TCC
Nokia

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

SAR Compliance Test Report

Test report no.:	FCC_RM-941_03	**Date of report:**	2013-05-24
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Tested device:	RM-941		
FCC ID:	QTLRM-941	**IC:**	-
Supplement reports:	SAR_Photo_RM-941_04		
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.		

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2013-05-09 to 2013-05-23
SN, HW and SW numbers of tested device	SN: 004402/47/299339/7, HW: 2000, SW: 3037.0000.1318.0000, DUT: 53192 SN: 004402/47/299330/6, HW: 2000, SW: 3037.0000.1318.0000, DUT: 53194 SN: 004402/47/299331/4, HW: 2000, SW: 3037.0000.1318.0000, DUT: 53193
Batteries used in testing	-
Headsets used in testing	WH-108, DUT: 52918, 52919
Other accessories used in testing	
State of sample	Prototype unit
Notes	-

1.2 Maximum Results

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

1.2.1 Head Configuration

Mode	Ch / *f*(MHz)	Conducted power	Position	Measured SAR value (1g avg)	Reported* SAR value (1g avg)	SAR limit (1g avg)	Result	Plot #
3-slot GPRS850	251 / 848.8	28.91 dBm	Left, Cheek	0.378 W/kg	**0.42 W/kg**	1.6 W/kg	PASSED	1
WCDMA850	4233 / 846.6	24.15 dBm	Left, Cheek	0.387 W/kg	**0.43 W/kg**	1.6 W/kg	PASSED	2
3-slot GPRS1900	661 / 1880.0	26.17 dBm	Right, Cheek	0.563 W/kg	**0.63 W/kg**	1.6 W/kg	PASSED	3
WLAN2450	11 / 2462.0	15.08 dBm	Right, Cheek	0.422 W/kg	**0.52 W/kg**	1.6 W/kg	PASSED	4
3-slot GPRS850 + WLAN2450	-	-	Right, Cheek	0.449 W/kg	**0.55 W/kg**	1.6 W/kg	PASSED	5
WCDMA850 + WLAN2450	-	-	Right, Cheek	0.449 W/kg	**0.55 W/kg**	1.6 W/kg	PASSED	6
3-slot GPRS1900 + WLAN2450	-	-	Right, Cheek	0.589 W/kg	**0.66 W/kg**	1.6 W/kg	PASSED	7

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 #
3-slot GPRS850	251 / 848.8	28.91 dBm	1.5 cm	0.441 W/kg	**0.50 W/kg**	1.6 W/kg	PASSED	8
WCDMA850	4233 / 846.6	24.15 dBm	1.5 cm	0.340 W/kg	**0.38 W/kg**	1.6 W/kg	PASSED	9
3-slot GPRS1900	661 / 1880.0	26.17 dBm	1.5 cm	0.361 W/kg	**0.41 W/kg**	1.6 W/kg	PASSED	10
WLAN2450	11 / 2462.0	15.08 dBm	1.5 cm	0.076 W/kg	**0.09 W/kg**	1.6 W/kg	PASSED	11
3-slot GPRS850 + WLAN2450	-	-	1.5 cm	0.441 W/kg	**0.50 W/kg**	1.6 W/kg	PASSED	12
WCDMA850 + WLAN2450	-	-	1.5 cm	0.346 W/kg	**0.39 W/kg**	1.6 W/kg	PASSED	13
3-slot GPRS1900 + WLAN2450	-	-	1.5 cm	0.361 W/kg	**0.41 W/kg**	1.6 W/kg	PASSED	14

1.2.3 Wireless Router Configuration

Summary of Maximum Results for Wireless Router mode at 10.0mm

Mode	Ch / *f*(MHz)	Conducted power	Separation distance	Measured SAR value (1g avg)	Reported* SAR value (1g avg)	SAR limit (1g avg)	Result	Plot #
3-slot GPRS850	251 / 848.8	28.91 dBm	1.0 cm	0.640 W/kg	**0.72 W/kg**	1.6 W/kg	PASSED	15
WCDMA850	4233 / 846.6	24.15 dBm	1.0 cm	0.477 W/kg	**0.54 W/kg**	1.6 W/kg	PASSED	16
3-slot GPRS1900	661 / 1880.0	26.17 dBm	1.0 cm	0.565 W/kg	**0.63 W/kg**	1.6 W/kg	PASSED	17
WLAN2450	11 / 2462.0	15.08 dBm	1.0 cm	0.119 W/kg	**0.15 W/kg**	1.6 W/kg	PASSED	18
3-slot GPRS850 + WLAN2450	-	-	1.0 cm	0.640 W/kg	**0.72 W/kg**	1.6 W/kg	PASSED	19
WCDMA850 + WLAN2450	-	-	1.0 cm	0.477 W/kg	**0.54 W/kg**	1.6 W/kg	PASSED	20
3-slot GPRS1900 + WLAN2450	-	-	1.0 cm	0.579 W/kg	**0.65 W/kg**	1.6 W/kg	PASSED	21

* 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	0.63 W/kg	0.52 W/kg	-
{Max + Max} Simultaneous Head SAR value	1.15 W/kg		
Maximum Body SAR values	0.50 W/kg	0.09 W/kg	-
{Max + Max} Simultaneous Body SAR value	0.53 W/kg		
Maximum Product Specific (Wireless Router) SAR values	0.72 W/kg	0.15 W/kg	-
{Max + Max} Simultaneous Product Specific SAR value	0.81 W/kg		
Maximum Simultaneous SAR value **Head SAR: 3-slot GPRS1900 + WLAN2450**	1.15 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	0.48dB

1.2.6 Measurement Uncertainty

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

2. DESCRIPTION OF THE DEVICE UNDER TEST

Device category	Portable
Exposure environment	General population / uncontrolled

Modes of Operation	Bands	Modulation Mode	Duty Cycle	Transmitter Frequency Range (MHz)	Power Tuning Target (dBm)				Upper Limit of Power Tuning Tolerance (dBm)			
					1-slot	2-slot	3-slot	4-slot	1-slot	2-slot	3-slot	4-slot
GSM / GPRS	850	GMSK	1/8 to 4/8	824 – 849	32.50	30.00	28.50	27.00	32.85	30.35	28.85	27.35
	1900			1850 – 1910	30.20	27.00	25.50	24.00	30.55	27.35	25.85	24.35
EGPRS	850	GMSK	1/8 to 4/8	824 – 849	27.00	25.50	24.00	22.50	26.85	26.35	25.35	24.35
	1900			1850 – 1910	26.00	24.50	23.00	21.50	26.35	24.85	23.35	21.85
WCDMA	850 (Band V)		1	826 – 847	23.80				24.15			
HSUPA	850 (Band V)		1	826 – 847	See Appendix D for details							
BT	2450	GFSK	1	2402 – 2480	6.00				7.50			
					Ch 1	Ch 6	Ch 11		Ch 1	Ch 6	Ch 11	
WLAN b-mode	2450	DSSS	1	2412 – 2472	14.00	14.00	14.00		15.50	15.50	15.50	
WLAN g-mode	2450	OFDM	1	2412 – 2472	10.00	10.00	10.00		11.50	11.50	11.50	
WLAN n-mode	2450	OFDM	1	2412 – 2462 2412 – 2472	10.00	10.00	10.00		11.50	11.50	11.50	

Outside of USA and Canada, the transmitter of the device is capable of operating also in GSM/GPRS/EGPRS900, GSM/GPRS/EGPRS1800, WCDMA900, WCDMA2100, LTE845 (Band 20), LTE1800 (Band 3), and LTE2500 (Band 7) bands which are not part of this filing.

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

This device has also HSUPA capabilities in all WCDMA bands listed above. HSUPA target powers are always lower than or equal to the corresponding WCDMA target power listed above, details of the HSUPA MPR scheme, power targets and power results can be found in Appendix D.

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 is 6dBm (3.98mW), 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.

This device uses a single antenna for transmission of GSM/GPRS/EGPRS850, WCDMA850, GSM/GPRS/EGPRS1900 and WCDMA1900 bands; a separate single antenna is used for WLAN. Simultaneous transmission of any singular cellular and PCS band is possible with WLAN in Head and Body-worn use according to the table below.

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

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

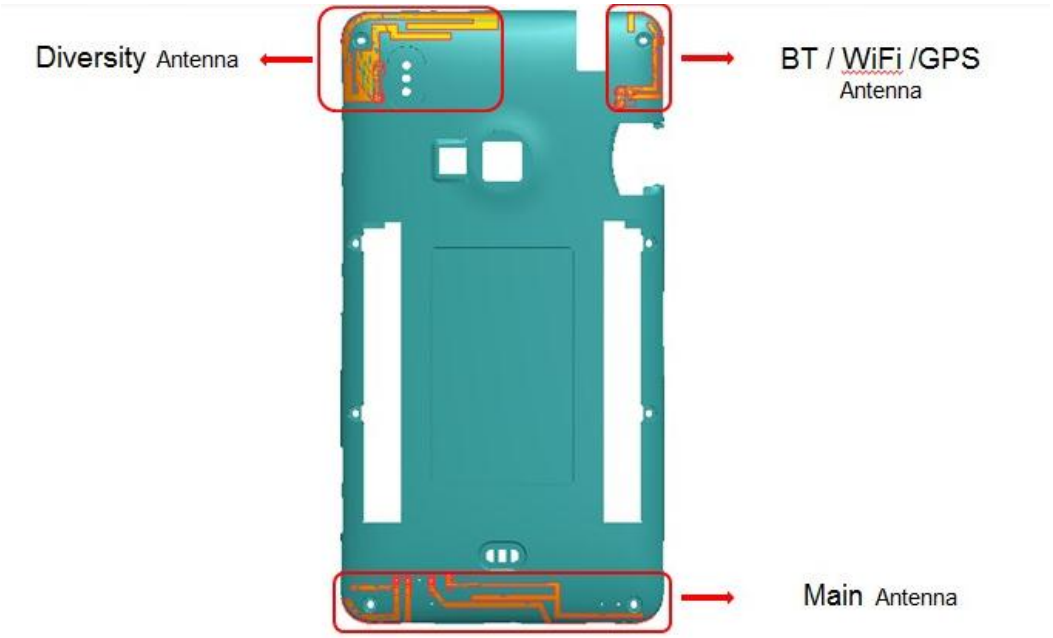
2.1 Power reductions in Wireless Router configurations

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

Band	Power reduction in WR mode	Target tuning power in WR mode
GPRS/EGPRS850	0 dB 0 dB 0 dB 0 dB 0 dB 0 dB 0 dB 0 dB	1-slot GPRS: 32.5 dBm 2-slot GPRS: 30.0 dBm 3-slot GPRS: 28.5 dBm 4-slot GPRS: 27.0 dBm 1-slot EGPRS: 27.0 dBm 2-slot EGPRS: 25.5 dBm 3-slot EGPRS: 24.0 dBm 4-slot EGPRS: 22.5 dBm
WCDMA850	0 dB	23.8 dBm
GPRS/EGPRS1900	0 dB 0 dB 0 dB 0 dB 0 dB 0 dB 0 dB 0 dB	1-slot GPRS: 30.2 dBm 2-slot GPRS: 27.0 dBm 3-slot GPRS: 25.5 dBm 4-slot GPRS: 24.0 dBm 1-slot EGPRS: 26.0 dBm 2-slot EGPRS: 24.5 dBm 3-slot EGPRS: 23.0 dBm 4-slot EGPRS: 21.5 dBm
WLAN2450 b-mode (DSSS 1 Mbps)	0 dB	Ch 1-11: 14.0 dBm
WLAN2450 g-mode (OFDM 6 Mbps)	0 dB	Ch 1-11: 10.0 dBm
WLAN2450 n-mode (MCS 0 – OFDM 6.5 Mbps)	0 dB	Ch 1-11: 10.0 dBm

2.2 Description of the Antenna

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



3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	20.8 – 22.5
Ambient humidity (RH %):	35 - 55

3.2 Test Signal, Frequencies and Output Power

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

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

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

The transmission mode of the device in all WCDMA tests was configured to 12.2kbps RMC with all TPC bits set as 1. All WCDMA testing has been carried out in accordance with FCC KDB 941225: SAR Measurement Procedures for 3G Devices.

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

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

The transmission mode of the device in all WLAN b-mode tests was DSSS QPSK 11Mbps. This mode has the highest (or equal highest) time-averaged output power of all the WLAN b and g modulation modes in Nokia devices. In WLAN n-mode, BPSK 6.5Mbps with 20MHz bandwidth was used. All WLAN testing has been carried out in accordance with FCC KDB 248227: SAR Measurement Procedures for 802.11 a/b/g Transmitters.

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
DAE 4	710	2013-03	2014-03
DAE 4	1324	2013-03	2014-03
DAE 4	705	2012-12	2013-12
E-field Probe EX3DV4	3836	2013-03	2014-03
E-field Probe EX3DV4	3823	2012-12	2013-12
E-field Probe EX3DV4	3838	2013-03	2014-03
Dipole Validation Kit, D835V2	4d005	2012-03	2014-03
Dipole Validation Kit, D835V2	479	2013-03	2015-03
Dipole Validation Kit, D1900V2	509	2012-12	2014-12
Dipole Validation Kit, D2450V2	883	2012-02	2014-02
DASY5 software	Version 52.8	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration date	Calibration expiry
Signal Generator	SME06	829445	2013-04	2014-04
Signal Generator	E4432B	US40052231	2013-04	2014-04
Signal Generator	SME06	829445/008	2013-04	2014-04
Call Tester	CMU200	835352/008	-	-
Call Tester	CMU200	831593/001	-	-
Call Tester	CMU200	110735	-	-
Call Tester	CMW500	113277	-	-
Call Tester	CMW500	115794	-	-
Amplifier	ZHL-42W	QA1252001	-	-
Amplifier	AR 5S1G4M1	306024	-	-
Amplifier	ZHL-4240W	e060204/1	-	-
RF Network Analyzer	8753ES	My40002096	2013-04	2014-04
RF Network Analyzer	8753ES	US39170317	2013-04	2014-04
Dielectric Probe Kit	85070C	2577	-	-
Dielectric Probe Kit	85070C	653	-	-
Power Meter	R&S NRP	101293	2013-04	2014-04
Power Sensor	R&S NRP-Z51	102842	2013-04	2014-04
Power Meter	Agilent E4419B	My41291520	2013-04	2014-04
Power Sensor	Agilent 8482A	US37295411	2013-04	2014-04
Power Meter	R&S NRVD	840297/008	2013-04	2014-04
Power Sensor	R&S NRV-Z51	101135	2013-04	2014-04

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 SAM 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 flat phantom also manufactured by SPEAG; this phantom conform to the requirements of OET Bulletin 65, Supplement C.

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

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 for all system check and device tests, measured from the ear reference point in the case of the SAM phantom and from the inner surface of the flat phantom.

4.3.1 Tissue Simulant Recipes

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

800MHz band

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

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

1900MHz band

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

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 Beijing / SAR-1	V52.8	D835V2 / 4d005	EX3DV4 / 3836	DAE4 / 710	2013-03	2013-03
835	TCC Beijing / SAR-3	V52.8	D835V2 / 479	EX3DV4 / 3838	DAE4 / 1324	2013-03	2013-04
835	TCC Beijing / SAR-4	V52.8	D835V2 / 4d005	EX3DV4 / 3823	DAE4 / 705	-	2013-03
1900	TCC Beijing / SAR-4	V52.8	D1900V2 / 509	EX3DV4 / 3823	DAE4 / 705	2013-04	2013-02
2450	TCC Beijing / SAR-4	V52.8	D2450V2 / 883	EX3DV4 / 3823	DAE4 / 705	2013-03	2013-03

4.4.2 System checking

The manufacturer calibrates the probes annually. Dielectric parameters of the tissue simulants were measured every day using the dielectric probe kit and the network analyser. A system check measurement was made following the determination of the dielectric parameters of the simulant, using the dipole validation kit. A power level of 250 mW was supplied to the dipole antenna, which was placed under the flat section of the twin SAM phantom for head system checking, and under the flat phantom for body system checking. The system checking results (dielectric parameters and SAR values) are given in the table below.

System checking, head tissue simulant

f[MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		SAR 1g Deviation from target	Dielectric Parameters Deviation from target		Temp	Plot #
			ε_r	1g	dSAR [%]	$d\varepsilon_r$ [%]	$d\sigma$ [%]	[°C]	
	Tolerances				±10 %	±5 %	±5 %		
	IEEE1528 / IEC62209		41.5	0.90					
	Reference result SN:479	2.48	40.9	0.94	TCC Beijing/SAR-3 EX3DV4 SN:3838 Head835				
	2013-05-15	2.33	40.7	0.91	-6.05	-0.49	-3.19	22.2	1
	2013-05-20	2.38	40.7	0.92	-4.03	-0.49	-2.13	22.1	-
	Reference result SN:4d005	2.32	41.5	0.89	TCC Beijing/SAR-1 EX3DV4 SN:3836 Head835				
835	2013-05-27	2.24	41.9	0.89	-3.45	0.96	0.00	22.4	2
	IEEE1528 / IEC62209		40.1	1.36					
	Reference result SN:509	9.63	39.5	1.38	TCC Beijing/SAR-4 EX3DV4 SN:3823 Head1900				
1900	2013-05-10	9.6	38.8	1.36	-0.31	-1.77	-1.45	22.5	3
	IEEE1528 / IEC62209		39.2	1.80					
	Reference result SN:883	13.8	38.9	1.86	TCC Beijing/SAR-4 EX3DV4 SN:3823 Head 2450MHz				
2450	2013-05-14	14.8	39.3	1.82	7.25	1.03	-2.15	22.5	4
	2013-05-15	14.8	39.5	1.81	7.25	1.54	-2.69	22.5	-

System checking, body tissue simulant

f[MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		SAR 1g Deviation from target	Dielectric Parameters Deviation from target		Temp	Plot #
			ε_r	σ [S/m]	dSAR [%]	$d\varepsilon_r$ [%]	$d\sigma$ [%]	[°C]	
	Tolerances				±10 %	±5 %	±5 %		
	IEEE1528 / IEC62209		55.2	0.97					
	Reference result SN:4d005	2.42	55.0	1.00	TCC Beijing/SAR-4 ES3DV3 SN:3823 Body835				
835	2013-05-22	2.22	55.1	0.97	-8.26	0.18	-3.00	21.6	5
	IEEE1528 / IEC62209		55.2	0.97					
	Reference result SN:4d005	2.42	55.0	1.00	TCC Beijing/SAR-1 ES3DV3 SN:3836 Body835				
835	2013-05-29	2.54	55.2	0.98	2.48	0.36	-2.00	21.9	-
	IEEE1528 / IEC62209		53.3	1.52					
	Reference result SN:509	9.84	52.2	1.52	TCC Beijing/SAR-4 EX4DV4 SN:3823 Body1900				
1900	2013-05-13	9.69	51.0	1.51	-1.52	-2.30	-0.66	21.9	6
	IEEE1528 / IEC62209		52.7	1.95					
	Reference result SN:883	13.2	52.3	2.02	TCC Beijing/SAR-3 EX4DV4 SN:3280 Body2450				
2450	2013-05-16	14.0	50.3	1.93	6.06	-3.82	-4.46	22.5	7

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 %	
	Recommended value	41.5	0.90			
835	2013-05-15	40.7	0.91	-1.93	1.11	22.2
	Recommended value	41.5	0.90			
	2013-05-20	40.7	0.92	-1.93	2.22	22.1
836	2013-05-27	41.9	0.89	0.96	-1.11	22.4
	Recommended value	40.0	1.40			
1880	2013-05-10	38.9	1.35	-2.75	-3.57	22.5
	Recommended value	39.2	1.79			
	2013-05-14	39.3	1.81	0.26	1.12	22.5
2437	2013-05-15	39.5	1.80	0.77	0.56	22.5

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Dielectric Parameters Deviation from Standard target		Temp [°C]
		ε_r	σ [S/m]	$d\varepsilon_r$ [%]	$d\sigma$ [%]	
	Tolerances			±5 %	±5 %	
	Recommended value	55.2	0.97			
835	2013-05-29	55.2	0.98	0.00	1.03	21.9
	Recommended value	55.2	0.97			
836	2013-05-22	55.1	0.97	-0.18	0.00	21.6
	Recommended value	53.3	1.52			
1880	2013-05-13	51.1	1.49	-4.13	-1.97	21.9
	Recommended value	52.7	1.94			
2437	2013-05-16	50.4	1.91	-4.36	-1.55	22.5

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".

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

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

5.2.2 Wireless Router Configuration

The device was placed in the SPEAG holder and, in sequence, the back, display and each of the 4 edges was positioned 10.0mm away from the flat phantom. The spacer was removed before the start of the measurements.

5.3 Scan Procedures

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

5.4 SAR Averaging Methods

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

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

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

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

6. MEASUREMENT UNCERTAINTY

Table 6.1 – Measurement uncertainty evaluation

Uncertainty Component	Section in IEEE 1528	Tol. (%)	Prob Dist	Div	c_i	$c_i . u_i$ (%)	v_i
Measurement System							
Probe Calibration	E2.1	±6.55	N	1	1	±6.55	∞
Axial Isotropy	E2.2	±4.7	R	√3	$(1-c_p)^{1/2}$	±1.9	∞
Hemispherical Isotropy	E2.2	±9.6	R	√3	$(c_p)^{1/2}$	±3.9	∞
Boundary Effect	E2.3	±1.0	R	√3	1	±0.6	∞
Linearity	E2.4	±4.7	R	√3	1	±2.7	∞
System Detection Limits	E2.5	±1.0	R	√3	1	±0.6	∞
Readout Electronics	E2.6	±1.0	N	1	1	±1.0	∞
Response Time	E2.7	±0.8	R	√3	1	±0.5	∞
Integration Time	E2.8	±2.6	R	√3	1	±1.5	∞
RF Ambient Conditions - Noise	E6.1	±3.0	R	√3	1	±1.7	∞
RF Ambient Conditions - Reflections	E6.1	±3.0	R	√3	1	±1.7	∞
Probe Positioner Mechanical Tolerance	E6.2	±0.4	R	√3	1	±0.2	∞
Probe Positioning with respect to Phantom Shell	E6.3	±2.9	R	√3	1	±1.7	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E5	±3.9	R	√3	1	±2.3	∞
Test sample Related							
Test Sample Positioning	E4.2	±6.0	N	1	1	±6.0	11
Device Holder Uncertainty	E4.1	±5.0	N	1	1	±5.0	7
Output Power Variation - SAR drift measurement	6.6.3	±0.0	R	√3	1	±0.0	∞
Phantom and Tissue Parameters							
Phantom Uncertainty (shape and thickness tolerances)	E3.1	±4.0	R	√3	1	±2.3	∞
Conductivity Target - tolerance	E3.2	±5.0	R	√3	0.64	±1.8	∞
Conductivity - measurement uncertainty	E3.3	±5.5	N	1	0.64	±3.5	5
Permittivity Target - tolerance	E3.2	±5.0	R	√3	0.6	±1.7	∞
Permittivity - measurement uncertainty	E3.3	±2.9	N	1	0.6	±1.7	5
Combined Standard Uncertainty			RSS			**±13.2**	116
Coverage Factor for 95%			**k=2**				
Expanded Uncertainty						**±26.4**	

7. RESULTS

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

850MHz Band Head SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	
1-slot GPRS	Tuning Target + Tolerance [dBm]		32.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		32.87	32.91	32.85	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		23.84	23.88	23.82	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR							
		Full SAR		0.304			0.341		
	Left Tilt	Estimated SAR							
		Full SAR							
	Right Cheek	Estimated SAR							
		Full SAR							
	Right Tilt	Estimated SAR							
		Full SAR							
2-slot GPRS	Tuning Target + Tolerance [dBm]		30.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		30.55	30.41	30.37	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.53	24.39	24.35	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR							
		Full SAR		0.300			0.337		
	Left Tilt	Estimated SAR							
		Full SAR							
	Right Cheek	Estimated SAR							
		Full SAR							
	Right Tilt	Estimated SAR							
		Full SAR							
3-slot GPRS	Tuning Target + Tolerance [dBm]		28.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		28.95	28.99	28.91	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.69	24.73	24.65	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR							1
		Full SAR	0.216	0.307	**0.378**	0.242	0.344	**0.424**	
	Left Tilt	Estimated SAR							
		Full SAR		0.146			0.164		
	Right Cheek	Estimated SAR							
		Full SAR		0.255			0.286		
	Right Tilt	Estimated SAR							
		Full SAR		0.151			0.169		

(850MHz Head SAR Table continues)

(850MHz Head SAR 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 GPRS	Tuning Target + Tolerance [dBm]		27.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		27.45	27.43	27.44	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.44	24.42	24.43	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR							
		Full SAR		0.268			0.301		
	Left Tilt	Estimated SAR							
		Full SAR							
	Right Cheek	Estimated SAR							
		Full SAR							
	Right Tilt	Estimated SAR							
		Full SAR							
3-slot 8PSK EGPRS	Tuning Target + Tolerance [dBm]		24.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		24.38	24.39	24.38	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		21.37	21.38	21.37	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR							
		Full SAR			0.181			0.203	
	Left Tilt	Estimated SAR							
		Full SAR							
	Right Cheek	Estimated SAR							
		Full SAR							
	Right Tilt	Estimated SAR							
		Full SAR							

(850MHz Head SAR Table continues)

(850MHz Head SAR Table continues)

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		24.15			Scaling factor*			
	Conducted Power [dBm]		24.16	24.18	24.15	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.16	24.18	24.15	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR							2
		Full SAR	0.343	0.328	**0.387**	0.385	0.368	**0.434**	
	Left Tilt	Estimated SAR							
		Full SAR		0.149			0.167		
	Right Cheek	Estimated SAR							
		Full SAR		0.281			0.315		
	Right Tilt	Estimated SAR							
		Full SAR		0.167			0.187		

1900MHz Band Head SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	
1-slot GPRS	Tuning Target + Tolerance [dBm]		30.55			Scaling factor*			
	Conducted Slot Average Power [dBm]		30.66	30.61	30.57	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		21.63	21.58	21.54	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR							
		Full SAR		0.299			0.335		
	Left Tilt	Estimated SAR							
		Full SAR							
	Right Cheek	Estimated SAR							
		Full SAR							
	Right Tilt	Estimated SAR							
		Full SAR							
2-slot GPRS	Tuning Target + Tolerance [dBm]		27.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		27.83	27.77	27.56	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		21.81	21.75	21.54	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR							
		Full SAR		0.278			0.312		
	Left Tilt	Estimated SAR							
		Full SAR							
	Right Cheek	Estimated SAR							
		Full SAR							
	Right Tilt	Estimated SAR							
		Full SAR							
3-slot GPRS	Tuning Target + Tolerance [dBm]		25.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		26.27	26.17	26.14	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		22.01	21.91	21.88	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR							
		Full SAR		0.308			0.346		
	Left Tilt	Estimated SAR							
		Full SAR		0.216			0.242		
	Right Cheek	Estimated SAR							3
		Full SAR	0.519	**0.563**	0.549	0.582	**0.632**	0.616	
	Right Tilt	Estimated SAR							
		Full SAR		0.241			0.270		

(1900MHz Head SAR Table continues)

(1900MHz Head SAR 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 GPRS	Tuning Target + Tolerance [dBm]		24.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		24.70	24.81	24.77	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		21.69	21.80	21.76	1.12	1.12	1.12	Lin
	Left Cheek	Estimated SAR							
		Full SAR		0.295			0.331		
	Left Tilt	Estimated SAR							
		Full SAR							
	Right Cheek	Estimated SAR							
		Full SAR							
	Right Tilt	Estimated SAR							
		Full SAR							
3-slot 8PSK EGPRS	Tuning Target + Tolerance [dBm]		23.35			Scaling factor*			
	Conducted Slot Average Power [dBm]		23.51	23.51	23.57	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		20.50	20.50	20.56	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		0.318			0.357		
	Right Tilt	Estimated SAR							
		Full SAR							

(1900MHz Head SAR Table continues)

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 1Mbps	Tuning Target + Tolerance [dBm]		15.50			Scaling factor*			
	Conducted Power [dBm]		14.50	14.54	15.08	1.50	1.46	0.92	dB
	Time-averaged power [dBm]		14.50	14.54	15.08	1.41	1.40	1.24	Lin
	Left Cheek	Estimated SAR							
		Full SAR		0.125			0.175		
	Left Tilt	Estimated SAR							
		Full SAR		0.127			0.178		
	Right Cheek	Estimated SAR							4
		Full SAR	0.198	0.281	**0.422**	0.280	0.393	**0.522**	
	Right Tilt	Estimated SAR							
		Full SAR		0.178			0.249		
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 5.5Mbps	Tuning Target + Tolerance [dBm]		15.50			Scaling factor*			
	Conducted Power [dBm]		14.50	14.54	15.08	1.50	1.46	0.92	dB
	Time-averaged power [dBm]		14.50	14.54	15.08	1.41	1.40	1.24	Lin
	Right Cheek	Estimated SAR							
		Full SAR		0.288			0.377		

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

Test configuration	Max. 1g SAR results			
	WLAN 2450	3-slot GPRS850	WCDMA 850	3-slot GPRS 1900
Head: Left, Cheek	0.175	0.424	0.434	0.346
Head: Left, Tilt	0.178	0.164	0.167	0.242
Head: Right, Cheek	0.522	0.286	0.315	0.632
Head: Right, Tilt	0.249	0.169	0.187	0.270

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

Test configuration	Max. 1g SAR results		
	3-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	3-slot GPRS1900 + WLAN2450
Head: Left, Cheek	0.599	0.609	0.521
Head: Left, Tilt	0.342	0.345	0.420
Head: Right, Cheek	**0.808**	**0.837**	**1.154**
Head: Right, Tilt	0.418	0.436	0.519

The following table gives a more accurate assessment of the SAR values for simultaneous transmission. These values have been calculated using the SPEAG Combined Multiband algorithm, which is based on area scans. It a) converts the 2D area scans into 3D volume scans by assuming frequency-dependent decay characteristics for the E-field, b) sums the SAR values for WLAN2450 and the cellular bands point-by-point and c) calculates the combined average SAR values. It is these values that appear in the Summary table in Section 1.2.

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

Test configuration	Max. 1g SAR results		
	3-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	3-slot GPRS1900 + WLAN2450
Head: Left, Cheek			
Head: Left, Tilt	-	-	-
Head: Right, Cheek	**0.554**	**0.554**	**0.663**
Head: Right, Tilt	-	-	-

Note: Plots #5-7

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

Plots of the Measurement scans are given in Appendix B.

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

850MHz Band Body SAR results

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
				Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	
3-slot GPRS	Tuning Target + Tolerance [dBm]			28.85			Scaling factor*			
	Conducted Slot Average Power [dBm]			28.95	28.99	28.91	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			24.69	24.73	24.65	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR							
			Full SAR		0.314			0.352		
		Headset WH-108	Estimated SAR							8
			Full SAR	0.194	0.336	**0.441**	0.218	0.377	**0.495**	
	Display facing phantom	Without headset	Estimated SAR							
			Full SAR		0.288			0.323		
		Headset WH-108	Estimated SAR							
			Full SAR		0.227			0.255		

Mode	Device orientation		SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
				Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]			24.15			Scaling factor*			
	Conducted Power [dBm]			24.16	24.18	24.15	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			24.16	24.18	24.15	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR							9
			Full SAR	0.320	0.315	**0.340**	0.359	0.353	**0.381**	
		Headset WH-108	Estimated SAR							
			Full SAR		0.173			0.194		
	Display facing phantom	Without headset	Estimated SAR							
			Full SAR		0.277			0.311		
		Headset WH-108	Estimated SAR							
			Full SAR		0.106			0.119		

1900MHz Band 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	
3-slot GPRS	Tuning Target + Tolerance [dBm]			25.85			Scaling factor*			
	Conducted Slot Average Power [dBm]			26.27	26.17	26.14	0.50	0.50	0.50	dB
	Time-averaged power [dBm]			22.01	21.91	21.88	1.12	1.12	1.12	Lin
	Back facing phantom	Without headset	Estimated SAR							
			Full SAR		0.296			0.332		
		Headset WH-108	Estimated SAR							
			Full SAR		0.280			0.314		
	Display facing phantom	Without headset	Estimated SAR							10
			Full SAR	0.277	**0.361**	0.267	0.311	**0.405**	0.300	
		Headset WH-108	Estimated SAR							
			Full SAR		0.336			0.377		

2450MHz Body 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]			15.50			Scaling factor*			
	Conducted Power [dBm]			14.50	14.54	15.08	1.50	1.46	0.92	dB
	Time-averaged power [dBm]			14.50	14.54	15.08	1.41	1.40	1.24	Lin
	Back facing phantom	Without headset	Estimated SAR							11
			Full SAR	0.030	0.039	**0.076**	0.042	0.055	**0.094**	
		Headset WH-108	Estimated SAR							
			Full SAR		0.025			0.035		
	Display facing phantom	Without headset	Estimated SAR							
			Full SAR		0.033			0.046		
		Headset WH-108	Estimated SAR							
			Full SAR		0.024			0.034		

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 5.5 Mbps	Tuning Target + Tolerance [dBm]			15.50			Scaling factor*			
	Conducted Power [dBm]				14.83			1.17		dB
	Time-averaged power [dBm]				14.83			1.31		Lin
	Back facing phantom	Without headset	Estimated SAR							
			Full SAR		0.040			0.052		

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

Test configuration	Max. 1g SAR results			
	WLAN 2450	3-slot GPRS850	WCDMA 850	3-slot GPRS 1900
Body: Back facing phantom, Without Headset	0.094	0.352	0.381	0.332
Body: Back facing phantom, Headset WH-108	0.035	0.495	0.194	0.314
Body: Display facing phantom, Without Headset	0.046	0.323	0.311	0.405
Body: Display facing phantom, Headset WH-108	0.034	0.255	0.119	0.377

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

Test configuration	Max. 1g SAR results		
	3-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	3-slot GPRS1900 + WLAN2450
Body: Back facing phantom, Without Headset	0.446	**0.475**	0.426
Body: Back facing phantom, Headset WH-108	**0.530**	0.229	0.349
Body: Display facing phantom, Without Headset	0.369	0.357	**0.451**
Body: Display facing phantom, Headset WH-108	0.289	0.153	0.411

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		
	3-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	3-slot GPRS1900 + WLAN2450
Body: Back facing phantom, Without Headset	-	**0.389**	-
Body: Back facing phantom, Headset WH-108	**0.498**	-	-
Body: Display facing phantom, Without Headset	-	-	**0.406**
Body: Display facing phantom, Headset WH-108	-	-	-

Note: Plots #12-14

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

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

Plots of the Measurement scans are given in Appendix B.

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

850MHz Band Wireless Router SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz	
3-slot GPRS	Tuning Target + Tolerance [dBm]		28.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		28.95	28.99	28.91	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.69	24.73	24.65	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR							15
		Full SAR	0.349	0.573	**0.640**	0.392	0.643	**0.718**	
	Display facing phantom	Estimated SAR							
		Full SAR		0.338			0.379		
	Top edge facing phantom	Estimated SAR							
		Full SAR		0.021			0.024		
	Bottom edge facing phantom	Estimated SAR							
		Full SAR		0.156			0.175		
	Left edge facing phantom	Estimated SAR							
		Full SAR		0.281			0.315		
	Right edge facing phantom	Estimated SAR							
		Full SAR		0.137			0.154		
Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz	
WCDMA	Tuning Target + Tolerance [dBm]		24.15			Scaling factor*			
	Conducted Power [dBm]		24.16	24.18	24.15	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		24.16	24.18	24.15	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR							16
		Full SAR	0.421	0.423	**0.477**	0.472	0.475	**0.535**	
	Display facing phantom	Estimated SAR							
		Full SAR		0.315			0.353		
	Top edge facing phantom	Estimated SAR							
		Full SAR		0.015			0.017		
	Bottom edge facing phantom	Estimated SAR							
		Full SAR		0.156			0.175		
	Left edge facing phantom	Estimated SAR							
		Full SAR		0.336			0.377		
	Right edge facing phantom	Estimated SAR							
		Full SAR		0.139			0.156		

1900MHz Band Wireless Router SAR results

Mode	Device orientation	SAR measurement	Measured 1g SAR [W/kg]			Reported* 1g SAR [W/kg]			Plot #
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz	
3-slot GPRS	Tuning Target + Tolerance [dBm]		25.85			Scaling factor*			
	Conducted Slot Average Power [dBm]		26.27	26.17	26.14	0.50	0.50	0.50	dB
	Time-averaged power [dBm]		22.01	21.91	21.88	1.12	1.12	1.12	Lin
	Back facing phantom	Estimated SAR							
		Full SAR		0.486			0.545		
	Display facing phantom	Estimated SAR							17
		Full SAR	0.509	**0.565**	0.477	0.571	**0.634**	0.535	
	Top edge facing phantom	Estimated SAR							
		Full SAR		0.077			0.086		
	Bottom edge facing phantom	Estimated SAR							
		Full SAR		0.249			0.279		
	Left edge facing phantom	Estimated SAR							
		Full SAR		0.299			0.335		
	Right edge facing phantom	Estimated SAR							
		Full SAR		0.112			0.126		

2450MHz Wireless Router 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]		15.50			Scaling factor*			
	Conducted Power [dBm]		14.50	14.54	15.08	1.50	1.46	0.92	dB
	Time-averaged power [dBm]		14.50	14.54	15.08	1.41	1.40	1.24	Lin
	Back facing phantom	Estimated SAR							
		Full SAR		0.066			0.092		
	Display facing phantom	Estimated SAR							
		Full SAR		0.058			0.081		
	Top edge facing phantom	Estimated SAR							18
		Full SAR	0.049	0.070	**0.119**	0.069	0.098	**0.147**	
	Bottom edge facing phantom	Estimated SAR							
		Full SAR		0.005			0.007		
	Left edge facing phantom	Estimated SAR							
		Full SAR		0.046			0.064		
	Right edge facing phantom	Estimated SAR							
		Full SAR		0.014			0.020		

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 5.5Mbps	Tuning Target + Tolerance [dBm]		15.50			Scaling factor*			
	Conducted Power [dBm]		14.50	14.54	15.08	1.50	1.46	0.92	dB
	Time-averaged power [dBm]		14.50	14.54	15.08	1.41	1.40	1.24	Lin
	Top edge facing phantom	Estimated SAR							
		Full SAR		0.040			0.052		

Simultaneous transmissions: Combined SAR results – Individual band Max results

Test configuration	Max. 1g SAR results			
	WLAN 2450	3-slot GPRS850	WCDMA 850	3-slot GPRS1900
WR: Back facing phantom	0.092	0.718	0.535	0.545
WR: Display facing phantom	0.081	0.379	0.353	0.634
WR: Top edge facing phantom	0.147	0.024	0.017	0.086
WR: Bottom edge facing phantom	0.007	0.175	0.175	0.279
WR: Left edge facing phantom	0.064	0.315	0.377	0.335
WR: Right edge facing phantom	0.020	0.154	0.156	0.126

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

Test configuration	Max. 1g SAR results		
	3-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	3-slot GPRS1900 + WLAN2450
WR: Back facing phantom	**0.810**	**0.627**	0.637
WR: Display facing phantom	0.460	0.434	**0.715**
WR: Top edge facing phantom	0.171	0.164	0.233
WR: Bottom edge facing phantom	0.182	0.182	0.286
WR: Left edge facing phantom	0.379	0.441	0.399
WR: Right edge facing phantom	0.174	0.176	0.146

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

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

Test configuration	Max. 1g SAR results		
	4-slot GPRS850 + WLAN2450	WCDMA850 + WLAN2450	GSM1900 + WLAN2450
WR: Back facing phantom	**0.713**	**0.528**	-
WR: Display facing phantom	-	-	**0.649**
WR: Top edge facing phantom	-	-	-
WR: Bottom edge facing phantom	-	-	-
WR: Left edge facing phantom	-	-	-
WR: Right edge facing phantom	-	-	-

Note: Plots #24-31

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

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

Plots of the Measurement scans are given in Appendix B.

APPENDIX A: SYSTEM CHECKING SCANS

Plot1:

Date/Time: 2013-05-15 10:00:28 AM

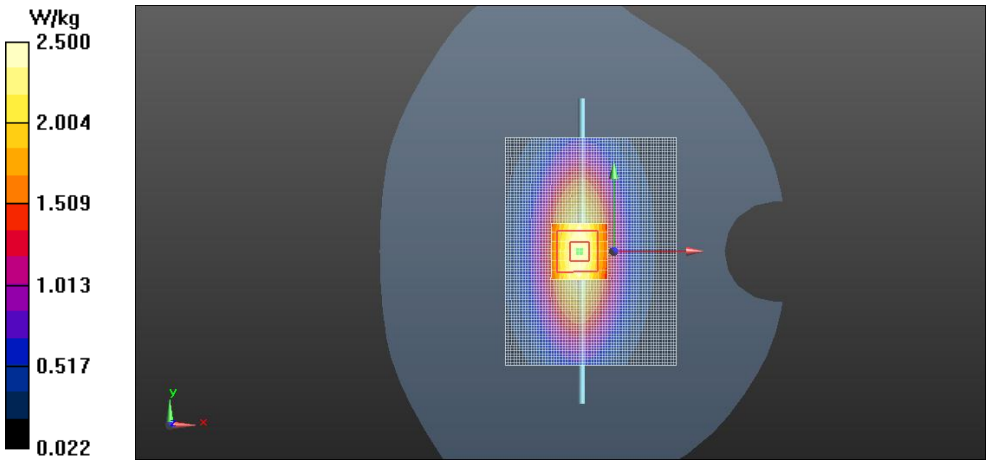
Test Laboratory: TCC Nokia
Type: D835V2; Serial: 479

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: Head835; Medium Notes: t= 22.2 C
Medium parameters used: f = 835 MHz; σ = 0.913 S/m; ε_r = 40.721; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3838
- ConvF(9.04, 9.04, 9.04); Calibrated: 2013-03-08;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1324; Calibrated: 2013-03-06
- Phantom: SAM9; Type: SAM; Serial: Not Specified
- Measurement SW: DASY52, Version 52.8 (5); 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) = 2.50 W/kg

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.050 V/m
Peak SAR (extrapolated) = 3.47 W/kg
SAR(1 g) = 2.33 W/kg
SAR(10 g) = 1.53 W/kg
Power Drift = -0.07 dB
Maximum value of SAR (measured) = 2.51 W/kg



Plot2:

Date/Time: 2013-05-27 9:43:55 AM

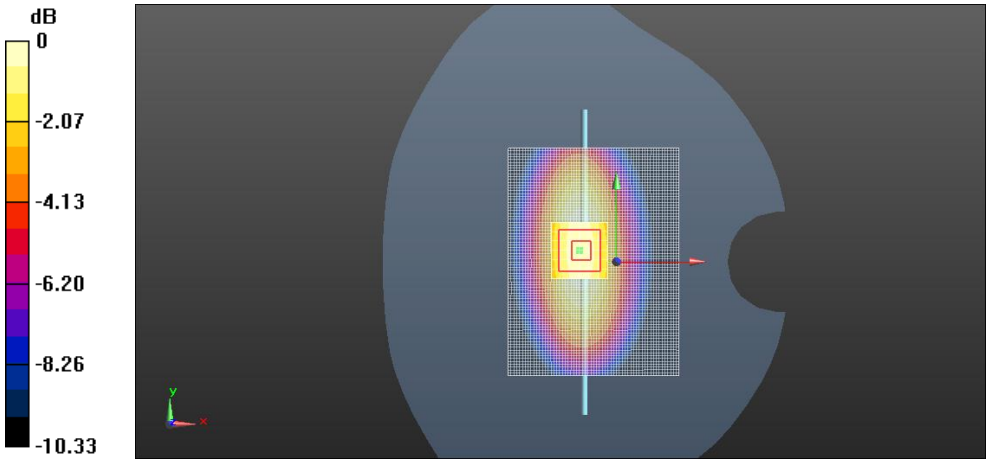
Test Laboratory: TCC Nokia
Type: D835V2; Serial: 4d005

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: Head 835; Medium Notes: Medium Temperature: t= 22.4 C
Medium parameters used: f = 835 MHz; σ = 0.887 S/m; ε_r = 41.941; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3836
- ConvF(9.03, 9.03, 9.03); Calibrated: 2013-03-08;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn710; Calibrated: 2013-03-08
- Phantom: SAM1; Type: SAM; Serial: TP - 01097
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

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

d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.495 V/m
Peak SAR (extrapolated) = 3.39 W/kg
SAR(1 g) = 2.24 W/kg
SAR(10 g) = 1.46 W/kg
Power Drift = -0.00 dB
Maximum value of SAR (measured) = 2.42 W/kg



0 dB = 2.42 W/kg = 3.84 dBW/kg

Plot3:

Date/Time: 2013-05-10 9:57:56 AM

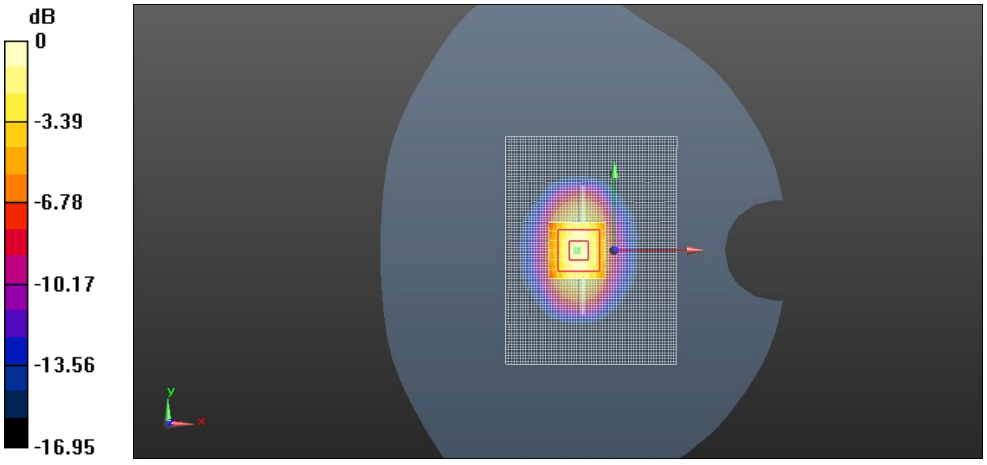
Test Laboratory: TCC Nokia
Type: D1900V2; Serial: 509

Communication System: CW1900
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: Head 1900; Medium Notes: Medium Temperature: t=22.5 C
Medium parameters used: f = 1900 MHz; σ = 1.364 S/m; ε_r = 38.828; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(7.62, 7.62, 7.62); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: SAM 1; Type: QD000P40CC; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (61x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 11.5 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.054 V/m
Peak SAR (extrapolated) = 17.6 W/kg
SAR(1 g) = 9.6 W/kg
SAR(10 g) = 5.03 W/kg
Power Drift = -0.12 dB
Maximum value of SAR (measured) = 10.8 W/kg



0 dB = 10.8 W/kg = 10.33 dBW/kg

Plot4:

Date/Time: 2013-05-14 9:58:04 AM

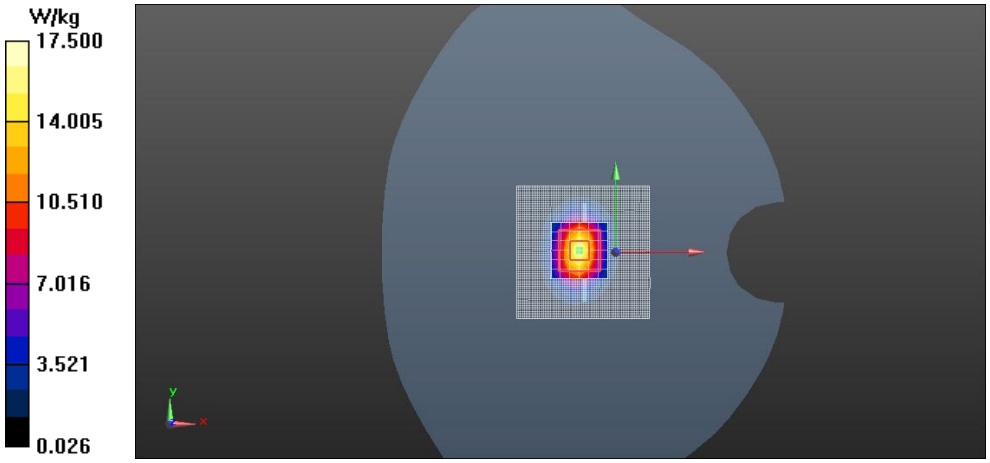
Test Laboratory: TCC Nokia
Type: D2450V2; Serial: D2450V2 - SN:883

Communication System: CW2450
Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: Head 2450; Medium Notes: Medium Temperature: t=22.5 C
Medium parameters used: f = 2450 MHz; σ = 1.822 S/m; ε_r = 39.255; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(6.91, 6.91, 6.91); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: SAM3; Type: QD000P40CC; Serial: TP:1301
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.5 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 93.800 V/m
Peak SAR (extrapolated) = 30.7 W/kg
SAR(1 g) = 14.8 W/kg
SAR(10 g) = 6.84 W/kg
Power Drift = 0.09 dB
Maximum value of SAR (measured) = 16.9 W/kg



Plot5:

Date/Time: 2013-05-22 10:08:37 AM

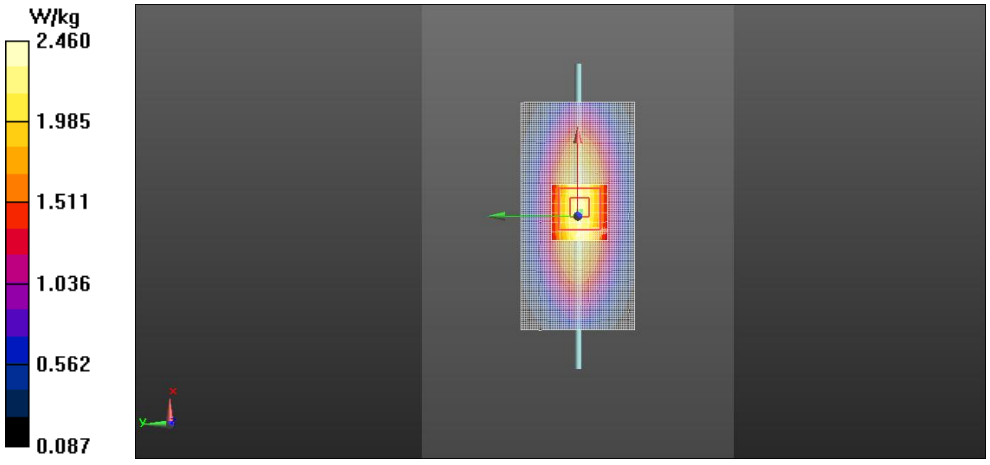
Test Laboratory: TCC Nokia
Type: D835V2; Serial: 4d005

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: Body 835; Medium Notes: Medium Temperature: t= 21.6 C
Medium parameters used: f = 835 MHz; σ = 0.968 S/m; ε_r = 55.112; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(9.09, 9.09, 9.09); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.8 (7028)

d=15mm, Pin=250mW/Area Scan (121x61x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 2.46 W/kg

d=15mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 51.010 V/m
Peak SAR (extrapolated) = 3.35 W/kg
SAR(1 g) = 2.22 W/kg
SAR(10 g) = 1.45 W/kg
Power Drift = -0.22 dB
Maximum value of SAR (measured) = 2.40 W/kg



Plot6:

Date/Time: 2013-05-13 10:33:02 AM

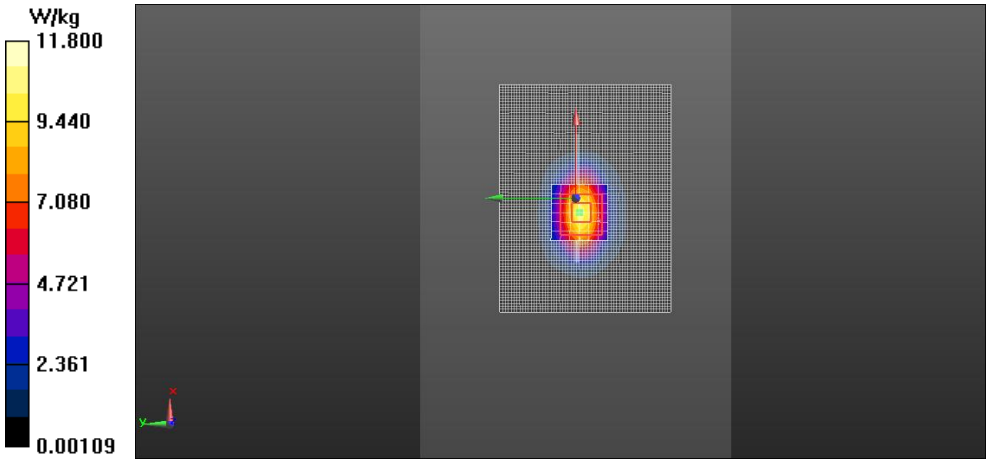
Test Laboratory: TCC Nokia
Type: D1900V2; Serial: 509

Communication System: CW1900
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: Body 1900; Medium Notes: Medium Temperature: t=21.9 C
Medium parameters used: f = 1900 MHz; σ = 1.509 S/m; ε_r = 51.018; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(7.28, 7.28, 7.28); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.8 (7028)

d=10mm, Pin=250mW/Area Scan (81x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 11.8 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 78.751 V/m
Peak SAR (extrapolated) = 17.4 W/kg
SAR(1 g) = 9.69 W/kg
SAR(10 g) = 5.11 W/kg
Power Drift = 0.01 dB
Maximum value of SAR (measured) = 10.9 W/kg



Plot7:

Date/Time: 2013-05-16 10:41:53 AM

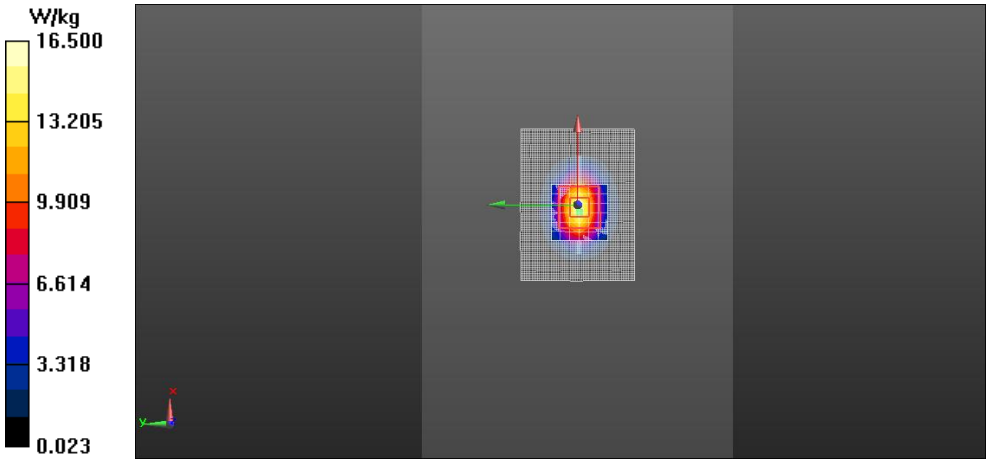
Test Laboratory: TCC Nokia
Type: D2450V2; Serial: D2450V2 - SN:883

Communication System: CW2450
Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: Body 2450; Medium Notes: Medium Temperature: t=22.5 C
Medium parameters used: f = 2450 MHz; σ = 1.933 S/m; ε_r = 50.34; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(6.9, 6.9, 6.9); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (1); 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) = 16.5 W/kg

d=10mm, Pin=250mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.556 V/m
Peak SAR (extrapolated) = 28.4 W/kg
SAR(1 g) = 14 W/kg
SAR(10 g) = 6.53 W/kg
Power Drift = 0.06 dB
Maximum value of SAR (measured) = 15.9 W/kg



APPENDIX B: MEASUREMENT SCANS

Plot 1:

Date/Time: 2013-05-27 10:06:39 AM

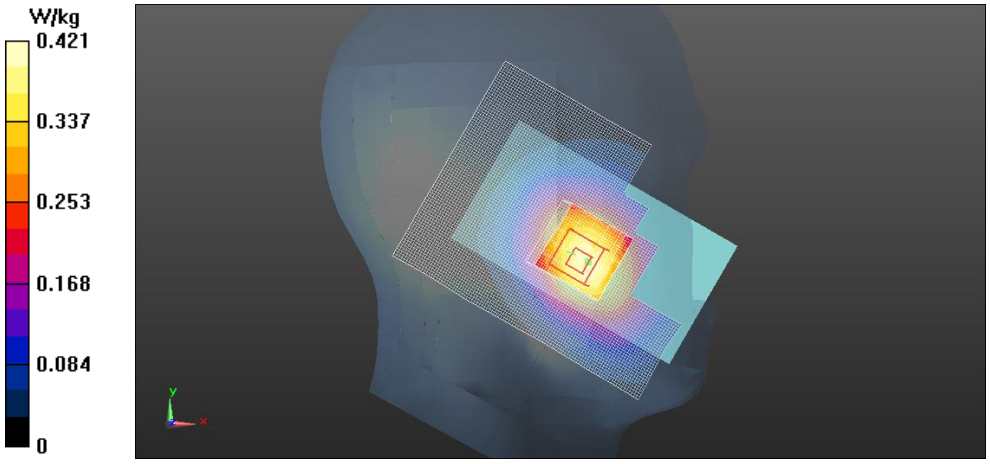
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299331/4

Communication System: 3-slot GPRS850
Frequency: 848.8 MHz; Duty Cycle: 1:2.80027
Medium: Head 835; Medium Notes: Medium Temperature: t= 22.4 C
Medium parameters used: f = 849 MHz; σ = 0.897 S/m; ε_r = 41.773; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY Configuration:
- Probe: EX3DV4 - SN3836
- ConvF(9.03, 9.03, 9.03); Calibrated: 2013-03-08;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn710; Calibrated: 2013-03-08
- Phantom: SAM1; Type: SAM; Serial: TP - 01097
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

3-slot GPRS850 - Left/Cheek - High/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.421 W/kg

3-slot GPRS850 - Left/Cheek - High/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 5.361 V/m
Peak SAR (extrapolated) = 0.476 W/kg
SAR(1 g) = 0.378 W/kg
SAR(10 g) = 0.289 W/kg
Power Drift = -0.42 dB
Maximum value of SAR (measured) = 0.391 W/kg



Plot 2:

Date/Time: 2013-05-15 12:50:36 PM

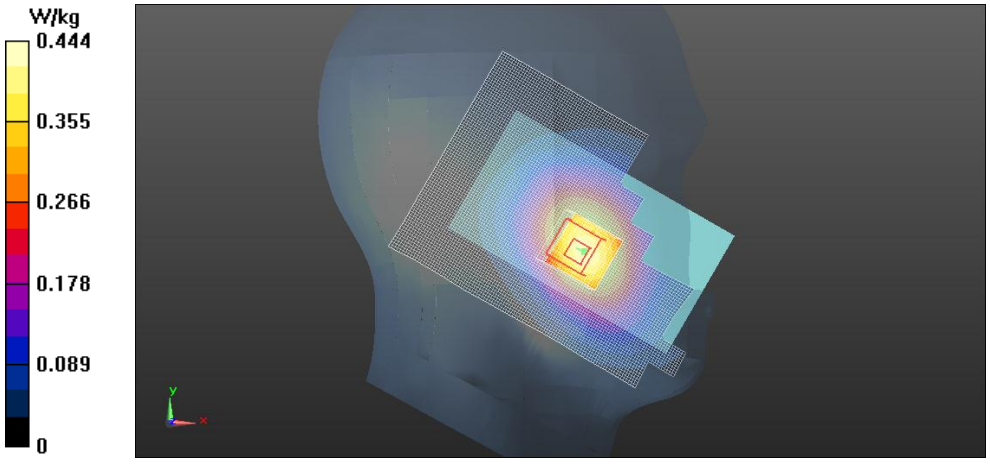
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299330/6

Communication System: WCDMA850
Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: Head835; Medium Notes: t= 22.2 C
Medium parameters used: f = 847 MHz; σ = 0.921 S/m; ε_r = 40.662; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY Configuration:
- Probe: EX3DV4 - SN3838
- ConvF(9.04, 9.04, 9.04); Calibrated: 2013-03-08;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1324; Calibrated: 2013-03-06
- Phantom: SAM9; Type: SAM; Serial: Not Specified
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

WCDMA850 (band 5) - Left/Cheek - High/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.444 W/kg

WCDMA850 (band 5) - Left/Cheek - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 5.072 V/m
Peak SAR (extrapolated) = 0.491 W/kg
SAR(1 g) = 0.387 W/kg
SAR(10 g) = 0.292 W/kg
Power Drift = 0.41 dB
Maximum value of SAR (measured) = 0.401 W/kg



Plot 3:

Date/Time: 2013-05-10 1:05:31 PM

Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299331/4

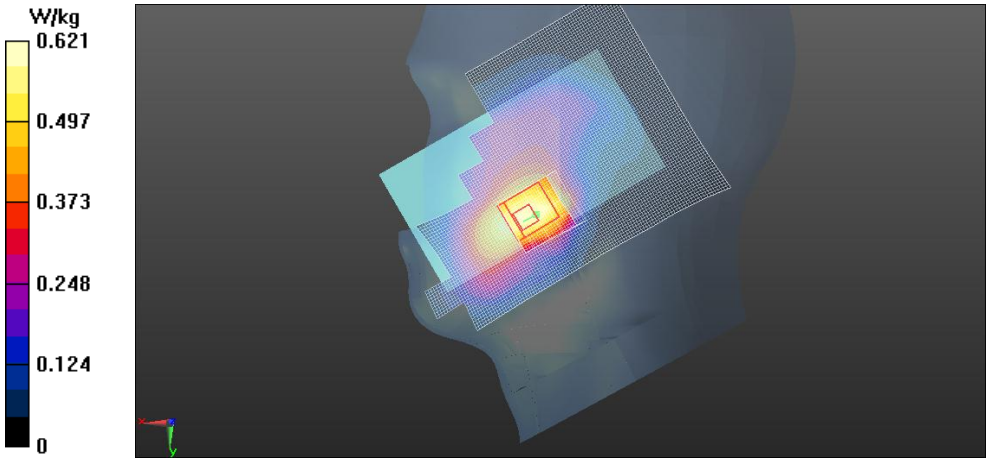
Communication System: 3-slot GPRS1900
Frequency: 1880 MHz; Duty Cycle: 1:2.80027
Medium: Head 1900; Medium Notes: Medium Temperature: t=22.5 C
Medium parameters used: f = 1880 MHz; σ = 1.346 S/m; ε_r = 38.925; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(7.62, 7.62, 7.62); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: SAM 1; Type: QD000P40CC; Serial: TP:xxxx
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.8 (7028)

3-slot GPRS1900 - Right/Cheek - Middle/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.621 W/kg

3-slot GPRS1900 - Right/Cheek - Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 5.373 V/m
Peak SAR (extrapolated) = 0.852 W/kg
SAR(1 g) = 0.563 W/kg
SAR(10 g) = 0.369 W/kg
Power Drift = -0.11 dB

Maximum value of SAR (measured) = 0.601 W/kg



Plot 4:

Date/Time: 2013-05-14 4:19:51 PM

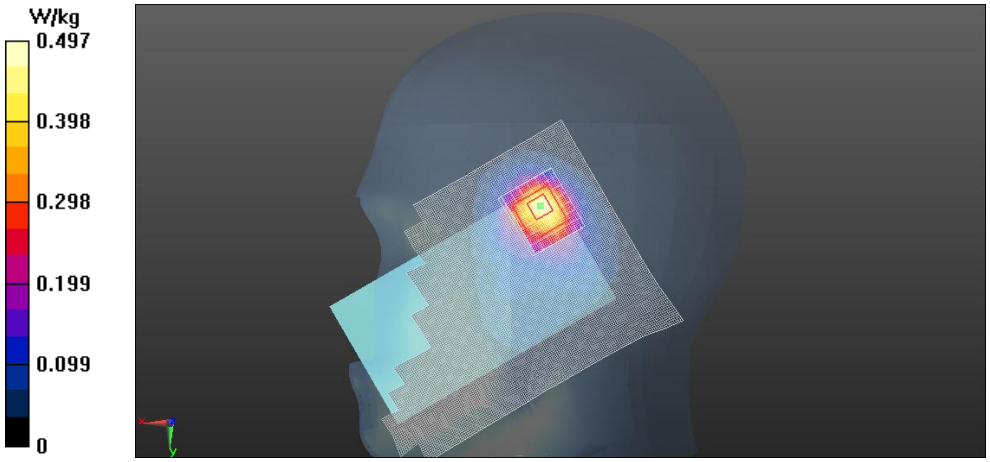
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299339/7

Communication System: WLAN2450 (US band)
Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: Head 2450; Medium Notes: Medium Temperature: t=22.5 C
Medium parameters used: f = 2462 MHz; σ = 1.834 S/m; ε_r = 39.2; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(6.91, 6.91, 6.91); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: SAM3; Type: QD000P40CC; Serial: TP:1301
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.8 (7028)

WLAN2450 b-mode - Right/Cheek - Channel 11 - DSSS 1 Mbps/Area Scan (121x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.497 W/kg

WLAN2450 b-mode - Right/Cheek - Channel 11 - DSSS 1 Mbps/Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.532 V/m
Peak SAR (extrapolated) = 0.835 W/kg
SAR(1 g) = 0.422 W/kg
SAR(10 g) = 0.215 W/kg
Power Drift = 0.04 dB
Maximum value of SAR (measured) = 0.464 W/kg



Plot 5:

Date/Time: 2013-05-14 4:19:51 PM

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 11 - DSSS 1 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299339/7
Communication System: WLAN2450 (US band); Frequency: 2462 MHz; Duty Cycle: 1:1; PMF: 1
Medium: Head 2450 Medium parameters used: f = 2462 MHz; σ = 1.834 S/m; ε_r = 39.2; ρ = 1000 kg/m^3
Phantom section: Right Section

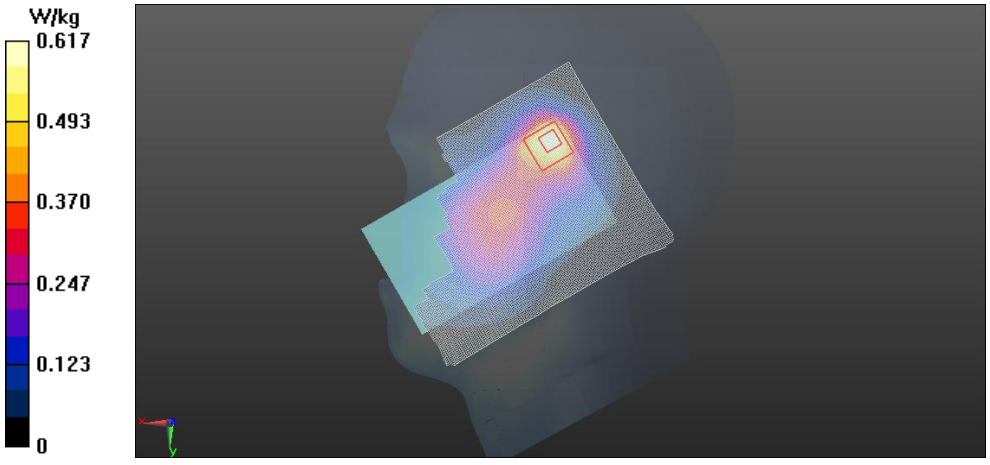
Probe: EX3DV4 - SN3823; ConvF(6.91, 6.91, 6.91); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: SAM3; Type: QD000P40CC; Serial: TP:1301
Measurement SW: DASY52, Version 52.8 (1)

Date/Time: 2013-05-20 4:31:24 PM

DASY Configuration for 3-slot GPRS850 - Right/Cheek - Middle/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299331/4
Communication System: 3-slot GPRS850; Frequency: 836.6 MHz; Duty Cycle: 1:2.80027; PMF: 1.6734
Medium: Head835 Medium parameters used: f = 837 MHz; σ = 0.922 S/m; ε_r = 40.722; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3838; ConvF(9.04, 9.04, 9.04); Calibrated: 2013-03-08;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1324; Calibrated: 2013-03-06
Phantom: SAM9; Type: SAM; Serial: Not Specified
Measurement SW: DASY52, Version 52.8 (5)

Fast SAR of Combined Scans: SAR(1 g) = 0.554 W/kg; SAR(10 g) = 0.286 W/kg
Maximum value of SAR (interpolated) = 0.617 W/kg



Plot 6:

Date/Time: 2013-05-14 4:19:51 PM

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 11 - DSSS 1 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299339/7
Communication System: WLAN2450 (US band); Frequency: 2462 MHz; Duty Cycle: 1:1; PMF: 1
Medium: Head 2450 Medium parameters used: f = 2462 MHz; σ = 1.834 S/m; ε_r = 39.2; ρ = 1000 kg/m^3
Phantom section: Right Section

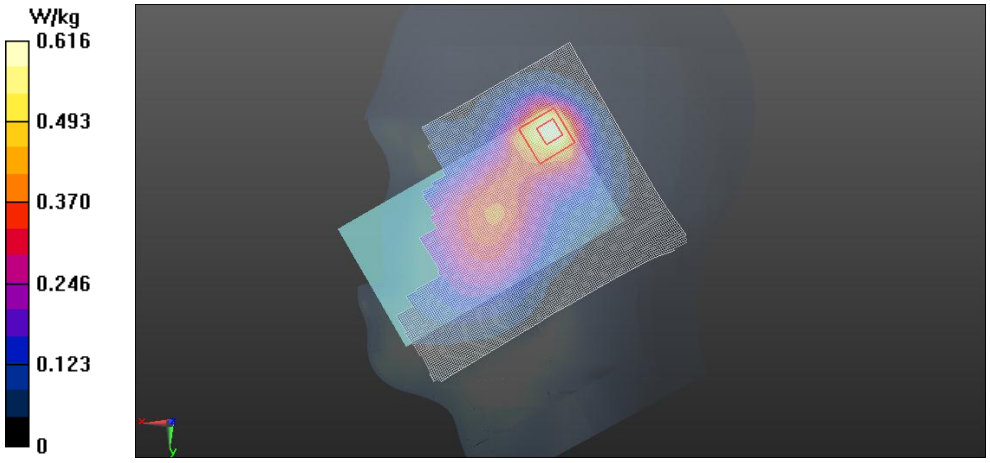
Probe: EX3DV4 - SN3823; ConvF(6.91, 6.91, 6.91); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: SAM3; Type: QD000P40CC; Serial: TP:1301
Measurement SW: DASY52, Version 52.8 (1)

Date/Time: 2013-05-15 11:15:39 AM

DASY Configuration for WCDMA850 (band 5) - Right/Cheek - Middle/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299330/6
Communication System: WCDMA850; Frequency: 835 MHz; Duty Cycle: 1:1; PMF: 1
Medium: Head835 Medium parameters used: f = 835 MHz; σ = 0.913 S/m; ε_r = 40.721; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3838; ConvF(9.04, 9.04, 9.04); Calibrated: 2013-03-08;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1324; Calibrated: 2013-03-06
Phantom: SAM9; Type: SAM; Serial: Not Specified
Measurement SW: DASY52, Version 52.8 (5)

Fast SAR of Combined Scans: SAR(1 g) = 0.554 W/kg; SAR(10 g) = 0.286 W/kg
Maximum value of SAR (interpolated) = 0.616 W/kg



Plot 7:

Date/Time: 2013-05-14 4:19:51 PM

DASY Configuration for WLAN2450 b-mode - Right/Cheek - Channel 11 - DSSS 1 Mbps/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299339/7
Communication System: WLAN2450 (US band); Frequency: 2462 MHz; Duty Cycle: 1:1; PMF: 1
Medium: Head 2450 Medium parameters used: f = 2462 MHz; σ = 1.834 S/m; ε_r = 39.2; ρ = 1000 kg/m^3
Phantom section: Right Section

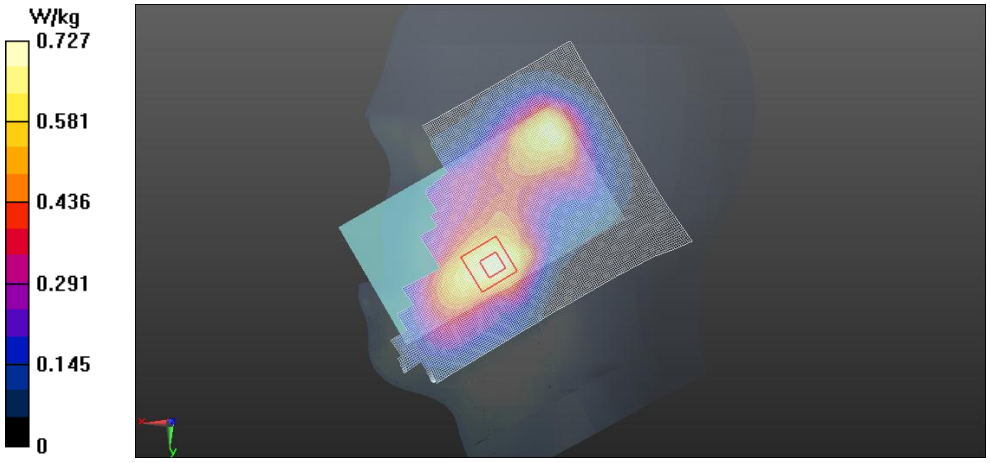
Probe: EX3DV4 - SN3823; ConvF(6.91, 6.91, 6.91); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: SAM3; Type: QD000P40CC; Serial: TP:1301
Measurement SW: DASY52, Version 52.8 (1)

Date/Time: 2013-05-10 1:05:31 PM

DASY Configuration for 3-slot GPRS1900 - Right/Cheek - Middle/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299331/4
Communication System: 3-slot GPRS1900; Frequency: 1880 MHz; Duty Cycle: 1:2.80027; PMF: 1.6734
Medium: Head 1900 Medium parameters used: f = 1880 MHz; σ = 1.346 S/m; ε_r = 38.925; ρ = 1000 kg/m^3
Phantom section: Right Section

Probe: EX3DV4 - SN3823; ConvF(7.62, 7.62, 7.62); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: SAM 1; Type: QD000P40CC; Serial: TP:xxxx
Measurement SW: DASY52, Version 52.8 (1)

Fast SAR of Combined Scans: SAR(1 g) = 0.663 W/kg; SAR(10 g) = 0.398 W/kg
Maximum value of SAR (interpolated) = 0.727 W/kg



Plot 8:

Date/Time: 2013-05-22 1:20:01 PM

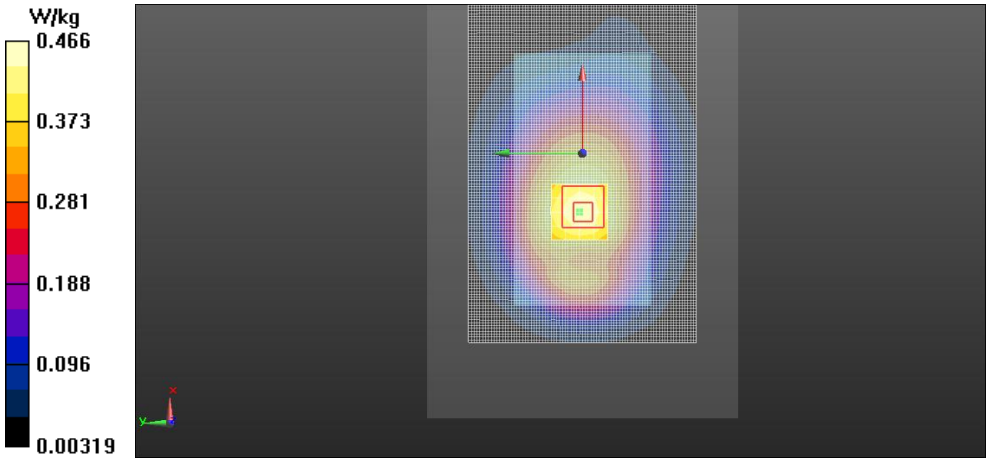
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299331/4

Communication System: 3-slot GPRS850
Frequency: 848.8 MHz; Duty Cycle: 1:2.80027
Medium: Body 835; Medium Notes: Medium Temperature: t= 21.6 C
Medium parameters used: f = 849 MHz; σ = 0.983 S/m; ε_r = 54.946; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(9.09, 9.09, 9.09); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.8 (7028)

3-slot GPRS850/Body - High - Spacer 15mm - WH-108 - Back Facing Phantom/Area Scan (81x121x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.466 W/kg

3-slot GPRS850/Body - High - Spacer 15mm - WH-108 - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 18.621 V/m
Peak SAR (extrapolated) = 0.567 W/kg
SAR(1 g) = 0.441 W/kg
SAR(10 g) = 0.330 W/kg
Power Drift = 0.04 dB
Maximum value of SAR (measured) = 0.464 W/kg



Plot 9:

Date/Time: 2013-05-29 11:54:04 AM

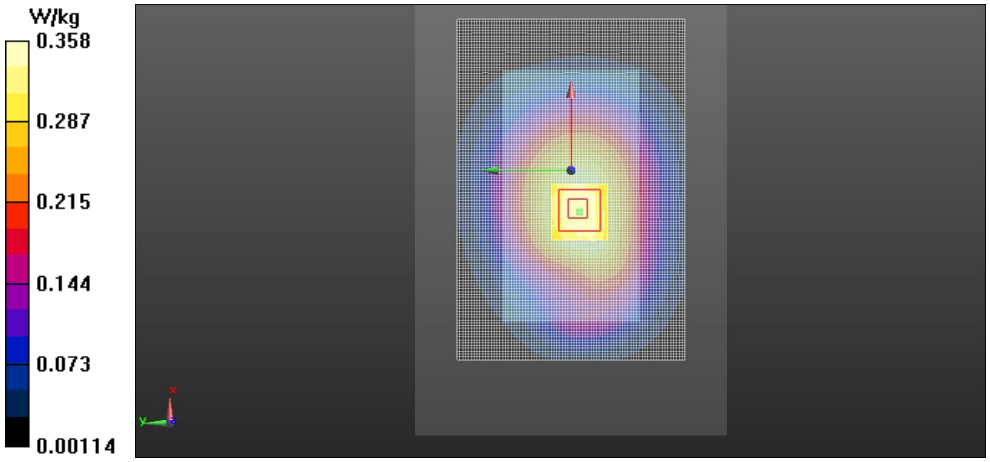
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299330/6

Communication System: WCDMA850
Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: Body 835; Medium Notes: Medium Temperature: t= 21.9 C
Medium parameters used: f = 847 MHz; σ = 0.986 S/m; ε_r = 55.102; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3836
- ConvF(8.97, 8.97, 8.97); Calibrated: 2013-03-08;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn710; Calibrated: 2013-03-08
- Phantom: TFP3; Type: QD 000 P51 CA; Serial: 1130
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

WCDMA850 (Band 5)/Body - High - Spacer 15mm - No headset - Back Facing Phantom/Area Scan (81x121x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.358 W/kg

WCDMA850 (Band 5)/Body - High - Spacer 15mm - No headset - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 18.237 V/m
Peak SAR (extrapolated) = 0.428 W/kg
SAR(1 g) = 0.340 W/kg
SAR(10 g) = 0.258 W/kg
Power Drift = -0.02 dB
Maximum value of SAR (measured) = 0.358 W/kg



Plot 10:

Date/Time: 2013-05-13 11:09:58 AM

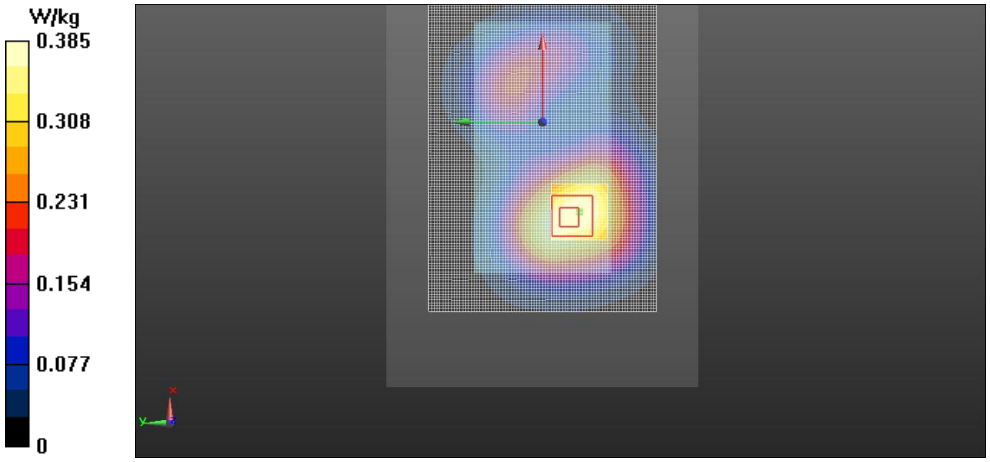
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299331/4

Communication System: 3-slot GPRS1900
Frequency: 1880 MHz; Duty Cycle: 1:2.80027
Medium: Body 1900; Medium Notes: Medium Temperature: t=21.9 C
Medium parameters used: f = 1880 MHz; σ = 1.489 S/m; ε_r = 51.077; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(7.28, 7.28, 7.28); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.8 (7028)

3-slot GPRS1900/Body - Middle - Spacer 15mm - No Headset - Display Facing Phantom/Area Scan (81x121x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.385 W/kg

3-slot GPRS1900/Body - Middle - Spacer 15mm - No Headset - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 15.814 V/m
Peak SAR (extrapolated) = 0.544 W/kg
SAR(1 g) = 0.361 W/kg
SAR(10 g) = 0.240 W/kg
Power Drift = 0.08 dB
Maximum value of SAR (measured) = 0.385 W/kg



Plot 11:

Date/Time: 2013-05-17 10:22:13 AM

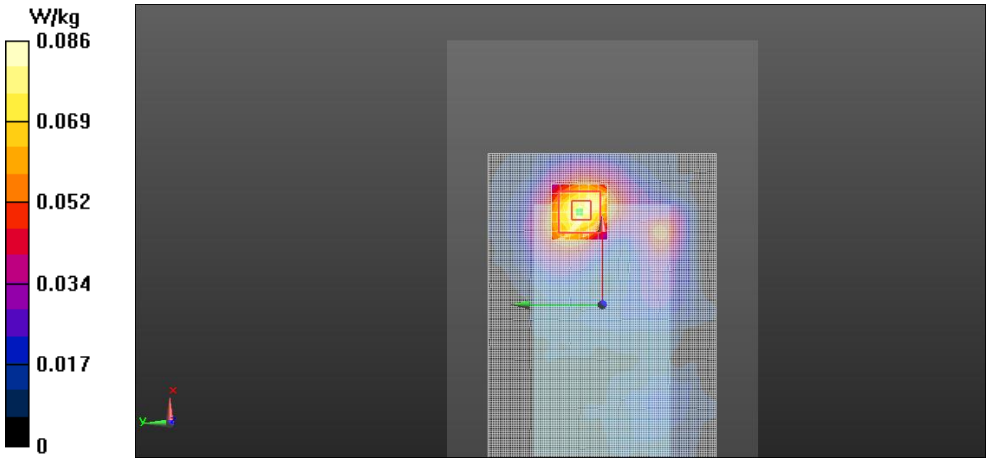
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299339/7

Communication System: WLAN2450 b-mode
Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: Body 2450; Medium Notes: Medium Temperature: t=22.5 C
Medium parameters used: f = 2462 MHz; σ = 1.956 S/m; ε_r = 50.322; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(6.9, 6.9, 6.9); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.8 (7028)

WLAN2450 b-mode/Body - Channel 11 - DSSS 1 Mbps - Spacer 15mm - No Headset - Back Facing Phantom/Area Scan (121x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0859 W/kg

WLAN2450 b-mode/Body - Channel 11 - DSSS 1 Mbps - Spacer 15mm - No Headset - Back Facing Phantom/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.512 V/m
Peak SAR (extrapolated) = 0.130 W/kg
SAR(1 g) = 0.076 W/kg
SAR(10 g) = 0.044 W/kg
Power Drift = -0.18 dB
Maximum value of SAR (measured) = 0.0821 W/kg



Plot 12:

Date/Time: 2013-05-16 2:50:11 PM

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 15mm - WH-108 - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299339/7
Communication System: WLAN2450 (US band); Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: Body 2450 Medium parameters used: f = 2437 MHz; σ = 1.905 S/m; ε_r = 50.347; ρ = 1000 kg/m^3
Phantom section: Center Section

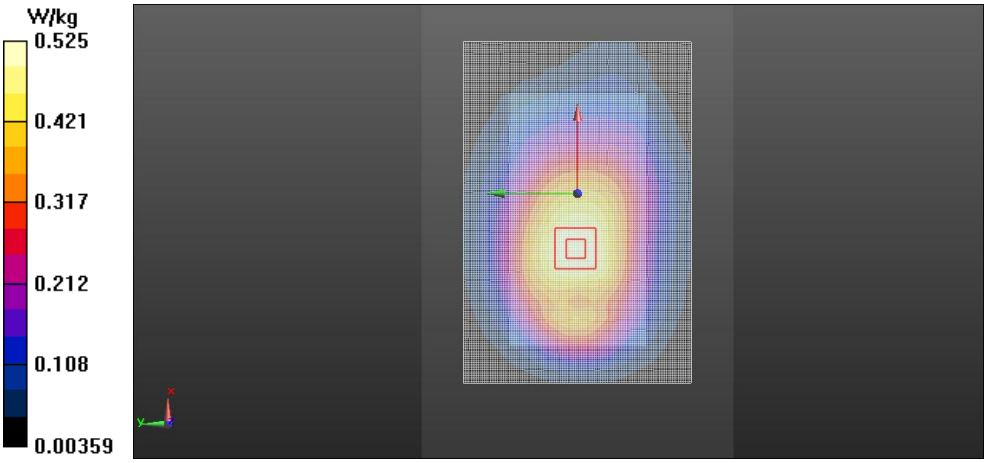
Probe: EX3DV4 - SN3823; ConvF(6.9, 6.9, 6.9); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (1)

Date/Time: 2013-05-22 1:20:01 PM

DASY Configuration for 3-slot GPRS850/Body - High - Spacer 15mm - WH-108 - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299331/4
Communication System: 3-slot GPRS850; Frequency: 848.8 MHz; Duty Cycle: 1:2.80027; PMF: 1.6734
Medium: Body 835 Medium parameters used: f = 849 MHz; σ = 0.983 S/m; ε_r = 54.946; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3823; ConvF(9.09, 9.09, 9.09); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (1)

Fast SAR of Combined Scans: SAR(1 g) = 0.498 W/kg; SAR(10 g) = 0.354 W/kg
Maximum value of SAR (interpolated) = 0.525 W/kg



Plot 13:

Date/Time: 2013-05-17 10:22:13 AM

DASY Configuration for WLAN2450 b-mode/Body - Channel 11 - DSSS 1 Mbps - Spacer 15mm - No Headset - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299339/7
Communication System: WLAN2450 b-mode; Frequency: 2462 MHz; Duty Cycle: 1:1; PMF: 1
Medium: Body 2450 Medium parameters used: f = 2462 MHz; σ = 1.956 S/m; ε_r = 50.322; ρ = 1000 kg/m^3
Phantom section: Center Section

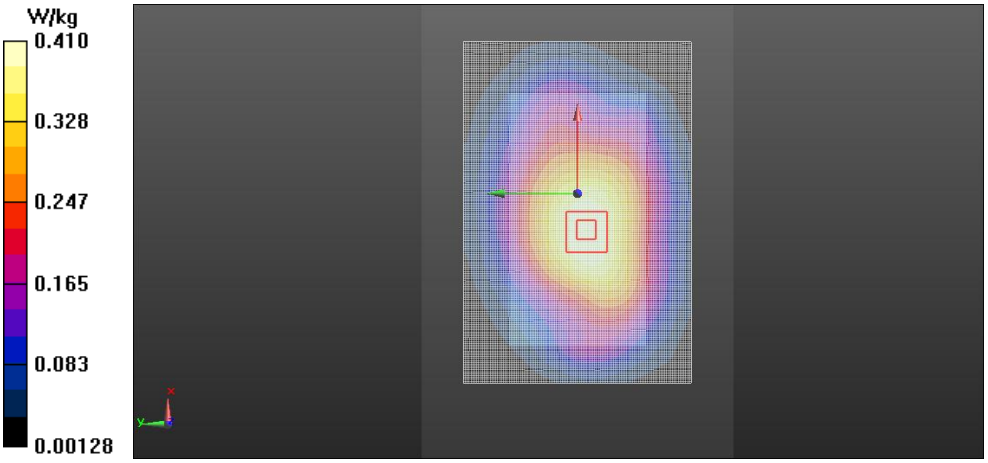
Probe: EX3DV4 - SN3823; ConvF(6.9, 6.9, 6.9); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (1)

Date/Time: 2013-05-29 11:54:04 AM

DASY Configuration for WCDMA850 (Band 5)/Body - High - Spacer 15mm - No headset - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299330/6
Communication System: WCDMA850; Frequency: 846.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: Body 835 Medium parameters used: f = 847 MHz; σ = 0.986 S/m; ε_r = 55.102; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3836; ConvF(8.97, 8.97, 8.97); Calibrated: 2013-03-08;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn710; Calibrated: 2013-03-08
Phantom: TFP3; Type: QD 000 P51 CA; Serial: 1130
Measurement SW: DASY52, Version 52.8 (5)

Fast SAR of Combined Scans: SAR(1 g) = 0.389 W/kg; SAR(10 g) = 0.277 W/kg
Maximum value of SAR (interpolated) = 0.410 W/kg



Plot 14:

Date/Time: 2013-05-16 3:36:58 PM

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 15mm - No Headset - Display Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299339/7
Communication System: WLAN2450 (US band); Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: Body 2450 Medium parameters used: f = 2437 MHz; σ = 1.905 S/m; ε_r = 50.347; ρ = 1000 kg/m^3
Phantom section: Center Section

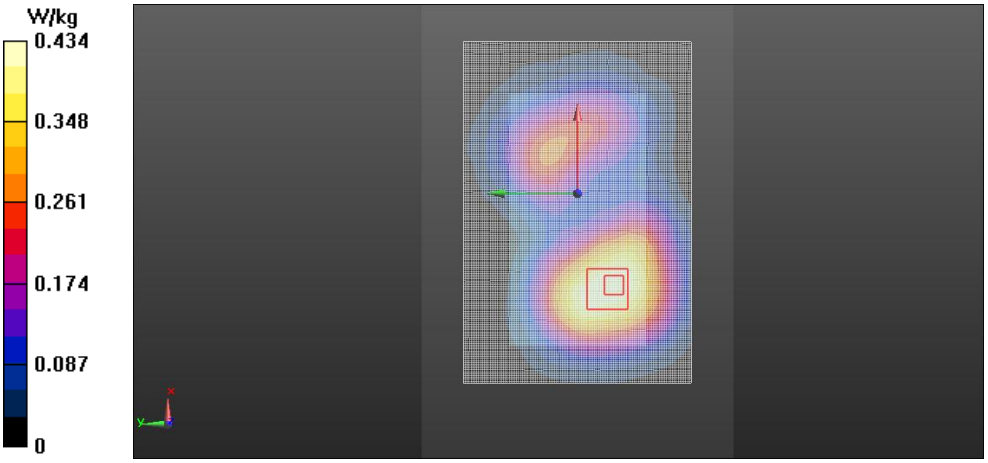
Probe: EX3DV4 - SN3823; ConvF(6.9, 6.9, 6.9); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (1)

Date/Time: 2013-05-13 11:09:58 AM

DASY Configuration for 3-slot GPRS1900/Body - Middle - Spacer 15mm - No Headset - Display Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299331/4
Communication System: 3-slot GPRS1900; Frequency: 1880 MHz; Duty Cycle: 1:2.80027; PMF: 1.6734
Medium: Body 1900 Medium parameters used: f = 1880 MHz; σ = 1.489 S/m; ε_r = 51.077; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3823; ConvF(7.28, 7.28, 7.28); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (1)

Fast SAR of Combined Scans: SAR(1 g) = 0.406 W/kg; SAR(10 g) = 0.255 W/kg
Maximum value of SAR (interpolated) = 0.434 W/kg



Plot 15:

Date/Time: 2013-05-22 5:02:23 PM

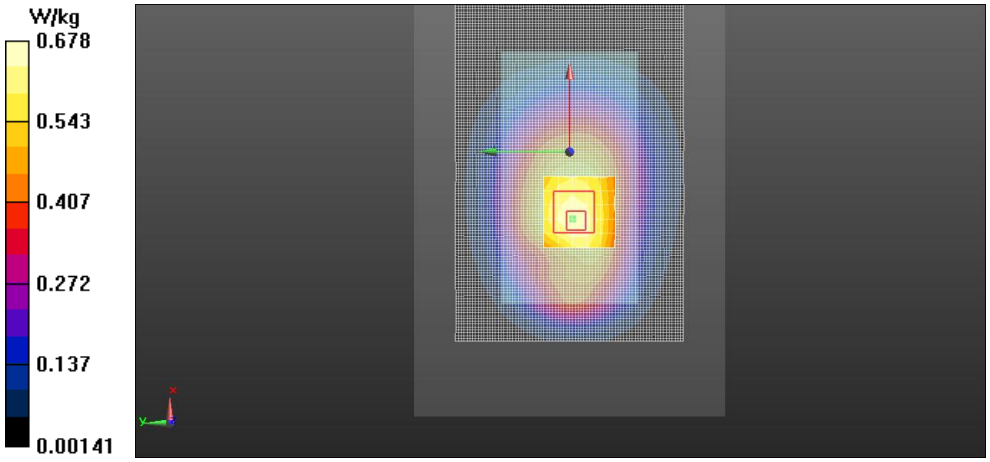
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299331/4

Communication System: 3-slot GPRS850
Frequency: 848.8 MHz; Duty Cycle: 1:2.80027
Medium: Body 835; Medium Notes: Medium Temperature: t= 21.6 C
Medium parameters used: f = 849 MHz; σ = 0.983 S/m; ε_r = 54.946; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(9.09, 9.09, 9.09); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.8 (7028)

3-slot GPRS850/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan (81x121x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.678 W/kg

3-slot GPRS850/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom/Zoom Scan (6x6x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 22.717 V/m
Peak SAR (extrapolated) = 0.799 W/kg
SAR(1 g) = 0.640 W/kg
SAR(10 g) = 0.485 W/kg
Power Drift = -0.05 dB
Maximum value of SAR (measured) = 0.669 W/kg



Plot 16:

Date/Time: 2013-05-29 11:16:48 AM

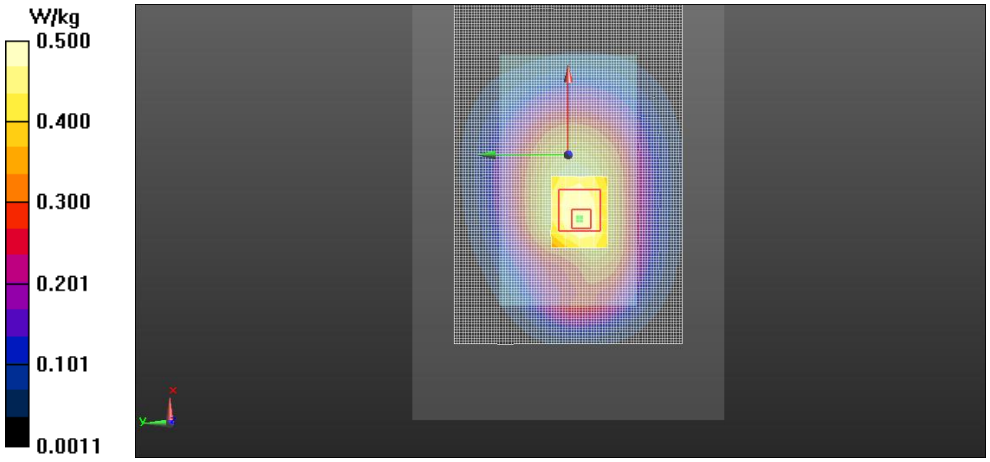
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299330/6

Communication System: WCDMA850
Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: Body 835; Medium Notes: Medium Temperature: t= 21.9 C
Medium parameters used: f = 847 MHz; σ = 0.986 S/m; ε_r = 55.102; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3836
- ConvF(8.97, 8.97, 8.97); Calibrated: 2013-03-08;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn710; Calibrated: 2013-03-08
- Phantom: TFP3; Type: QD 000 P51 CA; Serial: 1130
- Measurement SW: DASY52, Version 52.8 (5); SEMCAD X Version 14.6.8 (7028)

WCDMA5/Body - High - Spacer 10mm - No Headset - Back Facing Phantom/Area Scan (81x121x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.500 W/kg

WCDMA5/Body - High - Spacer 10mm - No Headset - Back Facing Phantom/Zoom Scan (5x6x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 20.688 V/m
Peak SAR (extrapolated) = 0.596 W/kg
SAR(1 g) = 0.477 W/kg
SAR(10 g) = 0.362 W/kg
Power Drift = 0.04 dB
Maximum value of SAR (measured) = 0.501 W/kg



Plot 17:

Date/Time: 2013-05-13 11:40:31 AM

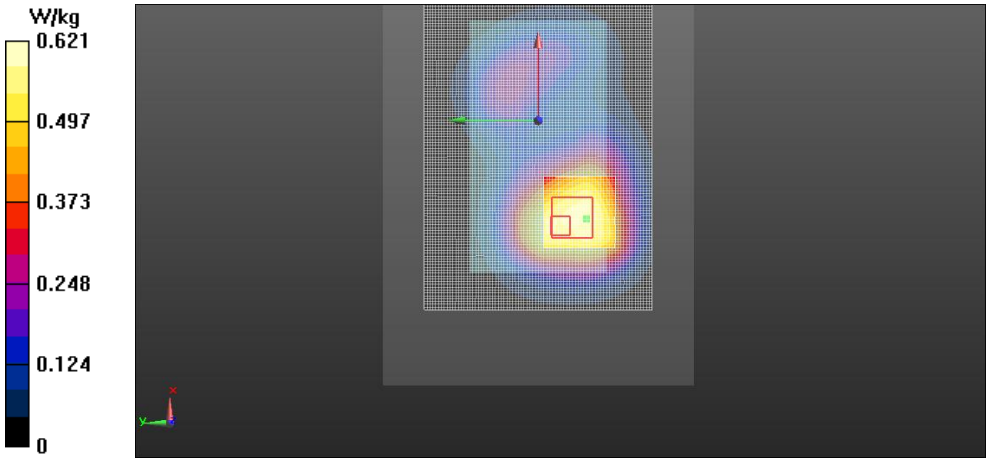
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299331/4

Communication System: 3-slot GPRS1900
Frequency: 1880 MHz; Duty Cycle: 1:2.80027
Medium: Body 1900; Medium Notes: Medium Temperature: t=21.9 C
Medium parameters used: f = 1880 MHz; σ = 1.489 S/m; ε_r = 51.077; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(7.28, 7.28, 7.28); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.8 (7028)

3-slot GPRS1900/Body - Middle - Spacer 10mm - No Headset - Display Facing Phantom/Area Scan (81x121x1):
Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.621 W/kg

3-slot GPRS1900/Body - Middle - Spacer 10mm - No Headset - Display Facing Phantom/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 9.193 V/m
Peak SAR (extrapolated) = 0.849 W/kg
SAR(1 g) = 0.565 W/kg
SAR(10 g) = 0.381 W/kg
Power Drift = 0.03 dB
Maximum value of SAR (measured) = 0.599 W/kg



Plot 18:

Date/Time: 2013-05-17 12:22:01 PM

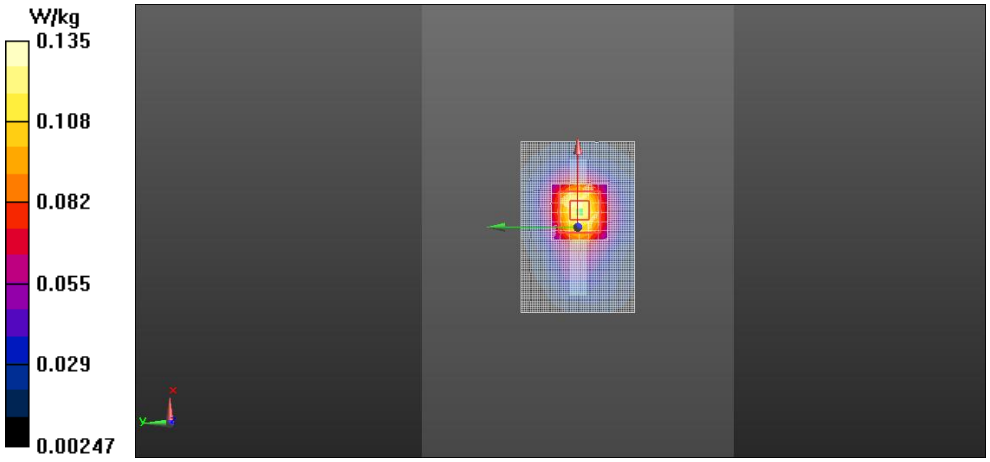
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299339/7

Communication System: WLAN2450 b-mode
Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: Body 2450; Medium Notes: Medium Temperature: t=21.9 C
Medium parameters used: f = 2462 MHz; σ = 1.953 S/m; ε_r = 50.567; ρ = 1000 kg/m^3
Phantom section: Center Section

DASY Configuration:
- Probe: EX3DV4 - SN3823
- ConvF(6.9, 6.9, 6.9); Calibrated: 2012-12-12;
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn705; Calibrated: 2012-12-04
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
- Measurement SW: DASY52, Version 52.8 (1); SEMCAD X Version 14.6.8 (7028)

WLAN2450 b-mode/Body - Channel 11 - DSSS 1 Mbps - Spacer 10mm - No Headset - Top edge Facing Phantom/Area Scan (61x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.135 W/kg

WLAN2450 b-mode/Body - Channel 11 - DSSS 1 Mbps - Spacer 10mm - No Headset - Top edge Facing Phantom/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.597 V/m
Peak SAR (extrapolated) = 0.219 W/kg
SAR(1 g) = 0.119 W/kg
SAR(10 g) = 0.064 W/kg
Power Drift = 0.05 dB
Maximum value of SAR (measured) = 0.133 W/kg



Plot 19:

Date/Time: 2013-05-16 1:41:24 PM

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 10mm - No Headset - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299339/7
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: Body 2450 Medium parameters used: f = 2437 MHz; σ = 1.905 S/m; ε_r = 50.347; ρ = 1000 kg/m^3
Phantom section: Center Section

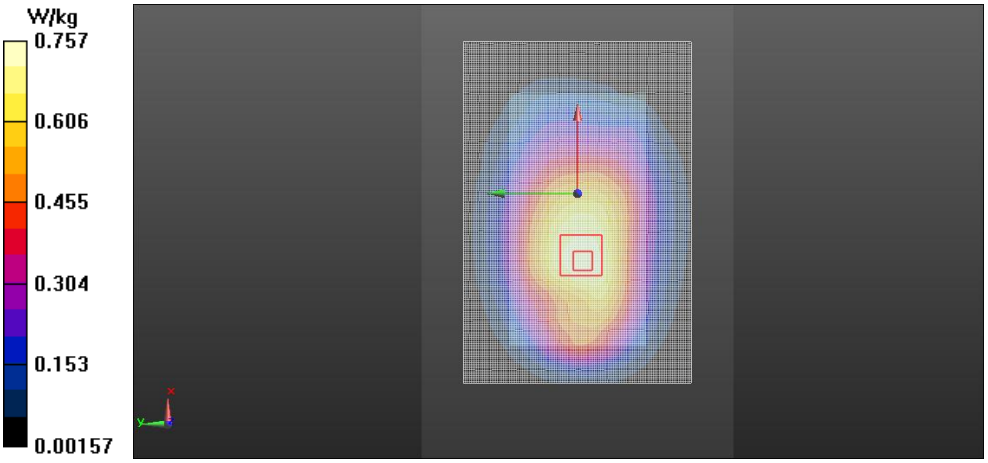
Probe: EX3DV4 - SN3823; ConvF(6.9, 6.9, 6.9); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (1)

Date/Time: 2013-05-22 5:02:23 PM

DASY Configuration for 3-slot GPRS850/Body - High - Spacer 10mm - No Accessory - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299331/4
Communication System: 3-slot GPRS850; Frequency: 848.8 MHz; Duty Cycle: 1:2.80027; PMF: 1.6734
Medium: Body 835 Medium parameters used: f = 849 MHz; σ = 0.983 S/m; ε_r = 54.946; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3823; ConvF(9.09, 9.09, 9.09); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (1)

Fast SAR of Combined Scans: SAR(1 g) = 0.713 W/kg; SAR(10 g) = 0.506 W/kg
Maximum value of SAR (interpolated) = 0.757 W/kg



Plot 20:

Date/Time: 2013-05-16 1:41:24 PM

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 10mm - No Headset - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299339/7
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: Body 2450 Medium parameters used: f = 2437 MHz; σ = 1.905 S/m; ε_r = 50.347; ρ = 1000 kg/m^3
Phantom section: Center Section

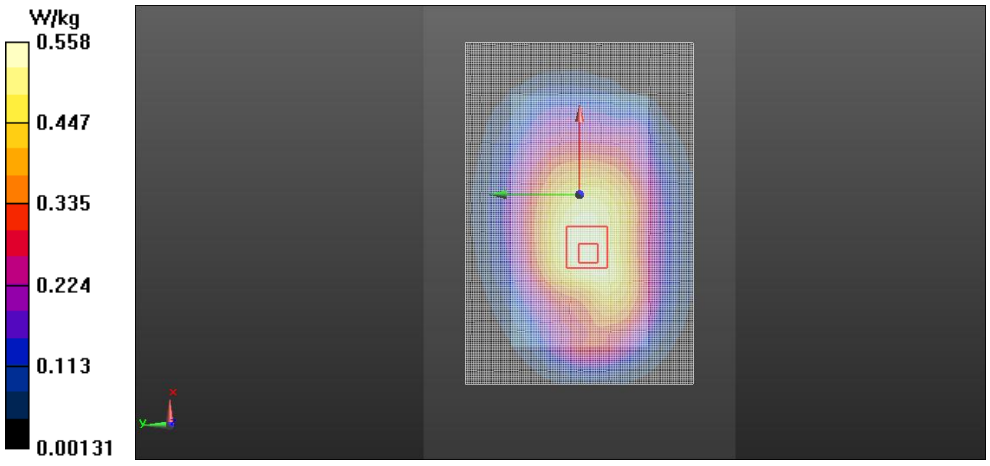
Probe: EX3DV4 - SN3823; ConvF(6.9, 6.9, 6.9); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (1)

Date/Time: 2013-05-29 11:16:48 AM

DASY Configuration for WCDMA5/Body - High - Spacer 10mm - No Headset - Back Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299330/6
Communication System: WCDMA850; Frequency: 846.6 MHz; Duty Cycle: 1:1; PMF: 1
Medium: Body 835 Medium parameters used: f = 847 MHz; σ = 0.986 S/m; ε_r = 55.102; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3836; ConvF(8.97, 8.97, 8.97); Calibrated: 2013-03-08;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn710; Calibrated: 2013-03-08
Phantom: TFP3; Type: QD 000 P51 CA; Serial: 1130
Measurement SW: DASY52, Version 52.8 (5)

Fast SAR of Combined Scans: SAR(1 g) = 0.528 W/kg; SAR(10 g) = 0.378 W/kg
Maximum value of SAR (interpolated) = 0.558 W/kg



Plot 21:

Date/Time: 2013-05-16 4:00:27 PM

DASY Configuration for WLAN2450 b-mode/Body - Channel 6 - DSSS 1 Mbps - Spacer 10mm - No Headset - Display Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299339/7
Communication System: WLAN2450 b-mode; Frequency: 2437 MHz; Duty Cycle: 1:1; PMF: 1
Medium: Body 2450 Medium parameters used: f = 2437 MHz; σ = 1.905 S/m; ε_r = 50.347; ρ = 1000 kg/m^3
Phantom section: Center Section

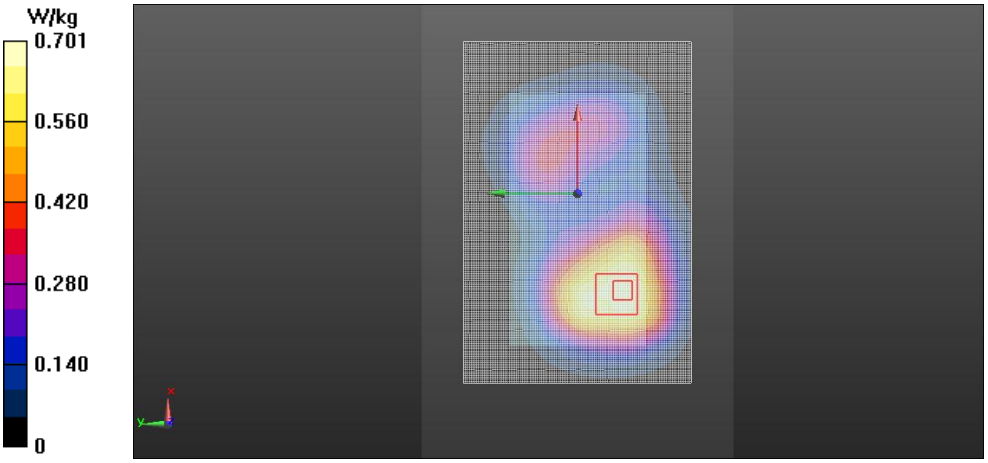
Probe: EX3DV4 - SN3823; ConvF(6.9, 6.9, 6.9); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (1)

Date/Time: 2013-05-13 11:40:31 AM

DASY Configuration for 3-slot GPRS1900/Body - Middle - Spacer 10mm - No Headset - Display Facing Phantom/Area Scan:
Test Laboratory: TCC Nokia
Type: RM-941; Serial: 004402/47/299331/4
Communication System: 3-slot GPRS1900; Frequency: 1880 MHz; Duty Cycle: 1:2.80027; PMF: 1.6734
Medium: Body 1900 Medium parameters used: f = 1880 MHz; σ = 1.489 S/m; ε_r = 51.077; ρ = 1000 kg/m^3
Phantom section: Center Section

Probe: EX3DV4 - SN3823; ConvF(7.28, 7.28, 7.28); Calibrated: 2012-12-12;
Sensor-Surface: 4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn705; Calibrated: 2012-12-04
Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: xxxx
Measurement SW: DASY52, Version 52.8 (1)

Fast SAR of Combined Scans: SAR(1 g) = 0.649 W/kg; SAR(10 g) = 0.407 W/kg
Maximum value of SAR (interpolated) = 0.701 W/kg



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	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
GSM/GPRS/ EGPRS850	2013-05-20	40.8	0.91	40.7	0.92	40.6	0.93
	2013-05-27	42.0	0.88	41.9	0.89	41.8	0.90
f (MHz)	Date	Dielectric Parameters					
		826.0MHz		835.0MHz		847.0MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
WCDMA850	2013-05-15	40.8	0.91	40.7	0.91	40.7	0.92
f (MHz)	Date	Dielectric Parameters					
		1850.0MHz		1880.0MHz		1910.0MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
GSM/GPRS/ EGPRS1900	2013-05-10	39.1	1.32	38.9	1.35	38.8	1.37
f (MHz)	Date	Dielectric Parameters					
		2412.0MHz		2442.0MHz		2462.0MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
WLAN2450	2013-05-14	39.4	1.78	39.3	1.81	39.2	1.83
	2013-05-15	39.7	1.76	39.5	1.80	39.4	1.83

Body tissue simulant dielectric parameters used in the measurements:

f (MHz)	Date	Dielectric Parameters					
		824.2MHz		837.0MHz		849.0MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
GSM/GPRS/ EGPRS850	2013-05-22	55.2	0.96	55.7	0.91	55.0	0.98
f (MHz)	Date	Dielectric Parameters					
		826.0MHz		835.0MHz		847.0MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
WCDMA850	2013-05-29	55.3	0.97	55.2	0.98	55.1	0.99
f (MHz)	Date	Dielectric Parameters					
		1850.0MHz		1880.0MHz		1910.0MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
GSM/GPRS/ EGPRS1900	2013-05-13	51.2	1.46	51.1	1.49	51	1.52
		Dielectric Parameters					
f (MHz)	Date	Dielectric Parameters					
		2412.0MHz		2442.0MHz		2462.0MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
WLAN2450	2013-05-16	50.3	1.85	50.4	1.92	50.3	1.96

APPENDIX D: CONDUCTED AVERAGE POWER MEASUREMENTS FOR WCDMA AND HSUPA

Test Laboratory: TCC Nokia
Type: RM-941; Serial:004402/47/299330/6, HW: 2000, SW: 3037.0000.1318.0000

D.1. WCDMA850 Test results

Average power

Ch / *f*(MHz)	P [dBm]
CH 4132 / 826.4 MHz	24.16
CH 4175 / 835.0 MHz	24.18
CH 4233 / 846.6 MHz	24.15

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
CH 4132 / 826.4 MHz	23.57	22.12	22.59	22.48	23.43
CH 4175 / 835.0 MHz	23.42	22.14	22.61	22.44	23.45
CH 4233 / 846.6 MHz	23.54	22.35	22.46	22.43	23.64

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
0.5dB	2dB	1.5dB	2dB	0.5dB

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
S Swiss Calibration Service

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

Accreditation No.: SCS 108

Client **Nokia Beijing TCC**

Certificate No: EX3-3836_Mar13

CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3836

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

Calibration date: March 8, 2013

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	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	31-Jan-13 (No. DAE4-660_Jan13)	Jan-14
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:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 8, 2013

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3836

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.40	0.47	0.45	± 10.1 %
DCP (mV)[B]	89.8	101.7	96.3	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	143.5	±3.0 %
		Y	0.0	0.0	1.0		155.5	
		Z	0.0	0.0	1.0		149.3	

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%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3836

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	9.44	9.44	9.44	0.80	0.60	± 12.0 %
835	41.5	0.90	9.03	9.03	9.03	0.79	0.60	± 12.0 %
1750	40.1	1.37	8.11	8.11	8.11	0.31	0.98	± 12.0 %
1900	40.0	1.40	7.79	7.79	7.79	0.35	0.92	± 12.0 %
2600	39.0	1.96	6.82	6.82	6.82	0.42	0.86	± 12.0 %

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

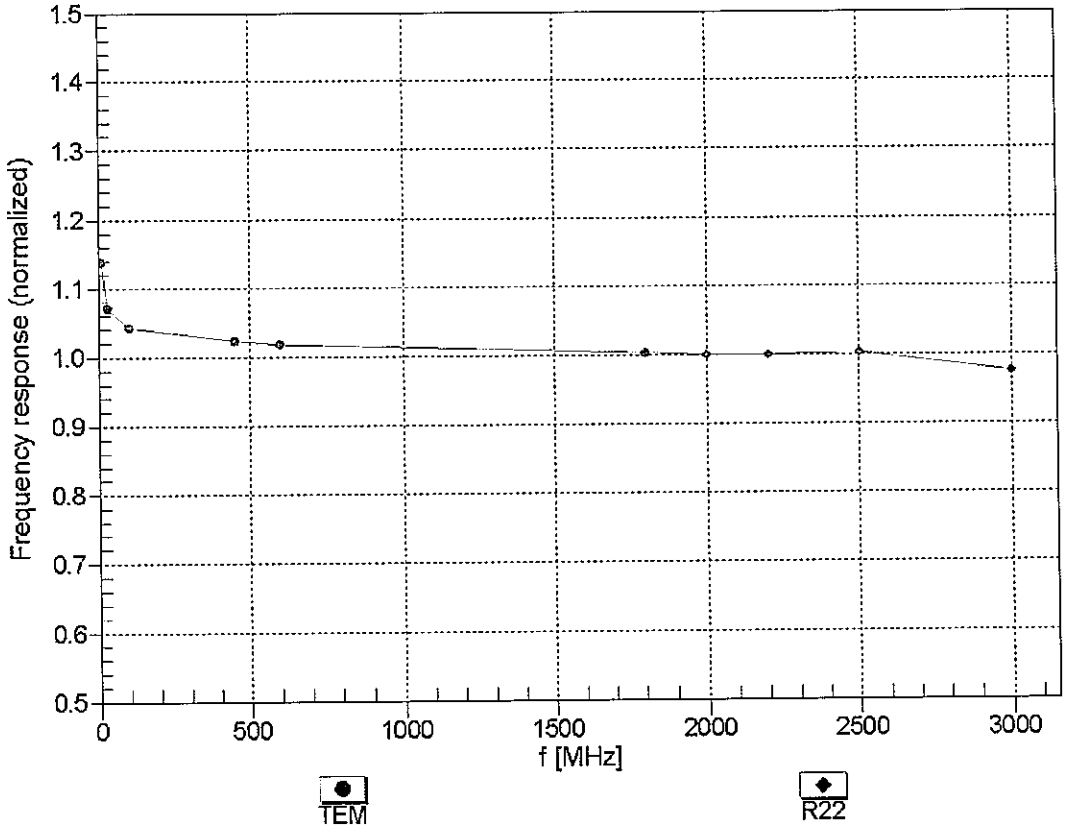
DASY/EASY - Parameters of Probe: EX3DV4 - SN:3836

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	9.07	9.07	9.07	0.80	0.61	± 12.0 %
835	55.2	0.97	8.97	8.97	8.97	0.70	0.67	± 12.0 %
1750	53.4	1.49	7.57	7.57	7.57	0.67	0.67	± 12.0 %
1900	53.3	1.52	7.18	7.18	7.18	0.80	0.61	± 12.0 %
2600	52.5	2.16	6.70	6.70	6.70	0.64	0.50	± 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.

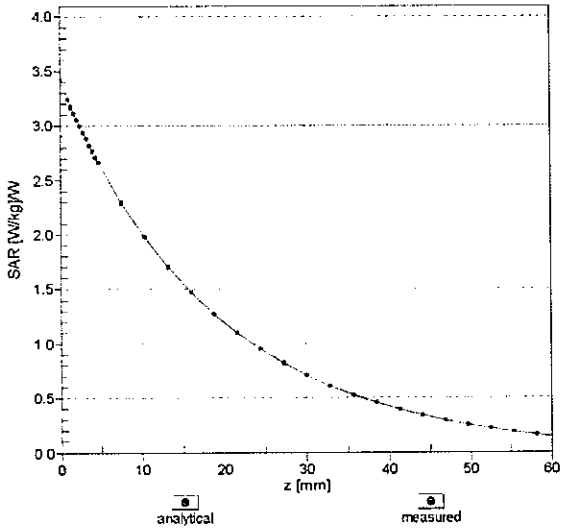
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



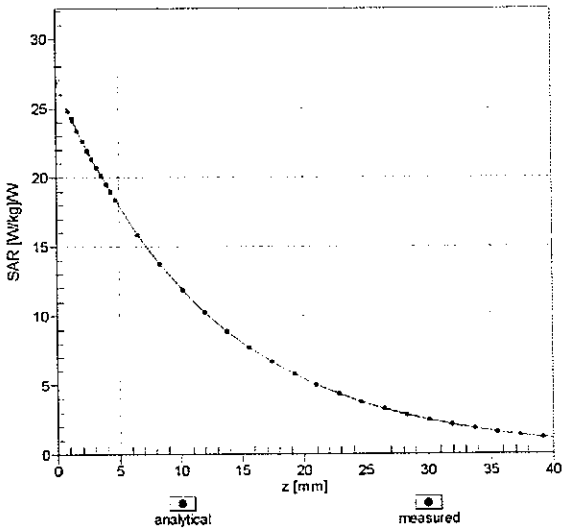
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

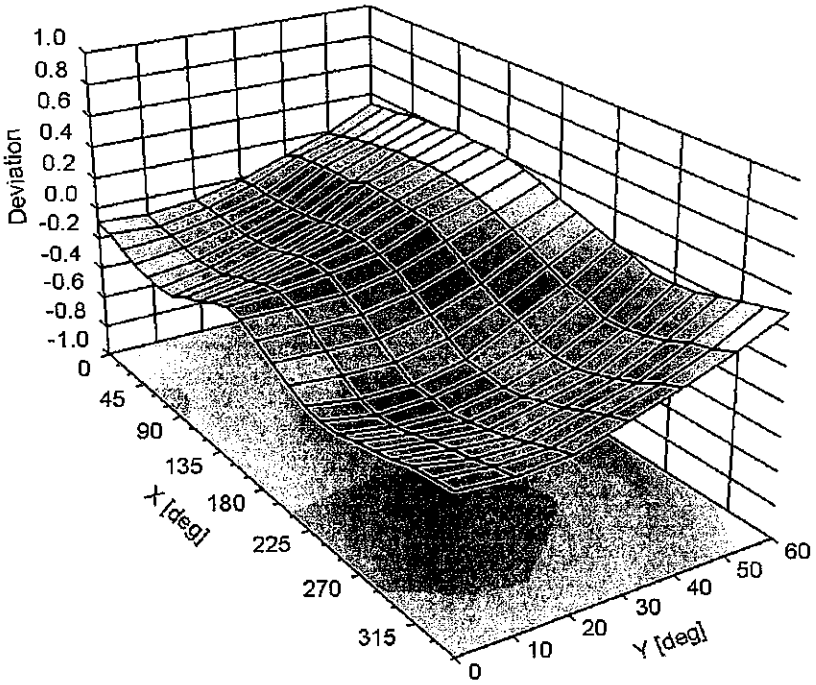


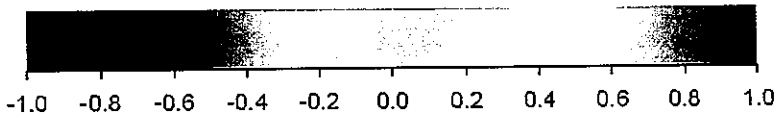
f = 1750 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz





Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

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

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

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

Accreditation No.: SCS 108

Client Nokia Beijing TCC

Certificate No: EX3-3823_Dec12

CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3823

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

Calibration date: December 12, 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: December 12, 2012

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3823

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.41	0.36	0.47	± 10.1 %
DCP (mV)[B]	100.6	102.8	99.2	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc[E] (k=2)
0	CW	0.00	X	0.0	0.0	1.0	134.4	±3.5 %
			Y	0.0	0.0	1.0	138.9	
			Z	0.0	0.0	1.0	114.7	

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%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3823

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
835	41.5	0.90	9.17	9.17	9.17	0.50	0.71	± 12.0 %
1750	40.1	1.37	7.86	7.86	7.86	0.52	0.71	± 12.0 %
1900	40.0	1.40	7.62	7.62	7.62	0.34	0.89	± 12.0 %
1950	40.0	1.40	7.33	7.33	7.33	0.39	0.80	± 12.0 %
2450	39.2	1.80	6.91	6.91	6.91	0.32	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.

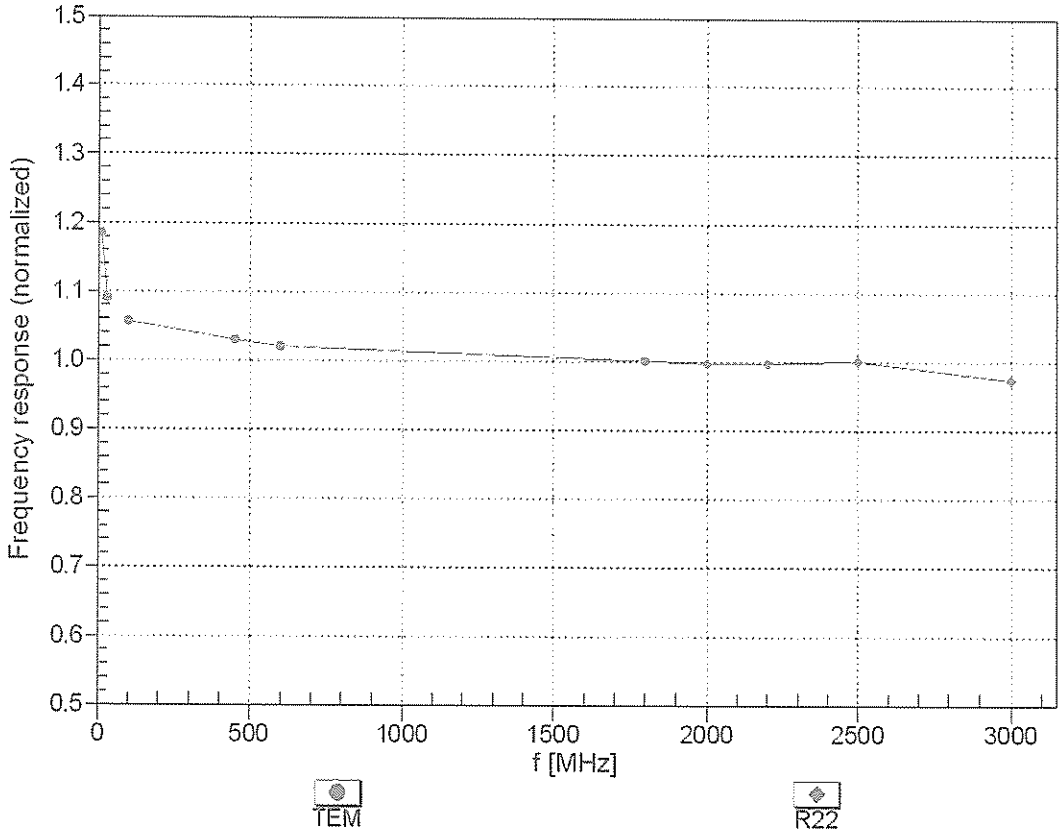
DASY/EASY - Parameters of Probe: EX3DV4 - SN:3823

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
835	55.2	0.97	9.09	9.09	9.09	0.38	0.82	± 12.0 %
1750	53.4	1.49	7.50	7.50	7.50	0.32	0.92	± 12.0 %
1900	53.3	1.52	7.28	7.28	7.28	0.41	0.78	± 12.0 %
1950	53.3	1.52	7.48	7.48	7.48	0.43	0.78	± 12.0 %
2450	52.7	1.95	6.90	6.90	6.90	0.80	0.50	± 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.

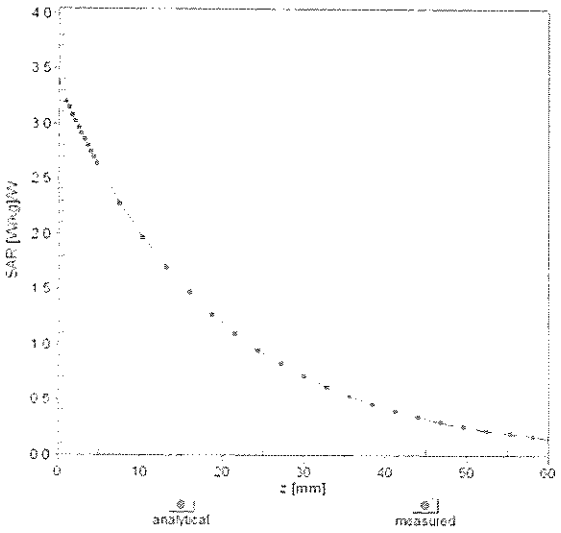
Frequency Response of E-Field
(TEM-Cell:ifi110 EXX, Waveguide: R22)



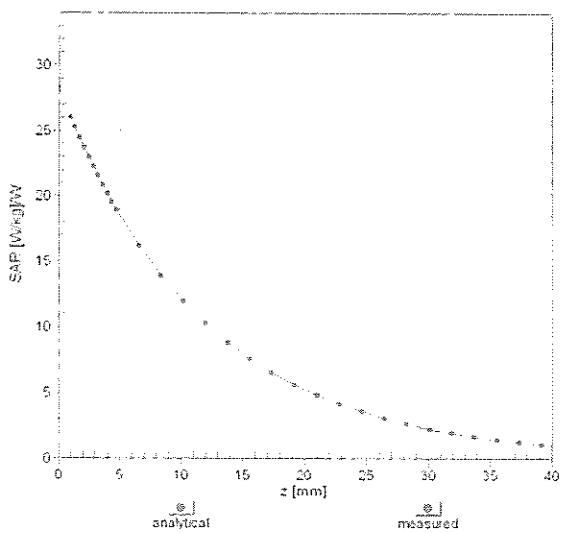
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

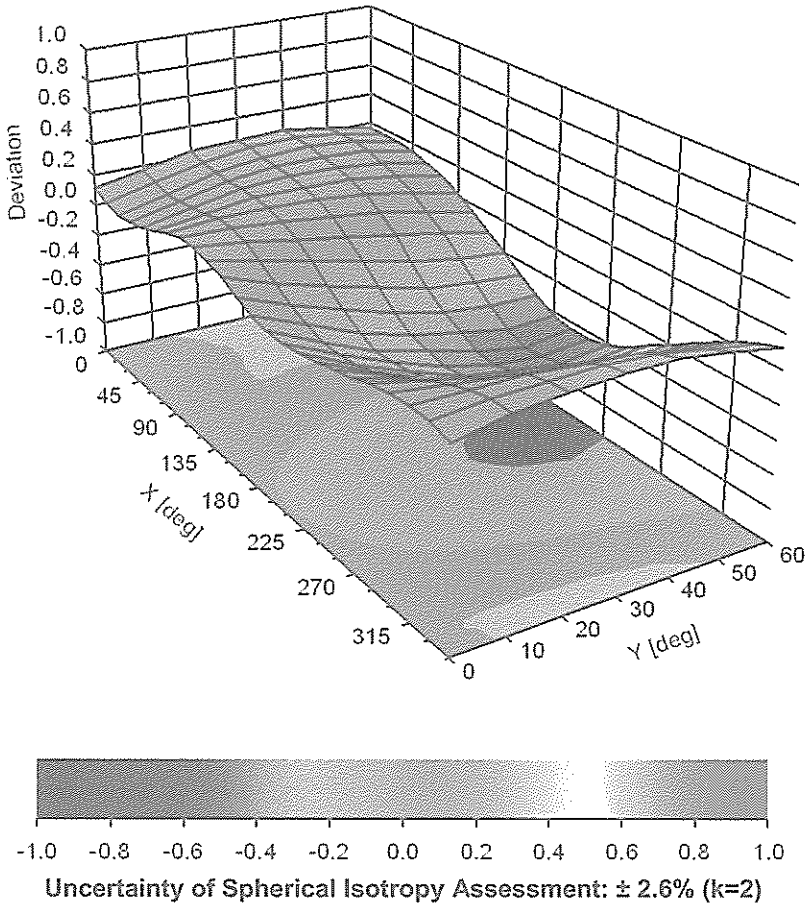


f = 1900 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

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

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

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

Accreditation No.: SCS 108

Client **Nokia Beijing TCC**

Certificate No: EX3-3838_Mar13

CALIBRATION CERTIFICATE

Object EX3DV4 - SN:3838

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

Calibration date: March 8, 2013

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	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	31-Jan-13 (No. DAE4-660_Jan13)	Jan-14
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:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 11, 2013

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3838

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.37	0.60	0.53	± 10.1 %
DCP (mV)[B]	105.0	99.6	100.1	

Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB√μV	C	D dB	VR mV	Unc[E] (k=2)
0	CW	X	0.0	0.0	1.0	0.00	147.3	±3.5 %
		Y	0.0	0.0	1.0		139.3	
		Z	0.0	0.0	1.0		128.2	

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%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3838

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
835	41.5	0.90	9.04	9.04	9.04	0.20	1.34	± 12.0 %
1750	40.1	1.37	7.65	7.65	7.65	0.56	0.79	± 12.0 %
1900	40.0	1.40	7.46	7.46	7.46	0.80	0.65	± 12.0 %

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

DASY/EASY - Parameters of Probe: EX3DV4 - SN:3838

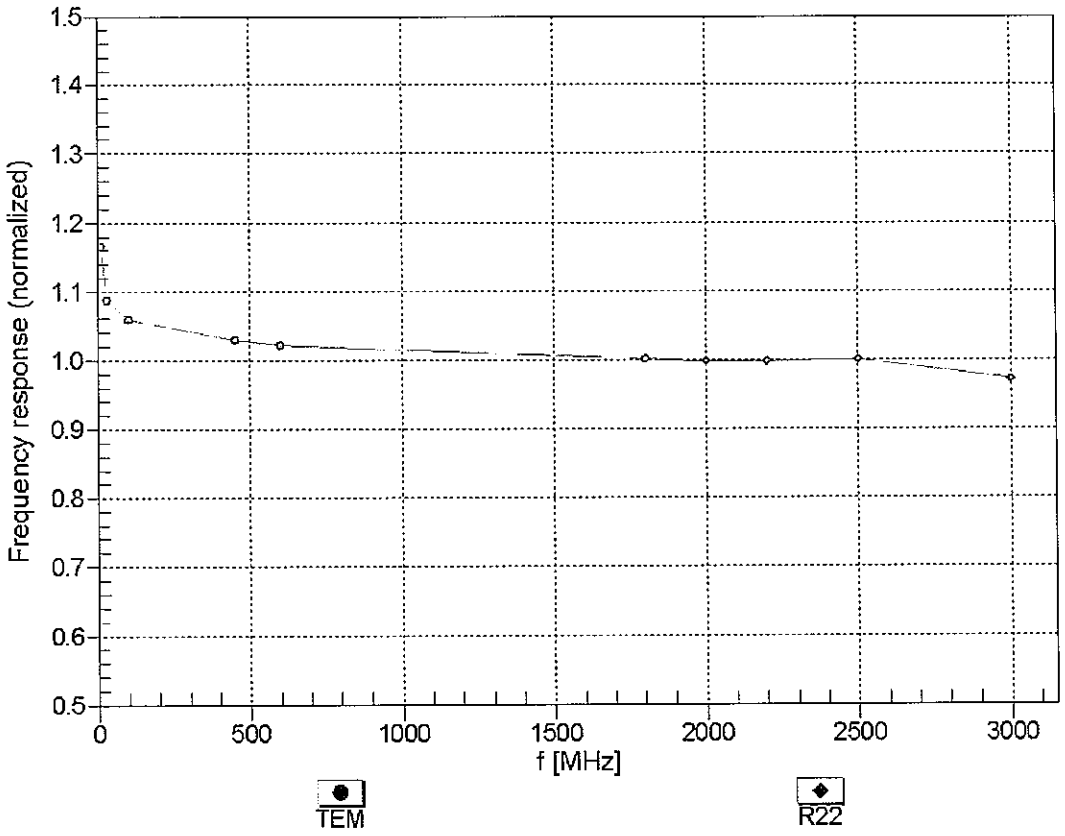
Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) [C]	Relative Permittivity [F]	Conductivity (S/m) [F]	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
835	55.2	0.97	9.07	9.07	9.07	0.27	1.22	± 12.0 %
1750	53.4	1.49	7.54	7.54	7.54	0.35	0.98	± 12.0 %
1900	53.3	1.52	7.21	7.21	7.21	0.30	1.04	± 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.

Frequency Response of E-Field

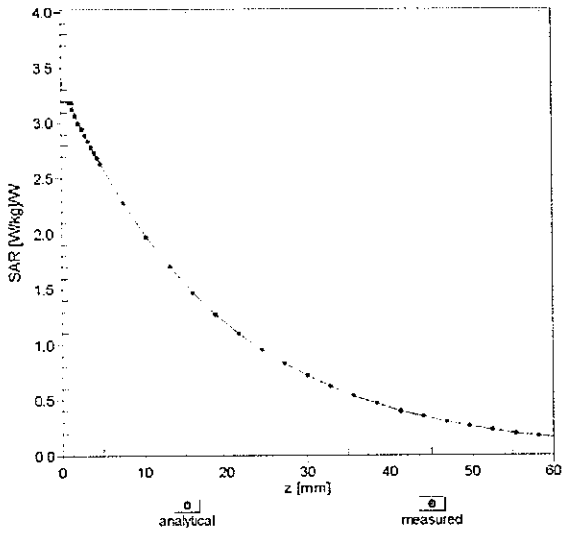
(TEM-Cell:ifi110 EXX, Waveguide: R22)



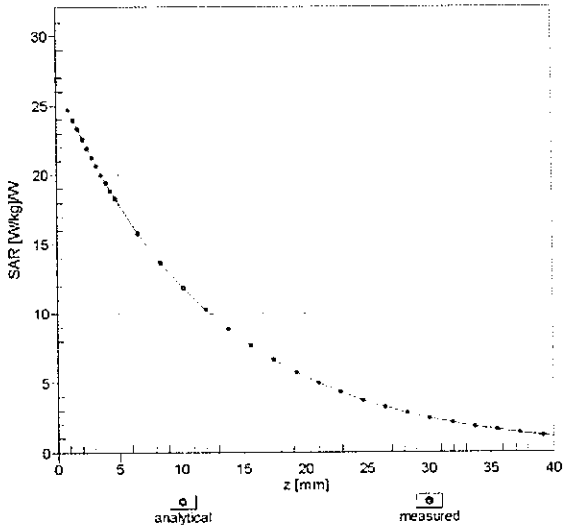
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Conversion Factor Assessment

f = 835 MHz,WGLS R9 (H_convF)

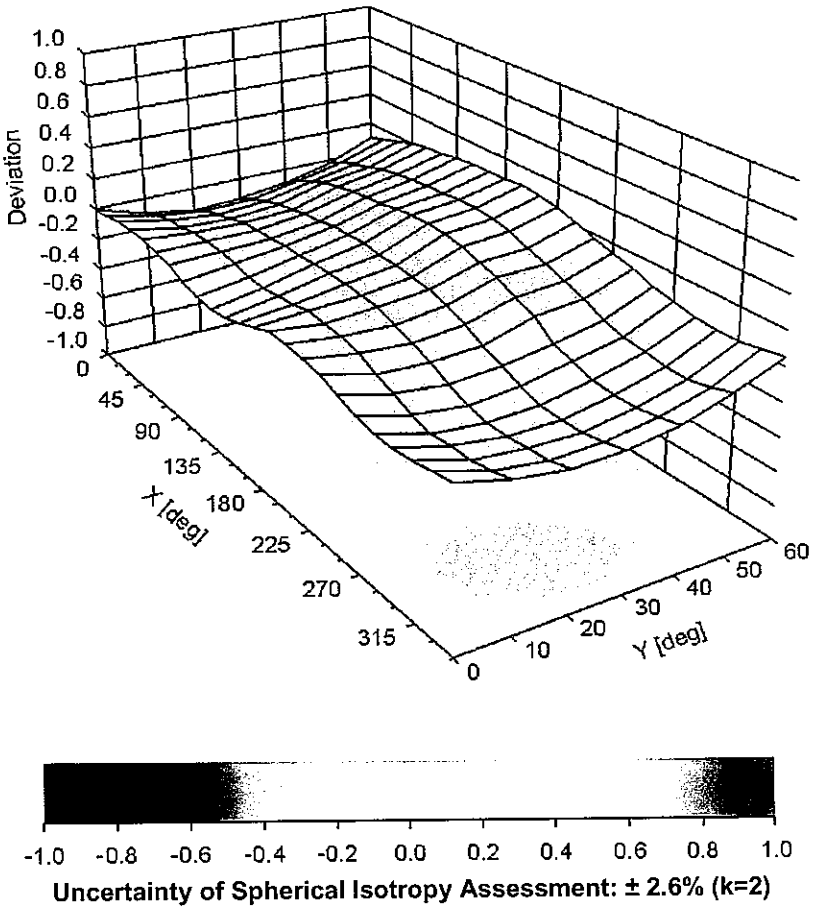


f = 1750 MHz,WGLS R22 (H_convF)



Deviation from Isotropy in Liquid

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

APPENDIX F: RELEVANT PAGES FROM DIPOLE VALIDATION KIT 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
S Swiss Calibration Service

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

Accreditation No.: SCS 108

Client **Nokia Beijing TCC**

Certificate No: D835V2-4d005_Mar12

CALIBRATION CERTIFICATE

Object: D835V2 - SN: 4d005

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

Calibration date: March 06, 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: March 6, 2012

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.7 Ω - 3.4 jΩ
Return Loss	- 27.5 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.8 Ω - 5.1 jΩ
Return Loss	- 24.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.394 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	July 11, 2003

DASY5 Validation Report for Head TSL

Date: 06.03.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d005

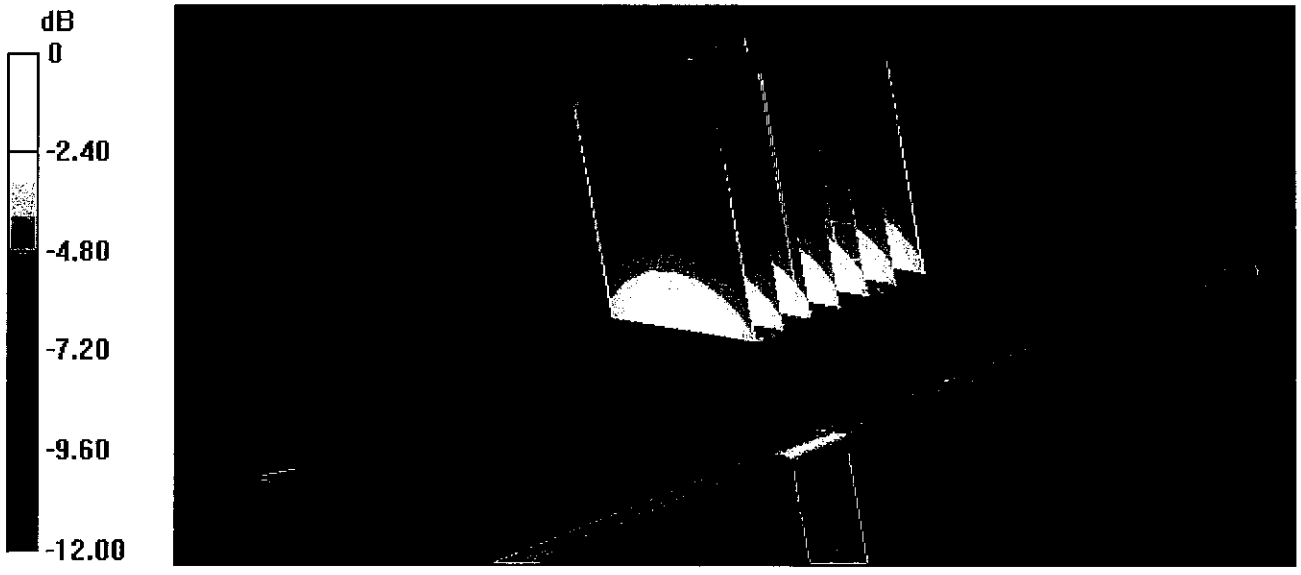
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.07, 6.07, 6.07); Calibrated: 30.12.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

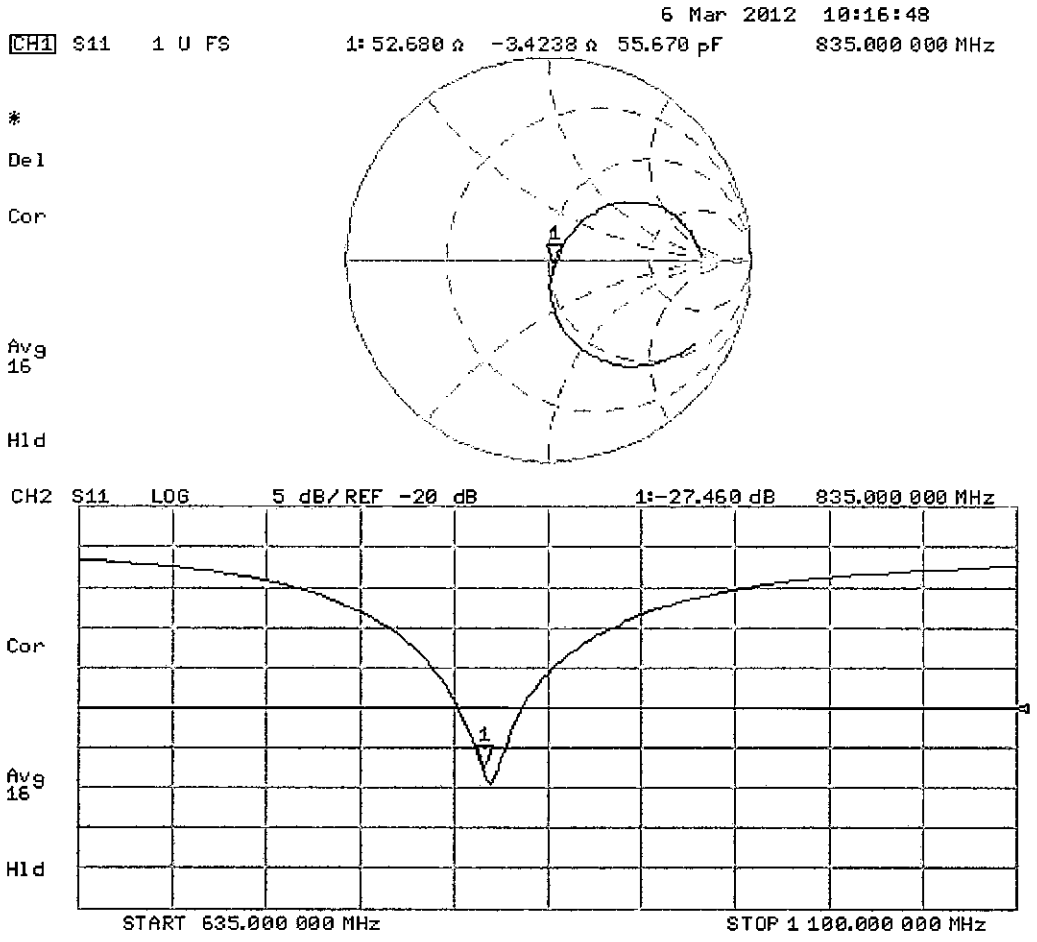
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.103 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 3.4310
SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.52 mW/g
Maximum value of SAR (measured) = 2.709 mW/g



0 dB = 2.710mW/g = 8.66 dB mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 05.03.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d005

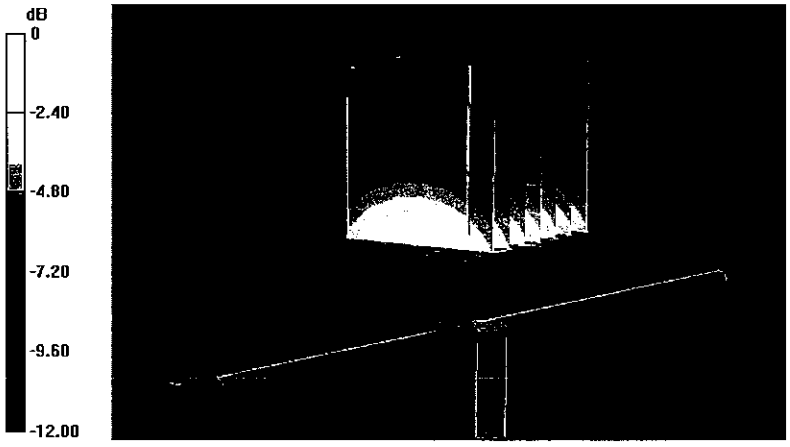
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.02, 6.02, 6.02); Calibrated: 30.12.2011
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.07.2011
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.0(692); SEMCAD X 14.6.4(4989)

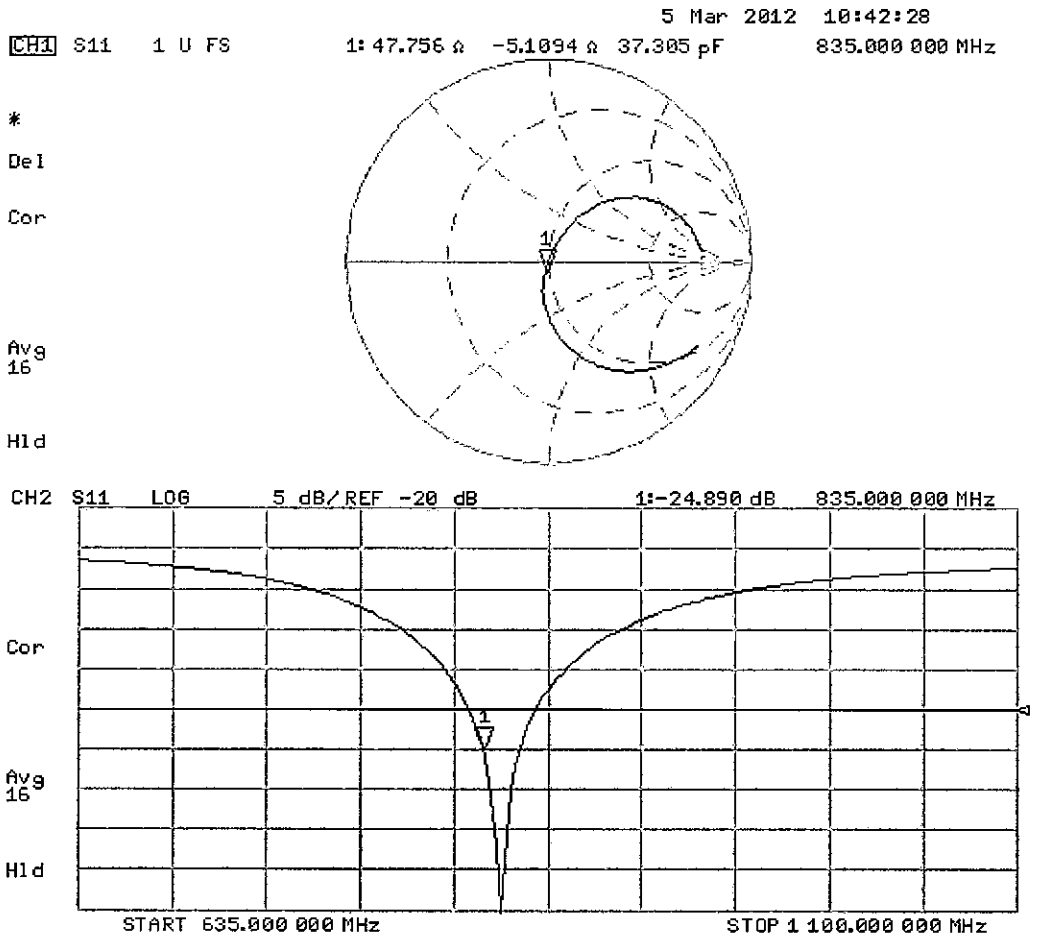
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.011 V/m; Power Drift = 0.0071 dB
Peak SAR (extrapolated) = 3.4950
SAR(1 g) = 2.42 mW/g; SAR(10 g) = 1.59 mW/g
Maximum value of SAR (measured) = 2.812 mW/g



0 dB = 2.810mW/g = 8.97 dB mW/g

Impedance Measurement Plot for Body TSL



Dipole D835V2 – SN: 4d005 Antenna Parameters

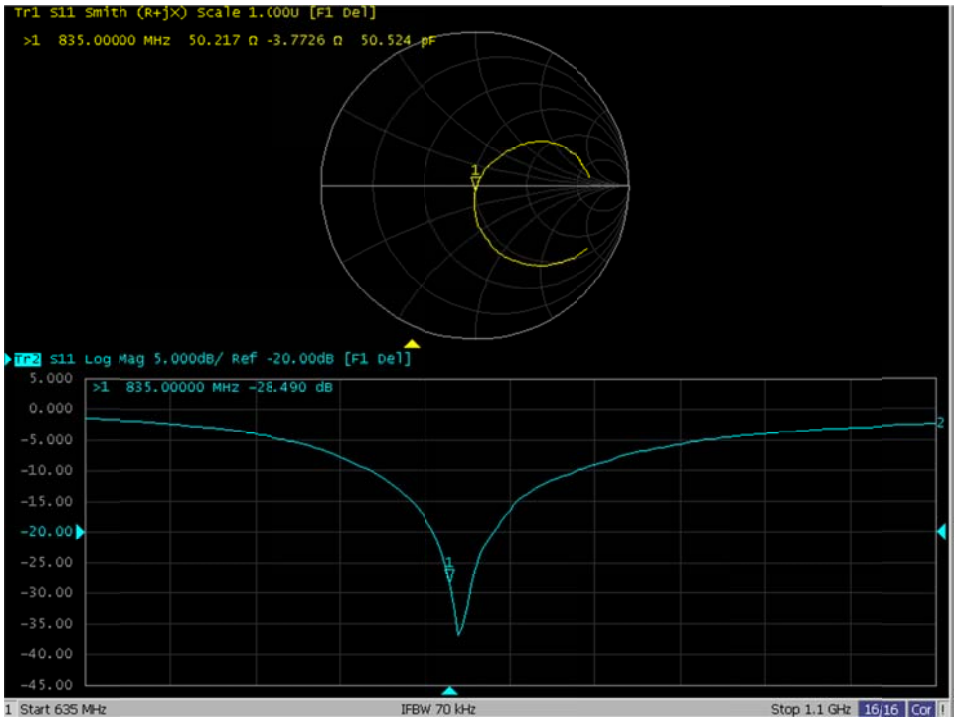
Antenna Parameters with Head TSL

	Calibration certificate	Annual measurement 2013-03-06
Impedance, transformed to feed point	52.7 Ω - 3.4 jΩ	50.2 Ω - 3.8 jΩ
Return loss	- 27.5 dB	- 28.5 dB

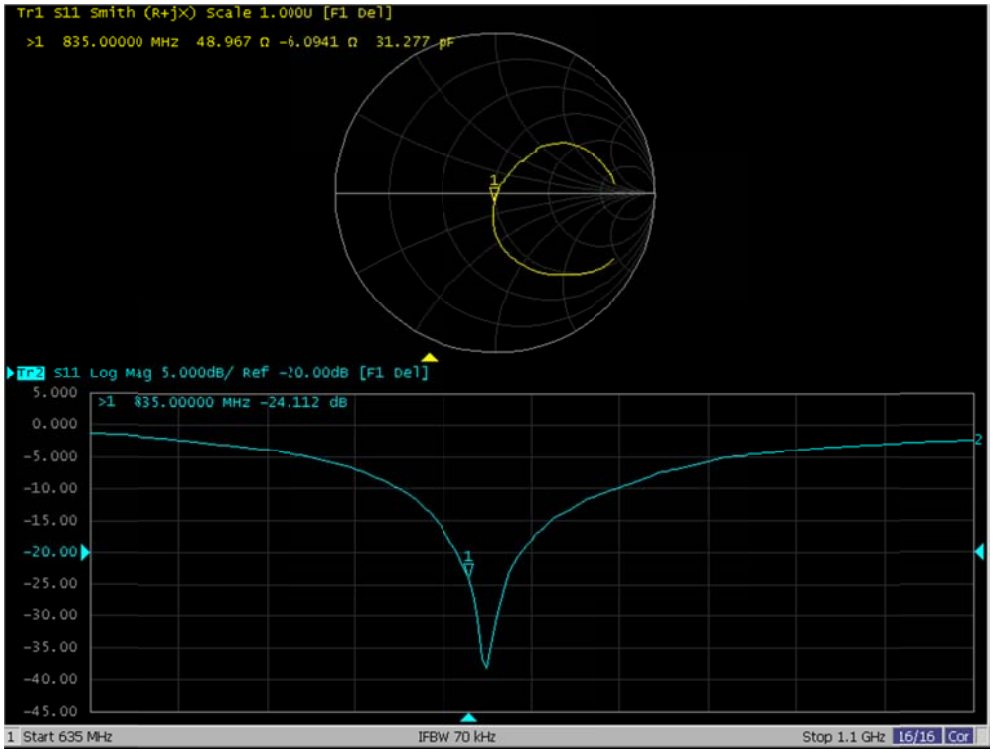
Antenna Parameters with Body TSL

	Calibration certificate	Annual measurement 2013-03-06
Impedance, transformed to feed point	47.8 Ω - 5.1 jΩ	49.0 Ω - 6.1 jΩ
Return loss	- 24.9 dB	- 24.1 dB

Impedance Measurement plot for Head TSL 835



Impedance Measurement plot for Body TSL 835



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Accredited by the Swiss Accreditation Service (SAS) **Accreditation No.: SCS 108**
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Client **Nokia Beijing TCC** **Certificate No: D835V2-479_Mar13**

CALIBRATION CERTIFICATE

Object D835V2 - SN: 479

Calibration procedure(s) QA CAL-05.v9
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: March 11, 2013

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	28-Dec-12 (No. ES3-3205_Dec12)	Dec-13
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: March 11, 2013

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.6 Ω - 3.7 jΩ
Return Loss	- 28.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.7 Ω - 5.7 jΩ
Return Loss	- 23.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.386 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 28, 2003

DASY5 Validation Report for Head TSL

Date: 05.03.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 479

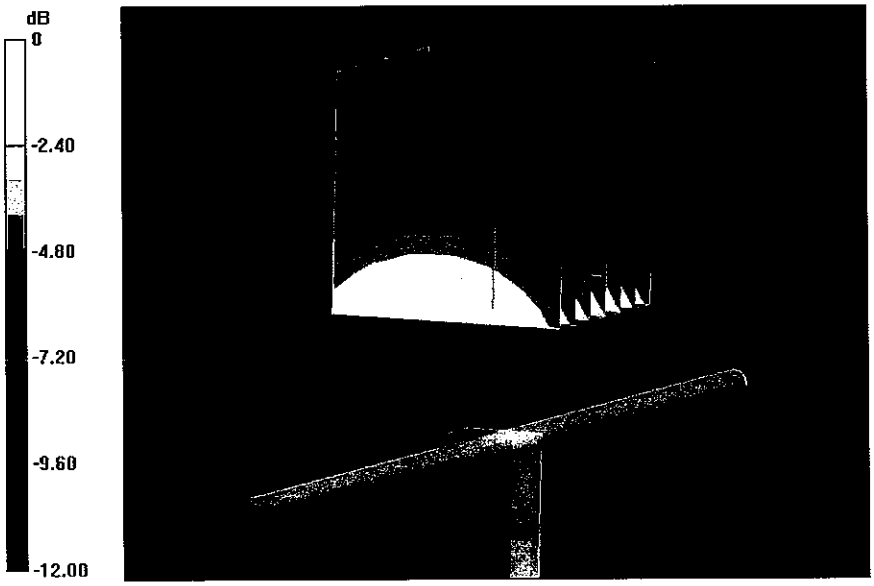
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.94 S/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.05, 6.05, 6.05); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.5(1059); SEMCAD X 14.6.8(7028)

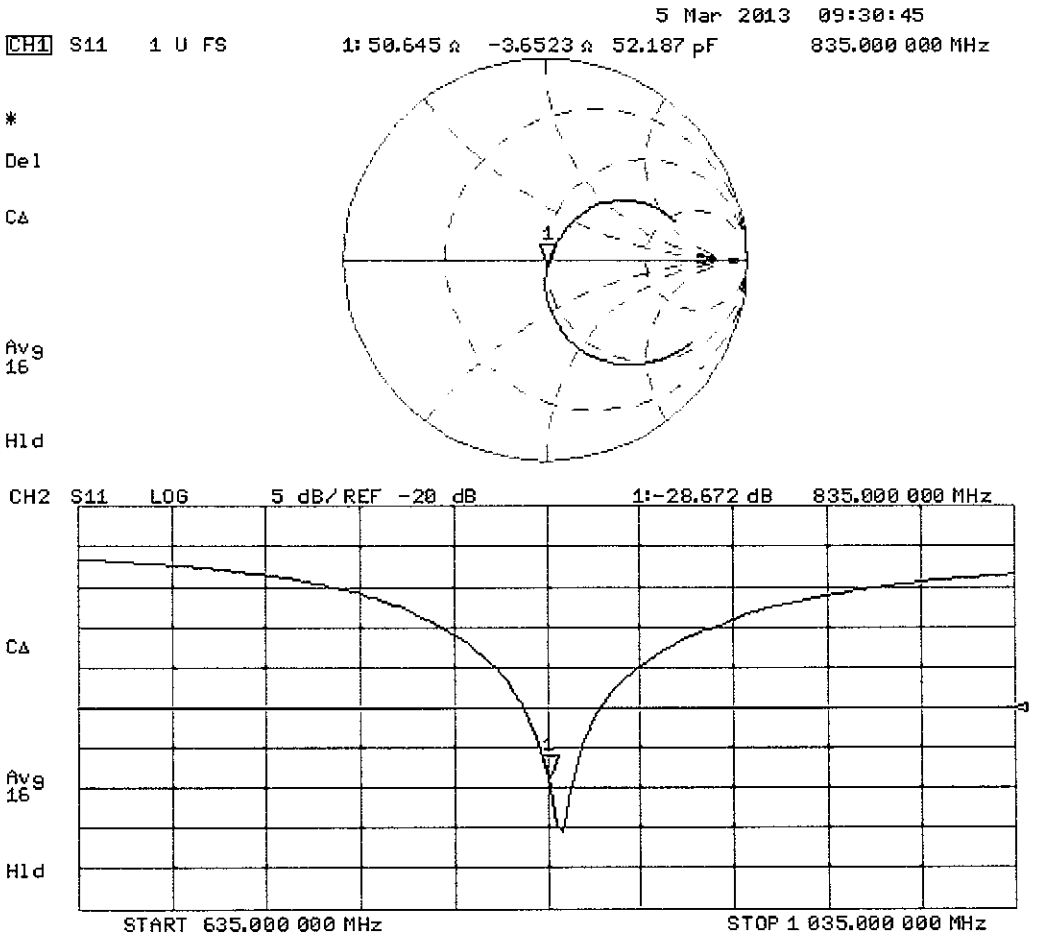
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.333 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 3.75 W/kg
SAR(1 g) = 2.48 W/kg; SAR(10 g) = 1.6 W/kg
Maximum value of SAR (measured) = 2.91 W/kg



0 dB = 2.91 W/kg = 4.64 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 11.03.2013

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 479

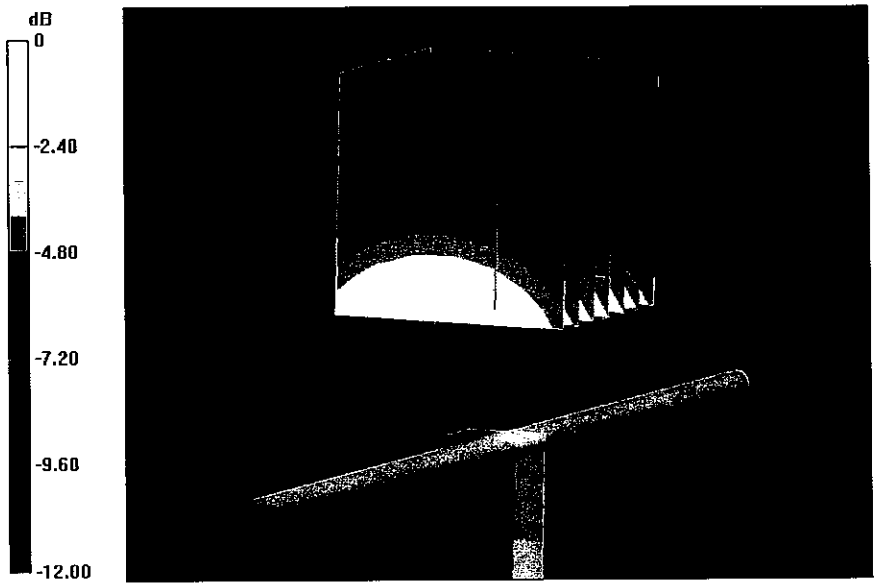
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.02 S/m; ε_r = 54.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.04, 6.04, 6.04); Calibrated: 28.12.2012;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.06.2012
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- DASY52 52.8.5(1059); SEMCAD X 14.6.8(7028)

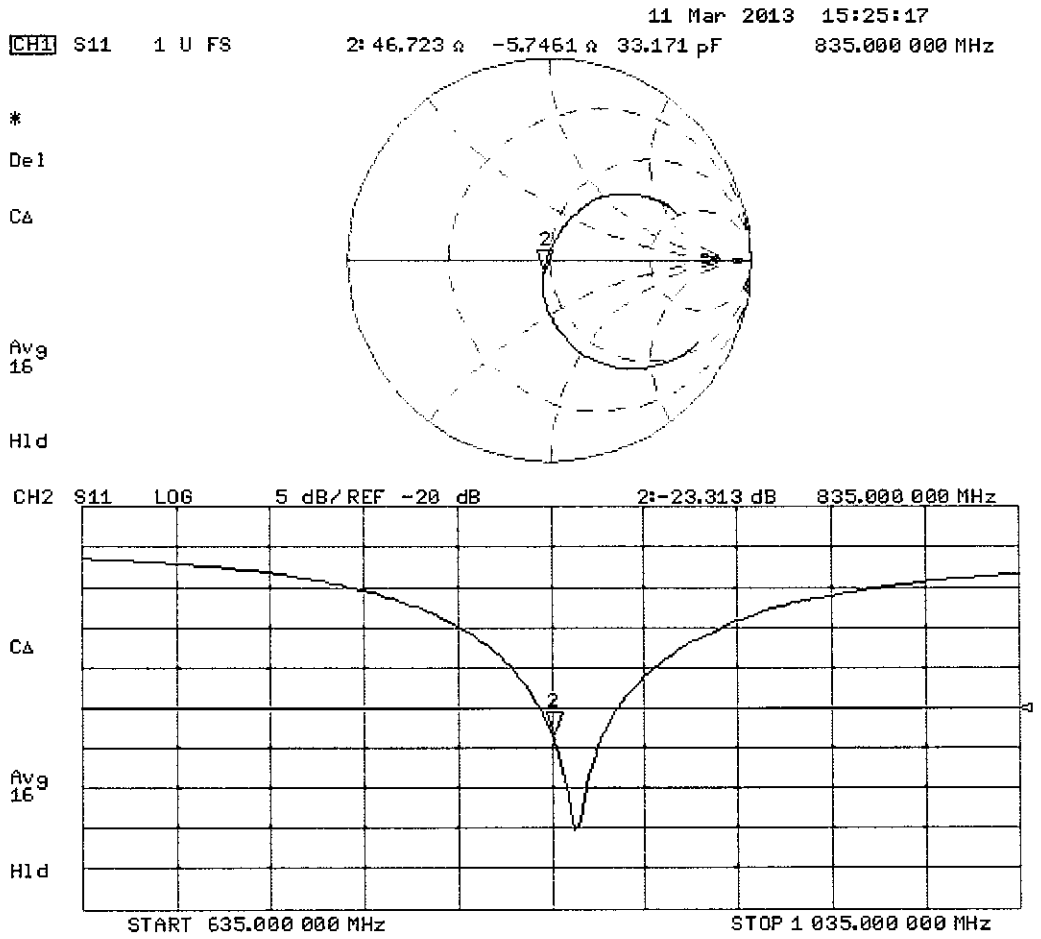
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.333 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 3.71 W/kg
SAR(1 g) = 2.52 W/kg; SAR(10 g) = 1.64 W/kg
Maximum value of SAR (measured) = 2.91 W/kg



0 dB = 2.91 W/kg = 4.64 dBW/kg

Impedance Measurement Plot for Body TSL



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

Accreditation No.: SCS 108

Client Nokia Beijing TCC

Certificate No: D1900V2-509_Dec12

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 509
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	December 06, 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 6, 2012

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	47.1 Ω - 5.1 jΩ
Return Loss	- 24.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	43.7 Ω - 5.2 jΩ
Return Loss	- 21.2 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	October 20, 1999

Date: 06.12.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 509

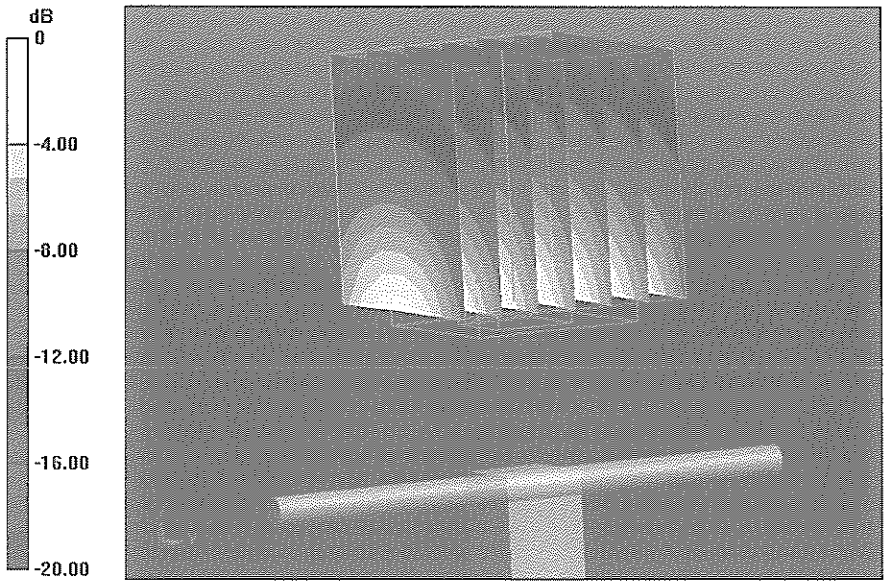
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.38 mho/m; ε_r = 39.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.01, 5.01, 5.01); 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)

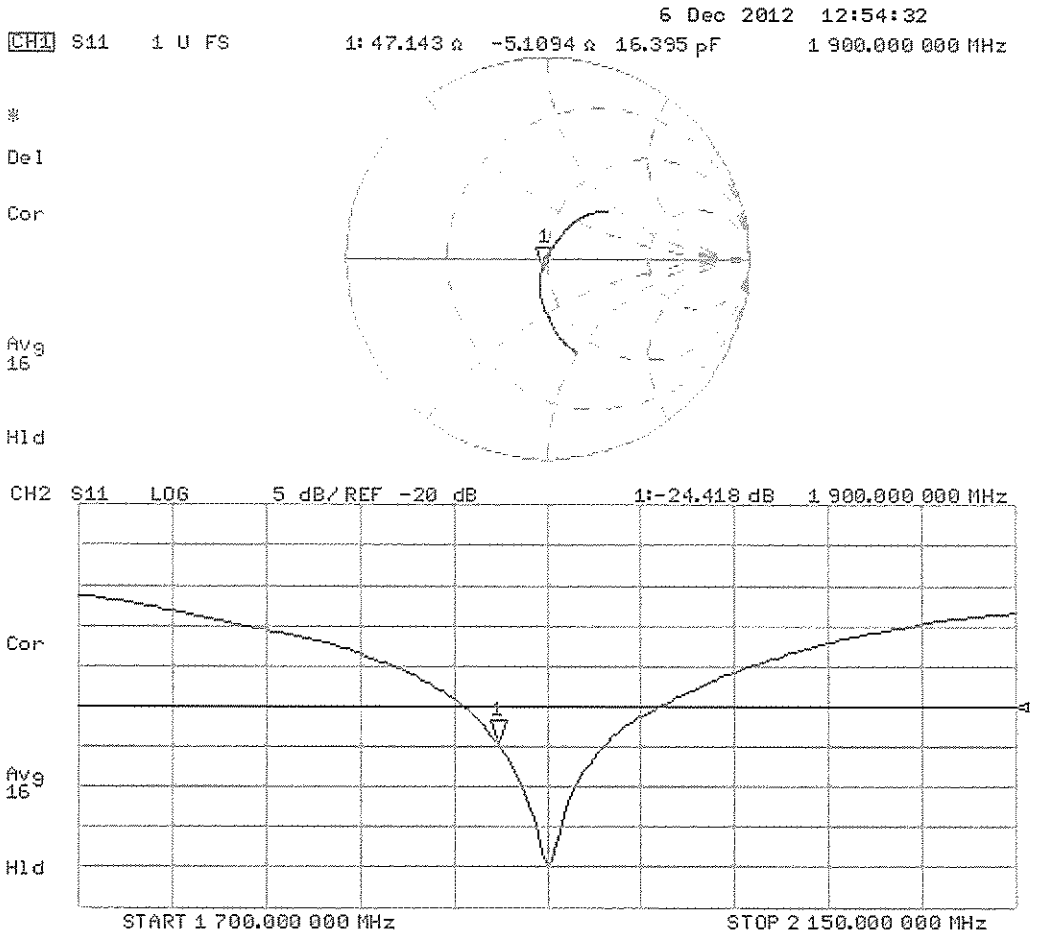
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.248 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 17.2 W/kg
SAR(1 g) = 9.63 W/kg; SAR(10 g) = 5.05 W/kg
Maximum value of SAR (measured) = 11.9 W/kg



0 dB = 11.9 W/kg = 10.76 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 06.12.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 509

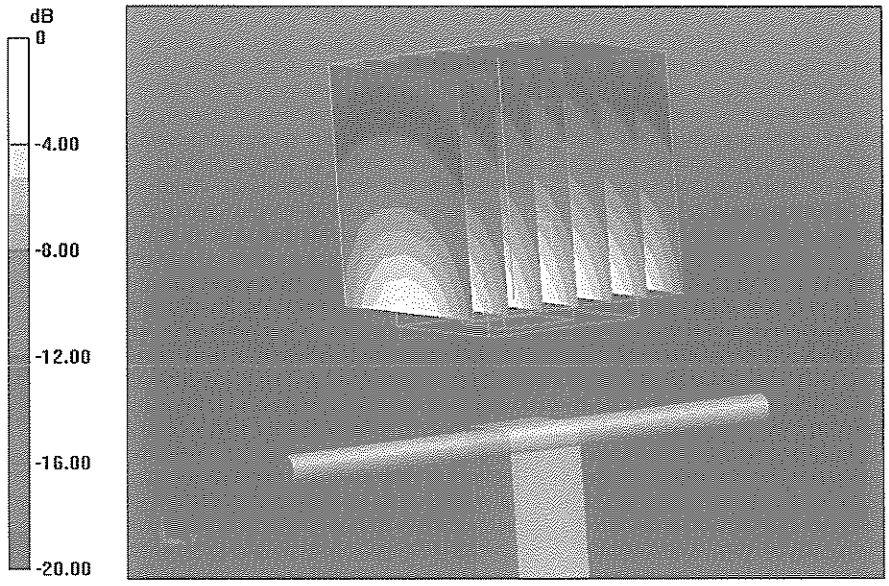
Communication System: CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.52 mho/m; ε_r = 52.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

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: 27.06.2012
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.3(988); SEMCAD X 14.6.7(6848)

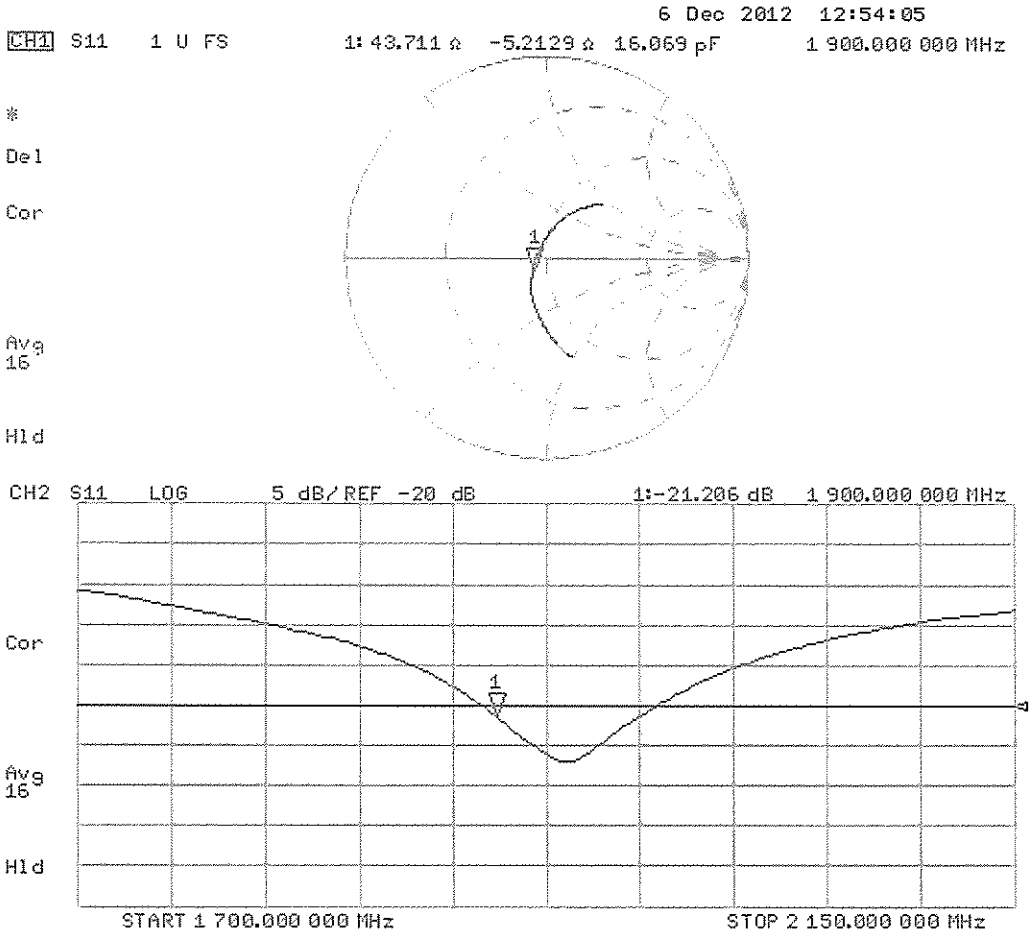
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.176 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 17.4 W/kg
SAR(1 g) = 9.84 W/kg; SAR(10 g) = 5.16 W/kg
Maximum value of SAR (measured) = 12.4 W/kg



0 dB = 12.4 W/kg = 10.93 dBW/kg

Impedance Measurement Plot for Body TSL



Dipole D1900V2 – SN: 509 Antenna Parameters

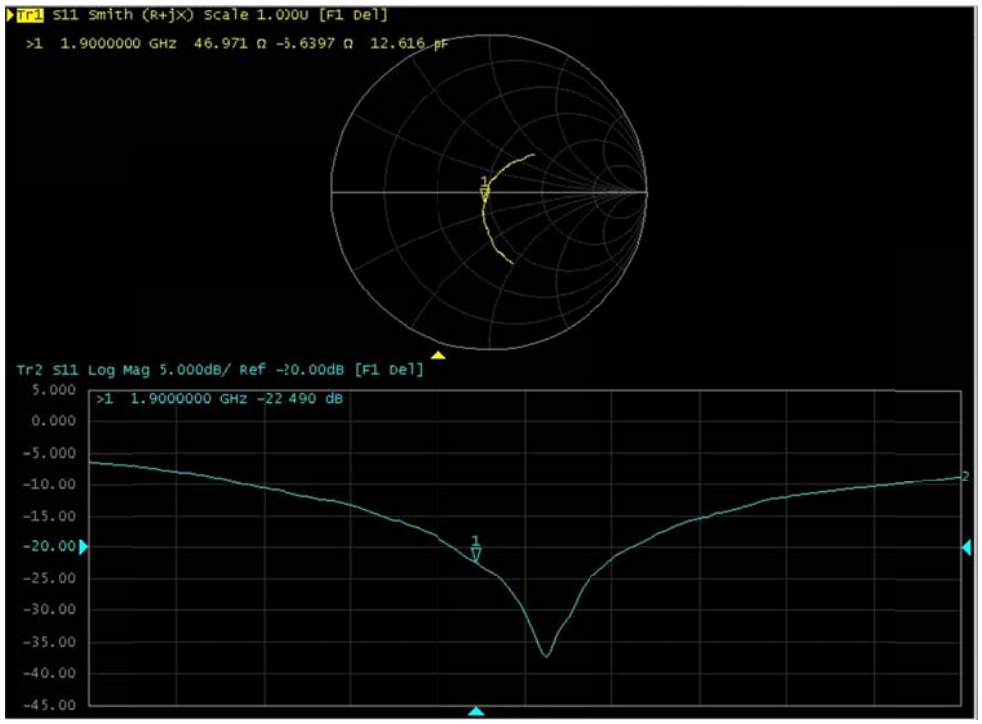
Antenna Parameters with Head TSL

	Calibration certificate	Annual measurement 2013-02-20
Impedance, transformed to feed point	47.1 Ω - 5.1 jΩ	47.0 Ω - 6.6 jΩ
Return loss	- 24.4 dB	- 22.5 dB

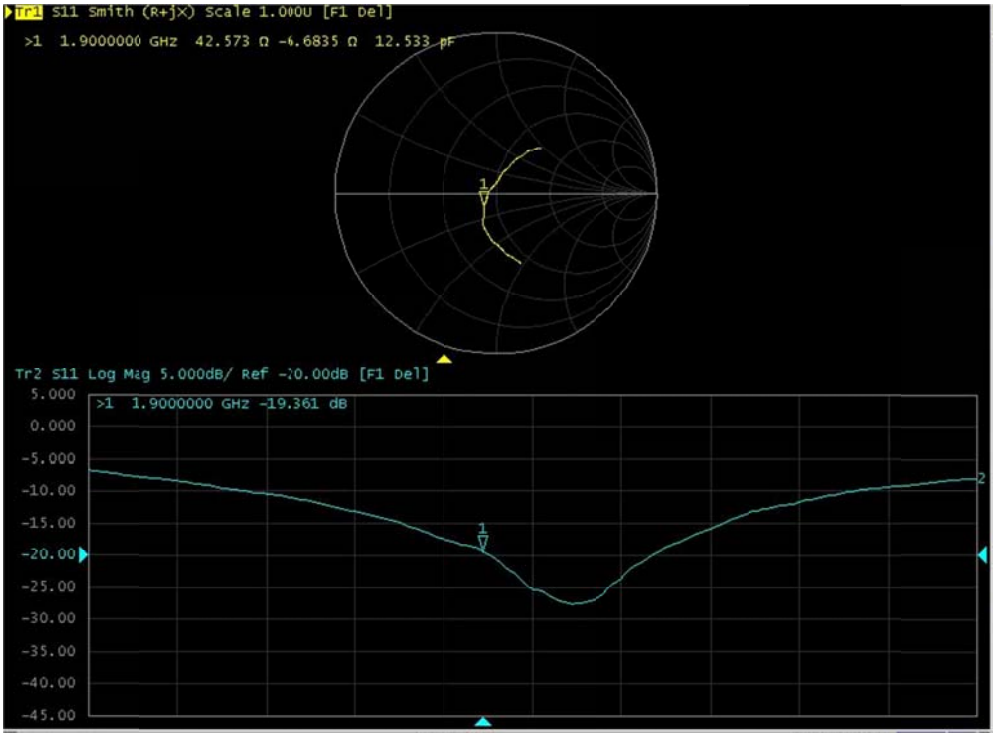
Antenna Parameters with Body TSL

	Calibration certificate	Annual measurement 2013-02-20
Impedance, transformed to feed point	43.7 Ω - 5.2 jΩ	42.6 Ω - 6.7 jΩ
Return loss	- 21.2 dB	- 19.4 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 Beijing TCC

Certificate No: D2450V2-883_Feb12

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 883
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	February 23, 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 23, 2012

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.1 Ω - 0.4 jΩ
Return Loss	- 28.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.4 Ω + 1.0 jΩ
Return Loss	- 39.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.165 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	October 06, 2011

DASY5 Validation Report for Head TSL

Date: 23.02.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 883

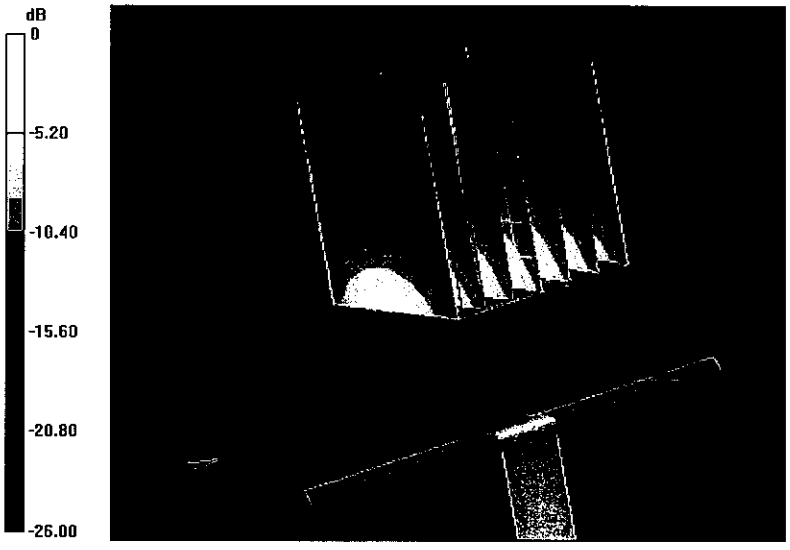
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 1.86 mho/m; ε_r = 38.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.45, 4.45, 4.45); Calibrated: 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)

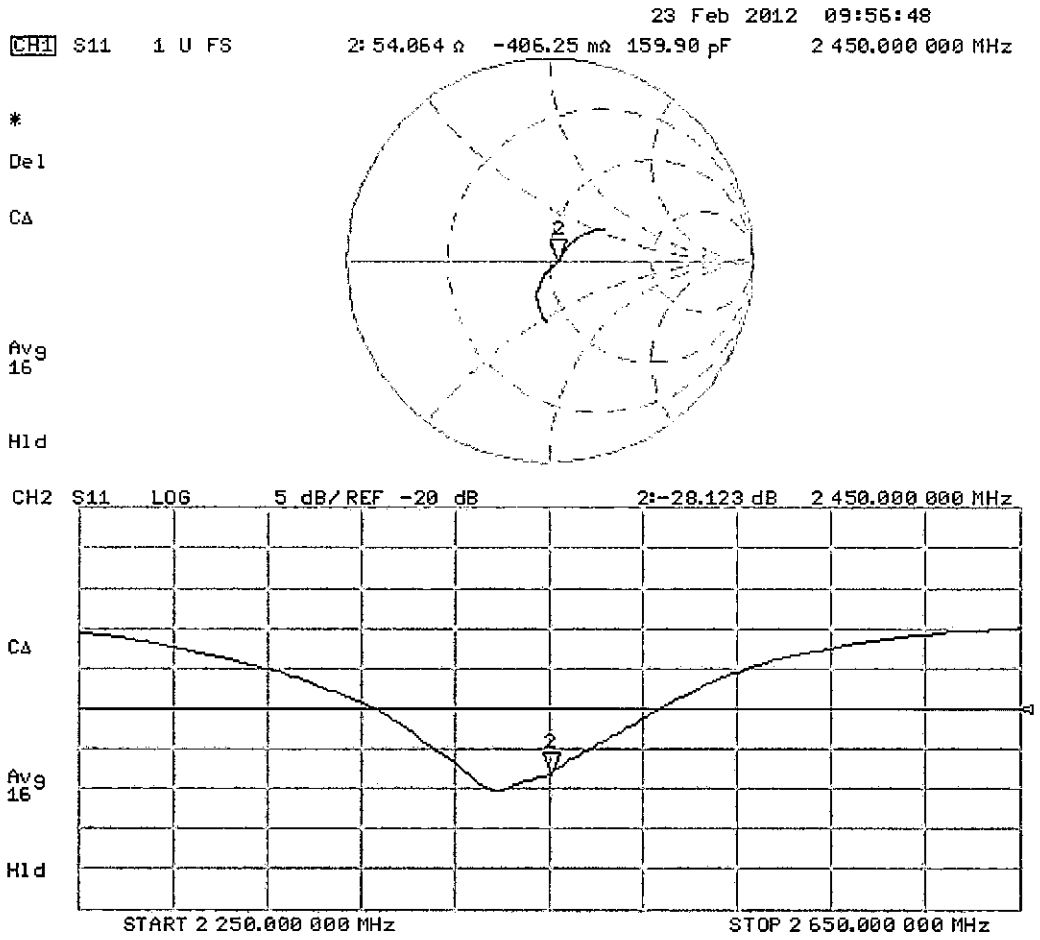
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 100.8 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 28.8960
SAR(1 g) = 13.8 mW/g; SAR(10 g) = 6.36 mW/g
Maximum value of SAR (measured) = 17.788 mW/g



0 dB = 17.790mW/g = 25.00 dB mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 23.02.2012

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 883

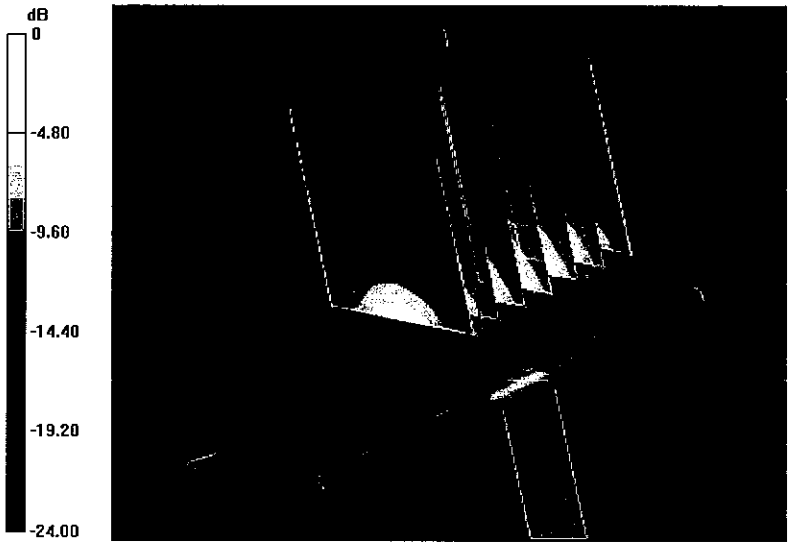
Communication System: CW; Frequency: 2450 MHz
Medium parameters used: f = 2450 MHz; σ = 2.02 mho/m; ε_r = 52.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.26, 4.26, 4.26); 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)

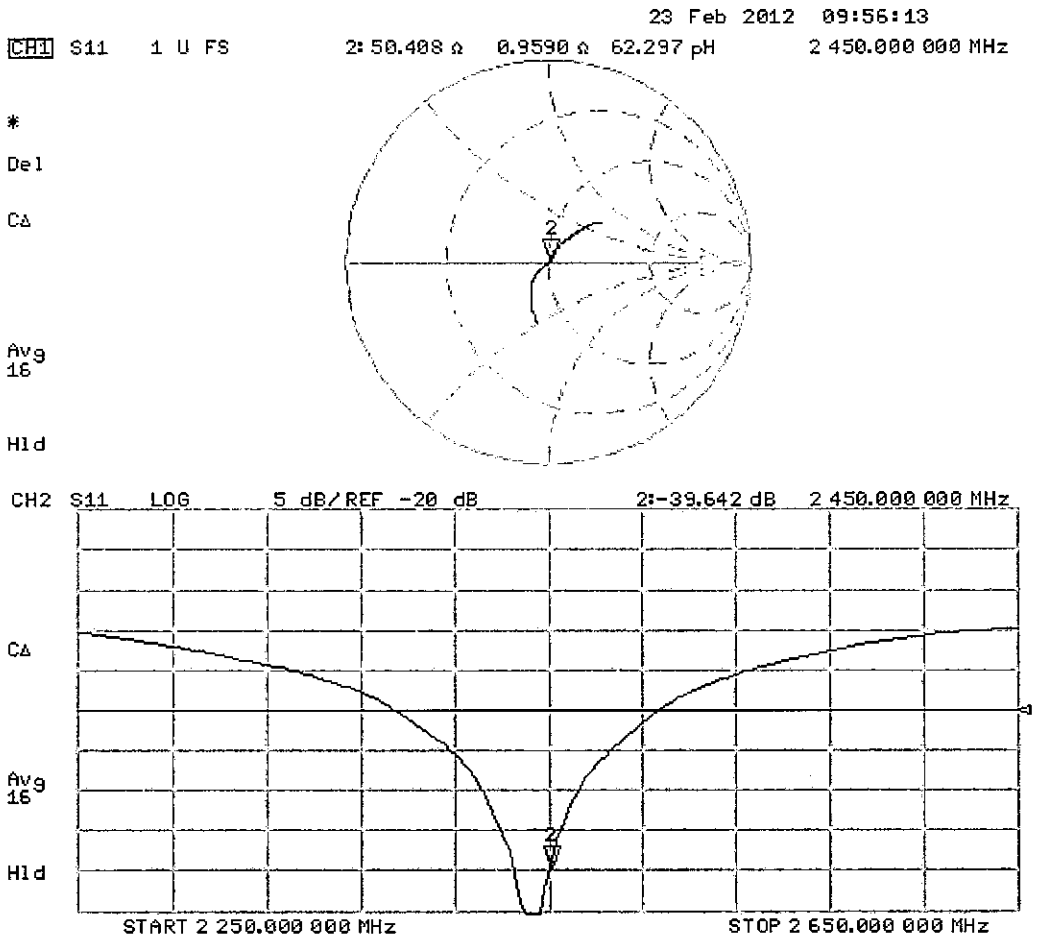
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.084 V/m; Power Drift = -0.00038 dB
Peak SAR (extrapolated) = 26.9170
SAR(1 g) = 13.2 mW/g; SAR(10 g) = 6.12 mW/g
Maximum value of SAR (measured) = 17.333 mW/g



0 dB = 17.330mW/g = 24.78 dB mW/g

Impedance Measurement Plot for Body TSL



Dipole D2450V2 – SN: 883 Antenna Parameters

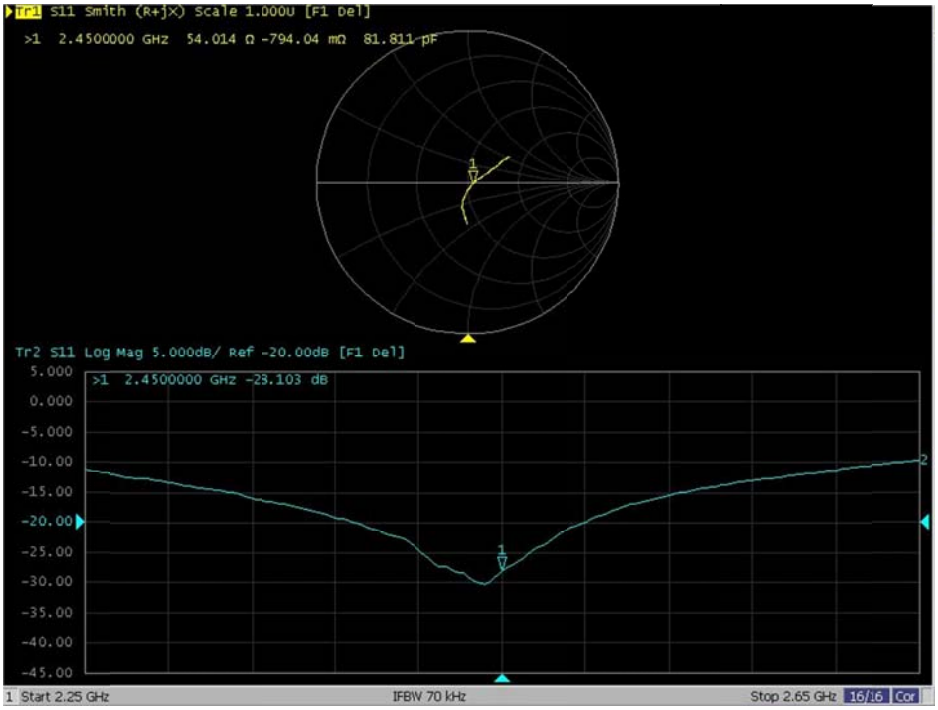
Antenna Parameters with Head TSL

	Calibration certificate	Annual measurement 2013-03-07
Impedance, transformed to feed point	54.1 Ω - 0.4 jΩ	54.0 Ω - 0.8 jΩ
Return loss	- 28.1 dB	- 28.1 dB

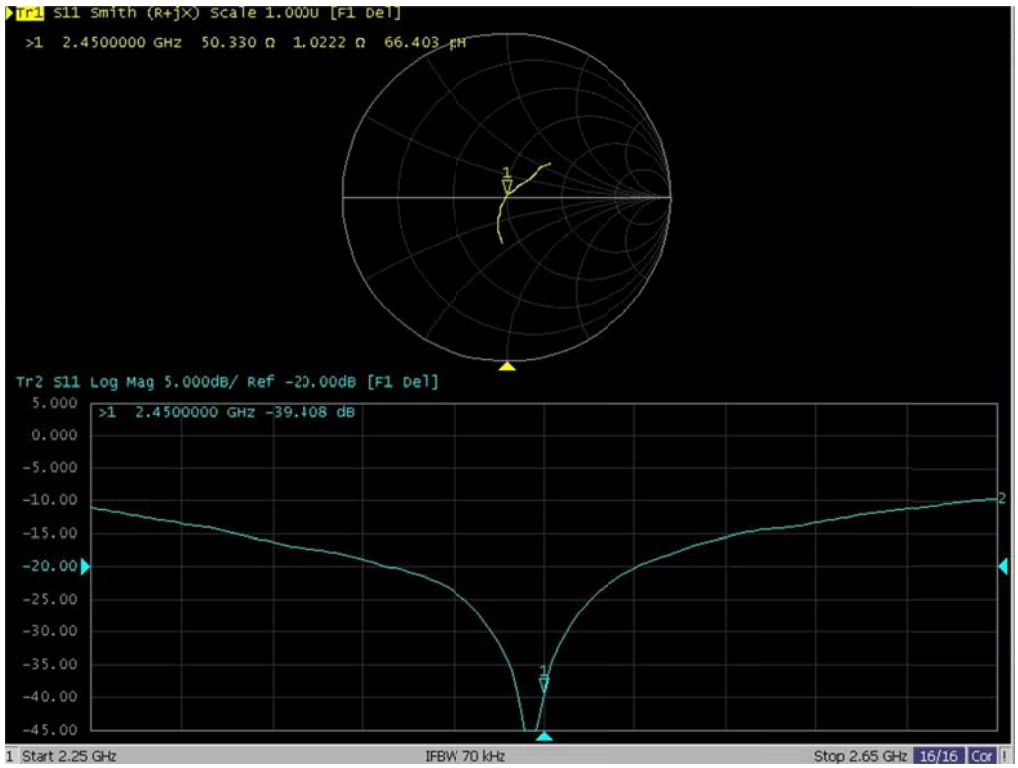
Antenna Parameters with Body TSL

	Calibration certificate	Annual measurement 2013-03-07
Impedance, transformed to feed point	50.4 Ω + 1.0 jΩ	50.3 Ω + 1.0 jΩ
Return loss	- 39.6 dB	- 39.4 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 for Head and Body-worn measurements

GSM 850			
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	28.50	28.50	28.50
GPRS 4-slot	27.00	27.00	27.00

GSM 1900			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	30.20	30.20	30.20
GPRS 2-slot	27.00	27.00	27.00
GPRS 3-slot	25.50	25.50	25.50
GPRS 4-slot	24.00	24.00	24.00

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

Type: RM-941; Serial number: 004402/47/299331/4 used for GSM/GPRS850 SAR Head and Body-worn measurements.

GSM 850			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	32.87	32.91	32.85
GPRS 2-slot	30.55	30.41	30.37
GPRS 3-slot	28.95	28.99	28.91
GPRS 4-slot	27.45	27.43	27.44

Type: RM-941; Serial number: 004402/47/299331/4 used for GSM/GPRS1900 SAR Head and Body-worn measurements.

GSM 1900			
Slot configuration	Low channel	Mid channel	High channel
GSM 1-slot	30.66	30.61	30.57
GPRS 2-slot	27.83	27.77	27.56
GPRS 3-slot	26.27	26.17	26.14
GPRS 4-slot	24.70	24.81	24.77

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	23.80	23.80	23.80

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

Type: RM-941; Serial number: 004402/47/299330/6 used for WCDMA850 SAR Head and Body-worn measurements.

WCDMA 850 (band 5)			
Mode	Low channel	Mid channel	High channel
WCDMA	24.16	24.18	24.15

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

Appendix I: CONDUCTED POWER MEASUREMENTS FOR WLAN

I.1 Power Tuning Targets

WLAN 2.4 GHz: 20 MHz channel bandwidth							
			Tuning target				
Standard	Modulation	Data speed [MBPS]	CH 1	CH 2	CH 6	CH 10	CH 11
802.11b	BPSK	1	14	14	14	14	14
802.11b	QPSK	2	14	14	14	14	14
802.11b	QPSK	5.5	14	14	14	14	14
802.11b	QPSK	11	14	14	14	14	14
802.11g	BPSK	6	10	10	10	10	10
802.11g	BPSK	9	10	10	10	10	10
802.11g	QPSK	12	10	10	10	10	10
802.11g	QPSK	18	10	10	10	10	10
802.11g	16QAM	24	10	10	10	10	10
802.11g	16QAM	36	10	10	10	10	10
802.11g	64QAM	48	10	10	10	10	10
802.11g	64QAM	54	10	10	10	10	10
802.11n	BPSK	6.5 / 7.25	10	10	10	10	10
802.11n	QPSK	13.0 / 14.4	10	10	10	10	10
802.11n	QPSK	19.5 / 21.7	10	10	10	10	10
802.11n	16QAM	26.0 / 28.9	10	10	10	10	10
802.11n	16QAM	39.0 / 43.3	10	10	10	10	10
802.11n	64QAM	52.0 / 57.8	10	10	10	10	10
802.11n	64QAM	58.5 / 65.0	10	10	10	10	10
802.11n	64QAM	65.0 / 72.2	10	10	10	10	10

I.2 Conducted Power measurements from the Samples used in the Testing

Type: RM-941; Serial number: 004402/47/299339/7 used for WLAN for SAR Head and Body-worn measurements.

			Measured value				
Standard	Modulation	Data speed [MBPS]	CH 1	CH 2	CH 6	CH 10	CH 11
802.11b	BPSK	1	14.50	14.25	14.54	15.43	15.08
802.11b	QPSK	2	14.55	14.32	14.58	15.46	15.08
802.11b	QPSK	5.5	14.63	14.48	14.83	15.63	15.23
802.11b	QPSK	11	14.70	14.49	14.75	15.63	15.26
802.11g	BPSK	6	10.45	10.12	10.47	11.37	10.72
802.11g	BPSK	9	10.44	10.17	10.49	11.36	10.80
802.11g	QPSK	12	10.46	10.21	10.53	11.37	10.83
802.11g	QPSK	18	10.52	10.22	10.54	11.41	10.83
802.11g	16QAM	24	10.56	10.24	10.55	11.45	10.84
802.11g	16QAM	36	10.64	10.30	10.57	11.50	10.88
802.11g	64QAM	48	10.65	10.34	10.61	11.54	10.97
802.11g	64QAM	54	10.57	10.26	10.56	11.55	10.92
802.11n	BPSK	6.5 / 7.25	10.48	10.14	10.50	11.28	10.75
802.11n	QPSK	13.0 / 14.4	10.50	10.17	10.58	11.34	10.79
802.11n	QPSK	19.5 / 21.7	10.51	10.22	10.61	11.43	10.82
802.11n	16QAM	26.0 / 28.9	10.65	10.29	10.62	11.44	10.86
802.11n	16QAM	39.0 / 43.3	10.70	10.32	10.65	11.48	10.92
802.11n	64QAM	52.0 / 57.8	10.68	10.34	10.70	11.51	10.93
802.11n	64QAM	58.5 / 65.0	10.69	10.39	10.74	11.52	10.96
802.11n	64QAM	65.0 / 72.2	10.74	10.44	10.76	11.58	11.03