

M/A-COM PRS INC. FCC ID: OWDTR-0013-E

Small Planar Phantom; Planar Section; Position: (270°,180°)

Probe: ET3DV6 - SN1387; ConvF(8.80,8.80,8.80); Crest factor: 1.0

150 MHz Muscle: $\sigma = 0.81$ mho/m $\epsilon_r = 61.1$ $\rho = 1.00$ g/cm³

Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0

Cube 5x5x7; Powerdrift: -0.16 dB

SAR (1g): 0.140 mW/g, SAR (10g): 0.104 mW/g

Body-Worn SAR with Nylon Case & Swivel Belt-Loop (KRY1011648/1)

(4.0cm Nylon Case/Swivel Belt-Loop Separation Distance)

Portable VHF PTT Radio Transceiver Model: P7100 (IP)

Helical Coil Antenna (KRE1011219/1)

NiCD Battery (BKB191210/3/5)

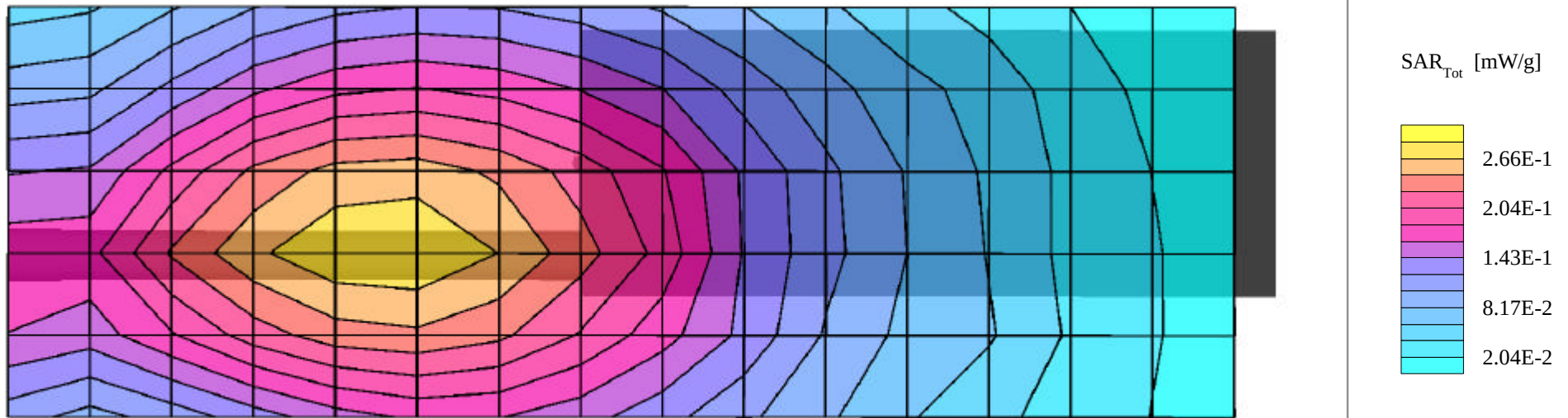
Continuous Wave Mode

Low Channel [136.00 MHz]

Conducted Power: 37.68 dBm

Ambient Temp. 23.1°C; Fluid Temp. 23.3°C

Date Tested: August 21, 2002



M/A-COM PRS INC. FCC ID: OWDTR-0013-E

Small Planar Phantom; Planar Section; Position: (270°,180°)

Probe: ET3DV6 - SN1387; ConvF(8.80,8.80,8.80); Crest factor: 1.0

150 MHz Muscle: $\sigma = 0.81$ mho/m $\epsilon_r = 61.1$ $\rho = 1.00$ g/cm³

Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0

Cube 5x5x7; Powerdrift: -0.17 dB

SAR (1g): 0.246 mW/g, SAR (10g): 0.187 mW/g

Body-Worn SAR with Nylon Case & Swivel Belt-Loop (KRY1011648/1)

(4.0cm Nylon Case/Swivel Belt-Loop Separation Distance)

Portable VHF PTT Radio Transceiver Model: P7100 (IP)

Helical Coil Antenna (KRE1011219/3)

NiCD Battery (BKB191210/3/5)

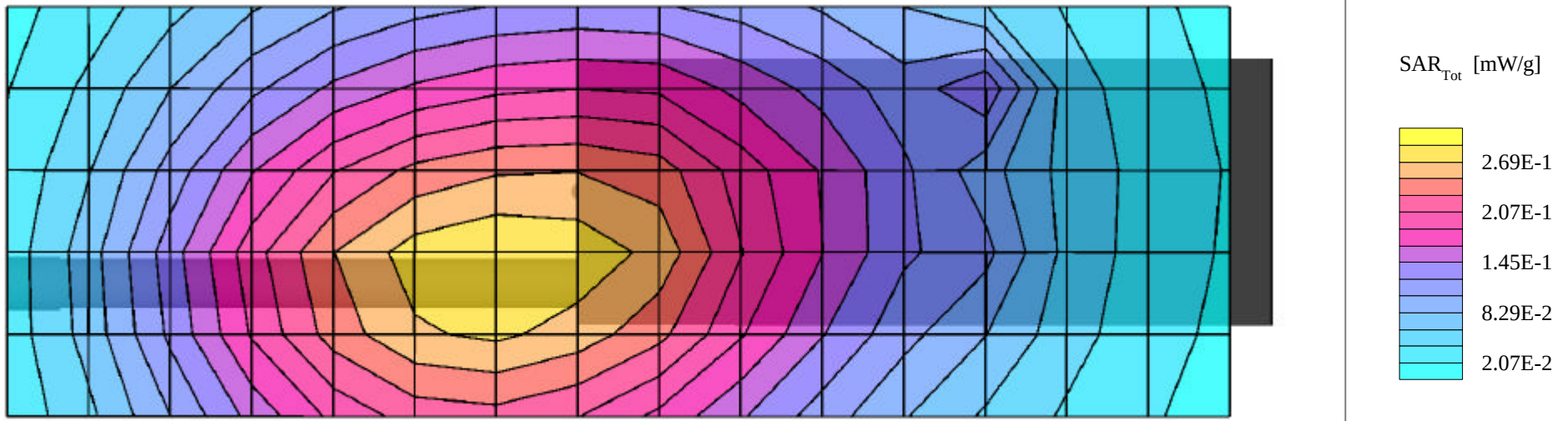
Continuous Wave Mode

High Channel [174.00 MHz]

Conducted Power: 37.40 dBm

Ambient Temp. 23.1°C; Fluid Temp. 23.3°C

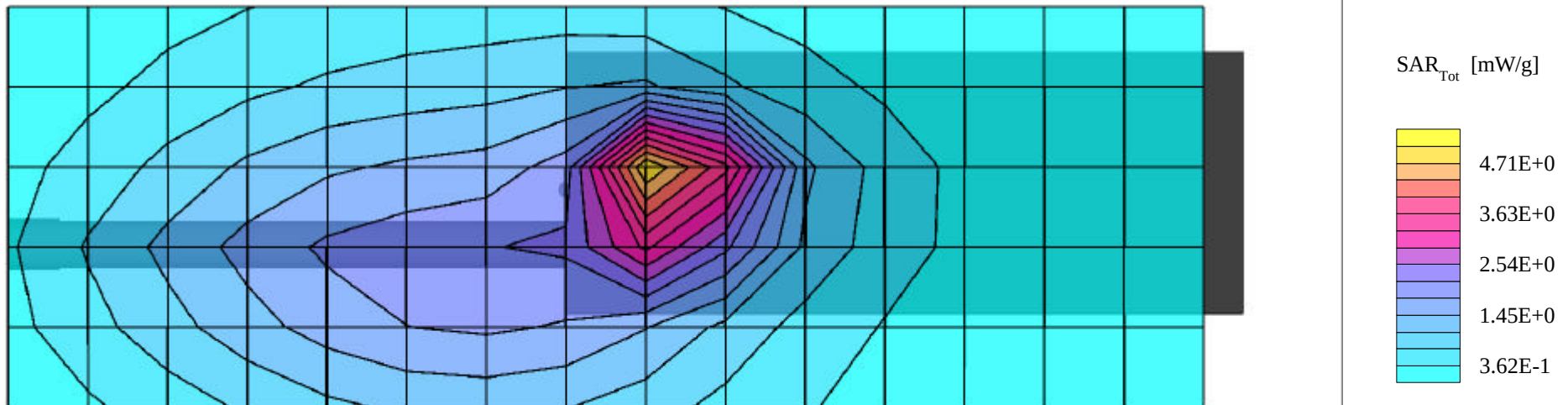
Date Tested: August 21, 2002



M/A-COM PRS INC. FCC ID: OWDTR-0013-E

Small Planar Phantom; Planar Section; Position: (270°,180°)
 Probe: ET3DV6 - SN1387; ConvF(8.80,8.80,8.80); Crest factor: 1.0
 150 MHz Muscle: $\sigma = 0.79$ mho/m $\epsilon_r = 60.7$ $\rho = 1.00$ g/cm³
 Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
 Cube 5x5x7; Powerdrift: -0.01 dB
 SAR (1g): 4.97 mW/g, SAR (10g): 2.58 mW/g

Body-Worn SAR with Metal Belt-Clip (KRY1011647/1)
 (1.1cm Belt-Clip Separation Distance)
 Portable VHF PTT Radio Transceiver Model: P7100(IP)
 Helical Coil Antenna (KRE1011219/2)
 NiMH Battery (BKB191210/4/6)
 Continuous Wave Mode
 Mid Channel [155.00 MHz]
 Conducted Power: 37.68 dBm
 Ambient Temp. 23.3°C; Fluid Temp. 22.5°C
 Date Tested: August 30, 2002



M/A-COM PRS INC. FCC ID: OWDTR-0013-E

Small Planar Phantom; Planar Section

Probe: ET3DV6 - SN1387; ConvF(8.80,8.80,8.80); Crest factor: 1.0

150 MHz Muscle: $\sigma = 0.79$ mho/m $\epsilon_r = 60.7$ $\rho = 1.00$ g/cm³

Z-Axis Extrapolation at Peak SAR Location

Body-Worn SAR with Metal Belt-Clip (KRY1011647/1)

(1.1cm Belt-Clip Separation Distance)

Portable VHF PTT Radio Transceiver Model: P7100(IP)

Helical Coil Antenna (KRE1011219/2)

NiMH Battery (BKB191210/4/6)

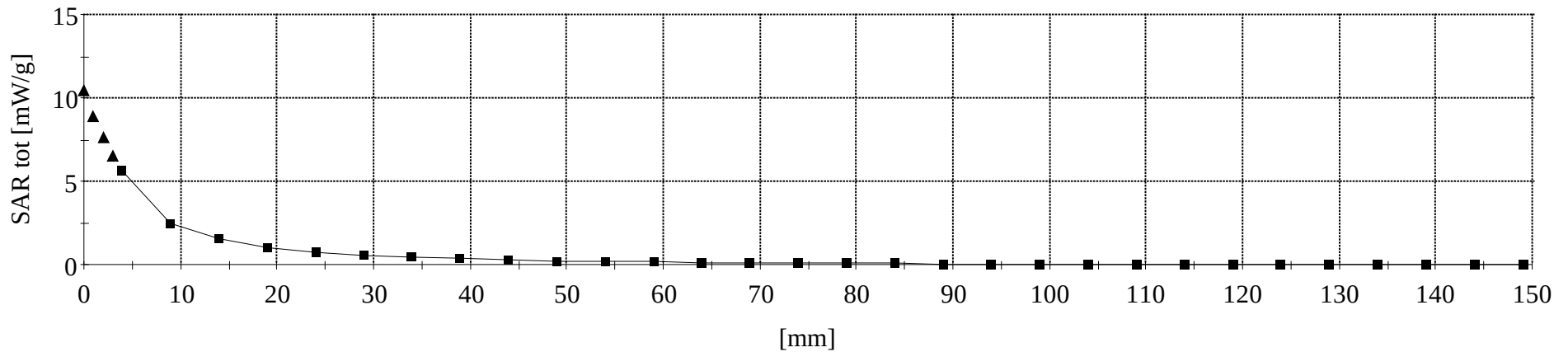
Continuous Wave Mode

Mid Channel [155.00 MHz]

Conducted Power: 37.68 dBm

Ambient Temp. 23.3°C; Fluid Temp. 22.5°C

Date Tested: August 30, 2002



M/A-COM PRS INC. FCC ID: OWDTR-0013-E

Small Planar Phantom; Planar Section; Position: (270°,180°)

Probe: ET3DV6 - SN1387; ConvF(8.80,8.80,8.80); Crest factor: 1.0

150 MHz Muscle: $\sigma = 0.79$ mho/m $\epsilon_r = 60.7$ $\rho = 1.00$ g/cm³

Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0

Cube 5x5x7; Powerdrift: -0.02 dB

SAR (1g): 4.60 mW/g, SAR (10g): 2.44 mW/g

Body-Worn SAR with Metal Belt-Clip (KRY1011647/1)

(1.1cm Belt-Clip Separation Distance)

Portable VHF PTT Radio Transceiver Model: P7100(IP)

Helical Coil Antenna (KRE1011219/2)

NiCD Battery (BKB191210/3/5)

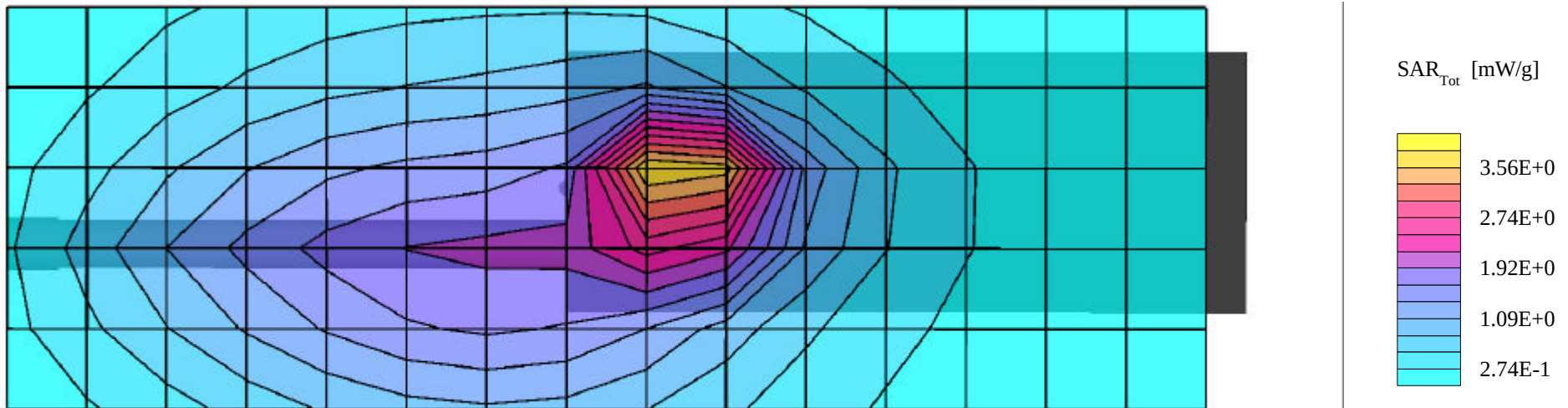
Continuous Wave Mode

Mid Channel [155.00 MHz]

Conducted Power: 37.68 dBm

Ambient Temp. 23.3°C; Fluid Temp. 22.5°C

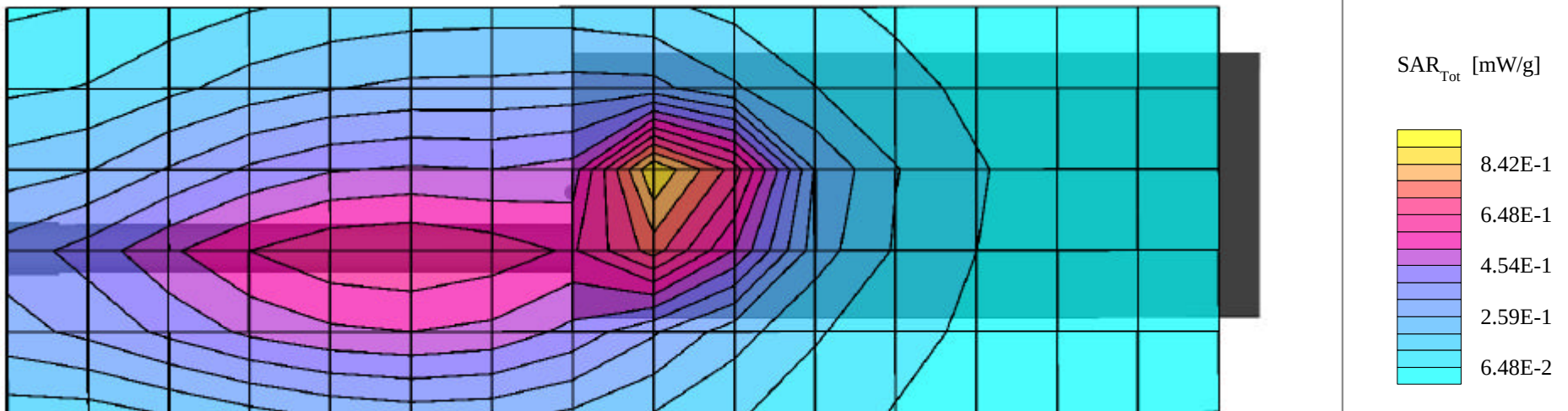
Date Tested: August 30, 2002



M/A-COM PRS INC. FCC ID: OWDTR-0013-E

Small Planar Phantom; Planar Section; Position: (270°,180°)
Probe: ET3DV6 - SN1387; ConvF(8.80,8.80,8.80); Crest factor: 1.0
150 MHz Muscle: $\sigma = 0.79$ mho/m $\epsilon_r = 60.7$ $\rho = 1.00$ g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.02 dB
SAR (1g): 0.918 mW/g, SAR (10g): 0.494 mW/g

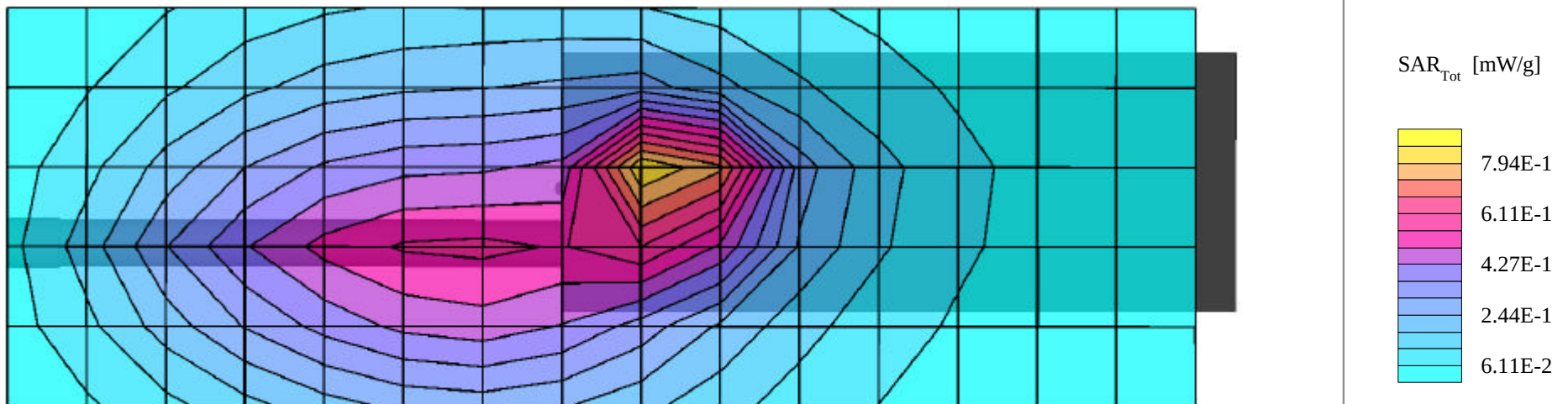
Body-Worn SAR with Metal Belt-Clip (KRY1011647/1)
(1.1cm Belt-Clip Separation Distance)
Portable VHF PTT Radio Transceiver Model: P7100(IP)
Helical Coil Antenna (KRE1011219/1)
NiMH Battery (BKB191210/4/6)
Continuous Wave Mode
Low Channel [136.00 MHz]
Conducted Power: 37.68 dBm
Ambient Temp. 23.3°C; Fluid Temp. 22.5°C
Date Tested: August 30, 2002



M/A-COM PRS INC. FCC ID: OWDTR-0013-E

Small Planar Phantom; Planar Section; Position: (270°,180°)
Probe: ET3DV6 - SN1387; ConvF(8.80,8.80,8.80); Crest factor: 1.0
150 MHz Muscle: $\sigma = 0.79$ mho/m $\epsilon_r = 60.7$ $\rho = 1.00$ g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.12 dB
SAR (1g): 0.852 mW/g, SAR (10g): 0.466 mW/g

Body-Worn SAR with Metal Belt-Clip (KRY1011647/1)
(1.1cm Belt-Clip Separation Distance)
Portable VHF PTT Radio Transceiver Model: P7100(IP)
Helical Coil Antenna (KRE1011219/3)
NiMH Battery (BKB191210/4/6)
Continuous Wave Mode
High Channel [174.00 MHz]
Conducted Power: 37.40 dBm
Ambient Temp. 23.3°C; Fluid Temp. 22.5°C
Date Tested: August 30, 2002



M/A-COM PRS INC. FCC ID: OWDTR-0013-E

Small Planar Phantom; Planar Section; Position: (270°,180°)

Probe: ET3DV6 - SN1387; ConvF(8.80,8.80,8.80); Crest factor: 1.0

150 MHz Muscle: $\sigma = 0.79$ mho/m $\epsilon_r = 60.7$ $\rho = 1.00$ g/cm³

Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0

Cube 5x5x7; Powerdrift: -0.19 dB

SAR (1g): 2.17 mW/g, SAR (10g): 1.65 mW/g

Body-Worn SAR with Belt-Loop & Swivel (KRY1011609/1)

(3.5cm Belt-Loop & Swivel Separation Distance)

Portable VHF PTT Radio Transceiver Model: P7100(IP)

Helical Coil Antenna (KRE1011219/2)

NiMH Battery (BKB191210/4/6)

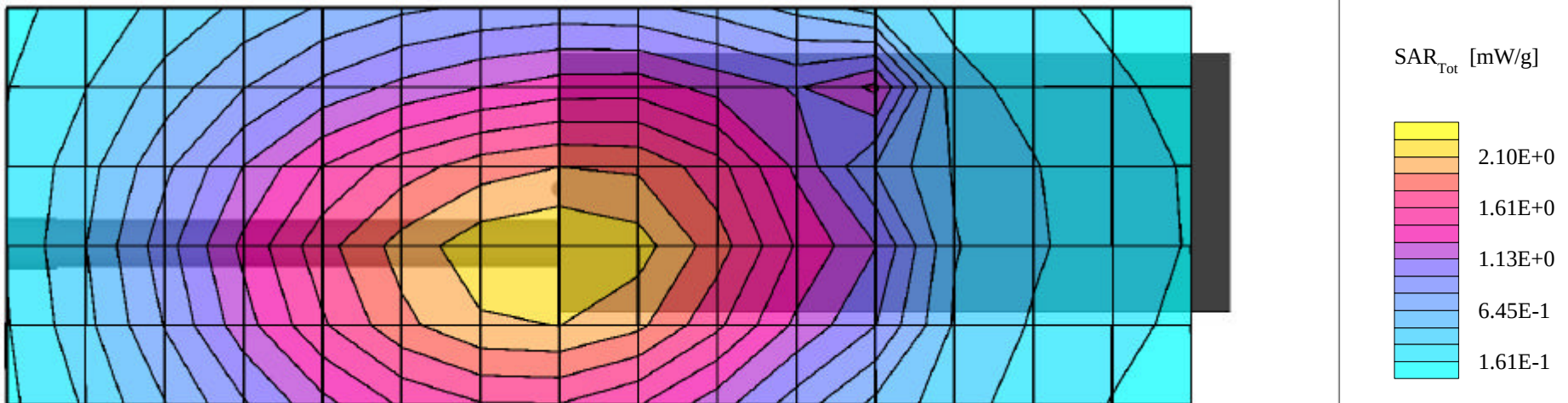
Continuous Wave Mode

Mid Channel [155.00 MHz]

Conducted Power: 37.68 dBm

Ambient Temp. 23.3°C; Fluid Temp. 22.5°C

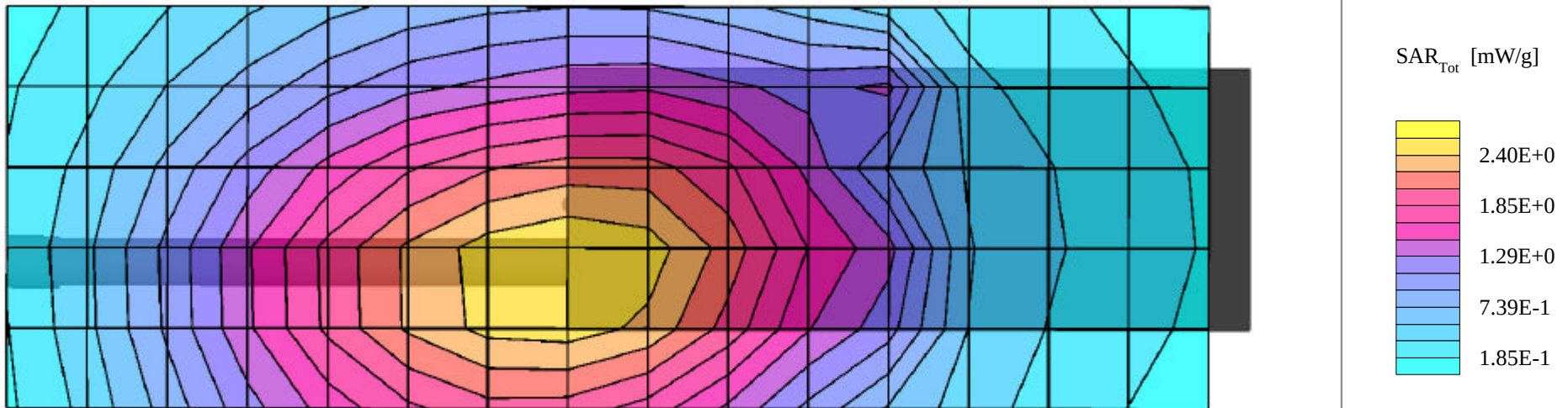
Date Tested: August 30, 2002



M/A-COM PRS INC. FCC ID: OWDTR-0013-E

Small Planar Phantom; Planar Section; Position: (270°,180°)
Probe: ET3DV6 - SN1387; ConvF(8.80,8.80,8.80); Crest factor: 1.0
150 MHz Muscle: $\sigma = 0.79$ mho/m $\epsilon_r = 60.7$ $\rho = 1.00$ g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.07 dB
SAR (1g): 2.62 mW/g, SAR (10g): 1.94 mW/g

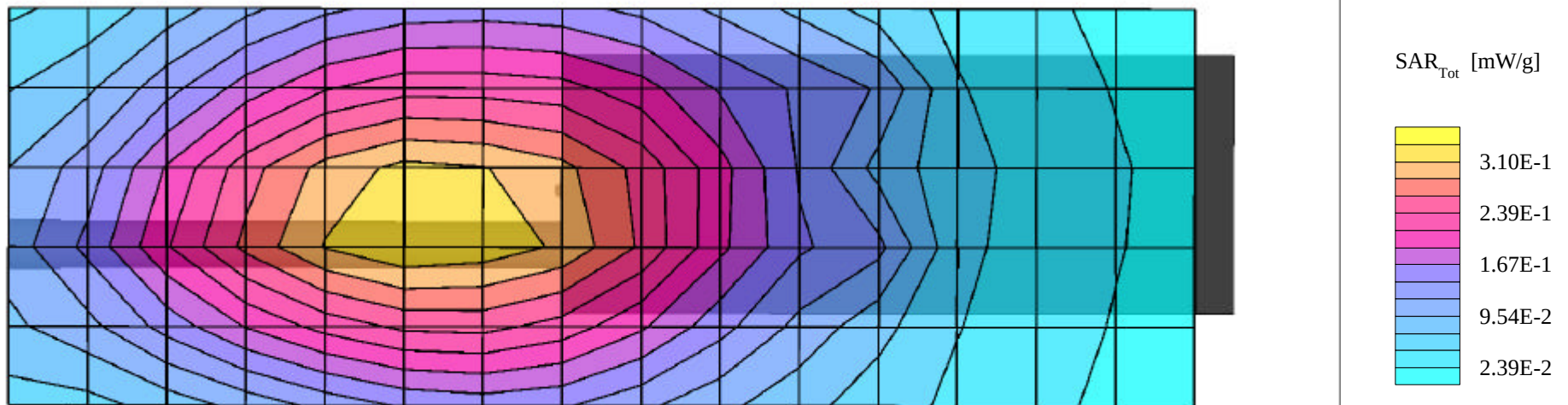
Body-Worn SAR with Belt-Loop & Swivel (KRY1011609/1)
(3.5cm Belt-Loop & Swivel Separation Distance)
Portable VHF PTT Radio Transceiver Model: P7100(IP)
Helical Coil Antenna (KRE1011219/2)
NiCD Battery (BKB191210/3/5)
Continuous Wave Mode
Mid Channel [155.00 MHz]
Conducted Power: 37.68 dBm
Ambient Temp. 23.3°C; Fluid Temp. 22.5°C
Date Tested: August 30, 2002



M/A-COM PRS INC. FCC ID: OWDTR-0013-E

Small Planar Phantom; Planar Section; Position: (270°,180°)
Probe: ET3DV6 - SN1387; ConvF(8.80,8.80,8.80); Crest factor: 1.0
150 MHz Muscle: $\sigma = 0.79$ mho/m $\epsilon_r = 60.7$ $\rho = 1.00$ g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.01 dB
SAR (1g): 0.309 mW/g, SAR (10g): 0.229 mW/g

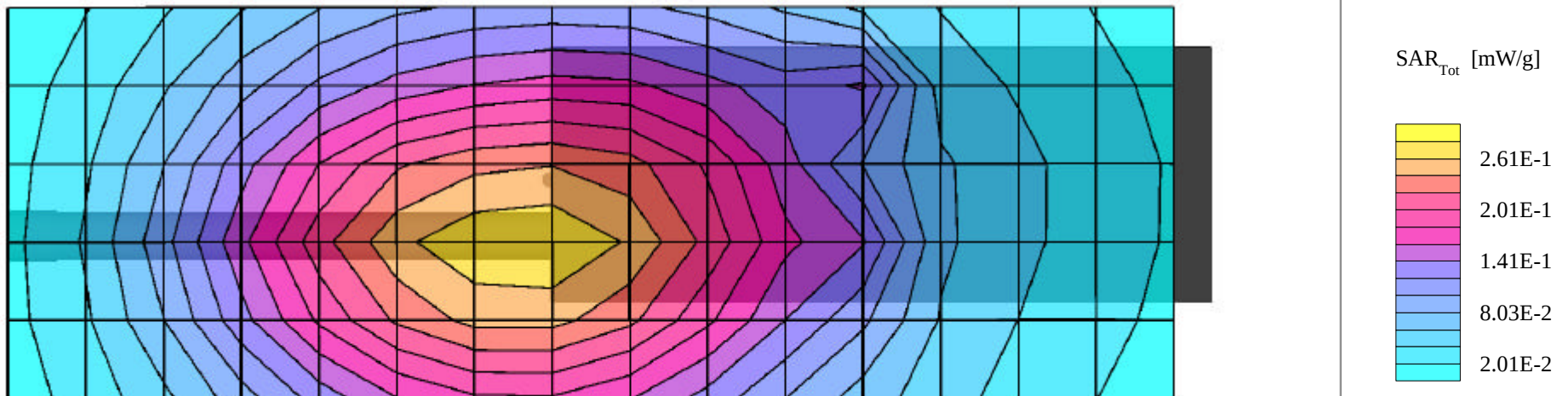
Body-Worn SAR with Belt-Loop & Swivel (KRY1011609/1)
(3.5cm Belt-Loop & Swivel Separation Distance)
Portable VHF PTT Radio Transceiver Model: P7100(IP)
Helical Coil Antenna (KRE1011219/1)
NiCD Battery (BKB191210/3/5)
Continuous Wave Mode
Low Channel [136.00 MHz]
Conducted Power: 37.68 dBm
Ambient Temp. 23.3°C; Fluid Temp. 22.5°C
Date Tested: August 30, 2002



M/A-COM PRS INC. FCC ID: OWDTR-0013-E

Small Planar Phantom; Planar Section; Position: (270°,180°)
Probe: ET3DV6 - SN1387; ConvF(8.80,8.80,8.80); Crest factor: 1.0
150 MHz Muscle: $\sigma = 0.79$ mho/m $\epsilon_r = 60.7$ $\rho = 1.00$ g/cm³
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.10 dB
SAR (1g): 0.270 mW/g, SAR (10g): 0.202 mW/g

Body-Worn SAR with Belt-Loop & Swivel (KRY1011609/1)
(3.5cm Belt-Loop & Swivel Separation Distance)
Portable VHF PTT Radio Transceiver Model: P7100(IP)
Helical Coil Antenna (KRE1011219/3)
NiCD Battery (BKB191210/3/5)
Continuous Wave Mode
High Channel [174.00 MHz]
Conducted Power: 37.40 dBm
Ambient Temp. 23.3°C; Fluid Temp. 22.5°C
Date Tested: August 30, 2002



APPENDIX B - SYSTEM PERFORMANCE CHECK DATA

System Performance Check - Dipole 300MHz

Large Planar Phantom; Planar Section

Probe: ET3DV6 - SN1387; ConvF(8.00,8.00,8.00); Crest factor: 1.0; 300 MHz Brain: $\sigma = 0.87$ mho/m $\epsilon_r = 45.8$ $\rho = 1.00$ g/cm³

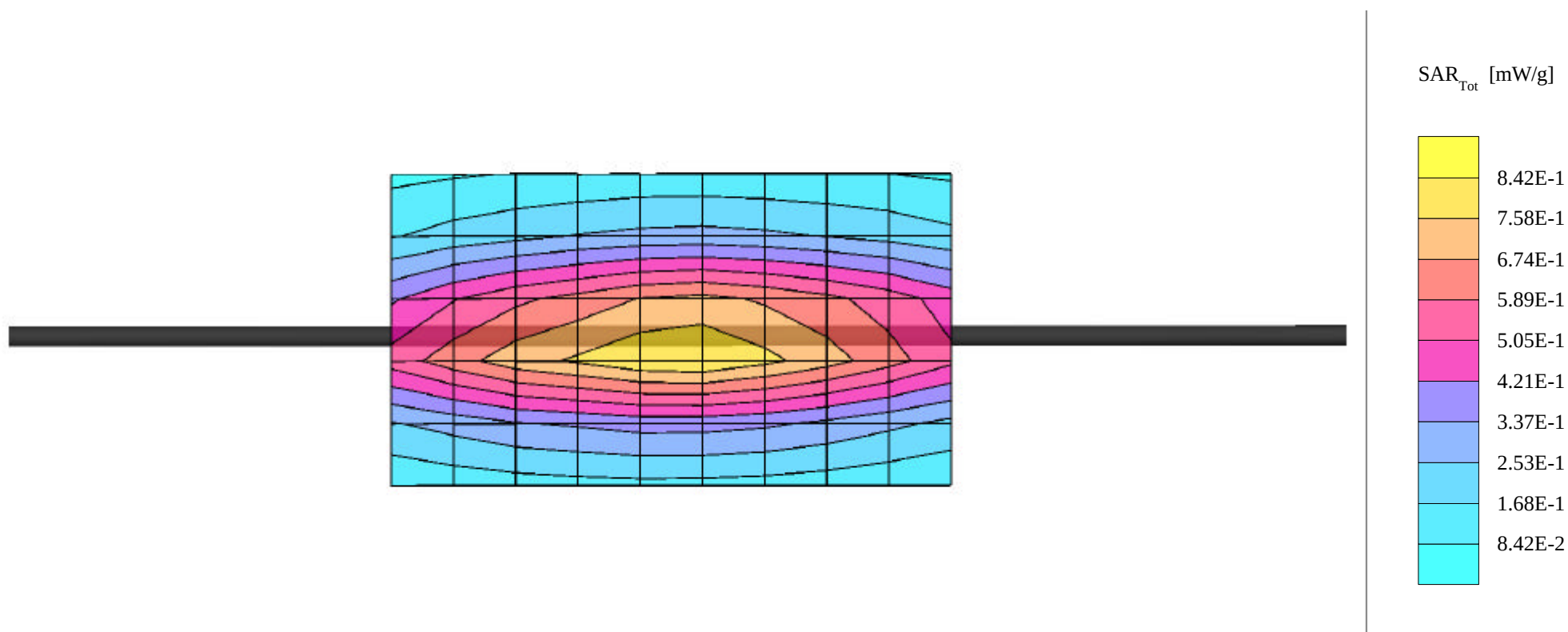
Cube 5x5x7: Peak: 1.41 mW/g, SAR (1g): 0.883 mW/g, SAR (10g): 0.582 mW/g, (Worst-case extrapolation)

Penetration depth: 12.4 (10.5, 14.9) [mm]; Ambient Temp.: 23.1°C; Fluid Temp.: 23.3°C

Powerdrift: -0.02 dB

Validation Date: August 21, 2002

Conducted Power: 250 mW



System Performance Check - Dipole 300MHz

Large Planar Phantom; Planar Section

Probe: ET3DV6 - SN1387; ConvF(8.00,8.00,8.00); Crest factor: 1.0; 300 MHz Brain: $\sigma = 0.87$ mho/m $\epsilon_r = 45.5$ $\rho = 1.00$ g/cm³

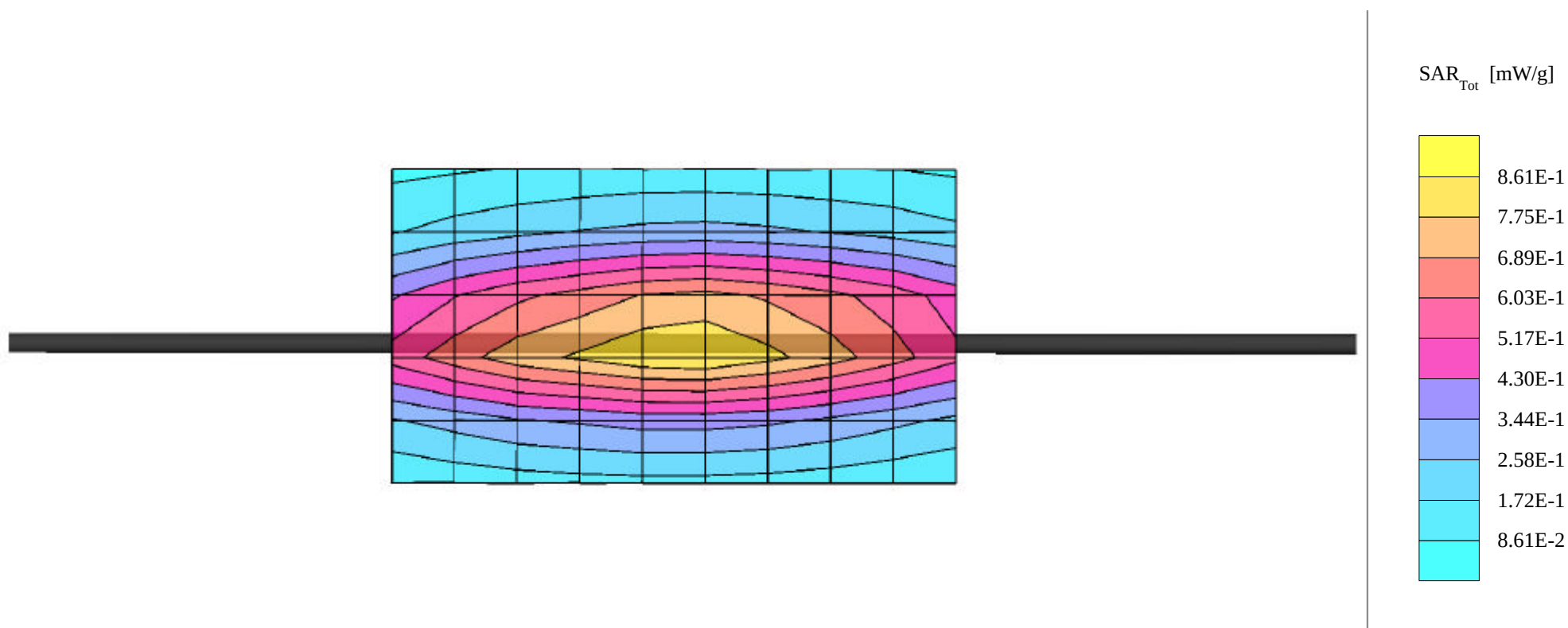
Cube 5x5x7: Peak: 1.43 mW/g, SAR (1g): 0.897 mW/g, SAR (10g): 0.589 mW/g, (Worst-case extrapolation)

Penetration depth: 12.2 (10.2, 14.7) [mm]; Ambient Temp.: 23.3°C; Fluid Temp.: 23.5°C

Powerdrift: 0.01 dB

Validation Date: August 22, 2002

Conducted Power: 250 mW



System Performance Check - Dipole 300MHz

Large Planar Phantom; Planar Section

Probe: ET3DV6 - SN1387; ConvF(8.00,8.00,8.00); Crest factor: 1.0; 300 MHz Brain: $\sigma = 0.88$ mho/m $\epsilon_r = 45.7$ $\rho = 1.00$ g/cm³

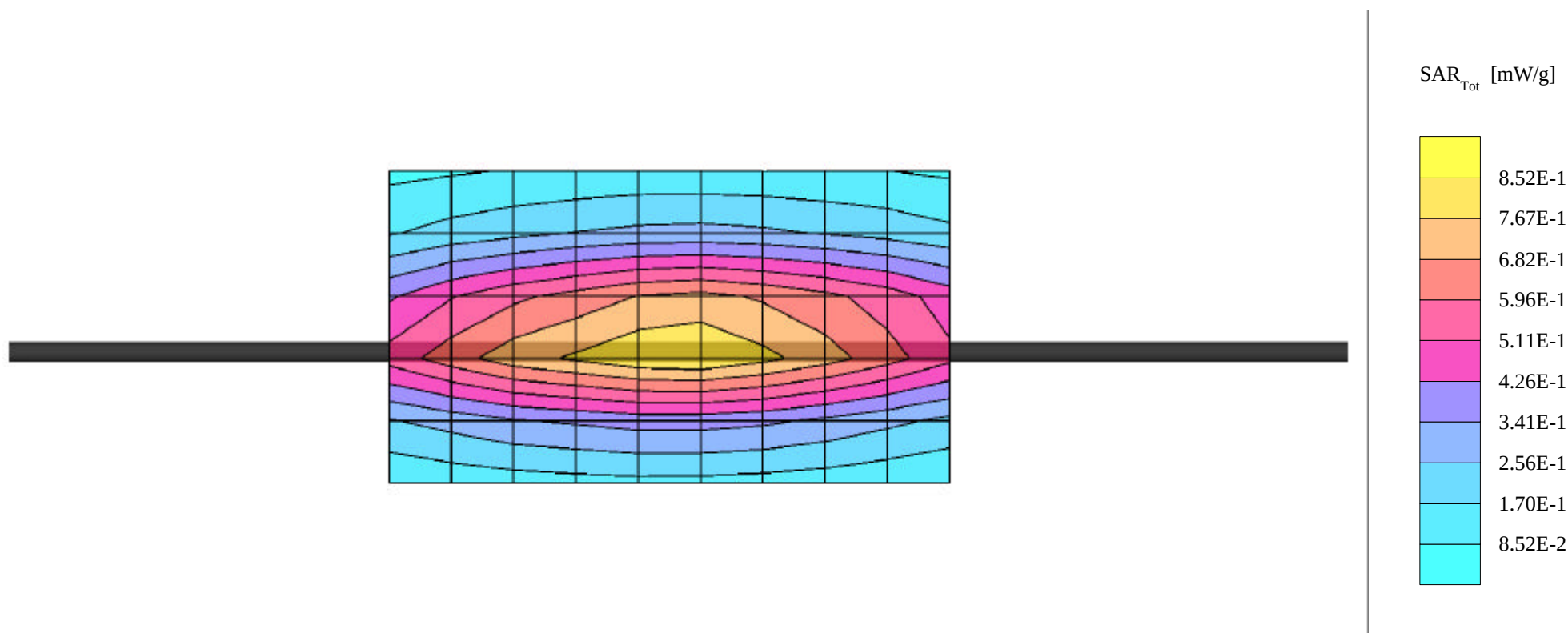
Cube 5x5x7: Peak: 1.44 mW/g, SAR (1g): 0.904 mW/g, SAR (10g): 0.595 mW/g, (Worst-case extrapolation)

Penetration depth: 12.1 (10.3, 14.8) [mm]; Ambient Temp.: 23.3°C; Fluid Temp.: 22.5°C

Powerdrift: -0.01 dB

Validation Date: August 30, 2002

Conducted Power: 250 mW



APPENDIX C - SYSTEM VALIDATION

300MHz SYSTEM VALIDATION DIPOLE

Type:

300MHz Validation Dipole

Serial Number:

135

Place of Calibration:

Celltech Research Inc.

Date of Calibration:

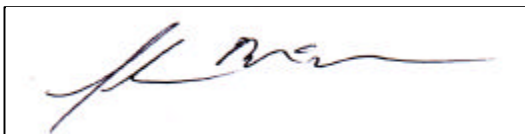
October 15, 2001

Celltech Research Inc. hereby certifies that this device has been calibrated on the date indicated above.

Calibrated by:



Approved by:



1. Dipole Construction & Electrical Characteristics

The validation dipole was constructed in accordance with the IEEE Std “Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques”. The electrical properties were measured using an HP 8753E Network Analyzer. The network analyzer was calibrated to the validation dipole N-type connector feed point using an HP85032E Type N calibration kit. The dipole was placed parallel to a planar phantom at a separation distance of 15.0mm from the simulating fluid using a loss-less dielectric spacer. The measured input impedance is:

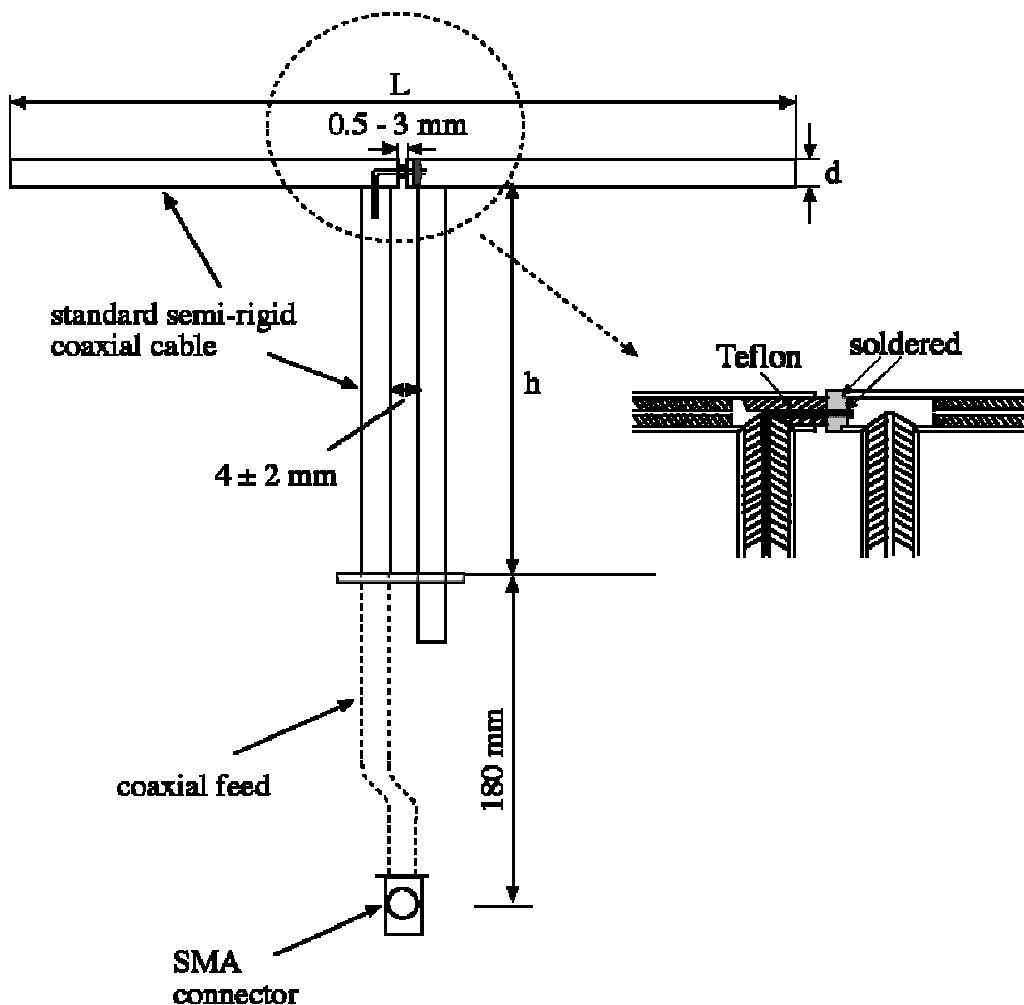
Feed point impedance at 300MHz

$$\text{Re}\{Z\} = 45.789\Omega$$

$$\text{Im}\{Z\} = 1.2598\Omega$$

Return Loss at 300MHz

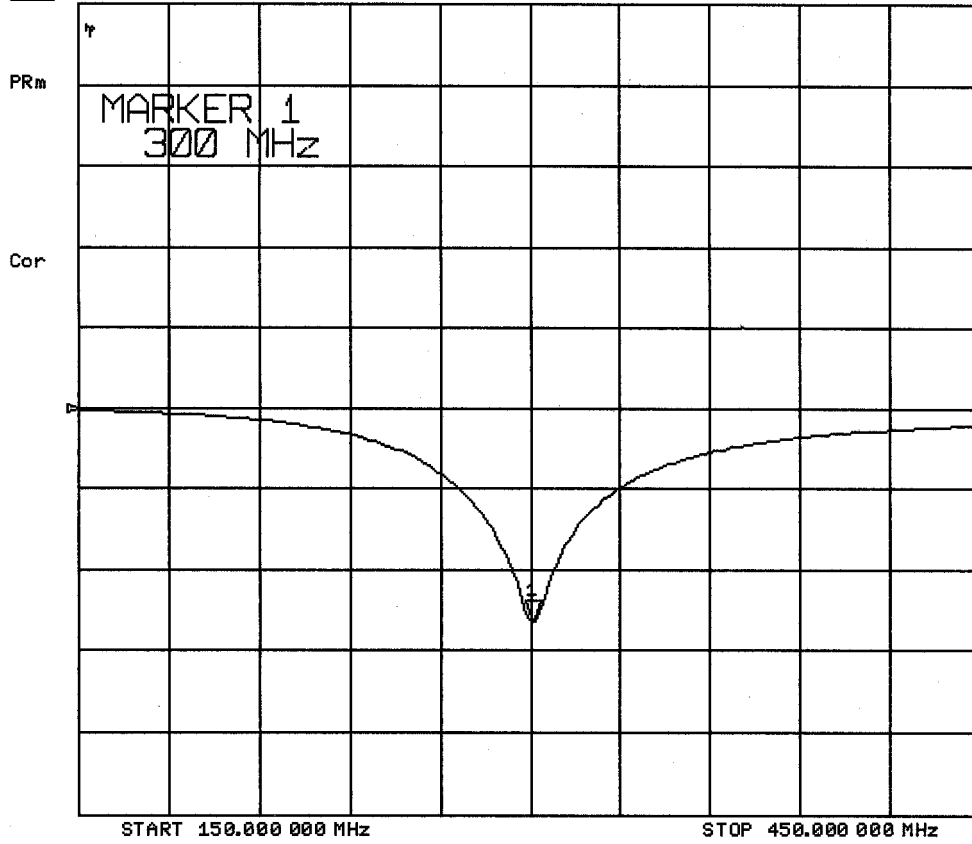
-26.394dB



26 Oct 2001 12:14:26

CH1 S11 LOG 10 dB/REF 0 dB

1:-26.394 dB 300.000 000 MHz



300.000 000 MHz

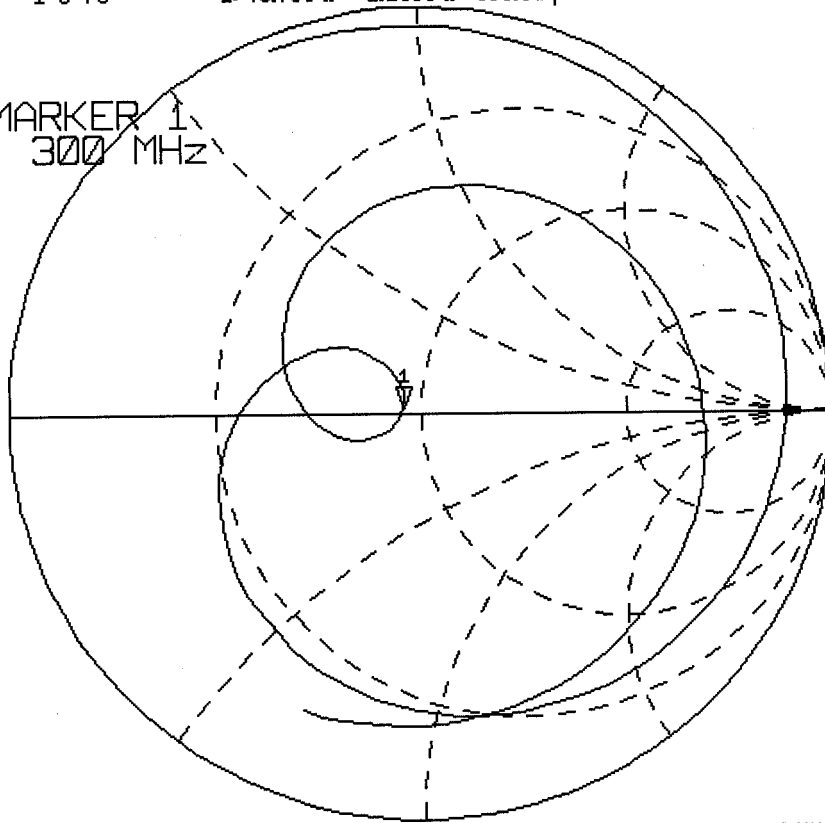
17

PR_m

MARKER 1
300 MHz

Cor

↑



START 150.000 000 MHz

STOP 450.000 000 MHz

Validation Dipole Dimensions

Frequency (MHz)	L (mm)	h (mm)	d (mm)
300	420.0	250.0	6.2
450	288.0	167.0	6.2
835	161.0	89.8	3.6
900	149.0	83.3	3.6
1450	89.1	51.7	3.6
1800	72.0	41.7	3.6
1900	68.0	39.5	3.6
2000	64.5	37.5	3.6
2450	51.8	30.6	3.6
3000	41.5	25.0	3.6

2. Validation Phantom

The validation phantom was constructed using relatively low-loss tangent Plexiglas material. The dimensions of the phantom are as follows:

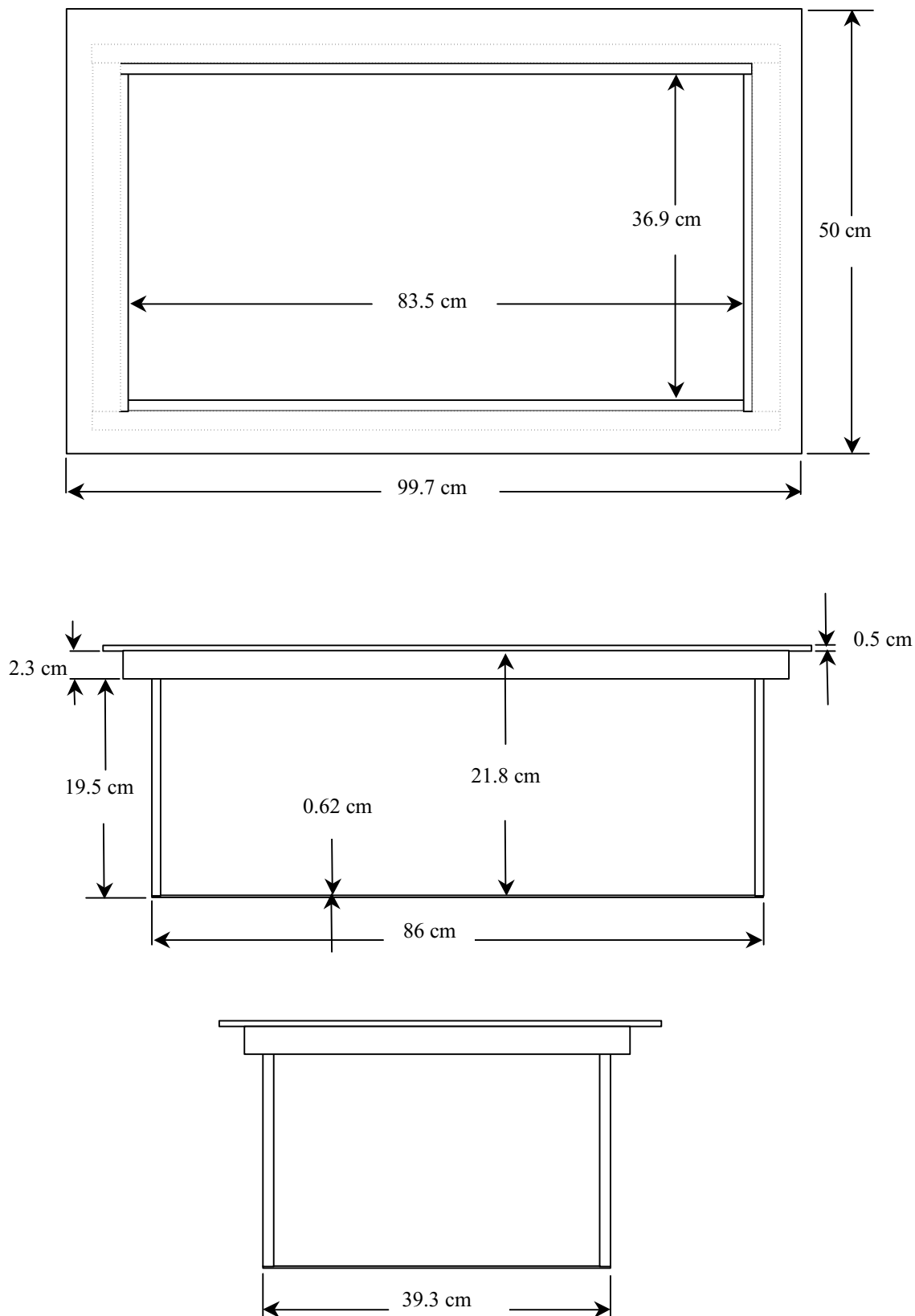
Length: 83.5 cm

Width: 36.9 cm

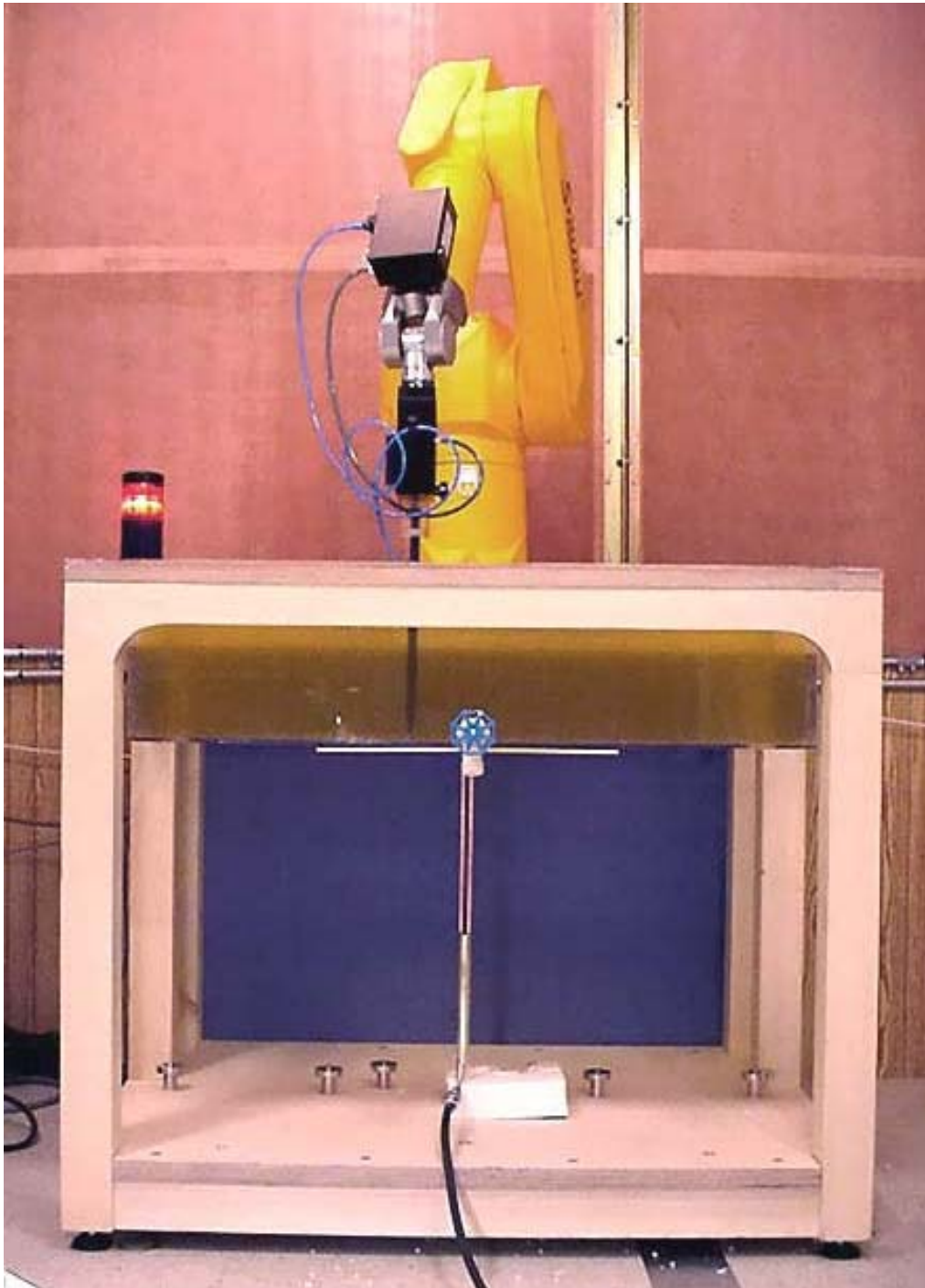
Height: 21.8 cm

The bottom of the phantom is constructed of 6.2 ± 0.1 mm Plexiglas.

Dimensions of Plexiglas Planar Phantom



300MHz Dipole Calibration Setup



300MHz Dipole Calibration Setup



3. Measurement Conditions

The planar phantom was filled with brain simulating tissue having the following electrical parameters at 300MHz:

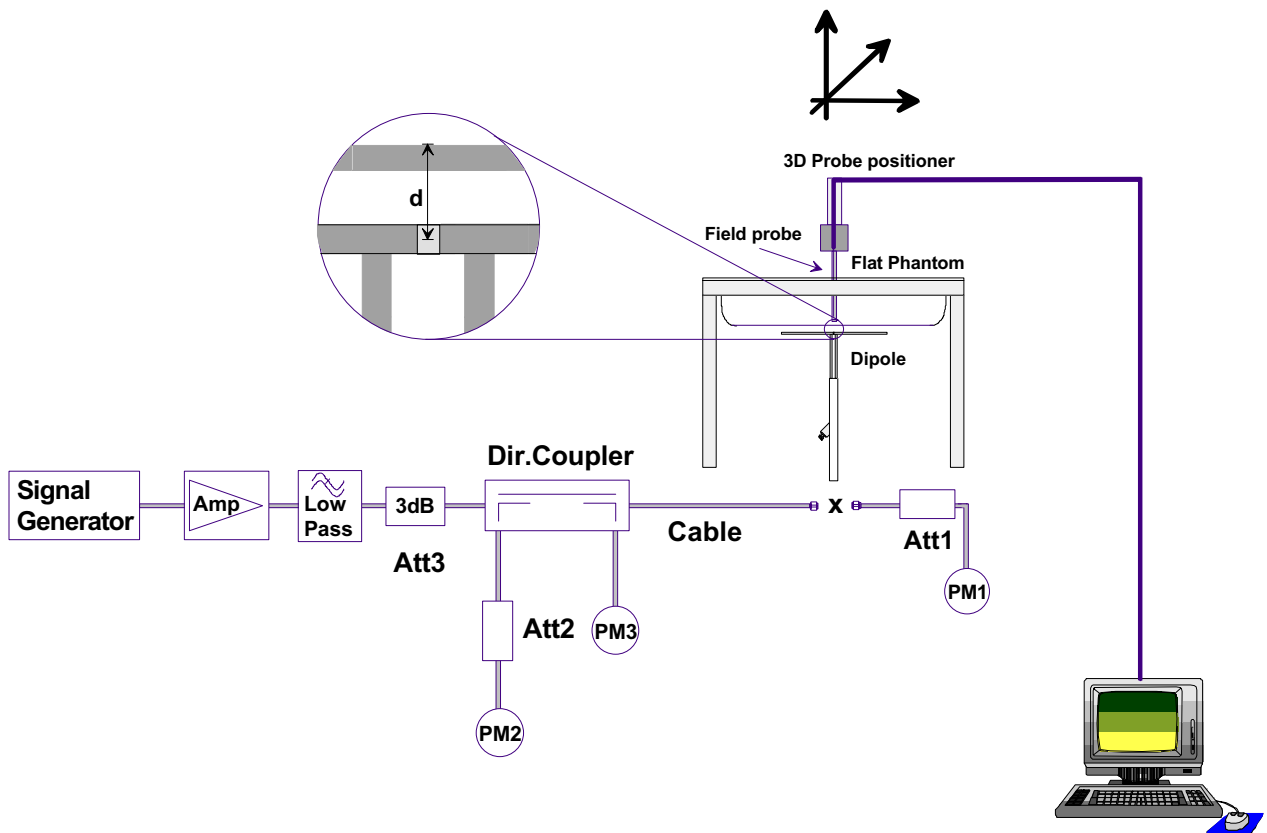
Relative Permittivity:	45.7	$\pm 5\%$
Conductivity:	0.86 mho/m	$\pm 5\%$
Temperature:	22.5°C	

The 300MHz simulating tissue consists of the following ingredients:

Ingredient	Percentage by weight
Water	37.56%
Sugar	55.32%
Salt	5.95%
HEC	0.98%
Dowicil 75	0.19%
Target Dielectric Parameters at 22°C	$\epsilon_r = 45.3$ $\sigma = 0.87 \text{ S/m}$

4. SAR Measurement

The SAR measurement was performed with the E-field probe in mechanical detection mode only. The setup and determination of the forward power into the dipole was performed using the following procedures.



First the power meter PM1 (including attenuator Att1) is connected to the cable to measure the forward power at the location of the dipole connector (X). The signal generator is adjusted for the desired forward power at the dipole connector (taking into account the attenuation of Att1) as read by power meter PM2. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2. If the signal generator does not allow adjustment in 0.01dB steps, the remaining difference at PM2 must be taken into consideration. PM3 records the reflected power from the dipole to ensure that the value is not changed from the previous value. The reflected power should be 20dB below the forward power.

Ten SAR measurements were performed in order to achieve repeatability and to establish an average target value.

Validation Dipole SAR Test Results

Validation Measurement	SAR @ 0.25W Input averaged over 1g	SAR @ 1W Input averaged over 1g	SAR @ 0.25W Input averaged over 10g	SAR @ 1W Input averaged over 10g	Peak SAR @ 0.25W Input
Test 1	0.872	3.488	0.579	2.316	1.38
Test 2	0.876	3.504	0.580	2.320	1.39
Test 3	0.876	3.504	0.581	2.324	1.39
Test 4	0.878	3.512	0.583	2.332	1.39
Test 5	0.881	3.524	0.581	2.324	1.39
Test 6	0.875	3.500	0.580	2.320	1.38
Test 7	0.884	3.536	0.582	2.328	1.40
Test 8	0.879	3.516	0.581	2.324	1.39
Test 9	0.876	3.504	0.580	2.320	1.39
Test10	0.873	3.492	0.579	2.316	1.39
Average Value	0.877	3.508	0.581	2.322	1.39

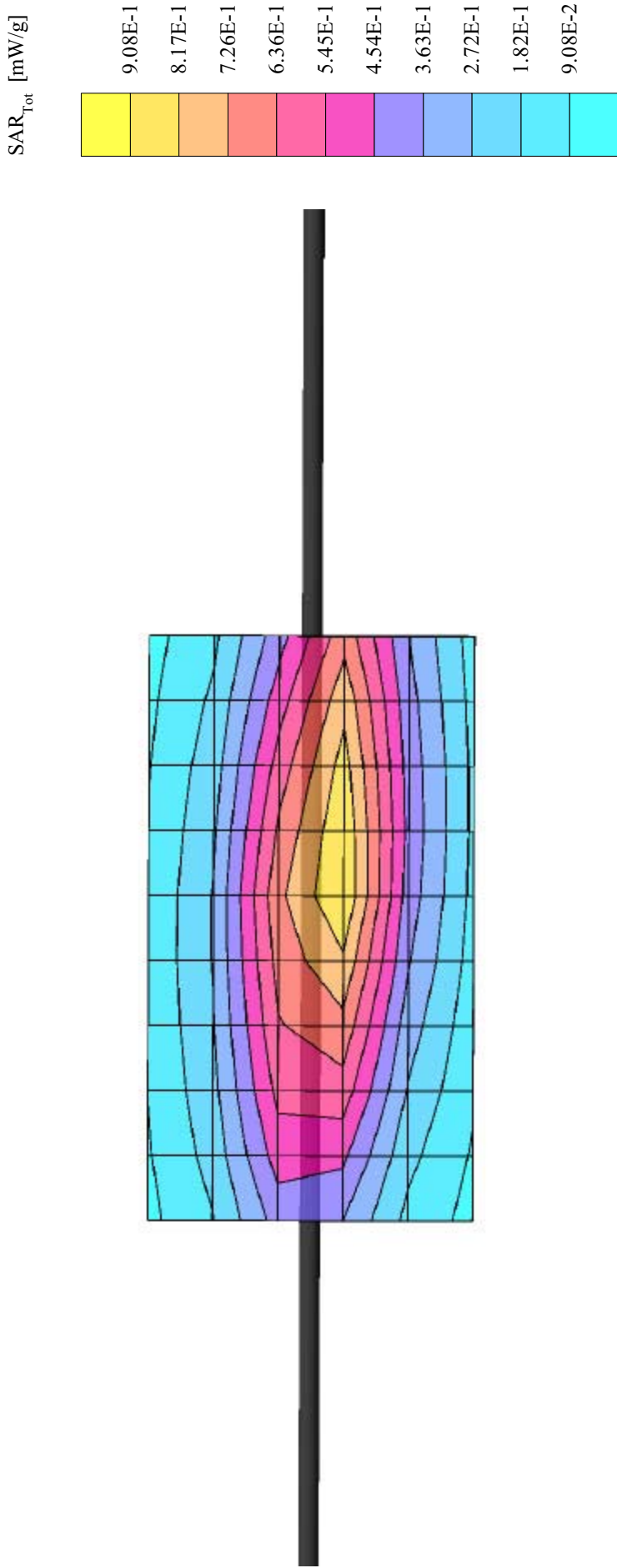
The results have been normalized to 1W (forward power) into the dipole.

Averaged over 1cm (1g) of tissue: 3.51 mW/g

Averaged over 10cm (10g) of tissue: 2.32 mW/g

Dipole 300 MHz

Frequency: 300 MHz; Conducted Input Power: 250 [mW]
Flat Phantom; Planar Section
Probe: ET3DV6 - SNI590; ConvF(7.54,7.54,7.54); Crest factor: 1.0; 300 MHz Brain: $\sigma = 0.87$ mho/m $\epsilon_r = 45.3$ $\rho = 1.00$ g/cm³
Cube 5x5x7; Peak: 1.43 mW/g, SAR (1g): 0.899 mW/g, SAR (10g): 0.592 mW/g, (Worst-case extrapolation)
Penetration depth: 12.4 (10.6, 14.7) [mm]
Powerdrift: -0.08 dB
Calibration Date: Oct. 15, 2001



Dipole 300 MHz

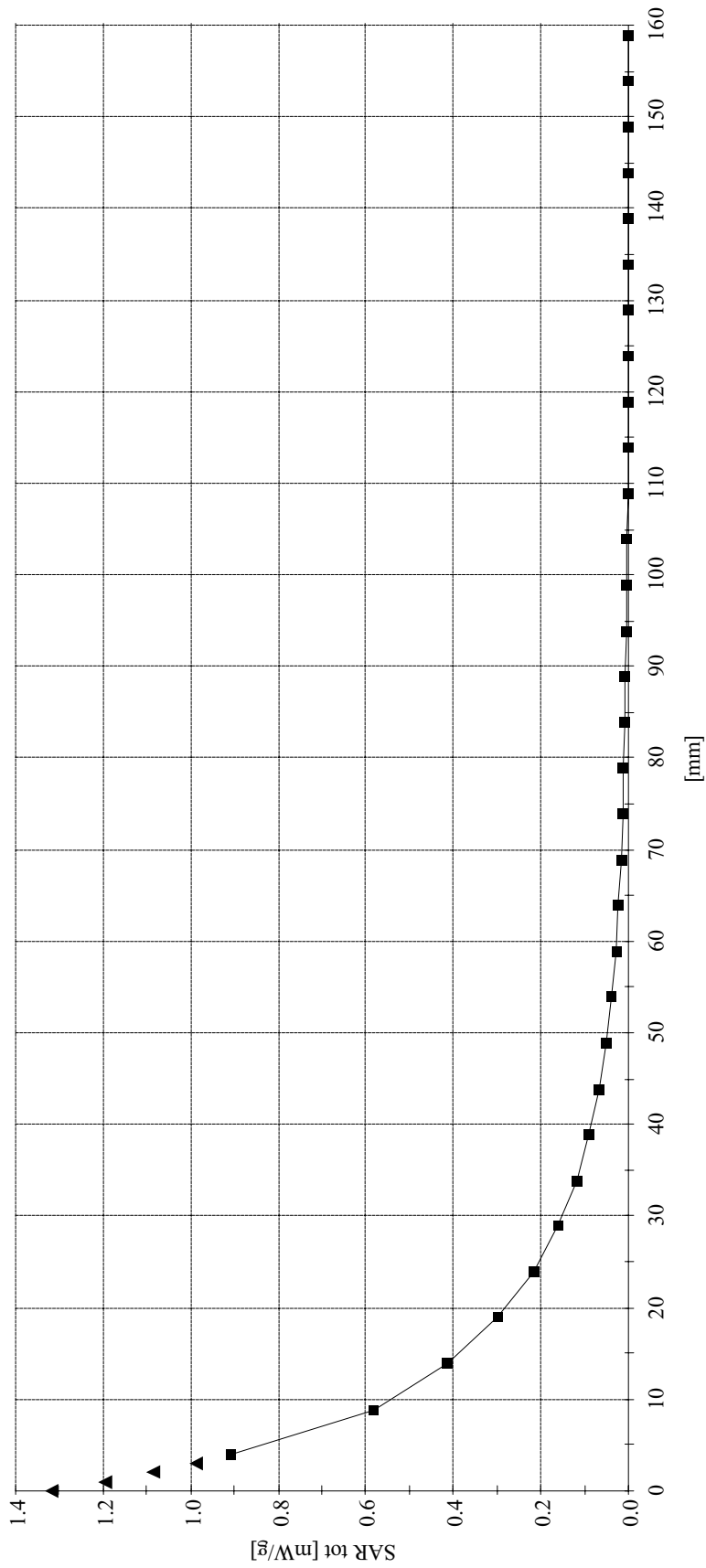
Flat Phantom; Planar Section

Probe: ET3DV6 - SN1590; ConvF(7.54,7.54,7.54); Crest factor: 1.0

300 MHz Brain: $\sigma = 0.87$ mho/m $\epsilon_r = 45.3$ $\rho = 1.00$ g/cm³

Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0

Date of Calibration: October 15, 2001



APPENDIX D - PROBE CALIBRATION