

SAR Compliance Test Report

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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-691

FCC_RM-691_01

Applicant: Nokia Corporation

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2011-01-12 to 2011-01-25
SN, HW and SW numbers of tested device	SN: 004402/13/311369/0, HW: 5000, SW: 020.022, DUT: 15430 SN: 004402/13/311732/9, HW: 5100, SW: 020.022, DUT: 15455
Batteries used in testing	BL-5K, DUT: 15433, 15434, 15435, 15436, 15437, 15438
Headsets used in testing	WH-102, DUT: 15311, 15432
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
GSM850	251 / 848.8	32.5 dBm	Left, Cheek	0.502 W/kg	0.56 W/kg	1.6 W/kg	PASSED
WCDMA850	4233 / 846.6	23.5 dBm	Left, Cheek	0.580 W/kg	0.65 W/kg	1.6 W/kg	PASSED
WCDMA1700/2100	1412 / 1732.4	23.8 dBm	Left, Cheek	1.32 W/kg	1.48 W/kg	1.6 W/kg	PASSED
GSM1900	810 / 1909.8	31.0 dBm	Left, Cheek	0.938 W/kg	1.05 W/kg	1.6 W/kg	PASSED
WLAN2450	7 / 2442.0	18.0 dBm	Right, Cheek	0.318 W/kg	0.36 W/kg	1.6 W/kg	PASSED
GSM850 + WLAN2450	-	-	Left, Cheek	0.521 W/kg	0.58 W/kg	1.6 W/kg	PASSED
WCDMA850 + WLAN2450	-	-	Left, Cheek	0.589 W/kg	0.66 W/kg	1.6 W/kg	PASSED
WCDMA1700/2100 + WLAN2450	-	-	Left, Cheek	1.37 W/kg	1.53 W/kg	1.6 W/kg	PASSED
GSM1900 + WLAN2450	-	-	Left, Cheek	0.938 W/kg	1.05 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
GSM850	251 / 848.8	32.5 dBm	1.5 cm	0.476 W/kg	0.53 W/kg	1.6 W/kg	PASSED
WCDMA850	4233 / 846.6	23.5 dBm	1.5 cm	0.548 W/kg	0.61 W/kg	1.6 W/kg	PASSED
WCDMA1700/2100	1513 / 1752.6	23.8 dBm	1.5 cm	0.969 W/kg	1.09 W/kg	1.6 W/kg	PASSED
GSM1900	810 / 1909.8	31.0 dBm	1.5 cm	0.679 W/kg	0.76 W/kg	1.6 W/kg	PASSED
WLAN2450	7 / 2442.0	18.0 dBm	1.5 cm	0.083 W/kg	0.09 W/kg	1.6 W/kg	PASSED
GSM850 + WLAN2450	-	-	1.5 cm	0.485 W/kg	0.54 W/kg	1.6 W/kg	PASSED
WCDMA850 + WLAN2450	-	-	1.5 cm	0.556 W/kg	0.62 W/kg	1.6 W/kg	PASSED
WCDMA1700/2100 + WLAN2450	-	-	1.5 cm	1.02 W/kg	1.14 W/kg	1.6 W/kg	PASSED
GSM1900 + WLAN2450	-	-	1.5 cm	0.704 W/kg	0.79 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	0.36 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 4/8	824 – 849 1850 – 1910
EGPRS	850 1900	GMSK / 8PSK	1/8 to 4/8	824 – 849 1850 – 1910
WCDMA	850 (Band V) 1700/2100 (Band IV)		1	826 – 847 1712 – 1753
HSUPA	850 (Band V) 1700/2100 (Band IV)		1	826 – 847 1712 – 1753
BT	2450	GFSK	1	2402 – 2480
WLAN b-mode	2450	Up to 11Mbps QPSK	1	2412 – 2462
WLAN g-mode	2450	Up to 54Mbps 64QAM	1	2412 – 2462
WLAN n-mode 20MHz	2450	Up to 72.2Mbps 64QAM	1	2412 – 2462

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

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

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.

This is a BT Class 1 device; as its power tuning target is 10dBm (10mW), SAR testing was deemed unnecessary.

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):	20.2 to 22.9
Ambient humidity (RH %):	26 to 34

3.2 Test Signal, Frequencies and Output Power

The device was put into operation by using a call tester except for testing WLAN2450 where control software was used. Communication between the device and the call tester was established by air link.

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

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

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

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

The transmission mode of the device in all WLAN b-mode tests was DSSS QPSK 11Mbps. This mode has the highest (or equal highest) time-averaged output power of all the WLAN b and g modulation modes in Nokia devices. In WLAN n-mode, BPSK 6.5Mbps with 20MHz bandwidth was used.

3.3 Test Cases and Test Minimisation

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

Whilst it's possible to identify the maximum SAR test cases from inspection of the conducted power levels given in the Results tables (Section 7), different modes in the same band and multi-slot transmit GSM/GPRS modes can create some difficulties. Therefore the sequence of the SAR tests made in evaluating this device has used test logic that is based on measured SAR values. Comparison of measured SAR values in this way, can also allow some test minimization (i.e. test elimination) to be made.

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

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

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

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

basic tests, it is also bolded and used as the basis for any further checking tests that might be needed.

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

4. DESCRIPTION OF THE TEST EQUIPMENT

4.1 Measurement System and Components

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

The following table lists calibration dates of SPEAG components:

Test Equipment	Serial Number	Calibration interval	Calibration expiry
DAE 4	538	12 months	2011-09
DAE 4	728	12 months	2011-03
DAE 4	793	12 months	2011-09
E-field Probe ES3DV3	3131	12 months	2011-09
E-field Probe ES3DV3	3165	12 months	2011-03
E-field Probe ES3DV3	3194	12 months	2011-09
Dipole Validation Kit, D835V2	480	24 months	2011-10
Dipole Validation Kit, D1800V2	256	24 months	2011-10
Dipole Validation Kit, D1900V2	5d013	24 months	2012-03
Dipole Validation Kit, D2450V2	749	24 months	2011-10
DASY4 software	Version 4.7	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration interval	Calibration expiry
Signal Generator	SML03	101265	12 months	2011-08
Amplifier	ZHL-42 (SMA)	N072095-5	12 months	2011-08
Power Meter	NRVS	849305/028	12 months	2011-08
Power Sensor	NRV-Z32	839176/020	12 months	2011-08
Call Tester	CMU 200	101111	-	-
Call Tester	CMU 200	104983	-	-
Vector Network Analyzer	8753E	US38432928	12 months	2011-08
Dielectric Probe Kit	85070B	US33020420	-	-
Signal Generator	E4436B	US39260114	12 months	2011-08
Amplifier	5S1G4	25583	12 months	2011-08
Power Meter	NRVS	849305/028	12 months	2011-08
Power Sensor	NRV-Z32	100067	12 months	2011-12

4.1.1 Isotropic E-field Probe Type ES3DV3

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., butyl diglycol)
Calibration	Calibration certificate in Appendix D
Frequency	10 MHz to 4 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm Tip length: 20 mm Body diameter: 12 mm Tip diameter: 3.9 mm 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 at least 15.0 cm measured from the ear reference point during system checking and device measurements.

4.3.1 Tissue Simulant Recipes

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

800MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	51.50	69.25
Tween 20	47.35	30.00
Salt	1.15	0.75

1800MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	54.0	70.20
Tween 20	45.6	29.37
Salt	0.4	0.43

1900MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	54.50	70.25
Tween 20	45.23	29.41
Salt	0.27	0.34

2450MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	56.0	70.20
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	2.36	40.5	0.88	
	$\pm 10\%$ window	2.12 – 2.60			
	2011-01-12	2.34	41.3	0.89	21.0
	2011-01-13	2.40	41.3	0.90	21.0
1800	Reference result	9.90	40.0	1.40	
	$\pm 10\%$ window	8.91 – 10.89			
	2011-01-24	10.0	38.3	1.35	21.0
1900	Reference result	10.2	41.2	1.45	
	$\pm 10\%$ window	9.2 – 11.2			
	2011-01-25	10.2	39.5	1.40	21.0
2450	Reference result	13.2	39.1	1.78	
	$\pm 10\%$ window	11.9 – 14.5			
	2011-01-24	13.9	37.7	1.82	21.0
	2011-01-25	14.3	37.6	1.83	21.0

System checking, body tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ϵ_r	σ [S/m]	
835	Reference result	2.52	53.2	1.01	
	$\pm 10\%$ window	2.27 – 2.77			
	2011-01-19	2.51	53.5	1.00	21.0
	2011-01-21	2.48	53.6	1.00	21.0

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

4.3.3 Tissue Simulants used in the Measurements

Head tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ϵ_r	σ [S/m]	
835	Recommended value	41.5	0.90	21.0
	$\pm 5\%$ window	39.4 – 43.6	0.86 – 0.95	
	2011-01-13	41.3	0.90	
836	Recommended value	41.5	0.90	21.0
	$\pm 5\%$ window	39.4 – 43.6	0.86 – 0.95	
	2011-01-12	41.3	0.89	
1732	Recommended value	40.1	1.36	21.0
	$\pm 5\%$ window	38.1 – 42.1	1.29 – 1.43	
	2011-01-24	38.5	1.30	
1880	Recommended value	40.0	1.40	21.0
	$\pm 5\%$ window	38.0 – 42.0	1.33 – 1.47	
	2011-01-25	39.6	1.38	
2442	Recommended value	39.2	1.79	21.0
	$\pm 5\%$ window	37.3 – 41.2	1.70 – 1.88	
	2011-01-24	37.7	1.81	

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ϵ_r	σ [S/m]	
835	Recommended value	55.2	0.97	21.0
	± 5% window	52.4 – 58.0	0.92 – 1.02	
	2011-01-21	53.6	1.00	
836	Recommended value	55.2	0.97	21.0
	± 5% window	52.4 – 58.0	0.92 – 1.02	
	2011-01-19	53.5	1.00	
1732	Recommended value	53.5	1.48	21.0
	± 5% window	50.8 – 56.2	1.40 – 1.55	
	2011-01-24	51.5	1.42	
1880	Recommended value	53.3	1.52	21.0
	± 5% window	50.6 – 56.0	1.44 – 1.60	
	2011-01-25	52.6	1.52	
2442	Recommended value	52.7	1.94	21.0
	± 5% window	50.1 – 55.3	1.85 – 2.04	
	2011-01-24	50.5	2.00	
	2011-01-25	50.3	1.99	

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.

Nokia body-worn accessories are commonly available for the separation distance used in this testing.

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

Mode	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		32.5 dBm	32.5 dBm	32.5 dBm
	Left	Cheek	0.342	0.394	0.502
		Tilt	-	0.268	-
	Right	Cheek	-	0.296	-
		Tilt	-	0.259	-
2-slot GPRS	Conducted Power		-	29.5 dBm	-
	Left	Cheek	-	0.382	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3-slot GPRS	Conducted Power		-	27.7 dBm	-
	Left	Cheek	-	0.374	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
4-slot GPRS	Conducted Power		-	26.5 dBm	-
	Left	Cheek	-	0.377	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
1-slot 8PSK EGPRS	Conducted Power		-	-	27.0 dBm
	Left	Cheek	-	-	0.046
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-

(850MHz Table continues)

(850MHz Table continues)

Mode	Test configuration		Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz
WCDMA	Conducted Power		23.5 dBm	23.5 dBm	23.5 dBm
	Left	Cheek	0.502	0.544	0.580
		Tilt	-	0.353	-
	Right	Cheek	-	0.410	-
		Tilt	-	0.339	-

1700/2100MHz Head SAR results

Mode	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		23.8 dBm	23.8 dBm	23.8 dBm
	Left	Cheek	1.24	1.32	1.31
		Tilt	-	0.498	-
	Right	Cheek	0.854	0.960	0.932
		Tilt	-	0.645	-

1900MHz Head SAR results

Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
GSM	Conducted Power		31.0 dBm	31.0 dBm	31.0 dBm
	Left	Cheek	0.835	0.863	0.938
		Tilt	-	0.324	-
	Right	Cheek	-	0.726	-
		Tilt	-	0.529	-
2-slot GPRS	Conducted Power		-	28.0 dBm	-
	Left	Cheek	-	0.772	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3-slot GPRS	Conducted Power		-	26.2 dBm	-
	Left	Cheek	-	0.796	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
4-slot GPRS	Conducted Power		-	25.0 dBm	-
	Left	Cheek	-	0.815	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
1-slot 8PSK EGPRS	Conducted Power		-	-	26.0 dBm
	Left	Cheek	-	-	0.260
		Tilt	-	-	-
	Right	Cheek	-	-	-
		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 b-mode	Conducted Power		16.0 dBm	18.0 dBm	16.0 dBm
	Left	Cheek	-	0.272	-
		Tilt	-	0.308	-
	Right	Cheek	0.174	0.318	0.166
		Tilt	-	0.286	-
WLAN n-mode 20MHz	Conducted Power		15.0 dBm	17.0 dBm	15.0 dBm
	Left	Cheek	-	-	-
		Tilt	-	-	-
	Right	Cheek	0.147	0.280	0.142
		Tilt	-	-	-

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

850MHz Body SAR results

Mode	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
GSM		Conducted Power	32.5 dBm	32.5 dBm	32.5 dBm
	Display facing phantom	Without headset	-	0.324	-
		Headset WH-102	-	0.211	-
	Back facing Phantom	Without headset	0.342	0.412	0.476
		Headset WH-102	-	0.311	-
Mode	Device orientation	Test configuration	Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz
WCDMA		Conducted Power	23.5 dBm	23.5 dBm	23.5 dBm
	Display facing phantom	Without headset	-	0.417	-
		Headset WH-102	-	0.346	-
	Back facing phantom	Without headset	0.462	0.528	0.548
		Headset WH-102	-	0.414	-

1700/2100MHz Body SAR results

Mode	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	23.8 dBm	23.8 dBm	23.8 dBm
	Display facing phantom	Without headset	-	0.707	-
		Headset WH-102	-	0.630	-
	Back facing phantom	Without headset	0.766	0.862	0.969
		Headset WH-102	0.759	0.846	0.891

1900MHz Body SAR results

Mode	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
GSM		Conducted Power	31.0 dBm	31.0 dBm	31.0 dBm
	Display facing phantom	Without headset	-	0.530	-
		Headset WH-102	-	0.495	-
	Back facing Phantom	Without headset	0.599	0.618	0.679
		Headset WH-102	-	0.568	-

2450MHz Body SAR results

Mode	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 1 2412.0 MHz	Ch 7 2442.0 MHz	Ch 11 2462.0 MHz
WLAN b-mode		Conducted Power	16.0 dBm	18.0 dBm	16.0 dBm
	Display facing phantom	Without headset	-	0.072	-
		Headset WH-102	-	0.062	-
	Back facing Phantom	Without headset	0.040	0.083	0.038
		Headset WH-102	-	0.076	-
WLAN n-mode 20MHz		Conducted Power	15.0 dBm	17.0 dBm	15.0 dBm
	Display facing phantom	Without headset	-	-	-
		Headset WH-102	-	-	-
	Back facing phantom	Without headset	0.034	0.065	0.032
		Headset WH-102	-	-	-

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

Test configuration	Max. 1g SAR results				
	WLAN	GSM850	WCDMA850	WCDMA 1700/2100	GSM1900
Head: Left, Cheek	0.272	0.502	0.580	1.32	0.938
Head: Left, Tilt	0.308	0.268	0.353	0.498	0.324
Head: Right, Cheek	0.318	0.296	0.410	0.960	0.726
Head: Right, Tilt	0.286	0.259	0.339	0.645	0.529
Body: Display facing phantom, Without Headset	0.072	0.324	0.417	0.707	0.530
Body: Display facing phantom, Headset WH-102	0.062	0.211	0.346	0.630	0.495
Body: Back facing phantom, Without Headset	0.083	0.476	0.548	0.969	0.679
Body: Back facing phantom, Headset WH-102	0.076	0.311	0.414	0.891	0.568

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

Test configuration	Combined 1g SAR values			
	GSM850 + WLAN	WCDMA850 + WLAN	WCDMA 1700/2100 + WLAN	GSM1900 + WLAN
Head: Left, Cheek	0.774	0.852	1.592	1.210
Head: Left, Tilt	0.576	0.661	0.806	0.632
Head: Right, Cheek	0.614	0.728	1.278	1.044
Head: Right, Tilt	0.545	0.625	0.931	0.815
Body: Display facing phantom, Without Headset	0.396	0.489	0.779	0.602
Body: Display facing phantom, Headset WH-102	0.273	0.408	0.692	0.557
Body: Back facing phantom, Without Headset	0.559	0.631	1.052	0.762
Body: Back facing phantom, Headset WH-102	0.387	0.490	0.967	0.644

The following table gives a more accurate assessment of the SAR values for simultaneous transmission. These values have been calculated using the SPEAG Combined Multiband algorithm, which is based on area scans. It a) converts the 2D area scans into 3D volume scans by assuming frequency-dependent decay characteristics for the E-field, b) sums the SAR values for WLAN2450 and the cellular bands point-by-point and c) calculates the combined average SAR values.

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

Test configuration	Combined 1g SAR values			
	GSM850 + WLAN	WCDMA850 + WLAN	WCDMA 1700/2100 + WLAN	GSM1900 + WLAN
Head: Left, Cheek	0.521	0.556	1.37	0.917
Head: Left, Tilt	-	-	-	-
Head: Right, Cheek	-	-	-	-
Head: Right, Tilt	-	-	-	-
Body: Display facing phantom, Without Headset	-	-	-	-
Body: Display facing phantom, Headset WH-102	-	-	-	-
Body: Back facing phantom, Without Headset	0.485	0.544	1.02	0.704
Body: Back facing phantom, Headset WH-102	-	-	-	-

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

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

Plots of the Measurement scans are given in Appendix B.

APPENDIX A: SYSTEM CHECKING SCANS

Date/Time: 2011-01-12 09:19:43

Test Laboratory: TCC Nokia

Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW835

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL850; Medium Notes: t= 20.5 C

Medium parameters used: f = 835 MHz; σ = 0.892 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 2.49 mW/g

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

Reference Value = 53.1 V/m

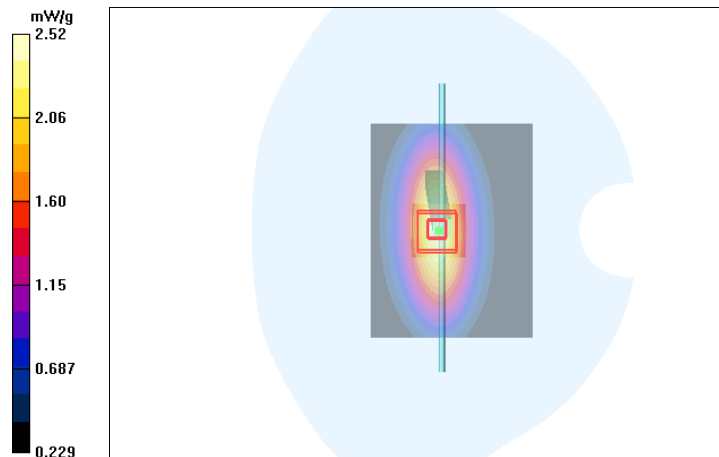
Peak SAR (extrapolated) = 3.52 W/kg

SAR(1 g) = 2.34 mW/g

SAR(10 g) = 1.52 mW/g

Power Drift = -0.005 dB

Maximum value of SAR (measured) = 2.52 mW/g



Date/Time: 2011-01-13 08:55:24

Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW835

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL850; Medium Notes: t= 20.0 C

Medium parameters used: f = 835 MHz; σ = 0.895 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 2.53 mW/g

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

Reference Value = 54.2 V/m

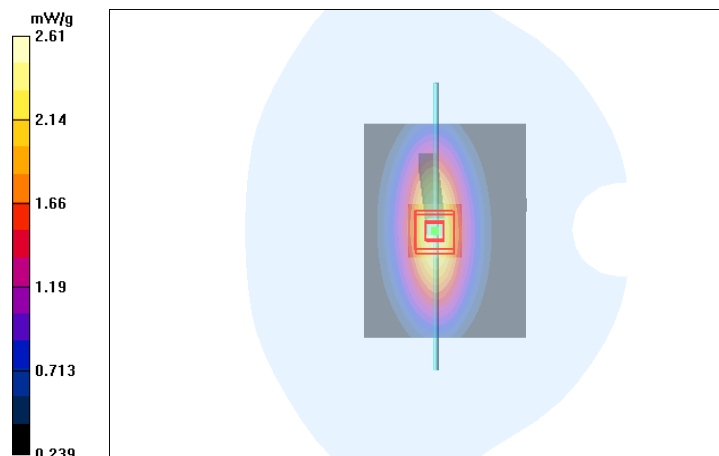
Peak SAR (extrapolated) = 3.62 W/kg

SAR(1 g) = 2.4 mW/g

SAR(10 g) = 1.56 mW/g

Power Drift = 0.037 dB

Maximum value of SAR (measured) = 2.61 mW/g



Date/Time: 2011-01-24 09:51:41

Test Laboratory: TCC Nokia

Type: D1800V2; Serial: D1800V2 - SN:256

Communication System: CW1800

Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: HSL1800; Medium Notes: t= 21.6 C

Medium parameters used: f = 1800 MHz; σ = 1.35 mho/m; ϵ_r = 38.3; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(5.06, 5.06, 5.06); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

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

Reference Value = 90.7 V/m

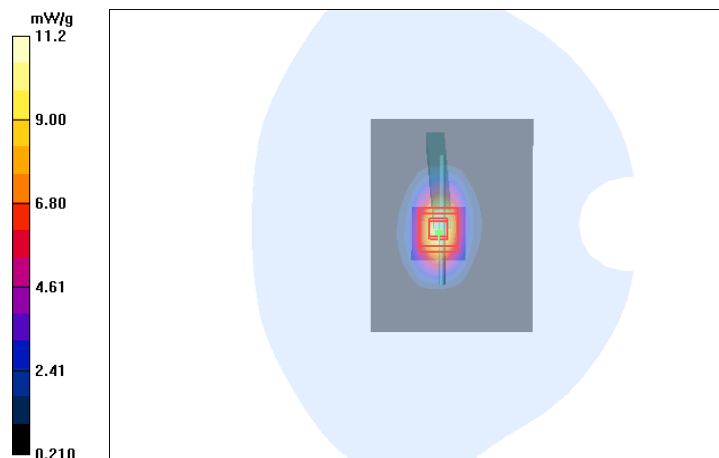
Peak SAR (extrapolated) = 18.4 W/kg

SAR(1 g) = 10 mW/g

SAR(10 g) = 5.26 mW/g

Power Drift = 0.117 dB

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



SAR Report

FCC_RM-691_01

Applicant: Nokia Corporation

Type: RM-691

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Date/Time: 2011-01-25 10:07:17

Test Laboratory: TCC Nokia

Type: D1900V2; Serial: D1900V2 - SN:5d013

Communication System: CW1900

Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL1900; Medium Notes: $t = 22.0\text{ }^{\circ}\text{C}$

Medium parameters used: $f = 1900\text{ MHz}$; $\sigma = 1.4\text{ mho/m}$; $\epsilon_r = 39.5$; $\rho = 1000\text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

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

Reference Value = 88.5 V/m

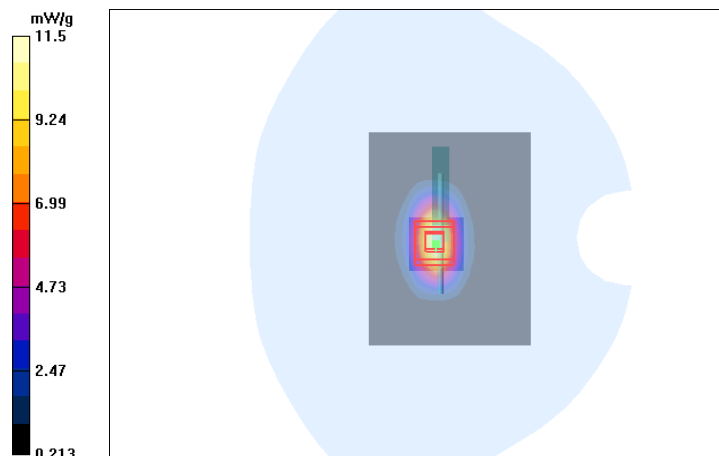
Peak SAR (extrapolated) = 18.4 W/kg

SAR(1 g) = 10.2 mW/g

SAR(10 g) = 5.34 mW/g

Power Drift = 0.117 dB

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



Date/Time: 2011-01-24 08:54:47

Test Laboratory: TCC Nokia

Type: D2450V2; Serial: D2450V2 - SN:749

Communication System: CW2450

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: $t = 19.8$ C

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.82$ mho/m; $\epsilon_r = 37.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.26, 4.26, 4.26); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2010-09-08
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

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

Reference Value = 96.1 V/m

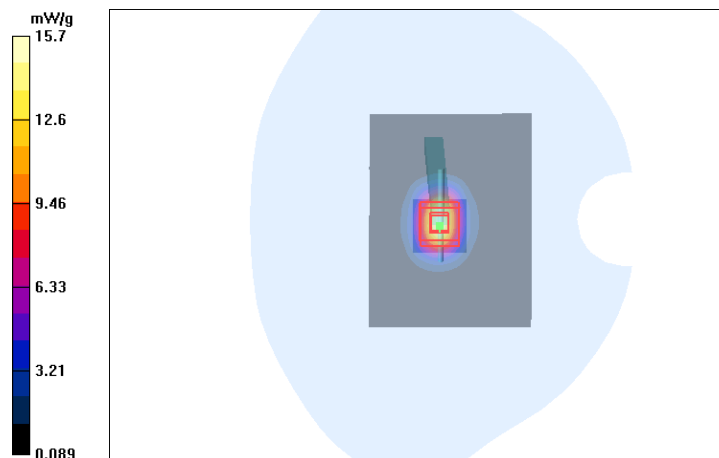
Peak SAR (extrapolated) = 28.9 W/kg

SAR(1 g) = 13.9 mW/g

SAR(10 g) = 6.4 mW/g

Power Drift = -0.043 dB

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



Date/Time: 2011-01-25 08:56:24

Test Laboratory: TCC Nokia

Type: D2450V2; Serial: D2450V2 - SN:749

Communication System: CW2450

Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: t= 19.8 C

Medium parameters used: f = 2450 MHz; σ = 1.83 mho/m; ϵ_r = 37.6; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.26, 4.26, 4.26); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2010-09-08
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 16.8 mW/g

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

Reference Value = 95.7 V/m

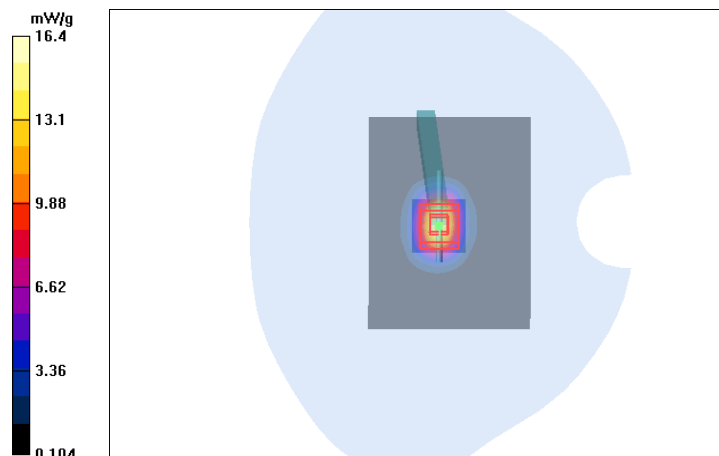
Peak SAR (extrapolated) = 29.7 W/kg

SAR(1 g) = 14.3 mW/g

SAR(10 g) = 6.62 mW/g

Power Drift = 0.061 dB

Maximum value of SAR (measured) = 16.4 mW/g



Date/Time: 2011-01-19 07:58:23

Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW835

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: BSL850; Medium Notes: t= 21.2 C

Medium parameters used: f = 835 MHz; σ = 1 mho/m; ϵ_r = 53.5; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(5.95, 5.95, 5.95); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 2.66 mW/g

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

Reference Value = 52.0 V/m

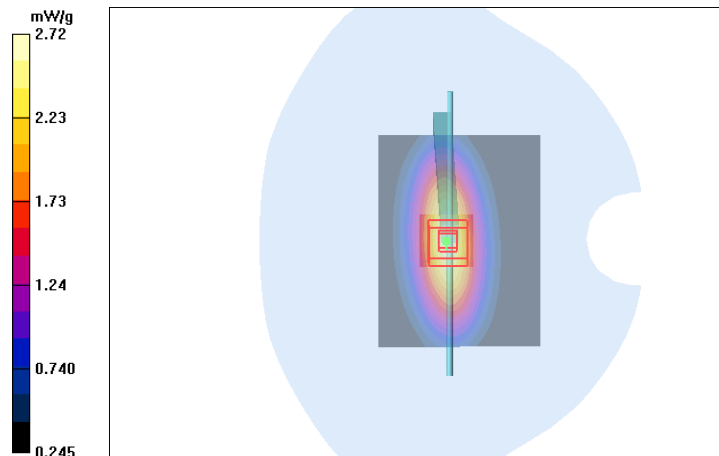
Peak SAR (extrapolated) = 3.79 W/kg

SAR(1 g) = 2.51 mW/g

SAR(10 g) = 1.63 mW/g

Power Drift = 0.060 dB

Maximum value of SAR (measured) = 2.72 mW/g



Date/Time: 2011-01-21 08:51:20

Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:480

Communication System: CW835

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: BSL850; Medium Notes: t= 21.0 C

Medium parameters used: f = 835 MHz; σ = 1 mho/m; ϵ_r = 53.6; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(5.95, 5.95, 5.95); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

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

Reference Value = 52.2 V/m

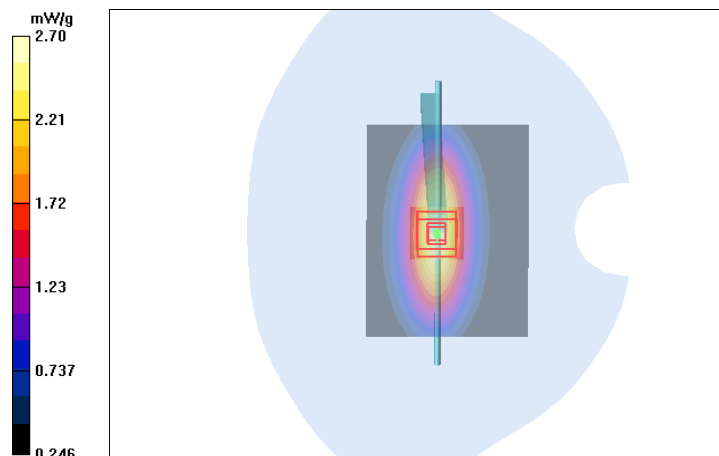
Peak SAR (extrapolated) = 3.77 W/kg

SAR(1 g) = 2.48 mW/g

SAR(10 g) = 1.62 mW/g

Power Drift = 0.043 dB

Maximum value of SAR (measured) = 2.70 mW/g



APPENDIX B: MEASUREMENT SCANS

Date/Time: 2011-01-12 13:52:32

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM850

Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium: HSL850; Medium Notes: t= 20.0 C

Medium parameters used: f = 849 MHz; σ = 0.901 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.548 mW/g

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

Reference Value = 9.94 V/m

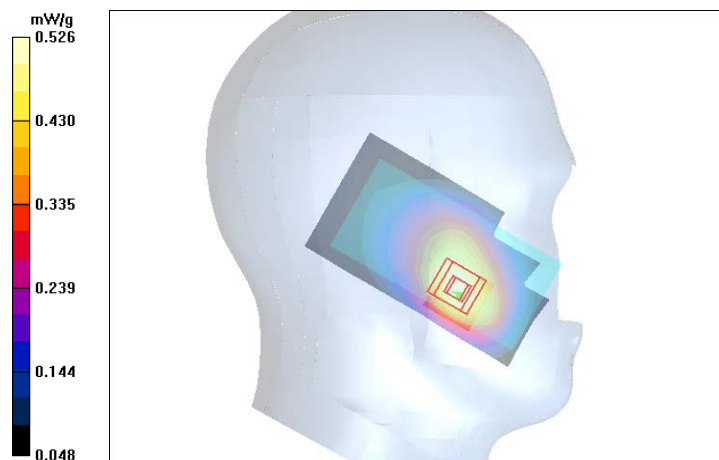
Peak SAR (extrapolated) = 0.700 W/kg

SAR(1 g) = 0.502 mW/g

SAR(10 g) = 0.361 mW/g

Power Drift = 0.046 dB

Maximum value of SAR (measured) = 0.526 mW/g



Date/Time: 2011-01-12 12:41:10

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: HSL850; Medium Notes: t= 20.0 C

Medium parameters used: f = 837 MHz; σ = 0.893 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.277 mW/g

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

Reference Value = 14.4 V/m

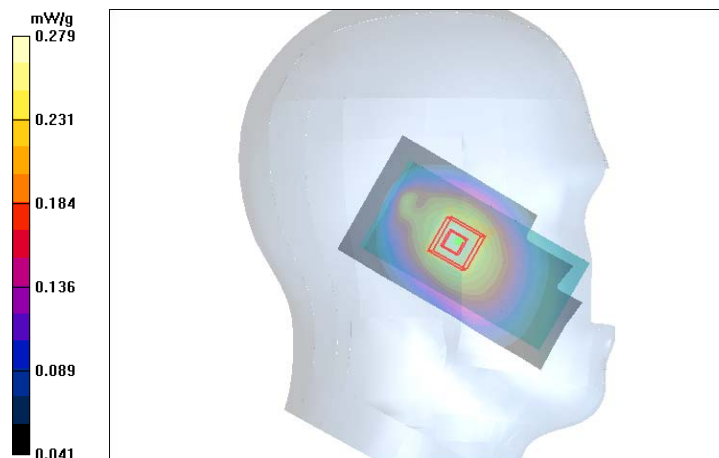
Peak SAR (extrapolated) = 0.337 W/kg

SAR(1 g) = 0.268 mW/g

SAR(10 g) = 0.202 mW/g

Power Drift = 0.032 dB

Maximum value of SAR (measured) = 0.279 mW/g



Date/Time: 2011-01-12 13:07:30

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: HSL850; Medium Notes: t= 19.5 C

Medium parameters used: f = 837 MHz; σ = 0.893 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.306 mW/g

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

Reference Value = 8.26 V/m

Peak SAR (extrapolated) = 0.361 W/kg

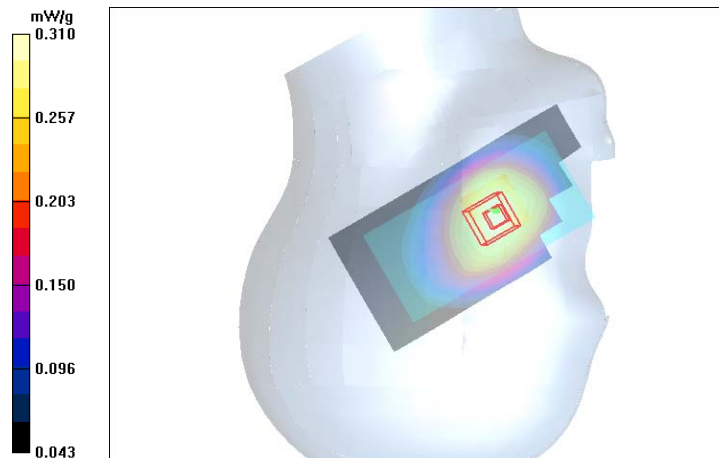
SAR(1 g) = 0.296 mW/g

SAR(10 g) = 0.229 mW/g

Power Drift = 0.081 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) = 0.310 mW/g



Date/Time: 2011-01-12 13:22:49

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: HSL850; Medium Notes: t= 19.5 C

Medium parameters used: f = 837 MHz; σ = 0.893 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

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

Reference Value = 14.7 V/m

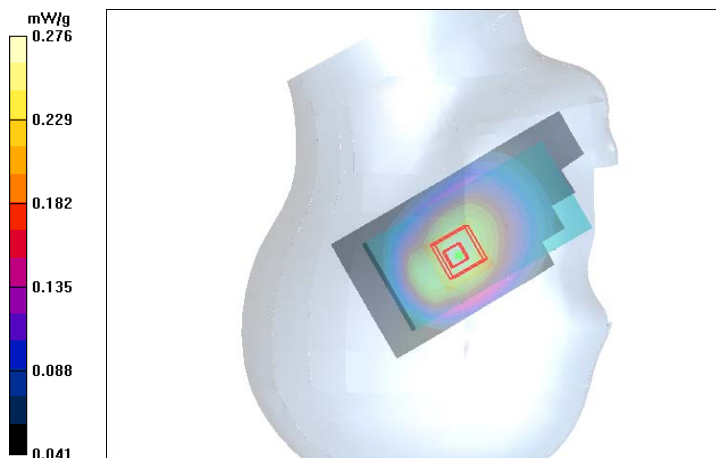
Peak SAR (extrapolated) = 0.326 W/kg

SAR(1 g) = 0.259 mW/g

SAR(10 g) = 0.195 mW/g

Power Drift = 0.015 dB

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



Date/Time: 2011-01-12 11:28:15

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: 2-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:4.2

Medium: HSL850; Medium Notes: t= 20.0 C

Medium parameters used: f = 837 MHz; σ = 0.893 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.402 mW/g

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

Reference Value = 9.03 V/m

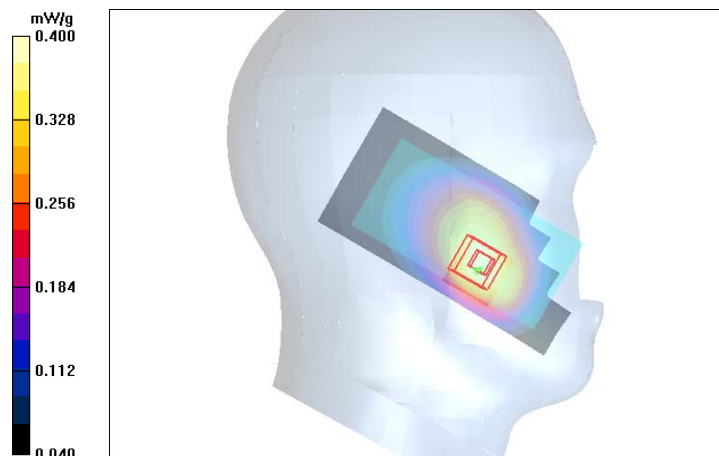
Peak SAR (extrapolated) = 0.514 W/kg

SAR(1 g) = 0.382 mW/g

SAR(10 g) = 0.278 mW/g

Power Drift = -0.033 dB

Maximum value of SAR (measured) = 0.400 mW/g



Date/Time: 2011-01-12 11:44:16

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: 3-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:2.8

Medium: HSL850; Medium Notes: t= 20.0 C

Medium parameters used: f = 837 MHz; σ = 0.893 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.398 mW/g

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

Reference Value = 9.02 V/m

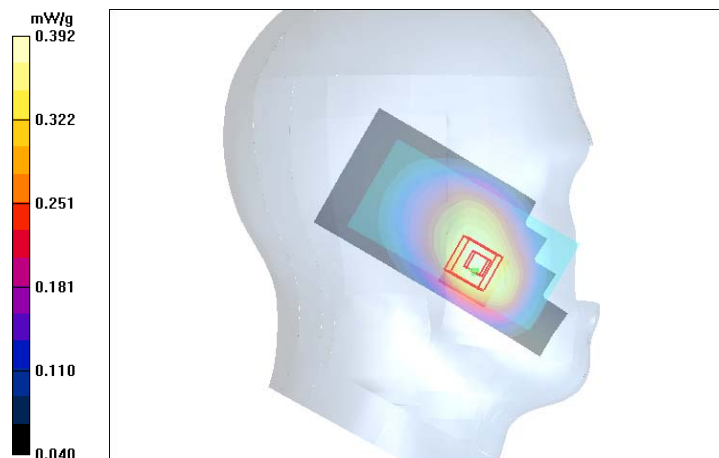
Peak SAR (extrapolated) = 0.504 W/kg

SAR(1 g) = 0.374 mW/g

SAR(10 g) = 0.274 mW/g

Power Drift = 0.017 dB

Maximum value of SAR (measured) = 0.392 mW/g



Date/Time: 2011-01-12 12:03:09

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: 4-slot GPRS850

Frequency: 836.6 MHz; Duty Cycle: 1:2.1

Medium: HSL850; Medium Notes: t= 20.0 C

Medium parameters used: f = 837 MHz; σ = 0.893 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.401 mW/g

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

Reference Value = 9.05 V/m

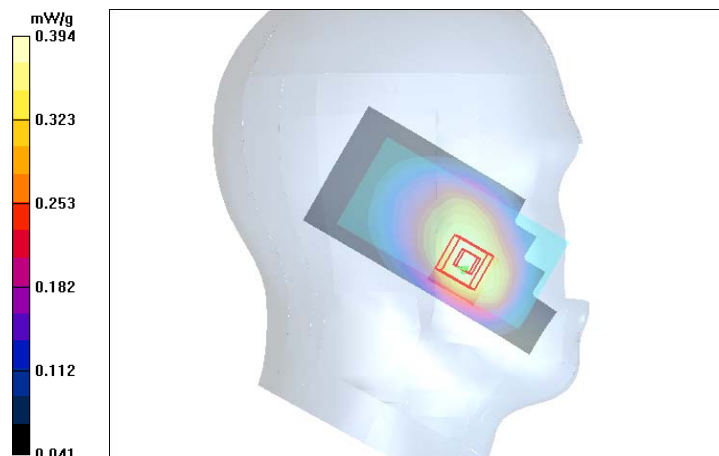
Peak SAR (extrapolated) = 0.502 W/kg

SAR(1 g) = 0.377 mW/g

SAR(10 g) = 0.276 mW/g

Power Drift = -0.022 dB

Maximum value of SAR (measured) = 0.394 mW/g



Date/Time: 2011-01-12 14:14:59

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: 1-slot 8PSK EGPRS850

Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium: HSL850; Medium Notes: t= 20.0 C

Medium parameters used: f = 849 MHz; σ = 0.901 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.050 mW/g

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

Reference Value = 2.91 V/m

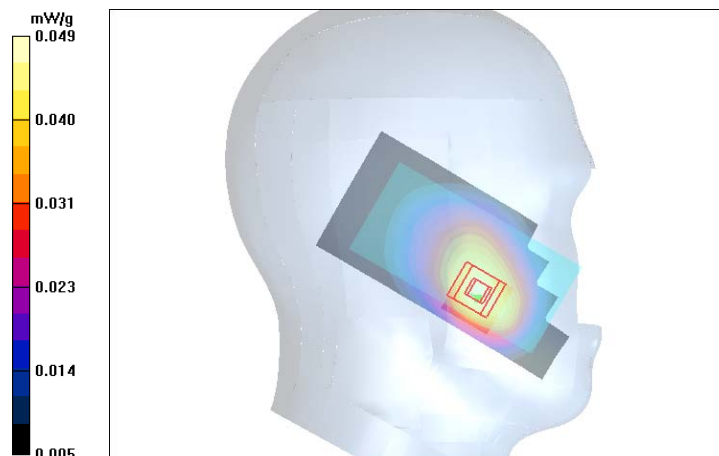
Peak SAR (extrapolated) = 0.064 W/kg

SAR(1 g) = 0.046 mW/g

SAR(10 g) = 0.033 mW/g

Power Drift = 0.304 dB

Maximum value of SAR (measured) = 0.049 mW/g



Date/Time: 2011-01-13 13:57:39

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WCDMA850

Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: HSL850; Medium Notes: t= 20.0 C

Medium parameters used: f = 847 MHz; $\sigma = 0.903$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.613 mW/g

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

Reference Value = 11.3 V/m

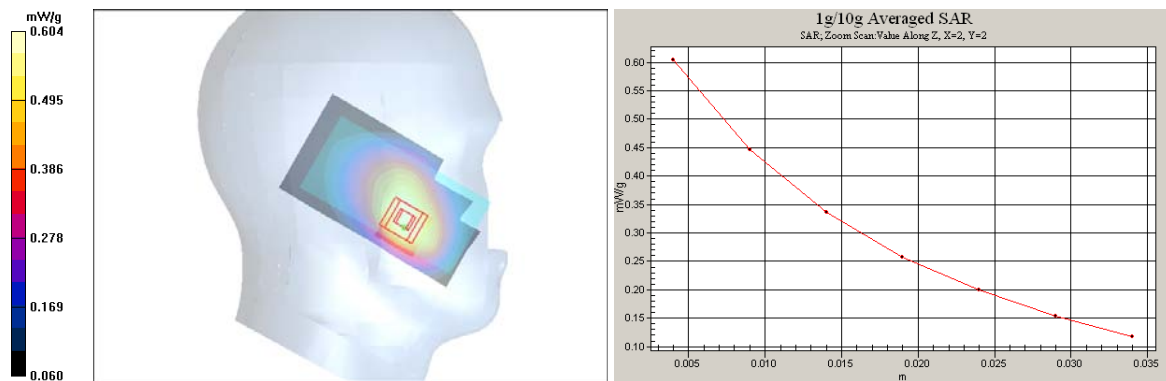
Peak SAR (extrapolated) = 0.793 W/kg

SAR(1 g) = 0.580 mW/g

SAR(10 g) = 0.419 mW/g

Power Drift = 0.122 dB

Maximum value of SAR (measured) = 0.604 mW/g



SAR Report

FCC_RM-691_01

Applicant: Nokia Corporation

Type: RM-691

Copyright © 2011 TCC Nokia

Date/Time: 2011-01-13 12:43:01

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WCDMA850

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL850; Medium Notes: t= 20.0 C

Medium parameters used: f = 835 MHz; σ = 0.895 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.363 mW/g

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

Reference Value = 16.4 V/m

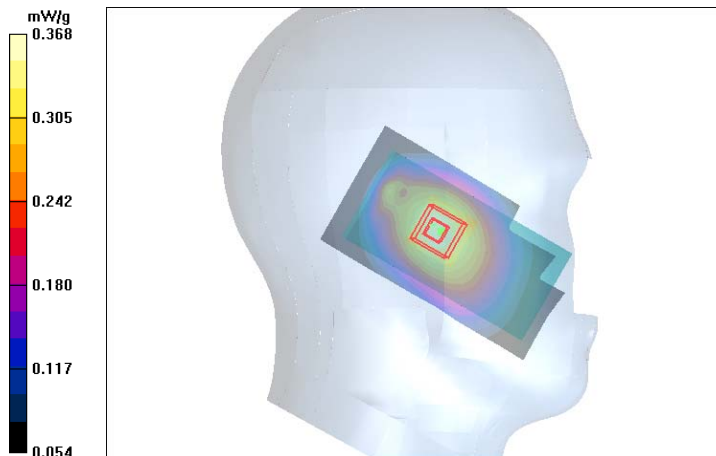
Peak SAR (extrapolated) = 0.441 W/kg

SAR(1 g) = 0.353 mW/g

SAR(10 g) = 0.268 mW/g

Power Drift = 0.030 dB

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



Date/Time: 2011-01-13 13:05:55

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WCDMA850

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL850; Medium Notes: t= 19.5 C

Medium parameters used: f = 835 MHz; σ = 0.895 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

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

Reference Value = 9.53 V/m

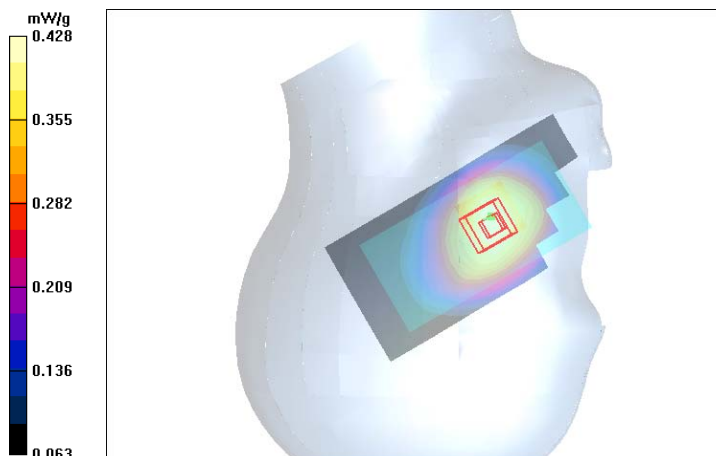
Peak SAR (extrapolated) = 0.497 W/kg

SAR(1 g) = 0.410 mW/g

SAR(10 g) = 0.319 mW/g

Power Drift = 0.055 dB

Maximum value of SAR (measured) = 0.428 mW/g



Date/Time: 2011-01-13 13:21:37

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WCDMA850

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL850; Medium Notes: t= 19.5 C

Medium parameters used: f = 835 MHz; σ = 0.895 mho/m; ϵ_r = 41.3; ρ = 1000 kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(6.09, 6.09, 6.09); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.357 mW/g

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

Reference Value = 16.1 V/m

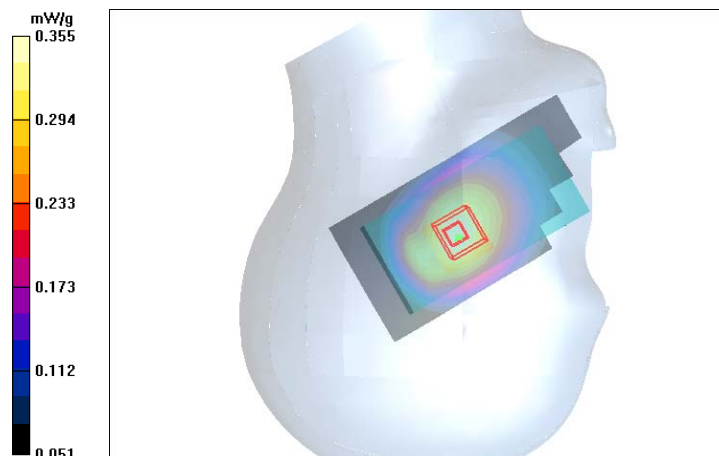
Peak SAR (extrapolated) = 0.423 W/kg

SAR(1 g) = 0.339 mW/g

SAR(10 g) = 0.257 mW/g

Power Drift = 0.077 dB

Maximum value of SAR (measured) = 0.355 mW/g



Date/Time: 2011-01-24 10:43:37

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311732/9

Communication System: WCDMA1700/2100

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: HSL1800; Medium Notes: t= 21.6 C

Medium parameters used (interpolated): f = 1732.4 MHz; $\sigma = 1.3$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(5.06, 5.06, 5.06); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 1.53 mW/g

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

Reference Value = 12.1 V/m

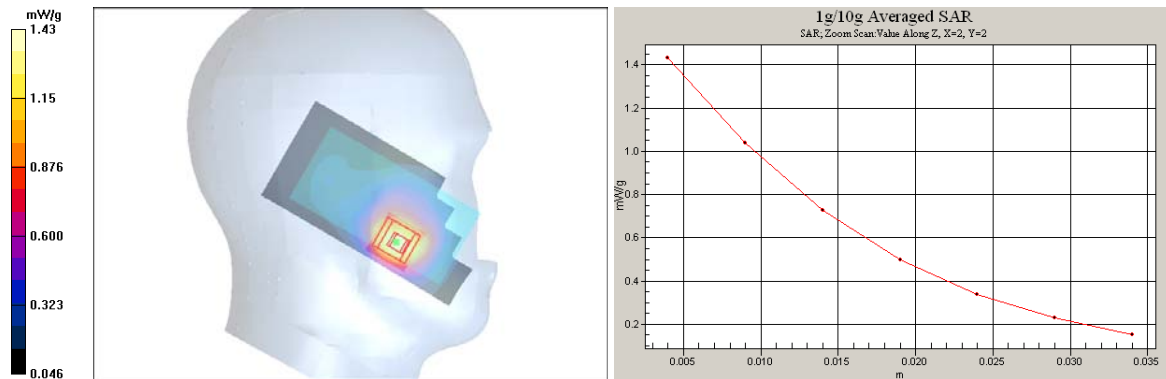
Peak SAR (extrapolated) = 1.90 W/kg

SAR(1 g) = 1.32 mW/g

SAR(10 g) = 0.840 mW/g

Power Drift = -0.069 dB

Maximum value of SAR (measured) = 1.43 mW/g



SAR Report

FCC_RM-691_01

Applicant: Nokia Corporation

Type: RM-691

Copyright © 2011 TCC Nokia

Date/Time: 2011-01-24 11:30:17

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311732/9

Communication System: WCDMA1700/2100

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: HSL1800; Medium Notes: t= 21.6 C

Medium parameters used (interpolated): f = 1732.4 MHz; σ = 1.3 mho/m; ϵ_r = 38.5; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165

- ConvF(5.06, 5.06, 5.06); Calibrated: 2010-03-16

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

- Electronics: DAE4 Sn728; Calibrated: 2010-03-19

- Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.587 mW/g

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

Reference Value = 19.7 V/m

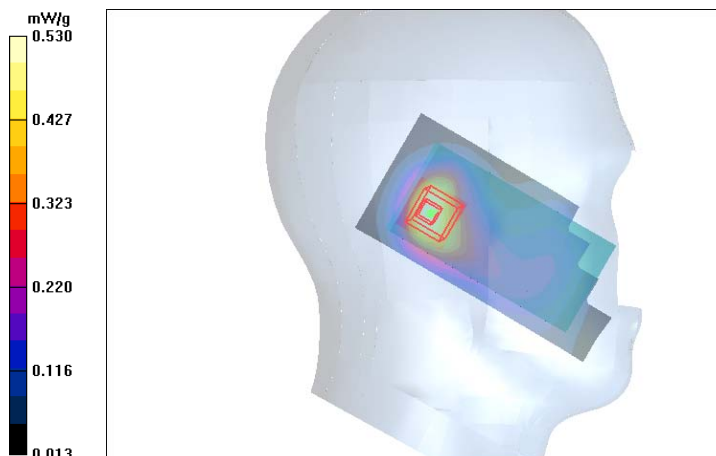
Peak SAR (extrapolated) = 0.748 W/kg

SAR(1 g) = 0.498 mW/g

SAR(10 g) = 0.312 mW/g

Power Drift = 0.004 dB

Maximum value of SAR (measured) = 0.530 mW/g



Date/Time: 2011-01-24 12:15:27

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311732/9

Communication System: WCDMA1700/2100

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: HSL1800; Medium Notes: t= 21.6 C

Medium parameters used (interpolated): f = 1732.4 MHz; σ = 1.3 mho/m; ϵ_r = 38.5; ρ = 1000 kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(5.06, 5.06, 5.06); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 1.08 mW/g

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

Reference Value = 9.68 V/m

Peak SAR (extrapolated) = 1.37 W/kg

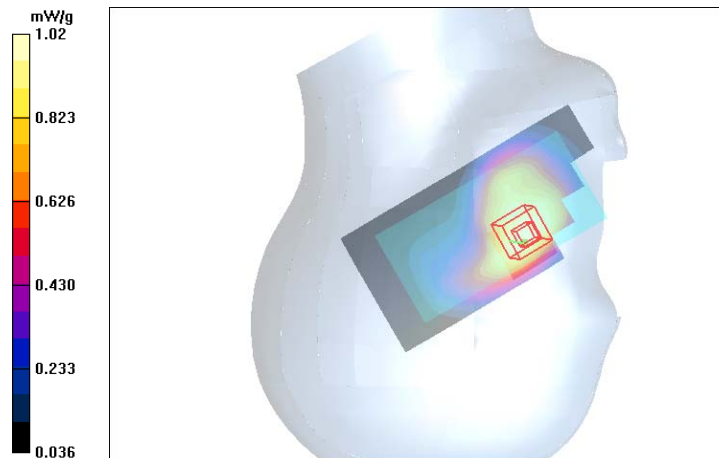
SAR(1 g) = 0.960 mW/g

SAR(10 g) = 0.665 mW/g

Power Drift = 0.008 dB

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

Maximum value of SAR (measured) = 1.02 mW/g



Date/Time: 2011-01-24 13:11:00

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311732/9

Communication System: WCDMA1700/2100

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: HSL1800; Medium Notes: t= 21.6 C

Medium parameters used (interpolated): f = 1732.4 MHz; σ = 1.3 mho/m; ϵ_r = 38.5; ρ = 1000 kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165

- ConvF(5.06, 5.06, 5.06); Calibrated: 2010-03-16

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

- Electronics: DAE4 Sn728; Calibrated: 2010-03-19

- Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.778 mW/g

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

Reference Value = 16.9 V/m

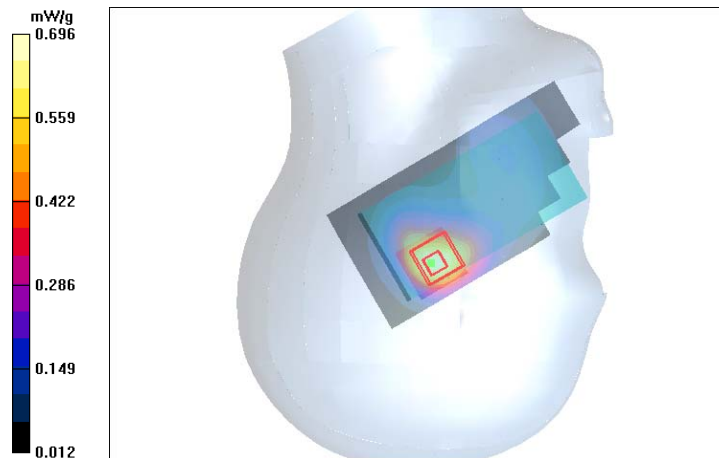
Peak SAR (extrapolated) = 0.958 W/kg

SAR(1 g) = 0.645 mW/g

SAR(10 g) = 0.401 mW/g

Power Drift = -0.022 dB

Maximum value of SAR (measured) = 0.696 mW/g



Date/Time: 2011-01-25 13:19:10

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM1900

Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium: HSL1900; Medium Notes: $t = 22.0$ C

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 1.04 mW/g

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

Reference Value = 8.33 V/m

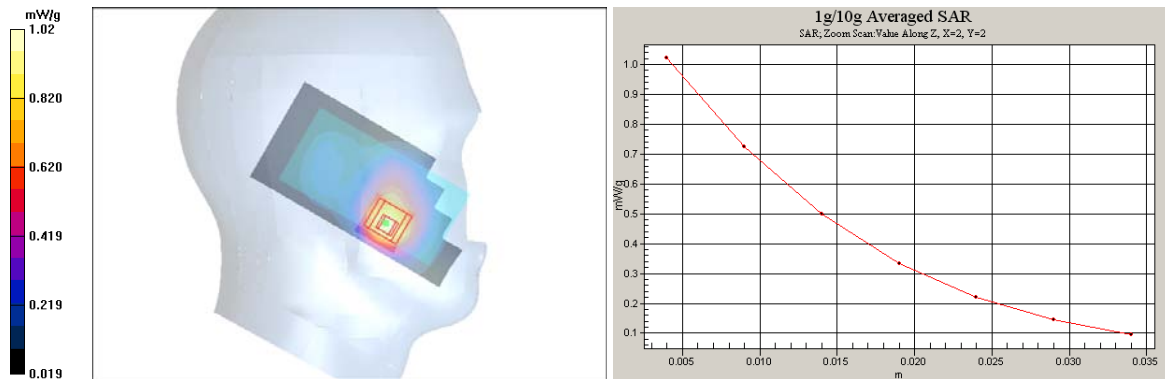
Peak SAR (extrapolated) = 1.39 W/kg

SAR(1 g) = 0.938 mW/g

SAR(10 g) = 0.588 mW/g

Power Drift = 0.176 dB

Maximum value of SAR (measured) = 1.02 mW/g



Date/Time: 2011-01-25 12:54:12

Test Laboratory: TCC Nokia
Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: HSL1900; Medium Notes: t= 22.0 C

Medium parameters used: f = 1880 MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.414 mW/g

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

Reference Value = 14.0 V/m

Peak SAR (extrapolated) = 0.477 W/kg

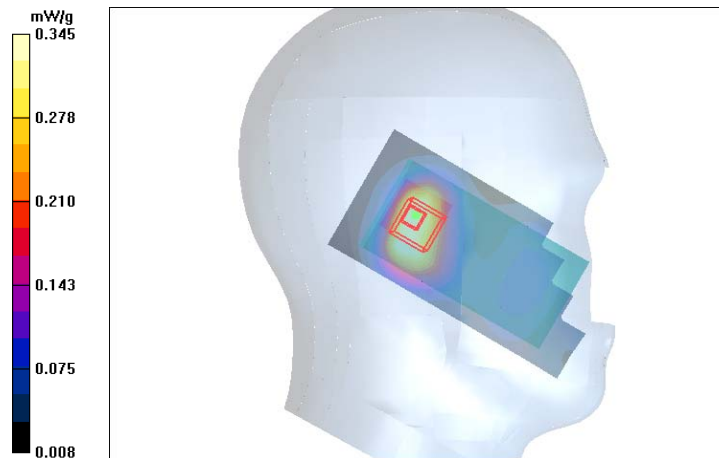
SAR(1 g) = 0.324 mW/g

SAR(10 g) = 0.209 mW/g

Power Drift = 0.019 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: 2011-01-25 13:33:01

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: HSL1900; Medium Notes: t= 22.0 C

Medium parameters used: f = 1880 MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.783 mW/g

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

Reference Value = 8.29 V/m

Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.726 mW/g

SAR(10 g) = 0.492 mW/g

Power Drift = 0.008 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) = 0.763 mW/g

Cheek - Middle/Zoom Scan 2 (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 8.29 V/m

Peak SAR (extrapolated) = 0.931 W/kg

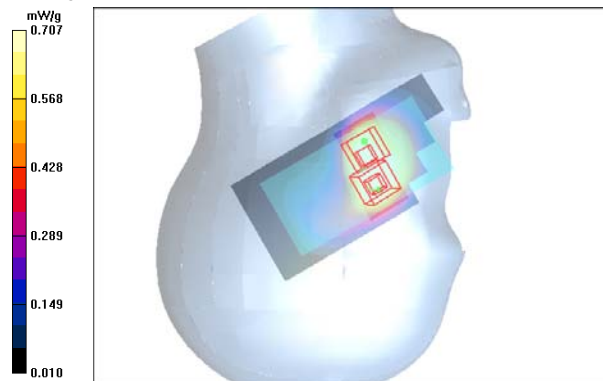
SAR(1 g) = 0.673 mW/g

SAR(10 g) = 0.456 mW/g

Power Drift = 0.008 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) = 0.707 mW/g



SAR Report

FCC_RM-691_01

Applicant: Nokia Corporation

Type: RM-691

Copyright © 2011 TCC Nokia

Date/Time: 2011-01-25 13:54:17

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: HSL1900; Medium Notes: t= 22.0 C

Medium parameters used: f = 1880 MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.655 mW/g

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

Reference Value = 16.1 V/m

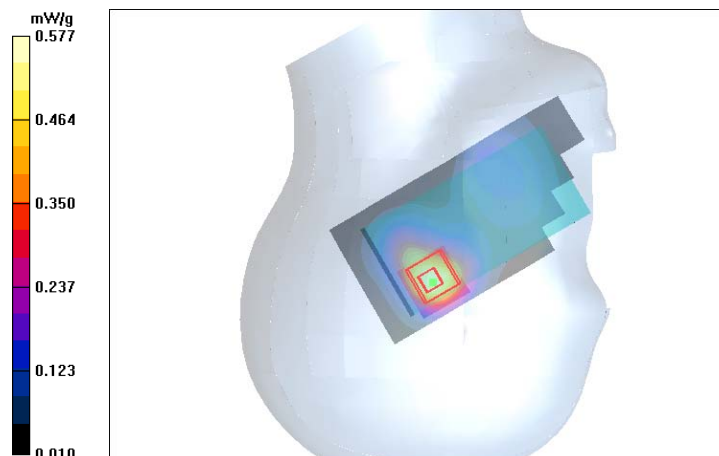
Peak SAR (extrapolated) = 0.787 W/kg

SAR(1 g) = 0.529 mW/g

SAR(10 g) = 0.322 mW/g

Power Drift = 0.019 dB

Maximum value of SAR (measured) = 0.577 mW/g



Date/Time: 2011-01-25 12:05:53

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: 2-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:4.2

Medium: HSL1900; Medium Notes: t= 22.0 C

Medium parameters used: f = 1880 MHz; σ = 1.38 mho/m; ϵ_r = 39.6; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.867 mW/g

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

Reference Value = 9.07 V/m

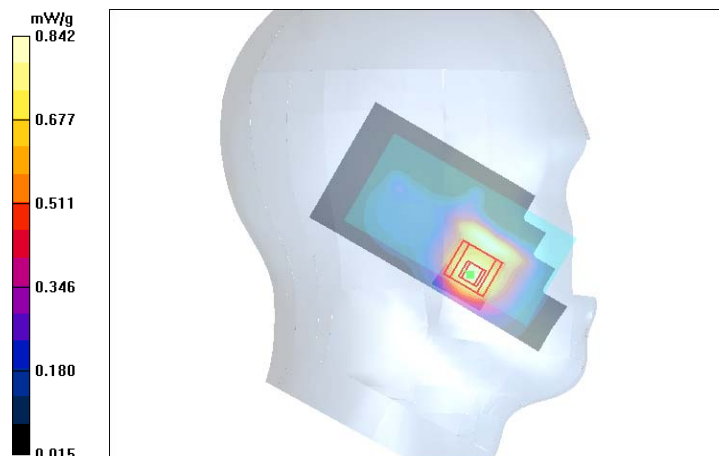
Peak SAR (extrapolated) = 1.11 W/kg

SAR(1 g) = 0.772 mW/g

SAR(10 g) = 0.494 mW/g

Power Drift = 0.002 dB

Maximum value of SAR (measured) = 0.842 mW/g



Date/Time: 2011-01-25 12:22:26

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: 3-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:2.8

Medium: HSL1900; Medium Notes: t= 22.0 C

Medium parameters used: f = 1880 MHz; σ = 1.38 mho/m; ϵ_r = 39.6; ρ = 1000 kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.908 mW/g

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

Reference Value = 9.23 V/m

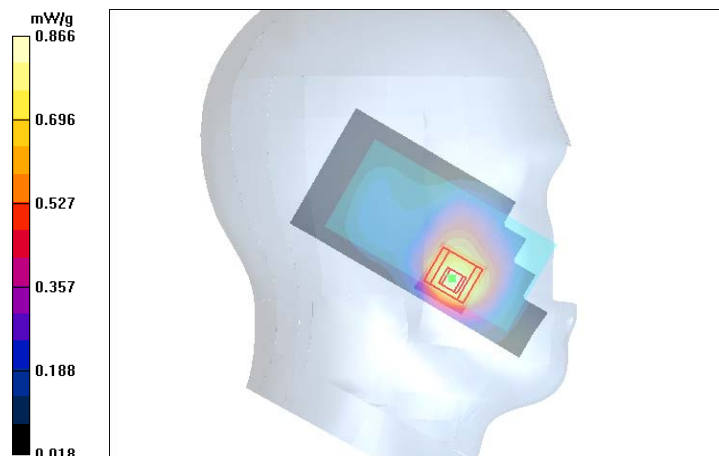
Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.796 mW/g

SAR(10 g) = 0.510 mW/g

Power Drift = -0.077 dB

Maximum value of SAR (measured) = 0.866 mW/g



Date/Time: 2011-01-25 12:37:11

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: 4-slot GPRS1900

Frequency: 1880 MHz; Duty Cycle: 1:2.1

Medium: HSL1900; Medium Notes: $t = 22.0$ C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.947 mW/g

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

Reference Value = 9.28 V/m

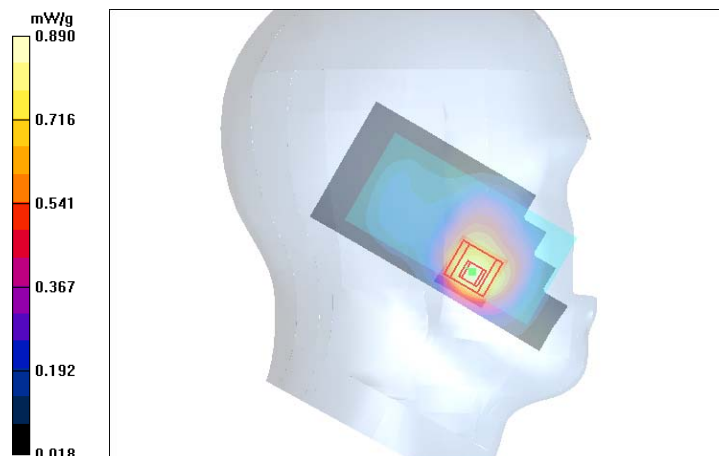
Peak SAR (extrapolated) = 1.18 W/kg

SAR(1 g) = 0.815 mW/g

SAR(10 g) = 0.522 mW/g

Power Drift = -0.032 dB

Maximum value of SAR (measured) = 0.890 mW/g



Date/Time: 2011-01-25 15:35:08

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: 1-slot 8PSK EGPRS1900

Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium: HSL1900; Medium Notes: t= 22.0 C

Medium parameters used: f = 1910 MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.9, 4.9, 4.9); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.307 mW/g

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

Reference Value = 5.36 V/m

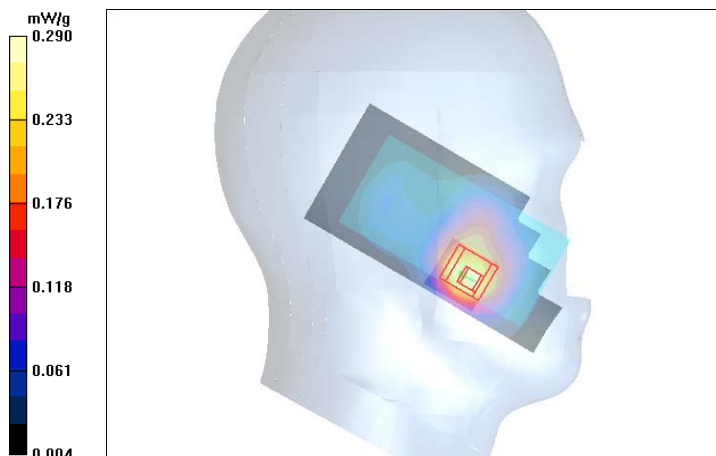
Peak SAR (extrapolated) = 0.405 W/kg

SAR(1 g) = 0.260 mW/g

SAR(10 g) = 0.163 mW/g

Power Drift = -0.359 dB

Maximum value of SAR (measured) = 0.290 mW/g



Date/Time: 2011-01-24 10:06:48

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: $t = 19.8$ C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.81$ mho/m; $\epsilon_r = 37.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.26, 4.26, 4.26); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2010-09-08
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.287 mW/g

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

Reference Value = 12.8 V/m

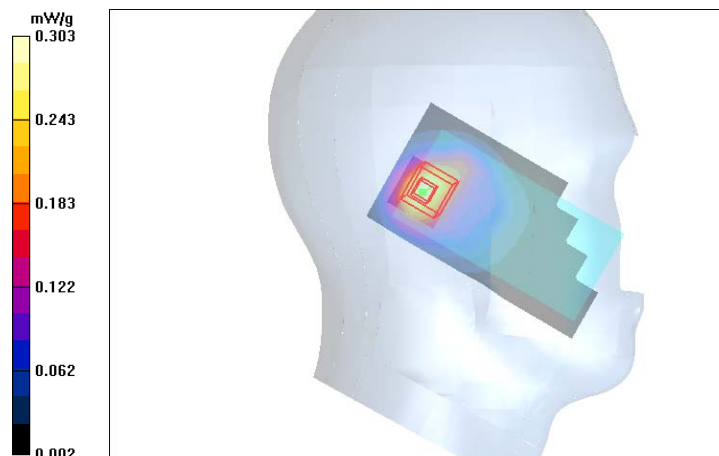
Peak SAR (extrapolated) = 0.500 W/kg

SAR(1 g) = 0.272 mW/g

SAR(10 g) = 0.144 mW/g

Power Drift = -0.125 dB

Maximum value of SAR (measured) = 0.303 mW/g



Date/Time: 2011-01-24 10:21:37

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: $t = 19.8$ C

Medium parameters used: $f = 2442$ MHz; $\sigma = 1.81$ mho/m; $\epsilon_r = 37.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.26, 4.26, 4.26); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2010-09-08
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.336 mW/g

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

Reference Value = 14.1 V/m

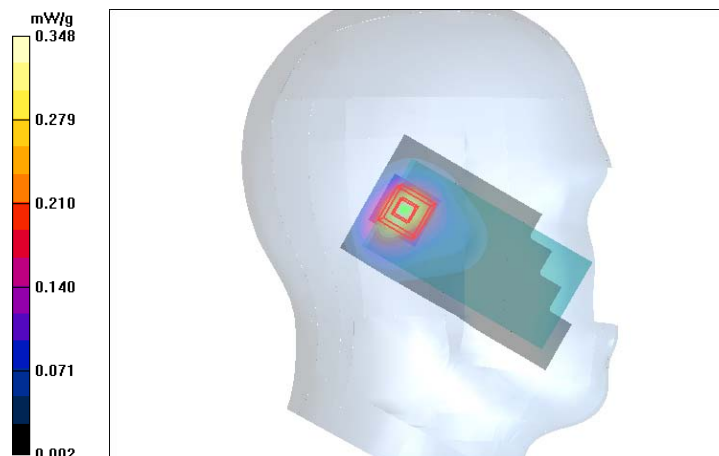
Peak SAR (extrapolated) = 0.581 W/kg

SAR(1 g) = 0.308 mW/g

SAR(10 g) = 0.158 mW/g

Power Drift = 0.027 dB

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



Date/Time: 2011-01-24 11:02:14

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: t= 19.8 C

Medium parameters used: f = 2442 MHz; $\sigma = 1.81$ mho/m; $\epsilon_r = 37.7$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.26, 4.26, 4.26); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2010-09-08
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.378 mW/g

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

Reference Value = 11.3 V/m

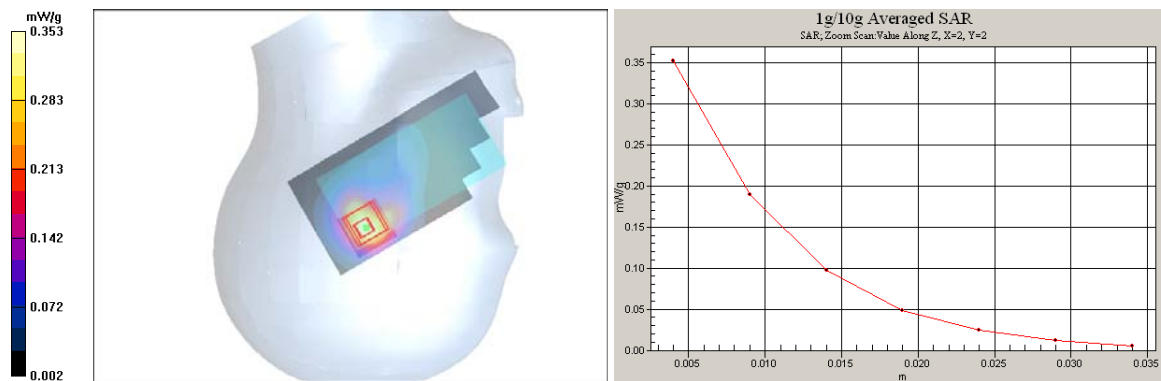
Peak SAR (extrapolated) = 0.619 W/kg

SAR(1 g) = 0.318 mW/g

SAR(10 g) = 0.163 mW/g

Power Drift = 0.036 dB

Maximum value of SAR (measured) = 0.353 mW/g



Date/Time: 2011-01-24 11:13:18

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: t= 19.8 C

Medium parameters used: f = 2442 MHz; $\sigma = 1.81$ mho/m; $\epsilon_r = 37.7$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.26, 4.26, 4.26); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2010-09-08
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

Tilt - 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) = 0.569 W/kg

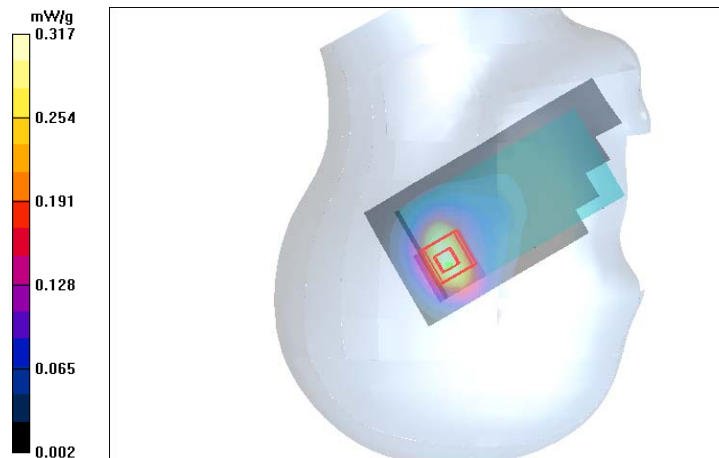
SAR(1 g) = 0.286 mW/g

SAR(10 g) = 0.149 mW/g

Power Drift = 0.032 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) = 0.317 mW/g



Date/Time: 2011-01-24 12:30:08

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WLAN2450 n-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: HSL2450; Medium Notes: t= 19.8 C

Medium parameters used: f = 2442 MHz; σ = 1.81 mho/m; ϵ_r = 37.7; ρ = 1000 kg/m³

Phantom section: Right Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.26, 4.26, 4.26); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2010-09-08
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

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

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

Reference Value = 10.1 V/m

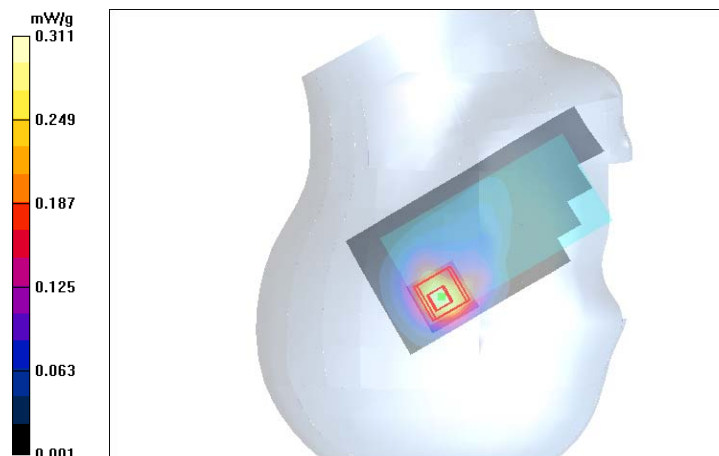
Peak SAR (extrapolated) = 0.562 W/kg

SAR(1 g) = 0.280 mW/g

SAR(10 g) = 0.140 mW/g

Power Drift = 0.025 dB

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



Date/Time: 2011-01-19 08:52:43

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: BSL850; Medium Notes: t= 21.2 C

Medium parameters used: f = 837 MHz; σ = 1 mho/m; ϵ_r = 53.5; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(5.95, 5.95, 5.95); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.343 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 = 7.61 V/m

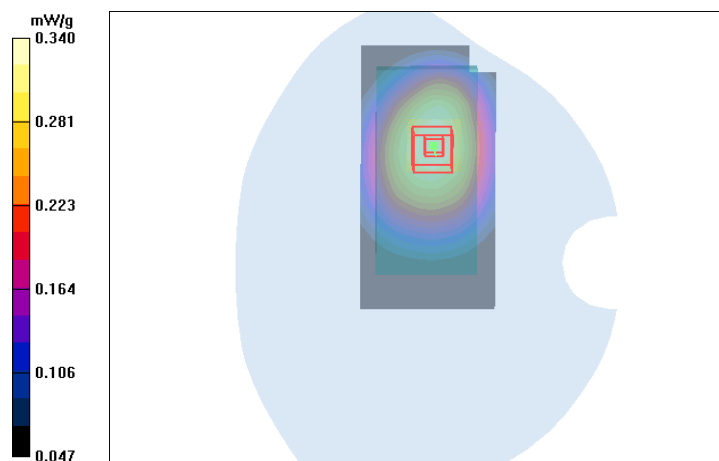
Peak SAR (extrapolated) = 0.412 W/kg

SAR(1 g) = 0.324 mW/g

SAR(10 g) = 0.244 mW/g

Power Drift = -0.023 dB

Maximum value of SAR (measured) = 0.340 mW/g



Date/Time: 2011-01-19 09:06:01

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: BSL850; Medium Notes: t= 21.2 C

Medium parameters used: f = 837 MHz; σ = 1 mho/m; ϵ_r = 53.5; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(5.95, 5.95, 5.95); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - Middle - WH-102 - Display Facing Phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.222 mW/g

Body - Middle - WH-102 - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 5.97 V/m

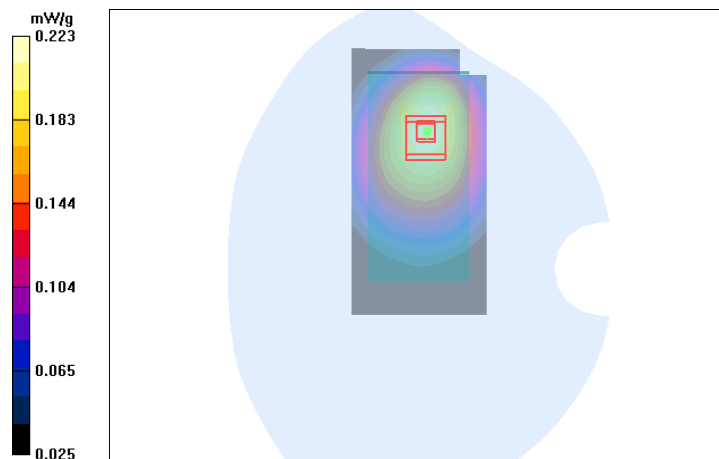
Peak SAR (extrapolated) = 0.274 W/kg

SAR(1 g) = 0.211 mW/g

SAR(10 g) = 0.156 mW/g

Power Drift = -0.038 dB

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



Date/Time: 2011-01-19 11:39:27

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM850

Frequency: 848.8 MHz; Duty Cycle: 1:8.3

Medium: BSL850; Medium Notes: t= 21.2 C

Medium parameters used: f = 849 MHz; σ = 1.01 mho/m; ϵ_r = 53.4; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(5.95, 5.95, 5.95); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - High - No Accessory - Back Facing Phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.501 mW/g

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

Reference Value = 7.85 V/m

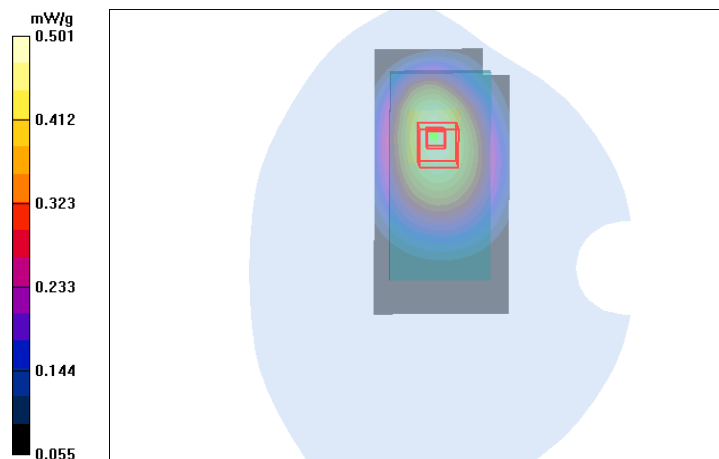
Peak SAR (extrapolated) = 0.621 W/kg

SAR(1 g) = 0.476 mW/g

SAR(10 g) = 0.349 mW/g

Power Drift = -0.010 dB

Maximum value of SAR (measured) = 0.501 mW/g



SAR Report

FCC_RM-691_01

Applicant: Nokia Corporation

Type: RM-691

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Date/Time: 2011-01-19 09:17:49

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM850

Frequency: 836.6 MHz; Duty Cycle: 1:8.3

Medium: BSL850; Medium Notes: t= 21.2 C

Medium parameters used: f = 837 MHz; $\sigma = 1$ mho/m; $\epsilon_r = 53.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(5.95, 5.95, 5.95); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - Middle - WH-102 - Back Facing Phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

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

Body - Middle - WH-102 - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 5.73 V/m

Peak SAR (extrapolated) = 0.415 W/kg

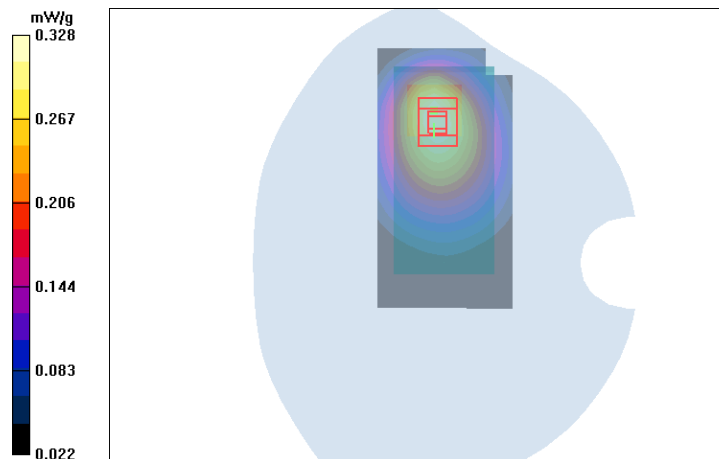
SAR(1 g) = 0.311 mW/g

SAR(10 g) = 0.221 mW/g

Power Drift = -0.032 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) = 0.328 mW/g



Date/Time: 2011-01-21 11:13:53

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WCDMA850

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: BSL850; Medium Notes: t= 21.0 C

Medium parameters used: f = 835 MHz; σ = 1 mho/m; ϵ_r = 53.6; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(5.95, 5.95, 5.95); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.442 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 = 8.37 V/m

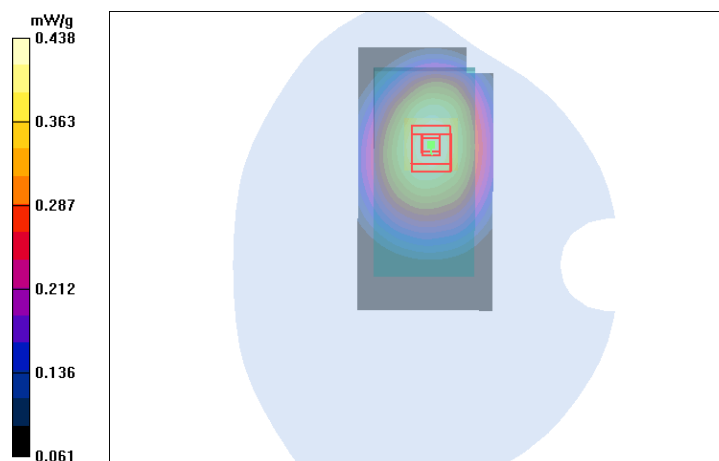
Peak SAR (extrapolated) = 0.530 W/kg

SAR(1 g) = 0.417 mW/g

SAR(10 g) = 0.313 mW/g

Power Drift = -0.153 dB

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



Date/Time: 2011-01-21 11:26:56

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WCDMA850

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: BSL850; Medium Notes: t= 21.0 C

Medium parameters used: f = 835 MHz; $\sigma = 1$ mho/m; $\epsilon_r = 53.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(5.95, 5.95, 5.95); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - Middle - WH-102 - Display Facing Phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.369 mW/g

Body - Middle - WH-102 - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 6.75 V/m

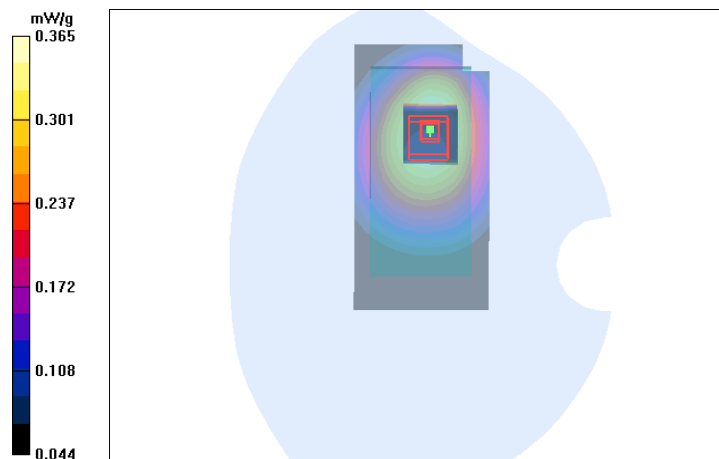
Peak SAR (extrapolated) = 0.445 W/kg

SAR(1 g) = 0.346 mW/g

SAR(10 g) = 0.258 mW/g

Power Drift = 0.036 dB

Maximum value of SAR (measured) = 0.365 mW/g



SAR Report

FCC_RM-691_01

Applicant: Nokia Corporation

Type: RM-691

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Date/Time: 2011-01-21 12:13:11

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WCDMA850

Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: BSL850; Medium Notes: t= 21.0 C

Medium parameters used: f = 847 MHz; σ = 1.01 mho/m; ϵ_r = 53.5; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(5.95, 5.95, 5.95); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - High - No Accessory - Back Facing Phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.577 mW/g

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

Reference Value = 8.07 V/m

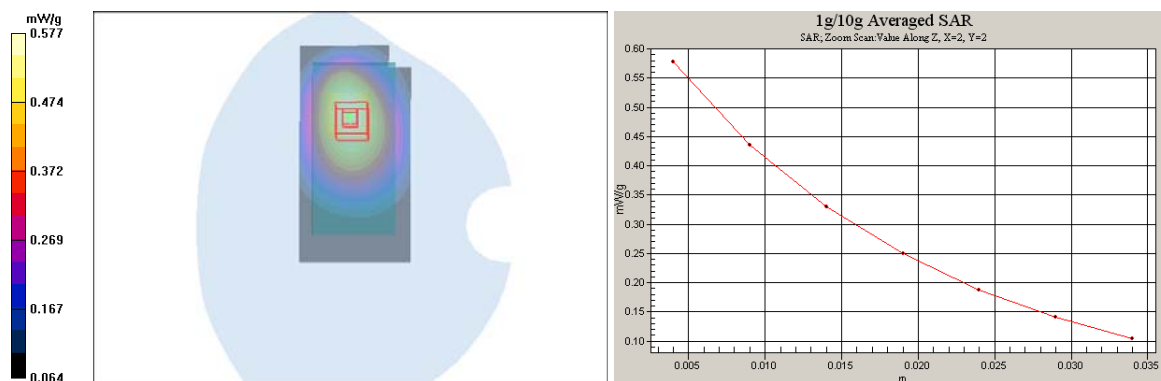
Peak SAR (extrapolated) = 0.716 W/kg

SAR(1 g) = 0.548 mW/g

SAR(10 g) = 0.401 mW/g

Power Drift = 0.029 dB

Maximum value of SAR (measured) = 0.577 mW/g



SAR Report

FCC_RM-691_01

Applicant: Nokia Corporation

Type: RM-691

Copyright © 2011 TCC Nokia

Date/Time: 2011-01-21 11:39:00

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WCDMA850

Frequency: 835 MHz; Duty Cycle: 1:1

Medium: BSL850; Medium Notes: t= 21.0 C

Medium parameters used: f = 835 MHz; $\sigma = 1$ mho/m; $\epsilon_r = 53.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194
- ConvF(5.95, 5.95, 5.95); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2010-09-09
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - Middle - WH-102 - Back Facing Phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.433 mW/g

Body - Middle - WH-102 - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 7.59 V/m

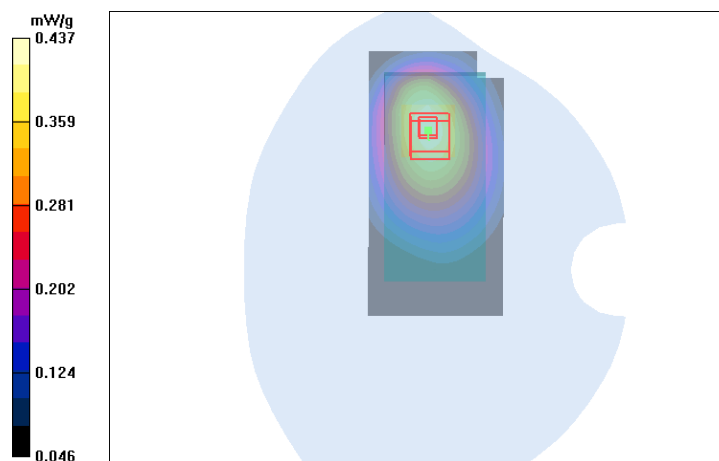
Peak SAR (extrapolated) = 0.547 W/kg

SAR(1 g) = 0.414 mW/g

SAR(10 g) = 0.301 mW/g

Power Drift = 0.061 dB

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



SAR Report

FCC_RM-691_01

Applicant: Nokia Corporation

Type: RM-691

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Date/Time: 2011-01-24 14:11:12

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311732/9

Communication System: WCDMA1700/2100

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: BSL1800; Medium Notes: t= 21.5 C

Medium parameters used (interpolated): f = 1732.4 MHz; σ = 1.43 mho/m; ϵ_r = 51.5; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.78, 4.78, 4.78); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.783 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 = 11.5 V/m

Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.707 mW/g

SAR(10 g) = 0.450 mW/g

Power Drift = -0.037 dB

Maximum value of SAR (measured) = 0.764 mW/g

Body - Middle - No Accessory - Display Facing Phantom/Zoom Scan 2 (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 11.5 V/m

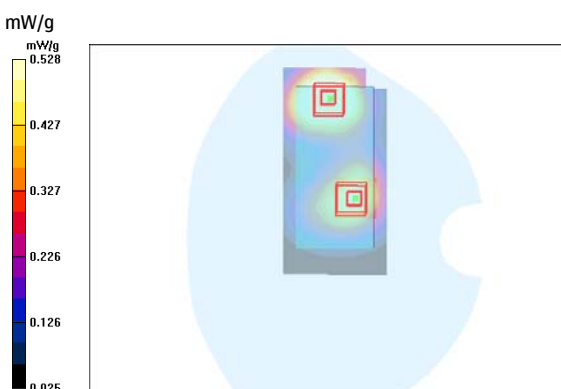
Peak SAR (extrapolated) = 0.703 W/kg

SAR(1 g) = 0.491 mW/g

SAR(10 g) = 0.323 mW/g

Power Drift = -0.037 dB

Maximum value of SAR (measured) = 0.528 mW/g



Date/Time: 2011-01-24 14:32:15

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311732/9

Communication System: WCDMA1700/2100

Frequency: 1732.4 MHz; Duty Cycle: 1:1

Medium: BSL1800; Medium Notes: t= 21.5 C

Medium parameters used (interpolated): f = 1732.4 MHz; $\sigma = 1.43$ mho/m; $\epsilon_r = 51.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165

- ConvF(4.78, 4.78, 4.78); Calibrated: 2010-03-16

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

- Electronics: DAE4 Sn728; Calibrated: 2010-03-19

- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - Middle - WH-102 - Dispaly Facing Phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.701 mW/g

Body - Middle - WH-102 - Dispaly Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 10.3 V/m

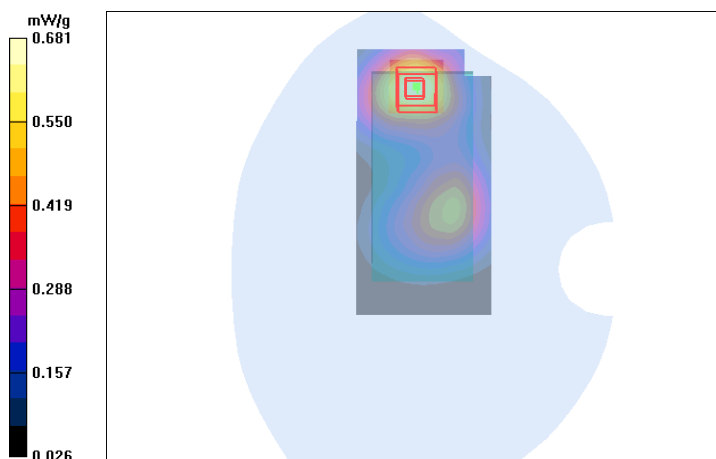
Peak SAR (extrapolated) = 0.953 W/kg

SAR(1 g) = 0.630 mW/g

SAR(10 g) = 0.401 mW/g

Power Drift = 0.040 dB

Maximum value of SAR (measured) = 0.681 mW/g



SAR Report

FCC_RM-691_01

Applicant: Nokia Corporation

Type: RM-691

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Date/Time: 2011-01-24 15:38:45

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311732/9

Communication System: WCDMA1700/2100

Frequency: 1752.6 MHz; Duty Cycle: 1:1

Medium: BSL1800; Medium Notes: t= 21.5 C

Medium parameters used: f = 1753 MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 51.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165

- ConvF(4.78, 4.78, 4.78); Calibrated: 2010-03-16

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

- Electronics: DAE4 Sn728; Calibrated: 2010-03-19

- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179

- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - High - No Accessory - Back Facing Phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

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

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

Reference Value = 12.7 V/m

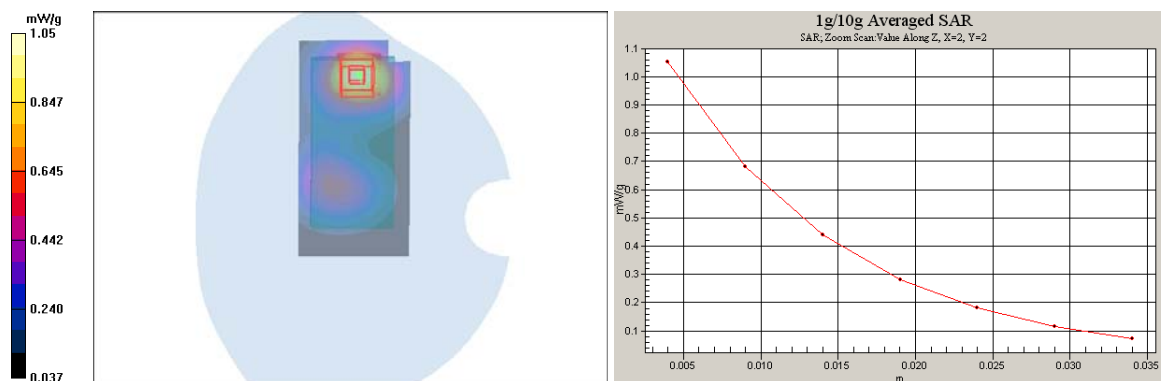
Peak SAR (extrapolated) = 1.47 W/kg

SAR(1 g) = 0.969 mW/g

SAR(10 g) = 0.599 mW/g

Power Drift = -0.306 dB

Maximum value of SAR (measured) = 1.05 mW/g



SAR Report

FCC_RM-691_01

Applicant: Nokia Corporation

Type: RM-691

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Date/Time: 2011-01-24 16:47:50

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311732/9

Communication System: WCDMA1700/2100

Frequency: 1752.6 MHz; Duty Cycle: 1:1

Medium: BSL1800; Medium Notes: t= 21.5 C

Medium parameters used: f = 1753 MHz; σ = 1.45 mho/m; ϵ_r = 51.4; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.78, 4.78, 4.78); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - High - WH-102 - Back Facing Phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.984 mW/g

Body - High - WH-102 - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Reference Value = 11.8 V/m

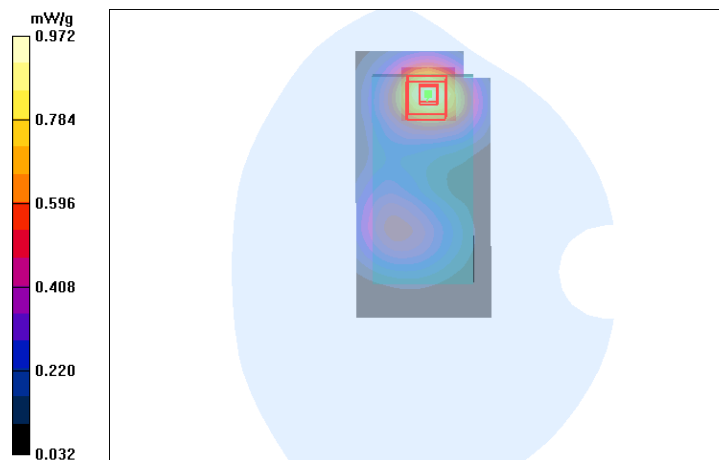
Peak SAR (extrapolated) = 1.36 W/kg

SAR(1 g) = 0.891 mW/g

SAR(10 g) = 0.548 mW/g

Power Drift = 0.009 dB

Maximum value of SAR (measured) = 0.972 mW/g



Date/Time: 2011-01-25 14:13:33

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: BSL1900; Medium Notes: $t = 21.4$ C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.59, 4.59, 4.59); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

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

Maximum value of SAR (interpolated) = 0.595 mW/g

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

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

Reference Value = 13.0 V/m

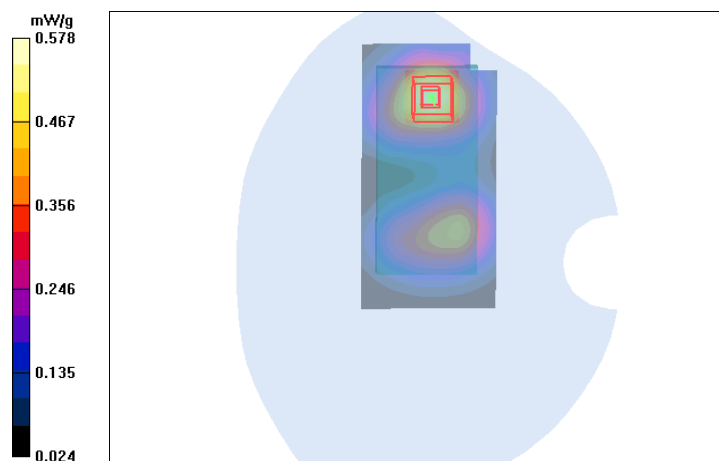
Peak SAR (extrapolated) = 0.789 W/kg

SAR(1 g) = 0.530 mW/g

SAR(10 g) = 0.335 mW/g

Power Drift = -0.062 dB

Maximum value of SAR (measured) = 0.578 mW/g



Date/Time: 2011-01-25 14:26:52

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: BSL1900; Medium Notes: $t = 21.4$ C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.59, 4.59, 4.59); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - Middle - WH-102 - Display Facing Phantom/Area Scan (51x101x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.553 mW/g

Body - Middle - WH-102 - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 11.6 V/m

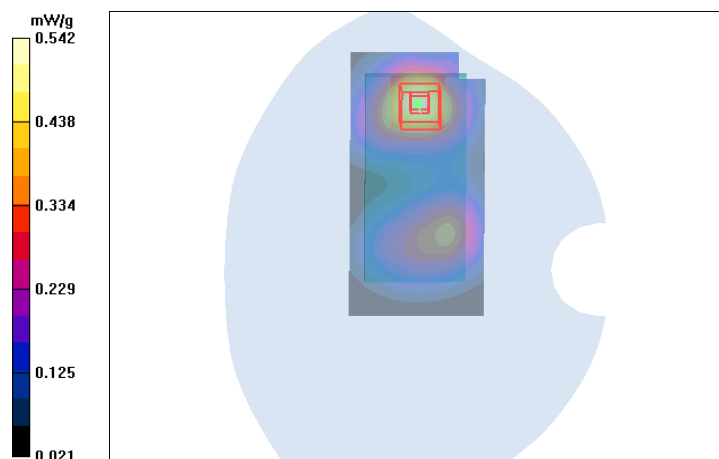
Peak SAR (extrapolated) = 0.749 W/kg

SAR(1 g) = 0.495 mW/g

SAR(10 g) = 0.310 mW/g

Power Drift = 0.111 dB

Maximum value of SAR (measured) = 0.542 mW/g



Date/Time: 2011-01-25 16:32:48

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM1900

Frequency: 1909.8 MHz; Duty Cycle: 1:8.3

Medium: BSL1900; Medium Notes: t= 21.4 C

Medium parameters used: f = 1910 MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 52.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.59, 4.59, 4.59); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - High - No Accessory - Back Facing Phantom/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.749 mW/g

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

Reference Value = 11.4 V/m

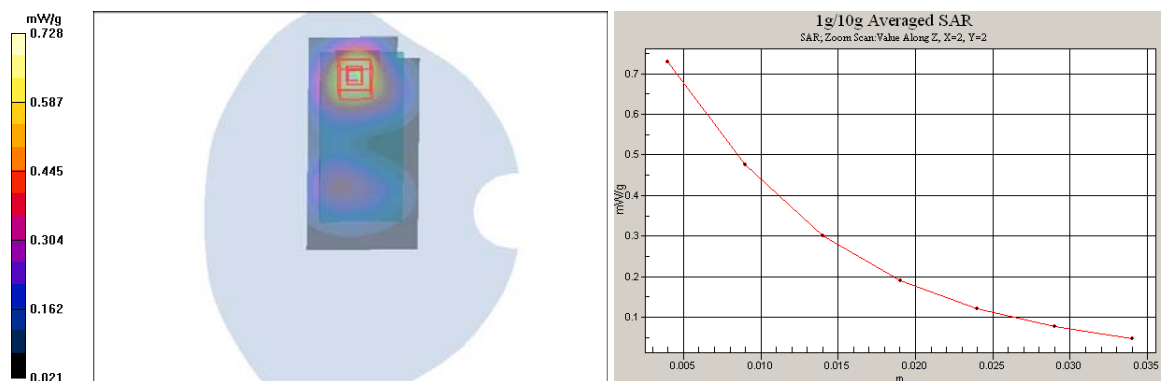
Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.679 mW/g

SAR(10 g) = 0.424 mW/g

Power Drift = 0.242 dB

Maximum value of SAR (measured) = 0.728 mW/g



SAR Report

FCC_RM-691_01

Applicant: Nokia Corporation

Type: RM-691

Copyright © 2011 TCC Nokia

Date/Time: 2011-01-25 14:50:29

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM1900

Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: BSL1900; Medium Notes: $t = 21.4$ C

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165
- ConvF(4.59, 4.59, 4.59); Calibrated: 2010-03-16
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2010-03-19
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - Middle - WH-102 - Back Facing Phantom/Area Scan (51x101x1): Measurement grid: $dx=15$ mm, $dy=15$ mm

Maximum value of SAR (interpolated) = 0.625 mW/g

Body - Middle - WH-102 - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5$ mm, $dy=7.5$ mm, $dz=5$ mm

Reference Value = 11.4 V/m

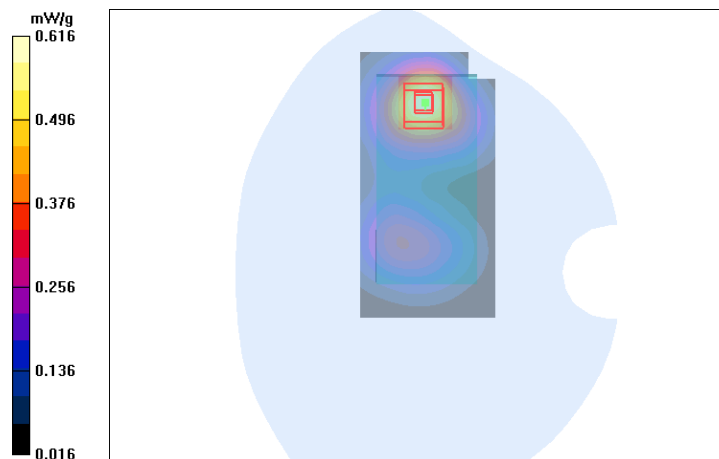
Peak SAR (extrapolated) = 0.862 W/kg

SAR(1 g) = 0.568 mW/g

SAR(10 g) = 0.353 mW/g

Power Drift = -0.004 dB

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



Date/Time: 2011-01-24 14:10:16

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: $t = 20.7\text{ C}$

Medium parameters used: $f = 2442\text{ MHz}$; $\sigma = 2\text{ mho/m}$; $\epsilon_r = 50.5$; $\rho = 1000\text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.05, 4.05, 4.05); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2010-09-08
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - Middle - No Accessory - Display Facing Phantom/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.080 mW/g

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

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

Reference Value = 5.86 V/m

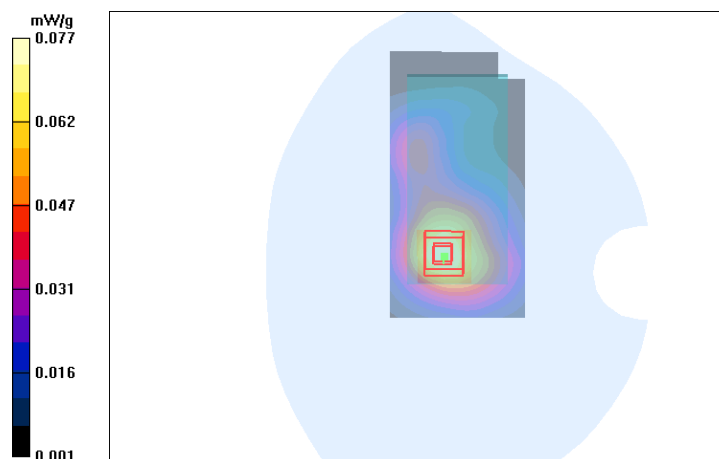
Peak SAR (extrapolated) = 0.127 W/kg

SAR(1 g) = 0.072 mW/g

SAR(10 g) = 0.042 mW/g

Power Drift = -0.221 dB

Maximum value of SAR (measured) = 0.077 mW/g



Date/Time: 2011-01-24 14:25:58

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: $t = 20.7\text{ }^{\circ}\text{C}$

Medium parameters used: $f = 2442\text{ MHz}$; $\sigma = 2\text{ mho/m}$; $\epsilon_r = 50.5$; $\rho = 1000\text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.05, 4.05, 4.05); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2010-09-08
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - Middle - WH-102 - Display Facing Phantom/Area Scan (51x101x1): Measurement grid: $dx=15\text{ mm}$, $dy=15\text{ mm}$

Maximum value of SAR (interpolated) = 0.069 mW/g

Body - Middle - WH-102 - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{ mm}$, $dy=7.5\text{ mm}$, $dz=5\text{ mm}$

Reference Value = 5.35 V/m

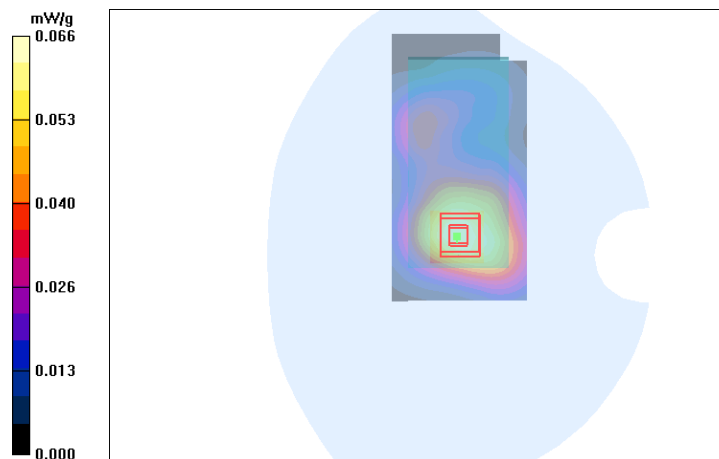
Peak SAR (extrapolated) = 0.107 W/kg

SAR(1 g) = 0.062 mW/g

SAR(10 g) = 0.037 mW/g

Power Drift = 0.057 dB

Maximum value of SAR (measured) = 0.066 mW/g



Date/Time: 2011-01-24 14:48:30

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: $t = 20.7\text{ C}$

Medium parameters used: $f = 2442\text{ MHz}$; $\sigma = 2\text{ mho/m}$; $\epsilon_r = 50.5$; $\rho = 1000\text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.05, 4.05, 4.05); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2010-09-08
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - Middle - No Accessory - Back Facing Phantom/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.090 mW/g

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

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

Reference Value = 5.98 V/m

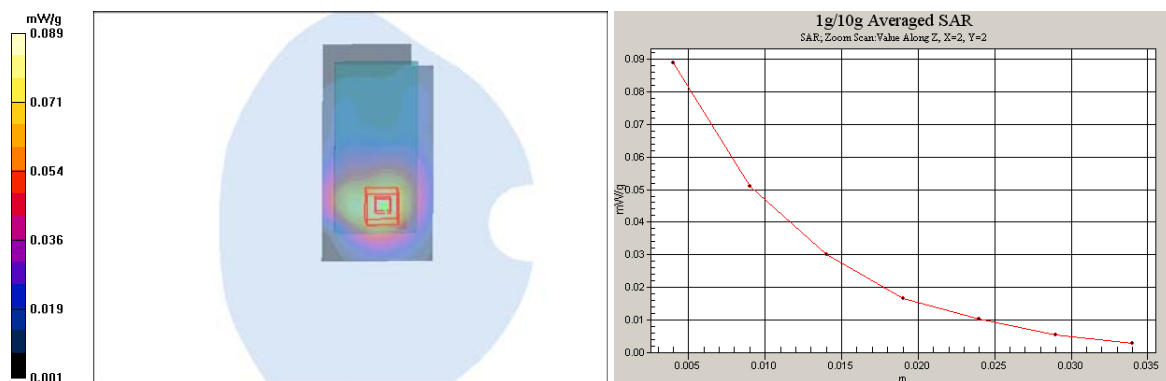
Peak SAR (extrapolated) = 0.145 W/kg

SAR(1 g) = 0.083 mW/g

SAR(10 g) = 0.049 mW/g

Power Drift = -0.084 dB

Maximum value of SAR (measured) = 0.089 mW/g



SAR Report

FCC_RM-691_01

Applicant: Nokia Corporation

Type: RM-691

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Date/Time: 2011-01-24 15:28:32

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WLAN2450 b-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: $t = 20.7\text{ C}$

Medium parameters used: $f = 2442\text{ MHz}$; $\sigma = 2\text{ mho/m}$; $\epsilon_r = 50.5$; $\rho = 1000\text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.05, 4.05, 4.05); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2010-09-08
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - Middle - WH-102 - Back Facing Phantom/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.086 mW/g

Body - Middle - WH-102 - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=7.5\text{mm}$, $dy=7.5\text{mm}$, $dz=5\text{mm}$

Reference Value = 5.78 V/m

Peak SAR (extrapolated) = 0.144 W/kg

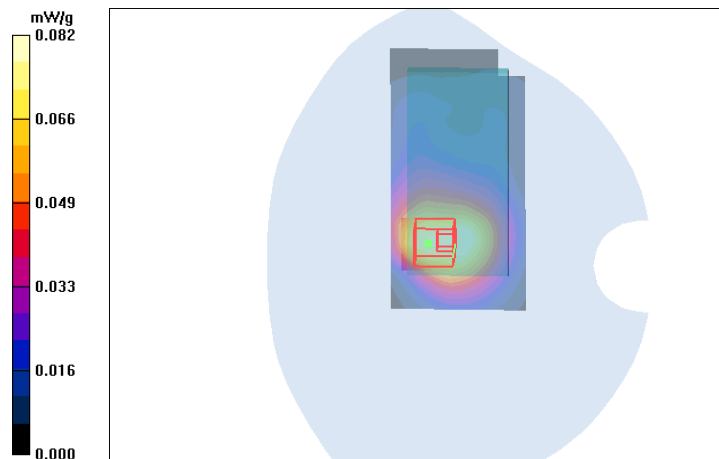
SAR(1 g) = 0.076 mW/g

SAR(10 g) = 0.044 mW/g

Power Drift = 0.017 dB

Warning: Maximum averaged SAR over 1 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) = 0.082 mW/g



Date/Time: 2011-01-24 17:08:43

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WLAN2450 n-mode

Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: BSL2450; Medium Notes: $t = 20.7\text{ C}$

Medium parameters used: $f = 2442\text{ MHz}$; $\sigma = 2\text{ mho/m}$; $\epsilon_r = 50.5$; $\rho = 1000\text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3131
- ConvF(4.05, 4.05, 4.05); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2010-09-08
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, V4.7 Build 55; Postprocessing SW: SEMCAD, V1.8 Build 176

Body - Middle - No Accessory - Back Facing Phantom/Area Scan (51x101x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.072 mW/g

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

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

Reference Value = 5.55 V/m

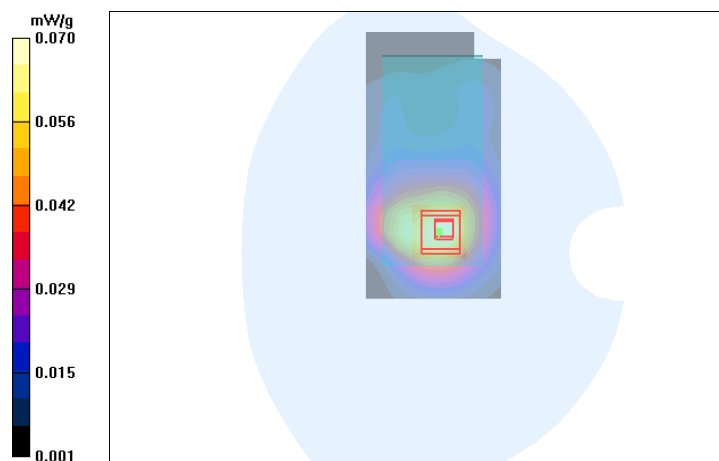
Peak SAR (extrapolated) = 0.115 W/kg

SAR(1 g) = 0.065 mW/g

SAR(10 g) = 0.038 mW/g

Power Drift = -0.274 dB

Maximum value of SAR (measured) = 0.070 mW/g



Date/Time: 2011-01-12 13:52:32, Date/Time: 2011-01-24 10:06:48

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM850, Communication System: WLAN2450 b-mode

Frequency: 848.8 MHz, Frequency: 2442 MHz; Duty Cycle: 1:8.3, Duty Cycle: 1:1

Medium: HSL850, Medium: HSL2450; Medium Notes: $t = 20.0$ C, Medium Notes: $t = 19.8$ C

Medium parameters used: $f = 849$ MHz; $\sigma = 0.901$ mho/m; $\epsilon_r = 41.3$; $\rho = 1000$ kg/m³, Medium parameters used:
 $f = 2442$ MHz; $\sigma = 1.81$ mho/m; $\epsilon_r = 37.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194, Probe: ES3DV3 - SN3131
- ConvF(6.09, 6.09, 6.09), ConvF(4.26, 4.26, 4.26); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538, Electronics: DAE4 Sn793; Calibrated: 2010-09-09, Calibrated: 2010-09-08
- Phantom: SAM 3, Phantom: SAM1; Type: Twin SAM 040 CA, Type: SAM; Serial: TP-1179, Serial: TP-1126
- ; SEMCAD X Version 14.0 Build 61

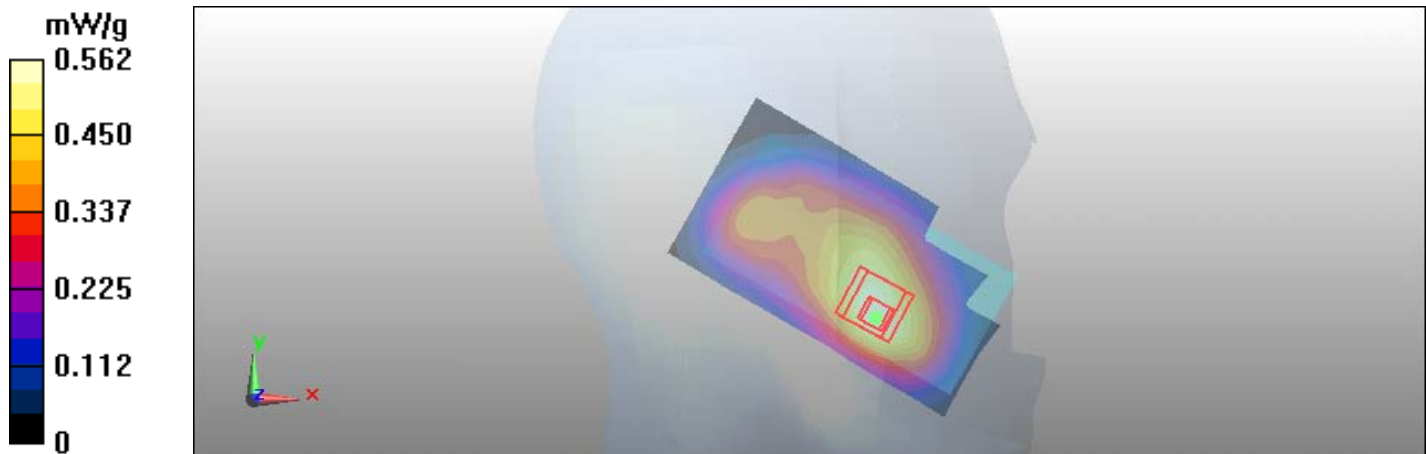
Configuration/Cheek - High/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm

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

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.521 mW/g

SAR(10 g) = 0.359 mW/g

Maximum value of SAR (measured) = 0.562 mW/g



Date/Time: 2011-01-13 13:57:39, Date/Time: 2011-01-24 10:06:48

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WCDMA850, Communication System: WLAN2450 b-mode

Frequency: 846.6 MHz, Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: HSL850, Medium: HSL2450; Medium Notes: $t = 20.0$ C, Medium Notes: $t = 19.8$ C

Medium parameters used: $f = 847$ MHz; $\sigma = 0.903$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³, Medium parameters used:
 $f = 2442$ MHz; $\sigma = 1.81$ mho/m; $\epsilon_r = 37.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194, Probe: ES3DV3 - SN3131
- ConvF(6.09, 6.09, 6.09), ConvF(4.26, 4.26, 4.26); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538, Electronics: DAE4 Sn793; Calibrated: 2010-09-09, Calibrated: 2010-09-08
- Phantom: SAM 3, Phantom: SAM1; Type: Twin SAM 040 CA, Type: SAM; Serial: TP-1179, Serial: TP-1126
- ; SEMCAD X Version 14.0 Build 61

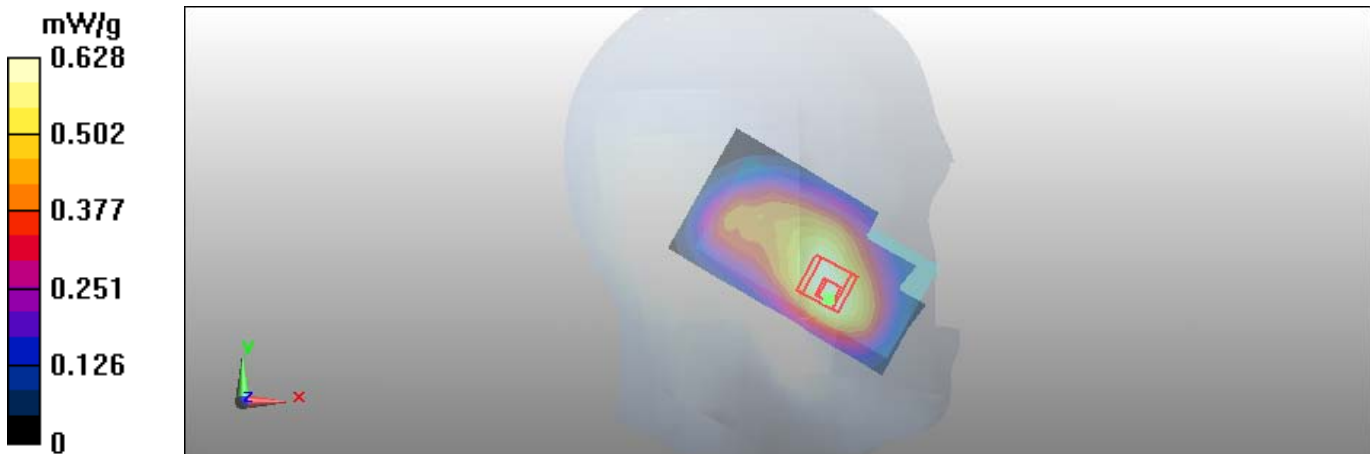
Configuration/Cheek - High/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm

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

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.589 mW/g

SAR(10 g) = 0.411 mW/g

Maximum value of SAR (measured) = 0.628 mW/g



Date/Time: 2011-01-24 10:43:37, Date/Time: 2011-01-24 10:06:48

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311732/9, Serial: 004402/13/311369/0

Communication System: WCDMA1700/2100, Communication System: WLAN2450 b-mode

Frequency: 1732.4 MHz, Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: HSL1800, Medium: HSL2450; Medium Notes: $t = 21.6$ C, Medium Notes: $t = 19.8$ C

Medium parameters used (interpolated): $f = 1732.4$ MHz; $\sigma = 1.3$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 2442$ MHz; $\sigma = 1.81$ mho/m; $\epsilon_r = 37.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165, Probe: ES3DV3 - SN3131
- ConvF(5.06, 5.06, 5.06), ConvF(4.26, 4.26, 4.26); Calibrated: 2010-03-16, Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728, Electronics: DAE4 Sn793; Calibrated: 2010-03-19, Calibrated: 2010-09-08
- Phantom: SAM 4, Phantom: SAM1; Type: Twin SAM 040 CA, Type: SAM; Serial: TP-1018, Serial: TP-1126
- ; SEMCAD X Version 14.0 Build 61

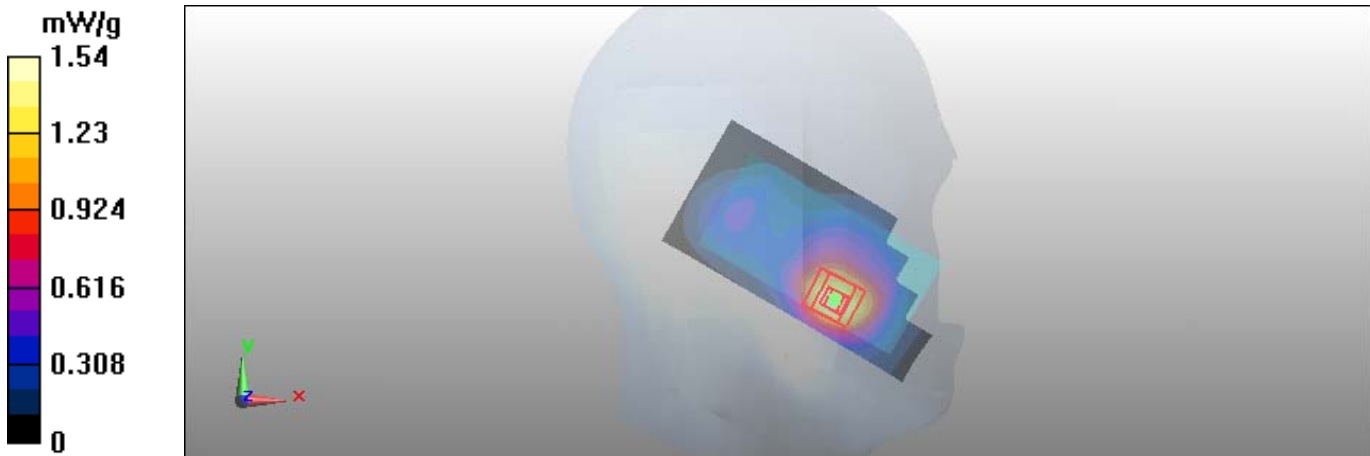
Configuration/Cheek - Middle/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm

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

Motorola Fast SAR of Combined Scans: SAR(1 g) = 1.37 mW/g

SAR(10 g) = 0.798 mW/g

Maximum value of SAR (measured) = 1.54 mW/g



Date/Time: 2011-01-25 13:19:10, Date/Time: 2011-01-24 10:06:48

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM1900, Communication System: WLAN2450 b-mode

Frequency: 1909.8 MHz, Frequency: 2442 MHz; Duty Cycle: 1:8.3, Duty Cycle: 1:1

Medium: HSL1900, Medium: HSL2450; Medium Notes: $t = 22.0$ C, Medium Notes: $t = 19.8$ C

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³, Medium parameters used:
 $f = 2442$ MHz; $\sigma = 1.81$ mho/m; $\epsilon_r = 37.7$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165, Probe: ES3DV3 - SN3131
- ConvF(4.9, 4.9, 4.9), ConvF(4.26, 4.26, 4.26); Calibrated: 2010-03-16, Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728, Electronics: DAE4 Sn793; Calibrated: 2010-03-19, Calibrated: 2010-09-08
- Phantom: SAM 1, Phantom: SAM1; Type: Twin SAM 040 CA, Type: SAM; Serial: TP-1449, Serial: TP-1126
- ; SEMCAD X Version 14.0 Build 61

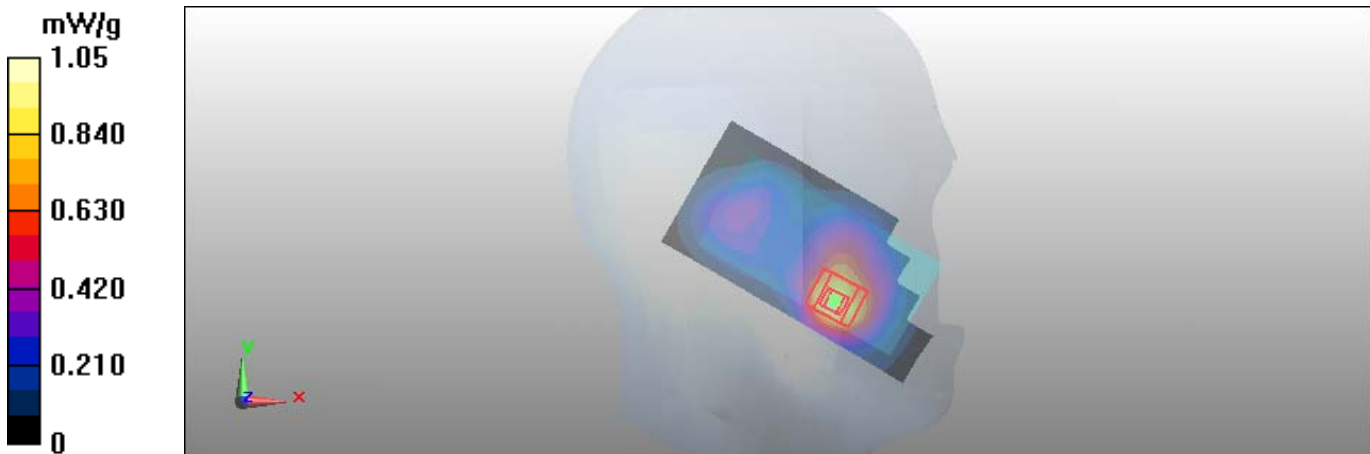
Configuration/Cheek - High/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm

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

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.917 mW/g

SAR(10 g) = 0.516 mW/g

Maximum value of SAR (measured) = 1.05 mW/g



Date/Time: 2011-01-19 11:39:27, Date/Time: 2011-01-24 14:48:30

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM850, Communication System: WLAN2450 b-mode

Frequency: 848.8 MHz, Frequency: 2442 MHz; Duty Cycle: 1:8.3, Duty Cycle: 1:1

Medium: BSL850, Medium: BSL2450; Medium Notes: $t = 21.2$ C, Medium Notes: $t = 20.7$ C

Medium parameters used: $f = 849$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³, Medium parameters used:
 $f = 2442$ MHz; $\sigma = 2$ mho/m; $\epsilon_r = 50.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

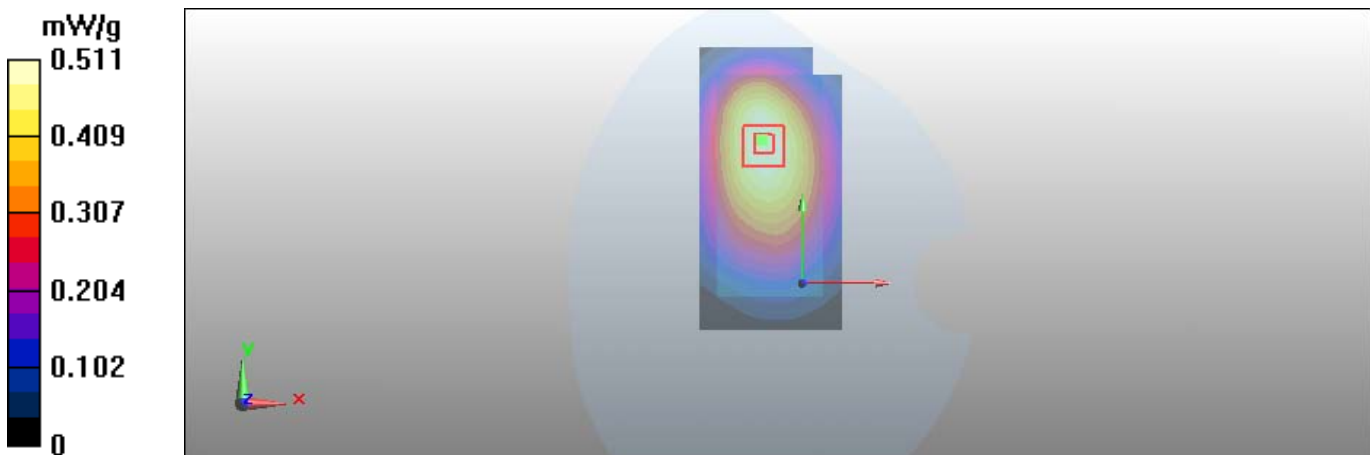
- Probe: ES3DV3 - SN3194, Probe: ES3DV3 - SN3131
- ConvF(5.95, 5.95, 5.95), ConvF(4.05, 4.05, 4.05); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn538, Electronics: DAE4 Sn793; Calibrated: 2010-09-09, Calibrated: 2010-09-08
- Phantom: SAM 1, Phantom: SAM2; Type: Twin SAM 040 CA, Type: SAM; Serial: TP-1179, Serial: TP-1570
- ; SEMCAD X Version 14.0 Build 61

Configuration/Body - High - No Accessory - Back Facing Phantom/Area Scan (6x11x1): Measurement grid:
dx=15mm, dy=15mm

Configuration/Body - Middle - No Accessory - Back Facing Phantom/Area Scan (6x11x1): Measurement grid:
dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.485 mW/g
SAR(10 g) = 0.343 mW/g

Maximum value of SAR (measured) = 0.511 mW/g



Date/Time: 2011-01-21 12:13:11, Date/Time: 2011-01-24 14:48:30

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: WCDMA850, Communication System: WLAN2450 b-mode

Frequency: 846.6 MHz, Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: BSL850, Medium: BSL2450; Medium Notes: t= 21.0 C, Medium Notes: t= 20.7 C

Medium parameters used: f = 847 MHz; σ = 1.01 mho/m; ϵ_r = 53.5; ρ = 1000 kg/m³, Medium parameters used:
f = 2442 MHz; σ = 2 mho/m; ϵ_r = 50.5; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3194, Probe: ES3DV3 - SN3131
- ConvF(5.95, 5.95, 5.95), ConvF(4.05, 4.05, 4.05); Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn538, Electronics: DAE4 Sn793; Calibrated: 2010-09-09, Calibrated: 2010-09-08
- Phantom: SAM 1, Phantom: SAM2; Type: Twin SAM 040 CA, Type: SAM; Serial: TP-1179, Serial: TP-1570
- ; SEMCAD X Version 14.0 Build 61

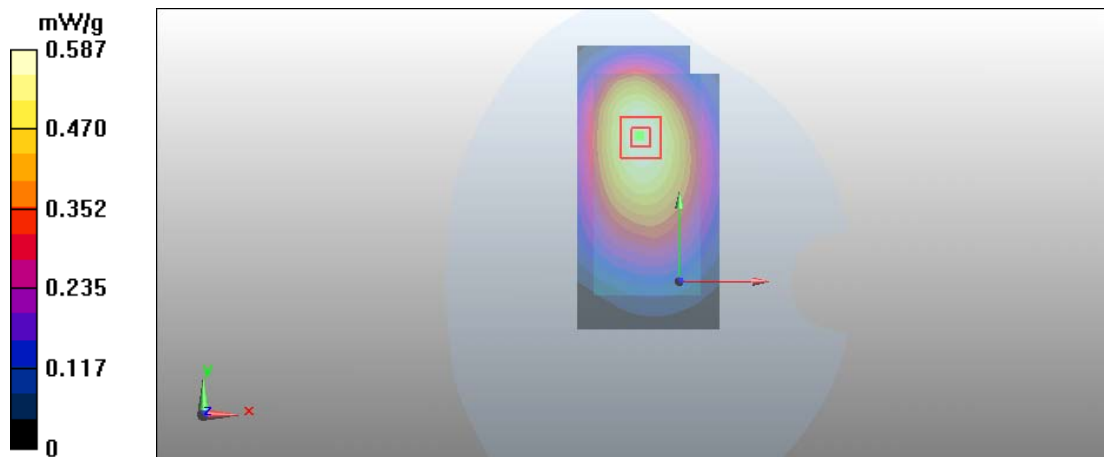
Configuration/Body - High - No Accessory - Back Facing Phantom/Area Scan (6x11x1): Measurement grid:
dx=15mm, dy=15mm

Configuration/Body - Middle - No Accessory - Back Facing Phantom/Area Scan (6x11x1): Measurement grid:
dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.556 mW/g

SAR(10 g) = 0.392 mW/g

Maximum value of SAR (measured) = 0.587 mW/g



Date/Time: 2011-01-24 15:38:45, Date/Time: 2011-01-24 14:48:30

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311732/9, Serial: 004402/13/311369/0

Communication System: WCDMA1700/2100, Communication System: WLAN2450 b-mode

Frequency: 1752.6 MHz, Frequency: 2442 MHz; Duty Cycle: 1:1

Medium: BSL1800, Medium: BSL2450; Medium Notes: t= 21.5 C, Medium Notes: t= 20.7 C

Medium parameters used: f = 1753 MHz; σ = 1.45 mho/m; ϵ_r = 51.4; ρ = 1000 kg/m³, Medium parameters used:
f = 2442 MHz; σ = 2 mho/m; ϵ_r = 50.5; ρ = 1000 kg/m³

Phantom section: Flat Section

DASY4 Configuration:

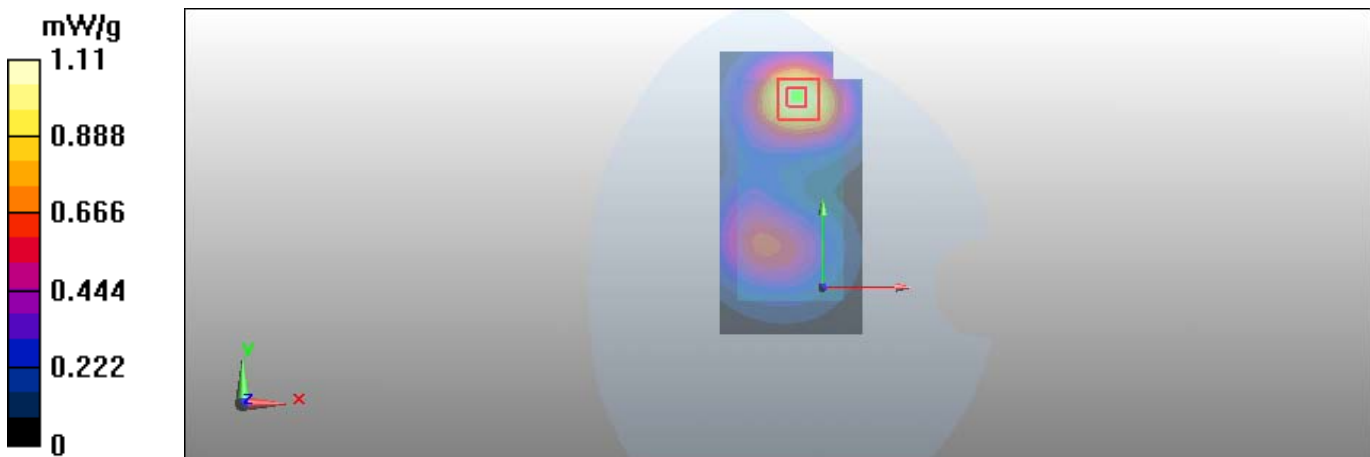
- Probe: ES3DV3 - SN3165, Probe: ES3DV3 - SN3131
- ConvF(4.78, 4.78, 4.78), ConvF(4.05, 4.05, 4.05); Calibrated: 2010-03-16, Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn728, Electronics: DAE4 Sn793; Calibrated: 2010-03-19, Calibrated: 2010-09-08
- Phantom: SAM 3, Phantom: SAM2; Type: Twin SAM 040 CA, Type: SAM; Serial: TP-1179, Serial: TP-1570
- ; SEMCAD X Version 14.0 Build 61

Configuration/Body - High - No Accessory - Back Facing Phantom/Area Scan (6x11x1): Measurement grid:
dx=15mm, dy=15mm

Configuration/Body - Middle - No Accessory - Back Facing Phantom/Area Scan (6x11x1): Measurement grid:
dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 1.02 mW/g
SAR(10 g) = 0.612 mW/g

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



Date/Time: 2011-01-25 16:32:48, Date/Time: 2011-01-24 14:48:30

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311369/0

Communication System: GSM1900, Communication System: WLAN2450 b-mode

Frequency: 1909.8 MHz, Frequency: 2442 MHz; Duty Cycle: 1:8.3, Duty Cycle: 1:1

Medium: BSL1900, Medium: BSL2450; Medium Notes: t= 21.4 C, Medium Notes: t= 20.7 C

Medium parameters used: f = 1910 MHz; $\sigma = 1.55$ mho/m; $\epsilon_r = 52.5$; $\rho = 1000$ kg/m³, Medium parameters used: f = 2442 MHz; $\sigma = 2$ mho/m; $\epsilon_r = 50.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ES3DV3 - SN3165, Probe: ES3DV3 - SN3131
- ConvF(4.59, 4.59, 4.59), ConvF(4.05, 4.05, 4.05); Calibrated: 2010-03-16, Calibrated: 2010-09-09
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn728, Electronics: DAE4 Sn793; Calibrated: 2010-03-19, Calibrated: 2010-09-08
- Phantom: SAM 2, Phantom: SAM2; Type: Twin SAM 040 CA, Type: SAM; Serial: TP - 1177, Serial: TP-1570
- ; SEMCAD X Version 14.0 Build 61

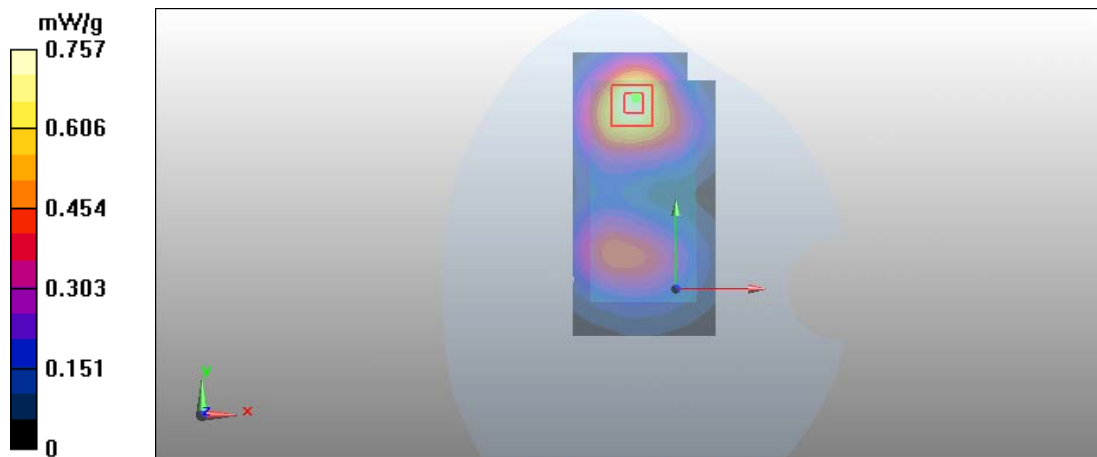
Configuration/Body - High - No Accessory - Back Facing Phantom/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm

Configuration/Body - Middle - No Accessory - Back Facing Phantom/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.704 mW/g

SAR(10 g) = 0.421 mW/g

Maximum value of SAR (measured) = 0.757 mW/g



APPENDIX C: CONDUCTED AVERAGE POWER MEASUREMENTS FOR WCDMA AND HSUPA

Test Laboratory: TCC Nokia

Type: RM-691; Serial: 004402/13/311334/4, HW: 5100, SW: 020.022

C.1. WCDMA850 Test results

Average power

Ch / f (MHz)	P [dBm]
4133	23.81
4175	23.51
4232	23.44

C.2. HSUPA850 Test results

Average power

Ch / f (MHz)	P [dBm]				
	Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
4133	20.00	20.55	21.33	19.60	22.31
4175	19.80	19.77	20.85	20.09	21.70
4232	19.46	19.66	20.52	19.72	21.47

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 2.0dB power reduction for all Subtest modes is implemented. As a result, the MPR for each of the Subtest modes is as follows:

Maximum Power Reduction (MPR)				
Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
3.5dB	4.0dB	3.0dB	4.0dB	2.0dB

Test Laboratory: TCC Nokia
Type: RM-691; Serial: 004402/13/311334/4, HW: 5100, SW: 020.022

C.3. WCDMA1700/2100 Test results

Average power

Ch / f (MHz)	P [dBm]
1313	23.02
1450	22.96
1512	23.04

C.4. 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	18.88	18.99	19.49	18.65	20.92
1450	18.86	18.45	19.53	18.74	20.92
1512	18.94	19.10	19.86	18.49	20.94

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 2.25dB power reduction for all Subtest modes is implemented. As a result, the MPR for each of the Subtest modes is as follows:

Maximum Power Reduction (MPR)				
Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
3.75dB	4.25dB	3.25dB	4.25dB	2.25dB

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



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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

Client **Nokia Salo TCC**

Certificate No: **ES3-3131_Sep10**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3131**

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 9, 2010**

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

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

Calibration Equipment used (M&TE critical for calibration)

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

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct10

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

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

Issued: September 9, 2010

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

DASY/EASY - Parameters of Probe: ES3DV3 SN:3131

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%	5.82	5.82	5.82	0.83	1.11 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	5.00	5.00	5.00	0.60	1.29 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.81	4.81	4.81	0.36	1.71 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.26	4.26	4.26	0.44	1.70 ± 11.0%

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

DASY/EASY - Parameters of Probe: ES3DV3 SN:3131

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%	5.73	5.73	5.73	0.91	1.09 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	4.61	4.61	4.61	0.35	2.06 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.38	4.38	4.38	0.33	2.33 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.05	4.05	4.05	0.98	1.04 ± 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.



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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

Client **Nokia Salo TCC**

Certificate No: **ES3-3165_Mar10**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3165**

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: **March 16, 2010**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41495277	1-Apr-09 (No. 217-01030)	Apr-10
Power sensor E4412A	MY41498087	1-Apr-09 (No. 217-01030)	Apr-10
Reference 3 dB Attenuator	SN: S5054 (3c)	31-Mar-09 (No. 217-01026)	Mar-10
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-09 (No. 217-01028)	Mar-10
Reference 30 dB Attenuator	SN: S5129 (30b)	31-Mar-09 (No. 217-01027)	Mar-10
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	29-Sep-09 (No. DAE4-660_Sep09)	Sep-10

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct10

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

Issued: March 19, 2010

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

DASY - Parameters of Probe: ES3DV3 SN:3165

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%	6.00	6.00	6.00	0.85	1.10 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	5.06	5.06	5.06	0.43	1.58 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.90	4.90	4.90	0.28	2.11 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.41	4.41	4.41	0.40	1.73 ± 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:3165

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%	5.91	5.91	5.91	0.80	1.16 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	4.78	4.78	4.78	0.33	2.16 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.59	4.59	4.59	0.29	2.53 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.22	4.22	4.22	0.66	1.36 ± 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.



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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

Client **Nokia Salo TCC**

Certificate No: **ES3-3194_Sep10**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3194**

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 9, 2010**

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

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

Calibration Equipment used (M&TE critical for calibration)

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

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct10

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

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

Issued: September 9, 2010

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

DASY/EASY - Parameters of Probe: ES3DV3 SN:3194

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%	6.09	6.09	6.09	0.99	1.05 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	5.14	5.14	5.14	0.45	1.74 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.93	4.93	4.93	0.44	1.85 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.30	4.30	4.30	0.41	1.99 ± 11.0%

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

DASY/EASY - Parameters of Probe: ES3DV3 SN:3194

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%	5.95	5.95	5.95	0.84	1.15 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	4.81	4.81	4.81	0.35	2.12 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.58	4.58	4.58	0.35	2.32 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.24	4.24	4.24	0.77	1.20 ± 11.0%

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

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



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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

Client **Nokia Salo TCC**

Certificate No: **D835V2-480_Oct09**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 480**

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

Calibration date: **October 19, 2009**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	31-Mar-09 (No. 217-01025)	Mar-10
Type-N mismatch combination	SN: 5047.2 / 06327	31-Mar-09 (No. 217-01029)	Mar-10
Reference Probe ES3DV3	SN: 3205	26-Jun-09 (No. ES3-3205_Jun09)	Jun-10
DAE4	SN: 601	07-Mar-09 (No. DAE4-601_Mar09)	Mar-10

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	

Approved by:	Katja Pokovic	Technical Manager
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Issued: October 19, 2009

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

DASY5 Validation Report for Head TSL

Date/Time: 19.10.2009 10:11:32

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: HSL900

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.88 \text{ mho/m}$; $\epsilon_r = 40.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.04, 6.04, 6.04); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

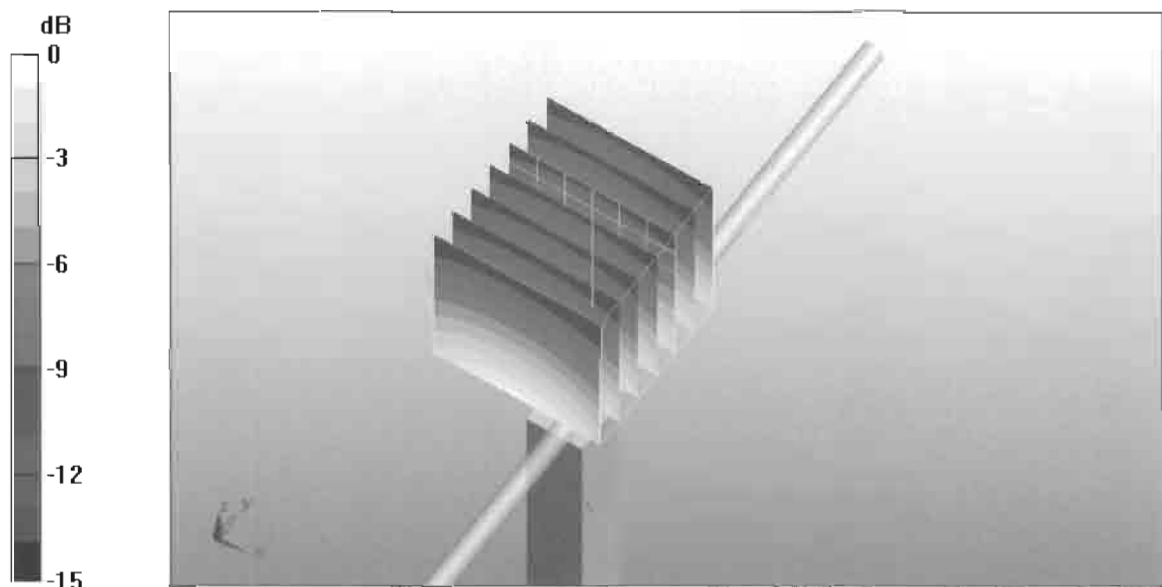
Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 57.6 V/m; Power Drift = 0.00856 dB

Peak SAR (extrapolated) = 3.53 W/kg

SAR(1 g) = 2.36 mW/g; SAR(10 g) = 1.55 mW/g

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



0 dB = 2.76mW/g

DASY5 Validation Report for Body

Date/Time: 19.10.2009 13:40:30

Test Laboratory: SPEAG, Zurich, Switzerland

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

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

Medium: MSL900

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 1.01 \text{ mho/m}$; $\epsilon_r = 53.2$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.97, 5.97, 5.97); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Pin250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement

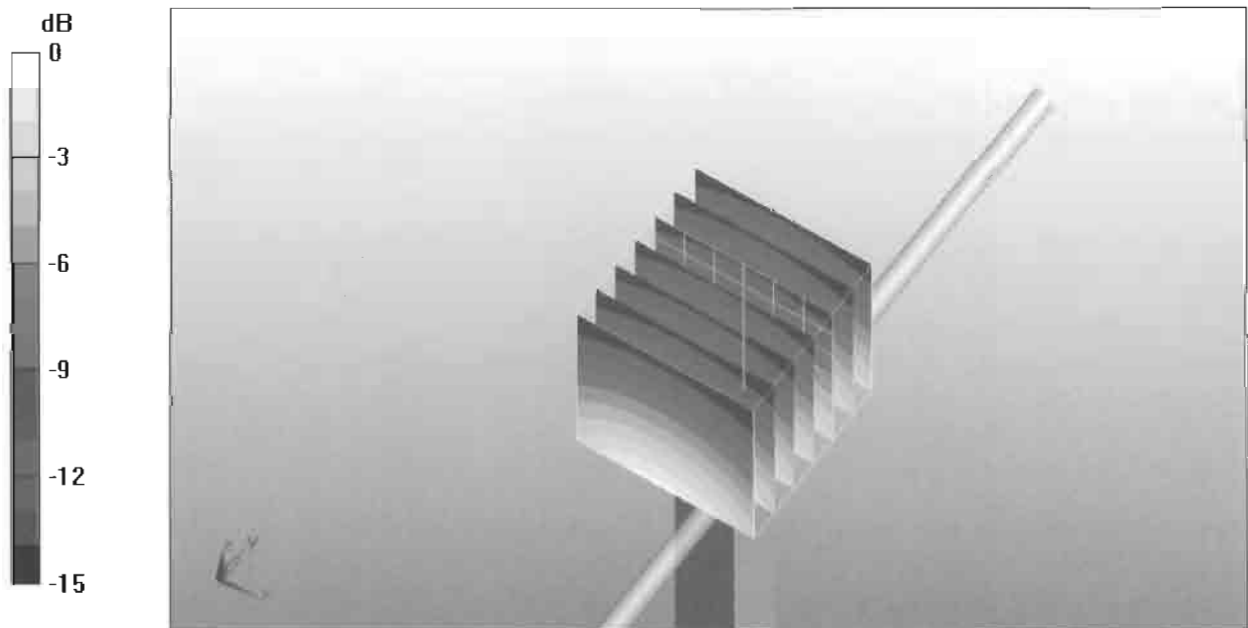
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.5 V/m; Power Drift = 0.014 dB

Peak SAR (extrapolated) = 3.74 W/kg

SAR(1 g) = 2.52 mW/g; SAR(10 g) = 1.65 mW/g

Maximum value of SAR (measured) = 2.94 mW/g



0 dB = 2.94mW/g



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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

Client **Nokia Salo TCC**

Certificate No: **D1800V2-256_Oct09**

CALIBRATION CERTIFICATE

Object **D1800V2 - SN: 256**

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

Calibration date: **October 20, 2009**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	31-Mar-09 (No. 217-01025)	Mar-10
Type-N mismatch combination	SN: 5047.2 / 06327	31-Mar-09 (No. 217-01029)	Mar-10
Reference Probe ES3DV3	SN: 3205	26-Jun-09 (No. ES3-3205_Jun09)	Jun-10
DAE4	SN: 601	07-Mar-09 (No. DAE4-601_Mar09)	Mar-10

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	

Approved by:	Katja Pokovic	Technical Manager
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Issued: October 21, 2009

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DASY5 Validation Report for Head TSL

Date/Time: 20.10.2009 10:26:59

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:256

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

Medium: HSL U11 BB

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.4$ mho/m; $\epsilon_r = 40$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.25, 5.25, 5.25); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

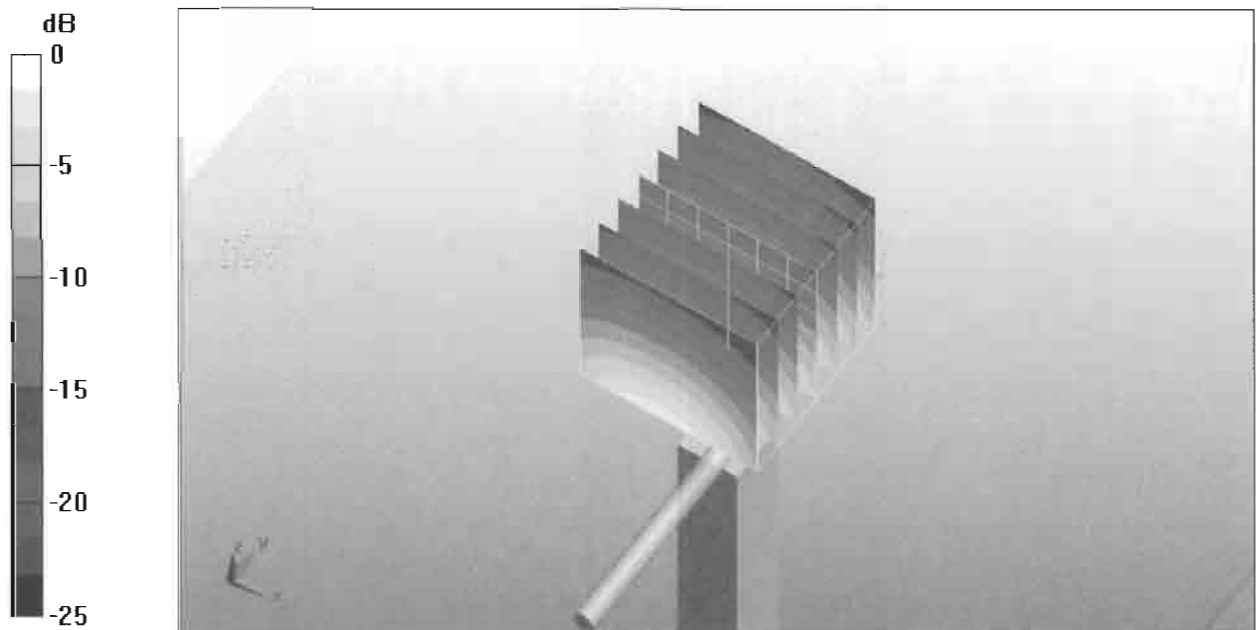
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 97.2 V/m; Power Drift = 0.025 dB

Peak SAR (extrapolated) = 17.9 W/kg

SAR(1 g) = 9.9 mW/g; SAR(10 g) = 5.21 mW/g

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



0 dB = 12.4mW/g

DASY5 Validation Report for Body

Date/Time: 20.10.2009 14:52:33

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:256

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

Medium: MSL U10 BB

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.5$ mho/m; $\epsilon_r = 53.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.8, 4.8, 4.8); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

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

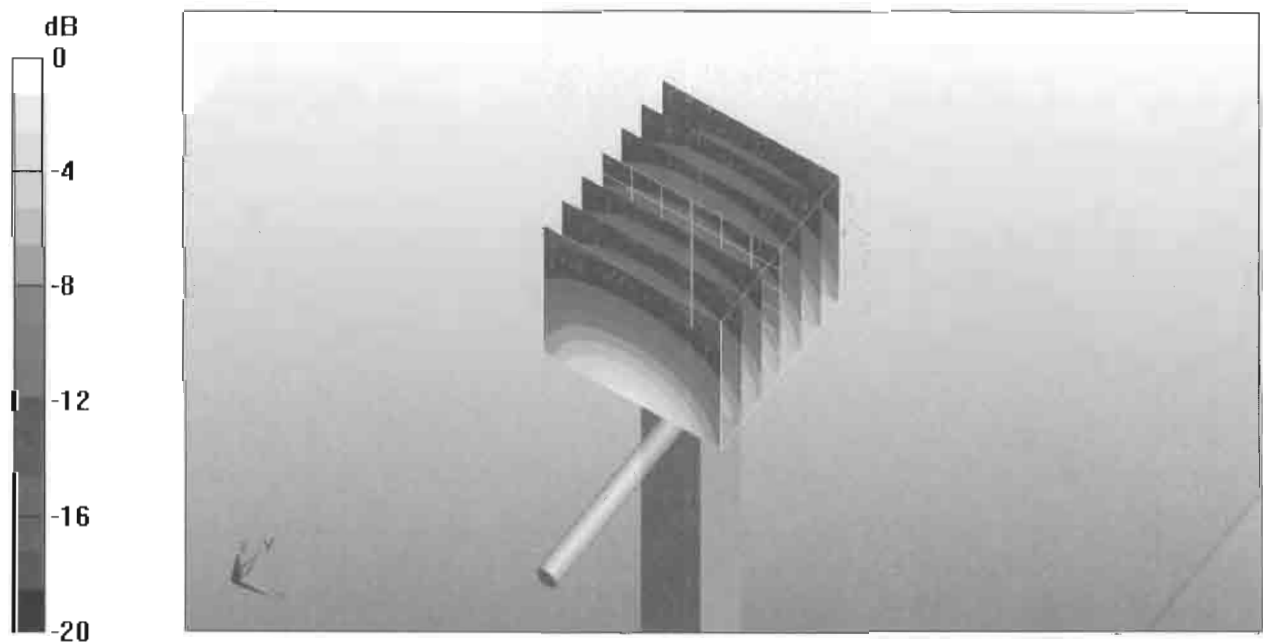
grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 94.2 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 16.8 W/kg

SAR(1 g) = 9.61 mW/g; SAR(10 g) = 5.07 mW/g

Maximum value of SAR (measured) = 12.2 mW/g



0 dB = 12.2mW/g



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

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 Multilateral Agreement for the recognition of calibration certificates

Client **Nokia Salo TCC**

Certificate No: **D1900V2-5d013_Mar10**

CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d013**

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

Calibration date: **March 23, 2010**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	31-Mar-09 (No. 217-01025)	Mar-10
Type-N mismatch combination	SN: 5047.2 / 06327	31-Mar-09 (No. 217-01029)	Mar-10
Reference Probe ES3DV3	SN: 3205	26-Jun-09 (No. ES3-3205_Jun09)	Jun-10
DAE4	SN: 601	02-Mar-10 (No. DAE4-601_Mar10)	Mar-11
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

Calibrated by: **Dinco Iliev** Name: **Dinco Iliev** Function: **Laboratory Technician** Signature: *[Signature]*

Approved by: **Katja Pokovic** Name: **Katja Pokovic** Function: **Technical Manager** Signature: *[Signature]*

Issued: March 23, 2010

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

DASY5 Validation Report for Head TSL

Date/Time: 23.03.2010 10:16:39

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d013

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

Medium: HSL U11 BB

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.45$ mho/m; $\epsilon_r = 41.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

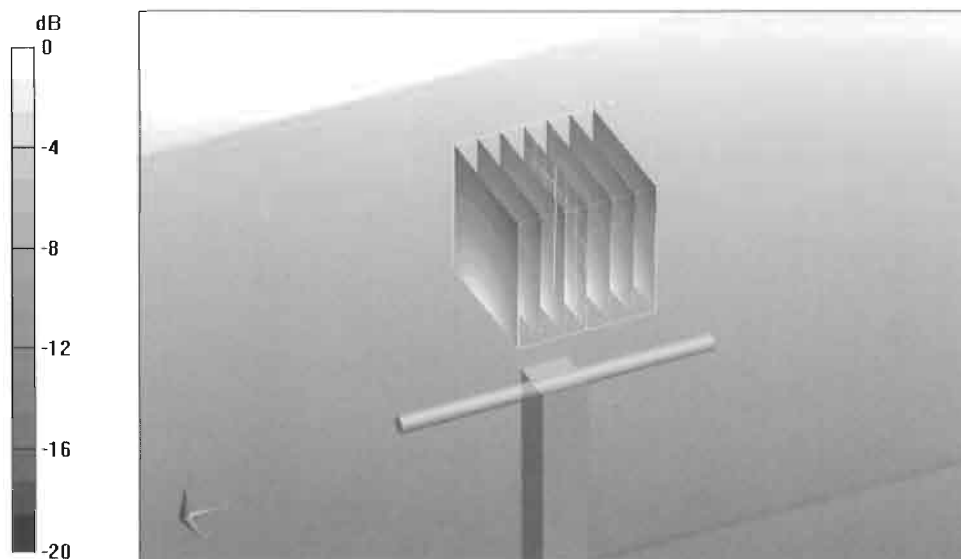
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.4 V/m; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 18.5 W/kg

SAR(1 g) = 10.2 mW/g; SAR(10 g) = 5.32 mW/g

Maximum value of SAR (measured) = 12.6 mW/g



0 dB = 12.6mW/g

DASY5 Validation Report for Body

Date/Time: 23.03.2010 13:12:18

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d013

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

Medium: MSL U11 BB

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 55$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

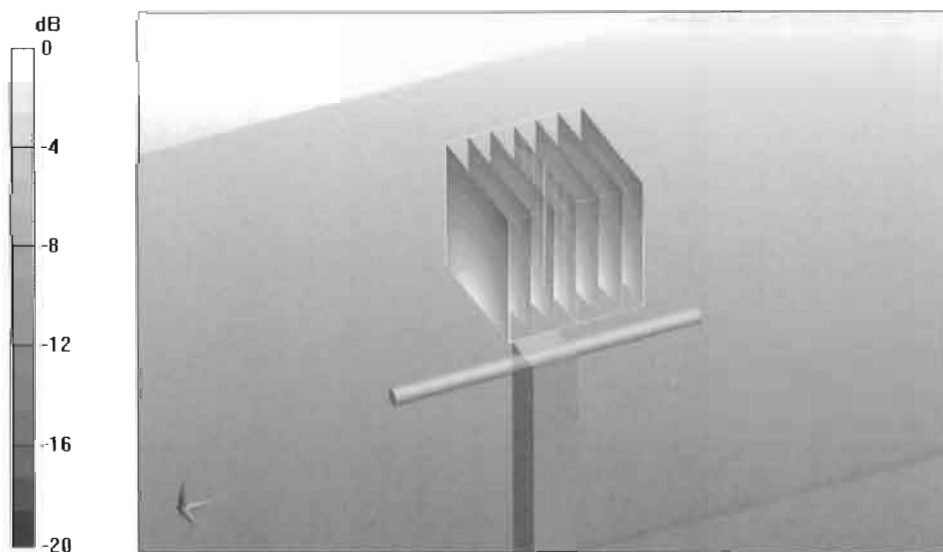
Pin250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 94.9 V/m; Power Drift = 0.00956 dB

Peak SAR (extrapolated) = 17.5 W/kg

SAR(1 g) = 10.4 mW/g; SAR(10 g) = 5.58 mW/g

Maximum value of SAR (measured) = 12.7 mW/g



0 dB = 12.7mW/g



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client Nokia Salo TCC Certificate No: D2450V2-749_Oct09

CALIBRATION CERTIFICATE

Object D2450V2 - SN: 749

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

Calibration date: October 21, 2009

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

Issued: October 22, 2009

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

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:749

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

Medium: HSL U11 BB

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.78 \text{ mho/m}$; $\epsilon_r = 39.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

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

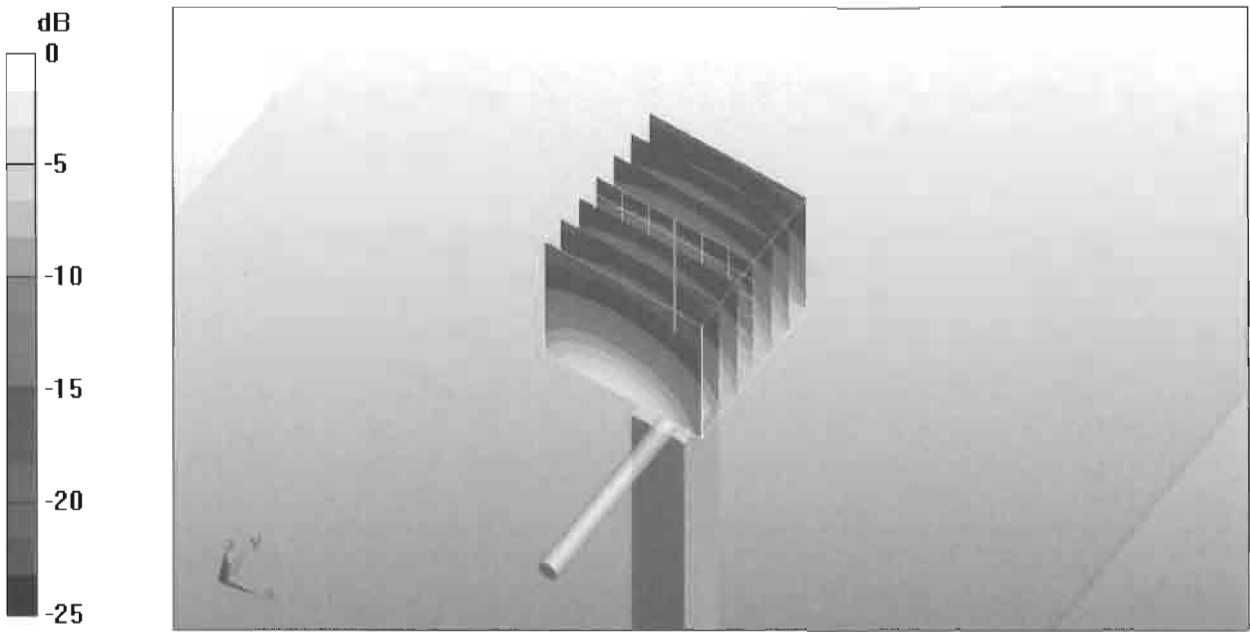
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 100.7 V/m; Power Drift = 0.078 dB

Peak SAR (extrapolated) = 26.8 W/kg

SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.18 mW/g

Maximum value of SAR (measured) = 16.9 mW/g



0 dB = 16.9mW/g

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:749

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

Medium: MSL U10 BB

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.98 \text{ mho/m}$; $\epsilon_r = 52.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

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

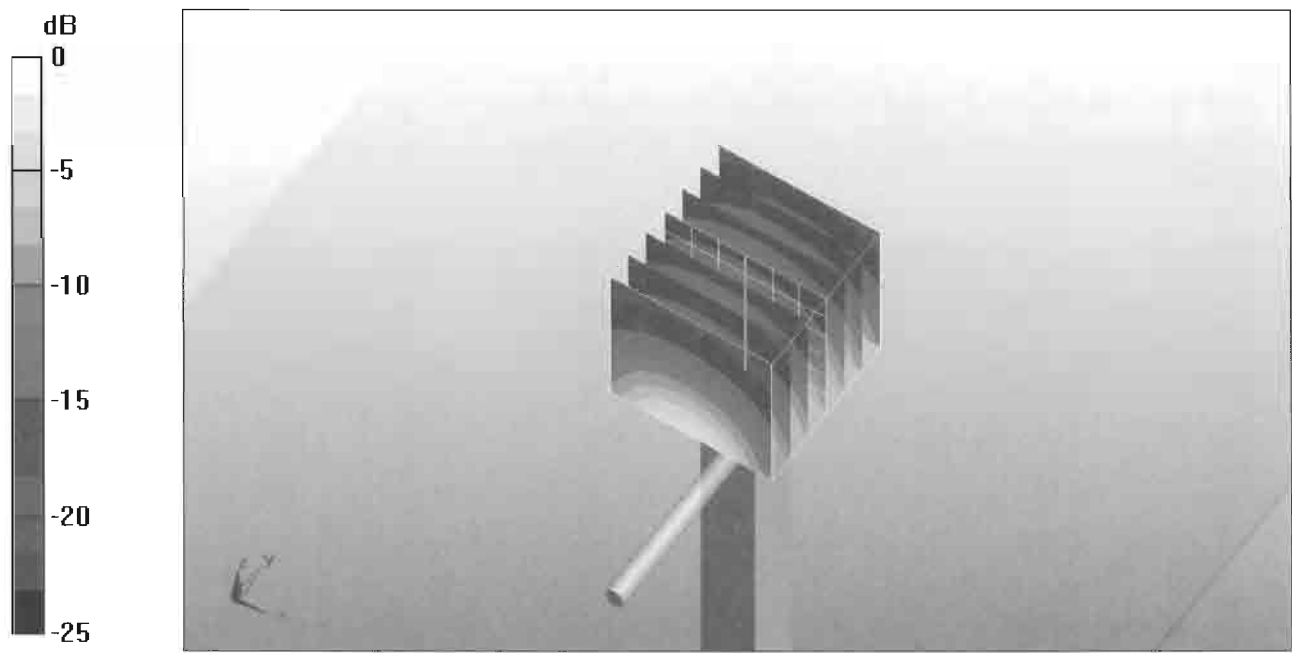
Pin250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 93.9 V/m; Power Drift = 0.046 dB

Peak SAR (extrapolated) = 25.8 W/kg

SAR(1 g) = 12.5 mW/g; SAR(10 g) = 5.81 mW/g

Maximum value of SAR (measured) = 16.4 mW/g



0 dB = 16.4mW/g