



Exhibit 11: SAR Test Report IHDT56EL1

Date of test: 11/10/2004 – 11/22/2004
Date of Report: 12/20/2004

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Accreditation: This laboratory is accredited to ISO/IEC 17025-1999 to perform the following tests:



Tests:
 Electromagnetic Specific Absorption Rate

Procedures:
 ANSI/IEEE C95.1-1992, 1999
 (SAR) IEEE C95.3-1991
 IEEE P1528 (DRAFT)
 FCC OET Bulletin 65 (including Supplements A, B, C)
 Australian Communications Authority Radio
 Communications (Electromagnetic Radiation – Human
 Exposure) Standard 1999
 CENELEC EN 50361 (2001)
 APP-0247
 DOI-0876, 0900, 0902, 0904, 0915

Simulated Tissue Preparation
 RF Power Measurement

On the following products or types of products:

Wireless Communications Devices (Examples): Two Way Radios; Portable Phones (including Cellular, Licensed Non-Broadcast and PCS); Low Frequency Readers; and Pagers

A2LA certificate #1651-01

Statement of Compliance: Motorola declares under its sole responsibility that portable cellular telephone FCC ID IHDT56EL1 to which this declaration relates, is in conformity with the appropriate General Population/Uncontrolled RF exposure standards, recommendations and guidelines (FCC 47 CFR §2.1093). 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:

(none)
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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.

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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 IHDT56EL1). The Specific Absorption Rate (SAR) of this product was measured. The portable cellular phone was tested in accordance with FCC OET Bulletin 65 Supplement C 01-01.

2 Description of the Device Under Test

2.1 Antenna description

Type	External	
Location	Upper Right	
Dimensions	Length	110 mm
	Width	8 mm
Configuration	Extendable Whip	

2.2 Device description

FCC ID Number	IHDT56CL1		
Serial number	68586566		
Mode(s) of Operation	800 CDMA	1900 CDMA	BlueTooth
Modulation Mode(s)	CDMA	CDMA	BlueTooth
Maximum Output Power Setting	25.00dBm	25.00dBm	4.00dBm
Duty Cycle	1:1	1:1	1:1
Transmitting Frequency Rang(s)	824-849MHz	1851-1909MHz	2400 - 2483.5MHz
Production Unit or Identical Prototype (47 CFR §2..908)	Identical Prototype		
Device Category	Portable		
RF Exposure Limits	General Population / Uncontrolled		

3 Test Equipment Used

3.1 Dosimetric System

The Motorola Personal Communications Sector Product Safety & Compliance Laboratory utilizes a Dosimetric Assessment System (Dasy3™ v3.1d) manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. All the SAR measurements are taken within a shielded enclosure. The overall RSS uncertainty of the measurement system is $\pm 11.7\%$ (K=1) with an expanded uncertainty of $\pm 23.0\%$ (K=2). The measurement uncertainty budget is given in Appendix 6. Per IEEE 1528, this uncertainty budget is applicable to the SAR range of 0.4 W/kg to 10 W/kg. The list of calibrated equipment used for the measurements is shown below.

Description	Serial Number	Cal Due Date
DASY3 DAE V1	316	12/17/2004
	437	3/16/2005
	440	2/09/2005
E-Field Probe ET3DV6	1513	9/24/2005
	1520	5/27/2005
	1397	4/21/2005
Dipole Validation Kit, D900V2	79	4/02/2005
S.A.M. Phantom used for 800MHz	TP-1132	
Dipole Validation Kit, D1800V2	251TR	4/02/2005
	246TR	4/02/2005
	259TR	4/02/2005
S.A.M. Phantom used for 1900MHz	TP-1160	
	TP-1159	
	TP-1154	

3.2 Additional Equipment

Description	Serial Number	Cal Due Date
Signal Generator HP8648C	3847A04632	10/25/2005
	3847A04850	2/2/2005
Power Meter E4419B	GB39510961	1/8/2005
	GB39511084	4/5/2005
Power Sensor #1 - E9301A	US39211006	7/21/2005
	US39210931	9/16/2005
Power Sensor #2 - E9301A	US39211007	7/21/2005
	US39210932	9/16/2005
Network Analyzer HP8753ES	US39171846	9/3/2005
Dielectric Probe Kit HP85070C	US99360070	N/A

4 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 the HP85070 Dielectric Probe Kit. These values, along with the temperature of the tissue simulate are shown in the table below. The recommended limits for maximum permittivity and minimum conductivity are also shown. These come from the Federal Communication Commission, OET Bulletin 65 Supplement C 01-01. 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)	Temp (°C)
835	Head	Measured, 11/10/2004	41.6	0.91	19.6
		Measured, 11/11/2004	41.3	0.90	19.5
		Measured, 11/12/2004	41.2	0.90	20.0
		Measured, 11/15/2004	43.0	0.92	19.7
		Measured, 11/16/2004	43.0	0.92	19.5
		Recommended Limits	41.5 $\pm$ 5%	0.90 $\pm$ 5%	18-25
	Body	Measured, 11/12/2004	55.6	0.98	19.3
		Measured, 11/16/2004	55.6	0.98	20.1
		Measured, 11/17/2004	55.4	0.98	19.9
		Recommended Limits	55.2 $\pm$ 5%	0.97 $\pm$ 5%	18-25
1880	Head	Measured, 11/13/2004	38.4	1.45	19.5
		Measured, 11/15/2004	38.1	1.46	20.6
		Measured, 11/22/2004	38.0	1.45	19.8
		Recommended Limits	40.0 $\pm$ 5%	1.40 $\pm$ 5%	18-25
	Body	Measured, 11/15/2004	50.8	1.59	19.0
		Measured, 11/16/2004	50.7	1.59	19.5
		Recommended Limits	53.3 $\pm$ 5%	1.52 $\pm$ 5%	18-25

The list of ingredients and the percent composition used for the tissue simulates are indicated in the table below.

Ingredient	800MHz Head	800MHz Body	1900MHz Head	1900MHz Body
Sugar	57.0	44.9	--	30.80
DGBE	--	--	47.0	--
Water	40.45	53.06	52.8	68.91
Salt	1.45	0.94	0.2	0.29
HEC	1.0	1.0	--	--
Bact.	0.1	0.1	--	--

5 System Accuracy Verification

A system accuracy verification of the DASY3 was performed using the measurement equipment listed in Section 3.1. The daily system accuracy verification occurs within center section of the SAM phantom.

A SAR measurement was performed to see if the measured SAR was within $\pm$ 10% from the target SAR indicated on the dipole certification sheet. These tests were done at 900MHz and/or 1800MHz. These frequencies are within 100MHz of the mid-band frequency of the test device. This is within the allowable window given in Supplement C 01-01 *Appendix D System Verification* section item #5. The test was conducted on the same days as the measurement of the DUT. Recommended limits for maximum permittivity, minimum conductivity are shown in the table below. These come from the Federal Communication Commission, OET Bulletin 65 Supplement C 01-01. The obtained results from the system accuracy verification are displayed in the table below. The distributions of SAR compare well with those of the reference measurements (see Appendix 1). The tissue stimulant depth was verified to be 15.0cm $\pm$ 0.5cm. Z-axis scans showing the SAR penetration are also included in Appendix 1. SAR values are normalized to 1W forward power delivered to the dipole.

<i>f</i> (MHz)	Description	SAR (W/kg), 1gram	Dielectric Parameters		Ambient Temp (°C)	Tissue Temp (°C)
			ϵ_r	σ (S/m)		
900	Measured, 11/10/2004	11.3	40.8	0.97	21.0	20.0
	Measured, 11/11/2004	11.3	40.6	0.96	21.0	20.4
	Measured, 11/12/2004	11.2	40.4	0.96	21.0	20.3
	Measured, 11/15/2004	11.2	40.2	0.96	21.0	20.1
	Measured, 11/16/2004	11.3	42.2	0.99	20.0	20.4
	Measured, 11/17/2004	11.1	42.3	0.98	21.0	20.3
	Recommended Limits	10.8	41.5 $\pm$ 5%	0.97 $\pm$ 5%	18-25	18-25
1800	Measured, 11/13/2004	36.6	38.8	1.36	21.0	19.3
	Measured, 11/15/2004	38.2	38.5	1.38	21.0	18.9
	Measured, 11/16/2004	38.7	38.4	1.38	20.0	19.0
	Measured, 11/17/2004	38.2	38.3	1.36	21.0	19.2
	Measured, 11/22/2004	37.5	38.3	1.37	20.0	19.7
	Recommended Limits	38.1	40.0 $\pm$ 5%	1.4 $\pm$ 5%	18-25	18-25

The following probe conversion factors were used on the E-Field probe(s) used for the system accuracy verification measurements:

Description	Serial Number	<i>f</i> (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ET3DV6	1397	900	6.10	7 of 8
		1800	5.09	7 of 8
	1513	900	5.99	8 of 9
		1810	4.95	8 of 9
	1520	900	6.25	7 of 8
		1800	5.16	7 of 8

6 Test Results

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 tested in the configurations stipulated in OET Bulletin 65 Supplement C 01-01. Motorola also followed the requirements in Supplement. C / Appendix D: SAR Measurement Procedures, section titled “*Devices Operating Next To A Person’s Ear* “. These directions state “The device should be tested on the left and right side of the head phantom in the “Cheek/Touch” and “Ear/Tilt” positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tile/Ear, extended and retracted) is at least 2.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s).”

The DASY v3.1d SAR measurement system specified in section 3.1 was utilized within the intended operations as set by the SPEAG™ setup. The phone was positioned into the measurement configurations using the positioner supplied with the DASY 3.1d SAR measurement system. The measured dielectric constant of the material used for the positioner is less than 2.9 and the loss tangent is less than 0.02 ($\pm 30\%$) at 850MHz. The default settings for the “coarse” and “cube” scans were chosen and use for measurements. The grid spacing of the course scan was set to 15cm as shown in the SAR plots included in appendix 2 and 3. Please refer to the DASY manual for additional information on SAR scanning procedures and algorithms used.

The Cellular Phone (FCC ID IHDT56EL1) has the following battery options:

SNN5760A - 1000mAH Battery

SNN5615A - 1400mAH Battery

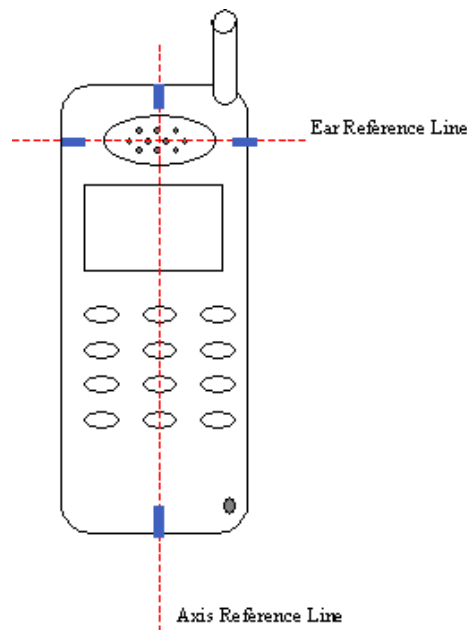
The battery with the highest capacity is the SNN5615A. This battery was used to do most of the SAR testing. The phone was placed in the SAR measurement system with a fully charged battery. The head and body configurations that produced the highest SAR values were tested using the other battery listed above.

6.1 Head Adjacent Test Results

To aid in positioning repeatability, the ear reference line of the device and the axis reference line of the device have been physically added using a non-metallic marker.

- Per Figure 1, the "Ear Reference Line" is centered vertically through the center of the listening area (as defined by the speaker holes in the housing).
- The "Axis Reference Line" bisects the front surface of the device at its top and bottom edges.
- The intersection of these two lines defines the location of the "Ear Reference Point".

The lines drawn on the device extended to the outside edges, as shown in blue in the figure below, & wrap around the sides of the device.



The SAR results shown in tables 1 through 5 are maximum SAR values averaged over 1 gram of phantom tissue. Also shown are the measured conducted output powers, the temperature of the test facility during the test, the temperature of the tissue simulate after the test, the measured drift and the extrapolated SAR. The exact method of extrapolation is $\text{New SAR} = \text{Old SAR} * 10^{(-\text{drift}/10)}$. The SAR reported at the end of the measurement process by the DASY™ measurement system can be scaled up by the measured drift to determine the SAR at the beginning of the measurement process. This is the most conservative SAR because it corresponds to the average output power at the beginning of the SAR test. This extrapolation has been done because when the DUT is operating properly it may exhibit a slump in radiated power and SAR over time. This is verified by measuring the SAR drift after the test. The test conditions indicated as bold numbers in the following table are included in Appendix 2

The SAR measurements were performed using the SAM phantoms listed in section 3.1. Since same phantoms and tissue simulate are used for the system accuracy verification as the device SAR measurements, the Z-axis scans included in within Appendix 1 are applicable for verification of tissue simulate depth to be 15.0cm ±0.5cm. All other test conditions measured lower SAR values than those included in Appendix 2. Note that 800MHz digital mode SAR measurements were performed in accordance with Supplement C.

The following probe conversion factors were used on the E-Field probe(s) used for the head adjacent measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ET3DV6	1397	900	6.10	7 of 8
		1800	5.09	7 of 8
	1513	900	5.99	8 of 9
		1810	4.95	8 of 9
	1520	900	6.25	7 of 8
		1800	5.16	7 of 8

f (MHz)	Description	Conducted Output Power (dBm)	Left Head (Cheek / Touch Position)							
			Ant Extended				Ant Retracted			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 800MHz	Channel 1013	24.93	1.07	-0.03	1.08	20.2	0.755	-0.06	0.76	19.1
	Channel 384	24.94	0.961	0.03	0.96	20.2	0.81	-0.07	0.82	19.5
	Channel 777	25.03	1.15	-0.10	1.18	20.0	0.89	-0.00	0.89	19.6
Digital 1900MHz	Channel 25	24.91								
	Channel 600	25.02	0.21	-0.2	0.22	19.5	0.526	0.2	0.53	19.5
	Channel 1175	24.95								

Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT56EL1 at highest possible output power. Measured against the left head in the Cheek/Touch Position.

f (MHz)	Description	Conducted Output Power (dBm)	Right Head (Cheek / Touch Position)							
			Ant Extended				Ant Retracted			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 800MHz	Channel 1013	24.93	1.12	-0.04	1.13	20.2	0.98	-0.03	0.99	20.1
	Channel 384	24.94	1.10	-0.18	1.15	20.2	1.12	-0.1	1.15	20.1
	Channel 777	25.03	1.21	-0.10	1.24	20.2	1.08	0.03	1.08	20.1
Digital 1900MHz	Channel 25	24.91								
	Channel 600	25.02	0.343	-0.2	0.36	19.5	0.487	-0.2	0.51	19.5
	Channel 1175	24.95								

Table 2: SAR measurement results for the portable cellular telephone FCC ID IHDT56EL1 at highest possible output power. Measured against the right head in the Cheek/Touch Position.

f (MHz)	Description	Conducted Output Power (dBm)	Left Head (15° Tilt Position)							
			Ant Extended				Ant Retracted			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 800MHz	Channel 1013	24.93								
	Channel 384	24.94	0.291	0.00	0.29	20.1	0.32	0.0	0.32	20.2
	Channel 777	25.03								
Digital 1900MHz	Channel 25	24.91								
	Channel 600	25.02	0.195	0.0	0.20	19.5	0.208	0.0	0.21	19.5
	Channel 1175	24.95								

Table 3: SAR measurement results for the portable cellular telephone FCC ID IHDT56EL1 at highest possible output power. Measured against the left head in the 15° Tilt Position.

f (MHz)	Description	Conducted Output Power (dBm)	Right Head (15° Tilt Position)							
			Ant Extended				Ant Retracted			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 800MHz	Channel 1013	24.93								
	Channel 384	24.94	0.285	-0.1	0.29	20.1	0.312	0.1	0.31	20.1
	Channel 777	25.03								
Digital 1900MHz	Channel 25	24.91								
	Channel 600	25.02	0.191	0.01	0.19	18.6	0.188	0.0	0.19	19.1
	Channel 1175	24.95								

Table 4: SAR measurement results for the portable cellular telephone FCC ID IHDT56EL1 at highest possible output power. Measured against the right head in the 15° Tilt Position.

f (MHz)	Description	Conducted Output Power (dBm)	Head (Cheek / Touch Position) with SNN5760A Battery							
			Ant Extended				Ant Retracted			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Right Head Digital 800MHz	Channel 1013	24.93	1.14	-0.05	1.15	19.8	0.831	0.01	0.83	19.6
	Channel 384	24.94	1.04	0.05	1.04	19.5	0.896	-0.11	0.92	19.9
	Channel 777	25.03	1.2	0.1	1.22	19.8	1.01	0.0	1.01	19.8
Left Head Digital 1900MHz	Channel 25	24.91								
	Channel 600	25.02	0.207	-0.1	0.21	19.0	0.47	-0.1	0.48	19.0
	Channel 1175	24.95								

Table 5: SAR measurement results for the portable cellular telephone FCC ID IHDT56EL1 at highest possible output power. Measured against the right head in the 15° Tilt Position.

6.2 Body Worn Test Results

The SAR results shown in table 6, 7 and 8 are the maximum SAR values averaged over 1 gram of phantom tissue. Also shown are the measured conducted output powers, the temperature of the test facility during the test, the temperature of the tissue simulate after the test, the measured drift and the extrapolated SAR. The exact method of extrapolation is $\text{New SAR} = \text{Old SAR} * 10^{(-\text{drift}/10)}$. The SAR reported at the end of the measurement process by the DASY™ measurement system can be scaled up by the measured drift to determine the SAR at the beginning of the measurement process. This is the most conservative SAR because it corresponds to the average output power at the beginning of the SAR test. This extrapolation has been done because when the DUT is operating properly it may exhibit a slump in radiated power and SAR over time. This is verified by measuring the SAR drift after the test. The test conditions indicated as bold numbers in the following table are included in Appendix 3. Note that 800MHz digital mode SAR measurements were performed in accordance with OET Bulletin 65 Supplement C 01-01. All other test conditions measured lower SAR values than those included in Appendix 3.

A “flat” phantom was for the body-worn tests. This “flat” phantom is made out of 1” thick natural High Density Polyethylene with a thickness at the bottom equal to 2.0mm. It measures 52.7cm(long) x 26.7cm(wide) x 21.2cm(tall). The measured dielectric constant of the material used is less than 2.3 and the loss tangent is less than 0.0046 all the way up to 2.184GHz.

The tissue stimulant depth was verified to be 15.0cm ±0.5cm. The same device holder described in section 6 was used for positioning the phone. The functional accessories were divided into two categories, the ones with metal components and the ones with non-metal components. For non-metallic component accessories’, testing was performed on the accessory that displayed the closest proximity to the flat phantom. Each metallic component accessory, if any, was checked for uniqueness of metal component so that each is tested with the device. If multiple accessories shared an identical metal component, only the accessory that dictates the closest spacing to the body was tested. The cellular phone was tested with a headset connected to the device for all body-worn SAR measurements.

A plastic holster with belt clip, model #SYN0912A, is the only body-worn accessory available for this phone. This holster was used for all body-worn SAR measurements.

The following probe conversion factors were used on the E-Field probe(s) used for the body worn measurements:

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ET3DV6	1397	900	5.92	7 of 8
		1800	4.52	7 of 8
	1513	900	5.85	8 of 9
		1810	4.41	8 of 9
	1520	900	6.14	7 of 8
		1800	4.54	7 of 8

f (MHz)	Description	Conducted Output Power (dBm)	Body Worn with SYN0912A							
			Ant Extended				Ant Retracted			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 800MHz	Channel 1013	24.93	1.26	-0.1	1.29	19.3	0.793	-0.06	0.80	19.8
	Channel 384	24.94	0.935	0.03	0.94	19.4	0.789	-0.13	0.81	19.5
	Channel 777	25.03	1.2	-0.11	1.23	19.1	0.849	0.0	0.85	19.3
Digital 1900MHz	Channel 25	24.91					0.939	-0.18	0.98	19.1
	Channel 600	25.02	0.58	-0.0	0.58	19.1	1.11	-0.1	1.14	19.1
	Channel 1175	24.95					0.888	-0.03	0.90	19.1

Table 6: SAR measurement results for the portable cellular telephone FCC ID IHDT56EL1 at highest possible output power. Measured against the body.

f (MHz)	Description	Conducted Output Power (dBm)	Body Worn with SYN0912A and Bluetooth							
			Ant Extended				Ant Retracted			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 800MHz	Channel 1013	24.93	1.21	-0.04	1.22	20.2	0.889	0.01	0.89	20.7
	Channel 384	24.94	1.00	0.01	1.00	20	0.921	-0.2	0.97	20.7
	Channel 777	25.03	1.26	-0.2	1.31	20.1	1.02	-0.1	1.03	20.1
Digital 1900MHz	Channel 25	24.91					0.961 R51115	-0.15	0.99	19.0
	Channel 600	25.02	0.608	0.00	0.61	19.0	1.12	-0.0	1.12	19.0
	Channel 1175	24.95					0.908	-0.16	0.94	19.5

Table 7: SAR measurement results for the portable cellular telephone FCC ID IHDT56EL1 at highest possible output power. Measured against the body.

f (MHz)	Description	Conducted Output Power (dBm)	Body Worn with SYN0912A and Bluetooth and SNN5760A							
			Ant Extended				Ant Retracted			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 800MHz	Channel 1013	24.93	1.20	-0.1	1.23	19.9	0.872	0.10	0.87	19.9
	Channel 384	24.94	0.989	-0.01	0.99	20.0	0.913	-0.01	0.92	20.0
	Channel 777	25.03	1.20	-0.01	1.20	20.0	0.978	-0.1	1.01	20.0
Digital 1900MHz	Channel 25	24.91					0.836	-0.12	0.86	19.3
	Channel 600	25.02	0.655	-0.1	0.67	19.5	1.05	-0.1	1.07	19.5
	Channel 1175	24.95					0.831	-0.10	0.85	20

Table 8: SAR measurement results for the portable cellular telephone FCC ID IHDT56EL1 at highest possible output power. Measured against the body.

Appendix 1

SAR distribution comparison for the system accuracy verification

Test Laboratory: Motorola 111004 900 MHz GOOD +4.6%

DUT: Dipole 900 MHz; Type: D900V2;

Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 79 PM1 Power = 200mW
Sim.Temp@meas=20.7C Sim.Temp@SPC = 20.0C Room Temp @ SPC = 21.0C

Communication System: CW - Dipole; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only; Medium parameters used: $\sigma = 0.97\text{mho/m}$, $\epsilon_r = 40.8$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.46 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 51.8 V/m; Power Drift = 0.1 dB

Peak SAR (extrapolated) = 3.51 W/kg

SAR(1 g) = 2.34 mW/g; SAR(10 g) = 1.5 mW/g

Maximum value of SAR (measured) = 2.54 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 51.8 V/m; Power Drift = 0.1 dB

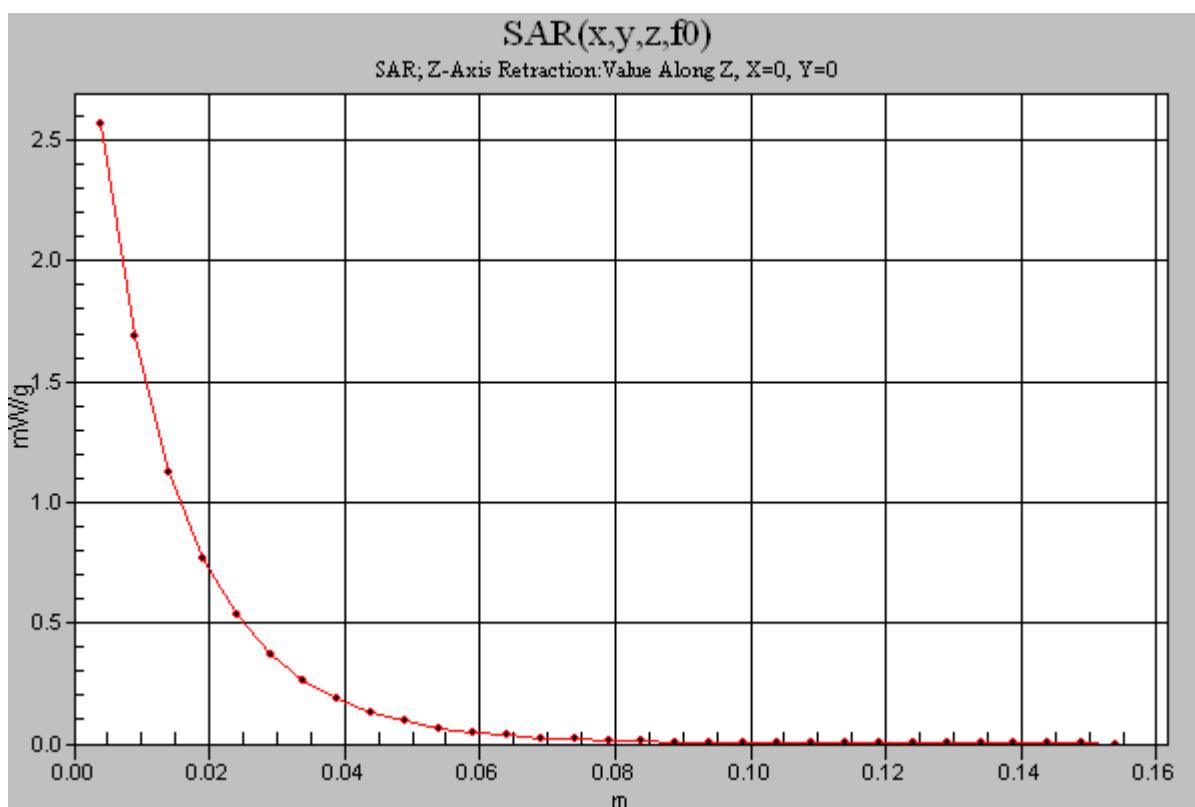
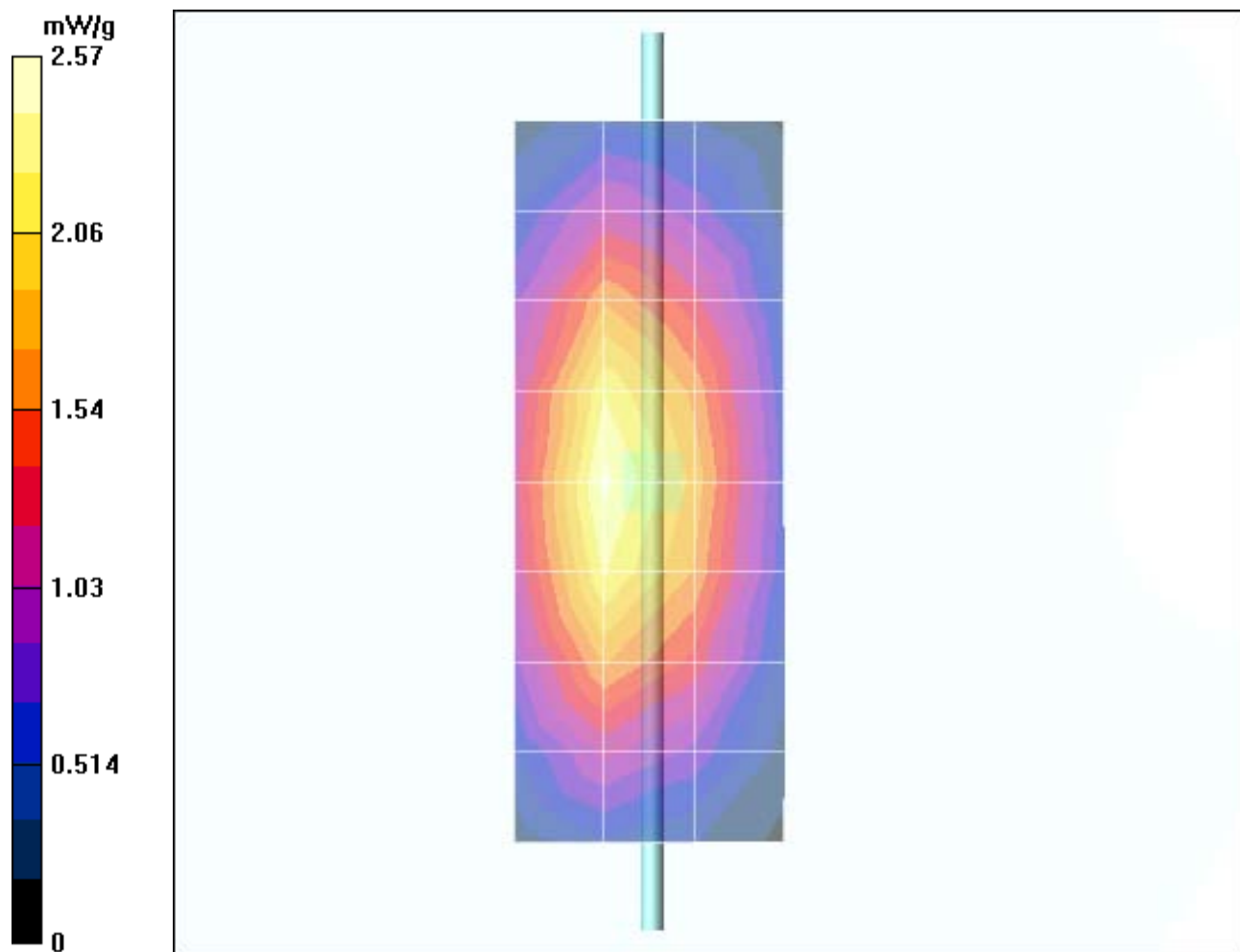
Peak SAR (extrapolated) = 3.24 W/kg

SAR(1 g) = 2.18 mW/g; SAR(10 g) = 1.4 mW/g

Maximum value of SAR (measured) = 2.37 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 2.57 mW/g



Test Laboratory: Motorola 111104 900 MHz GOOD +3.7%

DUT: Dipole 900 MHz; Type: D900V2

Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 079 PM1 Power = 200mW
Sim.Temp@meas = 20.4C Sim.Temp@SPC = 20.4C Room Temp @ SPC = 21C

Communication System: CW - Dipole; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only; Medium parameters used: $\sigma = 0.96\text{mho/m}$, $\epsilon_r = 40.6$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.34 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 52.8 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 3.47 W/kg

SAR(1 g) = 2.32 mW/g; SAR(10 g) = 1.49 mW/g

Maximum value of SAR (measured) = 2.52 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

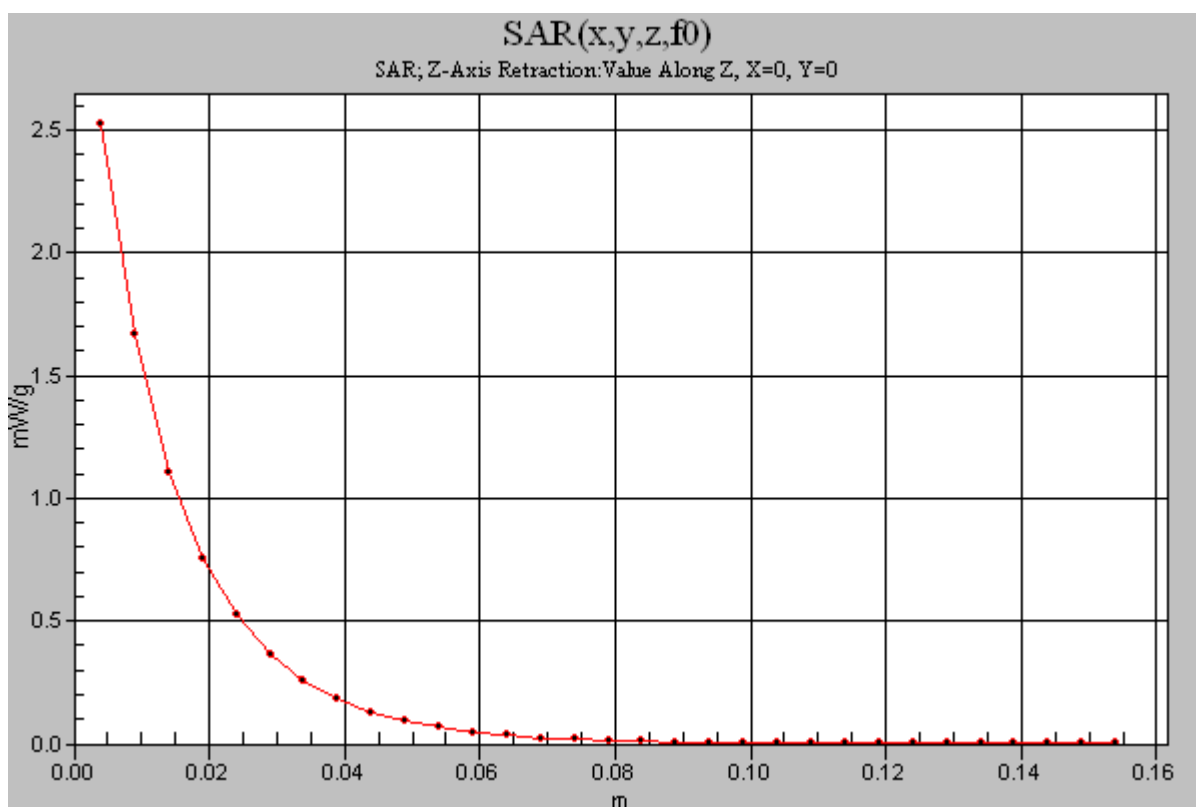
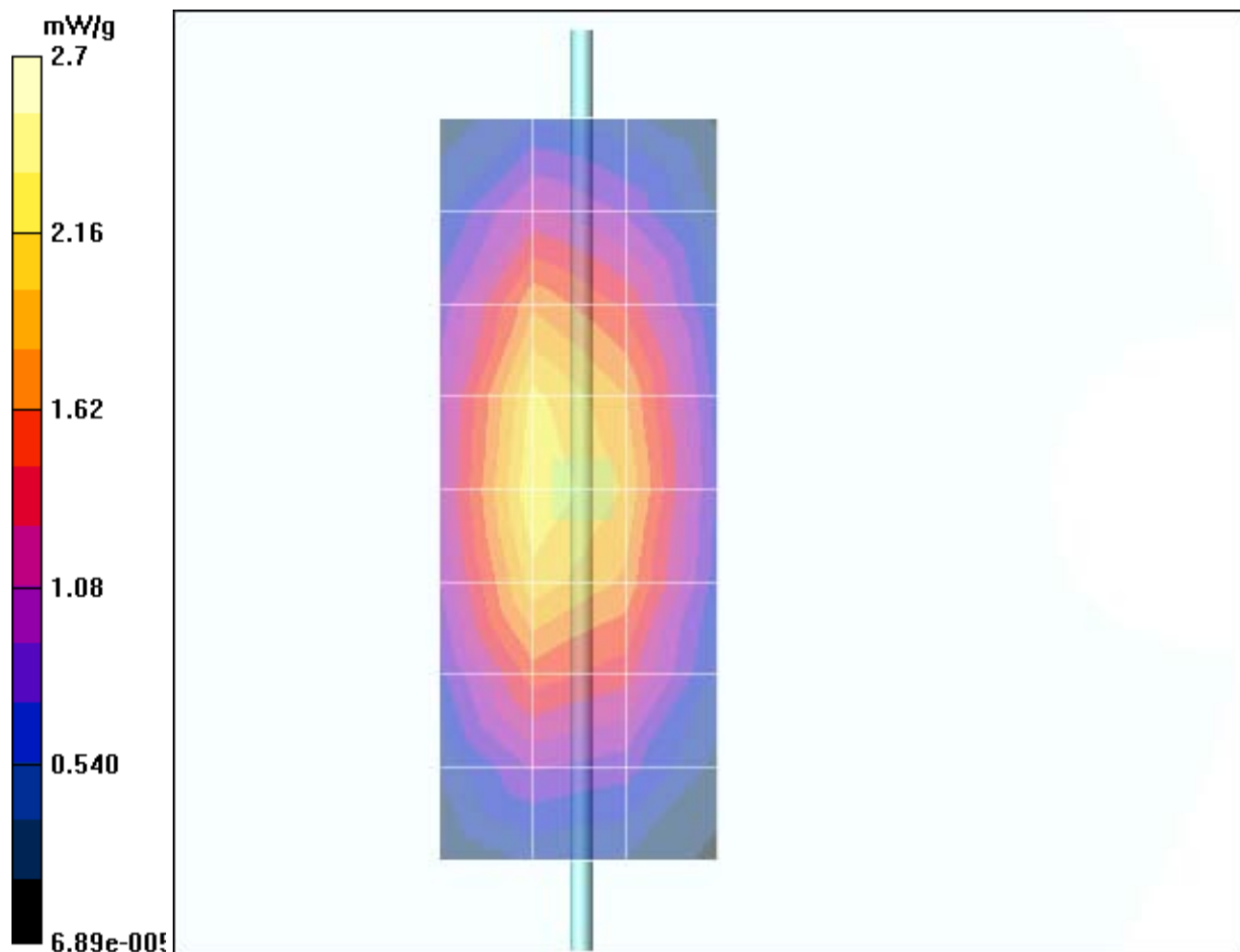
Reference Value = 52.8 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 3.21 W/kg

SAR(1 g) = 2.16 mW/g; SAR(10 g) = 1.39 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 2.53 mW/g



Test Laboratory: Motorola 111204 900 MHz GOOD +3.2%

DUT: Dipole 900 MHz; Type: D900V2

Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 079 PM1 Power = 200mW
Sim.Temp@meas= 20.3C Sim.Temp@SPC = 20.3C Room Temp @ SPC = 21C

Communication System: CW - Dipole; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only; Medium parameters used: $\sigma = 0.96\text{mho/m}$, $\epsilon_r = 40.4$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.47 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 49.5 V/m; Power Drift = 0.0 dB

Peak SAR (extrapolated) = 3.48 W/kg

SAR(1 g) = 2.31 mW/g; SAR(10 g) = 1.48 mW/g

Maximum value of SAR (measured) = 2.51 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

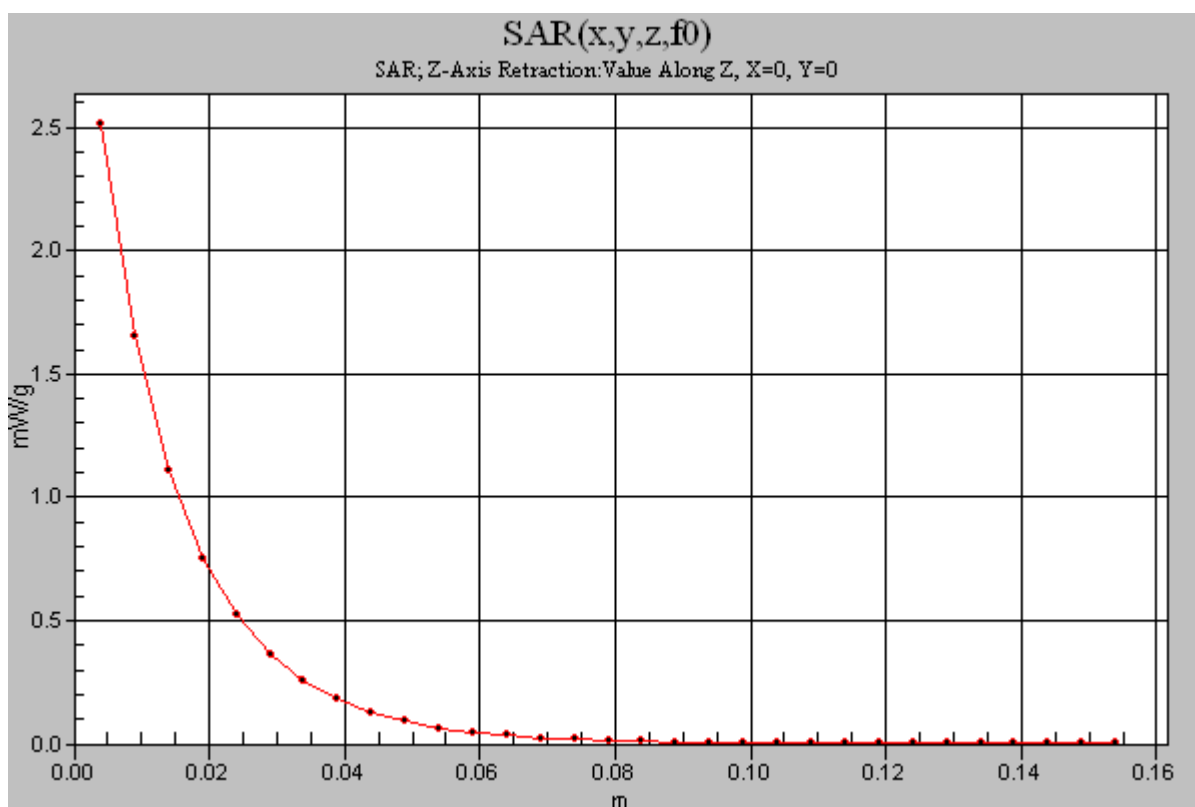
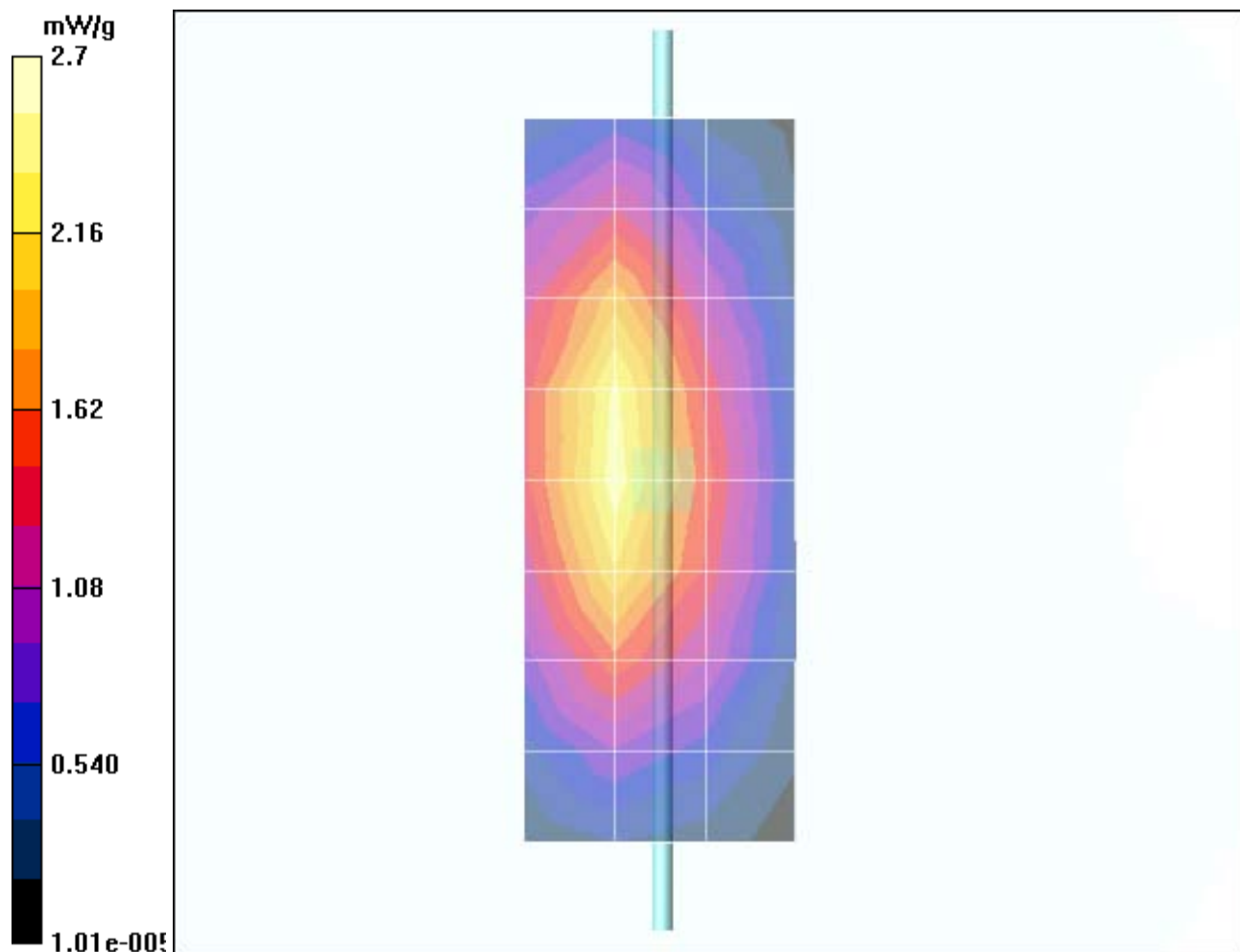
Reference Value = 49.5 V/m; Power Drift = 0.0 dB

Peak SAR (extrapolated) = 3.18 W/kg

SAR(1 g) = 2.15 mW/g; SAR(10 g) = 1.39 mW/g

Maximum value of SAR (measured) = 2.3 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm



Test Laboratory: Motorola 111304 1800MHz GOOD -4.0%

DUT: Dipole 1800 MHz; Type: D1800V2

Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 251TR PM1 Power = 200mW
Sim.Temp@meas=19.4 Sim.Temp@SPC = 19.3 Room Temp @ SPC = 21

Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only; Medium parameters used: $\sigma = 1.36\text{mho/m}$, $\epsilon_r = 38.8$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(5.16, 5.16, 5.16); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn437; Calibrated: 3/16/2004
- Phantom: R3; Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 6.42 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 82.5 V/m; **Power Drift = -0.0 dB**

Peak SAR (extrapolated) = 12.3 W/kg

SAR(1 g) = 7.27 mW/g; SAR(10 g) = 3.91 mW/g

Maximum value of SAR (measured) = 8.12 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 82.5 V/m; **Power Drift = -0.0 dB**

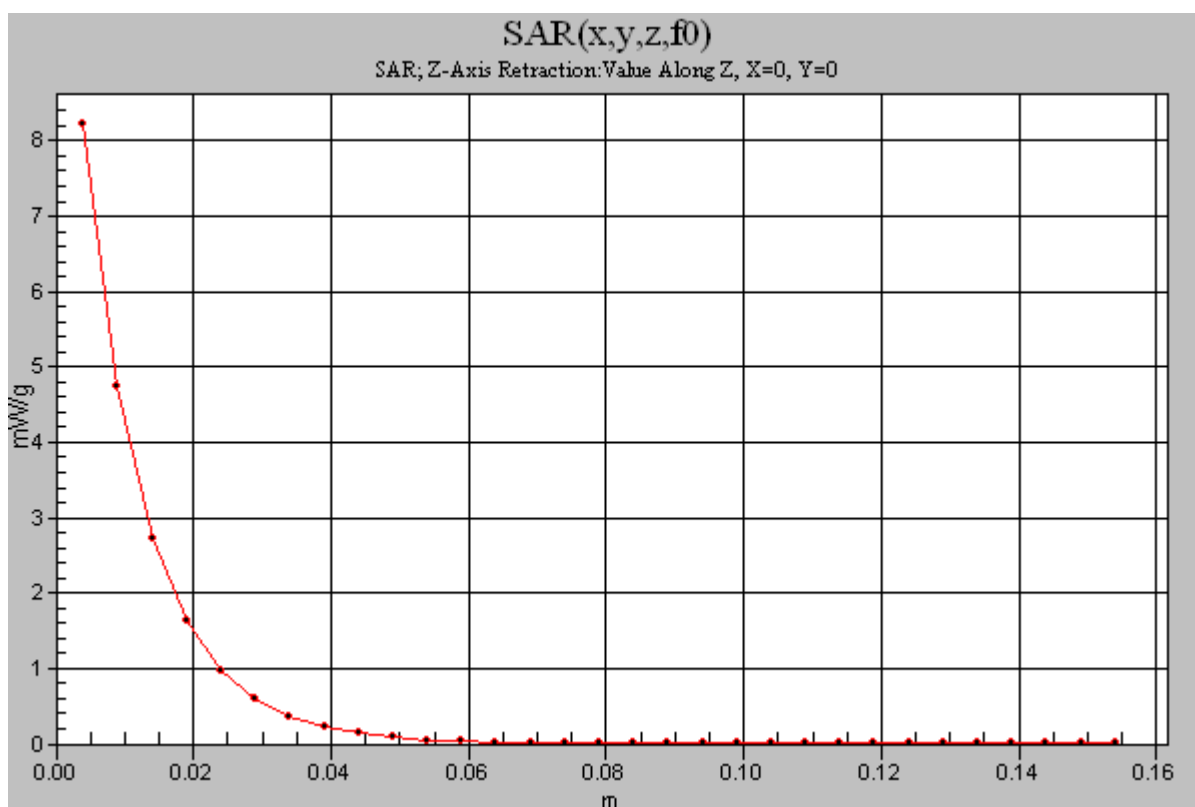
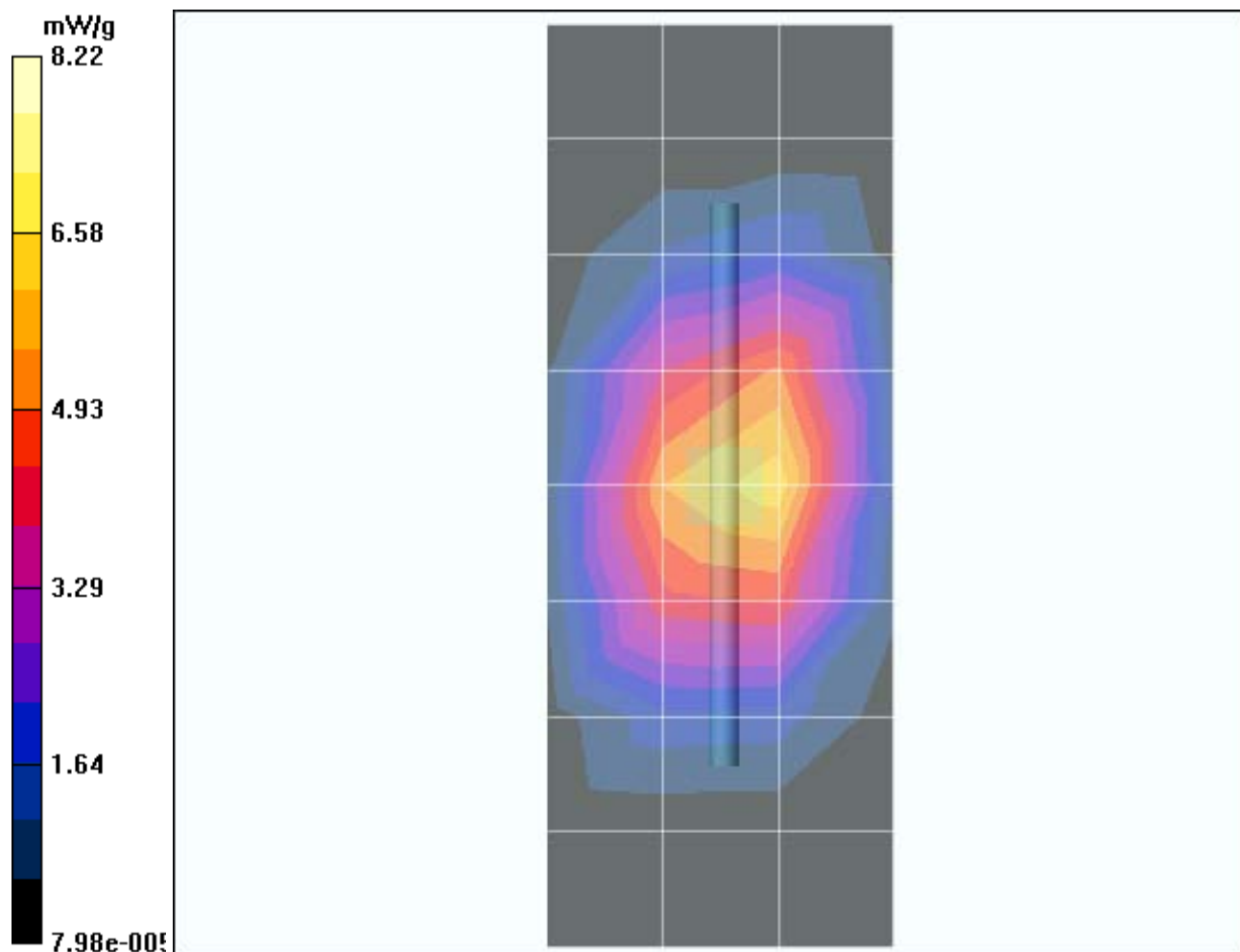
Peak SAR (extrapolated) = 12.7 W/kg

SAR(1 g) = 7.36 mW/g; SAR(10 g) = 3.91 mW/g

Maximum value of SAR (measured) = 7.83 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 8.22 mW/g



Test Laboratory: Motorola 111504 1800 MHz GOOD +0.3%

DUT: Dipole 1800 MHz; Type: D1800V2

Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 246TR PM1 Power = 200mW

Sim.Temp@meas=19.1C Sim.Temp@SPC = 18.9C Room Temp @ SPC = 21C

Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only; Medium parameters used: $\sigma = 1.38\text{mho/m}$, $\epsilon_r = 38.5$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(4.95, 4.95, 4.95); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Daily SPC Check/Dipole Area Scan (9x4x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 8.29 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 81.7 V/m; Power Drift = -0.1 dB

Peak SAR (extrapolated) = 13.6 W/kg

SAR(1 g) = 7.92 mW/g; SAR(10 g) = 4.22 mW/g

Maximum value of SAR (measured) = 8.93 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

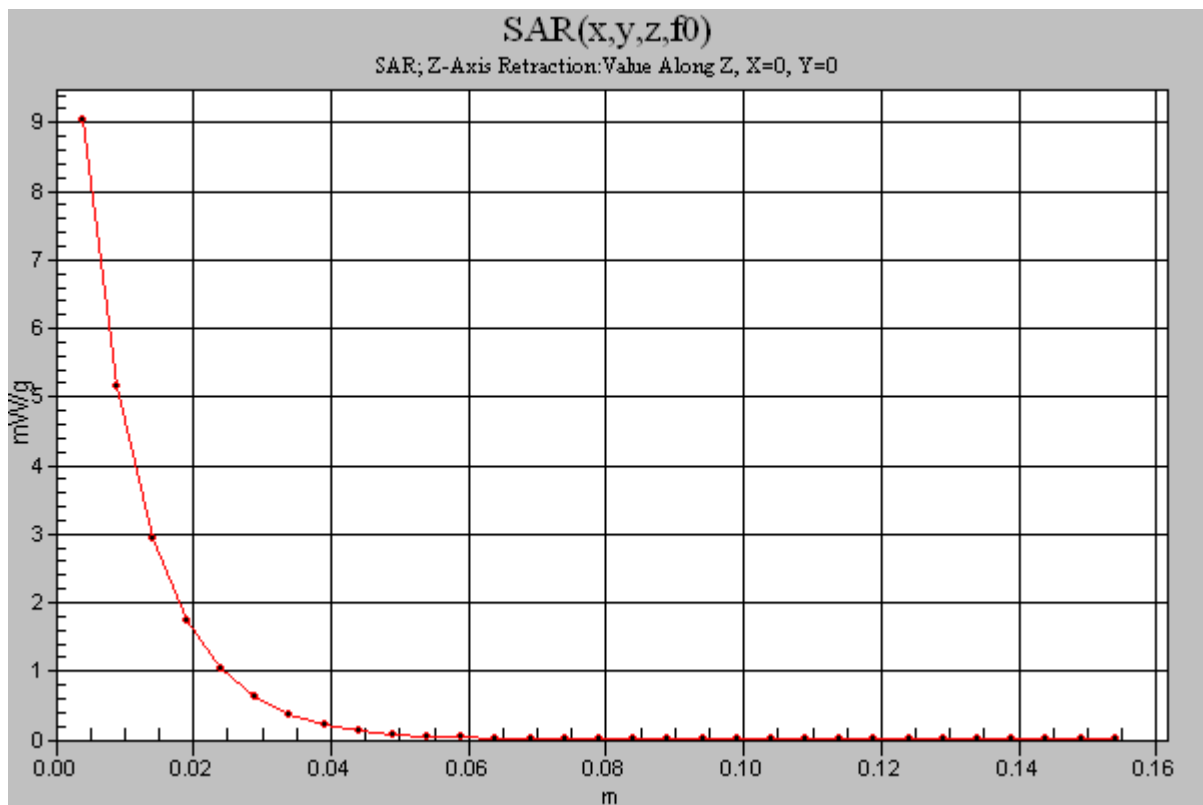
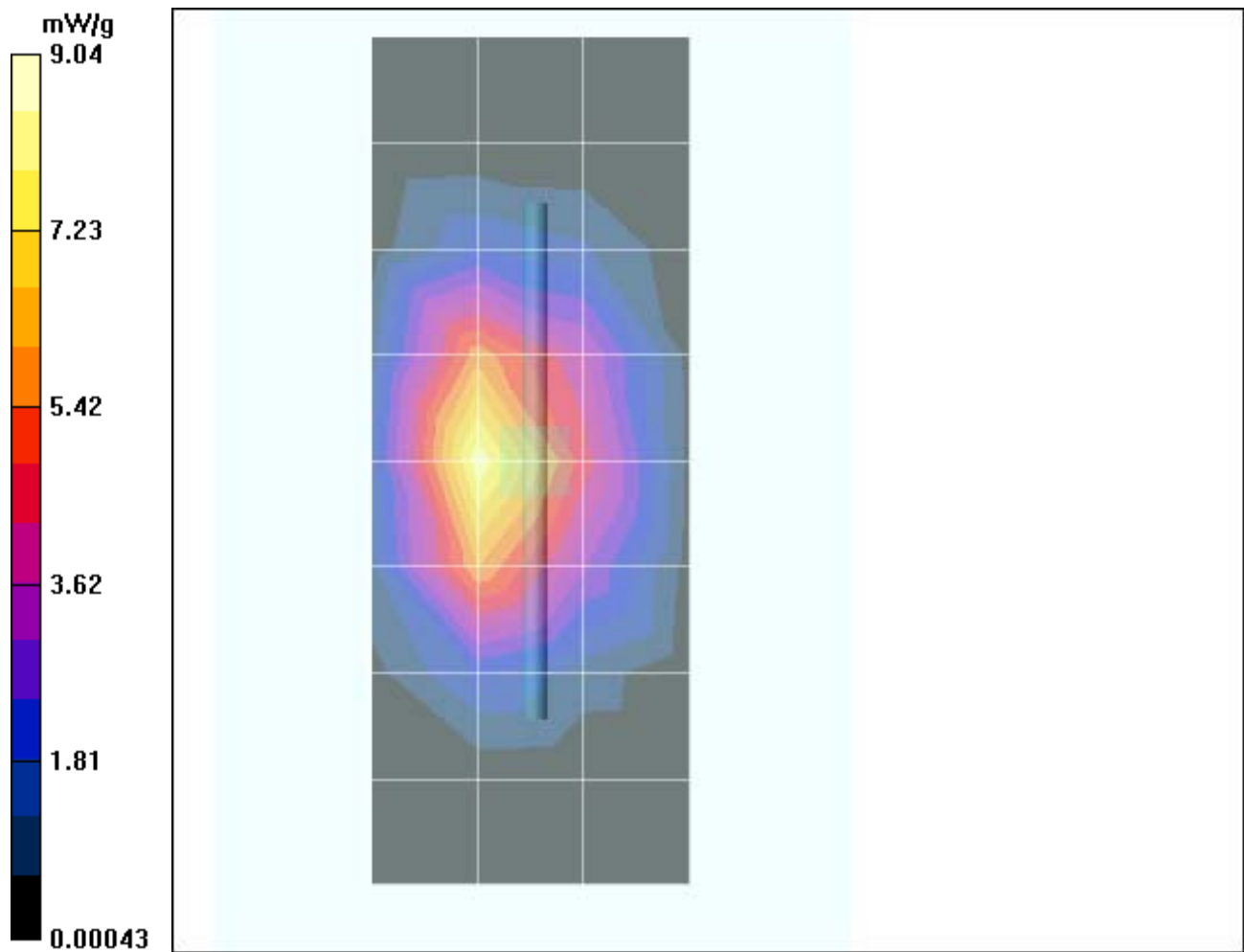
Reference Value = 81.7 V/m; Power Drift = -0.1 dB

Peak SAR (extrapolated) = 12.7 W/kg

SAR(1 g) = 7.37 mW/g; SAR(10 g) = 3.93 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 9.04 mW/g



Test Laboratory: Motorola 111504 900 MHz GOOD +3.2%

DUT: Dipole 900 MHz; Type: D900V2

Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 079 PM1 Power = 200mW
Sim.Temp@meas=20.1C Sim.Temp@SPC = 20.1C Room Temp @ SPC = 21C

Communication System: CW - Dipole; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only; Medium parameters used: $\sigma = 0.96\text{mho/m}$, $\epsilon_r = 40.2$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.28 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 52.7 V/m; Power Drift = 0.007 dB

Peak SAR (extrapolated) = 3.45 W/kg

SAR(1 g) = 2.3 mW/g; SAR(10 g) = 1.48 mW/g

Maximum value of SAR (measured) = 2.47 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 52.7 V/m; Power Drift = 0.007 dB

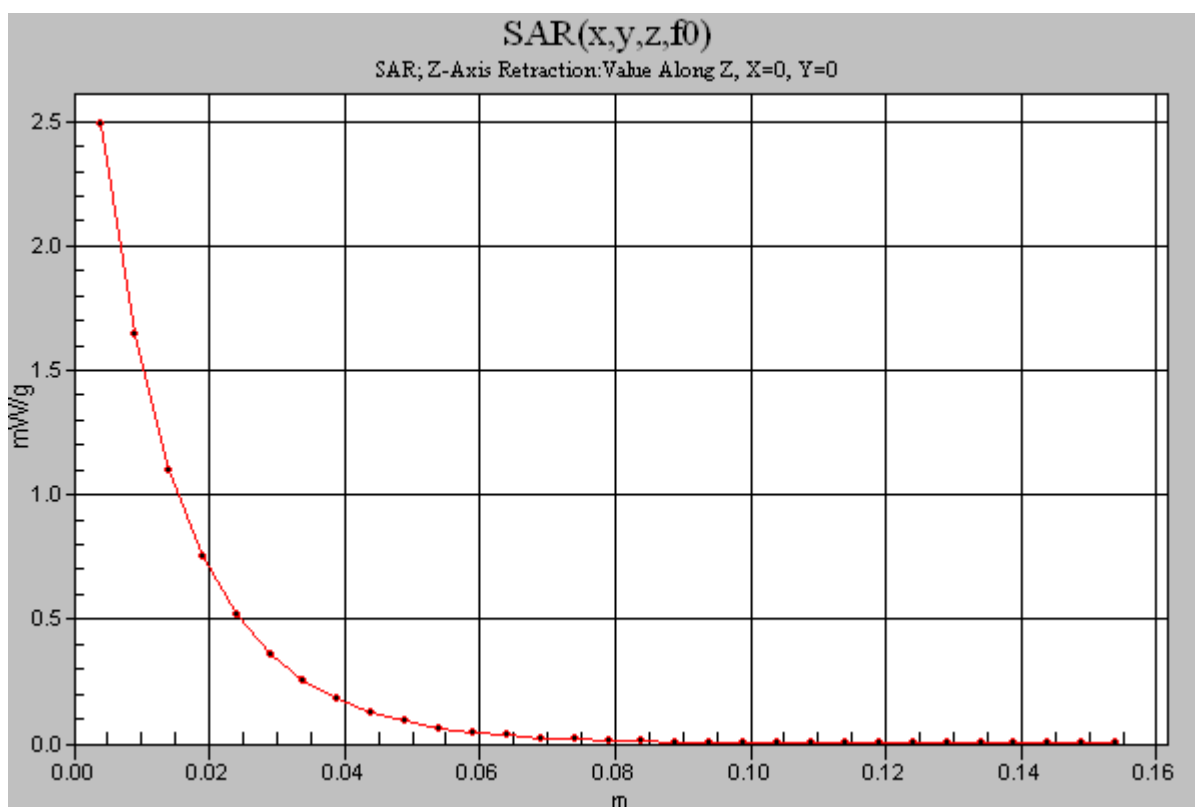
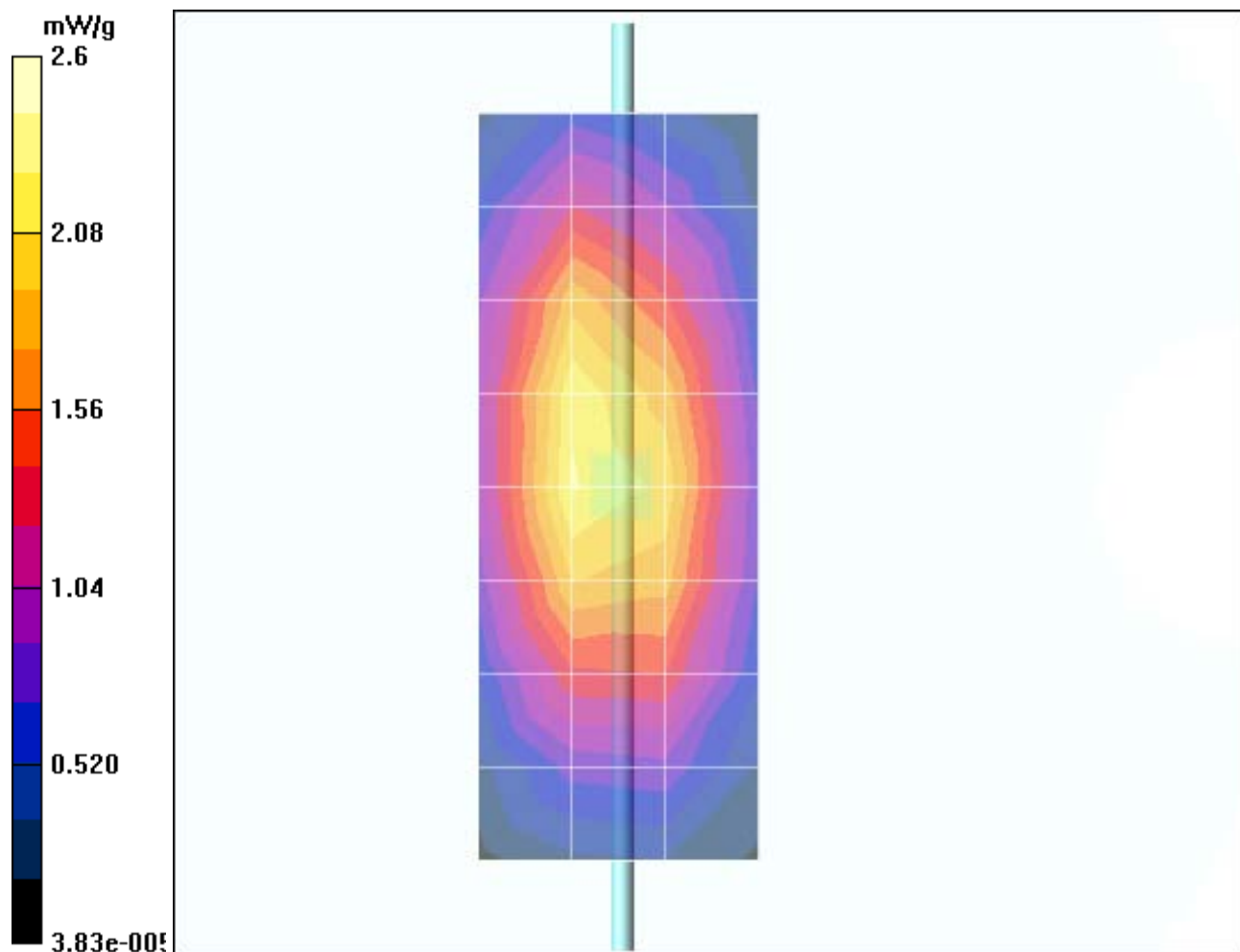
Peak SAR (extrapolated) = 3.23 W/kg

SAR(1 g) = 2.16 mW/g; SAR(10 g) = 1.39 mW/g

Maximum value of SAR (measured) = 2.36 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 2.49 mW/g



Test Laboratory: Motorola 111604 1800 MHz GOOD +1.5%

DUT: Dipole 1800 MHz; Type: D1800V2

Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 246TR PM1 Power = 200mW
Sim.Temp@meas=19.5C Sim.Temp@SPC = 19.0C Room Temp @ SPC = 20C

Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only; Medium parameters used: $\sigma = 1.38\text{mho/m}$, $\epsilon_r = 38.4$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(4.95, 4.95, 4.95); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Daily SPC Check/Dipole Area Scan (9x4x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 7.44 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 84 V/m; Power Drift = -0.008 dB

Peak SAR (extrapolated) = 13.9 W/kg

SAR(1 g) = 8.05 mW/g; SAR(10 g) = 4.28 mW/g

Maximum value of SAR (measured) = 9.06 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 84 V/m; Power Drift = -0.008 dB

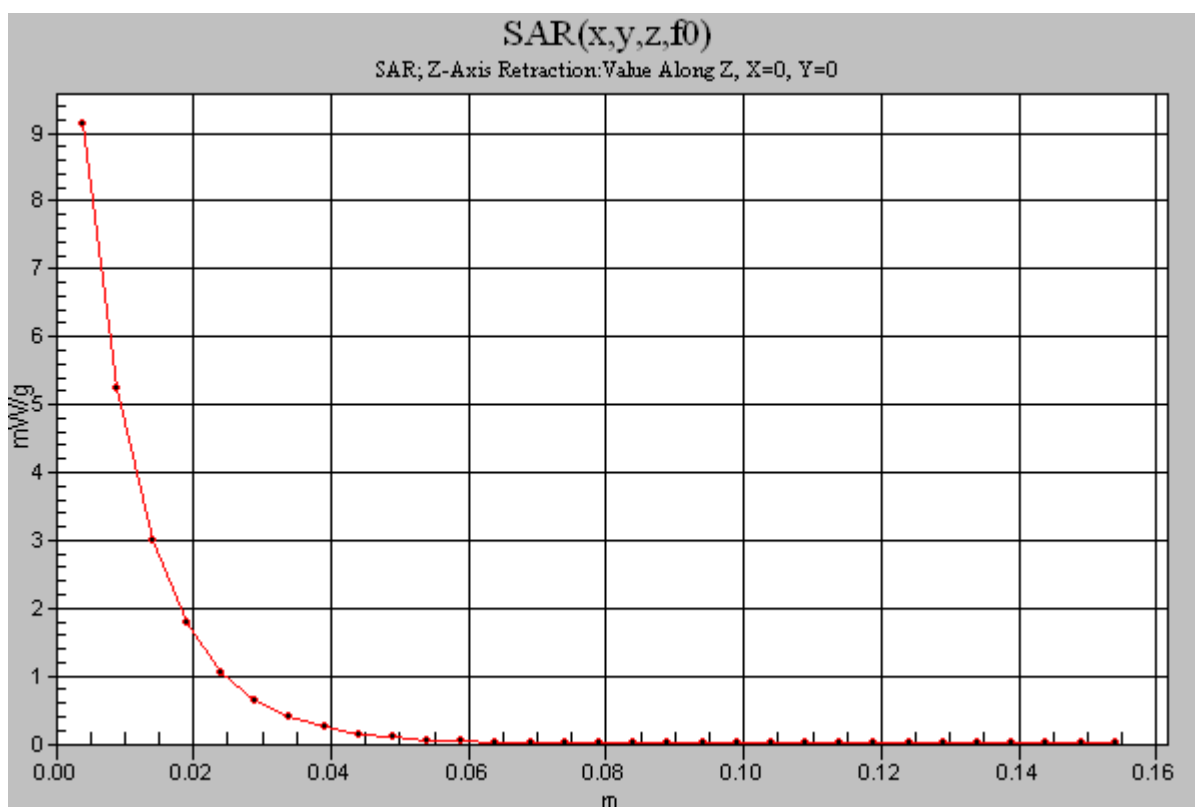
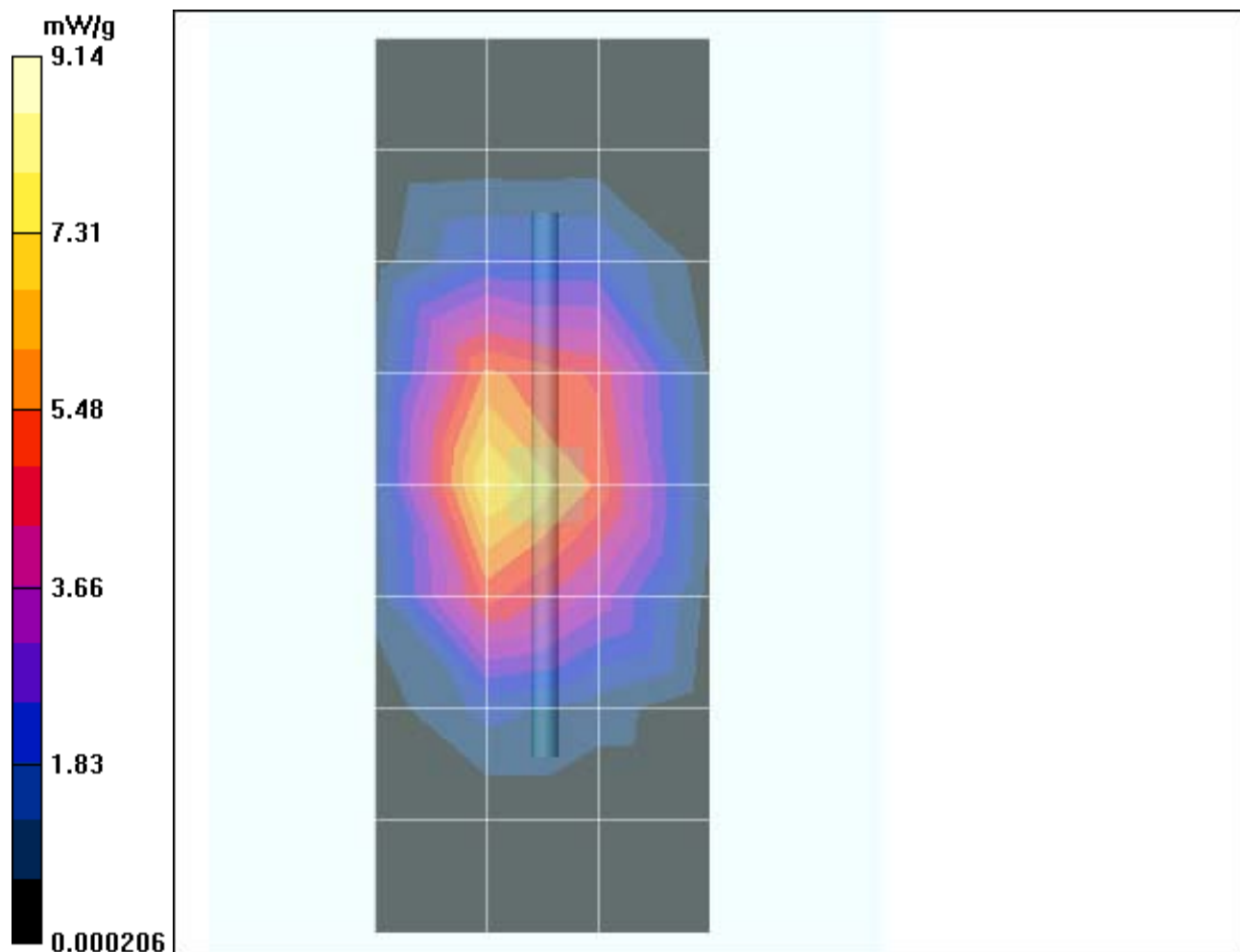
Peak SAR (extrapolated) = 12.7 W/kg

SAR(1 g) = 7.42 mW/g; SAR(10 g) = 3.99 mW/g

Maximum value of SAR (measured) = 7.89 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 9.14 mW/g



Test Laboratory: Motorola 111604 900 MHz GOOD +4.2%

DUT: Dipole 900 MHz; Type: D900V2

Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 079 PM1 Power = 200mW
Sim.Temp@meas=20.4C Sim.Temp@SPC = 20.4C Room Temp @ SPC = 20C

Communication System: CW - Dipole; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only; Medium parameters used: $\sigma = 0.99\text{mho/m}$, $\epsilon_r = 42.2$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.35 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 52.1 V/m; Power Drift = 0.003 dB

Peak SAR (extrapolated) = 3.5 W/kg

SAR(1 g) = 2.35 mW/g; SAR(10 g) = 1.51 mW/g

Maximum value of SAR (measured) = 2.55 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 52.1 V/m; Power Drift = 0.003 dB

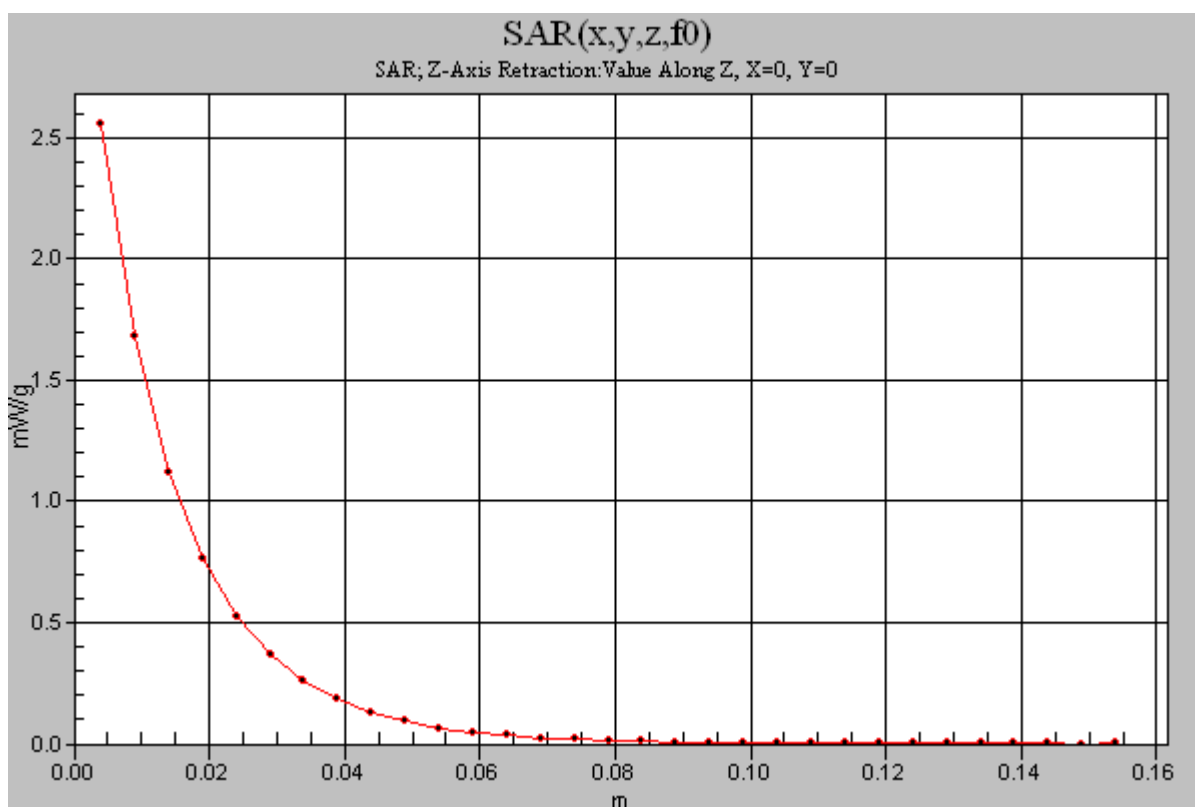
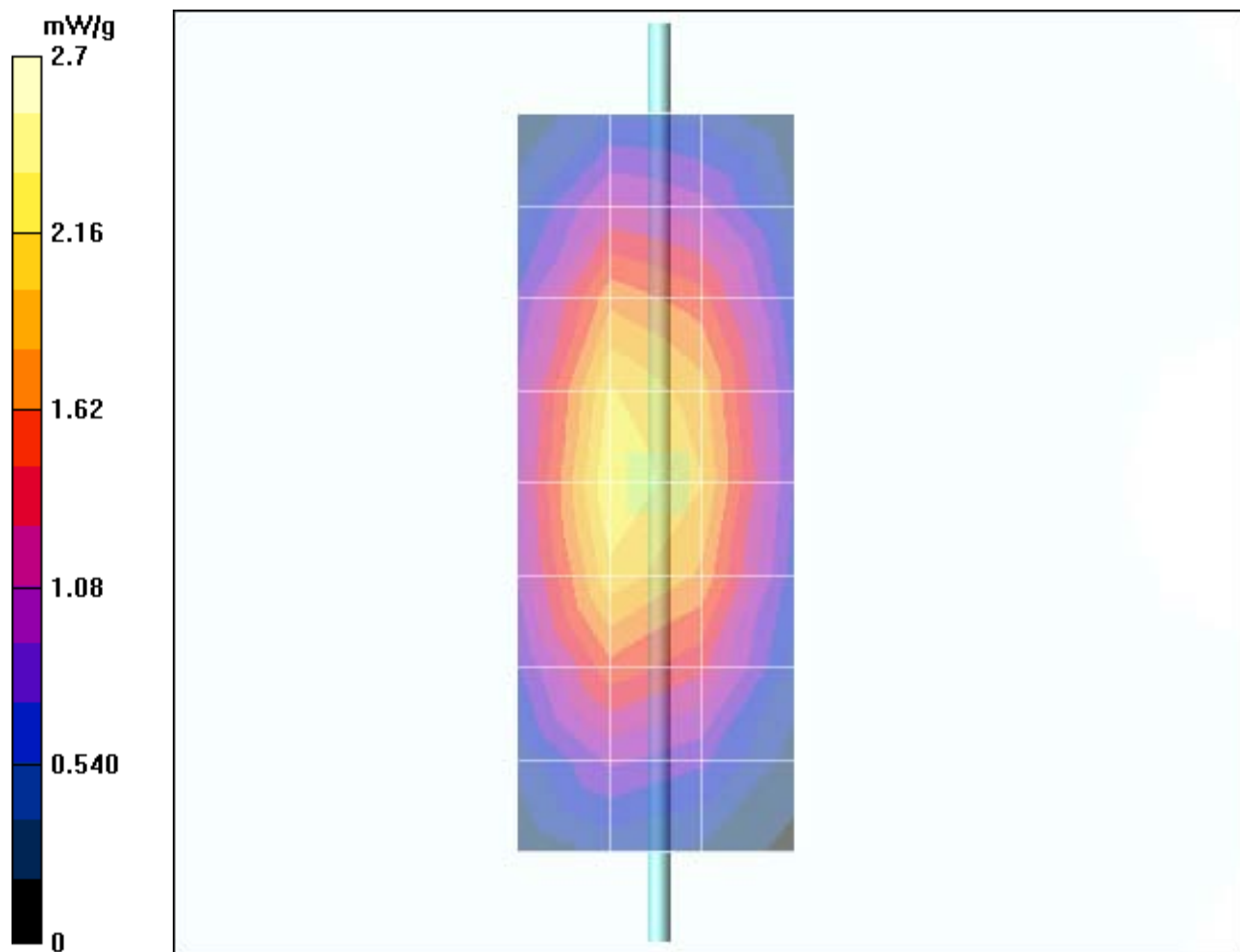
Peak SAR (extrapolated) = 3.21 W/kg

SAR(1 g) = 2.15 mW/g; SAR(10 g) = 1.38 mW/g

Maximum value of SAR (measured) = 2.34 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 2.56 mW/g



Test Laboratory: Motorola 111704 1800 MHz GOOD +0.3% FP#34

DUT: Dipole 1800 MHz; Type: D1800V2

Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 246TR PM1 Power = 200mW C
Sim.Temp@meas=19.7C Sim.Temp@SPC = 19.2C Room Temp @ SPC = 21C

Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only; Medium parameters used: $\sigma = 1.36\text{mho/m}$, $\epsilon_r = 38.3$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(4.95, 4.95, 4.95); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Daily SPC Check/Dipole Area Scan (9x4x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 6.9 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 86 V/m; **Power Drift = -0.0 dB**

Peak SAR (extrapolated) = 13.6 W/kg

SAR(1 g) = 7.9 mW/g; SAR(10 g) = 4.2 mW/g

Maximum value of SAR (measured) = 8.91 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 86 V/m; **Power Drift = -0.0 dB**

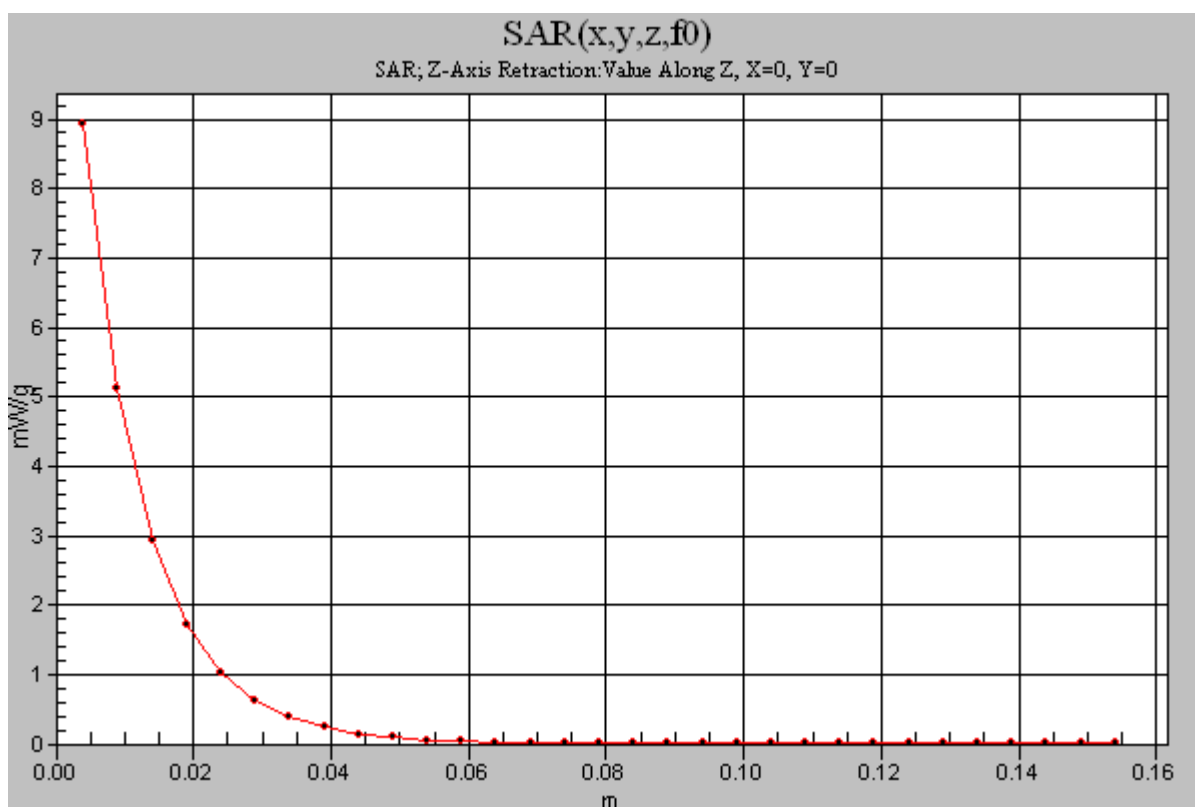
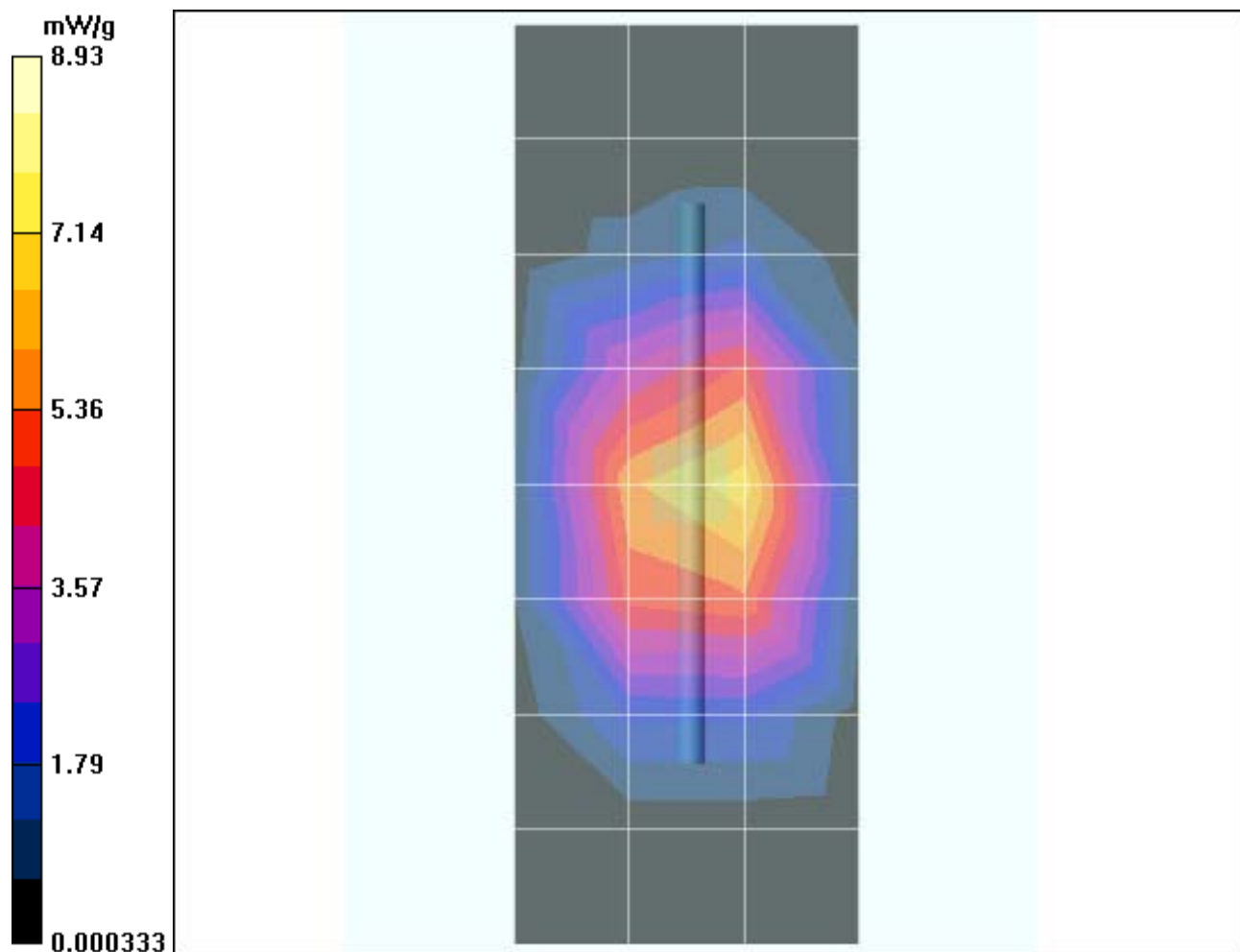
Peak SAR (extrapolated) = 12.6 W/kg

SAR(1 g) = 7.39 mW/g; SAR(10 g) = 3.96 mW/g

Maximum value of SAR (measured) = 8.31 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 8.93 mW/g



Test Laboratory: Motorola 111704 900 MHz GOOD +3.0%

DUT: Dipole 900 MHz; Type: D900V2

Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 079 PM1 Power = 200mW
Sim.Temp@meas=20.3C Sim.Temp@SPC = 20.3C Room Temp @ SPC = 21C

Communication System: CW - Dipole; Frequency: 900 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only; Medium parameters used: $\sigma = 0.98\text{mho/m}$, $\epsilon_r = 42.3$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.48 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 50 V/m; Power Drift = 0.0 dB

Peak SAR (extrapolated) = 3.43 W/kg

SAR(1 g) = 2.3 mW/g; SAR(10 g) = 1.48 mW/g

Maximum value of SAR (measured) = 2.5 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 50 V/m; Power Drift = 0.0 dB

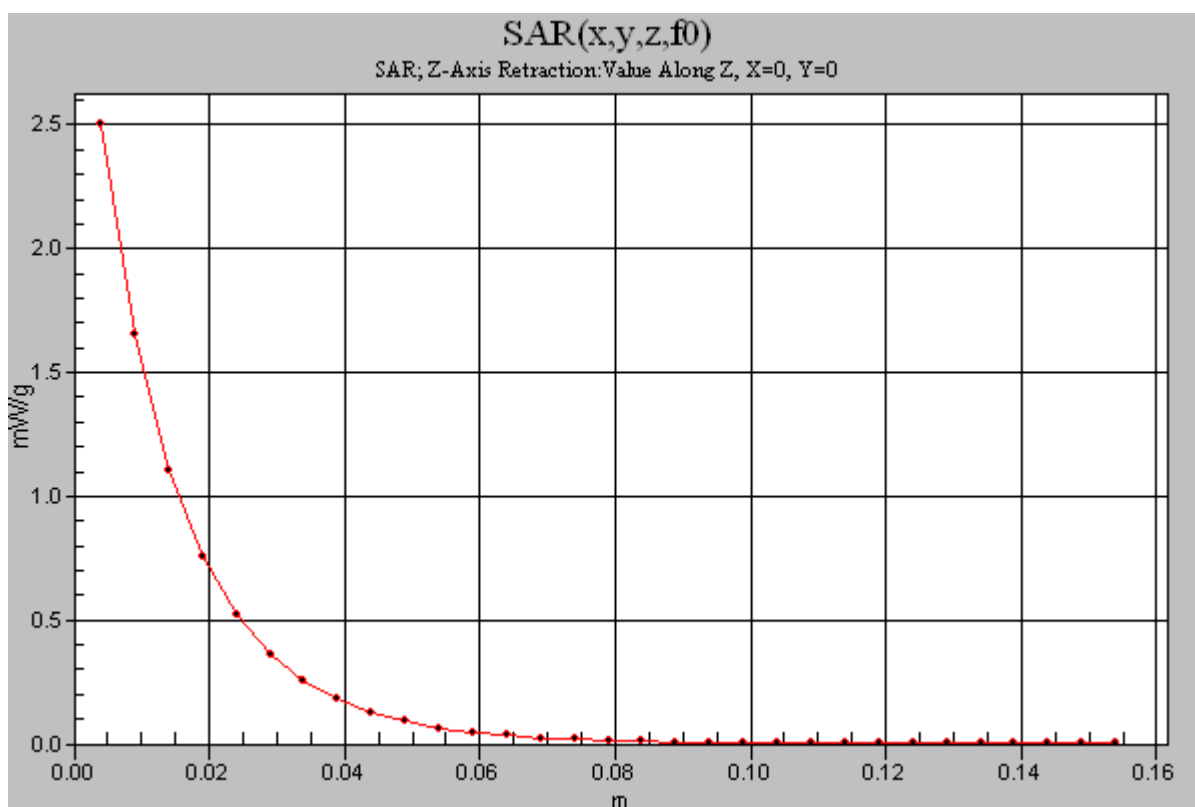
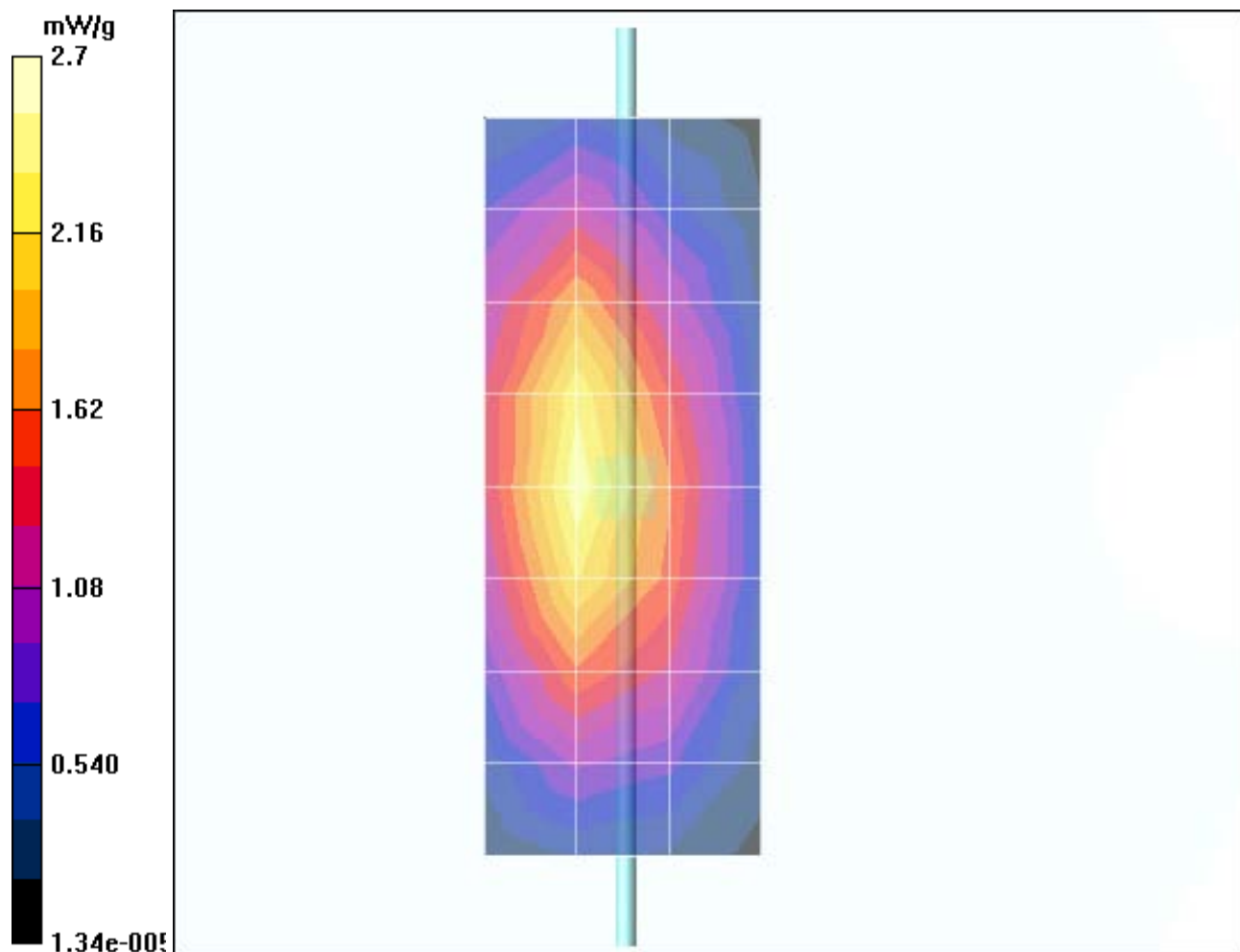
Peak SAR (extrapolated) = 3.19 W/kg

SAR(1 g) = 2.15 mW/g; SAR(10 g) = 1.38 mW/g

Maximum value of SAR (measured) = 2.34 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm



Test Laboratory: Motorola 112204 1800MHZ Good -1.7%

DUT: Dipole 1800 MHz; Type: D1800V2

Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 259tr PM1 Power = 200mW

Sim.Temp@meas=19.7°C Sim.Temp@SPC = 19.7°C Room Temp @ SPC = 20°C

Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only; Medium parameters used: $\sigma = 1.37\text{mho/m}$, $\epsilon_r = 38.3$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1397; ConvF(5.09, 5.09, 5.09); Calibrated: 5/21/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 2/9/2004
- Phantom: R1: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Daily SPC Check/Dipole Area Scan (9x4x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 6.72 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 81.7 V/m; **Power Drift = -0.0 dB**

Peak SAR (extrapolated) = 13.2 W/kg

SAR(1 g) = 7.62 mW/g; SAR(10 g) = 4.07 mW/g

Maximum value of SAR (measured) = 8.57 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

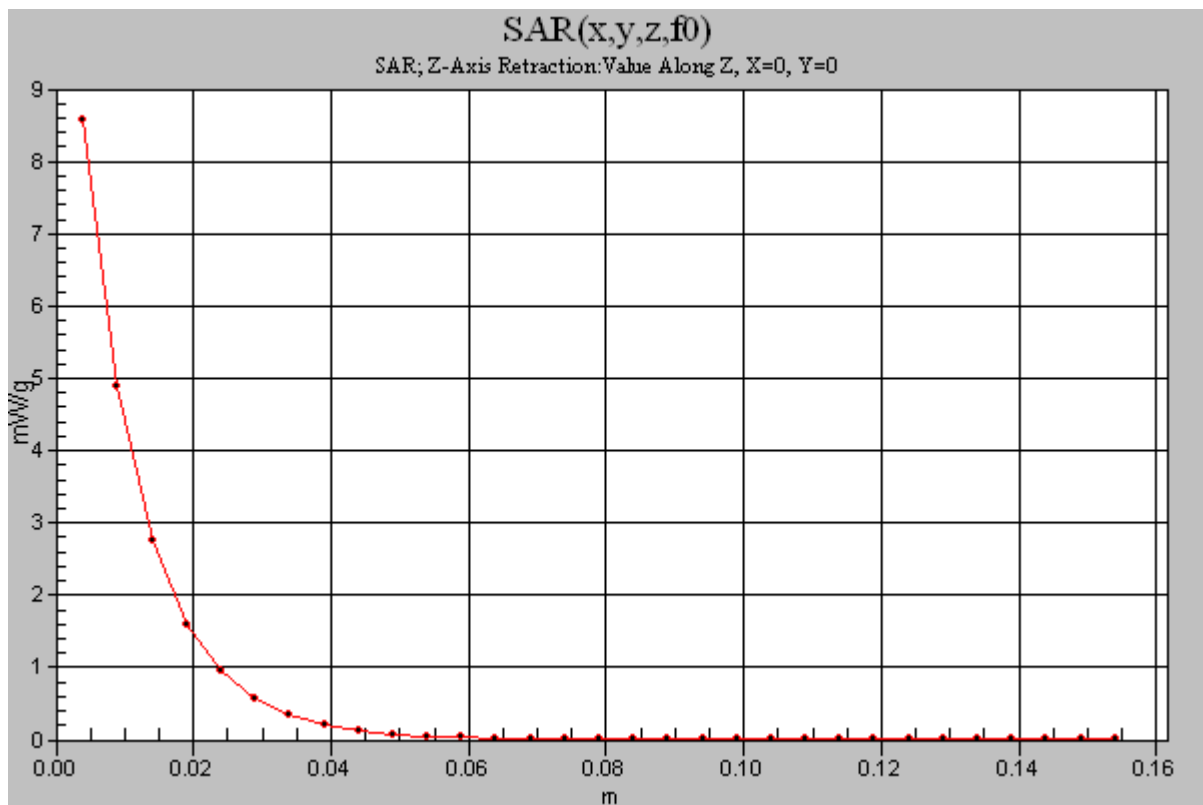
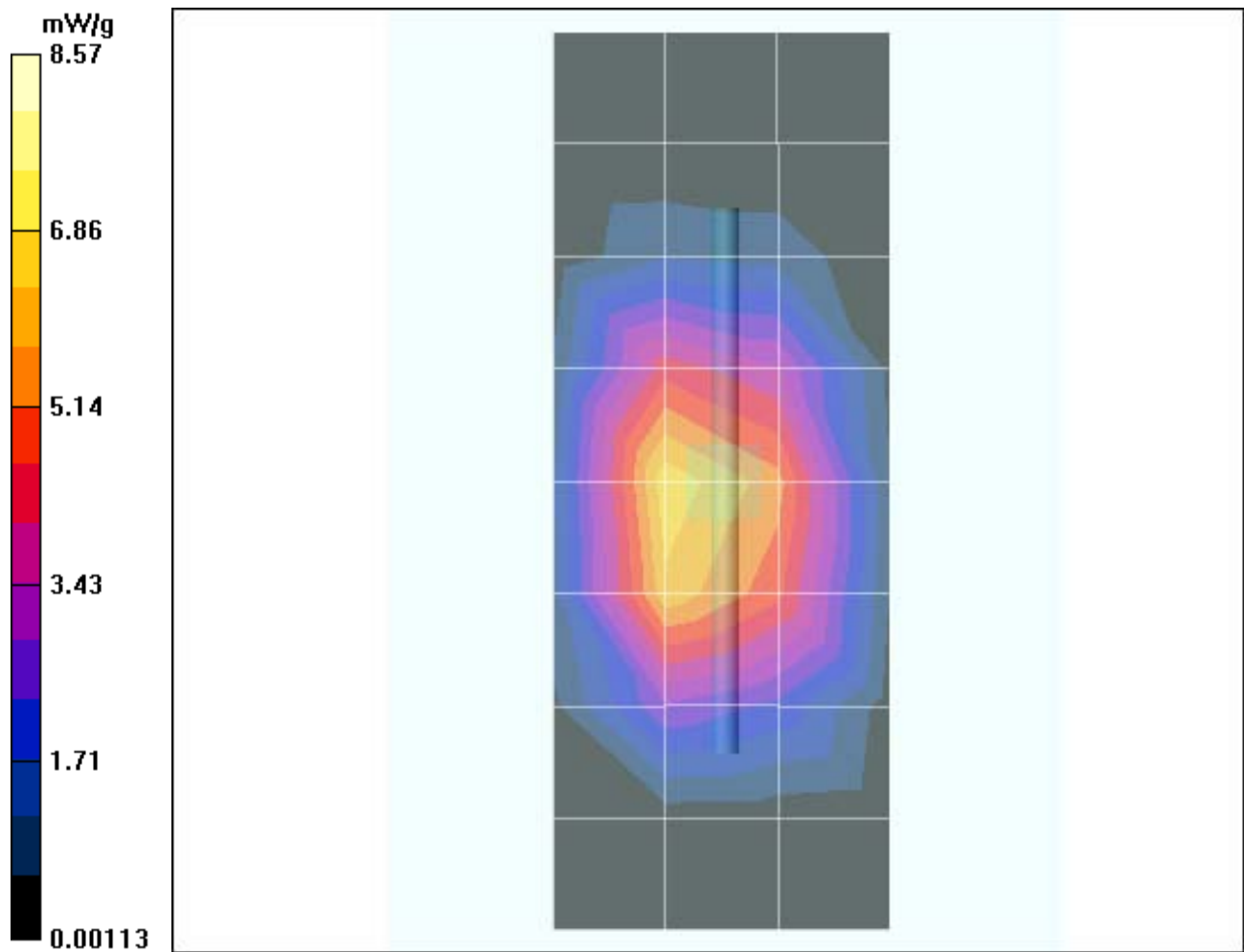
Reference Value = 81.7 V/m; **Power Drift = -0.0 dB**

Peak SAR (extrapolated) = 12.9 W/kg

SAR(1 g) = 7.36 mW/g; SAR(10 g) = 3.91 mW/g

Maximum value of SAR (measured) = 8.06 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm



Appendix 2

SAR distribution plots for Phantom Head Adjacent Use

Test Laboratory: Motorola 800 LH Cheek Ch777 flip open, antenna extended

Serial: 68586566

Procedure Notes: Ch# 777/ Pwr Step: OTA Antenna Position: EXTENDED Accessory Model #: ??? Battery Model #: SNN5615A
DEVICE POSITION (cheek or rotated): CHEEK

Communication System: CDMA 835; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Low Freq Head; Medium parameters used: $\sigma = 0.9\text{mho/m}$, $\epsilon_r = 41.3$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

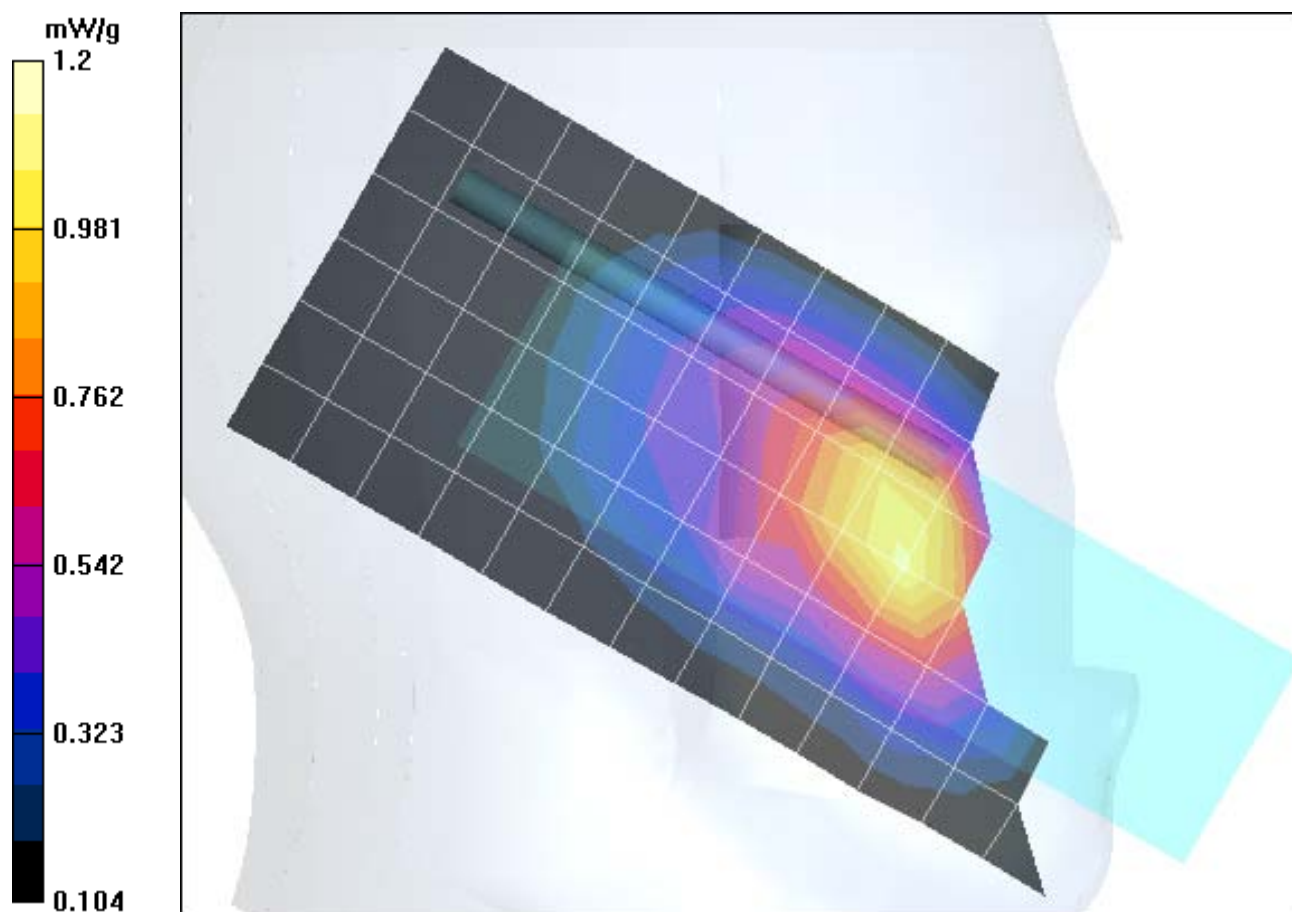
Left Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.08 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 37.4 V/m; **Power Drift = -0.1 dB** Peak SAR (extrapolated) = 1.61 W/kg

SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.765 mW/g Maximum value of SAR (measured) = 1.2 mW/g



Test Laboratory: Motorola 800 RH Tilt CH384 flip open, antenna extended

Serial: 68586566

Procedure Notes: Ch# 384 / Pwr Step: Always UP Antenna Position: EXT Accessory Model #: N/A Battery Model #: SNN5615A
DEVICE POSITION: 15 deg TILT

Communication System: CDMA 835; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Low Freq Head; Medium parameters used: $\sigma = 0.9\text{mho/m}$, $\epsilon_r = 41.2$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

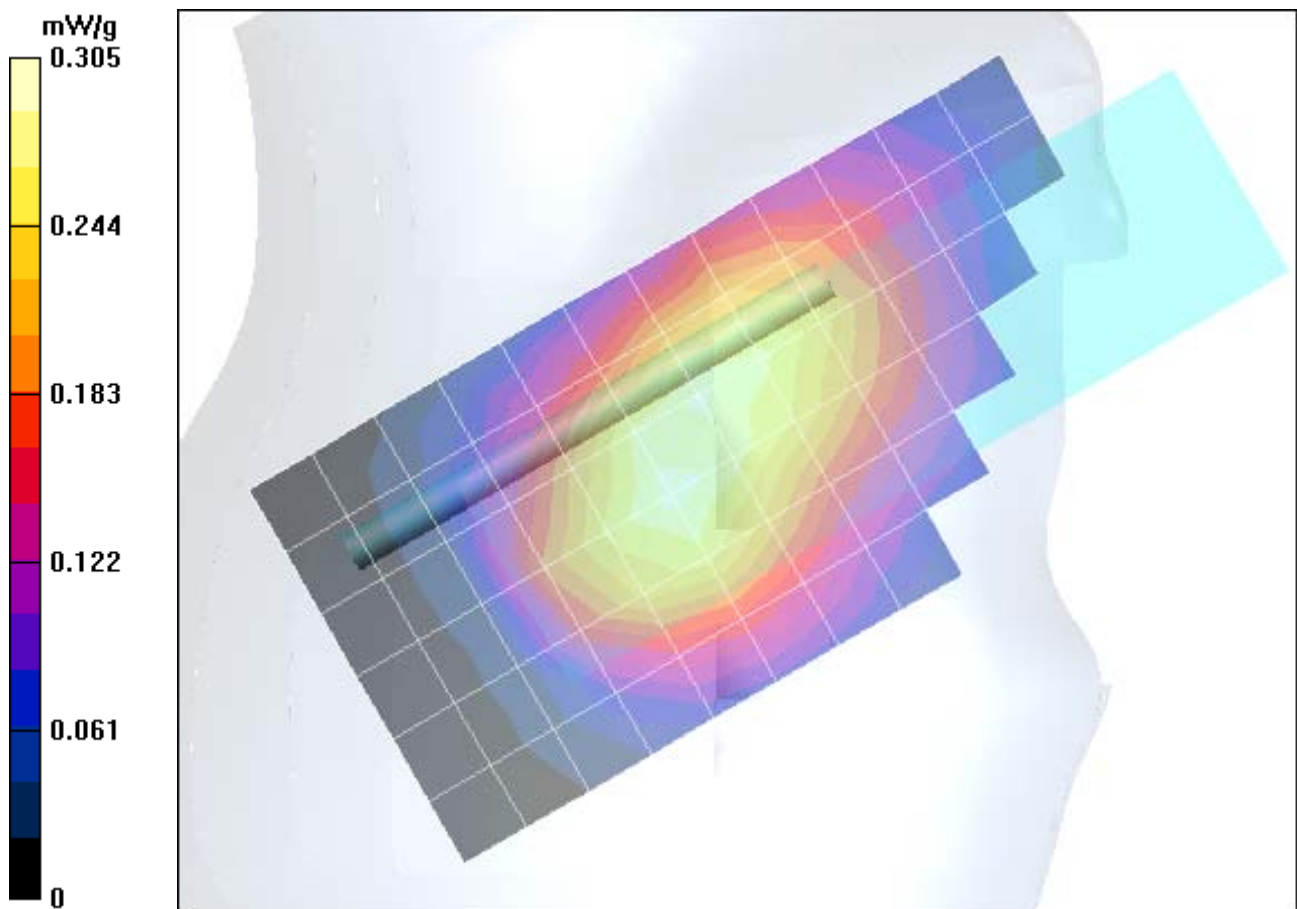
Right Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.296 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.6 V/m; Power Drift = -0.1 dB Peak SAR (extrapolated) = 0.356 W/kg

SAR(1 g) = 0.285 mW/g; SAR(10 g) = 0.220 mW/g Maximum value of SAR (measured) = 0.304 mW/g



Test Laboratory: Motorola 800 RH Cheek CH384 flip open, antenna extended

Serial: 68586566;

Procedure Notes: Ch# 777 / Pwr Step: Always UP Antenna Position: EXT Accessory Model #: N/A Battery Model #: SNN5615A

DEVICE POSITION: CHEEK

Communication System: CDMA 835; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Low Freq Head; Medium parameters used: $\sigma = 0.9\text{mho/m}$, $\epsilon_r = 41.2$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

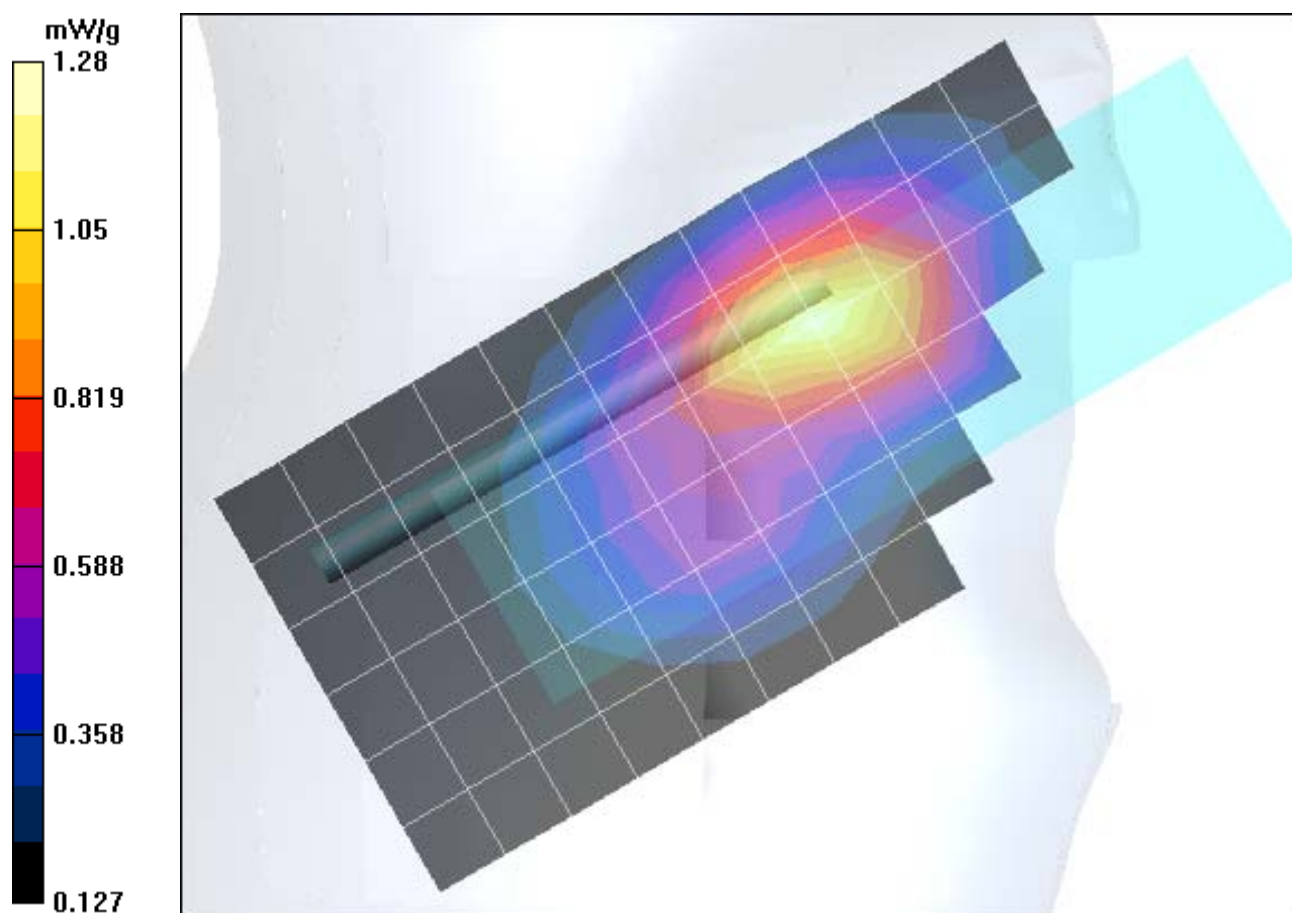
Right Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.25 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 35.4 V/m; Power Drift = -0.1 dB Peak SAR (extrapolated) = 1.84 W/kg

SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.783 mW/g Maximum value of SAR (measured) = 1.28 mW/g



Test Laboratory: Motorola 800 RH Cheek CH777 open, extended SNN5760A

Serial: 68586566;

Procedure Notes: Ch# 777 / Pwr Step: Always UP Antenna Position: EXT Accessory Model #: NONE Battery Model #: SNN5760A
DEVICE POSITION: CHEEK

Communication System: CDMA 835; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Low Freq Head; Medium parameters used: $\sigma = 0.92\text{mho/m}$, $\epsilon_r = 43$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

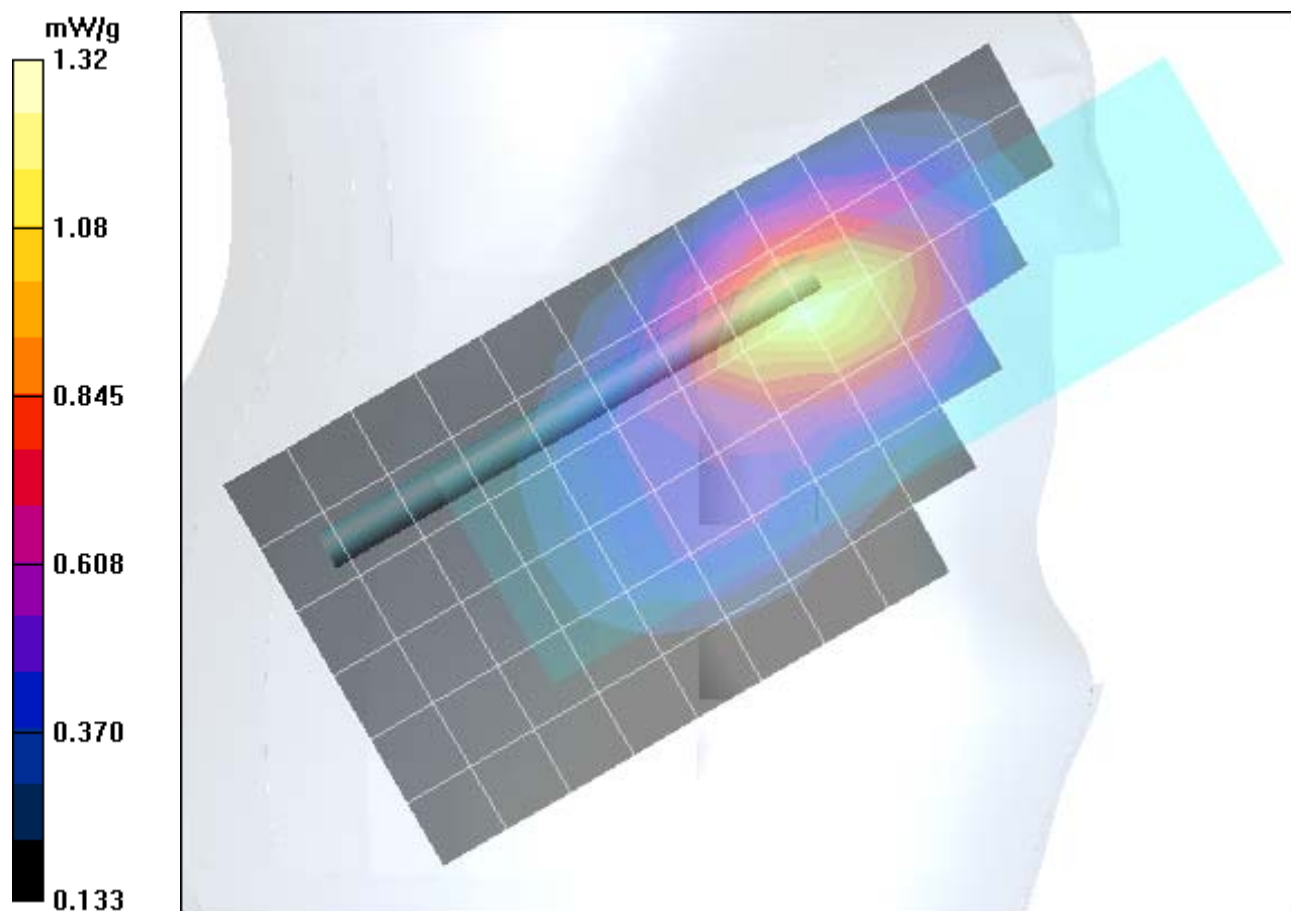
Right Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.28 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 35.3 V/m; **Power Drift = 0.1 dB** Peak SAR (extrapolated) = 1.76 W/kg

SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.808 mW/g Maximum value of SAR (measured) = 1.32 mW/g



Test Laboratory: Motorola 800 RH Cheek CH384 flip open, antenna retracted

Serial: 68586566

Procedure Notes: Ch# 384 / Pwr Step: OTA Antenna Position: RETRACTED Accessory Model #: ??? Battery Model #: SNN5615A DEVICE POSITION (cheek or rotated): CHEEK

Communication System: CDMA 835; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Low Freq Head; Medium parameters used: $\sigma = 0.9\text{mho/m}$, $\epsilon_r = 41.3$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

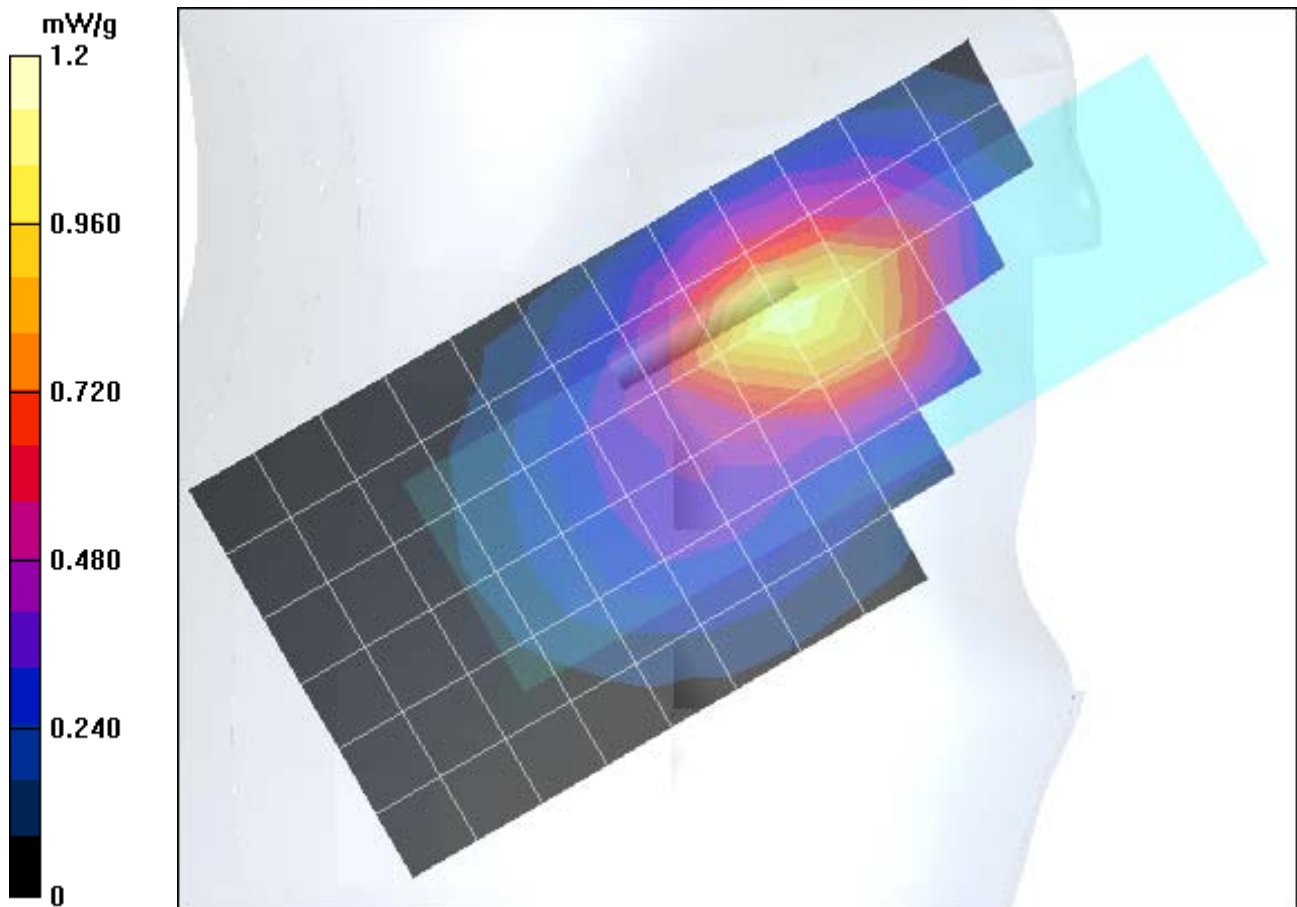
Right Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.14 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 34.7 V/m; Power Drift = -0.1 dB Peak SAR (extrapolated) = 1.76 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.721 mW/g Maximum value of SAR (measured) = 1.25 mW/g



Test Laboratory: Motorola 800 RH Cheek CH777 open, retracted SNN5760A

Serial: 68586566

Procedure Notes: Ch# 777 / Pwr Step: Always UP Antenna Position: RET Accessory Model #: NONE Battery Model #: SNN5760A DEVICE POSITION: CHEEK

Communication System: CDMA 835; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Low Freq Head; Medium parameters used: $\sigma = 0.92\text{mho/m}$, $\epsilon_r = 43$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

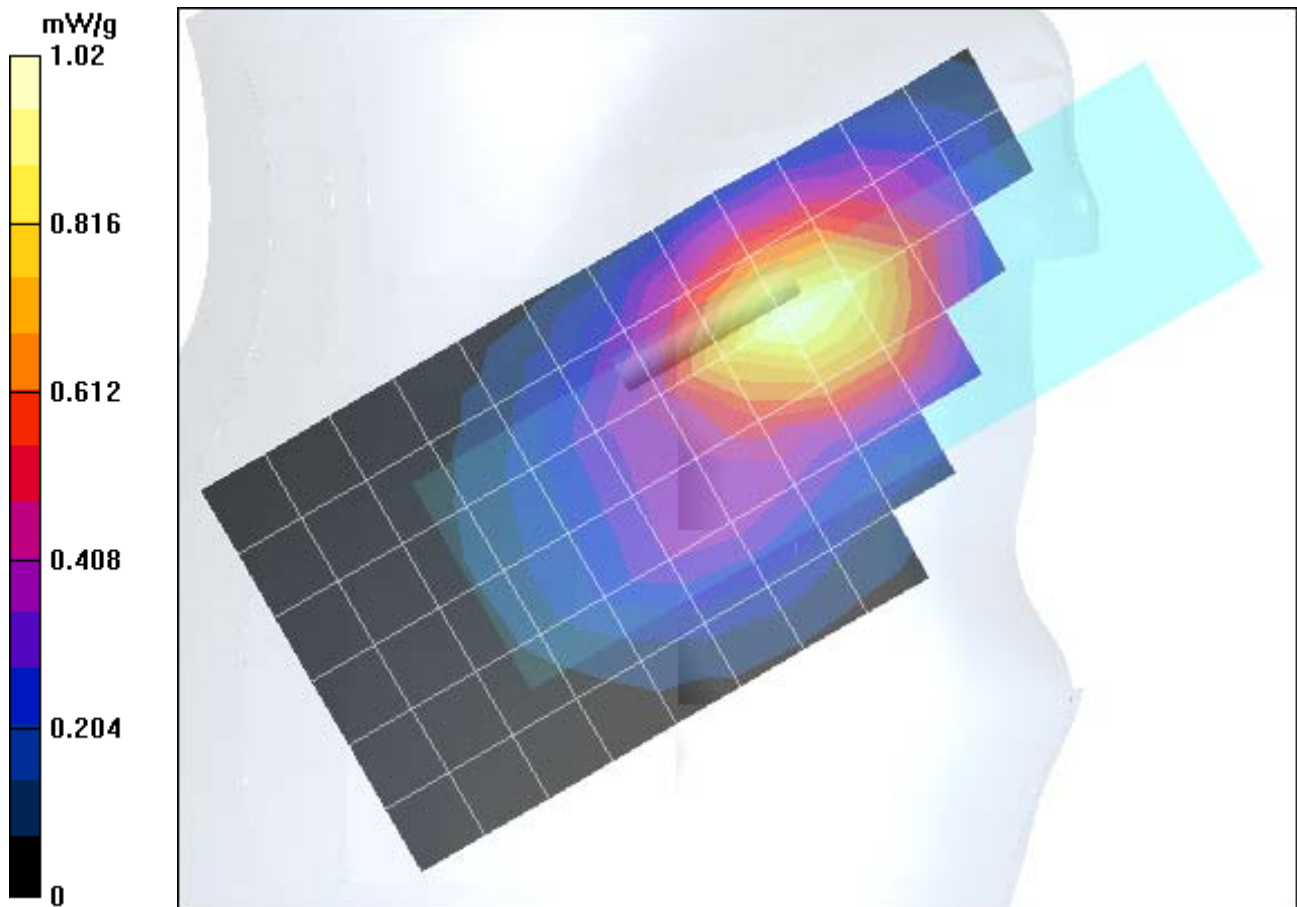
Right Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.02 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 32.4 V/m; Power Drift = 0.0 dB Peak SAR (extrapolated) = 1.48 W/kg

SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.662 mW/g Maximum value of SAR (measured) = 1.1 mW/g



Test Laboratory: Motorola 800 LH Tilt CH384 flip open, antenna retracted

Serial: 68586566;

Procedure Notes: Ch# 384 / Pwr Step: OTA Antenna Position: RETRACTED Accessory Model #: ??? Battery Model #: SNN5615A
DEVICE POSITION (cheek or rotated): ROTATED

Communication System: CDMA 835; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Low Freq Head; Medium parameters used: $\sigma = 0.9\text{mho/m}$, $\epsilon_r = 41.3$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

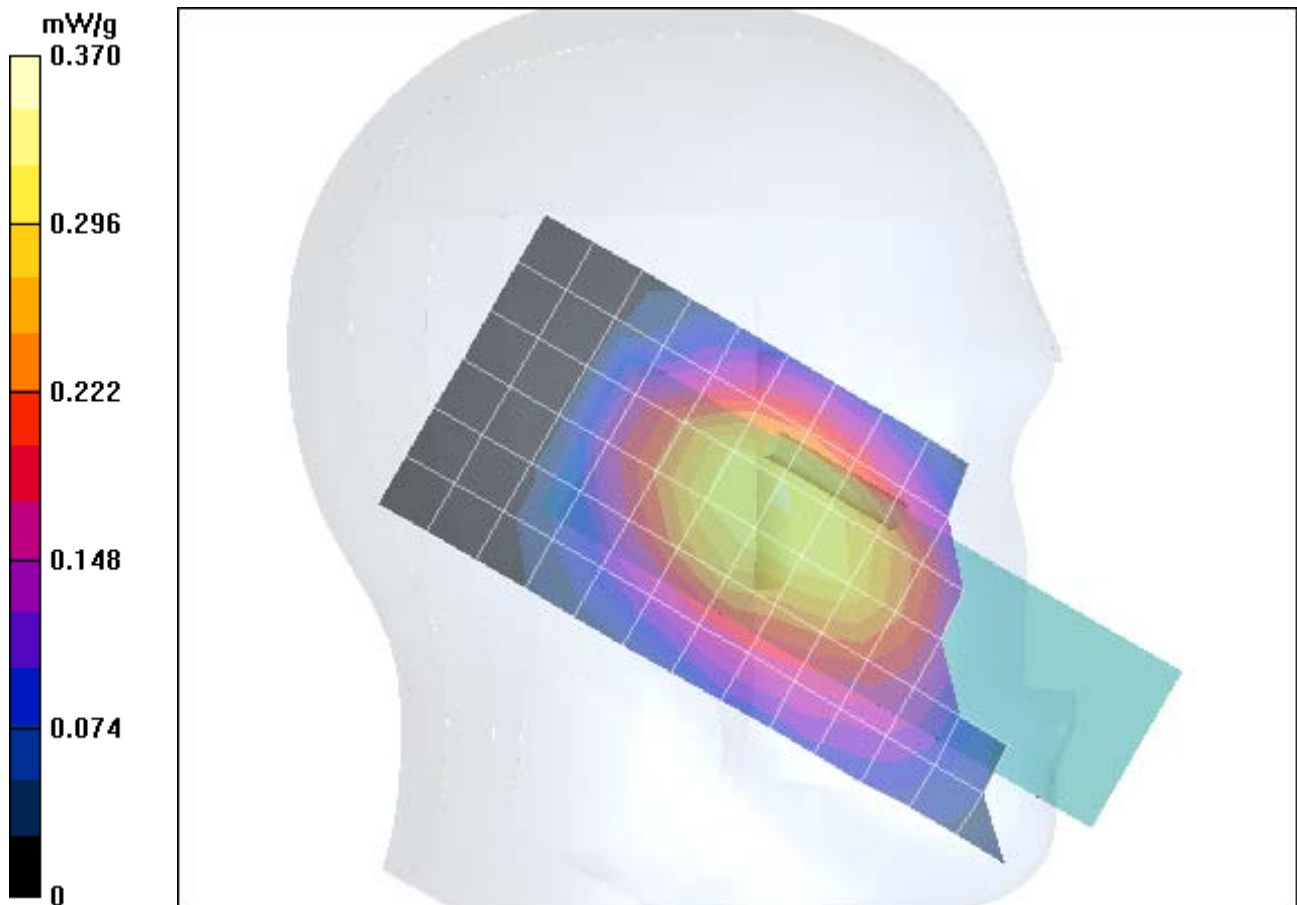
Left Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.323 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 20.2 V/m; **Power Drift = 0.0 Db** Peak SAR (extrapolated) = 0.407 W/kg

SAR(1 g) = 0.324 mW/g; SAR(10 g) = 0.253 mW/g Maximum value of SAR (measured) = 0.344 mW/g



Test Laboratory: Motorola 800 LH Tilt CH384 flip open, antenna extended

Serial: 68586566

Procedure Notes: Ch# 384 / Pwr Step: OTA Antenna Position: EXTENDED Accessory Model #: ??? Battery Model #: SNN5615A
DEVICE POSITION (cheek or rotated): rotated

Communication System: CDMA 835; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Low Freq Head; Medium parameters used: $\sigma = 0.9\text{mho/m}$, $\epsilon_r = 41.3$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

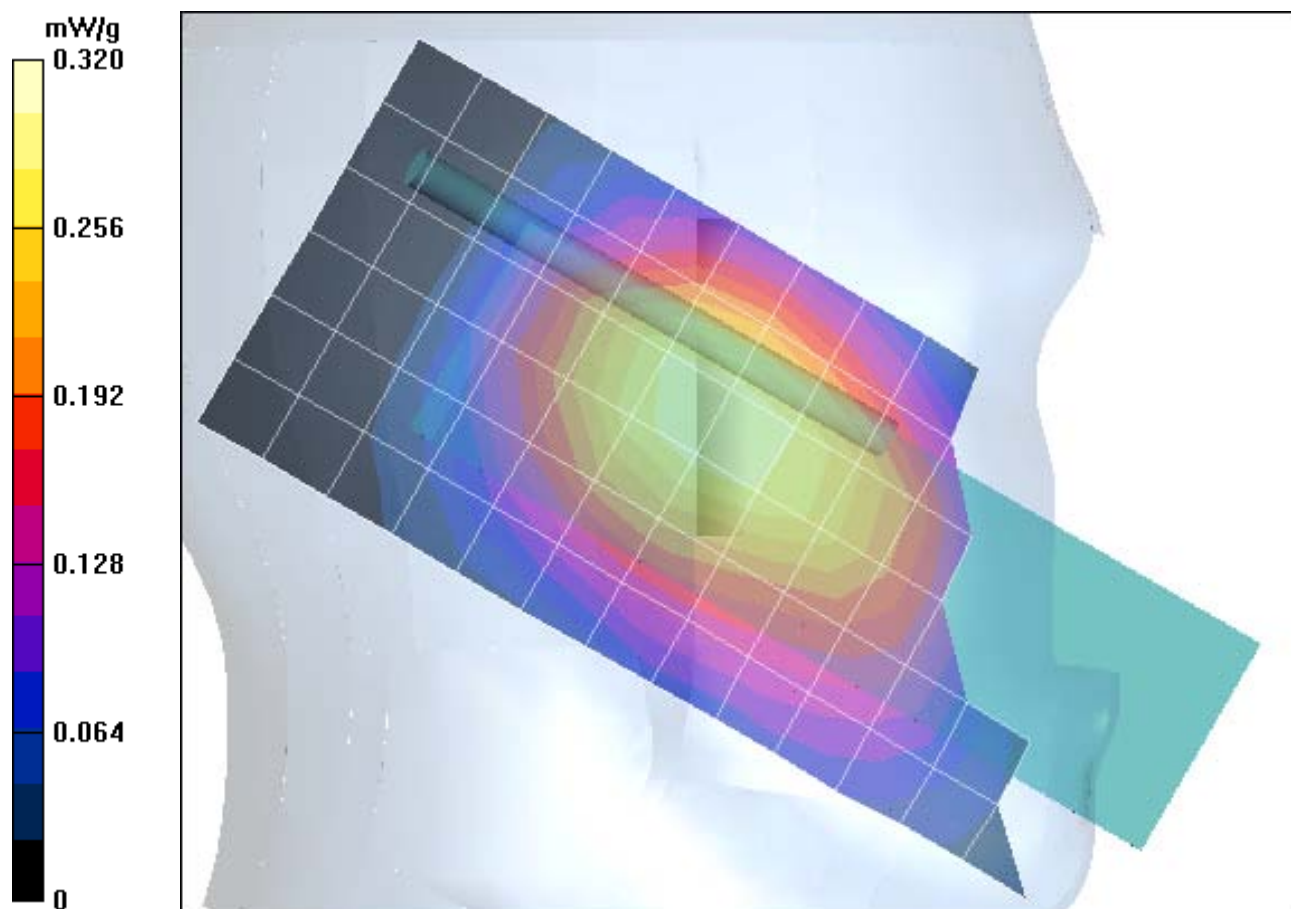
Left Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.292 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19 V/m; **Power Drift = 0.0 dB** Peak SAR (extrapolated) = 0.365 W/kg

SAR(1 g) = 0.291 mW/g; SAR(10 g) = 0.226 mW/g Maximum value of SAR (measured) = 0.313 mW/g



Test Laboratory: Motorola 800 LH Cheek CH777 flip open, antenna retracted

Serial: 68586566;

Procedure Notes: Ch# 777 / Pwr Step: Always Up Antenna Position: Retracted Accessory Model #: N/A Battery Model #: SNN5615A DEVICE POSITION (cheek or rotated): Cheek

Simulate Temp when Measured: 20.7C Simulate Temp after Test: 19.6C

Communication System: CDMA 835; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Low Freq Head; Medium parameters used: $\sigma = 0.91\text{mho/m}$, $\epsilon_r = 41.6$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

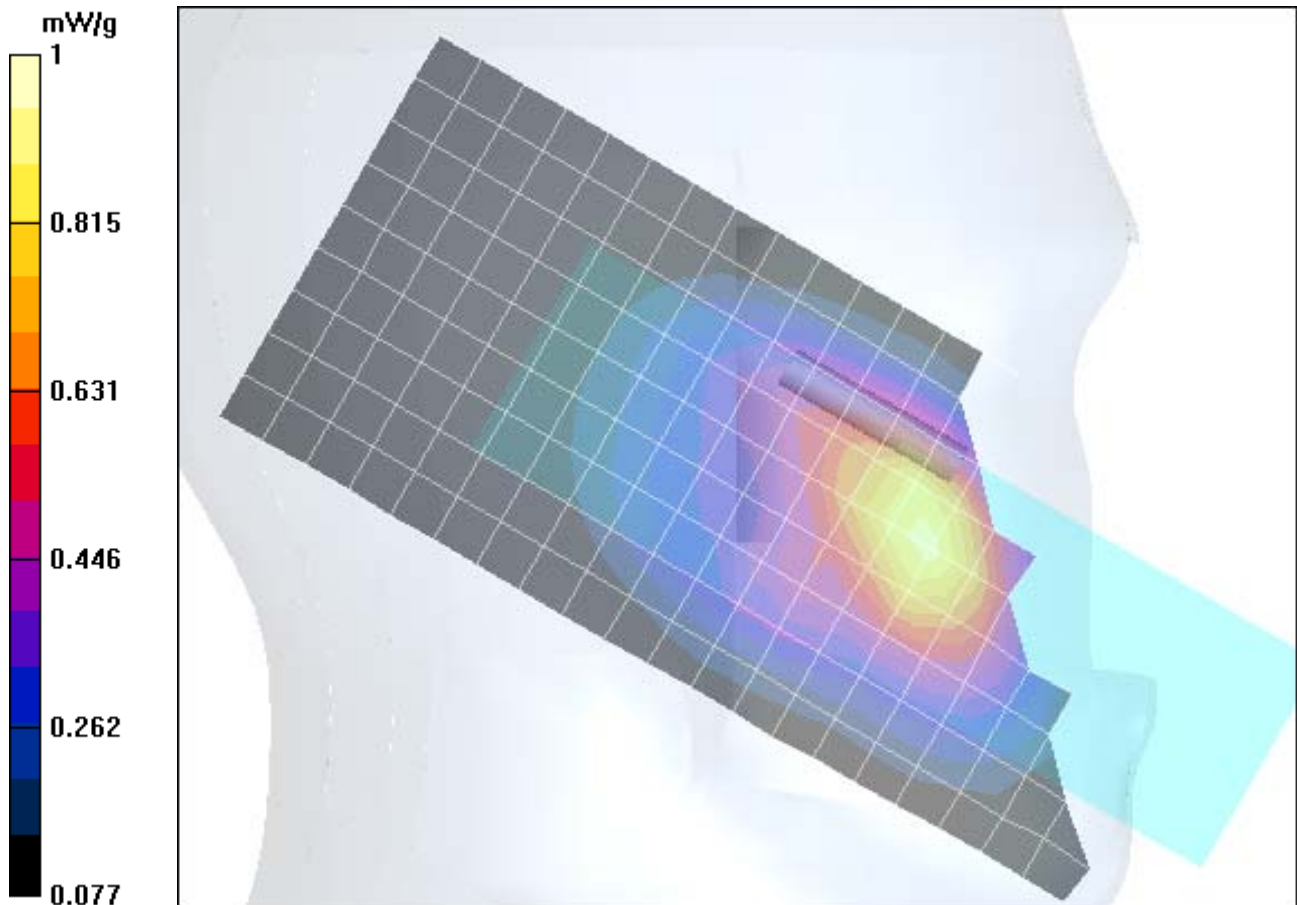
Left Head Template/Area Scan - Normal (10mm) (10x21x1):

Measurement grid: dx=10mm, dy=10mm Maximum value of SAR (measured) = 0.913 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 33 V/m; Power Drift = -0.0 dB Peak SAR (extrapolated) = 1.28 W/kg

SAR(1 g) = 0.890 mW/g; SAR(10 g) = 0.592 mW/g Maximum value of SAR (measured) = 0.927 mW/g



Test Laboratory: Motorola 800 RH Tilt CH384 flip open, antenna retracted

Serial: 68586566

Procedure Notes: Ch# 384 / Pwr Step: Always UP Antenna Position: RET Accessory Model #: N/A Battery Model #: SNN5615A
DEVICE POSITION: 15 deg TILT

Communication System: CDMA 835; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: Low Freq Head; Medium parameters used: $\sigma = 0.9\text{mho/m}$, $\epsilon_r = 41.2$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.99, 5.99, 5.99); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sugar Water SAM; Type: SAM; Serial: TP-1132;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

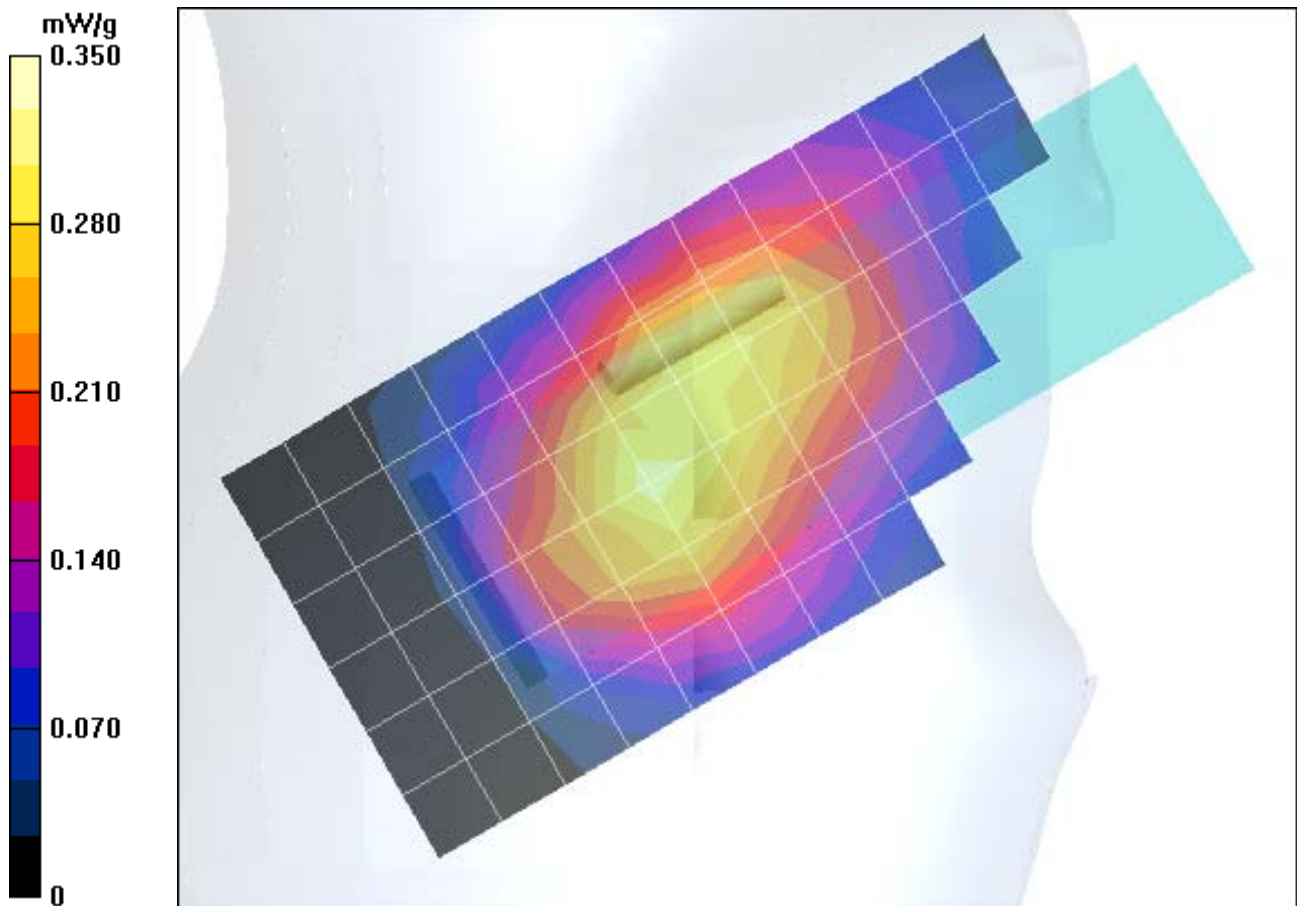
Right Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.319 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 19.1 V/m; **Power Drift = 0.1 dB** Peak SAR (extrapolated) = 0.406 W/kg

SAR(1 g) = 0.312 mW/g; SAR(10 g) = 0.237 mW/g Maximum value of SAR (measured) = 0.332 mW/g



Test Laboratory: Motorola 1900 LH Cheek CH600 open, extended, SNN5760A

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: ALWAYS UP Antenna Position: EXT Accessory Model #: NONE Battery Model #: SNN5760A
DEVICE POSITION (cheek or rotated): CHEEK

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Head; Medium parameters used: $\sigma = 1.46\text{mho/m}$, $\epsilon_r = 38.1$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(4.95, 4.95, 4.95); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Glycol SAM; Type: SAM; Serial: TP-1160;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

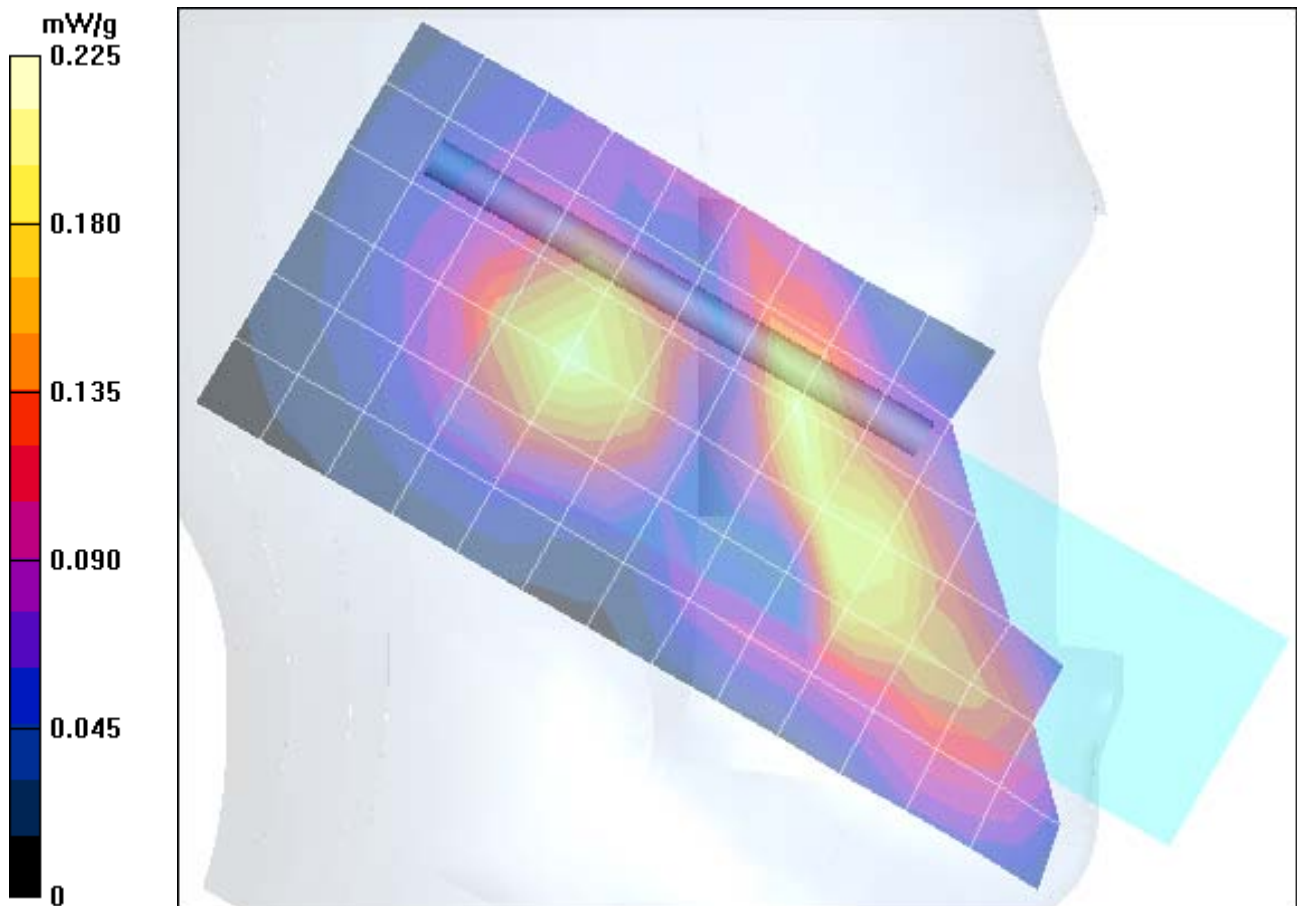
Left Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.210 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 13.6 V/m; Power Drift = -0.1 dB Peak SAR (extrapolated) = 0.291 W/kg

SAR(1 g) = 0.207 mW/g; SAR(10 g) = 0.132 mW/g Maximum value of SAR (measured) = 0.225 mW/g



Test Laboratory: Motorola 1900 RH Tilt CH600 flip open, antenna extended

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: ALWAYS UP Antenna Position: EXT Accessory Model #: NONE Battery Model #: SNN5615A
DEVICE POSITION (cheek or rotated): TILTED

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Head; Medium parameters used: $\sigma = 1.45 \text{ mho/m}$, $\epsilon_r = 38$; $\rho = 1000 \text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1397; ConvF(5.09, 5.09, 5.09); Calibrated: 5/21/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 2/9/2004
- Phantom: R1: Glycol SAM; Type: SAM; Serial: TP-1154;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

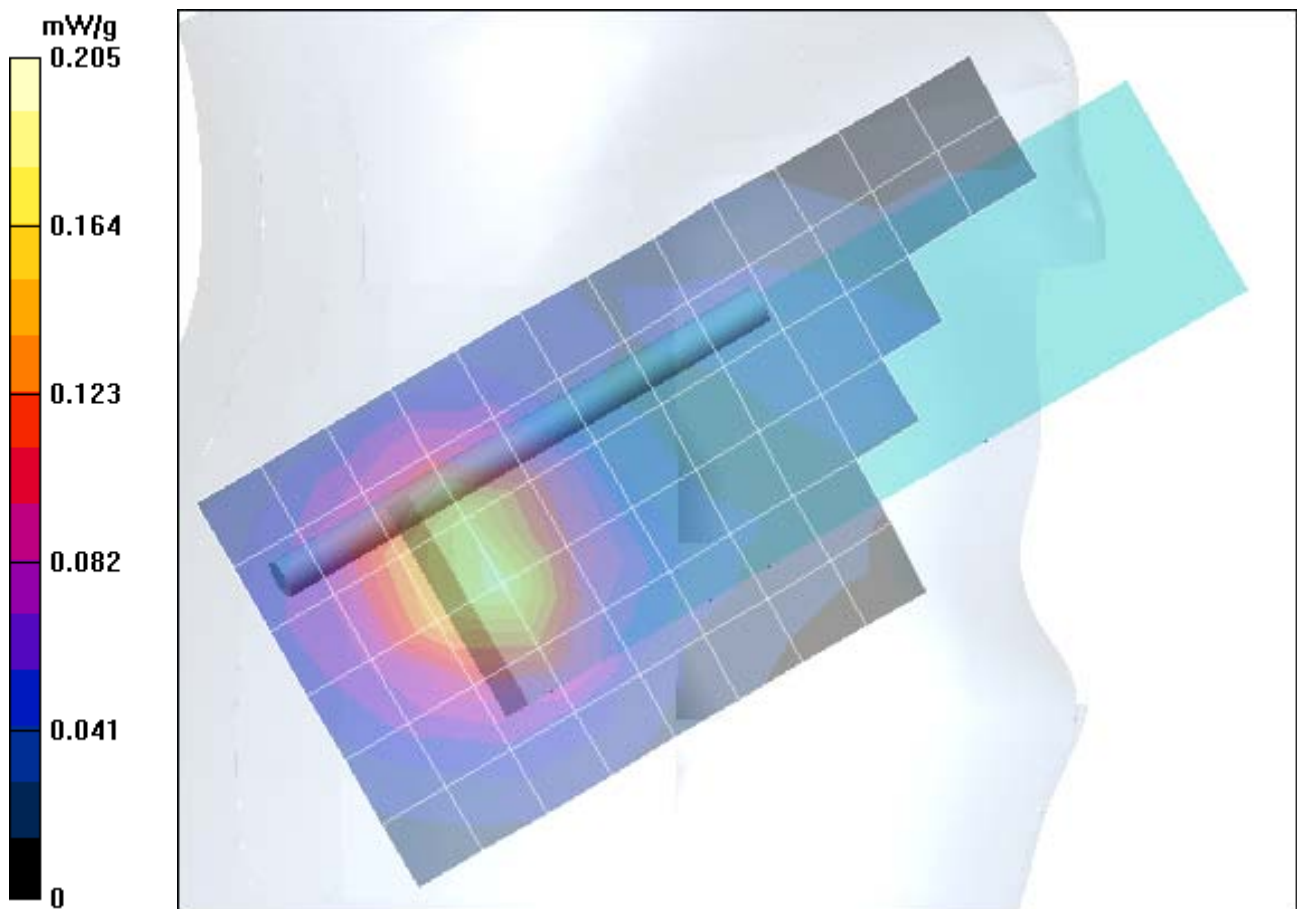
Right Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.188 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12 V/m; Power Drift = 0.008 dB Peak SAR (extrapolated) = 0.298 W/kg

SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.116 mW/g Maximum value of SAR (measured) = 0.208 mW/g



Test Laboratory: Motorola 1900 RH Cheek CH600 flip open, antenna retracted

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: RET Battery Model #: SNN5615A DEVICE POSITION cheekK

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Head; Medium parameters used: $\sigma = 1.45\text{mho/m}$, $\epsilon_r = 38.4$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(5.16, 5.16, 5.16); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn437; Calibrated: 3/16/2004
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

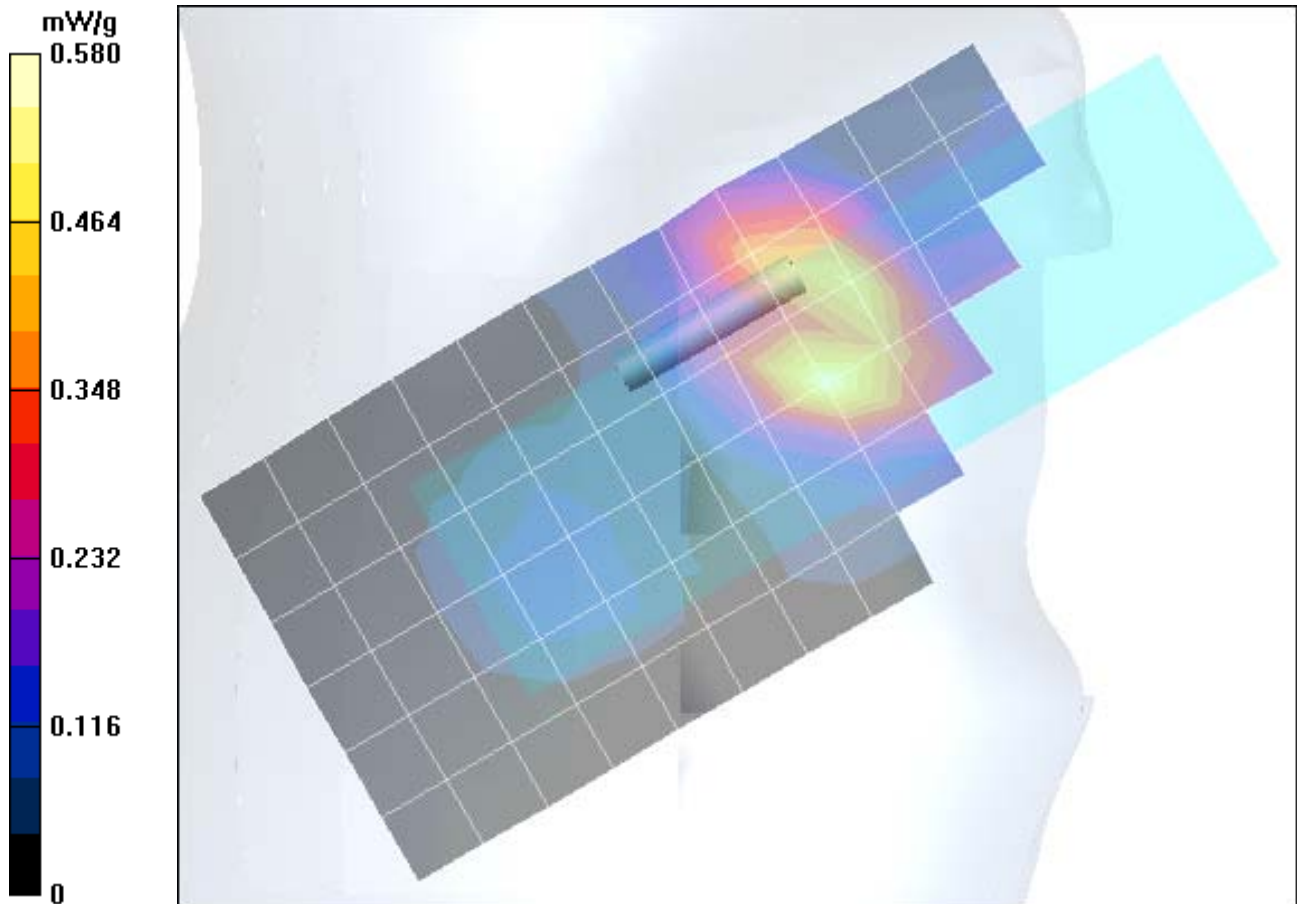
Right Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.548 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.5 V/m; Power Drift = -0.2 dB Peak SAR (extrapolated) = 0.847 W/kg

SAR(1 g) = 0.487 mW/g; SAR(10 g) = 0.296 mW/g Maximum value of SAR (measured) = 0.538 mW/g



Test Laboratory: Motorola 1900 RH Cheek CH600 flip open, antenna extended

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: EXT Battery Model #: SNN5615A DEVICE POSITION cheek

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Head; Medium parameters used: $\sigma = 1.45 \text{ mho/m}$, $\epsilon_r = 38.4$; $\rho = 1000 \text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(5.16, 5.16, 5.16); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn437; Calibrated: 3/16/2004
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

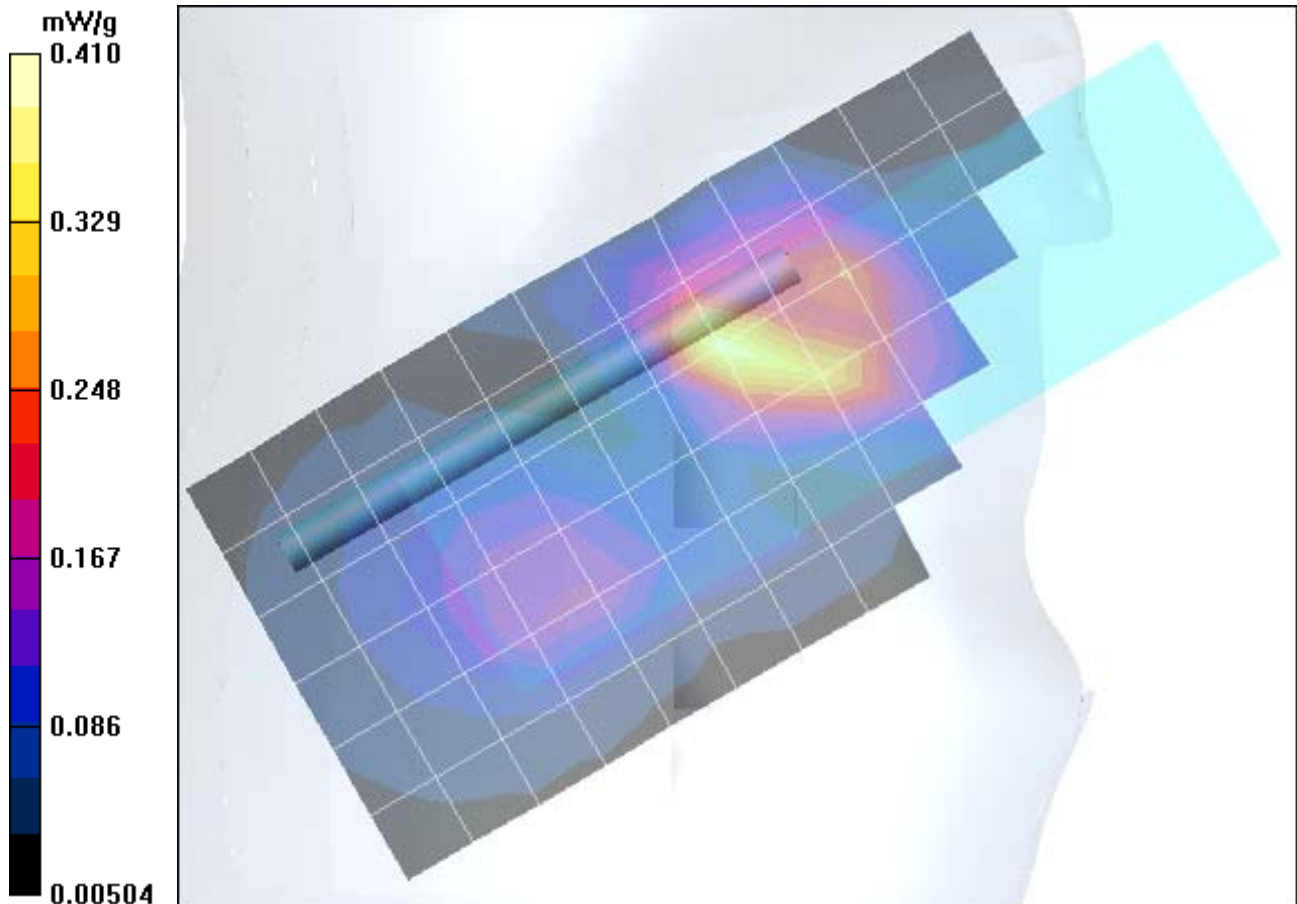
Right Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$ Maximum value of SAR (measured) = 0.386 mW/g

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

Reference Value = 16 V/m; Power Drift = -0.2 dB Peak SAR (extrapolated) = 0.495 W/kg

SAR(1 g) = 0.343 mW/g; SAR(10 g) = 0.196 mW/g Maximum value of SAR (measured) = 0.387 mW/g



Test Laboratory: Motorola 1900 LH Tilt CH600 flip open, antenna retracted

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: RET Battery Model #: SNN5615A DEVICE POSITION TILT

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Head; Medium parameters used: $\sigma = 1.45 \text{ mho/m}$, $\epsilon_r = 38.4$; $\rho = 1000 \text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(5.16, 5.16, 5.16); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn437; Calibrated: 3/16/2004
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

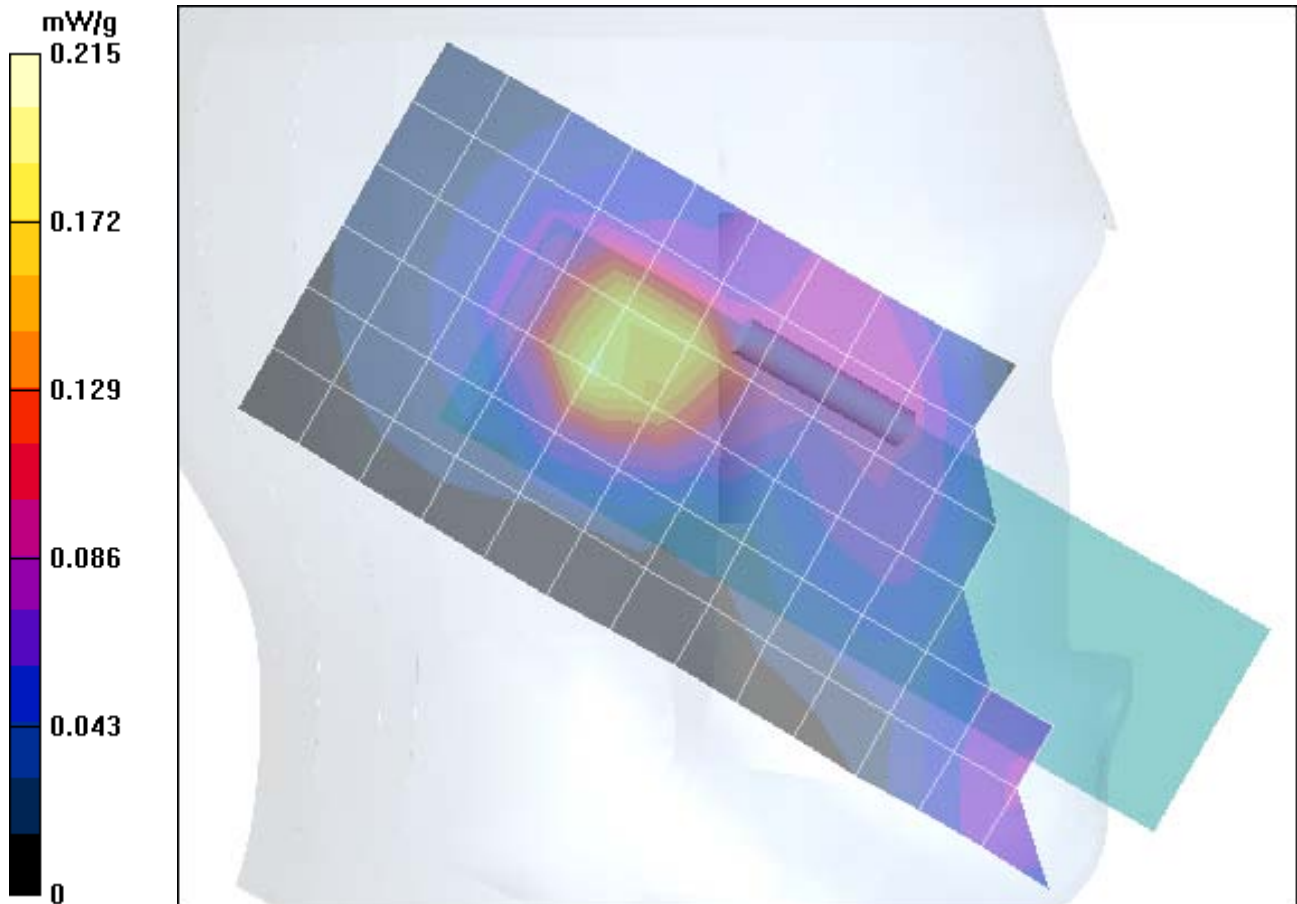
Left Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.193 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.7 V/m; Power Drift = 0.0 dB Peak SAR (extrapolated) = 0.311 W/kg

SAR(1 g) = 0.208 mW/g; SAR(10 g) = 0.124 mW/g Maximum value of SAR (measured) = 0.231 mW/g



Test Laboratory: Motorola 1900 LH Tilt CH600 flip open, antenna extended

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: EXT Battery Model #: SNN5615A DEVICE POSITION TILT

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Head; Medium parameters used: $\sigma = 1.45\text{mho/m}$, $\epsilon_r = 38.4$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(5.16, 5.16, 5.16); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn437; Calibrated: 3/16/2004
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

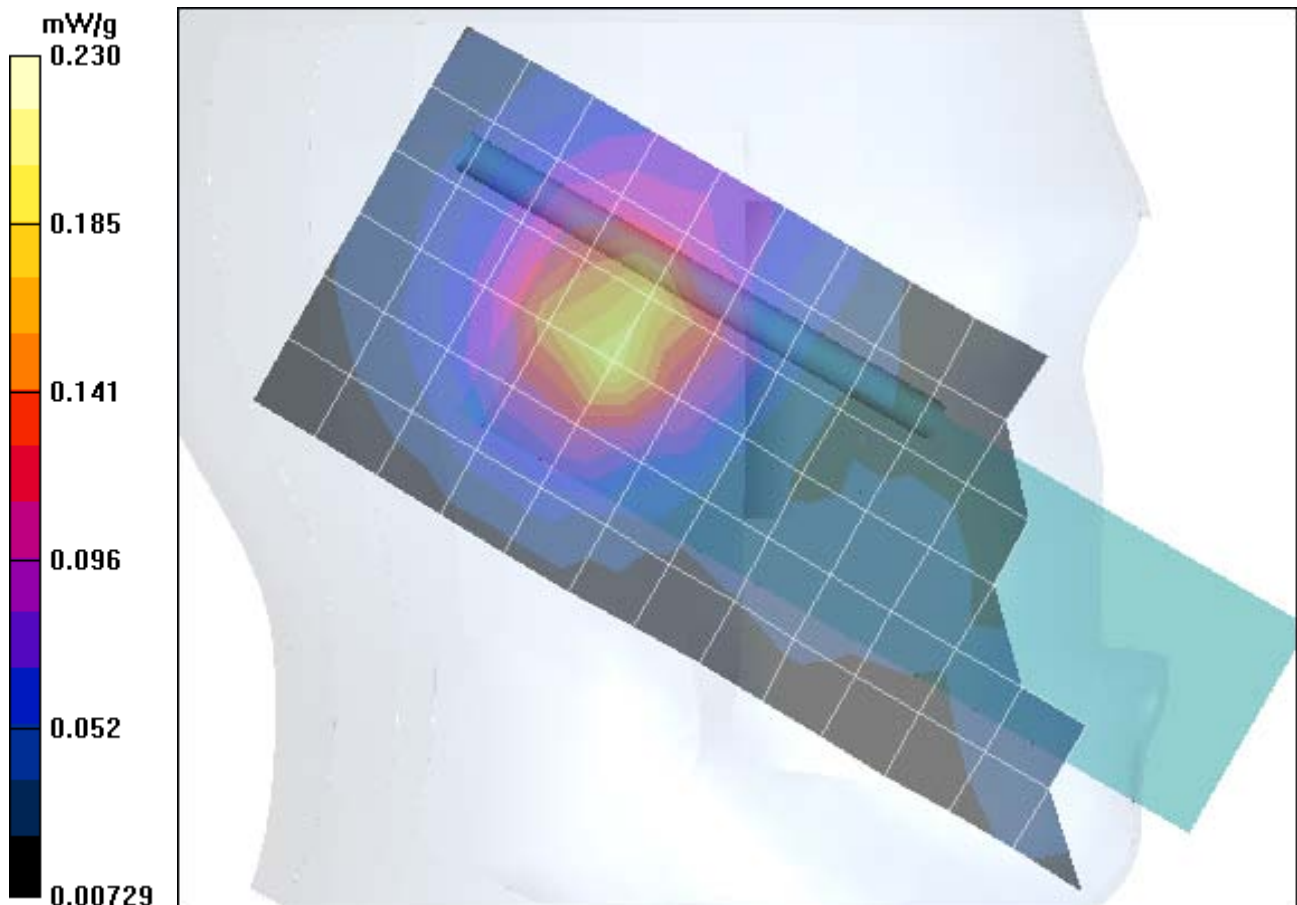
Left Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.199 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 11.8 V/m; Power Drift = 0.0 dB Peak SAR (extrapolated) = 0.297 W/kg

SAR(1 g) = 0.195 mW/g; SAR(10 g) = 0.121 mW/g Maximum value of SAR (measured) = 0.215 mW/g



Test Laboratory: Motorola 1900 LH Cheek CH600 flip open, antenna retracted

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: RET Battery Model #: SNN5615A DEVICE POSITION CHEEK

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Head; Medium parameters used: $\sigma = 1.45\text{mho/m}$, $\epsilon_r = 38.4$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(5.16, 5.16, 5.16); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn437; Calibrated: 3/16/2004
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

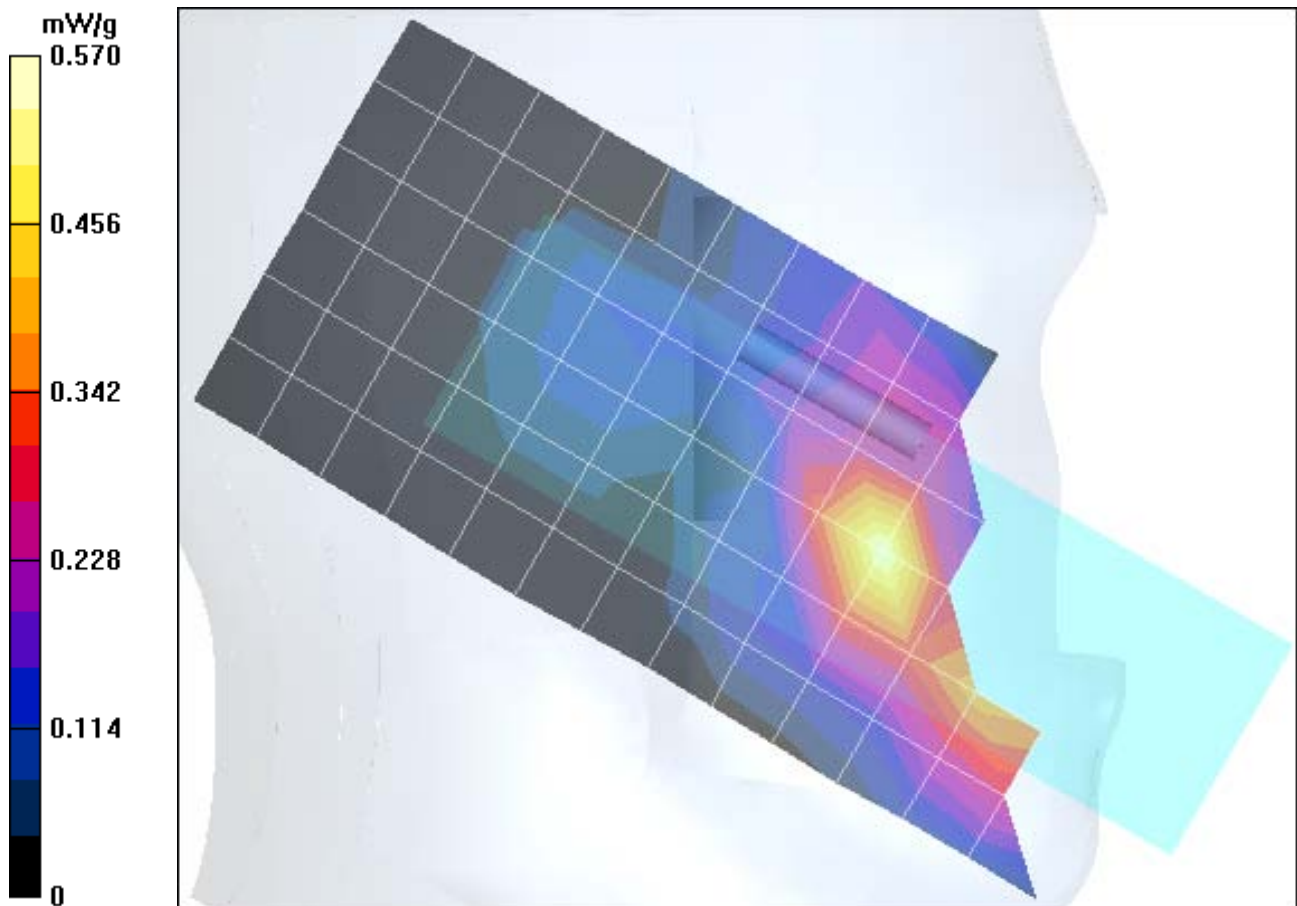
Left Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.549 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.4 V/m; **Power Drift = 0.2dB** Peak SAR (extrapolated) = 0.888 W/kg

SAR(1 g) = 0.526 mW/g; SAR(10 g) = 0.282 mW/g Maximum value of SAR (measured) = 0.578 mW/g



Test Laboratory: Motorola 1900 LH Cheek CH600 open, retracted, SNN5706A

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: ALWAYS UP Antenna Position: RET Accessory Model #: NONE Battery Model #: SNN5760A
DEVICE POSITION (cheek or rotated): CHEEK

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Head; Medium parameters used: $\sigma = 1.46\text{mho/m}$, $\epsilon_r = 38.1$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(4.95, 4.95, 4.95); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Glycol SAM; Type: SAM; Serial: TP-1160;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

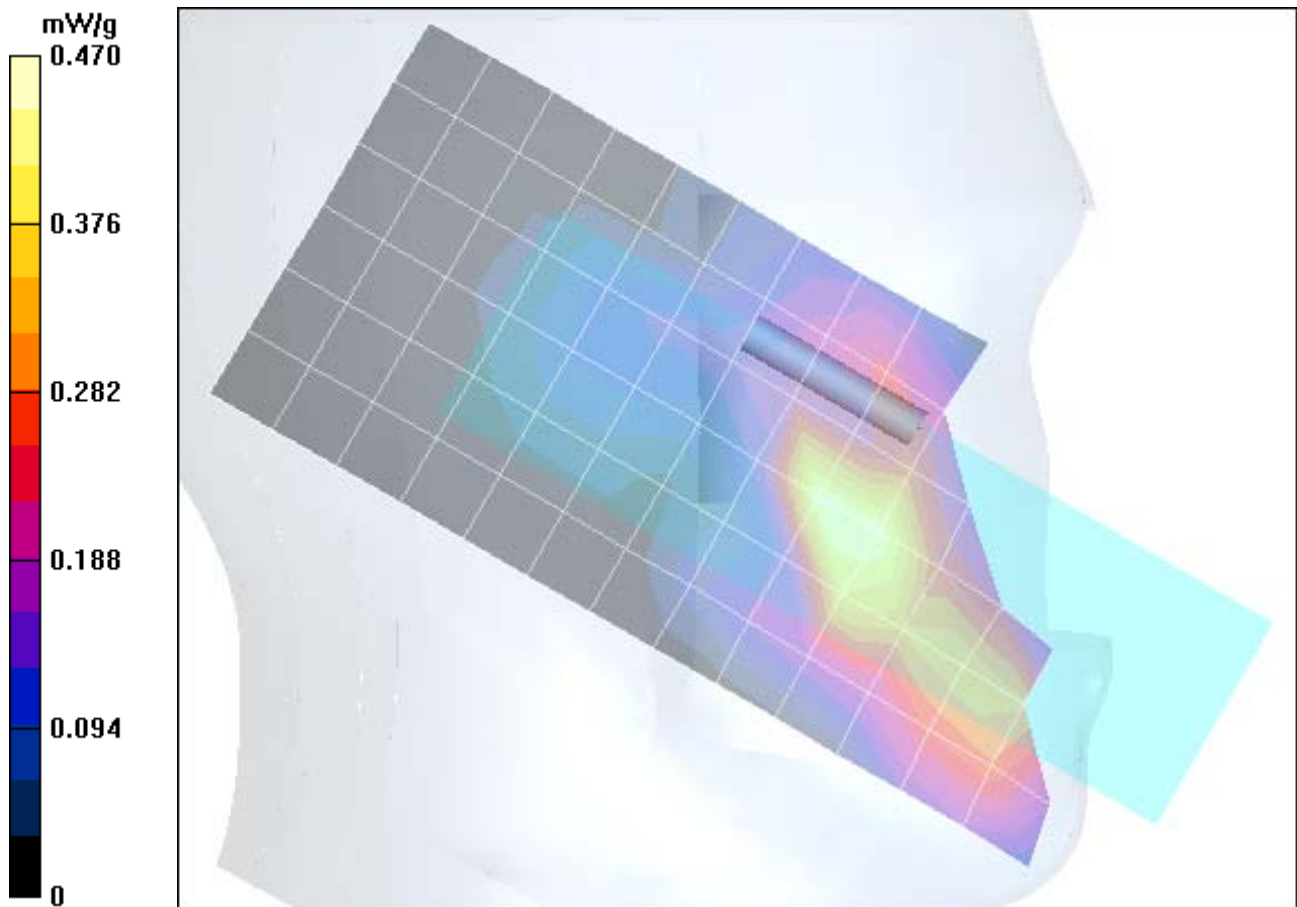
Left Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.443 mW/g

Left Head Template/Zoom Scan - to correct max outside (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.4 V/m; Power Drift = -0.1 dB Peak SAR (extrapolated) = 0.746 W/kg

SAR(1 g) = 0.470 mW/g; SAR(10 g) = 0.268 mW/g Maximum value of SAR (measured) = 0.529 mW/g



Test Laboratory: Motorola 1900 LH Cheek CH600 flip open, antenna extended

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: EXT Battery Model #: SNN5615A DEVICE POSITION CHK

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Head; Medium parameters used: $\sigma = 1.45 \text{ mho/m}$, $\epsilon_r = 38.4$; $\rho = 1000 \text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(5.16, 5.16, 5.16); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn437; Calibrated: 3/16/2004
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

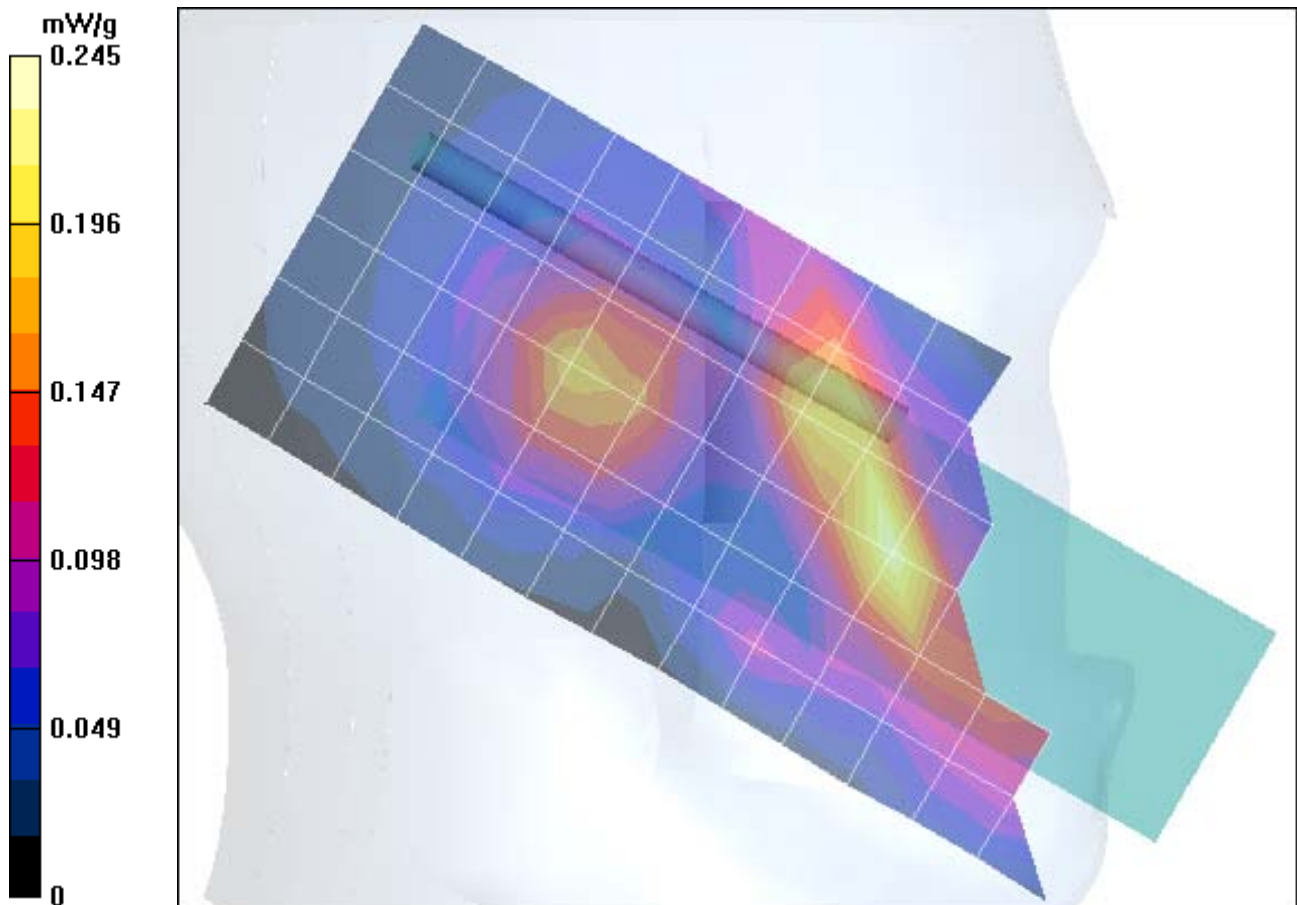
Left Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.235 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.9 V/m; **Power Drift = -0.2 dB** Peak SAR (extrapolated) = 0.355 W/kg

SAR(1 g) = 0.210 mW/g; SAR(10 g) = 0.114 mW/g Maximum value of SAR (measured) = 0.233 mW/g



Test Laboratory: Motorola 1900 RH Tilt CH600 flip open, antenna retracted

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: ALWAYS UP Antenna Position: RET Accessory Model #: NONE Battery Model #: SNN5615A
DEVICE POSITION (cheek or rotated): TILTED

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Head; Medium parameters used: $\sigma = 1.46\text{mho/m}$, $\epsilon_r = 38.1$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(4.95, 4.95, 4.95); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Glycol SAM; Type: SAM; Serial: TP-1160;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

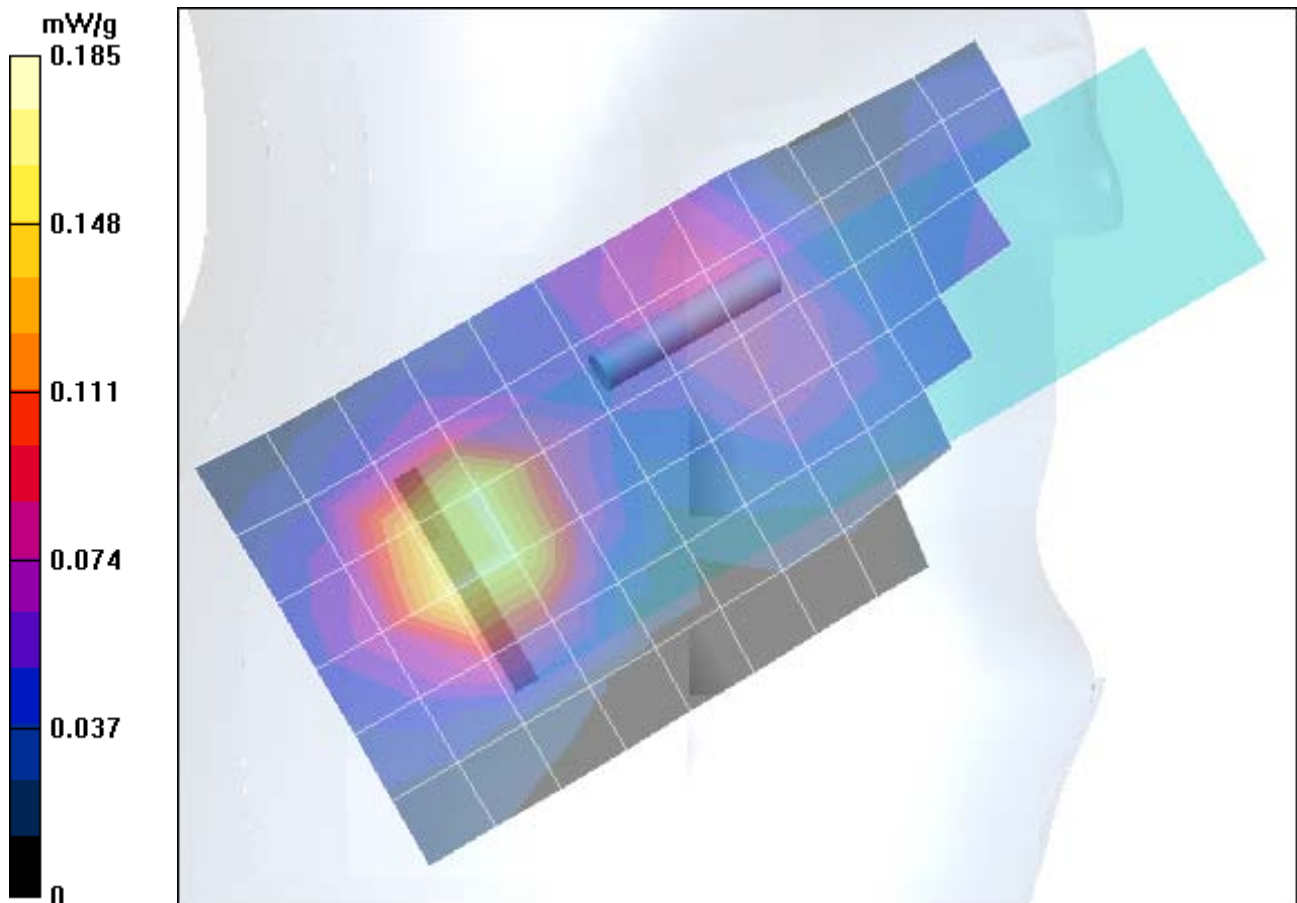
Right Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.165 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.4 V/m; Power Drift = 0.0 dB Peak SAR (extrapolated) = 0.277 W/kg

SAR(1 g) = 0.188 mW/g; SAR(10 g) = 0.113 mW/g Maximum value of SAR (measured) = 0.205 mW/g



Appendix 3

SAR distribution plots for Body Worn Configuration

Test Laboratory: Motorola

800 BW CH1013 closed, extended, SYN0912A, BT, SNN5760A

Serial: 68586566

Procedure Notes: Ch# 1013 / Pwr Step: Always Up Antenna Position: EXT Battery Model #: SNN5760A
Accessory Model # = SYN0912A Simulate Temp when Measured: 20.1C Simulate Temp after Test: 19.9C BLUETOOTH

Communication System: CDMA 835; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98\text{mho/m}$, $\epsilon_r = 55.4$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.85, 5.85, 5.85); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

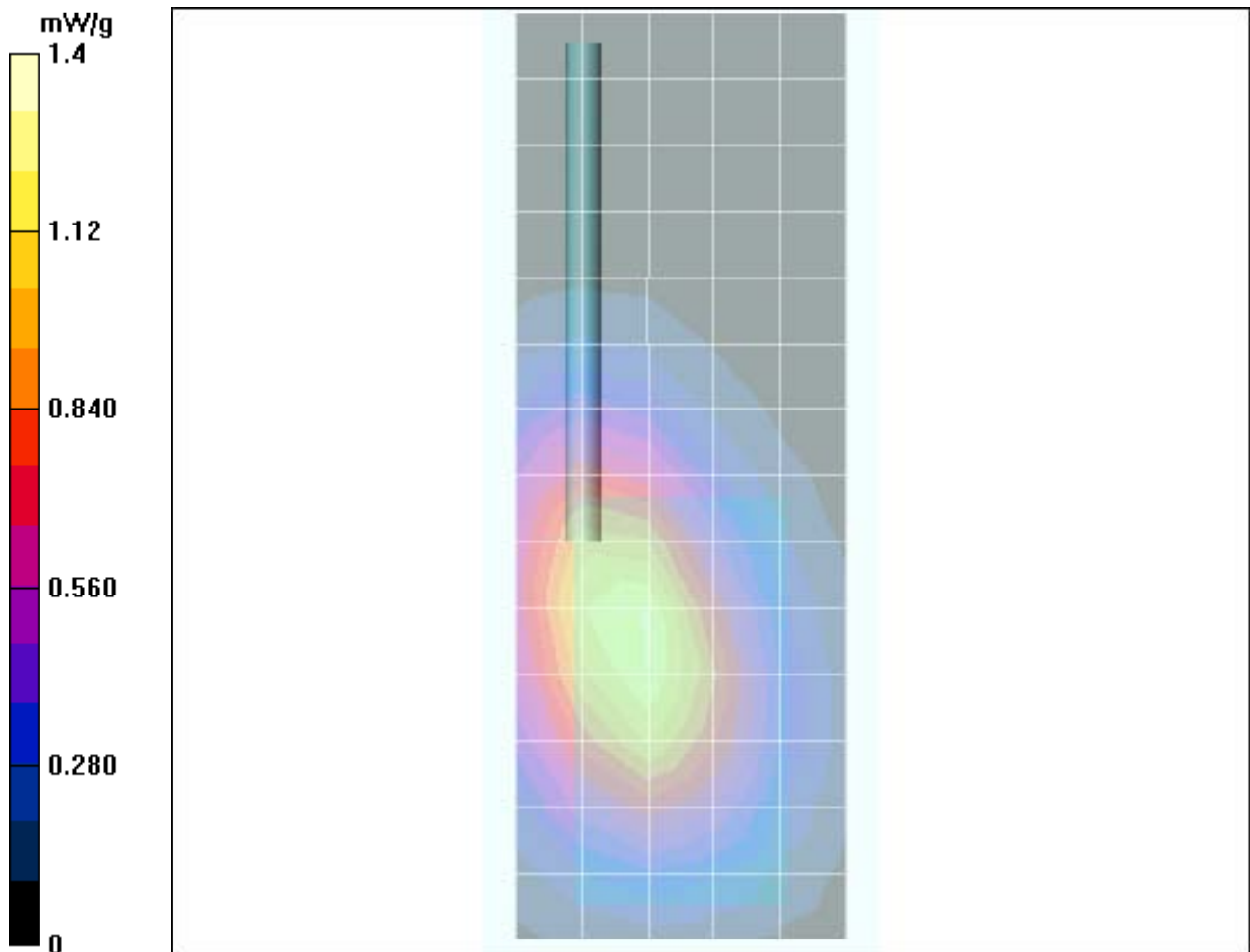
Amy Twin Phone Template/Area Scan - Full Body (15mm) (18x8x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.22 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 33.6 V/m; **Power Drift = -0.1 dB** Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.853 mW/g Maximum value of SAR (measured) = 1.27 mW/g



Test Laboratory: Motorola 800 BW CH777 closed, retracted, SYN0912A, BT

Serial: 68586566 Bluetooth Enabled

Procedure Notes: Ch# 777 / Pwr Step: Always Up Antenna Position: Retracted Battery Model #: SNN5615A Accessory Model # = SYN0912A
Simulate Temp when Measured: 20.4C Simulate Temp after Test: 20.1C

Communication System: CDMA 835; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98\text{mho/m}$, $\epsilon_r = 55.6$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.85, 5.85, 5.85); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

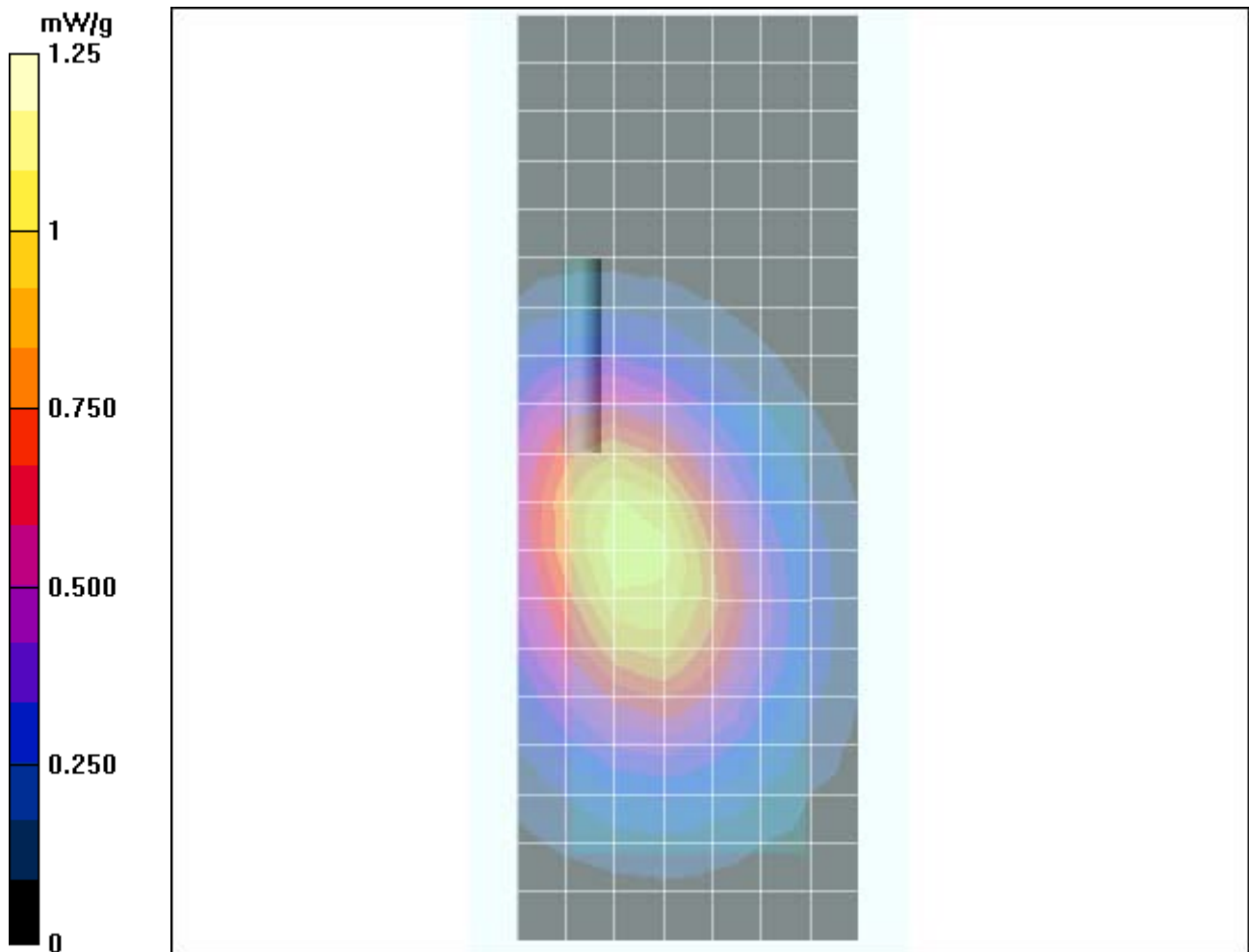
Amy Twin Phone Template/Area Scan - Normal Extended Body (10mm) (22x10x1):

Measurement grid: dx=10mm, dy=10mm Maximum value of SAR (measured) = 1.06 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 29.9 V/m; **Power Drift = -0.1 dB** Peak SAR (extrapolated) = 1.4 W/kg

SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.718 mW/g Maximum value of SAR (measured) = 1.08 mW/g



Test Laboratory: Motorola

800 BW CH777 closed, retracted, SYN0912A, BT, SNN5760A

Serial: 68586566

Procedure Notes: Ch# 777 / Pwr Step: Always Up Antenna Position: RET Battery Model #: SNN5760A Accessory Model # = SYN0912A
BLUETOOTH Simulate Temp when Measured: 20.1C Simulate Temp after Test: 20.0C

Communication System: CDMA 835; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98\text{mho/m}$, $\epsilon_r = 55.4$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.85, 5.85, 5.85); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

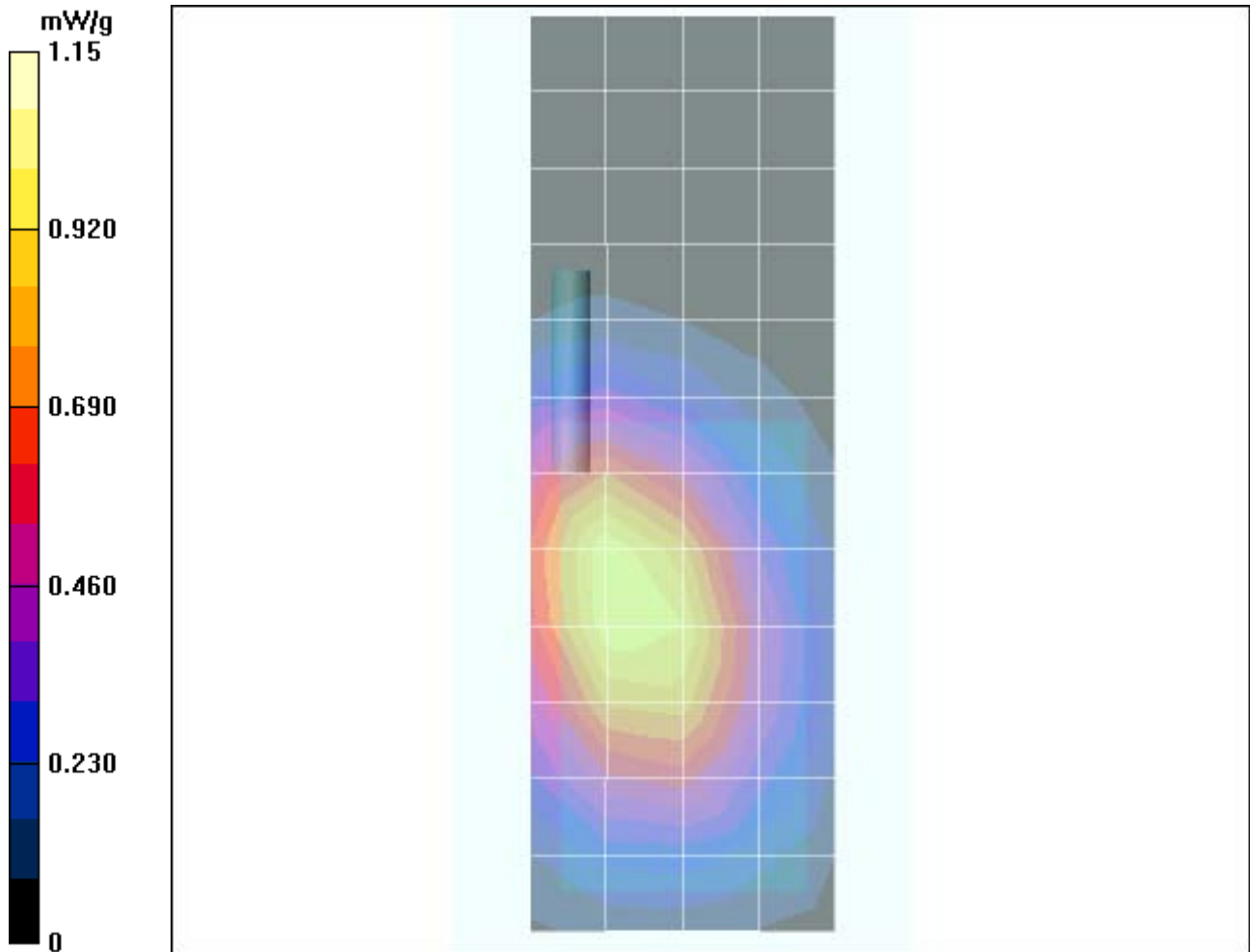
Amy Twin Phone Template/Area Scan - Normal Extended Body (15mm) (15x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.986 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 31 V/m; Power Drift = -0.1 dB Peak SAR (extrapolated) = 1.33 W/kg

SAR(1 g) = 0.978 mW/g; SAR(10 g) = 0.690 mW/g Maximum value of SAR (measured) = 1.06 mW/g



Test Laboratory: Motorola 800 BW CH777 closed, extended, SYN0912A, BT

Serial: 68586566

Procedure Notes: Ch# 777 / Pwr Step: Always Up Antenna Position: Extended Battery Model #: SNN5615A

Accessory Model # = SYN0912A Bluetooth Enabled Simulate Temp when Measured: 20.4C Simulate Temp after Test: 20.1C

Communication System: CDMA 835; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98\text{mho/m}$, $\epsilon_r = 55.6$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.85, 5.85, 5.85); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

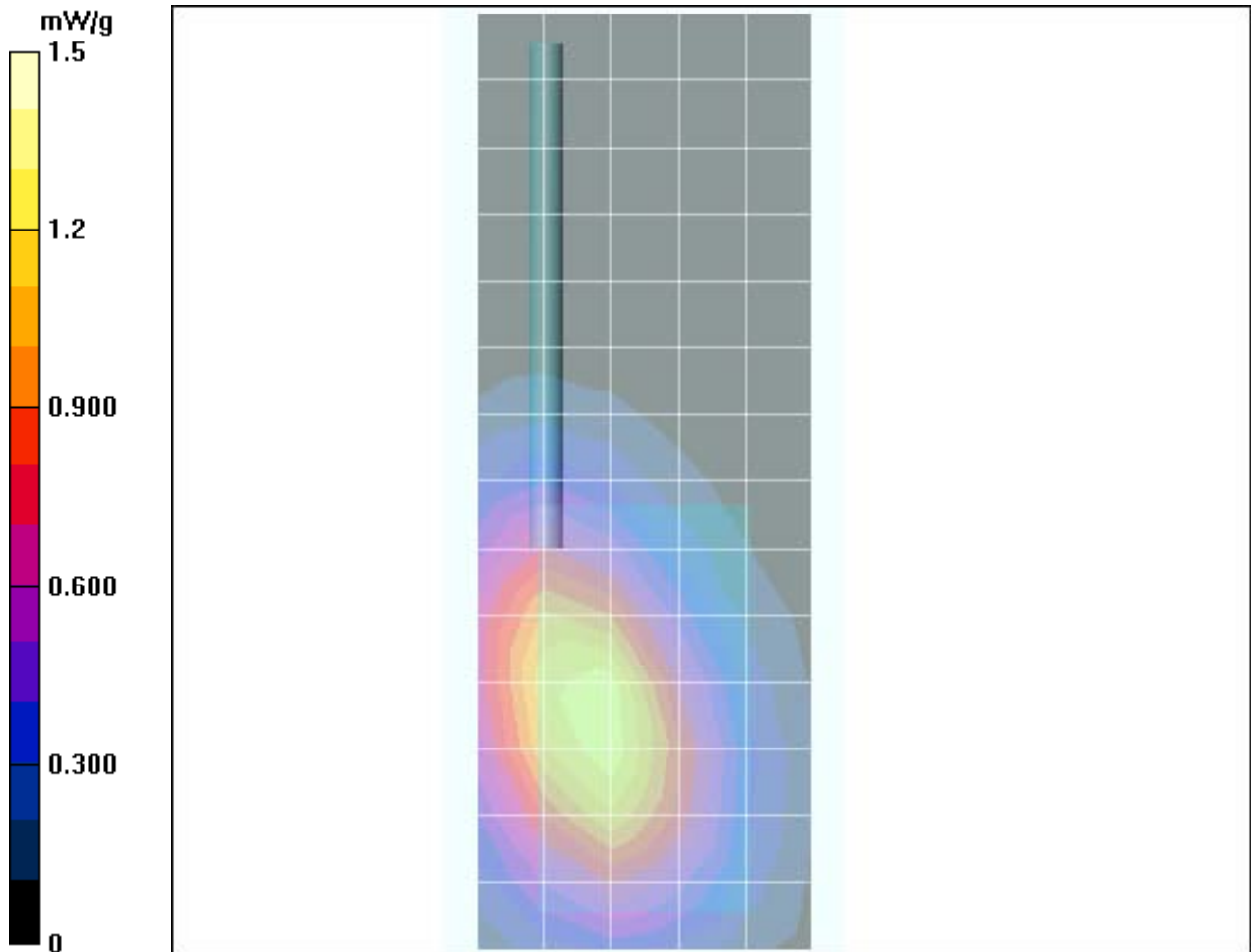
Amy Twin Phone Template/Area Scan - Full Body (15mm) (18x8x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.28 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 35.3 V/m; **Power Drift = -0.2 dB** Peak SAR (extrapolated) = 1.73 W/kg

SAR(1 g) = 1.26 mW/g; SAR(10 g) = 0.884 mW/g Maximum value of SAR (measured) = 1.35 mW/g



Test Laboratory: Motorola 800 BW CH1013 closed, extended, SYN0912A

Serial: 68586566

Procedure Notes: Ch# 1013 / Pwr Step: Always Up Antenna Position: Extended Battery Model #: SNN5615A
Accessory Model # = SYN0912A Simulate Temp when Measured: 20.4C Simulate Temp after Test: 19.3C

Communication System: CDMA 835; Frequency: 824.7 MHz; Duty Cycle: 1:1

Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98\text{mho/m}$, $\epsilon_r = 55.6$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.85, 5.85, 5.85); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

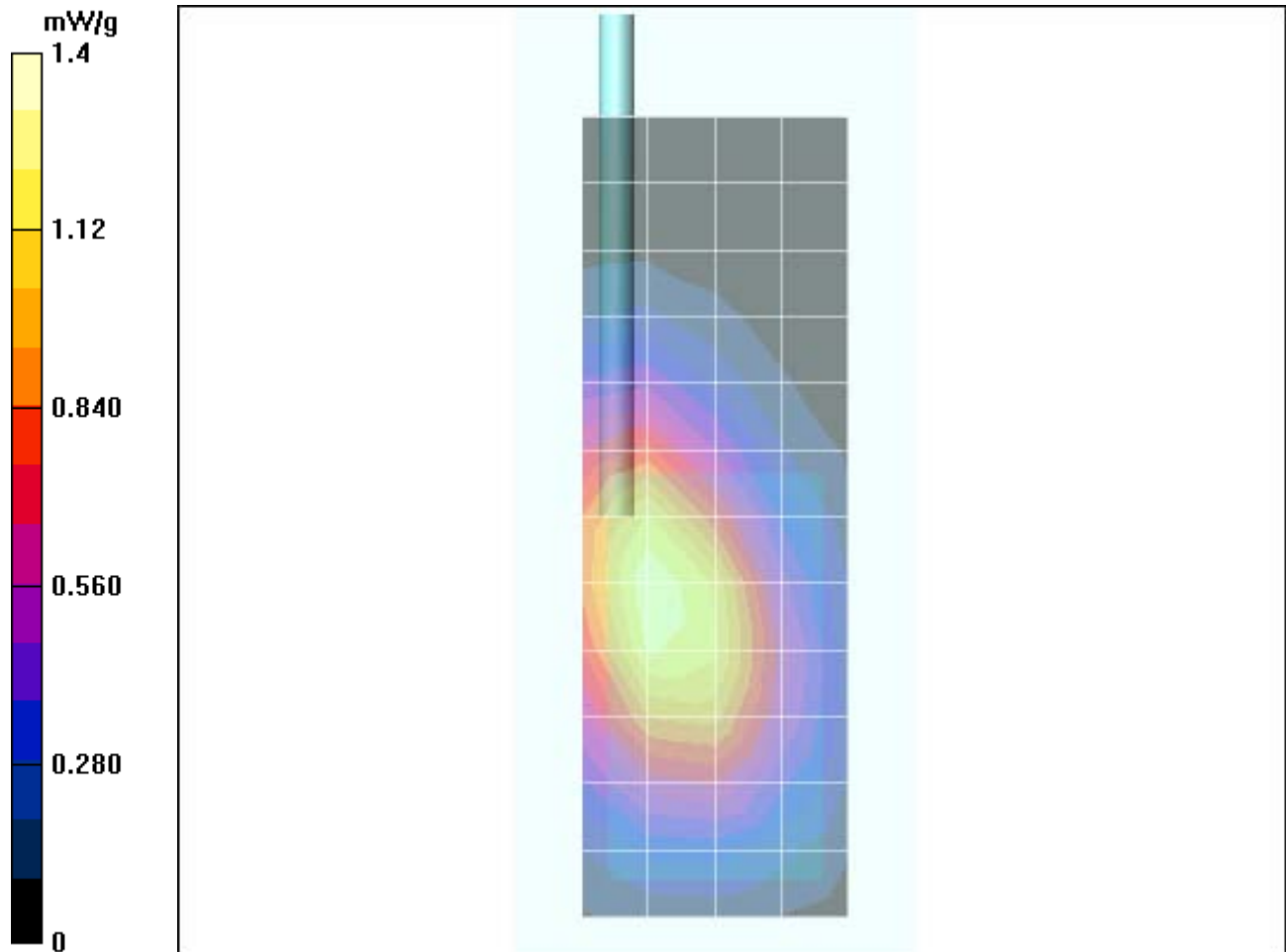
Amy Twin Phone Template/Area Scan - Normal Extended Body (15mm) (15x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.31 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 34.2 V/m; Power Drift = -0.1 dB Peak SAR (extrapolated) = 1.7 W/kg

SAR(1 g) = 1.26 mW/g; SAR(10 g) = 0.893 mW/g Maximum value of SAR (measured) = 1.36 mW/g



Test Laboratory: Motorola 800 BW CH777 closed, retracted, SYN0912A

Serial: 68586566

Procedure Notes: Ch# 777 / Pwr Step: Always Up Antenna Position: Retracted Battery Model #: SNN5615A
Accessory Model # = SYN0912A Simulate Temp when Measured: 20.4C Simulate Temp after Test: 19.3C

Communication System: CDMA 835; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98\text{mho/m}$, $\epsilon_r = 55.6$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(5.85, 5.85, 5.85); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

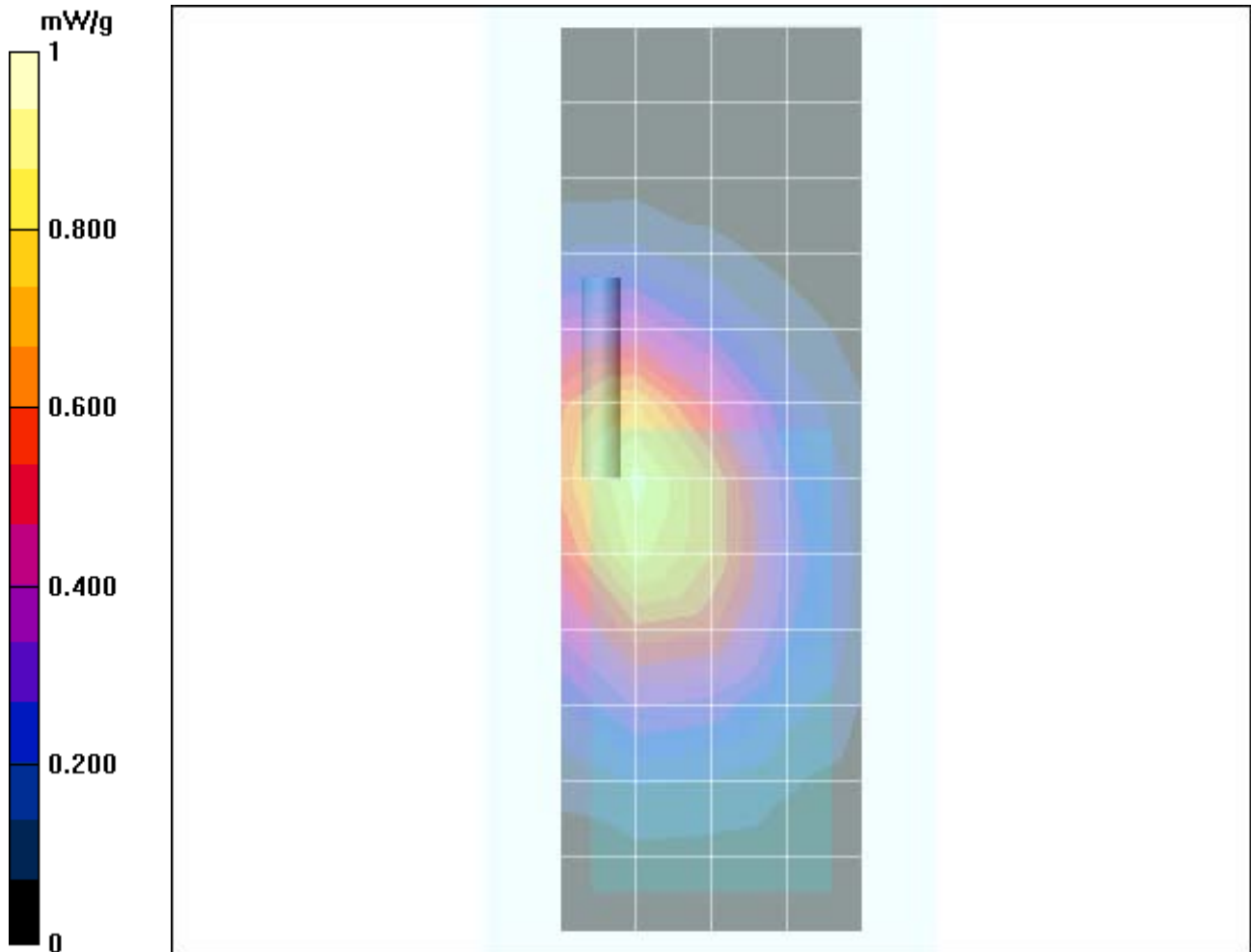
Amy Twin Phone Template/Area Scan - Normal Extended Body (15mm) (15x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.895 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 27.6 V/m; Power Drift = 0.0 dB Peak SAR (extrapolated) = 1.17 W/kg

SAR(1 g) = 0.849 mW/g; SAR(10 g) = 0.594 mW/g Maximum value of SAR (measured) = 0.908 mW/g



Test Laboratory: Motorola

1900 BW CH600 closed, extended, SYN0912A, BT, SNN5760A

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: EXT Battery Model #: SNN5760A
Accessory Model # = SYN0912A Simulate Temp when Measured: 19.5C Simulate Temp after Test: 19.5C BLUETOOTH

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Body; Medium parameters used: $\sigma = 1.59\text{mho/m}$, $\epsilon_r = 50.7$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(4.41, 4.41, 4.41); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

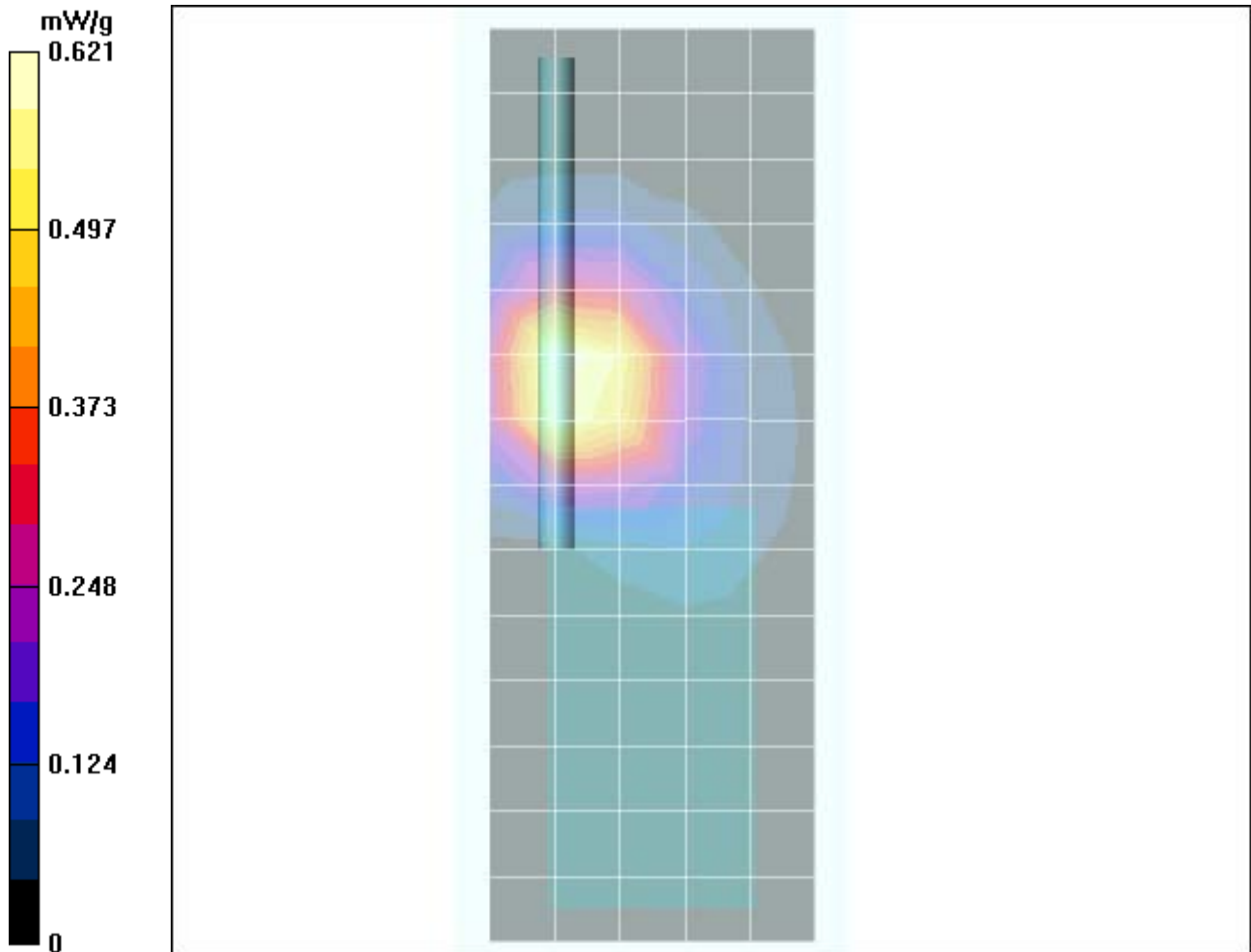
Amy Twin Phone Template/Area Scan - Full Body (15mm) (18x8x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.621 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 16.7 V/m; **Power Drift = -0.1 dB** Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.655 mW/g; SAR(10 g) = 0.391 mW/g Maximum value of SAR (measured) = 0.722 mW/g



Test Laboratory: Motorola 1900 BW CH600 closed, retracted, SYN0912A, BT

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: RET Battery Model #: SNN5615A

Accessory Model # = SYN0912A Simulate Temp when Measured: 19.3C Simulate Temp after Test: 19.0C BLUETOOTH

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Body; Medium parameters used: $\sigma = 1.59\text{mho/m}$, $\epsilon_r = 50.8$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(4.41, 4.41, 4.41); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

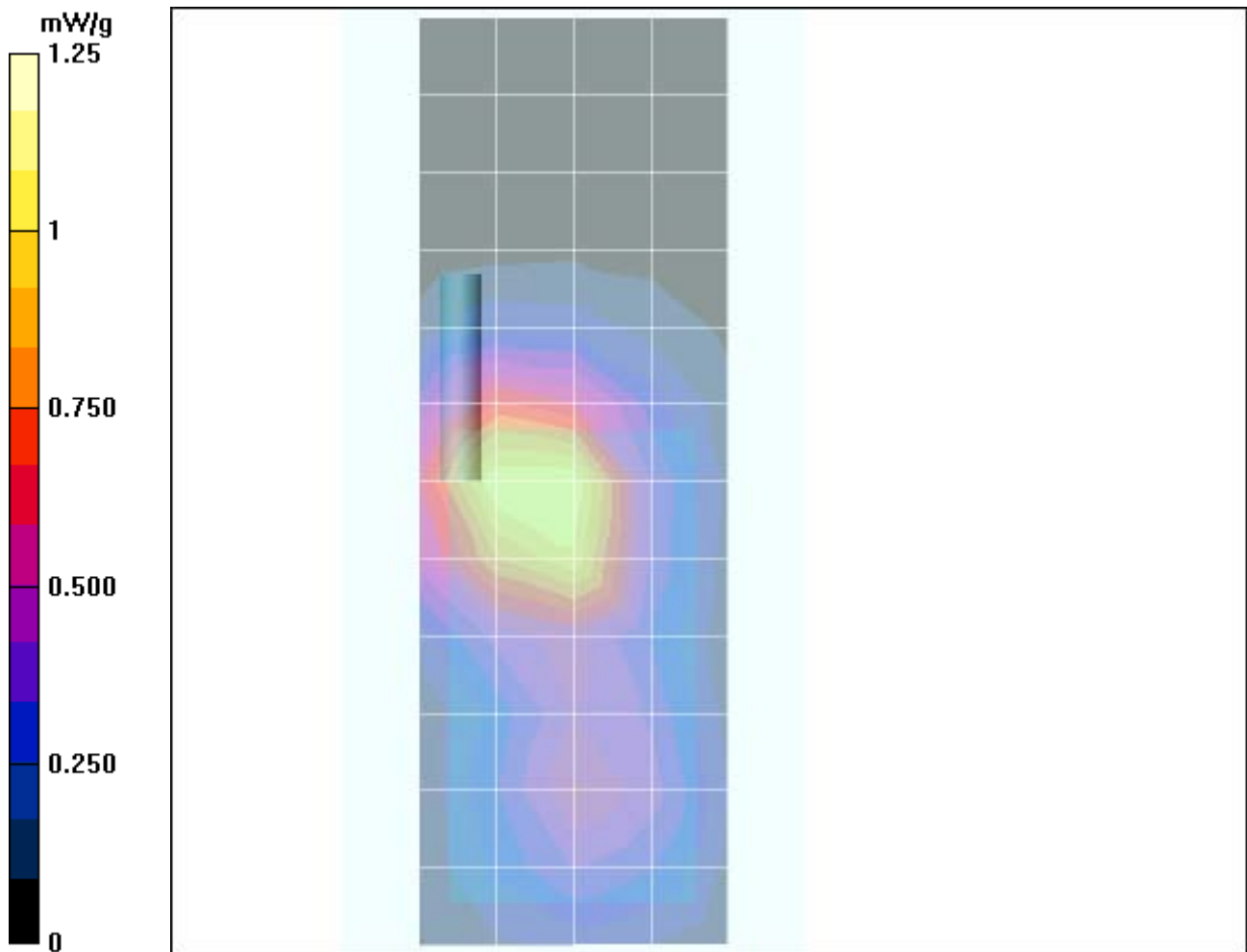
Amy Twin Phone Template/Area Scan - Normal Extended Body (15mm) (15x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.08 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 28.5 V/m; **Power Drift = -0.0 dB** Peak SAR (extrapolated) = 1.86 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.677 mW/g Maximum value of SAR (measured) = 1.23 mW/g



Test Laboratory: Motorola

1900 BW CH600 closed, retracted, SYN0912A, BT, SNN5760A

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: RET Battery Model #: SNN5760A

Accessory Model # = SYN0912A Simulate Temp when Measured: 19.5C Simulate Temp after Test: 19.5C BLUETOOTH

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Body; Medium parameters used: $\sigma = 1.59\text{mho/m}$, $\epsilon_r = 50.7$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(4.41, 4.41, 4.41); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

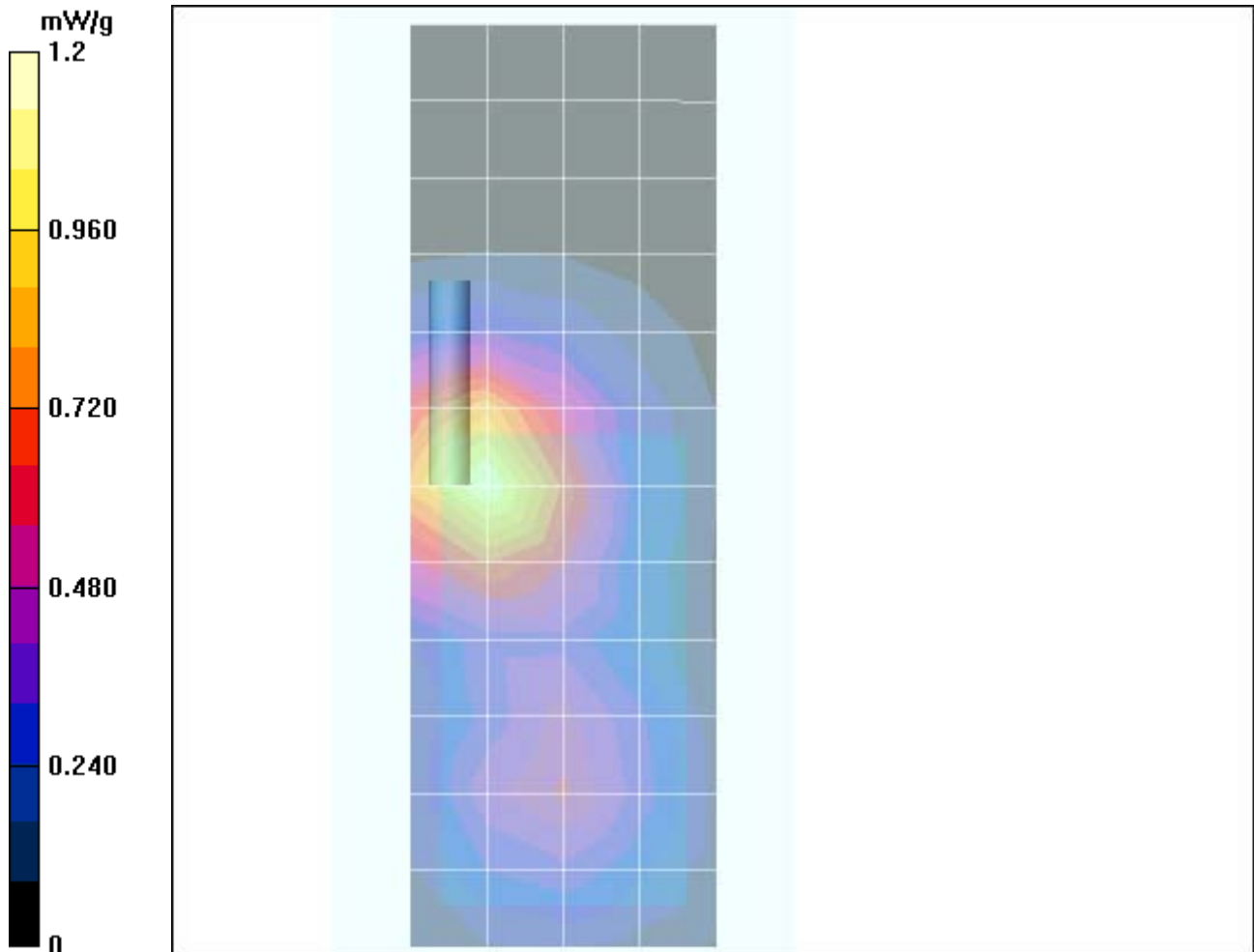
Amy Twin Phone Template/Area Scan - Normal Extended Body (15mm) (15x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.14 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 22.1 V/m; **Power Drift = -0.1 dB** Peak SAR (extrapolated) = 1.65 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.646 mW/g Maximum value of SAR (measured) = 1.13 mW/g



Test Laboratory: Motorola 1900 BW CH600 closed, extended, SYN0912A

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: EXT Battery Model #: SNN5615A
Accessory Model # = SYN0912A Simulate Temp when Measured: 19.3C Simulate Temp after Test: 19.1C

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Body; Medium parameters used: $\sigma = 1.59\text{mho/m}$, $\epsilon_r = 50.8$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(4.41, 4.41, 4.41); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

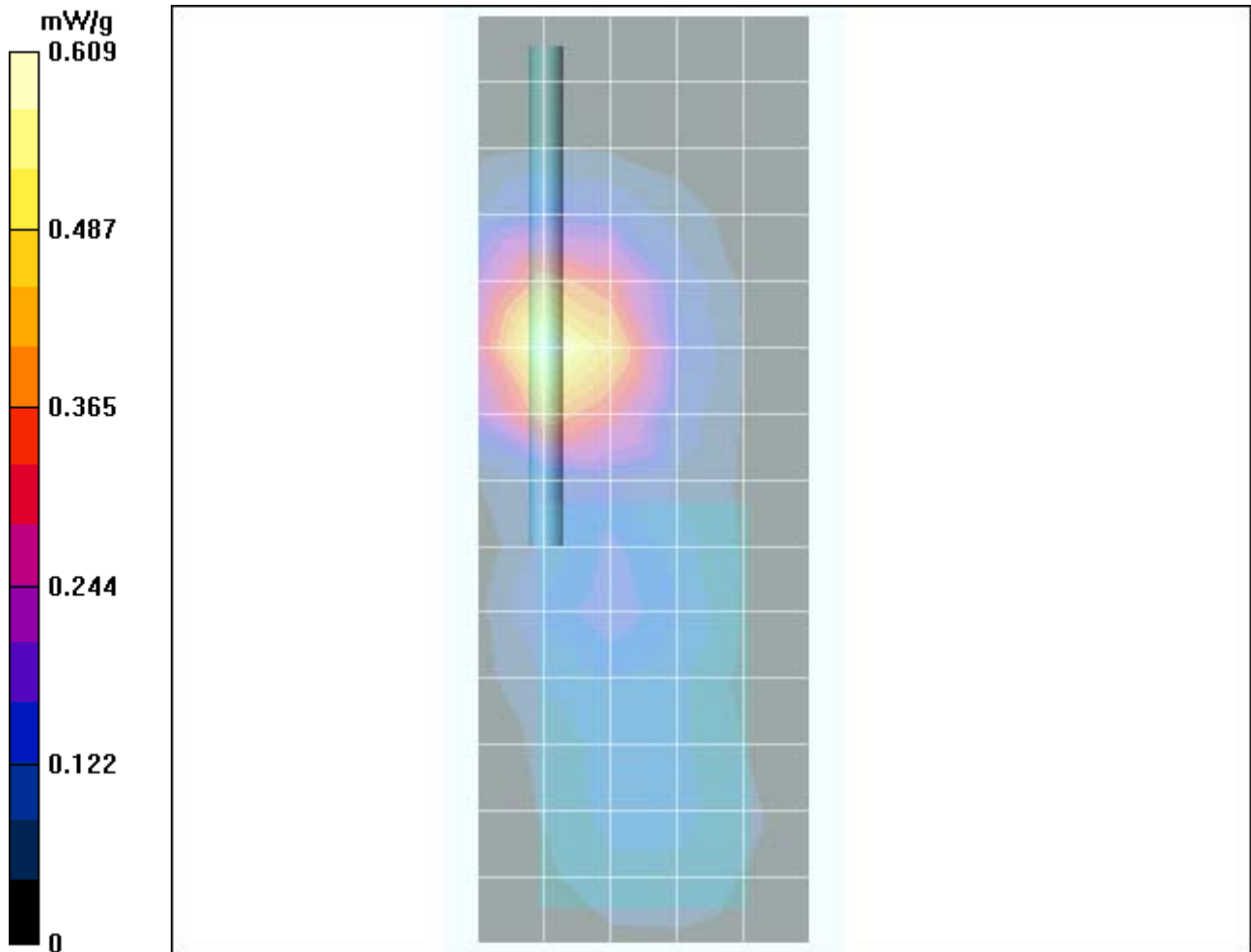
Amy Twin Phone Template/Area Scan - Full Body (15mm) (18x8x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.609 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.7 V/m; Power Drift = -0.0 dB Peak SAR (extrapolated) = 0.903 W/kg

SAR(1 g) = 0.580 mW/g; SAR(10 g) = 0.347 mW/g Maximum value of SAR (measured) = 0.634 mW/g



Test Laboratory: Motorola 1900 BW CH600 closed, extended, SYN0912A, BT

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: EXT Battery Model #: SNN5615A

Accessory Model # = SYN0912A Simulate Temp when Measured: 19.3C Simulate Temp after Test: 19.0C BLUETOOTH

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Body; Medium parameters used: $\sigma = 1.59\text{mho/m}$, $\epsilon_r = 50.8$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(4.41, 4.41, 4.41); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

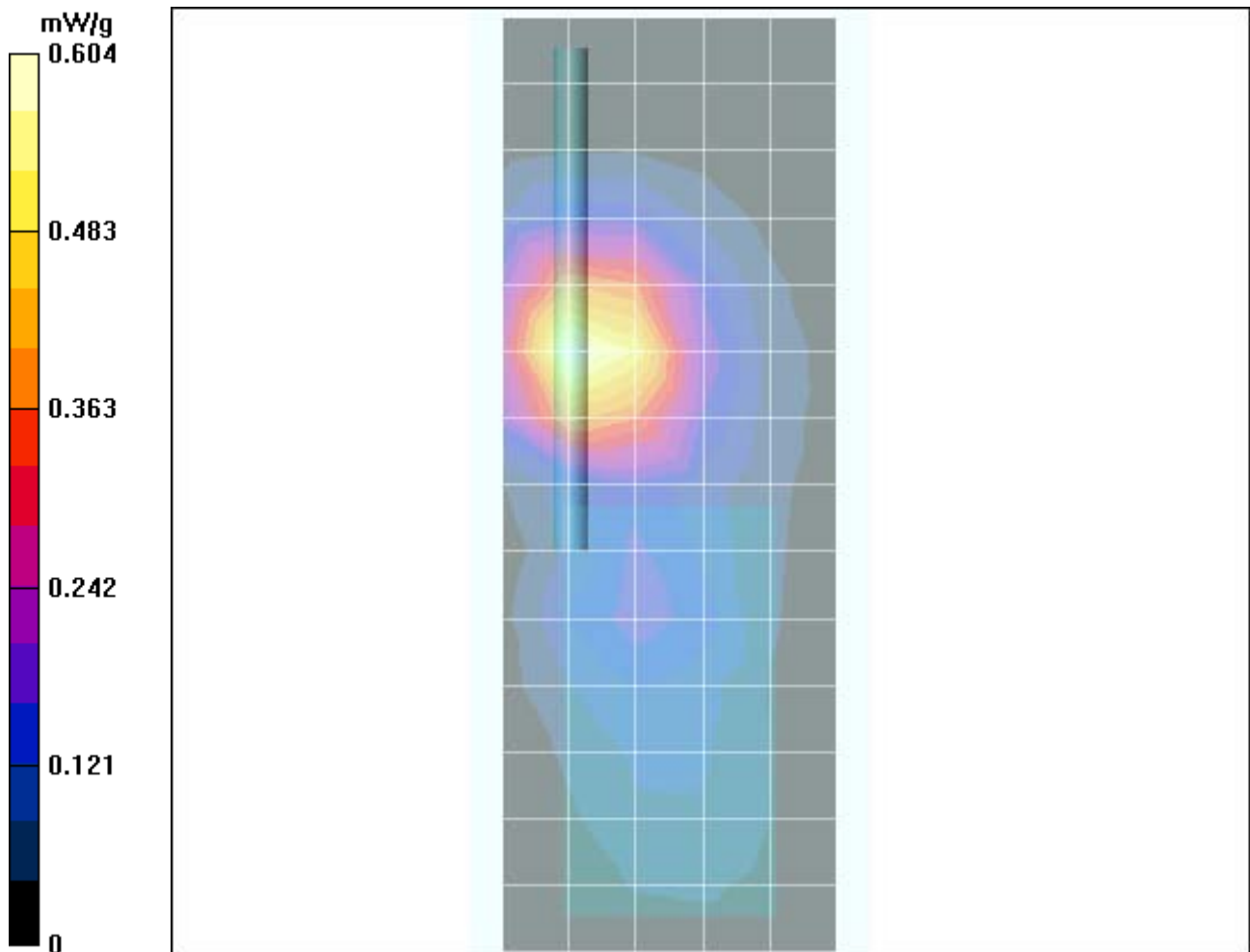
Amy Twin Phone Template/Area Scan - Full Body (15mm) (18x8x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.604 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 17.4 V/m; Power Drift = 0.003 dB Peak SAR (extrapolated) = 0.988 W/kg

SAR(1 g) = 0.608 mW/g; SAR(10 g) = 0.363 mW/g Maximum value of SAR (measured) = 0.669 mW/g



Test Laboratory: Motorola 1900 BW CH600 closed, retracted, SYN0912A

Serial: 68586566

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: RET Battery Model #: SNN5615A
Accessory Model # = SYN0912A Simulate Temp when Measured: 19.3C Simulate Temp after Test: 19.1C

Communication System: CDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Body; Medium parameters used: $\sigma = 1.59\text{mho/m}$, $\epsilon_r = 50.8$; $\rho = 1000\text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1513; ConvF(4.41, 4.41, 4.41); Calibrated: 9/24/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn316; Calibrated: 12/17/2003
- Phantom: R5: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

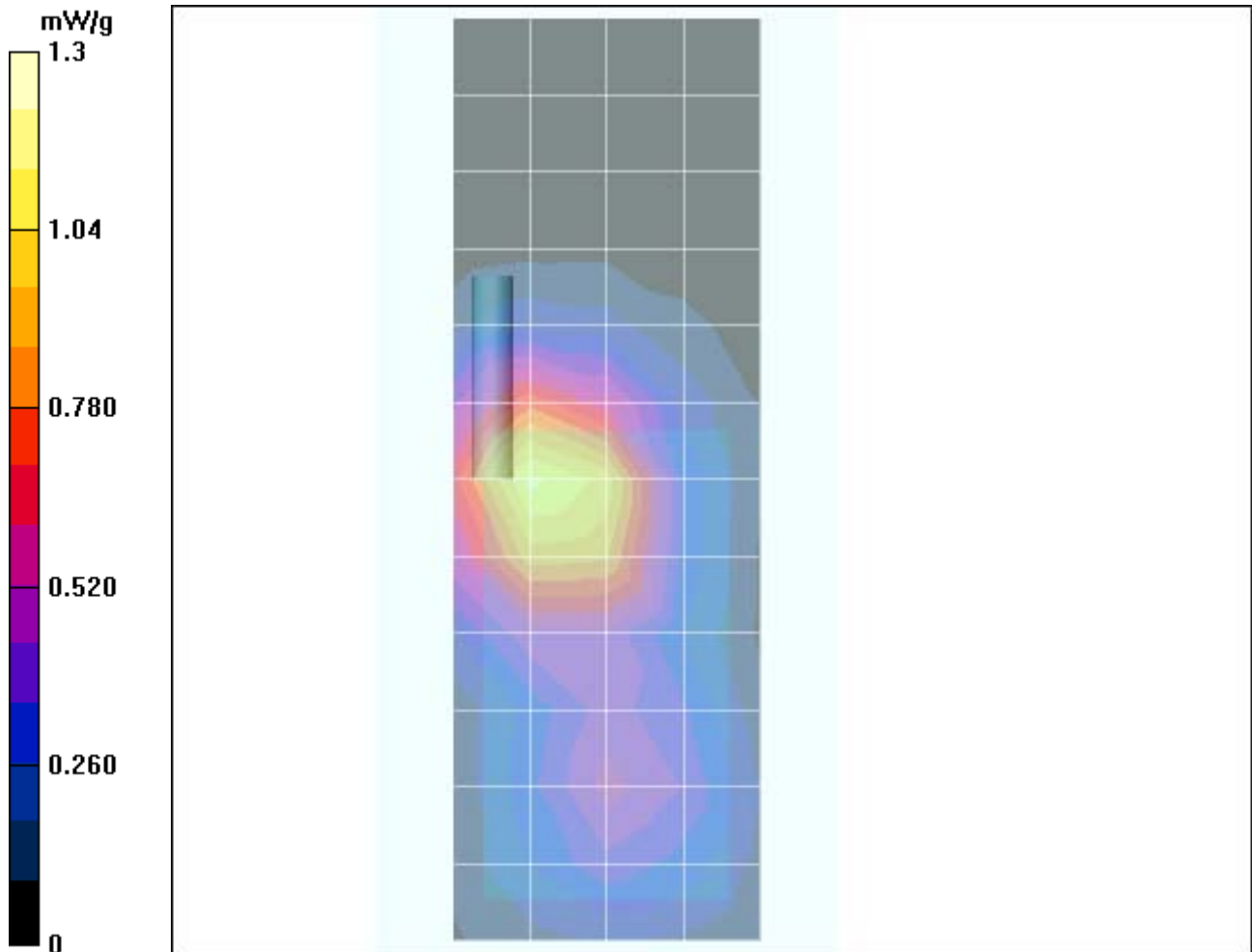
Amy Twin Phone Template/Area Scan - Normal Extended Body (15mm) (15x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.15 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 27.5 V/m; **Power Drift = -0.1 dB** Peak SAR (extrapolated) = 1.78 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.683 mW/g Maximum value of SAR (measured) = 1.19 mW/g



Appendix 4
Probe Calibration Certificate

Client

Motorola PCS

CALIBRATION CERTIFICATE

Object(s) ET3DV6R - SN:1397

Calibration procedure(s) QA CAL-01.v2
Calibration procedure for dosimetric E-field probes

Calibration date: May 21, 2004

Condition of the calibrated item In Tolerance (according to the specific calibration document)

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 ± 2 degrees Celsius and humidity $< 75\%$.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E4419B	GB41293874	5-May-04 (METAS, No 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No 251-00388)	May-05
Reference 20 dB Attenuator	SN: 5086 (20b)	3-May-04 (METAS, No 251-00389)	May-05
Fluke Process Calibrator Type 702	SN: 6295803	8-Sep-03 (Sintrel SCS No. E-030020)	Sep-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-03)	In house check: Oct 05

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Technician	

	Name	Function
Approved by:	Katja Pokovic	Laboratory Director

Date issued: May 21, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Probe ET3DV6R

SN:1397

Manufactured:	October 24, 1999
Last calibrated:	December 15, 2003
Repaired:	April 23, 2004
Recalibrated:	May 21, 2004

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6R SN:1397

Sensitivity in Free Space

Diode Compression^A

NormX	1.88 $\mu\text{V}/(\text{V/m})^2$	DCP X	95	mV
NormY	1.75 $\mu\text{V}/(\text{V/m})^2$	DCP Y	95	mV
NormZ	2.02 $\mu\text{V}/(\text{V/m})^2$	DCP Z	95	mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 7.

Boundary Effect

Head **900 MHz** Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	8.2	4.1
SAR _{be} [%]	With Correction Algorithm	0.0	0.0

Head **1800 MHz** Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	13.1	8.8
SAR _{be} [%]	With Correction Algorithm	0.1	0.0

Sensor Offset

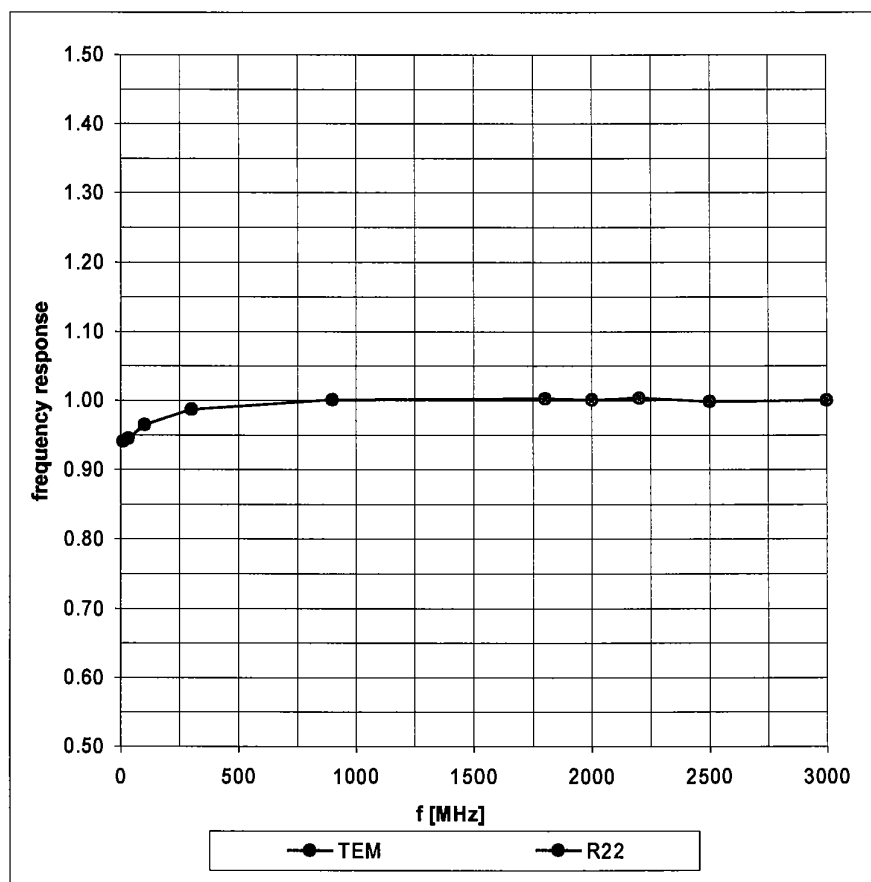
Probe Tip to Sensor Center **2.7** mm

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

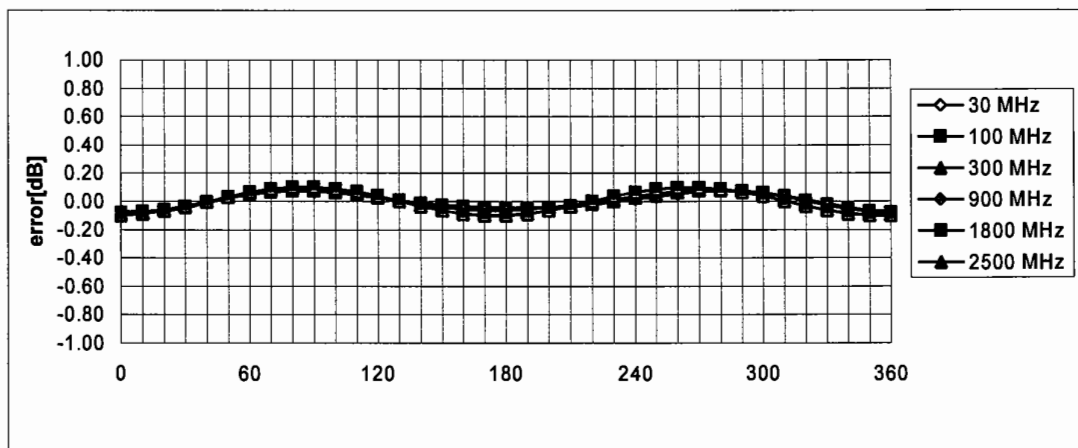
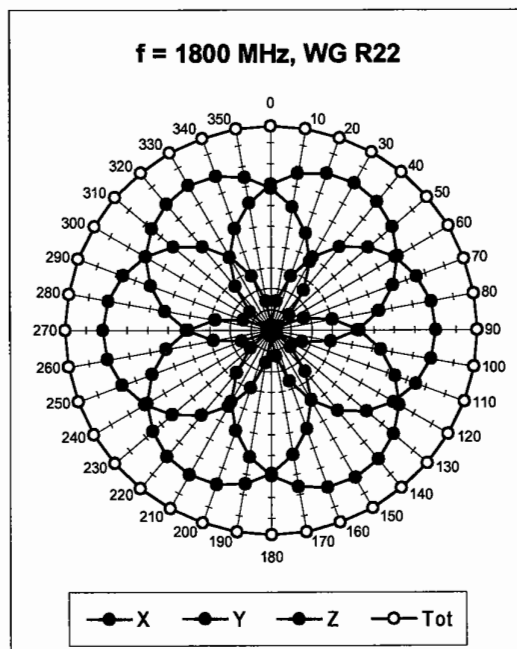
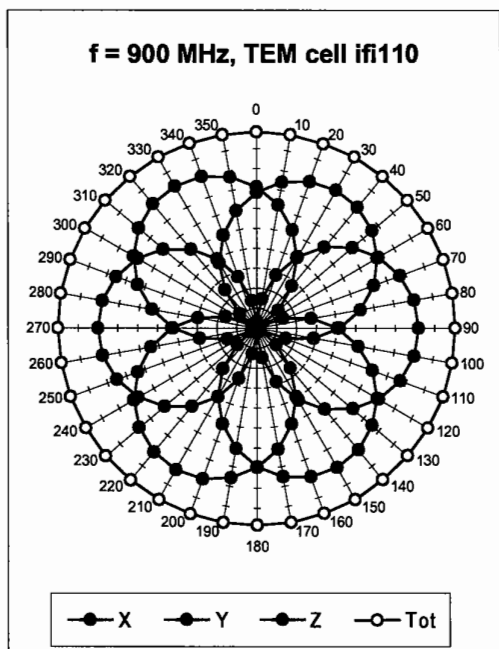
^A numerical linearization parameter: uncertainty not required

Frequency Response of E-Field

(TEM-Cell:ifi110, Waveguide R22)

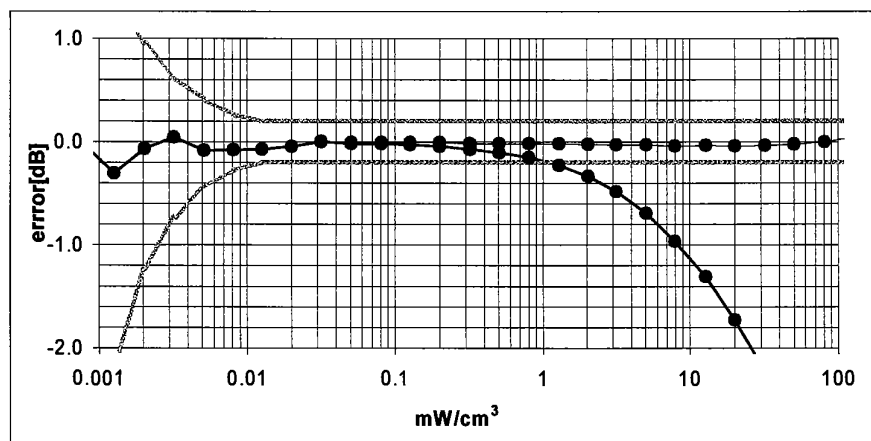
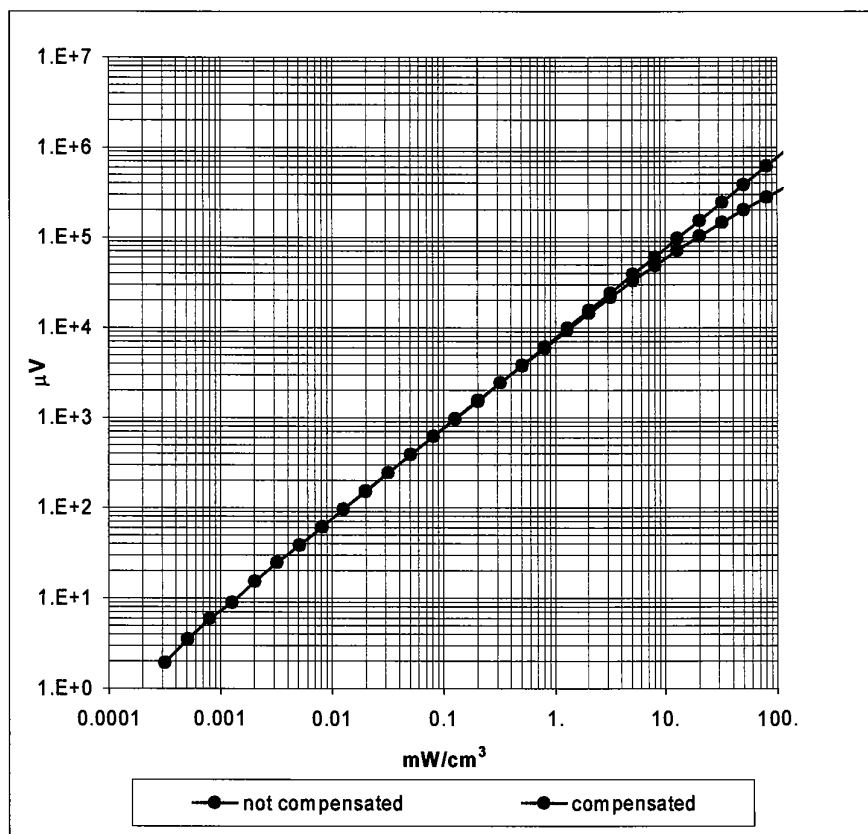


Receiving Pattern (ϕ), $\theta = 0^\circ$



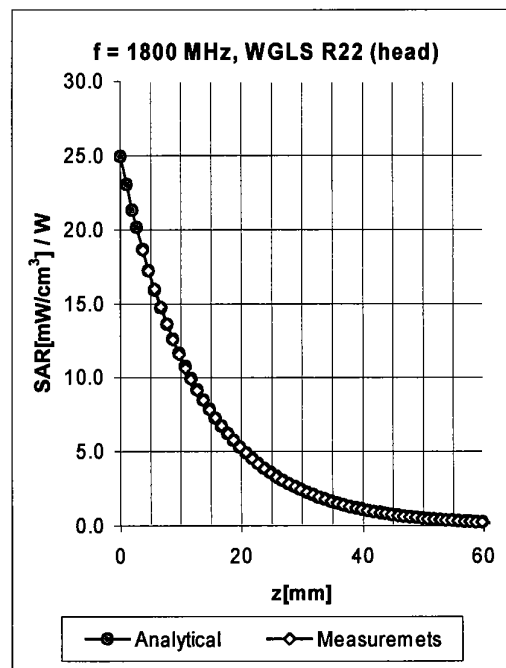
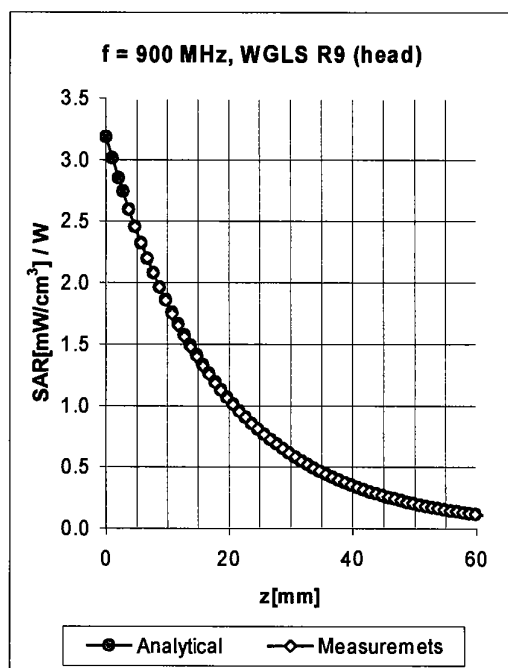
Axial Isotropy Error $< \pm 0.2$ dB

Dynamic Range $f(\text{SAR}_{\text{head}})$ (Waveguide R22)



Probe Linearity Error $< \pm 0.2$ dB

Conversion Factor Assessment

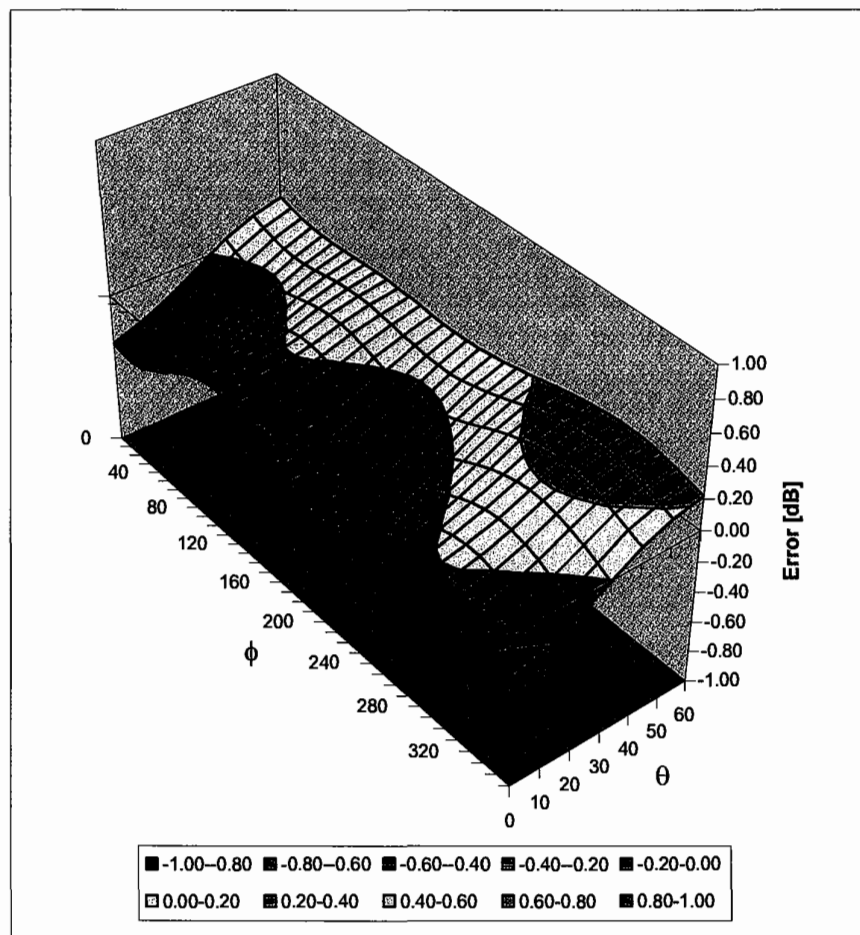


f [MHz]	Validity [MHz] ^B	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	800-1000	Head	41.5 ± 5%	0.97 ± 5%	0.83	1.55	6.10 ± 9.5% (k=2)
1800	1710-1910	Head	40.0 ± 5%	1.40 ± 5%	0.47	2.66	5.09 ± 9.5% (k=2)
1950	1900-2000	Head	40.0 ± 5%	1.40 ± 5%	0.57	2.51	4.80 ± 9.5% (k=2)
900	800-1000	Body	55.0 ± 5%	1.05 ± 5%	0.50	2.19	5.92 ± 9.5% (k=2)
1800	1710-1910	Body	53.3 ± 5%	1.52 ± 5%	0.55	2.84	4.52 ± 9.5% (k=2)
1950	1900-2000	Body	53.3 ± 5%	1.52 ± 5%	0.66	2.48	4.23 ± 9.5% (k=2)

^B The stated uncertainty of calibration in according to P1528.

Deviation from Isotropy in HSL

Error (θ, ϕ), $f = 900$ MHz



Spherical Isotropy Error $< \pm 0.4$ dB



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

Motorola PCS

Certificate No. **ET3-1513_Sep04**

CALIBRATION CERTIFICATE

Object

ET3DV6R - SN: 1513

Calibration procedure(s)

**QA CAL-01 v5
Calibration procedure for dosimetric E-field probes**

Calibration date:

September 24, 2004

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	5-May-04 (METAS, No. 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No. 251-00388)	May-05
Reference 3 dB Attenuator	SN: S5054 (3c)	3-Apr-03 (METAS, No. 251-00403)	Aug-05
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-04 (METAS, No. 251-00389)	May-05
Reference 30 dB Attenuator	SN: S5129 (30b)	3-Apr-03 (METAS, No. 251-00404)	Aug-05
Reference Probe ES3DV2	SN: 3013	8-Jan-04 (SPEAG, No. ES3-3013_Jan04)	Jan-05
DAE4	SN: 617	26-May-04 (SPEAG, No. DAE4-617_May04)	May-05

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-03)	In house check: Nov 04

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 24, 2004

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



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**

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
Polarization ϕ	ϕ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}:** Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E^2 -field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * frequency_response** (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP_{x,y,z}:** DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters:** Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY 4.3 B17 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical isotropy (3D deviation from isotropy):** in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset:** The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe ET3DV6R

SN:1513

Manufactured:	May 3, 2002
Last calibrated:	October 9, 2003
Recalibrated:	September 24, 2004

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6R SN:1513

Sensitivity in Free Space^A

Diode Compression^B

NormX	2.28 ± 9.9%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP X	94 mV
NormY	1.79 ± 9.9%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Y	94 mV
NormZ	2.06 ± 9.9%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Z	94 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL **900 MHz** **Typical SAR gradient: 5 % per mm**

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	10.3	5.3
SAR _{be} [%]	With Correction Algorithm	0.1	0.2

TSL **1810 MHz** **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	14.0	9.2
SAR _{be} [%]	With Correction Algorithm	1.1	0.0

Sensor Offset

Probe Tip to Sensor Center **2.7 mm**

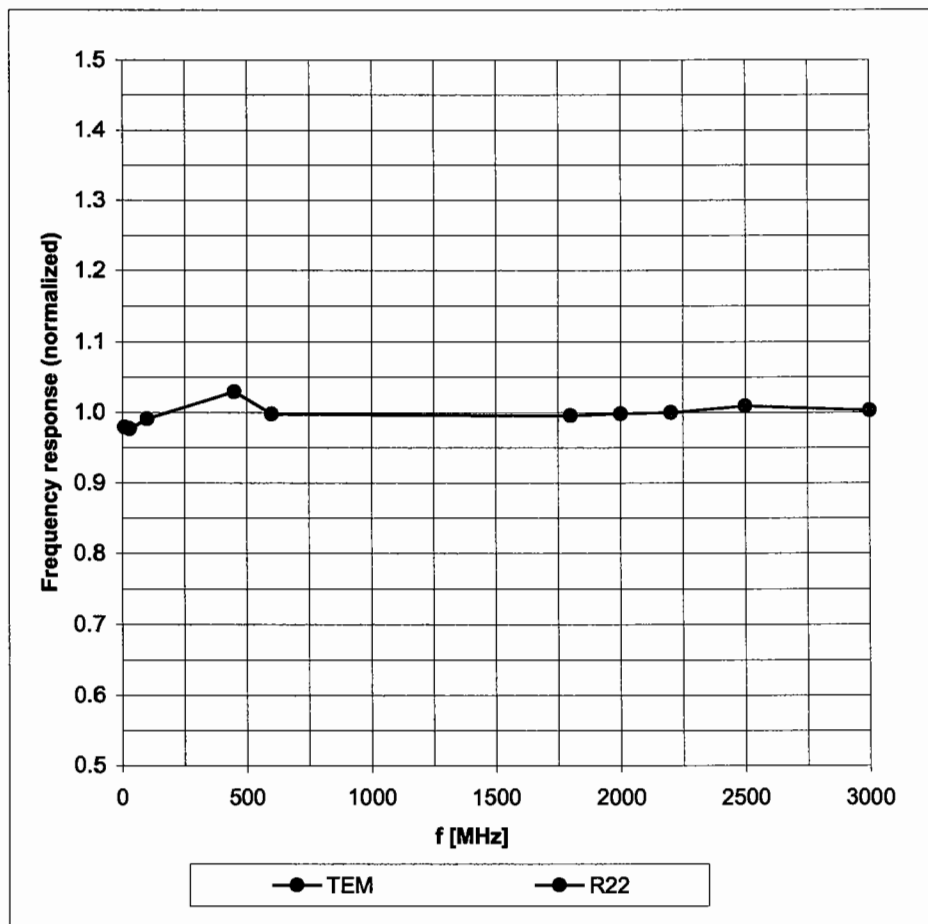
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 8).

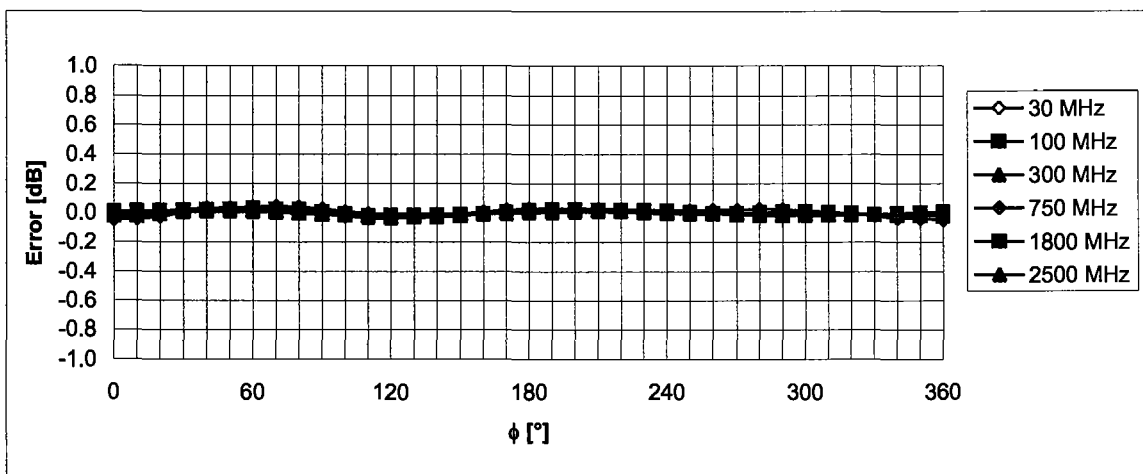
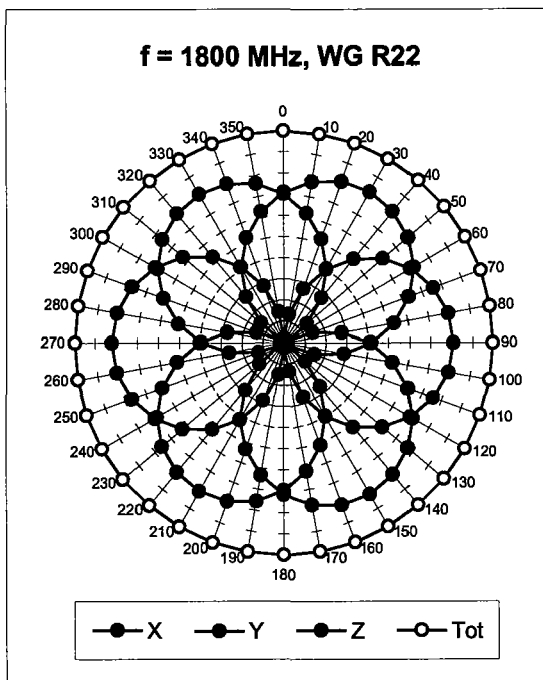
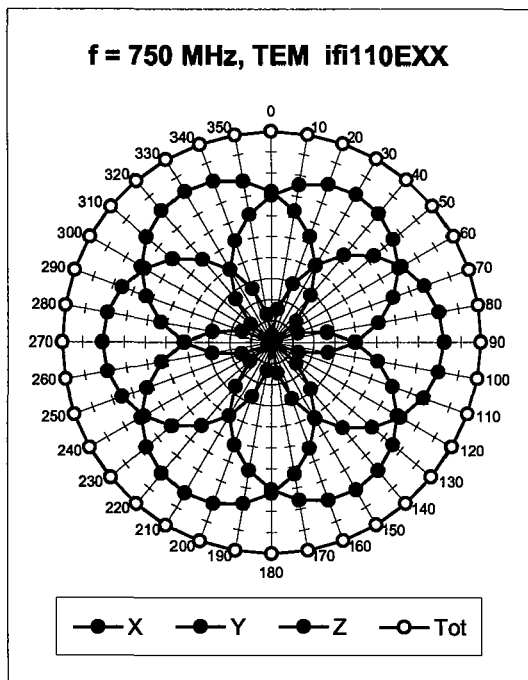
^B Numerical linearization parameter: uncertainty not required.

Frequency Response of E-Field

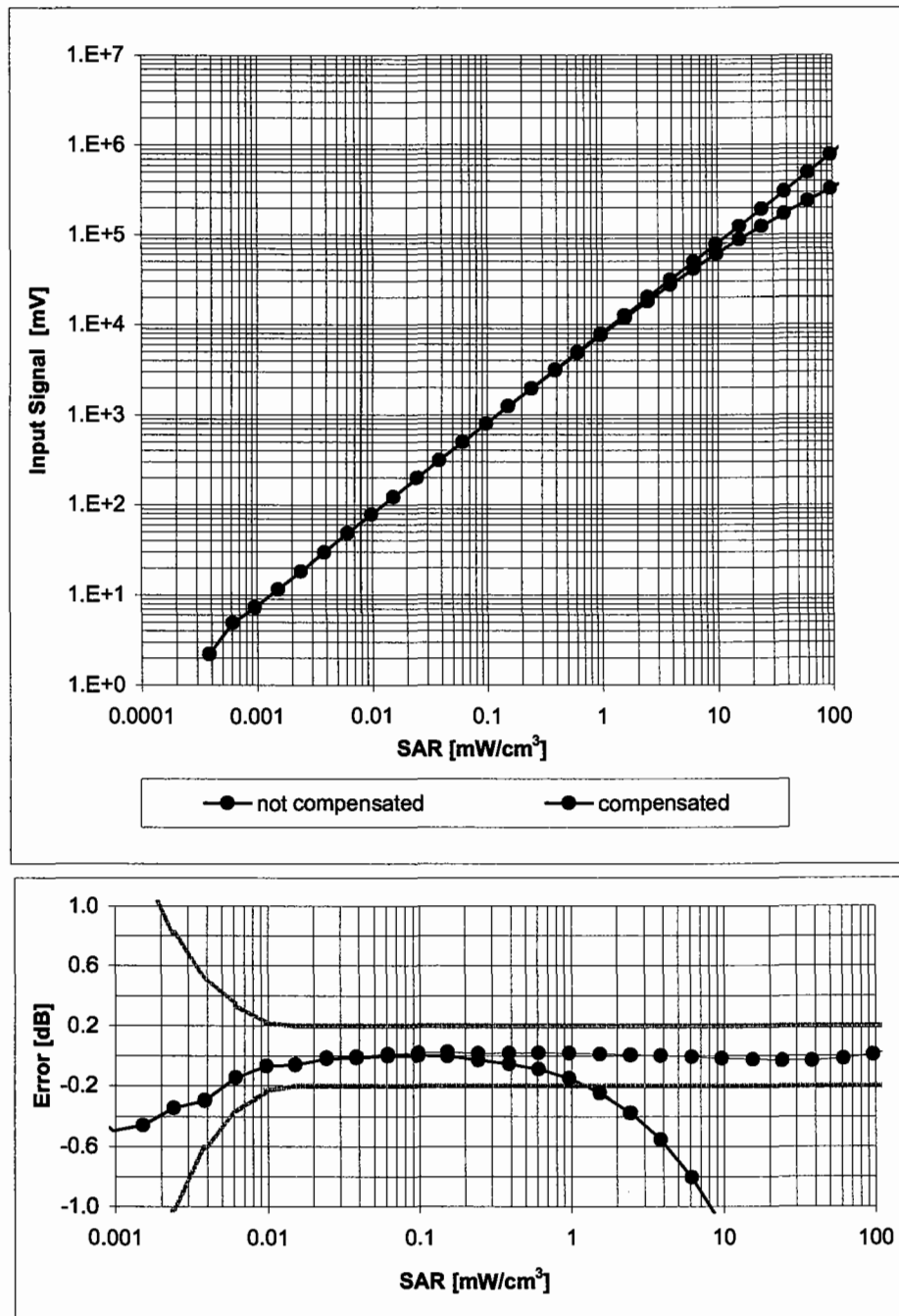
(TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

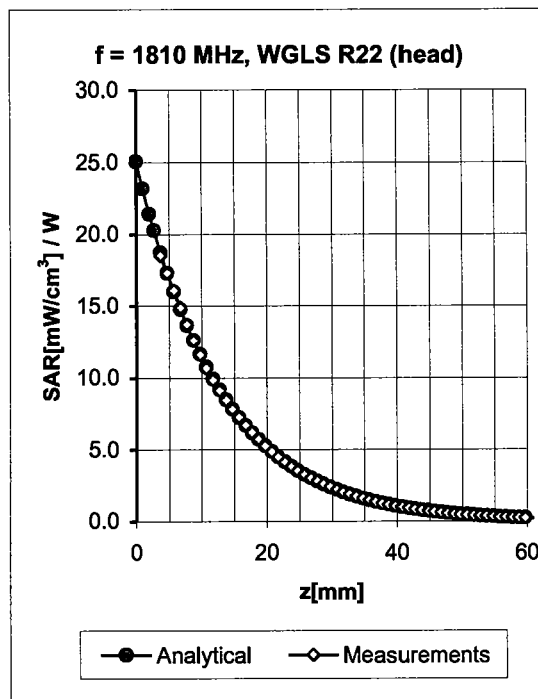
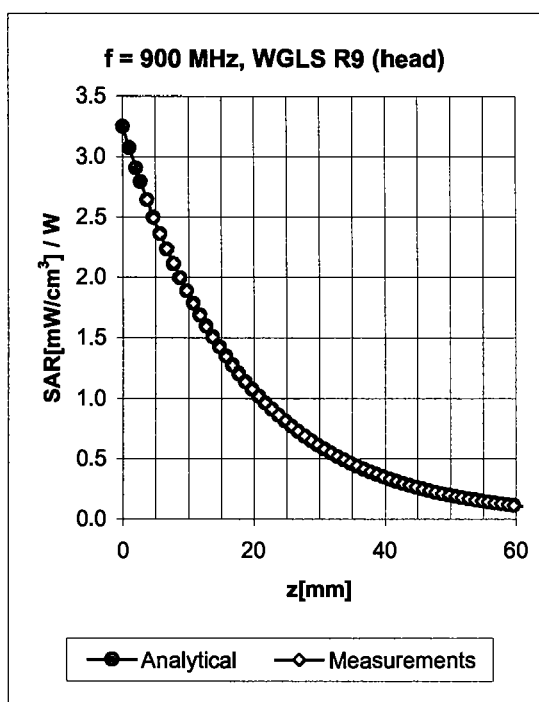
Receiving Pattern (ϕ), $\vartheta = 0^\circ$ Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Dynamic Range $f(\text{SAR}_{\text{head}})$ (Waveguide R22, $f = 1800$ MHz)



Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment

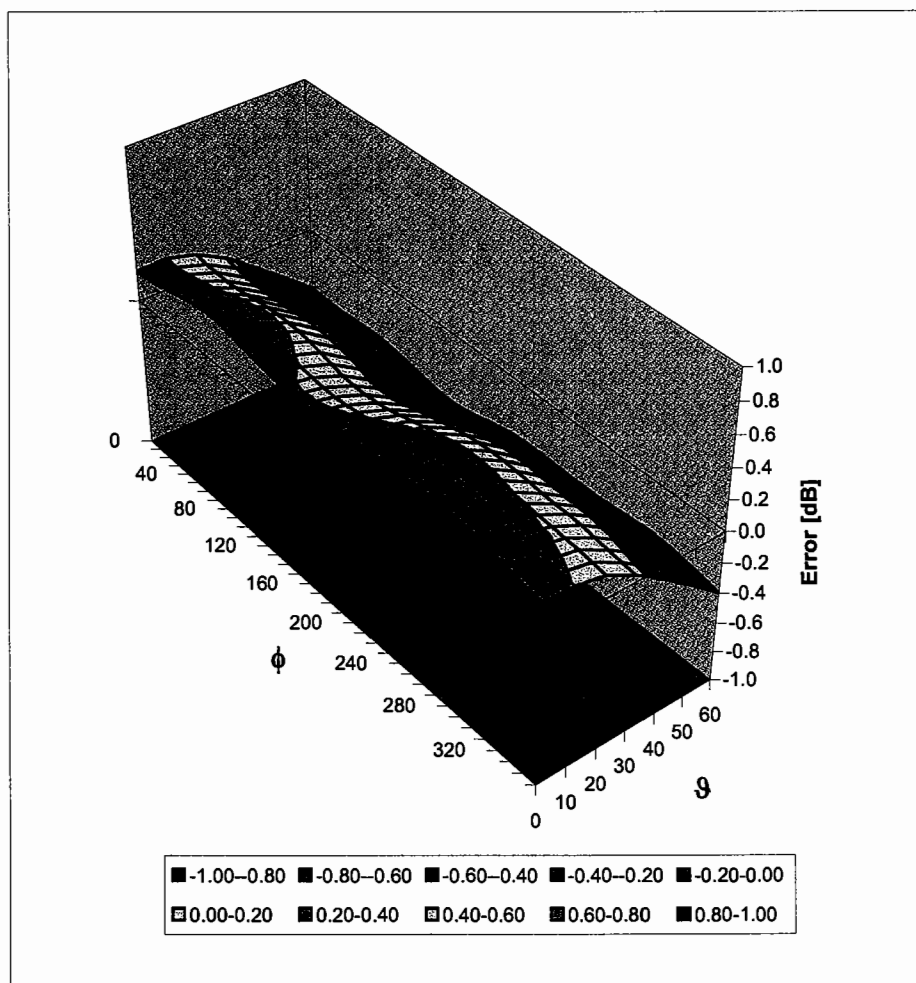


f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.75	1.76	5.99 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.71	2.20	4.95 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.68	2.35	4.62 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.80	2.08	4.26 ± 11.8% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.51	2.01	5.85 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.67	2.56	4.41 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.73	2.24	4.29 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.93	1.78	4.14 ± 11.8% (k=2)

^c The validity of ± 100 MHz only applies for DASY 4.3 B17 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.

Deviation from Isotropy in HSL

Error (ϕ , ϑ), $f = 900$ MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ ($k=2$)

Client

Motorola PCS

CALIBRATION CERTIFICATE

Object(s)

ET3DV6 - SN: 1520

Calibration procedure(s)

**QA CAL-01 v2
Calibration procedure for dosimetric E-field probes**

Calibration date:

May 27, 2004

Condition of the calibrated item

In Tolerance (according to the specific calibration document)

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 ± 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPME4419B	GB41293874	5-May-04 (METAS, No 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No 251-00388)	May-05
Reference 20 dB Attenuator	SN: 5086 (20b)	3-May-04 (METAS, No 251-00389)	May-05
Fluke Process Calibrator Type 702	SN: 6295803	8-Sep-03 (Sintrel SCS No. E-030020)	Sep-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-03)	In house check: Oct 05

Calibrated by:

Name

Function

Signature

Nico Vetterli

Technician



Approved by:

Katja Pokovic

Laboratory Director



Date issued: May 27, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Probe ET3DV6

SN:1520

Manufactured:	February 1, 2000
Last calibrated:	July 9, 2003
Recalibrated:	May 27, 2004

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1520

Sensitivity in Free Space

NormX	1.92 $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	1.72 $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.89 $\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression^A

DCP X	95	mV
DCP Y	95	mV
DCP Z	95	mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 7.

Boundary Effect

Head 900 MHz Typical SAR gradient: 5 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	9.1	4.8
SAR _{be} [%]	With Correction Algorithm	0.1	0.2

Head 1800 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		3.7 mm	4.7 mm
SAR _{be} [%]	Without Correction Algorithm	13.3	9.0
SAR _{be} [%]	With Correction Algorithm	0.2	0.2

Sensor Offset

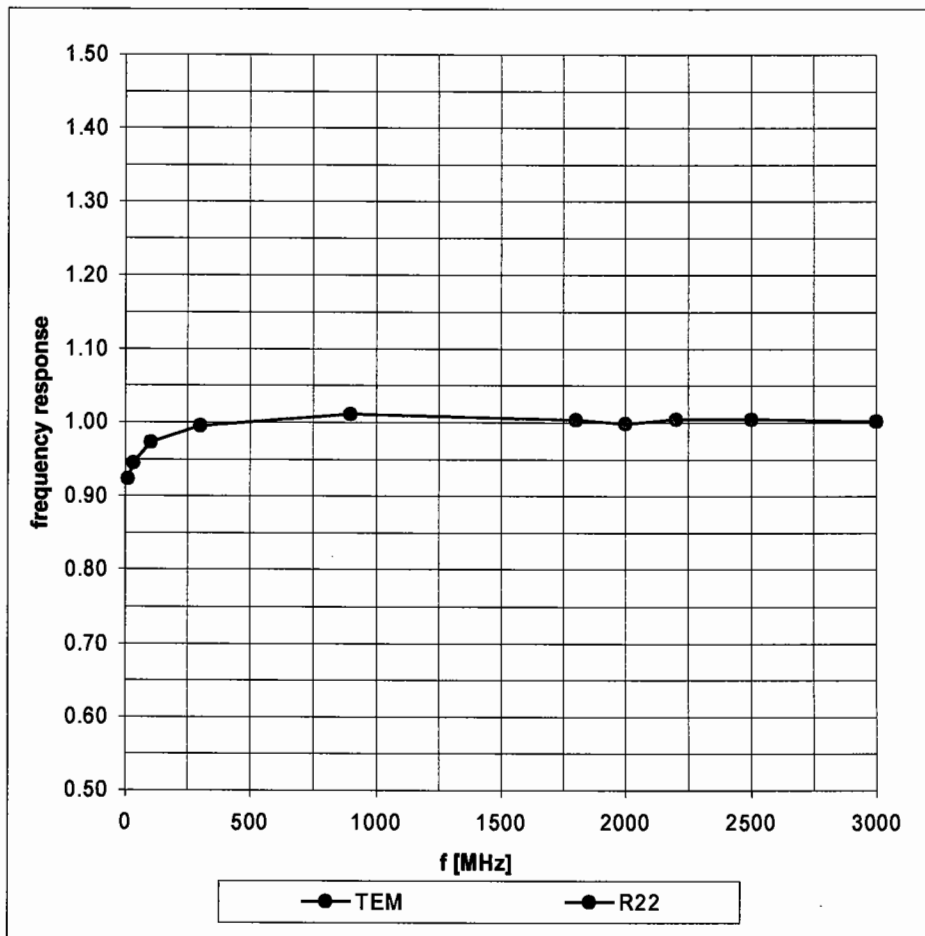
Probe Tip to Sensor Center	2.7 mm
Optical Surface Detection	in tolerance

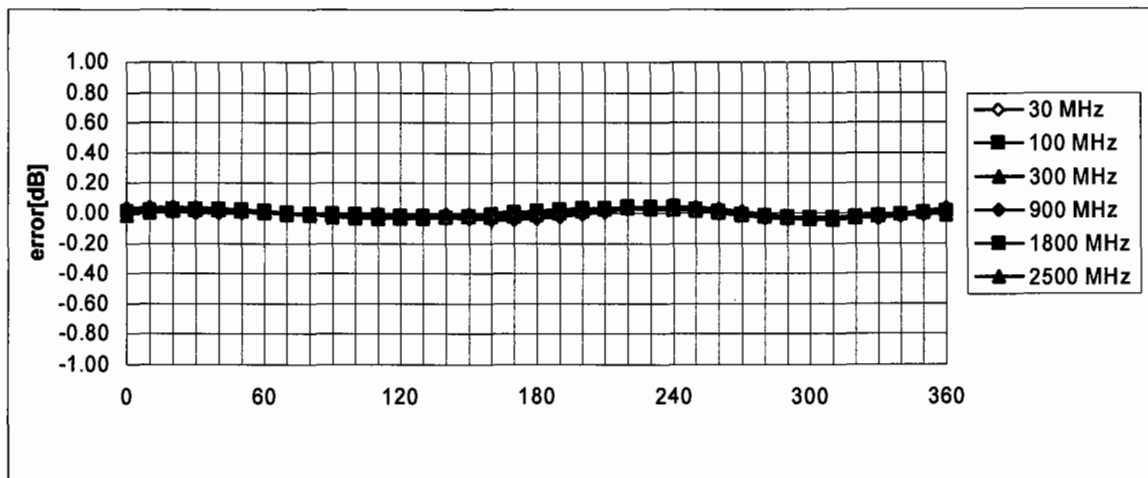
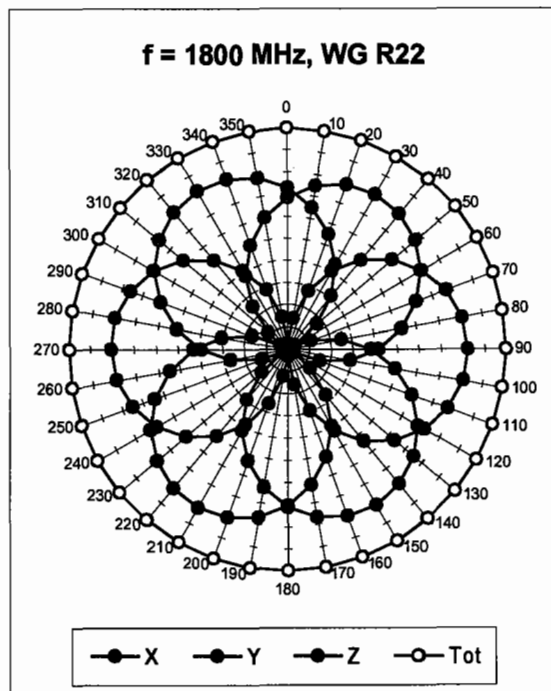
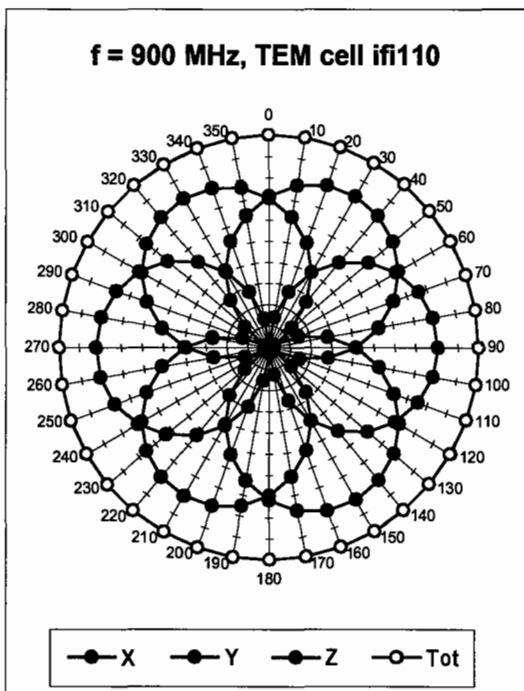
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A numerical linearization parameter: uncertainty not required

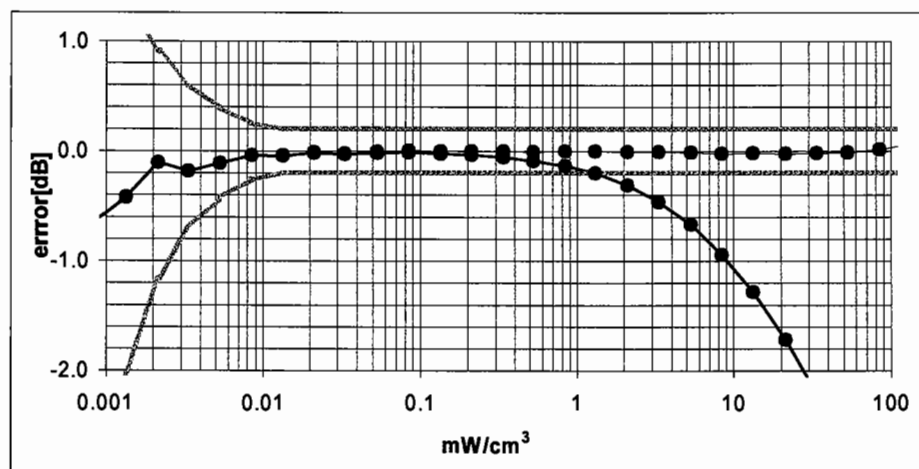
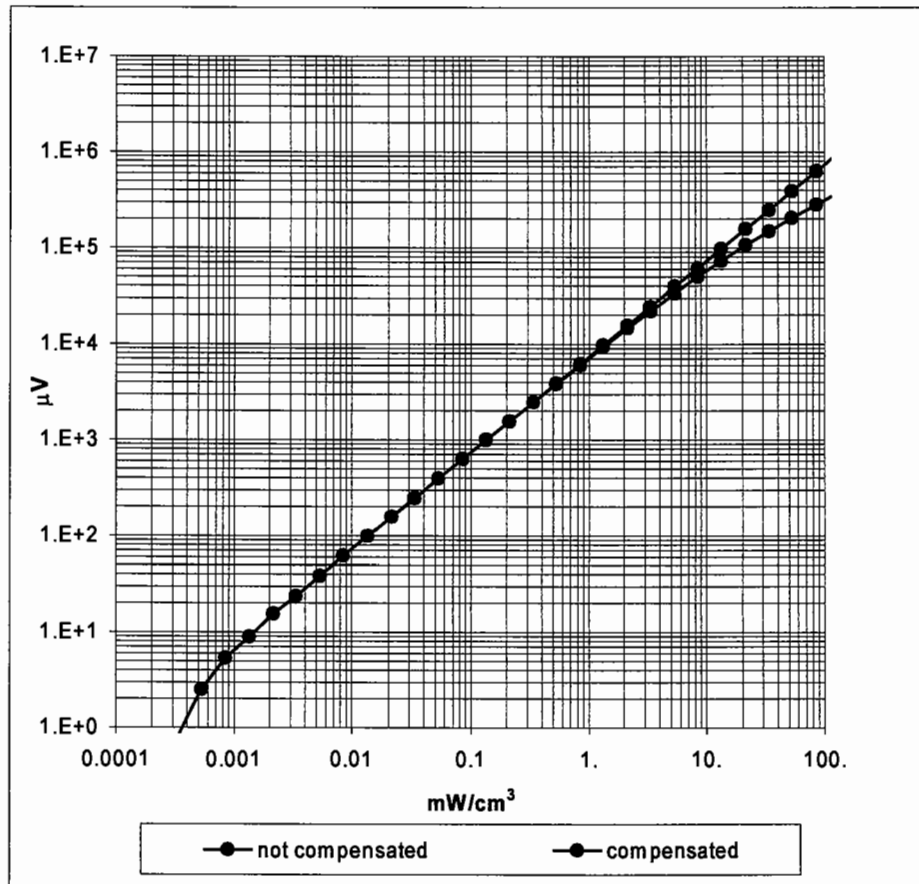
Frequency Response of E-Field

(TEM-Cell:ifi110, Waveguide R22)



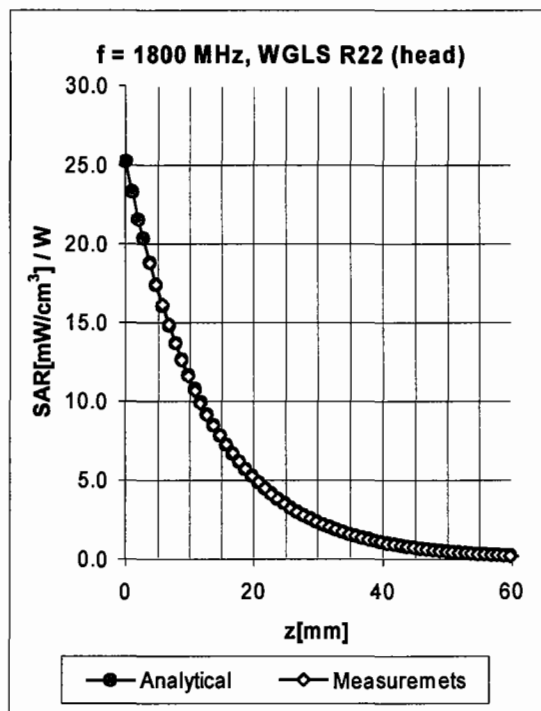
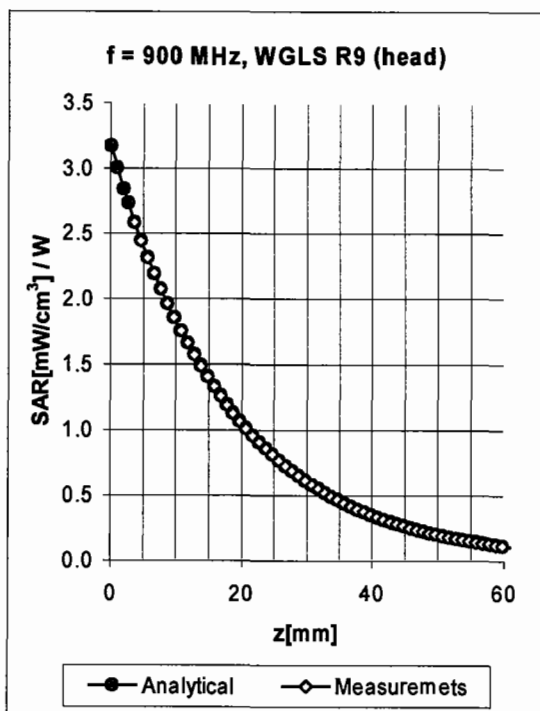
Receiving Pattern (ϕ), $\theta = 0^\circ$ **Axial Isotropy Error < ± 0.2 dB**

Dynamic Range f(SAR_{head}) (Waveguide R22)



Probe Linearity Error $< \pm 0.2$ dB

Conversion Factor Assessment

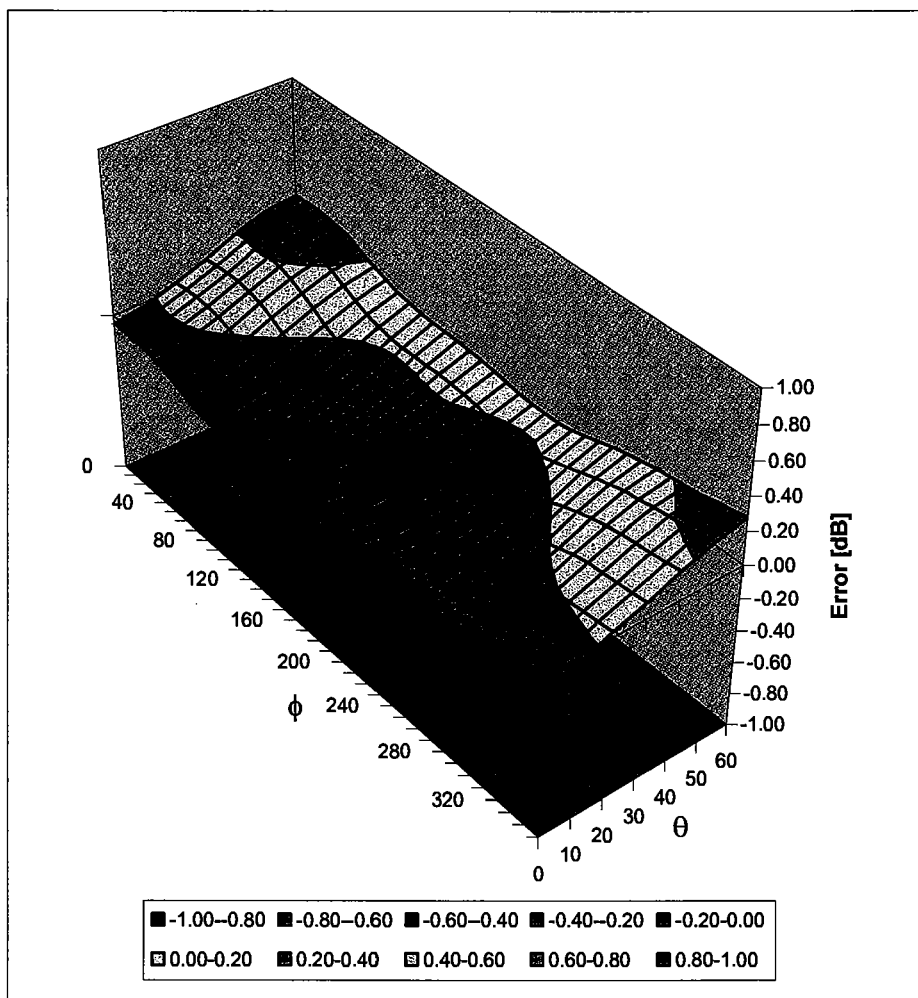


f [MHz]	Validity [MHz] ^B	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	800-1000	Head	41.5 ± 5%	0.97 ± 5%	0.61	1.85	6.25 ± 9.5% (k=2)
1800	1710-1910	Head	40.0 ± 5%	1.40 ± 5%	0.50	2.58	5.16 ± 9.5% (k=2)
1950	1900-2000	Head	40.0 ± 5%	1.40 ± 5%	0.58	2.45	4.87 ± 9.5% (k=2)
900	800-1000	Body	55.0 ± 5%	1.05 ± 5%	0.70	1.74	6.14 ± 9.5% (k=2)
1800	1710-1910	Body	53.3 ± 5%	1.52 ± 5%	0.58	2.71	4.54 ± 9.5% (k=2)
1950	1900-2000	Body	53.3 ± 5%	1.52 ± 5%	0.67	2.47	4.34 ± 9.5% (k=2)

^B The stated uncertainty of calibration in according to P1528.

Deviation from Isotropy in HSL

Error (θ, ϕ), $f = 900$ MHz



Spherical Isotropy Error $< \pm 0.4$ dB

Appendix 5

Dipole Characterization Certificate

Certification of System Performance Check Targets

Based on APP-0396

-Historical Data-

	835MHz	900MHz	1800MHz	1900MHz	
IEEE1528 Target: Advanced Extrapolation	9.5	10.8	38.1	39.7	(W/kg)
Measurement Uncertainty (k=1):	9.0%	9.0%	9.0%	9.0%	
Measurement Period:	1-July-03 to 1-Apr-04	1-July-03 to 1-Apr-04	1-July-03 to 1-Apr-04	1-July-03 to 1-Apr-04	
# of tests performed:	214	1148	1135	62	
Grand Average: Worst Case Extrapolation	10.0	11.4	40.7	42.0	(W/kg)
% Delta (Average - IEEE1528 Target)	5.3%	5.6%	6.8%	5.8%	
Is % Delta <= Measurement Uncertainty?	Yes	Yes	Yes	Yes	
Accept/Reject <u>Average</u> as new system performance check target?	ACCEPT	ACCEPT	ACCEPT	ACCEPT	
	Applicable 835MHz Dipole Serial Numbers:	Applicable 900MHz Dipole Serial Numbers:	Applicable 1800MHz Dipole Serial Numbers:	Applicable 1900MHz Dipole Serial Numbers:	
	420(TR), 421(TR)	77, 78	246(TR), 250(TR)	514(TR), 518(TR)	
	422(TR), 423(TR)	79, 80	251(TR), 258(TR)	519(TR), 520(TR)	
	424(TR), 425(TR)	91, 92	259(TR), 262(TR)	523(TR), 524(TR)	
	431(TR), 432(TR)	93, 94	263(TR), 271(TR)	526(TR), 527(TR)	
	433(TR), 434(TR)	95, 96	272(TR), 273(TR)	528(TR), 529(TR)	
	436(TR)	97, 55	276(TR), 277(TR)	530(TR), 533(TR)	
			279(TR), 280(TR)		
			281(TR), 282(TR)		
			283(TR), 284(TR)		

-New System Performance Check Targets- per APP-0396
(based on analysis of historical data)

Frequency	SAR Target (W/kg)	Permittivity	Conductivity (S/m)
835MHz	10.0	41.5 ± 5%	0.90 ± 5%
900MHz	11.4	41.5 ± 5%	0.97 ± 5%
1800MHz	40.7	40.0 ± 5%	1.40 ± 5%
1900MHz	42.0	40.0 ± 5%	1.40 ± 5%

=====

-Approvals-

Submitted by:

Marge Kaunas

Date:

2-Apr-04

Signed:

Marge Kaunas

Comments:

Spreadsheet detailing all historical measurements available upon request.

Approved by:

Mark Douglas

Date:

2-Apr-04

Signed:

Mark Douglas

Comments:

Targets and associated simulant properties are derived from the IEEE 1528 standard.

=====

Appendix 6
Measurement Uncertainty Budget

Uncertainty Budget for Device Under Test									
<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	<i>e = f(d,k)</i>	<i>f</i>	<i>g</i>	<i>h = c x f / e</i>	<i>i = c x g / e</i>	<i>k</i>
Uncertainty Component	Sec.	Tol. (± %)	Prob. Dist.	Div.	<i>c_i</i> (1 g)	<i>c_i</i> (10 g)	1 g <i>u_i</i> (±%)	10 g <i>u_i</i> (±%)	<i>v_i</i>
Measurement System									
Probe Calibration	E.2.1	9.5	N	2.00	1	1	4.8	4.8	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	5.8	R	1.73	1	1	3.3	3.3	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	1.0	N	1.00	1	1	1.0	1.0	∞
Response Time	E.2.7	0.8	R	1.73	1	1	0.5	0.5	∞
Integration Time	E.2.8	1.3	R	1.73	1	1	0.8	0.8	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.3	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	1.1	R	1.73	1	1	0.6	0.6	∞
Extrapolation, interpolation and Integration Algorithms for Max SAR Evaluation	E.5	3.9	R	1.73	1	1	2.3	2.3	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.6	N	1.00	1	1	3.6	3.6	29
Device Holder Uncertainty	E.4.1	2.8	N	1.00	1	1	2.8	2.8	8
Output Power Variation - SAR drift measurement	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	10.0	R	1.73	0.64	0.43	3.7	2.5	∞
Liquid Permittivity - deviation from target values	E.3.2	10.0	R	1.73	0.6	0.49	3.5	2.8	∞
Liquid Permittivity - measurement uncertainty	E.3.3	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Combined Standard Uncertainty			RSS				11.72	11.09	1363
Expanded Uncertainty (95% CONFIDENCE LEVEL)			<i>k</i> = 2				22.98	21.75	

Uncertainty Budget for System Performance Check (dipole & flat phantom)

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	$e = f(d, k)$	<i>f</i>	<i>g</i>	$h = c \times f / e$	$i = c \times g / e$	<i>k</i>
Uncertainty Component	Sec.	Tol. (± %)	Prob. Dist.	Div.	c_i (1 g)	c_i (10 g)	1 g u_i (±%)	10 g u_i (±%)	v_i
Measurement System									
Probe Calibration	E.2.1	9.5	N	2.00	1	1	4.8	4.8	∞
Axial Isotropy	E.2.2	4.7	R	1.73	1	1	2.7	2.7	∞
Spherical Isotropy	E.2.2	9.6	R	1.73	0	0	0.0	0.0	∞
Boundary Effect	E.2.3	5.8	R	1.73	1	1	3.3	3.3	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	1.0	N	1.00	1	1	1.0	1.0	∞
Response Time	E.2.7	0.0	R	1.73	1	1	0.0	0.0	∞
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	∞
RF Ambient Conditions	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.3	R	1.73	1	1	0.2	0.2	∞
Probe Positioning with respect to Phantom Shell	E.6.3	1.1	R	1.73	1	1	0.6	0.6	∞
Extrapolation, interpolation and Integration Algorithms for Max. SAR Evaluation	E.5	3.9	R	1.73	1	1	2.3	2.3	∞
Dipole									
Dipole Axis to Liquid Distance	8, E.4.2	1.0	R	1.73	1	1	0.6	0.6	∞
Input Power and SAR Drift Measurement	8, 6.6.2	4.7	R	1.73	1	1	2.7	2.7	∞
Phantom and Tissue Parameters									
Phantom Uncertainty (shape and thickness tolerances)	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity - deviation from target values	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity - measurement uncertainty	E.3.3	10.0	R	1.73	0.64	0.43	3.7	2.5	∞
Liquid Permittivity - deviation from target values	E.3.2	10.0	R	1.73	0.6	0.49	3.5	2.8	∞
Liquid Permittivity - measurement uncertainty	E.3.3	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Combined Standard Uncertainty			RSS				10.16	9.43	99999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			$k=2$				19.92	18.48	

Appendix 7

Photographs of the device under test



Figure 1. Front of Phone with Antenna Retracted



Figure 2. Front of Phone with Antenna Extended



Figure 3. Back of Phone with Antenna Retracted and Extended Battery cover



Figure 4. Back of Phone with Antenna Extended and Extended Battery cover



Figure 5. Back of Phone with Antenna Retracted and Standard Battery cover



Figure 6. Open Phone with Antenna Retracted



Figure 7. Open Phone with Antenna Extended



Figure 8. Side of Phone in Holster with Antenna Retracted and Standard Battery cover



Figure 9.Side of Phone in Holster with Antenna Extended and Standard Battery cover



Figure 10.Side of Phone in Holster with Antenna Retracted and Extended Battery cover



Figure 11. Side of Phone in Holster with Antenna Extended and Extended Battery cover

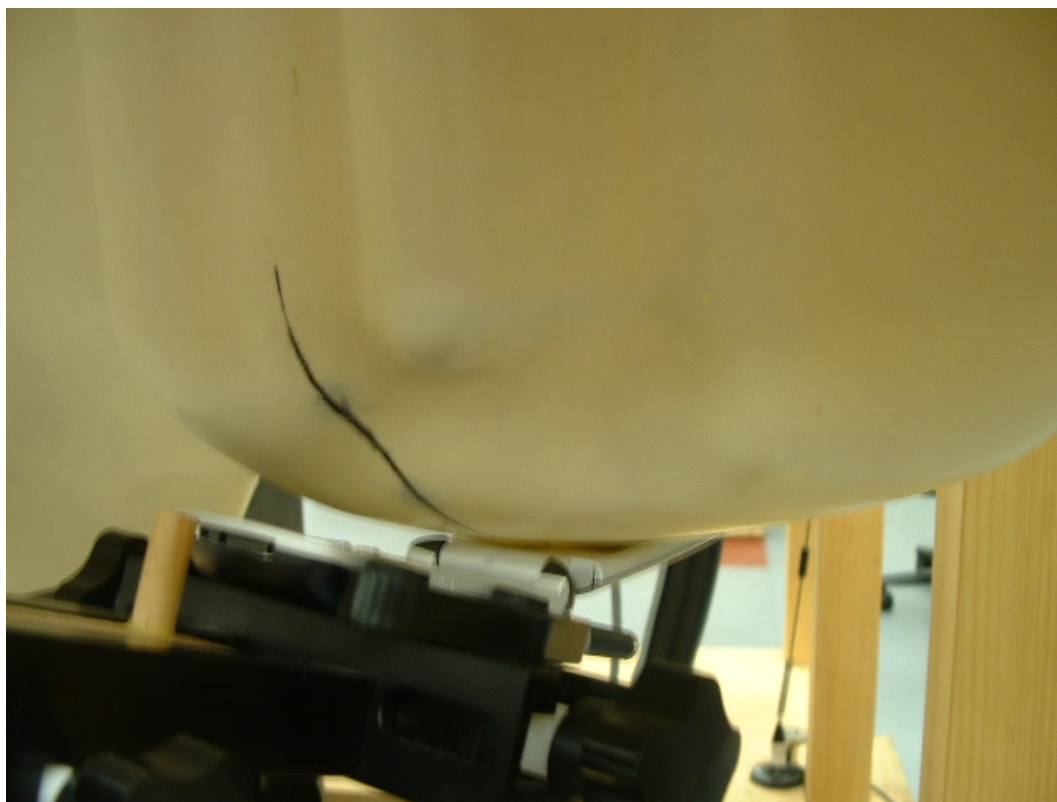


Figure 12. Phone Against the Head with Antenna Retracted (Front View – Cheek Touch)



Figure 13. Phone Against the Head with Antenna Retracted (Back View – Cheek Touch)

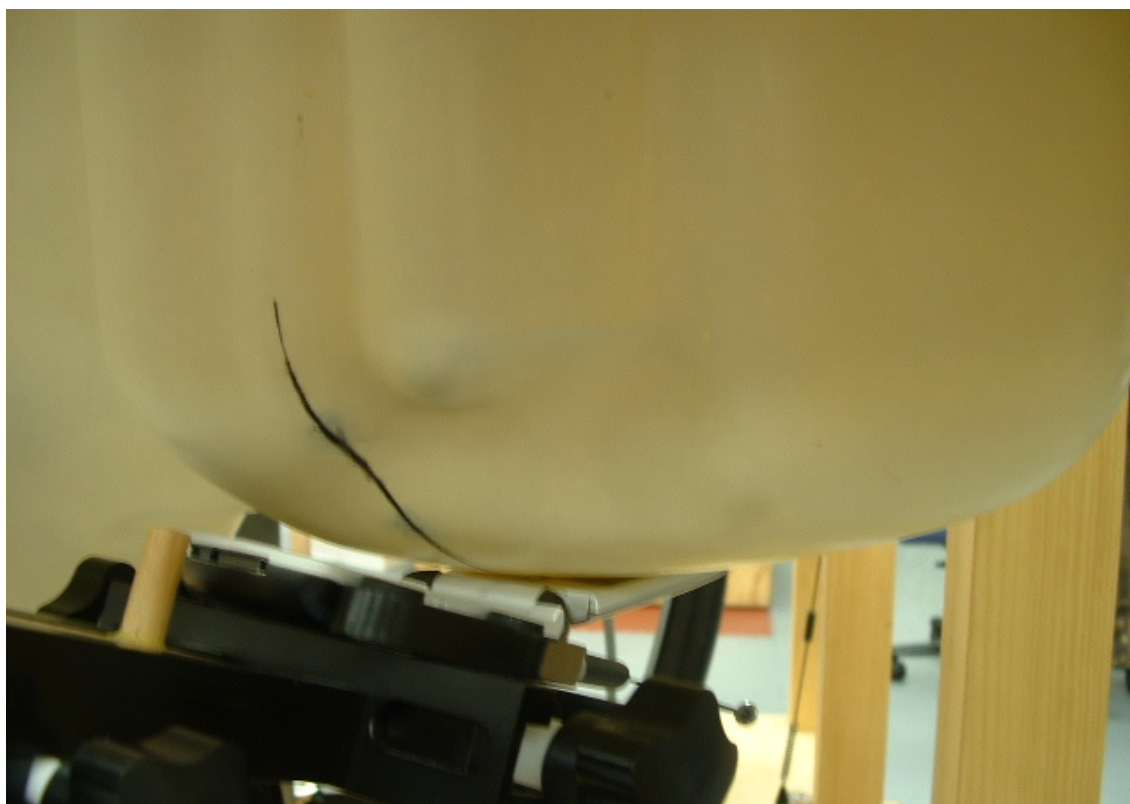


Figure 14. Phone Against the Head with Antenna Extended (Front View – Cheek Touch)



Figure 15. Phone Against the Head with Antenna Extended (Back View – Cheek Touch)



Figure 16. Phone Against the Head with Antenna Retracted (Front View – 15°Tilt)

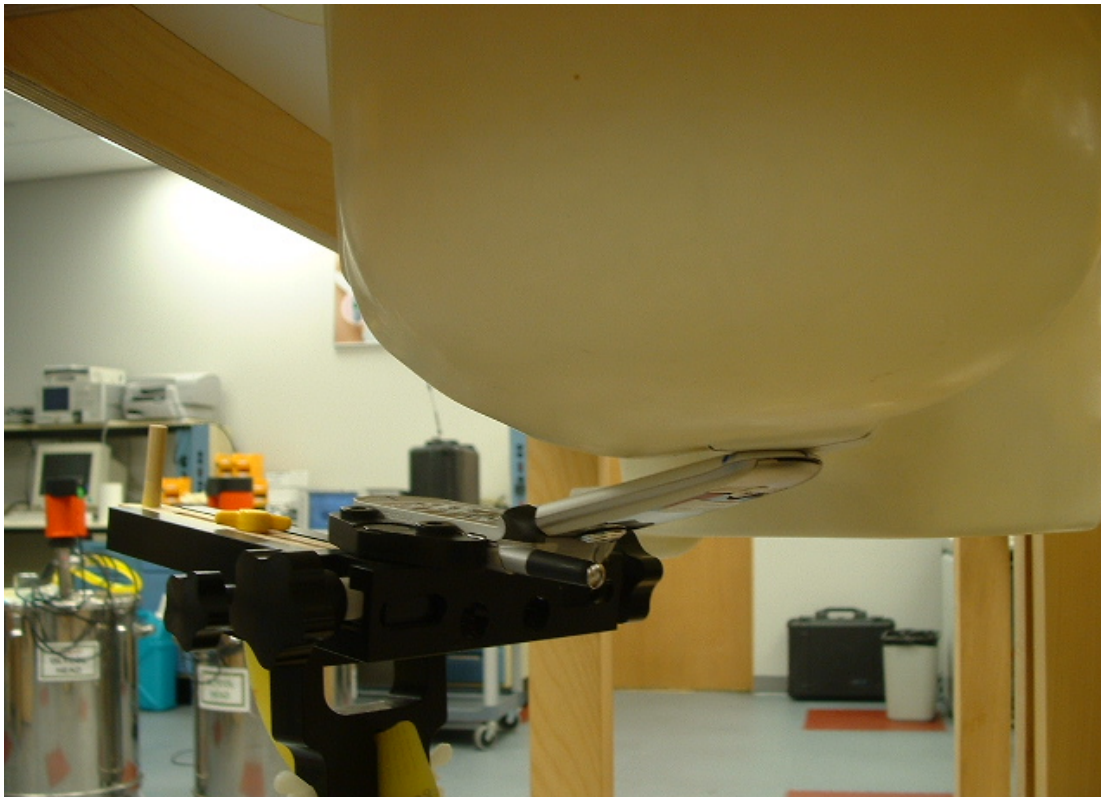


Figure 17. Phone Against the Head with Antenna Retracted (Back View – 15°Tilt)



Figure 18. Phone Against the Head with Antenna Extended (Front View – 15°Tilt)

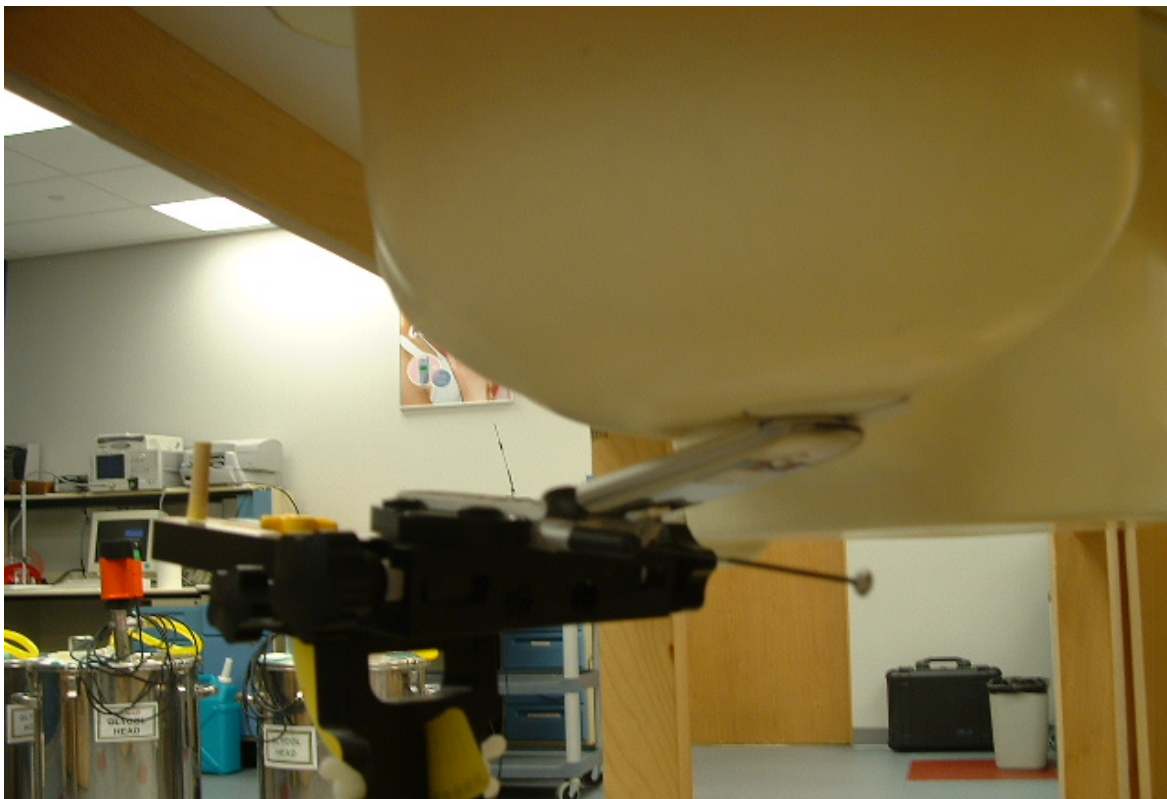


Figure 19. Phone Against the Head with Antenna Extended (Back View – 15°Tilt)

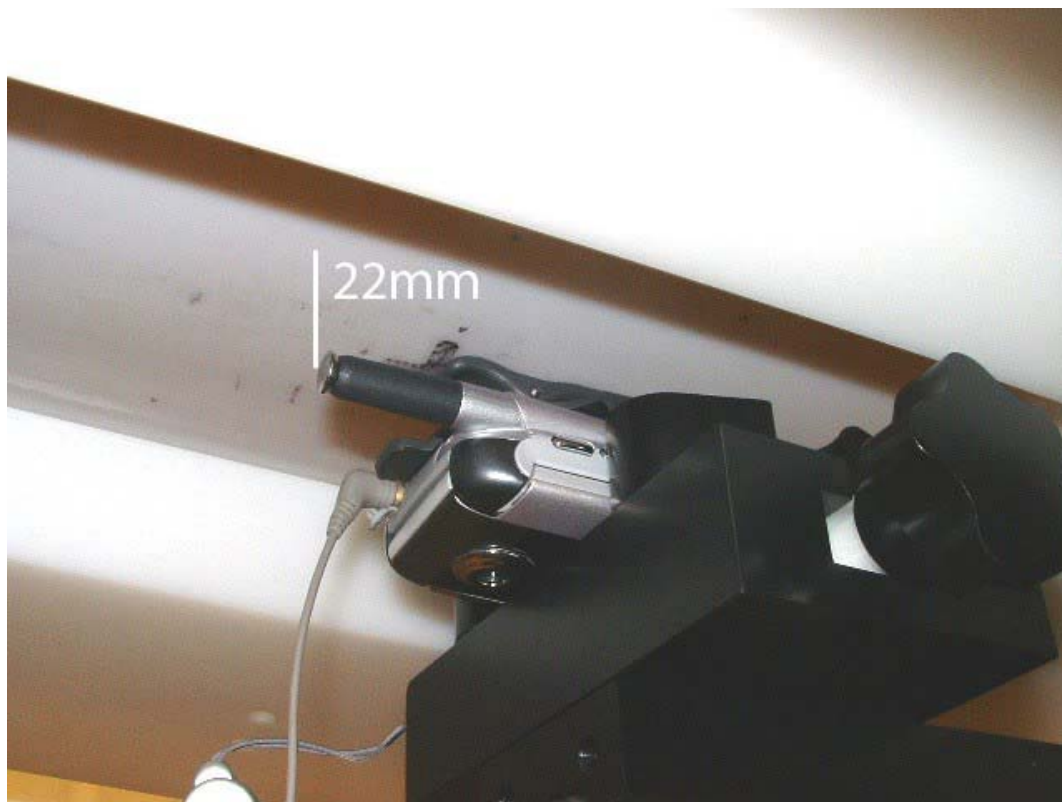


Figure 20. Phone in Holster Against the Flat Phantom with Antenna Retracted



Figure 21. Phone in Holster Against the Flat Phantom with Antenna Extended