Exhibit 11: SAR Test Report IHDT56FA1

Date of test: 04/07/2005 to 04/20/2005
Date of Report: 05/03/2005

Laboratory:
Motorola Personal Communications Sector Product Safety & Compliance Laboratory
600 N. US Highway 45
Room: MW113
Libertyville, Illinois 60048

Test Responsible:
Albert Patapack
Senior Staff Engineer

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

Tests:	Procedures:
Electromagnetic Specific Absorption Rate	ANSI/IEEE C95.1-1992, 1999 (SAR) IEEE C95.3-1991 IEEE 1528, IEC 62209-1 FCC OET Bulletin 65 (*including Supplements A, B, C*) Australian Communications Authority Radio Communications (Electromagnetic Radiation – Human Exposure) Standard 1999 CENELEC EN 50361 (2001)
Simulated Tissue Preparation	APP-0247
RF Power Measurement	DOI-0876, 0900, 0902, 0904, 0915

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 IHDT56FA1 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)

©Motorola, Inc. 2005
This test report shall not be reproduced except in full, without written approval of the laboratory.

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

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

Table of Contents

1. INTRODUCTION 3

2. DESCRIPTION OF THE DEVICE UNDER TEST 3

2.1 Antenna description 3

2.2 Device description 3

3. TEST EQUIPMENT USED 4

3.1 Dosimetric System 4

3.2 Additional Equipment 4

4. ELECTRICAL PARAMETERS OF THE TISSUE SIMULATING LIQUID 5

5. SYSTEM ACCURACY VERIFICATION 5

6. TEST RESULTS 7

6.1 Head Adjacent Test Results 7

6.2 Body Worn Test Results 10

APPENDIX 1: SAR DISTRIBUTION COMPARISON FOR SYSTEM ACCURACY VERIFICATION 13

APPENDIX 2: SAR DISTRIBUTION PLOTS FOR PHANTOM HEAD ADJACENT USE 14

APPENDIX 3: SAR DISTRIBUTION PLOTS FOR BODY WORN CONFIGURATION 15

APPENDIX 4: PROBE CALIBRATION CERTIFICATE 16

APPENDIX 5: MEASUREMENT UNCERTAINTY BUDGET 17

APPENDIX 6: PHOTOGRAPHS OF DEVICE UNDER TEST 20

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 IHDT56FA1). 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	100 mm
	Width	8 mm
Configuration	Extendable Whip	

2.2 Device description

FCC ID Number	**IHDT56FA1**		
Serial number	FC990BFA		
Mode(s) of Operation	800 AMPS	800 CDMA	1900 CDMA
Modulation Mode(s)	AMPS	CDMA	CDMA
Maximum Output Power Setting	27.8dBm	25.00dBm	25.00dBm
Duty Cycle	1:1	1:1	1:1
Transmitting Frequency Rang(s)	824.04-848.97 MHz	824.70-848.31 MHz	1851-1909MHz
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 ±11.7% (K=1) with an expanded uncertainty of ±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
DASY4 DAE4	376	01/13/2006
	316	01/13/2006
E-Field Probe ES3DV3	3037	11/25/2005
	1398	02/24/2006
Dipole Validation Kit, D900V2	80	
	91	
S.A.M. Phantom used for 800MHz	TP-1153	
Dipole Validation Kit, D1800V2	251tr	
S.A.M. Phantom used for 1900MHz	TP-1159	

3.2 Additional Equipment

Description	Serial Number	Cal Due Date
Signal Generator HP8648C	3847A04844	10/25/2005
	3847A04832	09/03/2005
Power Meter E4419B	GB39511088	12/16/2005
	GB39511087	01/25/2006
Power Sensor #1 – E9301A	US39210916	09/16/2005
	US39210931	09/16/2005
Power Sensor #2 - 8481A	US39210915	09/16/2005
	US39210932	09/16/2005
Network Analyzer HP8753ES	US39171846	09/03/2005
Dielectric Probe Kit HP85070C	US99360070	

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,** 04/07/2005	41.8	0.91	20.0
		Measured, 04/08/2005	41.8	0.91	20.0
		Recommended Limits	41.5 ±5%	0.90 ±5%	18-25
	Body	**Measured,** 04/11/2005	53.7	0.98	20.5
		Measured, 04/12/2005	53.4	0.97	20.5
		Measured, 04/13/2005	54.4	0.98	19.6
		Measured, 04/17/2005	54.0	0.98	20.0
		Measured, 04/18/2005	54.5	0.98	20.0
		Measured, 04/20/2005	53.4	0.97	20.0
		Recommended Limits	55.2 ±5%	0.97 ±5%	18-25
1880	Head	**Measured,** 04/09/2005	38.3	1.46	20.0
		Measured, 04/10/2005	38.2	1.44	20.0
		Recommended Limits	40.0 ±5%	1.40 ±5%	18-25
	Body	**Measured,** 04/11/2005	52.1	1.59	18.9
		Measured, 04/13/2005	52.1	1.59	19.1
		Measured, 04/18/2005	51.6	1.59	18.9
		Recommended Limits	53.3 ±5%	1.52 ±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	--	--
DGBE	--	--	47.0	30.80
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 DASY4.4 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 in Section 8.3.7 Reference SAR Values in IEEE 1528. 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,** 04/07/2005	10.98	41.0	0.97	21.0	20.0
	Measured, 04/08/2005	11.08	39.9	0.96	21.0	19.4
	Measured, 04/11/2005	11.00	42.3	0.97	20.0	20.5
	Measured, 04/12/2005	11.10	41.7	0.98	21.0	20.2
	Measured, 04/13/2005	10.98	41.8	0.98	20.0	20.1
	Measured, 04/16/2005	11.23	41.2	0.98	21.0	20.0
	Measured, 04/18/2005	11.15	41.5	0.98	21.0	20.2
	Measured, 04/20/2005	11.10	40.9	0.97	21.0	18.7
	Recommended Limits	10.8	41.5 ±5%	0.97 ±5%	18-25	18-25
1800	**Measured,** 04/09/2005	38.00	38.7	1.37	21.0	19.0
	Measured, 04/10/2005	37.73	38.6	1.36	21.0	19.0
	Measured, 04/11/2005	38.80	38.6	1.36	21.0	18.8
	Measured, 04/13/2005	37.15	39.6	1.36	20.0	19.1
	Measured, 04/18/2005	37.23	39.1	1.36	21.0	18.9
	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 ES3DV3	SN3037	900	6.11	8 of 9
		1810	5.16	8 of 9
E-Field Probe ET3DV6	SN1398	900	6.42	8 of 9
		1810	5.12	8 of 9

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 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 DASY 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 (± 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.

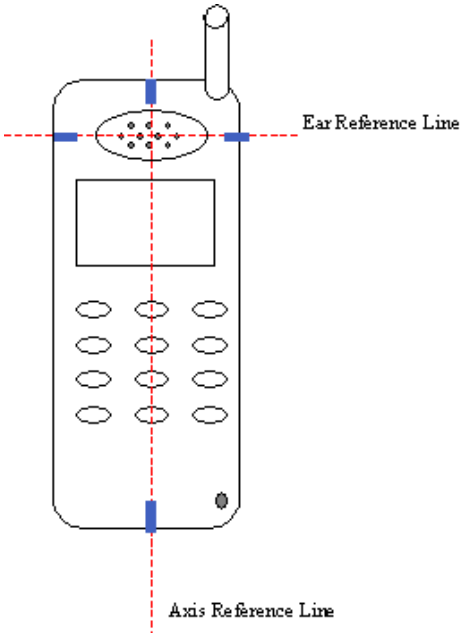
The Cellular Phone (FCC ID IHDT56FA1) has the SNN5762AA as the only available battery option. This battery was used to do all of the SAR testing. The phone was placed in the SAR measurement system with a fully charged battery.

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 through 4 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 New SAR = Old SAR * 10^(-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 ES3DV3	SN3037	900	6.11	8 of 9
		1810	5.16	8 of 9
E-Field Probe ET3DV6	SN1398	900	6.42	8 of 9
		1810	5.12	8 of 9

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)
Analog 800MHz	Channel 991	27.83	1.36	0.02	1.36	20.0	**1.48**	**-0.19**	**1.55**	**20.0**
	Channel 384	27.85	1.45	0.43	1.45	20.0	1.31	0.02	1.31	20.0
	Channel 799	27.75	1.35	-0.03	1.36	20.0	1.28	-0.3	1.37	19.2
Digital 800MHz	Channel 1013	24.93	**1.34**	**-0.01**	**1.34**	**20.0**	**1.46**	**-0.13**	**1.50**	**19.9**
	Channel 384	24.95	1.32	0.03	1.32	20.0	0.996	0.09	1.00	20
	Channel 777	24.93	1.16	-0.27	1.23	19.9	1.33	-0.33	1.43	20
Digital 1900MHz	Channel 25	25.02					1.08	0.07	1.08	19
	Channel 600	24.87	0.495	0.12	0.50	19	1.2	0.146	1.20	19
	Channel 1175	24.88					1.39	-0.13	1.43	19

Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT56FA1 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)
Analog 800MHz	Channel 991	27.83	**1.51**	**0.03**	**1.51**	**20**	1.44	-0.17	1.50	20
	Channel 384	27.85	1.43	0.18	1.43	20	1.37	-0.01	1.37	20
	Channel 799	27.75	1.32	-0.14	1.36	20	1.38	-0.3	1.48	20
Digital 800MHz	Channel 1013	24.93	1.26	0.03	1.26	20	1.39	-0.06	1.41	20
	Channel 384	24.95	1.28	0.15	1.28	20	0.988	-0.16	1.02	20
	Channel 777	24.93	1.14	-0.23	1.20	20	1.38	-0.06	1.40	20
Digital 1900MHz	Channel 25	25.02					1.2	-0.09	1.23	19
	Channel 600	24.87	**0.549**	**0.103**	**0.55**	**19**	1.17	-0.03	1.18	19
	Channel 1175	24.88					**1.41**	**-0.07**	**1.43**	**19**

Table 2: SAR measurement results for the portable cellular telephone FCC ID IHDT56FA1 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)
Analog 800MHz	Channel 991	27.83								
	Channel 384	27.85	**0.396**	**0.459**	**0.40**	**20**	0.357	-0.24	0.38	20
	Channel 799	27.75								
Digital 800MHz	Channel 1013	24.93								
	Channel 384	24.95	**0.364**	**-0.08**	**0.37**	**20**	**0.294**	**0.03**	**0.29**	**20**
	Channel 777	24.93								
Digital 1900MHz	Channel 25	25.02								
	Channel 600	24.87	**0.192**	**0.07**	**0.19**	**19**	**0.284**	**-0.07**	**0.29**	**19**
	Channel 1175	24.88								

Table 3: SAR measurement results for the portable cellular telephone FCC ID IHDT56FA1 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)
Analog 800MHz	Channel 991	27.83								
	Channel 384	27.85	0.37	0.27	0.37	20	**0.376**	**0.15**	**0.38**	**20**
	Channel 799	27.75								
Digital 800MHz	Channel 1013	24.93								
	Channel 384	24.95	0.359	0.41	0.36	20	0.286	0.1	0.29	20
	Channel 777	24.93								
Digital 1900MHz	Channel 25	25.02								
	Channel 600	24.87	0.139	-0.07	0.14	19	0.205	0.06	0.21	19
	Channel 1175	24.88								

Table 4: SAR measurement results for the portable cellular telephone FCC ID IHDT56FA1 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 5 through 7 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 New SAR = Old SAR * 10^(-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.

There is one Body-Worn Accessories available for this phone:
A Plastic Holster and Belt Clip: Model #1571091B01
The Plastic Holster 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 ES3DV3	SN3037	900	6.00	8 of 9
		1810	4.71	8 of 9
E-Field Probe ET3DV6	SN1398	900	6.04	8 of 9
		1810	4.65	8 of 9

f (MHz)	Description	Conducted Output Power (dBm)	Body Worn with 1571091B01 holster							
			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)
Analog 800MHz	Channel 991	27.83	1.27	0.03	1.27	19.1	**1.44**	**-0.38**	**1.57**	**20.5**
	Channel 384	27.85	**1.4**	**0.13**	**1.40**	**19.1**	0.877	0.049	0.88	20.5
	Channel 799	27.75	1.03	-0.06	1.04	19.1	0.98	-0.47	1.09	20.5
Digital 800MHz	Channel 1013	24.93								
	Channel 384	24.95	**0.644**	**0.08**	**0.64**	**20.5**	**0.386**	**0.05**	**0.39**	**20.5**
	Channel 777	24.93								
Digital 1900MHz	Channel 25	25.02								
	Channel 600	24.87	**0.23**	**0.07**	**0.23**	**18.9**	**0.546**	**-0.05**	**0.55**	**18.9**
	Channel 1175	24.88								

Table 5: SAR measurement results for the portable cellular telephone FCC ID IHDT56FA1 at highest possible output power. Measured against the body.

f (MHz)	Description	Conducted Output Power (dBm)	Body Worn front of phone 25mm from phantom							
			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)
Analog 800MHz	Channel 991	27.83								
	Channel 384	27.85	**0.267**	**0**	**0.27**	**20**	**0.435**	**0.03**	**0.44**	**20**
	Channel 799	27.75								
Digital 800MHz	Channel 1013	24.93								
	Channel 384	24.95	**0.365**	**0.084**	**0.37**	**20**	**0.195**	**0**	**0.20**	**20**
	Channel 777	24.93								
Digital 1900MHz	Channel 25	25.02								
	Channel 600	24.87	**0.181**	**-0.08**	**0.18**	**18.9**	**0.277**	**-0.09**	**0.28**	**18.9**
	Channel 1175	24.88								

Table 6: SAR measurement results for the portable cellular telephone FCC ID IHDT56FA1 at highest possible output power. Measured against the body.

f (MHz)	Description	Conducted Output Power (dBm)	Body Worn back of phone 25mm from phantom							
			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)
Analog 800MHz	Channel 991	27.83					**0.962**	**-0.29**	**1.03**	**19.6**
	Channel 384	27.85	**0.735**	**-0.02**	**0.74**	**19.6**	0.6	0.1	0.6	19.6
	Channel 799	27.75								
Digital 800MHz	Channel 1013	24.93								
	Channel 384	24.95	**0.427**	**-0.17**	**0.44**	**19.6**	**0.311**	**0**	**0.31**	**19.6**
	Channel 777	24.93								
Digital 1900MHz	Channel 25	25.02								
	Channel 600	24.87	**0.44**	**0.02**	**0.44**	**19.1**	**0.257**	**-0.15**	**0.27**	**19.1**
	Channel 1175	24.88								

Table 7: SAR measurement results for the portable cellular telephone FCC ID IHDT56FA1 at highest possible output power. Measured against the body.

Appendix 1

SAR distribution comparison for the system accuracy verification

Date/Time: 4/7/2005 7:28:37AM

Test Laboratory: Motorola

040705 900Mhz GOOD 1.6%

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 = 20.3 ┌C Sim.Temp@SPC = 20.2 ┌C Room Temp @ SPC = 21 ┌C

Communication System: CW - Dipole; Frequency: 900 MHz; Channel Number: 4; Duty Cycle: 1:1;

Medium: VALIDATION Only; Medium parameters used: $\sigma = 0.97$ mho/m, $\varepsilon_r = 41$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

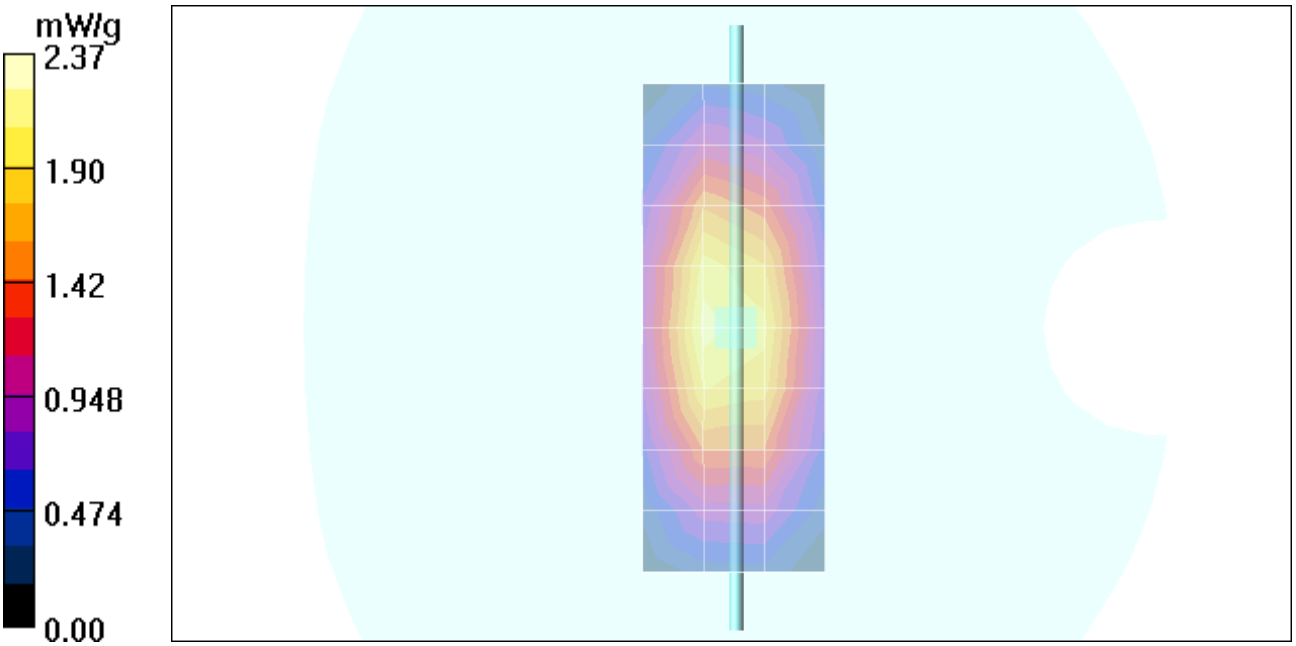
Daily SPC Check/Dipole Area Scan (4x9x1): \

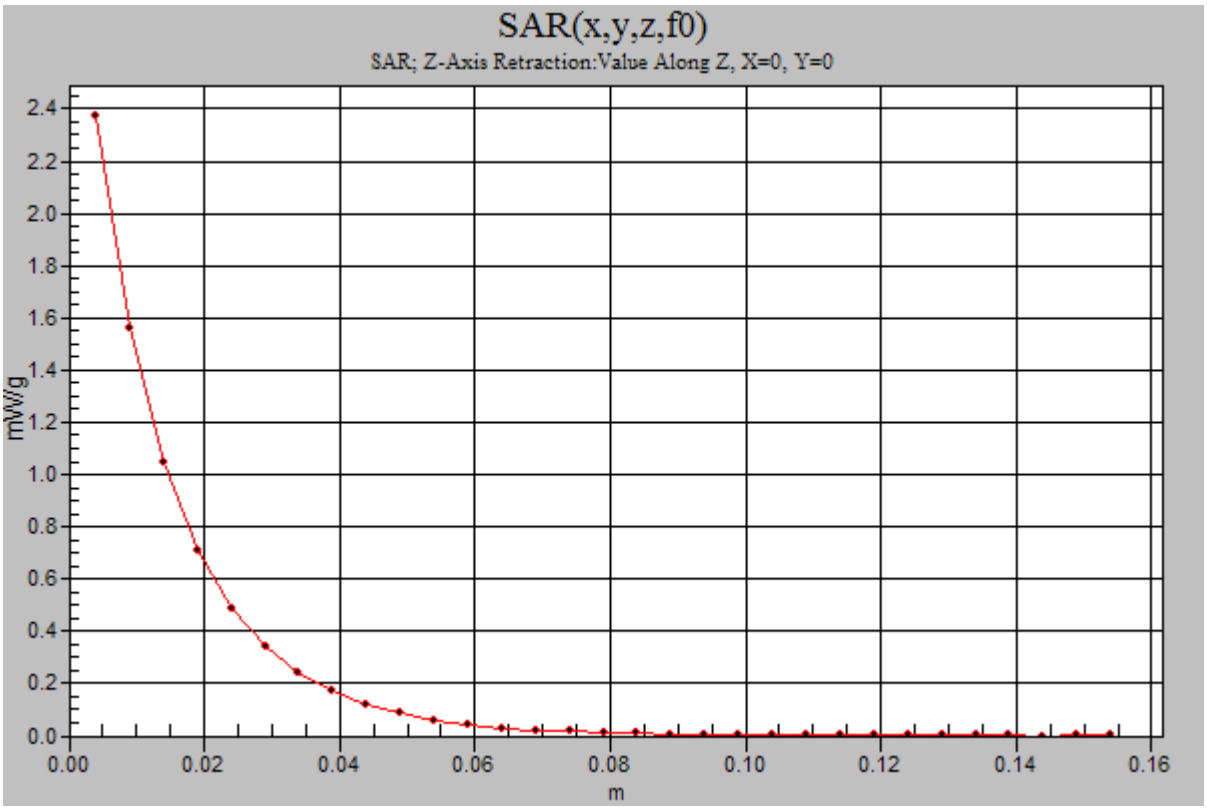
Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.13 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.0 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 3.32 W/kg
SAR(1 g) = 2.19 mW/g; SAR(10 g) = 1.41 mW/g
Maximum value of SAR (measured) = 2.37 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.0 V/m; Power Drift = -0.016 dB
Peak SAR (extrapolated) = 3.32 W/kg
SAR(1 g) = 2.2 mW/g; SAR(10 g) = 1.42 mW/g
Maximum value of SAR (measured) = 2.30 mW/g

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


mW/g
2.37
1.90
1.42
0.948
0.474
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 4/8/2005 10:38:16AM

Test Laboratory: Motorola

040805 900Mhz GOOD in IEEE Only 2.5%

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:080;

Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 080 PM1 Power = 200 mW

Sim.Temp@meas = 19.4 Sim.Temp@SPC = 19.4 Room Temp @ SPC = 21

Communication System: CW - Dipole; Frequency: 900 MHz; Channel Number: 4; Duty Cycle: 1:1;

Medium: Low Freq Head; Medium parameters used: σ = 0.96 mho/m, ε_r = 39.9; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.11 mW/g

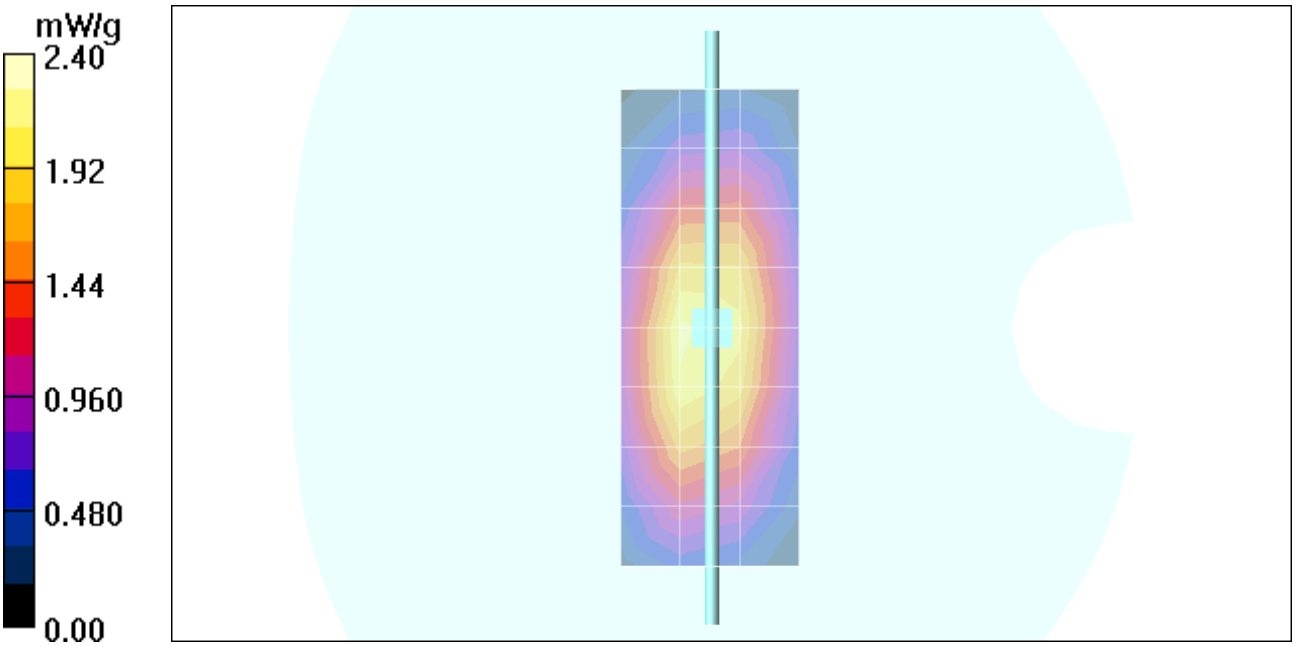
Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

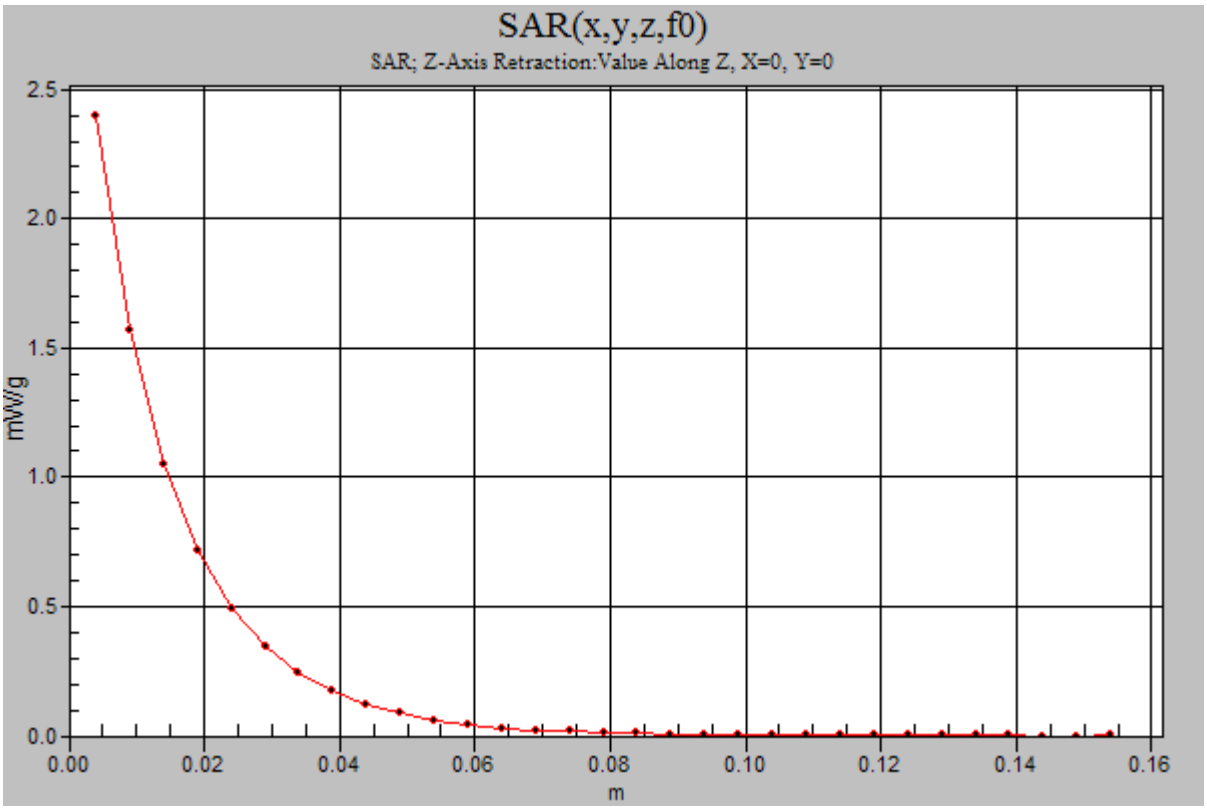
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.7 V/m; Power Drift = -0.070 dB
Peak SAR (extrapolated) = 3.36 W/kg
SAR(1 g) = 2.21 mW/g; SAR(10 g) = 1.41 mW/g
Maximum value of SAR (measured) = 2.40 mW/g

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

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.7 V/m; Power Drift = -0.070 dB
Peak SAR (extrapolated) = 3.37 W/kg
SAR(1 g) = 2.22 mW/g; SAR(10 g) = 1.42 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


mW/g
2.40
1.92
1.44
0.960
0.480
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 4/9/2005 7:14:01PM

Test Laboratory: Motorola

040905 1800Mhz GOOD-.3%

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:xxx;

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

Sim.Temp@meas = 18.9 Sim.Temp@SPC = 19 Room Temp @ SPC = 21

Communication System: CW - Dipole; Frequency: 1800 MHz; Channel Number: 8; Duty Cycle: 1:1;

Medium: VALIDATION Only; Medium parameters used: σ = 1.37 mho/m, ε_r = 38.7; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

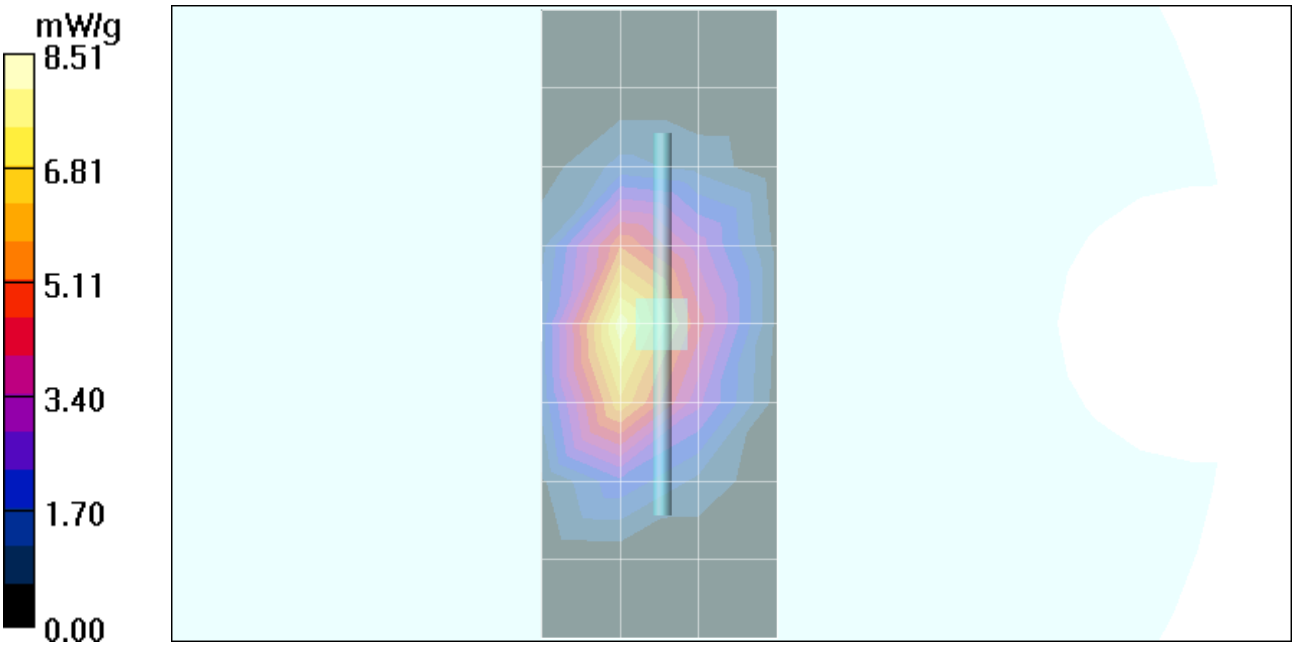
Daily SPC Check/Dipole Area Scan (4x9x1):

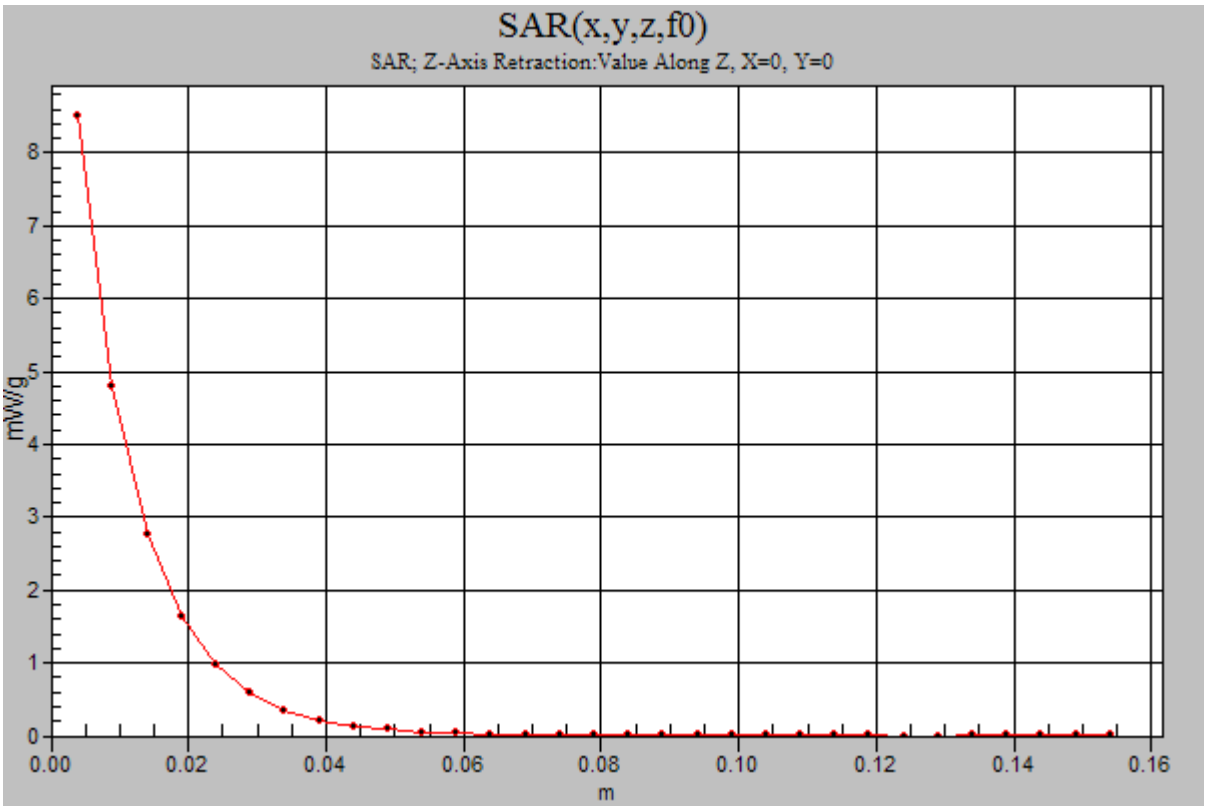
Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 7.74 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 76.4 V/m; Power Drift = 0.041 dB
Peak SAR (extrapolated) = 13.6 W/kg
SAR(1 g) = 7.59 mW/g; SAR(10 g) = 4 mW/g
Maximum value of SAR (measured) = 8.51 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 76.4 V/m; Power Drift = 0.041 dB
Peak SAR (extrapolated) = 13.5 W/kg
SAR(1 g) = 7.61 mW/g; SAR(10 g) = 4.02 mW/g
Maximum value of SAR (measured) = 8.38 mW/g

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


mW/g
8.51
6.81
5.11
3.40
1.70
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
0
1
2
3
4
5
6
7
8
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 4/10/2005 5:20:53PM

Test Laboratory: Motorola

041005 1800Mhz GOOD-1.0%

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:xxx;

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

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

Communication System: CW - Dipole; Frequency: 1800 MHz; Channel Number: 8; Duty Cycle: 1:1;

Medium: VALIDATION Only; Medium parameters used: σ = 1.36 mho/m, ε_r = 38.6; ρ = 1000 kg/m^3

DASY4 Configuration:

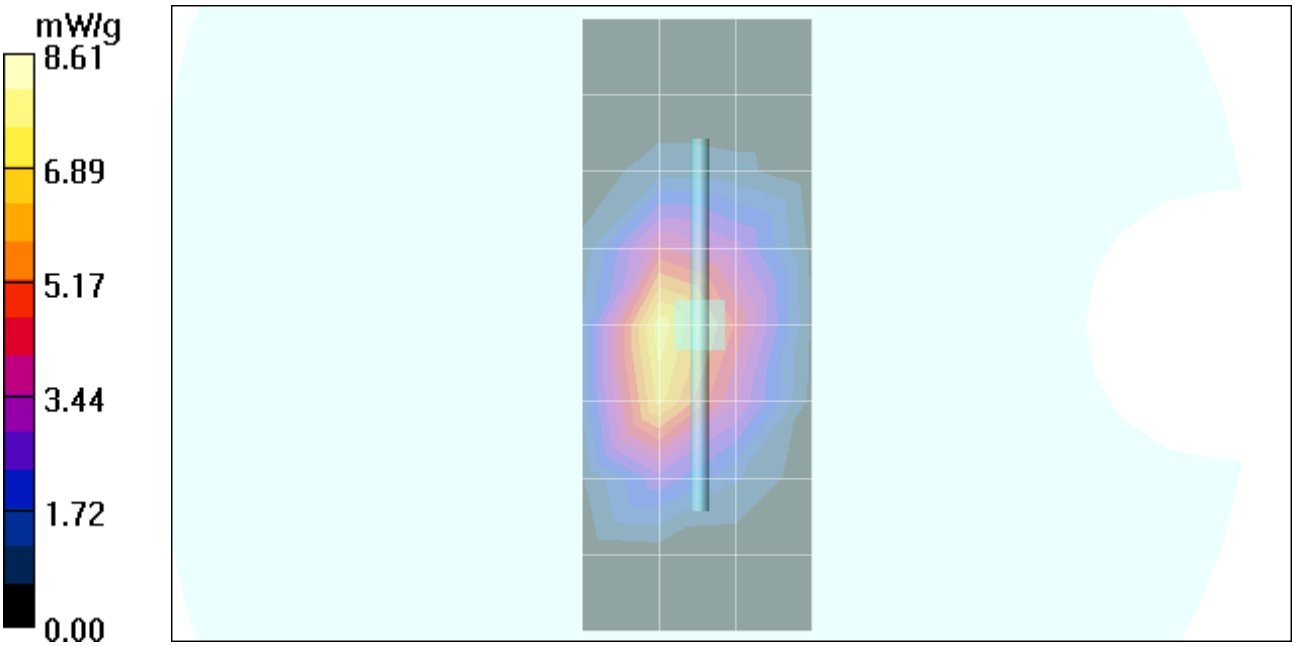
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

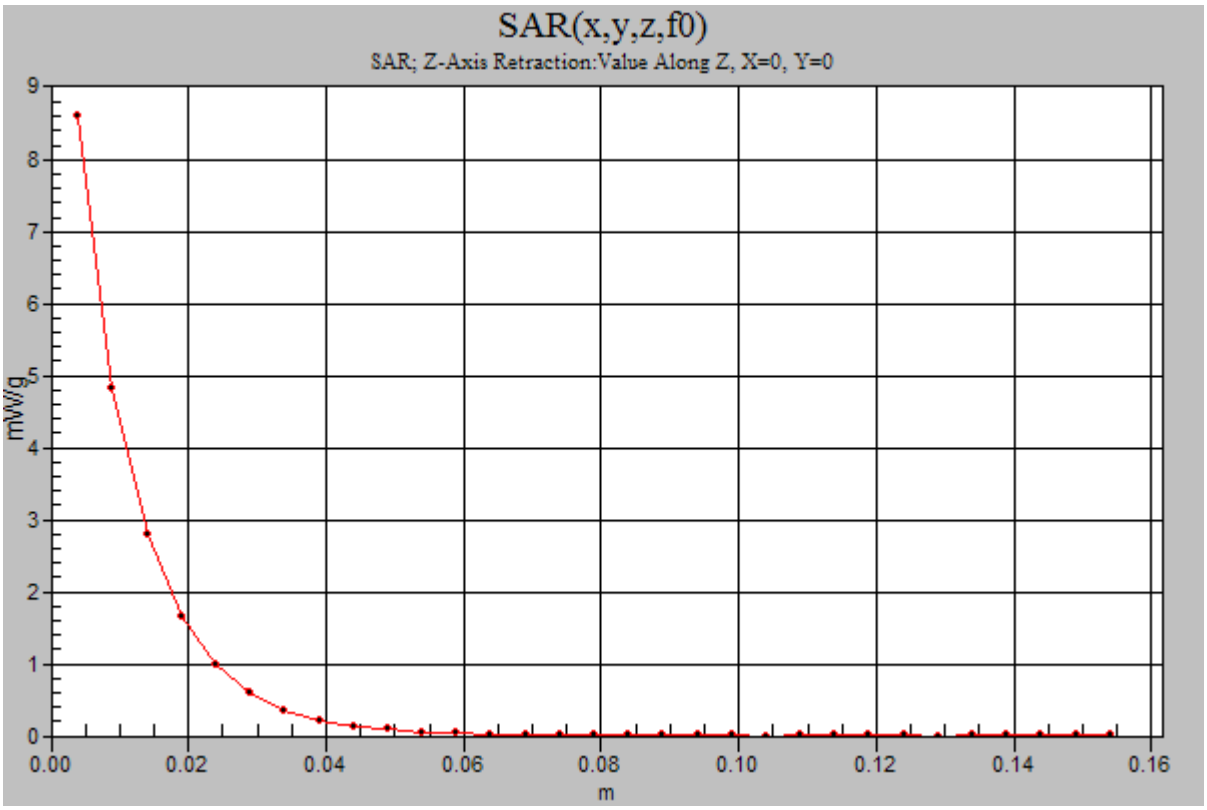
Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 7.30 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 77.3 V/m; Power Drift = 0.065 dB
Peak SAR (extrapolated) = 13.4 W/kg
SAR(1 g) = 7.54 mW/g; SAR(10 g) = 4 mW/g
Maximum value of SAR (measured) = 8.43 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 77.3 V/m; Power Drift = 0.065 dB
Peak SAR (extrapolated) = 13.4 W/kg
SAR(1 g) = 7.55 mW/g; SAR(10 g) = 4.01 mW/g
Maximum value of SAR (measured) = 8.42 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 8.61 mW/g


mW/g
8.61
6.89
5.17
3.44
1.72
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
m
0
1
2
3
4
5
6
7
8
9
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

Date/Time: 4/11/2005 6:07:52PM

Test Laboratory: Motorola

041105 900Mhz GOOD 1.9%

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

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

Sim.Temp@meas = 20.5 Sim.Temp@SPC = 20.5 Room Temp @ SPC = 20

Communication System: CW - Dipole; Frequency: 900 MHz; Channel Number: 4; Duty Cycle: 1:1;

Medium: VALIDATION Only; Medium parameters used: σ = 0.97 mho/m, ε_r = 42.3; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.15 mW/g

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

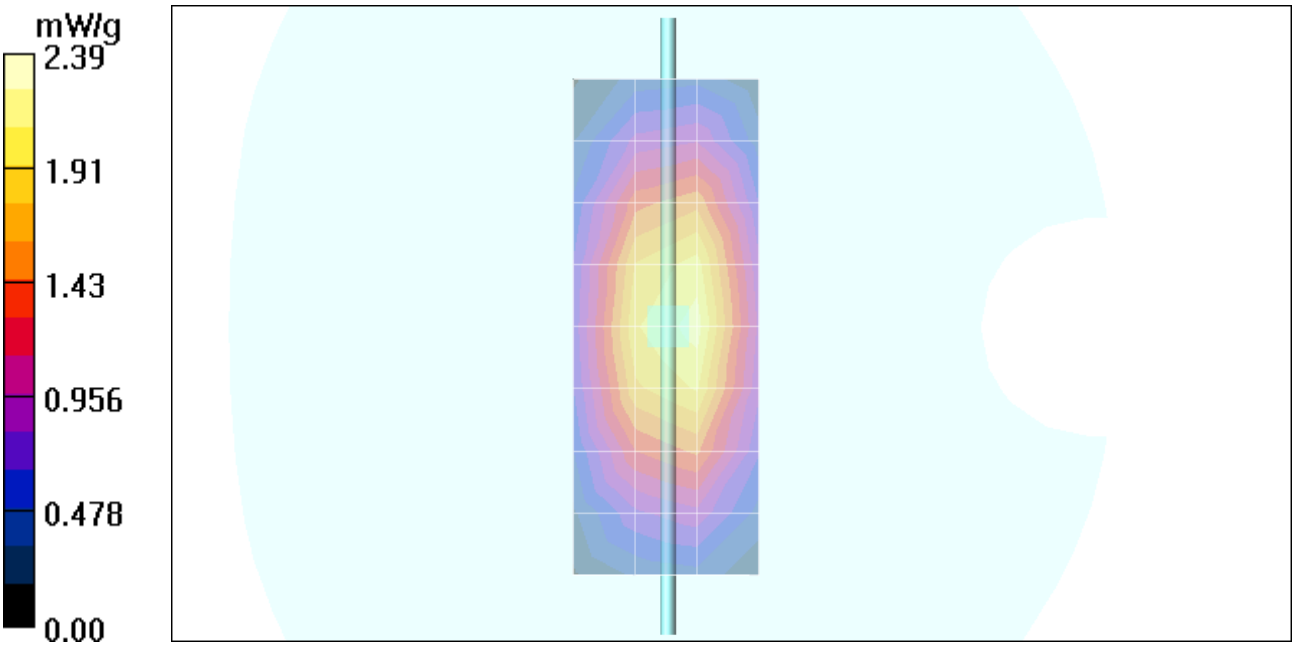
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.4 V/m; Power Drift = -0.056 dB
Peak SAR (extrapolated) = 3.32 W/kg
SAR(1 g) = 2.19 mW/g; SAR(10 g) = 1.4 mW/g
Maximum value of SAR (measured) = 2.36 mW/g

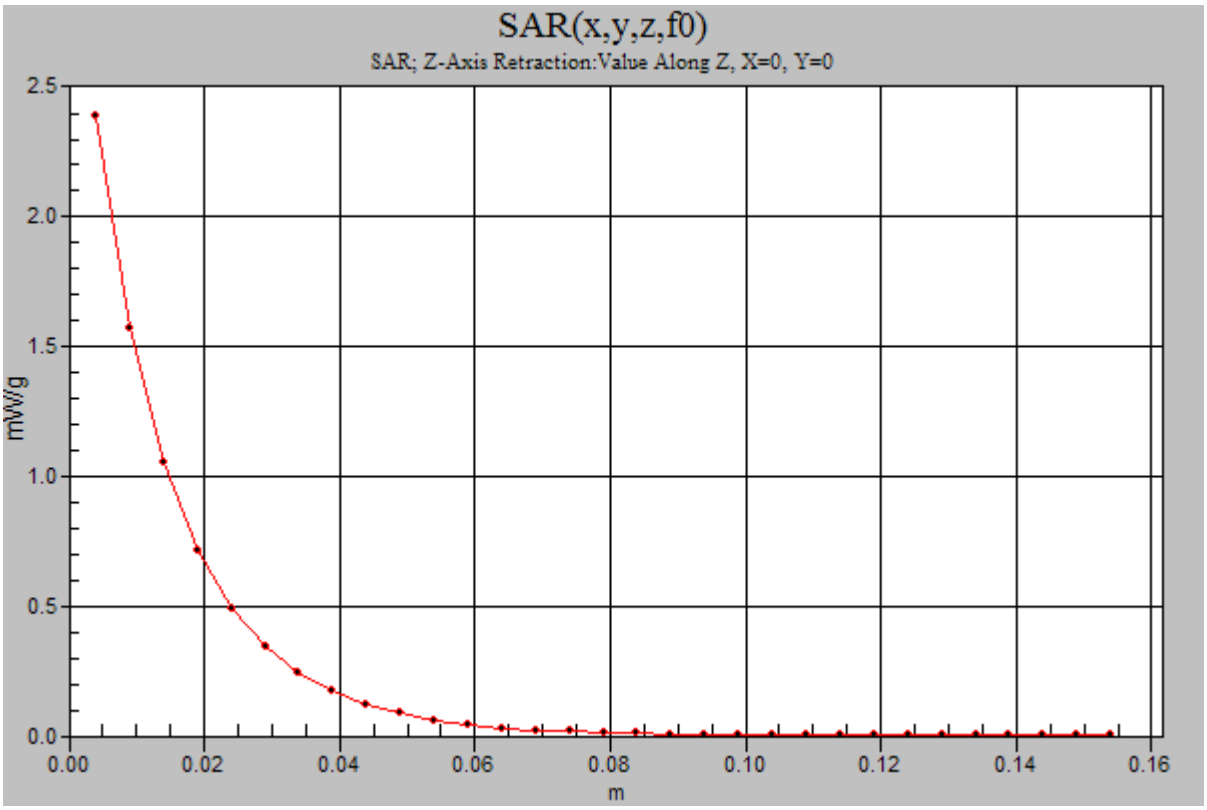
Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.4 V/m; Power Drift = -0.056 dB
Peak SAR (extrapolated) = 3.33 W/kg
SAR(1 g) = 2.21 mW/g; SAR(10 g) = 1.41 mW/g
Maximum value of SAR (measured) = 2.38 mW/g

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

Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 2.39 mW/g


mW/g
2.39
1.91
1.43
0.956
0.478
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 4/11/2005 8:25:13AM

Test Laboratory: Motorola

041105 1800Mhz GOOD 1.8%

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 = 19.0 ┌C Sim.Temp@SPC = 18.8 ┌C Room Temp @ SPC = 21 ┌C

Communication System: CW - Dipole; Frequency: 1800 MHz; Channel Number: 8; Duty Cycle: 1:1;

Medium: VALIDATION Only; Medium parameters used: σ = 1.36 mho/m, ε_r = 38.6; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 8.12 mW/g

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

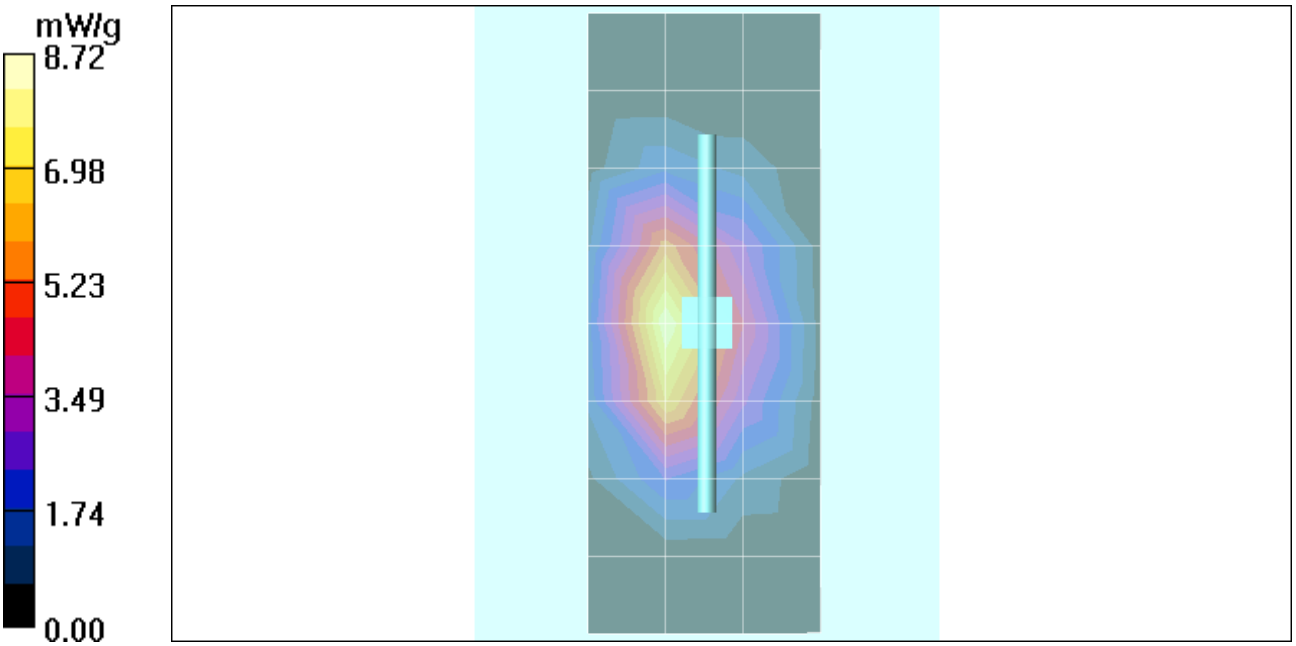
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 76.5 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 13.8 W/kg
SAR(1 g) = 7.74 mW/g; SAR(10 g) = 4.08 mW/g
Maximum value of SAR (measured) = 8.61 mW/g

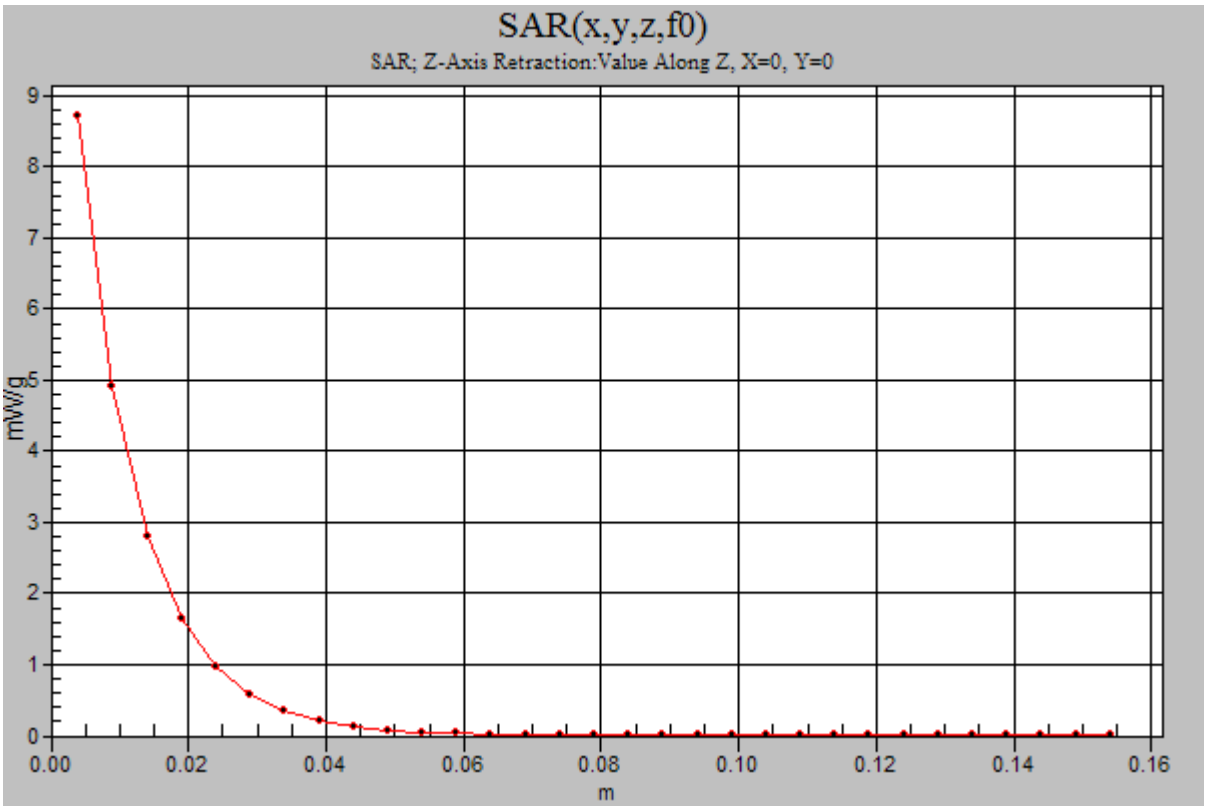
Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 76.5 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 13.9 W/kg
SAR(1 g) = 7.78 mW/g; SAR(10 g) = 4.13 mW/g
Maximum value of SAR (measured) = 8.58 mW/g

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

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 8.72 mW/g


mW/g
8.72
6.98
5.23
3.49
1.74
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
0
1
2
3
4
5
6
7
8
9
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 4/12/2005 7:35:17AM

Test Laboratory: Motorola

041205 900Mhz GOOD 2.8%

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

Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 080 PM1 Power = 200 mW

Sim.Temp@meas = 20.2 ┌C Sim.Temp@SPC = 20.2 ┌C Room Temp @ SPC = 21 ┌C

Communication System: CW - Dipole; Frequency: 900 MHz; Channel Number: 4; Duty Cycle: 1:1;

Medium: VALIDATION Only; Medium parameters used: $\sigma = 0.98$ mho/m, $\varepsilon_r = 41.7$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.08 mW/g

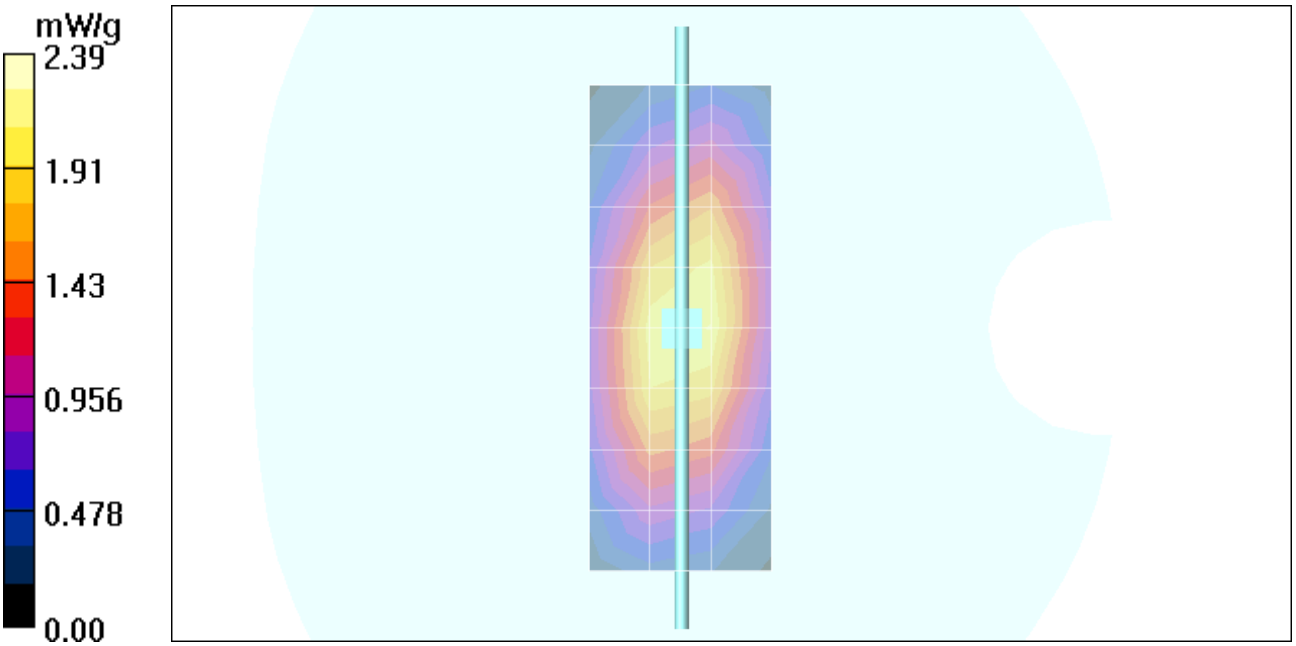
Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

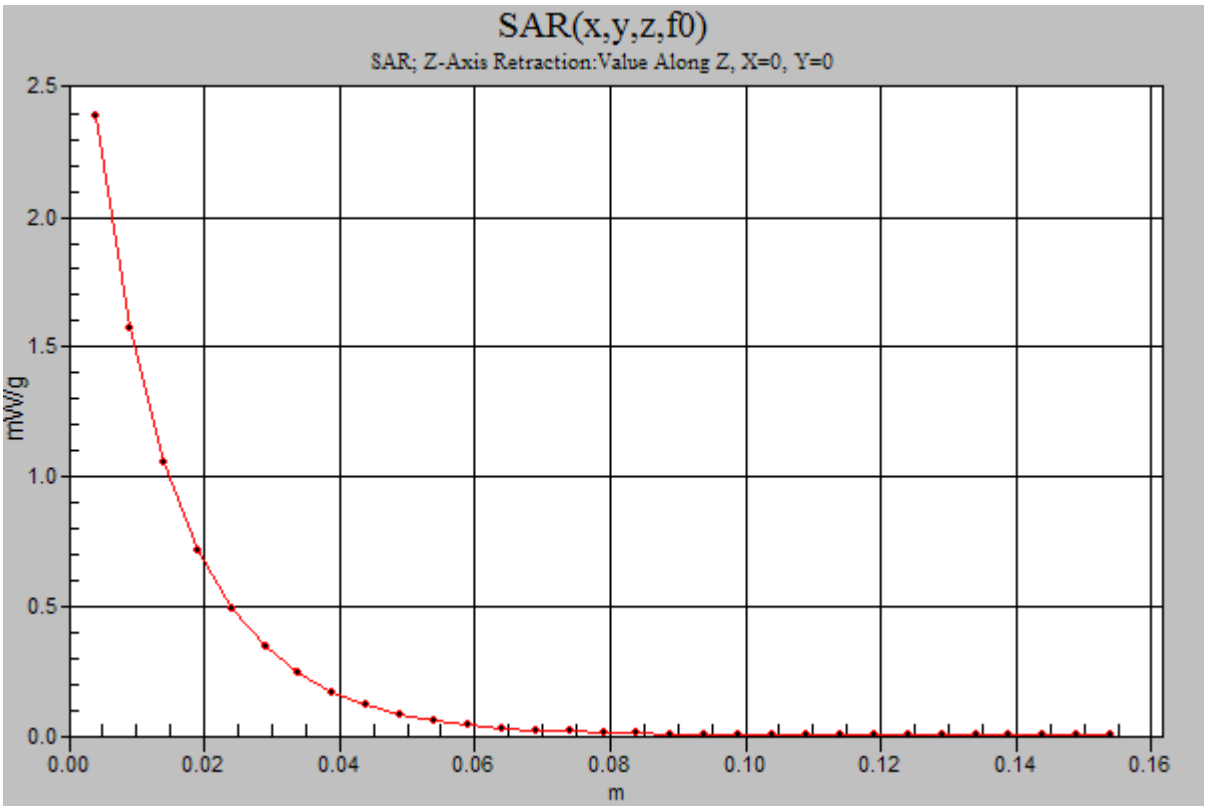
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.1 V/m; Power Drift = -0.022 dB
Peak SAR (extrapolated) = 3.35 W/kg
SAR(1 g) = 2.21 mW/g; SAR(10 g) = 1.41 mW/g
Maximum value of SAR (measured) = 2.39 mW/g

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

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.1 V/m; Power Drift = -0.022 dB
Peak SAR (extrapolated) = 3.38 W/kg
SAR(1 g) = 2.23 mW/g; SAR(10 g) = 1.42 mW/g
Maximum value of SAR (measured) = 2.40 mW/g

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


mW/g
2.39
1.91
1.43
0.956
0.478
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 4/13/2005 8:01:33 AM

Test Laboratory: Motorola

041305 900Mhz GOOD 1.6%

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

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

Medium: VALIDATION Only; Medium parameters used: σ = 0.98 mho/m, ε_r = 41.8; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.05 mW/g

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

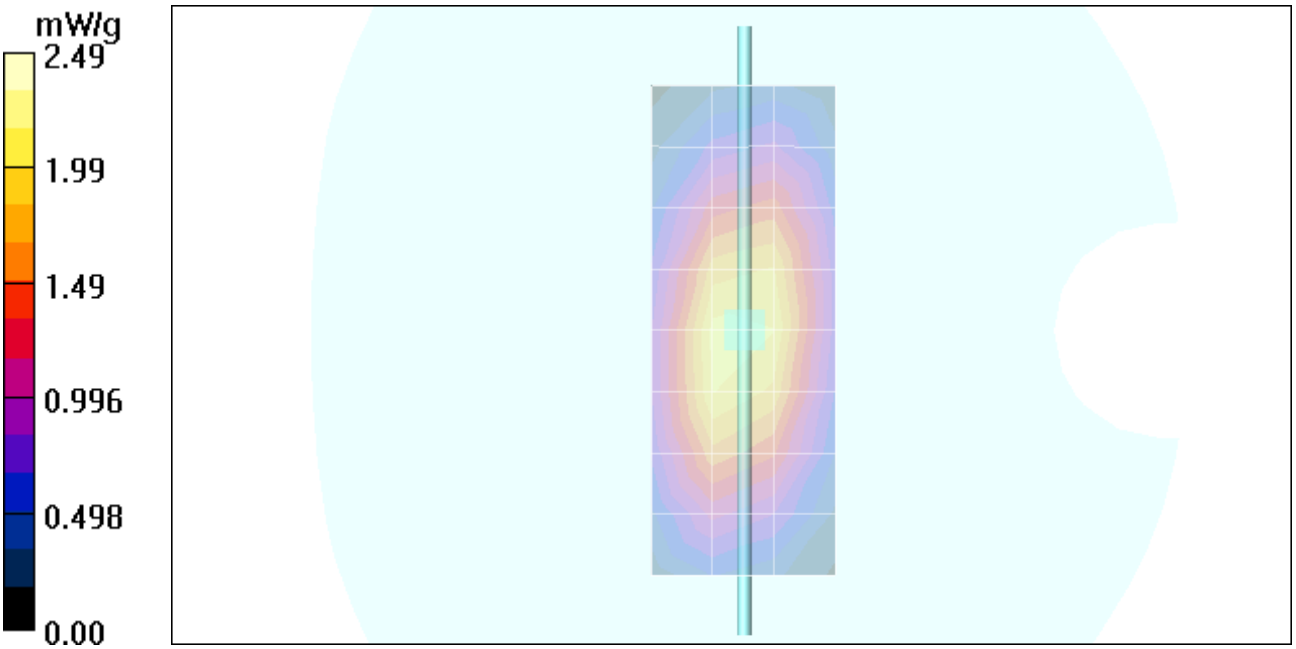
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.9 V/m; Power Drift = -0.014 dB
Peak SAR (extrapolated) = 3.32 W/kg
SAR(1 g) = 2.19 mW/g; SAR(10 g) = 1.4 mW/g
Maximum value of SAR (measured) = 2.37 mW/g

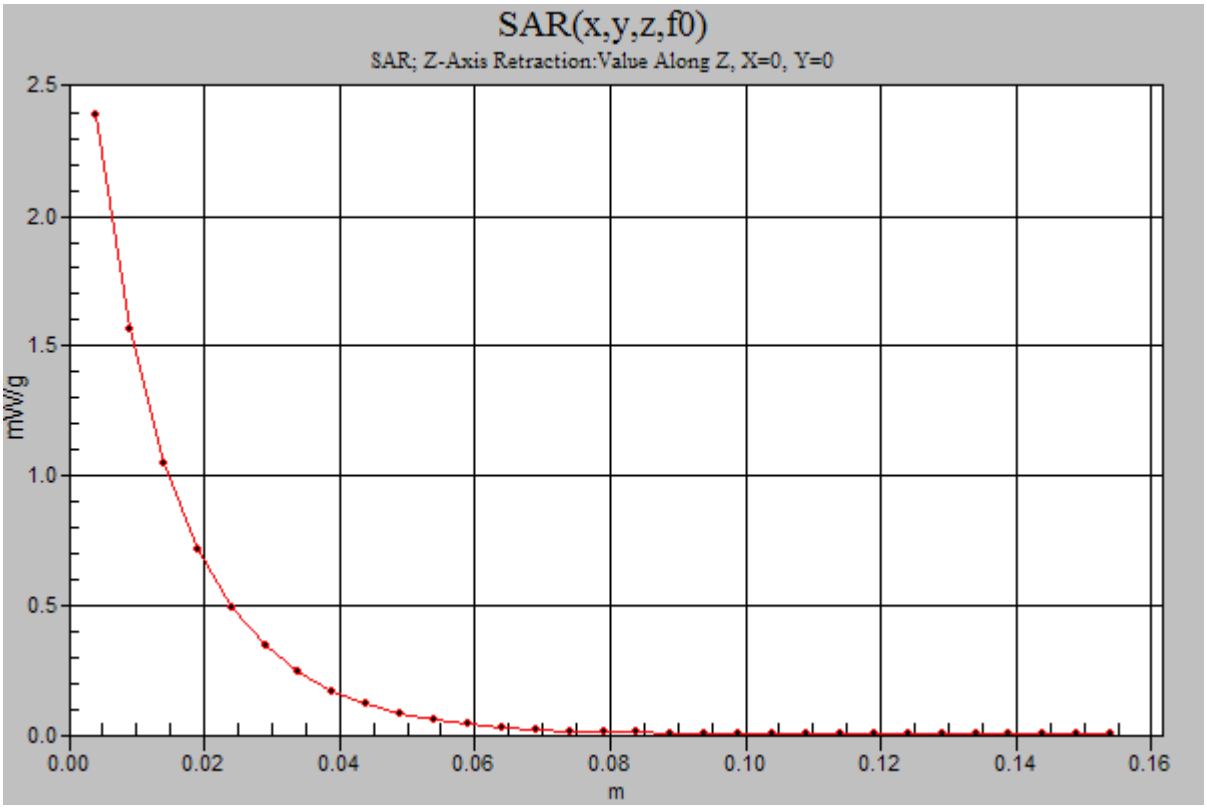
Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 49.9 V/m; Power Drift = -0.014 dB
Peak SAR (extrapolated) = 3.34 W/kg
SAR(1 g) = 2.2 mW/g; SAR(10 g) = 1.41 mW/g
Maximum value of SAR (measured) = 2.38 mW/g

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

Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 2.39 mW/g


mW/g
2.49
1.99
1.49
0.996
0.498
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 4/13/2005 6:25:34 AM

Test Laboratory: Motorola

041305 1800Mhz GOOD-2.5%

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 = 19.2 ┌C Sim.Temp@SPC = 19.1 ┌C Room Temp @ SPC = 20 ┌C

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

Medium: VALIDATION Only; Medium parameters used: σ = 1.36 mho/m, ε_r = 39.6; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 7.74 mW/g

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

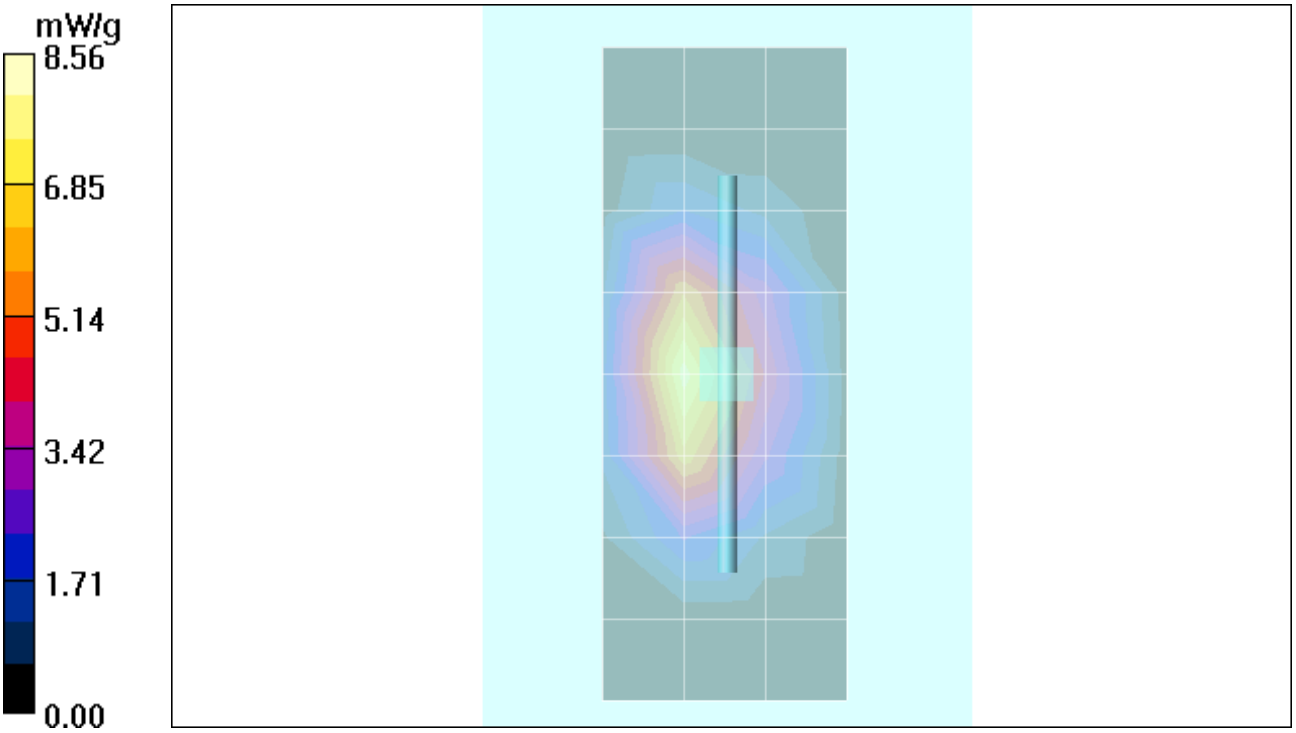
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 75.3 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 13.1 W/kg
SAR(1 g) = 7.41 mW/g; SAR(10 g) = 3.95 mW/g
Maximum value of SAR (measured) = 8.21 mW/g

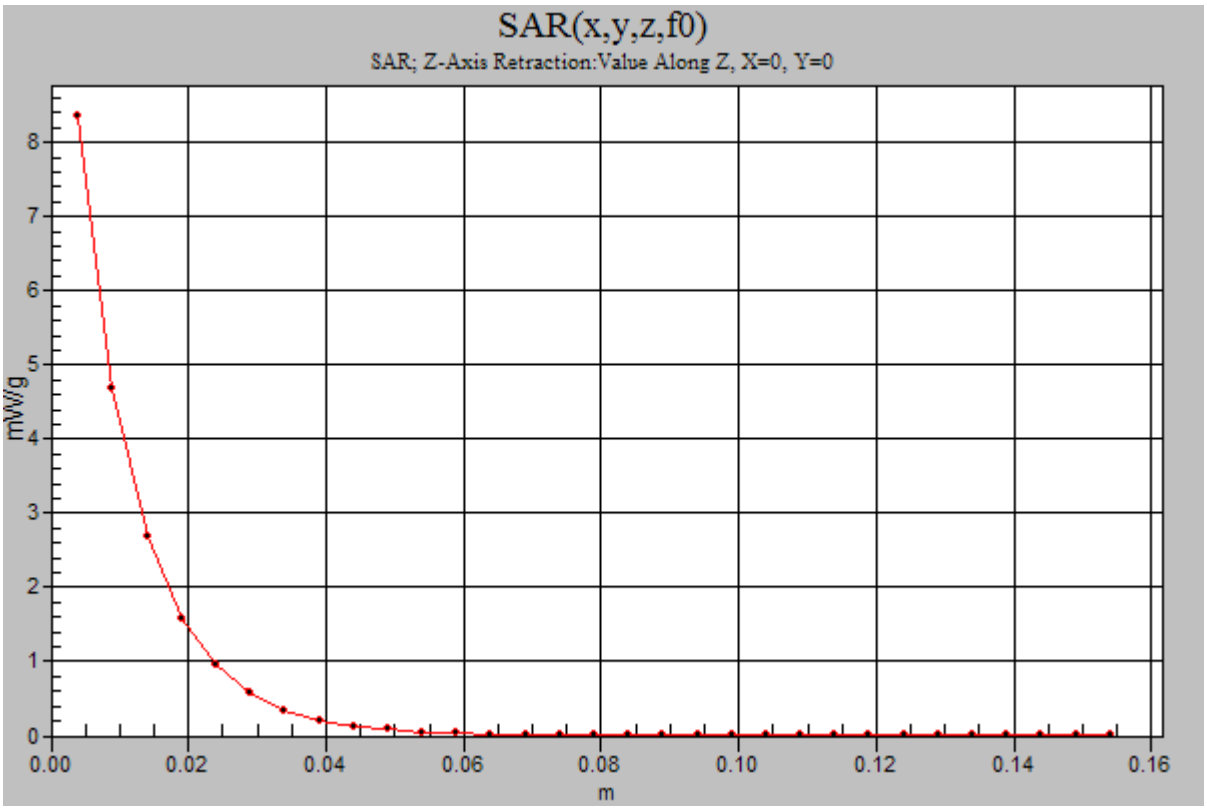
Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 75.3 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 13.2 W/kg
SAR(1 g) = 7.45 mW/g; SAR(10 g) = 3.98 mW/g
Maximum value of SAR (measured) = 8.30 mW/g

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

Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 8.36 mW/g


mW/g
8.56
6.85
5.14
3.42
1.71
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
0
1
2
3
4
5
6
7
8
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 4/16/2005 7:44:43 PM

Test Laboratory: Motorola

041605 900Mhz GOOD3.9%

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

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

Sim.Temp@meas = 20 Sim.Temp@SPC = 20 Room Temp @ SPC = 21

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

Medium: VALIDATION Only; Medium parameters used: σ = 0.98 mho/m, ε_r = 41.2; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.26 mW/g

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

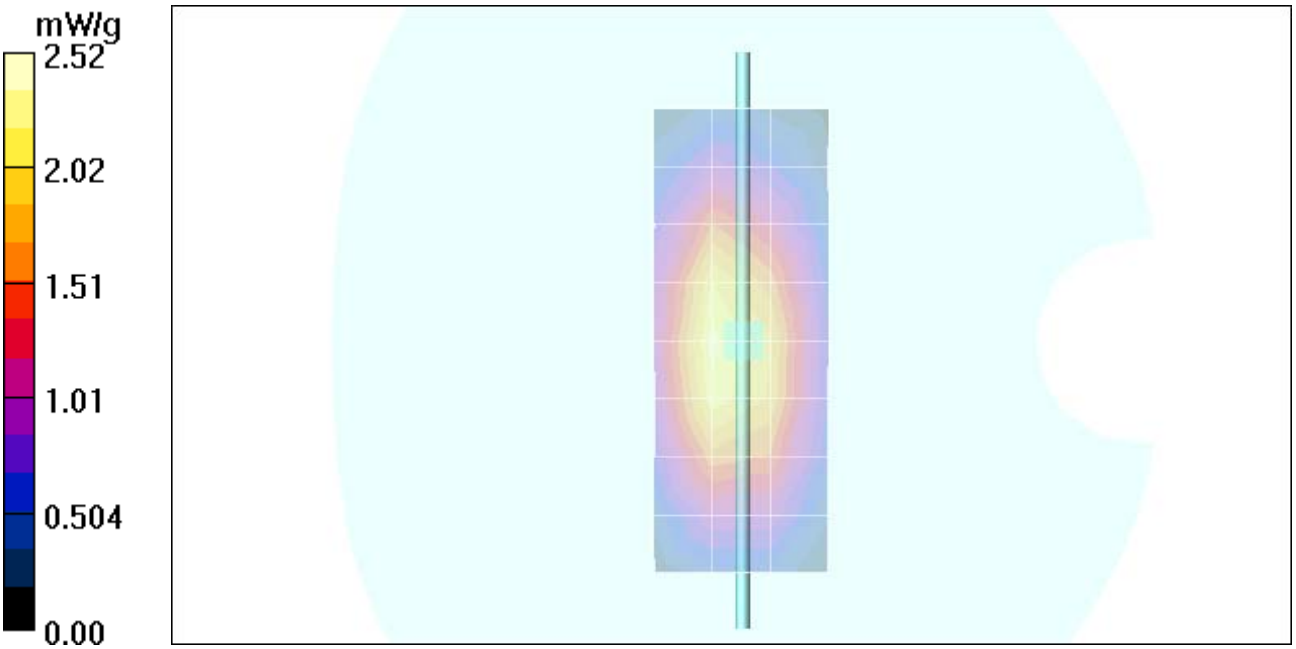
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.3 V/m; Power Drift = -0.110 dB
Peak SAR (extrapolated) = 3.38 W/kg
SAR(1 g) = 2.23 mW/g; SAR(10 g) = 1.43 mW/g
Maximum value of SAR (measured) = 2.42 mW/g

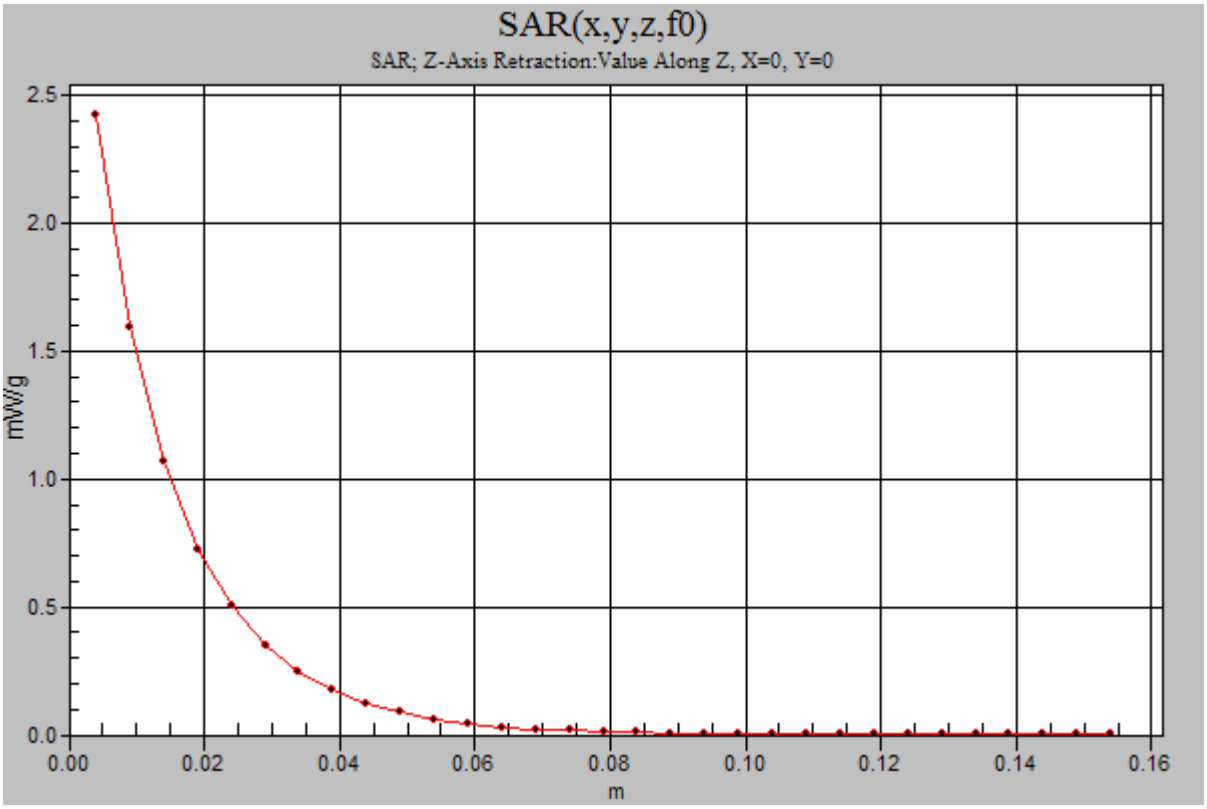
Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.3 V/m; Power Drift = -0.110 dB
Peak SAR (extrapolated) = 3.44 W/kg
SAR(1 g) = 2.26 mW/g; SAR(10 g) = 1.44 mW/g
Maximum value of SAR (measured) = 2.45 mW/g

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

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


mW/g
2.52
2.02
1.51
1.01
0.504
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 4/18/2005 6:35:18 AM

Test Laboratory: Motorola

041805 1800Mhz GOOD-2.3%

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 = 20.0 ┌C Sim.Temp@SPC = 18.9 ┌C Room Temp @ SPC = 21 ┌C

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

Medium: VALIDATION Only; Medium parameters used: σ = 1.36 mho/m, ε_r = 39.1; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 7.88 mW/g

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

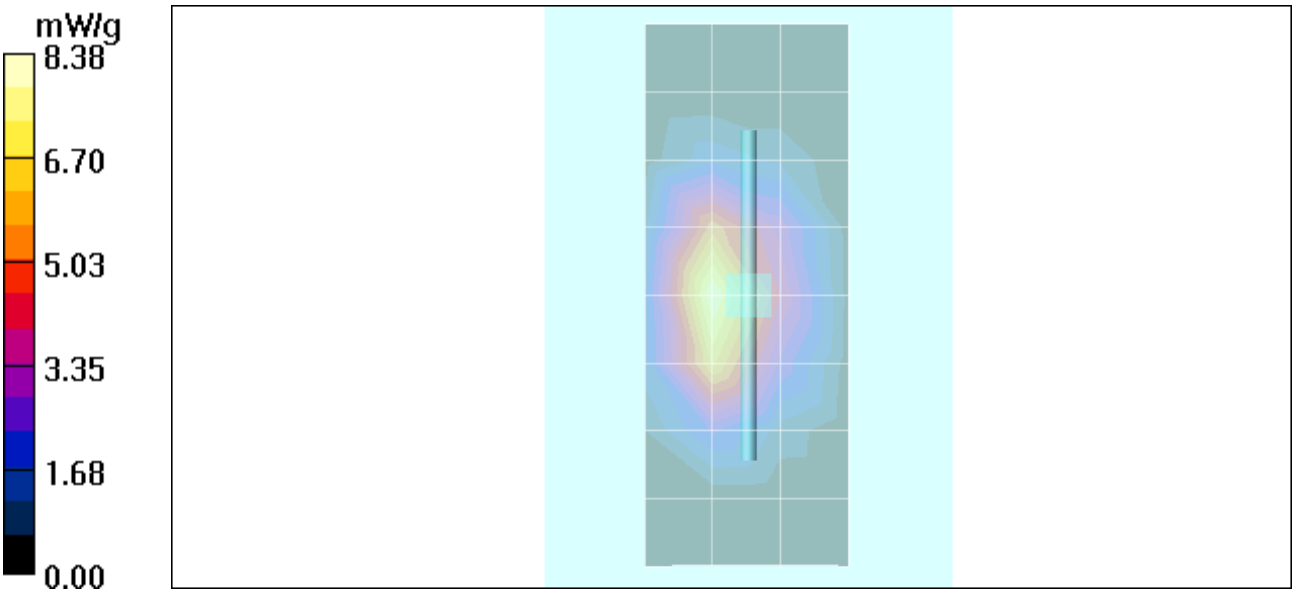
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 74.7 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 13.2 W/kg
SAR(1 g) = 7.43 mW/g; SAR(10 g) = 3.94 mW/g
Maximum value of SAR (measured) = 8.24 mW/g

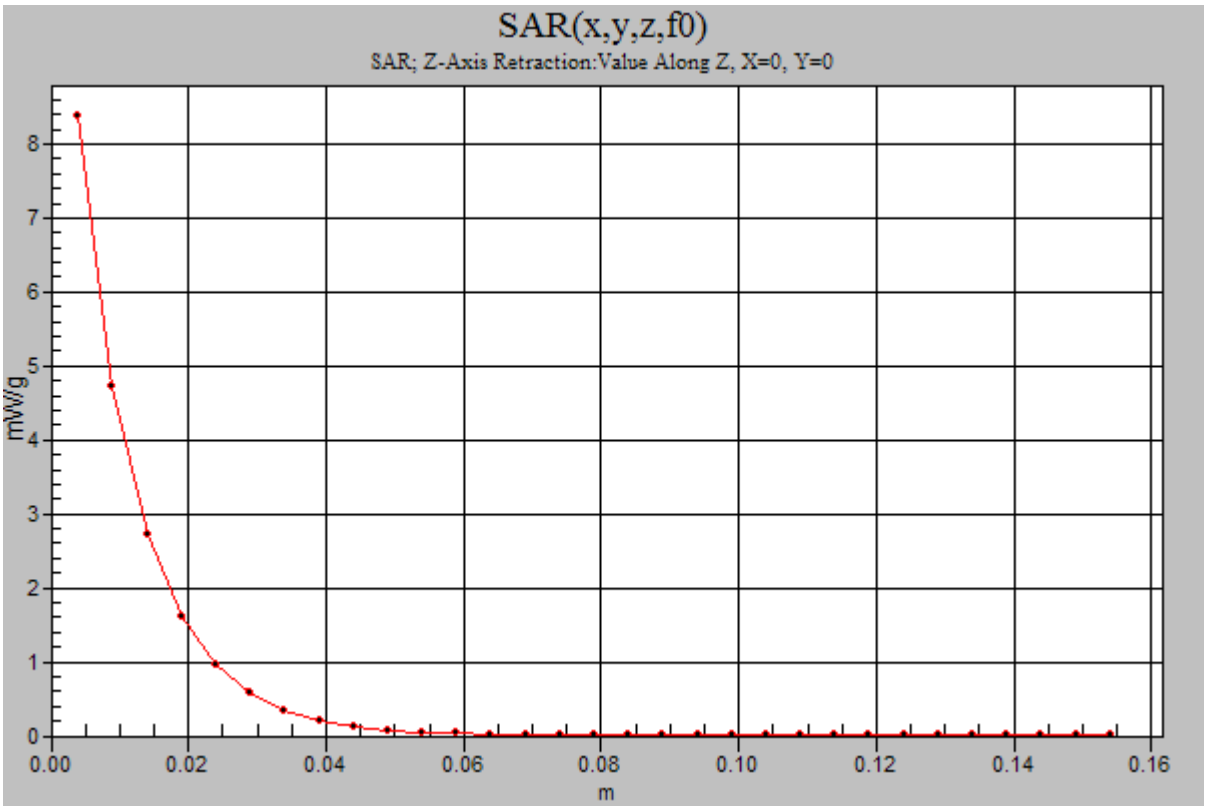
Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 74.7 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 13.2 W/kg
SAR(1 g) = 7.46 mW/g; SAR(10 g) = 3.97 mW/g
Maximum value of SAR (measured) = 8.32 mW/g

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

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 8.38 mW/g


mW/g
8.38
6.70
5.03
3.35
1.68
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
0
1
2
3
4
5
6
7
8
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 4/18/2005 8:00:15 AM

Test Laboratory: Motorola

041805 900Mhz GOOD 3.2%

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 = 20.2 ┌C Sim.Temp@SPC = 20.2 ┌C Room Temp @ SPC = 21 ┌C

Communication System: CW - Dipole; Frequency: 900 MHz;Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: $\sigma = 0.98$ mho/m, $\varepsilon_r = 41.5$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.07 mW/g

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

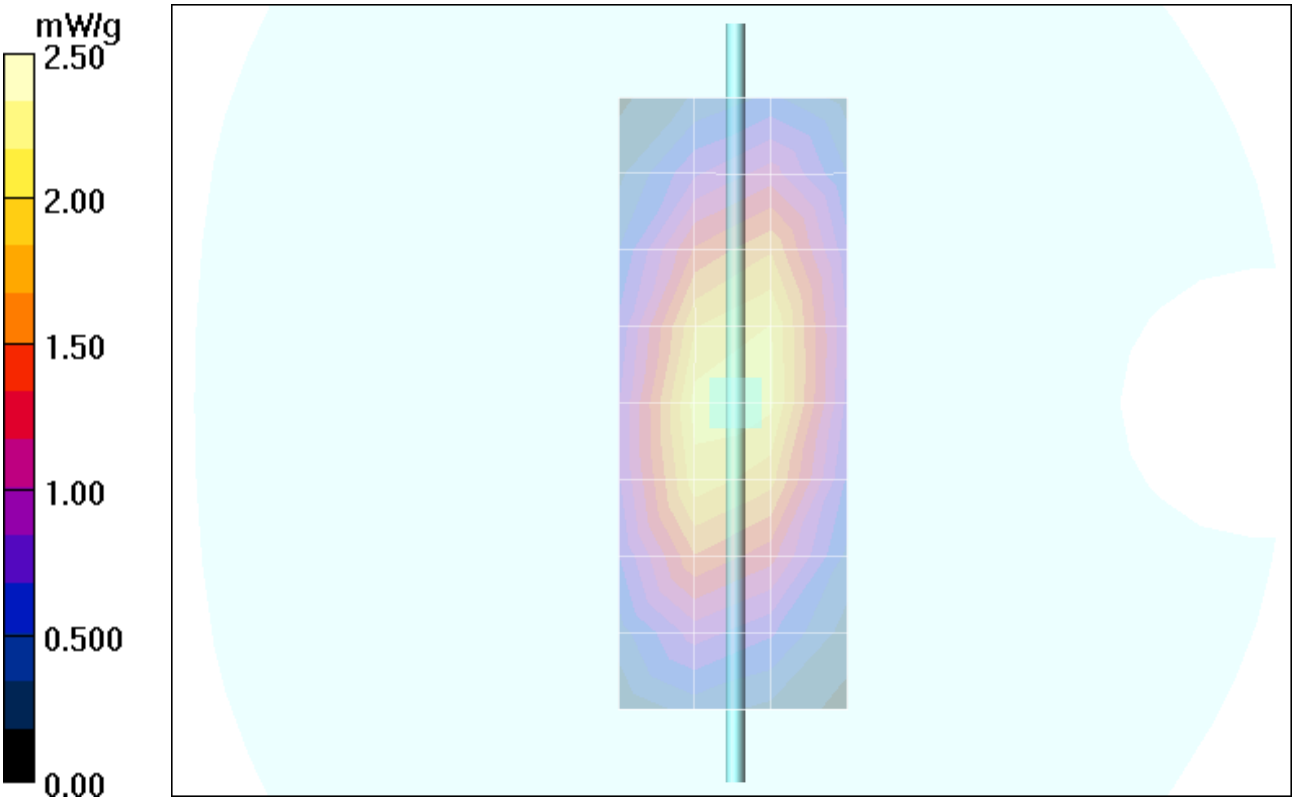
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.2 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 3.37 W/kg
SAR(1 g) = 2.22 mW/g; SAR(10 g) = 1.42 mW/g
Maximum value of SAR (measured) = 2.41 mW/g

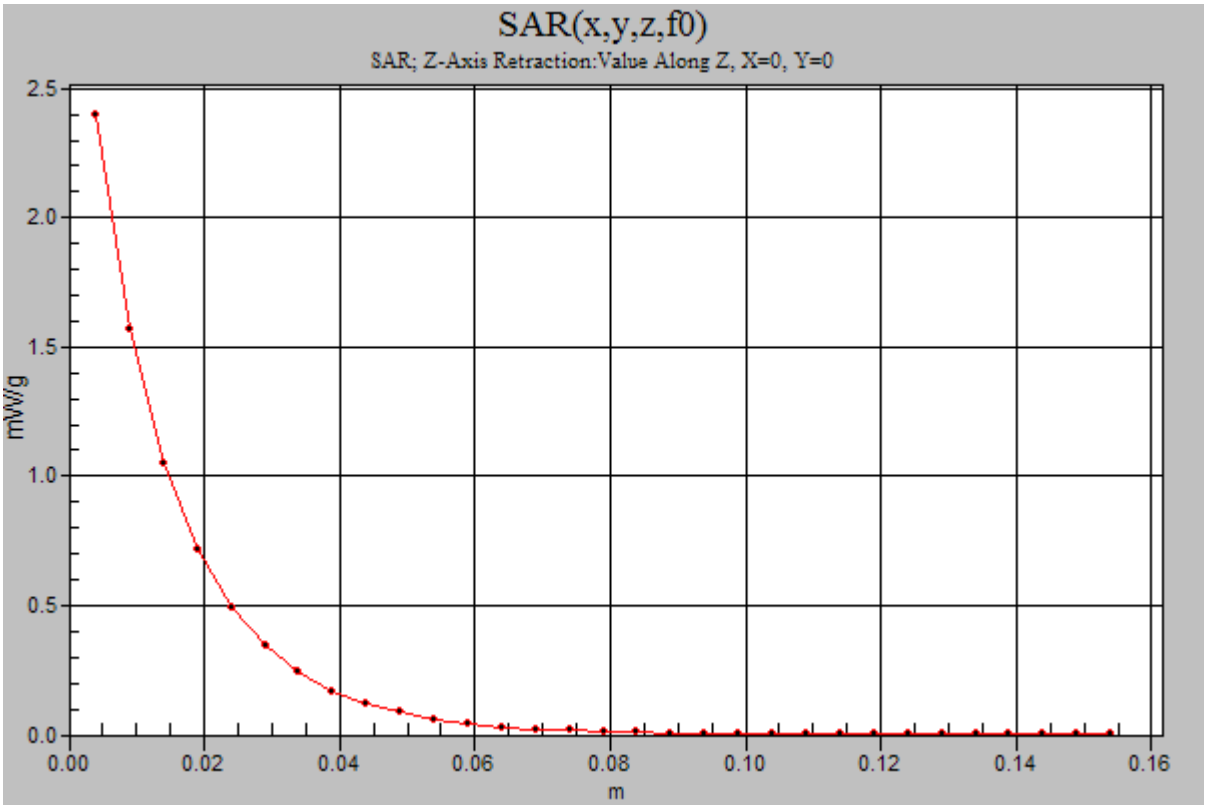
Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 50.2 V/m; Power Drift = -0.036 dB
Peak SAR (extrapolated) = 3.40 W/kg
SAR(1 g) = 2.24 mW/g; SAR(10 g) = 1.43 mW/g
Maximum value of SAR (measured) = 2.42 mW/g

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

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 2.40 mW/g


mW/g
2.50
2.00
1.50
1.00
0.500
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date/Time: 4/20/2005 7:50:52 AM

Test Laboratory: Motorola

042005 900 MHz GOOD 2.8%

DUT: Dipole 900 MHz; Type: D900V2; Serial: D900V2 - SN:xxx;
Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 91 PM1 Power = 200mW
Sim.Temp@meas=18.8 Sim.Temp@SPC = 18.7 Room Temp @ SPC = 21

Communication System: CW - Dipole; Frequency: 900 MHz;Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: $\sigma = 0.97$ mho/m, $\varepsilon_r = 40.9$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ET3DV6 - SN1398; ConvF(6.42, 6.42, 6.42); Calibrated: 2/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn316; Calibrated: 1/13/2005
- Phantom: R1: Sugar SAM; Type: SAM; Serial: TP-1005;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 2.30 mW/g

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

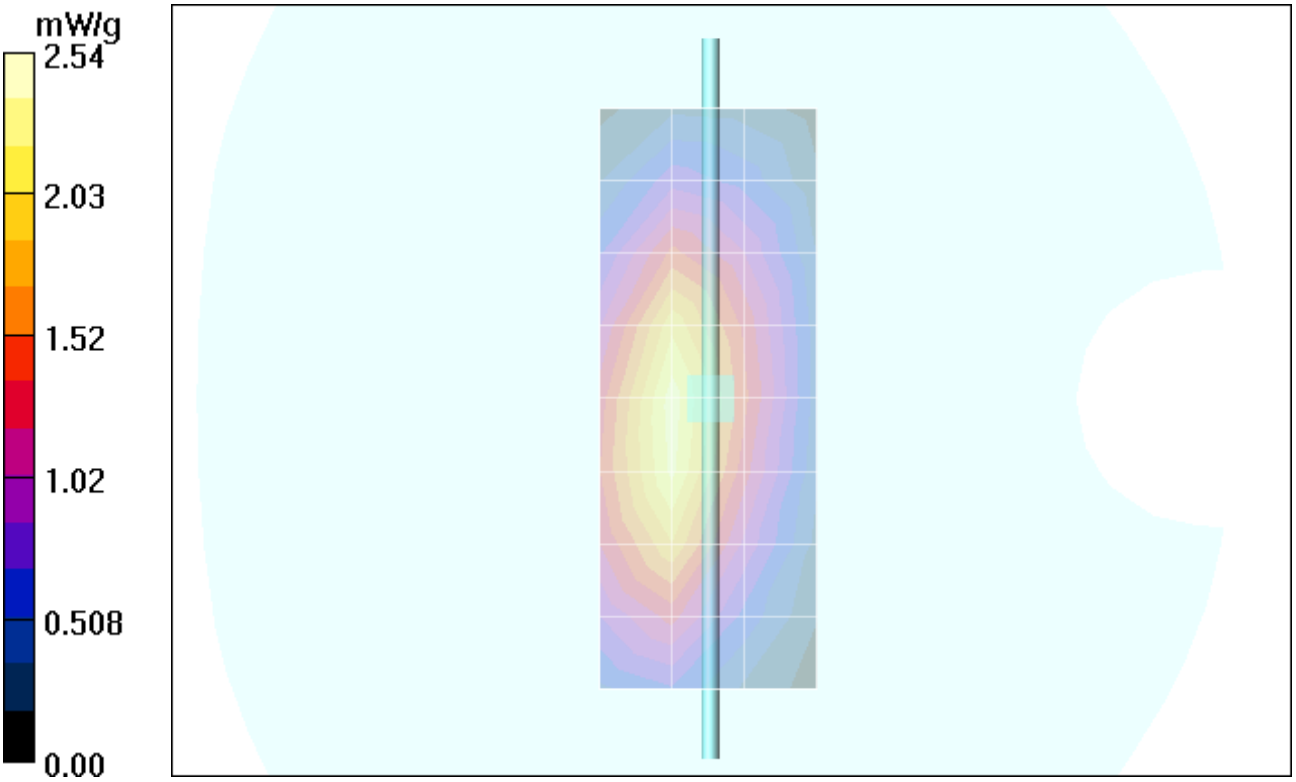
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 47.0 V/m; Power Drift = 0.126 dB
Peak SAR (extrapolated) = 3.28 W/kg
SAR(1 g) = 2.16 mW/g; SAR(10 g) = 1.38 mW/g
Maximum value of SAR (measured) = 2.34 mW/g

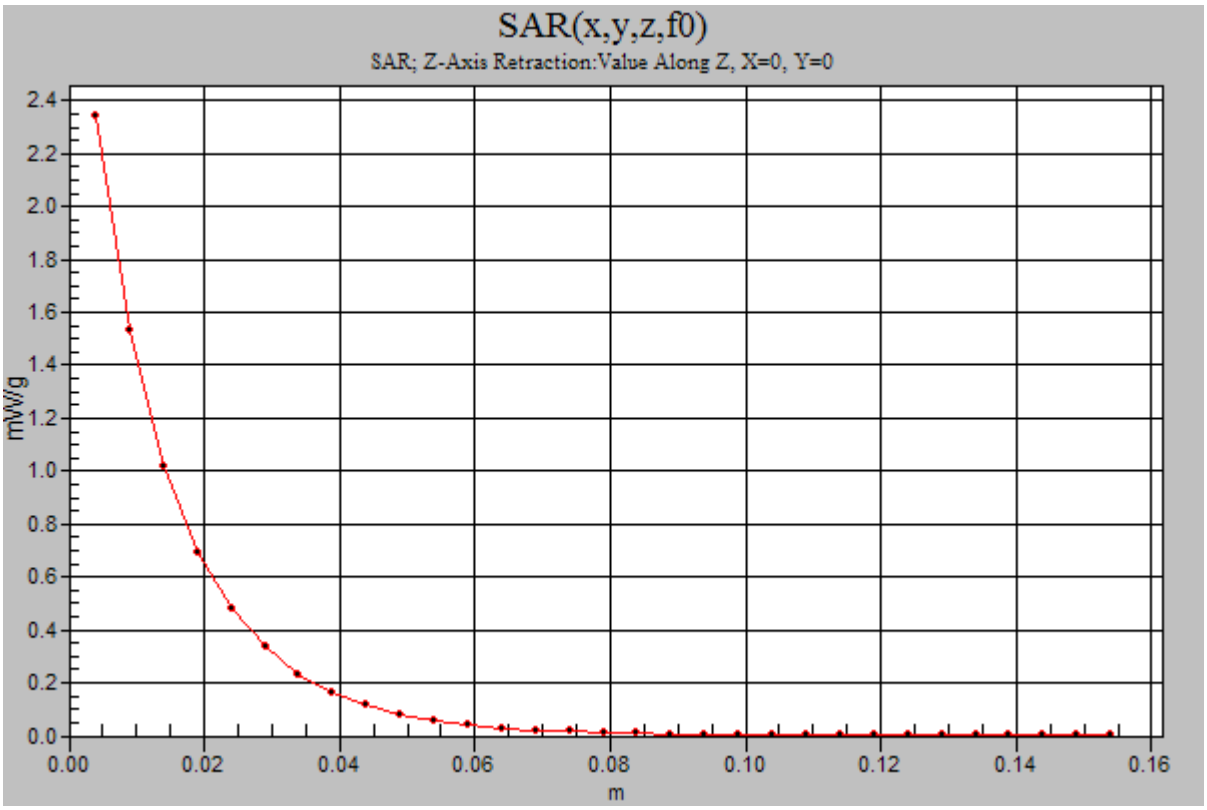
Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 47.0 V/m; Power Drift = 0.126 dB
Peak SAR (extrapolated) = 3.44 W/kg
SAR(1 g) = 2.28 mW/g; SAR(10 g) = 1.46 mW/g
Maximum value of SAR (measured) = 2.45 mW/g

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

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


mW/g
2.54
2.03
1.52
1.02
0.508
0.00


SAR(x,y,z,f0)
SAR; Z-Axis Retraction:Value Along Z, X=0, Y=0
mW/g
2.4
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Appendix 2

SAR distribution plots for Phantom Head Adjacent Use

Date/Time: 4/7/2005 10:09:23AM

Test Laboratory: Motorola AMPS RH cheek ch991 ant ext

Serial: FC990BFA
Procedure Notes: Ch# 991 / Pwr Step: 2 Antenna Position: Extended Accessory Model #: ???
Battery Model #: SNN5762A DEVICE POSITION (cheek or rotated): Cheek
Communication System: AMPS 835; Frequency: 824.04 MHz; Channel Number: 991; Duty Cycle: 1:1;
Medium: Low Freq Head; Medium parameters used: $\sigma = 0.91$ mho/m, $\varepsilon_r = 41.8$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

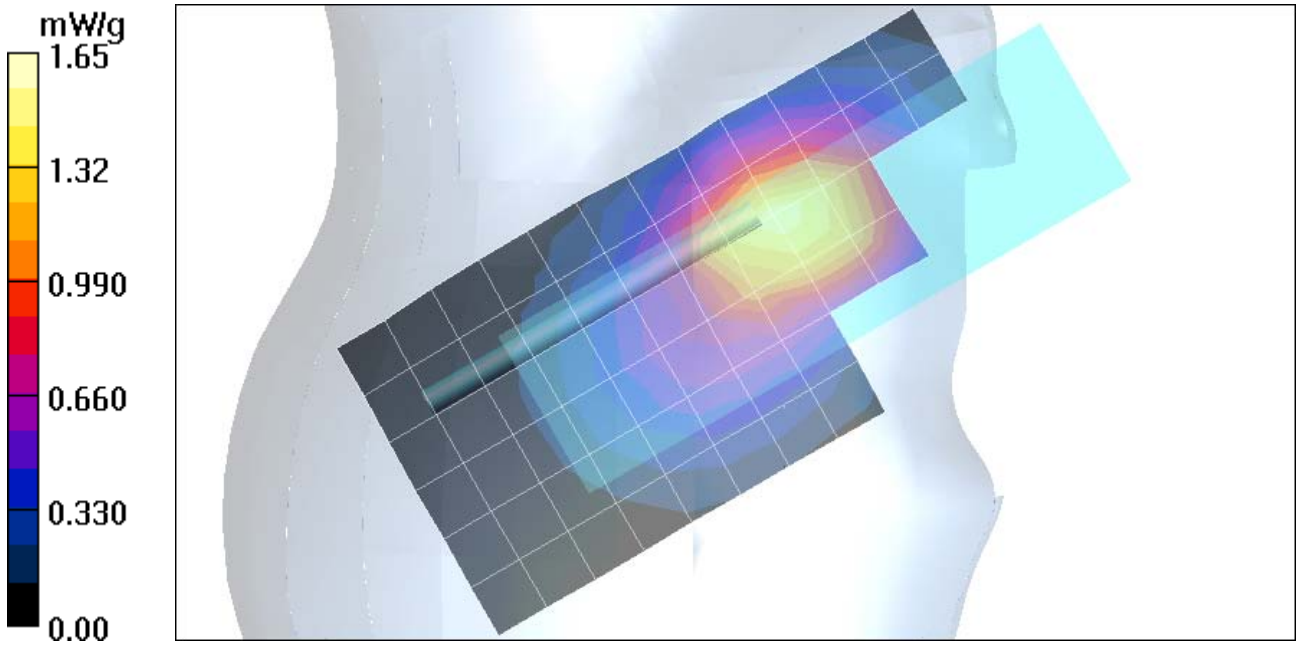
- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sugar Water SAM; Type: SAM; Serial: TP-1153;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Right Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.54 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 41.6 V/m; **Power Drift = 0.027dB** Peak SAR (extrapolated) = 2.14 W/kg
SAR(1 g) = 1.51 mW/g; SAR(10 g) = 1.04 mW/g Maximum value of SAR (measured) = 1.61 mW/g



Date/Time: 4/8/2005 8:57:40PM

Test Laboratory: Motorola AMPS LH tilt ch384 ant ext

Serial: FC990BFA
Procedure Notes: Ch# 384 / Pwr Step: 2 Antenna Position: EXTENDED Accessory Model #: None
Battery Model #: SNN5762A DEVICE POSITION (cheek or rotated): ROTATED
Communication System: AMPS 835; Frequency: 836.52 MHz; Channel Number: 384; Duty Cycle: 1:1;
Medium: Low Freq Head; Medium parameters used: $\sigma = 0.91$ mho/m, $\varepsilon_r = 41.8$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

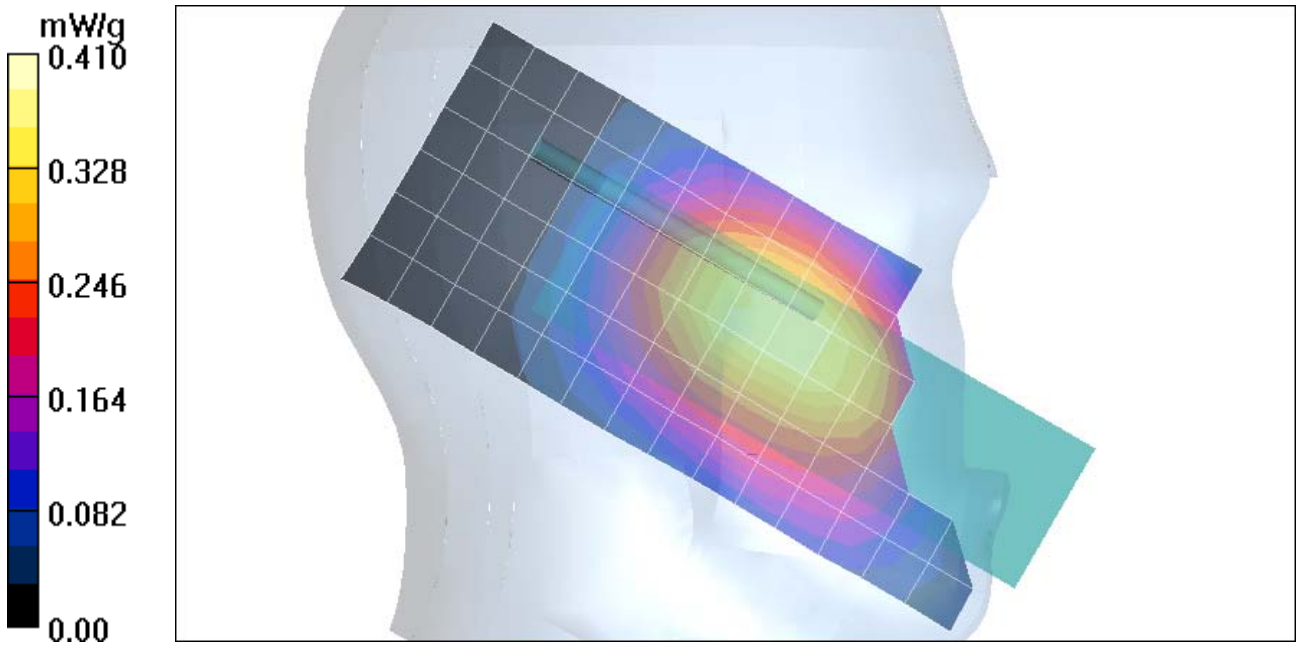
- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sugar Water SAM; Type: SAM; Serial: TP-1153;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Left Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.378 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.4 V/m; **Power Drift = 0.459 dB** Peak SAR (extrapolated) = 0.522 W/kg
SAR(1 g) = 0.396 mW/g; SAR(10 g) = 0.298 mW/g Maximum value of SAR (measured) = 0.416 mW/g\



Date/Time: 4/7/2005 2:51:03PM

Test Laboratory: Motorola AMPS LH cheek ch991 ant ret

Serial: FC990BFA
Procedure Notes: Ch# 991 / Pwr Step: 2 Antenna Position: Retracted Accessory Model #: ???
Battery Model #: SNN5762A DEVICE POSITION (cheek or rotated): Cheek
Communication System: AMPS 835; Frequency: 824.04 MHz; Channel Number: 991; Duty Cycle: 1:1;
Medium: Low Freq Head; Medium parameters used: $\sigma = 0.91$ mho/m, $\varepsilon_r = 41.8$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

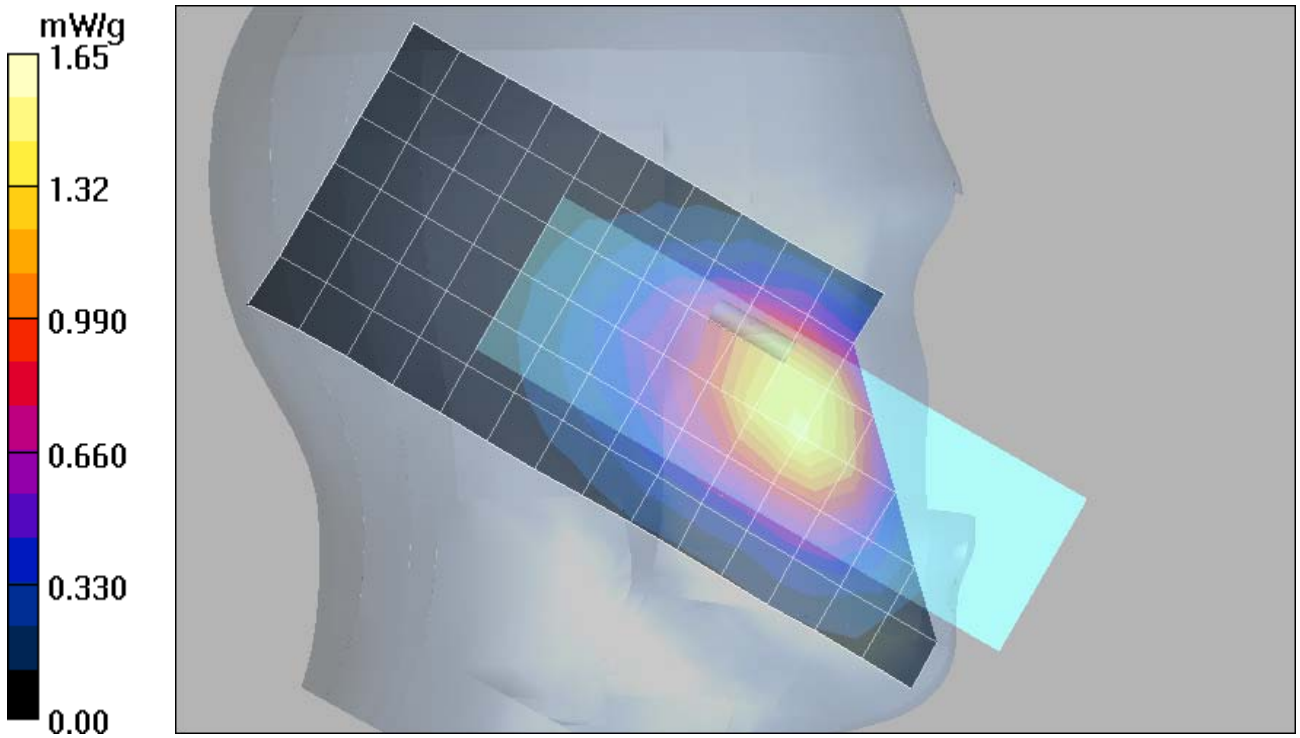
- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sugar Water SAM; Type: SAM; Serial: TP-1153;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Left Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.49 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 41.9 V/m; **Power Drift = -0.187dB** Peak SAR (extrapolated) = 2.00 W/kg
SAR(1 g) = 1.48 mW/g; SAR(10 g) = 1.03 mW/g Maximum value of SAR (measured) = 1.57 mW/g



Date/Time: 4/7/2005 11:24:15AM

Test Laboratory: Motorola AMPS RH tilt ch384 ant ret

Serial: FC990BFA
Procedure Notes: Ch# 384 / Pwr Step: 2 Antenna Position: Retracted Accessory Model #: ???
Battery Model #: SNN5762A DEVICE POSITION (cheek or rotated): Rotated
Communication System: AMPS 835; Frequency: 836.52 MHz; Channel Number: 384; Duty Cycle: 1:1;
Medium: Low Freq Head; Medium parameters used: $\sigma = 0.91$ mho/m, $\varepsilon_r = 41.8$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

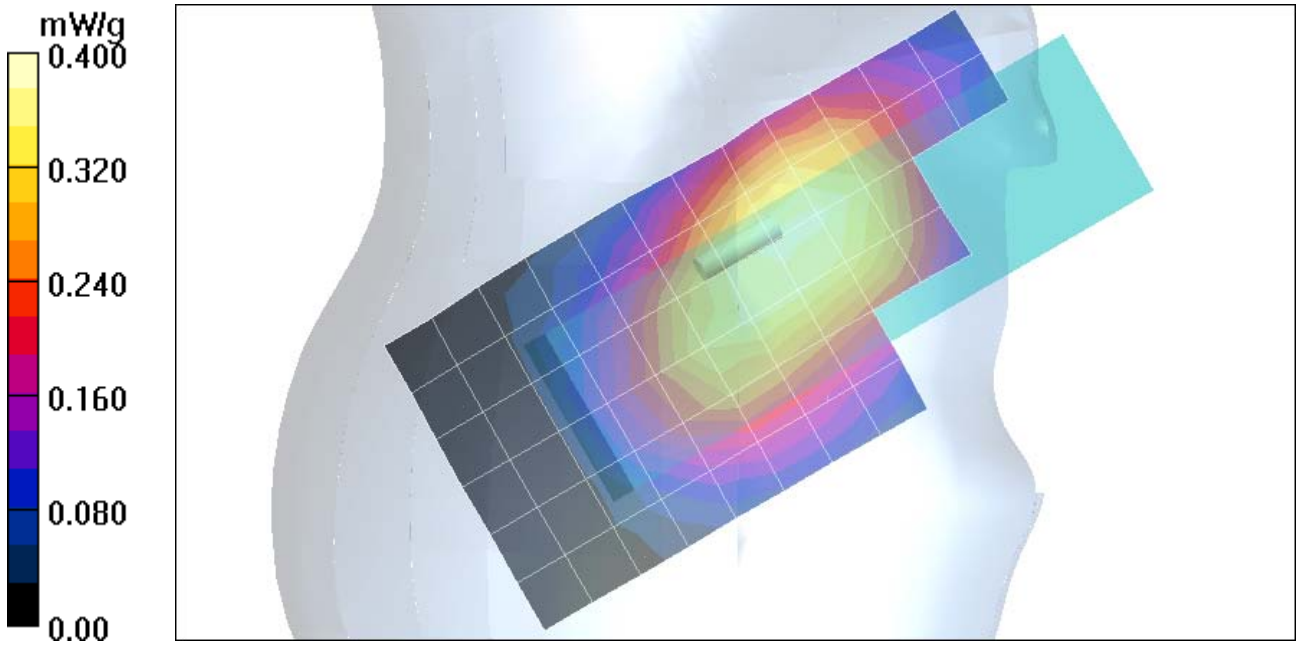
- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sugar Water SAM; Type: SAM; Serial: TP-1153;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Right Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.387 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.8 V/m; **Power Drift = 0.150 dB** Peak SAR (extrapolated) = 0.478 W/kg
SAR(1 g) = 0.376 mW/g; SAR(10 g) = 0.291 mW/g Maximum value of SAR (measured) = 0.397 mW/g



Date/Time: 4/8/2005 9:27:18PM

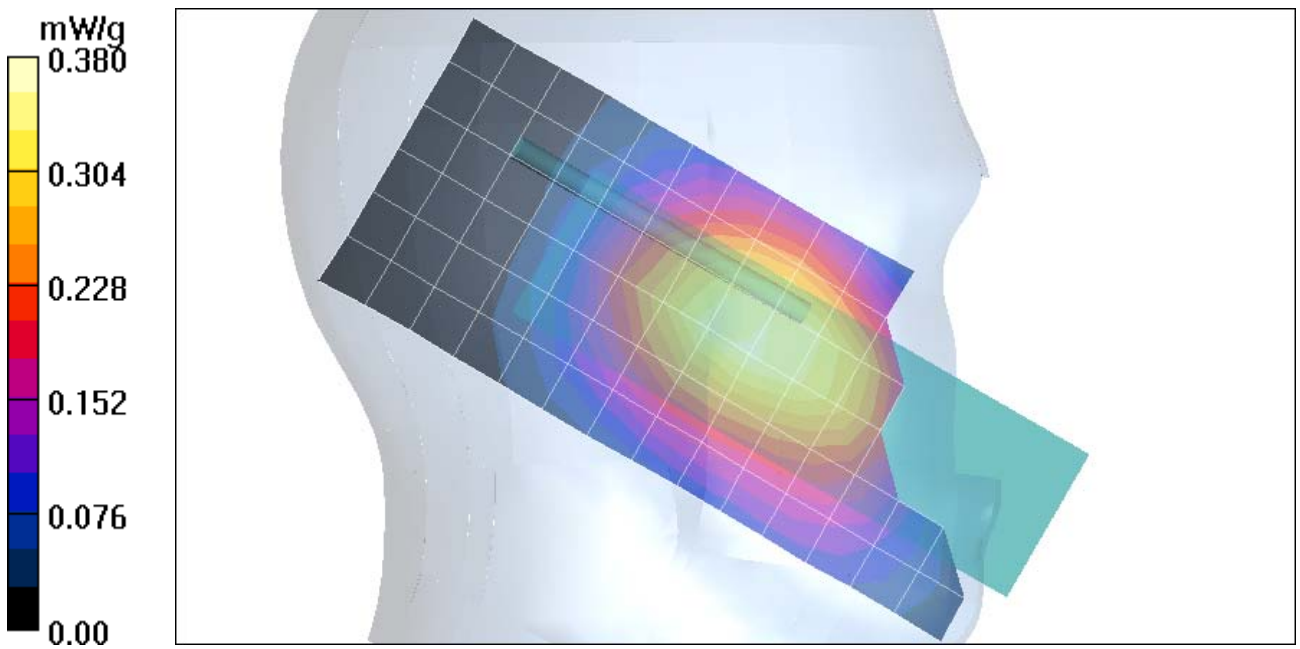
Test Laboratory: Motorola 800 LH tilt ch384 ant ext

Serial: FC990BFA
Procedure Notes: Ch# 384 / Pwr Step: always up Antenna Position: EXTENDED Accessory Model #: None
Battery Model #: SNN5762A DEVICE POSITION (cheek or rotated): ROTATED
Communication System: CDMA 835; Frequency: 836.52 MHz; Channel Number: 384; Duty Cycle: 1:1;
Medium: Low Freq Head; Medium parameters used: $\sigma = 0.91$ mho/m, $\varepsilon_r = 41.8$; $\rho = 1000$ kg/m^3

DASY4 Configuration:
- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Left Head Template/Area Scan - Normal (15mm) (7x17x1):
Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.361 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.7 V/m; **Power Drift = -0.080 dB** Peak SAR (extrapolated) = 0.475 W/kg
SAR(1 g) = 0.364 mW/g; SAR(10 g) = 0.275 mW/g Maximum value of SAR (measured) = 0.383 mW/g



Date/Time: 4/7/2005 11:12:07PM

Test Laboratory: Motorola 800 LH cheek ch1013 ant ret

Serial: FC990BFA;
Procedure Notes: Ch# 1013 / Pwr Step: OTA Antenna Position: RETRACTED Accessory Model #: ???
Battery Model #: SNN5762A DEVICE POSITION (cheek or rotated): Cheek
Communication System: CDMA 835; Frequency: 824.7 MHz; Channel Number: 1013; Duty Cycle: 1:1;
Medium: Low Freq Head; Medium parameters used: $\sigma = 0.91$ mho/m, $\varepsilon_r = 41.8$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

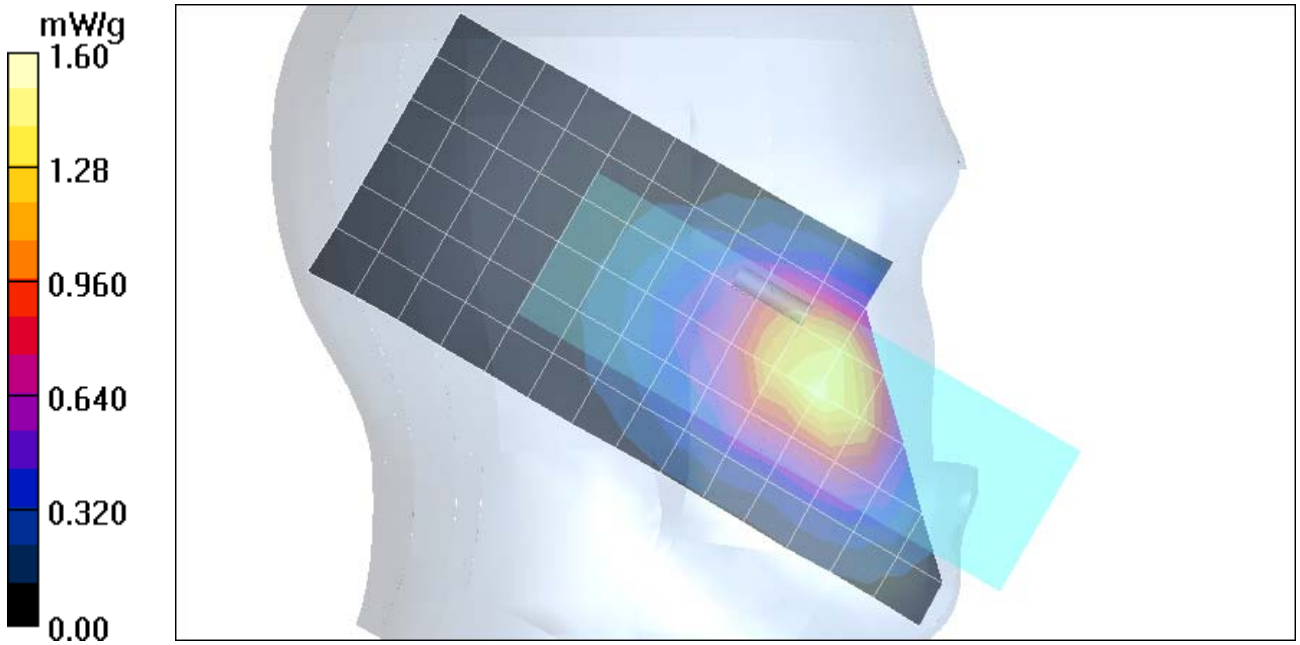
- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sugar Water SAM; Type: SAM; Serial: TP-1153;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Left Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.46 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 41.1 V/m; **Power Drift = -0.126 dB** Peak SAR (extrapolated) = 2.01 W/kg
SAR(1 g) = 1.46 mW/g; SAR(10 g) = 1.01 mW/g Maximum value of SAR (measured) = 1.52 mW/g



Date/Time: 4/7/2005 10:47:37PM

Test Laboratory: Motorola 800 LH cheek ch1013 ant ext

Serial: FC990BFA
Procedure Notes: Ch# 1013 / Pwr Step: OTA Antenna Position: EXTENDED Accessory Model #: ???
Battery Model #: SNN5762A DEVICE POSITION (cheek or rotated): Cheek
Communication System: CDMA 835; Frequency: 824.7MHz; Channel Number: 1013; Duty Cycle: 1:1;
Medium: Low Freq Head; Medium parameters used: σ = 0.91mho/m, ε_r = 41.8; ρ = 1000 kg/m^3

DASY4 Configuration:

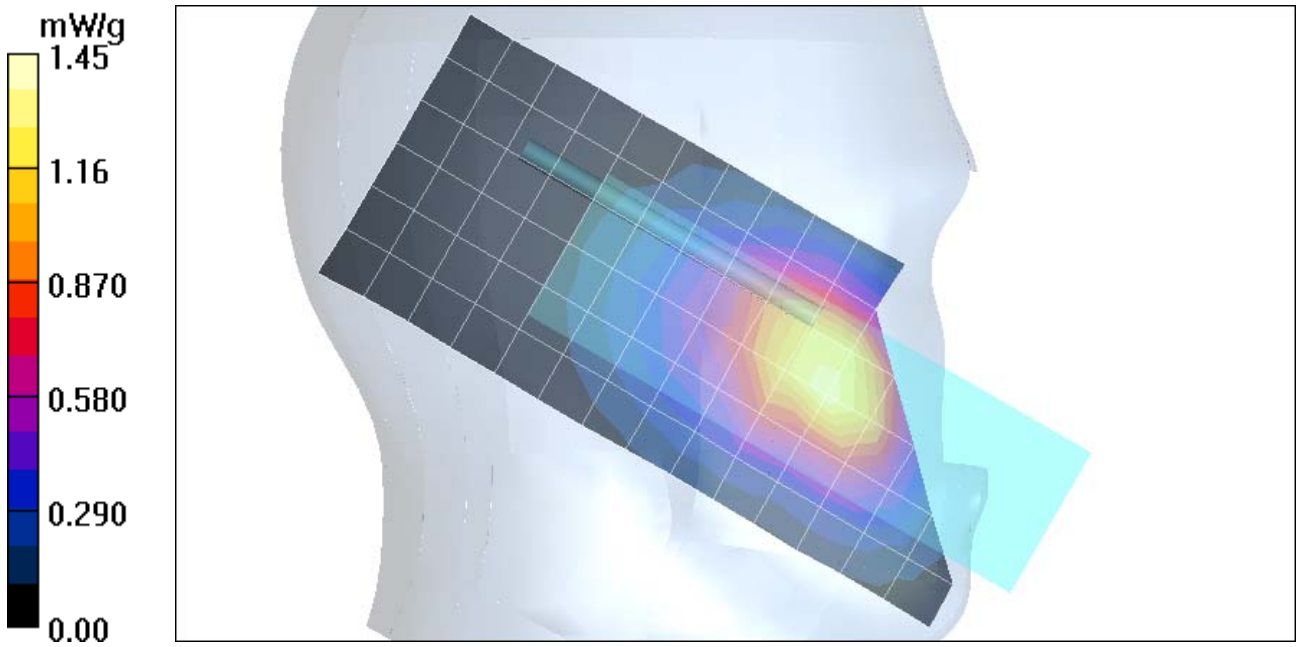
- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sugar Water SAM; Type: SAM; Serial: TP-1153;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Left Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.34 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm Reference Value = 39.2 V/m; **Power Drift = -0.014 dB**
Peak SAR (extrapolated) = 1.88 W/kg **SAR(1 g) = 1.34 mW/g; SAR(10 g) = 0.925 mW/g**
Maximum value of SAR (measured) = 1.42 mW/g



Date/Time: 4/8/2005 9:52:02PM

Test Laboratory: Motorola 800 LH tilt ch384 ant ret

Serial: FC990BFA
Procedure Notes: Ch# 384 / Pwr Step: OTA Antenna Position: RETRACTED Accessory Model #: None
Battery Model #: SNN5762A DEVICE POSITION (cheek or rotated): ROTATED
Communication System: CDMA 835; Frequency: 836.52 MHz; Channel Number: 384; Duty Cycle: 1:1;
Medium: Low Freq Head; Medium parameters used: $\sigma = 0.91$ mho/m, $\varepsilon_r = 41.8$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

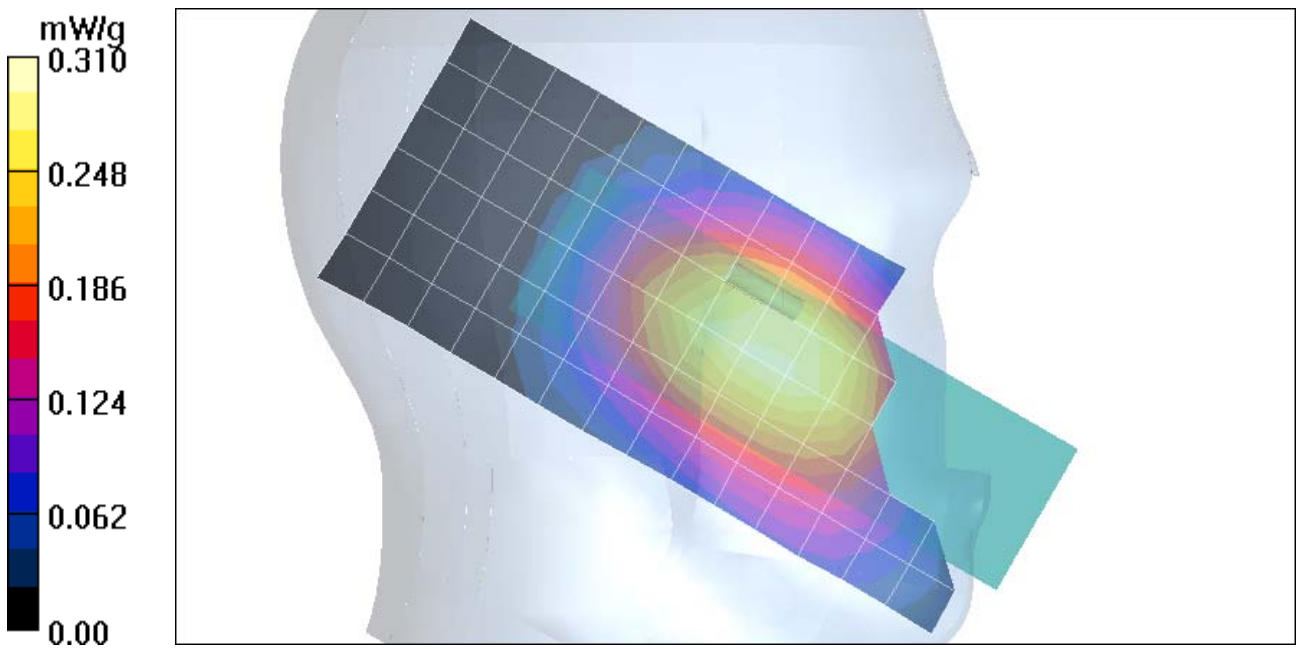
- Probe: ES3DV3 - SN3037; ConvF(6.11, 6.11, 6.11); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sugar Water SAM; Type: SAM; Serial: TP-1153;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Left Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.297 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.4 V/m; **Power Drift = 0.028 dB** Peak SAR (extrapolated) = 0.369 W/kg
SAR(1 g) = 0.294 mW/g; SAR(10 g) = 0.223 mW/g Maximum value of SAR (measured) = 0.303 mW/g



Date/Time: 4/10/2005 10:09:21PM

Test Laboratory: Motorola 1900 RH cheek ch600 ant ext

Serial: FC990BFA
Procedure Notes: Ch# 600 / Pwr Step: alwaysup Antenna Position:ext Accessory Model #: non
Battery Model #: snn5762a DEVICE POSITION cheek
Communication System: CDMA 1900; Frequency: 1880 MHz; Channel Number: 600; Duty Cycle: 1:1;
Medium: Back-Up Glycol Head; Medium parameters used: σ = 1.44 mho/m, ε_r = 38.2; ρ = 1000 kg/m^3

DASY4 Configuration:

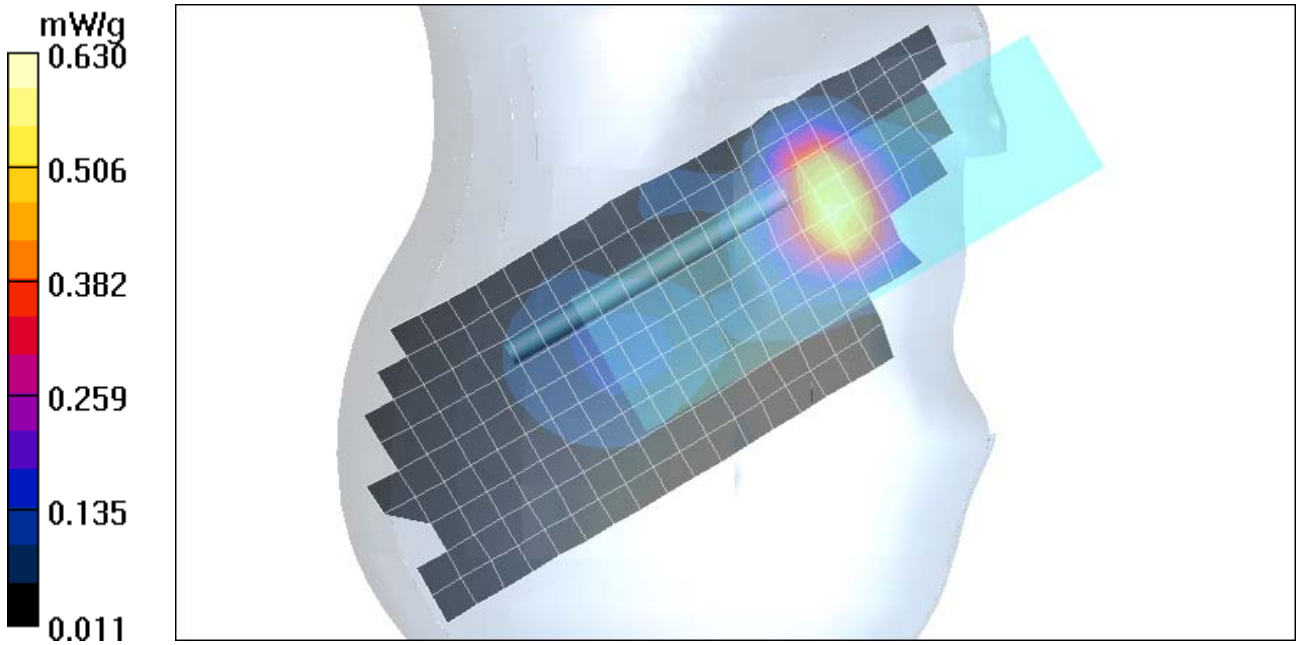
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Right Head Template/Area Scan - Normal Extended (10mm) (10x25x1):

Measurement grid: dx=10mm, dy=10mm Maximum value of SAR (measured) = 0.581 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.5 V/m; **Power Drift = 0.103 dB** Peak SAR (extrapolated) = 0.935 W/kg
SAR(1 g) = 0.549 mW/g; SAR(10 g) = 0.319 mW/g Maximum value of SAR (measured) = 0.595 mW/g



Date/Time: 4/9/2005 11:33:55PM

Test Laboratory: Motorola 1900 LH tilt ch600 ant ret

Serial: FC990BFA
Procedure Notes: Ch# 600 / Pwr Step: alwaysup Antenna Position: ret
Battery Model #: snn5762a DEVICE POSITION tilt
Communication System: CDMA 1900; Frequency: 1880 MHz; Channel Number: 600; Duty Cycle: 1:1;
Medium: Back-Up Glycol Head; Medium parameters used: $\sigma = 1.46$ mho/m, $\varepsilon_r = 38.3$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

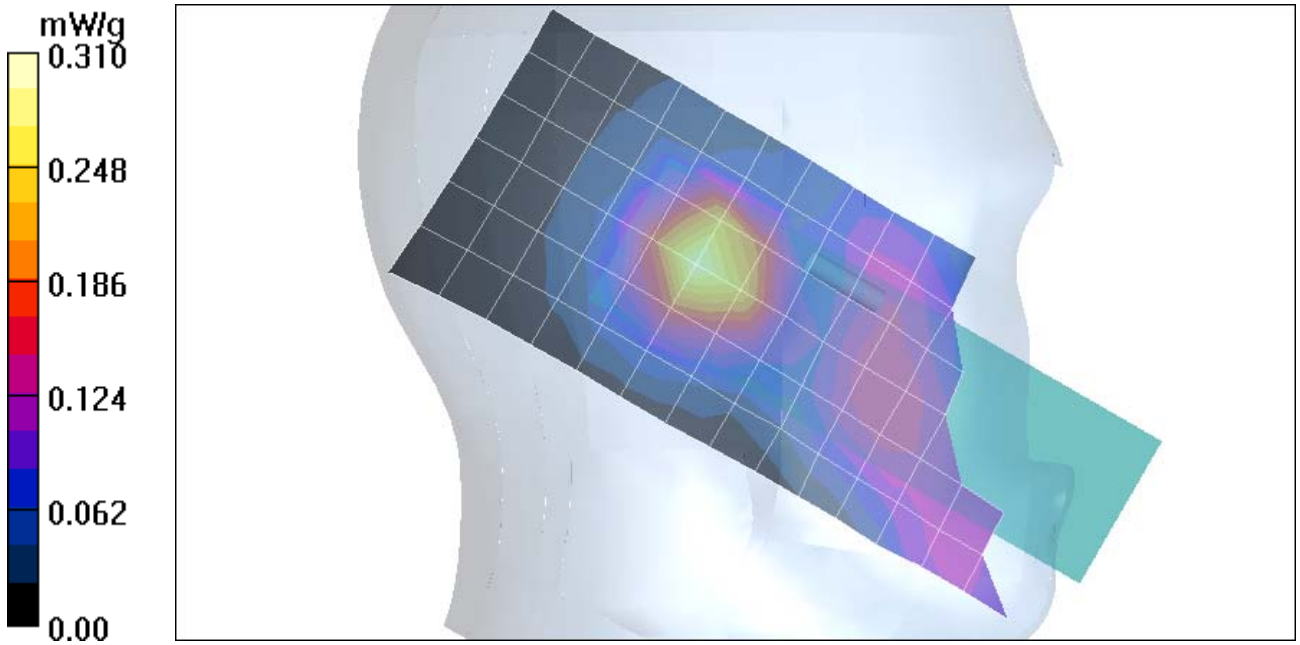
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Left Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.299 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.2 V/m; **Power Drift = -0.067 dB** Peak SAR (extrapolated) = 0.431 W/kg
SAR(1 g) = 0.284 mW/g; SAR(10 g) = 0.174 mW/g Maximum value of SAR (measured) = 0.306 mW/g



Date/Time: 4/10/2005 12:26:23AM

Test Laboratory: Motorola 1900 LH tilt ch600 ant ext

Serial: FC990BFA
Procedure Notes: Ch# 600 / Pwr Step: alwaysup Antenna Position: ext
Battery Model #: snn5762a DEVICE POSITION tilt
Communication System: CDMA 1900; Frequency: 1880 MHz; Channel Number: 600; Duty Cycle: 1:1;
Medium: Back-Up Glycol Head; Medium parameters used: σ = 1.46 mho/m, ε_r = 38.3; ρ = 1000 kg/m^3

DASY4 Configuration:

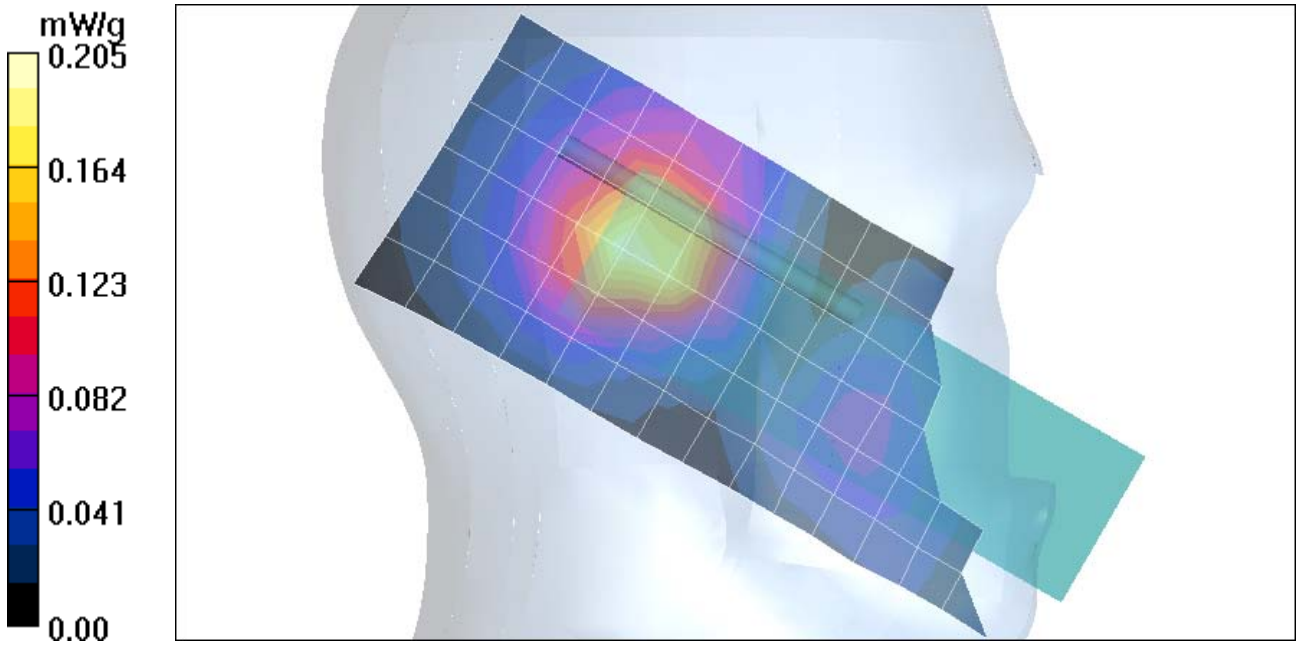
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Left Head Template/Area Scan - Normal (15mm) (7x17x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.195 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.7 V/m; **Power Drift = 0.074 dB** Peak SAR (extrapolated) = 0.285 W/kg
SAR(1 g) = 0.192 mW/g; SAR(10 g) = 0.120 mW/g Maximum value of SAR (measured) = 0.207 mW/g



Date/Time: 4/10/2005 9:24:41PM

Test Laboratory: Motorola 1900 RH cheek ch1175 ant ret

Serial: FC990BFA
Procedure Notes: Ch# 1175 / Pwr Step: alwaysup Antenna Position: ret Accessory Model #: non
Battery Model #: snn5762a DEVICE POSITION cheek
Communication System: CDMA 1900; Frequency: 1908.75 MHz; Channel Number: 1175; Duty Cycle: 1:1;
Medium: Back-Up Glycol Head; Medium parameters used: σ = 1.44 mho/m, ε_r = 38.2; ρ = 1000 kg/m^3

DASY4 Configuration:

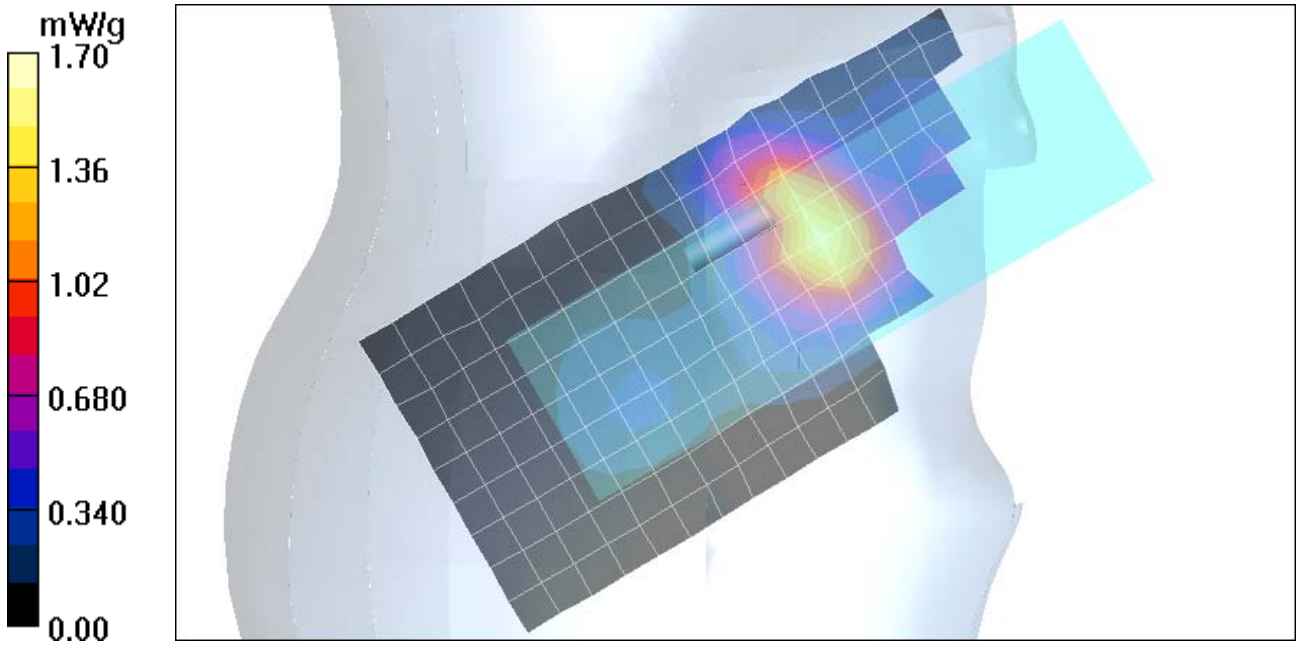
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Right Head Template/Area Scan - Normal (10mm) (10x25x1):

Measurement grid: dx=10mm, dy=10mm Maximum value of SAR (measured) = 1.57 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 28.8 V/m; **Power Drift = -0.067 dB** Peak SAR (extrapolated) = 2.27 W/kg
SAR(1 g) = 1.41 mW/g; SAR(10 g) = 0.812 mW/g Maximum value of SAR (measured) = 1.56 mW/g



Appendix 3

SAR distribution plots for Body Worn Configuration

Date/Time: 4/12/2005 8:45:06AM

Test Laboratory: Motorola AMPS BW ch384 with holster ant ext

Serial: FC990BFA
Procedure Notes: Ch# 384 / Pwr Step: 2 Antenna Position: Extended Battery Model #: SNN5762A
Accessory Model # = 1571091B01 Holster with the Phone Rotated 90 degrees Clockwise
Communication System: AMPS 835; Frequency: 836.52 MHz; Channel Number: 384; Duty Cycle: 1:1;
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.97$ mho/m, $\varepsilon_r = 53.4$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

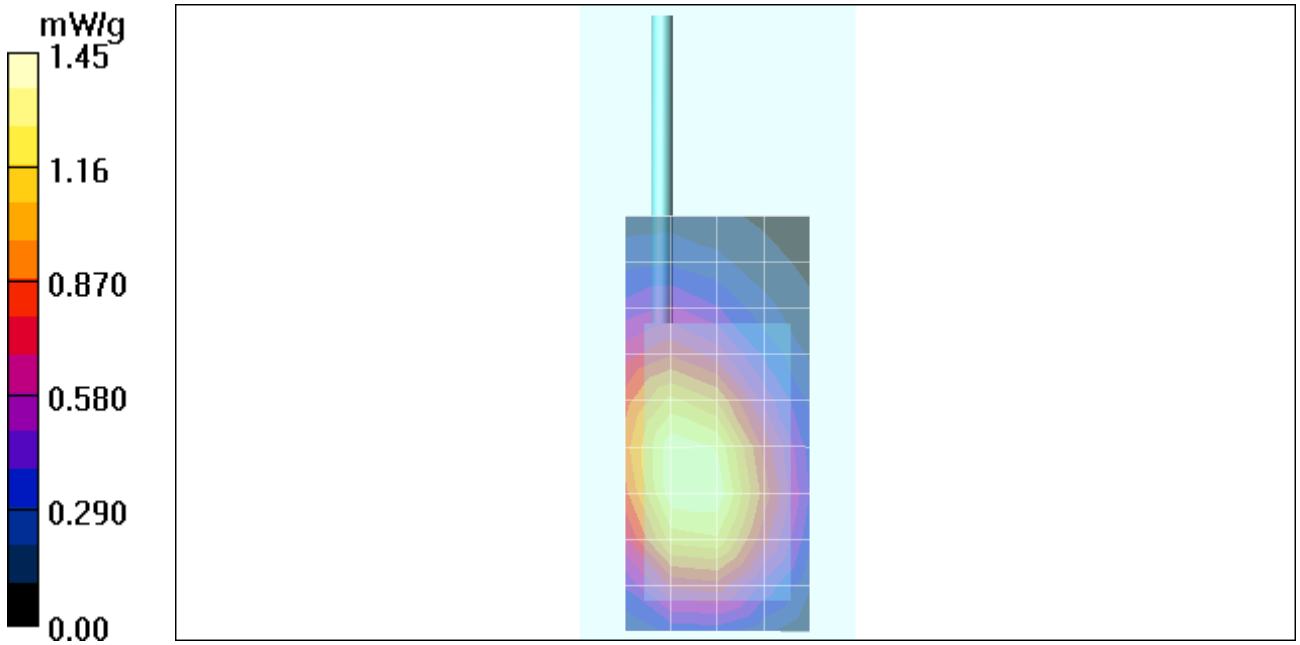
- Probe: ES3DV3 - SN3037; ConvF(6, 6, 6); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.33 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 37.5 V/m; **Power Drift = 0.128 dB** Peak SAR (extrapolated) = 1.86 W/kg
SAR(1 g) = 1.4 mW/g; SAR(10 g) = 1.02 mW/g Maximum value of SAR (measured) = 1.49 mW/g



Date/Time: 4/11/2005 7:14:26AM

Test Laboratory: Motorola 1900 BW ch600 holster ant ret

Serial: FC990BFA
Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: Retracted Battery Model #: SNN5762A
Accessory Model # = 1571091B01 Holster with Phone Rotated 90 degrees clockwise
Communication System: CDMA 1900; Frequency: 1880 MHz; Channel Number: 600; Duty Cycle: 1:1;
Medium: Regular Glycol Body; Medium parameters used: σ = 1.59 mho/m, ε_r = 52.1; ρ = 1000 kg/m^3

DASY4 Configuration:

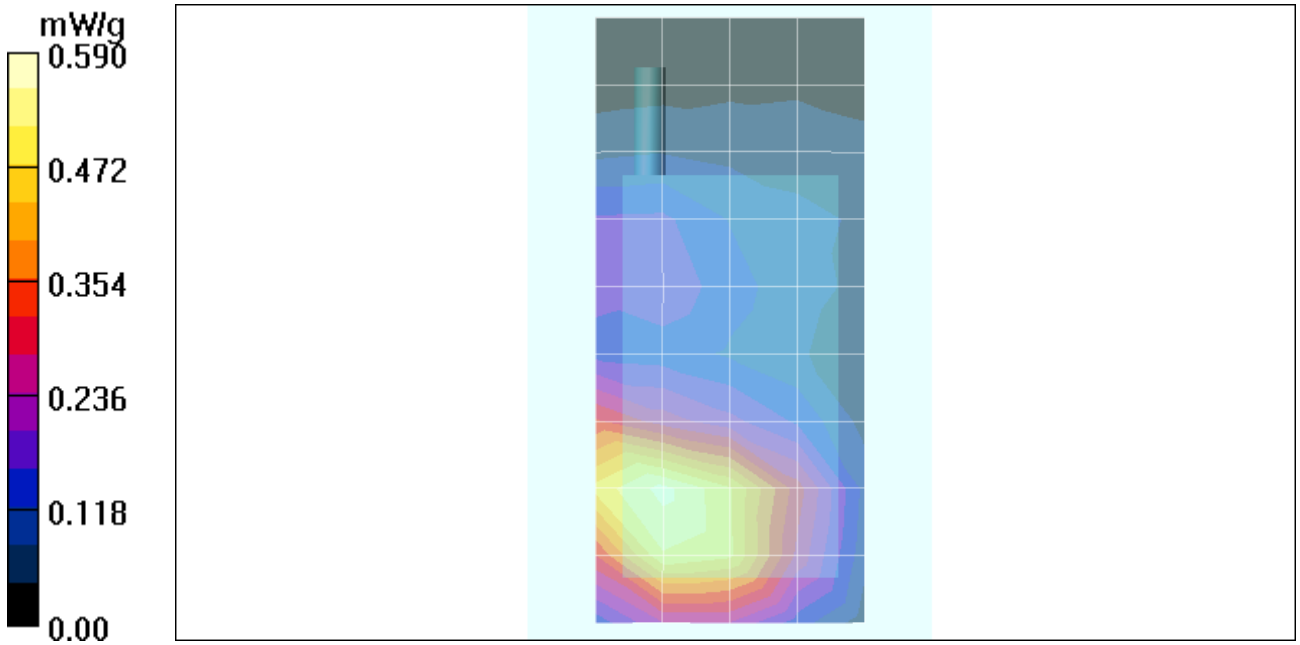
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.566 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.6 V/m; **Power Drift = -0.050 dB** Peak SAR (extrapolated) = 0.789 W/kg
SAR(1 g) = 0.546 mW/g; SAR(10 g) = 0.354 mW/g Maximum value of SAR (measured) = 0.583 mW/g



Date/Time: 4/11/2005 7:45:07AM

Test Laboratory: Motorola 1900 BW ch600 holster ant ext

Serial: FC990BFA
Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: Extended Battery Model #: SNN5762A
Accessory Model # = 1571091B01 Holster with Phone Rotated 90 degrees clockwise
Communication System: CDMA 1900; Frequency: 1880 MHz; Channel Number: 600; Duty Cycle: 1:1;
Medium: Regular Glycol Body; Medium parameters used: σ = 1.59 mho/m, ε_r = 52.1; ρ = 1000 kg/m^3

DASY4 Configuration:

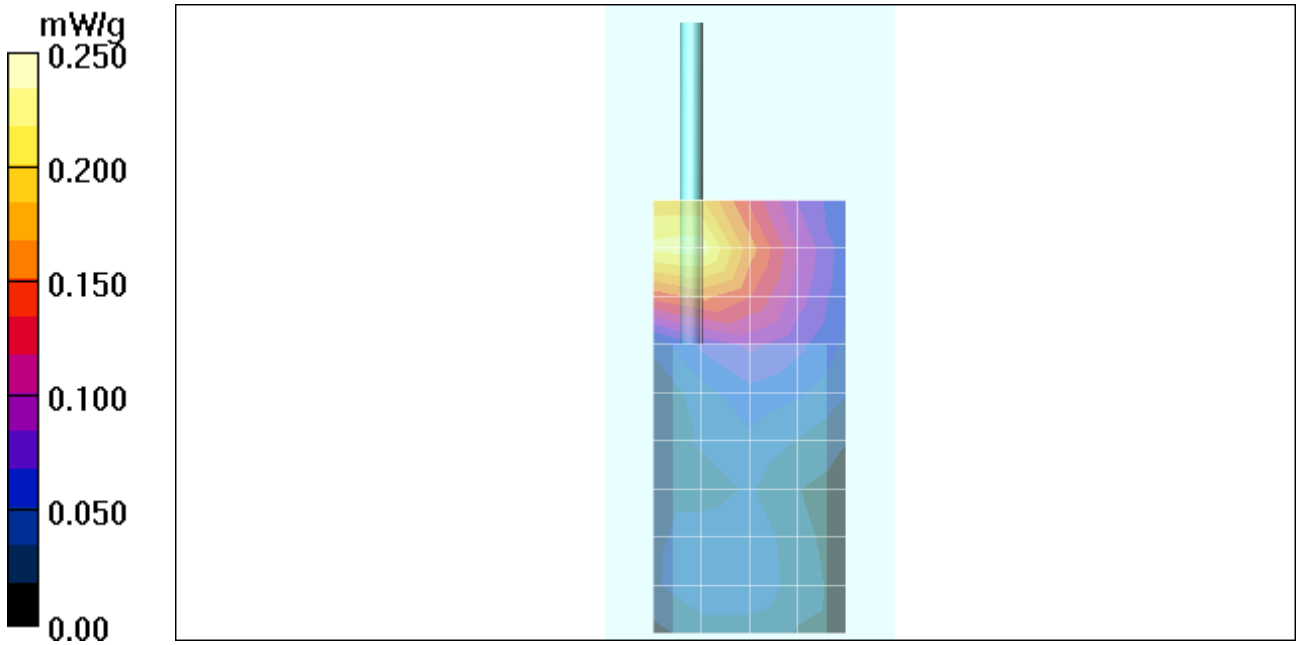
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.228 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.0 V/m; **Power Drift = 0.069 dB** Peak SAR (extrapolated) = 0.792 W/kg
SAR(1 g) = 0.230 mW/g; SAR(10 g) = 0.146 mW/g Maximum value of SAR (measured) = 0.792 mW/g



Date/Time: 4/11/2005 11:49:28PM

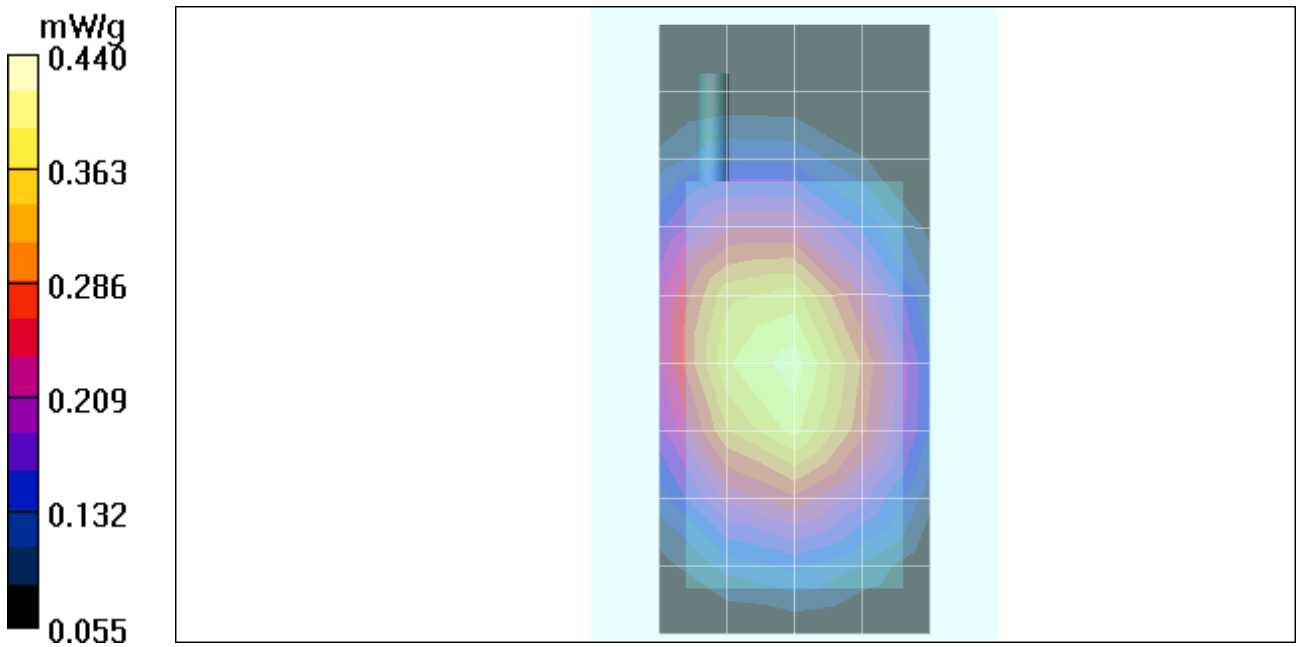
Test Laboratory: Motorola 800 BW ch384 holster ant ret

Serial: FC990BFA
Procedure Notes: Ch# 384 / Pwr Step: alwaysup Antenna Position: ret Battery Model #:snn5762a
BODYWORN WITH HOLSTER 1571091B01 ROTATED 90 DEGREES CLOCKWISE
Communication System: CDMA 835; Frequency: 836.52 MHz; Channel Number: 384; Duty Cycle: 1:1;
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98$ mho/m, $\varepsilon_r = 53.7$; $\rho = 1000$ kg/m^3

DASY4 Configuration:
- Probe: ES3DV3 - SN3037; ConvF(6, 6, 6); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (12x7x1):
Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.404 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.2 V/m; **Power Drift = 0.057 dB** Peak SAR (extrapolated) = 0.513 W/kg
SAR(1 g) = 0.386 mW/g; SAR(10 g) = 0.280 mW/g Maximum value of SAR (measured) = 0.410 mW/g



Date/Time: 4/12/2005 12:09:27AM

Test Laboratory: Motorola 800 BW ch384 with holster ant ext

Serial: FC990BFA;
Procedure Notes: Ch# 384 / Pwr Step: alwaysup Antenna Position: ext Battery Model #:snn5762a
BODYWORN WITH HOLSTER 1571091B01 ROTATED 90 DEGREES CLOCKWISE
Communication System: CDMA 835; Frequency: 836.52 MHz; Channel Number: 384; Duty Cycle: 1:1;
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98$ mho/m, $\varepsilon_r = 53.7$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

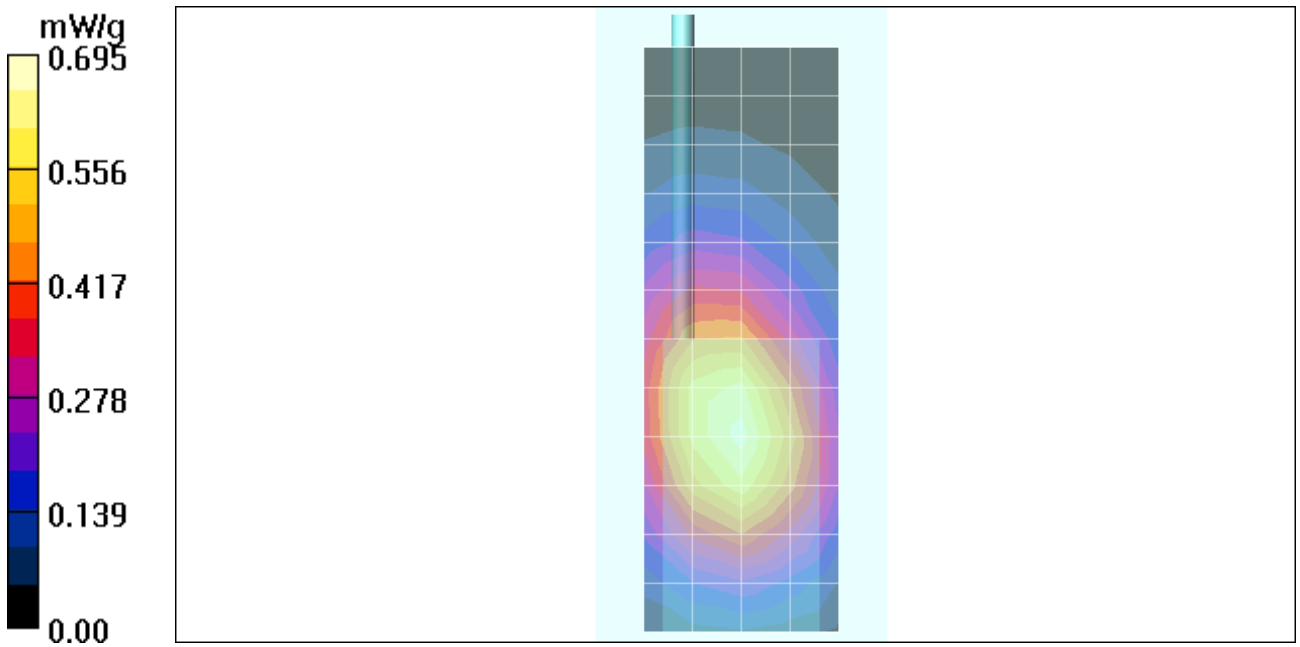
- Probe: ES3DV3 - SN3037; ConvF(6, 6, 6); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.671 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 25.9 V/m; **Power Drift = 0.082 dB** Peak SAR (extrapolated) = 0.874 W/kg
SAR(1 g) = 0.644 mW/g; SAR(10 g) = 0.469 mW/g Maximum value of SAR (measured) = 0.686 mW/g



Date/Time: 4/12/2005 1:09:40AM

Test Laboratory: Motorola AMPS BW ch991 with holster ant ret

Serial: FC990BFA
Procedure Notes: Ch# 991 / Pwr Step: 2 Antenna Position: ret Battery Model #:snn5762a
BODYWORN WITH HOLSTER 1571091B01 ROTATED 90 DEGREES CLOCKWISE
Communication System: AMPS 835; Frequency: 824.04 MHz; Channel Number: 991; Duty Cycle: 1:1;
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98$ mho/m, $\varepsilon_r = 53.7$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

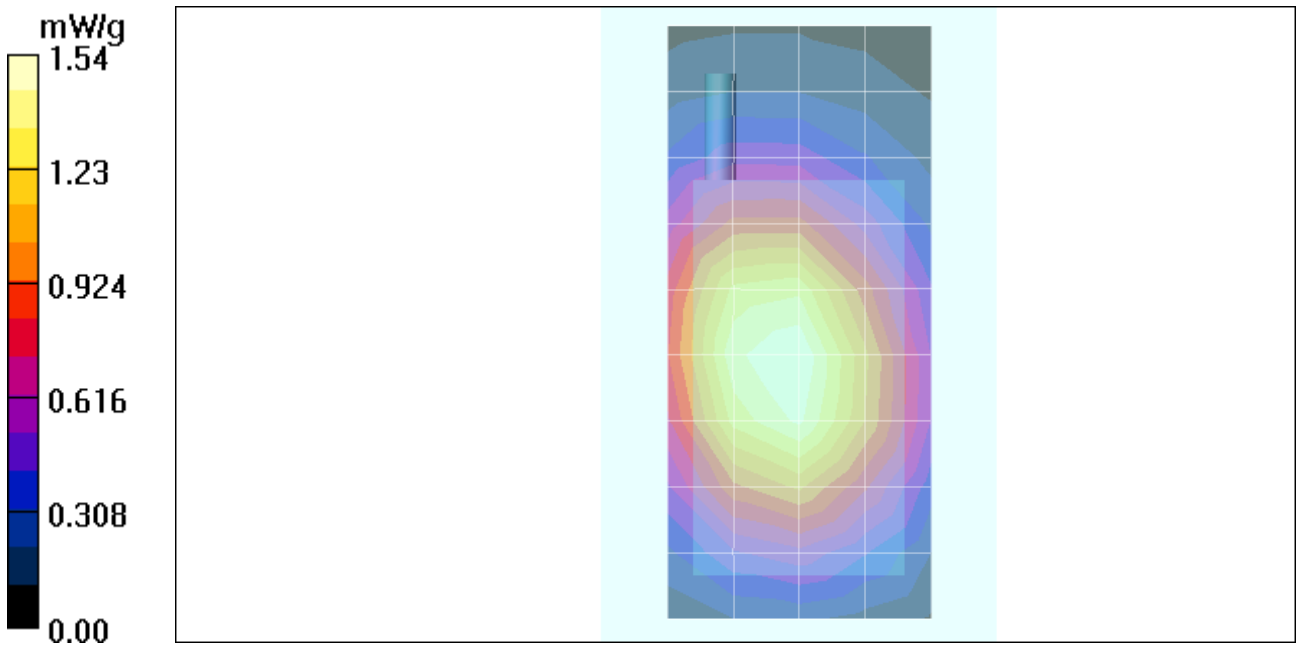
- Probe: ES3DV3 - SN3037; ConvF(6, 6, 6); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 1.54 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 40.3 V/m; **Power Drift = -0.378 dB** Peak SAR (extrapolated) = 1.88 W/kg
SAR(1 g) = 1.44 mW/g; SAR(10 g) = 1.04 mW/g Maximum value of SAR (measured) = 1.52 mW/g



Date/Time: 4/18/2005 5:34:48PM

Test Laboratory: Motorola AMPS BW ch384 front ant ret

Serial: FC990BFA
Procedure Notes: Ch# 384 / Pwr Step: 2 Antenna Position: ret Battery Model #: SNN5762A
Accessory Model # = Front of Phone 25mm From Phantom
Communication System: AMPS 835; Frequency: 836.52 MHz; Channel Number: 384; Duty Cycle: 1:1;
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98$ mho/m, $\varepsilon_r = 54.5$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

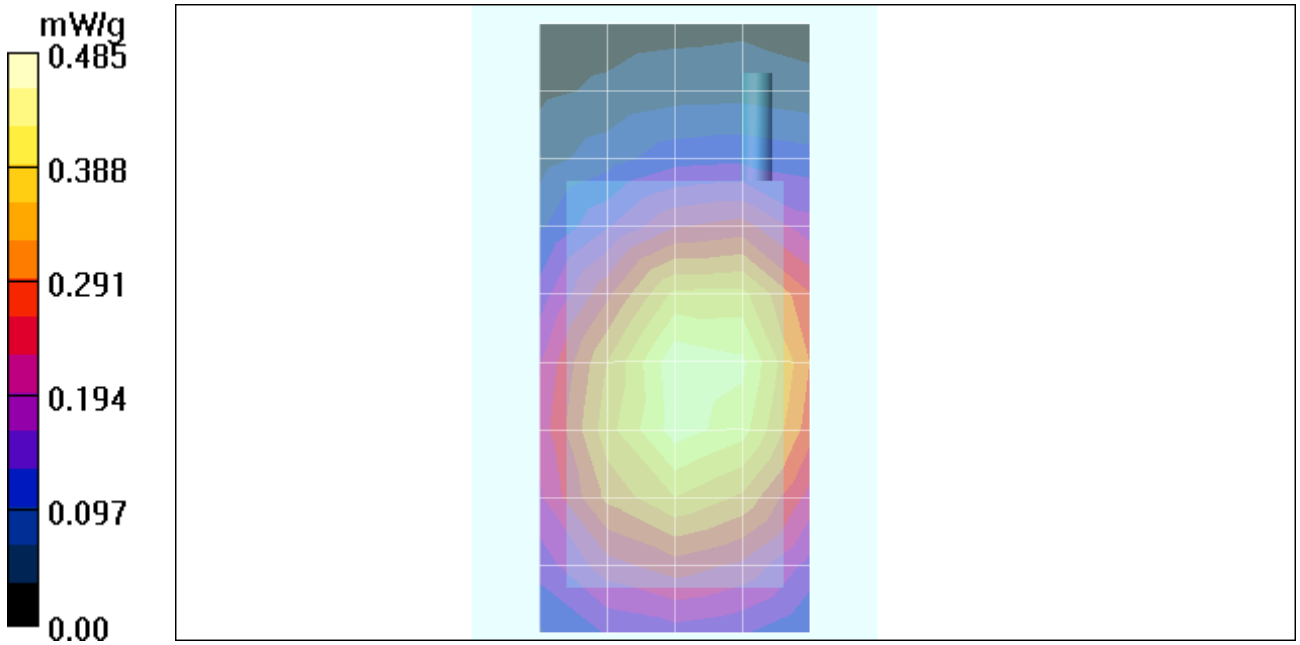
- Probe: ES3DV3 - SN3037; ConvF(6, 6, 6); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.445 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.5 V/m; **Power Drift = 0.034 dB** Peak SAR (extrapolated) = 0.568 W/kg
SAR(1 g) = 0.435 mW/g; SAR(10 g) = 0.321 mW/g Maximum value of SAR (measured) = 0.459 mW/g



Date/Time: 4/20/2005 8:40:18 AM

Test Laboratory: Motorola **AMPS BW ch384 front ant ext**

Serial: FC990BFA

Procedure Notes: Ch# 384 / Pwr Step: 02 Antenna Position: EXT Battery Model #: SNN5762A Accessory Model # = FRONT OF PHONE 25 MM

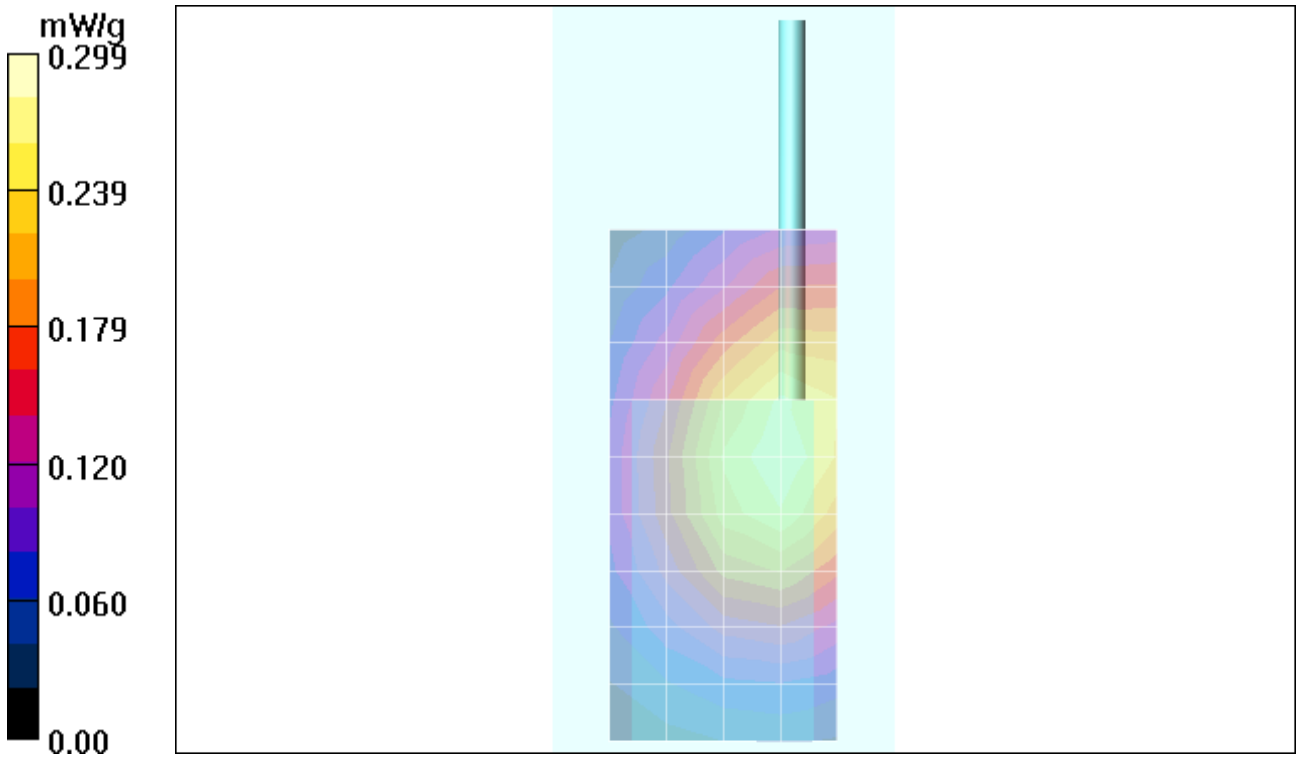
Communication System: AMPS 835; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.97$ mho/m, $\varepsilon_r = 53.4$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ET3DV6 - SN1398; ConvF(6.04, 6.04, 6.04); Calibrated: 2/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn316; Calibrated: 1/13/2005
- Phantom: R1: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.5 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.336 W/kg
SAR(1 g) = 0.267 mW/g; SAR(10 g) = 0.198 mW/g
Maximum value of SAR (measured) = 0.282 mW/g

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (12x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.279 mW/g



Date/Time: 4/13/2005 10:30:28 AM

Test Laboratory: Motorola **AMPS BW ch384 back ant ext**

Serial: FC990BFA

Procedure Notes: Ch# 384 / Pwr Step: 2 Antenna Position: Extended Battery Model #: SNN5762A Accessory Model # = Back of Phone 25mm from Phantom

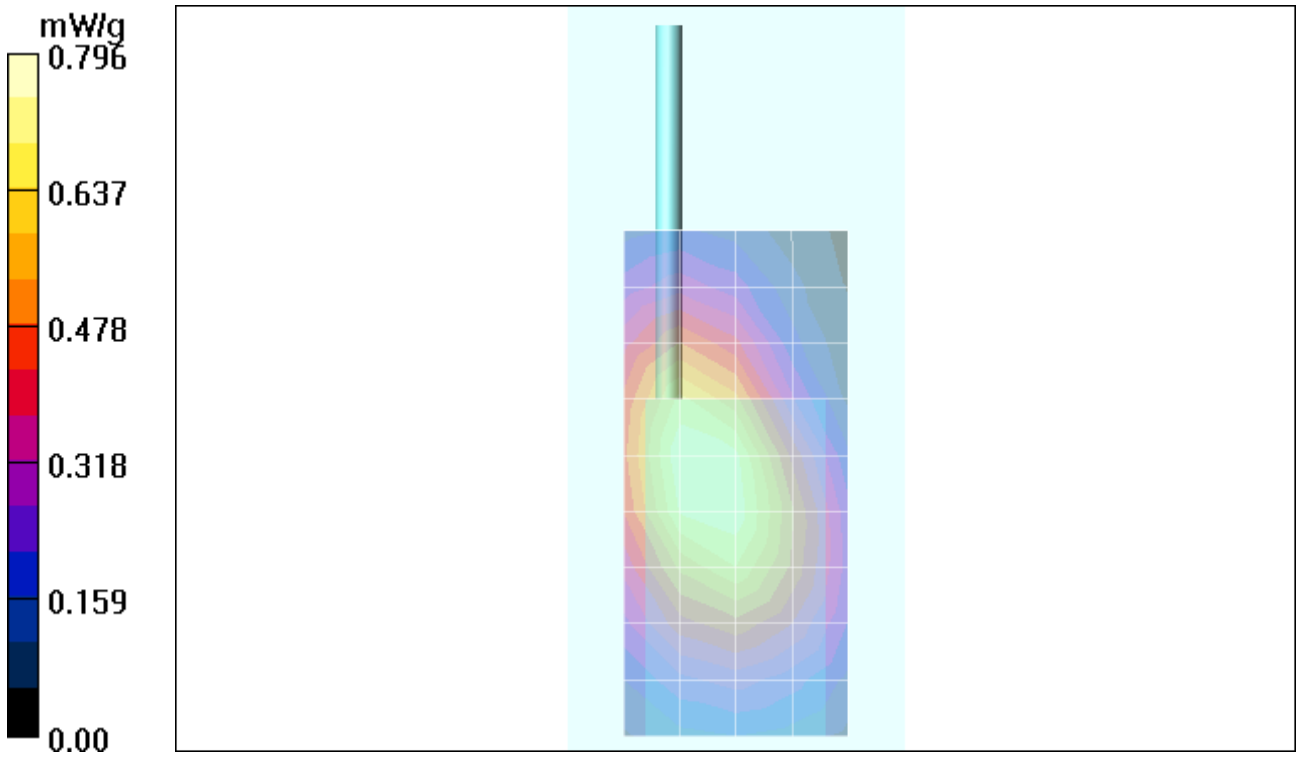
Communication System: AMPS 835; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98$ mho/m, $\varepsilon_r = 54.4$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(6, 6, 6); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 26.5 V/m; Power Drift = -0.017 dB
Peak SAR (extrapolated) = 0.996 W/kg
SAR(1 g) = 0.735 mW/g; SAR(10 g) = 0.536 mW/g
Maximum value of SAR (measured) = 0.784 mW/g

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (12x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.736 mW/g



Date/Time: 4/18/2005 3:25:34PM

Test Laboratory: Motorola 1900 BW ch600 front ant ret

Serial: FC990BFA
Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: Retracted Battery Model #: SNN5762A
Accessory Model # = Front of Phone 25mm From Phantom
Communication System: CDMA 1900; Frequency: 1880 MHz; Channel Number: 600; Duty Cycle: 1:1;
Medium: Regular Glycol Body; Medium parameters used: $\sigma = 1.59$ mho/m, $\varepsilon_r = 51.6$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

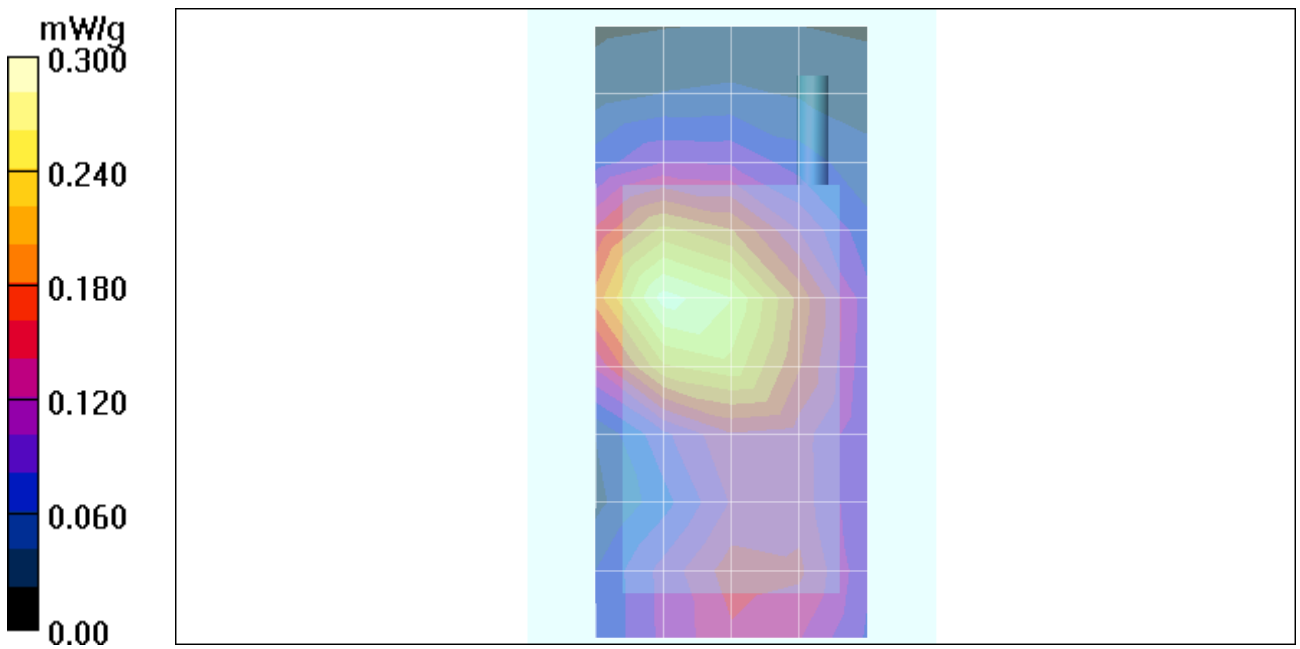
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.290 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.0 V/m; **Power Drift = -0.089 dB** Peak SAR (extrapolated) = 0.414 W/kg
SAR(1 g) = 0.277 mW/g; SAR(10 g) = 0.175 mW/g Maximum value of SAR (measured) = 0.298 mW/g



Date/Time: 4/18/2005 3:53:05 PM

Test Laboratory: Motorola **CDMA1900 BW ch600 front ant ext**

Serial: FC990BFA

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: Extended Battery Model #: SNN5762A Accessory Model # = Front of Phone 25mm From Phantom

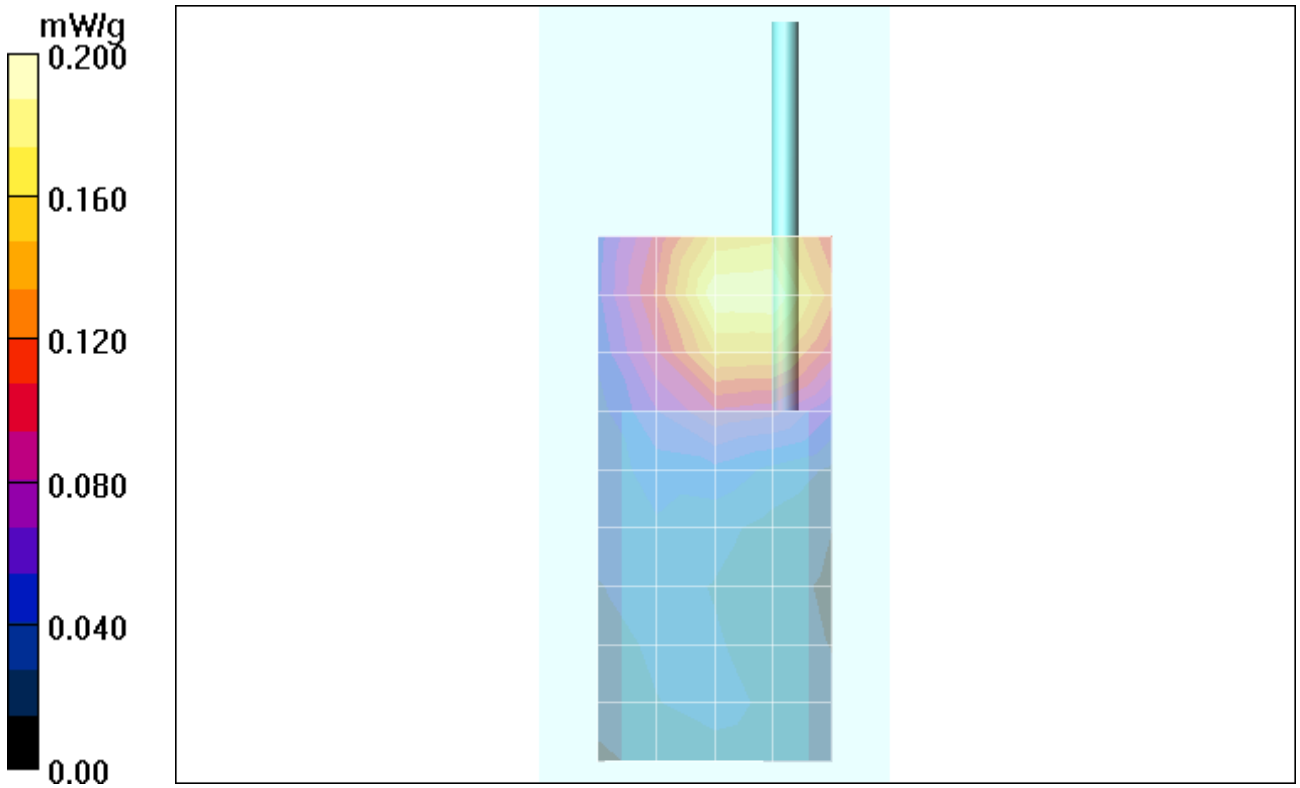
Communication System: CDMA 1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: Regular Glycol Body; Medium parameters used: σ = 1.59 mho/m, ε_r = 51.6; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.4 V/m; Power Drift = -0.082 dB
Peak SAR (extrapolated) = 0.264 W/kg
SAR(1 g) = 0.181 mW/g; SAR(10 g) = 0.117 mW/g
Maximum value of SAR (measured) = 0.195 mW/g

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (12x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.187 mW/g



Date/Time: 4/13/2005 3:15:31PM

Test Laboratory: Motorola 1900 BW ch600 back ant ret

Serial: FC990BFA
Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: Retracted Battery Model #: SNN5762A
Accessory Model # = Back of Phone 25mm from Phantom
Communication System: CDMA 1900; Frequency: 1880 MHz; Channel Number: 600; Duty Cycle: 1:1;
Medium: Regular Glycol Body; Medium parameters used: $\sigma = 1.59$ mho/m, $\varepsilon_r = 52.1$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

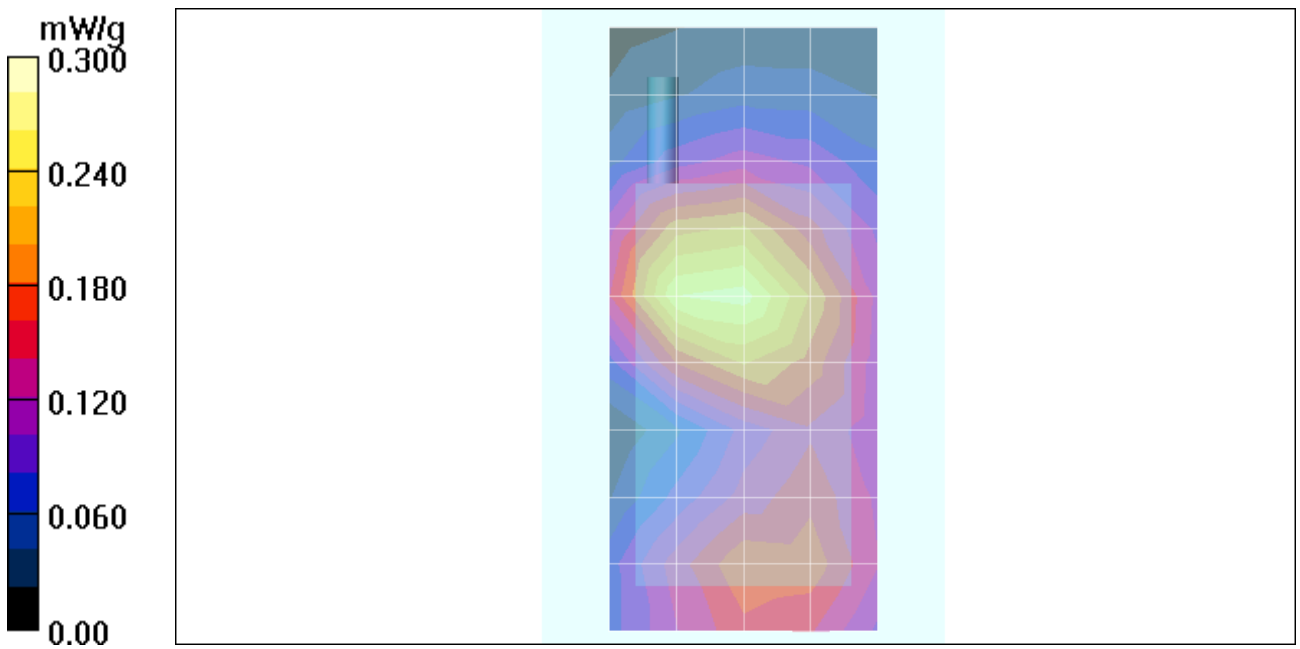
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.270 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.4 V/m; **Power Drift = -0.154 dB** Peak SAR (extrapolated) = 0.371 W/kg
SAR(1 g) = 0.257 mW/g; SAR(10 g) = 0.164 mW/g Maximum value of SAR (measured) = 0.278 mW/g



Date/Time: 4/13/2005 3:38:55 PM

Test Laboratory: Motorola **CDMA1900 BW ch600 back ant ext**

Serial: FC990BFA

Procedure Notes: Ch# 600 / Pwr Step: Always Up Antenna Position: Extended Battery Model #: SNN5762A Accessory Model # = Back of Phone 25mm from Phantom

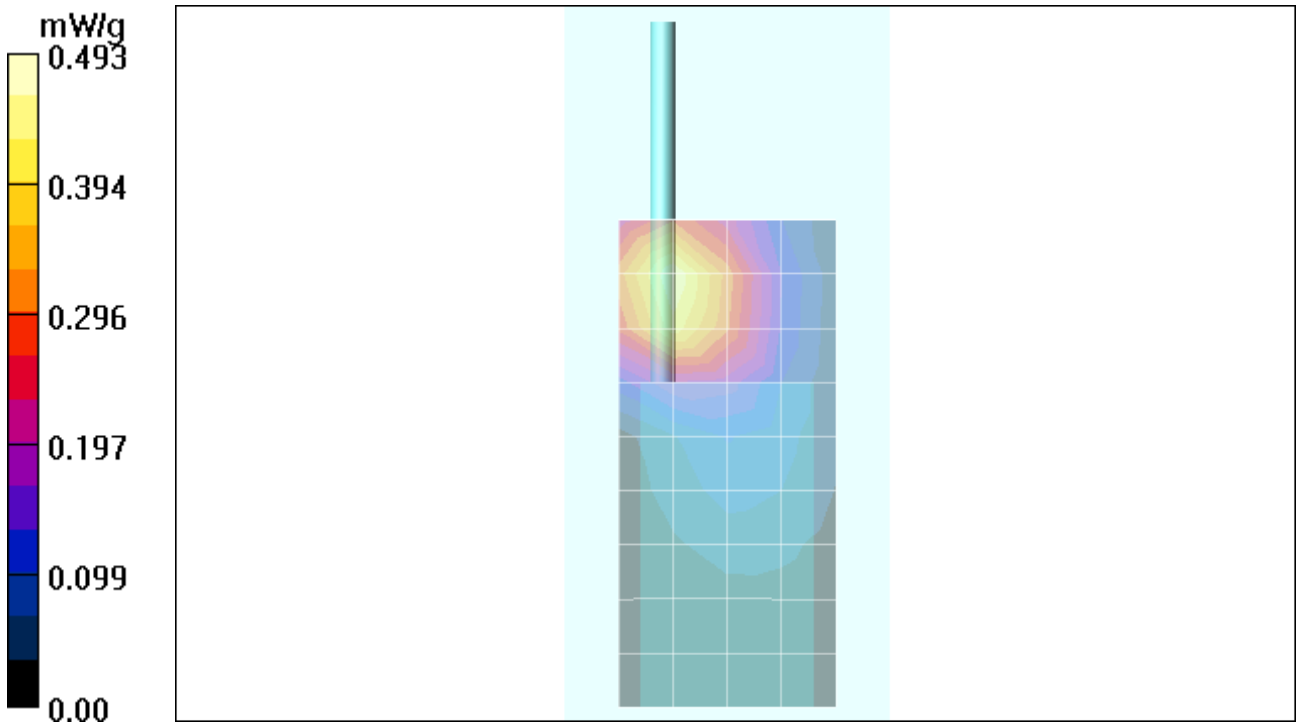
Communication System: CDMA 1900; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: Regular Glycol Body; Medium parameters used: σ = 1.59 mho/m, ε_r = 52.1; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.8 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 0.632 W/kg
SAR(1 g) = 0.440 mW/g; SAR(10 g) = 0.279 mW/g
Maximum value of SAR (measured) = 0.468 mW/g

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (12x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.463 mW/g



Date/Time: 4/17/2005 2:31:20AM

Test Laboratory: Motorola 800 BW ch384 front ant ret

Serial: FC990BFA
Procedure Notes: Ch# 384 / Pwr Step: always up Antenna Position: ret Battery Model #: snn5762
25mm from front
Communication System: CDMA 835; Frequency: 836.52 MHz; Channel Number: 384; Duty Cycle: 1:1;
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98$ mho/m, $\varepsilon_r = 54$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

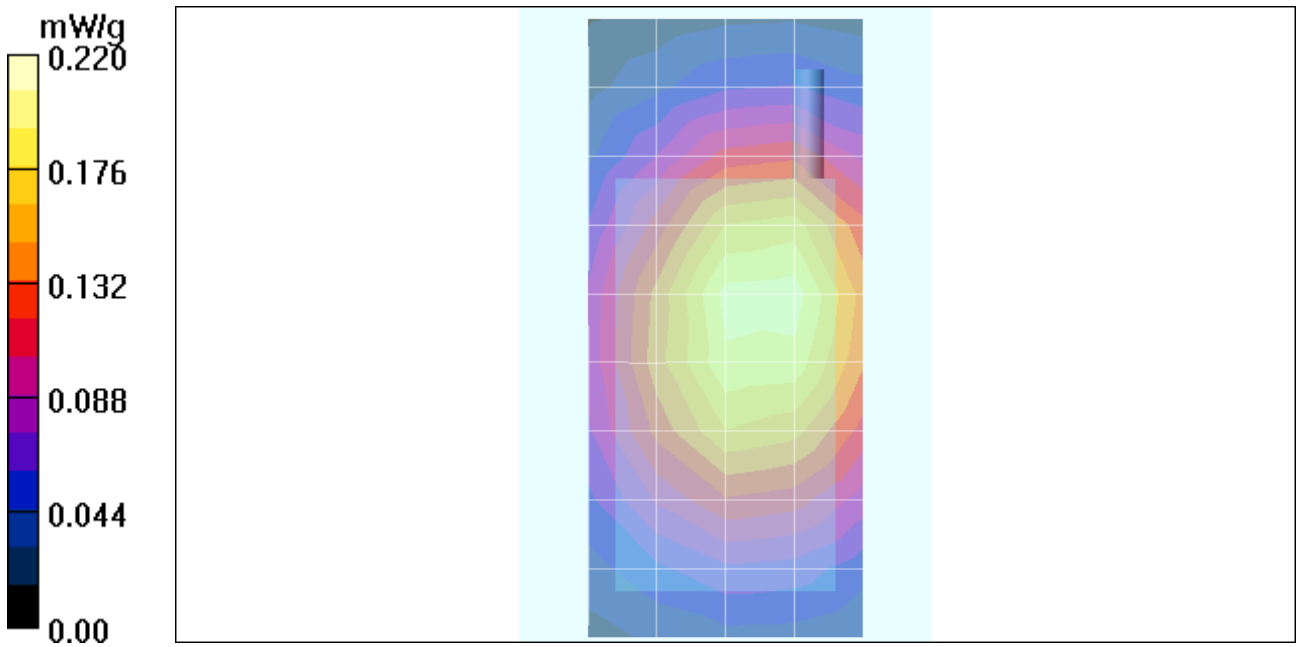
- Probe: ES3DV3 - SN3037; ConvF(6, 6, 6); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

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

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

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.0 V/m; **Power Drift = -0.00 dB** Peak SAR (extrapolated) = 0.254 W/kg
SAR(1 g) = 0.195 mW/g; SAR(10 g) = 0.144 mW/g Maximum value of SAR (measured) = 0.207 mW/g



Date/Time: 4/17/2005 2:09:56 AM

Test Laboratory: Motorola **CDMA800 BW ch384 front ant ext**

Serial: FC990BFA

Procedure Notes: Ch# 384 / Pwr Step: always up Antenna Position: ext Battery Model #: snn5762a 25mm from front

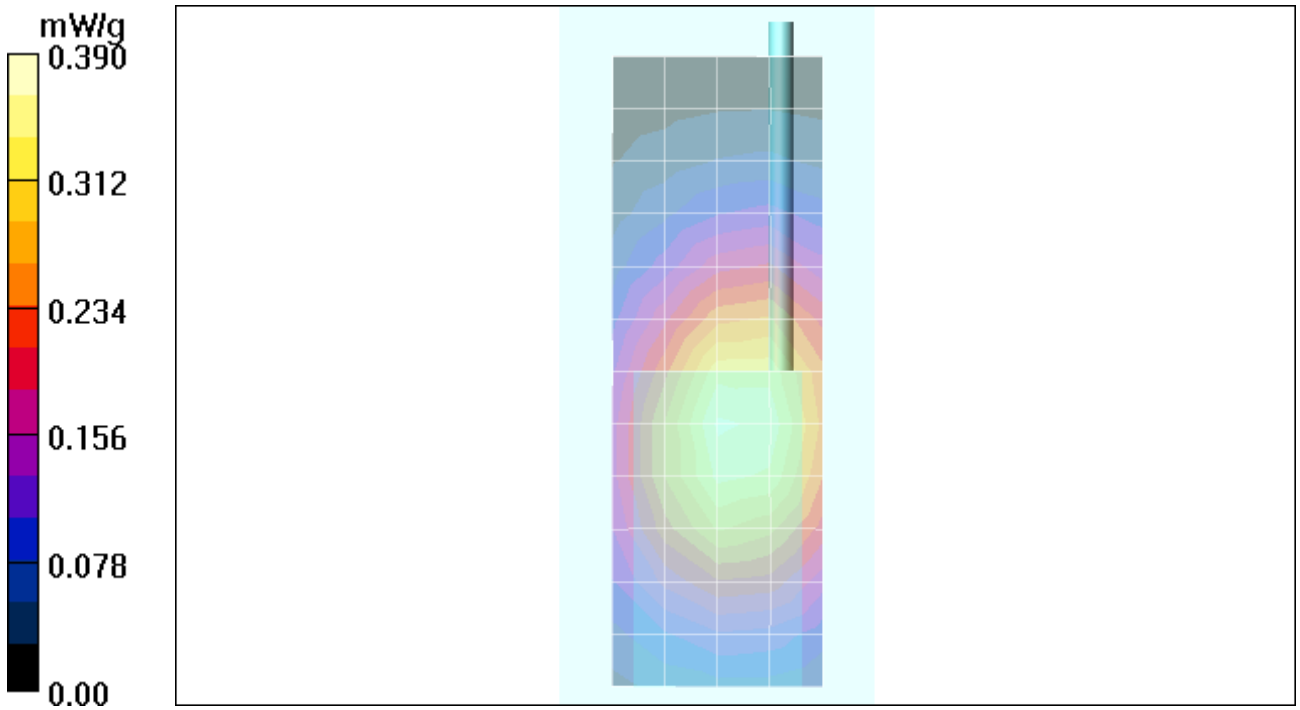
Communication System: CDMA 835; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98$ mho/m, $\varepsilon_r = 54$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(6, 6, 6); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Amy Twin Phone Template/Area Scan - Normal Extended Body (15mm) (15x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.370 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 19.3 V/m; Power Drift = 0.084 dB
Peak SAR (extrapolated) = 0.487 W/kg
SAR(1 g) = 0.365 mW/g; SAR(10 g) = 0.269 mW/g
Maximum value of SAR (measured) = 0.386 mW/g



Date/Time: 4/13/2005 12:56:14 PM

Test Laboratory: Motorola

CDMA800 BW ch384 back ant ret

Serial: FC990BFA

Procedure Notes: Ch# 384 / Pwr Step: Always Up Antenna Position: Retracted Battery Model #: SNN5762A Accessory Model # = Back of Phone 25mm from Phantom

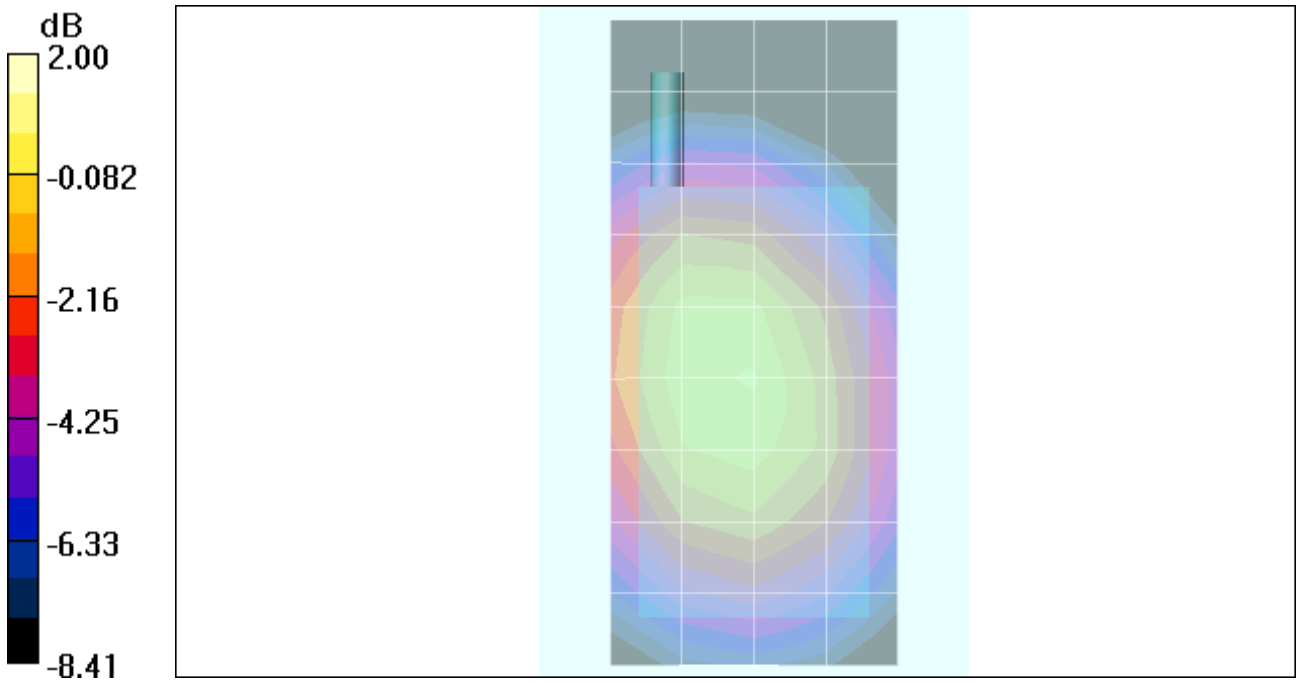
Communication System: CDMA 835; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98$ mho/m, $\varepsilon_r = 54.4$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(6, 6, 6); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.0 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 0.415 W/kg
SAR(1 g) = 0.311 mW/g; SAR(10 g) = 0.228 mW/g
Maximum value of SAR (measured) = 0.330 mW/g

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (12x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.321 mW/g



0 dB = 0.321mW/g

Date/Time: 4/13/2005 1:32:52 PM

Test Laboratory: Motorola **CDMA800 BW ch384 back ant ext**

Serial: FC990BFA

Procedure Notes: Ch# 384 / Pwr Step: Always Up Antenna Position: Extended Battery Model #: SNN5762A Accessory Model # = Back of Phone 25mm from Phantom

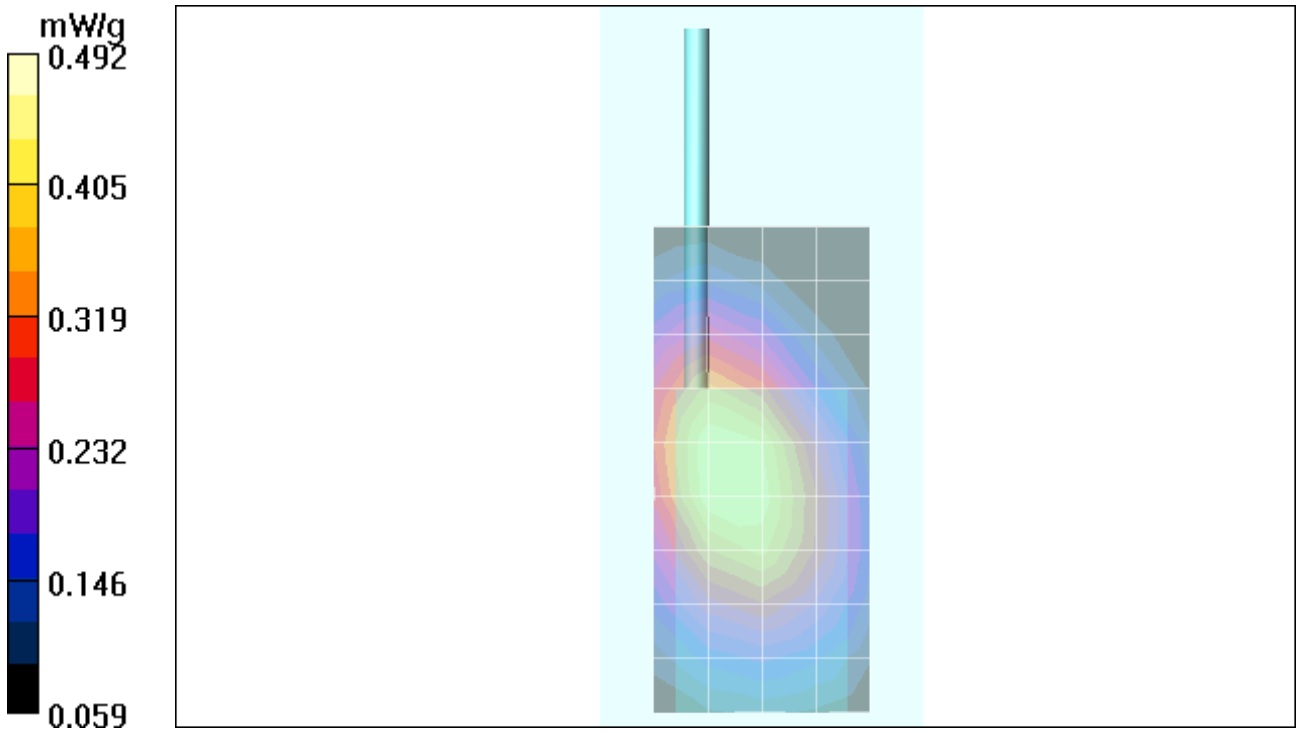
Communication System: CDMA 835; Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98$ mho/m, $\varepsilon_r = 54.4$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(6, 6, 6); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.9 V/m; Power Drift = -0.174 dB
Peak SAR (extrapolated) = 0.564 W/kg
SAR(1 g) = 0.427 mW/g; SAR(10 g) = 0.311 mW/g
Maximum value of SAR (measured) = 0.452 mW/g

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (12x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.432 mW/g



Date/Time: 4/13/2005 2:05:58 PM

Test Laboratory: Motorola

AMPS BW ch991 back ant ret

Serial: FC990BFA

Procedure Notes: Ch# 991 / Pwr Step: 2 Antenna Position: Retracted Battery Model #: SNN5762A Accessory Model # = Back of Phone 25mm from Phantom

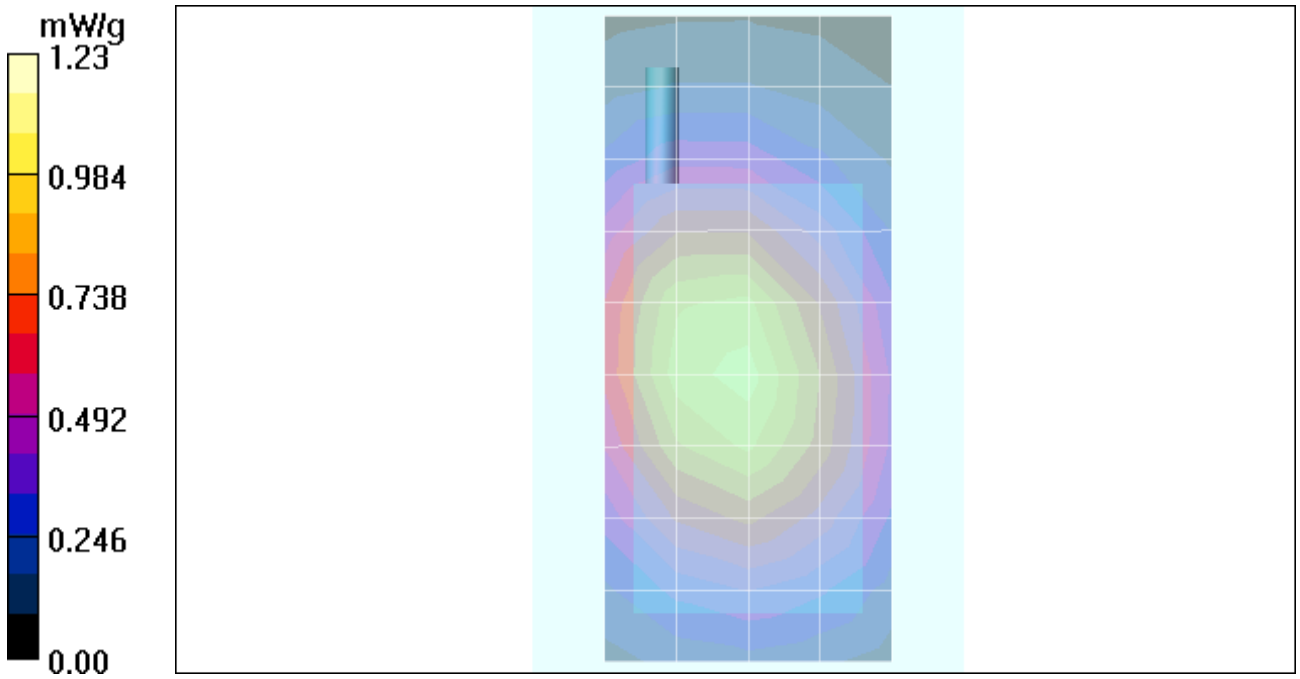
Communication System: AMPS 835; Frequency: 824.04 MHz;Duty Cycle: 1:1
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.98$ mho/m, $\varepsilon_r = 54.4$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ES3DV3 - SN3037; ConvF(6, 6, 6); Calibrated: 11/25/2004
- 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, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 32.2 V/m; Power Drift = -0.292 dB
Peak SAR (extrapolated) = 1.25 W/kg
SAR(1 g) = 0.962 mW/g; SAR(10 g) = 0.706 mW/g
Maximum value of SAR (measured) = 1.01 mW/g

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (12x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 1.03 mW/g



Appendix 4

Probe Calibration Certificate

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client Motorola PCS

Certificate No: ES3-3037_Nov04

CALIBRATION CERTIFICATE

Object	ES3DV3 - SN:3037
Calibration procedure(s)	QA CAL-01.v5 Calibration procedure for dosimetric E-field probes
Calibration date:	November 25, 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 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-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)	10-Aug-04 (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)	10-Aug-04 (METAS, No. 251-00404)	Aug-05
Reference Probe ES3DV2	SN: 3013	8-Jan-04 (SPEAG, No. ES3-3013_Jan04)	Jan-05
DAE4	SN: 617	29-Sep-04 (SPEAG, No. DAE4-617_Sep04)	Sep-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: November 26, 2004

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

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,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:

a) 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
b) 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:

- *NORMx,y,z:* Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,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*.
- *DCPx,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 *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 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 ES3DV3

SN:3037

Manufactured:	August 21, 2003
Last calibrated:	October 10, 2003
Recalibrated:	November 25, 2004

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ES3DV3 SN:3037

Sensitivity in Free Space[A]

NormX	**1.15** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**99** mV
NormY	**0.84** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**99** mV
NormZ	**0.94** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**99** mV

Diode Compression[B]

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		**3.0 mm**	**4.0 mm**
SAR_{be} [%]	Without Correction Algorithm	5.8	2.5
SAR_{be} [%]	With Correction Algorithm	0.0	0.1

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

Sensor Center to Phantom Surface Distance		**3.0 mm**	**4.0 mm**
SAR_{be} [%]	Without Correction Algorithm	7.7	4.5
SAR_{be} [%]	With Correction Algorithm	0.1	0.3

Sensor Offset

Probe Tip to Sensor Center **2.0** mm

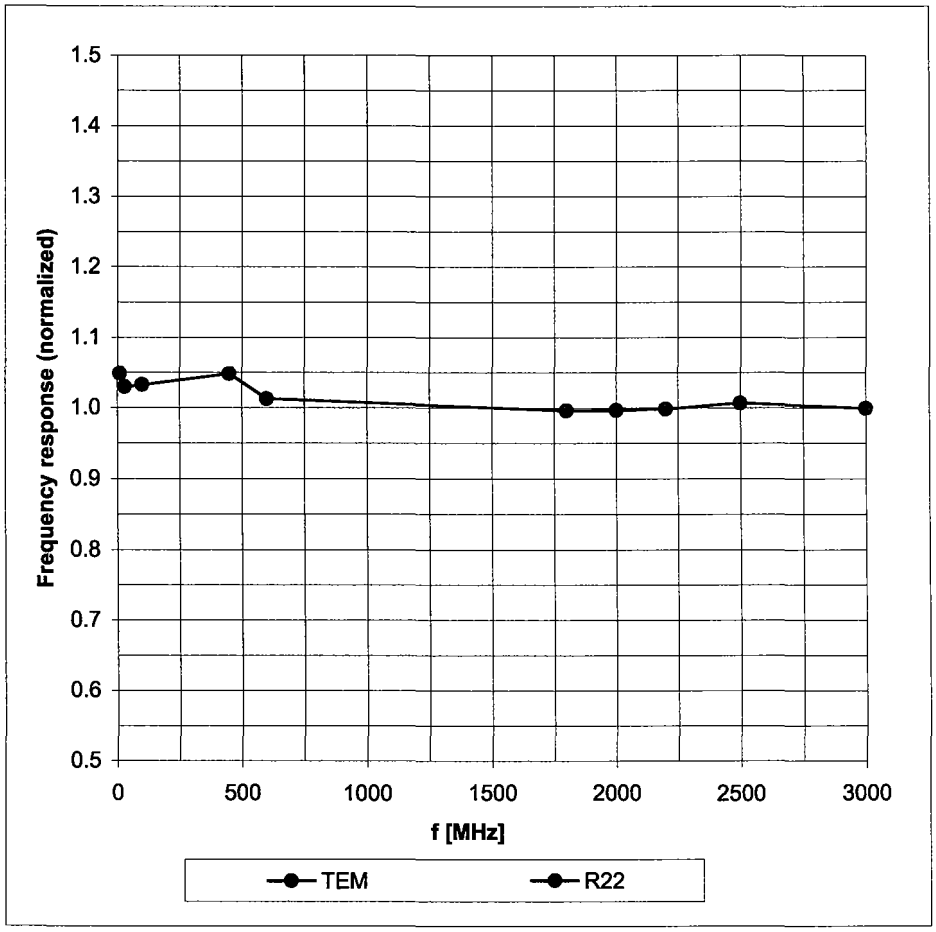
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

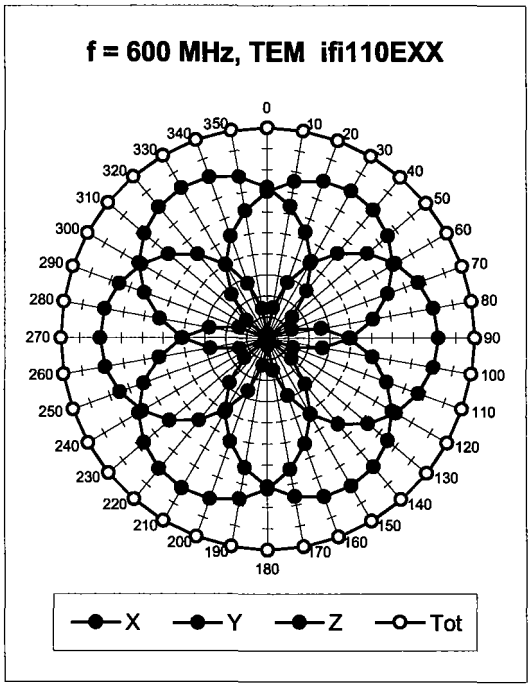
Frequency Response of E-Field

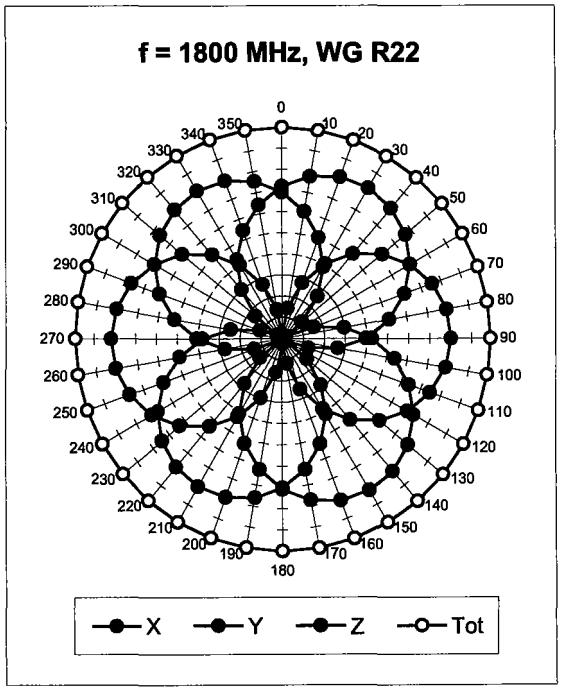
(TEM-Cell:ifi110 EXX, Waveguide: R22)

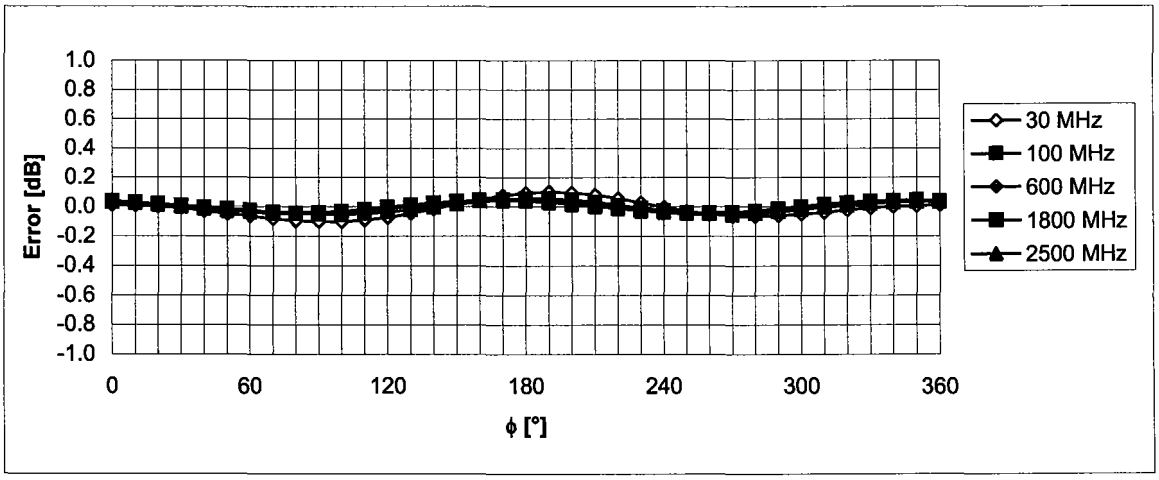


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



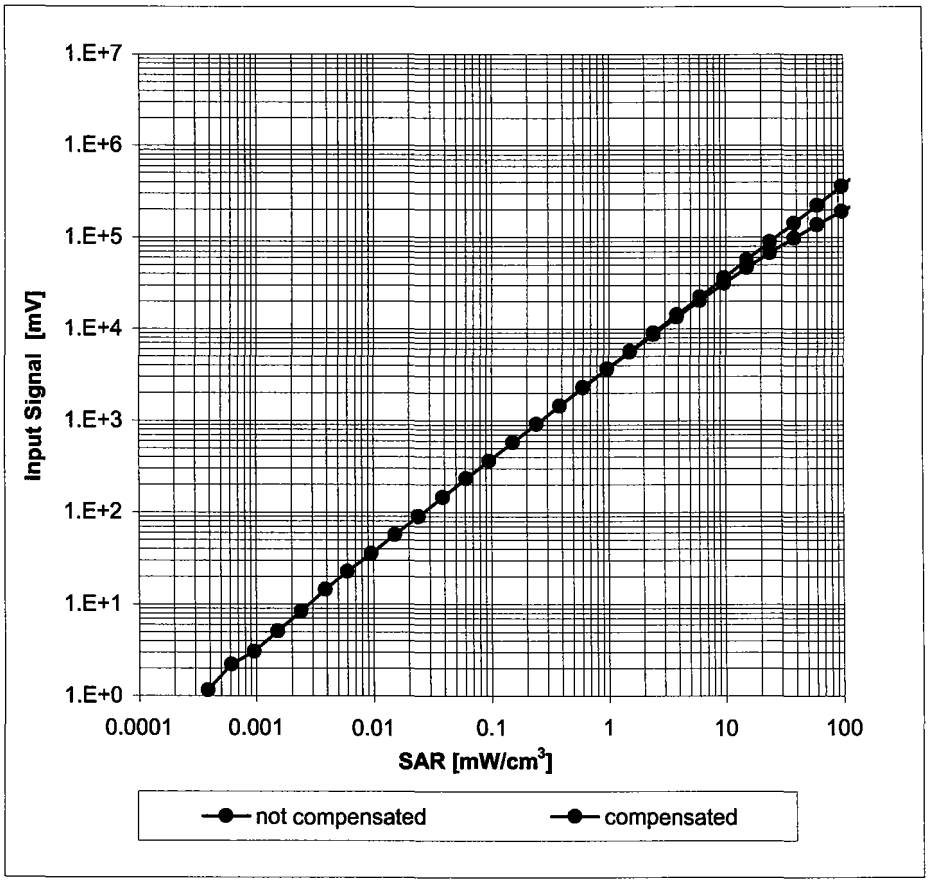


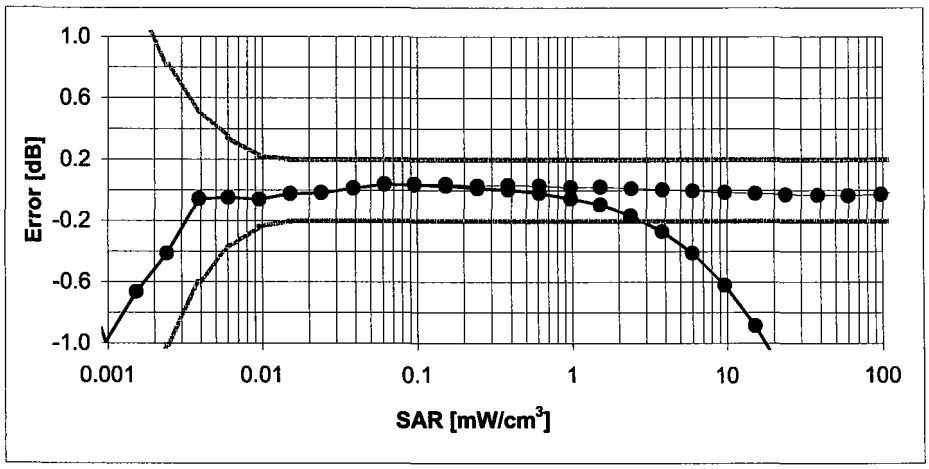


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

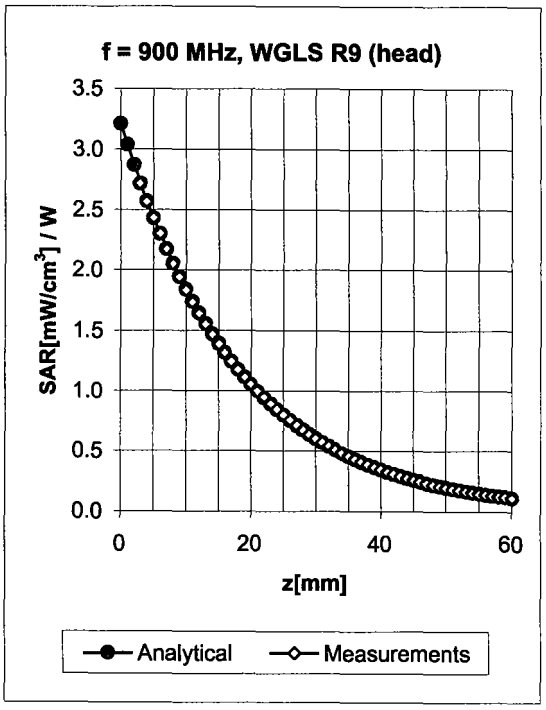
(Waveguide R22, f = 1800 MHz)

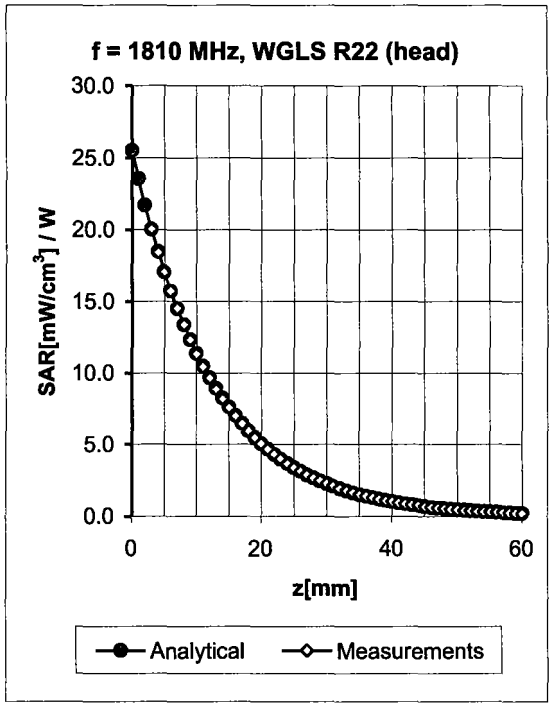




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



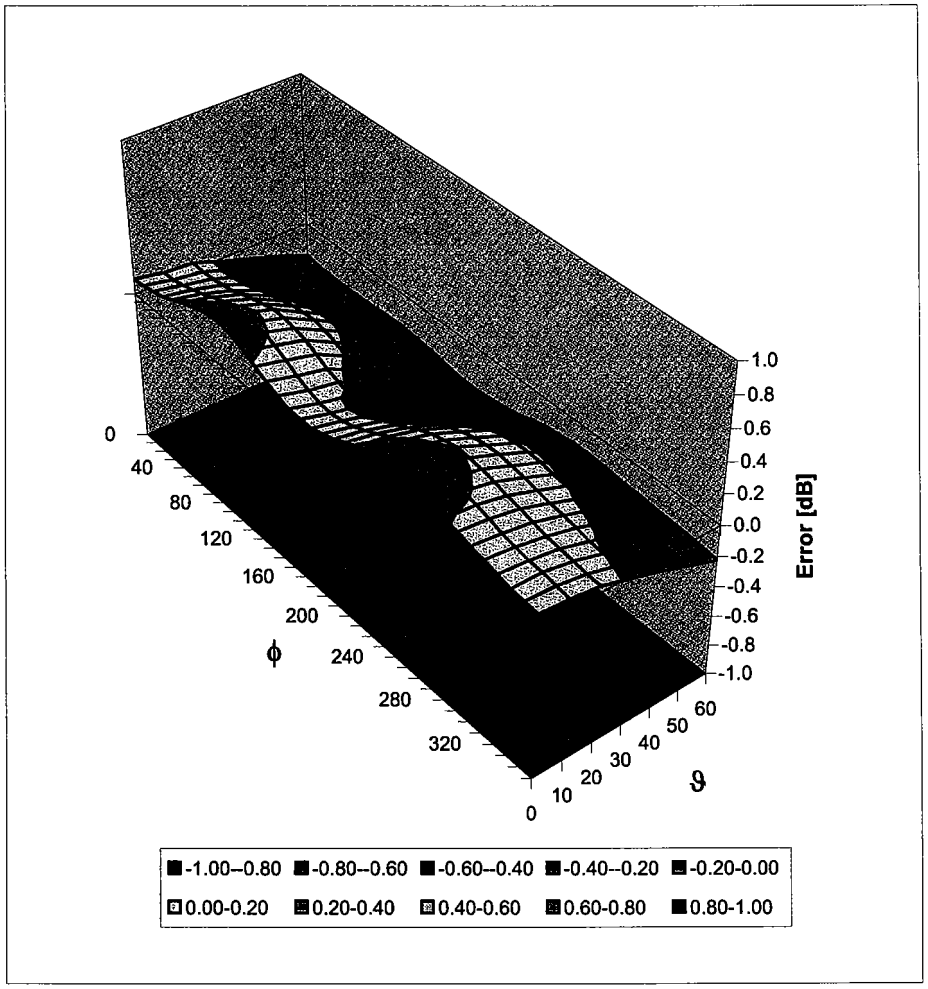


f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.56	1.29	6.11 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.25	2.34	5.16 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.28	2.26	4.77 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.66	1.23	6.00 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.23	3.26	4.71 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.32	2.16	4.56 ± 11.0% (k=2)

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

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

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

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client Motorola Korea

Certificate No: ET3-1398_Feb05

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1398
Calibration procedure(s)	QA CAL-01.v5 Calibration procedure for dosimetric E-field probes
Calibration date:	February 24, 2005
Condition of the calibrated item	In Tolerance

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter 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)	10-Aug-04 (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)	10-Aug-04 (METAS, No. 251-00404)	Aug-05
Reference Probe ES3DV2	SN: 3013	7-Jan-05 (SPEAG, No. ES3-3013_Jan05)	Jan-06
DAE4	SN: 617	19-Jan-05 (SPEAG, No. DAE4-617_Jan05)	Jan-06

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-04)	In house check: Nov 05

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

Issued: February 25, 2005

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

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,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:

a) 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
b) 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:

- *NORMx,y,z:* Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,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*.
- *DCPx,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 *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 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 ET3DV6

SN:1398

Manufactured:	October 24, 1999
Last calibrated:	February 16, 2004
Recalibrated:	February 24, 2005

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1398

Sensitivity in Free Space[A]

NormX	**1.48** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**92** mV
NormY	**1.61** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**92** mV
NormZ	**1.54** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**92** mV

Diode Compression[B]

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	8.4	4.3
SAR_{be} [%]	With Correction Algorithm	0.6	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	13.6	9.3
SAR_{be} [%]	With Correction Algorithm	0.9	0.2

Sensor Offset

Probe Tip to Sensor Center **2.7** mm

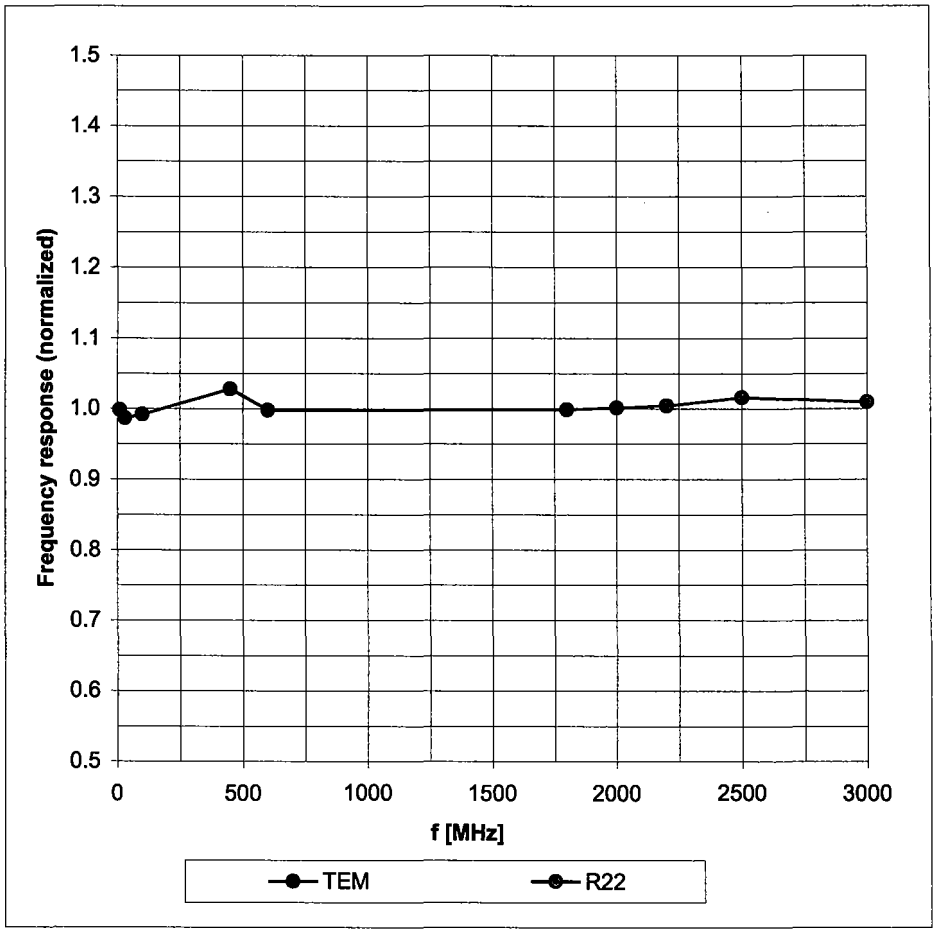
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

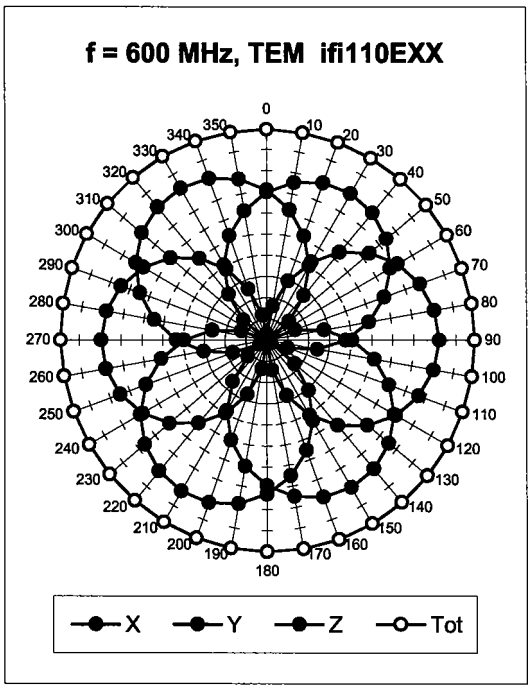
Frequency Response of E-Field

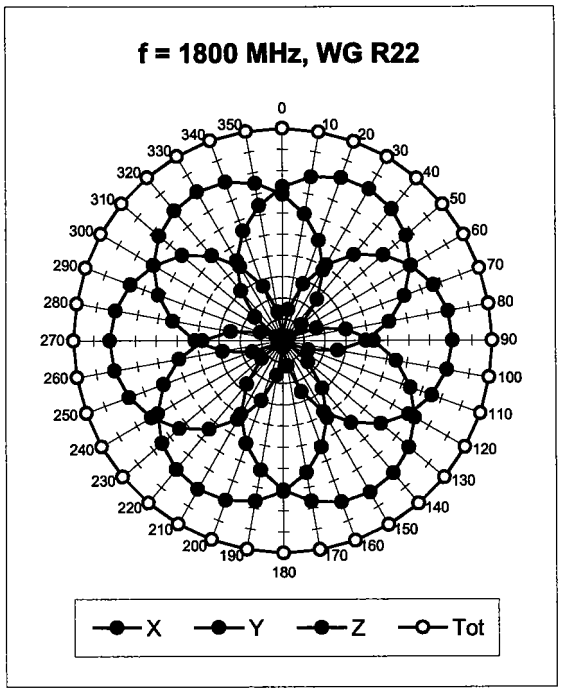
(TEM-Cell:ifi110 EXX, Waveguide: R22)

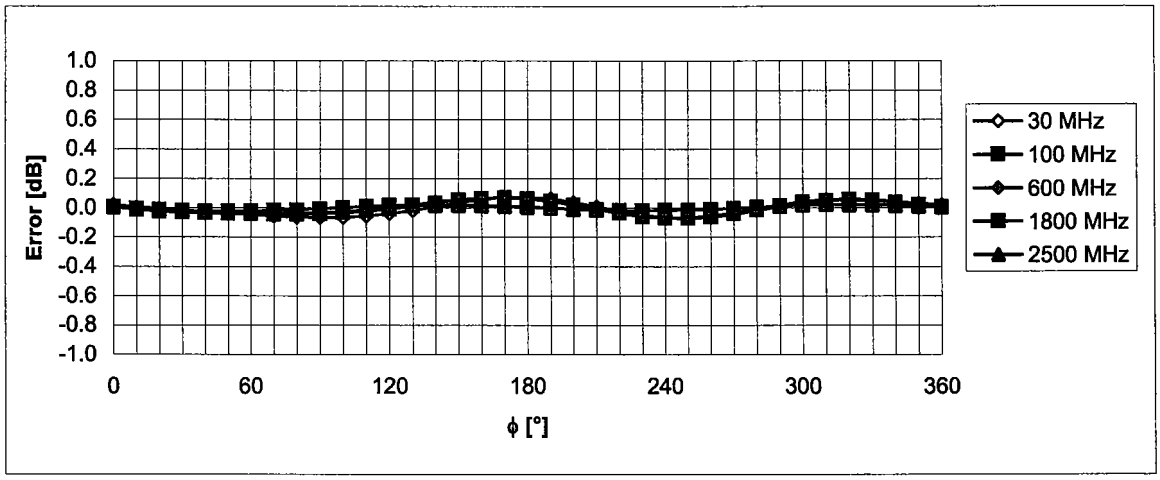


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



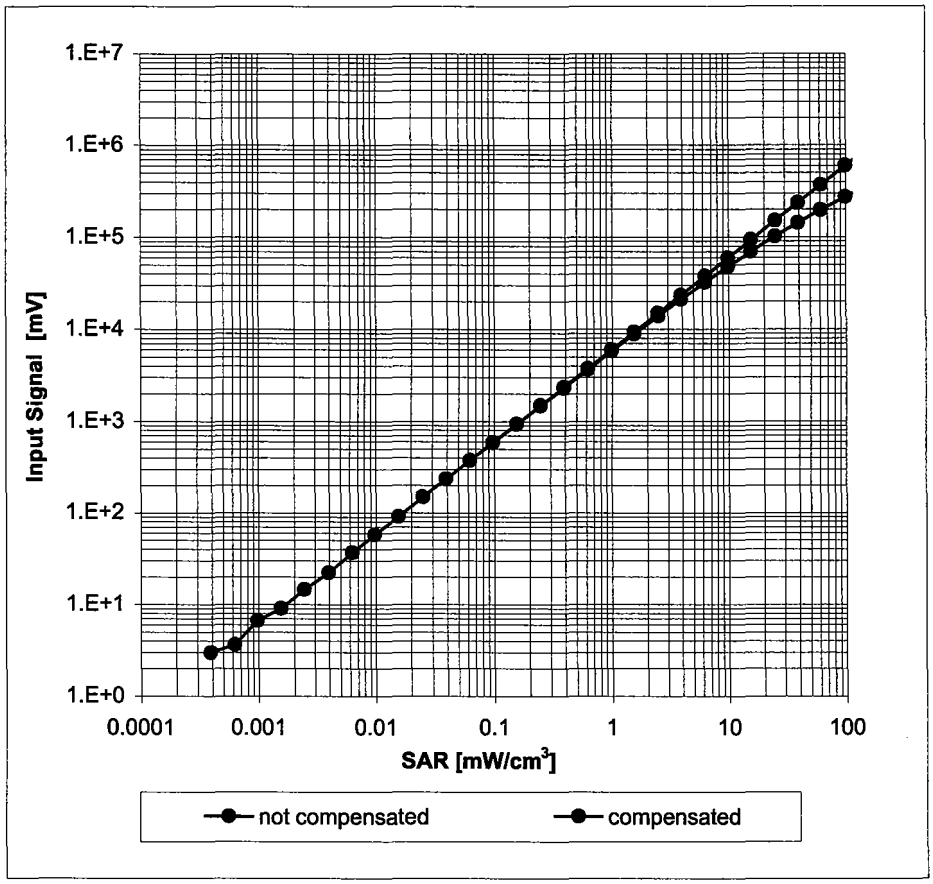


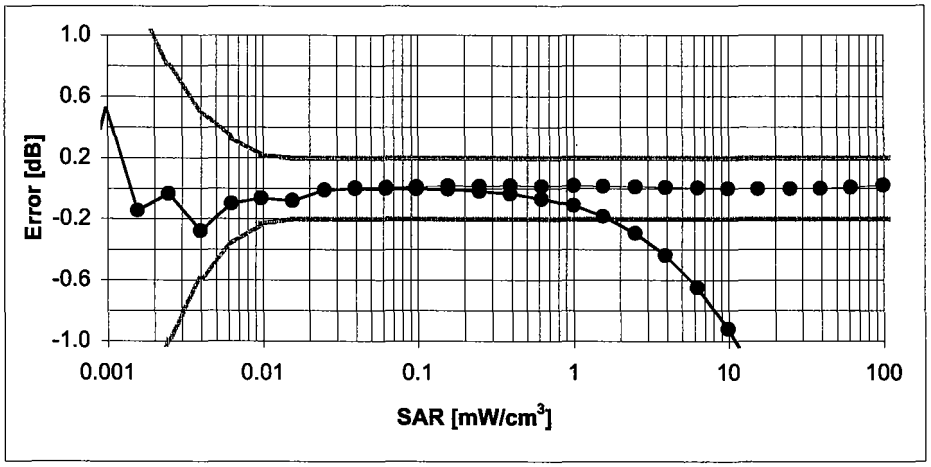


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

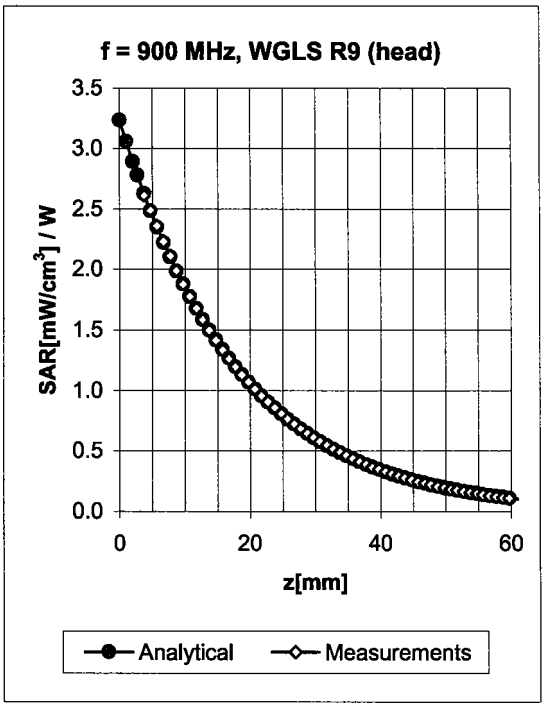
(Waveguide R22, f = 1800 MHz)

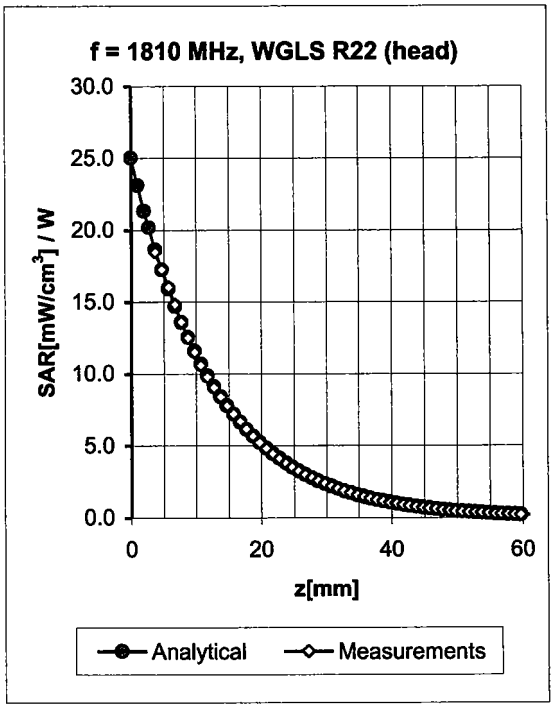




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



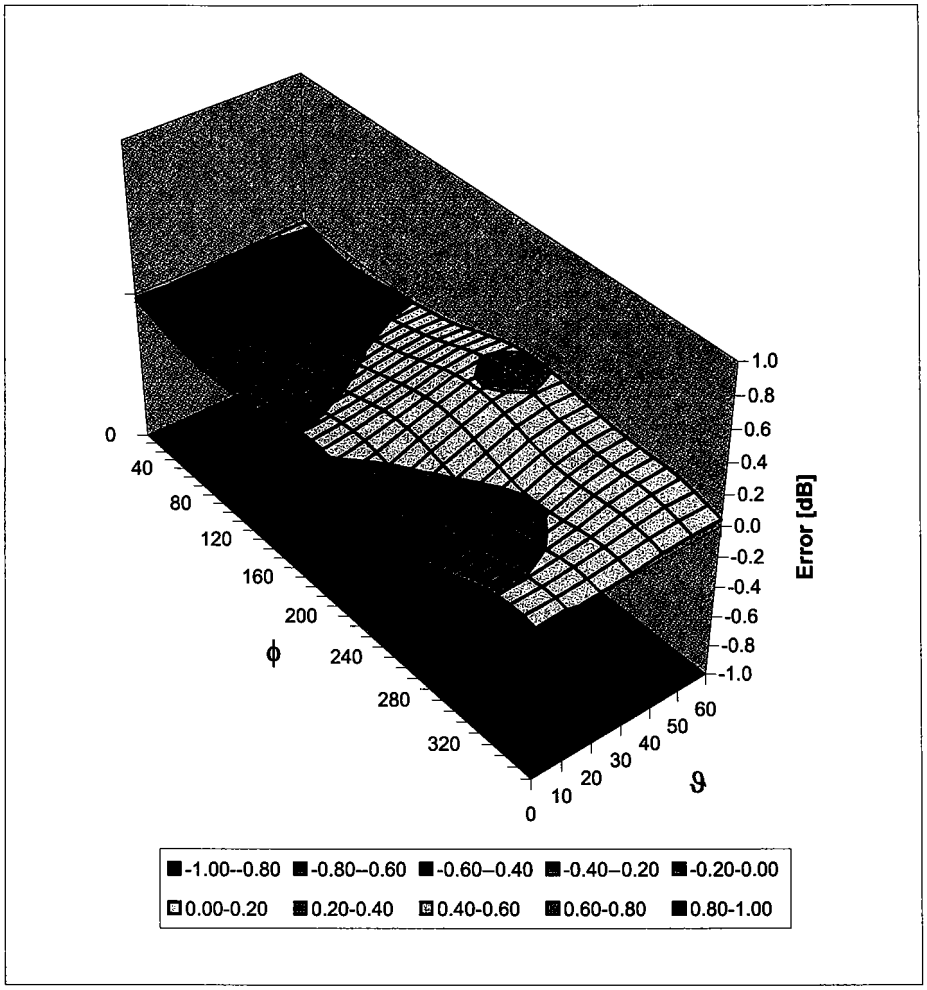


f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	1.29	1.35	6.42 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.61	2.36	5.12 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.59	2.50	4.87 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.74	2.11	4.50 ± 11.8% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	1.16	1.50	6.04 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.60	2.67	4.65 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.67	2.36	4.43 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.89	1.79	4.26 ± 11.8% (k=2)

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

Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Appendix 5

Measurement Uncertainty Budget

Uncertainty Budget for Device Under Test

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
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	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)			*k* =2				22.98	21.75	

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

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
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 6

Photographs of the device under test

Figure 1.Front of Phone with Antenna Retracted

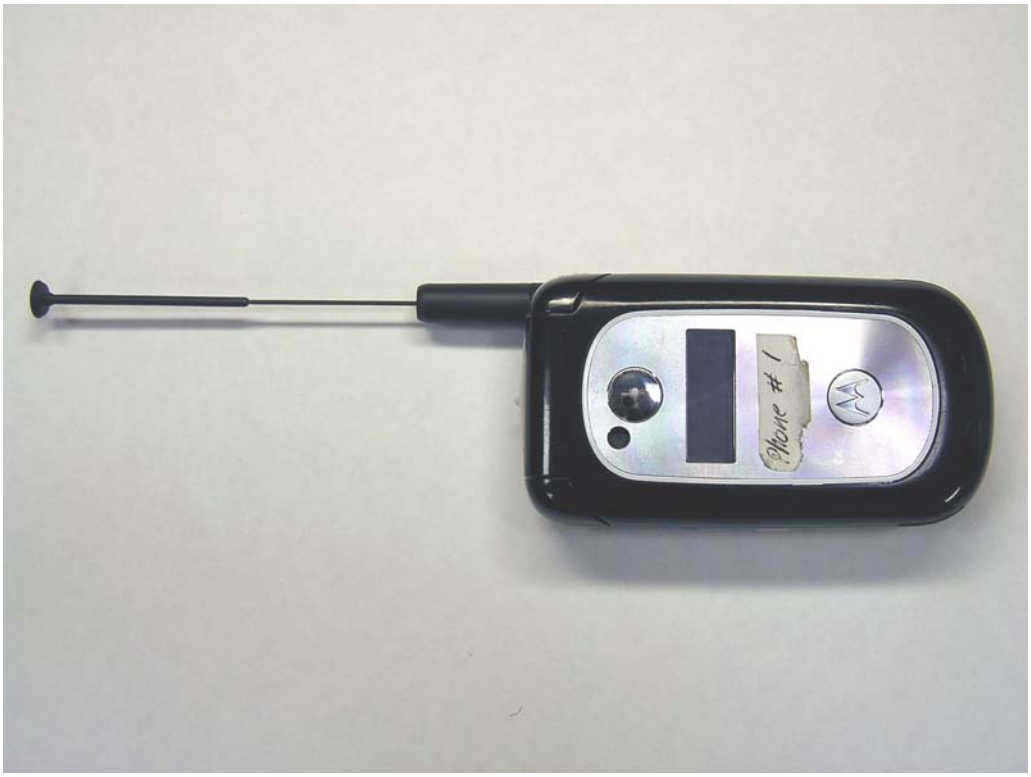


Figure 2.Front of Phone with Antenna Extended

Figure 3. Back of Phone with Antenna Retracted

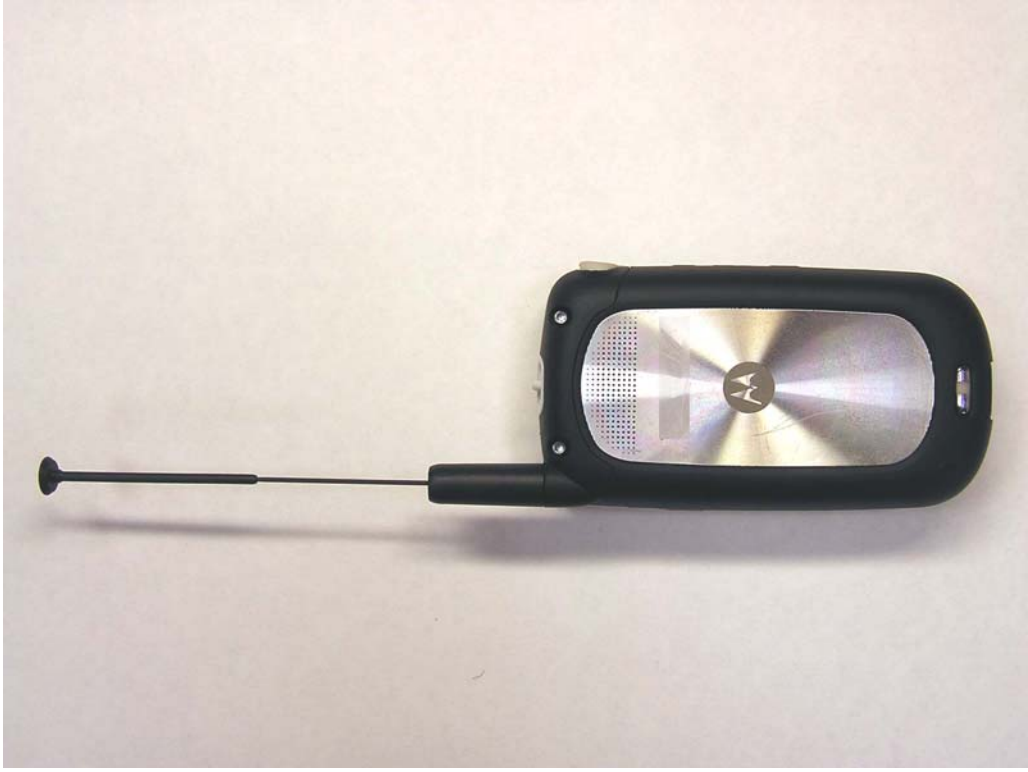


Figure 4. Back of Phone with Antenna Extended

Figure 5.Open Phone with Antenna Retracted

Figure 6.Open Phone with Antenna Extended

Figure 7. Phone in Holster with Antenna Retracted

Figure 8. Phone in Holster with Antenna Retracted side view

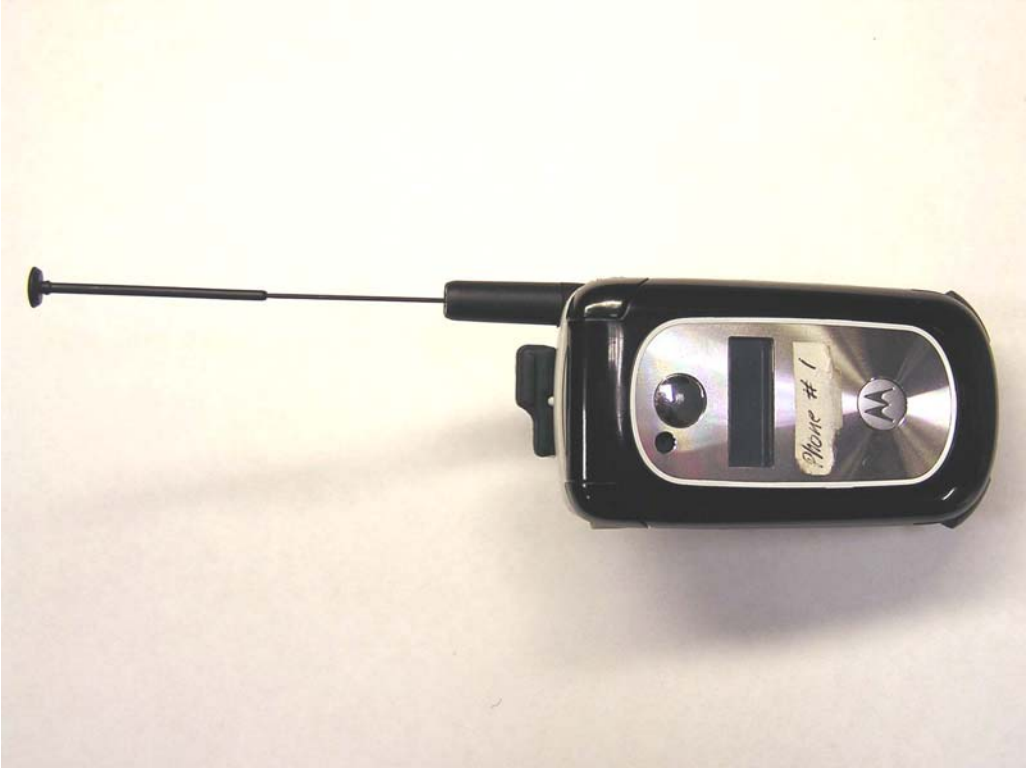


Figure 9. Phone in Holster with Antenna Extended

Figure 10. Phone in Holster with Antenna Retracted side view

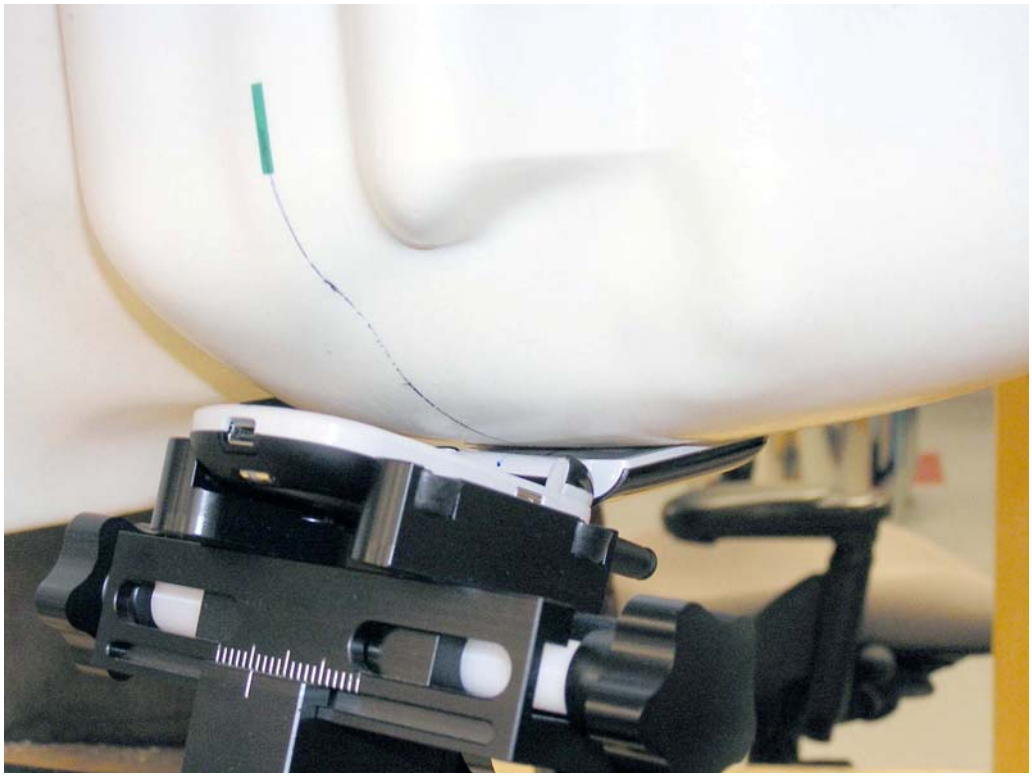


Figure 11. Phone Against the Head with Antenna Retracted (Front View – Cheek Touch)

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

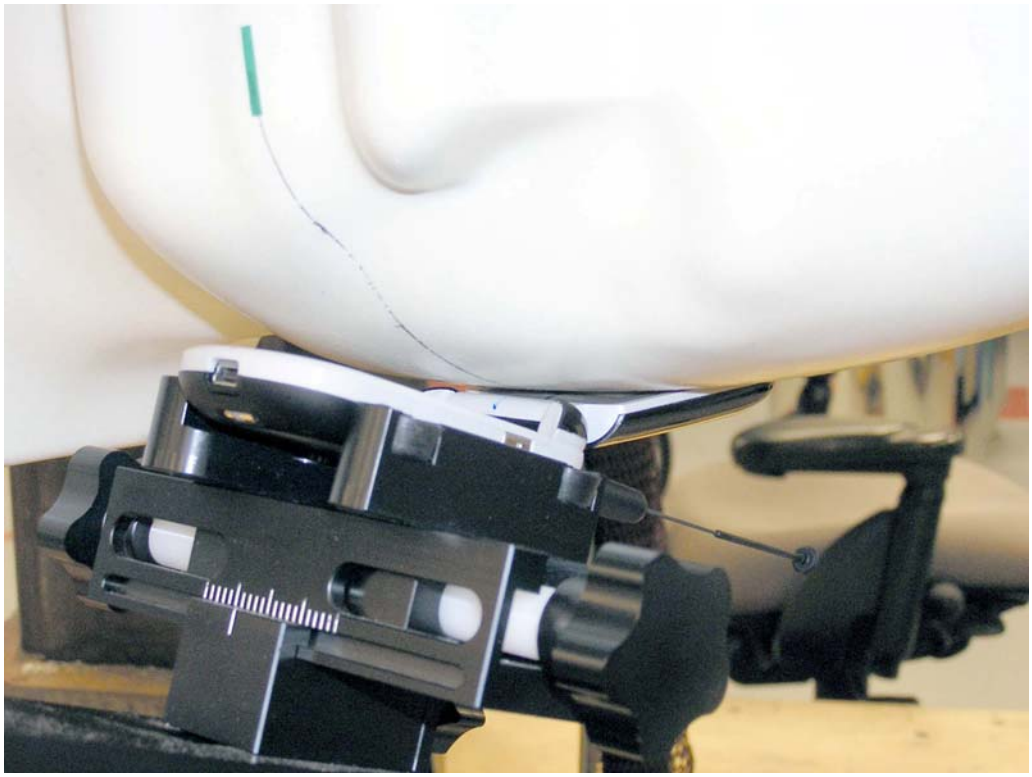


Figure 13. Phone Against the Head with Antenna Extended (Front View – Cheek Touch)

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

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

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

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

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

Figure 19. Phone in Holster Against the Flat Phantom with Antenna Retracted

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