



Exhibit 11: Class II Permissive Change SAR Test Report IHDT56EW1

Date of test: 03/01/2005 to 03/03/2005
Date of Report: 03/09/2005

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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 IHDT56EW1 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 IHDT56EW1). 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	Internal Antenna	
Location	Back of Phone	
Dimensions	Length	18mm
	Width	35mm
Configuration	FICA Antenna	

2.2 Device description

FCC ID Number	IHDT56EW1			
Serial number(s)	6053			
Mode(s) of Operation	GSM 850	GSM 1900	GPRS 850	GPRS 1900
Modulation Mode(s)	GSM	GSM	GSM	GSM
Maximum Output Power Setting	32.80dBm	30.10dBm	32.80dBm	30.10dBm
Duty Cycle	1:8	1:8	2:8	2:8
Transmitting Frequency Rang(s)	824.2-848.8 MHz	1850.2 – 1909.8 MHz	824.2-848.8 MHz	1850.2 – 1909.8 MHz
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 (Dasy4™ v4.4) 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	376	01/13/2006
	316	01/13/2006
E-Field Probe ET3DV6	1520	05/27/2005
	1397	05/21/2005
Dipole Validation Kit, D900V2	080	
S.A.M. Phantom used for 850MHz	TP-1153	
Dipole Validation Kit, D1800V2	251tr	
S.A.M. Phantom used for 1900MHz	TP-1159	
	TP-1154	

3.2 Additional Equipment

Description	Serial Number	Cal Due Date
Signal Generator HP8648C	3847A04844	10/25/2005
	3847A04832	09/03/2005
Power Meter E4419B	GB39511084	04/05/2005
	GB39511090	04/05/2005
Power Sensor #1 – E9301A	US39210931	09/16/2005
	US39210915	09/03/2005
Power Sensor #2 - E9301A	US39210932	09/16/2005
	US39210916	09/16/2005
Network Analyzer HP8753ES	US39171846	09/03/2005
Dielectric Probe Kit HP85070B	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, 03/01/2005	41.6	0.91	19.5
		Recommended Limits	41.5 $\pm$ 5%	0.90 $\pm$ 5%	18-25
	Body	Measured, 03/01/2005	53.6	0.97	19.7
		Recommended Limits	55.2 $\pm$ 5%	0.97 $\pm$ 5%	18-25
1880	Head	Measured, 03/02/2005	38.4	1.44	19.8
		Measured, 03/03/2005	38.2	1.45	20.1
		Recommended Limits	40.0 $\pm$ 5%	1.40 $\pm$ 5%	18-25
	Body	Measured, 03/01/2005	50.7	1.59	20.0
		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 +/- 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 ±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.

f (MHz)	Description	SAR (W/kg), 1gram	Dielectric Parameters		Ambient Temp (°C)	Tissue Temp (°C)
			ϵ_r	σ (S/m)		
900	Measured, 03/01/2005	11.16	40.8	0.97	20.1	20.0
	Recommended Limits	10.8	41.5 ±5%	0.97 ±5%	18-25	18-25
1800	Measured, 03/01/2005	37.28	38.5	1.38	19.0	20.0
	Measured, 03/02/2005	37.88	38.8	1.36	19.1	21.0
	Measured, 03/03/2005	38.18	38.6	1.36	19.0	21.0
	Recommended Limits	38.1	40.0 ±5%	1.4 ±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	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ET3DV6	1520	900	6.25	7 of 8
		1800	5.16	7 of 8
	1397	1800	5.09	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 Dasy4™ v4.4 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 Dasy4™ v4.4 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.

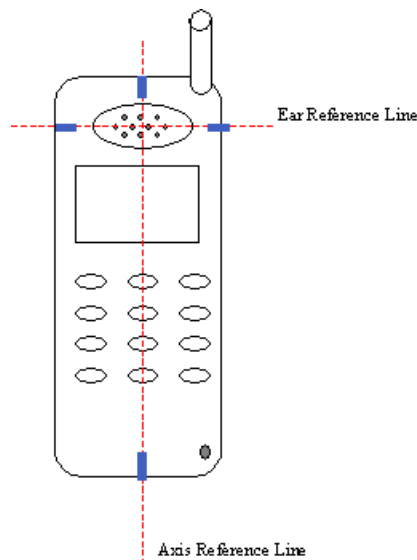
The Cellular Phone (FCC ID IHDT56EW1) has 760mAh AANN4258B as the only available battery option. This battery was used to do all of the SAR testing. The phone was placed in the SAR measurement system with a fully charged battery.

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 and 2 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 the 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.

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	1520	900	6.25	7 of 8
		1800	5.16	7 of 8
	1397	1800	5.09	7 of 8

f (MHz)	Description	Conducted Output Power (dBm)	Cheek / Touch Position							
			Left Head				Right Head			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 850MHz	Channel 128	32.76	1.15	0.00	1.15	20.0	1.22	0.10	1.22	20.0
	Channel 190	32.74	1.10	-0.05	1.11	20.0	1.20	-0.03	1.21	20.0
	Channel 251	32.74	0.904	-0.02	0.91	20.0	1.11	0.00	1.11	20.0
Digital 1900MHz	Channel 512	30.04								
	Channel 661	30.04	0.40	-0.1	0.41	19.1	0.409	0.0	0.41	19.1
	Channel 810	30.05								

Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT56EW1 at highest possible output power. Measured against the left head in the Cheek/Touch Position.

f (MHz)	Description	Conducted Output Power (dBm)	15° Tilt Position							
			Left Head				Right Head			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 850MHz	Channel 128	32.76								
	Channel 190	32.74	0.652	0.00	0.65	20.0	0.706	0.00	0.71	20.0
	Channel 251	32.74								
Digital 1900MHz	Channel 512	30.04								
	Channel 661	30.04	0.46	-0.1	0.47	19.1	0.475	-0.1	0.49	18.3
	Channel 810	30.05								

Table 2: SAR measurement results for the portable cellular telephone FCC ID IHDT56EW1 at highest possible output power. Measured against the left head in the 15° Tilt Position.

6.2 Body Worn Test Results

The SAR results shown in tables 3 and 4 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. There are no Body-Worn Accessories available for this phone at the time of testing hence the device was tested per the supplement C testing guidelines for devices that do not have body worn accessories. The phone was placed a maximum of 1 inch away from a flat phantom per the supplement C standard guidelines to perform SAR measurement. The cellular phone was tested with a headset connected to the device 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	1520	900	6.14	7 of 8
		1800	4.54	7 of 8
	1397	1800	4.52	7 of 8

f (MHz)	Description	Conducted Output Power (dBm)	GSM Body Worn							
			Front of Phone 15mm From Phantom				Back of Phone 15mm From Phantom			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 850MHz	Channel 128	32.76								
	Channel 190	32.74	0.43	-0.1	0.44	19.3	0.426	-0.0	0.43	19.3
	Channel 251	32.74								
Digital 1900MHz	Channel 512	30.04								
	Channel 661	30.04	0.185	-0.0	0.19	19.5	0.485	-0.0	0.49	19.5
	Channel 810	30.05								

Table 3: SAR measurement results for the portable cellular telephone FCC ID IHDT56EW1 at highest possible output power. Measured against the body.

f (MHz)	Description	Conducted Output Power (dBm)	GPRS Class 10 - Body Worn							
			Front of Phone 25mm From Phantom				Back of Phone 25mm From Phantom			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 850MHz	Channel 128	32.76								
	Channel 190	32.74	0.518	-0.1	0.53	19.3				
	Channel 251	32.74								
Digital 1900MHz	Channel 512	30.04								
	Channel 661	30.04					0.307	0.0	0.31	19.4
	Channel 810	30.05								

Table 4: SAR measurement results for the portable cellular telephone FCC ID IHDT56EW1 at highest possible output power. Measured against the body.

6.3 Push-to-Talk/Dispatch Mode Test Results

The original filing for IHDT56EW1 included Push-to-Talk/Dispatch Mode test results. For this ClassII Permissive Change update, the testing was performed using a new housing that does not allow for Push-to-Talk/Dispatch Mode operation. The Push-to-Talk feature was disabled via software. No testing was performed with the sample in the Push-to-Talk/Dispatch Mode.

Appendix 1

SAR distribution comparison for the system accuracy verification

Test Laboratory: Motorola 030105 1800Mhz GOOD-2.2%

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:251tr

Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 251tr PM1 Power = 200 mW

Sim.Temp@meas = 20.0C 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: $\sigma = 1.38$; mho/m, $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(5.16, 5.16, 5.16); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: 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

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 6.84 mW/g

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

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

Reference Value = 82.8 V/m; Power Drift = -0.0 dB Peak SAR (extrapolated) = 12.8 W/kg

SAR(1 g) = 7.43 mW/g; SAR(10 g) = 4 mW/g Maximum value of SAR (measured) = 8.29 mW/g

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

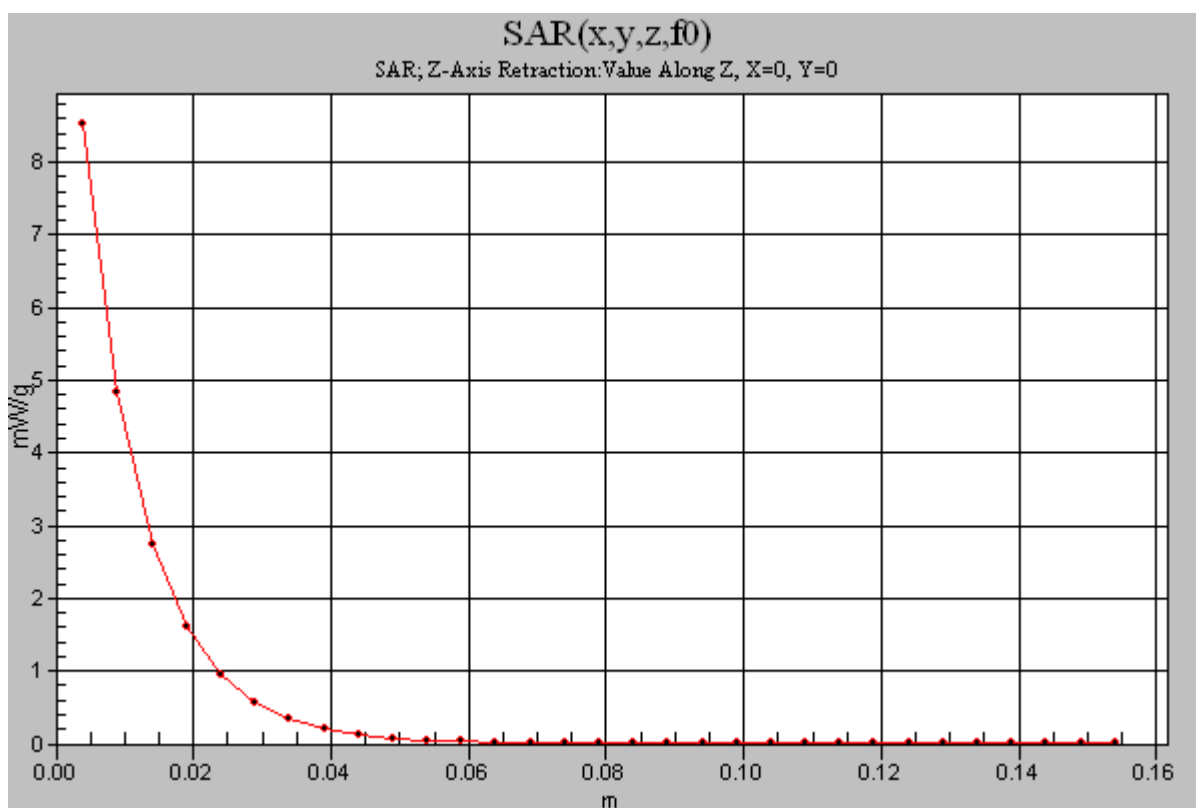
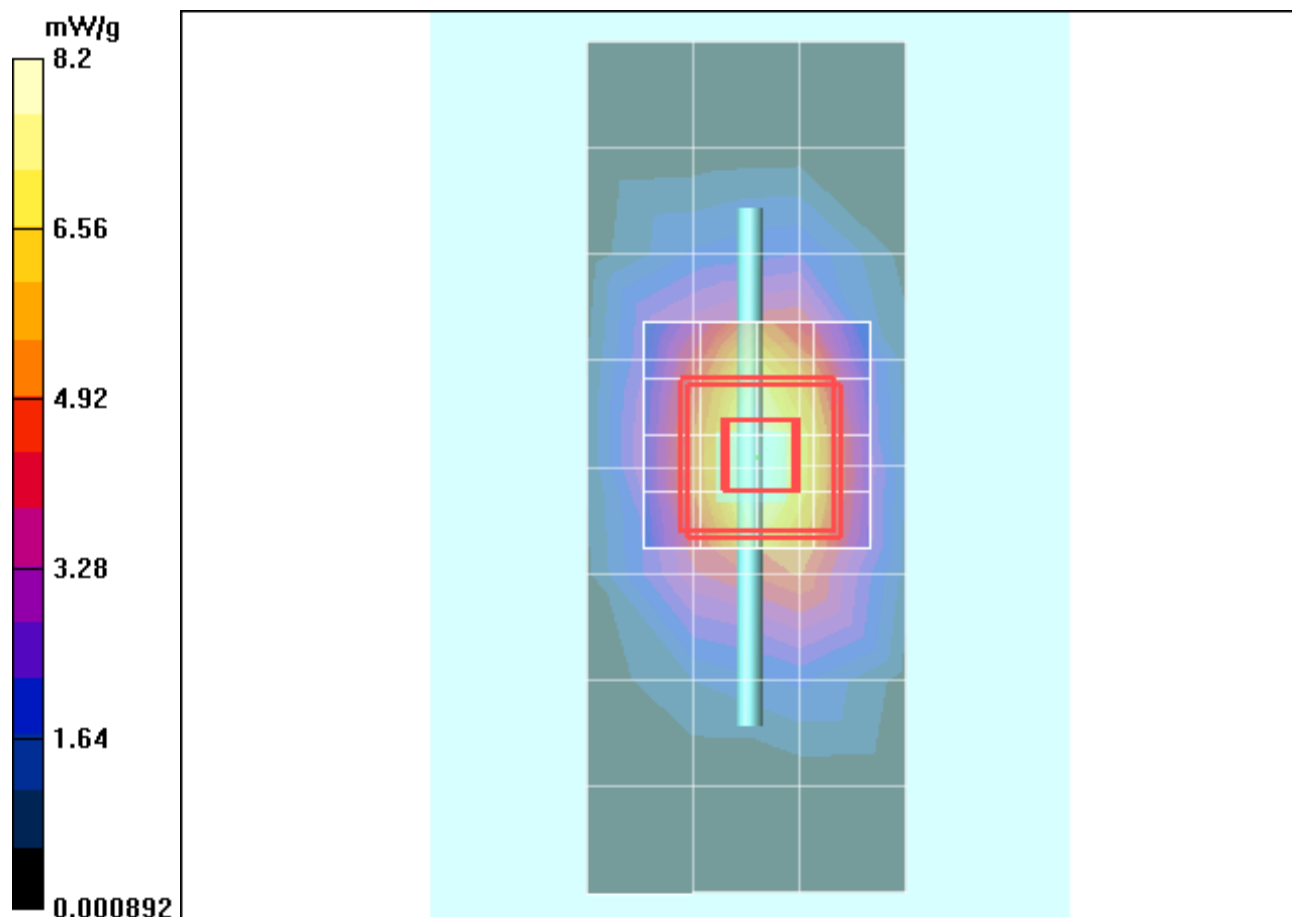
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 82.8 V/m; Power Drift = -0.0 dB Peak SAR (extrapolated) = 13 W/kg

SAR(1 g) = 7.48 mW/g; SAR(10 g) = 4.02 mW/g Maximum value of SAR (measured) = 8.3 mW/g

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

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 8.52 mW/g



Test Laboratory: Motorola 030205 1800Mhz GOOD-0.6%

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:251tr

Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 251tr PM1 Power = 200 mW

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

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

Medium: VALIDATION Only; Medium parameters used: $\sigma = 1.36$; mho/m, $\epsilon_r = 38.8$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(5.16, 5.16, 5.16); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: 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

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 7.71 mW/g

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

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

Reference Value = 79.2 V/m; Power Drift = -0.0 dB Peak SAR (extrapolated) = 13 W/kg

SAR(1 g) = 7.56 mW/g; SAR(10 g) = 4.06 mW/g Maximum value of SAR (measured) = 8.38 mW/g

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

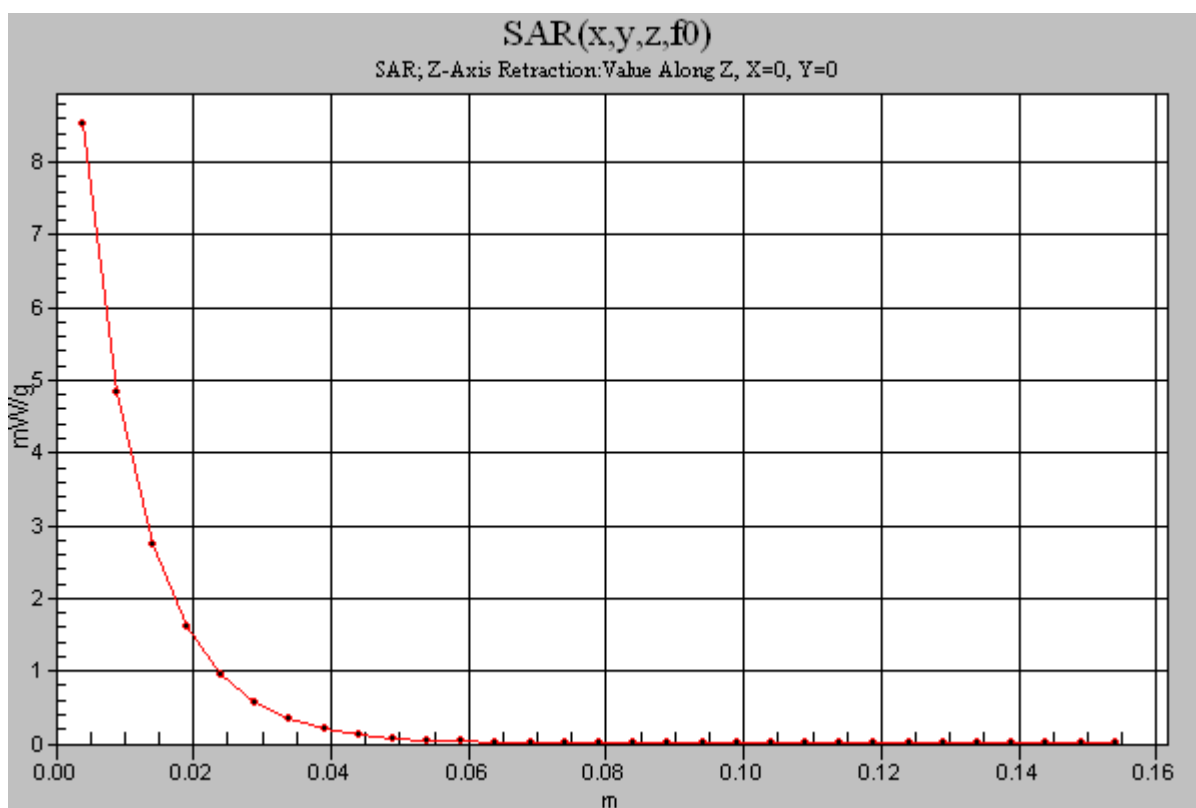
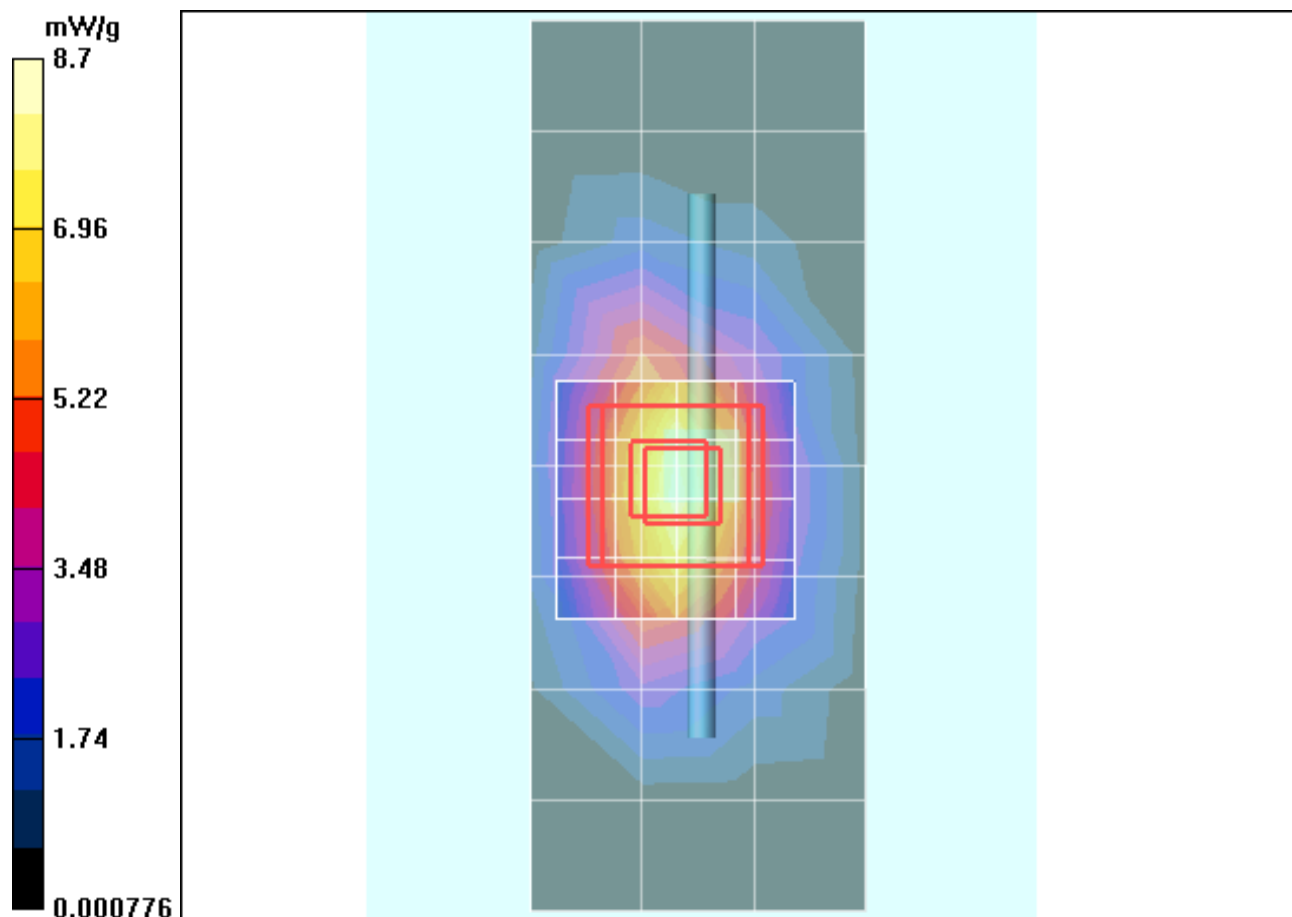
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 79.2 V/m; Power Drift = -0.0 dB Peak SAR (extrapolated) = 13.1 W/kg

SAR(1 g) = 7.59 mW/g; SAR(10 g) = 4.06 mW/g Maximum value of SAR (measured) = 8.49 mW/g

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

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 8.46 mW/g



Test Laboratory: Motorola 030105 900Mhz GOOD 3.5%

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:80;

Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 80 PM1 Power = 200 mW

Sim.Temp@meas = 20.1C Sim.Temp@SPC = 20.1C Room Temp @ SPC = 20C

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: ET3DV6 - SN1520; ConvF(6.25, 6.25, 6.25); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sugar Water SAM; Type: SAM; Serial: TP-1153;
- 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) = 2.2 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) = 3.4 W/kg

SAR(1 g) = 2.25 mW/g; SAR(10 g) = 1.44 mW/g Maximum value of SAR (measured) = 2.46 mW/g

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

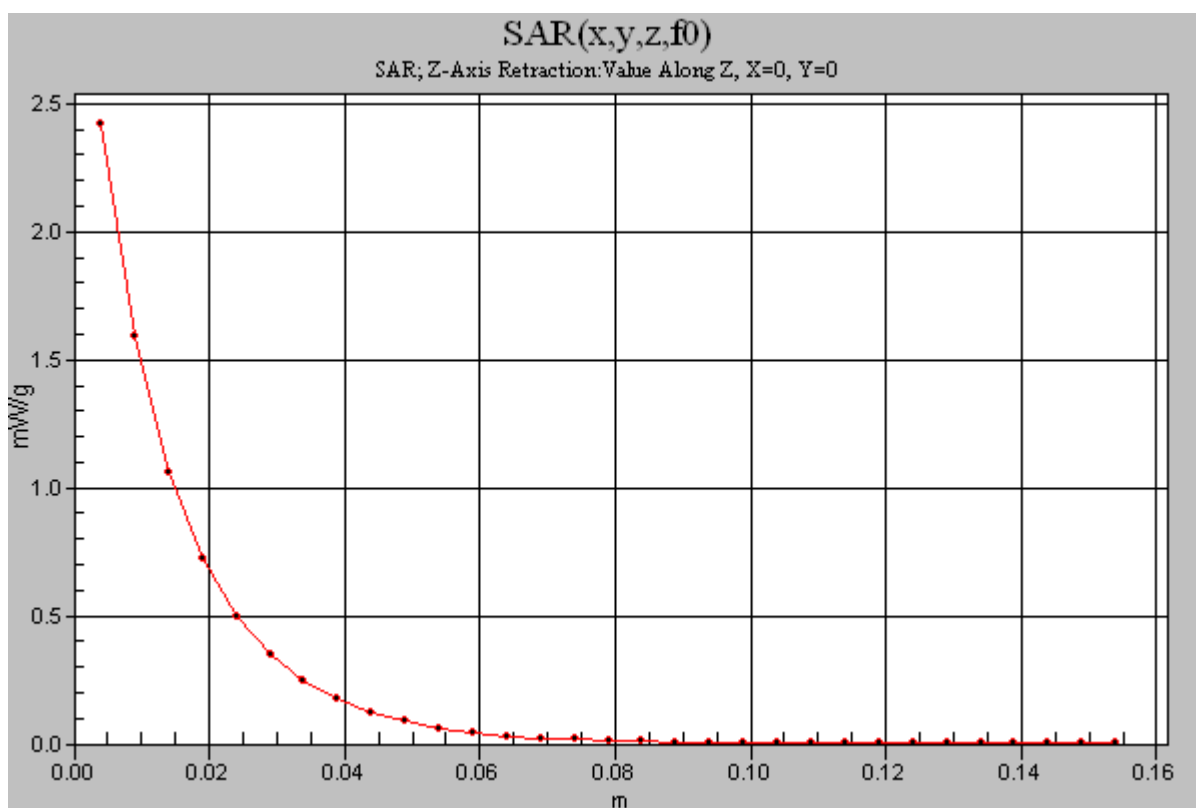
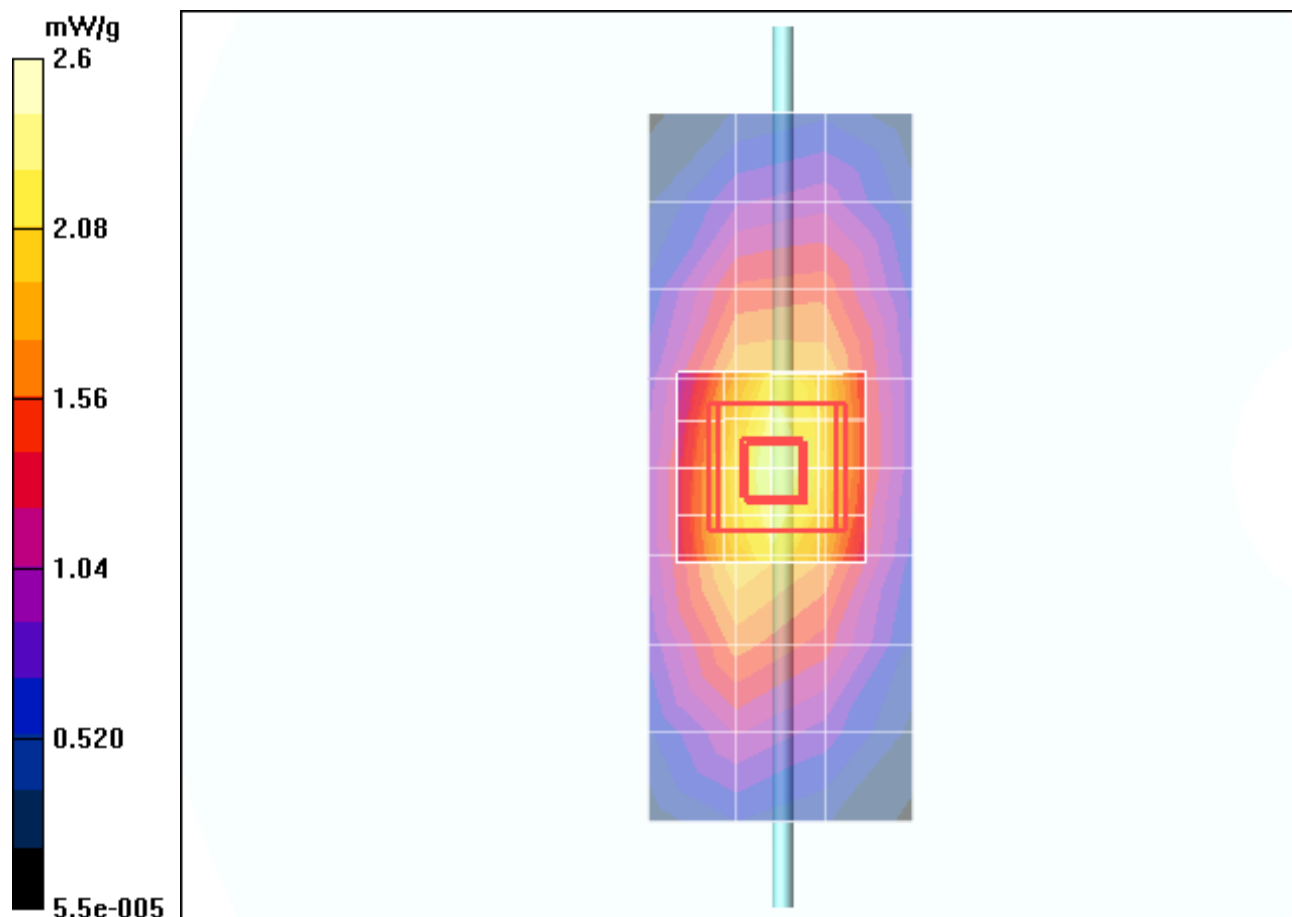
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 51.8 V/m; Power Drift = -0.1 dB Peak SAR (extrapolated) = 3.33 W/kg

SAR(1 g) = 2.22 mW/g; SAR(10 g) = 1.43 mW/g Maximum value of SAR (measured) = 2.41 mW/g

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

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 2.42 mW/g



Test Laboratory: Motorola 030305 1800 MHZ GOOD .2%

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2

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

Sim.Temp@meas = 18.8 Sim.Temp@SPC = 19 Room Temp @ SPC = 21

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

Medium: VALIDATION Only; Medium parameters used: $\sigma = 1.36$; mho/m, $\epsilon_r = 38.6$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ET3DV6R - SN1397; ConvF(5.09, 5.09, 5.09); Calibrated: 5/21/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn316; Calibrated: 1/13/2005
- 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) = 7.15 mW/g

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

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

Reference Value = 85.2 V/m; Power Drift = -0.0 dB Peak SAR (extrapolated) = 13.6 W/kg

SAR(1 g) = 7.84 mW/g; SAR(10 g) = 4.17 mW/g Maximum value of SAR (measured) = 8.9 mW/g

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

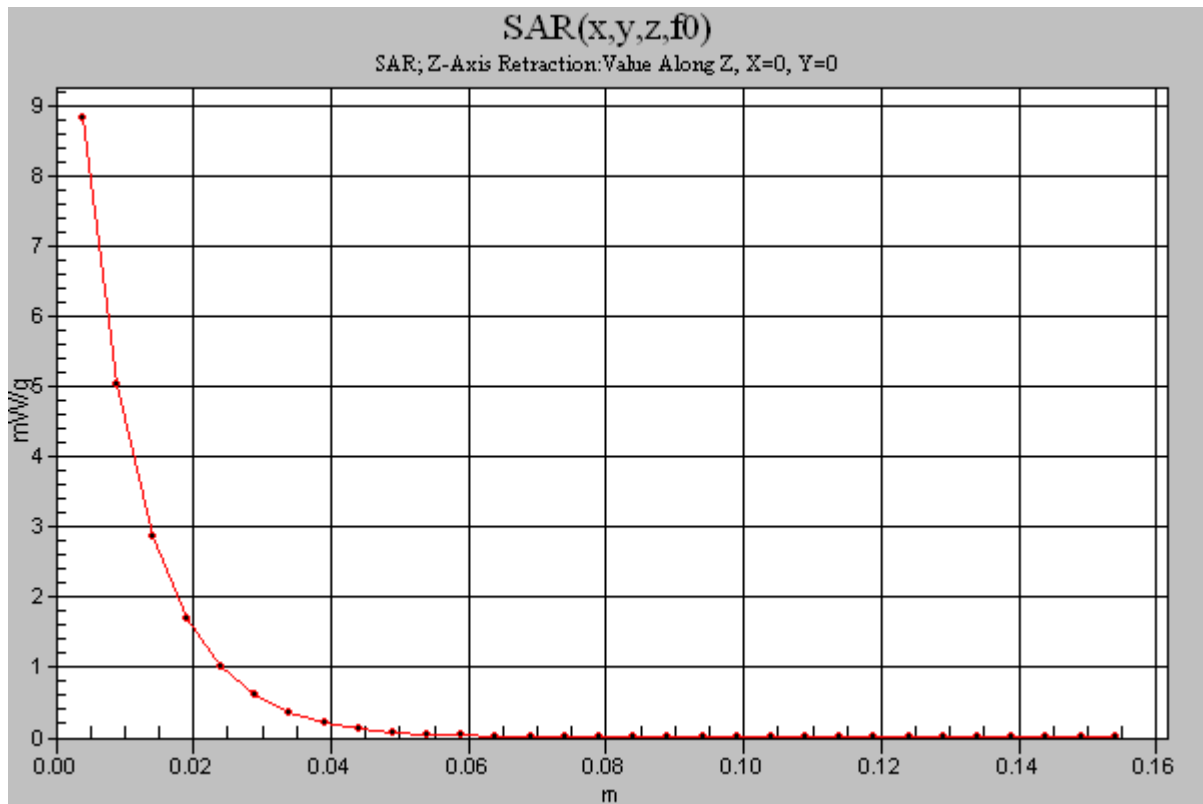
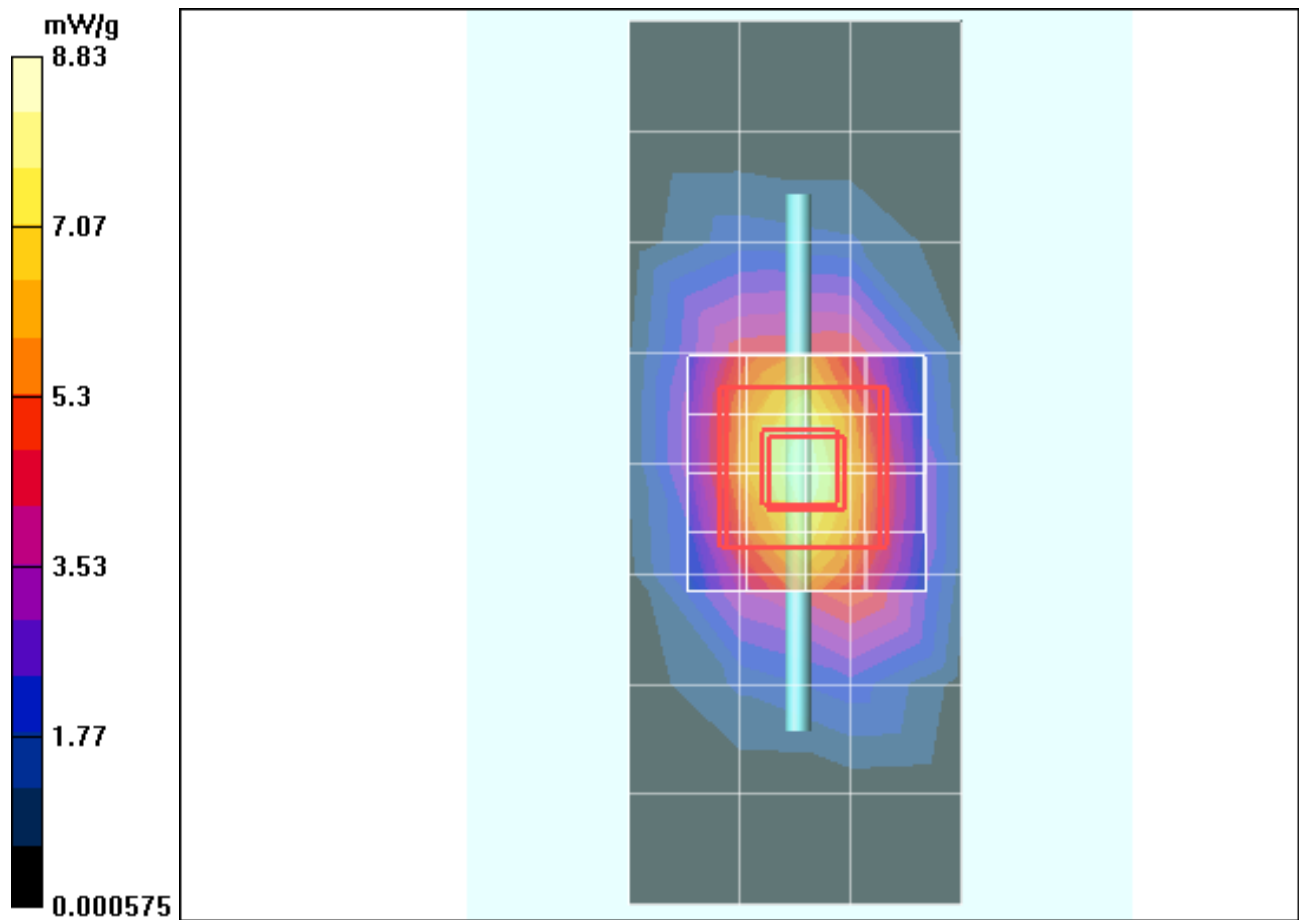
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 85.2 V/m; Power Drift = -0.0 dB Peak SAR (extrapolated) = 12.8 W/kg

SAR(1 g) = 7.43 mW/g; SAR(10 g) = 3.97 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) = 8.83 mW/g



Appendix 2

SAR distribution plots for Phantom Head Adjacent Use

Test Laboratory: Motorola 850 LH Cheek ch128**Serial: -6053**

Procedure Notes: Ch# 128 / Pwr Step: 5 Antenna Position: Internal Accessory Model #: ???

Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Cheek

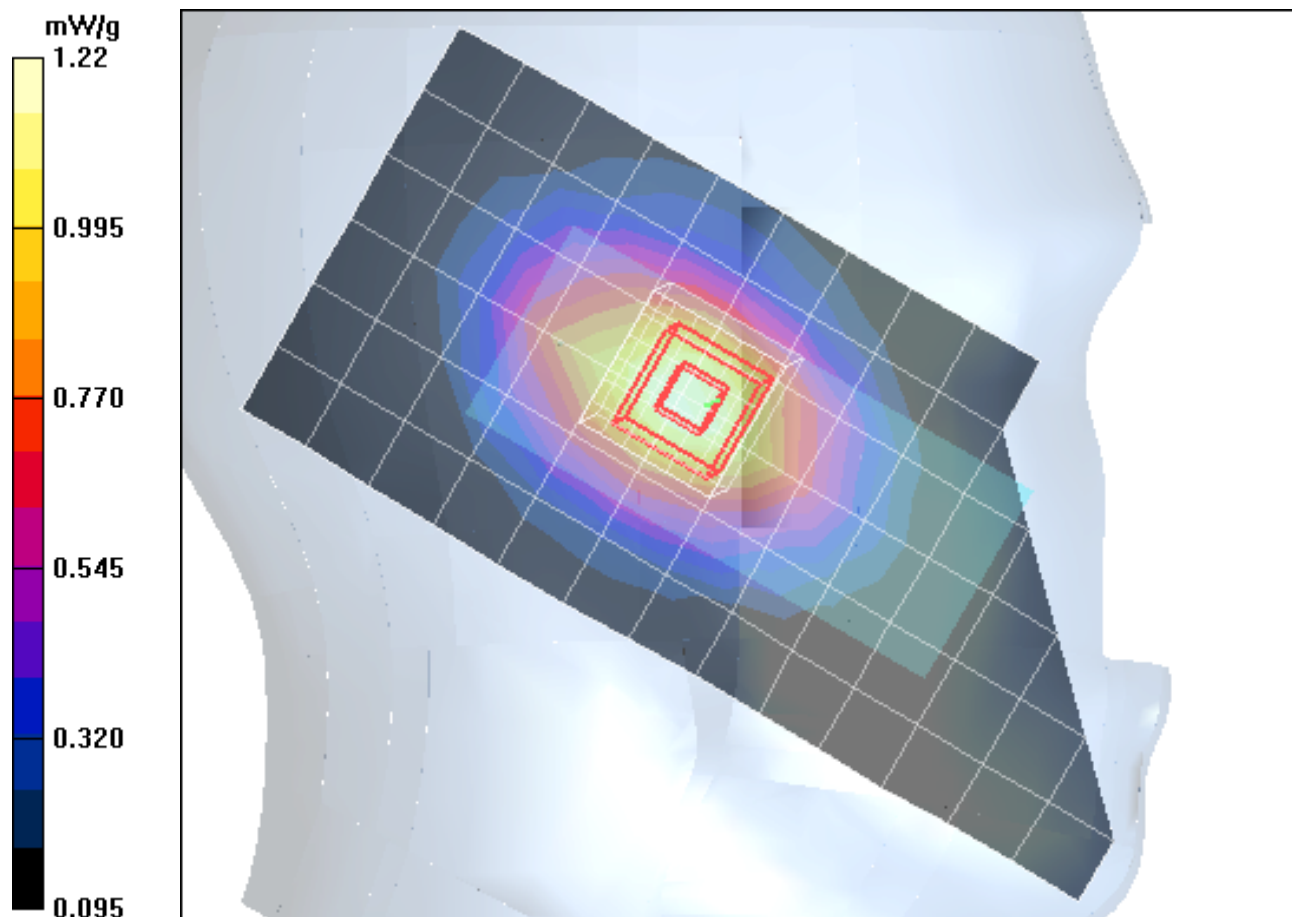
Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8

Medium: Low Freq Head; Medium parameters used: $\sigma = 0.91$; mho/m, $\epsilon_r = 41.6$; $\rho = 1000 \text{ kg/m}^3$ **DASY4 Configuration:**

- Probe: ET3DV6 - SN1520; ConvF(6.25, 6.25, 6.25); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sugar Water SAM; Type: SAM; Serial: TP-1153;
- 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) = 1.2 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mmReference Value = 35.7 V/m; **Power Drift = 0.0 dB** Peak SAR (extrapolated) = 1.55 W/kg**SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.788 mW/g** Maximum value of SAR (measured) = 1.22 mW/g

Test Laboratory: Motorola 850 RH Cheek ch128**Serial: -6053; DUT**

Procedure Notes: Ch# 128 / Pwr Step: 5 Antenna Position: Internal Accessory Model #: ???

Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Cheek

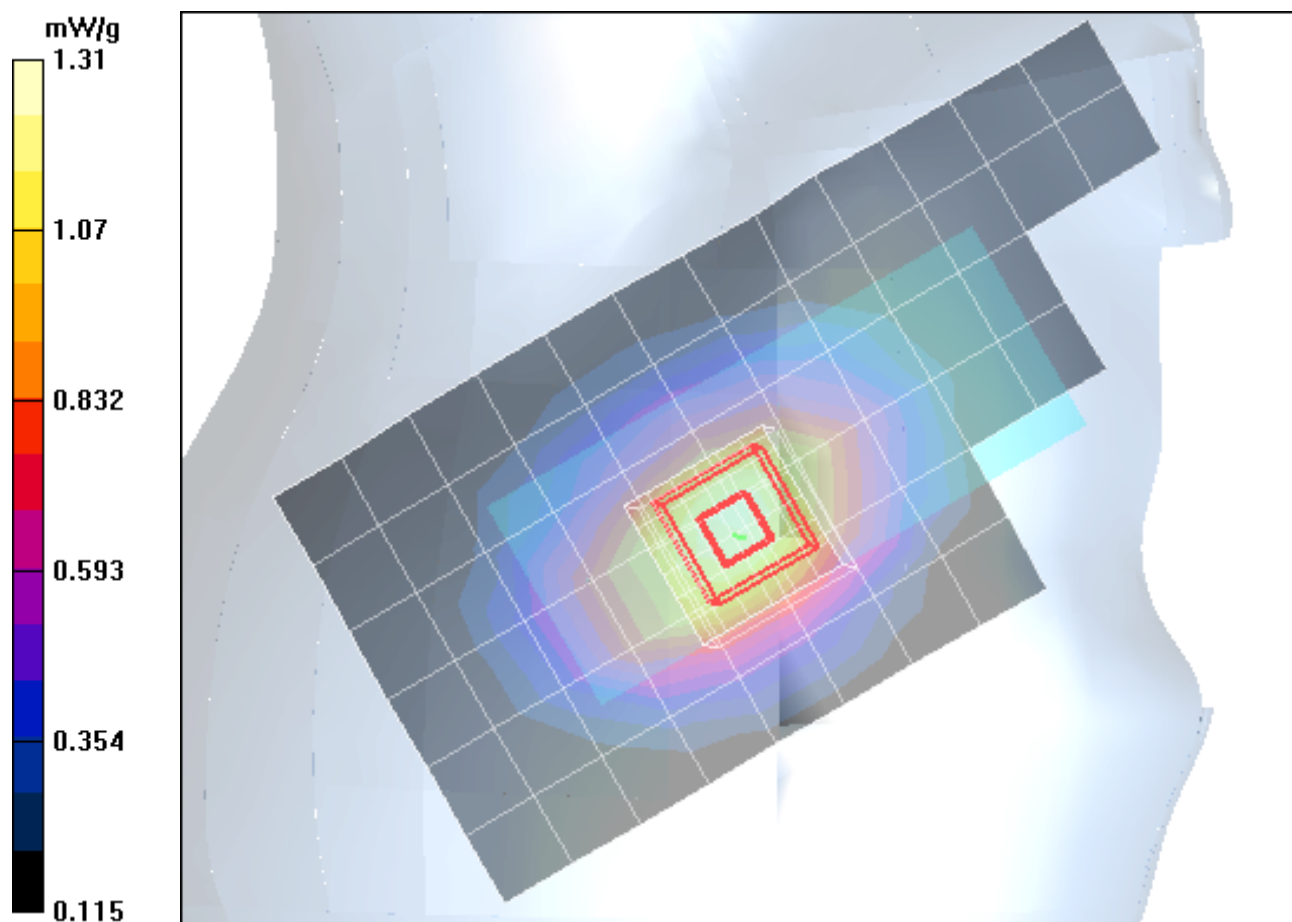
Communication System: GSM 850; Frequency: 824.2 MHz; Duty Cycle: 1:8

Medium: Low Freq Head; Medium parameters used: $\sigma = 0.91$; mho/m, $\epsilon_r = 41.6$; $\rho = 1000 \text{ kg/m}^3$ **DASY4 Configuration:**

- Probe: ET3DV6 - SN1520; ConvF(6.25, 6.25, 6.25); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sugar Water SAM; Type: SAM; Serial: TP-1153;
- 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) = 1.22 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mmReference Value = 38 V/m; **Power Drift = 0.1 dB** Peak SAR (extrapolated) = 1.64 W/kg**SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.834 mW/g** Maximum value of SAR (measured) = 1.31 mW/g

Test Laboratory: Motorola 850 LH Tilt ch190

Serial: -6053

Procedure Notes: Ch# 190 / Pwr Step: 5 Antenna Position: Internal Accessory Model #: ???

Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Rotated

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8

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

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(6.25, 6.25, 6.25); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sugar Water SAM; Type: SAM; Serial: TP-1153;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

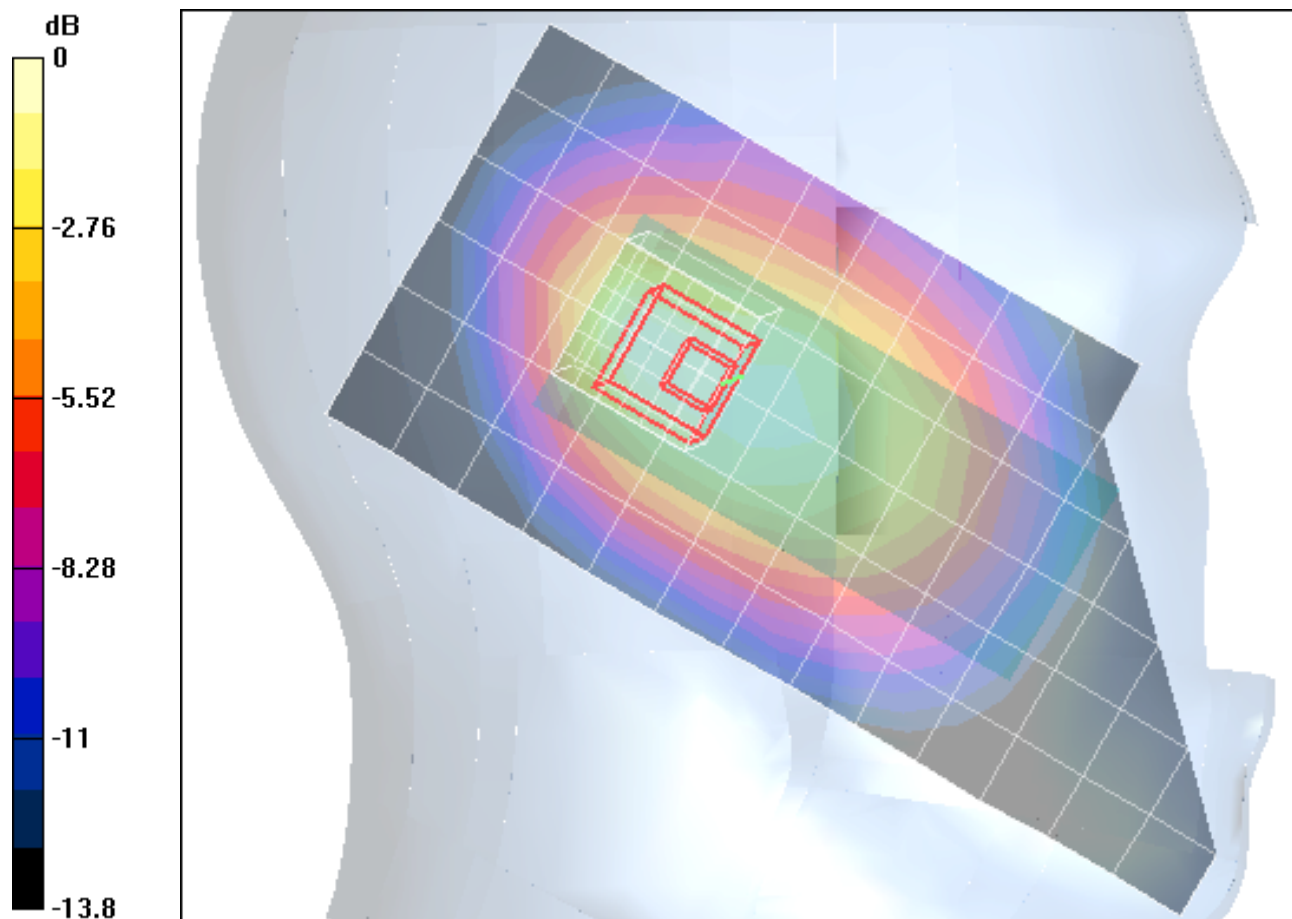
Left Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.715 mW/g

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

Reference Value = 27.2 V/m; **Power Drift = -0.0 dB** Peak SAR (extrapolated) = 1.1 W/kg

SAR(1 g) = 0.652 mW/g; SAR(10 g) = 0.425 mW/g



0 dB = 0.715mW/g

Test Laboratory: Motorola 850 RH Tilt ch190

Serial: -6053

Procedure Notes: Ch# 190 / Pwr Step: 5 Antenna Position: Internal Accessory Model #: ???

Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Rotated

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8

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

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(6.25, 6.25, 6.25); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sugar Water SAM; Type: SAM; Serial: TP-1153;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

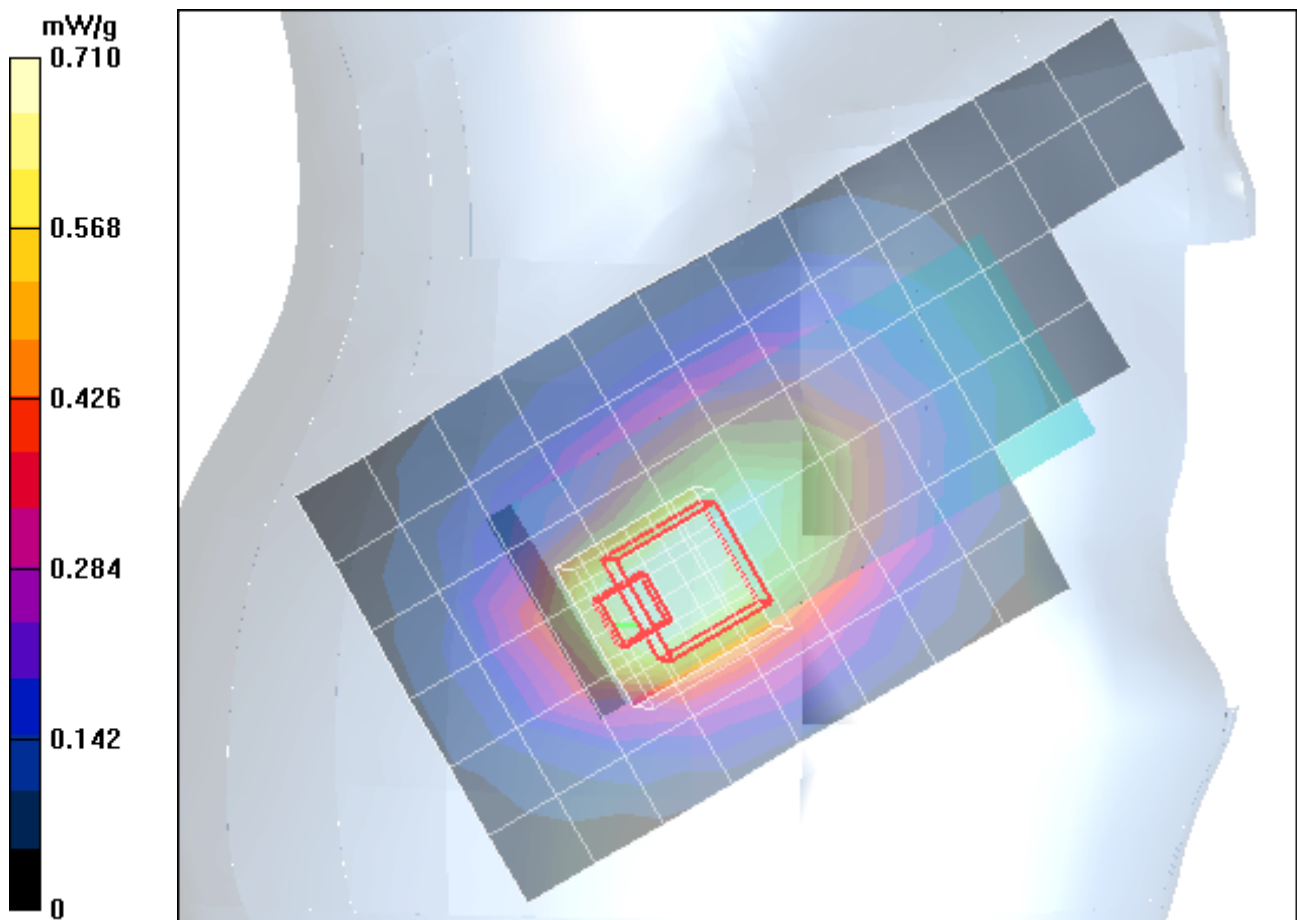
Right Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.710 mW/g

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

Reference Value = 29.1 V/m; **Power Drift = 0.0 dB** Peak SAR (extrapolated) = 1.14 W/kg

SAR(1 g) = 0.706 mW/g; SAR(10 g) = 0.486 mW/g Maximum value of SAR (measured) = 0.758 mW/g



Test Laboratory: Motorola 1900 LH Cheek ch661**Serial: -6053**

Procedure Notes: Ch# 661 / Pwr Step: 0 Antenna Position: Internal Accessory Model #: ???

Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Cheek

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Back-Up Glycol Head; Medium parameters used: $\sigma = 1.44$; mho/m, $\epsilon_r = 38.4$; $\rho = 1000 \text{ kg/m}^3$ **DASY4 Configuration:**

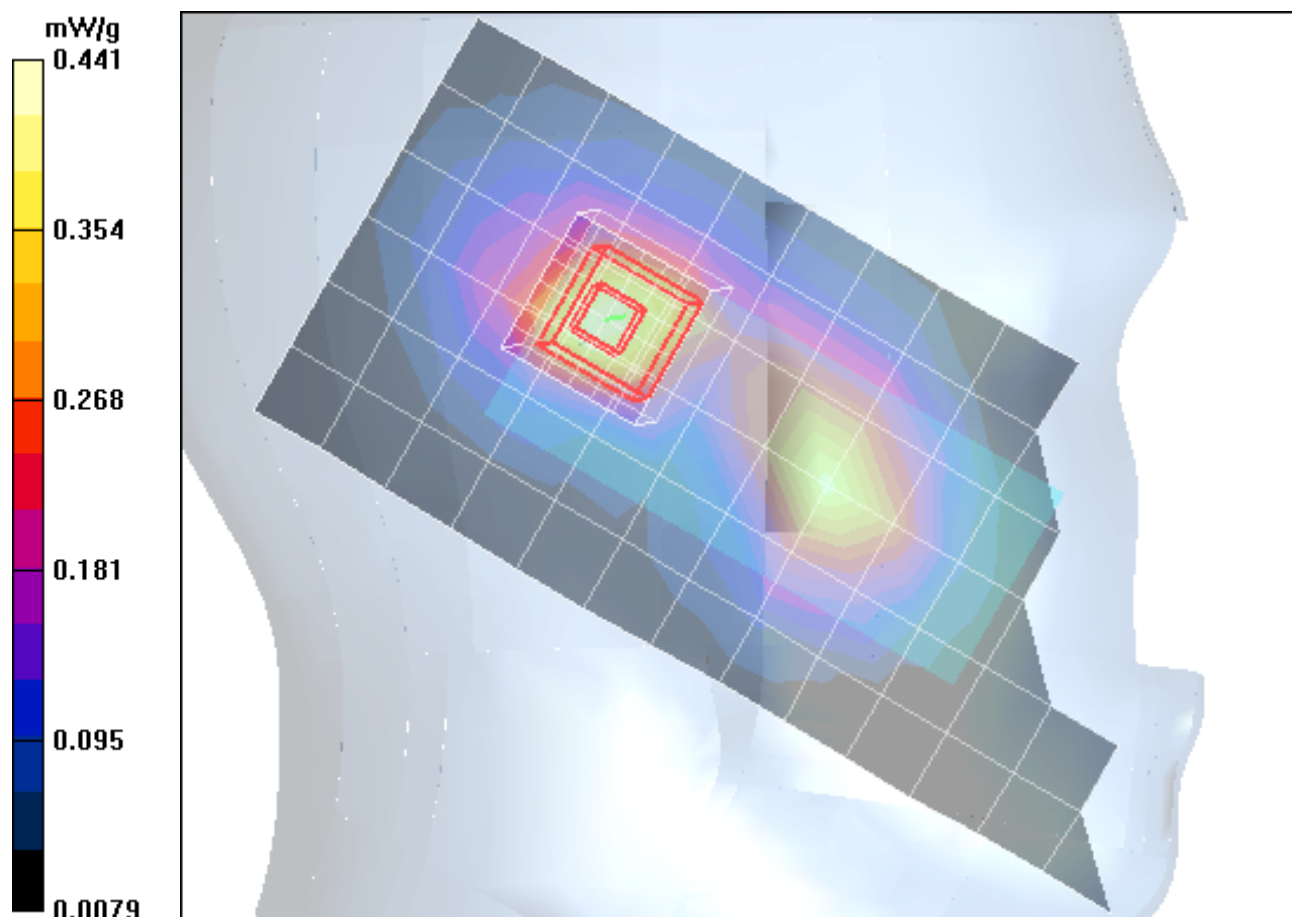
- Probe: ET3DV6 - SN1520; ConvF(5.16, 5.16, 5.16); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.403 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0:

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

Reference Value = 18.1 V/m; **Power Drift = -0.1 dB** Peak SAR (extrapolated) = 0.607 W/kg**SAR(1 g) = 0.400 mW/g; SAR(10 g) = 0.228 mW/g** Maximum value of SAR (measured) = 0.441 mW/g

Test Laboratory: Motorola 1900 RH Cheek ch661**Serial: -6053**

Procedure Notes: Ch# 661 / Pwr Step: 0 Antenna Position: Internal Accessory Model #: ???

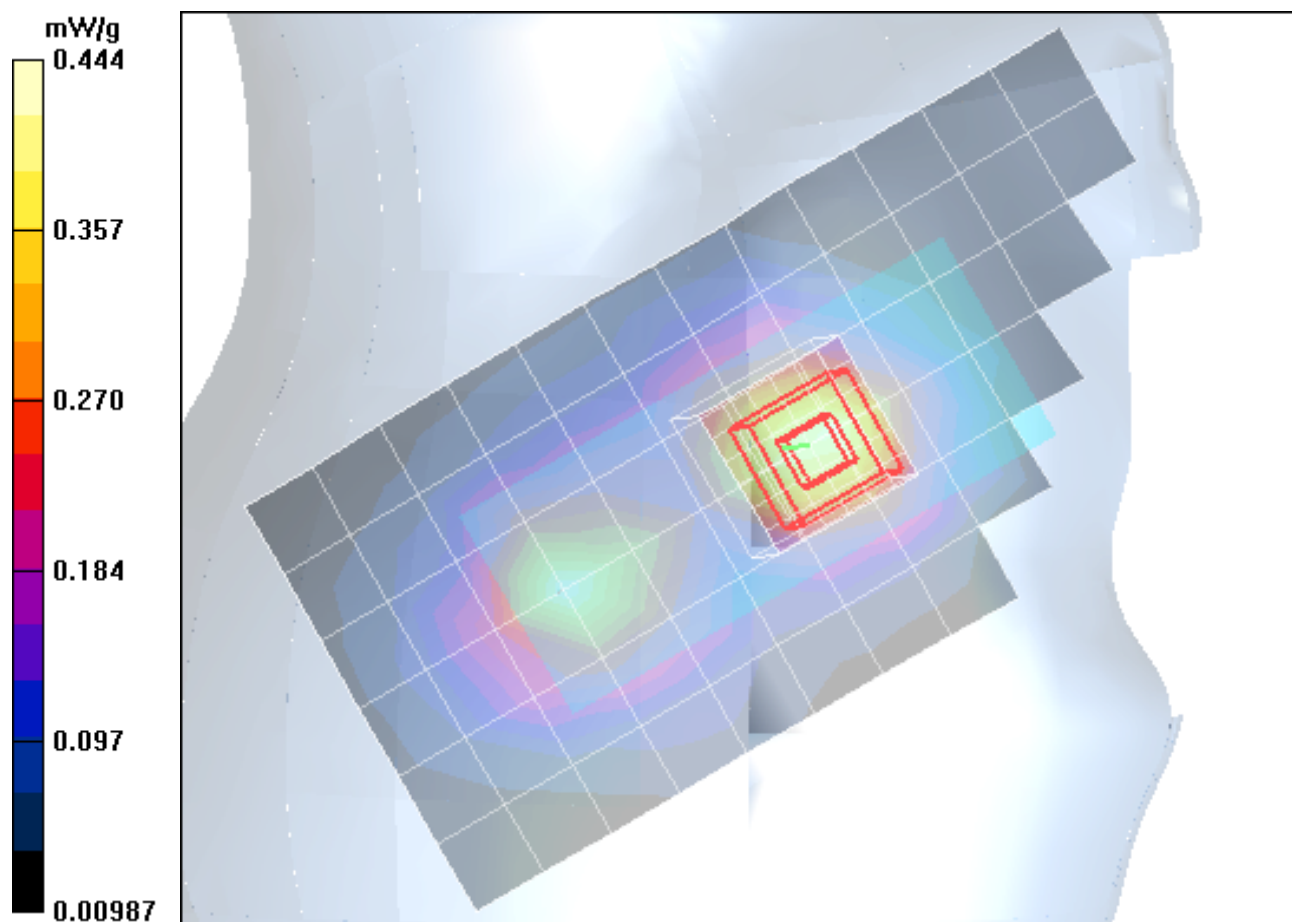
Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Cheek

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Back-Up Glycol Head; Medium parameters used: $\sigma = 1.44$; $\rho = 1000 \text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(5.16, 5.16, 5.16); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- 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) = 0.445 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 = 16.4 V/m; **Power Drift = 0.0 dB** Peak SAR (extrapolated) = 0.539 W/kg**SAR(1 g) = 0.409 mW/g; SAR(10 g) = 0.256 mW/g** Maximum value of SAR (measured) = 0.444 mW/g

Test Laboratory: Motorola 1900 LH Tilt ch661**Serial: -6053**

Procedure Notes: Ch# 661 / Pwr Step: 0 Antenna Position: Internal Accessory Model #: ???

Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Rotated

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Back-Up Glycol Head; Medium parameters used: $\sigma = 1.44$; mho/m, $\epsilon_r = 38.4$; $\rho = 1000 \text{ kg/m}^3$ **DASY4 Configuration:**

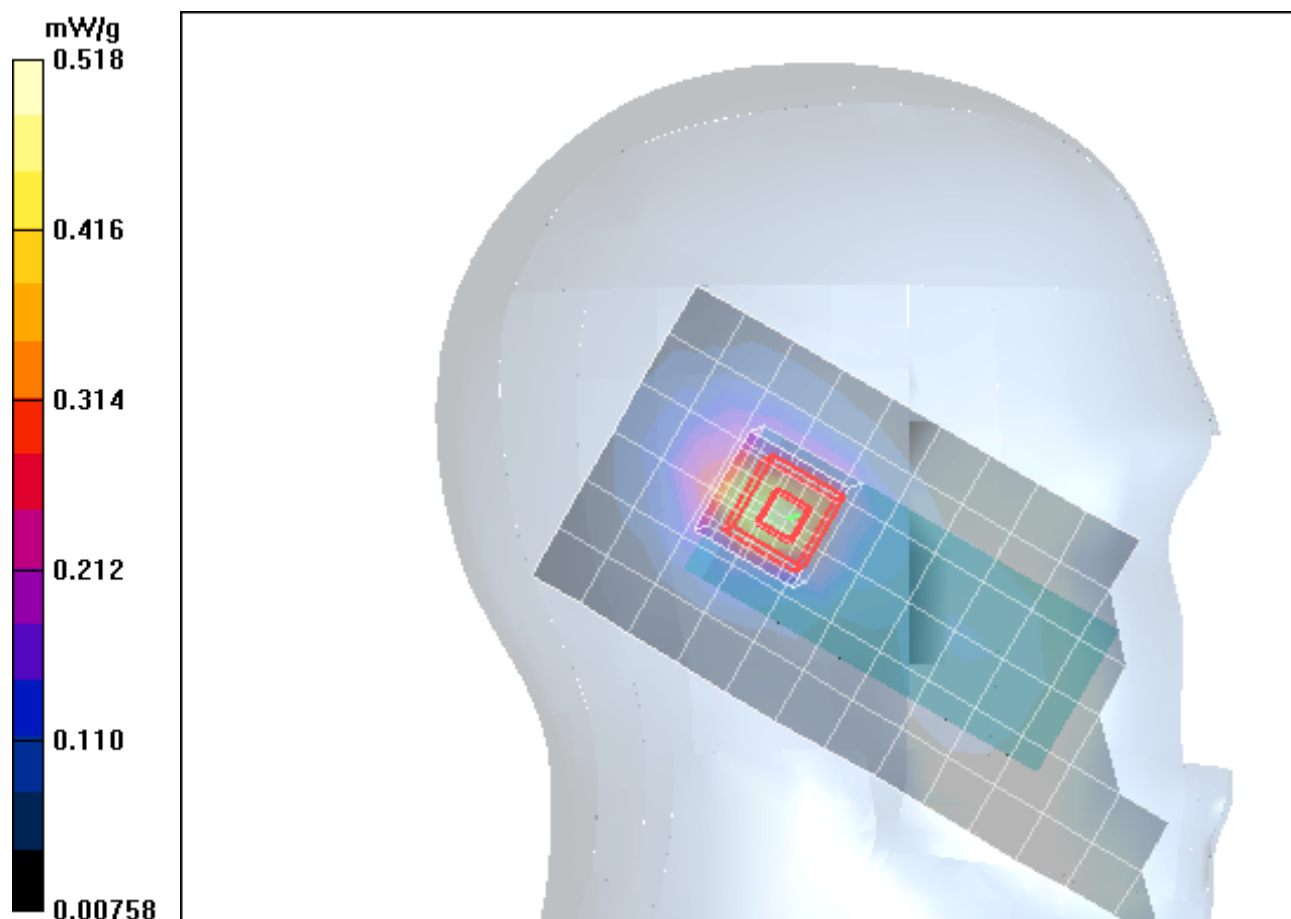
- Probe: ET3DV6 - SN1520; ConvF(5.16, 5.16, 5.16); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

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

Measurement grid: dx=15mm, dy=15mm maximum value of SAR (measured) = 0.474 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0:

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

Reference Value = 18.1 V/m; **Power Drift = -0.1 dB** Peak SAR (extrapolated) = 0.749 W/kg**SAR(1 g) = 0.460 mW/g; SAR(10 g) = 0.254 mW/g** Maximum value of SAR (measured) = 0.518 mW/g

Test Laboratory: Motorola 1900 RH Tilt ch661**Serial: 6053**

Procedure Notes: Ch# 661 / Pwr Step: 0 OTA Antenna Position: INTERNAL Accessory Model #: NONE
 Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): TILTED

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Back-Up Glycol Head; Medium parameters used: $\sigma = 1.45$; mho/m, $\epsilon_r = 38.2$; $\rho = 1000 \text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6R - SN1397; ConvF(5.09, 5.09, 5.09); Calibrated: 5/21/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn316; Calibrated: 1/13/2005
- Phantom: R1: Glycol SAM; Type: SAM; Serial: TP-1154;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

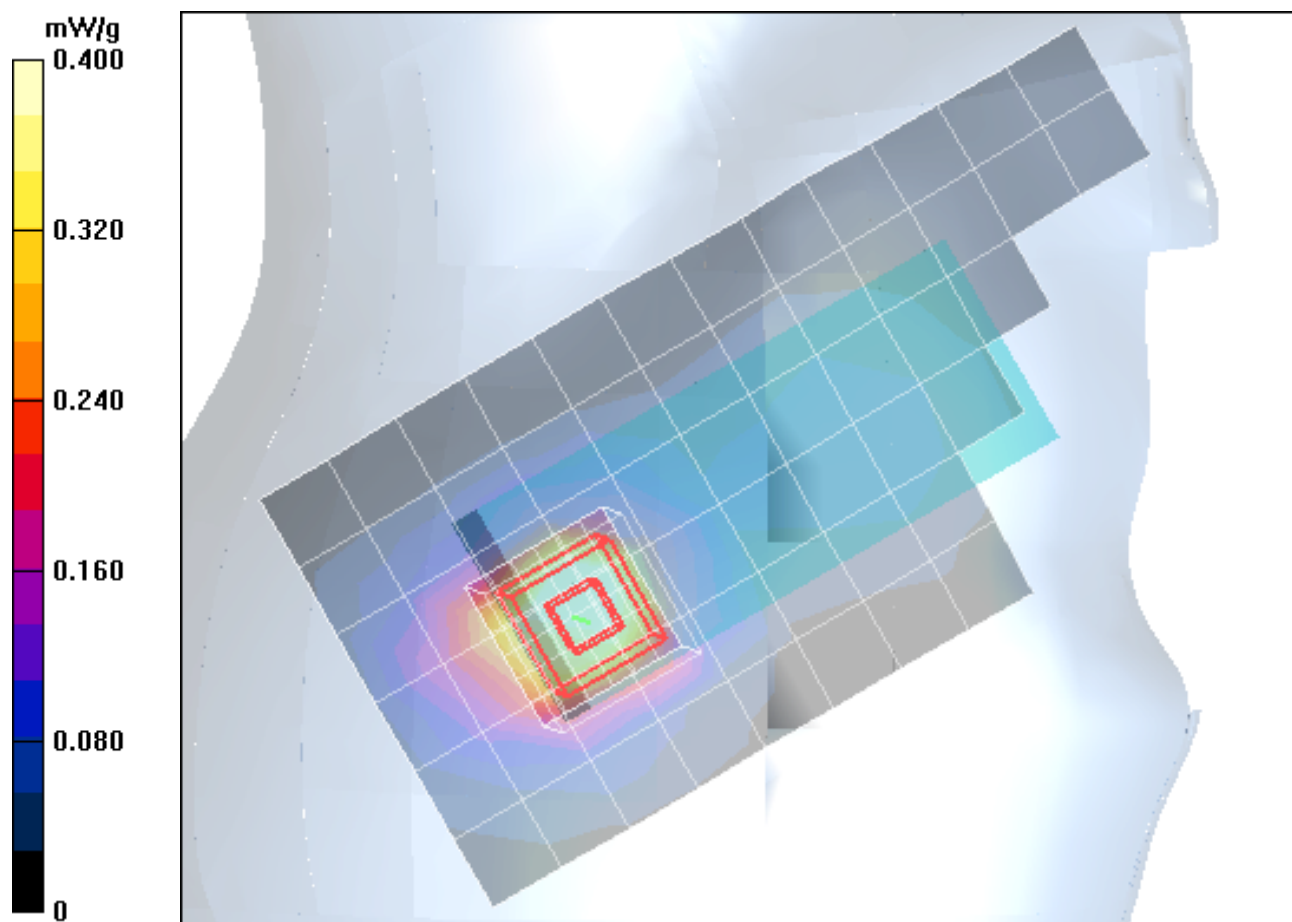
Right Head Template/Area Scan - Normal (15mm) (7x14x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.487 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 = -0.1 dB** Peak SAR (extrapolated) = 0.790 W/kg

SAR(1 g) = 0.475 mW/g; SAR(10 g) = 0.257 mW/g Maximum value of SAR (measured) = 0.521 mW/g



Appendix 3

SAR distribution plots for Body Worn Configuration

Test Laboratory: Motorola 850 GSM BW ch190 back 15mm**Serial: -6053**

Procedure Notes: Ch# 190 / Pwr Step: 5 Antenna Position: Internal Battery Model #: AANN4285B

Accessory Model # = Back of Phone 15mm from Phantom

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8

Medium: Low Freq Body; Medium parameters used: $\sigma = 0.97$; mho/m, $\epsilon_r = 53.6$; $\rho = 1000$ kg/m³

DASY4 Configuration:

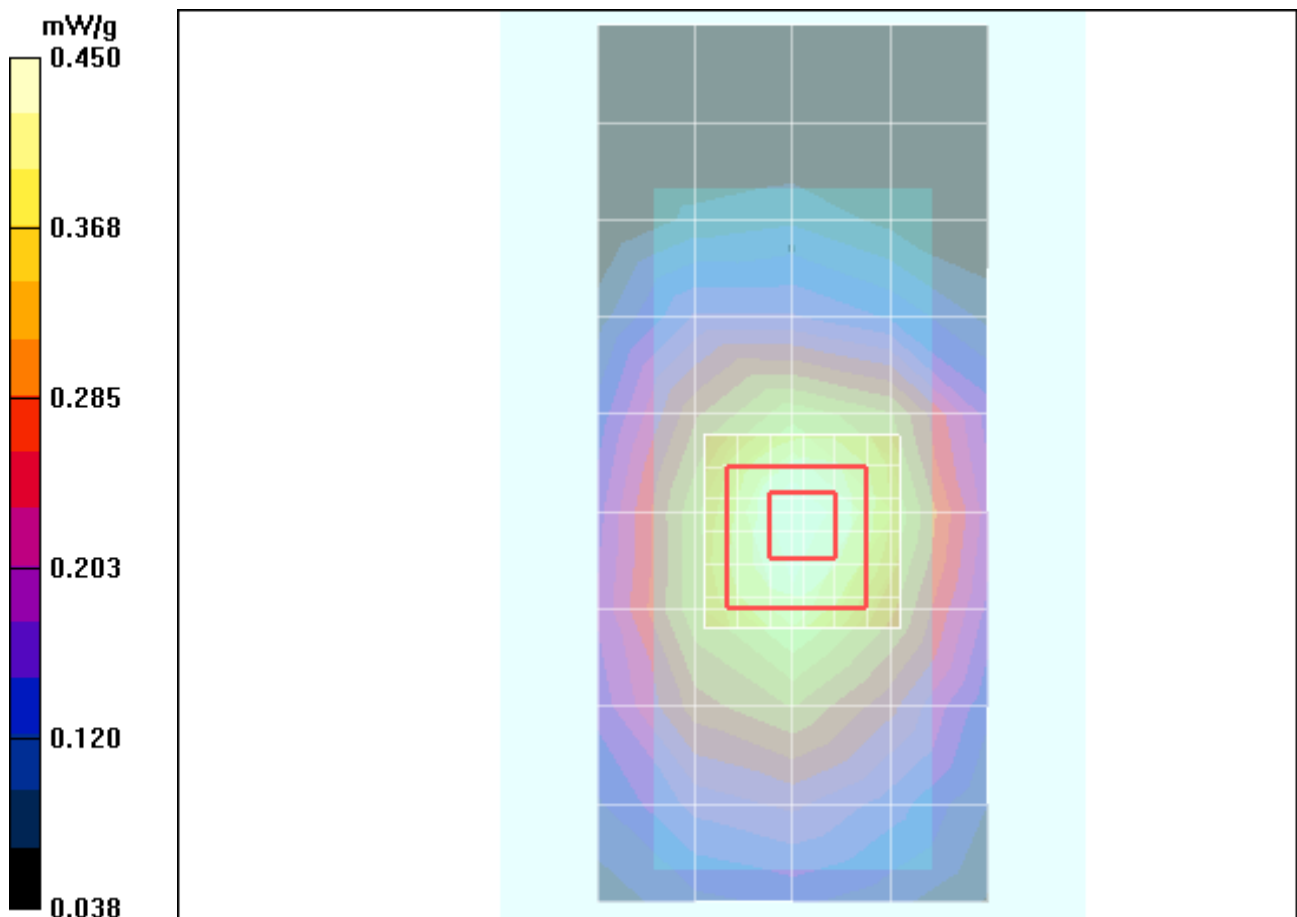
- Probe: ET3DV6 - SN1520; ConvF(6.14, 6.14, 6.14); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (12x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.452 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 = -0.0 dB** Peak SAR (extrapolated) = 0.568 W/kg**SAR(1 g) = 0.426 mW/g; SAR(10 g) = 0.303 mW/g** Maximum value of SAR (measured) = 0.450 mW/g

Test Laboratory: Motorola 850 GSM BW ch190 front 15mm

Serial: -6053

Procedure Notes: Ch# 190 / Pwr Step: 5 Antenna Position: Internal Battery Model #: AANN4285B
Accessory Model # = Front of Phone 15mm from Phantom

Communication System: GSM 850; Frequency: 836.6 MHz; Duty Cycle: 1:8

Medium: Low Freq Body; Medium parameters used: $\sigma = 0.97$; mho/m, $\epsilon_r = 53.6$; $\rho = 1000 \text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(6.14, 6.14, 6.14); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: 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 Body (15mm) (12x7x1):

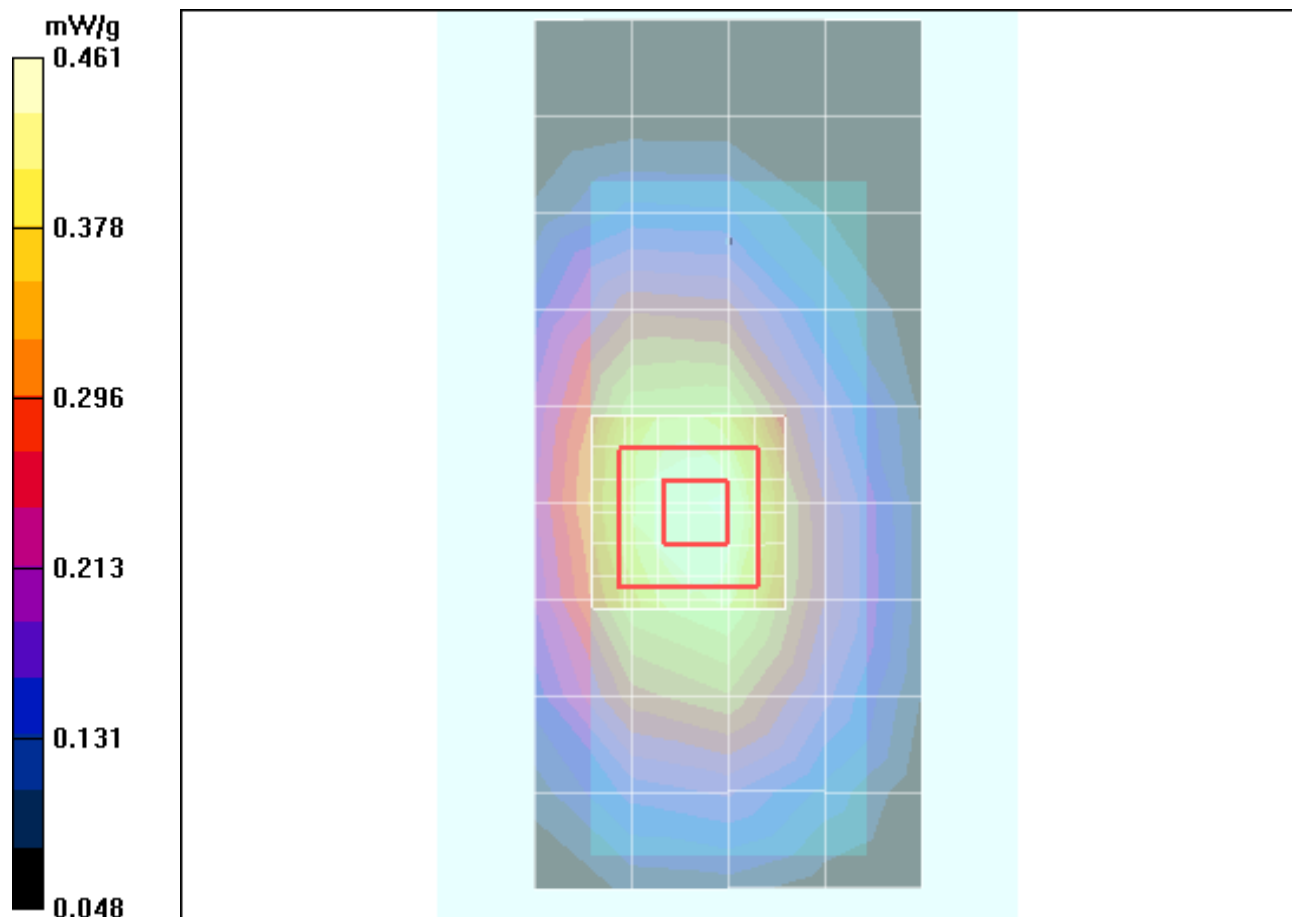
Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.440 mW/g

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) = 0.571 W/kg

SAR(1 g) = 0.433 mW/g; SAR(10 g) = 0.307 mW/g Maximum value of SAR (measured) = 0.461 mW/g



Test Laboratory: Motorola 850 GPRS BW ch190 front 25mm

Serial: -6053

Procedure Notes: Ch# 190 / Pwr Step: 5 Antenna Position: Internal Battery Model #: AANN4285B
Accessory Model # = Front of Phone 25mm from Phantom

Communication System: GPRS 850 - Class 10; Frequency: 836.6 MHz; Duty Cycle: 1:4

Medium: Low Freq Body; Medium parameters used: $\sigma = 0.97$; mho/m, $\epsilon_r = 53.6$; $\rho = 1000 \text{ kg/m}^3$

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(6.14, 6.14, 6.14); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: 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 Body (15mm) (12x7x1):

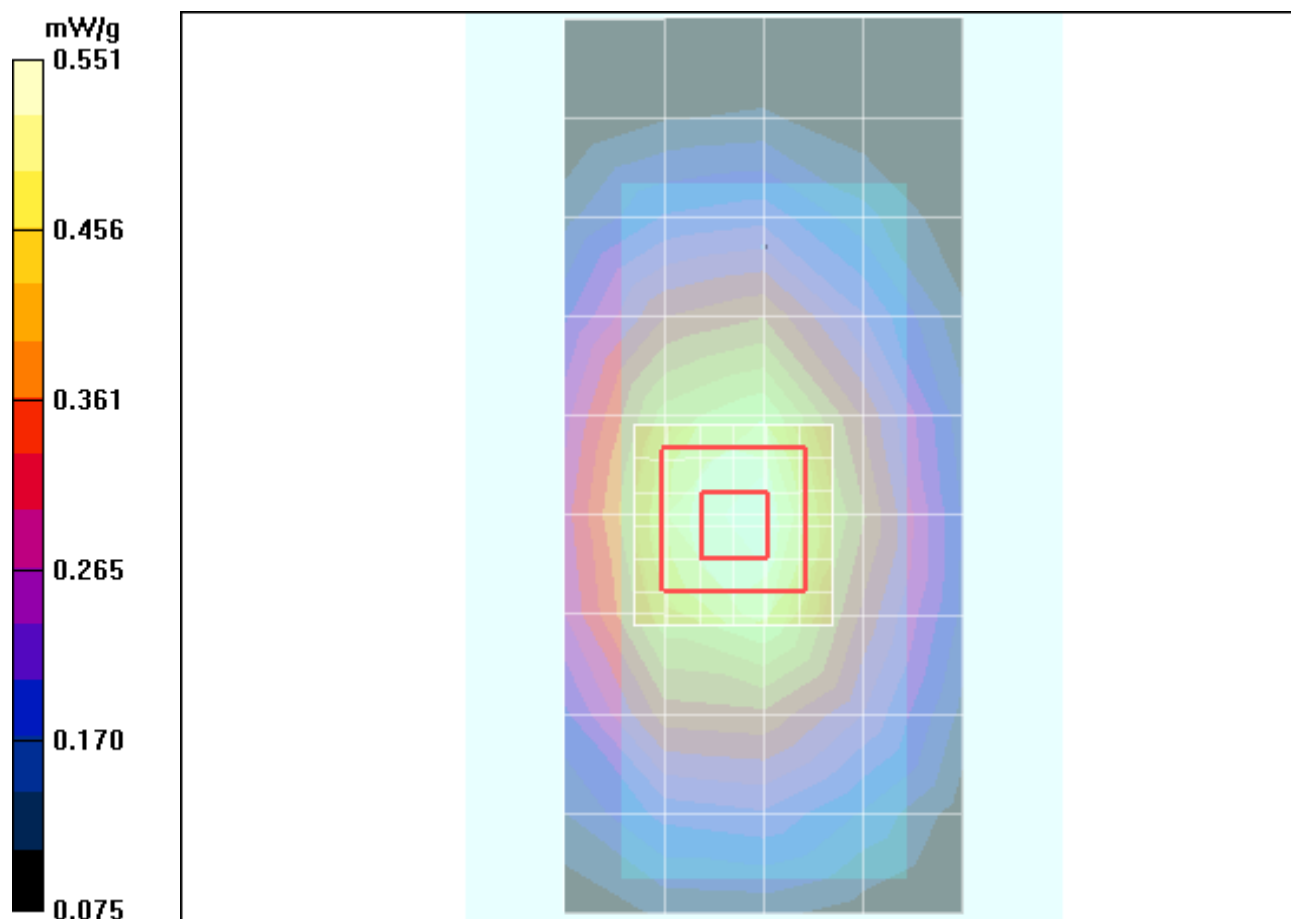
Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.542 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0:

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

Reference Value = 24.1 V/m; **Power Drift = -0.1 dB** Peak SAR (extrapolated) = 0.676 W/kg

SAR(1 g) = 0.518 mW/g; SAR(10 g) = 0.375 mW/g Maximum value of SAR (measured) = 0.551 mW/g



Test Laboratory: Motorola 1900 GPRS BW ch661 back 25mm**Serial: -6053; DUT**

Procedure Notes: Ch# 661 / Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B

Accessory Model # = back of Phone 25mm from Phantom

Communication System: GPRS 1900 - Class 10; Frequency: 1880 MHz; Duty Cycle: 1:4

Medium: Regular Glycol Body; Medium parameters used: $\sigma = 1.59$; mho/m, $\epsilon_r = 50.7$; $\rho = 1000$ kg/m³

DASY4 Configuration:

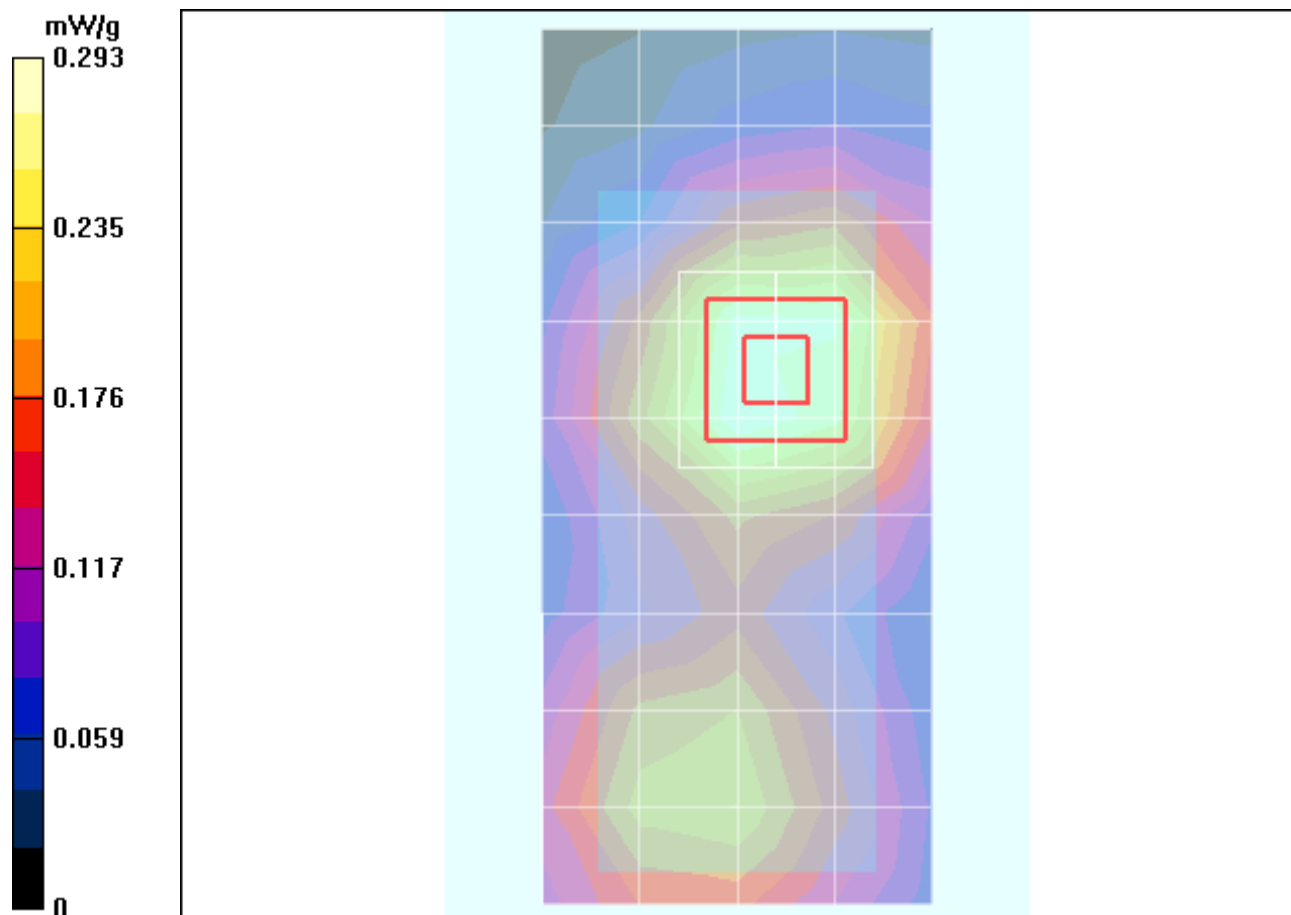
- Probe: ET3DV6 - SN1520; ConvF(4.54, 4.54, 4.54); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (12x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.293 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0:

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

Reference Value = 15.1 V/m; **Power Drift = 0.0 dB** Peak SAR (extrapolated) = 0.493 W/kg**SAR(1 g) = 0.307 mW/g; SAR(10 g) = 0.189 mW/g** Maximum value of SAR (measured) = 0.332 mW/g

Test Laboratory: Motorola 1900 GSM BW ch661 back 15mm**Serial: -6053**

Procedure Notes: Ch# 661 / Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B

Accessory Model # = back of Phone 15mm from Phantom

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Regular Glycol Body; Medium parameters used: $\sigma = 1.59$; mho/m, $\epsilon_r = 50.7$; $\rho = 1000$ kg/m³

DASY4 Configuration:

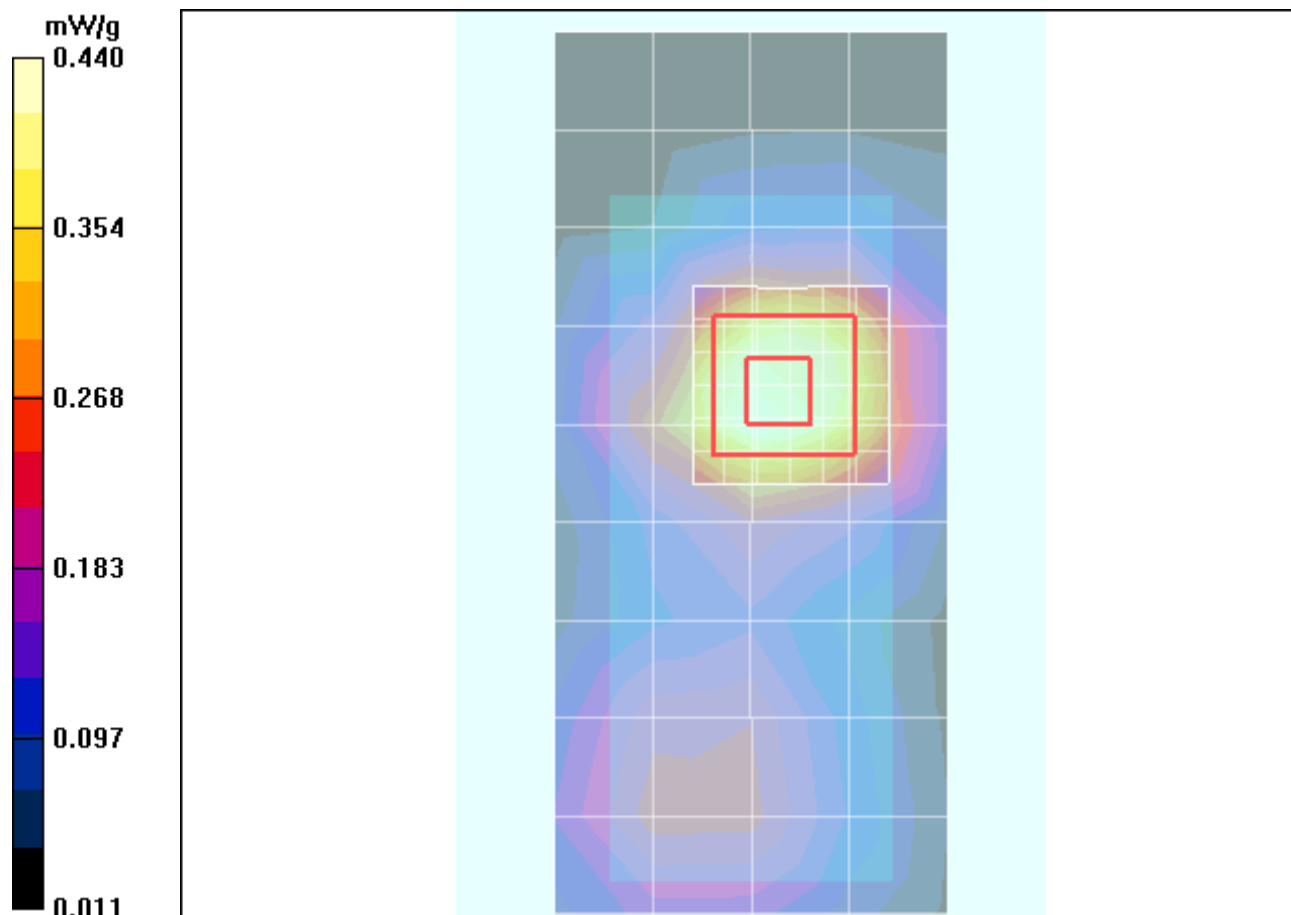
- Probe: ET3DV6 - SN1520; ConvF(4.54, 4.54, 4.54); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (12x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.447 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0:

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

Reference Value = 18.7 V/m; **Power Drift = -0.0 dB** Peak SAR (extrapolated) = 0.764 W/kg**SAR(1 g) = 0.458 mW/g; SAR(10 g) = 0.266 mW/g** Maximum value of SAR (measured) = 0.495 mW/g

Test Laboratory: Motorola 1900 GSM BW ch661 front 15mm

Serial: -6053

Procedure Notes: Ch# 661/ Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B
Accessory Model # = front of Phone 15mm from Phantom

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8

Medium: Regular Glycol Body; Medium parameters used: $\sigma = 1.59$; mho/m, $\epsilon_r = 50.7$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ET3DV6 - SN1520; ConvF(4.54, 4.54, 4.54); Calibrated: 5/27/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: 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 Body (15mm) (12x7x1):

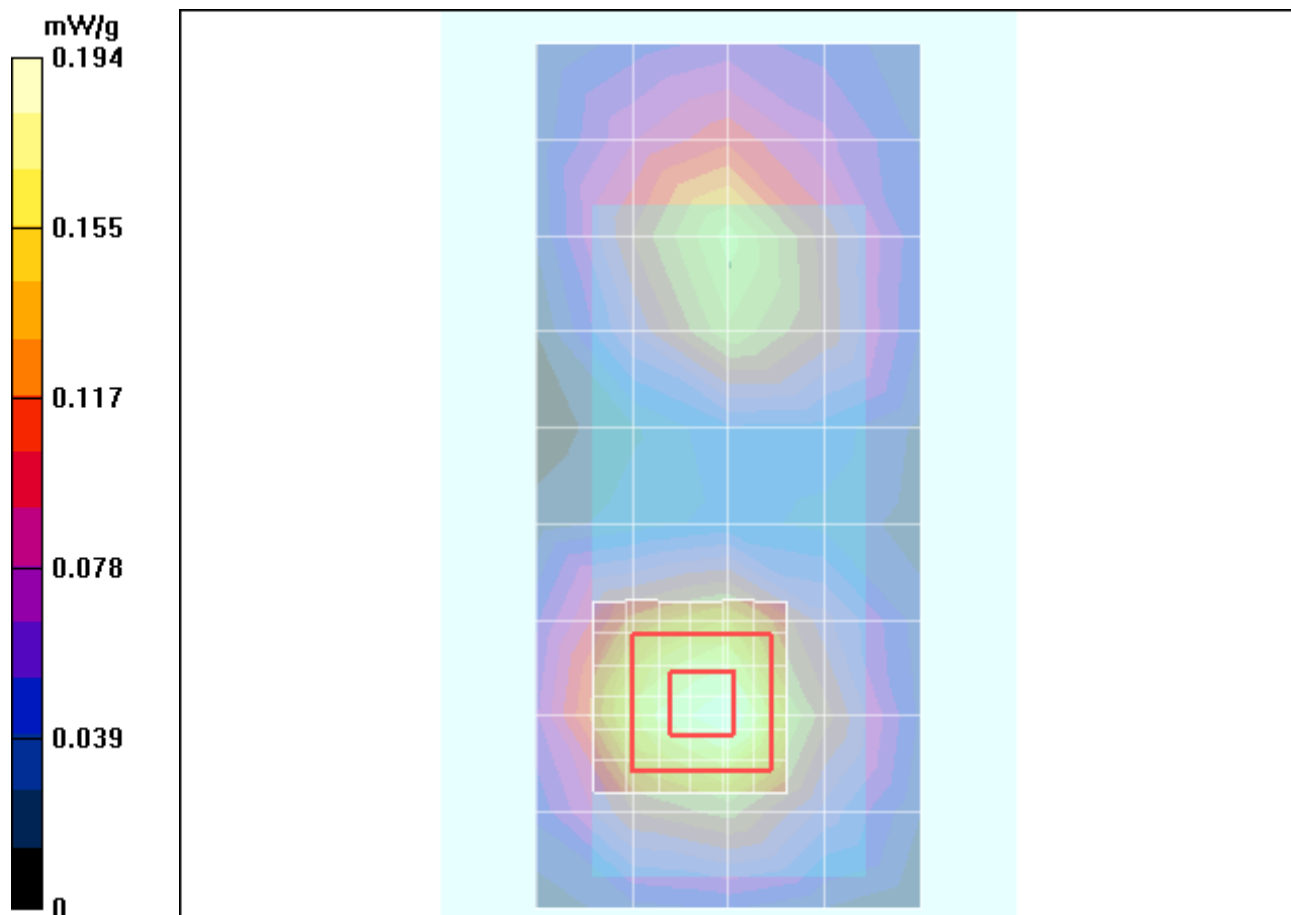
Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.194 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0:

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

Reference Value = 10.6 V/m; **Power Drift = -0.0 dB** Peak SAR (extrapolated) = 0.274 W/kg

SAR(1 g) = 0.185 mW/g; SAR(10 g) = 0.116 mW/g Maximum value of SAR (measured) = 0.199 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

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

NormX	$1.88 \mu\text{V}/(\text{V}/\text{m})^2$
NormY	$1.75 \mu\text{V}/(\text{V}/\text{m})^2$
NormZ	$2.02 \mu\text{V}/(\text{V}/\text{m})^2$

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	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

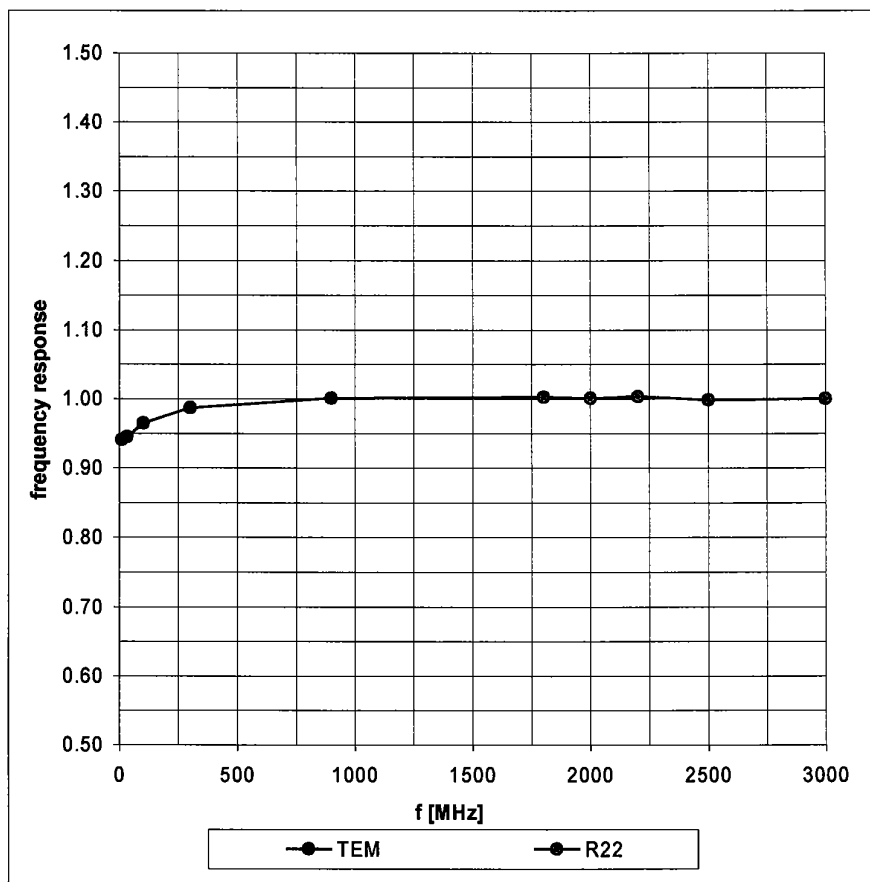
Probe Tip to Sensor Center 2.7 mm

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%.

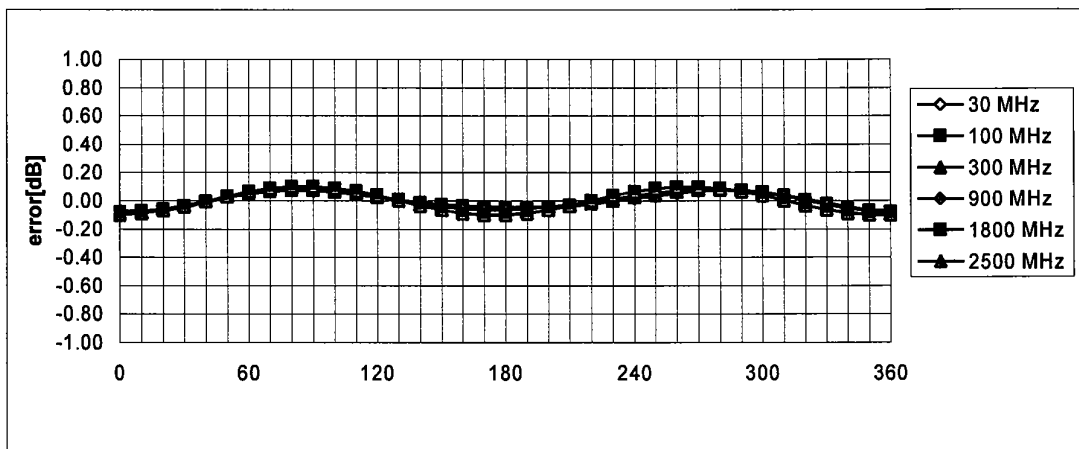
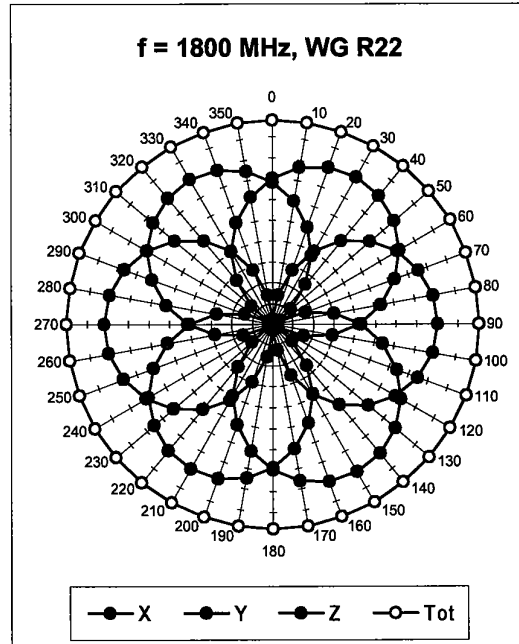
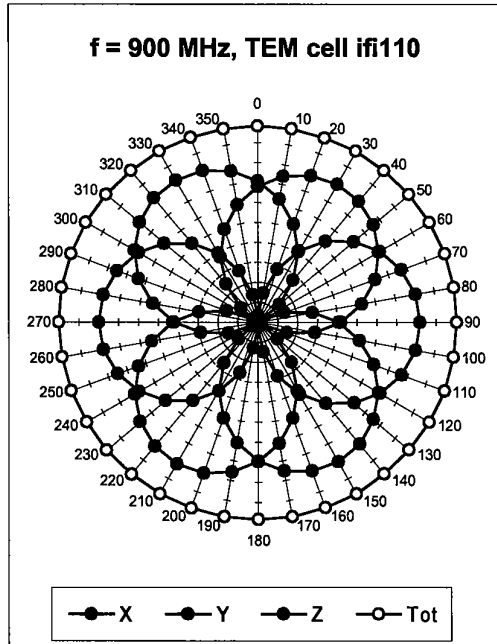
^A numerical linearization parameter: uncertainty not required

Frequency Response of E-Field

(TEM-Cell:ifi110, Waveguide R22)

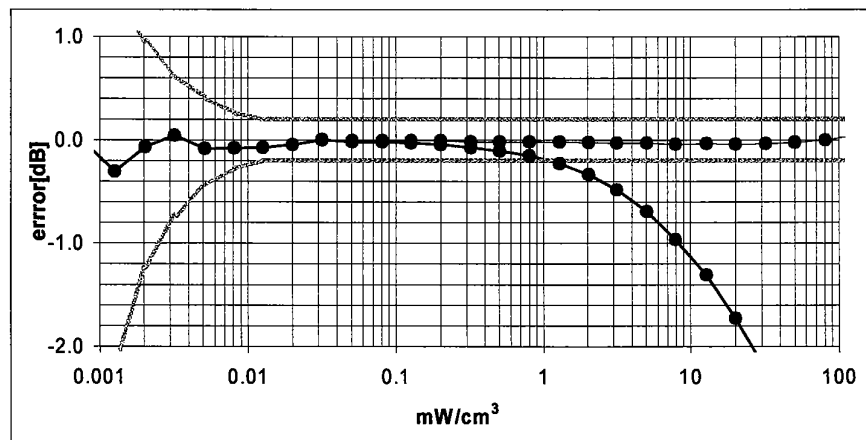
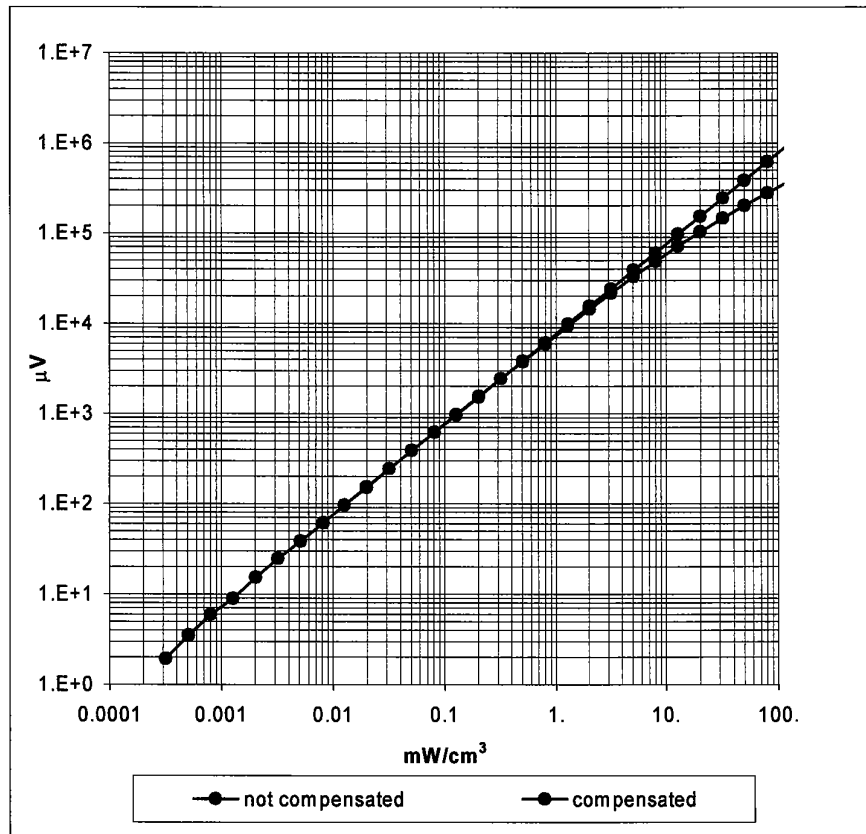


Receiving Pattern (ϕ), $\theta = 0^\circ$



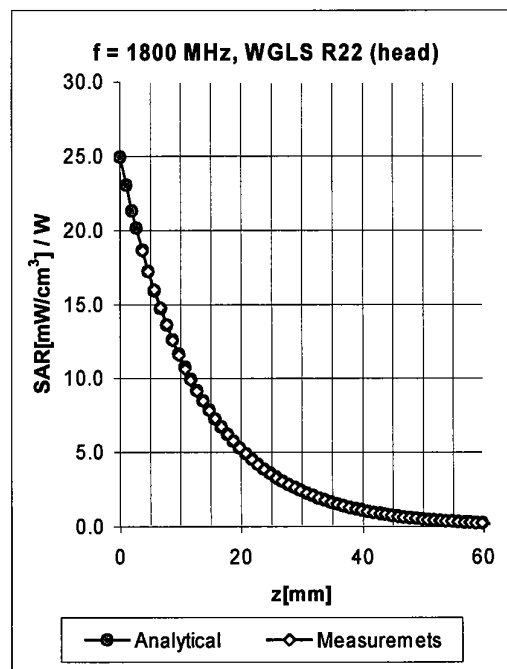
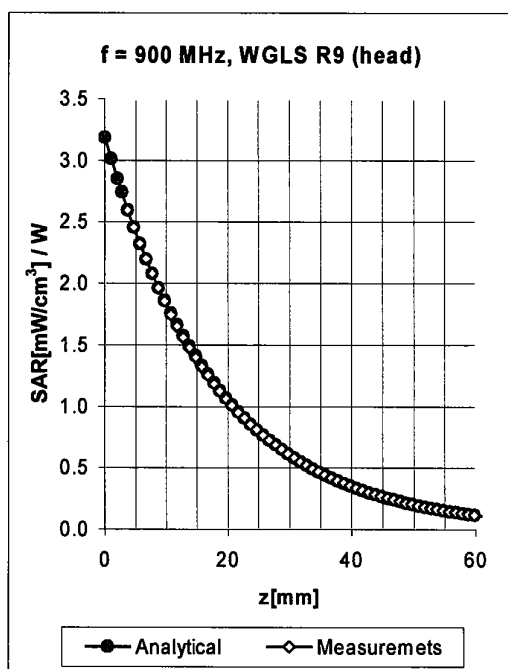
Axial Isotropy Error $< \pm 0.2$ dB

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



Probe Linearity Error $< \pm 0.2$ dB

Conversion Factor Assessment

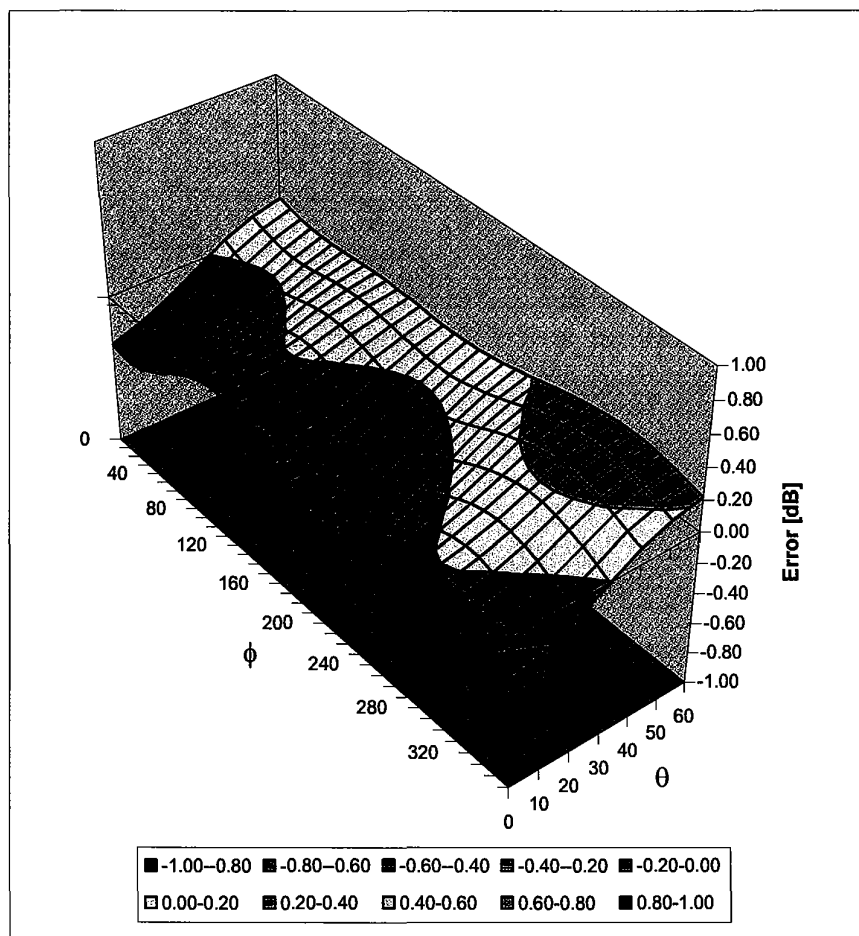


f [MHz]	Validity [MHz] ^B	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	800-1000	Head	41.5 ± 5%	0.97 ± 5%	0.83	1.55	6.10 ± 9.5% (k=2)
1800	1710-1910	Head	40.0 ± 5%	1.40 ± 5%	0.47	2.66	5.09 ± 9.5% (k=2)
1950	1900-2000	Head	40.0 ± 5%	1.40 ± 5%	0.57	2.51	4.80 ± 9.5% (k=2)
900	800-1000	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

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 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

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

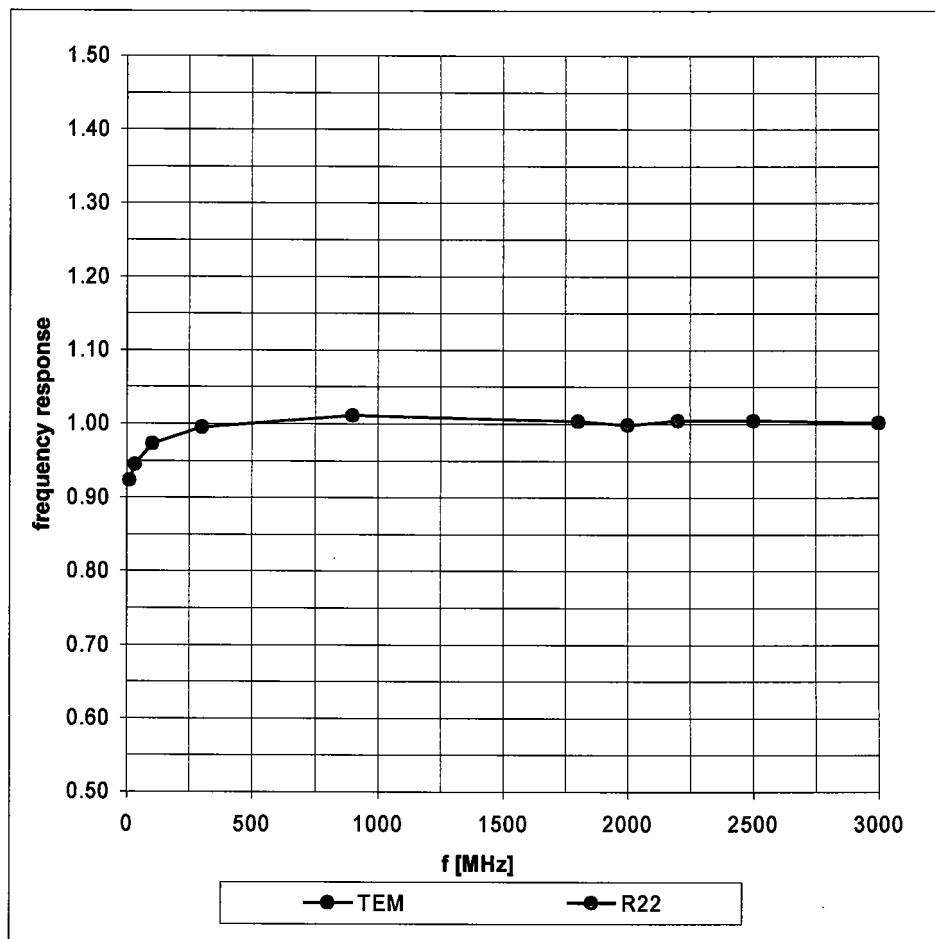
Probe Tip to Sensor Center	2.7 mm
Optical Surface Detection	in tolerance

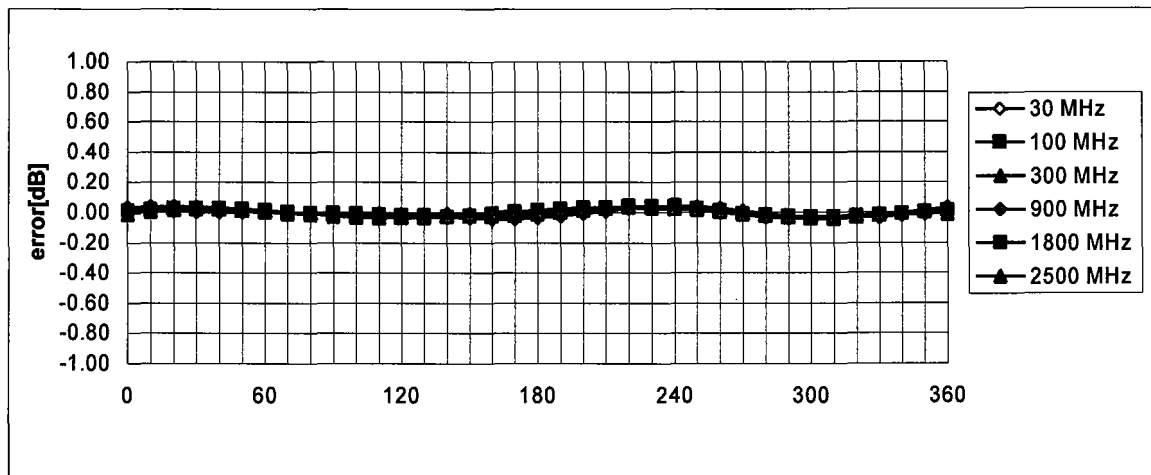
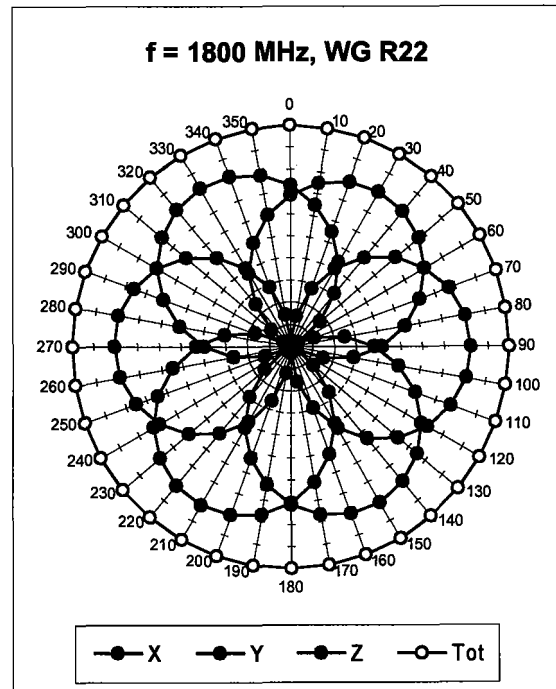
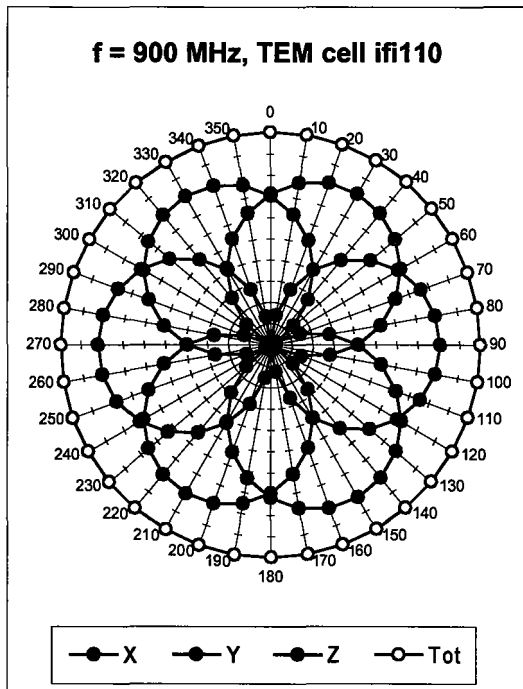
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A numerical linearization parameter: uncertainty not required

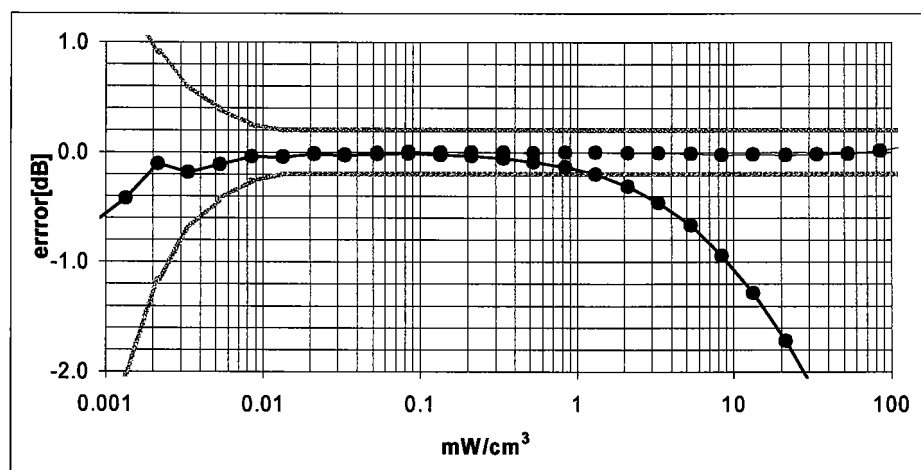
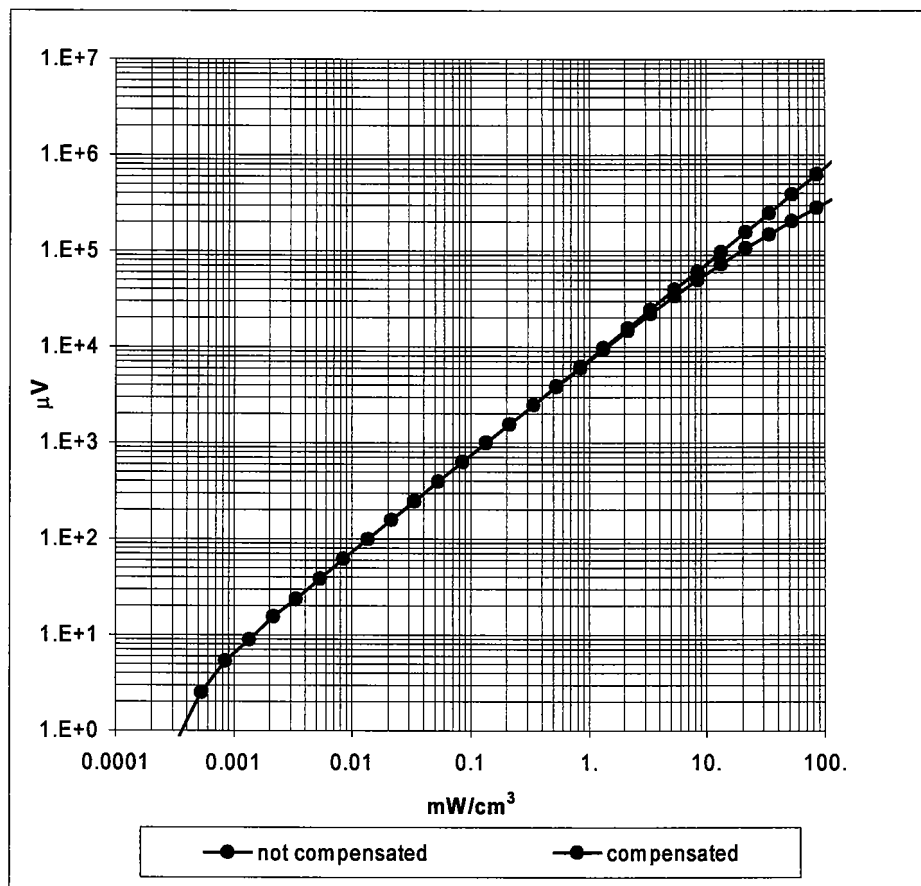
Frequency Response of E-Field

(TEM-Cell:ifi110, Waveguide R22)



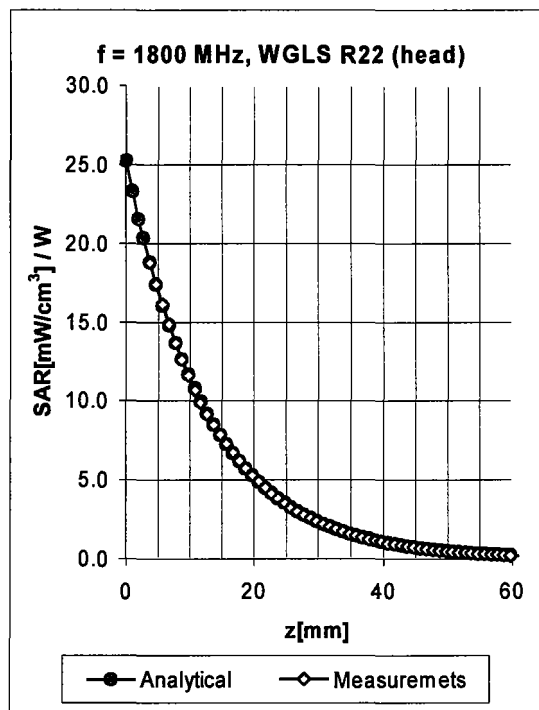
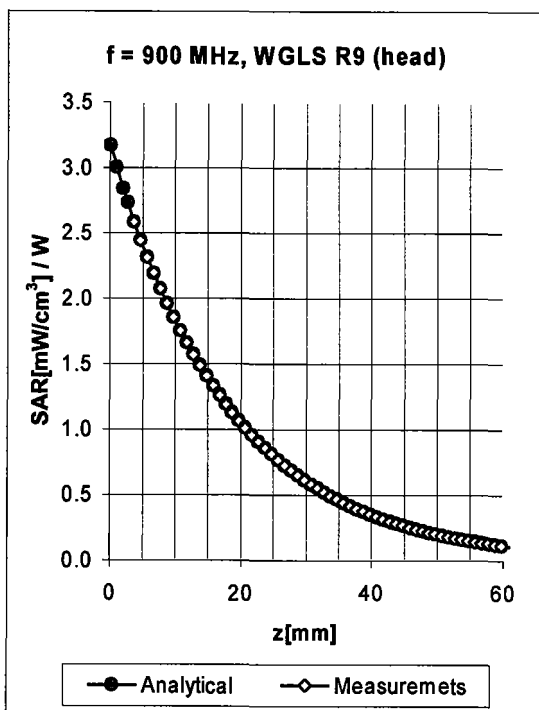
Receiving Pattern (ϕ), $\theta = 0^\circ$ **Axial Isotropy Error < ± 0.2 dB**

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



Probe Linearity Error < ± 0.2 dB

Conversion Factor Assessment

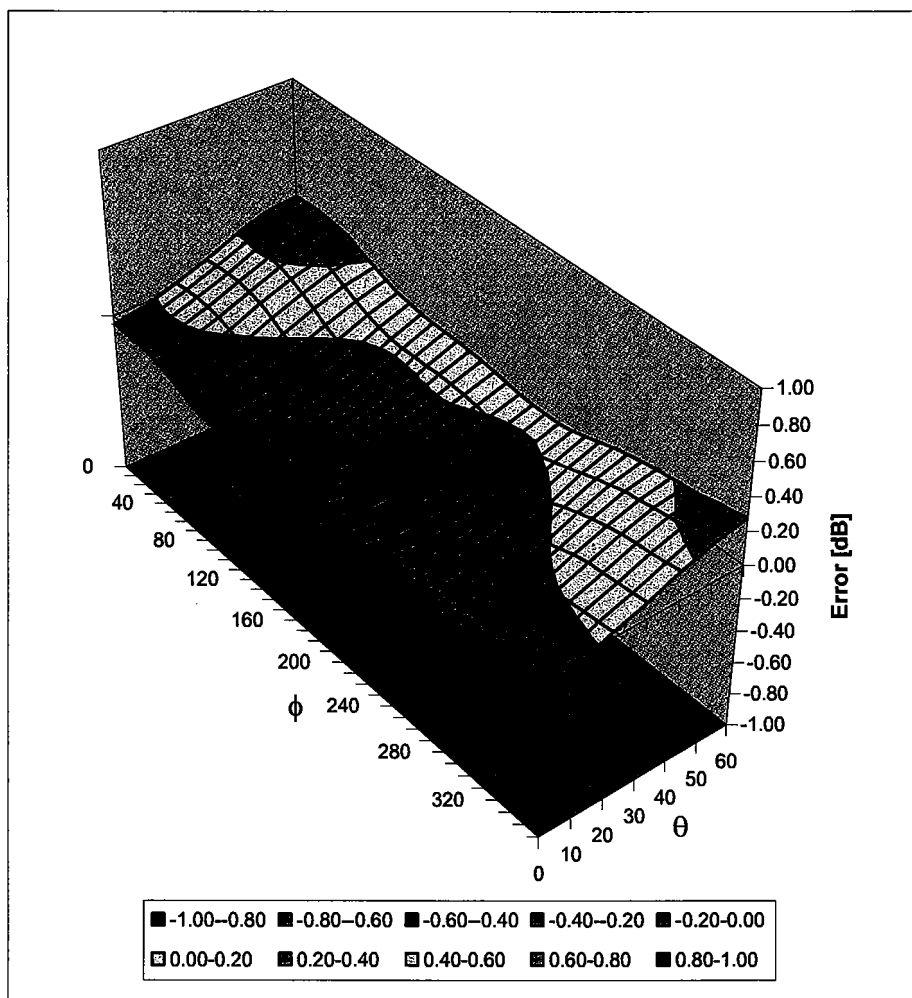


f [MHz]	Validity [MHz] ^B	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	800-1000	Head	41.5 ± 5%	0.97 ± 5%	0.61	1.85	6.25 ± 9.5% (k=2)
1800	1710-1910	Head	40.0 ± 5%	1.40 ± 5%	0.50	2.58	5.16 ± 9.5% (k=2)
1950	1900-2000	Head	40.0 ± 5%	1.40 ± 5%	0.58	2.45	4.87 ± 9.5% (k=2)
900	800-1000	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>	<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	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)			<i>k</i> =2				19.92	18.48	

Appendix 7

Photographs of the device under test



Figure 1. Front of Phone



Figure 2. Back of Phone

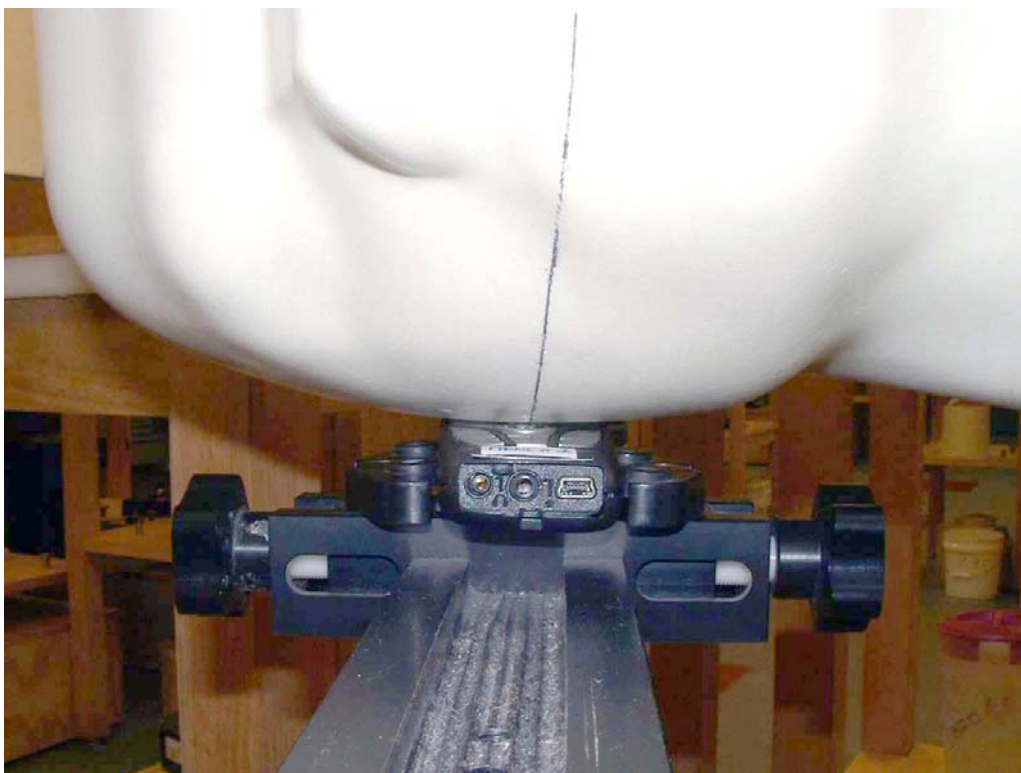


Figure 3. Phone Against the Head Phantom (Front View - Cheek Touch)



Figure 4. Phone Against the Head Phantom (Back View – Cheek Touch)

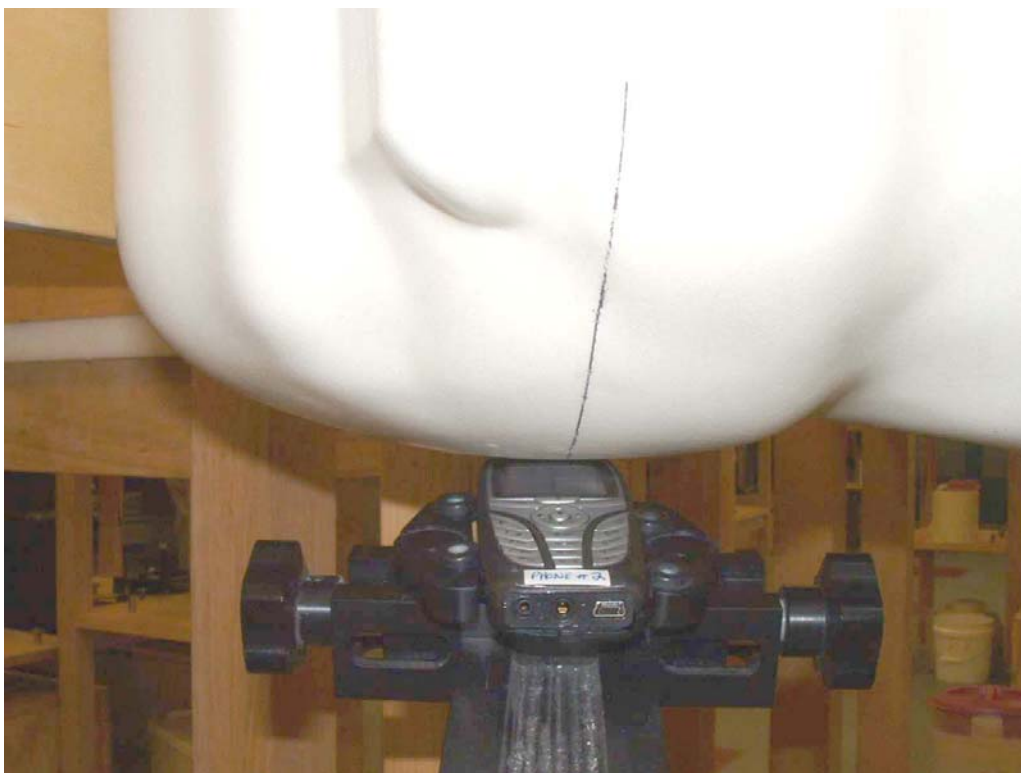


Figure 5. Phone Against the Head Phantom (Front View – 15°Tilt)



Figure 6. Phone Against the Head Phantom (Back View – 15°Tilt)

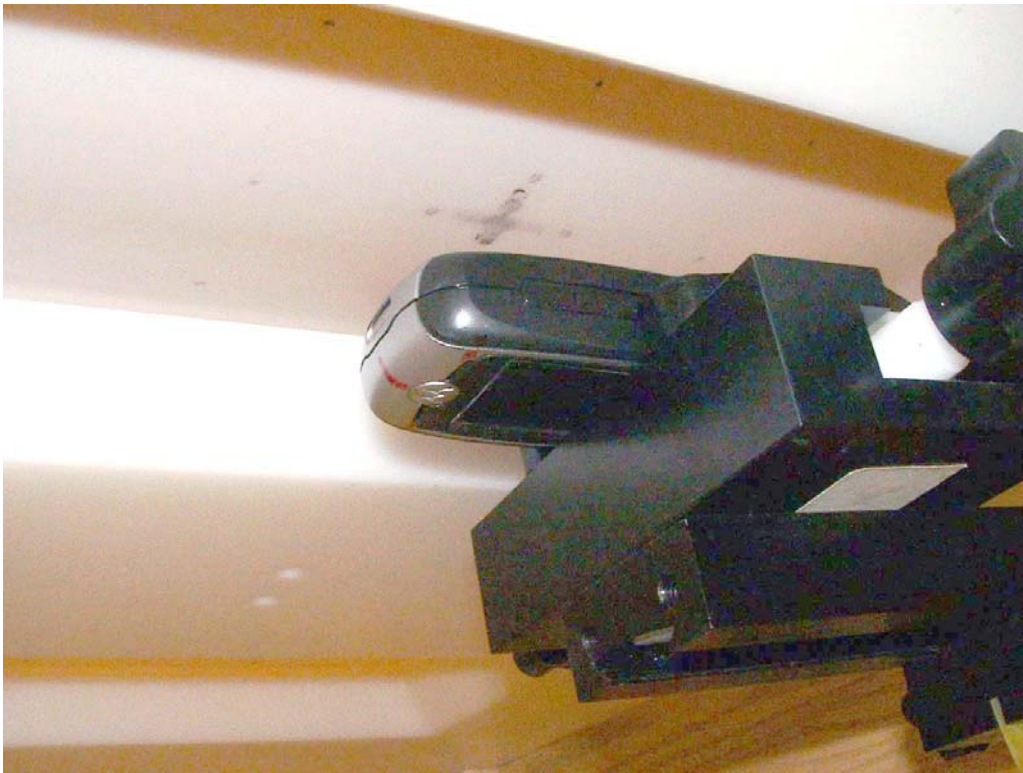


Figure 7. Phone Against the Flat Phantom