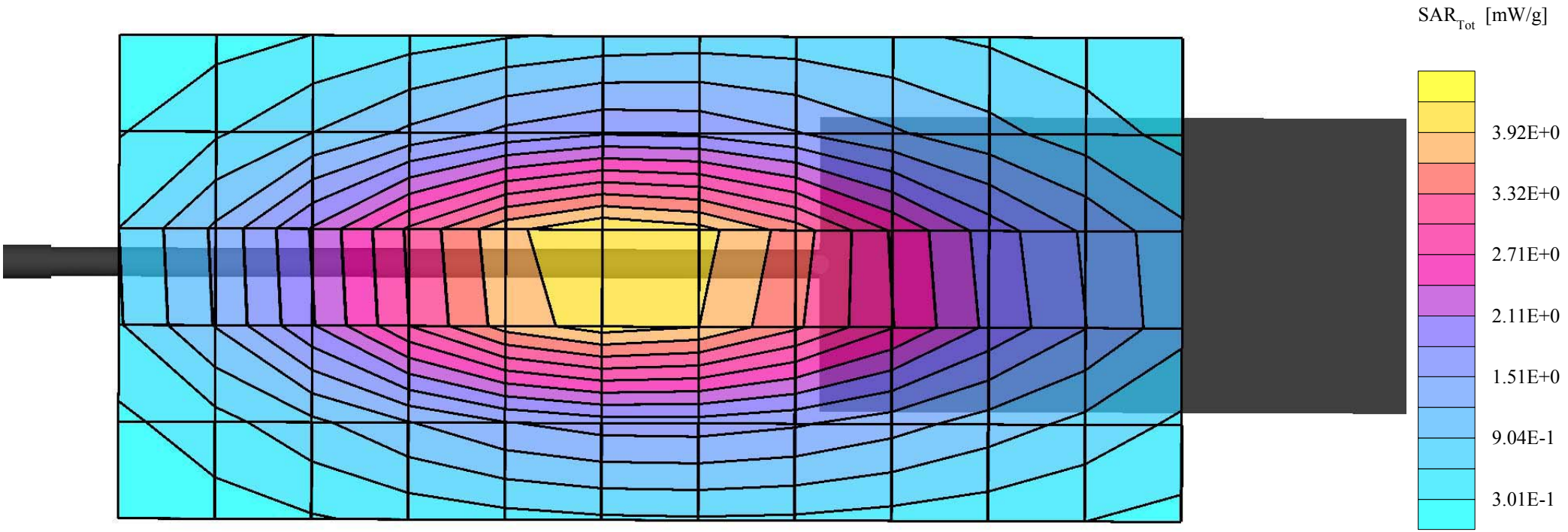
RITRON INC. FCC ID: AIERIT14-441

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: σ = 0.93 mho/m ε_r = 57.5 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.16 dB
SAR (1g): 4.40 mW/g, SAR (10g): 2.99 mW/g

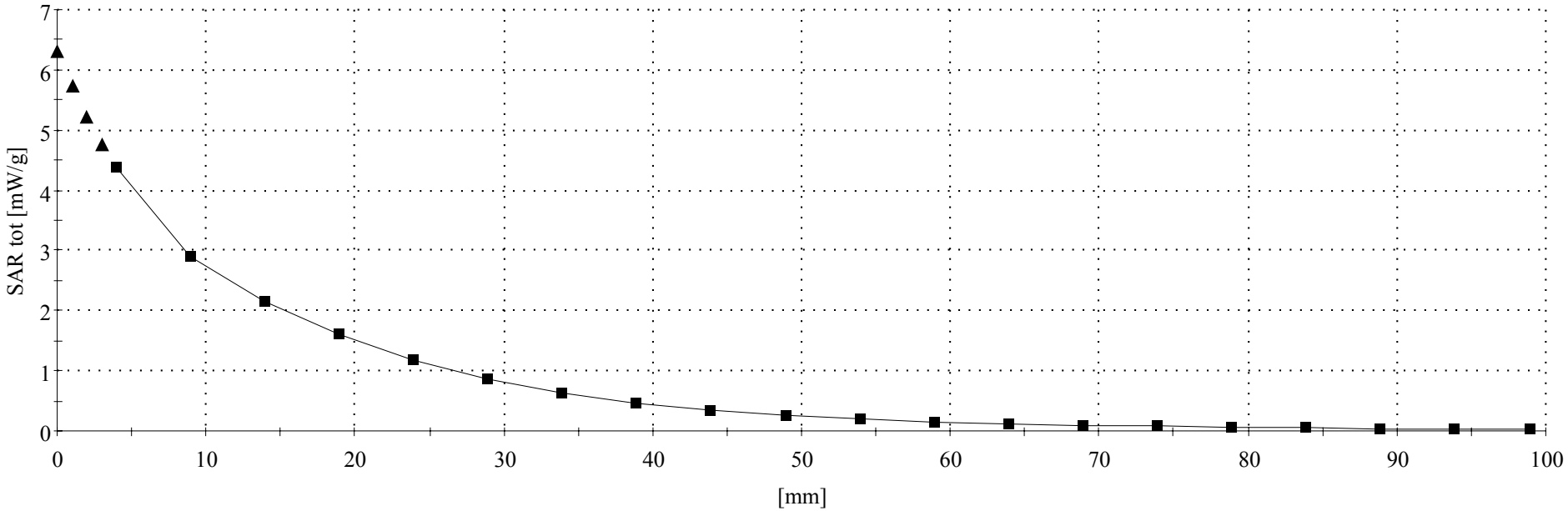
Body-Worn SAR with 1.0 cm Plastic Belt-Clip
Portable UHF PTT Radio Transceiver
Whip Antenna (Centurion AFS-450)
Nickel Metal Hydride Battery (BPS-6N-MH)
Ritron Model: JMX-441
Continuous Wave Mode
High Channel (469.950 MHz]
Conducted Power: 2.00 Watts
Date Tested: January 24, 2002



RITRON INC. FCC ID: AIERIT14-441

Small Planar Phantom; Planar Section; Position:
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: σ = 0.93 mho/m ε_r = 57.5 ρ = 1.00 g/cm^3
Z-Axis: Dx = 0.0, Dy = 0.0, Dz = 5.0

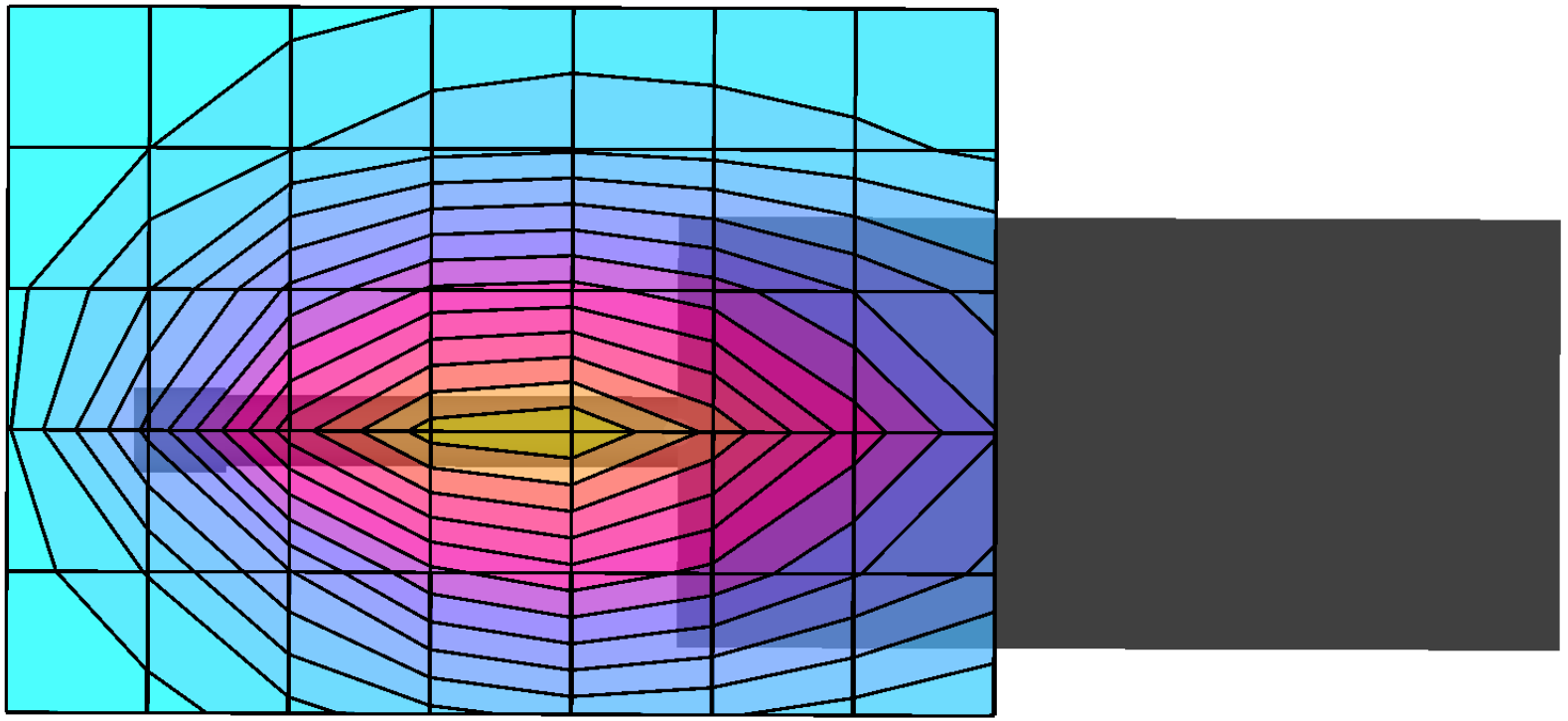
Body-Worn SAR with 1.0 cm Plastic Belt-Clip
Portable UHF PTT Radio Transceiver
Whip Antenna (Centurion AFS-450)
Nickel Metal Hydride Battery (BPS-6N-MH)
Ritron Model: JMX-441
Continuous Wave Mode
High Channel (469.950 MHz]
Conducted Power: 2.00 Watts
Date Tested: January 24, 2002



RITRON INC. FCC ID: AIERIT14-441

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: σ = 0.93 mho/m ε_r = 57.5 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.19 dB
SAR (1g): 3.39 mW/g, SAR (10g): 2.26 mW/g

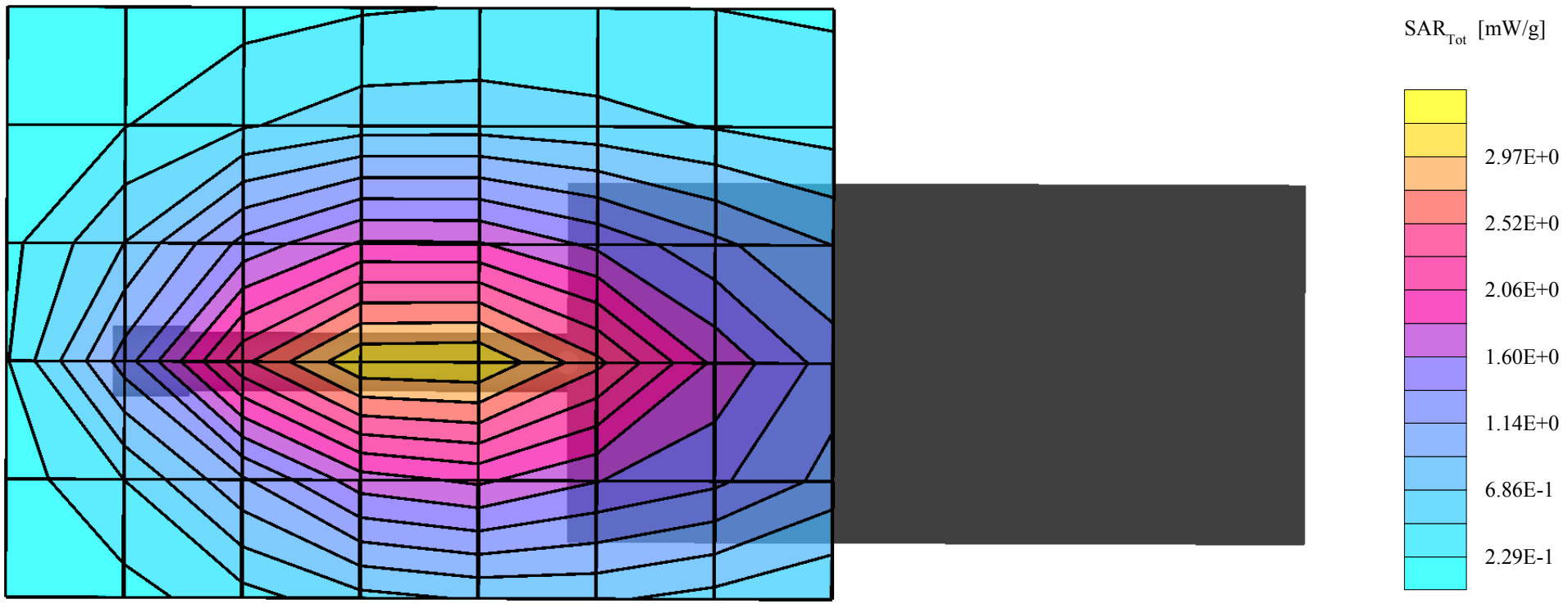
Body-Worn SAR with 1.0 cm Plastic Belt-Clip
Portable UHF PTT Radio Transceiver
Stubby Antenna (Centurion AFS-450S)
Nickel Cadmium Battery (BPJS-6N)
Ritron Model: JMX-441
Continuous Wave Mode
Low Channel (450.100 MHz]
Conducted Power: 1.80 Watts
Date Tested: January 24, 2002



RITRON INC. FCC ID: AIERIT14-441

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: $\sigma = 0.93$ mho/m $\varepsilon_r = 57.5$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.22 dB
SAR (1g): 2.90 mW/g, SAR (10g): 1.97 mW/g

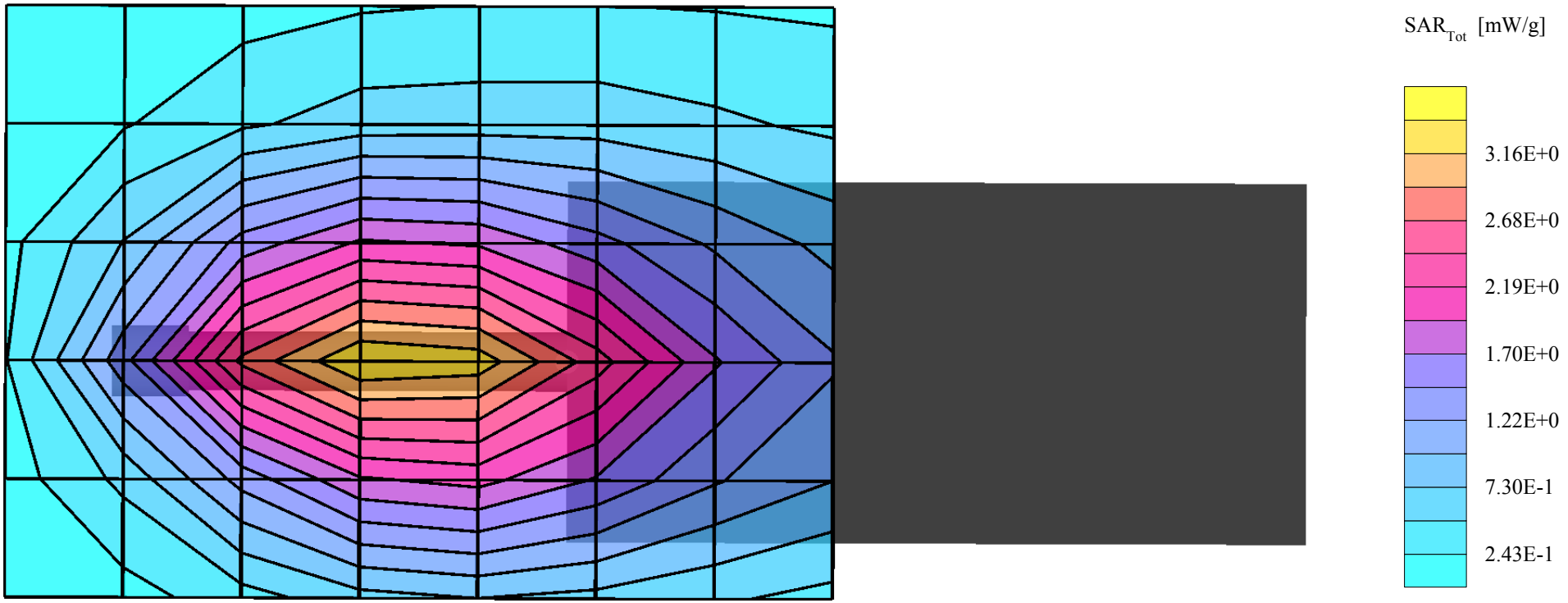
Body-Worn SAR with 1.0 cm Plastic Belt-Clip
Portable UHF PTT Radio Transceiver
Stubby Antenna (Centurion AFS-450S)
Nickel Cadmium Battery (BPJS-6N)
Ritron Model: JMX-441
Continuous Wave Mode
Mid Channel (460.100 MHz]
Conducted Power: 1.82 Watts
Date Tested: January 24, 2002



RITRON INC. FCC ID: AIERIT14-441

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: $\sigma = 0.93$ mho/m $\varepsilon_r = 57.5$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.15 dB
SAR (1g): 3.15 mW/g, SAR (10g): 2.14 mW/g

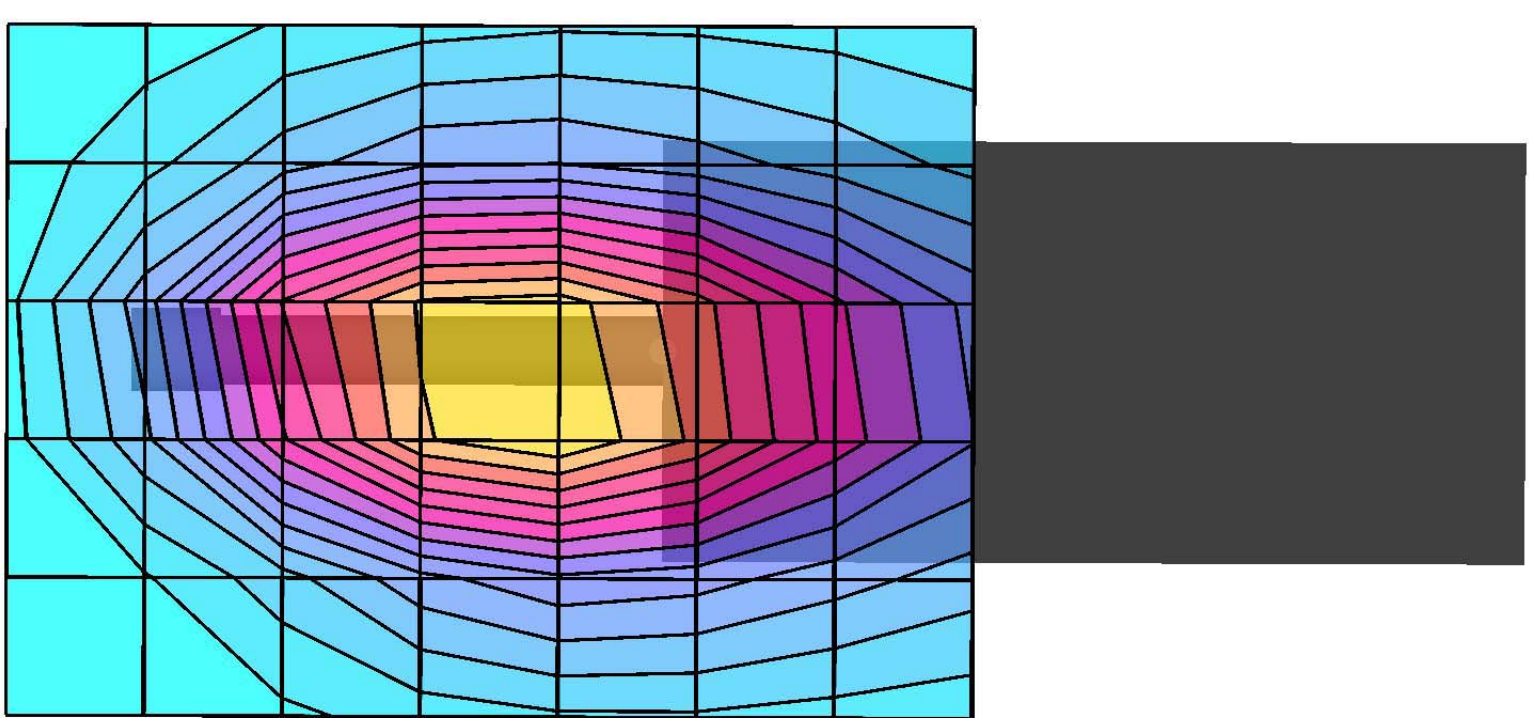
Body-Worn SAR with 1.0 cm Plastic Belt-Clip
Portable UHF PTT Radio Transceiver
Stubby Antenna (Centurion AFS-450S)
Nickel Cadmium Battery (BPJS-6N)
Ritron Model: JMX-441
Continuous Wave Mode
High Channel (469.950 MHz]
Conducted Power: 1.84 Watts
Date Tested: January 24, 2002



RITRON INC. FCC ID: AIERIT14-441

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: $\sigma = 0.93$ mho/m $\varepsilon_r = 57.5$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.14 dB
SAR (1g): 2.90 mW/g, SAR (10g): 1.96 mW/g

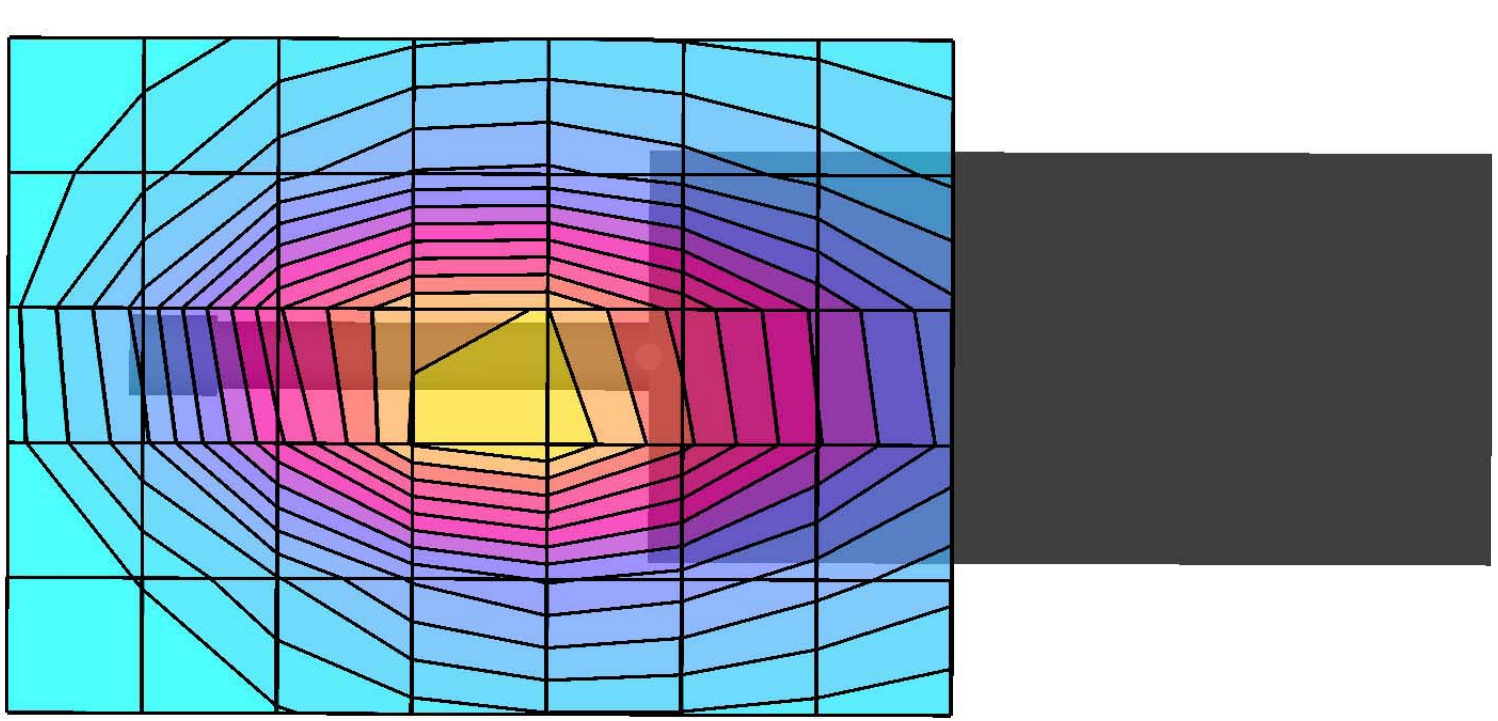
Body-Worn SAR with 1.0 cm Plastic Belt-Clip
Portable UHF PTT Radio Transceiver
Stubby Antenna (Centurion AFS-450S)
Nickel Metal Hydride Battery (BPS-6N-MH)
Ritron Model: JMX-441
Continuous Wave Mode
Low Channel (450.100 MHz]
Conducted Power: 1.92 Watts
Date Tested: January 24, 2002



RITRON INC. FCC ID: AIERIT14-441

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: $\sigma = 0.93$ mho/m $\varepsilon_r = 57.5$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.19 dB
SAR (1g): 3.34 mW/g, SAR (10g): 1.98 mW/g

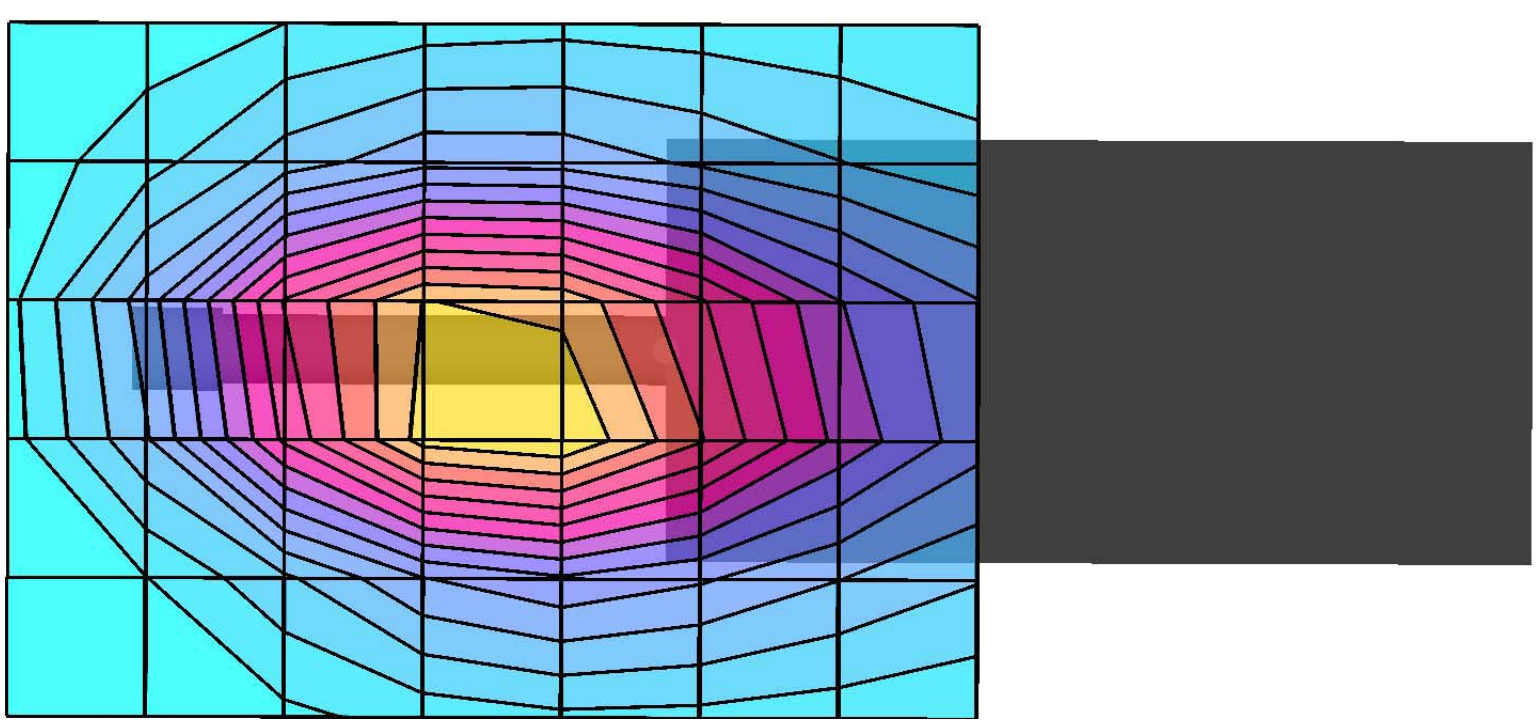
Body-Worn SAR with 1.0 cm Plastic Belt-Clip
Portable UHF PTT Radio Transceiver
Stubby Antenna (Centurion AFS-450S)
Nickel Metal Hydride Battery (BPS-6N-MH)
Ritron Model: JMX-441
Continuous Wave Mode
Mid Channel (460.100 MHz]
Conducted Power: 2.11 Watts
Date Tested: January 24, 2002



RITRON INC. FCC ID: AIERIT14-441

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: $\sigma = 0.93$ mho/m $\varepsilon_r = 57.5$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.16 dB
SAR (1g): 3.32 mW/g, SAR (10g): 2.11 mW/g

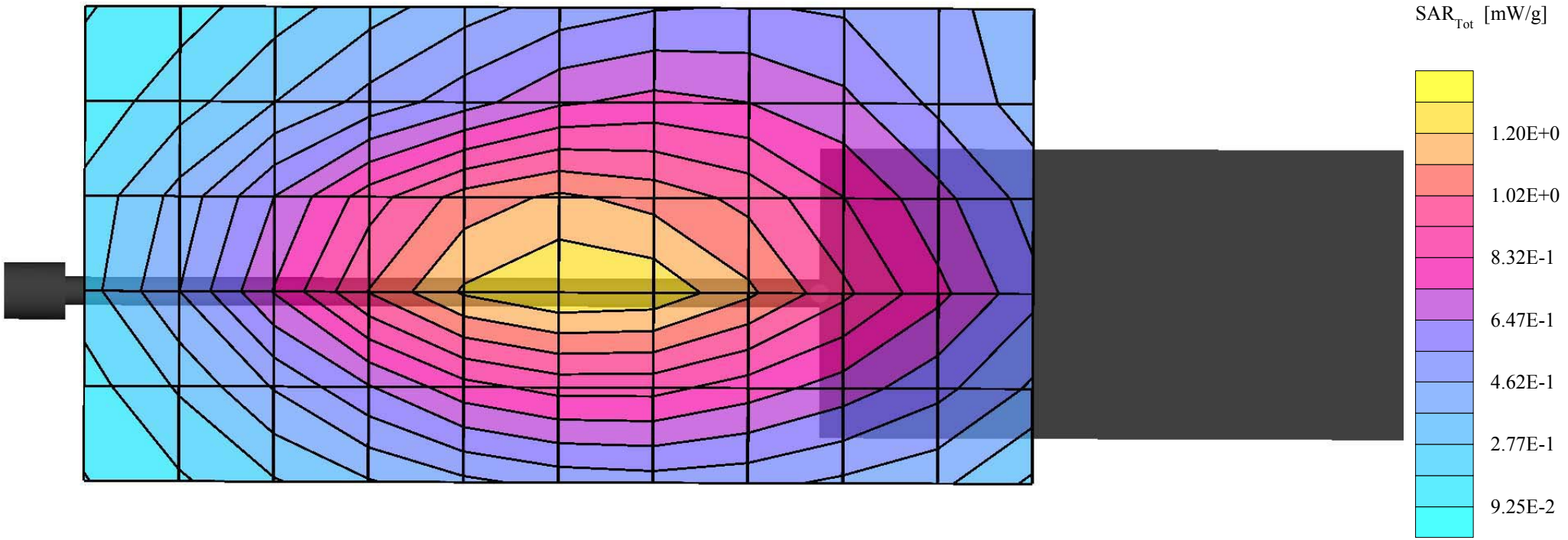
Body-Worn SAR with 1.0 cm Plastic Belt-Clip
Portable UHF PTT Radio Transceiver
Stubby Antenna (Centurion AFS-450S)
Nickel Metal Hydride Battery (BPS-6N-MH)
Ritron Model: JMX-441
Continuous Wave Mode
High Channel (469.950 MHz]
Conducted Power: 1.99 Watts
Date Tested: January 24, 2002



RITRON INC. FCC ID: AIERIT14-441

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: $\sigma = 0.93$ mho/m $\varepsilon_r = 57.5$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.14 dB
SAR (1g): 1.38 mW/g, SAR (10g): 1.01 mW/g

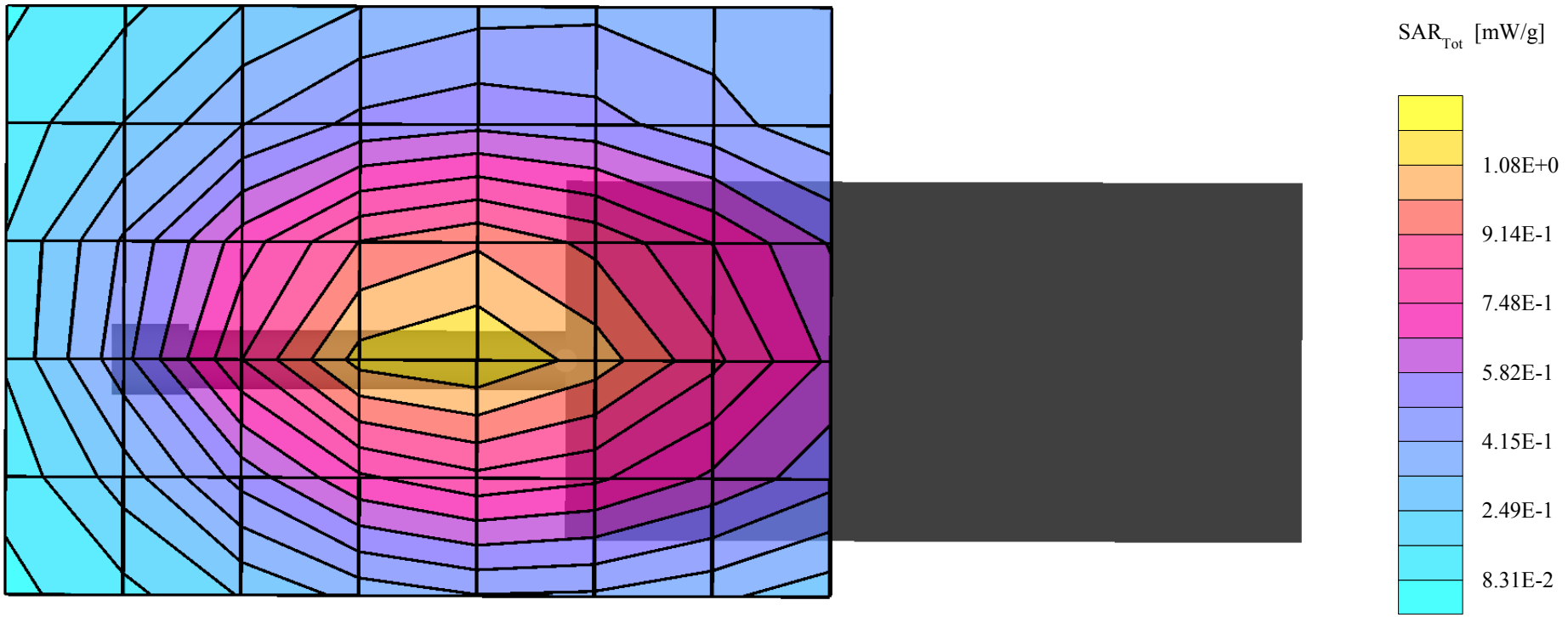
Body-Worn SAR with 3.0 cm Swivel Holster
Portable UHF PTT Radio Transceiver
Whip Antenna (Centurion AFS-450)
Nickel Metal Hydride Battery (BPS-6N-MH)
Ritron Model: JMX-441
Continuous Wave Mode
Mid Channel (460.100 MHz]
Conducted Power: 1.82 Watts
Date Tested: January 24, 2002



RITRON INC. FCC ID: AIERIT14-441

Small Planar Phantom; Planar Section; Position: (90°,180°)
Probe: ET3DV6 - SN1590; ConvF(7.23,7.23,7.23); Crest factor: 1.0
450 MHz Muscle: $\sigma = 0.93$ mho/m $\varepsilon_r = 57.5$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.23 dB
SAR (1g): 1.05 mW/g, SAR (10g): 0.750 mW/g

Body-Worn SAR with 3.0 cm Swivel Holster
Portable UHF PTT Radio Transceiver
Stubby Antenna (Centurion AFS-450S)
Nickel Metal Hydride Battery (BPS-6N-MH)
Ritron Model: JMX-441
Continuous Wave Mode
Mid Channel (460.100 MHz]
Conducted Power: 1.83 Watts
Date Tested: January 24, 2002



APPENDIX B - DIPOLE VALIDATION

450MHz Validation Dipole

Large Planar Phantom; Planar Section

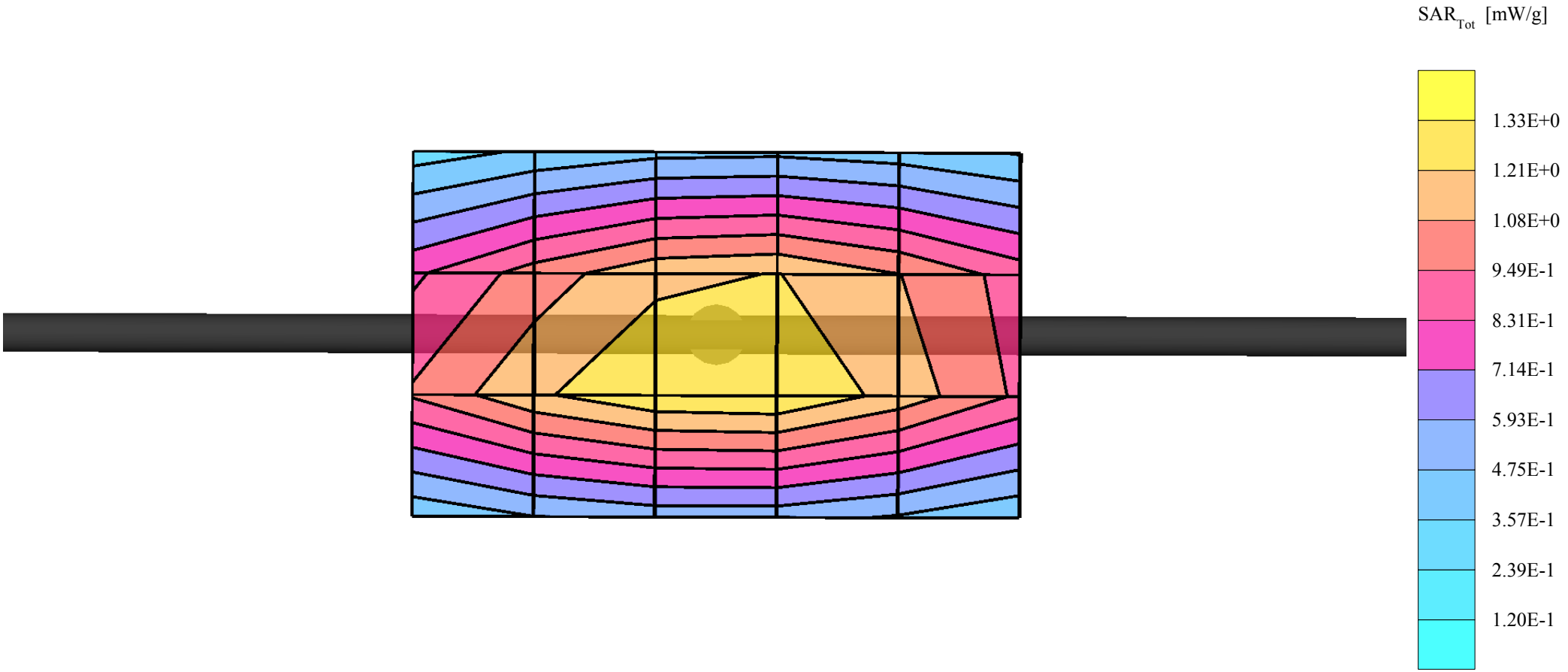
Probe: ET3DV6 - SN1590; ConvF(7.36,7.36,7.36); Crest factor: 1.0; 450 MHz Brain: $\sigma = 0.86$ mho/m $\varepsilon_r = 44.3$ $\rho = 1.00$ g/cm^3

Cube 5x5x7: Peak: 2.32 mW/g, SAR (1g): 1.45 mW/g, SAR (10g): 0.949 mW/g, (Worst-case extrapolation)

Penetration depth: 12.9 (11.2, 15.3) [mm]

Powerdrift: -0.00 dB; Conducted Input Power: 250 [mW]

Test Date: January 24, 2002



450MHz Validation Dipole

Large Planar Phantom; Planar Section

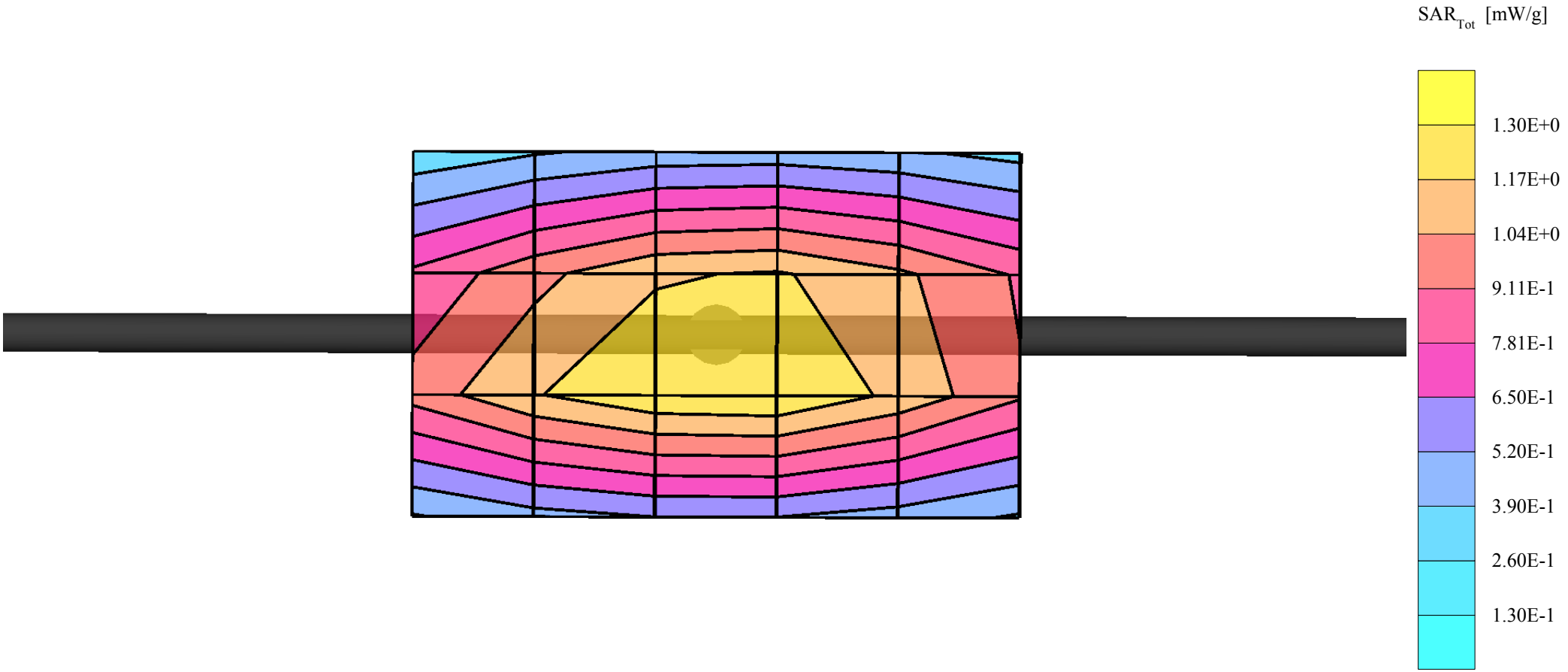
Probe: ET3DV6 - SN1590; ConvF(7.36,7.36,7.36); Crest factor: 1.0; 450 MHz Brain: $\sigma = 0.86$ mho/m $\varepsilon_r = 44.1$ $\rho = 1.00$ g/cm^3

Cube 5x5x7: Peak: 2.26 mW/g, SAR (1g): 1.44 mW/g, SAR (10g): 0.949 mW/g, (Worst-case extrapolation)

Penetration depth: 12.8 (11.1, 15.1) [mm]

Powerdrift: -0.00 dB; Conducted Input Power: 250 [mW]

Test Date: January 25, 2002



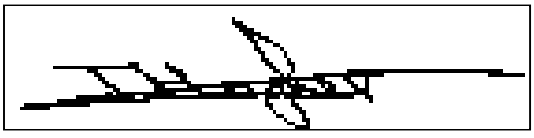
APPENDIX C - DIPOLE CALIBRATION

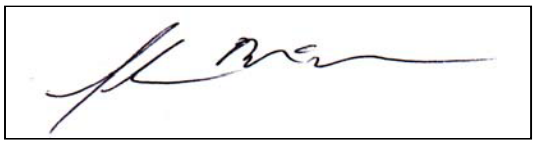
Celltech
Testing and Engineering Services Lab

450MHz SYSTEM VALIDATION DIPOLE

Type:	**450MHz Validation Dipole**
Serial Number:	**136**
Place of Calibration:	**Celltech Research Inc.**
Date of Calibration:	**October 17, 2001**

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

Calibrated by: 

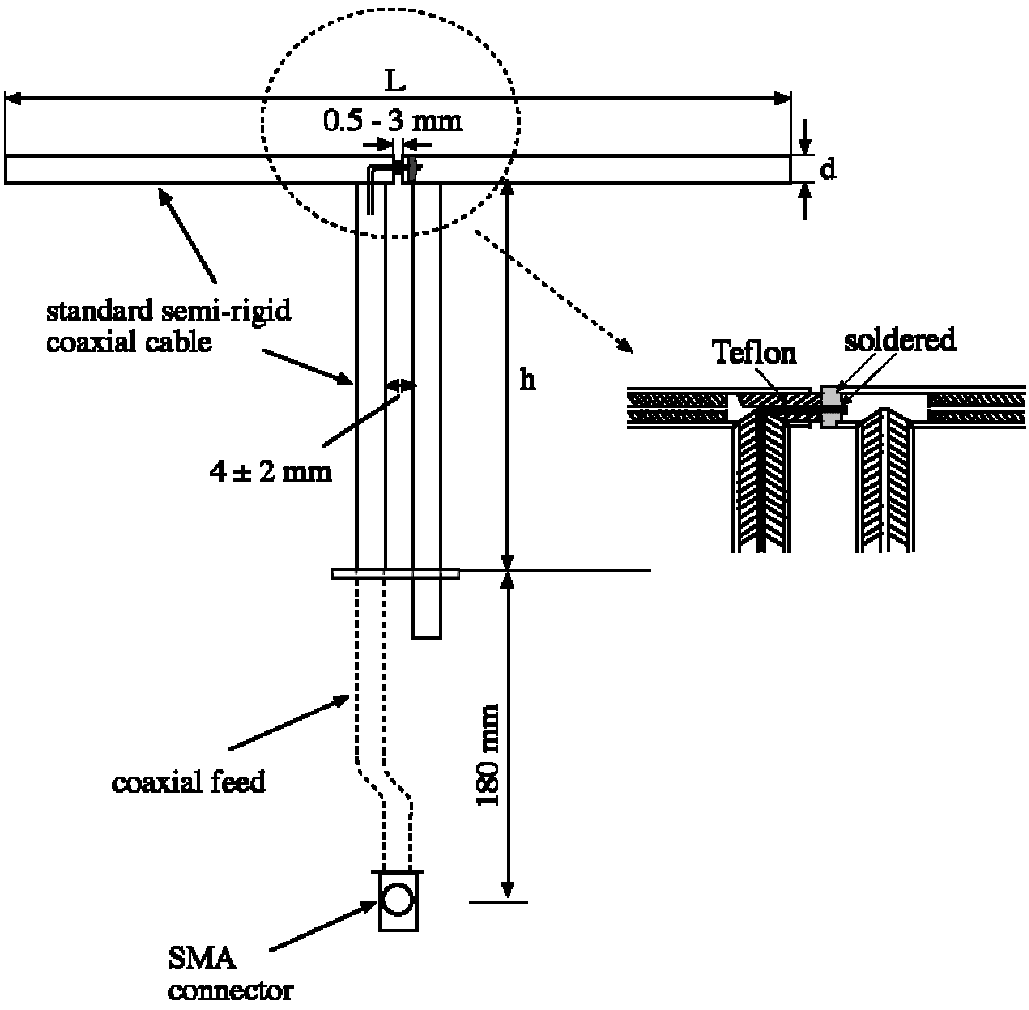
Approved by: 

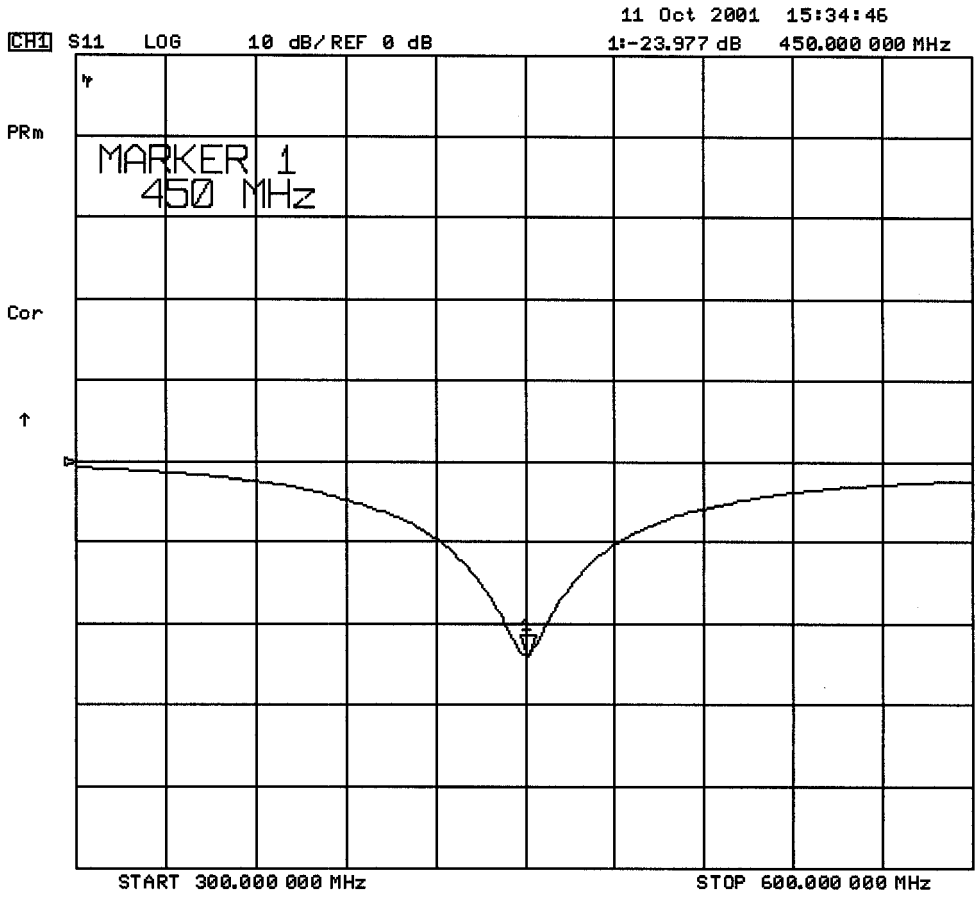
Celltech Research Inc. 1955 Moss Court, Kelowna, B.C. Canada V1Y 9L3
Tel. 250-860-3130 • Fax. 250-860-3110 • e-mail: info@celltechlabs.com
www.celltechlabs.com

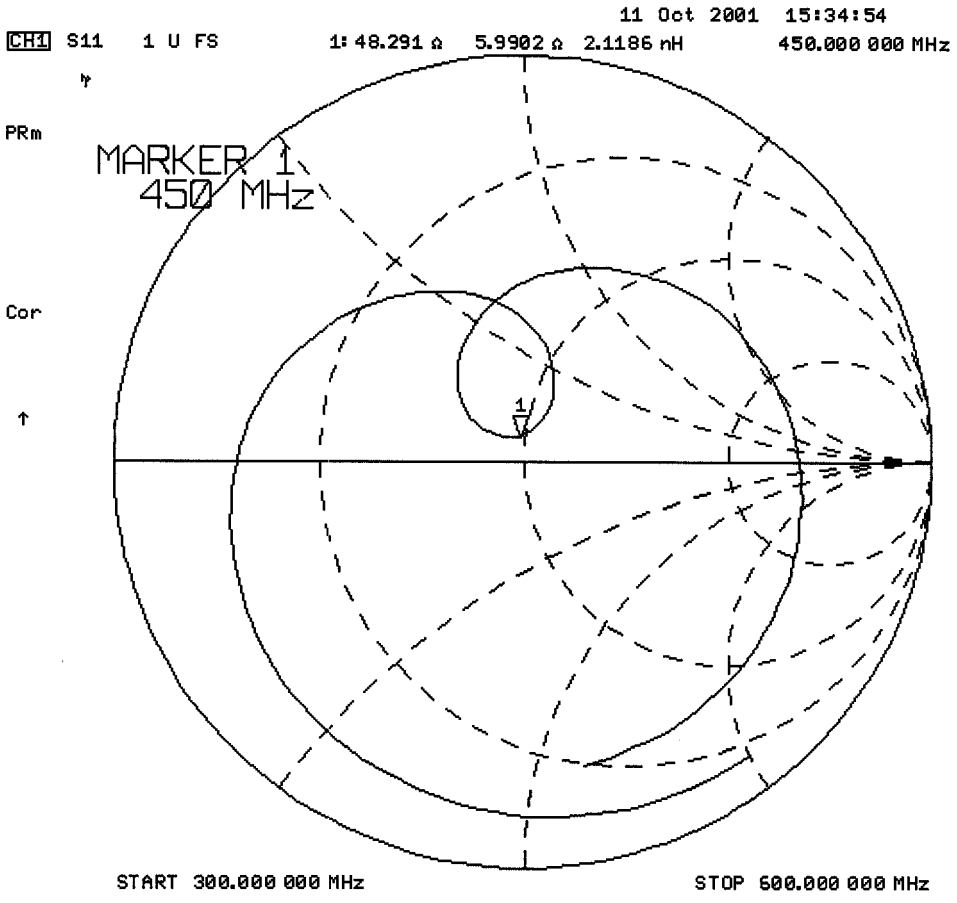
1. Dipole Construction & Electrical Characteristics

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 450MHz	$\mathrm{Re}\{Z\} = 49.982\Omega$
	$\mathrm{Im}\{Z\} = 5.8594\Omega$
Return Loss at 450MHz	-24.714dB




11 Oct 2001 15:34:46
CH1 S11 LOG 10 dB/ REF 0 dB
1:-23.977 dB 450.000 000 MHz
PRm
MARKER 1
450 MHz
Cor
START 300.000 000 MHz
STOP 600.000 000 MHz


11 Oct 2001 15:34:54
CH1 S11 1 U FS
1: 48.291 Ω 5.9902 Ω 2.1186 nH
450.000 000 MHz
PRm
MARKER 1
450 MHz
Cor
START 300.000 000 MHz
STOP 600.000 000 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

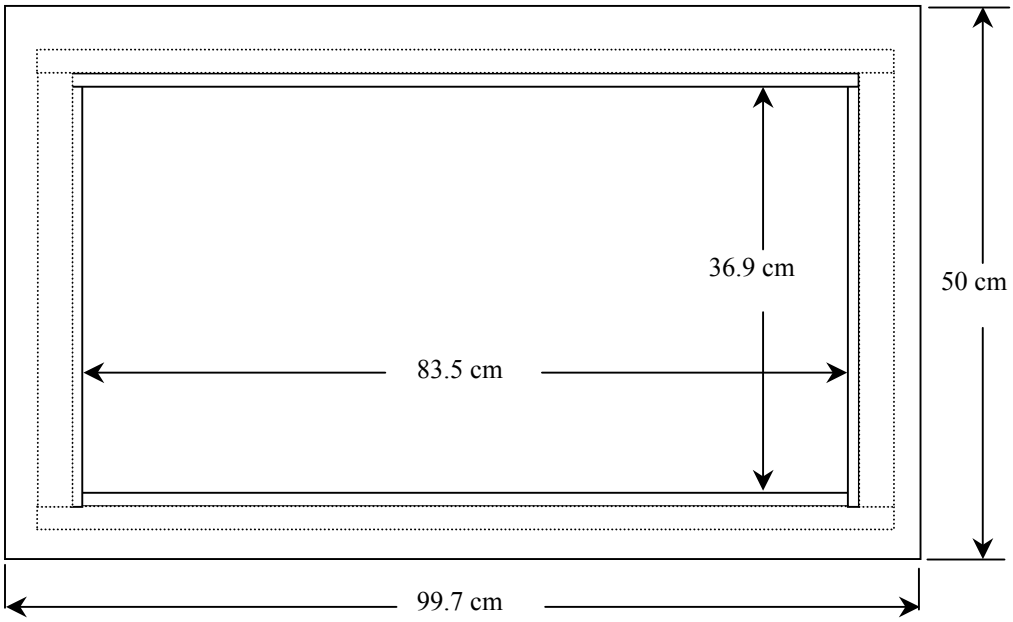
2. Validation Phantom

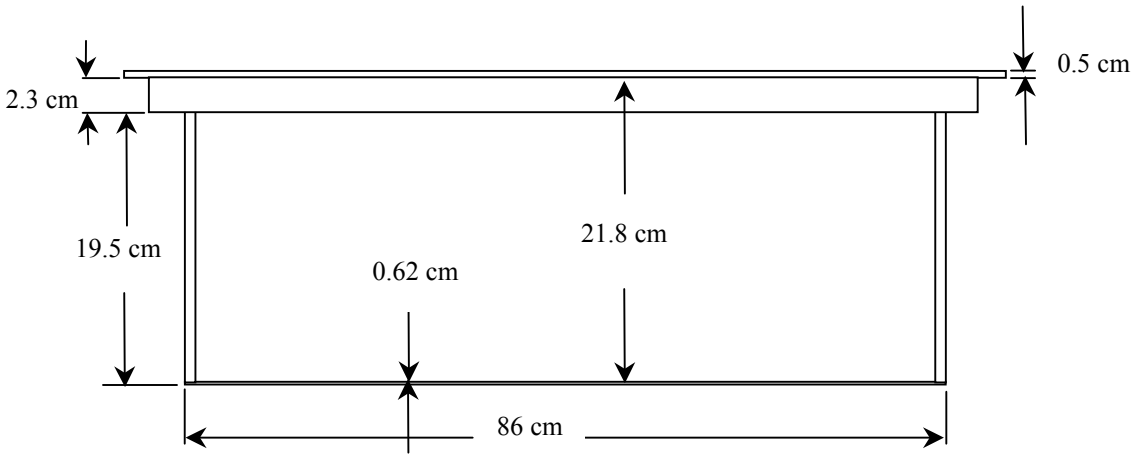
The validation phantom was constructed using relatively low-loss tangent Plexiglas material. The dimensions of the phantom are as follows:

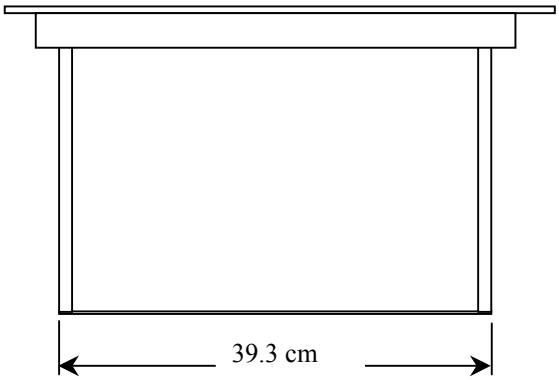
Length: 83.5 cm
Width: 36.9 cm
Height: 21.8 cm

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

Dimensions of Plexiglas Planar Phantom







450MHz Dipole Calibration Photo

450MHz Dipole Calibration Photo

3. Measurement Conditions

The planar phantom was filled with brain simulating tissue having the following electrical parameters at 450MHz:

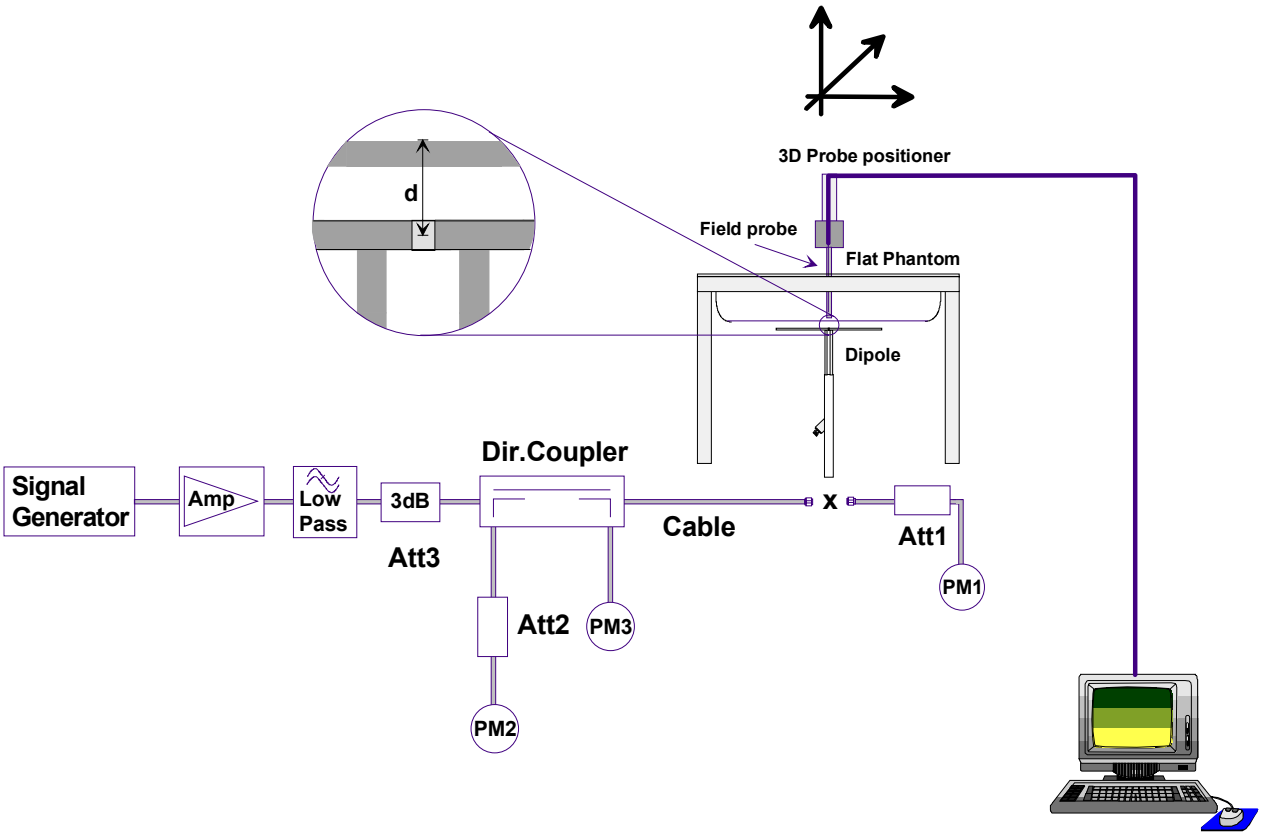
Relative Permitivity:	43.8	± 5%
Conductivity:	0.86 mho/m	± 5%
Temperature:	23.1°C	

The 450MHz simulating tissue consists of the following ingredients:

Ingredient	Percentage by weight
Water	38.56%
Sugar	56.32%
Salt	3.95%
HEC	0.98%
Dowicil 75	0.19%
Target Dielectric Parameters at 22°C	$\varepsilon_r = 43.5$ $\sigma = 0.87$ 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	1.47	5.88	0.971	3.88	2.31
Test 2	1.43	5.72	0.949	3.80	2.25
Test 3	1.45	5.80	0.961	3.84	2.27
Test 4	1.44	5.76	0.954	3.82	2.26
Test 5	1.46	5.84	0.969	3.88	2.29
Test 6	1.42	5.68	0.939	3.76	2.23
Test 7	1.45	5.80	0.960	3.84	2.27
Test 8	1.41	5.64	0.928	3.71	2.22
Test 9	1.43	5.72	0.950	3.80	2.25
Test10	1.46	5.84	0.971	3.88	2.29
Average Value	1.44	5.77	0.946	3.82	2.26

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

Averaged over 1cm (1g) of tissue: 5.77 mW/g

Averaged over 10cm (10g) of tissue: 3.82 mW/g