

SAR Compliance Test Report

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Tested device:	RM-313		
FCC ID:	QVVRM-313	IC:	661AE-RM313
Supplement reports:	Salo_SAR_0737_12		
Testing has been carried out in accordance with:	47CFR §2.1093 Radiofrequency Radiation Exposure Evaluation: Portable Devices FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01) Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields RSS-102 Evaluation Procedure for Mobile and Portable Radio Transmitters with Respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields IEEE 1528 - 2003 IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Technique		
Documentation:	The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test results:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		
Date and signatures:			
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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	4
1.2.3 Maximum Drift	4
1.2.4 Measurement Uncertainty	4
2. DESCRIPTION OF THE DEVICE UNDER TEST	5
2.1 PICTURE OF THE DEVICE.....	5
2.2 DESCRIPTION OF THE ANTENNA	5
3. TEST CONDITIONS	6
3.1 TEMPERATURE AND HUMIDITY	6
3.2 TEST SIGNAL, FREQUENCIES AND OUTPUT POWER	6
4. DESCRIPTION OF THE TEST EQUIPMENT	6
4.1 MEASUREMENT SYSTEM AND COMPONENTS	6
4.1.1 Isotropic E-field Probe Type ET3DV6	8
4.1.2 Isotropic E-field Probe Type ES3DV3	9
4.2 PHANTOMS	9
4.3 TISSUE SIMULANTS	10
4.3.1 Tissue Simulant Recipes	10
4.3.2 System Checking	11
4.3.3 Tissue Simulants used in the Measurements.....	12
5. DESCRIPTION OF THE TEST PROCEDURE	13
5.1 DEVICE HOLDER.....	13
5.2 TEST POSITIONS.....	14
5.2.1 Against Phantom Head.....	14
5.2.2 Body Worn Configuration	14
5.3 SCAN PROCEDURES.....	15
5.4 SAR AVERAGING METHODS.....	15
6. MEASUREMENT UNCERTAINTY	16
7. RESULTS	17
APPENDIX A: SYSTEM CHECKING SCANS.....	22
APPENDIX B: MEASUREMENT SCANS.....	27
APPENDIX C: RELEVANT PAGES FROM PROBE CALIBRATION REPORT(S)	48
APPENDIX D: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S)	49

1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2008-05-13 to 2008-05-16
SN, HW and SW numbers of tested device	SN: 358984/01/276084/2, HW: 4004, SW: V 20.0.062, DUT: 12880 SN: 358082/01/438829/8, HW: 4004, SW: V 20.0.062, DUT: 12881 SN: 358984/01/276082/6, HW: 4004, SW: V 20.0.062, DUT: 12883 SN: 358082/01/438808/2, HW: 4004, SW: V 20.0.062, DUT: 12884
Batteries used in testing	BP-6MT, DUT: 12876, 12877, 12878, 12879
Headsets used in testing	-
Other accessories used in testing	-
State of sample	Prototype unit
Notes	-

1.2 Maximum Results

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

1.2.1 Head Configuration

Mode	Ch / f (MHz)	Radiated power	Position	Measured SAR value (1g avg)	Scaled* SAR value (1g avg)	SAR limit (1g avg)	Result
3-slot GPRS850	251 / 848.8	27.3 dBm ERP	Left, Cheek	1.04 W/kg	1.16 W/kg	1.6 W/kg	PASSED
2-slot GPRS1900	661 / 1880.0	32.6 dBm EIRP	Left, Cheek	0.708 W/kg	0.79 W/kg	1.6 W/kg	PASSED
WLAN2450	7 / 2442.0	21.6 dBm EIRP	Right, Cheek	0.257 W/kg	0.29 W/kg	1.6 W/kg	PASSED
3-slot GPRS850 + WLAN2450	-	-	Left, Cheek	1.157 W/kg	1.30 W/kg	1.6 W/kg	PASSED
2-slot GPRS1900 + WLAN2450	-	-	Left, Cheek	0.888 W/kg	0.99 W/kg	1.6 W/kg	PASSED

1.2.2 Body Worn Configuration

Mode	Ch / f (MHz)	Radiated power	Separation distance	Measured SAR value (1g avg)	Scaled* SAR value (1g avg)	SAR limit (1g avg)	Result
3-slot GPRS850	251 / 848.8	27.3 dBm ERP	2.2cm	1.07 W/kg	1.20 W/kg	1.6 W/kg	PASSED
2-slot GPRS1900	661 / 1880.0	32.6 dBm EIRP	2.2cm	0.331 W/kg	0.37 W/kg	1.6 W/kg	PASSED
WLAN2450	7 / 2442.0	21.6 dBm EIRP	2.2cm	0.061 W/kg	0.07 W/kg	1.6 W/kg	PASSED
3-slot GPRS850 + WLAN2450	-	-	2.2cm	1.131 W/kg	1.27 W/kg	1.6 W/kg	PASSED
2-slot GPRS1900 + WLAN2450	-	-	2.2cm	0.392 W/kg	0.44 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	0.46dB

1.2.4 Measurement Uncertainty

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

Device category	Portable
Exposure environment	General population / uncontrolled

Modes of Operation	Bands	Modulation Mode	Duty Cycle	Transmitter Frequency Range (MHz)
GSM	850 1900	GMSK	1/8	824 – 849 1850 – 1910
GPRS	850 1900	GMSK	1/8 to 3/8	824 – 849 1850 – 1910
EGPRS	850 1900	GMSK / 8PSK	1/8 to 3/8	824 – 849 1850 – 1910
BT	2450	GFSK	1	2402 – 2480
WLAN	2450	11Mbps QPSK	1	2412 – 2462

Outside of USA and Canada, the transmitter of the device is capable of operating also in GSM/GPRS/EGPRS900, GSM/GPRS/EGPRS1800 and WCDMA2100 bands which are not part of this filing.

2.1 Picture of the Device



2.2 Description of the Antenna

The device has internal antennas.

3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	20.4 to 22.4
Ambient humidity (RH %):	29 to 38

3.2 Test Signal, Frequencies and Output Power

The device was put into operation by using a call tester except for testing WLAN2450 where control software was used. Communication between the device and the call tester was established by air link.

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

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

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

The number of test cases reported in this document has been minimised based on the earlier testing in Salo_SAR_0737_12.

4. DESCRIPTION OF THE TEST EQUIPMENT

4.1 Measurement System and Components

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

The following table lists calibration dates of SPEAG components:

Test Equipment	Serial Number	Calibration interval	Calibration expiry
DAE 4	538	12 months	2008-07
DAE 4	728	12 months	2009-04
E-field Probe ET3DV6	1395	12 months	2008-07
E-field Probe ES3DV3	3131	12 months	2009-04
Dipole Validation Kit, D835V2	480	24 months	2009-05
Dipole Validation Kit, D1900V2	5d013	24 months	2008-07
Dipole Validation Kit, D2450V2	729	24 months	2010-01
DASY4 software	Version 4.7	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration interval	Calibration expiry
Signal Generator	SML03	101265	12 months	2008-07
Amplifier	ZHL-42 (SMA)	N072095-5	12 months	2008-07
Power Meter	NRVS	849305/028	12 months	2008-07
Power Sensor	NRV-Z32	839176/020	12 months	2008-07
Call Tester	CMU 200	103293	-	-
Call Tester	CMU 200	100084	-	-
Vector Network Analyzer	8753E	US38432928	12 months	2008-07
Dielectric Probe Kit	85070B	US33020420	-	-

4.1.1 Isotropic E-field Probe Type ET3DV6

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

4.1.2 Isotropic E-field Probe Type ES3DV3

Construction	Symmetrical design with triangular core Interleaved sensors 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 4 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 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: 20 mm Body diameter: 12 mm Tip diameter: 3.9 mm Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

4.2 Phantoms

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

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

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

4.3 Tissue Simulants

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

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

4.3.1 Tissue Simulant Recipes

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

800MHz band

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

1900MHz band

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

2450MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	56.0	70.20
Tween 20	44.0	29.62
Salt	-	0.18

4.3.2 System Checking

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

System checking, head tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ϵ_r	σ [S/m]	
835	Reference result	2.29	41.6	0.90	
	$\pm 10\%$ window	2.06 – 2.52			
	2008-05-13	2.33	41.7	0.89	21.0
	2008-05-14	2.33	41.6	0.90	21.0
1900	Reference result	9.69	39.3	1.44	
	$\pm 10\%$ window	8.72 – 10.66			
	2008-05-15	9.89	38.4	1.44	21.0
2450	Reference result	14.3	37.8	1.82	
	$\pm 10\%$ window	12.9 – 15.7			
	2008-05-16	13.9	39.4	1.82	21.0

System checking, body tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ϵ_r	σ [S/m]	
2450	Reference result	13.8	52.5	1.99	
	$\pm 10\%$ window	12.4 – 15.2			
	2008-05-15	14.9	50.8	2.03	21.0

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

4.3.3 Tissue Simulants used in the Measurements

Head tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ϵ_r	σ [S/m]	
836	Recommended value	41.5	0.90	
	$\pm 5\%$ window	39.4 – 43.6	0.86 – 0.95	
	2008-05-13	41.7	0.89	21.0
	2008-05-14	41.6	0.90	21.0
1880	Recommended value	40.0	1.40	
	$\pm 5\%$ window	38.0 – 42.0	1.33 – 1.47	
	2008-05-15	38.5	1.42	21.0
2442	Recommended value	39.2	1.79	
	$\pm 5\%$ window	37.3 – 41.2	1.70 – 1.88	
	2008-05-16	39.5	1.82	21.0

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ϵ_r	σ [S/m]	
836	Recommended value	55.2	0.97	
	$\pm 5\%$ window	52.4 – 58.0	0.92 – 1.02	
	2008-05-14	54.2	0.97	21.0
1880	Recommended value	53.3	1.52	
	$\pm 5\%$ window	50.6 – 56.0	1.44 – 1.60	
	2008-05-15	51.9	1.53	21.0
2442	Recommended value	52.7	1.94	
	$\pm 5\%$ window	50.1 – 55.3	1.85 – 2.04	
	2008-05-15	50.8	2.02	21.0

5. DESCRIPTION OF THE TEST PROCEDURE

5.1 Device Holder

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



Device holder supplied by SPEAG

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



Nokia spacer

5.2 Test Positions

5.2.1 Against Phantom Head

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

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



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

7. RESULTS

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

850MHz Head SAR results

DUT	Option used	Test configuration		SAR, averaged over 1g (W/kg)		
				Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz
GSM		Power		26.8 dBm	27.9 dBm	28.2 dBm
12880	Silver covers	Left	Cheek	-	0.352	-
			Tilt	-	-	-
		Right	Cheek	-	-	-
			Tilt	-	-	-
2-slot GPRS		Power		26.7 dBm	27.9 dBm	28.2 dBm
12880	Silver covers	Left	Cheek	-	0.641	-
			Tilt	-	-	-
		Right	Cheek	-	-	-
			Tilt	-	-	-
3-slot GPRS		Power		25.6 dBm	26.9 dBm	27.0 dBm
12880	Silver covers	Left	Cheek	0.761	0.749	0.878
			Tilt	-	-	-
		Right	Cheek	-	-	-
			Tilt	-	-	-
3-slot GPRS		Power		26.4 dBm	28.0 dBm	27.3 dBm
12881	Painted covers	Left	Cheek	0.747	0.816	0.977
			Tilt	-	-	-
		Right	Cheek	-	-	-
			Tilt	-	-	-
3-slot GPRS 12881	Painted covers	Left Cheek, BT active		-	-	1.04

1900MHz Head SAR results

DUT	Option used	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		28.4 dBm	32.6 dBm	28.3 dBm
12880	Silver covers	Left	Cheek	-	0.246	-
			Tilt	-	-	-
		Right	Cheek	-	-	-
			Tilt	-	-	-
2-slot GPRS		Power		28.3 dBm	32.5 dBm	28.2 dBm
12880	Silver covers	Left	Cheek	0.309	0.442	0.385
			Tilt	-	-	-
		Right	Cheek	-	-	-
			Tilt	-	-	-
3-slot GPRS		Power		26.4 dBm	30.4 dBm	26.1 dBm
12880	Silver covers	Left	Cheek		0.392	
			Tilt	-	-	-
		Right	Cheek	-	-	-
			Tilt	-	-	-
2-slot GPRS		Power		30.5 dBm	32.6 dBm	30.4 dBm
12881	Painted covers	Left	Cheek	0.523	0.708	0.653
			Tilt	-	-	-
		Right	Cheek	-	-	-
			Tilt	-	-	-
2-slot GPRS 12881	Painted covers	Left Cheek, BT active		-	0.624	-

2450MHz Head SAR results

DUT	Option used	Test configuration		SAR, averaged over 1g (W/kg)		
				Ch 1 2412.0 MHz	Ch 7 2442.0 MHz	Ch 11 2462.0 MHz
WLAN		Power		20.6 dBm	24.5 dBm	23.8 dBm
12883	Silver covers	Left	Cheek	-	-	-
			Tilt	-	-	-
		Right	Cheek	0.148	0.152	0.177
			Tilt	-	-	-
WLAN		Power		20.6 dBm	21.6 dBm	20.8 dBm
12884	Painted covers	Left	Cheek	-	0.180	-
			Tilt	-	-	-
		Right	Cheek	0.175	0.257	0.162
			Tilt	-	-	-

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

850MHz Body SAR results

DUT	Option used	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz
3-slot GPRS		Power	25.6 dBm	26.9 dBm	27.0 dBm
12880	Silver covers	Without headset	0.753	0.928	0.952
		Headset	-	-	-
3-slot GPRS		Power	26.4 dBm	28.0 dBm	27.3 dBm
12881	Painted covers	Without headset	0.775	0.984	1.07
		Headset	-	-	-
3-slot GPRS 12881	Painted covers	Without headset, BT active	-	-	0.968

1900MHz Body SAR results

DUT	Option used	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
2-slot GPRS		Power	28.3 dBm	32.5 dBm	28.2 dBm
12880	Silver covers	Without headset	0.143	0.234	0.226
		Headset	-	-	-
2-slot GPRS		Power	30.5 dBm	32.6 dBm	30.4 dBm
12881	Painted covers	Without headset	0.225	0.331	0.327
		Headset	-	-	-
2-slot GPRS 12881	Painted covers	Without headset, BT active	-	0.315	-

2450MHz Body SAR results

DUT	Option used	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 1 2412.0 MHz	Ch 7 2442.0 MHz	Ch 11 2462.0 MHz
WLAN		Power	20.6 dBm	24.5 dBm	23.8 dBm
12883	Silver covers	Without headset	0.032	0.058	0.053
		Headset	-	-	-
WLAN		Power	20.6 dBm	21.6 dBm	20.8 dBm
12884	Painted covers	Without headset	0.035	0.061	0.042
		Headset	-	-	-

Simultaneous transmissions: Combined SAR results

Test configuration	Max. 1g SAR results			Combined 1g SAR values	
	WLAN	850MHz band	1900MHz band	WLAN + 850MHz band	WLAN + 1900MHz band
Head: Left, Cheek	0.180	0.977	0.708	1.157	0.888
Body: Without Headset	0.061	1.07	0.331	1.131	0.392

Combining the maximum SAR values of WLAN2450 and the cellular bands tends to overestimate the SAR value since their maxima do not necessarily occur in the same location.

Plots of the Measurement scans are given in Appendix B.

APPENDIX A: SYSTEM CHECKING SCANS

Date/Time: 2008-05-13 16:29:42

Test Laboratory: TCC Nokia

Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW835

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL900; Medium Notes: 20.2C

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.892 \text{ mho/m}$; $\epsilon_r = 41.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395; Probe Notes:
- ConvF(6.1, 6.1, 6.1); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 2.49 mW/g

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

Reference Value = 55.2 V/m

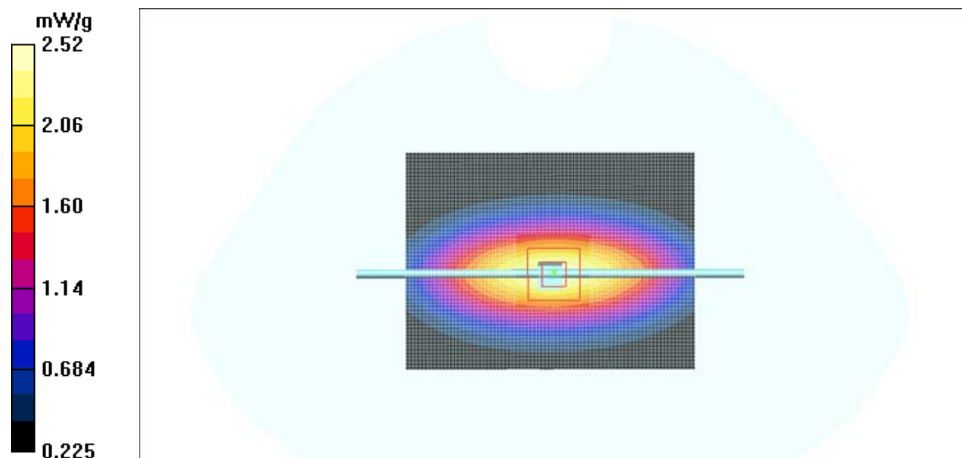
Peak SAR (extrapolated) = 3.51 W/kg

SAR(1 g) = 2.33 mW/g

SAR(10 g) = 1.52 mW/g

Power Drift = -0.032 dB

Maximum value of SAR (measured) = 2.52 mW/g



Date/Time: 2008-05-14 10:16:38

Test Laboratory: TCC Nokia

Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW835

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL900; Medium Notes: 21.3C

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.903 \text{ mho/m}$; $\epsilon_r = 41.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(6.1, 6.1, 6.1); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 2.49 mW/g

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

Reference Value = 54.6 V/m

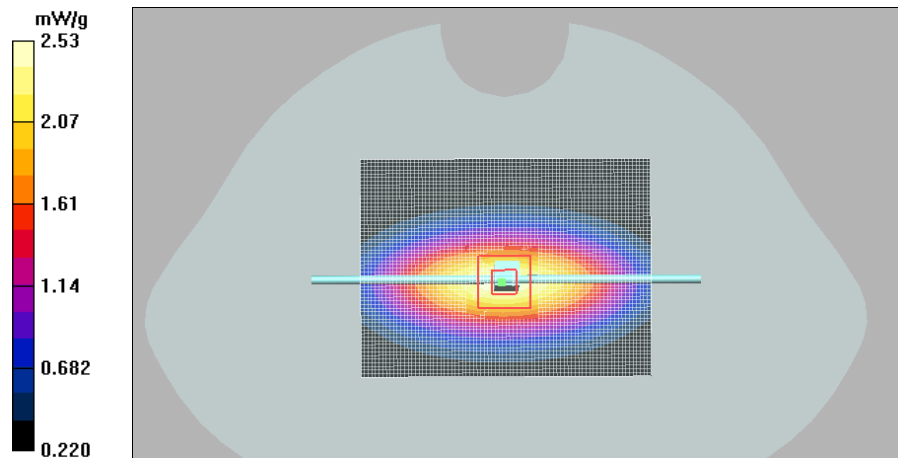
Peak SAR (extrapolated) = 3.53 W/kg

SAR(1 g) = 2.33 mW/g

SAR(10 g) = 1.51 mW/g

Power Drift = -0.032 dB

Maximum value of SAR (measured) = 2.53 mW/g



Date/Time: 2008-05-15 09:50:06

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

Communication System: CW1900

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL1900; Medium Notes: 21.3C

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(4.85, 4.85, 4.85); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1018
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

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

Reference Value = 94.1 V/m

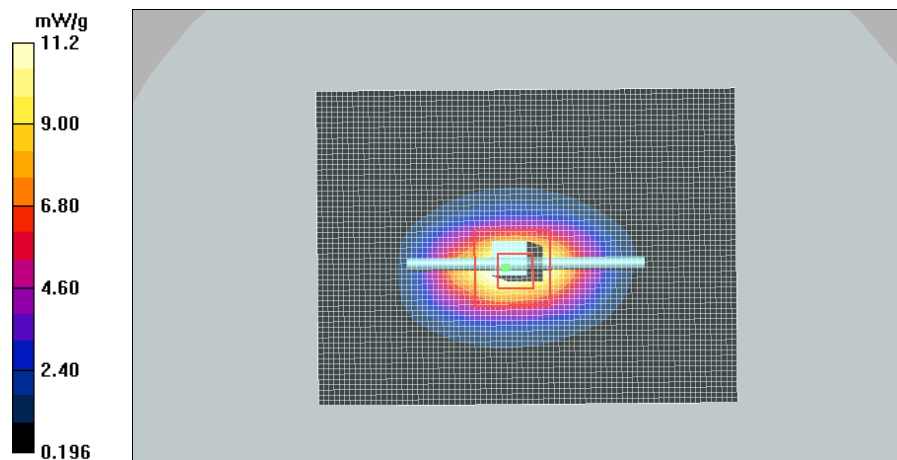
Peak SAR (extrapolated) = 17.0 W/kg

SAR(1 g) = 9.89 mW/g

SAR(10 g) = 5.24 mW/g

Power Drift = -0.056 dB

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



Date/Time: 2008-05-16 08:42:25

Test Laboratory: TCC Nokia

Type: D2450V2; Serial: D2450V2 - SN:729

Communication System: CW2450

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: 21.2C

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.82$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.45, 4.45, 4.45); Calibrated: 2007-02-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2008-04-23
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 16.2 mW/g

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

Reference Value = 94.8 V/m

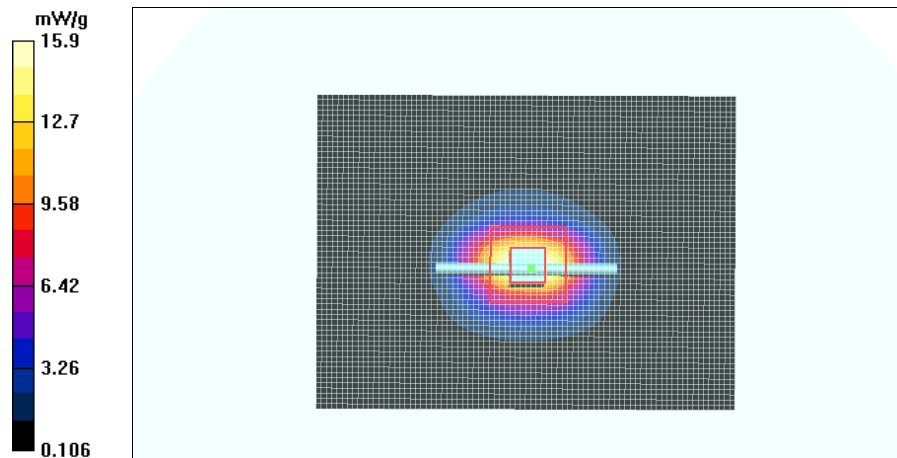
Peak SAR (extrapolated) = 28.9 W/kg

SAR(1 g) = 13.9 mW/g

SAR(10 g) = 6.46 mW/g

Power Drift = 0.017 dB

Maximum value of SAR (measured) = 15.9 mW/g



Date/Time: 2008-05-15 12:24:25

Test Laboratory: TCC Nokia

Type: D2450V2; Serial: D2450V2 - SN:729

Communication System: CW2450

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: 20.5C

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.03$ mho/m; $\epsilon_r = 50.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.1, 4.1, 4.1); Calibrated: 2007-02-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2008-04-23
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 17.0 mW/g

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

Reference Value = 93.6 V/m

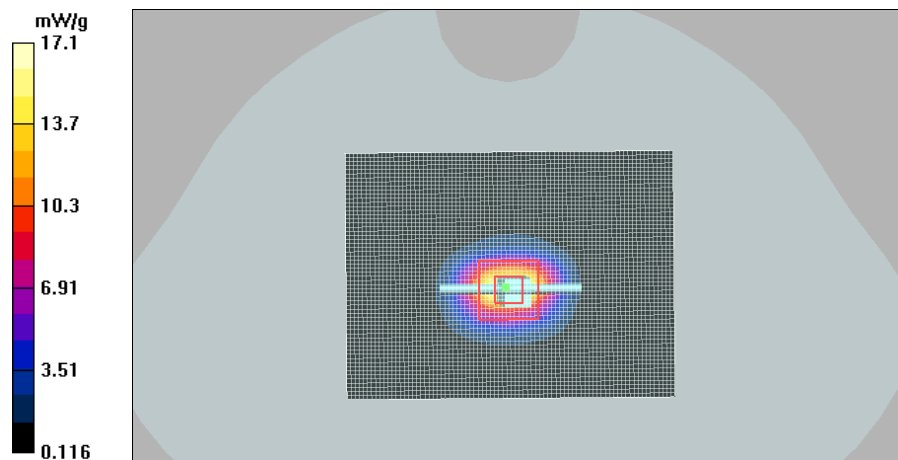
Peak SAR (extrapolated) = 31.1 W/kg

SAR(1 g) = 14.9 mW/g

SAR(10 g) = 6.82 mW/g

Power Drift = -0.030 dB

Maximum value of SAR (measured) = 17.1 mW/g



APPENDIX B: MEASUREMENT SCANS

Date/Time: 2008-05-13 20:51:38

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358984/01/276084/2

Communication System: GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: HSL900; Medium Notes: 20.0C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.894$ mho/m; $\epsilon_r = 41.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(6.1, 6.1, 6.1); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, Middle, Silver covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 7.62 V/m

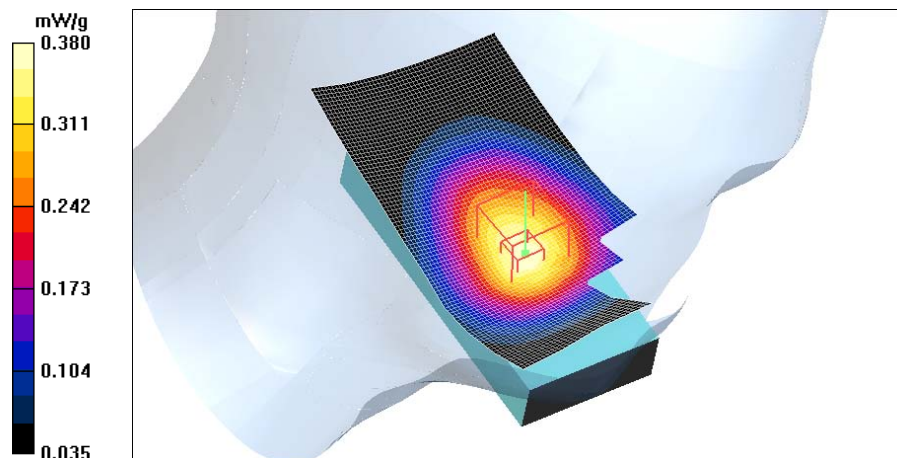
Peak SAR (extrapolated) = 0.471 W/kg

SAR(1 g) = 0.352 mW/g

SAR(10 g) = 0.246 mW/g

Power Drift = -0.194 dB

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



Date/Time: 2008-05-13 21:16:34

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358984/01/276084/2

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: HSL900; Medium Notes: 20.0C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.894$ mho/m; $\epsilon_r = 41.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(6.1, 6.1, 6.1); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, Middle, Silver covers /Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.681 mW/g

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

Reference Value = 10.2 V/m

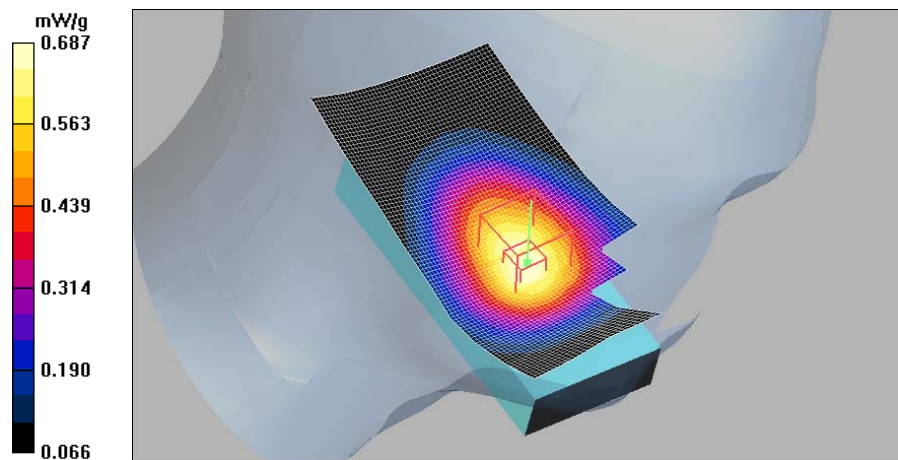
Peak SAR (extrapolated) = 0.854 W/kg

SAR(1 g) = 0.641 mW/g

SAR(10 g) = 0.449 mW/g

Power Drift = -0.212 dB

Maximum value of SAR (measured) = 0.687 mW/g



Date/Time: 2008-05-14 16:43:16

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358984/01/276084/2

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: HSL900; Medium Notes: 21.3C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.912$ mho/m; $\epsilon_r = 41.4$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395

- ConvF(6.1, 6.1, 6.1); Calibrated: 2007-07-18

- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn538; Calibrated: 2007-07-06

- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, High, Silver covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.962 mW/g

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

Reference Value = 11.6 V/m

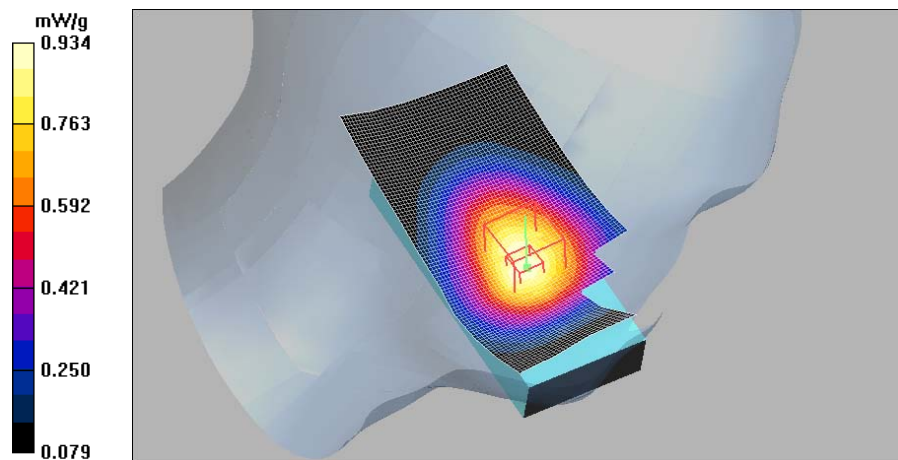
Peak SAR (extrapolated) = 1.18 W/kg

SAR(1 g) = 0.878 mW/g

SAR(10 g) = 0.617 mW/g

Power Drift = -0.275 dB

Maximum value of SAR (measured) = 0.934 mW/g



Date/Time: 2008-05-14 17:18:42

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358082/01/438829/8

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: HSL900; Medium Notes: 21.3C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.912$ mho/m; $\epsilon_r = 41.4$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395

- ConvF(6.1, 6.1, 6.1); Calibrated: 2007-07-18

- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn538; Calibrated: 2007-07-06

- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, High, Painted covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.05 mW/g

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

Reference Value = 14.0 V/m

Peak SAR (extrapolated) = 1.37 W/kg

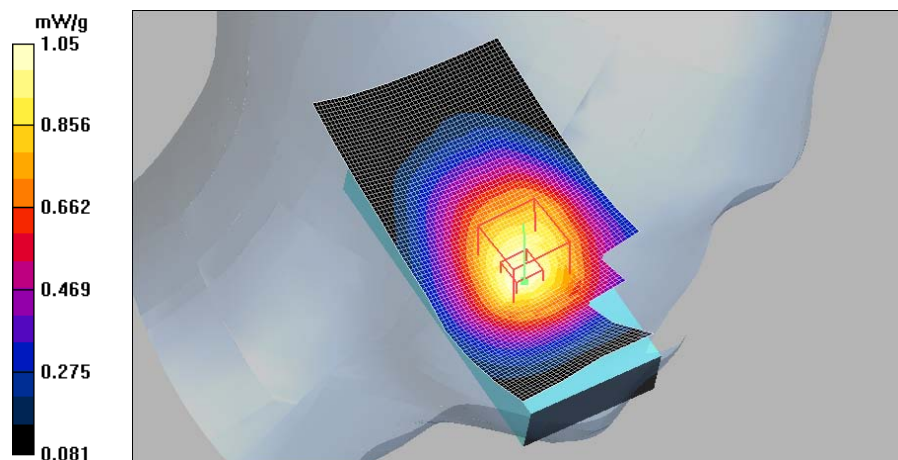
SAR(1 g) = 0.977 mW/g

SAR(10 g) = 0.692 mW/g

Power Drift = -0.203 dB

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

Maximum value of SAR (measured) = 1.05 mW/g



Date/Time: 2008-05-14 18:00:30

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358082/01/438829/8

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: HSL900; Medium Notes: 21.3C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.912$ mho/m; $\epsilon_r = 41.4$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395

- ConvF(6.1, 6.1, 6.1); Calibrated: 2007-07-18

- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn538; Calibrated: 2007-07-06

- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, High, Painted covers, BT/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.05 mW/g

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

Reference Value = 12.8 V/m

Peak SAR (extrapolated) = 1.52 W/kg

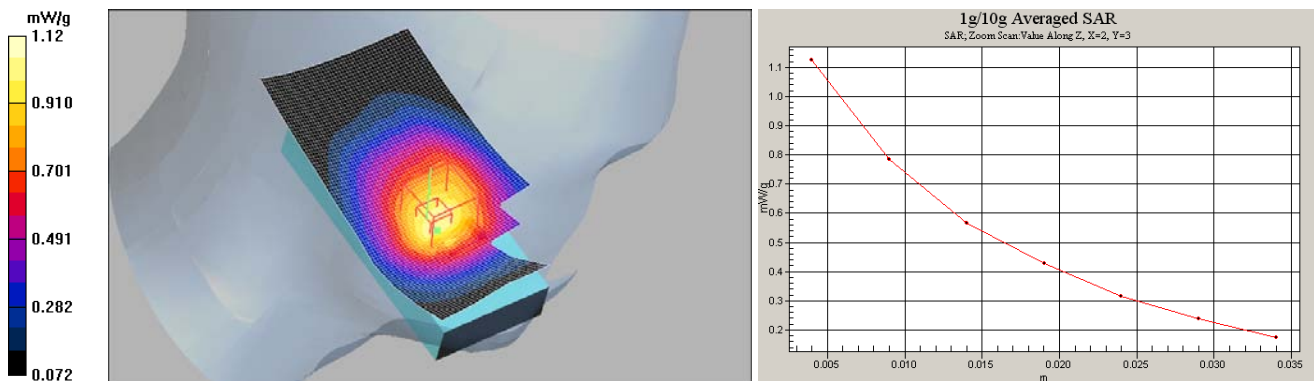
SAR(1 g) = 1.04 mW/g

SAR(10 g) = 0.693 mW/g

Power Drift = -0.369 dB

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

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



Date/Time: 2008-05-15 10:46:41

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358984/01/276084/2

Communication System: GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: HSL1900; Medium Notes: 21.0C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(4.85, 4.85, 4.85); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1018
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, Middle, Silver covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.273 mW/g

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

Reference Value = 4.90 V/m

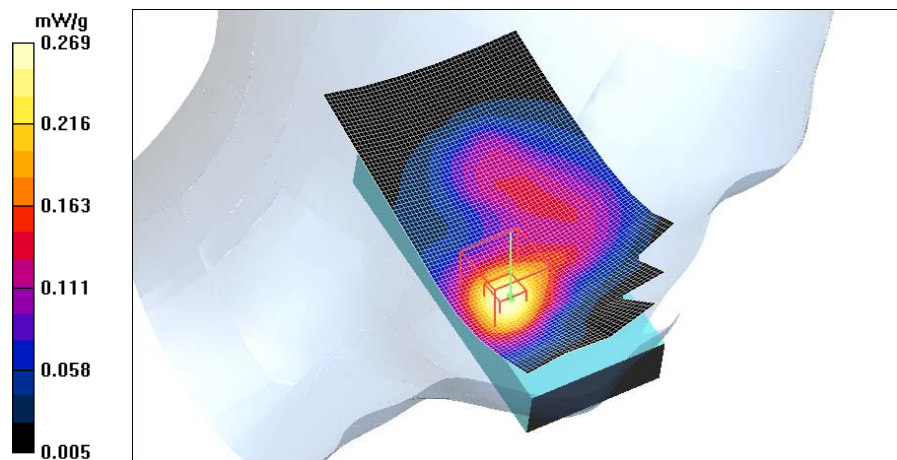
Peak SAR (extrapolated) = 0.375 W/kg

SAR(1 g) = 0.246 mW/g

SAR(10 g) = 0.143 mW/g

Power Drift = -0.410 dB

Maximum value of SAR (measured) = 0.269 mW/g



Date/Time: 2008-05-15 11:08:57

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358984/01/276084/2

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: 20.5C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(4.85, 4.85, 4.85); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1018
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, Middle, Silver covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.501 mW/g

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

Reference Value = 6.44 V/m

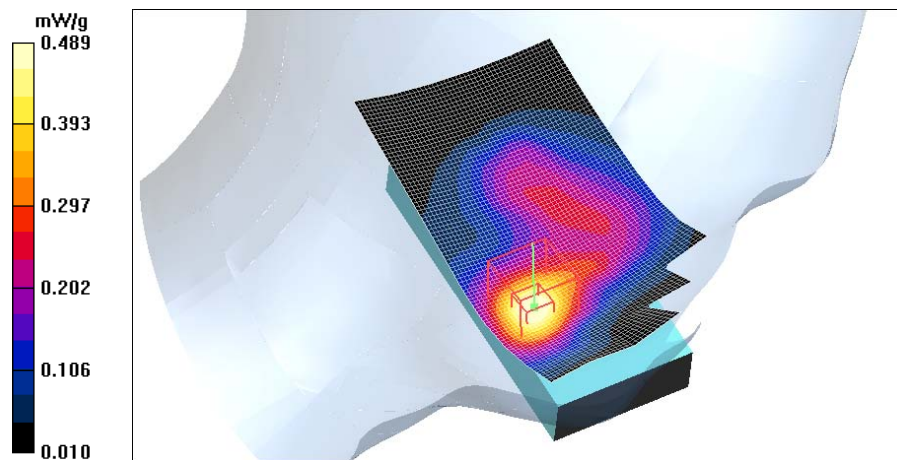
Peak SAR (extrapolated) = 0.673 W/kg

SAR(1 g) = 0.442 mW/g

SAR(10 g) = 0.259 mW/g

Power Drift = -0.362 dB

Maximum value of SAR (measured) = 0.489 mW/g



Date/Time: 2008-05-15 11:31:26

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358984/01/276084/2

Communication System: 3-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:2.8

Medium: HSL1900; Medium Notes: 21.0C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(4.85, 4.85, 4.85); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1018
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, Middle, Silver covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.449 mW/g

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

Reference Value = 6.35 V/m

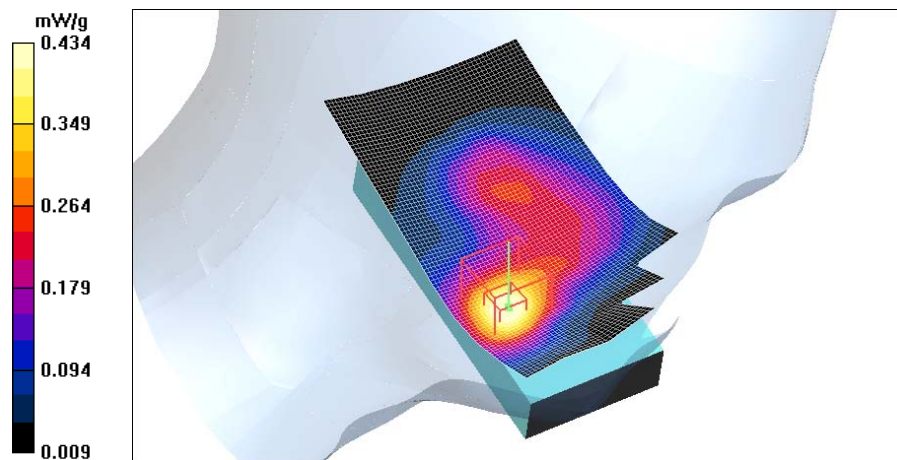
Peak SAR (extrapolated) = 0.594 W/kg

SAR(1 g) = 0.392 mW/g

SAR(10 g) = 0.230 mW/g

Power Drift = -0.398 dB

Maximum value of SAR (measured) = 0.434 mW/g



Date/Time: 2008-05-15 12:45:20

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358082/01/438829/8

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: 20.5C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395

- ConvF(4.85, 4.85, 4.85); Calibrated: 2007-07-18

- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn538; Calibrated: 2007-07-06

- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1018

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, Middle, Painted covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.792 mW/g

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

Reference Value = 9.15 V/m

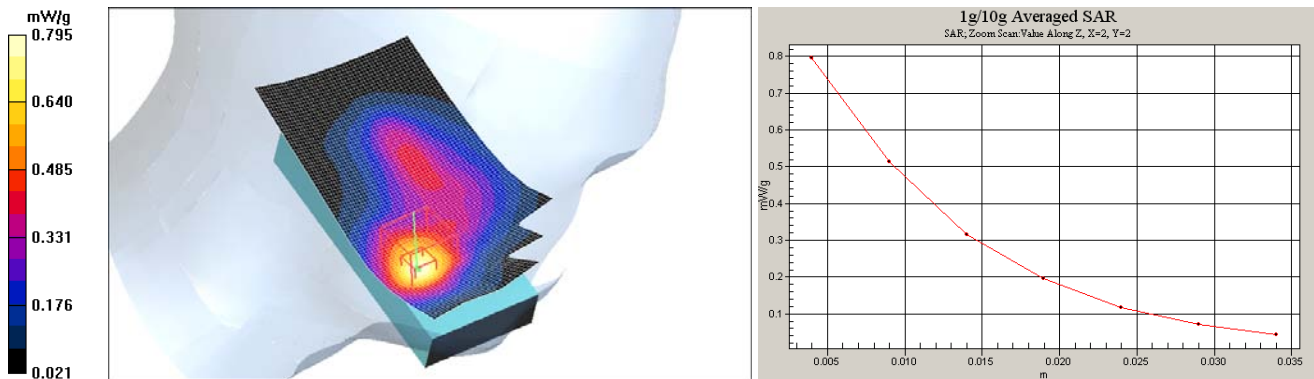
Peak SAR (extrapolated) = 1.08 W/kg

SAR(1 g) = 0.708 mW/g

SAR(10 g) = 0.406 mW/g

Power Drift = -0.182 dB

Maximum value of SAR (measured) = 0.795 mW/g



Date/Time: 2008-05-15 13:39:27

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358082/01/438829/8

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: 20.5C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(4.85, 4.85, 4.85); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1018
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, Middle, Painted covers, BT/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.687 mW/g

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

Reference Value = 8.81 V/m

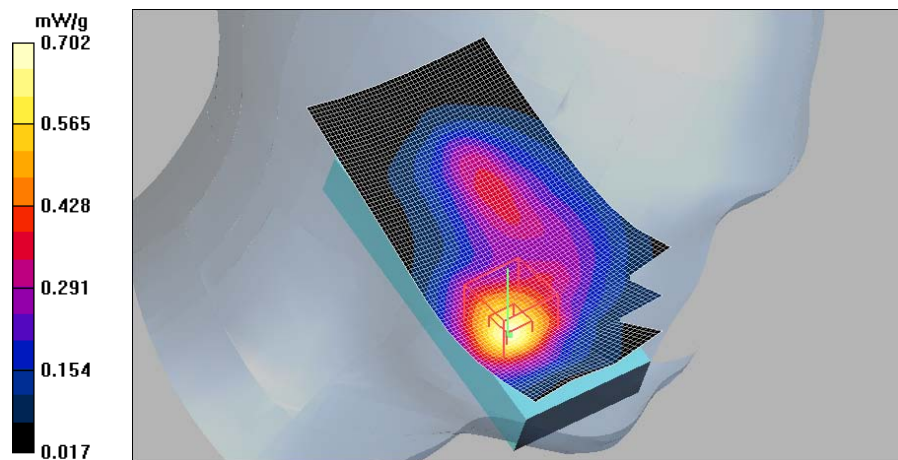
Peak SAR (extrapolated) = 0.976 W/kg

SAR(1 g) = 0.624 mW/g

SAR(10 g) = 0.359 mW/g

Power Drift = -0.024 dB

Maximum value of SAR (measured) = 0.702 mW/g



Date/Time: 2008-05-16 12:12:39

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358984/01/276082/6

Communication System: WLAN2450

Frequency: 2462 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: 21.2C

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.84$ mho/m; $\epsilon_r = 39.4$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.48, 4.48, 4.48); Calibrated: 2008-04-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2008-04-23
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, High, Silver covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.185 mW/g

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

Reference Value = 7.40 V/m

Peak SAR (extrapolated) = 0.399 W/kg

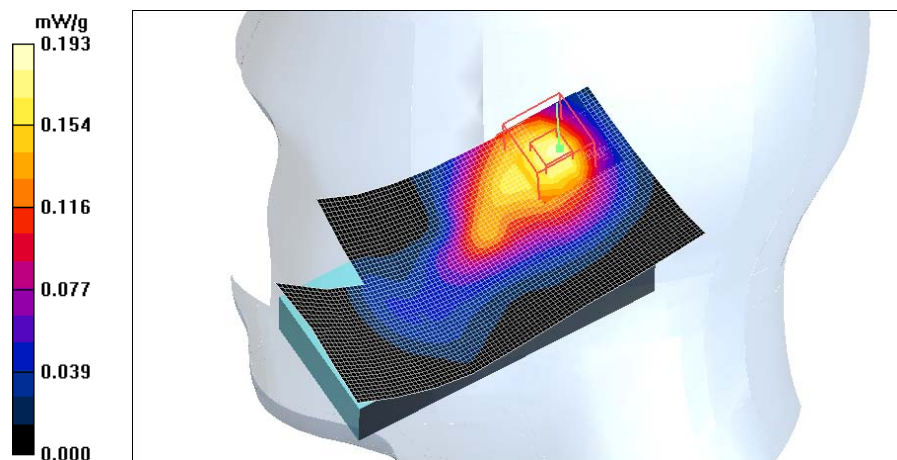
SAR(1 g) = 0.177 mW/g

SAR(10 g) = 0.089 mW/g

Power Drift = -0.020 dB

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

Maximum value of SAR (measured) = 0.193 mW/g



Date/Time: 2008-05-16 15:51:22

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358082/01/438808/2

Communication System: WLAN2450

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: 20.0C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.82$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.48, 4.48, 4.48); Calibrated: 2008-04-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2008-04-23
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, Middle, Painted covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.190 mW/g

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

Reference Value = 10.2 V/m

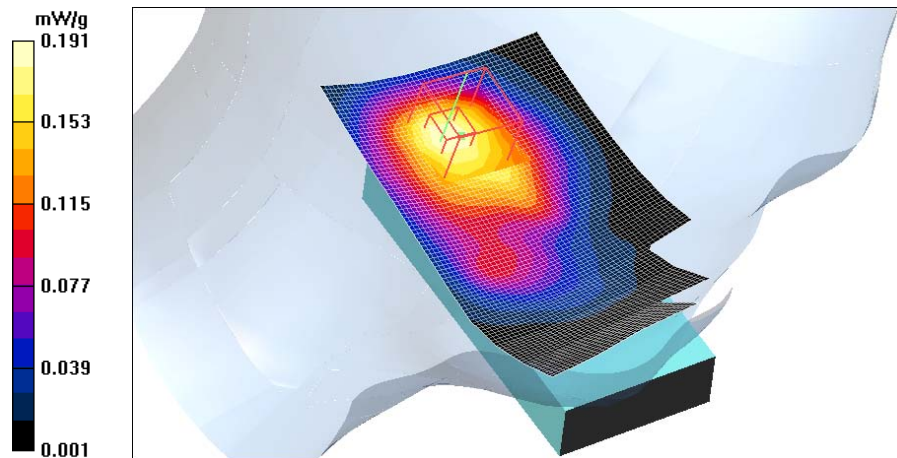
Peak SAR (extrapolated) = 0.333 W/kg

SAR(1 g) = 0.180 mW/g

SAR(10 g) = 0.099 mW/g

Power Drift = -0.196 dB

Maximum value of SAR (measured) = 0.191 mW/g



Date/Time: 2008-05-16 12:44:35

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358082/01/438808/2

Communication System: WLAN2450

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: 21.2C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.82$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.48, 4.48, 4.48); Calibrated: 2008-04-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2007-02-13
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Cheek position, Middle, Painted covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.273 mW/g

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

Reference Value = 8.86 V/m

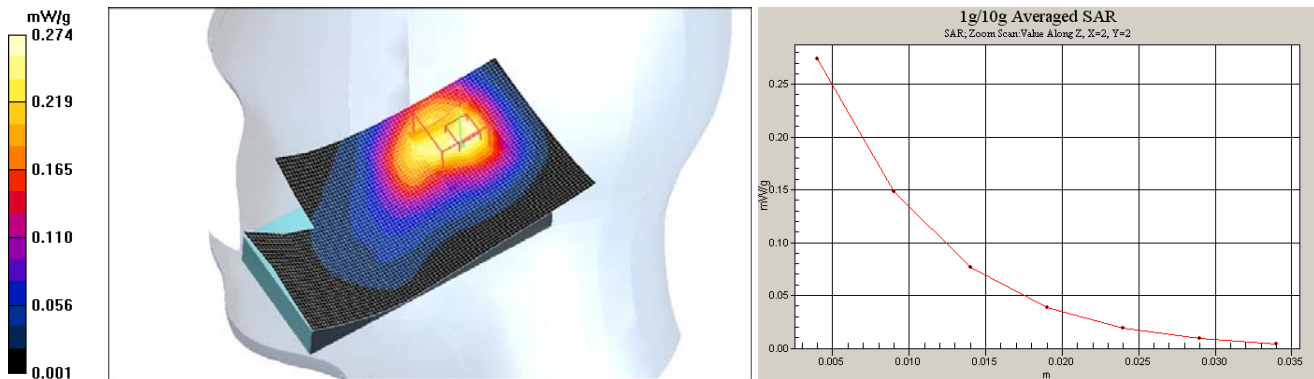
Peak SAR (extrapolated) = 0.536 W/kg

SAR(1 g) = 0.257 mW/g

SAR(10 g) = 0.134 mW/g

Power Drift = -0.163 dB

Maximum value of SAR (measured) = 0.274 mW/g



Date/Time: 2008-05-14 15:27:24

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358984/01/276084/2

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: BSL850; Medium Notes: 20.8C

Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.981 \text{ mho/m}$; $\epsilon_r = 54.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(5.69, 5.69, 5.69); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body Measurement, High, No accessory, Silver covers/Area Scan (51x91x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 1.03 mW/g

Body Measurement, High, No accessory, Silver covers/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 17.6 V/m

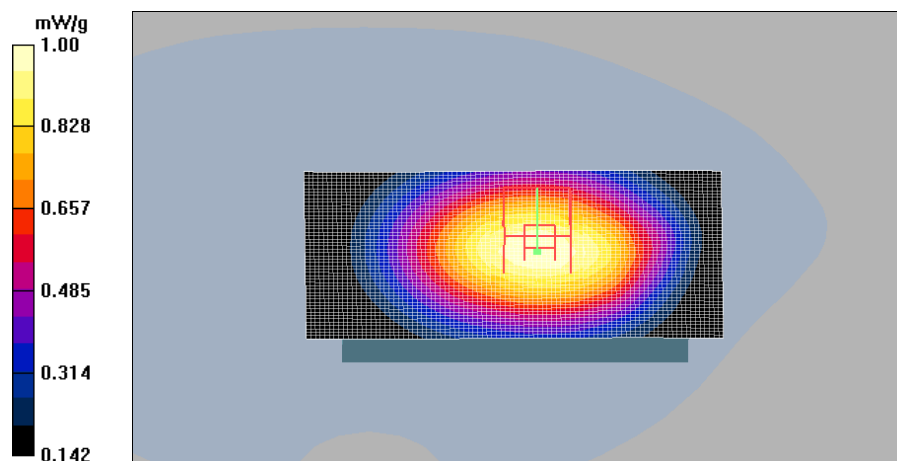
Peak SAR (extrapolated) = 1.16 W/kg

SAR(1 g) = 0.952 mW/g

SAR(10 g) = 0.706 mW/g

Power Drift = -0.225 dB

Maximum value of SAR (measured) = 1.00 mW/g



Date/Time: 2008-05-14 14:25:17

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358082/01/438829/8

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: BSL850; Medium Notes: 20.8C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.981$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(5.69, 5.69, 5.69); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body Measurement, High, No accessory, Painted covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.16 mW/g

Body Measurement, High, No accessory, Painted covers/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

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

Reference Value = 19.1 V/m

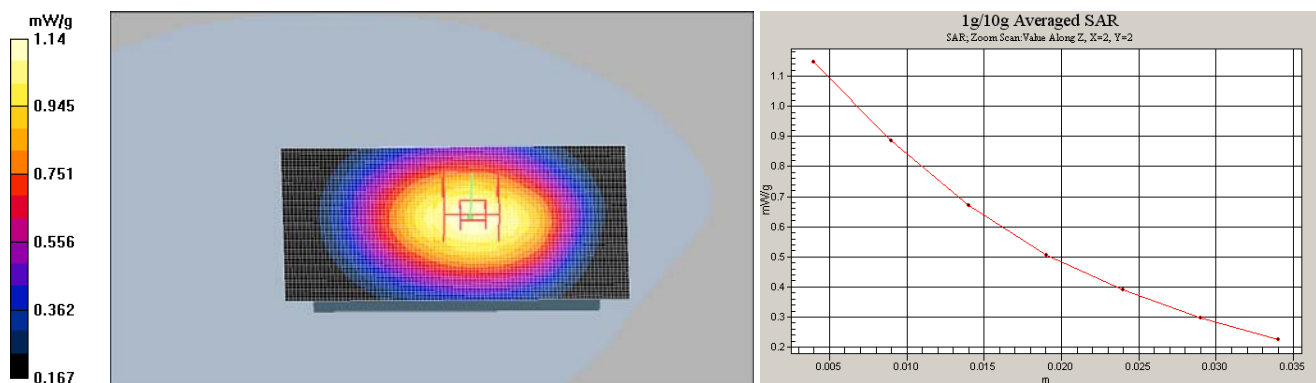
Peak SAR (extrapolated) = 1.32 W/kg

SAR(1 g) = 1.07 mW/g

SAR(10 g) = 0.794 mW/g

Power Drift = -0.232 dB

Maximum value of SAR (measured) = 1.14 mW/g



Date/Time: 2008-05-14 14:36:18

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358082/01/438829/8

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: BSL850; Medium Notes: 20.8C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.981$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(5.69, 5.69, 5.69); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body Measurement, High, No accessory, Painted covers, BT/Area Scan (51x91x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.02 mW/g

Body Measurement, High, No accessory, Painted covers, BT/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

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

Reference Value = 18.0 V/m

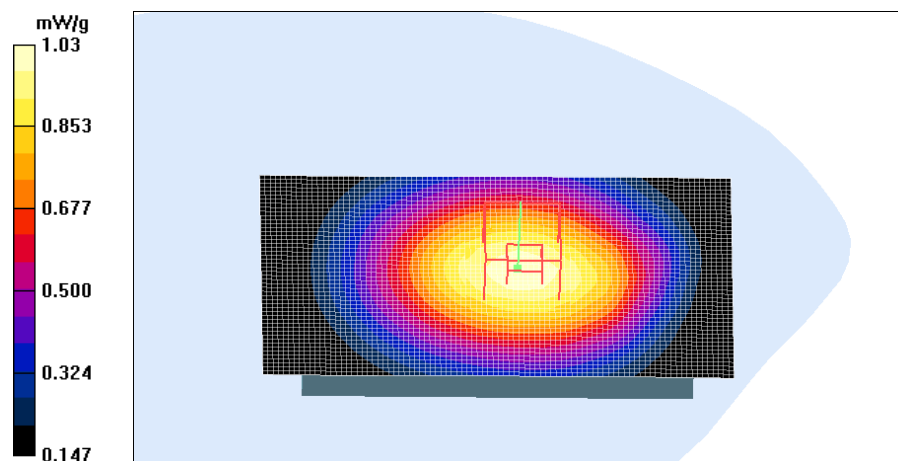
Peak SAR (extrapolated) = 1.20 W/kg

SAR(1 g) = 0.968 mW/g

SAR(10 g) = 0.713 mW/g

Power Drift = -0.079 dB

Maximum value of SAR (measured) = 1.03 mW/g



Date/Time: 2008-05-15 16:13:23

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358984/01/276084/2

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: BSL1900; Medium Notes: 21.4C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(4.51, 4.51, 4.51); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body Measurement, Middle, No accessory, Silver covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.250 mW/g

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

Reference Value = 10.2 V/m

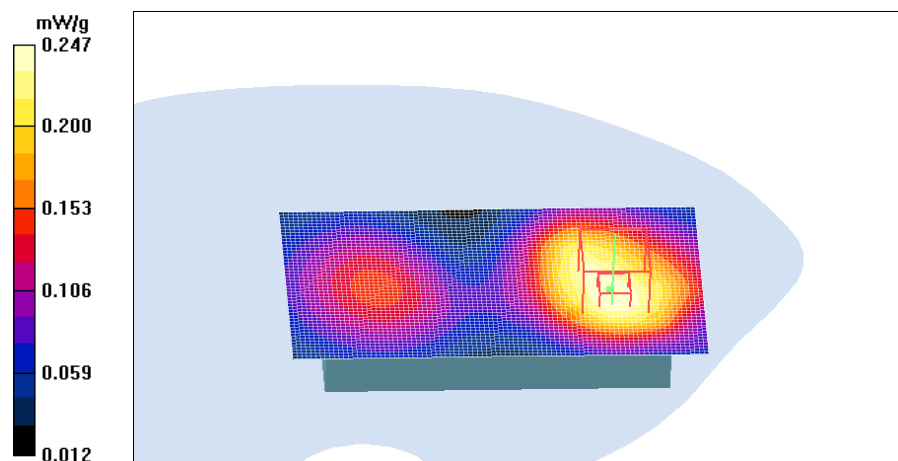
Peak SAR (extrapolated) = 0.367 W/kg

SAR(1 g) = 0.234 mW/g

SAR(10 g) = 0.151 mW/g

Power Drift = -0.086 dB

Maximum value of SAR (measured) = 0.247 mW/g



Date/Time: 2008-05-15 14:57:10

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358082/01/438829/8

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: BSL1900; Medium Notes: 21.4C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(4.51, 4.51, 4.51); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body Measurement, Middle, No accessory, Painted covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.368 mW/g

Body Measurement, Middle, No accessory, Painted covers/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

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

Reference Value = 12.4 V/m

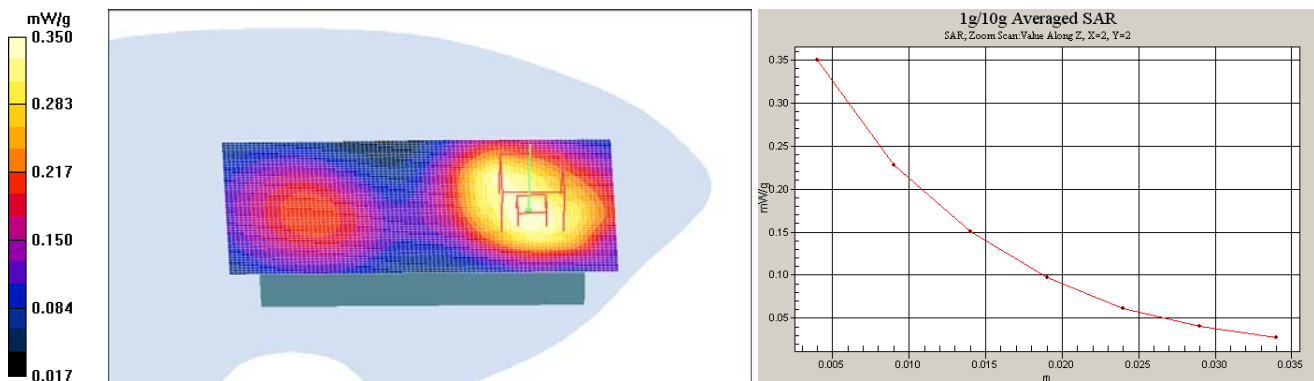
Peak SAR (extrapolated) = 0.517 W/kg

SAR(1 g) = 0.331 mW/g

SAR(10 g) = 0.215 mW/g

Power Drift = -0.267 dB

Maximum value of SAR (measured) = 0.350 mW/g



Date/Time: 2008-05-15 15:40:12

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358082/01/438829/8

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: BSL1900; Medium Notes: 21.4C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.53$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1395
- ConvF(4.51, 4.51, 4.51); Calibrated: 2007-07-18
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2007-07-06
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body Measurement, Middle, No accessory, Painted covers, BT/Area Scan (51x91x1): Measurement grid:

$dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.345 mW/g

Body Measurement, Middle, No accessory, Painted covers, BT/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

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

Reference Value = 11.6 V/m

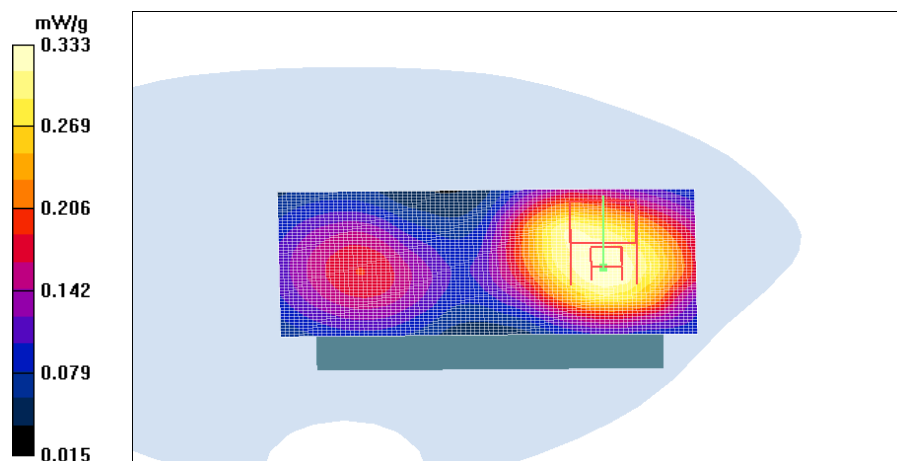
Peak SAR (extrapolated) = 0.494 W/kg

SAR(1 g) = 0.315 mW/g

SAR(10 g) = 0.207 mW/g

Power Drift = -0.116 dB

Maximum value of SAR (measured) = 0.333 mW/g



Date/Time: 2008-05-15 14:48:24

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358984/01/276082/6

Communication System: WLAN2450

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: 20.5C

Medium parameters used: $f = 2442$ MHz; $\sigma = 2.02$ mho/m; $\epsilon_r = 50.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.16, 4.16, 4.16); Calibrated: 2008-04-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2008-04-23
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body Measurement, Middle, No accessory, Silver covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.062 mW/g

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

Reference Value = 4.19 V/m

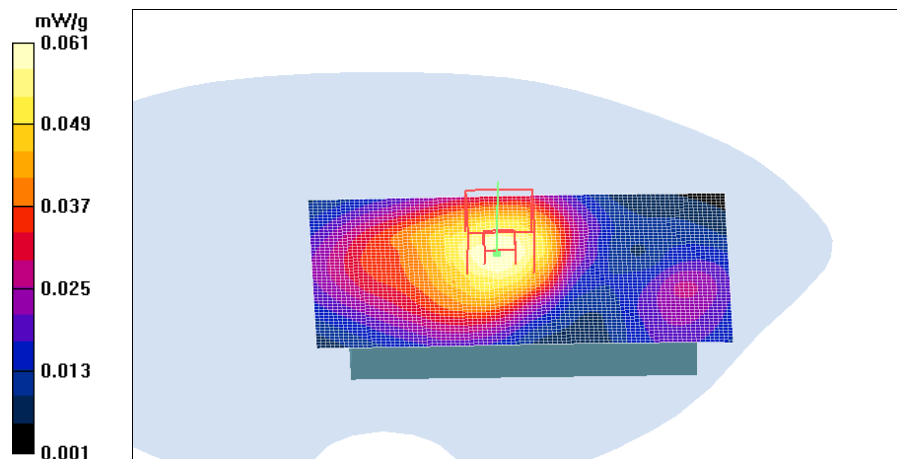
Peak SAR (extrapolated) = 0.101 W/kg

SAR(1 g) = 0.058 mW/g

SAR(10 g) = 0.034 mW/g

Power Drift = -0.044 dB

Maximum value of SAR (measured) = 0.061 mW/g



Date/Time: 2008-05-15 16:36:44

Test Laboratory: TCC Nokia

Type: RM-313; Serial: 358082/01/438808/2

Communication System: WLAN2450

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: 20.5C

Medium parameters used: $f = 2442$ MHz; $\sigma = 2.02$ mho/m; $\epsilon_r = 50.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.16, 4.16, 4.16); Calibrated: 2008-04-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2008-04-23
- Phantom: SAM 3; Type: SAM 4.0; Serial: 1272
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body Measurement, Middle, No accessory, Painted covers/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.068 mW/g

Body Measurement, Middle, No accessory, Painted covers/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

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

Reference Value = 4.09 V/m

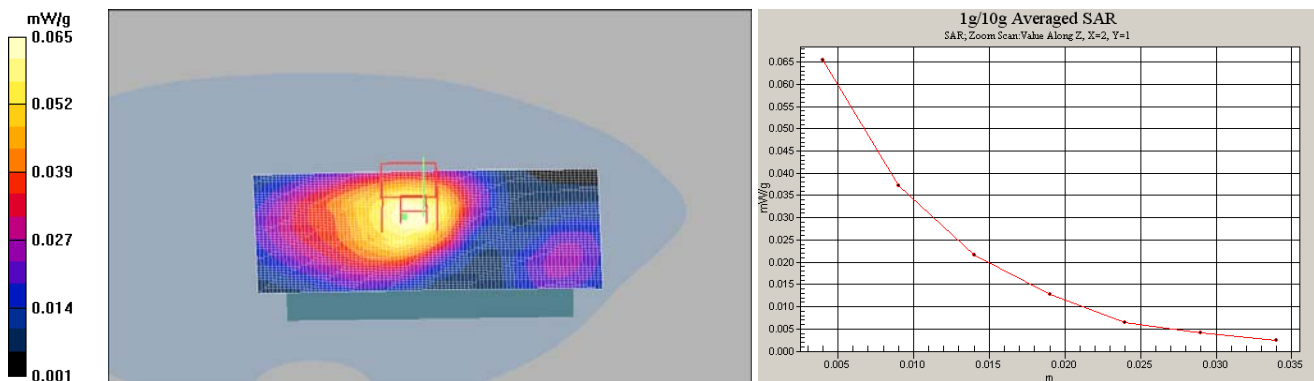
Peak SAR (extrapolated) = 0.107 W/kg

SAR(1 g) = 0.061 mW/g

SAR(10 g) = 0.036 mW/g

Power Drift = -0.161 dB

Maximum value of SAR (measured) = 0.065 mW/g



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

See the following pages.

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

See the following pages.