TCC
Nokia

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

SAR Compliance Test Report

Test report no.:	SD_SAR_0740_01	**Date of report:**	2007-10-04
Template version:	7.0	**Number of pages:**	38
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Responsible test engineer:	Jose Gomez	**Product contact person:**	Mary Washington
Measurements made by:	Jose Gomez, Julian Kim		
Tested device:	RH-108		
FCC ID:	QMNRH-108	**IC:**	661X-RH108
Supplement reports:	WR1192.002_2, SD_SAR_0740_02		

Testing has been carried out in accordance with:

47CFR §2.1093
Radiofrequency Radiation Exposure Evaluation: Portable Devices

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

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

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

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

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: **2007-10-04**

For the contents:

Jose D. Gomez
Certification Test Engineer

CONTENTS

1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2007-10-01 to 2007-10-03
SN, HW and SW numbers of tested device	SN: A00000011E70DB, HW: 3100, SW: SH_0490B_GEN, DUT: 3032 SN: A00000011E70D6, HW: 3100, SW: SH_0490B_GEN, DUT: 3033
Batteries used in testing	BL-5B, DUT: 3035, 3036, 3037
Headsets used in testing	HS-9, DUT: 3034
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 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
CDMA800	777/ 848.31	24.04 dBm	Left, Cheek	0.999W/kg	**1.12W/kg**	1.6 W/kg	**PASSED**
CDMA1900	25/ 1851.25	23.57 dBm	Right, Tilt	1.07W/kg	**1.20W/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
CDMA800	1013/ 824.70	24.57 dBm	2.2cm	0.548W/kg	**0.61W/kg**	1.6 W/kg	**PASSED**
CDMA1900	25/ 1851.25	23.57 dBm	2.2cm	0.525W/kg	**0.59W/kg**	1.6 W/kg	**PASSED**

*SAR values are scaled up by 12% to cover measurement drift.

1.2.3 Maximum Drift

Maximum drift covered by 12% scaling up of the SAR values	Maximum drift during measurements
0.5dB	0.33 dB

1.2.4 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)
CDMA	800 1900	QPSK	1	824 – 849 1850 – 1910

This is a CDMA2000 1x device.

2.1 Description of the Antenna

The device has an internal antenna.

3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	20.4 to 21.4
Ambient humidity (RH %):	45 to 55

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.

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

The number of test cases reported in this document has been minimised based on the earlier testing in WR1192.002_2.

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 interval	Calibration expiry
DAE 3	389	12 months	2008-02
DAE 3	308	12 months	2008-02
E-field Probe ET3DV6	1504	12 months	2008-08
E-field Probe ET3DV6	1516	12 months	2007-11
Dipole Validation Kit, D835V2	487	24 months	2008-11
Dipole Validation Kit, D1900V2	534	24 months	2008-09
DASY Software	Version 4.7	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration interval	Calibration expiry
Signal Generator	HP E4432B	US 40052231	24 months	2008-05
Signal Generator	HP E4432B	US 39260114	24 months	2008-06
Amplifier	Milmega AS0825-20L	1009777	-	-
Amplifier	Comtech PST AR8829-5	N2S7A00-1011	-	-
Power Meter	Agilent E4416A	GB41291842	12 months	2008-04
Power Meter	Agilent E4417A	GB41290918	12 months	2007-11
Power Sensor	Agilent E9327A	US40411295	12 months	2008-04
Power Sensor	Agilent E9301A	MY41497078	12 months	2007-10
Call Tester	Agilent 8960	GB41400499	-	-
Call Tester	Agilent 8960	GB44350217	-	-
Vector Network Analyzer	Agilent 8753ES	US39174327	12 months	2008-05
Dielectric Probe Kit	Agilent 85070D	US 01440165	-	-

4.1.1 Isotropic E-field Probe Type ET3DV6

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., butyl diglycol)
Calibration	Calibration certificate in Appendix C
Frequency	10 MHz to 3 GHz (dosimetry); Linearity: ± 0.2 dB (30 MHz to 3 GHz)
Optical Surface Detection	± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.4 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: 16 mm Body diameter: 12 mm Tip diameter: 6.8 mm Distance from probe tip to dipole centers: 2.7 mm
Application	General dosimetry up to 3 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 15.0 ± 0.5 cm measured from the ear reference point during system checking and device measurements.

4.3.1 Tissue Simulant Recipes

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

800MHz band

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

1900MHz band

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

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	2.29	42.3	0.90	
	± 10% window	2.06 - 2.52			
835	2007-10-01	2.40	42.1	0.89	21.4
	Reference result	9.38	38.6	1.41	
	± 10% window	8.44 – 10.32			
1900	2007-10-01	9.47	38.5	1.43	20.5

System checking, body tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ε_r	σ [S/m]	
	Reference result	2.44	53.7	0.99	
	± 10% window	2.20 – 2.68			
835	2007-10-02	2.41	55.9	0.98	20.9
	Reference result	10.1	52.6	1.56	
	± 10% window	9.09 – 11.1			
1900	2007-10-02	9.25	52.9	1.51	20.5

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

4.3.3 Tissue Simulants used in the Measurements

Head tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ε_r	σ [S/m]	
	Recommended value	41.5	0.90	
	± 5% window	39.4 – 43.6	0.86 – 0.95	
836	2007-10-01	42.1	0.89	21.4
	Recommended value	40.0	1.40	
	± 5% window	38.0 – 42.0	1.33 – 1.47	
1880	2007-10-01	38.7	1.41	20.9

Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ε_r	σ [S/m]	
	Recommended value	55.2	0.97	
	± 5% window	52.4 – 58.0	0.92 – 1.02	
836	2007-10-02	55.8	0.99	20.9
	Recommended value	53.3	1.52	
	± 5% window	50.6 – 56.0	1.44 – 1.60	
1880	2007-10-02	53.0	1.49	20.5

5. DESCRIPTION OF THE TEST PROCEDURE

5.1 Device Holder

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

Device holder supplied by SPEAG

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

Nokia spacer

5.2 Test Positions

5.2.1 Against Phantom Head

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

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

5.2.2 Body Worn Configuration

The device was placed in the SPEAG holder using the Nokia spacer and placed below the flat section of the phantom. The distance between the device and the phantom was kept at the separation distance indicated in Section 1.2.2 using a separate flat spacer that was removed before the start of the measurements. The device was oriented with its antenna facing the phantom since this orientation gives higher results.

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:

800MHz Head SAR results

Option used	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch1013 824.70MHz	Ch384 836.52MHz	Ch777 848.31MHz
RC3 / SO55		Power	24.57 dBm	24.31 dBm	24.04 dBm
CDMA800	Left	Cheek	0.794	0.731	**0.999**
		Tilt	-	0.426	-
	Right	Cheek	0.821	0.830	0.987
		Tilt	-	0.486	-

1900MHz Head SAR results

Option used	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch25 1851.25MHz	Ch600 1880.00MHz	Ch1175 1908.75MHz
RC3 / SO55		Power	23.57 dBm	23.55 dBm	23.49 dBm
CDMA1900	Left	Cheek	-	0.509	-
		Tilt	**-**	0.646	-
	Right	Cheek	-	0.801	**-**
		Tilt	**1.07**	0.919	0.933

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

800MHz Body SAR results

Option used	Test configuration	SAR, averaged over 1g (W/kg)		
		Ch 1013 824.70 MHz	Ch 384 836.52 MHz	Ch 777 848.31 MHz
RC3 / SO55	Power	24.57 dBm	24.31 dBm	24.04 dBm
CDMA 800	Without headset	**0.548**	0.487	0.509
	Headset HS-9	-	-	-

1900MHz Body SAR results

Option used	Test configuration	SAR, averaged over 1g (W/kg)		
		Ch25 1851.25MHz	Ch600 1880.00MHz	Ch1175 1908.75MHz
RC3 / SO55	Power	23.57 dBm	23.55 dBm	23.49 dBm
CDMA1900	Without headset	0.517	0.430	0.489
	Headset HS-9	**0.525**	0.433	0.499

Plots of the Measurement scans are given in Appendix B.

APPENDIX A: SYSTEM CHECKING SCANS

Date/Time: 2007-10-01 13:40:22

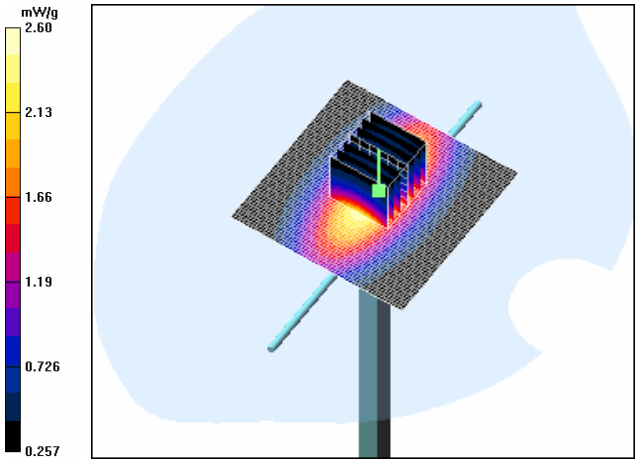
Test Laboratory: TCC Nokia
Type: D835V2; Serial: D835V2

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: Cellular Head; Medium Notes: T=21.4C
Medium parameters used: f = 835 MHz; σ = 0.894 mho/m; ε_r = 42.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1516; Probe Notes:
- ConvF(6.47, 6.47, 6.47); Calibrated: 2006-11-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 2007-02-16
- Phantom: SAM1; Type: Twin Phantom; Serial: TP-1035
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

835MHz system check /Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.60 mW/g

835MHz system check, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 55.7 V/m
Peak SAR (extrapolated) = 3.48 W/kg
SAR(1 g) = 2.4 mW/g
SAR(10 g) = 1.59 mW/g
Power Drift = -0.020 dB
Maximum value of SAR (measured) = 2.60 mW/g



Date/Time: 2007-10-01 15:38:48

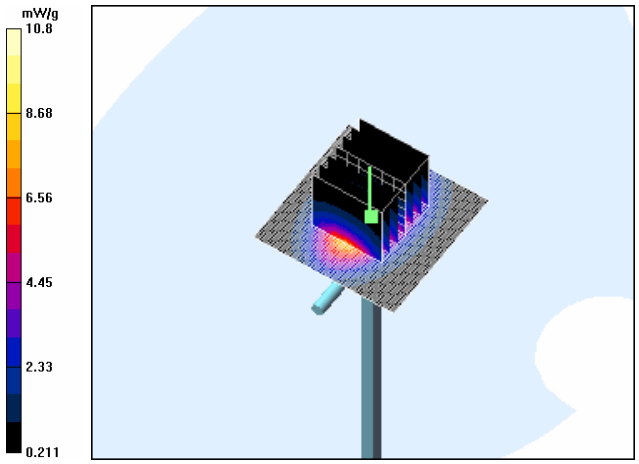
Test Laboratory: TCC Nokia
Type: D1900V2; Serial: 534

Communication System: CW1900
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900MHz Head; Medium Notes: T=20.5C
Medium parameters used: f = 1900 MHz; σ = 1.43 mho/m; ε_r = 38.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1504; Probe Notes:
- ConvF(5.09, 5.09, 5.09); Calibrated: 2007-08-29
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn308; Calibrated: 2007-02-16
- Phantom: SAM 2 ; Type: Twin Phantom; Serial: NMP03309
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

1900MHz system check/Area Scan (61x61x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 10.7 mW/g

1900MHz system check /Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 91.8 V/m
Peak SAR (extrapolated) = 16.1 W/kg
SAR(1 g) = 9.47 mW/g
SAR(10 g) = 5.02 mW/g
Power Drift = 0.019 dB
Maximum value of SAR (measured) = 10.8 mW/g



Date/Time: 2007-10-02 12:51:12

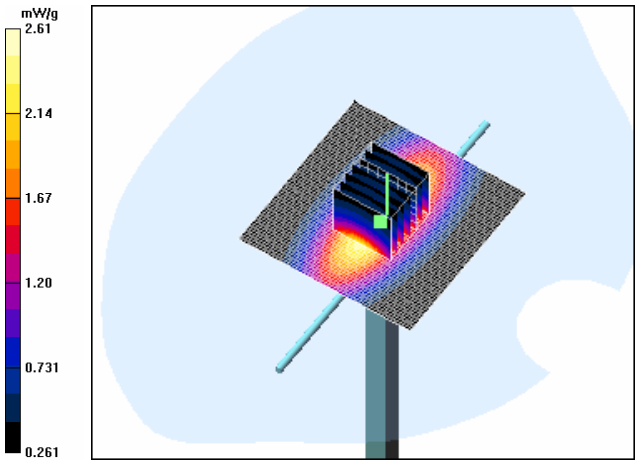
Test Laboratory: TCC Nokia
Type: D835V2; Serial: 487

Communication System: CW835
Frequency: 835 MHz; Duty Cycle: 1:1
Medium: Cellular Body; Medium Notes: T=21.4C
Medium parameters used: f = 835 MHz; σ = 0.982 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1516; Probe Notes:
- ConvF(6.31, 6.31, 6.31); Calibrated: 2006-11-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 2007-02-16
- Phantom: SAM2; Type: Twin Phantom; Serial: TP-1279
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

835MHz system check/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.62 mW/g

835MHz system check/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 53.8 V/m
Peak SAR (extrapolated) = 3.40 W/kg
SAR(1 g) = 2.41 mW/g
SAR(10 g) = 1.61 mW/g
Power Drift = -0.047 dB
Maximum value of SAR (measured) = 2.61 mW/g



Date/Time: 2007-10-02 16:28:48

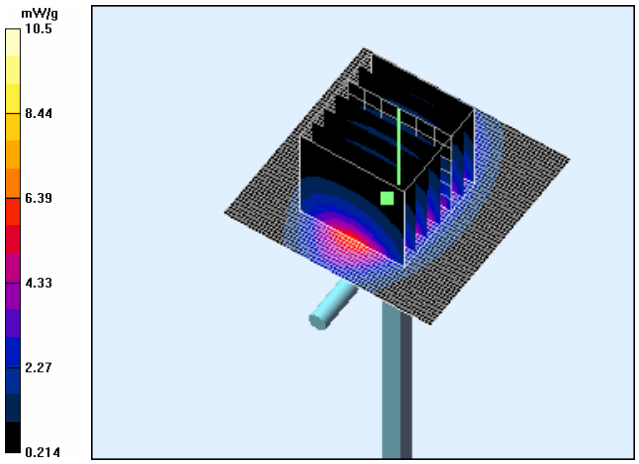
Test Laboratory: TCC Nokia
Type: D1900V2; Serial: 534

Communication System: CW1900
Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900MHz Body; Medium Notes: T=20.4C
Medium parameters used: f = 1900 MHz; σ = 1.51 mho/m; ε_r = 52.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1504; Probe Notes:
- ConvF(4.6, 4.6, 4.6); Calibrated: 2007-08-29
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn308; Calibrated: 2007-02-16
- Phantom: SAM 3; Type: Twin Phantom; Serial: NMP-03311
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

1900MHz system check/Area Scan (61x61x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 10.8 mW/g

1900MHz system check/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 89.9 V/m
Peak SAR (extrapolated) = 15.4 W/kg
SAR(1 g) = 9.25 mW/g
SAR(10 g) = 4.99 mW/g
Power Drift = 0.005 dB
Maximum value of SAR (measured) = 10.5 mW/g



APPENDIX B: MEASUREMENT SCANS

Date/Time: 2007-10-02 10:13:18

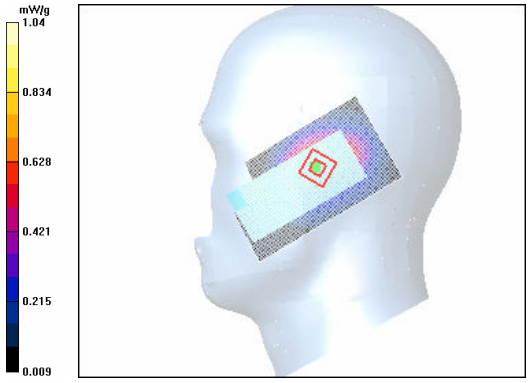
Test Laboratory: TCC Nokia
Type: RH-108; Serial: A00000011E70DB

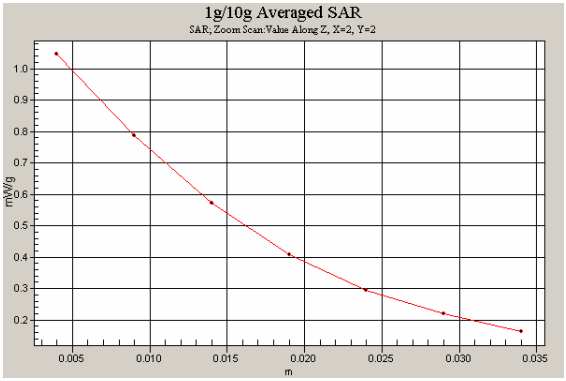
Communication System: CDMA800
Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium: Cellular Head; Medium Notes: T=21.5C
Medium parameters used (interpolated): f = 848.31 MHz; σ = 0.903 mho/m; ε_r = 42; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1516; Probe Notes:
- ConvF(6.47, 6.47, 6.47); Calibrated: 2006-11-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 2007-02-16
- Phantom: SAM1; Type: Twin Phantom; Serial: TP-1035
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left Cheek - High/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.09 mW/g

Left Cheek - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 29.6 V/m
Peak SAR (extrapolated) = 1.38 W/kg
SAR(1 g) = 0.999 mW/g
SAR(10 g) = 0.675 mW/g
Power Drift = -0.271 dB
Maximum value of SAR (measured) = 1.04 mW/g





Date/Time: 2007-10-01 14:43:12

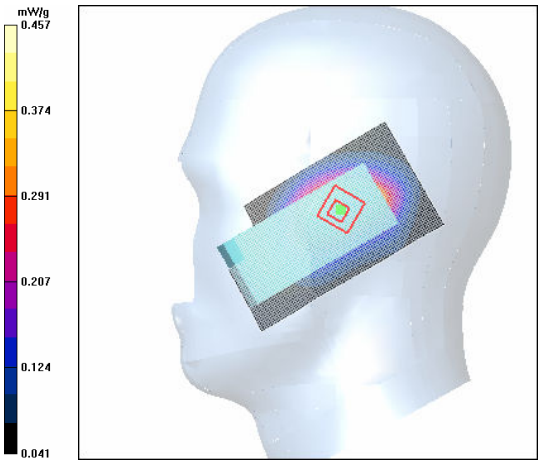
Test Laboratory: TCC Nokia
Type: RH-108; Serial: A00000011E70DB

Communication System: CDMA800
Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: Cellular Head; Medium Notes: T=21.5C
Medium parameters used: f = 837 MHz; σ = 0.896 mho/m; ε_r = 42.1; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1516; Probe Notes:
- ConvF(6.47, 6.47, 6.47); Calibrated: 2006-11-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 2007-02-16
- Phantom: SAM1; Type: Twin Phantom; Serial: TP-1035
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left Tilt - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.463 mW/g

Left Tilt - Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.5 V/m
Peak SAR (extrapolated) = 0.558 W/kg
SAR(1 g) = 0.426 mW/g
SAR(10 g) = 0.293 mW/g
Power Drift = -0.118 dB
Maximum value of SAR (measured) = 0.457 mW/g



Date/Time: 2007-10-02 09:10:12

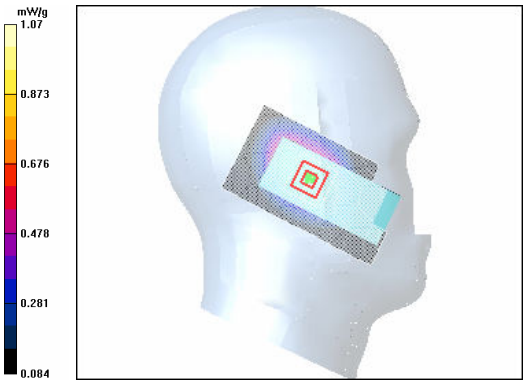
Test Laboratory: TCC Nokia
Type: RH-108; Serial: A00000011E70DB

Communication System: CDMA800
Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium: Cellular Head; Medium Notes: T=21.4C
Medium parameters used (interpolated): f = 848.31 MHz; σ = 0.903 mho/m; ε_r = 42; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1516; Probe Notes:
- ConvF(6.47, 6.47, 6.47); Calibrated: 2006-11-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 2007-02-16
- Phantom: SAM1; Type: Twin Phantom; Serial: TP-1035
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Right Cheek - High/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.10 mW/g

Right Cheek - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.4 V/m
Peak SAR (extrapolated) = 1.42 W/kg
SAR(1 g) = 0.987 mW/g
SAR(10 g) = 0.664 mW/g
Power Drift = -0.099 dB
Maximum value of SAR (measured) = 1.07 mW/g



Date/Time: 2007-10-01 15:30:17

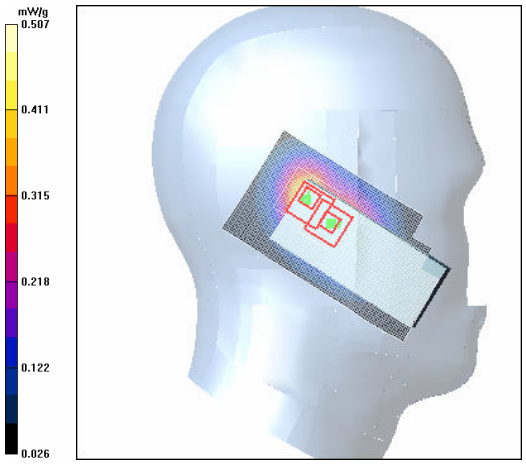
Test Laboratory: TCC Nokia
Type: RH-108; Serial: A00000011E70DB

Communication System: CDMA800
Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: Cellular Head; Medium Notes: T=21.4C
Medium parameters used: f = 837 MHz; σ = 0.896 mho/m; ε_r = 42.1; ρ = 1000 kg/m^3
Phantom section: Right Section
DASY4 Configuration:
- Probe: ET3DV6 - SN1516; Probe Notes:
- ConvF(6.47, 6.47, 6.47); Calibrated: 2006-11-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 2007-02-16
- Phantom: SAM1; Type: Twin Phantom; Serial: TP-1035
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Right Tilt - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.538 mW/g

Right Tilt - Middle/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.5 V/m
Peak SAR (extrapolated) = 0.689 W/kg
SAR(1 g) = 0.486 mW/g
SAR(10 g) = 0.330 mW/g
Power Drift = -0.253 dB
Maximum value of SAR (measured) = 0.524 mW/g

Right Tilt - Middle/Zoom Scan (7x7x7)/Cube 1: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 22.5 V/m
Peak SAR (extrapolated) = 0.776 W/kg
SAR(1 g) = 0.467 mW/g
SAR(10 g) = 0.301 mW/g
Power Drift = -0.253 dB
Maximum value of SAR (measured) = 0.507 mW/g



Date/Time: 2007-10-02 9:48:29

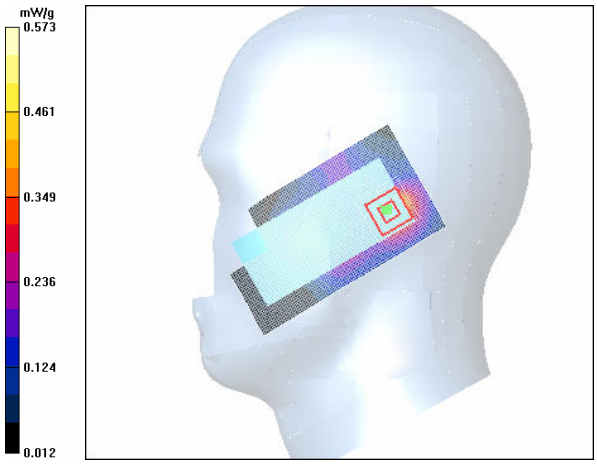
Test Laboratory: TCC Nokia
Type: RH-108; Serial: A00000011E70D6

Communication System: CDMA1900
Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900MHz Head; Medium Notes: T=20.4C
Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1504; Probe Notes:
- ConvF(5.09, 5.09, 5.09); Calibrated: 2007-08-29
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn308; Calibrated: 2007-02-16
- Phantom: SAM 2 ; Type: Twin Phantom; Serial: NMP03309
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left Cheek - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.546 mW/g

Left Cheek - Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 17.5 V/m
Peak SAR (extrapolated) = 0.781 W/kg
SAR(1 g) = 0.509 mW/g
SAR(10 g) = 0.289 mW/g
Power Drift = 0.076 dB
Maximum value of SAR (measured) = 0.573 mW/g



Date/Time: 2007-10-02 11:30:19

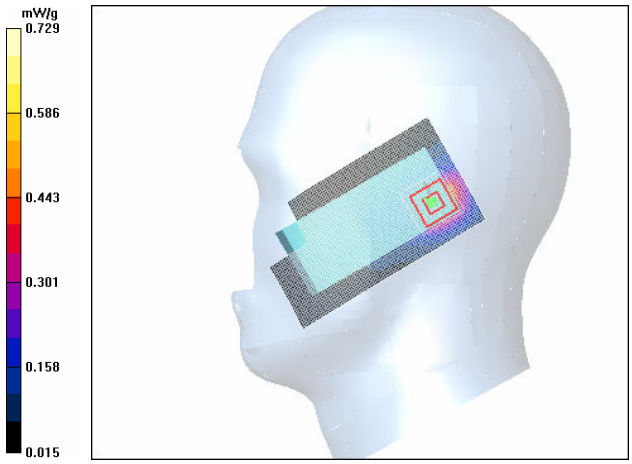
Test Laboratory: TCC Nokia
Type: RH-108; Serial: A00000011E70D6

Communication System: CDMA1900
Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900MHz Head; Medium Notes: T=20.4C
Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Phantom section: Left Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1504; Probe Notes:
- ConvF(5.09, 5.09, 5.09); Calibrated: 2007-08-29
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn308; Calibrated: 2007-02-16
- Phantom: SAM 2 ; Type: Twin Phantom; Serial: NMP03309
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Left Tilt - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.732 mW/g

Left Tilt - Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 19.7 V/m
Peak SAR (extrapolated) = 1.01 W/kg
SAR(1 g) = 0.646 mW/g
SAR(10 g) = 0.361 mW/g
Power Drift = 0.105 dB
Maximum value of SAR (measured) = 0.729 mW/g



Date/Time: 2007-10-02 12:18:28

Test Laboratory: TCC Nokia
Type: RH-108; Serial: A00000011E70D6

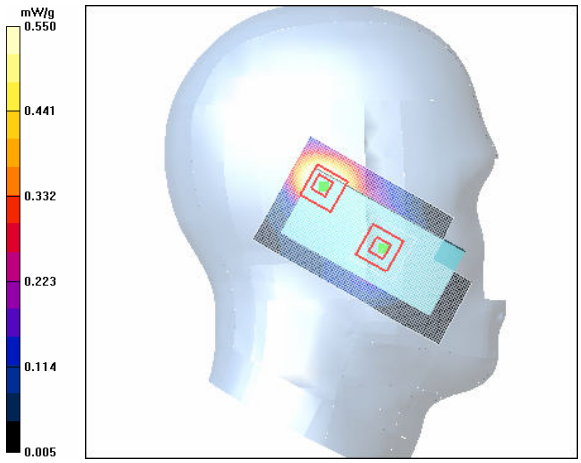
Communication System: CDMA1900
Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900MHz Head; Medium Notes: T=20.4C
Medium parameters used: f = 1880 MHz; σ = 1.41 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1504; Probe Notes:
- ConvF(5.09, 5.09, 5.09); Calibrated: 2007-08-29
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn308; Calibrated: 2007-02-16
- Phantom: SAM 2 ; Type: Twin Phantom; Serial: NMP03309
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Right Cheek - Middle/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.837 mW/g

Right Cheek - Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 18.1 V/m
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.801 mW/g
SAR(10 g) = 0.432 mW/g
Power Drift = -0.004 dB
Maximum value of SAR (measured) = 0.913 mW/g

Right Cheek - Middle/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 18.1 V/m
Peak SAR (extrapolated) = 0.660 W/kg
SAR(1 g) = 0.495 mW/g
SAR(10 g) = 0.300 mW/g
Power Drift = -0.004 dB
Maximum value of SAR (measured) = 0.550 mW/g



Date/Time: 2007-10-02 13:12:46

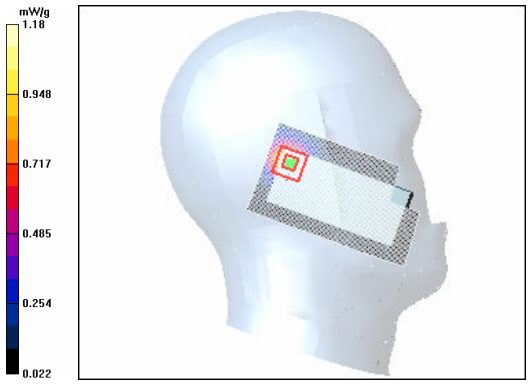
Test Laboratory: TCC Nokia
Type: RH-108; Serial: A00000011E70D6

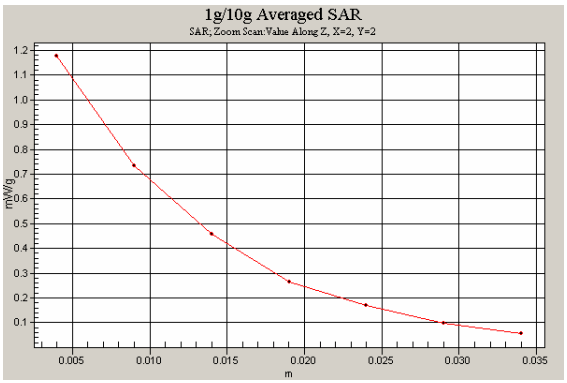
Communication System: CDMA1900
Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium: 1900MHz Head; Medium Notes: T=20.5C
Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.39 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Phantom section: Right Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1504; Probe Notes:
- ConvF(5.09, 5.09, 5.09); Calibrated: 2007-08-29
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn308; Calibrated: 2007-02-16
- Phantom: SAM 2 ; Type: Twin Phantom; Serial: NMP03309
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Right Tilt - Low/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.13 mW/g

Right Tilt - Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 25.8 V/m
Peak SAR (extrapolated) = 1.84 W/kg
SAR(1 g) = 1.07 mW/g
SAR(10 g) = 0.573 mW/g
Power Drift = -0.100 dB
Maximum value of SAR (measured) = 1.18 mW/g





Date/Time: 2007-10-02 14:01:17

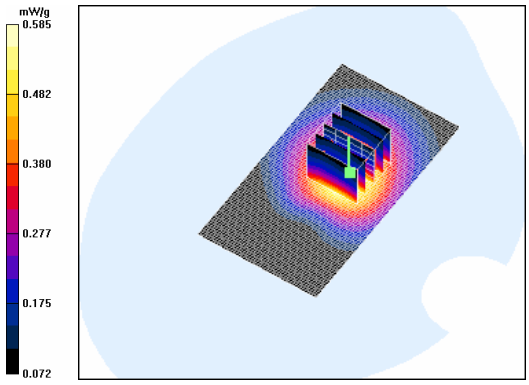
Test Laboratory: TCC Nokia
Type: RH-108; Serial: A00000011E70DB

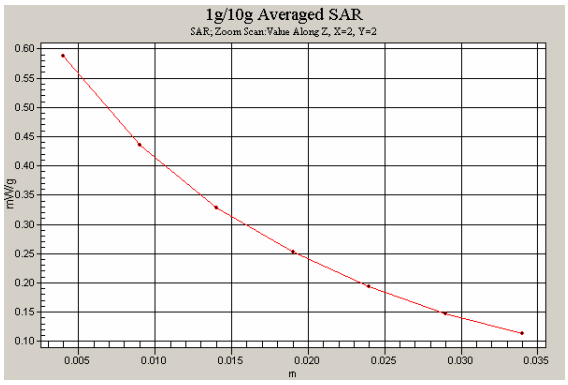
Communication System: CDMA800
Frequency: 824.7 MHz; Duty Cycle: 1:1
Medium: Cellular Body; Medium Notes: T= 21.3 C
Medium parameters used: f = 825 MHz; σ = 0.978 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1516; Probe Notes:
- ConvF(6.31, 6.31, 6.31); Calibrated: 2006-11-21
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 2007-02-16
- Phantom: SAM2; Type: Twin Phantom; Serial: TP-1279
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body – Low/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.570 mW/g

Body – Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.3 V/m
Peak SAR (extrapolated) = 0.714 W/kg
SAR(1 g) = 0.548 mW/g
SAR(10 g) = 0.393 mW/g
Power Drift = 0.147 dB
Maximum value of SAR (measured) = 0.585 mW/g





Date/Time: 2007-10-03 10:28:07

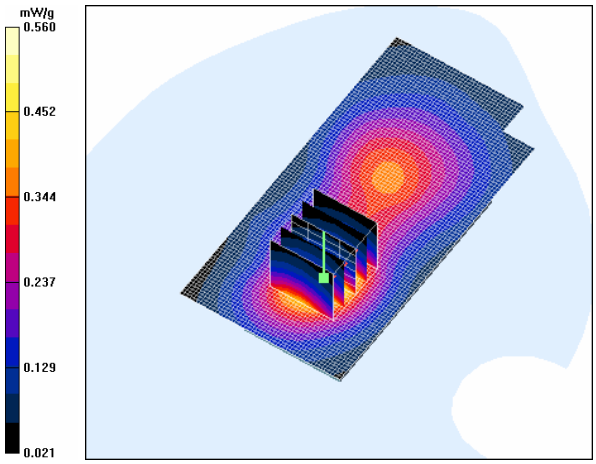
Test Laboratory: TCC Nokia
Type: RH-108; Serial: A00000011E70D6

Communication System: CDMA1900
Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium: 1900MHz Body; Medium Notes: 20.8C
Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.47 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1504; Probe Notes:
- ConvF(4.6, 4.6, 4.6); Calibrated: 2007-08-29
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn308; Calibrated: 2007-02-16
- Phantom: SAM 3; Type: Twin Phantom; Serial: NMP03311
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body – Low/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.584 mW/g

Body – Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 19.8 V/m
Peak SAR (extrapolated) = 0.747 W/kg
SAR(1 g) = 0.517 mW/g
SAR(10 g) = 0.328 mW/g
Power Drift = -0.055 dB
Maximum value of SAR (measured) = 0.560 mW/g



Date/Time: 2007-10-03 11:24:38

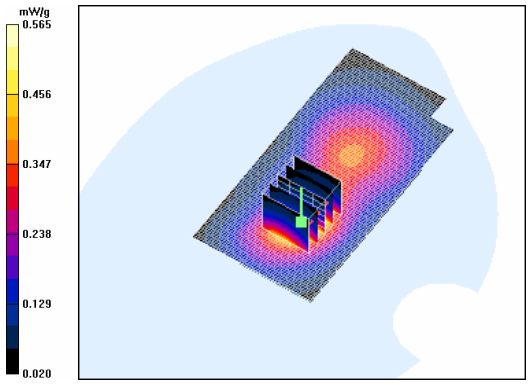
Test Laboratory: TCC Nokia
Type: RH-108; Serial: A00000011E70D6

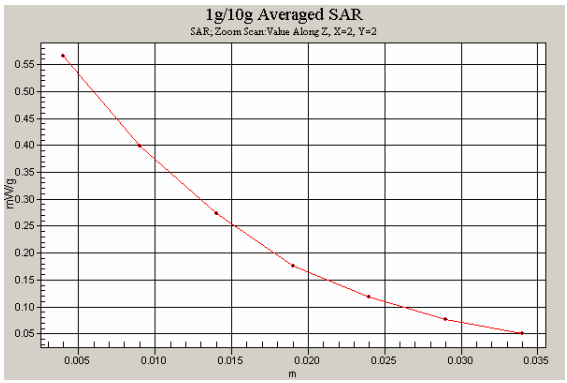
Communication System: CDMA1900
Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium: 1900MHz Body; Medium Notes: 20.6C
Medium parameters used (interpolated): f = 1851.25 MHz; σ = 1.47 mho/m; ε_r = 53.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: ET3DV6 - SN1504; Probe Notes:
- ConvF(4.6, 4.6, 4.6); Calibrated: 2007-08-29
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn308; Calibrated: 2007-02-16
- Phantom: SAM 3; Type: Twin Phantom; Serial: NMP03311
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body – Low – HS9/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 0.583 mW/g

Body – Low – HS9/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 19.3 V/m
Peak SAR (extrapolated) = 0.763 W/kg
SAR(1 g) = 0.525 mW/g
SAR(10 g) = 0.334 mW/g
Power Drift = 0.046 dB
Maximum value of SAR (measured) = 0.565 mW/g





APPENDIX C: 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 Federal Office of Metrology and Accreditation
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 SD TCC

Certificate No: ET3-1504_Aug07

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1504
Calibration procedure(s)	QA CAL-01.v6 Calibration procedure for dosimetric E-field probes
Calibration date:	August 29, 2007
Condition of the calibrated item	In Tolerance

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)

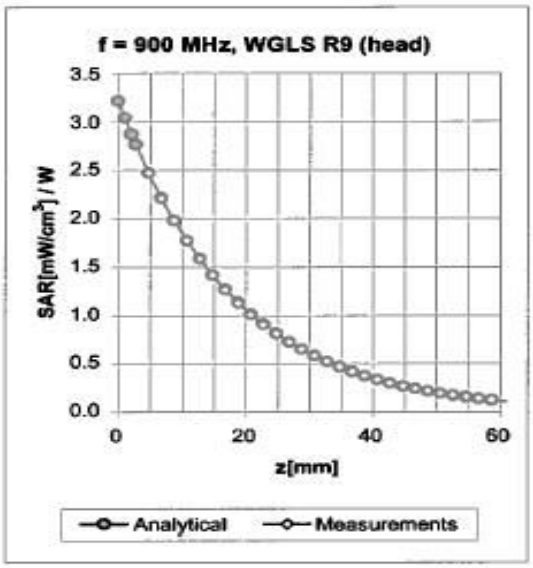
Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41495277	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41498087	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (METAS, No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-07 (METAS, No. 217-00671)	Mar-08
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (METAS, No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	4-Jan-07 (SPEAG, No. ES3-3013_Jan07)	Jan-08
DAE4	SN: 654	20-Apr-07 (SPEAG, No. DAE4-654_Apr07)	Apr-08

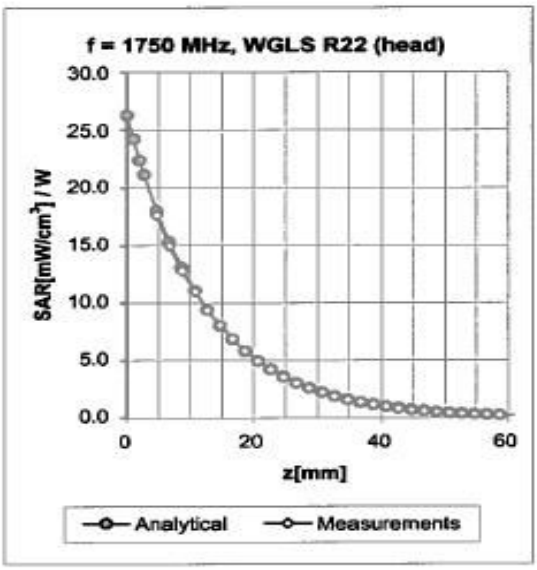
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: August 29, 2007

Conversion Factor Assessment





f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 99	Head	41.5 ± 5%	0.90 ± 5%	0.38	2.40	6.52 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.31	2.63	6.40 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.53	2.60	5.25 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.59	2.50	5.09 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.80	1.73	4.63 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.36	2.46	6.27 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.32	2.84	6.00 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.61	2.63	4.78 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.74	2.36	4.60 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.71	2.12	4.02 ± 11.8% (k=2)

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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

Accredited by the Swiss Federal Office of Metrology and Accreditation
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 SD TCC**

Certificate No: ET3-1516_Nov06

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1516
Calibration procedure(s)	QA CAL-01.v5 Calibration procedure for dosimetric E-field probes
Calibration date:	November 21, 2006
Condition of the calibrated item	In Tolerance

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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41495277	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41498087	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-06 (METAS, No. 217-00592)	Aug-07
Reference 20 dB Attenuator	SN: S5086 (20b)	4-Apr-06 (METAS, No. 251-00558)	Apr-07
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-06 (METAS, No. 217-00593)	Aug-07
Reference Probe ES3DV2	SN: 3013	2-Jan-06 (SPEAG, No. ES3-3013_Jan06)	Jan-07
DAE4	SN: 654	21-Jun-06 (SPEAG, No. DAE4-654_Jun06)	Jun-07

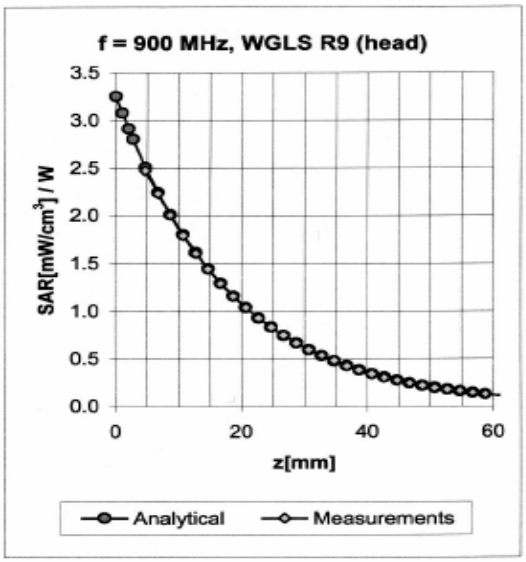
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

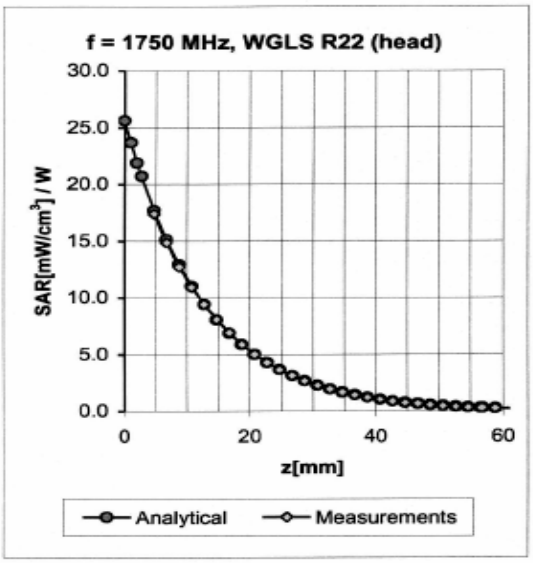
	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: November 22, 2006

ET3DV6 SN:1516 **November 21, 2006**

Conversion Factor Assessment





f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.35	2.47	6.47 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.32	2.61	6.41 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.55	2.50	5.16 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.56	2.48	4.91 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.80	1.81	4.38 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.35	2.64	6.31 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.41	2.56	6.19 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.64	2.56	4.60 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.72	2.26	4.51 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.79	1.84	4.27 ± 11.8% (k=2)

[C] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.