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Finnish Accreditation Service
T117 (EN ISO/IEC 17025)

SAR Compliance Test Report

Test report no.:	FCC_RM-819_03	**Date of report:**	2011-12-15
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Tested device:	RM-819		
FCC ID:	LJPA	**IC:**	661E-A
Supplement reports:	FCC_RM-801_02 for RM-801 / FCC ID: LJPRM-801 SAR_Photo_RM-819_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.

Date and signatures:

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2011-11-30
SN, HW and SW numbers of tested device	SN: 004402/13/599922/9, HW: 3000, SW: 1600.2479.7740.11451, DUT: 16059
Batteries used in testing	-
Headsets used in testing	WH-902, DUT: 15925
Other accessories used in testing	-
State of sample	Prototype unit
Notes	-

1.1.1 Supplement reports referenced on the front cover of this report

FCC_RM-801_02 for FCC ID: LJPRM-801:	All the SAR data for GSM/GPRS/EGPRS850, GSM/GPRS/EGPRS1900, WCDMA1900 and WLAN2450 bands have been taken from this earlier report; 2 samples were used in the RM-801 SAR testing; the FCC Grant for RM-801 / FCC ID: LJPRM-801 is dated 10/09/2011.

1.2 Maximum Results

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

1.2.1 Head Configuration

Mode	Ch / *f* (MHz)	Conducted power	Position	Measured SAR value (1g avg)	Scaled* SAR value (1g avg)	SAR limit (1g avg)	Result
3-slot GPRS850**	128 / 824.2	28.5 dBm	Left, Cheek	1.13 W/kg	**1.27 W/kg**	1.6 W/kg	PASSED
WCDMA850	4233 / 846.6	22.5 dBm	Left, Cheek	0.886 W/kg	**0.99 W/kg**	1.6 W/kg	PASSED
3-slot GPRS1900**	512 / 1850.2	25.5 dBm	Left, Cheek	0.937 W/kg	**1.05 W/kg**	1.6 W/kg	PASSED
WCDMA1900**	9262 / 1852.4	22.5 dBm	Left, Cheek	1.03 W/kg	**1.15 W/kg**	1.6 W/kg	PASSED
WLAN2450**	11 / 2462.0	13.0 dBm	Right, Cheek	0.488 W/kg	**0.49 W/kg*** **	1.6 W/kg	PASSED
3-slot GPRS850 + WLAN2450**	-	-	Right, Cheek	1.13 W/kg	**1.27 W/kg**	1.6 W/kg	PASSED
WCDMA850 + WLAN2450	-	-	Right, Cheek	0.886 W/kg	**0.99 W/kg**	1.6 W/kg	PASSED
3-slot GPRS1900 + WLAN2450**	-	-	Left, Cheek	0.976 W/kg	**1.09 W/kg**	1.6 W/kg	PASSED
WCDMA1900 + WLAN2450**	-	-	Right, Cheek	1.03 W/kg	**1.15 W/kg**	1.6 W/kg	PASSED

1.2.2 Body Worn Configuration

Mode	Ch / *f* (MHz)	Conducted power	Separation distance	Measured SAR value (1g avg)	Scaled* SAR value (1g avg)	SAR limit (1g avg)	Result
3-slot GPRS850**	251 / 828.8	28.5 dBm	1.5cm	0.950 W/kg	**1.06 W/kg**	1.6 W/kg	PASSED
WCDMA850	4132 / 826.4	22.5 dBm	1.5cm	0.804 W/kg	**0.90 W/kg**	1.6 W/kg	PASSED
3-slot GPRS1900**	512 / 1850.2	25.5 dBm	1.5cm	0.570 W/kg	**0.64 W/kg**	1.6 W/kg	PASSED
WCDMA1900**	9262 / 1852.4	22.5 dBm	1.5cm	0.746 W/kg	**0.84 W/kg**	1.6 W/kg	PASSED
WLAN2450**	11 / 2462.0	15.0 dBm	1.5cm	0.057 W/kg	**0.06 W/kg*** **	1.6 W/kg	PASSED
3-slot GPRS850 + WLAN2450**	-	-	1.5cm	0.968 W/kg	**1.08 W/kg**	1.6 W/kg	PASSED
WCDMA850 + WLAN2450	-	-	1.5cm	0.835 W/kg	**0.94 W/kg**	1.6 W/kg	PASSED
3-slot GPRS1900 + WLAN2450**	-	-	1.5cm	0.570 W/kg	**0.64 W/kg**	1.6 W/kg	PASSED
WCDMA1900 + WLAN2450**	-	-	1.5cm	0.771 W/kg	**0.86 W/kg**	1.6 W/kg	PASSED

* SAR values are scaled up by 12% to cover measurement drift. As a consequence of this upwards correction of the SAR values, the contribution of measurement drift to the overall measurement uncertainty (Section 6) is reduced to zero.
**SAR data taken from FCC_RM-801_02 for RM-801 / FCC ID: LJPRM-801.

***Scaling of individual SAR values of WLAN2450 is not necessary since the measured value incorporates full correction for the drift. (see Section 7 for details).

1.2.3 Summary SAR data

		FCC-defined SAR values for the Grants of Equipment Authorization
Maximum Cellular/AWS/PCS Head SAR value		**1.27 W/kg**
Maximum WLAN Head SAR value		0.49 W/kg
{Max + Max} Simultaneous Head SAR value	1.76 W/kg	
Maximum Cellular/AWS/PCS Body SAR value		**1.06 W/kg**
Maximum WLAN Body SAR value		0.06 W/kg
{Max + Max} Simultaneous Body SAR value	1.12 W/kg	
Maximum Product Specific (Wireless Router) SAR value		**N/A**
Maximum Simultaneous SAR value		**1.27 W/kg**

Note: The {Max + Max} Simultaneous Head SAR value quoted above appears > 1.6W/kg. However, the component SAR values of 1.27W/kg (cellular) and 0.49W/kg (WLAN) are from different test configurations (the cellular SAR value is from Left Cheek, whereas the WLAN value is from Right Cheek) and hence the quoted combined SAR value of 1.76W/kg cannot occur in practice. The true highest {Max + Max} Simultaneous Head SAR value is for 3-slot GPRS850 + WLAN2450, Right Cheek test configuration (see Combined tables in Section 7) and is 1.457W/kg unscaled. When the 3-slot GPRS850 SAR component value of 0.969 is scaled up by 12% to cover drift and added to the previously corrected WLAN SAR value of 0.488, 1.457W/kg unscaled translates to 1.57W/kg scaled and Simultaneous Transmission Procedures are therefore not required.

1.2.4 Maximum Drift

Maximum drift covered by 12% scaling up of the SAR values	Maximum drift during measurements
0.5dB	0.36dB

1.2.5 Measurement Uncertainty

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

2. DESCRIPTION OF THE DEVICE UNDER TEST

Device category	Portable
Exposure environment	General population / uncontrolled

Modes of Operation	Bands	Modulation Mode	Duty Cycle	Transmitter Frequency Range (MHz)
GSM	850 1900	GMSK	1/8	824 – 849 1850 – 1910
GPRS	850 1900	GMSK	1/8 to 4/8	824 – 849 1850 – 1910
EGPRS	850 1900	GMSK / 8PSK	1/8 to 4/8	824 – 849 1850 – 1910
WCDMA	850 (Band V) 1900 (Band II)		1	826 – 847 1852 – 1908
HSUPA	850 (Band V) 1900 (Band II)		1	826 – 847 1852 – 1908
BT	2450	GFSK	1	2402 – 2480
WLAN b-mode	2450	Up to 11Mbps QPSK	1	2412 – 2462
WLAN g-mode	2450	Up to 54Mbps 64QAM	1	2412 – 2462
WLAN n-mode 20MHz	2450	Up to 72.2Mbps 64QAM	1	2412 – 2462

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

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

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

2.1 Description of the Antenna

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

3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	21.5 – 22.7
Ambient humidity (RH %):	30 - 40

3.2 Test Signal, Frequencies and Output Power

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

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

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

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

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

Some of the SAR results given in this report are taken from the earlier report FCC_RM-801_02 for RM-801 / FCC ID: LJPRM-801. The difference between RM-819 and RM-801 is that the WCDMA900 capability in RM-801 has been replaced by WCDMA850 capability in RM-819.

3.3 Test Cases and Test Minimisation

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

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

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

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

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

In the results tables in Section 7, the maximum SAR value for the ‘basic’ tests (i.e. left cheek, left tilt, right cheek and right tilt in Head SAR testing; with and without headset with the back &/or

display side facing the flat phantom in Body SAR testing) is bolded for each band. In some cases, after full testing of the basic SAR test configurations has been completed, additional checking SAR tests are made. These checking tests are always based on the bolded result from the 'basic' testing. When the SAR value of a checking test exceeds the maximum value from the basic tests, it is also bolded and used as the basis for any further checking tests that might be needed.

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

4. DESCRIPTION OF THE TEST EQUIPMENT

4.1 Measurement System and Components

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

The following table lists calibration dates of SPEAG components:

Test Equipment	Serial Number	Calibration date	Calibration expiry
DAE 4	728	2011-05	2012-05
E-field Probe ES3DV3	3131	2011-09	2012-09
Dipole Validation Kit, D835V2	462	2011-09	2013-09
DASY4 software	Version 4.7	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration date	Calibration expiry
Signal Generator	E4436B	US39260114	2011-08	2012-08
Amplifier	5S1G4	25583	-	-
Power Meter	NRVS	849305/028	2011-08	2012-08
Power Sensor	NRV-Z32	100069	2011-07	2012-08
Call Tester	CMU 200	104983	-	-
Vector Network Analyzer	8753E	US38432928	2011-08	2012-08
Dielectric Probe Kit	85070B	US33020420	-	-

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

4.2 Phantoms

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

System checking was performed using the flat section, whilst Head SAR tests used the left and right head profile sections. Body SAR testing also used the flat section between the head profiles.

The SPEAG device holder (see Section 5.1) was used to position the device in all tests whilst a tripod was used to position the validation dipoles against the flat section of phantom.

4.3 Tissue Simulants

Recommended values for the dielectric parameters of the tissue simulants are given in IEEE 1528 - 2003 and FCC Supplement C to OET Bulletin 65. All tests were carried out using simulants whose dielectric parameters were within ± 5% of the recommended values. All tests were carried out within 24 hours of measuring the dielectric parameters.

The depth of the tissue simulant was at least 15.0 cm measured from the ear reference point during system checking and device measurements.

4.3.1 Tissue Simulant Recipes

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

800MHz band

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

4.3.2 System Checking

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

System checking, head tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ε_r	σ [S/m]	
	Reference result	2.33	41.1	0.89	
	± 10% window	2.10 – 2.56			
	IEEE1528 / IEC62209 Standard targets		41.5	0.90	
835	2011-11-30	2.45	40.8	0.91	21.0

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

4.3.3 Tissue Simulants used in the Measurements

Head tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ε_r	σ [S/m]	
	Recommended value	41.5	0.90	
	± 5% window	39.4 – 43.6	0.86 – 0.95	
835	2011-11-30	40.8	0.91	21.0

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ε_r	σ [S/m]	
	Recommended value	55.2	0.97	
	± 5% window	52.4 – 58.0	0.92 – 1.02	
835	2011-11-30	52.9	0.99	21.0

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

5. DESCRIPTION OF THE TEST PROCEDURE

5.1 Device Holder

The device was placed in the device holder (illustrated below) that is supplied by SPEAG as an integral part of the Dasy system.

Device holder supplied by SPEAG

A Nokia designed spacer (illustrated below) was used to position the device within the SPEAG holder. The spacer positions the device so that the holder has minimal effect on the test results but still holds the device securely. The spacer was removed before the tests.

Nokia spacer

5.2 Test Positions

5.2.1 Against Phantom Head

Measurements were made in “cheek” and “tilt” positions on both the left hand and right hand sides of the phantom.

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

5.2.2 Body Worn Configuration

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

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

5.3 Scan Procedures

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

5.4 SAR Averaging Methods

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

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

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

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

6. MEASUREMENT UNCERTAINTY

Table 6.1 – Measurement uncertainty evaluation

Uncertainty Component	Section in IEEE 1528	Tol. (%)	Prob Dist	Div	c_i	$c_i . u_i$ (%)	v_i
Measurement System							
Probe Calibration	E2.1	±5.9	N	1	1	±5.9	∞
Axial Isotropy	E2.2	±4.7	R	√3	$(1-c_p)^{1/2}$	±1.9	∞
Hemispherical Isotropy	E2.2	±9.6	R	√3	$(c_p)^{1/2}$	±3.9	∞
Boundary Effect	E2.3	±1.0	R	√3	1	±0.6	∞
Linearity	E2.4	±4.7	R	√3	1	±2.7	∞
System Detection Limits	E2.5	±1.0	R	√3	1	±0.6	∞
Readout Electronics	E2.6	±1.0	N	1	1	±1.0	∞
Response Time	E2.7	±0.8	R	√3	1	±0.5	∞
Integration Time	E2.8	±2.6	R	√3	1	±1.5	∞
RF Ambient Conditions - Noise	E6.1	±3.0	R	√3	1	±1.7	∞
RF Ambient Conditions - Reflections	E6.1	±3.0	R	√3	1	±1.7	∞
Probe Positioner Mechanical Tolerance	E6.2	±0.4	R	√3	1	±0.2	∞
Probe Positioning with respect to Phantom Shell	E6.3	±2.9	R	√3	1	±1.7	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E5	±3.9	R	√3	1	±2.3	∞
Test sample Related							
Test Sample Positioning	E4.2	±6.0	N	1	1	±6.0	11
Device Holder Uncertainty	E4.1	±5.0	N	1	1	±5.0	7
Output Power Variation - SAR drift measurement	6.6.3	±0.0	R	√3	1	±0.0	∞
Phantom and Tissue Parameters							
Phantom Uncertainty (shape and thickness tolerances)	E3.1	±4.0	R	√3	1	±2.3	∞
Conductivity Target - tolerance	E3.2	±5.0	R	√3	0.64	±1.8	∞
Conductivity - measurement uncertainty	E3.3	±5.5	N	1	0.64	±3.5	5
Permittivity Target - tolerance	E3.2	±5.0	R	√3	0.6	±1.7	∞
Permittivity - measurement uncertainty	E3.3	±2.9	N	1	0.6	±1.7	5
Combined Standard Uncertainty			RSS			**±12.9**	116
Coverage Factor for 95%			**k=2**				
Expanded Uncertainty						**±25.8**	

7. RESULTS

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

850MHz Head SAR results

Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz
GSM**	**Conducted Power**		**-**	**32.5 dBm**	**-**
	Left	Cheek	-	0.723	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
2-slot GPRS**	**Conducted Power**		**-**	**30.0 dBm**	**-**
	Left	Cheek	-	0.922	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3-slot GPRS**	**Conducted Power**		**28.5 dBm**	**28.5 dBm**	**28.5 dBm**
	Left	Cheek	**1.13**	1.02	0.974
		Tilt	-	0.608	-
	Right	Cheek	0.969	0.920	0.819
		Tilt	-	0.478	-
4-slot GPRS**	**Conducted Power**		**-**	**27.0 dBm**	**-**
	Left	Cheek	-	0.875	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3-slot 8PSK EGPRS**	**Conducted Power**		**24.0 dBm**	**-**	**-**
	Left	Cheek	0.313	-	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-

(850MHz Table continues)

(850MHz Table continues)

Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz
WCDMA	Conducted Power		22.5 dBm	22.5 dBm	22.5 dBm
	Left	Cheek	0.804	0.794	**0.886**
		Tilt	-	0.434	-
	Right	Cheek	-	0.727	-
		Tilt	-	0.397	-

1900MHz Head SAR results**

Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
GSM	Conducted Power		-	30.0 dBm	-
	Left	Cheek	-	0.335	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
2-slot GPRS	Conducted Power		-	27.0 dBm	-
	Left	Cheek	-	0.582	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3-slot GPRS	Conducted Power		25.5 dBm	25.5 dBm	25.5 dBm
	Left	Cheek	**0.937**	0.729	0.594
		Tilt	-	0.243	-
	Right	Cheek	-	0.580	-
		Tilt	-	0.314	-
4-slot GPRS	Conducted Power		-	24.0 dBm	-
	Left	Cheek	-	0.675	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
3-slot 8PSK EGPRS	Conducted Power		23.0 dBm	-	-
	Left	Cheek	0.409	-	-
		Tilt	-	-	-
	Right	Cheek	-	-	-
		Tilt	-	-	-
Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz
WCDMA	Conducted Power		22.5 dBm	22.5 dBm	22.5 dBm
	Left	Cheek	**1.03**	0.970	0.878
		Tilt	-	0.257	-
	Right	Cheek	0.821	0.806	0.687
		Tilt	-	0.320	-

2450MHz Head SAR results**

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

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

Mode	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 1 2412.0 MHz	Ch 7 2442.0 MHz	Ch 11 2462.0 MHz
WLAN b-mode	**Conducted Power**		**15.0 dBm**	**15.0 dBm**	**15.0 dBm**
	Left	Cheek	-	0.220	-
		Tilt	-	0.080	-
	Right	Cheek	0.372	0.438	**0.461**
		Tilt	-	0.083	-
WLAN n-mode 20MHz	**Conducted Power**		**13.0 dBm**	**13.0 dBm**	**13.0 dBm**
	Left	Cheek	-	-	-
		Tilt	-	-	-
	Right	Cheek	0.302	0.360	**0.488**
		Tilt	-	-	-

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

850MHz Body SAR results

Mode	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 128 824.2 MHz	Ch 190 836.6 MHz	Ch 251 848.8 MHz
3-slot GPRS**		Conducted Power	28.5 dBm	28.5 dBm	28.5 dBm
	Display facing phantom	Without headset	-	0.677	-
		Headset WH-902	-	0.582	-
	Back facing phantom	Without headset	0.912	0.927	**0.950**
		Headset WH-902	-	0.756	-
Mode	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 4132 826.4 MHz	Ch 4175 835.0 MHz	Ch 4233 846.6 MHz
WCDMA		Conducted Power	22.5 dBm	22.5 dBm	22.5 dBm
	Display facing phantom	Without headset	-	0.540	-
		Headset WH-902	-	0.407	-
	Back facing phantom	Without headset	**0.804**	0.733	0.790
		Headset WH-902	-	0.553	-

1900MHz Body SAR results**

Mode	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 512 1850.2 MHz	Ch 661 1880.0 MHz	Ch 810 1909.8 MHz
3-slot GPRS		Conducted Power	25.5 dBm	25.5 dBm	25.5 dBm
	Display facing phantom	Without headset	-	0.523	-
		Headset WH-902	-	0.408	-
	Back facing phantom	Without headset	**0.570**	0.561	0.434
		Headset WH-902	-	0.492	-
Mode	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 9262 1852.4 MHz	Ch 9400 1880.0 MHz	Ch 9538 1907.6 MHz
WCDMA		Conducted Power	22.5 dBm	22.5 dBm	22.5 dBm
	Display facing phantom	Without headset	-	0.658	-
		Headset WH-902	-	0.547	-
	Back facing phantom	Without headset	**0.746**	0.741	0.406
		Headset WH-902	-	0.735	-

2450MHz Body SAR results**

Mode	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 1 2412.0 MHz	Ch 7 2442.0 MHz	Ch 11 2462.0 MHz
WLAN b-mode		**Conducted Power**	**15.0 dBm**	**15.0 dBm**	**15.0 dBm**
	Display facing phantom	Without headset	-	0.027	-
		Headset WH-902	-	0.030	-
	Back facing Phantom	Without headset	0.047	0.051	**0.056**
		Headset WH-902	-	0.045	-
WLAN n-mode 20MHz		**Conducted Power**	**13.0 dBm**	**13.0 dBm**	**13.0 dBm**
	Display facing phantom	Without headset	-	-	-
		Headset WH-902	-	-	-
	Back facing phantom	Without headset	0.031	0.037	0.045
		Headset WH-902	-	-	-

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

Mode	Device orientation	Test configuration	SAR, averaged over 1g (W/kg)		
			Ch 1 2412.0 MHz	Ch 7 2442.0 MHz	Ch 11 2462.0 MHz
WLAN b-mode		**Conducted Power**	**15.0 dBm**	**15.0 dBm**	**15.0 dBm**
	Display facing phantom	Without headset	-	0.033	-
		Headset WH-902	-	0.040	-
	Back facing Phantom	Without headset	0.051	0.056	**0.057**
		Headset WH-902	-	0.045	-
WLAN n-mode 20MHz		**Conducted Power**	**13.0 dBm**	**13.0 dBm**	**13.0 dBm**
	Display facing phantom	Without headset	-	-	-
		Headset WH-902	-	-	-
	Back facing phantom	Without headset	0.034	0.038	0.047
		Headset WH-902	-	-	-

Simultaneous transmissions: Combined SAR results – Individual band Max results

Test configuration	Max. 1g SAR results				
	WLAN**	3-slot GPRS850**	WCDMA 850	3-slot GPRS1900**	WCDMA 1900**
Head: Left, Cheek	0.220	1.13	0.886	0.937	1.03
Head: Left, Tilt	0.080	0.608	0.434	0.243	0.257
Head: Right, Cheek	0.488	0.969	0.727	0.580	0.821
Head: Right, Tilt	0.083	0.478	0.397	0.314	0.320
Body: Display facing phantom, Without Headset	0.033	0.677	0.540	0.523	0.658
Body: Display facing phantom, Headset WH-902	0.040	0.582	0.407	0.408	0.547
Body: Back facing phantom, Without Headset	0.057	0.950	0.804	0.570	0.746
Body: Back facing phantom, Headset WH-902	0.045	0.756	0.553	0.492	0.735

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

Test configuration	Max. 1g SAR results			
	3-slot GPRS850 + WLAN**	WCDMA850 + WLAN	3-slot GPRS1900 + WLAN**	WCDMA1900 + WLAN**
Head: Left, Cheek	1.350	1.106	**1.157**	1.250
Head: Left, Tilt	0.688	0.514	0.323	0.337
Head: Right, Cheek	**1.457**	**1.215**	1.068	**1.309**
Head: Right, Tilt	0.561	0.480	0.397	0.403
Body: Display facing phantom, Without Headset	0.710	0.573	0.556	0.691
Body: Display facing phantom, Headset WH-902	0.622	0.447	0.448	0.587
Body: Back facing phantom, Without Headset	**1.007**	**0.861**	**0.627**	**0.803**
Body: Back facing phantom, Headset WH-902	0.801	0.598	0.537	0.780

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

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

Test configuration	Max. 1g SAR results			
	3-slot GPRS850 + WLAN**	WCDMA850 + WLAN	3-slot GPRS1900 + WLAN**	WCDMA1900 + WLAN**
Head: Left, Cheek	-	-	**0.976**	-
Head: Left, Tilt	-	-	-	-
Head: Right, Cheek	**0.990**	**0.773**	-	**1.01**
Head: Right, Tilt	-	-	-	-
Body: Display facing phantom, Without Headset	-	-	-	-
Body: Display facing phantom, Headset WH-902	-	-	-	-
Body: Back facing phantom, Without Headset	**0.968**	**0.835**	**0.565**	**0.771**
Body: Back facing phantom, Headset WH-902	-	-	-	-

**SAR data taken from FCC_RM-801_02 for RM-801 / FCC ID: LJPRM-801

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

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

Plots of the Measurement scans are given in Appendix B.

APPENDIX A: SYSTEM CHECKING SCANS

Date/Time: 2011-11-30 09:03:12, Date/Time: 2011-11-30 09:08:24

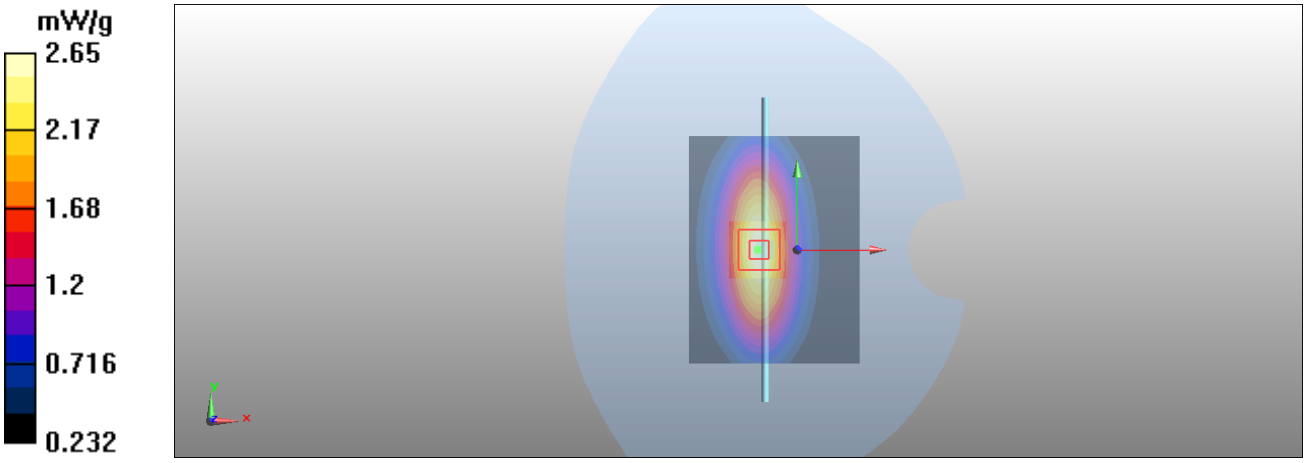
Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2 - SN:462

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL850; Medium Notes: t= 21.3 C
Medium parameters used: f = 835 MHz; σ = 0.912 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

Configuration/d=15mm, Pin=250mW/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.61 mW/g

Configuration/d=15mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.9 V/m
Peak SAR (extrapolated) = 3.6 W/kg
SAR(1 g) = 2.45 mW/g
SAR(10 g) = 1.6 mW/g
Power Drift = 0.025 dB
Maximum value of SAR (measured) = 2.65 mW/g



APPENDIX B: MEASUREMENT SCANS

Date/Time: 2011-11-30 11:49:28, Date/Time: 2011-11-30 11:53:08

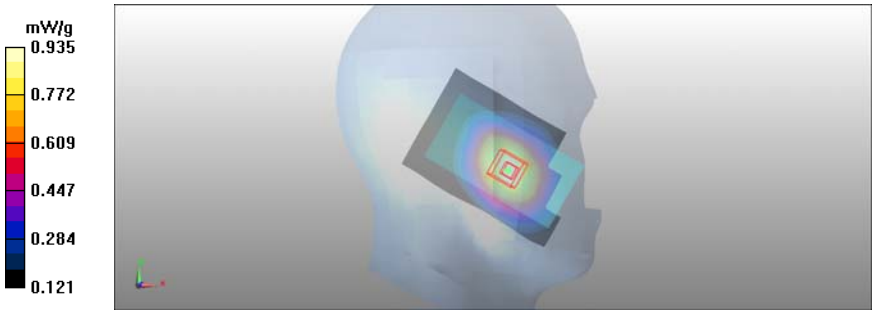
Test Laboratory: TCC Nokia
Type: RM-819; Serial: 004402/13/599922/9

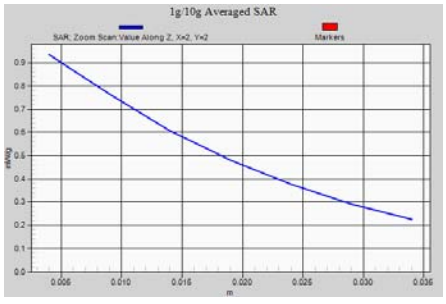
Communication System: WCDMA850
Frequency: 846.6 MHz; Duty Cycle: 1:1
Medium: HSL850; Medium Notes: t= 21.3 C
Medium parameters used: f = 847 MHz; σ = 0.92 mho/m; ε_r = 40.7; ρ = 1000 kg/m^3
Phantom section: Left Section

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

WCDMA - Left/Cheek - High/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.951 mW/g

WCDMA - Left/Cheek - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 10.2 V/m
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.886 mW/g
SAR(10 g) = 0.672 mW/g
Power Drift = -0.070 dB
Maximum value of SAR (measured) = 0.935 mW/g





Date/Time: 2011-11-30 09:54:19, Date/Time: 2011-11-30 09:57:58

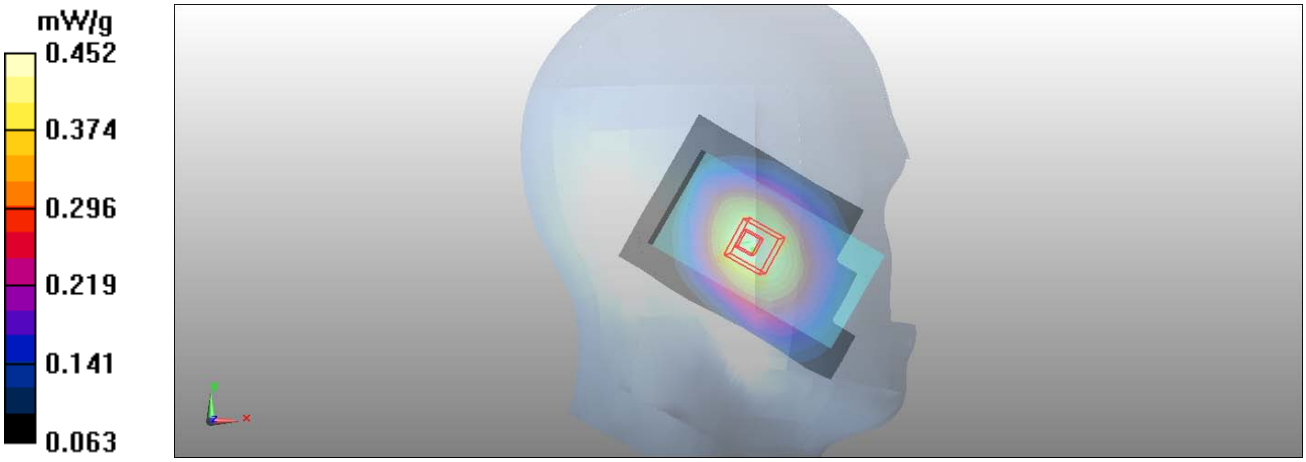
Test Laboratory: TCC Nokia
Type: RM-819; Serial: 004402/13/599922/9

Communication System: WCDMA850
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL850; Medium Notes: t= 21.3 C
Medium parameters used: f = 835 MHz; σ = 0.912 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Left Section

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

WCDMA - Left/Tilt - Middle/Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.449 mW/g

WCDMA - Left/Tilt - Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 13.3 V/m
Peak SAR (extrapolated) = 0.526 W/kg
SAR(1 g) = 0.434 mW/g
SAR(10 g) = 0.331 mW/g
Power Drift = -0.021 dB
Maximum value of SAR (measured) = 0.452 mW/g



Date/Time: 2011-11-30 10:11:16, Date/Time: 2011-11-30 10:16:12

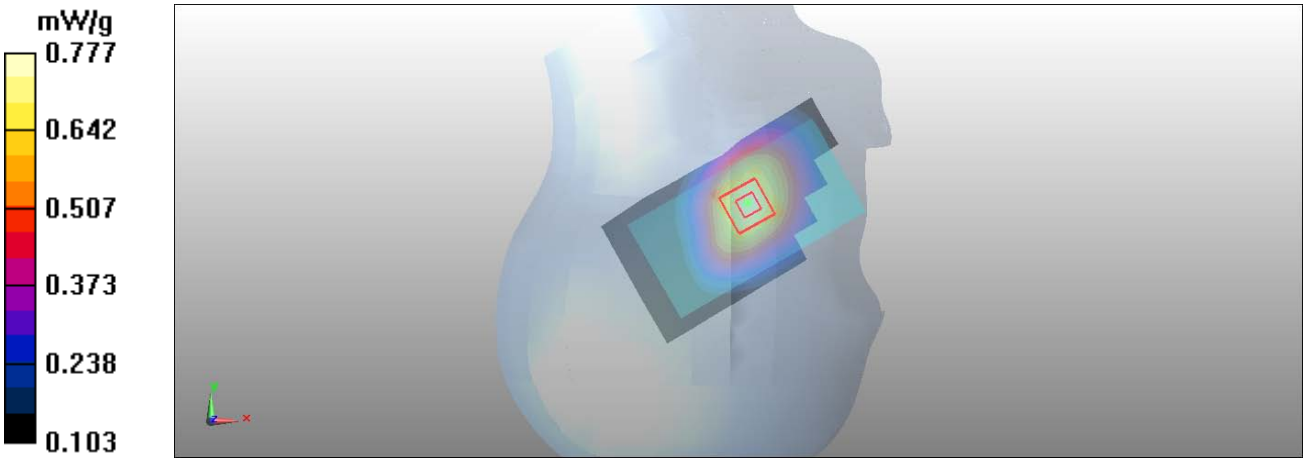
Test Laboratory: TCC Nokia
Type: RM-819; Serial: 004402/13/599922/9

Communication System: WCDMA850
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL850; Medium Notes: t= 21.3 C
Medium parameters used: f = 835 MHz; σ = 0.912 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Right Section

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

WCDMA - Right/Cheek - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.770 mW/g

WCDMA - Right/Cheek - Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 7.36 V/m
Peak SAR (extrapolated) = 0.877 W/kg
SAR(1 g) = 0.727 mW/g
SAR(10 g) = 0.546 mW/g
Power Drift = -0.361 dB
Maximum value of SAR (measured) = 0.777 mW/g



Date/Time: 2011-11-30 11:23:07, Date/Time: 2011-11-30 11:26:08

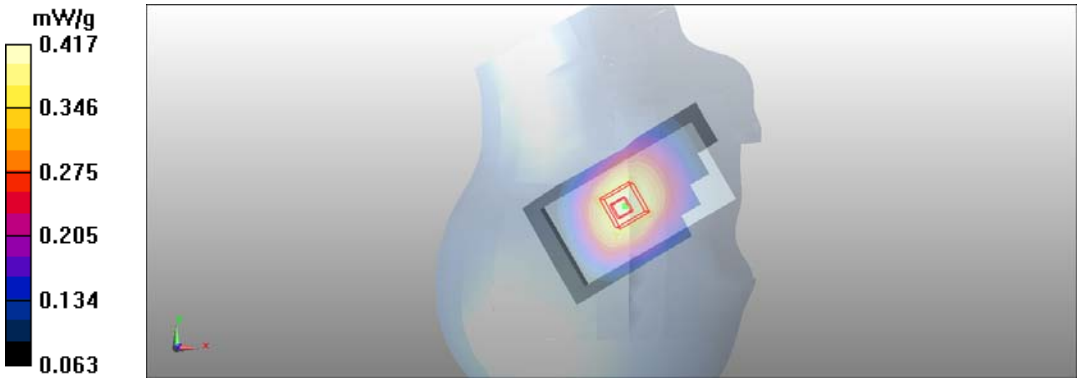
Test Laboratory: TCC Nokia
Type: RM-819; Serial: 004402/13/599922/9

Communication System: WCDMA850
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL850; Medium Notes: t= 21.3 C
Medium parameters used: f = 835 MHz; σ = 0.912 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Right Section

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

WCDMA - Right/Tilt - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.421 mW/g

WCDMA - Right/Tilt - Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 13.4 V/m
Peak SAR (extrapolated) = 0.482 W/kg
SAR(1 g) = 0.397 mW/g
SAR(10 g) = 0.300 mW/g
Power Drift = -0.205 dB
Maximum value of SAR (measured) = 0.417 mW/g



Date/Time: 2011-11-30 12:52:36, Date/Time: 2011-11-30 12:58:24

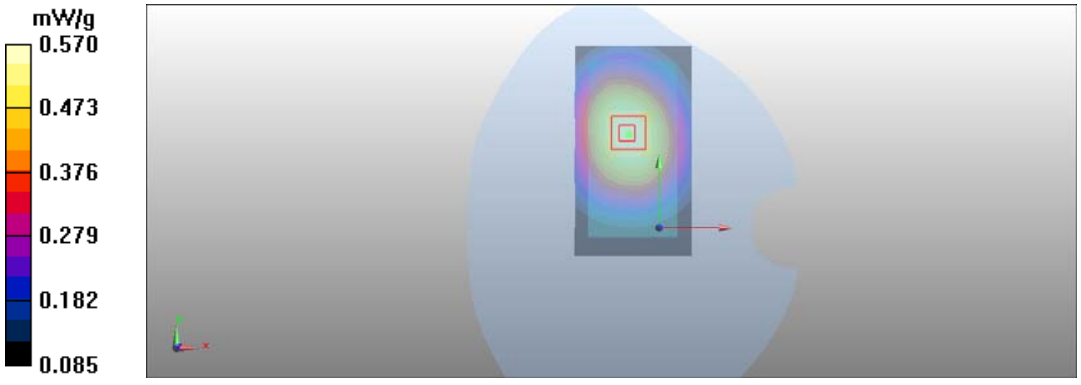
Test Laboratory: TCC Nokia
Type: RM-819; Serial: 004402/13/599922/9

Communication System: WCDMA850
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.5 C
Medium parameters used: f = 835 MHz; σ = 0.985 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

WCDMA - Body - Middle - No Accessory - Display Facing Phantom/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.578 mW/g

WCDMA - Body - Middle - No Accessory - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 11.1 V/m
Peak SAR (extrapolated) = 0.666 W/kg
SAR(1 g) = 0.540 mW/g
SAR(10 g) = 0.407 mW/g
Power Drift = -0.203 dB
Maximum value of SAR (measured) = 0.570 mW/g



Date/Time: 2011-11-30 13:07:59, Date/Time: 2011-11-30 13:10:55

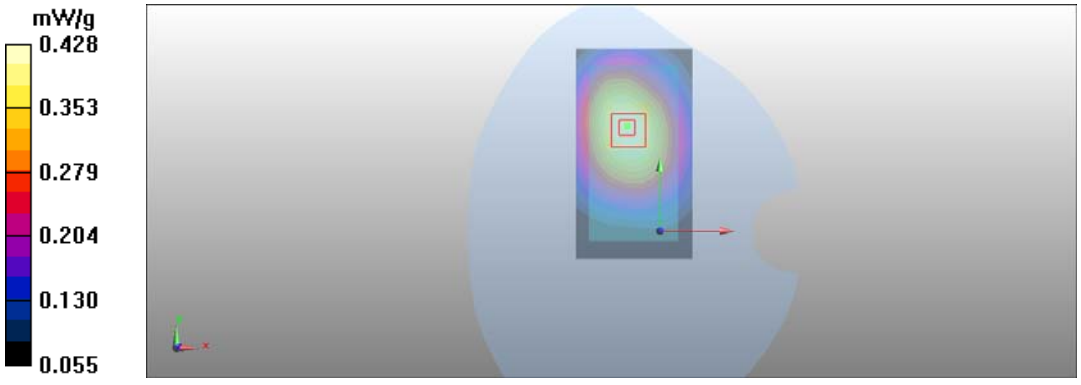
Test Laboratory: TCC Nokia
Type: RM-819; Serial: 004402/13/599922/9

Communication System: WCDMA850
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.5 C
Medium parameters used: f = 835 MHz; σ = 0.985 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

WCDMA - Body - Middle - WH-902 - Display Facing Phantom/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.434 mW/g

WCDMA - Body - Middle - WH-902 - Display Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 8.62 V/m
Peak SAR (extrapolated) = 0.506 W/kg
SAR(1 g) = 0.407 mW/g
SAR(10 g) = 0.305 mW/g
Power Drift = 0.039 dB
Maximum value of SAR (measured) = 0.428 mW/g



Date/Time: 2011-11-30 15:14:23, Date/Time: 2011-11-30 15:22:19

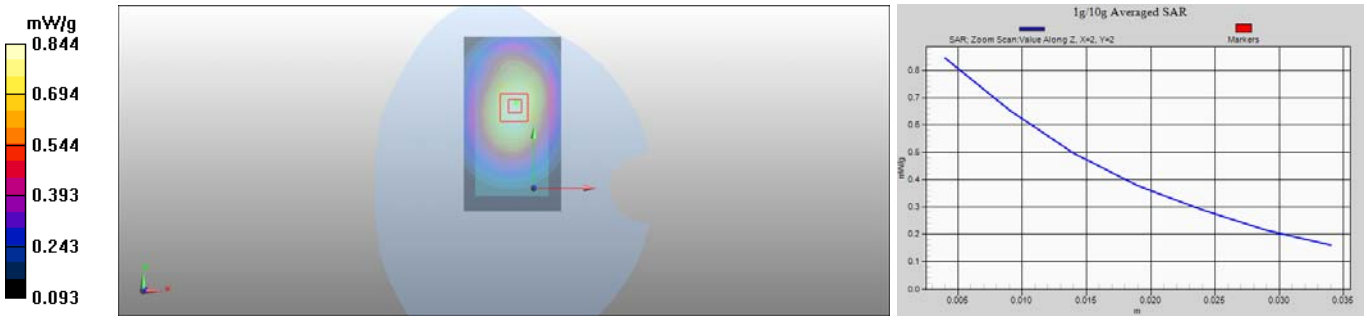
Test Laboratory: TCC Nokia
Type: RM-819; Serial: 004402/13/599922/9

Communication System: WCDMA850
Frequency: 826.4 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.5 C
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.98 mho/m; ε_r = 53; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

WCDMA - Body - Low - No Accessory - Back Facing Phantom/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.867 mW/g

WCDMA - Body - Low - No Accessory - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 12.6 V/m
Peak SAR (extrapolated) = 1 W/kg
SAR(1 g) = 0.804 mW/g
SAR(10 g) = 0.597 mW/g
Power Drift = 0.032 dB
Maximum value of SAR (measured) = 0.844 mW/g



Date/Time: 2011-11-30 13:19:23, Date/Time: 2011-11-30 13:22:20

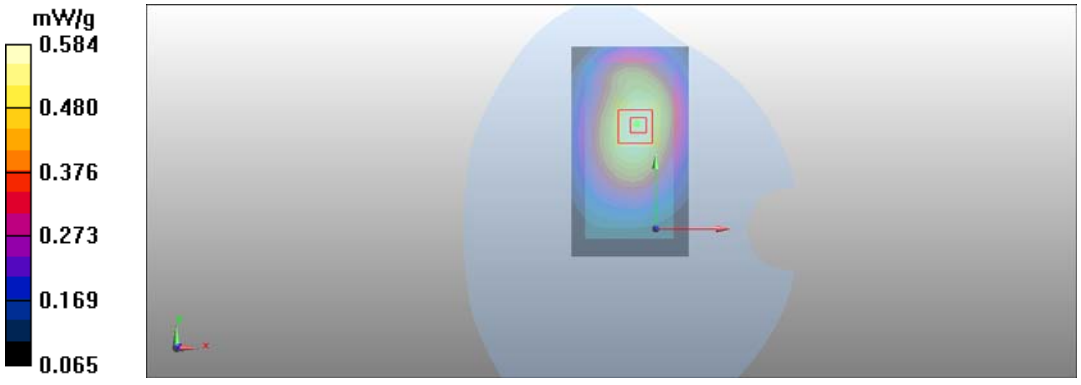
Test Laboratory: TCC Nokia
Type: RM-819; Serial: 004402/13/599922/9

Communication System: WCDMA850
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: BSL850; Medium Notes: t= 21.5 C
Medium parameters used: f = 835 MHz; σ = 0.985 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

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

WCDMA - Body - Middle - WH-902 - Back Facing Phantom/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.598 mW/g

WCDMA - Body - Middle - WH-902 - Back Facing Phantom/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 10.3 V/m
Peak SAR (extrapolated) = 0.697 W/kg
SAR(1 g) = 0.553 mW/g
SAR(10 g) = 0.411 mW/g
Power Drift = -0.127 dB
Maximum value of SAR (measured) = 0.584 mW/g



Date/Time: 2011-11-30 10:11:16, Date/Time: 2011-08-18 10:49:39

Test Laboratory: TCC Nokia
Type: RM-819, Type: RM-801; Serial: 004402/13/599922/9, Serial: 004402/13/553891/0

Communication System: WCDMA850, Communication System: WLAN2450 n-mode
Frequency: 835 MHz, Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: HSL850, Medium: HSL2450; Medium Notes: t= 21.3 C, Medium Notes: t= 22.3 C
Medium parameters used: f = 835 MHz; σ = 0.912 mho/m; ε_r = 40.8; ρ = 1000 kg/m^3 , Medium parameters used: f = 2462 MHz; σ = 1.83 mho/m; ε_r = 37.2; ρ = 1000 kg/m^3
Phantom section: Right Section

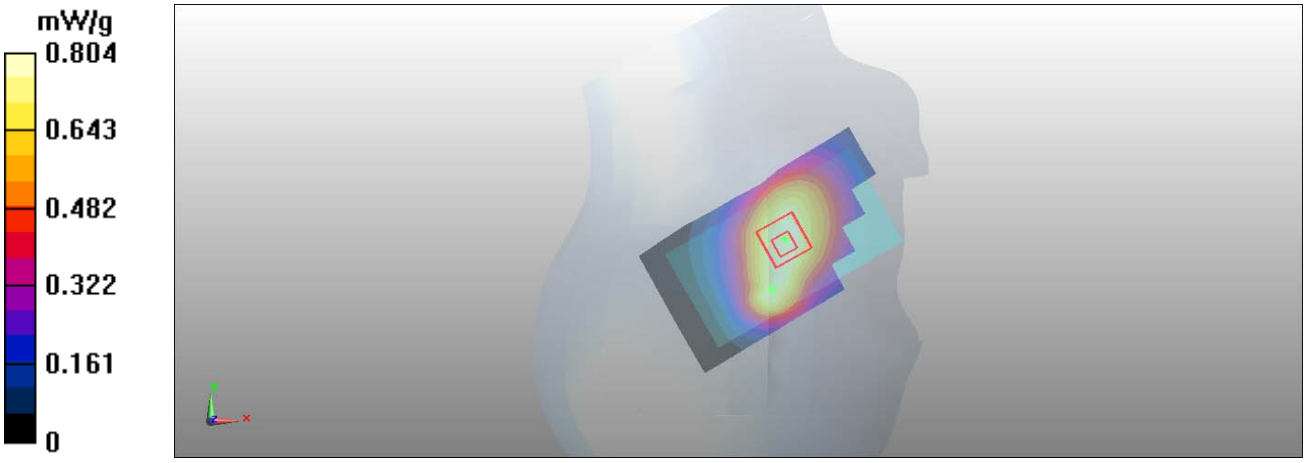
DASY Configuration:
- Probe: ES3DV3 - SN3131, Probe: EX3DV4 - SN3573
- ConvF(5.88, 5.88, 5.88), ConvF(6.69, 6.69, 6.69); Calibrated: 2011-09-14, Calibrated: 2011-02-17
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn728, Electronics: DAE4 Sn793; Calibrated: 2011-05-09, Calibrated: 2010-09-08
- Phantom: SAM2, Phantom: SAM1; Type: SAM; Serial: TP-1570, Serial: TP-1126
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

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

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

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.773 mW/g
SAR(10 g) = 0.532 mW/g

Maximum value of SAR (measured) = 0.830 mW/g



WLAN scaled up by 1.26dB to account for drift.

Date/Time: 2011-11-30 15:14:23, Date/Time: 2011-08-18 13:49:53

Test Laboratory: TCC Nokia
Type: RM-819, Type: RM-801; Serial: 004402/13/599922/9, Serial: 004402/13/553891/0

Communication System: WCDMA850, Communication System: WLAN2450 b-mode
Frequency: 826.4 MHz, Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: BSL850, Medium: BSL2450; Medium Notes: t= 21.5 C, Medium Notes: t= 21.3 C
Medium parameters used (interpolated): f = 826.4 MHz; σ = 0.98 mho/m; ε_r = 53; ρ = 1000 kg/m^3 , Medium parameters used: f = 2462 MHz; σ = 2 mho/m; ε_r = 50.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

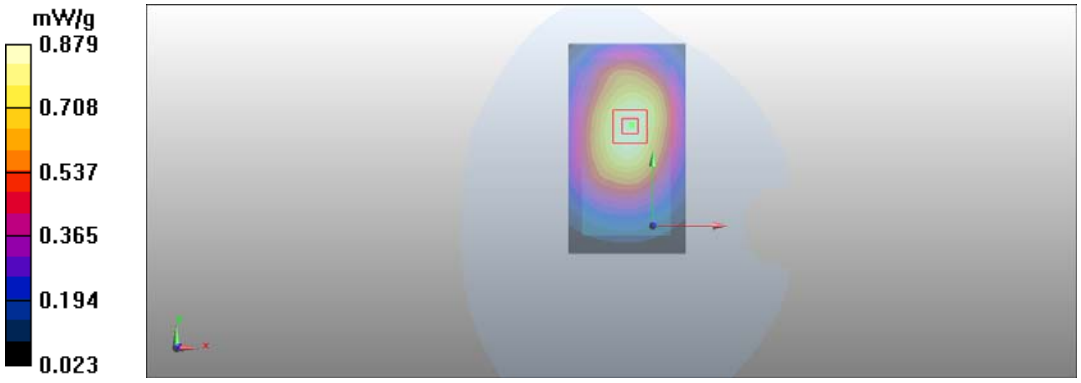
DASY Configuration:
- Probe: ES3DV3 - SN3131, Probe: EX3DV4 - SN3573
- ConvF(5.92, 5.92, 5.92), ConvF(6.8, 6.8, 6.8); Calibrated: 2011-09-14, Calibrated: 2011-02-17
- Sensor-Surface: 4mm (Mechanical Surface Detection (Locations From Previous Scan Used))
- Electronics: DAE4 Sn728, Electronics: DAE4 Sn793; Calibrated: 2011-05-09, Calibrated: 2010-09-08
- Phantom: SAM1, Phantom: SAM2; Type: SAM; Serial: TP-1126, Serial: TP-1570
- Measurement SW: DASY4, V4.7 Build 55; SEMCAD X Version 14.0 Build 61

WCDMA - Body - Low - No Accessory - Back Facing Phantom/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm

WLAN - Body - High - No accessory - Back Facing Phantom/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm

Motorola Fast SAR of Combined Scans: SAR(1 g) = 0.835 mW/g
SAR(10 g) = 0.590 mW/g

Maximum value of SAR (measured) = 0.884 mW/g



WLAN scaled up by 0.09dB to account for drift.

APPENDIX C: CONDUCTED AVERAGE POWER MEASUREMENTS FOR WCDMA AND HSUPA

Test Laboratory: TCC Nokia
Type: RM-819; Serial: 004402/13/600481/3, HW: 3000H, SW: Rev 1600.2479.7740.11451

C.1. WCDMA850 Test results

Average power

Ch / *f* (MHz)	P [dBm]
4133	22.31
4175	22.20
4232	21.98

C.2. HSUPA850 Test results

Average power

Ch / *f* (MHz)	P [dBm]				
	Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
4133	21.66	20.97	20.51	21.00	21.76
4175	21.37	20.70	20.25	20.55	21.38
4232	20.14	20.02	19.78	20.09	20.82

Note: In HSUPA operation, the output power is reduced relative to the tuning target power for WCDMA. This device sets the MPR values individually for each Subtest mode. The following table gives the set MPR values.

Maximum Power Reduction (MPR)				
Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
0.7dB	1.5dB	1.2dB	1.5dB	0.7dB

Test Laboratory: TCC Nokia
Type: RM-801; Serial: 004402/13/552686/5, HW: 1100H, SW: Rev 1600.2100.7720.11330 Rev 112.1402.2.2

C.3. WCDMA1900 Test results**

Average power

Ch / *f* (MHz)	P [dBm]
9263 / 1852.6	22.58
9400 / 1880.0	22.64
9537 / 1907.4	22.65

C.4. HSUPA1900 Test results **

Average power

Ch / *f* (MHz)	P [dBm]				
	Subtest mode 1	Subtest mode 2	Subtest mode 3	Subtest mode 4	Subtest mode 5
9263 / 1852.6	19.88	21.05	20.61	20.94	20.65
9400 / 1880.0	20.29	21.18	20.79	21.09	20.70
9537 / 1907.4	20.64	21.16	21.27	21.34	20.86

Note: In HSUPA operation, the output power is reduced relative to the tuning target power for WCDMA. This device runs two separate HSUPA power control routines: MPR and E-TFC MPR. In each Subtest mode, the routine with the higher power reduction dominates. Also additional power reduction of 1.0dB, 0.5dB and 2.0dB for Subtest Mode 1, 3 and 5, respectively, is used.
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
2.5dB	2.0dB	1.5dB	2.0dB	2.0dB

**Power data taken from FCC_RM-801_02 for RM-801 / FCC ID: LJPRM-801.

APPENDIX D: DIELECTRIC PARAMETERS OF THE TISSUE SIMULANTS

Head tissue simulant dielectric parameters used in the measurements:

f (MHz)	Date	Dielectric Parameters					
		Ch 4132 826.4 MHz		Ch 4175 835.0 MHz		Ch 4233 846.6 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
835	2011-11-30	40.8	0.91	40.8	0.91	40.7	0.92

Body tissue simulant dielectric parameters used in the measurements:

f (MHz)	Date	Dielectric Parameters					
		Ch 4132 826.4 MHz		Ch 4175 835.0 MHz		Ch 4233 846.6 MHz	
		ε_r	σ [S/m]	ε_r	σ [S/m]	ε_r	σ [S/m]
835	2011-11-30	53.0	0.98	52.9	0.99	52.9	0.99

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

CALIBRATION CERTIFICATE

Object ES3DV3 - SN:3131

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

Calibration date: September 14, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-11 (No. 217-01372)	Apr-12
Power sensor E4412A	MY41498087	31-Mar-11 (No. 217-01372)	Apr-12
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-11 (No. 217-01369)	Apr-12
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-11 (No. 217-01367)	Apr-12
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-11 (No. 217-01370)	Apr-12
Reference Probe ES3DV2	SN: 3013	29-Dec-10 (No. ES3-3013_Dec10)	Dec-11
DAE4	SN: 654	3-May-11 (No. DAE4-654_May11)	May-12
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

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

Issued: September 15, 2011

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

Calibration Parameter Determined in Head Tissue Simulating Media

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

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

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

Calibration Parameter Determined in Body Tissue Simulating Media

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

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

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

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

CALIBRATION CERTIFICATE

Object D835V2 - SN: 462

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

Calibration date: September 13, 2011

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

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

Calibration Equipment used (M&TE critical for calibration)

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

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

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

Issued: September 13, 2011

Date: 13.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

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

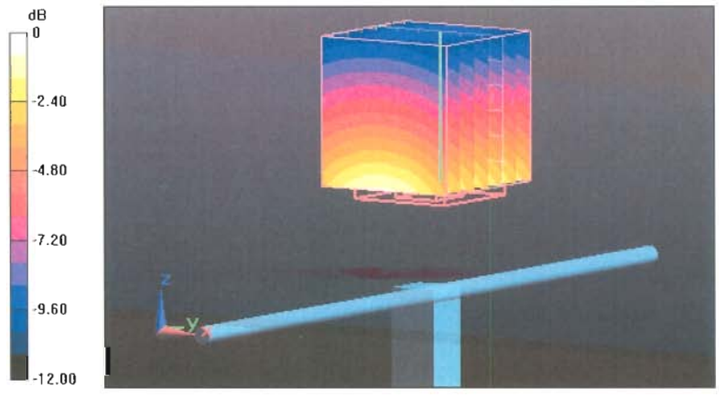
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.89 mho/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

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

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

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



0 dB = 2.710mW/g

DASY5 Validation Report for Body TSL

Date: 12.09.2011

Test Laboratory: SPEAG, Zurich, Switzerland

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

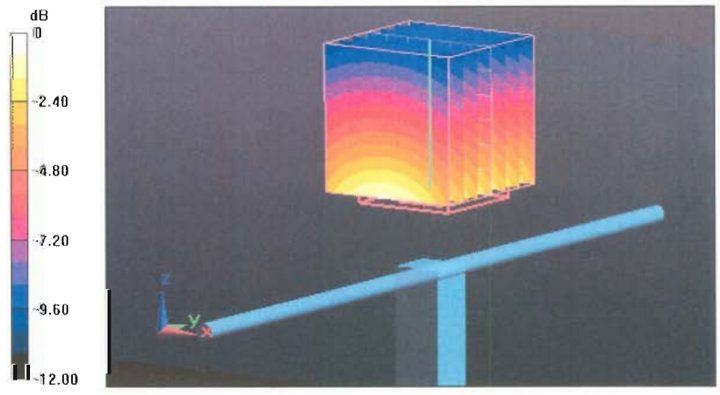
Communication System: CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY52 Configuration:

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

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

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



0 dB = 2.850mW/g