MOTOROLA

Exhibit 11: Class II Permissive Change Test Report IHDT56DW1

Date of test:	06 Feb, 2004 –10 Feb, 2004
Date of Report:	11- Feb-2004
Laboratory:	Motorola Personal Communications Sector Product Safety & Compliance Laboratory 600 N. US Highway 45 Room: MW113 Libertyville, Illinois 60048
Test Responsible:	Albert Patapack Senior Staff Engineer
Accreditation:	This laboratory is accredited to ISO/IEC 17025-1999 to perform the following tests:

ACCREDITED

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 IHDT56DW1 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)

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

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 IHDT56DW1). 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

a. Antenna description

Type	External	
Location	Upper right Corner	
Dimensions	Length	15mm
	Width	10mm
Configuration	Helix	

b. Device description

FCC ID Number	**IHDT56DW1**					
Serial number	L72A630007					
Mode(s) of Operation	GSM 850	GSM 1800	GSM 1900	EDGE 850	EDGE 1800	EDGE 1900
Modulation Mode(s)	GSM	GSM	GSM	GSM	GSM	GSM
Maximum Output Power Setting	31.00 dBm	29.50dBm	29.50dBm	27.50dBm	26.50dBm	26.50dBm
Duty Cycle	1:8	1:8	1:8	1:8	1:8	1:8
Transmitting Frequency Rang(s)	824.2-848.8 MHz	1710.2-1784.8 MHz	1850.2-1909.8 MHz	824.2-848.8 MHz	1710.2-1784.8 MHz	1850.2- 1909.8 MHz
Production Unit or Identical Prototype (47 CFR §2..908)	Identical Prototype					
Device Category	Portable					
RF Exposure Limits	General Population / Uncontrolled					

3. Test Equipment Used

3.1 Dosimetric System

The Motorola Personal Communications Sector Product Safety & Compliance Laboratory utilizes a Dosimetric Assessment System (Dasy3™ v3.1d) manufactured by Schmid & Partner Engineering AG (SPEAG™), of Zurich Switzerland. All the SAR measurements are taken within a shielded enclosure. The overall RSS uncertainty of the measurement system is ±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	SN378	30-May-04
E-Field Probe ET3DV6	SN1514	31-July-04
Dipole Validation Kit, D900V2	096	24-Jun-04
S.A.M. Phantom used for 900MHz	TP-1131	
Dipole Validation Kit, D1800V2	SN272TR	24-Jun-04
S.A.M. Phantom used for 1800MHz	TP-1250	

3.2 Additional Equipment

Description	Serial Number	Cal Due Date
Signal Generator HP8648C	3847A04822	06-Feb-05
Power Meter E4419B	GB39511088	18-Mar-04
Power Sensor #1 - E9301A	US39210915	05-Aug-04
Power Sensor #2 - E9301A	US39211009	05-Aug-04
Network Analyzer HP8753ES	US39171846	03-June-04
Dielectric Probe Kit HP85070B	US99360074	N/A

4. Electrical parameters of the tissue simulating liquid

Prior to conducting SAR measurements, the relative permittivity, ε_r, and the conductivity, σ, of the tissue simulating liquids were measured with the HP85070 Dielectric Probe Kit These values, along with the temperature of the tissue simulate are shown in the table below. The recommended limits for maximum permittivity and minimum conductivity are also shown. These come from the Federal Communication Commission, OET Bulletin 65 Supplement C 01-01. It is seen that the measured parameters are satisfactory for compliance testing.

f **(MHz)**	**Tissue type**	**Limits / Measured**	**Dielectric Parameters**		
			ε_r	**σ (S/m)**	**Temp (°C)**
835	**Head**	**Measured,** 07-Feb-04	42.1	0.91	19.3
		Recommended Limits	41.5 ±5%	0.90 ±5%	18-25
1880	**Head**	**Measured,** 06-Feb-04	39.2	1.45	19.0
		Measured, 08-Feb-04	39.7	1.43	19.1
		Measured, 10-Feb-04	39.0	1.44	18.8
		Recommended Limits	40.0 ±5%	1.40 ±5%	18-25

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

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

5. System Accuracy Verification

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

A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR indicated on the dipole certification sheet. These tests were done at 900MHz and 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 ε_r	Dielectric Parameters σ (S/m)	Ambient Temp (°C)	Tissue Temp (°C)
900	**Measured,** 07-Feb-04	11.29	41.0	0.97	20.0	19.9
	Recommended Limits	11.6	41.5 ±5%	0.97 ±5%	18-25	18-25
1800	**Measured,** 06-Feb-04	39.85	39.6	1.36	20.0	18.9
	Measured, 08-Feb-04	38.45	40.1	1.35	20.0	20.0
	Measured, 10-Feb-04	39.45	39.4	1.35	20.0	19.2
	Recommended Limits	39.7	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	SN1514	900	6.3	2 of 11
		1800	5.1	2 of 11

6. Test Results

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

The DASY v3.1d SAR measurement system specified in section 3.1 was utilized within the intended operations as set by the SPEAG™ setup. The phone was positioned into the measurement configurations using the positioner supplied with the DASY 3.1d SAR measurement system. The measured dielectric constant of the material used for the positioner is less than 2.9 and the loss tangent is less than 0.02 (± 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 IHDT56DW1) has the following battery options:

SNN5588A - 750mAH Battery
SNN5582A - 500mAH Battery

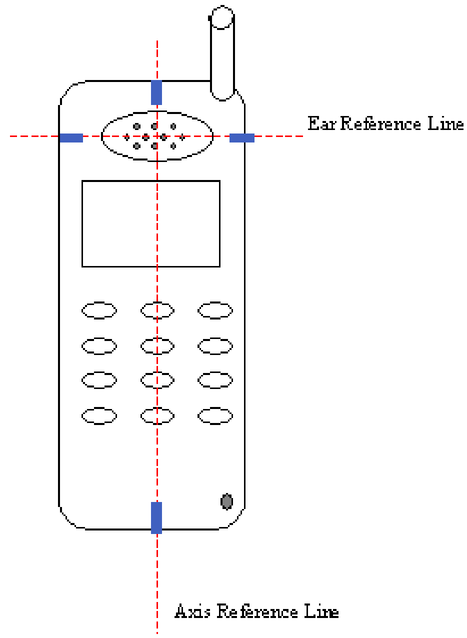
The battery with the highest capacity is the SNN5588A. This battery was used to do most of the SAR testing. The phone was placed in the SAR measurement system with a fully charged battery. The configuration that resulted in the highest SAR values were tested using the other batteries listed above.

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 the figure below, 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, and wrap around the sides of the device.



The SAR results shown in tables 1, 2 and 3 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 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	SN1514	835	6.3	7 of 11
		1900	5.1	7 of 11

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	31.00								
	Channel 189	31.00	**0.641 r40207**	**0.05**	**0.64**	**19.9**	**0.705 r40207**	**-0.07**	**0.72**	**19.9**
	Channel 251	31.00								
Digital 1900MHz	Channel 512	29.50					**0.956 r40208**	**-0.05**	**0.97**	**20.0**
	Channel 661	29.50	**0.739 r40206**	**-0.21**	**0.78**	**18.5**	0.892	-0.03	0.90	19.2
	Channel 810	29.50					0.843	-0.11	0.86	19.2

Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT56DW1 at highest possible output power. Measured against the 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	31.00								
	Channel 189	31.00	**0.157 r40207**	**-0.09**	**0.16**	**19.8**	**0.147 r40207**	**0.11**	**0.15**	**19.9**
	Channel 251	31.00								
Digital 1900MHz	Channel 512	29.50								
	Channel 661	29.50	**0.138 r40206**	**0.16**	**0.14**	**18.9**	**0.121 r40206**	**-0.04**	**0.12**	**18.6**
	Channel 810	29.50								

Table 2: SAR measurement results for the portable cellular telephone FCC ID IHDT56DW1 at highest possible output power. Measured against the head in the 15° Tilt Position.

f (MHz)	Description	Conducted Output Power (dBm)	**Cheek / Touch Position using SNN5582A battery**							
			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	31.00								
	Channel 189	31.00					**0.729 r40207**	**-0.03**	**0.73**	**19.9**
	Channel 251	31.00								
Digital 1900MHz	Channel 512	29.50					**1.01 r40210**	**-0.1**	**1.03**	**19.2**
	Channel 661	29.50					0.952	-0.03	0.96	19.2
	Channel 810	29.50					0.91	-0.03	0.91	19.2

Table 3: SAR measurement results for the portable cellular telephone FCC ID IHDT56DW1 at highest possible output power. Measured against the head in the Cheek/Touch Position using SNN5582A battery.

6.2 Body Worn Test Results

Body Worn testing was performed using the only Body-Worn Accessory available for this phone, the SNN8363A Plastic Holster with Belt Clip. No extrapolated SAR values produced for this test were greater than those from previous testing so no new SAR values are included here. 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. Note that 800MHz digital mode SAR measurements were performed in accordance with OET Bulletin 65 Supplement C 01-01.

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.

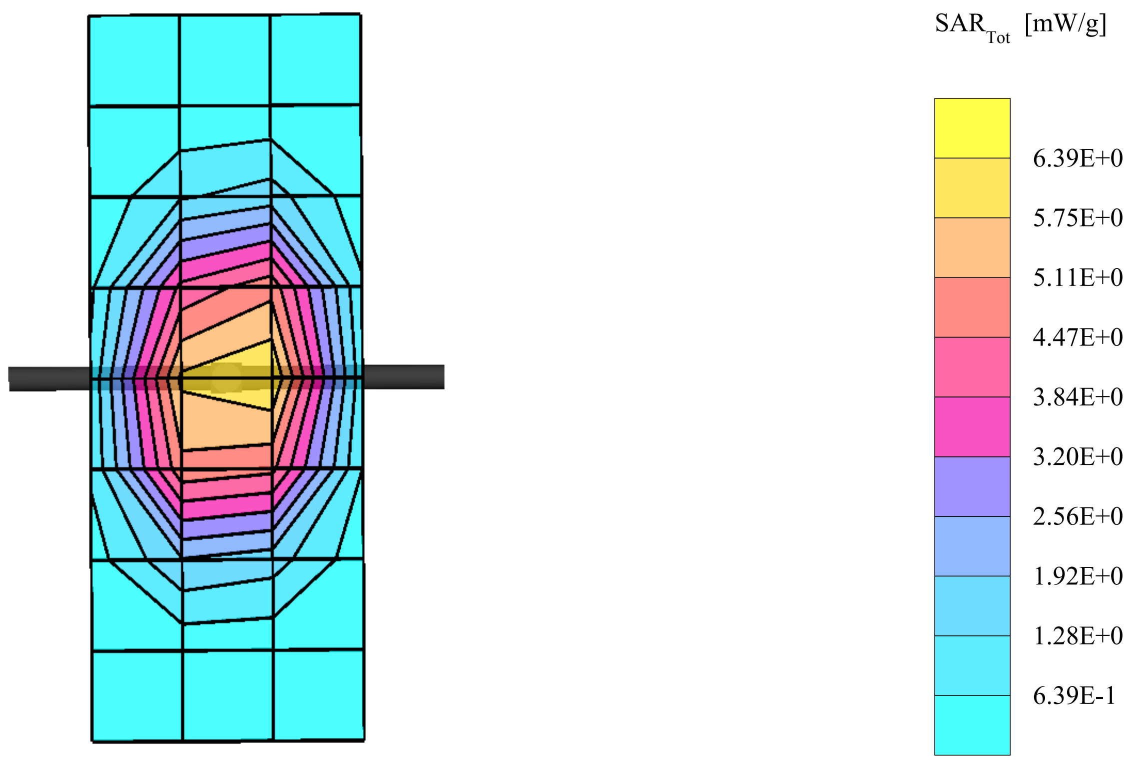
The tissue stimulant depth was verified to be 15.0cm ±0.5cm. The same device holder described in section 6 was used for positioning the phone. The cellular phone was tested with a headset connected to the device for all body-worn SAR measurements.

Appendix 1

SAR distribution comparison for the system accuracy verification

Dipole 1800 MHz

1800 MHz System Performance Check / Dipole Sn# 272tr
PM1 Power = 200mW PM2 Power = 198mW Refl.Pwr PM3= -24.7dB
Room Temp at time of measurement = 20*C Simulant Temp at time of measurement = 18.9*C
R4 - Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (90°,90°); Frequency: 1800 MHz
Probe: ET3DV6 - SN1514 - Validation.3; ConvF(5.10,5.10,5.10); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.36 mho/m ε_r = 39.6 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 7.97 mW/g ± 0.03 dB, SAR (10g): 4.17 mW/g ± 0.01 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 8.1 (7.7, 9.0) [mm]
Powerdrift: -0.07 dB



Dipole 1800 MHz

1800 MHz System Performance Check / Dipole Sn# 272tr
PM1 Power = 200mW PM2 Power = 198mW Refl.Pwr PM3= -24.7dB
Room Temp at time of measurement = 20*C Simulant Temp at time of measurement = 18.9*C
R4 - Amy Twin Phantom Rev.4 (22Aug02) Phantom; Section; Position: ; Frequency: 1800 MHz
Probe: ET3DV6 - SN1514 - Validation.3; ConvF(5.10,5.10,5.10); Crest factor: 1.0; 1800 MHz VALIDATION: $\sigma = 1.36$ mho/m $\varepsilon_r = 39.6$ $\rho = 1.00$ g/cm^3
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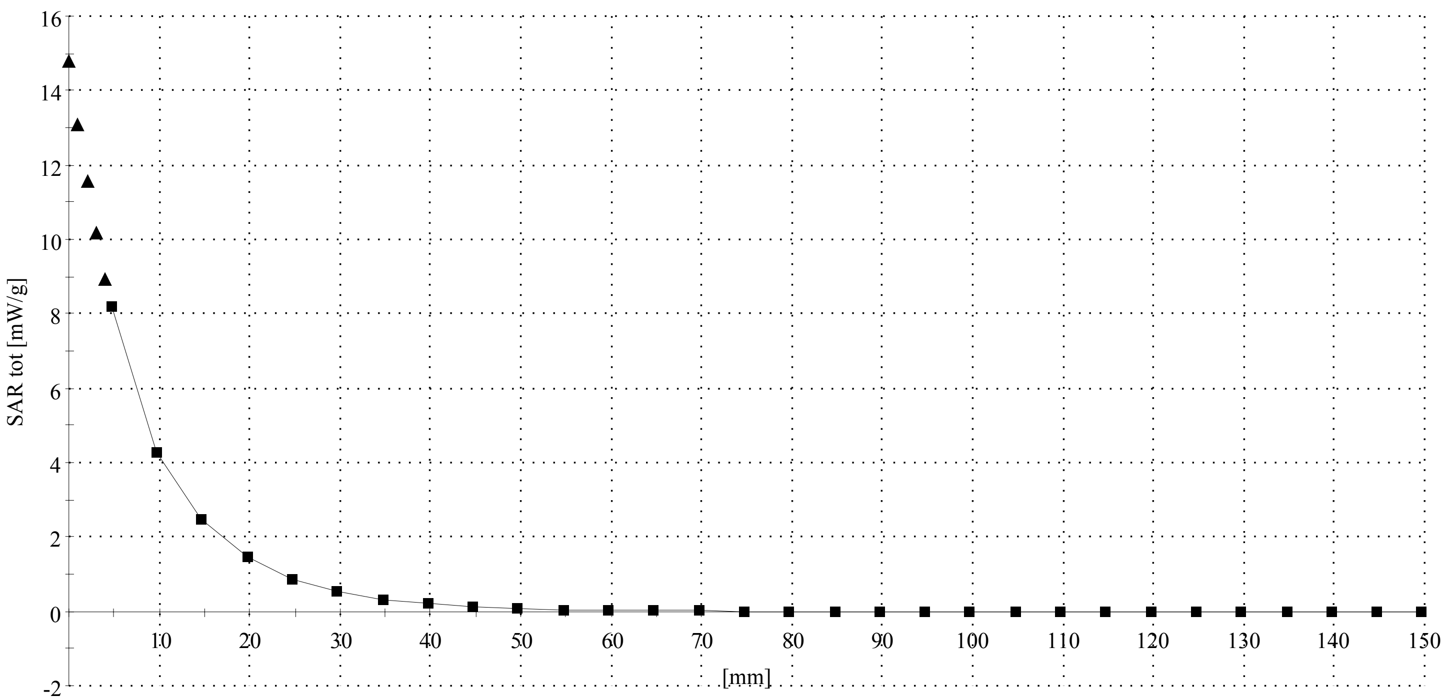
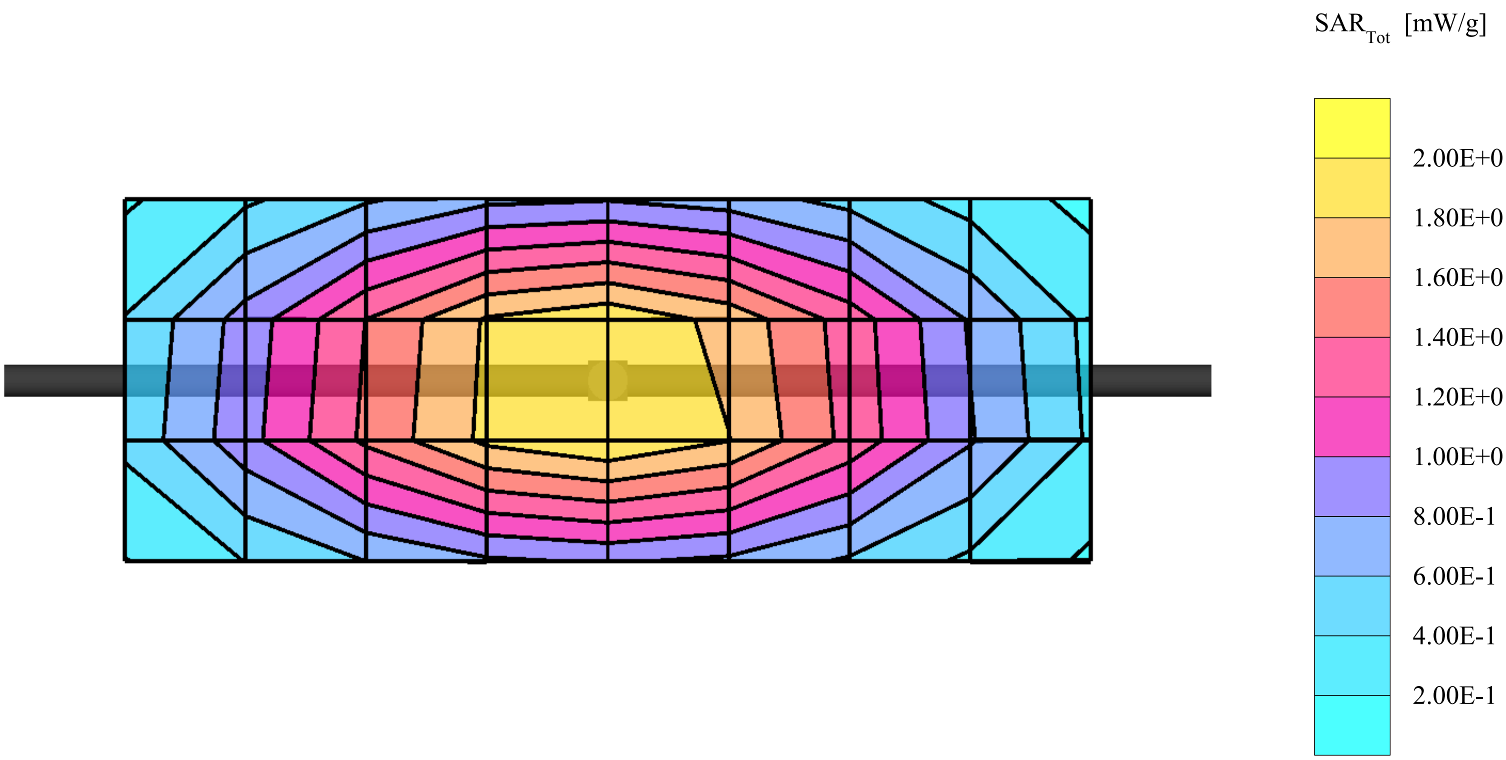
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 8.1 (7.7, 9.0) [mm]



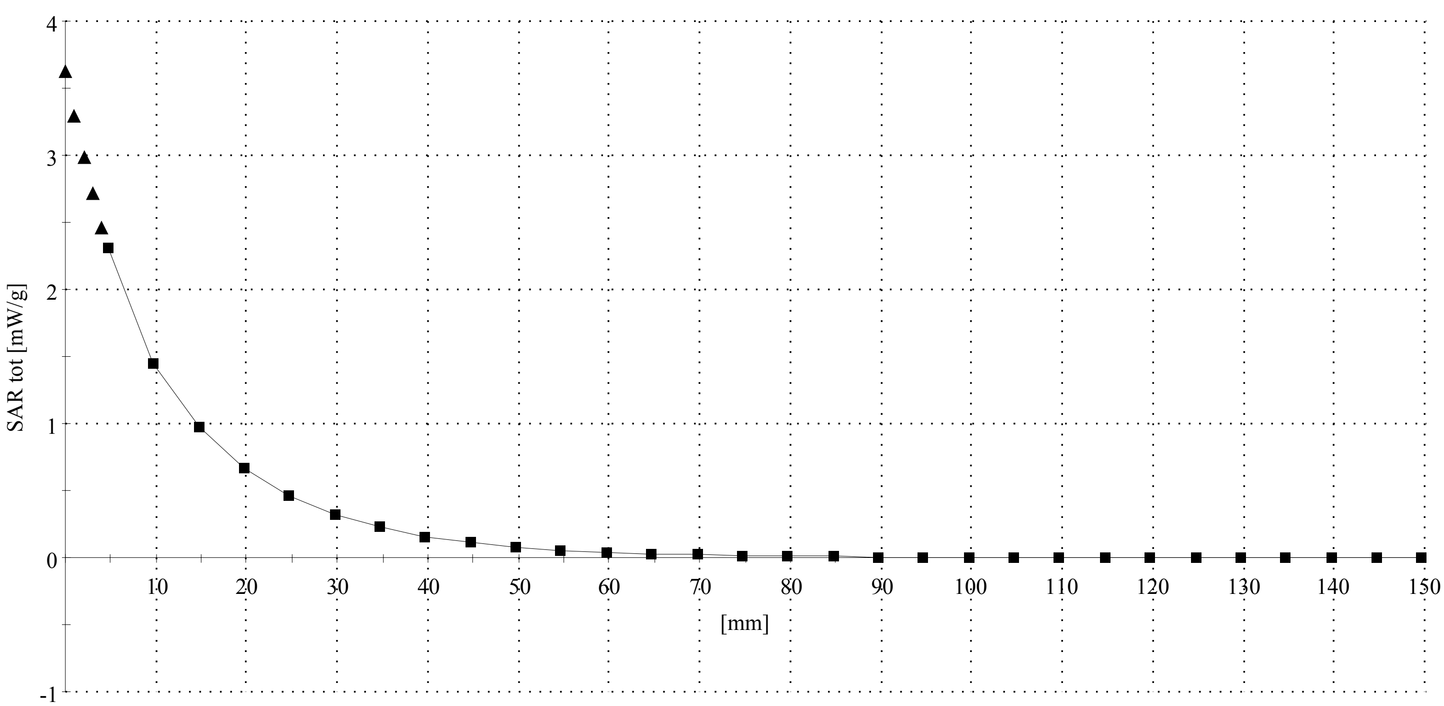
Dipole 900 MHz

900 MHz System Performance Check / Dipole Sn# 096
PM1 Power = 201mW PM2 Power = 202mW Refl.Pwr PM3= -20.1dB
Room Temp at time of measurement = 20*C Simulant Temp at time of measurement = 19.9*C
R4 TP-1131 SUGAR sam expanded (Rev. 2)-9Jan03 Phantom; Flat Section; Position: (90°,90°); Frequency: 900 MHz
Probe: ET3DV6 - SN1514 - Validation.3; ConvF(6.30,6.30,6.30); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.97 mho/m ε_r = 41.0 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 2.27 mW/g ± 0.06 dB, SAR (10g): 1.43 mW/g ± 0.06 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 11.4 (10.6, 12.6) [mm]
Powerdrift: 0.07 dB



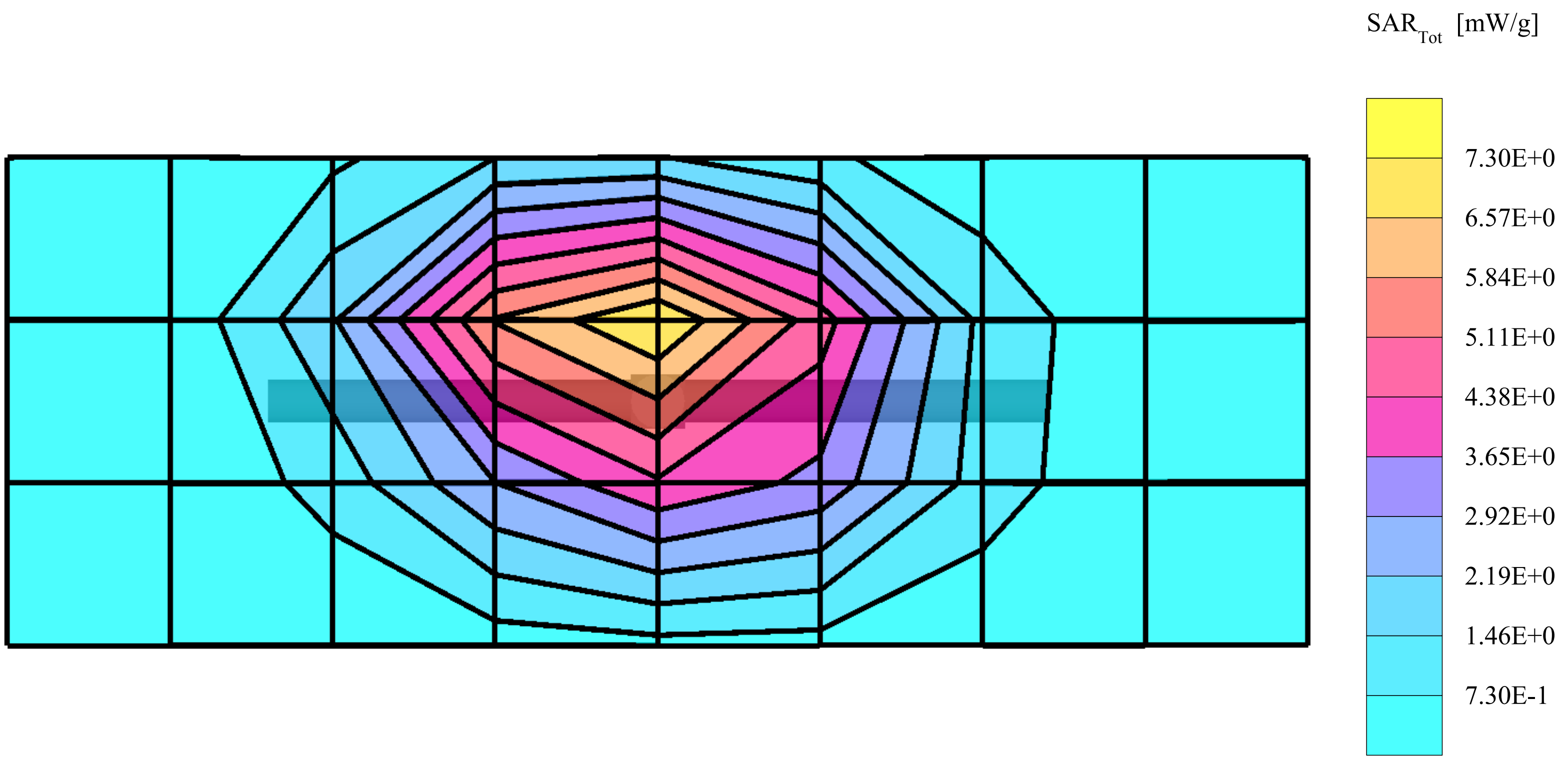
Dipole 900 MHz

900 MHz System Performance Check / Dipole Sn# 096
PM1 Power = 201mW PM2 Power = 202mW Refl.Pwr PM3= -20.1dB
Room Temp at time of measurement = 20*C Simulant Temp at time of measurement = 19.9*C
R4 TP-1131 SUGAR sam expanded (Rev. 2)-9Jan03 Phantom; Section; Position: ; Frequency: 900 MHz
Probe: ET3DV6 - SN1514 - Validation.3; ConvF(6.30,6.30,6.30); Crest factor: 1.0; 900 MHz VALIDATION: $\sigma = 0.97$ mho/m $\varepsilon_r = 41.0$ $\rho = 1.00$ g/cm^3
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 11.4 (10.6, 12.6) [mm]



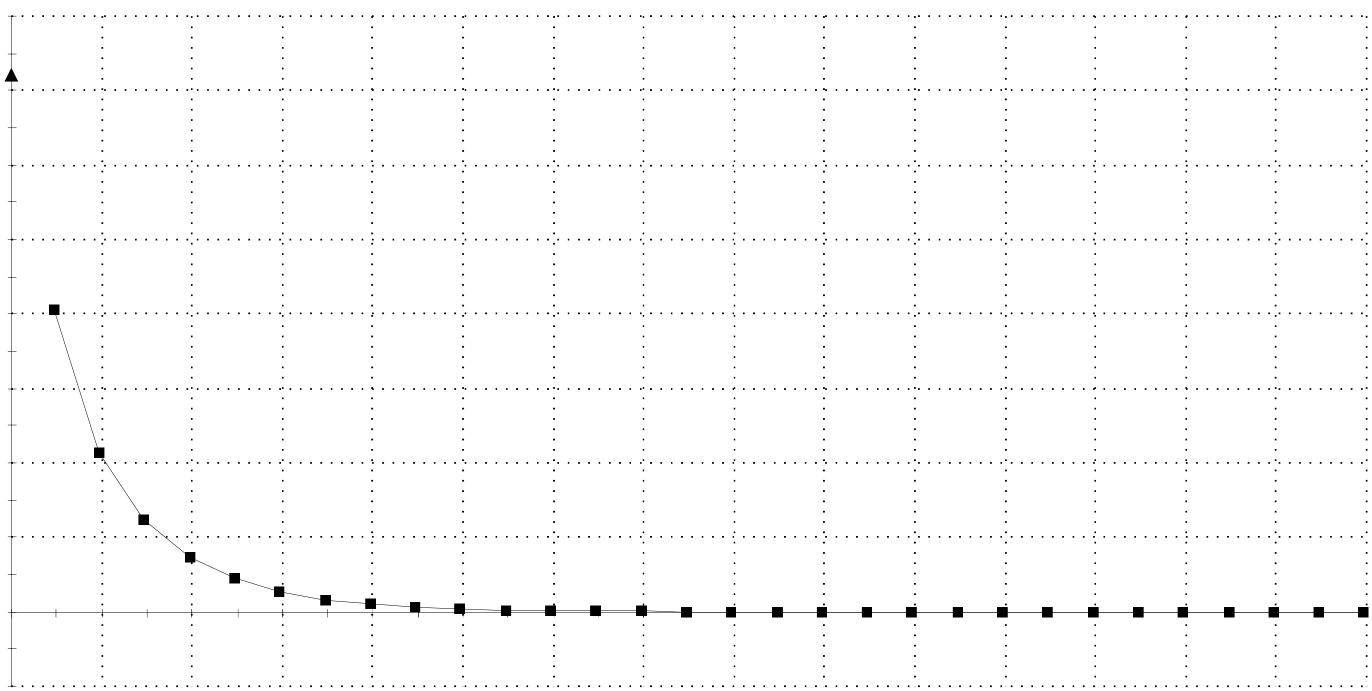
Dipole 1800 MHz

1800 MHz System Performance Check / Dipole Sn# 272tr
PM1 Power = 200mW PM2 Power = 199mW Refl.Pwr PM3= -25.6dB
Room Temp at time of measurement = 20*C Simulant Temp at time of measurement = 20.0*C
R4 TP-1250 GLYCOL sam expanded (Rev. 2)-9Jan03 Phantom; Flat Section; Position: (90°,90°); Frequency: 1800 MHz
Probe: ET3DV6 - SN1514 - Validation.3; ConvF(5.10,5.10,5.10); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.35 mho/m ε_r = 40.1 ρ = 1.00 g/cm^3
Cubes (2): SAR (1g): 7.69 mW/g ± 0.05 dB, SAR (10g): 4.07 mW/g ± 0.02 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 8.6 (8.2, 9.4) [mm]
Powerdrift: -0.04 dB



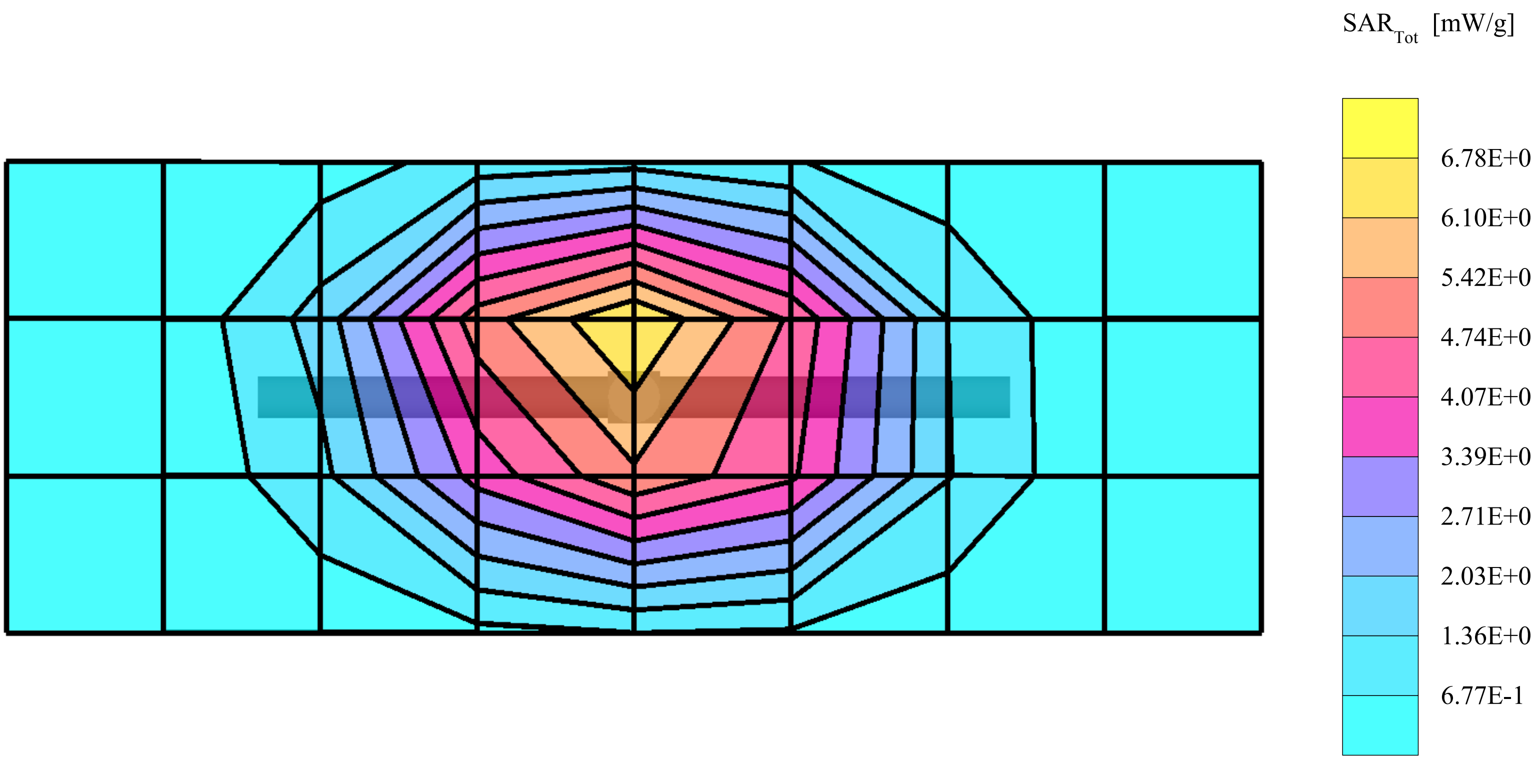
Dipole 1800 MHz

1800 MHz System Performance Check / Dipole Sn# 272tr
PM1 Power = 200mW PM2 Power = 199mW Refl.Pwr PM3= -25.6dB
Room Temp at time of measurement = 20*C Simulant Temp at time of measurement = 20.0*C
R4 TP-1250 GLYCOL sam expanded (Rev. 2)-9Jan03 Phantom; Section; Position: ; Frequency: 1800 MHz
Probe: ET3DV6 - SN1514 - Validation.3; ConvF(5.10,5.10,5.10); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.35 mho/m ε_r = 40.1 ρ = 1.00 g/cm³
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 8.3 (7.9, 9.2) [mm]



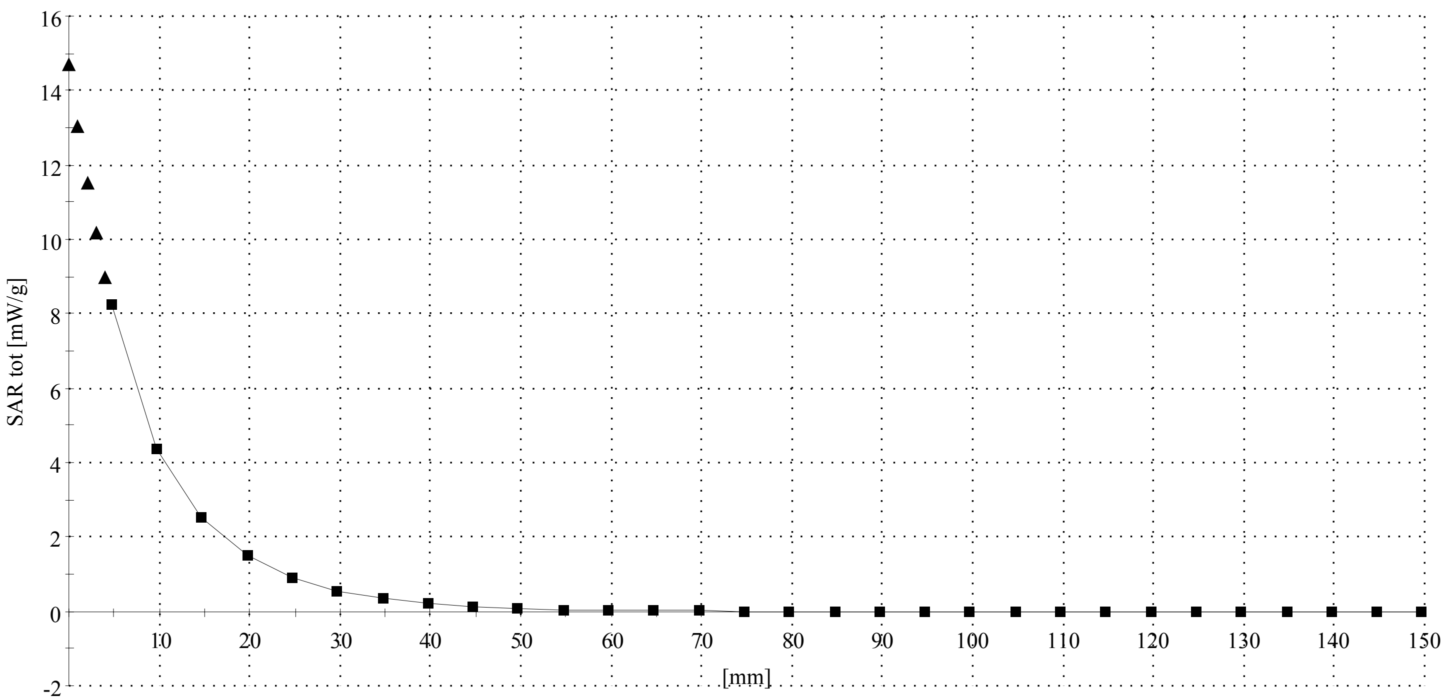
Dipole 1800 MHz

1800 MHz System Performance Check / Dipole Sn# 272tr
PM1 Power = 200mW PM2 Power =198mW Refl.Pwr PM3= -26.70dB
Room Temp at time of measurement = 20c Simulant Temp at time of measurement = 19.2c
R4 TP-1250 GLYCOL sam expanded (Rev. 2)-9Jan03 Phantom; Flat Section; Position: (90°,90°); Frequency: 1800 MHz
Probe: ET3DV6 - SN1514 - Validation.3; ConvF(5.10,5.10,5.10); Crest factor: 1.0; 1800 MHz VALIDATION: $\sigma = 1.35$ mho/m $\varepsilon_r = 39.4$ $\rho = 1.00$ g/cm^3
Cubes (2): SAR (1g): 7.89 mW/g ± 0.03 dB, SAR (10g): 4.16 mW/g ± 0.02 dB, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 8.5 (8.1, 9.4) [mm]
Powerdrift: 0.01 dB



Dipole 1800 MHz

1800 MHz System Performance Check / Dipole Sn# 272tr
PM1 Power = 200mW PM2 Power =198mW Refl.Pwr PM3= -26.70dB
Room Temp at time of measurement = 20c Simulant Temp at time of measurement = 19.2c
R4 TP-1250 GLYCOL sam expanded (Rev. 2)-9Jan03 Phantom; Section; Position: ; Frequency: 1800 MHz
Probe: ET3DV6 - SN1514 - Validation.3; ConvF(5.10,5.10,5.10); Crest factor: 1.0; 1800 MHz VALIDATION: $\sigma = 1.35$ mho/m $\varepsilon_r = 39.4$ $\rho = 1.00$ g/cm^3
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 8.3 (7.9, 9.2) [mm]



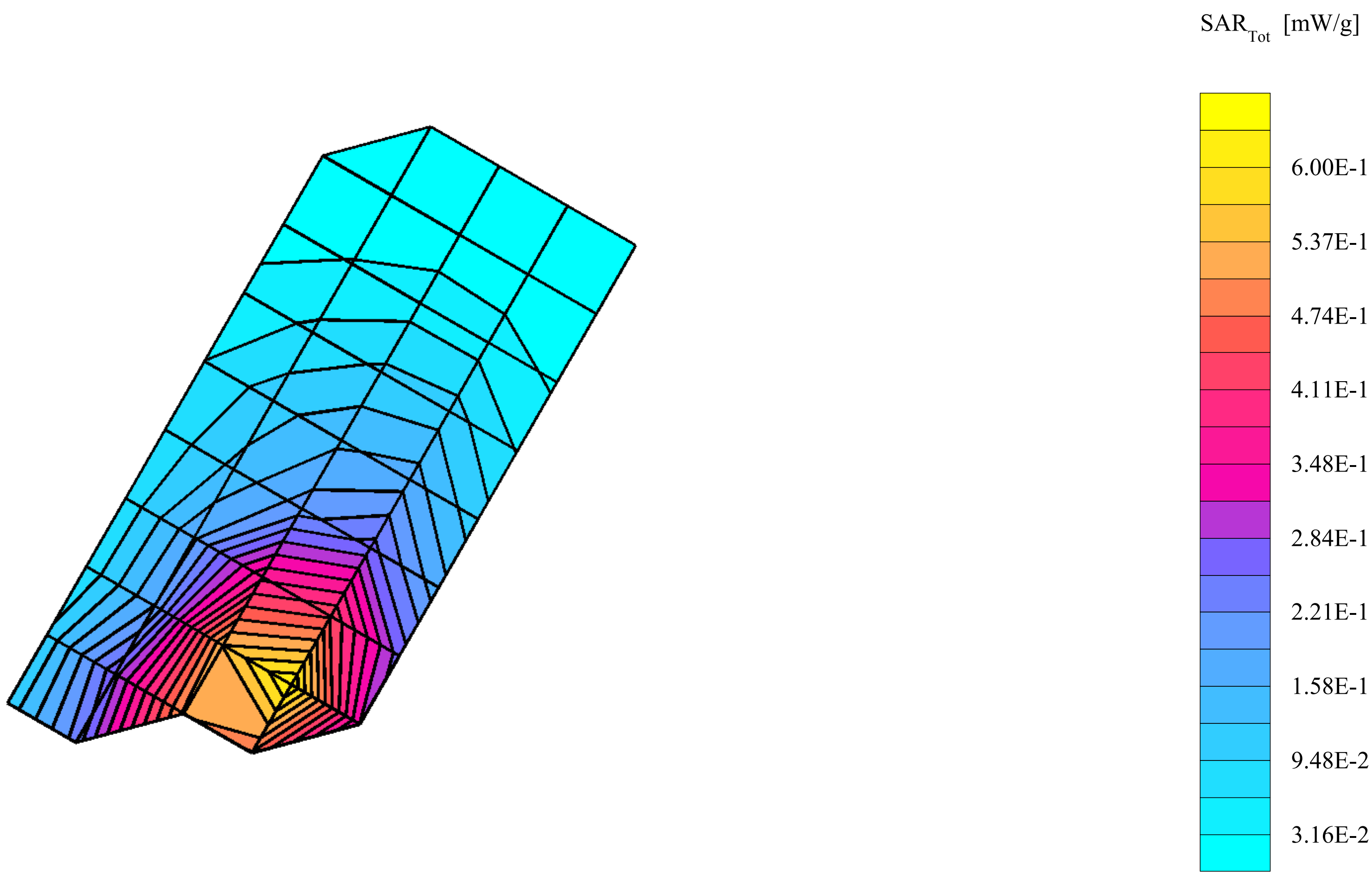
Appendix 2

SAR distribution plots for Phantom Head Adjacent Use

02/07/04

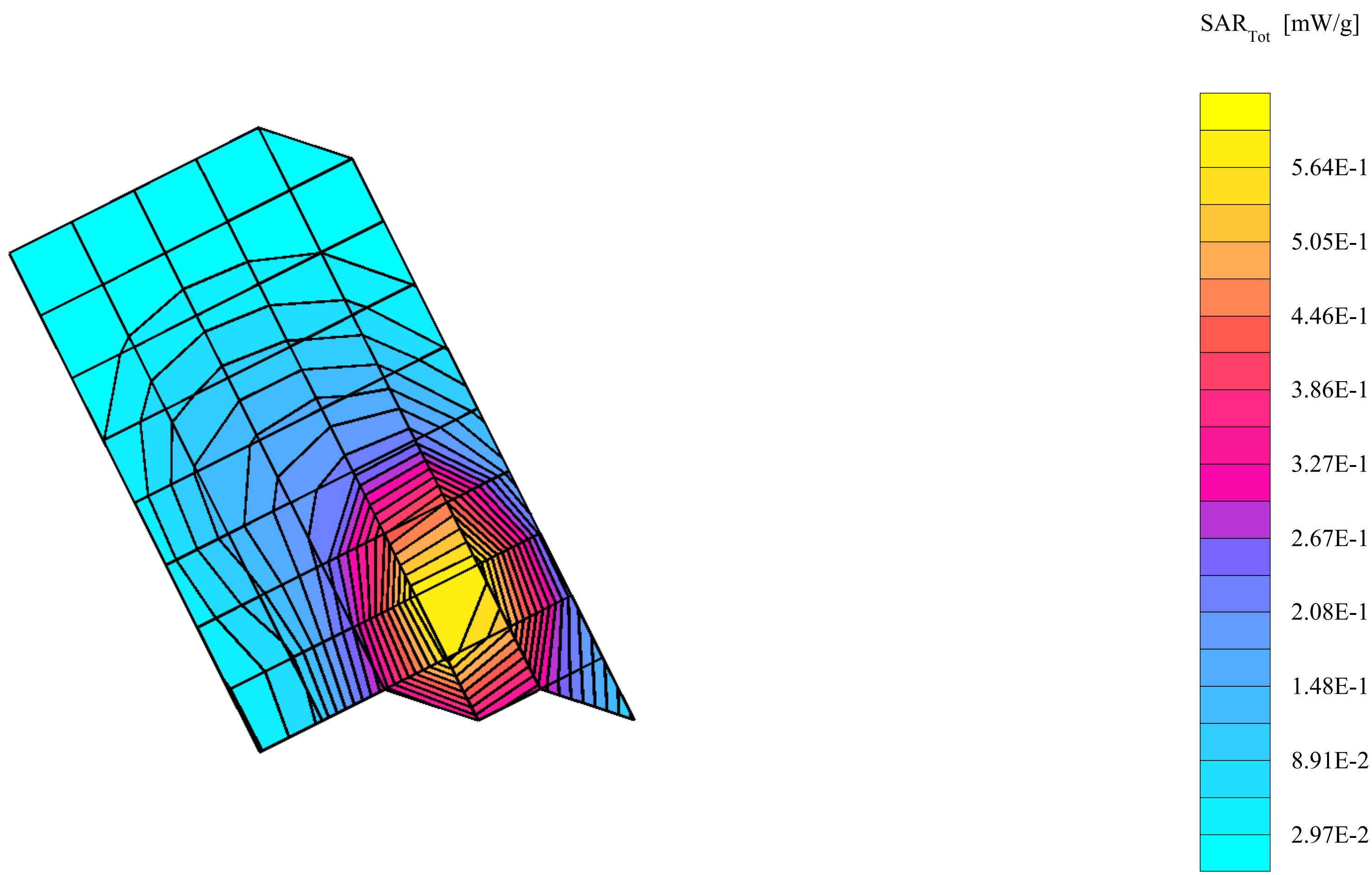
s/n: L72A630009

Ch# 189 Pwr Step: 7 (OTA)
Antenna Position: FIXED
Type of Modulation: 850 GSM
Battery Model #: SNN5588A
DEVICE POSITION: CHEEK
Accessory Model #: none
R4 TP-1131 SUGAR sam expanded (Rev. 2)-9Jan03 Phantom; Left Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1514 - IEEE Head.2; ConvF(6.30,6.30,6.30); Crest factor: 8.0; 835 MHz Head & Body: σ = 0.91 mho/m ε_r = 42.1 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.641 mW/g, SAR (10g): 0.421 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 14.4 (12.5, 16.8) [mm]
Powerdrift: 0.05 dB



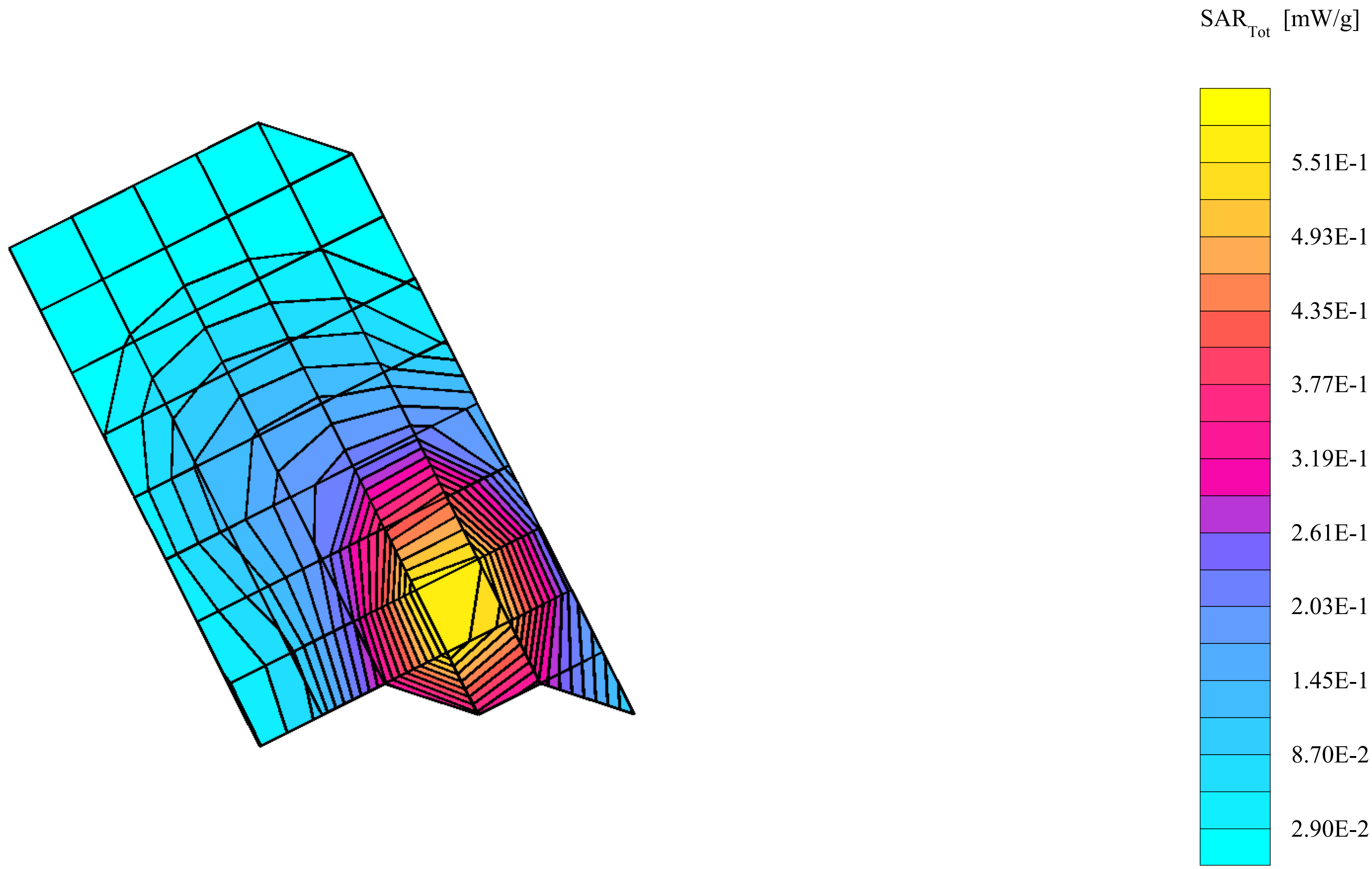
s/n L72A630009

Ch# 189 Pwr Step: 7 (OTA)
Antenna Position: FIXED
Type of Modulation: 850 GSM
Battery Model #: SNN5582B
DEVICE POSITION: CHEEK
Accessory Model #: none
R4 TP-1131 SUGAR sam expanded (Rev. 2)-9Jan03 Phantom; Right Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1514 - IEEE Head.2; ConvF(6.30,6.30,6.30); Crest factor: 8.0; 835 MHz Head & Body: σ = 0.90 mho/m ε_r = 41.8 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.729 mW/g, SAR (10g): 0.464 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 13.5 (11.7, 15.8) [mm]
Powerdrift: -0.03 dB



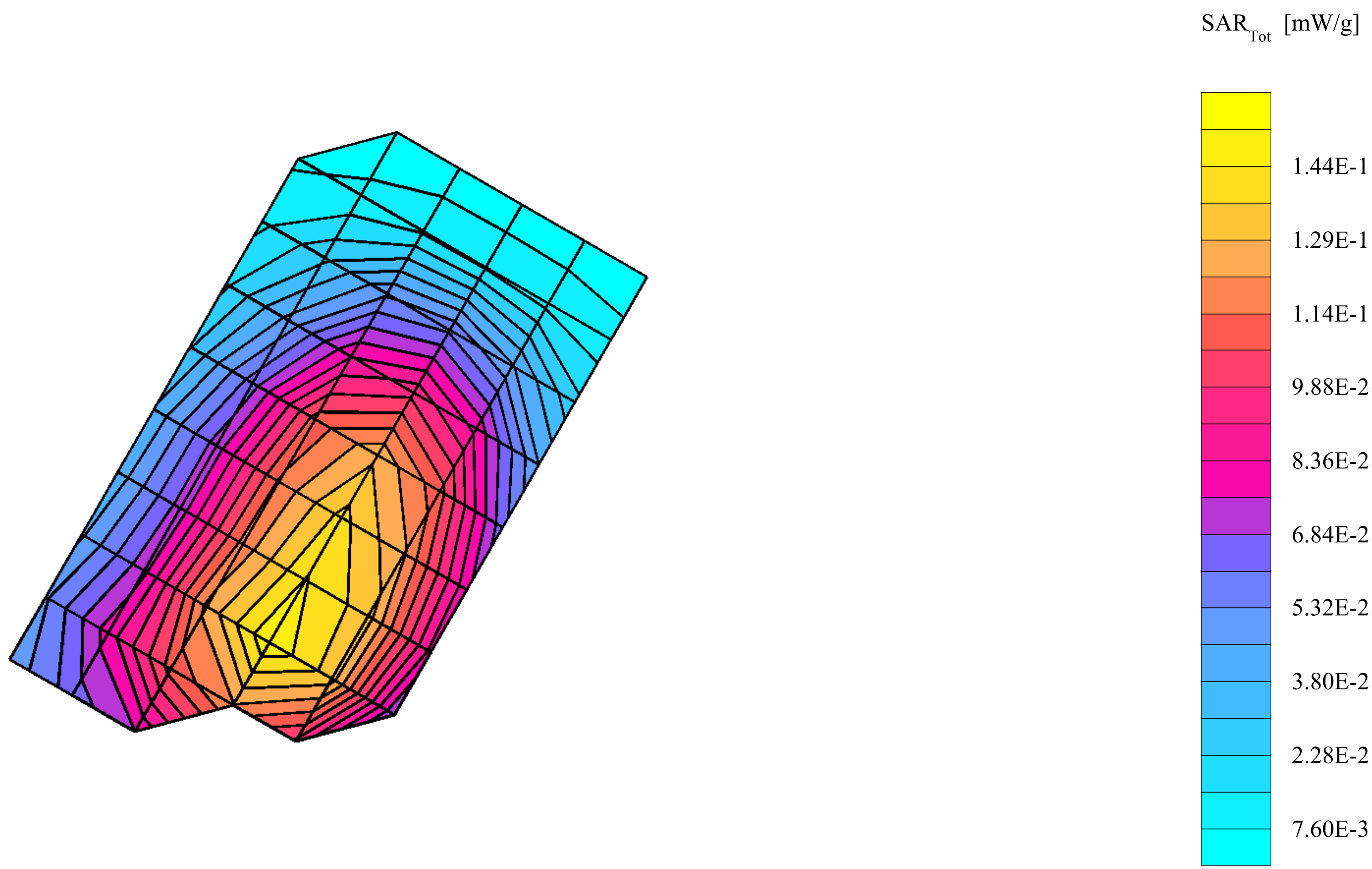
s/n: L72A630009

Ch# 189 Pwr Step: 7 (OTA)
Antenna Position: FIXED
Type of Modulation: 850 GSM
Battery Model #: SNN5588A
DEVICE POSITION: CHEEK
Accessory Model #: none
R4 TP-1131 SUGAR sam expanded (Rev. 2)-9Jan03 Phantom; Right Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1514 - IEEE Head.2; ConvF(6.30,6.30,6.30); Crest factor: 8.0; 835 MHz Head & Body: σ = 0.90 mho/m ε_r = 41.8 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.705 mW/g, SAR (10g): 0.451 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 13.6 (11.5, 16.3) [mm]
Powerdrift: -0.07 dB



s/n: L72A630009

Ch# 189 Pwr Step: 7 (OTA) Antenna Position: FIXED
Type of Modulation: 850 GSM Battery Model #: SNN5588A
DEVICE POSITION: TILT
Accessory Model #: none
R4 TP-1131 SUGAR sam expanded (Rev. 2)-9Jan03 Phantom; Left Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1514 - IEEE Head.2; ConvF(6.30,6.30,6.30); Crest factor: 8.0; 835 MHz Head & Body: σ = 0.91 mho/m ε_r = 42.1 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.157 mW/g, SAR (10g): 0.115 mW/g * Max outside, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 18.0 (14.9, 21.7) [mm]
Powerdrift: -0.09 dB

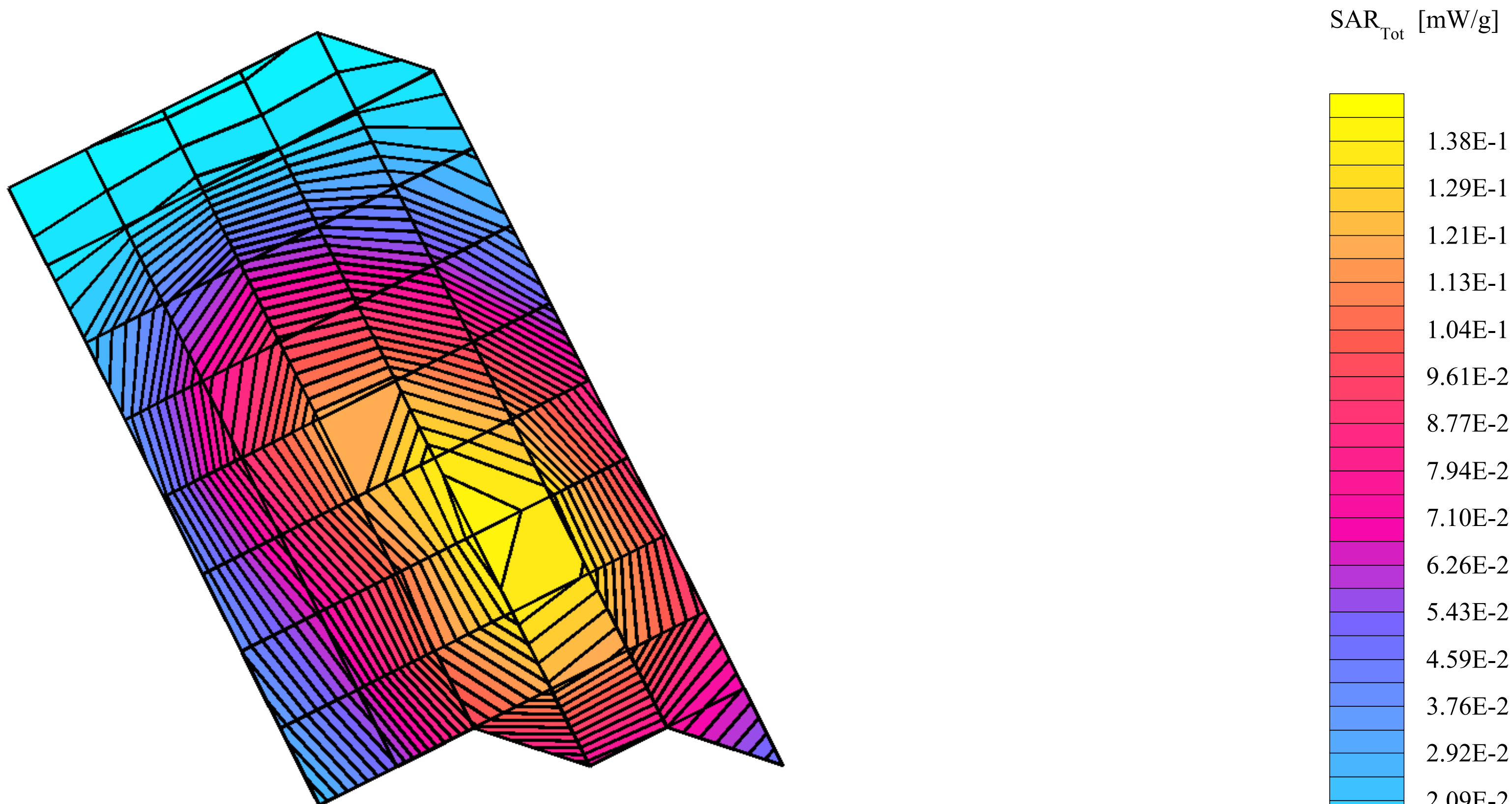


s/n: L72A630009

Ch# 189 Pwr Step: 7 (OTA)
Type of Modulation: 850 GSM
DEVICE POSITION: TILT
Accessory Model #: none

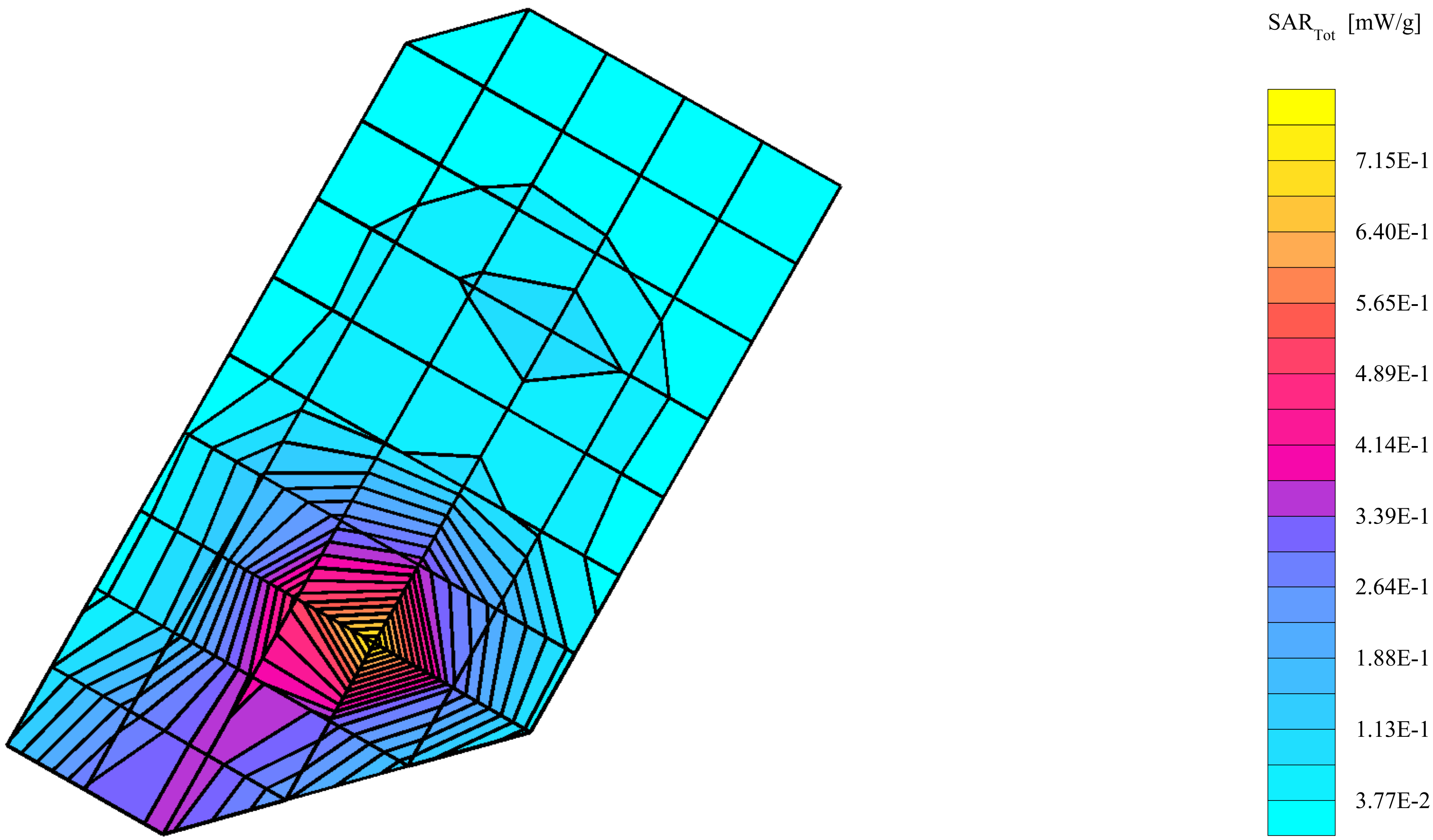
Antenna Position: FIXED
Battery Model #: SNN5588A

R4 TP-1131 SUGAR sam expanded (Rev. 2)-9Jan03 Phantom; Right Hand Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1514 - IEEE Head.2; ConvF(6.30,6.30,6.30); Crest factor: 8.0; 835 MHz Head & Body: σ = 0.90 mho/m ε_r = 41.8 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.147 mW/g, SAR (10g): 0.111 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 19.3 (17.1, 21.5) [mm]
Powerdrift: 0.11 dB



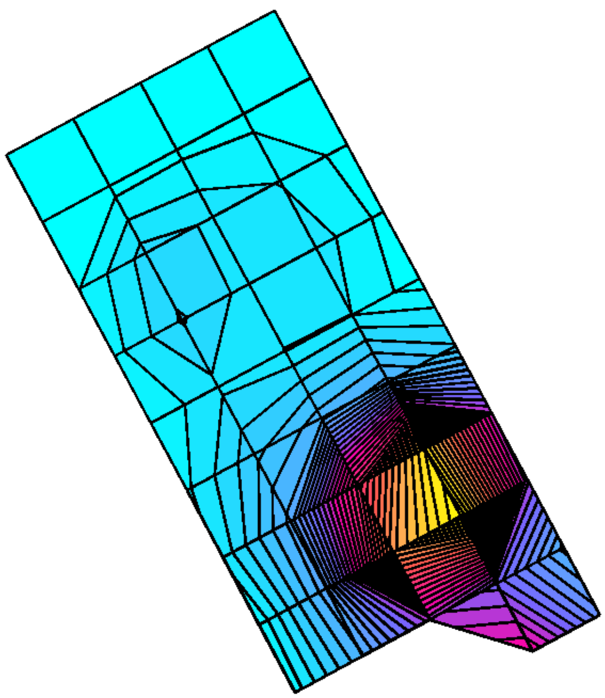
s/n: L72A630009

Ch# 661 / Pwr Step: 0 OTA
Antenna Position: FIXED
Type of Modulation: 1900 GSM
Battery Model #: SNN5588A
DEVICE POSITION (cheek or rotated): CHEEK
Accessory Model #: NONE
R4 TP-1250 GLYCOL sam expanded (Rev. 2)-9Jan03 Phantom; Left Hand Section; Position: (90°,180°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1514 - IEEE Head.2; ConvF(5.10,5.10,5.10); Crest factor: 8.0; 1880 MHz Head & Body: σ = 1.45 mho/m ε_r = 39.2 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.739 mW/g, SAR (10g): 0.384 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 8.8 (8.6, 9.4) [mm]
Powerdrift: -0.21 dB



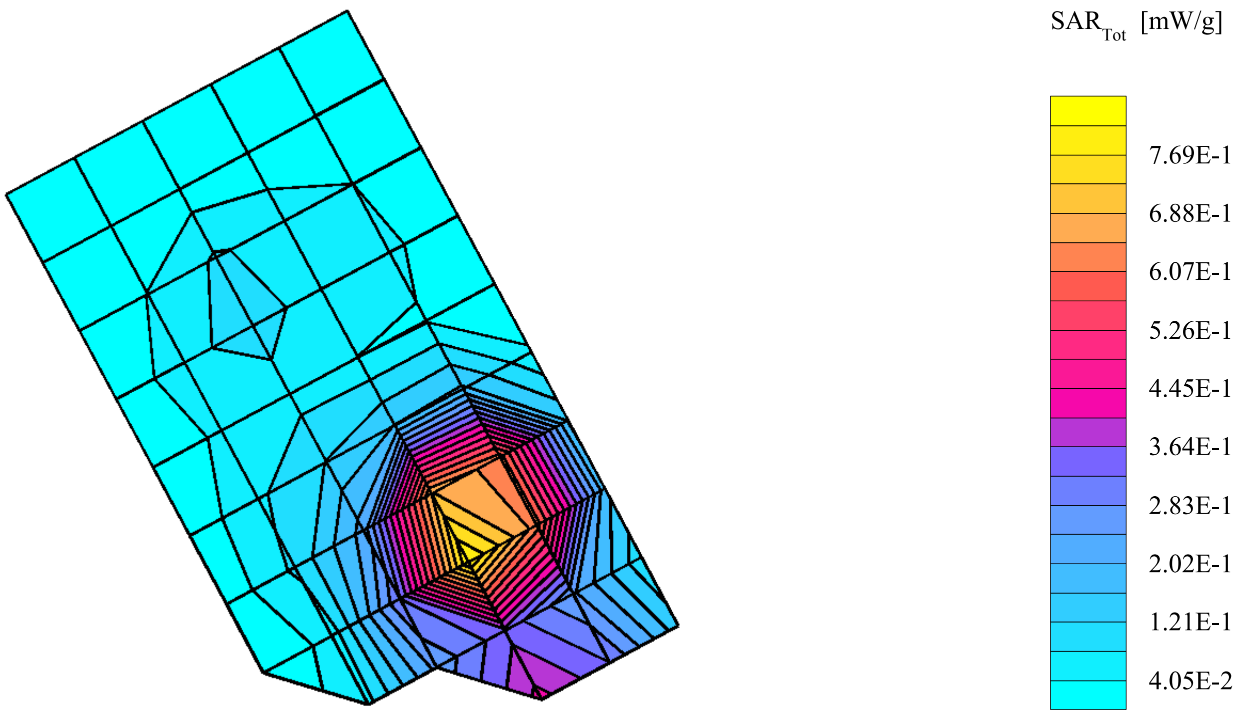
s/n: L72A630007

Ch# 512 Pwr Step: 0 (OTA)
Antenna Position: FIXED
Type of Modulation: 1900 GSM
Battery Model #: SNN5582B
DEVICE POSITION: CHEEK
Accessory Model #: none
R4 TP-1250 GLYCOL sam expanded (Rev. 2)-9Jan03 Phantom; Right Hand Section; Position: (90°,180°); Frequency: 1850 MHz
Probe: ET3DV6 - SN1514 - IEEE Head.2; ConvF(5.10,5.10,5.10); Crest factor: 8.0; 1880 MHz Head & Body: σ = 1.44 mho/m ε_r = 39.0 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 1.01 mW/g, SAR (10g): 0.518 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 8.9 (8.4, 9.8) [mm]
Powerdrift: -0.10 dB



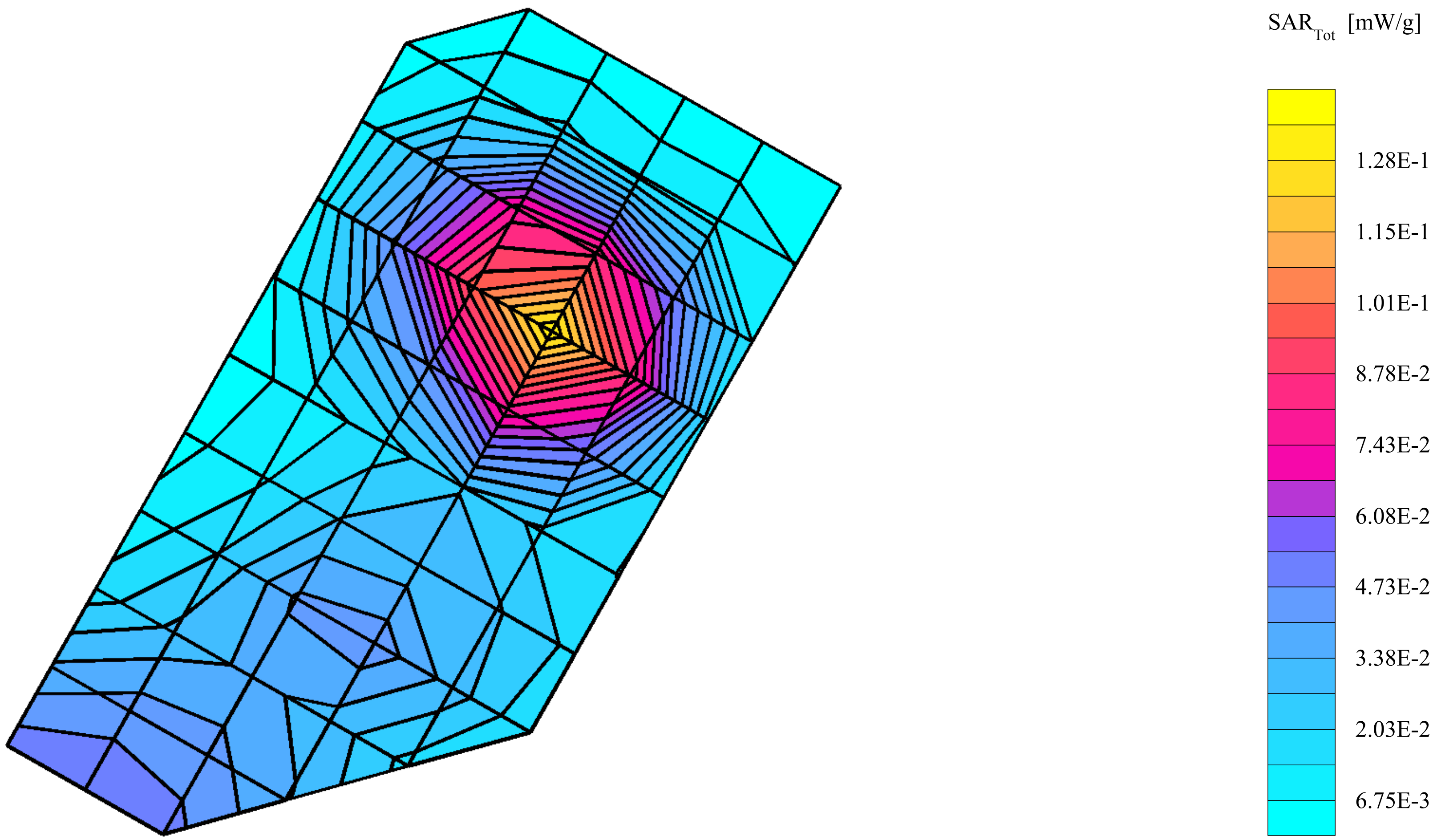
s/n: L72A630007

Ch# 512 Pwr Step: 0 (OTA) Antenna Position: FIXED
Type of Modulation: 1900 GSM Battery Model #: SNN5588A
DEVICE POSITION: CHEEK
Accessory Model #: none
R4 TP-1250 GLYCOL sam expanded (Rev. 2)-9Jan03 Phantom; Right Hand Section; Position: (90°,180°); Frequency: 1850 MHz
Probe: ET3DV6 - SN1514 - IEEE Head.2; ConvF(5.10,5.10,5.10); Crest factor: 8.0; 1880 MHz Head & Body: σ = 1.43 mho/m ε_r = 39.7 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.956 mW/g, SAR (10g): 0.499 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 9.2 (8.8, 9.9) [mm]
Powerdrift: -0.05 dB



s/n: L72A630009

Ch# 661 / Pwr Step: 0 OTA
Antenna Position: FIXED
Type of Modulation: 1900 GSM
Battery Model #: SNN5588A
DEVICE POSITION (cheek or rotated): TILTED
Accessory Model #: NONE
R4 TP-1250 GLYCOL sam expanded (Rev. 2)-9Jan03 Phantom; Left Hand Section; Position: (90°,180°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1514 - IEEE Head.2; ConvF(5.10,5.10,5.10); Crest factor: 8.0; 1880 MHz Head & Body: σ = 1.45 mho/m ε_r = 39.2 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.138 mW/g, SAR (10g): 0.0810 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 11.3 (10.6, 12.2) [mm]
Powerdrift: 0.16 dB



s/n: L72A630009

Ch# 661 / Pwr Step: 0 OTA

Antenna Position: FIXED

Type of Modulation: 1900 GSM

Battery Model #: SNN5588A

DEVICE POSITION (cheek or rotated): TILTED

Accessory Model #: NONE

R4 TP-1250 GLYCOL sam expanded (Rev. 2)-9Jan03 Phantom; Right Hand Section; Position: (90°,180°); Frequency: 1880 MHz

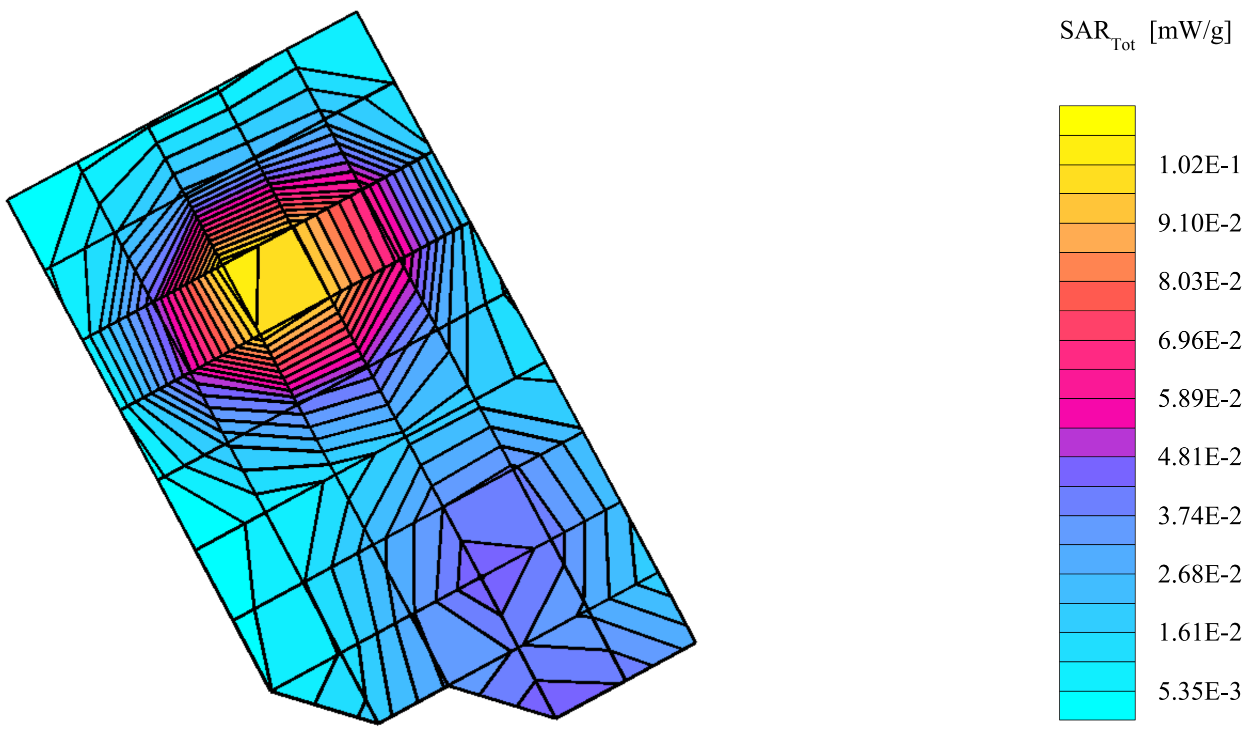
Probe: ET3DV6 - SN1514 - IEEE Head.2; ConvF(5.10,5.10,5.10); Crest factor: 8.0; 1880 MHz Head & Body: σ = 1.45 mho/m ε_r = 39.2 ρ = 1.00 g/cm^3

Cube 7x7x7: SAR (1g): 0.121 mW/g, SAR (10g): 0.0725 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0

Penetration depth: 11.2 (10.4, 12.1) [mm]

Powerdrift: -0.04 dB



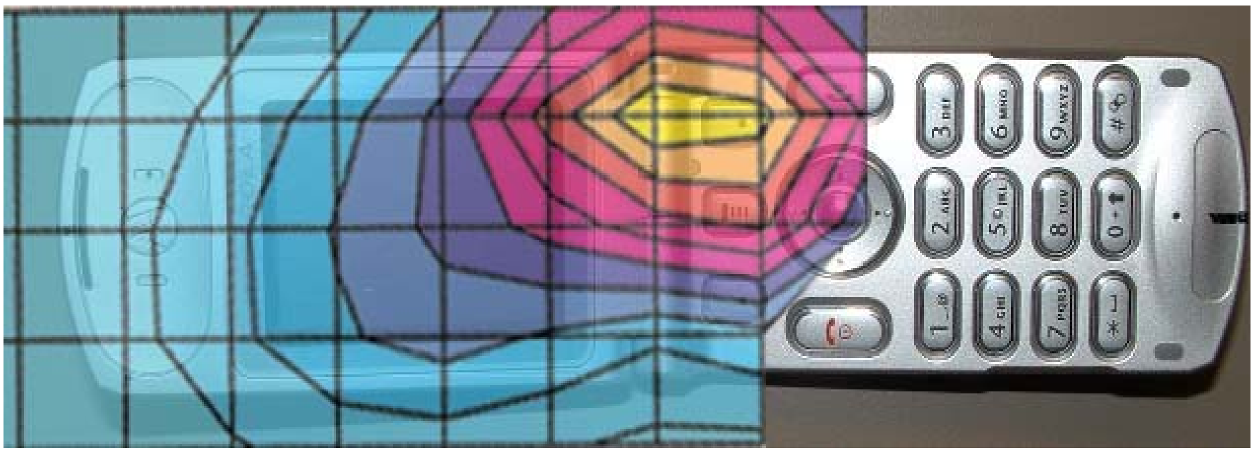


Figure 1.Typical 850MHz Head Adjacent Contour Overlaid on Phone (Cheek Touch)

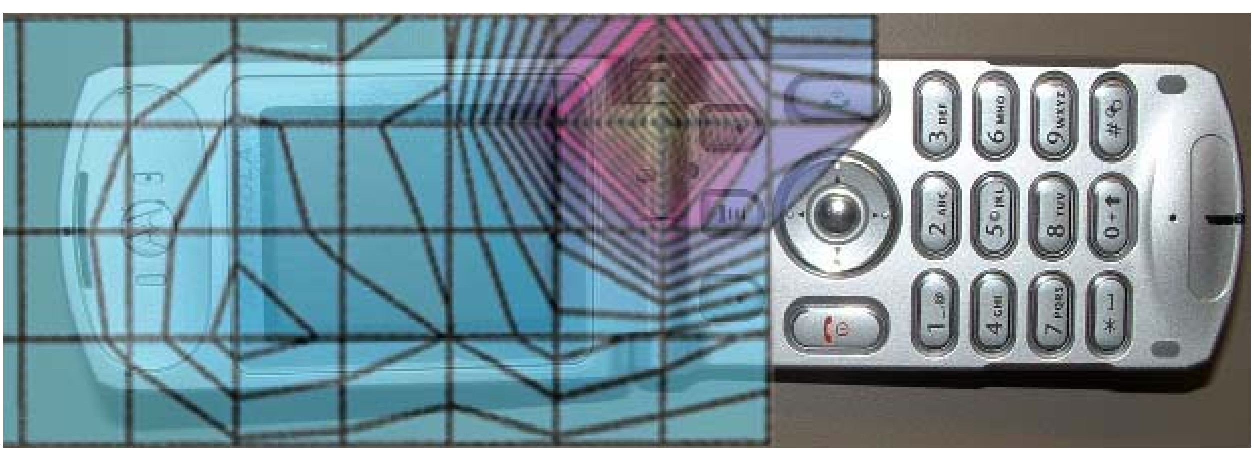


Figure 2.Typical 1900MHz Head Adjacent Contour Overlaid on Phone (Cheek Touch)

Figure 3.Typical 850MHz Head Adjacent Contour Overlaid on Phone (15 ˚ Tilt)

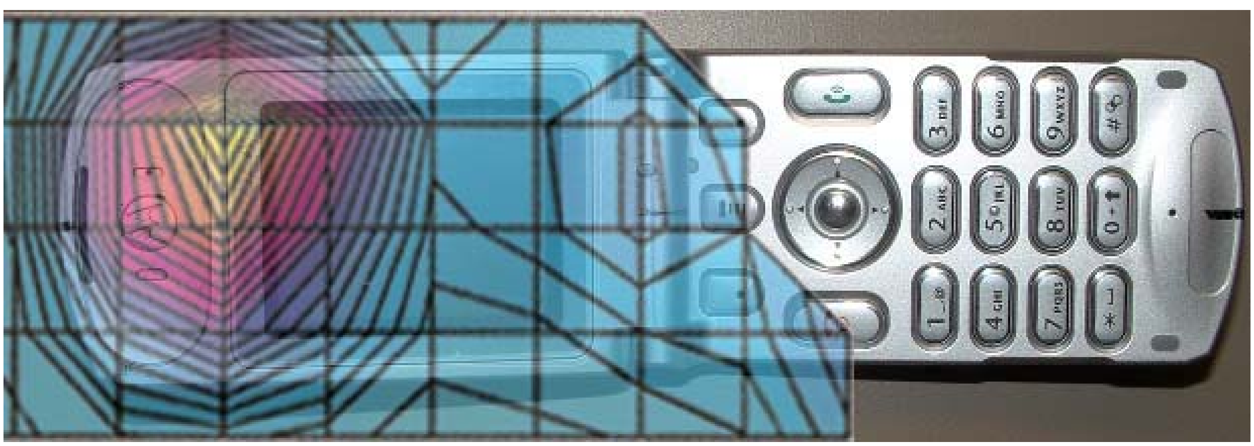


Figure 4.Typical 1900MHz Head Adjacent Contour Overlaid on Phone (15 ˚ Tilt)

Appendix 3

Probe Calibration Certificate

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

Client Motorola MRO

CALIBRATION CERTIFICATE

Object(s)	ET3DV6 - SN:1514
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	July 31, 2003
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

This calibration statement documents traceability of M&TE used in the calibration procedures and conformity of the procedures with the ISO/IEC 17025 international standard.

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
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Power sensor E4412A	MY41495277	2-Apr-03 (METAS, No 252-0250)	Apr-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (Agilent, No. 20020918)	Sep-03
Power meter EPM E4419B	GB41293874	2-Apr-03 (METAS, No 252-0250)	Apr-04
Network Analyzer HP 8753E	US37390585	18-Oct-01 (Agilent, No. 24BR1033101)	In house check: Oct 03
Fluke Process Calibrator Type 702	SN: 6295803	3-Sep-01 (ELCAL, No.2360)	Sep-03

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

Date issued: July 31, 2003

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.

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 1 245 9700, Fax +41 1 245 9779
info@speag.com, http://www.speag.com

Probe ET3DV6

SN:1514

Manufactured: November 24, 1999
Last calibration: July 25, 2002
Recalibrated: July 31, 2003

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1514

Sensitivity in Free Space

NormX	**1.70**	$\mu V/(V/m)^2$
NormY	**1.86**	$\mu V/(V/m)^2$
NormZ	**1.79**	$\mu V/(V/m)^2$

Diode Compression

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

Sensitivity in Tissue Simulating Liquid

Head 900 MHz ε_r = 41.5 ± 5% σ = 0.97 ± 5% mho/m

Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**6.3**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.3**	± 9.5% (k=2)	Alpha	**0.58**
ConvF Z	**6.3**	± 9.5% (k=2)	Depth	**1.95**

Head 1800 MHz ε_r = 40.0 ± 5% σ = 1.40 ± 5% mho/m

Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**5.1**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.1**	± 9.5% (k=2)	Alpha	**0.55**
ConvF Z	**5.1**	± 9.5% (k=2)	Depth	**2.48**

Boundary Effect

Head 900 MHz Typical SAR gradient: 5 % per mm

Probe Tip to Boundary	**1 mm**	**2 mm**
SAR_{be} [%] Without Correction Algorithm	9.7	5.1
SAR_{be} [%] With Correction Algorithm	0.2	0.4

Head 1800 MHz Typical SAR gradient: 10 % per mm

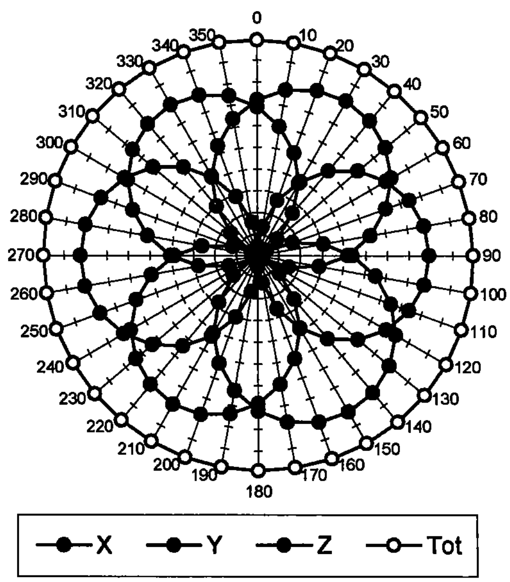
Probe Tip to Boundary	**1 mm**	**2 mm**
SAR_{be} [%] Without Correction Algorithm	13.9	9.0
SAR_{be} [%] With Correction Algorithm	0.1	0.0

Sensor Offset

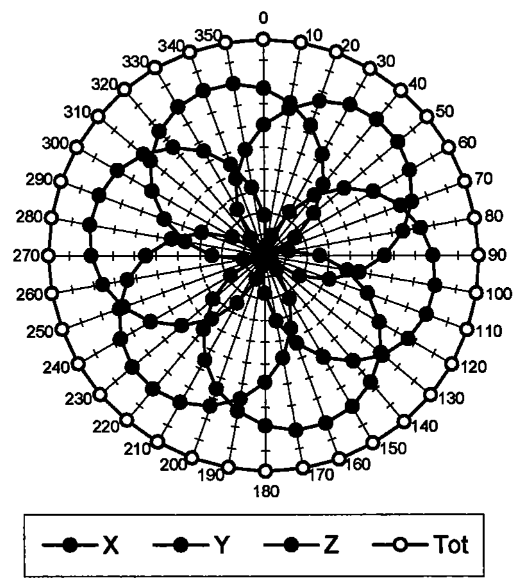
Probe Tip to Sensor Center	**2.7**	mm
Optical Surface Detection	**0.8 ± 0.2**	mm

Receiving Pattern (ϕ, θ = 0°)

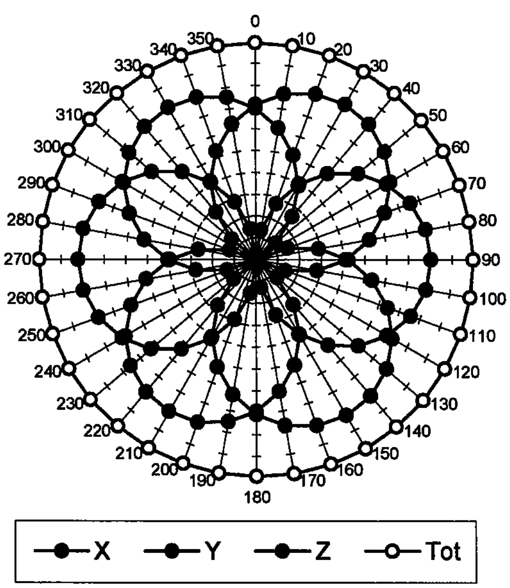
f = 30 MHz, TEM cell ifi110



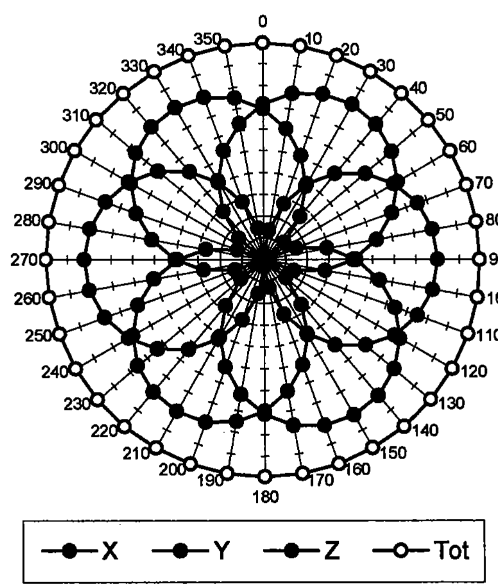
f = 100 MHz, TEM cell ifi110

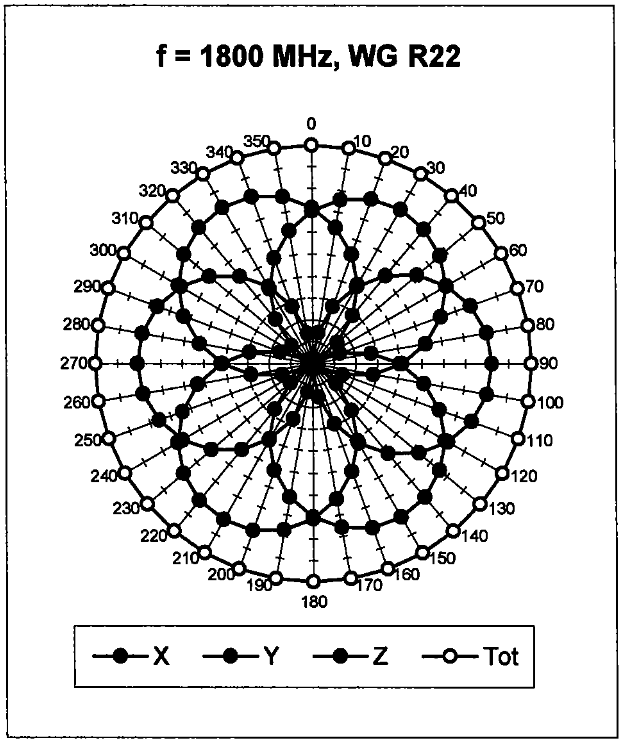


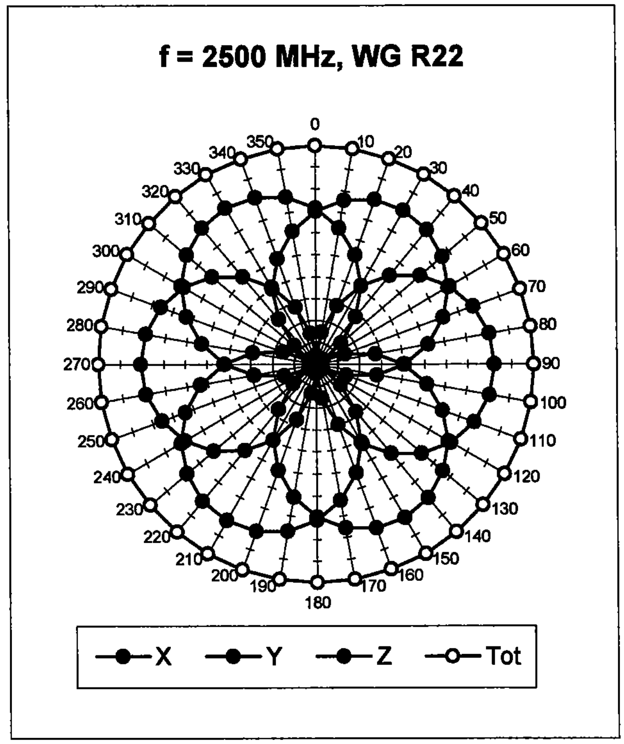
f = 300 MHz, TEM cell ifi110



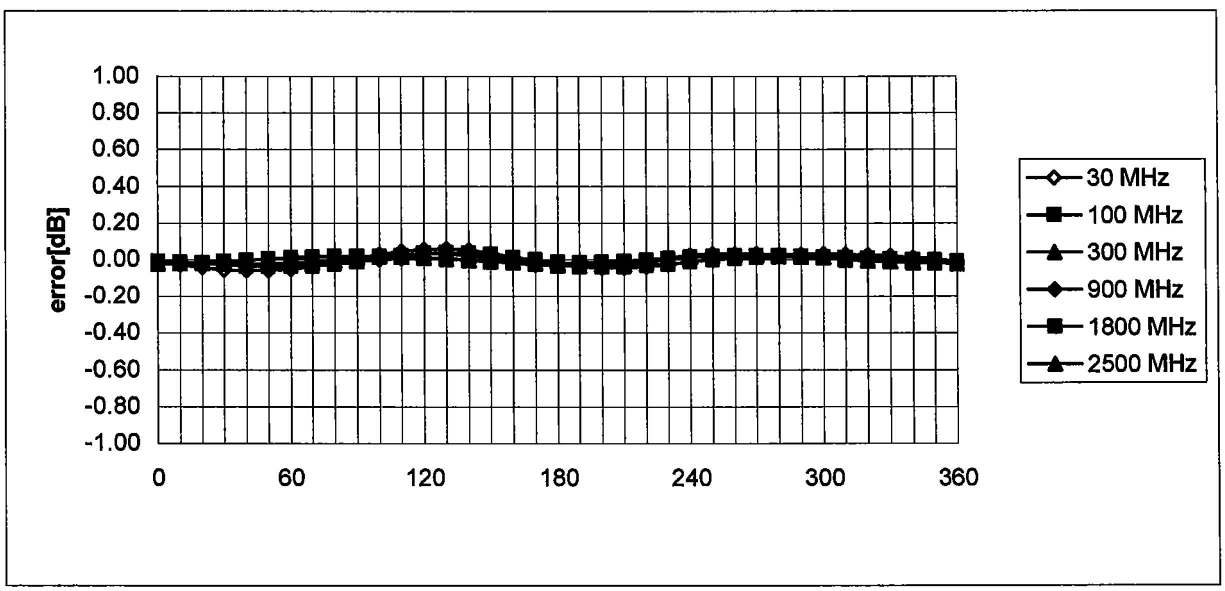
f = 900 MHz, TEM cell ifi110





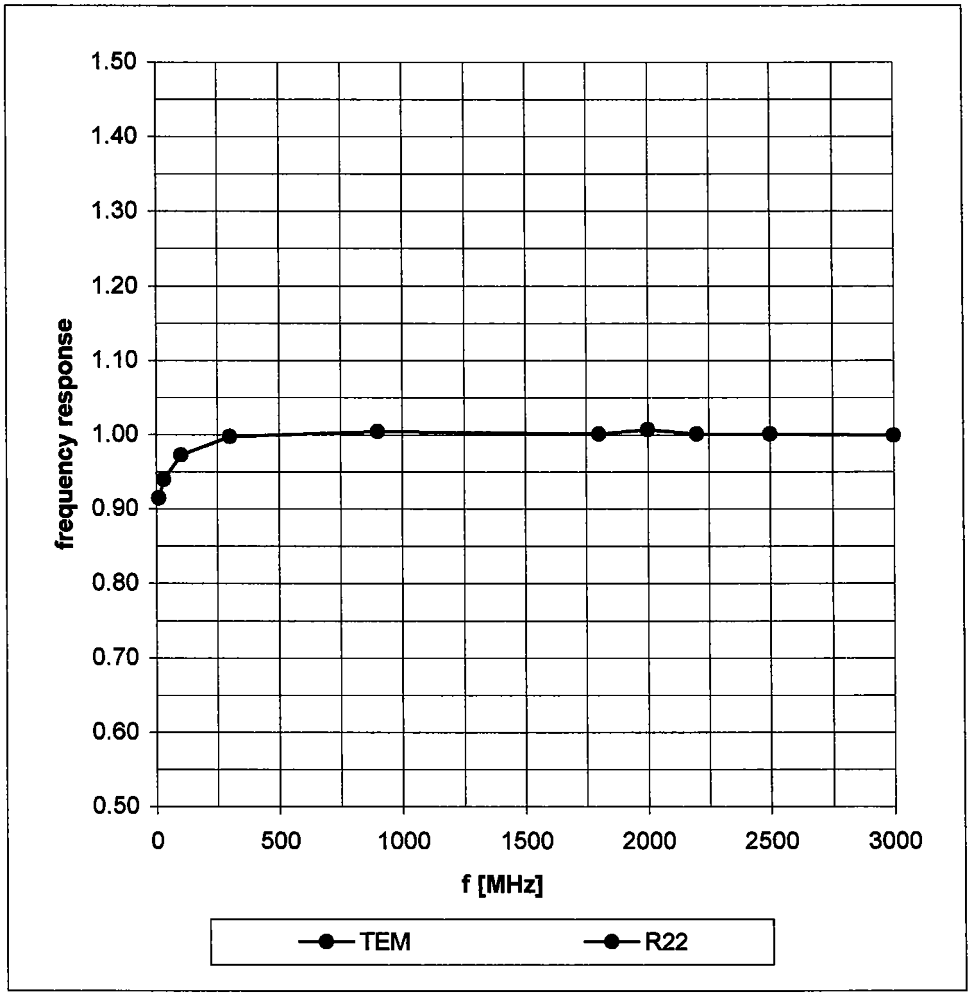


Isotropy Error (ϕ), θ = 0°



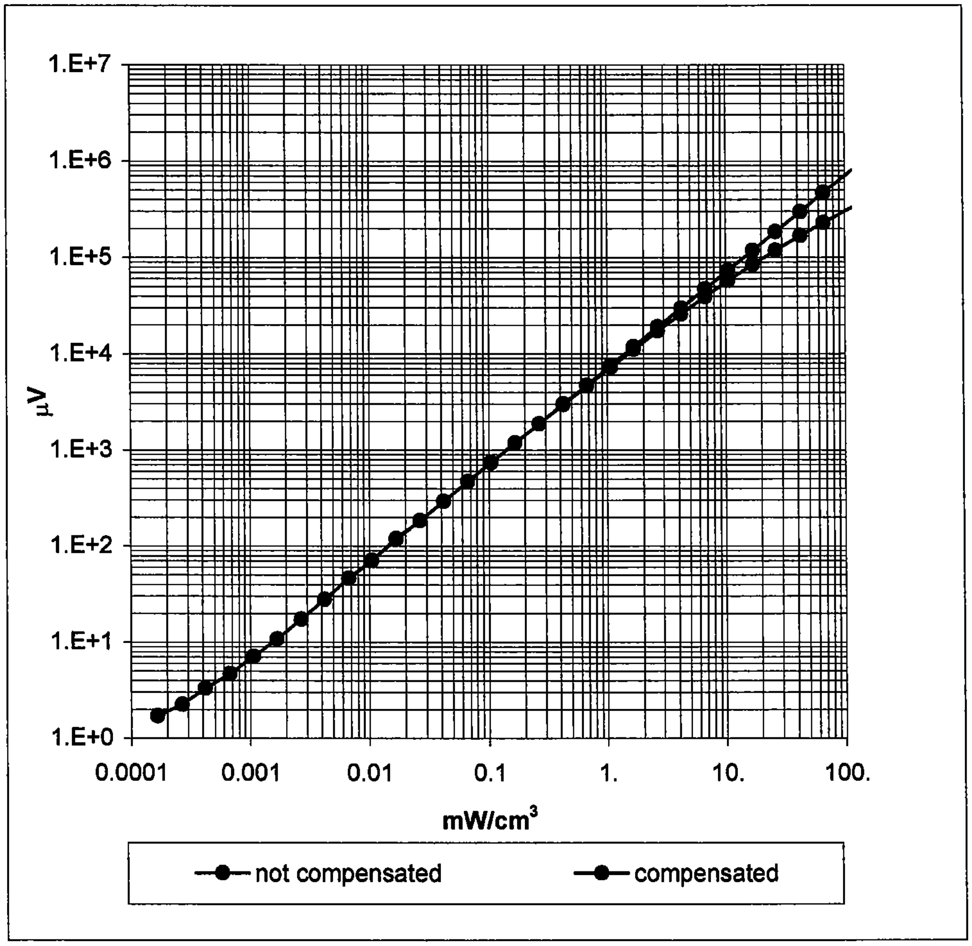
Frequency Response of E-Field

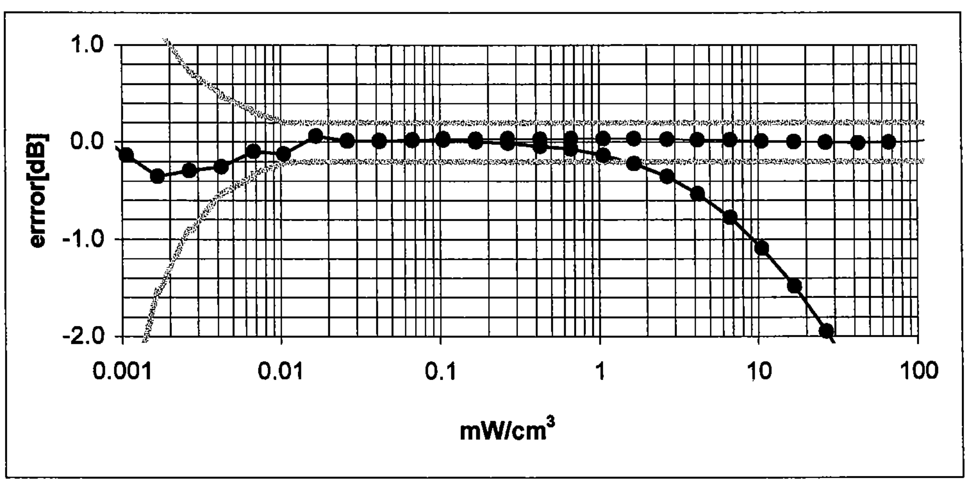
(TEM-Cell:ifi110, Waveguide R22)



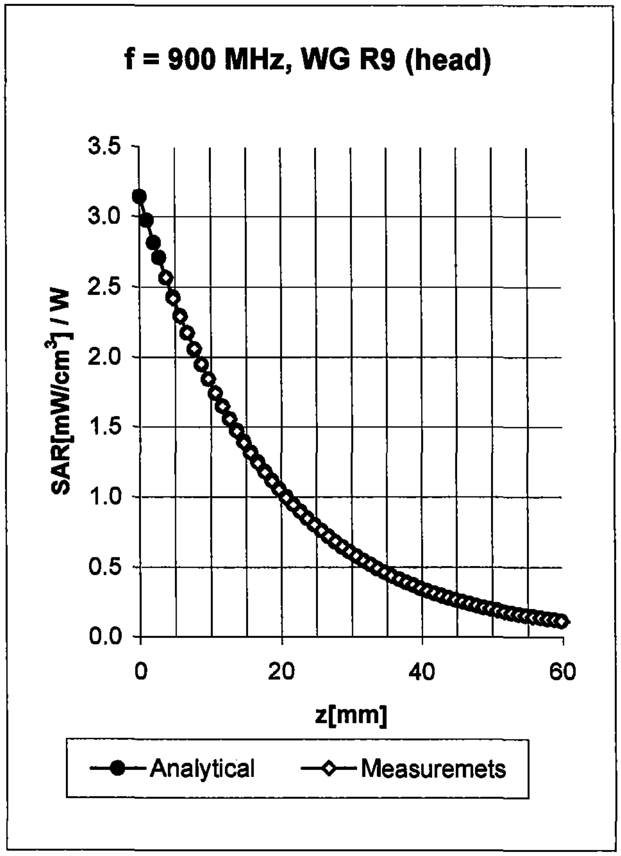
Dynamic Range f(SAR$_{brain}$)

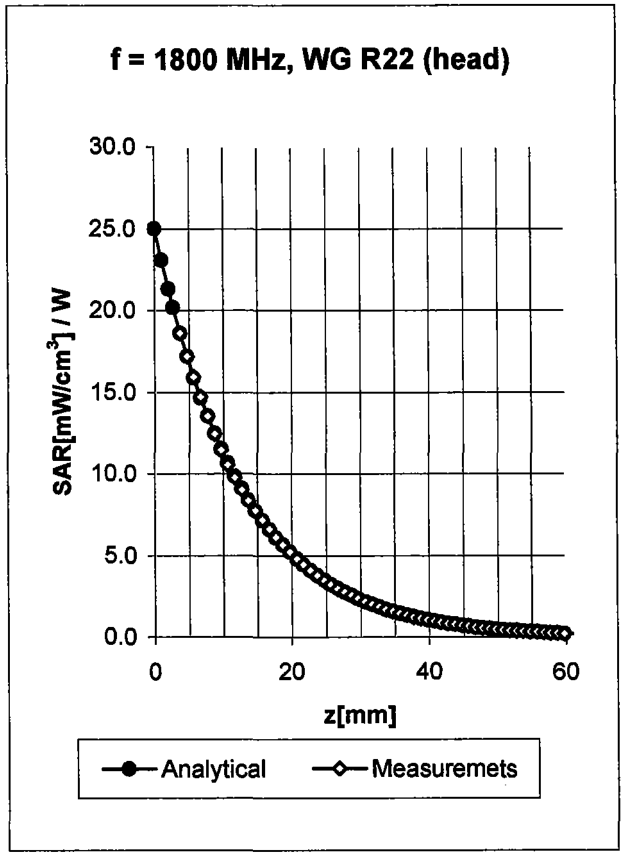
(Waveguide R22)





Conversion Factor Assessment





Head **900 MHz** ε_r **= 41.5 ± 5%** **σ = 0.97 ± 5% mho/m**

Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

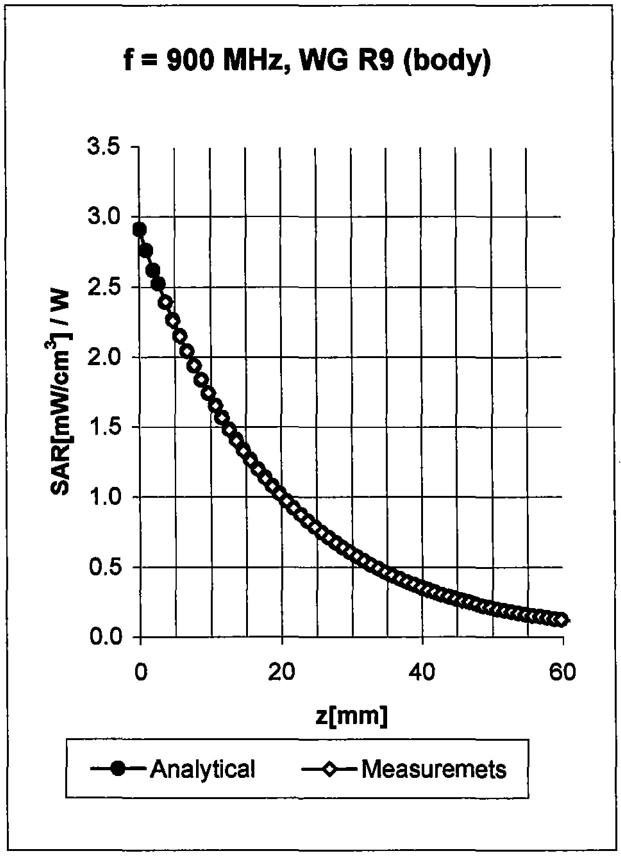
ConvF X	**6.3**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**6.3**	± 9.5% (k=2)	Alpha	**0.58**
ConvF Z	**6.3**	± 9.5% (k=2)	Depth	**1.95**

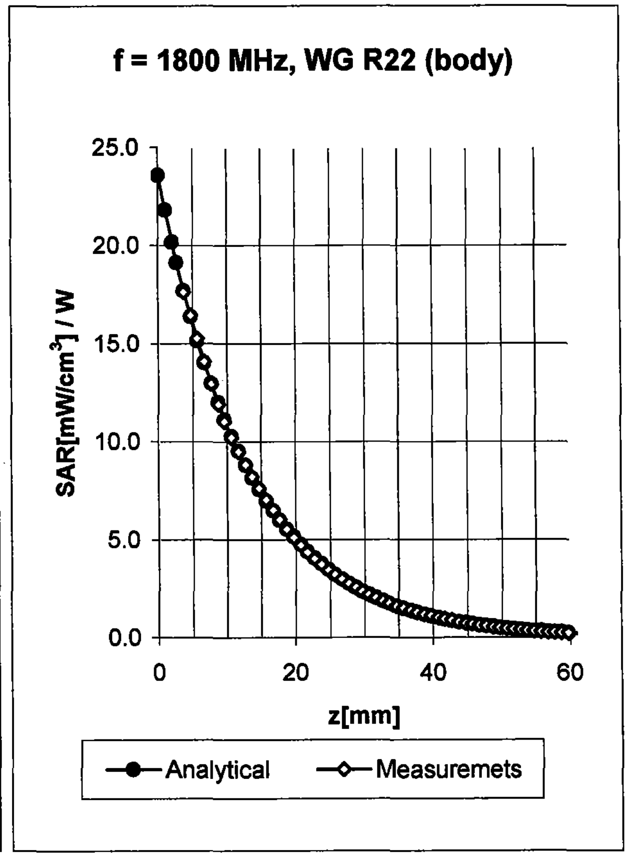
Head **1800 MHz** ε_r **= 40.0 ± 5%** **σ = 1.40 ± 5% mho/m**

Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**5.1**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**5.1**	± 9.5% (k=2)	Alpha	**0.55**
ConvF Z	**5.1**	± 9.5% (k=2)	Depth	**2.48**

Conversion Factor Assessment





Body **900 MHz** ε_r **= 55.0 ± 5%** σ **= 1.05 ± 5% mho/m**

Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to OET 65 Suppl. C

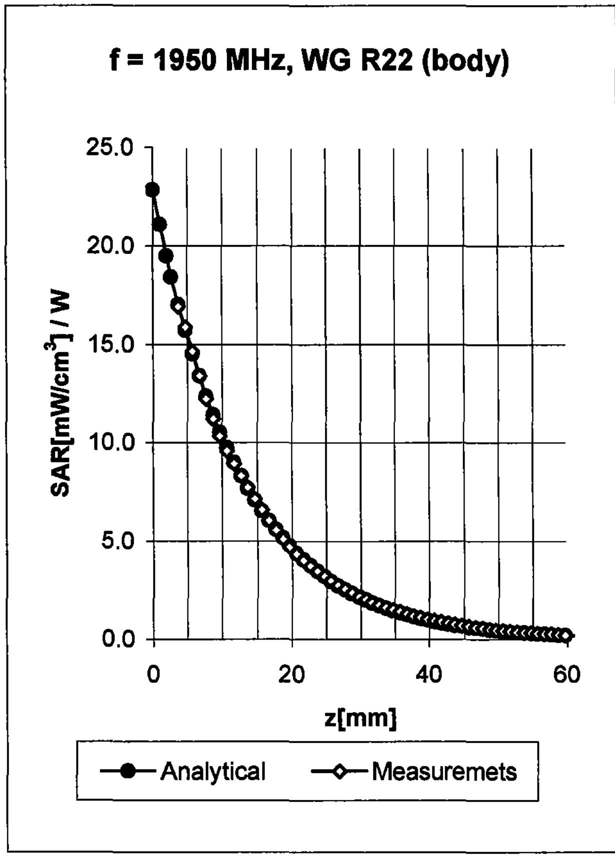
ConvF X	**6.1** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**6.1** ± 9.5% (k=2)		Alpha	**0.51**
ConvF Z	**6.1** ± 9.5% (k=2)		Depth	**2.18**

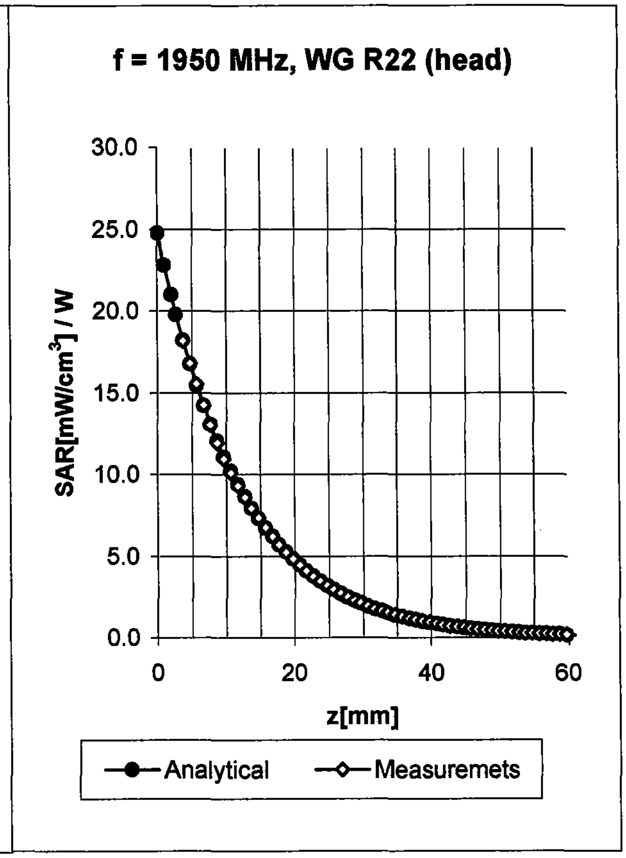
Body **1800 MHz** ε_r **= 53.3 ± 5%** σ **= 1.52 ± 5% mho/m**

Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**4.7** ± 9.5% (k=2)		Boundary effect:	
ConvF Y	**4.7** ± 9.5% (k=2)		Alpha	**0.57**
ConvF Z	**4.7** ± 9.5% (k=2)		Depth	**2.85**

Conversion Factor Assessment





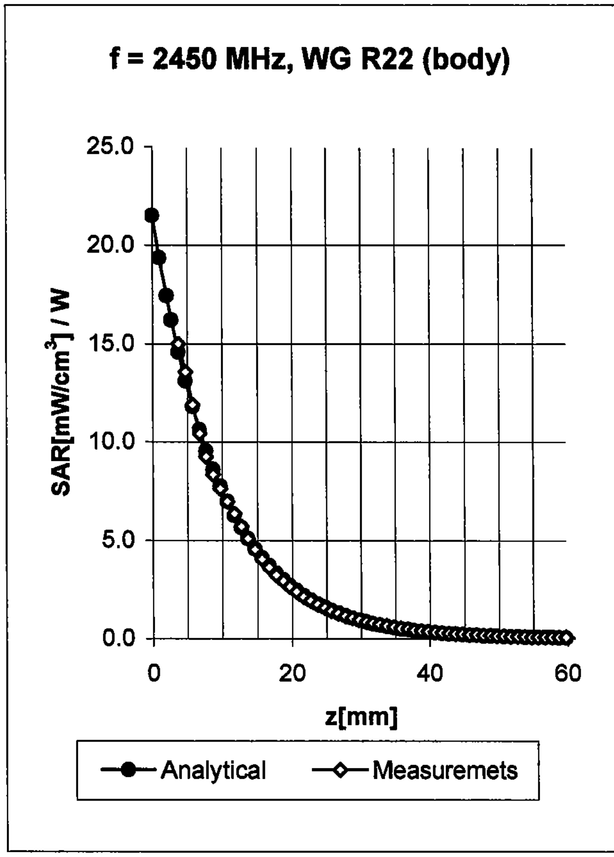
Body **1950 MHz** ε_r **= 53.3 ± 5%** σ **= 1.52 ± 5% mho/m**

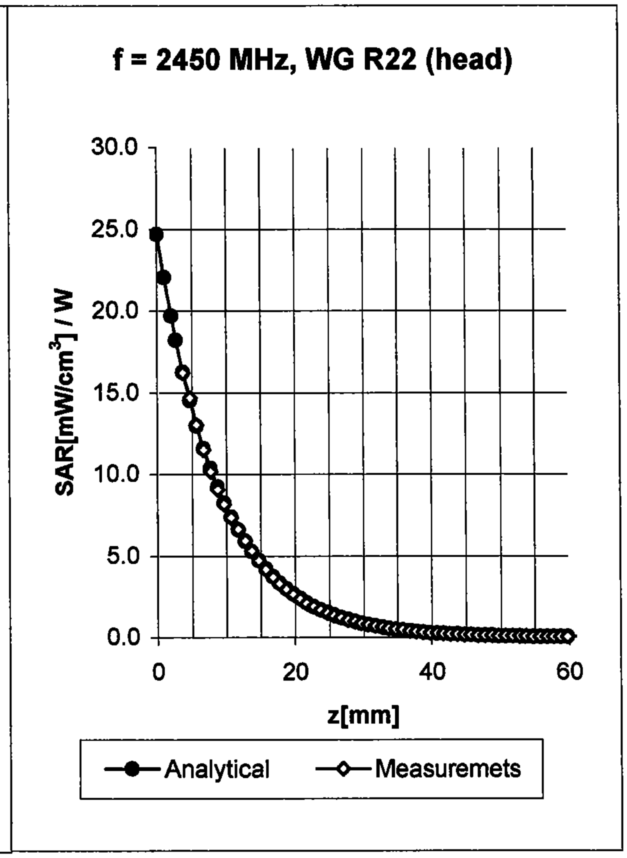
ConvF X	**4.5**	± 9.5% (k=2)	Boundary effect:	
ConvF Y	**4.5**	± 9.5% (k=2)	Alpha	**0.80**
ConvF Z	**4.5**	± 9.5% (k=2)	Depth	**2.23**

Head **1950 MHz** ε_r **= 40.0 ± 5%** σ **= 1.40 ± 5% mho/m**

ConvF X	**5.0**	± 8.9% (k=2)	Boundary effect:	
ConvF Y	**5.0**	± 8.9% (k=2)	Alpha	**0.60**
ConvF Z	**5.0**	± 8.9% (k=2)	Depth	**2.44**

Conversion Factor Assessment





Body **2450 MHz** ε_r **= 52.7 ± 5%** σ **= 1.95 ± 5% mho/m**

Valid for f=2400-2500 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

ConvF X	**4.4**	± 8.9% (k=2)	Boundary effect:	
ConvF Y	**4.4**	± 8.9% (k=2)	Alpha	**1.55**
ConvF Z	**4.4**	± 8.9% (k=2)	Depth	**1.45**

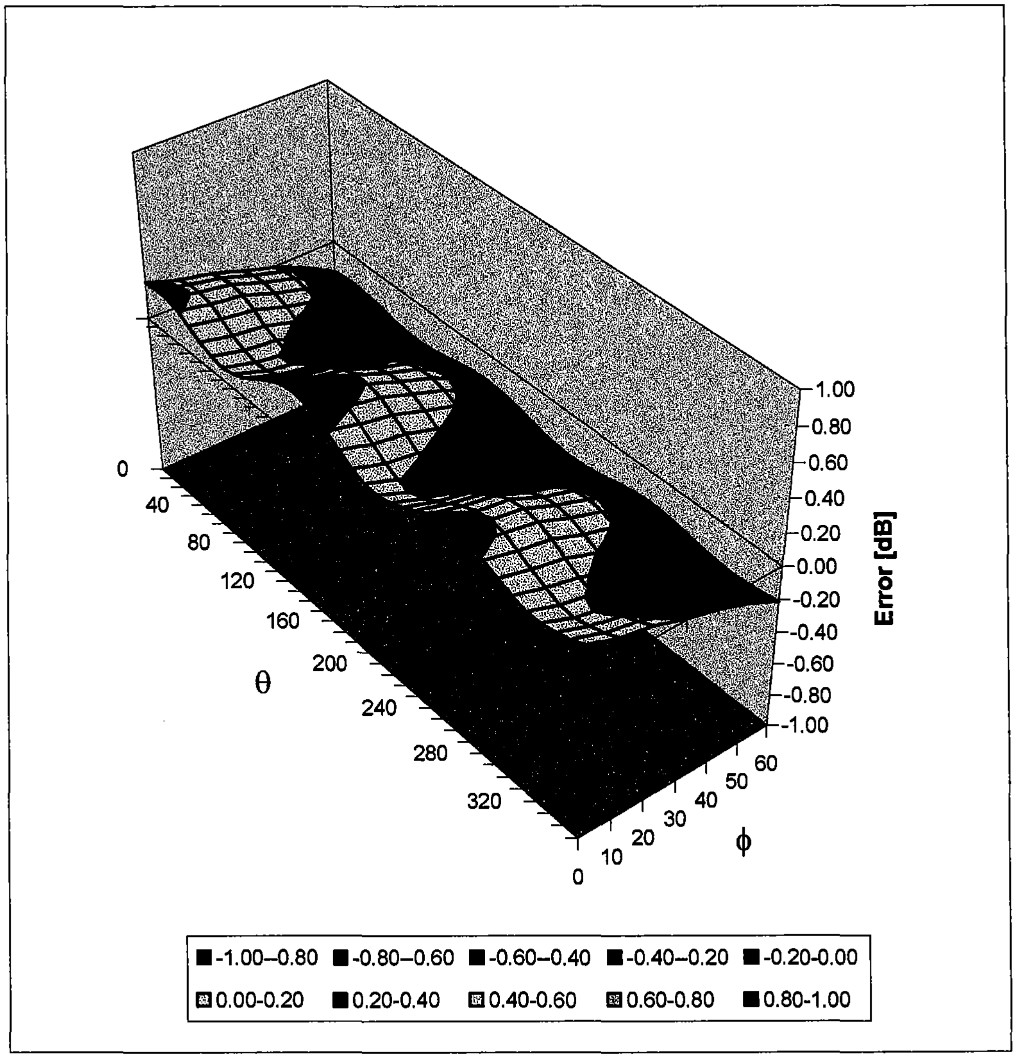
Head **2450 MHz** ε_r **= 39.2 ± 5%** σ **= 1.80 ± 5% mho/m**

Valid for f=2400-2500 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

ConvF X	**4.7**	± 8.9% (k=2)	Boundary effect:	
ConvF Y	**4.7**	± 8.9% (k=2)	Alpha	**1.24**
ConvF Z	**4.7**	± 8.9% (k=2)	Depth	**1.67**

Deviation from Isotropy in HSL

Error (θϕ), f = 900 MHz



Appendix 4

Dipole Characterization Certificate

Certification of System Performance Check Targets

Based on APP-0396

-Historical Data-

	835MHz	900MHz	1800MHz	1900MHz	
P1528 Target: Advanced Extrapolation	9.5	10.8	38.1	39.7	**(W/kg)**
Measurement Uncertainty (k=1):	10.2%	10.2%	10.2%	10.2%	
Measurement Period:	*November '02 - June '03*	*November '02 - June '03*	*November '02 - June '03*	*November '02 - June '03*	
# of tests performed:	169	728	868	26	
Grand Average: Worst Case Extrapolation	10.1	11.6	39.7	42.0	**(W/kg)**
% Delta (Average - P1528 Target)	6.5%	7.7%	4.2%	5.9%	
Is % Delta <= Measurement Uncertainty?	**Yes**	**Yes**	**Yes**	**Yes**	
Accept/Reject Average as new system performance check target?	**ACCEPT**	**ACCEPT**	**ACCEPT**	**ACCEPT**	
	Applicable 835MHz Dipole Serial Numbers:	**Applicable 900MHz Dipole Serial Numbers:**	**Applicable 1800MHz Dipole Serial Numbers:**	**Applicable 1900Mhz Dipole Serial Numbers:**	
	420(TR), 421(TR)	77, 78	246(TR), 250(TR)	514(TR), 518(TR)	
	422(TR), 423(TR)	79, 80	251(TR), 258(TR)	519(TR), 520(TR)	
	424(TR), 425(TR)	91, 92	259(TR), 262(TR)	523(TR), 524(TR)	
	431(TR), 432(TR)	93, 94	263(TR), 271(TR)	526(TR), 527(TR)	
	433(TR), 434(TR)	95, 96	272(TR), 273(TR)	528(TR), 529(TR)	
	436(TR)	97	276(TR), 277(TR)	530(TR), 533(TR)	
			279(TR), 280(TR)		
			281(TR), 282(TR)		
			283(TR), 284(TR)		

-New System Performance Check Targets- per APP-0396

(based on analysis of historical data)

Frequency	SAR Target (W/kg)	Permittivity	Conductivity (S/m)
835MHz	**10.1**	41.5 ± 5%	0.90 ± 5%
900MHz	**11.6**	41.5 ± 5%	0.97 ± 5%
1800MHz	**39.7**	40.0 ± 5%	1.40 ± 5%
1900MHz	**42.0**	40.0 ± 5%	1.40 ± 5%

-Approvals-

Submitted by: Marge Kaunas   Date: 24-Jun-03

Signed: Marge Kaunas

Comments: spreadsheet detailing all measurements available upon request

Approved by: Antonio Faraone   **Date:** 24-Jun-03

Signed: Antonio Faraone

Comments: Targets and associated simulant properties are derived from the IEEE P1528 draft standard

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 5. Front of Phone

Figure 6. Front of Phone with Flip Open

Figure 7. Side of Phone in holster

Figure 8. Back of Phone

Figure 9. Phone with Holster Against the Flat Phantom

Figure 10. Phone Against the Head Phantom (Front View - Cheek Touch)

Figure 11. Phone Against the Head Phantom (Back View – Cheek Touch)

Figure 12. Phone Against the Head Phantom (Front View – 15°Tilt)

Figure 13. Phone Against the Head Phantom (Back View – 15°Tilt)