

SAR Compliance Test Report

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

Date and signatures:

For the contents:

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2010-10-26 to 2010-10-27
SN, HW and SW numbers of tested device	SN: 004402/13/187906/0, HW: 3000, SW: V 10.0.022, DUT: 23970
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	0.528 W/kg	0.59 W/kg	1.6 W/kg	PASSED
3-slot GPRS1900	512 / 1850.2	24.4dBm	Left, Cheek	0.956 W/kg	1.07 W/kg	1.6 W/kg	PASSED
WCDMA1900	9538 / 1907.6	19.7dBm	Left, Cheek	1.03 W/kg	1.15 W/kg	1.6 W/kg	PASSED
WLAN2450	11 / 2462.0	16.0dBm	Left, Cheek	0.189 W/kg	0.21 W/kg	1.6 W/kg	PASSED
2-slot GPRS850 + WLAN2450	-	-	Right, Cheek	0.569 W/kg	0.64 W/kg	1.6 W/kg	PASSED
3-slot GPRS1900 + WLAN2450	-	-	Left, Cheek	0.975 W/kg	1.09 W/kg	1.6 W/kg	PASSED
WCDMA1900 + WLAN2450	-	-	Left, Cheek	1.04 W/kg	1.16 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	0.711 W/kg	0.80 W/kg	1.6 W/kg	PASSED
3-slot GPRS1900	810 / 1909.8	24.4 dBm	1.5 cm	0.396 W/kg	0.44 W/kg	1.6 W/kg	PASSED
WCDMA1900	9538 / 1907.6	19.7 dBm	1.5 cm	0.341 W/kg	0.38 W/kg	1.6 W/kg	PASSED
WLAN2450	7 / 2442.0	16.0 dBm	1.5 cm	0.079 W/kg	0.09 W/kg	1.6 W/kg	PASSED
2-slot GPRS850 + WLAN2450	-	-	1.5 cm	0.745 W/kg	0.83 W/kg	1.6 W/kg	PASSED
3-slot GPRS1900 + WLAN2450	-	-	1.5 cm	0.396 W/kg	0.44 W/kg	1.6 W/kg	PASSED
WCDMA1900 + WLAN2450	-	-	1.5 cm	0.341 W/kg	0.38 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	0.39dB

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.

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.

The number of test cases reported in this document has been minimised based on the earlier testing in FCC_RM-697_02.

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
DAE 3	339	12 months	2011-02
DAE 4	682	12 months	2011-07
E-field Probe ES3DV3	3116	12 months	2011-02
E-field Probe ES3DV3	3117	12 months	2011-07
E-field Probe EX3DV4	3581	12 months	2011-07
Dipole Validation Kit, D835V2	4d042	24 months	2012-07
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 C
Frequency	10 MHz to 4 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm Tip length: 20 mm Body diameter: 12 mm Tip diameter: 3.9 mm
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

4.1.2 Isotropic E-field Probe Type EX3DV4

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Calibration certificate in Appendix C
Frequency	10 MHz to >6 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 μ W/g to > 100 mW/g, Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm Tip length: 10 mm Body diameter: 12 mm Tip diameter: 2.5 mm
Application	Distance from probe tip to dipole centers: 1.0 mm General dosimetry up to 6 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	2.38	42.1	0.90	
	$\pm 10\%$ window	2.14 - 2.62			
	2010-10-27	2.47	41.2	0.90	21.9
1900	Reference result	9.98	39.2	1.42	
	$\pm 10\%$ window	8.98 - 11.0			
	2010-10-26	10.4	38.4	1.45	21.8
2450	Reference result	13.5	38.7	1.77	
	$\pm 10\%$ window	12.1 - 14.9			
	2010-10-26	14.6	38.0	1.83	21.5

System checking, body tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ϵ_r	σ [S/m]	
2450	Reference result	12.9	51.8	2.01	
	$\pm 10\%$ window	11.6 - 14.2			
	2010-10-27	13.5	51.0	2.01	22.2

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	21.9
	$\pm 5\%$ window	39.4 – 43.6	0.86 – 0.95	
	2010-10-27	41.2	0.90	
1880	Recommended value	40.0	1.40	21.8
	$\pm 5\%$ window	38.0 – 42.0	1.33 – 1.47	
	2010-10-26	38.5	1.42	
2442	Recommended value	39.2	1.79	21.5
	$\pm 5\%$ window	37.3 – 41.2	1.70 – 1.88	
	2010-10-26	38.0	1.82	

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ϵ_r	σ [S/m]	
836	Recommended value	55.2	0.97	21.9
	$\pm 5\%$ window	52.4 – 58.0	0.92 – 1.02	
	2010-10-27	54.6	0.97	
1880	Recommended value	53.3	1.52	21.5
	$\pm 5\%$ window	50.6 – 56.0	1.44 – 1.60	
	2010-10-26	52.2	1.46	
2442	Recommended value	52.7	1.94	22.2
	$\pm 5\%$ window	50.1 – 55.3	1.85 – 2.04	
	2010-10-27	51.0	2.00	

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
2-slot GPRS	Conducted Power		30.0 dBm	30.0 dBm	30.0 dBm
	Left	Cheek	-	-	-
		Tilt	-	-	-
	Right	Cheek	0.343	0.433	0.528
		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
3-slot GPRS	Conducted Power		24.4 dBm	24.4 dBm	24.4 dBm
	Left	Cheek	0.956	0.934	0.952
		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	1.00	1.01	1.03
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-

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	0.161	0.156	0.189
		Tilt	-	0.138	-
	Right	Cheek	-	0.135	-
		Tilt	-	0.143	-

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	-	-	-
		Headset HS-125	-	-	-
	Back facing phantom	Without headset	0.433	0.562	0.711
		Headset HS-125	-	-	-

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	-	-	-
		Headset HS-125	-	-	-
	Back facing phantom	Without headset	0.357	0.363	0.396
		Headset HS-125	-	-	-
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	-	-	-
		Headset HS-125	-	-	-
	Back facing phantom	Without headset	0.317	0.325	0.341
		Headset HS-125	-	-	-

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	-	0.038	-
		Headset HS-125	-	0.040	-
	Back facing phantom	Without headset	0.078	0.079	0.078
		Headset HS-125	-	0.073	-

**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	0.189	-	0.956	1.03
Head: Left, Tilt	0.138	-	-	-
Head: Right, Cheek	0.135	0.528	-	-
Head: Right, Tilt	0.143	-	-	-
Body: Display facing phantom, Without Headset	0.038	-	-	-
Body: Display facing phantom, Headset HS-125	0.040	-	-	-
Body: Back facing phantom, Without Headset	0.079	0.711	0.396	0.341
Body: Back facing phantom, Headset HS-125	0.073	-	-	-

**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	-	1.145	1.219
Head: Left, Tilt	-	-	-
Head: Right, Cheek	0.663	-	-
Head: Right, Tilt	-	-	-
Body: Display facing phantom, Without Headset	-	-	-
Body: Display facing phantom, Headset HS-125	-	-	-
Body: Back facing phantom, Without Headset	0.790	0.475	0.420
Body: Back facing phantom, Headset HS-125	-	-	-

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	-	0.975	1.04
Head: Left, Tilt	-	-	-
Head: Right, Cheek	0.569	-	-
Head: Right, Tilt	-	-	-
Body: Display facing phantom, Without Headset	-	-	-
Body: Display facing phantom, Headset HS-125	-	-	-
Body: Back facing phantom, Without Headset	0.745	0.390	0.336
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: 2010-10-27 11:07:38

Test Laboratory: TCC Nokia
Type: D835V2; Serial: 4d042

Communication System: CW835

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: Head 835; Medium Notes: Medium Temperature: 21.9 C

Medium parameters used: $f = 835$ MHz; $\sigma = 0.901$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(5.69, 5.69, 5.69); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 2010-02-15
- 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) = 2.67 mW/g

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

Reference Value = 49.9 V/m

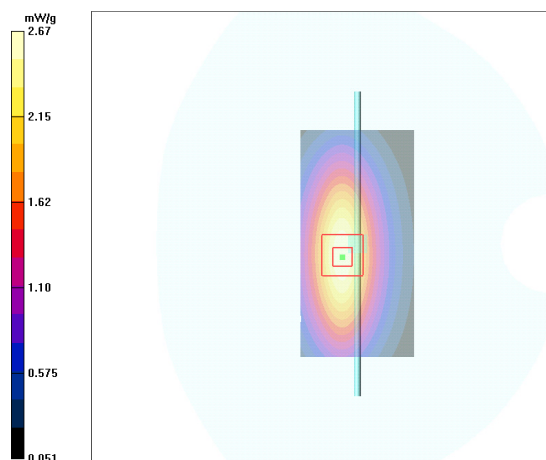
Peak SAR (extrapolated) = 3.74 W/kg

SAR(1 g) = 2.47 mW/g

SAR(10 g) = 1.61 mW/g

Power Drift = 0.013 dB

Maximum value of SAR (measured) = 2.68 mW/g



Date/Time: 2010-10-26 10:55:09

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: 21.8 C

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ 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 3; Type: Twin Phantom; Serial: TP-1302
- 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) = 12.0 mW/g

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

Reference Value = 80.2 V/m

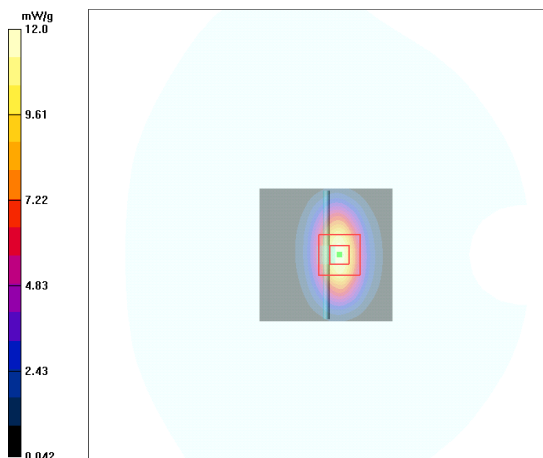
Peak SAR (extrapolated) = 19.3 W/kg

SAR(1 g) = 10.4 mW/g

SAR(10 g) = 5.37 mW/g

Power Drift = -0.067 dB

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



Date/Time: 2010-10-26 12:58:30

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: 21.5C

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.83$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3581; Probe Notes:
- ConvF(6.51, 6.51, 6.51); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2010-07-16
- 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) = 16.7 mW/g

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

Reference Value = 94.3 V/m

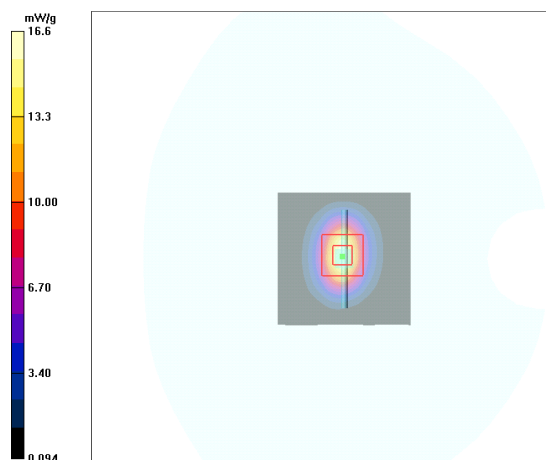
Peak SAR (extrapolated) = 31.1 W/kg

SAR(1 g) = 14.6 mW/g

SAR(10 g) = 6.69 mW/g

Power Drift = -0.018 dB

Maximum value of SAR (measured) = 16.6 mW/g



Date/Time: 2010-10-27 20:16:13

Test Laboratory: TCC Nokia

Type: D2450V2; Serial: 750

Communication System: CW2450

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 22.2 C

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.01$ mho/m; $\epsilon_r = 51$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 2010-02-15
- Phantom: ELI-4; Type: QDOVA001BB; Serial: SN:1074
- 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) = 16.1 mW/g

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

Reference Value = 89.2 V/m

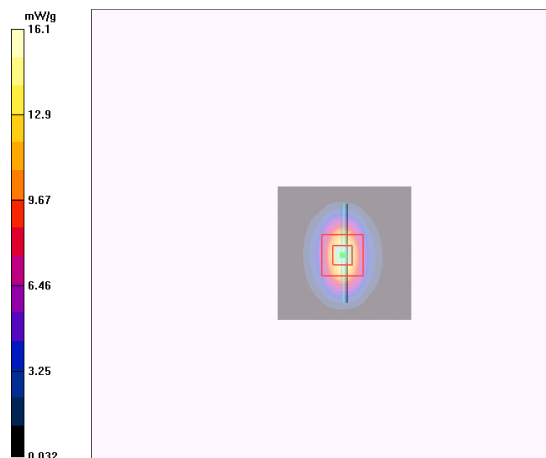
Peak SAR (extrapolated) = 27.3 W/kg

SAR(1 g) = 13.5 mW/g

SAR(10 g) = 6.36 mW/g

Power Drift = -0.003 dB

Maximum value of SAR (measured) = 15.5 mW/g



APPENDIX B: MEASUREMENT SCANS

See the following pages.

Date/Time: 2010-10-27 15:16:38

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: 2-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:4.2

Medium: Head 835; Medium Notes: Medium Temperature: 21.9 C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.915$ mho/m; $\epsilon_r = 41$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(5.69, 5.69, 5.69); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 2010-02-15
- 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) = 0.581 mW/g

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

Reference Value = 9.72 V/m

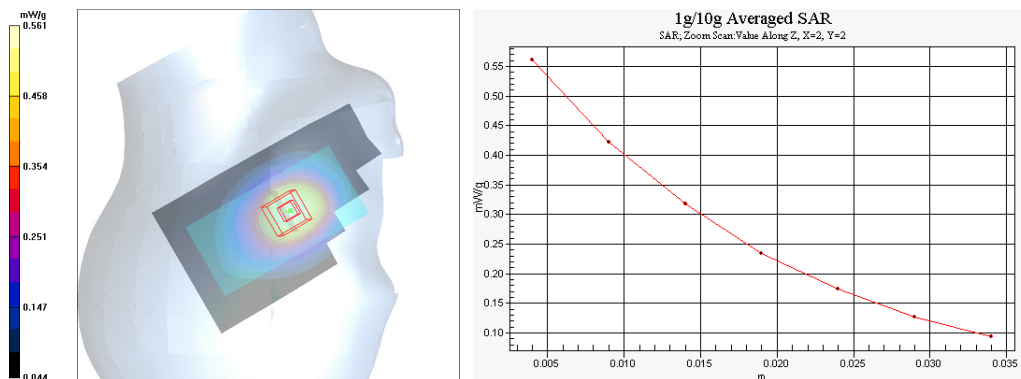
Peak SAR (extrapolated) = 0.700 W/kg

SAR(1 g) = 0.528 mW/g

SAR(10 g) = 0.369 mW/g

Power Drift = -0.185 dB

Maximum value of SAR (measured) = 0.561 mW/g



SAR Report

FCC_RM-697_06

Applicant: Nokia Corporation

Type: RM-697

Copyright © 2010 TCC Nokia

Date/Time: 2010-10-26 12:14:57

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: 3-slot GPRS1900

Frequency: 1850.2 MHz; Duty Cycle: 1:2.8

Medium: Head 1900; Medium Notes: Medium Temperature: 21.8 C

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 38.6$; $\rho = 1000$ 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 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

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

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

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

Reference Value = 8.64 V/m

Peak SAR (extrapolated) = 1.51 W/kg

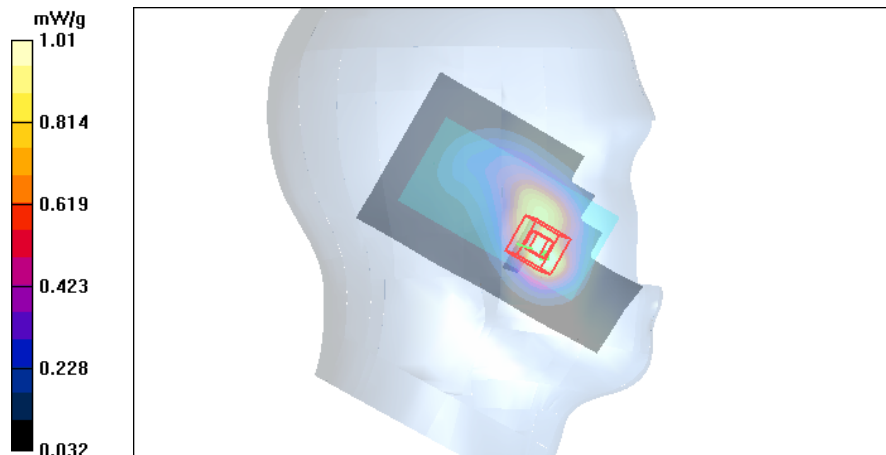
SAR(1 g) = 0.956 mW/g

SAR(10 g) = 0.558 mW/g

Power Drift = 0.344 dB

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

Maximum value of SAR (measured) = 1.01 mW/g



Date/Time: 2010-10-26 16:09:05

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: WCDMA1900

Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium: Head 1900; Medium Notes: Medium Temperature: 21.8 C

Medium parameters used: $f = 1908$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ 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 3; Type: Twin Phantom; Serial: TP-1302
- 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) = 1.24 mW/g

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

Reference Value = 7.78 V/m

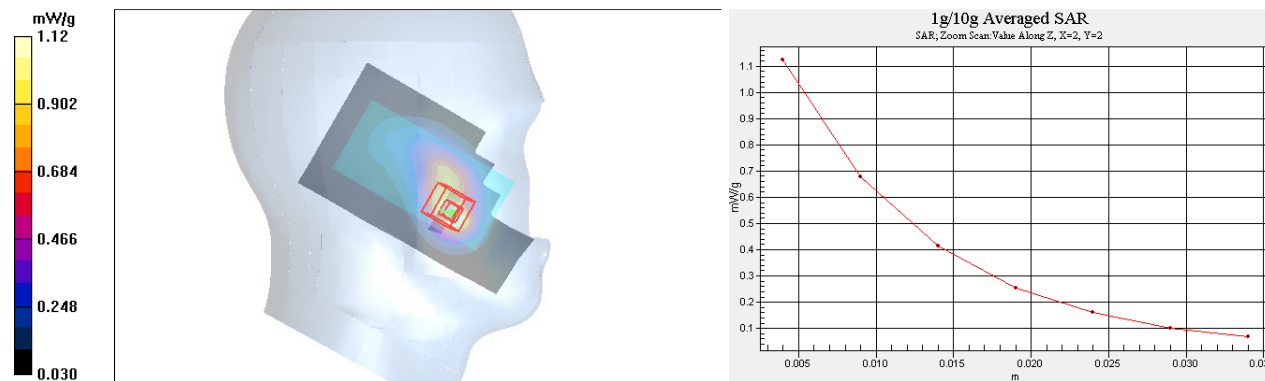
Peak SAR (extrapolated) = 1.73 W/kg

SAR(1 g) = 1.03 mW/g

SAR(10 g) = 0.577 mW/g

Power Drift = 0.141 dB

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



Date/Time: 2010-10-26 23:10:07

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: WLAN2450 b-mode

Frequency: 2462 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 21.5C

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.85$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3581; Probe Notes:
- ConvF(6.51, 6.51, 6.51); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2010-07-16
- 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) = 0.225 mW/g

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

Reference Value = 7.04 V/m

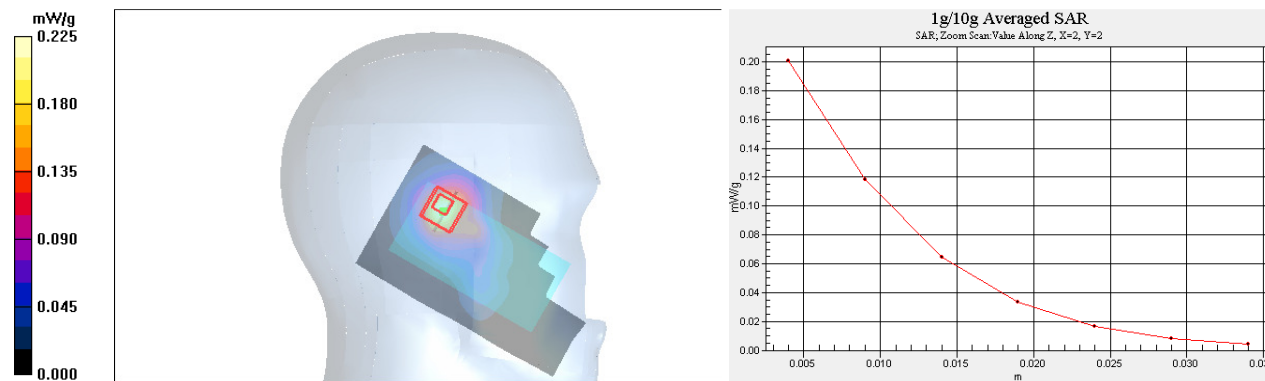
Peak SAR (extrapolated) = 0.358 W/kg

SAR(1 g) = 0.189 mW/g

SAR(10 g) = 0.095 mW/g

Power Drift = 0.103 dB

Maximum value of SAR (measured) = 0.201 mW/g



Date/Time: 2010-10-26 21:50:38

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 21.5C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.82$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3581; Probe Notes:
- ConvF(6.51, 6.51, 6.51); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2010-07-16
- 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) = 0.167 mW/g

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

Reference Value = 7.99 V/m

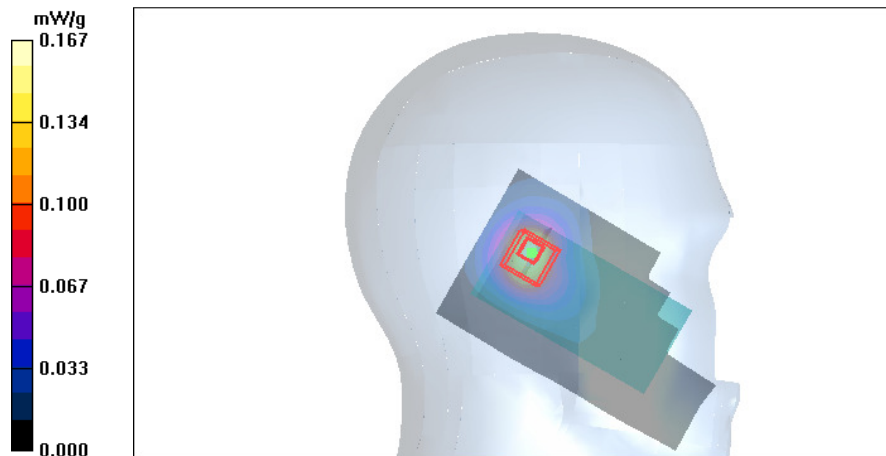
Peak SAR (extrapolated) = 0.257 W/kg

SAR(1 g) = 0.138 mW/g

SAR(10 g) = 0.072 mW/g

Power Drift = 0.094 dB

Maximum value of SAR (measured) = 0.151 mW/g



Date/Time: 2010-10-26 22:07:03

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 21.5C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.82$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3581; Probe Notes:
- ConvF(6.51, 6.51, 6.51); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2010-07-16
- 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) = 0.161 mW/g

Cheek - Middle/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 8.29 V/m

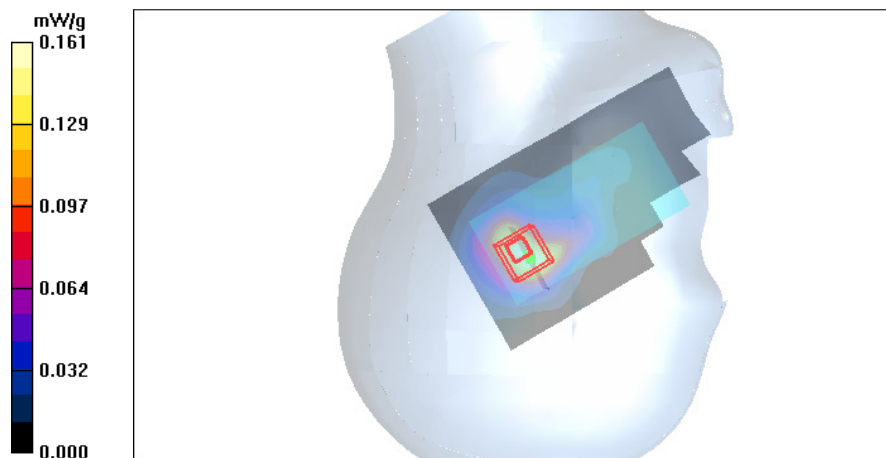
Peak SAR (extrapolated) = 0.250 W/kg

SAR(1 g) = 0.135 mW/g

SAR(10 g) = 0.074 mW/g

Power Drift = -0.215 dB

Maximum value of SAR (measured) = 0.151 mW/g



Date/Time: 2010-10-26 22:34:29

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Head 2450; Medium Notes: Medium Temperature: 21.5C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.82$ mho/m; $\epsilon_r = 38$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3581; Probe Notes:
- ConvF(6.51, 6.51, 6.51); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn682; Calibrated: 2010-07-16
- 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 (51x91x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 8.94 V/m

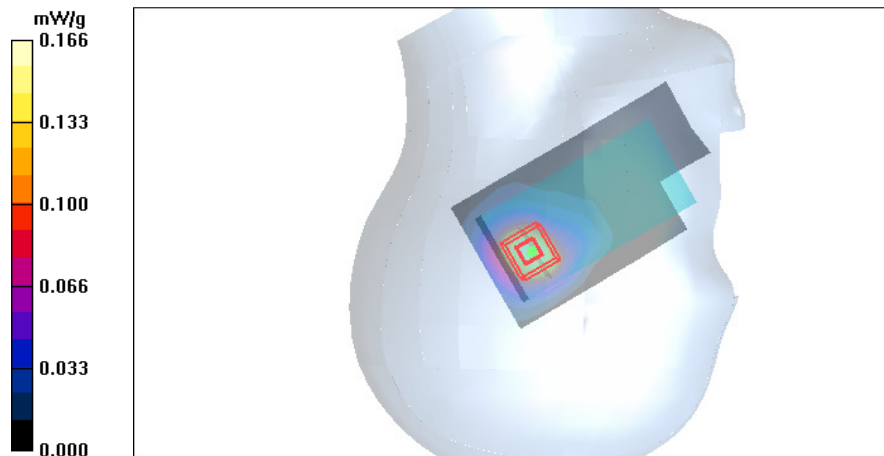
Peak SAR (extrapolated) = 0.255 W/kg

SAR(1 g) = 0.143 mW/g

SAR(10 g) = 0.076 mW/g

Power Drift = 0.033 dB

Maximum value of SAR (measured) = 0.158 mW/g



Date/Time: 2010-10-27 14:30:24

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: 2-slot GPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:4.2

Medium: Body 835; Medium Notes: Medium Temperature: 21.9 C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.984$ mho/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(5.7, 5.7, 5.7); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 2010-02-15
- 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) = 0.774 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 = 10.7 V/m

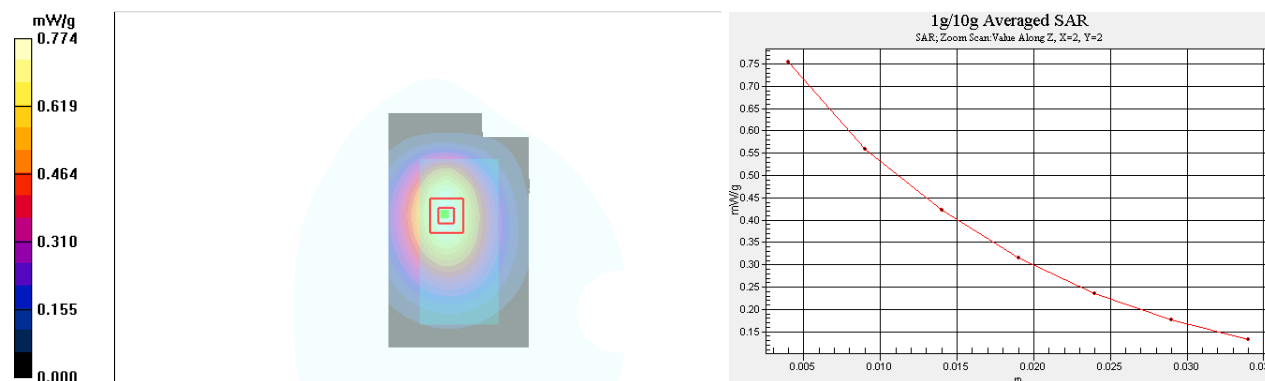
Peak SAR (extrapolated) = 0.950 W/kg

SAR(1 g) = 0.711 mW/g

SAR(10 g) = 0.511 mW/g

Power Drift = -0.014 dB

Maximum value of SAR (measured) = 0.754 mW/g



Date/Time: 2010-10-26 19:10:20

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: 3-slot GPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:2.8

Medium: Body 1900; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ 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) = 0.434 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 = 8.28 V/m

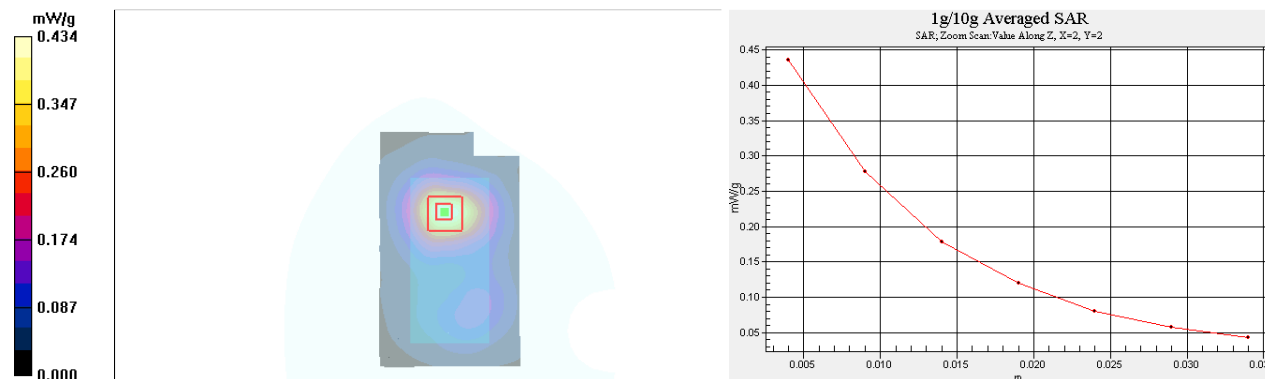
Peak SAR (extrapolated) = 0.631 W/kg

SAR(1 g) = 0.396 mW/g

SAR(10 g) = 0.241 mW/g

Power Drift = 0.204 dB

Maximum value of SAR (measured) = 0.435 mW/g



SAR Report

FCC_RM-697_06

Applicant: Nokia Corporation

Type: RM-697

Copyright © 2010 TCC Nokia

Date/Time: 2010-10-26 19:54:11

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: WCDMA1900

Frequency: 1907.6 MHz; Duty Cycle: 1:1

Medium: Body 1900; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used: $f = 1908$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ 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) = 0.373 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 = 7.87 V/m

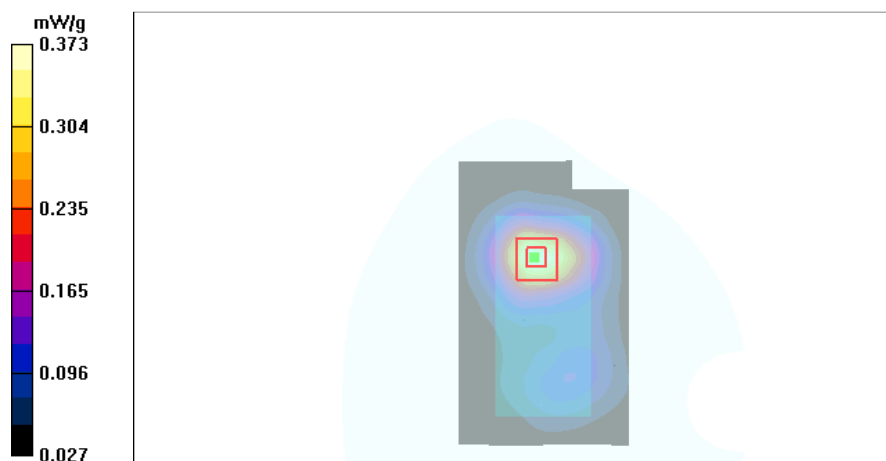
Peak SAR (extrapolated) = 0.518 W/kg

SAR(1 g) = 0.341 mW/g

SAR(10 g) = 0.211 mW/g

Power Drift = 0.079 dB

Maximum value of SAR (measured) = 0.373 mW/g



Date/Time: 2010-10-27 21:07:32

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 22.2 C

Medium parameters used: $f = 2442$ MHz; $\sigma = 2$ mho/m; $\epsilon_r = 51$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 2010-02-15
- Phantom: ELI-4; Type: QDOVA001BB; Serial: SN:1074
- 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) = 0.043 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 = 4.49 V/m

Peak SAR (extrapolated) = 0.068 W/kg

SAR(1 g) = 0.038 mW/g

SAR(10 g) = 0.022 mW/g

Power Drift = -0.203 dB

Maximum value of SAR (measured) = 0.040 mW/g



Date/Time: 2010-10-27 21:22:53

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 22.2 C

Medium parameters used: $f = 2442$ MHz; $\sigma = 2$ mho/m; $\epsilon_r = 51$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 2010-02-15
- Phantom: ELI-4; Type: QDOVA001BB; Serial: SN:1074
- 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) = 0.045 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 = 4.55 V/m

Peak SAR (extrapolated) = 0.069 W/kg

SAR(1 g) = 0.040 mW/g

SAR(10 g) = 0.023 mW/g

Power Drift = 0.007 dB

Maximum value of SAR (measured) = 0.042 mW/g



Date/Time: 2010-10-27 21:35:24

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 22.2 C

Medium parameters used: $f = 2442$ MHz; $\sigma = 2$ mho/m; $\epsilon_r = 51$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 2010-02-15
- Phantom: ELI-4; Type: QDOVA001BB; Serial: SN:1074
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 186

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

Maximum value of SAR (interpolated) = 0.087 mW/g

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

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

Reference Value = 6.12 V/m

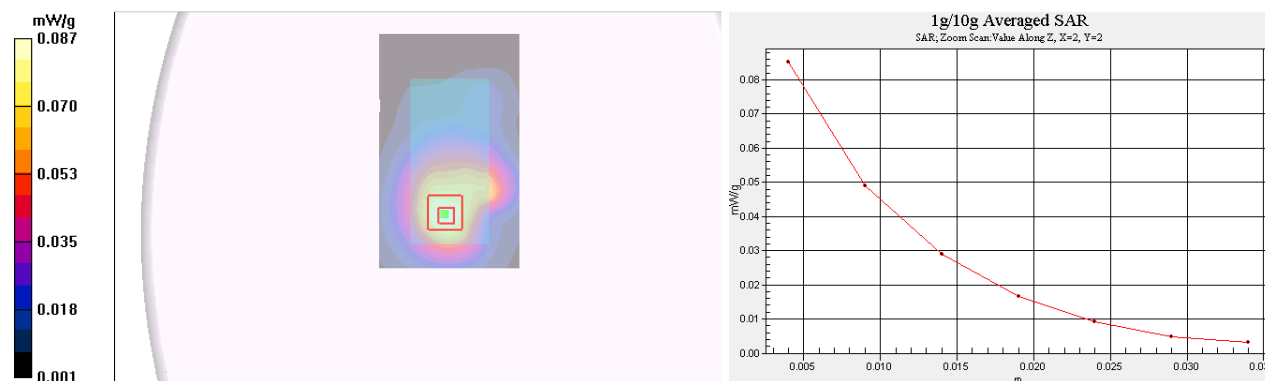
Peak SAR (extrapolated) = 0.137 W/kg

SAR(1 g) = 0.079 mW/g

SAR(10 g) = 0.046 mW/g

Power Drift = -0.075 dB

Maximum value of SAR (measured) = 0.085 mW/g



Date/Time: 2010-10-27 21:45:49

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Body 2450; Medium Notes: Medium Temperature: 22.2 C

Medium parameters used: $f = 2442$ MHz; $\sigma = 2$ mho/m; $\epsilon_r = 51$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.12, 4.12, 4.12); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn339; Calibrated: 2010-02-15
- Phantom: ELI-4; Type: QDOVA001BB; Serial: SN:1074
- 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) = 0.080 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 = 6.09 V/m

Peak SAR (extrapolated) = 0.128 W/kg

SAR(1 g) = 0.073 mW/g

SAR(10 g) = 0.042 mW/g

Power Drift = 0.081 dB

Maximum value of SAR (measured) = 0.078 mW/g



Date/Time: 2010-10-27 15:16:38, Date/Time: 2010-10-26 22:07:03

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

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 835, Medium: Head 2450; Medium Notes: Medium Temperature: 21.9 C, Medium Notes: Medium Temperature: 21.5C

Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.915 \text{ mho/m}$; $\epsilon_r = 41$; $\rho = 1000 \text{ kg/m}^3$, Medium parameters used: $f = 2442 \text{ MHz}$; $\sigma = 1.82 \text{ mho/m}$; $\epsilon_r = 38$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3117, Probe: EX3DV4 - SN3581; Probe Notes:
- ConvF(5.69, 5.69, 5.69), ConvF(6.51, 6.51, 6.51); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn339, Electronics: DAE4 Sn682; Calibrated: 2010-02-15, Calibrated: 2010-07-16
- 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

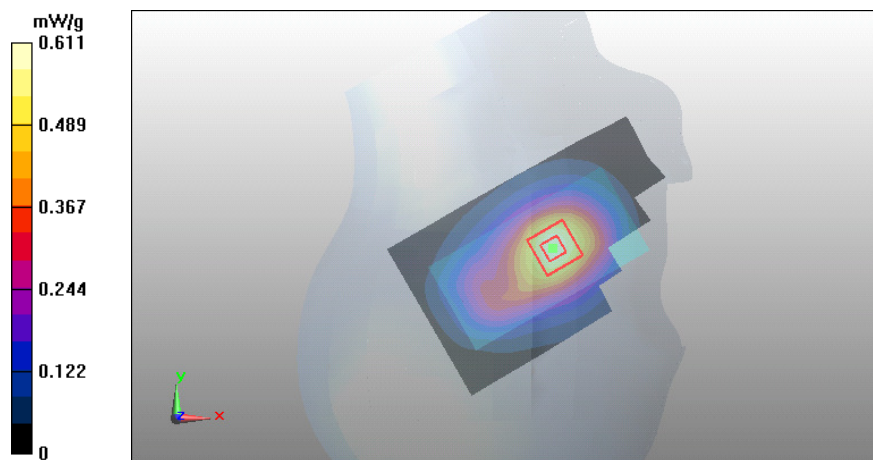
Configuration/Cheek - High/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.569 mW/g

SAR(10 g) = 0.382 mW/g

Maximum value of SAR (measured) = 0.611 mW/g



Date/Time: 2010-10-26 12:14:57, Date/Time: 2010-10-26 23:10:07

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

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

Frequency: 1850.2 MHz, Frequency: 2462 MHz; Duty Cycle: 1:2.8, Duty Cycle: 1:1

Medium: Head 1900, Medium: Head 2450; Medium Notes: Medium Temperature: 21.8 C, Medium Notes:

Medium Temperature: 21.5C

Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.4 \text{ mho/m}$; $\epsilon_r = 38.6$; $\rho = 1000 \text{ kg/m}^3$, Medium parameters used: $f = 2462 \text{ MHz}$; $\sigma = 1.85 \text{ mho/m}$; $\epsilon_r = 38$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116, Probe: EX3DV4 - SN3581; Probe Notes:
- ConvF(4.9, 4.9, 4.9), ConvF(6.51, 6.51, 6.51); Calibrated: 2010-02-24, Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE3 Sn501, Electronics: DAE4 Sn682; Calibrated: 2010-02-19, Calibrated: 2010-07-16
- Phantom: SAM 3, Phantom: SAM 8; Type: Twin Phantom, Type: SAM Twin Phantom; Serial: TP-1302, Serial: TP-1408
- ; SEMCAD X Version 14.0 Build 61

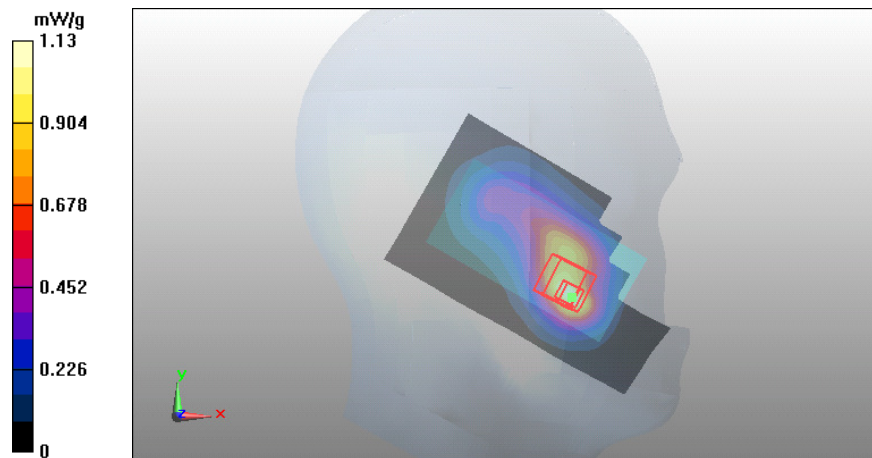
Configuration/Cheek - Low/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.975 mW/g

SAR(10 g) = 0.550 mW/g

Maximum value of SAR (measured) = 1.13 mW/g



Date/Time: 2010-10-26 16:09:05, Date/Time: 2010-10-26 23:10:07

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

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: 21.8 C, Medium Notes:

Medium Temperature: 21.5C

Medium parameters used: $f = 1908 \text{ MHz}$; $\sigma = 1.45 \text{ mho/m}$; $\epsilon_r = 38.4$; $\rho = 1000 \text{ kg/m}^3$, Medium parameters used:

$f = 2462 \text{ MHz}$; $\sigma = 1.85 \text{ mho/m}$; $\epsilon_r = 38$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

DASY4 Configuration:

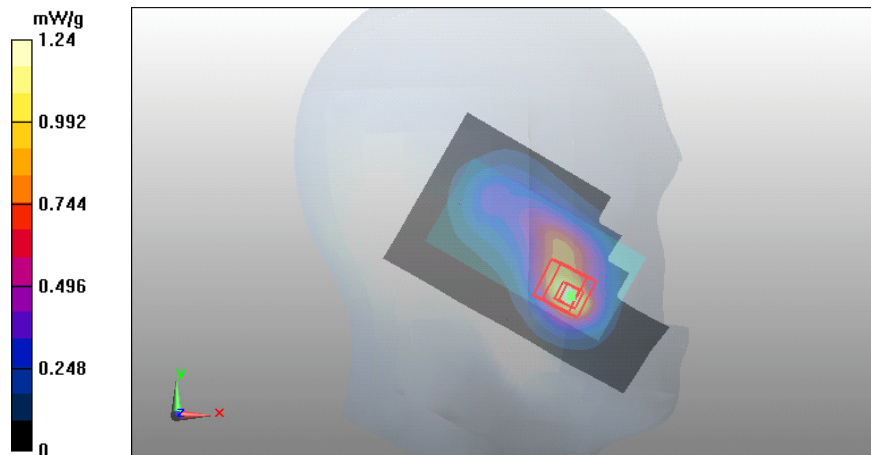
- Probe: ES3DV3 - SN3116, Probe: EX3DV4 - SN3581; Probe Notes:
- ConvF(4.9, 4.9, 4.9), ConvF(6.51, 6.51, 6.51); Calibrated: 2010-02-24, Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE3 Sn501, Electronics: DAE4 Sn682; Calibrated: 2010-02-19, Calibrated: 2010-07-16
- Phantom: SAM 3, Phantom: SAM 8; Type: Twin Phantom, Type: SAM Twin Phantom; Serial: TP-1302, Serial: TP-1408
- ; SEMCAD X Version 14.0 Build 61

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

Motorola Fast SAR of Combined Scans: SAR(1 g) = 1.04 mW/g

SAR(10 g) = 0.559 mW/g

Maximum value of SAR (measured) = 1.24 mW/g



Date/Time: 2010-10-27 14:30:24, Date/Time: 2010-10-27 21:35:24

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

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: Body 835, Medium: Body 2450; Medium Notes: Medium Temperature: 21.9 C, Medium Notes: Medium Temperature: 22.2 C

Medium parameters used: $f = 849 \text{ MHz}$; $\sigma = 0.984 \text{ mho/m}$; $\epsilon_r = 54.5$; $\rho = 1000 \text{ kg/m}^3$, Medium parameters used: $f = 2442 \text{ MHz}$; $\sigma = 2 \text{ mho/m}$; $\epsilon_r = 51$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

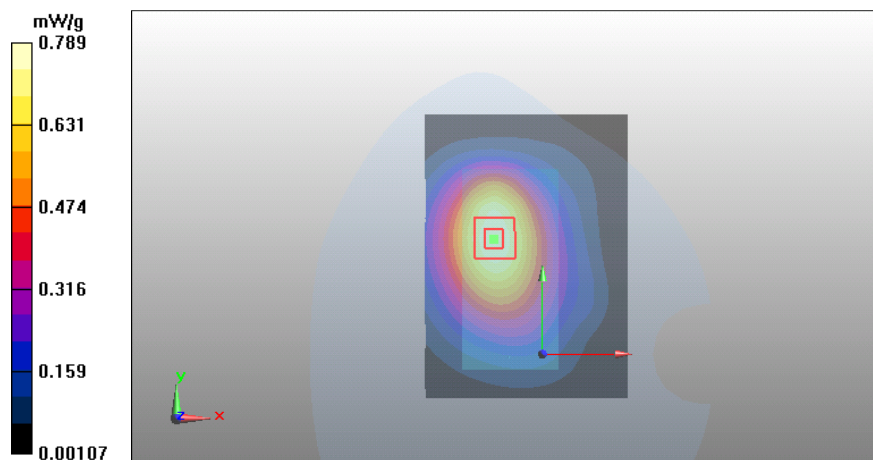
- Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(5.7, 5.7, 5.7), ConvF(4.12, 4.12, 4.12); Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE3 Sn339; Calibrated: 2010-02-15
- Phantom: SAM 5, Phantom: ELI-4; Type: Twin Phantom, Type: QDOVA001BB; Serial: TP-1302, Serial: SN:1074
- ; SEMCAD X Version 14.0 Build 61

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

Configuration/Body - Middle - 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) = 0.745 mW/g
SAR(10 g) = 0.520 mW/g

Maximum value of SAR (measured) = 0.789 mW/g



Date/Time: 2010-10-26 19:10:20, Date/Time: 2010-10-27 21:35:24

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

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

Frequency: 1909.8 MHz, Frequency: 2442 MHz; Duty Cycle: 1:2.8, Duty Cycle: 1:1

Medium: Body 1900, Medium: Body 2450; Medium Notes: Medium Temperature: 21.5 C, Medium Notes:

Medium Temperature: 22.2 C

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 52.2$; $\rho = 1000$ kg/m³, Medium parameters used:
 $f = 2442$ MHz; $\sigma = 2$ mho/m; $\epsilon_r = 51$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

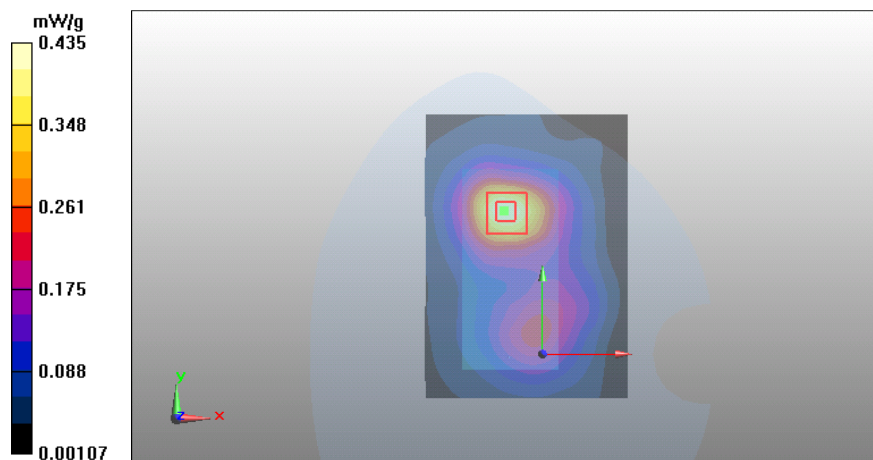
- Probe: ES3DV3 - SN3116, Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.58, 4.58, 4.58), ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24, Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE3 Sn501, Electronics: DAE3 Sn339; Calibrated: 2010-02-19, Calibrated: 2010-02-15
- Phantom: SAM 1, Phantom: ELI-4; Type: Twin Phantom, Type: QDOVA001BB; Serial: TP-1215, Serial: SN:1074
- ; SEMCAD X Version 14.0 Build 61

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

Configuration/Body - Middle - 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) = 0.228 mW/g

Maximum value of SAR (measured) = 0.435 mW/g



Date/Time: 2010-10-26 19:54:11, Date/Time: 2010-10-27 21:35:24

Test Laboratory: TCC Nokia

Type: RM-697; Serial: 004402/13/187906/0

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

Frequency: 1907.6 MHz, Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: Body 1900, Medium: Body 2450; Medium Notes: Medium Temperature: 21.5 C, Medium Notes:

Medium Temperature: 22.2 C

Medium parameters used: $f = 1908 \text{ MHz}$; $\sigma = 1.49 \text{ mho/m}$; $\epsilon_r = 52.2$; $\rho = 1000 \text{ kg/m}^3$, Medium parameters used:
 $f = 2442 \text{ MHz}$; $\sigma = 2 \text{ mho/m}$; $\epsilon_r = 51$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

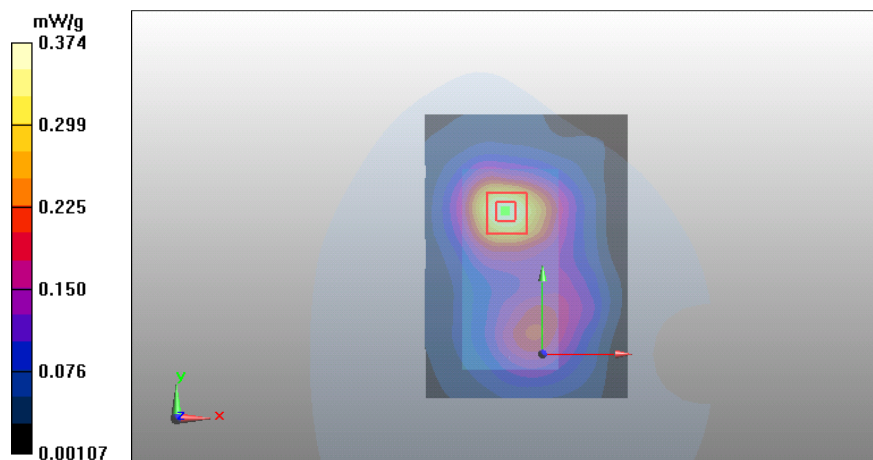
- Probe: ES3DV3 - SN3116, Probe: ES3DV3 - SN3117; Probe Notes:
- ConvF(4.58, 4.58, 4.58), ConvF(4.12, 4.12, 4.12); Calibrated: 2010-02-24, Calibrated: 2010-07-19
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE3 Sn501, Electronics: DAE3 Sn339; Calibrated: 2010-02-19, Calibrated: 2010-02-15
- Phantom: SAM 1, Phantom: ELI-4; Type: Twin Phantom, Type: QDOVA001BB; Serial: TP-1215, Serial: SN:1074
- ; SEMCAD X Version 14.0 Build 61

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

Configuration/Body - Middle - 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) = 0.336 mW/g
SAR(10 g) = 0.197 mW/g

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



APPENDIX C: 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

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 24, 2010

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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.



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client: **Nokia Denmark A/S**

Certificate No: **ES3-3117_Jul10**

CALIBRATION CERTIFICATE

Object: **ES3DV3 - SN:3117**

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: **July 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 E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

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**

Approved by: **Kalja Pokovic** **Technical Manager**

Issued: July 19, 2010

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

DASY/EASY - Parameters of Probe: ES3DV3 SN:3117

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%	5.69	5.69	5.69	0.77	1.13 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	4.94	4.94	4.94	0.45	1.56 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.71	4.71	4.71	0.42	1.65 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.22	4.22	4.22	0.46	1.64 ± 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/EASY - Parameters of Probe: ES3DV3 SN:3117

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%	5.70	5.70	5.70	0.91	1.12 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	4.68	4.68	4.68	0.42	1.74 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.46	4.46	4.46	0.35	2.10 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.12	4.12	4.12	0.70	1.31 ± 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.



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Accreditation No.: **SCS 108**

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Multilateral Agreement for the recognition of calibration certificates

Client **Nokia Denmark A/S**

Certificate No: **EX3-3581_Jul10**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3581**

Calibration procedure(s) **QA CAL-01.v6, QA CAL-14.v3, QA CAL-23.v3 and QA CAL-25.v2
Calibration procedure for dosimetric E-field probes**

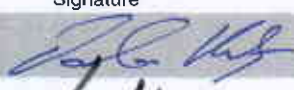
Calibration date: **July 19, 2010**

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 E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11
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: Oct-10

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

Issued: July 20, 2010

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

DASY/EASY - Parameters of Probe: EX3DV4 SN:3581

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%	8.44	8.44	8.44	0.72	0.65 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	7.42	7.42	7.42	0.96	0.54 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	7.08	7.08	7.08	0.99	0.52 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	6.51	6.51	6.51	0.69	0.62 ± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	6.48	6.48	6.48	0.48	0.73 ± 11.0%
5200	± 50 / ± 100	36.0 ± 5%	4.66 ± 5%	4.54	4.54	4.54	0.32	1.80 ± 13.1%
5500	± 50 / ± 100	35.6 ± 5%	4.96 ± 5%	3.90	3.90	3.90	0.45	1.80 ± 13.1%
5800	± 50 / ± 100	35.3 ± 5%	5.27 ± 5%	3.75	3.75	3.75	0.50	1.80 ± 13.1%

^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/EASY - Parameters of Probe: EX3DV4 SN:3581

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%	8.61	8.61	8.61	0.67	0.68 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	7.12	7.12	7.12	0.96	0.56 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	6.86	6.86	6.86	0.89	0.57 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	6.81	6.81	6.81	0.45	0.75 ± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	6.76	6.76	6.76	0.36	0.85 ± 11.0%
5200	± 50 / ± 100	49.0 ± 5%	5.30 ± 5%	3.84	3.84	3.84	0.50	1.90 ± 13.1%
5500	± 50 / ± 100	48.6 ± 5%	5.65 ± 5%	3.40	3.40	3.40	0.60	1.90 ± 13.1%
5800	± 50 / ± 100	48.2 ± 5%	6.00 ± 5%	3.45	3.45	3.45	0.60	1.90 ± 13.1%

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

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See the following pages.



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Accreditation No.: **SCS 108**

Client **Nokia Denmark A/S**

Certificate No: **D835V2-4d042_Jul10**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 4d042**

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

Calibration date: **July 20, 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)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11

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

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	

Approved by:	Katja Pokovic	Technical Manager
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Issued: July 20, 2010

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DASY5 Validation Report for Head TSL

Date/Time: 12.07.2010 10:35:49

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d042

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

Medium: HSL900

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.9 \text{ mho/m}$; $\epsilon_r = 42.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.03, 6.03, 6.03); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57 V/m; Power Drift = 0.025 dB

Peak SAR (extrapolated) = 3.56 W/kg

SAR(1 g) = 2.38 mW/g; SAR(10 g) = 1.55 mW/g

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



DASY5 Validation Report for Body

Date/Time: 20.07.2010 11:38:55

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d042

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

Medium: MSL900

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 1.01 \text{ mho/m}$; $\epsilon_r = 55$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.86, 5.86, 5.86); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

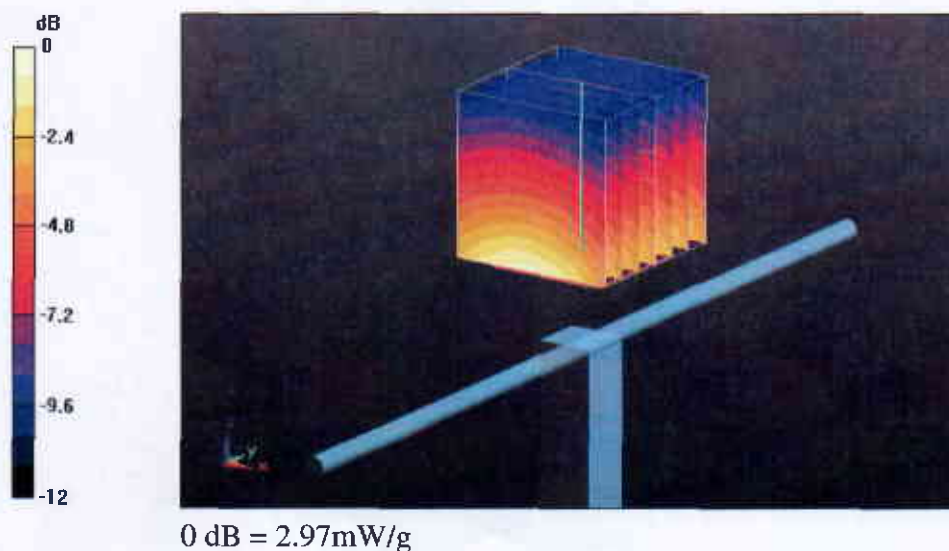
Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) Cube 0: Measurement
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.1 V/m; Power Drift = 0.014 dB

Peak SAR (extrapolated) = 3.78 W/kg

SAR(1 g) = 2.56 mW/g; SAR(10 g) = 1.68 mW/g

Maximum value of SAR (measured) = 2.97 mW/g





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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
Function
Laboratory Technician

Signature

Approved by: **Katja Pokovic**

Technical Manager

Issued: February 25, 2010

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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: 1:1

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

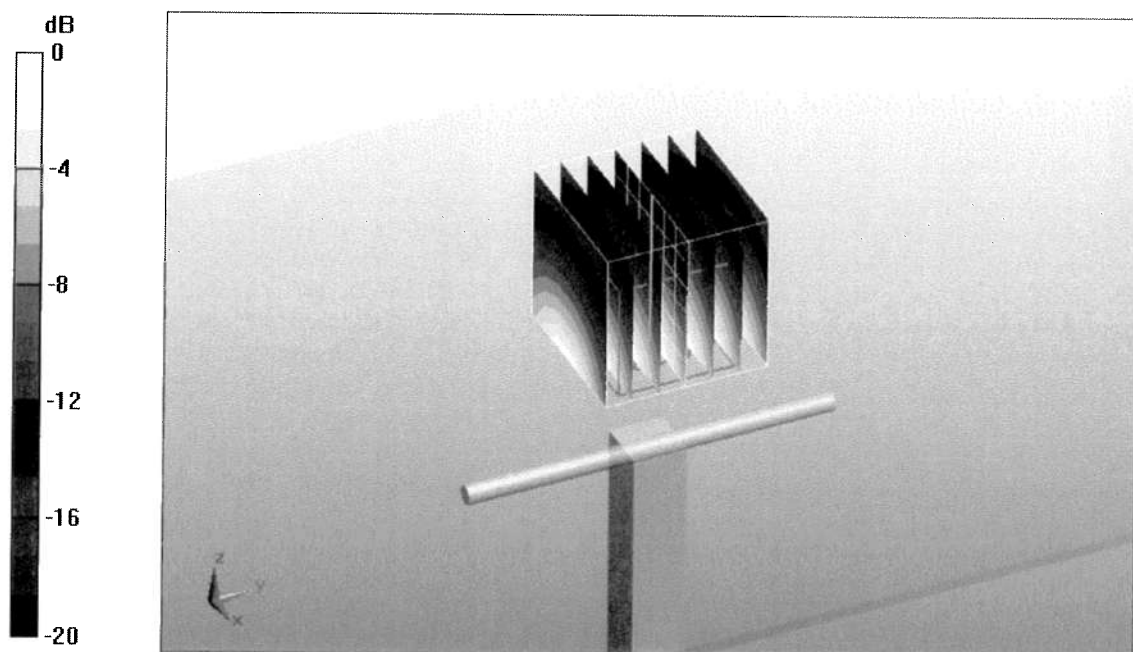
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

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

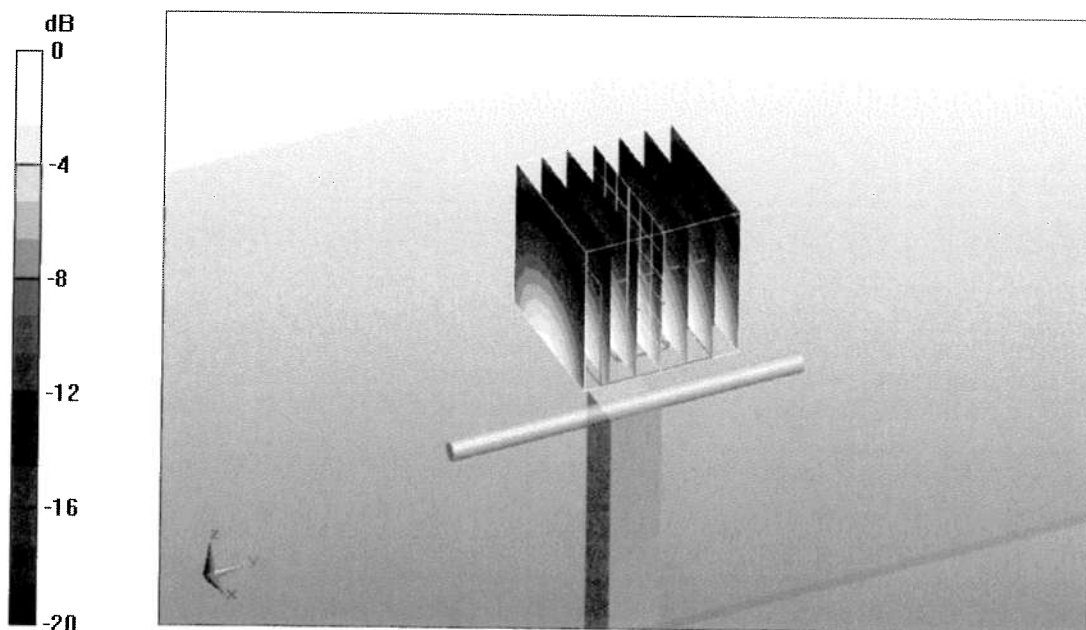
Pin250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement
grid: dx=5mm, dy=5mm, dz=5mm

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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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

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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

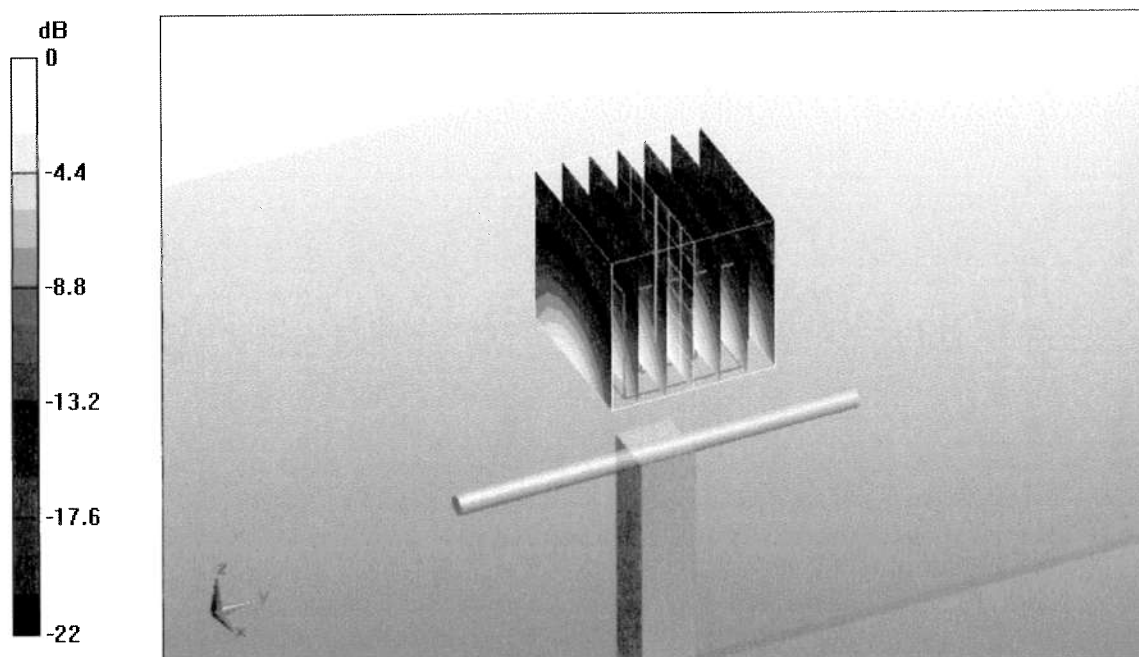
grid: dx=5mm, dy=5mm, dz=5mm

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:

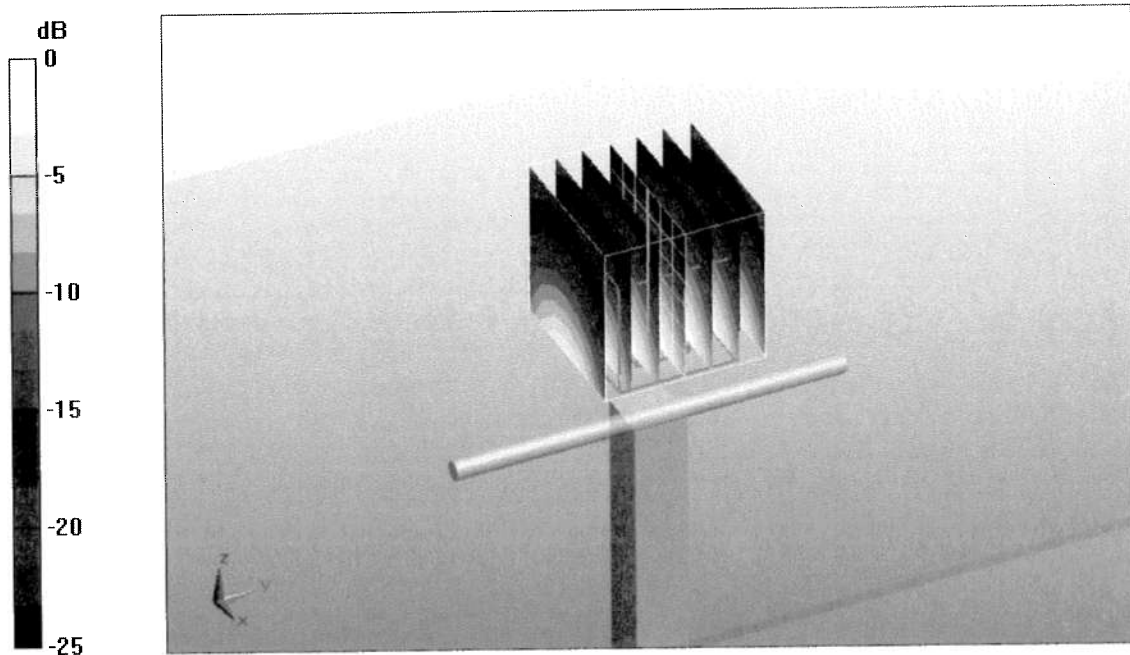
Measurement grid: dx=5mm, dy=5mm, dz=5mm

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