

SAR Compliance Test Report

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Measurements made by:	Leif Klysner / Jesper Nielsen		
Tested device:	RM-161		
FCC ID:	PPIRM-161	IC:	661U-RM161
Supplement reports:	-		
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 Techniques		
Documentation:	The documentation of the testing performed on the tested devices is archived for 15 years at TCC.		
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:	2006-01-12		
For the contents:			

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2006-01-02 to 2006-01-10
SN, HW and SW numbers of tested device	IMEI:004400/78/165822/2 HW:3060 SW:05W49.1 DUT#28476 IMEI:004400/78/166026/9 HW:3061 SW:05W49.1 DUT#28478
Batteries used in testing	BL-4C, DUT#28480, DUT#28481, DUT#28482
Headsets used in testing	HS-6, DUT# 28715
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
2-slot GPRS1900	810 / 1909.8	26.0 dBm EIRP	Left, Cheek	0.47 W/kg	0.53 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
2-slot GPRS1900	810 / 1909.8	26.0 dBm EIRP	2.2 cm	0.46 W/kg	0.52 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	-0.22 dB

1.2.4 Measurement Uncertainty

Expanded Uncertainty (k=2) 95%	$\pm 25.8\%$
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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 1900	GPRS 1900	EGPRS 1900	BT
Modulation Mode	GMSK	GMSK	GMSK / 8PSK	GFSK
Duty Cycle	1/8	1/8 or 2/8	1/8 or 2/8	
Transmitter Frequency Range (MHz)	1850 - 1910	1850 - 1910	1850 - 1910	2402-2480

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

This device has Push to Talk capability for use at the ear. Therefore, SAR for 2-slot GPRS mode was evaluated against the head profile of the phantom.

2.1 Picture of the Device



2.2 Description of the Antenna

The device has an external stubby antenna.

3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	20.5 to 21.5
Ambient humidity (RH %):	35 to 55

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 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 3	501	12 months	2006-01
DAE 3	339	12 months	2006-08
E-field Probe ET3DV6	1807	12 months	2006-01
E-field Probe ET3DV6	1786	12 months	2006-01
Dipole Validation Kit, D1900V2	5d013	24 months	2006-07
Dipole Validation Kit, D1900V2	5d030	24 months	2007-02
DASY4 software	Version 4.6	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration interval	Calibration expiry
Signal Generator	SME06	848650/011	36 months	2008-07
Amplifier	ZHL-42W	E012903	-	-
Power Meter	NRVD	840297/008	24 months	2007-11
Power Sensor	NRV-Z51	100184	24 months	2007-11
Call Tester	CMU200	836203/022	-	-
Call Tester	4400M	0411216	-	-
Vector Network Analyzer	AT8753ES	MY40001091	12 months	2006-08
Dielectric Probe Kit	HP85070B	US33020403	-	-

4.1.1 Isotropic E-field Probe Type 1786 & 1807

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 checking 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 recipes were used for Head and Body tissue simulants:

1900MHz band		
Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	54.88	69.02
Butyl Diglycol	44.91	30.76
Salt	0.21	0.22

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]	
1900	Reference result	10.0	39.4	1.44	
	$\pm 10\%$ window	9.0 - 11.0			
	2006-01-02	10.7	38.1	1.43	21.3

System checking, body tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ϵ_r	σ [S/m]	
1900	Reference result	9.94	52.2	1.57	
	$\pm 10\%$ window	8.95 - 10.93			
	2006-01-03	10.1	52.5	1.49	21.6
	2006-01-10	10.6	52.2	1.53	21.1

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

4.3.3 Tissue Simulants used in the Measurements

Head tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ϵ_r	σ [S/m]	
1880	Recommended value	40.0	1.40	
	$\pm 5\%$ window	38.0 – 42.0	1.33 – 1.47	
	2006-01-02	38.1	1.41	21.3

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ϵ_r	σ [S/m]	
1880	Recommended value	53.3	1.52	
	$\pm 5\%$ window	50.6 – 56.0	1.44 – 1.60	
	2006-01-03	52.6	1.47	21.6
	2006-01-10	52.3	1.50	21.1

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".

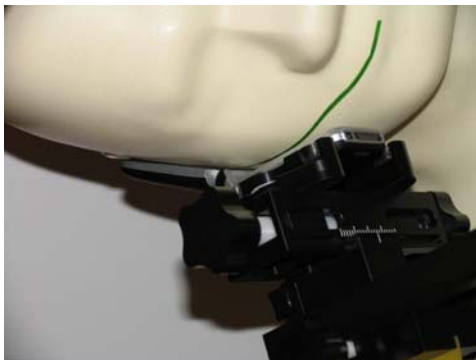


Photo of the device in "cheek" position

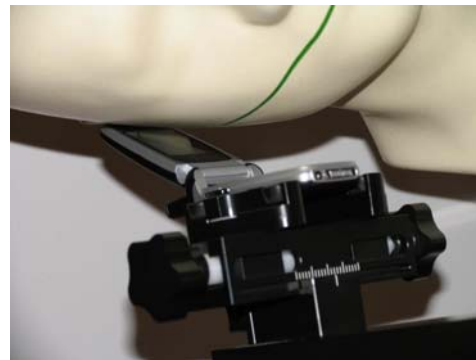


Photo of the device in "tilt" position

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 below 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.



Photo of the device positioned for Body SAR measurement.
The spacer was removed for the tests.

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	G_i	$G_i \cdot U_i$ (%)	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:

1900 MHz Head SAR results

Hardware ID	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		27.5 dBm	27.0 dBm	27.8 dBm
3061	Left	Cheek	-	0.276	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
2-slot GPRS	Power		26.0 dBm	26.3 dBm	26.0 dBm
3061	Left	Cheek	0.297	0.418	0.461
		Tilt	-	0.086	-
	Right	Cheek	-	0.379	-
		Tilt	-	0.091	-
2-slot EGPRS	Power		27.3 dBm	21.6 dBm	21.2 dBm
3061	Left	Cheek	-	-	0.116
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
2-slot GPRS	Power		28.6 dBm	26.7 dBm	27.1 dBm
3060	Left	Cheek	-	0.300	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3061	2-slot GPRS in Left Cheek position with BT active		-	-	0.473
3060	2-slot GPRS in Left Cheek position with BT active		0.281	0.302	0.348

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

1900 MHz Body SAR results

Hardware ID	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	27.5 dBm	27.0 dBm	27.8 dBm
3061	Without headset	-	0.260	-
	Headset HS-6	-	-	-
2-slot GPRS	Power	26.0 dBm	26.3 dBm	26.0 dBm
3061	Without headset	0.305	0.419	0.460
	Headset HS-6	0.264	0.346	0.437
2-slot GPRS	Power	28.6 dBm	26.7 dBm	27.1 dBm
3060	Without headset	-	0.325	-
	Headset HS-6	-	-	-
3061	2-slot GPRS without headset with BT active	-	-	0.464
3060	2-slot GPRS without headset with BT active	0.313	0.348	0.377

APPENDIX A: SYSTEM CHECKING SCANS

See the following pages.

Date/Time: 2006.01.02 12:08:28

Test Laboratory: TCC Copenhagen

Type: D1900V2; Serial: 5d013

Communication System: Continuous Wave

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: t=21.3 C

Medium parameters used: f = 1900 MHz; σ = 1.43 mho/m; ϵ_r = 38.1; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1786; Probe Notes: Advanced Extrapolation
- ConvF(5.11, 5.11, 5.11); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 17.08.2005
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

d=10mm, Pin=250mW/Area Scan (71x71x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 12.2 mW/g

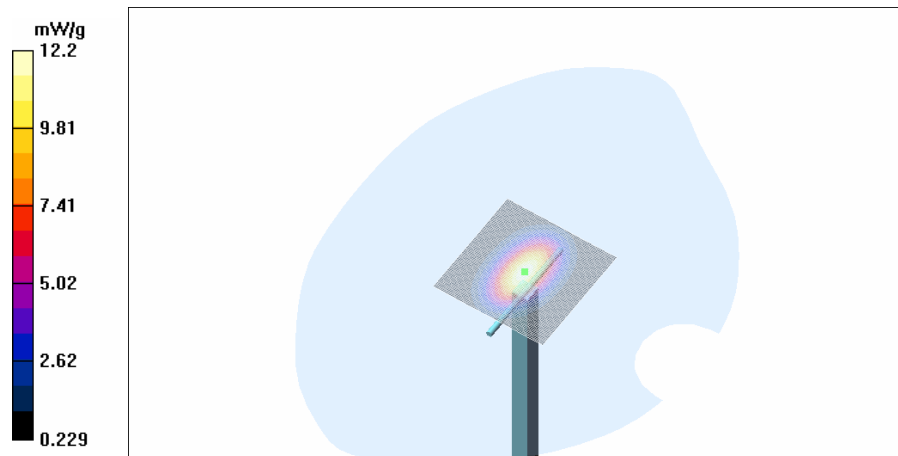
d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 98.1 V/m; Power Drift = 0.008 dB

Peak SAR (extrapolated) = 17.9 W/kg

SAR(1 g) = 10.7 mW/g; SAR(10 g) = 5.63 mW/g

Maximum value of SAR (measured) = 12.2 mW/g



Date/Time: 2006.01.03 09:55:25

Test Laboratory: TCC Copenhagen

Type: D1900V2; Serial: 5d030

Communication System: Continuous Wave

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: Body 1900; Medium Notes: Medium Temperature: t=21.6 C

Medium parameters used: f = 1900 MHz; σ = 1.49 mho/m; ϵ_r = 52.5; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1807; Probe Notes: Advanced Extrapolation
- ConvF(4.44, 4.44, 4.44); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 24.01.2005
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

d=10mm, Pin=250mW/Area Scan (71x71x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 11.9 mW/g

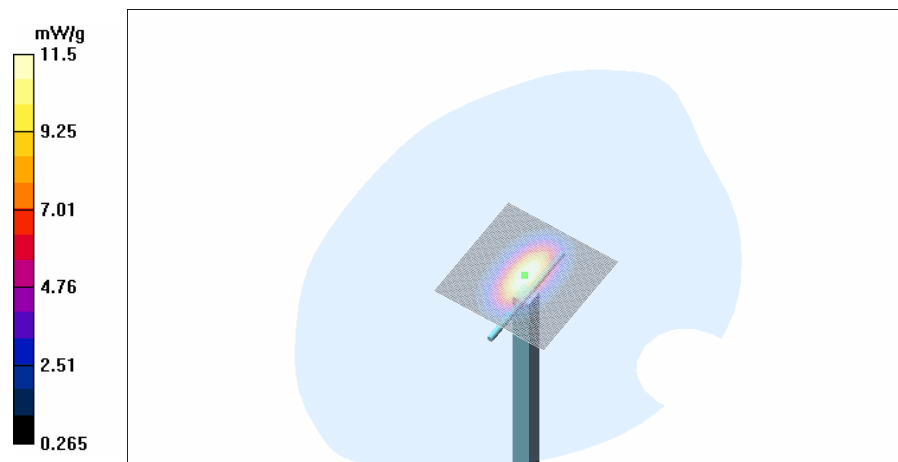
d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 93.6 V/m; Power Drift = 0.006 dB

Peak SAR (extrapolated) = 17.7 W/kg

SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.39 mW/g

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



Date/Time: 2006.01.10 17:31:48

Test Laboratory: TCC Copenhagen
Type: D1900V2; Serial: D1900V2 - SN:5d030

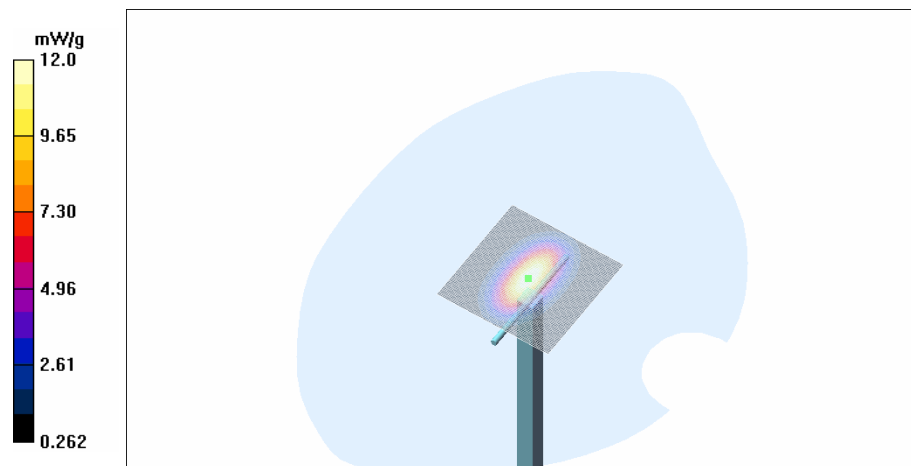
Communication System: Continuous Wave
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: Body 1900; Medium Notes: Medium Temperature: $t=21.1$ C
Medium parameters used: $f = 1900$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1807; Probe Notes: Advanced Extrapolation
- ConvF(4.44, 4.44, 4.44); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 24.01.2005
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

d=10mm, Pin=250mW/Area Scan (71x71x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 12.3 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.0 V/m; Power Drift = 0.011 dB
Peak SAR (extrapolated) = 18.5 W/kg
SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.58 mW/g
Maximum value of SAR (measured) = 12.0 mW/g



APPENDIX B: MEASUREMENT SCANS

SEE THE FOLLOWING PAGES

Date/Time: 2006.01.02 15:57:47

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/166026/9

Communication System: GSM 1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: Head 1900; Medium Notes: Medium Temperature: $t=21.3$ C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1786; Probe Notes: Advanced Extrapolation
- ConvF(5.11, 5.11, 5.11); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 17.08.2005
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek position - Middle/Area Scan (51x121x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.300 mW/g

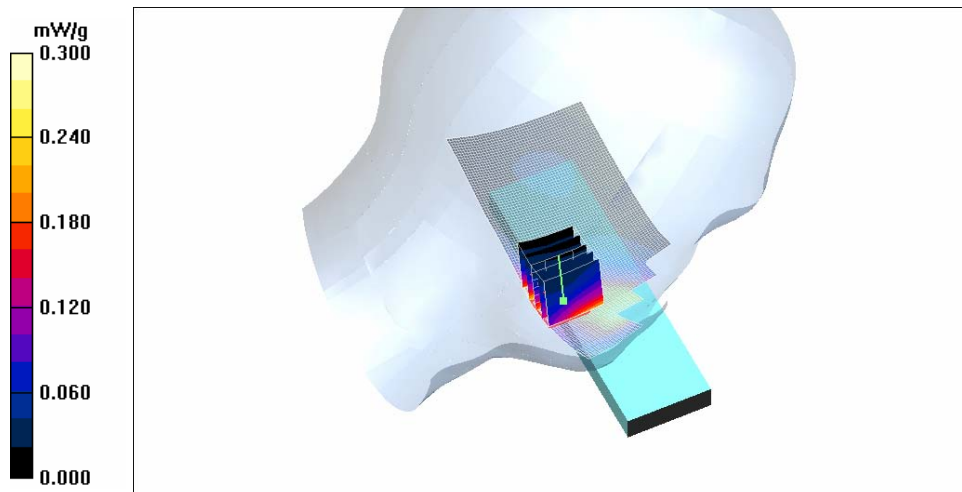
Cheek position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 4.71 V/m; Power Drift = 0.097 dB

Peak SAR (extrapolated) = 0.470 W/kg

SAR(1 g) = 0.276 mW/g; SAR(10 g) = 0.159 mW/g

Maximum value of SAR (measured) = 0.300 mW/g



Date/Time: 2006.01.02 17:19:52

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/166026/9

Communication System: 2-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: Head 1900; Medium Notes: Medium Temperature: t=21.3 C

Medium parameters used: f = 1910 MHz; σ = 1.44 mho/m; ϵ_r = 38; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1786; Probe Notes: Advanced Extrapolation
- ConvF(5.11, 5.11, 5.11); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 17.08.2005
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek position - High/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.504 mW/g

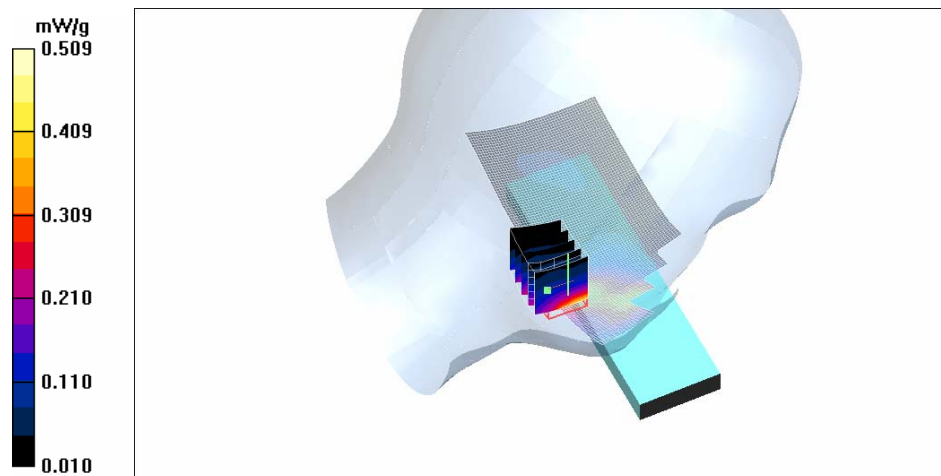
Cheek position - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 7.12 V/m; Power Drift = -0.101 dB

Peak SAR (extrapolated) = 0.760 W/kg

SAR(1 g) = 0.461 mW/g; SAR(10 g) = 0.267 mW/g

Maximum value of SAR (measured) = 0.509 mW/g



Date/Time: 2006.01.02 15:29:39

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/166026/9

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: Head 1900; Medium Notes: Medium Temperature: $t=21.3$ C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1786; Probe Notes: Advanced Extrapolation
- ConvF(5.11, 5.11, 5.11); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 17.08.2005
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Tilt position - Middle/Area Scan (51x121x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.090 mW/g

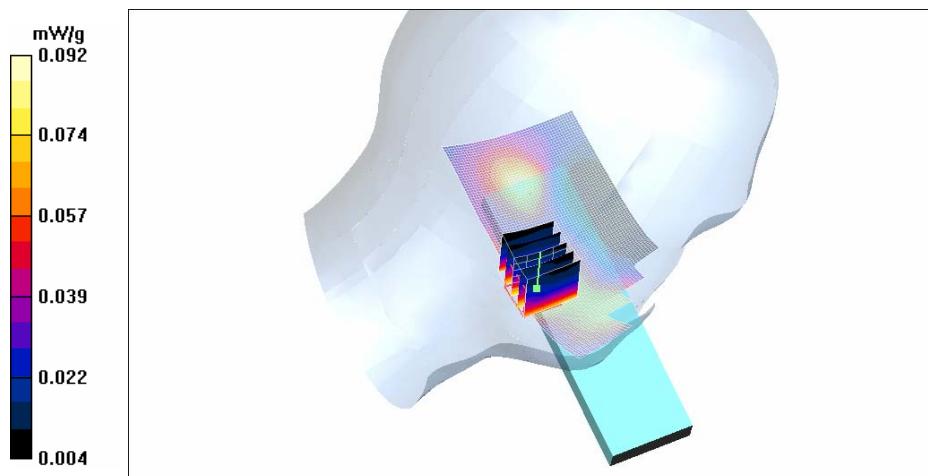
Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 7.70 V/m; Power Drift = 0.014 dB

Peak SAR (extrapolated) = 0.127 W/kg

SAR(1 g) = 0.086 mW/g; SAR(10 g) = 0.057 mW/g

Maximum value of SAR (measured) = 0.092 mW/g



Date/Time: 2006.01.02 16:31:39

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/166026/9

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: Head 1900; Medium Notes: Medium Temperature: $t=21.3$ C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.1$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1786; Probe Notes: Advanced Extrapolation
- ConvF(5.11, 5.11, 5.11); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 17.08.2005
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek position - Middle/Area Scan (51x121x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.415 mW/g

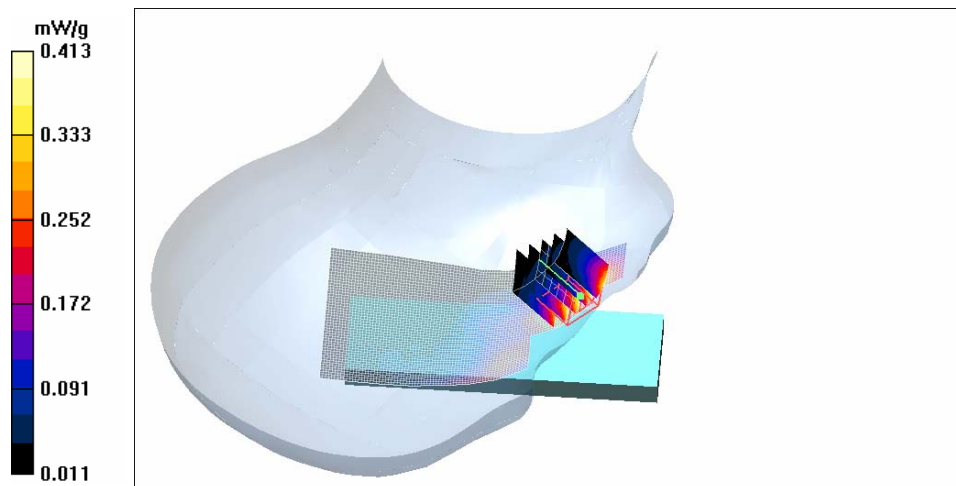
Cheek position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 4.76 V/m; Power Drift = -0.047 dB

Peak SAR (extrapolated) = 0.559 W/kg

SAR(1 g) = 0.379 mW/g; SAR(10 g) = 0.241 mW/g

Maximum value of SAR (measured) = 0.413 mW/g



Date/Time: 2006.01.02 16:47:38

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/166026/9

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: Head 1900; Medium Notes: Medium Temperature: t=21.3 C

Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ϵ_r = 38.1; ρ = 1000 kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1786; Probe Notes: Advanced Extrapolation
- ConvF(5.11, 5.11, 5.11); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 17.08.2005
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Tilt position - Middle/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.099 mW/g

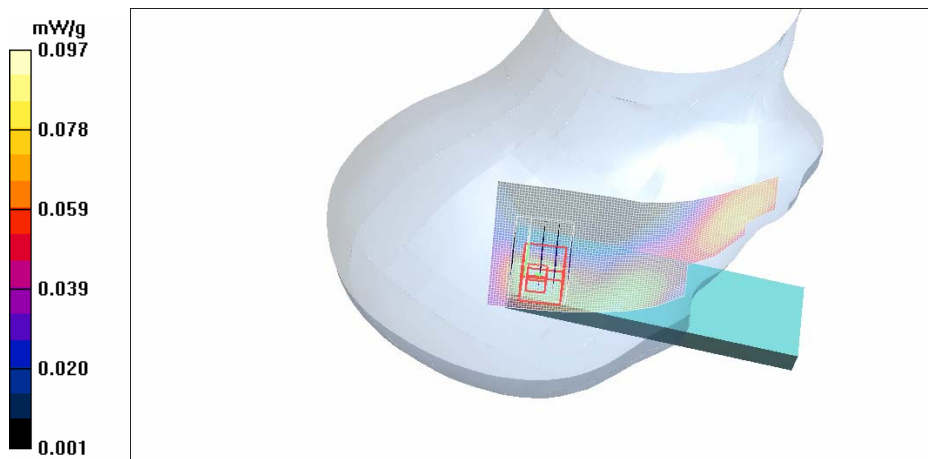
Tilt position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 5.97 V/m; Power Drift = -0.091 dB

Peak SAR (extrapolated) = 0.144 W/kg

SAR(1 g) = 0.091 mW/g; SAR(10 g) = 0.055 mW/g

Maximum value of SAR (measured) = 0.097 mW/g



Date/Time: 2006.01.02 19:03:36

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/166026/9

Communication System: 2-slot EGPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: Head 1900; Medium Notes: Medium Temperature: t=21.3 C

Medium parameters used: f = 1910 MHz; σ = 1.44 mho/m; ϵ_r = 38; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1786; Probe Notes: Advanced Extrapolation
- ConvF(5.11, 5.11, 5.11); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 17.08.2005
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek position - High/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.121 mW/g

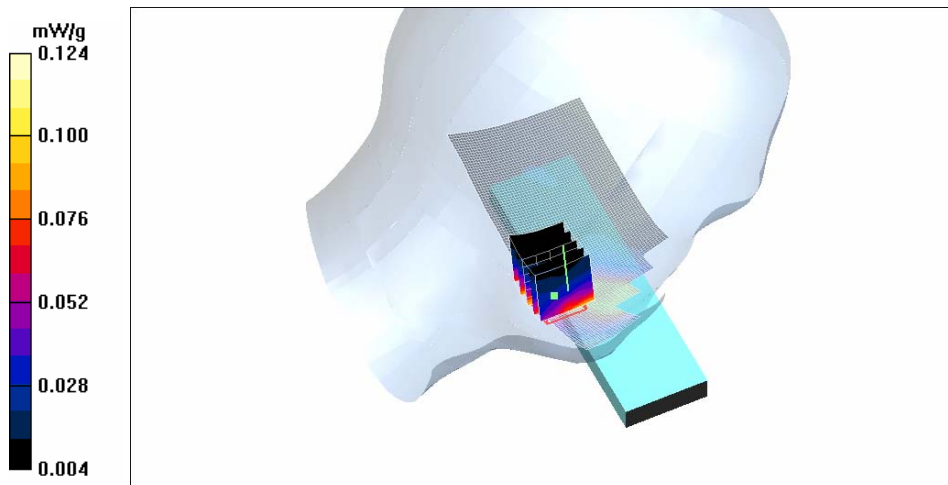
Cheek position - High/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 3.26 V/m; Power Drift = 0.042 dB

Peak SAR (extrapolated) = 0.203 W/kg

SAR(1 g) = 0.116 mW/g; SAR(10 g) = 0.067 mW/g

Maximum value of SAR (measured) = 0.124 mW/g



Date/Time: 2006.01.02 14:34:21

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/165822/2

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: Head 1900; Medium Notes: Medium Temperature: $t=21.3$ C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 38.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1786; Probe Notes: Advanced Extrapolation
- ConvF(5.11, 5.11, 5.11); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 17.08.2005
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek position - Middle/Area Scan (51x121x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.321 mW/g

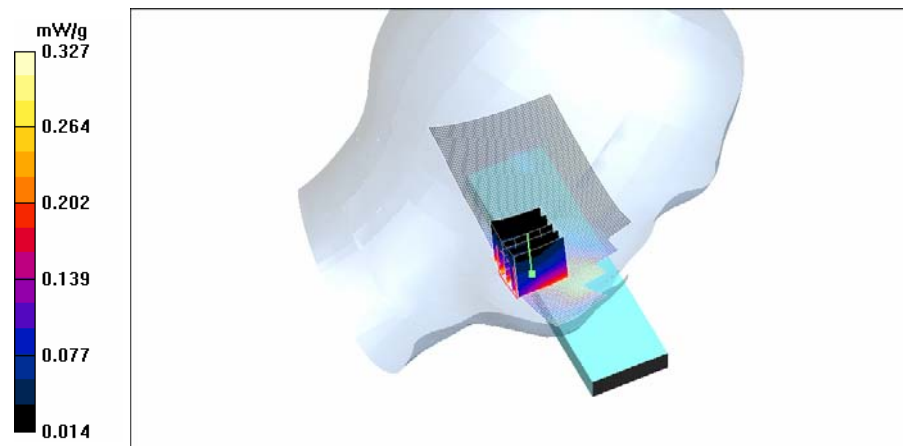
Cheek position - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 5.45 V/m; Power Drift = -0.024 dB

Peak SAR (extrapolated) = 0.484 W/kg

SAR(1 g) = 0.300 mW/g; SAR(10 g) = 0.176 mW/g

Maximum value of SAR (measured) = 0.327 mW/g



Date/Time: 2006.01.02 18:19:21

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/166026/9

Communication System: 2-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: Head 1900; Medium Notes: Medium Temperature: t=21.3 C

Medium parameters used: f = 1910 MHz; σ = 1.44 mho/m; ϵ_r = 38; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1786; Probe Notes: Advanced Extrapolation
- ConvF(5.11, 5.11, 5.11); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 17.08.2005
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek position - High - BT active/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.530 mW/g

Cheek position - High - BT active/Zoom Scan (8x8x7) (8x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

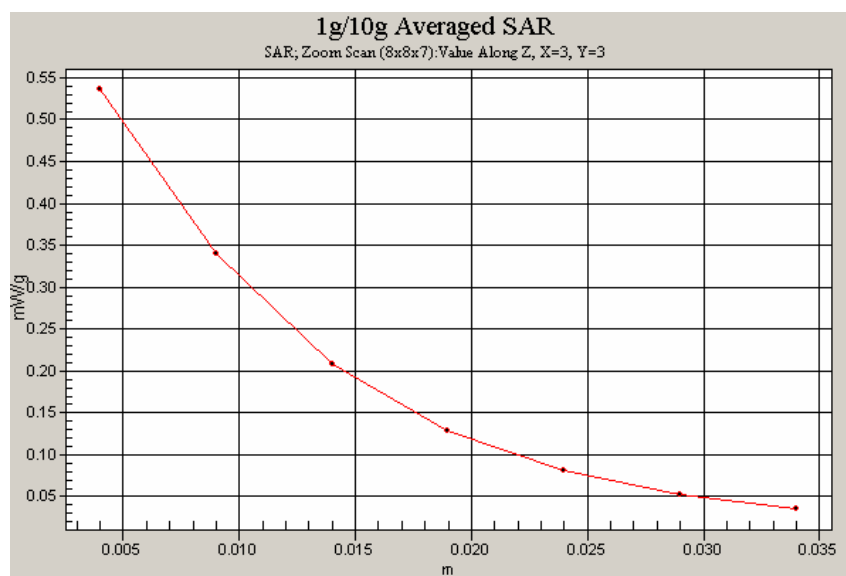
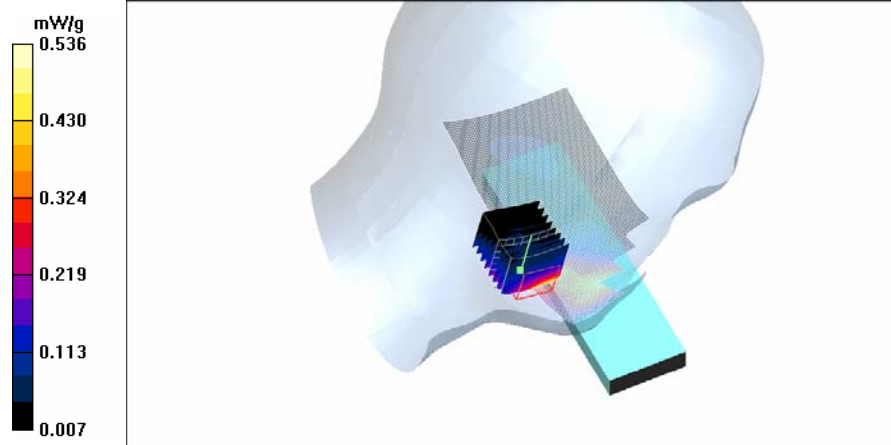
Reference Value = 7.15 V/m; Power Drift = -0.224 dB

Peak SAR (extrapolated) = 0.846 W/kg

SAR(1 g) = 0.473 mW/g; SAR(10 g) = 0.275 mW/g

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) = 0.536 mW/g



Date/Time: 2006.01.02 20:15:59

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/165822/2

Communication System: 2-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: Head 1900; Medium Notes: Medium Temperature: $t=21.3$ C

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1786; Probe Notes: Advanced Extrapolation
- ConvF(5.11, 5.11, 5.11); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 17.08.2005
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek position - High - BT active/Area Scan (51x121x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.372 mW/g

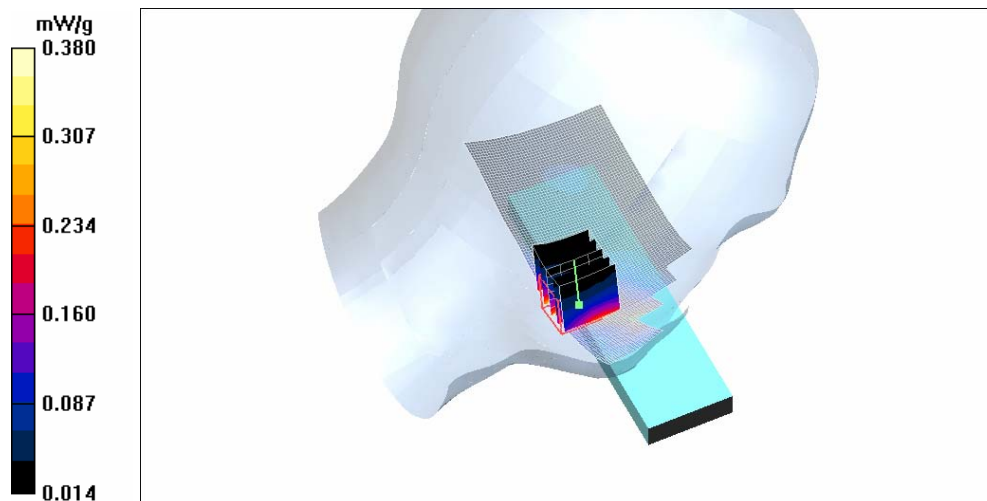
Cheek position - High - BT active/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 5.91 V/m; Power Drift = 0.009 dB

Peak SAR (extrapolated) = 0.659 W/kg

SAR(1 g) = 0.348 mW/g; SAR(10 g) = 0.197 mW/g

Maximum value of SAR (measured) = 0.380 mW/g



Date/Time: 2006.01.03 15:03:08

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/166026/9

Communication System: GSM 1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: Body 1900; Medium Notes: Medium Temperature: $t=21.6$ C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1807; Probe Notes: Advanced Extrapolation
- ConvF(4.44, 4.44, 4.44); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 24.01.2005
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body - Mid - No Accessory/Area Scan (51x91x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.283 mW/g

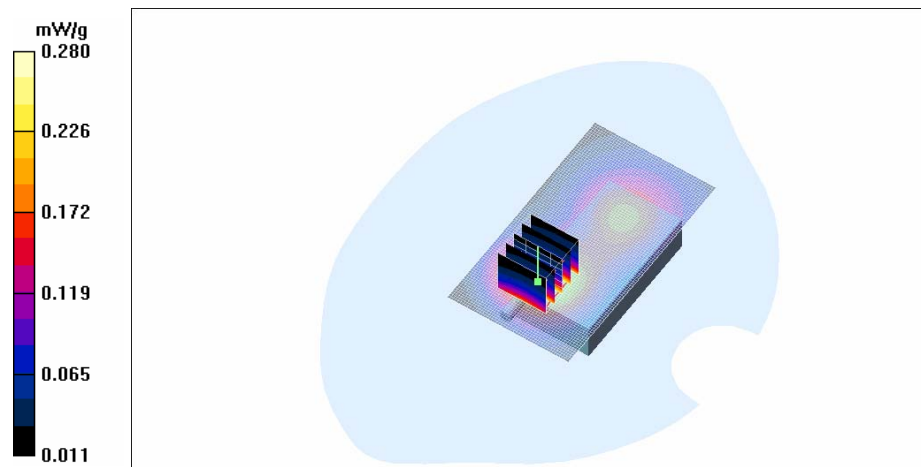
Body - Mid - No Accessory/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 13.7 V/m; Power Drift = 0.006 dB

Peak SAR (extrapolated) = 0.402 W/kg

SAR(1 g) = 0.260 mW/g; SAR(10 g) = 0.164 mW/g

Maximum value of SAR (measured) = 0.280 mW/g



Date/Time: 2006.01.03 13:50:31

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/166026/9

Communication System: 2-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: Body 1900; Medium Notes: Medium Temperature: t=21.6 C

Medium parameters used: f = 1910 MHz; σ = 1.51 mho/m; ϵ_r = 52.5; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1807; Probe Notes: Advanced Extrapolation
- ConvF(4.44, 4.44, 4.44); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection (Locations From Previous Scan Used))
- Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 24.01.2005
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body - High - No Accessory/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.495 mW/g

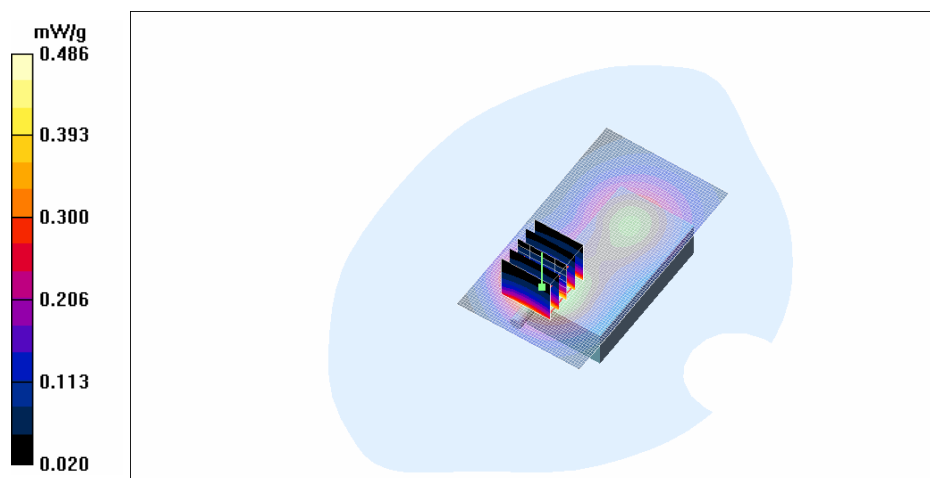
Body - High - No Accessory/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 17.3 V/m; Power Drift = 0.025 dB

Peak SAR (extrapolated) = 0.787 W/kg

SAR(1 g) = 0.460 mW/g; SAR(10 g) = 0.288 mW/g

Maximum value of SAR (measured) = 0.486 mW/g



Date/Time: 2006.01.03 13:37:52

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/166026/9

Communication System: 2-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: Body 1900; Medium Notes: Medium Temperature: t=21.6 C

Medium parameters used: f = 1910 MHz; σ = 1.51 mho/m; ϵ_r = 52.5; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1807; Probe Notes: Advanced Extrapolation
- ConvF(4.44, 4.44, 4.44); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 24.01.2005
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body - High + HS-6/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.471 mW/g

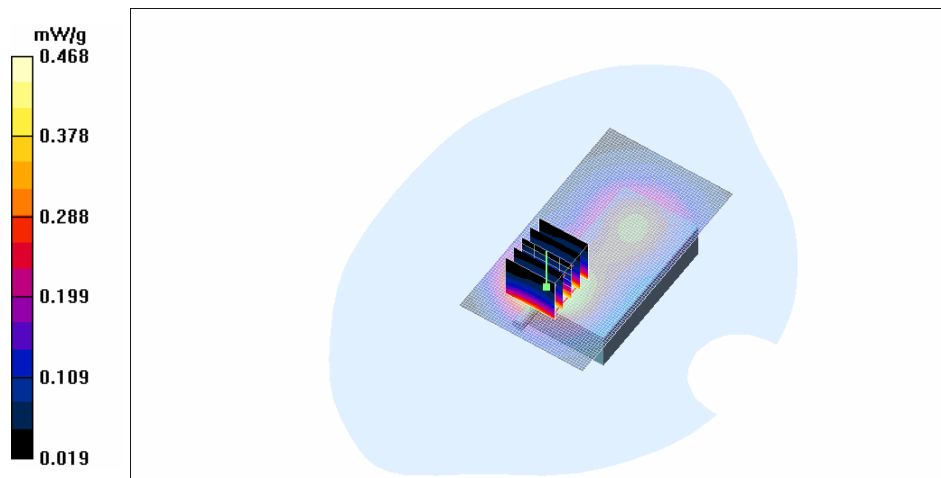
Body - High + HS-6/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 17.1 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 0.706 W/kg

SAR(1 g) = 0.437 mW/g; SAR(10 g) = 0.274 mW/g

Maximum value of SAR (measured) = 0.468 mW/g



Date/Time: 2006.01.03 11:47:11

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/165822/2

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: Body 1900; Medium Notes: Medium Temperature: t=21.6 C

Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ϵ_r = 52.6; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1807; Probe Notes: Advanced Extrapolation
- ConvF(4.44, 4.44, 4.44); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 24.01.2005
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body - Middle - No Accessory/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.360 mW/g

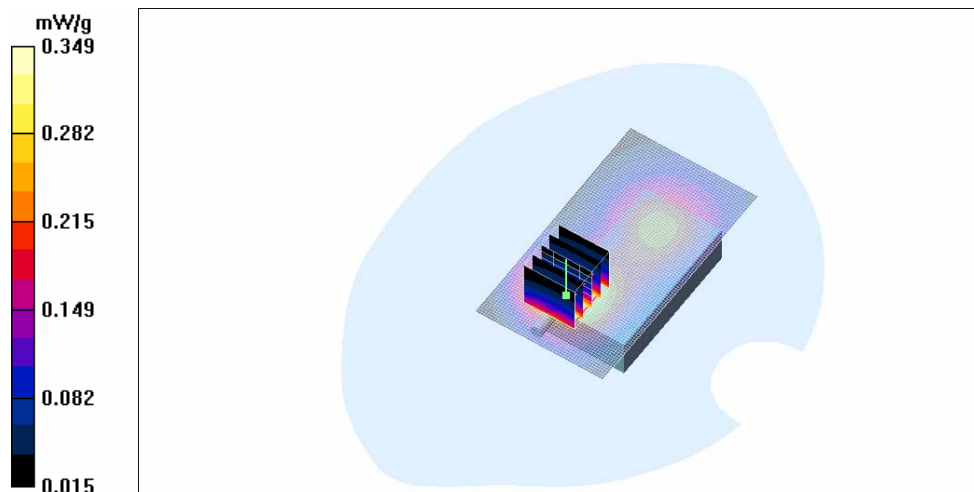
Body - Middle - No Accessory/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 15.0 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 0.498 W/kg

SAR(1 g) = 0.325 mW/g; SAR(10 g) = 0.204 mW/g

Maximum value of SAR (measured) = 0.349 mW/g



Date/Time: 2006.01.03 14:07:38

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/166026/9

Communication System: 2-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: Body 1900; Medium Notes: Medium Temperature: t=21.6 C

Medium parameters used: f = 1910 MHz; σ = 1.51 mho/m; ϵ_r = 52.5; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1807; Probe Notes: Advanced Extrapolation
- ConvF(4.44, 4.44, 4.44); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 24.01.2005
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body - High - No Accessory - BT Active/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.504 mW/g

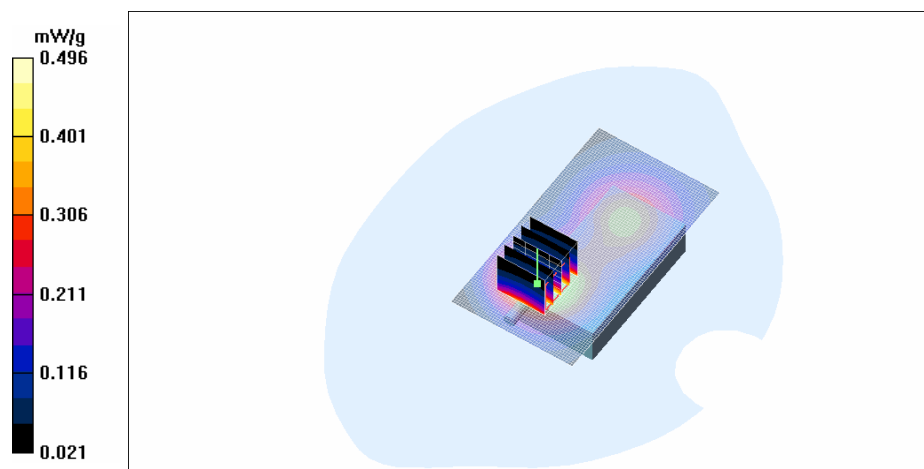
Body - High - No Accessory - BT Active/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

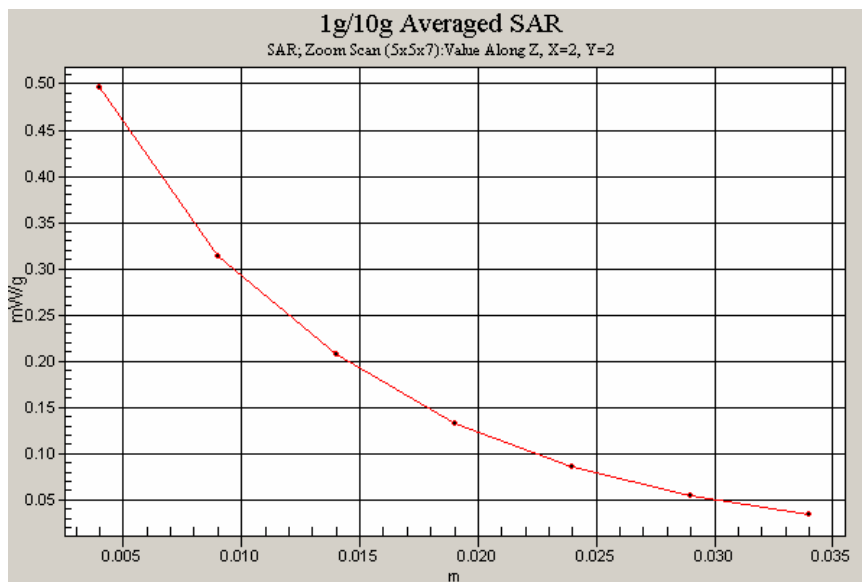
Reference Value = 17.7 V/m; Power Drift = -0.071 dB

Peak SAR (extrapolated) = 0.747 W/kg

SAR(1 g) = 0.464 mW/g; SAR(10 g) = 0.289 mW/g

Maximum value of SAR (measured) = 0.496 mW/g





Date/Time: 2006.01.10 17:11:10

Test Laboratory: TCC Copenhagen

Type: RM-161; Serial: 004400/78/165822/2

Communication System: 2-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: Body 1900; Medium Notes: Medium Temperature: t=21.1 C

Medium parameters used: f = 1910 MHz; σ = 1.54 mho/m; ϵ_r = 52.2; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1807; Probe Notes: Advanced Extrapolation
- ConvF(4.44, 4.44, 4.44); Calibrated: 21.01.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 24.01.2005
- Phantom: SAM 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body - High - No Accessory - BT active/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.420 mW/g

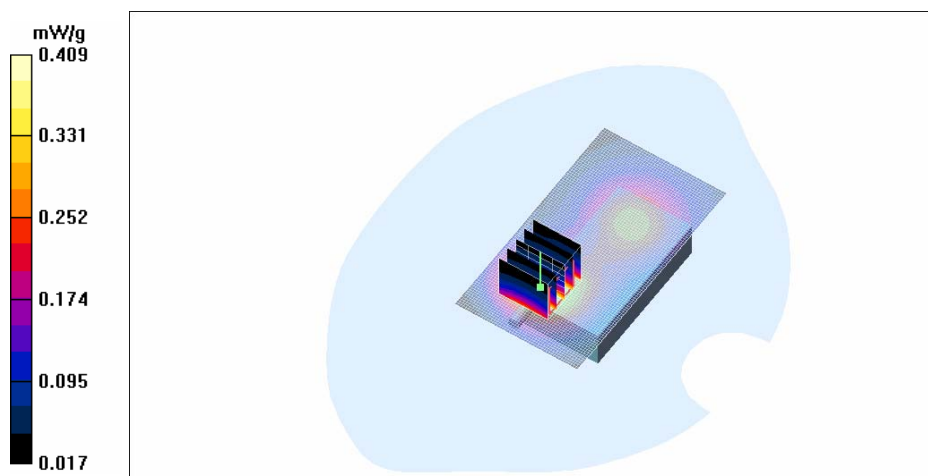
Body - High - No Accessory - BT active/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 15.5 V/m; Power Drift = -0.033 dB

Peak SAR (extrapolated) = 0.598 W/kg

SAR(1 g) = 0.377 mW/g; SAR(10 g) = 0.234 mW/g

Maximum value of SAR (measured) = 0.409 mW/g



APPENDIX C: RELEVANT PAGES FROM PROBE CALIBRATION REPORTS

See the following pages

18976

**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 **Nokia DK**

Certificate No: **ET3-1786_Jan05**

CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1786**

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

Calibration date: **January 21, 2005**

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-May-04 (METAS, No. 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No. 251-00388)	May-05
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-04 (METAS, No. 251-00403)	Aug-05
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-04 (METAS, No. 251-00389)	May-05
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-04 (METAS, No. 251-00404)	Aug-05
Reference Probe ES3DV2	SN: 3013	7-Jan-05 (SPEAG, No. ES3-3013_Jan05)	Jan-06
DAE4	SN: 617	29-Sep-04 (SPEAG, No. DAE4-617_Sep04)	Sep-05
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov 05

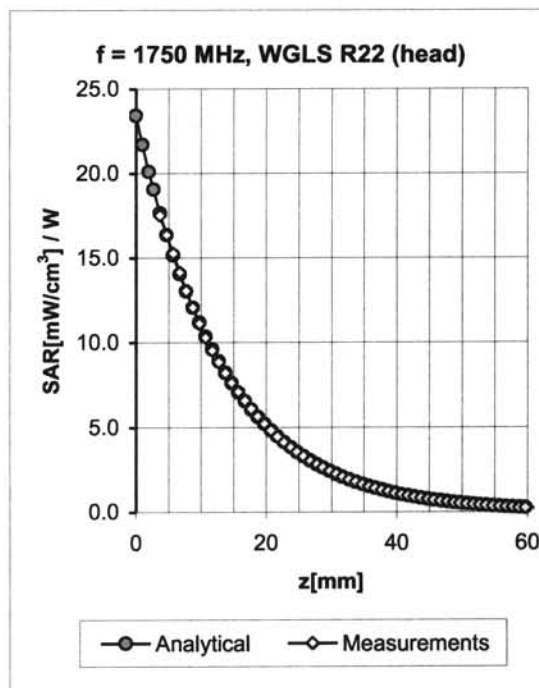
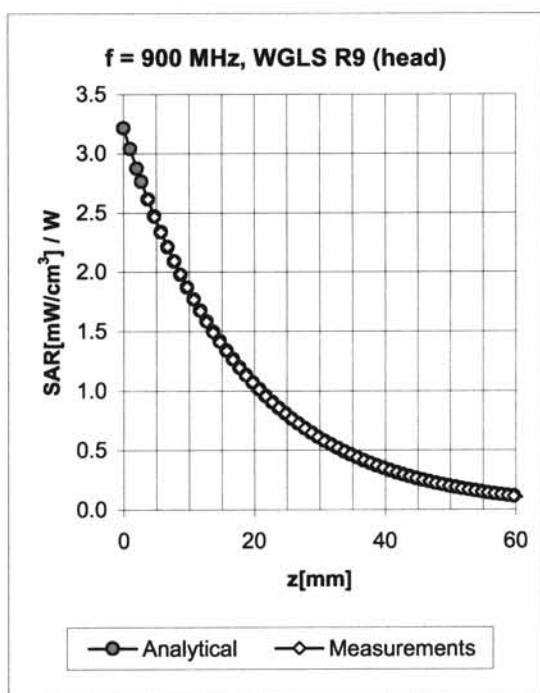
	Name	Function	Signature
Calibrated by:	Nico Vetterli	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 21, 2005

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

28/1-05
HL

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%	0.67	1.74	6.56 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.59	1.86	6.36 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.62	2.23	5.29 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.59	2.40	5.11 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.57	2.59	4.74 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.71	2.10	4.55 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.59	1.91	6.38 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.47	2.19	6.06 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.57	2.68	4.68 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.57	2.82	4.52 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.62	2.45	4.41 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.72	2.03	4.20 ± 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.

19227

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



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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 **Nokia DK**

Certificate No: **ET3-1807_Jan05**

CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1807**

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

Calibration date: **January 21, 2005**

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-May-04 (METAS, No. 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No. 251-00388)	May-05
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-04 (METAS, No. 251-00403)	Aug-05
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-04 (METAS, No. 251-00389)	May-05
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-04 (METAS, No. 251-00404)	Aug-05
Reference Probe ES3DV2	SN: 3013	7-Jan-05 (SPEAG, No. ES3-3013_Jan05)	Jan-06
DAE4	SN: 617	29-Sep-04 (SPEAG, No. DAE4-617_Sep04)	Sep-05

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov 05

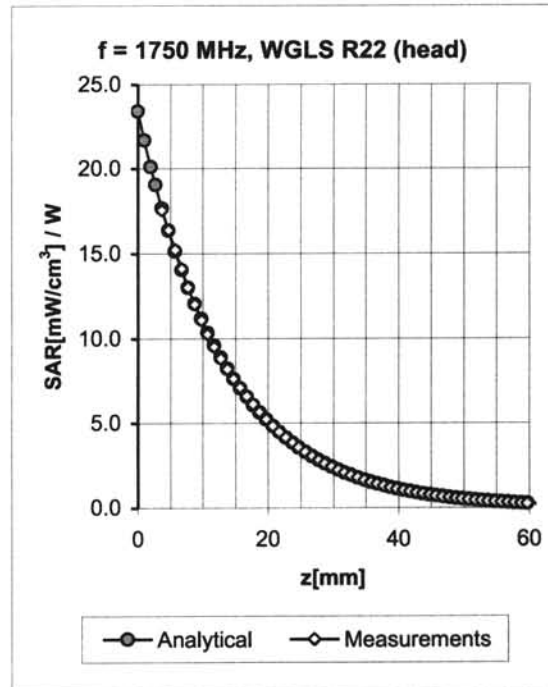
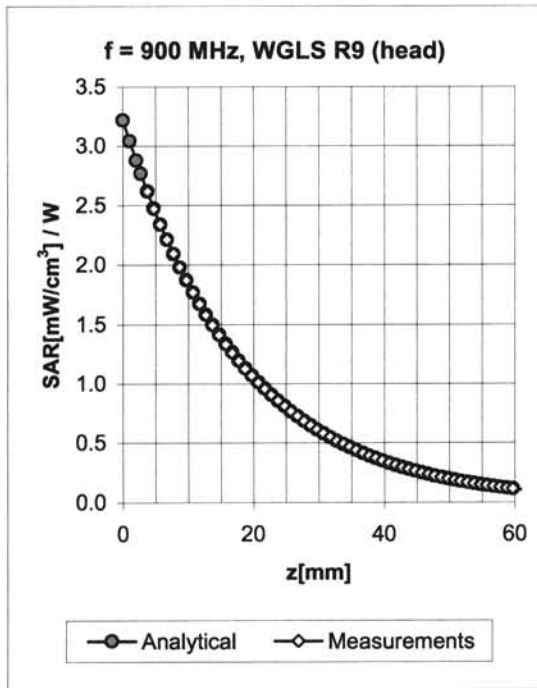
	Name	Function	Signature
Calibrated by:	Nico Vetterli	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 21, 2005

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

28/1-05
JK

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%	0.68	1.75	6.46 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.64	1.81	6.25 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.56	2.34	5.19 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.51	2.58	5.04 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.53	2.68	4.70 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.62	2.29	4.47 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.50	2.07	6.26 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.49	2.15	5.97 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.50	2.86	4.59 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.51	2.94	4.44 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.55	2.63	4.35 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.63	2.18	4.12 ± 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.

APPENDIX D: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORTS

See the following pages

Client

Nokia Salo TCC

CALIBRATION CERTIFICATE

Object(s) **D1900V2 - SN:5d013**

Calibration procedure(s) **QA CAL-05.v2
Calibration procedure for dipole validation kits**

Calibration date: **July 13, 2004**

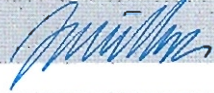
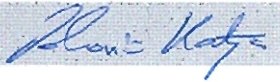
Condition of the calibrated item **In Tolerance (according to the specific calibration document)**

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E442	GB37480704	6-Nov-03 (METAS, No. 252-0254)	Nov-04
Power sensor HP 8481A	US37292783	6-Nov-03 (METAS, No. 252-0254)	Nov-04
Power sensor HP 8481A	MY41092317	18-Oct-02 (Agilent, No. 20021018)	Oct-04
RF generator R&S SML-03	100698	27-Mar-2002 (R&S, No. 20-92389)	In house check: Mar-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-03)	In house check: Oct 05

	Name	Function	Signature
Calibrated by:	Judith Mueller	Technician	
Approved by:	Katja Pokovic	Laboratory Director	

Date issued: July 15, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN5d013

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

Medium: HSL 1900 MHz;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.96, 4.96, 4.96); Calibrated: 1/23/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn903; Calibrated: 2/19/2004
- Phantom: Flat Phantom quarter size; Type: QD000P50AA; Serial: SN:1002;
- Measurement SW: DASY4, V4.3 Build 8; Postprocessing SW: SEMCAD, V1.8 Build 117

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 11.4 mW/g

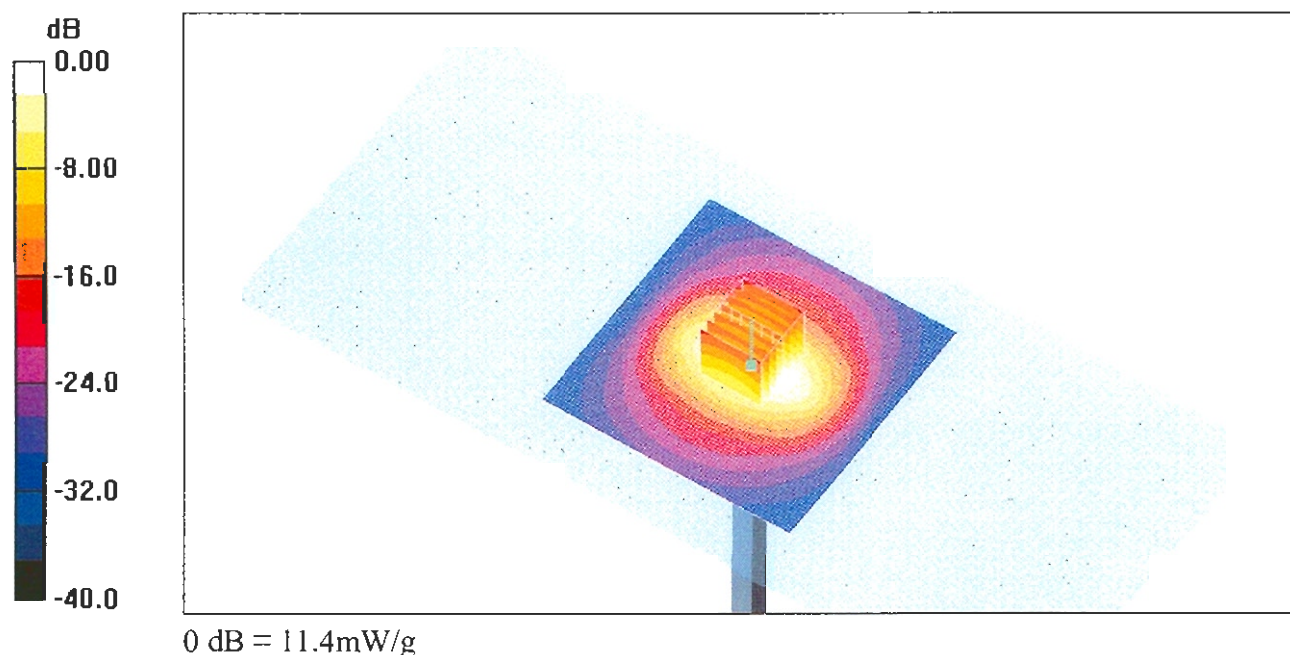
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 93.6 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 17.9 W/kg

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

Maximum value of SAR (measured) = 11.4 mW/g



Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN5d013

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

Medium: Muscle 1900 MHz;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.57, 4.57, 4.57); Calibrated: 1/23/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn903; Calibrated: 2/19/2004
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006;
- Measurement SW: DASY4, V4.3 Build 8; Postprocessing SW: SEMCAD, V1.8 Build 117

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.0 mW/g

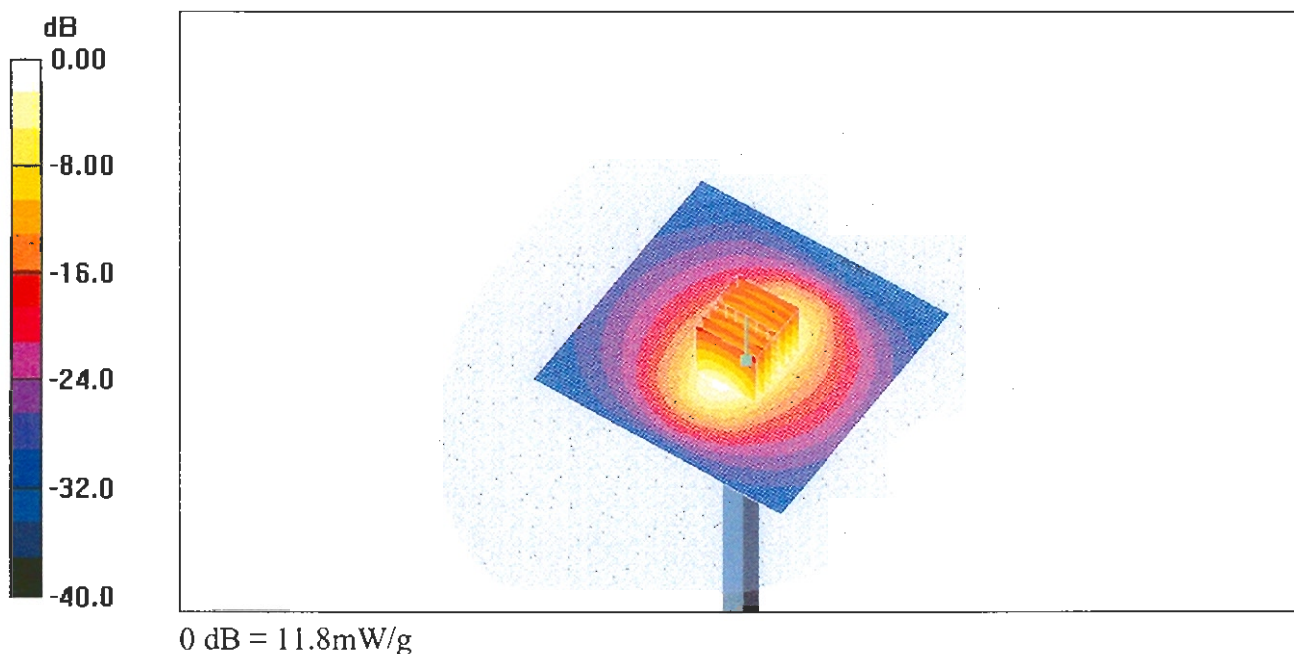
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 82.5 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 18.9 W/kg

SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.41 mW/g

Maximum value of SAR (measured) = 11.8 mW/g





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 Oulu 2**

Certificate No: **D1900V2-5d030_Feb05**

CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d030**

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

Calibration date: **February 18, 2005**

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 E442	GB37480704	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Power sensor HP 8481A	US37292783	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Reference 20 dB Attenuator	SN: 5086 (20g)	10-Aug-04 (METAS, No 251-00402)	Aug-05
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-04 (METAS, No 251-00402)	Aug-05
Reference Probe ET3DV6	SN 1507	26-Oct-04 (SPEAG, No. ET3-1507_Oct04)	Oct-05
DAE4	SN 601	07-Jan-05 (SPEAG, No. DAE4-601_Jan05)	Jan-06

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-03)	In house check: Oct-05
RF generator R&S SML-03	100698	27-Mar-02 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov 05

Calibrated by:

Name	Function	Signature
Mike Meili	Laboratory Technician	

Approved by:

Katja Pokovic	Technical Manager	
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Issued: February 25, 2005

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

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d030

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

Medium: HSL 1800 MHz;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.46$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.96, 4.96, 4.96); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 5.0; Type: QD000P50AA; Serial: 1001;
- Measurement SW: DASY4, V4.5 Build 11; Postprocessing SW: SEMCAD, V1.8 Build 144

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.2 mW/g

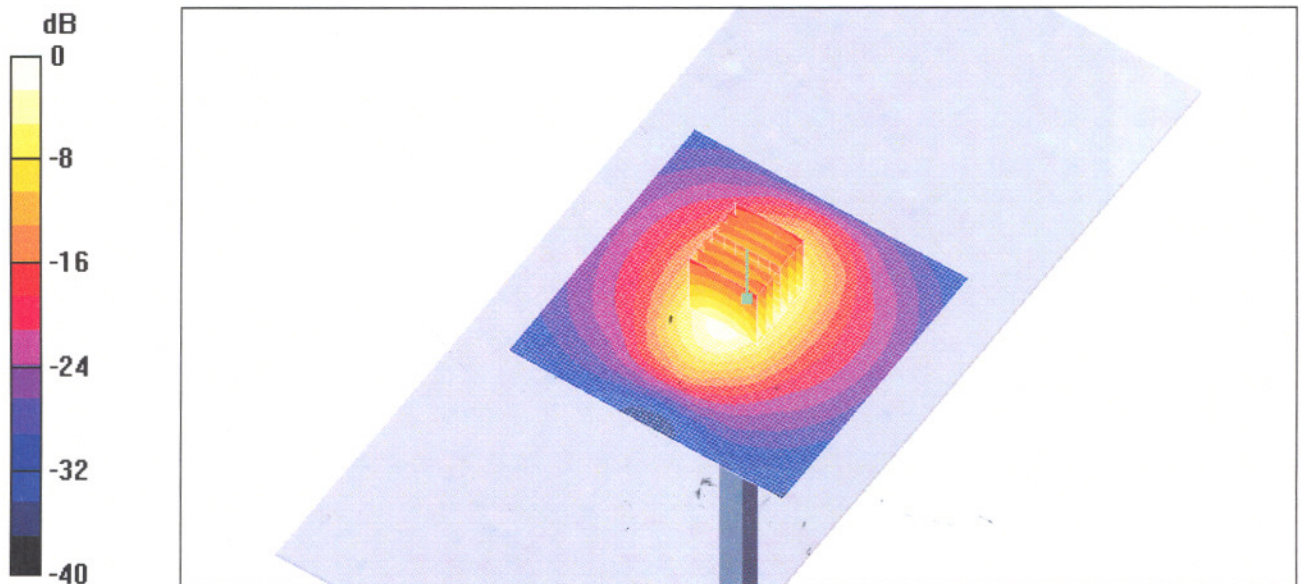
Pin = 250 mW; d = 10 mm/Zoom Scan 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 88.4 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 17.1 W/kg

SAR(1 g) = 9.76 mW/g; SAR(10 g) = 5.09 mW/g

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



0 dB = 11.1 mW/g

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d030

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

Medium: Muscle 1800 MHz;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.57$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.43, 4.43, 4.43); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 5.0; Type: QD000P50AA; Serial: 1001;
- Measurement SW: DASY4, V4.5 Build 13; Postprocessing SW: SEMCAD, V1.8 Build 142

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm

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

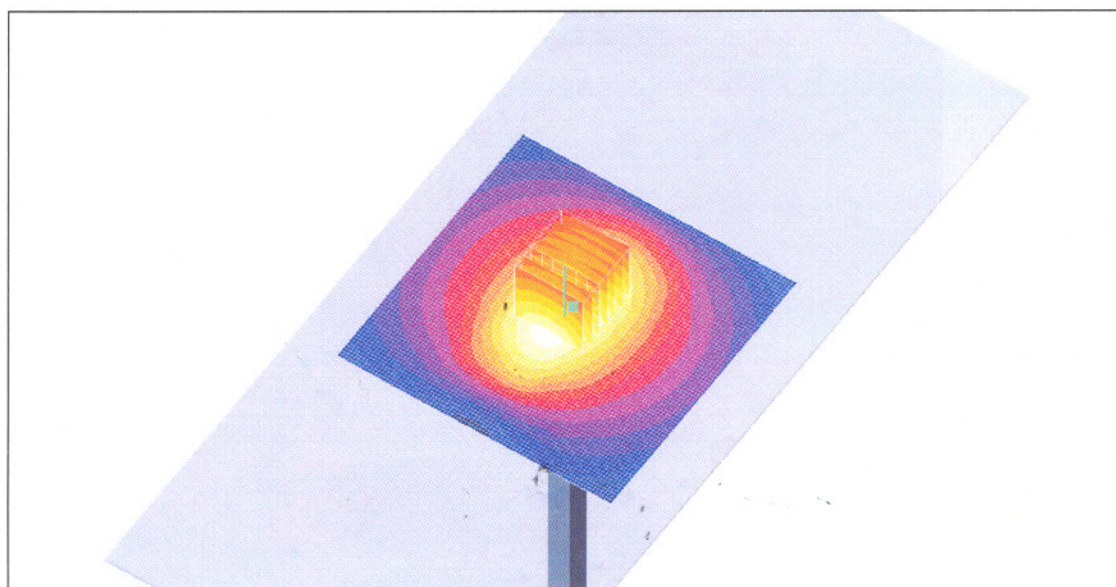
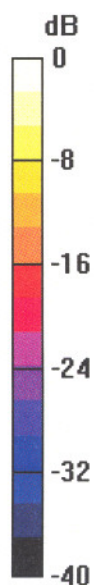
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.4 V/m; Power Drift = 0.0 dB

Peak SAR (extrapolated) = 16.7 W/kg

SAR(1 g) = 9.94 mW/g; SAR(10 g) = 5.3 mW/g

Maximum value of SAR (measured) = 11.2 mW/g



0 dB = 11.2 mW/g