APPENDIX B: SAR EVALUATION OF HW4001 (SAR REPORT FCC_RM-846_07X)

TCC
Nokia

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SAR Compliance Test Report

Test report no.:	FCC_RM-846_07	**Date of report:**	2013-02-11
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Tested device:	RM-846		
FCC ID:	PDNRM-846X	**IC:**	661R-RM846
Supplement reports:			
Testing has been carried out in accordance with:	**47CFR §2.1093** Radiofrequency Radiation Exposure Evaluation: Portable Devices **FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)** Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields **RSS-102** Evaluation Procedure for Mobile and Portable Radio Transmitters with Respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields **IEEE 1528 - 2003** IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Technique		
Documentation:	The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test results:	**The tested device complies with the requirements in respect of all parameters subject to the test.** The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		

Date and signatures:

For the contents:

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2013-01-07 to 2013-02-05
SN, HW and SW numbers of tested device	SN: 004402/47/199979/1, HW: 4001, SW: 1030.5603.1249.10032, DUT: 17050 SN: 004402/47/200018/5, HW: 4001, SW: 1030.5603.1249.10032, DUT: 17049 SN: 004402/47/200007/8, HW: 4001, SW: 1030.5603.1249.10032, DUT: 17048
Batteries used in testing	BL-4J, DUT: 17055, 17054, 17053, 17052, 17051
Headsets used in testing	WH-108, DUT: 16804, 16805, 16806, 16808
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-846_03 / FCC ID: PDNRM-846 / IC: 661R-RM846:

Head, Body-worn and Wireless Router SAR data for WLAN2450 and Head and Body-worn SAR data for WLAN5000 have been taken from this report; 2 sample were used in the RM-846 SAR testing to test WLAN2450 and WLAN5000. FCC Grant for RM-846 / FCC ID: PDNRM-846 / IC: 661R-RM846 was issued on December 7th 2012.

1.2 Maximum Results

The maximum measured SAR values for Head configuration and 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 standards 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)	Reported* SAR value (1g avg)	SAR limit (1g avg)	Result	Plot #
4-slot GPRS850	128 / 824.2	29.63 dBm	Right, Cheek	0.947 W/kg	**1.06 W/kg**	1.6 W/kg	PASSED	1
WCDMA850	4132 / 826.4	24.32 dBm	Right, Cheek	0.624 W/kg	**0.71 W/kg**	1.6 W/kg	PASSED	2
4-slot GPRS1900	512 / 1850.2	26.88 dBm	Right, Cheek	0.796 W/kg	**0.89 W/kg**	1.6 W/kg	PASSED	3
WCDMA1900	9262 / 1852.4	23.02 dBm	Right, Cheek	0.914 W/kg	**1.03 W/kg**	1.6 W/kg	PASSED	4
WLAN2450**	2 / 2415.0	18.11 dBm	Right, Cheek	0.229 W/kg	**0.28 W/kg**	1.6 W/kg	PASSED	-
WLAN5000**	157 / 5785.0	15.46 dBm	Right, Tilt	0.206 W/kg	**0.29 W/kg**	1.6 W/kg	PASSED	-
4-slot GPRS850 + WLAN2450	-	-	Right, Cheek	0.958 W/kg	**1.07 W/kg**	1.6 W/kg	PASSED	5
WCDMA850 + WLAN2450	-	-	Right, Cheek	0.624 W/kg	**0.71 W/kg**	1.6 W/kg	PASSED	2
4-slot GPRS1900 + WLAN2450	-	-	Right, Cheek	0.803 W/kg	**0.90 W/kg**	1.6 W/kg	PASSED	7
WCDMA1900 + WLAN2450	-	-	Right, Cheek	0.914 W/kg	**1.03 W/kg**	1.6 W/kg	PASSED	4
4-slot GPRS850 + WLAN5000	-	-	Right, Cheek	0.947 W/kg	**1.06 W/kg**	1.6 W/kg	PASSED	1
WCDMA850 + WLAN5000	-	-	Right, Cheek	0.624 W/kg	**0.71 W/kg**	1.6 W/kg	PASSED	2
4-slot GPRS1900 + WLAN5000	-	-	Right, Cheek	0.796 W/kg	**0.89 W/kg**	1.6 W/kg	PASSED	3
WCDMA1900 + WLAN5000	-	-	Right, Cheek	0.914 W/kg	**1.03 W/kg**	1.6 W/kg	PASSED	4

1.2.2 Body Worn Configuration

Mode	Ch / *f*(MHz)	Conducted power	Separation distance	Measured SAR value (1g avg)	Reported* SAR value (1g avg)	SAR limit (1g avg)	Result	Plot#
4-slot GPRS850	128 / 824.2	29.63 dBm	1.5 cm	0.918 W/kg	**1.03 W/kg**	1.6 W/kg	PASSED	**13**
WCDMA850	4175 / 835.0	24.35 dBm	1.5 cm	0.711 W/kg	**0.80 W/kg**	1.6 W/kg	PASSED	**14**
4-slot GPRS1900	810 / 1909.8	27.06 dBm	1.5 cm	0.695 W/kg	**0.78 W/kg**	1.6 W/kg	PASSED	**15**
WCDMA1900	9538 / 1907.6	22.75 dBm	1.5 cm	0.859 W/kg	**0.99 W/kg**	1.6 W/kg	PASSED	**16**
WLAN2450**	2 / 2415.0	18.11 dBm	1.5 cm	0.041 W/kg	**0.05 W/kg**	1.6 W/kg	PASSED	**-**
WLAN5000**	132 / 5660.0	15.48 dBm	1.5 cm	0.233W/kg	**0.33 W/kg**	1.6 W/kg	PASSED	**-**
4-slot GPRS850 + WLAN2450	-	-	1.5 cm	0.936 W/kg	**1.05 W/kg**	1.6 W/kg	PASSED	**17**
WCDMA850 + WLAN2450	-	-	1.5 cm	0.716 W/kg	**0.80 W/kg**	1.6 W/kg	PASSED	**18**
4-slot GPRS1900 + WLAN2450	-	-	1.5 cm	0.695 W/kg	**0.78 W/kg**	1.6 W/kg	PASSED	**15**
WCDMA1900 + WLAN2450	-	-	1.5 cm	0.859 W/kg	**0.99 W/kg**	1.6 W/kg	PASSED	**16**
4-slot GPRS850 + WLAN5000	-	-	1.5 cm	0.925 W/kg	**1.04 W/kg**	1.6 W/kg	PASSED	**21**
WCDMA850 + WLAN5000	-	-	1.5 cm	0.711 W/kg	**0.80 W/kg**	1.6 W/kg	PASSED	**14**
4-slot GPRS1900 + WLAN5000	-	-	1.5 cm	0.695 W/kg	**0.78 W/kg**	1.6 W/kg	PASSED	**15**
WCDMA1900 + WLAN5000	-	-	1.5 cm	0.859 W/kg	**0.99 W/kg**	1.6 W/kg	PASSED	**16**

1.2.3 Wireless Router Configuration

Mode	Ch / *f*(MHz)	Conducted power	Separation distance	Measured SAR value (1g avg)	Reported* SAR value (1g avg)	SAR limit (1g avg)	Result	Plot#
4-slot GPRS850	128 / 824.2	27.40 dBm	10.0 mm	0.817 W/kg	**0.92 W/kg**	1.6 W/kg	PASSED	**25**
WCDMA850	4132 / 826.4	24.32 dBm	10.0 mm	0.996 W/kg	**1.13 W/kg**	1.6 W/kg	PASSED	**26**
4-slot GPRS1900	810 / 1909.8	21.55 dBm	10.0 mm	0.677 W/kg	**0.81 W/kg**	1.6 W/kg	PASSED	**27**
WCDMA1900	9538 / 1907.6	19.32 dBm	10.0 mm	1.10 W/kg	**1.24 W/kg**	1.6 W/kg	PASSED	**28**
WLAN2450**	2 / 2415.0	18.11 dBm	10.0 mm	0.110 W/kg	**0.14 W/kg**	1.6 W/kg	PASSED	**-**
4-slot GPRS850 + WLAN2450	-	-	10.0 mm	0.847 W/kg	**0.95 W/kg**	1.6 W/kg	PASSED	**29**
WCDMA850 + WLAN2450	-	-	10.0 mm	1.02 W/kg	**1.15 W/kg**	1.6 W/kg	PASSED	**30**
4-slot GPRS1900 + WLAN2450	-	-	10.0 mm	0.700 W/kg	**0.84 W/kg**	1.6 W/kg	PASSED	**31**
WCDMA1900 + WLAN2450	-	-	10.0 mm	1.13 W/kg	**1.28 W/kg**	1.6 W/kg	PASSED	**32**

* Reported SAR values are scaled to, or measured at, upper limit of power tuning tolerance. In addition, SAR values are scaled up by 12% to cover measurement drift. As a consequence of this upward drift correction, the contribution of measurement drift to the overall measurement uncertainty (Section 6) is reduced to zero.
**SAR data taken from FCC_RM-846_03.

1.2.4 Summary SAR data

	FCC-defined SAR values for the Grants of Equipment Authorization		
	PCE	DTS	NII
Maximum Head SAR values	1.06 W/kg	0.29 W/kg	0.29 W/Kg
{Max + Max} Simultaneous Head SAR value	1.34 W/kg		
Maximum Body SAR values	1.03 W/kg	0.29 W/kg	0.33 W/Kg
{Max + Max} Simultaneous Body SAR value	1.36 W/kg		
Maximum Product Specific (Wireless Router) SAR values	1.24 W/kg	0.14 W/kg	N/A
{Max + Max} Simultaneous Product Specific SAR value	1.26 W/kg		
Maximum Simultaneous SAR value **Body SAR: 4-slot GPRS850+WLAN5000**	1.36 W/kg		

PCE contains the highest results between all cellular modes (cellular and PCS bands)
DTS contains the highest results between WLAN 2.4GHz + RLAN 5725-5850MHz
NII contains the highest results between RLAN 5150-5250, 5250-5350 and 5470-5725

1.2.5 Maximum Drift

Maximum drift covered by 12% scaling up of the SAR values	Maximum drift during measurements
0.5dB	0.48dB

1.2.6 Measurement Uncertainty

Expanded Uncertainty (k=2) 95%	± 26.4%

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)	Power Tuning Target (dBm)				Upper Limit of Power Tuning Tolerance (dBm)			
					1-slot	2-slot	3-slot	4-slot	1-slot	2-slot	3-slot	4-slot
GSM / GPRS	850	GMSK	1/8 to 4/8	824 – 849	32.50	31.50	29.70	28.50	32.85	31.85	30.05	28.85
	1900			1850 – 1910	30.00	29.50	27.70	26.50	30.35	29.85	28.05	26.85
EGPRS	850	GMSK	1/8 to 4/8	824 – 849	26.50	26.50	26.20	25.00	26.85	26.85	26.55	25.35
	1900			1850 – 1910	25.50	25.50	25.50	25.00	25.85	25.85	25.85	25.35
WCDMA	850 (Band V)		1	826 – 847	24.00				24.35			
	1900 (Band II)			1852 – 1908	22.50				22.85			
HSUPA**	850 (Band V)		1	832 – 838	-							
	1900 (Band II)			1852 – 1908								
BT	2450	GFSK	1	2402 – 2480	8.00				9.50			
					Ch 1	Ch 2 - 11			Ch 1	Ch 2 - 11		
WLAN b-mode	2450	DSSS	1	2412 – 2462	15.00	17.00			16.50	18.50		
WLAN g-mode	2450	OFDM	1	2412 – 2462	15.00	16.00			16.50	17.50		
WLAN n-mode 20Mhz	2450	OFDM	1	2412 – 2462	14.00	14.00			15.50	15.50		
					Ch 40-60	Ch 108-132	Ch 153-165		Ch 40-60	Ch 108-132	Ch 153-165	
WLAN a-mode 20MHz	5000	OFDM	1	5150 – 5825	15				16.50			
WLAN n-mode 20MHz	5000	OFDM	1	5150 – 5825	13				14.50			
WLAN n-mode 40MHz	5000	OFDM	1	5150 – 5825	12				13.50			

**HSUPA powers described in supplement report FCC_RM-846_03.

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 uses a single antenna for transmission of all the cellular and PCS bands; a separate single antenna is used for transmission of WLAN and BT. Simultaneous transmission of any singular cellular or PCS band is possible with either WLAN or BT in Head and Body-worn use.

Simultaneous transmission capabilities in Head and Body-worn use		
	WLAN2450	WLAN5000
GSM/GPRS/EGPRS850	✓	✓
WCDMA850	✓	✓
GSM/GPRS/EGPRS1900	✓	✓
WCDMA1900	✓	✓

This device has Wireless Router “Hotspot” mode capability. Simultaneous transmission of any singular cellular and PCS band is possible with WLAN2450 or BT in Wireless Router mode. Wireless Router mode capability is not available with WLAN5000.

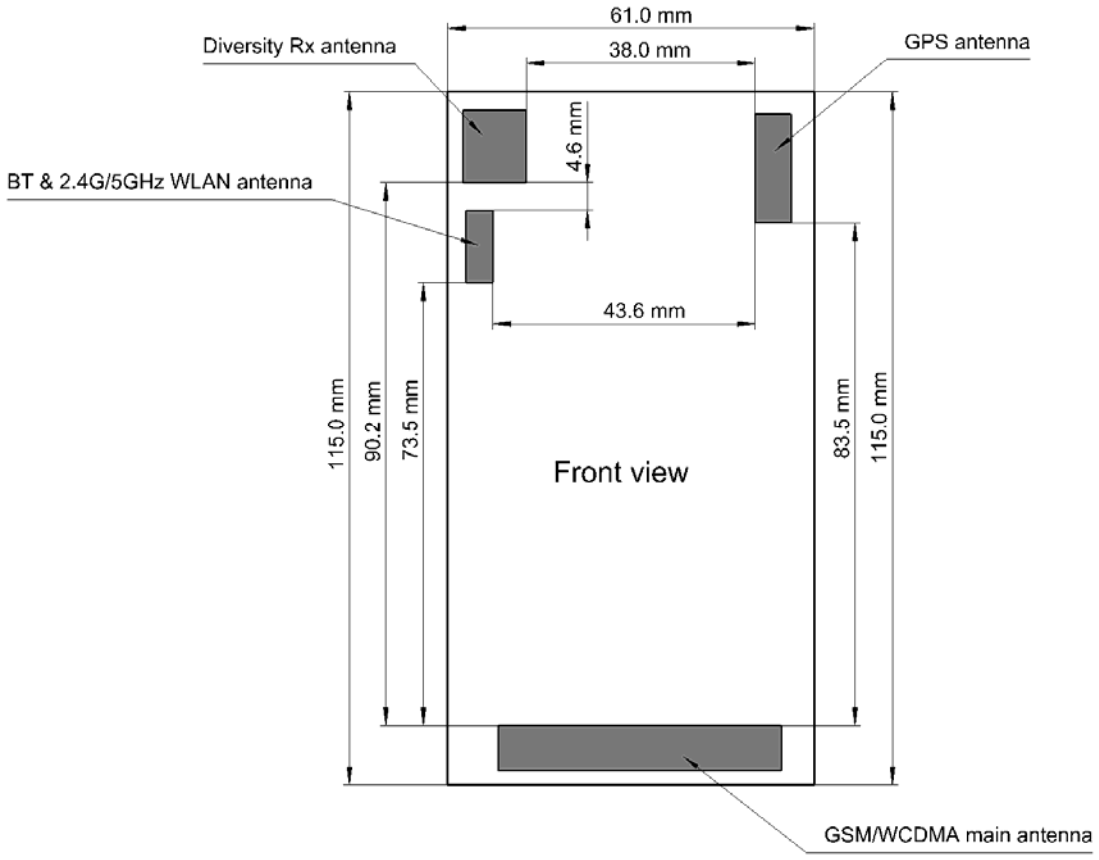
Simultaneous transmission capabilities in Wireless Router use		
	WLAN2450	WLAN5000
GSM/GPRS/EGPRS850	✓	x
WCDMA850	✓	x
GSM/GPRS/EGPRS1900	✓	x
WCDMA1900	✓	x

The following table details the power reductions active in Wireless Router mode:

Band	Power reduction in WR mode	Target tuning power in WR mode	
GPRS/EGPRS850	0 dB 1.5 dB 1.5 dB 1.5 dB 0 dB 0 dB 0 dB 0 dB	1-slot GPRS: 32.5 dBm 2-slot GPRS: 30.0 dBm 3-slot GPRS: 28.2 dBm 4-slot GPRS: 27.0 dBm 1-slot EGPRS: 26.5 dBm 2-slot EGPRS: 26.5 dBm 3-slot EGPRS: 26.2 dBm 4-slot EGPRS: 25.0 dBm	
WCDMA850	0 dB	24.0 dBm	
GPRS/EGPRS1900	2.5 dB 5.0 dB 5.0 dB 5.0 dB 0 dB 1.0 dB 2.8 dB 3.5 dB	1-slot GPRS: 27.5 dBm 2-slot GPRS: 24.5 dBm 3-slot GPRS: 22.7 dBm 4-slot GPRS: 21.5 dBm 1-slot EGPRS: 25.5 dBm 2-slot EGPRS: 24.5 dBm 3-slot EGPRS: 22.7 dBm 4-slot EGPRS: 21.5 dBm	
WCDMA1900	3.5 dB	19.0 dBm	
WLAN2450 b-mode (DSSS 1 Mbps)	0 dB	Ch 1: 15 dBm	Ch 2 - 11: 16 dBm
WLAN2450 g-mode (OFDM 6 Mbps)	0 dB	Ch 1: 15 dBm	Ch 2 - 11: 16 dBm
WLAN2450 n-mode (MCS 0 – OFDM 6.5 Mbps)	0 dB	Ch 1: 14 dBm	Ch 2 - 11: 14 dBm

2.1 Description of the Antenna

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



3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	20.3 – 22.4
Ambient humidity (RH %):	28 - 36

3.2 Test Signal, Frequencies and Output Power

The device was put into operation by using a call tester. Communication between the device and the call tester was established by air link.

A CMU200 call tester was used for all the GSM/GPRS/EGPRS and WCDMA bands; in the case of GSM/GPRS/EGPRS the MS signal was always set to maximum power, whereas for WCDMA the UE uplink signal was configured to 12.2kbps RMC with all TPC bit set to 1.

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

All WCDMA testing has been carried out in accordance with FCC KDB 941225: SAR Measurement Procedures for 3G Devices.

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

The conducted output power of the device was measured by a separate test laboratory on the same units as used for SAR testing. The results are given in Appendices F-G of this report.

The testing reported in this document has been minimised based on the earlier report FCC_RM-846_03. WLAN2450 and WLAN5000 SAR results presented are taken from the same earlier report FCC_RM-846_03.

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	793	2012-08	2013-08
DAE4	538	2012-08	2013-08
E-field Probe ES3DV3	3194	2012-08	2013-08
E-field Probe EX3DV4	3892	2012-11	2013-11
Dipole Validation Kit, D835V2	462	2011-09	2013-09
Dipole Validation Kit, D1900V2	5d030	2012-02	2014-02
DASY4 software	Version 4.7	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration date	Calibration expiry
Signal Generator	E4438C	MY42080610	2012-08	2013-08
Signal Generator	SML03	101264	2012-08	2013-08
Amplifier	5S1G4M3	302338	-	-
Amplifier	ZHL-42-SMA	NO72095-5	-	-
Power Meter	NRVS	838624/032	2012-08	2013-08
Power Meter	NRVD	840023/028	2012-08	2013-08
Power Sensor	NRV-Z32	100067	2012-08	2013-08
Power Sensor	NRV-Z32	849745/018	2012-08	2013-08
Call Tester	CMU 200	103293	-	-
Call Tester	CMU 200	104983	-	-
Call Tester	MT8820C	6200883095	-	-
Network Analyzer	ENA E5071C	MY46213166	2012-08	2013-08
Dielectric Probe Kit	DAK-3.5	1042	-	-

4.1.1 Isotropic E-field Probe Type ES3DV3

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., butyl diglycol)
Calibration	Calibration certificate in Appendix D
Frequency	10 MHz to 4 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 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 D
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 Head SAR 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.

The phantom used for all Body SAR tests i.e. for both system checks and device testing, was a “Triple Flat Phantom” manufactured by SPEAG; this phantom conform to the requirements of OET Bulletin 65, Supplement C.

System checking for Head SAR testing was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. System checking for Body SAR testing was performed using the Triple Flat Phantom.

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. The depth of the tissue simulant was at least 15.0 cm for all system check and device tests, measured from the flat reference point of the Triple Flat Phantom.

4.3.1 Tissue Simulant Recipes

The following recipes were used for Head and Body tissue simulants:

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

4.4 System validation and System checking

4.4.1 System validation status

Probe Calibration Point f / MHz	Test System	DASY SW	Dipole Type / SN	Probe Type / SN	DAE unit Type / SN	Validation done	
						Head tissue simulant	Body tissue simulant
835	TCC Salo / SAR-3	V4.7	D835V2 / 462	EX3DV4 / 3892	DAE4 / 793	2013-01	2013-01
1900	TCC Salo / SAR-1	V4.7	D1900V2 / 5d030	ES3DV3 / 3194	DAE4 / 538	2012-11	2012-11

4.4.2 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

Dipole frequency [MHz]	Description	SAR 1g [W/kg]	Dielectric Parameters		SAR 1g Deviation	Dielectric Parameters Deviation		Temp [°C]	Plot #
			ε_r	1g	dSAR [%]	$d\varepsilon_r$ [%]	$d\sigma$ [%]		
	Tolerances				±10 %	±5 %	±5 %		
835	IEEE1528 / IEC62209		41.5	0.90					
	Reference result SN:462	2.33	41.1	0.89	TCC Salo/SAR-3 EX3DV4 SN:3892 Head 835MHz				
	2013-01-14	2.32	40.4	0.92	-0.4	-1.7	3.4	21.0	1
	Tolerances				±10 %	±5 %	±5 %		
1900	IEEE1528 / IEC62209		40.0	1.40					
	Reference result SN:5d030	9.79	40.4	1.40	TCC Salo/SAR-1 ES3DV3 SN:3194 Head 1900MHz				
	2013-01-07	10.2	38.9	1.38	4.2	-3.7	-1.4	21.0	-
	2013-01-08	10.3	39.2	1.40	5.2	-3.0	0.0	21.0	2
	2013-01-09	10.2	38.5	1.38	4.2	-4.7	-1.4	21.0	-

System checking, body tissue simulant

Dipole frequency [MHz]	Description	SAR 1g [W/kg]	Dielectric Parameters		SAR 1g Deviation	Dielectric Parameters Deviation		Temp [°C]	Plot #
			ε_r	1g	dSAR [%]	$d\varepsilon_r$ [%]	$d\sigma$ [%]		
	Tolerances				±10 %	±5 %	±5 %		
835	IEEE1528 / IEC62209		55.2	0.97					
	Reference result SN:462	2.45	53.5	1.00	TCC Salo/SAR-3 EX3DV4 SN:3892 Body 835MHz				
	2013-01-16	2.37	53.0	1.01	-3.3	-0.9	1.0	21.0	3
	2013-01-21	2.38	53.3	1.00	-2.9	-0.4	0.0	21.0	-
	2013-01-25	2.38	53.3	1.00	-2.9	-0.4	0.0	21.0	-
	Tolerances				±10 %	±5 %	±5 %		
1900	IEEE1528 / IEC62209		53.3	1.52					
	Reference result SN:5d030	9.87	53.0	1.56	TCC Salo/SAR-1 ES3DV3 SN:3194 Body 1900MHz				
	2013-01-14	10.1	52.0	1.54	2.3	-1.9	-1.3	21.0	4
	2013-01-17	10.0	51.9	1.52	1.3	-2.1	-2.6	21.0	-
	2013-02-05	10.0	52.2	1.52	1.3	-1.5	-2.6	21.0	-

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

4.4.3 Tissue Simulants used in the Measurements

Head tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Dielectric Parameters Deviation from Standard target		Temp [°C]
		ε_r	σ [S/m]	$d\varepsilon_r$ [%]	$d\sigma$ [%]	
	Tolerances			±5 %	±5 %	
	Recommended value	41.5	0.90			
835	2013-01-14	40.4	0.92	-2.7	2.2	21.0
	Tolerances			±5 %	±5 %	
	Recommended value	41.5	0.90			
836	2013-01-14	40.4	0.92	-2.7	2.2	21.0
	Tolerances			±5 %	±5 %	
	Recommended value	40.0	1.40			
1880	2013-01-07	39.0	1.36	-2.5	-2.9	21.0
	2013-01-08	39.2	1.37	-2.0	-2.1	21.0
	2013-01-09	38.6	1.36	-3.5	-2.9	21.0

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Dielectric Parameters Deviation from Standard target		Temp [°C]
		ε_r	σ [S/m]	$d\varepsilon_r$ [%]	$d\sigma$ [%]	
	Tolerances			±5 %	±5 %	
	Recommended value	55.2	0.97			
835	2013-01-16	53.0	1.00	-4.0	3.1	21.0
	Tolerances			±5 %	±5 %	
	Recommended value	55.2	0.97			
836	2013-01-16	53.0	1.00	-4.0	3.1	21.0
	2013-01-21	53.2	1.00	-3.6	3.1	21.0
	2013-01-25	53.3	1.00	-3.4	3.1	21.0
	Tolerances			±5 %	±5 %	
	Recommended value	53.3	1.52			
1880	2013-01-14	52.1	1.52	-2.3	0.0	21.0
	2013-01-17	52.0	1.50	-2.4	-1.3	21.0
	2013-02-05	52.3	1.51	-1.9	-0.7	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 positions used in the measurements were according to IEEE 1528 - 2003 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

5.2.2 Body Worn Configuration

The device was placed in the SPEAG holder using the Nokia spacer and placed below the flat section of the phantom. The distance between the device and the phantom was kept at the separation distance indicated in Section 1.2.2 using a separate flat spacer that was removed before the start of the measurements.

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

5.2.3 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	±6.55	N	1	1	±6.55	∞
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			**±13.2**	116
Coverage Factor for 95%			**k=2**				
Expanded Uncertainty						**±26.4**	

7. RESULTS

7.1 The measured Head SAR values for the test device

850MHz Band Head SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	
4-slot GPRS	Tuning Target + Tolerance [dBm]		28.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		29.63	29.09	29.10	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		26.62	26.08	26.09	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.872	0.783	0.624	0.978	0.879	0.700	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek, Repeated	Estimated SAR	-	-	-	-	-	-	1
		Full SAR	**0.947**	-	-	**1.06**	-	-	
Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		24.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		24.32	24.35	24.48	0.53	0.50	0.50	dB
	Time-averaged power [dBm]		24.32	24.35	24.48	1.13	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	2
		Full SAR	**0.624**	0.566	0.582	**0.705**	0.635	0.653	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	

1900MHz Band Head SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	
4-slot GPRS	Tuning Target + Tolerance [dBm]		26.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		26.88	27.21	27.06	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		23.87	24.20	24.05	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	3
		Full SAR	**0.796**	0.644	0.483	**0.893**	0.723	0.542	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz	Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		22.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		23.02	22.97	22.75	0.50	0.50	0.60	dB
	Time-averaged power [dBm]		23.02	22.97	22.75	1.12	1.12	1.15	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.860	0.778	0.567	0.965	0.873	0.651	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek, Repeated	Estimated SAR	-	-	-	-	-	-	4
		Full SAR	**0.914**	-	-	**1.03**	-	-	

2450MHz Head SAR results**

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 2 2415.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz	Ch 2 2415.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz	
WLAN b-mode DSSS 1 Mbps	Tuning Target + Tolerance [dBm]		17.50			Scaling factor*			
	Conducted Slot Average Power [dBm]		17.01	17.29	17.41	0.99	0.71	0.59	dB
	Time-averaged power [dBm]		17.01	17.29	17.41	1.26	1.18	1.15	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.065	-	-	0.077	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.072	-	-	0.085	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.162	0.16	0.142	0.203	0.188	0.163	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.078	-	-	0.092	-	
WLAN b-mode DSSS 5.5 Mbps	Tuning Target + Tolerance [dBm]		18.50			Scaling factor*			
	Conducted Slot Average Power [dBm]		18.11	18.51	18.44	0.89	0.50	0.56	dB
	Time-averaged power [dBm]		18.11	18.51	18.44	1.23	1.12	1.14	Lin
	Right Cheek, Worst case	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	**0.229**	0.215	0.193	**0.281**	0.241	0.220	

5000MHz Head SAR results
5150–5250 MHz and 5250–5350 MHz**

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]				Reported* 1g SAR [W/kg]				Plot #
			Ch 40	Ch 48	Ch 56	Ch 60	Ch 40	Ch 48	Ch 56	Ch 60	
			5200.0 MHz	5240.0 MHz	5280.0 MHz	5300.0 MHz	5200.0 MHz	5240.0 MHz	5280.0 MHz	5300.0 MHz	
WLAN a-mode OFDM 6 Mbps	Tuning Target + Tolerance [dBm]		16.50				Scaling factor*				
	Conducted Slot Average Power [dBm]		15.07	15.66	15.51	15.75	1.93	1.34	1.49	1.25	dB
	Time-averaged power [dBm]		15.07	15.66	15.51	15.75	1.56	1.36	1.41	1.33	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	0.049	0.038	0.036	0.049	0.076	0.052	0.051	0.065	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	0.041	-	-	0.041	0.064	-	-	0.055	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	0.108	-	-	0.128	0.168	-	-	0.171	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	0.069	-	-	0.084	0.108	-	-	0.112	

5000MHz Head SAR results
5470–5725 MHz**

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]				Reported* 1g SAR [W/kg]				Plot #
			Ch 108	Ch 116	Ch 124	Ch 132	Ch 108	Ch 116	Ch 124	Ch 132	
			5540.0 MHz	5580.0 MHz	5620.0 MHz	5660.0 MHz	5540.0 MHz	5580.0 MHz	5620.0 MHz	5660.0 MHz	
WLAN a-mode OFDM 6 Mbps	Tuning Target + Tolerance [dBm]		16.50				Scaling factor*				
	Conducted Slot Average Power [dBm]		15.75	16.63	15.71	15.48	1.25	0.50	1.29	1.52	dB
	Time-averaged power [dBm]		15.75	16.63	15.71	15.48	1.33	1.12	1.35	1.42	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	0.067	0.079	0.104	0.108	0.089	0.089	0.140	0.153	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	-	-	-	0.123	-	-	-	0.175	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	-	-	-	0.165	-	-	-	0.234	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	-	-	-	0.202	-	-	-	0.287	

5000MHz Head SAR results
5725–5850 MHz**

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 153 5765.0 MHz	Ch 157 5785.0 MHz	Ch 165 5825.0 MHz	Ch 153 5765.0 MHz	Ch 157 5785.0 MHz	Ch 165 5825.0 MHz	
WLAN a-mode OFDM 6 Mbps	Tuning Target + Tolerance [dBm]		16.50			Scaling factor*			
	Conducted Slot Average Power [dBm]		15.46	15.46	15.61	1.54	1.54	1.39	dB
	Time-averaged power [dBm]		15.46	15.46	15.61	1.43	1.43	1.38	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.104	0.116	0.111	0.148	0.165	0.153	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.131	-	-	0.187	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.179	-	-	0.255	-	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	**0.206**	-	-	**0.294**	-	

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

Test configuration	Max. 1g SAR results					
	WLAN 2450**	WLAN 5000**	4-slot GPRS850	WCDMA 850	4-slot GPRS 1900	WCDMA 1900
Head: Left, Cheek	0.077	0.165	-	-	-	-
Head: Left, Tilt	0.085	0.187	-	-	-	-
Head: Right, Cheek	0.281	0.255	1.06	0.705	0.893	1.03
Head: Right, Tilt	0.092	0.294	-	-	-	-

**SAR data taken from FCC_RM-846_03.

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

Test configuration	Max. 1g SAR results			
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	4-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450
Head: Left, Cheek	-	-	-	-
Head: Left, Tilt	-	-	-	-
Head: Right, Cheek	**1.34**	**0.986**	**1.17**	**1.31**
Head: Right, Tilt	-	-	-	-
Test configuration	**Max. 1g SAR results**			
	4-slot GPRS850 + WLAN5000	**WCDMA850 + WLAN5000**	**4-slot GPRS1900 + WLAN5000**	**WCDMA1900 + WLAN5000**
Head: Left, Cheek	-	-	-	-
Head: Left, Tilt	-	-	-	-
Head: Right, Cheek	**1.32**	**0.960**	**1.15**	**1.28**
Head: Right, Tilt	-	-	-	-

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 or WLAN5000 and the cellular bands point-by-point and c) calculates the combined average SAR values.

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

Test configuration	Max. 1g SAR results			
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	4-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450
Head: Left, Cheek	-	-	-	-
Head: Left, Tilt	-	-	-	-
Head: Right, Cheek	**1.07**	**0.698**	**0.901**	**1.02**
Head: Right, Tilt	-	-	-	-
Test configuration	**Max. 1g SAR results**			
	4-slot GPRS850 + WLAN5000	**WCDMA850 + WLAN5000**	**4-slot GPRS1900 + WLAN5000**	**WCDMA1900 + WLAN5000**
Head: Left, Cheek	-	-	-	-
Head: Left, Tilt	-	-	-	-
Head: Right, Cheek	**1.06**	**0.686**	**0.888**	**1.00**
Head: Right, Tilt	-	-	-	-

Some of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 or WLAN5000 and b) uncertainties associated with the different methods of calculation. In these cases, the maximum SAR values given for the combined Modes in the Summary table in Section 1.2 are those for the individual cellular or WLAN band.

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

Plots of the Measurement scans are given in Appendix B.1.

7.2 The measured Body SAR values for the test device

850MHz Band Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
				Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	
4-slot GPRS	Tuning Target + Tolerance [dBm]			28.85			Scaling factor*			
	Conducted Slot Average Power [dBm]			29.63	29.09	29.10	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			26.62	26.08	26.09	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	13
			Full SAR	**0.918**	0.774	0.743	**1.03**	0.868	0.834	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.791	0.645	0.614	0.888	0.724	0.689	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
	Back facing phantom, Without headset, Repeated		Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.860	-	-	0.965	-	-	

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
				Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]			24.35			Scaling factor*			
	Conducted Power [dBm]			24.32	24.35	24.48	0.53	0.50	0.50	dB
	Time-averaged power [dBm]			24.32	24.35	24.48	1.13	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	14
			Full SAR	0.699	**0.711**	0.683	0.790	**0.798**	0.766	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	

1900MHz Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg] Ch 512 1850.2 MHz	Measured 1g SAR [W/kg] Ch 661 1880.0 MHz	Measured 1g SAR [W/kg] Ch 810 1909.8 MHz	Reported* 1g SAR [W/kg] Ch 512 1850.2 MHz	Reported* 1g SAR [W/kg] Ch 661 1880.0 MHz	Reported* 1g SAR [W/kg] Ch 810 1909.8 MHz	Plot #
4-slot GPRS	Tuning Target + Tolerance [dBm]			26.85			Scaling factor*			
	Conducted Slot Average Power [dBm]			26.88	27.21	27.06	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			23.87	24.20	24.05	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	15
			Full SAR	0.482	0.542	**0.695**	0.541	0.608	**0.780**	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR							
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg] Ch 9262 1852.4 MHz	Measured 1g SAR [W/kg] Ch 9400 1880.0 MHz	Measured 1g SAR [W/kg] Ch 9538 1907.6 MHz	Reported* 1g SAR [W/kg] Ch 9262 1852.4 MHz	Reported* 1g SAR [W/kg] Ch 9400 1880.0 MHz	Reported* 1g SAR [W/kg] Ch 9538 1907.6 MHz	Plot #
WCDMA	Tuning Target + Tolerance [dBm]			22.85			Scaling factor*			
	Conducted Power [dBm]			23.02	22.97	22.75	0.50	0.50	0.60	dB
	Time-averaged power [dBm]			23.02	22.97	22.75	1.12	1.12	1.15	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	16
			Full SAR	0.548	0.706	**0.859**	0.615	0.792	**0.986**	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
	Back facing phantom, Without headset, Repeated		Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	0.831	-	-	0.954	

2450MHz Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
				Ch 2 2415.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz	Ch 2 2415.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz	
WLAN b-mode DSSS 1 Mbps	Tuning Target + Tolerance [dBm]			17.50			Scaling factor*			
	Conducted Power [dBm]			17.01	17.29	17.41	0.99	0.71	0.59	dB
	Time-averaged power [dBm]			17.01	17.29	17.41	1.26	1.18	1.15	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.034	0.033	0.028	0.043	0.039	0.032	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.030	-	-	0.035	-	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.023	-	-	0.027	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.021	-	-	0.025	-	
WLAN b-mode DSSS 5.5 Mbps	Tuning Target + Tolerance [dBm]			18.50			Scaling factor*			
	Conducted Power [dBm]			18.11	18.51	18.44	0.89	0.50	0.56	dB
	Time-averaged power [dBm]			18.11	18.51	18.44	1.23	1.12	1.14	Lin
	Back facing phantom Without headset, Worst case		Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.041	**0.042**	0.040	**0.050**	0.047	0.046	

5000MHz Body SAR results
5150–5250 MHz and 5250–5350 MHz**

Mode	Test configurtion		SAR measurement	Measured 1g SAR [W/kg]				Reported* 1g SAR [W/kg]				Plot #
				Ch 40	Ch 48	Ch 56	Ch 60	Ch 40	Ch 48	Ch 56	Ch 60	
				5200.0 MHz	5240.0 MHz	5280.0 MHz	5300.0 MHz	5200.0 MHz	5240.0 MHz	5280.0 MHz	5300.0 MHz	
WLAN a-mode OFDM 6 Mbps	Tuning Target + Tolerance [dBm]			16.50				Scaling factor*				
	Conducted S Power [dBm]			15.07	15.66	15.51	15.75	1.93	1.34	1.49	1.25	dB
	Time-averaged power [dBm]			15.07	15.66	15.51	15.75	1.56	1.36	1.41	1.33	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	0.123	0.129	0.139	0.156	0.192	0.176	0.196	0.208	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	-	0.124	-	0.128	-	0.169	-	0.171	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	-	0.035	-	0.037	-	0.048	-	0.049	
		Headset WH-18	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	-	0.023	-	0.032	-	0.031	-	0.043	

5000MHz Body SAR results
5470–5725 MHz**

Mode	Test configurtion		SAR measurement	Measured 1g SAR [W/kg]				Reported* 1g SAR [W/kg]				Plot #
				Ch 108 5540.0 MHz	Ch 116 5580.0 MHz	Ch 124 5620.0 MHz	Ch 132 5660.0 MHz	Ch 108 5540.0 MHz	Ch 116 5580.0 MHz	Ch 124 5620.0 MHz	Ch 132 5660.0 MHz	
WLAN a-mode OFDM 6 Mbps	Tuning Target + Tolerance [dBm]			16.50				Scaling factor*				
	Conducted S Power [dBm]			15.75	16.63	15.71	15.48	1.25	0.50	1.29	1.52	dB
	Time-averaged power [dBm]			15.75	16.63	15.71	15.48	1.33	1.12	1.35	1.42	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	0.169	0.185	0.221	**0.233**	0.225	0.208	0.297	**0.331**	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	-	-	-	0.214	-	-	-	0.304	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	-	-	-	0.044	-	-	-	0.062	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	-	-	-	0.034	-	-	-	0.048	

5000MHz Body SAR results
5725–5850 MHz**

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
				Ch 153 5765.0 MHz	Ch 157 5785.0 MHz	Ch 165 5825.0 MHz	Ch 153 5765.0 MHz	Ch 157 5785.0 MHz	Ch 165 5825.0 MHz	
WLAN a-mode OFDM 6 Mbps	Tuning Target + Tolerance [dBm]			16.50			Scaling factor*			
	Conducted Power [dBm]			15.46	15.46	15.61	1.54	1.54	1.39	dB
	Time-averaged power [dBm]			15.46	15.46	15.61	1.43	1.43	1.38	Lin
	Back facing phantom	Without headset	Estimated SAR	-						-
			Full SAR	0.202	0.184	0.211	0.288	0.262	0.291	
		Headset WH-108	Estimated SAR							-
			Full SAR			0.196			0.270	
	Display facing phantom	Without headset	Estimated SAR							-
			Full SAR			0.039			0.054	
		Headset WH-108	Estimated SAR							-
			Full SAR			0.042			0.058	

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

Test configuration	Max. 1g SAR results					
	WLAN 2450**	WLAN 5000**	4-slot GPRS850	WCDMA 850	4-slot GPRS 1900	WCDMA 1900
Body: Back facing phantom, Without Headset	0.050	0.331	1.03	0.798	-	0.986
Body: Back facing phantom, Headset WH-108	0.035	0.304	-	-	0.780	-
Body: Display facing phantom, Without Headset	0.027	0.062	0.888	-	-	-
Body: Display facing phantom, Headset WH-108	0.025	0.058	-	-	-	-

**SAR data taken from FCC_RM-846_03.

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

Test configuration	Max. 1g SAR results			
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	4-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450
Body: Back facing phantom, Without Headset	1.08	0.848	-	1.04
Body: Back facing phantom, Headset WH-108	-	-	0.815	-
Body: Display facing phantom, Without Headset	0.915	-	-	-
Body: Display facing phantom, Headset WH-108	-	-	-	-
Test configuration	**Max. 1g SAR results**			
	4-slot GPRS850 + WLAN5000	WCDMA850 + WLAN5000	4-slot GPRS1900 + WLAN5000	WCDMA1900 + WLAN5000
Body: Back facing phantom, Without Headset	1.36	1.13	-	1.32
Body: Back facing phantom, Headset WH-108	-	-	1.08	-
Body: Display facing phantom, Without Headset	0.950	-	-	-
Body: Display facing phantom, Headset WH-108	-	-	-	-

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 or WLAN5000 and the cellular bands point-by-point and c) calculates the combined average SAR values.

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

Test configuration	Max. 1g SAR results			
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	4-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450
Body: Back facing phantom, Without Headset	1.05	0.803	-	0.947
Body: Back facing phantom, Headset WH-108	-	-	0.746	-
Body: Display facing phantom, Without Headset	-	-	-	-
Body: Display facing phantom, Headset WH-108	-	-	-	-
Test configuration	**Max. 1g SAR results**			
	4-slot GPRS850 + WLAN5000	**WCDMA850 + WLAN5000**	**4-slot GPRS1900 + WLAN5000**	**WCDMA1900 + WLAN5000**
Body: Back facing phantom, Without Headset	1.04	0.789	-	0.927
Body: Back facing phantom, Headset WH-108	-	-	0.747	-
Body: Display facing phantom, Without Headset	-	-	-	-
Body: Display facing phantom, Headset WH-108	-	-	-	-

Some of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 or WLAN5000 and b) uncertainties associated with the different methods of calculation. In these cases, the maximum SAR values given for the combined Modes in the Summary table in Section 1.2 are those for the individual cellular or WLAN band.

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

Plots of the Measurement scans are given in Appendix B.2.

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

850MHz Wireless Router SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	
4-slot GPRS	Tuning Target + Tolerance [dBm]		27.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		27.40	27.43	27.50	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.39	24.42	24.49	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	25
		Full SAR	**0.817**	0.677	0.684	**0.917**	0.760	0.767	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Back facing phantom, Repeated	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.804	-	-	0.902	-	-	

(850MHz WR SAR Table continues)

(850MHz WR SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		24.35			Scaling factor*			
	Conducted Power [dBm]		24.32	24.35	24.48	0.53	0.50	0.50	dB
	Time-averaged power [dBm]		24.32	24.35	24.48	1.13	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.987	0.942	0.954	1.12	1.06	1.07	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Back facing phantom, Repeated	Estimated SAR	-	-	-	-	-	-	26
		Full SAR	**0.996**	-	-	**1.13**	-	-	

1900MHz Band Wireless Router SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	
4-slot GPRS	Tuning Target + Tolerance [dBm]		21.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		21.54	21.87	21.55	0.81	0.50	0.80	dB
	Time-averaged power [dBm]		18.53	18.86	18.54	1.21	1.12	1.20	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	27
		Full SAR	0.322	0.497	**0.677**	0.388	0.558	**0.814**	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	

(1900MHz WR SAR Table continues)

(1900MHz WR SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz	Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		19.35			Scaling factor*			
	Conducted Power [dBm]		19.65	19.54	19.32	0.50	0.50	0.53	dB
	Time-averaged power [dBm]		19.65	19.54	19.32	1.12	1.12	1.13	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	28
		Full SAR	0.544	0.826	**1.10**	0.610	0.927	**1.24**	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Bottom edge facing phantom, Repeated	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	1.08	-	-	1.22	

2450MHz Wireless Router SAR results**

Mode	Test configuration	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 2	Ch 6	Ch 11	Ch 2	Ch 6	Ch 11	
			2415.0 MHz	2437.0 MHz	2462.0 MHz	2415.0 MHz	2437.0 MHz	2462.0 MHz	
WLAN b-mode DSSS 1 Mbps	Tuning Target + Tolerance [dBm]		17.50			Scaling factor*			
	Conducted Power [dBm]		17.01	17.29	17.41	0.99	0.71	0.59	dB
	Time-averaged power [dBm]		17.01	17.29	17.41	1.26	1.18	1.15	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.074	0.084	0.065	0.093	0.099	0.075	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.044	-	-	0.052	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.029	-	-	0.034	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.011	-	-	0.013	-	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.061	-	-	0.072	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.006	-	-	0.007	-	
WLAN b-mode DSSS 5.5 Mbps	Tuning Target + Tolerance [dBm]		18.50			Scaling factor*			
	Conducted Power [dBm]		18.11	18.51	18.44	0.89	0.50	0.56	dB
	Time-averaged power [dBm]		18.11	18.51	18.44	1.23	1.12	1.14	Lin
	Back facing phantom, Worst case	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.110	0.086	0.099	0.138	0.101	0.114	

Simultaneous transmissions: Combined Wireless Router SAR results – Individual band Max results

Test configuration	Max. 1g SAR results				
	WLAN 2450**	4-slot GPRS850	WCDMA 850	4-slot GPRS1900	WCDMA 1900
WR: Back facing phantom	0.138	0.917	1.13	-	-
WR: Display facing phantom	0.052	-	-	-	-
WR: Top edge facing phantom	0.034	-	-	-	-
WR: Bottom edge facing phantom	0.013	-	-	0.814	1.24
WR: Left edge facing phantom	0.072	-	-	-	-
WR: Right edge facing phantom	0.007	-	-	-	-

**SAR data taken from FCC_RM-846_03.

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

Test configuration	Max. 1g SAR results			
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	4-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN 2450
WR: Back facing phantom	**1.06**	**1.27**	-	-
WR: Display facing phantom	-	-	-	-
WR: Top edge facing phantom	-	-	-	-
WR: Bottom edge facing phantom	-	-	**0.827**	**1.25**
WR: Left edge facing phantom	-	-	-	-
WR: Right edge facing phantom	-	-	-	-

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. It is these values that appear in the Summary table in Section 1.2.

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

Test configuration	Max. 1g SAR results			
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	4-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN 2450
WR: Back facing phantom	0.952	1.15	-	-
WR: Display facing phantom	-	-	-	-
WR: Top edge facing phantom	-	-	-	-
WR: Bottom edge facing phantom	-	-	0.840	1.28
WR: Left edge facing phantom	-	-	-	-
WR: 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.3.

APPENDIX A: SYSTEM CHECKING SCANS

Plot #1

Date/Time: 2013-01-14 09:06:07

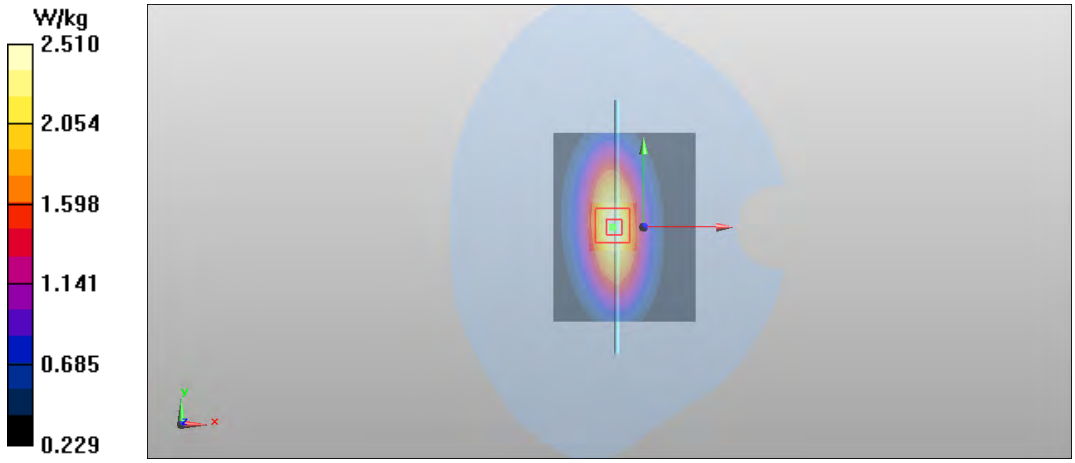
Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:462

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL850; Medium Notes: t= 21.3C
Medium parameters used: f = 835 MHz; σ = 0.916 S/m; ε_r = 40.374; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

d=15mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.46 W/kg

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.748 V/m
Peak SAR (extrapolated) = 3.45 W/kg
SAR(1 g) = 2.32 W/kg
SAR(10 g) = 1.52 W/kg
Power Drift = -0.06 dB
Maximum value of SAR (measured) = 2.51 W/kg



Plot #2

Date/Time: 2013-01-08 09:43:02

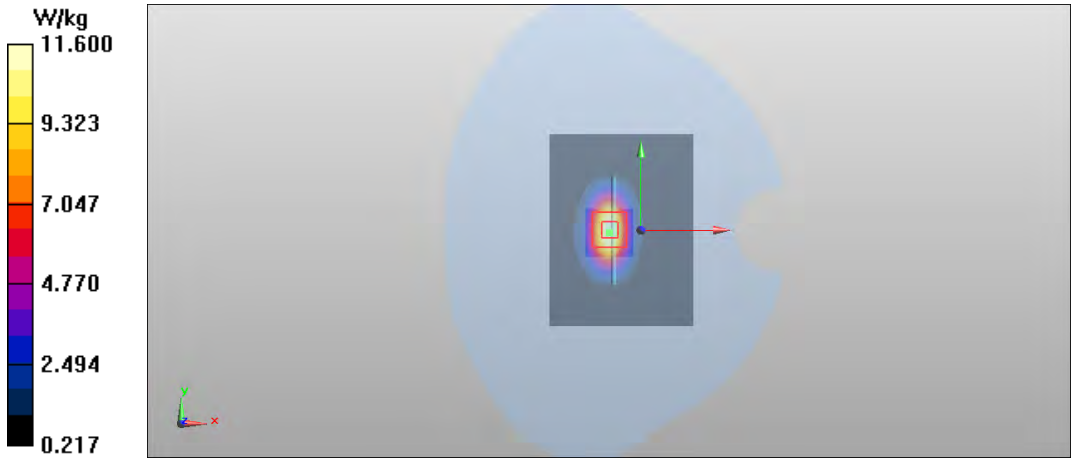
Test Laboratory: TCC Nokia
Type: D1900V2; Serial: D1900V2 - SN:5d030

Communication System: CW1900
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL1900; Medium Notes: t= 21.6 C
Medium parameters used: f = 1900 MHz; σ = 1.395 S/m; ε_r = 39.153; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.2 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.068 V/m
Peak SAR (extrapolated) = 19.1 W/kg
SAR(1 g) = 10.3 W/kg
SAR(10 g) = 5.38 W/kg
Power Drift = 0.17 dB
Maximum value of SAR (measured) = 11.6 W/kg



Plot #3

Date/Time: 2013-01-16 07:56:25

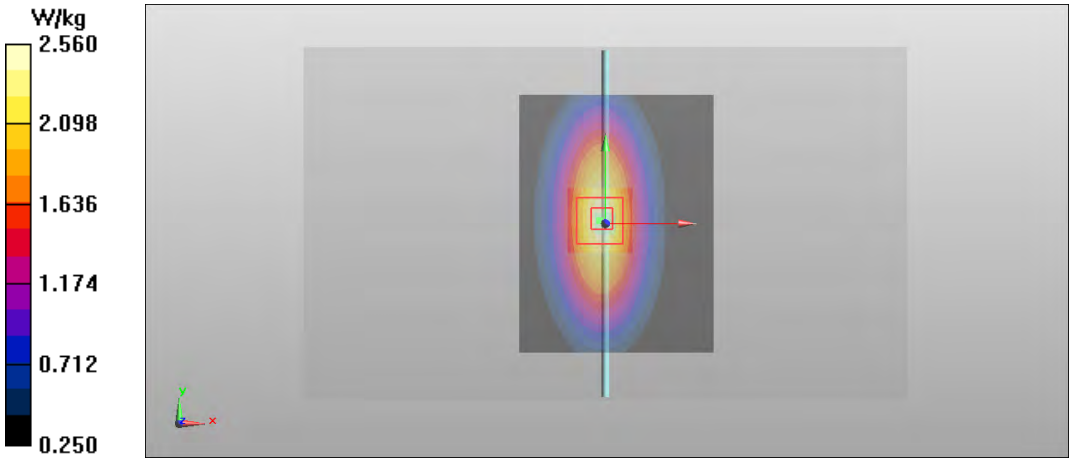
Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:462

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.3C
Medium parameters used: f = 835 MHz; σ = 1.005 S/m; ε_r = 53.035; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

d=15mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.51 W/kg

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.262 V/m
Peak SAR (extrapolated) = 3.50 W/kg
SAR(1 g) = 2.37 W/kg
SAR(10 g) = 1.57 W/kg
Power Drift = 0.03 dB
Maximum value of SAR (measured) = 2.56 W/kg



Plot #4

Date/Time: 2013-01-14 09:09:44

Test Laboratory: TCC Nokia
Type: D1900V2; Serial: D1900V2 - SN:5d030

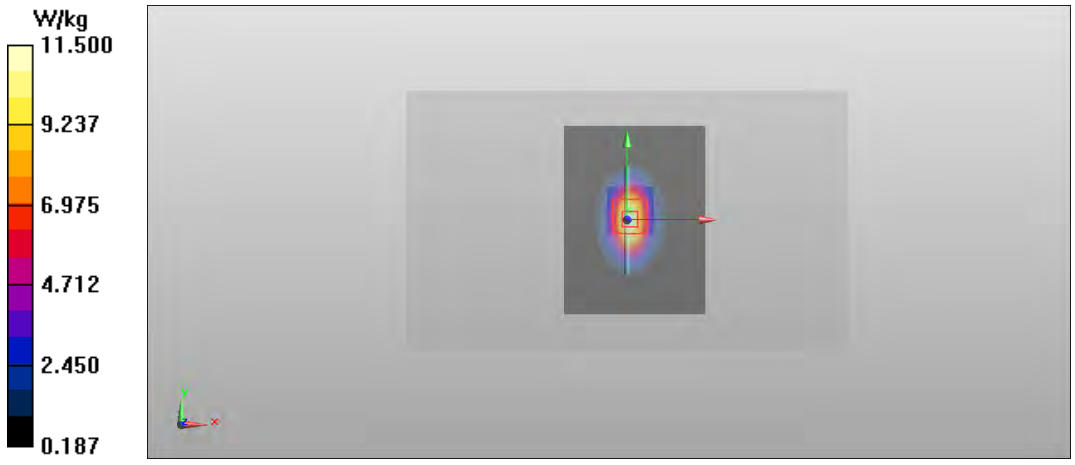
Communication System: CW1900
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 20.2 C
Medium parameters used: f = 1900 MHz; σ = 1.538 S/m; ε_r = 52.038; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 11.9 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 86.855 V/m
Peak SAR (extrapolated) = 18.4 W/kg
SAR(1 g) = 10.1 W/kg
SAR(10 g) = 5.25 W/kg
Power Drift = -0.02 dB

Maximum value of SAR (measured) = 11.5 W/kg



APPENDIX B.1: HEAD MEASUREMENT SCANS

Plot #1

Date/Time: 2013-01-14 13:28:48

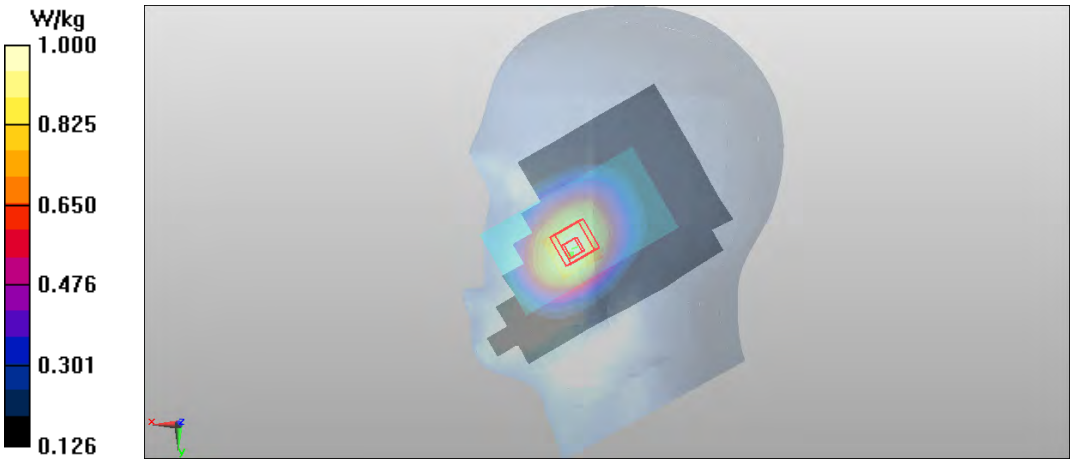
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/199979/1

Communication System: 4-slot GPRS850
Frequency: 824.2 MHz; Duty Cycle: 1:2.1
Medium: HSL850; Medium Notes: t= 21.3C
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.909 S/m; ε_r = 40.447; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

4-slot GPRS850 - Right/Cheek - Low - Repeated/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.02 W/kg

4-slot GPRS850 - Right/Cheek - Low - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 11.880 V/m
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.947 W/kg
SAR(10 g) = 0.712 W/kg
Power Drift = 0.17 dB
Maximum value of SAR (measured) = 1.00 W/kg



Plot #2

Date/Time: 2013-01-14 14:54:51

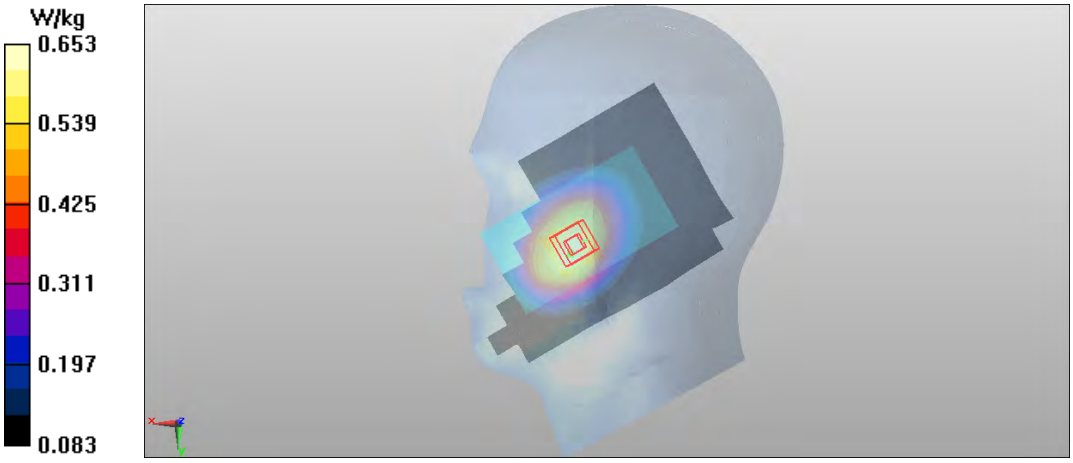
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/199979/1

Communication System: WCDMA850 (Band 5)
Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium: HSL850; Medium Notes: t= 21.3C
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.91 S/m; ε_r = 40.433; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

WCDMA850 (Band 5) - Right/Cheek - Low/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.650 W/kg

WCDMA850 (Band 5) - Right/Cheek - Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 9.488 V/m
Peak SAR (extrapolated) = 0.783 W/kg
SAR(1 g) = 0.624 W/kg
SAR(10 g) = 0.469 W/kg
Power Drift = 0.04 dB
Maximum value of SAR (measured) = 0.653 W/kg



Plot #3

Date/Time: 2013-01-08 11:45:53

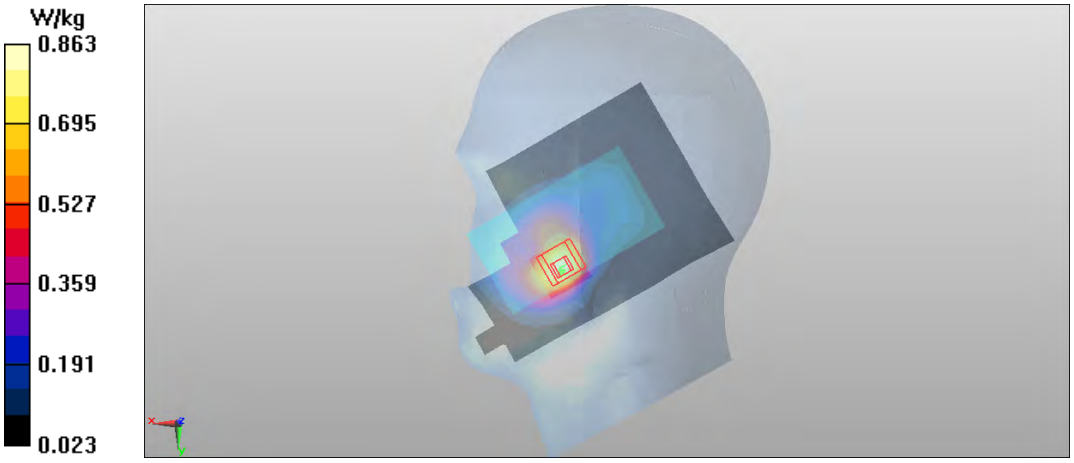
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200018/5

Communication System: 4-slot GPRS1900
Frequency: 1850.2 MHz; Duty Cycle: 1:2.1
Medium: HSL1900; Medium Notes: t= 21.6 C
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.349 S/m; ε_r = 39.312; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

4-slot GPRS1900 - Right/Cheek - Low/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.888 W/kg

4-slot GPRS1900 - Right/Cheek - Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 8.384 V/m
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.796 W/kg
SAR(10 g) = 0.505 W/kg
Power Drift = 0.04 dB
Maximum value of SAR (measured) = 0.863 W/kg



Plot #4

Date/Time: 2013-01-09 10:05:12

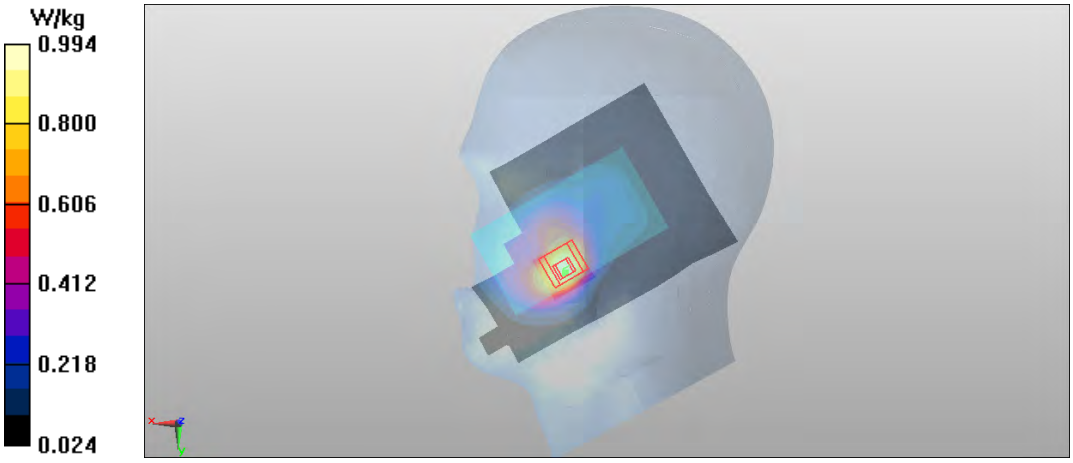
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200018/5

Communication System: WCDMA1900 (Band 2)
Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: HSL1900; Medium Notes: t= 21.5 C
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.342 S/m; ε_r = 38.687; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

WCDMA1900 (Band 2) - Right/Cheek - Low - Repeated/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.01 W/kg

WCDMA1900 (Band 2) - Right/Cheek - Low - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 8.796 V/m
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 0.914 W/kg
SAR(10 g) = 0.577 W/kg
Power Drift = 0.05 dB
Maximum value of SAR (measured) = 0.994 W/kg



Plot #5

Date/Time: 2012-10-25 10:45:46

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 2 - DSSS 5.5 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2417 MHz; σ = 1.763 S/m; ε_r = 38.113; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3835; ConvF(6.73, 6.73, 6.73); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018
Measurement SW: DASY4, Version 4.7 (80)

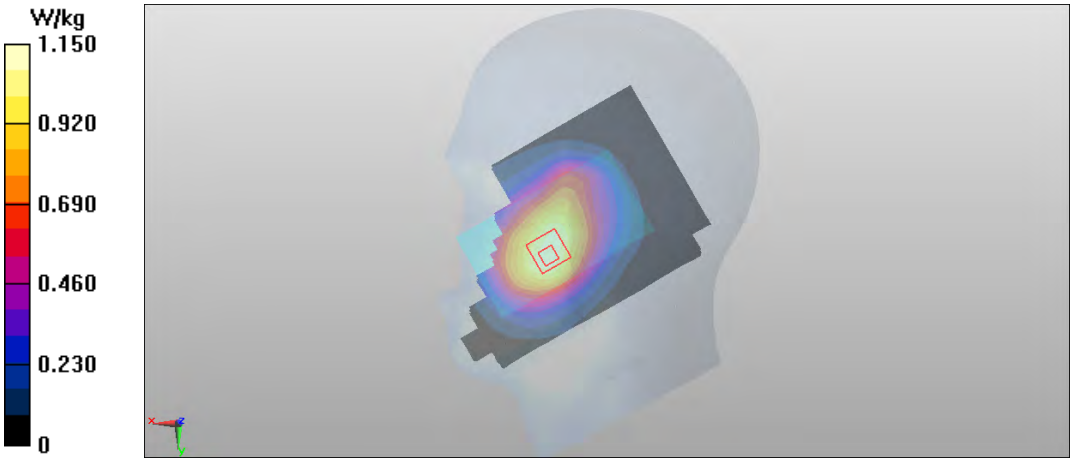
Date/Time: 2013-01-14 13:28:48

DASY Configuration for 4-slot GPRS850 - Right/Cheek - Low - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/199979/1
Communication System: 4-slot GPRS850; Frequency: 824.2 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL850 Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.909 S/m; ε_r = 40.447; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3892; ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: SAM2; Type: SAM; Serial: TP-1570
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.753 W/kg
Maximum value of SAR (interpolated) = 1.15 W/kg

WLAN2450 b-mode was scaled with factor 1.23, 4-slot GPRS850 with factor 1.12, before combining in SEMCAD SW.



Plot #6

Date/Time: 2012-10-25 10:45:46

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 2 - DSSS 5.5 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2417 MHz; σ = 1.763 S/m; ε_r = 38.113; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3835; ConvF(6.73, 6.73, 6.73); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018
Measurement SW: DASY4, Version 4.7 (80)

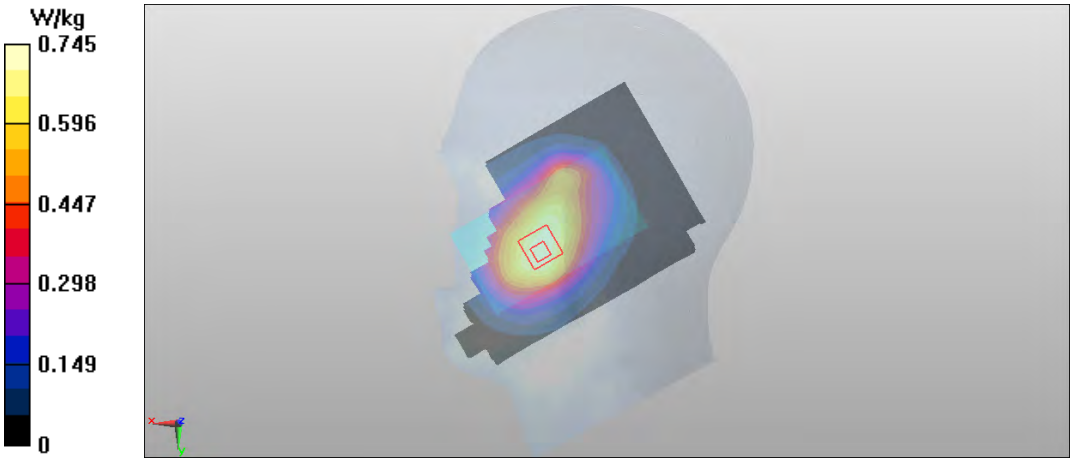
Date/Time: 2013-01-14 14:54:51

DASY Configuration for WCDMA850 (Band 5) - Right/Cheek - Low/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/199979/1
Communication System: WCDMA850 (Band 5); Frequency: 826.4 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL850 Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.91 S/m; ε_r = 40.433; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3892; ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: SAM2; Type: SAM; Serial: TP-1570
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.698 W/kg; SAR(10 g) = 0.489 W/kg
Maximum value of SAR (interpolated) = 0.745 W/kg

WLAN2450 b-mode was scaled with factor 1.23, WCDMA850 (Band 5) with factor 1.13, before combining in SEMCAD SW.



Plot #7

Date/Time: 2012-10-25 10:45:46

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 2 - DSSS 5.5 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2417 MHz; σ = 1.763 S/m; ε_r = 38.113; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3835; ConvF(6.73, 6.73, 6.73); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018
Measurement SW: DASY4, Version 4.7 (80)

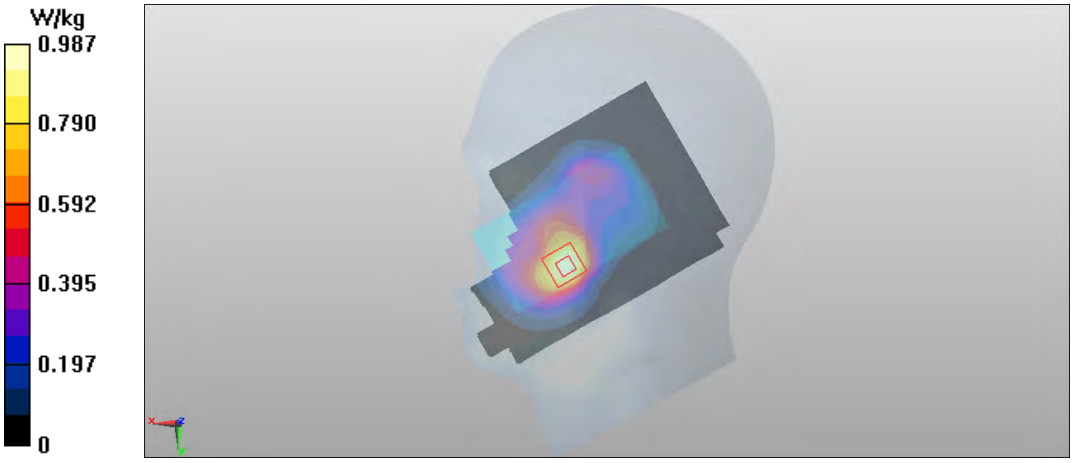
Date/Time: 2013-01-08 11:45:53

DASY Configuration for 4-slot GPRS1900 - Right/Cheek - Low/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200018/5
Communication System: 4-slot GPRS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL1900 Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.349 S/m; ε_r = 39.312; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: ES3DV3 - SN3194; ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.901 W/kg; SAR(10 g) = 0.528 W/kg
Maximum value of SAR (interpolated) = 0.987 W/kg

WLAN2450 b-mode was scaled with factor 1.23, 4-slot GPRS1900 with factor 1.12, before combining in SEMCAD SW.



Plot #8

Date/Time: 2012-10-25 10:45:46

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 2 - DSSS 5.5 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2417 MHz; σ = 1.763 S/m; ε_r = 38.113; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3835; ConvF(6.73, 6.73, 6.73); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018
Measurement SW: DASY4, Version 4.7 (80)

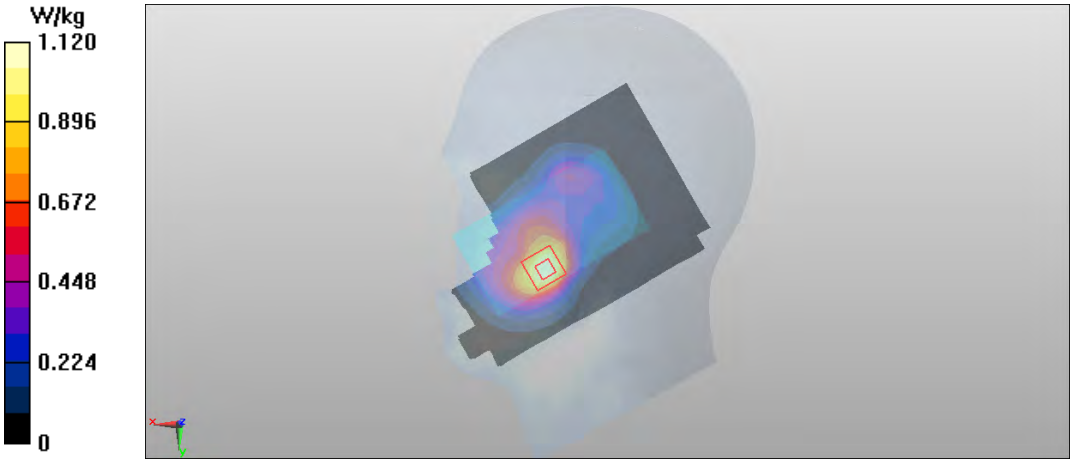
Date/Time: 2013-01-09 10:05:12

DASY Configuration for WCDMA1900 (Band 2) - Right/Cheek - Low - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200018/5
Communication System: WCDMA1900 (Band 2); Frequency: 1852.4 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL1900 Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.342 S/m; ε_r = 38.687; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: ES3DV3 - SN3194; ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.02 W/kg; SAR(10 g) = 0.593 W/kg
Maximum value of SAR (interpolated) = 1.12 W/kg

WLAN2450 b-mode was scaled with factor 1.23, WCDMA1900 (Band 2) with factor 1.12, before combining in SEMCAD SW.



Plot #9

Date/Time: 2012-11-02 13:07:28

DASY Configuration for WLAN5000 a-mode - Right/Cheek - Channel 157 - OFDM 6 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5785 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL5000 Medium parameters used: f = 5785 MHz; σ = 5.135 S/m; ε_r = 34.696; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3573; ConvF(3.99, 3.99, 3.99); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM #2 CRP ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

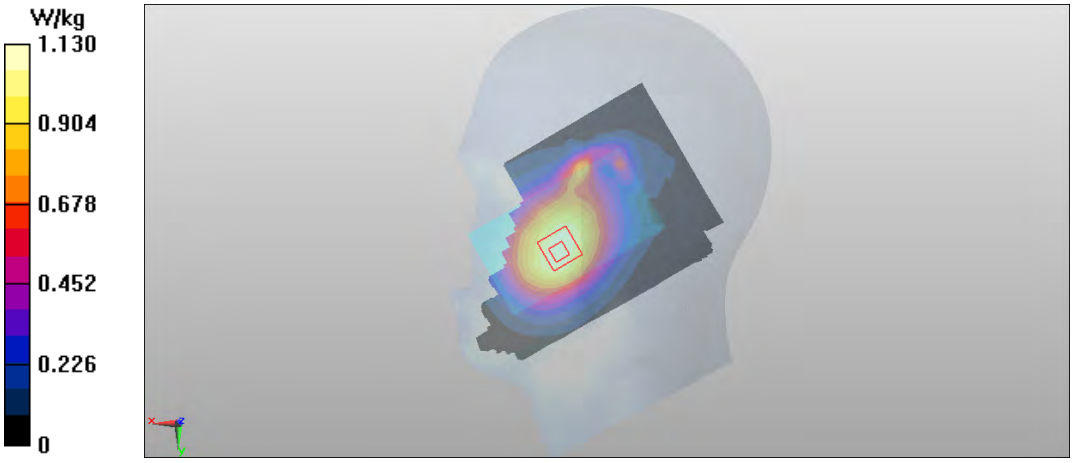
Date/Time: 2013-01-14 13:28:48

DASY Configuration for 4-slot GPRS850 - Right/Cheek - Low - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/199979/1
Communication System: 4-slot GPRS850; Frequency: 824.2 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL850 Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.909 S/m; ε_r = 40.447; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3892; ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: SAM2; Type: SAM; Serial: TP-1570
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.06 W/kg; SAR(10 g) = 0.747 W/kg
Maximum value of SAR (interpolated) = 1.13 W/kg

WLAN5000 a-mode was scaled with factor 1.43, 4-slot GPRS850 with factor 1.12, before combining in SEMCAD SW.



Plot #10

Date/Time: 2012-11-02 13:07:28

DASY Configuration for WLAN5000 a-mode - Right/Cheek - Channel 157 - OFDM 6 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5785 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL5000 Medium parameters used: f = 5785 MHz; σ = 5.135 S/m; ε_r = 34.696; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3573; ConvF(3.99, 3.99, 3.99); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM #2 CRP ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

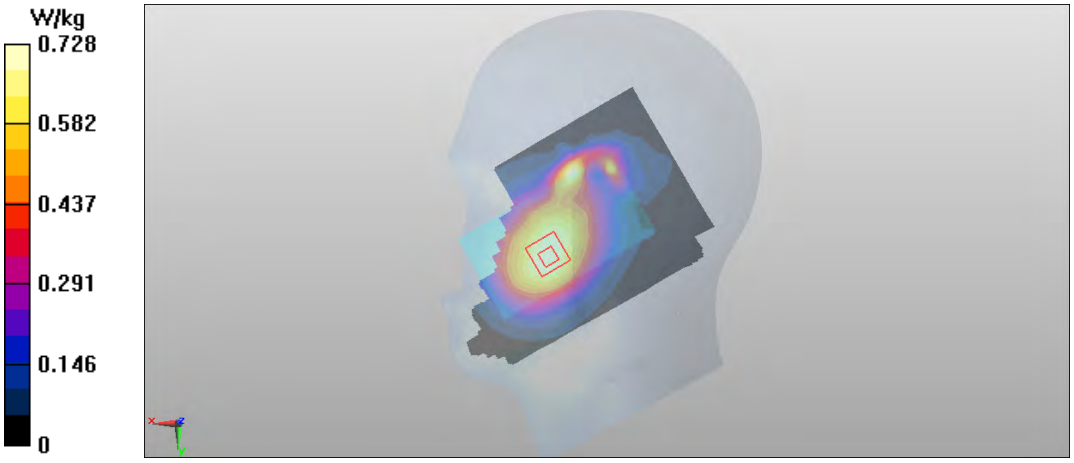
Date/Time: 2013-01-14 14:54:51

DASY Configuration for WCDMA850 (Band 5) - Right/Cheek - Low/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/199979/1
Communication System: WCDMA850 (Band 5); Frequency: 826.4 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL850 Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.91 S/m; ε_r = 40.433; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3892; ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: SAM2; Type: SAM; Serial: TP-1570
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.686 W/kg; SAR(10 g) = 0.483 W/kg
Maximum value of SAR (interpolated) = 0.728 W/kg

WLAN5000 a-mode was scaled with factor 1.43, WCDMA850 (Band 5) with factor 1.13, before combining in SEMCAD SW.



Plot #11

Date/Time: 2012-11-02 13:07:28

DASY Configuration for WLAN5000 a-mode - Right/Cheek - Channel 157 - OFDM 6 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5785 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL5000 Medium parameters used: f = 5785 MHz; σ = 5.135 S/m; ε_r = 34.696; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3573; ConvF(3.99, 3.99, 3.99); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM #2 CRP ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

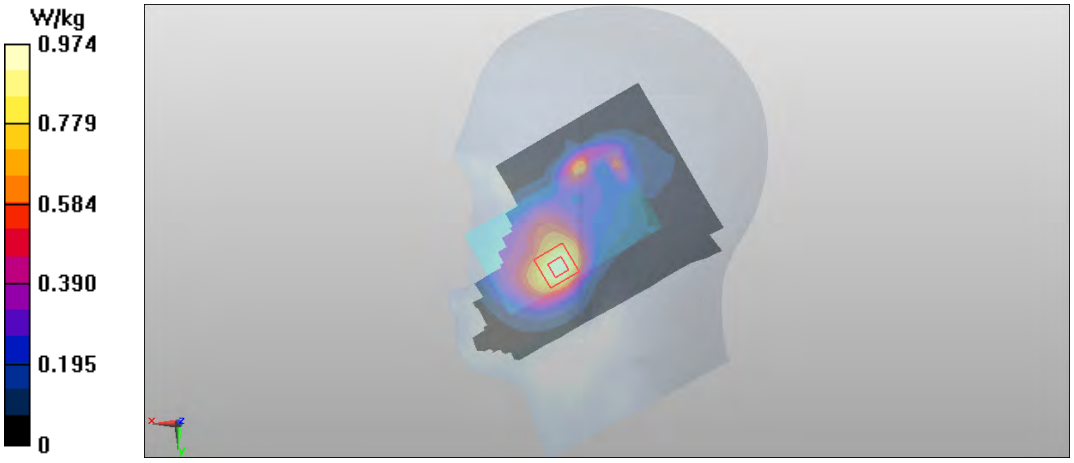
Date/Time: 2013-01-08 11:45:53

DASY Configuration for 4-slot GPRS1900 - Right/Cheek - Low/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200018/5
Communication System: 4-slot GPRS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL1900 Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.349 S/m; ε_r = 39.312; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: ES3DV3 - SN3194; ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.888 W/kg; SAR(10 g) = 0.518 W/kg
Maximum value of SAR (interpolated) = 0.974 W/kg

WLAN5000 a-mode was scaled with factor 1.43, 4-slot GPRS1900 with factor 1.12, before combining in SEMCAD SW.



Plot #12

Date/Time: 2012-11-02 13:07:28

DASY Configuration for WLAN5000 a-mode - Right/Cheek - Channel 157 - OFDM 6 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5785 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL5000 Medium parameters used: f = 5785 MHz; σ = 5.135 S/m; ε_r = 34.696; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3573; ConvF(3.99, 3.99, 3.99); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM #2 CRP ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

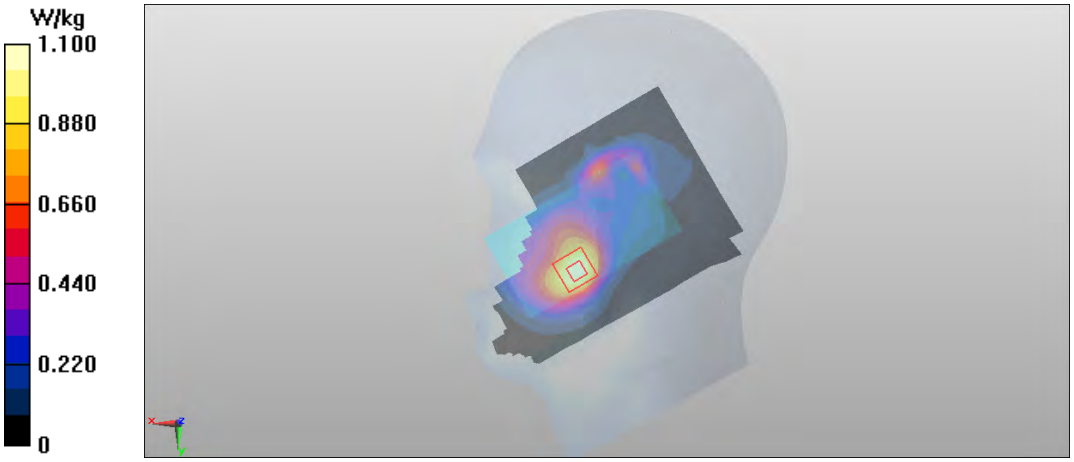
Date/Time: 2013-01-09 10:05:12

DASY Configuration for WCDMA1900 (Band 2) - Right/Cheek - Low - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200018/5
Communication System: WCDMA1900 (Band 2); Frequency: 1852.4 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL1900 Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.342 S/m; ε_r = 38.687; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: ES3DV3 - SN3194; ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1 W/kg; SAR(10 g) = 0.583 W/kg
Maximum value of SAR (interpolated) = 1.10 W/kg

WLAN5000 a-mode was scaled with factor 1.43, WCDMA1900 (Band 2) with factor 1.12, before combining in SEMCAD SW.



APPENDIX B.2: BODY-WORN MEASUREMENT SCANS

Plot #13

Date/Time: 2013-01-21 09:34:52

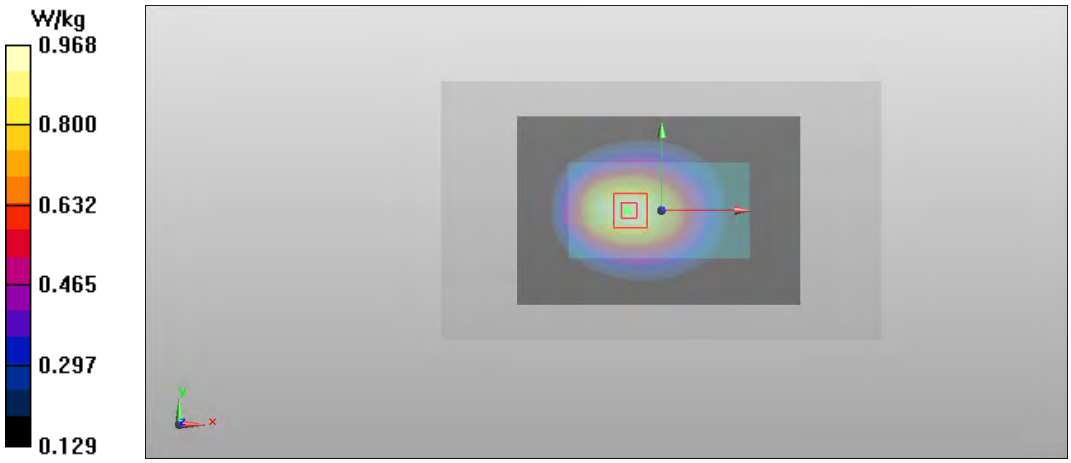
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/199979/1

Communication System: 4-slot GPRS850
Frequency: 824.2 MHz; Duty Cycle: 1:2.1
Medium: BSL850; Medium Notes: t= 20.9C
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.991 S/m; ε_r = 53.298; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

4-slot GPRS850/Body - Low - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan (81x121x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.975 W/kg

4-slot GPRS850/Body - Low - Spacer 15mm - No Accessory - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 31.237 V/m
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.918 W/kg
SAR(10 g) = 0.684 W/kg
Power Drift = 0.04 dB
Maximum value of SAR (measured) = 0.968 W/kg



Plot #14

Date/Time: 2013-01-16 09:49:40

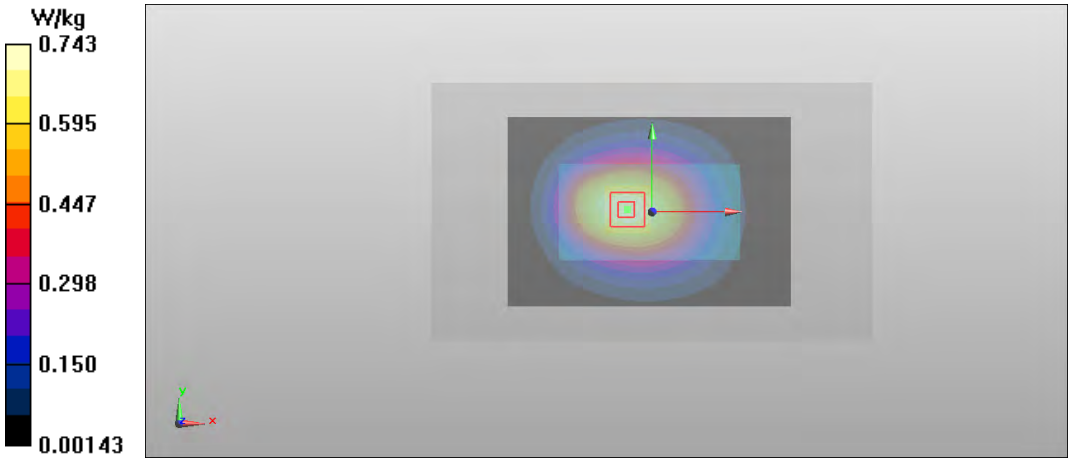
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/199979/1

Communication System: WCDMA850 (Band 5)
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.3C
Medium parameters used: f = 835 MHz; σ = 1.005 S/m; ε_r = 53.035; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

WCDMA850 (Band 5)/Body - Middle - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.743 W/kg

WCDMA850 (Band 5)/Body - Middle - Spacer 15mm - No Accessory - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 27.173 V/m
Peak SAR (extrapolated) = 0.905 W/kg
SAR(1 g) = 0.711 W/kg
SAR(10 g) = 0.526 W/kg
Power Drift = 0.11 dB
Maximum value of SAR (measured) = 0.751 W/kg



Plot #15

Date/Time: 2013-01-17 11:15:05

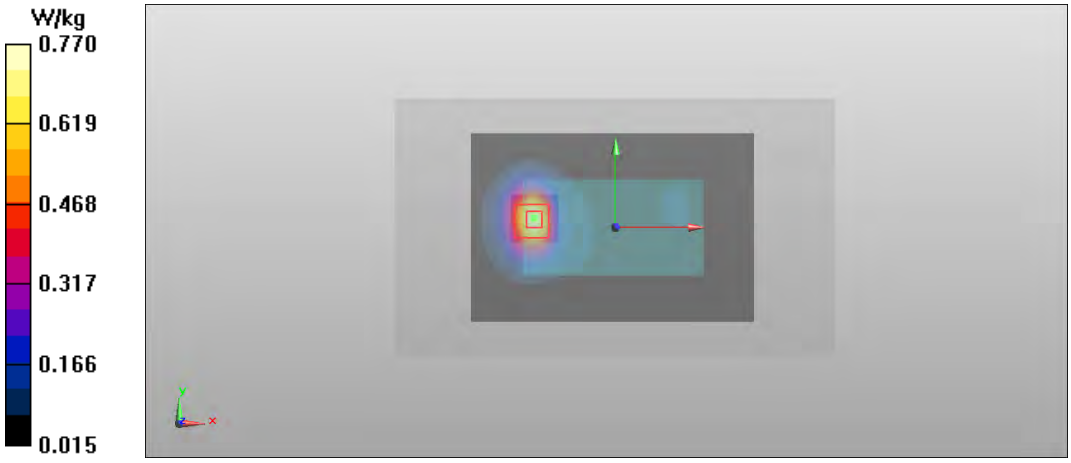
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200018/5

Communication System: 4-slot GPRS1900
Frequency: 1909.8 MHz; Duty Cycle: 1:2.1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1910 MHz; σ = 1.527 S/m; ε_r = 51.922; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

4-slot GPRS1900/Body - High - Spacer 15mm - WH-108 - Back Facing Phantom/Area Scan (81x121x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.776 W/kg

4-slot GPRS1900/Body - High - Spacer 15mm - WH-108 - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 4.210 V/m
Peak SAR (extrapolated) = 1.19 W/kg
SAR(1 g) = 0.695 W/kg
SAR(10 g) = 0.386 W/kg
Power Drift = 0.20 dB
Maximum value of SAR (measured) = 0.770 W/kg



Plot #16

Date/Time: 2013-01-14 15:04:10

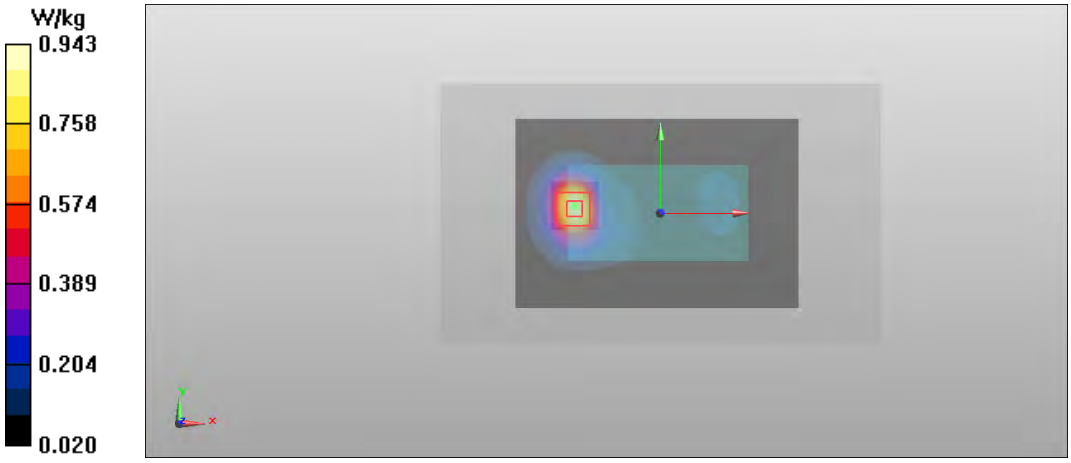
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200018/5

Communication System: WCDMA1900 (Band 2)
Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 20.2 C
Medium parameters used: f = 1908 MHz; σ = 1.546 S/m; ε_r = 52.006; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

WCDMA1900 (Band2)/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.944 W/kg

WCDMA1900 (Band2)/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 3.878 V/m
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.859 W/kg
SAR(10 g) = 0.480 W/kg
Power Drift = 0.30 dB
Maximum value of SAR (measured) = 0.943 W/kg



Plot #17

Date/Time: 2012-10-25 21:05:03

DASY Configuration for WLAN2450 b-mode/Body - Channel 2 - DSSS 5.5 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/106986/8

Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1

Medium: BSL2450 Medium parameters used: f = 2417 MHz; σ = 1.905 S/m; ε_r = 50.425; ρ = 1000 kg/m^3

Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-01-21 09:34:52

DASY Configuration for 4-slot GPRS850/Body - Low - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/199979/1

Communication System: 4-slot GPRS850; Frequency: 824.2 MHz; Duty Cycle: 1:2.1; PMF: 1.44914

Medium: BSL850 Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.991 S/m; ε_r = 53.298; ρ = 1000 kg/m^3

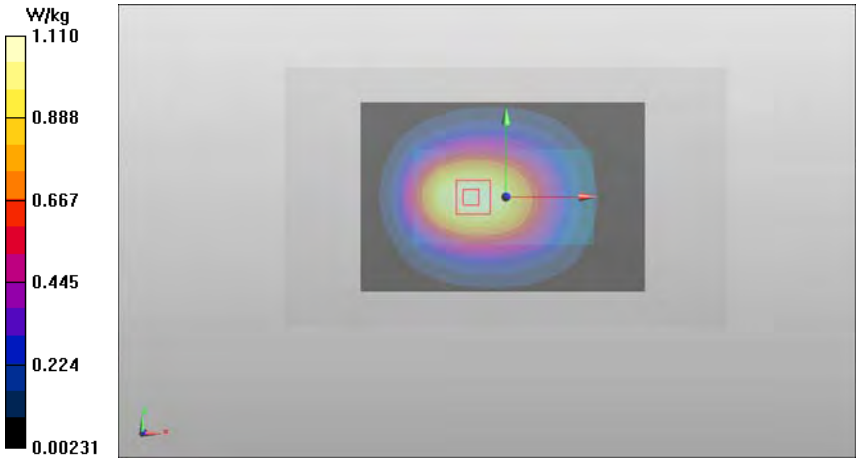
Phantom section: Center Section

Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.05 W/kg; SAR(10 g) = 0.744 W/kg

Maximum value of SAR (interpolated) = 1.11 W/kg

WLAN2450 b-mode was scaled with factor 1.23, 4-slot GPRS850 with factor 1.12, before combining in SEMCAD SW.



Plot #18

Date/Time: 2012-10-25 21:05:03

DASY Configuration for WLAN2450 b-mode/Body - Channel 2 - DSSS 5.5 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/106986/8

Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1

Medium: BSL2450 Medium parameters used: f = 2417 MHz; σ = 1.905 S/m; ε_r = 50.425; ρ = 1000 kg/m^3

Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-01-16 09:49:40

DASY Configuration for WCDMA850 (Band 5)/Body - Middle - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/199979/1

Communication System: WCDMA850 (Band 5); Frequency: 835 MHz; Duty Cycle: 1:1; PMF: 1

Medium: BSL850 Medium parameters used: f = 835 MHz; σ = 1.005 S/m; ε_r = 53.035; ρ = 1000 kg/m^3

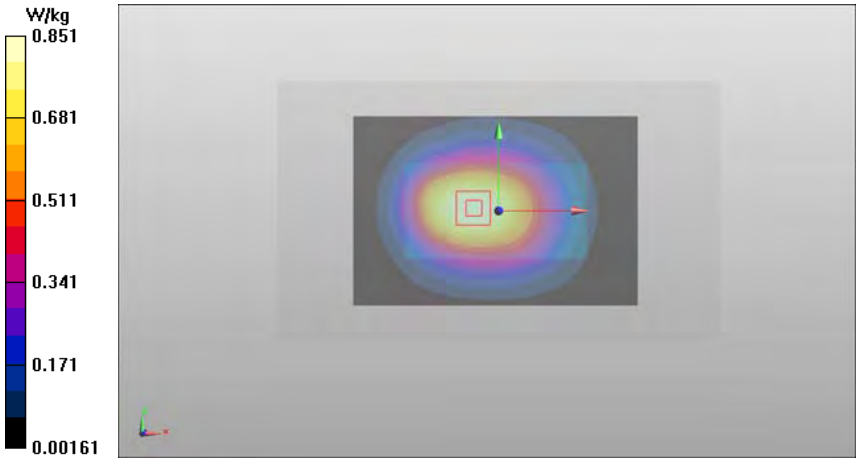
Phantom section: Center Section

Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.803 W/kg; SAR(10 g) = 0.569 W/kg

Maximum value of SAR (interpolated) = 0.851 W/kg

WLAN2450 b-mode was scaled with factor 1.23, WCDMA850 (Band 5) with factor 1.12, before combining in SEMCAD SW



Plot #19

Date/Time: 2012-10-25 19:21:51

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 15mm - WH-108 - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2437 MHz; σ = 1.928 S/m; ε_r = 50.325; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

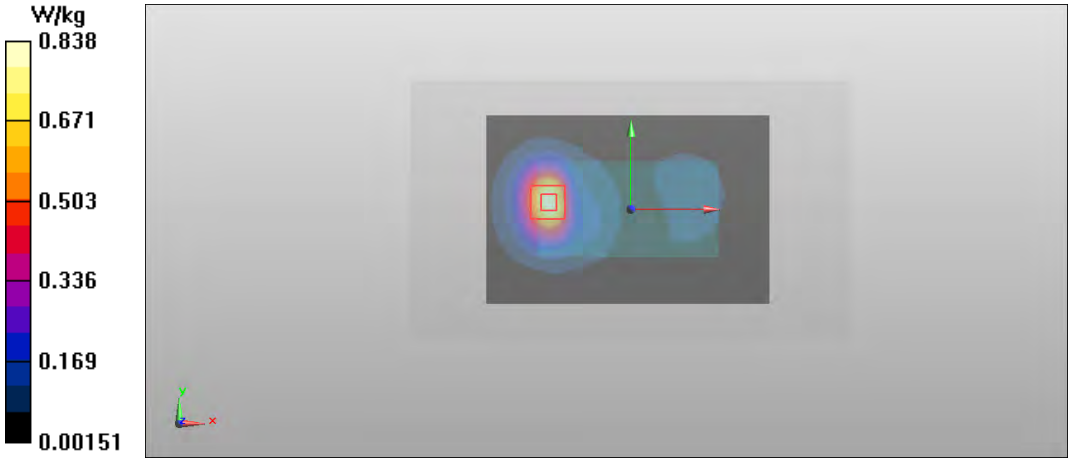
Date/Time: 2013-01-17 11:15:05

DASY Configuration for 4-slot GPRS1900/Body - High - Spacer 15mm - WH-108 - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200018/5
Communication System: 4-slot GPRS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: BSL1900 Medium parameters used: f = 1910 MHz; σ = 1.527 S/m; ε_r = 51.922; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3194; ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.746 W/kg; SAR(10 g) = 0.404 W/kg
Maximum value of SAR (interpolated) = 0.838 W/kg

WLAN2450 b-mode was scaled with factor 1.18, 4-slot GPRS1900 with factor 1.12, before combining in SEMCAD SW.



Plot #20

Date/Time: 2012-10-25 21:05:03

DASY Configuration for WLAN2450 b-mode/Body - Channel 2 - DSSS 5.5 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2417 MHz; σ = 1.905 S/m; ε_r = 50.425; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

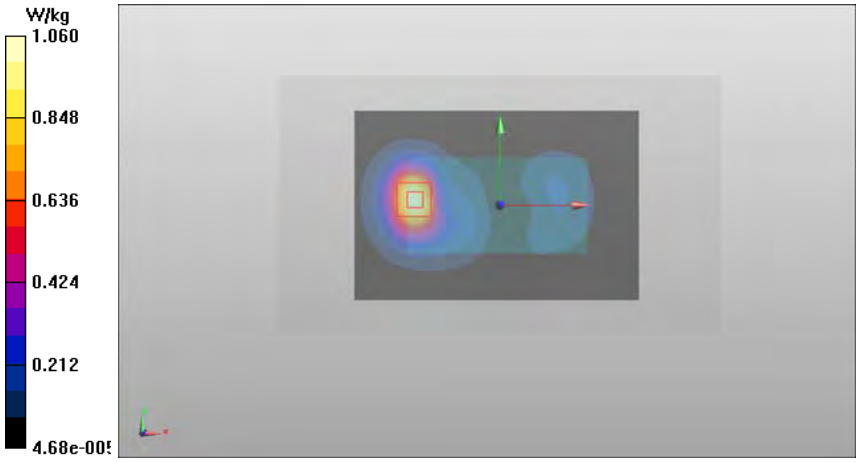
Date/Time: 2013-01-14 15:04:10

DASY Configuration for WCDMA1900 (Band2)/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200018/5
Communication System: WCDMA1900 (Band 2); Frequency: 1907.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL1900 Medium parameters used: f = 1908 MHz; σ = 1.546 S/m; ε_r = 52.006; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3194; ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.947 W/kg; SAR(10 g) = 0.522 W/kg
Maximum value of SAR (interpolated) = 1.06 W/kg

WLAN2450 b-mode was scaled with factor 1.23, WCDMA1900 (Band 2) with factor 1.15, before combining in SEMCAD SW.



Plot #21

Date/Time: 2012-11-07 15:29:20

DASY Configuration for WLAN5000 a-mode/Body - Channel 132 - OFDM 6 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5660 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL5000 Medium parameters used: f = 5660 MHz; σ = 6.024 S/m; ε_r = 46.395; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3573; ConvF(3.05, 3.05, 3.05); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (2)

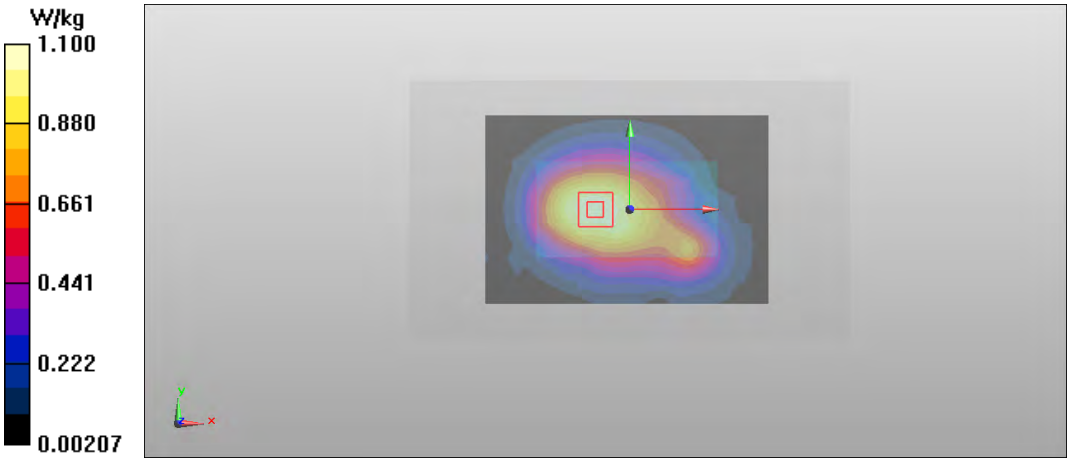
Date/Time: 2013-01-21 09:34:52

DASY Configuration for 4-slot GPRS850/Body - Low - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/199979/1
Communication System: 4-slot GPRS850; Frequency: 824.2 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: BSL850 Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.991 S/m; ε_r = 53.298; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.04 W/kg; SAR(10 g) = 0.737 W/kg
Maximum value of SAR (interpolated) = 1.10 W/kg

WLAN5000 a-mode was scaled with factor 1.42, 4-slot GPRS850 with factor 1.12, before combining in SEMCAD SW.



Plot #22

Date/Time: 2012-11-07 15:29:20

DASY Configuration for WLAN5000 a-mode/Body - Channel 132 - OFDM 6 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/106943/9

Communication System: WLAN5000 a-mode; Frequency: 5660 MHz; Duty Cycle: 1:1; PMF: 1

Medium: BSL5000 Medium parameters used: f = 5660 MHz; σ = 6.024 S/m; ε_r = 46.395; ρ = 1000 kg/m^3

Phantom section: Center Section

Probe: EX3DV4 - SN3573; ConvF(3.05, 3.05, 3.05); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (2)

Date/Time: 2013-01-16 09:49:40

DASY Configuration for WCDMA850 (Band 5)/Body - Middle - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/199979/1

Communication System: WCDMA850 (Band 5); Frequency: 835 MHz; Duty Cycle: 1:1; PMF: 1

Medium: BSL850 Medium parameters used: f = 835 MHz; σ = 1.005 S/m; ε_r = 53.035; ρ = 1000 kg/m^3

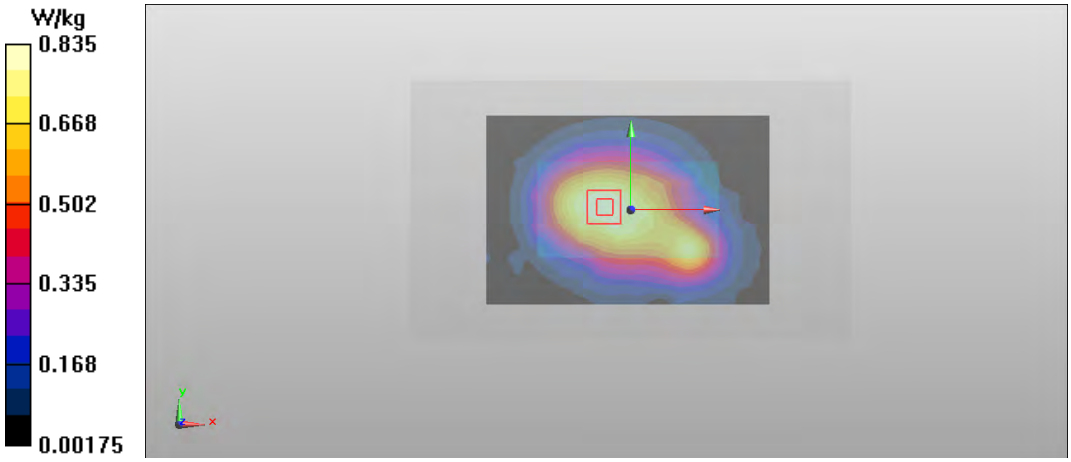
Phantom section: Center Section

Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.789 W/kg; SAR(10 g) = 0.561 W/kg

Maximum value of SAR (interpolated) = 0.835 W/kg

WLAN5000 a-mode was scaled with factor 1.42, WCDMA850 (Band 5) with factor 1.12, before combining in SEMCAD SW.



Plot #23

Date/Time: 2012-11-07 16:24:31

DASY Configuration for WLAN5000 a-mode/Body - Channel 132 - OFDM 6 Mbps - Spacer 15mm - WH-108 - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5660 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL5000 Medium parameters used: f = 5660 MHz; σ = 6.024 S/m; ε_r = 46.395; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3573; ConvF(3.05, 3.05, 3.05); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (2)

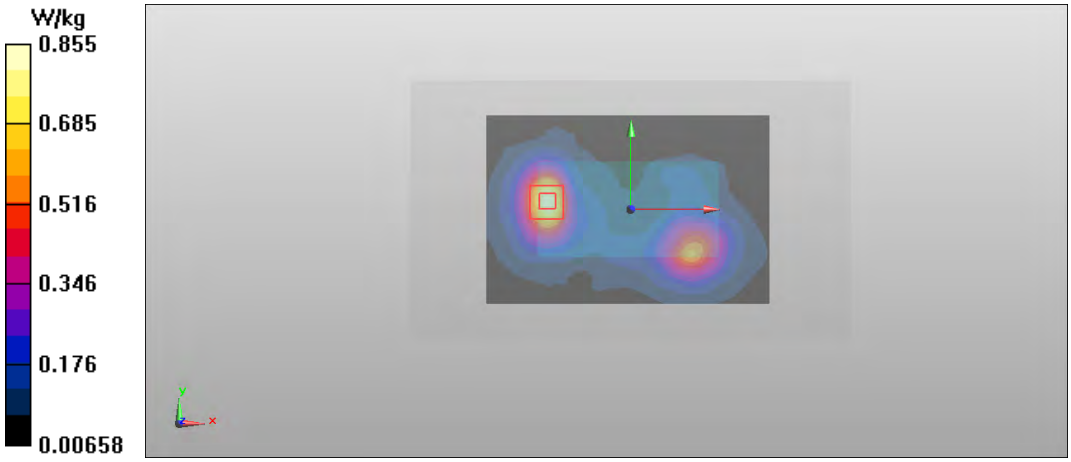
Date/Time: 2013-01-17 11:15:05

DASY Configuration for 4-slot GPRS1900/Body - High - Spacer 15mm - WH-108 - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200018/5
Communication System: 4-slot GPRS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: BSL1900 Medium parameters used: f = 1910 MHz; σ = 1.527 S/m; ε_r = 51.922; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3194; ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.747 W/kg; SAR(10 g) = 0.402 W/kg
Maximum value of SAR (interpolated) = 0.855 W/kg

WLAN5000 a-mode was scaled with factor 1.42, 4-slot GPRS1900 with factor 1.12, before combining in SEMCAD SW.



Plot #24

Date/Time: 2012-11-07 15:29:20

DASY Configuration for WLAN5000 a-mode/Body - Channel 132 - OFDM 6 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5660 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL5000 Medium parameters used: f = 5660 MHz; σ = 6.024 S/m; ε_r = 46.395; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3573; ConvF(3.05, 3.05, 3.05); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (2)

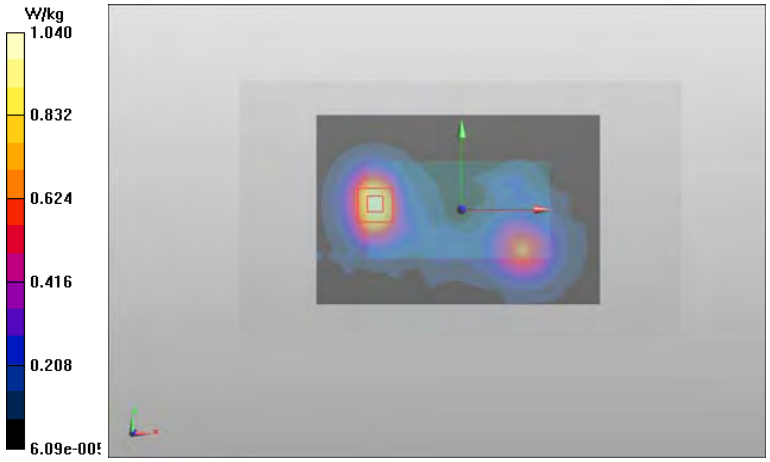
Date/Time: 2013-01-14 15:04:10

DASY Configuration for WCDMA1900 (Band2)/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200018/5
Communication System: WCDMA1900 (Band 2); Frequency: 1907.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL1900 Medium parameters used: f = 1908 MHz; σ = 1.546 S/m; ε_r = 52.006; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3194; ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.927 W/kg; SAR(10 g) = 0.507 W/kg
Maximum value of SAR (interpolated) = 1.04 W/kg

WLAN5000 a-mode was scaled with factor 1.42, WCDMA1900 (Band2) with factor 1.15, before combining in SEMCAD SW.



APPENDIX B.3: WIRELESS ROUTER MEASUREMENT SCANS

Plot #25

Date/Time: 2013-01-16 13:08:34

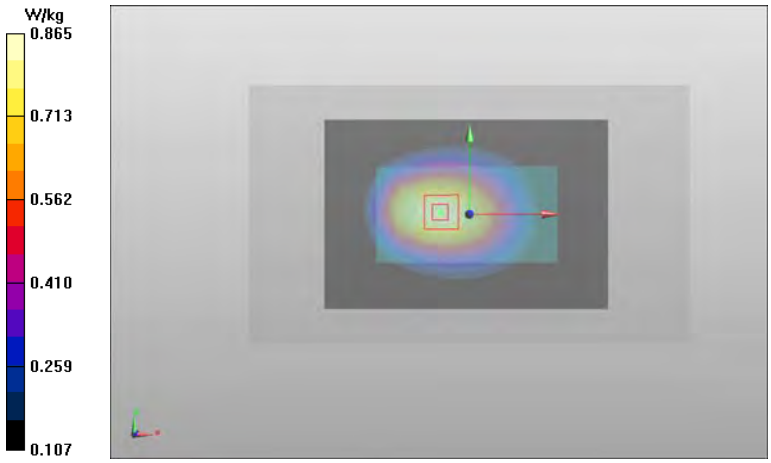
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/200007/8

Communication System: 4-slot GPRS850
Frequency: 824.2 MHz; Duty Cycle: 1:2.1
Medium: BSL850; Medium Notes: t= 21.3C
Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.997 S/m; ε_r = 53.103; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

4-slot GPRS850/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (81x121x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.864 W/kg

4-slot GPRS850/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 = 29.469 V/m
Peak SAR (extrapolated) = 1.04 W/kg
SAR(1 g) = 0.817 W/kg
SAR(10 g) = 0.606 W/kg
Power Drift = -0.06 dB
Maximum value of SAR (measured) = 0.865 W/kg



Plot #26

Date/Time: 2013-01-16 12:29:48

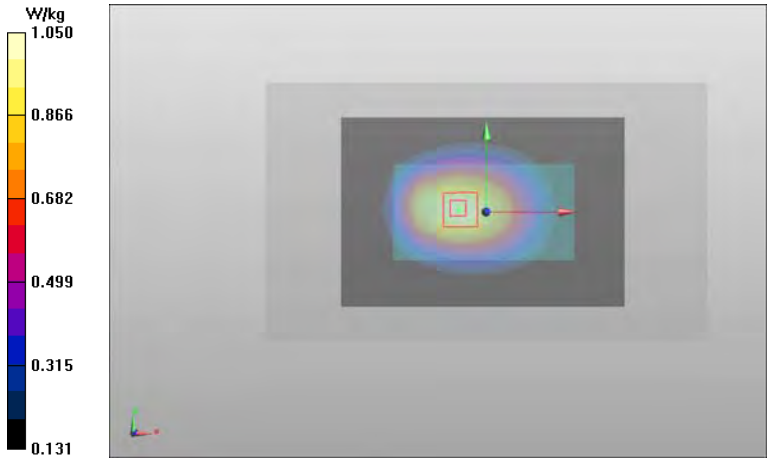
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/199979/1

Communication System: WCDMA850 (Band 5)
Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.3C
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.999 S/m; ε_r = 53.088; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

WCDMA850 (Band 5)/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom - Repeated/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.04 W/kg

WCDMA850 (Band 5)/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 32.475 V/m
Peak SAR (extrapolated) = 1.26 W/kg
SAR(1 g) = 0.996 W/kg
SAR(10 g) = 0.740 W/kg
Power Drift = 0.02 dB
Maximum value of SAR (measured) = 1.05 W/kg



Plot #27

Date/Time: 2013-01-17 13:03:34

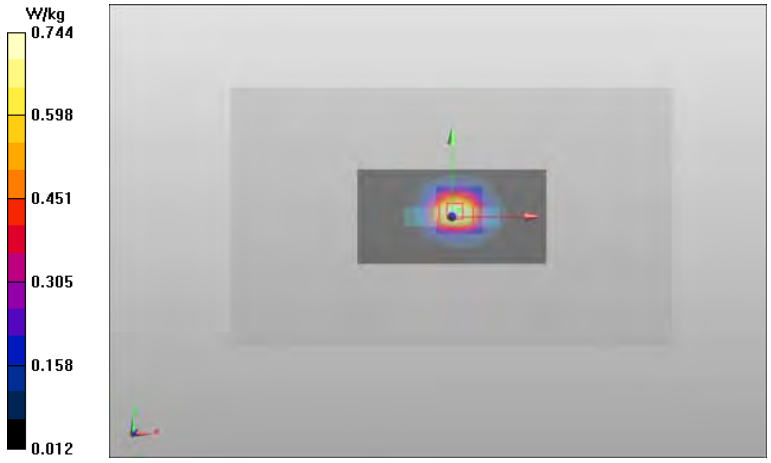
Test Laboratory: TCC Nokia
Type: RM-846 ; Serial: 004402/47/200007/8

Communication System: 4-slot GPRS1900
Frequency: 1909.8 MHz; Duty Cycle: 1:2.1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1910 MHz; σ = 1.527 S/m; ε_r = 51.922; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

4-slot GPRS1900/Body - High - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom/Area Scan (41x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.823 W/kg

4-slot GPRS1900/Body - High - 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 = 21.911 V/m
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.677 W/kg
SAR(10 g) = 0.357 W/kg
Power Drift = 0.15 dB
Maximum value of SAR (measured) = 0.744 W/kg



Plot #28

Date/Time: 2013-02-05 12:16:15

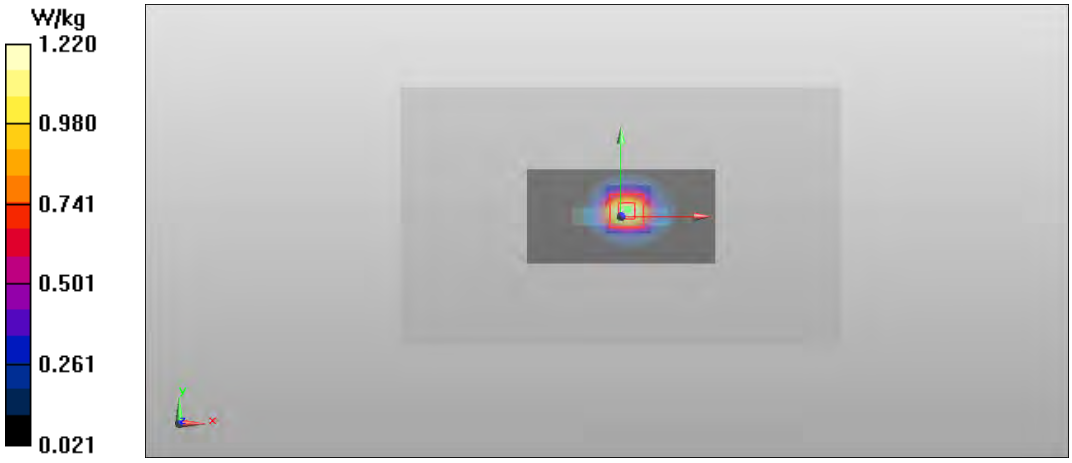
Test Laboratory: TCC Nokia
Type: RM-846 ; Serial: 004402/47/200007/8

Communication System: WCDMA1900 (Band 2)
Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 21,0 C
Medium parameters used: f = 1908 MHz; σ = 1.533 S/m; ε_r = 52.222; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

WCDMA1900 (Band 2)/Body - High - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom/Area Scan (41x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.36 W/kg

WCDMA1900 (Band 2)/Body - High - 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 = 27.310 V/m
Peak SAR (extrapolated) = 1.90 W/kg
SAR(1 g) = 1.1 W/kg
SAR(10 g) = 0.575 W/kg
Power Drift = 0.04 dB
Maximum value of SAR (measured) = 1.22 W/kg



Plot #29

Date/Time: 2012-10-26 14:01:02

DASY Configuration for WLAN2450 b-mode/Body - Channel 2 - DSSS 5.5 Mbps - Spacer 10mm - No Accessory - Back Facing Phantom /Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/106986/8

Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1

Medium: BSL2450 Medium parameters used: f = 2417 MHz; σ = 1.905 S/m; ε_r = 50.425; ρ = 1000 kg/m^3

Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-01-16 13:08:34

DASY Configuration for 4-slot GPRS850/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/200007/8

Communication System: 4-slot GPRS850; Frequency: 824.2 MHz; Duty Cycle: 1:2.1; PMF: 1.44914

Medium: BSL850 Medium parameters used (interpolated): f = 824.2 MHz; σ = 0.997 S/m; ε_r = 53.103; ρ = 1000 kg/m^3

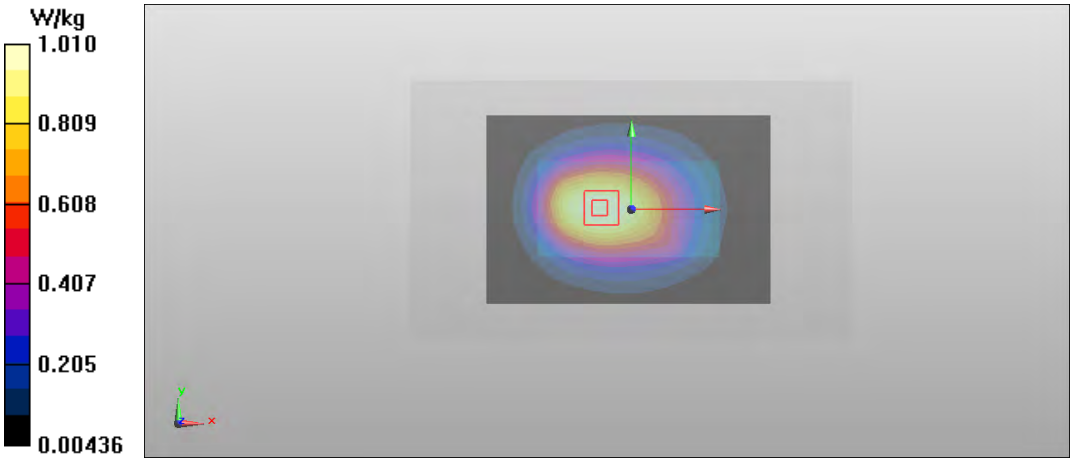
Phantom section: Center Section

Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.952 W/kg; SAR(10 g) = 0.674 W/kg

Maximum value of SAR (interpolated) = 1.01 W/kg

WLAN2450 b-mode was scaled with factor 1.23, 4-slot GPRS850 with factor 1.12, before combining in SEMCAD SW.



Plot #30

Date/Time: 2012-10-26 14:01:02

DASY Configuration for WLAN2450 b-mode/Body - Channel 2 - DSSS 5.5 Mbps - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/106986/8

Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1

Medium: BSL2450 Medium parameters used: f = 2417 MHz; σ = 1.905 S/m; ε_r = 50.425; ρ = 1000 kg/m^3

Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-01-16 12:29:48

DASY Configuration for WCDMA850 (Band 5)/Body - Low - Spacer 10mm - No Accessory - Back Facing Phantom - Repeated/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/199979/1

Communication System: WCDMA850 (Band 5); Frequency: 826.4 MHz; Duty Cycle: 1:1; PMF: 1

Medium: BSL850 Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.999 S/m; ε_r = 53.088; ρ = 1000 kg/m^3

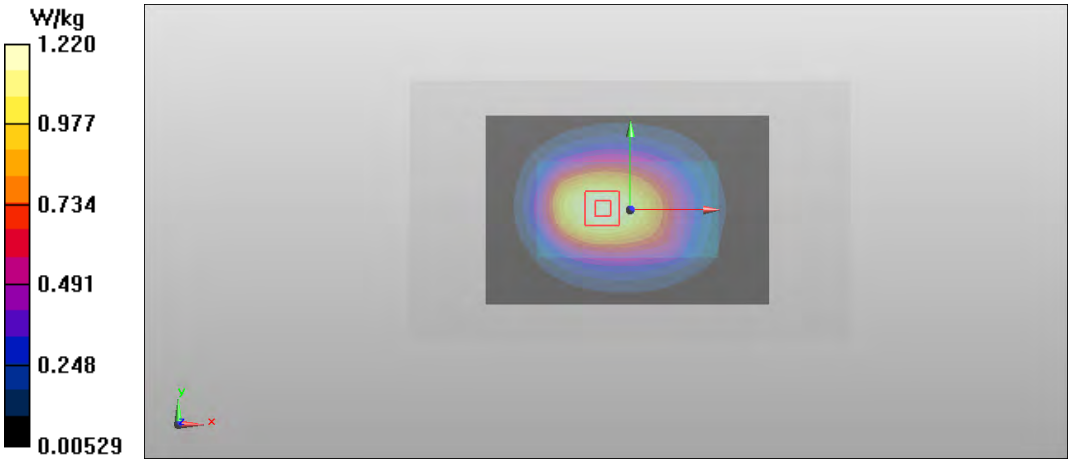
Phantom section: Center Section

Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.815 W/kg

Maximum value of SAR (interpolated) = 1.22 W/kg

WLAN2450 b-mode was scaled with factor 1.23, WCDMA850 (Band 5) with factor 1.13, before combining in SEMCAD SW.



Plot #31

Date/Time: 2012-10-26 09:38:52

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/106986/8

Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1

Medium: BSL2450 Medium parameters used: f = 2437 MHz; σ = 1.928 S/m; ε_r = 50.325; ρ = 1000 kg/m^3

Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-01-17 13:03:34

DASY Configuration for 4-slot GPRS1900/Body - High - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846 ; Serial: 004402/47/200007/8

Communication System: 4-slot GPRS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2.1; PMF: 1.44914

Medium: BSL1900 Medium parameters used: f = 1910 MHz; σ = 1.527 S/m; ε_r = 51.922; ρ = 1000 kg/m^3

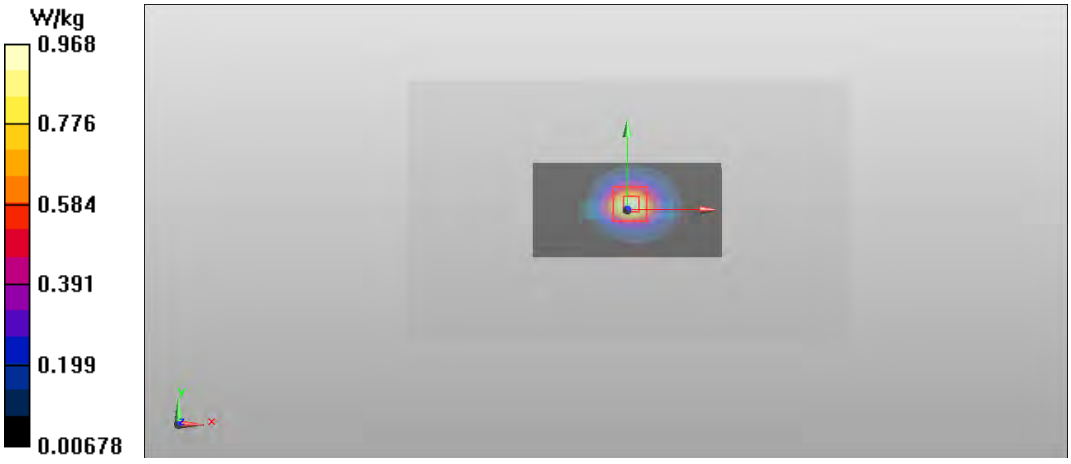
Phantom section: Center Section

Probe: ES3DV3 - SN3194; ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.840 W/kg; SAR(10 g) = 0.421 W/kg

Maximum value of SAR (interpolated) = 0.968 W/kg

WLAN2450 b-mode was scaled with factor 1.18, 4-slot GPRS1900 with factor 1.20, before combining in SEMCAD SW.



Plot #32

Date/Time: 2012-10-26 09:38:52

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2437 MHz; σ = 1.928 S/m; ε_r = 50.325; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

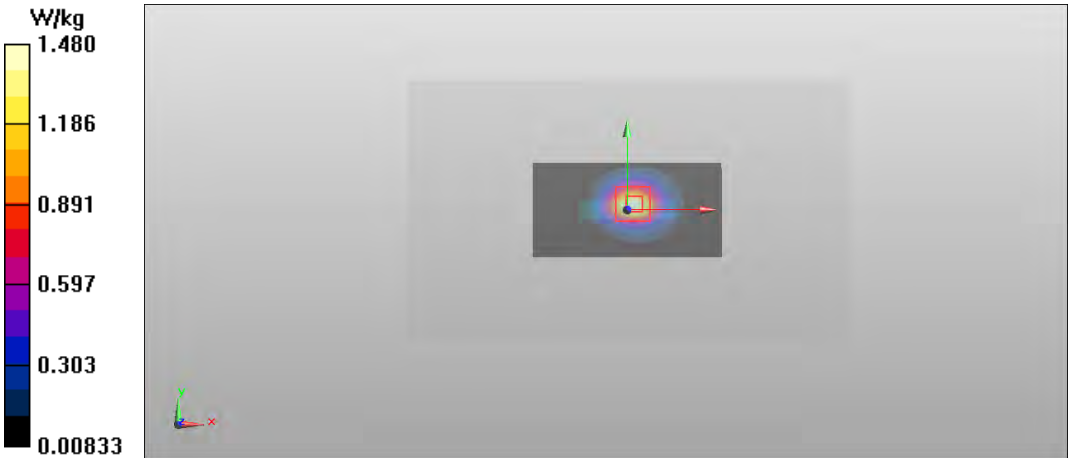
Date/Time: 2013-02-05 12:16:15

DASY Configuration for WCDMA1900 (Band 2)/Body - High - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846 ; Serial: 004402/47/200007/8
Communication System: WCDMA1900 (Band 2); Frequency: 1907.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL1900 Medium parameters used: f = 1908 MHz; σ = 1.533 S/m; ε_r = 52.222; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3194; ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.28 W/kg; SAR(10 g) = 0.631 W/kg
Maximum value of SAR (interpolated) = 1.48 W/kg

WLAN2450 b-mode was scaled with factor 1.18, WCDMA1900 (Band 2) with factor 1.13, before combining in SEMCAD SW.



APPENDIX C: DIELECTRIC PARAMETERS OF THE TISSUE SIMULANTS

Head tissue simulant dielectric parameters used in the measurements 824 – 1907.6 MHz:

F (MHz)	Date	Dielectric Parameters					
		Ch 4132 826.4 MHz		Ch 4175 835.0 MHz		Ch 4233 846.6 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
835	2013-01-14	40.4	0.91	40.4	0.92	40.3	0.92
f (MHz)	**Date**	**Dielectric Parameters**					
		Ch 128 824.2 MHz		Ch 190 836.6 MHz		Ch 251 848.8 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
836	2013-01-14	40.4	0.91	40.4	0.92	40.3	0.92
f (MHz)	**Date**	**Dielectric Parameters**					
		Ch 512 1850.2 MHz		Ch 661 1880.0 MHz		Ch 810 1909.8 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
1880	2013-01-08	39.3	1.35	39.2	1.37	39.1	1.40
f (MHz)	**Date**	**Dielectric Parameters**					
		Ch 9262 1852.4 MHz		Ch 9400 1880.0 MHz		Ch 9538 1907.6 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
1880	2013-01-07	39.1	1.34	39.0	1.36	38.9	1.38
	2013-01-09	38.7	1.34	38.6	1.36	38.4	1.39

Body tissue simulant dielectric parameters used in the measurements 824 – 1907.6 MHz:

F (MHz)	Date	Dielectric Parameters					
		Ch 4132 826.4 MHz		Ch 4175 835.0 MHz		Ch 4233 846.6 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
835	2013-01-16	53.1	1.00	53.0	1.00	53.0	1.01
f (MHz)	**Date**	**Dielectric Parameters**					
		Ch 128 824.2 MHz		Ch 190 836.6 MHz		Ch 251 848.8 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
836	2013-01-16	53.1	1.00	53.0	1.00	53.0	1.01
	2013-01-21	53.3	0.99	53.2	1.00	53.2	1.01
	2013-01-25	53.4	0.99	53.3	1.00	53.3	1.01
f (MHz)	**Date**	**Dielectric Parameters**					
		Ch 512 1850.2 MHz		Ch 661 1880.0 MHz		Ch 810 1909.8 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
1880	2013-01-17	52.1	1.47	52.0	1.50	51.9	1.53
f (MHz)	**Date**	**Dielectric Parameters**					
		Ch 9262 1852.4 MHz		Ch 9400 1880.0 MHz		Ch 9538 1907.6 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
1880	2013-01-14	52.2	1.49	52.1	1.52	52.0	1.55
	2013-01-17	52.1	1.47	52.0	1.50	51.9	1.52
	2013-02-05	52.3	1.48	52.3	1.51	52.2	1.53

APPENDIX D: RELEVANT PAGES FROM PROBE CALIBRATION REPORTS

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
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: **ES3-3194_Aug12**

CALIBRATION CERTIFICATE

Object: ES3DV3 - SN:3194

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

Calibration date: August 27, 2012

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	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

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

Issued: August 27, 2012

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

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	6.35	6.35	6.35	0.29	2.00	± 12.0 %
835	41.5	0.90	6.09	6.09	6.09	0.38	1.54	± 12.0 %
1750	40.1	1.37	5.17	5.17	5.17	0.45	1.52	± 12.0 %
1900	40.0	1.40	4.97	4.97	4.97	0.80	1.16	± 12.0 %
2450	39.2	1.80	4.37	4.37	4.37	0.70	1.40	± 12.0 %
2600	39.0	1.96	4.27	4.27	4.27	0.80	1.29	± 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:3194

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	6.18	6.18	6.18	0.43	1.60	± 12.0 %
835	55.2	0.97	6.03	6.03	6.03	0.28	2.04	± 12.0 %
1750	53.4	1.49	4.83	4.83	4.83	0.73	1.33	± 12.0 %
1900	53.3	1.52	4.62	4.62	4.62	0.76	1.31	± 12.0 %
2450	52.7	1.95	4.20	4.20	4.20	0.73	1.08	± 12.0 %
2600	52.5	2.16	4.07	4.07	4.07	0.66	0.98	± 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.

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

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

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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: EX3-3892_Nov12

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3892

Calibration procedure(s): QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: November 21, 2012

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	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: November 22, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3892

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	10.29	10.29	10.29	0.35	0.87	± 12.0 %
835	41.5	0.90	9.75	9.75	9.75	0.15	1.46	± 12.0 %
1750	40.1	1.37	9.08	9.08	9.08	0.32	0.98	± 12.0 %
1900	40.0	1.40	8.79	8.79	8.79	0.75	0.63	± 12.0 %
2450	39.2	1.80	7.85	7.85	7.85	0.33	1.00	± 12.0 %
2600	39.0	1.96	7.55	7.55	7.55	0.48	0.82	± 12.0 %
5200	36.0	4.66	5.18	5.18	5.18	0.38	1.80	± 13.1 %
5300	35.9	4.76	4.86	4.86	4.86	0.38	1.80	± 13.1 %
5500	35.6	4.96	4.69	4.69	4.69	0.39	1.80	± 13.1 %
5600	35.5	5.07	4.45	4.45	4.45	0.39	1.80	± 13.1 %
5800	35.3	5.27	4.72	4.72	4.72	0.40	1.80	± 13.1 %

[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:3892

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	9.94	9.94	9.94	0.23	1.24	± 12.0 %
835	55.2	0.97	9.73	9.73	9.73	0.30	1.03	± 12.0 %
1750	53.4	1.49	8.00	8.00	8.00	0.24	1.09	± 12.0 %
1900	53.3	1.52	7.61	7.61	7.61	0.42	0.81	± 12.0 %
2450	52.7	1.95	7.35	7.35	7.35	0.73	0.58	± 12.0 %
2600	52.5	2.16	7.12	7.12	7.12	0.80	0.50	± 12.0 %
5200	49.0	5.30	4.36	4.36	4.36	0.51	1.90	± 13.1 %
5300	48.9	5.42	4.23	4.23	4.23	0.45	1.90	± 13.1 %
5500	48.6	5.65	3.98	3.98	3.98	0.49	1.90	± 13.1 %
5600	48.5	5.77	4.04	4.04	4.04	0.38	1.90	± 13.1 %
5800	48.2	6.00	4.10	4.10	4.10	0.48	1.90	± 13.1 %

[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 REPORTS

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

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

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: 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

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.6 Ω - 1.8 jΩ
Return Loss	- 32.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.8 Ω - 3.7 jΩ
Return Loss	- 27.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.391 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	March 27, 2002

Date: 13.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

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

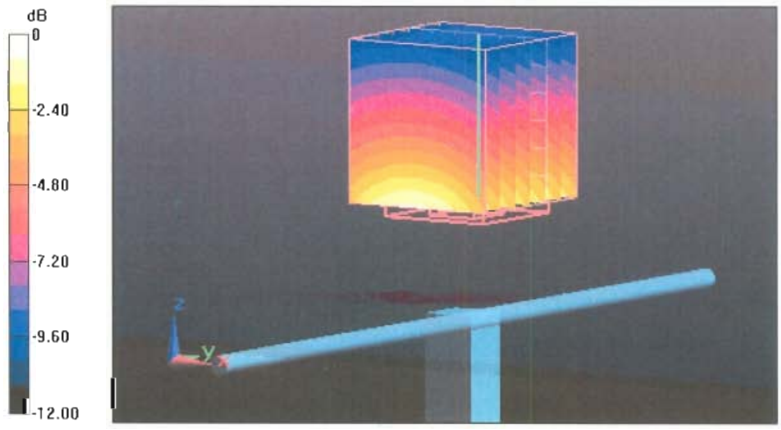
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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)

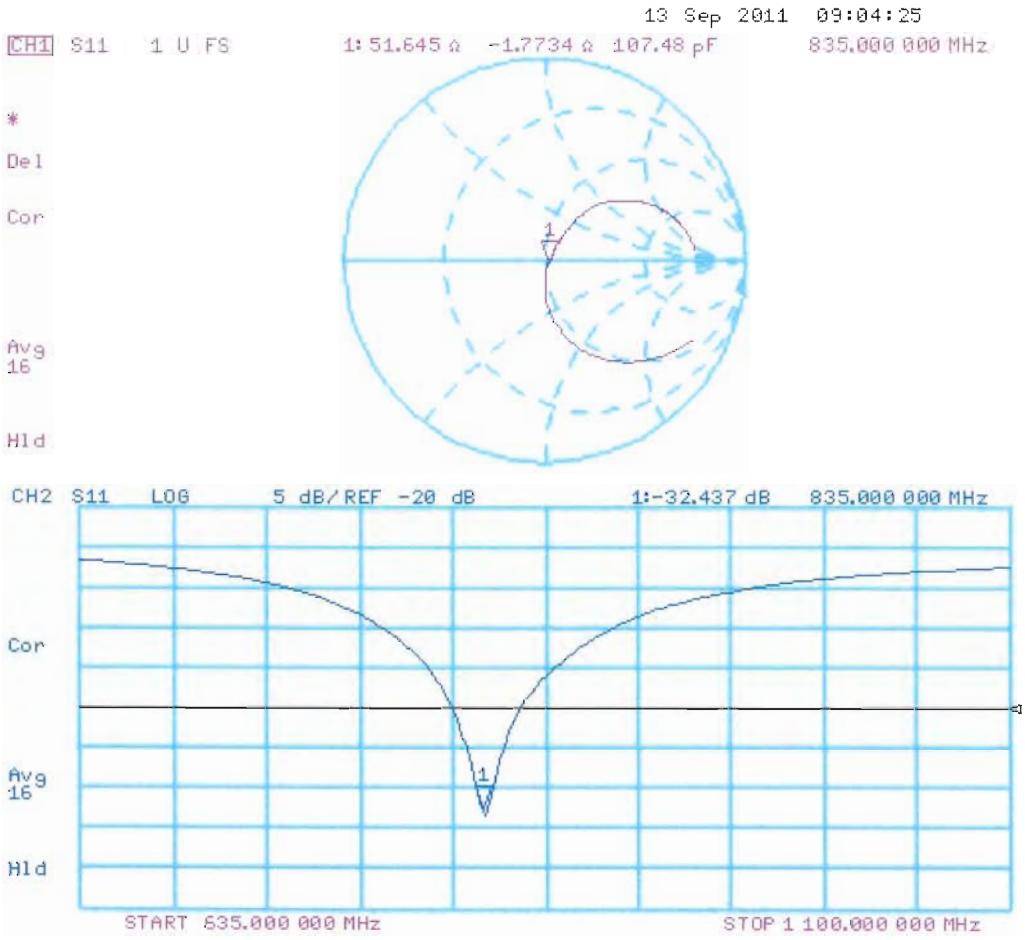
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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

Impedance Measurement Plot for Head TSL



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

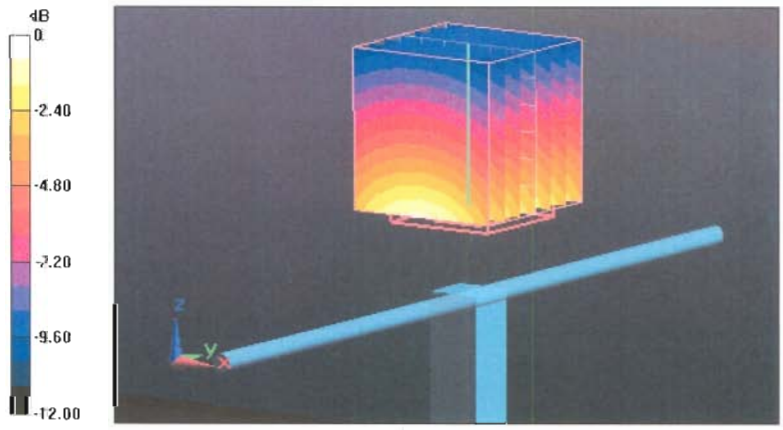
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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)

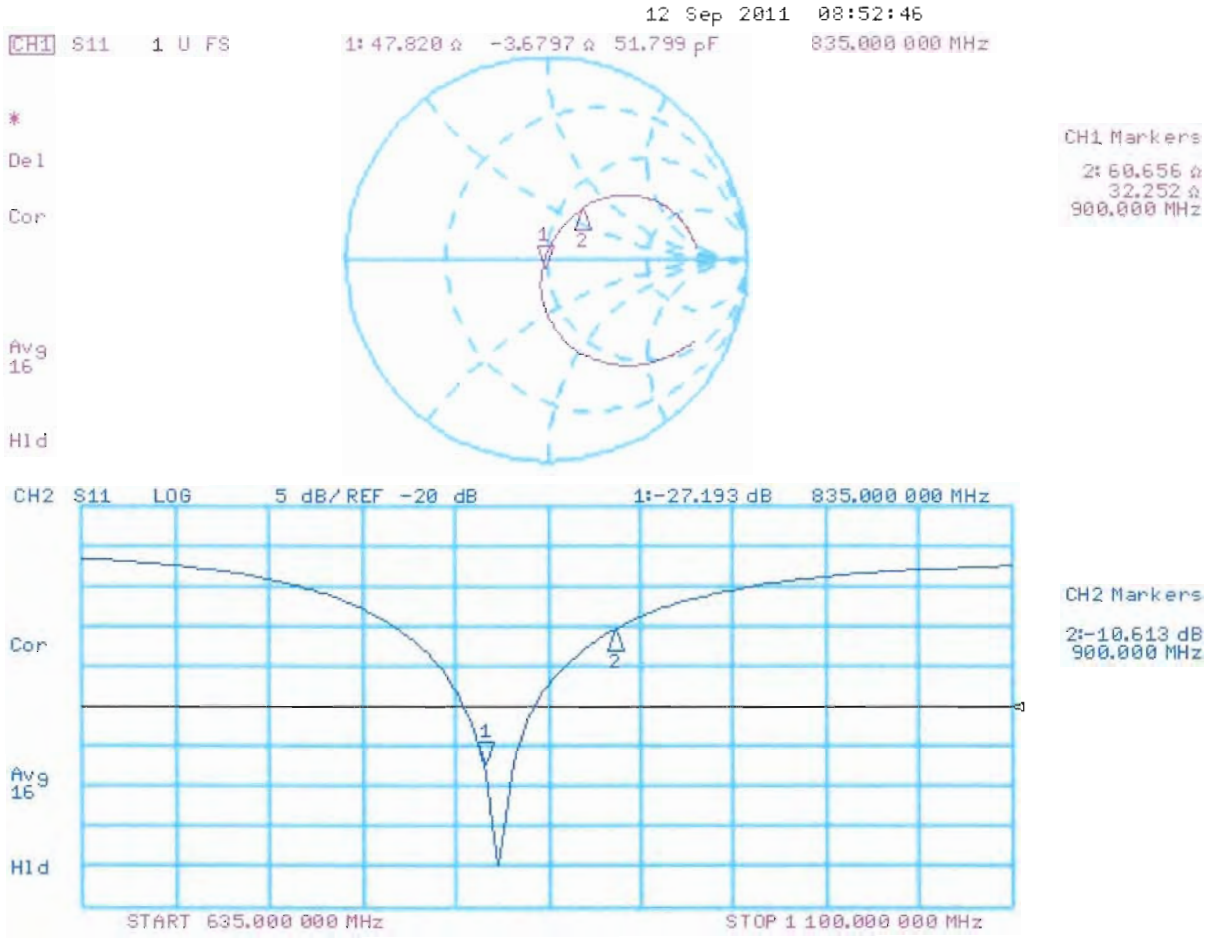
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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

Impedance Measurement Plot for Body TSL



Dipole D835V2 – SN: 462 Antenna Parameters measured: 2012-04-03.

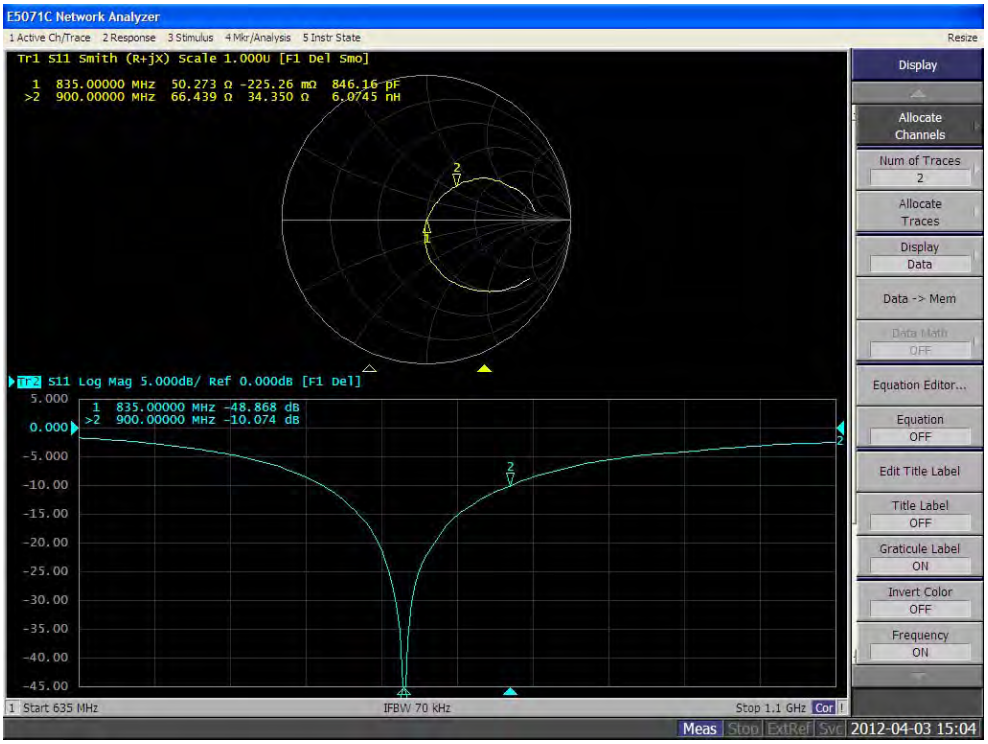
Antenna Parameters with Head TSL

	Calibration certificate	Annual measurement
Impedance, transformed to feed point	50.7 Ω - 2.8 jΩ	50.3 Ω - 0.2 jΩ
Return loss	-30.7 dB	-48.9 dB

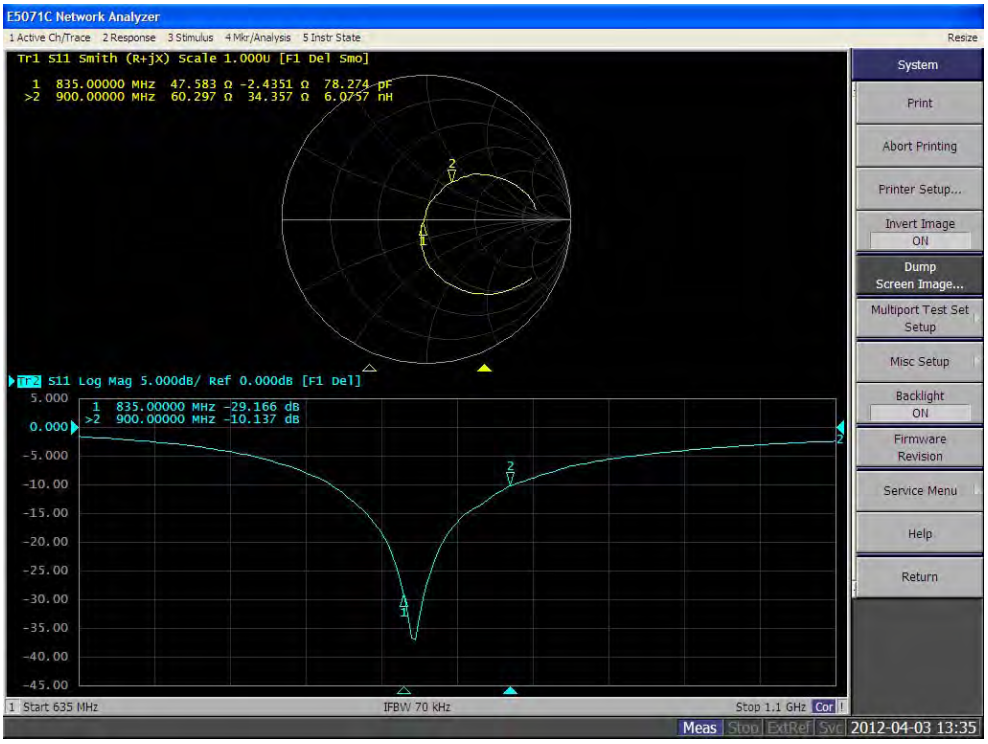
Antenna Parameters with Body TSL

	Calibration certificate	Annual measurement
Impedance, transformed to feed point	47.4 Ω - 3.8 jΩ	47.6 Ω - 2.4 jΩ
Return loss	-26.5 dB	-29.2 dB

Impedance Measurement Plot for Head TSL 835



Impedance Measurement Plot for Body TSL 835



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

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

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: D1900V2-5d030_Feb12

CALIBRATION CERTIFICATE

Object: D1900V2 - SN: 5d030

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

Calibration date: February 22, 2012

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	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5086 (20g)	29-Mar-11 (No. 217-01368)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-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-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	Israe El-Naouq
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 22, 2012

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.0 Ω + 5.3 jΩ
Return Loss	- 25.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.6 Ω + 5.4 jΩ
Return Loss	- 24.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.192 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
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	December 17, 2002

DASY5 Validation Report for Head TSL

Date: 22.02.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d030

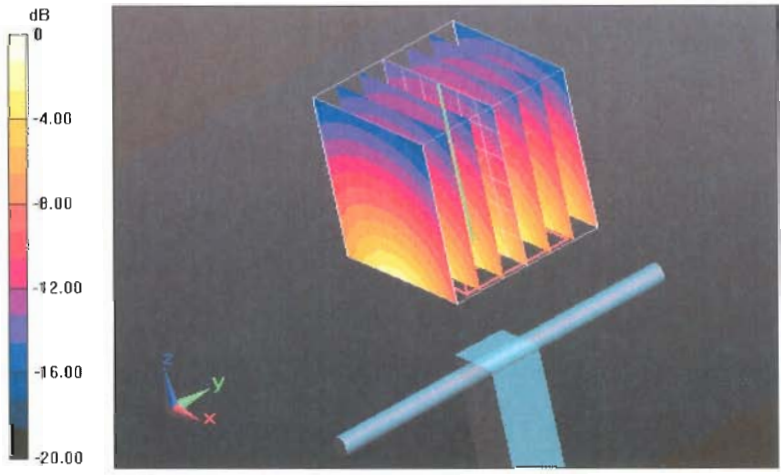
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.4 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); Calibrated: 30.12.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

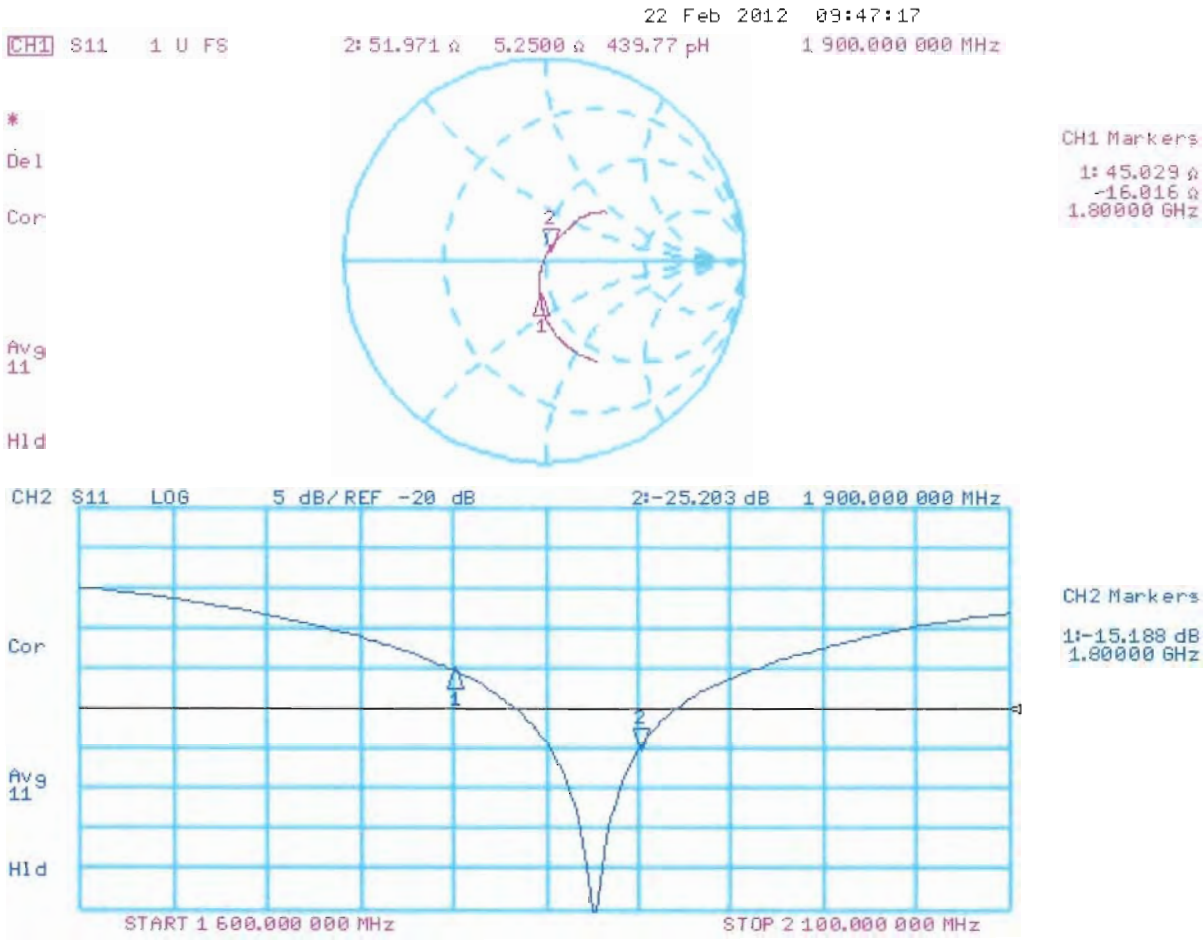
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.565 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 17.4270
SAR(1 g) = 9.79 mW/g; SAR(10 g) = 5.18 mW/g
Maximum value of SAR (measured) = 12.117 mW/g



0 dB = 12.120mW/g = 21.67 dB mW/g

Impedance Measurement Plot for Head TSL



Date: 22.02.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d030

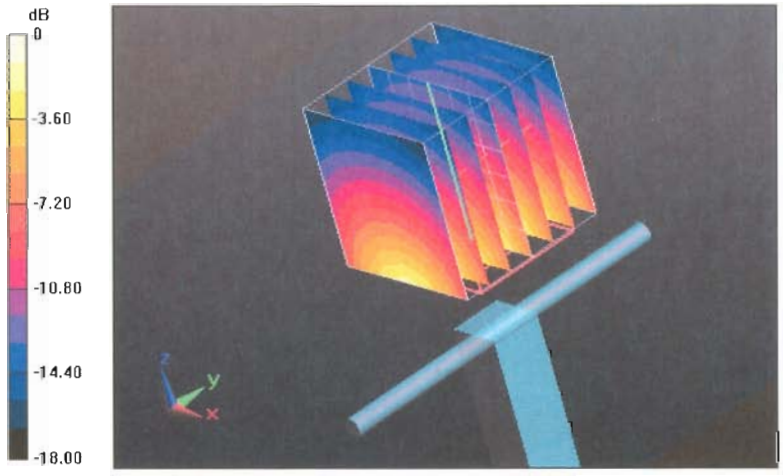
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.56 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.62, 4.62, 4.62); Calibrated: 30.12.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

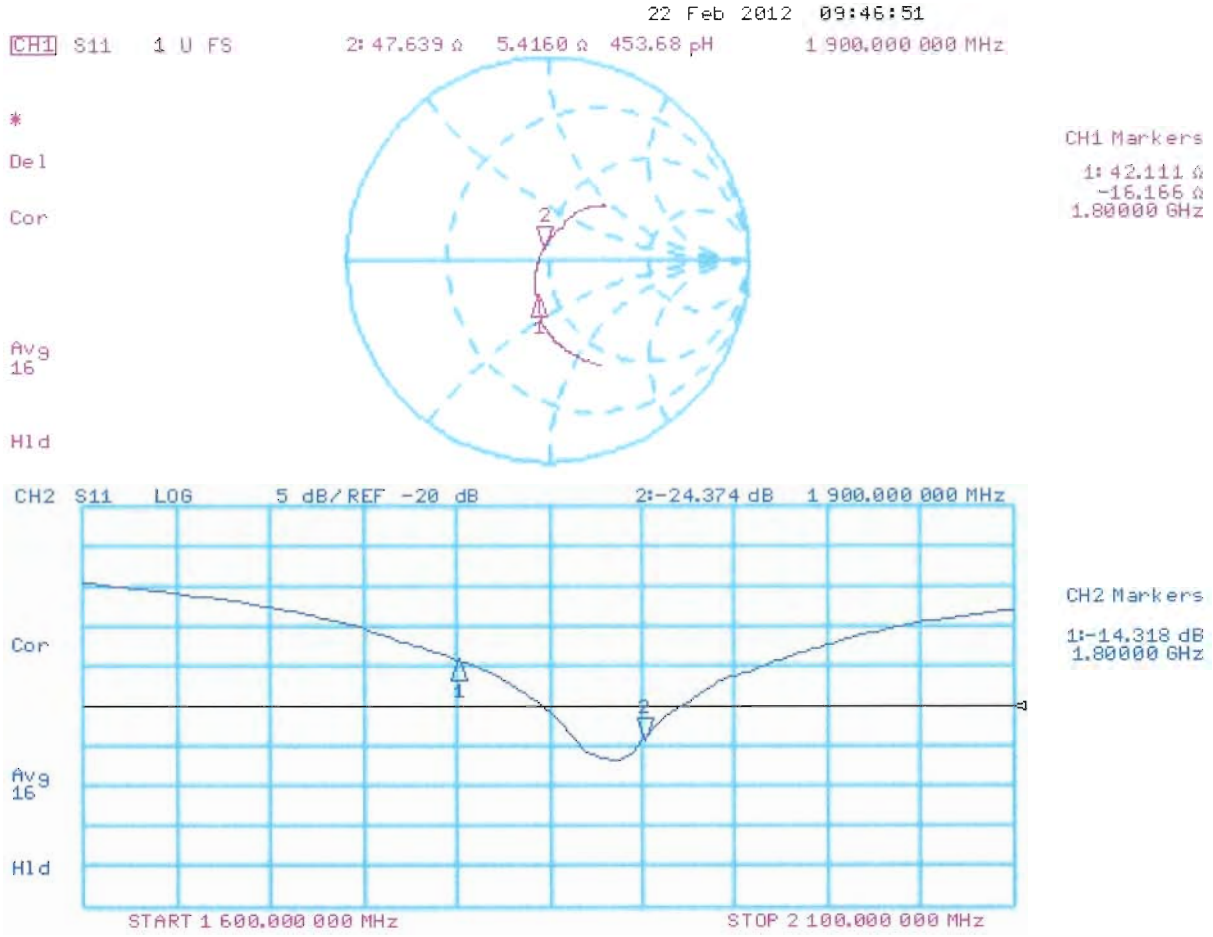
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.541 V/m; Power Drift = -0.0095 dB
Peak SAR (extrapolated) = 17.4260
SAR(1 g) = 9.87 mW/g; SAR(10 g) = 5.17 mW/g
Maximum value of SAR (measured) = 12.485 mW/g



0 dB = 12.480mW/g = 21.92 dB mW/g

Impedance Measurement Plot for Body TSL



Dipole D1900V2 - SN5d030 Antenna Parameters measured: 2012-04-02.

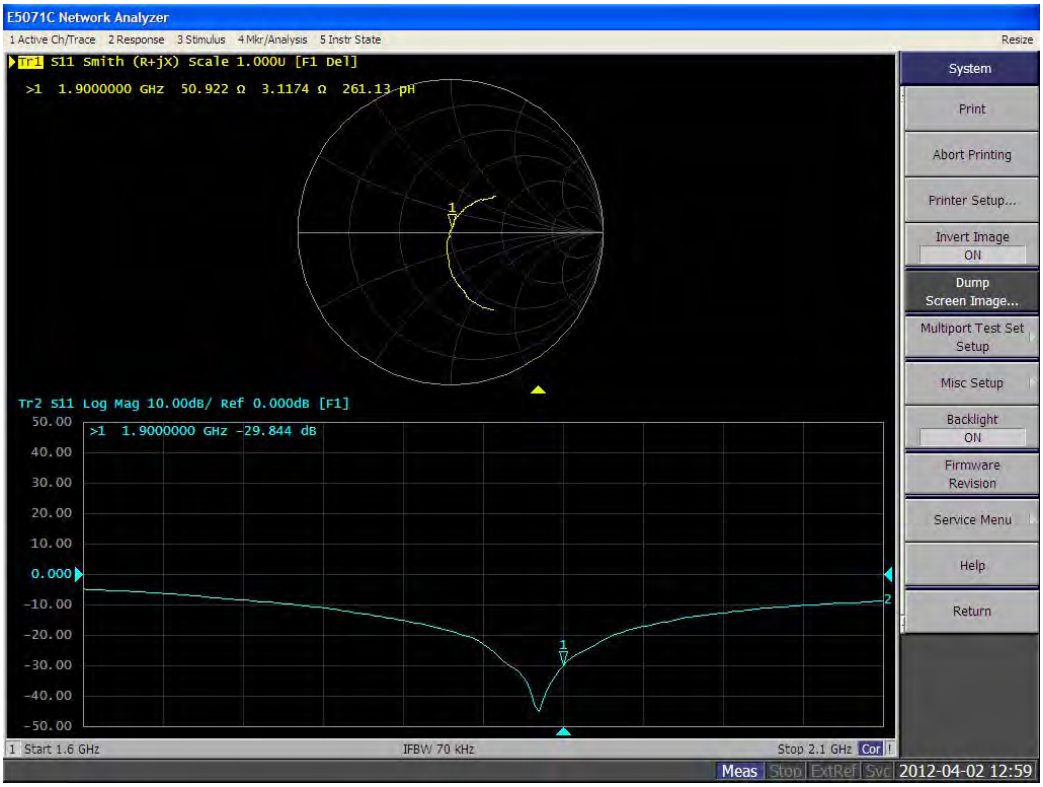
Antenna Parameters with Head TSL

	Calibration certificate	Annual measurement
Impedance, transformed to feed point	52.0 Ω 5.3 jΩ	50.9 Ω 3.1 jΩ
Return loss	-25.2 dB	-29.8 dB

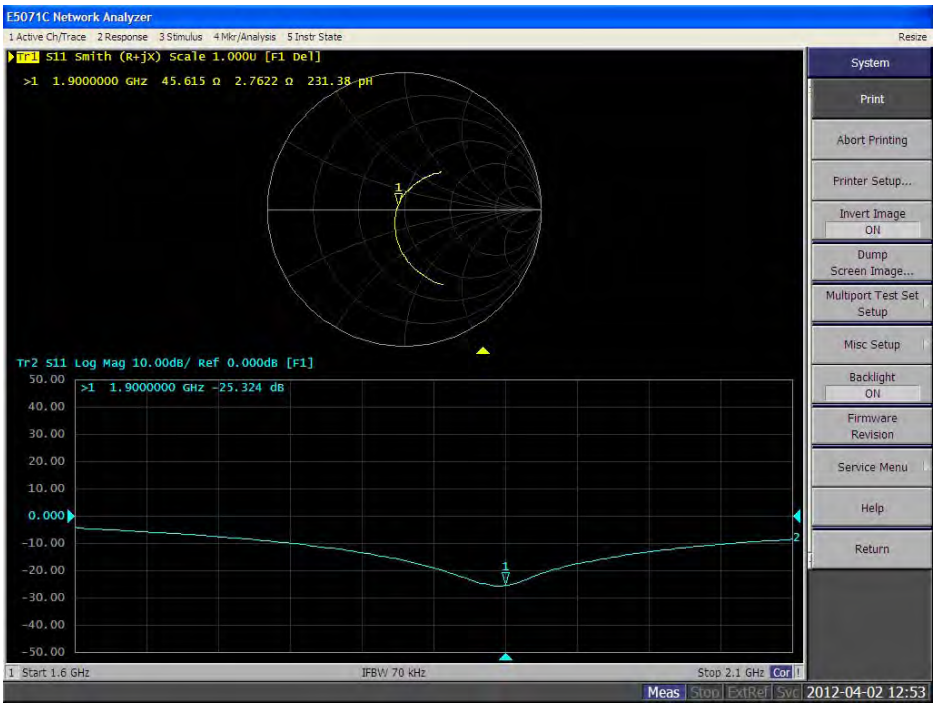
Antenna Parameters with Body TSL

	Calibration certificate	Annual measurement
Impedance, transformed to feed point	47.6 Ω 5.4 jΩ	45.6 Ω 2.8 jΩ
Return loss	-24.4 dB	-25.3 dB

Impedance Measurement Plot for Head TSL 1900



Impedance Measurement Plot for Body TSL 1900



APPENDIX F: CONDUCTED POWER MEASUREMENTS FOR SUPPORTED GSM/GPRS/EGPRS TRANSMISSION MODES

F.1 Power Tuning Targets

Tuning targets GSM850			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	32.5	32.5	32.5
GPRS 2-slot	31.5	31.5	31.5
GPRS 3-slot	29.7	29.7	29.7
GPRS 4-slot	28.5	28.5	28.5
EGRPS 1-slot	26.5	26.5	26.5
EGPRS 2-slot	26.5	26.5	26.5
EGRPS 3-slot	26.2	26.2	26.2
EGPRS 4-slot	25.0	25.0	25.0

Tuning targets GSM850 in WR mode			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	32.5	32.5	32.5
GPRS 2-slot	30.0	30.0	30.0
GPRS 3-slot	28.2	28.2	28.2
GPRS 4-slot	27.0	27.0	27.0
EGRPS 1-slot	26.5	26.5	26.5
EGPRS 2-slot	26.5	26.5	26.5
EGRPS 3-slot	26.2	26.2	26.2
EGPRS 4-slot	25.0	25.0	25.0

Tuning targets GSM1900			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	30.0	30.0	30.0
GPRS 2-slot	29.5	29.5	29.5
GPRS 3-slot	27.7	27.7	27.7
GPRS 4-slot	26.5	26.5	26.5
EGRPS 1-slot	25.5	25.5	25.5
EGPRS 2-slot	25.5	25.5	25.5
EGRPS 3-slot	25.5	25.5	25.5
EGPRS 4-slot	25.0	25.0	25.0

Tuning targets GSM1900 in WR mode			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	27.5	27.5	27.5
GPRS 2-slot	24.5	24.5	24.5
GPRS 3-slot	22.7	22.7	22.7
GPRS 4-slot	21.5	21.5	21.5
EGRPS 1-slot	25.5	25.5	25.5
EGPRS 2-slot	24.5	24.5	24.5
EGRPS 3-slot	22.7	22.7	22.7
EGPRS 4-slot	21.5	21.5	21.5

F.2 Conducted Power from the Samples used in the Testing

Type: RM-846; Serial number: 004402/47/199979/1 used for GSM/GPRS/EGPRS850 for SAR Head and Body-worn measurements

Type: RM-846; Serial number: 004402/47/200018/5 used for GSM/GPRS/EGPRS1900 for SAR Head and Body-worn measurements.

GSM850			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	33.28	32.64	33.15
GPRS 2-slot	32.35	32.22	32.06
GPRS 3-slot	30.34	30.21	30.52
GPRS 4-slot	29.63	29.09	29.1
EGRPS 1-slot	27.14	26.99	27.1
EGPRS 2-slot	27.08	26.99	27.05
EGRPS 3-slot	26.7	26.66	26.6
EGPRS 4-slot	25.73	25.52	25.52

GSM1900			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	30.49	30.75	30.76
GPRS 2-slot	29.8	30.07	29.95
GPRS 3-slot	28.18	28.32	28.36
GPRS 4-slot	26.88	27.21	27.06
EGRPS 1-slot	25.91	26.05	25.93
EGPRS 2-slot	25.97	26.18	26.01
EGRPS 3-slot	25.78	25.93	25.83
EGPRS 4-slot	25.31	25.45	25.42

Type: RM-846; Serial number: 004402/47/200007/8 used for GSM/GPRS/EGPRS850 and for GSM/GPRS/EGPRS1900 Wireless Router mode testing.

GSM850 in WR mode			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	32.85	32.47	32.94
GPRS 2-slot	30.2	30.09	30.46
GPRS 3-slot	28.53	28.6	28.77
GPRS 4-slot	27.4	27.43	27.5
EGRPS 1-slot	-	-	-
EGPRS 2-slot	-	-	-
EGRPS 3-slot	-	-	-
EGPRS 4-slot	-	-	-

GSM1900 in WR mode			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	27.68	27.96	27.9
GPRS 2-slot	24.68	24.9	24.6
GPRS 3-slot	23.04	23.24	23.1
GPRS 4-slot	21.54	21.87	21.55
EGRPS 1-slot	25.9	26.09	25.92
EGPRS 2-slot	24.93	25.09	24.94
EGRPS 3-slot	22.8	22.98	22.83
EGPRS 4-slot	21.78	21.94	21.79

APPENDIX G: CONDUCTED POWER MEASUREMENTS FOR SUPPORTED WCDMA TRANSMISSION MODES

G.1 Power Tuning Targets

Tuning targets			
Mode	Low channel	Mid channel	High channel
WCDMA850	24.0	24.0	24.0
WCDMA1900	22.5	22.5	22.5

Tuning targets in WR mode			
Mode	Low channel	Mid channel	High channel
WCDMA850	24.0	24.0	24.0
WCDMA1900	19.0	19.0	19.0

G.2 Conducted Power from the Samples used in the Testing

Type: RM-846; Serial number: 004402/47/199979/1 used for WCDMA850 for SAR Head and Body-worn and Wireless router measurements

Type: RM-846; Serial number: 004402/47/200018/5 used for WCDMA1900 for SAR Head and Body-worn measurements

WCDMA850 (Band 5)			
Mode	Low channel	Mid channel	High channel
WCDMA	24.32	24.35	24.48

WCDMA1900 (Band 2)			
Mode	Low channel	Mid channel	High channel
WCDMA	23.02	22.97	22.75

Type: RM-846; Serial number: 004402/47/200007/8 used for WCDMA1900 Wireless Router mode testing.

WCDMA1900 (Band 2) in WR mode			
Mode	Low channel	Mid channel	High channel
WCDMA	19.65	19.54	19.32

APPENDIX C: SAR EVALUATION OF HW7000 (SAR REPORT FCC_RM-846_14X)

TCC
Nokia

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

SAR Compliance Test Report

Test report no.:	FCC_RM-846_14	**Date of report:**	2013-04-05
Template version:	19.3	**Number of pages:**	49
Testing laboratory:	TCC Nokia Salo Laboratory P.O.Box 86 Joensuunkatu 7H / Kiila 1B FIN-24101 SALO, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 45220	**Client:**	Nokia Corporation P.O. Box 68 Sinitaival 5 FIN-33721 TAMPERE, FINLAND Tel. +358 (0) 7180 08000 Fax. +358 (0) 7180 46880
Responsible test engineer:	Juha-Matti Varjonen	**Product contact person:**	Janne Sarna
Measurements made by:	Teuvo Miettinen, Nina Koskinen, Janne Hirsimäki, Anni Manninen, Juha-Matti Varjonen		
Tested device:	RM-846		
FCC ID:	PDNRM-846X	**IC:**	661R-RM846
Supplement reports:			
Testing has been carried out in accordance with:	**47CFR §2.1093** Radiofrequency Radiation Exposure Evaluation: Portable Devices **FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)** Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields **RSS-102** Evaluation Procedure for Mobile and Portable Radio Transmitters with Respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields **IEEE 1528 - 2003** IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Technique		
Documentation:	The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test results:	**The tested device complies with the requirements in respect of all parameters subject to the test.** The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		

Date and signatures:

For the contents:

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2013-03-22 to 2013-03-28
SN, HW and SW numbers of tested device	SN: 004402/47/107954/5, HW: 7000, SW: 1030.6407.1308.0000, DUT: 17307 SN: 004402/47/107848/9, HW: 7000, SW: 1030.6407.1308.0000, DUT: 17303 SN: 004402/47/107849/7, HW: 7000, SW: 1030.6407.1308.0000, DUT: 17302
Batteries used in testing	BL-4J, DUT: 17055, 17054, 17053, 17052, 17051
Headsets used in testing	WH-108, DUT: 16804, 16805, 16806, 16808
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-846_03 / FCC ID: PDNRM-846 / IC: 661R-RM846:

Head, Body-worn and Wireless Router SAR data for WLAN2450 and Head and Body-worn SAR data for WLAN5000 have been taken from this report; 2 sample were used in the RM-846 SAR testing to test WLAN2450 and WLAN5000. FCC Grant for RM-846 / FCC ID: PDNRM-846 / IC: 661R-RM846 was issued on December 7th 2012.

1.2 Maximum Results

The maximum measured SAR values for Head configuration and 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 standards 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)	Reported* SAR value (1g avg)	SAR limit (1g avg)	Result	Plot #
4-slot GPRS850	251 / 848.8	29.05 dBm	Right, Cheek	1.01 W/kg	**1.13 W/kg**	1.6 W/kg	PASSED	1
WCDMA850	4132 / 826.4	24.51 dBm	Right, Cheek	0.692 W/kg	**0.78 W/kg**	1.6 W/kg	PASSED	2
4-slot GPRS1900	512 / 1850.2	26.88 dBm	Right, Cheek	0.949 W/kg	**1.06 W/kg**	1.6 W/kg	PASSED	3
WCDMA1900	9262 / 1852.4	22.93 dBm	Right, Cheek	0.987 W/kg	**1.11 W/kg**	1.6 W/kg	PASSED	4
WLAN2450**	2 / 2415.0	18.11 dBm	Right, Cheek	0.229 W/kg	**0.28 W/kg**	1.6 W/kg	PASSED	-
WLAN5000**	157 / 5785.0	15.46 dBm	Right, Tilt	0.206 W/kg	**0.29 W/kg**	1.6 W/kg	PASSED	-
4-slot GPRS850 + WLAN2450	-	-	Right, Cheek	1.01 W/kg	**1.13 W/kg**	1.6 W/kg	PASSED	1
WCDMA850 + WLAN2450	-	-	Right, Cheek	0.702 W/kg	**0.79 W/kg**	1.6 W/kg	PASSED	6
4-slot GPRS1900 + WLAN2450	-	-	Right, Cheek	0.956 W/kg	**1.07 W/kg**	1.6 W/kg	PASSED	7
WCDMA1900 + WLAN2450	-	-	Right, Cheek	0.988 W/kg	**1.11 W/kg**	1.6 W/kg	PASSED	8
4-slot GPRS850 + WLAN5000	-	-	Right, Cheek	1.01 W/kg	**1.13 W/kg**	1.6 W/kg	PASSED	1
WCDMA850 + WLAN5000	-	-	Right, Cheek	0.692 W/kg	**0.78 W/kg**	1.6 W/kg	PASSED	2
4-slot GPRS1900 + WLAN5000	-	-	Right, Cheek	0.949 W/kg	**1.06 W/kg**	1.6 W/kg	PASSED	3
WCDMA1900 + WLAN5000	-	-	Right, Cheek	0.987 W/kg	**1.11 W/kg**	1.6 W/kg	PASSED	4

1.2.2 Body Worn Configuration

Mode	Ch / *f*(MHz)	Conducted power	Separation distance	Measured SAR value (1g avg)	Reported* SAR value (1g avg)	SAR limit (1g avg)	Result	Plot#
4-slot GPRS850	251 / 848.8	29.05 dBm	1.5 cm	1.32 W/kg	**1.48 W/kg**	1.6 W/kg	PASSED	**13**
WCDMA850	4175 / 835.0	24.40 dBm	1.5 cm	0.846 W/kg	**0.95 W/kg**	1.6 W/kg	PASSED	**14**
4-slot GPRS1900	810 / 1909.8	27.06 dBm	1.5 cm	1.02 W/kg	**1.14 W/kg**	1.6 W/kg	PASSED	**15**
WCDMA1900	9538 / 1907.6	22.89 dBm	1.5 cm	0.780 W/kg	**0.88 W/kg**	1.6 W/kg	PASSED	**16**
WLAN2450**	2 / 2415.0	18.11 dBm	1.5 cm	0.041 W/kg	**0.05 W/kg**	1.6 W/kg	PASSED	**-**
WLAN5000**	132 / 5660.0	15.48 dBm	1.5 cm	0.233W/kg	**0.33 W/kg**	1.6 W/kg	PASSED	**-**
4-slot GPRS850 + WLAN2450	-	-	1.5 cm	1.32 W/kg	**1.48 W/kg**	1.6 W/kg	PASSED	**13**
WCDMA850 + WLAN2450	-	-	1.5 cm	0.853 W/kg	**0.96 W/kg**	1.6 W/kg	PASSED	**18**
4-slot GPRS1900 + WLAN2450	-	-	1.5 cm	1.02 W/kg	**1.14 W/kg**	1.6 W/kg	PASSED	**15**
WCDMA1900 + WLAN2450	-	-	1.5 cm	0.780 W/kg	**0.88 W/kg**	1.6 W/kg	PASSED	**16**
4-slot GPRS850 + WLAN5000	-	-	1.5 cm	1.32 W/kg	**1.48 W/kg**	1.6 W/kg	PASSED	**13**
WCDMA850 + WLAN5000	-	-	1.5 cm	0.846 W/kg	**0.95 W/kg**	1.6 W/kg	PASSED	**14**
4-slot GPRS1900 + WLAN5000	-	-	1.5 cm	1.02 W/kg	**1.14 W/kg**	1.6 W/kg	PASSED	**15**
WCDMA1900 + WLAN5000	-	-	1.5 cm	0.780 W/kg	**0.88 W/kg**	1.6 W/kg	PASSED	**16**

1.2.3 Wireless Router Configuration

Mode	Ch / *f*(MHz)	Conducted power	Separation distance	Measured SAR value (1g avg)	Reported* SAR value (1g avg)	SAR limit (1g avg)	Result	Plot#
4-slot GPRS850	251 / 848.8	27.36 dBm	10.0 mm	1.21 W/kg	**1.36 W/kg**	1.6 W/kg	PASSED	**25**
WCDMA850	4233 / 846.6	24.36 dBm	10.0 mm	1.17 W/kg	**1.31 W/kg**	1.6 W/kg	PASSED	**26**
4-slot GPRS1900	810 / 1909.8	21.94 dBm	10.0 mm	1.09 W/kg	**1.22 W/kg**	1.6 W/kg	PASSED	**27**
WCDMA1900	9538 / 1907.6	19.40 dBm	10.0 mm	1.14 W/kg	**1.28 W/kg**	1.6 W/kg	PASSED	**28**
WLAN2450**	2 / 2415.0	18.11 dBm	10.0 mm	0.110 W/kg	**0.14 W/kg**	1.6 W/kg	PASSED	**-**
4-slot GPRS850 + WLAN2450	-	-	10.0 mm	1.22 W/kg	**1.37 W/kg**	1.6 W/kg	PASSED	**29**
WCDMA850 + WLAN2450	-	-	10.0 mm	1.18 W/kg	**1.33 W/kg**	1.6 W/kg	PASSED	**30**
4-slot GPRS1900 + WLAN2450	-	-	10.0 mm	1.10 W/kg	**1.24 W/kg**	1.6 W/kg	PASSED	**31**
WCDMA1900 + WLAN2450	-	-	10.0 mm	1.16 W/kg	**1.30 W/kg**	1.6 W/kg	PASSED	**32**

* Reported SAR values are scaled to, or measured at, upper limit of power tuning tolerance. In addition, SAR values are scaled up by 12% to cover measurement drift. As a consequence of this upward drift correction, the contribution of measurement drift to the overall measurement uncertainty (Section 6) is reduced to zero.
**SAR data taken from FCC_RM-846_03.

1.2.4 Summary SAR data

	FCC-defined SAR values for the Grants of Equipment Authorization		
	PCE	DTS	NII
Maximum Head SAR values	1.13 W/kg	0.29 W/kg	0.29 W/Kg
{Max + Max} Simultaneous Head SAR value	1.41 W/kg		
Maximum Body SAR values	1.48 W/kg	0.29 W/kg	0.33 W/Kg
{Max + Max} Simultaneous Body SAR value	1.53 W/kg		
Maximum Product Specific (Wireless Router) SAR values	1.36 W/kg	0.14 W/kg	N/A
{Max + Max} Simultaneous Product Specific SAR value	1.50 W/kg		
Maximum Simultaneous SAR value **Body SAR: 4-slot GPRS850+WLAN2450**	1.53 W/kg		

PCE contains the highest results between all cellular modes (cellular and PCS bands)
DTS contains the highest results between WLAN 2.4GHz + RLAN 5725-5850MHz
NII contains the highest results between RLAN 5150-5250, 5250-5350 and 5470-5725

1.2.5 Maximum Drift

Maximum drift covered by 12% scaling up of the SAR values	Maximum drift during measurements
0.5dB	0.46dB

1.2.6 Measurement Uncertainty

Expanded Uncertainty (k=2) 95%	± 26.4%

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)	Power Tuning Target (dBm)				Upper Limit of Power Tuning Tolerance (dBm)			
					1-slot	2-slot	3-slot	4-slot	1-slot	2-slot	3-slot	4-slot
GSM / GPRS	850	GMSK	1/8 to 4/8	824 – 849	32.50	31.50	29.70	28.50	32.85	31.85	30.05	28.85
	1900			1850 – 1910	30.00	29.50	27.70	26.50	30.35	29.85	28.05	26.85
EGPRS	850	GMSK	1/8 to 4/8	824 – 849	26.50	26.50	26.20	25.00	26.85	26.85	26.55	25.35
	1900			1850 – 1910	25.50	25.50	25.50	25.00	25.85	25.85	25.85	25.35
WCDMA	850 (Band V)		1	826 – 847	24.00				24.35			
	1900 (Band II)			1852 – 1908	22.50				22.85			
HSUPA**	850 (Band V)		1	832 – 838	-							
	1900 (Band II)			1852 – 1908								
BT	2450	GFSK	1	2402 – 2480	8.00				9.50			
					Ch 1	Ch 2 - 11			Ch 1	Ch 2 - 11		
WLAN b-mode	2450	DSSS	1	2412 – 2462	15.00	17.00			16.50	18.50		
WLAN g-mode	2450	OFDM	1	2412 – 2462	15.00	16.00			16.50	17.50		
WLAN n-mode 20Mhz	2450	OFDM	1	2412 – 2462	14.00	14.00			15.50	15.50		
					Ch 40-165				Ch 40-165			
WLAN a-mode 20MHz	5000	OFDM	1	5150 – 5825	15				16.50			
WLAN n-mode 20MHz	5000	OFDM	1	5150 – 5825	13				14.50			
WLAN n-mode 40MHz	5000	OFDM	1	5150 – 5825	12				13.50			

**HSUPA powers described in supplement report FCC_RM-846_03.

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 uses a single antenna for transmission of all the cellular and PCS bands; a separate single antenna is used for transmission of WLAN and BT. Simultaneous transmission of any singular cellular or PCS band is possible with either WLAN or BT in Head and Body-worn use.

Simultaneous transmission capabilities in Head and Body-worn use		
	WLAN2450	WLAN5000
GSM/GPRS/EGPRS850	✓	✓
WCDMA850	✓	✓
GSM/GPRS/EGPRS1900	✓	✓
WCDMA1900	✓	✓

This device has Wireless Router “Hotspot” mode capability. Simultaneous transmission of any singular cellular and PCS band is possible with WLAN2450 or BT in Wireless Router mode. Wireless Router mode capability is not available with WLAN5000.

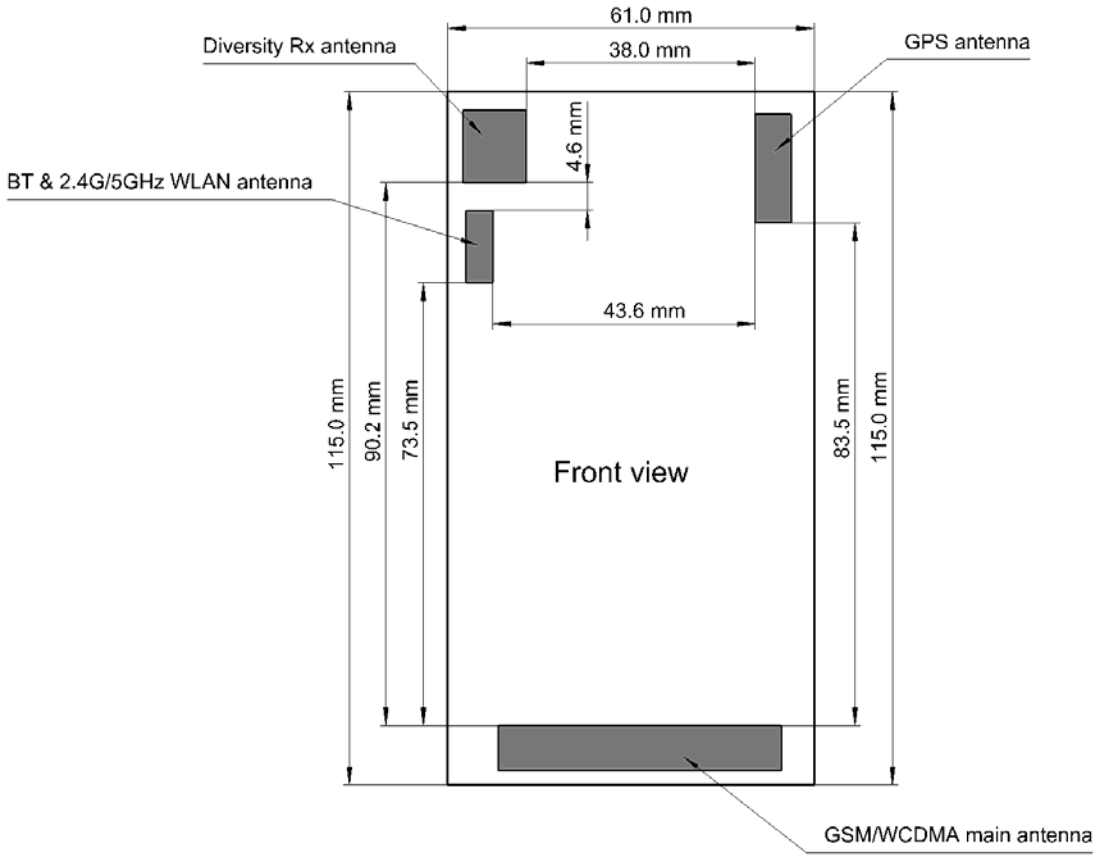
Simultaneous transmission capabilities in Wireless Router use		
	WLAN2450	WLAN5000
GSM/GPRS/EGPRS850	✓	x
WCDMA850	✓	x
GSM/GPRS/EGPRS1900	✓	x
WCDMA1900	✓	x

The following table details the power reductions active in Wireless Router mode:

Band	Power reduction in WR mode	Target tuning power in WR mode	
GPRS/EGPRS850	0 dB 1.5 dB 1.5 dB 1.5 dB 0 dB 0 dB 0 dB 0 dB	1-slot GPRS: 32.5 dBm 2-slot GPRS: 30.0 dBm 3-slot GPRS: 28.2 dBm 4-slot GPRS: 27.0 dBm 1-slot EGPRS: 26.5 dBm 2-slot EGPRS: 26.5 dBm 3-slot EGPRS: 26.2 dBm 4-slot EGPRS: 25.0 dBm	
WCDMA850	0 dB	24.0 dBm	
GPRS/EGPRS1900	2.5 dB 5.0 dB 5.0 dB 5.0 dB 0 dB 1.0 dB 2.8 dB 3.5 dB	1-slot GPRS: 27.5 dBm 2-slot GPRS: 24.5 dBm 3-slot GPRS: 22.7 dBm 4-slot GPRS: 21.5 dBm 1-slot EGPRS: 25.5 dBm 2-slot EGPRS: 24.5 dBm 3-slot EGPRS: 22.7 dBm 4-slot EGPRS: 21.5 dBm	
WCDMA1900	3.5 dB	19.0 dBm	
WLAN2450 b-mode (DSSS 1 Mbps)	0 dB	Ch 1: 15 dBm	Ch 2 - 11: 16 dBm
WLAN2450 g-mode (OFDM 6 Mbps)	0 dB	Ch 1: 15 dBm	Ch 2 - 11: 16 dBm
WLAN2450 n-mode (MCS 0 – OFDM 6.5 Mbps)	0 dB	Ch 1: 14 dBm	Ch 2 - 11: 14 dBm

2.1 Description of the Antenna

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



3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	20.0 – 23.2
Ambient humidity (RH %):	28 - 38

3.2 Test Signal, Frequencies and Output Power

The device was put into operation by using a call tester. Communication between the device and the call tester was established by air link.

A CMU200 call tester was used for all the GSM/GPRS/EGPRS and WCDMA bands; in the case of GSM/GPRS/EGPRS the MS signal was always set to maximum power, whereas for WCDMA the UE uplink signal was configured to 12.2kbps RMC with all TPC bit set to 1.

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

All WCDMA testing has been carried out in accordance with FCC KDB 941225: SAR Measurement Procedures for 3G Devices.

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

The conducted output power of the device was measured by a separate test laboratory on the same units as used for SAR testing. The results are given in Appendices F-G of this report.

The testing reported in this document has been minimised based on the earlier report FCC_RM-846_03. WLAN2450 and WLAN5000 SAR results presented are taken from the same earlier report FCC_RM-846_03.

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	793	2012-08	2013-08
DAE4	538	2012-08	2013-08
DAE4	728	2012-08	2013-08
E-field Probe ES3DV3	3194	2012-08	2013-08
E-field Probe ES3DV3	3131	2012-08	2013-08
E-field Probe EX3DV4	3892	2012-11	2013-11
Dipole Validation Kit, D835V2	462	2011-09	2013-09
Dipole Validation Kit, D1900V2	5d030	2012-02	2014-02
DASY4 software	Version 4.7	-	-
DASY5 software	Version 52.8	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration date	Calibration expiry
Signal Generator	E4438C	MY42080610	2012-08	2013-08
Signal Generator	SML03	101264	2012-08	2013-08
Signal Generator	E4436B	US39260114	2012-08	2013-08
Amplifier	5S1G4M3	302338	-	-
Amplifier	ZHL-42-SMA	NO72095-5	-	-
Amplifier	5S1G4	25583	-	-
Power Meter	NRVS	838624/032	2012-08	2013-08
Power Meter	NRVD	840023/028	2012-08	2013-08
Power Meter	NRVZ	849305/029	2012-08	2013-08
Power Sensor	NRV-Z32	100067	2012-08	2013-08
Power Sensor	NRV-Z32	849745/018	2012-08	2013-08
Power Sensor	NRV-Z32	825600/002	2012-08	2013-08
Call Tester	CMU 200	103293	-	-
Call Tester	CMU 200	104983	-	-
Call Tester	CMU 200	103294	-	-
Call Tester	MT8820C	6200883095	-	-
Network Analyzer	ENA E5071C	MY46213166	2012-08	2013-08
Dielectric Probe Kit	DAK-3.5	1042	-	-

4.1.1 Isotropic E-field Probe Type ES3DV3

Construction	Symmetrical design with triangular core Interleaved sensors Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., butyl diglycol)
Calibration	Calibration certificate in Appendix D
Frequency	10 MHz to 4 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 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 D
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 Head SAR 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.

The phantom used for all Body SAR tests i.e. for both system checks and device testing, was a “Triple Flat Phantom” manufactured by SPEAG; this phantom conform to the requirements of OET Bulletin 65, Supplement C.

System checking for Head SAR testing was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. System checking for Body SAR testing was performed using the Triple Flat Phantom.

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. The depth of the tissue simulant was at least 15.0 cm for all system check and device tests, measured from the flat reference point of the Triple Flat Phantom.

4.3.1 Tissue Simulant Recipes

The following recipes were used for Head and Body tissue simulants:

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

4.4 System validation and System checking

4.4.1 System validation status

Probe Calibration Point f / MHz	Test System	DASY SW	Dipole Type / SN	Probe Type / SN	DAE unit Type / SN	Validation done	
						Head tissue simulant	Body tissue simulant
835	TCC Salo / SAR-3	V4.7	D835V2 / 462	EX3DV4 / 3892	DAE4 / 793	2013-01	2013-01
1900	TCC Salo / SAR-1	V4.7	D1900V2 / 5d030	ES3DV3 / 3194	DAE4 / 538	2012-11	2012-11
1900	TCC Salo / SAR-4	V52.8	D1900V2 / 5d030	ES3DV4 / 3131	DAE4 / 728	-	2013-03

4.4.2 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

Dipole frequency [MHz]	Description	SAR 1g [W/kg]	Dielectric Parameters		SAR 1g Deviation	Dielectric Parameters Deviation		Temp [°C]	Plot #
			ε_r	1g	dSAR [%]	$d\varepsilon_r$ [%]	$d\sigma$ [%]		
	Tolerances				±10 %	±5 %	±5 %		
835	IEEE1528 / IEC62209		41.5	0.90					
	Reference result SN:462	2.33	41.1	0.89	TCC Salo/SAR-3 EX3DV4 SN:3892 Head 835MHz				
	2013-03-22	2.28	40.5	0.90	-2.15	-1.46	1.12	21.0	1
	Tolerances				±10 %	±5 %	±5 %		
1900	IEEE1528 / IEC62209		40.0	1.40					
	Reference result SN:5d030	9.79	40.4	1.40	TCC Salo/SAR-1 ES3DV3 SN:3194 Head 1900MHz				
	2013-03-25	10.3	38.7	1.38	5.21	-4.21	-1.43	21.0	2

System checking, body tissue simulant

Dipole frequency [MHz]	Description	SAR 1g [W/kg]	Dielectric Parameters		SAR 1g Deviation	Dielectric Parameters Deviation		Temp [°C]	Plot #
			ε_r	1g	dSAR [%]	$d\varepsilon_r$ [%]	$d\sigma$ [%]		
	Tolerances				±10 %	±5 %	±5 %		
835	IEEE1528 / IEC62209		55.2	0.97					
	Reference result SN:462	2.45	53.5	1.00	TCC Salo/SAR-3 EX3DV4 SN:3892 Body 835MHz				
	2013-03-26	2.30	53.2	0.98	-6.12	-0.56	-2.00	21.0	3
	2013-03-28	2.31	53.6	0.98	-5.71	0.19	-2.00	21.0	-
	Tolerances				±10 %	±5 %	±5 %		
1900	IEEE1528 / IEC62209		53.3	1.52					
	Reference result SN:5d030	9.87	53.0	1.56	TCC Salo/SAR-1 ES3DV3 SN:3194 Body 1900MHz				
	2013-03-27	9.98	51.6	1.52	1.11	-2.64	-2.56	21.0	4
	Tolerances				±10 %	±5 %	±5 %		
1900	IEEE1528 / IEC62209		53.3	1.52					
	Reference result SN:5d030	9.87	53.0	1.56	TCC Salo/SAR-4 ES3DV3 SN:3131 Body 1900MHz				
	2013-03-26	9.84	51.7	1.51	-0.30	-2.45	-3.21	21.0	5

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

4.4.3 Tissue Simulants used in the Measurements

Head tissue simulant measurements

f [MHz]	Description	Dielectric Parameters εr	Dielectric Parameters σ [S/m]	Dielectric Parameters Deviation from Standard target dεr [%]	Dielectric Parameters Deviation from Standard target dσ [%]	Temp [°C]
	Tolerances			±5 %	±5 %	
835	Recommended value	41.5	0.90			
	2013-03-22	40.5	0.90	-2.41	0.00	21.0
	Tolerances			±5 %	±5 %	
836	Recommended value	41.5	0.90			
	2013-03-22	40.5	0.90	-2.41	0.00	21.0
	Tolerances			±5 %	±5 %	
1880	Recommended value	40.0	1.40			
	2013-03-25	38.8	1.36	-3.00	-2.86	21.0

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters εr	Dielectric Parameters σ [S/m]	Dielectric Parameters Deviation from Standard target dεr [%]	Dielectric Parameters Deviation from Standard target dσ [%]	Temp [°C]
	Tolerances			±5 %	±5 %	
835	Recommended value	55.2	0.97			
	2013-03-26	53.2	0.97	-3.62	0.00	21.0
	2013-03-28	53.6	0.97	-2.90	0.00	21.0
	Tolerances			±5 %	±5 %	
836	Recommended value	55.2	0.97			
	2013-03-26	53.2	0.97	-3.62	0.00	21.0
	2013-03-28	53.6	0.98	-2.90	1.03	21.0
	Tolerances			±5 %	±5 %	
1880	Recommended value	53.3	1.52			
	2013-03-26	51.8	1.49	-2.81	-1.97	21.0
	2013-03-27	51.6	1.49	-3.19	-1.97	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 positions used in the measurements were according to IEEE 1528 - 2003 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

5.2.2 Body Worn Configuration

The device was placed in the SPEAG holder using the Nokia spacer and placed below the flat section of the phantom. The distance between the device and the phantom was kept at the separation distance indicated in Section 1.2.2 using a separate flat spacer that was removed before the start of the measurements.

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

5.2.3 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	±6.55	N	1	1	±6.55	∞
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			**±13.2**	116
Coverage Factor for 95%			**k=2**				
Expanded Uncertainty						**±26.4**	

7. RESULTS

7.1 The measured Head SAR values for the test device

850MHz Band Head SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 128	Ch 190	Ch 251	Ch 128	Ch 190	Ch 251	
			824.2 MHz	836.6 MHz	848.8 MHz	824.2 MHz	836.6 MHz	848.8 MHz	
4-slot GPRS	Tuning Target + Tolerance [dBm]		28.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		29.31	29.30	29.05	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		26.30	26.29	26.04	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.598	0.757	1.01	0.671	0.849	1.13	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek, Repeated	Estimated SAR	-	-	-	-	-	-	1
		Full SAR	-	-	**1.01**	-	-	**1.13**	

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 4132	Ch 4175	Ch 4233	Ch 4132	Ch 4175	Ch 4233	
			826.4 MHz	835.0 MHz	846.6 MHz	826.4 MHz	835.0 MHz	846.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		24.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		24.51	24.40	24.36	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.51	24.40	24.36	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	2
		Full SAR	**0.692**	0.682	0.683	**0.776**	0.765	0.766	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	

1900MHz Band Head SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	
4-slot GPRS	Tuning Target + Tolerance [dBm]		26.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		27.26	27.14	27.06	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		23.87	24.20	24.05	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.943	0.839	0.709	1.06	0.941	0.796	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek, Repeated	Estimated SAR	-	-	-	-	-	-	3
		Full SAR	**0.949**	-	-	**1.06**	-	-	

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz	Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		22.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		22.93	22.90	22.89	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		22.93	22.90	22.89	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	4
		Full SAR	**0.987**	0.755	0.608	**1.11**	0.847	0.682	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek, Repeated	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.978			1.10	-	-	

2450MHz Head SAR results**

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 2 2415.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz	Ch 2 2415.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz	
WLAN b-mode DSSS 1 Mbps	Tuning Target + Tolerance [dBm]		17.50			Scaling factor*			
	Conducted Slot Average Power [dBm]		17.01	17.29	17.41	0.99	0.71	0.59	dB
	Time-averaged power [dBm]		17.01	17.29	17.41	1.26	1.18	1.15	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.065	-	-	0.077	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.072	-	-	0.085	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.162	0.16	0.142	0.203	0.188	0.163	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.078	-	-	0.092	-	
WLAN b-mode DSSS 5.5 Mbps	Tuning Target + Tolerance [dBm]		18.50			Scaling factor*			
	Conducted Slot Average Power [dBm]		18.11	18.51	18.44	0.89	0.50	0.56	dB
	Time-averaged power [dBm]		18.11	18.51	18.44	1.23	1.12	1.14	Lin
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	**0.229**	0.215	0.193	**0.281**	0.241	0.220	

5000MHz Head SAR results
5150–5250 MHz and 5250–5350 MHz**

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]				Reported* 1g SAR [W/kg]				Plot #
			Ch 40	Ch 48	Ch 56	Ch 60	Ch 40	Ch 48	Ch 56	Ch 60	
			5200.0 MHz	5240.0 MHz	5280.0 MHz	5300.0 MHz	5200.0 MHz	5240.0 MHz	5280.0 MHz	5300.0 MHz	
WLAN a-mode OFDM 6 Mbps	Tuning Target + Tolerance [dBm]		16.50				Scaling factor*				
	Conducted Slot Average Power [dBm]		15.07	15.66	15.51	15.75	1.93	1.34	1.49	1.25	dB
	Time-averaged power [dBm]		15.07	15.66	15.51	15.75	1.56	1.36	1.41	1.33	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	0.049	0.038	0.036	0.049	0.076	0.052	0.051	0.065	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	0.041	-	-	0.041	0.064	-	-	0.055	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	0.108	-	-	0.128	0.168	-	-	0.171	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	0.069	-	-	0.084	0.108	-	-	0.112	

5000MHz Head SAR results
5470–5725 MHz**

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]				Reported* 1g SAR [W/kg]				Plot #
			Ch 108	Ch 116	Ch 124	Ch 132	Ch 108	Ch 116	Ch 124	Ch 132	
			5540.0 MHz	5580.0 MHz	5620.0 MHz	5660.0 MHz	5540.0 MHz	5580.0 MHz	5620.0 MHz	5660.0 MHz	
WLAN a-mode OFDM 6 Mbps	Tuning Target + Tolerance [dBm]		16.50				Scaling factor*				
	Conducted Slot Average Power [dBm]		15.75	16.63	15.71	15.48	1.25	0.50	1.29	1.52	dB
	Time-averaged power [dBm]		15.75	16.63	15.71	15.48	1.33	1.12	1.35	1.42	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	0.067	0.079	0.104	0.108	0.089	0.089	0.140	0.153	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	-	-	-	0.123	-	-	-	0.175	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	-	-	-	0.165	-	-	-	0.234	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-	-	-
		Full SAR	-	-	-	0.202	-	-	-	0.287	

5000MHz Head SAR results
5725–5850 MHz**

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 153 5765.0 MHz	Ch 157 5785.0 MHz	Ch 165 5825.0 MHz	Ch 153 5765.0 MHz	Ch 157 5785.0 MHz	Ch 165 5825.0 MHz	
WLAN a-mode OFDM 6 Mbps	Tuning Target + Tolerance [dBm]		16.50			Scaling factor*			
	Conducted Slot Average Power [dBm]		15.46	15.46	15.61	1.54	1.54	1.39	dB
	Time-averaged power [dBm]		15.46	15.46	15.61	1.43	1.43	1.38	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.104	0.116	0.111	0.148	0.165	0.153	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.131	-	-	0.187	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.179	-	-	0.255	-	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	**0.206**	-	-	**0.294**	-	

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

Test configuration	Max. 1g SAR results					
	WLAN 2450**	WLAN 5000**	4-slot GPRS850	WCDMA 850	4-slot GPRS 1900	WCDMA 1900
Head: Left, Cheek	0.077	0.165	-	-	-	-
Head: Left, Tilt	0.085	0.187	-	-	-	-
Head: Right, Cheek	0.281	0.255	1.13	0.776	1.06	1.11
Head: Right, Tilt	0.092	0.294	-	-	-	-

**SAR data taken from FCC_RM-846_03.

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

Test configuration	Max. 1g SAR results			
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	4-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450
Head: Left, Cheek	-	-	-	-
Head: Left, Tilt	-	-	-	-
Head: Right, Cheek	**1.41**	**1.06**	**1.34**	**1.39**
Head: Right, Tilt	-	-	-	-
Test configuration	**Max. 1g SAR results**			
	4-slot GPRS850 + WLAN5000	**WCDMA850 + WLAN5000**	**4-slot GPRS1900 + WLAN5000**	**WCDMA1900 + WLAN5000**
Head: Left, Cheek	-	-	-	-
Head: Left, Tilt	-	-	-	-
Head: Right, Cheek	**1.39**	**1.03**	**1.32**	**1.37**
Head: Right, Tilt	-	-	-	-

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 or WLAN5000 and the cellular bands point-by-point and c) calculates the combined average SAR values.

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

Test configuration	Max. 1g SAR results			
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	4-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450
Head: Left, Cheek	-	-	-	-
Head: Left, Tilt	-	-	-	-
Head: Right, Cheek	**1.13**	**0.788**	**1.07**	**1.11**
Head: Right, Tilt	-	-	-	-
Test configuration	**Max. 1g SAR results**			
	4-slot GPRS850 + WLAN5000	**WCDMA850 + WLAN5000**	**4-slot GPRS1900 + WLAN5000**	**WCDMA1900 + WLAN5000**
Head: Left, Cheek	-	-	-	-
Head: Left, Tilt	-	-	-	-
Head: Right, Cheek	**1.11**	**0.774**	**1.06**	**1.09**
Head: Right, Tilt	-	-	-	-

Some of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 or WLAN5000 and b) uncertainties associated with the different methods of calculation. In these cases, the maximum SAR values given for the combined Modes in the Summary table in Section 1.2 are those for the individual cellular or WLAN band.

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

Plots of the Measurement scans are given in Appendix B.1.

7.2 The measured Body SAR values for the test device

850MHz Band Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
				Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	
4-slot GPRS	Tuning Target + Tolerance [dBm]			28.85			Scaling factor*			
	Conducted Slot Average Power [dBm]			29.31	29.30	29.05	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			26.30	26.29	26.04	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.769	1.02	1.30	0.863	1.14	1.46	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.738	0.799	0.743	0.828	0.896	0.834	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
	Back facing phantom, Without headset, Repeated		Estimated SAR	-	-	-	-	-	-	13
			Full SAR	-	-	**1.32**	-	-	**1.48**	

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
				Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]			24.35			Scaling factor*			
	Conducted Power [dBm]			24.51	24.40	24.36	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			24.51	24.40	24.36	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.757	0.836	0.823	0.849	0.938	0.923	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
	Back facing phantom, Without headset, Repeated		Estimated SAR	-	-	-	-	-	-	14
			Full SAR	-	**0.846**	-	-	**0.949**	-	

1900MHz Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg] Ch 512 1850.2 MHz	Measured 1g SAR [W/kg] Ch 661 1880.0 MHz	Measured 1g SAR [W/kg] Ch 810 1909.8 MHz	Reported* 1g SAR [W/kg] Ch 512 1850.2 MHz	Reported* 1g SAR [W/kg] Ch 661 1880.0 MHz	Reported* 1g SAR [W/kg] Ch 810 1909.8 MHz	Plot #
4-slot GPRS	Tuning Target + Tolerance [dBm]			26.85			Scaling factor*			
	Conducted Slot Average Power [dBm]			27.26	27.14	27.06	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			24.25	24.13	24.05	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.615	0.666	0.994	0.690	0.747	1.12	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR							
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
	Back facing phantom, Headset WH-108, Repeated		Estimated SAR	-	-	-	-	-	-	15
			Full SAR	-	-	1.02	-	-	1.14	

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg] Ch 9262 1852.4 MHz	Measured 1g SAR [W/kg] Ch 9400 1880.0 MHz	Measured 1g SAR [W/kg] Ch 9538 1907.6 MHz	Reported* 1g SAR [W/kg] Ch 9262 1852.4 MHz	Reported* 1g SAR [W/kg] Ch 9400 1880.0 MHz	Reported* 1g SAR [W/kg] Ch 9538 1907.6 MHz	Plot #
WCDMA	Tuning Target + Tolerance [dBm]			22.85			Scaling factor*			
	Conducted Power [dBm]			22.93	22.90	22.89	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			22.93	22.90	22.89	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	16
			Full SAR	0.613	0.651	0.780	0.688	0.730	0.875	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	-	-	-	-	

2450MHz Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg] Ch 2 2415.0 MHz	Measured 1g SAR [W/kg] Ch 6 2437.0 MHz	Measured 1g SAR [W/kg] Ch 11 2462.0 MHz	Reported* 1g SAR [W/kg] Ch 2 2415.0 MHz	Reported* 1g SAR [W/kg] Ch 6 2437.0 MHz	Reported* 1g SAR [W/kg] Ch 11 2462.0 MHz	Plot #
WLAN b-mode DSSS 1 Mbps	Tuning Target + Tolerance [dBm]			17.50			Scaling factor*			
	Conducted Power [dBm]			17.01	17.29	17.41	0.99	0.71	0.59	dB
	Time-averaged power [dBm]			17.01	17.29	17.41	1.26	1.18	1.15	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.034	0.033	0.028	0.043	0.039	0.032	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.030	-	-	0.035	-	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.023	-	-	0.027	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.021	-	-	0.025	-	
WLAN b-mode DSSS 5.5 Mbps	Tuning Target + Tolerance [dBm]			18.50			Scaling factor*			
	Conducted Power [dBm]			18.11	18.51	18.44	0.89	0.50	0.56	dB
	Time-averaged power [dBm]			18.11	18.51	18.44	1.23	1.12	1.14	Lin
	Back facing phantom Without headset, Worst case		Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.041	**0.042**	0.040	**0.050**	0.047	0.046	

5000MHz Body SAR results
5150–5250 MHz and 5250–5350 MHz**

Mode	Test configurtion		SAR measurement	Measured 1g SAR [W/kg]				Reported* 1g SAR [W/kg]				Plot #
				Ch 40	Ch 48	Ch 56	Ch 60	Ch 40	Ch 48	Ch 56	Ch 60	
				5200.0 MHz	5240.0 MHz	5280.0 MHz	5300.0 MHz	5200.0 MHz	5240.0 MHz	5280.0 MHz	5300.0 MHz	
WLAN a-mode OFDM 6 Mbps	Tuning Target + Tolerance [dBm]			16.50				Scaling factor*				
	Conducted S Power [dBm]			15.07	15.66	15.51	15.75	1.93	1.34	1.49	1.25	dB
	Time-averaged power [dBm]			15.07	15.66	15.51	15.75	1.56	1.36	1.41	1.33	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	0.123	0.129	0.139	0.156	0.192	0.176	0.196	0.208	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	-	0.124	-	0.128	-	0.169	-	0.171	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	-	0.035	-	0.037	-	0.048	-	0.049	
		Headset WH-18	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	-	0.023	-	0.032	-	0.031	-	0.043	

5000MHz Body SAR results
5470–5725 MHz**

Mode	Test configurtion		SAR measurement	Measured 1g SAR [W/kg]				Reported* 1g SAR [W/kg]				Plot #
				Ch 108 5540.0 MHz	Ch 116 5580.0 MHz	Ch 124 5620.0 MHz	Ch 132 5660.0 MHz	Ch 108 5540.0 MHz	Ch 116 5580.0 MHz	Ch 124 5620.0 MHz	Ch 132 5660.0 MHz	
WLAN a-mode OFDM 6 Mbps	Tuning Target + Tolerance [dBm]			16.50				Scaling factor*				
	Conducted S Power [dBm]			15.75	16.63	15.71	15.48	1.25	0.50	1.29	1.52	dB
	Time-averaged power [dBm]			15.75	16.63	15.71	15.48	1.33	1.12	1.35	1.42	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	0.169	0.185	0.221	**0.233**	0.225	0.208	0.297	**0.331**	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	-	-	-	0.214	-	-	-	0.304	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	-	-	-	0.044	-	-	-	0.062	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-	-	-
			Full SAR	-	-	-	0.034	-	-	-	0.048	

5000MHz Body SAR results
5725–5850 MHz**

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
				Ch 153 5765.0 MHz	Ch 157 5785.0 MHz	Ch 165 5825.0 MHz	Ch 153 5765.0 MHz	Ch 157 5785.0 MHz	Ch 165 5825.0 MHz	
WLAN a-mode OFDM 6 Mbps	Tuning Target + Tolerance [dBm]			16.50			Scaling factor*			
	Conducted Power [dBm]			15.46	15.46	15.61	1.54	1.54	1.39	dB
	Time-averaged power [dBm]			15.46	15.46	15.61	1.43	1.43	1.38	Lin
	Back facing phantom	Without headset	Estimated SAR	-						-
			Full SAR	0.202	0.184	0.211	0.288	0.262	0.291	
		Headset WH-108	Estimated SAR							-
			Full SAR			0.196			0.270	
	Display facing phantom	Without headset	Estimated SAR							-
			Full SAR			0.039			0.054	
		Headset WH-108	Estimated SAR							-
			Full SAR			0.042			0.058	

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

Test configuration	Max. 1g SAR results					
	WLAN 2450**	WLAN 5000**	4-slot GPRS850	WCDMA 850	4-slot GPRS 1900	WCDMA 1900
Body: Back facing phantom, Without Headset	0.050	0.331	1.48	0.949	-	0.875
Body: Back facing phantom, Headset WH-108	0.035	0.304	-	-	1.14	-
Body: Display facing phantom, Without Headset	0.027	0.062	0.896	-	-	-
Body: Display facing phantom, Headset WH-108	0.025	0.058	-	-	-	-

**SAR data taken from FCC_RM-846_03.

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

Test configuration	Max. 1g SAR results			
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	4-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450
Body: Back facing phantom, Without Headset	1.53	0.999	-	0.925
Body: Back facing phantom, Headset WH-108	-	-	1.18	-
Body: Display facing phantom, Without Headset	0.92	-	-	-
Body: Display facing phantom, Headset WH-108	-	-	-	-
Test configuration	**Max. 1g SAR results**			
	4-slot GPRS850 + WLAN5000	WCDMA850 + WLAN5000	4-slot GPRS1900 + WLAN5000	WCDMA1900 + WLAN5000
Body: Back facing phantom, Without Headset	1.81	1.28	-	1.21
Body: Back facing phantom, Headset WH-108	-	-	1.44	-
Body: Display facing phantom, Without Headset	0.96	-	-	-
Body: Display facing phantom, Headset WH-108	-	-	-	-

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 or WLAN5000 and the cellular bands point-by-point and c) calculates the combined average SAR values.

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

Test configuration	Max. 1g SAR results			
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	4-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN2450
Body: Back facing phantom, Without Headset	**1.48**	**0.957**	-	**0.860**
Body: Back facing phantom, Headset WH-108	-	-	**1.11**	-
Body: Display facing phantom, Without Headset	-	-	-	-
Body: Display facing phantom, Headset WH-108	-	-	-	-
Test configuration	**Max. 1g SAR results**			
	4-slot GPRS850 + WLAN5000	**WCDMA850 + WLAN5000**	**4-slot GPRS1900 + WLAN5000**	**WCDMA1900 + WLAN5000**
Body: Back facing phantom, Without Headset	**1.46**	**0.943**	-	**0.837**
Body: Back facing phantom, Headset WH-108	-	-	**1.11**	-
Body: Display facing phantom, Without Headset	-	-	-	-
Body: Display facing phantom, Headset WH-108	-	-	-	-

Some of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 or WLAN5000 and b) uncertainties associated with the different methods of calculation. In these cases, the maximum SAR values given for the combined Modes in the Summary table in Section 1.2 are those for the individual cellular or WLAN band.

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

Plots of the Measurement scans are given in Appendix B.2.

7.2.1 Simultaneous Transmission SAR Test Exclusion Considerations for Body Measurements

Simultaneous transmission SAR test exclusion procedures as described in KDB 447498 D01 v05.

Following table gives antenna pair SAR to peak location separation ratios for the transmitter combination for which the sum of simultaneously transmitting 1g SAR was above limit (See "Max+Max Combined results" table in previous section).

Antenna Pair SAR to Peak Locatio Separation Ratio

Body: Back facing phantom, Without Headset	WLAN 5000	4-slot GPRS850
X [mm]	39.0	-15.5
Y [mm]	-26.0	0.0
Z [mm]	-171.9	-171.6
DISTANCE [mm]	60.40	
MAX + MAX (Reported SAR)	1.81	
SAR to peak location separation ratio	**0.04**	

All simultaneous transmitter configurations where all antenna pairs' SPLSR is equal to or below 0.04 are excluded from expanded zoom scan testing.

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

850MHz Wireless Router SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	
4-slot GPRS	Tuning Target + Tolerance [dBm]		27.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		27.62	27.49	27.36	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.61	24.48	24.35	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	25
		Full SAR	0.792	0.938	**1.21**	0.889	1.05	**1.36**	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Back facing phantom, Repeated	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	1.14	-	-	1.28	

(850MHz WR SAR Table continues)

(850MHz WR SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		24.35			Scaling factor*			
	Conducted Power [dBm]		24.51	24.40	24.36	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.51	24.40	24.36	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	1.05	1.11	1.12	1.18	1.25	1.26	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Back facing phantom, Repeated	Estimated SAR	-	-	-	-	-	-	26
		Full SAR	-	-	**1.17**	-	-	**1.31**	

1900MHz Band Wireless Router SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	
4-slot GPRS	Tuning Target + Tolerance [dBm]		21.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		22.05	22.05	21.94	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		19.04	19.04	18.93	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	27
		Full SAR	0.504	0.735	**1.09**	0.565	0.825	**1.22**	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Bottom edge facing phantom, Repeated	Estimated SAR	-	-	-	-	-	-	-
		Full SAR			1.09	-	-	1.22	

(1900MHz WR SAR Table continues)

(1900MHz WR SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz	Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		19.35			Scaling factor*			
	Conducted Power [dBm]		19.54	19.53	19.40	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		19.54	19.53	19.40	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.666	0.755	1.12	0.747	0.847	1.26	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Bottom edge facing phantom, Repeated	Estimated SAR	-	-	-	-	-	-	28
		Full SAR	-	-	**1.14**	-	-	**1.28**	

2450MHz Wireless Router SAR results**

Mode	Test configuration	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 2	Ch 6	Ch 11	Ch 2	Ch 6	Ch 11	
			2415.0 MHz	2437.0 MHz	2462.0 MHz	2415.0 MHz	2437.0 MHz	2462.0 MHz	
WLAN b-mode DSSS 1 Mbps	Tuning Target + Tolerance [dBm]		17.50			Scaling factor*			
	Conducted Power [dBm]		17.01	17.29	17.41	0.99	0.71	0.59	dB
	Time-averaged power [dBm]		17.01	17.29	17.41	1.26	1.18	1.15	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.074	0.084	0.065	0.093	0.099	0.075	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.044	-	-	0.052	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.029	-	-	0.034	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.011	-	-	0.013	-	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.061	-	-	0.072	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.006	-	-	0.007	-	
WLAN b-mode DSSS 5.5 Mbps	Tuning Target + Tolerance [dBm]		18.50			Scaling factor*			
	Conducted Power [dBm]		18.11	18.51	18.44	0.89	0.50	0.56	dB
	Time-averaged power [dBm]		18.11	18.51	18.44	1.23	1.12	1.14	Lin
	Back facing phantom, Worst case	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.110	0.086	0.099	0.138	0.101	0.114	

Simultaneous transmissions: Combined Wireless Router SAR results – Individual band Max results

Test configuration	Max. 1g SAR results				
	WLAN 2450**	4-slot GPRS850	WCDMA 850	4-slot GPRS1900	WCDMA 1900
WR: Back facing phantom	0.138	1.36	1.31	-	-
WR: Display facing phantom	0.052	-	-	-	-
WR: Top edge facing phantom	0.034	-	-	-	-
WR: Bottom edge facing phantom	0.013	-	-	1.22	1.28
WR: Left edge facing phantom	0.072	-	-	-	-
WR: Right edge facing phantom	0.007	-	-	-	-

**SAR data taken from FCC_RM-846_03.

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

Test configuration	Max. 1g SAR results			
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	4-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN 2450
WR: Back facing phantom	**1.50**	**1.45**	-	-
WR: Display facing phantom	-	-	-	-
WR: Top edge facing phantom	-	-	-	-
WR: Bottom edge facing phantom	-	-	**1.23**	**1.29**
WR: Left edge facing phantom	-	-	-	-
WR: Right edge facing phantom	-	-	-	-

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. It is these values that appear in the Summary table in Section 1.2.

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

Test configuration	Max. 1g SAR results			
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	4-slot GPRS1900 + WLAN2450	WCDMA1900 + WLAN 2450
WR: Back facing phantom	**1.37**	**1.33**	-	-
WR: Display facing phantom	-	-	-	-
WR: Top edge facing phantom	-	-	-	-
WR: Bottom edge facing phantom	-	-	**1.24**	**1.30**
WR: Left edge facing phantom	-	-	-	-
WR: 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.3.

APPENDIX A: SYSTEM CHECKING SCANS

Plot #1

Date/Time: 2013-03-22 10:32:02

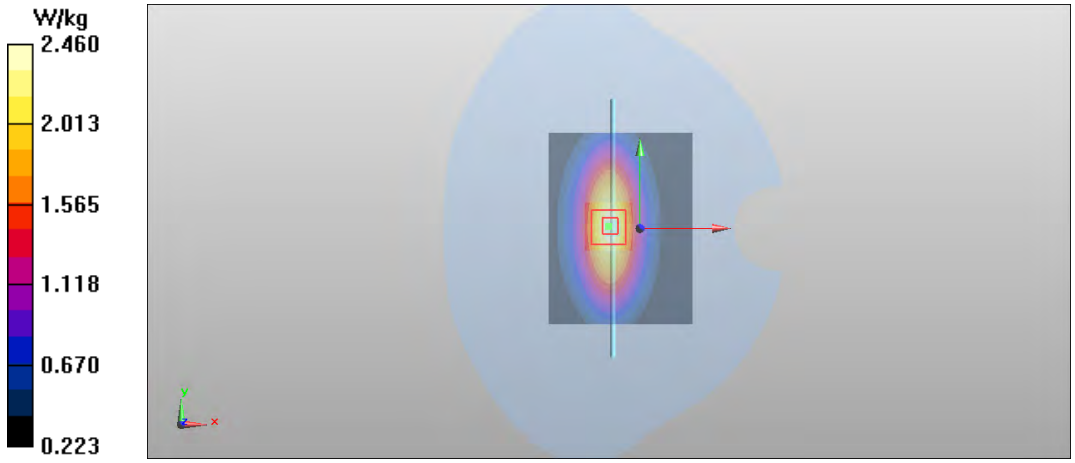
Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:462

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 835 MHz; σ = 0.904 S/m; ε_r = 40.47; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

d=15mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.41 W/kg

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.968 V/m
Peak SAR (extrapolated) = 3.39 W/kg
SAR(1 g) = 2.28 W/kg
SAR(10 g) = 1.49 W/kg
Power Drift = 0.03 dB
Maximum value of SAR (measured) = 2.46 W/kg



Plot #2

Date/Time: 2013-03-25 07:51:08

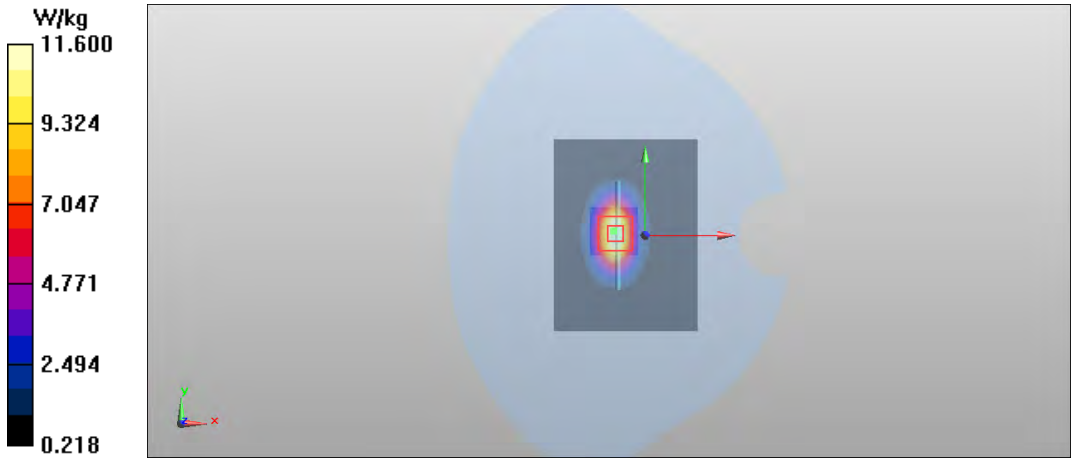
Test Laboratory: TCC Nokia
Type: D1900V2; Serial: D1900V2 - SN:5d030

Communication System: CW1900
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL1900; Medium Notes: t= 21.9 C
Medium parameters used: f = 1900 MHz; σ = 1.382 S/m; ε_r = 38.748; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 12.4 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.862 V/m
Peak SAR (extrapolated) = 19.3 W/kg
SAR(1 g) = 10.3 W/kg
SAR(10 g) = 5.39 W/kg
Power Drift = 0.16 dB
Maximum value of SAR (measured) = 11.6 W/kg



Plot #3

Date/Time: 2013-03-26 09:19:01

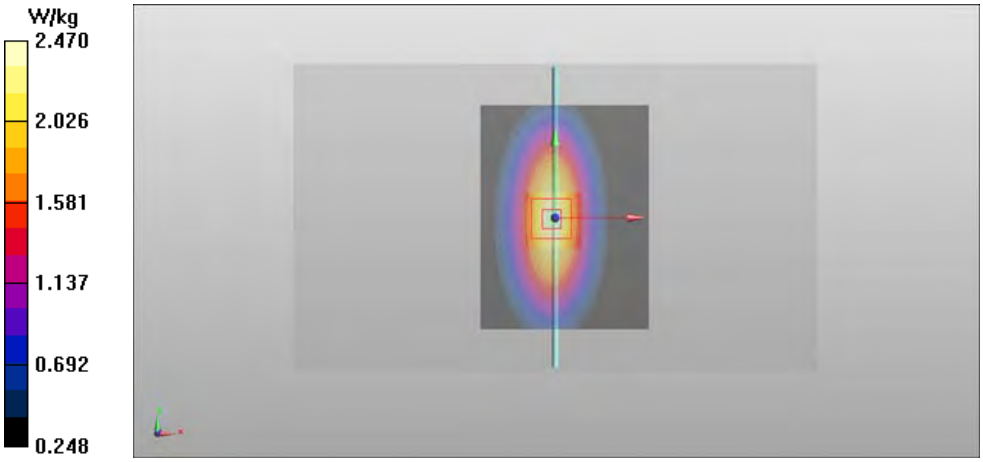
Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:462

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.4 C
Medium parameters used: f = 835 MHz; σ = 0.975 S/m; ε_r = 53.223; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

d=15mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 2.44 W/kg

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.291 V/m
Peak SAR (extrapolated) = 3.38 W/kg
SAR(1 g) = 2.3 W/kg
SAR(10 g) = 1.53 W/kg
Power Drift = 0.02 dB
Maximum value of SAR (measured) = 2.47 W/kg



Plot #4

Date/Time: 2013-03-27 11:41:28

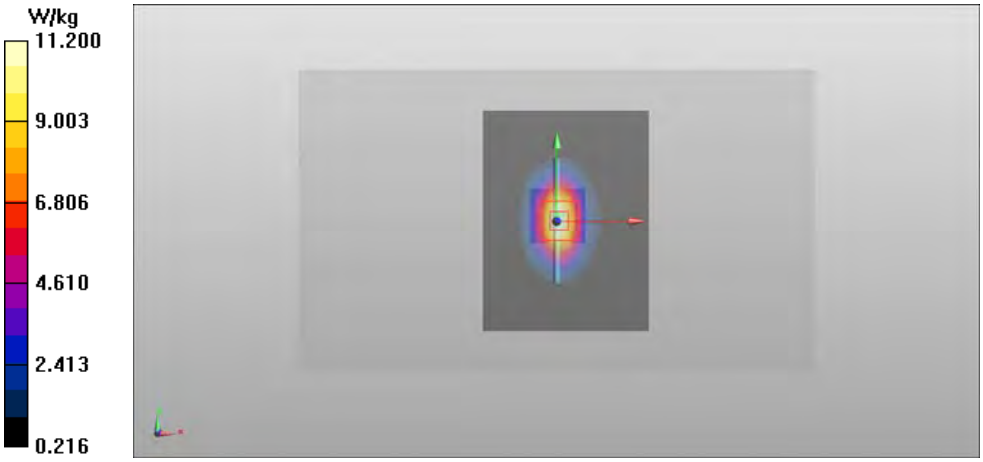
Test Laboratory: TCC Nokia
Type: D1900V2; Serial: D1900V2 - SN:5d030

Communication System: CW1900
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 21.3 C
Medium parameters used: f = 1900 MHz; σ = 1.517 S/m; ε_r = 51.601; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 11.6 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 87.507 V/m
Peak SAR (extrapolated) = 18.1 W/kg
SAR(1 g) = 9.98 W/kg
SAR(10 g) = 5.23 W/kg
Power Drift = -0.02 dB
Maximum value of SAR (measured) = 11.2 W/kg



Plot #5

Date/Time: 2013-03-26 09:20:17

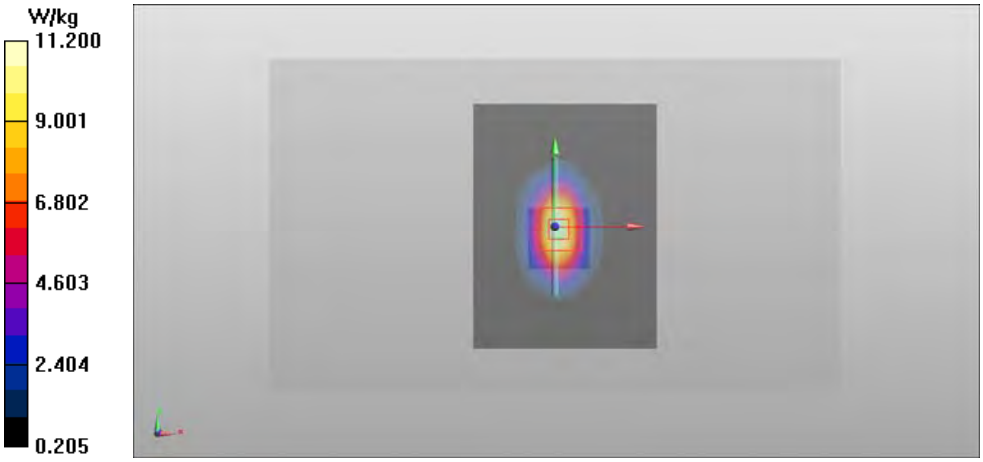
Test Laboratory: TCC Nokia
Type: D1900V2; Serial: D1900V2 - SN:5d030

Communication System: CW1900
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 21.3 C
Medium parameters used: f = 1900 MHz; σ = 1.513 S/m; ε_r = 51.748; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(4.51, 4.51, 4.51); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2012-08-21
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA;
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 11.7 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 86.715 V/m
Peak SAR (extrapolated) = 17.7 W/kg
SAR(1 g) = 9.84 W/kg
SAR(10 g) = 5.18 W/kg
Power Drift = -0.04 dB
Maximum value of SAR (measured) = 11.2 W/kg



APPENDIX B.1: HEAD MEASUREMENT SCANS

Plot #1

Date/Time: 2013-03-22 12:55:38

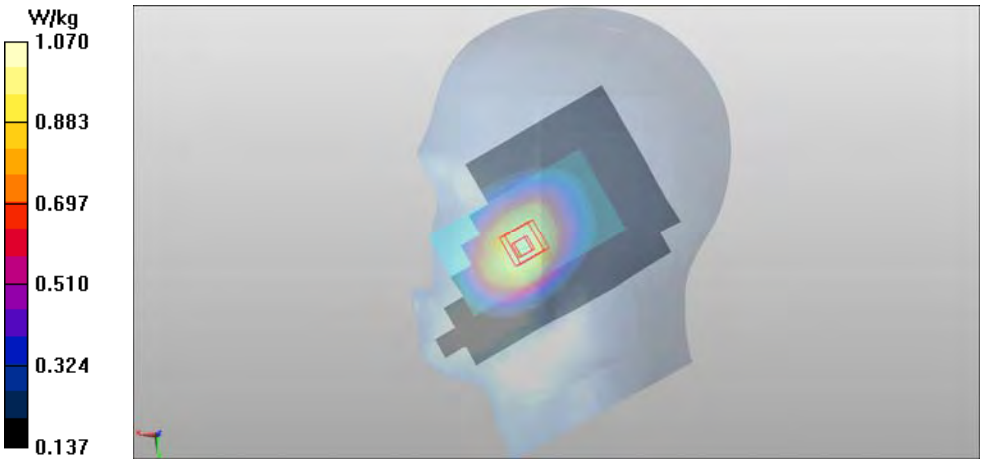
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7

Communication System: 4-slot GPRS850
Frequency: 848.8 MHz; Duty Cycle: 1:2.1
Medium: HSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 849 MHz; σ = 0.913 S/m; ε_r = 40.396; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

4-slot GPRS850 - Right/Cheek - High - Repeated/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.06 W/kg

4-slot GPRS850 - Right/Cheek - High - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 33.543 V/m
Peak SAR (extrapolated) = 1.27 W/kg
SAR(1 g) = 1.01 W/kg
SAR(10 g) = 0.766 W/kg
Power Drift = 0.09 dB
Maximum value of SAR (measured) = 1.07 W/kg



Plot #2

Date/Time: 2013-03-22 13:43:54

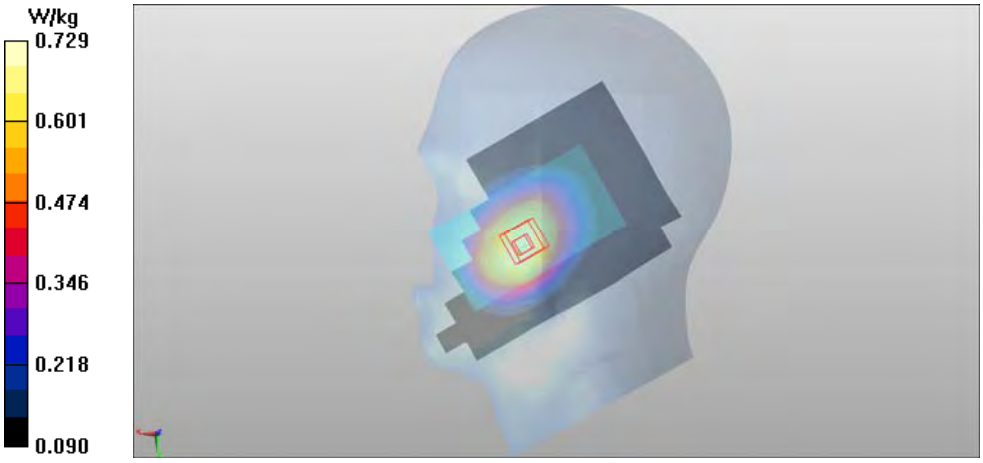
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7

Communication System: WCDMA850 (Band 5)
Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium: HSL850; Medium Notes: t= 21.1 C
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.898 S/m; ε_r = 40.517; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: SAM2; Type: SAM; Serial: TP-1570
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

WCDMA850 (Band 5) - Right/Cheek - Low/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.740 W/kg

WCDMA850 (Band 5) - Right/Cheek - Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 28.330 V/m
Peak SAR (extrapolated) = 0.869 W/kg
SAR(1 g) = 0.692 W/kg
SAR(10 g) = 0.517 W/kg
Power Drift = -0.01 dB
Maximum value of SAR (measured) = 0.729 W/kg



Plot #3

Date/Time: 2013-03-25 09:20:07

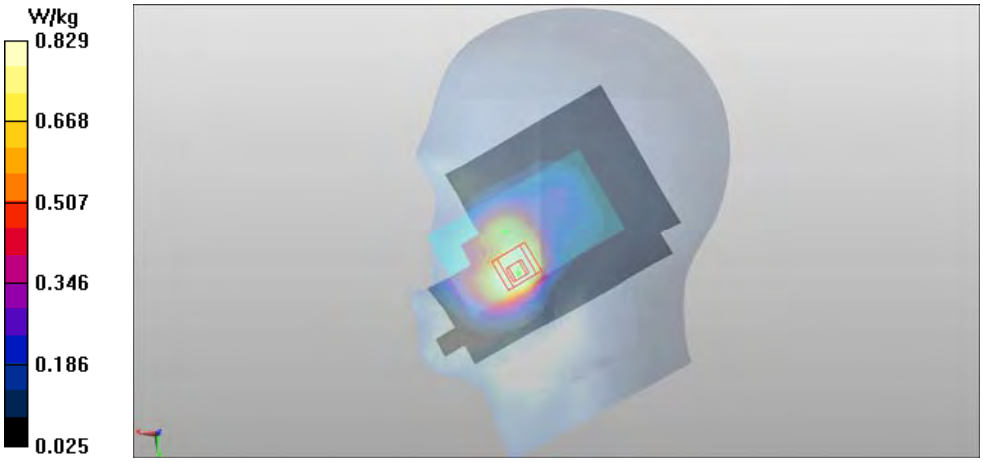
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107848/9

Communication System: 4-slot GPRS1900
Frequency: 1850.2 MHz; Duty Cycle: 1:2.1
Medium: HSL1900; Medium Notes: t= 21.9 C
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.342 S/m; ε_r = 38.982; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

4-slot GPRS1900 - Right/Cheek - Low - Repeated/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.06 W/kg

4-slot GPRS1900 - Right/Cheek - Low - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 27.210 V/m
Peak SAR (extrapolated) = 1.42 W/kg
SAR(1 g) = 0.949 W/kg
SAR(10 g) = 0.606 W/kg
Power Drift = 0.01 dB
Maximum value of SAR (measured) = 1.03 W/kg



Plot #4

Date/Time: 2013-03-25 10:11:35

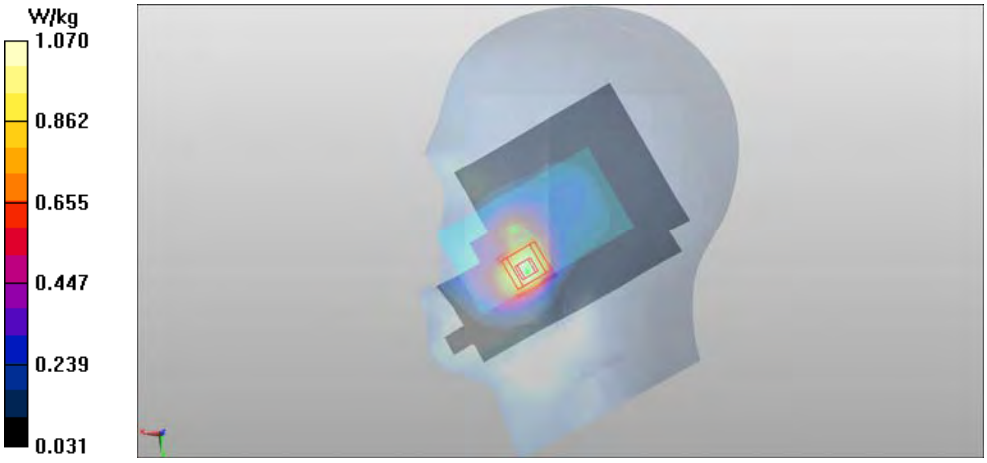
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107848/9

Communication System: WCDMA1900 (Band 2)
Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: HSL1900; Medium Notes: t= 21.9 C
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.344 S/m; ε_r = 38.974; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

WCDMA1900 (Band 2) - Right/Cheek - Low/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.10 W/kg

WCDMA1900 (Band 2) - Right/Cheek - Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 27.823 V/m
Peak SAR (extrapolated) = 1.48 W/kg
SAR(1 g) = 0.987 W/kg
SAR(10 g) = 0.630 W/kg
Power Drift = 0.01 dB
Maximum value of SAR (measured) = 1.07 W/kg



Plot #5

Date/Time: 2012-10-25 10:45:46

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 2 - DSSS 5.5 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2417 MHz; σ = 1.763 S/m; ε_r = 38.113; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3835; ConvF(6.73, 6.73, 6.73); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018
Measurement SW: DASY4, Version 4.7 (80)

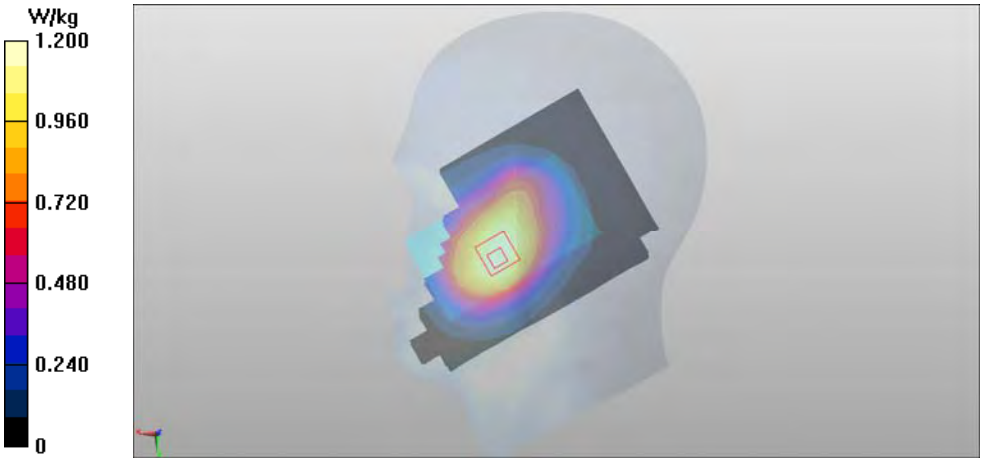
Date/Time: 2013-03-22 12:55:38

DASY Configuration for 4-slot GPRS850 - Right/Cheek - High - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7
Communication System: 4-slot GPRS850; Frequency: 848.8 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL850 Medium parameters used: f = 849 MHz; σ = 0.913 S/m; ε_r = 40.396; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3892; ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: SAM2; Type: SAM; Serial: TP-1570
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.13 W/kg; SAR(10 g) = 0.790 W/kg
Maximum value of SAR (interpolated) = 1.20 W/kg

WLAN2450 b-mode was scaled with factor 1.23, 4-slot GPRS850 with factor 1.12, before combining in SEMCAD SW.



Plot #6

Date/Time: 2012-10-25 10:45:46

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 2 - DSSS 5.5 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2417 MHz; σ = 1.763 S/m; ε_r = 38.113; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3835; ConvF(6.73, 6.73, 6.73); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018
Measurement SW: DASY4, Version 4.7 (80)

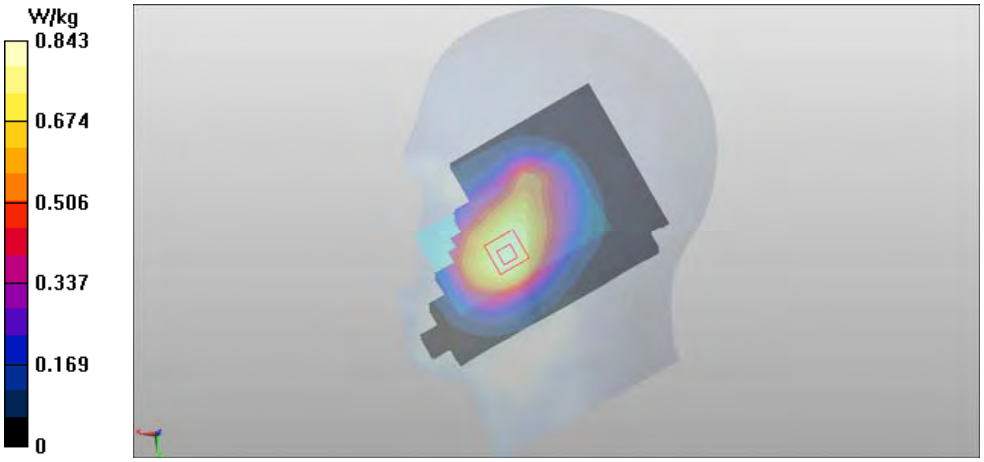
Date/Time: 2013-03-22 13:43:54

DASY Configuration for WCDMA850 (Band 5) - Right/Cheek - Low/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7
Communication System: WCDMA850 (Band 5); Frequency: 826.4 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL850 Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.898 S/m; ε_r = 40.517; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3892; ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: SAM2; Type: SAM; Serial: TP-1570
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.788 W/kg; SAR(10 g) = 0.551 W/kg
Maximum value of SAR (interpolated) = 0.843 W/kg

WLAN2450 b-mode was scaled with factor 1.23, WCDMA850 (Band 5) with factor 1.12, before combining in SEMCAD SW.



Plot #7

Date/Time: 2012-10-25 10:45:46

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 2 - DSSS 5.5 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2417 MHz; σ = 1.763 S/m; ε_r = 38.113; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3835; ConvF(6.73, 6.73, 6.73); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018
Measurement SW: DASY4, Version 4.7 (80)

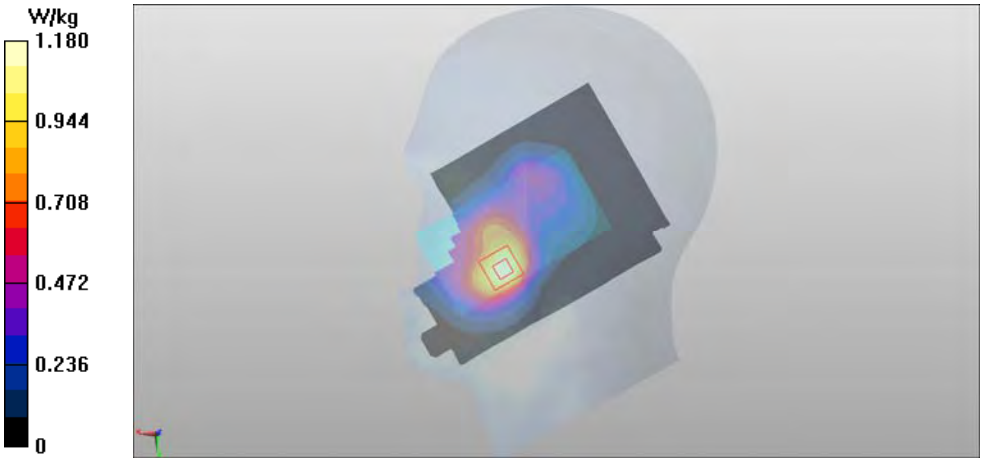
Date/Time: 2013-03-25 09:20:07

DASY Configuration for 4-slot GPRS1900 - Right/Cheek - Low - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107848/9
Communication System: 4-slot GPRS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL1900 Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.342 S/m; ε_r = 38.982; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: ES3DV3 - SN3194; ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.631 W/kg
Maximum value of SAR (interpolated) = 1.18 W/kg

WLAN2450 b-mode was scaled with factor 1.23, 4-slot GPRS1900 with factor 1.12, before combining in SEMCAD SW.



Plot #8

Date/Time: 2012-10-25 10:45:46

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 2 - DSSS 5.5 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2417 MHz; σ = 1.763 S/m; ε_r = 38.113; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3835; ConvF(6.73, 6.73, 6.73); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018
Measurement SW: DASY4, Version 4.7 (80)

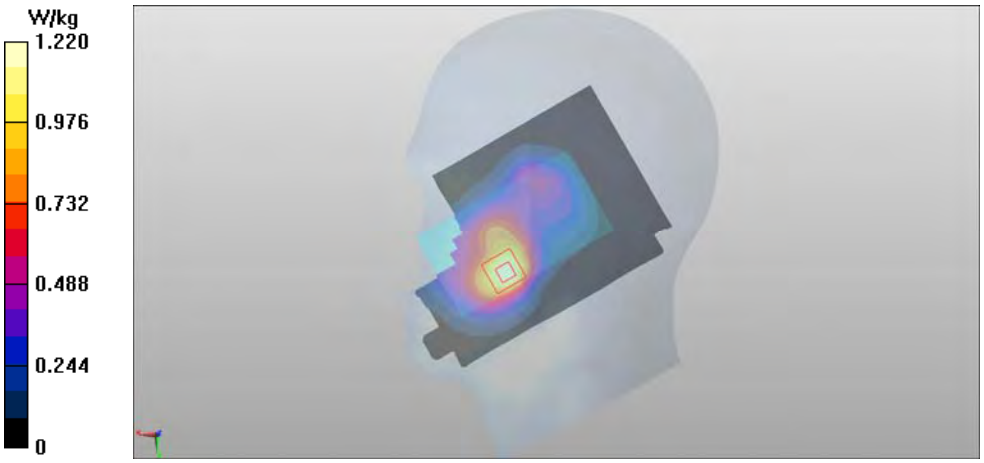
Date/Time: 2013-03-25 10:11:35

DASY Configuration for WCDMA1900 (Band 2) - Right/Cheek - Low/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107848/9
Communication System: WCDMA1900 (Band 2); Frequency: 1852.4 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL1900 Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.344 S/m; ε_r = 38.974; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: ES3DV3 - SN3194; ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.11 W/kg; SAR(10 g) = 0.651 W/kg
Maximum value of SAR (interpolated) = 1.22 W/kg

WLAN2450 b-mode was scaled with factor 1.23, WCDMA1900 (Band 2) with factor 1.12, before combining in SEMCAD SW.



Plot #9

Date/Time: 2012-11-02 13:07:28

DASY Configuration for WLAN5000 a-mode - Right/Cheek - Channel 157 - OFDM 6 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5785 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL5000 Medium parameters used: f = 5785 MHz; σ = 5.135 S/m; ε_r = 34.696; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3573; ConvF(3.99, 3.99, 3.99); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM #2 CRP ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

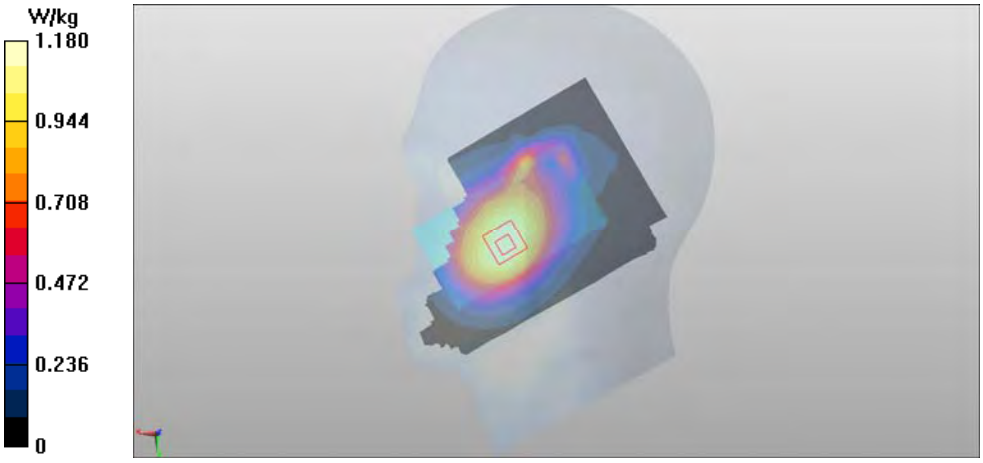
Date/Time: 2013-03-22 12:55:38

DASY Configuration for 4-slot GPRS850 - Right/Cheek - High - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7
Communication System: 4-slot GPRS850; Frequency: 848.8 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL850 Medium parameters used: f = 849 MHz; σ = 0.913 S/m; ε_r = 40.396; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3892; ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: SAM2; Type: SAM; Serial: TP-1570
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.11 W/kg; SAR(10 g) = 0.786 W/kg
Maximum value of SAR (interpolated) = 1.18 W/kg

WLAN5000 a-mode was scaled with factor 1.43, 4-slot GPRS850 with factor 1.12, before combining in SEMCAD SW.



Plot #10

Date/Time: 2012-11-02 13:07:28

DASY Configuration for WLAN5000 a-mode - Right/Cheek - Channel 157 - OFDM 6 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5785 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL5000 Medium parameters used: f = 5785 MHz; σ = 5.135 S/m; ε_r = 34.696; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3573; ConvF(3.99, 3.99, 3.99); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM #2 CRP ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

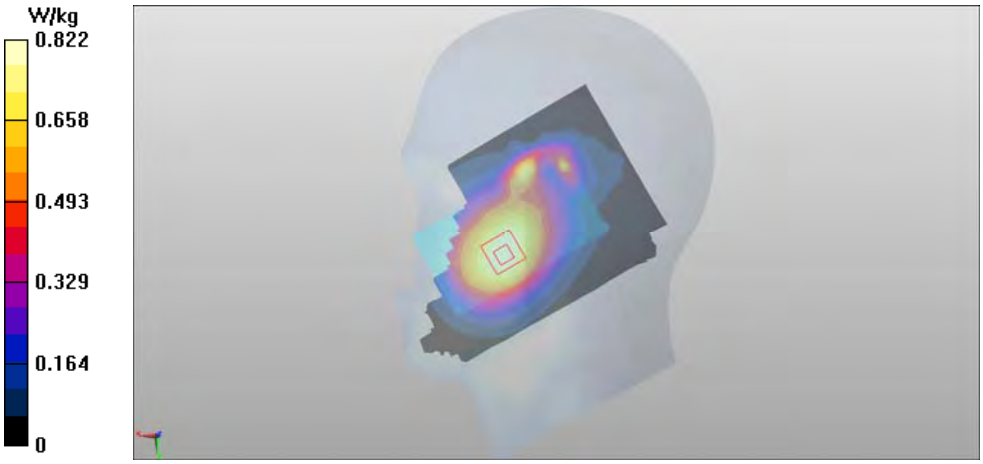
Date/Time: 2013-03-22 13:43:54

DASY Configuration for WCDMA850 (Band 5) - Right/Cheek - Low/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7
Communication System: WCDMA850 (Band 5); Frequency: 826.4 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL850 Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.898 S/m; ε_r = 40.517; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3892; ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: SAM2; Type: SAM; Serial: TP-1570
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.774 W/kg; SAR(10 g) = 0.545 W/kg
Maximum value of SAR (interpolated) = 0.822 W/kg

WLAN5000 a-mode was scaled with factor 1.43, WCDMA850 (Band 5) with factor 1.12, before combining in SEMCAD SW.



Plot #11

Date/Time: 2012-11-02 13:07:28

DASY Configuration for WLAN5000 a-mode - Right/Cheek - Channel 157 - OFDM 6 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5785 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL5000 Medium parameters used: f = 5785 MHz; σ = 5.135 S/m; ε_r = 34.696; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3573; ConvF(3.99, 3.99, 3.99); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM #2 CRP ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

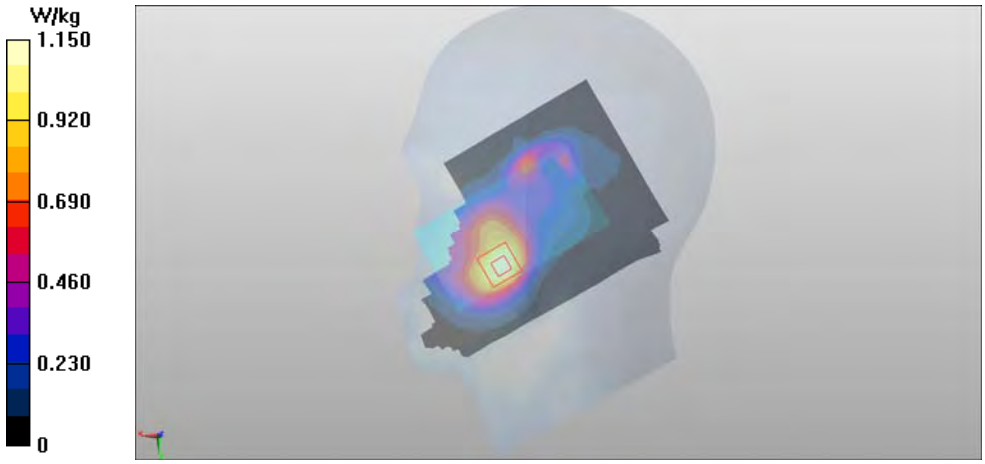
Date/Time: 2013-03-25 09:20:07

DASY Configuration for 4-slot GPRS1900 - Right/Cheek - Low - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107848/9
Communication System: 4-slot GPRS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL1900 Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.342 S/m; ε_r = 38.982; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: ES3DV3 - SN3194; ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.06 W/kg; SAR(10 g) = 0.623 W/kg
Maximum value of SAR (interpolated) = 1.15 W/kg

WLAN5000 a-mode was scaled with factor 1.43, 4-slot GPRS1900 with factor 1.12, before combining in SEMCAD SW.



Plot #12

Date/Time: 2012-11-02 13:07:28

DASY Configuration for WLAN5000 a-mode - Right/Cheek - Channel 157 - OFDM 6 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5785 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL5000 Medium parameters used: f = 5785 MHz; σ = 5.135 S/m; ε_r = 34.696; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3573; ConvF(3.99, 3.99, 3.99); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM #2 CRP ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

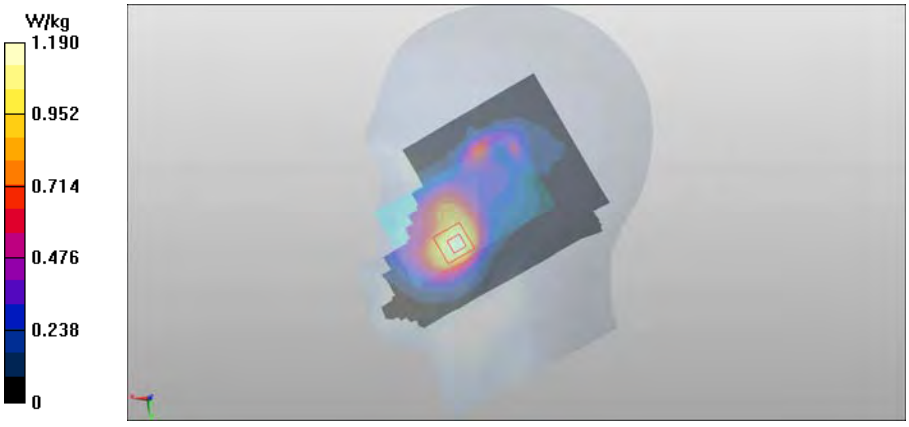
Date/Time: 2013-03-25 10:11:35

DASY Configuration for WCDMA1900 (Band 2) - Right/Cheek - Low/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107848/9
Communication System: WCDMA1900 (Band 2); Frequency: 1852.4 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL1900 Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.344 S/m; ε_r = 38.974; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: ES3DV3 - SN3194; ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.09 W/kg; SAR(10 g) = 0.643 W/kg
Maximum value of SAR (interpolated) = 1.19 W/kg

WLAN5000 a-mode was scaled with factor 1.43, WCDMA1900 (Band 2) with factor 1.12, before combining in SEMCAD SW.



APPENDIX B.2: BODY-WORN MEASUREMENT SCANS

Plot #13

Date/Time: 2013-03-26 14:09:43

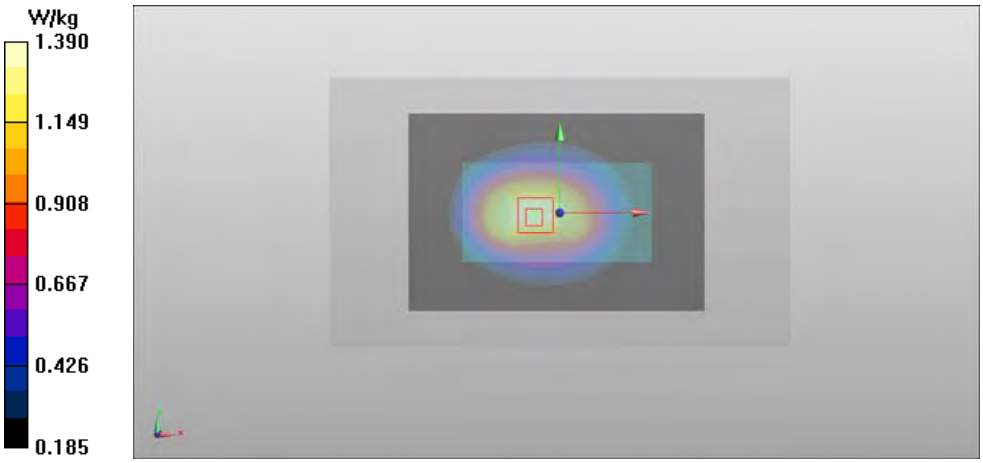
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7

Communication System: 4-slot GPRS850
Frequency: 848.8 MHz; Duty Cycle: 1:2.1
Medium: HSL850; Medium Notes: t= 21.4 C
Medium parameters used: f = 849 MHz; σ = 0.984 S/m; ε_r = 53.159; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

4-slot GPRS850/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom - Repeated/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.39 W/kg

4-slot GPRS850/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 37.796 V/m
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 1.32 W/kg
SAR(10 g) = 0.988 W/kg
Power Drift = -0.03 dB
Maximum value of SAR (measured) = 1.39 W/kg



Plot #14

Date/Time: 2013-03-28 10:41:25

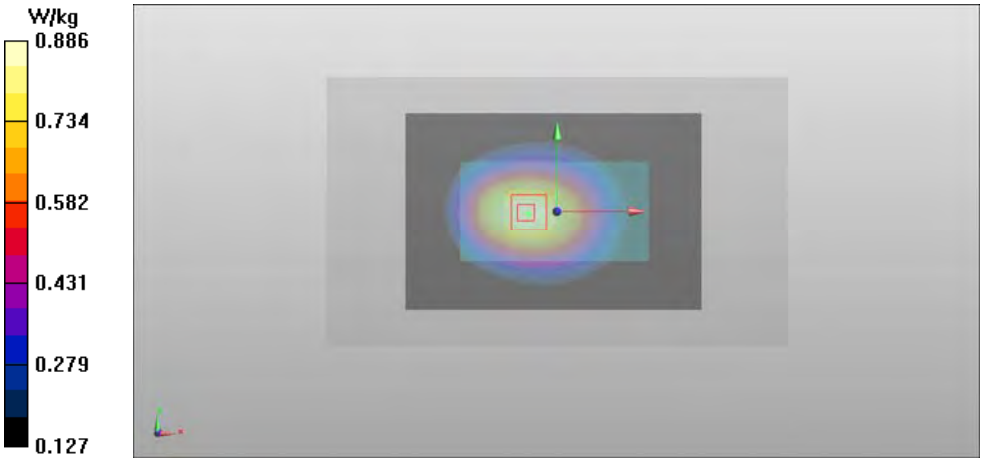
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7

Communication System: WCDMA850 (Band 5)
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.3 C
Medium parameters used: f = 835 MHz; σ = 0.976 S/m; ε_r = 53.57; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

WCDMA850 (Band 5)/Body - Middle - Spacer 15mm - No Accessory - Back Facing Phantom - Repeated/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.886 W/kg

WCDMA850 (Band 5)/Body - Middle - Spacer 15mm - No Accessory - Back Facing Phantom - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 29.735 V/m
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.846 W/kg
SAR(10 g) = 0.632 W/kg
Power Drift = 0.15 dB
Maximum value of SAR (measured) = 0.886 W/kg



Plot #15

Date/Time: 2013-03-26 19:50:22

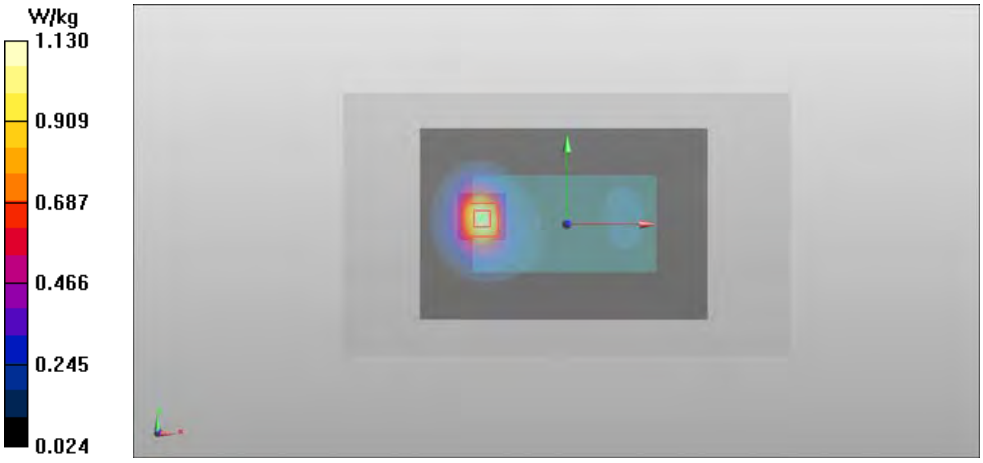
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107848/9

Communication System: 4-slot GPRS1900
Frequency: 1909.8 MHz; Duty Cycle: 1:2.09991
Medium: BSL1900; Medium Notes: t= 21.3 C
Medium parameters used: f = 1910 MHz; σ = 1.523 S/m; ε_r = 51.719; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(4.51, 4.51, 4.51); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2012-08-21
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

4-slot GPRS1900/Body - High - Spacer 15mm - WH-108 - Back Facing Phantom - Repeated/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.15 W/kg

4-slot GPRS1900/Body - High - Spacer 15mm - WH-108 - Back Facing Phantom - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 24.651 V/m
Peak SAR (extrapolated) = 1.70 W/kg
SAR(1 g) = 1.02 W/kg
SAR(10 g) = 0.566 W/kg
Power Drift = 0.03 dB
Maximum value of SAR (measured) = 1.13 W/kg



Plot #16

Date/Time: 2013-03-26 16:07:03

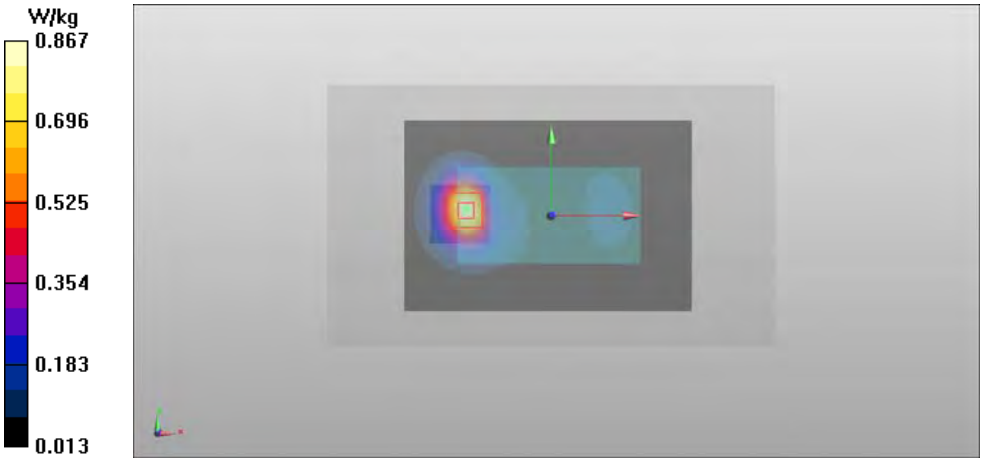
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107848/9

Communication System: WCDMA1900 (Band 2)
Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 21.3 C
Medium parameters used: f = 1908 MHz; σ = 1.521 S/m; ε_r = 51.725; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(4.51, 4.51, 4.51); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2012-08-21
- Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

WCDMA1900 (Band 2)/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.885 W/kg

WCDMA1900 (Band 2)/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 21.805 V/m
Peak SAR (extrapolated) = 1.31 W/kg
SAR(1 g) = 0.780 W/kg
SAR(10 g) = 0.434 W/kg
Power Drift = 0.00 dB
Maximum value of SAR (measured) = 0.867 W/kg



Plot #17

Date/Time: 2012-10-25 21:05:03

DASY Configuration for WLAN2450 b-mode/Body - Channel 2 - DSSS 5.5 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2417 MHz; σ = 1.905 S/m; ε_r = 50.425; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA
Measurement SW: DASY4, Version 4.7 (80)

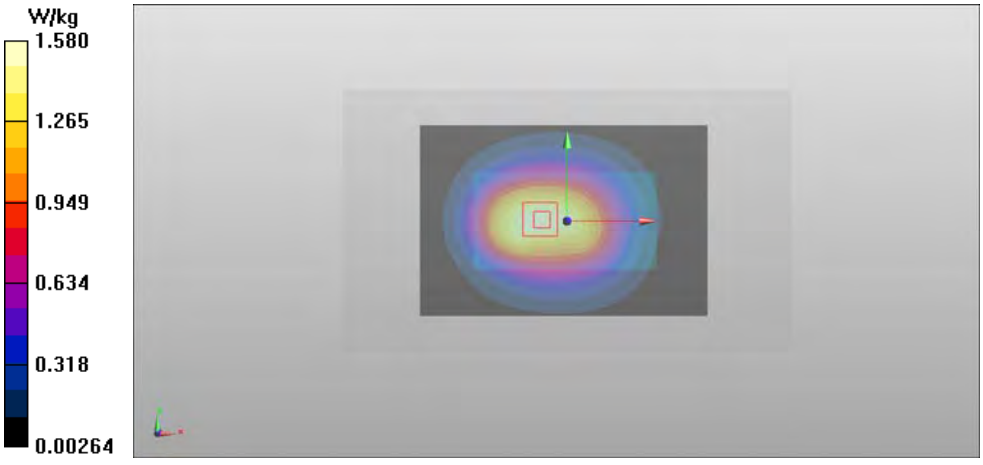
Date/Time: 2013-03-26 14:09:43

DASY Configuration for 4-slot GPRS850/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7
Communication System: 4-slot GPRS850; Frequency: 848.8 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL850 Medium parameters used: f = 849 MHz; σ = 0.984 S/m; ε_r = 53.159; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.48 W/kg; SAR(10 g) = 1.04 W/kg
Maximum value of SAR (interpolated) = 1.58 W/kg

WLAN2450 b-mode was scaled with factor 1.23, 4-slot GPRS850 with factor 1.12, before combining in SEMCAD SW.



Plot #18

Date/Time: 2012-10-25 21:05:03

DASY Configuration for WLAN2450 b-mode/Body - Channel 2 - DSSS 5.5 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2417 MHz; σ = 1.905 S/m; ε_r = 50.425; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA
Measurement SW: DASY4, Version 4.7 (80)

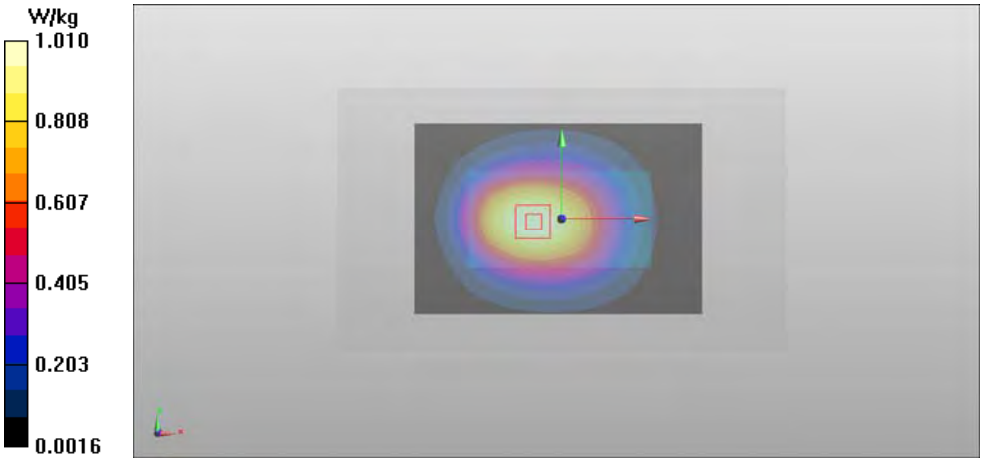
Date/Time: 2013-03-28 10:41:25

DASY Configuration for WCDMA850 (Band 5)/Body - Middle - Spacer 15mm - No Accessory - Back Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7
Communication System: WCDMA850 (Band 5); Frequency: 835 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL850 Medium parameters used: f = 835 MHz; σ = 0.976 S/m; ε_r = 53.57; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.957 W/kg; SAR(10 g) = 0.678 W/kg
Maximum value of SAR (interpolated) = 1.01 W/kg

WLAN2450 b-mode was scaled with factor 1.23, WCDMA850 (Band 5) with factor 1.12, before combining in SEMCAD SW



Plot #19

Date/Time: 2012-10-25 19:21:51

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 15mm - WH-108 - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2437 MHz; σ = 1.928 S/m; ε_r = 50.325; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA
Measurement SW: DASY4, Version 4.7 (80)

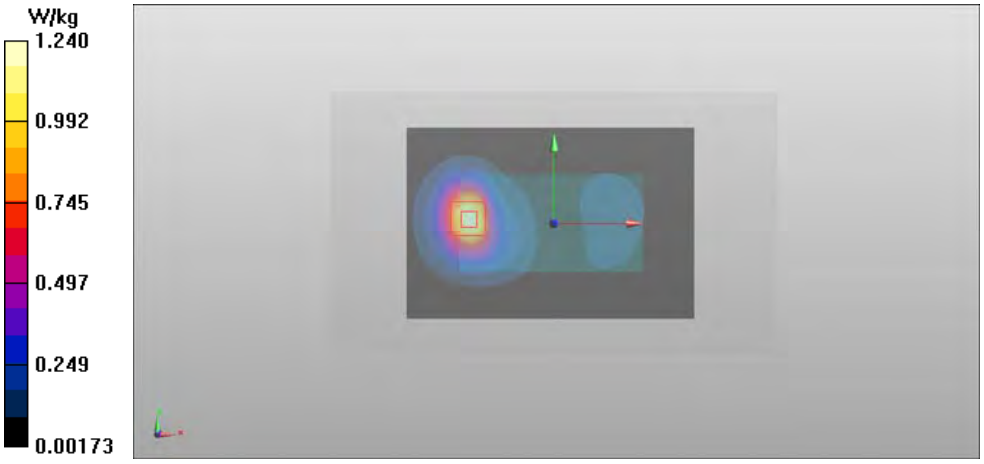
Date/Time: 2013-03-26 19:50:22

DASY Configuration for 4-slot GPRS1900/Body - High - Spacer 15mm - WH-108 - Back Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107848/9
Communication System: 4-slot GPRS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2.09991; PMF: 1.44911
Medium: BSL1900 Medium parameters used: f = 1910 MHz; σ = 1.523 S/m; ε_r = 51.719; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.51, 4.51, 4.51); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn728; Calibrated: 2012-08-21
Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA
Measurement SW: DASY52, Version 52.8 (5)

Fast SAR of Combined Scans: SAR(1 g) = 1.11 W/kg; SAR(10 g) = 0.606 W/kg
Maximum value of SAR (interpolated) = 1.24 W/kg

WLAN2450 b-mode was scaled with factor 1.18, 4-slot GPRS1900 with factor 1.12, before combining in SEMCAD SW.



Plot #20

Date/Time: 2012-10-25 21:05:03

DASY Configuration for WLAN2450 b-mode/Body - Channel 2 - DSSS 5.5 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2417 MHz; σ = 1.905 S/m; ε_r = 50.425; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA
Measurement SW: DASY4, Version 4.7 (80)

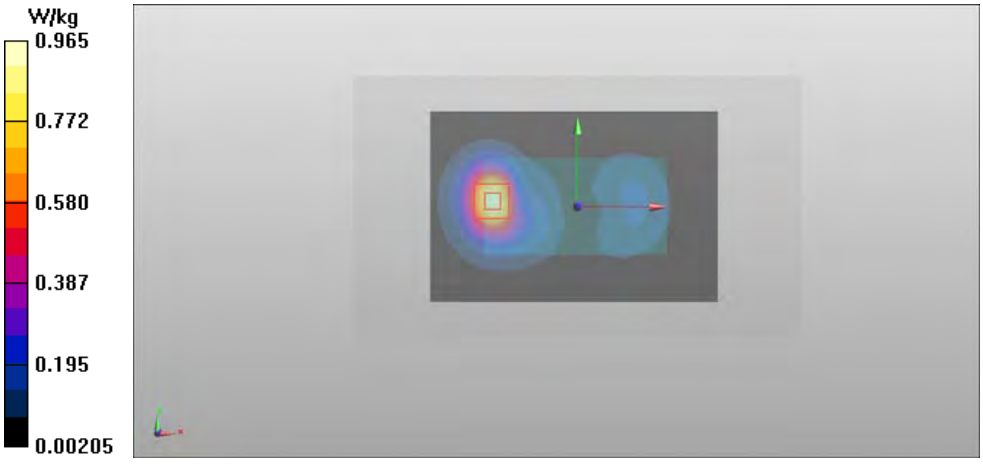
Date/Time: 2013-03-26 16:07:03

DASY Configuration for WCDMA1900 (Band 2)/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107848/9
Communication System: WCDMA1900 (Band 2); Frequency: 1907.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL1900 Medium parameters used: f = 1908 MHz; σ = 1.521 S/m; ε_r = 51.725; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.51, 4.51, 4.51); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn728; Calibrated: 2012-08-21
Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA
Measurement SW: DASY52, Version 52.8 (5)

Fast SAR of Combined Scans: SAR(1 g) = 0.860 W/kg; SAR(10 g) = 0.469 W/kg
Maximum value of SAR (interpolated) = 0.965 W/kg

WLAN2450 b-mode was scaled with factor 1.23, WCDMA1900 (Band 2) with factor 1.12, before combining in SEMCAD SW.



Plot #21

Date/Time: 2012-11-07 15:29:20

DASY Configuration for WLAN5000 a-mode/Body - Channel 132 - OFDM 6 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5660 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL5000 Medium parameters used: f = 5660 MHz; σ = 6.024 S/m; ε_r = 46.395; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3573; ConvF(3.05, 3.05, 3.05); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA
Measurement SW: DASY52, Version 52.8 (2)

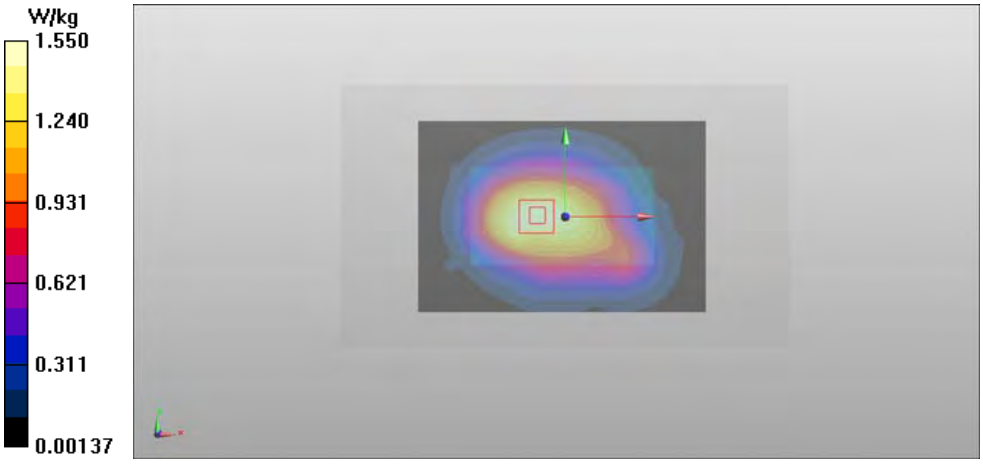
Date/Time: 2013-03-26 14:09:43

DASY Configuration for 4-slot GPRS850/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7
Communication System: 4-slot GPRS850; Frequency: 848.8 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL850 Medium parameters used: f = 849 MHz; σ = 0.984 S/m; ε_r = 53.159; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.46 W/kg; SAR(10 g) = 1.03 W/kg
Maximum value of SAR (interpolated) = 1.55 W/kg

WLAN5000 a-mode was scaled with factor 1.42, 4-slot GPRS850 with factor 1.12, before combining in SEMCAD SW.



Plot #22

Date/Time: 2012-11-07 15:29:20

DASY Configuration for WLAN5000 a-mode/Body - Channel 132 - OFDM 6 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5660 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL5000 Medium parameters used: f = 5660 MHz; σ = 6.024 S/m; ε_r = 46.395; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3573; ConvF(3.05, 3.05, 3.05); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA
Measurement SW: DASY52, Version 52.8 (2)

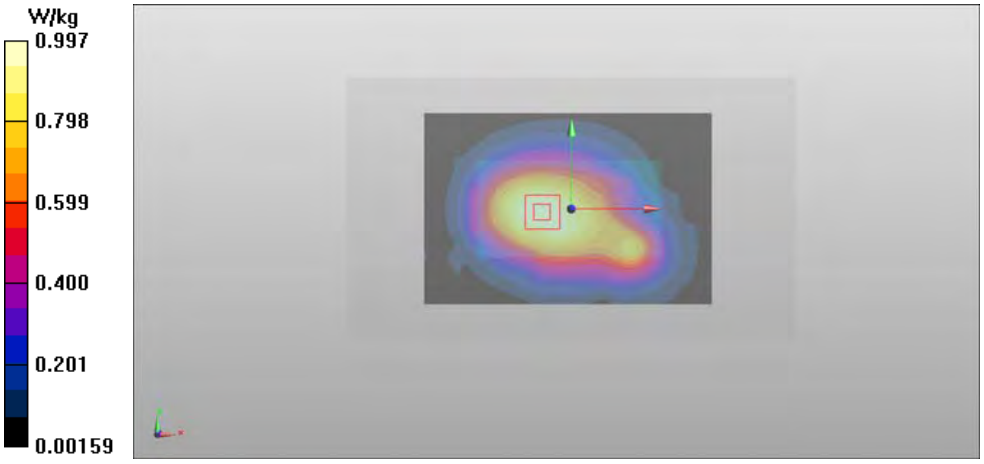
Date/Time: 2013-03-28 10:41:25

DASY Configuration for WCDMA850 (Band 5)/Body - Middle - Spacer 15mm - No Accessory - Back Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7
Communication System: WCDMA850 (Band 5); Frequency: 835 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL850 Medium parameters used: f = 835 MHz; σ = 0.976 S/m; ε_r = 53.57; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 0.943 W/kg; SAR(10 g) = 0.671 W/kg
Maximum value of SAR (interpolated) = 0.997 W/kg

WLAN5000 a-mode was scaled with factor 1.42, WCDMA850 (Band 5) with factor 1.12, before combining in SEMCAD SW.



Plot #23

Date/Time: 2012-11-07 16:24:31

DASY Configuration for WLAN5000 a-mode/Body - Channel 132 - OFDM 6 Mbps - Spacer 15mm - WH-108 - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5660 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL5000 Medium parameters used: f = 5660 MHz; σ = 6.024 S/m; ε_r = 46.395; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3573; ConvF(3.05, 3.05, 3.05); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA
Measurement SW: DASY52, Version 52.8 (2)

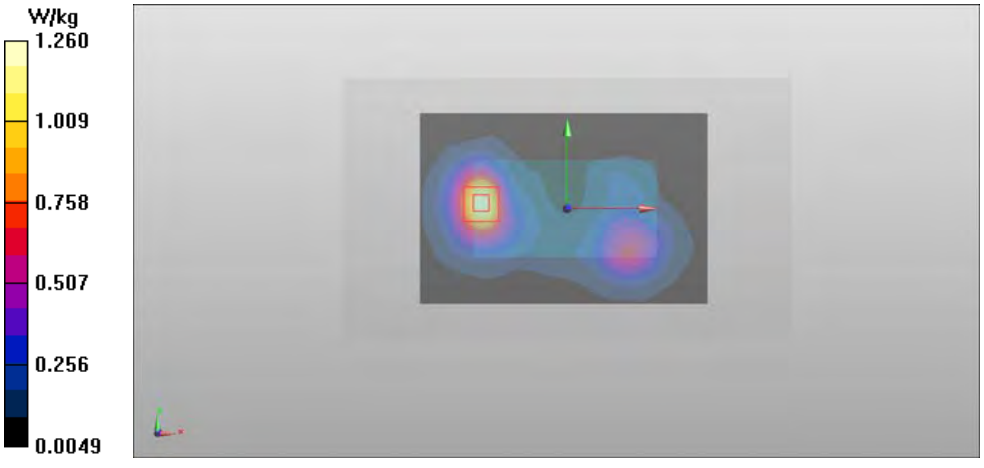
Date/Time: 2013-03-26 19:50:22

DASY Configuration for 4-slot GPRS1900/Body - High - Spacer 15mm - WH-108 - Back Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107848/9
Communication System: 4-slot GPRS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2.09991; PMF: 1.44911
Medium: BSL1900 Medium parameters used: f = 1910 MHz; σ = 1.523 S/m; ε_r = 51.719; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.51, 4.51, 4.51); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn728; Calibrated: 2012-08-21
Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA
Measurement SW: DASY52, Version 52.8 (5)

Fast SAR of Combined Scans: SAR(1 g) = 1.11 W/kg; SAR(10 g) = 0.602 W/kg
Maximum value of SAR (interpolated) = 1.26 W/kg

WLAN5000 a-mode was scaled with factor 1.42, 4-slot GPRS1900 with factor 1.12, before combining in SEMCAD SW.



Plot #24

Date/Time: 2012-11-07 15:29:20

DASY Configuration for WLAN5000 a-mode/Body - Channel 132 - OFDM 6 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106943/9
Communication System: WLAN5000 a-mode; Frequency: 5660 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL5000 Medium parameters used: f = 5660 MHz; σ = 6.024 S/m; ε_r = 46.395; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3573; ConvF(3.05, 3.05, 3.05); Calibrated: 2012-02-23;
Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn1309; Calibrated: 2012-01-11
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA
Measurement SW: DASY52, Version 52.8 (2)

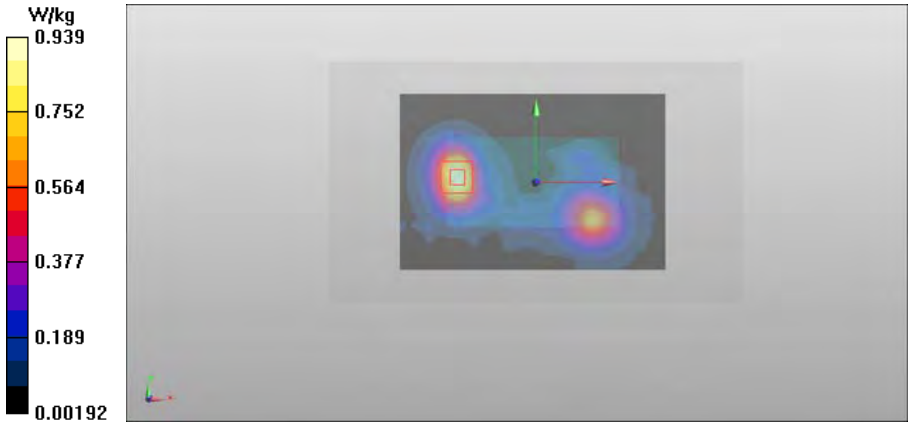
Date/Time: 2013-03-26 16:07:03

DASY Configuration for WCDMA1900 (Band 2)/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107848/9
Communication System: WCDMA1900 (Band 2); Frequency: 1907.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL1900 Medium parameters used: f = 1908 MHz; σ = 1.521 S/m; ε_r = 51.725; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.51, 4.51, 4.51); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn728; Calibrated: 2012-08-21
Phantom: #2 Triple, SAR4; Type: QD 000 P51 CA
Measurement SW: DASY52, Version 52.8 (5)

Fast SAR of Combined Scans: SAR(1 g) = 0.837 W/kg; SAR(10 g) = 0.455 W/kg
Maximum value of SAR (interpolated) = 0.939 W/kg

WLAN5000 a-mode was scaled with factor 1.42, WCDMA1900 (Band2) with factor 1.12, before combining in SEMCAD SW.



APPENDIX B.3: WIRELESS ROUTER MEASUREMENT SCANS

Plot #25

Date/Time: 2013-03-28 10:06:19

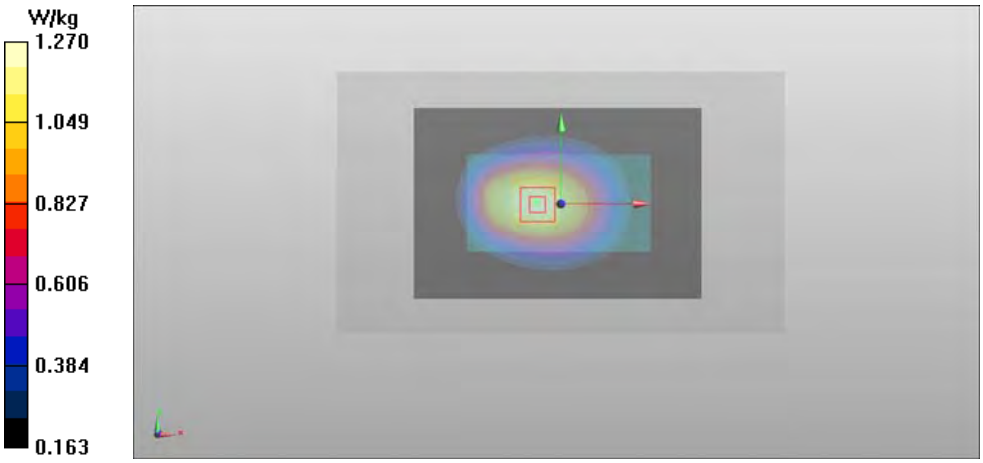
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107954/5

Communication System: 4-slot GPRS850
Frequency: 848.8 MHz; Duty Cycle: 1:2.1
Medium: BSL850; Medium Notes: t= 21.3 C
Medium parameters used: f = 849 MHz; σ = 0.985 S/m; ε_r = 53.501; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

4-slot GPRS850/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (81x121x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.26 W/kg

4-slot GPRS850/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 = 36.043 V/m
Peak SAR (extrapolated) = 1.53 W/kg
SAR(1 g) = 1.21 W/kg
SAR(10 g) = 0.900 W/kg
Power Drift = -0.27 dB
Maximum value of SAR (measured) = 1.27 W/kg



Plot #26

Date/Time: 2013-03-26 21:06:41

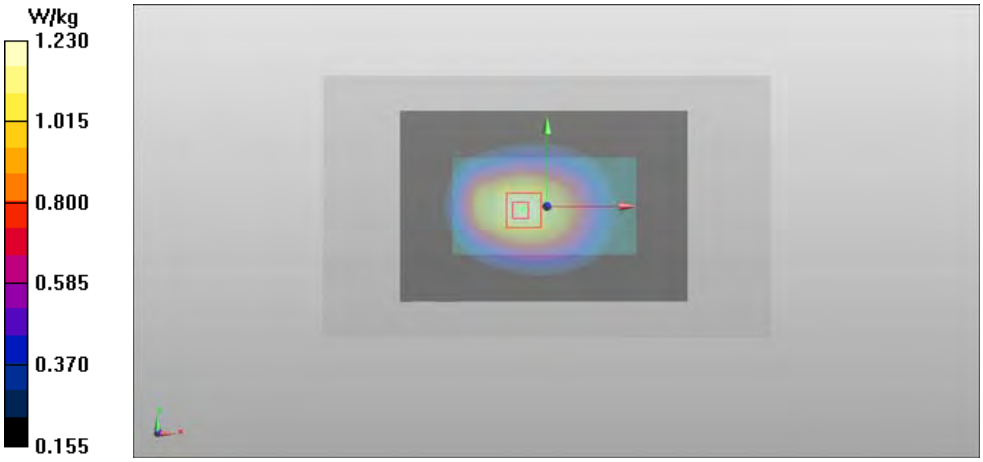
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7

Communication System: WCDMA850 (Band 5)
Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.4 C
Medium parameters used: f = 847 MHz; σ = 0.983 S/m; ε_r = 53.166; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3892
- ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn793; Calibrated: 2012-08-28
- Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

WCDMA850 (Band 5)/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom - Repeated/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.21 W/kg

WCDMA850 (Band 5)/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 35.502 V/m
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 1.17 W/kg
SAR(10 g) = 0.875 W/kg
Power Drift = 0.12 dB
Maximum value of SAR (measured) = 1.23 W/kg



Plot #27

Date/Time: 2013-03-27 14:48:45

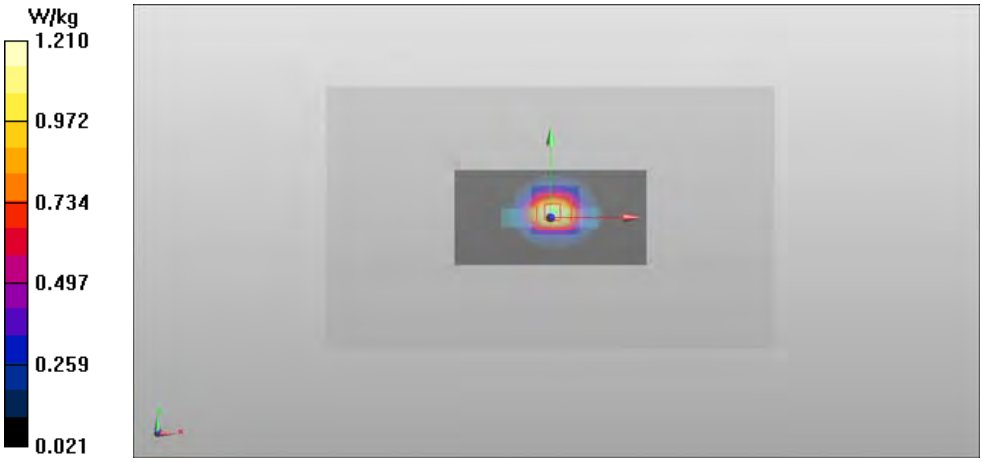
Test Laboratory: TCC Nokia
Type: RM-846 ; Serial: 004402/47/107954/5

Communication System: 4-slot GPRS1900
Frequency: 1909.8 MHz; Duty Cycle: 1:2.1
Medium: BSL1900; Medium Notes: t= 21.3 C
Medium parameters used: f = 1910 MHz; σ = 1.525 S/m; ε_r = 51.581; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

4-slot GPRS1900/Body - High - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom/Area Scan (41x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.30 W/kg

4-slot GPRS1900/Body - High - 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 = 27.953 V/m
Peak SAR (extrapolated) = 1.89 W/kg
SAR(1 g) = 1.09 W/kg
SAR(10 g) = 0.569 W/kg
Power Drift = 0.02 dB
Maximum value of SAR (measured) = 1.21 W/kg



Plot #28

Date/Time: 2013-03-27 15:23:29

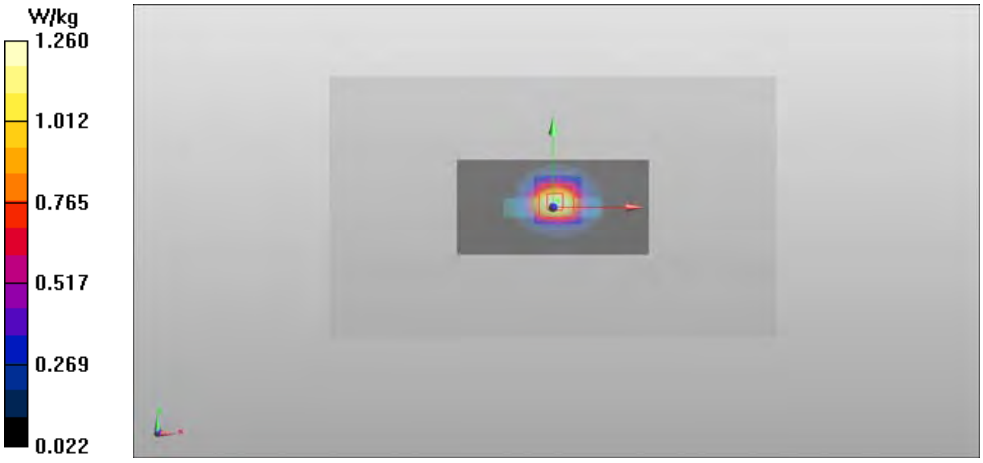
Test Laboratory: TCC Nokia
Type: RM-846 ; Serial: 004402/47/107954/5

Communication System: WCDMA1900 (Band 2)
Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 21.3 C
Medium parameters used: f = 1908 MHz; σ = 1.524 S/m; ε_r = 51.586; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn538; Calibrated: 2012-08-03
- Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.8 (7028)

WCDMA1900 (Band 2)/Body - High - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom - Repeated/Area Scan (41x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.37 W/kg

WCDMA1900 (Band 2)/Body - High - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 28.570 V/m
Peak SAR (extrapolated) = 2.01 W/kg
SAR(1 g) = 1.14 W/kg
SAR(10 g) = 0.596 W/kg
Power Drift = -0.03 dB
Maximum value of SAR (measured) = 1.26 W/kg



Plot #29

Date/Time: 2012-10-26 14:01:02

DASY Configuration for WLAN2450 b-mode/Body - Channel 2 - DSSS 5.5 Mbps - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/106986/8

Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1

Medium: BSL2450 Medium parameters used: f = 2417 MHz; σ = 1.905 S/m; ε_r = 50.425; ρ = 1000 kg/m^3

Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-03-28 10:06:19

DASY Configuration for 4-slot GPRS850/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:

Test Laboratory: TCC Nokia

Type: RM-846; Serial: 004402/47/107954/5

Communication System: 4-slot GPRS850; Frequency: 848.8 MHz; Duty Cycle: 1:2.1; PMF: 1.44914

Medium: BSL850 Medium parameters used: f = 849 MHz; σ = 0.985 S/m; ε_r = 53.501; ρ = 1000 kg/m^3

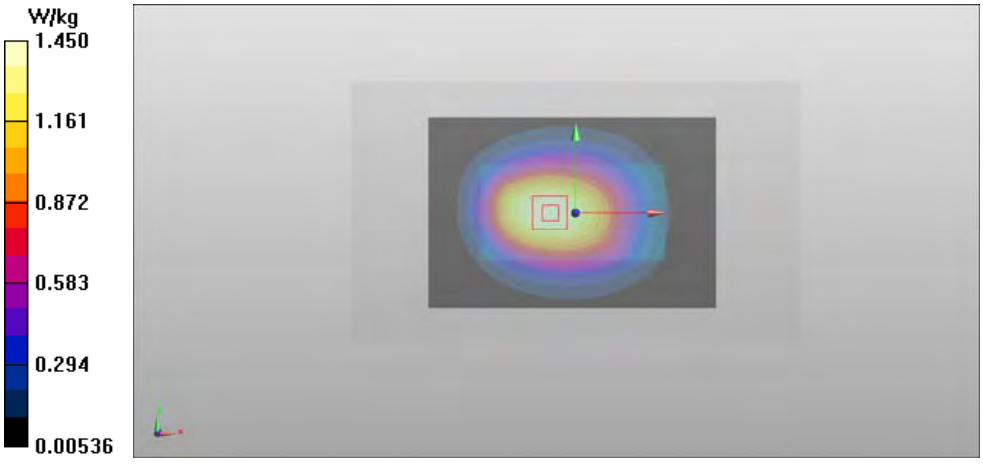
Phantom section: Center Section

Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.37 W/kg; SAR(10 g) = 0.973 W/kg

Maximum value of SAR (interpolated) = 1.45 W/kg

WLAN2450 b-mode was scaled with factor 1.23, 4-slot GPRS850 with factor 1.12, before combining in SEMCAD SW.



Plot #30

Date/Time: 2012-10-26 14:01:02

DASY Configuration for WLAN2450 b-mode/Body - Channel 2 - DSSS 5.5 Mbps - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2417 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2417 MHz; σ = 1.905 S/m; ε_r = 50.425; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

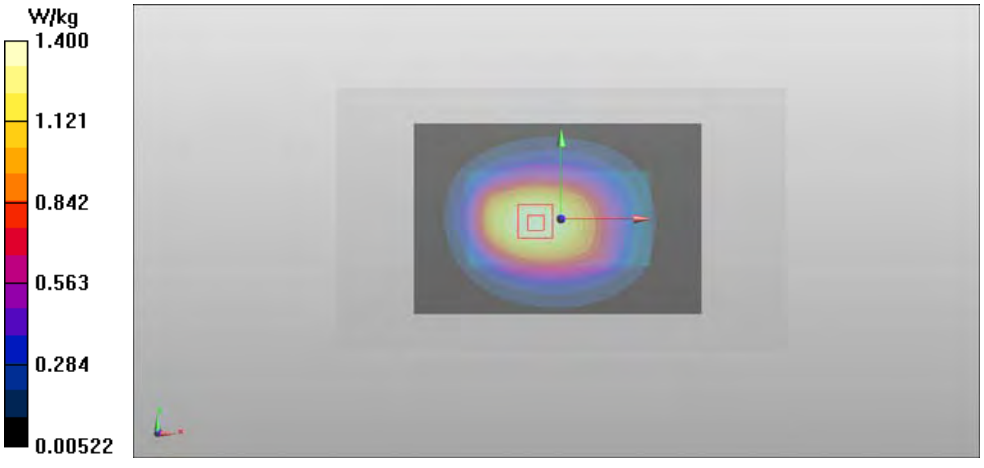
Date/Time: 2013-03-26 21:06:41

DASY Configuration for WCDMA850 (Band 5)/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/107849/7
Communication System: WCDMA850 (Band 5); Frequency: 846.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL850 Medium parameters used: f = 847 MHz; σ = 0.983 S/m; ε_r = 53.166; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.33 W/kg; SAR(10 g) = 0.938 W/kg
Maximum value of SAR (interpolated) = 1.40 W/kg

WLAN2450 b-mode was scaled with factor 1.23, WCDMA850 (Band 5) with factor 1.12, before combining in SEMCAD SW.



Plot #31

Date/Time: 2012-10-26 09:38:52

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2437 MHz; σ = 1.928 S/m; ε_r = 50.325; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

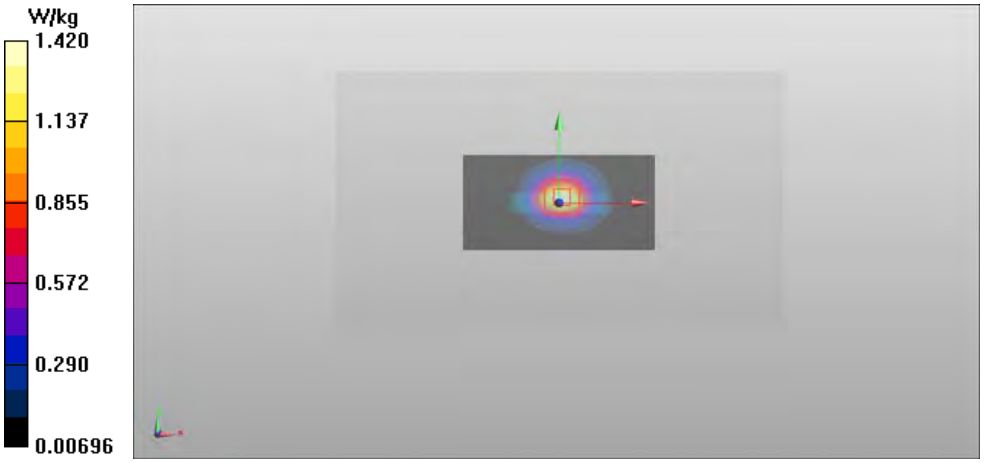
Date/Time: 2013-03-27 14:48:45

DASY Configuration for 4-slot GPRS1900/Body - High - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846 ; Serial: 004402/47/107954/5
Communication System: 4-slot GPRS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: BSL1900 Medium parameters used: f = 1910 MHz; σ = 1.525 S/m; ε_r = 51.581; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3194; ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.24 W/kg; SAR(10 g) = 0.618 W/kg
Maximum value of SAR (interpolated) = 1.42 W/kg

WLAN2450 b-mode was scaled with factor 1.18, 4-slot GPRS1900 with factor 1.12, before combining in SEMCAD SW.



Plot #32

Date/Time: 2012-10-26 09:38:52

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846; Serial: 004402/47/106986/8
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2437 MHz; σ = 1.928 S/m; ε_r = 50.325; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3835; ConvF(6.57, 6.57, 6.57); Calibrated: 2012-02-07;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 2 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

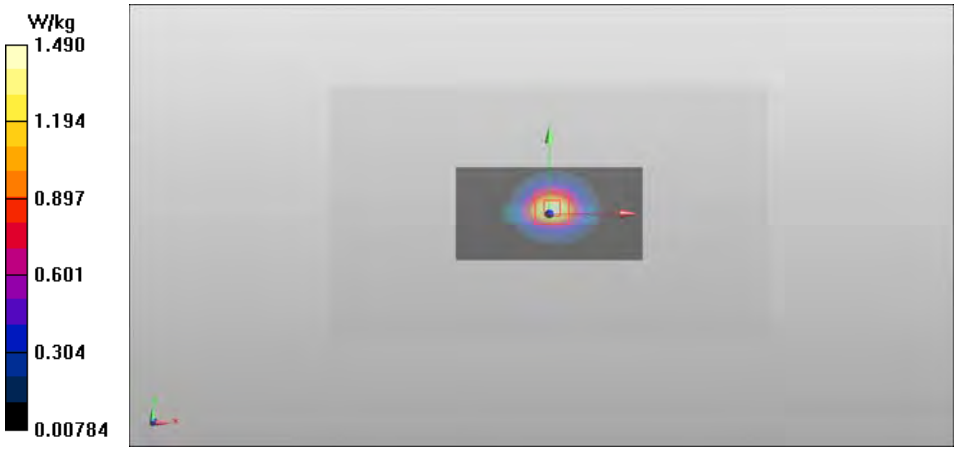
Date/Time: 2013-03-27 15:23:29

DASY Configuration for WCDMA1900 (Band 2)/Body - High - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-846 ; Serial: 004402/47/107954/5
Communication System: WCDMA1900 (Band 2); Frequency: 1907.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL1900 Medium parameters used: f = 1908 MHz; σ = 1.524 S/m; ε_r = 51.586; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3194; ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Fast SAR of Combined Scans: SAR(1 g) = 1.3 W/kg; SAR(10 g) = 0.647 W/kg
Maximum value of SAR (interpolated) = 1.49 W/kg

WLAN2450 b-mode was scaled with factor 1.18, WCDMA1900 (Band 2) with factor 1.12, before combining in SEMCAD SW.



APPENDIX C: DIELECTRIC PARAMETERS OF THE TISSUE SIMULANTS

Head tissue simulant dielectric parameters used in the measurements 824 – 1907.6 MHz:

F (MHz)	Date	Dielectric Parameters					
		Ch 4132 826.4 MHz		Ch 4175 835.0 MHz		Ch 4233 846.6 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
835	2013-03-22	40.5	0.90	40.5	0.90	40.4	0.91
f (MHz)	**Date**	**Dielectric Parameters**					
		Ch 128 824.2 MHz		Ch 190 836.6 MHz		Ch 251 848.8 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
836	2013-03-22	40.5	0.90	40.5	0.90	40.4	0.91
f (MHz)	**Date**	**Dielectric Parameters**					
		Ch 512 1850.2 MHz		Ch 661 1880.0 MHz		Ch 810 1909.8 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
1880	2013-03-25	39.0	1.34	38.8	1.36	38.7	1.39
f (MHz)	**Date**	**Dielectric Parameters**					
		Ch 9262 1852.4 MHz		Ch 9400 1880.0 MHz		Ch 9538 1907.6 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
1880	2013-03-25	39.0	1.34	38.8	1.36	38.7	1.39

Body tissue simulant dielectric parameters used in the measurements 824 – 1907.6 MHz:

F (MHz)	Date	Dielectric Parameters					
		Ch 4132 826.4 MHz		Ch 4175 835.0 MHz		Ch 4233 846.6 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
835	2013-03-26	53.3	0.97	53.2	0.97	53.2	0.98
	2013-03-28	53.6	0.97	53.6	0.98	53.5	0.98
f (MHz)	**Date**	**Dielectric Parameters**					
		Ch 128 824.2 MHz		Ch 190 836.6 MHz		Ch 251 848.8 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
836	2013-03-26	53.3	0.97	53.2	0.97	53.2	0.98
	2013-03-28	53.6	0.97	53.6	0.98	53.5	0.99
f (MHz)	**Date**	**Dielectric Parameters**					
		Ch 512 1850.2 MHz		Ch 661 1880.0 MHz		Ch 810 1909.8 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
1880	2013-03-26	51.9	1.47	51.8	1.49	51.7	1.52
	2013-03-27	51.8	1.47	51.6	1.49	51.6	1.53
f (MHz)	**Date**	**Dielectric Parameters**					
		Ch 9262 1852.4 MHz		Ch 9400 1880.0 MHz		Ch 9538 1907.6 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
1880	2013-03-26	51.9	1.47	51.8	1.49	51.7	1.52
	2013-03-27	51.8	1.47	51.6	1.49	51.6	1.52

APPENDIX D: RELEVANT PAGES FROM PROBE CALIBRATION REPORTS

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
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: **ES3-3194_Aug12**

CALIBRATION CERTIFICATE

Object: ES3DV3 - SN:3194

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

Calibration date: August 27, 2012

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	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

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

Issued: August 27, 2012

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

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	6.35	6.35	6.35	0.29	2.00	± 12.0 %
835	41.5	0.90	6.09	6.09	6.09	0.38	1.54	± 12.0 %
1750	40.1	1.37	5.17	5.17	5.17	0.45	1.52	± 12.0 %
1900	40.0	1.40	4.97	4.97	4.97	0.80	1.16	± 12.0 %
2450	39.2	1.80	4.37	4.37	4.37	0.70	1.40	± 12.0 %
2600	39.0	1.96	4.27	4.27	4.27	0.80	1.29	± 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:3194

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	6.18	6.18	6.18	0.43	1.60	± 12.0 %
835	55.2	0.97	6.03	6.03	6.03	0.28	2.04	± 12.0 %
1750	53.4	1.49	4.83	4.83	4.83	0.73	1.33	± 12.0 %
1900	53.3	1.52	4.62	4.62	4.62	0.76	1.31	± 12.0 %
2450	52.7	1.95	4.20	4.20	4.20	0.73	1.08	± 12.0 %
2600	52.5	2.16	4.07	4.07	4.07	0.66	0.98	± 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.

Calibration Laboratory of
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Zeughausstrasse 43, 8004 Zurich, Switzerland

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C Service suisse d'étalonnage
S Servizio svizzero di taratura
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: ES3-3131_Aug12

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: August 27, 2012

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	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

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

Issued: August 28, 2012

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	6.20	6.20	6.20	0.25	2.11	± 12.0 %
835	41.5	0.90	5.96	5.96	5.96	0.26	2.04	± 12.0 %
1750	40.1	1.37	5.09	5.09	5.09	0.76	1.16	± 12.0 %
1900	40.0	1.40	4.92	4.92	4.92	0.61	1.32	± 12.0 %
2450	39.2	1.80	4.34	4.34	4.34	0.65	1.35	± 12.0 %
2600	39.0	1.96	4.15	4.15	4.15	0.79	1.28	± 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	5.99	5.99	5.99	0.34	1.76	± 12.0 %
835	55.2	0.97	5.95	5.95	5.95	0.45	1.53	± 12.0 %
1750	53.4	1.49	4.74	4.74	4.74	0.80	1.19	± 12.0 %
1900	53.3	1.52	4.51	4.51	4.51	0.56	1.49	± 12.0 %
2450	52.7	1.95	4.11	4.11	4.11	0.64	0.99	± 12.0 %
2600	52.5	2.16	3.94	3.94	3.94	0.61	0.94	± 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.

Calibration Laboratory of
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Swiss Calibration Service

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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: EX3-3892_Nov12

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3892

Calibration procedure(s): QA CAL-01.v8, QA CAL-14.v3, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes

Calibration date: November 21, 2012

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	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-11 (No. ES3-3013_Dec11)	Dec-12
DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: November 22, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3892

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	10.29	10.29	10.29	0.35	0.87	± 12.0 %
835	41.5	0.90	9.75	9.75	9.75	0.15	1.46	± 12.0 %
1750	40.1	1.37	9.08	9.08	9.08	0.32	0.98	± 12.0 %
1900	40.0	1.40	8.79	8.79	8.79	0.75	0.63	± 12.0 %
2450	39.2	1.80	7.85	7.85	7.85	0.33	1.00	± 12.0 %
2600	39.0	1.96	7.55	7.55	7.55	0.48	0.82	± 12.0 %
5200	36.0	4.66	5.18	5.18	5.18	0.38	1.80	± 13.1 %
5300	35.9	4.76	4.86	4.86	4.86	0.38	1.80	± 13.1 %
5500	35.6	4.96	4.69	4.69	4.69	0.39	1.80	± 13.1 %
5600	35.5	5.07	4.45	4.45	4.45	0.39	1.80	± 13.1 %
5800	35.3	5.27	4.72	4.72	4.72	0.40	1.80	± 13.1 %

[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:3892

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	9.94	9.94	9.94	0.23	1.24	± 12.0 %
835	55.2	0.97	9.73	9.73	9.73	0.30	1.03	± 12.0 %
1750	53.4	1.49	8.00	8.00	8.00	0.24	1.09	± 12.0 %
1900	53.3	1.52	7.61	7.61	7.61	0.42	0.81	± 12.0 %
2450	52.7	1.95	7.35	7.35	7.35	0.73	0.58	± 12.0 %
2600	52.5	2.16	7.12	7.12	7.12	0.80	0.50	± 12.0 %
5200	49.0	5.30	4.36	4.36	4.36	0.51	1.90	± 13.1 %
5300	48.9	5.42	4.23	4.23	4.23	0.45	1.90	± 13.1 %
5500	48.6	5.65	3.98	3.98	3.98	0.49	1.90	± 13.1 %
5600	48.5	5.77	4.04	4.04	4.04	0.38	1.90	± 13.1 %
5800	48.2	6.00	4.10	4.10	4.10	0.48	1.90	± 13.1 %

[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 REPORTS

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

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

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: 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

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.6 Ω - 1.8 jΩ
Return Loss	- 32.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.8 Ω - 3.7 jΩ
Return Loss	- 27.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.391 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	March 27, 2002

Date: 13.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

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

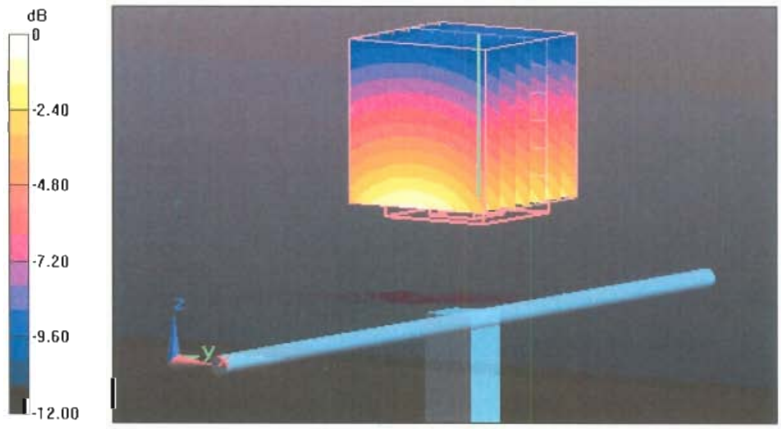
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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)

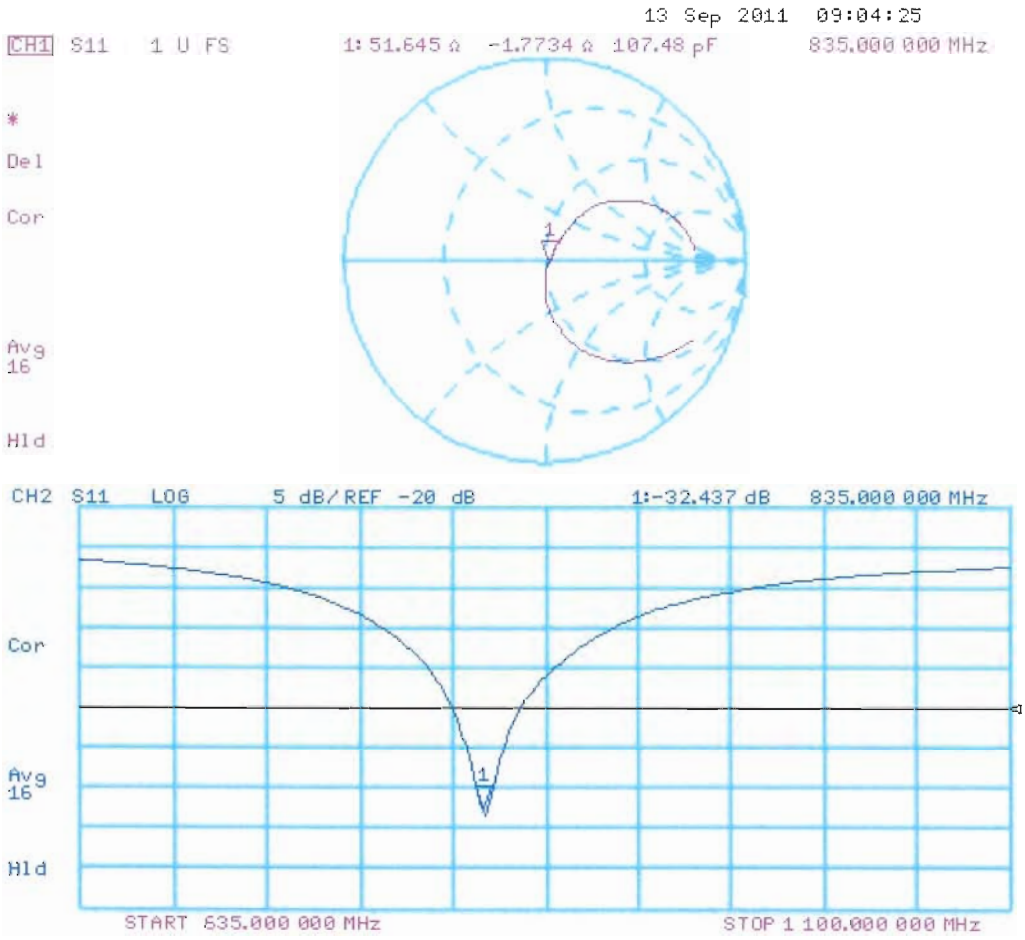
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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

Impedance Measurement Plot for Head TSL



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

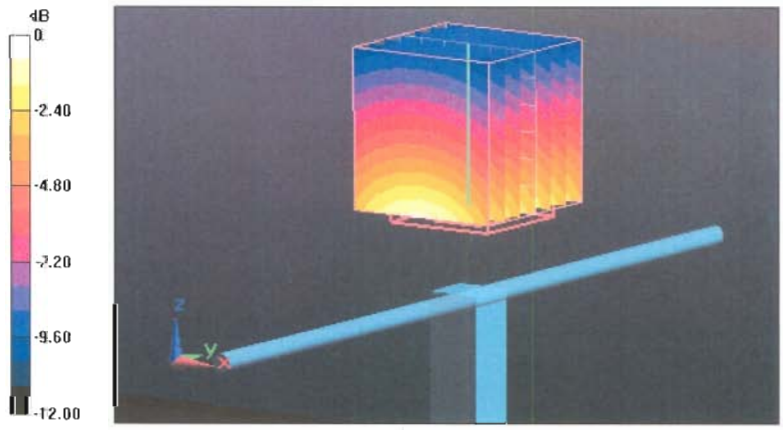
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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)

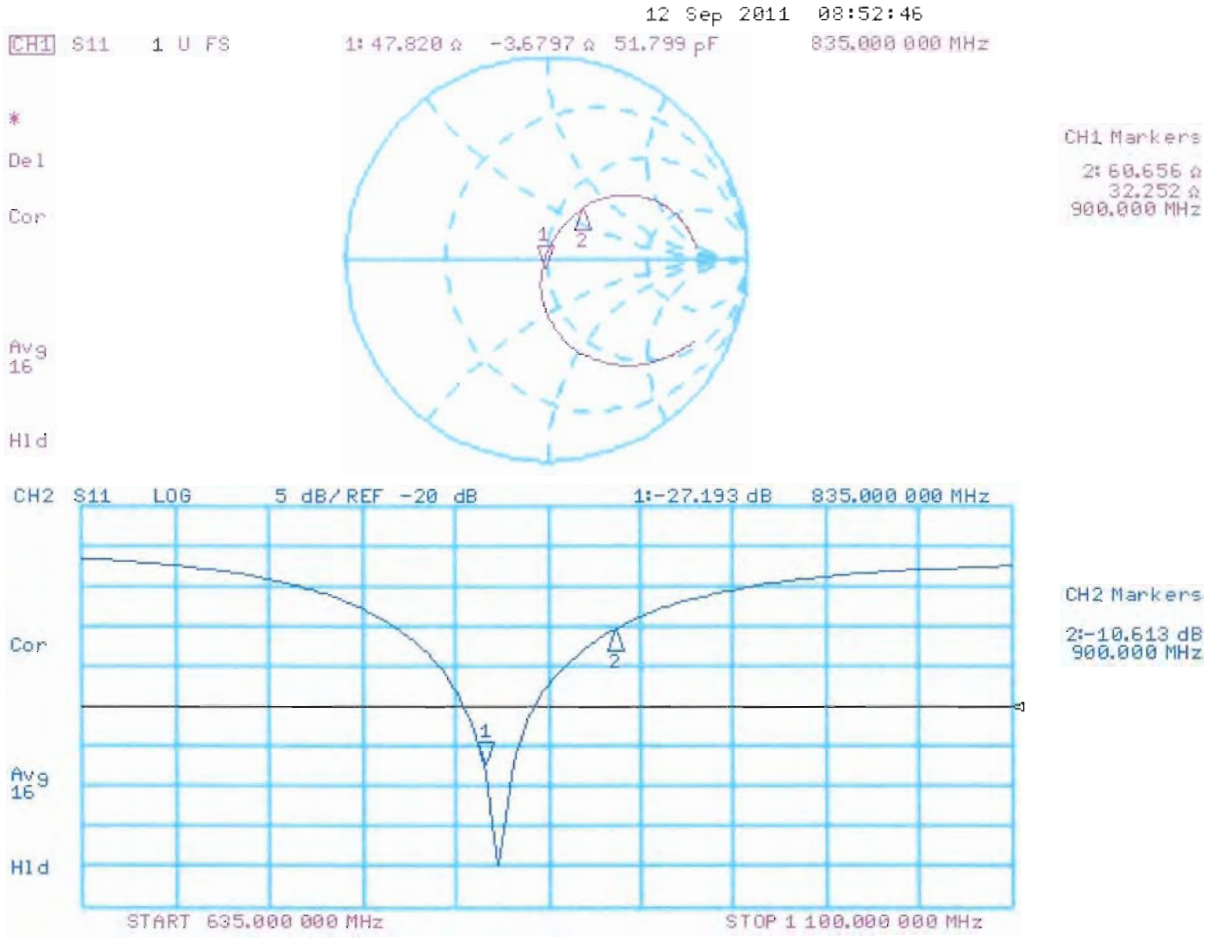
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

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

Impedance Measurement Plot for Body TSL



Dipole D835V2 – SN: 462 Antenna Parameters measured: 2012-04-03.

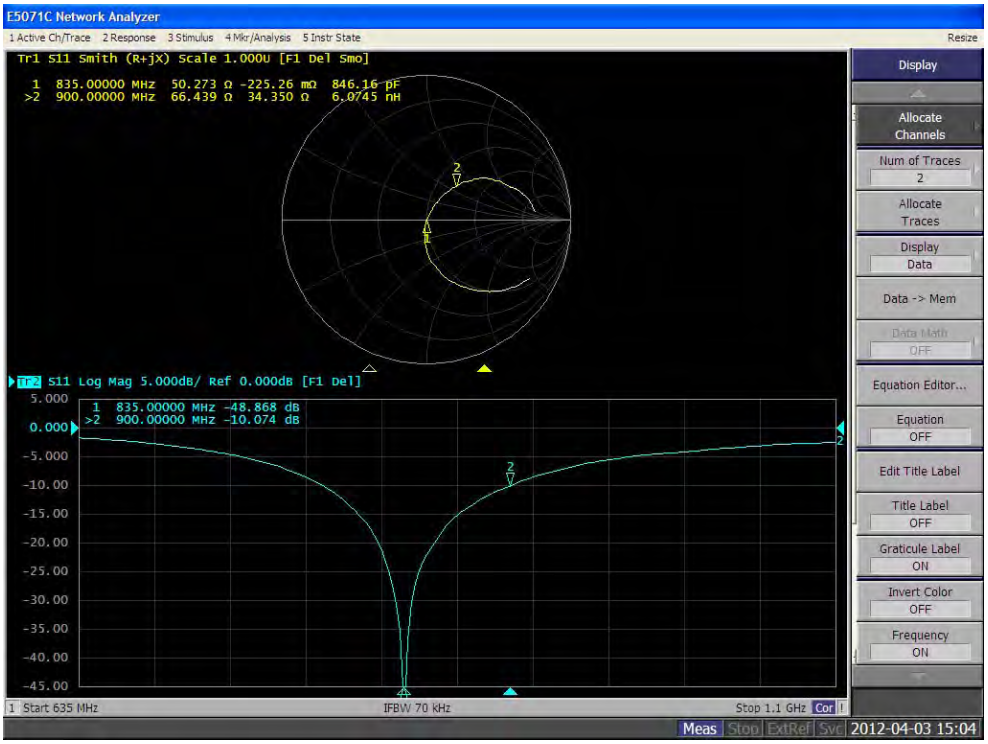
Antenna Parameters with Head TSL

	Calibration certificate	Annual measurement
Impedance, transformed to feed point	50.7 Ω - 2.8 jΩ	50.3 Ω - 0.2 jΩ
Return loss	-30.7 dB	-48.9 dB

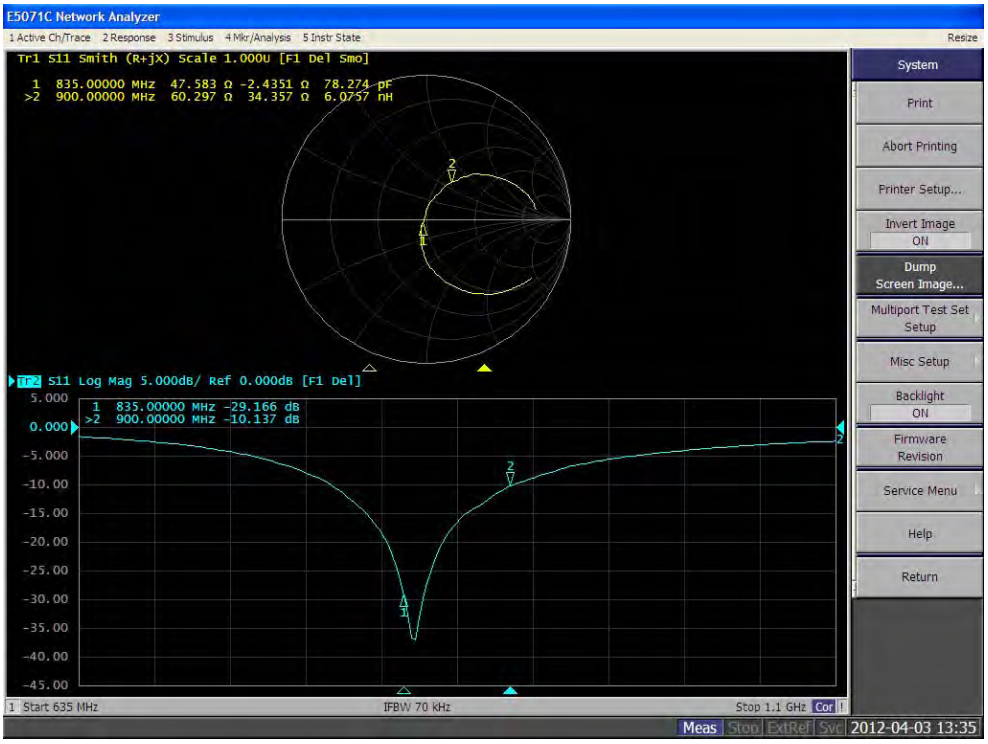
Antenna Parameters with Body TSL

	Calibration certificate	Annual measurement
Impedance, transformed to feed point	47.4 Ω - 3.8 jΩ	47.6 Ω - 2.4 jΩ
Return loss	-26.5 dB	-29.2 dB

Impedance Measurement Plot for Head TSL 835



Impedance Measurement Plot for Body TSL 835



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

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

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: D1900V2-5d030_Feb12

CALIBRATION CERTIFICATE

Object: D1900V2 - SN: 5d030

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

Calibration date: February 22, 2012

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	05-Oct-11 (No. 217-01451)	Oct-12
Power sensor HP 8481A	US37292783	05-Oct-11 (No. 217-01451)	Oct-12
Reference 20 dB Attenuator	SN: 5086 (20g)	29-Mar-11 (No. 217-01368)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-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-11)	In house check: Oct-13
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-11)	In house check: Oct-13
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-11)	In house check: Oct-12

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	Israe El-Naouq
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 22, 2012

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.0 Ω + 5.3 jΩ
Return Loss	- 25.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.6 Ω + 5.4 jΩ
Return Loss	- 24.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.192 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
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	December 17, 2002

DASY5 Validation Report for Head TSL

Date: 22.02.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d030

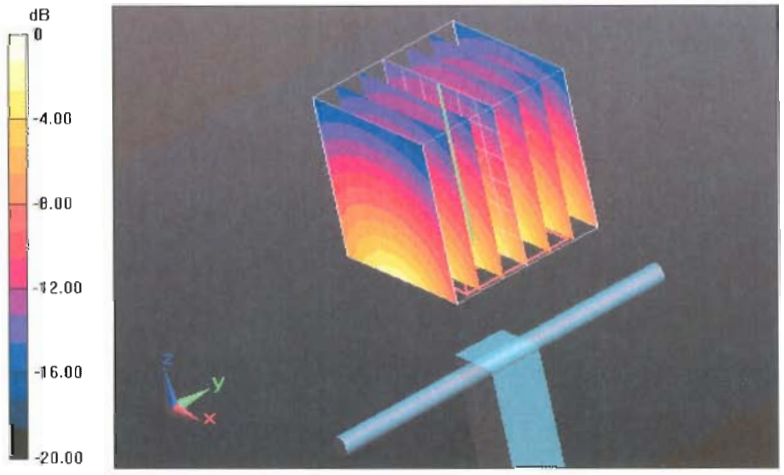
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.4 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); Calibrated: 30.12.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

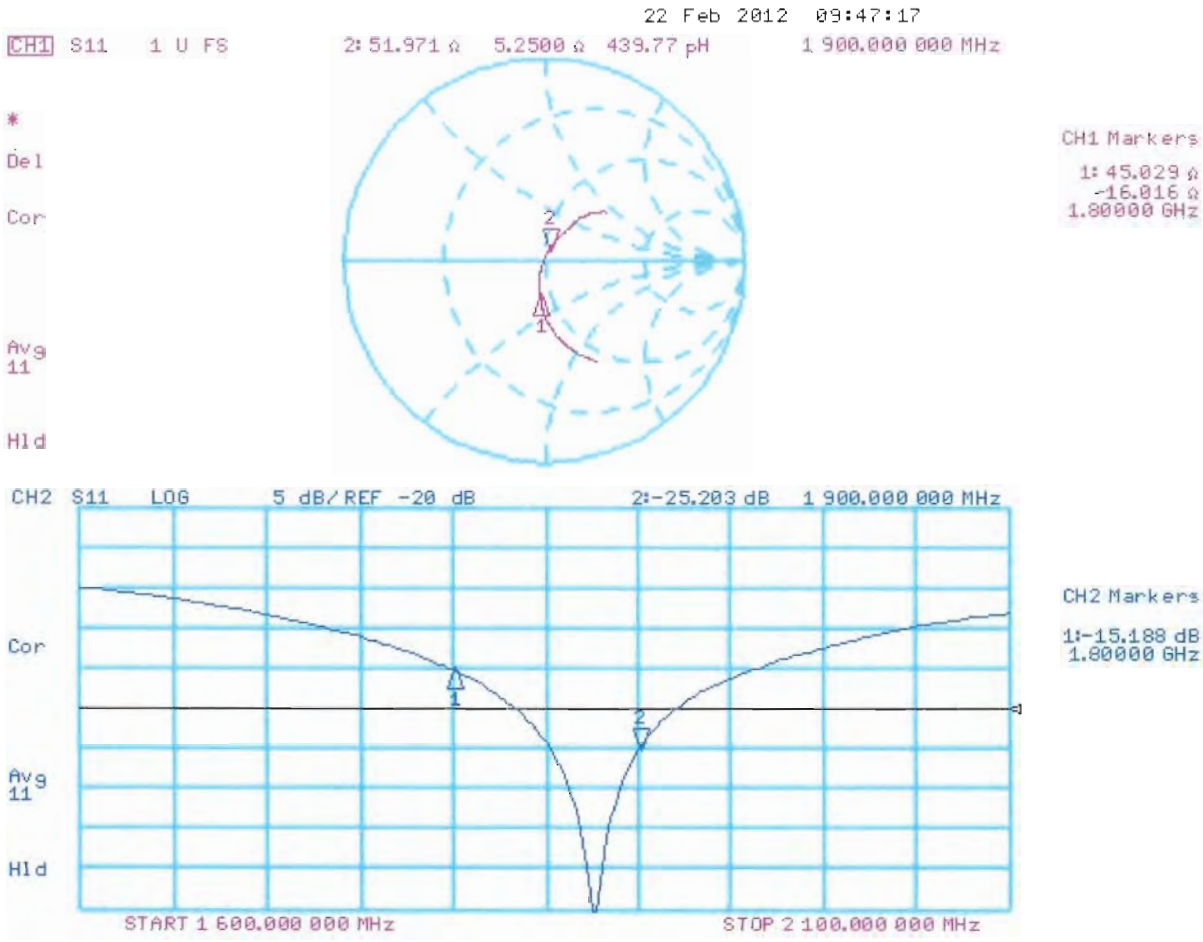
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.565 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 17.4270
SAR(1 g) = 9.79 mW/g; SAR(10 g) = 5.18 mW/g
Maximum value of SAR (measured) = 12.117 mW/g



0 dB = 12.120mW/g = 21.67 dB mW/g

Impedance Measurement Plot for Head TSL



Date: 22.02.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d030

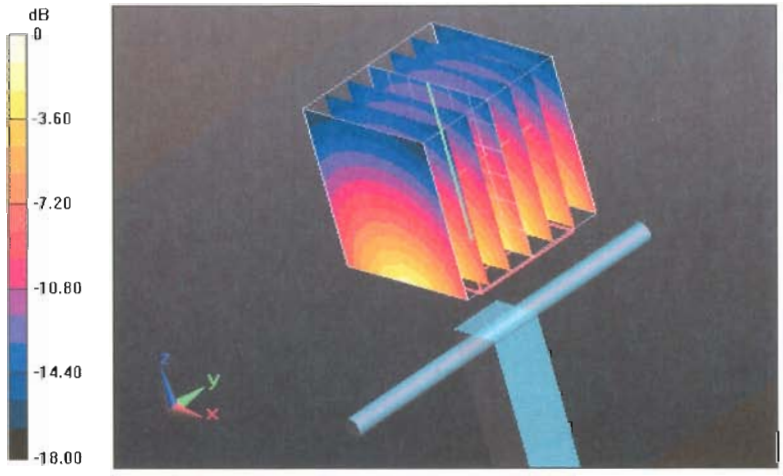
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.56 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.62, 4.62, 4.62); Calibrated: 30.12.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

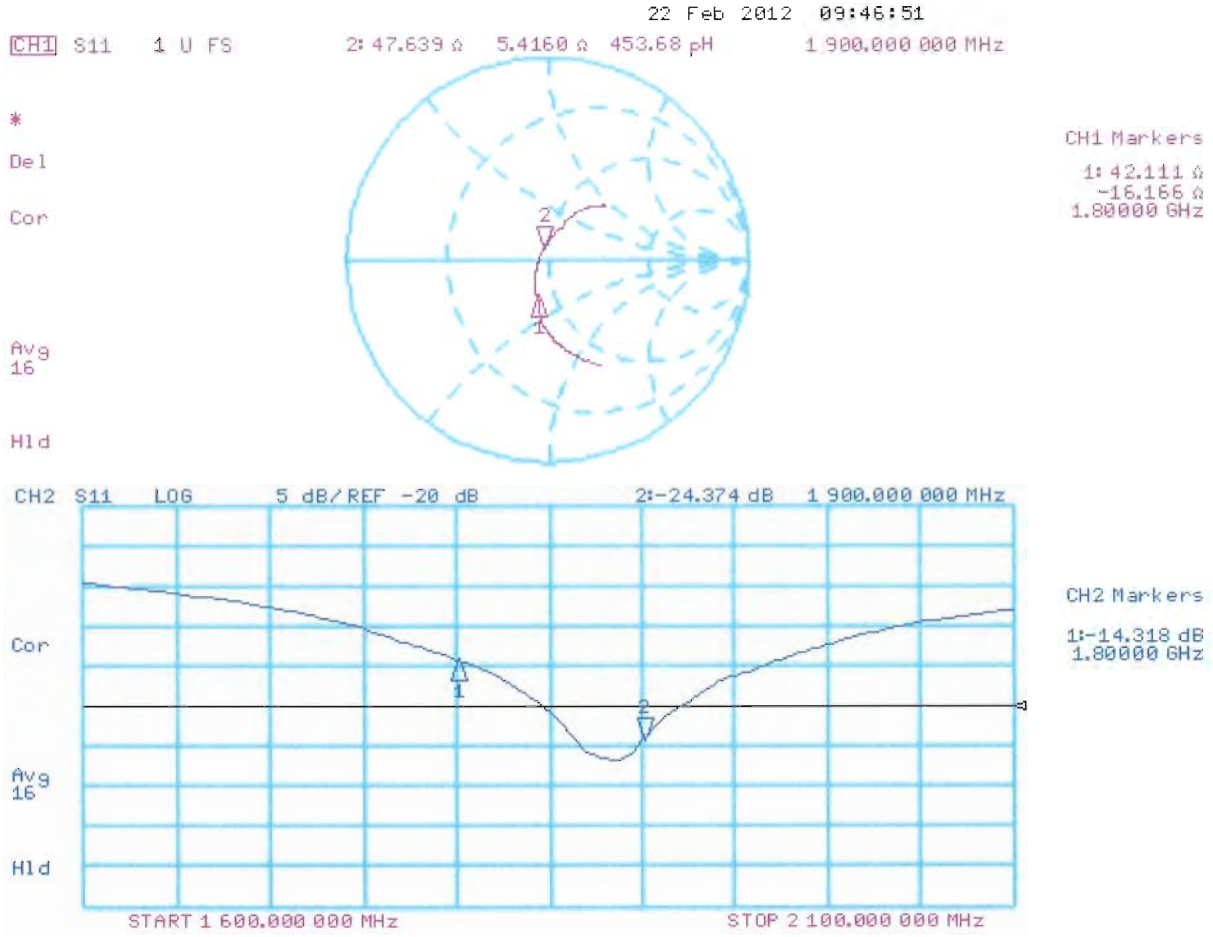
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.541 V/m; Power Drift = -0.0095 dB
Peak SAR (extrapolated) = 17.4260
SAR(1 g) = 9.87 mW/g; SAR(10 g) = 5.17 mW/g
Maximum value of SAR (measured) = 12.485 mW/g



0 dB = 12.480mW/g = 21.92 dB mW/g

Impedance Measurement Plot for Body TSL



Dipole D1900V2 - SN5d030 Antenna Parameters measured: 2012-04-02.

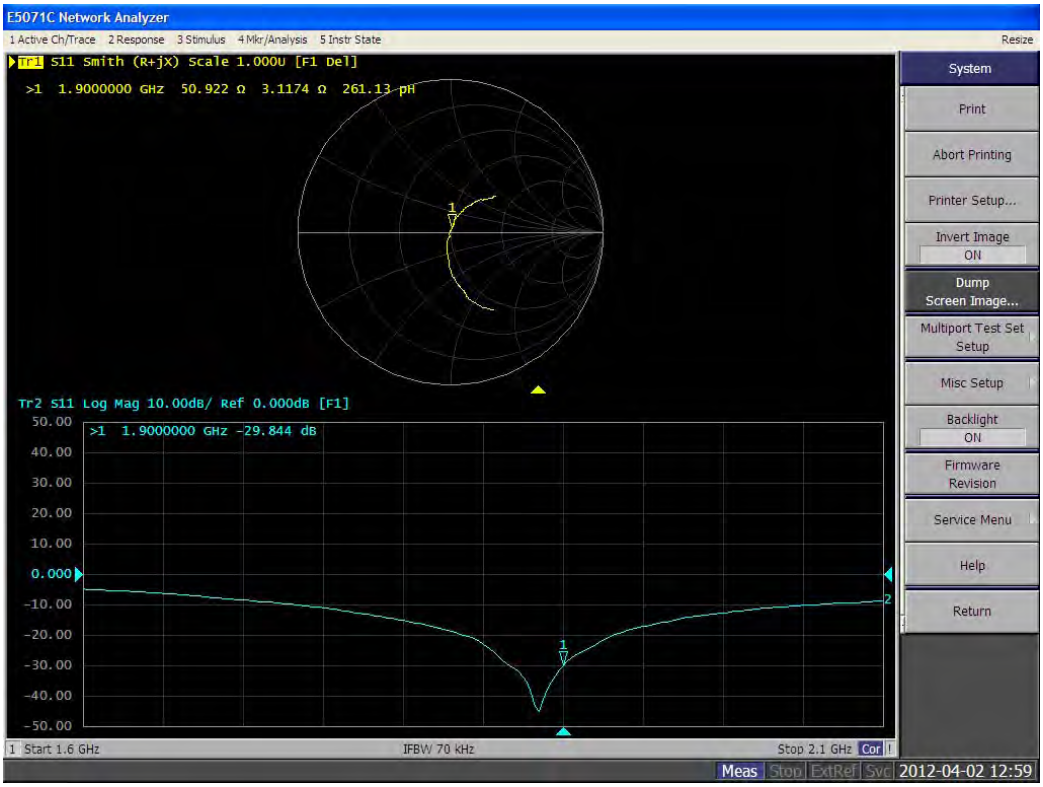
Antenna Parameters with Head TSL

	Calibration certificate	Annual measurement
Impedance, transformed to feed point	52.0 Ω 5.3 jΩ	50.9 Ω 3.1 jΩ
Return loss	-25.2 dB	-29.8 dB

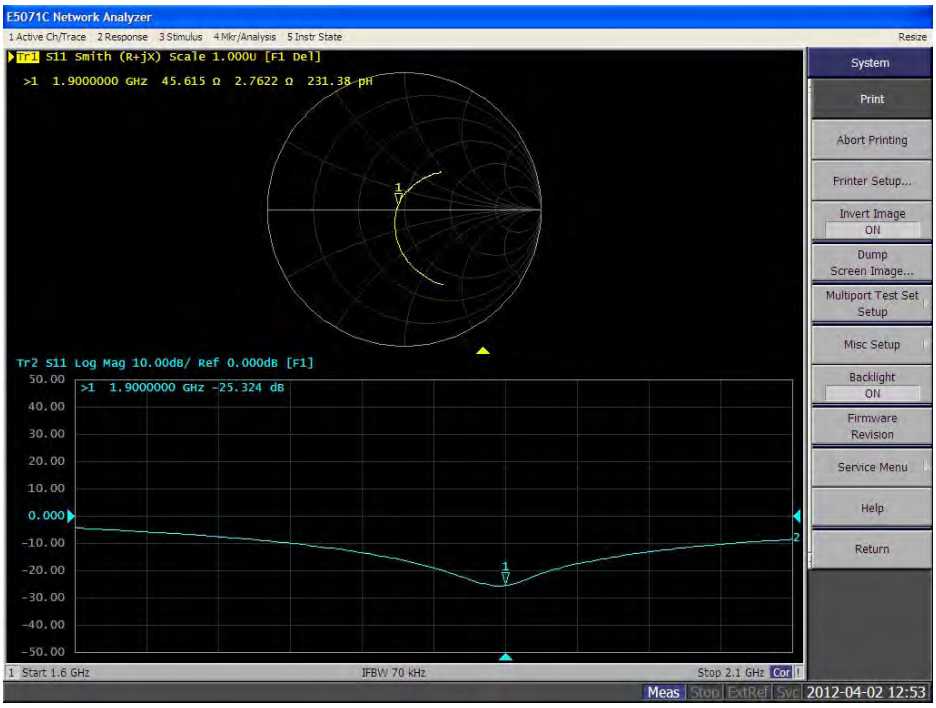
Antenna Parameters with Body TSL

	Calibration certificate	Annual measurement
Impedance, transformed to feed point	47.6 Ω 5.4 jΩ	45.6 Ω 2.8 jΩ
Return loss	-24.4 dB	-25.3 dB

Impedance Measurement Plot for Head TSL 1900



Impedance Measurement Plot for Body TSL 1900



APPENDIX F: CONDUCTED POWER MEASUREMENTS FOR SUPPORTED GSM/GPRS/EGPRS TRANSMISSION MODES

F.1 Power Tuning Targets

Tuning targets GSM850			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	32.5	32.5	32.5
GPRS 2-slot	31.5	31.5	31.5
GPRS 3-slot	29.7	29.7	29.7
GPRS 4-slot	28.5	28.5	28.5
EGRPS 1-slot	26.5	26.5	26.5
EGPRS 2-slot	26.5	26.5	26.5
EGRPS 3-slot	26.2	26.2	26.2
EGPRS 4-slot	25.0	25.0	25.0

Tuning targets GSM850 in WR mode			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	32.5	32.5	32.5
GPRS 2-slot	30.0	30.0	30.0
GPRS 3-slot	28.2	28.2	28.2
GPRS 4-slot	27.0	27.0	27.0
EGRPS 1-slot	26.5	26.5	26.5
EGPRS 2-slot	26.5	26.5	26.5
EGRPS 3-slot	26.2	26.2	26.2
EGPRS 4-slot	25.0	25.0	25.0

Tuning targets GSM1900			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	30.0	30.0	30.0
GPRS 2-slot	29.5	29.5	29.5
GPRS 3-slot	27.7	27.7	27.7
GPRS 4-slot	26.5	26.5	26.5
EGRPS 1-slot	25.5	25.5	25.5
EGPRS 2-slot	25.5	25.5	25.5
EGRPS 3-slot	25.5	25.5	25.5
EGPRS 4-slot	25.0	25.0	25.0

Tuning targets GSM1900 in WR mode			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	27.5	27.5	27.5
GPRS 2-slot	24.5	24.5	24.5
GPRS 3-slot	22.7	22.7	22.7
GPRS 4-slot	21.5	21.5	21.5
EGRPS 1-slot	25.5	25.5	25.5
EGPRS 2-slot	24.5	24.5	24.5
EGRPS 3-slot	22.7	22.7	22.7
EGPRS 4-slot	21.5	21.5	21.5

F.2 Conducted Power from the Samples used in the Testing

Type: RM-846; Serial number: 004402/47/107849/7 used for GSM/GPRS/EGPRS850 for SAR Head and Body-worn measurements

Type: RM-846; Serial number: 004402/47/107848/9 used for GSM/GPRS/EGPRS1900 for SAR Head and Body-worn measurements.

GSM850			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	33.53	33.28	33.27
GPRS 2-slot	31.86	32.05	32.02
GPRS 3-slot	30.54	30.67	30.50
GPRS 4-slot	29.31	29.30	29.05
EGRPS 1-slot	27.21	27.31	26.97
EGPRS 2-slot	27.11	27.17	26.86
EGRPS 3-slot	27.01	26.98	26.79
EGPRS 4-slot	25.77	25.74	25.48

GSM1900			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	30.64	30.36	30.41
GPRS 2-slot	30.09	30.10	29.96
GPRS 3-slot	28.31	28.27	28.26
GPRS 4-slot	27.26	27.14	27.06
EGRPS 1-slot	26.17	26.06	26.12
EGPRS 2-slot	26.08	26.03	26.04
EGRPS 3-slot	26.01	25.89	25.86
EGPRS 4-slot	25.88	25.68	25.62

Type: RM-846; Serial number: 004402/47/107954/5 used for GSM/GPRS/EGPRS850 and for GSM/GPRS/EGPRS1900 Wireless Router mode testing.

GSM850 in WR mode			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	33.02	33.19	33.24
GPRS 2-slot	30.53	30.66	30.64
GPRS 3-slot	29.03	29.03	28.83
GPRS 4-slot	27.62	27.49	27.36
EGRPS 1-slot	27.08	27.11	27.12
EGPRS 2-slot	26.99	27.00	26.92
EGRPS 3-slot	26.78	26.87	26.70
EGPRS 4-slot	25.67	25.73	25.67

GSM1900 in WR mode			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	28.11	28.10	28.02
GPRS 2-slot	25.08	25.00	24.92
GPRS 3-slot	23.11	23.15	23.08
GPRS 4-slot	22.05	22.05	21.94
EGRPS 1-slot	26.12	26.14	26.12
EGPRS 2-slot	25.14	25.00	24.95
EGRPS 3-slot	23.19	23.13	23.11
EGPRS 4-slot	22.06	21.98	21.90

APPENDIX G: CONDUCTED POWER MEASUREMENTS FOR SUPPORTED WCDMA TRANSMISSION MODES

G.1 Power Tuning Targets

Tuning targets			
Mode	Low channel	Mid channel	High channel
WCDMA850	24.0	24.0	24.0
WCDMA1900	22.5	22.5	22.5

Tuning targets in WR mode			
Mode	Low channel	Mid channel	High channel
WCDMA850	24.0	24.0	24.0
WCDMA1900	19.0	19.0	19.0

G.2 Conducted Power from the Samples used in the Testing

Type: RM-846; Serial number: 004402/47/107849/7 used for WCDMA850 for SAR Head and Body-worn and Wireless router measurements

Type: RM-846; Serial number: 004402/47/107848/9 used for WCDMA1900 for SAR Head and Body-worn measurements

WCDMA850 (Band 5)			
Mode	Low channel	Mid channel	High channel
WCDMA	24.51	24.40	24.36

WCDMA1900 (Band 2)			
Mode	Low channel	Mid channel	High channel
WCDMA	22.93	22.90	22.89

Type: RM-846; Serial number: 004402/47/107954/5 used for WCDMA1900 Wireless Router mode testing.

WCDMA1900 (Band 2) in WR mode			
Mode	Low channel	Mid channel	High channel
WCDMA	19.54	19.53	19.40