



Exhibit 11: SAR Test Report: IHDT56AL1

Date of test: 12/28/00-1/11/01

Laboratory: Motorola Personal Communications Sector Product Safety Laboratory
2001 N. Division
Room: AS228
Harvard, Illinois 60033

Test Responsible: Steven Hauswirth
Staff Engineer

Accreditation: ISO Guide 25 Accredited Lab, A2LA certificate #1651-01

Statement of Compliance: Motorola declares under its sole responsibility that portable cellular telephone FCC ID IHDT56AL1 to which this declaration relates, is in conformity with the appropriate RF exposure standards, recommendations and guidelines. It also declares that the product was tested in accordance with the appropriate measurement standards, guidelines and recommended practices. Any deviations from these standards, guidelines and recommended practices are noted below:

©Motorola

This test report shall not be reproduced in full, without written approval of the laboratory.

The results and statements contained herein relate only to the items tested. The names of individuals involved may be mentioned only in connection with the statements or results from this report.

Motorola encourages all feedback, both positive and negative, on this test report.

Table of Contents

1) Introduction	3
2) Description of the Device Under Test	3
Antenna description	3
Device description	3
3) Test Results	3
4) Test Equipment	4
4.1 Dosimetric system	4
4.2 Additional equipment used	5
5) Electrical parameters of the tissue simulating liquid	5
6) System Accuracy Verification	5

Reference Notes

Appendix 1: SAR distribution comparison for the system accuracy verification	7
Appendix 2: SAR distribution plots for Phantom Head Adjacent Use	8
Appendix 3: SAR distribution plots for Body Worn Configuration	10
Appendix 4: Photographs of the device under test	11

1. Introduction

The Motorola Personal Communications Sector Product Safety Laboratory has performed measurements of the maximum potential exposure to the user of portable cellular phone FCC ID IHDT56AL1. The Specific Absorption Rate (SAR) of this product was measured. The portable cellular phone was tested in accordance with the latest available test guidelines. The SAR values found for the portable cellular phone (FCC ID IHDT56AL1) are below the maximum recommended levels of 1.6 W/kg. Detailed procedures of the test are described in the *Motorola Exhibit 11 Reference SAR Test Report*.

2. Description of the Device Under Test

Antenna description

Type	Extendable whip
Location	Right Side
Configuration	Helix

Device description

FCC ID Number	IHDT56AL1		
Serial number	A88BC505		
Mode(s) of Operation	AMPS800	CDMA800	CDMA1900
Modulation Mode(s)	AMPS	CDMA	CDMA
Maximum Output Power Setting	26.4dBm	23.6dBm	23.9dBm
Duty Cycle	1:1	1:1	1:1
Transmitting Frequency Rang(s)	824-849MHz	824-849MHz	1851-1909MHz

3. Test Results

The SAR results shown in tables 1 and 2 are maximum SAR values averaged over 1 gram of phantom tissue. Also shown are the measured conducted output powers and the temperature of the test facility during the test.

The test sample was operated in a test mode that allows control of the transmitter without the need to place actual phone calls. For the purposes of this test the unit is commanded to test mode and manually set to the proper channel, transmitter power level and transmit mode of operation. The phone was then placed in the SAR measurement system with a fully charged battery.

A full data set output of two test conditions with the highest SAR values from the Dasy™ measurement system is included as appendix 2 and 3. The test conditions included are indicated as bold numbers in the following table. All other test conditions measured lower SAR values than those included. Note that digital mode SAR data was measured only for the test conditions that resulted in the highest analog SAR values. This is because the only difference between analog and digital modes that can impact SAR is the average transmitter power.

<i>f</i> (MHz)	Description	Conducted Output Power (dBm)	SAR, 1g (W/kg)			
			Left Head		Right Head	
			Ant Ext	Ant Ret	Ant Ext	Ant Ret
Analog 800MHz	Channel 991	25.6	1.27	0.92	1.00	0.82
	Channel 384	26.7	0.97	1.04	1.12	1.09
	Channel 799	26.4	1.16	1.26	1.12	1.12
Digital 800MHz	Channel 1013	23.2	0.63			
	Channel 779	23.6		0.77		
Digital 1900MHz	Channel 25	23.9	0.57	1.38	0.27	1.32
	Channel 600	23.3	0.63	0.98	0.30	0.79
	Channel 1175	22.9	0.23	0.60	0.17	0.63

Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT56AL1 at highest possible output power. Measured against the head.

<i>f</i> (MHz)	Description	Conducted Output Power (dBm)	SAR, 1g (W/kg)	
			Belt Clip	
			Ant Ext	Ant Ret
Analog 800MHz	Channel 991	25.6	1.36	0.95
	Channel 384	26.7	0.64	0.79
	Channel 799	26.4	0.63	0.67
Digital 800MHz	Channel 1013	23.2	0.79	0.66
Digital 1900MHz	Channel 25	23.9	0.75	0.54
	Channel 600	23.3	0.78	0.39
	Channel 1175	22.9	0.36	0.22

Table 2: SAR measurement results for the portable cellular telephone FCC ID IHDT56AL1 at highest possible output power. Measured against the body.

4. Test Equipment Used

4.1 Dosimetric System

The Motorola Personal Communications Sector Product Safety Laboratory utilizes a Dosimetric Assessment System (Dasy3™) SAR measurement system manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. The overall RSS uncertainty of the measurement system is ±12.0% (K=1).

Description	Serial Number	Cal Due Date
DASY3 DAE V1	SN375	10/2001
E-Field Probe ETDV6	SN1515	2/2001
Dipole Validation Kit, DV835V2	SN416	2/2002
Dipole Validation Kit, DV1800V2	SN259	1/2002

4.2 Additional Equipment

Description	Serial Number	Cal Due Date
Signal Generator HP8648C	3847A04843	2/25/01
Power Meter E4419B	GB39511086	3/13/01
Power Sensor E9301A	US39210930	2/09/01

5. Electrical parameters of the tissue simulating liquid

Prior to conducting SAR measurements, the relative permittivity, ϵ_r , and the conductivity, σ , of the tissue simulating liquids were measured with HP85070 Dielectric Probe Kit. These values are shown in the table below. The mass density, ρ , used by the dosimetric system is also given. Recommended limits for maximum permittivity, minimum conductivity and maximum mass density are also shown. These come from the Federal Communication Commission, "Tissue Dielectric Properties" web site at <http://www.fcc.gov/fcc-bin/dielec.sh>. It is seen that the measured parameters are satisfactory for compliance testing.

f (MHz)	Tissue type	Limits / Measured	Dielectric Parameters		
			ϵ_r	σ (S/m)	ρ (g/cm ³)
836	Head	Measured, 1/11/01	43.04	0.87	1.00
		Recommended Limits	46.08	0.74	1.03
	Body	Measured, 12/28/00	50.62	1.09	1.00
		Recommended Limits	56.11	0.94	1.04
1880	Head	Measured, 1/06/01	39.00	1.43	1.00
		Recommended Limits	43.40	1.19	1.03
	Body	Measured, 12/28/00	48.04	1.64	1.00
		Recommended Limits	54.33	1.43	1.04

6. System Accuracy Verification

A system accuracy verification of the DASY3 was performed using the measurement equipment listed in Section 4. The test was conducted on the same day as the measurement of the DUT. The obtained results are displayed in the table below. The distributions of SAR compare well with those of the reference measurements (see Appendix 1).

Validations for Head Adjacent Use:

f (MHz)	Description	SAR (W/kg), 1gram	Dielectric Parameters		Temp (°C)
			ϵ_r	σ (S/m)	
835	Measured	8.88	42.58	0.81	23
	Recommended Limits	9.12	44.30	0.80	NA
1800	Measured	44.00	40.06	1.76	23
	Recommended Limits	39.27	41.10	1.69	NA

Validations for Body-Worn Use:

<i>f</i> (MHz)	Description	SAR (W/kg), 1gram	Dielectric Parameters		Temp (°C)
			ϵ_r	σ (S/m)	
835	Measured	8.48	42.45	0.81	24
	Recommended Limits	9.12	44.30	0.80	NA
1800	Measured	41.6	39.81	1.75	24
	Recommended Limits	39.27	41.10	1.69	NA

Appendix 1

SAR distribution comparison for the system accuracy verification

Dipole 835 MHz

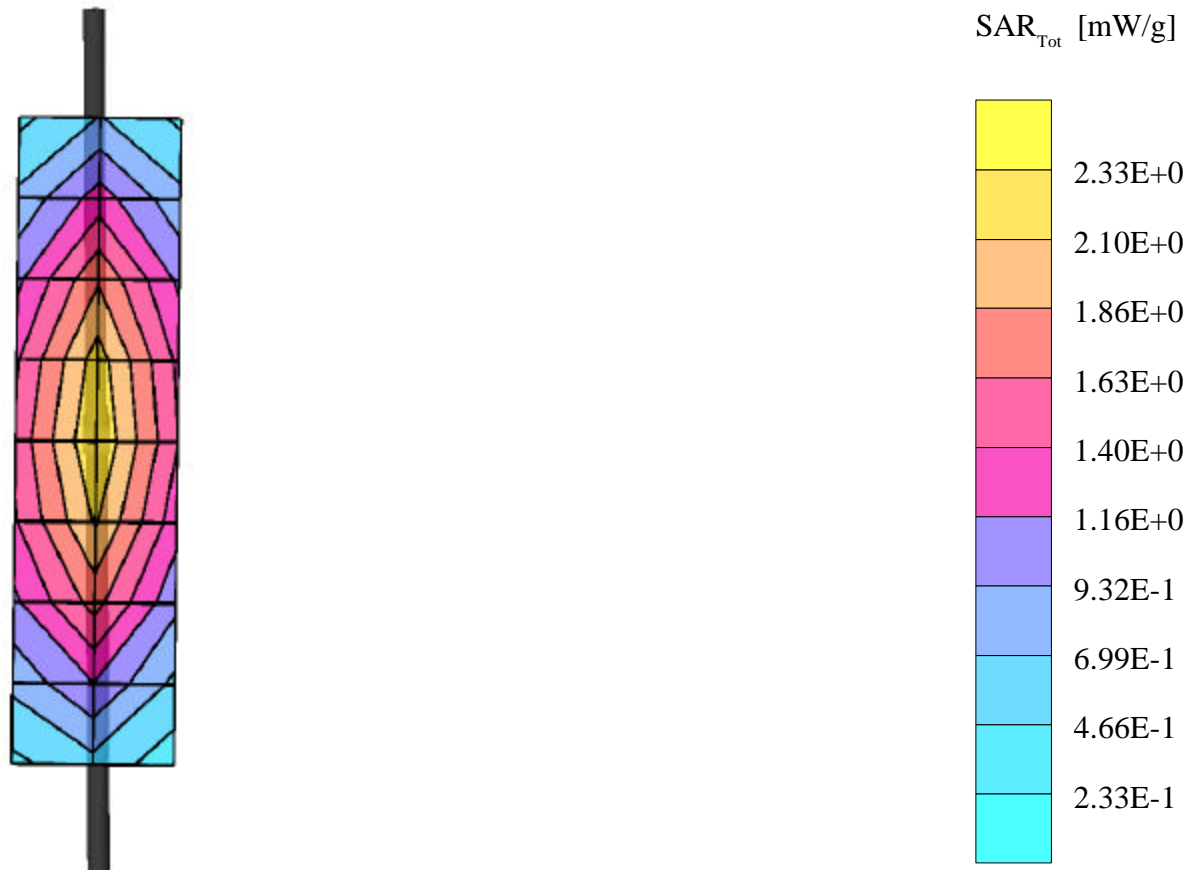
835 MHz Dipole Validation / Dipole Sn#416 / Forward Power = 245mW

Acceptable Temp Range is 15-25°C, Temp at time of measurement = 23

Amy Twin Optics OFF; Section2

Probe: ET3DV6 - SN1515 Validation 11-11-00; ConvF(6.61,6.61,6.61); Crest factor: 1.0; Validation 835 MHz: $\sigma = 0.81$ mho/m $\epsilon_r = 42.6$ $\rho = 1.00$ g/cm³

Cubes (2): Peak: 3.43 mW/g ± 0.02 dB, SAR (1g): 2.22 mW/g ± 0.00 dB, SAR (10g): 1.46 mW/g ± 0.01 dB, (Worst-case extrapolation)



Dipole 1800 MHz

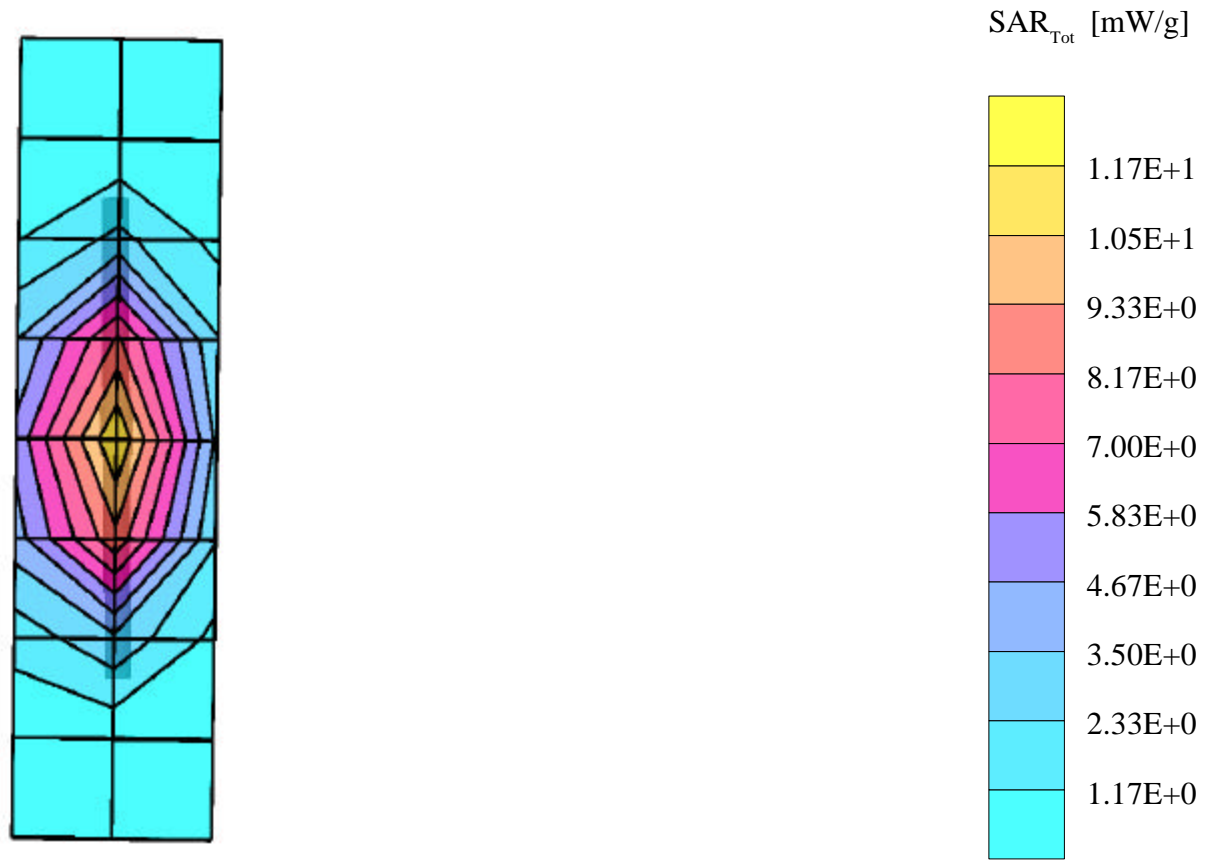
1800 MHz Dipole Validation / Dipole Sn# 259 / Forward Power =254mW

Acceptable Temp Range is 15-25°C, Temp at time of measurement = 23

Amy Twin Optics OFF; Section2

Probe: ET3DV6 - SN1515 Validation 11-11-00; ConvF(5.51,5.51,5.51); Crest factor: 1.0; Validation 1800 MHz: $\sigma = 1.76 \text{ mho/m}$ $\epsilon_r = 40.1$ $\rho = 1.00 \text{ g/cm}^3$

Cubes (2): Peak: 21.7 mW/g $\pm 0.01 \text{ dB}$, SAR (1g): 11.0 mW/g $\pm 0.00 \text{ dB}$, SAR (10g): 5.47 mW/g $\pm 0.00 \text{ dB}$, (Worst-case extrapolation)



Dipole 835 MHz

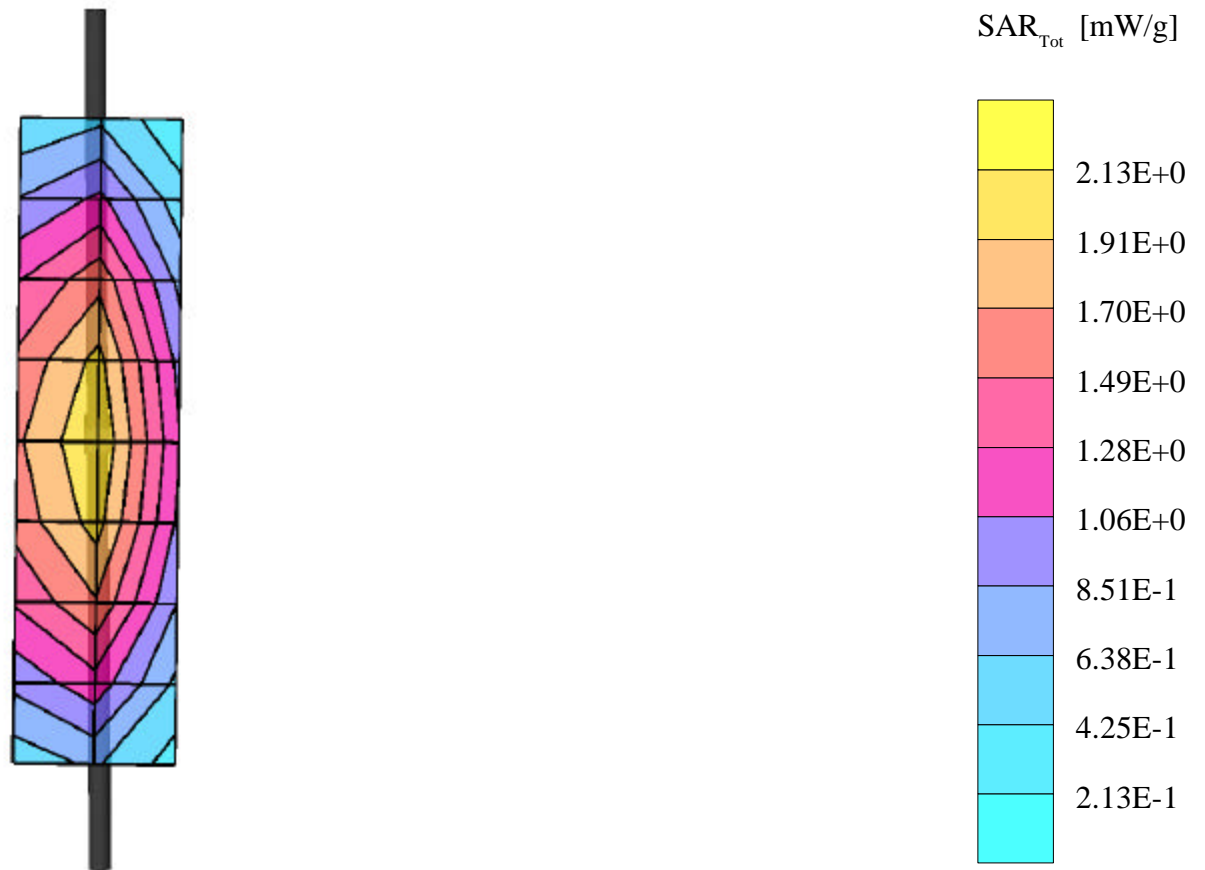
835 MHz Dipole Validation / Dipole Sn# 416 / Forward Power = 245mW

Acceptable Temp Range is 15-25°C, Temp at time of measurement = 24

Amy Twin Optics OFF; Section2

Probe: ET3DV6 - SN1515 Validation 11-11-00; ConvF(6.61,6.61,6.61); Crest factor: 1.0; Validation 835 MHz: $\sigma = 0.81$ mho/m $\epsilon_r = 42.5$ $\rho = 1.00$ g/cm³

Cubes (2): Peak: 3.27 mW/g ± 0.05 dB, SAR (1g): 2.12 mW/g ± 0.06 dB, SAR (10g): 1.40 mW/g ± 0.06 dB, (Worst-case extrapolation)



Dipole 1800 MHz

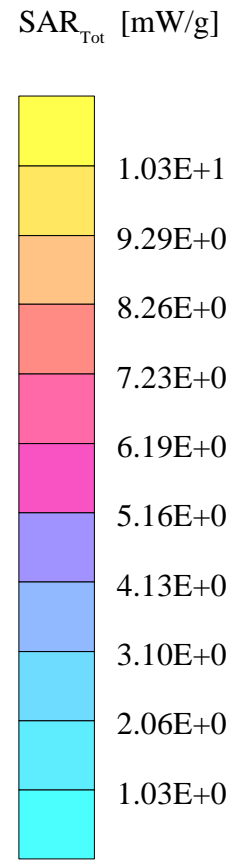
1800 MHz Dipole Validation / Dipole Sn# 259 / Forward Power = 252mW

Acceptable Temp Range is 15-25°C, Temp at time of measurement = 24

Amy Twin Optics OFF; Section2

Probe: ET3DV6 - SN1515 Validation 11-11-00; ConvF(5.51,5.51,5.51); Crest factor: 1.0; Validation 1800 MHz: $\sigma = 1.75$ mho/m $\epsilon_r = 39.8$ $\rho = 1.00$ g/cm³

Cubes (2): Peak: 20.2 mW/g ± 0.06 dB, SAR (1g): 10.4 mW/g ± 0.05 dB, SAR (10g): 5.23 mW/g ± 0.04 dB, (Worst-case extrapolation)



Appendix 2

SAR distribution plots for Phantom Head Adjacent Use

s/n A88BC505

Ch#991/ Pwr Step:2 / Antenna Position: Extended

Luke (Left Head) Phantom; Left Head Section; Position: (80°,180°); Frequency: 824 MHz

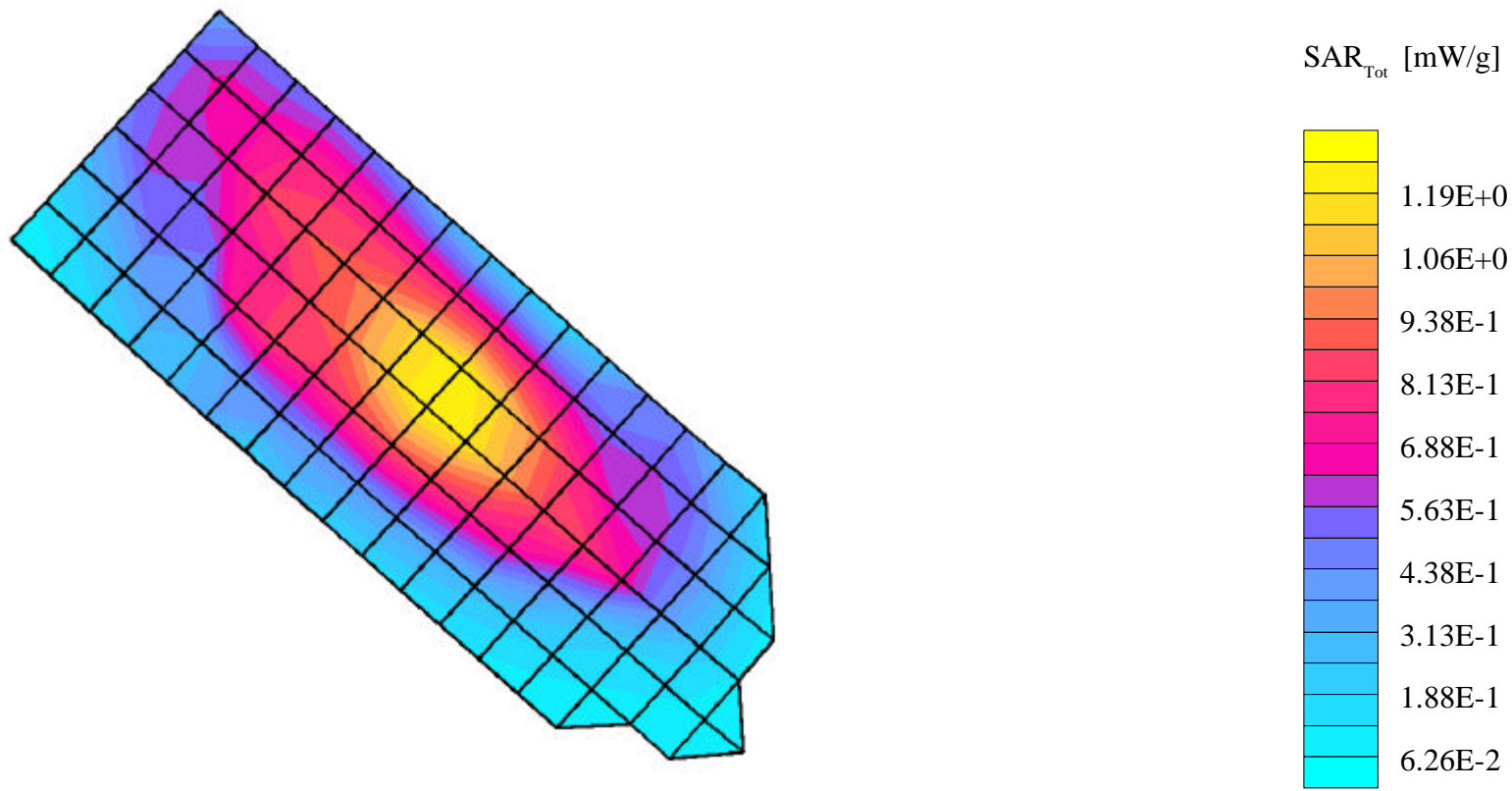
Probe: ET3DV6 - SN1515 Head (Sugar Water) 11-11-00; ConvF(6.61,6.61,6.61); Crest factor: 1.0; Head 835 MHz: $\sigma = 0.87$ mho/m $\epsilon_r = 43.0$ $\rho = 1.00$ g/cm³

Cube 5x5x7: SAR (1g): 1.27 mW/g, SAR (10g): 0.872 mW/g, (Worst-case extrapolation)

Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0

Penetration depth: 16.8 (15.2, 18.3) [mm]

Powerdrift: -0.13 dB



s/n A88BC505

Ch#799 / Pwr Step:02 / Antenna Position: Retracted

Luke (Left Head) Phantom; Left Head Section; Position: (80°,180°); Frequency: 849 MHz

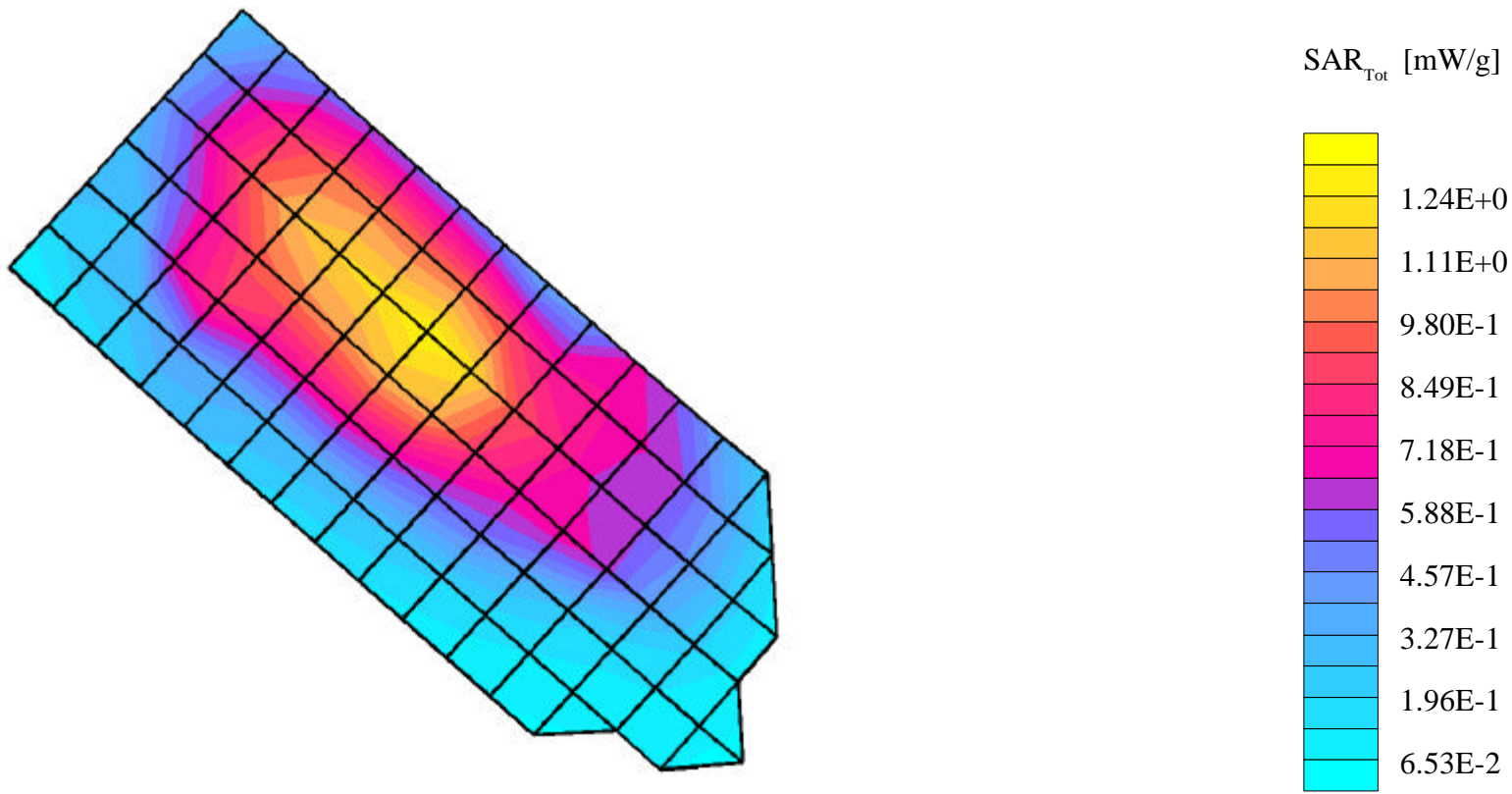
Probe: ET3DV6 - SN1515 Head (Sugar Water) 11-11-00; ConvF(6.61,6.61,6.61); Crest factor: 1.0; Head 835 MHz: $\sigma = 0.87$ mho/m $\epsilon_r = 43.0$ $\rho = 1.00$ g/cm³

Cube 5x5x7: SAR (1g): 1.26 mW/g, SAR (10g): 0.852 mW/g, (Worst-case extrapolation)

Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0

Penetration depth: 15.1 (13.2, 17.3) [mm]

Powerdrift: 0.14 dB



s/n A88BC505

Ch#600 / Antenna Position:Extended / Type of Modulation: CDMA1900

Anakin (Left Head) Phantom; Left Head Section; Position: (80°,180°); Frequency: 1880 MHz

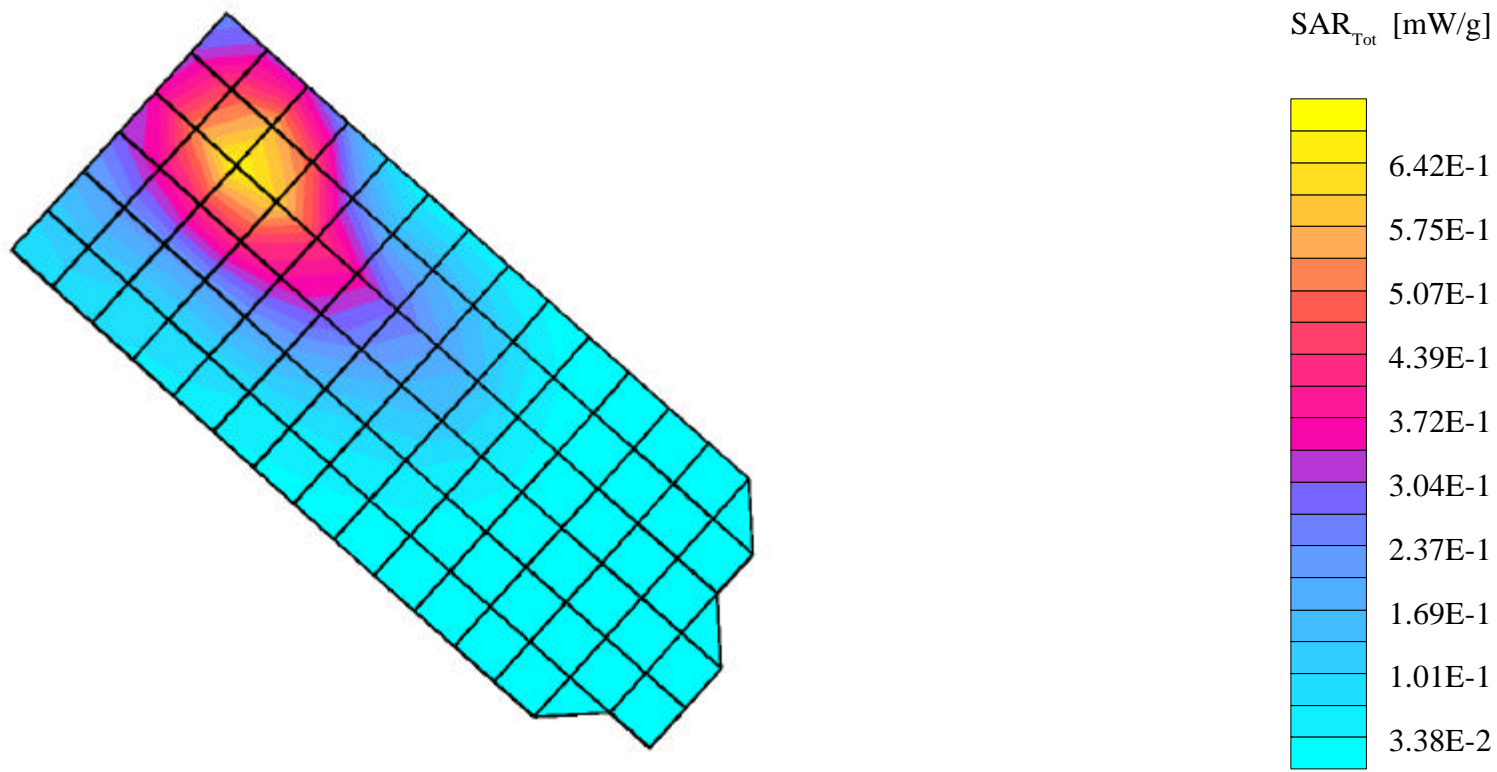
Probe: ET3DV6 - SN1515 Head (Glycol) 11-11-00; ConvF(5.25,5.25,5.25); Crest factor: 1.0; Head Glycol 1900 MHz: $\sigma = 1.43$ mho/m $\epsilon_r = 39.0$ $\rho = 1.00$ g/cm³

Cube 5x5x7: SAR (1g): 0.631 mW/g, SAR (10g): 0.378 mW/g, (Worst-case extrapolation)

Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0

Penetration depth: 11.4 (10.5, 12.6) [mm]

Powerdrift: 0.09 dB



s/n A88BC505

Ch# 25 / Antenna Position:Retracted / Type of Modulation: CDMA1900

Anakin (Left Head) Phantom; Left Head Section; Position: (90°,77°); Frequency: 1851 MHz

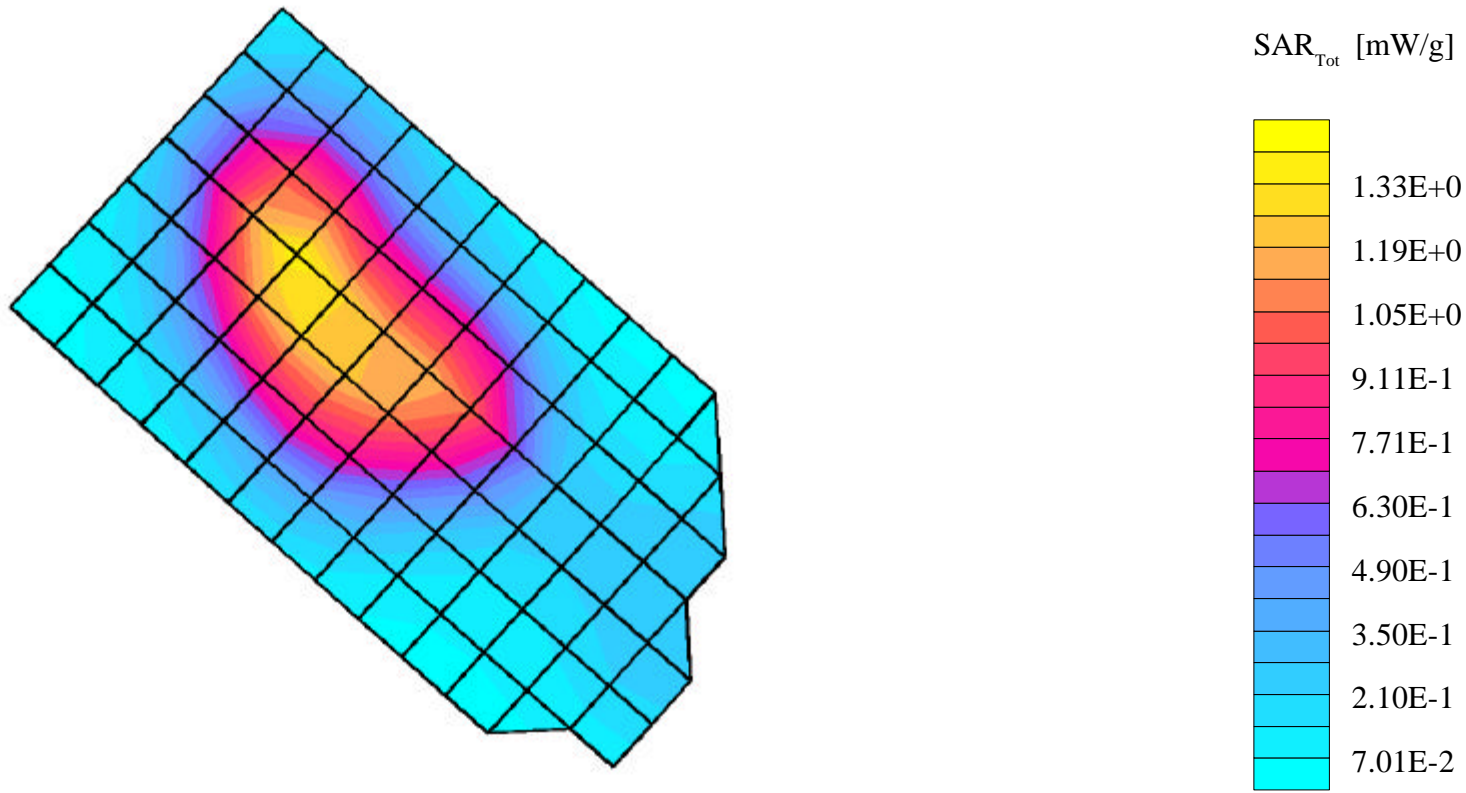
Probe: ET3DV6 - SN1515 Head (Glycol) 11-11-00; ConvF(5.25,5.25,5.25); Crest factor: 1.0; Head Glycol 1900 MHz: $\sigma = 1.43$ mho/m $\epsilon_r = 39.0$ $\rho = 1.00$ g/cm³

Cube 5x5x7: SAR (1g): 1.38 mW/g, SAR (10g): 0.822 mW/g, (Worst-case extrapolation)

Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0

Penetration depth: 10.1 (9.4, 11.1) [mm]

Powerdrift: 0.07 dB



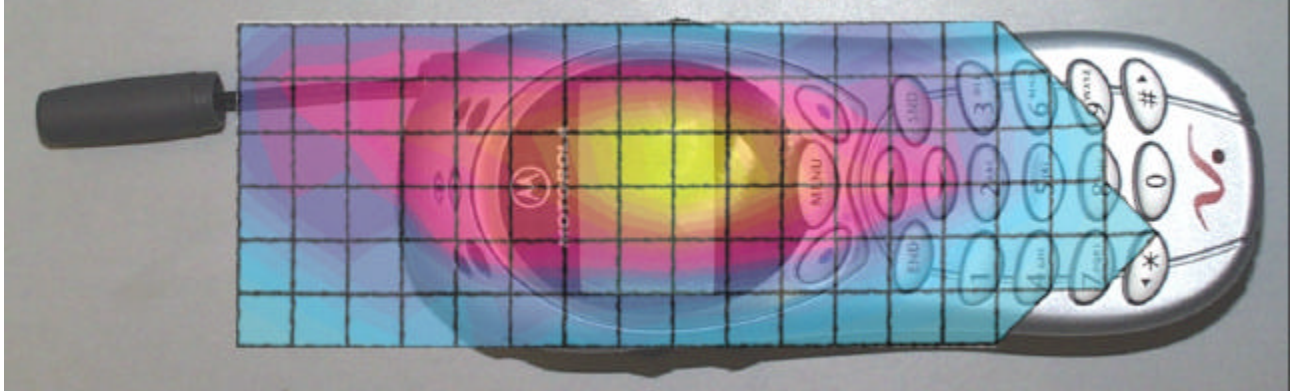


Figure 1. Front of Phone Overlaid with Typical 800MHz Contour

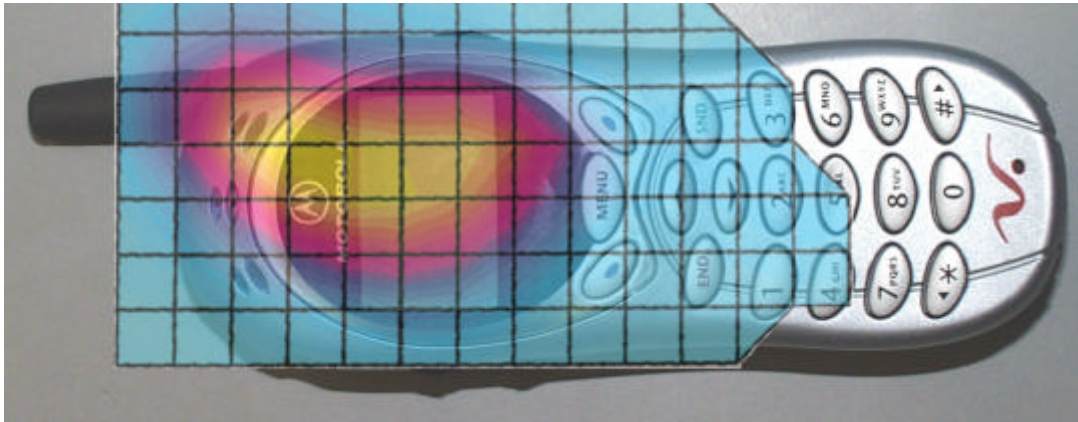


Figure 2. Front of Phone Overlaid with Typical 1900MHz Contour

Appendix 3

SAR distribution plots for Body Worn Configuration

s/n A88BC505

Ch#991 / Pwr Step: 02 / Antenna Position: Extended / Body-Worn

Amy Twin Optics OFF Phantom; Section 1 Section; Position: (0°,0°); Frequency: 824 MHz

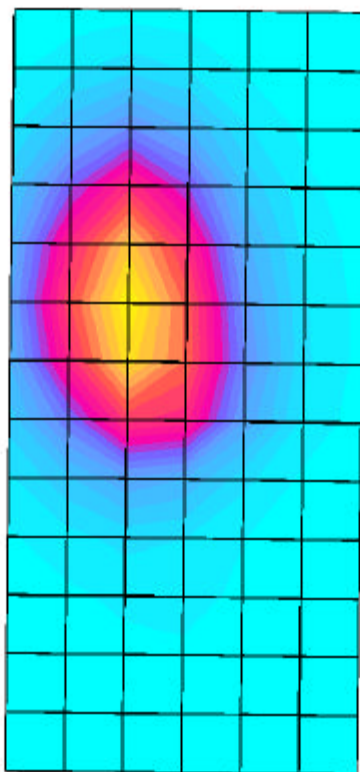
Probe: ET3DV6 - SN1515 - Muscle (Sugar Water) 11-11-00; ConvF(6.56,6.56,6.56); Crest factor: 1.0; Muscle 835 MHz: $\sigma = 1.09$ mho/m $\epsilon_r = 50.6$ $\rho = 1.00$ g/cm³

Cube 5x5x7: SAR (1g): 1.36 mW/g, SAR (10g): 0.892 mW/g, (Worst-case extrapolation)

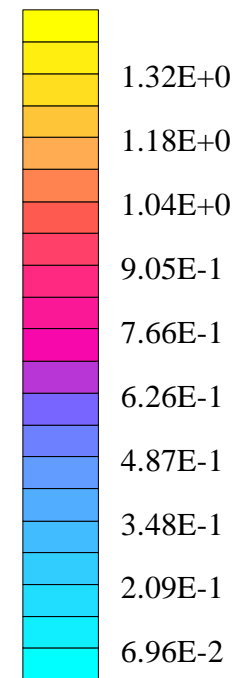
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 12.7 (11.7, 13.8) [mm]

Powerdrift: -0.26 dB



SAR_{Tot} [mW/g]



s/n A88BC505

Ch#991 / Pwr Step: 02 / Antenna Position: Retracted / Body-worn

Amy Twin Optics OFF Phantom; Section 1 Section; Position: (0°,0°); Frequency: 824 MHz

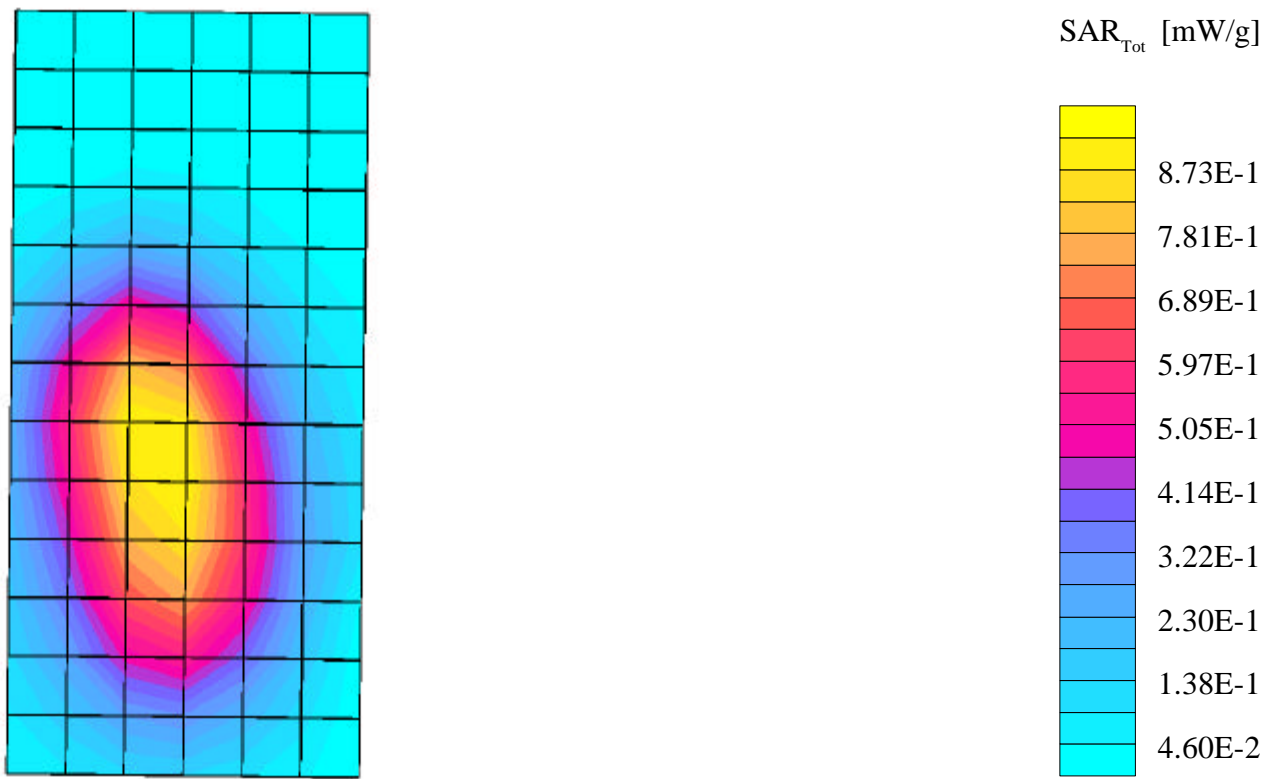
Probe: ET3DV6 - SN1515 - Muscle (Sugar Water) 11-11-00; ConvF(6.56,6.56,6.56); Crest factor: 1.0; Muscle 835 MHz: $\sigma = 1.09$ mho/m $\epsilon_r = 50.6$ $\rho = 1.00$ g/cm³

Cube 5x5x7: SAR (1g): 0.945 mW/g, SAR (10g): 0.642 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 13.6 (12.6, 14.8) [mm]

Powerdrift: -0.07 dB



s/n A88BC505

Ch#600 / Antenna Position: Extended / Type of Modulation: CDMA1900 / Body-Worn

Amy Twin Optics OFF Phantom; Section 1 Section; Position: (0°,0°); Frequency: 1880 MHz

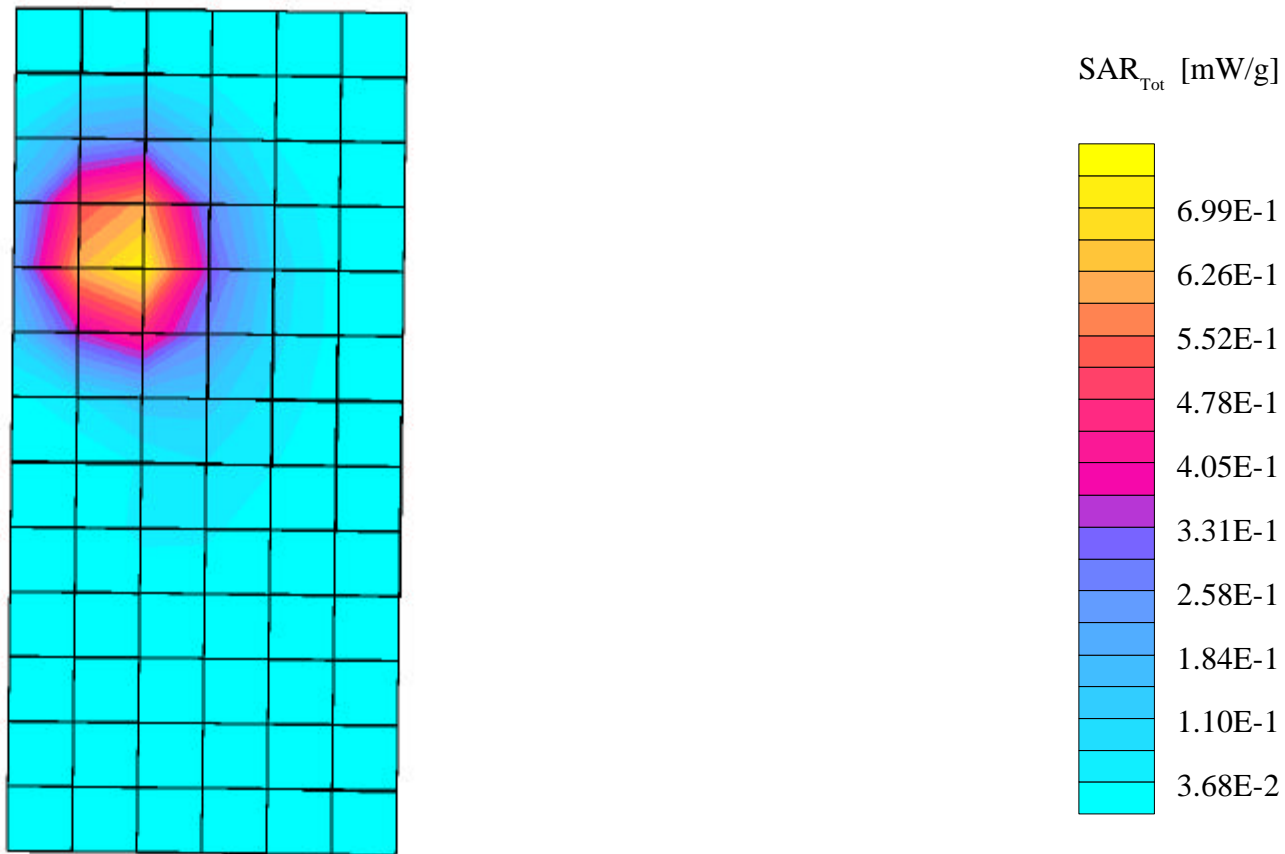
Probe: ET3DV6 - SN1515 - Muscle (Glycol) 11-11-00; ConvF(4.98,4.98,4.98); Crest factor: 1.0; Muscle Glycol 1900 MHz: $\sigma = 1.64$ mho/m $\epsilon_r = 48.0$ $\rho = 1.00$ g/cm³

Cube 5x5x7: SAR (1g): 0.779 mW/g, SAR (10g): 0.438 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 9.1 (8.6, 10.0) [mm]

Powerdrift: 0.15 dB



s/n A88BC505

Ch#25 / Antenna Position: Retracted / Type of Modulation: CDMA1900 / Body Worn

Amy Twin Optics OFF Phantom; Section 1 Section; Position: (0°,0°); Frequency: 1850 MHz

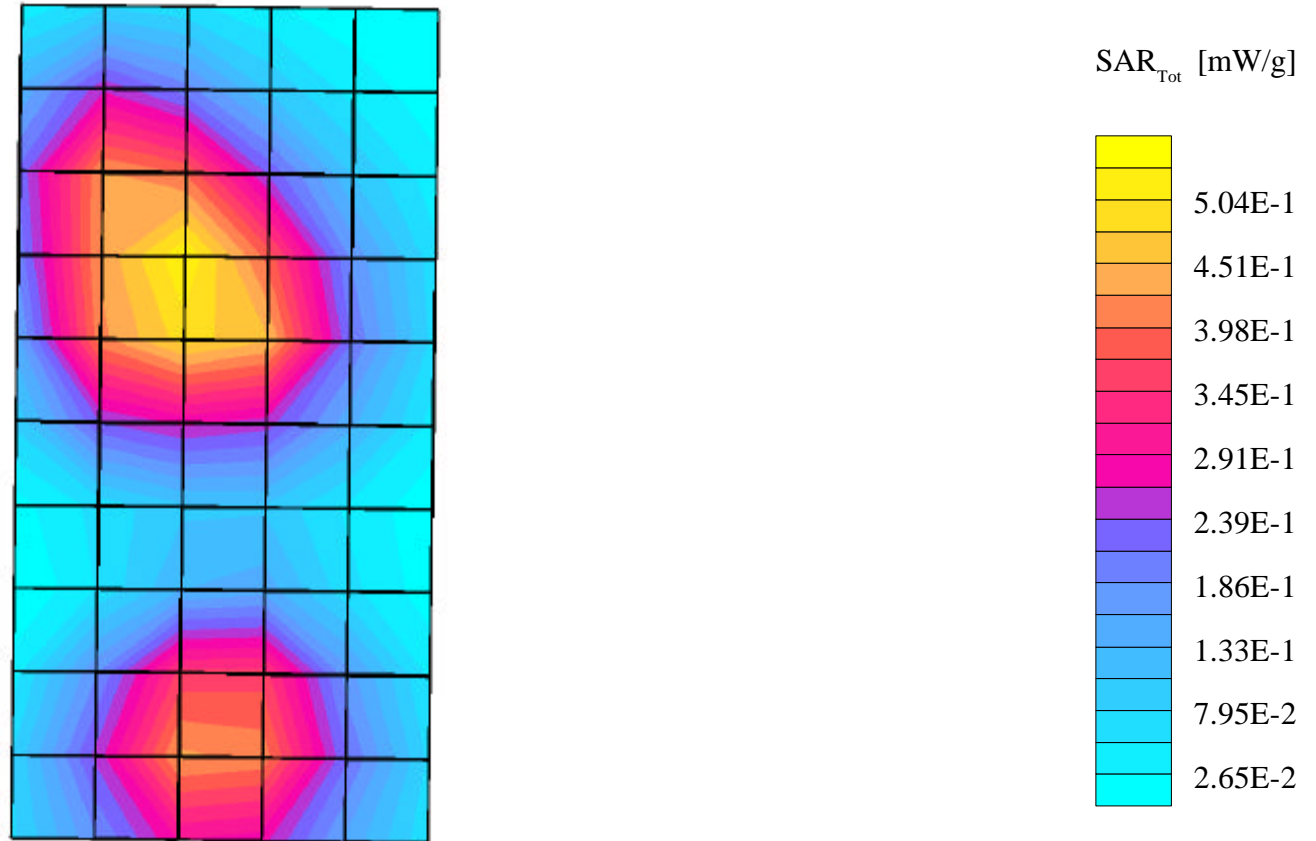
Probe: ET3DV6 - SN1515 - Muscle (Glycol) 11-11-00; ConvF(4.98,4.98,4.98); Crest factor: 1.0; Muscle Glycol 1900 MHz: $\sigma = 1.64$ mho/m $\epsilon_r = 48.0$ $\rho = 1.00$ g/cm³

Cube 5x5x7: SAR (1g): 0.540 mW/g, SAR (10g): 0.328 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 10.1 (9.5, 11.0) [mm]

Powerdrift: 0.05 dB



Appendix 4

Photographs of the device under test



Figure 3. Front of Phone with Antenna Extended



Figure 4. Front of Phone with Antenna Retracted



Figure 5. Phone Against Phantom Head with Antenna Extended



Figure 6. Phone Against Phantom Head with Antenna Retracted.



Figure 7. Side of Phone with Antenna Retracted



Figure 8. Back of Phone with Belt-Clip Attached.



Figure 9. Distance Provided by Belt-Clip with Antenna Retracted



Figure 10. Distance Provided by Belt-Clip with Antenna Extended