Exhibit 11: SAR Test Report IHDT6FH1

Date of test: 06/13/2005 to 06/25/2005
Date of Report: 06/29/2005

Laboratory:
Motorola Mobile Devices Business Product Safety & Compliance Laboratory
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Room: MW113
Libertyville, Illinois 60048

Test Responsible:
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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 IHDT6FH1 to which this declaration relates, is in conformity with the appropriate General Population/Uncontrolled RF exposure standards, recommendations and guidelines (FCC 47 CFR §2.1093). It also declares that the product was tested in accordance with the appropriate measurement standards, guidelines and recommended practices. Any deviations from these standards, guidelines and recommended practices are noted below:

(none)

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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

2.2 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 6

6.1 Head Adjacent Test Results 7

6.2 Body Worn Test Results 9

APPENDIX 1: SAR DISTRIBUTION COMPARISON FOR SYSTEM ACCURACY VERIFICATION 12

APPENDIX 2: SAR DISTRIBUTION PLOTS FOR PHANTOM HEAD ADJACENT USE 13

APPENDIX 3: SAR DISTRIBUTION PLOTS FOR BODY WORN CONFIGURATION 14

APPENDIX 4: PROBE CALIBRATION CERTIFICATE 15

APPENDIX 5: MEASUREMENT UNCERTAINTY BUDGET 16

APPENDIX 6: PHOTOGRAPHS OF DEVICE UNDER TEST 19

1 Introduction

The Motorola Mobile Devices Business Product Safety Laboratory has performed measurements of the maximum potential exposure to the user of portable cellular phone (FCC ID IHDT6FH1). The Specific Absorption Rate (SAR) of this product was measured. The portable cellular phone was tested in accordance with FCC OET Bulletin 65 Supplement C 01-01.

2 Description of the Device Under Test

2.1 Antenna description

Type	Internal Antenna	
Location	Back of Phone	
Dimensions	Length	20mm
	Width	35mm
Configuration	FICA Antenna	

2.2 Device description

FCC ID Number	**IHDT6FH1**						
Serial number(s)	004400012410096 & 004400012410328						
Mode(s) of Operation	GSM 900	GSM 1800	GSM 1900	GPRS 900	GPRS 1800	GPRS 1900	BlueTooth
Modulation Mode(s)	GSM	GSM	GSM	GSM	GSM	GSM	BlueTooth
Maximum Output Power Setting	33.00dBm	30.60dBm	30.60dBm	33.00dBm	30.60dBm	30.60dBm	0.00 - 4.00 dBm
Duty Cycle	1:8	1:8	1:8	2:8	2:8	2:8	1:1
Transmitting Frequency Rang(s)	880.2 - 914.8 MHz	1710.2- 1784.8 MHz	1850.2 – 1909.8 Mhz	880.2 - 914.8 MHz	1710.2- 1784.8 MHz	1850.2 – 1909.8 MHz	2400 - 2483.5 MHz
Production Unit or Identical Prototype (47 CFR §2..908)	Identical Prototype						
Device Category	Portable						
RF Exposure Limits	General Population / Uncontrolled						

3 Test Equipment Used

3.1 Dosimetric System

The Motorola Mobile Devices Business 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 ±11.1% (K=1) with an expanded uncertainty of ±22.2% (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
E-Field Probe ET3DV6	1398	02/24/2006
Dipole Validation Kit, D1800V2	259TR	
	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	GB39511087	01/25/2006
	GB39511088	12/16/2005
Power Sensor #1 - 8481A	US39210931	09/16/2005
	US39210916	09/16/2005
Power Sensor #2 - 8481A	US39210932	09/16/2005
	US39210915	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)
1880	**Head**	**Measured,** 06/13/04	38.0	1.47	20.0
		Recommended Limits	40.0 ±5%	1.40 ±5%	18-25
	Body	**Measured,** 06/13/04	52.0	1.58	19.5
		Measured, 06/17/04	52.3	1.58	20.2
		Measured, 06/25/04	52.0	1.59	19.7
		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 v4.5 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)		
1800	**Measured,** 06/13/04	37.83	39.6	1.36	20.0	19.9
	Measured, 06/17/04	37.70	39.6	1.35	20.0	19.9
	Measured, 06/25/04	37.35	39.1	1.37	21.0	20.0
	Recommended Limits	38.1	40.0 ±5%	1.4 ±5%	18-25	18-25

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

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ET3DV6	1398	1810	5.12	8 of 9
E-Field Probe ES3DV3	3037	1810	5.16	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 IHDT6FH1) has the following battery options:

AANN4285A - 860mAH Battery
AANN4285A Lischen cell - 860mAH Battery

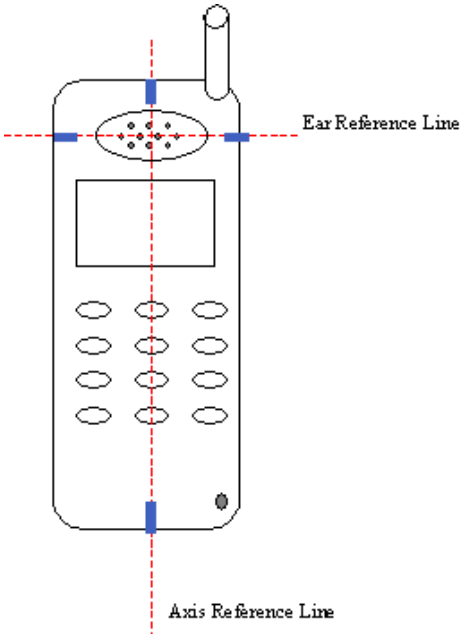
Both batteries have the same capacity. AANN4285A was used to do most of the SAR testing. The phone was placed in the SAR measurement system with a fully charged battery. The configuration that resulted in the highest SAR values were tested using the other batteries listed above.

6.1 Head Adjacent Test Results

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

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

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



The SAR results shown in tables 1 through 6 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.

There are two different external housings for this phone. They are:
Blue Housing
Black Housing
The Black Housing is considered to be an accessory. As such, the Black Housing was tested on those configurations that produced the highest SAR values for the Blue Housing.

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

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ET3DV6	1398	1810	5.12	8 of 9
E-Field Probe ES3DV3	3037	1810	5.16	8 of 9

f (MHz)	Description	Conducted Output Power (dBm)	Cheek / Touch Position with Blue Housing							
			Left Head				Right Head			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60								
	Channel 661	30.60	**0.513**	**0.15**	**0.51**	**19.8**	**0.562**	**0.07**	**0.56**	**19.8**
	Channel 810	30.60								

Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the head in the Cheek/Touch Position.

f (MHz)	Description	Conducted Output Power (dBm)	Cheek / Touch Position with Black Housing							
			Right Head				Right Head with CEC3801			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60								
	Channel 661	30.60	**0.582**	**0.08**	**0.58**	**19.8**	**0.597**	**0.07**	**0.60**	**20.0**
	Channel 810	30.60								

Table 2: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the head in the Cheek/Touch Position.

f (MHz)	Description	Conducted Output Power (dBm)	Cheek / Touch Position with Black Housing			
			Right Head with CEC3801 and AANN4285A Lischen cell			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60				
	Channel 661	30.60	**0.58**	**0.01**	**0.58**	**20.0**
	Channel 810	30.60				

Table 3: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the head in the Cheek/Touch Position.

f (MHz)	Description	Conducted Output Power (dBm)	15° Tilt Position with Blue Housing							
			Left Head				Right Head			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60								
	Channel 661	30.60	**0.422**	**0.08**	**0.42**	**19.8**	**0.438**	**-0.12**	**0.45**	**19.8**
	Channel 810	30.60								

Table 4: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the head in the 15° Tilt Position.

f (MHz)	Description	Conducted Output Power (dBm)	15° Tilt Position with Black Housing							
			Right Head				Right Head with CEC3801			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60								
	Channel 661	30.60	**0.428**	**-0.19**	**0.45**	**19.8**	**0.383**	**0.00**	**0.38**	**20.0**
	Channel 810	30.60								

Table 5: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the head in the 15° Tilt Position.

f (MHz)	Description	Conducted Output Power (dBm)	15° Tilt Position with Black Housing			
			Right Head with AANN4285A Lischen cell			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60				
	Channel 661	30.60	**0.44**	**-0.06**	**0.45**	**20.0**
	Channel 810	30.60				

Table 6: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the head in the 15° Tilt Position.

6.2 Body Worn Test Results

The SAR results shown in tables 7 through 13 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. 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 are four Body-Worn Accessories available for this phone:
Leather Pouch: Model # EL33301 with SYN8631A belt clip
Pouch with clip: Model # CE33202
Leather Pouch: Model # CLAD01
Leather case: Model # CEC3801 with SYN8631A belt clip
All accessories were tested. In addition, the phone was tested in a body worn configuration, per Supplement C, by using a separation distance of 25mm between the phone and the phantom.

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

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ET3DV6	1398	1810	4.65	8 of 9
E-Field Probe ES3DV3	3037	1810	4.71	8 of 9

f (MHz)	Description	Conducted Output Power (dBm)	GSM Body Worn Position with Blue Housing							
			Front of Phone 25mm Away from Phantom				Back of Phone 25mm Away from Phantom			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60								
	Channel 661	30.60	**0.0924**	**-0.14**	**0.10**	**20.0**	**0.191**	**-0.04**	**0.19**	**20.0**
	Channel 810	30.60								

Table 7: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the body.

f (MHz)	Description	Conducted Output Power (dBm)	GSM Body Worn Position with Bluetooth enabled							
			Back of Phone 25mm Away from Phantom with Blue Housing				Back of Phone 25mm Away from Phantom with Black Housing			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60								
	Channel 661	30.60	**0.191**	**-0.03**	**0.19**	**20.0**	**0.18**	**-0.20**	**0.19**	**20.0**
	Channel 810	30.60								

Table 8: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the body.

f (MHz)	Description	Conducted Output Power (dBm)	GSM Body Worn Position with Black Housing & Bluetooth enabled							
			CEC3801				EL33301			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60								
	Channel 661	30.60	**0.323**	**0.395**	**0.32**	**20.0**	**0.35**	**-0.03**	**0.35**	**20.0**
	Channel 810	30.60								

Table 9: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the body.

f (MHz)	Description	Conducted Output Power (dBm)	GSM Body Worn Position with Black Housing & Bluetooth enabled							
			CE33202				CE33202 with AANN4285 Lischen cell			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60								
	Channel 661	30.60	**0.408**	**-0.01**	**0.41**	**20.0**	**0.382**	**0.03**	**0.38**	**19.8**
	Channel 810	30.60								

Table 10: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the body.

f (MHz)	Description	Conducted Output Power (dBm)	GSM Body Worn Position			
			CLAD001 with Blue Housing			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60				
	Channel 661	30.60	**0.23**	**0.132**	**0.23**	**19.6**
	Channel 810	30.60				

Table 11: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the body.

f (MHz)	Description	Conducted Output Power (dBm)	GPRS Body Worn Position with Black Housing							
			Front of Phone 25mm Away from Phantom				Back of Phone 25mm Away from Phantom			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60								
	Channel 661	30.60	**0.165**	**-0.08**	**0.17**	**20.0**	**0.299**	**0.00**	**0.30**	**20.0**
	Channel 810	30.60								

Table 12: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the body.

f (MHz)	Description	Conducted Output Power (dBm)	GPRS Body Worn Position with Blue Housing			
			Back of Phone 25mm Away from Phantom			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 1900MHz	Channel 512	30.60				
	Channel 661	30.60	**0.219**	**0.027**	**0.22**	**19.8**
	Channel 810	30.60				

Table 13: SAR measurement results for the portable cellular telephone FCC ID IHDT6FH1 at highest possible output power. Measured against the body.

Appendix 1

SAR distribution comparison for the system accuracy verification

Date/Time: 6/13/2005 6:37:50AM

Test Laboratory: Motorola 061305 1800Mhz GOOD-0.7%

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 = 19.9 ┌C Sim.Temp@SPC = 19.9 ┌C Room Temp @ SPC = 20 ┌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 = 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) = 7.70 mW/g

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

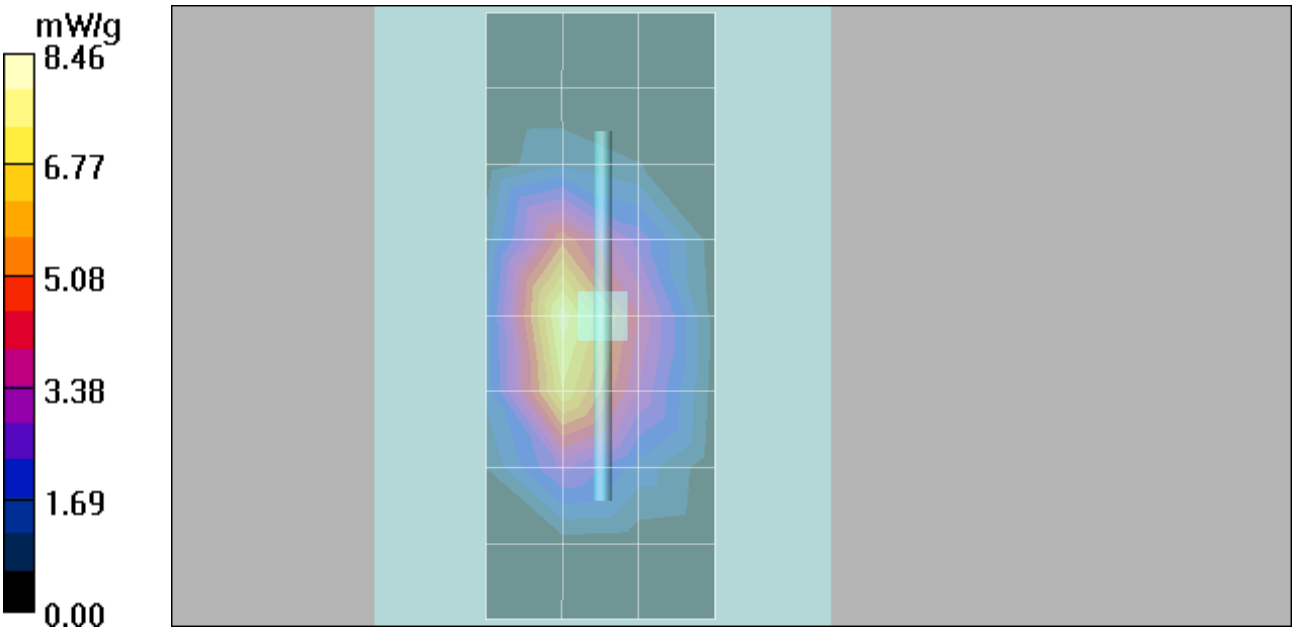
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 75.1 V/m; **Power Drift = 0.01 dB** Peak SAR (extrapolated) = 13.4 W/kg
SAR(1 g) = 7.54 mW/g; SAR(10 g) = 4 mW/g Maximum value of SAR (measured) = 8.40 mW/g

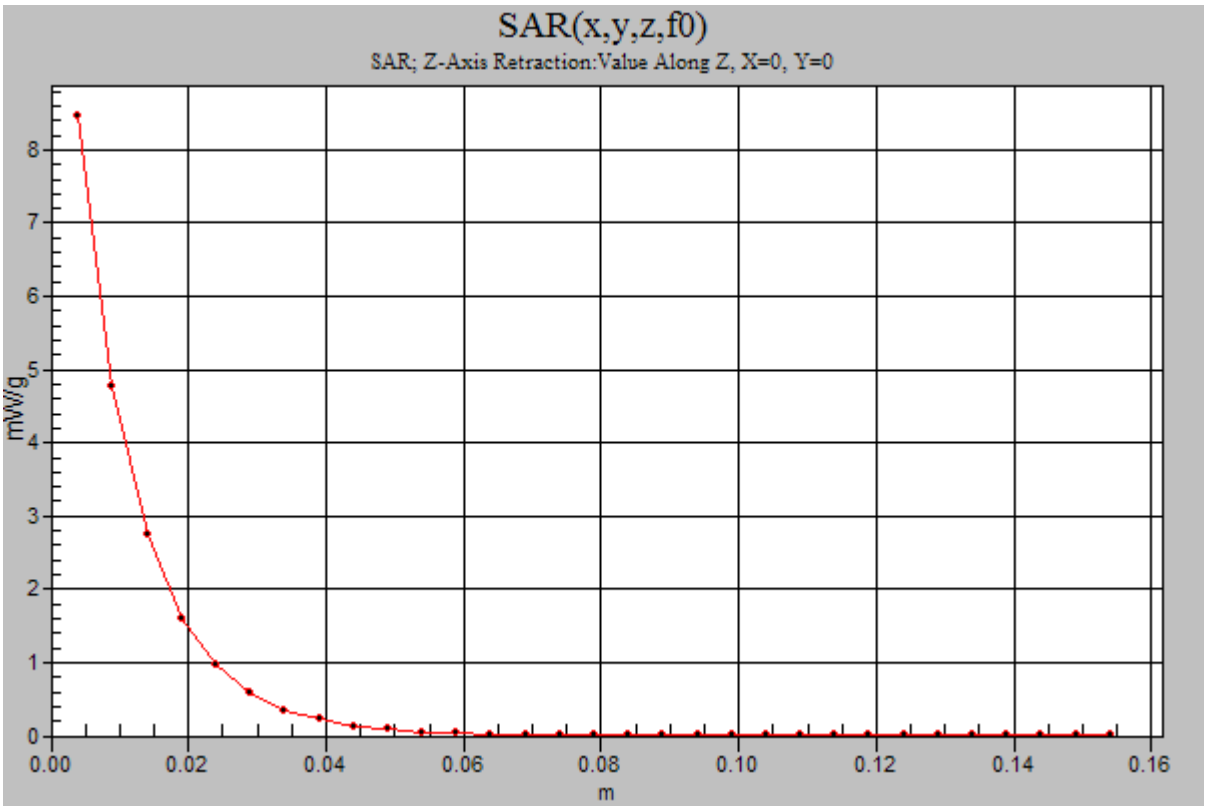
Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 75.1 V/m; **Power Drift = 0.01 dB** Peak SAR (extrapolated) = 13.5 W/kg
SAR(1 g) = 7.59 mW/g; SAR(10 g) = 4.03 mW/g Maximum value of SAR (measured) = 8.44 mW/g

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

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


mW/g
8.46
6.77
5.08
3.38
1.69
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: 6/17/2005 6:44:29AM

Test Laboratory: Motorola 061705 1800Mhz GOOD-1.0%

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 = 19.9 ┌C Room Temp @ SPC = 20 ┌C

Communication System: CW - Dipole; Frequency: 1800 MHz; Channel Number: 8; Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: σ = 1.35 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) = 7.67 mW/g

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

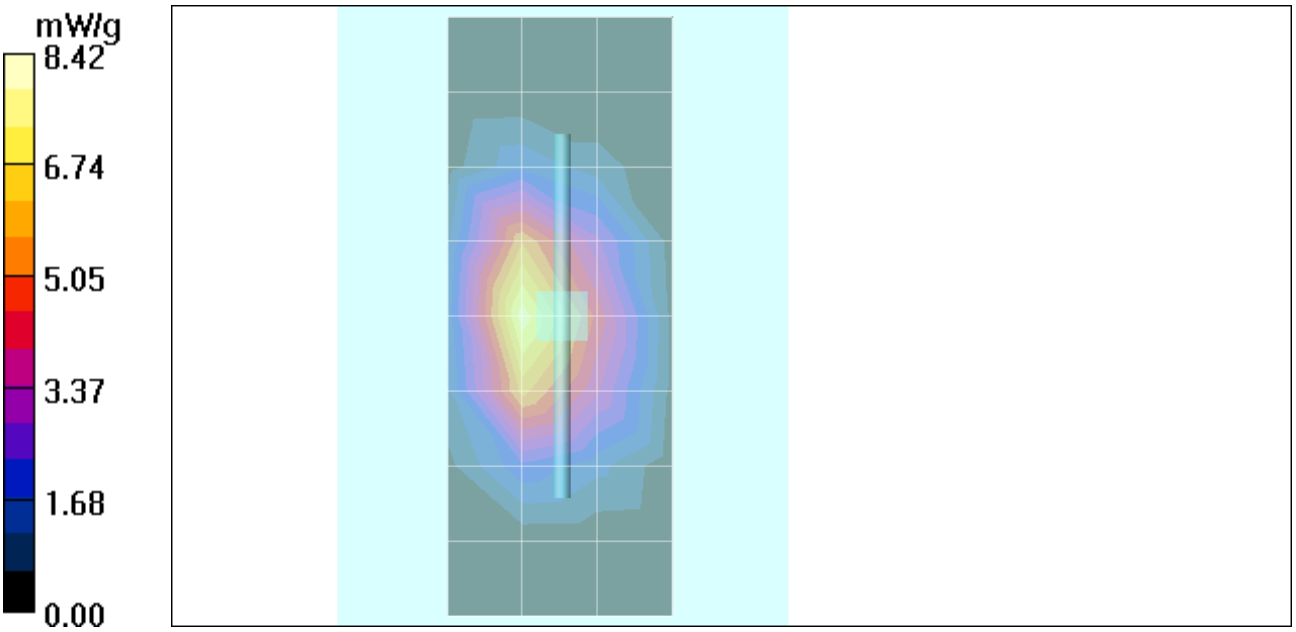
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 77.1 V/m; **Power Drift = 0.056 dB** Peak SAR (extrapolated) = 13.5 W/kg
SAR(1 g) = 7.54 mW/g; SAR(10 g) = 3.99 mW/g Maximum value of SAR (measured) = 8.41 mW/g

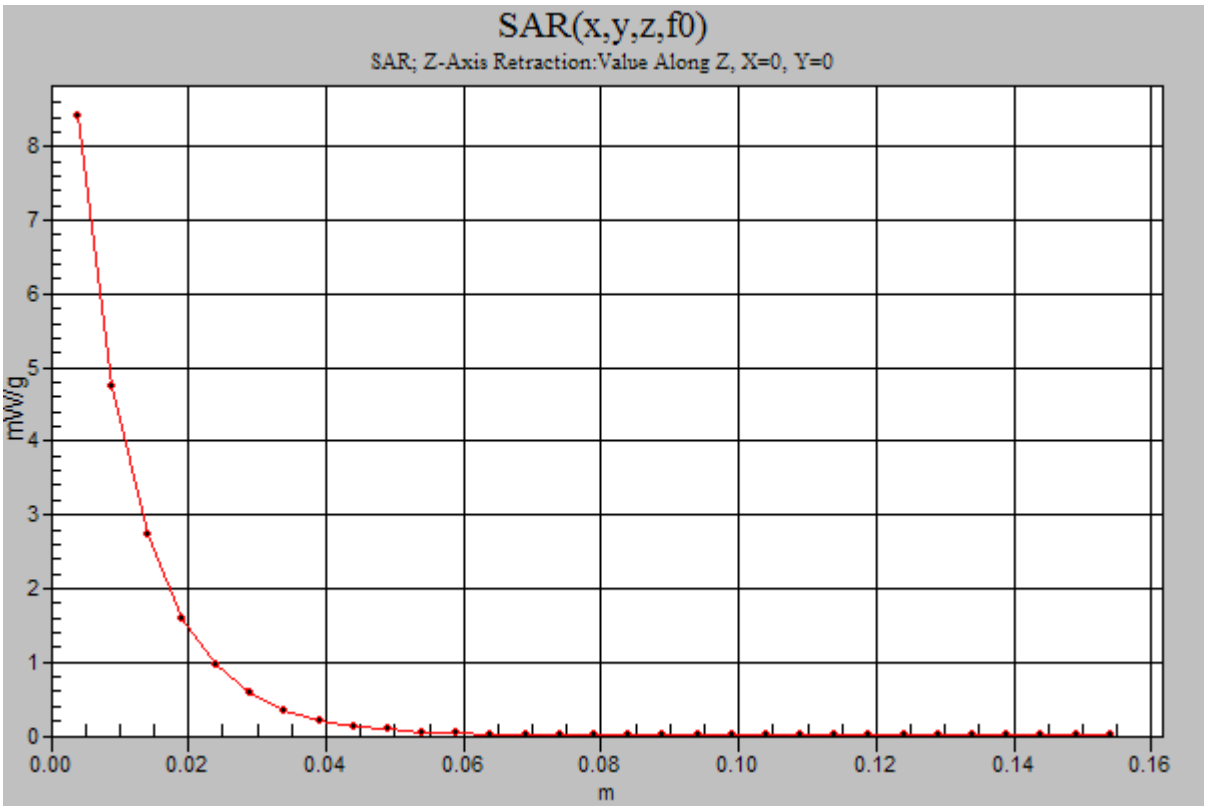
Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 77.1 V/m; **Power Drift = 0.056 dB** Peak SAR (extrapolated) = 13.3 W/kg
SAR(1 g) = 7.54 mW/g; SAR(10 g) = 4.01 mW/g Maximum value of SAR (measured) = 8.39 mW/g

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

Measurement grid: dx=20mm, dy=20mm, dz=5mm Maximum value of SAR (measured) = 8.42 mW/g


mW/g
8.42
6.74
5.05
3.37
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: 6/25/2005 7:00:40PM

Test Laboratory: Motorola 062505 1800 MHZ Good -2.0%

DUT: Dipole 1800 MHz; Type: D1800V2;
Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 259TR PM1 Power = 200 mW

Sim.Temp@meas = 20*C Sim.Temp@SPC = 20*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 = 1.37 mho/m, ε_r = 39.1; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ET3DV6 - SN1398; ConvF(5.12, 5.12, 5.12); Calibrated: 2/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn316; Calibrated: 1/13/2005
- Phantom: R1: Glycol SAM; Type: SAM; Serial: TP-1154;
- Measurement SW: DASY4, V4.5 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) = 7.18 mW/g

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

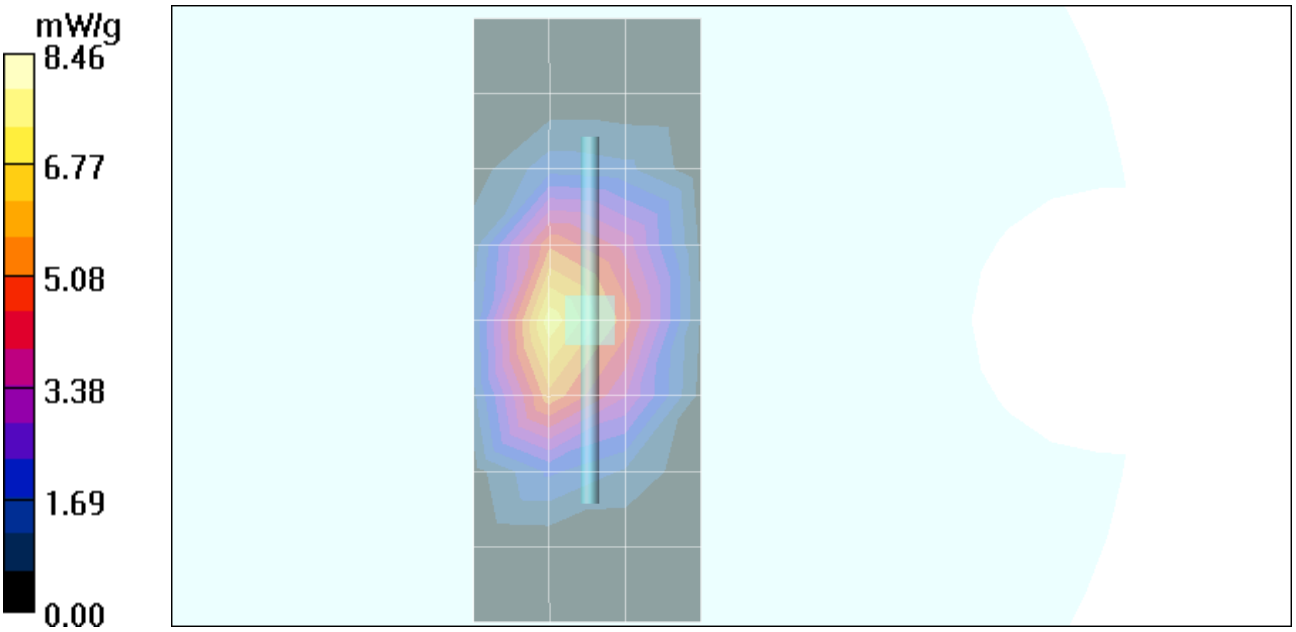
Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 81.5 V/m; **Power Drift = 0.127 dB** Peak SAR (extrapolated) = 12.5 W/kg
SAR(1 g) = 7.42 mW/g; SAR(10 g) = 3.99 mW/g Maximum value of SAR (measured) = 8.33 mW/g

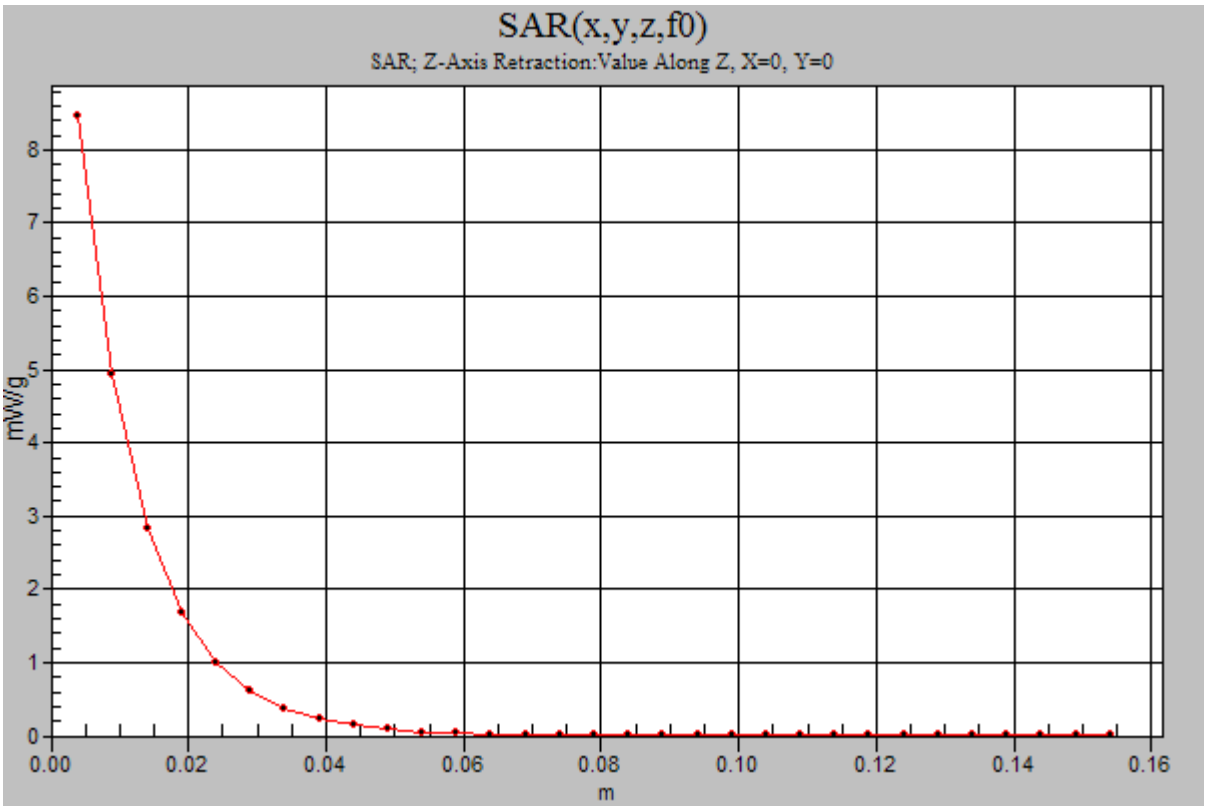
Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 81.5 V/m; **Power Drift = 0.127 dB** Peak SAR (extrapolated) = 12.7 W/kg
SAR(1 g) = 7.52 mW/g; SAR(10 g) = 4.04 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) = 8.46 mW/g


mW/g
8.46
6.77
5.08
3.38
1.69
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

Appendix 2

SAR distribution plots for Phantom Head Adjacent Use

Date/Time: 6/13/2005 3:38:27PM

Test Laboratory: Motorola RH Tilt ch661 with Black Hsng

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Accessory Model #:
Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Rotated with Black Housing
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Back-Up Glycol Head; Medium parameters used: σ = 1.47 mho/m, ε_r = 38; ρ = 1000 kg/m^3

DASY4 Configuration:

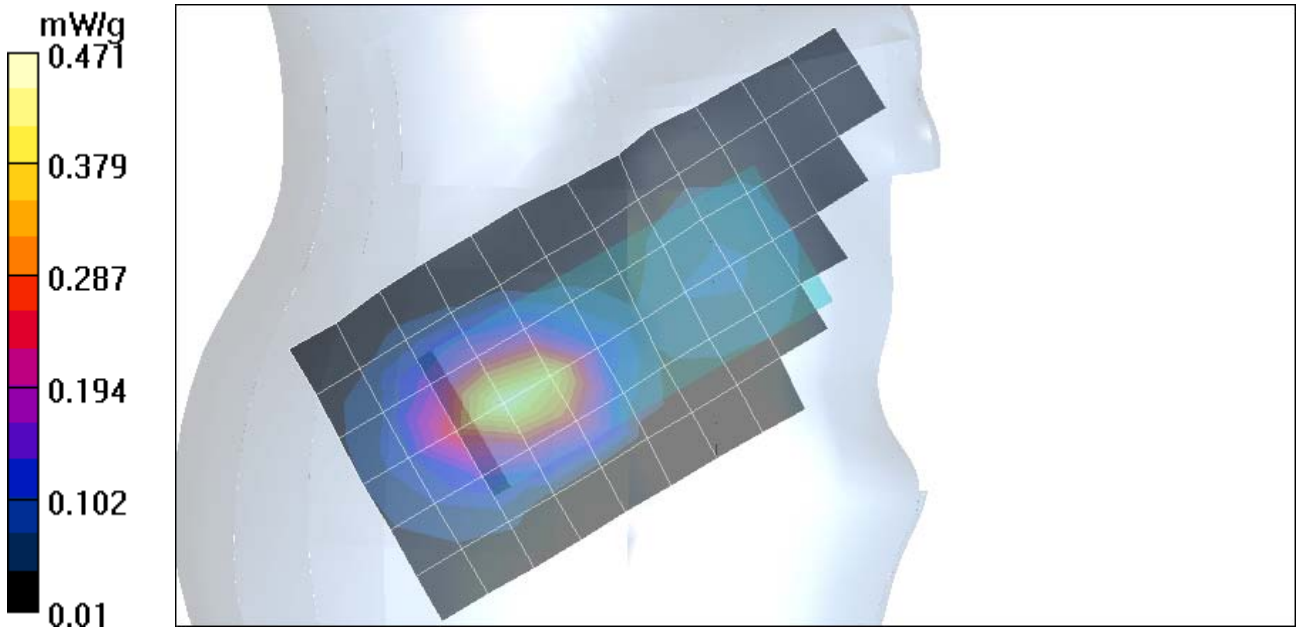
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8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

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.453 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.8 V/m; **Power Drift = -0.194 dB** Peak SAR (extrapolated) = 0.695 W/kg
SAR(1 g) = 0.428 mW/g; SAR(10 g) = 0.242 mW/g Maximum value of SAR (measured) = 0.471 mW/g



Date/Time: 6/13/2005 5:14:51PM

Test Laboratory: Motorola RH Tilt ch661 with Black Hsng & CEC3801

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B
CEC3801 with Black Housing tilt Position
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Back-Up Glycol Head; Medium parameters used: σ = 1.47 mho/m, ε_r = 38; ρ = 1000 kg/m^3

DASY4 Configuration:

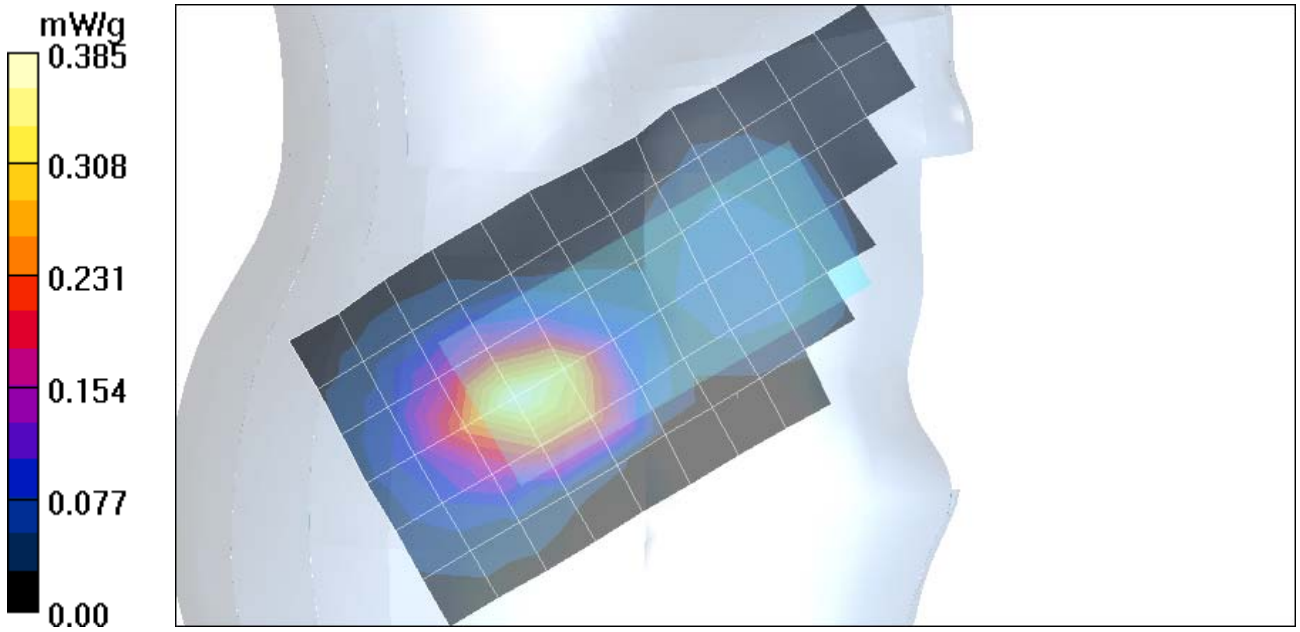
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8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

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.385 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.3 V/m; **Power Drift = -0.00 dB** Peak SAR (extrapolated) = 0.594 W/kg
SAR(1 g) = 0.383 mW/g; SAR(10 g) = 0.217 mW/g Maximum value of SAR (measured) = 0.426 mW/g



Date/Time: 6/13/2005 6:09:19PM

Test Laboratory: Motorola

RH Tilt ch661 with Black Hsng & AANN4285B Lischen

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal
Battery Model #: AANN4285B battery from #16333 CEC3801 with Black Housing tilt Position
Communication System: GSM 1900; Frequency: 1880 MHz Channel Number: 661; Duty Cycle: 1:8
Medium: Back-Up Glycol Head; Medium parameters used: σ = 1.47 mho/m, ε_r = 38; ρ = 1000 kg/m^3

DASY4 Configuration:

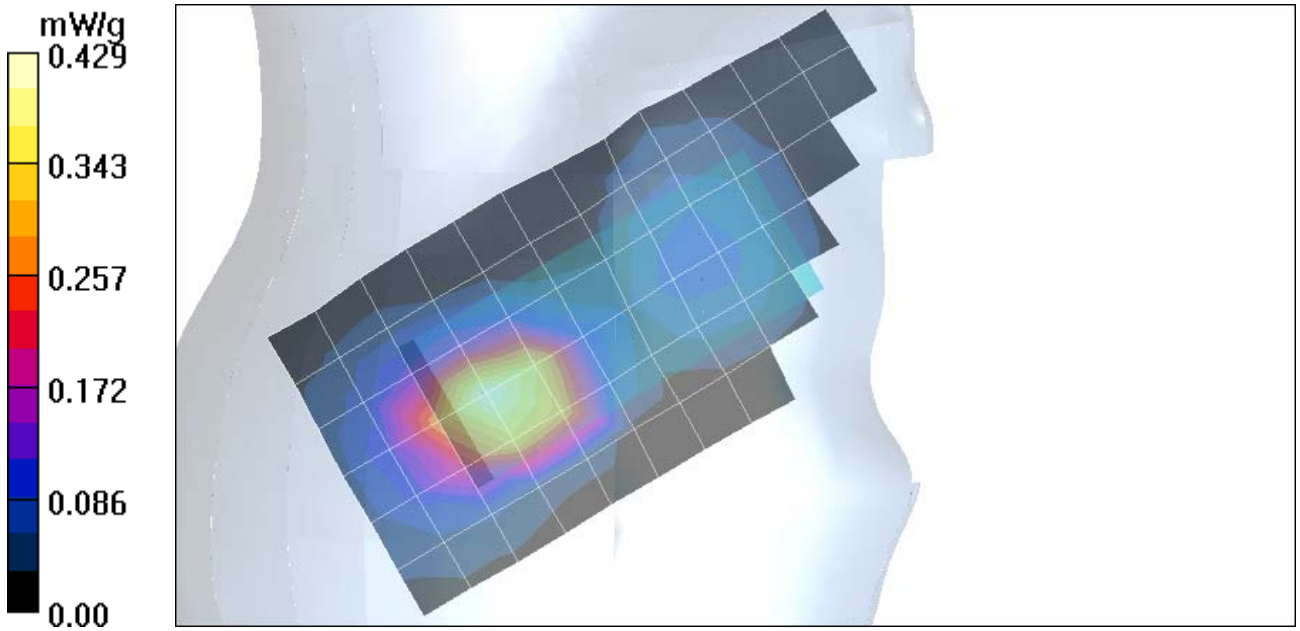
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8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

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.429 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.8 V/m; **Power Drift = -0.061 dB** Peak SAR (extrapolated) = 0.688 W/kg
SAR(1 g) = 0.440 mW/g; SAR(10 g) = 0.250 mW/g Maximum value of SAR (measured) = 0.481 mW/g



Date/Time: 6/13/2005 2:14:31PM

Test Laboratory: Motorola RH Cheek with Blue Hsng ch661

Serial: 4400012410096;
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Accessory Model #:
Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Cheek
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Back-Up Glycol Head; Medium parameters used: σ = 1.47 mho/m, ε_r = 38; ρ = 1000 kg/m^3

DASY4 Configuration:

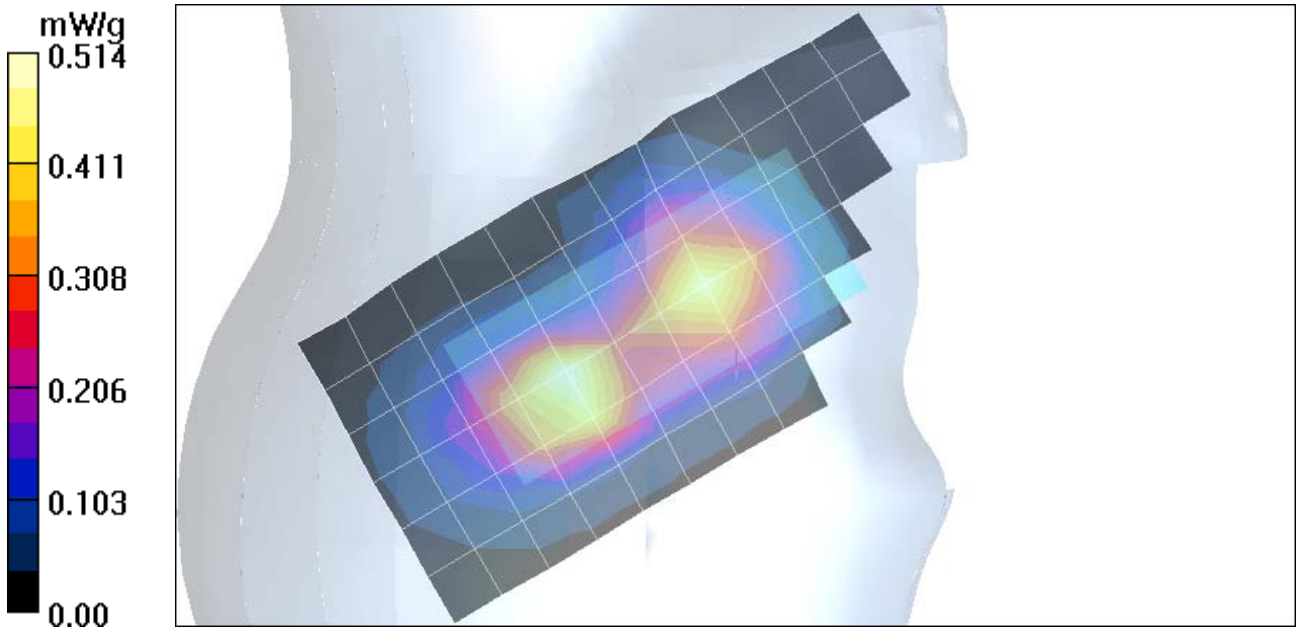
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8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

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.514 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.4 V/m; **Power Drift = 0.069 dB** Peak SAR (extrapolated) = 0.877 W/kg
SAR(1 g) = 0.562 mW/g; SAR(10 g) = 0.310 mW/g Maximum value of SAR (measured) = 0.631 mW/g



Date/Time: 6/13/2005 3:08:08PM

Test Laboratory: Motorola RH Cheek with Black Hsng ch661

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Accessory Model #:
Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Cheek with Black Housing
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Back-Up Glycol Head; Medium parameters used: σ = 1.47 mho/m, ε_r = 38; ρ = 1000 kg/m^3

DASY4 Configuration:

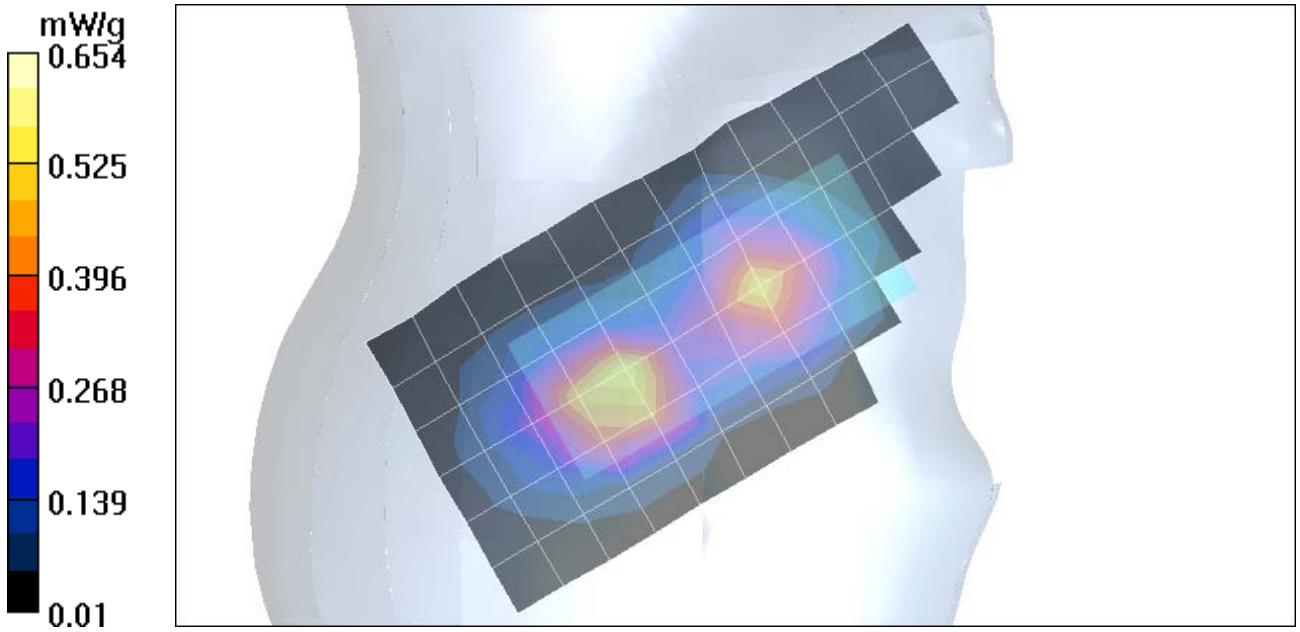
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8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

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.529 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 = 0.076 dB** Peak SAR (extrapolated) = 0.914 W/kg
SAR(1 g) = 0.582 mW/g; SAR(10 g) = 0.321 mW/g Maximum value of SAR (measured) = 0.654 mW/g



Date/Time: 6/13/2005 4:48:14PM

Test Laboratory: Motorola RH Cheek with Black Hsng & CEC3801 ch661

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B
CEC3801 with Black Housing Cheek Position
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Back-Up Glycol Head; Medium parameters used: $\sigma = 1.47$ mho/m, $\varepsilon_r = 38$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

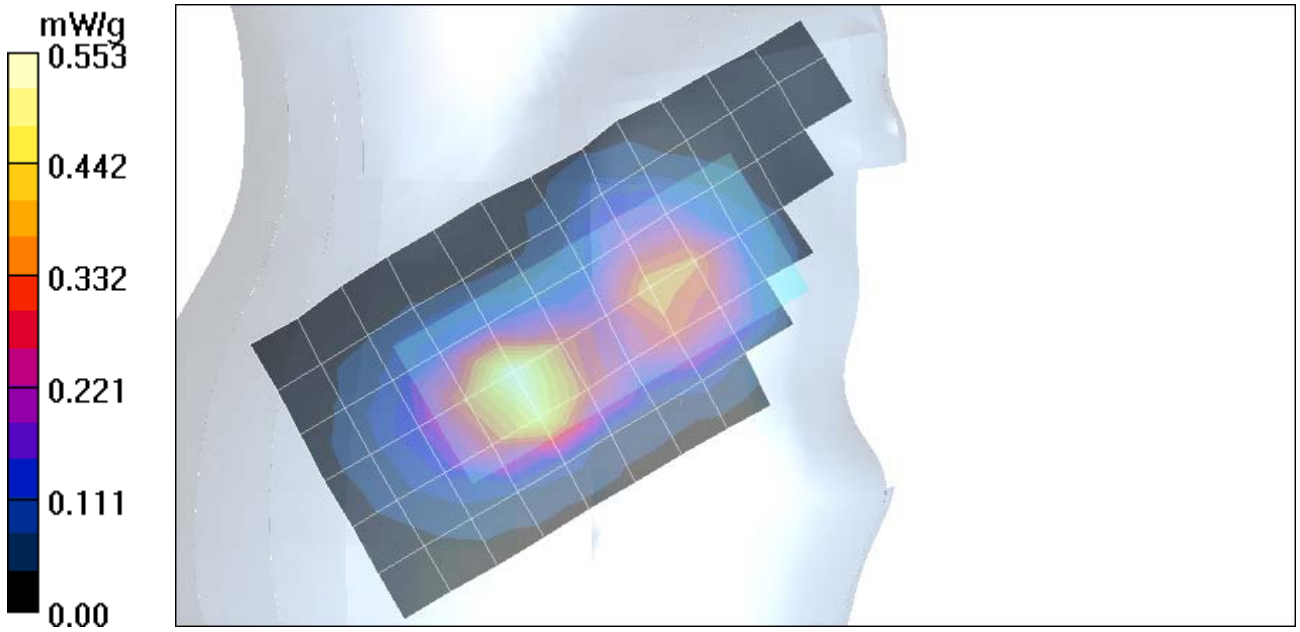
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8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

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.553 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.6 V/m; **Power Drift = 0.075 dB** Peak SAR (extrapolated) = 0.965 W/kg
SAR(1 g) = 0.597 mW/g; SAR(10 g) = 0.324 mW/g Maximum value of SAR (measured) = 0.669 mW/g



Date/Time: 6/13/2005 5:42:08PM

Test Laboratory: Motorola

RH Cheek ch661 with Black Hsng, CEC3801 & AANN4285 Lischen

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal
Battery Model #: AANN4285B battery from #16333 CEC3801 with Black Housing Cheek Position
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Back-Up Glycol Head; Medium parameters used: σ = 1.47 mho/m, ε_r = 38; ρ = 1000 kg/m^3

DASY4 Configuration:

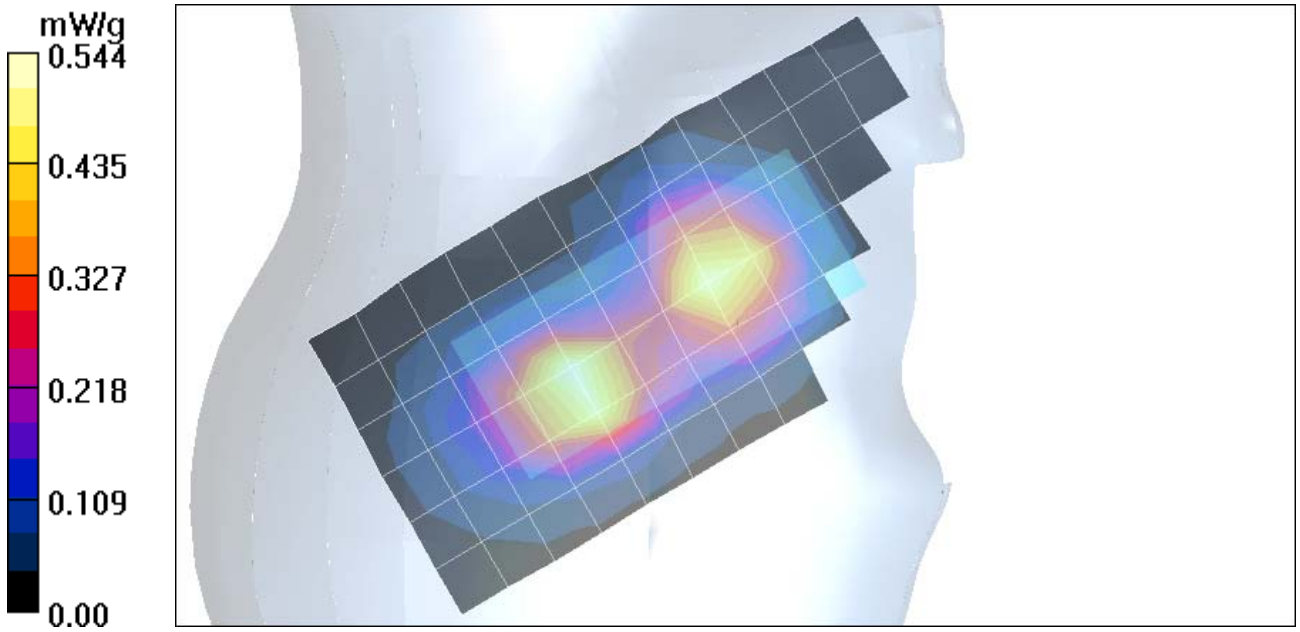
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8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

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.544 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.9 V/m; **Power Drift = 0.014 dB** Peak SAR (extrapolated) = 0.918 W/kg
SAR(1 g) = 0.580 mW/g; SAR(10 g) = 0.321 mW/g Maximum value of SAR (measured) = 0.652 mW/g



Date/Time: 6/13/2005 1:39:15PM

Test Laboratory: Motorola LH Tilt with Blue Hsng ch661

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Accessory Model #:
Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Rotated
Communication System: GSM 1900; Frequency: 1880 MHz Channel Number: 661; Duty Cycle: 1:8
Medium: Back-Up Glycol Head; Medium parameters used: σ = 1.47 mho/m, ε_r = 38; ρ = 1000 kg/m^3

DASY4 Configuration:

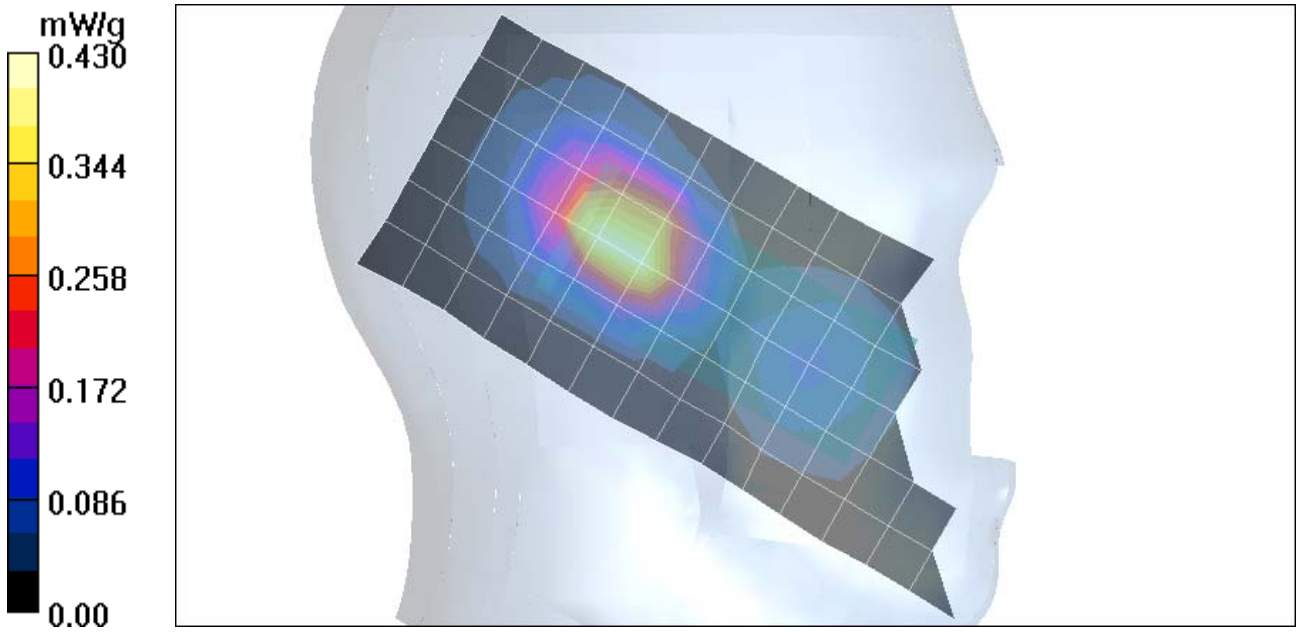
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8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

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.419 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.5 V/m; **Power Drift = 0.083 dB** Peak SAR (extrapolated) = 0.711 W/kg
SAR(1 g) = 0.422 mW/g; SAR(10 g) = 0.243 mW/g Maximum value of SAR (measured) = 0.458 mW/g



Date/Time: 6/13/2005 1:09:12PM

Test Laboratory: Motorola LH Cheek with Blue Hsng ch661

Serial: 4400012410096;
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Accessory Model #:
Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Cheek
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Back-Up Glycol Head; Medium parameters used: σ = 1.47 mho/m, ε_r = 38; ρ = 1000 kg/m^3

DASY4 Configuration:

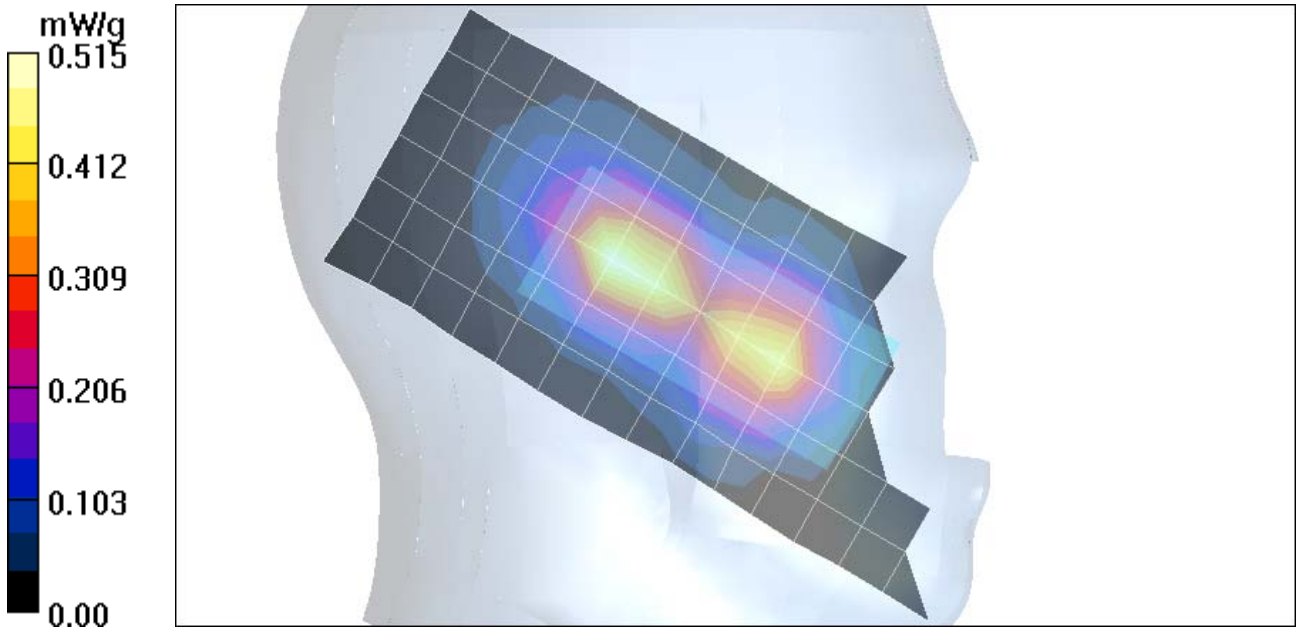
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8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

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.515 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 17.0 V/m; **Power Drift = 0.147 dB** Peak SAR (extrapolated) = 0.763 W/kg
SAR(1 g) = 0.513 mW/g; SAR(10 g) = 0.292 mW/g Maximum value of SAR (measured) = 0.566 mW/g



Date/Time: 6/13/2005 2:39:18PM

Test Laboratory: Motorola RH Tilt with Blue Hsng ch661

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Accessory Model #:
Battery Model #: AANN4285B DEVICE POSITION (cheek or rotated): Rotated
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Back-Up Glycol Head; Medium parameters used: σ = 1.47 mho/m, ε_r = 38; ρ = 1000 kg/m^3

DASY4 Configuration:

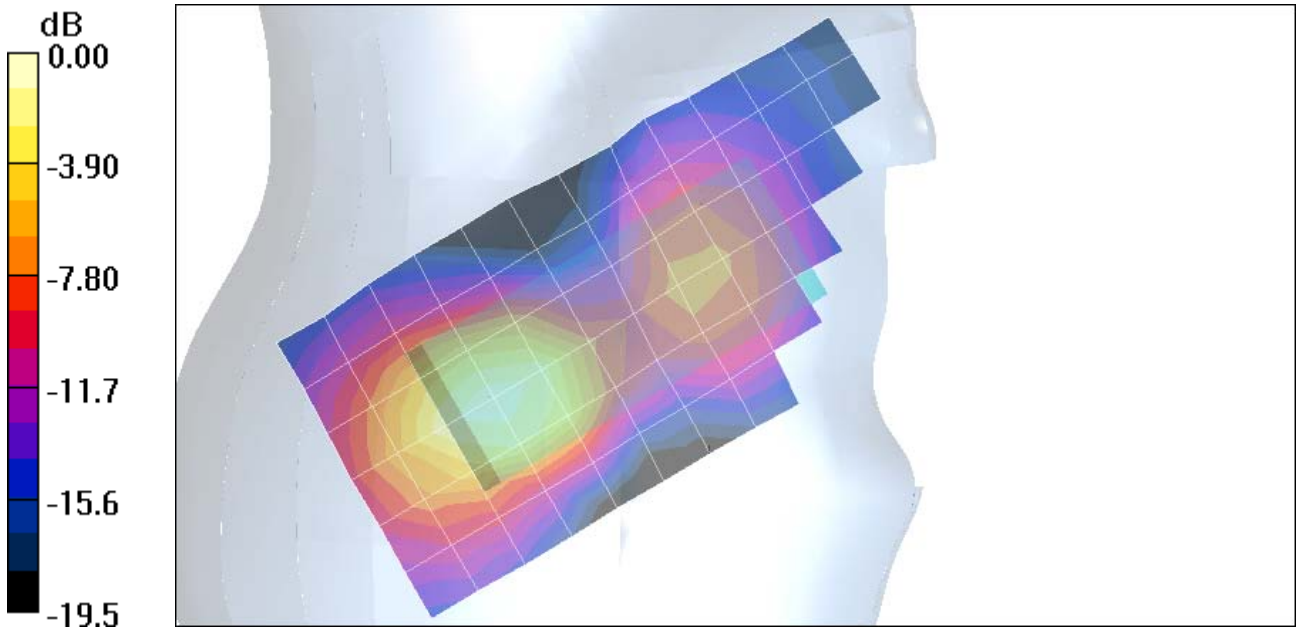
- Probe: ES3DV3 - SN3037; ConvF(5.16, 5.16, 5.16); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Glycol SAM; Type: SAM; Serial: TP-1159;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8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

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

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.461 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.6 V/m; **Power Drift = -0.123 dB** Peak SAR (extrapolated) = 0.714 W/kg
SAR(1 g) = 0.438 mW/g; SAR(10 g) = 0.248 mW/g Maximum value of SAR (measured) = 0.482 mW/g



0 dB = 0.482mW/g

Appendix 3

SAR distribution plots for Body Worn Configuration

Date/Time: 6/17/2005 8:56:15PM

Test Laboratory: Motorola 1900 GSM BW ch661 blue hsng CLAD001

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 OTA Antenna Position: INTERNAL Battery Model #: AANN4285B
Accessory Model # = CLAD001 Pouch Blue Housing
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Body; Medium parameters used: σ = 1.58 mho/m, ε_r = 52.3; ρ = 1000 kg/m^3

DASY4 Configuration:

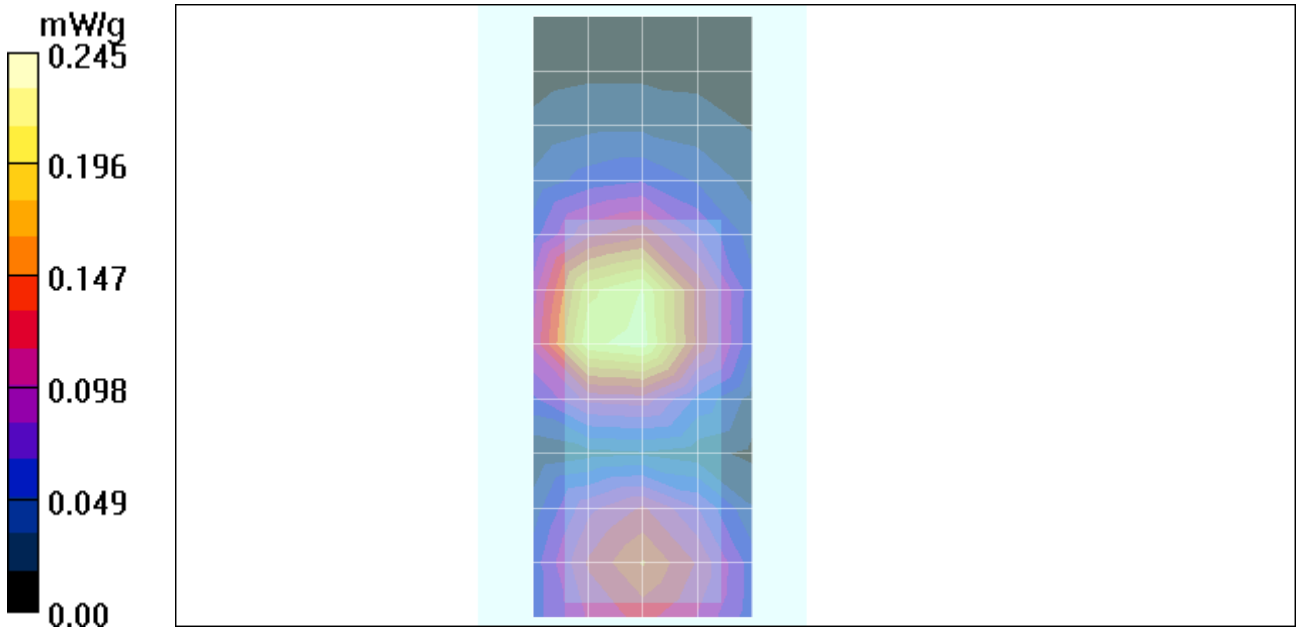
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: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

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.221 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.4 V/m; **Power Drift = 0.132 dB** Peak SAR (extrapolated) = 0.336 W/kg
SAR(1 g) = 0.230 mW/g; SAR(10 g) = 0.144 mW/g Maximum value of SAR (measured) = 0.246 mW/g



Date/Time: 6/14/2005 12:25:02AM

Test Laboratory: Motorola 1900 GSM BW ch661 black hsng EL33301 & BT

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B
BODY WORN Bluetooth, with EL33301 & wishbone clip black housing
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Body; Medium parameters used: σ = 1.58 mho/m, ε_r = 52; ρ = 1000 kg/m^3

DASY4 Configuration:

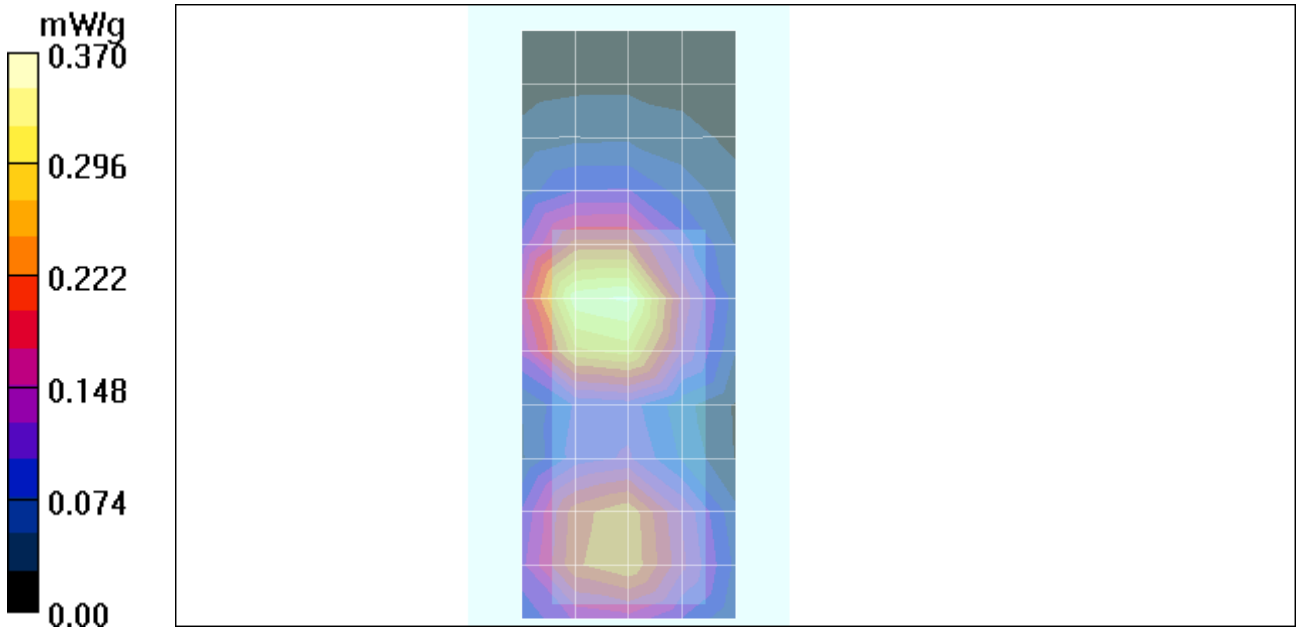
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: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

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.351 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.9 V/m; **Power Drift = -0.034 dB** Peak SAR (extrapolated) = 0.517 W/kg
SAR(1 g) = 0.350 mW/g; SAR(10 g) = 0.218 mW/g Maximum value of SAR (measured) = 0.380 mW/g



Date/Time: 6/13/2005 11:41:58PM

Test Laboratory: Motorola 1900 GSM BW ch661 black hsng CEC3801 & BT

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B
BODY WORN Bluetooth, with CEC3801 & wishbone clip black housing
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Body; Medium parameters used: σ = 1.58 mho/m, ε_r = 52; ρ = 1000 kg/m^3

DASY4 Configuration:

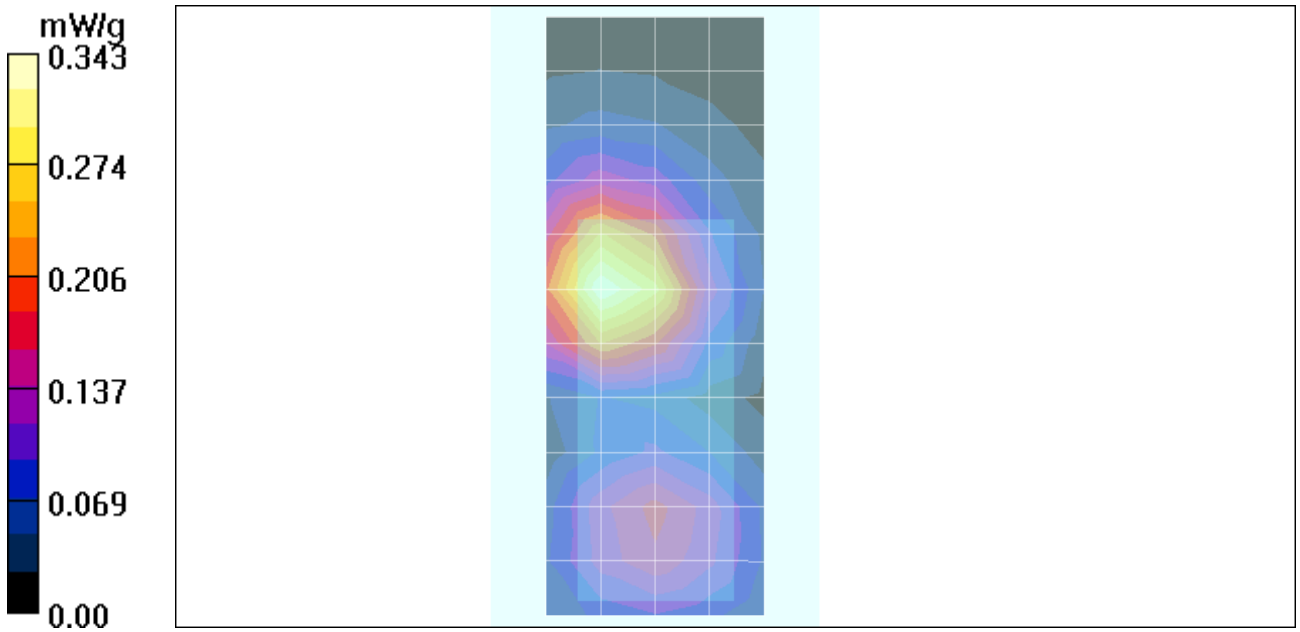
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: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

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.343 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.6 V/m; **Power Drift = 0.395 dB** Peak SAR (extrapolated) = 0.477 W/kg
SAR(1 g) = 0.323 mW/g; SAR(10 g) = 0.202 mW/g Maximum value of SAR (measured) = 0.350 mW/g



Date/Time: 6/25/2005 9:38:47PM

Test Laboratory: Motorola

1900 GSM BW ch661 black hsng CE33202 Lischen & BT

Serial: 4400012410096
Procedure Notes: Pwr Step: 00 Antenna Position: INTERNAL Battery Model #: AANN4285B/16333
Accessory Model # = BLACK HSNG/BLUETOOTH/CE33202
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Body; Medium parameters used: $\sigma = 1.59$ mho/m, $\varepsilon_r = 52$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

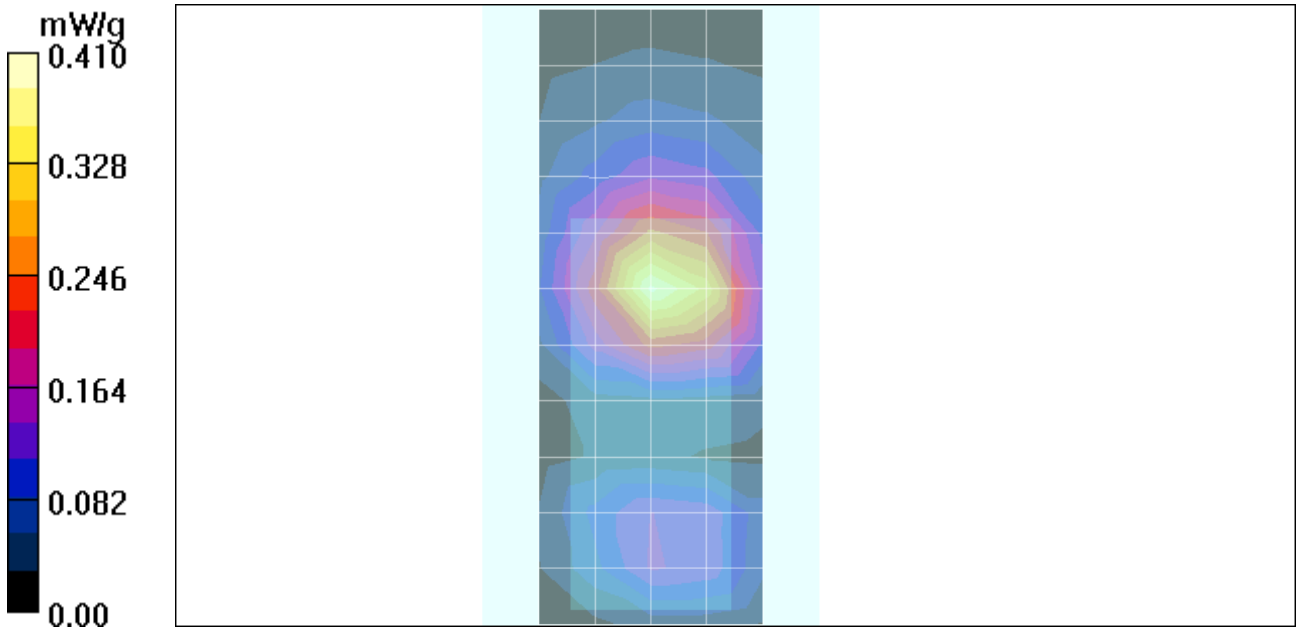
- Probe: ET3DV6 - SN1398; ConvF(4.65, 4.65, 4.65); Calibrated: 2/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn316; Calibrated: 1/13/2005
- Phantom: R1: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.391 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.1 V/m; **Power Drift = 0.025 dB** Peak SAR (extrapolated) = 0.573 W/kg
SAR(1 g) = 0.382 mW/g; SAR(10 g) = 0.233 mW/g Maximum value of SAR (measured) = 0.417 mW/g



Date/Time: 6/14/2005 12:56:36AM

Test Laboratory: Motorola 1900 GSM BW ch661 black hsng CE33202 & BT

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B
BODY WORN with CE33202 & Bluetooth enabled black housing
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Body; Medium parameters used: σ = 1.58 mho/m, ε_r = 52; ρ = 1000 kg/m^3

DASY4 Configuration:

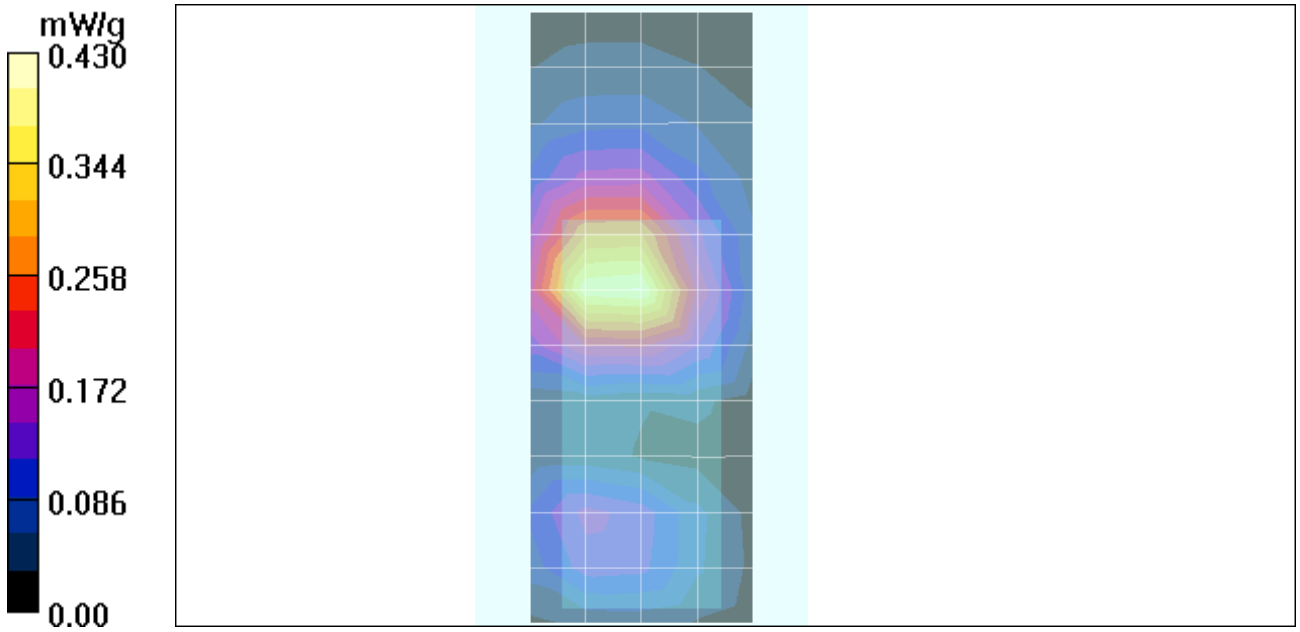
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: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

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.406 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 14.1 V/m; **Power Drift = -0.012 dB** Peak SAR (extrapolated) = 0.597 W/kg
SAR(1 g) = 0.408 mW/g; SAR(10 g) = 0.250 mW/g Maximum value of SAR (measured) = 0.446 mW/g



Date/Time: 6/13/2005 11:11:58PM

Test Laboratory: Motorola 1900 GSM BW ch661 black hsng back 25mm & BT

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B
BODY WORN back OF PHONE 25MM AWAY FROM PHANTOM blutooth Black Housing
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Body; Medium parameters used: σ = 1.58 mho/m, ε_r = 52; ρ = 1000 kg/m^3

DASY4 Configuration:

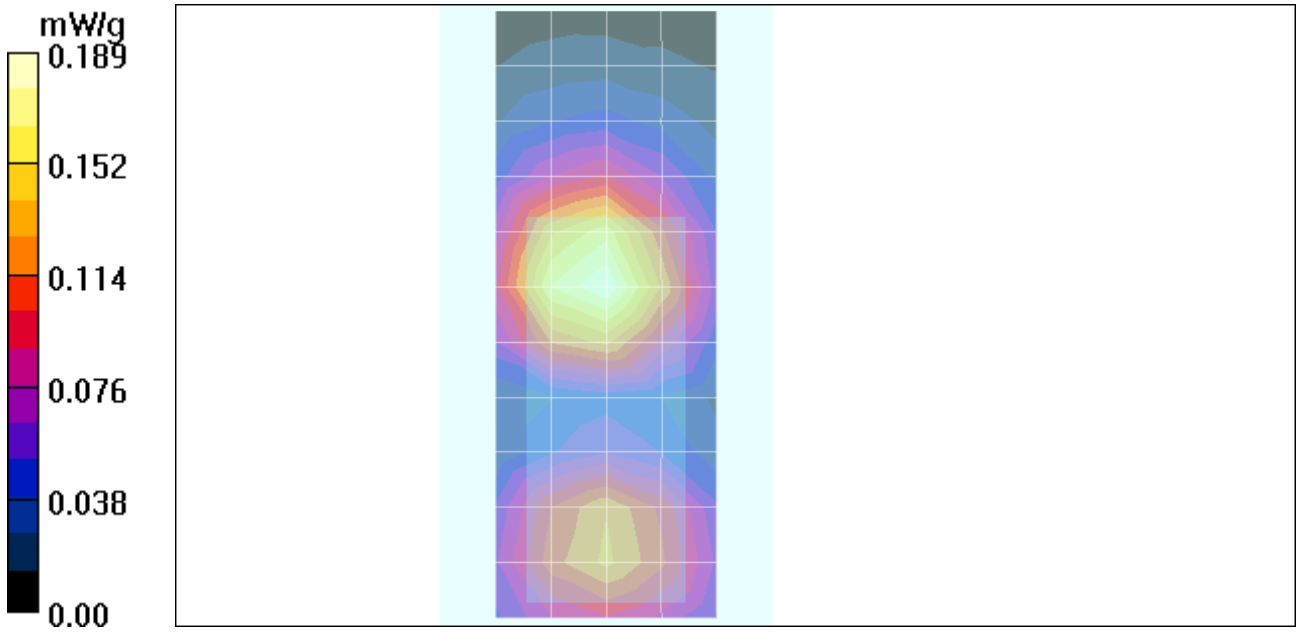
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: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

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.189 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.2 V/m; **Power Drift = -0.205 dB** Peak SAR (extrapolated) = 0.263 W/kg
SAR(1 g) = 0.180 mW/g; SAR(10 g) = 0.115 mW/g Maximum value of SAR (measured) = 0.192 mW/g



Date/Time: 6/13/2005 10:01:10PM

Test Laboratory: Motorola 1900 GSM BW ch661 back 25mm

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B
BODY WORN back OF PHONE 25MM AWAY FROM PHANTOM
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Body; Medium parameters used: σ = 1.58 mho/m, ε_r = 52; ρ = 1000 kg/m^3

DASY4 Configuration:

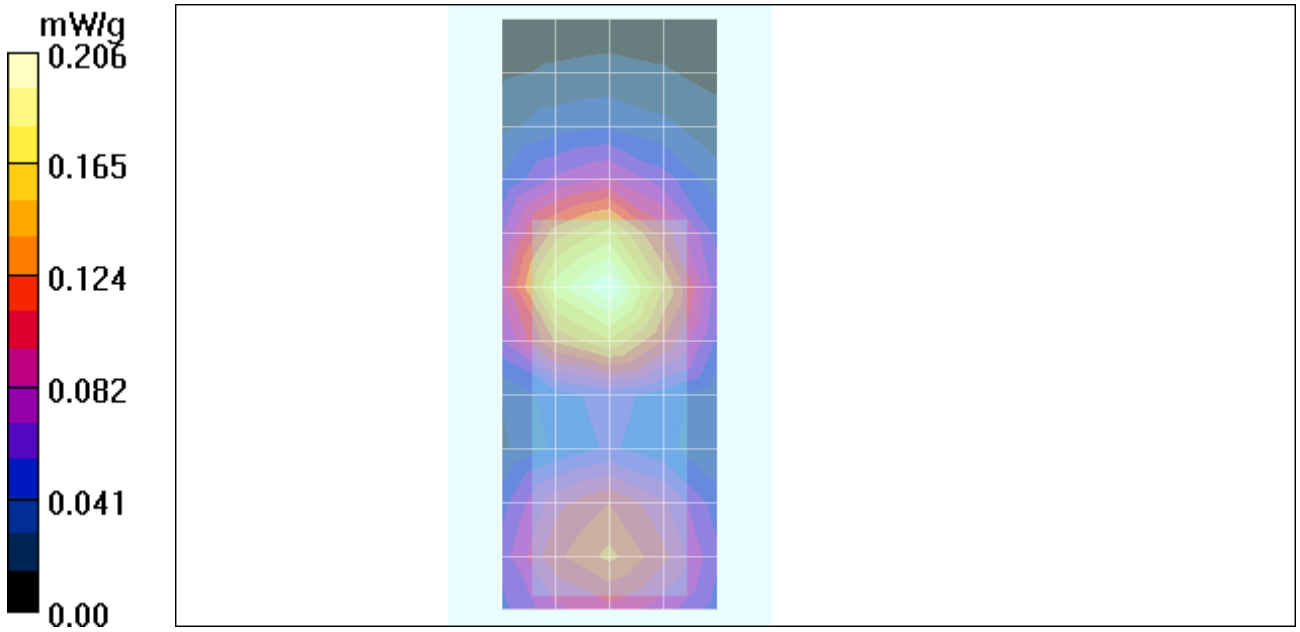
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: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

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.206 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 = -0.040 dB** Peak SAR (extrapolated) = 0.277 W/kg
SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.122 mW/g Maximum value of SAR (measured) = 0.205 mW/g



Date/Time: 6/13/2005 10:27:34PM

Test Laboratory: Motorola 1900 GSM BW ch661 back 25mm & BT

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B
BODY WORN back OF PHONE 25MM AWAY FROM PHANTOM with blutooth
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Body; Medium parameters used: σ = 1.58 mho/m, ε_r = 52; ρ = 1000 kg/m^3

DASY4 Configuration:

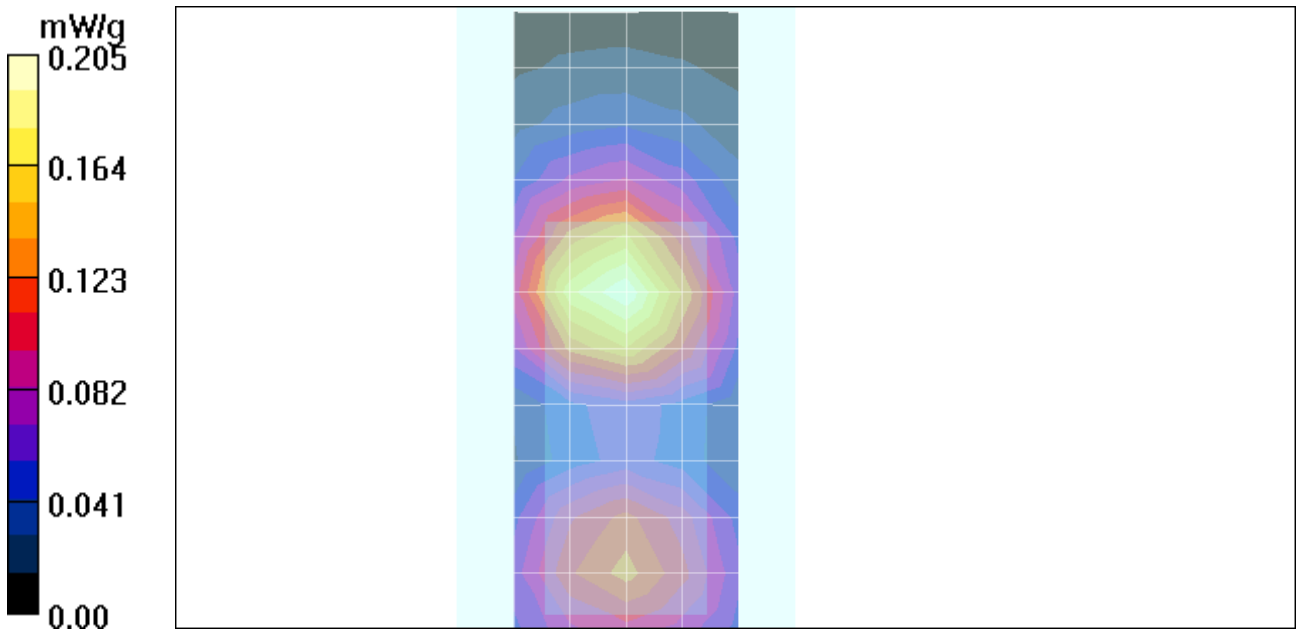
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: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

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.205 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.9 V/m; **Power Drift = -0.033 dB** Peak SAR (extrapolated) = 0.279 W/kg
SAR(1 g) = 0.191 mW/g; SAR(10 g) = 0.121 mW/g Maximum value of SAR (measured) = 0.206 mW/g



Date/Time: 6/26/2005 12:02:55AM

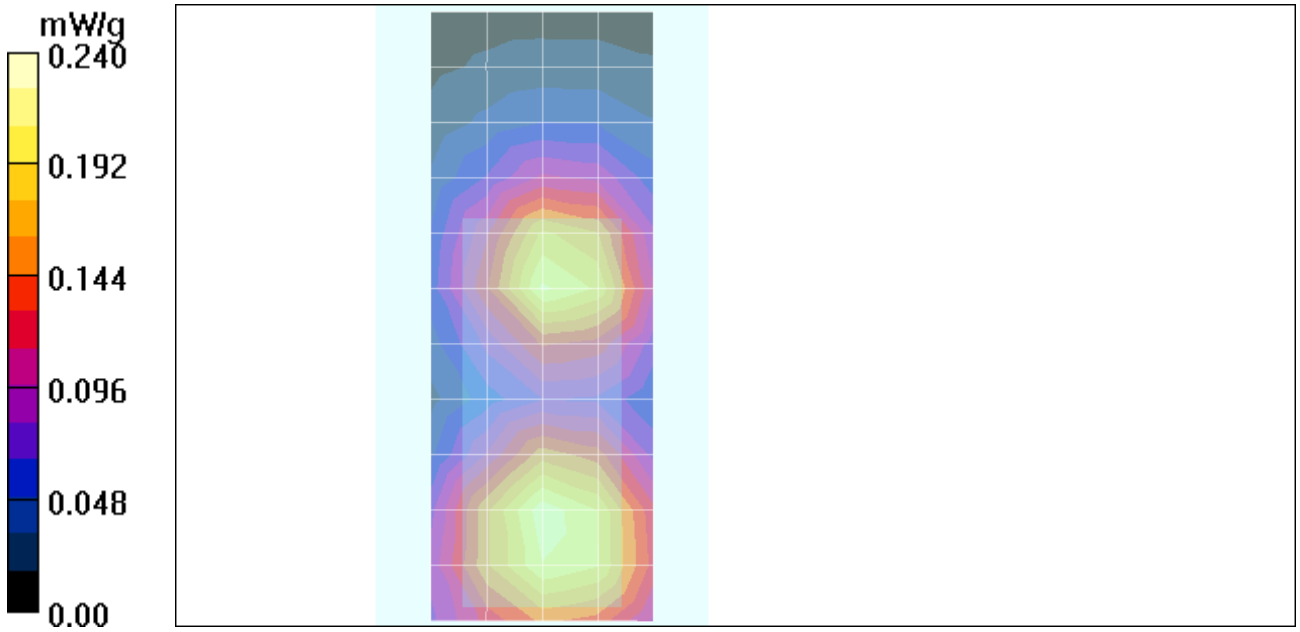
Test Laboratory: Motorola 1900 GPRS BW ch661 blue hsng back 25mm

Serial: 4400012410096
Procedure Notes: Pwr Step: 00 Antenna Position: INTERNAL Battery Model #: AANN4285B
Accessory Model # = BLUE HSNG BACK OF PHONE 25MM FROM PHANTOM
Communication System: GPRS 1900-CL10; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:4
Medium: Regular Glycol Body; Medium parameters used: σ = 1.59 mho/m, ε_r = 52; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: ET3DV6 - SN1398; ConvF(4.65, 4.65, 4.65); Calibrated: 2/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn316; Calibrated: 1/13/2005
- Phantom: R1: Sect.2, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 147

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):
Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.219 mW/g

Amy Twin Phone Template/Zoom Scan - (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.7 V/m; **Power Drift = 0.027 dB** Peak SAR (extrapolated) = 0.337 W/kg
SAR(1 g) = 0.219 mW/g; SAR(10 g) = 0.142 mW/g Maximum value of SAR (measured) = 0.235 mW/g



Date/Time: 6/14/2005 1:20:28AM

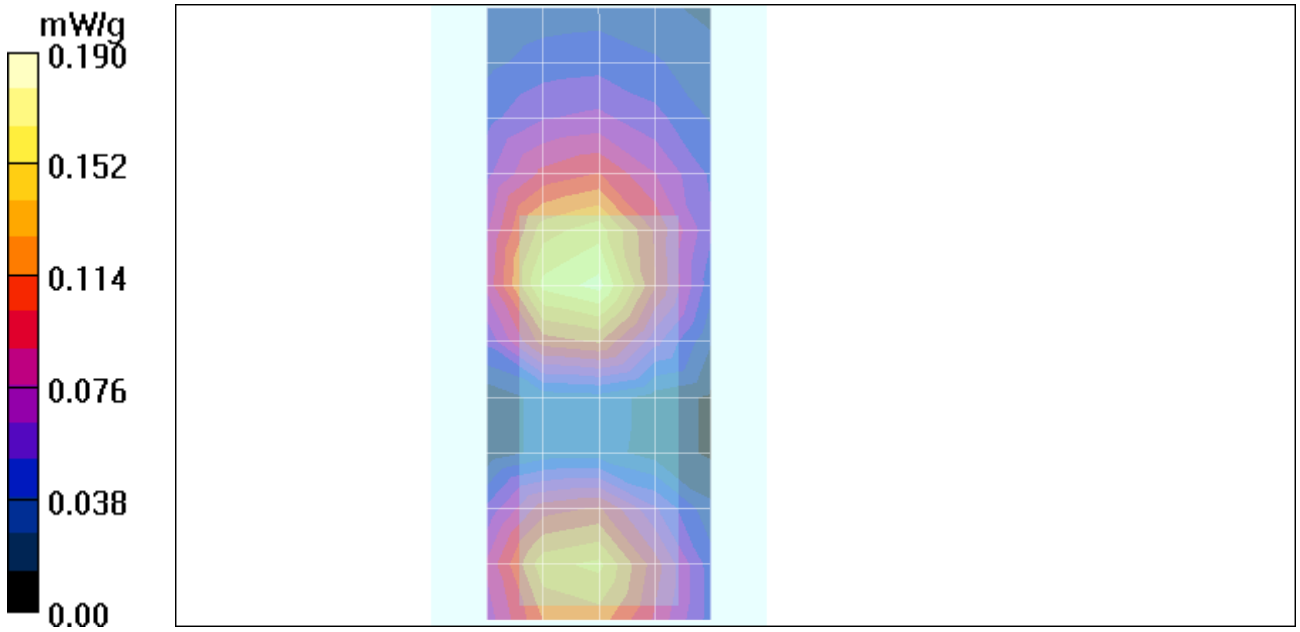
Test Laboratory: Motorola 1900 GPRS BW ch661 black hsng front 25mm

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B
GPRS BODY WORN FRONT OF PHONE 25MM AWAY FROM PHANTOM black housing
Communication System: GPRS 1900-CL10; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:4
Medium: Regular Glycol Body; Medium parameters used: σ = 1.58 mho/m, ε_r = 52; 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) (13x7x1):
Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.170 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.72 V/m; **Power Drift = -0.076 dB** Peak SAR (extrapolated) = 0.240 W/kg
SAR(1 g) = 0.165 mW/g; SAR(10 g) = 0.106 mW/g Maximum value of SAR (measured) = 0.177 mW/g



Date/Time: 6/14/2005 1:42:49AM

Test Laboratory: Motorola 1900 GPRS BW ch661 black hsng back 25mm

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B
GPRS BODY WORN b ack OF PHONE 25MM AWAY FROM PHANTOM black housing
Communication System: GPRS 1900-CL10; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:4
Medium: Regular Glycol Body; Medium parameters used: σ = 1.58 mho/m, ε_r = 52; ρ = 1000 kg/m^3

DASY4 Configuration:

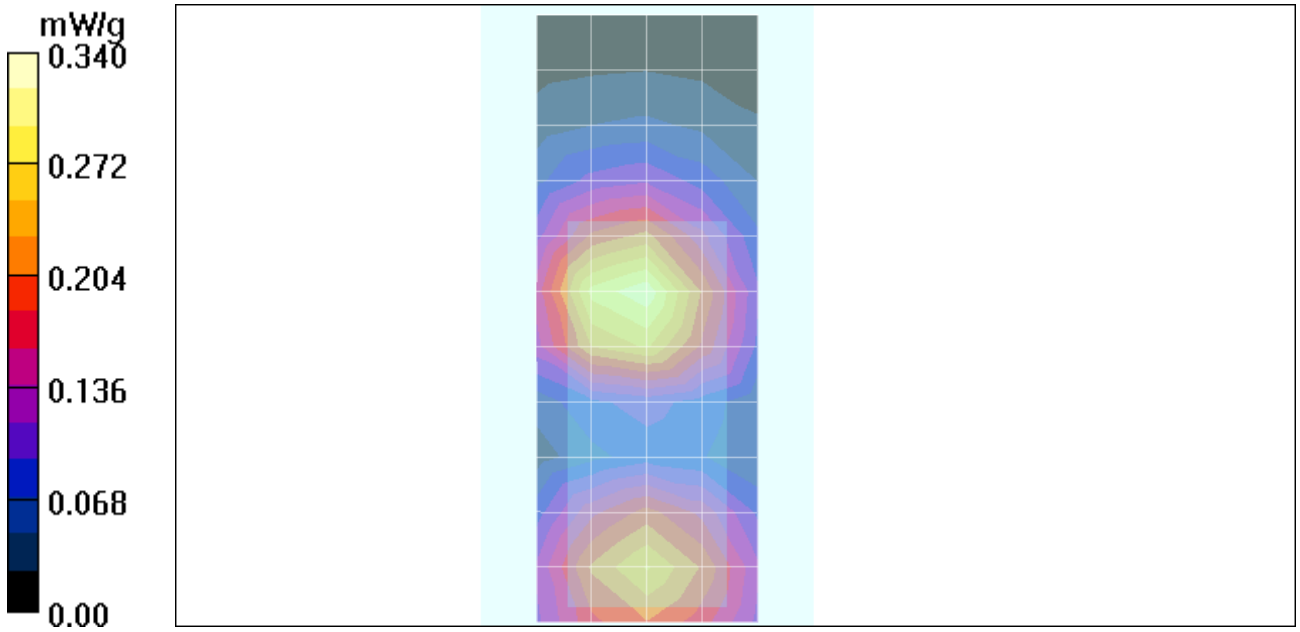
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: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

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.312 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) = 0.436 W/kg
SAR(1 g) = 0.299 mW/g; SAR(10 g) = 0.190 mW/g Maximum value of SAR (measured) = 0.321 mW/g



Date/Time: 6/13/2005 9:40:35PM

Test Laboratory: Motorola 1900 GSM BW ch661 front 25mm

Serial: 4400012410096
Procedure Notes: Pwr Step: 0 Antenna Position: Internal Battery Model #: AANN4285B
BODY WORN FRONT OF PHONE 25MM AWAY FROM PHANTOM
Communication System: GSM 1900; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:8
Medium: Regular Glycol Body; Medium parameters used: σ = 1.58 mho/m, ε_r = 52; ρ = 1000 kg/m^3

DASY4 Configuration:

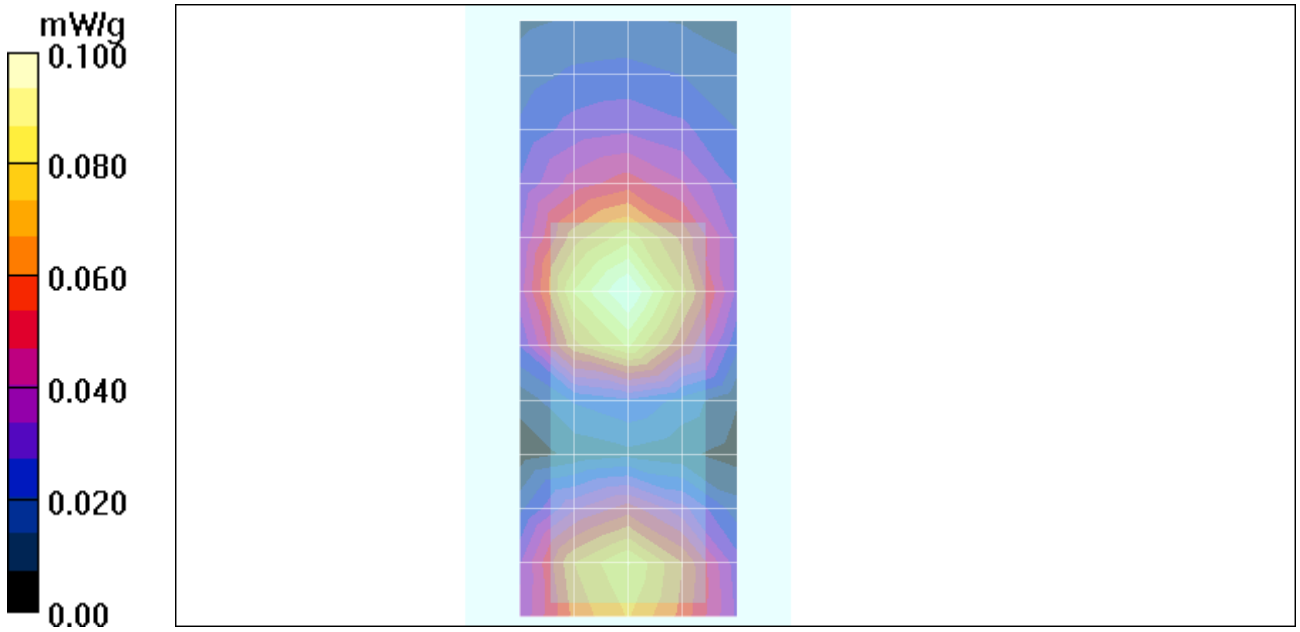
- Probe: ES3DV3 - SN3037; ConvF(4.71, 4.71, 4.71); Calibrated: 11/25/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn376; Calibrated: 1/13/2005
- Phantom: R3: Sect.1, Amy Twin; Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: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

Amy Twin Phone Template/Area Scan - Normal Body (15mm) (13x7x1):

Measurement grid: dx=15mm, dy=15mm Maximum value of SAR (measured) = 0.101 mW/g

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.94 V/m; **Power Drift = -0.139 dB** Peak SAR (extrapolated) = 0.135 W/kg
SAR(1 g) = 0.092 mW/g; SAR(10 g) = 0.059 mW/g Maximum value of SAR (measured) = 0.100 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

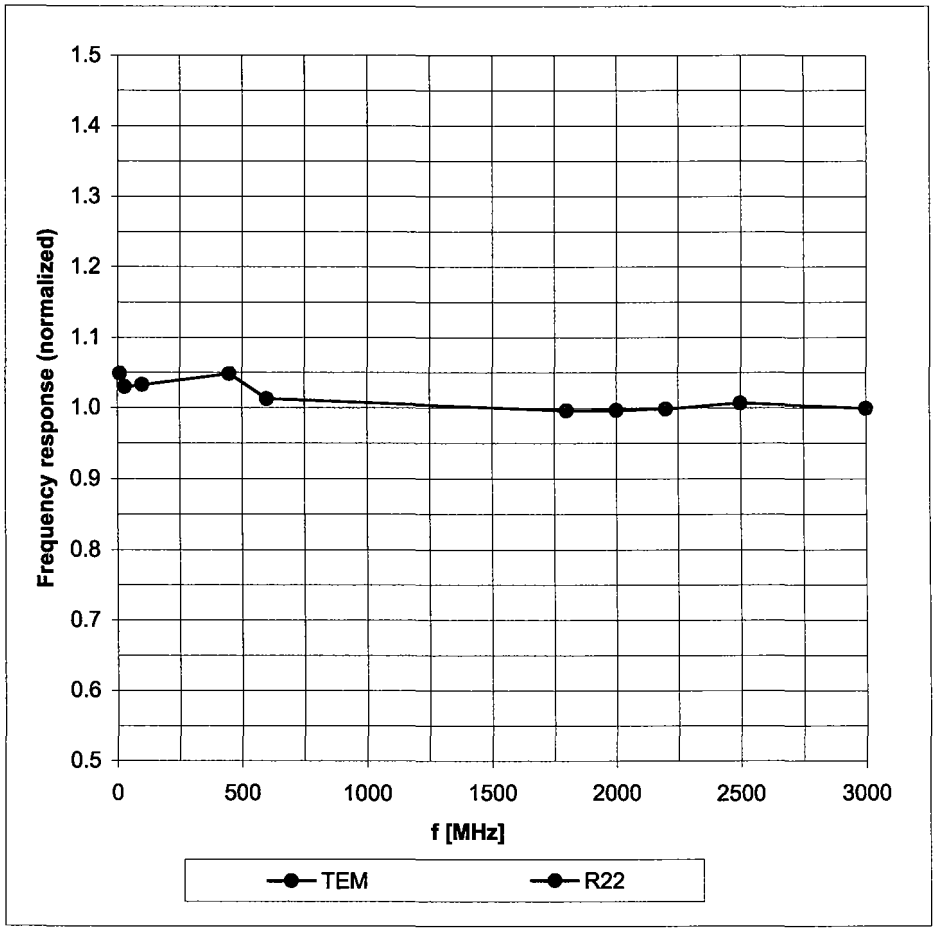
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[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.

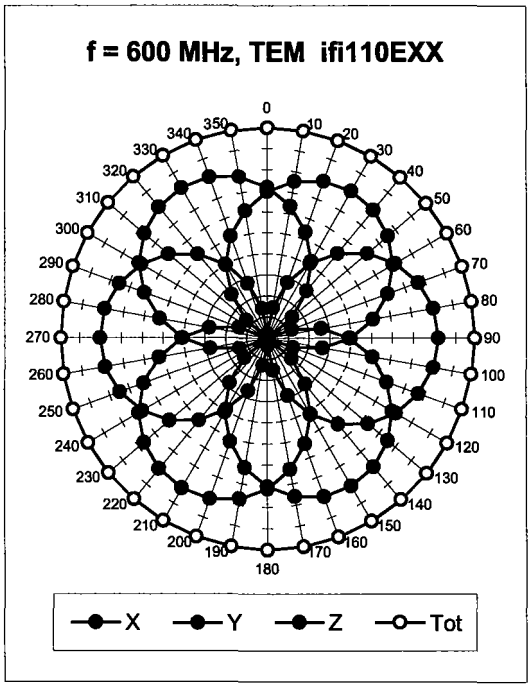
Frequency Response of E-Field

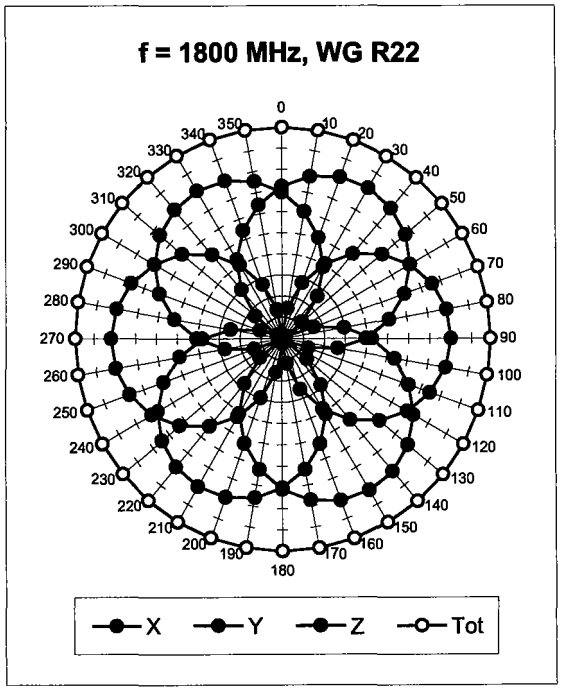
(TEM-Cell:ifi110 EXX, Waveguide: R22)

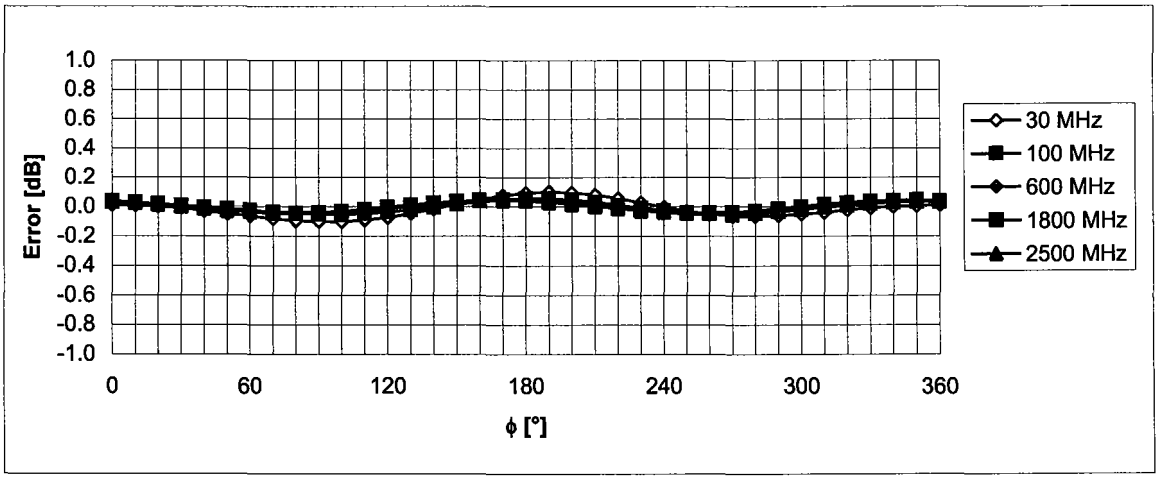


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



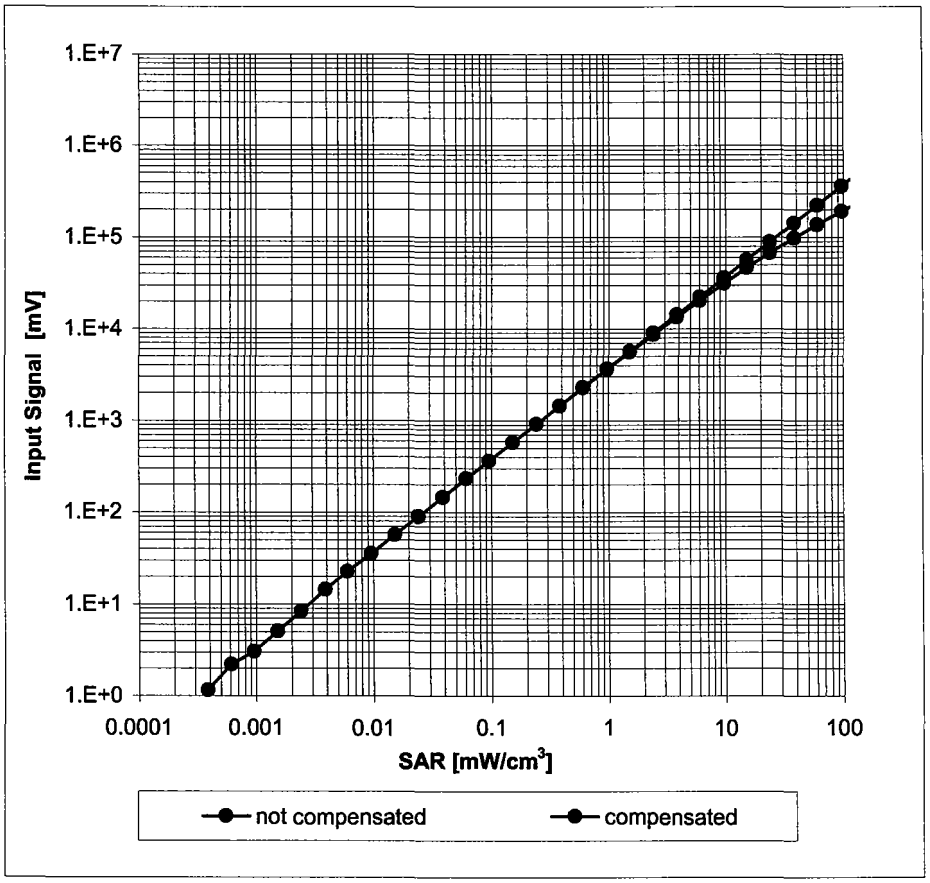


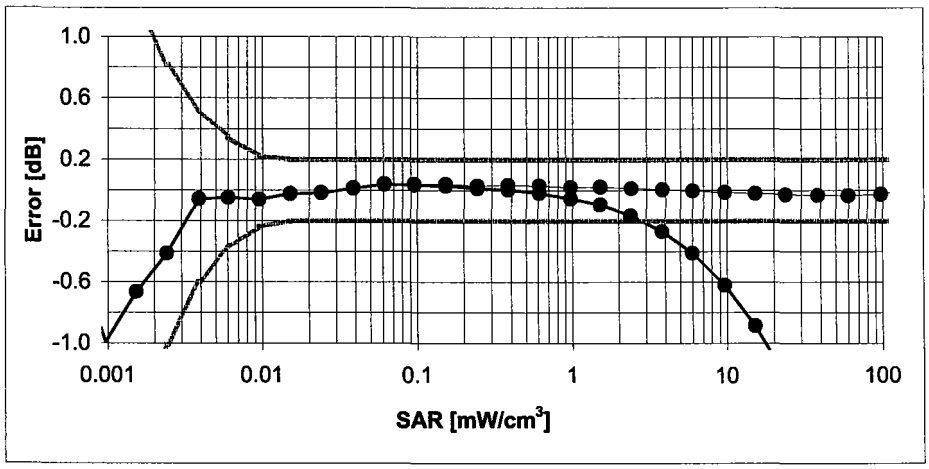


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

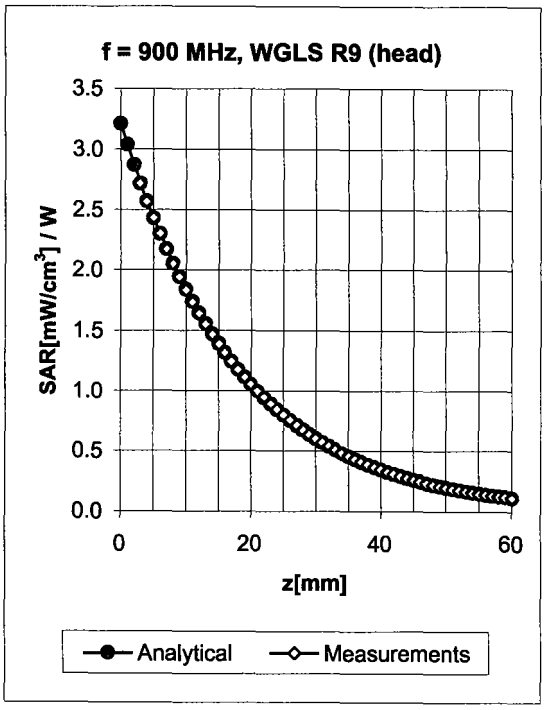
(Waveguide R22, f = 1800 MHz)

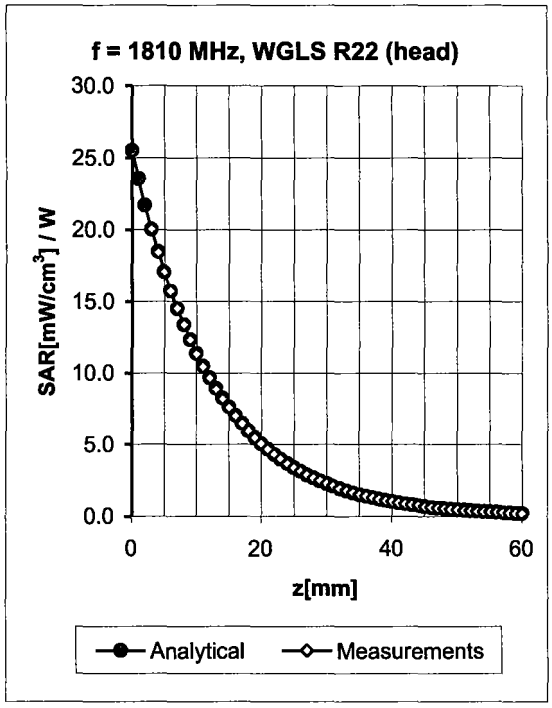




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



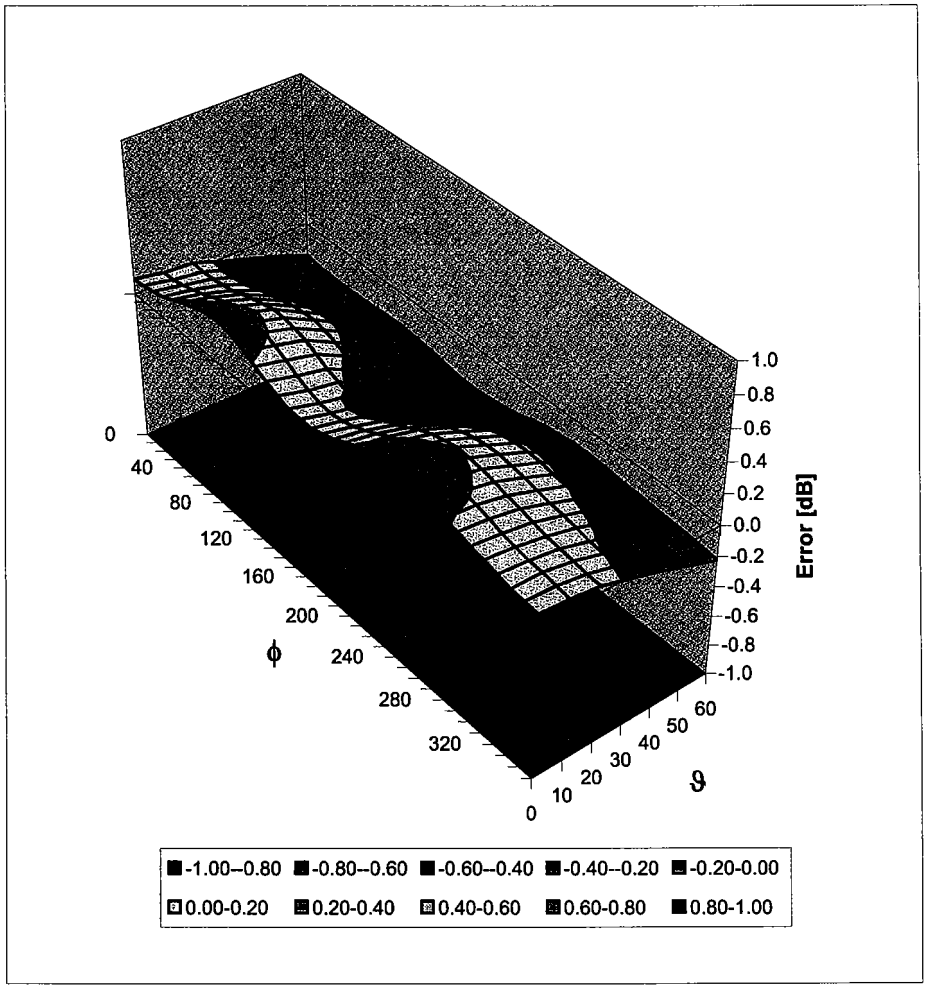


f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.56	1.29	6.11 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.25	2.34	5.16 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.28	2.26	4.77 ± 11.0% (k=2)
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

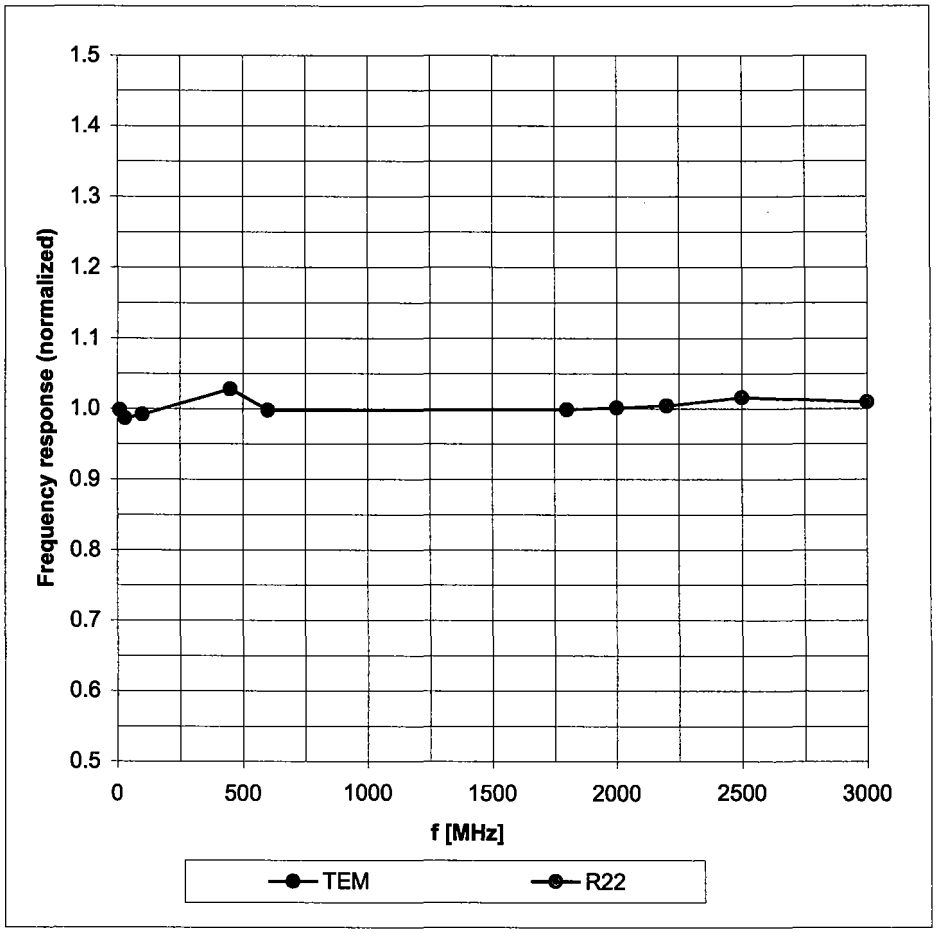
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[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.

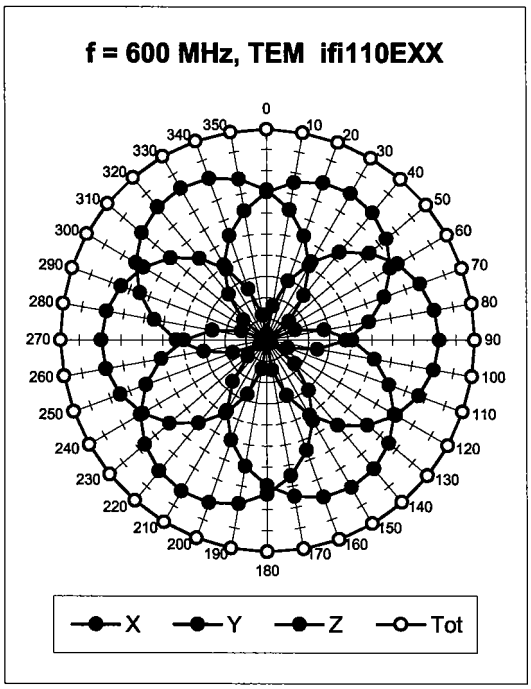
Frequency Response of E-Field

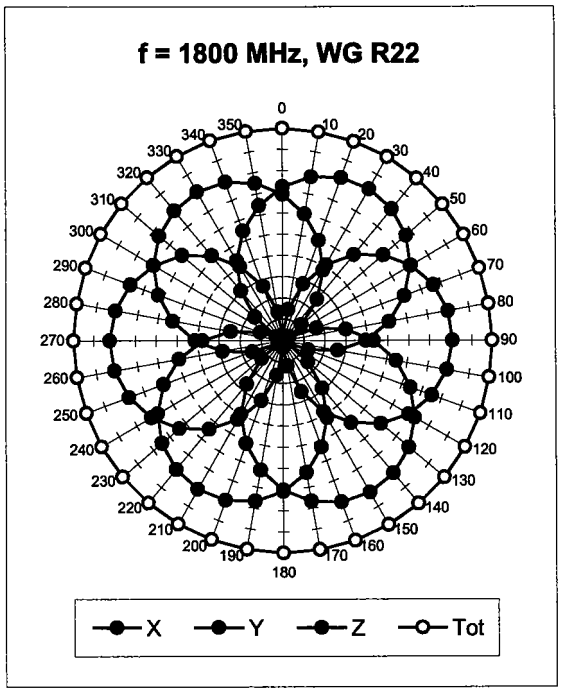
(TEM-Cell:ifi110 EXX, Waveguide: R22)

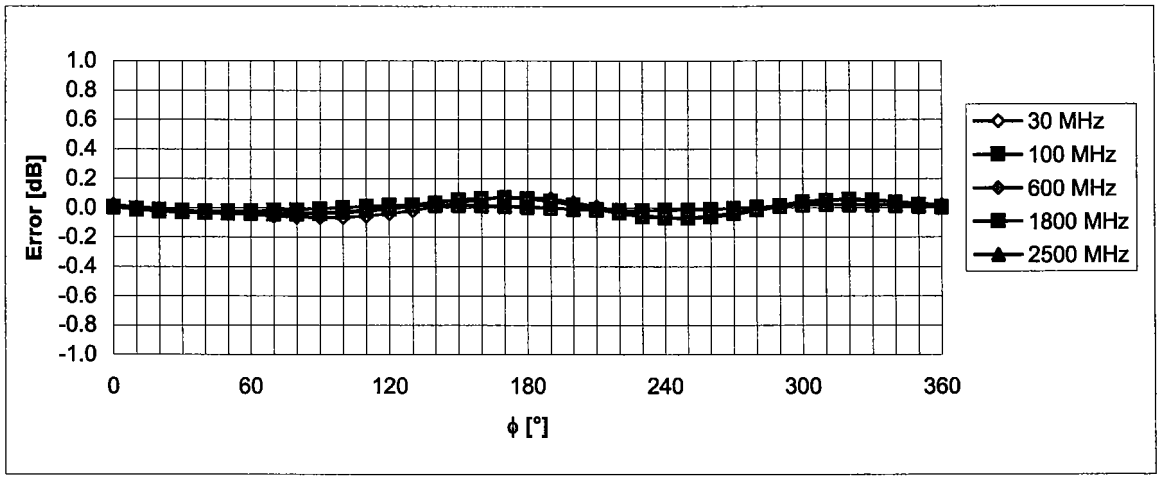


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



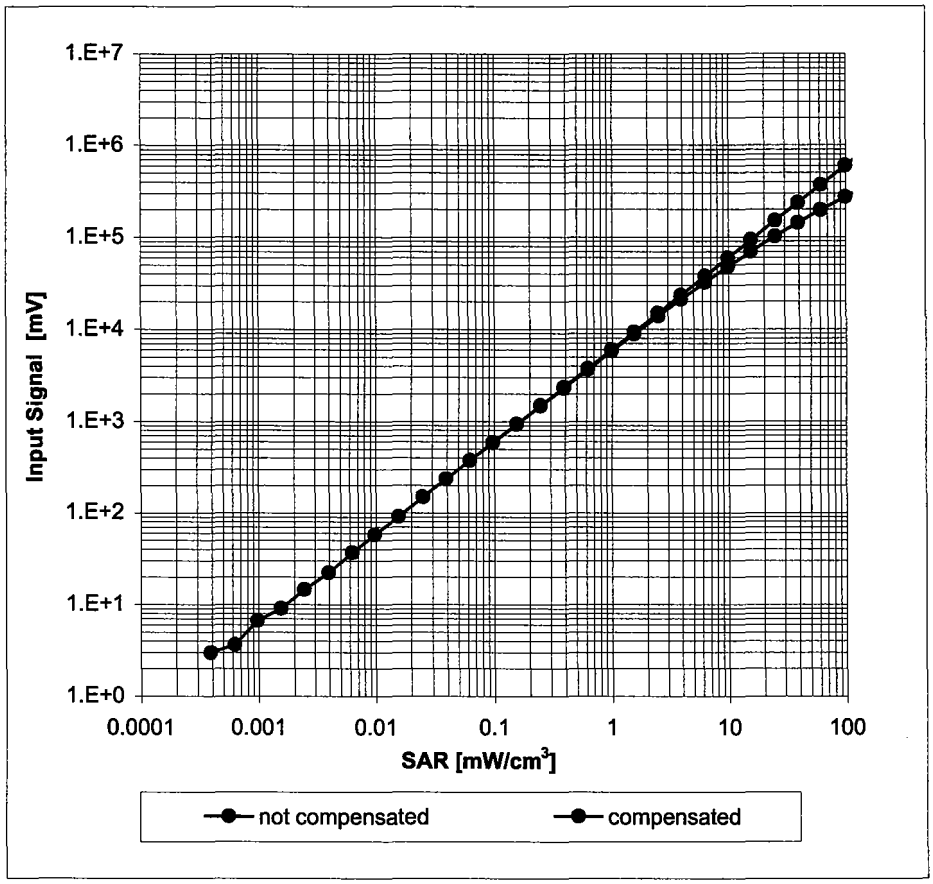


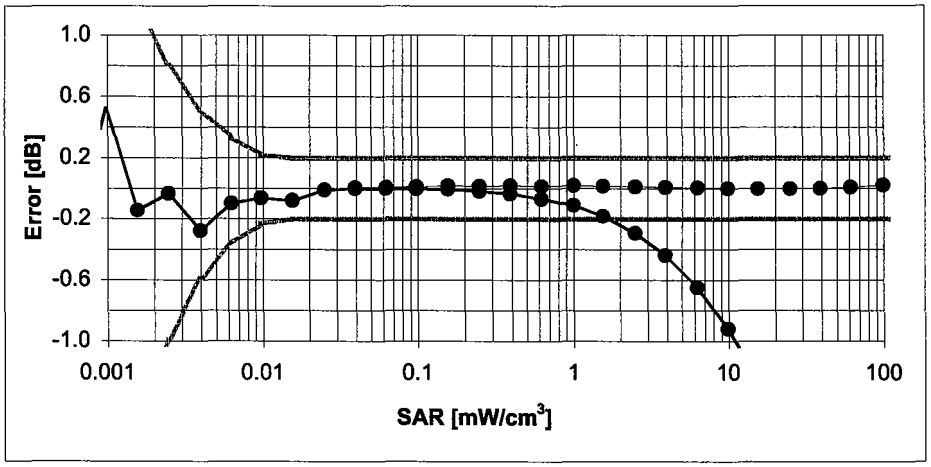


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

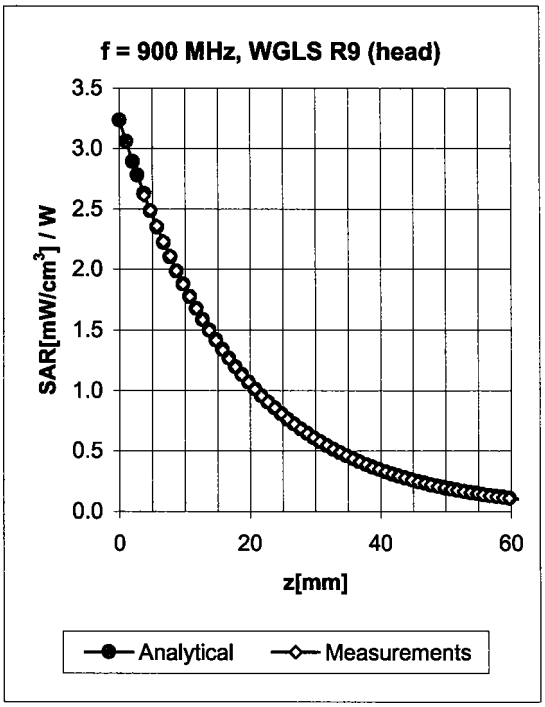
(Waveguide R22, f = 1800 MHz)

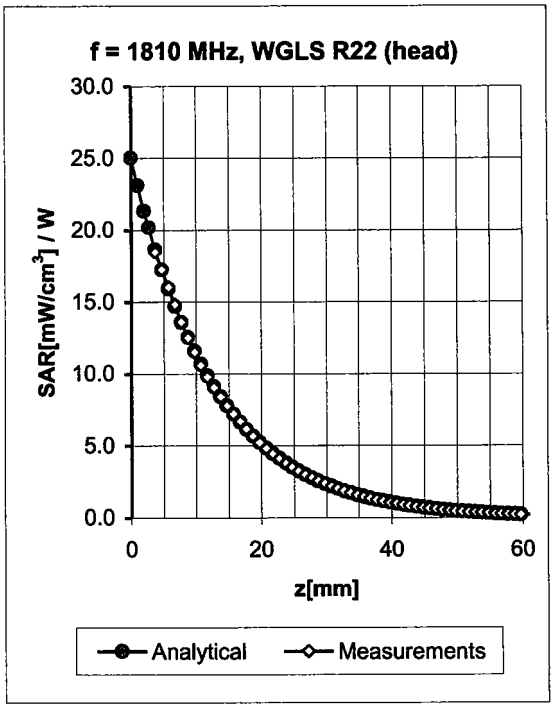




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



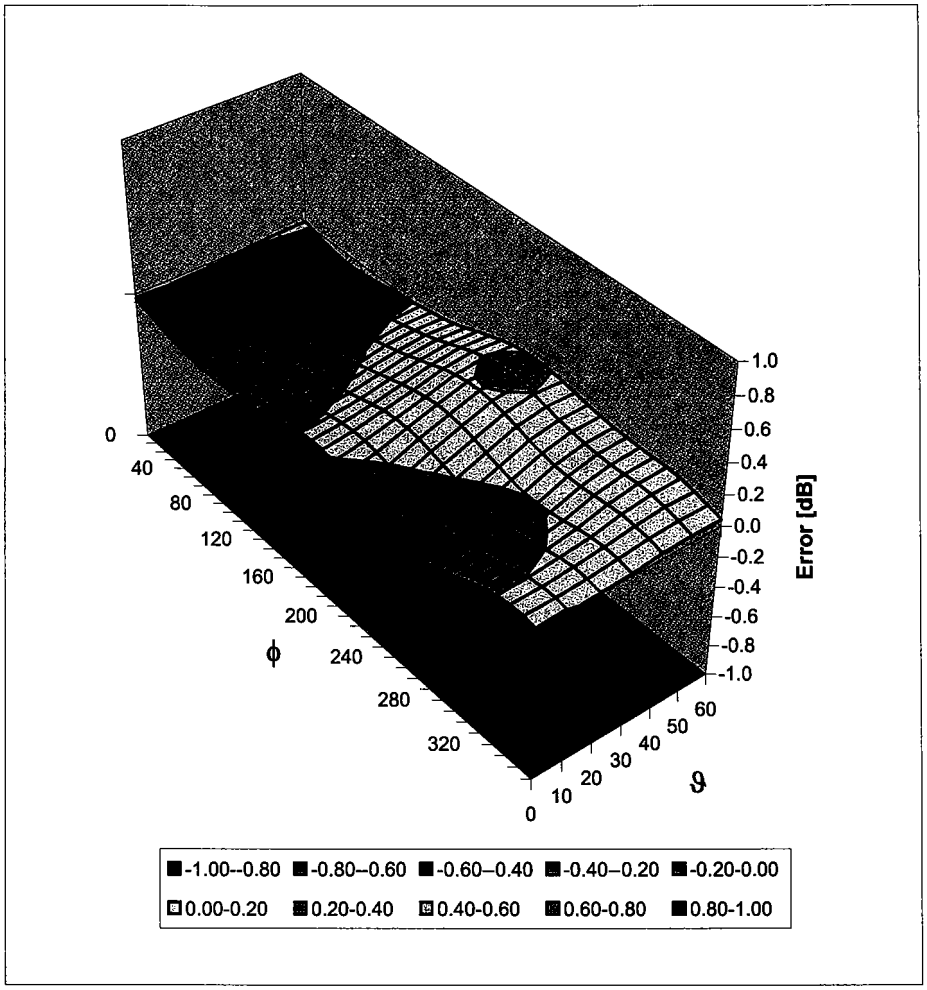


f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	1.29	1.35	6.42 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.61	2.36	5.12 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.59	2.50	4.87 ± 11.0% (k=2)
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: 30 – 3000 MHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	**IEEE 1528 section**	**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	5.9	N	1.00	1	1	5.9	5.9	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	∞
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	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	1.1	R	1.73	1	1	0.6	0.6	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mech. Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.2	N	1.00	1	1	3.2	3.2	29
Device Holder Uncertainty	E.4.1	4.0	N	1.00	1	1	4.0	4.0	8
SAR drift	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	3.3	N	1.00	0.64	0.43	2.1	1.4	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	N	1.00	0.6	0.49	1.1	0.9	∞
Combined Standard Uncertainty			RSS				11.1	10.8	411
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				22.2	21.6	

Uncertainty Budget for System Check: 30 – 3000 MHz

a	*b*	*c*	*d*	*e = f(d,k)*	*f*	*g*	*h = c x f / e*	*i = c x g / e*	*k*
Uncertainty Component	**IEEE 1528 section**	**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	5.9	N	1.00	1	1	5.9	5.9	∞
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	1.0	R	1.73	1	1	0.6	0.6	∞
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	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	0.0	R	1.73	1	1	0.0	0.0	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mechanical Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t. Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Dipole									
Dipole Axis to Liquid Distance	8, E.4.2	2.0	R	1.73	1	1	1.2	1.2	∞
Input Power and SAR Drift Measurement	8, 6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	3.3	R	1.73	0.64	0.43	1.2	0.8	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	R	1.73	0.6	0.49	0.6	0.5	∞
Combined Standard Uncertainty			RSS				9.0	8.8	99999
Expanded Uncertainty (95% CONFIDENCE LEVEL)			*k*=2				17.7	17.3	

Appendix 6

Photographs of the device under test

Figure 1. Front and back of Phone with Blue Housing

Figure 2. Front and back of Phone with Black Housing

Figure 3. Top View of CE33202

Figure 4. Side View of CE33202

Figure 5. Top View of CEC3801

Figure 6. Side View of CEC3801

Figure 7. Top View of CLAD01

Figure 8. Side View of CLAD01

Figure 9. Top View of EL33301

Figure 10. Side View of EL33301

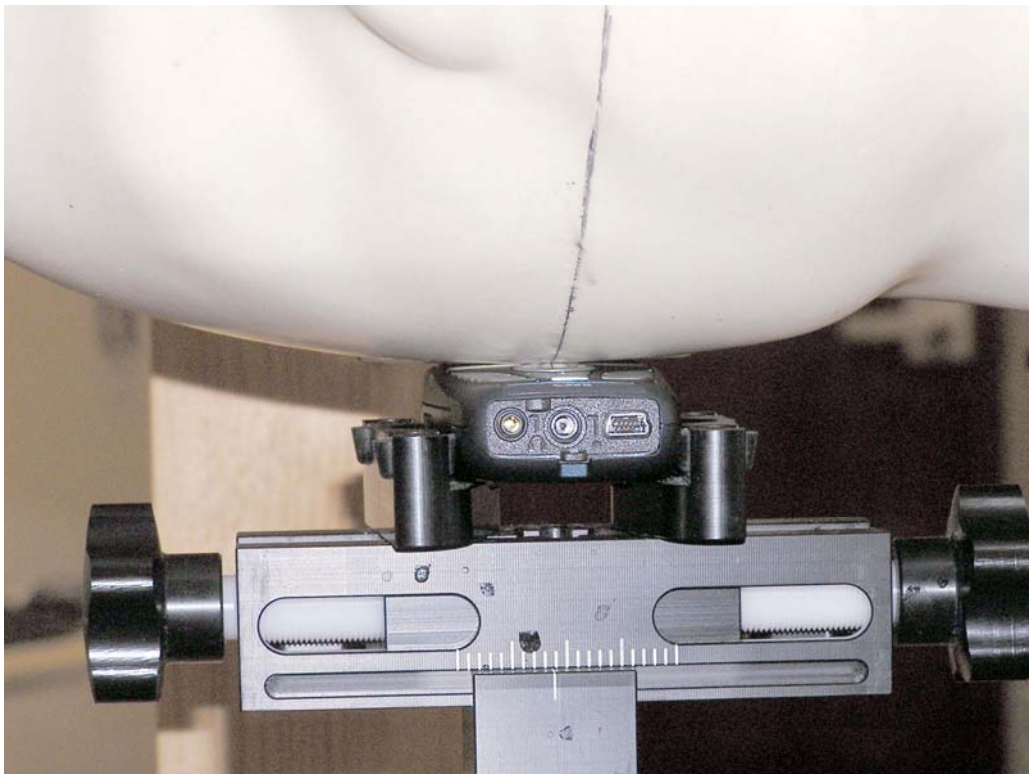


Figure 11. Front View; Cheek/Touch Position

Figure 12. Rear View; Cheek/Touch Position

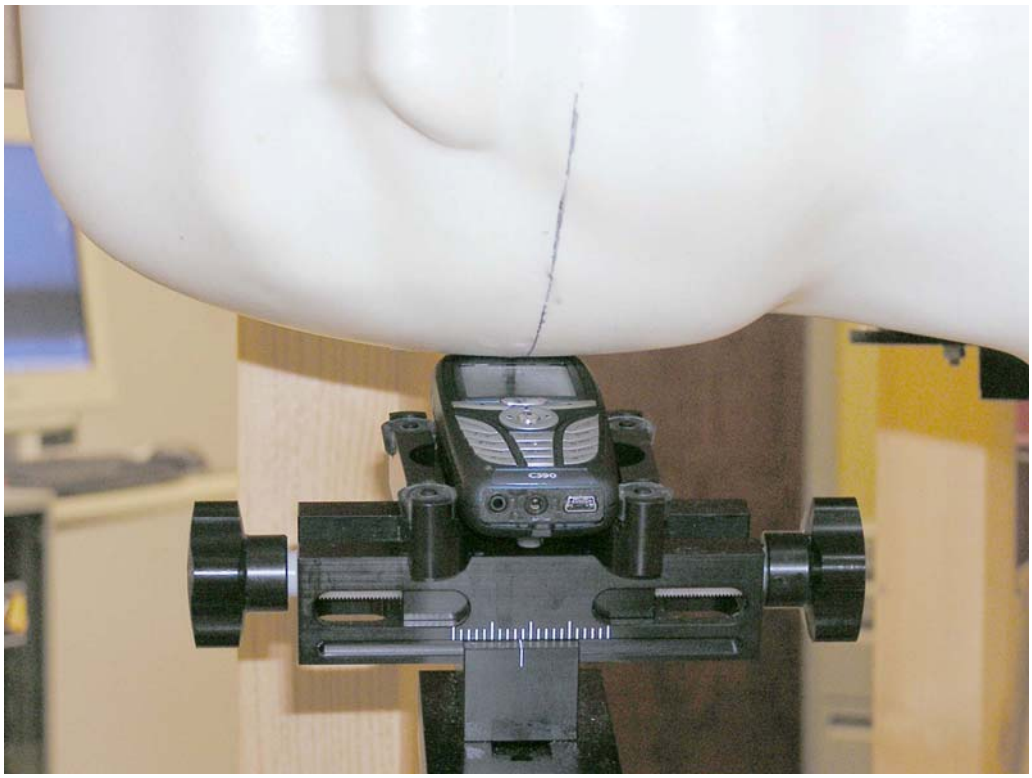


Figure 13. Front View; Tilt Position

Figure 14. Rear View; Tilt Position

Figure 15. Body Worn Testing