Exhibit 11: SAR Test Report IHDT56EG1

Date of test: 14 & 15 April, 2005
Date of Report: 27 April, 2005

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

Test Responsible:
Steven Hauswirth
Principal 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 P1528 (*DRAFT*) FCC OET Bulletin 65 (*including Supplements A, B, C*) Australian Communications Authority Radio Communications (Electromagnetic Radiation – Human Exposure) Standard 1999 CENELEC EN 50361 (2001)
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 IHDT56EG1 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.

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1 Introduction

The Motorola Personal Communications Sector Product Safety Laboratory has performed measurements of the maximum potential exposure to the user of portable cellular phone (FCC ID IHDT56EG1). 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 Corner	
Dimensions	Length	25mm
	Width	9mm
Configuration	Helix	

2.2 Device description

FCC ID Number	**IHDT56EG1**	
Serial number	010543000001963	
Mode(s) of Operation	GSM 850	GSM 1900
Modulation Mode(s)	GMSK	GMSK
Target Value for Maximum Output Power Setting	32.80 dBm	30.00 dBm
Duty Cycle	1:8	1:8
Transmitting Frequency Rang(s)	824.20 - 848.80 MHz	1850.20 – 1909.80 MHz
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
DASY3 DAE V1	SN367	7-Oct-05
E-Field Probe ET3DV6	SN1502	16-Jul-05
Dipole Validation Kit, D900V2	SN094	
S.A.M. Phantom used for 800MHz	TP-1168	
Dipole Validation Kit, D1800V2	SN276TR	
S.A.M. Phantom used for 1900MHz	TP-1138	

3.2 Additional Equipment

Description	Serial Number	Cal Due Date
Signal Generator HP8648C	3847A04630	2-Mar-06
Power Meter E4419B	GB43310686	2-Mar-06
Power Sensor #1 - 8481A	MY41095452	9-Mar-06
Power Sensor #2 - 8481A	MY41095450	9-Mar-06
Network Analyzer HP8753ES	3847A04822	6-Feb-06
Dielectric Probe Kit HP85070B	US99360074	

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 HP85070C 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,** 14-Apr-05	41.7	0.91	22.5
		Recommended Limits	41.5 ±5%	0.90 ±5%	18-25
	Body	**Measured,** 14-Apr-05	54.6	0.97	22.4
		Recommended Limits	55.2 ±5%	0.97 ±5%	18-25
1880	**Head**	**Measured,** 14-Apr-05	38.6	1.43	21.6
		Recommended Limits	40.0 ±5%	1.40 ±5%	18-25
	Body	**Measured,** 15-Apr-05	51.5	1.57	22.2
		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	--	30.80
DGBE	--	--	47.0	--
Water	40.45	53.06	52.8	68.91
Salt	1.45	0.94	0.2	0.29
HEC	1.0	1.0	--	--
Bact.	0.1	0.1	--	--

5 System Accuracy Verification

A system accuracy verification of the 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,** 14-Apr-05	11.4	41.0	0.97	22	22.2
	Recommended Limits	10.8	41.5 ±5%	0.97 ±5%	18-25	18-25
1800	**Measured,** 14-Apr-05	38.0	39.0	1.35	22	22.4
	Measured, 15-Apr-05	38.4	38.8	1.35	21	21.9
	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 ET3DV6	SN1502	900	6.45	7 of 8
		1800	5.13	7 of 8

6 Test Results

The test sample was operated in a test mode that allows control of the transmitter without the need to place actual phone calls. For the purposes of this test the unit is commanded to test mode and manually set to the proper channel, transmitter power level and transmit mode of operation. The phone was tested in the configurations stipulated in OET Bulletin 65 Supplement C 01-01. Motorola also followed the requirements in Supplement. C / Appendix D: SAR Measurement Procedures, section titled "*Devices Operating Next To A Person's Ear* ". These directions state "The device should be tested on the left and right side of the head phantom in the "Cheek/Touch" and "Ear/Tilt" positions. When applicable, each configuration should be tested with the antenna in its fully extended and fully retracted positions. These test configurations should be tested at the high, middle and low frequency channels of each operating mode; for example, AMPS, CDMA, and TDMA. If the SAR measured at the middle channel for each test configuration (left, right, Cheek/Touch, Tile/Ear, extended and retracted) is at least 2.0 dB lower than the SAR limit, testing at the high and low channels is optional for such test configuration(s)."

The DASY 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.

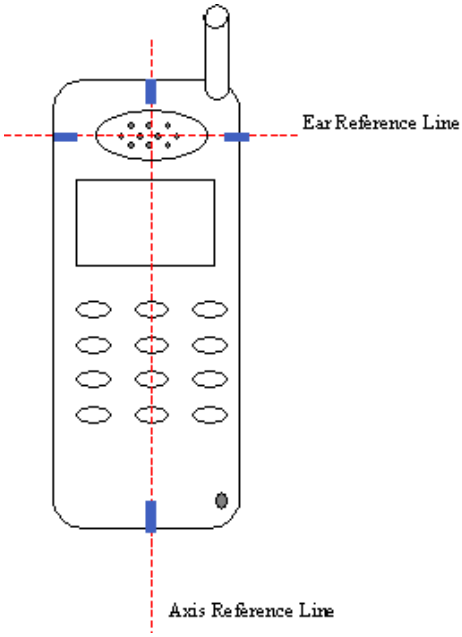
The Cellular Phone (FCC ID IHDT56EG1) has 920mAhr SNN5749A as the only available battery option. This battery was used to do all of the SAR testing. The phone was placed in the SAR measurement system with a fully charged battery.

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 2 are maximum SAR values averaged over 1 gram of phantom tissue. Also shown are the measured conducted output powers, the temperature of the test facility during the test, the temperature of the tissue simulate after the test, the measured drift and the extrapolated SAR. The exact method of extrapolation is 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.

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	SN1502	900	6.45	7 of 8
		1800	5.13	7 of 8

f (MHz)	Description	Conducted Output Power (dBm)	Cheek / Touch Position							
			Left Head				Right Head			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 850MHz	Channel 128	32.76	1.07	-0.19	1.12	22.4	**1.15**	**-0.24**	**1.22**	**22.5**
	Channel 189	32.97	0.955	-0.17	0.99	22.3	1.09	-0.31	1.17	22.6
	Channel 251	32.99	0.934	-0.18	0.97	22.3	1.03	-0.2	1.08	22.7
Digital 1900MHz	Channel 512	29.87	0.82	-0.18	0.85	22.1	0.895	-0.07	0.91	21.4
	Channel 661	29.98	0.834	-0.03	0.84	22.3	**0.902**	**-0.07**	**0.92**	**21.6**
	Channel 810	30.18	0.706	-0.23	0.74	21.4	0.824	-0.09	0.84	21.5

Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT56EG1 at highest possible output power. Measured against the left and right head in the Cheek/Touch Position.

f (MHz)	Description	Conducted Output Power (dBm)	15° Tilt Position							
			Left Head				Right Head			
			Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Extrapolated (W/kg)	Simulate Temp (°C)
Digital 850MHz	Channel 128	32.76								
	Channel 189	32.97	0.26	-0.21	0.27	22.5	**0.269**	**-0.26**	**0.29**	**22.2**
	Channel 251	32.99								
Digital 1900MHz	Channel 512	29.87								
	Channel 661	29.98	**0.13**	**-0.25**	**0.14**	**21.7**	0.112	0.01	0.11	21.7
	Channel 810	30.18								

Table 2: SAR measurement results for the portable cellular telephone FCC ID IHDT56EG1 at highest possible output power. Measured against the left and right head in the 15° Tilt Position.

6.2 Body Worn Test Results

The SAR results shown in table 3 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. There are no Body-Worn Accessories available for this phone at the time of testing hence the device was tested per the supplement C testing guidelines for devices that do not have body worn accessories. The phone was placed a maximum of 1 inch away from a flat phantom per the supplement C standard guidelines to perform SAR measurement. The cellular phone was tested with a headset connected to the device for all body-worn SAR measurements.

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

Description	Serial Number	f (MHz)	Conversion Factor	Cal Cert pg #
E-Field Probe ET3DV6	SN1502	900	6.23	7 of 8
		1800	4.48	7 of 8

f (MHz)	Description	Conducted Output Power (dBm)	Body Worn							
			Front of phone 15 mm away from phantom				Back of phone 15 mm 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 850MHz	Channel 128	32.76								
	Channel 189	32.97	**0.276**	**-0.22**	**0.29**	**22.2**	**0.493**	**-0.16**	**0.51**	**22.4**
	Channel 251	32.99								
Digital 1900MHz	Channel 512	29.87								
	Channel 661	29.98	**0.0966**	**-0.16**	**0.10**	**22.3**	**0.162**	**-0.08**	**0.17**	**22.2**
	Channel 810	30.18								

Table 3: SAR measurement results for the portable cellular telephone FCC ID IHDT56EG1 at highest possible output power. Measured against the body.

Appendix 1

SAR distribution comparison for the system accuracy verification

Date/Time: 4/14/2005 7:45:19 AM

Test Laboratory: Motorola

900MHz Validation

Serial: D900V2 - SN:094;
Procedure Notes: 900 MHz System Performance Check / Dipole Sn# 094 PM1 PM2 Power = 200 mW Refl.Pwr PM3 = -24.25 dB

Sim.Temp@SPC = 22.2 ┌C Room Temp @ SPC = 22 ┌C

Communication System: CW - Dipole; Frequency: 900 MHz;Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: σ = 0.97 mho/m, ε_r = 41; ρ = 1000 kg/m^3

DASY4 Configuration:

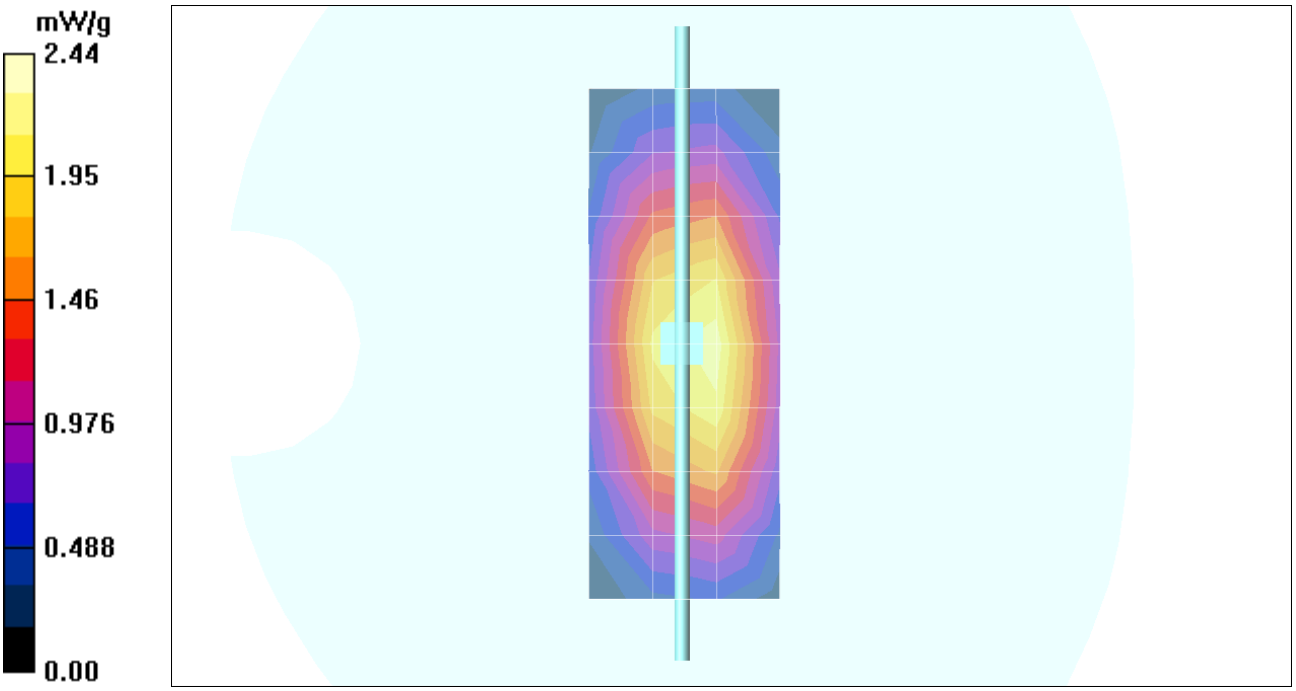
- Probe: ET3DV6 - SN1502; ConvF(6.45, 6.45, 6.45); Calibrated: 7/16/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn367; Calibrated: 10/7/2004
- Phantom: PCS-8: Sugar Water SAM; Type: SAM; Serial: TP-1168;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 147

Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 2.22 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 51.8 V/m; Power Drift = -0.027 dB
Peak SAR (extrapolated) = 3.40 W/kg
SAR(1 g) = 2.25 mW/g; SAR(10 g) = 1.44 mW/g
Maximum value of SAR (measured) = 2.44 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 51.8 V/m; Power Drift = -0.027 dB
Peak SAR (extrapolated) = 3.51 W/kg
SAR(1 g) = 2.33 mW/g; SAR(10 g) = 1.49 mW/g
Maximum value of SAR (measured) = 2.51 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm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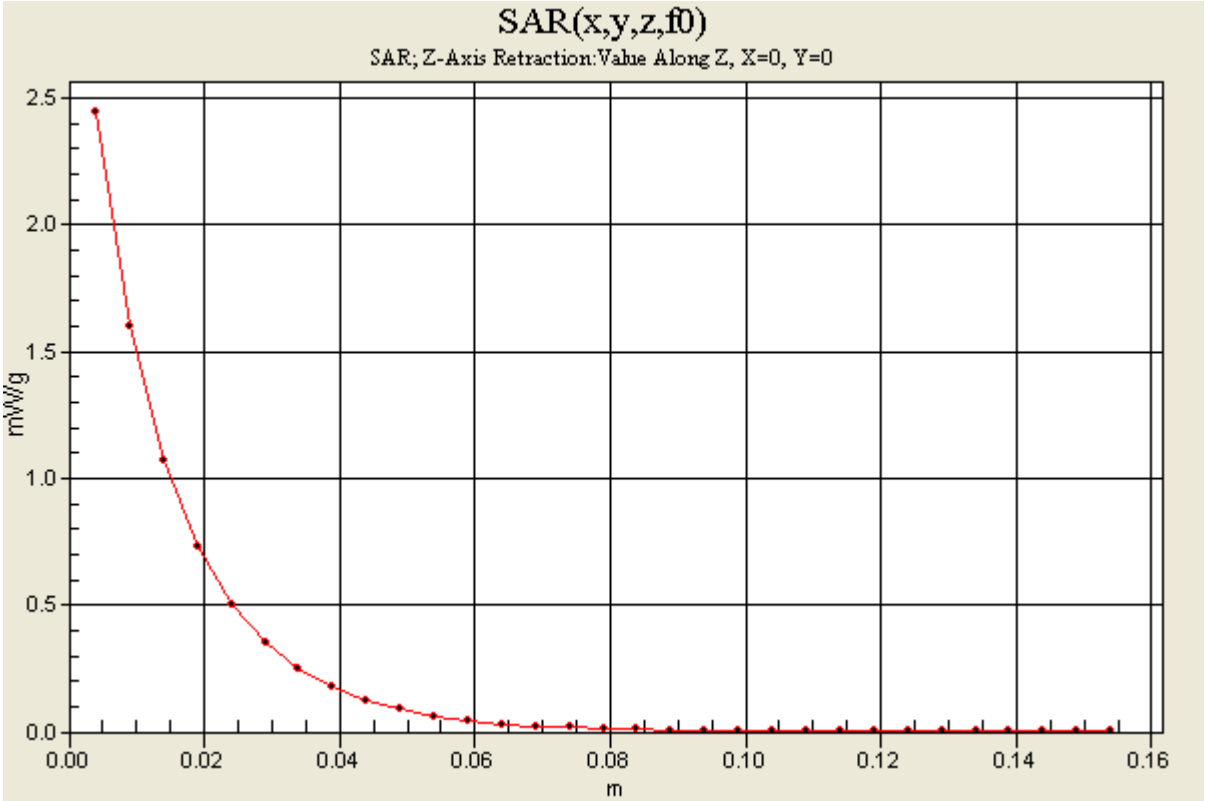
1.95
1.46
0.976
0.488
0.00


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: 4/14/2005 2:44:15 PM

Test Laboratory: Motorola

1800MHz Validation

Serial: D1800V2 - SN:276tr;
Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 276tr PM2 Power = 200 mW Refl.Pwr PM3 = -23.04 dB

Sim.Temp@SPC = 22.4 ┌C Room Temp @ SPC = 22 ┌C

Communication System: CW - Dipole; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: σ = 1.35 mho/m, ε_r = 39; ρ = 1000 kg/m^3

DASY4 Configuration:

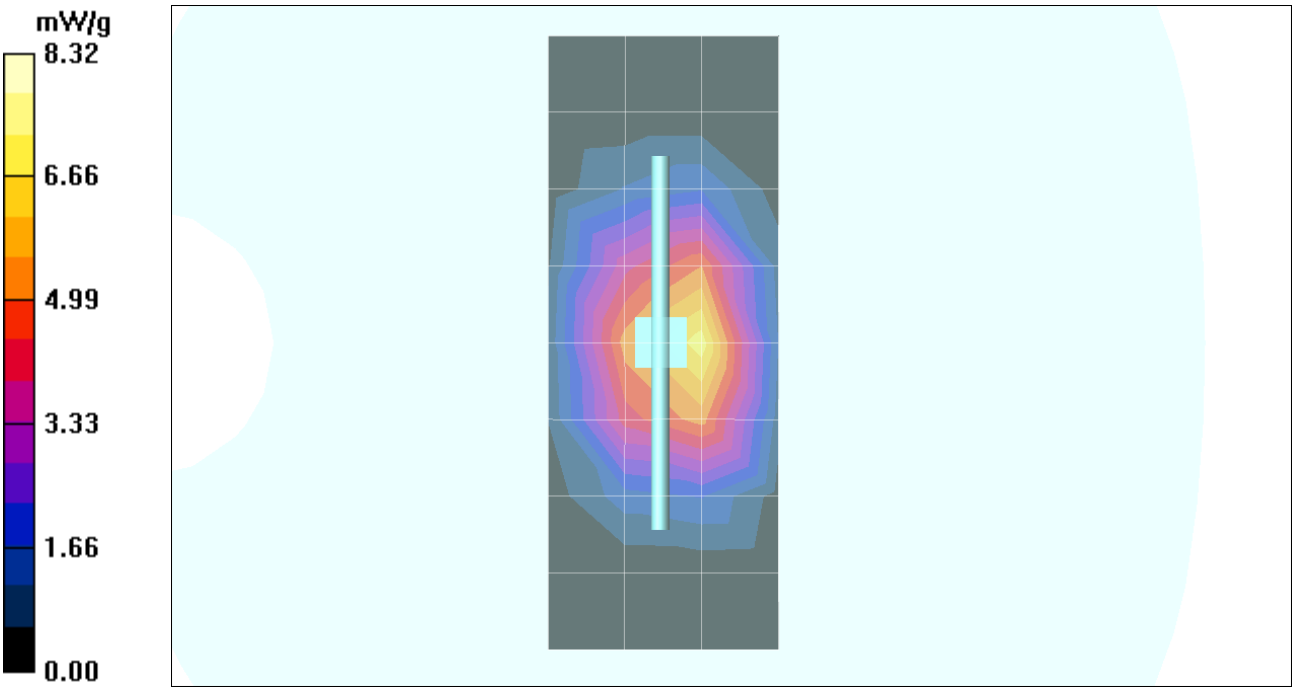
- Probe: ET3DV6 - SN1502; ConvF(5.13, 5.13, 5.13); Calibrated: 7/16/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn367; Calibrated: 10/7/2004
- Phantom: PCS-8: Glycol SAM; Type: SAM; Serial: TP-1138;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 147

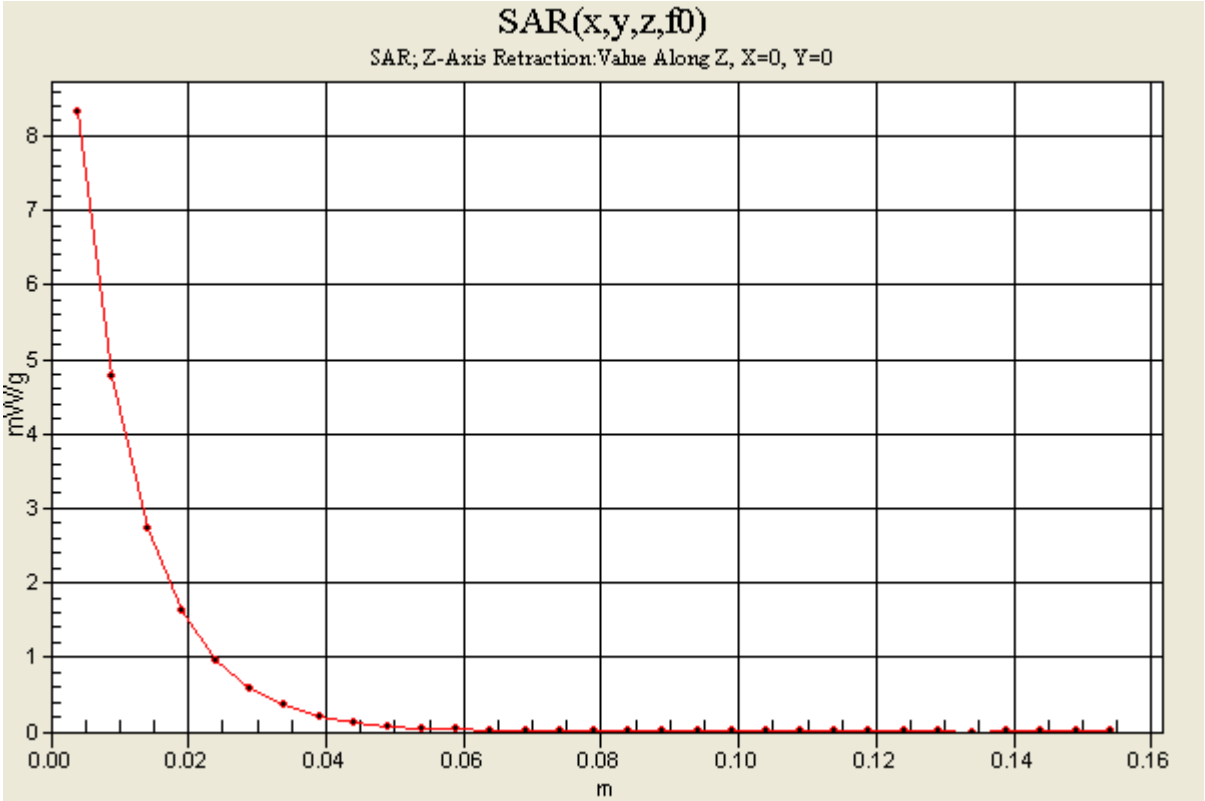
Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 7.00 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 81.7 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 12.9 W/kg
SAR(1 g) = 7.41 mW/g; SAR(10 g) = 3.96 mW/g
Maximum value of SAR (measured) = 8.26 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 81.7 V/m; Power Drift = 0.033 dB
Peak SAR (extrapolated) = 13.6 W/kg
SAR(1 g) = 7.8 mW/g; SAR(10 g) = 4.17 mW/g
Maximum value of SAR (measured) = 8.57 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 8.32 mW/g


mW/g
8.32
6.66
4.99
3.33
1.66
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: 4/15/2005 2:20:50 PM

Test Laboratory: Motorola

1800MHz Validation

Serial: D1800V2 - SN:276tr;
Procedure Notes: 1800 MHz System Performance Check / Dipole Sn# 276tr

PM2 Power = 200 mW Refl.Pwr PM3 = -23.21 dB

Sim.Temp@SPC =21.9 ┌C Room Temp @ SPC = 21 ┌C

Communication System: CW - Dipole; Frequency: 1800 MHz;Duty Cycle: 1:1
Medium: VALIDATION Only; Medium parameters used: σ = 1.35 mho/m, ε_r = 38.8; ρ = 1000 kg/m^3

DASY4 Configuration:

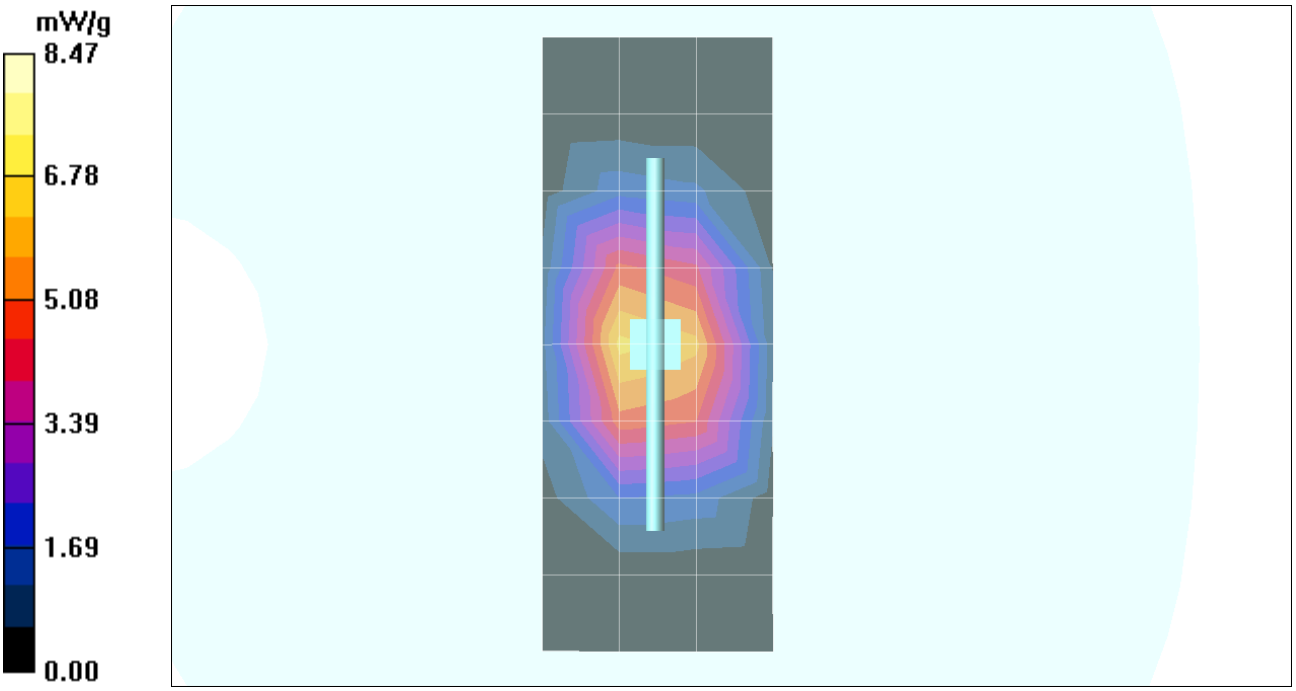
- Probe: ET3DV6 - SN1502; ConvF(5.13, 5.13, 5.13); Calibrated: 7/16/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn367; Calibrated: 10/7/2004
- Phantom: PCS-8: Glycol SAM; Type: SAM; Serial: TP-1138;
- Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 147

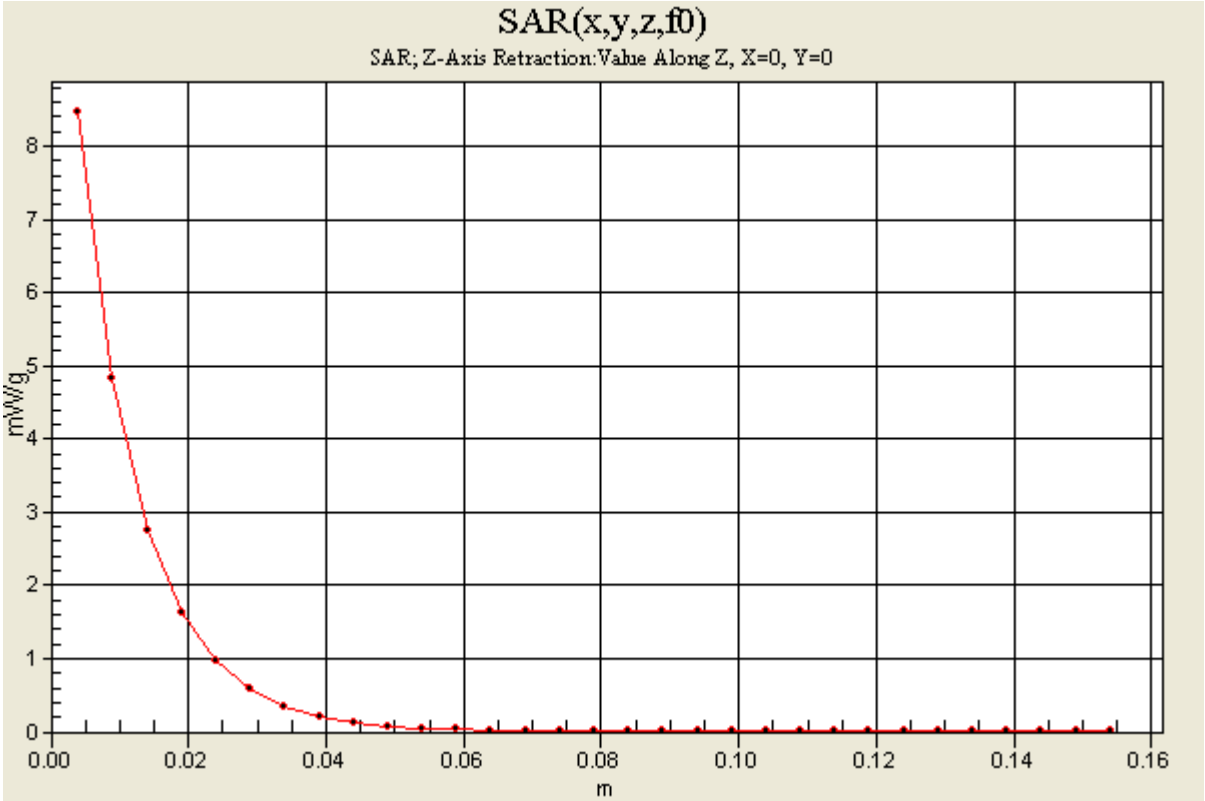
Daily SPC Check/Dipole Area Scan (4x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 6.42 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 82.6 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 13.2 W/kg
SAR(1 g) = 7.52 mW/g; SAR(10 g) = 4.01 mW/g
Maximum value of SAR (measured) = 8.45 mW/g

Daily SPC Check/90-Degree 5x5x7 Cube (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 82.6 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 13.7 W/kg
SAR(1 g) = 7.86 mW/g; SAR(10 g) = 4.21 mW/g
Maximum value of SAR (measured) = 8.63 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm
Maximum value of SAR (measured) = 8.47 mW/g


mW/g
8.47
6.78
5.08
3.39
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: 4/13/2005 9:58:57 PM

Test Laboratory: Motorola

GSM 850 Cheek

Serial: 01010543000001963;
Procedure Notes: Ch# 128 / Pwr Step: 05(OTA) Battery Model #: SNN5749A

DEVICE POSITION (cheek or rotated): Cheek

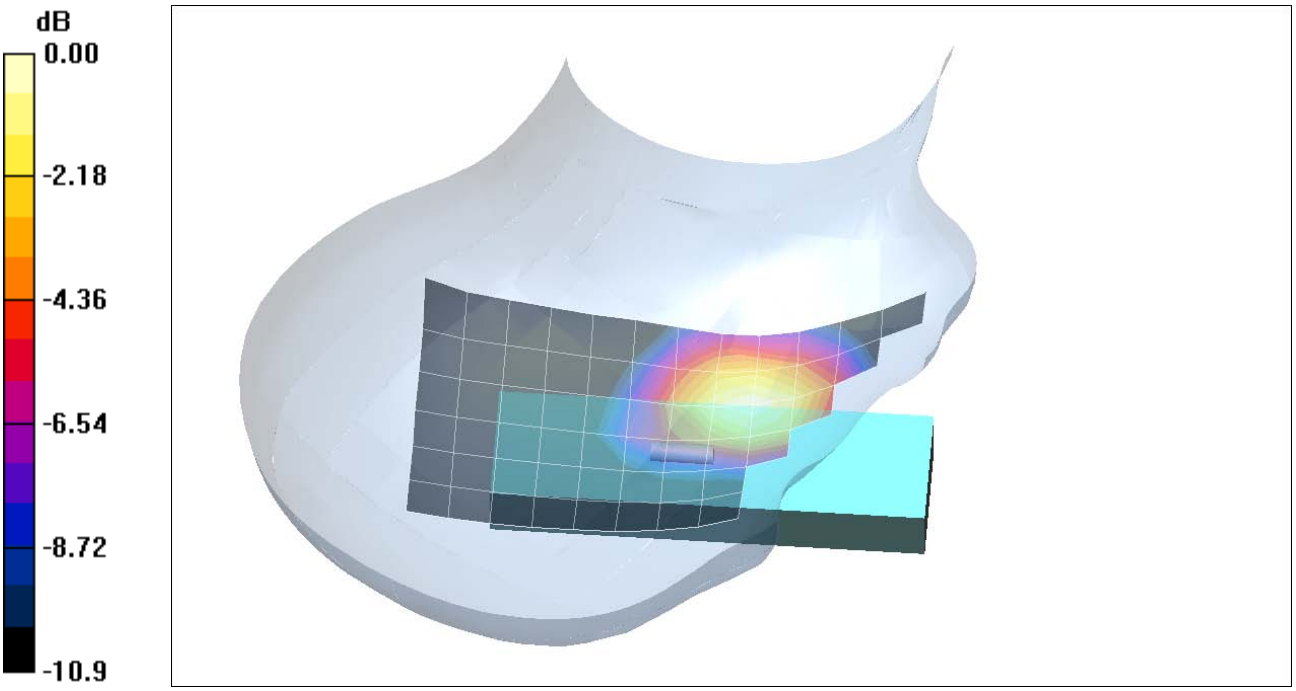
Communication System: GSM 850; Frequency: 824.2 MHz;Duty Cycle: 1:8
Medium: Low Freq Head; Medium parameters used: $\sigma = 0.9$ mho/m, $\varepsilon_r = 41.2$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ET3DV6 - SN1502; ConvF(6.45, 6.45, 6.45); Calibrated: 7/16/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn367; Calibrated: 10/7/2004
- Phantom: PCS-8: Sugar Water SAM; Type: SAM; Serial: TP-1168;
- Measurement SW: DASY4, V4.4 Build 3; 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) = 1.27 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 37.9 V/m; Power Drift = -0.237 dB
Peak SAR (extrapolated) = 1.64 W/kg
SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.758 mW/g
Maximum value of SAR (measured) = 1.26 mW/g



0 dB = 1.26mW/g

Date/Time: 4/14/2005 8:38:52 AM

Test Laboratory: Motorola

GSM 850 Tilt

Serial: 01010543000001963 ;
Procedure Notes: Ch# 189 / Pwr Step: 05(OTA) Battery Model #: SNN5749A

DEVICE POSITION (cheek or rotated): rotated

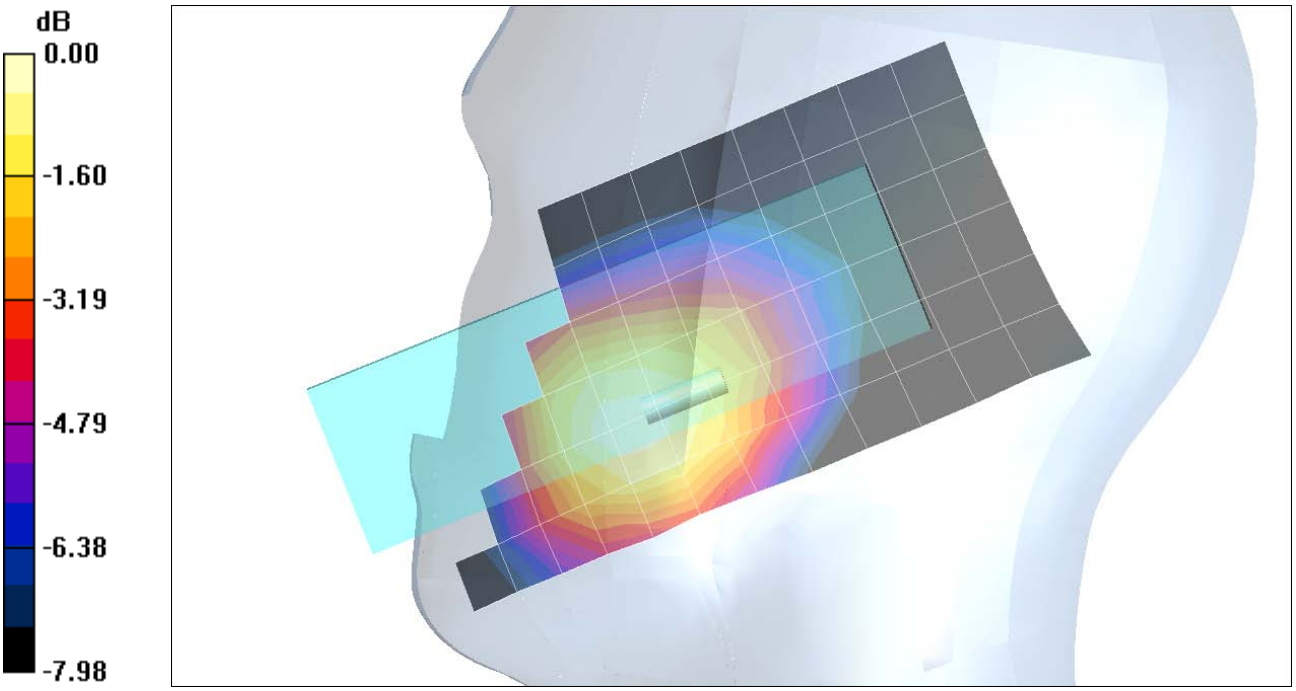
Communication System: GSM 850; Frequency: 836.4 MHz;Duty Cycle: 1:8
Medium: Low Freq Head; Medium parameters used: $\sigma = 0.91$ mho/m, $\varepsilon_r = 41.7$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ET3DV6 - SN1502; ConvF(6.45, 6.45, 6.45); Calibrated: 7/16/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn367; Calibrated: 10/7/2004
- Phantom: PCS-8: Sugar Water SAM; Type: SAM; Serial: TP-1168;
- Measurement SW: DASY4, V4.4 Build 3; 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) = 0.286 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 18.2 V/m; Power Drift = -0.257 dB
Peak SAR (extrapolated) = 0.348 W/kg
SAR(1 g) = 0.269 mW/g; SAR(10 g) = 0.199 mW/g



0 dB = 0.286mW/g

Date/Time: 4/14/2005 8:39:21 PM

Test Laboratory: Motorola

GSM 1900 Cheek

Serial: 0101543000001963;
Procedure Notes: Ch# 661 / Pwr Step: 00(OTA) Battery Model #: SNN5749A

DEVICE POSITION (cheek or rotated): Cheek

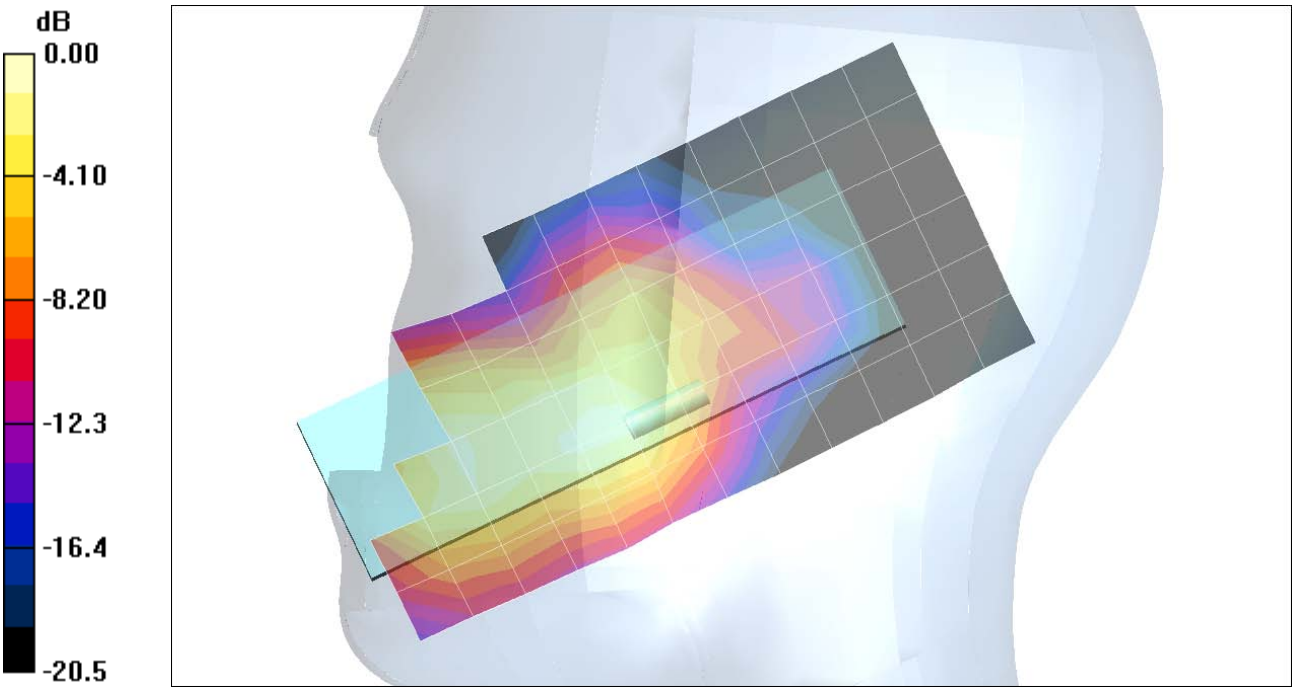
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8
Medium: Regular Glycol Head; Medium parameters used: σ = 1.43 mho/m, ε_r = 38.6; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ET3DV6 - SN1502; ConvF(5.13, 5.13, 5.13); Calibrated: 7/16/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn367; Calibrated: 10/7/2004
- Phantom: PCS-8: Glycol SAM; Type: SAM; Serial: TP-1138;
- Measurement SW: DASY4, V4.4 Build 3; 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) = 0.902 mW/g

Right Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 27.2 V/m; Power Drift = -0.070 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 0.902 mW/g; SAR(10 g) = 0.500 mW/g
Maximum value of SAR (measured) = 0.995 mW/g



0 dB = 0.995mW/g

Date/Time: 4/14/2005 7:50:16 PM

Test Laboratory: Motorola

GSM 1900 Tilt

Serial: 0101543000001963;
Procedure Notes: Ch# 661 / Pwr Step: 00(OTA) Battery Model #: SNN5749A

DEVICE POSITION (cheek or rotated): Rotated

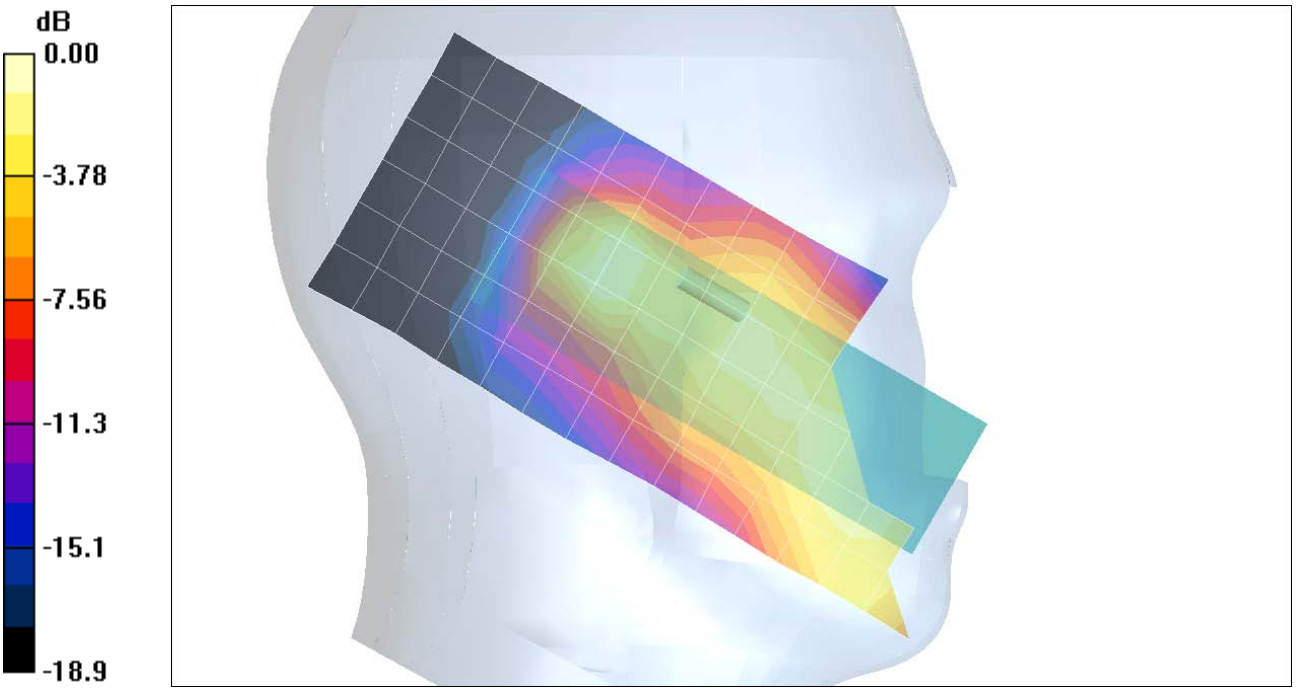
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8
Medium: Regular Glycol Head; Medium parameters used: σ = 1.43 mho/m, ε_r = 38.6; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ET3DV6 - SN1502; ConvF(5.13, 5.13, 5.13); Calibrated: 7/16/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn367; Calibrated: 10/7/2004
- Phantom: PCS-8: Glycol SAM; Type: SAM; Serial: TP-1138;
- Measurement SW: DASY4, V4.4 Build 3; 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) = 0.114 mW/g

Left Head Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.61 V/m; Power Drift = -0.251 dB
Peak SAR (extrapolated) = 0.217 W/kg
SAR(1 g) = 0.130 mW/g; SAR(10 g) = 0.069 mW/g
Maximum value of SAR (measured) = 0.146 mW/g



0 dB = 0.146mW/g

Appendix 3

SAR distribution plots for Body Worn Configuration

Date/Time: 4/14/2005 10:04:33 AM

Test Laboratory: Motorola

GSM 850 Body

Serial: 0101543000001963 ;
Procedure Notes: Ch# 189 / Pwr Step: 05(OTA) Battery Model #: SNN5749A

Accessory Model # = Back of Phone 15mm from Phantom

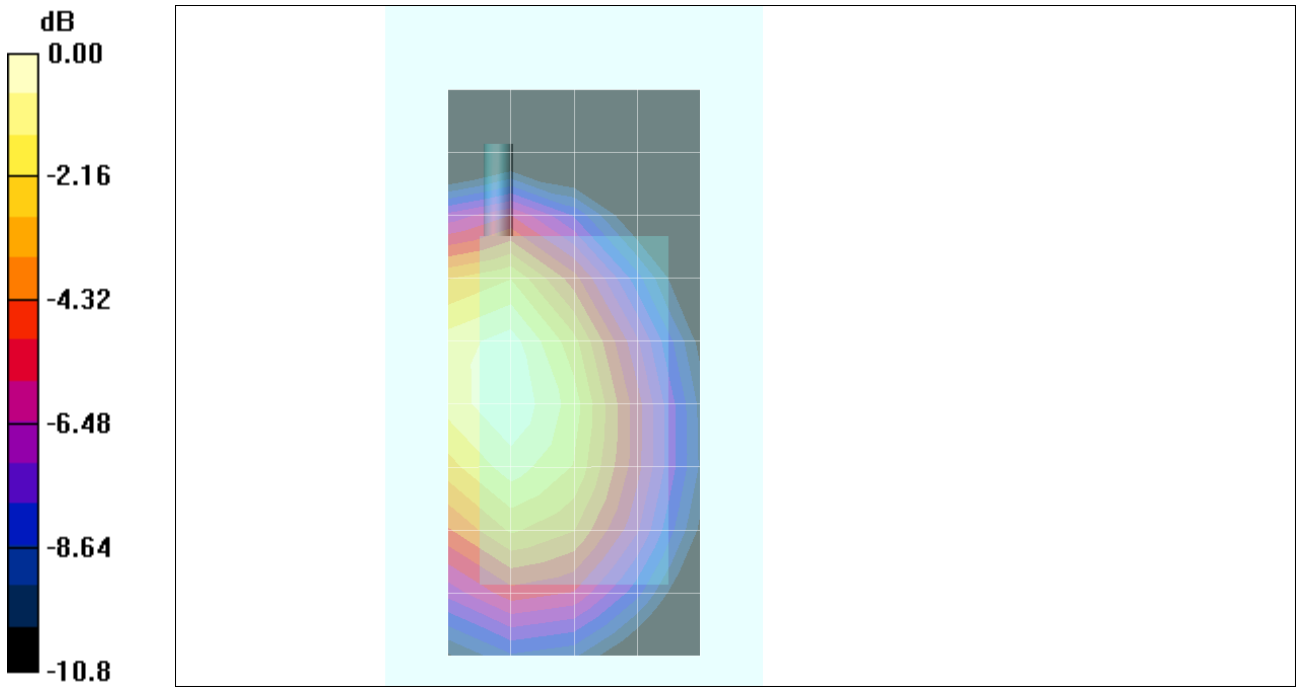
Communication System: GSM 850; Frequency: 836.4 MHz;Duty Cycle: 1:8
Medium: Low Freq Body; Medium parameters used: $\sigma = 0.97$ mho/m, $\varepsilon_r = 54.6$; $\rho = 1000$ kg/m^3

DASY4 Configuration:

- Probe: ET3DV6 - SN1502; ConvF(6.23, 6.23, 6.23); Calibrated: 7/16/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn367; Calibrated: 10/7/2004
- Phantom: PCS-8: Section 1, Amy Twin, Rev2 (23-June-04); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; 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) = 0.521 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 20.6 V/m; Power Drift = -0.156 dB
Peak SAR (extrapolated) = 0.678 W/kg
SAR(1 g) = 0.493 mW/g; SAR(10 g) = 0.338 mW/g
Maximum value of SAR (measured) = 0.528 mW/g



0 dB = 0.528mW/g

Date/Time: 4/15/2005 9:20:20 AM

Test Laboratory: Motorola

GSM 1900 Body

Serial: 0101543000001963 ;
Procedure Notes: Ch# 661 / Pwr Step: 00(OTA) Battery Model # = SNN5749A

Back of Phone 15mm from Phantom

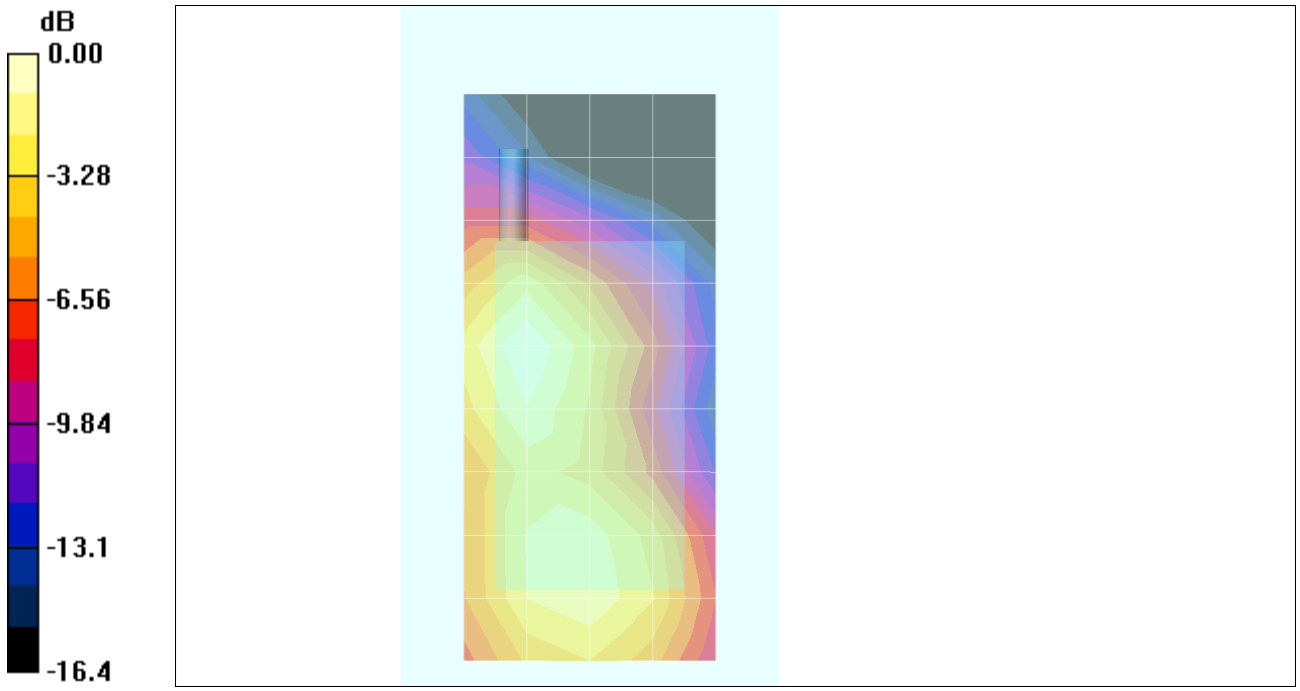
Communication System: GSM 1900; Frequency: 1880 MHz;Duty Cycle: 1:8
Medium: Regular Glycol Body; Medium parameters used: σ = 1.57 mho/m, ε_r = 51.5; ρ = 1000 kg/m^3

DASY4 Configuration:

- Probe: ET3DV6 - SN1502; ConvF(4.48, 4.48, 4.48); Calibrated: 7/16/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn367; Calibrated: 10/7/2004
- Phantom: PCS-8: Section 2, Amy Twin, Rev2 (23-June-04); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.4 Build 3; 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) = 0.178 mW/g

Amy Twin Phone Template/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.1 V/m; Power Drift = -0.077 dB
Peak SAR (extrapolated) = 0.252 W/kg
SAR(1 g) = 0.162 mW/g; SAR(10 g) = 0.096 mW/g
Maximum value of SAR (measured) = 0.179 mW/g



0 dB = 0.179mW/g

Appendix 4

Probe Calibration Certificate

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

Client Motorola PCS

CALIBRATION CERTIFICATE

Object(s)	ET3DV6 - SN:1502
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	July 16, 2004
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

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

All calibrations have been conducted in the closed laboratory facility: environment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

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

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

Date issued: July 16, 2004

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

Probe ET3DV6

SN:1502

Manufactured:	October 24, 1999
Last calibrated:	October 10, 2003
Repaired:	June 16, 2004
Recalibrated:	July 16, 2004

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1502

Sensitivity in Free Space

NormX	**1.67** $\mu V/(V/m)^2$
NormY	**1.85** $\mu V/(V/m)^2$
NormZ	**1.78** $\mu V/(V/m)^2$

Diode Compression[A]

DCP X	**93**	mV
DCP Y	**93**	mV
DCP Z	**93**	mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Plese see Page 7.

Boundary Effect

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

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	8.2	4.5
SAR_{be} [%]	With Correction Algorithm	0.1	0.2

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

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	12.1	8.4
SAR_{be} [%]	With Correction Algorithm	0.2	0.2

Sensor Offset

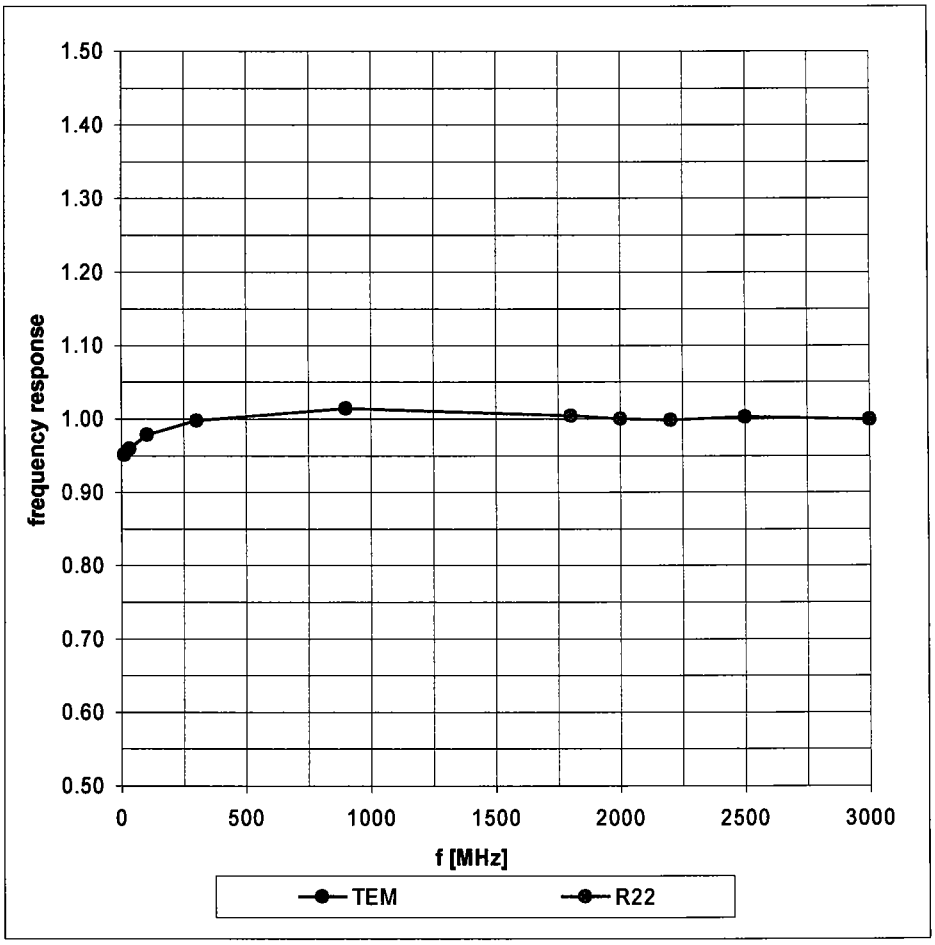
Probe Tip to Sensor Center	**2.7** mm
Optical Surface Detection	**in tolerance**

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

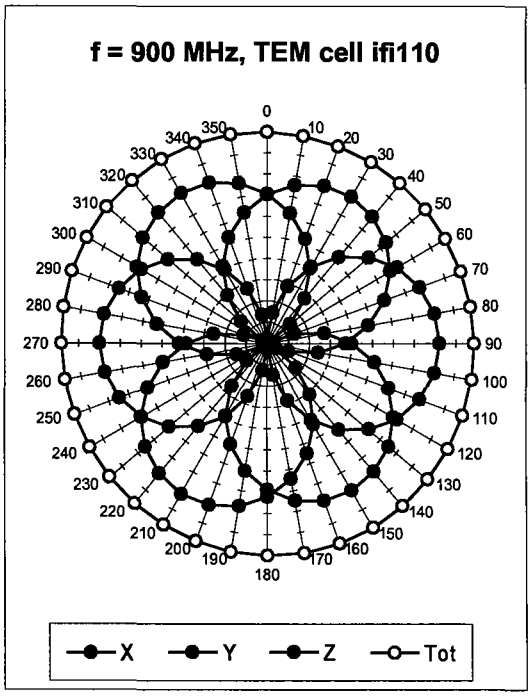
[A] numerical linearization parameter: uncertainty not required

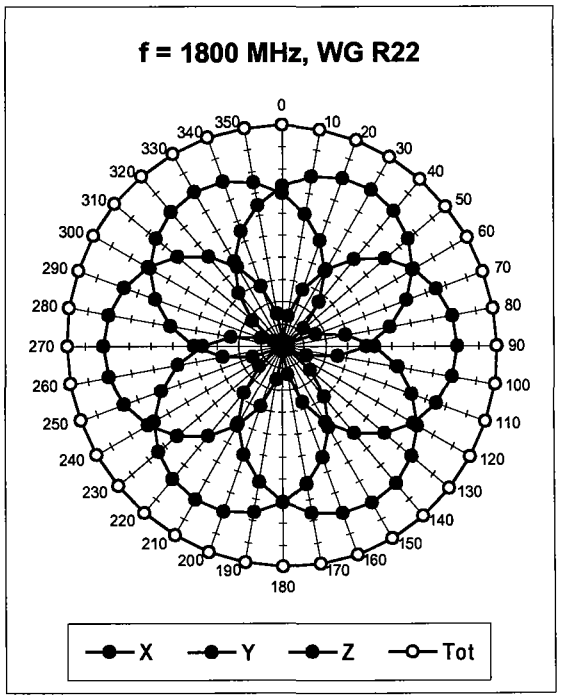
Frequency Response of E-Field

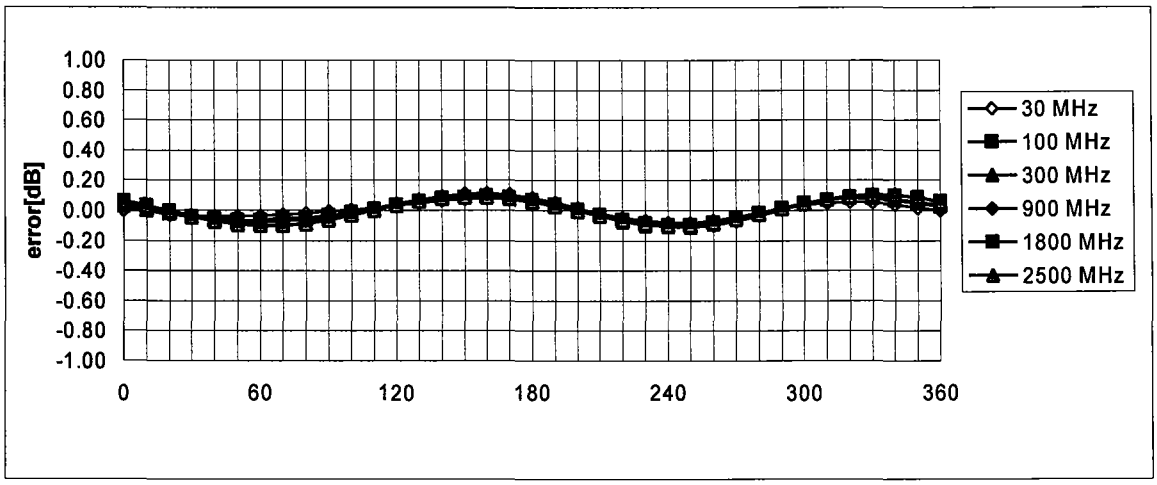
(TEM-Cell:ifi110, Waveguide R22)



Receiving Pattern (ϕ), θ = 0°



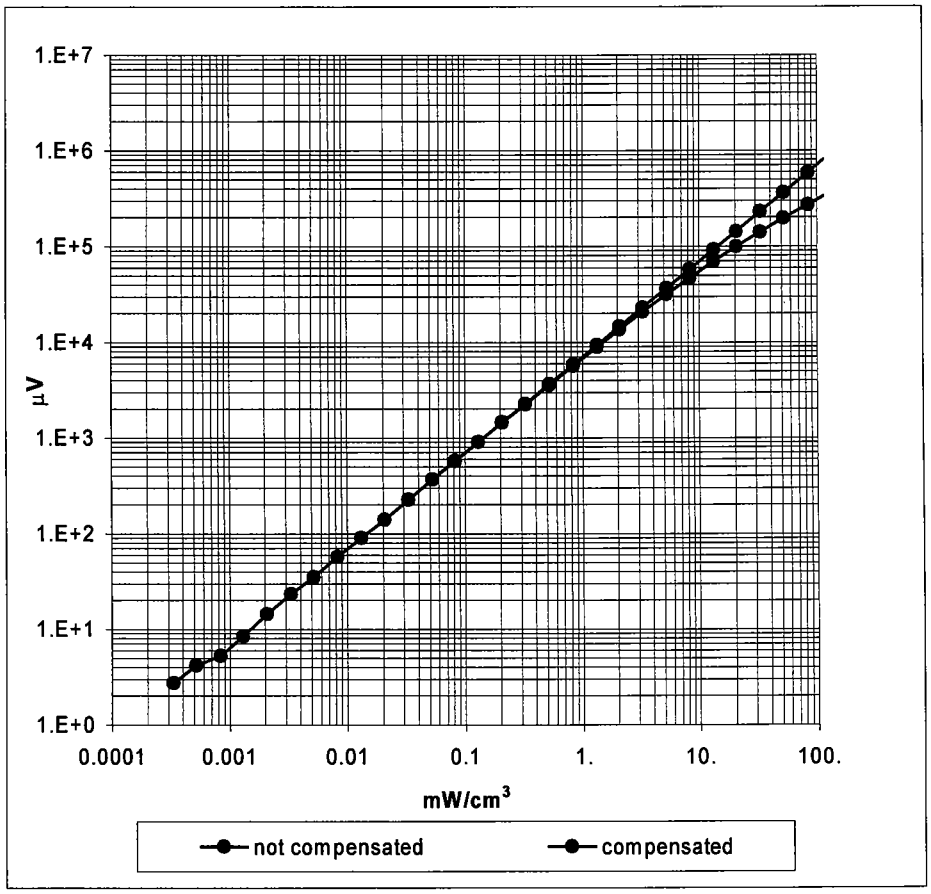


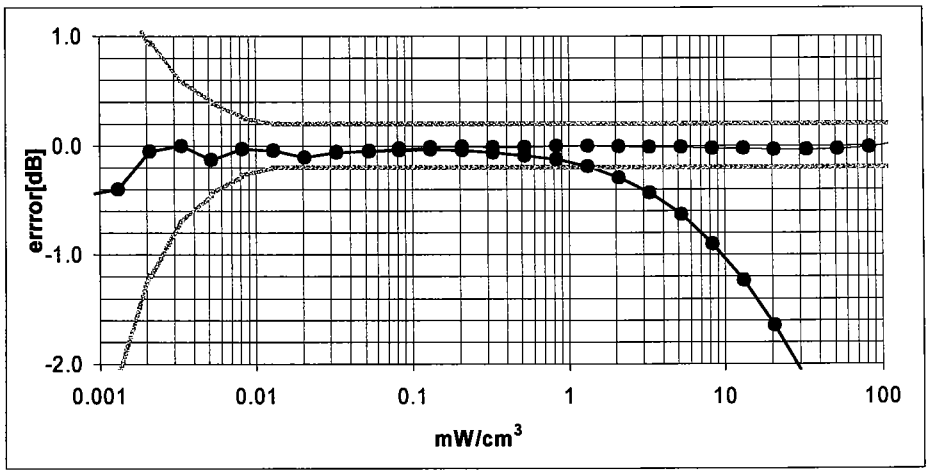


Axial Isotropy Error < ± 0.2 dB

Dynamic Range f(SAR_{head})

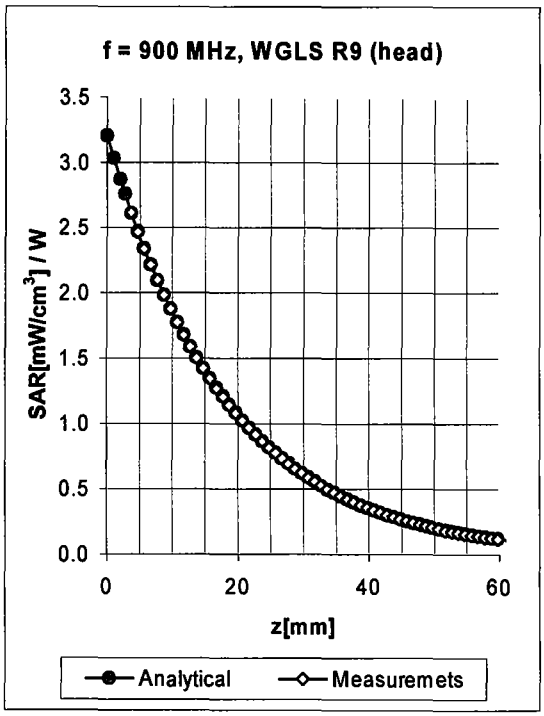
(Waveguide R22)

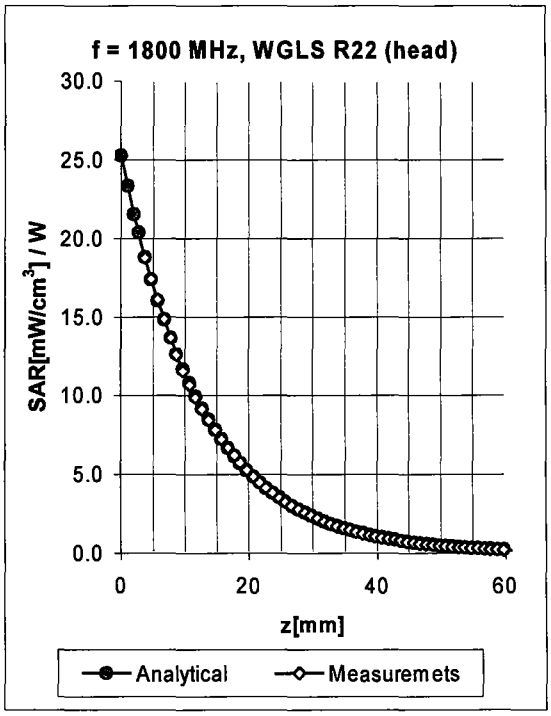




Probe Linearity Error < ± 0.2 dB

Conversion Factor Assessment



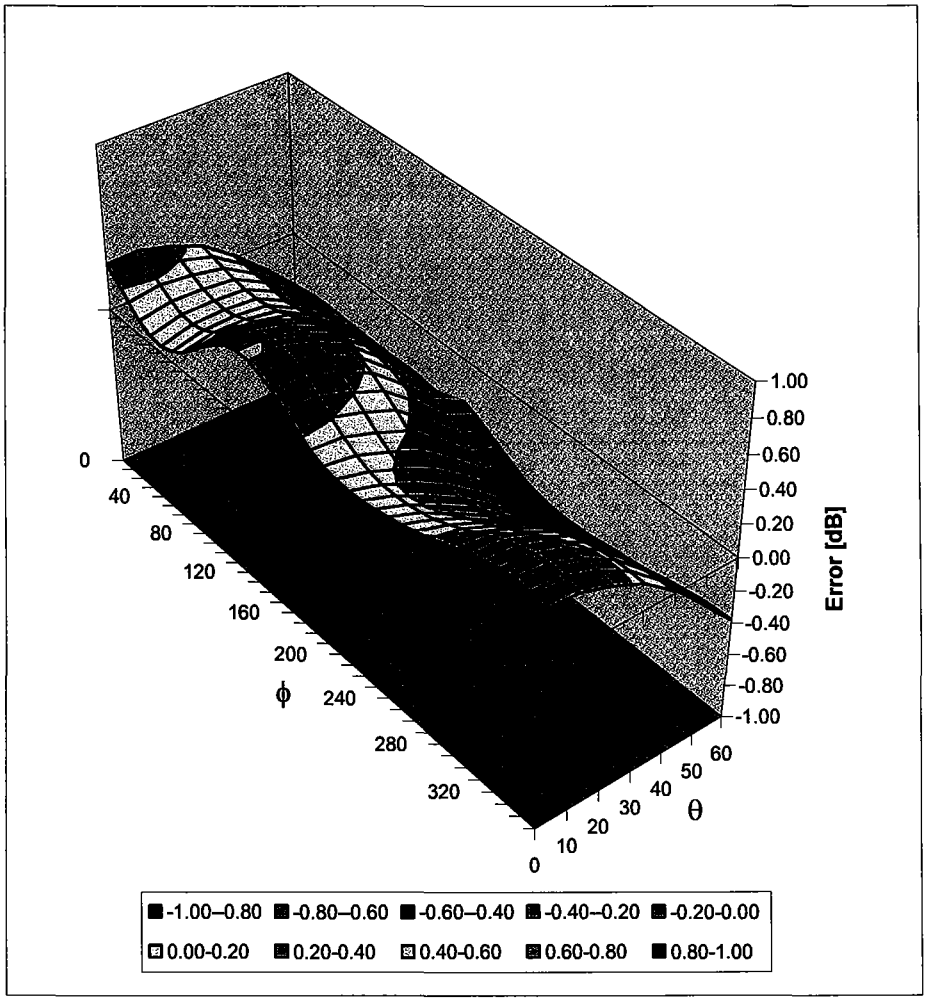


f [MHz]	Validity [MHz][B]	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF	Uncertainty
900	800-1000	Head	41.5 ± 5%	0.97 ± 5%	0.53	1.90	6.45	± 9.5% (k=2)
1800	1710-1910	Head	40.0 ± 5%	1.40 ± 5%	0.44	2.67	5.13	± 9.5% (k=2)
900	800-1000	Body	55.0 ± 5%	1.05 ± 5%	0.45	2.20	6.23	± 9.5% (k=2)
1800	1710-1910	Body	53.3 ± 5%	1.52 ± 5%	0.50	2.89	4.48	± 9.5% (k=2)

[B] The stated uncertainty of calibration in according to P1528.

Deviation from Isotropy in HSL

Error (θ, ϕ), f = 900 MHz



Spherical Isotropy Error < ± 0.4 dB

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

Figure 2: Phone Open

Figure 3: Back of Phone

Figure 4: Back of Phone 15mm from Phantom

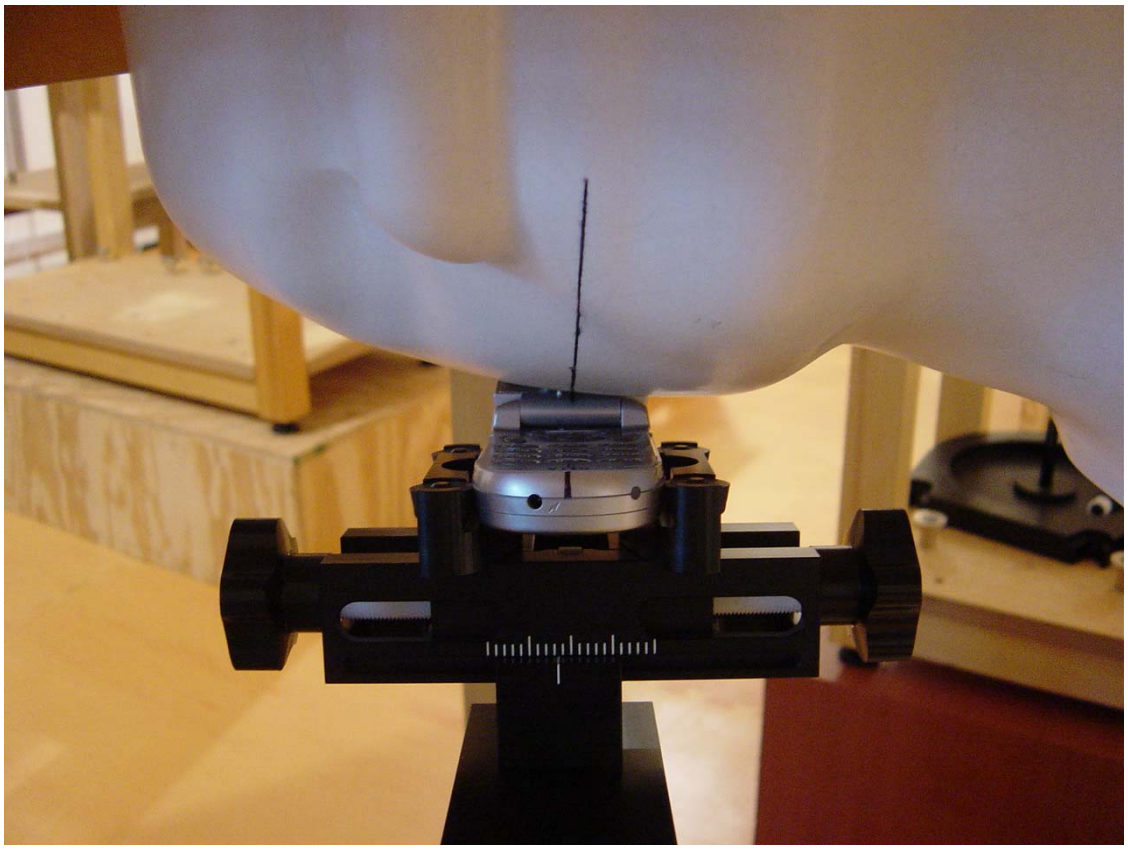


Figure 5: Phone Against the Head Phantom (Front View – Cheek Touch)

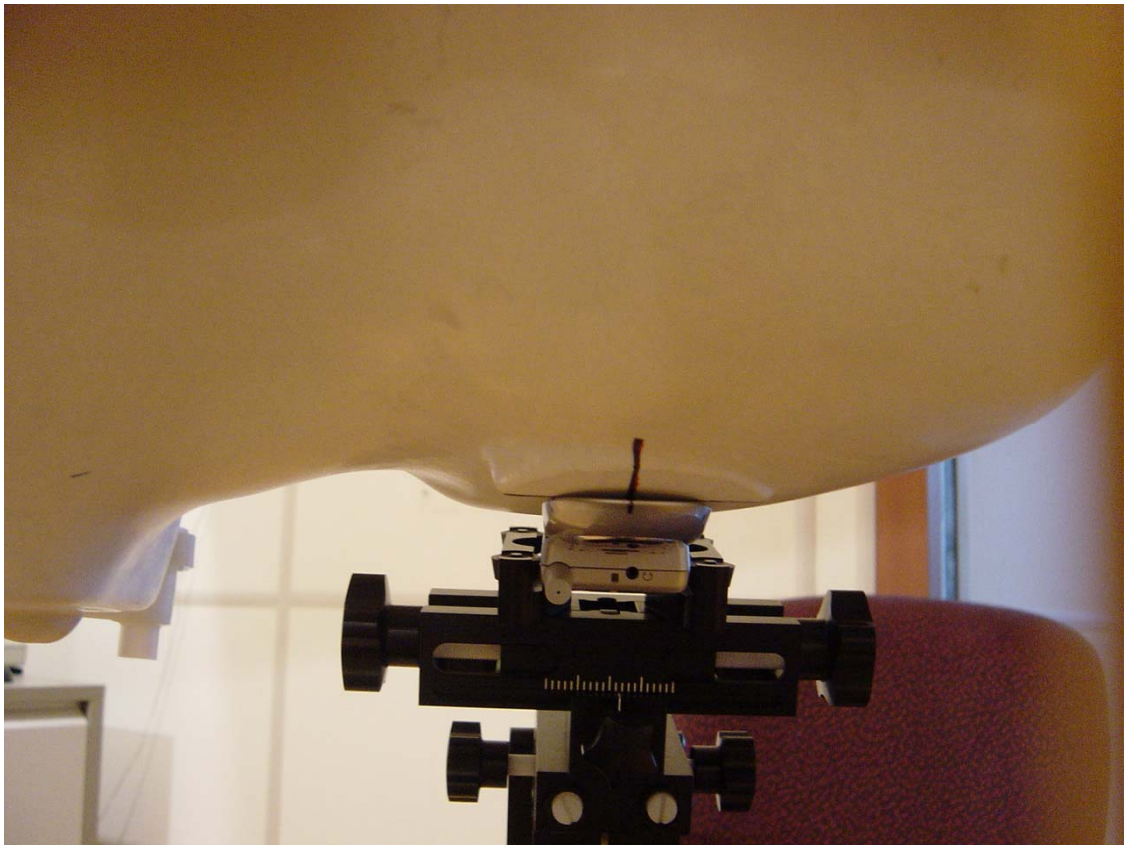


Figure 6: Phone Against the Head Phantom (Back View – Cheek Touch)

Figure 7: Phone Against the Head Phantom (Front View – Tilt)

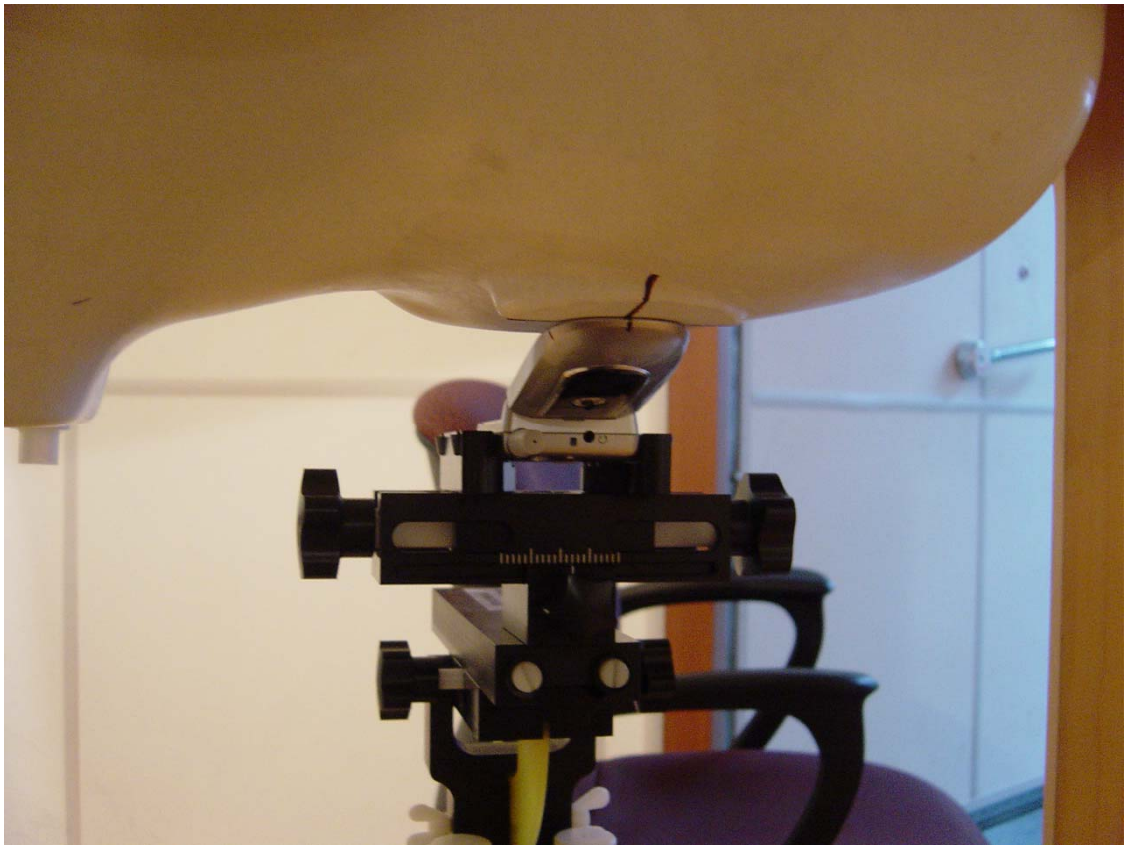


Figure 8: Phone Against the Head Phantom (Back View – Tilt)