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SAR Compliance Test Report

Test report no.:	Salo_SAR_0605_03	**Date of report:**	2006-03-01
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Tested device:	RM-55		
FCC ID:	QVVRM-55	**IC:**	661AE-RM55
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 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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Test System Manager

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2006-01-31 to 2006-02-22
SN, HW and SW numbers of tested device	SN: 004400/80/172229/7, HW: 4002, SW: 2.0551.0, DUT: 11017 SN: 004400/80/172229/7, HW: 4002, SW: 02.0.026, DUT: 11017
Batteries used in testing	BP-6M, DUT: 11020, 11021
Headsets used in testing	HS-6, DUT: 11019
Other accessories used in testing	MU-card, DUT: 11022
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 GPRS1900	810 / 1909.8	28.5dBm EIRP	Right, Cheek	0.61 W/kg	**0.68 W/kg**	1.6 W/kg	PASSED
3-slot GPRS1900 + WLAN2450	-	-	Right, Cheek	0.62 W/kg	**0.69 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 GPRS1900	661 / 1880.0	28.7 dBm EIRP	1.5cm	1.02 W/kg	**1.14 W/kg**	1.6 W/kg	PASSED
3-slot GPRS1900 + WLAN2450	-	-	1.5cm	1.10 W/kg	**1.23 W/kg**	1.6 W/kg	PASSED

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

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1.2.3 Maximum Drift

Maximum drift covered by 12% scaling up of the SAR values	Maximum drift during measurements
0.5dB	-0.50dB

1.2.4 Measurement Uncertainty

Expanded Uncertainty (k=2) 95%	± 25.8%

2. DESCRIPTION OF THE DEVICE UNDER TEST

Device category	Portable
Exposure environment	General population / uncontrolled

Modes and Bands of Operation	GSM 1900	GPRS 1900	EGPRS 1900	BT	WLAN
Modulation Mode	GMSK	GMSK	GMSK / 8PSK	GFSK	
Duty Cycle	1/8	1/8 to 3/8	1/8 to 3/8		1
Transmitter Frequency Range (MHz)	1850 - 1910	1850 - 1910	1850 - 1910	2402-2480	2412-2462

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

This device has Push to Talk and Voice over IP capability for use at the ear. Therefore, SAR for 2-slot and 3-slot GPRS modes were evaluated against the head profile of the phantom.

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2.1 Picture of the Device

2.2 Description of the Antenna

The device has internal patch antennas.

3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	21.7 – 22.8
Ambient humidity (RH %):	30 - 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 as used for SAR testing.

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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 V1	372	12 months	2006-08
E-field Probe ET3DV6	1395	12 months	2006-09
E-field Probe ET3DV6	1766	12 months	2006-04
Dipole Validation Kit, D1900V2	5d013	24 months	2006-07
Dipole Validation Kit, D2450V2	749	24 months	2006-06
DASY4 software	Version 4.6	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration interval	Calibration expiry
Signal Generator	SML03	101265	12 months	2006-07
Amplifier	ZHL-42 (SMA)	N072095-5	-	-
Power Meter	NRVS	849305/028	12 months	2006-07
Power Sensor	NRV-Z32	839176/020	12 months	2006-07
Call Tester	CMU 200	101111	-	-
Call Tester	CMU 200	104983	-	-
Vector Network Analyzer	8753E	US38432928	12 months	2006-10
Dielectric Probe Kit	85070B	US33020420	-	-

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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 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm Tip length: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application	General dosimetry up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

4.2 Phantoms

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

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

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

4.3 Tissue Simulants

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

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

4.3.1 Tissue Simulant Recipes

The following recipes were used for Head and Body tissue simulants:

1900MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	54.50	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	70.2
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.

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System checking, head tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			εr	σ [S/m]	
1900	Reference result ± 10% window	10.0 9.0 – 11.0	39.4	1.44	
	2006-01-31	10.8	38.3	1.42	21.9
2450	Reference result ± 10% window	13.5 12.2 – 14.8	38.5	1.86	
	2006-02-21	14.0	37.9	1.87	20.7
	2006-02-22	14.0	37.6	1.85	21.4

System checking, body tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			εr	σ [S/m]	
1900	Reference result ± 10% window	10.4 9.4 – 11.4	52.2	1.58	
	2006-02-01	11.1	53.0	1.55	21.9

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]
		εr	σ [S/m]	
1880	Recommended value ± 5% window	40.0 38.0 – 42.0	1.40 1.33 – 1.47	
	2006-01-31	38.0	1.39	21.0
2442	Recommended value ± 5% window	39.2 37.3 – 41.2	1.79 1.70 – 1.88	
	2006-02-21	38.0	1.85	21.0
	2006-02-22	37.6	1.84	21.0

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Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ε_r	σ [S/m]	
1880	Recommended value	53.3	1.52	
	± 5% window	50.6 – 56.0	1.44 – 1.60	
	2006-02-01	52.6	1.52	21.0
2442	Recommended value	52.7	1.94	
	± 5% window	50.1 – 55.3	1.85 – 2.04	
	2006-02-22	52.6	1.91	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

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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

Photo of the device in “tilt” position

5.2.2 Body Worn Configuration

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

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

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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.

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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	±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**	

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7. RESULTS

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

1900MHz, SAR results

Option Flip	Option MU-card	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**		**29.2 dBm**	**31.9 dBm**	**29.2 dBm**
Open	Without MU-card	Left	Cheek	-	0.165	-
	2-slot GPRS	**Power**		**29.8 dBm**	**32.4 dBm**	**30.4 dBm**
Open	Without MU-card	Left	Cheek	-	0.311	-
			Tilt	-	-	-
		Right	Cheek	0.408	0.456	**0.603**
			Tilt	-	-	-
	3-slot GPRS	**Power**		**28.0 dBm**	**30.5 dBm**	**28.5 dBm**
Open	Without MU-card	Left	Cheek	-	0.327	-
			Tilt	-	0.152	-
		Right	Cheek	0.428	0.486	**0.611**
			Tilt	-	0.138	-
	3-slot EGPRS	**Power**		**27.6 dBm**	**26.3 dBm**	**25.2 dBm**
Open	Without MU-card	Right Cheek		-	-	0.223
Open	3-slot GPRS withMU-card	Right Cheek		-	-	0.603
	3-slot GPRS without MU-card	Right Cheek with BT active		-	-	0.598

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2450MHz, SAR results

Option Flip	Option MU-card	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		19.2 dBm	23.3 dBm	23.6 dBm
Open	Without MU-card	Left	Cheek	0.0098	0.0095	**0.0103**
			Tilt	-	0.0058	-
		Right	Cheek	-	0.0076	-
			Tilt	-	0.0043	-
Open	WLAN withMU-card	Left Cheek		-	-	**0.0104**

1900MHz, Body SAR results

Option Flip	Option MU-card	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	29.0 dBm	30.9 dBm	29.2 dBm
Closed	Without MU-card	Without headset	0.873	0.832	-
3-slot GPRS		Power	28.2 dBm	28.7 dBm	27.7 dBm
Closed	Without MU-card	Without headset	1.01	**1.02**	0.858
		Headset HS-6	0.833	0.919	0.756
Closed	3-slot GPRS with MU-card	Without headset	-	0.996	-
Closed	3-slot GPRS without MU-card	Without headset and with BT active	-	0.932	-

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2450MHz, Body SAR results

Option Flip	Option MU-card	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	20.9 dBm	21.1 dBm	21.4 dBm
Closed	Without MU-card	Without headset	0.046	0.061	**0.081**
		Headset HS-6	0.030	0.055	0.054
Closed	WLAN with MU-card	Without headset	-	-	0.064

Simultaneous transmissions: Combined SAR results

Flip	Test configuration	Max. 1g SAR results		Combined 1g SAR values
		WLAN	Cellular 1900MHz	WLAN + Cellular 1900MHz
Open	Head: Left, Cheek	0.0104	0.327	0.337
	Head: Left, Tilt	0.0058	0.152	0.158
	Head: Right, Cheek	0.0076	0.611	**0.619**
	Head: Right, Tilt	0.0043	0.138	0.142
Closed	Body: With Headset	0.055	0.919	0.974
	Body: Without Headset	0.081	1.02	**1.10**

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.

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APPENDIX A: SYSTEM CHECKING SCANS

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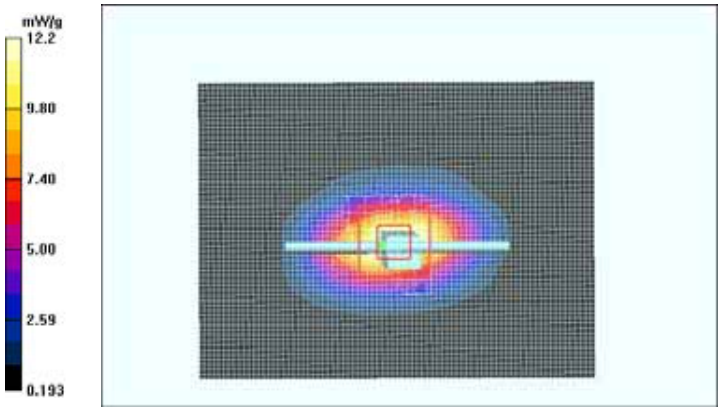
Date/Time: 2006-01-31 09:36:50
Test Laboratory: TCC Nokia
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d013, Program Name: System Check

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.42 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.73, 4.73, 4.73); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

d=15mm, Pin=250mW, t=21.9 C/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.8 mW/g

d=15mm, Pin=250mW, t=21.9 C/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 99.4 V/m; Power Drift = -0.026 dB
Peak SAR (extrapolated) = 18.7 W/kg
SAR(1 g) = 10.8 mW/g; SAR(10 g) = 5.69 mW/g
Maximum value of SAR (measured) = 12.2 mW/g



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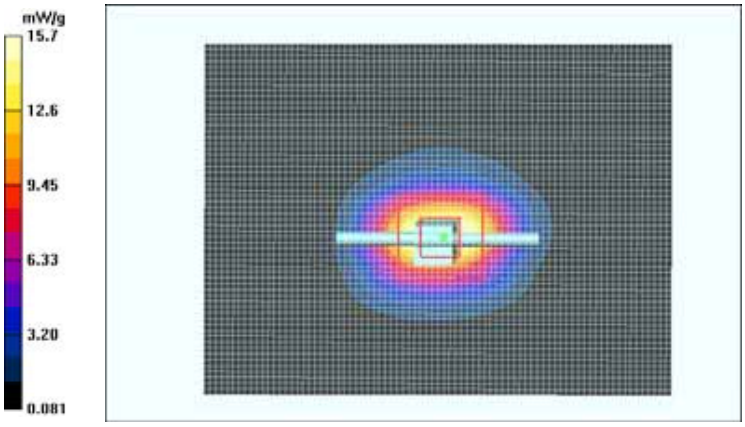
Date/Time: 2006-02-21 11:03:57
Test Laboratory: TCC Nokia
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:749, Program Name: System Check

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.87 mho/m; ε_r = 37.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; ConvF(4.35, 4.35, 4.35); Calibrated: 22.04.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

d=15mm, Pin=250mW, t=20.7 C/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 16.5 mW/g

d=15mm, Pin=250mW, t=20.7 C/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.4 V/m; Power Drift = -0.055 dB
Peak SAR (extrapolated) = 29.9 W/kg
SAR(1 g) = 14 mW/g; SAR(10 g) = 6.44 mW/g
Maximum value of SAR (measured) = 15.7 mW/g



Copyright © 2006 TCC Nokia

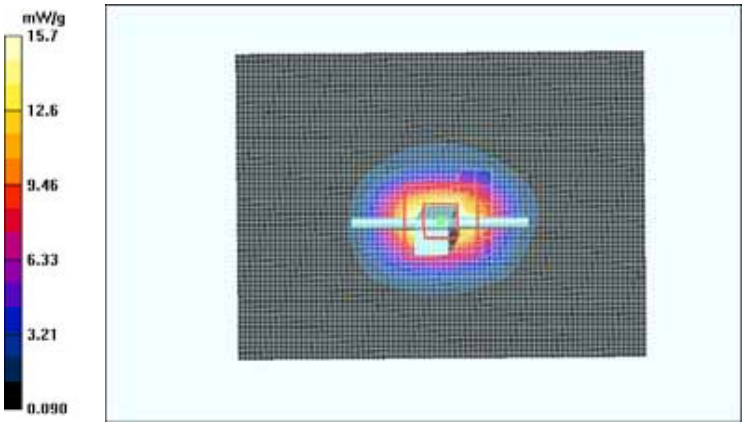
Date/Time: 2006-02-22 07:46:30
Test Laboratory: TCC Nokia
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:749, Program Name: System Check

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2450 MHz; σ = 1.85 mho/m; ε_r = 37.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; ConvF(4.35, 4.35, 4.35); Calibrated: 22.04.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

d=15mm, Pin=250mW, t=21.4 C/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 16.4 mW/g

d=15mm, Pin=250mW, t=21.4 C/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 97.7 V/m; Power Drift = -0.009 dB
Peak SAR (extrapolated) = 29.8 W/kg
SAR(1 g) = 14 mW/g; SAR(10 g) = 6.44 mW/g
Maximum value of SAR (measured) = 15.7 mW/g



Copyright © 2006 TCC Nokia

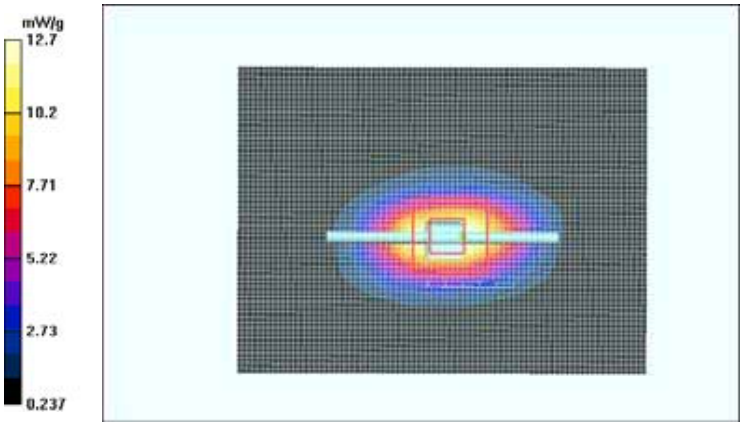
Date/Time: 2006-02-01 10:10:16
Test Laboratory: TCC Nokia
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d013, Program Name: System Check

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium parameters used: f = 1900 MHz; σ = 1.55 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.19, 4.19, 4.19); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

d=15mm, Pin=250mW, t=21.9 C/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 13.3 mW/g

d=15mm, Pin=250mW, t=21.9 C/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.3 V/m; Power Drift = -0.011 dB
Peak SAR (extrapolated) = 19.5 W/kg
SAR(1 g) = 11.1 mW/g; SAR(10 g) = 5.9 mW/g
Maximum value of SAR (measured) = 12.7 mW/g



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APPENDIX B: MEASUREMENT SCANS

Copyright © 2006 TCC Nokia

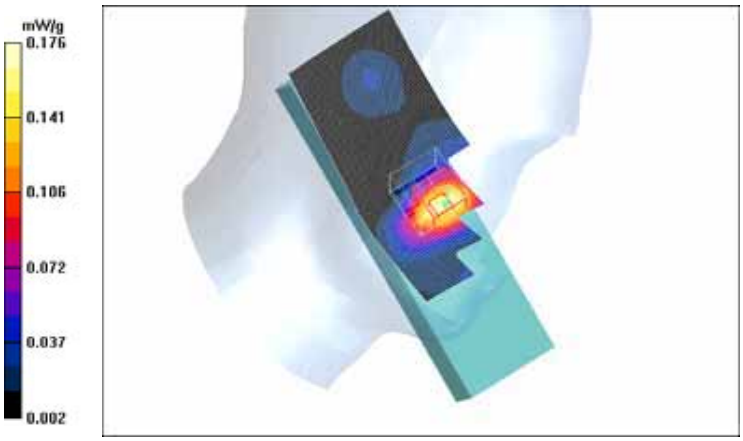
Date/Time: 2006-01-31 10:55:51
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Left, Advanced Extrapolation, t=21.5 C, Flip open,no MU, no BT

Communication System: GSM1900; Frequency: 1880 MHz;Duty Cycle: 1:8.3
Medium parameters used: f = 1880 MHz; σ = 1.39 mho/m; ε_r = 38; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.73, 4.73, 4.73); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Cheek position /Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.180 mW/g

Cheek position /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 4.10 V/m; Power Drift = -0.039 dB
Peak SAR (extrapolated) = 0.239 W/kg
SAR(1 g) = 0.165 mW/g; SAR(10 g) = 0.096 mW/g
Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube.
Maximum value of SAR (measured) = 0.176 mW/g



Copyright © 2006 TCC Nokia

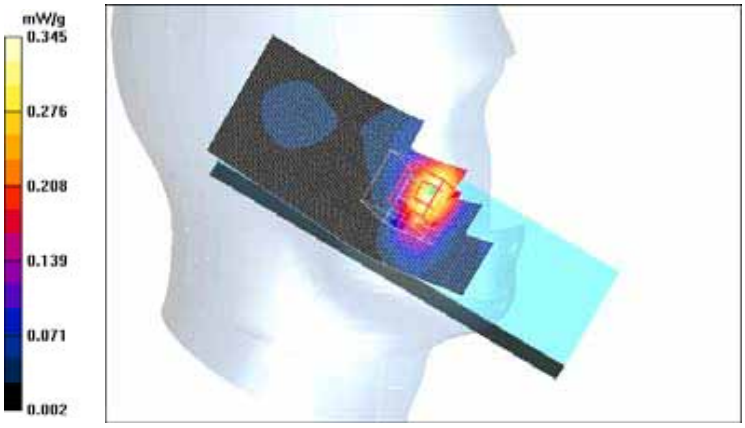
Date/Time: 2006-01-31 12:18:20
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Left, Advanced Extrapolation, t=21.0 C, Flip open, no MU, no BT

Communication System: 2-slot GPRS1900; Frequency: 1880 MHz;Duty Cycle: 1:4.2
Medium parameters used: f = 1880 MHz; σ = 1.39 mho/m; ε_r = 38; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.73, 4.73, 4.73); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Cheek position /Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.344 mW/g

Cheek position /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 5.45 V/m; Power Drift = -0.244 dB
Peak SAR (extrapolated) = 0.459 W/kg
SAR(1 g) = 0.311 mW/g; SAR(10 g) = 0.180 mW/g
Maximum value of SAR (measured) = 0.345 mW/g



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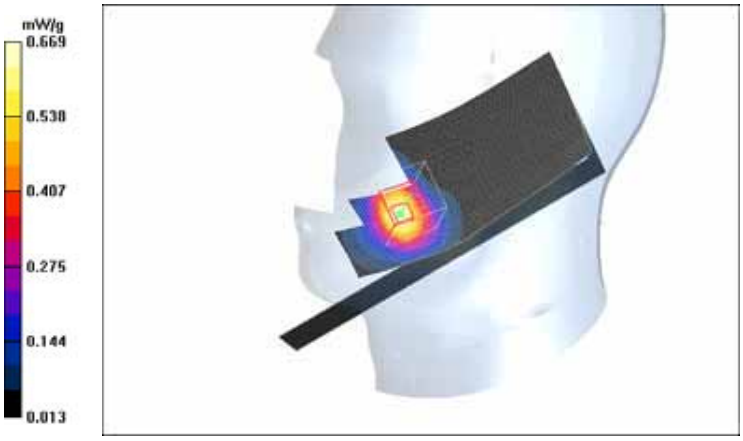
Date/Time: 2006-01-31 16:25:50
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Right, Advanced Extrapolation, t=20.6 C, Flip open, no MU, no BT

Communication System: 2-slot GPRS1900; Frequency: 1909.8 MHz;Duty Cycle: 1:4.2
Medium parameters used: f = 1910 MHz; σ = 1.43 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.73, 4.73, 4.73); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Cheek position/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.664 mW/g

Cheek position/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 5.06 V/m; Power Drift = -0.220 dB
Peak SAR (extrapolated) = 0.909 W/kg
SAR(1 g) = 0.603 mW/g; SAR(10 g) = 0.351 mW/g
Maximum value of SAR (measured) = 0.669 mW/g



Copyright © 2006 TCC Nokia

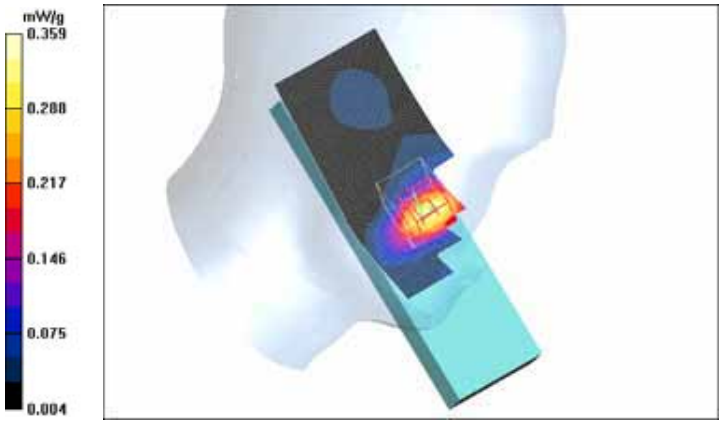
Date/Time: 2006-01-31 12:51:53
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Left, Advanced Extrapolation, t=20.8 C, Flip open, no MU, no BT

Communication System: 3-slot GPRS1900; Frequency: 1880 MHz;Duty Cycle: 1:2.8
Medium parameters used: f = 1880 MHz; σ = 1.39 mho/m; ε_r = 38; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.73, 4.73, 4.73); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Cheek position/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.357 mW/g

Cheek position/Zoom Scan 2 (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 5.69 V/m; Power Drift = -0.198 dB
Peak SAR (extrapolated) = 0.478 W/kg
SAR(1 g) = 0.327 mW/g; SAR(10 g) = 0.195 mW/g
Maximum value of SAR (measured) = 0.359 mW/g



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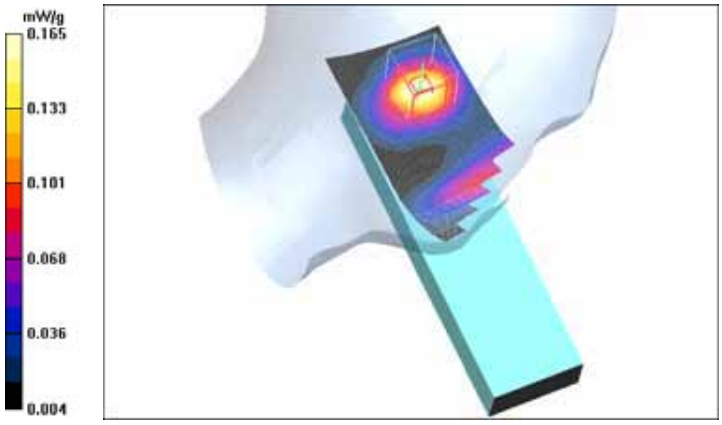
Date/Time: 2006-01-31 13:45:16
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Left, Advanced Extrapolation, t=20.8 C, Flip open, no MU, no BT

Communication System: 3-slot GPRS1900; Frequency: 1880 MHz;Duty Cycle: 1:2.8
Medium parameters used: f = 1880 MHz; σ = 1.39 mho/m; ε_r = 38; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.73, 4.73, 4.73); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Tilt position/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.184 mW/g

Tilt position/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 10.4 V/m; Power Drift = -0.187 dB
Peak SAR (extrapolated) = 0.221 W/kg
SAR(1 g) = 0.152 mW/g; SAR(10 g) = 0.092 mW/g
Maximum value of SAR (measured) = 0.165 mW/g



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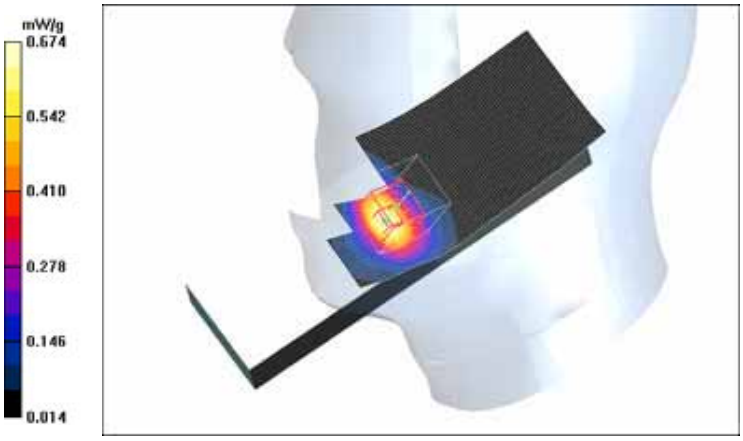
Date/Time: 2006-01-31 15:43:30
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Right, Advanced Extrapolation, t=20.4 C, Flip open, no MU, no BT

Communication System: 3-slot GPRS1900; Frequency: 1909.8 MHz;Duty Cycle: 1:2.8
Medium parameters used: f = 1910 MHz; σ = 1.43 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.73, 4.73, 4.73); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Cheek position/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.674 mW/g

Cheek position/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 5.21 V/m; Power Drift = -0.504 dB
Peak SAR (extrapolated) = 0.918 W/kg
SAR(1 g) = 0.611 mW/g; SAR(10 g) = 0.357 mW/g
Maximum value of SAR (measured) = 0.674 mW/g



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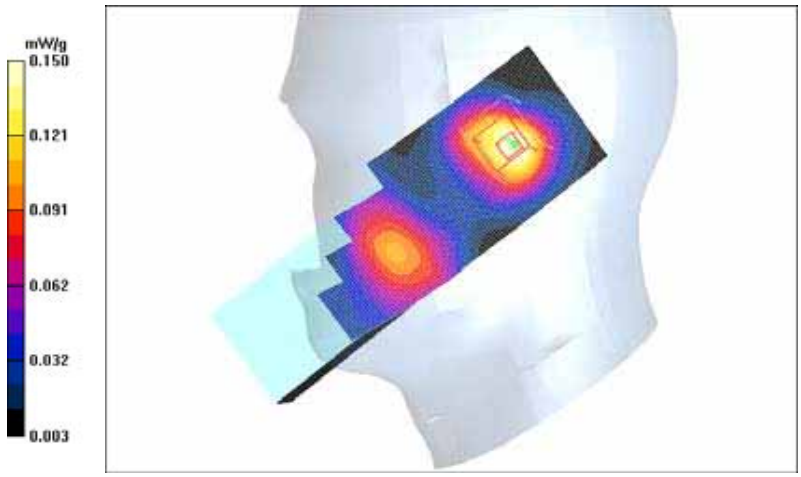
Date/Time: 2006-01-31 14:37:31
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Right, Advanced Extrapolation, t=20.6 C, Flip open, no MU, no BT

Communication System: 3-slot GPRS1900; Frequency: 1880 MHz;Duty Cycle: 1:2.8
Medium parameters used: f = 1880 MHz; σ = 1.39 mho/m; ε_r = 38; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.73, 4.73, 4.73); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Tilt position/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.163 mW/g

Tilt position/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 10.4 V/m; Power Drift = -0.139 dB
Peak SAR (extrapolated) = 0.196 W/kg
SAR(1 g) = 0.138 mW/g; SAR(10 g) = 0.087 mW/g
Maximum value of SAR (measured) = 0.150 mW/g



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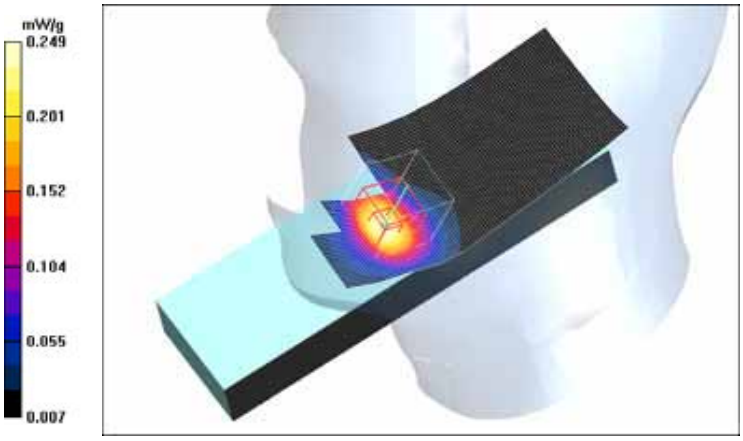
Date/Time: 2006-01-31 19:36:18
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Right, Advanced Extrapolation, t=20.3 C, Flip open, no MU, no BT

Communication System: 3-slot EGPRS1900; Frequency: 1909.8 MHz;Duty Cycle: 1:2.8
Medium parameters used: f = 1910 MHz; σ = 1.43 mho/m; ε_r = 38.4; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.73, 4.73, 4.73); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Cheek position/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.243 mW/g

Cheek position/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 3.15 V/m; Power Drift = -0.013 dB
Peak SAR (extrapolated) = 0.334 W/kg
SAR(1 g) = 0.223 mW/g; SAR(10 g) = 0.132 mW/g
Maximum value of SAR (measured) = 0.249 mW/g



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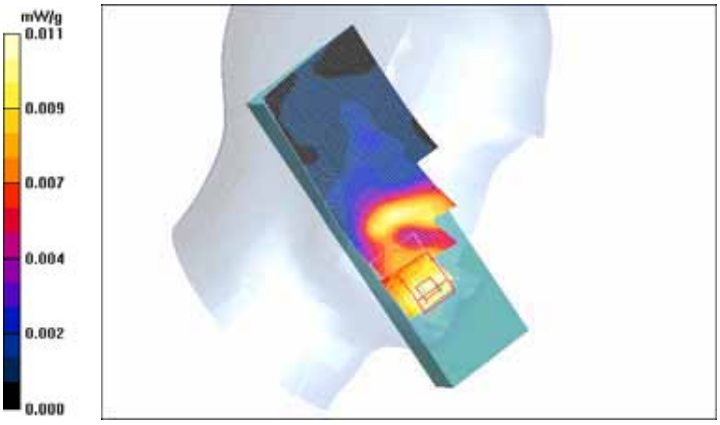
Date/Time: 2006-02-21 16:35:26
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Left, Advanced Extrapolation, t=19.8 C, Flip open, no MU,

Communication System: WLAN 2450; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2462 MHz; σ = 1.88 mho/m; ε_r = 37.9; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; ConvF(4.35, 4.35, 4.35); Calibrated: 22.04.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Cheek position/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.011 mW/g

Cheek position/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.778 V/m; Power Drift = -0.242 dB
Peak SAR (extrapolated) = 0.019 W/kg
SAR(1 g) = 0.010 mW/g; SAR(10 g) = 0.00591 mW/g
Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube.
Maximum value of SAR (measured) = 0.011 mW/g



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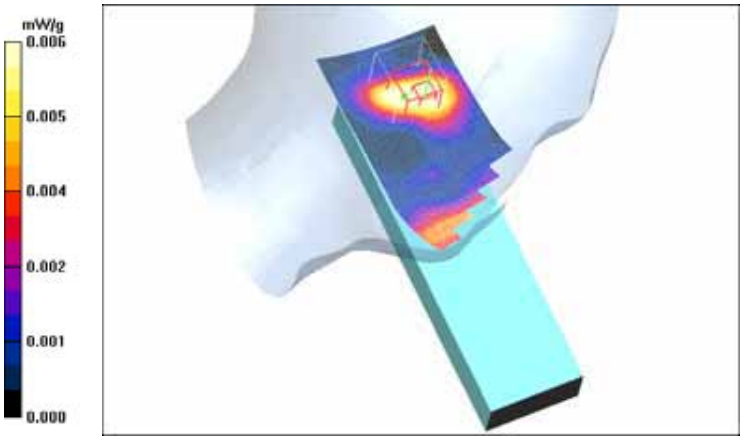
Date/Time: 2006-02-21 12:18:33
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Left, Advanced Extrapolation, t=20.5 C, Flip open,no MU

Communication System: WLAN 2450; Frequency: 2442 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2442 MHz; σ = 1.85 mho/m; ε_r = 38; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; ConvF(4.35, 4.35, 4.35); Calibrated: 22.04.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Tilt position/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.008 mW/g

Tilt position/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.96 V/m; Power Drift = -0.359 dB
Peak SAR (extrapolated) = 0.013 W/kg
SAR(1 g) = 0.00582 mW/g; SAR(10 g) = 0.00318 mW/g
Maximum value of SAR (measured) = 0.006 mW/g



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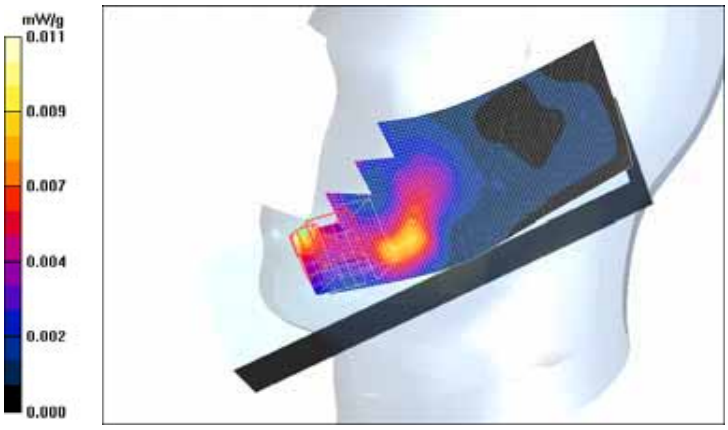
Date/Time: 2006-02-21 12:58:40
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Right, Advanced Extrapolation, t=20.5 C, Flip open, no MU

Communication System: WLAN 2450; Frequency: 2442 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2442 MHz; σ = 1.85 mho/m; ε_r = 38; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; ConvF(4.35, 4.35, 4.35); Calibrated: 22.04.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Cheek position/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.009 mW/g

Cheek position/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.971 V/m; Power Drift = -0.503 dB
Peak SAR (extrapolated) = 0.017 W/kg
SAR(1 g) = 0.00764 mW/g; SAR(10 g) = 0.00328 mW/g
Warning: Maximum averaged SAR over 1 g is located on the boundary of the measurement cube.
Maximum averaged SAR over 10 g is located on the boundary of the measurement cube.
Maximum value of SAR (measured) = 0.011 mW/g



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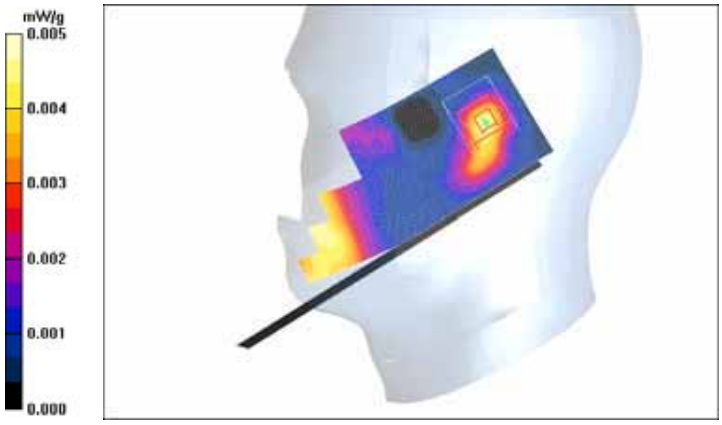
Date/Time: 2006-02-21 14:25:06
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Right, Advanced Extrapolation, t=20.3 C, Flip open,no MU

Communication System: WLAN 2450; Frequency: 2442 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2442 MHz; σ = 1.85 mho/m; ε_r = 38; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; ConvF(4.35, 4.35, 4.35); Calibrated: 22.04.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Tilt position/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.005 mW/g

Tilt position/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.75 V/m; Power Drift = -0.063 dB
Peak SAR (extrapolated) = 0.007 W/kg
SAR(1 g) = 0.00428 mW/g; SAR(10 g) = 0.0022 mW/g
Maximum value of SAR (measured) = 0.005 mW/g



Copyright © 2006 TCC Nokia

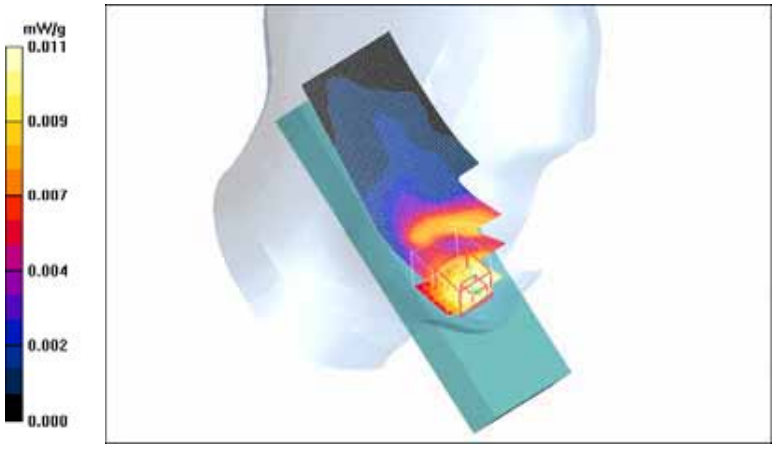
Date/Time: 2006-02-21 17:16:41
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Head Measurement - Left, Advanced Extrapolation, t=19.8 C, Flip open, MU

Communication System: WLAN 2450; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2462 MHz; σ = 1.88 mho/m; ε_r = 37.9; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; ConvF(4.35, 4.35, 4.35); Calibrated: 22.04.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Cheek position/Area Scan (51x141x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.011 mW/g

Cheek position/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.755 V/m; Power Drift = 0.057 dB
Peak SAR (extrapolated) = 0.018 W/kg
SAR(1 g) = 0.010 mW/g; SAR(10 g) = 0.00583 mW/g
Warning: Maximum averaged SAR over 10 g is located on the boundary of the measurement cube.
Maximum value of SAR (measured) = 0.011 mW/g



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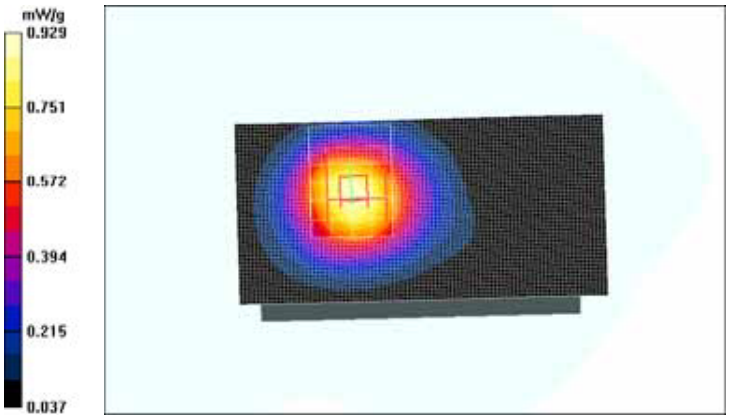
Date/Time: 2006-02-01 14:21:17
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Body measurement, Advanced Extrapolation, t=21.8 C, Flip closed, no hs, no MU, no BT

Communication System: 2-slot GPRS1900; Frequency: 1850.2 MHz;Duty Cycle: 1:4.2
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.47 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.19, 4.19, 4.19); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Body Measurement /Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 0.967 mW/g

Body Measurement /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 19.0 V/m; Power Drift = -0.135 dB
Peak SAR (extrapolated) = 1.40 W/kg
SAR(1 g) = 0.873 mW/g; SAR(10 g) = 0.537 mW/g
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 0.929 mW/g



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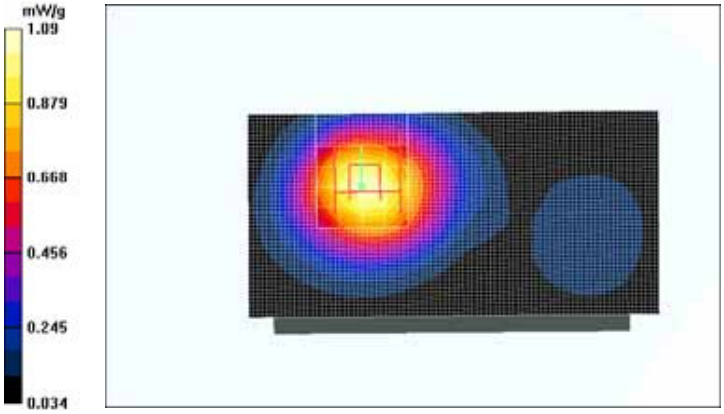
Date/Time: 2006-02-01 11:33:21
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Body measurement, Advanced Extrapolation, t=21.8 C, Flip closed, no hs, no MU, no BT

Communication System: 3-slot GPRS1900; Frequency: 1880 MHz;Duty Cycle: 1:2.8
Medium parameters used: f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.19, 4.19, 4.19); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Body Measurement /Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.14 mW/g

Body Measurement /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 22.2 V/m; Power Drift = -0.209 dB
Peak SAR (extrapolated) = 1.64 W/kg
SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.624 mW/g
Maximum value of SAR (measured) = 1.09 mW/g



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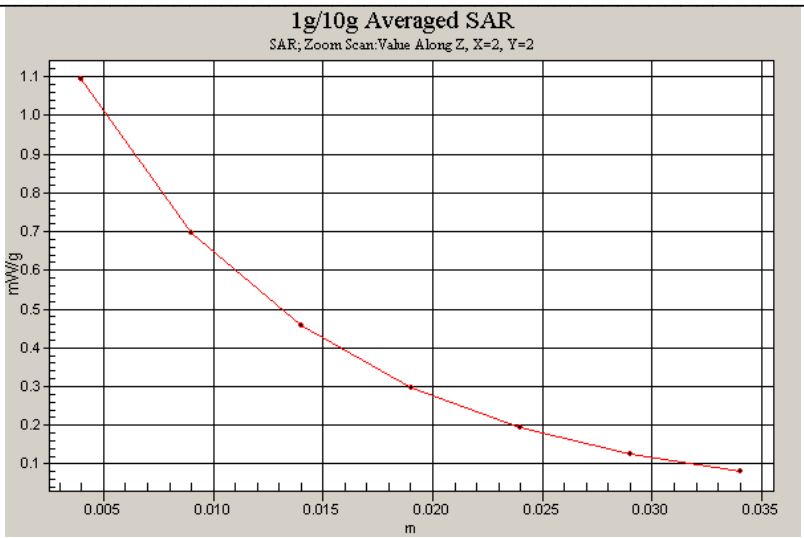

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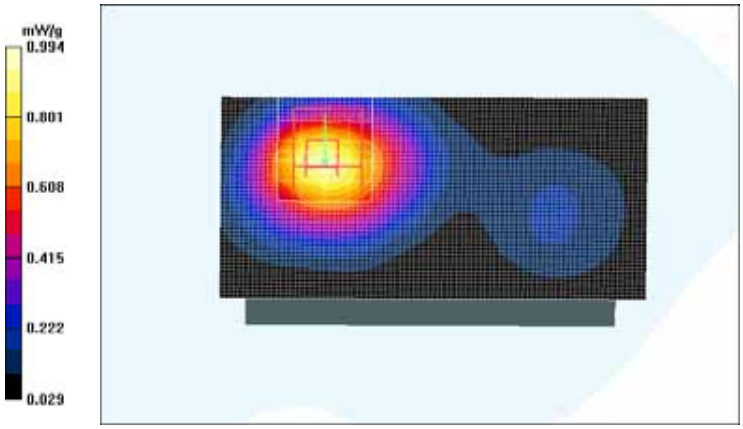
Date/Time: 2006-02-01 13:18:54
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Body measurement, Advanced Extrapolation, t=21.8 C, Flip closed, HS-6, no MU, no BT

Communication System: 3-slot GPRS1900; Frequency: 1880 MHz;Duty Cycle: 1:2.8
Medium parameters used: f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1395; ConvF(4.19, 4.19, 4.19); Calibrated: 03.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Body Measurement /Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.03 mW/g

Body Measurement /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 22.7 V/m; Power Drift = -0.292 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 0.919 mW/g; SAR(10 g) = 0.553 mW/g
Maximum value of SAR (measured) = 0.994 mW/g



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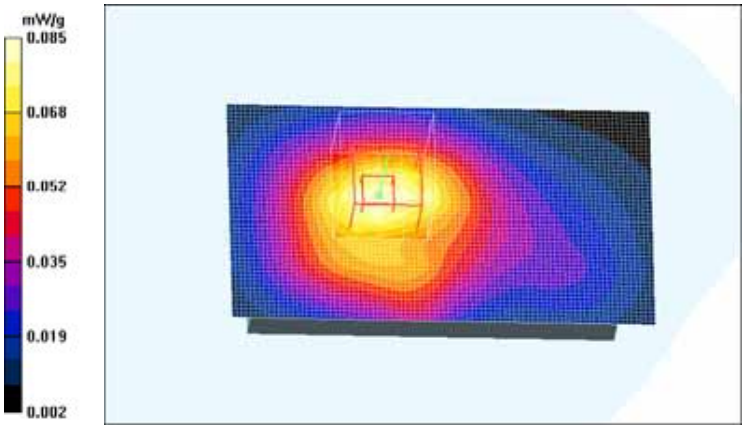
Date/Time: 2006-02-22 10:32:01
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Body measurement, Advanced Extrapolation, t=21.8 C, Flip closed, no hs, no MU

Communication System: WLAN2450; Frequency: 2462 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2462 MHz; σ = 1.95 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; ConvF(4.08, 4.08, 4.08); Calibrated: 22.04.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Body Measurement /Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.089 mW/g

Body Measurement /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 5.59 V/m; Power Drift = -0.132 dB
Peak SAR (extrapolated) = 0.152 W/kg
SAR(1 g) = 0.081 mW/g; SAR(10 g) = 0.048 mW/g
Maximum value of SAR (measured) = 0.085 mW/g



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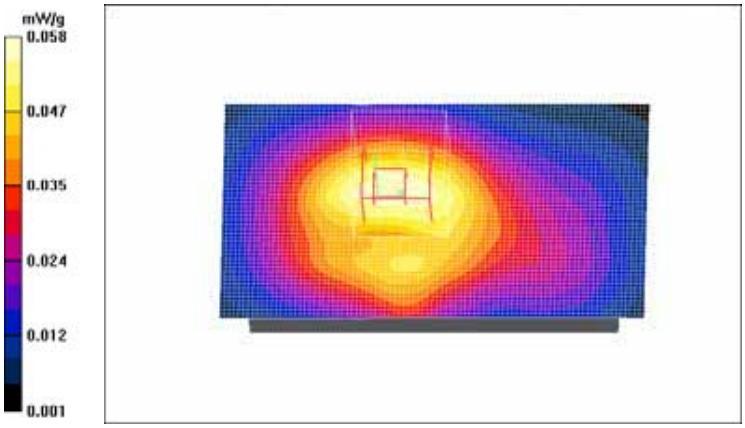
Date/Time: 2006-02-22 11:43:12
Test Laboratory: TCC Nokia
Type: RM-55;
Program Name: Body measurement, Advanced Extrapolation, t=21.5 C, Flip closed, HS-6, no MU
Communication System: WLAN2450; Frequency: 2442 MHz;Duty Cycle: 1:1
Medium parameters used: f = 2442 MHz; σ = 1.91 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1766; ConvF(4.08, 4.08, 4.08); Calibrated: 22.04.2005
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn372; Calibrated: 18.08.2005
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 159

Body Measurement /Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.060 mW/g

Body Measurement /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 4.66 V/m; Power Drift = -0.086 dB
Peak SAR (extrapolated) = 0.103 W/kg
SAR(1 g) = 0.055 mW/g; SAR(10 g) = 0.033 mW/g
Maximum value of SAR (measured) = 0.058 mW/g



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

E-field probe ET3DV, SN: 1395 and 1766
See the next six pages.

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **Nokia Salo TCC**

Certificate No: ET3-1395_Sep05

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1395
Calibration procedure(s)	QA CAL-01.v5 and QA CAL-12.v4 Calibration procedure for dosimetric E-field probes
Calibration date:	September 3, 2005
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41495277	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41498087	3-May-05 (METAS, No. 251-00466)	May-06
Reference 3 dB Attenuator	SN: S5054 (3c)	11-Aug-05 (METAS, No. 251-00499)	Aug-06
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-05 (METAS, No. 251-00467)	May-06
Reference 30 dB Attenuator	SN: S5129 (30b)	11-Aug-05 (METAS, No. 251-00500)	Aug-06
Reference Probe ES3DV2	SN: 3013	7-Jan-05 (SPEAG, No. ES3-3013_Jan05)	Jan-06
DAE4	SN: 654	29-Nov-04 (SPEAG, No. DAE4-654_Nov04)	Nov-05

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

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

Issued: September 5, 2005

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

DASY - Parameters of Probe: ET3DV6 SN:1395

Sensitivity in Free Space[A]

NormX	**1.86** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**91** mV
NormY	**1.82** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**91** mV
NormZ	**1.82** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**91** mV

Diode Compression[B]

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

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

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	9.6	5.0
SAR_{be} [%]	With Correction Algorithm	0.0	0.2

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

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	13.4	8.8
SAR_{be} [%]	With Correction Algorithm	1.1	0.1

Sensor Offset

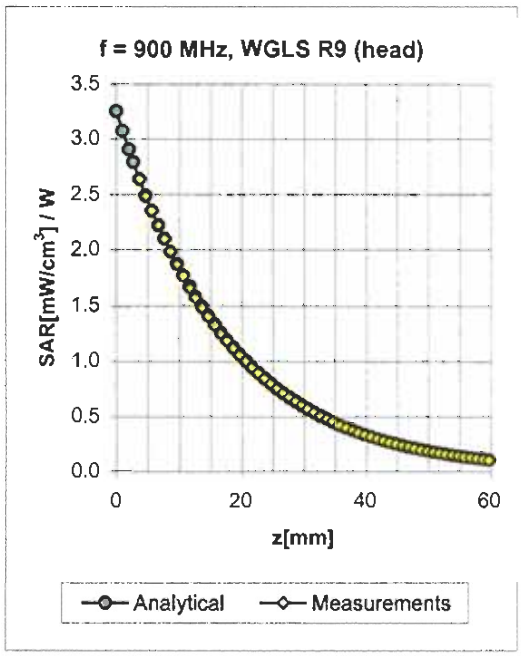
Probe Tip to Sensor Center **2.7** mm

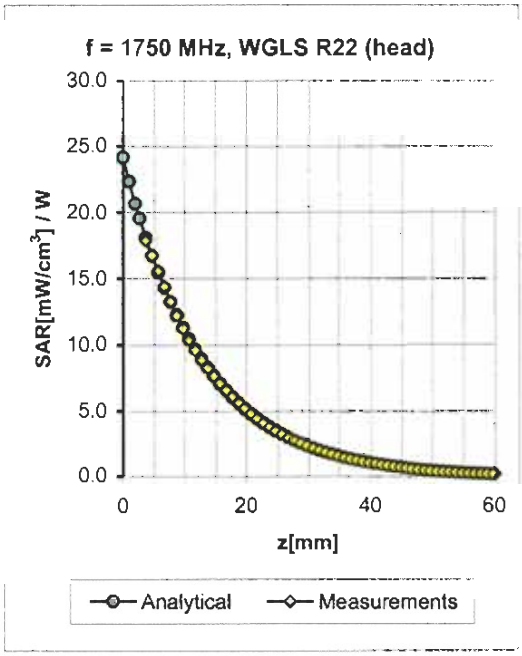
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

Conversion Factor Assessment





f [MHz]	Validity [MHz][c]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
450	± 50 / ± 100	Head	43.5 ± 5%	0.87 ± 5%	0.05	1.80	6.78	± 13.3% (k=2)
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.77	1.66	5.96	± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.71	1.77	5.88	± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.74	2.11	4.87	± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.67	2.33	4.73	± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.67	2.32	4.54	± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.87	1.91	4.30	± 11.8% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.03	1.95	6.92	± 13.3% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.63	1.87	5.91	± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.62	1.93	5.71	± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.62	2.73	4.22	± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.67	2.46	4.19	± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.68	2.37	4.09	± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.95	1.69	4.04	± 11.8% (k=2)

[c] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **Nokia Oulu**

Certificate No: ET3-1766_Apr05

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1766
Calibration procedure(s)	QA CAL-01.v5 Calibration procedure for dosimetric E-field probes
Calibration date:	April 22, 2005
Condition of the calibrated item	In Tolerance

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-May-04 (METAS, No. 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No. 251-00388)	May-05
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-04 (METAS, No. 251-00403)	Aug-05
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-04 (METAS, No. 251-00389)	May-05
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-04 (METAS, No. 251-00404)	Aug-05
Reference Probe ES3DV2	SN: 3013	7-Jan-05 (SPEAG, No. ES3-3013_Jan05)	Jan-06
DAE4	SN: 617	19-Jan-05 (SPEAG, No. DAE4-617_Jan05)	Jan-06

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

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

Issued: April 25, 2005

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

Samsung - Exhibit 1017 - Page 49

DASY - Parameters of Probe: ET3DV6 SN:1766

Sensitivity in Free Space[A]

NormX	**1.99** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**93** mV
NormY	**1.71** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**93** mV
NormZ	**1.89** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**93** mV

Diode Compression[B]

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

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

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	8.8	4.5
SAR_{be} [%]	With Correction Algorithm	0.1	0.3

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

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	13.2	8.8
SAR_{be} [%]	With Correction Algorithm	0.9	0.1

Sensor Offset

Probe Tip to Sensor Center **2.7** mm

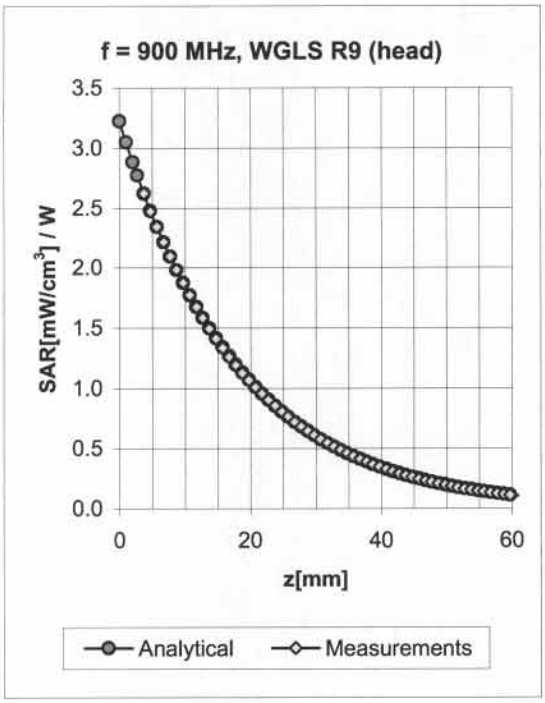
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

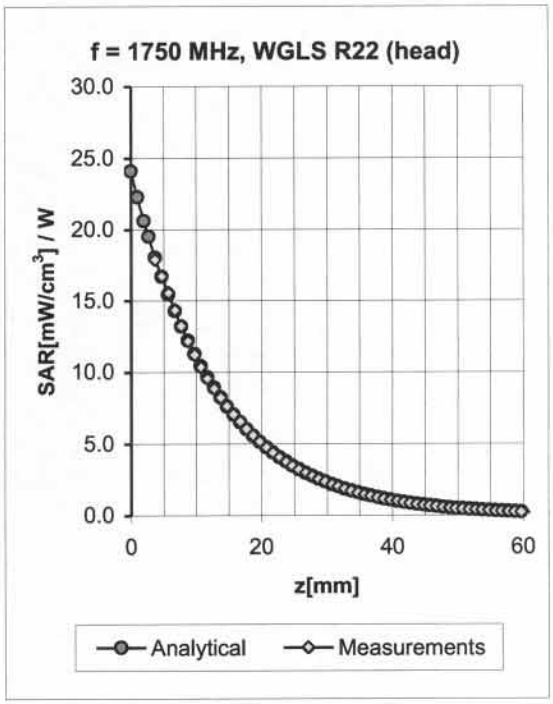
[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

Samsung - Exhibit 1017 - Page 50

Conversion Factor Assessment





f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.66	1.77	6.37 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.68	1.74	6.16 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.65	2.24	5.04 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.64	2.36	4.90 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.64	2.38	4.75 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.74	2.13	4.35 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.53	2.03	6.32 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.53	2.06	5.98 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.63	2.59	4.59 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.63	2.64	4.42 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.66	2.45	4.25 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.82	1.95	4.08 ± 11.8% (k=2)

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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

1900MHz dipole D1900V2, SN: 5d013
2450MHz dipole D2450V2, SN: 749
See the next six pages.

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

Client **Nokia Salo TCC**

CALIBRATION CERTIFICATE

Object(s)	D1900V2 - SN:5d013
Calibration procedure(s)	QA CAL-05.v2 Calibration procedure for dipole validation kits
Calibration date:	July 13, 2004
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

Date issued: July 15, 2004

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

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Date/Time: 07/13/04 11:09:33

Test Laboratory: SPEAG, Zurich, Switzerland

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

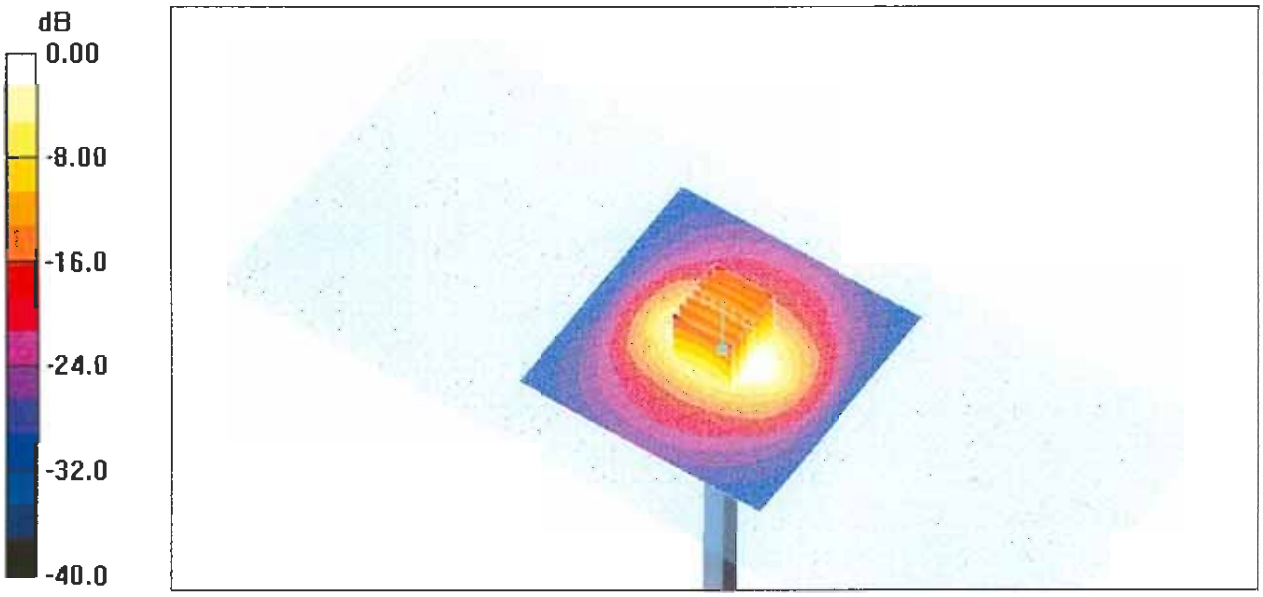
Communication System: CW-1900; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: HSL 1900 MHz;
Medium parameters used: f = 1900 MHz; σ = 1.44 mho/m; ε_r = 39.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

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

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

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.6 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 17.9 W/kg
SAR(1 g) = 10 mW/g; SAR(10 g) = 5.24 mW/g
Maximum value of SAR (measured) = 11.4 mW/g



0 dB = 11.4mW/g

Date/Time: 07/07/04 17:18:35

Test Laboratory: SPEAG, Zurich, Switzerland

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

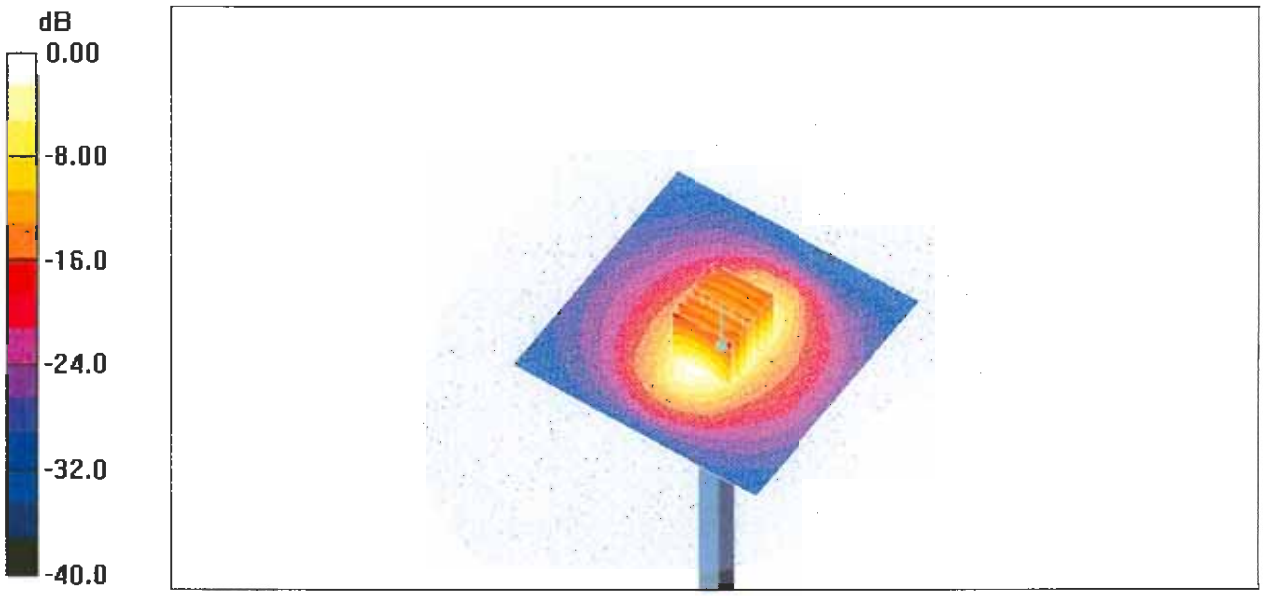
Communication System: CW-1900; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: Muscle 1900 MHz;
Medium parameters used: f = 1900 MHz; σ = 1.58 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

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

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

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 82.5 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 18.9 W/kg
SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.41 mW/g
Maximum value of SAR (measured) = 11.8 mW/g



0 dB = 11.8mW/g

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

Client **Nokia Salo TCC**

CALIBRATION CERTIFICATE

Object(s)	D2450V2 - SN:749
Calibration procedure(s)	QA CAL-05.v2 Calibration procedure for dipole validation kits
Calibration date:	June 7, 2004
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

Date issued: June 14, 2004

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

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Date/Time: 06/07/04 11:53:10

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN749

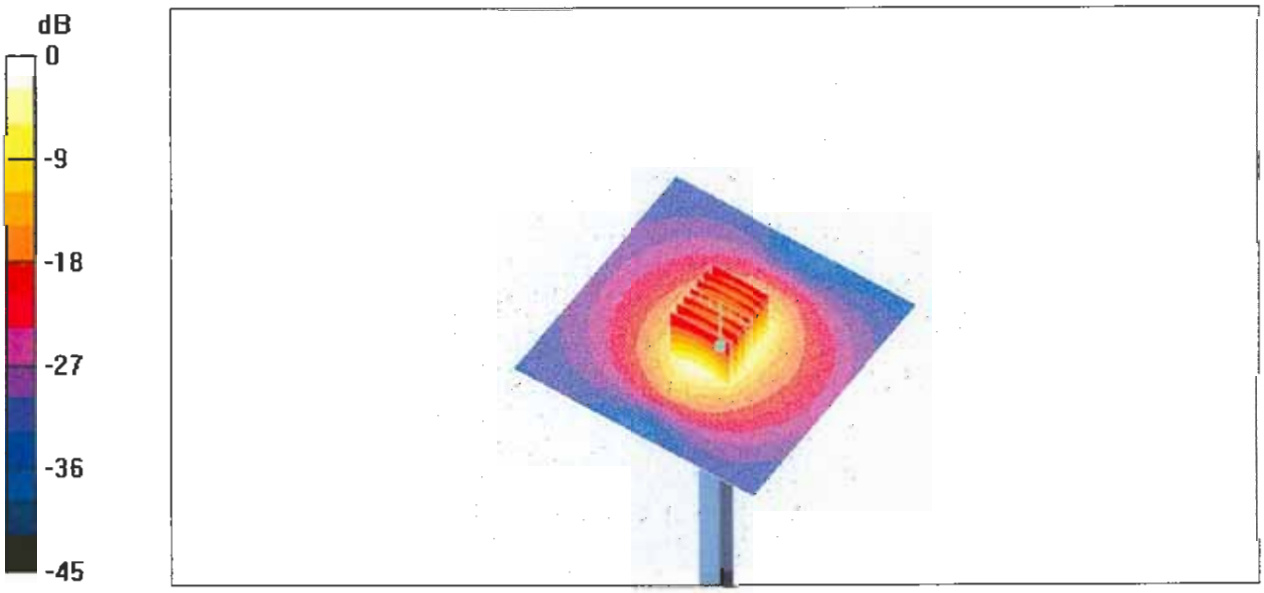
Communication System: CW-2450; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL 2450 MHz;
Medium parameters used: f = 2450 MHz; σ = 1.86 mho/m; ε_r = 38.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.55, 4.55, 4.55); Calibrated: 9/29/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn411; Calibrated: 11/6/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006;
- Measurement SW: DASY4, V4.2 Build 54; Postprocessing SW: SEMCAD, V1.8 Build 112

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 85.3 V/m; Power Drift = 0.0 dB
Maximum value of SAR (interpolated) = 15.2 mW/g

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.3 V/m; Power Drift = 0.0 dB
Maximum value of SAR (measured) = 15.2 mW/g
Peak SAR (extrapolated) = 29.2 W/kg
SAR(1 g) = 13.5 mW/g; SAR(10 g) = 6.11 mW/g



0 dB = 15.2mW/g

Date/Time: 06/07/04 14:29:30

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN749

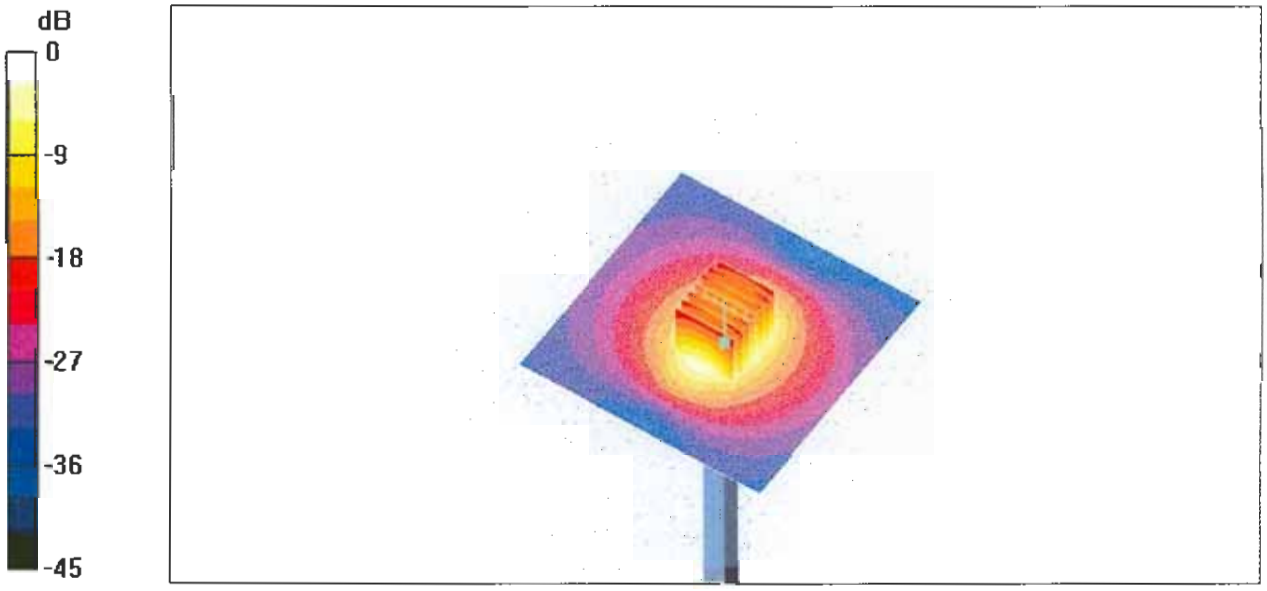
Communication System: CW-2450; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: Muscle 2450 MHz;
Medium parameters used: f = 2450 MHz; σ = 2 mho/m; ε_r = 51.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.22, 4.22, 4.22); Calibrated: 9/29/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn411; Calibrated: 11/6/2003
- Phantom: SAM with CRP - TP1006; Type: SAM 4.0; Serial: TP:1006;
- Measurement SW: DASY4, V4.2 Build 54; Postprocessing SW: SEMCAD, V1.8 Build 112

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 81.2 V/m; Power Drift = 0.0 dB
Maximum value of SAR (interpolated) = 15 mW/g

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 81.2 V/m; Power Drift = 0.0 dB
Maximum value of SAR (measured) = 15.1 mW/g
Peak SAR (extrapolated) = 27.5 W/kg
SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.1 mW/g



0 dB = 15.1mW/g