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Finnish Accreditation Service
T117 (EN ISO/IEC 17025)

SAR Compliance Test Report

Test report no.:	FCC_RM-917_01	**Date of report:**	2013-03-02
Template version:	19.3	**Number of pages:**	114
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Measurements made by:	Juha-Matti Varjonen, Teuvo Miettinen, Koskinen Nina, Maninen Anni		
Tested device:	RM-917		
FCC ID:	QTLRM-917	**IC:**	-
Supplement reports:	SAR_Photo_RM-917_02		
Testing has been carried out in accordance with:	**47CFR §2.1093** Radiofrequency Radiation Exposure Evaluation: Portable Devices **FCC OET Bulletin 65 (Edition 97-01), Supplement C (Edition 01-01)** Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields **RSS-102** Evaluation Procedure for Mobile and Portable Radio Transmitters with Respect to Health Canada's Safety Code 6 for Exposure of Humans to Radio Frequency Fields **IEEE 1528 - 2003** IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Technique		
Documentation:	The documentation of the testing performed on the tested devices is archived for 15 years at TCC Nokia.		
Test results:	**The tested device complies with the requirements in respect of all parameters subject to the test.** The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.		

Date and signatures:

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2013-02-07 to 2013-03-01
SN, HW and SW numbers of tested device	SN: 355913/05/000064/0, HW: 0201, SW: 1030.6400.1304.10070, DUT: 17096 SN: 355913/05/000072/3, HW: 0201, SW: 1030.6400.1304.10070, DUT: 17098 SN: 355913/05/000069/9, HW: 0201, SW: 1030.6400.1304.10070, DUT: 17097 SN: 355913/05/000096/2, HW: 0201, SW: 1030.6400.1304.10070, DUT: 17259 SN: 355913/05/000141/6, HW: 0201, SW: 1030.6400.1304.10070, DUT: 17258
Batteries used in testing	BL-5J, DUT: 17099, 17100, 17101, 17102, 17103, 17104, 17105, 17106
Headsets used in testing	WH-108, DUT: 17107, 17108, 17109, 17110
Other accessories used in testing	-
State of sample	Prototype unit
Notes	-

1.2 Maximum Results

The maximum measured SAR values for Head, Body Worn and Wireless Router configuration are given in sections 1.2.1, 1.2.2 and 1.2.3 respectively. The device conforms to the requirements of the standard(s) when the maximum measured SAR value is less than or equal to the limit.

1.2.1 Head Configuration

Mode	Ch / *f*(MHz)	Conducted power	Position	Measured SAR value (1g avg)	Reported* SAR value (1g avg)	SAR limit (1g avg)	Result	Plot #
4-slot GPRS850	190 / 836.6	27.35 dBm	Right, Cheek	1.21 W/kg	**1.36 W/kg**	1.6 W/kg	PASSED	1
WCDMA850	4233 / 846.6	24.00 dBm	Right, Cheek	0.844 W/kg	**0.95 W/kg**	1.6 W/kg	PASSED	2
WCDMA1700/2100	1312 / 1712.4	24.43 dBm	Left, Cheek	1.23 W/kg	**1.38 W/kg**	1.6 W/kg	PASSED	3
4-slot GPRS1900	512 / 1850.2	24.90 dBm	Left, Cheek	0.733 W/kg	**0.82 W/kg**	1.6 W/kg	PASSED	4
WCDMA1900	9262 / 1852.4	22.96 dBm	Left, Cheek	0.795 W/kg	**0.89 W/kg**	1.6 W/kg	PASSED	5
WLAN2450	1 / 2412.0	18.60 dBm	Right, Cheek	0.945 W/kg	**1.06 W/kg**	1.6 W/kg	PASSED	6
4-slot GPRS850 + WLAN2450	-	-	Right, Cheek	1.23 W/kg	**1.38 W/kg**	1.6 W/kg	PASSED	12
WCDMA850 + WLAN2450	-	-	Right, Cheek	1.07 W/kg	**1.20 W/kg**	1.6 W/kg	PASSED	8
WCDMA1700/2100 + WLAN2450	-	-	Left, Cheek	1.28 W/kg	**1.43 W/kg**	1.6 W/kg	PASSED	9
4-slot GPRS1900 + WLAN2450	-	-	Right, Cheek	1.02 W/kg	**1.14 W/kg**	1.6 W/kg	PASSED	10
WCDMA1900 + WLAN2450	-	-	Right, Cheek	1.04 W/kg	**1.16 W/kg**	1.6 W/kg	PASSED	11

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	190 / 836.6	27.35 dBm	1.5 cm	0.904 W/kg	**1.01 W/kg**	1.6 W/kg	PASSED	15
WCDMA850	4175 / 835.0	23.92 dBm	1.5 cm	0.845 W/kg	**0.95 W/kg**	1.6 W/kg	PASSED	16
WCDMA1700/2100	1312 / 1712.4	24.43 dBm	1.5 cm	0.924 W/kg	**1.04 W/kg**	1.6 W/kg	PASSED	17
4-slot GPRS1900	810 / 1909.8	24.90 dBm	1.5 cm	0.878 W/kg	**0.99 W/kg**	1.6 W/kg	PASSED	18
WCDMA1900	9538 / 1907.6	23.20 dBm	1.5 cm	1.23 W/kg	**1.38 W/kg**	1.6 W/kg	PASSED	19
WLAN2450	11 / 2462.0	18.50 dBm	1.5 cm	0.135 W/kg	**0.16 W/kg**	1.6 W/kg	PASSED	20
4-slot GPRS850 + WLAN2450	-	-	1.5 cm	0.920 W/kg	**1.03 W/kg**	1.6 W/kg	PASSED	21
WCDMA850 + WLAN2450	-	-	1.5 cm	0.866 W/kg	**0.97 W/kg**	1.6 W/kg	PASSED	22
WCDMA1700/2100 + WLAN2450	-	-	1.5 cm	0.924 W/kg	**1.04 W/kg**	1.6 W/kg	PASSED	17
4-slot GPRS1900 + WLAN2450	-	-	1.5 cm	0.878 W/kg	**0.99 W/kg**	1.6 W/kg	PASSED	18
WCDMA1900 + WLAN2450	-	-	1.5 cm	1.23 W/kg	**1.38 W/kg**	1.6 W/kg	PASSED	19

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 #
GSM850	251 / 848.8	32.96 dBm	10.0 mm	1.08 W/kg	**1.21 W/kg**	1.6 W/kg	PASSED	**26**
WCDMA850	4175 / 835.0	23.65 dBm	10.0 mm	1.01 W/kg	**1.13 W/kg**	1.6 W/kg	PASSED	**27**
WCDMA1700/2100	1513 / 1752.6	23.60 dBm	10.0 mm	1.05 W/kg	**1.18 W/kg**	1.6 W/kg	PASSED	**28**
4-slot GPRS1900	810 / 1909.8	22.50 dBm	10.0 mm	0.770 W/kg	**0.86 W/kg**	1.6 W/kg	PASSED	**29**
WCDMA1900	9538 / 1907.6	19.11 dBm	10.0 mm	1.00 W/kg	**1.12 W/kg**	1.6 W/kg	PASSED	**30**
WLAN2450	1 / 2412.0	18.60 dBm	10.0 mm	0.256 W/kg	**0.29 W/kg**	1.6 W/kg	PASSED	**31**
4-slot GPRS850 + WLAN2450	-	-	10.0 mm	1.13 W/kg	**1.27 W/kg**	1.6 W/kg	PASSED	**32**
WCDMA850 + WLAN2450	-	-	10.0 mm	1.04 W/kg	**1.16 W/kg**	1.6 W/kg	PASSED	**33**
WCDMA1700/2100 + WLAN2450	-	-	10.0 mm	1.05 W/kg	**1.18 W/kg**	1.6 W/kg	PASSED	**28**
4-slot GPRS1900 + WLAN2450	-	-	10.0 mm	0.770 W/kg	**0.86 W/kg**	1.6 W/kg	PASSED	**29**
WCDMA1900 + WLAN2450	-	-	10.0 mm	1.00 W/kg	**1.12 W/kg**	1.6 W/kg	PASSED	**30**

* 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.

1.2.4 Summary SAR data

	FCC-defined SAR values for the Grants of Equipment Authorization		
	PCE	DTS	NII
Maximum Head SAR values	1.38W/kg	1.06W/kg	-
{Max + Max} Simultaneous Head SAR value	1.58W/kg		
Maximum Body SAR values	1.38W/kg	0.16W/kg	-
{Max + Max} Simultaneous Body SAR value	1.51W/kg		
Maximum Product Specific (Wireless Router) SAR values	1.21 W/kg	0.29 W/kg	-
Maximum Simultaneous SAR value head SAR: WCDMA1900 + WLAN2450	1.58 W/kg		

Note:

PCE contains the highest results between all cellular modes (cellular, AWS 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	0.50dB

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	30.00	28.20	27.00	32.85	30.35	28.55	27.35
	1900			1850 – 1910	28.50	27.50	25.70	24.50	28.85	27.85	26.05	24.85
EGPRS	850	GMSK	1/8 to 4/8	824 – 849	27.00	25.50	23.50	21.50	27.35	25.85	23.85	21.85
	1900			1850 – 1910	26.00	24.50	22.50	20.50	26.35	24.85	22.85	20.85
WCDMA	850		1	826 – 847	23.50				23.85			
	1700/ 2100			1712-1753	24.00				24.35			
	1900			1852 – 1908	22.50				22.85			
BT	2450	GFSK	1	2402 – 2480	9.00				10.50			

Modes of Operation	Bands	Modulation Mode	Duty Cycle	Transmitter Frequency Range (MHz)	Power Tuning Target (dBm)					Upper Limit of Power Tuning Tolerance (dBm)				
					Sub Mode 1	Sub Mode 2	Sub Mode 3	Sub Mode 4	Sub Mode 5	Sub Mode 1	Sub Mode 2	Sub Mode 3	Sub Mode 4	Sub Mode 5
HSUPA	850		1	826 – 847	22.50	21.50	20.50	21.50	22.50	22.85	21.85	20.85	21.85	22.85
	1700/ 2100			1712-1753	23.00	22.00	21.00	22.00	23.00	23.35	22.35	21.35	22.35	23.35
	1900			1852 – 1908	21.50	20.50	19.50	20.50	21.50	21.85	20.85	19.85	20.85	21.85

Modes of Operation	Bands	Modulation Mode	Duty Cycle	Transmitter Frequency Range (MHz)	Data Rate (Mbps)	Power Tuning Target (dBm)			Upper Limit of Power Tuning Tolerance (dBm)		
						Ch 1	Ch 6	Ch 11	Ch 1	Ch 6	Ch 11
WLAN b-mode	2450	DSSS	1	2412 – 2472	1	17.00	17.00	17.00	18.50	18.50	18.50
					2	17.00	17.00	17.00	18.50	18.50	18.50
					5.5	17.00	17.00	17.00	18.50	18.50	18.50
					11	17.00	17.00	17.00	18.50	18.50	18.50
WLAN g-mode	2450	OFDM	1	2412 – 2472	6	16.00	16.00	16.00	17.50	17.50	17.50
					9	16.00	16.00	16.00	17.50	17.50	17.50
					12	15.50	15.50	15.50	17.00	17.00	17.00
					18	15.00	15.00	15.00	16.50	16.50	16.50
					24	14.50	14.50	14.50	16.00	16.00	16.00
					36	14.00	14.00	14.00	15.50	15.50	15.50
					48	13.50	13.50	13.50	15.00	15.00	15.00
					54	13.50	13.50	13.50	15.00	15.00	15.00
WLAN n-mode 20MHz	2450	OFDM	1	2412 – 2472	6.5/7.25	15.50	15.50	15.50	17.00	17.00	17.00
					13.0/14.4	15.00	15.00	15.00	16.50	16.50	16.50
					19.5/21.7	14.50	14.50	14.50	16.00	16.00	16.00
					26.0/28.9	14.00	14.00	14.00	15.50	15.50	15.50
					39.0/43.3	14.00	14.00	14.00	15.50	15.50	15.50
					52.0/57.8	13.50	13.50	13.50	15.00	15.00	15.00
					58.5/65.0	13.00	13.00	13.00	14.50	14.50	14.50
					65.0/72.2	13.00	13.00	13.00	14.50	14.50	14.50

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

This device has Voice-over-IP and DTM capability for use at the ear. Therefore, SAR for multi slot GPRS mode was evaluated against the head profile of the phantom.

This is a WCDMA HSUPA device, but SAR tests for HSUPA mode have not been performed as no HSUPA Sub-test mode has an average power > 0.25dB above the basic WCDMA 12.2kbps RMC mode. Appendix D of this report gives a summary of the measured WCDMA and HSUPA average powers; a detailed report of these WCDMA and HSUPA conducted power tests is submitted separately.

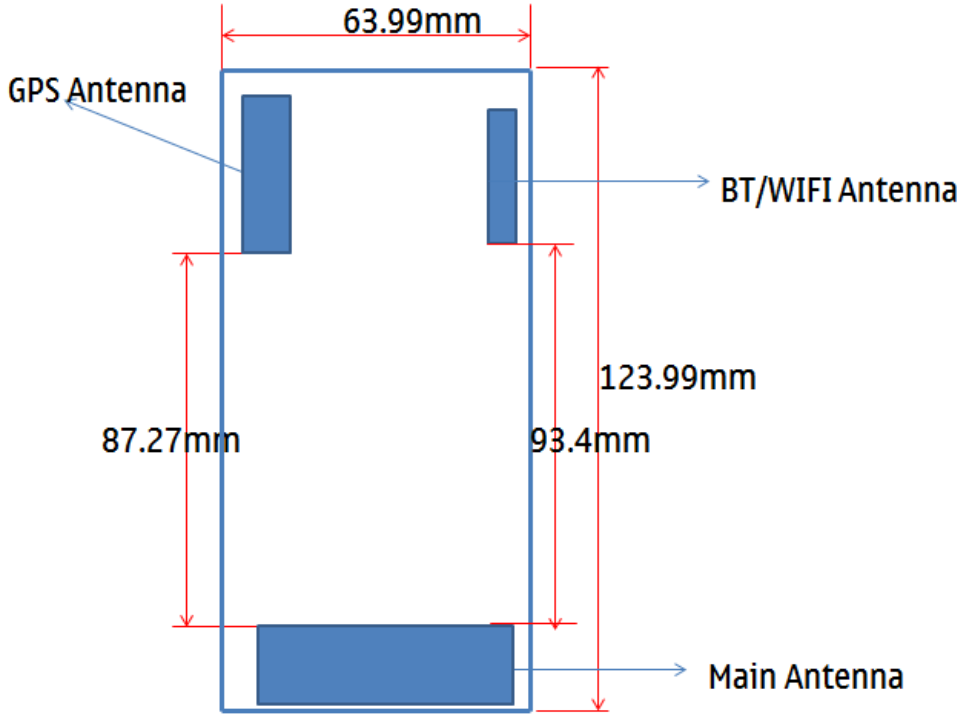
This is a BT Class 1 device; as its power tuning target plus tolerance is 8.5dBm (7.08mW), SAR testing was deemed unnecessary since (7.08mW/5mm)*√2.48GHz < 3.0 (KDB447498 D01 General RF Exposure Guidelines v05 Section 4.3.1 Standalone SAR test exclusion considerations)

This device has Wireless Router "Hotspot" mode capability.

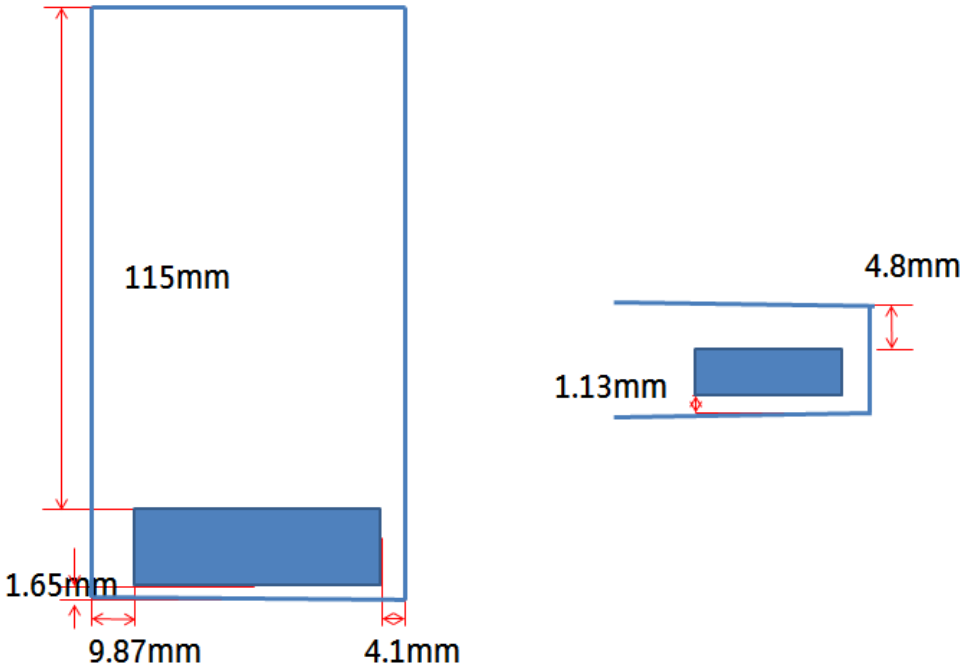
2.1 Description of the Antenna

The device has internal antennas for both cellular and WLAN use. The cellular antenna is located at the bottom underneath the back cover. The WLAN antenna is located at the top underneath the back cover.

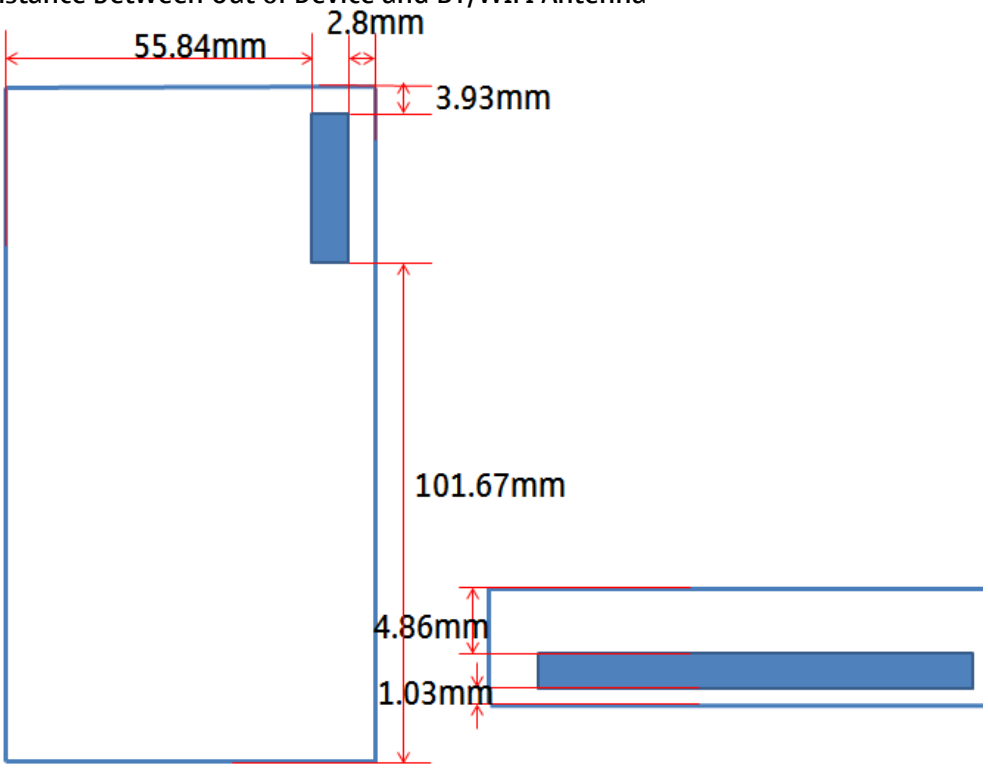
Phone Dimension and Distance Between Main antenna and BT Antenna



Distance between Out of Device and Main Antenna



Distance between Out of Device and BT/WIFI Antenna



3. TEST CONDITIONS

3.1 Temperature and Humidity

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

3.2 Test Signal, Frequencies and Output Power

This device was tested in all the available multi-slot GMSK GPRS modes.

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

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

The maximum power levels in tested samples were set to upper limit of production tuning tolerance. The conducted output power of the device was measured by a separate test laboratory on the same units as used for SAR testing. Tuning targets and conducted power results are presented in Appendix G-I.

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

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

The transmission mode of the device in all WLAN b-mode tests was DSSS QPSK 1Mbps. This mode is the default test mode used in Nokia's WLAN SAR testing.

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, D1750V2	1082	2012-12	2014-12
Dipole Validation Kit, D1900V2	5d030	2012-02	2014-02
Dipole Validation Kit, D2450V2	729	2011-09	2013-09
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	-	-
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 E
Frequency	10 MHz to 4 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 4 GHz)
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in HSL (rotation normal to probe axis)
Dynamic Range	5 µW/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 330 mm Tip length: 20 mm Body diameter: 12 mm Tip diameter: 3.9 mm Distance from probe tip to dipole centers: 2.0 mm
Application	General dosimetry up to 4 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms

4.1.2 Isotropic E-field Probe Type EX3DV4

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

4.2 Phantoms

The phantom used for all 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.

4.3.1 Tissue Simulant Recipes

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

800MHz band

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

1800MHz band

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

1900MHz band

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

2450MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	56.0	70.20
Tween 20	44.0	29.62
Salt	-	0.18

4.4 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
1750	TCC Salo / SAR-1	V4.7	D1750V2 / 1082	ES3DV3 / 3194	DAE4 / 538	2012-12	2012-12
1900	TCC Salo / SAR-1	V4.7	D1900V2 / 5d030	ES3DV3 / 3194	DAE4 / 538	2012-11	2012-11
2450	TCC Salo / SAR-4	V52.8	D2450V2 / 729	ES3DV4 / 3131	DAE4 / 728	2013-01	2013-01

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				
	2013-02-14	2.31	40.6	0.91	-0.86	-1.22	2.25	21.1	-
	2013-02-20	2.35	39.8	0.91	0.86	-3.16	2.25	21.1	1
	2013-03-01	2.34	40.4	0.92	0.43	-1.70	3.37	21.7	-
	Tolerances				±10 %	±5 %	±5 %		
1750	IEEE1528 / IEC62209		40.1	1.37					
	Reference result SN:1082	8.99	39.3	1.34	TCC Salo/SAR-1 ES3DV3 SN:3194 Head 1800MHz				
	2013-02-14	9.44	38.8	1.36	5.01	-1.27	1.49	20.6	2
	2013-02-20	9.42	39.1	1.34	4.78	-0.51	0.00	21.0	-
	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				
	2013-02-16	10.3	39.2	1.40	5.21	-2.97	0.00	21.0	3
	2013-02-18	10.1	39.5	1.41	3.17	-2.23	0.71	21.1	-
	Tolerances				±10 %	±5 %	±5 %		
2450	IEEE1528 / IEC62209		39.2	1.79					
	Reference result SN:729	13.9	38.3	1.85	TCC Salo/SAR-4 ES3DV3 SN:3131 Head 2450MHz				
	2013-02-07	13.4	37.7	1.80	-3.60	-1.57	-2.70	20.9	4
	2013-02-12	13.6	37.3	1.81	-2.16	-2.61	-2.16	20.9	-
	2013-03-01	13.5	38.5	1.80	-2.88	0.52	-2.70	20.7	-

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				
	2013-02-22	2.39	53.4	1.01	-2.45	-0.19	1.00	21.1	5
	2013-02-25	2.39	54.0	1.00	-2.45	0.93	0.00	21.6	-
	2013-02-26	2.40	53.5	1.01	-2.04	0.00	1.00	21.6	-
	Tolerances				±10 %	±5 %	±5 %		
1750	IEEE1528 / IEC62209		53.4	1.49					
	Reference result SN:1082	9.21	51.8	1.47	TCC Salo/SAR-1 ES3DV3 SN:3194 Body 1800MHz				
	2012-02-26	9.75	51.9	1.47	5.86	0.19	0.00	20.8	6
	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				
	2013-02-25	10.0	51.9	1.53	1.32	-2.08	-1.92	20.4	7
	2013-02-26	10.0	51.9	1.54	1.32	-2.08	-1.28	20.8	-
	Tolerances				±10 %	±5 %	±5 %		
2450	IEEE1528 / IEC62209		51.7	1.93					
	Reference result SN:729	13.3	51.7	2.04	TCC Salo/SAR-4 ES3DV3 SN:3131 Body 2450MHz				
	2013-02-12	13.4	50.8	1.97	0.75	-1.74	-3.43	20.7	8

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

4.5 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 %	
835	Recommended value	41.5	0.90			
	2013-02-20	40.6	0.91	-2.17	1.11	21.1
	Tolerances			±5 %	±5 %	
836	Recommended value	41.5	0.90			
	2013-02-14	40.6	0.91	-2.17	1.11	21.1
	2013-02-20	40.6	0.91	-2.17	1.11	21.1
	2013-03-01	40.4	0.92	-2.65	2.22	21.7
	Tolerances			±5 %	±5 %	
1732	Recommended value	40.1	1.36			
	2013-02-14	38.8	1.34	-3.24	-1.47	20.6
	2013-02-20	39.1	1.33	-2.49	-2.21	21.0
	Tolerances			±5 %	±5 %	
1880	Recommended value	40.0	1.40			
	2013-02-16	39.3	1.39	-1.75	-0.71	21.0
	2013-02-18	39.5	1.39	-1.25	-0.71	21.1
	Tolerances			±5 %	±5 %	
2437	Recommended value	39.2	1.79			
	2013-02-07	37.7	1.79	-3.83	0.00	20.9
	2013-02-12	37.4	1.80	-4.59	0.56	20.9
	2013-03-01	38.5	1.79	-1.79	0.00	20.7

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 %	
835	Recommended value	55.2	0.97			
	2013-02-22	53.4	1.01	-3.26	4.12	21.1
	2013-02-25	54.0	1.00	-2.17	3.09	21.6
	2013-02-26	53.5	1.01	-3.08	4.12	21.6
	Tolerances			±5 %	±5 %	
836	Recommended value	55.2	0.97			
	2013-02-22	53.4	1.01	-3.26	4.12	21.1
	2013-02-25	54.0	1.00	-2.17	3.09	21.6
	2013-02-26	53.5	1.01	-3.08	4.12	21.6
	Tolerances			±5 %	±5 %	
1732	Recommended value	53.5	1.48			
	2013-02-26	51.9	1.45	-2.99	-2.03	20.8
	Tolerances			±5 %	±5 %	
1880	Recommended value	53.3	1.52			
	2013-02-25	52.0	1.51	-2.44	-0.66	20.4
	2013-02-26	52.0	1.52	-2.44	0.00	20.8
	Tolerances			±5 %	±5 %	
2437	Recommended value	52.7	1.94			
	2013-02-12	50.8	1.95	-3.61	0.52	20.7

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” and “tilt” positions on both the left hand and right hand sides of the phantom.

The positions used in the measurements were according to IEEE 1528 - 2003 "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques".

5.2.2 Body Worn Configuration

The device was placed in the SPEAG holder using the Nokia spacer and placed below the flat section of the phantom. The distance between the device and the phantom was kept at the

separation distance indicated in Section 1.2.2 using a separate flat spacer that was removed before the start of the measurements. The device was oriented with both sides facing the phantom to find the highest results.

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

5.3 Scan Procedures

First, area scans were used for determination of the field distribution. Next, a zoom scan, a minimum of 5x5x7 points covering a volume of at least 30x30x30mm, was performed around the highest E-field value to determine the averaged SAR value. Drift was determined by measuring the same point at the start of the area scan and again at the end of the zoom scan.

5.4 SAR Averaging Methods

The maximum SAR value was averaged over a cube of tissue using interpolation and extrapolation.

The interpolation, extrapolation and maximum search routines within Dasy4 are all based on the modified Quadratic Shepard's method (Robert J. Renka, "Multivariate Interpolation Of Large Sets Of Scattered Data", University of North Texas ACM Transactions on Mathematical Software, vol. 14, no. 2, June 1988, pp. 139-148).

The interpolation scheme combines a least-square fitted function method with a weighted average method. A trivariate 3-D / bivariate 2-D quadratic function is computed for each measurement point and fitted to neighbouring points by a least-square method. For the zoom scan, inverse distance weighting is incorporated to fit distant points more accurately. The interpolating function is finally calculated as a weighted average of the quadratics.

In the zoom scan, the interpolation function is used to extrapolate the Peak SAR from the deepest measurement points to the inner surface of the phantom.

6. MEASUREMENT UNCERTAINTY

Table 6.1 – Measurement uncertainty evaluation

Uncertainty Component	Section in IEEE 1528	Tol. (%)	Prob Dist	Div	c_i	$c_i . u_i$ (%)	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 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	
GSM	Tuning Target + Tolerance [dBm]		32.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		32.88	32.89	32.89	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		23.85	23.86	23.86	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.737	0.769	0.725	0.827	0.863	0.813	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR							
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
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	
2-slot GPRS	Tuning Target + Tolerance [dBm]		30.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		30.80	30.41	30.35	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.78	24.39	24.33	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.954	0.984	0.901	1.07	1.10	1.01	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR							
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	

(850MHz Table continues)

(850MHz Table continues)

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	
3-slot GPRS	Tuning Target + Tolerance [dBm]		28.55			Scaling factor*			
	Conducted Slot Average Power [dBm]		28.97	28.83	28.81	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.71	24.57	24.55	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	1.03	1.02	0.967	1.16	1.14	1.09	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR							
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	

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]		27.55	27.35	27.37	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.54	24.34	24.36	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.949	1.11	1.01	1.07	1.25	1.13	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.548	-	-	0.615	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	1
		Full SAR	1.04	**1.21**	1.04	1.17	**1.36**	1.17	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.553	-	-	0.620	-	
	Right Cheek, Repeated	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	1.12	-	-	1.26	-	

(850MHz Table continues)

(850MHz Table continues)

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 8PSK EGPRS	Tuning Target + Tolerance [dBm]		21.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		21.85	21.87	21.90	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		18.84	18.86	18.89	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	-	0.258	-	-	0.289	-	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	

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]		23.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		23.85	23.92	24.00	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		23.85	23.92	24.00	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.661	0.779	0.804	0.742	0.874	0.902	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.402	-	-	0.451	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.669	0.785	0.841	0.751	0.881	0.944	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.411	-	-	0.461	-	
	Right Cheek Repeated	Estimated SAR	-	-	-	-	-	-	2
		Full SAR	-	-	**0.844**	-	-	**0.945**	

1700/2100MHz Head SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 1312 1712.4 MHz	Ch 1412 1732.4 MHz	Ch 1513 1752.6 MHz	Ch 1312 1712.4 MHz	Ch 1412 1732.4 MHz	Ch 1513 1752.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		24.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		24.43	24.57	24.58	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.43	24.57	24.58	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	1.20	0.787	1.20	1.35	0.883	1.35	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.445	-	-	0.499	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.644	-	-	0.723	-	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.635	-	-	0.712	-	
	Left Cheek, Repeated	Estimated SAR	-	-	-	-	-	-	3
		Full SAR	1.23	-	-	1.38	-	-	

1900MHz 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	
GSM	Tuning Target + Tolerance [dBm]		28.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		28.87	28.89	28.95	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		19.84	19.86	19.92	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.370		-	0.415	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR							
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	

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	
2-slot GPRS	Tuning Target + Tolerance [dBm]		27.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		27.89	27.97	27.97	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		21.87	21.95	21.95	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.542		-	0.608	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR							
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	

(1900MHz Table continues)

(1900MHz Table continues)

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	
3-slot GPRS	Tuning Target + Tolerance [dBm]		26.05			Scaling factor*			
	Conducted Slot Average Power [dBm]		26.05	26.07	26.17	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		21.79	21.81	21.91	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.579	-	-	0.650	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	

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]		24.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		24.90	24.86	24.90	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		21.89	21.85	21.89	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	4
		Full SAR	**0.733**	0.718	0.660	**0.822**	0.806	0.741	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.255	-	-	0.286	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.394	-	-	0.442	-	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.262	-	-	0.294	-	

(1900MHz Table continues)

(1900MHz Table continues)

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 8PSK EGPRS	Tuning Target + Tolerance [dBm]		20.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		21.00	21.09	20.99	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		17.99	18.08	17.98	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.188	-	-	0.211	-	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	-	-	-	-	
	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]		22.96	23.21	23.20	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		22.96	23.21	23.20	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	5
		Full SAR	**0.795**	0.750	0.693	**0.892**	0.842	0.778	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.308	-	-	0.346	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.467	-	-	0.524	-	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.333	-	-	0.374	-	

2450MHz Head SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 1 2412.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz	Ch 1 2412.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz	
WLAN b-mode DSSS 1 Mbps	Tuning Target + Tolerance [dBm]		18.50			Scaling factor*			
	Conducted Slot Average Power [dBm]		18.60	18.50	18.40	0.50	0.50	0.60	dB
	Time-averaged power [dBm]		18.60	18.50	18.40	1.12	1.12	1.15	Lin
	Left Cheek	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.446	-	-	0.500	-	
	Left Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.358		-	0.402	-	
	Right Cheek	Estimated SAR	-	-	-	-	-	-	6
		Full SAR	**0.945**	0.738	0.854	**1.06**	0.828	0.981	
	Right Tilt	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.495	-	-	0.555	-	
	Right Cheek, Repeated	Estimated SAR	-	-	-	-	-	-	
		Full SAR	0.881	-	-	0.988	-	-	

Values in following combined SAR tables are reported SAR values

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

Test configuration	Max. 1g SAR results					
	WLAN	4-slot GPRS 850	WCDMA 850	WCDMA 1700 /2100	4-slot GPRS 1900	WCDMA 1900
Head: Left, Cheek	0.500	1.25	0.902	**1.38**	**0.822**	**0.892**
Head: Left, Tilt	0.402	0.615	0.451	0.499	0.286	0.346
Head: Right, Cheek	**1.06**	**1.36**	**0.945**	0.723	0.442	0.524
Head: Right, Tilt	0.555	0.620	0.461	0.712	0.294	0.374

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

Test configuration	Max. 1g SAR results				
	4-slot GPRS 850 + WLAN	WCDMA 850 + WLAN	WCDMA 1700/2100 + WLAN	4-slot GPRS 1900 + WLAN	WCDMA 1900 + WLAN
Head: Left, Cheek	1.750	1.402	**1.880**	1.322	1.392
Head: Left, Tilt	1.017	0.853	0.901	0.688	0.748
Head: Right, Cheek	**2.420**	**2.005**	1.783	**1.502**	**1.584**
Head: Right, Tilt	1.175	1.016	1.267	0.849	0.929

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

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

Test configuration	Max. 1g SAR results				
	4-slot GPRS 850 + WLAN	WCDMA 850 + WLAN	WCDMA 1700/2100 + WLAN	4-slot GPRS 1900 + WLAN	WCDMA 1900 + WLAN
Head: Left, Cheek	-	-	**1.43**	-	-
Head: Left, Tilt	-	-	-	-	-
Head: Right, Cheek	**1.31**	**1.20**	-	**1.14**	**1.16**
Head: Right, Tilt	-	-	-	-	-
Plot #	07-36	08-36	09-36	10-36	11-36

Some of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 and b) uncertainties associated with the different methods of calculation.

7.1.1 Simultaneous Transmission SAR Test Exclusion Considerations

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 combinations for which the sum of simultaneously transmitting 1g SAR was above limit (See "Max+Max Combined results" table in previous section.)

Simultaneous transmissions: SAR to peak location separation ratios (KDB 447498 D01 v05)

	4-slot GPRS 850	WLAN 2450	4-slot GPRS 850	WLAN 2450	WCDMA 850	WLAN 2450	WCDMA 1700/ 2100	WLAN 2450	WCDMA 1700/ 2100	WLAN 2450
Test configration	Left Cheek		Right Cheek		Right Cheek		Left Cheek		Right Cheek	
X [mm]	68.3	19.9	67.5	30.5	66.0	30.5	69.1	19.9	66.0	30.5
Y [mm]	171.3	31.76	-264.7	-321.9	-262.1	-321.9	252.2	31.76	-258.7	-321.9
Z [mm]	-177.4	-17.43	-175.1	-175.5	-175.2	-175.5	-17.48	-17.43	-175.7	-175.5
DISTANCE [mm]	67.0		68.1		69.5		79.4		72.5	
MAX + MAX (Reported SAR)	1.745		2.418		2.005		1.880		1.783	
SAR to peak location separation ratio	0.03		**0.06**		0.04		0.03		0.03	

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

For all transmitters where SPLSR is >0.04, the following tables give individual and combined expanded zoom scan results.

Expanded Zoom Scans

Mode	Test configuration	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
		-	Ch 190 836.6 MHz	-	-	Ch 190 836.6 MHz	-	
4-slot GPRS850	Tuning Target + Tolerance [dBm]	27.35			Scaling factor*			
	Conducted Slot Average Power [dBm]	-	27.35	-	-	0.50	-	dB
	Time-averaged power [dBm]	-	24.34	-	-	1.12	-	Lin
	Right, Cheek Expanded Zoom scan	-	1.11	-	-	1.24	-	12
Mode	**Test configuration**	**Measured 1g SAR [W/kg]**			**Reported* 1g SAR [W/kg]**			**Plot #**
		Ch 1 2412.0 MHz	-	-	Ch 1 2412.0 MHz	-	-	
WLAN b-mode DSSS 1 Mbps	Tuning Target + Tolerance [dBm]	18.50	-	-	Scaling factor*			
	Conducted Slot Average Power [dBm]	18.60	-	-	0.50	-	-	dB
	Time-averaged power [dBm]	18.60	-	-	1.12	-	-	Lin
	Right, Cheek Expanded Zoom scan	0.822	-	-	0.92	-	-	13

Simultaneous transmissions: Combined SAR results – Combined Expanded Zoom Scan results

Test configuration	Max. 1g SAR results				
	4-slot GPRS 850 + WLAN	WCDMA 850 + WLAN	WCDMA 1700/2100 + WLAN	4-slot GPRS 1900 + WLAN	WCDMA 1900 + WLAN
Head: Left, Cheek	-	-	-	-	-
Head: Left, Tilt	-	-	-	-	-
Head: Right, Cheek	**1.38****	-	-	-	-
Head: Right, Tilt	-	-	-	-	-
Plot #	14-36	-	-	-	-

**both 4-slot GPRS850 and WLAN scaling factor is 1.12.

Highest result within individual zoom scan or individual expanded zoom scan results is given in Section 1.2.1 for each transmitter. Highest result within contributing individual zoom scan, individual expanded zoom scan, Speag combined algorithm or combined expanded zoom scan results are given in Section for each simultaneous transmitter combination.

7.2 The measured Body SAR values for the test device

850MHz Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg] Ch 128 824.2 MHz	Measured 1g SAR [W/kg] Ch 190 836.6 MHz	Measured 1g SAR [W/kg] Ch 251 848.8 MHz	Reported* 1g SAR [W/kg] Ch 128 824.2 MHz	Reported* 1g SAR [W/kg] Ch 190 836.6 MHz	Reported* 1g SAR [W/kg] Ch 251 848.8 MHz	Plot #
4-slot GPRS	Tuning Target + Tolerance [dBm]			27.35			Scaling factor*			
	Conducted Slot Average Power [dBm]			27.55	27.35	27.37	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			24.54	24.34	24.36	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	15
			Full SAR	0.848	**0.904**	0.885	0.951	**1.01**	0.993	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.771	0.714	0.739	0.865	0.801	0.829	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.792	0.871	0.833	0.889	0.977	0.935	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.766	-	-	0.777	-	
	Back facing phantom, Without headset, Repeated		Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.891	-	-	1.00	-	

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg] Ch 4132 826.4 MHz	Measured 1g SAR [W/kg] Ch 4175 835.0 MHz	Measured 1g SAR [W/kg] Ch 4233 846.6 MHz	Reported* 1g SAR [W/kg] Ch 4132 826.4 MHz	Reported* 1g SAR [W/kg] Ch 4175 835.0 MHz	Reported* 1g SAR [W/kg] Ch 4233 846.6 MHz	Plot #
WCDMA	Tuning Target + Tolerance [dBm]			23.85			Scaling factor*			
	Conducted Power [dBm]			23.85	23.92	24.00	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			23.85	23.92	24.00	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.748	0.813	0.769	0.839	0.912	0.863	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.647	0.728	0.687	0.726	0.817	0.771	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.652	0.739	0.729	0.732	0.829	0.818	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.588	-	-	0.660	-	
	Back facing phantom, Without headset, Repeated		Estimated SAR	-	-	-	-	-	-	16
			Full SAR	-	**0.845**		-	**0.948**	-	

1700/2100MHz Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
				Ch 1312 1712.4 MHz	Ch 1412 1732.4 MHz	Ch 1513 1752.6 MHz	Ch 1312 1712.4 MHz	Ch 1412 1732.4 MHz	Ch 1513 1752.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]			24.35			Scaling factor*			
	Conducted Slot Average Power [dBm]			24.43	24.57	24.58	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			24.43	24.57	24.58	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.838	0.713	0.808	0.940	0.800	0.907	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.639	-	-	0.717	-	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.661	-	-	0.742	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.656	-	-	0.736	-	
	Back facing phantom, Without headset, Repeated		Estimated SAR	-	-	-	-	-	-	17
			Full SAR	**0.924**	-	-	**1.04**	-	-	

1900MHz Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg] Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	Reported* 1g SAR [W/kg] Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	Plot #
4-slot GPRS	Tuning Target + Tolerance [dBm]			24.85			Scaling factor*			
	Conducted Slot Average Power [dBm]			24.90	24.86	24.90	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			21.89	21.85	21.89	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	18
			Full SAR	0.476	0.644	**0.878**	0.534	0.723	**0.985**	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	
			Full SAR		0.630	-	-	0.707	-	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.450	-	-	0.505	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.436	-	-	0.489	-	
	Back facing phantom, Without headset, Repeated		Estimated SAR	-	-	-	-	-	-	
			Full SAR	-	-	0.876	-	-	0.981	

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg] Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz	Reported* 1g SAR [W/kg] Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz	Plot #
WCDMA	Tuning Target + Tolerance [dBm]			22.85			Scaling factor*			
	Conducted Power [dBm]			22.96	23.21	23.20	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			22.96	23.21	23.20	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	19
			Full SAR	0.587	0.910	**1.23**	0.659	1.02	**1.38**	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	0.529	0.817	1.14	0.594	0.917	1.28	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR		0.571	-	-	0.641	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.550	-	-	0.617	-	
	Back facing phantom, Without headset, Repeated		Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	-	1.16	-	-	1.30	

2450MHz Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg] Ch 1 2412.0 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 1 2412.0 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]			18.50			Scaling factor*			
	Conducted Power [dBm]			18.60	18.50	18.40	0.50	0.50	0.60	dB
	Time-averaged power [dBm]			18.60	18.50	18.40	1.12	1.12	1.15	Lin
	Back facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.119	-	-	0.134	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	20
			Full SAR	0.131	0.136	**0.135**	0.147	0.153	**0.155**	
	Display facing phantom	Without headset	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.081	-	-	0.090	-	
		Headset WH-108	Estimated SAR	-	-	-	-	-	-	-
			Full SAR	-	0.088	-	-	0.099	-	

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

Test configuration	Max. 1g SAR results WLAN	4-slot GPRS850	WCDMA 850	WCDMA 1700 /2100	4-slot GPRS 1900	WCDMA 1900
Body: Back facing phantom, Without Headset	0.134	1.01	0.948	1.04	0.985	1.38
Body: Back facing phantom, Headset WH-108	0.155	0.865	0.817	0.717	0.707	1.28
Body: Display facing phantom, Without Headset	0.090	0.977	0.829	0.742	0.505	0.641
Body: Display facing phantom, Headset WH-108	0.099	0.777	0.660	0.736	0.489	0.617

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

Test configuration	Max. 1g SAR results				
	4-slot GPRS 850 + WLAN	WCDMA 850 + WLAN	WCDMA 1700/2100 + WLAN	4-slot GPRS 1900 + WLAN	WCDMA 1900 + WLAN
Body: Back facing phantom, Without Headset	**1.144**	**1.082**	**1.174**	**1.119**	**1.514**
Body: Back facing phantom, Headset WH-108	1.020	0.972	0.872	0.862	1.435
Body: Display facing phantom, Without Headset	1.067	0.919	0.832	0.595	0.731
Body: Display facing phantom, Headset WH-108	0.876	0.759	0.835	0.588	0.716

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

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

Test configuration	Max. 1g SAR results				
	4-slot GPRS 850 + WLAN	WCDMA 850 + WLAN	WCDMA 1700/2100 + WLAN	4-slot GPRS 1900 + WLAN	WCDMA 1900 + WLAN
Body: Back facing phantom, Without Headset	**1.03**	**0.971**	**1.04**	**0.935**	**1.31**
Body: Back facing phantom, Headset WH-108	-	-	-	-	-
Body: Display facing phantom, Without Headset	-	-	-	-	-
Body: Display facing phantom, Headset WH-108	-	-	-	-	-
Plot #	21-36	22-36	23-36	24-36	25-36

Some of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 and b) uncertainties associated with the different methods of calculation. In these cases, the maximum SAR values given for the combined Modes in the Summary table in Section 1.2.2 are those for the individual cellular band.

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

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

850MHz 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	
GSM	Tuning Target + Tolerance [dBm]		32.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		32.90	32.94	32.96	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		23.87	23.91	23.93	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR				-	-	-	-
		Full SAR	0.927	0.953	1.03	1.04	1.07	1.16	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.796	0.832	0.916	0.893	0.934	1.03	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.025		-	0.028	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.046		-	0.052	-	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.428		-	0.480	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.395	-	-	0.443	-	
	Back facing phantom, Repeated	Estimated SAR	-	-	-	-	-	-	26
		Full SAR	-	-	**1.08**	-	-	**1.21**	
2-slot GPRS	Tuning Target + Tolerance [dBm]		29.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		29.35	29.58	29.29	0.50	0.50	0.56	dB
	Time-averaged power [dBm]		23.33	23.56	23.31	1.12	1.12	1.14	Lin
	Back facing phantom	Estimated SAR				-	-	-	-
		Full SAR	0.832	0.833	0.837	0.932	0.935	0.954	
	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	-	-	-	-	-	-	

(850MHz Table continues)

(850MHz Table continues)

3-slot GPRS	Tuning Target + Tolerance [dBm]		27.55			Scaling factor*			
	Conducted Slot Average Power [dBm]		27.65	27.66	27.57	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		23.39	23.40	23.31	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR				-	-	-	-
		Full SAR	0.793	0.847	0.855	0.890	0.950	0.959	
	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	-	-	-	-	-	-	
4-slot GPRS	Tuning Target + Tolerance [dBm]		26.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		26.39	26.42	26.35	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		23.38	23.41	23.34	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR				-	-	-	-
		Full SAR	0.789	0.831	0.849	0.885	0.932	0.953	
	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	-	-	-	-	-	-	

(850MHz Table continues)

(850MHz Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 4132 826.4 MHz	Ch4175 835.0 MHz	Ch4233 846.6 MHz	Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		23.35			Scaling factor*			
	Conducted Power [dBm]		23.56	23.65	23.48	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		23.56	23.65	23.48	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.901	1.00	0.874	1.01	1.12	0.981	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.669	0.766	0.699	0.751	0.859	0.784	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.021	-	-	0.023	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.046	-	-	0.052	-	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.546	-	-	0.613	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.509	-	-	0.571	-	
	Back facing phantom, Repeated	Estimated SAR	-	-	-	-	-	-	27
		Full SAR	-	1.01	-	-	1.13	-	

1700/2100MHz Body SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 1312 1712.4 MHz	Ch 1412 1732.4 MHz	Ch 1513 1752.6 MHz	Ch 1312 1712.4 MHz	Ch 1412 1732.4 MHz	Ch 1513 1752.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		23.35			Scaling factor*			
	Conducted Power [dBm]		23.35	23.68	23.60	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		23.35	23.68	23.60	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.999	0.954	1.01	1.12	1.07	1.13	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	28
		Full SAR	1.02	0.969	**1.05**	1.14	1.09	**1.18**	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.082	-	-	0.092	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.593	-	-	0.665	-	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.379	-	-	0.425	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.140	-	-	0.157	-	
	Display facing phantom, Repeated	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	-	1.01	-	-	1.13	

1900MHz Body 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	
GSM	Tuning Target + Tolerance [dBm]		27.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		27.94	27.84	27.90	0.50	0.51	0.50	dB
	Time-averaged power [dBm]		18.91	18.81	18.87	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.565	-	-	0.634	-	
	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	-	-	-	-	-	-	

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	
2-slot GPRS	Tuning Target + Tolerance [dBm]		25.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		25.50	25.34	25.37	0.50	0.51	0.50	dB
	Time-averaged power [dBm]		19.48	19.32	19.35	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.543	-	-	0.609	-	
	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	-	-	-	-	-	-	

(1900MHz Table continues)

(1900MHz Table continues)

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	
3-slot GPRS	Tuning Target + Tolerance [dBm]		23.55			Scaling factor*			
	Conducted Slot Average Power [dBm]		23.61	23.55	23.70	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		19.35	19.29	19.44	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.573	-	-	0.643	-	
	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	-	-	-	-	-	-	

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]		22.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		22.44	22.44	22.50	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		19.43	19.43	19.49	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.607	-	-	0.681	-	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.454	-	-	0.509	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.024	-	-	0.027	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	29
		Full SAR	0.394	0.666	**0.770**	0.442	0.747	**0.864**	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.132	-	-	0.148	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.027	-	-	0.031	-	

(1900MHz 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]		18.85			Scaling factor*			
	Conducted Power [dBm]		19.12	19.02	19.11	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		19.12	19.02	19.11	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.492	0.731	0.964	0.552	0.820	1.08	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.544	-	-	0.610	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.029	-	-	0.033	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	0.405	0.652	0.942	0.454	0.732	1.06	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.152	-	-	0.171	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.035	-	-	0.039	-	
	Back edge facing phantom, Repeated	Estimated SAR	-	-	-	-	-	-	30
		Full SAR	-	-	**1.00**	-	-	**1.12**	

2450MHz Body SAR results

Mode	Test configuration	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 1 2412.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz	Ch 1 2412.0 MHz	Ch 6 2437.0 MHz	Ch 11 2462.0 MHz	
WLAN b-mode DSSS 1 Mbps	Tuning Target + Tolerance [dBm]		18.5			Scaling factor*			
	Conducted Power [dBm]		18.6	18.5	18.4	0.50	0.50	0.60	dB
	Time-averaged power [dBm]		18.6	18.5	18.4	1.12	1.12	1.15	Lin
	Back facing phantom	Estimated SAR	-	-	-	-	-	-	31
		Full SAR	**0.256**	0.230	0.208	**0.287**	0.258	0.239	
	Display facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.154	-	-	0.173	-	
	Top edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.111	-	-	0.125	-	
	Bottom edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.010	-	-	0.012	-	
	Left edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.003	-	-	0.004	-	
	Right edge facing phantom	Estimated SAR	-	-	-	-	-	-	-
		Full SAR	-	0.001	-	-	0.001	-	

Simultaneous transmissions: Combined SAR results – Individual band Max results

Test configuration	Max. 1g SAR results					
	WLAN	GSM 850	WCDMA 850	WCDMA 1700 /2100	4-slot GPRS1900	WCDMA 1900
Back facing phantom	0.287	1.21	1.13	1.13	0.681	1.12
Display facing phantom	0.173	1.03	0.859	1.18	0.509	0.610
Top edge facing phantom	0.125	0.028	0.023	0.092	0.027	0.033
Bottom edge facing phantom	0.012	0.052	0.052	0.665	0.864	1.06
Left edge facing phantom	0.004	0.480	0.613	0.425	0.148	0.171
Right edge facing phantom	0.001	0.443	0.571	0.157	0.031	0.039

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

Test configuration	Max. 1g SAR results				
	GSM 850 + WLAN	WCDMA 850 + WLAN	WCDMA 1700/2100 + WLAN	GSM 1900 + WLAN	WCDMA 1900 + WLAN
Back facing phantom	**1.497**	**1.417**	**1.417**	**0.968**	**1.407**
Display facing phantom	1.203	1.032	1.353	0.682	0.783
Top edge facing phantom	0.153	0.148	0.217	0.152	0.158
Bottom edge facing phantom	0.064	0.064	0.677	0.876	1.072
Left edge facing phantom	0.484	0.617	0.429	0.152	0.175
Right edge facing phantom	0.444	0.572	0.158	0.032	0.040

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

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

Test configuration	Max. 1g SAR results				
	GSM 850 + WLAN	WCDMA 850 + WLAN	WCDMA 1700/2100 + WLAN	GSM 1900 + WLAN	WCDMA 1900 + WLAN
Back facing phantom	**1.27**	**1.16**	**1.16**	**0.625**	**1.05**
Display facing phantom	-	-	-	-	-
Top edge facing phantom	-	-	-	-	-
Bottom edge facing phantom	-	-	-	-	-
Left edge facing phantom	-	-	-	-	-
Right edge facing phantom	-	-	-	-	-
Plot #	32-36	33-36	34-36	35-36	36-36

Some of the Combined SAR values in the above table are less than the maximum SAR values for the contributing cellular band. This is due to a) minimal overlap of the SAR distributions of the cellular band with WLAN2450 and b) uncertainties associated with the different methods of calculation. In these cases, the maximum SAR values given for the combined Modes in the Summary table in Section 1.2.3 are those for the individual cellular band.

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

Plots of the Measurement scans are given in Appendix B.

APPENDIX A: SYSTEM CHECKING SCANS

Plot 1

Date/Time: 2013-02-20 9:06:39

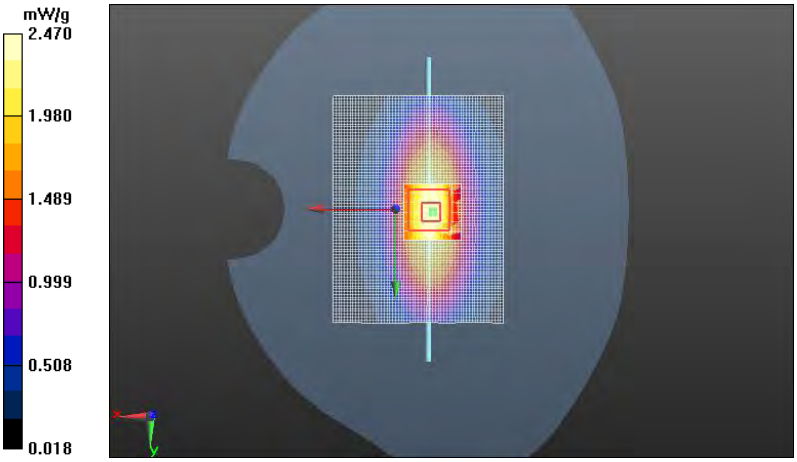
Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:462

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 = 0.906 mho/m; ε_r = 39.842; 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 14.6.5 (6469)

d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.47 mW/g

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 52.792 V/m
Peak SAR (extrapolated) = 3.528 mW/g
SAR(1 g) = 2.35 mW/g
SAR(10 g) = 1.51 mW/g
Power Drift = -0.03 dB
Maximum value of SAR (measured) = 2.53 mW/g



Plot 2

Date/Time: 2013-02-14 8:55:53

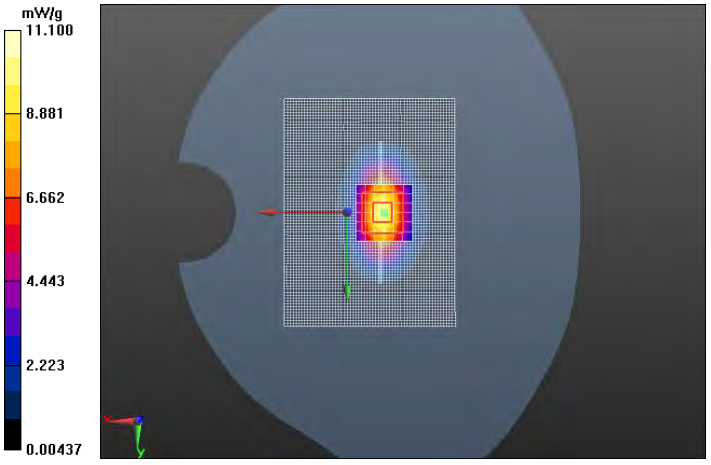
Test Laboratory: TCC Nokia
Type: D1750V2; Serial: D1750V2 - SN:1082

Communication System: CW1750
Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: HSL1800; Medium Notes: t= 20.6 C
Medium parameters used: f = 1750 MHz; σ = 1.355 mho/m; ε_r = 38.749; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(5.17, 5.17, 5.17); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- 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); SEMCAD X Version 14.6.5 (6469)

d=10mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 11.1 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.251 V/m
Peak SAR (extrapolated) = 17.152 mW/g
SAR(1 g) = 9.44 mW/g
SAR(10 g) = 5.01 mW/g
Power Drift = -0.00 dB
Maximum value of SAR (measured) = 10.6 mW/g



Plot 3

Date/Time: 2013-02-19 6:03:41
Date/Time: 2013-02-16 11:21:19

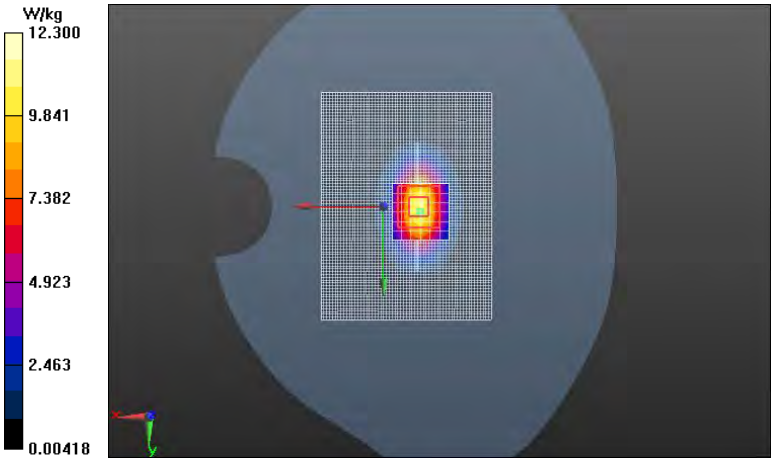
Test Laboratory: TCC Nokia
Type: D1900V2; Serial: D1900V2 - SN:5d030

Communication System: CW
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL1900; Medium Notes: t= 21.0 C
Medium parameters used: f = 1900 MHz; σ = 1.402 S/m; ε_r = 39.223; 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) = 12.3 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.668 V/m
Peak SAR (extrapolated) = 19.1 W/kg
SAR(1 g) = 10.3 W/kg
SAR(10 g) = 5.39 W/kg
Power Drift = 0.03 dB
Maximum value of SAR (measured) = 11.5 W/kg



Plot 4

Date/Time: 2013-02-07 8:59:51

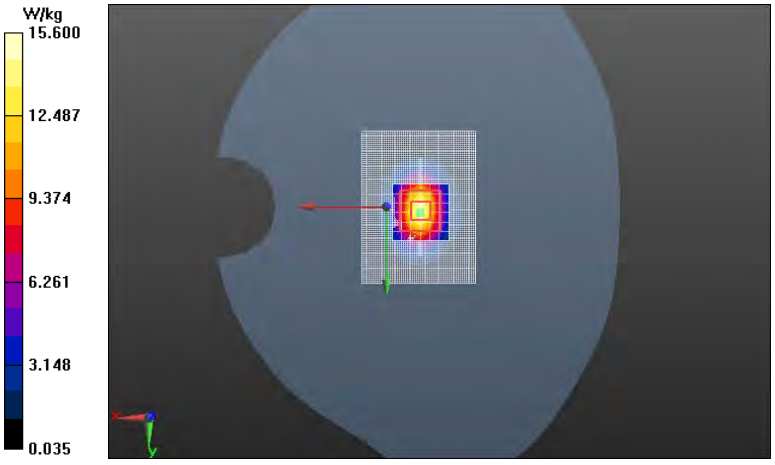
Test Laboratory: TCC Nokia
Type: D2450V2; Serial: D2450V2 - SN:729

Communication System: CW
Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: HSL2450; Medium Notes: t= 20.8 C
Medium parameters used: f = 2450 MHz; σ = 1.804 S/m; ε_r = 37.685; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(4.34, 4.34, 4.34); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2012-08-21
- Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 15.6 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.351 V/m
Peak SAR (extrapolated) = 28.2 W/kg
SAR(1 g) = 13.4 W/kg
SAR(10 g) = 6.2 W/kg
Power Drift = 0.01 dB
Maximum value of SAR (measured) = 15.3 W/kg



Plot 5

Date/Time: 2013-02-22 8:28:03

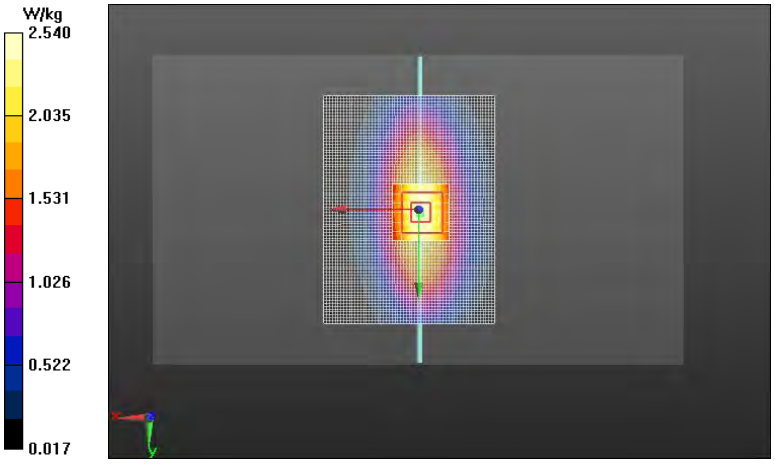
Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:462

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 835 MHz; σ = 1.007 S/m; ε_r = 53.371; 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) = 2.54 W/kg

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 50.448 V/m
Peak SAR (extrapolated) = 3.52 W/kg
SAR(1 g) = 2.39 W/kg
SAR(10 g) = 1.58 W/kg
Power Drift = 0.03 dB
Maximum value of SAR (measured) = 2.57 W/kg



Plot 6

Date/Time: 2013-02-26 18:10:59

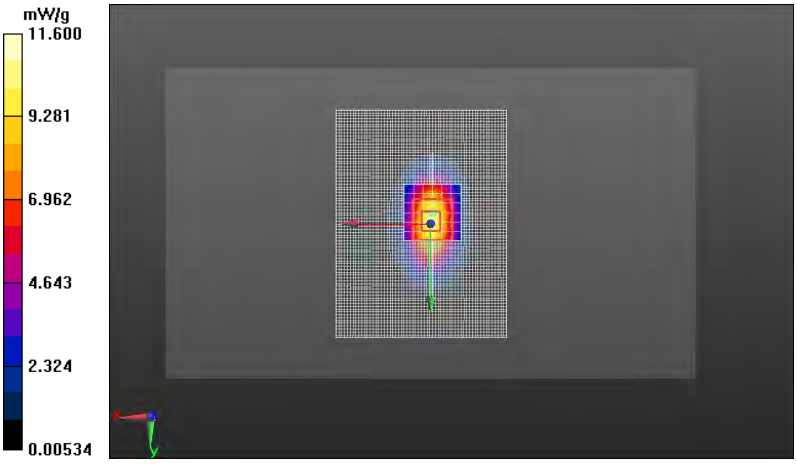
Test Laboratory: TCC Nokia
Type: D1750V2; Serial: D1750V2 - SN:1082

Communication System: CW1750
Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: BSL1800; Medium Notes: t= 20.8 C
Medium parameters used: f = 1750 MHz; σ = 1.465 mho/m; ε_r = 51.862; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.83, 4.83, 4.83); 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 14.6.5 (6469)

d=10mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 11.6 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.067 V/m
Peak SAR (extrapolated) = 17.319 mW/g
SAR(1 g) = 9.75 mW/g
SAR(10 g) = 5.22 mW/g
Power Drift = -0.01 dB
Maximum value of SAR (measured) = 11.0 mW/g



Plot 7

Date/Time: 2013-02-25 8:43:06

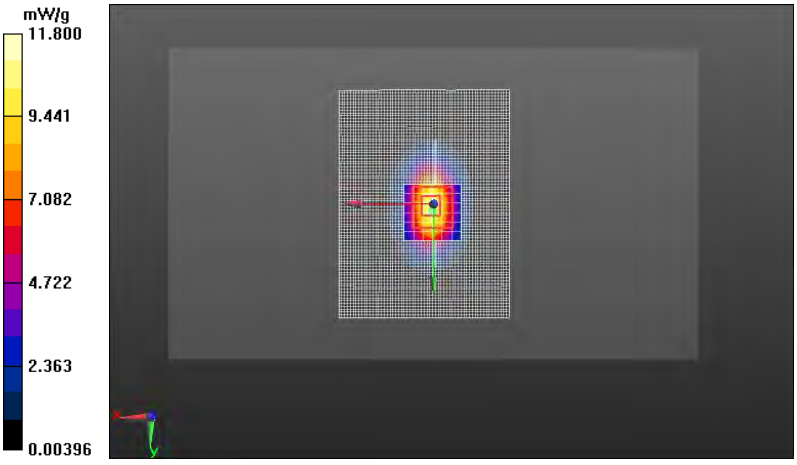
Test Laboratory: TCC Nokia
Type: D1900V2; Serial: D1900V2 - SN:5d030

Communication System: CW1900
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 20.4 C
Medium parameters used: f = 1900 MHz; σ = 1.533 mho/m; ε_r = 51.924; 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 14.6.5 (6469)

d=10mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 11.8 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 87.648 V/m
Peak SAR (extrapolated) = 18.075 mW/g
SAR(1 g) = 10 mW/g
SAR(10 g) = 5.27 mW/g
Power Drift = -0.02 dB
Maximum value of SAR (measured) = 11.3 mW/g



Plot 8

Date/Time: 2013-02-12 18:43:27

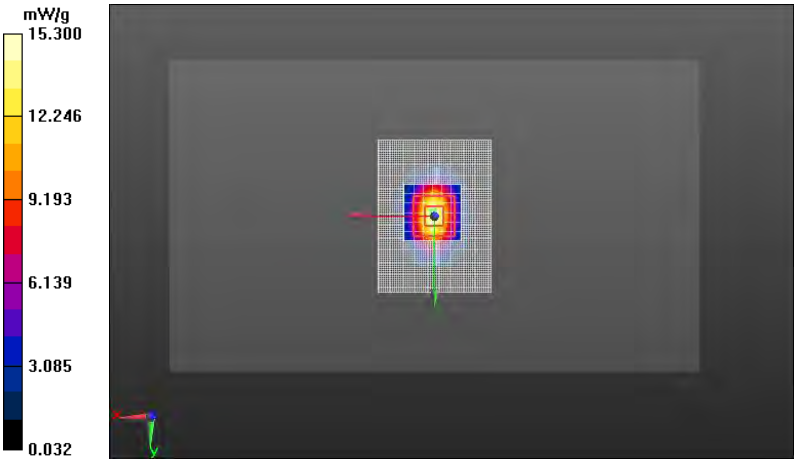
Test Laboratory: TCC Nokia
Type: D2450V2; Serial: D2450V2 - SN:729

Communication System: CW2450
Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: BSL2450; Medium Notes: t= 20.7 C
Medium parameters used: f = 2450 MHz; σ = 1.969 mho/m; ε_r = 50.792; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(4.11, 4.11, 4.11); 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 (2); SEMCAD X Version 14.6.5 (6469)

d=10mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 15.3 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 88.511 V/m
Peak SAR (extrapolated) = 28.507 mW/g
SAR(1 g) = 13.4 mW/g
SAR(10 g) = 6.24 mW/g
Power Drift = 0.04 dB
Maximum value of SAR (measured) = 15.2 mW/g



APPENDIX B: MEASUREMENT SCANS

Plot 1

Date/Time: 2013-02-15 9:13:55

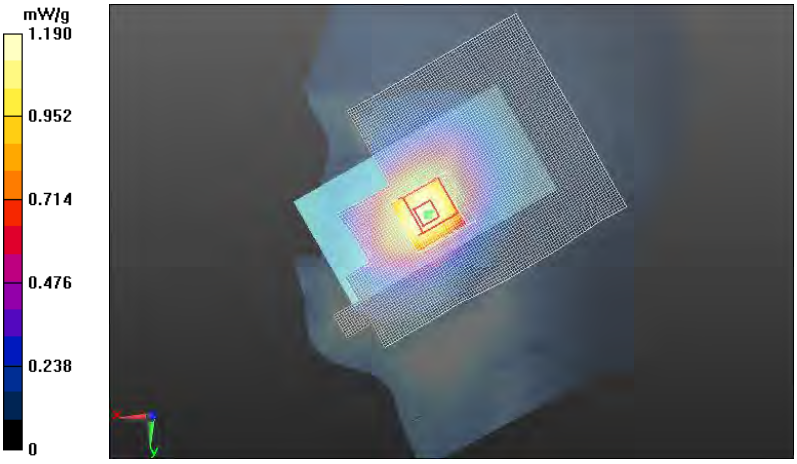
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000069/9

Communication System: 4-slot GPRS850
Frequency: 836.6 MHz; Duty Cycle: 1:2.1
Medium: HSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 837 MHz; σ = 0.909 mho/m; ε_r = 40.546; 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 14.6.5 (6469)

4-slot GPRS850 - Right/Cheek - Middle/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.19 mW/g

4-slot GPRS850 - Right/Cheek - Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 36.450 V/m
Peak SAR (extrapolated) = 1.508 mW/g
SAR(1 g) = 1.21 mW/g
SAR(10 g) = 0.908 mW/g
Power Drift = -0.04 dB
Maximum value of SAR (measured) = 1.28 mW/g



Plot 2

Date/Time: 2013-02-20 18:56:23

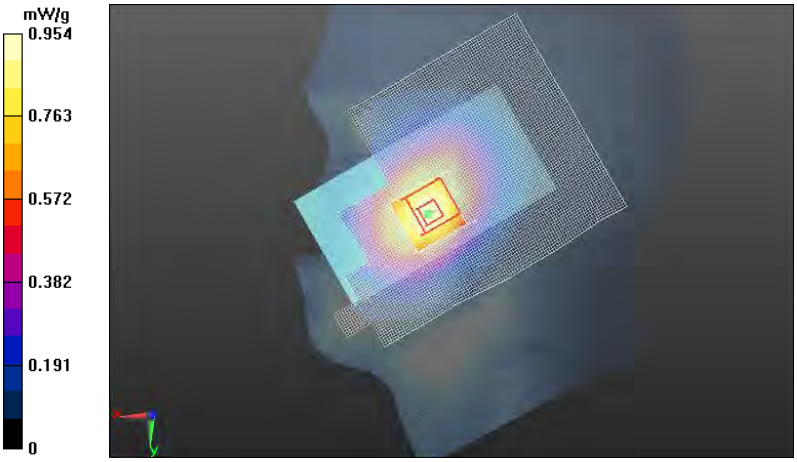
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0

Communication System: WCDMA850 (Band 5)
Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: HSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 847 MHz; σ = 0.915 mho/m; ε_r = 39.767; 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 14.6.5 (6469)

WCDMA850 (Band 5) - Right/Cheek - High - Repeated/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.954 mW/g

WCDMA850 (Band 5) - Right/Cheek - High - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 8.404 V/m
Peak SAR (extrapolated) = 1.064 mW/g
SAR(1 g) = 0.844 mW/g
SAR(10 g) = 0.638 mW/g
Power Drift = 0.01 dB
Maximum value of SAR (measured) = 0.885 mW/g



Plot 3

Date/Time: 2013-02-14 13:32:26

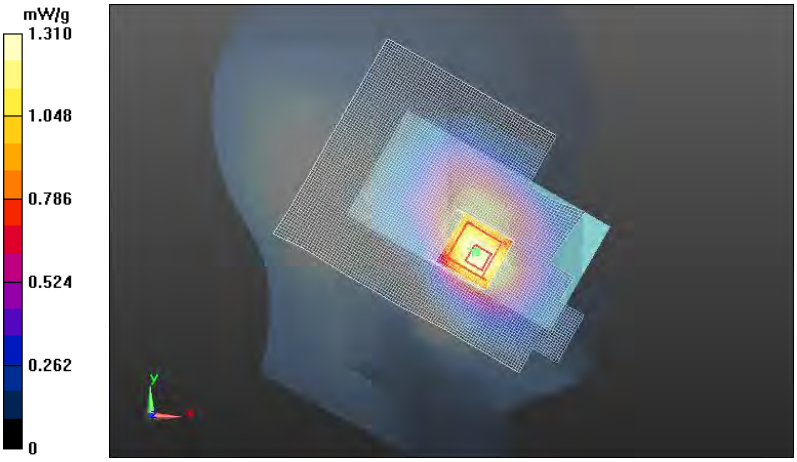
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000072/3

Communication System: WCDMA1700/2100 (Band 4)
Frequency: 1712.4 MHz; Duty Cycle: 1:1
Medium: HSL1800; Medium Notes: t= 20.6 C
Medium parameters used (interpolated): f = 1712.4 MHz; σ = 1.315 mho/m; ε_r = 38.893; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(5.17, 5.17, 5.17); 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 4; Type: Twin SAM 040 CA; Serial: TP-1018
- Measurement SW: DASY4, Version 4.7 (80); SEMCAD X Version 14.6.5 (6469)

WCDMA1700/2100 (Band 4) - Left/Cheek - Low - Repeated/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.31 mW/g

WCDMA1700/2100 (Band 4) - Left/Cheek - Low - Repeated/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 7.633 V/m
Peak SAR (extrapolated) = 1.789 mW/g
SAR(1 g) = 1.23 mW/g
SAR(10 g) = 0.806 mW/g
Power Drift = 0.01 dB
Maximum value of SAR (measured) = 1.32 mW/g



Plot 4

Date/Time: 2013-02-18 11:18:50

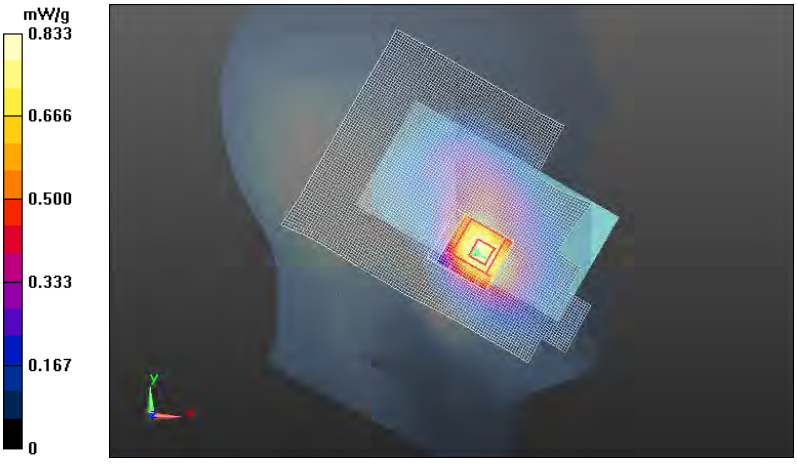
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000072/3

Communication System: 4-slot GPRS1900
Frequency: 1850.2 MHz; Duty Cycle: 1:2.1
Medium: HSL1900; Medium Notes: t= 21.1 C
Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.365 mho/m; ε_r = 39.65; ρ = 1000 kg/m^3
Phantom section: Left 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 14.6.5 (6469)

4-slot GPRS1900 - Left/Cheek - Low/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.833 mW/g

4-slot GPRS1900 - Left/Cheek - Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 22.992 V/m
Peak SAR (extrapolated) = 1.105 mW/g
SAR(1 g) = 0.733 mW/g
SAR(10 g) = 0.470 mW/g
Power Drift = 0.07 dB
Maximum value of SAR (measured) = 0.782 mW/g



Plot 5

Date/Time: 2013-02-16 12:03:14

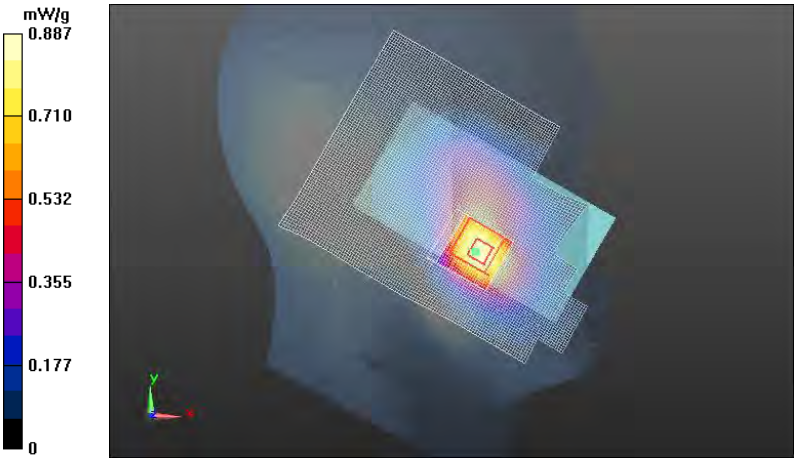
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000072/3

Communication System: WCDMA1900 (Band 2)
Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: HSL1900; Medium Notes: t= 21.0 C
Medium parameters used (interpolated): f = 1852.4 MHz; σ = 1.364 mho/m; ε_r = 39.411; ρ = 1000 kg/m^3
Phantom section: Left 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 14.6.5 (6469)

WCDMA1900 (Band 2) - Left/Cheek - Low/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.887 mW/g

WCDMA1900 (Band 2) - Left/Cheek - Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 23.691 V/m
Peak SAR (extrapolated) = 1.198 mW/g
SAR(1 g) = 0.795 mW/g
SAR(10 g) = 0.509 mW/g
Power Drift = 0.08 dB
Maximum value of SAR (measured) = 0.849 mW/g



Plot 6

Date/Time: 2013-02-12 10:15:11

Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0

Communication System: WLAN2450 b-mode
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: HSL2450; Medium Notes: t= 20.9 C
Medium parameters used: f = 2412 MHz; σ = 1.77 mho/m; ε_r = 37.448; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(4.34, 4.34, 4.34); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2012-08-21
- Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.5 (6469)

WLAN2450 b-mode - Right/Cheek - Channel 1 - DSSS 1 Mbps/Area Scan (121x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.11 mW/g

WLAN2450 b-mode - Right/Cheek - Channel 1 - DSSS 1 Mbps/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.872 V/m
Peak SAR (extrapolated) = 1.950 mW/g
SAR(1 g) = 0.945 mW/g
SAR(10 g) = 0.443 mW/g
Power Drift = 0.27 dB
Maximum value of SAR (measured) = 1.11 mW/g

Plot 7

Date/Time: 2013-02-15 9:13:55

DASY Configuration for 4-slot GPRS850 - Right/Cheek - Middle/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000069/9
Communication System: 4-slot GPRS850; Frequency: 836.6 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL850 Medium parameters used: f = 837 MHz; σ = 0.909 mho/m; ε_r = 40.546; ρ = 1000 kg/m^3
Phantom section: Right Section

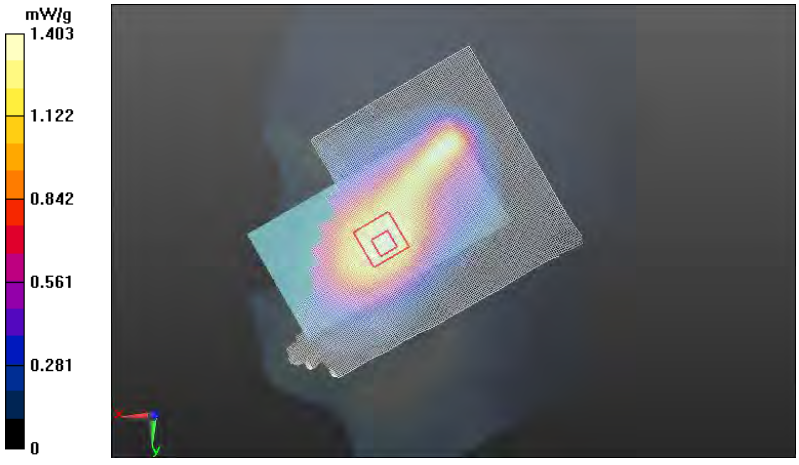
Probe: EX3DV4 - SN3892; ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: SAM2; Type: SAM; Serial: TP-1570
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-02-12 10:15:11

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 1 - DSSS 1 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2412 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2412 MHz; σ = 1.77 mho/m; ε_r = 37.448; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: ES3DV3 - SN3131; ConvF(4.34, 4.34, 4.34); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 2012-08-21
Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

Fast SAR of Combined Scans: SAR(1 g) = 1.31 mW/g; SAR(10 g) = 0.891 mW/g
Maximum value of SAR (interpolated) = 1.40 mW/g



Plot 8

Date/Time: 2013-02-20 18:56:23

DASY Configuration for WCDMA850 (Band 5) - Right/Cheek - High - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WCDMA850 (Band 5); Frequency: 846.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL850 Medium parameters used: f = 847 MHz; σ = 0.915 mho/m; ε_r = 39.767; ρ = 1000 kg/m^3
Phantom section: Right Section

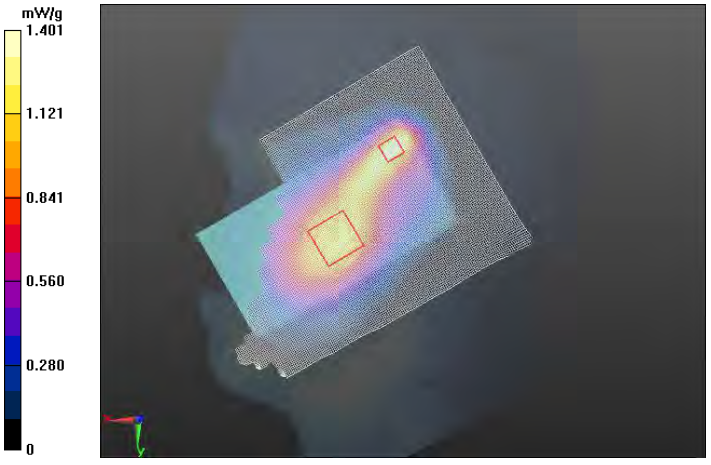
Probe: EX3DV4 - SN3892; ConvF(9.75, 9.75, 9.75); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: SAM2; Type: SAM; Serial: TP-1570
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-02-12 10:15:11

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 1 - DSSS 1 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2412 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2412 MHz; σ = 1.77 mho/m; ε_r = 37.448; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: ES3DV3 - SN3131; ConvF(4.34, 4.34, 4.34); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 2012-08-21
Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

Fast SAR of Combined Scans: SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.738 mW/g
Maximum value of SAR (interpolated) = 1.40 mW/g



Plot 9

Date/Time: 2013-02-14 13:32:26

DASY Configuration for WCDMA1700/2100 (Band 4) - Left/Cheek - Low - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000072/3
Communication System: WCDMA1700/2100 (Band 4); Frequency: 1712.4 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL1800 Medium parameters used (interpolated): f = 1712.4 MHz; σ = 1.315 mho/m; ε_r = 38.893; ρ = 1000 kg/m^3
Phantom section: Left Section

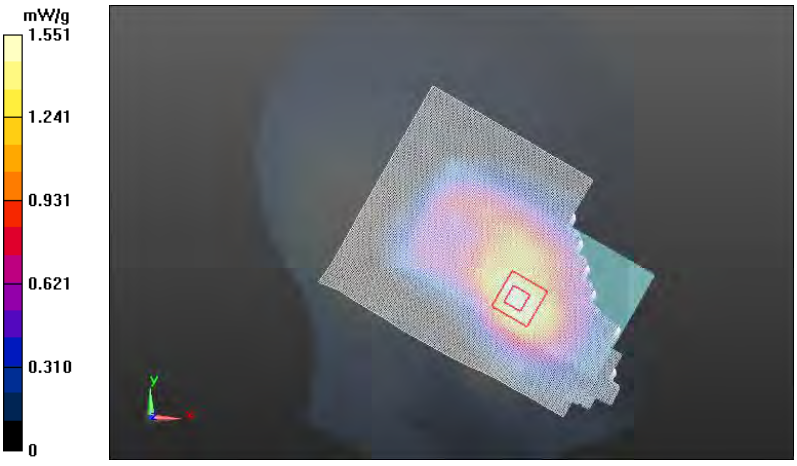
Probe: ES3DV3 - SN3194; ConvF(5.17, 5.17, 5.17); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 4; Type: Twin SAM 040 CA; Serial: TP-1018
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-02-07 10:21:53

DASY Configuration for WLAN2450 b-mode - Left/Cheek - Channel 6 - DSSS 1 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2437 MHz; σ = 1.789 mho/m; ε_r = 37.74; ρ = 1000 kg/m^3
Phantom section: Left Section

Probe: ES3DV3 - SN3131; ConvF(4.34, 4.34, 4.34); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 2012-08-21
Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

Fast SAR of Combined Scans: SAR(1 g) = 1.43 mW/g; SAR(10 g) = 0.873 mW/g
Maximum value of SAR (interpolated) = 1.55 mW/g



Plot 10

Date/Time: 2013-02-18 12:48:15

DASY Configuration for 4-slot GPRS1900 - Right/Cheek - Middle/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000072/3
Communication System: 4-slot GPRS1900; Frequency: 1880 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.388 mho/m; ε_r = 39.532; ρ = 1000 kg/m^3
Phantom section: Right Section

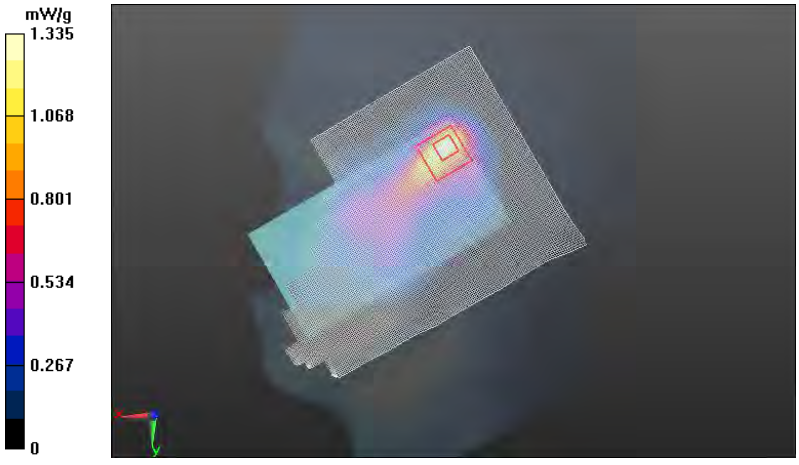
Probe: ES3DV3 - SN3194; ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-02-12 10:15:11

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 1 - DSSS 1 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2412 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2412 MHz; σ = 1.77 mho/m; ε_r = 37.448; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: ES3DV3 - SN3131; ConvF(4.34, 4.34, 4.34); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 2012-08-21
Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

Fast SAR of Combined Scans: SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.538 mW/g
Maximum value of SAR (interpolated) = 1.34 mW/g



Plot 11

Date/Time: 2013-02-16 12:52:40

DASY Configuration for WCDMA1900 (Band 2) - Right/Cheek - Middle/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000072/3
Communication System: WCDMA1900 (Band 2); Frequency: 1880 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL1900 Medium parameters used: f = 1880 MHz; σ = 1.385 mho/m; ε_r = 39.307; ρ = 1000 kg/m^3
Phantom section: Right Section

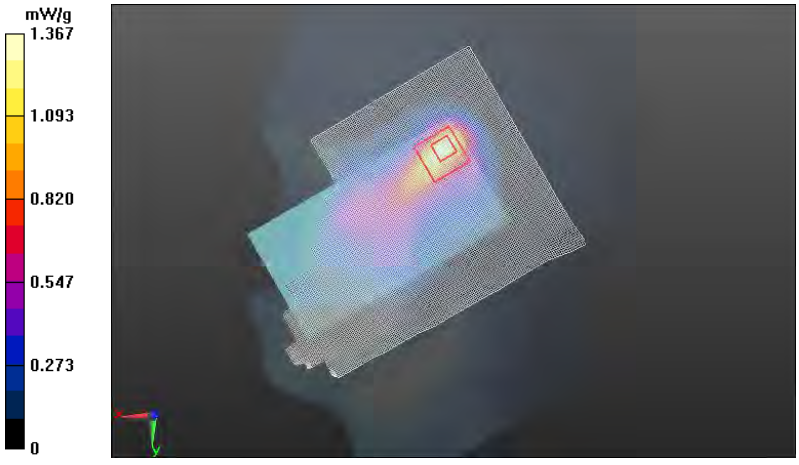
Probe: ES3DV3 - SN3194; ConvF(4.97, 4.97, 4.97); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 1; Type: Twin SAM 040 CA; Serial: TP-1449
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-02-12 10:15:11

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 1 - DSSS 1 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2412 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2412 MHz; σ = 1.77 mho/m; ε_r = 37.448; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: ES3DV3 - SN3131; ConvF(4.34, 4.34, 4.34); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 2012-08-21
Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (2)

Fast SAR of Combined Scans: SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.557 mW/g
Maximum value of SAR (interpolated) = 1.37 mW/g



Plot 12

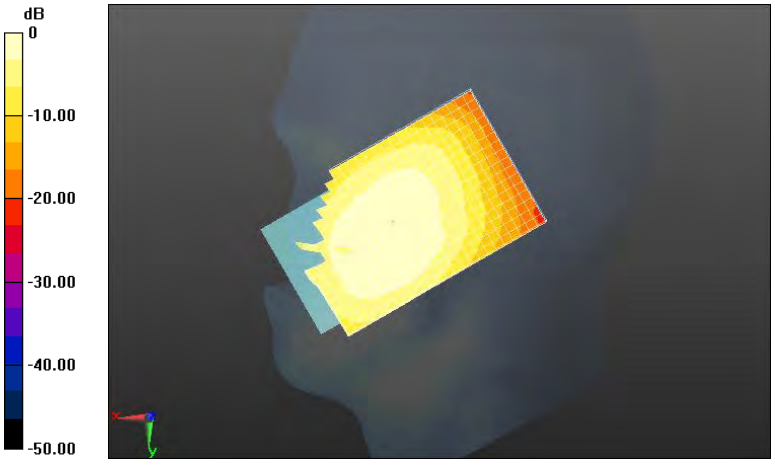
Date/Time: 2013-03-01 9:27:09

Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000069/9

Communication System: 4-slot GPRS850
Frequency: 836.6 MHz; Duty Cycle: 1:2.1
Medium: HSL850; Medium Notes: t= 21.7 C
Medium parameters used: f = 837 MHz; σ = 0.925 S/m; ε_r = 40.401; 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)

4-slot GPRS850 - Right/Cheek - Middle/Volume Scan (17x25x7): Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.676 V/m
Peak SAR (extrapolated) = 17.4 W/kg
SAR(1 g) = 1.11 W/kg
SAR(10 g) = 0.813 W/kg
Power Drift = 0.14 dB
Total Absorbed Power = 0.0937 W
Maximum value of SAR (measured) = 1.17 W/kg



0 dB = 1.17 W/kg = 0.68 dBW/kg

Plot 13

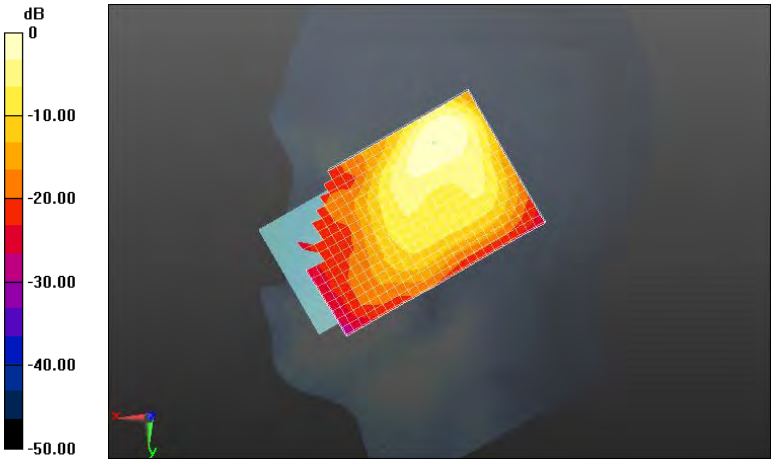
Date/Time: 2013-03-01 11:59:17

Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0

Communication System: WLAN2450 b-mode
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: HSL2450; Medium Notes: t= 20.7 C
Medium parameters used: f = 2412 MHz; σ = 1.769 S/m; ε_r = 38.574; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(4.34, 4.34, 4.34); Calibrated: 2012-08-27;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn728; Calibrated: 2012-08-21
- Phantom: #4 SAM, SAR4 ; Type: QD000P40CD; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.8 (7028)

WLAN2450 b-mode - Right/Cheek - Channel 1 - DSSS 1 Mbps/Volume Scan (17x25x7): Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.266 V/m
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 0.822 W/kg
SAR(10 g) = 0.384 W/kg
Power Drift = 0.04 dB
Total Absorbed Power = 0.0164 W
Maximum value of SAR (measured) = 0.917 W/kg



0 dB = 0.917 W/kg = -0.38 dBW/kg

Plot 14

Date/Time: 2013-03-01 11:59:17

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 1 - DSSS 1 Mbps/Volume Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2412 MHz; Duty Cycle: 1:1; PMF: 1
Medium: HSL2450 Medium parameters used: f = 2412 MHz; σ = 1.769 S/m; ε_r = 38.574; ρ = 1000 kg/m^3
Phantom section: Right Section

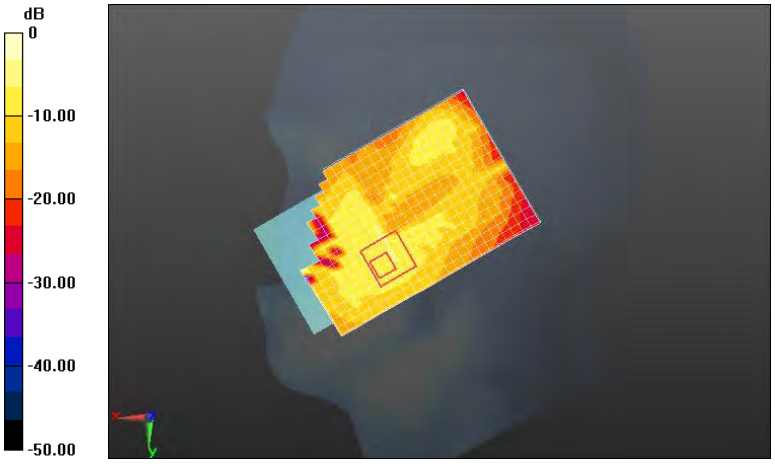
Probe: ES3DV3 - SN3131; ConvF(4.34, 4.34, 4.34); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 2012-08-21
Phantom: #4 SAM, SAR4 ; Type: QD000P40CD;
Measurement SW: DASY52, Version 52.8 (2)

Date/Time: 2013-03-01 9:27:09

DASY Configuration for 4-slot GPRS850 - Right/Cheek - Middle/Volume Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000069/9
Communication System: 4-slot GPRS850; Frequency: 836.6 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: HSL850 Medium parameters used: f = 837 MHz; σ = 0.925 S/m; ε_r = 40.401; 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)

Multi Band Result:
SAR(1 g) = 1.38 W/kg; SAR(10 g) = 0.874 W/kg
Maximum value of SAR (interpolated) = 6.14 W/kg



0 dB = 6.14 W/kg = 7.88 dBW/kg

Plot 15

Date/Time: 2013-02-22 9:46:27

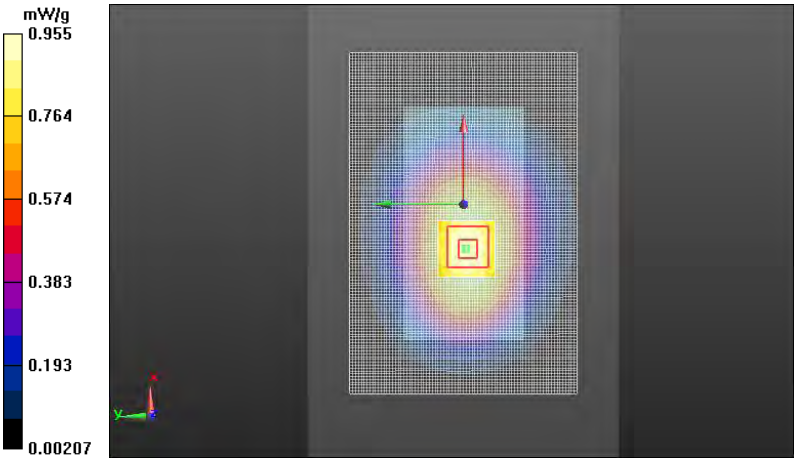
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000069/9

Communication System: 4-slot GPRS850
Frequency: 836.6 MHz; Duty Cycle: 1:2.1
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 837 MHz; σ = 1.009 mho/m; ε_r = 53.362; 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 14.6.5 (6469)

4-slot GPRS850/Body - Middle - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan (81x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.955 mW/g

4-slot GPRS850/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 = 28.076 V/m
Peak SAR (extrapolated) = 1.136 mW/g
SAR(1 g) = 0.904 mW/g
SAR(10 g) = 0.678 mW/g
Power Drift = -0.01 dB
Maximum value of SAR (measured) = 0.947 mW/g



Plot 16

Date/Time: 2013-02-22 15:29:03

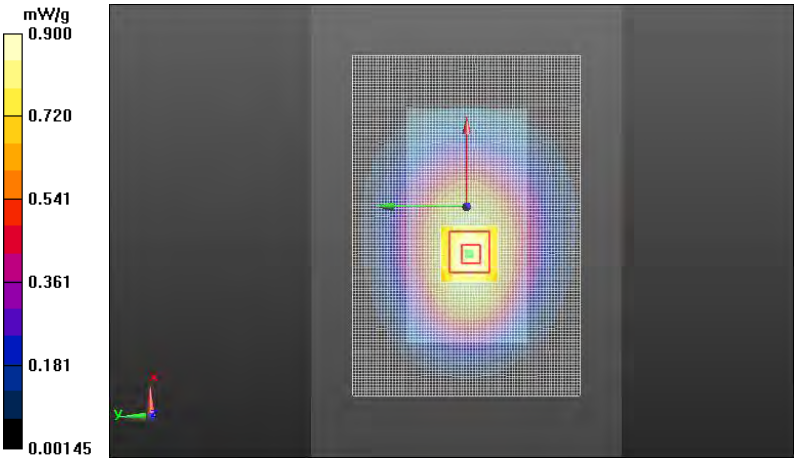
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0

Communication System: WCDMA850 (Band 5)
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.1 C
Medium parameters used: f = 835 MHz; σ = 1.007 mho/m; ε_r = 53.371; 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 14.6.5 (6469)

WCDMA850 (Band 5)/Body - Middle - Spacer 15mm - No Accessory - Back Facing Phantom - Repeated/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.900 mW/g

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 = 27.122 V/m
Peak SAR (extrapolated) = 1.065 mW/g
SAR(1 g) = 0.845 mW/g
SAR(10 g) = 0.633 mW/g
Power Drift = -0.05 dB
Maximum value of SAR (measured) = 0.889 mW/g



Plot 17

Date/Time: 2013-02-26 22:07:17

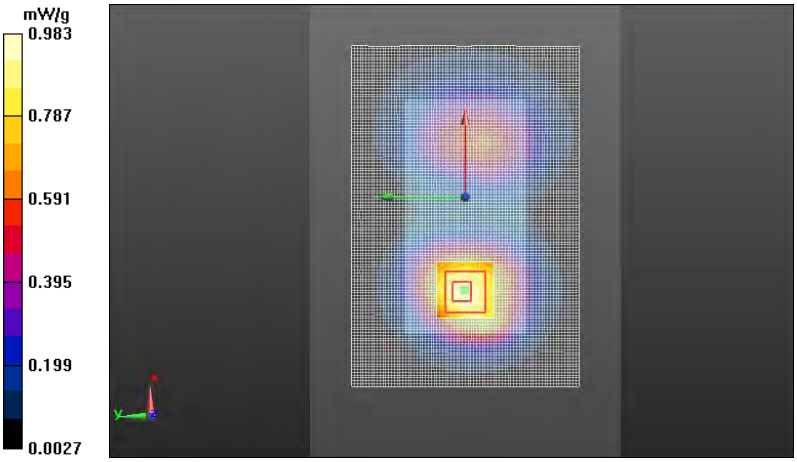
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000072/3

Communication System: WCDMA1700/2100 (Band 4)
Frequency: 1712.4 MHz; Duty Cycle: 1:1
Medium: BSL1800; Medium Notes: t= 20.8 C
Medium parameters used (interpolated): f = 1712.4 MHz; σ = 1.427 mho/m; ε_r = 51.975; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.83, 4.83, 4.83); 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 14.6.5 (6469)

WCDMA1700/2100 (Band 4)/Body - Low - Spacer 15mm - No Accessory - Back Facing Phantom - Repeated/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.983 mW/g

WCDMA1700/2100 (Band 4)/Body - Low - 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 = 10.716 V/m
Peak SAR (extrapolated) = 1.428 mW/g
SAR(1 g) = 0.924 mW/g
SAR(10 g) = 0.597 mW/g
Power Drift = 0.02 dB
Maximum value of SAR (measured) = 0.984 mW/g



Plot 18

Date/Time: 2013-02-25 11:23:06

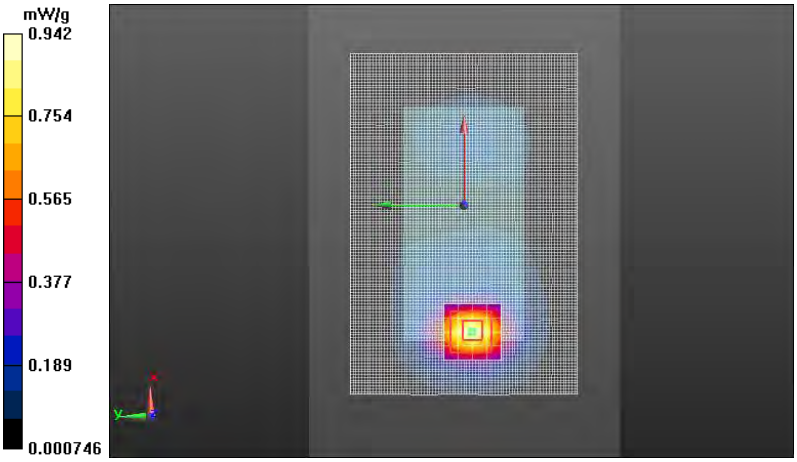
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000072/3

Communication System: 4-slot GPRS1900
Frequency: 1909.8 MHz; Duty Cycle: 1:2.1
Medium: BSL1900; Medium Notes: t= 20.4 C
Medium parameters used: f = 1910 MHz; σ = 1.542 mho/m; ε_r = 51.884; 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 14.6.5 (6469)

4-slot GPRS1900/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan (81x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.942 mW/g

4-slot GPRS1900/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 = 4.662 V/m
Peak SAR (extrapolated) = 1.485 mW/g
SAR(1 g) = 0.878 mW/g
SAR(10 g) = 0.486 mW/g
Power Drift = 0.18 dB
Maximum value of SAR (measured) = 0.979 mW/g



Plot 19

Date/Time: 2013-02-25 13:42:00

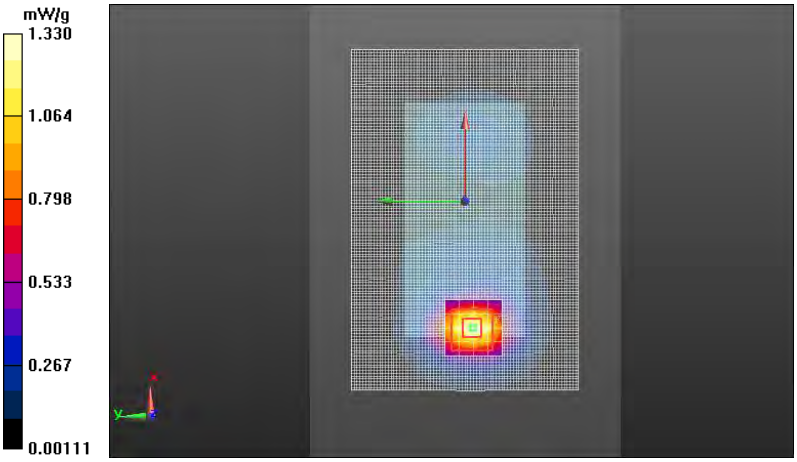
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000072/3

Communication System: WCDMA1900 (Band 2)
Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 20.4 C
Medium parameters used: f = 1908 MHz; σ = 1.541 mho/m; ε_r = 51.893; 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 14.6.5 (6469)

WCDMA1900 (Band 2)/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.33 mW/g

WCDMA1900 (Band 2)/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 = 5.779 V/m
Peak SAR (extrapolated) = 2.052 mW/g
SAR(1 g) = 1.23 mW/g
SAR(10 g) = 0.681 mW/g
Power Drift = 0.06 dB
Maximum value of SAR (measured) = 1.37 mW/g



Plot 20

Date/Time: 2013-02-13 9:53:03

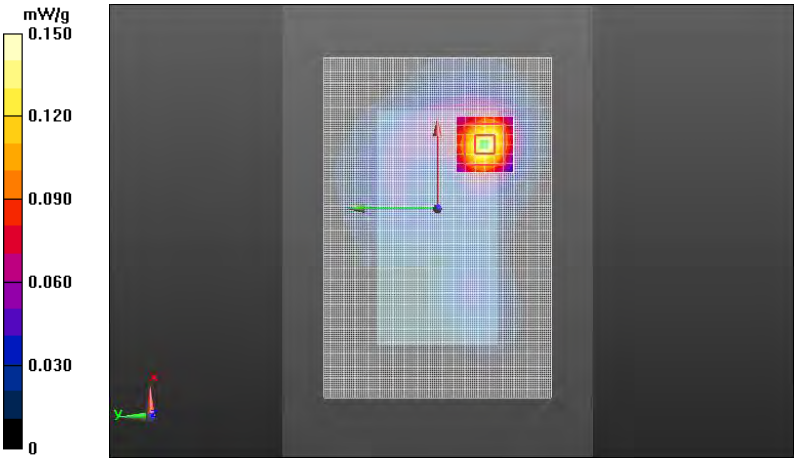
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0

Communication System: WLAN2450 b-mode
Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: BSL2450; Medium Notes: t= 20.7 C
Medium parameters used: f = 2462 MHz; σ = 1.984 mho/m; ε_r = 50.748; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(4.11, 4.11, 4.11); 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 (2); SEMCAD X Version 14.6.5 (6469)

WLAN2450 b-mode/Body - Channel 11 - DSSS 1 Mbps - Spacer 15mm - WH-108 - Back Facing Phantom/Area Scan (121x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.150 mW/g

WLAN2450 b-mode/Body - Channel 11 - DSSS 1 Mbps - Spacer 15mm - WH-108 - Back Facing Phantom/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.759 V/m
Peak SAR (extrapolated) = 0.273 mW/g
SAR(1 g) = 0.135 mW/g
SAR(10 g) = 0.068 mW/g
Power Drift = 0.17 dB
Maximum value of SAR (measured) = 0.149 mW/g



Plot 21

Date/Time: 2013-02-22 9:46:27

DASY Configuration for 4-slot GPRS850/Body - Middle - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000069/9
Communication System: 4-slot GPRS850; Frequency: 836.6 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: BSL850 Medium parameters used: f = 837 MHz; σ = 1.009 mho/m; ε_r = 53.362; ρ = 1000 kg/m^3
Phantom section: Center Section

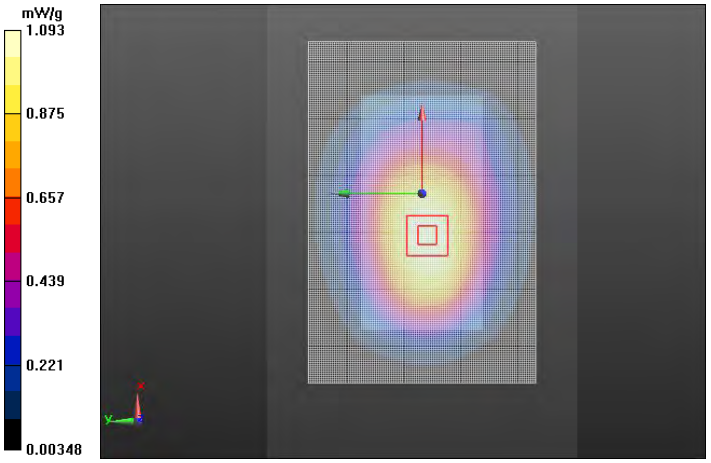
Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-02-12 19:30:38

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2437 MHz; σ = 1.953 mho/m; ε_r = 50.843; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.11, 4.11, 4.11); 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 (2)

Fast SAR of Combined Scans: SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.733 mW/g
Maximum value of SAR (interpolated) = 1.09 mW/g



Plot 22

Date/Time: 2013-02-22 15:29:03

DASY Configuration for WCDMA850 (Band 5)/Body - Middle - Spacer 15mm - No Accessory - Back Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WCDMA850 (Band 5); Frequency: 835 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL850 Medium parameters used: f = 835 MHz; σ = 1.007 mho/m; ε_r = 53.371; ρ = 1000 kg/m^3
Phantom section: Center Section

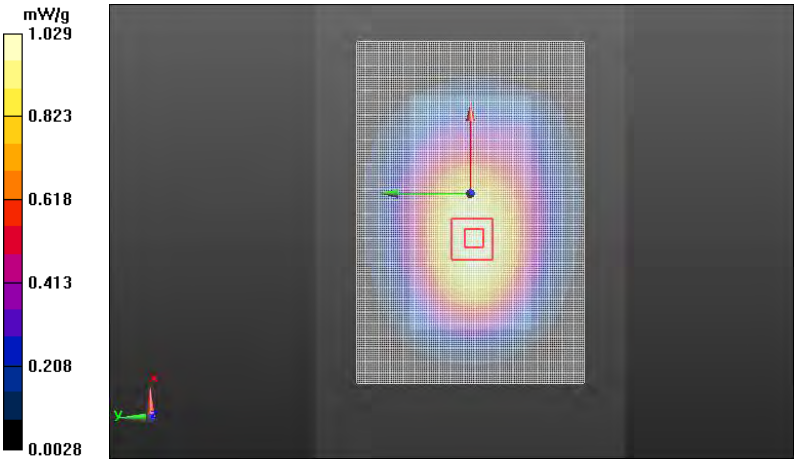
Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7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

Date/Time: 2013-02-12 19:30:38

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2437 MHz; σ = 1.953 mho/m; ε_r = 50.843; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.11, 4.11, 4.11); 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 (2)

Fast SAR of Combined Scans: SAR(1 g) = 0.971 mW/g; SAR(10 g) = 0.688 mW/g
Maximum value of SAR (interpolated) = 1.03 mW/g



Plot 23

Date/Time: 2013-02-26 22:07:17

DASY Configuration for WCDMA1700/2100 (Band 4)/Body - Low - Spacer 15mm - No Accessory - Back Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000072/3
Communication System: WCDMA1700/2100 (Band 4); Frequency: 1712.4 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL1800 Medium parameters used (interpolated): f = 1712.4 MHz; σ = 1.427 mho/m; ε_r = 51.975; ρ = 1000 kg/m^3
Phantom section: Center Section

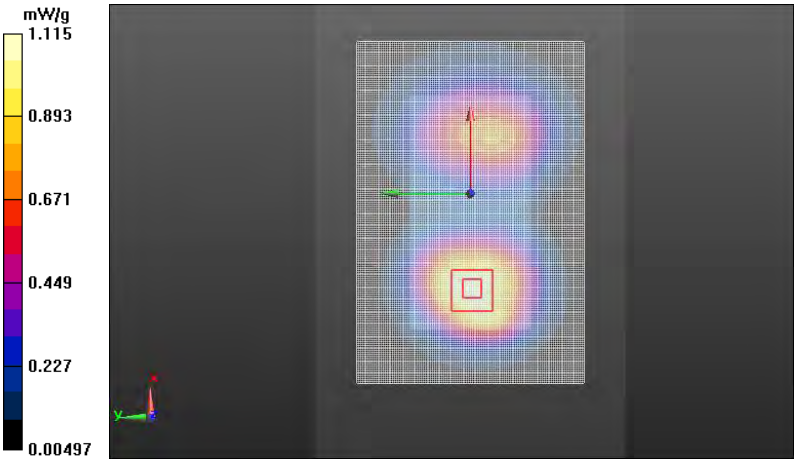
Probe: ES3DV3 - SN3194; ConvF(4.83, 4.83, 4.83); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-02-12 19:30:38

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2437 MHz; σ = 1.953 mho/m; ε_r = 50.843; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.11, 4.11, 4.11); 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 (2)

Fast SAR of Combined Scans: SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.657 mW/g
Maximum value of SAR (interpolated) = 1.12 mW/g



Plot 24

Date/Time: 2013-02-25 11:23:06

DASY Configuration for 4-slot GPRS1900/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000072/3
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 = 1.542 mho/m; ε_r = 51.884; ρ = 1000 kg/m^3
Phantom section: Center Section

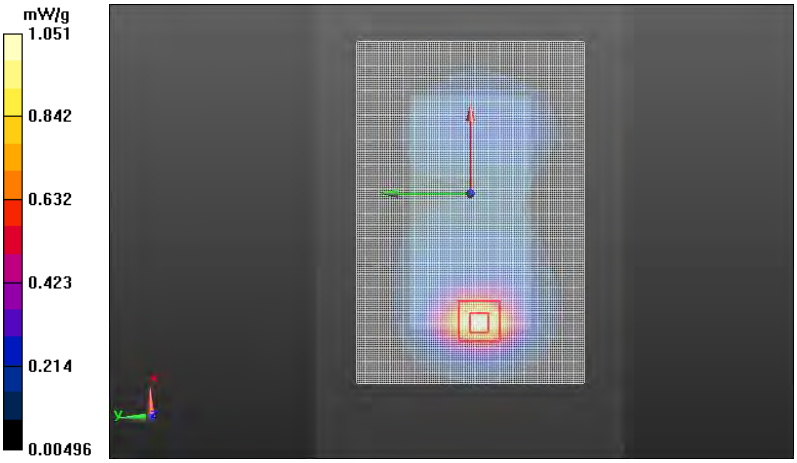
Probe: ES3DV3 - SN3194; ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-02-12 19:30:38

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2437 MHz; σ = 1.953 mho/m; ε_r = 50.843; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.11, 4.11, 4.11); 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 (2)

Fast SAR of Combined Scans: SAR(1 g) = 0.935 mW/g; SAR(10 g) = 0.501 mW/g
Maximum value of SAR (interpolated) = 1.05 mW/g



Plot 25

Date/Time: 2013-02-25 13:42:00

DASY Configuration for WCDMA1900 (Band 2)/Body - High - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000072/3
Communication System: WCDMA1900 (Band 2); Frequency: 1907.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL1900 Medium parameters used: f = 1908 MHz; σ = 1.541 mho/m; ε_r = 51.893; ρ = 1000 kg/m^3
Phantom section: Center Section

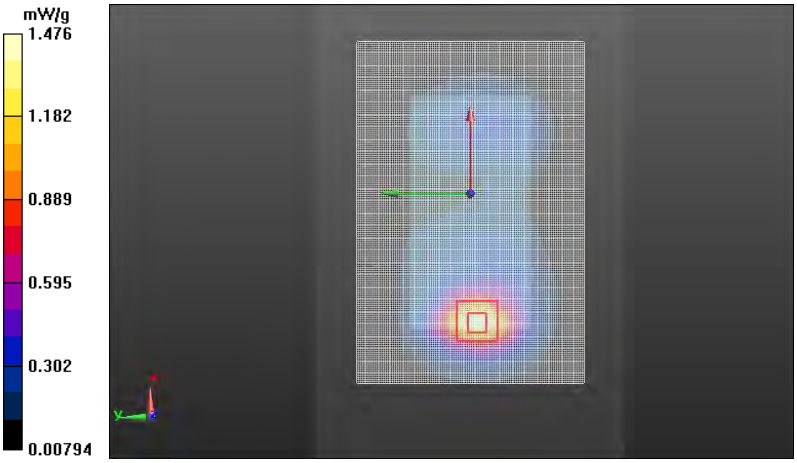
Probe: ES3DV3 - SN3194; ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-02-12 19:30:38

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 15mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2437 MHz; σ = 1.953 mho/m; ε_r = 50.843; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.11, 4.11, 4.11); 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 (2)

Fast SAR of Combined Scans: SAR(1 g) = 1.31 mW/g; SAR(10 g) = 0.700 mW/g
Maximum value of SAR (interpolated) = 1.48 mW/g



Plot 26

Date/Time: 2013-02-26 18:20:24

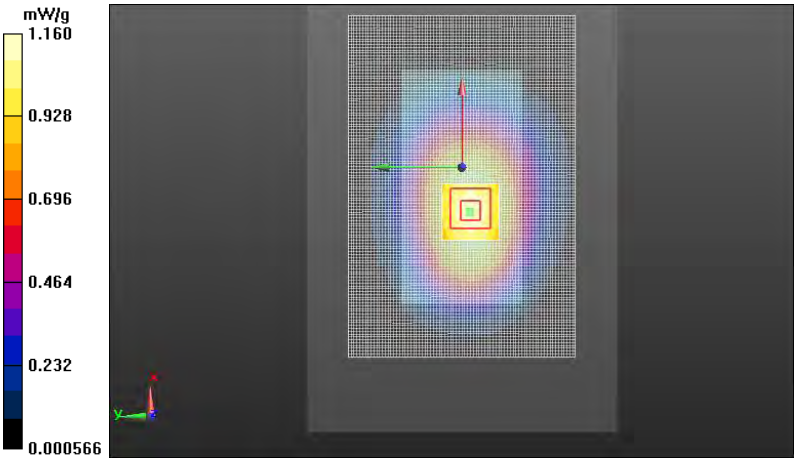
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000141/6

Communication System: GSM850
Frequency: 848.8 MHz; Duty Cycle: 1:8.3
Medium: BSL850; Medium Notes: t= 21.6
Medium parameters used: f = 849 MHz; σ = 1.024 mho/m; ε_r = 53.464; 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 14.6.5 (6469)

GSM850/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom - Repeated/Area Scan (81x121x1):
Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.16 mW/g

GSM850/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 = 30.831 V/m
Peak SAR (extrapolated) = 1.357 mW/g
SAR(1 g) = 1.08 mW/g
SAR(10 g) = 0.816 mW/g
Power Drift = -0.11 dB
Maximum value of SAR (measured) = 1.14 mW/g



Plot 27

Date/Time: 2013-02-26 10:30:04

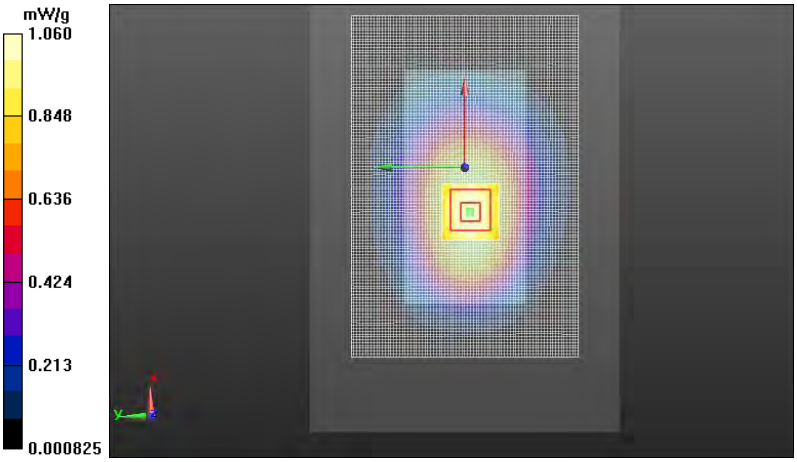
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000141/6

Communication System: WCDMA850 (Band 5)
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.6
Medium parameters used: f = 835 MHz; σ = 1 mho/m; ε_r = 53.977; 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 14.6.5 (6469)

WCDMA850 (Band 5)/Body - Middle - Spacer 10mm - No Accessory - Back Facing Phantom - Repeated/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.06 mW/g

WCDMA850 (Band 5)/Body - Middle - 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 = 29.691 V/m
Peak SAR (extrapolated) = 1.261 mW/g
SAR(1 g) = 1.01 mW/g
SAR(10 g) = 0.759 mW/g
Power Drift = 0.03 dB
Maximum value of SAR (measured) = 1.06 mW/g



Plot 28

Date/Time: 2013-02-27 13:06:41

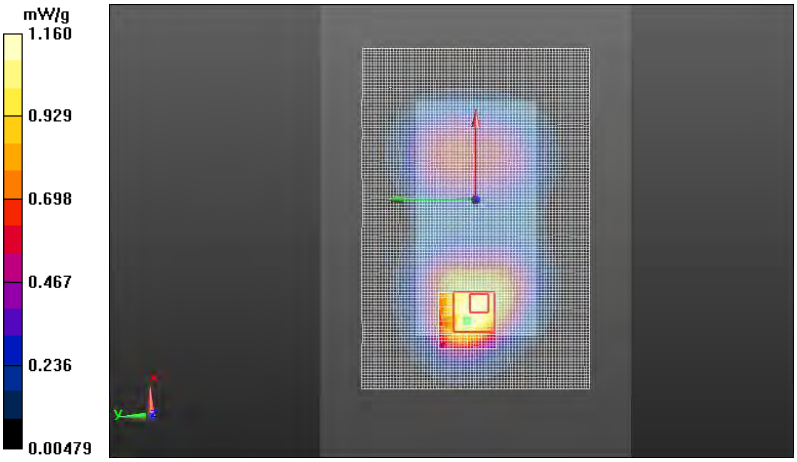
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000096/2

Communication System: WCDMA1700/2100 (Band 4)
Frequency: 1752.6 MHz; Duty Cycle: 1:1
Medium: BSL1800; Medium Notes: t= 20.8 C
Medium parameters used: f = 1753 MHz; σ = 1.468 mho/m; ε_r = 51.854; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3194
- ConvF(4.83, 4.83, 4.83); 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 14.6.5 (6469)

WCDMA1700/2100 (Band 4)/Body - High - Spacer 10mm - No Accessory - Display Facing Phantom/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.16 mW/g

WCDMA1700/2100 (Band 4)/Body - High - Spacer 10mm - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 28.150 V/m
Peak SAR (extrapolated) = 1.692 mW/g
SAR(1 g) = 1.05 mW/g
SAR(10 g) = 0.654 mW/g
Power Drift = -0.07 dB
Maximum value of SAR (measured) = 1.13 mW/g



Plot 29

Date/Time: 2013-02-26 13:41:01

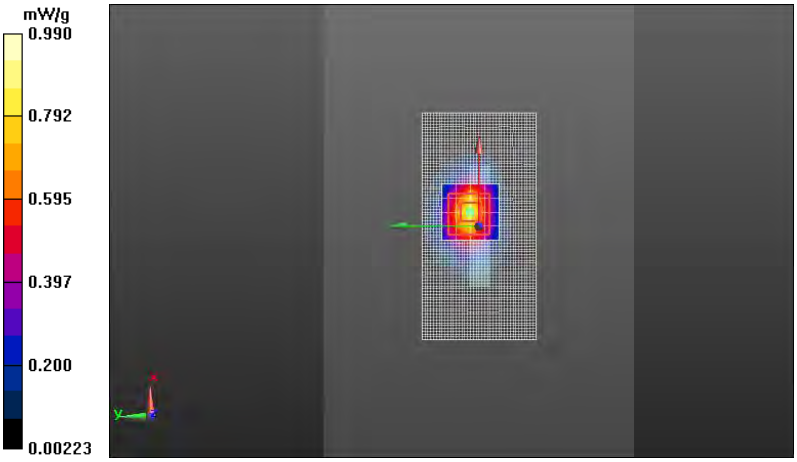
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000096/2

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 = 1.551 mho/m; ε_r = 51.909; 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 14.6.5 (6469)

4-slot GPRS1900/Body - High - Spacer 10mm - No Accessory - Bottom Edge Facing Phantom/Area Scan (41x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.990 mW/g

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 = 21.071 V/m
Peak SAR (extrapolated) = 1.311 mW/g
SAR(1 g) = 0.770 mW/g
SAR(10 g) = 0.410 mW/g
Power Drift = -0.07 dB
Maximum value of SAR (measured) = 0.865 mW/g



Plot 30

Date/Time: 2013-02-26 22:37:41

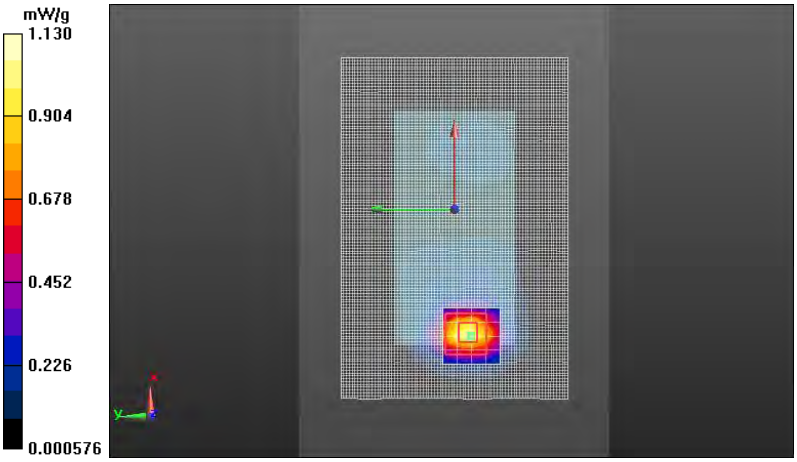
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000096/2

Communication System: WCDMA1900 (Band 2)
Frequency: 1907.6 MHz; Duty Cycle: 1:1
Medium: BSL1900; Medium Notes: t= 20.8 C
Medium parameters used: f = 1908 MHz; σ = 1.549 mho/m; ε_r = 51.917; 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 14.6.5 (6469)

WCDMA1900 (Band 2)/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom - Repeated/Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.13 mW/g

WCDMA1900 (Band 2)/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 = 4.524 V/m
Peak SAR (extrapolated) = 1.817 mW/g
SAR(1 g) = 1 mW/g
SAR(10 g) = 0.510 mW/g
Power Drift = 0.06 dB
Maximum value of SAR (measured) = 1.09 mW/g



Plot 31

Date/Time: 2013-02-13 15:59:26

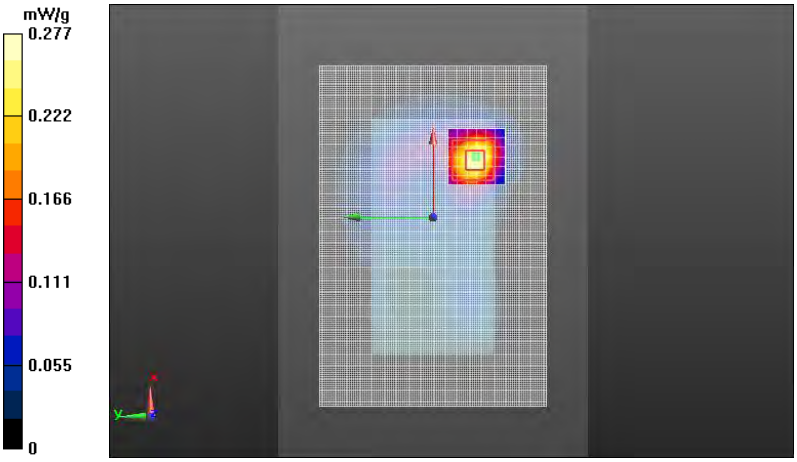
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0

Communication System: WLAN2450 b-mode
Frequency: 2412 MHz; Duty Cycle: 1:1
Medium: BSL2450; Medium Notes: t= 20.7 C
Medium parameters used: f = 2412 MHz; σ = 1.924 mho/m; ε_r = 50.928; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: ES3DV3 - SN3131
- ConvF(4.11, 4.11, 4.11); 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 (2); SEMCAD X Version 14.6.5 (6469)

WLAN2450 b-mode/Body - Channel 1 - DSSS 1 Mbps - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (121x181x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.277 mW/g

WLAN2450 b-mode/Body - Channel 1 - DSSS 1 Mbps - Spacer 10mm - No Accessory - Back Facing Phantom/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.461 V/m
Peak SAR (extrapolated) = 0.546 mW/g
SAR(1 g) = 0.256 mW/g
SAR(10 g) = 0.123 mW/g
Power Drift = -0.10 dB
Maximum value of SAR (measured) = 0.287 mW/g



Plot 32

Date/Time: 2013-02-26 18:20:24

DASY Configuration for GSM850/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000141/6
Communication System: GSM850; Frequency: 848.8 MHz; Duty Cycle: 1:8.3; PMF: 2.88097
Medium: BSL850 Medium parameters used: f = 849 MHz; σ = 1.024 mho/m; ε_r = 53.464; ρ = 1000 kg/m^3
Phantom section: Center Section

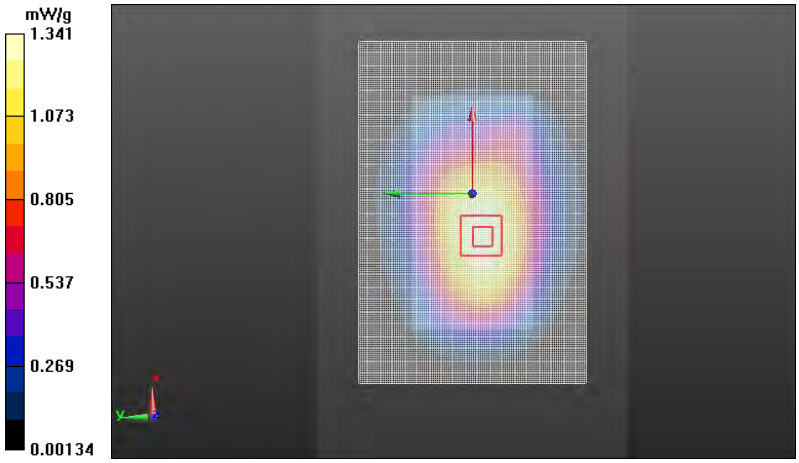
Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7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

Date/Time: 2013-02-13 15:59:26

DASY Configuration for WLAN2450 b-mode/Body - Channel 1 - DSSS 1 Mbps - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2412 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2412 MHz; σ = 1.924 mho/m; ε_r = 50.928; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.11, 4.11, 4.11); 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 (2)

Fast SAR of Combined Scans: SAR(1 g) = 1.27 mW/g; SAR(10 g) = 0.895 mW/g
Maximum value of SAR (interpolated) = 1.34 mW/g



Plot 33

Date/Time: 2013-02-26 10:30:04

DASY Configuration for WCDMA850 (Band 5)/Body - Middle - Spacer 10mm - No Accessory - Back Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000141/6
Communication System: WCDMA850 (Band 5); Frequency: 835 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL850 Medium parameters used: f = 835 MHz; σ = 1 mho/m; ε_r = 53.977; ρ = 1000 kg/m^3
Phantom section: Center Section

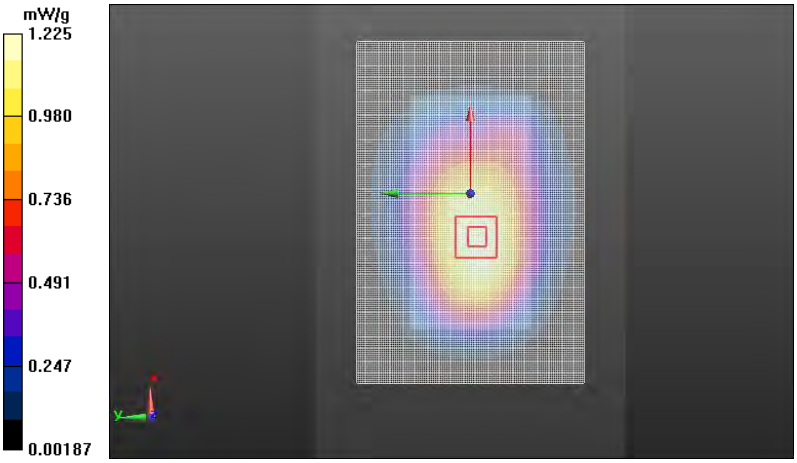
Probe: EX3DV4 - SN3892; ConvF(9.73, 9.73, 9.73); Calibrated: 2012-11-21;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn793; Calibrated: 2012-08-28
Phantom: 1. Triple Flat Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7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

Date/Time: 2013-02-13 15:59:26

DASY Configuration for WLAN2450 b-mode/Body - Channel 1 - DSSS 1 Mbps - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2412 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2412 MHz; σ = 1.924 mho/m; ε_r = 50.928; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.11, 4.11, 4.11); 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 (2)

Fast SAR of Combined Scans: SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.822 mW/g
Maximum value of SAR (interpolated) = 1.23 mW/g



Plot 34

Date/Time: 2013-02-27 8:15:35

DASY Configuration for WCDMA1700/2100 (Band 4)/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000096/2
Communication System: WCDMA1700/2100 (Band 4); Frequency: 1752.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL1800 Medium parameters used: f = 1753 MHz; σ = 1.468 mho/m; ε_r = 51.854; ρ = 1000 kg/m^3
Phantom section: Center Section

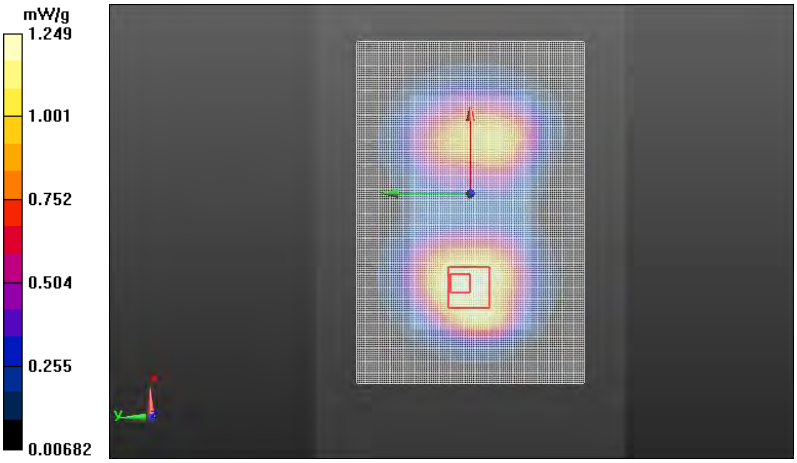
Probe: ES3DV3 - SN3194; ConvF(4.83, 4.83, 4.83); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-02-13 15:59:26

DASY Configuration for WLAN2450 b-mode/Body - Channel 1 - DSSS 1 Mbps - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2412 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2412 MHz; σ = 1.924 mho/m; ε_r = 50.928; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.11, 4.11, 4.11); 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 (2)

Fast SAR of Combined Scans: SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.737 mW/g
Maximum value of SAR (interpolated) = 1.25 mW/g



Plot 35

Date/Time: 2013-02-26 11:30:43

DASY Configuration for 4-slot GPRS1900/Body - Middle - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000096/2
Communication System: 4-slot GPRS1900; Frequency: 1880 MHz; Duty Cycle: 1:2.1; PMF: 1.44914
Medium: BSL1900 Medium parameters used: f = 1880 MHz; σ = 1.523 mho/m; ε_r = 52.02; ρ = 1000 kg/m^3
Phantom section: Center Section

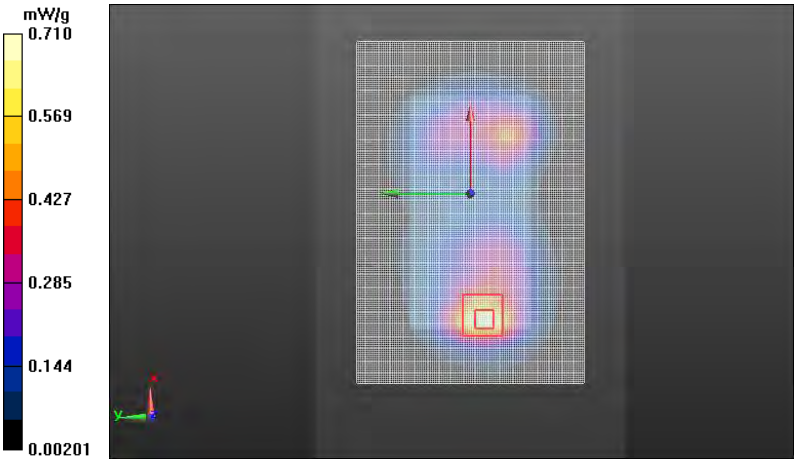
Probe: ES3DV3 - SN3194; ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-02-13 15:59:26

DASY Configuration for WLAN2450 b-mode/Body - Channel 1 - DSSS 1 Mbps - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2412 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2412 MHz; σ = 1.924 mho/m; ε_r = 50.928; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.11, 4.11, 4.11); 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 (2)

Fast SAR of Combined Scans: SAR(1 g) = 0.625 mW/g; SAR(10 g) = 0.332 mW/g
Maximum value of SAR (interpolated) = 0.710 mW/g



Plot 36

Date/Time: 2013-02-26 22:37:41

DASY Configuration for WCDMA1900 (Band 2)/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom - Repeated/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000096/2
Communication System: WCDMA1900 (Band 2); Frequency: 1907.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL1900 Medium parameters used: f = 1908 MHz; σ = 1.549 mho/m; ε_r = 51.917; ρ = 1000 kg/m^3
Phantom section: Center Section

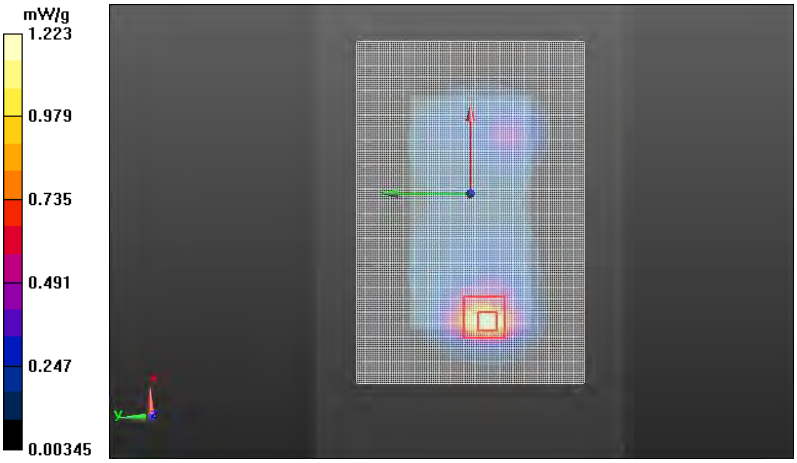
Probe: ES3DV3 - SN3194; ConvF(4.62, 4.62, 4.62); Calibrated: 2012-08-27;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn538; Calibrated: 2012-08-03
Phantom: SAM 3 Triple Phantom 5.1C; Type: QD 000 P51 CA;
Measurement SW: DASY4, Version 4.7 (80)

Date/Time: 2013-02-13 15:59:26

DASY Configuration for WLAN2450 b-mode/Body - Channel 1 - DSSS 1 Mbps - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-917; Serial: 355913/05/000064/0
Communication System: WLAN2450 b-mode; Frequency: 2412 MHz; Duty Cycle: 1:1; PMF: 1
Medium: BSL2450 Medium parameters used: f = 2412 MHz; σ = 1.924 mho/m; ε_r = 50.928; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: ES3DV3 - SN3131; ConvF(4.11, 4.11, 4.11); 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 (2)

Fast SAR of Combined Scans: SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.527 mW/g
Maximum value of SAR (interpolated) = 1.22 mW/g



APPENDIX C: DIELECTRIC PARAMETERS OF THE TISSUE SIMULANTS

Head tissue simulant dielectric parameters used in the measurements:

f (MHz)	Date	Dielectric Parameters					
		824.2MHz		837.0MHz		849.0MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
GSM/GPRS/ EGPRS850	2013-02-14	40.6	0.90	40.5	0.91	40.5	0.92
	2013-02-20	39.9	0.90	39.8	0.91	39.8	0.91
	2013-03-01	40.5	0.92	40.4	0.92	40.3	0.93
f (MHz)	Date	Dielectric Parameters					
		826.0MHz		835.0MHz		847.0MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
WCDMA850	2013-02-20	39.9	0.90	39.8	0.91	39.8	0.91
F (MHz)	Date	Dielectric Parameters					
		1712.4MHz		1732.4MHz		1753.0MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
WCDMA1700/ 2100	2013-02-14	38.9	1.32	38.8	1.34	38.7	1.36
	2013-02-20	39.2	1.31	39.1	1.33	39.0	1.35
f (MHz)	Date	Dielectric Parameters					
		1850.0MHz		1880.0MHz		1910.0MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
GSM/GPRS/ EGPRS1900	2013-02-18	39.7	1.37	39.5	1.39	39.4	1.41
f (MHz)	Date	Dielectric Parameters					
		1852.4MHz		1880.0MHz		1908.0MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
WCDMA1900	2013-02-16	39.4	1.36	39.3	1.39	39.2	1.41
f (MHz)	Date	Dielectric Parameters					
		2412.0MHz		2442.0MHz		2462.0MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
WLAN2450	2013-02-07	37.8	1.76	37.7	1.79	37.6	1.82
	2013-02-12	37.5	1.77	37.3	1.80	37.3	1.82
	2013-03-01	38.6	1.77	38.5	1.80	38.4	1.81

Body tissue simulant dielectric parameters used in the measurements:

f (MHz)	Date	Dielectric Parameters					
		824.2MHz		837.0MHz		849.0MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
GSM/GPRS/ EGPRS850	2013-02-22	53.4	1.00	53.4	1.01	53.3	1.02
	2013-02-25	54.0	0.99	54.0	1.00	53.9	1.01
	2013-02-26	53.6	1.01	53.5	1.01	53.5	1.02
f (MHz)	Date	Dielectric Parameters					
		826.0MHz		835.0MHz		847.0MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
WCDMA850	2013-02-22	53.4	1.00	53.4	1.01	53.3	1.01
	2013-02-25	54.0	0.99	54.0	1.00	53.9	1.01
	2013-02-26	53.6	1.01	53.5	1.01	53.5	1.02
f (MHz)	Date	Dielectric Parameters					
		1712.4MHz		1732.4MHz		1753.0MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
WCDMA1700/ 2100	2013-02-26	52.0	1.43	51.9	1.45	51.9	1.47
f (MHz)	Date	Dielectric Parameters					
		1850.0MHz		1880.0MHz		1910.0MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
GSM/GPRS/ EGPRS1900	2013-02-25	52.1	1.48	52.0	1.51	51.9	1.54
	2013-02-26	52.1	1.50	52.0	1.52	51.9	1.55
f (MHz)	Date	Dielectric Parameters					
		1852.4MHz		1880.0MHz		1908.0MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
WCDMA1900	2013-02-25	52.1	1.48	52.0	1.51	51.9	1.54
	2013-02-26	52.1	1.50	52.0	1.52	51.9	1.55
f (MHz)	Date	Dielectric Parameters					
		2412.0MHz		2442.0MHz		2462.0MHz	
		εr	σ [S/m]	εr	σ [S/m]	εr	σ [S/m]
WLAN2450	2013-02-12	50.9	1.92	50.8	1.95	50.8	1.98

APPENDIX D: CONDUCTED AVERAGE POWER MEASUREMENTS FOR WCDMA AND HSUPA

Type: RM-917; Serial number: 355913/05/000064/0 SW: 1030.6400.1304.10070

D.1 WCDMA850 Test results

Average power

Ch / *f*(MHz)	P [dBm]
4133	23.85
4175	23.92
4232	24.00

D.2 HSUPA850 Test results

Average power

Ch / *f* (MHz)	P [dBm]				
	Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
4133	22.07	21.61	20.91	22.11	22.70
4175	22.72	21.90	21.71	22.35	22.82
4232	22.65	21.72	21.05	22.22	22.81

Note: In HSUPA operation, the output power is reduced relative to the tuning target power for WCDMA. This device runs a single HSUPA power control routine: MPR. As a result, the MPR for each of the Subtest modes is as follows:

Maximum Power Reduction (MPR)				
Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
1.0dB	2.0dB	3.0dB	2.0dB	1.0dB

D.3 WCDMA1700/2100 Test results

Average power

Ch / *f*(MHz)	P [dBm]
9263	24.43
9400	24.57
9537	24.58

D.4 HSUPA1700/2100 Test results

Average power

Ch / *f* (MHz)	P [dBm]				
	Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
9263	23.01	21.88	21.40	22.67	23.32
9400	23.36	22.42	22.22	22.66	23.27
9537	23.24	22.15	21.35	22.83	23.26

Note: In HSUPA operation, the output power is reduced relative to the tuning target power for WCDMA. This device runs a single HSUPA power control routine: MPR. As a result, the MPR for each of the Subtest modes is as follows:

Maximum Power Reduction (MPR)				
Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
1.0dB	2.0dB	3.0dB	2.0dB	1.0dB

D.5 WCDMA1900 Test results

Average power

Ch / *f*(MHz)	P [dBm]
9263	22.96
9400	23.21
9537	23.20

D.6 HSUPA1900 Test results

Average power

Ch / *f* (MHz)	P [dBm]				
	Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
9263	21.34	20.97	20.20	21.59	22.09
9400	21.99	21.21	21.21	21.56	22.16
9537	22.07	20.96	20.44	21.64	22.15

Note: In HSUPA operation, the output power is reduced relative to the tuning target power for WCDMA. This device runs a single HSUPA power control routine: MPR. As a result, the MPR for each of the Subtest modes is as follows:

Maximum Power Reduction (MPR)				
Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
1.0dB	2.0dB	3.0dB	2.0dB	1.0dB

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

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.

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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.

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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 F: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S)

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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

Date: 13.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

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

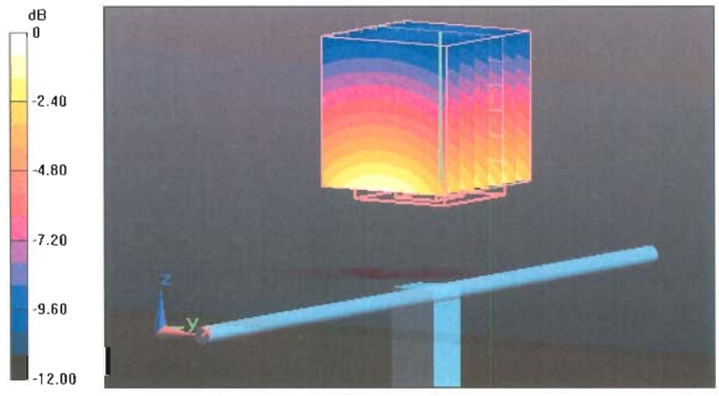
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

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

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

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



0 dB = 2.710mW/g

DASY5 Validation Report for Body TSL

Date: 12.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

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

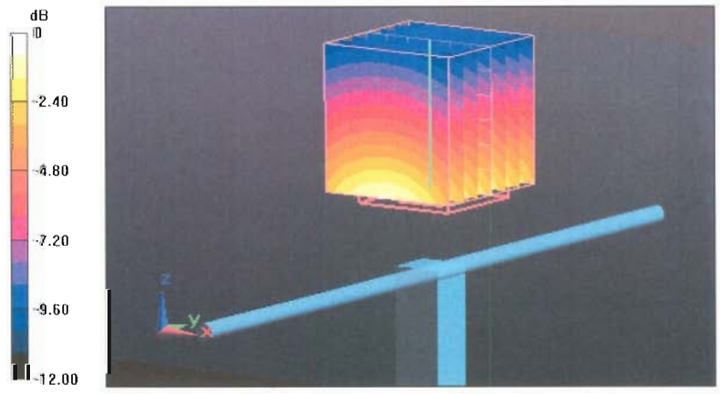
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

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

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

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



0 dB = 2.850mW/g

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

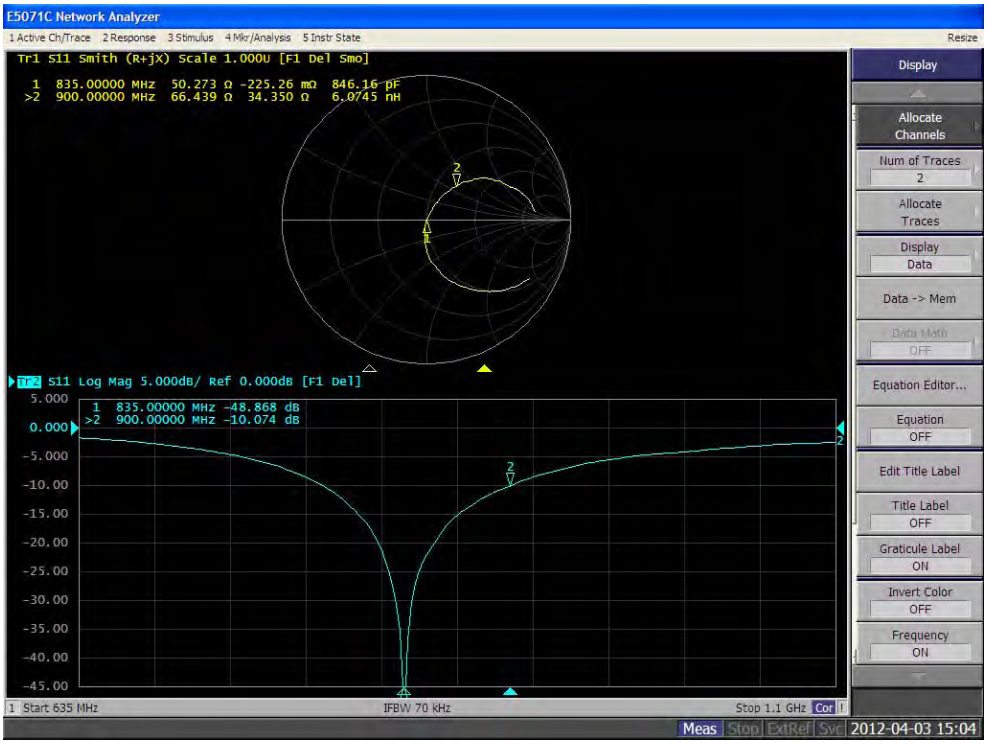
Antenna Parameters with Head TSL

	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

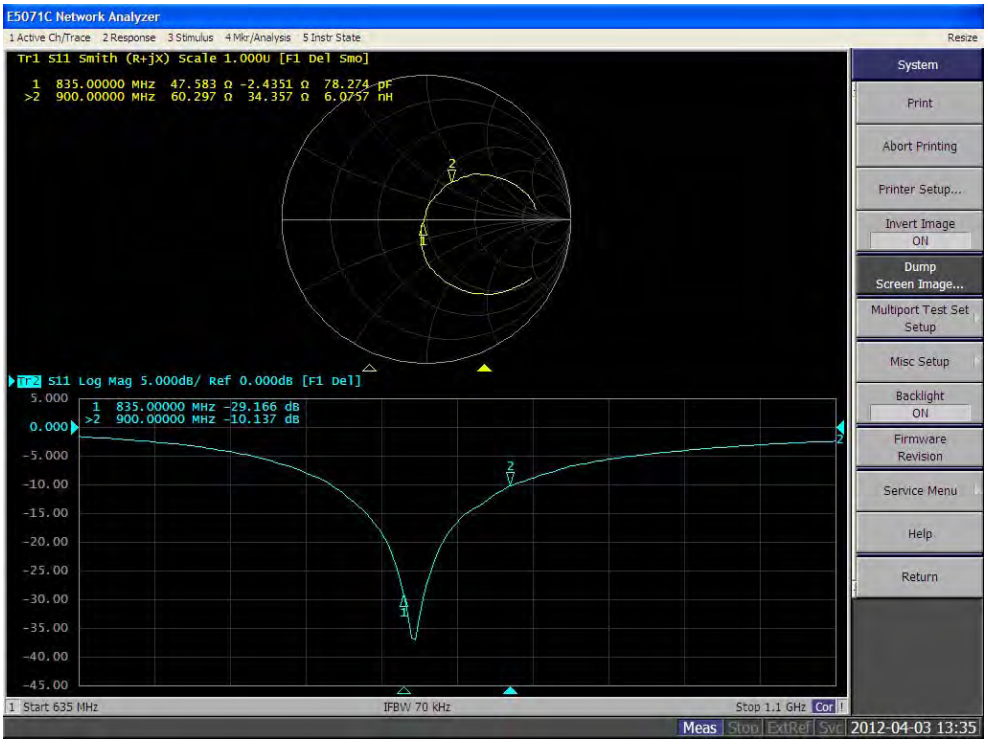
Antenna Parameters with Body TSL

	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



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Accreditation No.: SCS 108

Client **Nokia Salo TCC**

Certificate No: D1750V2-1082_Dec12

CALIBRATION CERTIFICATE

Object	D1750V2 - SN: 1082
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	December 05, 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	01-Nov-12 (No. 217-01640)	Oct-13
Power sensor HP 8481A	US37292783	01-Nov-12 (No. 217-01640)	Oct-13
Reference 20 dB Attenuator	SN: 5058 (20k)	27-Mar-12 (No. 217-01530)	Apr-13
Type-N mismatch combination	SN: 5047.3 / 06327	27-Mar-12 (No. 217-01533)	Apr-13
Reference Probe ES3DV3	SN: 3205	30-Dec-11 (No. ES3-3205_Dec11)	Dec-12
DAE4	SN: 601	27-Jun-12 (No. DAE4-601_Jun12)	Jun-13

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-12)	In house check: Oct-13

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

Issued: December 5, 2012

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Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY5	V52.8.3
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.3 ± 6 %	1.34 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	8.99 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.3 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.80 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.3 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.8 ± 6 %	1.47 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.21 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**36.9 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.95 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.8 W/kg ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.8 Ω + 0.7 jΩ
Return Loss	- 43.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.2 Ω + 0.8 jΩ
Return Loss	- 27.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.219 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	January 19, 2011

Date: 05.12.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1082

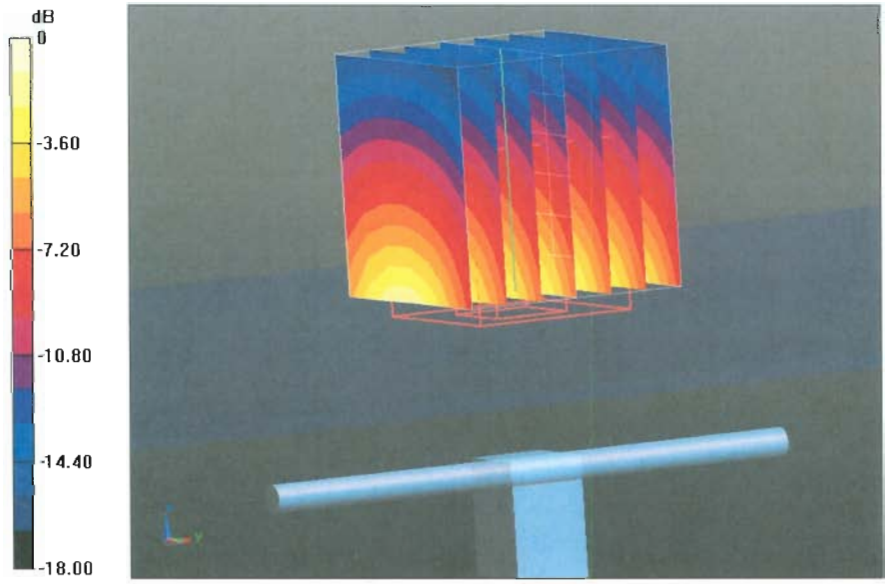
Communication System: CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.34 mho/m; ε_r = 39.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.22, 5.22, 5.22); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.3(988); SEMCAD X 14.6.7(6848)

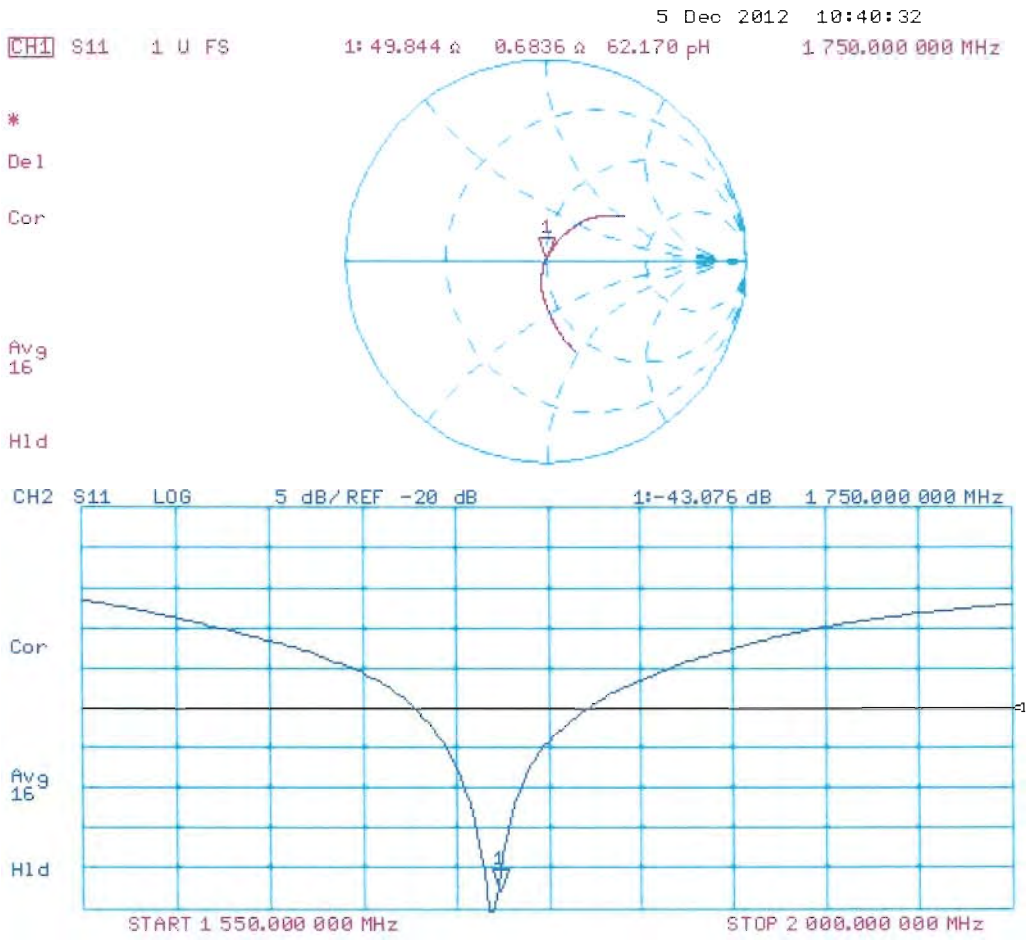
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.445 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 15.9 W/kg
SAR(1 g) = 8.99 W/kg; SAR(10 g) = 4.8 W/kg
Maximum value of SAR (measured) = 10.9 W/kg



0 dB = 10.9 W/kg = 10.37 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 05.12.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1082

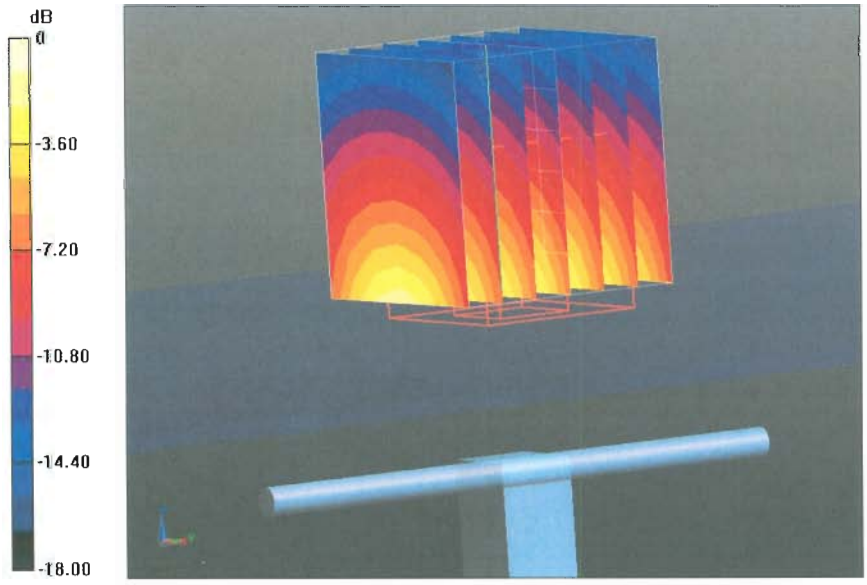
Communication System: CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.47 mho/m; ε_r = 51.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.85, 4.85, 4.85); Calibrated: 30.12.2011;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.3(988); SEMCAD X 14.6.7(6848)

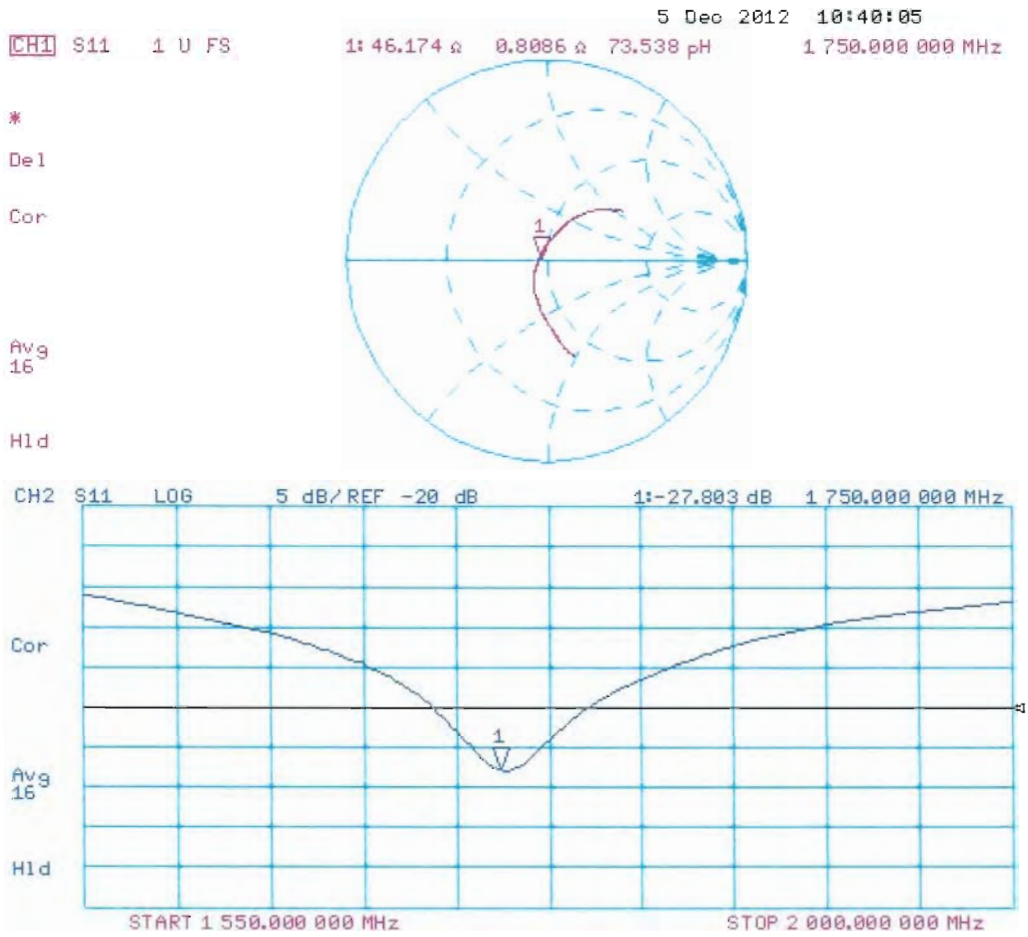
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 92.445 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 15.9 W/kg
SAR(1 g) = 9.21 W/kg; SAR(10 g) = 4.95 W/kg
Maximum value of SAR (measured) = 11.5 W/kg



0 dB = 11.5 W/kg = 10.61 dBW/kg

Impedance Measurement Plot for Body TSL



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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

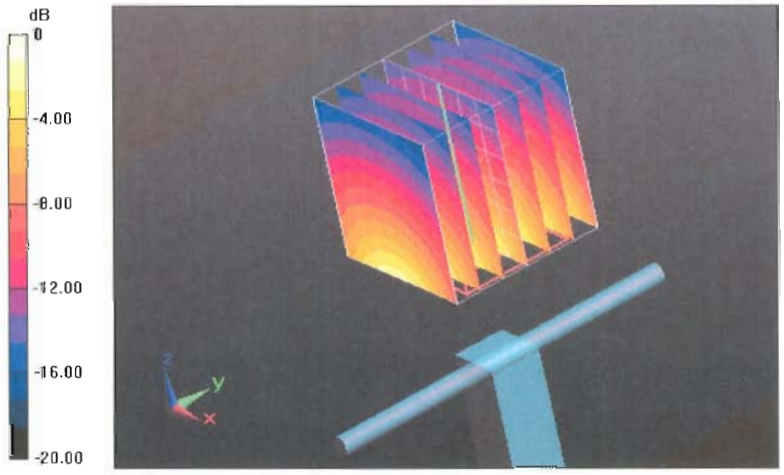
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.4 mho/m; ε_r = 40.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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)

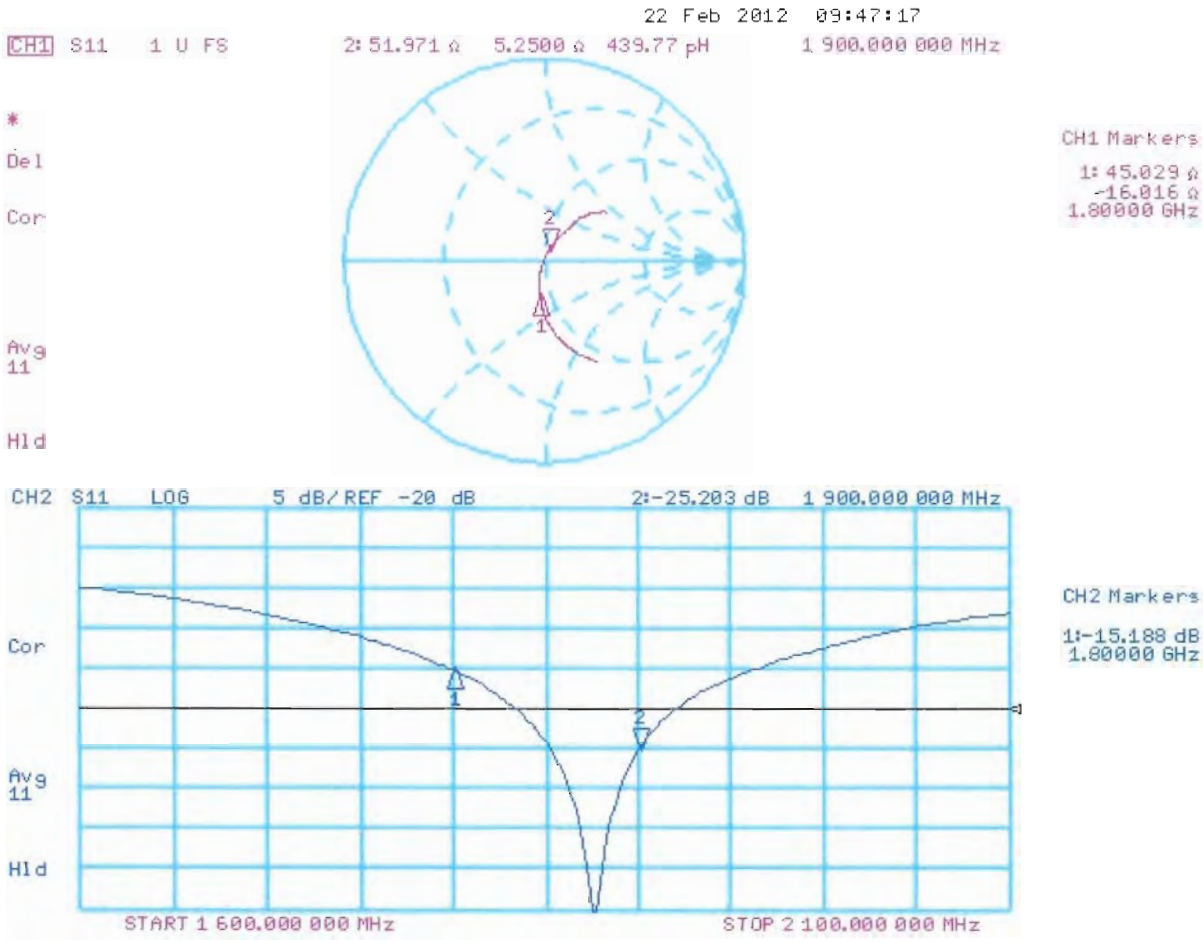
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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

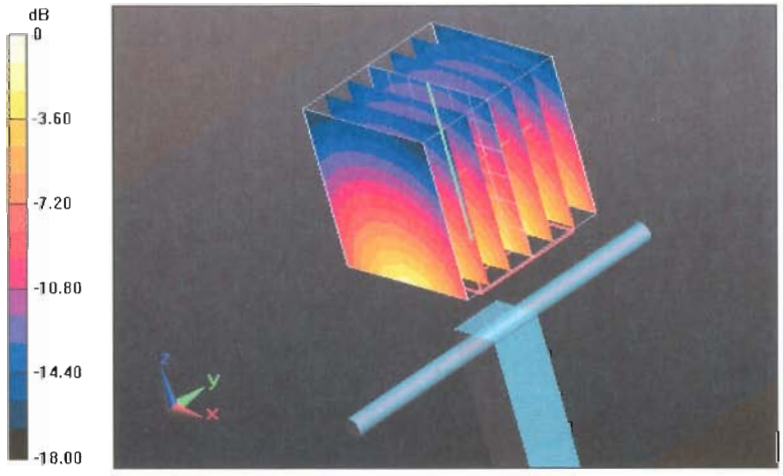
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.56 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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)

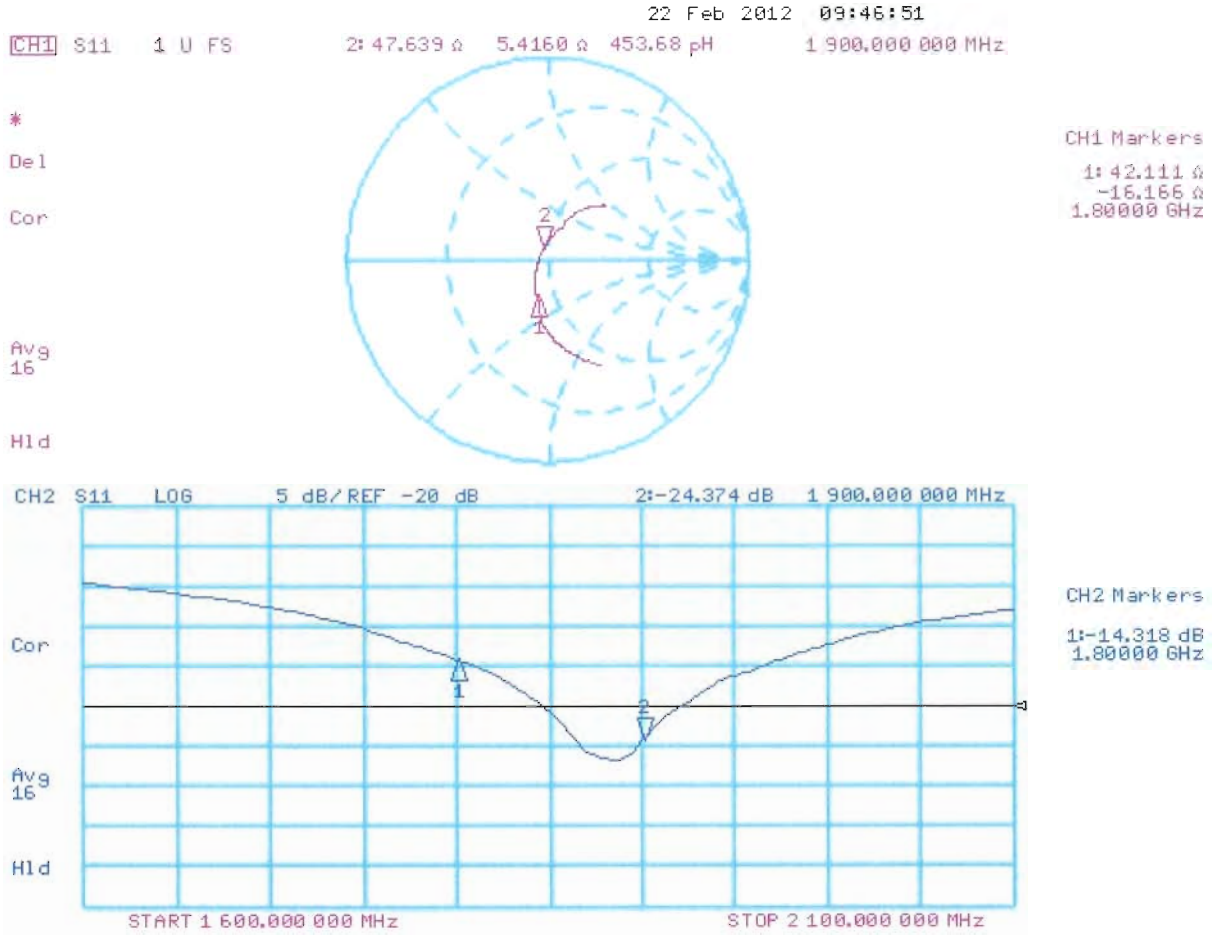
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

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.

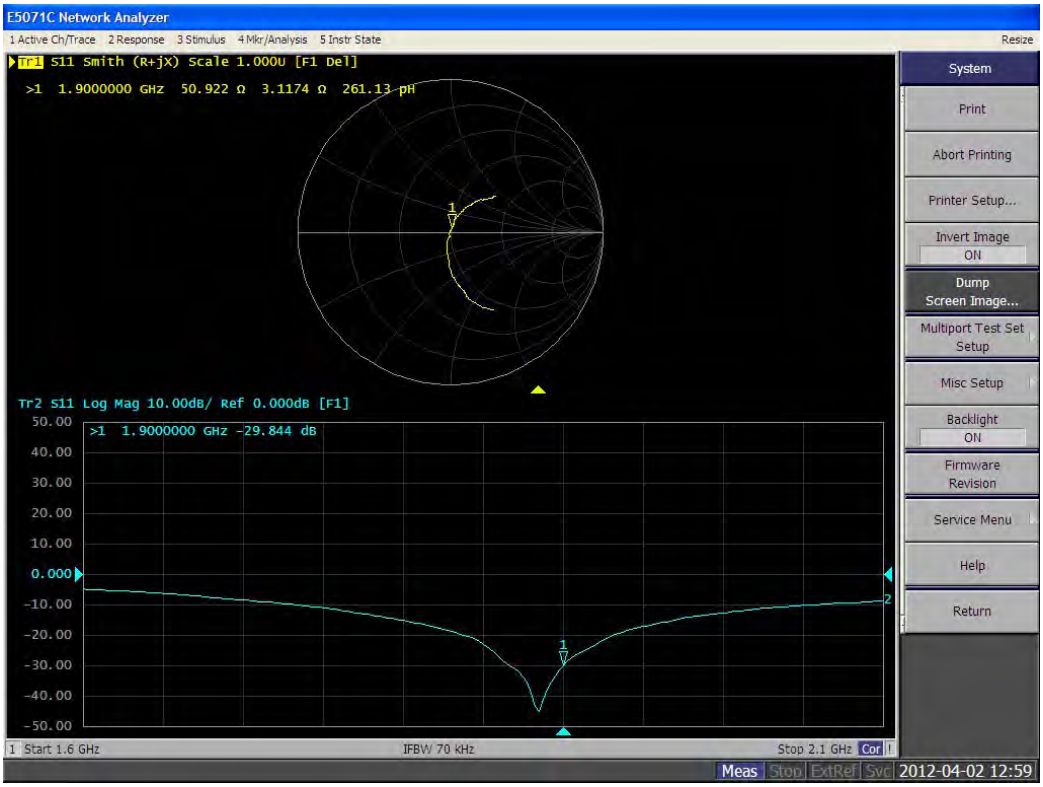
Antenna Parameters with Head TSL

	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

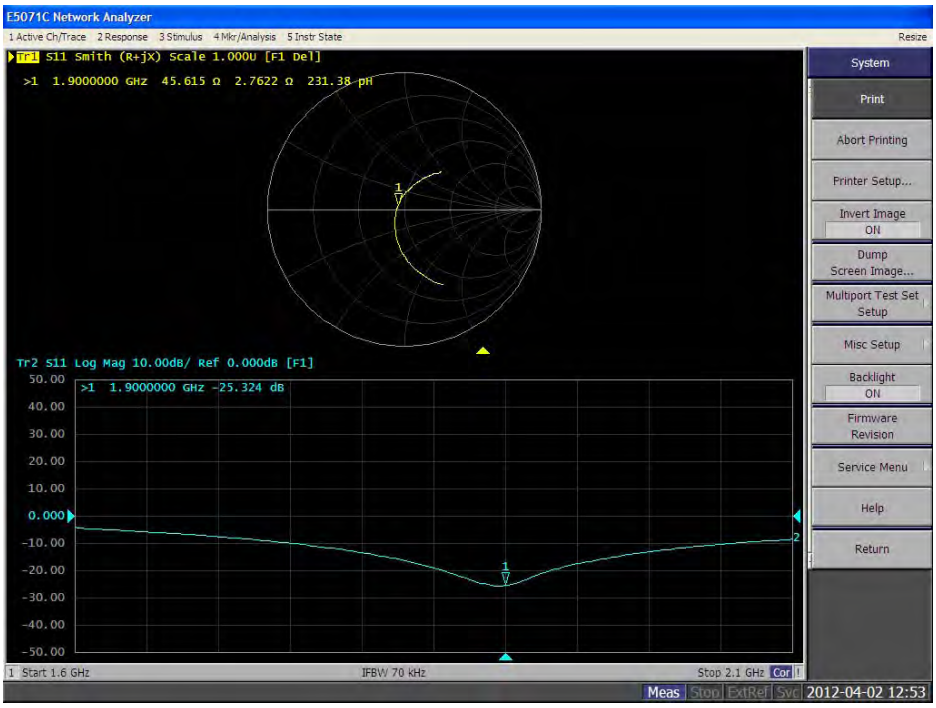
Antenna Parameters with Body TSL

	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



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Accreditation No.: SCS 108

Client Nokia Salo TCC

Certificate No: D2450V2-729_Sep11

CALIBRATION CERTIFICATE

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

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Type-N mismatch combination	SN: 5047.2 / 06327	29-Mar-11 (No. 217-01371)	Apr-12
Reference Probe ES3DV3	SN: 3205	29-Apr-11 (No. ES3-3205_Apr11)	Apr-12
DAE4	SN: 601	04-Jul-11 (No. DAE4-601_Jul11)	Jul-12

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

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

Issued: September 13, 2011

Date: 13.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

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

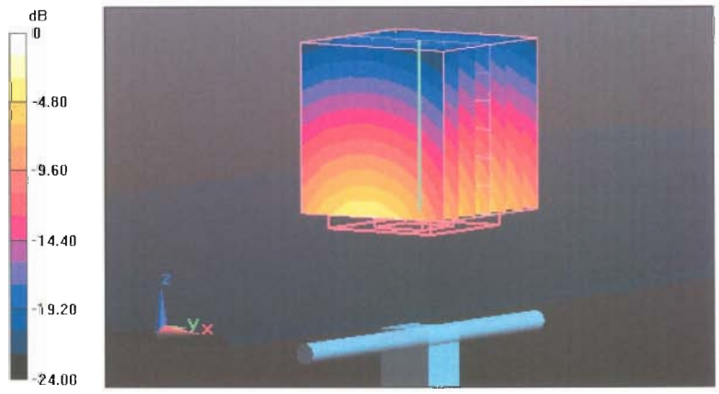
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.85 mho/m; ε_r = 38.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

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

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

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



0 dB = 18.130mW/g

Date: 12.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

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

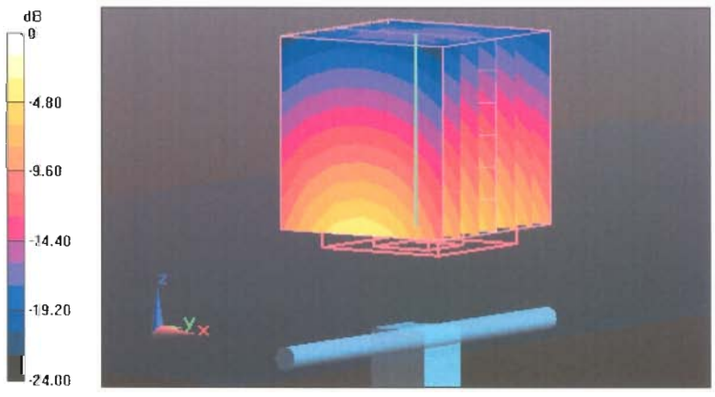
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.04 mho/m; ε_r = 51.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

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

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

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



0 dB = 17.570mW/g

Dipole D2450V2 – SN:729 Antenna Parameters measured: 2012-04-03.

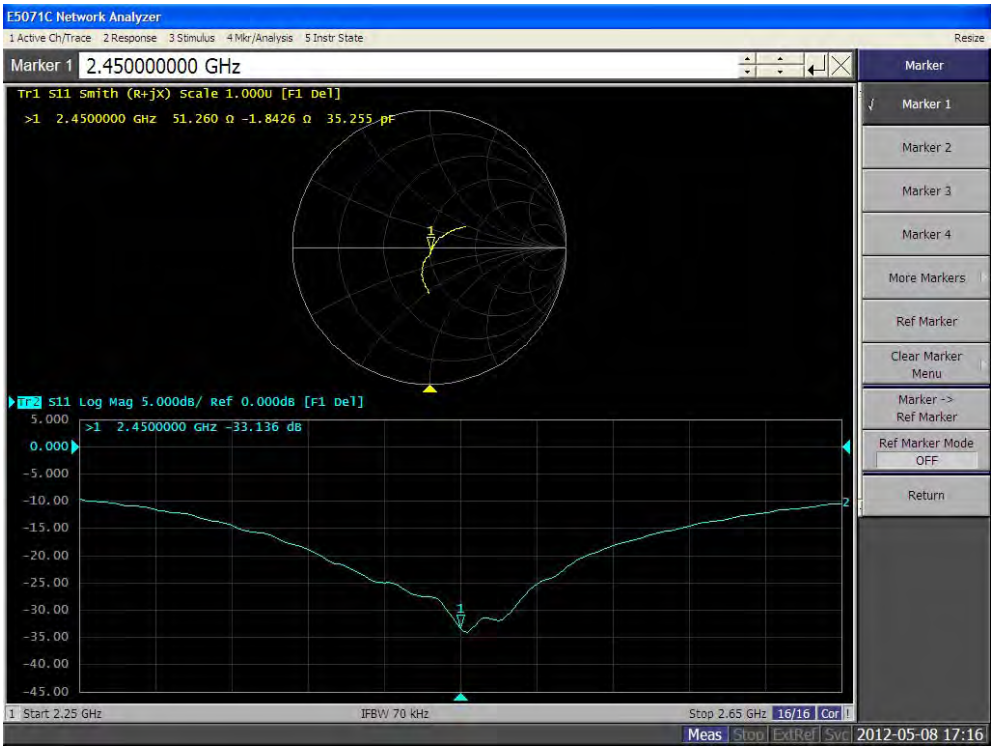
Antenna Parameters with Head TSL

	Calibration certificate	Annual measurement
Impedance, transformed to feed point	51.8 Ω - 0.6 jΩ	51.3 Ω - 1.8 jΩ
Return loss	-34.7 dB	-33.1 dB

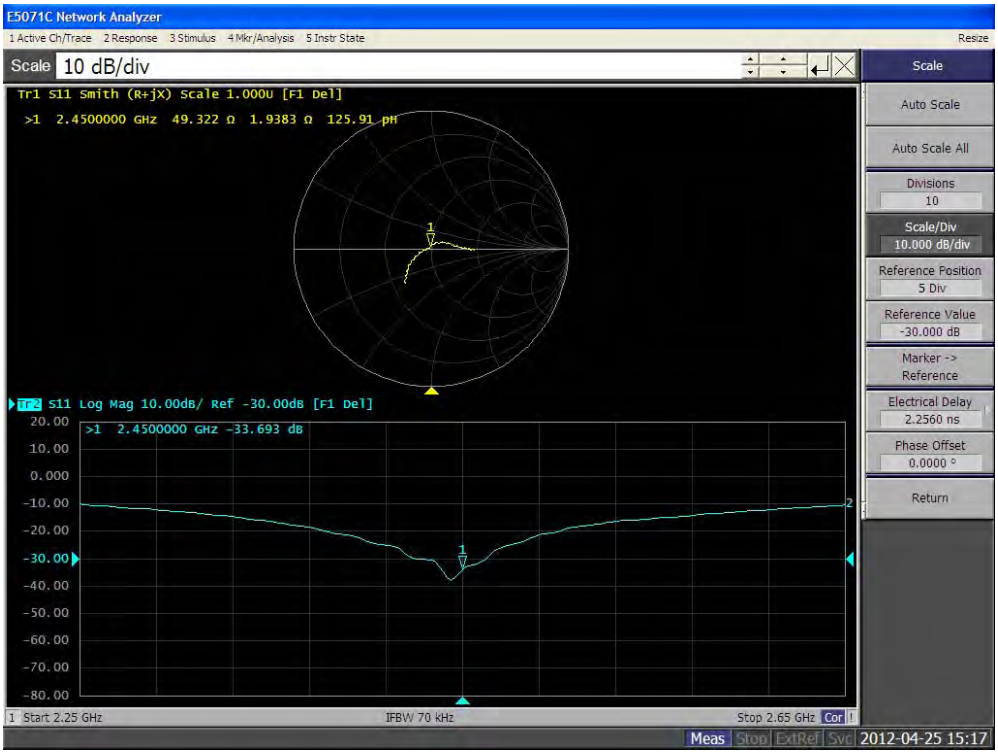
Antenna Parameters with Body TSL

	Calibration certificate	Annual measurement
Impedance, transformed to feed point	48.7 Ω - 1.1 jΩ	49.3 Ω 1.9 jΩ
Return loss	-35.5 dB	-33.7 dB

Impedance Measurement Plot for Head TSL 2450



Impedance Measurement Plot for Body TSL 2450



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

G.1 Power Tuning Targets

Tuning targets GSM/GPRS/EGPRS850			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	32.50	32.50	32.50
GPRS 2-slot	30.00	30.00	30.00
GPRS 3-slot	28.20	28.20	28.20
GPRS 4-slot	27.00	27.00	27.00
EGRPS 1-slot	27.00	27.00	27.00
EGPRS 2-slot	25.50	25.50	25.50
EGRPS 3-slot	23.50	23.50	23.50
EGPRS 4-slot	21.50	21.50	21.50

Tuning targets GSM/GPRS/EGPRS850 in WR mode			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	32.50	32.50	32.50
GPRS 2-slot	29.00	29.00	29.00
GPRS 3-slot	27.20	27.20	27.20
GPRS 4-slot	26.00	26.00	26.00
EGRPS 1-slot	27.00	27.00	27.00
EGPRS 2-slot	25.50	25.50	25.50
EGRPS 3-slot	23.50	23.50	23.50
EGPRS 4-slot	21.50	21.50	21.50

Tuning targets GSM/GPRS/EGPRS1900			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	28.50	28.50	28.50
GPRS 2-slot	27.50	27.50	27.50
GPRS 3-slot	25.70	25.70	25.70
GPRS 4-slot	24.50	24.50	24.50
EGRPS 1-slot	26.00	26.00	26.00
EGPRS 2-slot	24.50	24.50	24.50
EGRPS 3-slot	22.50	22.50	22.50
EGPRS 4-slot	20.50	20.50	20.50

Tuning targets GSM/GPRS/EGPRS1900 in WR mode			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	27.50	27.50	27.50
GPRS 2-slot	25.00	25.00	25.00
GPRS 3-slot	23.20	23.20	23.20
GPRS 4-slot	22.00	22.00	22.00
EGRPS 1-slot	26.00	26.00	26.00
EGPRS 2-slot	24.50	24.50	24.50
EGRPS 3-slot	22.50	22.50	22.50
EGPRS 4-slot	20.50	20.50	20.50

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

Type: RM-917; Serial number: 355913/05/000069/9 used for GSM/GPRS/EGPRS850 for SAR Head and Body-worn measurements

Type: RM-917; Serial number: 355913/05/000072/3 used for GSM/GPRS/EGPRS1900 for SAR Head and Body-worn measurements.

GSM/GPRS/EGPRS850			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	32.88	32.89	32.89
GPRS 2-slot	30.80	30.41	30.35
GPRS 3-slot	28.97	28.83	28.81
GPRS 4-slot	27.55	27.35	27.37
EGRPS 1-slot	27.67	27.52	27.70
EGPRS 2-slot	25.86	25.85	26.10
EGRPS 3-slot	24.22	24.16	24.02
EGPRS 4-slot	21.85	21.87	21.90

GSM/GPRS/EGPRS1900			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	28.87	28.89	28.95
GPRS 2-slot	27.89	27.97	27.97
GPRS 3-slot	26.05	26.07	26.17
GPRS 4-slot	24.90	24.86	24.90
EGRPS 1-slot	26.40	26.50	26.37
EGPRS 2-slot	24.86	24.88	24.88
EGRPS 3-slot	22.85	23.06	22.88
EGPRS 4-slot	21.00	21.09	20.99

Type: RM-917; Serial number: 355913/05/000141/6 used for GSM/GPRS/EGPRS850 Wireless Router mode testing.

Type: RM-917; Serial number: 355913/05/000096/2 used for GSM/GPRS/EGPRS1900 Wireless Router mode testing.

GSM/GPRS/EGPRS850 in WR mode			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	32.90	32.94	32.96
GPRS 2-slot	29.35	29.58	29.29
GPRS 3-slot	27.65	27.66	27.57
GPRS 4-slot	26.39	26.42	26.35
EGRPS 1-slot	27.36	27.49	27.50
EGPRS 2-slot	25.85	25.97	26.92
EGRPS 3-slot	23.85	23.91	23.96
EGPRS 4-slot	21.85	21.9	21.96

GSM/GPRS/EGPRS1900 in WR mode			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	27.94	27.84	27.90
GPRS 2-slot	25.50	25.34	25.37
GPRS 3-slot	23.61	23.55	23.70
GPRS 4-slot	22.44	22.44	22.50
EGRPS 1-slot	26.41	26.35	26.36
EGPRS 2-slot	24.87	24.85	24.79
EGRPS 3-slot	22.99	22.89	22.89
EGPRS 4-slot	20.85	20.86	20.87

APPENDIX H: CONDUCTED POWER MEASUREMENTS FOR SUPPORTED WCDMA TRANSMISSION MODES

H.1 Power Tuning Targets

Tuning targets			
Mode	Low channel	Mid channel	High channel
WCDMA850	23.50	23.50	23.50
WCDMA1700/2100	24.00	24.00	24.00
WCDMA1900	22.50	22.50	22.50

Tuning targets in WR mode			
Mode	Low channel	Mid channel	High channel
WCDMA850	23.00	23.00	23.00
WCDMA1700/2100	23.00	23.00	23.00
WCDMA1900	18.50	18.50	18.50

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

Type: RM-917; Serial number: 355913/05/000064/0 used for WCDMA850 for SAR Head and Body-worn measurements

Type: RM-917; Serial number: 355913/05/000072/3 used for WCDMA1700/2100 and WCDMA1900 for SAR Head and Body-worn measurements

WCDMA850 (Band 5)			
Mode	Low channel	Mid channel	High channel
WCDMA	23.85	23.92	24.00

WCDMA1700/2100 (Band 4)			
Mode	Low channel	Mid channel	High channel
WCDMA	24.43	24.57	24.58

WCDMA1900 (Band 2)			
Mode	Low channel	Mid channel	High channel
WCDMA	22.96	23.21	23.20

WCDMA and HSUPA Subtest mode conducted powers, measured from as separate, fully representative sample are presented in Appendix D.

Type: RM-917; Serial number: 355913/05/000141/6 used for WCDMA850 Wireless Router mode testing.

Type: RM-917; Serial number: 355913/05/000096/2 used for WCDMA1700/2100 and WCDMA1900 Wireless Router mode testing.

WCDMA850 (Band 5) in WR mode			
Mode	Low channel	Mid channel	High channel
WCDMA	23.56	23.65	23.48

WCDMA1700/2100 (Band 4) in WR mode			
Mode	Low channel	Mid channel	High channel
WCDMA	23.35	23.68	23.60

WCDMA1900 (Band 2) in WR mode			
Mode	Low channel	Mid channel	High channel
WCDMA	19.12	19.02	19.11

APPENDIX I: CONDUCTED POWER MEASUREMENTS FOR WLAN

I.1 Power Tuning Targets

Tuning targets for WLAN 2.4 GHz					
Modulation mode	Ch 1	Ch 2	Ch 3	Ch 4	Ch 5
b-mode WLAN DSSS 1 Mbps	17.00	17.00	17.00	17.00	17.00
b-mode WLAN DSSS 2 Mbps	17.00	17.00	17.00	17.00	17.00
b-mode WLAN DSSS 5.5 Mbps	17.00	17.00	17.00	17.00	17.00
b-mode WLAN DSSS 11 Mbps	17.00	17.00	17.00	17.00	17.00
g-mode WLAN OFDM 6 Mbps	16.00	16.00	16.00	16.00	16.00
g-mode WLAN OFDM 9 Mbps	16.00	16.00	16.00	16.00	16.00
g-mode WLAN OFDM 12 Mbps	15.50	15.50	15.50	15.50	15.50
g-mode WLAN OFDM 18 Mbps	15.00	15.00	15.00	15.00	15.00
g-mode WLAN OFDM 24 Mbps	14.50	14.50	14.50	14.50	14.50
g-mode WLAN OFDM 36 Mbps	14.00	14.00	14.00	14.00	14.00
g-mode WLAN OFDM 48 Mbps	13.50	13.50	13.50	13.50	13.50
g-mode WLAN OFDM 54 Mbps	13.50	13.50	13.50	13.50	13.50
n-mode MCS 0: OFDM 6.5 / 7.25 Mbps	15.50	15.50	15.50	15.50	15.50
n-mode MCS 1: OFDM 13.0 / 14.4 Mbps	15.00	15.00	15.00	15.00	15.00
n-mode MCS 2: OFDM 19.5 / 21.7 Mbps	14.50	14.50	14.50	14.50	14.50
n-mode MCS 3: OFDM 26.0 / 28.9 Mbps	14.00	14.00	14.00	14.00	14.00
n-mode MCS 4: OFDM 39.0 / 43.3 Mbps	14.00	14.00	14.00	14.00	14.00
n-mode MCS 5: OFDM 52.0 / 57.8 Mbps	13.50	13.50	13.50	13.50	13.50
n-mode MCS 6: OFDM 58.5 / 65.0 Mbps	13.00	13.00	13.00	13.00	13.00
n-mode MCS 7: OFDM 65.0 / 72.2 Mbps	13.00	13.00	13.00	13.00	13.00

(Tuning targets for WLAN 2.4 GHz continues)

(Tuning targets for WLAN 2.4 GHz continues)

Tuning targets for WLAN 2.4 GHz						
Modulation mode	Ch 6	Ch 7	Ch 8	Ch 9	Ch 10	Ch 11
b-mode WLAN DSSS 1 Mbps	17.00	17.00	17.00	17.00	17.00	17.00
b-mode WLAN DSSS 2 Mbps	17.00	17.00	17.00	17.00	17.00	17.00
b-mode WLAN DSSS 5.5 Mbps	17.00	17.00	17.00	17.00	17.00	17.00
b-mode WLAN DSSS 11 Mbps	17.00	17.00	17.00	17.00	17.00	17.00
g-mode WLAN OFDM 6 Mbps	16.00	16.00	16.00	16.00	16.00	16.00
g-mode WLAN OFDM 9 Mbps	16.00	16.00	16.00	16.00	16.00	16.00
g-mode WLAN OFDM 12 Mbps	15.50	15.50	15.50	15.50	15.50	15.50
g-mode WLAN OFDM 18 Mbps	15.00	15.00	15.00	15.00	15.00	15.00
g-mode WLAN OFDM 24 Mbps	14.50	14.50	14.50	14.50	14.50	14.50
g-mode WLAN OFDM 36 Mbps	14.00	14.00	14.00	14.00	14.00	14.00
g-mode WLAN OFDM 48 Mbps	13.50	13.50	13.50	13.50	13.50	13.50
g-mode WLAN OFDM 54 Mbps	13.50	13.50	13.50	13.50	13.50	13.50
n-mode MCS 0: OFDM 6.5 / 7.25 Mbps	15.50	15.50	15.50	15.50	15.50	15.50
n-mode MCS 1: OFDM 13.0 / 14.4 Mbps	15.00	15.00	15.00	15.00	15.00	15.00
n-mode MCS 2: OFDM 19.5 / 21.7 Mbps	14.50	14.50	14.50	14.50	14.50	14.50
n-mode MCS 3: OFDM 26.0 / 28.9 Mbps	14.00	14.00	14.00	14.00	14.00	14.00
n-mode MCS 4: OFDM 39.0 / 43.3 Mbps	14.00	14.00	14.00	14.00	14.00	14.00
n-mode MCS 5: OFDM 52.0 / 57.8 Mbps	13.50	13.50	13.50	13.50	13.50	13.50
n-mode MCS 6: OFDM 58.5 / 65.0 Mbps	13.00	13.00	13.00	13.00	13.00	13.00
n-mode MCS 7: OFDM 65.0 / 72.2 Mbps	13.00	13.00	13.00	13.00	13.00	13.00

I.2 Conducted Power measurements

Type: RM-917; Serial number: 355913/05/000064/0 used for WLAN for SAR Head, Body-worn and Wireless Router measurements.

WLAN 2.4 GHz					
Modulation mode	Ch 1	Ch 2	Ch 3	Ch 4	Ch 5
b-mode WLAN DSSS 1 Mbps	18.60	-	-	-	-
b-mode WLAN DSSS 2 Mbps	18.50	-	-	-	-
b-mode WLAN DSSS 5.5 Mbps	18.50	-	-	-	-
b-mode WLAN DSSS 11 Mbps	18.40	-	-	-	-
g-mode WLAN OFDM 6 Mbps	17.45	-	-	-	-
g-mode WLAN OFDM 9 Mbps	17.50	-	-	-	-
g-mode WLAN OFDM 12 Mbps	17.10	-	-	-	-
g-mode WLAN OFDM 18 Mbps	16.60	-	-	-	-
g-mode WLAN OFDM 24 Mbps	15.90	-	-	-	-
g-mode WLAN OFDM 36 Mbps	15.50	-	-	-	-
g-mode WLAN OFDM 48 Mbps	15.10	-	-	-	-
g-mode WLAN OFDM 54 Mbps	15.10	-	-	-	-
n-mode MCS 0: OFDM 6.5 / 7.25 Mbps	17.00	-	-	-	-
n-mode MCS 1: OFDM 13.0 / 14.4 Mbps	16.60	-	-	-	-
n-mode MCS 2: OFDM 19.5 / 21.7 Mbps	15.98	-	-	-	-
n-mode MCS 3: OFDM 26.0 / 28.9 Mbps	15.60	-	-	-	-
n-mode MCS 4: OFDM 39.0 / 43.3 Mbps	15.60	-	-	-	-
n-mode MCS 5: OFDM 52.0 / 57.8 Mbps	15.10	-	-	-	-
n-mode MCS 6: OFDM 58.5 / 65.0 Mbps	14.58	-	-	-	-
n-mode MCS 7: OFDM 65.0 / 72.2 Mbps	14.60	-	-	-	-

Tuning targets for WLAN 2.4 GHz						
Modulation mode	Ch 6	Ch 7	Ch 8	Ch 9	Ch 10	Ch 11
b-mode WLAN DSSS 1 Mbps	18.50	-	-	-	-	18.40
b-mode WLAN DSSS 2 Mbps	18.44	-	-	-	-	18.40
b-mode WLAN DSSS 5.5 Mbps	18.50	-	-	-	-	18.44
b-mode WLAN DSSS 11 Mbps	18.51	-	-	-	-	18.44
g-mode WLAN OFDM 6 Mbps	17.47	-	-	-	-	17.50
g-mode WLAN OFDM 9 Mbps	17.50	-	-	-	-	17.50
g-mode WLAN OFDM 12 Mbps	17.10	-	-	-	-	17.00
g-mode WLAN OFDM 18 Mbps	16.70	-	-	-	-	16.70
g-mode WLAN OFDM 24 Mbps	16.30	-	-	-	-	16.30
g-mode WLAN OFDM 36 Mbps	15.70	-	-	-	-	15.70
g-mode WLAN OFDM 48 Mbps	15.30	-	-	-	-	15.20
g-mode WLAN OFDM 54 Mbps	15.20	-	-	-	-	15.20
n-mode MCS 0: OFDM 6.5 / 7.25 Mbps	17.30	-	-	-	-	17.20
n-mode MCS 1: OFDM 13.0 / 14.4 Mbps	16.80	-	-	-	-	16.70
n-mode MCS 2: OFDM 19.5 / 21.7 Mbps	16.30	-	-	-	-	16.30
n-mode MCS 3: OFDM 26.0 / 28.9 Mbps	15.80	-	-	-	-	15.80
n-mode MCS 4: OFDM 39.0 / 43.3 Mbps	15.50	-	-	-	-	15.90
n-mode MCS 5: OFDM 52.0 / 57.8 Mbps	15.30	-	-	-	-	15.40
n-mode MCS 6: OFDM 58.5 / 65.0 Mbps	15.00	-	-	-	-	14.70
n-mode MCS 7: OFDM 65.0 / 72.2 Mbps	14.60	-	-	-	-	14.80