MOTOROLA

Exhibit 11: SAR Test Report IHDT56CA2

Date of test:	April 23 - 29, 2002 & May 16 – 17, 2002
Date of Report:	20 May, 2002
Laboratory:	Motorola Personal Communications Sector Product Safety & Compliance Laboratory 2001 N. Division Room: AS228 Harvard, Illinois 60033
Test Responsible:	Steven Hauswirth Senior Staff Engineer
Accreditation:	This laboratory is accredited to ISO/IEC 17025-1999 to perform the following electromagnetic exposure tests: System Validation & Interlaboratory Comparison Simulated Tissue Specifications and Procedure EME Cellular Phone Testing Procedure On the following 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 IHDT56CA2 to which this declaration relates, is in conformity with the appropriate General Population/Uncontrolled RF exposure standards, recommendations and guidelines (FCC 47 CFR §2.1093). It also declares that the product was tested in accordance with the appropriate measurement standards, guidelines and recommended practices. Any deviations from these standards, guidelines and recommended practices are noted below: (none)

©Motorola, Inc. 2002
This test report shall not be reproduced in full, without written approval of the laboratory.

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

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

Table of Contents

1)	Introduction	3
2)	Description of the Device Under Test	3
	Antenna description	3
	Device description	3
3)	Test Equipment	3
	3.1 Dosimetric system	3
	3.2 Additional equipment used	4
4)	Electrical parameters of the tissue simulating liquid	4
5)	System Accuracy Verification	5
6)	Test Results	6
	6.1 Head Adjacent Test Results	6
	6.2 Body-Worn Test Results	7

References:

Appendix 1: SAR distribution comparison for the system accuracy verification	9
Appendix 2: SAR distribution plots for Phantom Head Adjacent Use	10
Appendix 3: SAR distribution plots for Body Worn Configuration	12
Appendix 4. Probe Calibration Certificates	15
Appendix 5: Photographs of the device under test	16

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 IHDT56CA2). 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

Antenna description

Type	Stubby	
Location	Right Side	
Dimensions	Length	25mm
	Width	5mm
Configuration	Stuby	

Device description

FCC ID Number	IHDT56CA2		
Serial number(s)	525FE8A8 & 525FE4E1		
Mode(s) of Operation	800 AMPS	TDMA 800	TDMA 1900
Modulation Mode(s)	AMPS	TDMA	TDMA
Maximum Output Power Setting	25.50 dBm	27.50 dBm	26.90 dBm
Duty Cycle	1:1	1:3	1:3
Transmitting Frequency Rang(s)	824.04-848.97 MHz	824.04-848.97 MHz	1850.04-1909.92 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. The overall RSS uncertainty of the measurement system is ±12.0% (K=1) with an expanded uncertainty of ±24.0% (K=2). The breakdown of the individual uncertainties is as follows:

Probe Uncertainty	**±%**
Isotropy error	7.2
Calibration error	3.3
Spatial resolution	0.5

SAR Evaluation	**±%**
Conductivity measurement	5.0
Environmental errors	1.0

Peak SAR Evaluation	**±%**
Probe positioning	1.0
Volumetric averaging	4.2
Device positioning	6.0

The list of calibrated equipment used for the measurements is shown below.

Description	Serial Number	Cal Due Date
DASY3 DAE V1	SN375	15-Nov-02
E-Field Probe ETDV6	SN1391	25-Oct-02
Dipole Validation Kit, DV900V2	SN092	3-Jan-03
SAM Phantom used for 800MHz	TP-1132	
DASY3 DAE V1	SN365	26-Sep-02
E-Field Probe ETDV6	SN1508	25-Oct-02
Dipole Validation Kit, DV900V2	SN95	3-Jan-03
SAM Phantom used for 800MHz	TP-1005	
Dipole Validation Kit, DV1800V2	SN284TR	5-Jan-03
DASY3 DAE V1	SN383	19-Mar-03
Dipole Validation Kit, DV1800V2	SN283TR	5-Jan-03
SAM Phantom used for 1900MHz	TP-1133	

3.2 Additional Equipment

Description	Serial Number	Cal Due Date
Signal Generator HP8648C	3847A04848	19-Jan-03
Power Meter E4419B	GB39511090	28-Nov-02
Power Sensor #1 - 8481A	US39211007	19-Dec-02
Power Sensor #2 - 8481A	US39210929	19-Dec-02
Network Analyzer HP8753ES	US39172529	5-Jul-02

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 a HP85070 Dielectric Probe Kit These values 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, 23-Apr-02**	41.8	0.91	22.1
		Recommended Limits	41.5	0.90	20-25
		Measured, 24-Apr-02	41.6	0.90	21.4
		Recommended Limits	41.5	0.90	20-25
		Measured, 16-May-02	41.9	0.91	22.5
		Recommended Limits	41.5	0.90	20-25
	Body	**Measured, 17-May-02**	54.3	0.98	22.5
		Recommended Limits	55.2	0.97	20-25
1880	Head	**Measured, 23-Apr-02**	38.4	1.44	20
		Recommended Limits	40.0	1.40	20-25
		Measured, 24-Apr-02	38.4	1.44	21.5
		Recommended Limits	40.0	1.40	20-25
	Body	**Measured, 29-Apr-02**	51.1	1.58	20.7
		Recommended Limits	53.3	1.52	20-25

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	47.0	30.80
DGBE	--	--	52.8	68.91
Water	40.45	53.06	0.2	0.29
Salt	1.45	0.94	--	--
HEC	1.0	1.0	--	--
Bact.	0.1	0.1	--	--

5. System Accuracy Verification

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

A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR indicated on the dipole certification sheet. These tests were done at 900MHz and/or 1800MHz. These frequencies are within 100MHz of the mid-band frequency of the test device. This is within the allowable window given in Supplement C 01-01 Appendix D System Verification section item #5. The test was conducted on the same days as the measurement of the DUT. Recommended limits for maximum permittivity, minimum conductivity are shown in the table below. These come from the Federal Communication Commission, OET Bulletin 65 Supplement C 01-01. The obtained results from the system accuracy verification are displayed in the table below. The distributions of SAR compare well with those of the reference measurements (see Appendix 1). The tissue stimulant depth was verified to be 15.0cm ±0.5cm. Z-axis scans showing the SAR penetration are also included in Appendix 1. SAR values are normalized to 1W forward power delivered to the dipole.

Daily, prior to conducting tests, measurements were made with the RF sources powered off to determine the system noise level. The highest system noise was 0.00 W/kg.

f (MHz)	Description	SAR (W/kg), 1gram	Dielectric Parameters		Ambient Temp (°C)	Tissue Temp (°C)
			ε_r	σ (S/m)		
900	**Measured, 23-Apr-02**	11.99	41	0.97	23	22.6
	Recommended Limits	11.4	40.3	0.95	20-26	20-26
900	**Measured, 24-Apr-02**	11.94	40.6	0.96	23	21.6
	Recommended Limits	11.4	40.3	0.95	20-26	20-26
900	**Measured, 16-May-02**	11.86	41.1	0.97	23	22.3
	Recommended Limits	11.4	40.3	0.95	20-26	20-26
900	**Measured, 17-May-02**	11.94	40.3	0.96	23	22.1
	Recommended Limits	11.4	40.3	0.95	20-26	20-26
1800	**Measured, 23-Apr-02**	39.08	38.6	1.36	24	22.1
	Recommended Limits	38.8	39.6	1.37	20-26	20-26
1800	**Measured, 24-Apr-02**	40.24	39.5	1.39	23	20.9
	Recommended Limits	38.8	39.6	1.37	20-26	20-26
1800	**Measured, 29Apr-02**	38.25	39.9	1.39	22	21.5
	Recommended Limits	38.8	39.6	1.37	20-26	20-26

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 then placed in the SAR measurement system with a fully charged battery. The phone was tested in the configurations stipulated in OET Bulletin 65 Supplement C 01-01. The phone was positioned into these 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 Cellular Phone (FCC ID IHDT56CA2) has the SNN5571A bttery as the only available battery option. This battery was used to do all of the SAR testing.

6.1 Head Adjacent Test Results

The SAR results shown in tables 1 and 2 are maximum SAR values averaged over 1 gram of phantom tissue. Also shown are the measured conducted output powers, the temperature of the test facility during the test and the temperature of the tissue simulate after the test. The SAR measurements were performed using the SAM phantoms listed in section 3.1. The tissue stimulant depth was verified to be 15.0cm ±0.5cm at the center of the ear by doing a Z-axis scan during the system accuracy verification.

The test conditions indicated as bold numbers in the following table are included in Appendix 2. All other test conditions measured lower SAR values than those included. Note that 800MHz digital mode SAR data was measured only for the test conditions that resulted in the highest analog SAR values. This is because the maximum power in the 800MHz digital mode is significantly lower than that of the analog mode, therefore the resulting SAR values are also lower and not listed.

f (MHz)	Description	Conducted Output Power (dBm)	**(Cheek / Touch Position)**					
			Left Head			Right Head		
			Measured (W/kg)	Drift (dB)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Simulate Temp (°C)
Analog 800MHz	Channel 991	25.54	**1.44**	**-0.07**	**22.1**	1.41	-0.23	22.0
	Channel 384	25.50	1.28	-0.03	22.2	1.20	0.00	22.5
	Channel 799	25.44	1.31	-0.10	22.2	1.27	0.00	22.0
Digital 800MHz	Channel 1013	27.48						
	Channel 383	27.56	**0.959**	**-0.03**	**21.4**	0.917	-0.05	21.4
	Channel 779	27.56						
Digital 1900MHz	Channel 2	26.99	1.07	-0.04	21.5	1.06	-0.05	21.5
	Channel 1001	26.93	1.05	0.00	21.5	1.04	-0.09	21.5
	Channel 1998	26.89	**1.13**	**-0.03**	**21.5**	1.11	-0.02	21.5

Table 1: SAR measurement results for the portable cellular telephone FCC ID IHDT56CA2 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)	Simulate Temp (°C)	Measured (W/kg)	Drift (dB)	Simulate Temp (°C)
Analog 800MHz	Channel 991	25.54						
	Channel 384	25.50	**0.690**	**-0.32**	**22.5**	0.619	-0.45	22.5
	Channel 799	25.44						
Digital 1900MHz	Channel 2	26.99	**1.46**	**-0.11**	**20.0**	1.24	0.00	21.5
	Channel 1001	26.93	1.37	-0.05	21.5	1.21	-0.04	21.5
	Channel 1998	26.89	1.35	-0.17	20.2	1.13	-0.03	21.5

Table 2: SAR measurement results for the portable cellular telephone FCC ID IHDT56CA2 at highest possible output power. Measured against the head in the 15° Tilt Position.

6.2 Body-Worn Test Results

The SAR results shown in 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 and the temperature of the tissue simulate after the test. A "flat" phantom was for the body-worn tests. This "flat" phantom is made out of 1" thick natural High Density Polyethylene with a thickness at the bottom equal to 2.0mm. It measures 52.7cm(long) x 26.7cm(wide) x 21.2cm(tall). The measured dielectric constant of the material used is less than 2.3 and the loss tangent is less than 0.0046 all the way up to 2.184GHz.

The tissue stimulant depth was verified to be 15.0cm ±0.5cm. The same device holder described in section 6 was used for positioning the phone. The functional accessories were divided into two categories, the ones with metal components and the ones with non-metal components. For non-metallic component accessories', testing was performed on the accessory that displayed the closest proximity to the flat phantom. Each metallic component accessory, if any, was checked for uniqueness of metal component so that each is tested with the device. If multiple accessories shared an identical metal component, only the accessory that dictates the closest spacing to the body was tested. The cellular phone was tested with a headset connected to the device for all body-worn SAR measurements.

There are two Body-Worn Accessories available for this phone:
A Plastic Holster and Belt Clip: Model SHH7175A
A Leather Pouch with Belt Clip: Models SYN9170A and SYN8631A

The Plastic Belt-Clip causes closer proximity and was used for the SAR measurements.

A full data set output of two test conditions with the highest SAR values from the Dasy™ measurement system is included as appendix 3 . The test conditions included are indicated as bold numbers in the following table. All other test conditions measured lower SAR values than those included. Note that 800MHz digital mode SAR data was measured only for the test conditions that resulted in the highest analog SAR values. This is because the maximum power in the 800MHz digital mode is significantly lower than that of the analog mode, therefore the resulting SAR values are also lower and not listed.

f (MHz)	Description	Conducted Output Power (dBm)	Body Worn Ant Extended Measured (W/kg)	Drift (dB)	Simulate Temp (°C)
Analog 800MHz	Channel 991	25.54	**0.693**	**-0.1**	**22.2**
	Channel 384	25.50	0.631	0.06	22.3
	Channel 799	25.44	0.627	0.01	22.1
Digital 1900MHz	Channel 2	26.99	0.187	-0.26	20.7
	Channel 1001	26.93	**0.195**	**-0.08**	**20.7**
	Channel 1998	26.89	0.195	-0.01	20.7

Table 3: SAR measurement results for the portable cellular telephone FCC ID IHDT56CA2 at highest possible output power. Measured against the body.

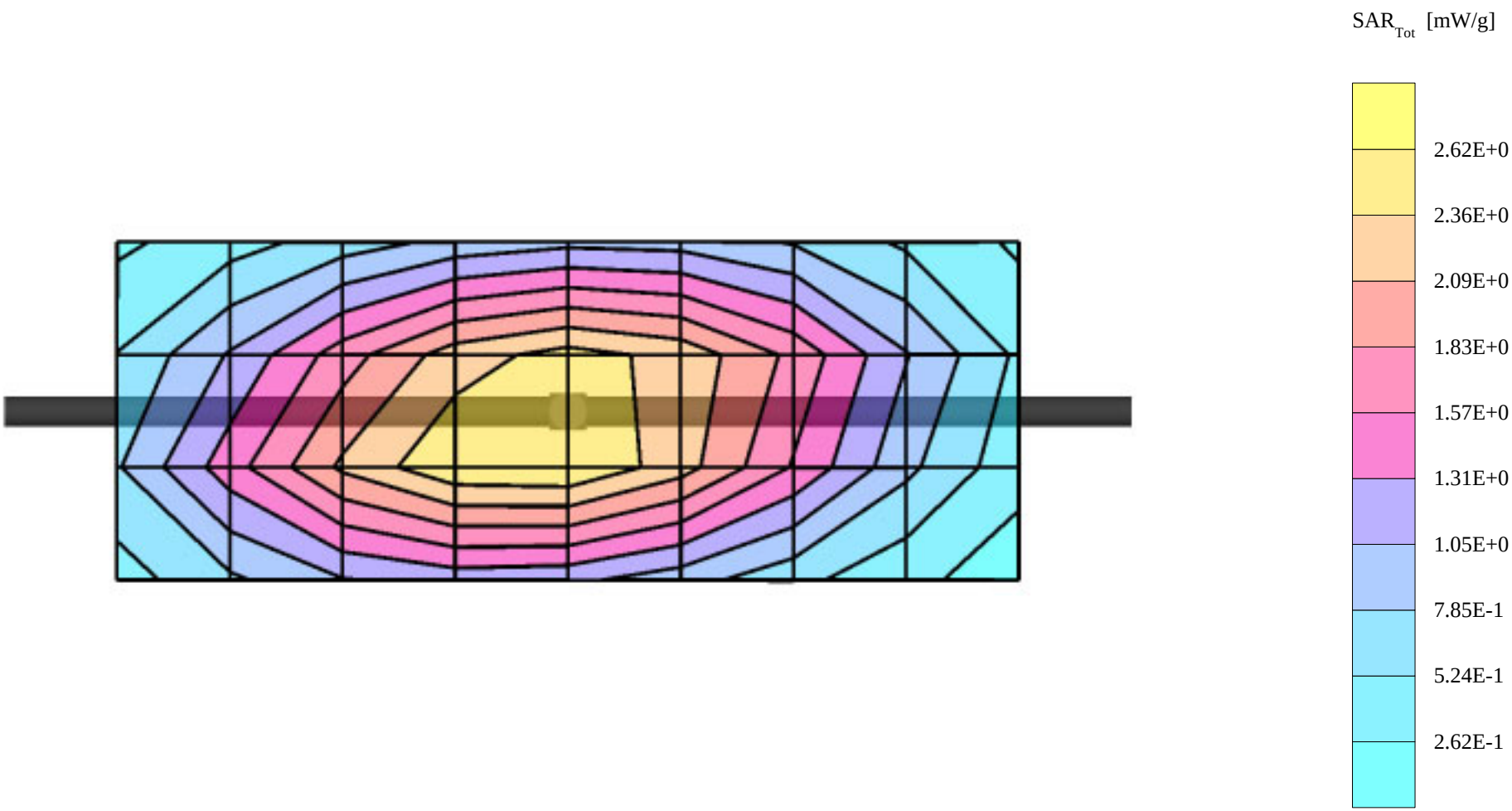
Appendix 1

SAR distribution comparison for the system accuracy verification

04/23/02

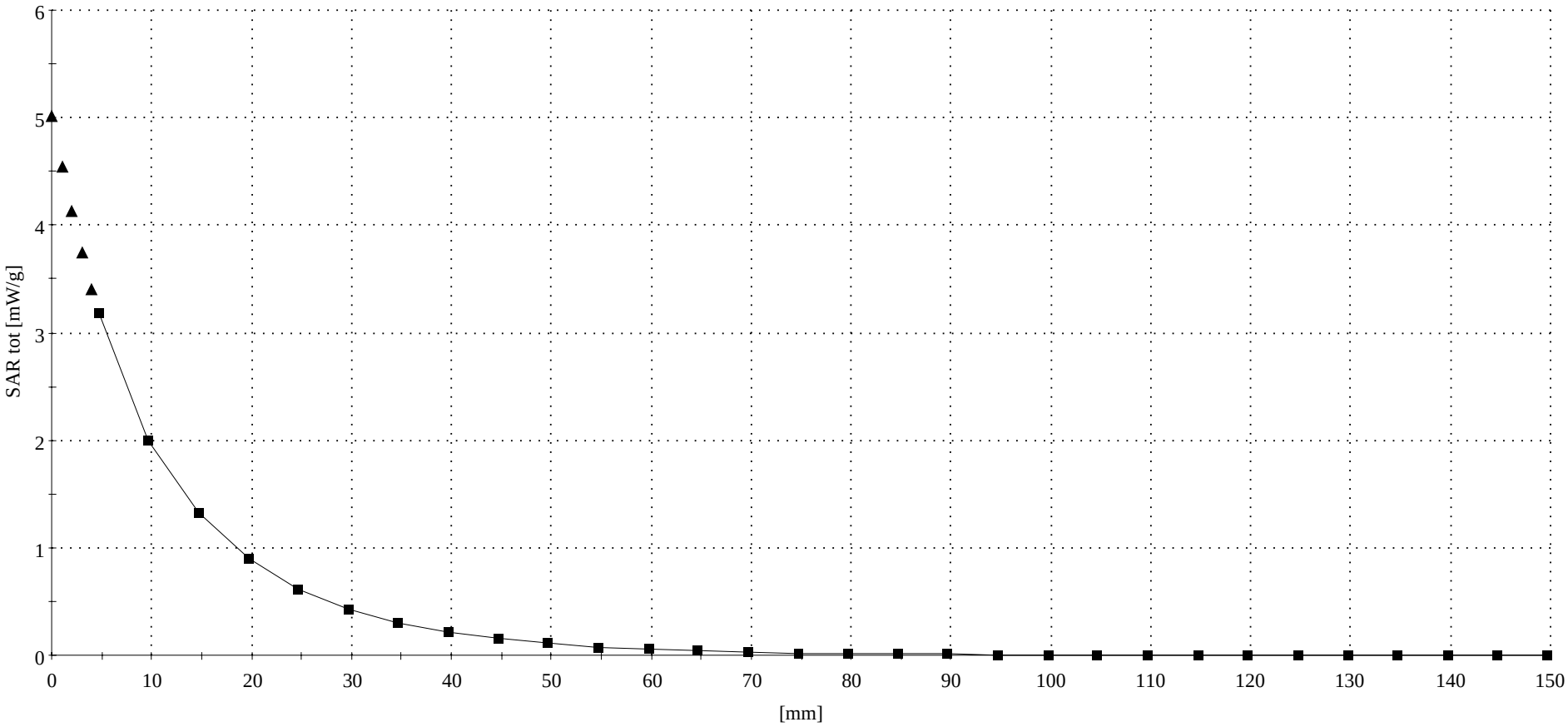
Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 092
Forward Power = 251mW Reflected Power = -26.18dB
Room Temp at time of measurement = 23C Simulant Temp at time of measurement = 22.6C
R5: TP-1132 SUGAR (rev.3); Flat
Probe: ET3DV6 - SN1391 - VALIDATION; ConvF(6.31,6.31,6.31); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.97 mho/m ε_r = 41.0 ρ = 1.00 g/cm^3
Cubes (2): Peak: 4.76 mW/g ± 0.15 dB, SAR (1g): 3.01 mW/g ± 0.14 dB, SAR (10g): 1.91 mW/g ± 0.15 dB, (Worst-case extrapolation)
Penetration depth: 11.6 (10.8, 12.7) [mm]
Powerdrift: 0.08 dB



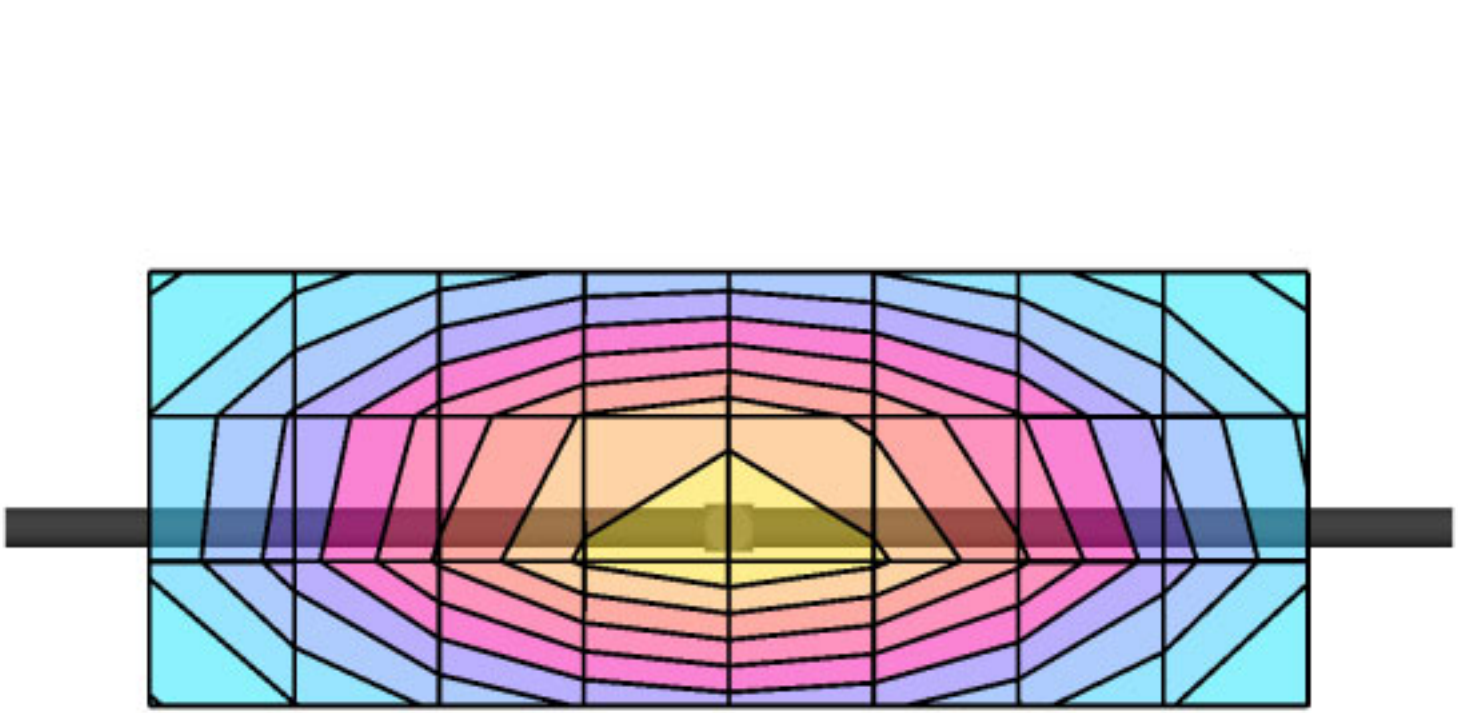
Dipole 900 MHz

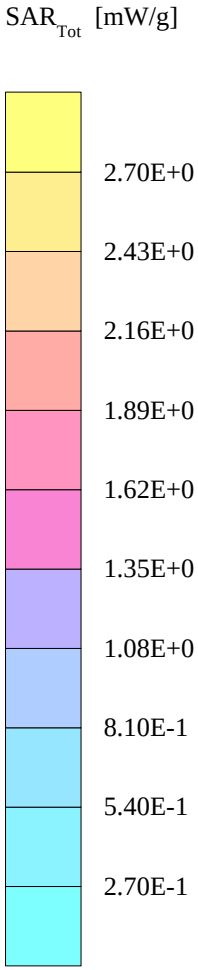
900 MHz Dipole Validation / Dipole Sn# 092
Forward Power = 251mW Reflected Power = -26.18dB
Room Temp at time of measurement = 23C Simulant Temp at time of measurement = 22.6C
R5: TP-1132 SUGAR (rev.3);
Probe: ET3DV6 - SN1391 - VALIDATION; ConvF(6.31,6.31,6.31); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.97 mho/m ε_r = 41.0 ρ = 1.00 g/cm^3
: , , ()
Penetration depth: 11.3 (10.5, 12.4) [mm]



Dipole 900 MHz

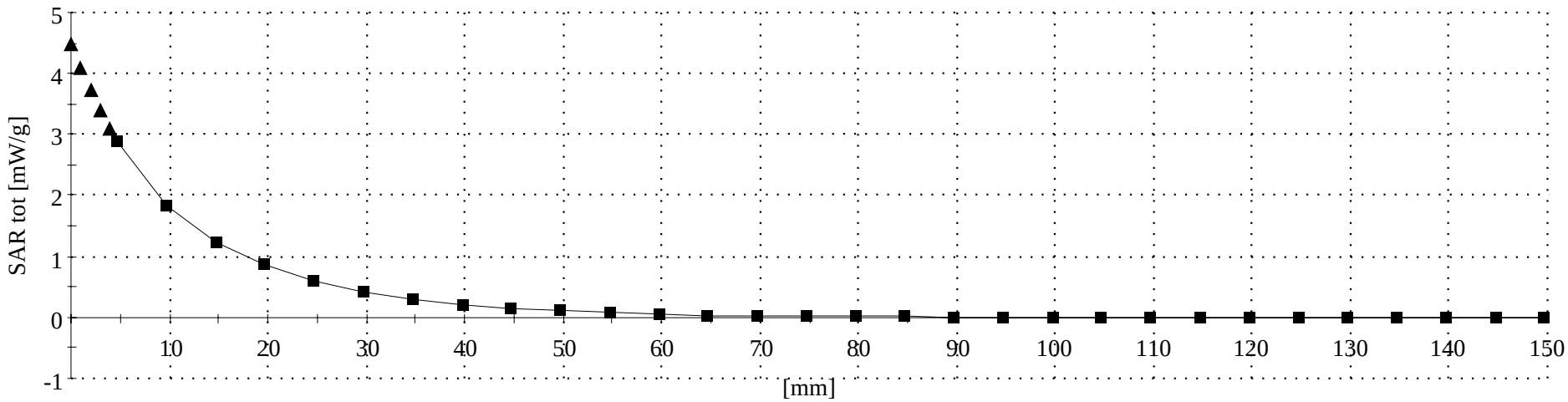
900 MHz Dipole Validation / Dipole Sn# 092
Forward Power = 247mW Reflected Power = -28.30dB
Room Temp at time of measurement = 23C Simulant Temp at time of measurement = 21.6C
R5: TP-1132 SUGAR (rev.3); Flat
Probe: ET3DV6 - SN1391 - VALIDATION; ConvF(6.31,6.31,6.31); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.96 mho/m ε_r = 40.6 ρ = 1.00 g/cm^3
Cubes (2): Peak: 4.69 mW/g ± 0.08 dB, SAR (1g): 2.95 mW/g ± 0.08 dB, SAR (10g): 1.86 mW/g ± 0.07 dB, (Worst-case extrapolation)
Penetration depth: 11.5 (10.7, 12.7) [mm]
Powerdrift: 0.04 dB





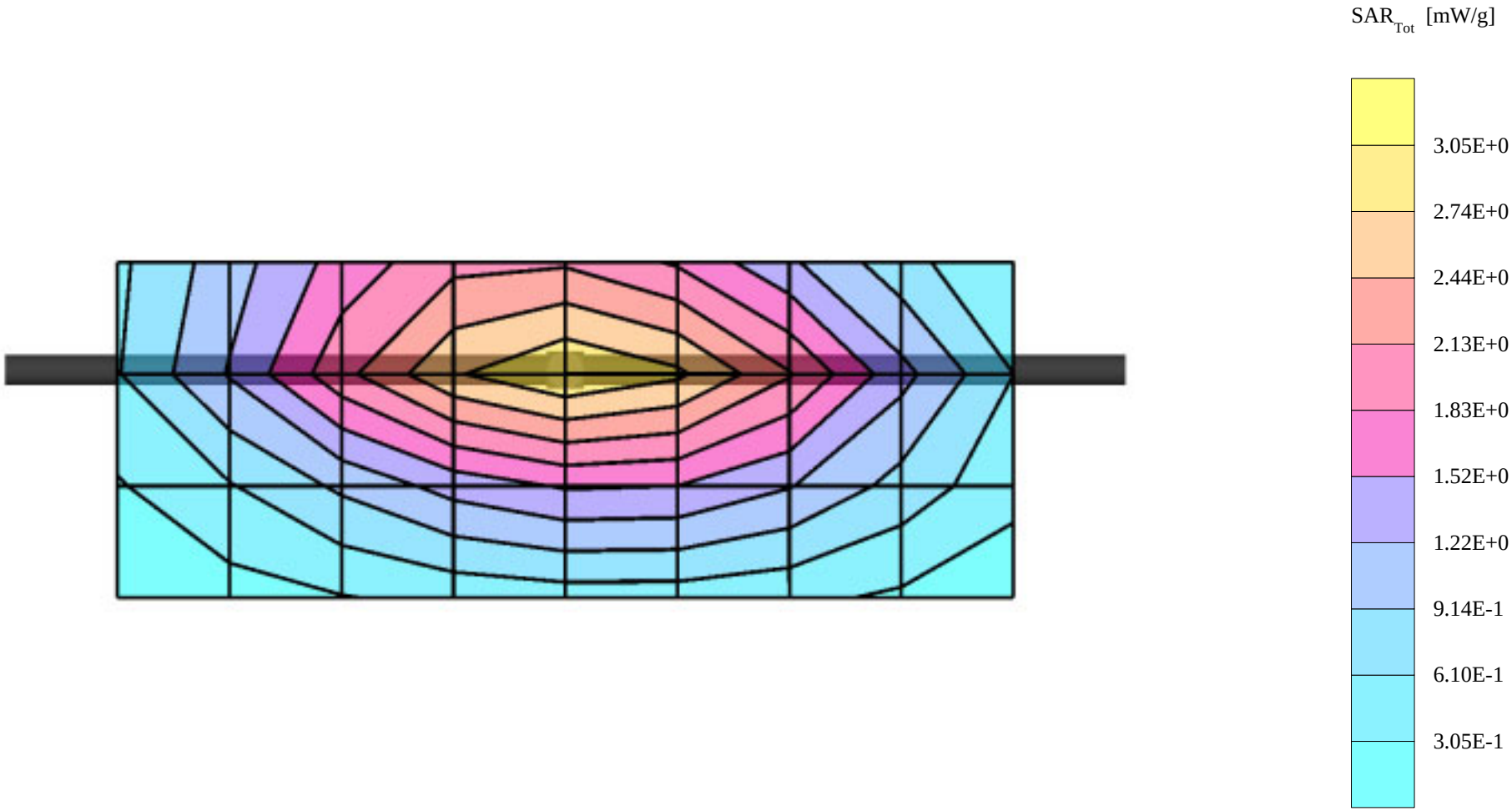
Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 092
Forward Power = 247mW Reflected Power = -28.30dB
Room Temp at time of measurement = 23C Simulant Temp at time of measurement = 21.6C
R5: TP-1132 SUGAR (rev.3) Phantom; Section; Position: ; Frequency: 900 MHz
Probe: ET3DV6 - SN1391 - VALIDATION; ConvF(6.31,6.31,6.31); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.96 mho/m ε_r = 40.6 ρ = 1.00 g/cm^3
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 11.7 (10.8, 12.9) [mm]



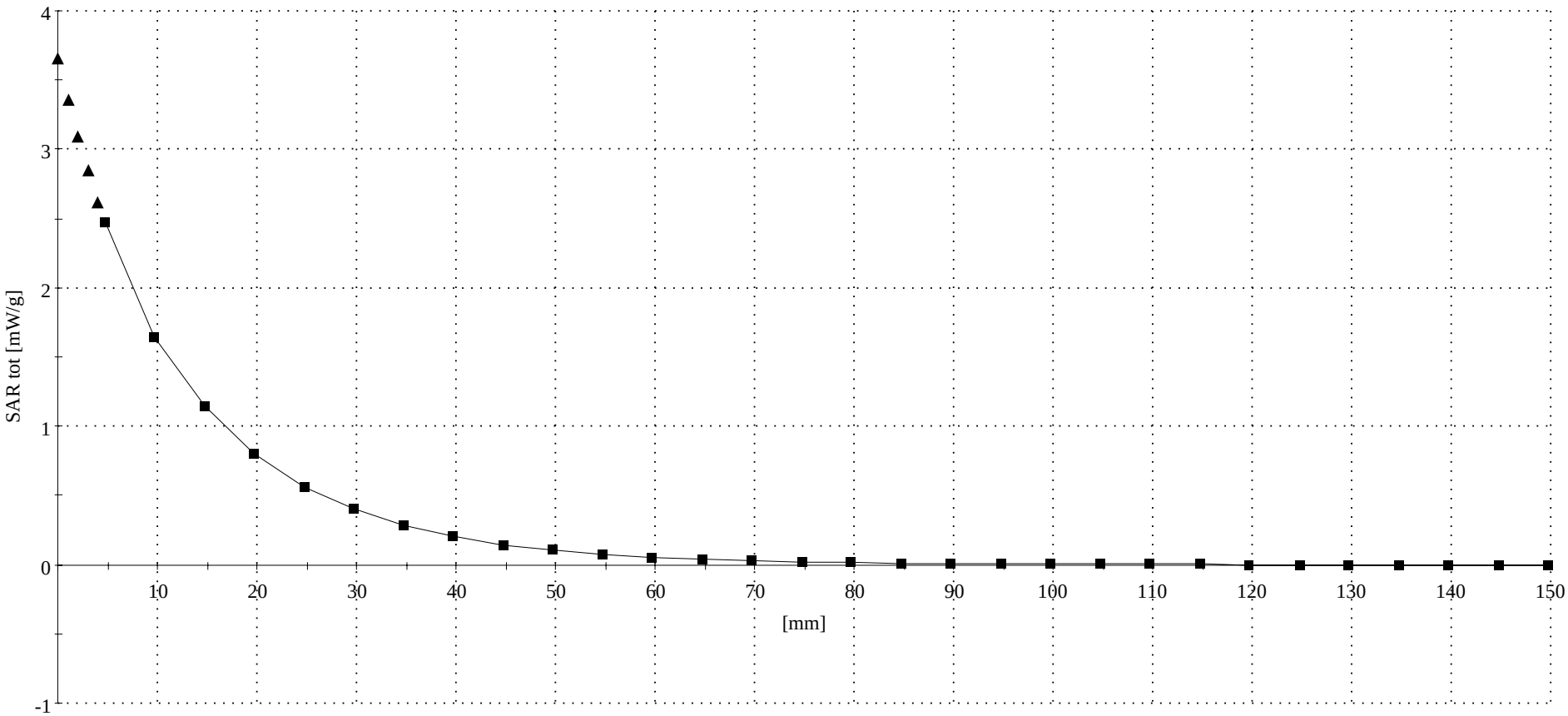
Dipole 900 MHz

900MHz Dipole Validation / Dipole Sn# 95
Forward Power = 253mW Reflected Power = -20.80dB
Room Temp at time of measurement =23c Simulant Temp at time of measurement = 22.3
R1: TP-1005 SUGAR (rev. 3) ; Flat
Probe: ET3DV6 - SN1508 - Validation; ConvF(6.35,6.35,6.35); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.97 mho/m ε_r = 41.1 ρ = 1.00 g/cm^3
Cubes (2): Peak: 4.76 mW/g ± 0.03 dB, SAR (1g): 3.00 mW/g ± 0.05 dB, SAR (10g): 1.89 mW/g ± 0.05 dB, (Worst-case extrapolation)
Penetration depth: 11.6 (10.8, 12.7) [mm]
Powerdrift: 0.07 dB



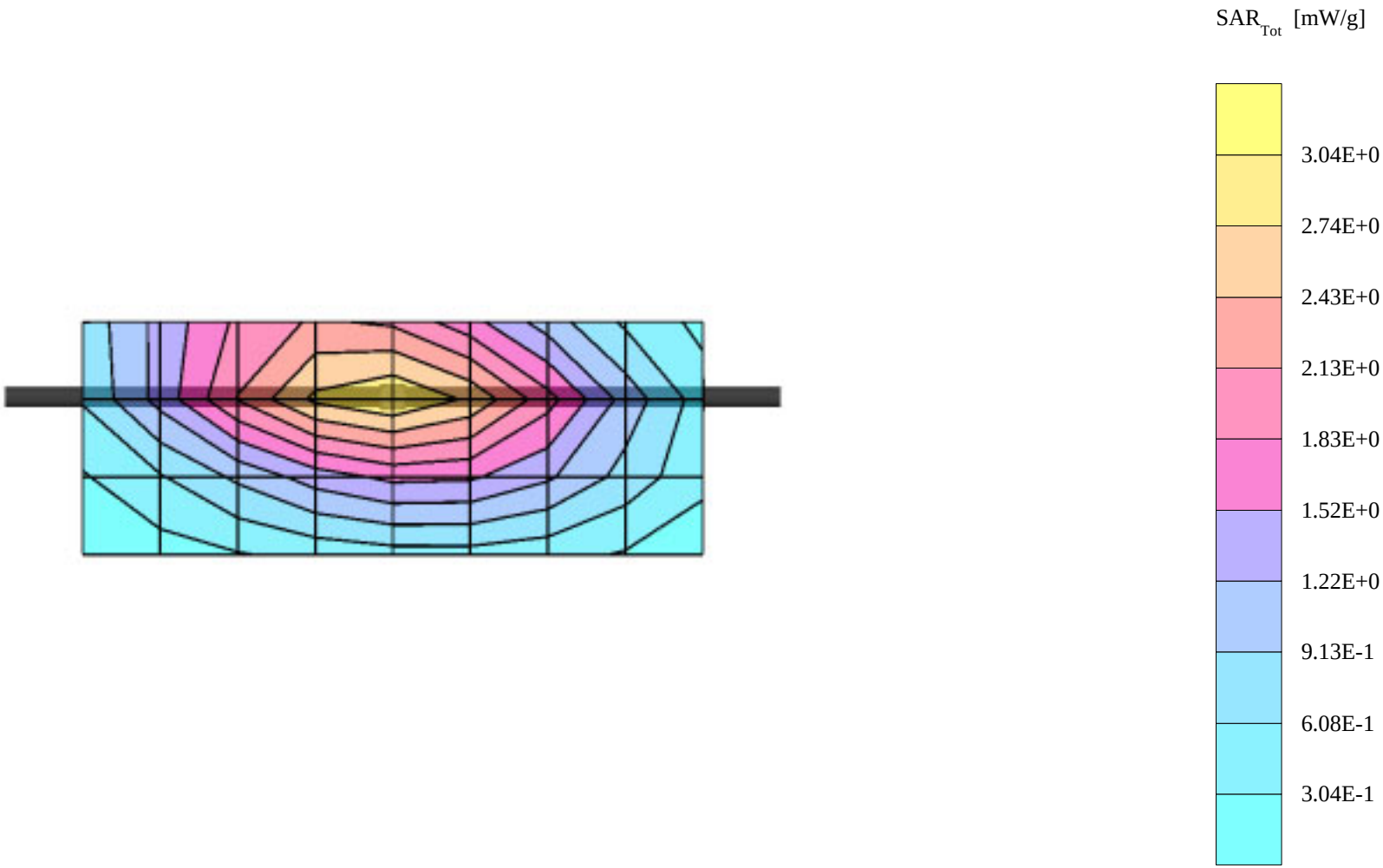
Dipole 900 MHz

900MHz Dipole Validation / Dipole Sn# 95
Forward Power = 253mW Reflected Power = -20.80dB
Room Temp at time of measurement =23c Simulant Temp at time of measurement = 22.3
R1: TP-1005 SUGAR (rev. 3) Phantom; Section; Position: ; Frequency: 900 MHz
Probe: ET3DV6 - SN1508 - Validation; ConvF(6.35,6.35,6.35); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.97 mho/m ε_r = 41.1 ρ = 1.00 g/cm^3
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 12.9 (12.2, 13.7) [mm]



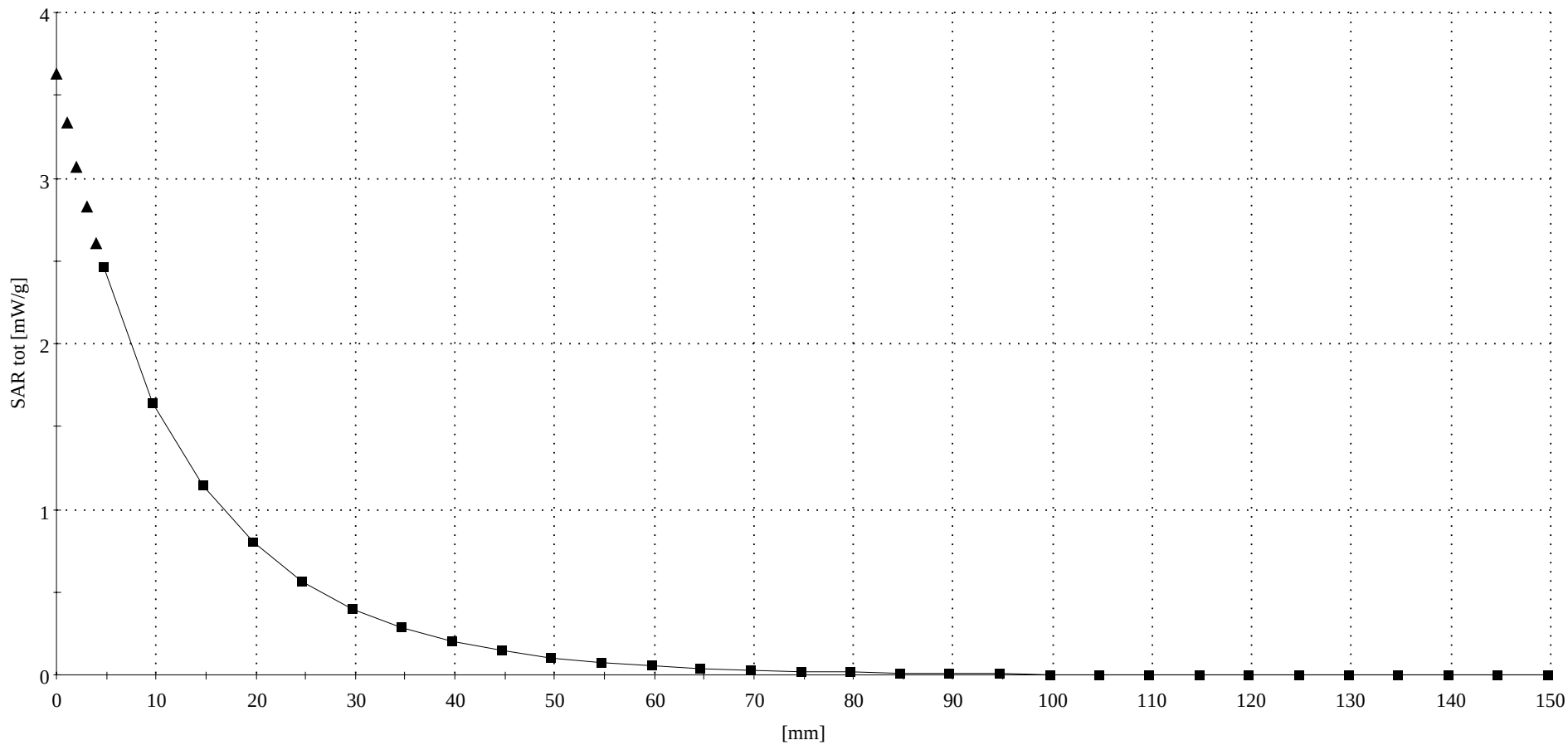
Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 95
Forward Power = 252 mW Reflected Power = -20.52dB
R1: TP-1005 SUGAR (rev. 3) ; Flat
Probe: ET3DV6 - SN1508 - Validation; ConvF(6.35,6.35,6.35); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.96 mho/m ε_r = 40.3 ρ = 1.00 g/cm^3
Cubes (2): Peak: 4.78 mW/g ± 0.06 dB, SAR (1g): 3.01 mW/g ± 0.06 dB, SAR (10g): 1.90 mW/g ± 0.06 dB, (Worst-case extrapolation)
Penetration depth: 11.6 (10.8, 12.8) [mm]
Powerdrift: 0.03 dB



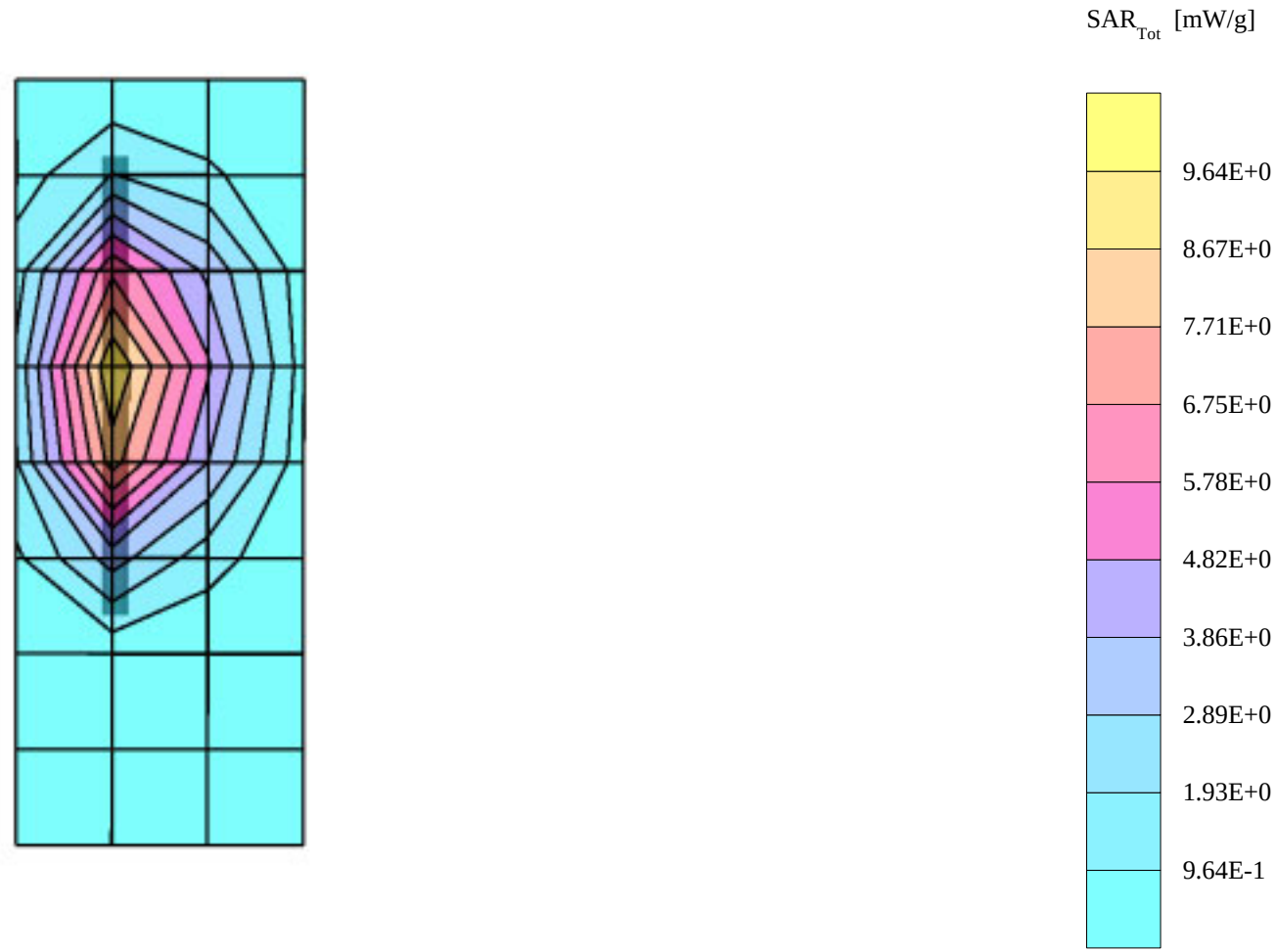
Dipole 900 MHz

900 MHz Dipole Validation / Dipole Sn# 95
Forward Power = 252mW Reflected Power = -20.52 dB
R1: TP-1005 SUGAR (rev. 3) ;
Probe: ET3DV6 - SN1508 - Validation; ConvF(6.35,6.35,6.35); Crest factor: 1.0; 900 MHz VALIDATION: σ = 0.96 mho/m ε_r = 40.3 ρ = 1.00 g/cm^3
: , , ()
Penetration depth: 12.9 (12.2, 13.8) [mm]



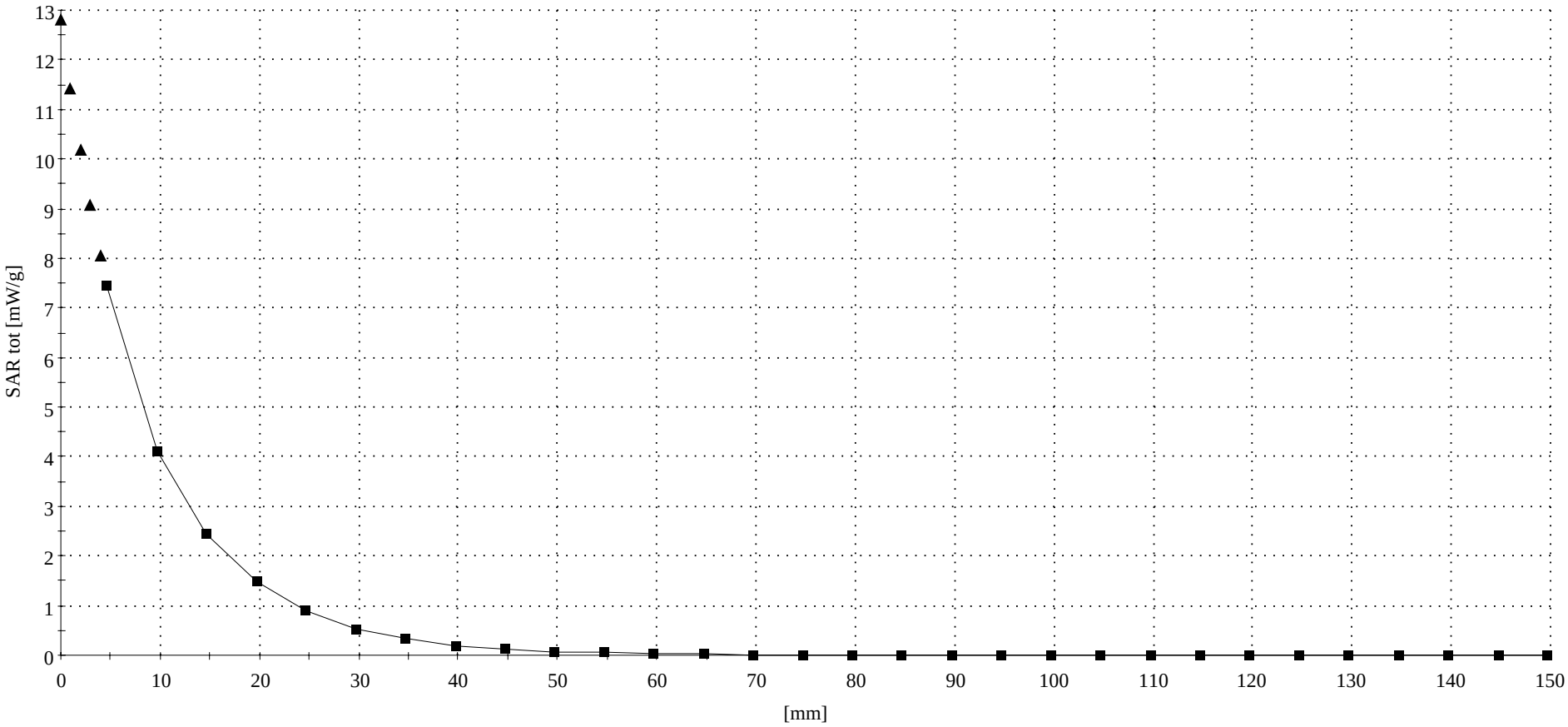
Dipole 1800 MHz

1800 MHz Dipole Validation / Dipole Sn# 284TR
Forward Power = 249 mW Reflected Power = -23.85dB
Room Temp at time of measurement = 24C Simulant Temp at time of measurement = 22.1C
R5 Amy Twin Phantom Rev.3 ; section 1
Probe: ET3DV6 - SN1391 - VALIDATION; ConvF(5.43,5.43,5.43); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.36 mho/m ε_r = 38.6 ρ = 1.00 g/cm^3
Cubes (2): Peak: 17.9 mW/g ± 0.02 dB, SAR (1g): 9.73 mW/g ± 0.07 dB, SAR (10g): 5.13 mW/g ± 0.10 dB, (Worst-case extrapolation)
Penetration depth: 8.6 (8.3, 9.4) [mm]
Powerdrift: -0.03 dB



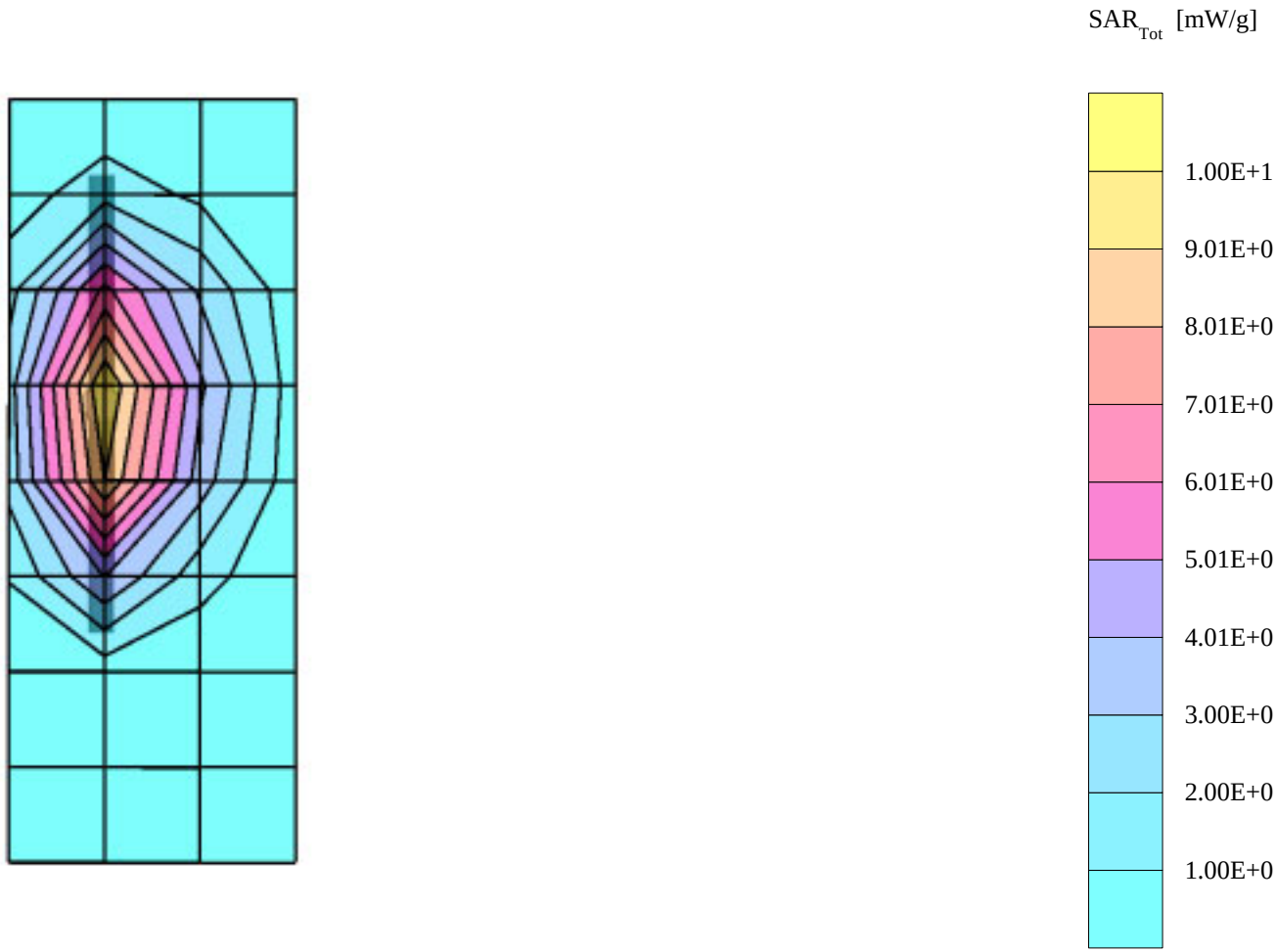
Dipole 1800 MHz

1800 MHz Dipole Validation / Dipole Sn# 284TR
Forward Power = 249mW Reflected Power = -23.85dB
Room Temp at time of measurement = 24C Simulant Temp at time of measurement = 22.1C
R5 Amy Twin Phantom Rev.3 ;
Probe: ET3DV6 - SN1391 - VALIDATION; ConvF(5.43,5.43,5.43); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.36 mho/m ε_r = 38.6 ρ = 1.00 g/cm^3
: , , ()
Penetration depth: 8.9 (8.5, 9.6) [mm]



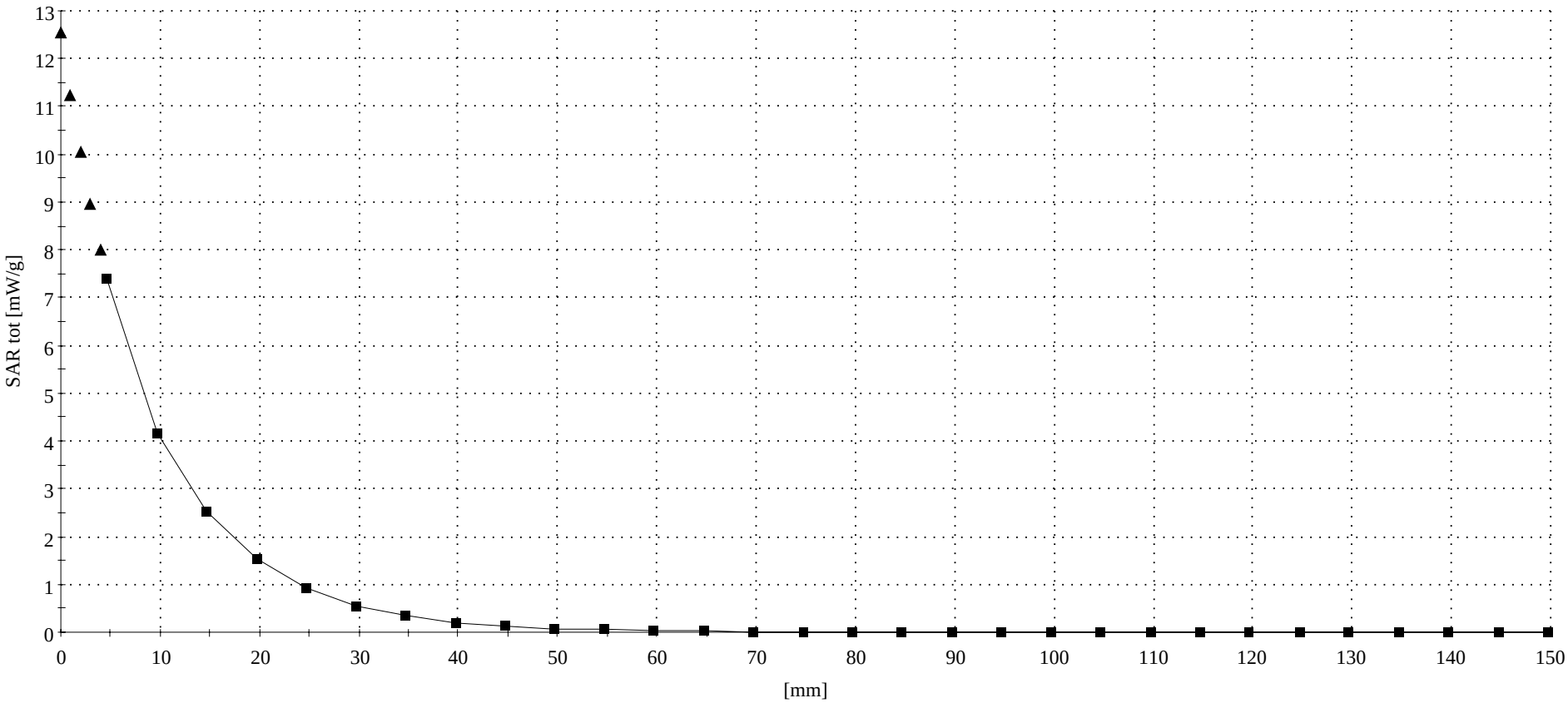
Dipole 1800 MHz

1800 MHz Dipole Validation / Dipole Sn# 284TR
Forward Power = 251mW Reflected Power = -24.50dB
Room Temp at time of measurement = 23C Simulant Temp at time of measurement = 20.9C
R5 Amy Twin Phantom Rev.3 ; section 1
Probe: ET3DV6 - SN1391 - VALIDATION; ConvF(5.43,5.43,5.43); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.39 mho/m ε_r = 39.5 ρ = 1.00 g/cm^3
Cubes (2): Peak: 18.6 mW/g ± 0.05 dB, SAR (1g): 10.1 mW/g ± 0.01 dB, SAR (10g): 5.28 mW/g ± 0.02 dB, (Worst-case extrapolation)
Penetration depth: 8.4 (8.1, 9.2) [mm]
Powerdrift: 0.01 dB



Dipole 1800 MHz

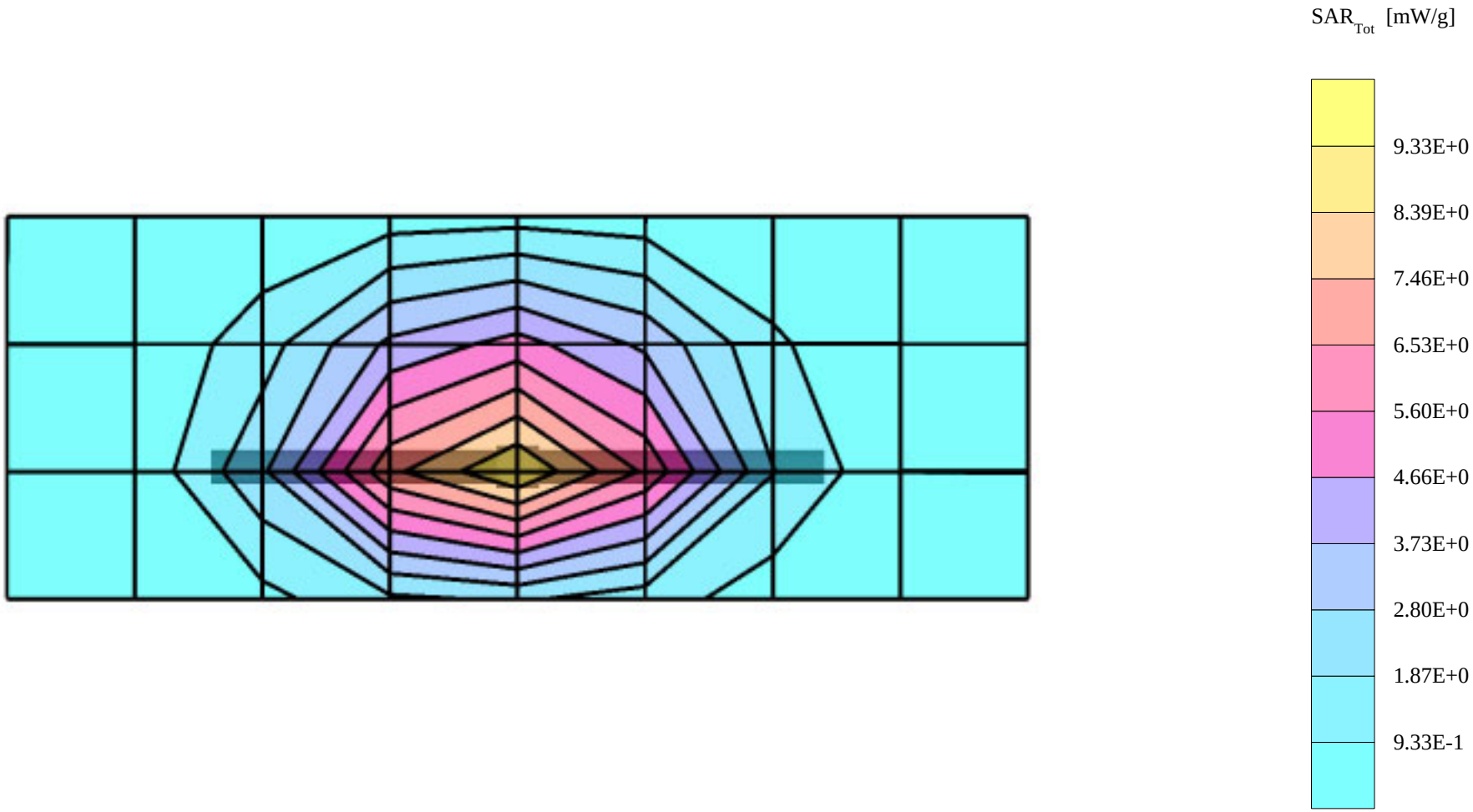
1800 MHz Dipole Validation / Dipole Sn# 284TR
Forward Power = 251mW Reflected Power = -24.50dB
Room Temp at time of measurement = 23C Simulant Temp at time of measurement = 20.9C
R5 Amy Twin Phantom Rev.3 Phantom; Section; Position: ; Frequency: 1800 MHz
Probe: ET3DV6 - SN1391 - VALIDATION; ConvF(5.43,5.43,5.43); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.39 mho/m ε_r = 39.5 ρ = 1.00 g/cm^3
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 9.1 (8.8, 9.8) [mm]



04/29/02

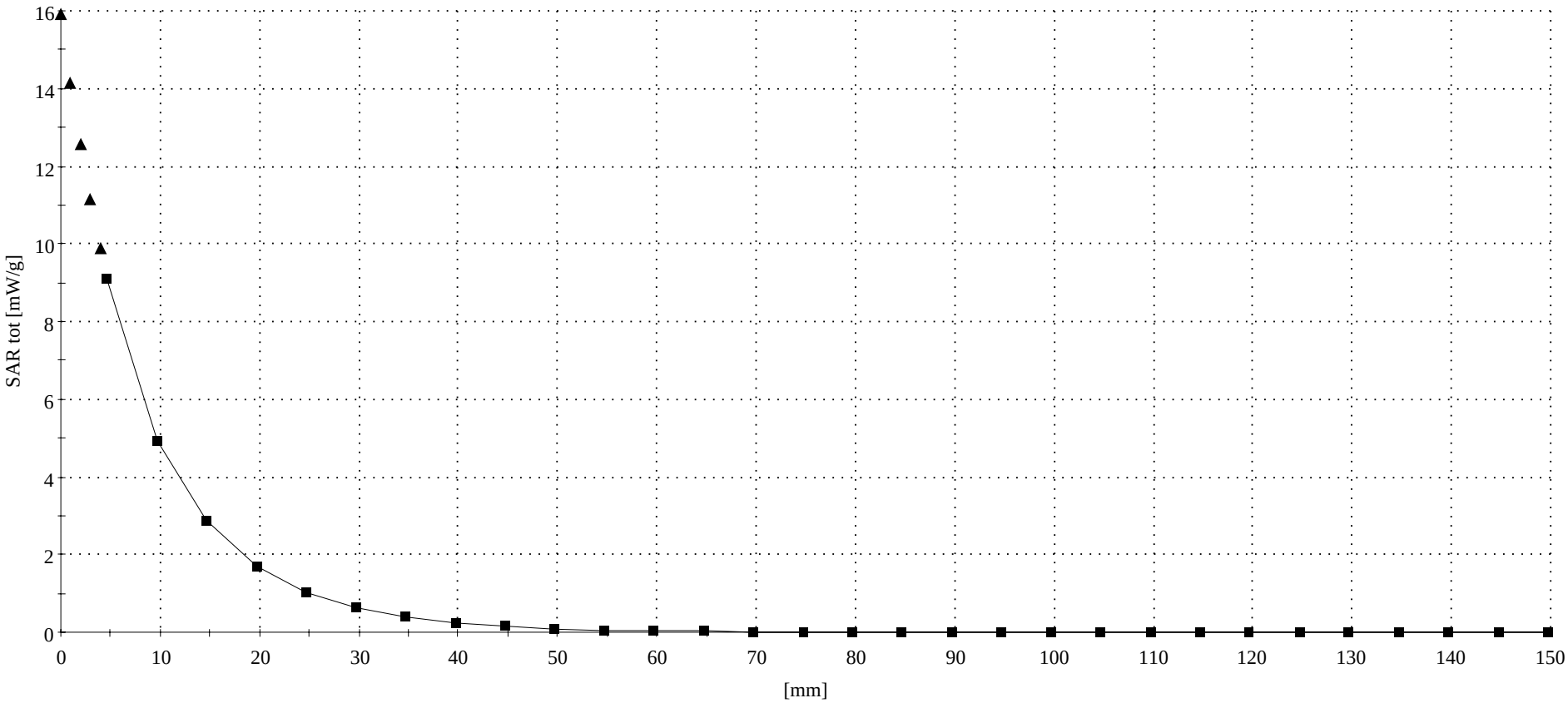
Dipole 1800 MHz

1800 MHz Dipole Validation / Dipole Sn# 283TR
Forward Power = 251mW Reflected Power = -25.61dB
Room Temp at time of measurement = 22C Simulant Temp at time of measurement = 21.5C
R5: TP-1133 GLYCOL (rev. 3) ; Flat
Probe: ET3DV6 - SN1391 - VALIDATION; ConvF(5.43,5.43,5.43); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.39 mho/m ε_r = 39.9 ρ = 1.00 g/cm^3
Cubes (2): Peak: 17.6 mW/g ± 0.05 dB, SAR (1g): 9.60 mW/g ± 0.02 dB, SAR (10g): 5.05 mW/g ± 0.00 dB, (Worst-case extrapolation)
Penetration depth: 8.4 (8.1, 9.2) [mm]
Powerdrift: 0.00 dB



Dipole 1800 MHz

1800 MHz Dipole Validation / Dipole Sn# 283TR
Forward Power = 251mW Reflected Power = -25.61dB
Room Temp at time of measurement = 22C Simulant Temp at time of measurement = 21.5C
R5: TP-1133 GLYCOL (rev. 3) Phantom; Section; Position: ; Frequency: 1800 MHz
Probe: ET3DV6 - SN1391 - VALIDATION; ConvF(5.43,5.43,5.43); Crest factor: 1.0; 1800 MHz VALIDATION: σ = 1.39 mho/m ε_r = 39.9 ρ = 1.00 g/cm^3
: , ()
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0
Penetration depth: 8.5 (8.2, 9.3) [mm]



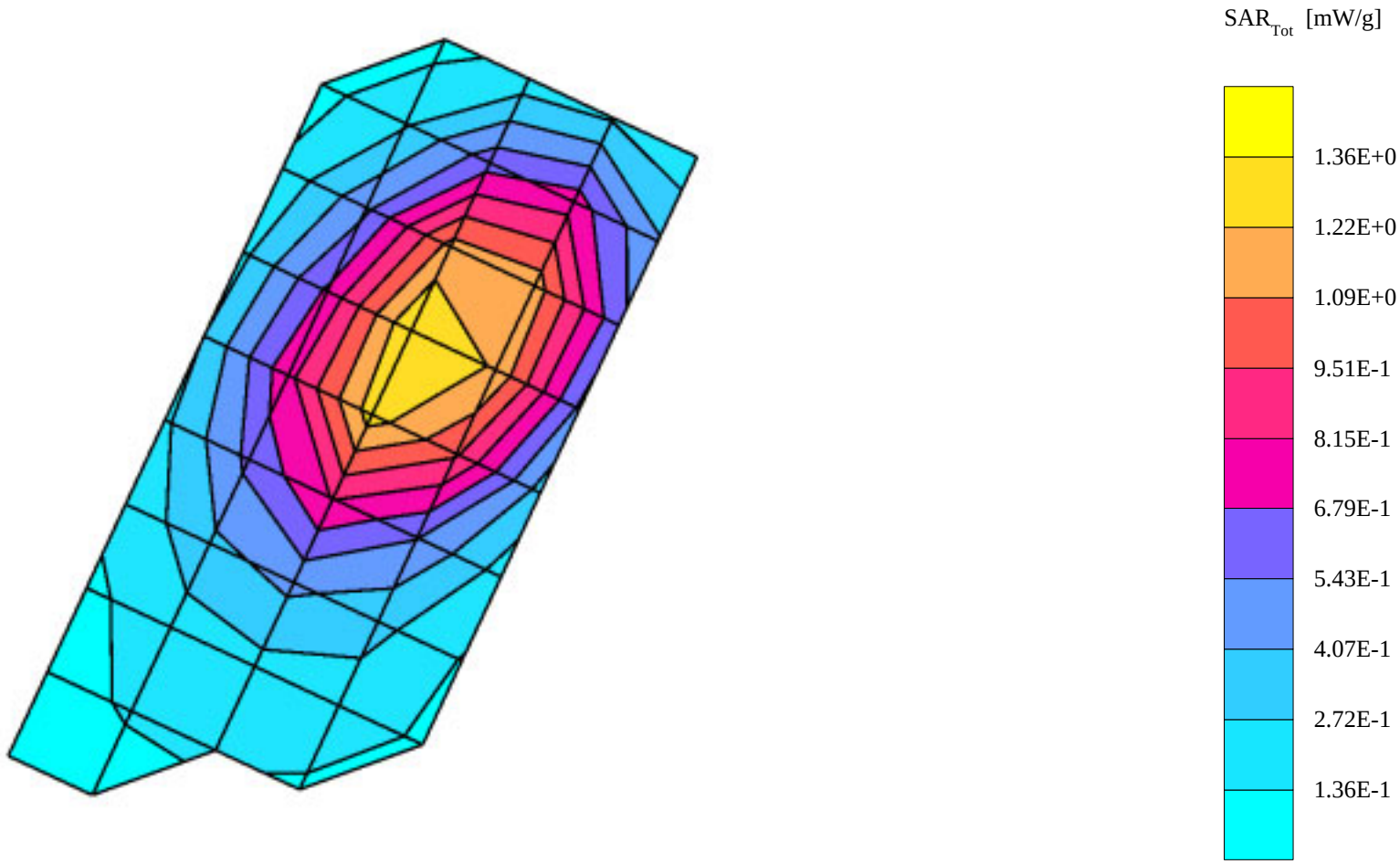
Appendix 2

SAR distribution plots for Phantom Head Adjacent Use

04/23/02

s/n: 525FE4E1

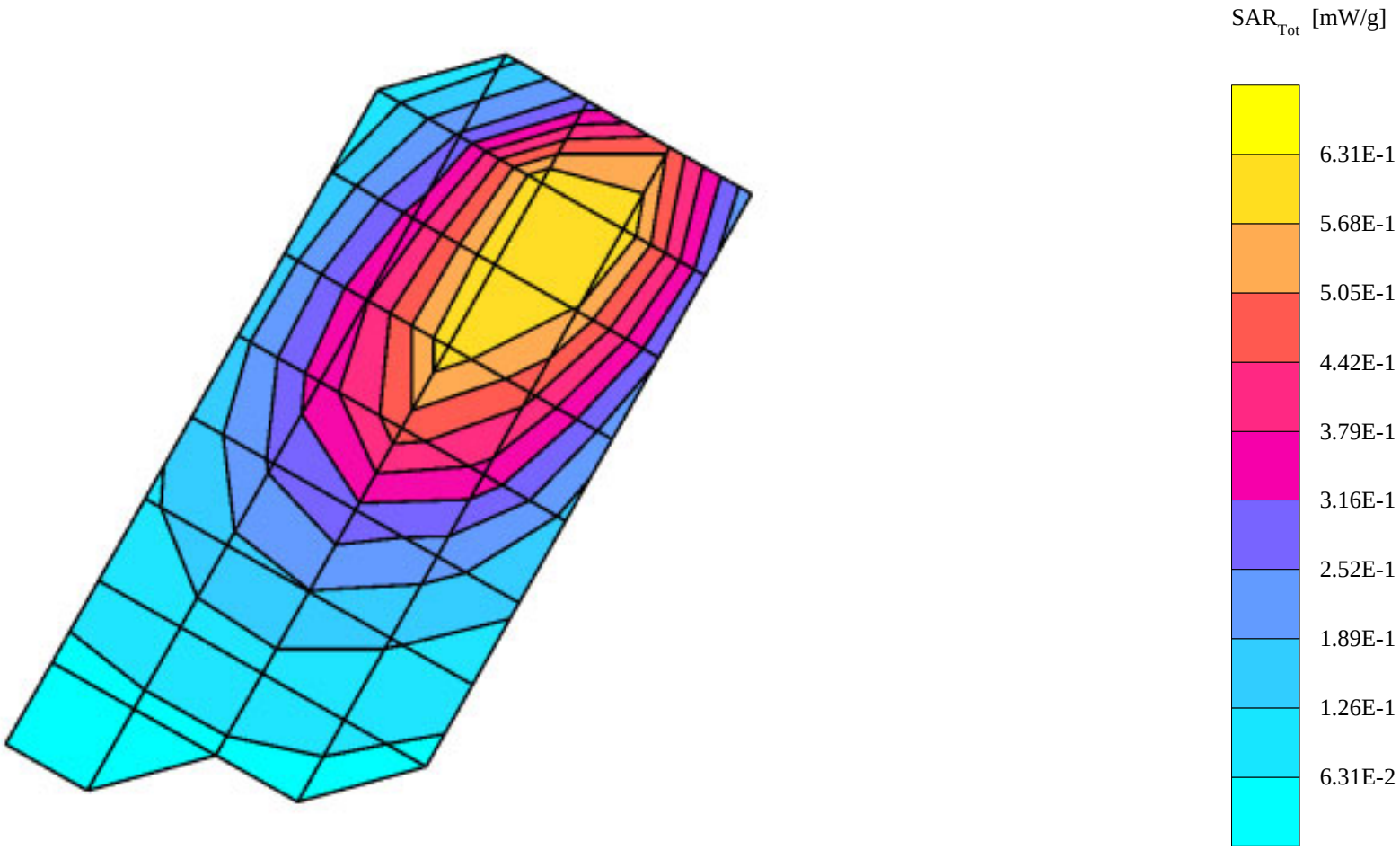
Ch# 991 / Pwr Step: 02 / Type of Modulation: 800 Analog / Battery Model #: SNN5571A
DEVICE POSITION: cheek
Simulant TEMP: When Measured = 22.6 °C After Test = 22.1 °C
R5: TP-1132 SUGAR (rev.3) Phantom; R5 Gilligan Left Hand Section; Position: (90°,180°); Frequency: 824 MHz
Probe: ET3DV6 - SN1391 - IEEE Head; ConvF(6.40,6.40,6.40); Crest factor: 1.0; 835 MHz Head & Body: σ = 0.91 mho/m ε_r = 41.8 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 1.44 mW/g, SAR (10g): 0.963 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 13.7 (12.4, 15.2) [mm]
Powerdrift: -0.07 dB



05/16/02

s/n: 525FE4E1

Ch# 384 / Pwr Step: 2 / Type of Modulation: 800 Analog / Battery Model #: SNN5571A
DEVICE POSITION: Tilted
Simulant TEMP: When Measured = 22.3 °C After Test = 22.5 °C
R1: TP-1005 SUGAR (rev. 3) Phantom; R2 Homer Left Head Section; Position: (90°,180°); Frequency: 836 MHz
Probe: ET3DV6 - SN1508 - IEEE Head; ConvF(6.50,6.50,6.50); Crest factor: 1.0; 835 MHz Head & Body: σ = 0.91 mho/m ε_r = 41.9 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.690 mW/g, SAR (10g): 0.446 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 12.5 (11.7, 13.4) [mm]



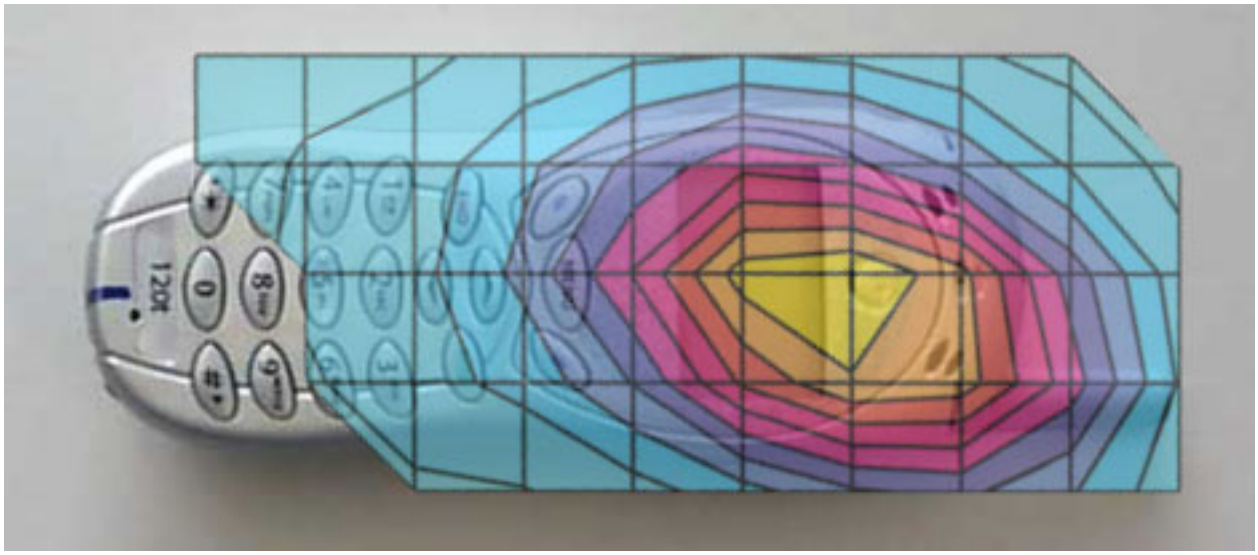


Figure 1. Typical 800MHz Cheek Touch SAR Contour Overlaid on Front of Phone

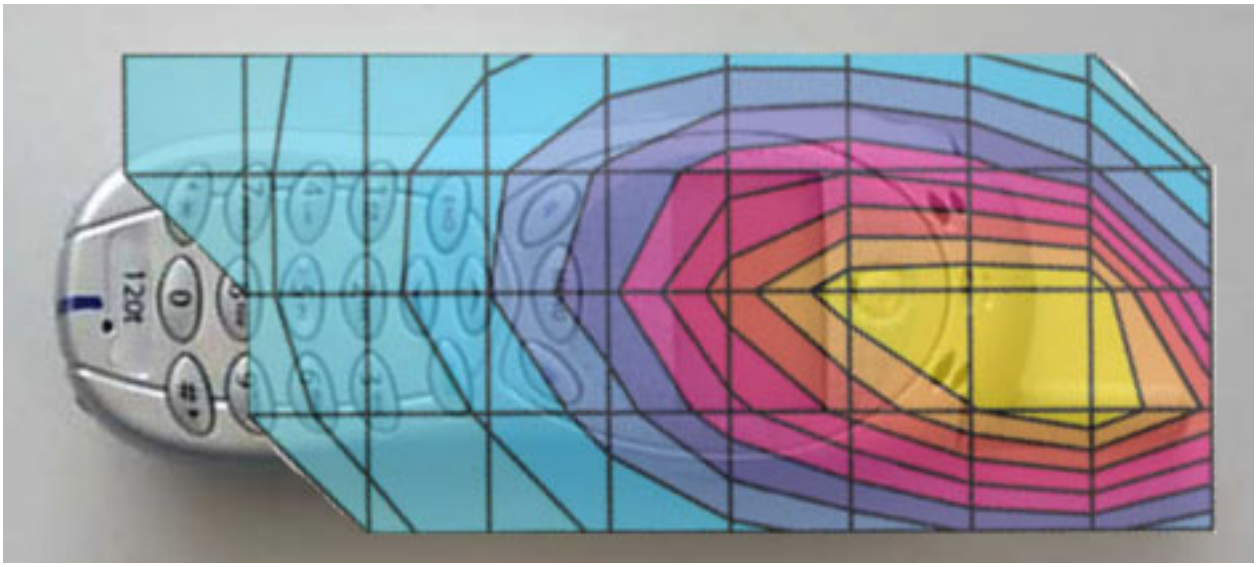
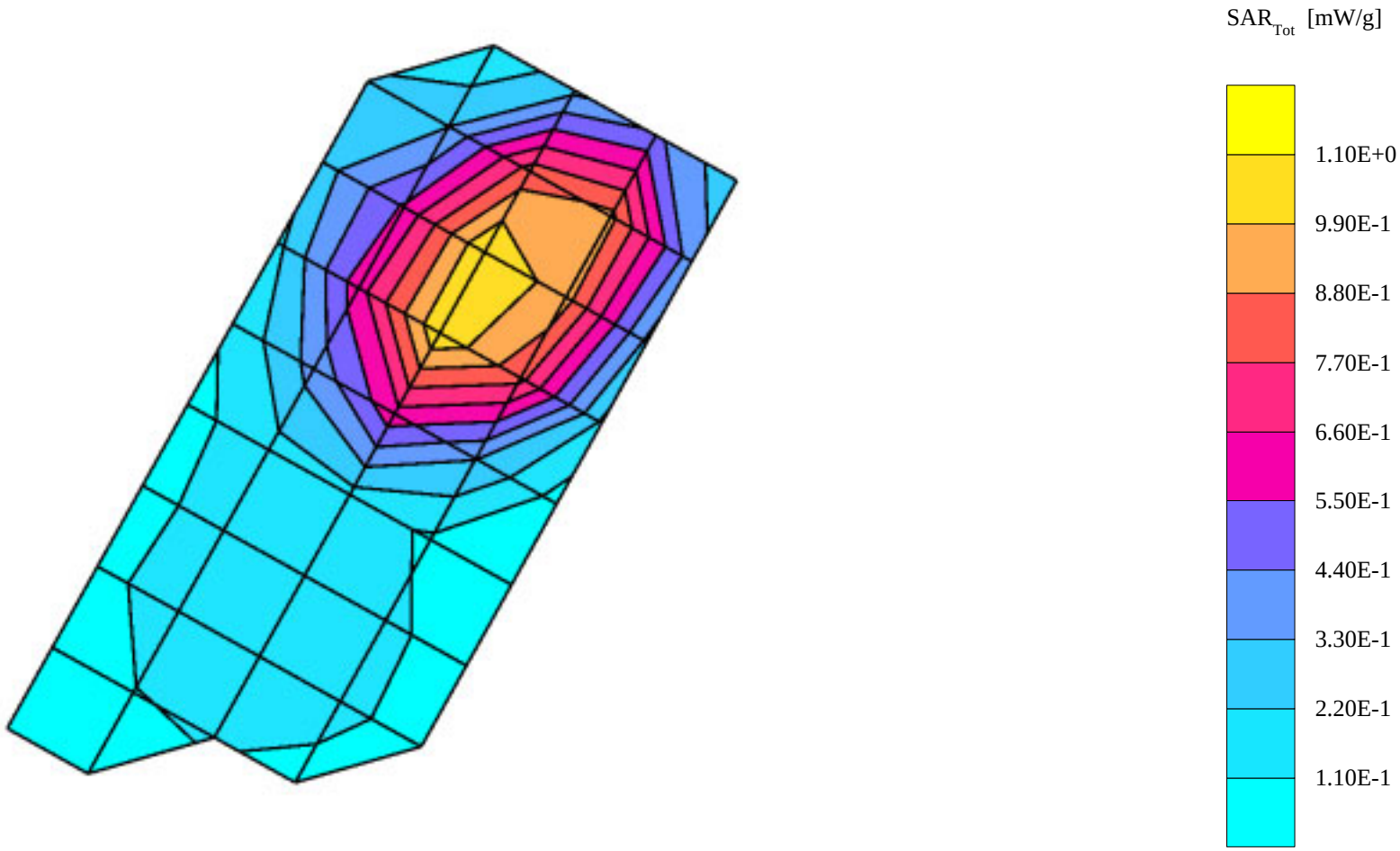


Figure 2. Typical 800MHz 15 Degree Tilt SAR Contour Overlaid on Front of Phone

04/23/02

s/n: 525FE8A8

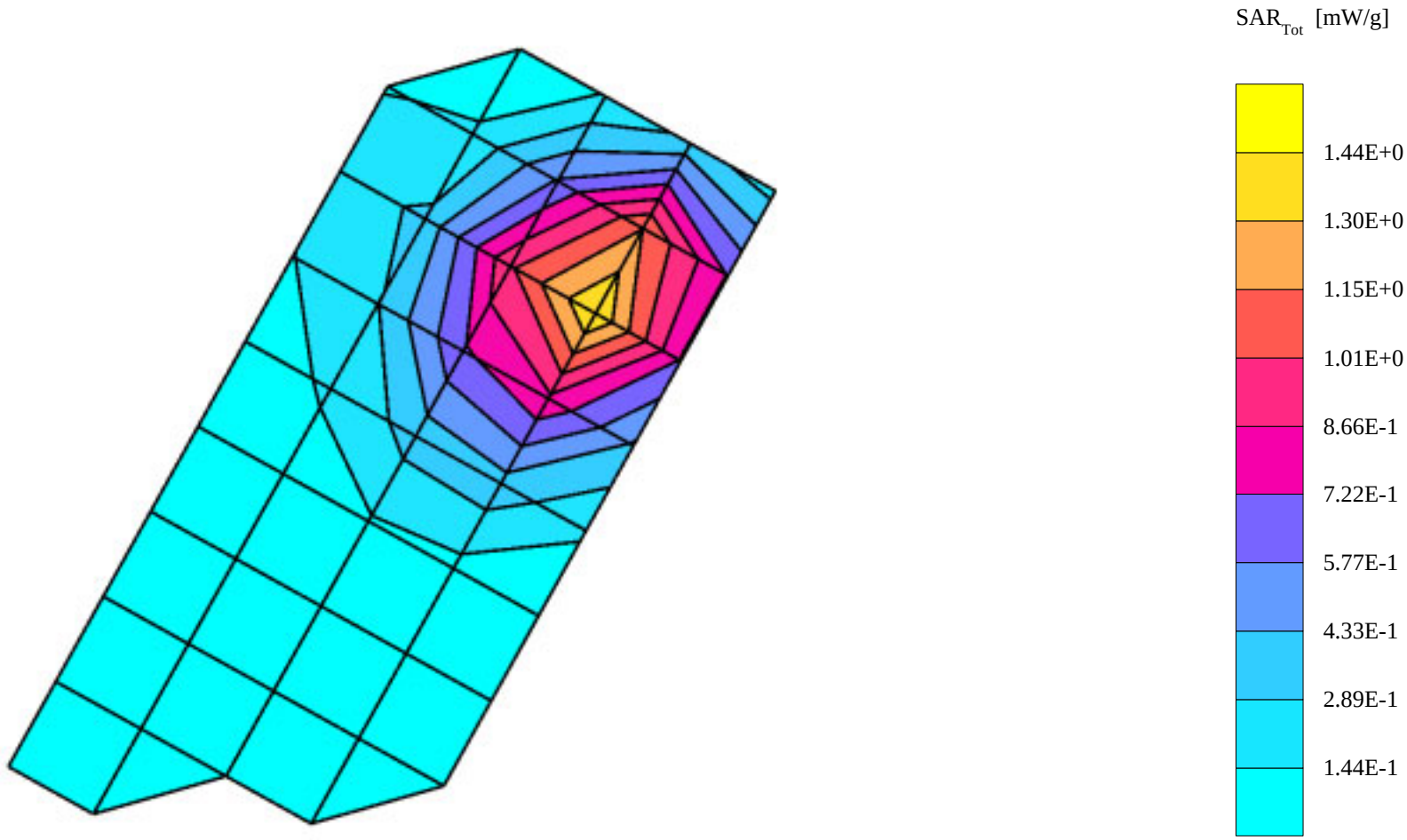
Ch# 1998 / Pwr Step: 2 / Type of Modulation:1900 TDMA / Battery Model #: SNN5571A
DEVICE POSITION: cheek
Simulant TEMP: When Measured = 22.1 °C After Test = 21.5 °C
R5: TP-1133 GLYCOL (rev. 3) Phantom; R5 Skipper Left Hand Section; Position: (90°,180°); Frequency: 1910 MHz
Probe: ET3DV6 - SN1391 - IEEE Head; ConvF(5.43,5.43,5.43); Crest factor: 3.0; 1880 MHz Head & Body: σ = 1.44 mho/m ε_r = 38.4 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 1.13 mW/g, SAR (10g): 0.695 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 10.9 (10.7, 11.1) [mm]



04/24/02

s/n: 525FE8A8

Ch# 2 / Pwr Step: 02 / Type of Modulation:1900 TDMA / Battery Model #: SNN5571A
DEVICE POSITION: 15 deg TILT
Simulant TEMP: When Measured = 20.9 °C After Test = 20.0 °C
R5: TP-1133 GLYCOL (rev. 3) Phantom; R5 Skipper Left Hand Section; Position: (90°,180°); Frequency: 1850 MHz
Probe: ET3DV6 - SN1391 - IEEE Head; ConvF(5.43,5.43,5.43); Crest factor: 3.0; 1880 MHz Head & Body: σ = 1.47 mho/m ε_r = 39.1 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 1.46 mW/g, SAR (10g): 0.821 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 15.0
Penetration depth: 9.1 (8.8, 9.7) [mm]
Powerdrift: -0.11 dB



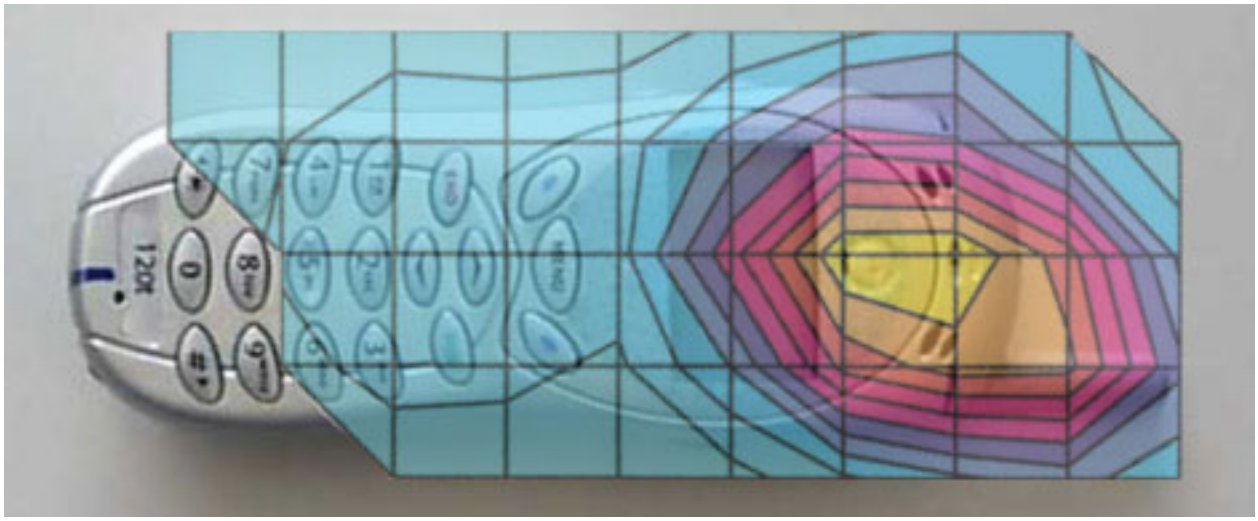


Figure 3. Typical 1900MHz Cheek Touch SAR Contour Overlaid on Front of Phone

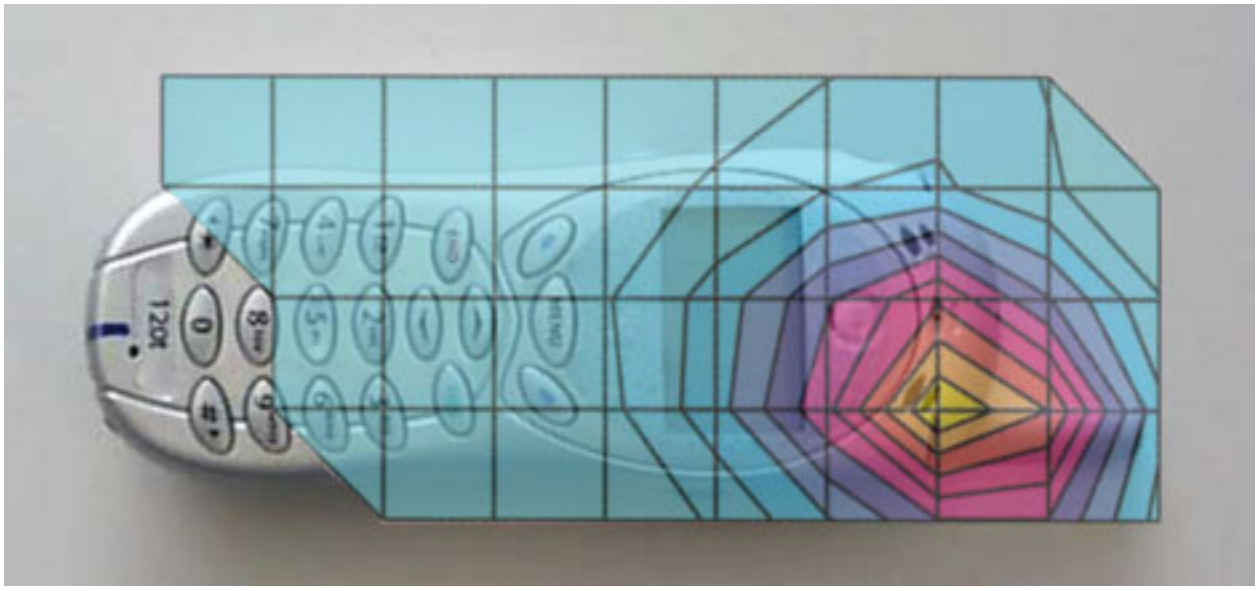


Figure 4. Typical 1900MHz 15 Degree Tilt SAR Contour Overlaid on Front of Phone

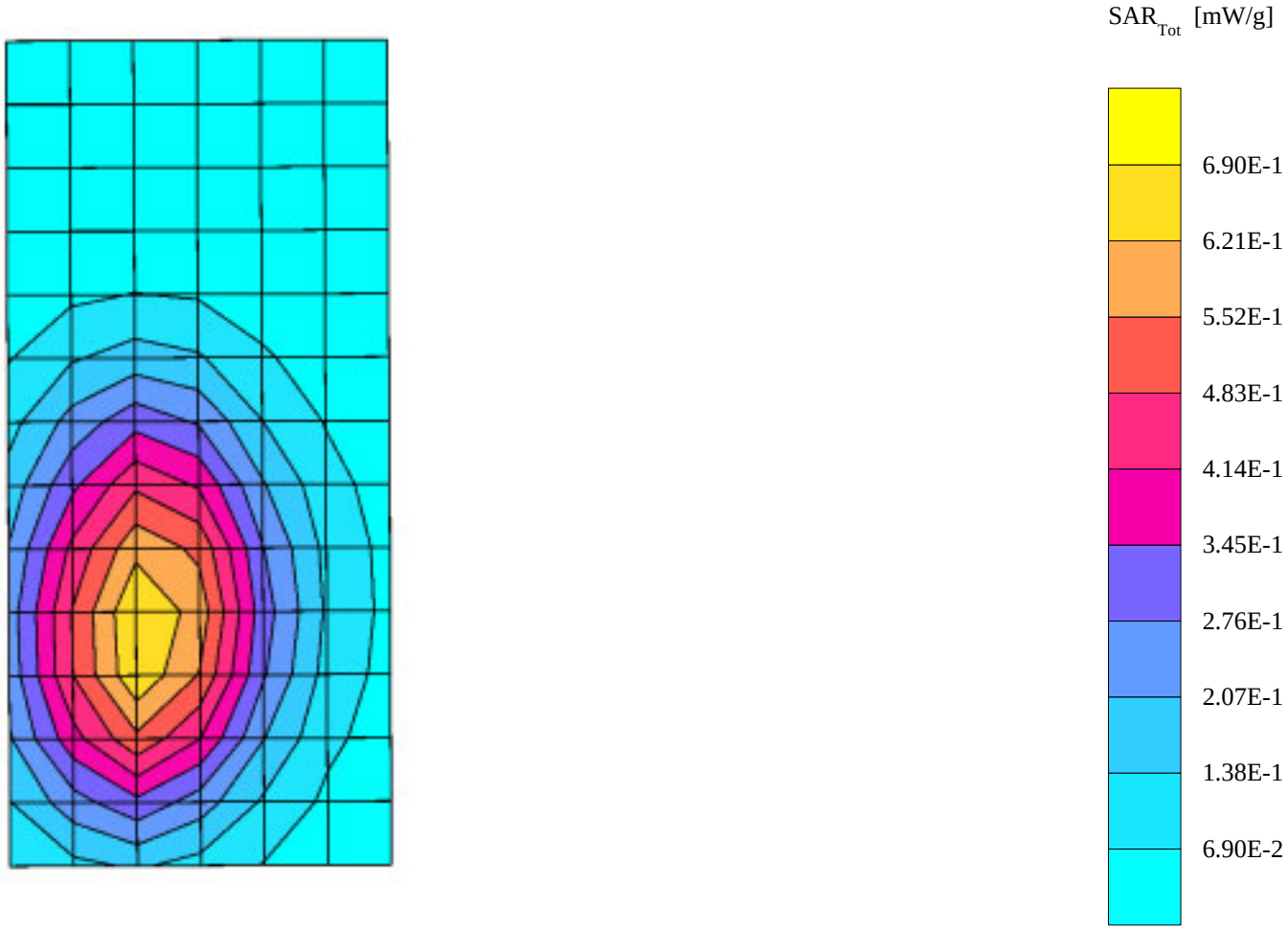
Appendix 3

SAR distribution plots for Body Worn Configuration

05/17/02

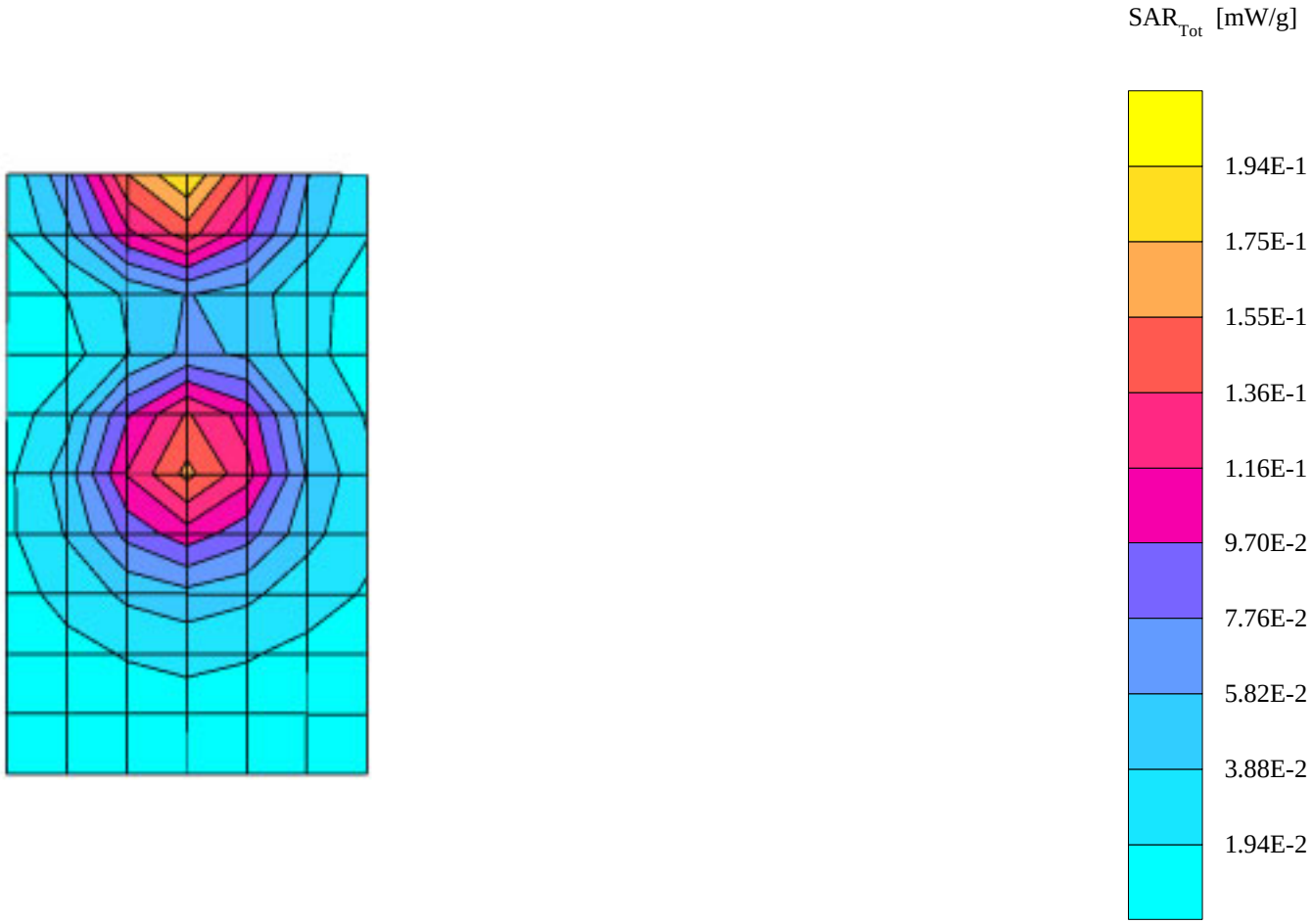
s/n: 525FE4E1

Ch#991 / Pwr Step:02 / Type of Modulation: 800 Analog / Battery Model #: SNN5571A
Accessory Model # = SHN7175A
R1 Amy Twin Phantom Rev.3 Phantom; section 2 Section; Position: (0°,0°); Frequency: 824 MHz
Probe: ET3DV6 - SN1508 - FCC Body; ConvF(6.20,6.20,6.20); Crest factor: 1.0; 835 MHz Head & Body: σ = 0.98 mho/m ε_r = 54.3 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.693 mW/g, SAR (10g): 0.494 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 16.3 (15.2, 17.6) [mm]
Powerdrift: -0.10 dB



s/n: 525FE8A8

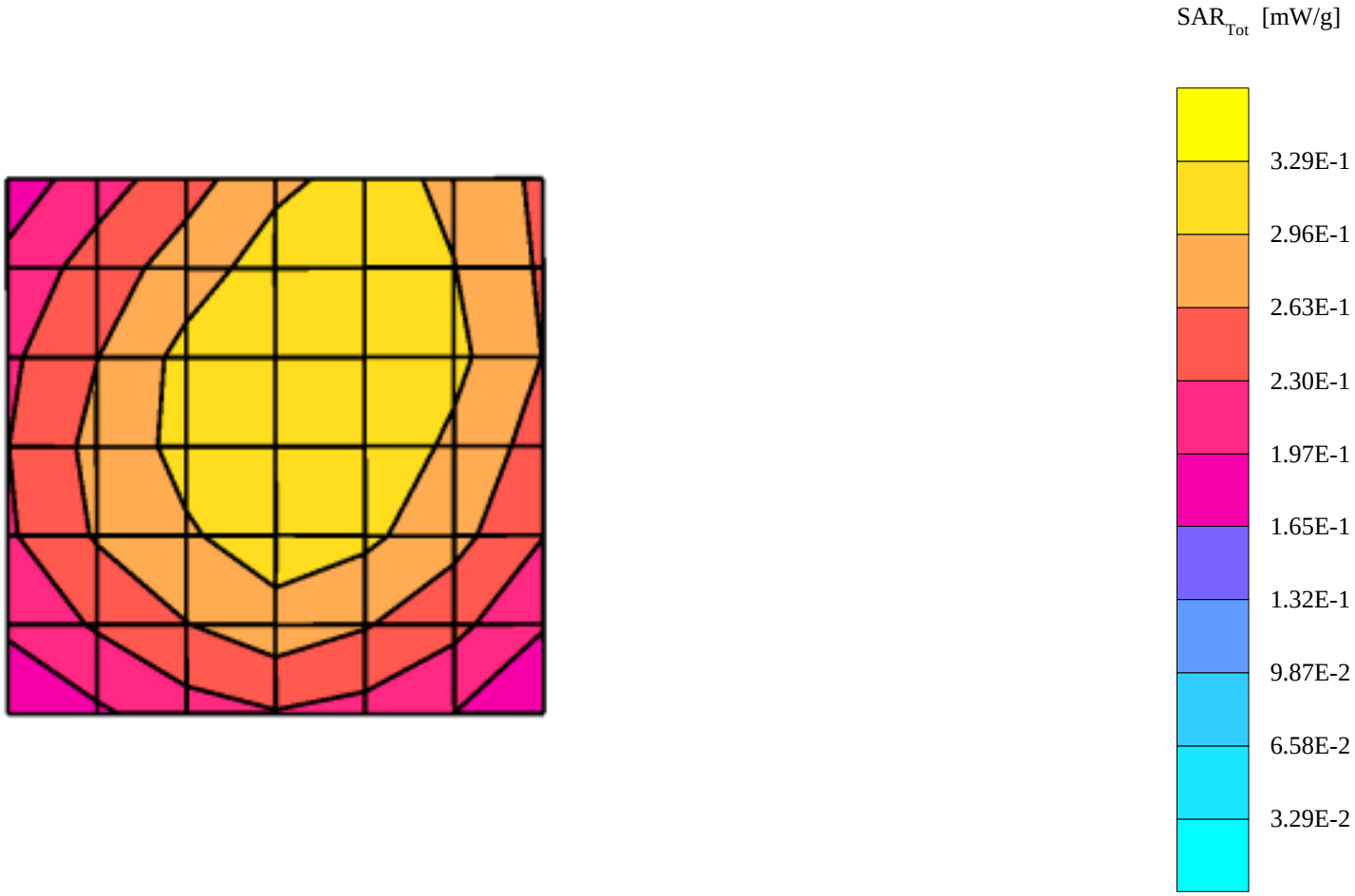
Ch# 1001 / Pwr Step: 02 / Antenna Position: Fixed / Type of Modulation: 1900 TDMA / Battery Model #: SNN5571A
Simulant TEMP: When Measured = 20.7 °C After Test = 20.7 °C
Accessory Model # = Belt Clip SHN7175A
R5 Amy Twin Phantom Rev.3 Phantom; section 1 Section; Position: (0°,0°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1391 - FCC Body; ConvF(5.00,5.00,5.00); Crest factor: 3.0; 1880 MHz Head & Body: σ = 1.58 mho/m ε_r = 51.1 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.195 mW/g, SAR (10g): 0.119 mW/g, (Worst-case extrapolation)
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Penetration depth: 10.3 (9.1, 12.1) [mm]
Powerdrift: -0.08 dB



04/29/02

s/n: 525FE8A8

Ch# 1001 / Pwr Step: 02 / Antenna Position: Fixed / Type of Modulation: 1900 TDMA / Battery Model #: SNN5571A
Simulant TEMP: When Measured = 20.7 °C After Test = 20.7 °C
Accessory Model # = Belt Clip SHN7175A
R5 Amy Twin Phantom Rev.3 Phantom; section 1 Section; Position: (0°,0°); Frequency: 1880 MHz
Probe: ET3DV6 - SN1391 - FCC Body; ConvF(5.00,5.00,5.00); Crest factor: 3.0; 1880 MHz Head & Body: σ = 1.58 mho/m ε_r = 51.1 ρ = 1.00 g/cm^3
Cube 7x7x7: SAR (1g): 0.195 mW/g, SAR (10g): 0.119 mW/g, (Worst-case extrapolation)
Cube 7x7x7: Dx = 5.0, Dy = 5.0, Dz = 5.0
Penetration depth: 10.3 (9.1, 12.1) [mm]



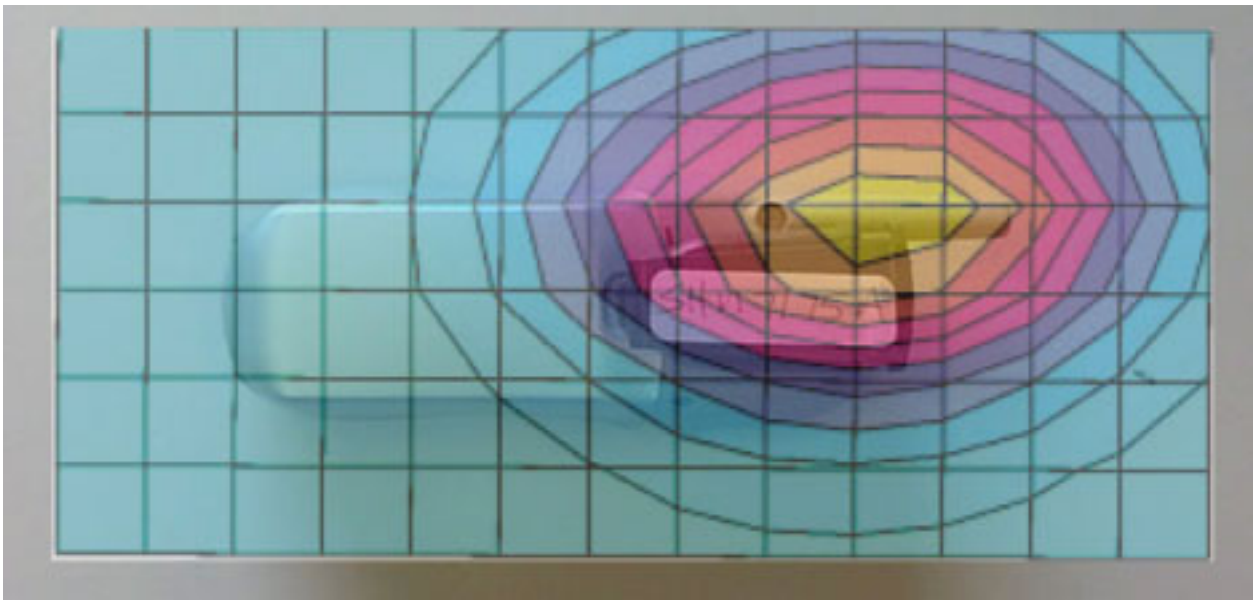


Figure 5. Typical 800MHz Body Worn SAR Contour Overlaid on Back of Phone

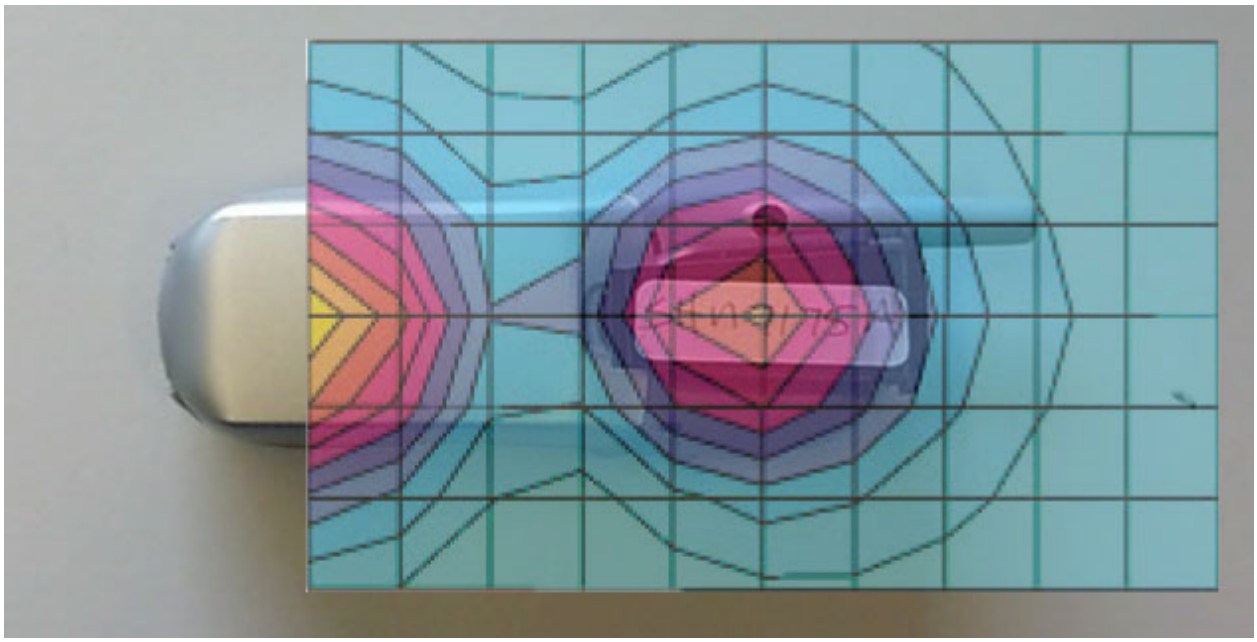


Figure 6. Typical 1900MHz Body Worn SAR Contour Overlaid on Back of Phone

Appendix 5

Photographs of the device under test

Figure 7. Front of Phone

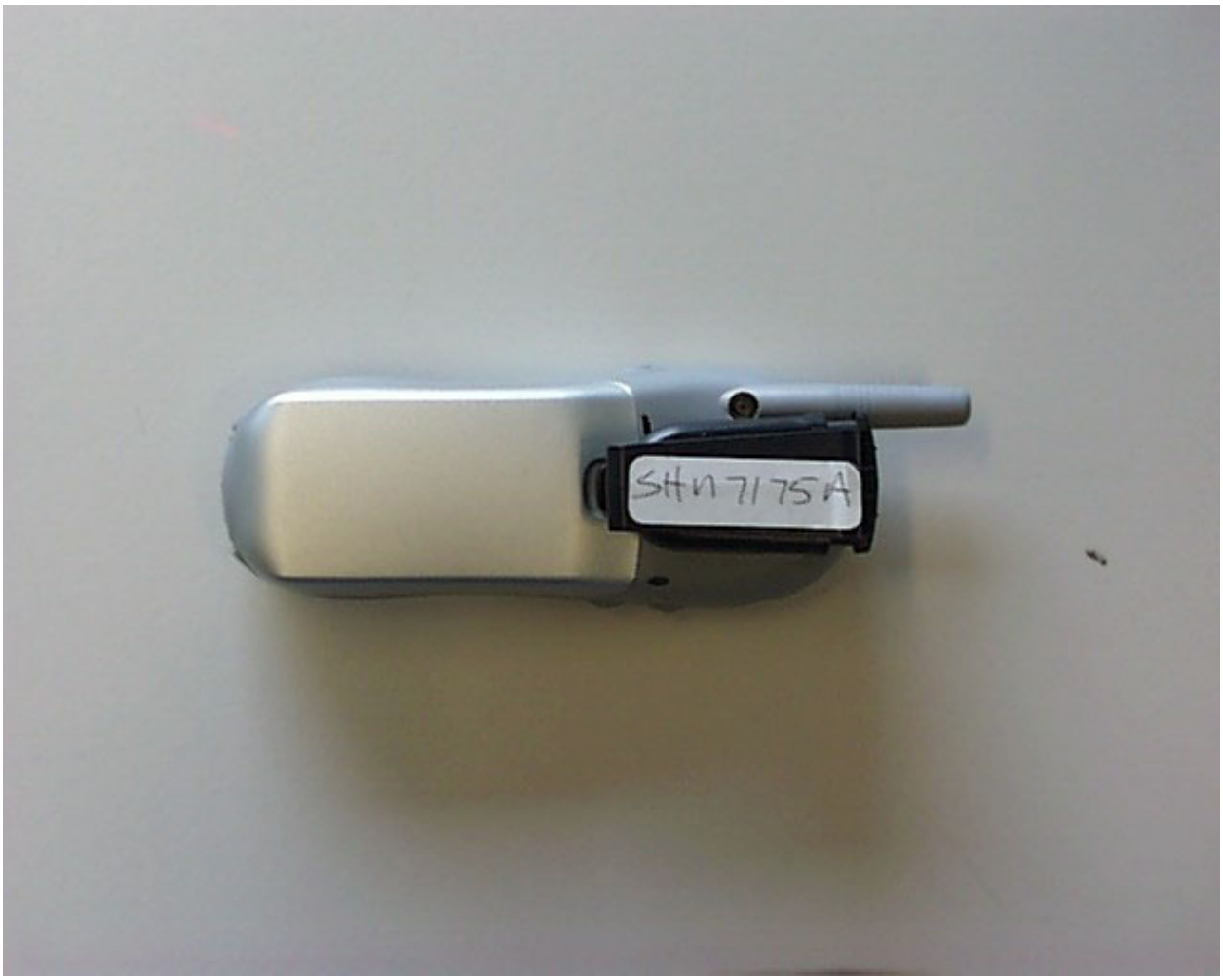


Figure 8. Back of Phone with Plastic Belt Clip Attached

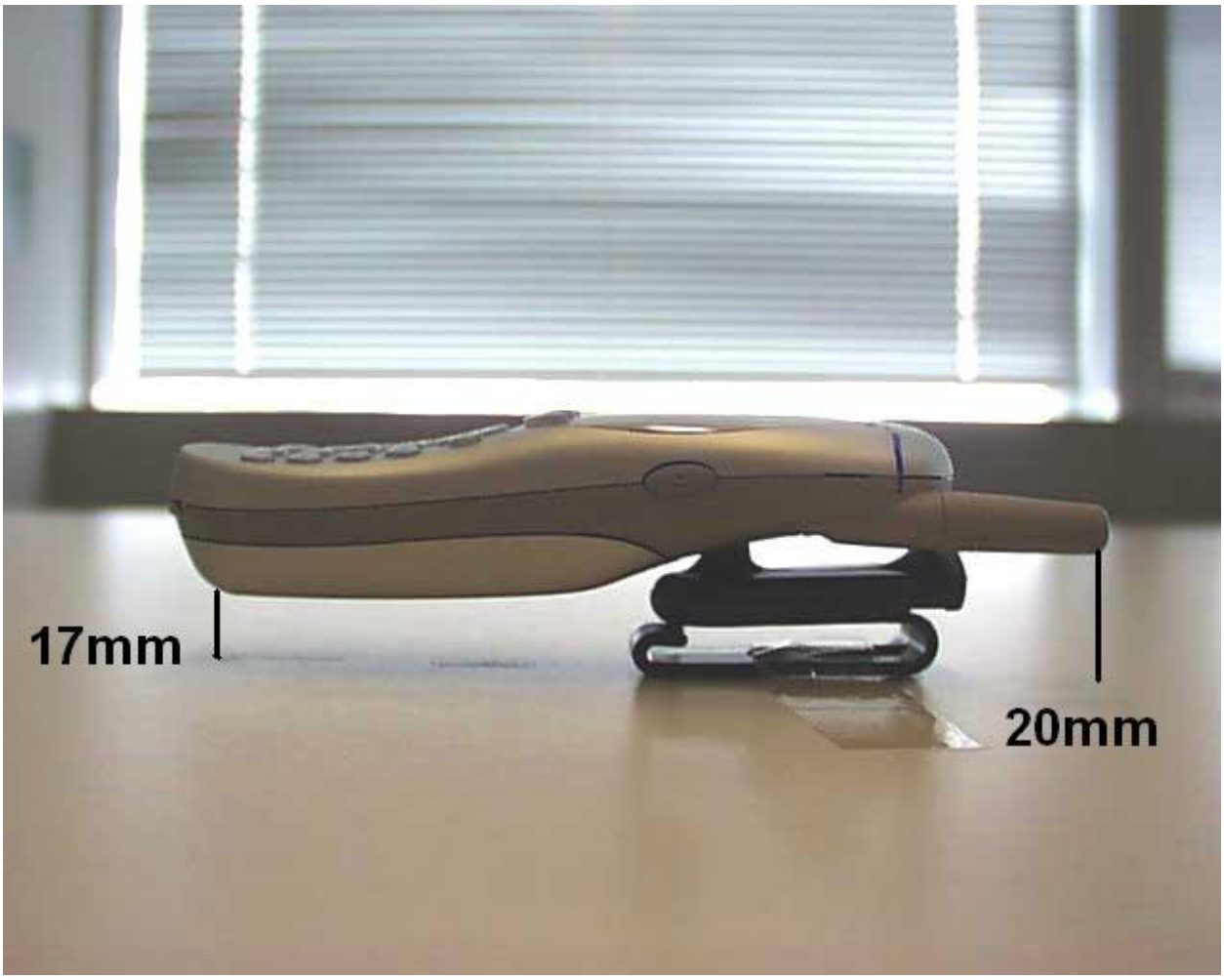


Figure 9. Separation Distance Provided from Plastic Belt Clip

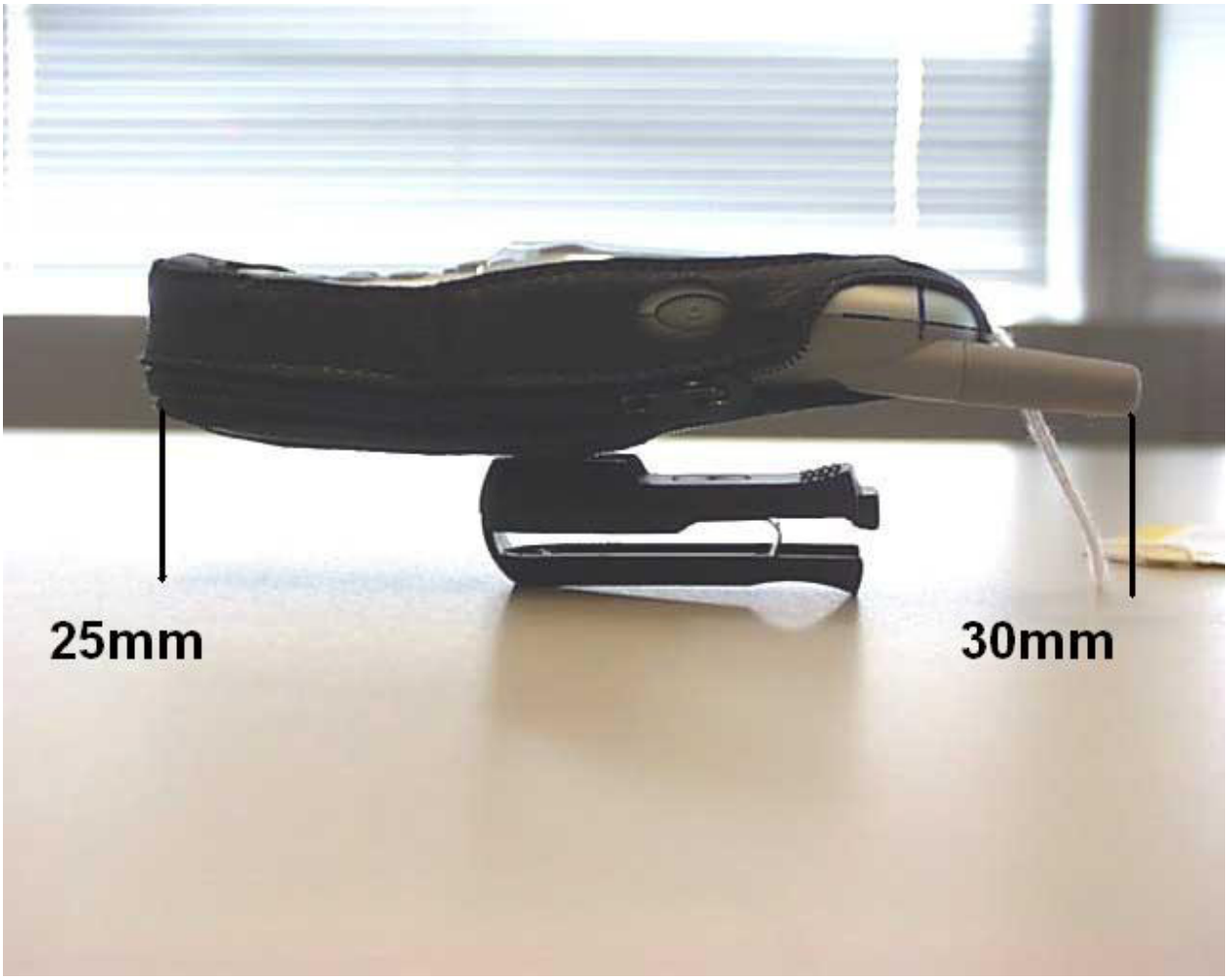


Figure 10. Separation Distance Provided from Leather Pouch

Figure 11. Top of Phone Seen in Cheek Touch Testing Configuration

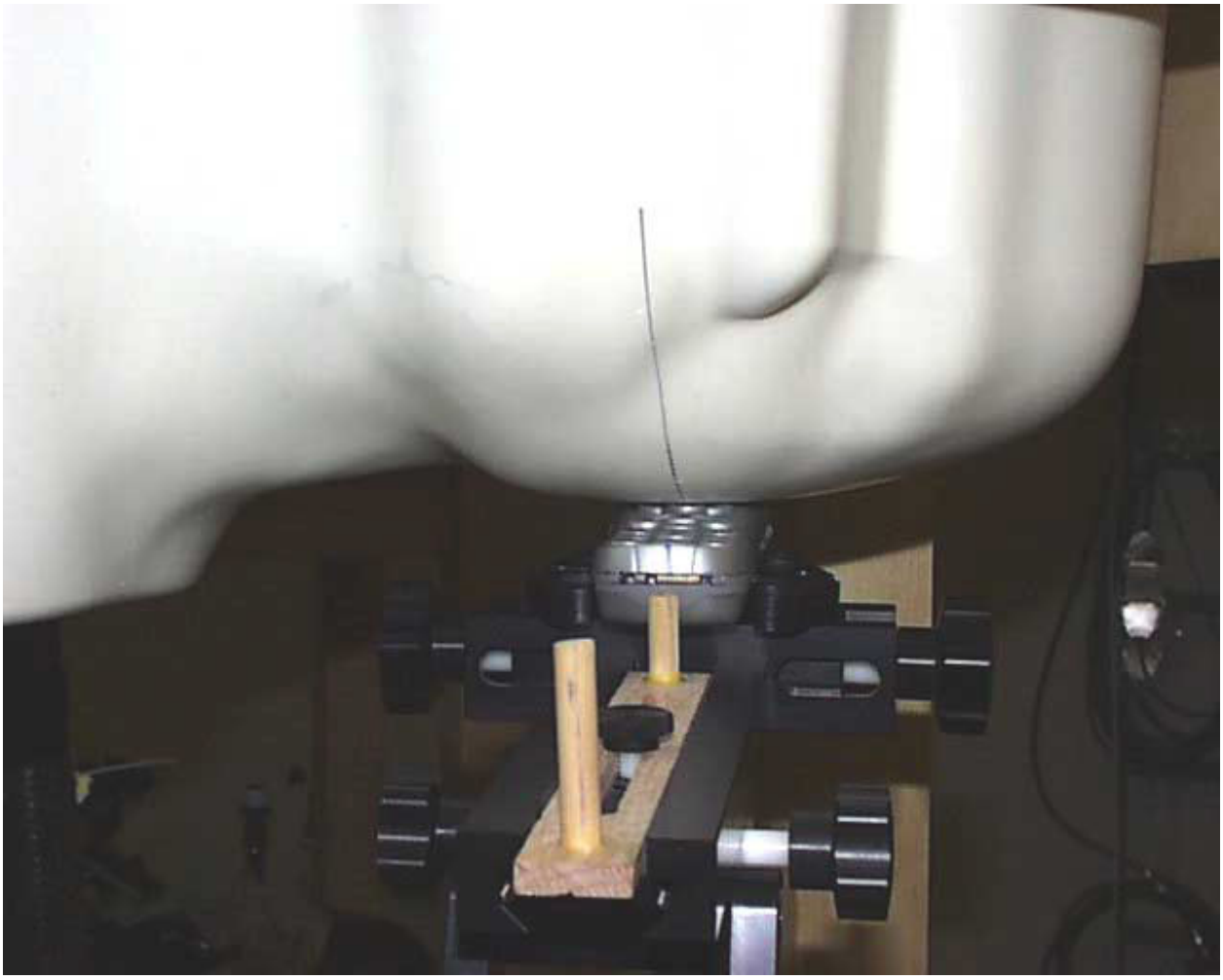


Figure 12. Bottom of Phone Seen in Cheek Touch Testing Configuration

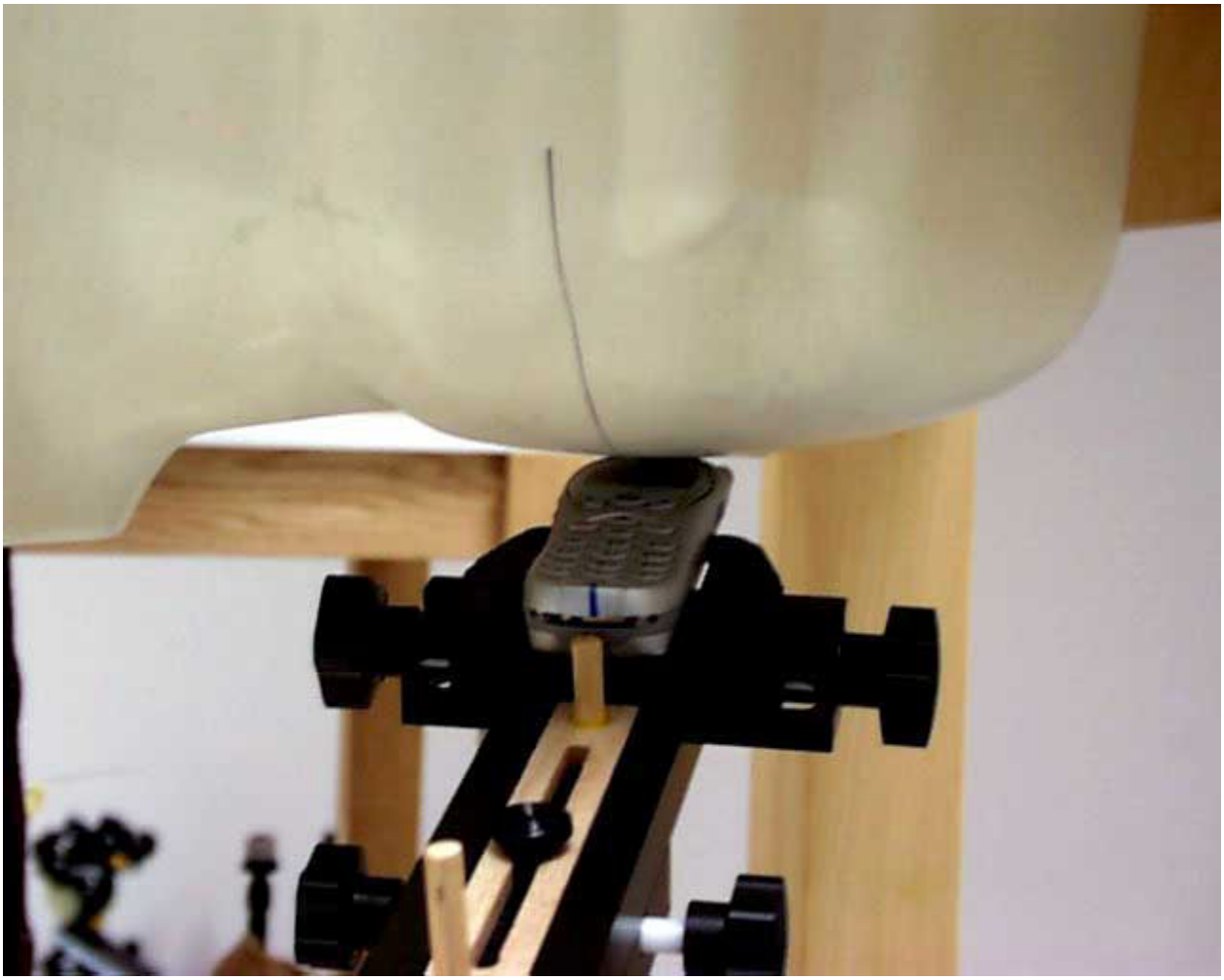


Figure 13. Bottom of Phone Seen in 15 Degree Tilt Testing Configuration

Figure 14. Top of Phone Seen in 15 Degree Tilt Testing Configuration

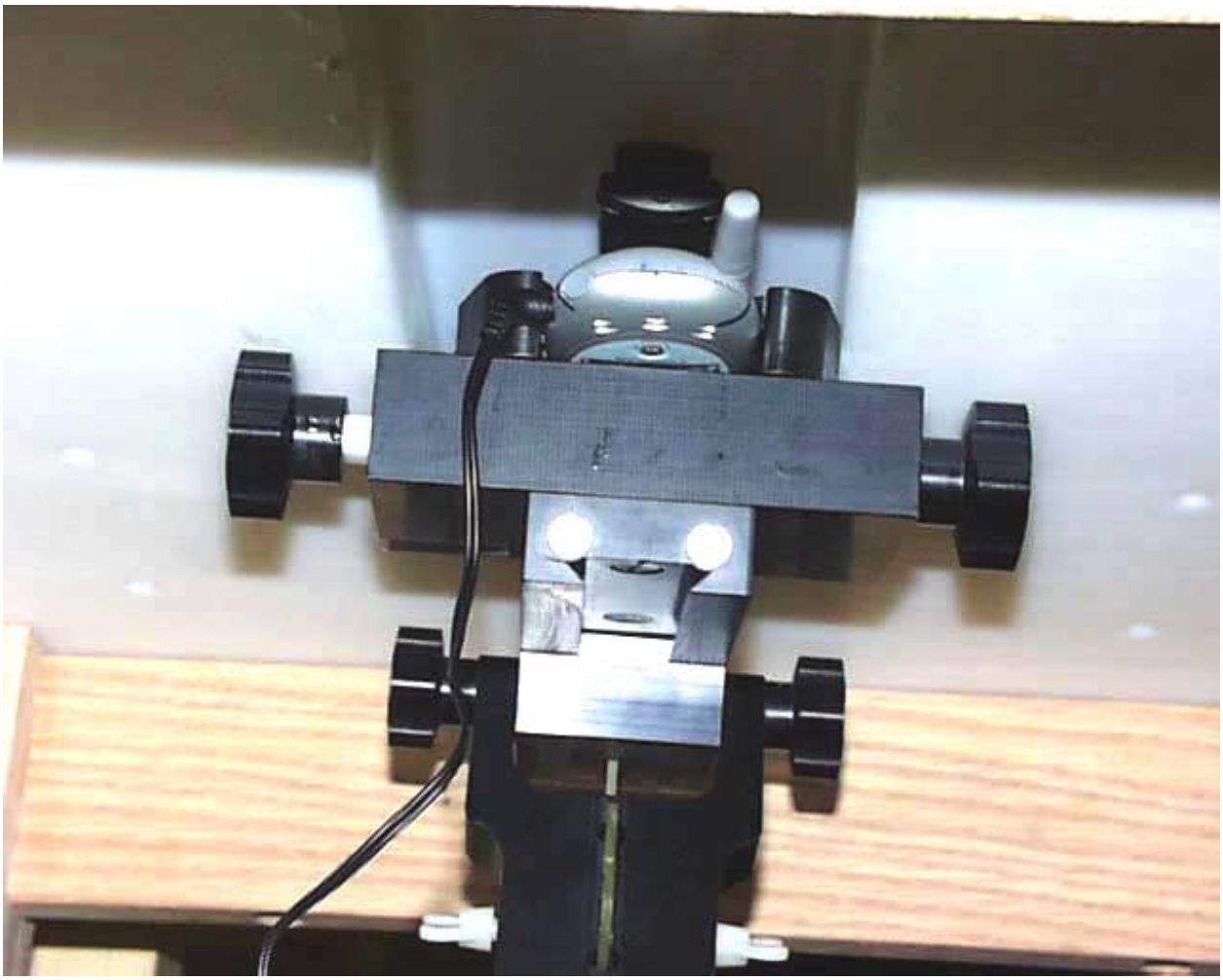


Figure 15. Phone Placed in Body Worn Testing Configuration with Plastic Belt Clip and Headset Attached