

SAR Compliance Test Report

Test report no.:	FCC_RM-697_02	Date of report:	2010-10-06
Template version:	16.0	Number of pages:	77
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Tested device:	RM-697		
FCC ID:	QTKRM-697	IC:	-
Supplement reports:	SAR_Photo_RM-697_04		
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.		
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CONTENTS

1. SUMMARY OF SAR TEST REPORT	3
1.1 TEST DETAILS.....	3
1.2 MAXIMUM RESULTS.....	3
1.2.1 Head Configuration.....	3
1.2.2 Body Worn Configuration	4
1.2.3 Maximum Drift	4
1.2.4 Measurement Uncertainty.....	4
2. DESCRIPTION OF THE DEVICE UNDER TEST.....	5
2.1 DESCRIPTION OF THE ANTENNA.....	5
3. TEST CONDITIONS	6
3.1 TEMPERATURE AND HUMIDITY.....	6
3.2 TEST SIGNAL, FREQUENCIES AND OUTPUT POWER.....	6
3.3 TEST CASES AND TEST MINIMISATION	6
4. DESCRIPTION OF THE TEST EQUIPMENT	9
4.1 MEASUREMENT SYSTEM AND COMPONENTS	9
4.1.1 Isotropic E-field Probe Type ES3DV3	10
4.2 PHANTOMS	10
4.3 TISSUE SIMULANTS.....	11
4.3.1 Tissue Simulant Recipes.....	11
4.3.2 System Checking	12
4.3.3 Tissue Simulants used in the Measurements.....	13
5. DESCRIPTION OF THE TEST PROCEDURE	14
5.1 DEVICE HOLDER.....	14
5.2 TEST POSITIONS.....	14
5.2.1 Against Phantom Head.....	14
5.2.2 Body Worn Configuration	15
5.3 SCAN PROCEDURES.....	15
5.4 SAR AVERAGING METHODS.....	15
6. MEASUREMENT UNCERTAINTY	16
7. RESULTS.....	17
APPENDIX A: SYSTEM CHECKING SCANS.....	23
APPENDIX B: MEASUREMENT SCANS.....	30
APPENDIX C: CONDUCTED AVERAGE POWER MEASUREMENTS FOR WCDMA AND HSUPA.....	75
APPENDIX D: RELEVANT PAGES FROM PROBE CALIBRATION REPORT(S).....	76
APPENDIX E: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S)	77

1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2010-09-13 to 2010-09-27
SN, HW and SW numbers of tested device	SN: 004402/13/108348/1, HW: 2200a, SW: V 0.0.109, DUT: 24088
Batteries used in testing	BL-4U, DUT: 14984, 14985, 24081, 24083
Headsets used in testing	HS-125, DUT: 24072
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)	Conducted power	Position	Measured SAR value (1g avg)	Scaled* SAR value (1g avg)	SAR limit (1g avg)	Result
2-slot GPRS850	251 / 848.8	30.0dBm	Right, Cheek	0.740 W/kg	0.83 W/kg	1.6 W/kg	PASSED
3-slot GPRS1900	810 / 1909.8	24.4dBm	Left, Cheek	1.09 W/kg	1.22 W/kg	1.6 W/kg	PASSED
WCDMA1900	938 / 1907.6	19.7dBm	Left, Cheek	1.11 W/kg	1.24 W/kg	1.6 W/kg	PASSED
WLAN2450	11 / 2462.0	16.0dBm	Left, Cheek	0.226 W/kg	0.25 W/kg	1.6 W/kg	PASSED
2-slot GPRS850 + WLAN2450	-	-	Right, Cheek	0.836 W/kg	0.94 W/kg	1.6 W/kg	PASSED
3-slot GPRS1900 + WLAN2450	-	-	Left, Cheek	1.09 W/kg	1.22 W/kg	1.6 W/kg	PASSED
WCDMA1900 + WLAN2450	-	-	Left, Cheek	1.15 W/kg	1.29 W/kg	1.6 W/kg	PASSED

1.2.2 Body Worn Configuration

Mode	Ch / f (MHz)	Conducted power	Separation distance	Measured SAR value (1g avg)	Scaled* SAR value (1g avg)	SAR limit (1g avg)	Result
2-slot GPRS850	251 / 848.8	30.0 dBm	1.5 cm	0.739 W/kg	0.83 W/kg	1.6 W/kg	PASSED
3-slot GPRS1900	810 / 1909.8	24.4 dBm	1.5 cm	0.393 W/kg	0.44 W/kg	1.6 W/kg	PASSED
WCDMA1900	9538 / 1907.6	19.7 dBm	1.5 cm	0.502 W/kg	0.56 W/kg	1.6 W/kg	PASSED
WLAN2450	11 / 2462.0	16.0 dBm	1.5 cm	0.076 W/kg	0.09 W/kg	1.6 W/kg	PASSED
2-slot GPRS850 + WLAN2450	-	-	1.5 cm	0.792 W/kg	0.89 W/kg	1.6 W/kg	PASSED
3-slot GPRS1900 + WLAN2450	-	-	1.5 cm	0.390 W/kg	0.44 W/kg	1.6 W/kg	PASSED
WCDMA1900 + WLAN2450	-	-	1.5 cm	0.504 W/kg	0.56 W/kg	1.6 W/kg	PASSED

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

1.2.3 Maximum Drift

Maximum drift covered by 12% scaling up of the SAR values	Maximum drift during measurements
0.5dB	0.45dB

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
WCDMA	1900 (Band II)		1	1852 – 1908
HSUPA	1900 (Band II)		1	1852 – 1908
BT	2450	GFSK	1	2402 – 2480
WLAN b-mode	2450	Up to 11Mbps QPSK	1	2412 – 2462
WLAN g-mode	2450	Up to 54Mbps 64QAM	1	2412 – 2462

Outside of USA and Canada, the transmitter of the device is capable of operating also in GSM/GPRS/EGPRS900, GSM/GPRS/EGPRS1800, WCDMA900 and WCDMA2100 bands which are not part of this filing.

This device has 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.

This is a WCDMA HSUPA device, but SAR tests for HSUPA mode have not been performed as no HSUPA Sub-test mode has an average power > 0.25dB above the basic WCDMA 12.2kbps RMC mode. Appendix C of this report gives a summary of the measured WCDMA and HSUPA average powers; a detailed report of these WCDMA and HSUPA conducted power tests is submitted separately.

2.1 Description of the Antenna

The device has internal antennas for both cellular and WLAN use. The cellular antenna is located at the bottom underneath the back cover. The WLAN antenna is located at the top underneath the back cover.

3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	20.5 to 22.5
Ambient humidity (RH %):	35 to 55

3.2 Test Signal, Frequencies and Output Power

The device was put into operation by using a call tester 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.

The transmission mode of the device in all WCDMA tests was configured to 12.2kbps RMC with all TPC bits set as “1”.

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

The radiated output power of the device was measured by a separate test laboratory on the same unit(s) as used for SAR testing. The results are given in the EMC report supporting this application.

The transmission mode of the device in all WLAN b-mode tests was DSSS QPSK 11Mbps. This mode has the highest (or equal highest) time-averaged output power of all the WLAN b and g modulation modes in Nokia devices.

3.3 Test Cases and Test Minimisation

The tested device examined in this report may not incorporate all of the features described in the text that follows, but its SAR evaluation will have been subjected to the same considerations and test logic described below.

Whilst it's possible to identify the maximum SAR test cases from inspection of the conducted power levels given in the Results tables (Section 7), different modes in the same band and multi-slot transmit GSM/GPRS modes can create some difficulties. Therefore the sequence of

the SAR tests made in evaluating this device has used test logic that is based on measured SAR values. Comparison of measured SAR values in this way, can also allow some test minimization (i.e. test elimination) to be made.

For example, when SAR testing multi-slot GSM/GPRS/EGPRS modes, it is an inefficient use of test resources to fully SAR test every test configuration in each of the different modes as these modes have a fixed power relationship between them that is the same, irrespective of the test configuration. In the case of multi-slot GSM/GPRS modes, a single comparative SAR test - using the same test channel and test configuration - is made in each of the n-slot modes; the mode with the highest measured SAR value is then subjected to full SAR testing in all test configurations. These comparative SAR tests (same frequency, same test configuration) are regarded as extremely accurate as they are relative tests in which the tested device changes neither its frequency nor its position between tests. For different modes that operate in the same band and use the same antenna e.g. GSM/GPRS850 and WCDMA850, full SAR testing is carried out in the GSM/GPRS850 mode but WCDMA850 testing is limited to 3 channel testing in the maximum SAR test configuration for GSM/GPRS850.

Multi-slot SAR testing against the Head is always performed whenever such a device offers Push to Talk over cellular with the internal earpiece active, Dual Transfer Mode (i.e. the ability to transmit voice and data simultaneously using the same transmitter) or has WLAN (which enables a Voice over IP call to take place whilst the device can simultaneously transmit data on a cellular band). Whenever a device has an intended multi-slot use against the head, it is also Head SAR tested in EGPRS mode. It should be noted that EGPRS transmit modes can have either GMSK or 8PSK modulation but, when tested, only 8PSK EGPRS will appear explicitly in the results tables, as GMSK EGPRS mode has identical time-averaged power to the reported GPRS mode.

Devices that have flips or slides are fully SAR tested in all device configurations consistent with their intended usage. For example, flip phones that can receive a call in closed mode are SAR tested against the head in both open and closed configurations. Similarly, slide phones are fully SAR tested in all slide configurations in which calls are intended to be made or received.

In the results tables in Section 7, the maximum SAR value for the 'basic' tests (i.e. left cheek, left tilt, right cheek and right tilt in Head SAR testing; with and without headset with the back &/or display side facing the flat phantom in Body SAR testing) is bolded for each band. In some cases, after full testing of the basic SAR test configurations has been completed, additional checking SAR tests are made. These checking tests are always based on the bolded result from the 'basic' testing. When the SAR value of a checking test exceeds the maximum value from the basic tests, it is also bolded and used as the basis for any further checking tests that might be needed.

Checking tests are largely voluntary and can cover optional batteries, different camera slide positions, optional covers, etc. In the case of optional batteries, if the construction of the

optional battery is significantly different to the battery used in the full testing e.g. if the outer can is floating electrically rather than grounded, then the maximum SAR test configuration in each band is tested with the optional battery in 3 channels. For camera slides, if the slide material is metal, then checking tests in 3 channels are again run for the maximum SAR test configuration in each band. For plastic camera slides, SAR checking is only carried out in the channel that provided the maximum SAR value for the original. Optional front and back covers are tested if their shape differs significantly from the original or if their metallic content varies by more than 15% from the original; in the former case, the testing depends on the extent of the physical differences, whereas in the latter case, 3 channel SAR testing is performed in every band in the max SAR test configuration.

4. DESCRIPTION OF THE TEST EQUIPMENT

4.1 Measurement System and Components

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

The following table lists calibration dates of SPEAG components:

Test Equipment	Serial Number	Calibration interval	Calibration expiry
DAE 3	501	12 months	2011-02
E-field Probe ES3DV3	3116	12 months	2011-02
Dipole Validation Kit, D835V2	476	24 months	2011-03
Dipole Validation Kit, D1900V2	5d063	24 months	2012-02
Dipole Validation Kit, D2450V2	750	24 months	2012-02
DASY4 software	Version 4.7	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration interval	Calibration expiry
Signal Generator	SME06	829445/008	36 months	2012-02
Amplifier	ZHL-42W	E012903	-	-
Power Meter	NRP	100808	24 months	2012-04
Power Sensor	NRP-Z51	100410	24 months	2012-04
Vector Network Analyzer	AT8753ES	MY40001091	12 months	2011-08
Dielectric Probe Kit	HP85070B	US33020403	-	-

4.1.1 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 D
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
Application	Distance from probe tip to dipole centers: 2.0 mm General dosimetry up to 4 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

4.2 Phantoms

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

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

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

4.3 Tissue Simulants

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

The depth of the tissue simulant was at least 15.0 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	39.74	55.97
HEC	0.25	1.21
Sugar	58.31	41.76
Preservative	0.15	0.27
Salt	1.55	0.79

1900MHz band

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

2450MHz band

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

4.3.2 System Checking

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

System checking, head tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ϵ_r	σ [S/m]	
835	Reference result	2.31	40.1	0.87	
	$\pm 10\%$ window	2.08 - 2.54			
	2010-09-21	2.46	41.1	0.90	21.6
1900	Reference result	9.98	39.2	1.42	
	$\pm 10\%$ window	8.98 - 11.0			
	2010-09-13	10.1	38.9	1.37	21.3
	2010-09-14	10.1	38.5	1.37	21.4
	2010-09-22	10.2	40.2	1.39	21.6
	2010-09-27	10.4	40.1	1.39	22.0
2450	Reference result	13.5	38.7	1.77	
	$\pm 10\%$ window	12.1 - 14.9			
	2010-09-23	14.1	37.9	1.85	21.7

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

4.3.3 Tissue Simulants used in the Measurements

Head tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ϵ_r	σ [S/m]	
836	Recommended value	41.5	0.90	
	$\pm 5\%$ window	39.4 – 43.6	0.86 – 0.95	
	2010-09-21	41.1	0.90	21.6
1880	Recommended value	40.0	1.40	
	$\pm 5\%$ window	38.0 – 42.0	1.33 – 1.47	
	2010-09-13	39.0	1.35	21.3
	2010-09-22	40.3	1.38	21.6
	2010-09-27	40.2	1.37	22.0
2442	Recommended value	39.2	1.79	
	$\pm 5\%$ window	37.3 – 41.2	1.70 – 1.88	
	2010-09-23	38.0	1.84	21.7

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ϵ_r	σ [S/m]	
836	Recommended value	55.2	0.97	
	$\pm 5\%$ window	52.4 – 58.0	0.92 – 1.02	
	2010-09-21	54.0	0.97	21.6
1880	Recommended value	53.3	1.52	
	$\pm 5\%$ window	50.6 – 56.0	1.44 – 1.60	
	2010-09-14	51.6	1.47	21.0
	2010-09-22	52.7	1.47	22.0
2442	Recommended value	52.7	1.94	
	$\pm 5\%$ window	50.1 – 55.3	1.85 – 2.04	
	2010-09-23	51.2	1.96	21.8

5. DESCRIPTION OF THE TEST PROCEDURE

5.1 Device Holder

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



Device holder supplied by SPEAG

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



Nokia spacer

5.2 Test Positions

5.2.1 Against Phantom Head

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

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

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 Section 1.2.2 using a separate flat spacer that was removed before the start of the measurements. The device was oriented with both sides facing the phantom to find the highest results.

5.3 Scan Procedures

First, area scans were used for determination of the field distribution. Next, a zoom scan, a minimum of 5x5x7 points covering a volume of at least 30x30x30mm, was performed around the highest E-field value to determine the averaged SAR value. Drift was determined by measuring the same point at the start of the area scan and again at the end of the zoom scan.

5.4 SAR Averaging Methods

The maximum SAR value was averaged over a cube of tissue using interpolation and extrapolation.

The interpolation, extrapolation and maximum search routines within Dasy4 are all based on the modified Quadratic Shepard's method (Robert J. Renka, "Multivariate Interpolation Of Large Sets Of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148).

The interpolation scheme combines a least-square fitted function method with a weighted average method. A trivariate 3-D / bivariate 2-D quadratic function is computed for each measurement point and fitted to neighbouring points by a least-square method. For the zoom scan, inverse distance weighting is incorporated to fit distant points more accurately. The interpolating function is finally calculated as a weighted average of the quadratics.

In the zoom scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

6. MEASUREMENT UNCERTAINTY

Table 6.1 – Measurement uncertainty evaluation

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

7. RESULTS

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

850 MHz Head SAR results

Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 128 824.2 MHz	Ch190 836.6 MHz	Ch 251 848.8 MHz
GSM	Conducted Power		32.5 dBm	32.5 dBm	32.5 dBm
	Left	Cheek	-	0.337	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
2-slot GPRS	Conducted Power		30.0 dBm	30.0 dBm	30.0 dBm
	Left	Cheek	-	0.533	-
		Tilt	-	0.296	-
	Right	Cheek	0.437	0.593	0.740
		Tilt	-	0.325	-
3-slot GPRS	Conducted Power		28.2 dBm	28.2 dBm	28.2 dBm
	Left	Cheek	-	0.490	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
2-slot 8PSK EGPRS	Conducted Power		26.5 dBm	26.5 dBm	26.5 dBm
	Left	Cheek	-	-	-
		Tilt	-	-	-
	Right	Cheek	-	-	0.154
		Tilt	-	-	-

1900 MHz Head SAR results

Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
GSM	Conducted Power		29.2 dBm	29.2 dBm	29.2 dBm
	Left	Cheek	-	1.01	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
2-slot GPRS	Conducted Power		26.2 dBm	26.2 dBm	26.2 dBm
	Left	Cheek	-	1.03	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3-slot GPRS	Conducted Power		24.4 dBm	24.4 dBm	24.4 dBm
	Left	Cheek	1.02	1.07	1.09
		Tilt	-	0.256	-
	Right	Cheek	0.649	0.868	0.620
		Tilt	-	0.286	-
3-slot 8PSK EGPRS	Conducted Power		23.2 dBm	23.2 dBm	23.2 dBm
	Left	Cheek	-	-	0.598
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz
WCDMA	Conducted Power		19.7 dBm	19.7 dBm	19.7 dBm
	Left	Cheek	1.05	1.09	1.11
		Tilt	-	0.264	-
	Right	Cheek	0.738	0.880	0.751
		Tilt	-	0.299	-

2450 MHz Head SAR results

Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 1 2412.0 MHz	Ch 7 2442.0 MHz	Ch 11 2462.0 MHz
WLAN b-mode	Conducted Power		16.0 dBm	16.0 dBm	16.0 dBm
	Left	Cheek	0.198	0.213	0.226
		Tilt	-	0.202	-
	Right	Cheek	-	0.192	-
		Tilt	-	0.200	-

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

850 MHz Body SAR results

Mode	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 128 824.2 MHz	Ch190 836.6 MHz	Ch 251 848.8 MHz
2-slot GPRS		Conducted Power	30.0 dBm	30.0 dBm	30.0 dBm
	Display facing phantom	Without headset	-	0.394	-
		Headset HS-125	-	0.306	-
	Back facing phantom	Without headset	0.522	0.654	0.739
		Headset HS-125	-	0.484	-

1900 MHz Body SAR results

Mode	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
3-slot GPRS		Conducted Power	24.4 dBm	24.4 dBm	24.4 dBm
	Display facing phantom	Without headset	-	0.276	-
		Headset HS-125	-	0.286	-
	Back facing phantom	Without headset	0.379	0.382	0.393
		Headset HS-125	-	0.379	-
Mode	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz
WCDMA		Conducted Power	19.7 dBm	19.7 dBm	19.7 dBm
	Display facing phantom	Without headset	-	0.299	-
		Headset HS-125	-	0.295	-
	Back facing phantom	Without headset	0.447	0.461	0.502
		Headset HS-125	-	0.453	-

2450 MHz Body SAR results

Mode	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 1 2412.0 MHz	Ch 7 2442.0 MHz	Ch 11 2462.0 MHz
WLAN b-mode		Conducted Power	16.0 dBm	16.0 dBm	16.0 dBm
	Display facing phantom	Without headset	-	0.057	-
		Headset HS-125	-	0.052	-
	Back facing phantom	Without headset	0.068	0.076	0.076
		Headset HS-125	-	0.070	-

**Simultaneous transmissions: Combined SAR results –
Individual band Max results**

Test configuration	Max. 1g SAR results			
	WLAN	2-slot GPRS850	3-slot GPRS1900	WCDMA1900
Head: Left, Cheek	0.226	0.533	1.09	1.11
Head: Left, Tilt	0.202	0.296	0.256	0.264
Head: Right, Cheek	0.192	0.740	0.868	0.880
Head: Right, Tilt	0.200	0.325	0.286	0.299
Body: Display facing phantom, Without Headset	0.057	0.394	0.276	0.299
Body: Display facing phantom, Headset HS-125	0.052	0.306	0.286	0.295
Body: Back facing phantom, Without Headset	0.076	0.739	0.393	0.502
Body: Back facing phantom, Headset HS-125	0.070	0.484	0.379	0.453

**Simultaneous transmissions: Combined SAR results –
Max + Max combined results**

Test configuration	Combined 1g SAR values		
	2-slot GPRS850 + WLAN2450	3-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450
Head: Left, Cheek	0.759	1.32	1.34
Head: Left, Tilt	0.498	0.458	0.466
Head: Right, Cheek	0.932	1.06	1.07
Head: Right, Tilt	0.525	0.486	0.499
Body: Display facing phantom, Without Headset	0.451	0.333	0.356
Body: Display facing phantom, Headset HS-125	0.358	0.338	0.347
Body: Back facing phantom, Without Headset	0.815	0.469	0.578
Body: Back facing phantom, Headset HS-125	0.554	0.449	0.523

The following table gives a more accurate assessment of the SAR values for simultaneous transmission. These values have been calculated using the SPEAG Combined Multiband algorithm, which is based on area scans. It a) converts the 2D area scans into 3D volume scans by assuming frequency-dependent decay characteristics for the E-field, b) sums the SAR values

for WLAN2450 and the cellular bands point-by-point and c) calculates the combined average SAR values.

**Simultaneous transmissions: Combined SAR results –
SPEAG Combined Multiband algorithm results**

Test configuration	Combined 1g SAR values		
	2-slot GPRS850 + WLAN2450	3-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450
Head: Left, Cheek	-	1.02	1.15
Head: Left, Tilt	-	-	-
Head: Right, Cheek	0.836	-	-
Head: Right, Tilt	-	-	-
Body: Display facing phantom, Without Headset	-	-	-
Body: Display facing phantom, Headset HS-125	-	-	-
Body: Back facing phantom, Without Headset	0.792	0.390	0.504
Body: Back facing phantom, Headset HS-125	-	-	-

Some of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 and b) uncertainties associated with the different methods of calculation. In these cases, the maximum SAR values given for the combined Modes in the Summary table in Section 1.2 are those for the individual cellular band.

Note: Simultaneous Transmission Procedures as described in KDB648474 are not required for this product. The Combined SAR data given in the tables above has been voluntarily calculated.

Plots of the Measurement scans are given in Appendix B.

APPENDIX A: SYSTEM CHECKING SCANS

See the following pages.

Date/Time: 2010-09-21 10:35:57

Test Laboratory: TCC Nokia

Type: D835V2; Serial: 476

Communication System: CW850

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Head 850; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 835$ MHz; $\sigma = 0.901$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.94, 5.94, 5.94); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

d=15mm, Pin=250mW/Area Scan (61x121x1): Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 51.3 V/m

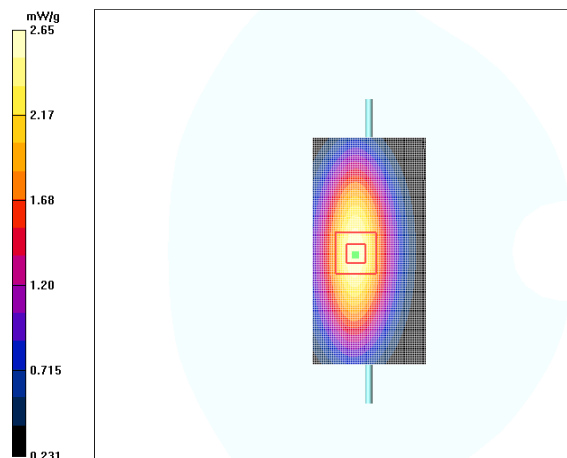
Peak SAR (extrapolated) = 3.74 W/kg

SAR(1 g) = 2.46 mW/g

SAR(10 g) = 1.6 mW/g

Power Drift = -0.029 dB

Maximum value of SAR (measured) = 2.65 mW/g



Date/Time: 2010-09-13 09:53:14

Test Laboratory: TCC Nokia
Type: D1900V2; Serial: 5d063

Communication System: CW1900

Frequency: 1900 MHz; Duty Cycle: 1:1

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

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

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

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

Reference Value = 91.8 V/m

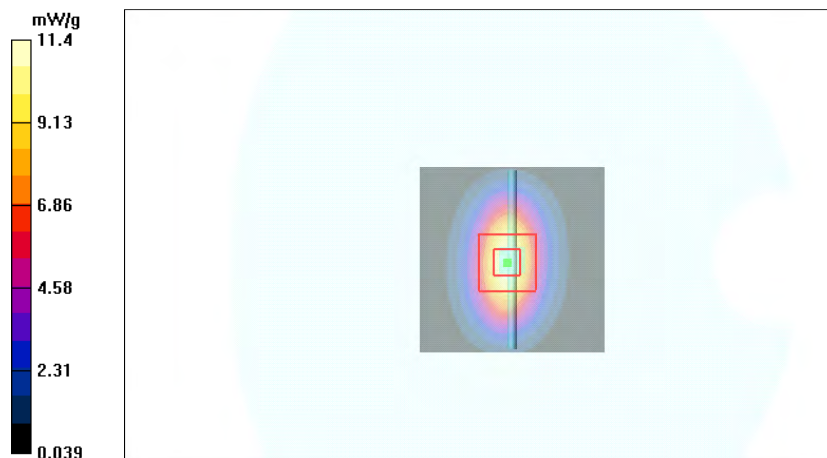
Peak SAR (extrapolated) = 18.3 W/kg

SAR(1 g) = 10.1 mW/g

SAR(10 g) = 5.27 mW/g

Power Drift = 0.076 dB

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



Date/Time: 2010-09-14 09:07:41

Test Laboratory: TCC Nokia
Type: D1900V2; Serial: 5d063

Communication System: CW1900

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 21.4 C

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

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

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

Reference Value = 93.3 V/m

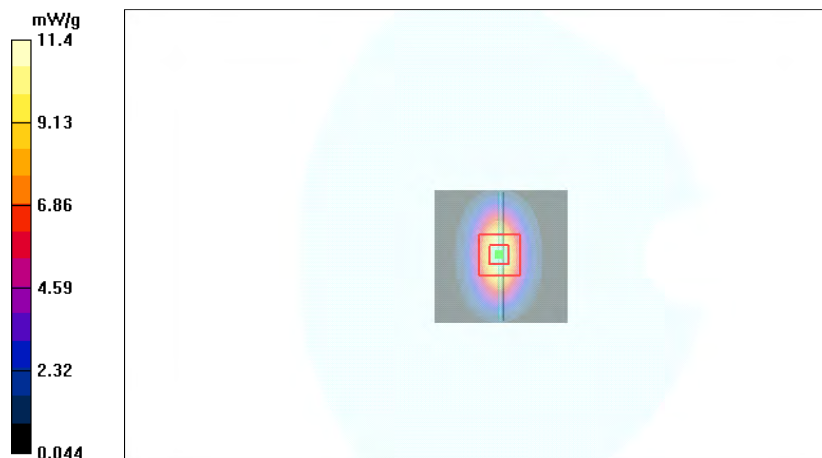
Peak SAR (extrapolated) = 18.3 W/kg

SAR(1 g) = 10.1 mW/g

SAR(10 g) = 5.28 mW/g

Power Drift = 0.017 dB

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



Date/Time: 2010-09-22 12:07:05

Test Laboratory: TCC Nokia
Type: D1900V2; Serial: 5d063

Communication System: CW1900

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

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

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

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

Reference Value = 91.9 V/m

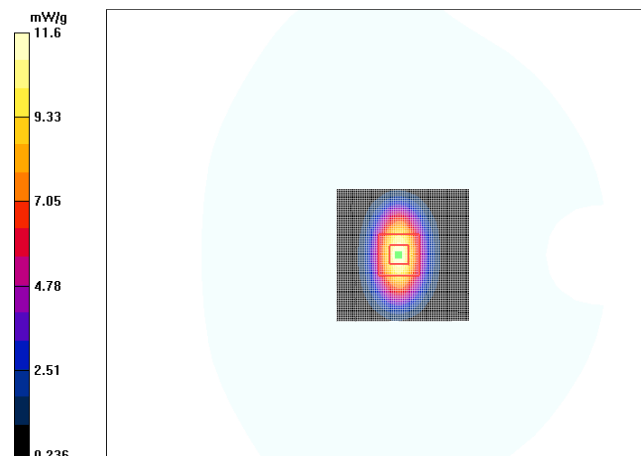
Peak SAR (extrapolated) = 18.6 W/kg

SAR(1 g) = 10.2 mW/g

SAR(10 g) = 5.31 mW/g

Power Drift = -0.022 dB

Maximum value of SAR (measured) = 11.6 mW/g



Date/Time: 2010-09-27 17:12:36

Test Laboratory: TCC Nokia
Type: D1900V2; Serial: 5d063

Communication System: CW1900

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 22.0 C

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 40.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

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

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

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

Reference Value = 90.9 V/m

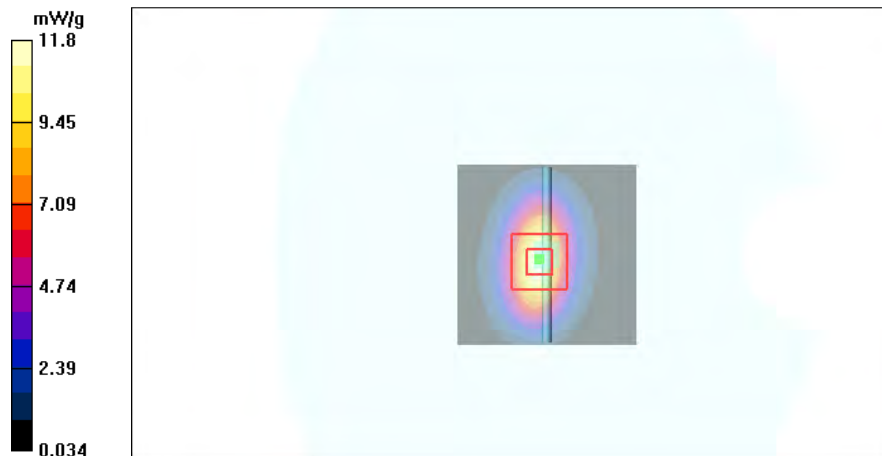
Peak SAR (extrapolated) = 19.1 W/kg

SAR(1 g) = 10.4 mW/g

SAR(10 g) = 5.38 mW/g

Power Drift = -0.072 dB

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



Date/Time: 2010-09-23 09:58:25

Test Laboratory: TCC Nokia

Type: D2450V2; Serial: 750

Communication System: CW2450

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 21.7C

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.85$ mho/m; $\epsilon_r = 37.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.36, 4.36, 4.36); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Maximum value of SAR (interpolated) = 16.5 mW/g

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

Reference Value = 95.3 V/m

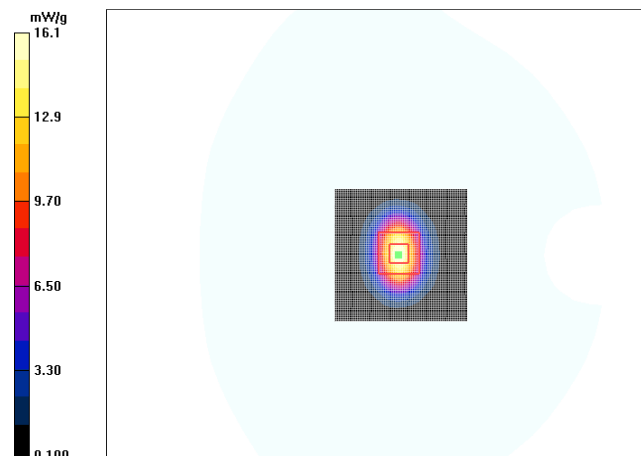
Peak SAR (extrapolated) = 29.0 W/kg

SAR(1 g) = 14.1 mW/g

SAR(10 g) = 6.5 mW/g

Power Drift = 0.011 dB

Maximum value of SAR (measured) = 16.1 mW/g



APPENDIX B: MEASUREMENT SCANS

See the following pages.

Date/Time: 2010-09-21 11:54:57

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: Head 850; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.904$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.94, 5.94, 5.94); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.374 mW/g

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

Reference Value = 8.36 V/m

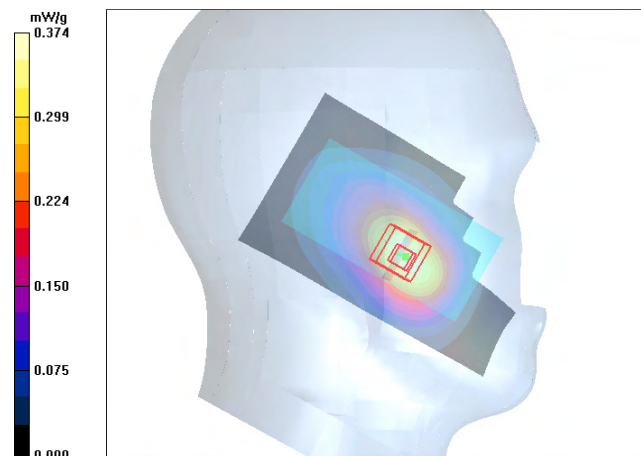
Peak SAR (extrapolated) = 0.470 W/kg

SAR(1 g) = 0.337 mW/g

SAR(10 g) = 0.230 mW/g

Power Drift = -0.112 dB

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



Date/Time: 2010-09-21 12:14:31

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Head 850; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.904$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.94, 5.94, 5.94); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.594 mW/g

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

Reference Value = 10.7 V/m

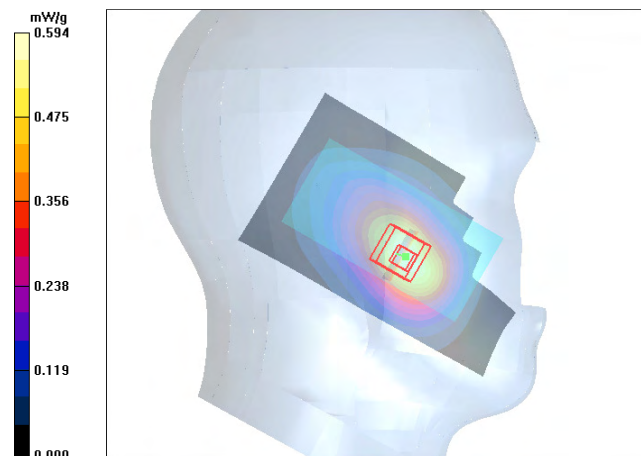
Peak SAR (extrapolated) = 0.757 W/kg

SAR(1 g) = 0.533 mW/g

SAR(10 g) = 0.361 mW/g

Power Drift = -0.362 dB

Maximum value of SAR (measured) = 0.569 mW/g



Date/Time: 2010-09-21 12:52:26

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Head 850; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.904$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.94, 5.94, 5.94); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.319 mW/g

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

Reference Value = 14.7 V/m

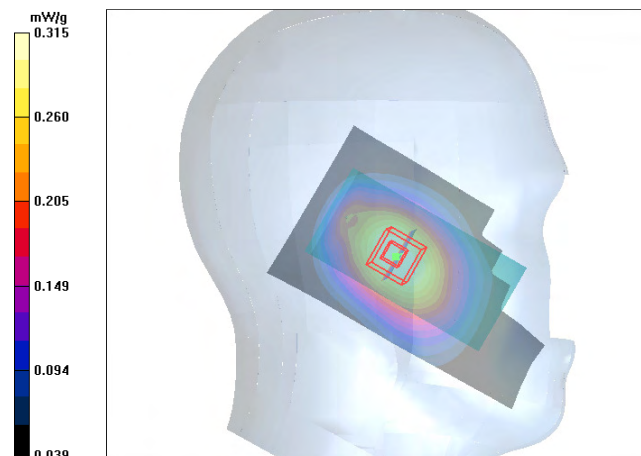
Peak SAR (extrapolated) = 0.389 W/kg

SAR(1 g) = 0.296 mW/g

SAR(10 g) = 0.215 mW/g

Power Drift = -0.423 dB

Maximum value of SAR (measured) = 0.315 mW/g



Date/Time: 2010-09-21 14:01:51

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 2-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:4.2

Medium: Head 850; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.916$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.94, 5.94, 5.94); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek - High/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 11.6 V/m

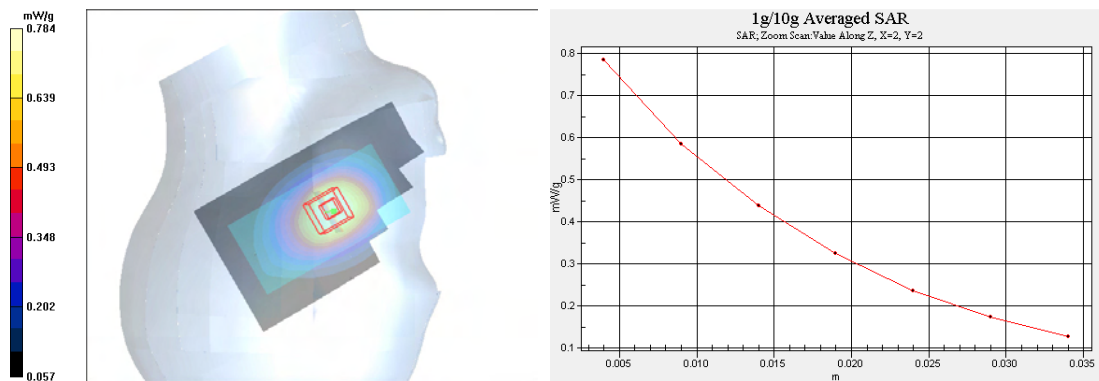
Peak SAR (extrapolated) = 0.994 W/kg

SAR(1 g) = 0.740 mW/g

SAR(10 g) = 0.511 mW/g

Power Drift = -0.189 dB

Maximum value of SAR (measured) = 0.784 mW/g



SAR Report

FCC_RM-697_02

Applicant: Nokia Corporation

Type: RM-697

Copyright © 2010 TCC Nokia

Date/Time: 2010-09-21 13:36:36

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Head 850; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.904$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.94, 5.94, 5.94); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.348 mW/g

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

Reference Value = 14.6 V/m

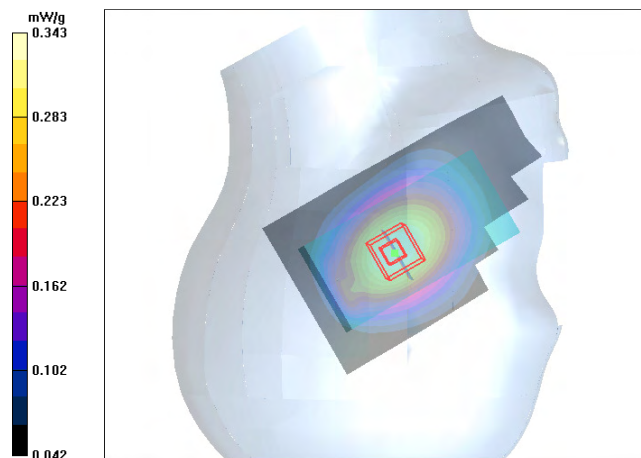
Peak SAR (extrapolated) = 0.422 W/kg

SAR(1 g) = 0.325 mW/g

SAR(10 g) = 0.237 mW/g

Power Drift = -0.234 dB

Maximum value of SAR (measured) = 0.343 mW/g



Date/Time: 2010-09-21 12:33:41

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 3-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:2.8

Medium: Head 850; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.904$ mho/m; $\epsilon_r = 41.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.94, 5.94, 5.94); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.549 mW/g

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

Reference Value = 10.3 V/m

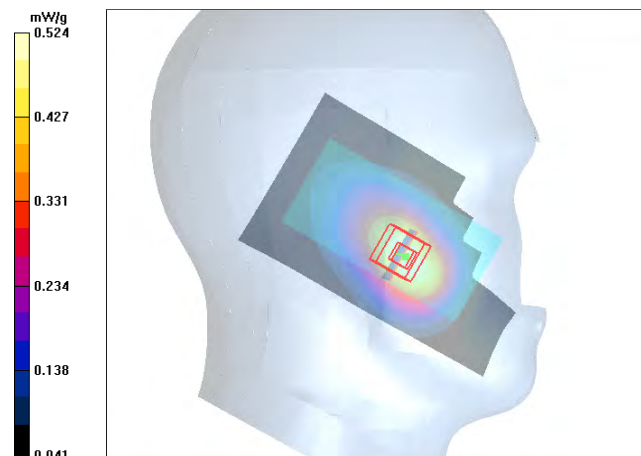
Peak SAR (extrapolated) = 0.695 W/kg

SAR(1 g) = 0.490 mW/g

SAR(10 g) = 0.334 mW/g

Power Drift = -0.445 dB

Maximum value of SAR (measured) = 0.524 mW/g



Date/Time: 2010-09-21 14:16:59

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 2-slot 8PSK EGPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:4.2

Medium: Head 850; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.916$ mho/m; $\epsilon_r = 40.9$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.94, 5.94, 5.94); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek - High/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 5.21 V/m

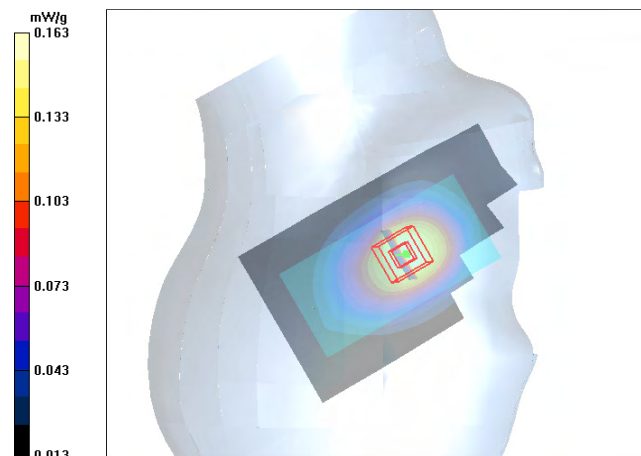
Peak SAR (extrapolated) = 0.204 W/kg

SAR(1 g) = 0.154 mW/g

SAR(10 g) = 0.107 mW/g

Power Drift = 0.081 dB

Maximum value of SAR (measured) = 0.163 mW/g



Date/Time: 2010-09-13 10:34:48

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: GSM 1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Maximum value of SAR (interpolated) = 1.11 mW/g

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

Reference Value = 9.26 V/m

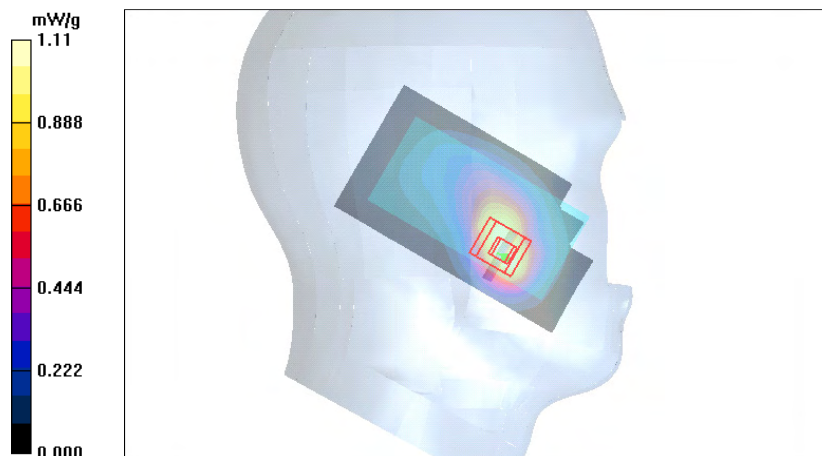
Peak SAR (extrapolated) = 1.65 W/kg

SAR(1 g) = 1.01 mW/g

SAR(10 g) = 0.581 mW/g

Power Drift = -0.406 dB

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



Date/Time: 2010-09-13 10:50:10

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Maximum value of SAR (interpolated) = 1.10 mW/g

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

Reference Value = 8.62 V/m

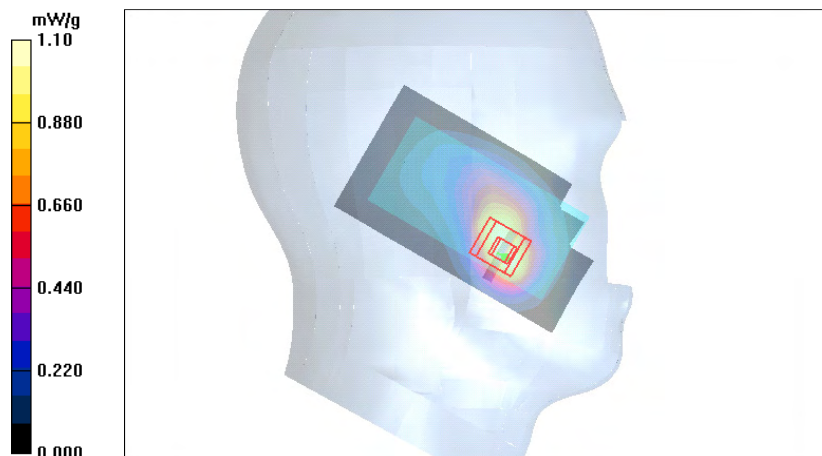
Peak SAR (extrapolated) = 1.69 W/kg

SAR(1 g) = 1.03 mW/g

SAR(10 g) = 0.588 mW/g

Power Drift = 0.025 dB

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



Date/Time: 2010-09-13 13:04:39

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 3-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:2.8

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Maximum value of SAR (interpolated) = 1.17 mW/g

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

Reference Value = 9.90 V/m

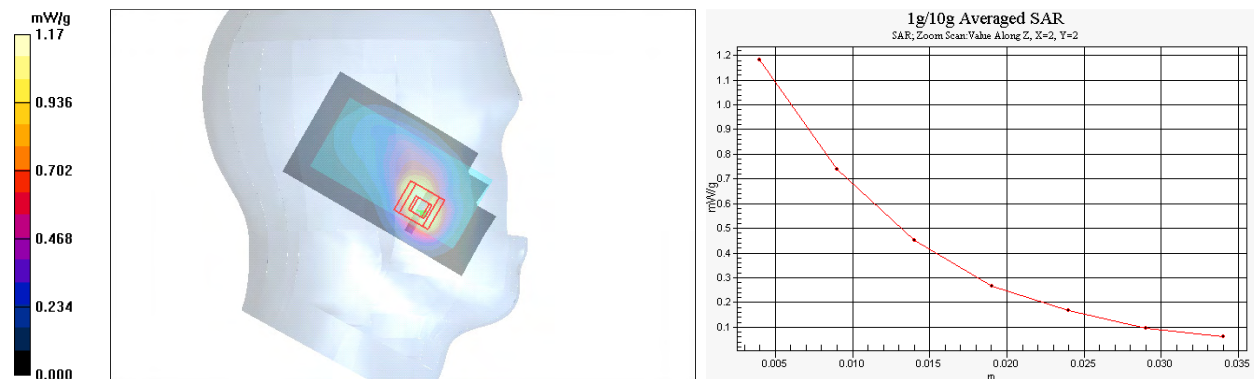
Peak SAR (extrapolated) = 1.81 W/kg

SAR(1 g) = 1.09 mW/g

SAR(10 g) = 0.615 mW/g

Power Drift = -0.088 dB

Maximum value of SAR (measured) = 1.18 mW/g



SAR Report

FCC_RM-697_02

Applicant: Nokia Corporation

Type: RM-697

Copyright © 2010 TCC Nokia

Date/Time: 2010-09-13 11:39:12

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 3-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:2.8

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt position - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 13.9 V/m

Peak SAR (extrapolated) = 0.395 W/kg

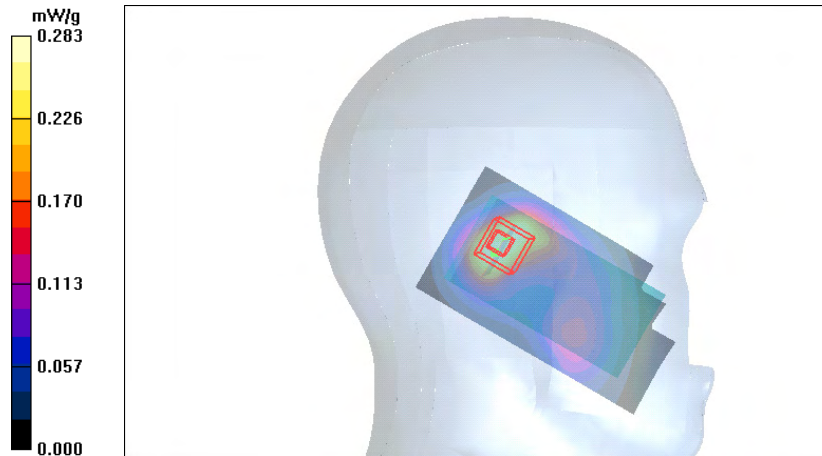
SAR(1 g) = 0.256 mW/g

SAR(10 g) = 0.159 mW/g

Power Drift = 0.129 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) = 0.280 mW/g



Date/Time: 2010-09-13 12:01:14

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 3-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:2.8

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Maximum value of SAR (interpolated) = 0.965 mW/g

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

Reference Value = 10.5 V/m

Peak SAR (extrapolated) = 1.41 W/kg

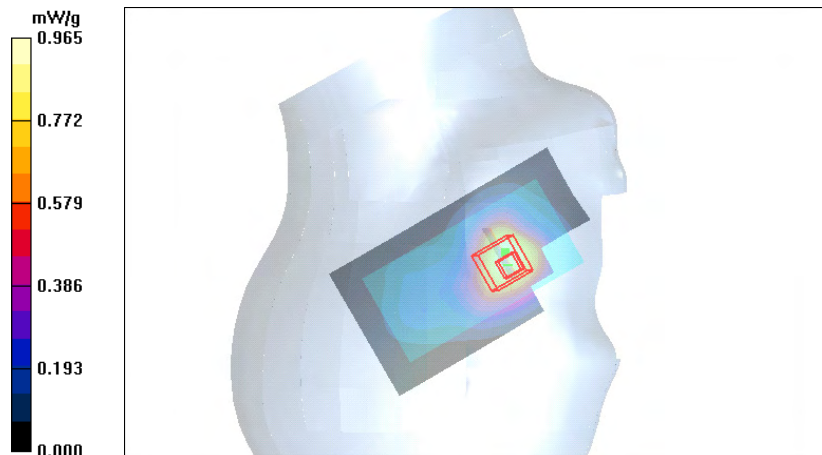
SAR(1 g) = 0.868 mW/g

SAR(10 g) = 0.535 mW/g

Power Drift = -0.229 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) = 0.946 mW/g



Date/Time: 2010-09-13 12:17:18

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 3-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:2.8

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 39$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt position - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.315 mW/g

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

Reference Value = 15.2 V/m

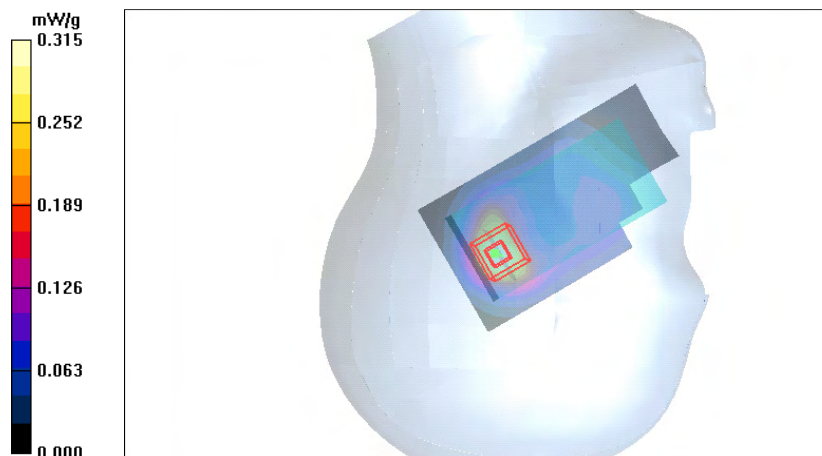
Peak SAR (extrapolated) = 0.435 W/kg

SAR(1 g) = 0.286 mW/g

SAR(10 g) = 0.170 mW/g

Power Drift = 0.148 dB

Maximum value of SAR (measured) = 0.311 mW/g



Date/Time: 2010-09-13 13:39:45

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 3-slot 8PSK EGPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:2.8

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Maximum value of SAR (interpolated) = 0.664 mW/g

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

Reference Value = 7.28 V/m

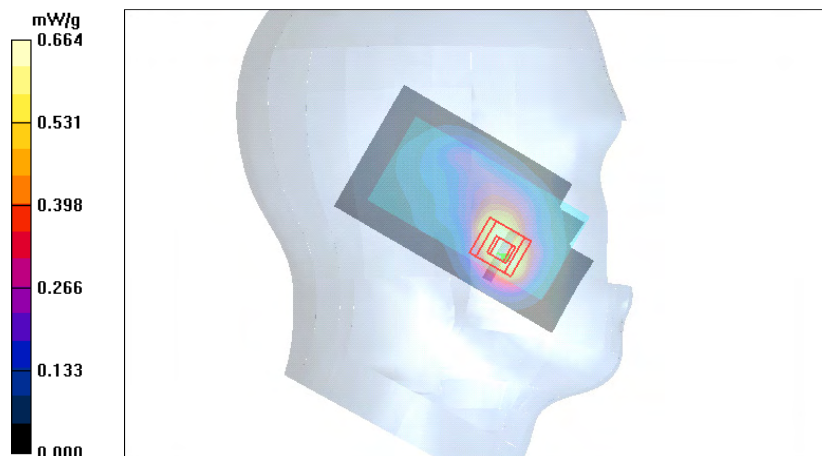
Peak SAR (extrapolated) = 0.993 W/kg

SAR(1 g) = 0.598 mW/g

SAR(10 g) = 0.339 mW/g

Power Drift = -0.030 dB

Maximum value of SAR (measured) = 0.656 mW/g



Date/Time: 2010-09-22 14:10:25

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WCDMA1900

Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 1908$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek -High/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.29 mW/g

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

Reference Value = 9.71 V/m

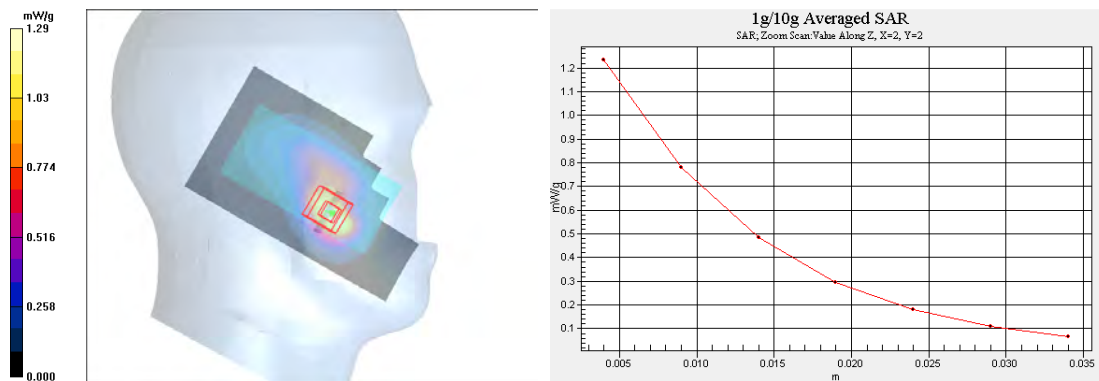
Peak SAR (extrapolated) = 1.79 W/kg

SAR(1 g) = 1.11 mW/g

SAR(10 g) = 0.624 mW/g

Power Drift = -0.127 dB

Maximum value of SAR (measured) = 1.23 mW/g



SAR Report

FCC_RM-697_02

Applicant: Nokia Corporation

Type: RM-697

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Date/Time: 2010-09-22 13:09:52

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WCDMA1900

Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 14.1 V/m

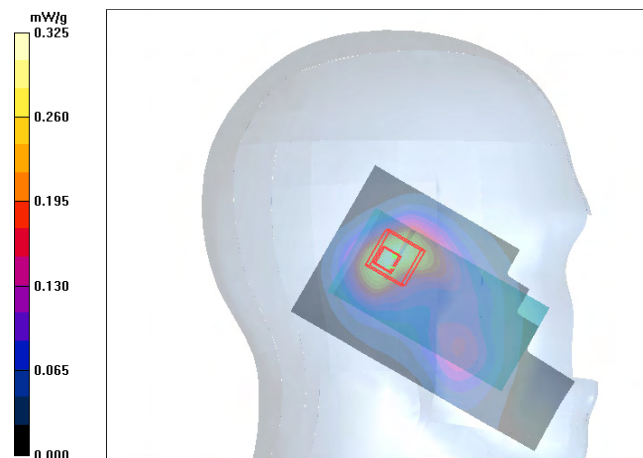
Peak SAR (extrapolated) = 0.396 W/kg

SAR(1 g) = 0.264 mW/g

SAR(10 g) = 0.166 mW/g

Power Drift = -0.186 dB

Maximum value of SAR (measured) = 0.276 mW/g



Date/Time: 2010-09-22 13:24:57

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WCDMA1900

Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 10.0 V/m

Peak SAR (extrapolated) = 1.31 W/kg

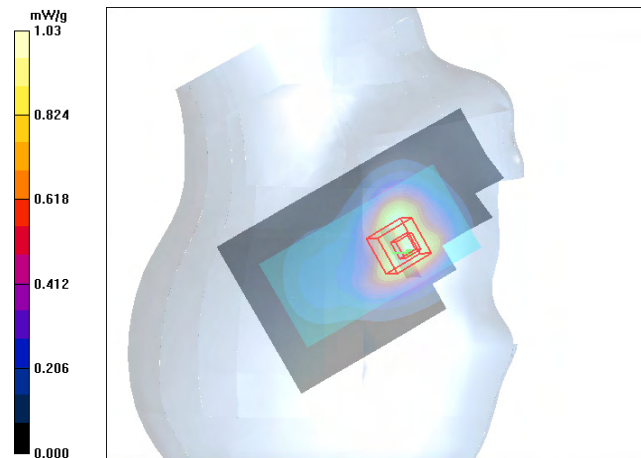
SAR(1 g) = 0.880 mW/g

SAR(10 g) = 0.558 mW/g

Power Drift = -0.384 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) = 0.945 mW/g



Date/Time: 2010-09-22 13:41:43

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WCDMA1900

Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 40.3$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 6; Type: SAM Twin Phantom; Serial: TP-1301
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.341 mW/g

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

Reference Value = 15.0 V/m

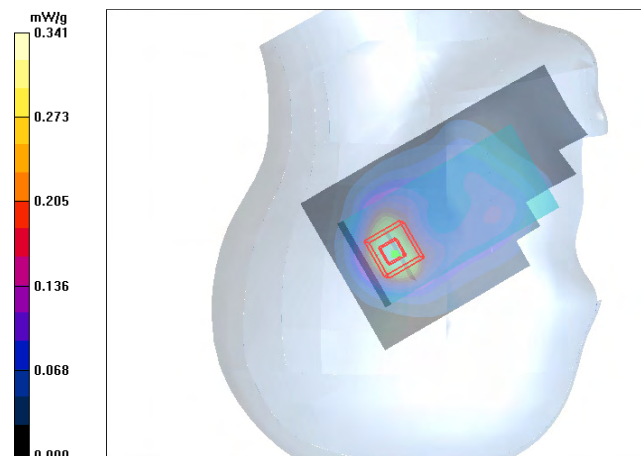
Peak SAR (extrapolated) = 0.459 W/kg

SAR(1 g) = 0.299 mW/g

SAR(10 g) = 0.176 mW/g

Power Drift = -0.032 dB

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



Date/Time: 2010-09-23 13:43:17

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WLAN2450 b-mode

Frequency: 2462 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 21.7C

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.87$ mho/m; $\epsilon_r = 37.9$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.36, 4.36, 4.36); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek - High/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.266 mW/g

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

Reference Value = 8.53 V/m

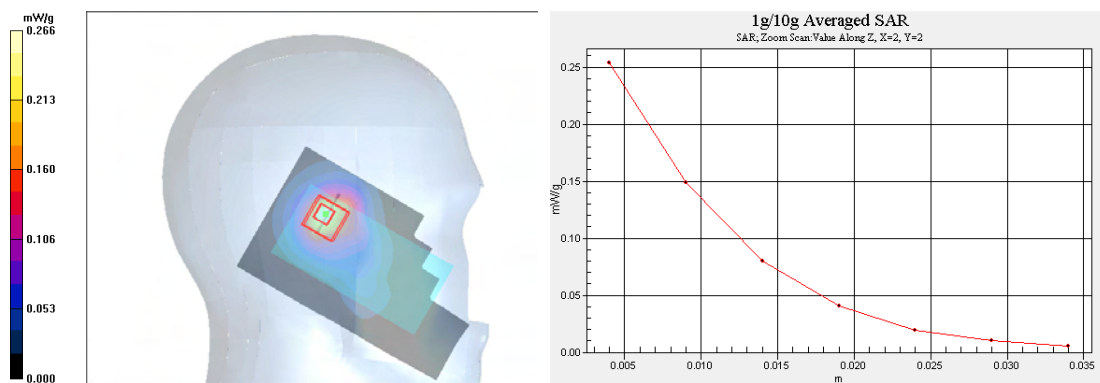
Peak SAR (extrapolated) = 0.396 W/kg

SAR(1 g) = 0.226 mW/g

SAR(10 g) = 0.117 mW/g

Power Drift = 0.051 dB

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



SAR Report

FCC_RM-697_02

Applicant: Nokia Corporation

Type: RM-697

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Date/Time: 2010-09-23 12:40:11

Test Laboratory: TCC Nokia

Type: **RM-697**; Serial: **004402/13/108348/1**

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 21.7C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.84$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:

- ConvF(4.36, 4.36, 4.36); Calibrated: 2010-02-24

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

- Electronics: DAE3 Sn501; Calibrated: 2010-02-19

- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.232 mW/g

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

Reference Value = 10.1 V/m

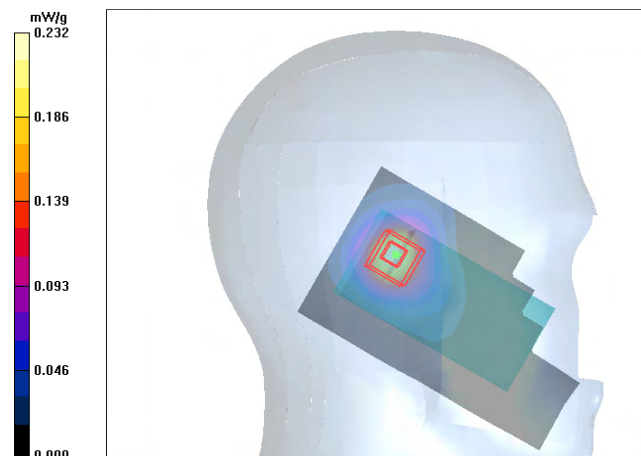
Peak SAR (extrapolated) = 0.360 W/kg

SAR(1 g) = 0.202 mW/g

SAR(10 g) = 0.107 mW/g

Power Drift = -0.049 dB

Maximum value of SAR (measured) = 0.221 mW/g



Date/Time: 2010-09-23 12:58:58

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 21.7C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.84$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.36, 4.36, 4.36); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Cheek - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.215 mW/g

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

Reference Value = 10.5 V/m

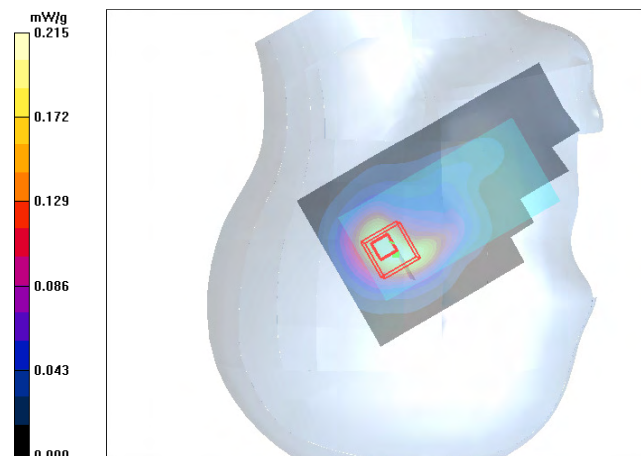
Peak SAR (extrapolated) = 0.330 W/kg

SAR(1 g) = 0.192 mW/g

SAR(10 g) = 0.107 mW/g

Power Drift = 0.128 dB

Maximum value of SAR (measured) = 0.204 mW/g



Date/Time: 2010-09-23 13:11:20

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 21.7C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.84$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.36, 4.36, 4.36); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt - Middle/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.221 mW/g

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

Reference Value = 11.2 V/m

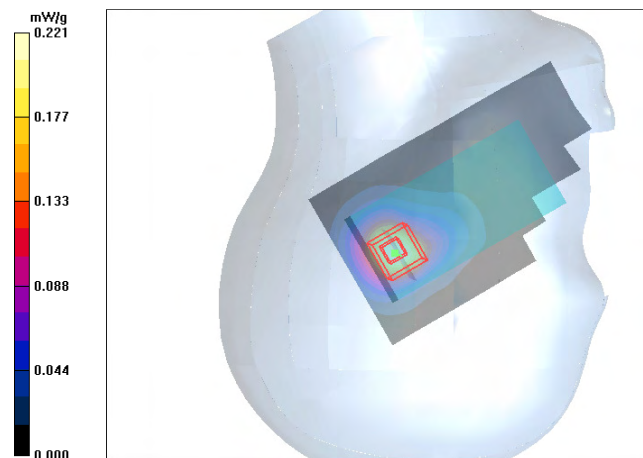
Peak SAR (extrapolated) = 0.352 W/kg

SAR(1 g) = 0.200 mW/g

SAR(10 g) = 0.106 mW/g

Power Drift = 0.006 dB

Maximum value of SAR (measured) = 0.221 mW/g



Date/Time: 2010-09-21 17:17:46

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Body 850; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.971$ mho/m; $\epsilon_r = 54$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.84, 5.84, 5.84); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 5; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Middle - No Accessory - Display Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.432 mW/g

Body - Middle - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

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

Reference Value = 9.46 V/m

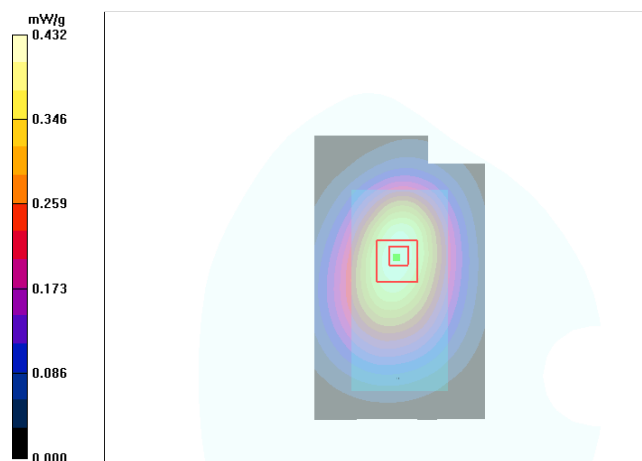
Peak SAR (extrapolated) = 0.517 W/kg

SAR(1 g) = 0.394 mW/g

SAR(10 g) = 0.285 mW/g

Power Drift = -0.296 dB

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



Date/Time: 2010-09-21 17:44:54

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Body 850; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.971$ mho/m; $\epsilon_r = 54$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.84, 5.84, 5.84); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 5; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Middle - HS-125 - Display Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.334 mW/g

Body - Middle - HS-125 - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 9.06 V/m

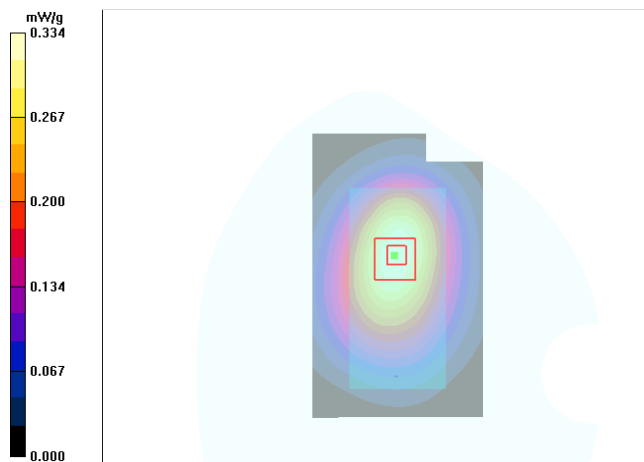
Peak SAR (extrapolated) = 0.403 W/kg

SAR(1 g) = 0.306 mW/g

SAR(10 g) = 0.221 mW/g

Power Drift = -0.306 dB

Maximum value of SAR (measured) = 0.323 mW/g



Date/Time: 2010-09-21 18:38:55

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 2-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:4.2

Medium: Body 850; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.983$ mho/m; $\epsilon_r = 53.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.84, 5.84, 5.84); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 5; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - High - No Accessory - Back Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.811 mW/g

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

Reference Value = 13.0 V/m

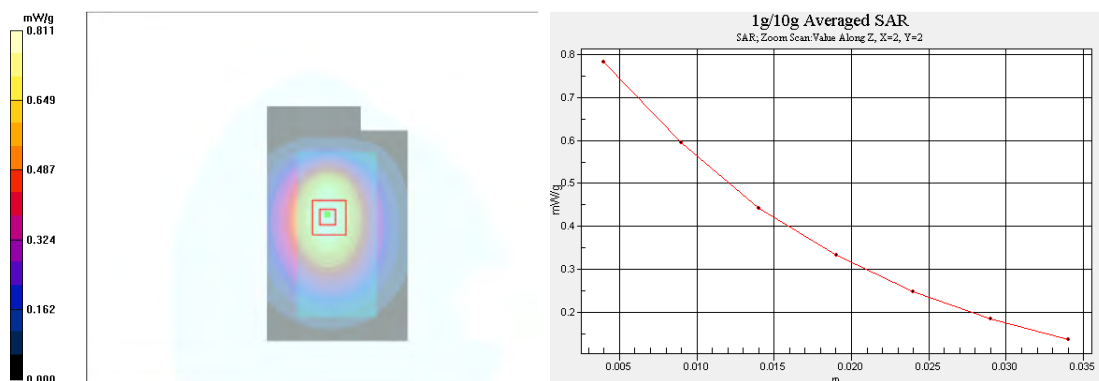
Peak SAR (extrapolated) = 0.966 W/kg

SAR(1 g) = 0.739 mW/g

SAR(10 g) = 0.533 mW/g

Power Drift = -0.118 dB

Maximum value of SAR (measured) = 0.782 mW/g



SAR Report

FCC_RM-697_02

Applicant: Nokia Corporation

Type: RM-697

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Date/Time: 2010-09-21 19:08:29

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Body 850; Medium Notes: Medium Temperature: 21.6 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.971$ mho/m; $\epsilon_r = 54$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.84, 5.84, 5.84); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 5; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Middle - HS-125 - Back Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.539 mW/g

Body - Middle - HS-125 - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 10.5 V/m

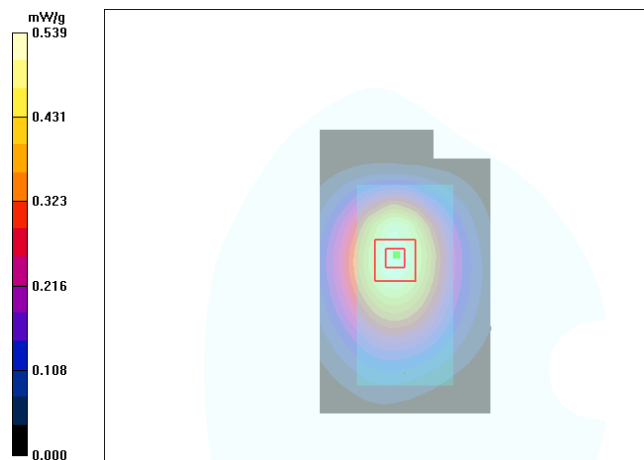
Peak SAR (extrapolated) = 0.645 W/kg

SAR(1 g) = 0.484 mW/g

SAR(10 g) = 0.348 mW/g

Power Drift = -0.081 dB

Maximum value of SAR (measured) = 0.513 mW/g



Date/Time: 2010-09-14 12:24:16

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 3-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:2.8

Medium: Body 1900; Medium Notes: Medium Temperature: 21.0 C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.58, 4.58, 4.58); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 1; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Maximum value of SAR (interpolated) = 0.305 mW/g

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

Reference Value = 9.19 V/m

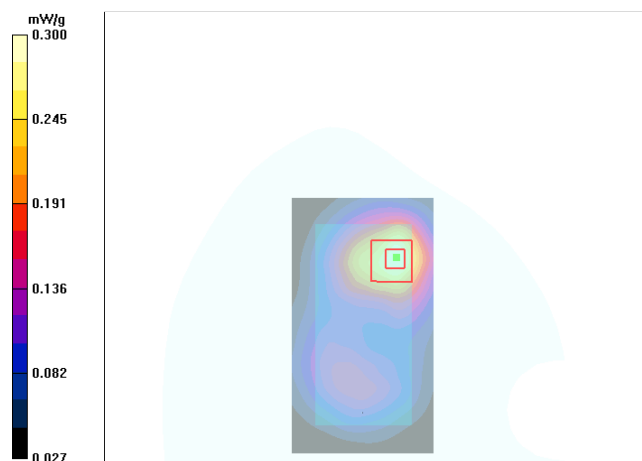
Peak SAR (extrapolated) = 0.407 W/kg

SAR(1 g) = 0.276 mW/g

SAR(10 g) = 0.179 mW/g

Power Drift = -0.070 dB

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



Date/Time: 2010-09-14 12:37:57

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 3-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:2.8

Medium: Body 1900; Medium Notes: Medium Temperature: 21.0 C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.58, 4.58, 4.58); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 1; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Middle - Headset HS-125 - Display Facing Phantom/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

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

Body - Middle - Headset HS-125 - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

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

Reference Value = 8.84 V/m

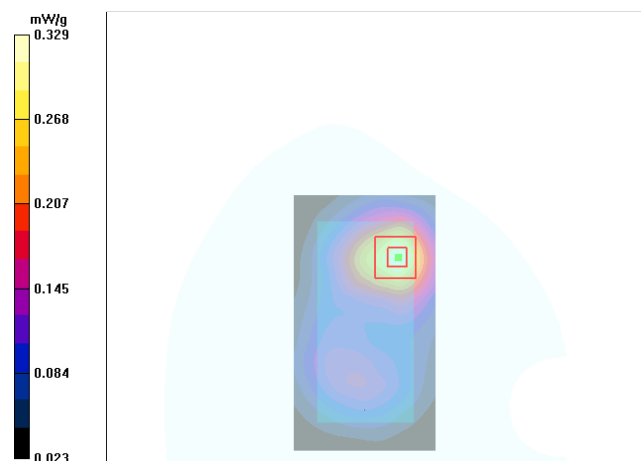
Peak SAR (extrapolated) = 0.433 W/kg

SAR(1 g) = 0.286 mW/g

SAR(10 g) = 0.183 mW/g

Power Drift = 0.305 dB

Maximum value of SAR (measured) = 0.315 mW/g



Date/Time: 2010-09-14 13:29:45

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 3-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:2.8

Medium: Body 1900; Medium Notes: Medium Temperature: 21.0 C

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 51.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.58, 4.58, 4.58); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 1; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Maximum value of SAR (interpolated) = 0.445 mW/g

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

Reference Value = 7.92 V/m

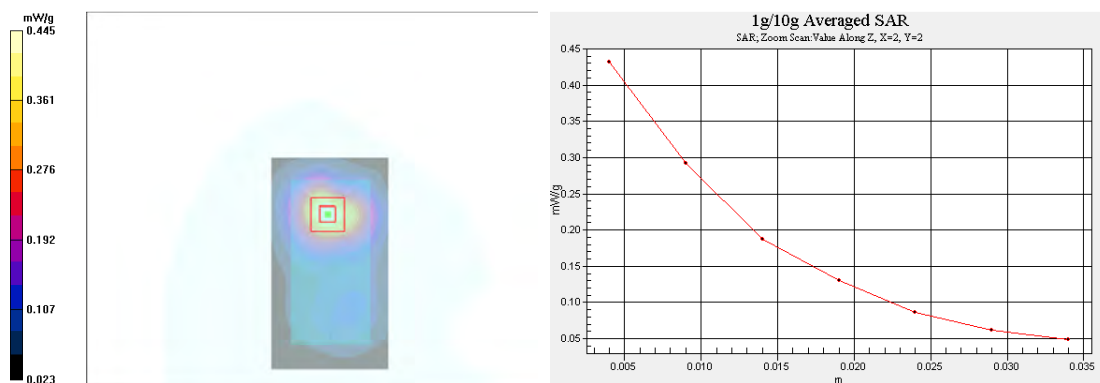
Peak SAR (extrapolated) = 0.594 W/kg

SAR(1 g) = 0.393 mW/g

SAR(10 g) = 0.243 mW/g

Power Drift = -0.045 dB

Maximum value of SAR (measured) = 0.430 mW/g



SAR Report

FCC_RM-697_02

Applicant: Nokia Corporation

Type: RM-697

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Date/Time: 2010-09-14 13:02:06

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 3-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:2.8

Medium: Body 1900; Medium Notes: Medium Temperature: 21.0 C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.58, 4.58, 4.58); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 1; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Middle - Headset HS-125 - Back Facing Phantom/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.422 mW/g

Body - Middle - Headset HS-125 - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

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

Reference Value = 8.12 V/m

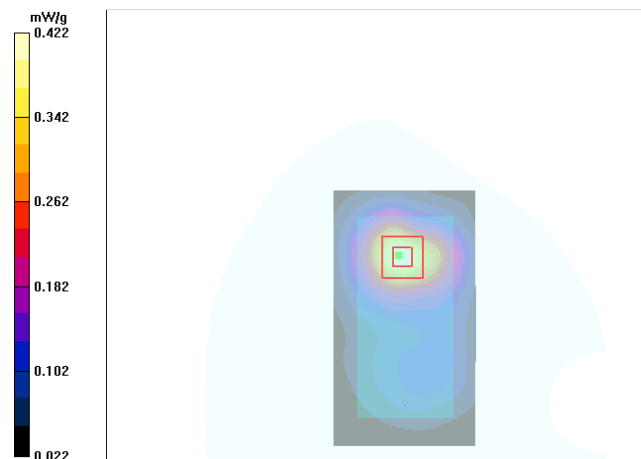
Peak SAR (extrapolated) = 0.566 W/kg

SAR(1 g) = 0.379 mW/g

SAR(10 g) = 0.235 mW/g

Power Drift = -0.011 dB

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



Date/Time: 2010-09-22 19:32:25

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WCDMA1900

Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Body 1900; Medium Notes: Medium Temperature: 22.0 C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.58, 4.58, 4.58); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 1; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Middle - No Accessory - Display Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

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

Body - Middle - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

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

Reference Value = 9.66 V/m

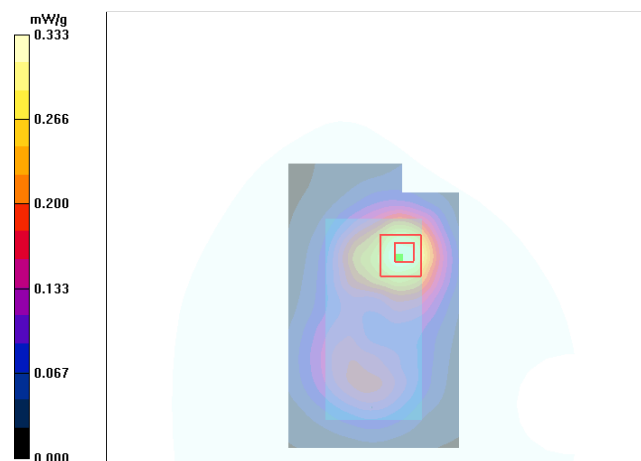
Peak SAR (extrapolated) = 0.450 W/kg

SAR(1 g) = 0.299 mW/g

SAR(10 g) = 0.191 mW/g

Power Drift = -0.004 dB

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



Date/Time: 2010-09-22 19:46:40

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WCDMA1900

Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Body 1900; Medium Notes: Medium Temperature: 22.0 C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.58, 4.58, 4.58); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 1; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Middle - HS-125 - Display Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

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

Body - Middle - HS-125 - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 9.48 V/m

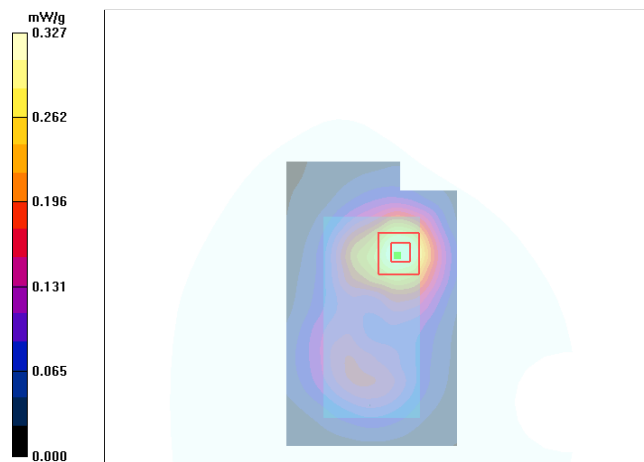
Peak SAR (extrapolated) = 0.432 W/kg

SAR(1 g) = 0.295 mW/g

SAR(10 g) = 0.190 mW/g

Power Drift = 0.021 dB

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



Date/Time: 2010-09-22 20:24:26

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WCDMA1900

Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium: Body 1900; Medium Notes: Medium Temperature: 22.0 C

Medium parameters used: $f = 1908$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.58, 4.58, 4.58); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 1; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - High - No Accessory - Back Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.569 mW/g

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

Reference Value = 9.00 V/m

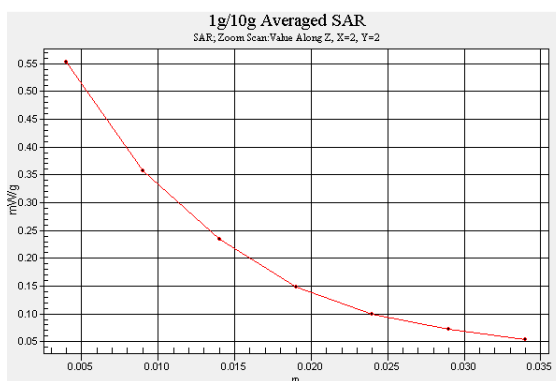
Peak SAR (extrapolated) = 0.784 W/kg

SAR(1 g) = 0.502 mW/g

SAR(10 g) = 0.303 mW/g

Power Drift = -0.062 dB

Maximum value of SAR (measured) = 0.552 mW/g



SAR Report

FCC_RM-697_02

Applicant: Nokia Corporation

Type: RM-697

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Date/Time: 2010-09-22 20:35:22

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WCDMA1900

Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Body 1900; Medium Notes: Medium Temperature: 22.0 C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 52.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.58, 4.58, 4.58); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 1; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Middle - HS-125 - Back Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.515 mW/g

Body - Middle - HS-125 - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 8.58 V/m

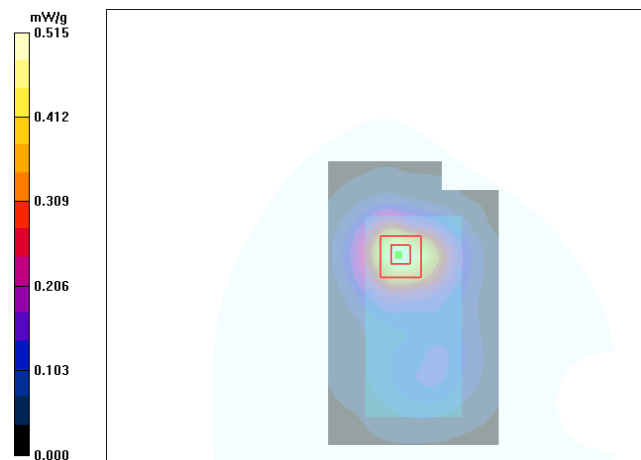
Peak SAR (extrapolated) = 0.689 W/kg

SAR(1 g) = 0.453 mW/g

SAR(10 g) = 0.278 mW/g

Power Drift = 0.074 dB

Maximum value of SAR (measured) = 0.498 mW/g



Date/Time: 2010-09-23 17:35:23

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 21.8 C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.96$ mho/m; $\epsilon_r = 51.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Middle - No Accessory - Display Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.064 mW/g

Body - Middle - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid:

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

Reference Value = 5.36 V/m

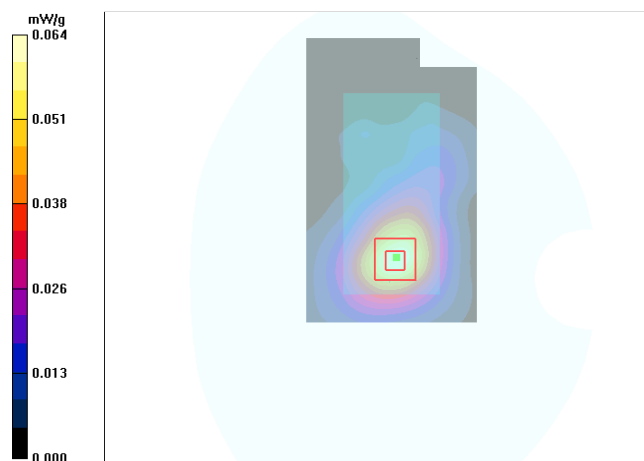
Peak SAR (extrapolated) = 0.098 W/kg

SAR(1 g) = 0.057 mW/g

SAR(10 g) = 0.033 mW/g

Power Drift = -0.191 dB

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



Date/Time: 2010-09-23 17:49:59

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 21.8 C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.96$ mho/m; $\epsilon_r = 51.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Middle - HS-125 - Display Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.058 mW/g

Body - Middle - HS-125 - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 5.08 V/m

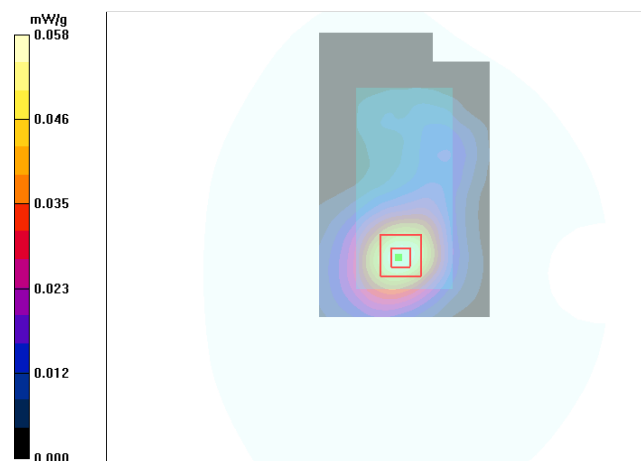
Peak SAR (extrapolated) = 0.092 W/kg

SAR(1 g) = 0.052 mW/g

SAR(10 g) = 0.030 mW/g

Power Drift = -0.099 dB

Maximum value of SAR (measured) = 0.056 mW/g



Date/Time: 2010-09-23 18:41:44

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WLAN2450 b-mode

Frequency: 2462 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 21.8 C

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.98$ mho/m; $\epsilon_r = 51.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - High - No Accessory - Back Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.083 mW/g

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

Reference Value = 6.32 V/m

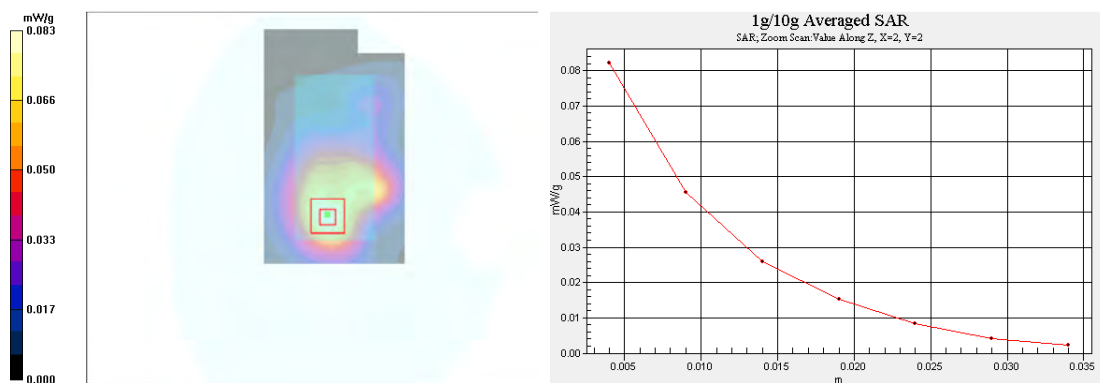
Peak SAR (extrapolated) = 0.136 W/kg

SAR(1 g) = 0.076 mW/g

SAR(10 g) = 0.044 mW/g

Power Drift = -0.012 dB

Maximum value of SAR (measured) = 0.082 mW/g



Date/Time: 2010-09-23 18:16:27

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 21.8 C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.96$ mho/m; $\epsilon_r = 51.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

Body - Middle - HS-125 - Back Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

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

Body - Middle - HS-125 - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 6.14 V/m

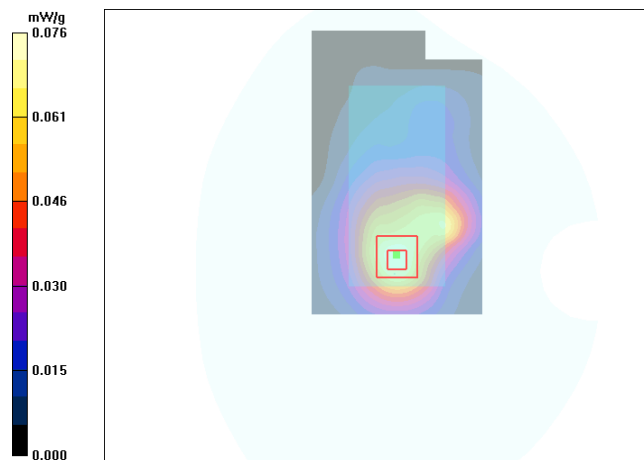
Peak SAR (extrapolated) = 0.124 W/kg

SAR(1 g) = 0.070 mW/g

SAR(10 g) = 0.040 mW/g

Power Drift = 0.013 dB

Maximum value of SAR (measured) = 0.075 mW/g



Date/Time: 2010-09-21 14:01:51, Date/Time: 2010-09-23 12:58:58

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 2-slot GPRS850, Communication System: WLAN2450 b-mode

Frequency: 848.8 MHz, Frequency: 2442 MHz; Duty Cycle: 1:4.2, Duty Cycle: 1:1

Medium: Head 850, Medium: Head 2450; Medium Notes: Medium Temperature: 21.6 C, Medium Notes: Medium Temperature: 21.7C

Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.916 \text{ mho/m}$; $\epsilon_r = 40.9$; $\rho = 1000 \text{ kg/m}^3$, Medium parameters used: $f = 2442 \text{ MHz}$; $\sigma = 1.84 \text{ mho/m}$; $\epsilon_r = 38$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.94, 5.94, 5.94), ConvF(4.36, 4.36, 4.36); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 4, Phantom: SAM 8; Type: Twin Phantom, Type: SAM Twin Phantom; Serial: TP-1410, Serial: TP-1408
- ; SEMCAD X Version 14.0 Build 61

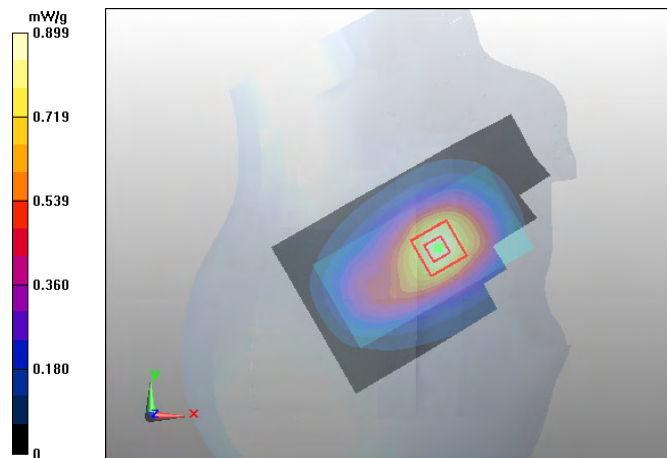
Configuration/Cheek - High/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Configuration/Cheek - Middle/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.836 mW/g

SAR(10 g) = 0.559 mW/g

Maximum value of SAR (measured) = 0.899 mW/g



Date/Time: 2010-09-13 13:04:39, Date/Time: 2010-09-23 13:43:17

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 3-slot GPRS1900, Communication System: WLAN2450 b-mode

Frequency: 1909.8 MHz, Frequency: 2462 MHz; Duty Cycle: 1:2.8, Duty Cycle: 1:1

Medium: Head 1900, Medium: Head 2450; Medium Notes: Medium Temperature: 21.3 C, Medium Notes:

Medium Temperature: 21.7C

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³, Medium parameters used:

$f = 2462$ MHz; $\sigma = 1.87$ mho/m; $\epsilon_r = 37.9$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:

- ConvF(4.9, 4.9, 4.9), ConvF(4.36, 4.36, 4.36); Calibrated: 2010-02-24

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

- Electronics: DAE3 Sn501; Calibrated: 2010-02-19

- Phantom: SAM 6, Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1301, Serial: TP-1408

-; SEMCAD X Version 14.0 Build 61

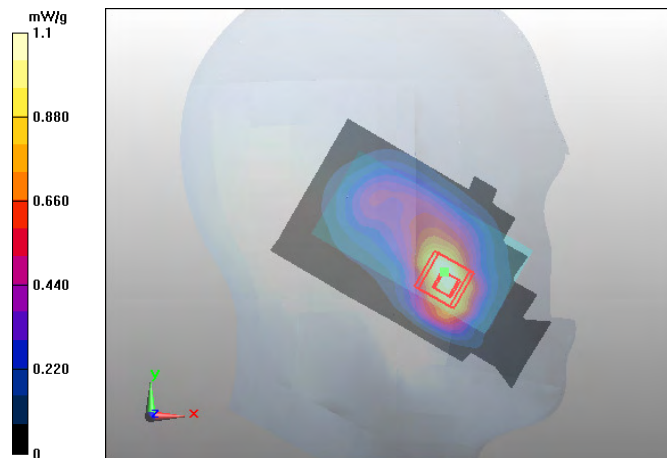
Configuration/Cheek position - High/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm

Configuration/Cheek - High/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 1.02 mW/g

SAR(10 g) = 0.589 mW/g

Maximum value of SAR (measured) = 1.1 mW/g



Date/Time: 2010-09-22 14:10:25, Date/Time: 2010-09-23 13:43:17

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WCDMA1900, Communication System: WLAN2450 b-mode

Frequency: 1907.6 MHz, Frequency: 2462 MHz; Duty Cycle: 1:1

Medium: Head 1900, Medium: Head 2450; Medium Notes: Medium Temperature: 21.6 C, Medium Notes:

Medium Temperature: 21.7C

Medium parameters used: $f = 1908 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 40.2$; $\rho = 1000 \text{ kg/m}^3$, Medium parameters used:

$f = 2462 \text{ MHz}$; $\sigma = 1.87 \text{ mho/m}$; $\epsilon_r = 37.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:

- ConvF(4.9, 4.9, 4.9), ConvF(4.36, 4.36, 4.36); Calibrated: 2010-02-24

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

- Electronics: DAE3 Sn501; Calibrated: 2010-02-19

- Phantom: SAM 6, Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1301, Serial: TP-1408

-; SEMCAD X Version 14.0 Build 61

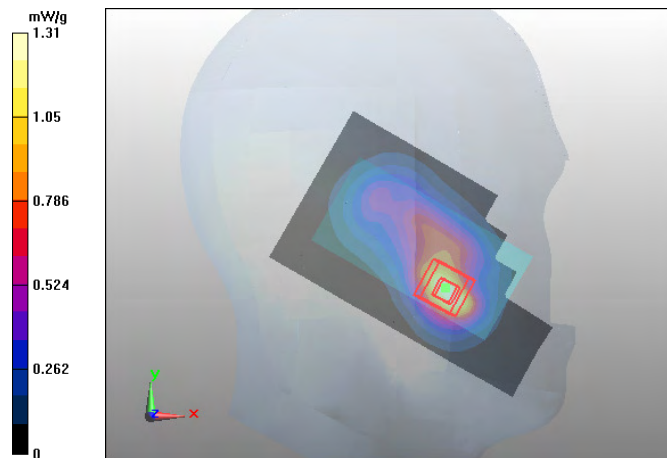
Configuration/Cheek -High/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Configuration/Cheek - High/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 1.15 mW/g

SAR(10 g) = 0.615 mW/g

Maximum value of SAR (measured) = 1.31 mW/g



Date/Time: 2010-09-21 18:38:55, Date/Time: 2010-09-23 18:41:44

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 2-slot GPRS850, Communication System: WLAN2450 b-mode

Frequency: 848.8 MHz, Frequency: 2462 MHz; Duty Cycle: 1:4.2, Duty Cycle: 1:1

Medium: Body 850, Medium: Body 2450; Medium Notes: Medium Temperature: 21.6 C, Medium Notes: Medium Temperature: 21.8 C

Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.983 \text{ mho/m}$; $\epsilon_r = 53.8$; $\rho = 1000 \text{ kg/m}^3$, Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 1.98 \text{ mho/m}$; $\epsilon_r = 51.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

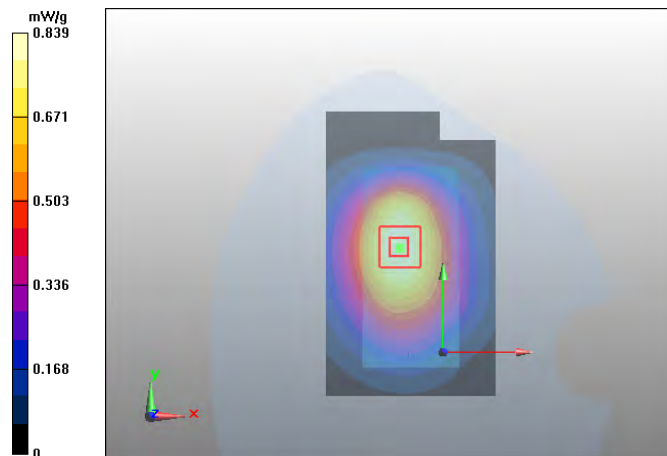
- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.84, 5.84, 5.84), ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 5, Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1302, Serial: TP-1215
- ; SEMCAD X Version 14.0 Build 61

Configuration/Body - High - No Accessory - Back Facing Phantom/Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.792 mW/g

SAR(10 g) = 0.552 mW/g

Maximum value of SAR (measured) = 0.839 mW/g



Date/Time: 2010-09-14 13:29:45, Date/Time: 2010-09-23 18:41:44

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: 3-slot GPRS1900, Communication System: WLAN2450 b-mode

Frequency: 1909.8 MHz, Frequency: 2462 MHz; Duty Cycle: 1:2.8, Duty Cycle: 1:1

Medium: Body 1900, Medium: Body 2450; Medium Notes: Medium Temperature: 21.0 C, Medium Notes:

Medium Temperature: 21.8 C

Medium parameters used: $f = 1910 \text{ MHz}$; $\sigma = 1.5 \text{ mho/m}$; $\epsilon_r = 51.5$; $\rho = 1000 \text{ kg/m}^3$, Medium parameters used:

$f = 2462 \text{ MHz}$; $\sigma = 1.98 \text{ mho/m}$; $\epsilon_r = 51.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

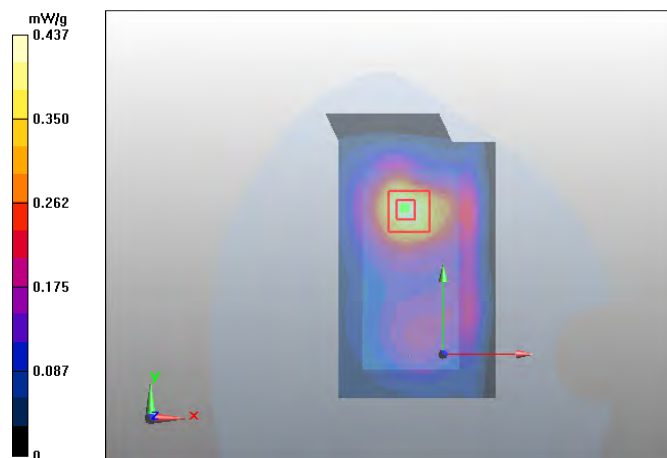
- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.58, 4.58, 4.58), ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 1, Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- ; SEMCAD X Version 14.0 Build 61

Configuration/Body - High - No Accessory - Back Facing Phantom/Area Scan (6x10x1): Measurement grid:
dx=15mm, dy=15mm

Configuration/Body - High - No Accessory - Back Facing Phantom/Area Scan (7x11x1): Measurement grid:
dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.390 mW/g
SAR(10 g) = 0.227 mW/g

Maximum value of SAR (measured) = 0.437 mW/g



Date/Time: 2010-09-22 20:24:26, Date/Time: 2010-09-23 18:41:44

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108348/1

Communication System: WCDMA1900, Communication System: WLAN2450 b-mode

Frequency: 1907.6 MHz, Frequency: 2462 MHz; Duty Cycle: 1:1

Medium: Body 1900, Medium: Body 2450; Medium Notes: Medium Temperature: 22.0 C, Medium Notes:

Medium Temperature: 21.8 C

Medium parameters used: $f = 1908 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 52.6$; $\rho = 1000 \text{ kg/m}^3$, Medium parameters used:

$f = 2462 \text{ MHz}$; $\sigma = 1.98 \text{ mho/m}$; $\epsilon_r = 51.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

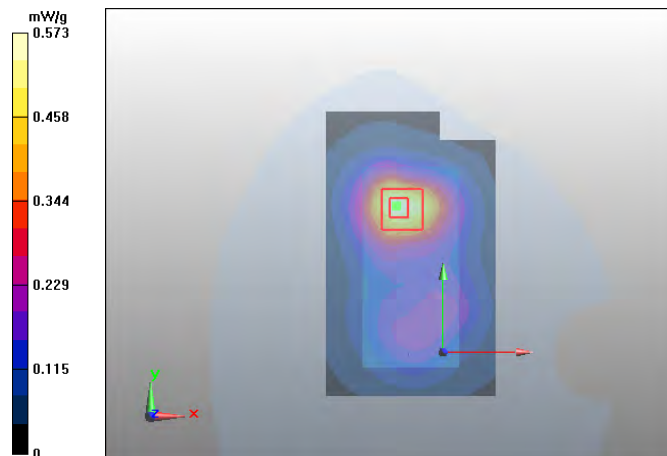
- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.58, 4.58, 4.58), ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE3 Sn501; Calibrated: 2010-02-19
- Phantom: SAM 1, Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- ; SEMCAD X Version 14.0 Build 61

Configuration/Body - High - No Accessory - Back Facing Phantom/Area Scan (7x11x1): Measurement grid:
dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.504 mW/g

SAR(10 g) = 0.290 mW/g

Maximum value of SAR (measured) = 0.573 mW/g



APPENDIX C: CONDUCTED AVERAGE POWER MEASUREMENTS FOR WCDMA AND HSUPA

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/108427/3, HW: 2200a, SW: 10.0.004

C.1. WCDMA1900 Test results

Average power

Ch / f (MHz)	P [dBm]
9263 / 1852.6	20.15
9400 / 1880.0	20.21
9537 / 1907.4	20.51

C.2. HSUPA1900 Test results

Average power

Ch / f (MHz)	P [dBm]				
	Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
9263 / 1852.6	18.14	18.02	19.25	18.03	20.28
9400 / 1880.0	17.72	18.13	19.06	18.04	20.22
9537 / 1907.4	18.17	18.40	19.45	18.29	20.56

Note: In HSUPA operation, the output power is reduced relative to the tuning target power for WCDMA. This device runs two separate HSUPA power control routines: MPR and E-TFC MPR. In each Subtest mode, the routine with the higher power reduction dominates. As a result, the MPR for each of the Subtest modes is as follows:

Maximum Power Reduction (MPR)				
Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
1.5dB	2.0dB	1.0dB	2.0dB	0.0dB

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

See the following pages.



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 Denmark A/S**

Certificate No: **ES3-3116_Feb10**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3116**

Calibration procedure(s) **QA CAL-01.v6, QA CAL-23.v3 and QA CAL-25.v2
Calibration procedure for dosimetric E-field probes**

Calibration date: **February 24, 2010**

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 (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41495277	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41498087	1-Apr-09 (No. 217-01030)	Apr-10
Reference 3 dB Attenuator	SN S5054 (3c)	31-Mar-09 (No. 217-01026)	Mar-10
Reference 20 dB Attenuator	SN S5086 (20b)	31-Mar-09 (No. 217-01028)	Mar-10
Reference 30 dB Attenuator	SN: S5129 (30b)	31-Mar-09 (No. 217-01027)	Mar-10
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	29-Sep-09 (No. DAE4-660_Sep09)	Sep-10
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check Oct10
Calibrated by	Name Jeton Kastrati	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Technical Manager	

Issued: February 24, 2010

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

DASY - Parameters of Probe: ES3DV3 SN:3116

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz] ^C	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	5.94	5.94	5.94	0.83	1.07 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	5.05	5.05	5.05	0.45	1.55 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.90	4.90	4.90	0.33	1.91 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.36	4.36	4.36	0.41	1.86 ± 11.0%

^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.

DASY - Parameters of Probe: ES3DV3 SN:3116

Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz] ^C	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	5.84	5.84	5.84	0.72	1.23 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	4.82	4.82	4.82	0.45	1.75 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.58	4.58	4.58	0.33	2.40 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.12	4.12	4.12	0.82	1.17 ± 11.0%

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

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

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See the following pages.



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 Denmark A/S**

Certificate No: **D835V2-476_Mar09**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 476**

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

Calibration date: **March 16, 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 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	08-Oct-08 (No. 217-00898)	Oct-09
Power sensor HP 8481A	US37292783	08-Oct-08 (No. 217-00898)	Oct-09
Reference 20 dB Attenuator	SN: 5086 (20g)	01-Jul-08 (No. 217-00864)	Jul-09
Type-N mismatch combination	SN: 5047.2 / 06327	01-Jul-08 (No. 217-00867)	Jul-09
Reference Probe ES3DV2	SN: 3025	28-Apr-08 (No. ES3-3025_Apr08)	Apr-09
DAE4	SN: 601	07-Mar-09 (No. DAE4-601_Mar09)	Mar-10

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	

Approved by:	Katja Pokovic	Technical Manager
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Issued: March 17, 2009

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DASY5 Validation Report for Head TSL

Date/Time: 16.03.2009 11:39:39

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:476

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

Medium: HSL 900 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.87 \text{ mho/m}$; $\epsilon_r = 40.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/TEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.97, 5.97, 5.97); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Pin=250mW; dip=15mm; dist=3.4mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid:

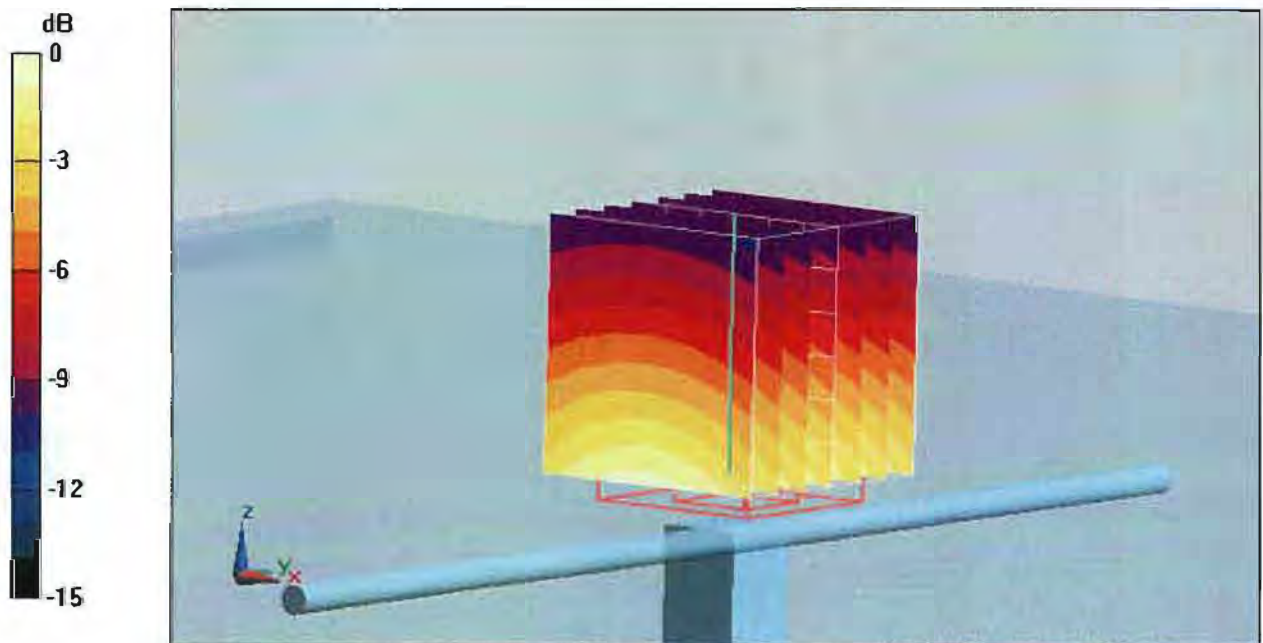
$dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 56.1 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 3.4 W/kg

SAR(1 g) = 2.31 mW/g; SAR(10 g) = 1.52 mW/g

Maximum value of SAR (measured) = 2.62 mW/g



0 dB = 2.62mW/g

DASY5 Validation Report for Body TSL

Date/Time: 09.03.2009 12:30:34

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:476

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

Medium: MSL900

Medium parameters used: $f = 835$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 53.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(5.9, 5.9, 5.9); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn907; Calibrated: 18.07.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

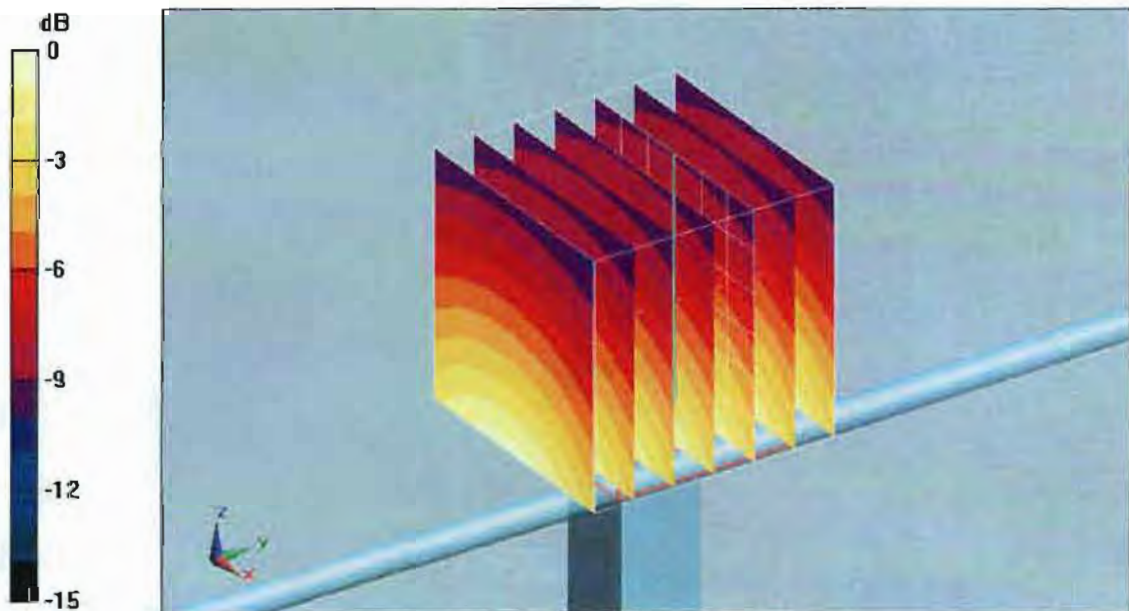
Pin = 250mW, d = 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.4 V/m; Power Drift = -0.000393 dB

Peak SAR (extrapolated) = 3.62 W/kg

SAR(1 g) = 2.47 mW/g; SAR(10 g) = 1.62 mW/g

Maximum value of SAR (measured) = 2.76 mW/g



0 dB = 2.76mW/g



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Nokia Denmark A/S**

Certificate No: **D1900V2-5d063_Feb10**

CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d063**

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

Calibration date: **February 23, 2010**

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 EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	31-Mar-09 (No. 217-01025)	Mar-10
Type-N mismatch combination	SN: 5047.2 / 06327	31-Mar-09 (No. 217-01029)	Mar-10
Reference Probe ES3DV3	SN: 3205	26-Jun-09 (No. ES3-3205_Jun09)	Jun-10
DAE4	SN: 601	07-Mar-09 (No. DAE4-601_Mar09)	Mar-10
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

Calibrated by: **Jeton Kastrati** Name
Laboratory Technician Function

Approved by: **Katja Pokovic** Name
Technical Manager Function

Signature

Issued: February 25, 2010

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

DASY5 Validation Report for Head TSL

Date/Time: 23.02.2010 13:21:31

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d063

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

Medium: HSL U11 BB

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.42$ mho/m; $\epsilon_r = 39.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

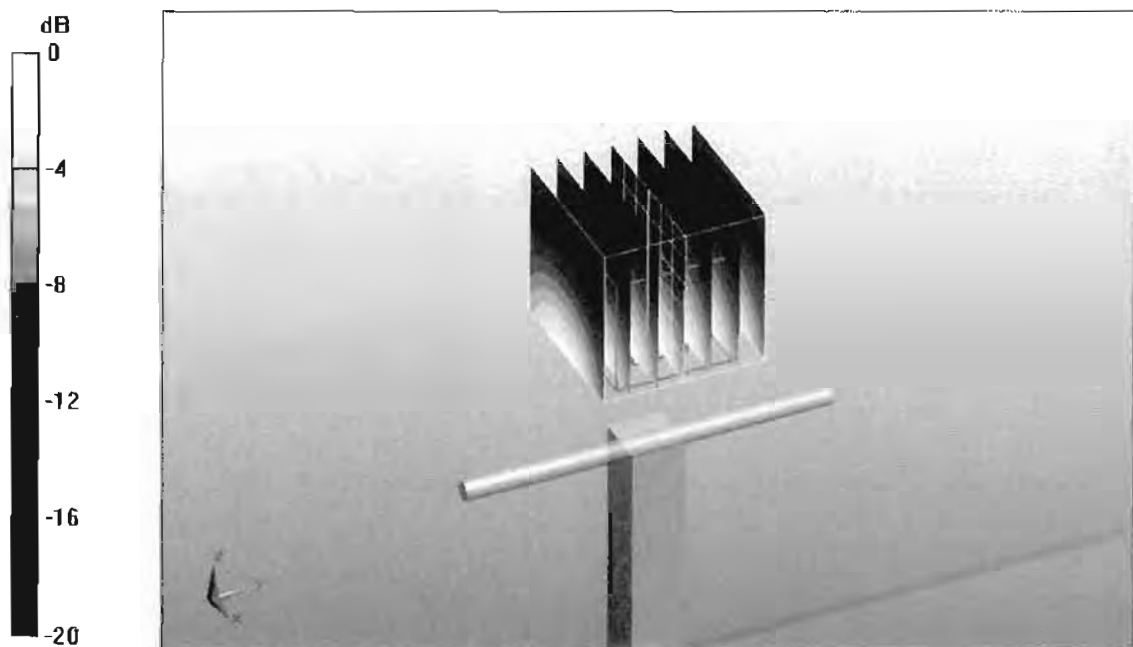
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.1 V/m; Power Drift = 0.041 dB

Peak SAR (extrapolated) = 18.3 W/kg

SAR(1 g) = 9.98 mW/g; SAR(10 g) = 5.2 mW/g

Maximum value of SAR (measured) = 12.4 mW/g



0 dB = 12.4mW/g

DASY5 Validation Report for Body

Date/Time: 16.02.2010 13:00:42

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d063

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

Medium: MSL U10 BB

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.56$ mho/m; $\epsilon_r = 52.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

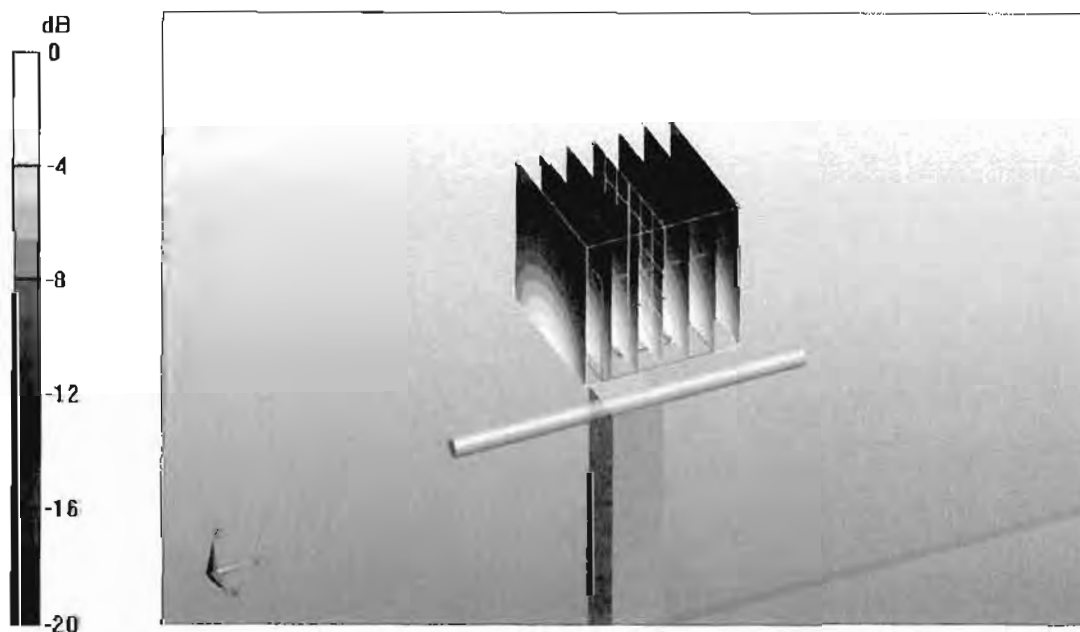
Pin250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.1 V/m; Power Drift = 0.078 dB

Peak SAR (extrapolated) = 16.7 W/kg

SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.31 mW/g

Maximum value of SAR (measured) = 12.8 mW/g



0 dB = 12.8mW/g



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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Nokia Denmark A/S**

Certificate No: **D2450V2-750_Feb10**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 750**

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

Calibration date: **February 19, 2010**

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 (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	31-Mar-09 (No. 217-01025)	Mar-10
Type-N mismatch combination	SN: 5047.2 / 06327	31-Mar-09 (No. 217-01029)	Mar-10
Reference Probe ES3DV3	SN: 3205	26-Jun-09 (No. ES3-3205_Jun09)	Jun-10
DAE4	SN: 601	07-Mar-09 (No. DAE4-601_Mar09)	Mar-10
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

Calibrated by: **Jeton Kastrati** Name **Jeton Kastrati** Function **Laboratory Technician**

Approved by: **Katja Pokovic** Name **Katja Pokovic** Function **Technical Manager**

Signature




Issued: February 22, 2010

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

DASY5 Validation Report for Head TSL

Date/Time: 17.02.2010 14:26:37

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:750

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL U11 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.77$ mho/m; $\epsilon_r = 38.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

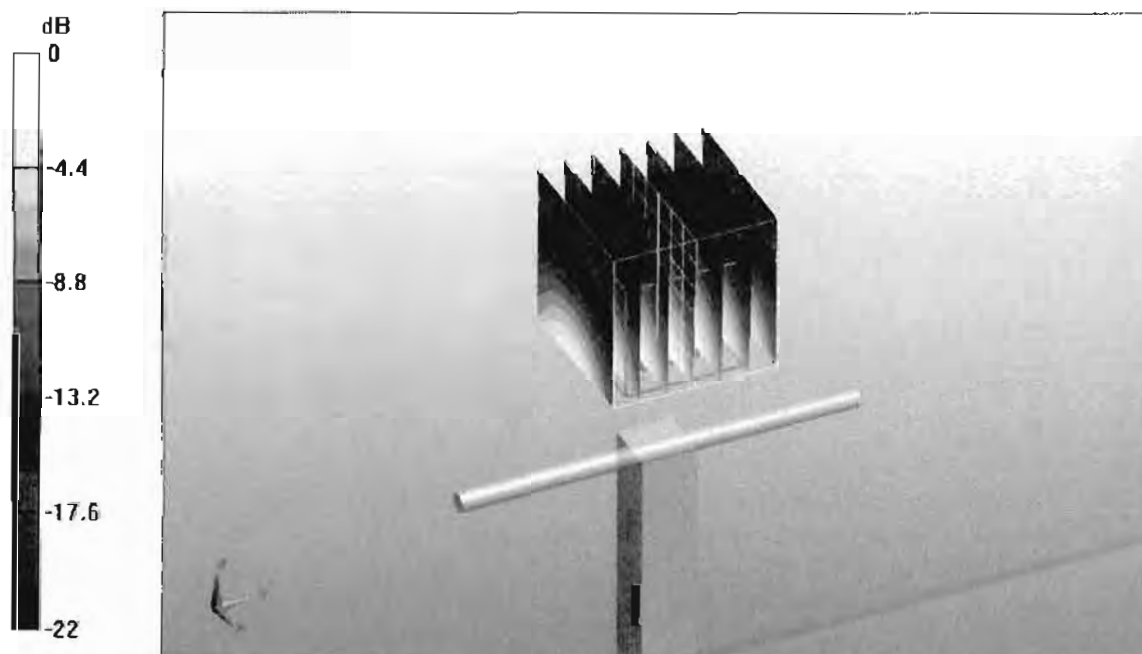
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 103.2 V/m; Power Drift = 0.00838 dB

Peak SAR (extrapolated) = 27.5 W/kg

SAR(1 g) = 13.5 mW/g; SAR(10 g) = 6.3 mW/g

Maximum value of SAR (measured) = 17.4 mW/g



0 dB = 17.4mW/g

DASY5 Validation Report for Body

Date/Time: 19.02.2010 14:00:59

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:750

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: MSL U10 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.01$ mho/m; $\epsilon_r = 51.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.31, 4.31, 4.31); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Body/d=10mm, Pin250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0:

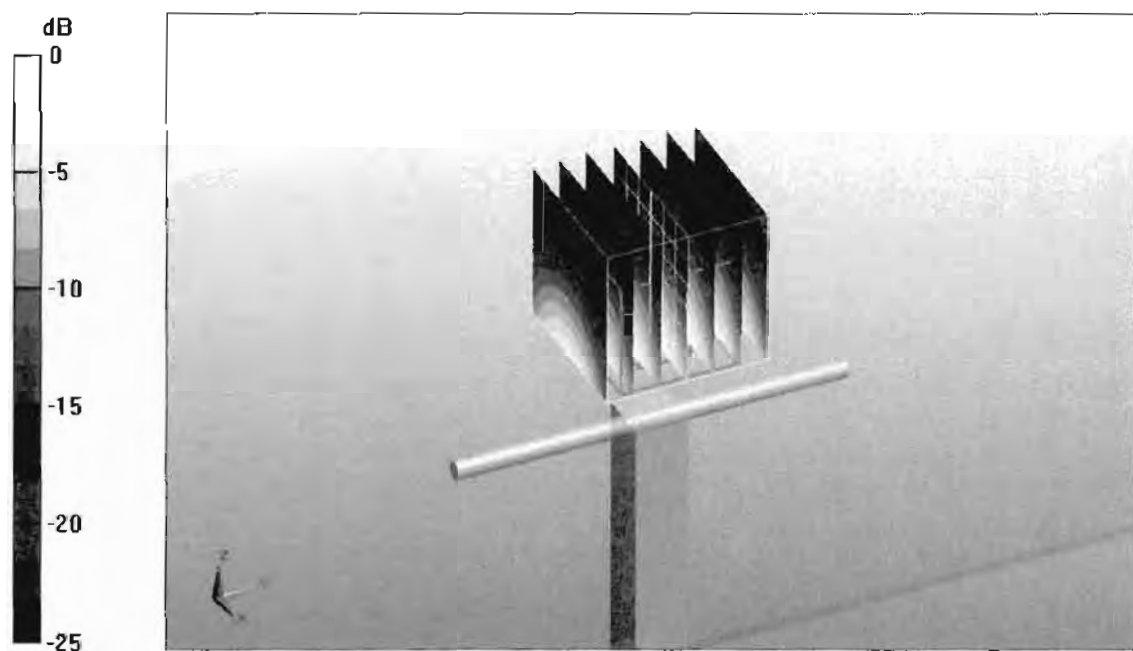
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 94.7 V/m; Power Drift = 0.082 dB

Peak SAR (extrapolated) = 26.9 W/kg

SAR(1 g) = 12.9 mW/g; SAR(10 g) = 5.9 mW/g

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



0 dB = 17.1mW/g