

SAR Compliance Test Report

Test report no.:	WR1124.301_V2	Date of report:	2006-06-15
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Testing laboratory:	TCC, Dallas Nokia, Inc. 6021 Connection Drive Irving, TX 75039, USA Tel. +1 972 894 5000 Fax +1 972 894 4988	Client:	Nokia Mobile Phones, Inc. 12278 Scripps Summit Drive San Diego, CA 92131, USA Tel. +1 858 831 5000 Fax. +1858 831 6500
Responsible test engineer:	Anu Balijepalli	Product contact person:	Mario Murillo
Measurements made by:	B Alexander, A Balijepalli		

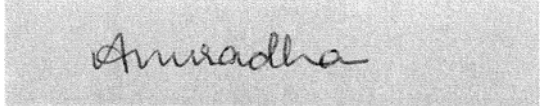
Tested device:	RM-155
FCC ID:	QMNRM-155
IC:	NA

Supplement reports:	Test Set-up Photos for RM-155 SAR Compliance Test Report, WR1124.303_V1
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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 Techniques
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Documentation:	The documentation of the testing performed on the tested devices is archived for 15 years at TCC Dallas.
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Test results:	The tested device complies with the requirements in respect of all parameters subject to the test. The test results and statements relate only to the items tested. The test report shall not be reproduced except in full, without written approval of the laboratory.
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Date and signatures:	2006-06-15
For the contents:	 Anu Balijepalli Test Engineer  Nerina Walton Lab Manager

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1. SUMMARY OF SAR TEST REPORT

1.1 Test Details

Period of test	2006-05-24 to 2006-06-02
SN, HW and SW numbers of tested device	026/01186372, 3001, V PR100_05w21_46.nbp
Batteries used in testing	BL-5B
Headsets used in testing	HS-9, HS-3
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
CDMA 800	777/848.31	23.3 dBm	Right, Cheek	1.16 W/kg	1.30 W/kg	1.6 W/kg	PASSED
CDMA 1900	25/1851.25	23.0 dBm	Left, Cheek	1.10 W/kg	1.23 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
CDMA 800	777/848.31	23.3 dBm	2.2 cm	0.68 W/kg	0.76 W/kg	1.6 W/kg	PASSED
CDMA 1900	1175/1908.75	23.0 dBm	2.2 cm	0.39 W/kg	0.44 W/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	0.38 dB

1.2.4 Measurement Uncertainty

Expanded Uncertainty (k=2) 95%	$\pm 25.8\%$
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2. DESCRIPTION OF THE DEVICE UNDER TEST

Device category	Portable
Exposure environment	General population / uncontrolled

Modes and Bands of Operation	CDMA 800 / 1900	BT
Modulation Mode	QPSK	GFSK
Duty Cycle	1	
Transmitter Frequency Range (MHz)	824 – 849 1850 - 1910	2402-2480

2.1 Description of the Antenna

The device has a stubby antenna.

3. TEST CONDITIONS

3.1 Temperature and Humidity

Ambient temperature (°C):	20.0 to 25.0
Ambient humidity (RH %):	45 to 65

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.

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 V1	389	12 months	2007-01
E-field Probe ET3DV6	1801	12 months	2007-01
Dipole Validation Kit, D835V2	486	24 months	2007-01
Dipole Validation Kit, D1900V2	504	24 months	2007-07
DASY4 software	Version 4.6	-	-

Additional test equipment used in testing:

Test Equipment	Model	Serial Number	Calibration interval	Calibration expiry
Signal Generator	SME03	DE15555	12 months	2006-08
Amplifier	AR 551G2	25583	-	-
Power Meter	Boonton 4232A	64701	12 months	2006-09
Power Sensor	Boonton 51015	32137	12 months	2006-09
Power Sensor	Boonton 51015	32188	12 months	2006-09
Call Tester	R&S CMU200	10624	12 months	2007-02
Call Tester	R&S CMU200	8326	12 months	2006-09
Vector Network Analyzer	Agilent 8753ES	US39174327	12 months	2006-06
Dielectric Probe Kit	Agilent 85070D	US11400325380	-	-

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 μ W/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
Application	Distance from probe tip to dipole centers: 2.7 mm 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 checking 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 $\pm 5\%$ 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 recipes were used for Head and Body tissue simulants:

800MHz band

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

1900MHz band

Ingredient	Head (% by weight)	Body (% by weight)
Deionised Water	54.88	69.02
Butyl Diglycol	44.91	30.76
Salt	0.21	0.22

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]	
835	Reference result	2.25	42.0	0.91	
	± 10% window	2.02 - 2.48			
	2006-05-24	2.47	42.4	0.91	20.7
1900	Reference result	10.1	38.7	1.47	
	± 10% window	9.1 - 11.1			
	2006-06-02	10.9	39.5	1.46	20.3

System checking, body tissue simulant

f [MHz]	Description	SAR [W/kg], 1g	Dielectric Parameters		Temp [°C]
			ϵ_r	σ [S/m]	
835	Reference result	2.43	54.9	1.01	
	± 10% window	2.19 - 2.67			
	2006-05-25	2.57	55.5	0.99	20.8
1900	Reference result	9.71	53.3	1.60	
	± 10% window	8.74 - 10.68			
	2006-05-30	10.1	51.6	1.57	21.7

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]	
836	Recommended value	41.5	0.90	20.7
	$\pm 5\%$ window	39.4 – 43.6	0.86 – 0.95	
	2006-05-24	42.4	0.91	
1880	Recommended value	40.0	1.40	20.3
	$\pm 5\%$ window	38.0 – 42.0	1.33 – 1.47	
	2006-06-02	39.6	1.44	

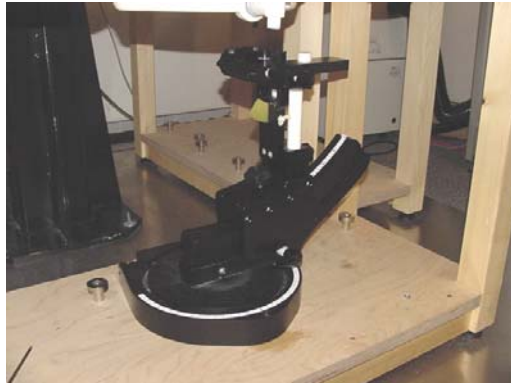
Body tissue simulant measurements

f [MHz]	Description	Dielectric Parameters		Temp [°C]
		ϵ_r	σ [S/m]	
836	Recommended value	55.2	0.97	20.8
	$\pm 5\%$ window	52.4 – 58.0	0.92 – 1.02	
	2006-05-25	55.5	0.99	
1880	Recommended value	53.3	1.52	21.7
	$\pm 5\%$ window	50.6 – 56.0	1.44 – 1.60	
	2006-05-30	51.7	1.55	

5. DESCRIPTION OF THE TEST PROCEDURE

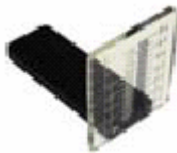
5.1 Device Holder

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 the photo below 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	G_i	$G_i \cdot U_i$ (%)	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.

CDMA800 Head 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
Power			23.3 dBm	23.2 dBm	23.3 dBm
Flip Open	Left	Cheek	0.89	1.02	1.12
		Tilt	-	0.35	-
	Right	Cheek	0.82	1.03	1.16
		Tilt	-	0.33	-
Flip Open	Right Cheek, BT Active		-	-	1.11

CDMA1900 Head SAR results

Option used	Test configuration		SAR, averaged over 1g (W/kg)		
			Ch 25 1851.25MHz	Ch 600 1880.00MHz	Ch 1175 1908.75MHz
Power			23.0 dBm	23.1 dBm	23.0 dBm
Flip Open	Left	Cheek	1.10	1.04	1.06
		Tilt	-	0.78	-
	Right	Cheek	1.09	1.04	0.99
		Tilt	0.85	0.80	0.79
Flip Open	Left Cheek, BT Active		0.91	-	-

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

CDMA800 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
Power		23.3 dBm	23.2 dBm	23.3 dBm
Flip Closed	Without headset	0.44	0.57	0.68
	Headset HS-9	-	0.48	-
	Headset HS-3	-	0.30	-
Flip Closed	Without headset, BT Active	-	-	0.68

CDMA1900 Body SAR results

Option used	Test configuration	SAR, averaged over 1g (W/kg)		
		Ch 25 1851.25MHz	Ch 600 1880.00MHz	Ch 1175 1908.75MHz
Power		23.0 dBm	23.1 dBm	23.0 dBm
Flip Closed	Without headset	0.28	0.35	0.39
	Headset HS-9	-	0.27	-
	Headset HS-3	-	0.33	-
Flip Closed	Without headset, BT Active	-	-	0.37

Plots of the Measurement scans are given in Appendix B.

APPENDIX A: SYSTEM CHECKING SCANS

Date/Time: 2006-05-24 10:15:10 AM

Test Laboratory: TCC Dallas

835MHz Head System Check

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.906 \text{ mho/m}$; $\epsilon_r = 42.4$; $\rho = 1000 \text{ kg/m}^3$

Liquid Temperature: 20.7

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(6.28, 6.28, 6.28); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM1 Cellular Head; Phantom section: Flat Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

System Check/Area Scan (71x71x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.64 mW/g

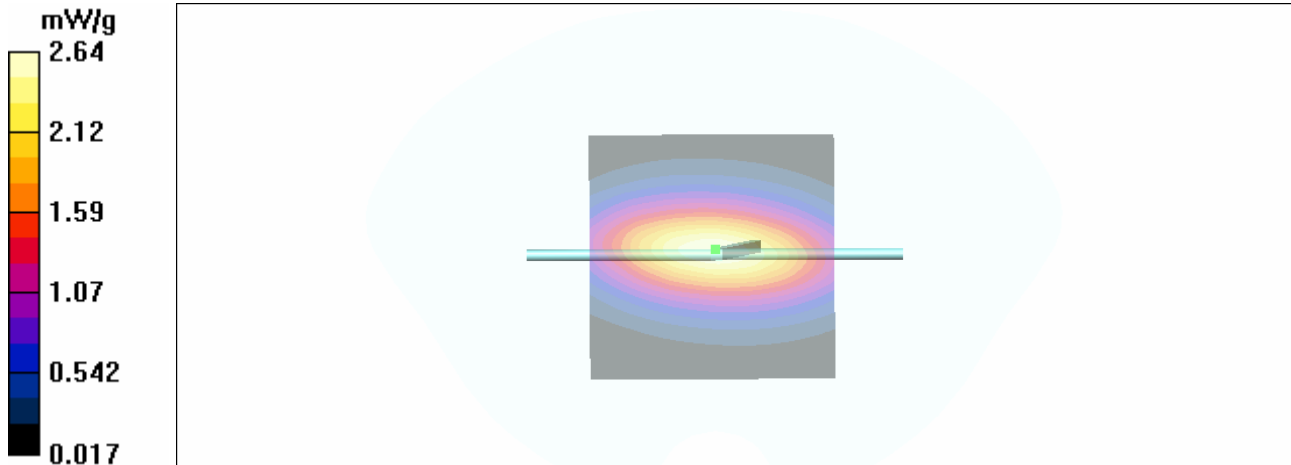
System Check/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 56.3 V/m; Power Drift = -0.026 dB

Peak SAR (extrapolated) = 3.72 W/kg

SAR(1 g) = 2.47 mW/g; SAR(10 g) = 1.61 mW/g

Maximum value of SAR (measured) = 2.66 mW/g



Date/Time: 2006-06-02 6:46:39 AM

Test Laboratory: TCC Dallas

1900MHz Head System Check

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.46 \text{ mho/m}$; $\epsilon_r = 39.5$; $\rho = 1000 \text{ kg/m}^3$

Liquid Temperature: 20.3

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(4.84, 4.84, 4.84); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM3 PCS Head and Body; Phantom section: Flat Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

System Check/Area Scan (71x71x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 13.0 mW/g

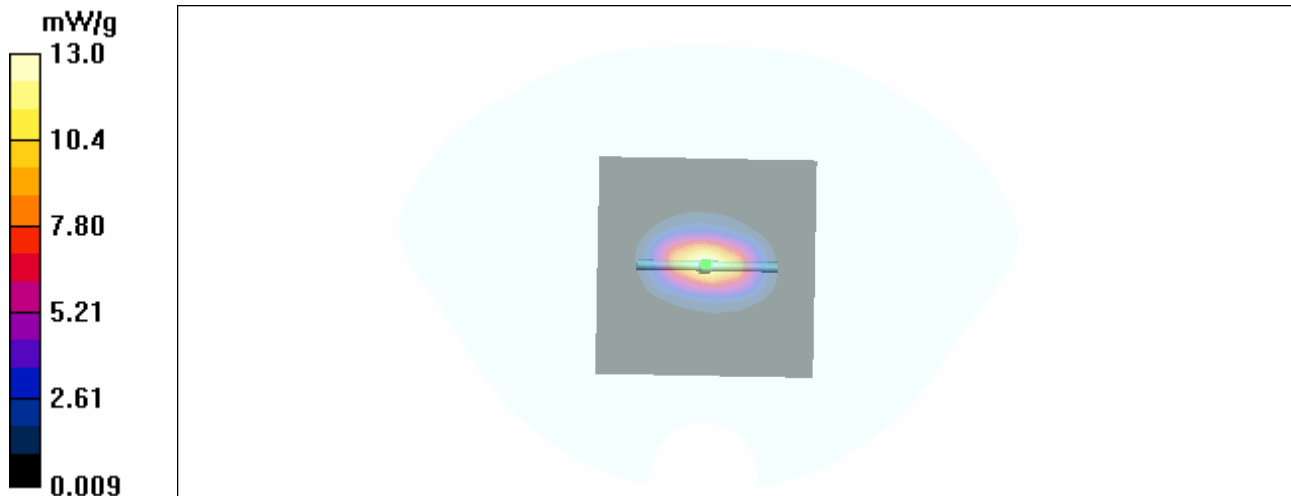
System Check/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 94.2 V/m; Power Drift = 0.018 dB

Peak SAR (extrapolated) = 21.4 W/kg

SAR(1 g) = 10.9 mW/g; SAR(10 g) = 5.56 mW/g

Maximum value of SAR (measured) = 12.3 mW/g



Date/Time: 2006-05-25 11:48:00 AM

Test Laboratory: TCC Dallas

835MHz Body System Check

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.987 \text{ mho/m}$; $\epsilon_r = 55.5$; $\rho = 1000 \text{ kg/m}^3$

Liquid Temperature: 20.8

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(6.02, 6.02, 6.02); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM2 Cellular Body; Phantom section: Flat Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

System Check/Area Scan (71x71x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 2.75 mW/g

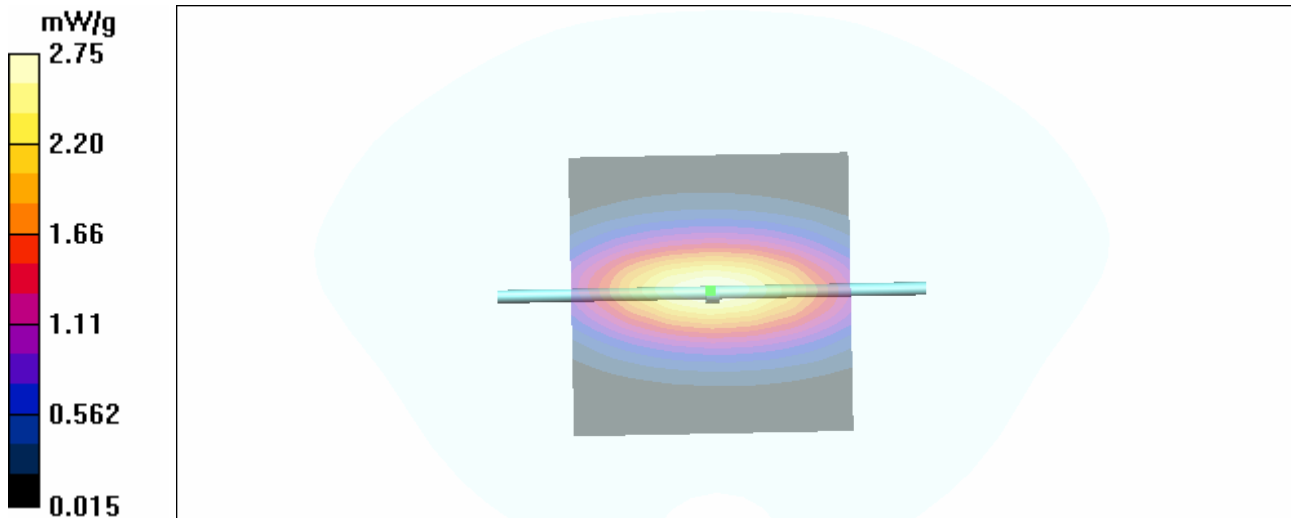
System Check/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 54.8 V/m; Power Drift = 0.033 dB

Peak SAR (extrapolated) = 3.76 W/kg

SAR(1 g) = 2.57 mW/g; SAR(10 g) = 1.69 mW/g

Maximum value of SAR (measured) = 2.76 mW/g



Date/Time: 2006-05-30 9:53:22 AM

Test Laboratory: TCC Dallas

1900MHz Body System Check

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.57$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Liquid Temperature: 21.7

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(4.33, 4.33, 4.33); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM3 PCS Head and Body; Phantom section: Flat Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

System Check/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 89.0 V/m; Power Drift = -0.003 dB

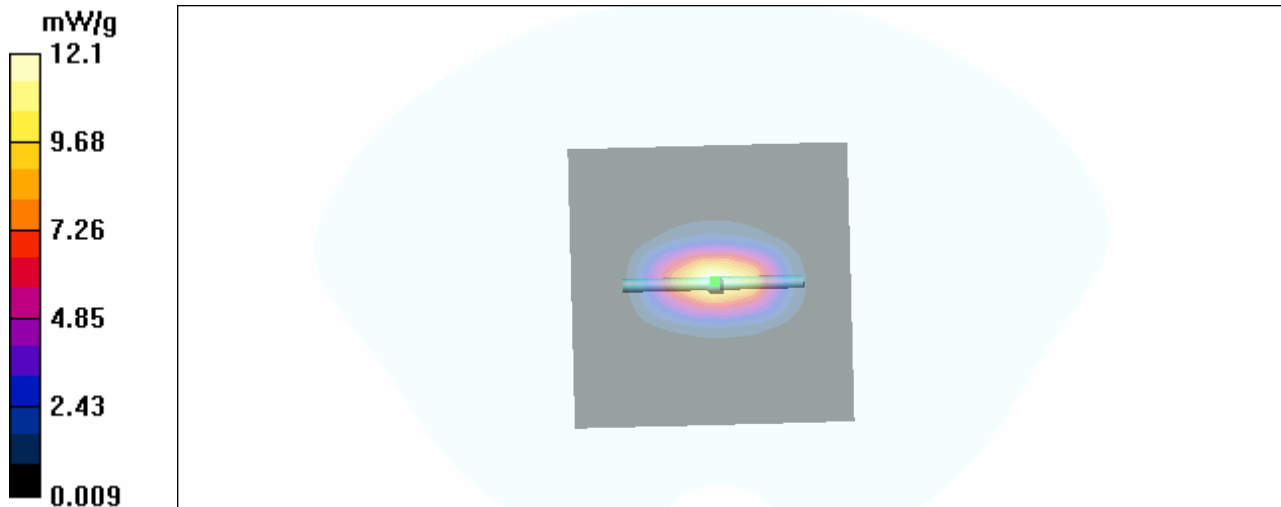
Peak SAR (extrapolated) = 18.6 W/kg

SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.23 mW/g

Maximum value of SAR (measured) = 11.4 mW/g

System Check/Area Scan (71x71x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 12.1 mW/g



APPENDIX B: MEASUREMENT SCANS

Date/Time: 2006-05-24 4:58:44 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 800, Channel 777, Left Cheek Position with BL-5B Battery, Flip Open Position

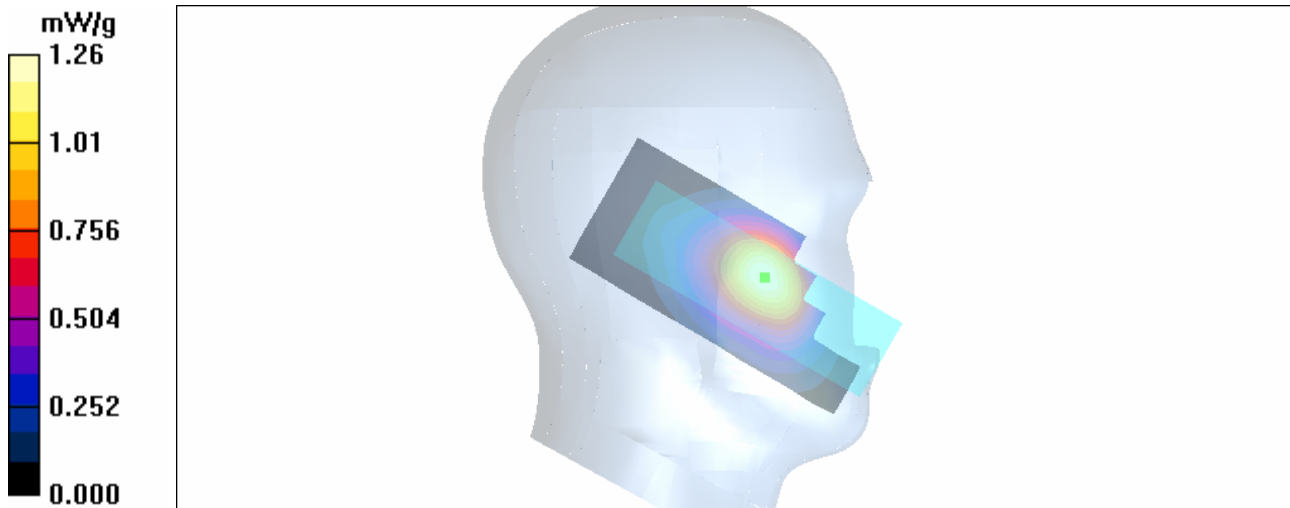
Communication System: CDMA800; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 848.5$ MHz; $\sigma = 0.919$ mho/m; $\epsilon_r = 42.2$; $\rho = 1000$ kg/m³
Liquid Temperature: 20.7

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(6.28, 6.28, 6.28); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM1 Cellular Head; Phantom section: Left Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Left Cheek/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 1.26 mW/g

Left Cheek/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.4 V/m; Power Drift = -0.292 dB
Peak SAR (extrapolated) = 1.56 W/kg
SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.771 mW/g
Maximum value of SAR (measured) = 1.21 mW/g



Date/Time: 2006-05-24 1:15:36 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 800, Channel 384, Left Tilt Position with BL-5B Battery, Flip Open Position

Communication System: CDMA800; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.908$ mho/m; $\epsilon_r = 42.3$; $\rho = 1000$ kg/m³

Liquid Temperature: 20.7

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(6.28, 6.28, 6.28); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM1 Cellular Head; Phantom section: Left Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Left Tilt/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.0 V/m; Power Drift = -0.054 dB

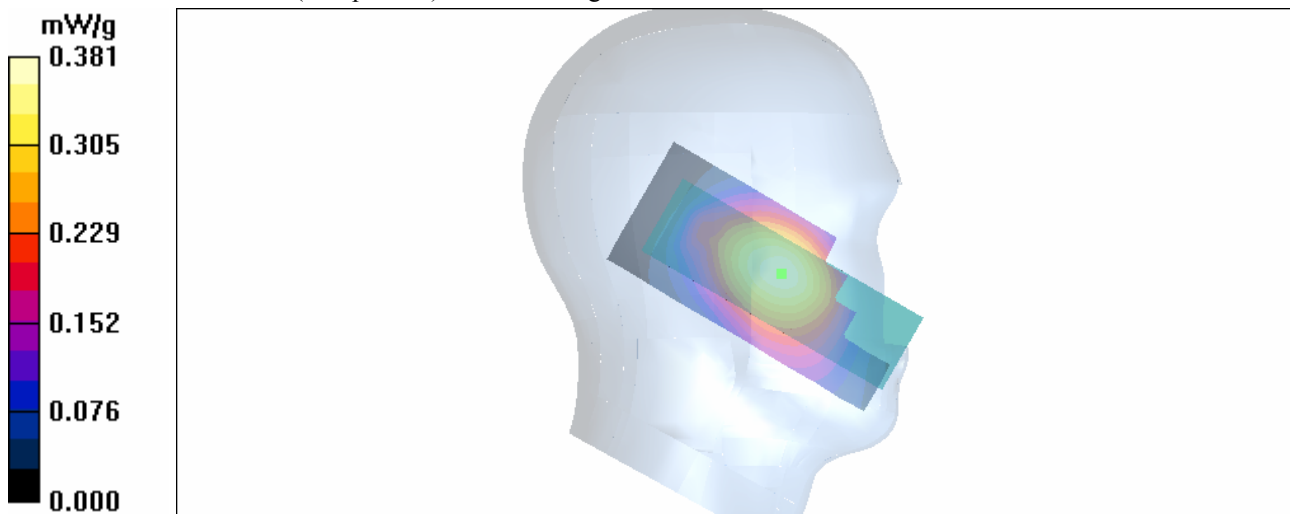
Peak SAR (extrapolated) = 0.460 W/kg

SAR(1 g) = 0.354 mW/g; SAR(10 g) = 0.264 mW/g

Maximum value of SAR (measured) = 0.373 mW/g

Left Tilt/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.381 mW/g



Date/Time: 2006-05-24 4:01:47 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 800, Channel 777, Right Cheek Position with BL-5B Battery, Flip Open Position

Communication System: CDMA800; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 848.5$ MHz; $\sigma = 0.919$ mho/m; $\epsilon_r = 42.2$; $\rho = 1000$ kg/m³
Liquid Temperature: 20.7

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(6.28, 6.28, 6.28); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM1 Cellular Head; Phantom section: Right Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Right Cheek/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.1 V/m; Power Drift = -0.071 dB

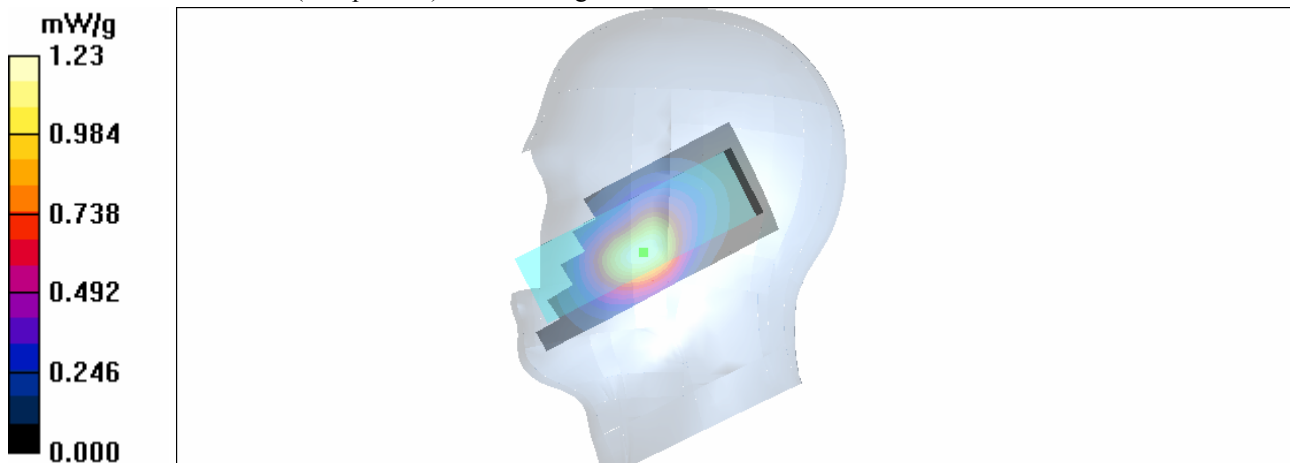
Peak SAR (extrapolated) = 1.63 W/kg

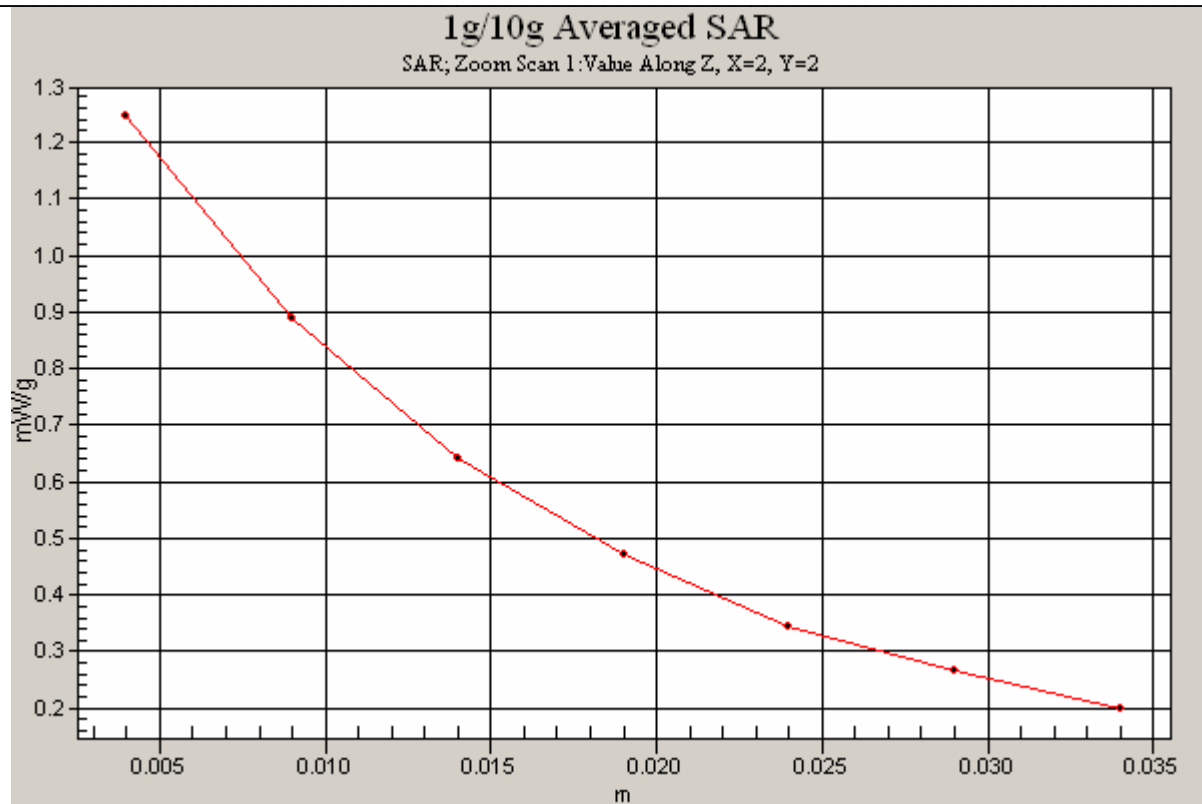
SAR(1 g) = 1.16 mW/g; SAR(10 g) = 0.783 mW/g

Maximum value of SAR (measured) = 1.25 mW/g

Right Cheek/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.23 mW/g





Date/Time: 2006-05-24 3:16:57 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 800, Channel 384, Right Tilt Position with BL-5B Battery, Flip Open Position

Communication System: CDMA800; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.908$ mho/m; $\epsilon_r = 42.3$; $\rho = 1000$ kg/m³

Liquid Temperature: 20.7

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(6.28, 6.28, 6.28); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM1 Cellular Head; Phantom section: Right Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Right Tilt/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.6 V/m; Power Drift = 0.040 dB

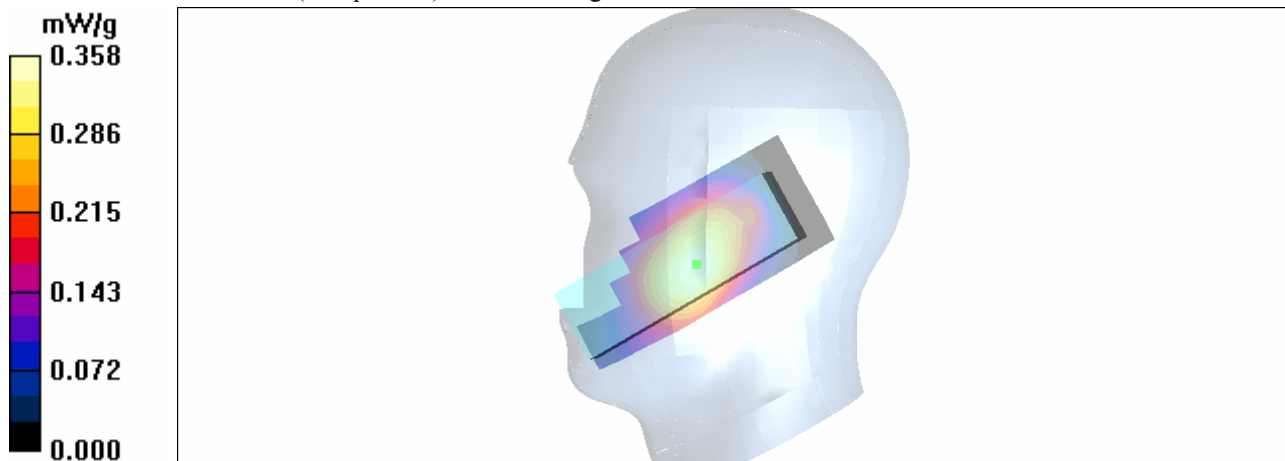
Peak SAR (extrapolated) = 0.432 W/kg

SAR(1 g) = 0.334 mW/g; SAR(10 g) = 0.250 mW/g

Maximum value of SAR (measured) = 0.349 mW/g

Right Tilt/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.358 mW/g



Date/Time: 2006-05-24 5:46:37 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 800, Channel 777, Right Cheek Position with BL-5B Battery, Flip Open Position with BTActive

Communication System: CDMA800; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 848.5$ MHz; $\sigma = 0.919$ mho/m; $\epsilon_r = 42.2$; $\rho = 1000$ kg/m³

Liquid Temperature: 20.7

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(6.28, 6.28, 6.28); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM1 Cellular Head; Phantom section: Right Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Right Cheek/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.22 mW/g

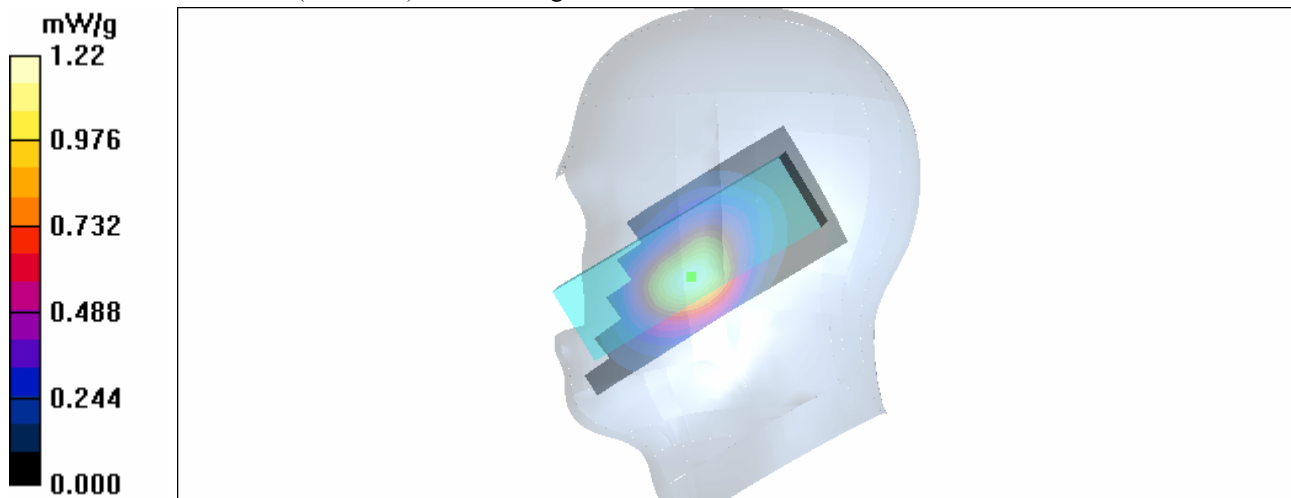
Right Cheek/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.2 V/m; Power Drift = -0.325 dB

Peak SAR (extrapolated) = 1.57 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.760 mW/g

Maximum value of SAR (measured) = 1.19 mW/g



Date/Time: 2006-06-02 9:42:53 AM

Test Laboratory: TCC Dallas

RM-155, CDMA 1900, Channel 25, Left Cheek Position with BL-5B Battery, Flip Open Position

Communication System: CDMA1900; Frequency: 1851.25 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Liquid Temperature: 20.3

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(4.84, 4.84, 4.84); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM3 PCS Head and Body; Phantom section: Left Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Left Cheek/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.1 V/m; Power Drift = 0.022 dB

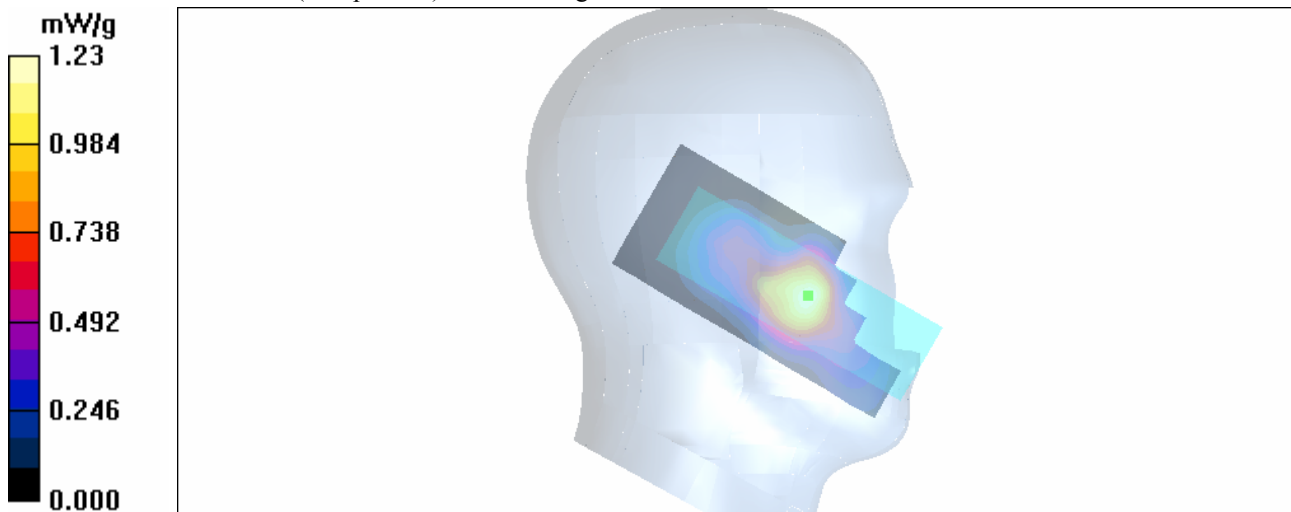
Peak SAR (extrapolated) = 2.03 W/kg

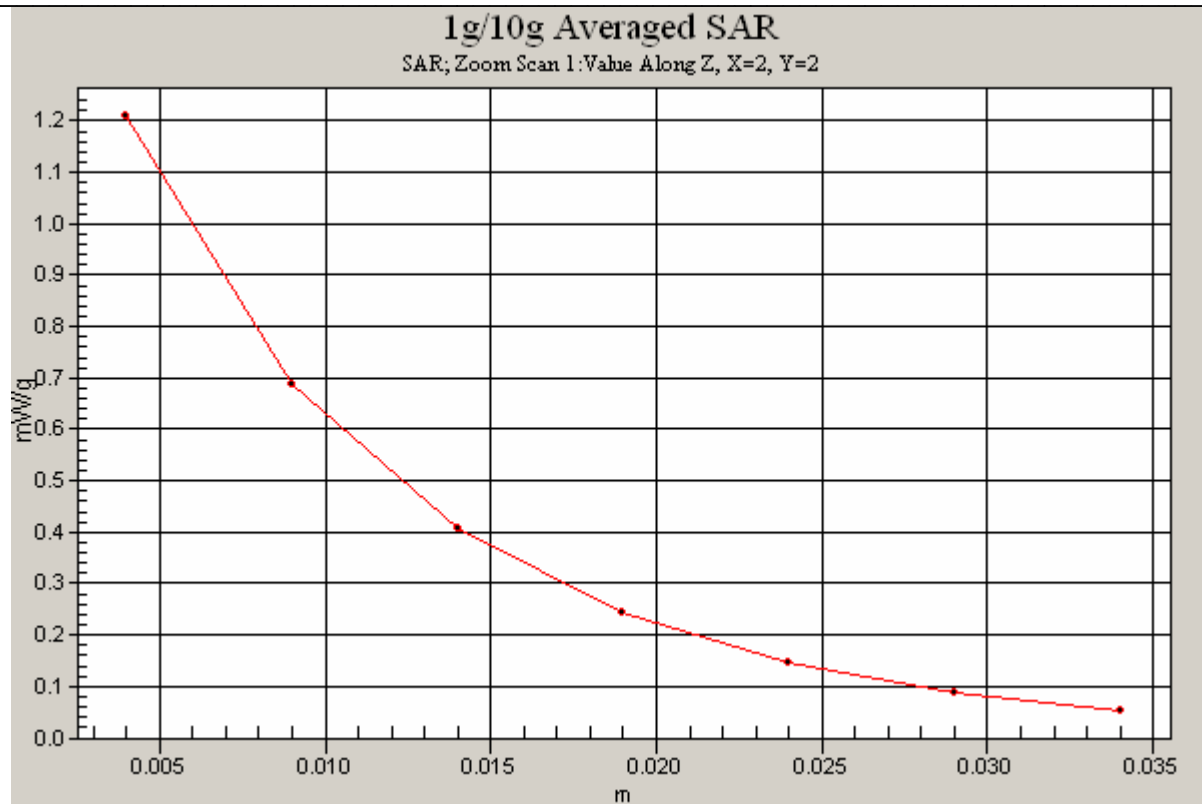
SAR(1 g) = 1.1 mW/g; SAR(10 g) = 0.635 mW/g

Maximum value of SAR (measured) = 1.21 mW/g

Left Cheek/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.23 mW/g





Date/Time: 2006-06-02 10:36:13 AM

Test Laboratory: TCC Dallas

RM-155, CDMA 1900, Channel 600, Left Tilt Position with BL-5B Battery, Flip Open Position

Communication System: CDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.44 \text{ mho/m}$; $\epsilon_r = 39.6$; $\rho = 1000 \text{ kg/m}^3$

Liquid Temperature: 20.3

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(4.84, 4.84, 4.84); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM3 PCS Head and Body; Phantom section: Left Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Left Tilt/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 17.2 V/m; Power Drift = 0.024 dB

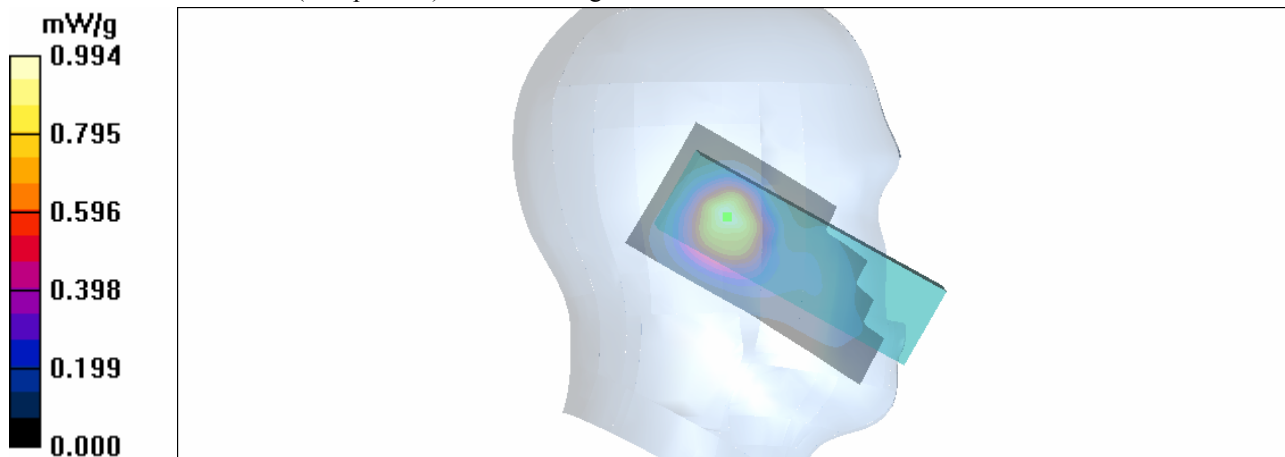
Peak SAR (extrapolated) = 1.21 W/kg

SAR(1 g) = 0.781 mW/g; SAR(10 g) = 0.492 mW/g

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

Left Tilt/Area Scan (51x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.994 mW/g



Date/Time: 2006-06-02 11:56:24 AM

Test Laboratory: TCC Dallas

RM-155, CDMA 1900, Channel 25, Right Cheek Position with BL-5B Battery, Flip Open Position

Communication System: CDMA1900; Frequency: 1851.25 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Liquid Temperature: 20.3

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(4.84, 4.84, 4.84); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM3 PCS Head and Body; Phantom section: Right Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Right Cheek/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 14.1 V/m; Power Drift = 0.088 dB

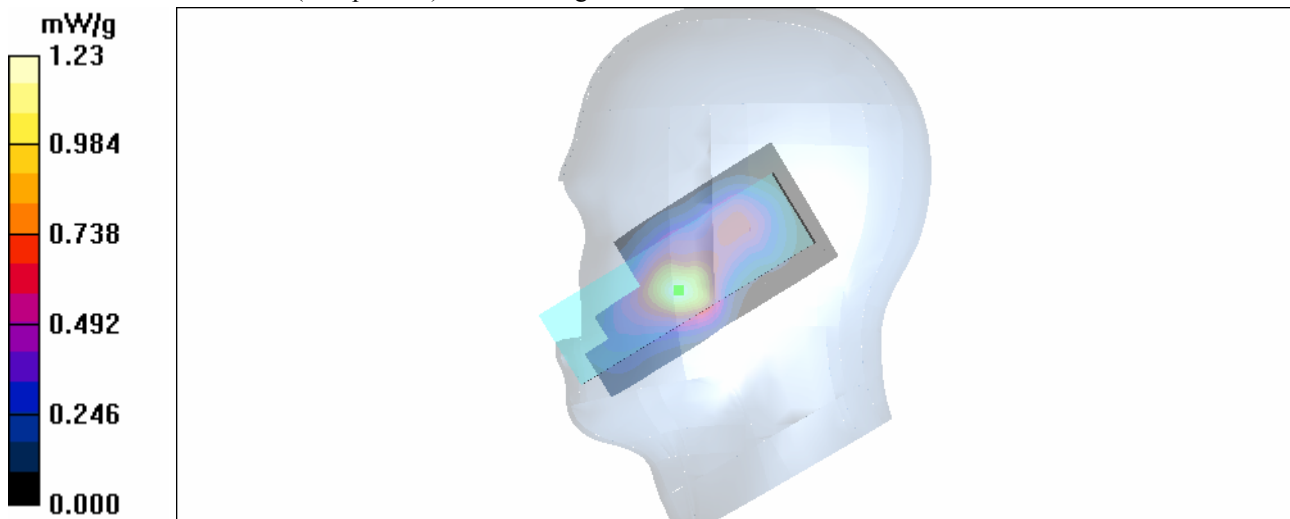
Peak SAR (extrapolated) = 1.84 W/kg

SAR(1 g) = 1.09 mW/g; SAR(10 g) = 0.629 mW/g

Maximum value of SAR (measured) = 1.18 mW/g

Right Cheek/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.23 mW/g



Date/Time: 2006-06-02 12:40:11 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 1900, Channel 25, Right Tilt Position with BL-5B Battery, Flip Open Position

Communication System: CDMA1900; Frequency: 1851.25 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Liquid Temperature: 20.3

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(4.84, 4.84, 4.84); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM3 PCS Head and Body; Phantom section: Right Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Right Tilt/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.6 V/m; Power Drift = -0.038 dB

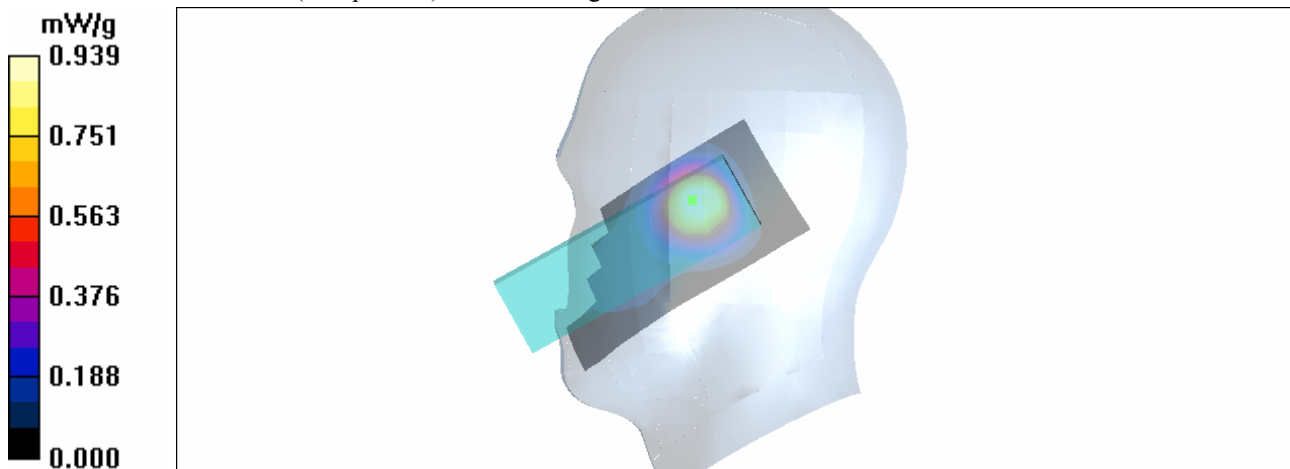
Peak SAR (extrapolated) = 1.36 W/kg

SAR(1 g) = 0.854 mW/g; SAR(10 g) = 0.522 mW/g

Maximum value of SAR (measured) = 0.927 mW/g

Right Tilt/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.939 mW/g



Date/Time: 2006-06-02 1:50:47 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 1900, Channel 25, Left Cheek Position with BL-5B Battery, Flip Open Position with BT Active

Communication System: CDMA1900; Frequency: 1851.25 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1851.25$ MHz; $\sigma = 1.41$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

Liquid Temperature: 20.3

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(4.84, 4.84, 4.84); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM3 PCS Head and Body; Phantom section: Left Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Left Cheek/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.46 V/m; Power Drift = -0.043 dB

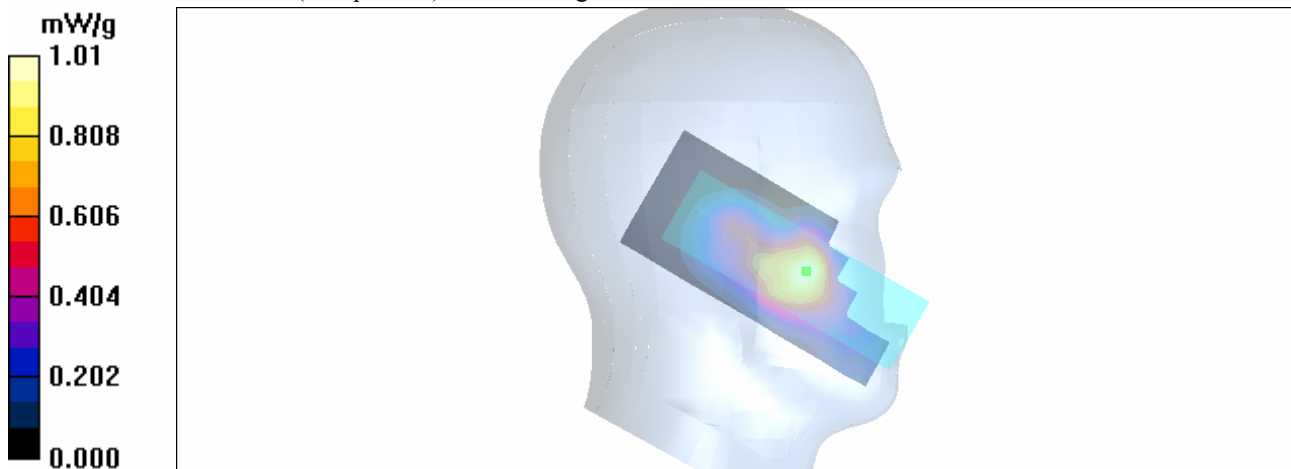
Peak SAR (extrapolated) = 1.66 W/kg

SAR(1 g) = 0.909 mW/g; SAR(10 g) = 0.518 mW/g

Maximum value of SAR (measured) = 1.01 mW/g

Left Cheek/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.01 mW/g



Date/Time: 2006-05-25 2:02:54 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 800, Channel 777, Body Position with 2.2cm Spacer with BL-5B Battery, Flip Closed Position

Communication System: CDMA800; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 848.5$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³
Liquid Temperature: 20.8

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(6.02, 6.02, 6.02); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM2 Cellular Body; Phantom section: Flat Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.2 V/m; Power Drift = -0.294 dB

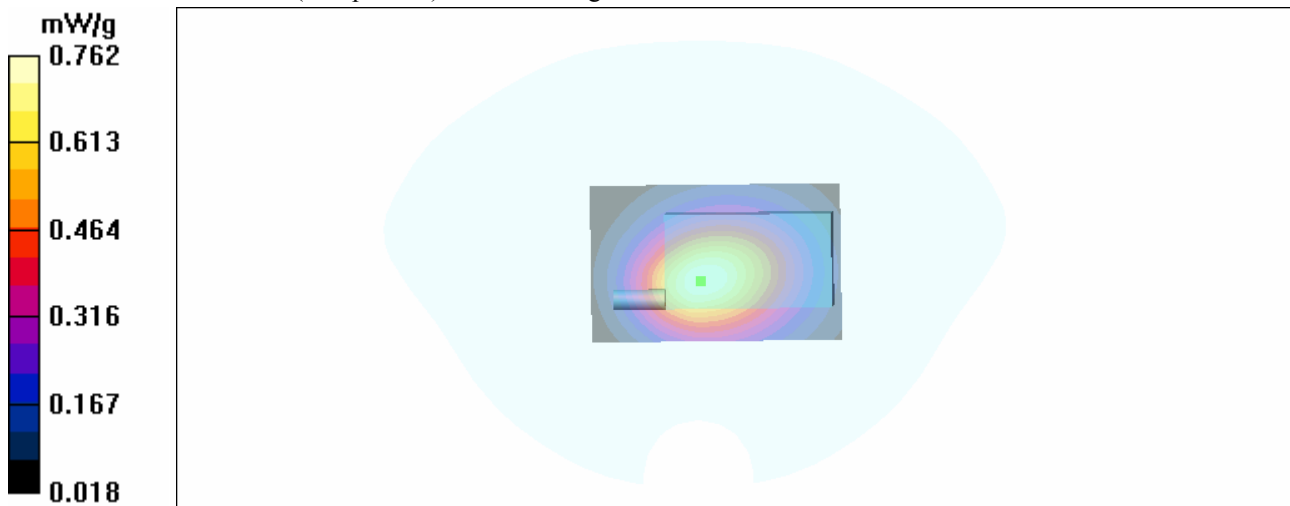
Peak SAR (extrapolated) = 0.899 W/kg

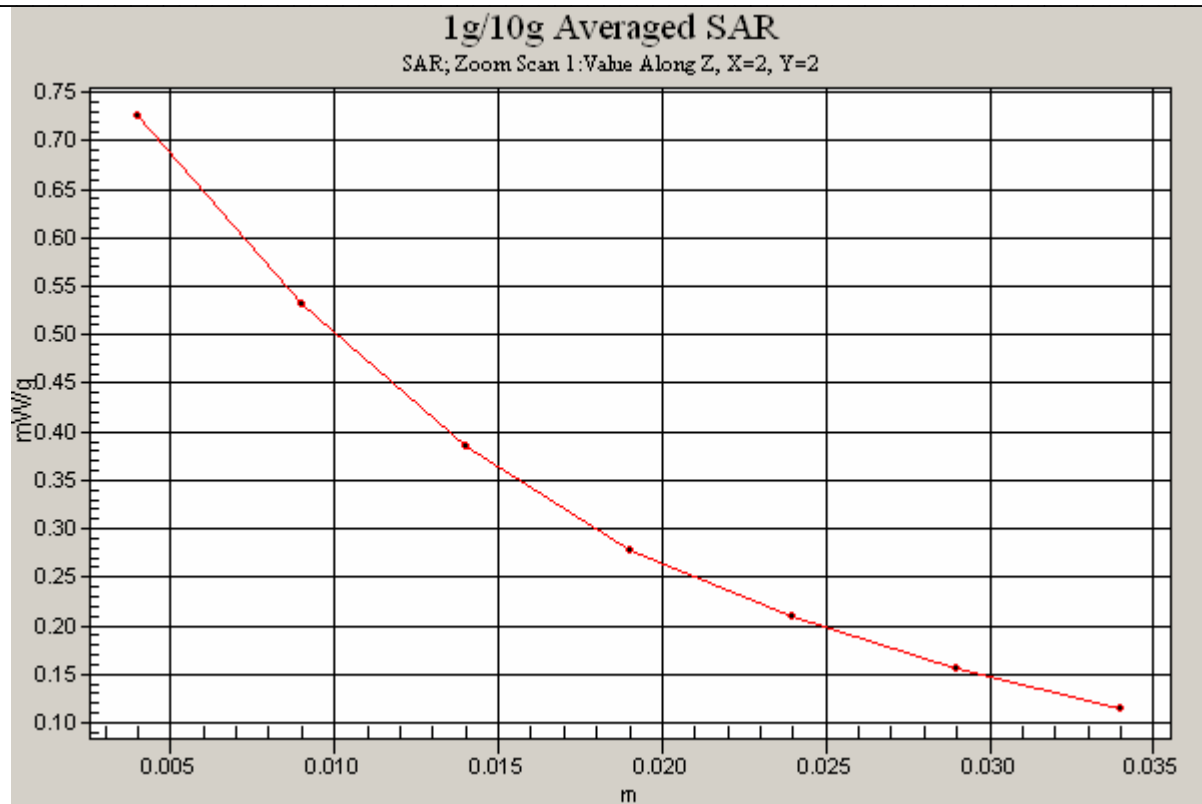
SAR(1 g) = 0.679 mW/g; SAR(10 g) = 0.478 mW/g

Maximum value of SAR (measured) = 0.725 mW/g

Body/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.762 mW/g





Date/Time: 2006-05-25 12:51:22 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 800, Channel 384, Body Position with 2.2cm Spacer with BL-5B Battery, Flip Closed Position, with HS-9 Headset

Communication System: CDMA800; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.989$ mho/m; $\epsilon_r = 55.5$; $\rho = 1000$ kg/m³

Liquid Temperature: 20.8

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(6.02, 6.02, 6.02); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM2 Cellular Body; Phantom section: Flat Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.8 V/m; Power Drift = 0.070 dB

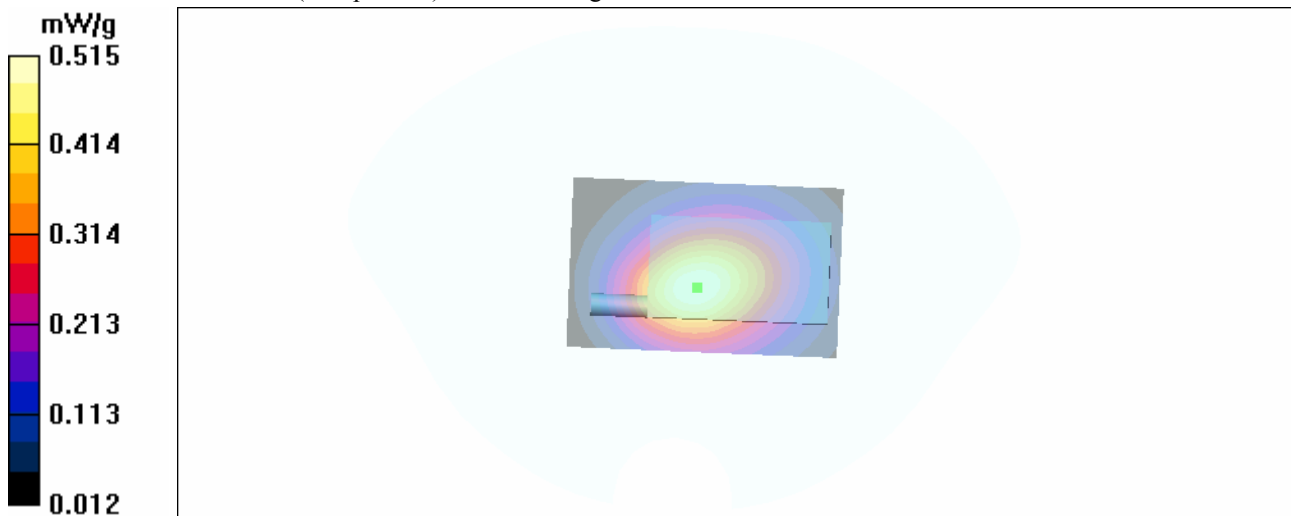
Peak SAR (extrapolated) = 0.639 W/kg

SAR(1 g) = 0.477 mW/g; SAR(10 g) = 0.336 mW/g

Maximum value of SAR (measured) = 0.511 mW/g

Body/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.515 mW/g



Date/Time: 2006-05-25 1:19:58 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 800, Channel 384, Body Position with 2.2cm Spacer with BL-5B Battery, Flip Closed Position, with HS-3 Headset

Communication System: CDMA800; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 836.52$ MHz; $\sigma = 0.989$ mho/m; $\epsilon_r = 55.5$; $\rho = 1000$ kg/m³

Liquid Temperature: 20.8

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(6.02, 6.02, 6.02); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM2 Cellular Body; Phantom section: Flat Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.2 V/m; Power Drift = -0.054 dB

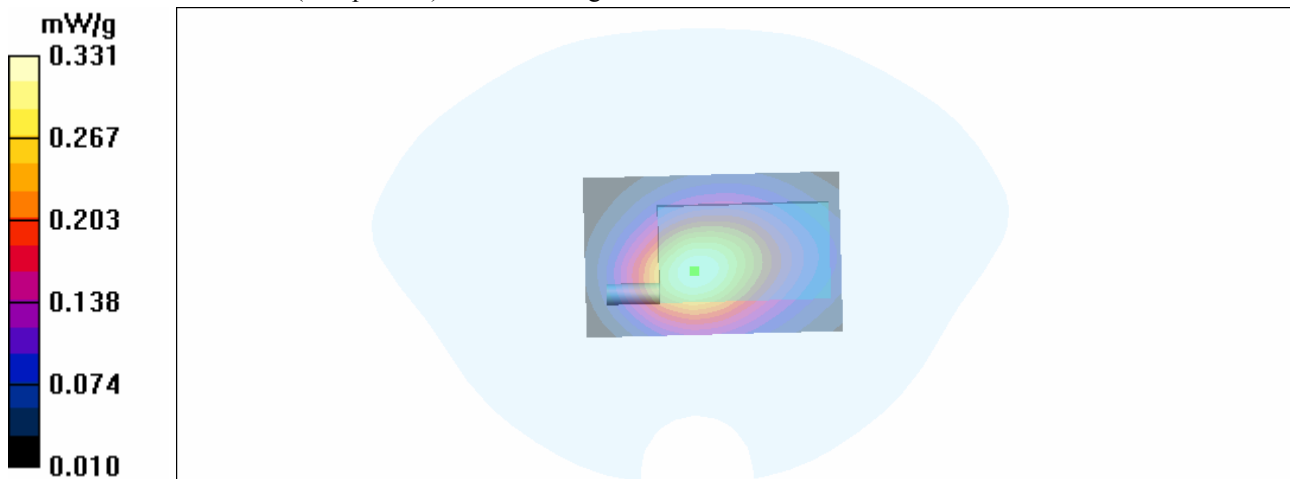
Peak SAR (extrapolated) = 0.407 W/kg

SAR(1 g) = 0.303 mW/g; SAR(10 g) = 0.214 mW/g

Maximum value of SAR (measured) = 0.324 mW/g

Body/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.331 mW/g



Date/Time: 2006-05-25 2:36:18 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 800, Channel 777, Body Position with 2.2cm Spacer with BL-5B Battery, Flip Closed Position, with BT Active

Communication System: CDMA800; Frequency: 848.31 MHz; Duty Cycle: 1:1
Medium parameters used: $f = 848.5$ MHz; $\sigma = 1$ mho/m; $\epsilon_r = 55.4$; $\rho = 1000$ kg/m³
Liquid Temperature: 20.8

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(6.02, 6.02, 6.02); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM2 Cellular Body; Phantom section: Flat Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body/Area Scan (51x81x1): Measurement grid: $dx=15$ mm, $dy=15$ mm
Maximum value of SAR (interpolated) = 0.756 mW/g

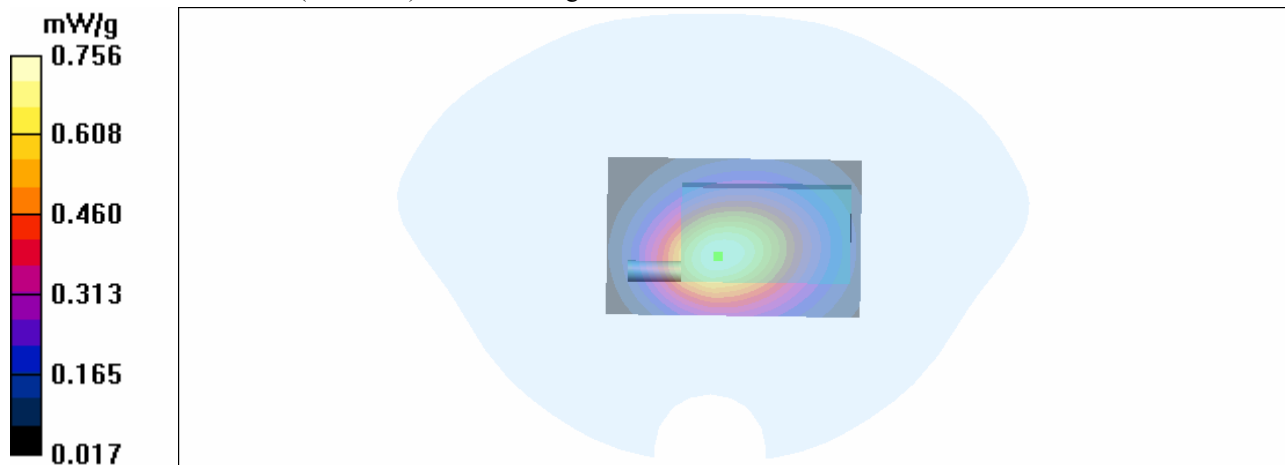
Body/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 27.2 V/m; Power Drift = -0.345 dB

Peak SAR (extrapolated) = 0.925 W/kg

SAR(1 g) = 0.677 mW/g; SAR(10 g) = 0.475 mW/g

Maximum value of SAR (measured) = 0.721 mW/g



Date/Time: 2006-05-30 1:42:20 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 1900, Channel 1175, Body Position with 2.2cm Spacer with BL-5B Battery, Flip Closed Position

Communication System: CDMA1900; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1909$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Liquid Temperature: 21.7

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(4.33, 4.33, 4.33); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM3 PCS Head and Body; Phantom section: Flat Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.1 V/m; Power Drift = -0.323 dB

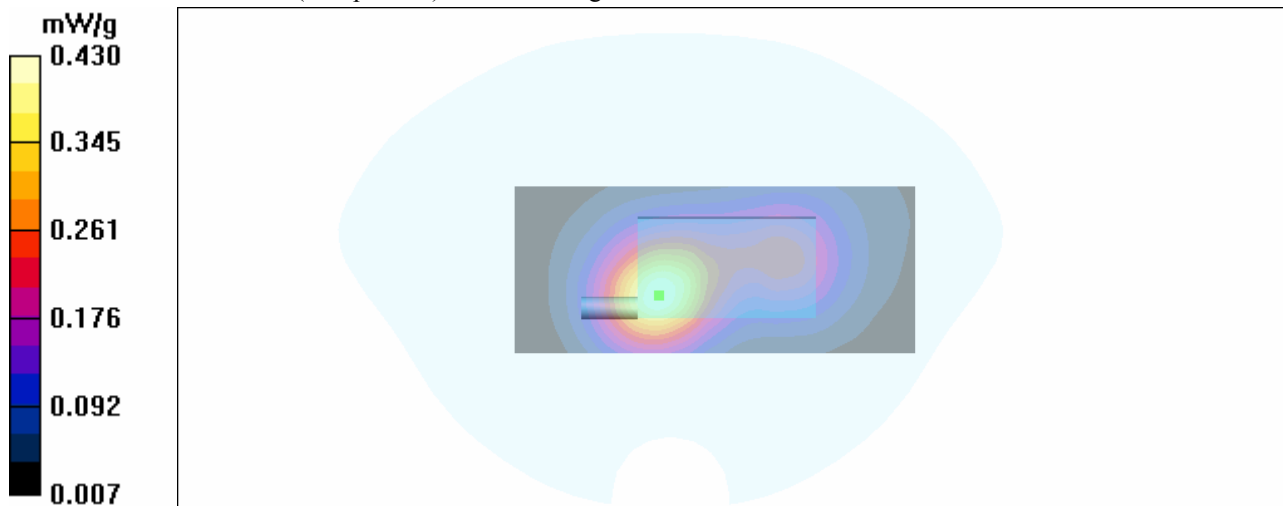
Peak SAR (extrapolated) = 0.644 W/kg

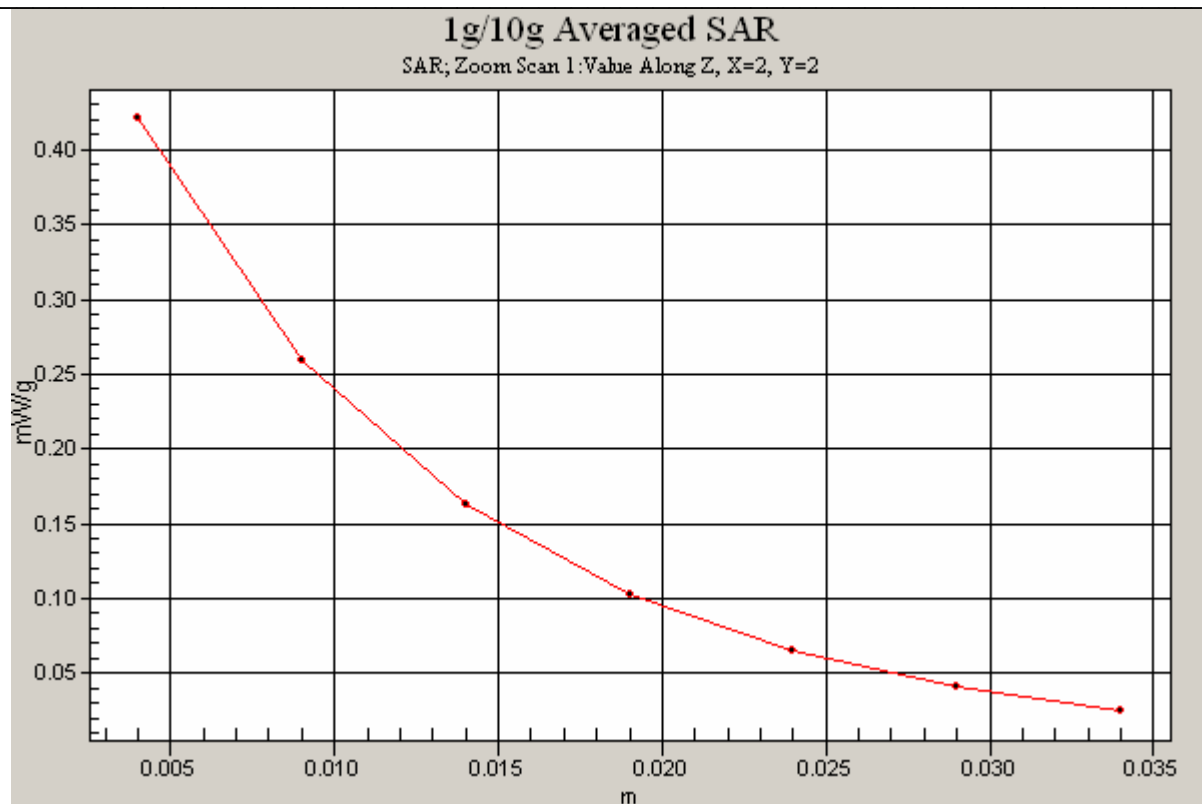
SAR(1 g) = 0.390 mW/g; SAR(10 g) = 0.239 mW/g

Maximum value of SAR (measured) = 0.421 mW/g

Body/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.430 mW/g





Date/Time: 2006-05-30 12:39:19 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 1900, Channel 600, Body Position with 2.2cm Spacer with BL-5B Battery, Flip Closed Position, with HS-9 Headset

Communication System: CDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.55 \text{ mho/m}$; $\epsilon_r = 51.7$; $\rho = 1000 \text{ kg/m}^3$

Liquid Temperature: 21.7

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(4.33, 4.33, 4.33); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM3 PCS Head and Body; Phantom section: Flat Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 13.1 V/m; Power Drift = -0.011 dB

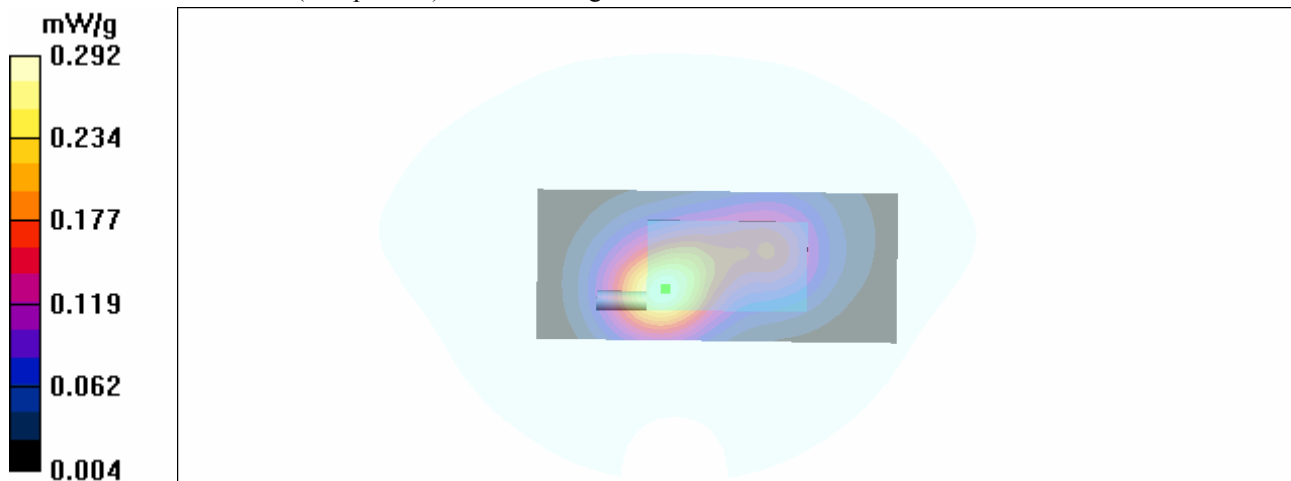
Peak SAR (extrapolated) = 0.448 W/kg

SAR(1 g) = 0.272 mW/g; SAR(10 g) = 0.167 mW/g

Maximum value of SAR (measured) = 0.294 mW/g

Body/Area Scan (51x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.292 mW/g



Date/Time: 2006-05-30 1:11:21 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 1900, Channel 600, Body Position with 2.2cm Spacer with BL-5B Battery, Flip Closed Position, with HS-3 Headset

Communication System: CDMA1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1880 \text{ MHz}$; $\sigma = 1.55 \text{ mho/m}$; $\epsilon_r = 51.7$; $\rho = 1000 \text{ kg/m}^3$

Liquid Temperature: 21.7

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(4.33, 4.33, 4.33); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM3 PCS Head and Body; Phantom section: Flat Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body/Area Scan (51x121x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

Maximum value of SAR (interpolated) = 0.359 mW/g

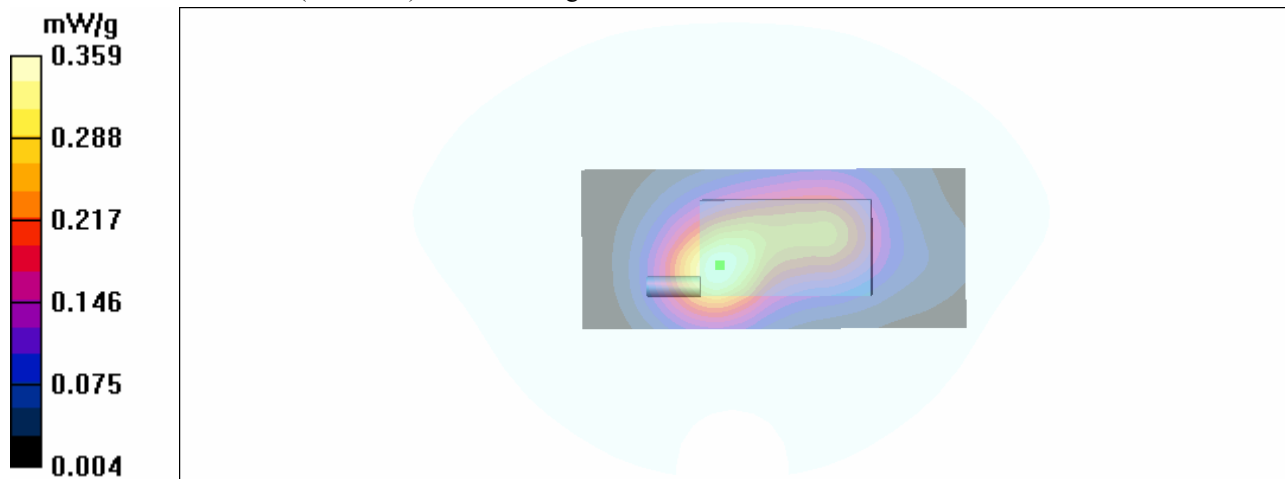
Body/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 15.1 V/m; Power Drift = -0.074 dB

Peak SAR (extrapolated) = 0.567 W/kg

SAR(1 g) = 0.333 mW/g; SAR(10 g) = 0.205 mW/g

Maximum value of SAR (measured) = 0.355 mW/g



Date/Time: 2006-05-30 2:15:56 PM

Test Laboratory: TCC Dallas

RM-155, CDMA 1900, Channel 1175, Body Position with 2.2cm Spacer with BL-5B Battery, Flip Closed Position, with BTActive

Communication System: CDMA1900; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1909$ MHz; $\sigma = 1.58$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

Liquid Temperature: 21.7

DASY4 Configuration:

- Probe: ET3DV6 - SN1801; ConvF(4.33, 4.33, 4.33); Calibrated: 1/24/2006
- Sensor-Surface: 4mm (Mechanical And Optical Surface Detection)
- Electronics: DAE3 Sn389; Calibrated: 1/20/2006
- Phantom: SAM3 PCS Head and Body; Phantom section: Flat Section
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Body/Zoom Scan 1 (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.9 V/m; Power Drift = -0.255 dB

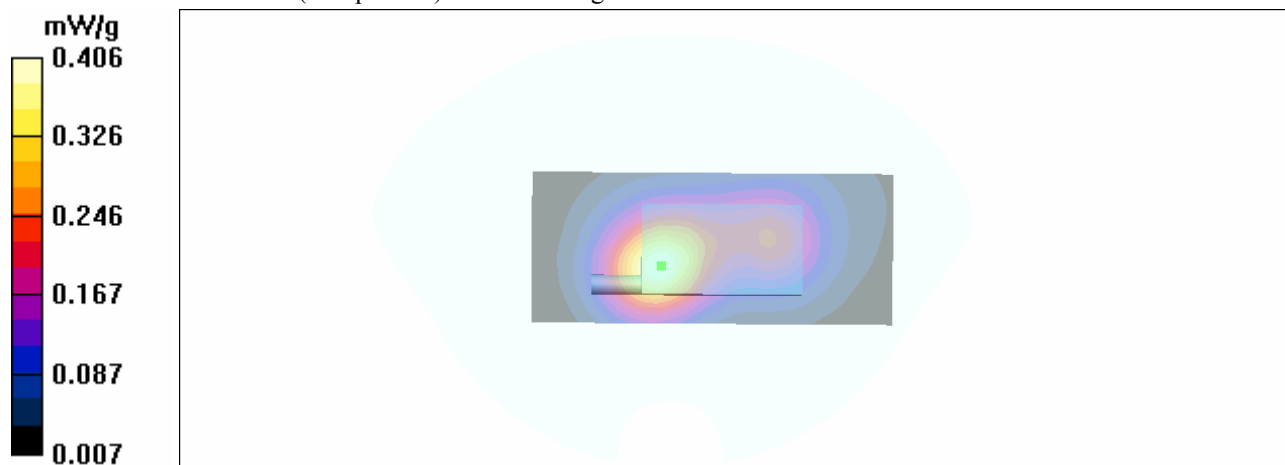
Peak SAR (extrapolated) = 0.626 W/kg

SAR(1 g) = 0.369 mW/g; SAR(10 g) = 0.226 mW/g

Maximum value of SAR (measured) = 0.397 mW/g

Body/Area Scan (51x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.406 mW/g



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



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 TX**

Certificate No: **ET3-1801_Jan06**

CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1801**

Calibration procedure(s) **QA CAL-01.v5
Calibration procedure for dosimetric E-field probes**

Calibration date: **January 24, 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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

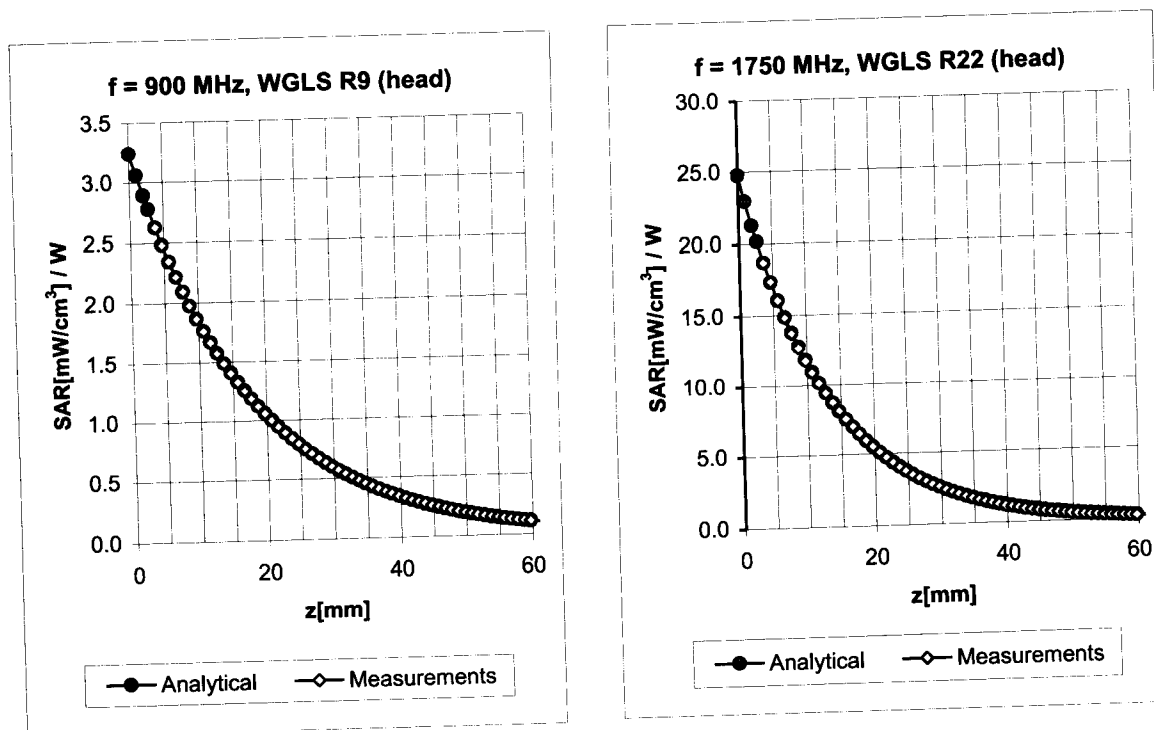
Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41495277	3-May-05 (METAS, No. 251-00466)	May-06
Power sensor E4412A	MY41498087	3-May-05 (METAS, No. 251-00466)	May-06
Reference 3 dB Attenuator	SN: S5054 (3c)	11-Aug-05 (METAS, No. 251-00499)	Aug-06
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-05 (METAS, No. 251-00467)	May-06
Reference 30 dB Attenuator	SN: S5129 (30b)	11-Aug-05 (METAS, No. 251-00500)	Aug-06
Reference Probe ES3DV2	SN: 3013	2-Jan-06 (SPEAG, No. ES3-3013_Jan06)	Jan-07
DAE4	SN: 654	27-Oct-05 (SPEAG, No. DAE4-654_Oct05)	Oct-06
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 Nov-05)	In house check: Nov 06

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

Issued: January 24, 2006

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

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%	0.66	1.73	6.28 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.54	1.93	6.26 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.60	1.65	5.03 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.60	1.77	4.84 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.70	1.34	4.37 ± 11.8% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.55	1.93	6.02 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.49	2.11	5.82 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.69	1.95	4.54 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.67	2.09	4.33 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.54	1.75	4.03 ± 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.

APPENDIX D: RELEVANT PAGES FROM DIPOLE VALIDATION KIT REPORT(S)



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 TX**

Certificate No: **D835V2-486_Jan05**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 486**

Calibration procedure(s) **QA CAL-05.v6
Calibration procedure for dipole validation kits**

Calibration date: **January 18, 2005**

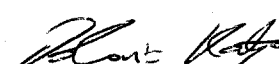
Condition of the calibrated item **In Tolerance**

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 EPM E442	GB37480704	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Power sensor HP 8481A	US37292783	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Reference 20 dB Attenuator	SN: 5086 (20g)	10-Aug-04 (METAS, No 251-00402)	Aug-05
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-04 (METAS, No 251-00402)	Aug-05
Reference Probe ET3DV6	SN 1507	26-Oct-04 (SPEAG, No. ET3-1507_Oct04)	Oct-05
DAE4	SN 601	07-Jan-05 (SPEAG, No. DAE4-601_Jan05)	Jan-06
DAE4	SN 907	03-May-04 (SPEAG, No. DAE4-907_May04)	May-05
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-03)	In house check: Oct-05
RF generator R&S SML-03	100698	27-Mar-02 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov-05

Calibrated by:	Name Judith Müller	Function Laboratory Technician	Signature 
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 19, 2005

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

DASY4 Validation Report for Head TSL

Date/Time: 01/18/05 15:04:27

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN486

Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL 900 MHz;

Medium parameters used: $f = 835$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 42$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.24, 6.24, 6.24); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom half size; Type: QD000P49AA; Serial: SN:1001;
- Measurement SW: DASY4, V4.4 Build 11; Postprocessing SW: SEMCAD, V1.8 Build 133

Pin = 250 mW; d = 15 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.43 mW/g

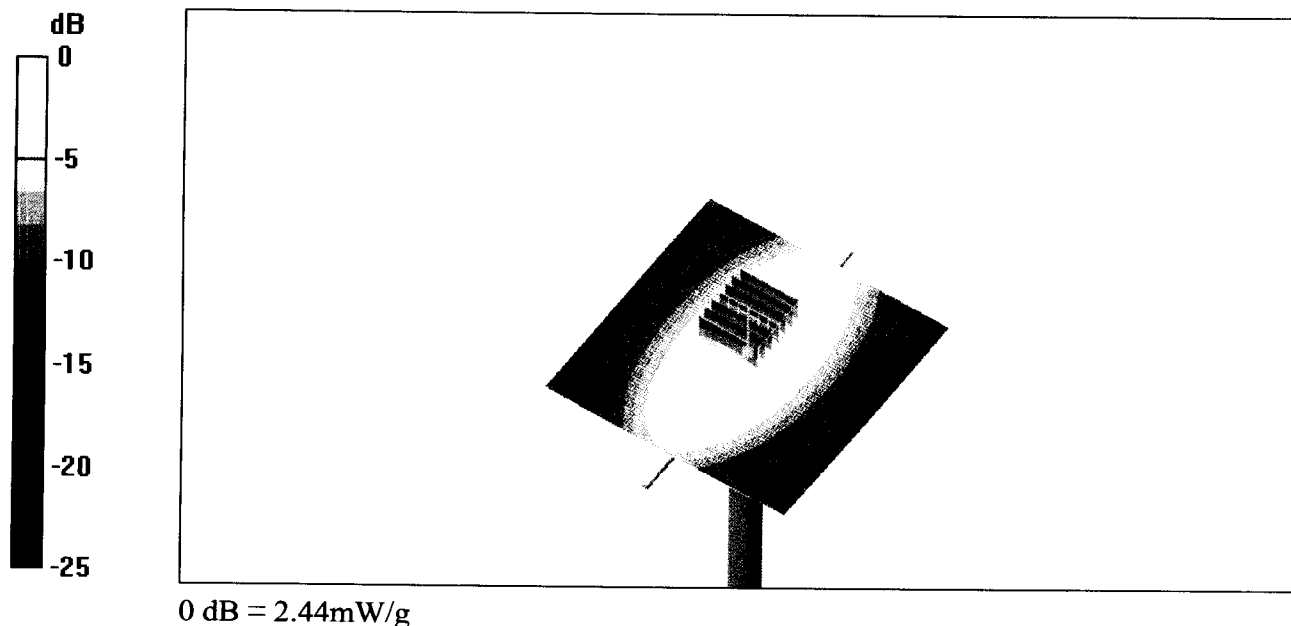
Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.5 V/m; Power Drift = 0.005 dB

Peak SAR (extrapolated) = 3.28 W/kg

SAR(1 g) = 2.25 mW/g; SAR(10 g) = 1.47 mW/g

Maximum value of SAR (measured) = 2.44 mW/g



DASY4 Validation Report for Body TSL

Date/Time: 01/11/05 13:56:07

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN486

Communication System: CW-835; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: MSL 900 MHz;

Medium parameters used: $f = 835$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 54.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(5.98, 5.98, 5.98); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn907; Calibrated: 03.05.2004
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001;
- Measurement SW: DASY4, V4.4 Build 10; Postprocessing SW: SEMCAD, V1.8 Build 133

Pin = 250 mW; d = 15 mm/Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 2.64 mW/g

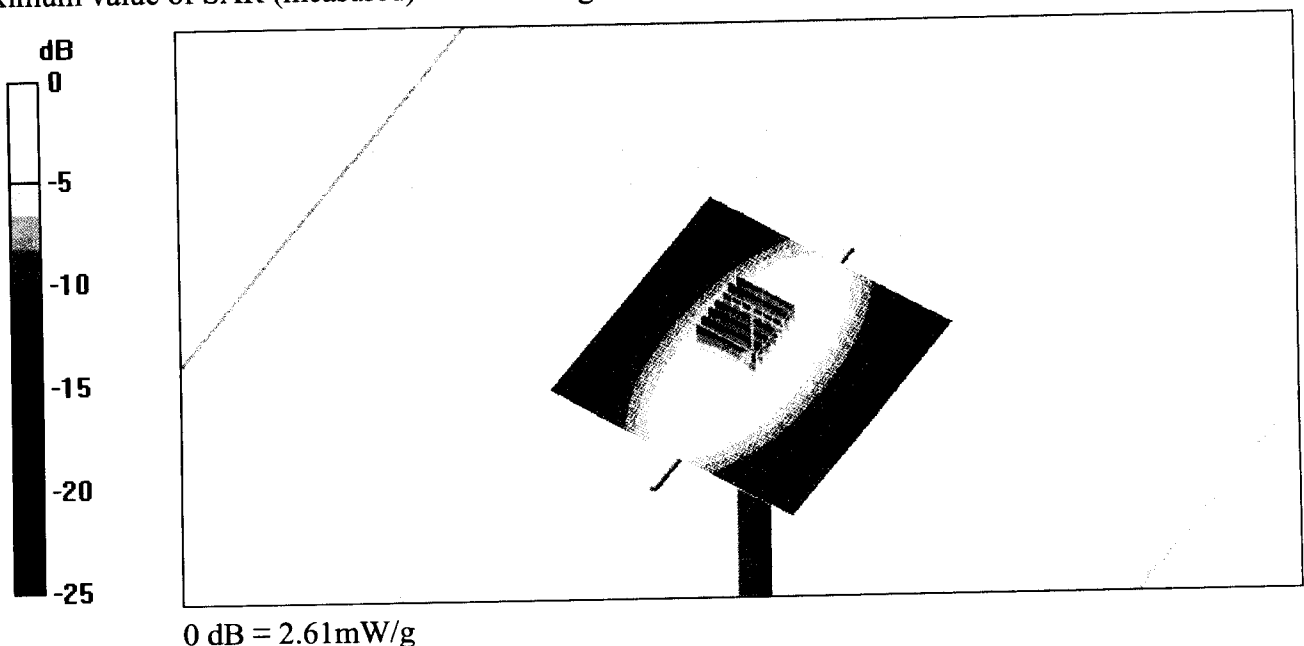
Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.3 V/m; Power Drift = 0.0 dB

Peak SAR (extrapolated) = 3.48 W/kg

SAR(1 g) = 2.43 mW/g; SAR(10 g) = 1.6 mW/g

Maximum value of SAR (measured) = 2.61 mW/g



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

CALIBRATION CERTIFICATE

Object

D1900V2 SN 504

Calibration procedure(s)

GA CAL 105-16

Calibration procedure for portable analyzers

Calibration date:

July 05, 2005

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 $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E442	GB37480704	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Power sensor HP 8481A	US37292783	12-Oct-04 (METAS, No. 251-00412)	Oct-05
Reference 20 dB Attenuator	SN: 5086 (20g)	10-Aug-04 (METAS, No 251-00402)	Aug-05
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-04 (METAS, No 251-00402)	Aug-05
Reference Probe ET3DV6	SN 1507	26-Oct-04 (SPEAG, No. ET3-1507_Oct04)	Oct-05
DAE4	SN 601	07-Jan-05 (SPEAG, No. DAE4-601_Jan05)	Jan-06
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (SPEAG, in house check Oct-03)	In house check: Oct-05
RF generator R&S SML-03	100698	27-Mar-02 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov 05

Calibrated by:

Name

Function

Signature

Approved by:

Issued: July 7, 2005

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

DASY4 Validation Report for Head TSL

Date/Time: 05.07.2005 11:26:42

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:504

Communication System: CW-1900; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL 1900 MHz;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.47$ mho/m; $\epsilon_r = 38.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.96, 4.96, 4.96); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.6 Build 4; Postprocessing SW: SEMCAD, V1.8 Build 149

Pin = 250 mW; d = 10 mm/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (interpolated) = 12.2 mW/g

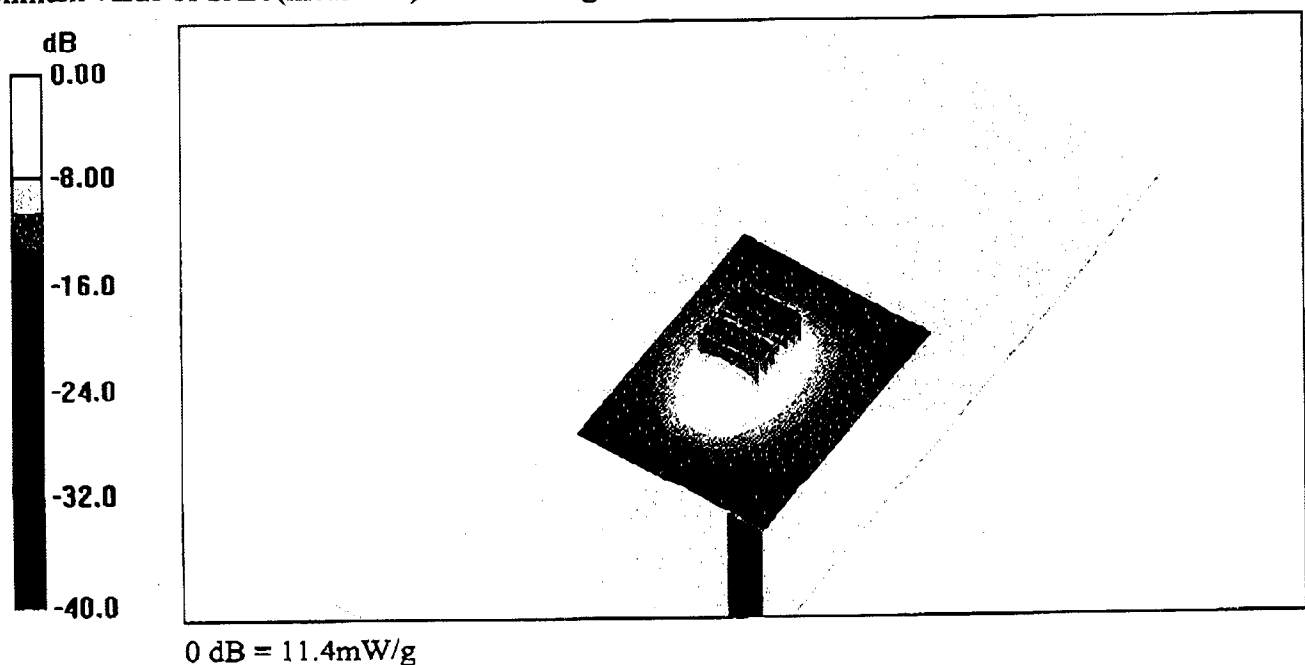
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 93.8 V/m; Power Drift = -0.030 dB

Peak SAR (extrapolated) = 17.7 W/kg

SAR(1 g) = 10.1 mW/g; SAR(10 g) = 5.29 mW/g

Maximum value of SAR (measured) = 11.4 mW/g



DASY4 Validation Report for Body TSL

Date/Time: 26.08.2005 14:08:35

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:504

Communication System: CW-1900; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: MSL 1900 MHz;

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.6$ mho/m; $\epsilon_r = 53.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.43, 4.43, 4.43); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA
- Measurement SW: DASY4, V4.6 Build 9; Postprocessing SW: SEMCAD, V1.8 Build 151

Pin = 250 mW; d = 10 mm 2/Area Scan (81x81x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 11.0 mW/g

Pin = 250 mW; d = 10 mm 2/Zoom Scan (7x7x7)/Cube 0:

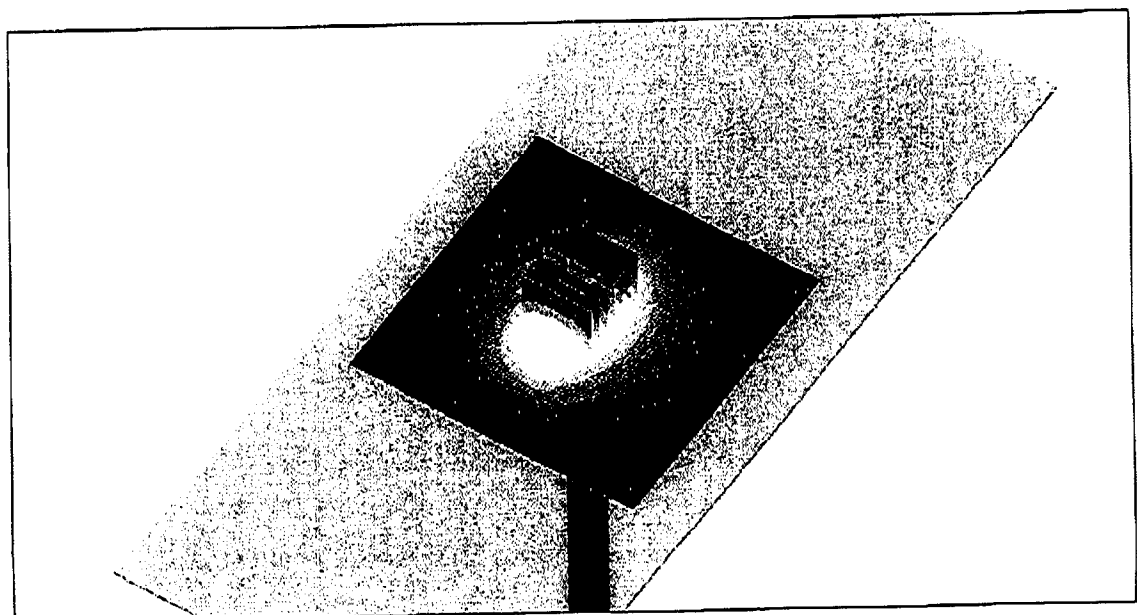
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 86.3 V/m; Power Drift = 0.042 dB

Peak SAR (extrapolated) = 16.4 W/kg

SAR(1 g) = 9.71 mW/g; SAR(10 g) = 5.16 mW/g

Maximum value of SAR (measured) = 11.1 mW/g



0 dB = 11.1mW/g