TCC
Nokia

FINAS
Finnish Accreditation Service
T117 (EN ISO/IEC 17025)

SAR Compliance Test Report

Test report no.:	FCC_RM-801_05	**Date of report:**	2012-03-07
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Tested device:	RM-801		
FCC ID:	LJPRM-801	**IC:**	-
Supplement reports:	FCC_RM-801_02, SAR_Photo_RM-801_06		

Testing has been carried out in accordance with:

47CFR §2.1093
Radiofrequency Radiation Exposure Evaluation: Portable Devices

FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)
Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields

RSS-102
Evaluation Procedure for Mobile and Portable Radio Transmitters with Respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields

IEEE 1528 - 2003
IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Technique

Documentation: The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.

Test results: **The tested device complies with the requirements in respect of all parameters subject to the test.** The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.

Date and signatures:

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2012-02-20 to 2012-03-06
SN, HW and SW numbers of tested device	SN: 359289/04/001467/8, HW: 3300, SW: 1600.2479.7740.11451, DUT: 16231 SN: 004402/13/553891/0, HW: 1100, SW: 1600.1800.7720.11300, DUT: 15785 SN: 004402/13/553871/2, HW: 1100, SW: 1600.1800.7720.11300, DUT: 15784
Batteries used in testing	-
Headsets used in testing	-
Other accessories used in testing	-
State of sample	Prototype unit
Notes	-

1.1.1 Supplement reports referenced on the front cover of this report

FCC_RM-801_02: All the SAR data except Wireless Router results have been taken from this earlier report; two samples were used in the RM-801 SAR testing.

1.2 Maximum Results

The maximum measured SAR values for Head configuration, Body Worn configuration and Wireless Router ("Hotspot") configuration are given in section 1.2.1, 1.2.2 and 1.2.3 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
3-slot GPRS850	128 / 824.2	28.5 dBm	Left, Cheek	1.13 W/kg	**1.27 W/kg**	1.6 W/kg	PASSED
3-slot GPRS1900	512 / 1850.2	25.5 dBm	Left, Cheek	0.937 W/kg	**1.05 W/kg**	1.6 W/kg	PASSED
WCDMA1900	9262 / 1852.4	23.5 dBm	Left, Cheek	1.03 W/kg	**1.15 W/kg**	1.6 W/kg	PASSED
WLAN2450	11 / 2462.0	13.0 dBm	Right, Cheek	0.488 W/kg	**0.55 W/kg**	1.6 W/kg	PASSED
3-slot GPRS850 + WLAN2450	-	-	Right, Cheek	1.13 W/kg	**1.27 W/kg**	1.6 W/kg	PASSED
3-slot GPRS1900 + WLAN2450	-	-	Left, Cheek	0.976 W/kg	**1.09 W/kg**	1.6 W/kg	PASSED
WCDMA1900 + WLAN2450	-	-	Right, Cheek	1.03 W/kg	**1.15 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
3-slot GPRS850	251 / 848.8	28.5 dBm	1.5cm	0.950 W/kg	**1.06 W/kg**	1.6 W/kg	PASSED
3-slot GPRS1900	512 / 1850.2	25.5 dBm	1.5cm	0.570 W/kg	**0.64 W/kg**	1.6 W/kg	PASSED
WCDMA1900	9262 / 1852.4	23.5 dBm	1.5cm	0.746 W/kg	**0.84 W/kg**	1.6 W/kg	PASSED
WLAN2450	11 / 2462.0	15.0 dBm	1.5cm	0.057 W/kg	**0.06 W/kg**	1.6 W/kg	PASSED
3-slot GPRS850 + WLAN2450	-	-	1.5cm	0.968 W/kg	**1.08 W/kg**	1.6 W/kg	PASSED
3-slot GPRS1900 + WLAN2450	-	-	1.5cm	0.570 W/kg	**0.64 W/kg**	1.6 W/kg	PASSED
WCDMA1900 + WLAN2450	-	-	1.5cm	0.771 W/kg	**0.86 W/kg**	1.6 W/kg	PASSED

1.2.3 Wireless Router Configuration

Mode	Ch / *f*(MHz)	Conducted power	Separation distance	Measured SAR value (1g avg)	Scaled* SAR value (1g avg)	SAR limit (1g avg)	Result
4-slot GPRS850	128 / 824.2	27.0 dBm	10.0 mm	0.927 W/kg	**1.04 W/kg**	1.6 W/kg	PASSED
4-slot GPRS1900	512 / 1850.2	24.0 dBm	10.0 mm	1.09 W/kg	**1.22 W/kg**	1.6 W/kg	PASSED
WCDMA1900	9262 / 1852.4	21.5 dBm	10.0 mm	1.30 W/kg	**1.46 W/kg**	1.6 W/kg	PASSED
WLAN2450	11 / 2462.0	14.0 dBm	10.0 mm	0.474 W/kg	**0.53 W/kg**	1.6 W/kg	PASSED
4-slot GPRS850 + WLAN2450	-	-	10.0 mm	0.996 W/kg	**1.12 W/kg**	1.6 W/kg	PASSED
4-slot GPRS1900 + WLAN2450	-	-	10.0 mm	1.17 W/kg	**1.31 W/kg**	1.6 W/kg	PASSED
WCDMA1900 + WLAN2450	-	-	10.0 mm	1.35 W/kg	**1.51 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.
**SAR data taken from FCC_RM-801_02.

1.2.4 Summary SAR data

		FCC-defined SAR values for the Grants of Equipment Authorization
Maximum Cellular/AWS/PCS Head SAR value		**1.27 W/kg**
Maximum WLAN Head SAR value		0.55 W/kg
{Max + Max} Simultaneous Head SAR value	1.82 W/kg†	
Maximum Cellular/AWS/PCS Body SAR value		**1.06 W/kg**
Maximum WLAN Body SAR value		0.06 W/kg
{Max + Max} Simultaneous Body SAR value	1.12 W/kg	
Maximum Product Specific (Wireless Router) SAR value		**1.46 W/kg††**
Maximum Simultaneous SAR value		**1.46 W/kg†††**

† The 1.82 W/kg {max + max} Simultaneous Head SAR value quoted here exceeds 1.6 W/kg; however, this summation of SAR values cannot occur in practice as the maximum Cellular/AWS/PCS/ Head SAR value of 1.27 W/kg is from Left Cheek test, whereas the WLAN Head SAR value of 0.55 W/kg is from Right Cheek.

†† The highest {max + max} SAR value in Wireless Router configuration is 1.774W/kg (see Section 7) which, scaled up by 12%, gives 1.99 W/kg. However, Simultaneous Transmission Procedures are not required as the Antenna Pair SAR to Peak Location Separation Ratio is 1.99W/kg / 8.99cm = 0.22 i.e. < 0.3 (see Section 7). The 1.46W/kg SAR value quoted here is the higher of the individual SAR values involved in the highest {max + max} Wireless Router SAR value i.e. 1.30W/kg for WCDMA1900, scaled up by 12%.

††† From Section 7:

The highest {max + max} Head SAR value is 1.457W/kg (0.969 for 3-slot GPRS850, 0.488 for WLAN2450) which, scaled up by 12%, gives 1.63W/kg. Antenna Pair SAR to Peak Location Separation Ration is 1.63W/kg / 3.08cm = 0.53 i.e. > 0.3. Therefore, according to KDB648474 D01 SAR Handsets Multi Xmiter and Ant, v01r05, Simultaneous Transmission Procedures are required. Expanded zoom SAR scans (presented in Appendix B) fully including the Right Cheek SAR distributions of both 3-slot GPRS850 and WLAN2450 were performed. The resulting combined SAR value was 0.905 W/kg.
The highest {max + max} Body SAR value is 1.007W/kg (0.746 for 3-slot GPRS850, 0.057 for WLAN2450) which, scaled up by 12% gives 1.13W/kg
The highest {max + max} WR SAR value is 1.774W/kg (1.30 for WCDMA1900, 0.474 for WLAN2450) and is fully explained in the †† note above.
Consequently, the 1.46W/kg value quoted here is the highest individual WR SAR value of 1.30W/kg scaled up by 12%.

1.2.5 Maximum Drift

Maximum drift covered by 12% scaling up of the SAR values	Maximum drift during measurements
0.5dB	0.50dB

1.2.6 Measurement Uncertainty

Expanded Uncertainty (k=2) 95%	± 25.8%

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	1900 (Band II)		1	1852 – 1908
HSUPA	1900 (Band II)		1	1852 – 1908
BT	2450	GFSK	1	2402 – 2480
WLAN b-mode	2450	Up to 11Mbps QPSK	1	2412 – 2462
WLAN g-mode	2450	Up to 54Mbps 64QAM	1	2412 – 2462
WLAN n-mode 20MHz	2450	Up to 72.2Mbps 64QAM	1	2412 – 2462

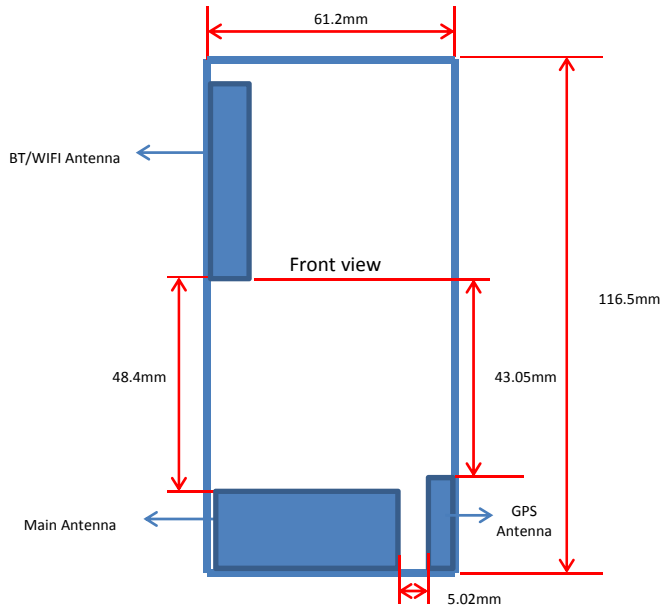
Outside of USA and Canada, the transmitter of the device is capable of operating also in GSM/GPRS/EGPRS900, GSM/GPRS/EGPRS1800, WCDMA900 and WCDMA2100 bands which are not part of this filing.

This device has Wireless Router “Hotspot” mode capability.

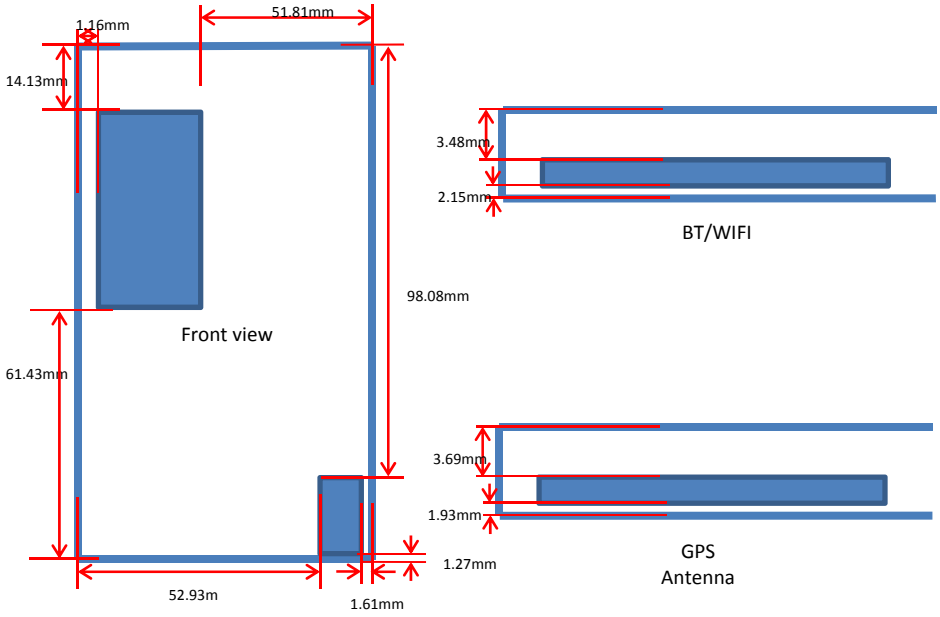
2.1 Description of the Antenna

The device has internal antennas for both cellular/PCS and WLAN use. The cellular/PCS antenna is located at the bottom underneath the back cover. The WLAN antenna is located at the top underneath the back cover. The device dimensions, antenna locations and antenna interdistances are illustrated below.

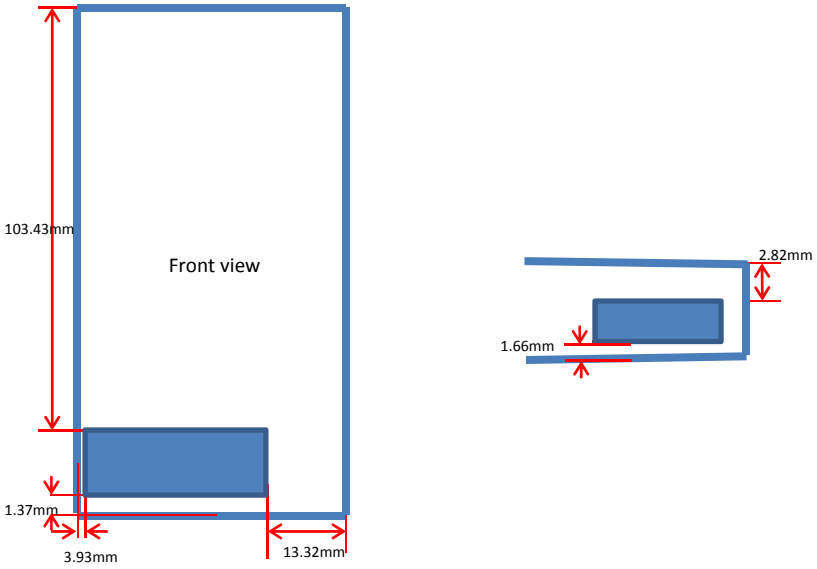
Phone Outside Dimension and Distance Between Main Antenna, BT/WIFI and GPS Antenna



Distance between Device Edges and Faces and BT/WIFI and GPS Antenna Antenna



Distance between Device Edges and Faces and Main Antenna



3. TEST CONDITIONS

3.1 Temperature and Humidity

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

3.2 Test Signal, Frequencies and Output Power

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

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

This device was tested in all the available multi-slot GMSK GPRS modes; Dual Transfer Mode was not specifically tested as the average power in multi-slot GMSK GPRS mode is always greater than, or equal to, the average power in Dual Transfer Mode in Nokia devices.

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.

All of the Head SAR and Body-worn (at 15mm) SAR results presented in this report have been taken from the earlier report FCC_RM-801_02. This report presents test details and results for Body SAR testing at 10mm separation distance (i.e. Wireless Router “Hotspot” mode) only; these details and results are given in Section 7.

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 DASY near-field scanning system 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 date	Calibration expiry
DAE4	538	2011-09	2012-09
DAE 4	728	2011-05	2012-05
DAE 4	793	2011-09	2012-09
E-field Probe ES3DV3	3131	2011-09	2012-09
E-field Probe ES3DV3	3119	2011-09	2012-09
E-field Probe EX3DV4	3790	2011-05	2012-05
Dipole Validation Kit, D835V2	462	2011-09	2013-09
Dipole Validation Kit, D1900V2	5d013	2010-03	2012-03
Dipole Validation Kit, D2450V2	729	2011-09	2013-09
DASY4 software	Version 4.7	-	-
DASY5 software	Version 52.6.1.408	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration date	Calibration expiry
Signal Generator	SML03	101265	2011-08	2012-08
Amplifier	5S1G4M3	302338	-	-
Power Meter	NRVS	838624/032	2011-08	2012-08
Power Sensor	NRV-Z32	100067	2011-08	2012-08
Call Tester	CMU 200	101111	-	-
Vector Network Analyzer	8753E	US38432928	2011-08	2012-08
ENA Network Analyzer	E5071C	MY46213166	2012-01	2013-01
Dielectric Probe Kit	85070B	US33020420	-	-
Signal Generator	E4436B	US39260114	2011-08	2012-08
Amplifier	5S1G4	25583	-	-
Power Meter	NRVS	849305/028	2011-08	2012-08
Power Sensor	NRV-Z32	100069	2011-07	2012-08
Call Tester	CMU 200	104983	-	-

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 E
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 µW/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

4.1.2 Isotropic E-field Probe Type EX3DV4

Construction	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	Calibration certificate in Appendix E
Frequency	10 MHz to >6 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 100 mW/g, Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm Tip length: 10 mm Body diameter: 12 mm Tip diameter: 2.5 mm Distance from probe tip to dipole centers: 1.0 mm
Application	General dosimetry up to 6 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

4.2 Phantoms

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

System checking was performed using the flat section.

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 ± 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

1900MHz band

Ingredient	Body (% by weight)
Deionised Water	70.25
Tween 20	29.41
Salt	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]	
	Reference result	2.33	41.1	0.89	
	± 10% window	2.10 – 2.56			
	IEEE1528 / IEC62209-1 Standard target		41.5	0.90	
835	2012-03-06	2.41	39.9	0.90	21.0
	Reference result	13.9	38.3	1.85	
	± 10% window	12.5 – 15.3			
	IEEE1528 / IEC62209-1 Standard target		39.2	1.80	
2450	2012-03-06	13.8	37.4	1.78	21.0

System checking, body tissue simulant

f[MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ε_r	σ [S/m]	
	Reference result	2.45	53.5	1.00	
	± 10% window	2.20 – 2.70			
	IEEE1528 / IEC62209 Standard targets		55.2	0.97	
835	2012-02-22	2.46	53.2	1.00	21.0
	Reference result	10.4	55.0	1.58	
	± 10% window	9.4 – 11.4			
	IEEE1528 / IEC62209 Standard targets		53.3	1.52	
1900	2012-02-20	10.2	52.4	1.51	21.0
	2012-02-22	10.7	52.4	1.54	21.0
	Reference result	13.3	51.7	2.04	
	± 10% window	12.0 – 14.6			
	IEEE1528 / IEC62209 Standard targets		52.7	1.95	
2450	2012-02-23	13.3	50.4	1.96	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]	
	Recommended value	41.5	0.90	
	± 5% window	39.4 – 43.6	0.86 – 0.95	
836	2012-03-06	39.9	0.90	21.0
	Recommended value			
	± 5% window			
2442	2012-03-06	37.4	1.77	21.0

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ε_r	σ [S/m]	
	Recommended value	55.2	0.97	
	± 5% window	52.4 – 58.0	0.92 – 1.02	
836	2012-02-22	53.2	1.00	21.0
	Recommended value	53.3	1.52	
	± 5% window	50.6 – 56.0	1.44 – 1.60	
1880	2012-02-20	52.6	1.49	21.0
	2012-02-22	52.4	1.52	21.0
	Recommended value	52.7	1.94	
	± 5% window	50.1 – 55.3	1.85 – 2.04	
2442	2012-02-23	50.4	1.95	21.0

Dielectric parameter data for the band edges is given in Appendix C.

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” position on the right hand side of the phantom.

The position used in the measurements was 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 Wireless Router Configuration

The device was placed in the SPEAG holder using the Nokia spacer and positioned 10.0mm away from the flat phantom. The spacer was removed before the start of the measurements.

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	$c_i . u_i$ (%)	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**	**-**
	Left	Cheek	-	0.723	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
2-slot GPRS	**Conducted Power**		**-**	**30.0 dBm**	**-**
	Left	Cheek	-	0.922	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3-slot GPRS	**Conducted Power**		**28.5 dBm**	**28.5 dBm**	**28.5 dBm**
	Left	Cheek	**1.13**	1.02	0.974
		Tilt	-	0.608	-
	Right	Cheek	0.969	0.920	0.819
		Tilt	-	0.478	-
4-slot GPRS	**Conducted Power**		**-**	**27.0 dBm**	**-**
	Left	Cheek	-	0.875	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3-slot 8PSK EGPRS	**Conducted Power**		**24.0 dBm**	**-**	**-**
	Left	Cheek	0.313	-	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-

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		-	30.0 dBm	-
	Left	Cheek	-	0.335	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
2-slot GPRS	Conducted Power		-	27.0 dBm	-
	Left	Cheek	-	0.582	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3-slot GPRS	Conducted Power		25.5 dBm	25.5 dBm	25.5 dBm
	Left	Cheek	**0.937**	0.729	0.594
		Tilt	-	0.243	-
	Right	Cheek	-	0.580	-
		Tilt	-	0.314	-
4-slot GPRS	Conducted Power		-	24.0 dBm	-
	Left	Cheek	-	0.675	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3-slot 8PSK EGPRS	Conducted Power		23.0 dBm	-	-
	Left	Cheek	0.409	-	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz
WCDMA	Conducted Power		23.5 dBm	23.5 dBm	23.5 dBm
	Left	Cheek	**1.03**	0.970	0.878
		Tilt	-	0.257	-
	Right	Cheek	0.821	0.806	0.687
		Tilt	-	0.320	-

2450MHz Head SAR results**

Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 1 2412.0 MHz	Ch 7 2442.0 MHz	Ch 11 2462.0 MHz
WLAN b-mode	**Conducted Power**		**15.0 dBm**	**15.0 dBm**	**15.0 dBm**
	Left	Cheek	-	0.212	-
		Tilt	-	0.076	-
	Right	Cheek	0.370	0.409	**0.439**
		Tilt	-	0.076	-
WLAN n-mode 20MHz	**Conducted Power**		**13.0 dBm**	**13.0 dBm**	**13.0 dBm**
	Left	Cheek	-	-	-
		Tilt	-	-	-
	Right	Cheek	0.240	0.319	0.365
		Tilt	-	-	-

2450MHz Head SAR results – corrected for power drift**

Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 1 2412.0 MHz	Ch 7 2442.0 MHz	Ch 11 2462.0 MHz
WLAN b-mode	**Conducted Power**		**15.0 dBm**	**15.0 dBm**	**15.0 dBm**
	Left	Cheek	-	0.220	-
		Tilt	-	0.080	-
	Right	Cheek	0.372	0.438	**0.461**
		Tilt	-	0.083	-
WLAN n-mode 20MHz	**Conducted Power**		**13.0 dBm**	**13.0 dBm**	**13.0 dBm**
	Left	Cheek	-	-	-
		Tilt	-	-	-
	Right	Cheek	0.302	0.360	**0.488**
		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
3-slot GPRS		Conducted Power	28.5 dBm	28.5 dBm	28.5 dBm
	Display facing phantom	Without headset	-	0.677	-
		Headset WH-902	-	0.582	-
	Back facing phantom	Without headset	0.912	0.927	**0.950**
		Headset WH-902	-	0.756	-

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
3-slot GPRS		Conducted Power	25.5 dBm	25.5 dBm	25.5 dBm
	Display facing phantom	Without headset	-	0.523	-
		Headset WH-902	-	0.408	-
	Back facing phantom	Without headset	**0.570**	0.561	0.434
		Headset WH-902	-	0.492	-
Mode	**Device orientation**	**Test configuration**	**SAR, averaged over 1g (W/kg)**		
			Ch 9262 1852.4 MHz	**Ch 9400 1880.0 MHz**	**Ch 9538 1907.6 MHz**
WCDMA		Conducted Power	23.5 dBm	23.5 dBm	23.5 dBm
	Display facing phantom	Without headset	-	0.658	-
		Headset WH-902	-	0.547	-
	Back facing phantom	Without headset	**0.746**	0.741	0.406
		Headset WH-902	-	0.735	-

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**	**15.0 dBm**	**15.0 dBm**	**15.0 dBm**
	Display facing phantom	Without headset	-	0.027	-
		Headset WH-902	-	0.030	-
	Back facing Phantom	Without headset	0.047	0.051	**0.056**
		Headset WH-902	-	0.045	-
WLAN n-mode 20MHz		**Conducted Power**	**13.0 dBm**	**13.0 dBm**	**13.0 dBm**
	Display facing phantom	Without headset	-	-	-
		Headset WH-902	-	-	-
	Back facing phantom	Without headset	0.031	0.037	0.045
		Headset WH-902	-	-	-

2450MHz Body SAR results – corrected for power drift**

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**	**15.0 dBm**	**15.0 dBm**	**15.0 dBm**
	Display facing phantom	Without headset	-	0.033	-
		Headset WH-902	-	0.040	-
	Back facing Phantom	Without headset	0.051	0.056	**0.057**
		Headset WH-902	-	0.045	-
WLAN n-mode 20MHz		**Conducted Power**	**13.0 dBm**	**13.0 dBm**	**13.0 dBm**
	Display facing phantom	Without headset	-	-	-
		Headset WH-902	-	-	-
	Back facing phantom	Without headset	0.034	0.038	0.047
		Headset WH-902	-	-	-

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

Test configuration	Max. 1g SAR results			
	WLAN	3-slot GPRS850	3-slot GPRS1900	WCDMA 1900
Head: Left, Cheek	0.220	1.13	0.937	1.03
Head: Left, Tilt	0.080	0.608	0.243	0.257
Head: Right, Cheek	0.488	0.969	0.580	0.821
Head: Right, Tilt	0.083	0.478	0.314	0.320
Body: Display facing phantom, Without Headset	0.033	0.677	0.523	0.658
Body: Display facing phantom, Headset WH-902	0.040	0.582	0.408	0.547
Body: Back facing phantom, Without Headset	0.057	0.950	0.570	0.746
Body: Back facing phantom, Headset WH-902	0.045	0.756	0.492	0.735

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

Test configuration	Max. 1g SAR results		
	3-slot GPRS850 + WLAN	3-slot GPRS1900 + WLAN	WCDMA1900 + WLAN
Head: Left, Cheek	1.350	**1.157**	1.250
Head: Left, Tilt	0.688	0.323	0.337
Head: Right, Cheek	**1.457**	1.068	**1.309**
Head: Right, Tilt	0.561	0.397	0.403
Body: Display facing phantom, Without Headset	0.710	0.556	0.691
Body: Display facing phantom, Headset WH-902	0.622	0.448	0.587
Body: Back facing phantom, Without Headset	**1.007**	**0.627**	**0.803**
Body: Back facing phantom, Headset WH-902	0.801	0.537	0.780

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	Max. 1g SAR results		
	3-slot GPRS850 + WLAN	3-slot GPRS1900 + WLAN	WCDMA1900 + WLAN
Head: Left, Cheek	-	**0.976**	-
Head: Left, Tilt	-	-	-
Head: Right, Cheek	**0.990**	-	**1.01**
Head: Right, Tilt	-	-	-
Body: Display facing phantom, Without Headset	-	-	-
Body: Display facing phantom, Headset WH-902	-	-	-
Body: Back facing phantom, Without Headset	**0.968**	**0.565**	**0.771**
Body: Back facing phantom, Headset WH-902	-	-	-

**SAR data taken from FCC_RM-801_02.

Body SAR assessment of Wireless Router mode at 10.0mm separation distance

850MHz Body SAR results

Option used	Device orientation	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**	**-**
	Display facing phantom	-	0.576	-
	Back facing phantom	-	-	-
	Top edge facing phantom	-	-	-
	Bottom edge facing phantom	-	-	-
	Left edge facing phantom	-	-	-
	Right edge facing phantom	-	-	-
2-slot GPRS	**Conducted Power**	**-**	**29.0 dBm**	**-**
	Display facing phantom	-	0.487	-
	Back facing phantom	-	-	-
	Top edge facing phantom	-	-	-
	Bottom edge facing phantom	-	-	-
	Left edge facing phantom	-	-	-
	Right edge facing phantom	-	-	-
3-slot GPRS	**Conducted Power**	**-**	**28.5 dBm**	**-**
	Display facing phantom	-	0.571	-
	Back facing phantom	-	-	-
	Top edge facing phantom	-	-	-
	Bottom edge facing phantom	-	-	-
	Left edge facing phantom	-	-	-
	Right edge facing phantom	-	-	-

(850MHz Table continues)

(850MHz Table continues)

4-slot GPRS	Conducted Power	27.0 dBm	27.0 dBm	27.0 dBm
	Display facing phantom	-	0.587	-
	Back facing phantom	**0.927**	0.867	0.831
	Top edge facing phantom	-	0.036	-
	Bottom edge facing phantom	-	0.149	-
	Left edge facing phantom	-	0.505	-
	Right edge facing phantom	-	0.423	-

1900MHz Body SAR results

Option used	Device orientation	SAR, averaged over 1g (W/kg)		
		Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
GSM	Conducted Power	-	30.0 dBm	-
	Display facing phantom	-	0.460	-
	Back facing phantom	-	-	-
	Top edge facing phantom	-	-	-
	Bottom edge facing phantom	-	-	-
	Left edge facing phantom	-	-	-
	Right edge facing phantom	-	-	-
2-slot GPRS	Conducted Power	-	27.0 dBm	-
	Display facing phantom	-	0.474	-
	Back facing phantom	-	-	-
	Top edge facing phantom	-	-	-
	Bottom edge facing phantom	-	-	-
	Left edge facing phantom	-	-	-
	Right edge facing phantom	-	-	-
3-slot GPRS	Conducted Power	-	25.5 dBm	-
	Display facing phantom	-	0.549	-
	Back facing phantom	-	-	-
	Top edge facing phantom	-	-	-
	Bottom edge facing phantom	-	-	-
	Left edge facing phantom	-	-	-
	Right edge facing phantom	-	-	-

(1900MHz Table continues)

(1900MHz Table continues)

4-slot GPRS	Conducted Power	24.0 dBm	24.0 dBm	24.0 dBm
	Display facing phantom	-	0.728	-
	Back facing phantom	**1.09**	0.888	0.800
	Top edge facing phantom	-	0.063	-
	Bottom edge facing phantom	-	0.496	-
	Left edge facing phantom	-	0.182	-
	Right edge facing phantom	-	0.200	-
Option used	Device orientation	SAR, averaged over 1g (W/kg)		
		Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz
WCDMA	Conducted Power	21.5 dBm	21.5 dBm	21.5 dBm
	Display facing phantom	0.934	0.902	0.740
	Back facing phantom	**1.30**	1.23	1.08
	Top edge facing phantom	-	0.086	-
	Bottom edge facing phantom	-	0.668	-
	Left edge facing phantom	-	0.260	-
	Right edge facing phantom	-	0.277	-

2450MHz Body SAR results

Option used	Device orientation	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	14.0 dBm	14.0 dBm	14.0 dBm
	Display facing phantom	-	0.159	-
	Back facing phantom	0.426	0.362	**0.474**
	Top edge facing phantom	-	0.123	-
	Bottom edge facing phantom	-	0.065	-
	Left edge facing phantom	-	0.287	-
	Right edge facing phantom	-	0.033	-
WLAN n-mode 20MHz	Conducted Power	12.0 dBm	12.0 dBm	12.0 dBm
	Display facing phantom	-	-	-
	Back facing phantom	0.191	0.177	0.114
	Top edge facing phantom	-	-	-
	Bottom edge facing phantom	-	-	-
	Left edge facing phantom	-	-	-
	Right edge facing phantom	-	-	-

Simultaneous transmissions: Combined SAR results – Individual band Max results

Test configuration	Max. 1g SAR results			
	WLAN	4-slot GPRS850	4-slot GPRS1900	WCDMA 1900
Display facing phantom	0.159	0.587	0.728	0.934
Back facing phantom	0.474	0.927	1.09	1.30
Top edge facing phantom	0.123	0.036	0.063	0.086
Bottom edge facing phantom	0.065	0.149	0.496	0.668
Left edge facing phantom	0.287	0.505	0.182	0.260
Right edge facing phantom	0.033	0.423	0.200	0.277

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

Test configuration	Max. 1g SAR results		
	4-slot GPRS850 + WLAN	4-slot GPRS1900 + WLAN	WCDMA1900 + WLAN
Display facing phantom	0.746	0.887	1.093
Back facing phantom	**1.401**	**1.564**	**1.774**
Top edge facing phantom	0.159	0.186	0.209
Bottom edge facing phantom	0.214	0.561	0.733
Left edge facing phantom	0.792	0.469	0.547
Right edge facing phantom	0.456	0.233	0.310

For WCDMA1900 + WLAN the combined Max + Max SAR value > 1.6 W/kg. The separation distance between the SAR peaks on the plots is 8.99cm, hence the value of (Max + Max SAR i.e. 1.774)/(separation distance in cm) = 0.20. As this ratio < 0.3, Simultaneous Transmission Procedures as described in KDB648474 are not required for this product and expanded zoom SAR scanning is not required to evaluate the combined SAR value.

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	Max. 1g SAR results		
	4-slot GPRS850 + WLAN	4-slot GPRS1900 + WLAN	WCDMA1900 + WLAN
Display facing phantom	-	-	-
Back facing phantom	**0.996**	**1.17**	**1.35**
Top edge facing phantom	-	-	-
Bottom edge facing phantom	-	-	-
Left edge facing phantom	-	-	-
Right edge facing phantom	-	-	-

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: 2012-03-06 08:42:53, Date/Time: 2012-03-06 08:48:12

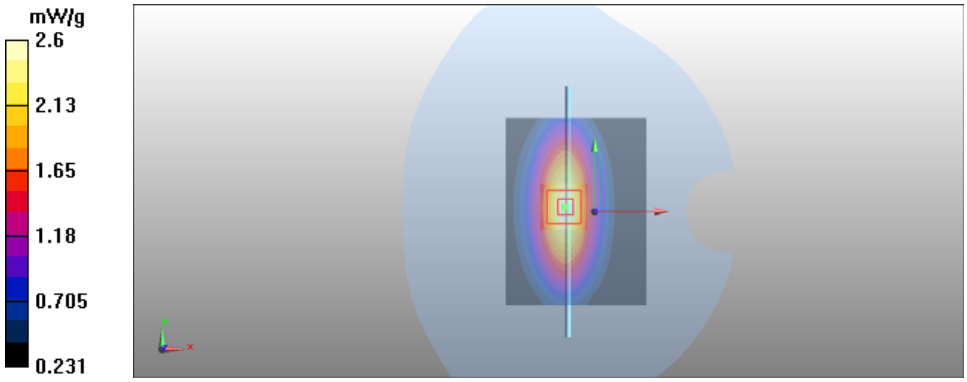
Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:462

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL850; Medium Notes: t= 21.0 C
Medium parameters used: f = 835 MHz; σ = 0.901 mho/m; ε_r = 39.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(5.88, 5.88, 5.88); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2011-05-09
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

Configuration/d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.57 mW/g

Configuration/d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 54.5 V/m
Peak SAR (extrapolated) = 3.51 W/kg
SAR(1 g) = 2.41 mW/g
SAR(10 g) = 1.58 mW/g
Power Drift = 0.00772 dB
Maximum value of SAR (measured) = 2.6 mW/g



Date/Time: 2012-03-06 06:45:12, Date/Time: 2012-03-06 06:51:00

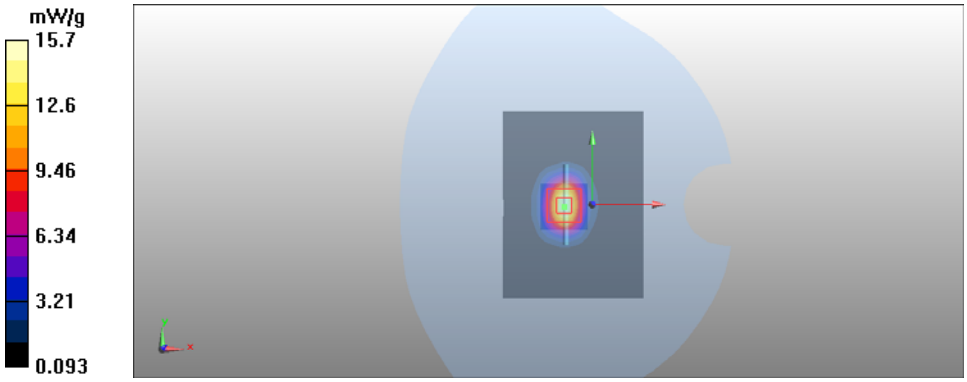
Test Laboratory: TCC Nokia
Type: D2450V2; Serial: D2450V2 - SN:729

Communication System: CW2450
Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: HSL2450; Medium Notes: t= 21.0 C
Medium parameters used: f = 2450 MHz; σ = 1.78 mho/m; ε_r = 37.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3790
- ConvF(6.67, 6.67, 6.67); Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2011-09-15
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

Configuration/d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 16.5 mW/g

Configuration/d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.2 V/m
Peak SAR (extrapolated) = 29.4 W/kg
SAR(1 g) = 13.8 mW/g
SAR(10 g) = 6.36 mW/g
Power Drift = -0.062 dB
Maximum value of SAR (measured) = 15.7 mW/g



Date/Time: 2012-02-22 08:01:28, Date/Time: 2012-02-22 08:07:32

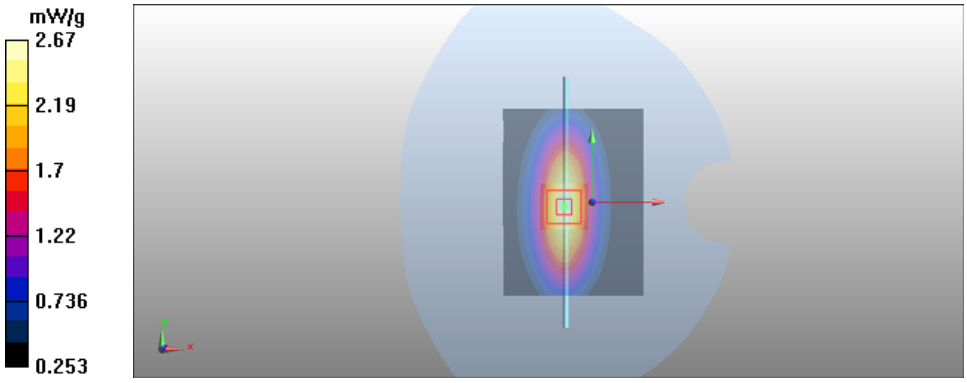
Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:462

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 835 MHz; σ = 1 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(5.92, 5.92, 5.92); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2011-05-09
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

Configuration/d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.62 mW/g

Configuration/d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.6 V/m
Peak SAR (extrapolated) = 3.55 W/kg
SAR(1 g) = 2.46 mW/g
SAR(10 g) = 1.62 mW/g
Power Drift = 0.016 dB
Maximum value of SAR (measured) = 2.67 mW/g



Date/Time: 2012-02-20 14:27:51, Date/Time: 2012-02-20 14:33:27

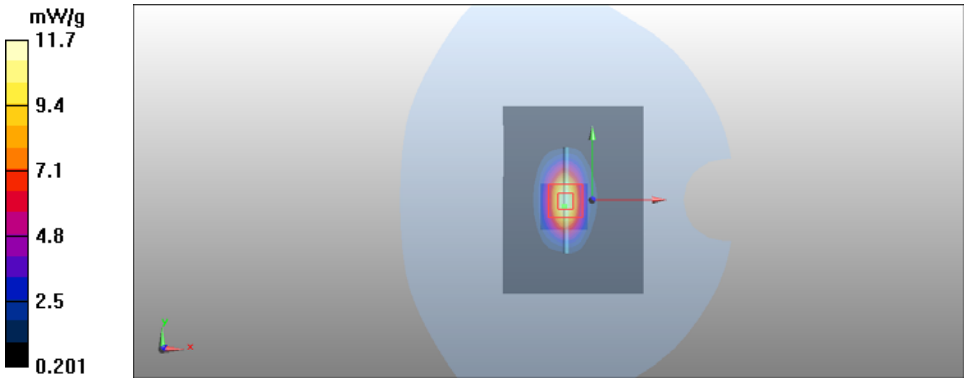
Test Laboratory: TCC Nokia
Type: D1900V2; Serial: D1900V2 - SN:5d013

Communication System: CW1900
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1900 MHz; σ = 1.51 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.43, 4.43, 4.43); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 61

Configuration/d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.2 mW/g

Configuration/d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.8 V/m
Peak SAR (extrapolated) = 17.9 W/kg
SAR(1 g) = 10.2 mW/g
SAR(10 g) = 5.33 mW/g
Power Drift = -0.025 dB
Maximum value of SAR (measured) = 11.7 mW/g



Date/Time: 2012-02-22 13:32:37, Date/Time: 2012-02-22 14:02:58

Test Laboratory: TCC Nokia
Type: D1900V2; Serial: D1900V2 - SN:5d013

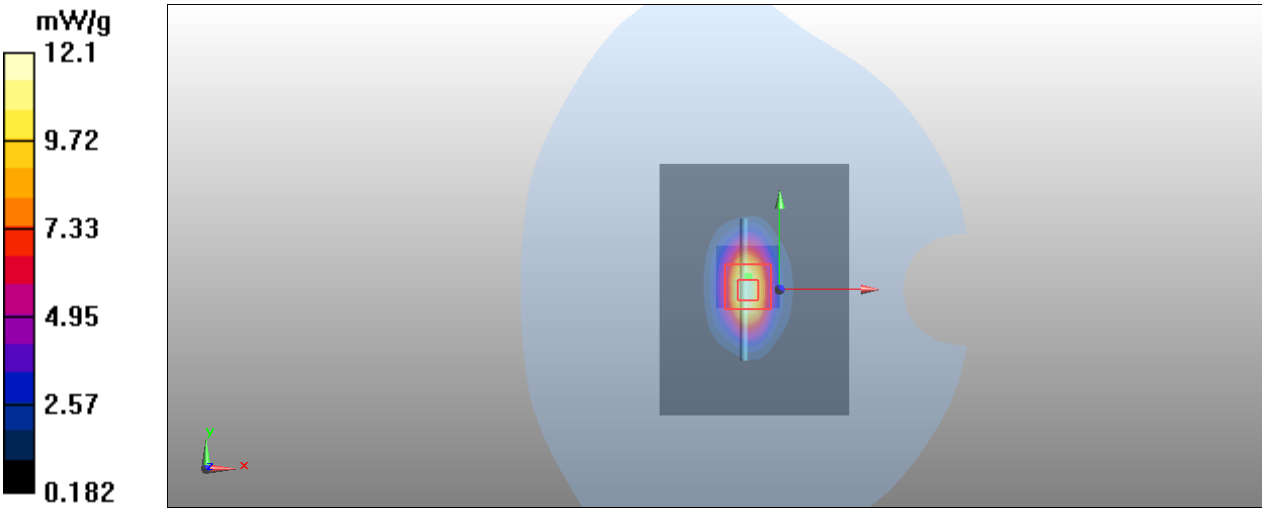
Communication System: CW1900
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 21.6 C
Medium parameters used: f = 1900 MHz; σ = 1.54 mho/m; ε_r = 52.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.43, 4.43, 4.43); Calibrated: 2009-09-22
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 14.0 Build 61

Configuration/d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.6 mW/g

Configuration/d=15mm, Pin=250mW/Zoom Scan 2 2 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91 V/m
Peak SAR (extrapolated) = 18.7 W/kg
SAR(1 g) = 10.7 mW/g
SAR(10 g) = 5.58 mW/g
Power Drift = -0.028 dB

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



Date/Time: 2012-02-23 07:24:55, Date/Time: 2012-02-23 07:30:54

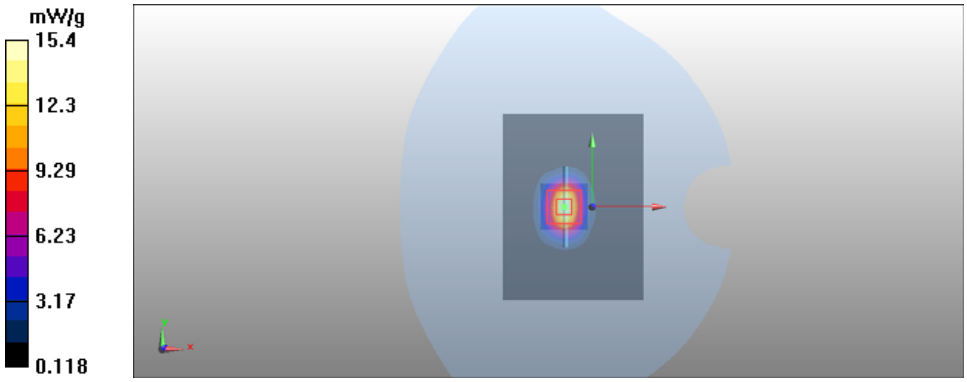
Test Laboratory: TCC Nokia
Type: D2450V2; Serial: D2450V2 - SN:729

Communication System: CW2450
Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: BSL2450; Medium Notes: t= 21.0 C
Medium parameters used: f = 2450 MHz; σ = 1.96 mho/m; ε_r = 50.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3790
- ConvF(6.85, 6.85, 6.85); Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2011-09-15
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

Configuration/d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 15.5 mW/g

Configuration/d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.3 V/m
Peak SAR (extrapolated) = 27.3 W/kg
SAR(1 g) = 13.3 mW/g
SAR(10 g) = 6.17 mW/g
Power Drift = -0.011 dB
Maximum value of SAR (measured) = 15.4 mW/g



APPENDIX B: MEASUREMENT SCANS

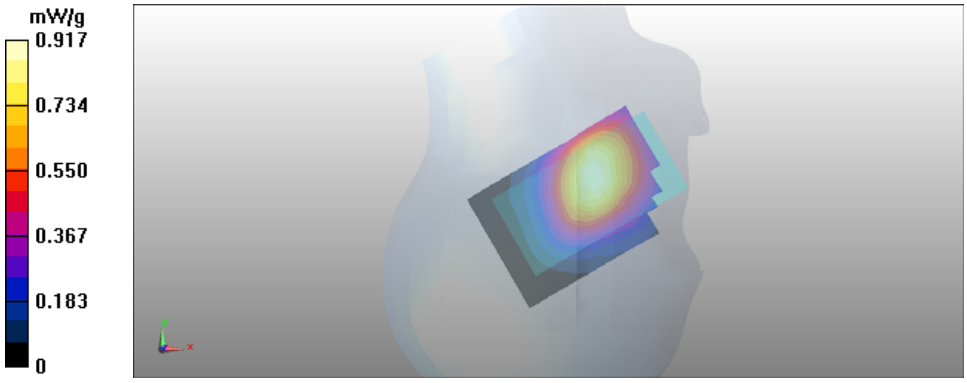
Date/Time: 2012-03-06 09:57:11

Test Laboratory: TCC Nokia
Type: RM-801; Serial: 004402/13/553871/2

Communication System: 3-slot GPRS850 EXPANDED VOLUME SCAN
Frequency: 824.2 MHz; Duty Cycle: 1:2.8
Medium: HSL850; Medium Notes: t= 21.0 C
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.895 mho/m; ε_r = 39.9; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(5.88, 5.88, 5.88); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2011-05-09
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

3-slot GPRS - Right/Cheek - Low/Volume Scan (12x17x7): Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 8.69 V/m
Peak SAR (extrapolated) = 1.06 W/kg
SAR(1 g) = 0.871 mW/g
SAR(10 g) = 0.656 mW/g
Power Drift = -0.019 dB
Total Absorbed Power = 0.0677229 W
Maximum value of SAR (measured) = 0.917 mW/g



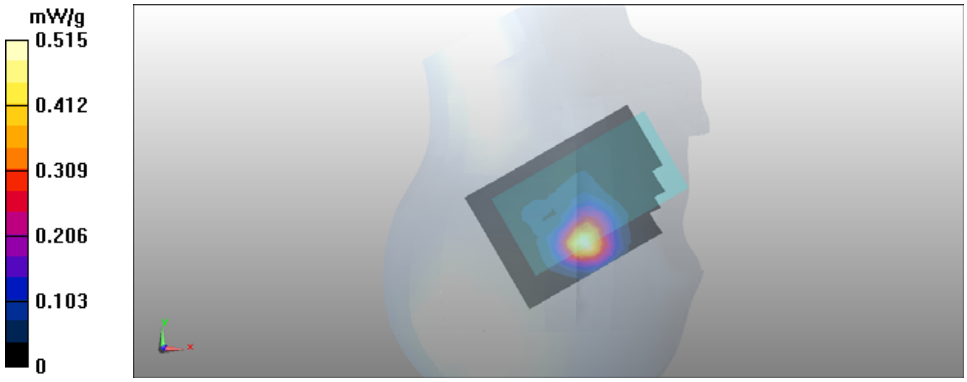
Date/Time: 2012-03-06 13:02:23

Test Laboratory: TCC Nokia
Type: RM-801; Serial: 004402/13/553891/0

Communication System: WLAN2450 n-mode EXPANDED VOLUME SCAN
Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: HSL2450; Medium Notes: t= 21.0 C
Medium parameters used: f = 2462 MHz; σ = 1.8 mho/m; ε_r = 37.3; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: EX3DV4 - SN3790
- ConvF(6.67, 6.67, 6.67); Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2011-09-15
- Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

WLAN n-mode - Right/Cheek - High/Volume Scan (12x17x7): Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 3.67 V/m
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.484 mW/g
SAR(10 g) = 0.213 mW/g
Power Drift = 0.366 dB
Total Absorbed Power = 0.00682568 W
Maximum value of SAR (measured) = 0.515 mW/g



Date/Time: 2012-02-22 08:34:26, Date/Time: 2012-02-22 08:49:47

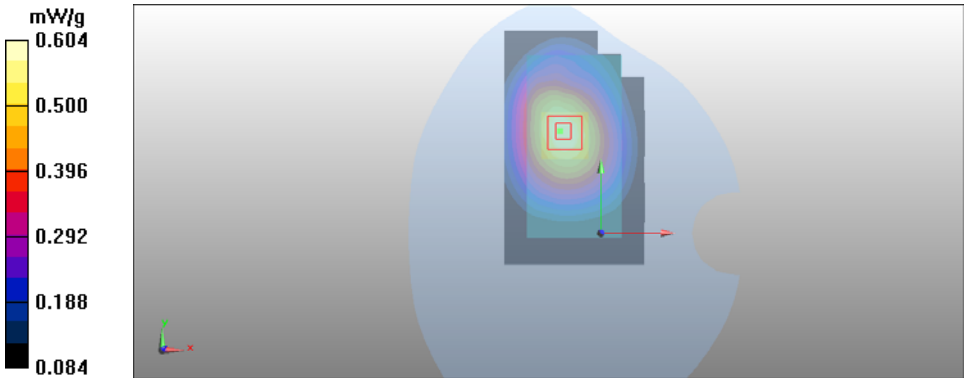
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: GSM850
Frequency: 836.6 MHz; Duty Cycle: 1:8.3
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 837 MHz; σ = 1 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(5.92, 5.92, 5.92); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2011-05-09
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

GSM/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.558 mW/g

GSM/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Zoom Scan 3 (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 8.48 V/m
Peak SAR (extrapolated) = 0.706 W/kg
SAR(1 g) = 0.576 mW/g
SAR(10 g) = 0.435 mW/g
Power Drift = 0.018 dB
Maximum value of SAR (measured) = 0.604 mW/g



Date/Time: 2012-02-22 08:59:37, Date/Time: 2012-02-22 09:06:41

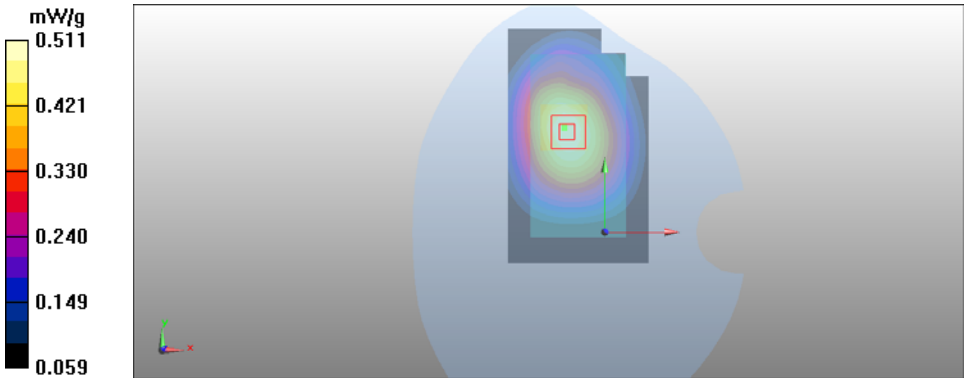
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 2-slot GPRS850
Frequency: 836.6 MHz; Duty Cycle: 1:4.2
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 837 MHz; σ = 1 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(5.92, 5.92, 5.92); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2011-05-09
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

2-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.520 mW/g

2-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 7.91 V/m
Peak SAR (extrapolated) = 0.602 W/kg
SAR(1 g) = 0.487 mW/g
SAR(10 g) = 0.367 mW/g
Power Drift = -0.066 dB
Maximum value of SAR (measured) = 0.511 mW/g



Date/Time: 2012-02-22 09:14:59, Date/Time: 2012-02-22 09:22:04

Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

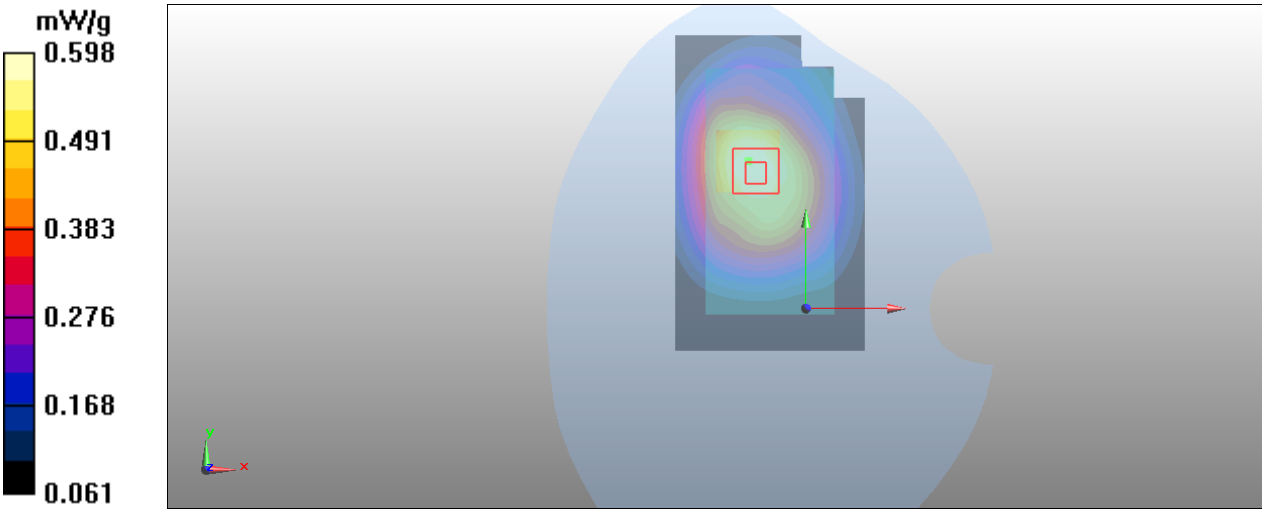
Communication System: 3-slot GPRS850
Frequency: 836.6 MHz; Duty Cycle: 1:2.8
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 837 MHz; σ = 1 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(5.92, 5.92, 5.92); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2011-05-09
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

3-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.608 mW/g

3-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 8.36 V/m
Peak SAR (extrapolated) = 0.701 W/kg
SAR(1 g) = 0.571 mW/g
SAR(10 g) = 0.433 mW/g
Power Drift = 0.245 dB

Maximum value of SAR (measured) = 0.598 mW/g



Date/Time: 2012-02-22 09:33:10, Date/Time: 2012-02-22 09:40:15

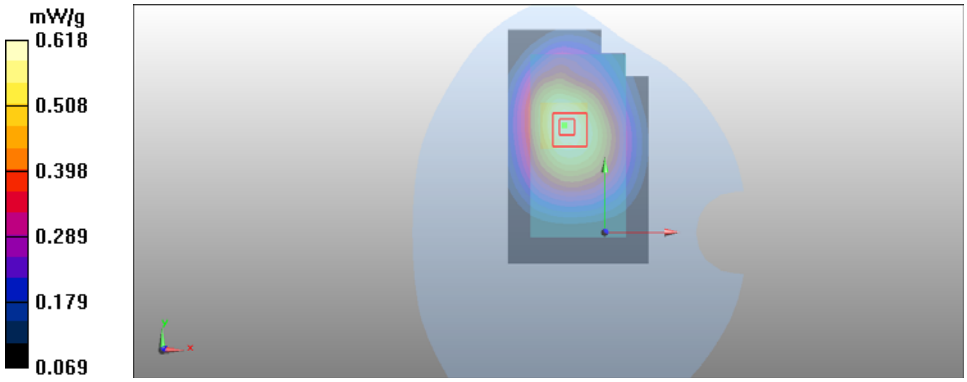
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS850
Frequency: 836.6 MHz; Duty Cycle: 1:2.1
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 837 MHz; σ = 1 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(5.92, 5.92, 5.92); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2011-05-09
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.635 mW/g

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 8.44 V/m
Peak SAR (extrapolated) = 0.726 W/kg
SAR(1 g) = 0.587 mW/g
SAR(10 g) = 0.444 mW/g
Power Drift = 0.00544 dB
Maximum value of SAR (measured) = 0.618 mW/g



Date/Time: 2012-02-22 12:07:21, Date/Time: 2012-02-22 12:10:57

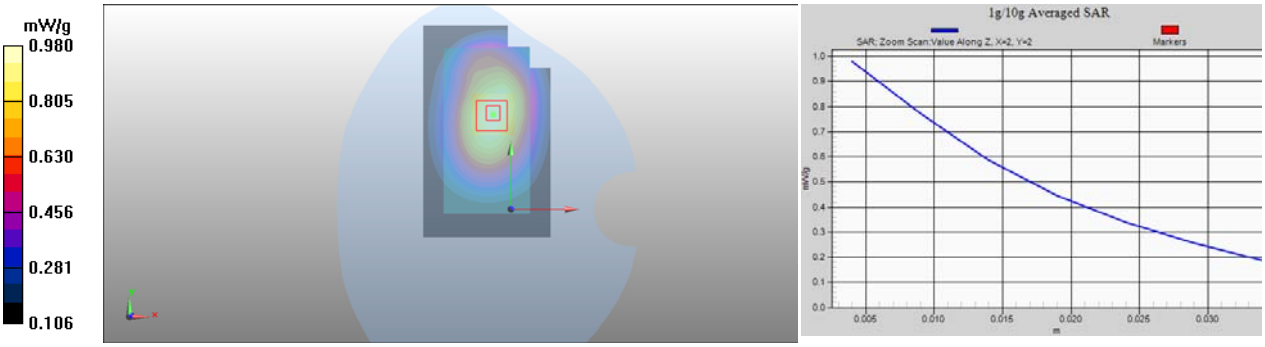
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS850
Frequency: 824.2 MHz; Duty Cycle: 1:2.1
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.994 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(5.92, 5.92, 5.92); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2011-05-09
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.991 mW/g

4-slot GPRS/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 11.2 V/m
Peak SAR (extrapolated) = 1.16 W/kg
SAR(1 g) = 0.927 mW/g
SAR(10 g) = 0.689 mW/g
Power Drift = -0.116 dB
Maximum value of SAR (measured) = 0.980 mW/g



Date/Time: 2012-02-22 10:24:30, Date/Time: 2012-02-22 10:27:16

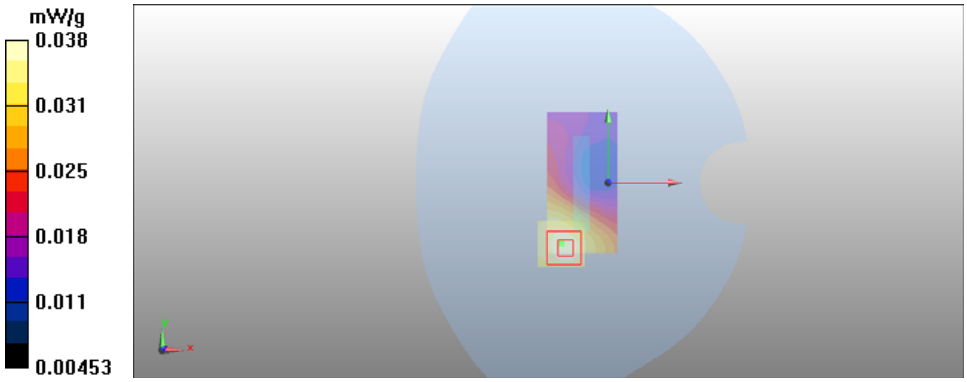
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS850
Frequency: 836.6 MHz; Duty Cycle: 1:2.1
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 837 MHz; σ = 1 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(5.92, 5.92, 5.92); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2011-05-09
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Top Edge Facing Phantom/Area Scan (31x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.038 mW/g

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Top Edge Facing Phantom /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 4.08 V/m
Peak SAR (extrapolated) = 0.046 W/kg
SAR(1 g) = 0.036 mW/g
SAR(10 g) = 0.026 mW/g
Power Drift = 0.133 dB
Maximum value of SAR (measured) = 0.038 mW/g



Date/Time: 2012-02-22 10:37:28, Date/Time: 2012-02-22 10:38:55

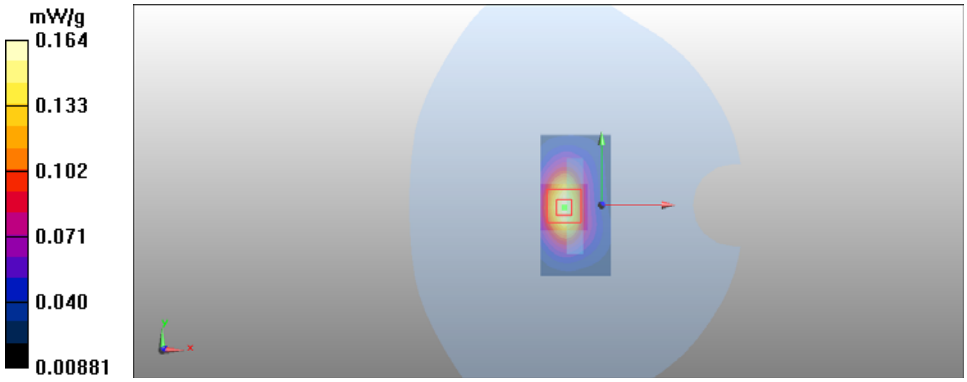
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS850
Frequency: 836.6 MHz; Duty Cycle: 1:2.1
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 837 MHz; σ = 1 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(5.92, 5.92, 5.92); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2011-05-09
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory – Bottom Edge Facing Phantom/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.166 mW/g

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory – Bottom Edge Facing Phantom /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 11.9 V/m
Peak SAR (extrapolated) = 0.236 W/kg
SAR(1 g) = 0.149 mW/g
SAR(10 g) = 0.089 mW/g
Power Drift = 0.045 dB
Maximum value of SAR (measured) = 0.164 mW/g



Date/Time: 2012-02-22 11:39:49, Date/Time: 2012-02-22 11:41:57

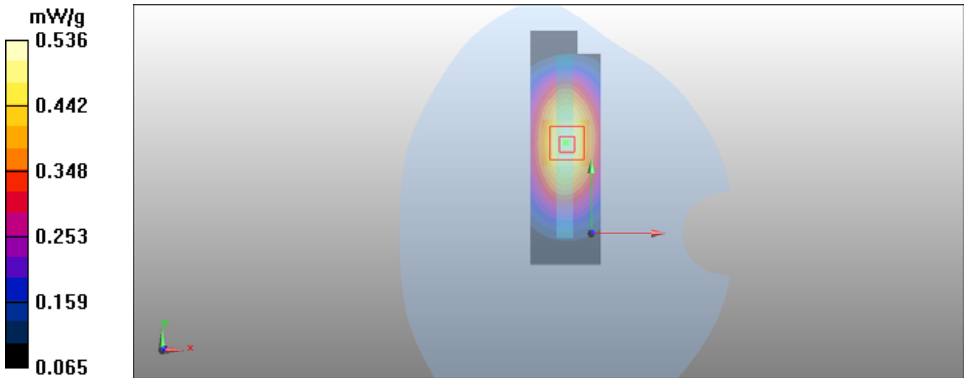
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS850
Frequency: 836.6 MHz; Duty Cycle: 1:2.1
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 837 MHz; σ = 1 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(5.92, 5.92, 5.92); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2011-05-09
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Left Edge Facing Phantom/Area Scan (31x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.534 mW/g

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Left Edge 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) = 0.670 W/kg
SAR(1 g) = 0.505 mW/g
SAR(10 g) = 0.357 mW/g
Power Drift = -0.073 dB
Maximum value of SAR (measured) = 0.536 mW/g



Date/Time: 2012-02-22 11:27:26, Date/Time: 2012-02-22 11:31:39

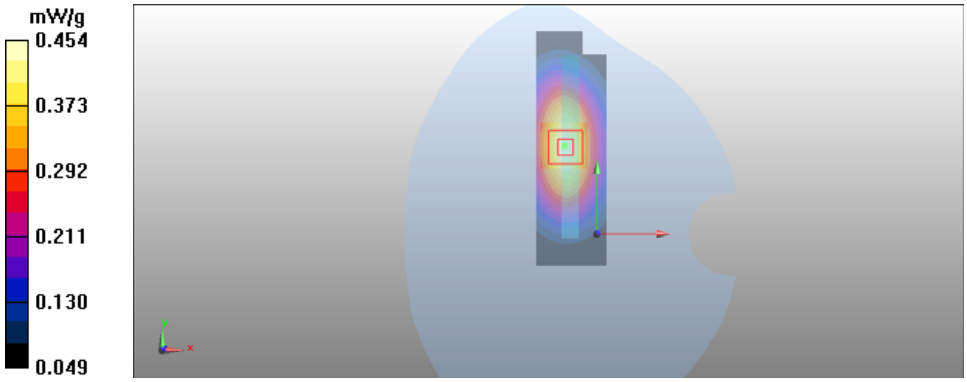
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS850
Frequency: 836.6 MHz; Duty Cycle: 1:2.1
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 837 MHz; σ = 1 mho/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(5.92, 5.92, 5.92); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2011-05-09
- Phantom: SAM1; Type: SAM; Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Right Edge Facing Phantom/Area Scan (31x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.450 mW/g

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Right Edge Facing Phantom /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 10.8 V/m
Peak SAR (extrapolated) = 0.587 W/kg
SAR(1 g) = 0.423 mW/g
SAR(10 g) = 0.290 mW/g
Power Drift = -0.172 dB
Maximum value of SAR (measured) = 0.454 mW/g



Date/Time: 2012-02-21 09:07:32, Date/Time: 2012-02-21 09:14:18

Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

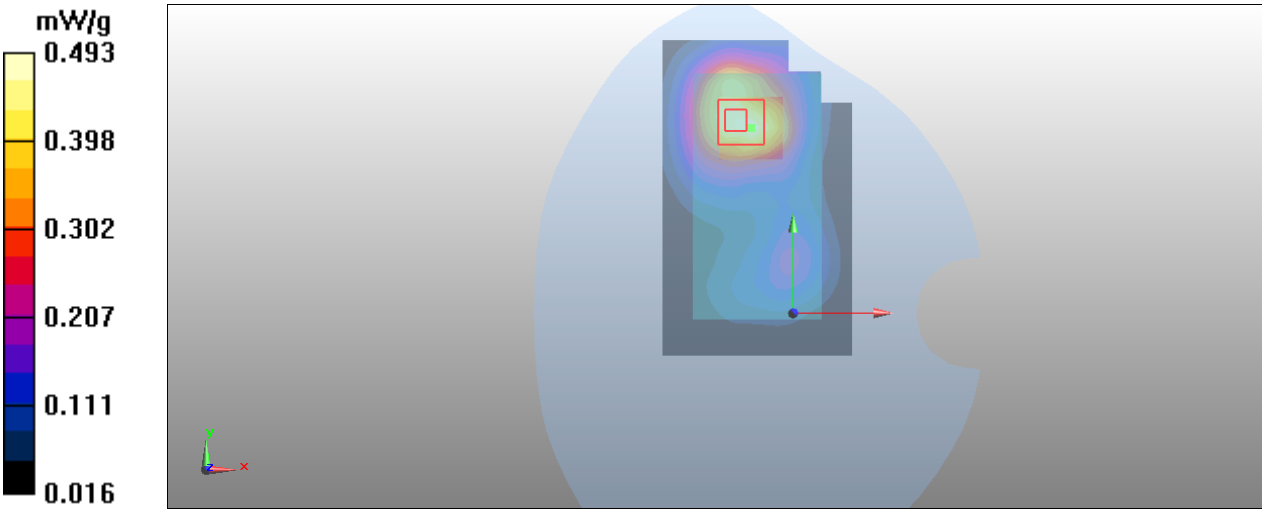
Communication System: GSM1900
Frequency: 1880 MHz; Duty Cycle: 1:8.3
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

GSM/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.483 mW/g

GSM/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 7.11 V/m
Peak SAR (extrapolated) = 0.733 W/kg
SAR(1 g) = 0.460 mW/g
SAR(10 g) = 0.285 mW/g
Power Drift = 0.310 dB

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



Date/Time: 2012-02-21 09:26:03, Date/Time: 2012-02-21 09:32:46

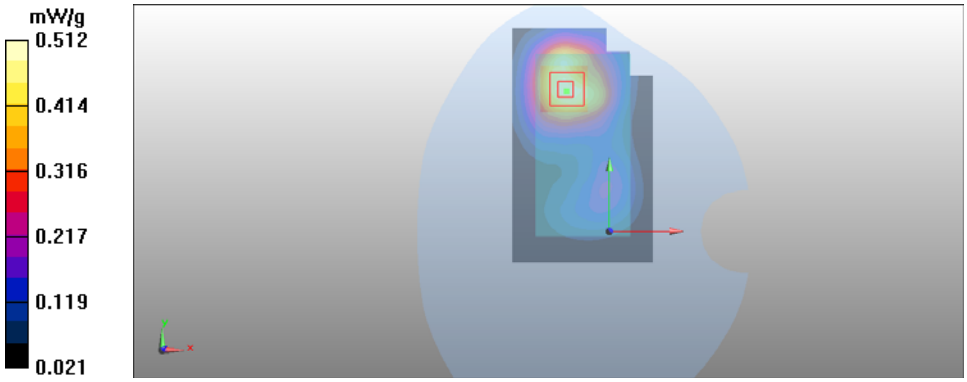
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 2-slot GPRS1900
Frequency: 1880 MHz; Duty Cycle: 1:4.2
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

GSM/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.522 mW/g

GSM/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 7.67 V/m
Peak SAR (extrapolated) = 0.744 W/kg
SAR(1 g) = 0.474 mW/g
SAR(10 g) = 0.298 mW/g
Power Drift = -0.157 dB
Maximum value of SAR (measured) = 0.512 mW/g



Date/Time: 2012-02-21 09:41:32, Date/Time: 2012-02-21 09:48:16

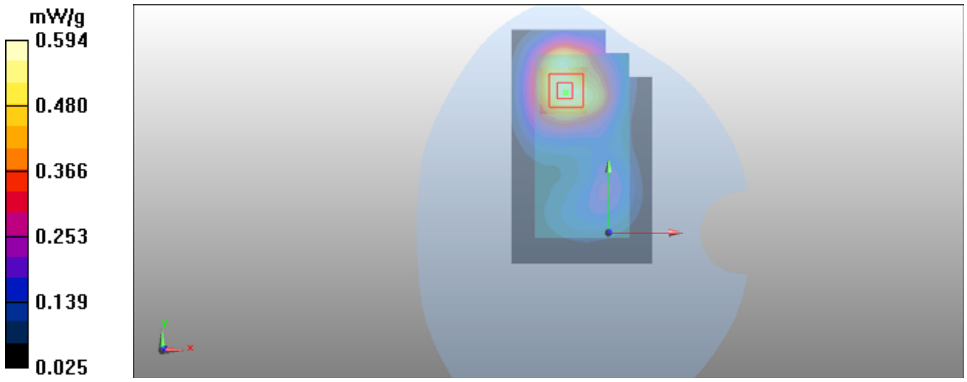
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 3-slot GPRS1900
Frequency: 1880 MHz; Duty Cycle: 1:2.8
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

3-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.609 mW/g

3-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 8.44 V/m
Peak SAR (extrapolated) = 0.867 W/kg
SAR(1 g) = 0.549 mW/g
SAR(10 g) = 0.344 mW/g
Power Drift = -0.362 dB
Maximum value of SAR (measured) = 0.594 mW/g



Date/Time: 2012-02-21 09:56:44, Date/Time: 2012-02-21 10:03:28

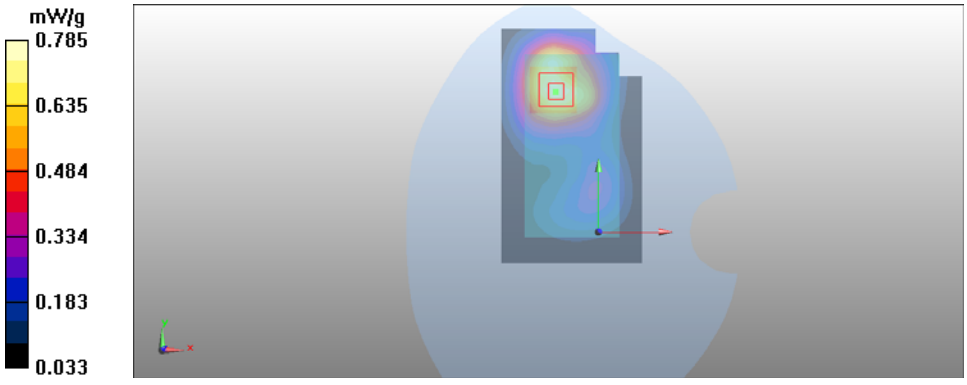
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS1900
Frequency: 1880 MHz; Duty Cycle: 1:2.1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.801 mW/g

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 9.41 V/m
Peak SAR (extrapolated) = 1.15 W/kg
SAR(1 g) = 0.728 mW/g
SAR(10 g) = 0.455 mW/g
Power Drift = -0.064 dB
Maximum value of SAR (measured) = 0.785 mW/g



Date/Time: 2012-02-21 10:28:37, Date/Time: 2012-02-21 10:32:25

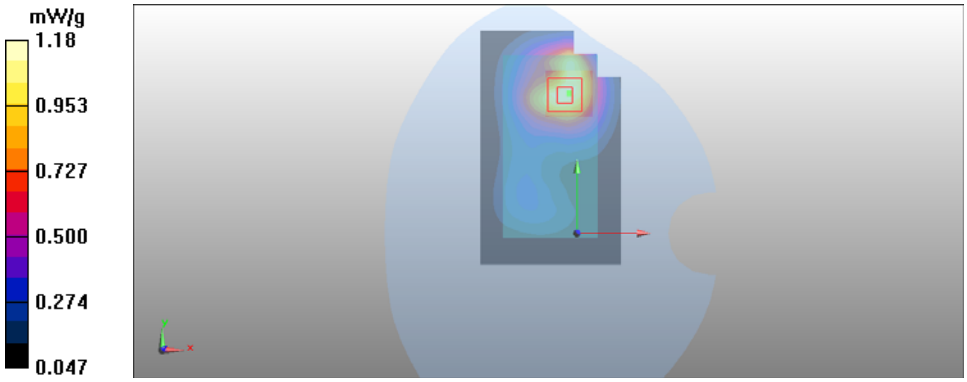
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS1900
Frequency: 1850.2 MHz; Duty Cycle: 1:2.1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.48 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.21 mW/g

4-slot GPRS/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 9.9 V/m
Peak SAR (extrapolated) = 1.77 W/kg
SAR(1 g) = 1.09 mW/g
SAR(10 g) = 0.665 mW/g
Power Drift = -0.308 dB
Maximum value of SAR (measured) = 1.18 mW/g



Date/Time: 2012-02-21 12:34:09, Date/Time: 2012-02-21 12:36:47

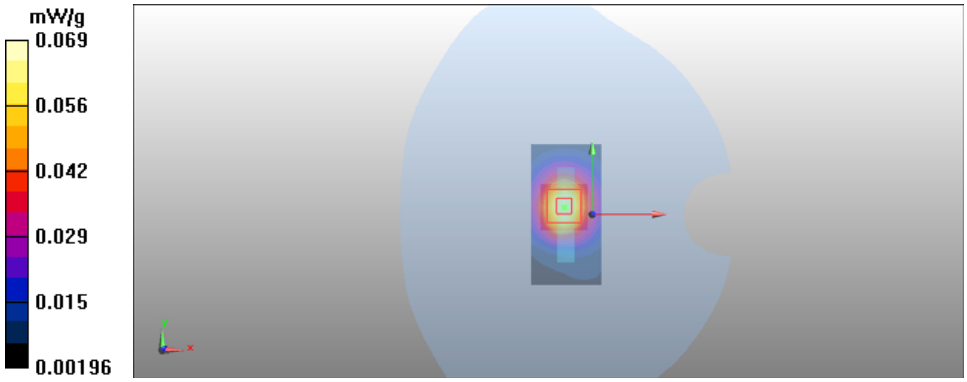
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS1900
Frequency: 1880 MHz; Duty Cycle: 1:2.1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Top Edge Facing Phantom/Area Scan (31x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.076 mW/g

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Top Edge Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 6.61 V/m
Peak SAR (extrapolated) = 0.102 W/kg
SAR(1 g) = 0.063 mW/g
SAR(10 g) = 0.037 mW/g
Power Drift = 0.077 dB
Maximum value of SAR (measured) = 0.069 mW/g



Date/Time: 2012-02-21 12:44:36, Date/Time: 2012-02-21 12:46:07

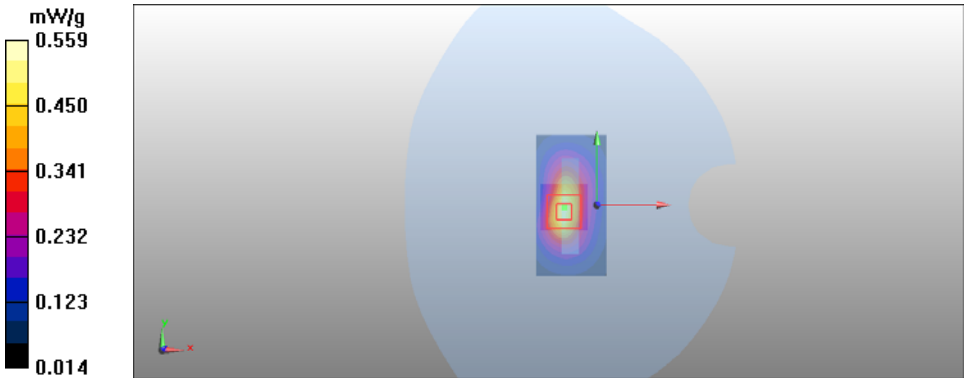
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS1900
Frequency: 1880 MHz; Duty Cycle: 1:2.1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory – Bottom Edge Facing Phantom/Area Scan (31x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.546 mW/g

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory – Bottom Edge Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 19.1 V/m
Peak SAR (extrapolated) = 0.830 W/kg
SAR(1 g) = 0.496 mW/g
SAR(10 g) = 0.274 mW/g
Power Drift = -0.094 dB
Maximum value of SAR (measured) = 0.559 mW/g



Date/Time: 2012-02-21 13:14:25, Date/Time: 2012-02-21 13:16:42

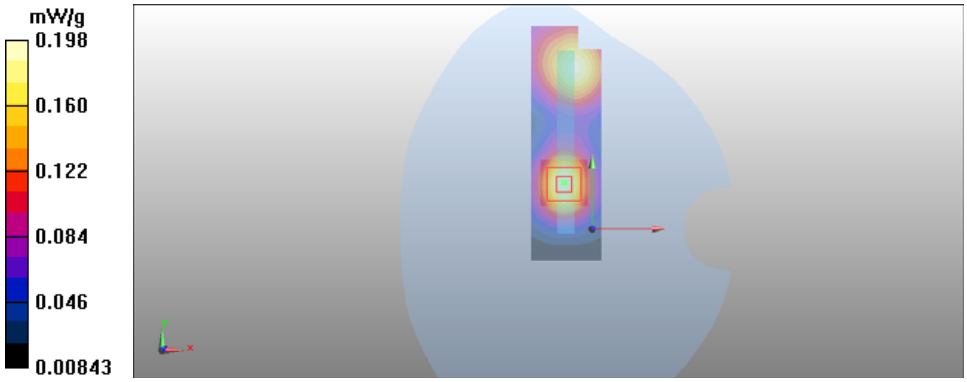
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS1900
Frequency: 1880 MHz; Duty Cycle: 1:2.1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory – Left Edge Facing Phantom/Area Scan (31x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.205 mW/g

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Left Edge Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 6.63 V/m
Peak SAR (extrapolated) = 0.290 W/kg
SAR(1 g) = 0.182 mW/g
SAR(10 g) = 0.111 mW/g
Power Drift = -0.118 dB
Maximum value of SAR (measured) = 0.198 mW/g



Date/Time: 2012-02-21 12:57:21, Date/Time: 2012-02-21 13:01:24

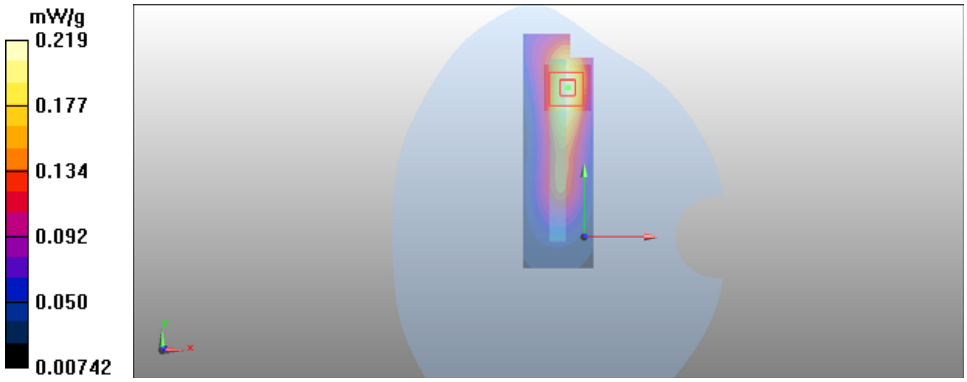
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS1900
Frequency: 1880 MHz; Duty Cycle: 1:2.1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Right Edge Facing Edge Phantom/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.225 mW/g

4-slot GPRS/Body - Middle - Spacer 10mm - No Accessory - Right Edge Facing Edge Phantom /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 5.81 V/m
Peak SAR (extrapolated) = 0.327 W/kg
SAR(1 g) = 0.200 mW/g
SAR(10 g) = 0.119 mW/g
Power Drift = -0.046 dB
Maximum value of SAR (measured) = 0.219 mW/g



Date/Time: 2012-02-22 14:49:53, Date/Time: 2012-02-22 14:53:42

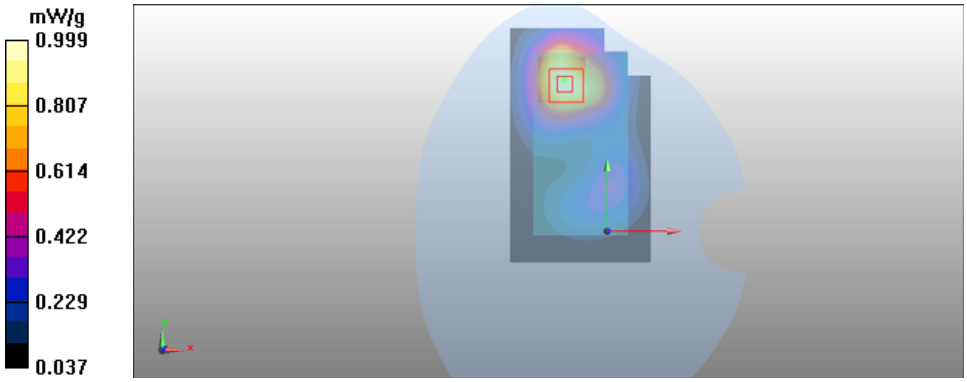
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: WCDMA1900
Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 21.6 C
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.49 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

Configuration/WCDMA/Body - Low - Spacer 10mm - No Accessory - Display Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.02 mW/g

Configuration/WCDMA/Body - Low - Spacer 10mm - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 10.6 V/m
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.934 mW/g
SAR(10 g) = 0.580 mW/g
Power Drift = -0.051 dB
Maximum value of SAR (measured) = 0.999 mW/g



Date/Time: 2012-02-22 15:23:22, Date/Time: 2012-02-22 15:34:39

Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

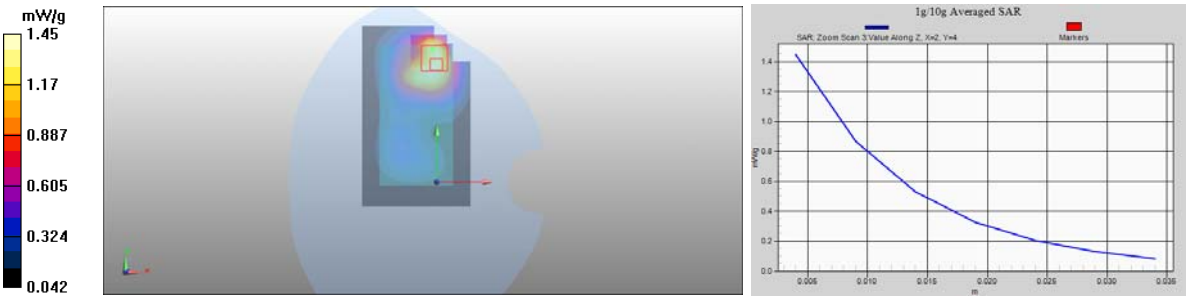
Communication System: WCDMA1900
Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 21.6 C
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.49 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

WCDMA/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.47 mW/g

WCDMA/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 10.4 V/m
Peak SAR (extrapolated) = 2.25 W/kg
SAR(1 g) = 1.3 mW/g
SAR(10 g) = 0.769 mW/g
Power Drift = -0.014 dB

Maximum value of SAR (measured) = 1.45 mW/g



Date/Time: 2012-02-21 13:53:36, Date/Time: 2012-02-21 13:56:10

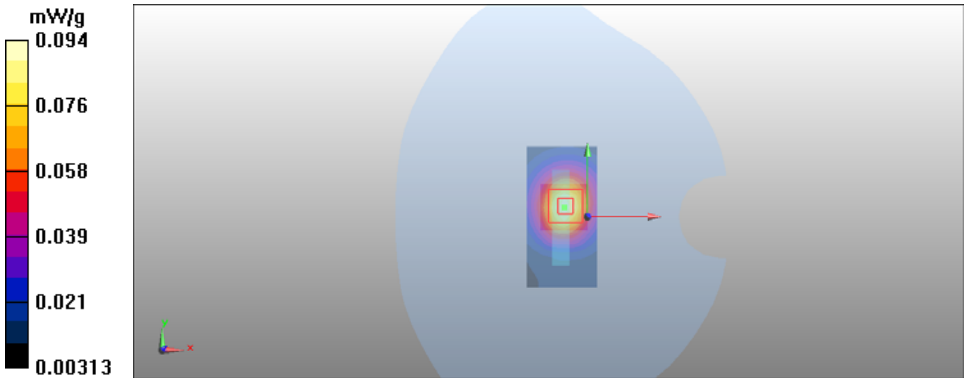
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: WCDMA1900
Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

WCDMA/Body - Middle - Spacer 10mm - No Accessory – Top Edge Facing Phantom/Area Scan (31x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.104 mW/g

WCDMA/Body - Middle - Spacer 10mm - No Accessory – Top Edge Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 7.83 V/m
Peak SAR (extrapolated) = 0.136 W/kg
SAR(1 g) = 0.086 mW/g
SAR(10 g) = 0.051 mW/g
Power Drift = -0.069 dB
Maximum value of SAR (measured) = 0.094 mW/g



Date/Time: 2012-02-21 14:02:58, Date/Time: 2012-02-21 14:04:29

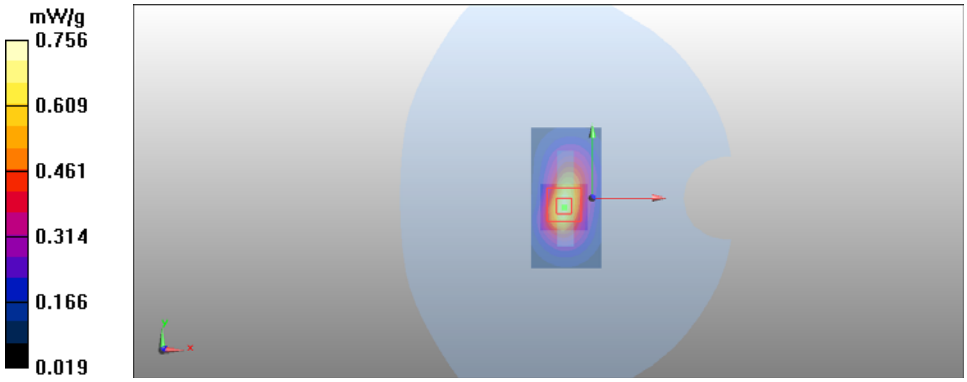
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: WCDMA1900
Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

WCDMA/Body - Middle - Spacer 10mm - No Accessory – Bottom Edge Facing Phantom/Area Scan (31x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.708 mW/g

WCDMA/Body - Middle - Spacer 10mm - No Accessory – Bottom Edge Facing Phantom /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 22.7 V/m
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.668 mW/g
SAR(10 g) = 0.369 mW/g
Power Drift = 0.023 dB
Maximum value of SAR (measured) = 0.756 mW/g



Date/Time: 2012-02-21 13:27:56, Date/Time: 2012-02-21 13:31:57

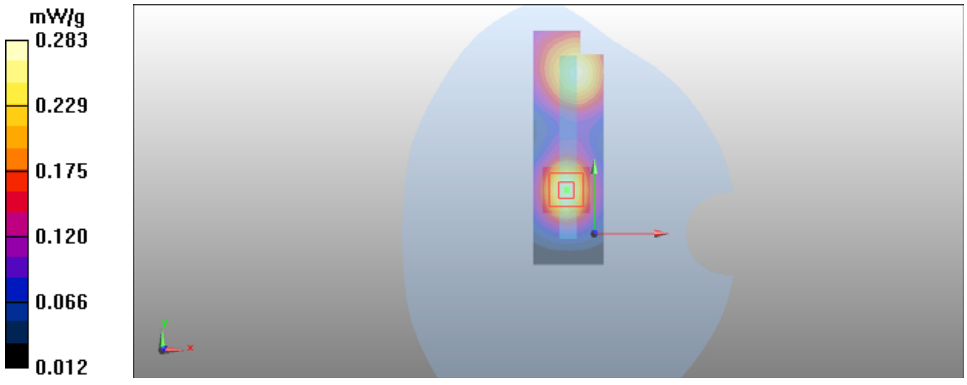
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: WCDMA1900
Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

WCDMA/Body - Middle - Spacer 10mm - No Accessory - Left Facing Phantom/Area Scan (31x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.297 mW/g

WCDMA/Body - Middle - Spacer 10mm - No Accessory - Left Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 8.04 V/m
Peak SAR (extrapolated) = 0.408 W/kg
SAR(1 g) = 0.260 mW/g
SAR(10 g) = 0.159 mW/g
Power Drift = -0.105 dB
Maximum value of SAR (measured) = 0.283 mW/g



Date/Time: 2012-02-21 13:39:52, Date/Time: 2012-02-21 13:43:51

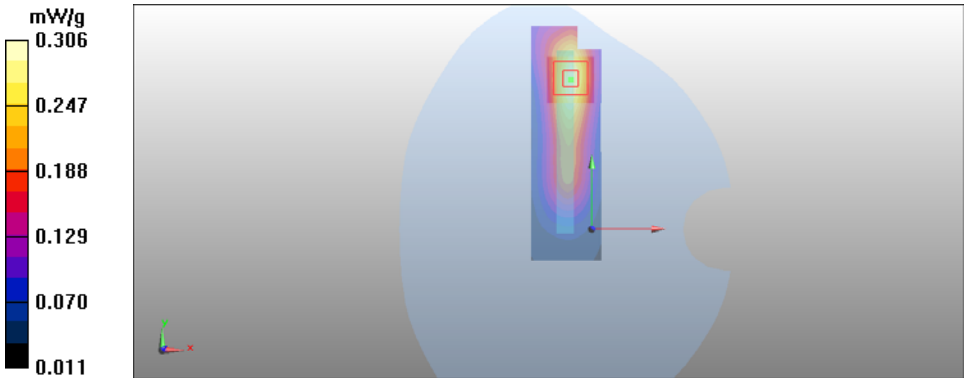
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: WCDMA1900
Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3119
- ConvF(4.46, 4.46, 4.46); Calibrated: 2011-09-14
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2011-09-16
- Phantom: SAM 2; Type: Twin SAM 040 CA; Serial: TP - 1177
- Measurement SW: DASY5, V5.2 Build 162; SEMCAD X Version 14.0 Build 61

WCDMA/Body - Middle - Spacer 10mm - No Accessory - Right Facing Phantom/Area Scan (31x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.309 mW/g

WCDMA/Body - Middle - Spacer 10mm - No Accessory - Right Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 6.84 V/m
Peak SAR (extrapolated) = 0.451 W/kg
SAR(1 g) = 0.277 mW/g
SAR(10 g) = 0.165 mW/g
Power Drift = -0.00518 dB
Maximum value of SAR (measured) = 0.306 mW/g



Date/Time: 2012-02-23 08:51:04, Date/Time: 2012-02-23 08:58:09

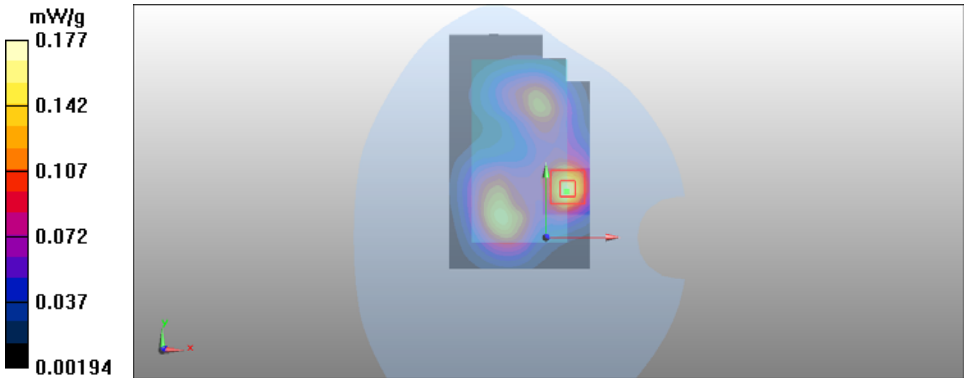
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: WLAN2450 b-mode
Frequency: 2442 MHz; Duty Cycle: 1:1
Medium: BSL2450; Medium Notes: t= 21.0 C
Medium parameters used: f = 2442 MHz; σ = 1.95 mho/m; ε_r = 50.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3790
- ConvF(6.85, 6.85, 6.85); Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2011-09-15
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

WLAN b-mode/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.170 mW/g

WLAN b-mode/Body - Middle - Spacer 10mm - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 6.81 V/m
Peak SAR (extrapolated) = 0.319 W/kg
SAR(1 g) = 0.159 mW/g
SAR(10 g) = 0.079 mW/g
Power Drift = 0.105 dB
Maximum value of SAR (measured) = 0.177 mW/g



Date/Time: 2012-02-23 15:14:15, Date/Time: 2012-02-23 15:17:49

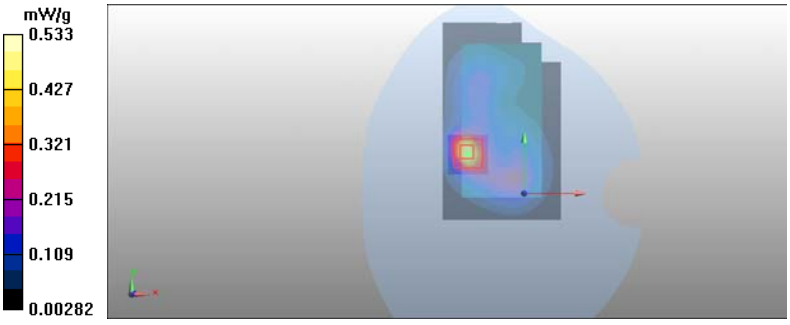
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

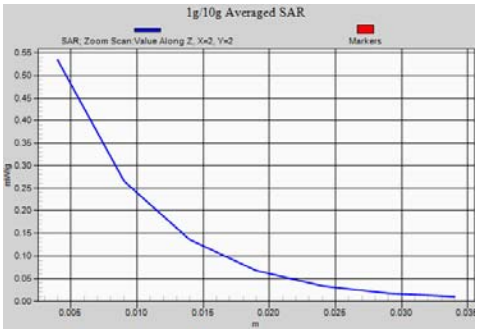
Communication System: WLAN2450 b-mode
Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: BSL2450; Medium Notes: t= 21.0 C
Medium parameters used: f = 2462 MHz; σ = 1.97 mho/m; ε_r = 50.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3790
- ConvF(6.85, 6.85, 6.85); Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2011-09-15
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

WLAN b-mode/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.463 mW/g

WLAN b-mode/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 9.36 V/m
Peak SAR (extrapolated) = 1.03 W/kg
SAR(1 g) = 0.474 mW/g
SAR(10 g) = 0.214 mW/g
Power Drift = 0.277 dB
Maximum value of SAR (measured) = 0.533 mW/g





Date/Time: 2012-02-23 12:00:12, Date/Time: 2012-02-23 12:03:41

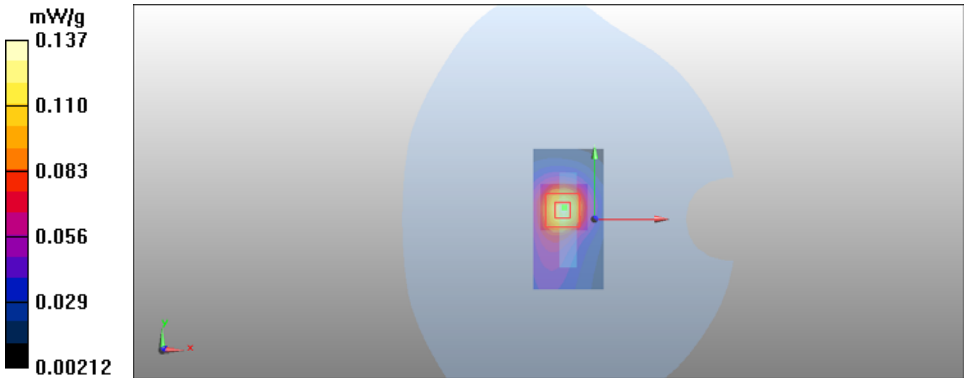
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: WLAN2450 b-mode
Frequency: 2442 MHz; Duty Cycle: 1:1
Medium: BSL2450; Medium Notes: t= 21.0 C
Medium parameters used: f = 2442 MHz; σ = 1.95 mho/m; ε_r = 50.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3790
- ConvF(6.85, 6.85, 6.85); Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2011-09-15
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

WLAN b-mode/Body - Middle - Spacer 10mm - No Accessory – Top Edge Facing Phantom/Area Scan (31x61x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.133 mW/g

WLAN b-mode/Body - Middle - Spacer 10mm - No Accessory – Top edge Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 7.82 V/m
Peak SAR (extrapolated) = 0.225 W/kg
SAR(1 g) = 0.123 mW/g
SAR(10 g) = 0.065 mW/g
Power Drift = 0.093 dB
Maximum value of SAR (measured) = 0.137 mW/g



Date/Time: 2012-02-23 12:36:36, Date/Time: 2012-02-23 12:38:00

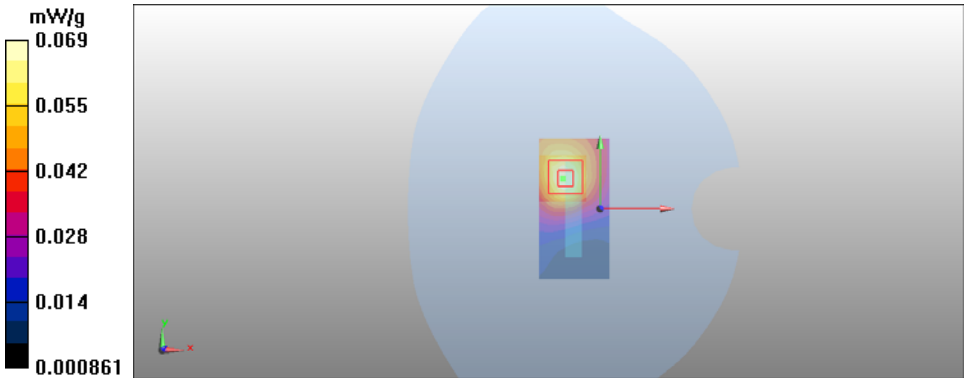
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: WLAN2450 b-mode
Frequency: 2442 MHz; Duty Cycle: 1:1
Medium: BSL2450; Medium Notes: t= 21.0 C
Medium parameters used: f = 2442 MHz; σ = 1.95 mho/m; ε_r = 50.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3790
- ConvF(6.85, 6.85, 6.85); Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2011-09-15
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

WLAN b-mode/Body - Middle - Spacer 10mm - No Accessory – Bottom Edge Facing Phantom/Area Scan (31x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.071 mW/g

WLAN b-mode/Body - Middle - Spacer 10mm - No Accessory – Bottom Edge Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 4.45 V/m
Peak SAR (extrapolated) = 0.112 W/kg
SAR(1 g) = 0.065 mW/g
SAR(10 g) = 0.037 mW/g
Power Drift = 0.199 dB
Maximum value of SAR (measured) = 0.069 mW/g



Date/Time: 2012-02-23 09:58:28, Date/Time: 2012-02-23 10:00:35

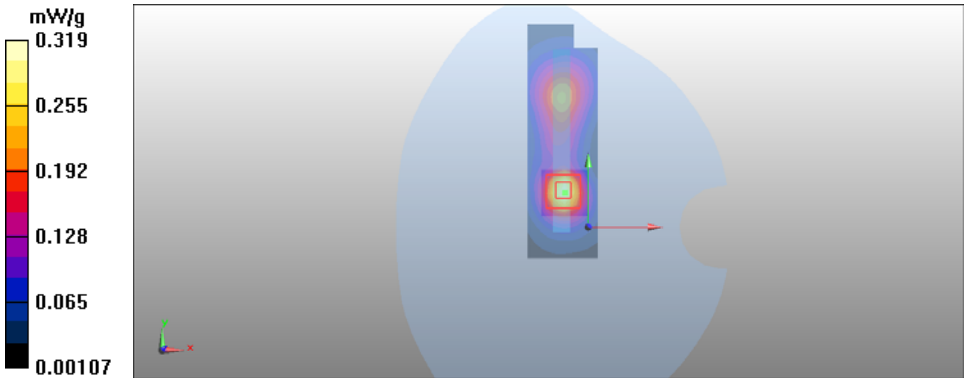
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: WLAN2450 b-mode
Frequency: 2442 MHz; Duty Cycle: 1:1
Medium: BSL2450; Medium Notes: t= 21.0 C
Medium parameters used: f = 2442 MHz; σ = 1.95 mho/m; ε_r = 50.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3790
- ConvF(6.85, 6.85, 6.85); Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2011-09-15
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

WLAN b-mode/Body - Middle - Spacer 10mm - No Accessory - Left Edge Facing Phantom/Area Scan (31x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.324 mW/g

WLAN b-mode/Body - Middle - Spacer 10mm - No Accessory - Left Edge Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 6.77 V/m
Peak SAR (extrapolated) = 0.557 W/kg
SAR(1 g) = 0.287 mW/g
SAR(10 g) = 0.142 mW/g
Power Drift = 0.030 dB
Maximum value of SAR (measured) = 0.319 mW/g



Date/Time: 2012-02-23 09:30:38, Date/Time: 2012-02-23 09:34:47

Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

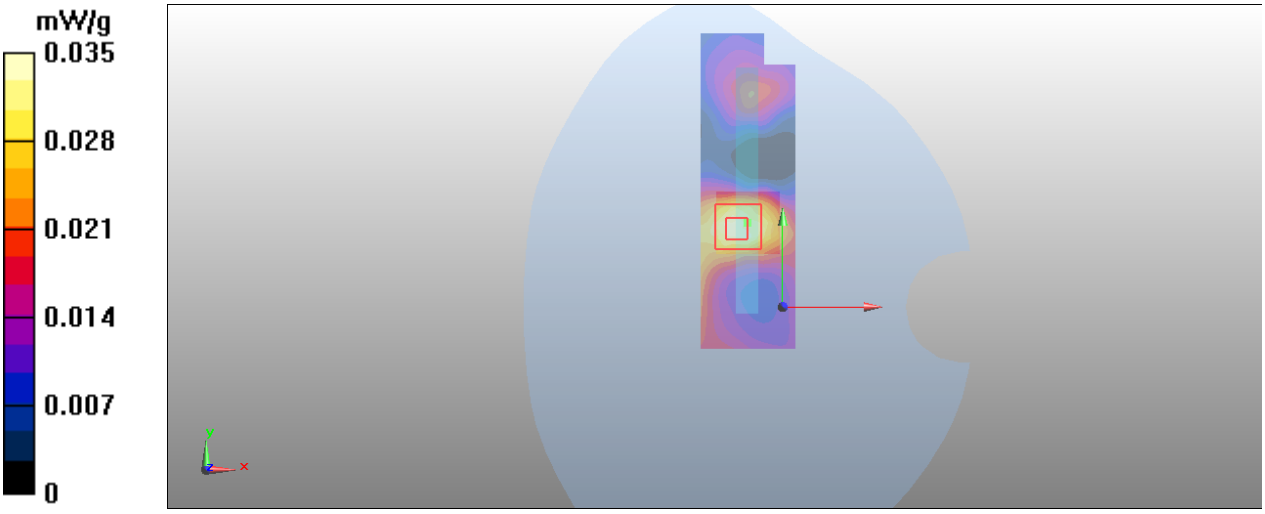
Communication System: WLAN2450 b-mode
Frequency: 2442 MHz; Duty Cycle: 1:1
Medium: BSL2450; Medium Notes: t= 21.0 C
Medium parameters used: f = 2442 MHz; σ = 1.95 mho/m; ε_r = 50.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3790
- ConvF(6.85, 6.85, 6.85); Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2011-09-15
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

WLAN b-mode/Body - Middle - Spacer 10mm - No Accessory - Right Edge Facing Phantom/Area Scan (31x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.039 mW/g

WLAN b-mode/Body - Middle - Spacer 10mm - No Accessory - Right Edge Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 2.04 V/m
Peak SAR (extrapolated) = 0.060 W/kg
SAR(1 g) = 0.033 mW/g
SAR(10 g) = 0.019 mW/g
Power Drift = -0.498 dB

Maximum value of SAR (measured) = 0.035 mW/g



Date/Time: 2012-02-23 15:48:31, Date/Time: 2012-02-23 15:52:05

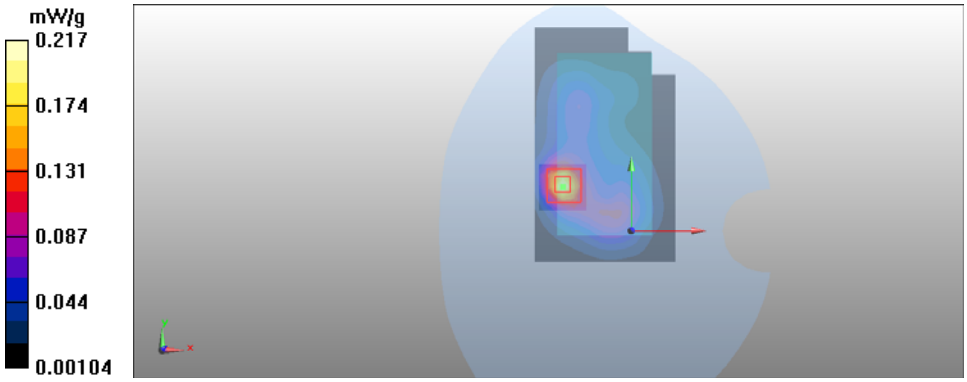
Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: WLAN2450 n-mode
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: BSL2450; Medium Notes: t= 21.0 C
Medium parameters used: f = 2412 MHz; σ = 1.91 mho/m; ε_r = 50.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3790
- ConvF(6.85, 6.85, 6.85); Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2011-09-15
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1179
- Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

WLAN n-mode/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (61x101x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.196 mW/g

WLAN n-mode/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 6.4 V/m
Peak SAR (extrapolated) = 0.433 W/kg
SAR(1 g) = 0.191 mW/g
SAR(10 g) = 0.086 mW/g
Power Drift = 0.177 dB
Maximum value of SAR (measured) = 0.217 mW/g



Date/Time: 2012-03-06 09:57:11, Date/Time2012-03-06 13:02:23

Test Laboratory: TCC Nokia
Type: RM-801; 004402/13/553871/2, Serial: 004402/13/553891/0

Communication System: 3-slot GPRS850, Communication System: WLAN2450 n-mode EXPANDED VOLUME SCAN

Frequency: 824.2 MHz, Frequency: 2462 MHz; Duty Cycle: 1:2.8, Duty Cycle: 1:1
Medium: HSL850, Medium: HSL2450; Medium Notes: t= 21 C, Medium Notes: t= 20.9 C
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.895 mho/m; εr = 39.937; ρ = 1000 kg/m3,
Medium parameters used: f = 2462 MHz; σ = 1.795 mho/m; εr = 37.34; ρ = 1000 kg/m3
Phantom section: Right Section

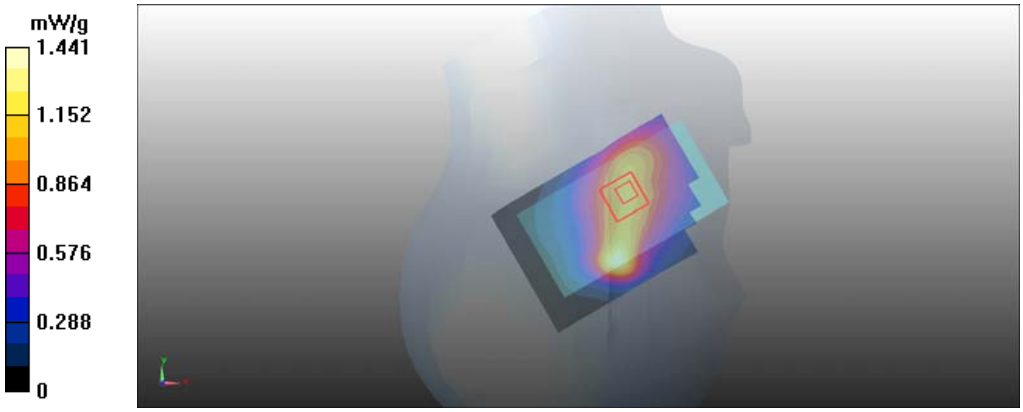
DASY Configuration:
- Probe: ES3DV3 - SN3131, Probe: EX3DV4 - SN3790
- ConvF(5.88, 5.88, 5.88); ConvF(6.67, 6.67, 6.67); Calibrated: 2011-09-14; Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Electronics: DAE4 Sn538; Calibrated: 2011-05-09; Calibrated: 2011-09-15
- Phantom: SAM2; Phantom: SAM 3; Type: Twin SAM 040 CA; Serial: TP-1570; Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55; Measurement SW: DASY52, V52.6 Build 2; SEMCAD X Version 14.0 Build 61

2-slot GPRS - Right/Cheek - Low/Volume Scan (12x17x7): Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

WLAN b-mode - Right/Cheek - High/Volume Scan (12x17x7): Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm

Multi Band Result:
SAR(1 g) = 0.905 mW/g; SAR(10 g) = 0.681 mW/g

Maximum value of SAR (measured) = 1.441 mW/g



Date/Time: 2012-02-22 12:07:21, Date/Time: 2012-02-23 15:14:15

Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS850, Communication System: WLAN2450 b-mode

Frequency: 824.2 MHz, Frequency: 2462 MHz; Duty Cycle: 1:2.1, Duty Cycle: 1:1
Medium: BSL850, Medium: BSL2450; Medium Notes: t= 21.1 C, Medium Notes: t= 21.0 C
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.994 mho/m; ε_r = 53.3; ρ = 1000 kg/m^3 , Medium parameters used: f = 2462 MHz; σ = 1.97 mho/m; ε_r = 50.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

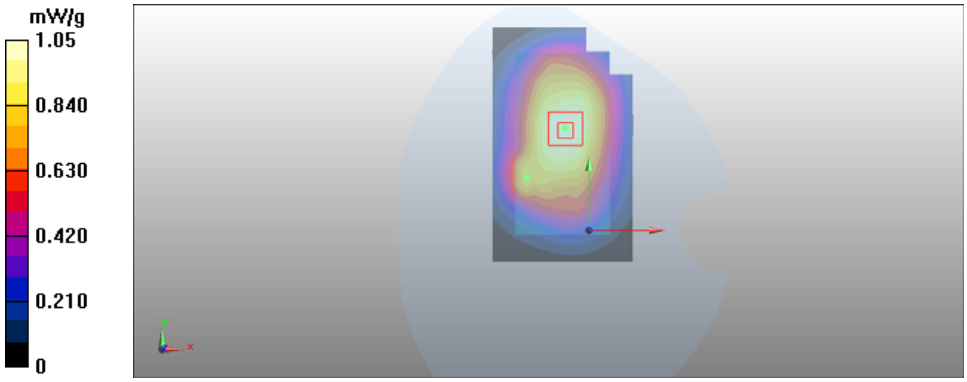
DASY Configuration:
- Probe: ES3DV3 - SN3131, Probe: EX3DV4 - SN3790
- ConvF(5.92, 5.92, 5.92), ConvF(6.85, 6.85, 6.85); Calibrated: 2011-09-14, Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn728, Electronics: DAE4 Sn538; Calibrated: 2011-05-09, Calibrated: 2011-09-15
- Phantom: SAM1, Phantom: SAM 1; Type: SAM, Type: Twin SAM 040 CA; Serial: TP-1126, Serial: TP-1179
- Measurement SW: DASY4, V4.7 Build 55, Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (7x11x1):
Measurement grid: dx=15mm, dy=15mm

WLAN b-mode/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (7x11x1):
Measurement grid: dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.996 mW/g
SAR(10 g) = 0.704 mW/g

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



Date/Time: 2012-02-21 10:28:37, Date/Time: 2012-02-23 15:14:15

Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: 4-slot GPRS1900, Communication System: WLAN2450 b-mode
Frequency: 1850.2 MHz, Frequency: 2462 MHz; Duty Cycle: 1:2.1, Duty Cycle: 1:1
Medium: BSL1900, Medium: BSL2450; Medium Notes: t= 20.8 C, Medium Notes: t= 21.0 C
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.48 mho/m; ε_r = 52.6; ρ = 1000 kg/m^3 , Medium parameters used: f = 2462 MHz; σ = 1.97 mho/m; ε_r = 50.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

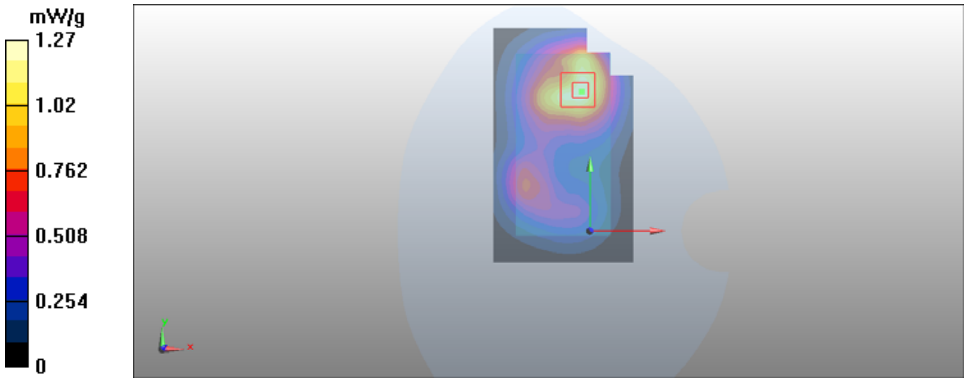
DASY Configuration:
- Probe: ES3DV3 - SN3119, Probe: EX3DV4 - SN3790
- ConvF(4.46, 4.46, 4.46), ConvF(6.85, 6.85, 6.85); Calibrated: 2011-09-14, Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn793, Electronics: DAE4 Sn538; Calibrated: 2011-09-16, Calibrated: 2011-09-15
- Phantom: SAM 2, Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP - 1177, Serial: TP-1179
- Measurement SW: DASY5, V5.2 Build 162, Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

4-slot GPRS/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (7x11x1):
Measurement grid: dx=15mm, dy=15mm

WLAN b-mode/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (7x11x1):
Measurement grid: dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 1.17 mW/g
SAR(10 g) = 0.695 mW/g

Maximum value of SAR (measured) = 1.27 mW/g



Date/Time: 2012-02-22 15:23:22, Date/Time: 2012-02-23 15:14:15

Test Laboratory: TCC Nokia
Type: RM-801; Serial: 359289/04/001467/8

Communication System: WCDMA1900, Communication System: WLAN2450 b-mode
Frequency: 1852.4 MHz, Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: BSL1900, Medium: BSL2450; Medium Notes: t= 21.6 C, Medium Notes: t= 21.0 C
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.49 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3 , Medium parameters used: f = 2462 MHz; σ = 1.97 mho/m; ε_r = 50.4; ρ = 1000 kg/m^3
Phantom section: Flat Section

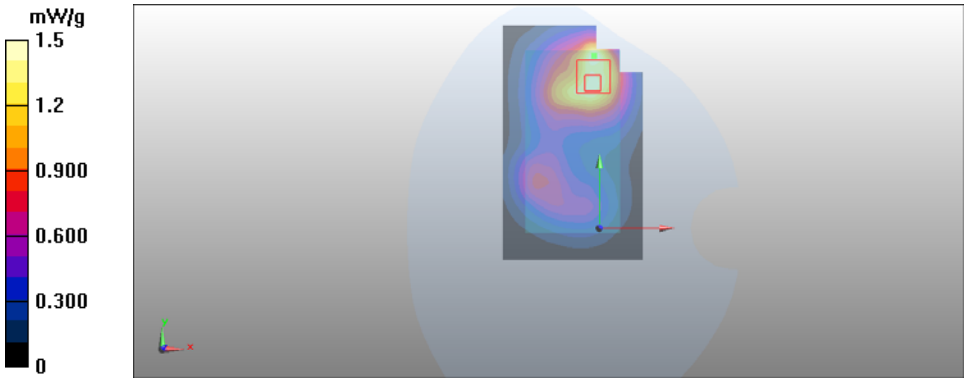
DASY Configuration:
- Probe: ES3DV3 - SN3119, Probe: EX3DV4 - SN3790
- ConvF(4.46, 4.46, 4.46), ConvF(6.85, 6.85, 6.85); Calibrated: 2011-09-14, Calibrated: 2011-05-24
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn793, Electronics: DAE4 Sn538; Calibrated: 2011-09-16, Calibrated: 2011-09-15
- Phantom: SAM 2, Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP - 1177, Serial: TP-1179
- Measurement SW: DASY5, V5.2 Build 162, Measurement SW: DASY52, V52.8 Build 0; SEMCAD X Version 14.0 Build 61

Configuration/WCDMA/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (7x11x1):
Measurement grid: dx=15mm, dy=15mm

WLAN b-mode/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (7x11x1):
Measurement grid: dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 1.35 mW/g
SAR(10 g) = 0.819 mW/g

Maximum value of SAR (measured) = 1.5 mW/g



APPENDIX C: DIELECTRIC PARAMETERS OF THE TISSUE SIMULANTS

Head tissue simulant dielectric parameters used in the measurements:

f (MHz)	Date	Dielectric Parameters					
		Ch 128 824.2 MHz		Ch 190 836.6 MHz		Ch 251 848.8 MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
836	2012-03-06	39.9	0.89	39.9	0.90	39.8	0.91
f (MHz)	Date	Dielectric Parameters					
		Ch 1 2412.0 MHz		Ch 7 2442.0 MHz		Ch 11 2462.0 MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
2442	2012-03-06	37.5	1.73	37.4	1.77	37.3	1.80

Body tissue simulant dielectric parameters used in the measurements:

f (MHz)	Date	Dielectric Parameters					
		Ch 128 824.2 MHz		Ch 190 836.6 MHz		Ch 251 848.8 MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
836	2012-02-22	53.3	0.99	53.2	1.00	53.2	1.01
f (MHz)	Date	Dielectric Parameters					
		Ch 512 1850.2 MHz		Ch 661 1880.0 MHz		Ch 810 1909.8 MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
1880	2012-02-20	52.6	1.48	52.6	1.49	52.3	1.53
f (MHz)	Date	Dielectric Parameters					
		Ch 9262 1852.4 MHz		Ch 9400 1880.0 MHz		Ch 9538 1907.6 MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
1880	2012-02-20	52.7	1.48	52.6	1.49	52.3	1.52
	2012-02-22	52.5	1.49	52.7	1.52	52.4	1.54
f (MHz)	Date	Dielectric Parameters					
		Ch 1 2412.0 MHz		Ch 7 2442.0 MHz		Ch 11 2462.0 MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
2442	2012-02-23	50.9	1.91	50.4	1.95	50.4	1.97

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

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

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Accreditation No.: SCS 108

Client **Nokia Salo TCC** **Certificate No: ES3-3131_Sep11**

CALIBRATION CERTIFICATE

Object ES3DV3 - SN:3131

Calibration procedure(s) QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: September 14, 2011

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	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
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-10)	In house check: Oct-11

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

Issued: September 15, 2011

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

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	6.10	6.10	6.10	0.80	1.00	± 12.0 %
835	41.5	0.90	5.88	5.88	5.88	0.80	1.31	± 12.0 %
1750	40.1	1.37	5.14	5.14	5.14	0.80	1.25	± 12.0 %
1900	40.0	1.40	4.92	4.92	4.92	0.80	1.25	± 12.0 %
2450	39.2	1.80	4.32	4.32	4.32	0.79	1.25	± 12.0 %
2600	39.0	1.96	4.21	4.21	4.21	0.76	1.30	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	5.97	5.97	5.97	0.80	1.00	± 12.0 %
835	55.2	0.97	5.92	5.92	5.92	0.80	1.34	± 12.0 %
1750	53.4	1.49	4.64	4.64	4.64	0.80	1.35	± 12.0 %
1900	53.3	1.52	4.44	4.44	4.44	0.80	1.28	± 12.0 %
2450	52.7	1.95	4.07	4.07	4.07	0.80	1.17	± 12.0 %
2600	52.5	2.16	3.97	3.97	3.97	0.80	1.00	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

20175

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Accreditation No.: SCS 108

Client **Nokia Denmark A/S**

Certificate No: ES3-3119_Sep11

CALIBRATION CERTIFICATE

Object: ES3DV3 - SN:3119

Calibration procedure(s): QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: September 14, 2011

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	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
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-10)	In house check: Oct-11

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

Issued: September 15, 2011

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3119

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
835	41.5	0.90	5.92	5.92	5.92	0.80	1.00	± 12.0 %
1750	40.1	1.37	5.12	5.12	5.12	0.80	1.28	± 12.0 %
1900	40.0	1.40	4.93	4.93	4.93	0.80	1.26	± 12.0 %
2450	39.2	1.80	4.31	4.31	4.31	0.80	1.26	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: ES3DV3- SN:3119

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
835	55.2	0.97	5.95	5.95	5.95	0.80	1.00	± 12.0 %
1750	53.4	1.49	4.69	4.69	4.69	0.80	1.34	± 12.0 %
1900	53.3	1.52	4.46	4.46	4.46	0.80	1.31	± 12.0 %
2450	52.7	1.95	4.15	4.15	4.15	0.80	1.00	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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Accreditation No.: SCS 108

Client Nokia Salo TCC

Certificate No: EX3-3790_May11

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3790

Calibration procedure(s): QA CAL-01.v7, QA CAL-23.v4, QA CAL-25.v3
Calibration procedure for dosimetric E-field probes

Calibration date: May 24, 2011

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	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
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-10)	In house check: Oct-11

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

Issued: May 27, 2011

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3790

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	8.74	8.74	8.74	0.80	0.72	± 12.0 %
835	41.5	0.90	8.49	8.49	8.49	0.80	0.69	± 12.0 %
1750	40.1	1.37	7.49	7.49	7.49	0.80	0.59	± 12.0 %
1900	40.0	1.40	7.25	7.25	7.25	0.80	0.59	± 12.0 %
2450	39.2	1.80	6.67	6.67	6.67	0.75	0.59	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

DASY/EASY - Parameters of Probe: EX3DV4- SN:3790

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	8.57	8.57	8.57	0.80	0.74	± 12.0 %
835	55.2	0.97	8.39	8.39	8.39	0.80	0.75	± 12.0 %
1750	53.4	1.49	7.72	7.72	7.72	0.80	0.72	± 12.0 %
1900	53.3	1.52	7.32	7.32	7.32	0.80	0.71	± 12.0 %
2450	52.7	1.95	6.85	6.85	6.85	0.80	0.58	± 12.0 %

[C] Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
[F] At frequencies below 3 GHz, the validity of tissue parameters (ε and σ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters (ε and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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

Calibration Laboratory of
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Zeughausstrasse 43, 8004 Zurich, Switzerland

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Client Nokia Salo TCC **Certificate No: D835V2-462_Sep11**

CALIBRATION CERTIFICATE

Object D835V2 - SN: 462

Calibration procedure(s) QA CAL-05.v8
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: September 13, 2011

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-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

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	04-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-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 13, 2011

Date: 13.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 462

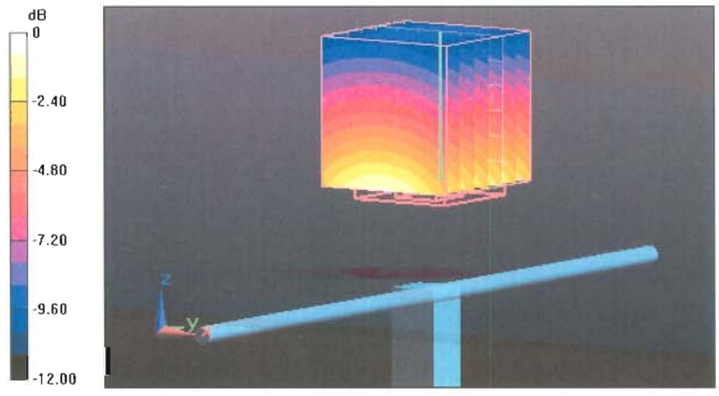
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.987 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.423 W/kg
SAR(1 g) = 2.33 mW/g; SAR(10 g) = 1.52 mW/g
Maximum value of SAR (measured) = 2.708 mW/g



0 dB = 2.710mW/g

DASY5 Validation Report for Body TSL

Date: 12.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 462

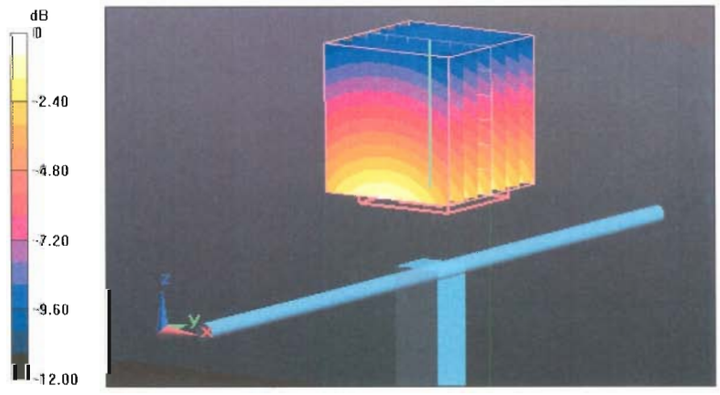
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.464 V/m; Power Drift = 0.0033 dB
Peak SAR (extrapolated) = 3.540 W/kg
SAR(1 g) = 2.45 mW/g; SAR(10 g) = 1.61 mW/g
Maximum value of SAR (measured) = 2.851 mW/g



0 dB = 2.850mW/g

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Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client Nokia Salo TCC

Certificate No: D1900V2-5d013_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

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 23, 2010

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.7 Ω + 6.5 jΩ
Return Loss	- 23.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.7 Ω + 7.0 jΩ
Return Loss	- 22.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.195 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	April 30, 2002

DASY5 Validation Report for Head TSL

Date/Time: 23.03.2010 10:16:39

Test Laboratory: SPEAG, Zurich, Switzerland

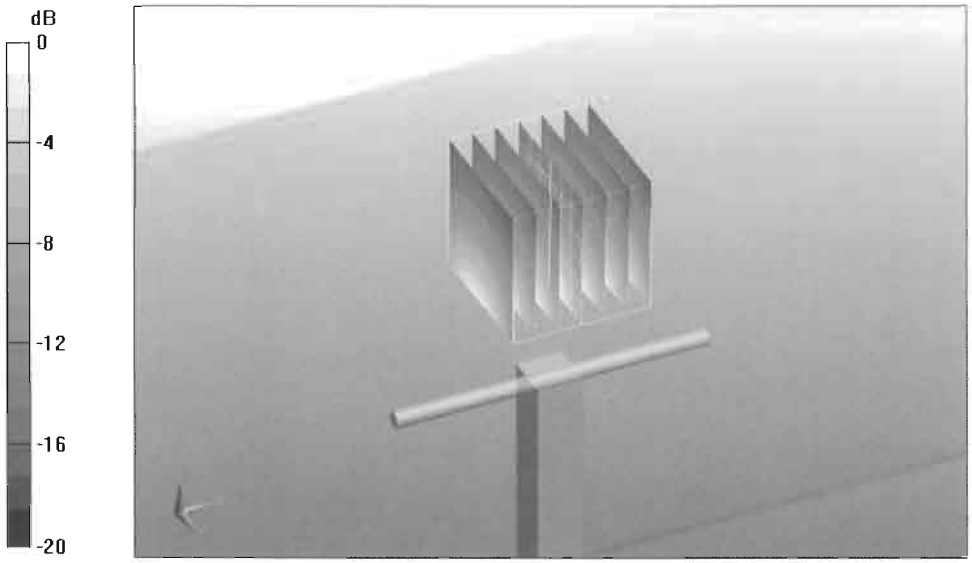
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d013

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL U11 BB
Medium parameters used: f = 1900 MHz; σ = 1.45 mho/m; ε_r = 41.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

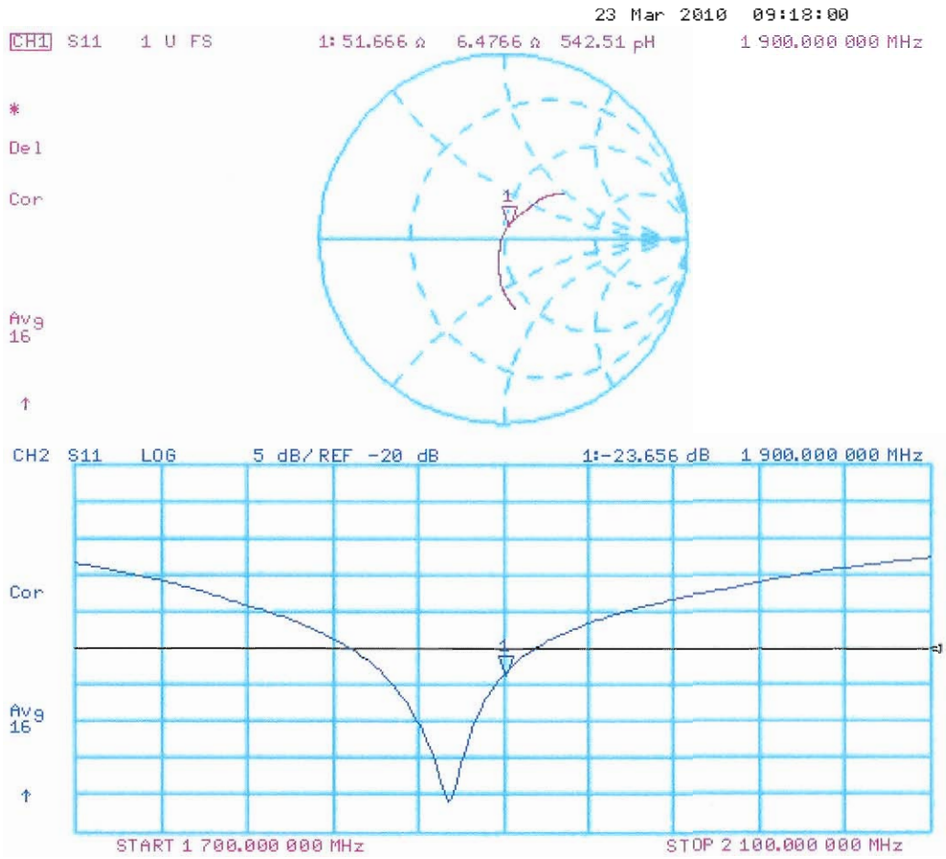
- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version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

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body

Date/Time: 23.03.2010 13:12:18

Test Laboratory: SPEAG, Zurich, Switzerland

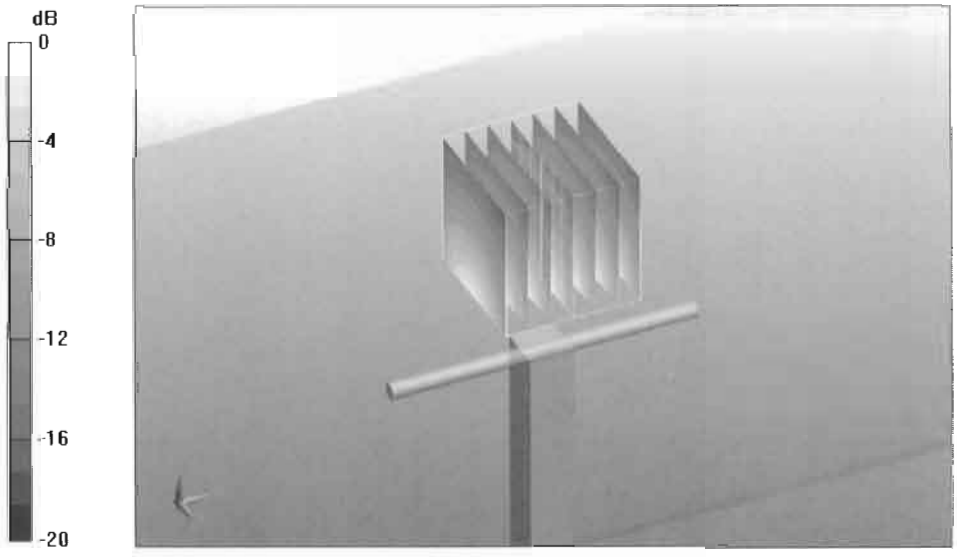
DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d013

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: MSL U11 BB
Medium parameters used: f = 1900 MHz; σ = 1.58 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

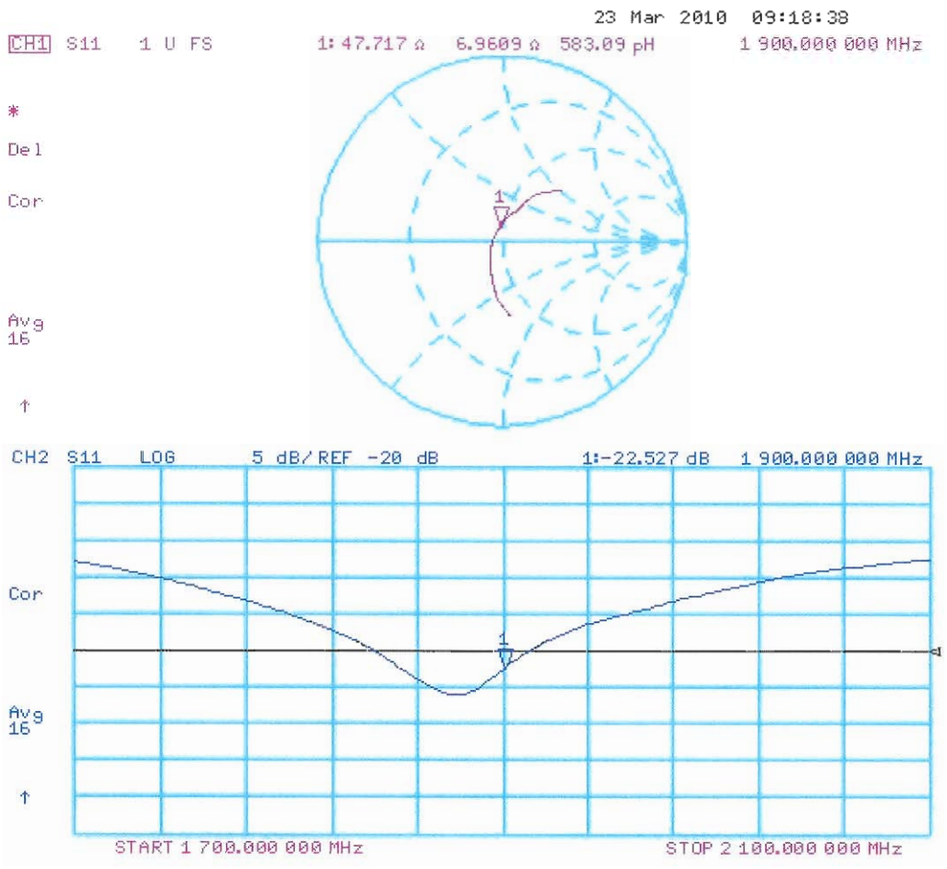
- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); Calibrated: 26.06.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 02.03.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version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

Impedance Measurement Plot for Body TSL



Dipole D1900V2 – SN: 5d013 Antenna Parameters

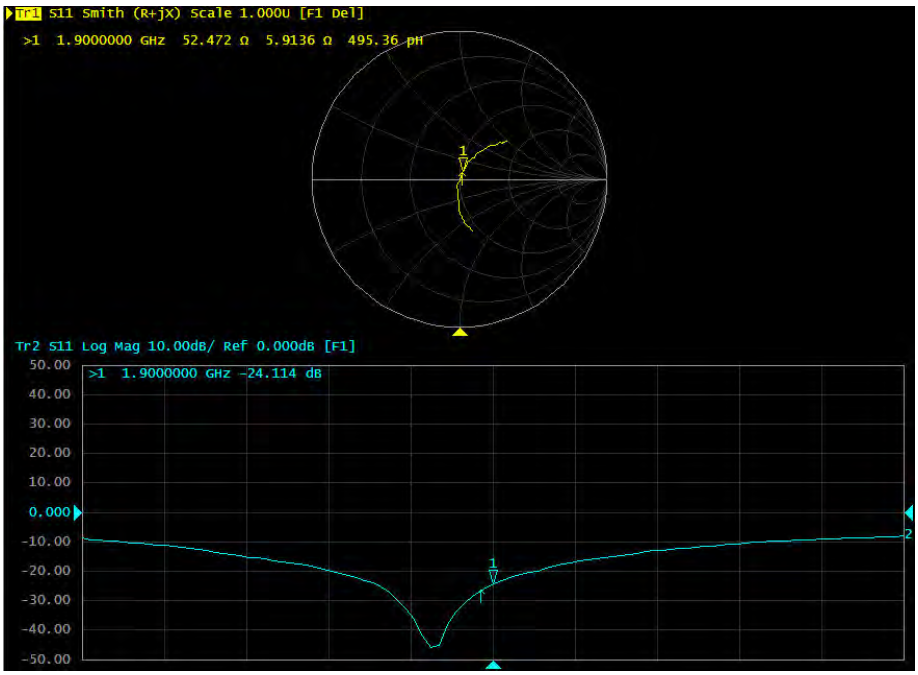
Antenna Parameters with Head TSL

	Calibration certificate	Annual measurement 2012-02-27
Impedance, transformed to feed point	51.7 Ω + 6.5 jΩ	52.5 Ω + 5.9 jΩ
Return loss	-23.7 dB	-24.1 dB

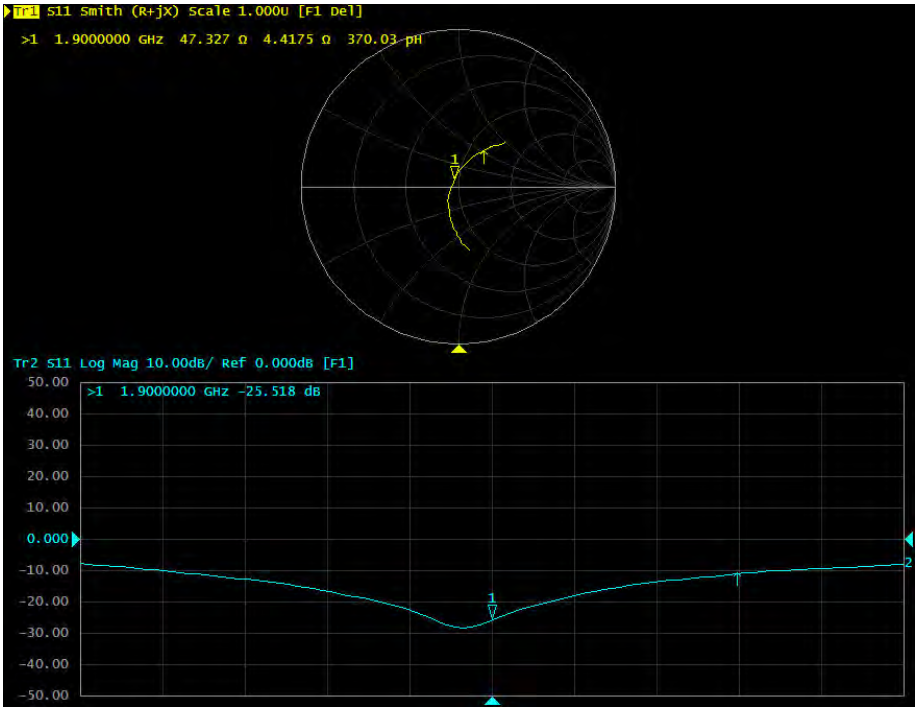
Antenna Parameters with Body TSL

	Calibration certificate	Annual measurement 2012-02-27
Impedance, transformed to feed point	47.7 Ω + 7.0 jΩ	47.3 Ω + 4.4 jΩ
Return loss	-22.5 dB	-25.5 dB

Impedance Measurement Plot for Head TSL 1900



Impedance Measurement Plot for Body TSL 1900



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

Accreditation No.: SCS 108

Client Nokia Salo TCC

Certificate No: D2450V2-729_Sep11

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 729
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	September 13, 2011

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-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

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	04-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-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Dimce Iliev	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 13, 2011

Date: 13.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 729

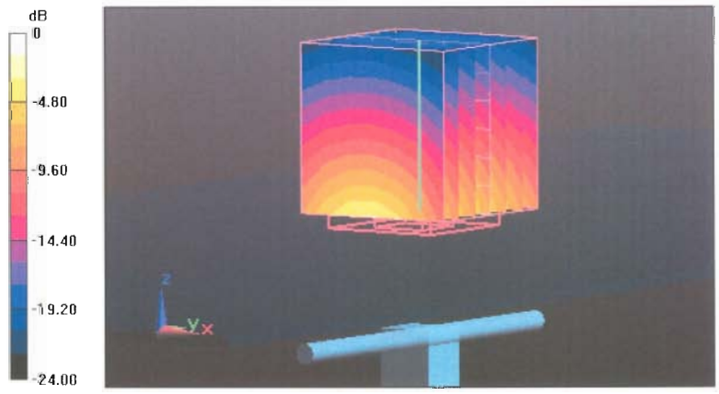
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.85 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.5 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 28.852 W/kg
SAR(1 g) = 13.9 mW/g; SAR(10 g) = 6.45 mW/g
Maximum value of SAR (measured) = 18.134 mW/g



0 dB = 18.130mW/g

Date: 12.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 729

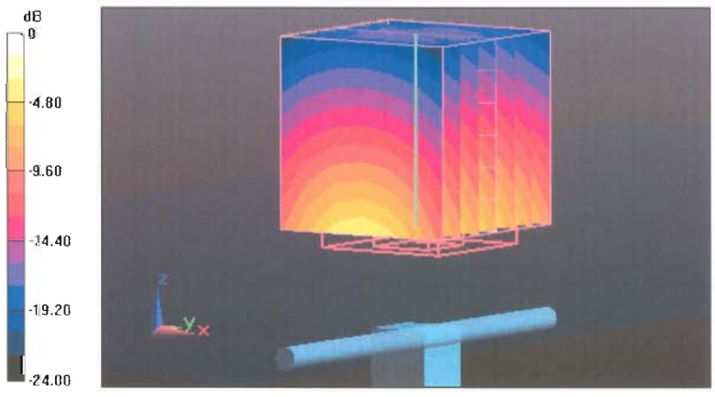
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.04 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.26, 4.26, 4.26); Calibrated: 29.04.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.6.2(482); SEMCAD X 14.4.5(3634)

Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.035 V/m; Power Drift = -0.0016 dB
Peak SAR (extrapolated) = 27.393 W/kg
SAR(1 g) = 13.3 mW/g; SAR(10 g) = 6.18 mW/g
Maximum value of SAR (measured) = 17.569 mW/g



0 dB = 17.570mW/g