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T117 (EN ISO/IEC 17025)

SAR Compliance Test Report

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Measurements made by:	Lili Nie		
Tested device:	RM-25		
FCC ID:	QTKRM-25	IC:	661AD-RM25
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 Copenhagen.

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: July 12, 2004

For the contents:

Leif Funch Klysner
Test Engineer

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CONTENTS

1. SUMMARY OF SAR TEST REPORT 3

1.1 TEST DETAILS 3
1.2 MAXIMUM RESULTS 3
1.2.1 Head Configuration 3
1.2.2 Body Worn Configuration 3
1.2.3 Maximum Drift 3
1.2.4 Measurement Uncertainty 4

2. DESCRIPTION OF THE DEVICE UNDER TEST 4

2.1 PICTURE OF THE DEVICE 4
2.2 DESCRIPTION OF THE ANTENNA 5

3. TEST CONDITIONS 5

3.1 TEMPERATURE AND HUMIDITY 5
3.2 TEST SIGNAL, FREQUENCIES, AND OUTPUT POWER 5

4. DESCRIPTION OF THE TEST EQUIPMENT 5

4.1 MEASUREMENT SYSTEM AND COMPONENTS 5
4.1.1 Isotropic E-field Probe 1395 6
4.2 PHANTOMS 7
4.3 SIMULATING LIQUIDS 7
4.3.1 Liquid Recipes 8
4.3.2 Verification of the System 9
4.3.3 Tissue Simulants used in the Measurements 10

5. DESCRIPTION OF THE TEST PROCEDURE 11

5.1 DEVICE HOLDER 11
5.2 TEST POSITIONS 12
5.2.1 Against Phantom Head 12
5.2.2 Body Worn Configuration 12
5.3 SCAN PROCEDURES 13
5.4 SAR AVERAGING METHODS 13

6. MEASUREMENT UNCERTAINTY 14

7. RESULTS 15

APPENDIX A: VALIDATION SCANS 17

APPENDIX B: MEASUREMENT SCANS 18

APPENDIX C: RELEVANT PAGES FROM PROBE CALIBRATION REPORT(S) 19

APPENDIX D: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S) 20

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	June 18, 2004 – June 28, 2004
SN, HW and SW numbers of tested device	IMEI: 004400/48/16968/1 HW: 0313 SW: 2.0419.50 DUT#234154
Batteries used in testing	BL-4C, DUT#234158, DUT#234159, DUT#234160
Headsets used in testing	HDS-3, DUT#234175
Other accessories used in testing	MMC Card, DUT#233526
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)	EIRP	Position	SAR limit (1g avg)	Measured SAR value (1g avg)	Result
GPRS1900	810 / 1909.8	25.7 dBm	Left, Tilt Closed mode	1.6 W/kg	0.77 W/kg	PASSED

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

1.2.2 Body Worn Configuration

Mode	Ch / *f* (MHz)	EIRP	Separation distance	SAR limit (1g avg)	Measured SAR value (1g avg)	Result
GPRS1900	810 / 1909.8	25.7 dBm	2.2 cm	1.6 W/kg	0.57 W/kg	PASSED

1.2.3 Maximum Drift

Maximum drift during measurements	-0.34 dB

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1.2.4 Measurement Uncertainty

Extended Uncertainty (k=2) 95%	± 29.1 %

2. DESCRIPTION OF THE DEVICE UNDER TEST

Device category	Portable
Exposure environment	General population

Modes and Bands of Operation	GSM 1900	GPRS (GSM)	BT
Modulation Mode	GMSK	GMSK	GFSK
Duty Cycle	1/8	1/8 or 2/8	
Transmitter Frequency Range (MHz)	1850.2 - 1909.8	1850.2 - 1909.8	2400.0 – 2483.5

Outside of USA and Canada, the transmitter of the device is capable of operating also in GSM900/GSM1800, which are not part of this filing.

2.1 Picture of the Device

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2.2 Description of the Antenna

The device has an internal PIFA antenna.

3. TEST CONDITIONS

3.1 Temperature and Humidity

Period of measurement: (dd.mm.yyyy)	18.06.2004 – 28.06.2004
Ambient temperature (°C):	22 ±1
Ambient humidity (RH %):	45 ±10

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 power output 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, DASY 4 software version 4.2, manufactured by Schmid & Partner Engineering AG (SPEAG) in Switzerland. The SAR extrapolation algorithm used in all measurements on the device was the 'worst-case extrapolation' algorithm.

The following table lists calibration dates of SPEAG components:

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Test Equipment	Serial Number	Calibration interval	Calibration expiry
DAE3	501	12 months	01/2005
DAE3	573	12 months	07/2004
E-field Probe ET3DV6R	1395	12 months	08/2004
Dipole Validation Kit, D1900V2	5d026	24 months	02/2005

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration interval	Calibration expiry
Signal Generator	SMIQ03B	826046/034	36 months	02/2007
Amplifier	ZHL-42W	E012903	-	-
Power Meter	NRVD	840297/008	24 months	11/2005
Power Sensor	NRV-Z51	100184	24 months	11/2005
Call Tester	4400M	0411216	-	-
Vector Network Analyzer	AT8753ES	MY40001091	12 months	09/2004
Dielectric Probe Kit	HP85070B	US33020403	-	-

4.1.1 Isotropic E-field Probe 1395

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 µW/g to > 100 mW/g; Linearity: ± 0.2 dB

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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 validation testing and device testing, was the twin-headed "SAM Phantom", manufactured by SPEAG. The phantom conforms to the requirements of IEEE 1528 - 2003.

Validation tests were 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 Simulating Liquids

Recommended values for the dielectric parameters of the simulating liquids are given in IEEE 1528 - 2003 and FCC Supplement C to OET Bulletin 65. All tests were carried out using liquids whose dielectric parameters were within ± 5% of the recommended values. All tests were carried out within 24 hours of measuring the dielectric parameters.

The depth of the liquid was 15.0 ± 0.5 cm measured from the ear reference point during validation and device measurements.

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4.3.1 Liquid Recipes

The following recipes were used for Head and Body liquids:

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

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4.3.2 Verification of the System

The manufacturer calibrates the probes annually. Dielectric parameters of the simulating liquids were measured every day using the dielectric probe kit and the network analyser. A SAR measurement was made following the determination of the dielectric parameters of the liquids, 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 validation results (dielectric parameters and SAR values) are given in the table below.

System verification, head tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ε_r	σ [S/m]	
1900	Reference result	10.4	38.6	1.46	N/A
	± 10% window	9.4 – 11.4			
	June 18, 2004	9.9	38.5	1.49	22 ±1
	June 21, 2004	10.1	38.7	1.49	22 ±1
	June 23, 2004	9.80	38.4	1.49	22 ±1
	June 25, 2004	9.87	38.0	1.48	22 ±1

System verification, body tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ε_r	σ [S/m]	
1900	Reference result	10.6	51.2	1.59	N/A
	± 10% window	9.5 – 11.7			
	June 25, 2004	9.73	51.4	1.59	22 ±1
	June 28, 2004	9.66	51.2	1.58	22 ±1

Plots of the Verification scans are given in Appendix A.

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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	N/A
	± 5% window	38.0 – 42.0	1.33 – 1.47	
	June 18, 2004	38.6	1.47	22 ±1
	June 21, 2004	38.7	1.46	22 ±1
	June 23, 2004	38.4	1.46	22 ±1
	June 25, 2004	38.1	1.45	22 ±1

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ε_r	σ [S/m]	
1880	Recommended value	53.3	1.52	N/A
	± 5% window	50.6 – 56.0	1.44 – 1.60	
	June 25, 2004	51.5	1.56	22 ±1
	June 28, 2004	51.3	1.55	22 ±1

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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

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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”.

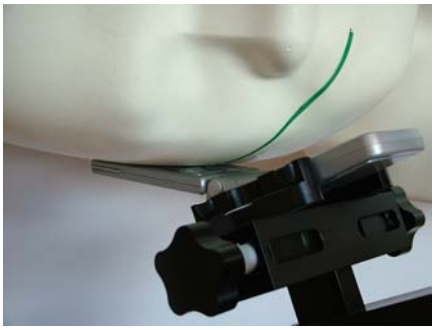

Photo of the device in “cheek” position – Open Mode

Photo of the device in “tilt” position - Open Mode

Photo of the device in “cheek” position – Closed Mode

Photo of the device in “tilt” position – Closed Mode

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 gave higher results.

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

5.3 Scan Procedures

First coarse scans were used for determination of the field distribution. Next a cube scan, 7x7x7 points covering a volume of 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 coarse scan and again at the end of the cube 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 cube 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 cube scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

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6. MEASUREMENT UNCERTAINTY

Table 6.1 – Measurement uncertainty evaluation

Uncertainty Component	Section in IEEE 1528	Tol. (%)	Prob Dist	Div	c_i	$c_i . u_i$ (%)	v_i
Measurement System							
Probe Calibration	E2.1	±4.8	N	1	1	±4.8	∞
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	±8.3	R	√3	1	±4.8	∞
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	E5.2	±3.9	R	√3	1	±2.3	∞
Test sample Related							
Test Sample Positioning	E4.2.1	±6.0	N	1	1	±6.0	11
Device Holder Uncertainty	E4.1.1	±5.0	N	1	1	±5.0	7
Output Power Variation - SAR drift measurement	6.6.3	±10.0	R	√3	1	±5.8	∞
Phantom and Tissue Parameters							
Phantom Uncertainty (shape and thickness tolerances)	E3.1	±4.0	R	√3	1	±2.3	∞
Liquid Conductivity Target - tolerance	E3.2	±5.0	R	√3	0.64	±1.8	∞
Liquid Conductivity - measurement uncertainty	E3.3	±5.5	N	1	0.64	±3.5	5
Liquid Permittivity Target tolerance	E3.2	±5.0	R	√3	0.6	±1.7	∞
Liquid Permittivity - measurement uncertainty	E3.3	±2.9	N	1	0.6	±1.7	5
Combined Standard Uncertainty			RSS			**±14.5**	187
Coverage Factor for 95%			**k=2**				
Expanded Standard Uncertainty						**±29.1**	

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7. RESULTS

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

GSM1900 Head SAR results

Open/Closed Mode	Position		SAR, averaged over 1g (W/kg)		
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
Open	Power level		27.0 dBm	27.1 dBm	25.7 dBm
	Left	Cheek		0.10 *	
		Tilt		0.04	
	Right	Cheek		0.09	
		Tilt		0.03	
Closed	Left	Cheek		0.26	
		Tilt	0.39	0.40	**0.42**
	Right	Cheek		0.29	
		Tilt		0.39	
Closed	Highest SAR Configuration repeated with MMC Card		0.34	0.38	0.41
Closed	Highest SAR value measurement in this band repeated with BT active				**0.43**
Closed	Highest SAR value measurement in this band repeated in GPRS mode 2/8				**0.77**

*) Open/Left/Cheek and Open/Right/Cheek results are not accurate due to limited scan area. SAR distribution of Open/Left/Cheek configuration is presented in an additional plot. The SAR distribution study was carried out with expired liquid parameter / system validation results and SAR value of that scan is not presented in the SAR results table. The Open/Left/Cheek SAR scan is the best presentation of SAR distribution we were able to create due to limitations of Dasy4 to go further to chin area.

It is evident from the actual scans and SAR distribution study, that max SAR of the device is presented in the table and conclusion of compliance can be based on that result.

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

GPRS1900 Body SAR results

Body-worn location setup	SAR, averaged over 1g (W/kg)		
	Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
Power level	27.0 dBm	27.1 dBm	25.7 dBm
Without headset	0.47	0.56	**0.57**
Headset HDS-3	0.48	0.55	0.49
Highest SAR Configuration repeated with MMC Card	0.47	0.49	0.51
Highest SAR value measurement in this mode repeated with BT active	-	-	0.51

Plots of the Measurement scans are given in Appendix B.

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APPENDIX A: VALIDATION SCANS

See the following pages.

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Date/Time: 06/18/04 13:42:56

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DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026

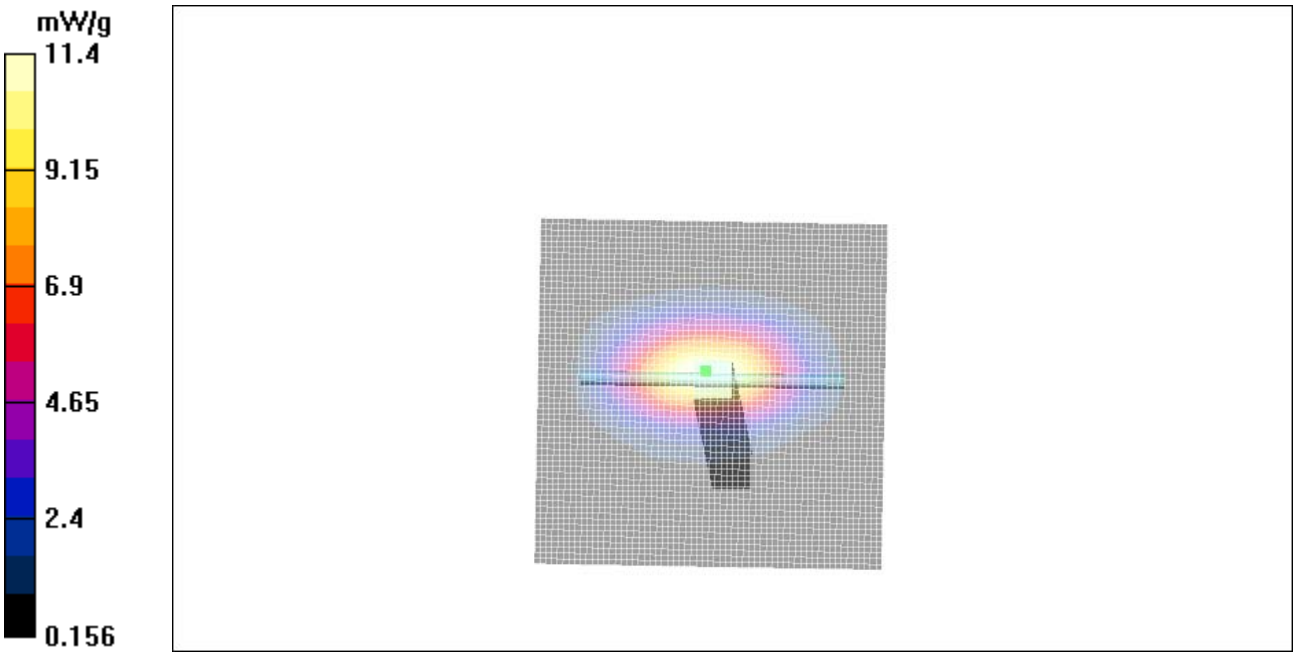
Communication System: Continuous Wave; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: Head 1900 Medium parameters used: f = 1900 MHz; σ = 1.49 mho/m; ε_r = 38.5; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 02.07.2003
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 109

d=10mm, Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 91.5 V/m; Power Drift = 0.0 dB
Maximum value of SAR (interpolated) = 11.5 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.5 V/m; Power Drift = 0.0 dB
Maximum value of SAR (measured) = 11.4 mW/g
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 9.9 mW/g; SAR(10 g) = 5.1 mW/g


mW/g
11.4
9.15
6.9
4.65
2.4
0.156

Date/Time: 06/21/04 13:47:44

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DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026

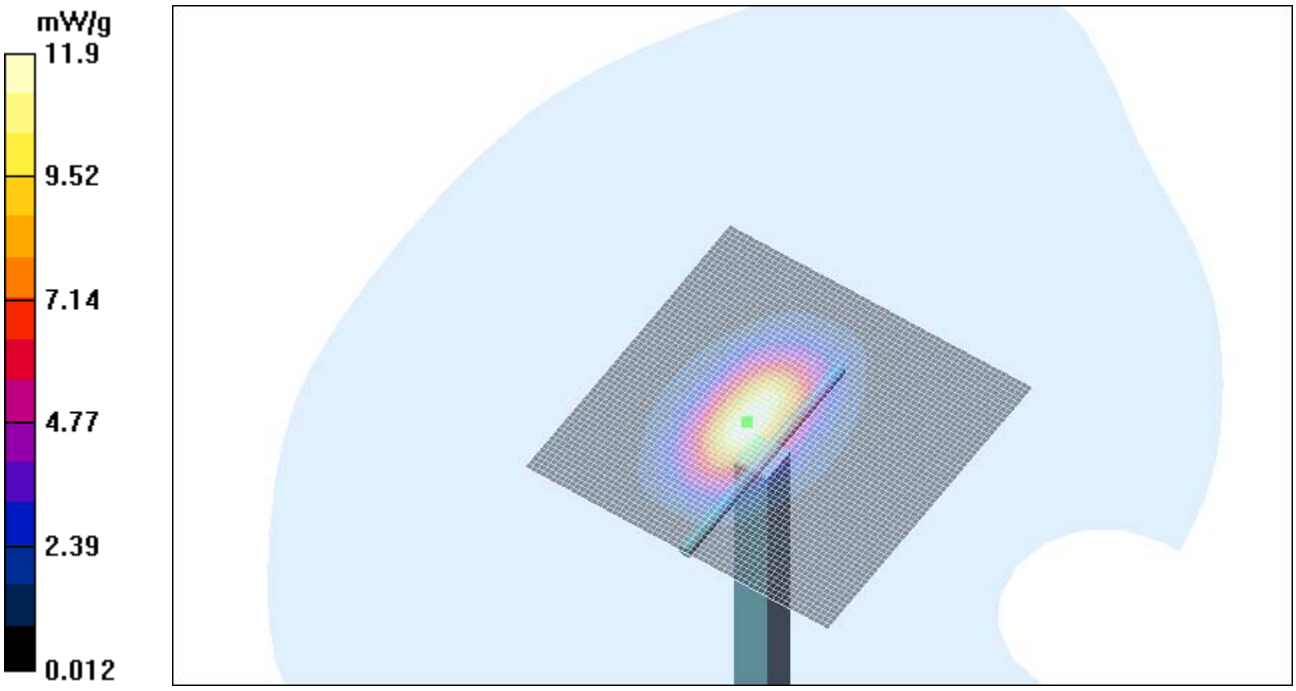
Communication System: Continuous Wave; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: Head 1900 Medium parameters used: f = 1900 MHz; σ = 1.49 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 02.07.2003
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

d=10mm, Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 91.9 V/m; Power Drift = 0.008 dB
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 = 91.9 V/m; Power Drift = 0.008 dB
Maximum value of SAR (measured) = 11.3 mW/g
Peak SAR (extrapolated) = 18.3 W/kg
SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.18 mW/g


mW/g
11.9
9.52
7.14
4.77
2.39
0.012

Date/Time: 06/23/04 10:24:53

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DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026

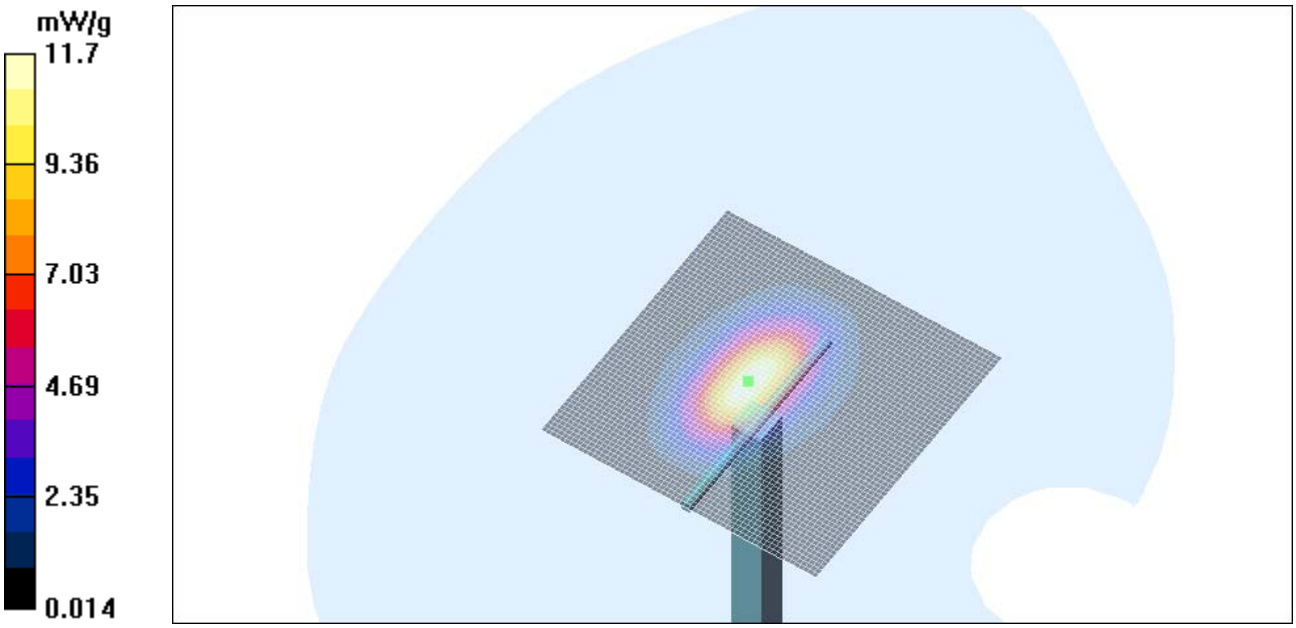
Communication System: Continuous Wave; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: Head 1900 Medium parameters used: f = 1900 MHz; σ = 1.49 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 15.01.2004
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 109

d=10mm, Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 91.2 V/m; Power Drift = 0.0 dB
Maximum value of SAR (interpolated) = 11.7 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.2 V/m; Power Drift = 0.0 dB
Maximum value of SAR (measured) = 11 mW/g
Peak SAR (extrapolated) = 17.3 W/kg
SAR(1 g) = 9.8 mW/g; SAR(10 g) = 5.1 mW/g


mW/g
11.7
9.36
7.03
4.69
2.35
0.014

Date/Time: 06/25/04 08:47:17

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DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026

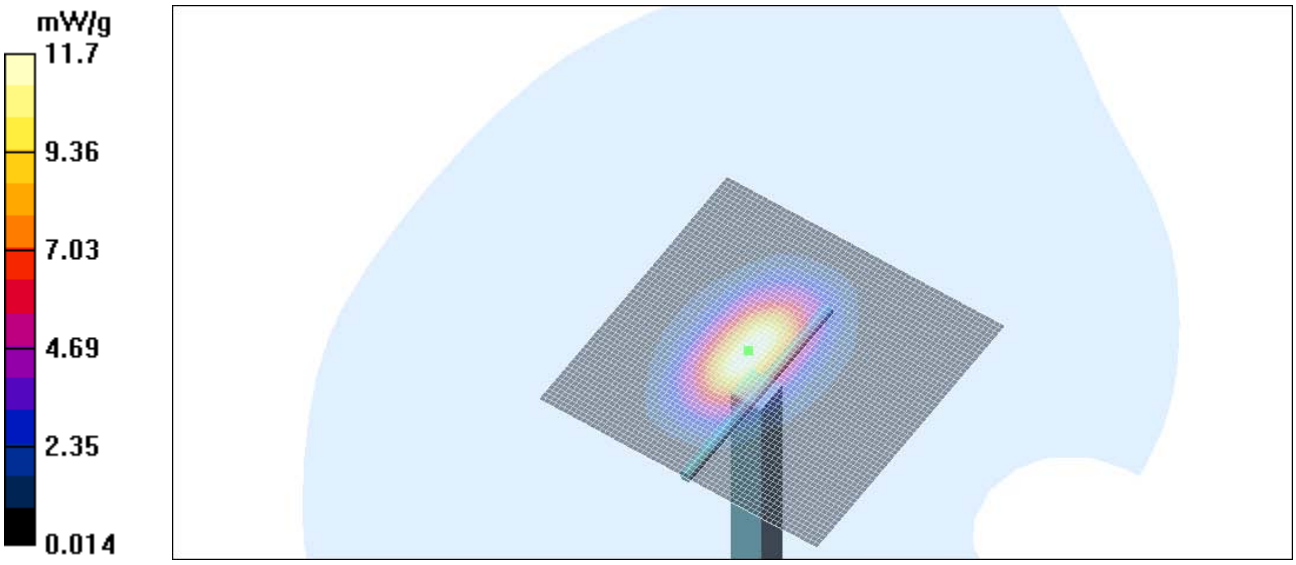
Communication System: Continuous Wave; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: Head 1900 Medium parameters used: f = 1900 MHz; σ = 1.48 mho/m; ε_r = 38; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 15.01.2004
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 109

d=10mm, Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 91.7 V/m; Power Drift = 0.0 dB
Maximum value of SAR (interpolated) = 11.7 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.7 V/m; Power Drift = 0.0 dB
Maximum value of SAR (measured) = 11.1 mW/g
Peak SAR (extrapolated) = 17.6 W/kg
SAR(1 g) = 9.87 mW/g; SAR(10 g) = 5.11 mW/g


mW/g
11.7
9.36
7.03
4.69
2.35
0.014

Date/Time: 06/25/04 13:48:35

TCC

Copenhagen

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026

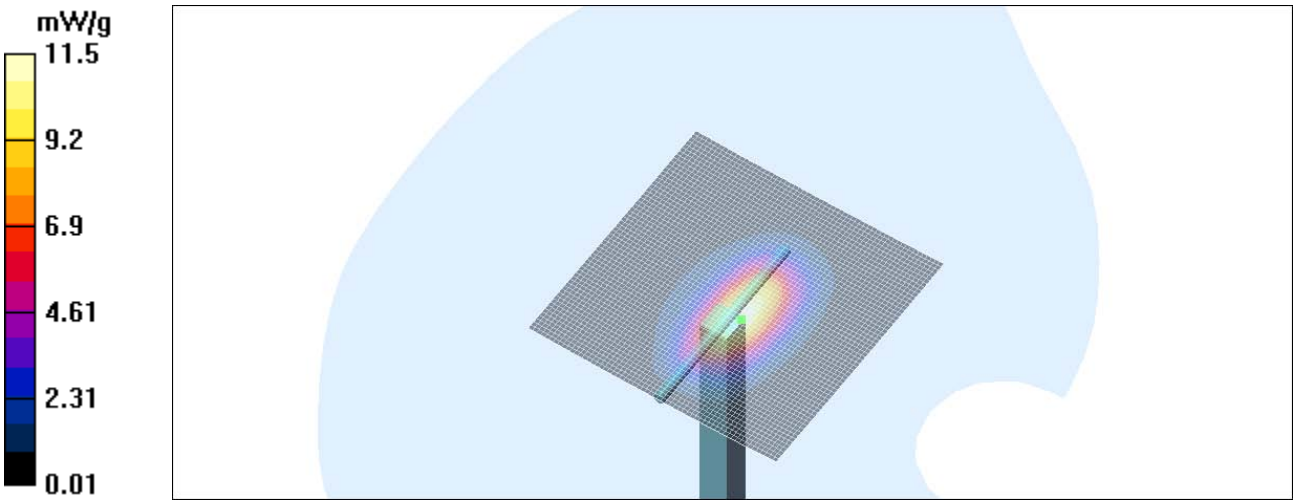
Communication System: Continuous Wave; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: Body 1900 Medium parameters used: f = 1900 MHz; σ = 1.59 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395; ConvF(4.9, 4.9, 4.9); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 15.01.2004
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1301
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 109

d=10mm, Pin=250mW/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 63.3 V/m; Power Drift = -0.006 dB
Maximum value of SAR (interpolated) = 11.5 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 63.3 V/m; Power Drift = -0.006 dB
Maximum value of SAR (measured) = 11 mW/g
Peak SAR (extrapolated) = 16.8 W/kg
SAR(1 g) = 9.73 mW/g; SAR(10 g) = 5.14 mW/g


mW/g
11.5
9.2
6.9
4.61
2.31
0.01

Date/Time: 06/28/04 08:18:19

TCC

Copenhagen

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026

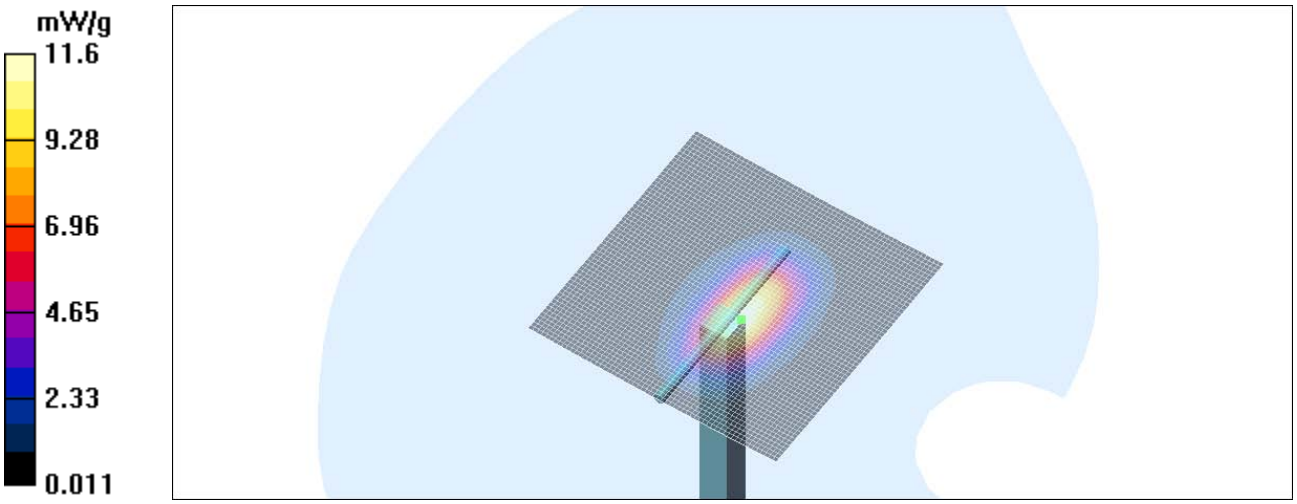
Communication System: Continuous Wave; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: Body 1900 Medium parameters used: f = 1900 MHz; σ = 1.58 mho/m; ε_r = 51.2; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395; ConvF(4.9, 4.9, 4.9); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 15.01.2004
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1301
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 109

d=10mm, Pin=250mW 2/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 60.4 V/m; Power Drift = 0.0 dB
Maximum value of SAR (interpolated) = 11.6 mW/g

d=10mm, Pin=250mW 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.4 V/m; Power Drift = 0.0 dB
Maximum value of SAR (measured) = 11 mW/g
Peak SAR (extrapolated) = 16.8 W/kg
SAR(1 g) = 9.66 mW/g; SAR(10 g) = 5.07 mW/g


mW/g
11.6
9.28
6.96
4.65
2.33
0.011

APPENDIX B: MEASUREMENT SCANS

See the following pages.

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Date/Time: 06/18/04 15:38:23

TCC

Copenhagen

DUT: 234154; Type: RM-25; Serial: 004400/48/16968/1

Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395 - WCE; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 02.07.2003
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 109

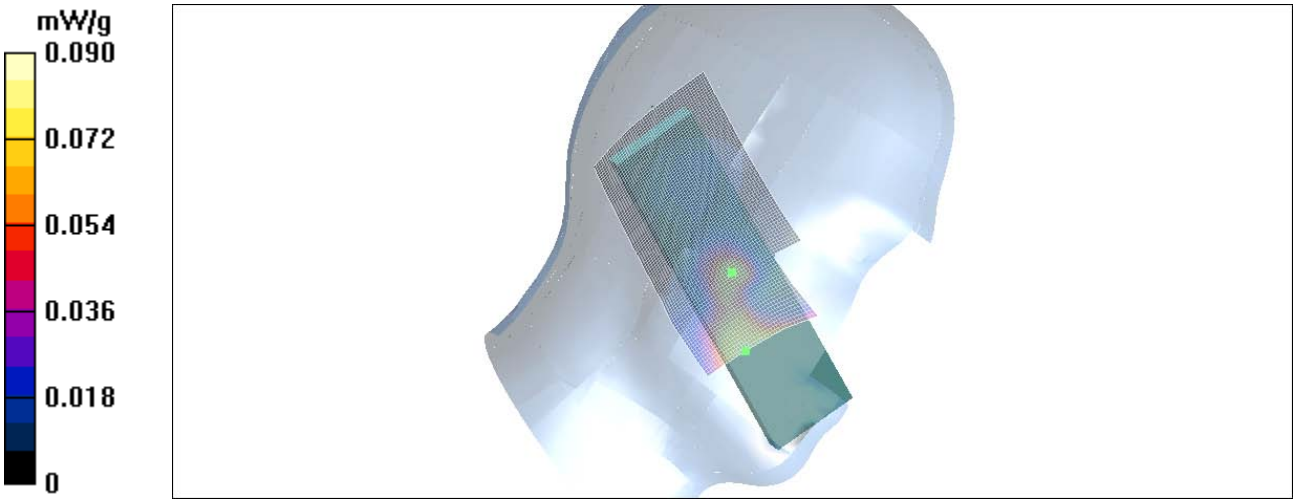
Touch position - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 2.67 V/m; Power Drift = -0.3 dB
Maximum value of SAR (interpolated) = 0.090 mW/g

Touch position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.67 V/m; Power Drift = -0.3 dB
Maximum value of SAR (measured) = 0.107 mW/g
Peak SAR (extrapolated) = 0.196 W/kg
SAR(1 g) = 0.102 mW/g; SAR(10 g) = 0.058 mW/g

Warning: Maximum averaged SAR over 1 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 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.

Touch position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.67 V/m; Power Drift = -0.3 dB
Maximum value of SAR (measured) = 0.089 mW/g
Peak SAR (extrapolated) = 0.174 W/kg
SAR(1 g) = 0.081 mW/g; SAR(10 g) = 0.037 mW/g



Date/Time: 06/18/04 15:38:23

TCC

Copenhagen

DUT: 234154; Type: RM-25; Serial: 004400/48/16968/1

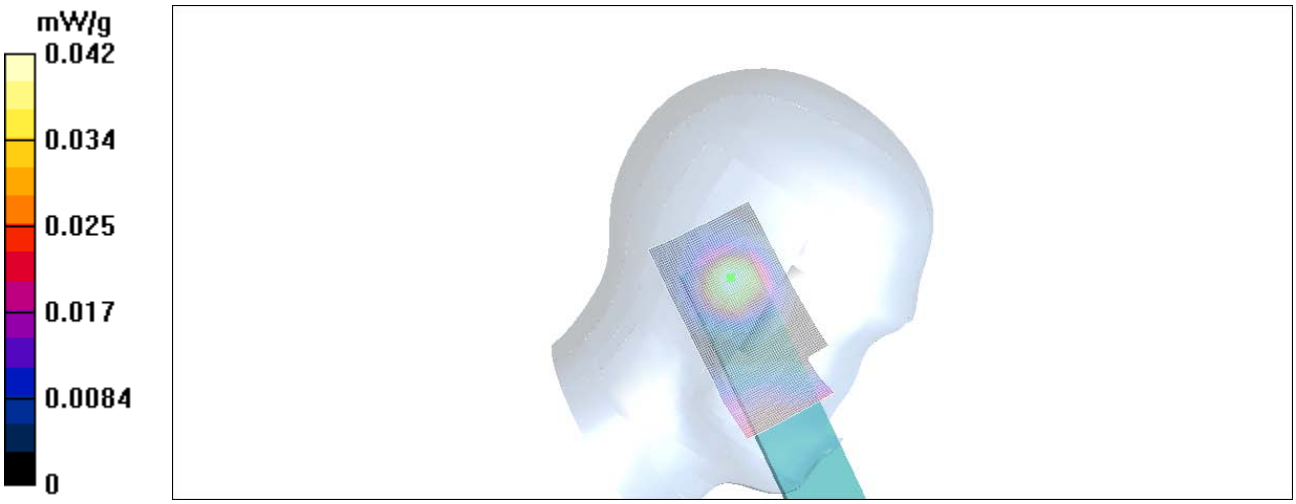
Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395 - WCE; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 02.07.2003
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 4.8 V/m; Power Drift = -0.3 dB
Maximum value of SAR (interpolated) = 0.042 mW/g

Tilt position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.8 V/m; Power Drift = -0.3 dB
Maximum value of SAR (measured) = 0.039 mW/g
Peak SAR (extrapolated) = 0.067 W/kg
SAR(1 g) = 0.037 mW/g; SAR(10 g) = 0.022 mW/g


mW/g
0.042
0.034
0.025
0.017
0.0084
0

Date/Time: 06/21/04 11:28:17

TCC

Copenhagen

DUT: 234154; Type: RM-25; Serial: 004400/48/16968/1

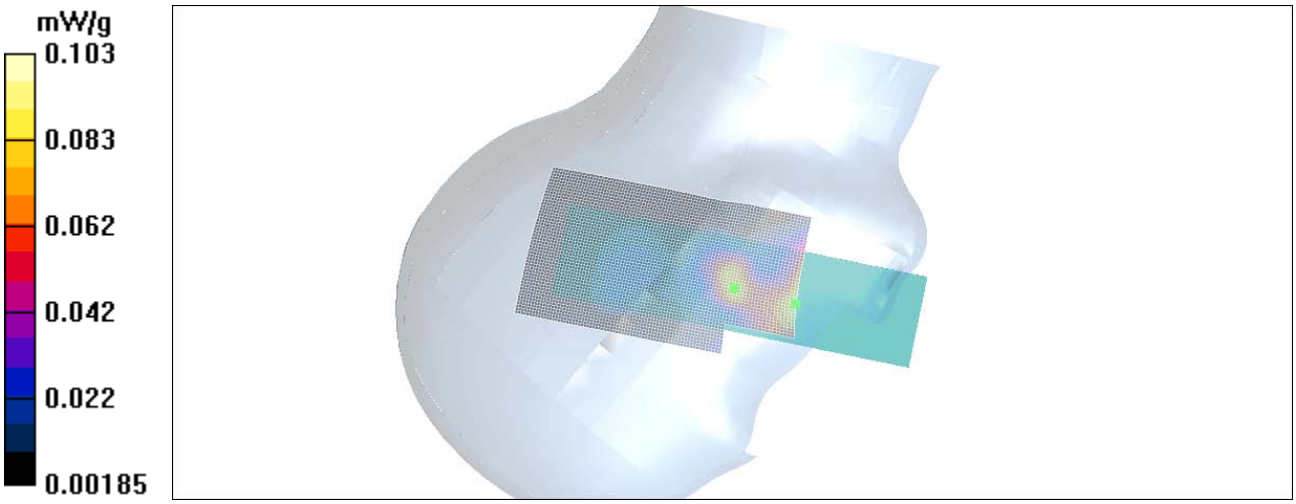
Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used: f = 1880 MHz; σ = 1.47 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395 - WCE; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 02.07.2003
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

Touch position - Middle 2/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 1.9 V/m; Power Drift = 0.1 dB
Maximum value of SAR (interpolated) = 0.091 mW/g

Touch position - Middle 2/Zoom Scan (7x7x7) (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.9 V/m; Power Drift = 0.1 dB
Maximum value of SAR (measured) = 0.103 mW/g
Peak SAR (extrapolated) = 0.220 W/kg
SAR(1 g) = 0.093 mW/g; SAR(10 g) = 0.043 mW/g


mW/g
0.103
0.083
0.062
0.042
0.022
0.00185

Date/Time: 06/21/04 11:28:38

TCC

Copenhagen

DUT: 234154; Type: RM-25; Serial: 004400/48/16968/1

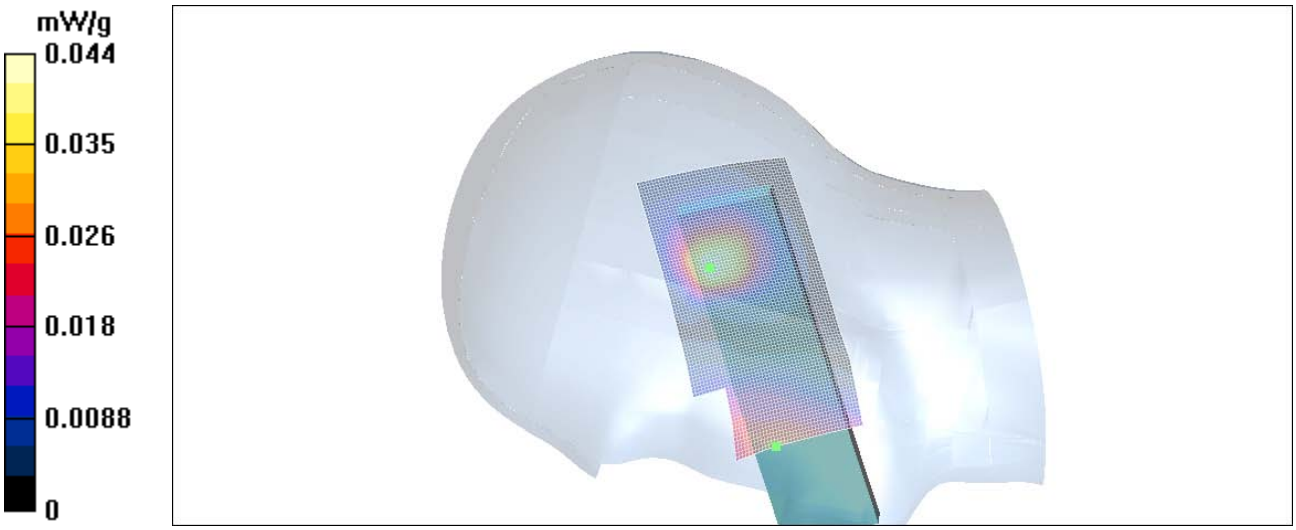
Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used: f = 1880 MHz; σ = 1.46 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395 - WCE; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 02.07.2003
- Phantom: SAM Low Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 3.88 V/m; Power Drift = -0.006 dB
Maximum value of SAR (interpolated) = 0.044 mW/g

Tilt position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.88 V/m; Power Drift = -0.006 dB
Maximum value of SAR (measured) = 0.037 mW/g
Peak SAR (extrapolated) = 0.067 W/kg
SAR(1 g) = 0.034 mW/g; SAR(10 g) = 0.020 mW/g


mW/g
0.044
0.035
0.026
0.018
0.0088
0

Date/Time: 07/12/04 13:04:57

TCC

Copenhagen

DUT: 234154; Type: RM-25; Serial: 004400/48/16968/1

Plot of SAR Distribution study.

Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.4 mho/m; ε_r = 38.8; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1786; ConvF(5.2, 5.2, 5.2); Calibrated: 30.07.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 15.01.2004
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1301
- Measurement SW: DASY4, V4.2 Build 44; Postprocessing SW: SEMCAD, V1.8 Build 109

Touch position - Low/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 3.22 V/m; Power Drift = -0.01 dB
Maximum value of SAR (interpolated) = 0.128 mW/g

Info: Interpolated medium parameters used for SAR evaluation!

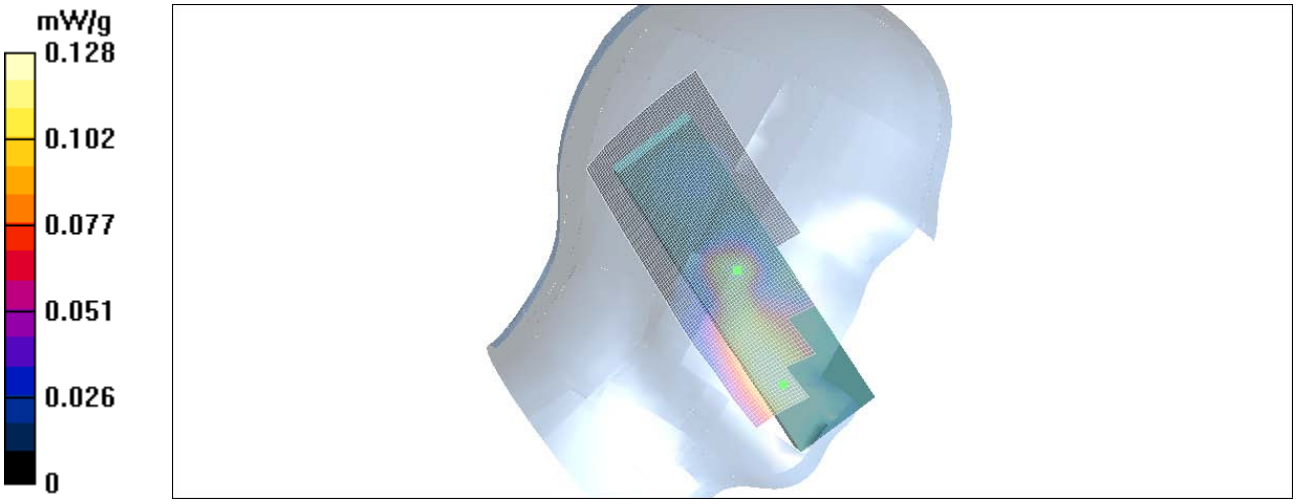
Touch position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.22 V/m; Power Drift = -0.01 dB
Maximum value of SAR (measured) = 0.131 mW/g
Peak SAR (extrapolated) = 0.239 W/kg
SAR(1 g) = 0.129 mW/g; SAR(10 g) = 0.077 mW/g

Info: Interpolated medium parameters used for SAR evaluation!

Touch position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 3.22 V/m; Power Drift = -0.01 dB
Maximum value of SAR (measured) = 0.152 mW/g
Peak SAR (extrapolated) = 0.319 W/kg
SAR(1 g) = 0.139 mW/g; SAR(10 g) = 0.067 mW/g

Info: Interpolated medium parameters used for SAR evaluation!



Date/Time: 06/23/04 20:59:57

TCC

Copenhagen

DUT: 234154; Type: RM-25; Serial: 004400/48/16968/1

Communication System: DCS 1900; Frequency: 1850.2 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.44 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Left Section

DASY4 Configuration:

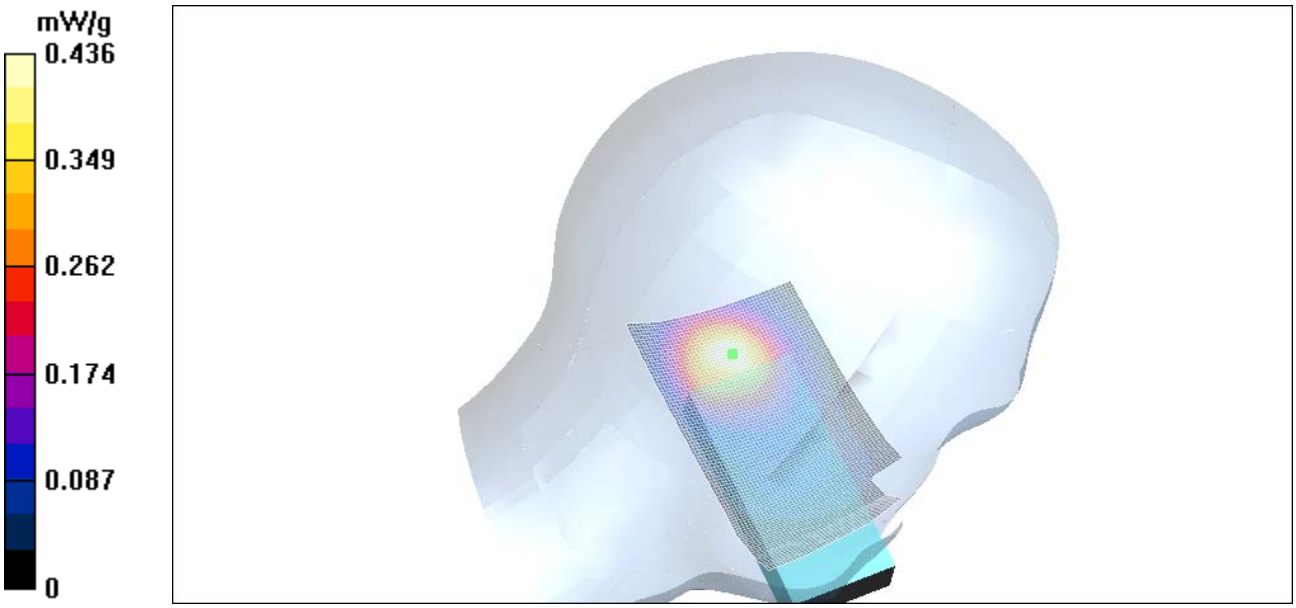
- Probe: ET3DV6 - SN1395 - WCE; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 15.01.2004
- Phantom: SAM **High** Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - Low/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 16.2 V/m; Power Drift = -0.1 dB
Maximum value of SAR (interpolated) = 0.436 mW/g

Info: Interpolated medium parameters used for SAR evaluation!

Tilt position - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.2 V/m; Power Drift = -0.1 dB
Maximum value of SAR (measured) = 0.404 mW/g
Peak SAR (extrapolated) = 0.699 W/kg
SAR(1 g) = 0.385 mW/g; SAR(10 g) = 0.230 mW/g

Info: Interpolated medium parameters used for SAR evaluation!


mW/g
0.436
0.349
0.262
0.174
0.087
0

Date/Time: 06/21/04 15:01:30

TCC

Copenhagen

DUT: 234154; Type: RM-25; Serial: 004400/48/16968/1

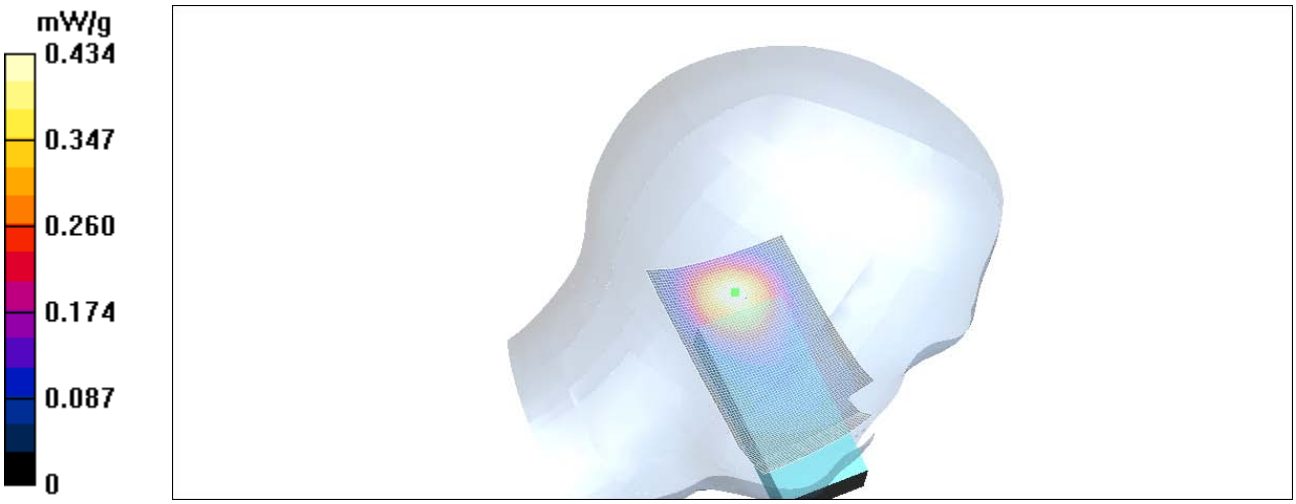
Communication System: DCS 1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used: f = 1880 MHz; σ = 1.46 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Left Section

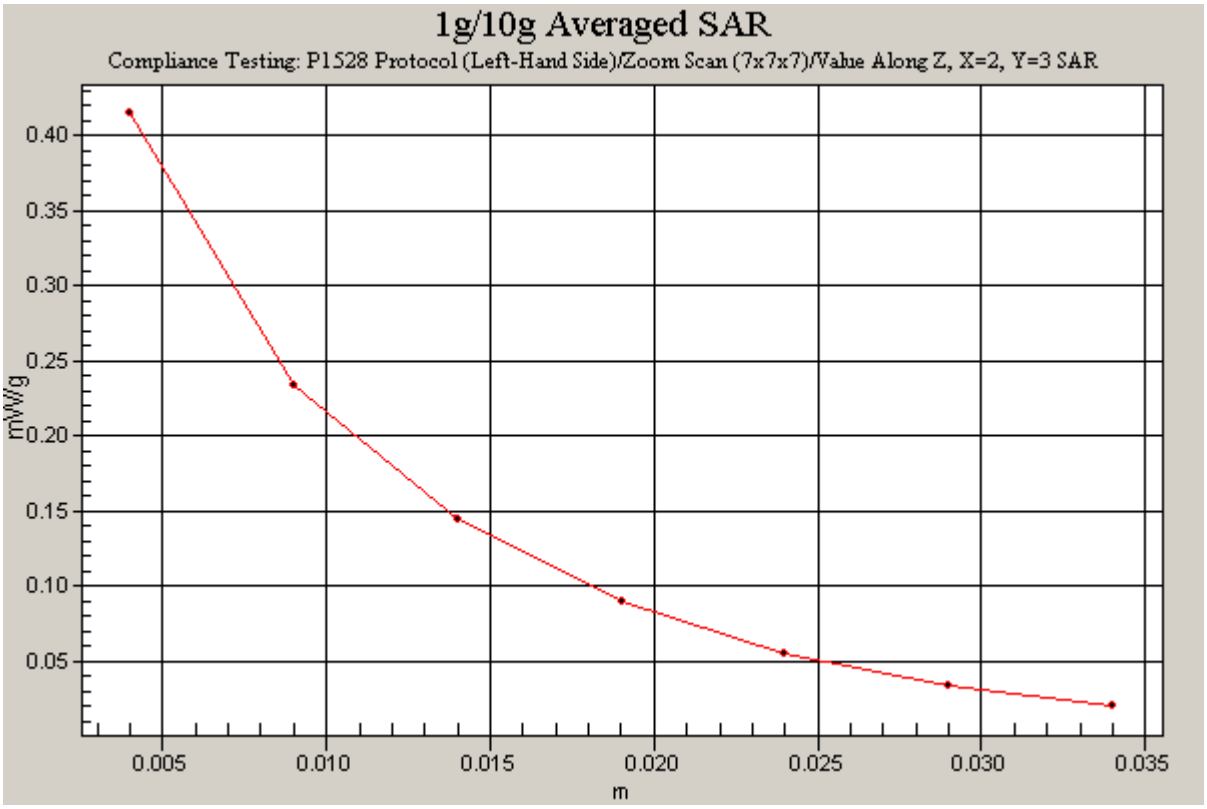
DASY4 Configuration:

- Probe: ET3DV6 - SN1395 - WCE; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 02.07.2003
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 16.1 V/m; Power Drift = 0.0 dB
Maximum value of SAR (interpolated) = 0.434 mW/g

Tilt position - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.1 V/m; Power Drift = 0.0 dB
Maximum value of SAR (measured) = 0.414 mW/g
Peak SAR (extrapolated) = 0.737 W/kg
SAR(1 g) = 0.395 mW/g; SAR(10 g) = 0.234 mW/g


mW/g
0.434
0.347
0.260
0.174
0.087
0


1g/10g Averaged SAR
Compliance Testing: P1528 Protocol (Left-Hand Side)/Zoom Scan (7x7x7)/Value Along Z, X=2, Y=3 SAR
mW/g
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

Date/Time: 06/23/04 20:59:57

TCC

Copenhagen

DUT: 234154; Type: RM-25; Serial: 004400/48/16968/1

Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used (interpolated): f = 1909.8 MHz; σ = 1.5 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Left Section

DASY4 Configuration:

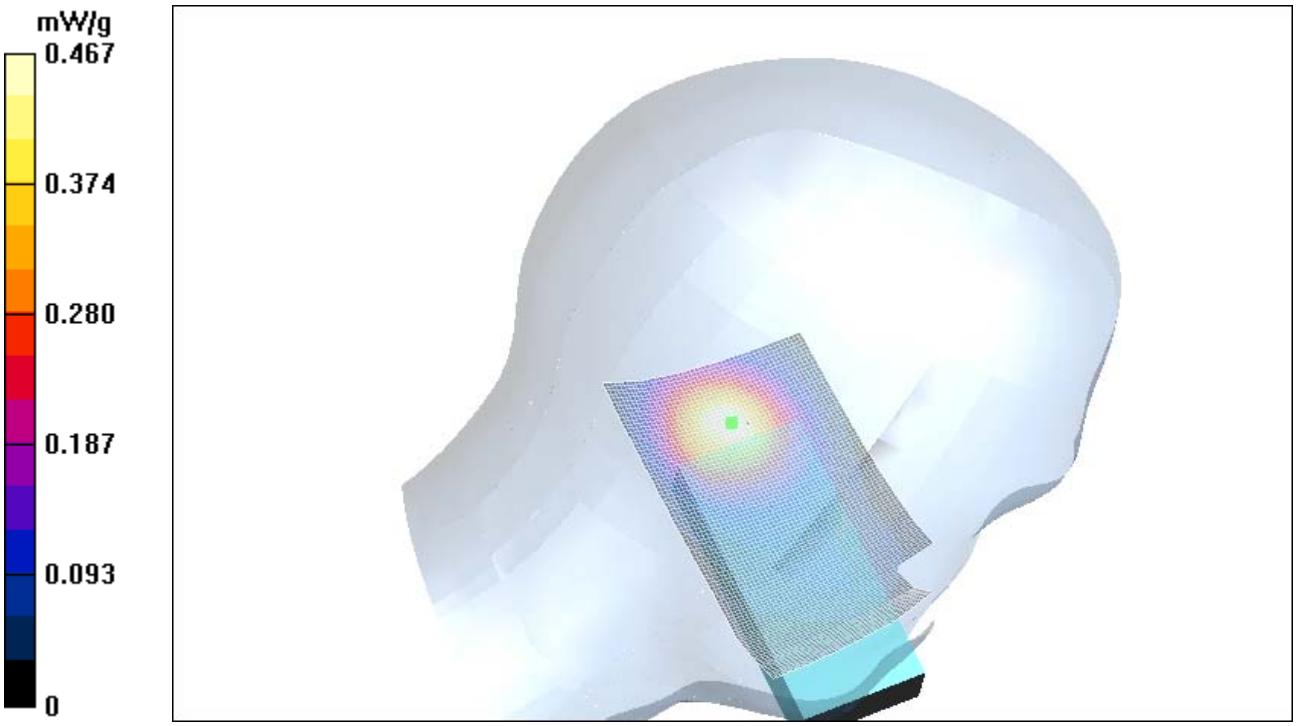
- Probe: ET3DV6 - SN1395 - WCE; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 15.01.2004
- Phantom: SAM **High** Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

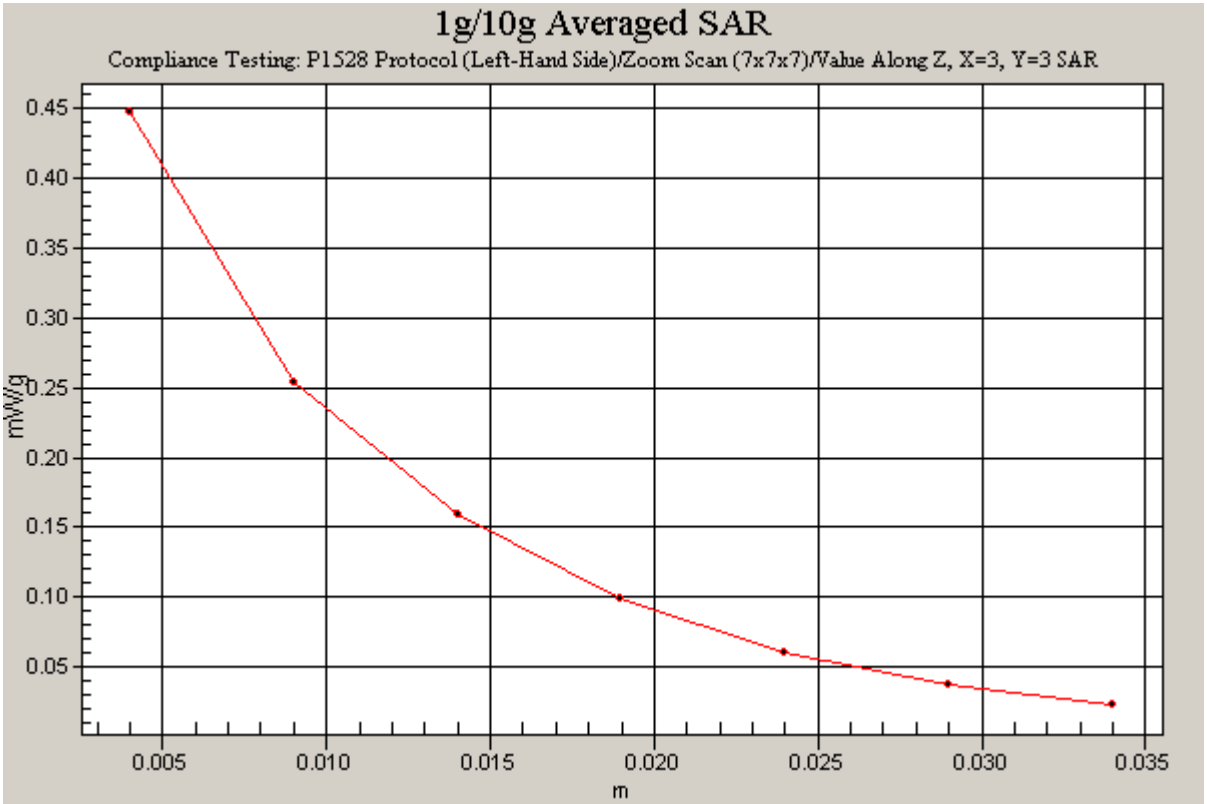
Tilt position - High/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 16.7 V/m; Power Drift = -0.1 dB
Maximum value of SAR (interpolated) = 0.467 mW/g

Info: Interpolated medium parameters used for SAR evaluation!

Tilt position - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.7 V/m; Power Drift = -0.1 dB
Maximum value of SAR (measured) = 0.447 mW/g
Peak SAR (extrapolated) = 0.804 W/kg
SAR(1 g) = 0.424 mW/g; SAR(10 g) = 0.247 mW/g

Info: Interpolated medium parameters used for SAR evaluation!


mW/g
0.467
0.374
0.280
0.187
0.093
0


1g/10g Averaged SAR
Compliance Testing: P1528 Protocol (Left-Hand Side)/Zoom Scan (7x7x7)/Value Along Z, X=3, Y=3 SAR
mW/g
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

Date/Time: 06/23/04 16:44:16

TCC

Copenhagen

DUT: 234154; Type: RM-25; Serial: 004400/48/16968/1

Communication System: DCS 1900; Frequency: 1909.8 MHz;Duty Cycle: 1:8.3
Medium: Head 1900 Medium parameters used (interpolated): f = 1909.8 MHz; σ = 1.5 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Left Section

DASY4 Configuration:

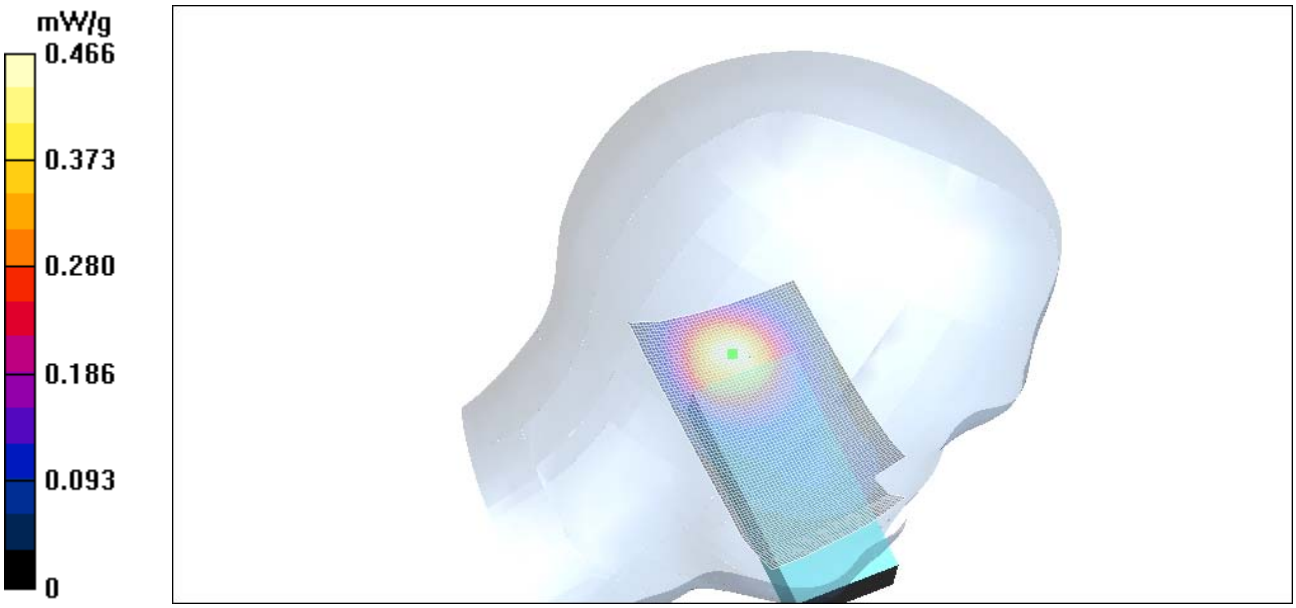
- Probe: ET3DV6 - SN1395 - WCE; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 15.01.2004
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

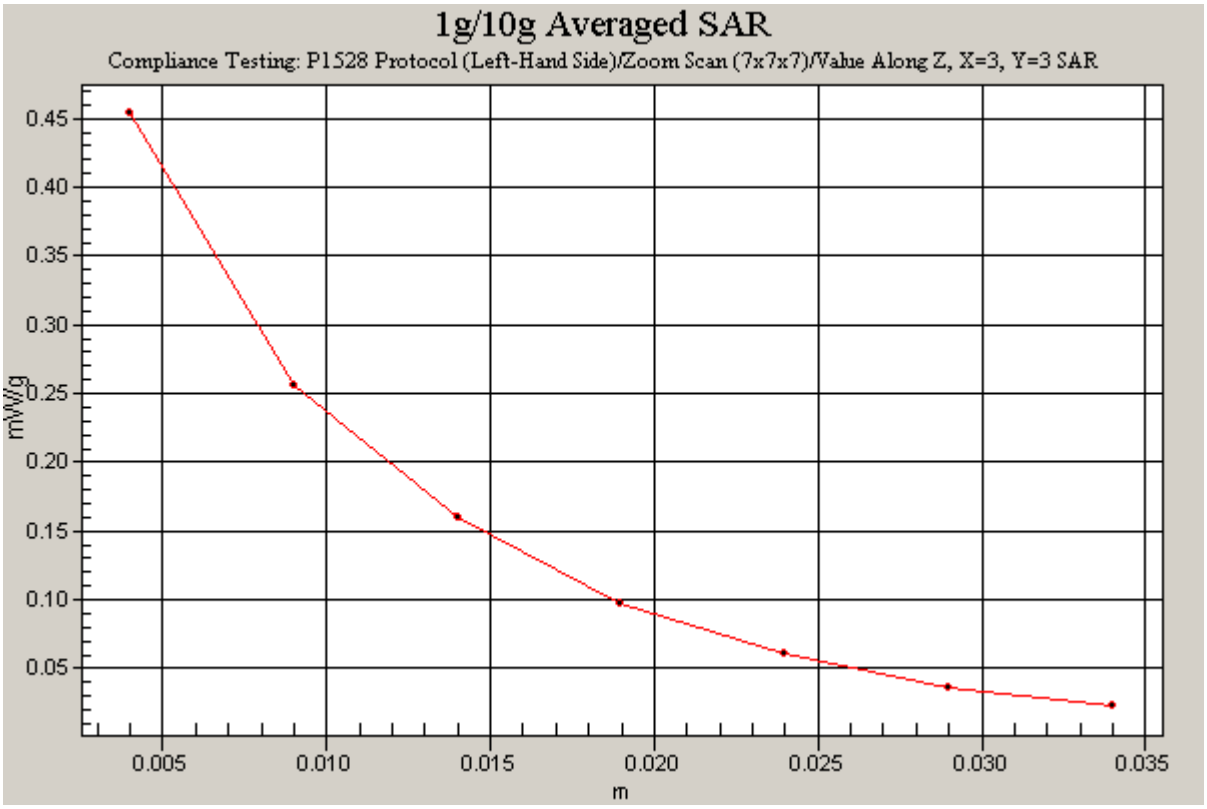
Tilt position - High - BT/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 16.5 V/m; Power Drift = -0.1 dB
Maximum value of SAR (interpolated) = 0.466 mW/g

Info: Interpolated medium parameters used for SAR evaluation!

Tilt position - High - BT/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = -0.1 dB
Maximum value of SAR (measured) = 0.454 mW/g
Peak SAR (extrapolated) = 0.814 W/kg
SAR(1 g) = 0.426 mW/g; SAR(10 g) = 0.247 mW/g

Info: Interpolated medium parameters used for SAR evaluation!


mW/g
0.466
0.373
0.280
0.186
0.093
0


1g/10g Averaged SAR
Compliance Testing: P1528 Protocol (Left-Hand Side)/Zoom Scan (7x7x7)/Value Along Z, X=3, Y=3 SAR
mW/g
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

Date/Time: 06/25/04 13:47:16

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DUT: 234154; Type: RM-25; Serial: 004400/48/16968/1

Communication System: DCS 1900 (GPRS) 2UL; Frequency: 1909.8 MHz;Duty Cycle: 1:4
Medium: Head 1900 Medium parameters used (interpolated): f = 1909.8 MHz; σ = 1.49 mho/m; ε_r = 38; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Left Section

DASY4 Configuration:

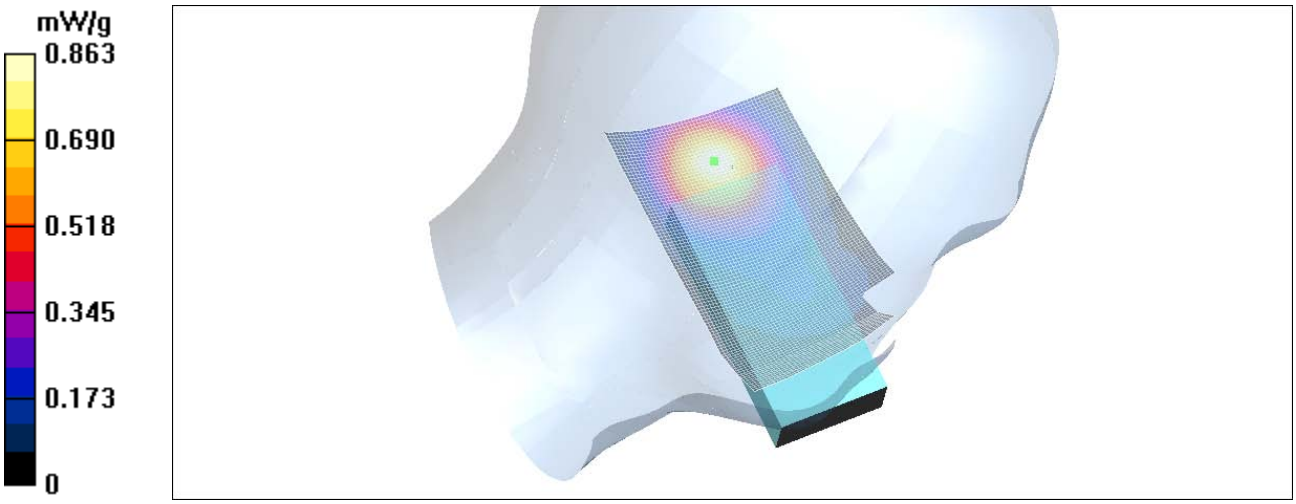
- Probe: ET3DV6 - SN1395 - WCE; ConvF(5.2, 5.2, 5.2); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 15.01.2004
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1302
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

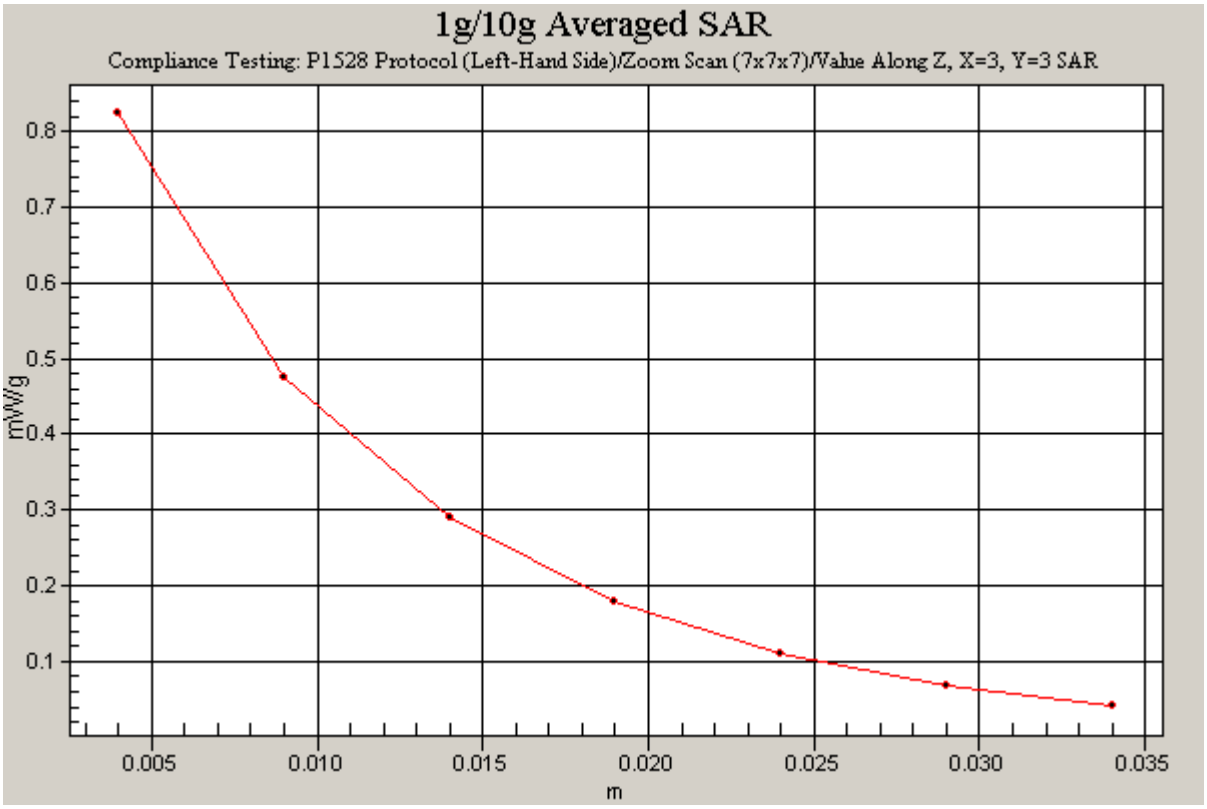
Tilt position - High - GPRS 2UL 2/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 22.2 V/m; Power Drift = 0.0 dB
Maximum value of SAR (interpolated) = 0.863 mW/g

Info: Interpolated medium parameters used for SAR evaluation!

Tilt position - High - GPRS 2UL 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.2 V/m; Power Drift = 0.0 dB
Maximum value of SAR (measured) = 0.823 mW/g
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.771 mW/g; SAR(10 g) = 0.451 mW/g

Info: Interpolated medium parameters used for SAR evaluation!


mW/g
0.863
0.690
0.518
0.345
0.173
0


1g/10g Averaged SAR
Compliance Testing: P1528 Protocol (Left-Hand Side)/Zoom Scan (7x7x7)/Value Along Z, X=3, Y=3 SAR
mW/g
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

Date/Time: 06/25/04 16:54:24

TCC

Copenhagen

DUT: 234154; Type: RM-25; Serial: 004400/48/16968/1

Communication System: DCS 1900 (GPRS 1UP/2DL); Frequency: 1909.8 MHz;Duty Cycle: 1:4
Medium: Body 1900 Medium parameters used (interpolated): f = 1909.8 MHz; σ = 1.6 mho/m; ε_r = 51.4; ρ = 1000 kg/m^3
Ambient temperature: 22 ±1 [°C]
Ambient humidity: 45 ±10 [RH %]
Phantom section: Flat Section

DASY4 Configuration:

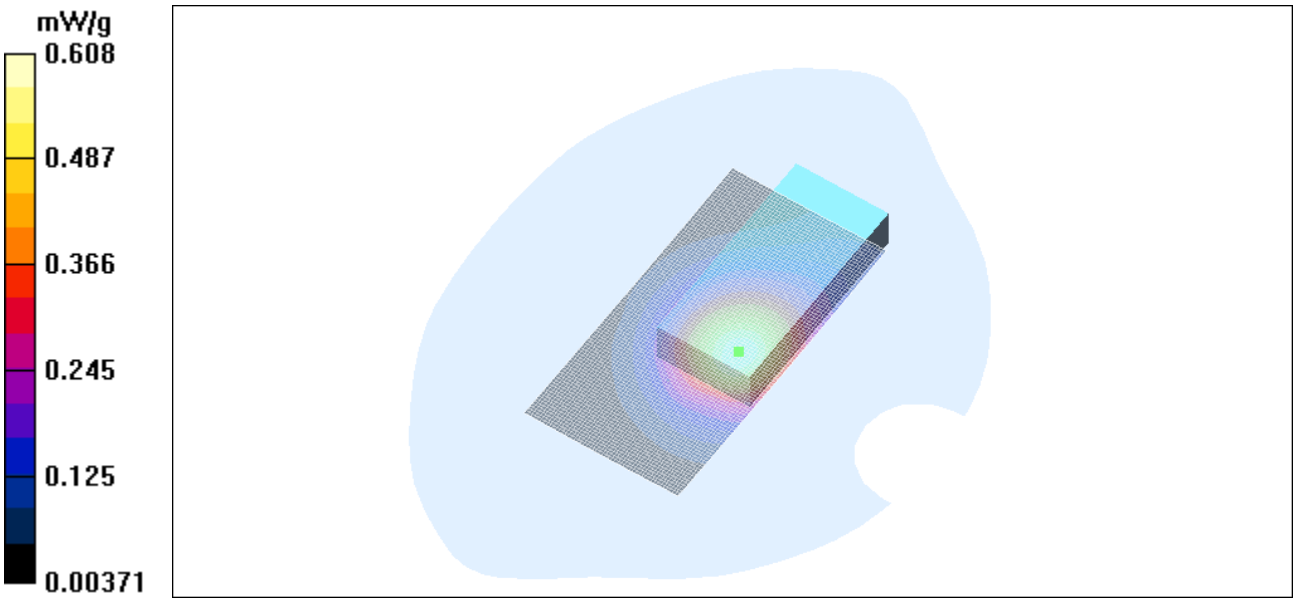
- Probe: ET3DV6 - SN1395 - WCE; ConvF(4.9, 4.9, 4.9); Calibrated: 28.08.2003
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 15.01.2004
- Phantom: SAM High Band; Type: QD000P40CB; Serial: TP-1301
- Measurement SW: DASY4, V4.2 Build 37; Postprocessing SW: SEMCAD, V1.8 Build 109

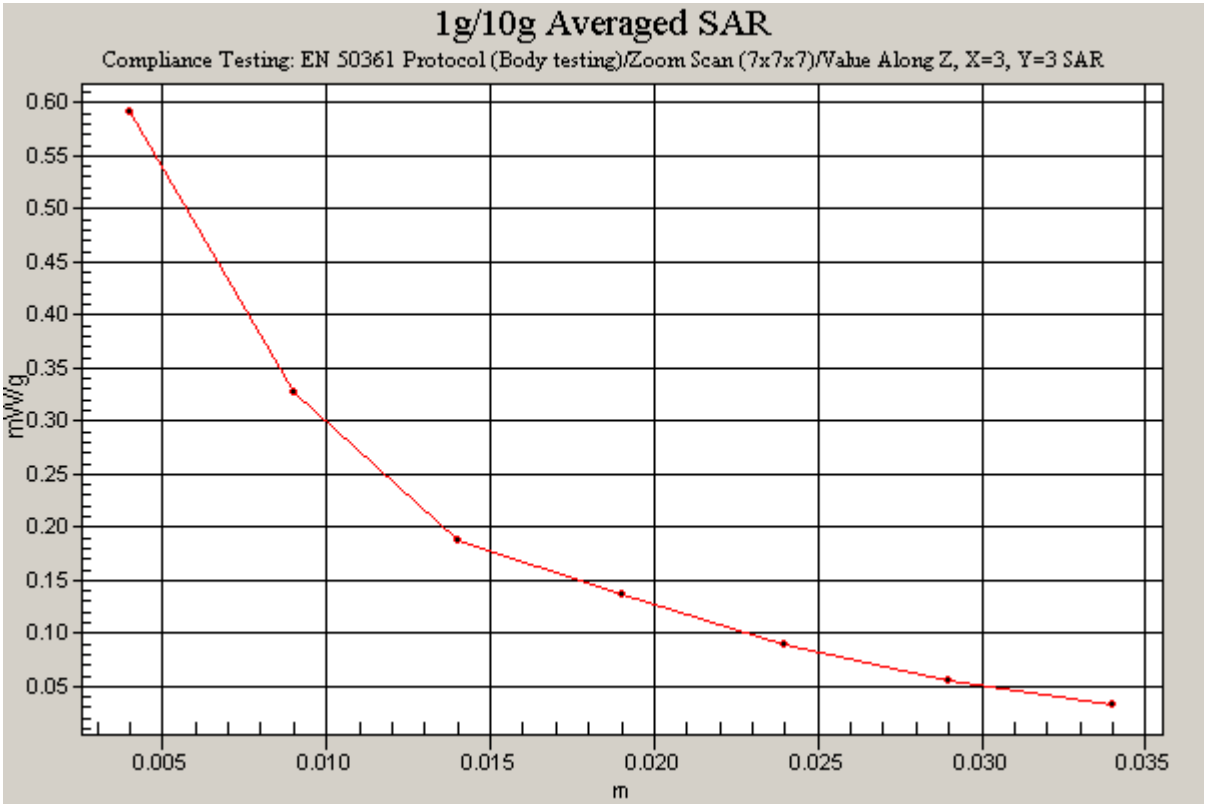
Body - High - No Accessory - Display in/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 17.3 V/m; Power Drift = -0.1 dB
Maximum value of SAR (interpolated) = 0.608 mW/g

Info: Interpolated medium parameters used for SAR evaluation!

Body - High - No Accessory - Display in/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.3 V/m; Power Drift = -0.1 dB
Maximum value of SAR (measured) = 0.591 mW/g
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.567 mW/g; SAR(10 g) = 0.340 mW/g

Info: Interpolated medium parameters used for SAR evaluation!


mW/g
0.608
0.487
0.366
0.245
0.125
0.00371


1g/10g Averaged SAR
Compliance Testing: EN 50361 Protocol (Body testing)/Zoom Scan (7x7x7)/Value Along Z, X=3, Y=3 SAR
mW/g
0.60
0.55
0.50
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.005
0.010
0.015
0.020
0.025
0.030
0.035
m

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

See the following pages.

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

Client Nokia TCC Salo

CALIBRATION CERTIFICATE

Object(s)	ET3DV6 - SN:1395
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	August 28, 2003
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)

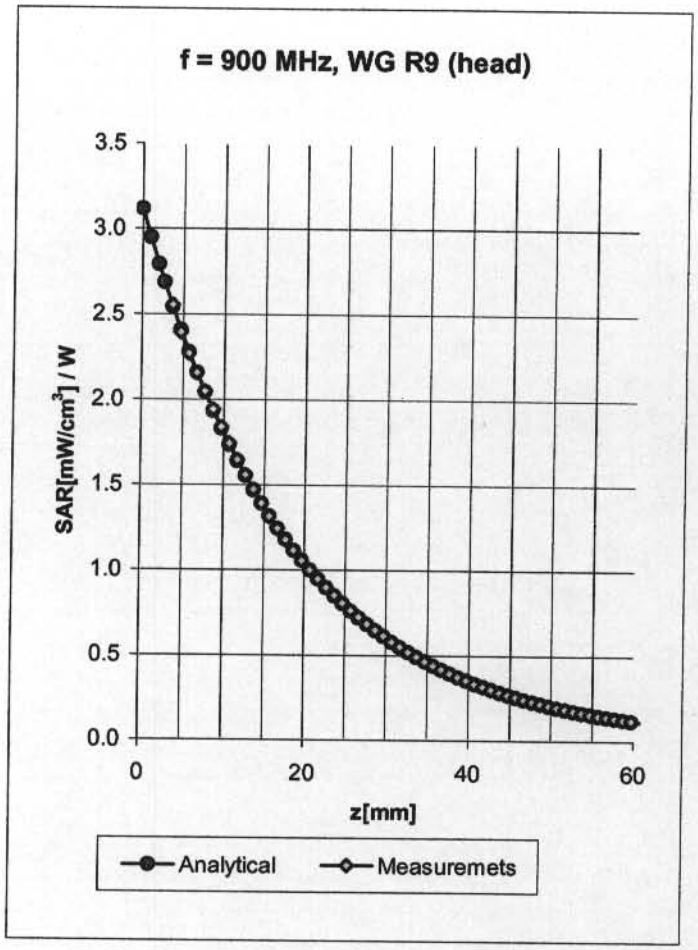
Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Power sensor E4412A	MY41495277	2-Apr-03 (METAS, No 252-0250)	Apr-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (Agilent, No. 20020918)	Sep-03
Power meter EPM E4419B	GB41293874	2-Apr-03 (METAS, No 252-0250)	Apr-04
Network Analyzer HP 8753E	US37390585	18-Oct-01 (Agilent, No. 24BR1033101)	In house check: Oct 03
Fluke Process Calibrator Type 702	SN: 6295803	3-Sep-01 (ELCAL, No.2360)	Sep-03

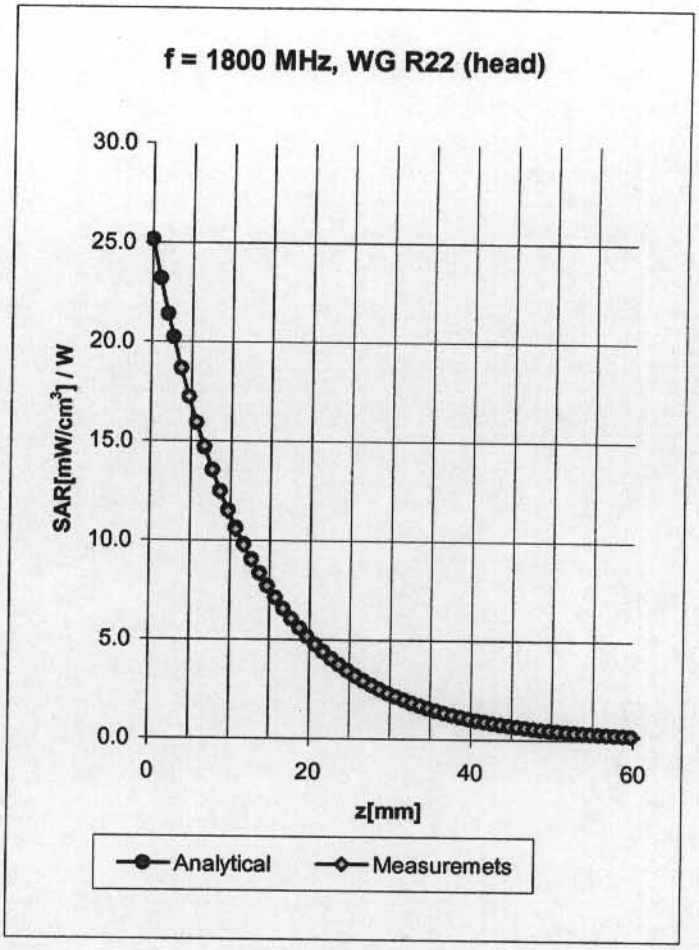
	Name	Function	Signature
Calibrated by:	Nico Vetterli	Technician	
Approved by:	Katja Pokovic	Laboratory Director	

Date issued: August 28, 2003

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.

Conversion Factor Assessment





Head 900 MHz ε_r = 41.5 ± 5% σ = 0.97 ± 5% mho/m

Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

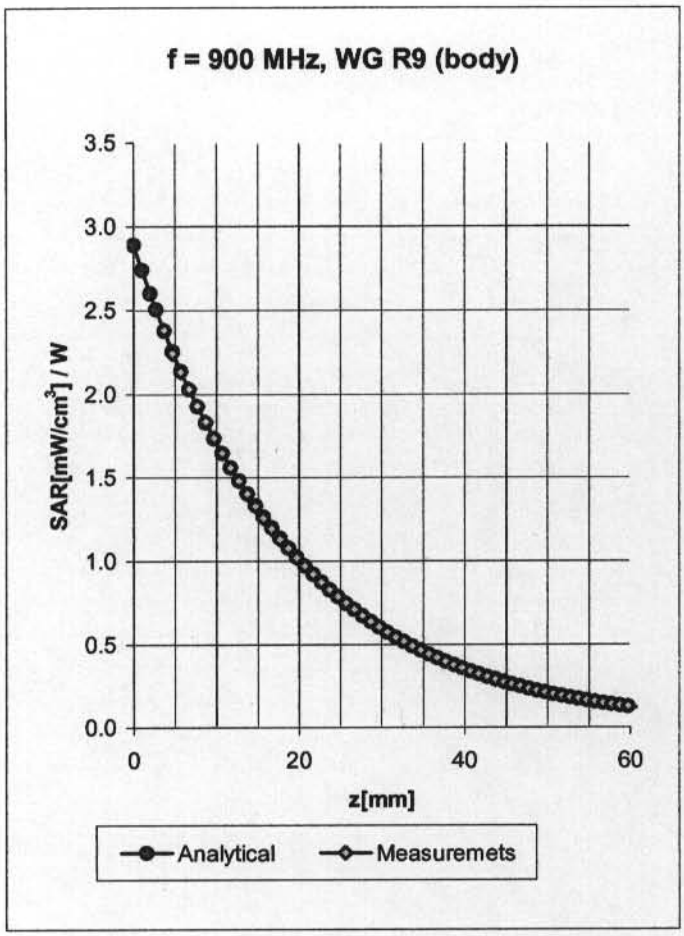
ConvF X	6.3 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.3 ± 9.5% (k=2)	Alpha	**0.42**
ConvF Z	6.3 ± 9.5% (k=2)	Depth	**2.59**

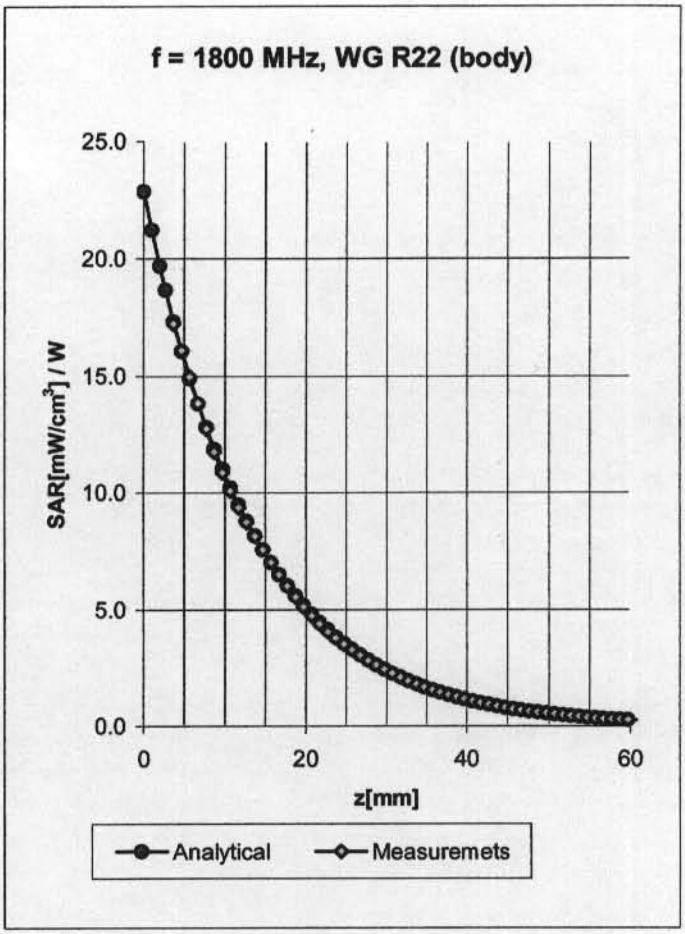
Head 1800 MHz ε_r = 40.0 ± 5% σ = 1.40 ± 5% mho/m

Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	5.2 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	5.2 ± 9.5% (k=2)	Alpha	**0.54**
ConvF Z	5.2 ± 9.5% (k=2)	Depth	**2.56**

Conversion Factor Assessment





Body 900 MHz ε_r = 55.0 ± 5% σ = 1.05 ± 5% mho/m

Valid for f=800-1000 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	6.2 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	6.2 ± 9.5% (k=2)	Alpha	**0.49**
ConvF Z	6.2 ± 9.5% (k=2)	Depth	**2.37**

Body 1800 MHz ε_r = 53.3 ± 5% σ = 1.52 ± 5% mho/m

Valid for f=1710-1910 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	4.9 ± 9.5% (k=2)	Boundary effect:	
ConvF Y	4.9 ± 9.5% (k=2)	Alpha	**0.61**
ConvF Z	4.9 ± 9.5% (k=2)	Depth	**2.60**

APPENDIX D: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S)

See the following pages.

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18307

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

Client **Nokia Danmark A/S**

CALIBRATION CERTIFICATE

Object(s)	D1900V2 - SN:5d026
Calibration procedure(s)	QA CAL-05.v2 Calibration procedure for dipole validation kits
Calibration date:	February 26, 2003
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	Scheduled Calibration
RF generator R&S SML-03	100698	27-Mar-2002	In house check: Mar-05
Power sensor HP 8481A	MY41092317	18-Oct-02	Oct-04
Power sensor HP 8481A	US37292783	30-Oct-02	Oct-03
Power meter EPM E442	GB37480704	30-Oct-02	Oct-03
Network Analyzer HP 8753E	US38432426	3-May-00	In house check: May 03

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

Date issued: February 26, 2003

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.

Date/Time: 02/26/03 17:17:26

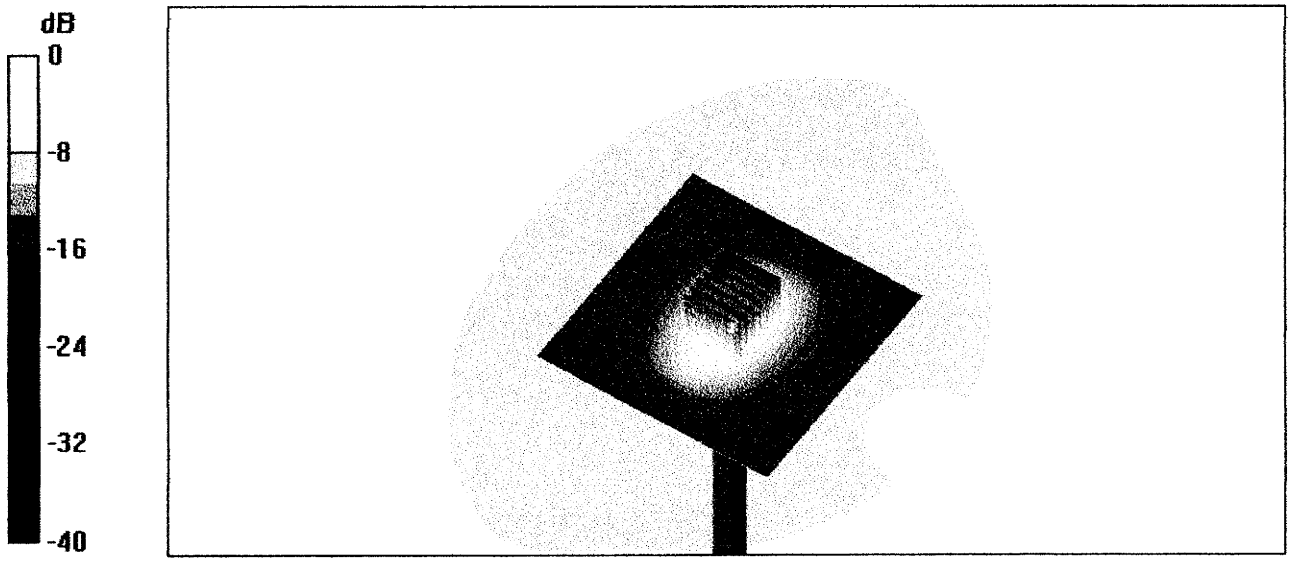
Test Laboratory: SPEAG, Zurich, Switzerland
File Name: SN5d026_SN1507_HSL1900_260203.da4

DUT: Dipole 1900 MHz; Serial: D1900V2 - SN5d026
Program: Dipole Calibration

Communication System: CW-1900; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL 1900 MHz; (σ = 1.46 mho/m, ε_r = 38.6, ρ = 1000 kg/m^3)
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1507; ConvF(5.2, 5.2, 5.2); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 25; Postprocessing SW: SEMCAD, V1.6 Build 105

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.2 V/m
Peak SAR = 18.6 W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.31 mW/g
Power Drift = 0.04 dB



18508

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

Client **Nokia Danmark A/S**

CALIBRATION CERTIFICATE

Object(s)	D1900V2 - SN:5d026
Calibration procedure(s)	QA CAL-05.v2 Calibration procedure for dipole validation kits
Calibration date:	April 8, 2003
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	Scheduled Calibration
RF generator R&S SML-03	100698	27-Mar-2002	In house check: Mar-05
Power sensor HP 8481A	MY41092317	18-Oct-02	Oct-04
Power sensor HP 8481A	US37292783	30-Oct-02	Oct-03
Power meter EPM E442	GB37480704	30-Oct-02	Oct-03
Network Analyzer HP 8753E	US38432426	3-May-00	In house check: May 03

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

Date issued: April 12, 2003

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.

Date/Time: 04/08/03 13:41:14

Test Laboratory: SPEAG, Zurich, Switzerland
File Name: SN5d026_SN1507_M1900_080403.da4

DUT: Dipole 1900 MHz; Serial: D1900V2 - SN5d026
Program: Dipole Calibration

Communication System: CW-1900; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: Muscle 1900 MHz; (σ = 1.59 mho/m, ε_r = 51.2, ρ = 1000 kg/m^3)
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1507; ConvF(4.8, 4.8, 4.8); Calibrated: 1/18/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 - SN411; Calibrated: 1/16/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006
- Measurement SW: DASY4, V4.1 Build 33; Postprocessing SW: SEMCAD, V1.6 Build 109

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.2 V/m
Peak SAR = 18.6 W/kg
SAR(1 g) = 10.6 mW/g; SAR(10 g) = 5.51 mW/g
Power Drift = 0.09 dB