

SAR Compliance Test Report

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Tested device:	RM-506		
FCC ID:	QVVRM-506	IC:	661AE-RM506
Supplement reports:	SAR_Salo_0910_04 for RM-505 / FCC ID: QVVRM-505 / IC ID: 661AE-RM505, SD_SAR_0910_06		
Testing has been carried out in accordance with:	47CFR §2.1093 Radiofrequency Radiation Exposure Evaluation: Portable Devices FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01) Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields RSS-102 Evaluation Procedure for Mobile and Portable Radio Transmitters with Respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields IEEE 1528 - 2003 IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Technique		
Documentation:	The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test results:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		

Date and signatures:

For the contents:


Jose Gomez
Certification Test Engineer

2009-03-13

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2009-02-26 to 2009-03-06
SN, HW and SW numbers of tested device	SN: 04401/10/448325/6, HW: 2004, SW: v52.50.2009.05.1, DUT: 13508
Batteries used in testing	BP-4L, DUT: 13509, 13510, 13511, 13512, 13513, 13514
Headsets used in testing	HS-45, DUT: 13517 AD-54, DUT: 13518
Other accessories used in testing	-
State of sample	Prototype unit
Notes	-

1.2 Maximum Results**

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

1.2.1 Head Configuration

Mode	Ch / f (MHz)	Radiated power	Position	Measured SAR value (1g avg)	Scaled* SAR value (1g avg)	SAR limit (1g avg)	Result
3-slot GPRS850	251 / 848.8	23.1 dBm ERP	Right, Cheek	0.468 W/kg	0.52 W/kg	1.6 W/kg	PASSED
2-slot GPRS1900	810 / 1909.8	24.2 dBm EIRP	Right, Cheek	0.409 W/kg	0.46 W/kg	1.6 W/kg	PASSED

1.2.2 Body Worn Configuration

Mode	Ch / f (MHz)	Radiated power	Separation distance	Measured SAR value (1g avg)	Scaled* SAR value (1g avg)	SAR limit (1g avg)	Result
3-slot GPRS850	251 / 848.8	23.1 dBm ERP	1.5 cm	0.812 W/kg	0.91 W/kg	1.6 W/kg	PASSED
2-slot GPRS1900	661 / 1880	25.8 dBm EIRP	1.5 cm	0.356 W/kg	0.40 W/kg	1.6 W/kg	PASSED

*SAR values are scaled up by 12% to cover measurement drift. As a consequence of this conservative scaling of the SAR values, the contribution of measurement drift to the overall measurement uncertainty (Section 6) is reduced to zero.

** SAR results duplicated from Salo_SAR_0910_04 for RM-505 / FCC ID: QVVRM-505 / IC ID: 661AE-RM505.

1.2.3 Maximum Drift

Maximum drift covered by 12% scaling up of the SAR values	Maximum drift during measurements
0.5dB	0.49 dB

1.2.4 Measurement Uncertainty

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

Device category	Portable
Exposure environment	General population / uncontrolled

Modes 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

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

This device has Voice-over-IP/Dual Transfer Mode capability for use at the ear. Therefore, SAR for multi slot GPRS mode was evaluated against the head profile of the phantom. Dual Transfer Mode is a feature that utilises the multi-slot GPRS capability in this device; it allows simultaneous transmission of voice and data during the same call, using the same transmitter and antenna.

2.1 Description of the Antenna

The device has an internal antenna. The main cellular antenna is located at the bottom of the device underneath the back surface.

3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	19.9 to 22.9
Ambient humidity (RH %):	28 to 46

3.2 Test Signal, Frequencies and Output Power

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

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

When testing GSM/GPRS/EGPRS modes, comparative 1-slot, 2-slot and 3-slot SAR measurements are initially made for the same test configuration and the same frequency to determine which mode has the highest SAR value i.e. the highest average power. These tests are carried out with much reduced measurement uncertainty as they are relative tests in which the device does not change either its position or its operating frequency. Once the highest SAR mode has been determined, full SAR testing then takes place in the identified mode. It should be noted that the peak power levels given in the Results tables (Section 7) are poor indicators of the highest SAR modes as a) they are radiated tests and therefore subject to significant measurement uncertainty and b) take no account of the number of time slots. Head SAR checking in 8PSK EGPRS mode was subsequently performed in the maximum SAR test configuration for GSM/GPRS.

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.

All of the SAR results, SAR plots and test details given in this report are duplicated from the earlier report Salo_SAR_0910_04 for RM-505 / FCC ID: QVVRM-505 / IC ID: 661EA-RM505. The difference between RM-505 and RM-506 is that RM-506 has had the WCDMA900, WCDMA1900, WCDMA2100 and WLAN2450 components removed.

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	555	12 months	2009-11
DAE 4	793	12 months	2009-04
E-field Probe ES3DV3	3165	12 months	2009-04
E-field Probe ES3DV6	3131	12 months	2010-02
Dipole Validation Kit, D835V2	480	24 months	2009-05
Dipole Validation Kit, D1900V2	5d030	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	2009-07
Amplifier	ZHL-42 (SMA)	N072095-5	12 months	2009-07
Power Meter	NRVS	849305/028	12 months	2009-07
Power Sensor	NRV-Z32	839176/020	12 months	2009-07
Call Tester	CMU 200	101111	-	-
Call Tester	CMU 200	103293	-	-
Vector Network Analyzer	8753E	US38432928	12 months	2009-07
Dielectric Probe Kit	85070B	US33020420	-	-

4.1.1 Isotropic E-field Probe Type ES3DV6

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
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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

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	
	± 10% window	2.06 – 2.52			
	2009-03-05	2.48	40.4	0.92	21.0
1900	Reference result	10.2	38.5	1.46	
	± 10% window	9.2 – 11.2			
	2009-02-26	10.4	38.0	1.47	21.0
	2009-03-04	10.7	38.5	1.46	21.0

System checking, body tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ϵ_r	σ [S/m]	
1900	Reference result	9.62	53.1	1.54	
	± 10% window	8.66 – 10.58			
	2009-03-06	9.93	51.7	1.55	21.0
f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ϵ_r	σ [S/m]	
1900	Reference result	9.62	53.1	1.54	
	± 10% window	8.66 – 10.58			
	2009-03-06	9.93	51.7	1.55	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	
	± 5% window	39.4 – 43.6	0.86 – 0.95	
	2009-03-05	40.4	0.92	21.0
1880	Recommended value	40.0	1.40	
	± 5% window	38.0 – 42.0	1.33 – 1.47	
	2009-02-26	38.1	1.45	21.0
	2009-03-04	38.6	1.44	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	
	± 5% window	52.4 – 58.0	0.92 – 1.02	
	2009-03-05	52.7	1.00	21.0
1880	Recommended value	53.3	1.52	
	± 5% window	50.6 – 56.0	1.44 – 1.60	
	2009-03-06	51.8	1.54	21.0

DESCRIPTION OF THE TEST PROCEDURE

4.4 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

4.5 Test Positions

4.5.1 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".

4.5.2 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 Section 1.2.2 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.

4.6 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.

4.7 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.

5. MEASUREMENT UNCERTAINTY

Table 6.1 – Measurement uncertainty evaluation

Uncertainty Component	Section in IEEE 1528	Tol. (%)	Prob Dist	Div	C_i	$C_i \cdot U_i$ (%)	ν_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	

6. RESULTS

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

850MHz Head SAR results

Mode	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	Phone slide closed Camera slide closed	Power		23.1 dBm	23.9 dBm	24.8 dBm
		Left	Cheek	-	0.158	-
			Tilt	-	-	-
		Right	Cheek	-	-	-
			Tilt	-	-	-
2-slot GPRS	Phone slide closed Camera slide closed	Power		23.3 dBm	24.0 dBm	24.9 dBm
		Left	Cheek	-	0.305	-
			Tilt	-	-	-
		Right	Cheek	-	-	-
			Tilt	-	-	-
3-slot GPRS	Phone slide closed Camera slide closed	Power		21.5 dBm	22.4 dBm	23.1 dBm
		Left	Cheek	-	0.308	-
			Tilt	-	0.307	-
		Right	Cheek	0.410	0.419	0.468
			Tilt	-	0.297	-
3-slot 8PSK GPRS	Phone slide closed Camera slide closed	Power		12.8 dBm	13.5 dBm	15.1 dBm
		Left	Cheek	-	-	-
			Tilt	-	-	-
		Right	Cheek	-	-	0.071
			Tilt	-	-	-
3-slot GPRS	Phone slide closed Camera slide opened	Right, Cheek		0.392	0.427	0.464

1900MHz Head SAR results

Mode	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	Phone slide closed Camera slide closed	Power		23.1 dBm	25.8 dBm	24.0 dBm
		Left	Cheek	-	0.162	-
			Tilt	-	-	-
		Right	Cheek	-	-	-
			Tilt	-	-	-
2-slot GPRS	Phone slide closed Camera slide closed	Power		22.9 dBm	25.8 dBm	24.2 dBm
		Left	Cheek	-	0.298	-
			Tilt	-	0.229	-
		Right	Cheek	0.343	0.371	0.395
			Tilt	-	0.218	-
3-slot GPRS	Phone slide closed Camera slide closed	Power		21.0 dBm	24.0 dBm	22.3 dBm
		Left	Cheek	-	0.292	-
			Tilt	-	-	-
		Right	Cheek	-	-	-
			Tilt	-	-	-
2-slot 8PSK GPRS	Phone slide closed Camera slide closed	Power		18.9 dBm	21.3 dBm	18.4 dBm
		Left	Cheek	-	-	-
			Tilt	-	-	-
		Right	Cheek	-	-	0.093
			Tilt	-	-	-
2-slot GPRS	Phone slide closed Camera slide opened	Right, Cheek		0.355	0.356	0.409

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

850MHz Body SAR results

Mode	Option used	Device orientation	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	Phone slide closed Camera slide closed		Power	21.5 dBm	22.4 dBm	23.1 dBm
		Display facing phantom	Without headset	-	-	-
			Headset HS-45 + AD-54	-	-	-
		Back facing phantom	Without headset	0.625	0.701	0.812
			Headset HS-45 + AD-54	-	0.466	-

1900MHz Body SAR results

Mode	Option used	Device orientation	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	Phone slide closed Camera slide closed		Power	22.9 dBm	25.8 dBm	24.2 dBm
		Display facing phantom	Without headset	-	-	-
			Headset HS-45 + AD-54	-	-	-
		Back facing phantom	Without headset	0.339	0.356	0.314
			Headset HS-45 + AD-54	-	0.333	-

Plots of the Measurement scans are given in Appendix B.

APPENDIX A: SYSTEM CHECKING SCANS

Date/Time: 2009-03-05 8:50:34

Test Laboratory: TCC Nokia

Type: D835V2; Serial: 480

Communication System: CW835

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL850; Medium Notes: 20.6 C

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.92 \text{ mho/m}$; $\epsilon_r = 40.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131; Probe Notes:
- ConvF(5.7, 5.7, 5.7); Calibrated: 2009-02-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2008-11-07
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

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

Maximum value of SAR (interpolated) = 2.64 mW/g

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

Reference Value = 54.7 V/m

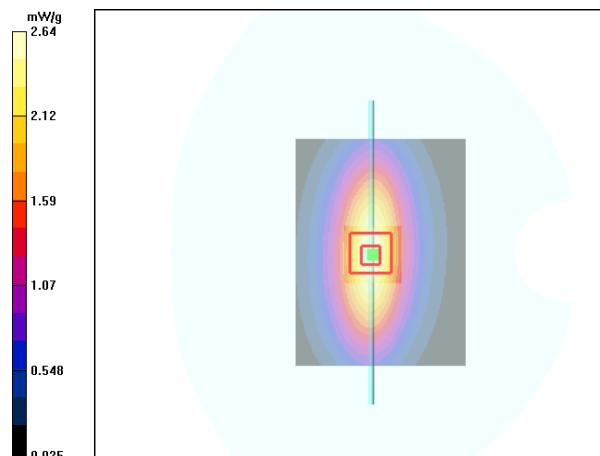
Peak SAR (extrapolated) = 3.77 W/kg

SAR(1 g) = 2.48 mW/g

SAR(10 g) = 1.6 mW/g

Power Drift = -0.025 dB

Maximum value of SAR (measured) = 2.69 mW/g



Date/Time: 2009-02-26 10:53:14

Test Laboratory: TCC Nokia
Type: D1900V2; Serial: 5d030

Communication System: CW1900

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL1900; Medium Notes: 20.9C

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.14, 5.14, 5.14); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

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 = 90.6 V/m

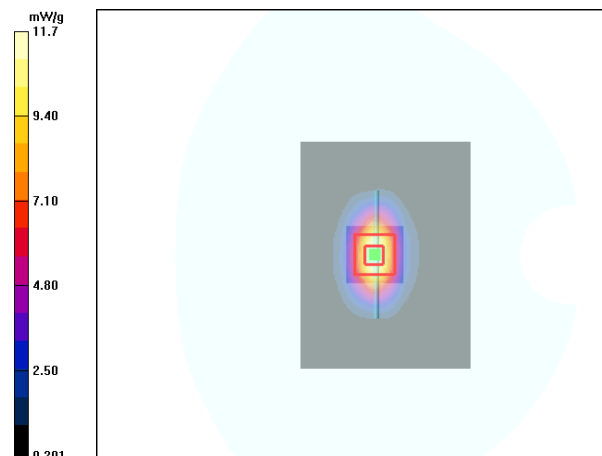
Peak SAR (extrapolated) = 19.7 W/kg

SAR(1 g) = 10.4 mW/g

SAR(10 g) = 5.33 mW/g

Power Drift = 0.027 dB

Maximum value of SAR (measured) = 11.7 mW/g



Date/Time: 2009-03-04 9:37:29

Test Laboratory: TCC Nokia
Type: D1900V2; Serial: 5d030

Communication System: CW1900

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL1900; Medium Notes: t=21.1C

Medium parameters used: f = 1900 MHz; $\sigma = 1.46$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.14, 5.14, 5.14); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

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

Maximum value of SAR (interpolated) = 12.5 mW/g

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

Reference Value = 92.0 V/m

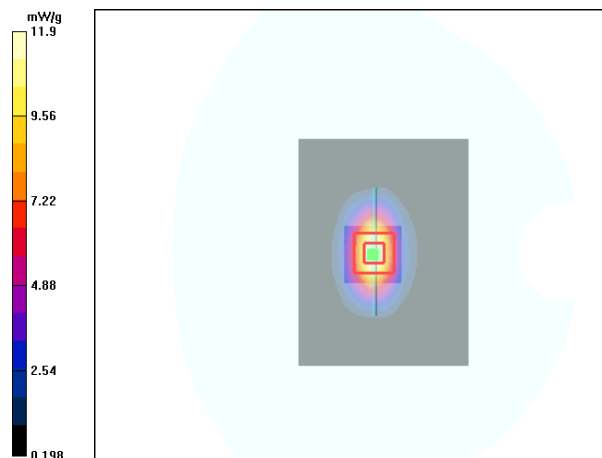
Peak SAR (extrapolated) = 20.3 W/kg

SAR(1 g) = 10.7 mW/g

SAR(10 g) = 5.47 mW/g

Power Drift = -0.017 dB

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



Date/Time: 2009-03-06 9:54:53

Test Laboratory: TCC Nokia
Type: D1900V2; Serial: 5d030

Communication System: CW1900

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: BSL1900; Medium Notes: t=20.2C

Medium parameters used: f = 1900 MHz; σ = 1.55 mho/m; ϵ_r = 51.7; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.23, 5.23, 5.23); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

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

Maximum value of SAR (interpolated) = 12.0 mW/g

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

Reference Value = 84.3 V/m

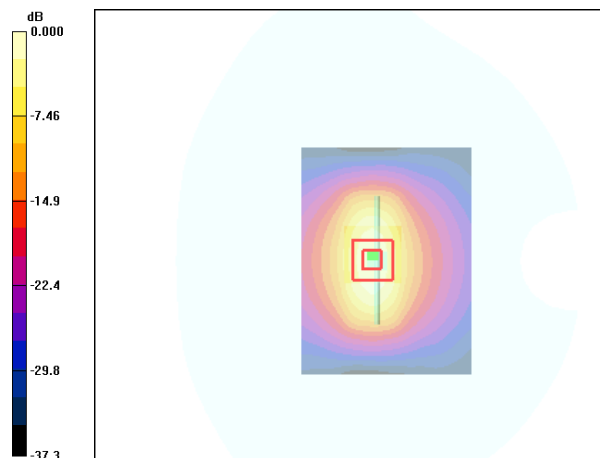
Peak SAR (extrapolated) = 18.6 W/kg

SAR(1 g) = 9.93 mW/g

SAR(10 g) = 5.11 mW/g

Power Drift = 0.028 dB

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



APPENDIX B: MEASUREMENT SCANS

Date/Time: 2009-03-05 9:22:24

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: HSL850; Medium Notes: 20.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.922$ mho/m; $\epsilon_r = 40.4$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131; Probe Notes:
- ConvF(5.7, 5.7, 5.7); Calibrated: 2009-02-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2008-11-07
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Cheek position - Middle – Phone slide opened - Camera slide closed/Area Scan (51x91x1): Measurement grid:
dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.166 mW/g

Cheek position - Middle – Phone slide opened - Camera slide closed/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 5.82 V/m

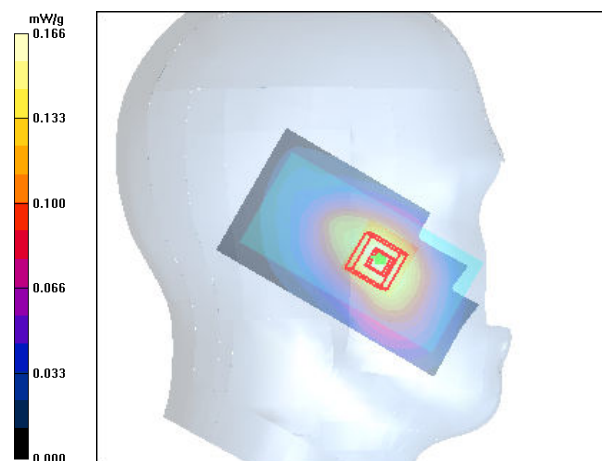
Peak SAR (extrapolated) = 0.193 W/kg

SAR(1 g) = 0.158 mW/g

SAR(10 g) = 0.117 mW/g

Power Drift = -0.282 dB

Maximum value of SAR (measured) = 0.167 mW/g



Date/Time: 2009-03-05 9:37:15

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: HSL850; Medium Notes: 20.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.922$ mho/m; $\epsilon_r = 40.4$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131; Probe Notes:
- ConvF(5.7, 5.7, 5.7); Calibrated: 2009-02-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2008-11-07
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Cheek position - Middle - Phone slide opened - Camera slide closed/Area Scan (51x91x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 0.325 mW/g

Cheek position - Middle - Phone slide opened - Camera slide closed/Zoom Scan (5x5x7)/Cube 0: Measurement

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

Reference Value = 7.87 V/m

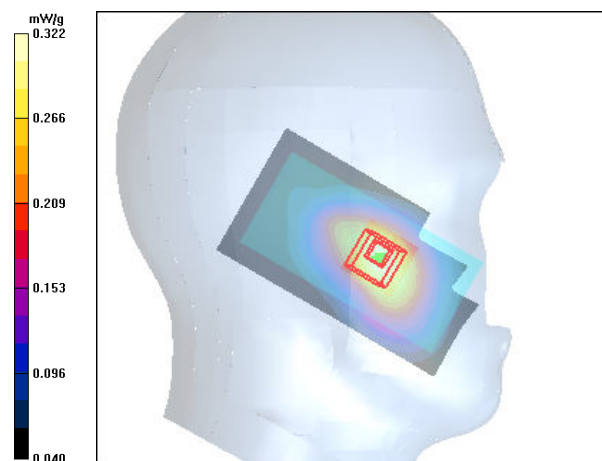
Peak SAR (extrapolated) = 0.378 W/kg

SAR(1 g) = 0.305 mW/g

SAR(10 g) = 0.227 mW/g

Power Drift = 0.091 dB

Maximum value of SAR (measured) = 0.322 mW/g



Date/Time: 2009-03-05 9:51:41

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 3-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:2.8

Medium: HSL850; Medium Notes: 20.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.922$ mho/m; $\epsilon_r = 40.4$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131; Probe Notes:
- ConvF(5.7, 5.7, 5.7); Calibrated: 2009-02-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2008-11-07
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Cheek position - Middle – Phone slide opened - Camera slide closed/Area Scan (51x91x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 0.328 mW/g

Cheek position - Middle – Phone slide opened - Camera slide closed/Zoom Scan (5x5x7)/Cube 0: Measurement

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

Reference Value = 7.94 V/m

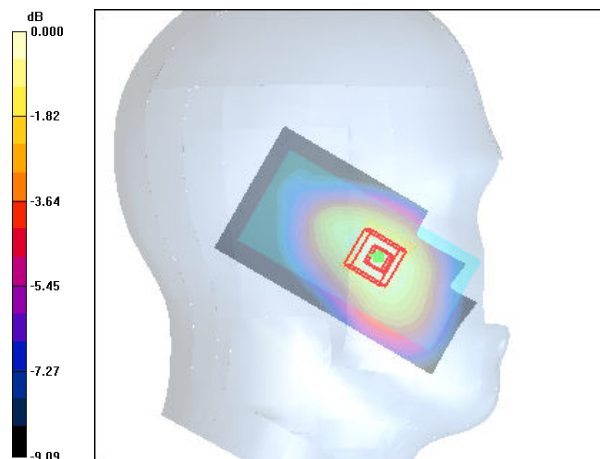
Peak SAR (extrapolated) = 0.377 W/kg

SAR(1 g) = 0.308 mW/g

SAR(10 g) = 0.231 mW/g

Power Drift = 0.229 dB

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



Date/Time: 2009-03-05 10:08:43

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 3-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:2.8

Medium: HSL850; Medium Notes: 20.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.922$ mho/m; $\epsilon_r = 40.4$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131; Probe Notes:
- ConvF(5.7, 5.7, 5.7); Calibrated: 2009-02-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2008-11-07
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Tilt position - Middle - Phone slide opened -Camera Slide Closed/Area Scan (51x91x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 0.316 mW/g

Tilt position - Middle - Phone slide opened - Camera Slide Closed/Zoom Scan (5x5x7)/Cube 0: Measurement

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

Reference Value = 14.9 V/m

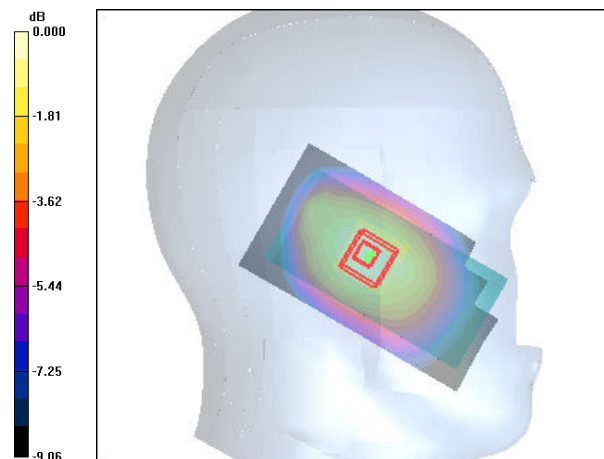
Peak SAR (extrapolated) = 0.405 W/kg

SAR(1 g) = 0.307 mW/g

SAR(10 g) = 0.222 mW/g

Power Drift = 0.096 dB

Maximum value of SAR (measured) = 0.325 mW/g



Date/Time: 2009-03-05 11:37:42

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: HSL850; Medium Notes: 20.6 C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.93$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131; Probe Notes:
- ConvF(5.7, 5.7, 5.7); Calibrated: 2009-02-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2008-11-07
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Cheek position - High - Phone slide opened - Camera slide closed/Area Scan (51x91x1): Measurement grid:
dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.520 mW/g

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

Reference Value = 8.98 V/m

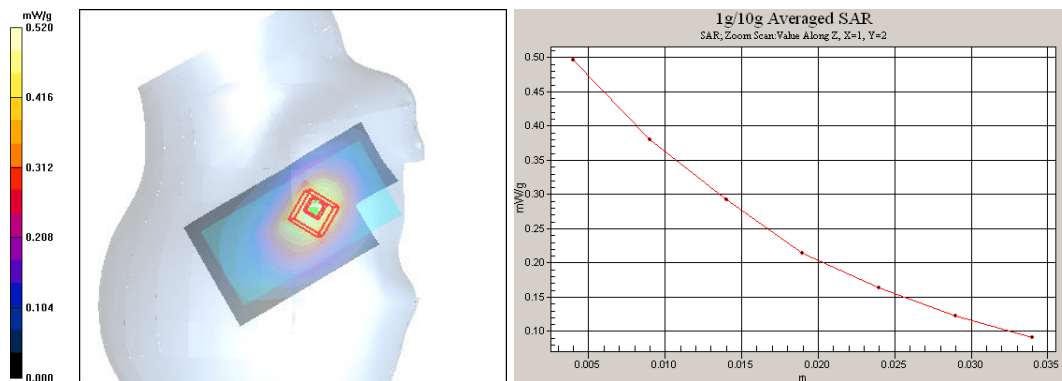
Peak SAR (extrapolated) = 0.594 W/kg

SAR(1 g) = 0.468 mW/g

SAR(10 g) = 0.339 mW/g

Power Drift = 0.132 dB

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



SAR Report

SD_SAR_0910_05

Applicant: Nokia Corporation

Type: RM-506

Copyright © 2009 TCC Nokia

Date/Time: 2009-03-05 10:27:53

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 3-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:2.8

Medium: HSL850; Medium Notes: 20.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.922$ mho/m; $\epsilon_r = 40.4$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131; Probe Notes:
- ConvF(5.7, 5.7, 5.7); Calibrated: 2009-02-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2008-11-07
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Tilt position - Middle - Phone slide opened - Camera slide closed/Area Scan (51x91x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 0.316 mW/g

Tilt position - Middle - Phone slide opened - Camera slide closed/Zoom Scan (5x5x7)/Cube 0: Measurement

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

Reference Value = 14.4 V/m

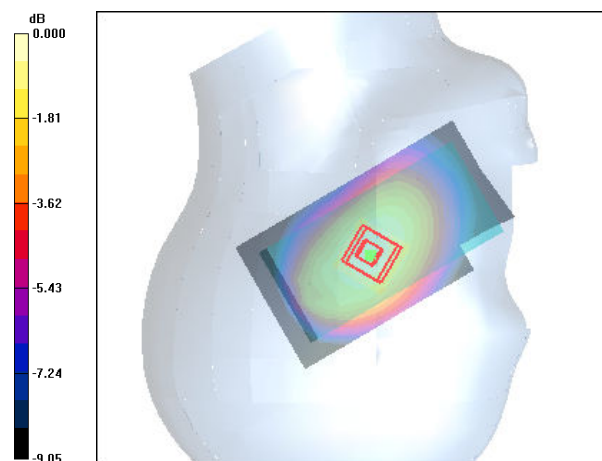
Peak SAR (extrapolated) = 0.380 W/kg

SAR(1 g) = 0.297 mW/g

SAR(10 g) = 0.217 mW/g

Power Drift = 0.058 dB

Maximum value of SAR (measured) = 0.313 mW/g



Date/Time: 2009-03-05 12:45:55

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 3-slot 8PSK EGPRS850

Frequency: 849 MHz; Duty Cycle: 1:2.8

Medium: HSL850; Medium Notes: 20.6 C

Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.93 \text{ mho/m}$; $\epsilon_r = 40.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131; Probe Notes:
- ConvF(5.7, 5.7, 5.7); Calibrated: 2009-02-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2008-11-07
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Cheek position - High - Phone slide opened - Camera slide closed/Area Scan (51x91x1): Measurement grid:

$dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.076 mW/g

Cheek position - High - Phone slide opened - Camera slide closed/Zoom Scan (5x5x7)/Cube 0: Measurement

grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 3.30 V/m

Peak SAR (extrapolated) = 0.092 W/kg

SAR(1 g) = 0.071 mW/g

SAR(10 g) = 0.052 mW/g

Power Drift = 0.490 dB

Maximum value of SAR (measured) = 0.074 mW/g



Date/Time: 2009-03-05 11:53:08

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: HSL850; Medium Notes: 20.6 C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.93$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131; Probe Notes:
- ConvF(5.7, 5.7, 5.7); Calibrated: 2009-02-12
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2008-11-07
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Cheek position - High - Phone slide opened - Camera slide opened/Area Scan (51x91x1): Measurement grid:

dx=15mm, dy=15mm

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

Cheek position - High - Phone slide opened - Camera slide opened/Zoom Scan (5x5x7)/Cube 0: Measurement

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

Reference Value = 9.01 V/m

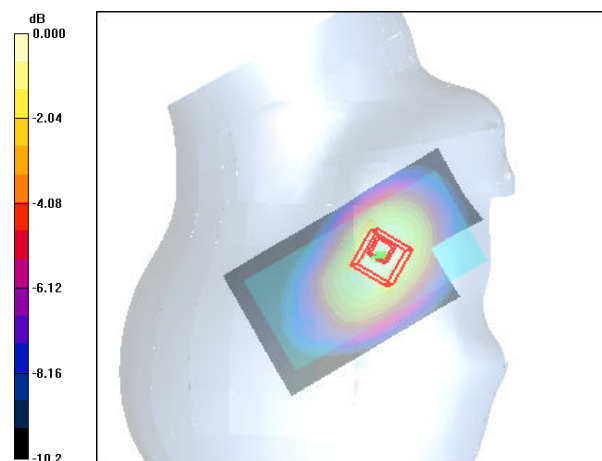
Peak SAR (extrapolated) = 0.614 W/kg

SAR(1 g) = 0.464 mW/g

SAR(10 g) = 0.340 mW/g

Power Drift = -0.110 dB

Maximum value of SAR (measured) = 0.488 mW/g



Date/Time: 2009-02-26 11:37:32

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: HSL1900; Medium Notes: 20.6C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 38.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.14, 5.14, 5.14); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Cheek position – Middle - Phone slide opened - Camera slide closed/Area Scan (51x91x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 0.181 mW/g

Cheek position – Middle - Phone slide opened - Camera slide closed/Zoom Scan (5x5x7)/Cube 0: Measurement

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

Reference Value = 4.61 V/m

Peak SAR (extrapolated) = 0.271 W/kg

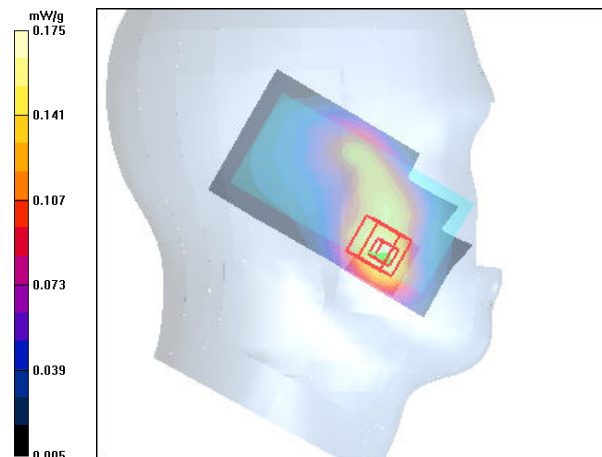
SAR(1 g) = 0.162 mW/g

SAR(10 g) = 0.096 mW/g

Power Drift = -0.159 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) = 0.175 mW/g



Date/Time: 2009-02-26 11:54:44

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: 20.6C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 38.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.14, 5.14, 5.14); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Cheek position – Middle - Phone slide opened - Camera slide closed/Area Scan (51x91x1): Measurement grid:

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

Maximum value of SAR (interpolated) = 0.329 mW/g

Cheek position – Middle - Phone slide opened - Camera slide closed/Zoom Scan (5x5x7)/Cube 0: Measurement

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

Reference Value = 6.09 V/m

Peak SAR (extrapolated) = 0.488 W/kg

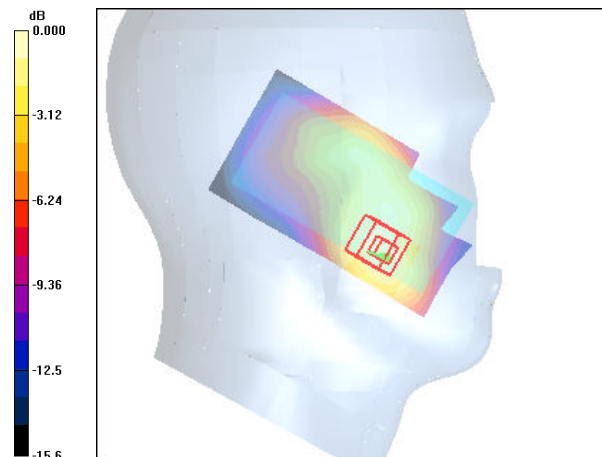
SAR(1 g) = 0.298 mW/g

SAR(10 g) = 0.177 mW/g

Power Drift = -0.107 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) = 0.319 mW/g



Date/Time: 2009-02-26 13:06:19

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: 20.6C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 38.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.14, 5.14, 5.14); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Tilt position – Middle - Phone slide opened - Camera slide closed/Area Scan (51x91x1): Measurement grid:
dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.265 mW/g

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

Reference Value = 11.1 V/m

Peak SAR (extrapolated) = 0.365 W/kg

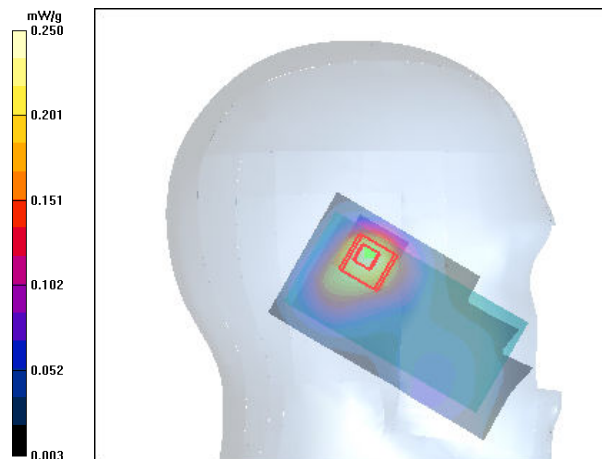
SAR(1 g) = 0.229 mW/g

SAR(10 g) = 0.139 mW/g

Power Drift = 0.152 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) = 0.250 mW/g



SAR Report

SD_SAR_0910_05

Applicant: Nokia Corporation

Type: RM-506

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Date/Time: 2009-03-04 10:44:57

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 2-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: t=20.8C

Medium parameters used: f = 1910 MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.14, 5.14, 5.14); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Cheek position - High - Phone slide closed - Camera slide closed/Area Scan (51x91x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.410 mW/g

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

Reference Value = 8.16 V/m

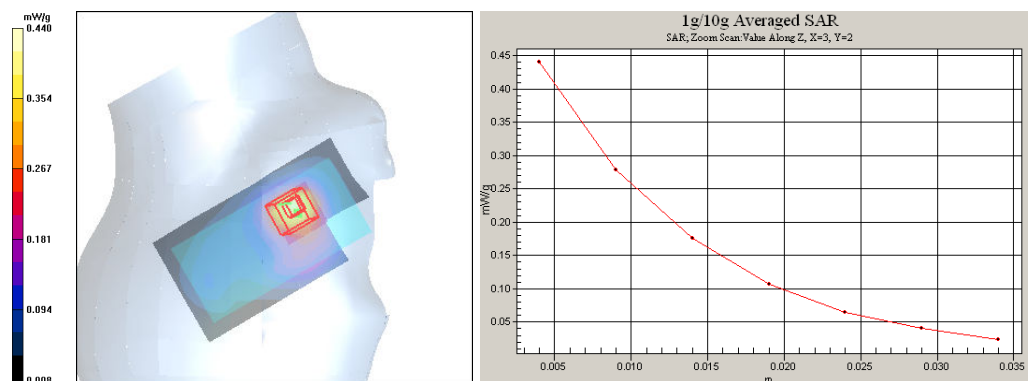
Peak SAR (extrapolated) = 0.607 W/kg

SAR(1 g) = 0.395 mW/g

SAR(10 g) = 0.232 mW/g

Power Drift = 0.164 dB

Maximum value of SAR (measured) = 0.440 mW/g



SAR Report

SD_SAR_0910_05

Applicant: Nokia Corporation

Type: RM-506

Copyright © 2009 TCC Nokia

Date/Time: 2009-02-26 13:55:56

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: 20.9C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 38.1$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.14, 5.14, 5.14); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Tilt position - Middle - Phone slide opened - Camera slide closed/Area Scan (51x91x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.254 mW/g

Tilt position - Middle - Phone slide opened - Camera slide closed/Zoom Scan (5x5x7)/Cube 0: Measurement

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

Reference Value = 12.7 V/m

Peak SAR (extrapolated) = 0.355 W/kg

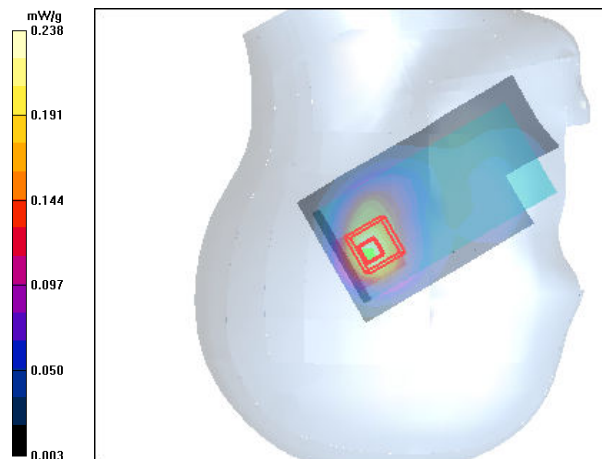
SAR(1 g) = 0.218 mW/g

SAR(10 g) = 0.131 mW/g

Power Drift = 0.015 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) = 0.238 mW/g



Date/Time: 2009-02-26 12:09:51

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 3-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:2.8

Medium: HSL1900; Medium Notes: 20.6C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 38.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.14, 5.14, 5.14); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Cheek position – Middle - Phone slide opened - Camera slide closed/Area Scan (51x91x1): Measurement grid:
dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.337 mW/g

Cheek position – Middle - Phone slide opened - Camera slide closed/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 5.98 V/m

Peak SAR (extrapolated) = 0.478 W/kg

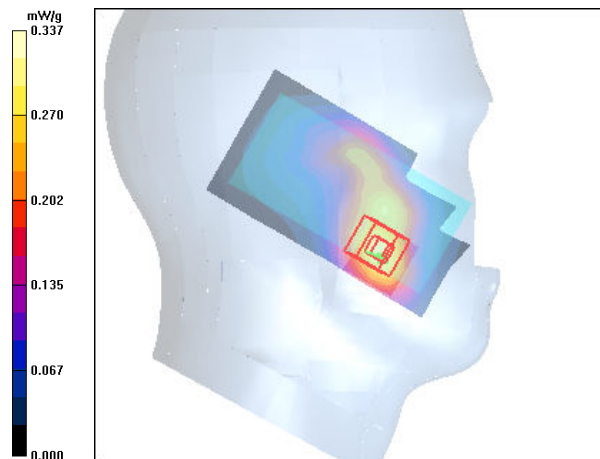
SAR(1 g) = 0.292 mW/g

SAR(10 g) = 0.173 mW/g

Power Drift = 0.004 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) = 0.312 mW/g



Date/Time: 2009-03-04 12:39:29

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 2-slot 8PSK EGPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: t=20.8C

Medium parameters used: f = 1910 MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.14, 5.14, 5.14); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Cheek position - High - Phone slide opened - Camera slide closed/Area Scan (51x91x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.088 mW/g

Cheek position - High - Phone slide opened - Camera slide closed/Zoom Scan (5x5x7)/Cube 0: Measurement

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

Reference Value = 3.69 V/m

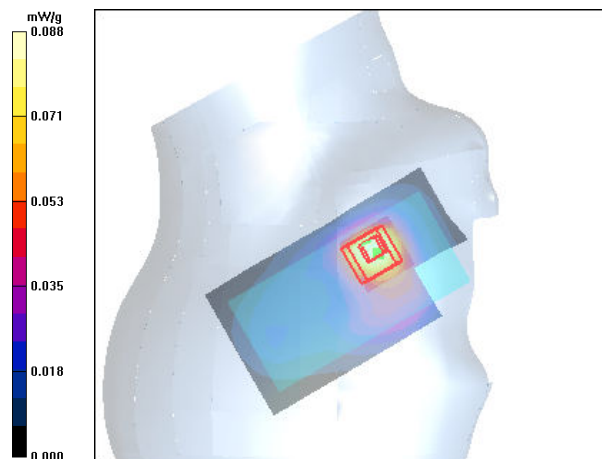
Peak SAR (extrapolated) = 0.151 W/kg

SAR(1 g) = 0.093 mW/g

SAR(10 g) = 0.053 mW/g

Power Drift = 0.208 dB

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



Date/Time: 2009-03-04 11:57:28

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 2-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: t=20.8C

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.14, 5.14, 5.14); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Cheek position - High – Phone slide opened - Camera slide open/Area Scan (51x91x1): Measurement grid:

dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.412 mW/g

Cheek position - High – Phone slide opened - Camera slide open/Zoom Scan (5x5x7)/Cube 0: Measurement

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

Reference Value = 8.10 V/m

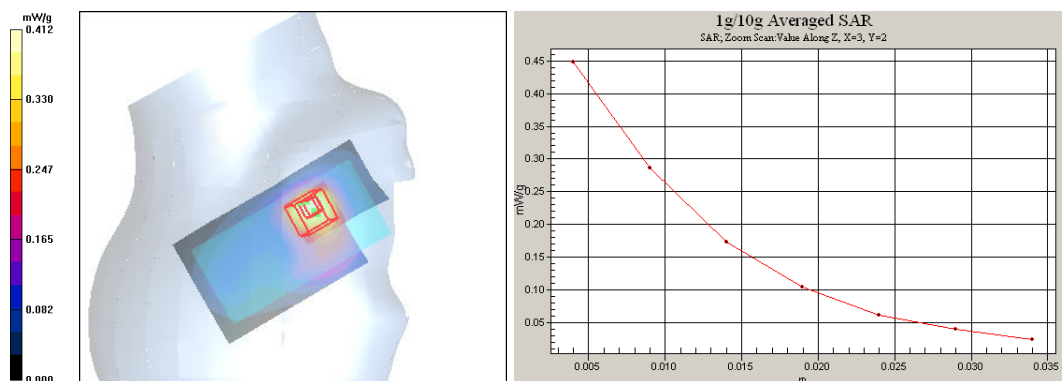
Peak SAR (extrapolated) = 0.632 W/kg

SAR(1 g) = 0.409 mW/g

SAR(10 g) = 0.236 mW/g

Power Drift = 0.164 dB

Maximum value of SAR (measured) = 0.448 mW/g



SAR Report

SD_SAR_0910_05

Applicant: Nokia Corporation

Type: RM-506

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Date/Time: 2009-03-05 13:56:36

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 3-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:2.8

Medium: BSL850; Medium Notes: 20.8 C

Medium parameters used: $f = 849$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131; Probe Notes:
- ConvF(5.64, 5.64, 5.64); Calibrated: 2009-02-12
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2008-11-07
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Measurement - High - Phone slide closed - Camera slide closed - No Accessory - Back Facing

Phantom/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.852 mW/g

Body Measurement - High - Phone slide closed - Camera slide closed - No Accessory - Back Facing

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

Reference Value = 13.8 V/m

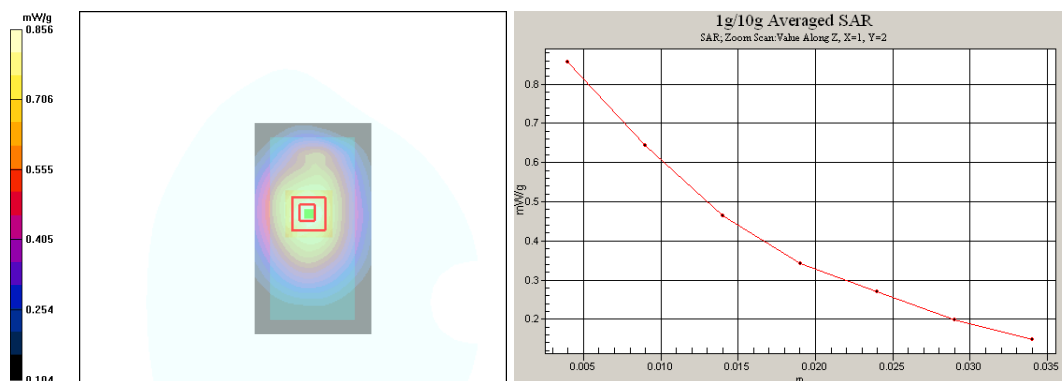
Peak SAR (extrapolated) = 1.10 W/kg

SAR(1 g) = 0.812 mW/g

SAR(10 g) = 0.590 mW/g

Power Drift = -0.015 dB

Maximum value of SAR (measured) = 0.856 mW/g



SAR Report

SD_SAR_0910_05

Applicant: Nokia Corporation

Type: RM-506

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Date/Time: 2009-03-05 13:29:11

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 3-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:2.8

Medium: BSL850; Medium Notes: 20.8 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.998$ mho/m; $\epsilon_r = 52.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131; Probe Notes:
- ConvF(5.64, 5.64, 5.64); Calibrated: 2009-02-12
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn555; Calibrated: 2008-11-07
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Measurement - Middle - Phone slide closed - Camera slide closed - HS-45+AD-54 - Back Facing

Phantom/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.476 mW/g

Body Measurement - Middle - Phone slide closed - Camera slide closed - HS-45+AD-54 - Back Facing

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

Reference Value = 12.1 V/m

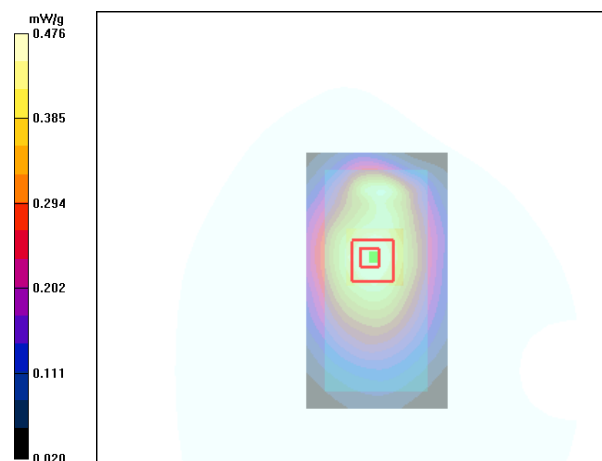
Peak SAR (extrapolated) = 0.611 W/kg

SAR(1 g) = 0.466 mW/g

SAR(10 g) = 0.337 mW/g

Power Drift = 0.010 dB

Maximum value of SAR (measured) = 0.494 mW/g



Date/Time: 2009-03-06 12:40:24

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: BSL1900; Medium Notes: t=20.2C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.23, 5.23, 5.23); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Measurement - Middle – Phone slide closed - Camera Slide Closed - No Accessory - Back Facing

Phantom/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.381 mW/g

Body Measurement - Middle – Phone slide closed - Camera Slide Closed - No Accessory - Back Facing

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

Reference Value = 8.74 V/m

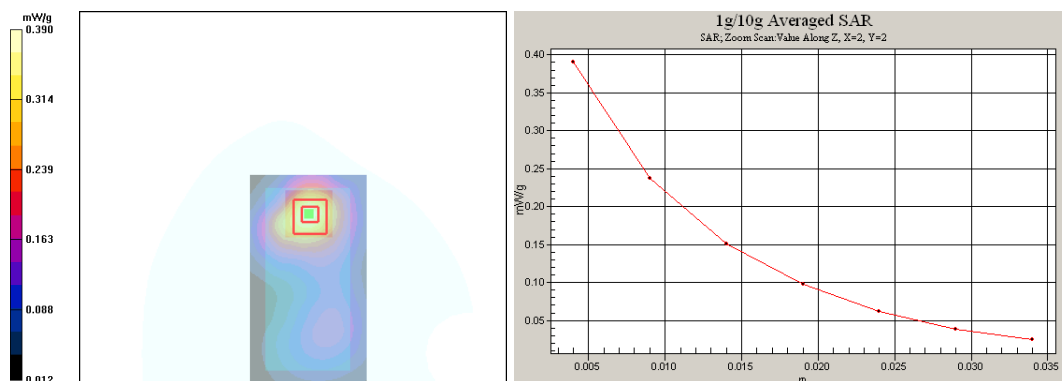
Peak SAR (extrapolated) = 0.593 W/kg

SAR(1 g) = 0.356 mW/g

SAR(10 g) = 0.215 mW/g

Power Drift = 0.227 dB

Maximum value of SAR (measured) = 0.390 mW/g



SAR Report

SD_SAR_0910_05

Applicant: Nokia Corporation

Type: RM-506

Copyright © 2009 TCC Nokia

Date/Time: 2009-03-06 12:54:50

Test Laboratory: TCC Nokia

Type: RM-505; Serial: 004401/10/448325/6

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: BSL1900; Medium Notes: t=20.2C

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 51.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165; Probe Notes:
- ConvF(5.23, 5.23, 5.23); Calibrated: 2008-04-23
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2008-04-30
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Measurement - Middle – Phone slide closed - Camera Slide Closed - HS-45 + AD-54 - Back Facing

Phantom/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

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

Body Measurement - Middle – Phone slide closed - Camera Slide Closed - HS-45 + AD-54 - Back Facing

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

Reference Value = 7.54 V/m

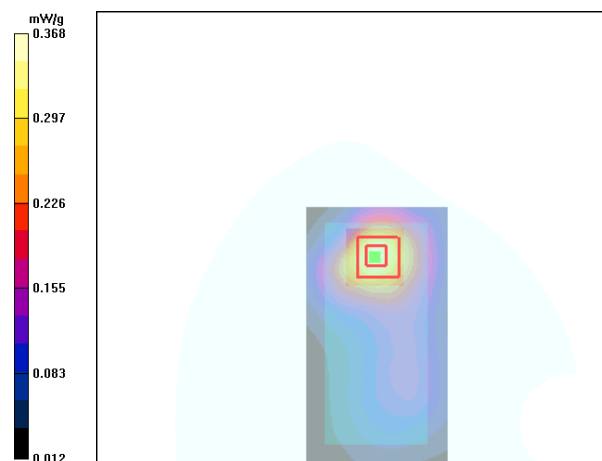
Peak SAR (extrapolated) = 0.542 W/kg

SAR(1 g) = 0.333 mW/g

SAR(10 g) = 0.204 mW/g

Power Drift = 0.135 dB

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



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

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



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

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Client **Nokia Salo TCC**

Certificate No: **ES3-3131_Feb09**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3131**

Calibration procedure(s) **QA CAL-01.v6 and QA CAL-23.v3
Calibration procedure for dosimetric E-field probes**

Calibration date: **February 12, 2009**

Condition of the calibrated item **In Tolerance**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	1-Jul-08 (No. 217-00865)	Jul-09
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	1-Jul-08 (No. 217-00866)	Jul-09
Reference Probe ES3DV2	SN: 3013	2-Jan-09 (No. ES3-3013_Jan09)	Jan-10
DAE4	SN: 660	9-Sep-08 (No. DAE4-660_Sep08)	Sep-09
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

Calibrated by: **Name** **Function** **Signature**
Katja Pokovic **Technical Manager**

Approved by: **Niels Kuster** **Quality Manager**

Issued: February 12, 2009

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

Certificate No: **ES3-3131_Feb09**

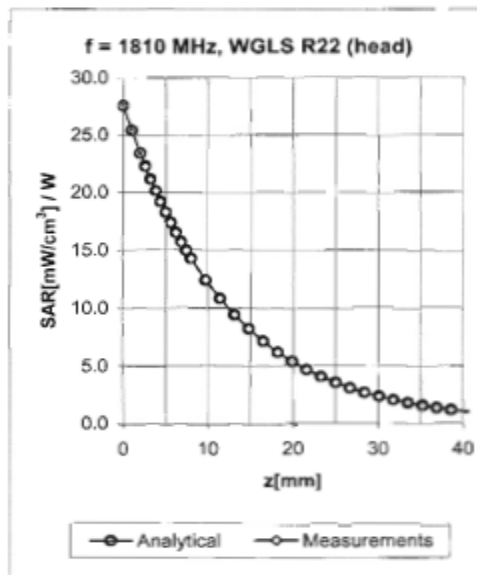
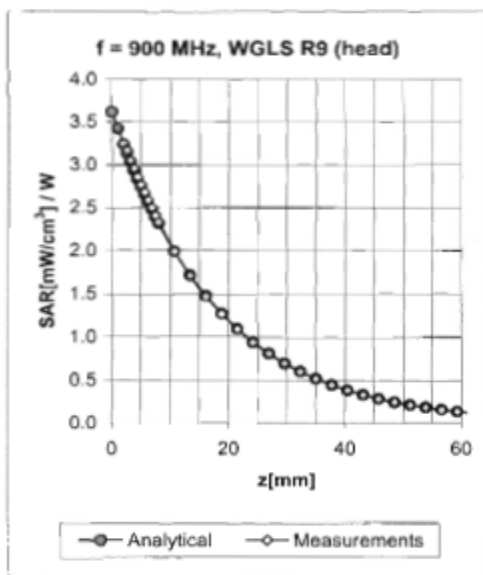
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SAR Report
SD_SAR_0910_05
Applicant: Nokia Corporation

Type: RM-506

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Conversion Factor Assessment



f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.69	1.17	5.70 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.39	1.63	4.86 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.47	1.46	4.66 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.42	1.74	4.33 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.69	1.26	5.64 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.49	1.37	4.65 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.45	1.46	4.61 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.99	1.08	3.98 ± 11.0% (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
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
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: **ES3-3165_Apr08**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3165**

Calibration procedure(s) **QA CAL-01.v6 and QA CAL-23.v3
Calibration procedure for dosimetric E-field probes**

Calibration date: **April 23, 2008**

Condition of the calibrated item **In Tolerance**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41496087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 660	3-Sep-07 (No. DAE4-660_Sep07)	Sep-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

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

Issued: April 23, 2008

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

Certificate No: **ES3-3165_Apr08**

Page 1 of 9

Type: **RM-506**

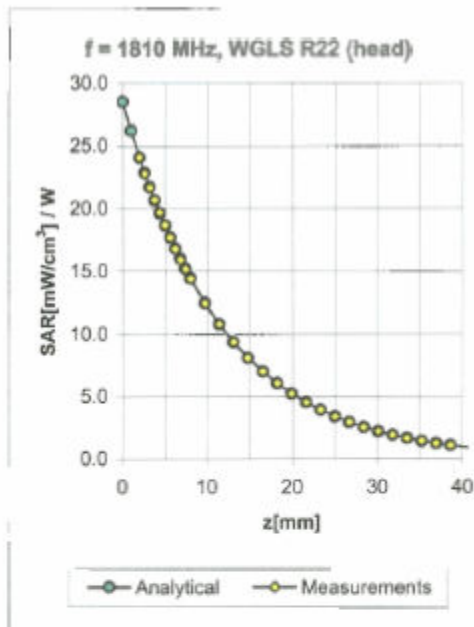
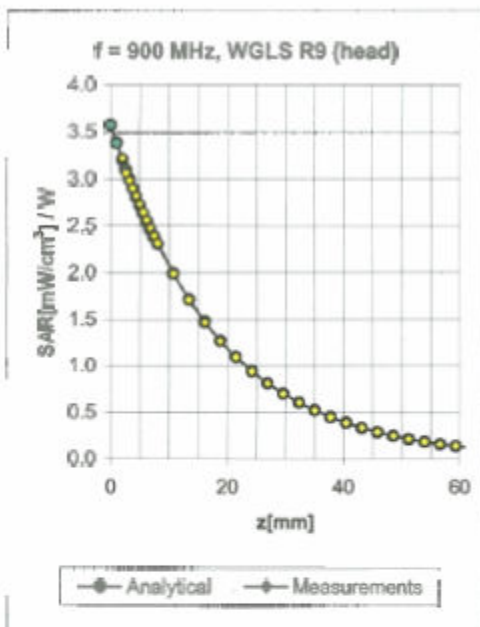
SAR Report

SD_SAR_0910_05

Applicant: Nokia Corporation

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Conversion Factor Assessment



f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	$\pm 50 / \pm 100$	Head	$41.5 \pm 5\%$	$0.97 \pm 5\%$	0.84	1.20	$6.23 \pm 11.0\% (k=2)$
1810	$\pm 50 / \pm 100$	Head	$40.0 \pm 5\%$	$1.40 \pm 5\%$	0.93	1.13	$5.14 \pm 11.0\% (k=2)$
1950	$\pm 50 / \pm 100$	Head	$40.0 \pm 5\%$	$1.40 \pm 5\%$	0.88	1.17	$4.87 \pm 11.0\% (k=2)$
2450	$\pm 50 / \pm 100$	Head	$39.2 \pm 5\%$	$1.80 \pm 5\%$	0.79	1.24	$4.57 \pm 11.0\% (k=2)$
2600	$\pm 50 / \pm 100$	Head	$39.0 \pm 5\%$	$1.96 \pm 5\%$	0.73	1.30	$4.49 \pm 11.0\% (k=2)$
900	$\pm 50 / \pm 100$	Body	$55.0 \pm 5\%$	$1.05 \pm 5\%$	1.00	1.14	$5.75 \pm 11.0\% (k=2)$
1810	$\pm 50 / \pm 100$	Body	$53.3 \pm 5\%$	$1.52 \pm 5\%$	0.97	1.12	$5.23 \pm 11.0\% (k=2)$
1950	$\pm 50 / \pm 100$	Body	$53.3 \pm 5\%$	$1.52 \pm 5\%$	0.79	1.29	$4.96 \pm 11.0\% (k=2)$
2450	$\pm 50 / \pm 100$	Body	$52.7 \pm 5\%$	$1.95 \pm 5\%$	0.63	1.50	$4.24 \pm 11.0\% (k=2)$
2600	$\pm 50 / \pm 100$	Body	$52.5 \pm 5\%$	$2.16 \pm 5\%$	0.70	1.44	$4.07 \pm 11.0\% (k=2)$

^c The validity of $\pm 100 \text{ MHz}$ only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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

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



S Schweizerischer Kalibrierdienst
S Service suisse d'étalonnage
C 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: **D835V2-480_May07**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 480**

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

Calibration date: **May 21, 2007**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	03-Oct-06 (METAS, No. 217-00608)	Oct-07
Power sensor HP 8481A	US37292783	03-Oct-06 (METAS, No. 217-00608)	Oct-07
Reference 20 dB Attenuator	SN: 5086 (20g)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference Probe ET3DV6 (HF)	SN 1507	19-Oct-06 (SPEAG, No. ET3-1507_Oct06)	Oct-07
DAE4	SN 601	30-Jan-07 (SPEAG, No. DAE4-601_Jan07)	Jan-08
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-05)	in house check: Oct-07
RF generator Agilent E4421B	MY41000675	11-May-05 (SPEAG, in house check Nov-05)	in house check: Nov-07
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-06)	in house check: Oct-07

	Name	Function	Signature
Calibrated by:	Marcel Fehr	Laboratory Technician	

	Name	Function	Signature
Approved by:	Katja Pokovic	Technical Manager	

Issued: May 30, 2007

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

DASY4 Validation Report for Head TSL

Date/Time: 21.05.2007 15:29:18

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL 900 MHz;

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.9 \text{ mho/m}$; $\epsilon_r = 41.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(6.09, 6.09, 6.09); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0:

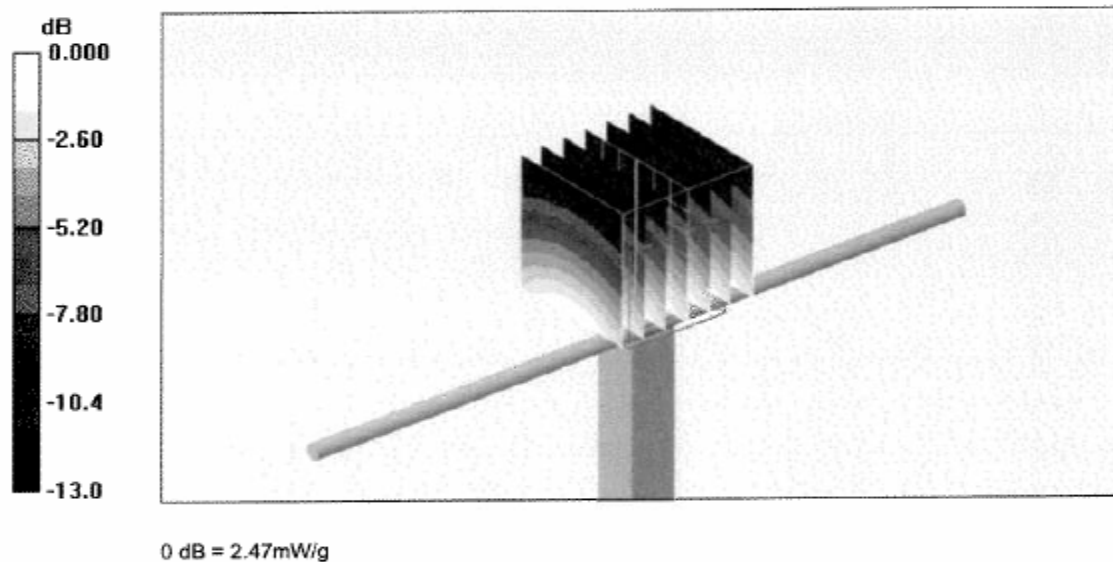
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 54.7 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 3.29 W/kg

SAR(1 g) = 2.29 mW/g; SAR(10 g) = 1.5 mW/g

Maximum value of SAR (measured) = 2.47 mW/g



DASY4 Validation Report for Body TSL

Date/Time: 21.05.2007 12:35:17

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: MSL900;

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.98 \text{ mho/m}$; $\epsilon_r = 53$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(5.75, 5.75, 5.75); Calibrated: 19.10.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250mW, d = 15mm/Zoom Scan (7x7x7)/Cube 0:

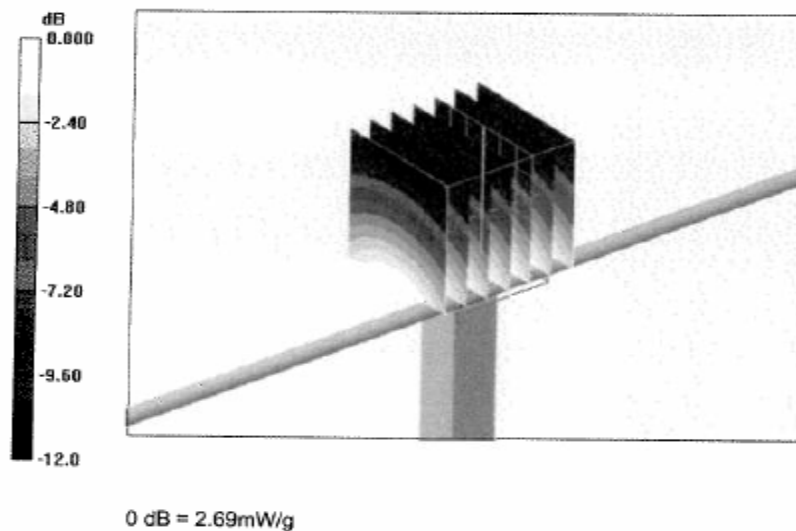
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 54.8 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 3.45 W/kg

SAR(1 g) = 2.48 mW/g; SAR(10 g) = 1.65 mW/g

Maximum value of SAR (measured) = 2.69 mW/g



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



S Schweizerischer Kalibrierdienst
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S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
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: **D1900V2-5d030_Jan08**

CALIBRATION CERTIFICATE

Object: **D1900V2 - SN: 5d030**

Calibration procedure(s): **QA CAL-05.v7
Calibration procedure for dipole validation kits**

Calibration date: **January 29, 2008**

Condition of the calibrated item: **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference 10 dB Attenuator	SN: 5047.2 (10r)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference Probe ET3DV6 (HF)	SN: 1507	26-Oct-07 (SPEAG, No. ET3-1507_Oct07)	Oct-08
DAE4	SN 601	3-Jan-08 (SPEAG, No. DAE4-601_Jan08)	Jan-09
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-07)	in house check: Oct-08
RF generator R&S SMT-06	100005	4-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08

Calibrated by:	Name Mike Meili	Function Laboratory Technician	Signature
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 30, 2008

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

DASY4 Validation Report for Head TSL

Date/Time: 29.01.2008 14:30:03

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: HSL U10 BB;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.46$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.86, 4.86, 4.86); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 03.01.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

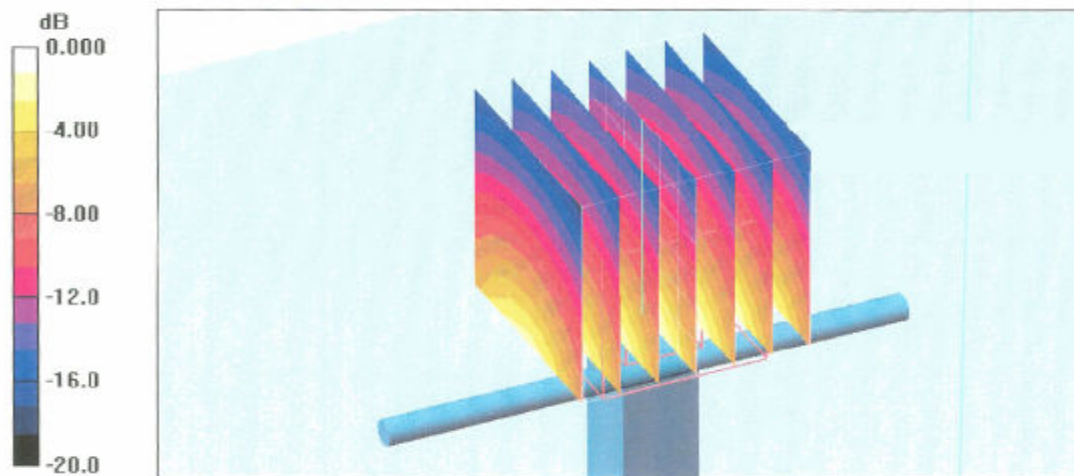
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 93.8 V/m; Power Drift = 0.031 dB

Peak SAR (extrapolated) = 18.0 W/kg

SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.3 mW/g

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



DASY4 Validation Report for Body TSL

Date/Time: 22.01.2008 14:15:36

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: MSL U10 BB;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(4.48, 4.48, 4.48); Calibrated: 26.10.2007
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 03.01.2008
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

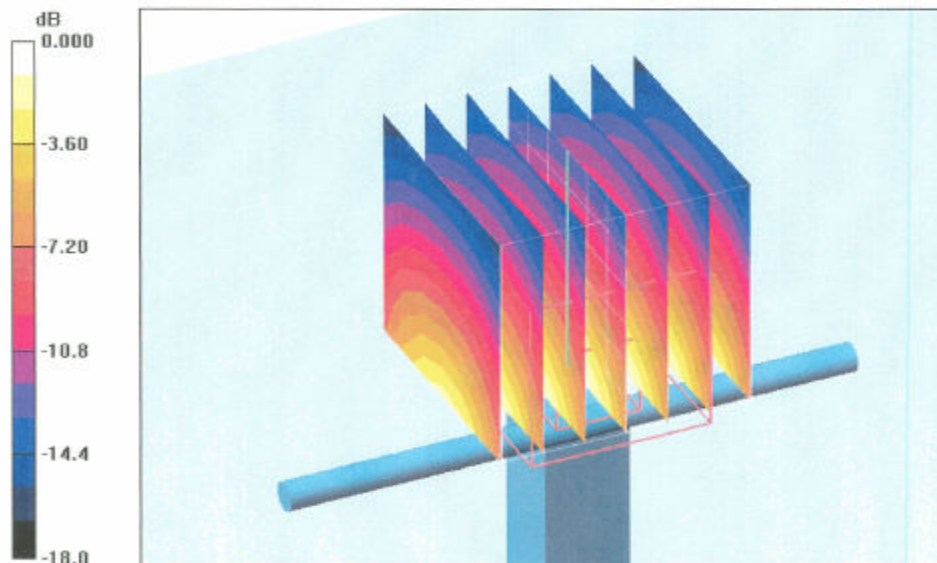
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 90.4 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 16.6 W/kg

SAR(1 g) = 9.62 mW/g; SAR(10 g) = 5.1 mW/g

Maximum value of SAR (measured) = 10.9 mW/g



0 dB = 10.9mW/g