13.0 MEASUREMENT UNCERTAINTIES

Uncertainty Description	Error	Distribution	Weight	Standard Deviation	Offset
Probe Uncertainty					
Axial isotropy	±0.2 dB	U-Shaped	0.5	±2.4 %	
Spherical isotropy	±0.4 dB	U-Shaped	0.5	±4.8 %	
Isotropy from gradient	±0.5 dB	U-Shaped	0	±	
Spatial resolution	±0.5 %	Normal	1	±0.5 %	
Linearity error	±0.2 dB	Rectangle	1	±2.7 %	
Calibration error	±3.3 %	Normal	1	±3.3 %	
SAR Evaluation Uncertainty					
Data acquisition error	±1 %	Rectangle	1	±0.6 %	
ELF and RF disturbances	±0.25 %	Normal	1	±0.25 %	
Conductivity assessment	±10 %	Rectangle	1	±5.8 %	
Spatial Peak SAR Evaluation Uncertainty					
Extrapolated boundary effect	±3 %	Normal	1	±3 %	±5 %
Probe positioning error	±0.1 mm	Normal	1	±1 %	
Integrated and cube orientation	±3 %	Normal	1	±3 %	
Cube Shape inaccuracies	±2 %	Rectangle	1	±1.2 %	
Device positioning	±6 %	Normal	1	±6 %	
Combined Uncertainties				±11.7 %	±5 %

Measurement uncertainties in SAR measurements are difficult to quantify due to several variables including biological, physiological, and environmental. However, the estimated measurement uncertainties in SAR are less than 15-25 %.

According to ANSI/IEEE C95.3, the overall uncertainties are difficult to assess and will vary with the type of meter and usage situation. However, accuracy's of ± 1 to 3 dB can be expected in practice, with greater uncertainties in near-field situations and at higher frequencies (shorter wavelengths), or areas where large reflecting objects are present. Under optimum measurement conditions, SAR measurement uncertainties of at least ± 2dB can be expected.

According to CENELEC, typical worst-case uncertainty of field measurements is ± 5 dB.
For well-defined modulation characteristics the uncertainty can be reduced to ± 3 dB.

14.0 REFERENCES

(1) ANSI, *ANSI/IEEE C95.1: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 Ghz, The Institute of Electrical and Electronics Engineers, Inc., New York, NY 10017, 1992;*

(2) Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields", OET Bulletin 65, FCC, Washington, D.C. 20554, 1997;

(3) Thomas Schmid, Oliver Egger, and Neils Kuster, "Automated E-field scanning system for dosimetric assessments", IEEE *Transaction on Microwave Theory and Techniques,* Vol. 44, pp. 105 – 113, January, 1996.

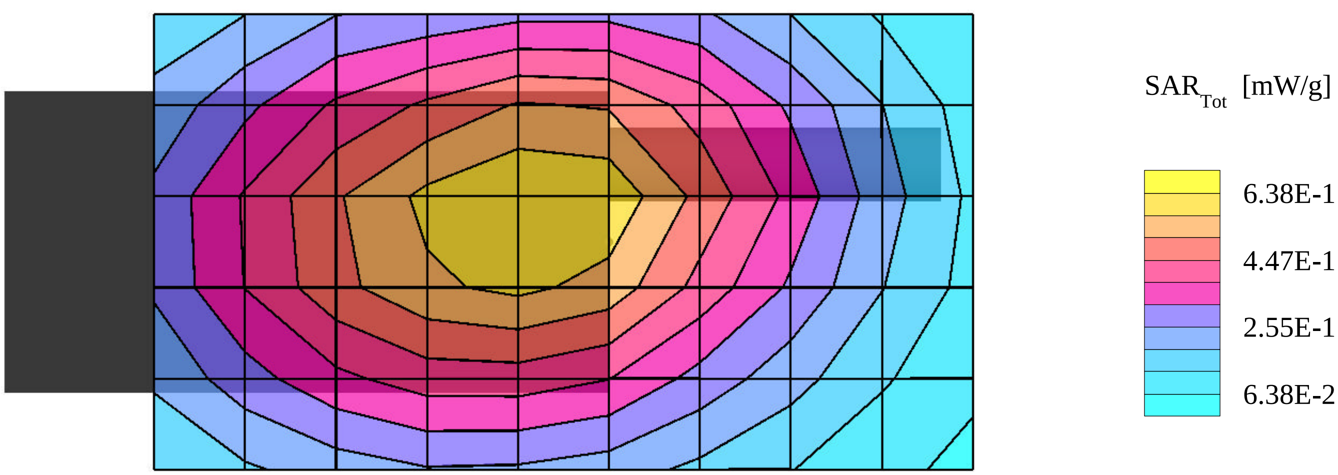
(4) Niels Kuster, Ralph Kastle, and Thomas Schmid, "Dosimetric evaluation of mobile communications equipment with know precision", IEICE Transactions of Communications, vol. E80-B, no. 5, pp. 645 – 652, May 1997.

APPENDIX "A" - SAR MEASUREMENT DATA

RADIOSHACK CORPORATION

Generic Twin Phantom; Flat Section; Position: (90°,90°);
Probe: ET3DV6 - SN1387; ConvF(6.76,6.76,6.76); Crest factor: 1.0;
450MHz Brain: σ = 0.61 mho/m ε_r = 48.9 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.563 mW/g * , SAR (10g): 0.422 mW/g Max outside

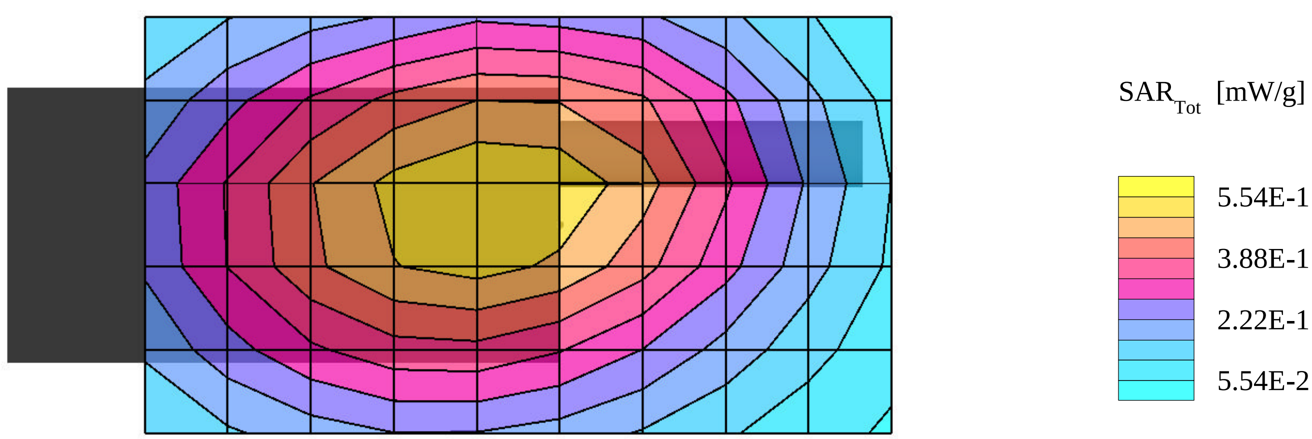
Face SAR
RadioShack Corporation
Model 19-1207
Low Channel [461.0375MHz]
Conducted Power 32dBm
Test date: Oct 24, 2000



RADIOSHACK CORPORATION

Generic Twin Phantom; Flat Section; Position: (90°,90°);
Probe: ET3DV6 - SN1387; ConvF(6.76,6.76,6.76); Crest factor: 1.0;
450MHz Brain: σ = 0.61 mho/m ε_r = 48.9 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 0.561 mW/g, SAR (10g): 0.425 mW/g

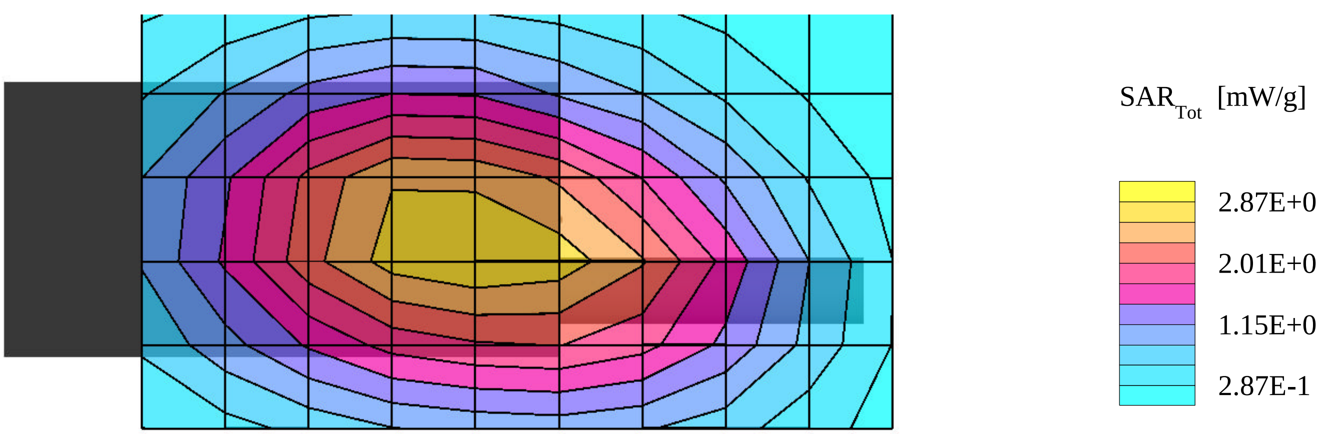
Face SAR
RadioShack Corporation
Model: 19-1207
Unmodulated Carrier
High Channel [469.5625MHz]
Conducted Power 32dBm
Test date: Oct 24, 2000



RADIOSHACK CORPORATION

Generic Twin Phantom; Flat Section; Position: (270°,270°);
Probe: ET3DV6 - SN1387; ConvF(6.76,6.76,6.76); Crest factor: 1.0;
450MHz Muscle: σ = 0.84 mho/m ε_r = 57.5 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 2.52 mW/g, SAR (10g): 1.89 mW/g

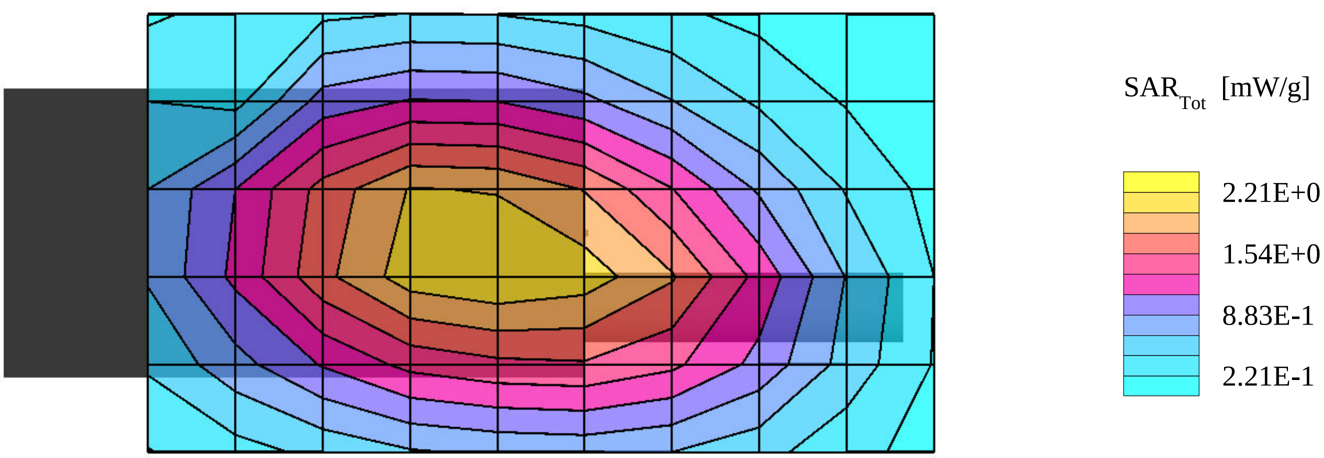
Body SAR Using Belt Clip
Separation Distance 0.8cm
RadioShack Corporation
Model 19-1207
Low Channel [461.0375MHz]
Conducted Power 32dBm
Test date: Oct 24, 2000



RADIOSHACK CORPORATION

Generic Twin Phantom; Flat Section; Position: (270°,270°);
Probe: ET3DV6 - SN1387; ConvF(6.76,6.76,6.76); Crest factor: 1.0;
450MHz Muscle: σ = 0.84 mho/m ε_r = 57.5 ρ = 1.00 g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 1.99 mW/g, SAR (10g): 1.49 mW/g

Body SAR Using Belt Clip
Separation Distance 0.8cm
RadioShack Corporation
Model 19-1207
High Channel [469.5625MHz]
Conducted Power 32dBm
Test date: Oct 24, 2000

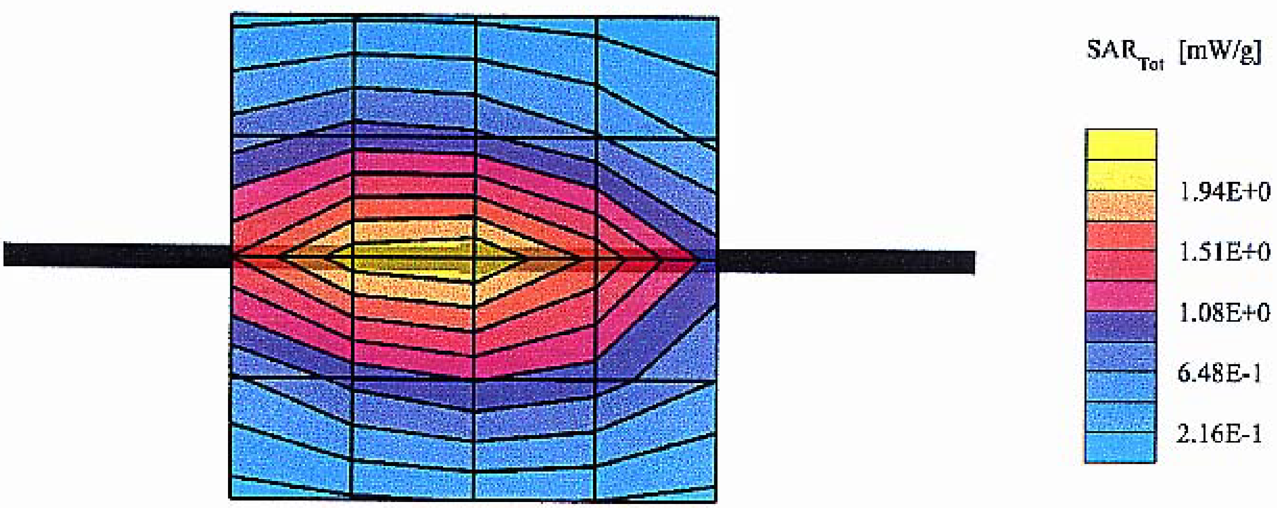


APPENDIX "B" – DIPOLE VALIDATION

Dipole 835 MHz

Generic Twin Phantom; Flat Section; Position: (90°,90°);
Probe: ET3DV6 - SN1387; ConvF(6.43,6.43,6.43); Crest factor: 1.0;
Brain 835 MHz: $\sigma = 0.80$ mho/m $\epsilon_r = 44.2$ $\rho = 1.00$ g/cm^3
Coarse: Dx = 20.0, Dy = 20.0, Dz = 10.0
Cube 5x5x7
SAR (1g): 2.03 mW/g, SAR (10g): 1.34 mW/g

Validation Date: Oct. 24, 2000



Validation Dipole D835V2 SN:411, d = 15mm

Frequency: 835 MHz; Antenna Input Power: 250 [mW]
Generic Twin Phantom; Flat Section; Grid Spacing: Dx = 20.0, Dy = 20.0, Dz = 10.0
Probe: ET3DV5 - SN1342/DAE3; ConvF(5.75,5.75,5.75); Brain 835 MHz: σ = 0.80 mho/m ε_r = 44.2 ρ = 1.00 g/cm^3
Cubes (2): Peak: 3.07 mW/g ± 0.05 dB, SAR (1g): 2.06 mW/g ± 0.05 dB, SAR (10g): 1.38 mW/g ± 0.05 dB, (Worst-case extrapolation)
Penetration depth: 13.6 (12.7, 14.8) [mm]
Powerdrift: -0.00 dB