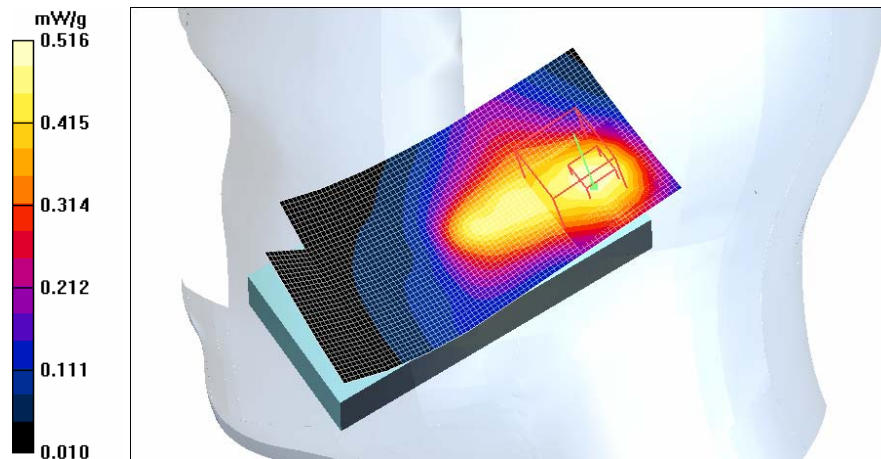
Peak SAR (extrapolated) = 0.794 W/kg

SAR(1 g) = 0.483 mW/g

SAR(10 g) = 0.286 mW/g

Power Drift = -0.288 dB

Maximum value of SAR (measured) = 0.516 mW/g



Date/Time: 2006-12-27 15:59:14

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: 19.8C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(5.37, 5.37, 5.37); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

Maximum value of SAR (interpolated) = 0.567 mW/g

Tilt position, Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 19.8 V/m

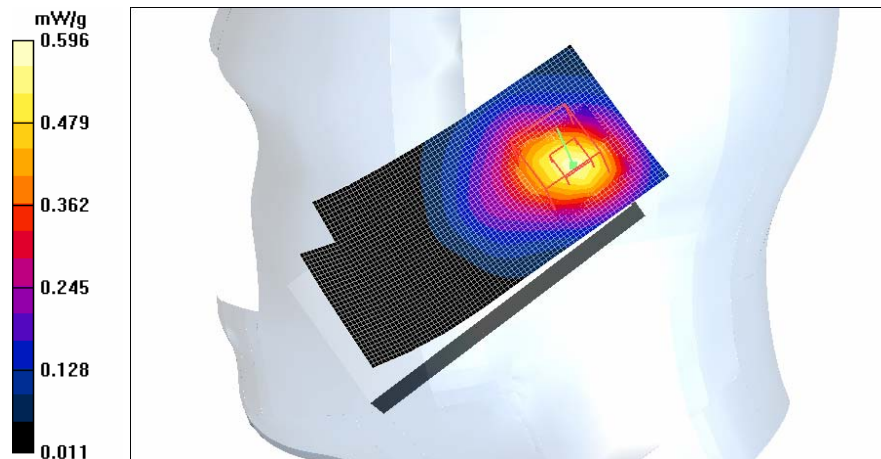
Peak SAR (extrapolated) = 0.873 W/kg

SAR(1 g) = 0.532 mW/g

SAR(10 g) = 0.305 mW/g

Power Drift = -0.141 dB

Maximum value of SAR (measured) = 0.596 mW/g



Date/Time: 2006-12-27 14:18:24

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 3-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:2.8

Medium: HSL1900; Medium Notes: 20.0C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(5.37, 5.37, 5.37); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

Maximum value of SAR (interpolated) = 0.919 mW/g

Cheek position, Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 17.9 V/m

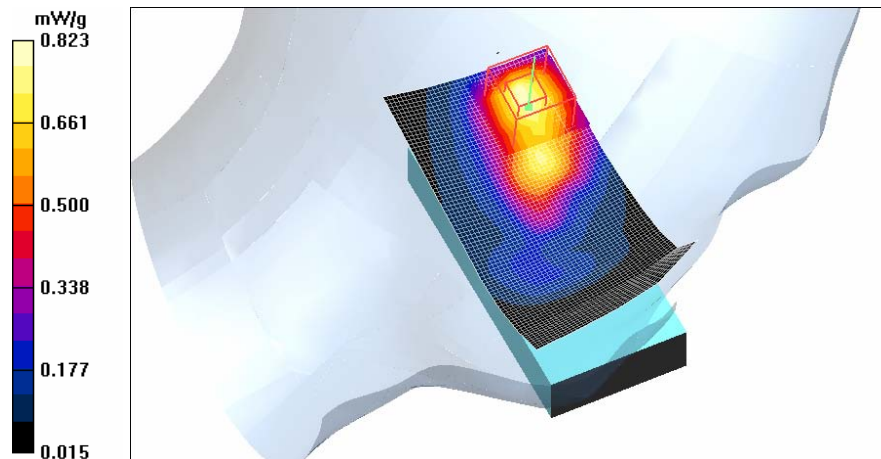
Peak SAR (extrapolated) = 1.38 W/kg

SAR(1 g) = 0.755 mW/g

SAR(10 g) = 0.408 mW/g

Power Drift = -0.162 dB

Maximum value of SAR (measured) = 0.823 mW/g



Date/Time: 2006-12-27 17:40:12

Test Laboratory: TCC Nokia
Type: RM-230; Serial: 004400/95/169013/8

Communication System: 2-slot GPRS1900
Frequency: 1880 MHz; Duty Cycle: 1:4.2
Medium: HSL1900; Medium Notes: 20.0C
Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³
Phantom section: Left Section

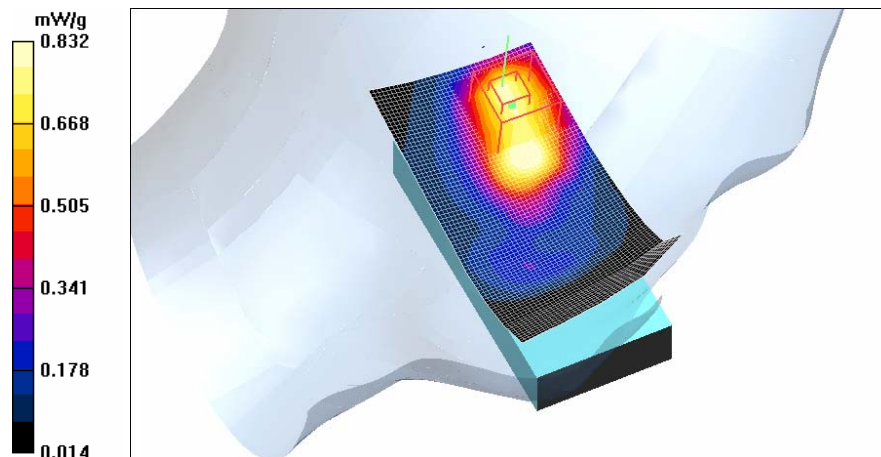
DASY4 Configuration:
- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(5.37, 5.37, 5.37); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

Cheek position, Middle, swivelled/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.935 mW/g

Cheek position, Middle, swivelled/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 18.9 V/m
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.754 mW/g
SAR(10 g) = 0.433 mW/g
Power Drift = -0.192 dB

Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube. This cube might not incorporate the absolute averaged SAR. Please consider a refinement of the Area Scan measurement.
Maximum value of SAR (measured) = 0.832 mW/g



Date/Time: 2006-12-27 19:23:12

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 2-slot 8PSK EGPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: 19.6C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 40.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(5.37, 5.37, 5.37); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

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

Maximum value of SAR (interpolated) = 0.268 mW/g

Cheek position, Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 9.48 V/m

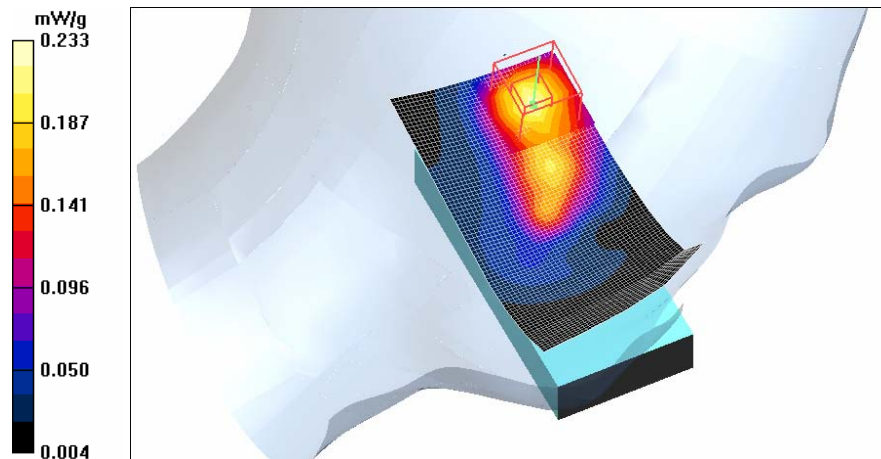
Peak SAR (extrapolated) = 0.369 W/kg

SAR(1 g) = 0.206 mW/g

SAR(10 g) = 0.113 mW/g

Power Drift = -0.053 dB

Maximum value of SAR (measured) = 0.233 mW/g



Date/Time: 2007-01-05 10:52:51

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: BSL850; Medium Notes: t=21.2C

Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.977 \text{ mho/m}$; $\epsilon_r = 56.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.2, 6.2, 6.2); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

Body Measurement, high, no accessory/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.10 mW/g

Body Measurement, high, no accessory /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 20.8 V/m

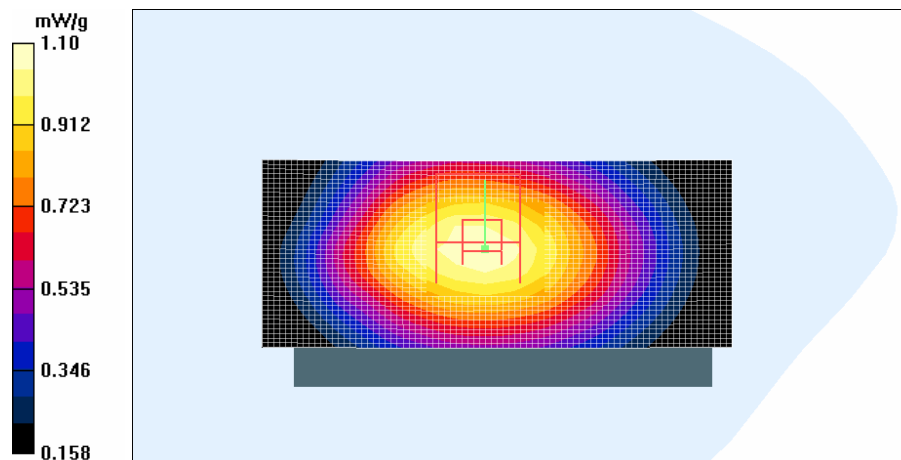
Peak SAR (extrapolated) = 1.33 W/kg

SAR(1 g) = 1.03 mW/g

SAR(10 g) = 0.757 mW/g

Power Drift = -0.089 dB

Maximum value of SAR (measured) = 1.10 mW/g



Date/Time: 2007-01-05 11:26:28

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: BSL850; Medium Notes: t=20.7C

Medium parameters used: f = 849 MHz; σ = 0.977 mho/m; ϵ_r = 56.2; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.2, 6.2, 6.2); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

Body Measurement, high, HS-44 + AD-44/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.568 mW/g

Body Measurement, high, HS-44 + AD-44/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 16.1 V/m

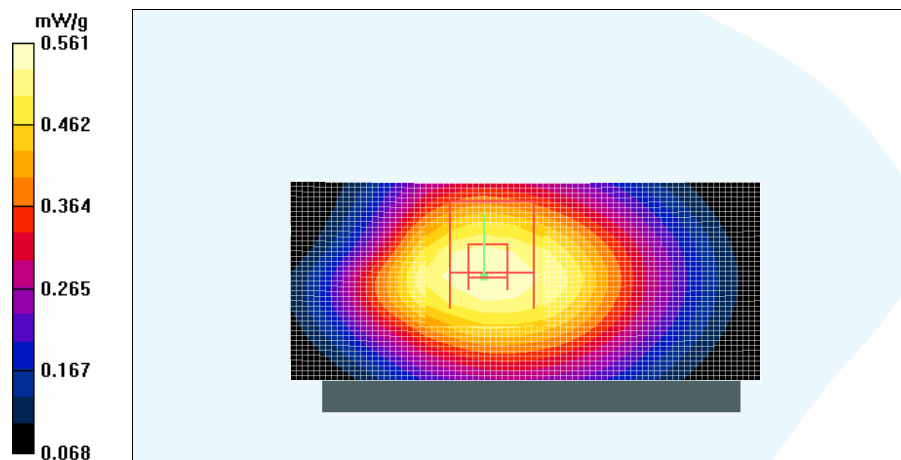
Peak SAR (extrapolated) = 0.683 W/kg

SAR(1 g) = 0.531 mW/g

SAR(10 g) = 0.390 mW/g

Power Drift = -0.068 dB

Maximum value of SAR (measured) = 0.561 mW/g



Date/Time: 2007-01-05 12:02:32

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: BSL850; Medium Notes: t=20.6C

Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.977 \text{ mho/m}$; $\epsilon_r = 56.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.2, 6.2, 6.2); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

Body Measurement, high, swivelled, no accessory /Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

Body Measurement, high, swivelled, no accessory /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 21.8 V/m

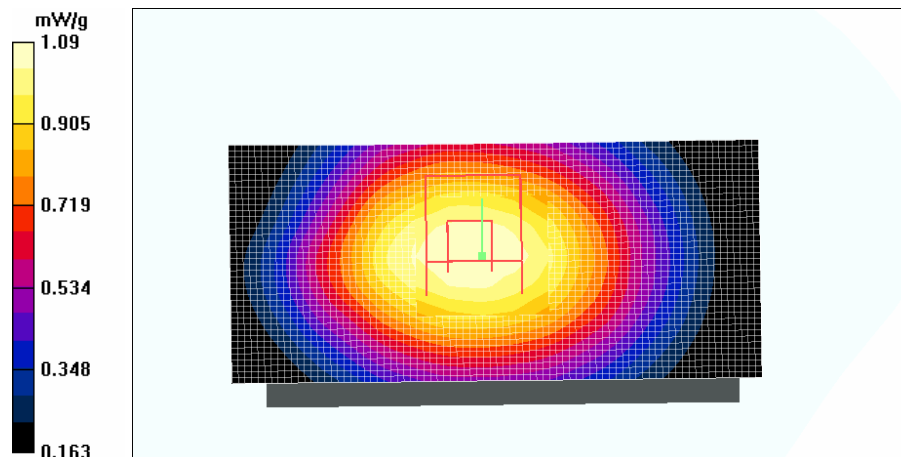
Peak SAR (extrapolated) = 1.32 W/kg

SAR(1 g) = 1.04 mW/g

SAR(10 g) = 0.765 mW/g

Power Drift = -0.198 dB

Maximum value of SAR (measured) = 1.09 mW/g



Date/Time: 2007-01-05 14:01:21

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: BSL850; Medium Notes: t=20.4C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.977$ mho/m; $\epsilon_r = 56.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1766; Probe Notes: Advanced extrapolation
- ConvF(6.2, 6.2, 6.2); Calibrated: 2006-05-03
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2006-05-17
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

Body Measurement, high, swivelled, no accessory, BT/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

Body Measurement, high, swivelled, no accessory, BT/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 23.0 V/m

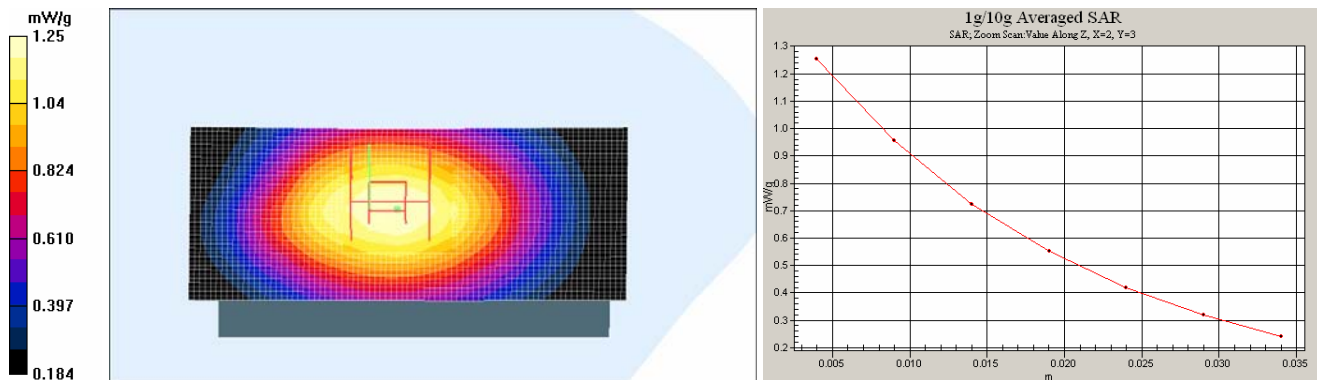
Peak SAR (extrapolated) = 1.51 W/kg

SAR(1 g) = 1.19 mW/g

SAR(10 g) = 0.877 mW/g

Power Drift = -0.083 dB

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



Date/Time: 2007-01-02 14:44:13

Test Laboratory: TCC Nokia Salo Laboratory

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: BSL1900; Medium Notes: 20.6C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(4.58, 4.58, 4.58); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

Body Measurement, middle, no accessory /Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.625 mW/g

Body Measurement, middle, no accessory /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 20.7 V/m

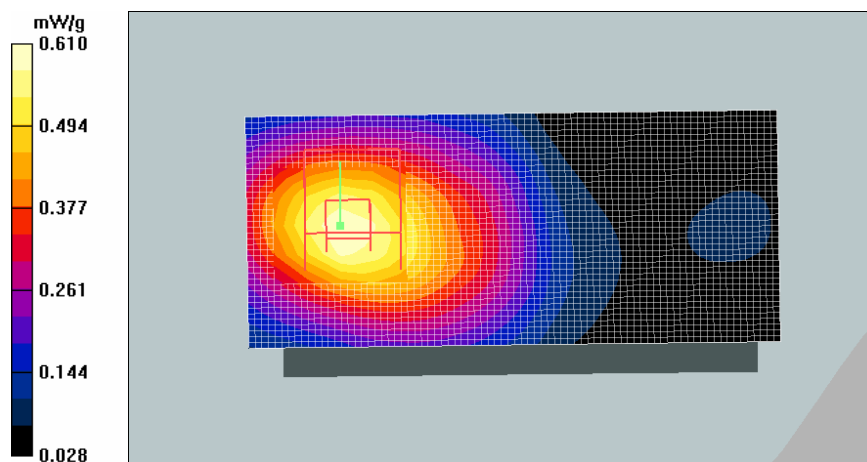
Peak SAR (extrapolated) = 0.846 W/kg

SAR(1 g) = 0.567 mW/g

SAR(10 g) = 0.361 mW/g

Power Drift = -0.270 dB

Maximum value of SAR (measured) = 0.610 mW/g



Date/Time: 2007-01-02 15:31:40

Test Laboratory: TCC Nokia Salo Laboratory

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 2-slot GPRS1900

Frequency: 1850.2 MHz; Duty Cycle: 1:4.2

Medium: BSL1900; Medium Notes: 20.6C

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.48$ mho/m; $\epsilon_r = 54.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(4.58, 4.58, 4.58); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

Body Measurement, low, HS-44 + AD-44/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.574 mW/g

Body Measurement, low, HS-44 + AD-44/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 20.5 V/m

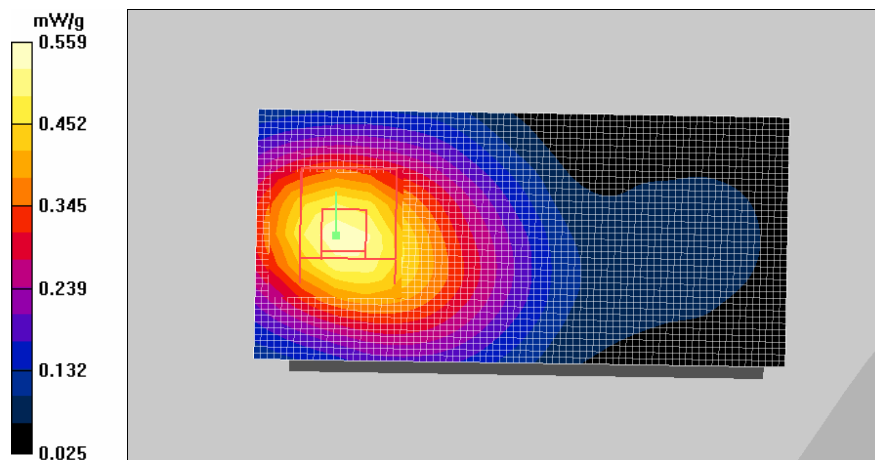
Peak SAR (extrapolated) = 0.757 W/kg

SAR(1 g) = 0.515 mW/g

SAR(10 g) = 0.326 mW/g

Power Drift = -0.167 dB

Maximum value of SAR (measured) = 0.559 mW/g



Date/Time: 2007-01-02 16:58:03

Test Laboratory: TCC Nokia

Type: RM-230; Serial: 004400/95/169013/8

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: BSL1900; Medium Notes: 20.6C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.51$ mho/m; $\epsilon_r = 53.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1396; Probe Notes: Advanced extrapolation
- ConvF(4.58, 4.58, 4.58); Calibrated: 2006-01-24
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2006-02-16
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 161

Body Measurement, middle, swivelled, no accessory /Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm

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

Body Measurement, middle, swivelled, no accessory /Zoom Scan (5x5x7)/Cube 0: Measurement grid:

dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 21.3 V/m

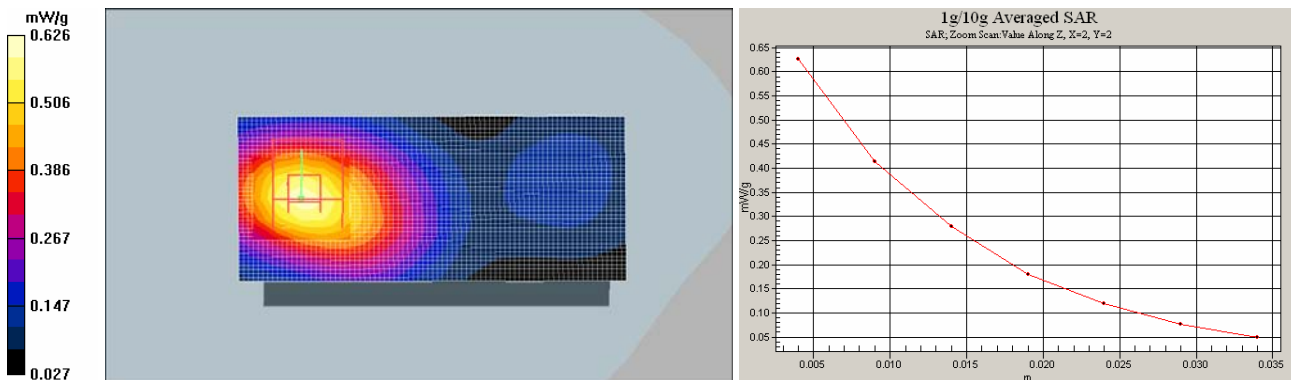
Peak SAR (extrapolated) = 0.881 W/kg

SAR(1 g) = 0.576 mW/g

SAR(10 g) = 0.362 mW/g

Power Drift = -0.235 dB

Maximum value of SAR (measured) = 0.626 mW/g



APPENDIX C: RELEVANT PAGES FROM PROBE CALIBRATION REPORT(S)

See the following 6 pages.



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 **Nokia Salo TCC**

Certificate No: **ET3-1396_Jan06**

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1396
Calibration procedure(s)	QA CAL-01.v5 and QA CAL-12.v4 Calibration procedure for dosimetric E-field probes
Calibration date:	January 24, 2006
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41495277	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41498087	3-May-05 (METAS, No. 251-00466)	May-06
Reference 3 dB Attenuator	SN: S5054 (3c)	11-Aug-05 (METAS, No. 251-00499)	Aug-06
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-05 (METAS, No. 251-00467)	May-06
Reference 30 dB Attenuator	SN: S5129 (30b)	11-Aug-05 (METAS, No. 251-00500)	Aug-06
Reference Probe ES3DV2	SN: 3013	2-Jan-06 (SPEAG, No. ES3-3013_Jan06)	Jan-07
DAE4	SN: 654	27-Oct-05 (SPEAG, No. DAE4-654_Oct05)	Oct-06
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 Nov-05)	In house check: Nov 06

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

Issued: January 24, 2006

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

DASY - Parameters of Probe: ET3DV6 SN:1396

Sensitivity in Free Space ^A			Diode Compression ^B	
NormX	1.83 ± 10.1%	μV/(V/m) ²	DCP X	91 mV
NormY	1.82 ± 10.1%	μV/(V/m) ²	DCP Y	91 mV
NormZ	1.95 ± 10.1%	μV/(V/m) ²	DCP Z	91 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL	900 MHz	Typical SAR gradient: 5 % per mm		
Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm	
SAR _{be} [%]	Without Correction Algorithm	7.3	3.8	
SAR _{be} [%]	With Correction Algorithm	0.1	0.1	
TSL	1750 MHz	Typical SAR gradient: 10 % per mm		
Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm	
SAR _{be} [%]	Without Correction Algorithm	7.1	4.1	
SAR _{be} [%]	With Correction Algorithm	0.2	0.2	

Sensor Offset

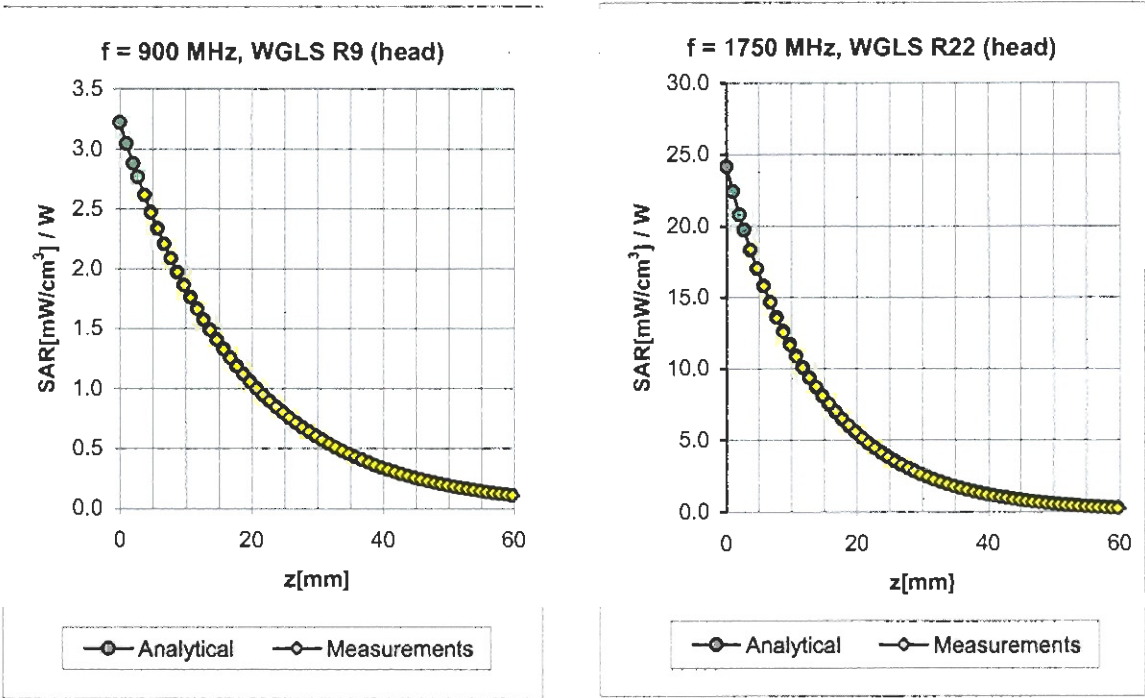
Probe Tip to Sensor Center	2.7 mm
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The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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

^B Numerical linearization parameter; uncertainty not required.

Conversion Factor Assessment



f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
450	± 50 / ± 100	Head	43.5 ± 5%	0.87 ± 5%	0.27	3.22	6.97 ± 13.3% (k=2)
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.47	1.91	6.79 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.57	1.75	6.55 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.51	1.79	5.52 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.56	1.71	5.37 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.61	1.69	5.02 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.72	1.28	4.58 ± 11.8% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.24	4.42	7.36 ± 13.3% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.48	1.99	6.41 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.48	2.08	6.29 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.66	1.97	4.79 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.64	2.12	4.58 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.55	2.61	4.33 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.57	1.58	4.22 ± 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.



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 **Nokia Safe TCC**

Calibration No. **ET3-1766_May06**

CALIBRATION CERTIFICATE

Object **ET3DV6 - SN: 1766**

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

Calibration date: **May 3, 2006**

Condition of the calibrated item **In Tolerance**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^\circ\text{C}$ 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)	11-Aug-05 (METAS, No. 251-00499)	Aug-06
Reference 20 dB Attenuator	SN: S5086 (20b)	4-Apr-06 (METAS, No. 251-00558)	Apr-07
Reference 30 dB Attenuator	SN: S5129 (30b)	11-Aug-05 (METAS, No. 251-00500)	Aug-06
Reference Probe ES3DV2	SN: 3013	2-Jan-06 (SPEAG, No. ES3-3013_Jan06)	Jan-07
DAE4	SN: 654	2-Feb-06 (SPEAG, No. DAE4-654_Feb06)	Feb-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 Nov-05)	In house check: Nov 06

	Name	Function	Signature
Calibrated by:	Katja Pokorec	Technical Manager	
Approved by:	Markus Kuster	Quality Manager	

Issued: May 3, 2006

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

DASY - Parameters of Probe: ET3DV6 SN:1766

Sensitivity in Free Space^A

Diode Compression^B

NormX	2.00 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP X	93 mV
NormY	1.71 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Y	93 mV
NormZ	1.88 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Z	93 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

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

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	8.3	4.2
SAR _{be} [%]	With Correction Algorithm	0.1	0.3

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	3.6
SAR _{be} [%]	With Correction Algorithm	0.2	0.2

Sensor Offset

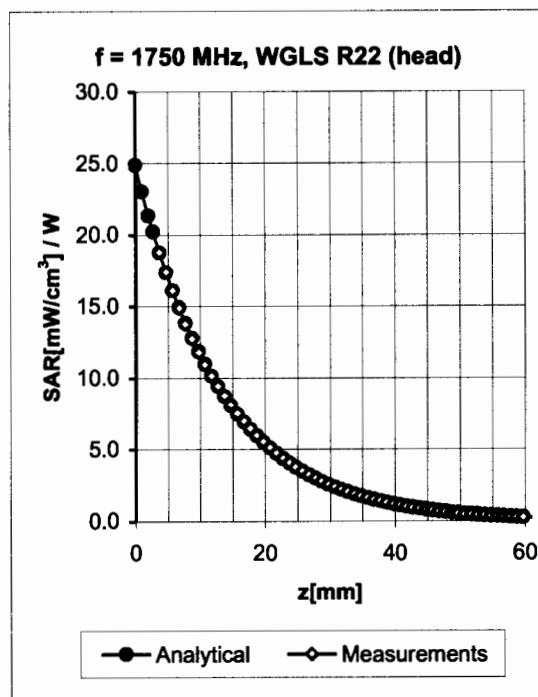
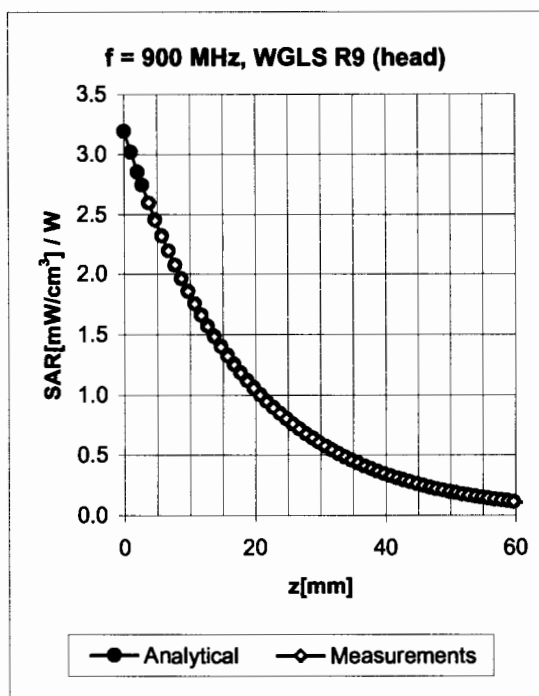
Probe Tip to Sensor Center **2.7 mm**

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

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

^B Numerical linearization parameter: uncertainty not required.

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%	0.64	1.73	6.42 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.60	1.79	6.25 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.53	2.47	5.18 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.57	2.44	4.99 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.57	2.49	4.71 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.74	1.75	4.42 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.51	2.00	6.20 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.48	2.11	5.94 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.59	2.54	4.66 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.69	2.32	4.48 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.75	2.17	4.40 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.71	1.78	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.