

SAR Compliance Test Report

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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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SAR Report

Type: RM-658

FCC_RM-658_01

Applicant: Nokia Corporation

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2010-03-12 to 2010-03-18
SN, HW and SW numbers of tested device	SN: 004401/01/981109/6, HW: 9013, SW: 041.003RD, DUT: 24367
Batteries used in testing	BP-4L, DUT: 24422, 24362, 24361
Headsets used in testing	WH-205, DUT: 24416
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 GPRS 850	190 / 836.6	29.0 dBm	Left, Cheek	0.775 W/kg	0.87 W/kg	1.6 W/kg	PASSED
WCDMA 1700/2100	1513 / 1752.6	24.0 dBm	Right, Cheek	0.762 W/kg	0.85 W/kg	1.6 W/kg	PASSED
GSM 1900	810 / 1909.8	29.5 dBm	Right, Cheek	0.559 W/kg	0.63 W/kg	1.6 W/kg	PASSED
WLAN 2450	7 / 2442.0	18.0 dBm	Left, Cheek	0.177 W/kg	0.20 W/kg	1.6 W/kg	PASSED
2-slot GPRS850 + WLAN2450	-	-	Left, Cheek	0.952 W/kg	1.07 W/kg	1.6 W/kg	PASSED
WCDMA 1700/2100 + WLAN2450	-	-	Right, Cheek	0.859 W/kg	0.96 W/kg	1.6 W/kg	PASSED
GSM 1900 + WLAN2450	-	-	Left, Cheek	0.687 W/kg	0.77 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 GPRS 850	128 / 824.2	29.0 dBm	1.5 cm	0.761 W/kg	0.85 W/kg	1.6 W/kg	PASSED
WCDMA 1700/2100	1513 / 1752.6	24.0 dBm	1.5 cm	0.553 W/kg	0.62 W/kg	1.6 W/kg	PASSED
GSM 1900	661 / 1880.0	29.5 dBm	1.5 cm	1.01 W/kg	1.13 W/kg	1.6 W/kg	PASSED
WLAN 2450	7 / 2442.0	18.0 dBm	1.5 cm	0.207 W/kg	0.23 W/kg	1.6 W/kg	PASSED
2-slot GPRS850 + WLAN2450	-	-	1.5 cm	0.968 W/kg	1.08 W/kg	1.6 W/kg	PASSED
WCDMA 1700/2100 + WLAN2450	-	-	1.5 cm	0.760 W/kg	0.85 W/kg	1.6 W/kg	PASSED
GSM 1900 + WLAN2450	-	-	1.5 cm	1.217 W/kg	1.36 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	0.45 dB

1.2.4 Measurement Uncertainty

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

Device category	Portable
Exposure environment	General population / uncontrolled

Modes of Operation	Bands	Modulation Mode	Duty Cycle	Transmitter Frequency Range (MHz)
GSM	850 1900	GMSK	1/8	824 – 849 1850 – 1910
GPRS	850 1900	GMSK	1/8 to 3/8	824 – 849 1850 – 1910
EGPRS	850 1900	GMSK / 8PSK	1/8 to 3/8	824 – 849 1850 – 1910
WCDMA	1700/2100 (Band IV)	-	1	1712 – 1753
HSUPA	1700/2100 (Band IV)	-	1	1712 – 1753
BT	2450	GFSK	1	2402 – 2480
WLAN	2450	11Mbps QPSK	1	2412 – 2462

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

This device has Dual Transfer Mode/Voice over IP 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 tests was DSSS QPSK 11Mbps. This mode has the highest (or equal highest) time-averaged output power of all the WLAN 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
DAE3	501	12 months	2011-02
DAE3	573	12 months	2010-07
E-field Probe ES3DV3	3116	12 months	2011-02
E-field Probe ES3DV3	3118	12 months	2010-09
Dipole Validation Kit, D835V2	4d042	24 months	2010-09
Dipole Validation Kit, D1800V2	230	24 months	2010-03
Dipole Validation Kit, D1900V2	5d026	24 months	2010-03
Dipole Validation Kit, D2450V2	790	24 months	2010-09
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
Signal Generator	SME06	848650/011	36 months	2012-08
Amplifier	ZHL-42W	E012903	-	-
Amplifier	2100-BBS3Q8CJ	1003	-	-
Power Meter	NRP	100808	24 months	2010-04
Power Meter	NRP	101293	24 months	2011-08
Power Sensor	NRP-Z51	100410	24 months	2010-04
Power Sensor	NRP-Z51	100830	24 months	2011-08
Call Tester	CMU200	110735	-	-
Call Tester	CMU200	105900	-	-
Vector Network Analyzer	AT8753ES	MY40001091	12 months	
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 Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

4.2 Phantoms

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

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

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

4.3 Tissue Simulants

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

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

4.3.1 Tissue Simulant Recipes

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

800MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	39.74	55.97
HEC	0.25	1.21
Sugar	58.31	41.76
Preservative	0.15	0.27
Salt	1.55	0.79

1800-1900MHz 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	41.4	0.90	
	± 10% window	2.14 - 2.62			
	2010-03-12	2.48	41.2	0.91	21.5
	2010-03-18	2.53	40.6	0.90	22.0
1800	Reference result	9.86	40.4	1.40	
	± 10% window	8.87 - 10.85			
	2010-03-16	9.67	39.5	1.39	21.5
	2010-03-17	9.87	38.9	1.38	21.5
1900	Reference result	10.3	40.2	1.47	
	± 10% window	9.3 - 11.3			
	2010-03-17	10.7	38.4	1.49	21.5
2450	Reference result	13.2	39.8	1.80	
	± 10% window	11.9 - 14.5			
	2010-03-12	14.1	38.2	1.89	21.8

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	
	2010-03-12	41.2	0.90	21.5
	2010-03-18	40.6	0.90	22.0
1732	Recommended value	40.1	1.36	
	$\pm 5\%$ window	38.1 – 42.1	1.29 – 1.43	
	2010-03-16	39.8	1.32	21.5
1880	Recommended value	40.0	1.40	
	$\pm 5\%$ window	38.0 – 42.0	1.33 – 1.47	
	2010-03-17	38.5	1.47	21.5
2442	Recommended value	39.2	1.79	
	$\pm 5\%$ window	37.3 – 41.2	1.70 – 1.88	
	2010-03-12	38.2	1.88	21.8

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	
	2010-03-12	53.6	0.97	21.9
1732	Recommended value	53.5	1.48	
	$\pm 5\%$ window	50.8 – 56.2	1.40 – 1.55	
	2010-03-17	51.7	1.41	21.8
1880	Recommended value	53.3	1.52	
	$\pm 5\%$ window	50.6 – 56.0	1.44 – 1.60	
	2010-03-17	51.1	1.57	21.9
2442	Recommended value	52.7	1.94	
	$\pm 5\%$ window	50.1 – 55.3	1.85 – 2.04	
	2010-03-12	50.3	1.87	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	$C_i \cdot U_i$ (%)	V_i
Measurement System							
Probe Calibration	E2.1	±5.9	N	1	1	±5.9	∞
Axial Isotropy	E2.2	±4.7	R	√3	$(1-c_p)^{1/2}$	±1.9	∞
Hemispherical Isotropy	E2.2	±9.6	R	√3	$(c_p)^{1/2}$	±3.9	∞
Boundary Effect	E2.3	±1.0	R	√3	1	±0.6	∞
Linearity	E2.4	±4.7	R	√3	1	±2.7	∞
System Detection Limits	E2.5	±1.0	R	√3	1	±0.6	∞
Readout Electronics	E2.6	±1.0	N	1	1	±1.0	∞
Response Time	E2.7	±0.8	R	√3	1	±0.5	∞
Integration Time	E2.8	±2.6	R	√3	1	±1.5	∞
RF Ambient Conditions - Noise	E6.1	±3.0	R	√3	1	±1.7	∞
RF Ambient Conditions - Reflections	E6.1	±3.0	R	√3	1	±1.7	∞
Probe Positioner Mechanical Tolerance	E6.2	±0.4	R	√3	1	±0.2	∞
Probe Positioning with respect to Phantom Shell	E6.3	±2.9	R	√3	1	±1.7	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E5	±3.9	R	√3	1	±2.3	∞
Test sample Related							
Test Sample Positioning	E4.2	±6.0	N	1	1	±6.0	11
Device Holder Uncertainty	E4.1	±5.0	N	1	1	±5.0	7
Output Power Variation - SAR drift measurement	6.6.3	±0.0	R	√3	1	±0.0	∞
Phantom and Tissue Parameters							
Phantom Uncertainty (shape and thickness tolerances)	E3.1	±4.0	R	√3	1	±2.3	∞
Conductivity Target - tolerance	E3.2	±5.0	R	√3	0.64	±1.8	∞
Conductivity - measurement uncertainty	E3.3	±5.5	N	1	0.64	±3.5	5
Permittivity Target - tolerance	E3.2	±5.0	R	√3	0.6	±1.7	∞
Permittivity - measurement uncertainty	E3.3	±2.9	N	1	0.6	±1.7	5
Combined Standard Uncertainty			RSS			±12.9	116
Coverage Factor for 95%			k=2				
Expanded Uncertainty						±25.8	

7. RESULTS

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

850MHz Head SAR results

Option used	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz
GSM	Conducted Power		-	32.0 dBm	-
	Left	Cheek	-	0.767	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
2-slot GPRS	Conducted Power		29.0 dBm	29.0 dBm	29.0 dBm
	Left	Cheek	0.746	0.775	0.760
		Tilt	-	0.474	-
	Right	Cheek	-	0.728	-
		Tilt	-	0.444	-
3-slot GPRS	Conducted Power		-	27.2 dBm	-
	Left	Cheek	-	0.755	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
2-slot 8PSK EGPRS	Conducted Power		-	25.2 dBm	-
	Left	Cheek	-	0.222	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-

1700/2100MHz Head SAR results

Option used	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 1312 1712.4 MHz	Ch 1412 1732.4 MHz	Ch 1513 1752.6 MHz
WCDMA	Conducted Power		24.0 dBm	24.0 dBm	24.0 dBm
	Left	Cheek	-	0.569	-
		Tilt	-	0.508	-
	Right	Cheek	0.535	0.648	0.762
		Tilt	-	0.453	-

1900MHz Head SAR results

Option used	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
GSM	Conducted Power		29.5 dBm	29.5 dBm	29.5 dBm
	Left	Cheek	-	0.510	-
		Tilt	-	0.161	-
	Right	Cheek	0.466	0.516	0.559
		Tilt	-	0.152	-
2-slot GPRS	Conducted Power		-	26.5 dBm	-
	Left	Cheek	-	0.503	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3-slot GPRS	Conducted Power		-	24.7 dBm	-
	Left	Cheek	-	0.483	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
1-slot 8PSK EGPRS	Conducted Power		-	-	25.5 dBm
	Left	Cheek	-	-	-
		Tilt	-	-	-
	Right	Cheek	-	-	0.186
		Tilt	-	-	-

2450MHz Head SAR results

Option used	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 1 2412.0 MHz	Ch 7 2442.0 MHz	Ch 11 2462.0 MHz
WLAN	Conducted Power		18.0 dBm	18.0 dBm	18.0 dBm
	Left	Cheek	0.115	0.177	0.120
		Tilt	-	0.147	-
	Right	Cheek	-	0.097	-
		Tilt	-	0.101	-

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

850MHz Body SAR results

Option used	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz
2-slot GPRS		Conducted Power	29.0 dBm	29.0 dBm	29.0 dBm
	Display facing phantom	Without headset	-	0.668	-
		Headset WH-205	-	0.455	-
	Back facing phantom	Without headset	0.761	0.727	0.726
		Headset WH-205	-	0.484	-

1700/2100MHz Body SAR results

Option used	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 1312 1712.4 MHz	Ch 1412 1732.4 MHz	Ch 1513 1752.6 MHz
WCDMA		Conducted Power	24.0 dBm	24.0 dBm	24.0 dBm
	Display facing phantom	Without headset	0.473	0.526	0.553
		Headset WH-205	-	0.448	-
	Back facing phantom	Without headset	-	0.489	-
		Headset WH-205	-	0.397	-

1900MHz Body SAR results

Option used	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
GSM		Conducted Power	29.5 dBm	29.5 dBm	29.5 dBm
	Display facing phantom	Without headset	-	0.667	-
		Headset WH-205	-	0.675	-
	Back facing phantom	Without headset	0.966	1.01	0.988
		Headset WH-205	0.998	0.995	0.993

2450MHz Body SAR results

Option used	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		Conducted Power	18.0 dBm	18.0 dBm	18.0 dBm
	Display facing phantom	Without headset	-	-	-
		Headset WH-205	-	-	-
	Back facing phantom	Without headset	0.119	0.207	0.191
		Headset WH-205	-	0.202	-

Simultaneous transmissions: Combined SAR results

Test configuration	Max. 1g SAR results			
	WLAN	2-slot GPRS 850	WCDMA1700/2100	GSM 1900
Head: Left, Cheek	0.177	0.775	0.569	0.510
Head: Left, Tilt	0.147	0.474	0.508	0.161
Head: Right, Cheek	0.097	0.728	0.762	0.559
Head: Right, Tilt	0.101	0.444	0.453	0.152
Body: Without Headset	0.207	0.761	0.553	1.01
Body: Headset WH-205	0.202	0.484	0.448	0.998

Test configuration	Combined 1g SAR values		
	WLAN + 2-slot GPRS 850	WLAN + WCDMA1700/2100	WLAN + GSM 1900
Head: Left, Cheek	0.952	0.746	0.687
Head: Left, Tilt	0.621	0.655	0.308
Head: Right, Cheek	0.825	0.859	0.656
Head: Right, Tilt	0.545	0.554	0.253
Body: Without Headset	0.968	0.760	1.217
Body: Headset WH-205	0.686	0.650	1.200

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

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: 2010-03-12 10:41:32

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: 21.5 C

Medium parameters used: $f = 835$ MHz; $\sigma = 0.906$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ 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 184

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

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

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

Reference Value = 54.4 V/m

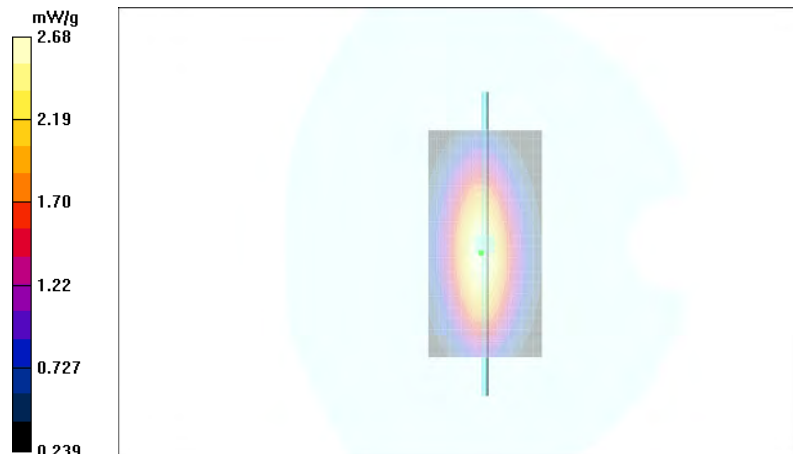
Peak SAR (extrapolated) = 3.78 W/kg

SAR(1 g) = 2.48 mW/g

SAR(10 g) = 1.62 mW/g

Power Drift = -0.008 dB

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



Date/Time: 2010-03-18 09:36:17

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: 22.0 C

Medium parameters used: $f = 835$ MHz; $\sigma = 0.903$ mho/m; $\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.85, 5.85, 5.85); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

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

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

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

Reference Value = 54.9 V/m

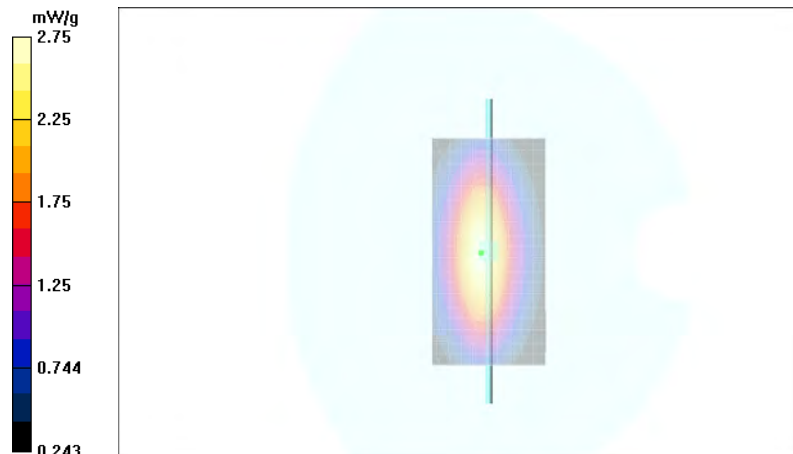
Peak SAR (extrapolated) = 3.87 W/kg

SAR(1 g) = 2.53 mW/g

SAR(10 g) = 1.64 mW/g

Power Drift = -0.016 dB

Maximum value of SAR (measured) = 2.75 mW/g



Date/Time: 2010-03-16 12:00:04

Test Laboratory: TCC Nokia

Type: D1800V2; Serial: 230

Communication System: CW1800

Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: Head 1800; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.39$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.05, 5.05, 5.05); 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 184

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

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

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

Reference Value = 87.7 V/m

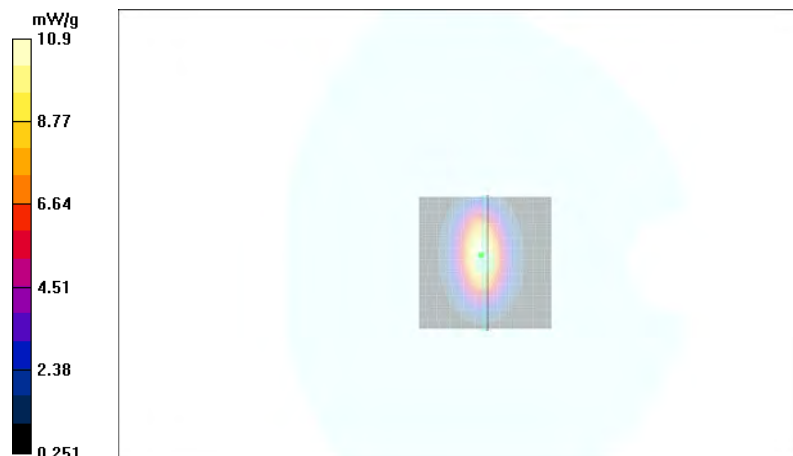
Peak SAR (extrapolated) = 17.6 W/kg

SAR(1 g) = 9.67 mW/g

SAR(10 g) = 5.09 mW/g

Power Drift = 0.057 dB

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



Date/Time: 2010-03-17 09:18:16

Test Laboratory: TCC Nokia
Type: D1800V2; Serial: 230

Communication System: CW1800

Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: Head 1800; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.05, 5.05, 5.05); 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 184

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

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

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

Reference Value = 89.6 V/m

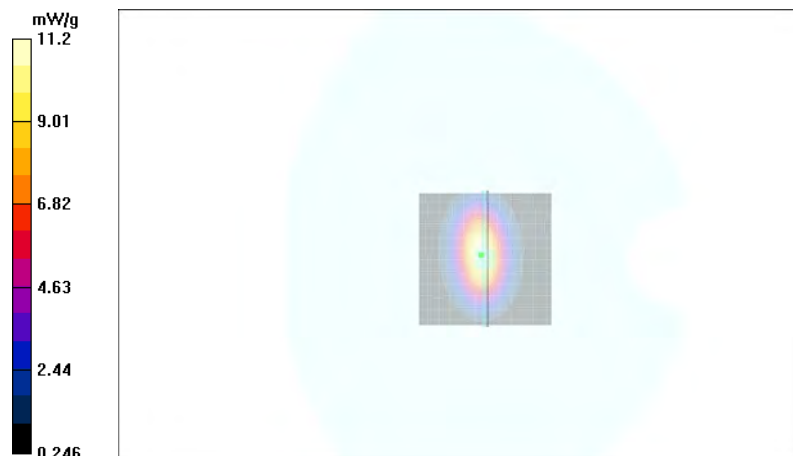
Peak SAR (extrapolated) = 18.2 W/kg

SAR(1 g) = 9.87 mW/g

SAR(10 g) = 5.18 mW/g

Power Drift = 0.076 dB

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



Date/Time: 2010-03-17 15:08:59

Test Laboratory: TCC Nokia
Type: D1900V2; Serial: 5d026

Communication System: CW1900

Frequency: 1900 MHz; Duty Cycle: 1:1

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

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.49$ 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 184

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

Maximum value of SAR (interpolated) = 12.1 mW/g

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

Reference Value = 87.5 V/m

Peak SAR (extrapolated) = 19.8 W/kg

SAR(1 g) = 10.7 mW/g

SAR(10 g) = 5.48 mW/g

Power Drift = 0.050 dB

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



Date/Time: 2010-03-12 18:37:52

Test Laboratory: TCC Nokia

Type: D2450V2; Serial: 790

Communication System: CW2450

Frequency: 2450 MHz; Duty Cycle: 1:1

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

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.89$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.21, 4.21, 4.21); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

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

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

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

Reference Value = 87.7 V/m

Peak SAR (extrapolated) = 29.5 W/kg

SAR(1 g) = 14.1 mW/g

SAR(10 g) = 6.54 mW/g

Power Drift = -0.068 dB

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



APPENDIX B: MEASUREMENT SCANS

See the following pages

Date/Time: 2010-03-18 10:15:23

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: Head 850; Medium Notes: Medium Temperature: 22.0 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.904$ mho/m; $\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(5.85, 5.85, 5.85); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4; Type: Twin Phantom; Serial: TP-1410
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek position - Middle/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.816 mW/g

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

Reference Value = 13.3 V/m

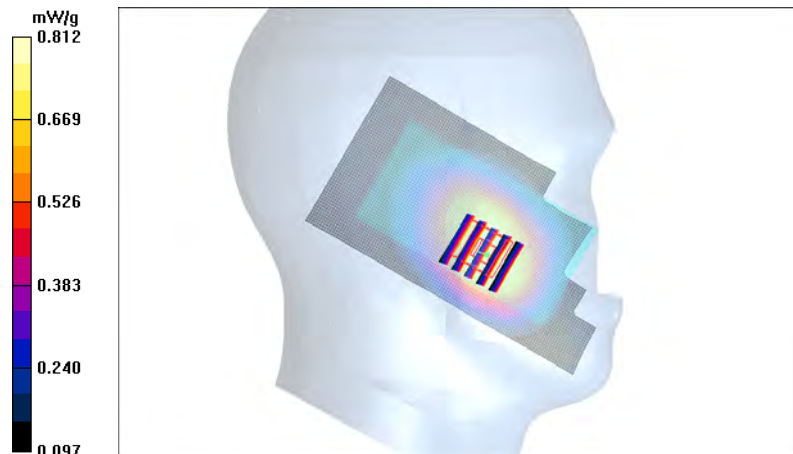
Peak SAR (extrapolated) = 1.00 W/kg

SAR(1 g) = 0.767 mW/g

SAR(10 g) = 0.563 mW/g

Power Drift = -0.118 dB

Maximum value of SAR (measured) = 0.812 mW/g



Date/Time: 2010-03-12 12:48:06

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Head 850; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.907$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ 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 184

Cheek position - Middle/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.797 mW/g

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

Reference Value = 13.0 V/m

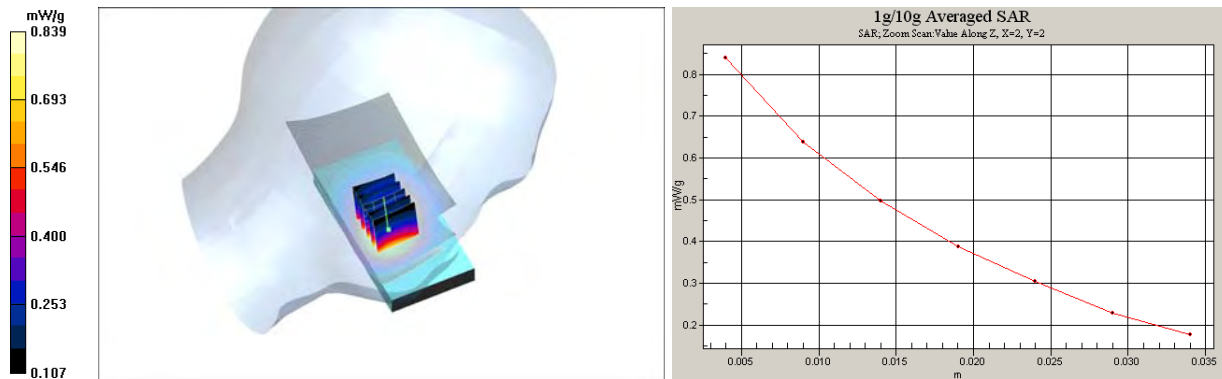
Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.775 mW/g

SAR(10 g) = 0.569 mW/g

Power Drift = -0.102 dB

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



Date/Time: 2010-03-12 14:18:38

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Head 850; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.907$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ 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 184

Tilt position - Middle/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.502 mW/g

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

Reference Value = 17.4 V/m

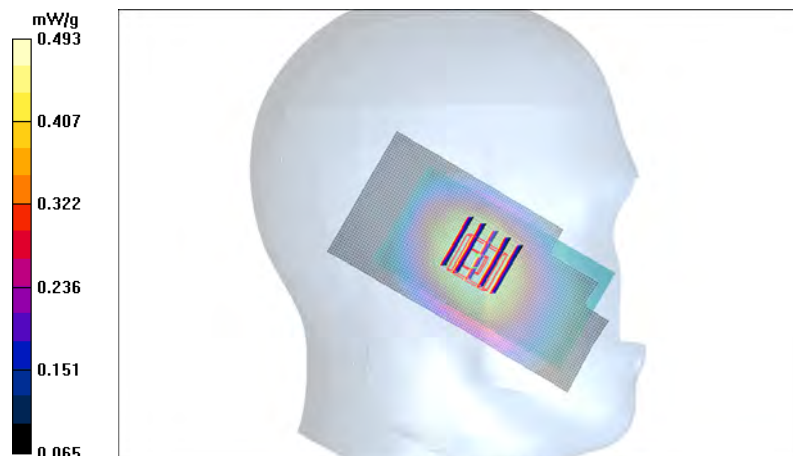
Peak SAR (extrapolated) = 0.603 W/kg

SAR(1 g) = 0.474 mW/g

SAR(10 g) = 0.358 mW/g

Power Drift = -0.064 dB

Maximum value of SAR (measured) = 0.493 mW/g



Date/Time: 2010-03-12 14:34:11

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Head 850; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.907$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ 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 184

Cheek position - Middle/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.774 mW/g

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

Reference Value = 13.9 V/m

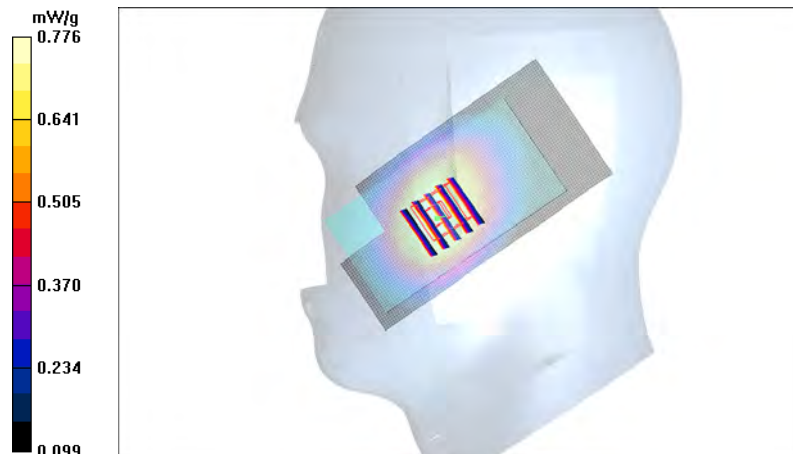
Peak SAR (extrapolated) = 0.891 W/kg

SAR(1 g) = 0.728 mW/g

SAR(10 g) = 0.554 mW/g

Power Drift = 0.005 dB

Maximum value of SAR (measured) = 0.776 mW/g



Date/Time: 2010-03-12 14:56:29

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Head 850; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.907$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ 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 184

Tilt position - Middle/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.463 mW/g

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

Reference Value = 17.6 V/m

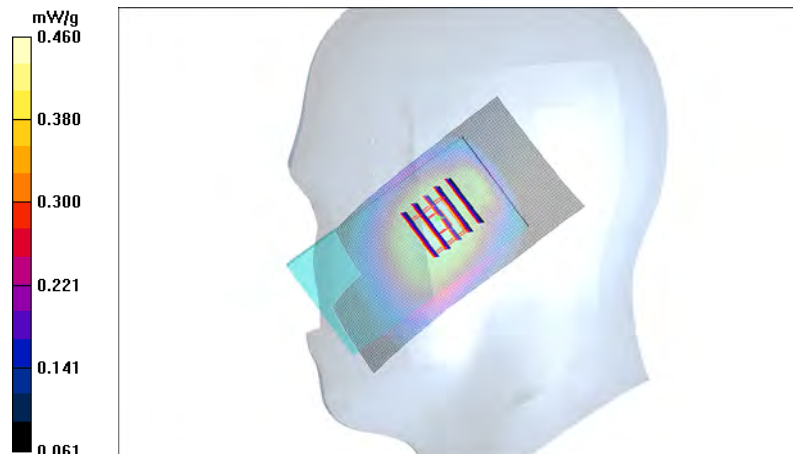
Peak SAR (extrapolated) = 0.560 W/kg

SAR(1 g) = 0.444 mW/g

SAR(10 g) = 0.338 mW/g

Power Drift = 0.056 dB

Maximum value of SAR (measured) = 0.460 mW/g



Date/Time: 2010-03-12 13:04:36

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: 3-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:2.8

Medium: Head 850; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.907$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ 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 184

Cheek position - Middle/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.785 mW/g

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

Reference Value = 13.0 V/m

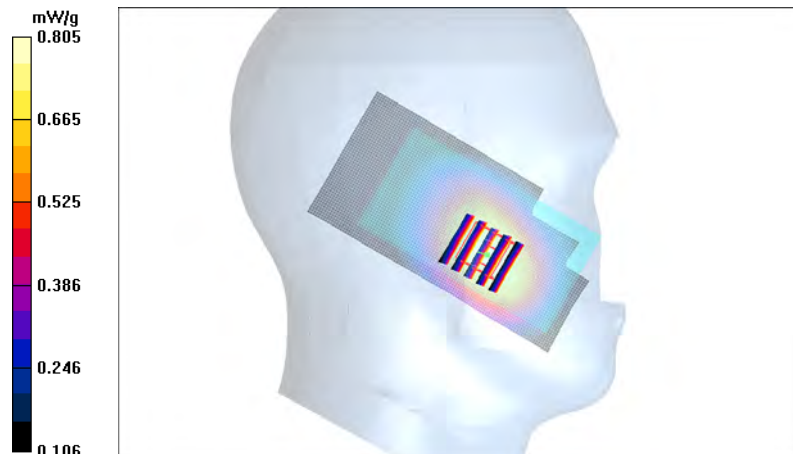
Peak SAR (extrapolated) = 0.995 W/kg

SAR(1 g) = 0.755 mW/g

SAR(10 g) = 0.560 mW/g

Power Drift = -0.029 dB

Maximum value of SAR (measured) = 0.805 mW/g



Date/Time: 2010-03-12 18:10:46

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: 2-slot 8PSK EGPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Head 850; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.907$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ 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 184

Cheek position - Middle/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.243 mW/g

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

Reference Value = 7.67 V/m

Peak SAR (extrapolated) = 0.345 W/kg

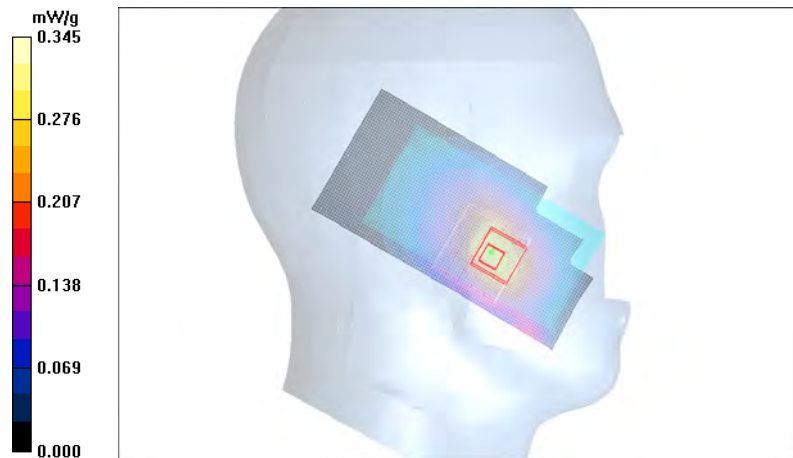
SAR(1 g) = 0.222 mW/g

SAR(10 g) = 0.161 mW/g

Power Drift = -0.180 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) = 0.345 mW/g



Date/Time: 2010-03-16 12:28:02

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WCDMA1700/2100

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: Head 1800; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used (interpolated): $f = 1732.4$ MHz; $\sigma = 1.32$ mho/m; $\epsilon_r = 39.8$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.05, 5.05, 5.05); 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 184

Cheek position - Middle/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.636 mW/g

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

Reference Value = 12.2 V/m

Peak SAR (extrapolated) = 0.794 W/kg

SAR(1 g) = 0.569 mW/g

SAR(10 g) = 0.380 mW/g

Power Drift = -0.393 dB

Maximum value of SAR (measured) = 0.616 mW/g

Cheek position - Middle/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 12.2 V/m

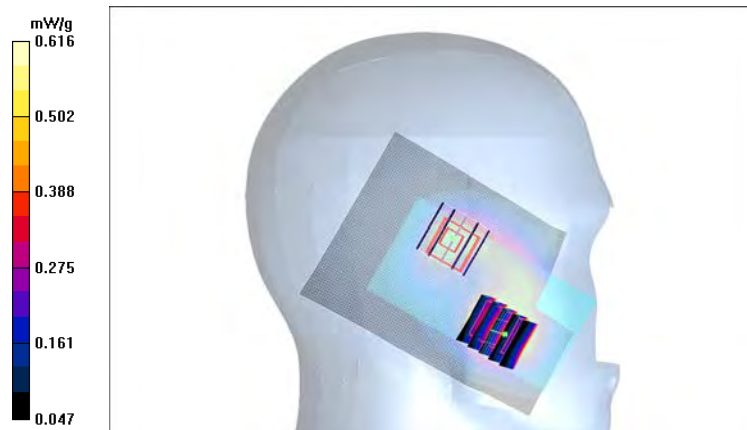
Peak SAR (extrapolated) = 0.642 W/kg

SAR(1 g) = 0.463 mW/g

SAR(10 g) = 0.306 mW/g

Power Drift = -0.393 dB

Maximum value of SAR (measured) = 0.500 mW/g



Date/Time: 2010-03-16 12:53:13

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WCDMA1700/2100

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: Head 1800; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used (interpolated): $f = 1732.4$ MHz; $\sigma = 1.32$ mho/m; $\epsilon_r = 39.8$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.05, 5.05, 5.05); 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 184

Tilt position - Middle/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 16.0 V/m

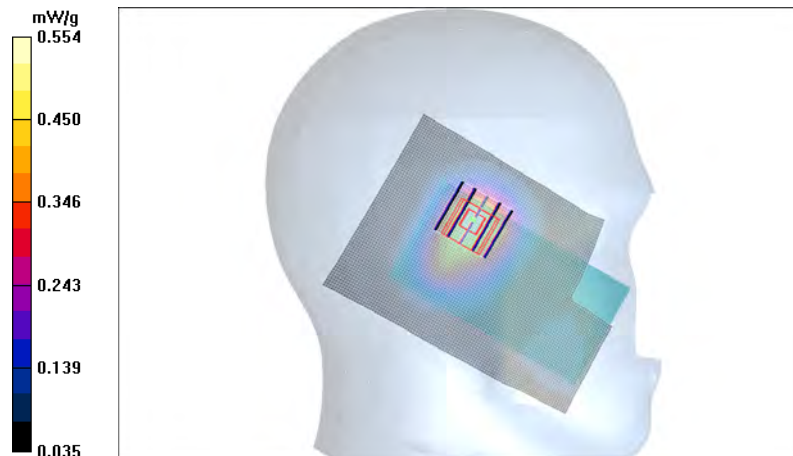
Peak SAR (extrapolated) = 0.728 W/kg

SAR(1 g) = 0.508 mW/g

SAR(10 g) = 0.333 mW/g

Power Drift = 0.031 dB

Maximum value of SAR (measured) = 0.554 mW/g



Date/Time: 2010-03-16 15:26:59

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WCDMA1700/2100

Frequency: 1752.6 MHz; Duty Cycle: 1:1

Medium: Head 1800; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used: $f = 1753$ MHz; $\sigma = 1.34$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.05, 5.05, 5.05); 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 184

Cheek position - High/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.820 mW/g

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

Reference Value = 12.0 V/m

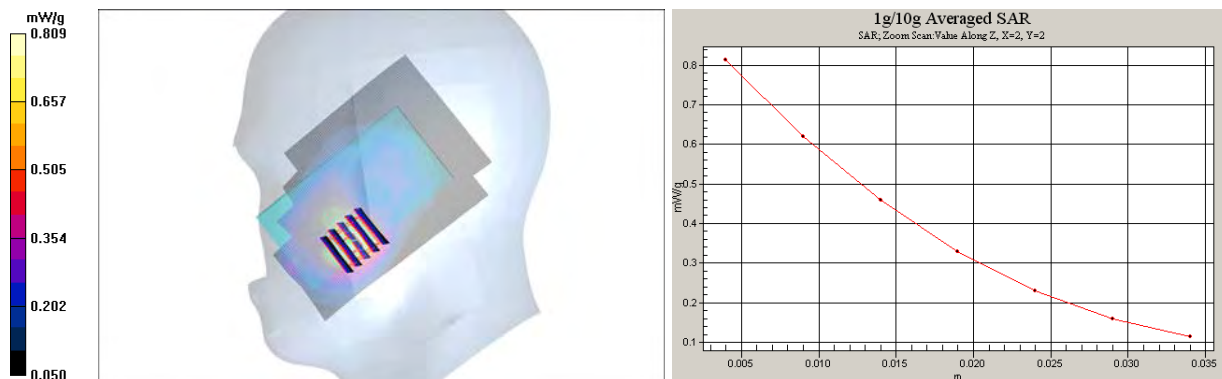
Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.762 mW/g

SAR(10 g) = 0.506 mW/g

Power Drift = 0.061 dB

Maximum value of SAR (measured) = 0.809 mW/g



SAR Report

FCC_RM-658_01

Applicant: Nokia Corporation

Type: RM-658

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Date/Time: 2010-03-16 14:49:18

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WCDMA1700/2100

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: Head 1800; Medium Notes: Medium Temperature: 21.5 C

Medium parameters used (interpolated): $f = 1732.4$ MHz; $\sigma = 1.32$ mho/m; $\epsilon_r = 39.8$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(5.05, 5.05, 5.05); 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 184

Tilt position - Middle/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.523 mW/g

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

Reference Value = 17.5 V/m

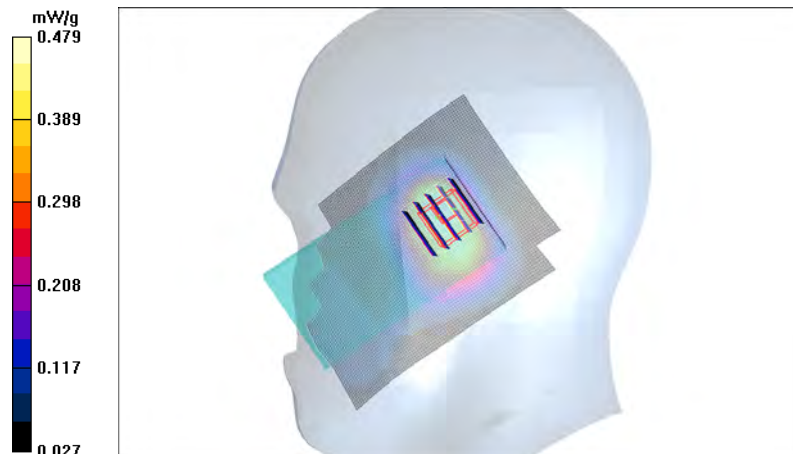
Peak SAR (extrapolated) = 0.646 W/kg

SAR(1 g) = 0.453 mW/g

SAR(10 g) = 0.301 mW/g

Power Drift = 0.029 dB

Maximum value of SAR (measured) = 0.479 mW/g



Date/Time: 2010-03-17 18:22:35

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: GSM 1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ 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 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek position - Middle/Area Scan (91x171x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.596 mW/g

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

Reference Value = 6.04 V/m

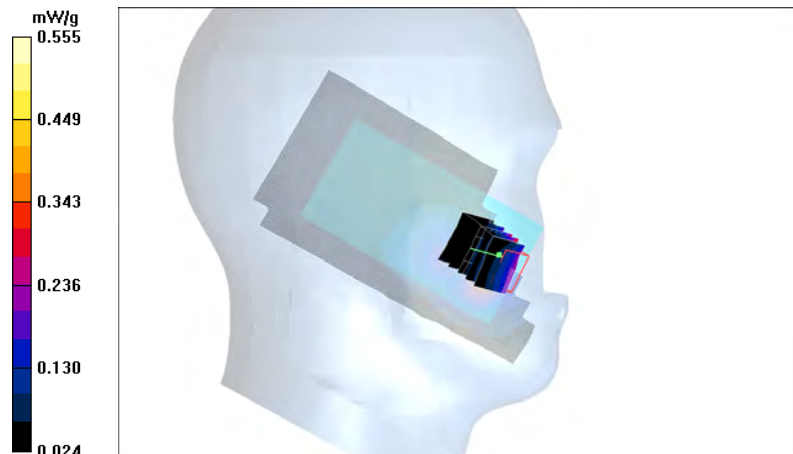
Peak SAR (extrapolated) = 0.959 W/kg

SAR(1 g) = 0.510 mW/g

SAR(10 g) = 0.263 mW/g

Power Drift = 0.094 dB

Maximum value of SAR (measured) = 0.555 mW/g



Date/Time: 2010-03-17 18:59:27

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: GSM 1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ 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 184

Tilt position - Middle/Area Scan (91x171x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.171 mW/g

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

Reference Value = 9.78 V/m

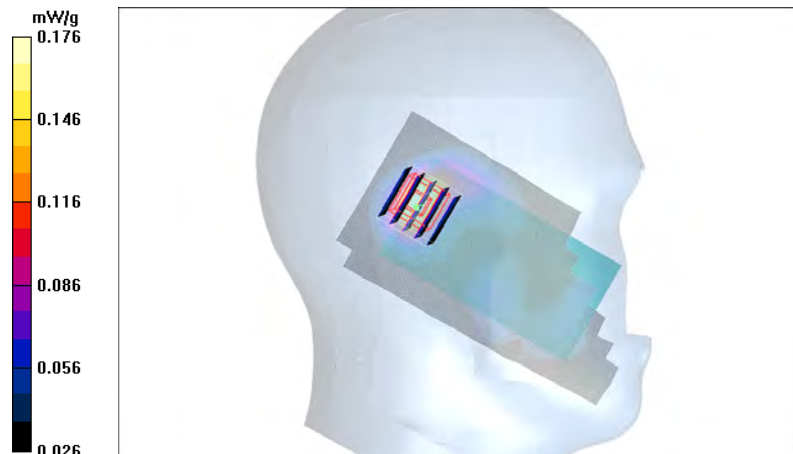
Peak SAR (extrapolated) = 0.268 W/kg

SAR(1 g) = 0.161 mW/g

SAR(10 g) = 0.097 mW/g

Power Drift = 0.157 dB

Maximum value of SAR (measured) = 0.176 mW/g



Date/Time: 2010-03-17 20:39:26

Test Laboratory: TCC Nokia
Type: RM-658; Serial: 004401/01/981109/6

Communication System: GSM 1900

Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ 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 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek position - High/Area Scan (91x171x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.658 mW/g

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

Reference Value = 6.31 V/m

Peak SAR (extrapolated) = 1.10 W/kg

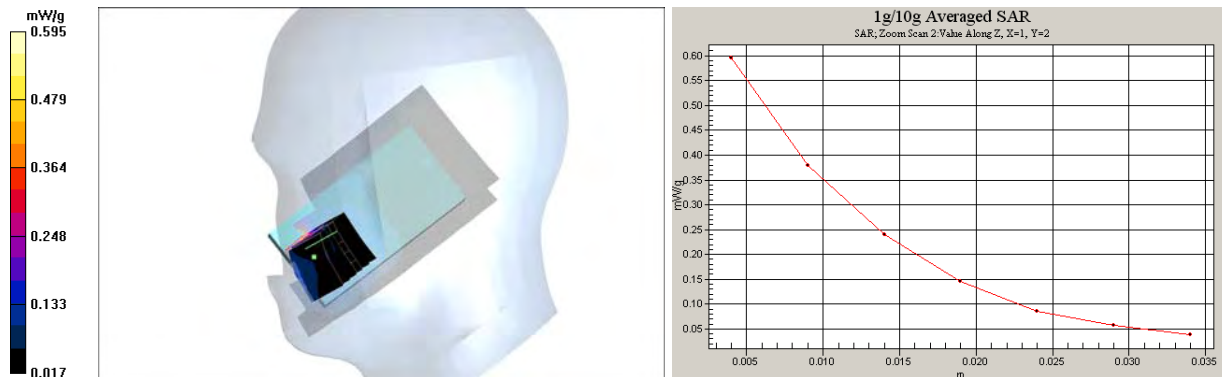
SAR(1 g) = 0.559 mW/g

SAR(10 g) = 0.285 mW/g

Power Drift = -0.030 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) = 0.595 mW/g



Date/Time: 2010-03-17 21:23:36

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: GSM 1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ 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 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Tilt position - Middle/Area Scan (91x171x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.173 mW/g

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

Reference Value = 10.7 V/m

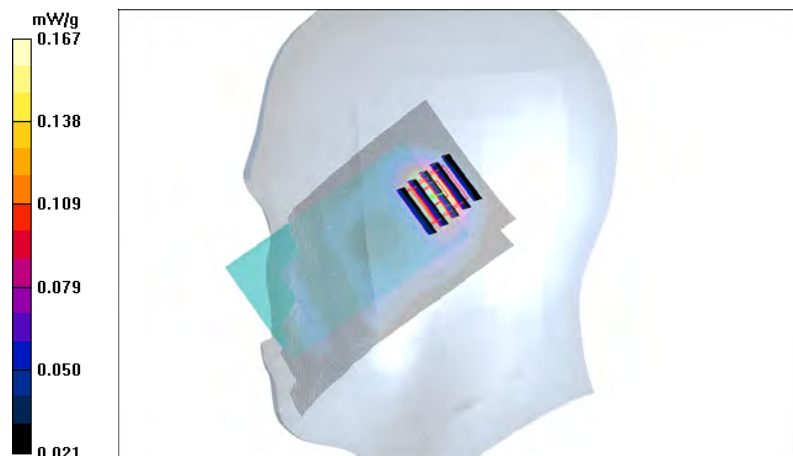
Peak SAR (extrapolated) = 0.246 W/kg

SAR(1 g) = 0.152 mW/g

SAR(10 g) = 0.090 mW/g

Power Drift = -0.034 dB

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



Date/Time: 2010-03-17 17:57:23

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ 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 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek position - Middle/Area Scan (91x171x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.601 mW/g

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

Reference Value = 5.91 V/m

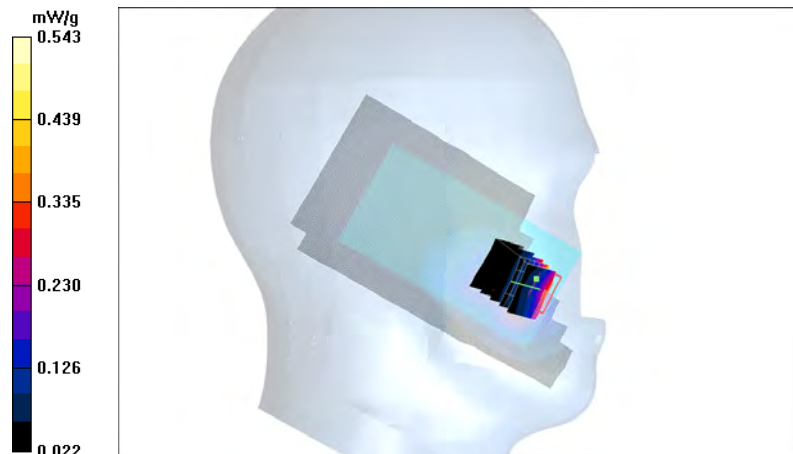
Peak SAR (extrapolated) = 0.864 W/kg

SAR(1 g) = 0.503 mW/g

SAR(10 g) = 0.246 mW/g

Power Drift = 0.148 dB

Maximum value of SAR (measured) = 0.543 mW/g



Date/Time: 2010-03-17 16:44:08

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: 3-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:2.8

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

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ 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 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek position - Middle/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.396 mW/g

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

Reference Value = 5.81 V/m

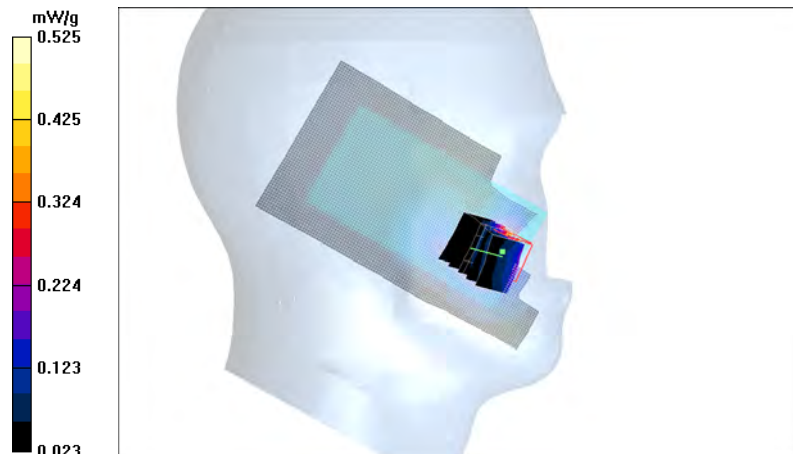
Peak SAR (extrapolated) = 0.871 W/kg

SAR(1 g) = 0.483 mW/g

SAR(10 g) = 0.252 mW/g

Power Drift = 0.169 dB

Maximum value of SAR (measured) = 0.525 mW/g



Date/Time: 2010-03-17 21:44:34

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: 1-slot 8PSK EGPRS 1900

Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

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

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ 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 3; Type: Twin Phantom; Serial: TP-1302
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek position - Middle/Area Scan (91x171x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.231 mW/g

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

Reference Value = 4.27 V/m

Peak SAR (extrapolated) = 0.383 W/kg

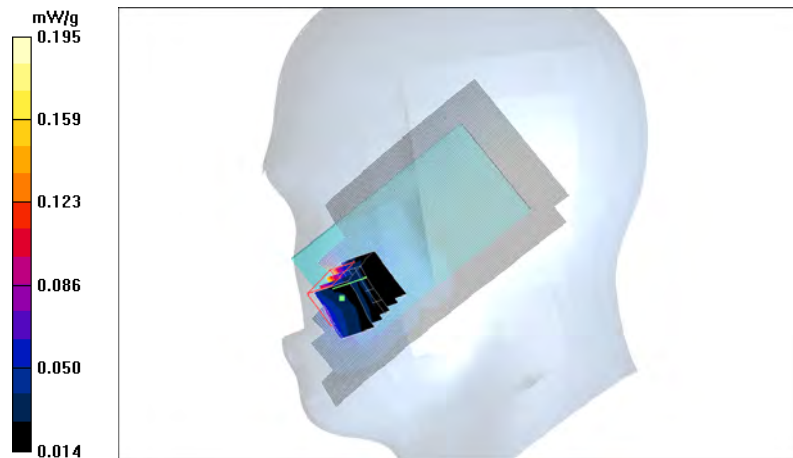
SAR(1 g) = 0.186 mW/g

SAR(10 g) = 0.099 mW/g

Power Drift = -0.446 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) = 0.195 mW/g



Date/Time: 2010-03-12 19:35:59

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WLAN2450

Frequency: 2442 MHz; Duty Cycle: 1:1

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

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.88$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.21, 4.21, 4.21); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek position - Middle/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.207 mW/g

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

Reference Value = 8.08 V/m

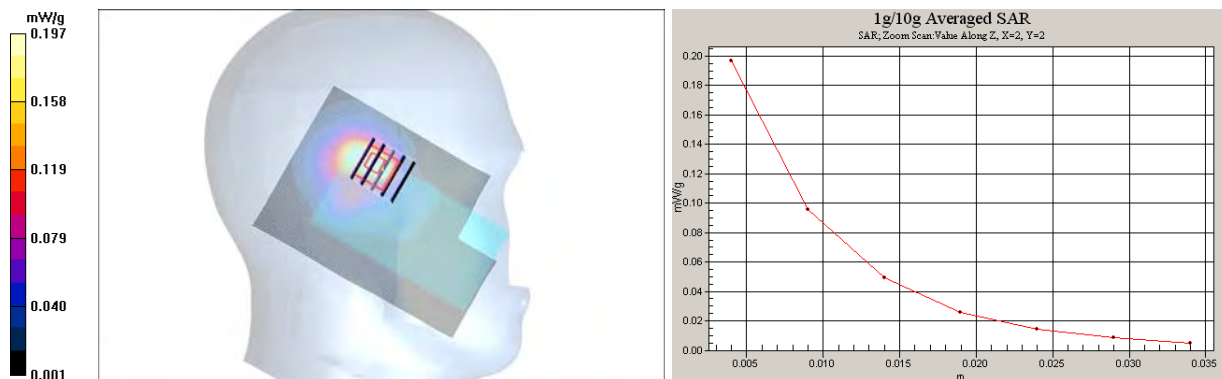
Peak SAR (extrapolated) = 0.357 W/kg

SAR(1 g) = 0.177 mW/g

SAR(10 g) = 0.090 mW/g

Power Drift = 0.046 dB

Maximum value of SAR (measured) = 0.197 mW/g



SAR Report

FCC_RM-658_01

Applicant: Nokia Corporation

Type: RM-658

Copyright © 2010 TCC Nokia

Date/Time: 2010-03-12 19:53:26

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WLAN2450

Frequency: 2442 MHz; Duty Cycle: 1:1

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

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.88$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.21, 4.21, 4.21); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Tilt position - Middle/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 7.67 V/m

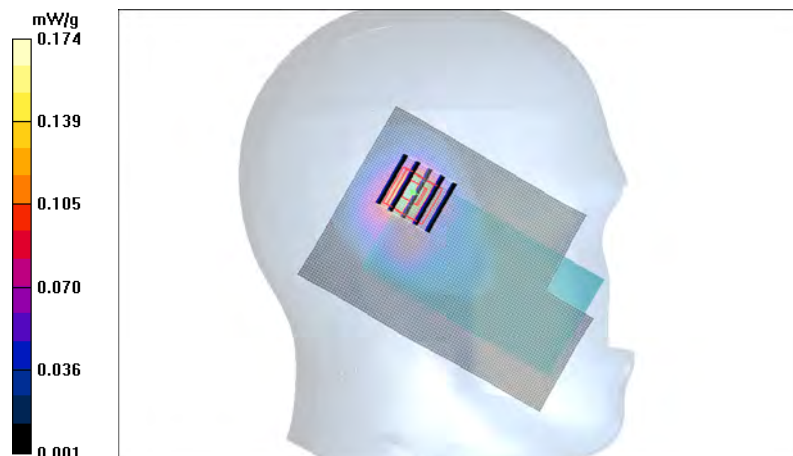
Peak SAR (extrapolated) = 0.318 W/kg

SAR(1 g) = 0.147 mW/g

SAR(10 g) = 0.069 mW/g

Power Drift = -0.348 dB

Maximum value of SAR (measured) = 0.174 mW/g



Date/Time: 2010-03-12 20:55:26

Test Laboratory: TCC Nokia
Type: RM-658; Serial: 004401/01/981109/6

Communication System: WLAN2450

Frequency: 2442 MHz; Duty Cycle: 1:1

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

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.88$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.21, 4.21, 4.21); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Cheek position - Middle/Area Scan (71x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.095 mW/g

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

Reference Value = 7.98 V/m

Peak SAR (extrapolated) = 0.187 W/kg

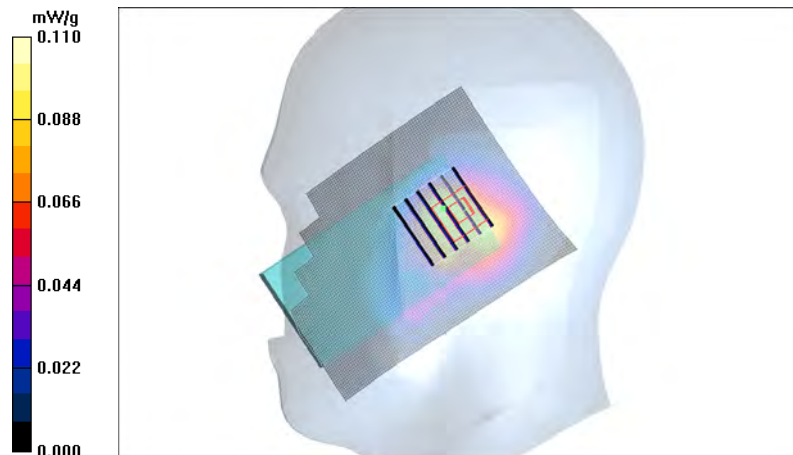
SAR(1 g) = 0.097 mW/g

SAR(10 g) = 0.053 mW/g

Power Drift = 0.072 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) = 0.110 mW/g



Date/Time: 2010-03-12 21:36:24

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WLAN2450

Frequency: 2442 MHz; Duty Cycle: 1:1

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

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.88$ mho/m; $\epsilon_r = 38.2$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.21, 4.21, 4.21); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 8; Type: SAM Twin Phantom; Serial: TP-1408
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Tilt position - Middle/Area Scan (71x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.113 mW/g

Tilt position - Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 7.70 V/m

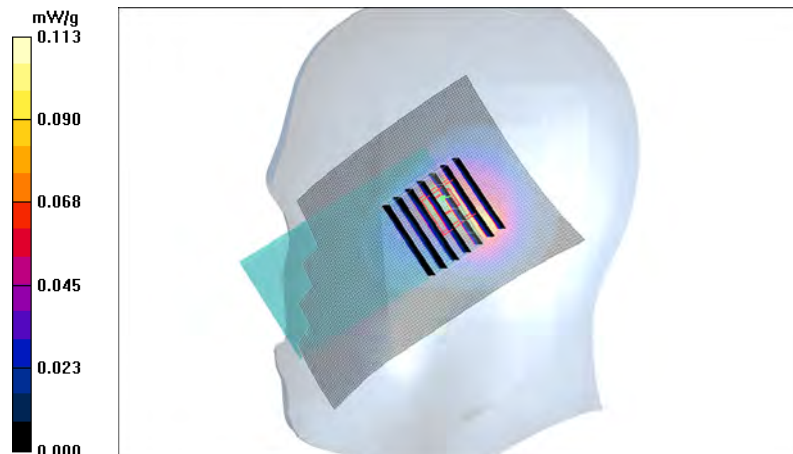
Peak SAR (extrapolated) = 0.205 W/kg

SAR(1 g) = 0.101 mW/g

SAR(10 g) = 0.049 mW/g

Power Drift = 0.409 dB

Maximum value of SAR (measured) = 0.113 mW/g



Date/Time: 2010-03-12 16:04:44

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Body 850; Medium Notes: Medium Temperature: 21.9 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.971$ mho/m; $\epsilon_r = 53.6$; $\rho = 1000$ 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 184

Body - Middle - No Accessory - Display facing phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.706 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 = 12.5 V/m

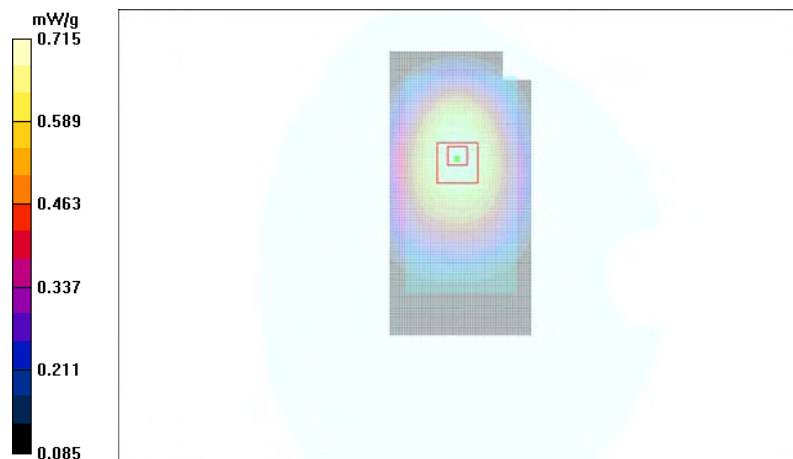
Peak SAR (extrapolated) = 0.855 W/kg

SAR(1 g) = 0.668 mW/g

SAR(10 g) = 0.503 mW/g

Power Drift = 0.002 dB

Maximum value of SAR (measured) = 0.715 mW/g



Date/Time: 2010-03-12 16:28:24

Test Laboratory: TCC Nokia
Type: RM-658; Serial: 004401/01/981109/6

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Body 850; Medium Notes: Medium Temperature: 21.9 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.971$ mho/m; $\epsilon_r = 53.6$; $\rho = 1000$ 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 184

Body - Middle - WH-205 - Display facing phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.483 mW/g

Body - Middle - WH-205 - Display facing phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 10.3 V/m

Peak SAR (extrapolated) = 0.596 W/kg

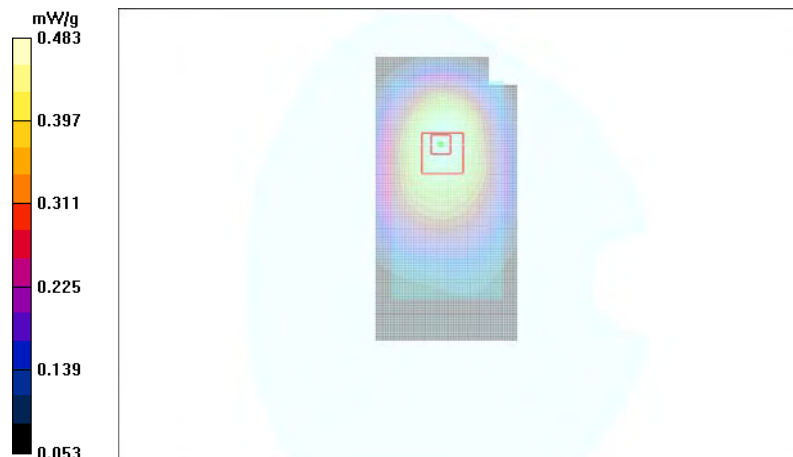
SAR(1 g) = 0.455 mW/g

SAR(10 g) = 0.333 mW/g

Power Drift = -0.091 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) = 0.483 mW/g



Date/Time: 2010-03-12 17:32:30

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: 2-slot GPRS850

Frequency: 824.2 MHz; Duty Cycle: 1:4.2

Medium: Body 850; Medium Notes: Medium Temperature: 21.9 C

Medium parameters used (interpolated): $f = 824.2$ MHz; $\sigma = 0.957$ mho/m; $\epsilon_r = 53.7$; $\rho = 1000$ 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 184

Body - Low - No Accessory - Back facing phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

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

Body - Low - No Accessory - Back facing phantom/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 12.2 V/m

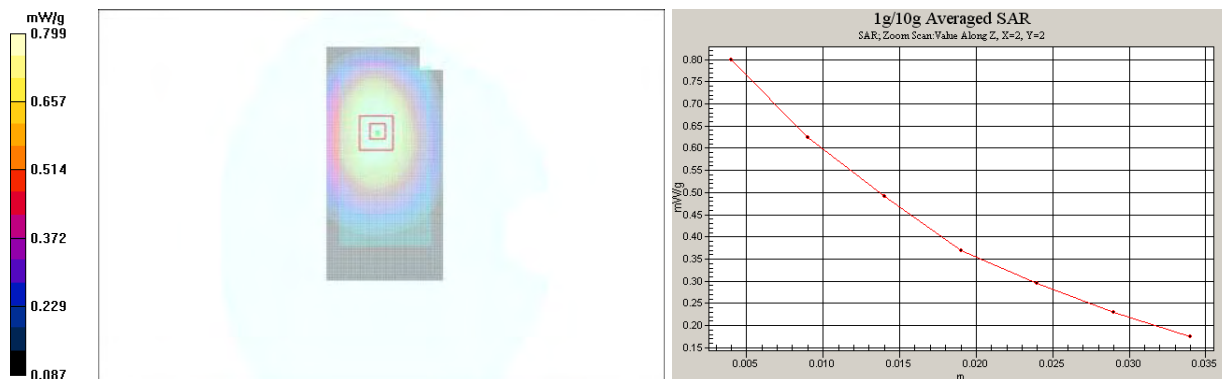
Peak SAR (extrapolated) = 0.959 W/kg

SAR(1 g) = 0.761 mW/g

SAR(10 g) = 0.575 mW/g

Power Drift = 0.087 dB

Maximum value of SAR (measured) = 0.799 mW/g



SAR Report

FCC_RM-658_01

Applicant: Nokia Corporation

Type: RM-658

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Date/Time: 2010-03-12 17:46:10

Test Laboratory: TCC Nokia
Type: RM-658; Serial: 004401/01/981109/6

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: Body 850; Medium Notes: Medium Temperature: 21.9 C

Medium parameters used: $f = 837$ MHz; $\sigma = 0.971$ mho/m; $\epsilon_r = 53.6$; $\rho = 1000$ 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 184

Body - Middle - WH-205 - Back facing phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.512 mW/g

Body - Middle - WH-205 - Back facing phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 9.84 V/m

Peak SAR (extrapolated) = 0.627 W/kg

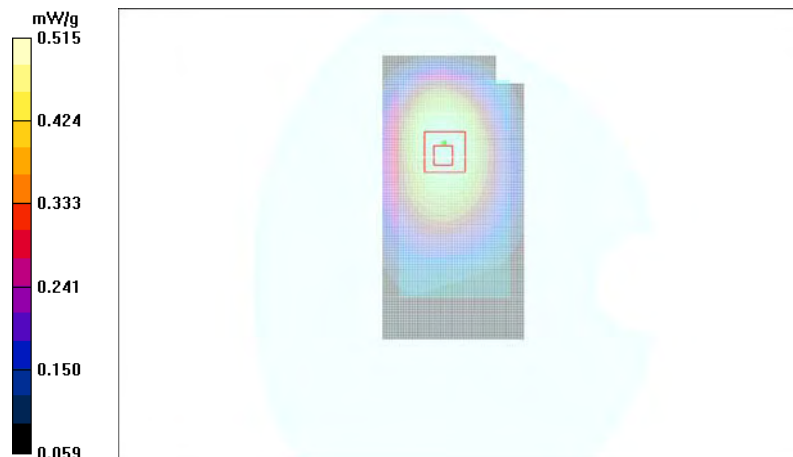
SAR(1 g) = 0.484 mW/g

SAR(10 g) = 0.359 mW/g

Power Drift = -0.150 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) = 0.515 mW/g



Date/Time: 2010-03-17 11:45:19

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WCDMA1700/2100

Frequency: 1752.6 MHz; Duty Cycle: 1:1

Medium: Body 1800; Medium Notes: Medium Temperature: 21.8 C

Medium parameters used: $f = 1753$ MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.82, 4.82, 4.82); 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 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Body - High - No Accessory - Display facing phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.619 mW/g

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

Reference Value = 12.0 V/m

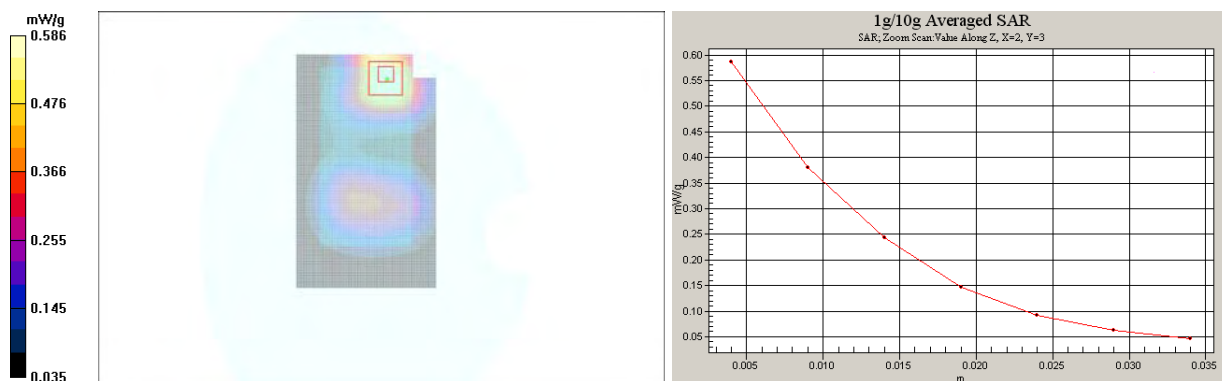
Peak SAR (extrapolated) = 0.858 W/kg

SAR(1 g) = 0.553 mW/g

SAR(10 g) = 0.344 mW/g

Power Drift = -0.083 dB

Maximum value of SAR (measured) = 0.586 mW/g



Date/Time: 2010-03-17 10:28:28

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WCDMA1700/2100

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: Body 1800; Medium Notes: Medium Temperature: 21.8 C

Medium parameters used (interpolated): $f = 1732.4$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 51.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.82, 4.82, 4.82); 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 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Body - Middle - WH 205 - Display facing phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.495 mW/g

Body - Middle - WH 205 - Display facing phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 10.2 V/m

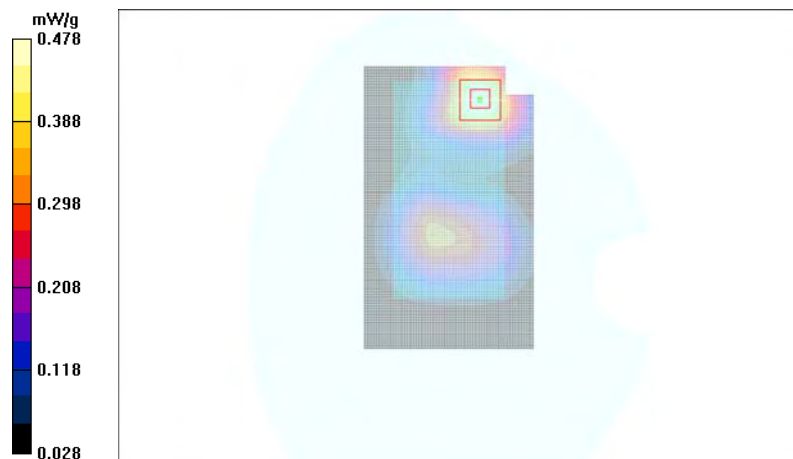
Peak SAR (extrapolated) = 0.675 W/kg

SAR(1 g) = 0.448 mW/g

SAR(10 g) = 0.279 mW/g

Power Drift = -0.087 dB

Maximum value of SAR (measured) = 0.478 mW/g



Date/Time: 2010-03-17 10:44:01

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WCDMA1700/2100

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: Body 1800; Medium Notes: Medium Temperature: 21.8 C

Medium parameters used (interpolated): $f = 1732.4$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 51.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.82, 4.82, 4.82); 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 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

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

Maximum value of SAR (interpolated) = 0.555 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 = 13.8 V/m

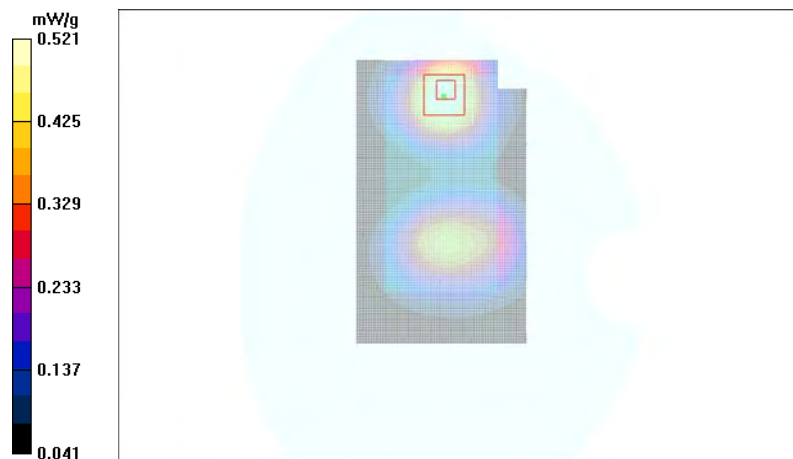
Peak SAR (extrapolated) = 0.726 W/kg

SAR(1 g) = 0.489 mW/g

SAR(10 g) = 0.316 mW/g

Power Drift = -0.008 dB

Maximum value of SAR (measured) = 0.521 mW/g



Date/Time: 2010-03-17 10:55:32

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WCDMA1700/2100

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: Body 1800; Medium Notes: Medium Temperature: 21.8 C

Medium parameters used (interpolated): $f = 1732.4$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 51.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3116; Probe Notes:
- ConvF(4.82, 4.82, 4.82); 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 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Body - Middle - WH 205 - Back facing phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.438 mW/g

Body - Middle - WH 205 - Back facing phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 12.1 V/m

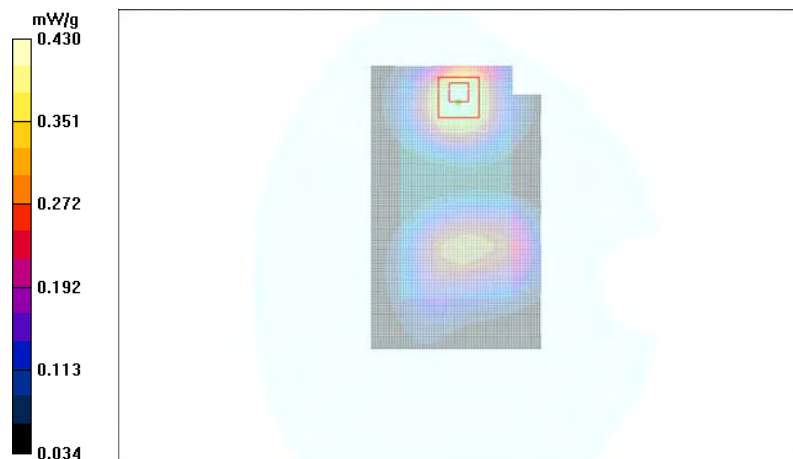
Peak SAR (extrapolated) = 0.601 W/kg

SAR(1 g) = 0.397 mW/g

SAR(10 g) = 0.254 mW/g

Power Drift = 0.064 dB

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



Date/Time: 2010-03-17 22:26:04

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: GSM 1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: Body1900; Medium Notes: Medium Temperature: 21.9 C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.57$ mho/m; $\epsilon_r = 51.1$; $\rho = 1000$ 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 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Body - Middle - No Accessory - Display facing phantom/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.703 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 = 5.26 V/m

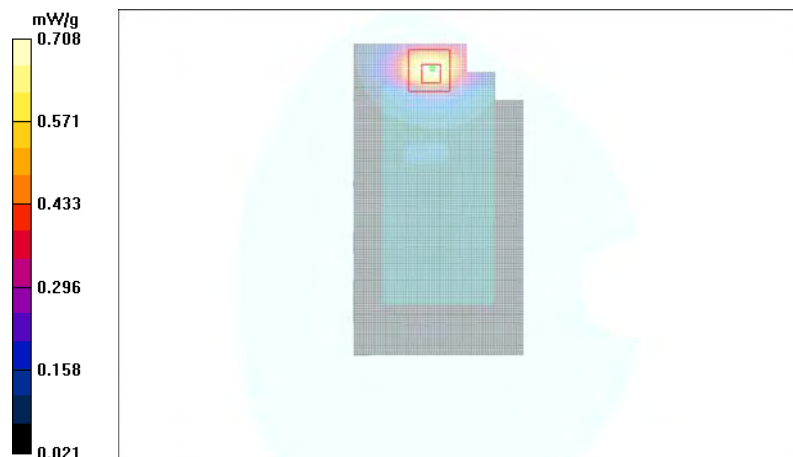
Peak SAR (extrapolated) = 1.07 W/kg

SAR(1 g) = 0.667 mW/g

SAR(10 g) = 0.366 mW/g

Power Drift = 0.046 dB

Maximum value of SAR (measured) = 0.708 mW/g



Date/Time: 2010-03-17 22:42:35

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: GSM 1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: Body1900; Medium Notes: Medium Temperature: 21.9 C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.57$ mho/m; $\epsilon_r = 51.1$; $\rho = 1000$ 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 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Body - Middle - WH-205 - Display facing phantom/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.718 mW/g

Body - Middle - WH-205 - Display facing phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 5.29 V/m

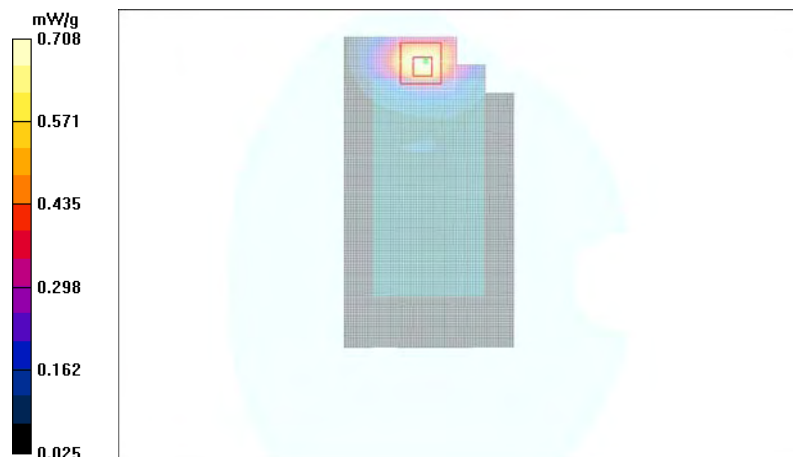
Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.675 mW/g

SAR(10 g) = 0.374 mW/g

Power Drift = -0.424 dB

Maximum value of SAR (measured) = 0.708 mW/g



Date/Time: 2010-03-17 23:38:26

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: GSM 1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: Body1900; Medium Notes: Medium Temperature: 21.9 C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.57$ mho/m; $\epsilon_r = 51.1$; $\rho = 1000$ 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 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Body - Middle - No Accessory - Back facing phantom/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.07 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 = 4.77 V/m

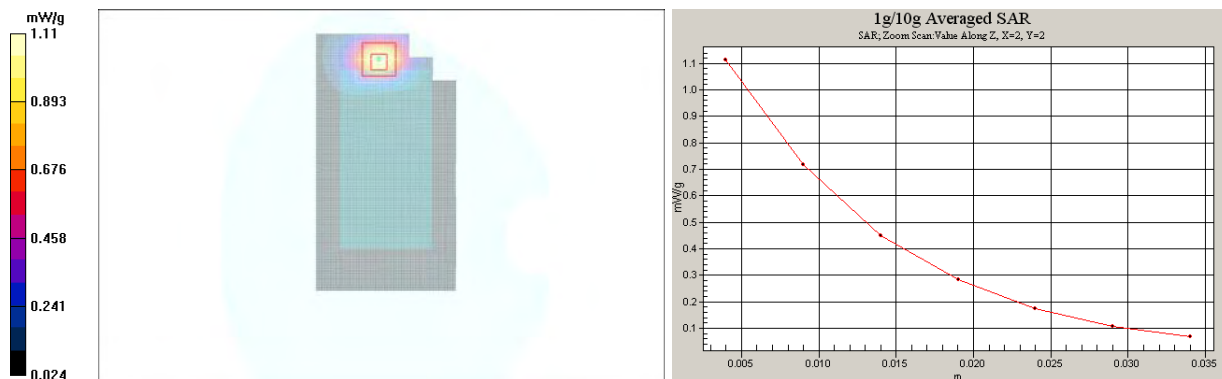
Peak SAR (extrapolated) = 1.68 W/kg

SAR(1 g) = 1.01 mW/g

SAR(10 g) = 0.540 mW/g

Power Drift = 0.194 dB

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



SAR Report

FCC_RM-658_01

Applicant: Nokia Corporation

Type: RM-658

Copyright © 2010 TCC Nokia

Date/Time: 2010-03-18 00:58:56

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: GSM 1900

Frequency: 1850.2 MHz; Duty Cycle: 1:8.3

Medium: Body1900; Medium Notes: Medium Temperature: 21.9 C

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 51.2$; $\rho = 1000$ 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 2; Type: Twin Phantom; Serial: TP-1037
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Body - Low - WH-205 - Back facing phantom/Area Scan (61x111x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.06 mW/g

Body - Low - WH-205 - Back facing phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 5.47 V/m

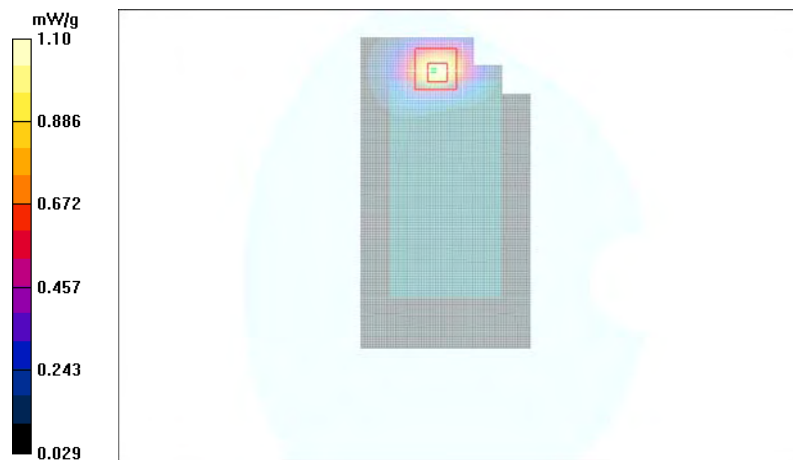
Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 0.998 mW/g

SAR(10 g) = 0.540 mW/g

Power Drift = 0.172 dB

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



Date/Time: 2010-03-13 00:02:27

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WLAN2450

Frequency: 2442 MHz; Duty Cycle: 1:1

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

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.87$ mho/m; $\epsilon_r = 50.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.05, 4.05, 4.05); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

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

Maximum value of SAR (interpolated) = 0.236 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 = 8.93 V/m

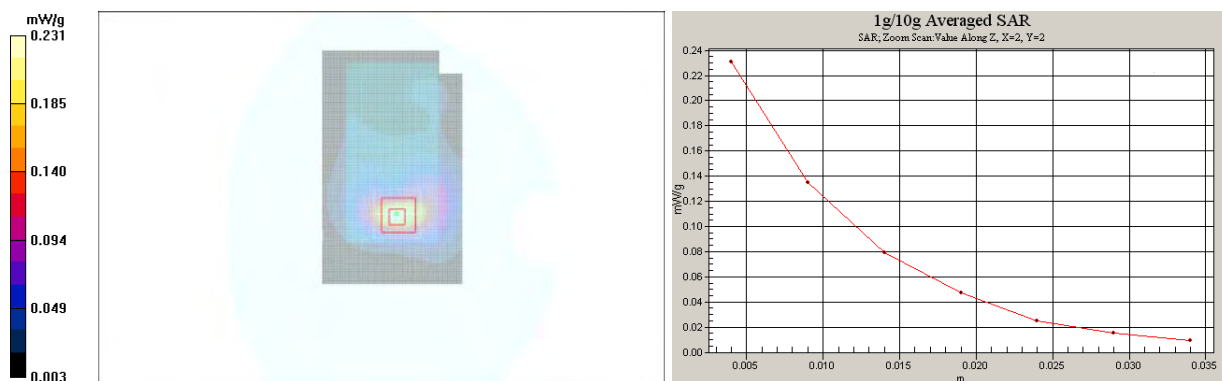
Peak SAR (extrapolated) = 0.371 W/kg

SAR(1 g) = 0.207 mW/g

SAR(10 g) = 0.104 mW/g

Power Drift = 0.013 dB

Maximum value of SAR (measured) = 0.231 mW/g



SAR Report

FCC_RM-658_01

Applicant: Nokia Corporation

Type: RM-658

Copyright © 2010 TCC Nokia

Date/Time: 2010-03-13 00:13:00

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/01/981109/6

Communication System: WLAN2450

Frequency: 2442 MHz; Duty Cycle: 1:1

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

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.87$ mho/m; $\epsilon_r = 50.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3118; Probe Notes:
- ConvF(4.05, 4.05, 4.05); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn573; Calibrated: 2009-07-21
- Phantom: SAM 4.5; Type: Twin Phantom; Serial: TP-1215
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

Body - Middle - WH-205 – Back facing phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.226 mW/g

Body - Middle - WH-205 – Back facing phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 8.83 V/m

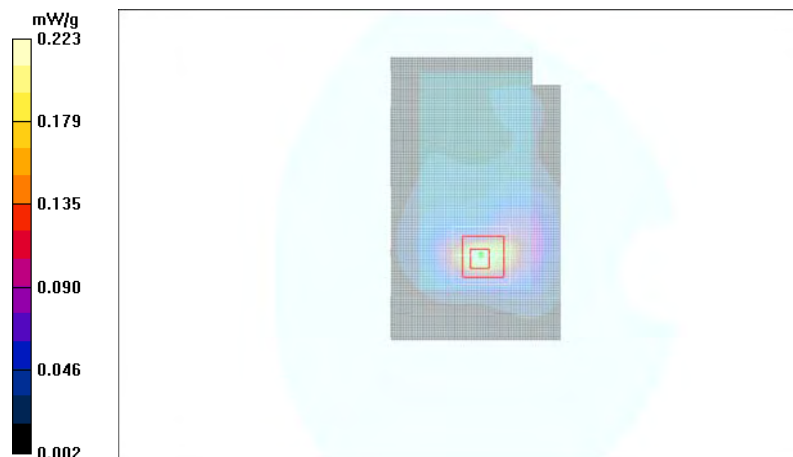
Peak SAR (extrapolated) = 0.370 W/kg

SAR(1 g) = 0.202 mW/g

SAR(10 g) = 0.102 mW/g

Power Drift = 0.171 dB

Maximum value of SAR (measured) = 0.223 mW/g



APPENDIX C: CONDUCTED AVERAGE POWER MEASUREMENTS FOR WCDMA AND HSUPA

Test Laboratory: TCC Nokia

Type: RM-658; Serial: 004401/10/952053/2, HW: 9013, SW: 041.003

C.1. WCDMA1700/2100 Test results

Average power

Ch/ f [MHz]	P [dBm]
1313 / 1712.6	23.31
1450 / 1740.0	23.09
1512 / 1752.4	23.26

C.2. HSUPA1700/2100 Test results

Average power

Ch / f [MHz]	P [dBm]				
	Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
1313 / 1712.6	18.80	18.11	20.19	18.06	18.82
1450 / 1740.0	18.78	17.90	19.06	17.86	18.82
1512 / 1752.4	18.63	18.14	20.25	19.09	19.43

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. In addition, to ensure linearity of the PA output, a further 2dB power reduction for all Subtest modes is implemented. As a result, the overall 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
3.5dB	4.0dB	3.0dB	4.0dB	3.5dB

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 Oct-10

	Name	Function	Signature
Calibrated by	Jeton Kastrati	Laboratory Technician	
Approved by:	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.



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Nokia Denmark A/S**

Certificate No: **ES3-3118_Sep09**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3118**

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: **September 22, 2009**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-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	2-Jan-09 (No. ES3-3013_Jan09)	Jan-10
DAE4	SN: 660	9-Sep-08 (No. DAE4-660_Sep08)	Sep-09

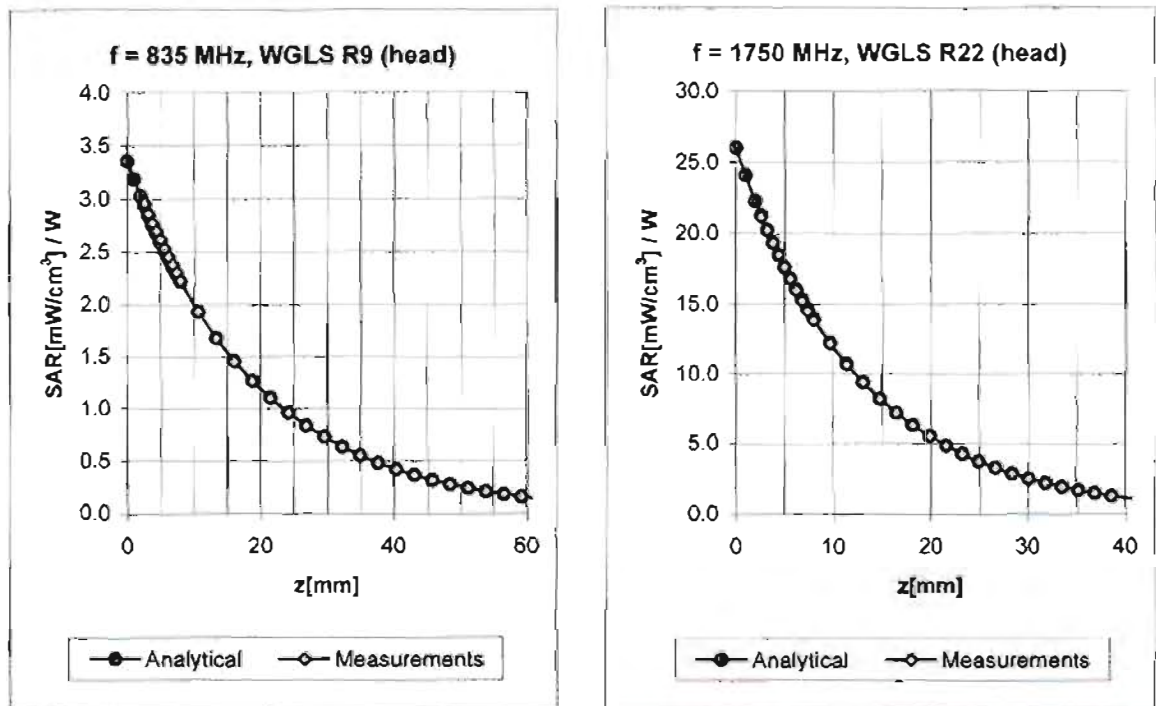
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

	Name	Function	Signature
Calibrated by:	Marcel Fehr	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 22, 2009

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

Conversion Factor Assessment



f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	$\pm 50 / \pm 100$	Head	$41.5 \pm 5\%$	$0.90 \pm 5\%$	0.97	1.07	$5.85 \pm 11.0\% (k=2)$
1750	$\pm 50 / \pm 100$	Head	$40.1 \pm 5\%$	$1.37 \pm 5\%$	0.61	1.40	$4.97 \pm 11.0\% (k=2)$
1900	$\pm 50 / \pm 100$	Head	$40.0 \pm 5\%$	$1.40 \pm 5\%$	0.50	1.53	$4.74 \pm 11.0\% (k=2)$
2450	$\pm 50 / \pm 100$	Head	$39.2 \pm 5\%$	$1.80 \pm 5\%$	0.46	1.69	$4.21 \pm 11.0\% (k=2)$
835	$\pm 50 / \pm 100$	Body	$55.2 \pm 5\%$	$0.97 \pm 5\%$	0.95	1.13	$5.65 \pm 11.0\% (k=2)$
1750	$\pm 50 / \pm 100$	Body	$53.4 \pm 5\%$	$1.49 \pm 5\%$	0.41	1.92	$4.60 \pm 11.0\% (k=2)$
1900	$\pm 50 / \pm 100$	Body	$53.3 \pm 5\%$	$1.52 \pm 5\%$	0.41	2.14	$4.37 \pm 11.0\% (k=2)$
2450	$\pm 50 / \pm 100$	Body	$52.7 \pm 5\%$	$1.95 \pm 5\%$	0.99	1.05	$4.05 \pm 11.0\% (k=2)$

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

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

See the following pages



Accredited by the Swiss Accreditation Service (SAS)
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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Nokia Denmark A/S**

Certificate No: **D835V2-4d042_Sep08**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 4d042**

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

Calibration date: **September 22, 2008**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (No. 217-00736)	Oct-08
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	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09

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-07)	In house check: Oct-08

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

Issued: September 22, 2008

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

DASY5 Validation Report for Head TSL

Date/Time: 22.09.2008 10:40:16

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: HSL 900 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.901 \text{ mho/m}$; $\epsilon_r = 41.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

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: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

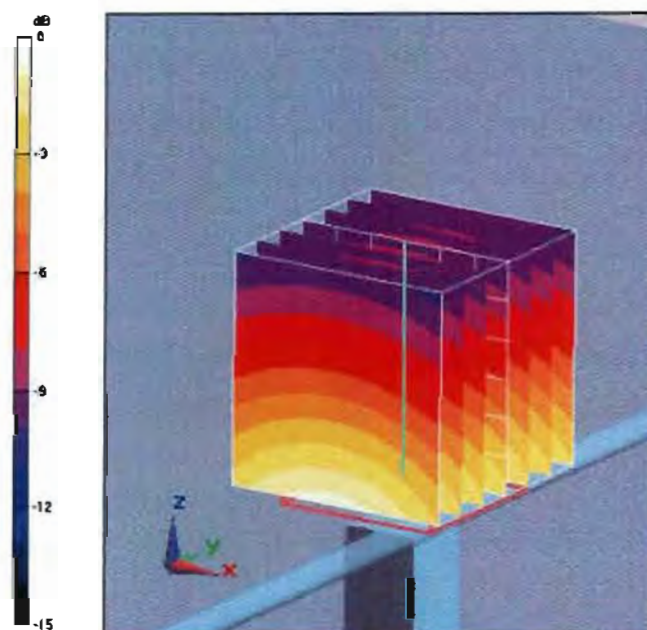
$P_{in}=250\text{mW}$; $dip=15\text{mm}$; $dist=3.4\text{mm}$ /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value $\approx 55.9 \text{ V/m}$; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 3.48 W/kg

SAR(1 g) = 2.38 mW/g; SAR(10 g) = 1.57 mW/g

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



0 dB = 2.69mW/g

DASY5 Validation Report for Body TSL

Date/Time: 16.09.2008 10:46:36

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: $f = 835 \text{ MHz}$; $\sigma = 1.01 \text{ mho/m}$; $\epsilon_r = 53.3$; $\rho = 1000 \text{ kg/m}^3$

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 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

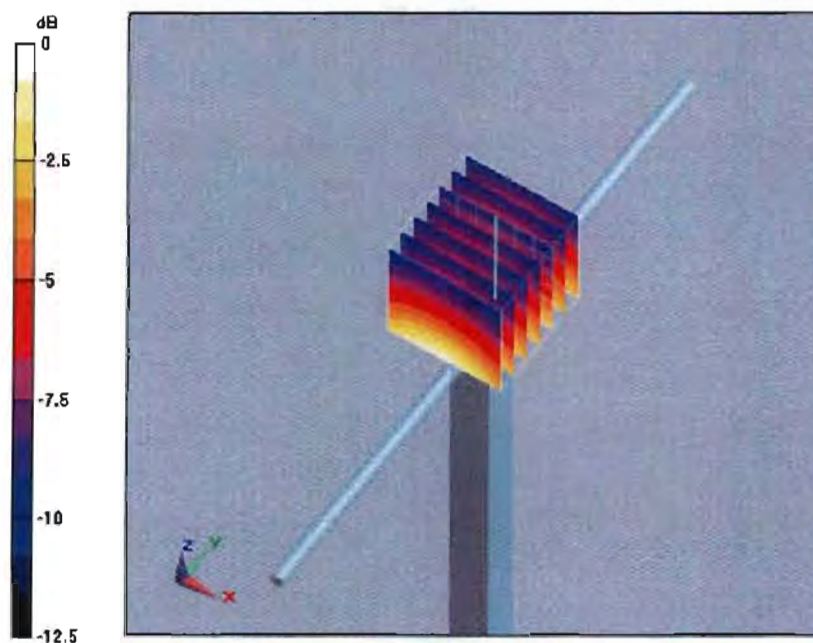
Pin = 250mW, d = 15mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54 V/m; Power Drift = 0.024 dB

Peak SAR (extrapolated) = 3.63 W/kg

SAR(1 g) = 2.51 mW/g; SAR(10 g) = 1.65 mW/g

Maximum value of SAR (measured) = 2.81 mW/g



0 dB = 2.81 mW/g

15205

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



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

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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Nokia Denmark A/S**

Certificate No: **D1800V2-230_Mar08**

CALIBRATION CERTIFICATE

Object **D1800V2 - SN: 230**

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

Calibration date: **March 18, 2008**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	07-Aug-07 (METAS, No. 217-00718)	Aug-08
Reference Probe ES3DV2	SN: 3025	01-Mar-08 (SPEAG, No. ES3-3025_Mar08)	Mar-09
DAE4	SN: 909	3-Sep-07 (SPEAG, No. DAE4-909_Sep07)	Sep-08

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

Calibrated by: **Name** **Function** **Signature**
Marcel Fehr **Laboratory Technician**

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

Issued: March 18, 2008

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

DASY4 Validation Report for Head TSL

Date/Time: 18.03.2008 10:22:59

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: SN:230

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: HSL U10 BB;

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 40.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.96, 4.96, 4.96); Calibrated: 01.03.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn909; Calibrated: 03.09.2007
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

**Pin = 250 mW; dip = 10 mm, scan at 3.4mm/Zoom Scan (dist=3.4mm, probe 0deg)
(7x7x7)/Cube 0:**

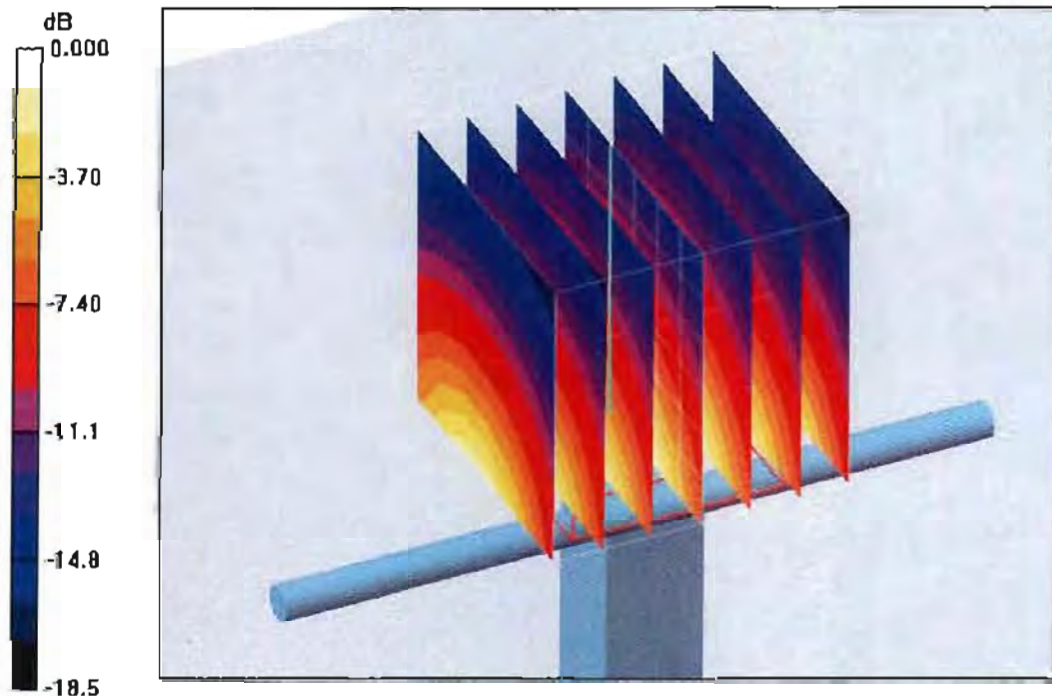
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.4 V/m; Power Drift = 0.043 dB

Peak SAR (extrapolated) = 18.1 W/kg

SAR(1 g) = 9.86 mW/g; SAR(10 g) = 5.14 mW/g

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



0 dB = 11.5mW/g

DASY4 Validation Report for Body TSL

Date/Time: 14.03.2008 10:46:16

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:230

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: MSL U10 BB;

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 51.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.73, 4.73, 4.73); Calibrated: 01.03.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn909; Calibrated: 03.09.2007
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

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

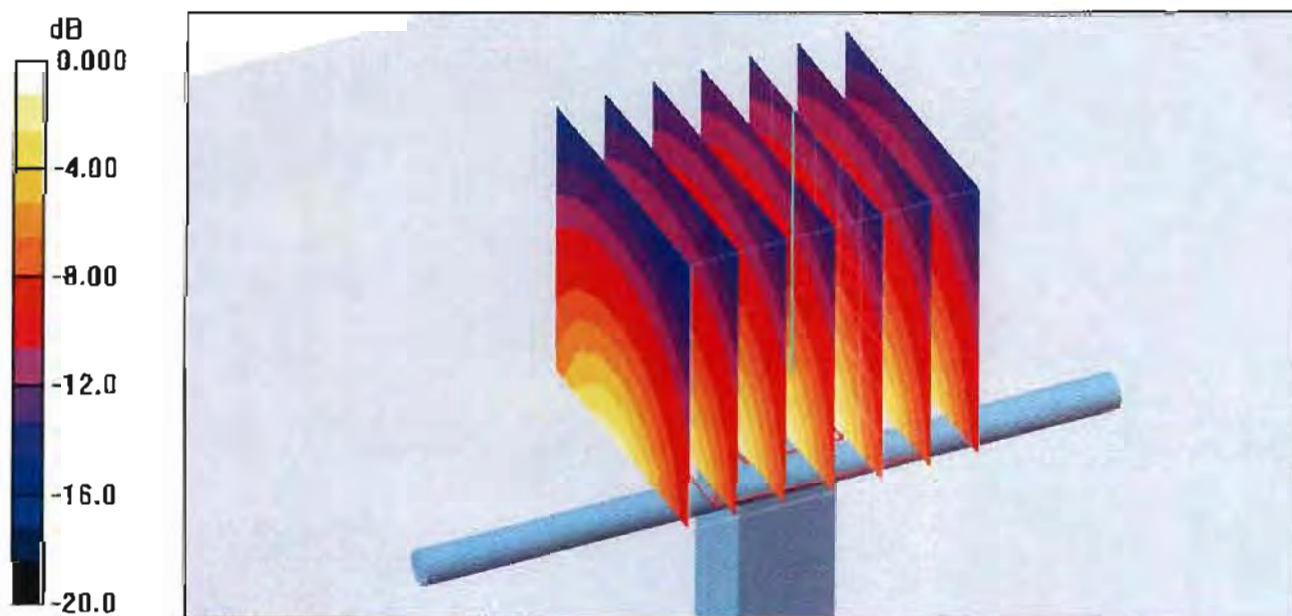
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 87.9 V/m; Power Drift = 0.049 dB

Peak SAR (extrapolated) = 17.3 W/kg

SAR(1 g) = 9.67 mW/g; SAR(10 g) = 5.12 mW/g

Maximum value of SAR (measured) = 11.1 mW/g



0 dB = 11.1mW/g

18307

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



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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 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: **D1900V2-5d026_Mar08**

CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d026**

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

Calibration date: **March 18, 2008**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (METAS, No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: 5086 (20g)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference 10 dB Attenuator	SN: 5047.2 (10r)	07-Aug-07 (METAS, No 217-00718)	Aug-08
Reference Probe ES3DV2	SN: 3025	01-Mar-08 (SPEAG, No. ES3-3025_Mar08)	Mar-09
DAE4	SN 909	3-Sep-08 (SPEAG, No. DAE4-909_Sep07)	Sep-07
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-07)	In house check: Oct-08
RF generator R&S SMT-06	100005	4-Aug-99 (SPEAG, in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-07)	In house check: Oct-08
Power meter EPM-442A	GB37480704	04-Oct-07 (METAS, No. 217-00736)	Oct-08

	Name	Function	Signature
Calibrated by:	Marcel Fehr	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 18, 2008

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DASY4 Validation Report for Head TSL

Date/Time: 18.03.2008 11:48:54

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026

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

Medium: HSL U10 BB;

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.47 \text{ mho/m}$; $\epsilon_r = 40.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.9, 4.9, 4.9); Calibrated: 01.03.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn909; Calibrated: 03.09.2007
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

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

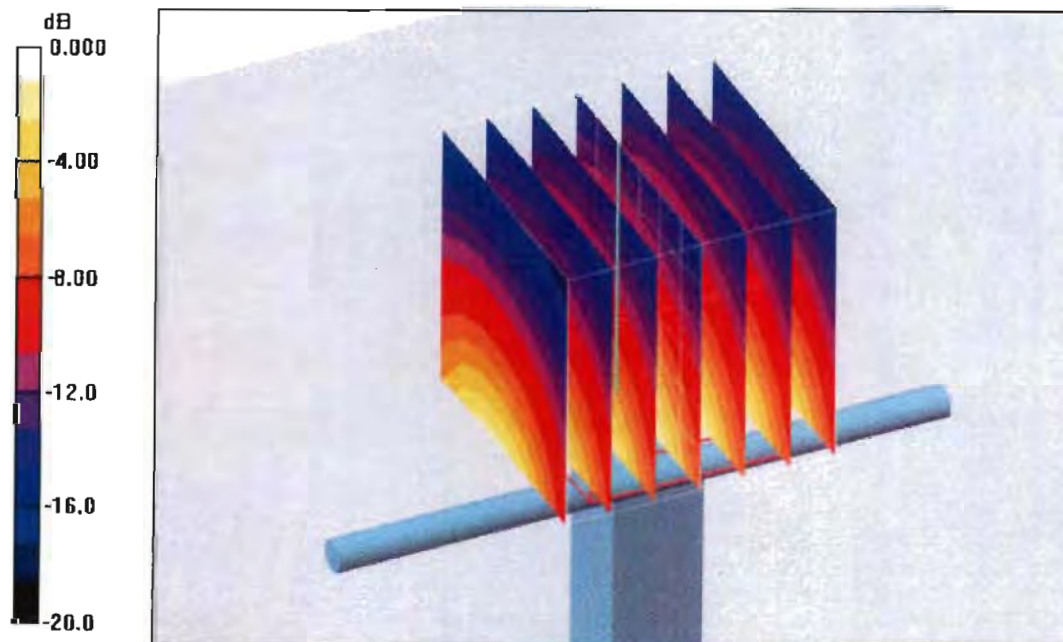
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 90.7 V/m ; Power Drift = 0.071 dB

Peak SAR (extrapolated) = 19.3 W/kg

SAR(1 g) = 10.3 mW/g ; SAR(10 g) = 5.27 mW/g

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



0 dB = 12.0 mW/g

DASY4 Validation Report for Body TSL

Date/Time: 14.03.2008 12:53:13

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d026

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

Medium: MSL U10 BB;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.57$ mho/m; $\epsilon_r = 51.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.5, 4.5, 4.5); Calibrated: 01.03.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn909; Calibrated: 03.09.2007
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 172

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

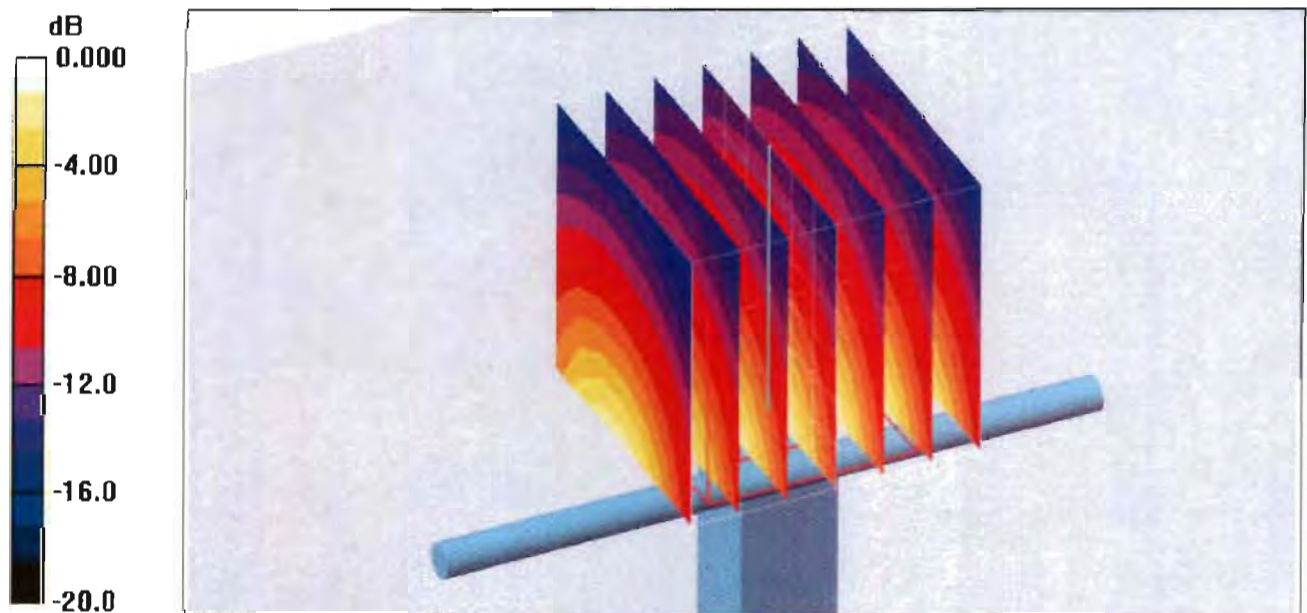
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.8 V/m; Power Drift = 0.050 dB

Peak SAR (extrapolated) = 18.7 W/kg

SAR(1 g) = 10.5 mW/g; SAR(10 g) = 5.5 mW/g

Maximum value of SAR (measured) = 12.1 mW/g



0 dB = 12.1mW/g



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 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: **D2450V2-790_Sep08**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 790**

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

Calibration date: **September 24, 2008**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	04-Oct-07 (No. 217-00736)	Oct-08
Power sensor HP 8481A	US37292783	04-Oct-07 (No. 217-00736)	Oct-08
Reference 20 dB Attenuator	SN: S5086 (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	14-Mar-08 (No. DAE4-601_Mar08)	Mar-09
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-07)	In house check: Oct-08

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

Issued: September 25, 2008

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

DASY5 Validation Report for Head TSL

Date/Time: 24.09.2008 12:50:11

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN790

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

Medium: HSL U10 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.8$ mho/m; $\epsilon_r = 39.8$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.4, 4.4, 4.4); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

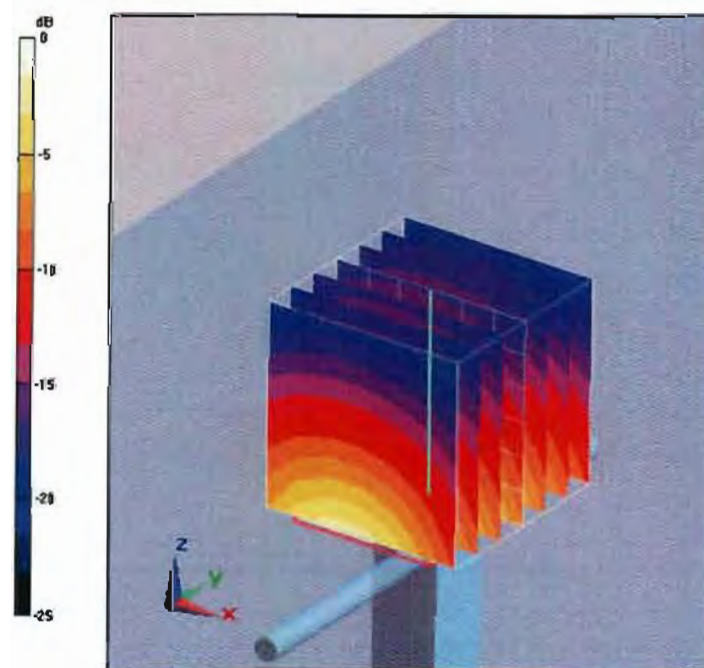
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95.9 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 27.6 W/kg

SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.15 mW/g

Maximum value of SAR (measured) = 15.8 mW/g



0 dB = 15.8mW/g

DASY5 Validation Report for Body TSL

Date/Time: 18.09.2008 13:52:58

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:790

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

Medium: MSL U10 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.97$ mho/m; $\epsilon_r = 50.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.07, 4.07, 4.07); Calibrated: 28.04.2008
- Sensor-Surface: 3.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 14.03.2008
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.0 Build 119; SEMCAD X Version 13.2 Build 87

P_{in} = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.9 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 26 W/kg

SAR(1 g) = 12.6 mW/g; SAR(10 g) = 5.81 mW/g

Maximum value of SAR (measured) = 15.7 mW/g



0 dB = 15.7mW/g