

### **Appendix 3**

#### **SAR distribution plots for Body Worn Configuration**

338CA46B

Ch# 1013 / Pwr Step: ALWAYS UP

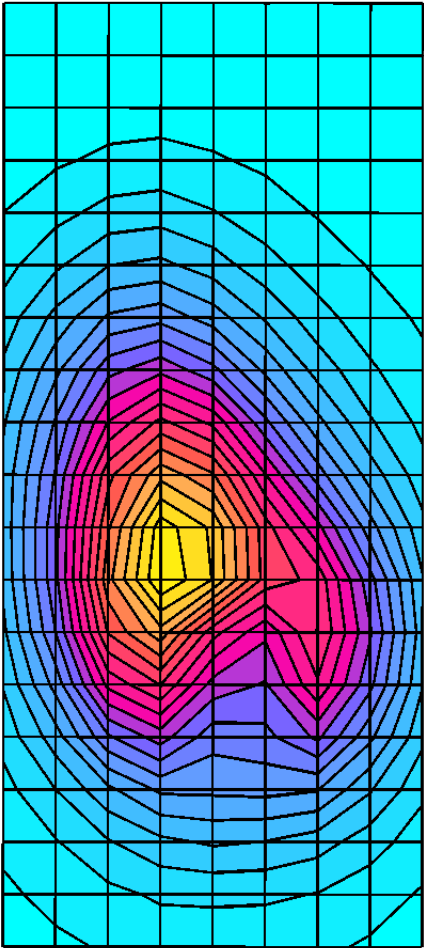
Antenna Position: Extended

Type of Modulation: 800 CDMA

Battery Model #: SNN5695A

Accessory Model # =Leather Pouch CHYN4459

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 825 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 55.4$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.864 mW/g, SAR (10g): 0.562 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0  
Penetration depth: 12.7 (11.8, 13.8) [mm]  
Powerdrift: 0.19 dB



338CA46B

Ch# 777 / Pwr Step: ALWAYS UP

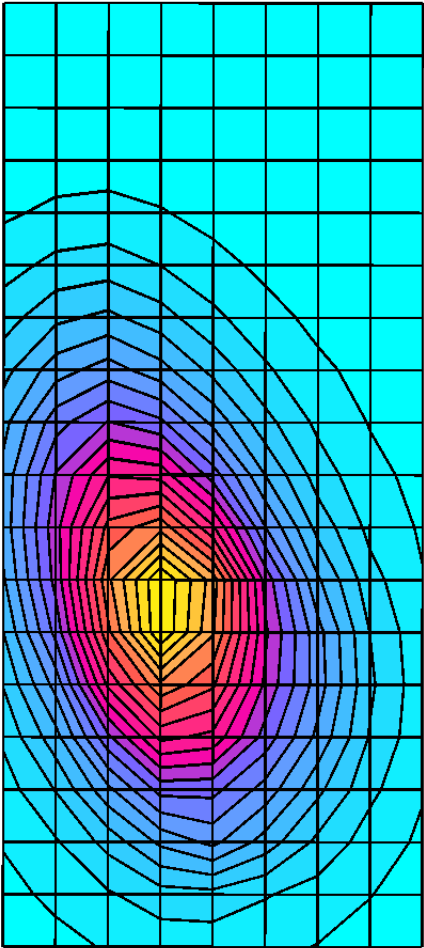
Antenna Position:Extended

Type of Modulation: 800 CDMA

Battery Model #: SNN5695A

Accessory Model # =Leather Pouch CHYN4459

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 848 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 55.4$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.961 mW/g, SAR (10g): 0.604 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0  
Penetration depth: 11.9 (10.4, 13.9) [mm]  
Powerdrift: -0.02 dB



338CA46B

Ch# 600 / Pwr Step:always up

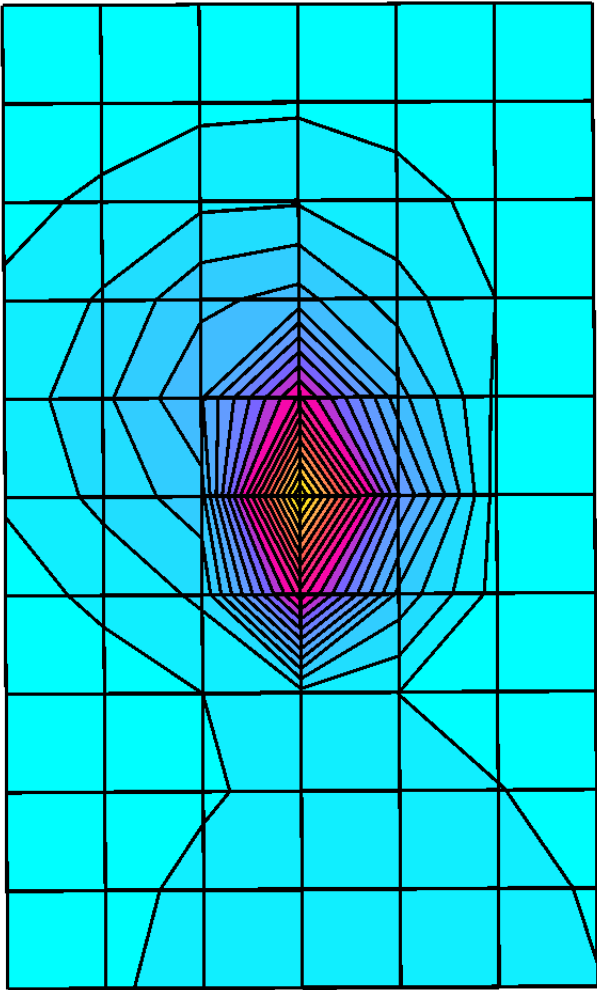
Antenna Position: ret

Type of Modulation:1900 cdma

Battery Model #: SNN5695A

Accessory Model # = SYN8763B UNIVERSAL CLIP

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1880 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58 \text{ mho/m}$   $\epsilon_r = 50.9$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 7x7x7: SAR (1g): 1.40 mW/g, SAR (10g): 0.691 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 9.2 (8.8, 9.8) [mm]  
Powerdrift: -0.21 dB



## 338CA46B

Ch# 600 / Pwr Step: ALWAYS UP

Type of Modulation: 1900 CDMA

Accessory Model # = SYN9766 CASE SYN8763A UNIVERSAL BELT CLIP

Antenna Position: RET

Battery Model #: EXT BATTERY

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1880 MHz

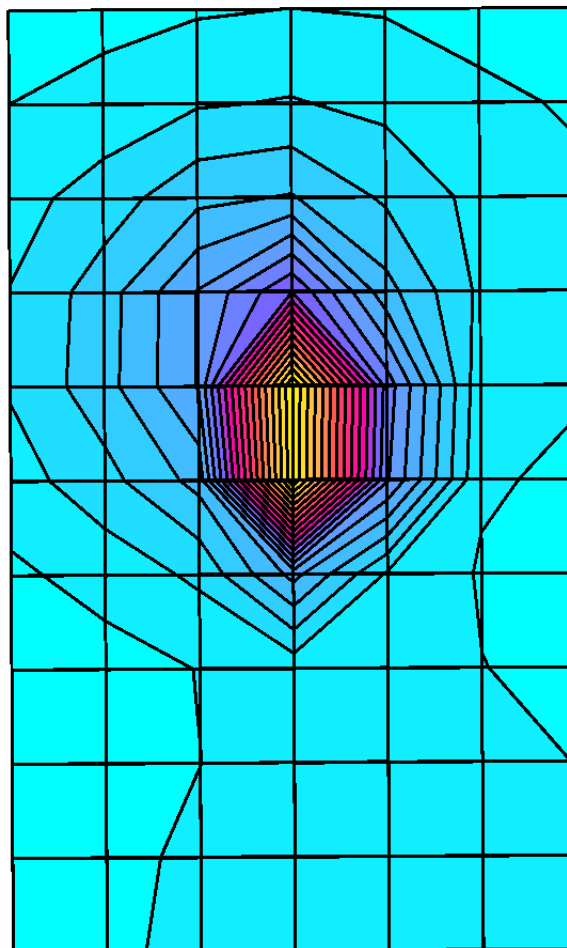
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58 \text{ mho/m}$   $\epsilon_r = 50.9$   $\rho = 1.00 \text{ g/cm}^3$

Cube 7x7x7: SAR (1g): 1.16 mW/g, SAR (10g): 0.584 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 9.2 (9.0, 9.6) [mm]

Powerdrift: -0.07 dB



## 338CA46B

Ch# 600 / Pwr Step:always up

Type of Modulation:1900 cdma

Accessory Model # = SYN8763B UNIVERSAL CLIP

Antenna Position:EXT

Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1880 MHz

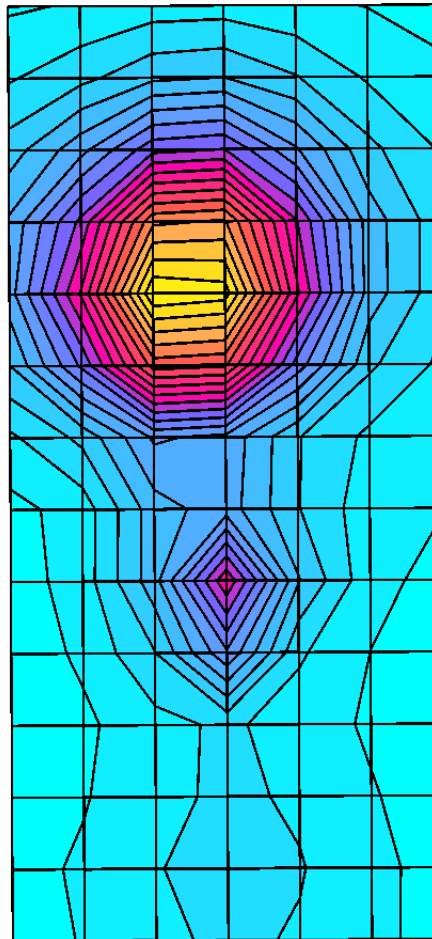
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58$  mho/m  $\epsilon_r = 50.9$   $\rho = 1.00$  g/cm<sup>3</sup>

Cube 7x7x7: SAR (1g): 0.393 mW/g, SAR (10g): 0.244 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 11.0 (10.5, 11.6) [mm]

Powerdrift: -0.07 dB



## 338CA46B

Ch# 600 / Pwr Step: ALWAYS UP

Antenna Position: EXT

Type of Modulation: 1900 CDMA

Battery Model #: EXT BATTERY

Accessory Model # = SYN9766 CASE SYN8763A UNIVERSAL BELT CLIP

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1880 MHz

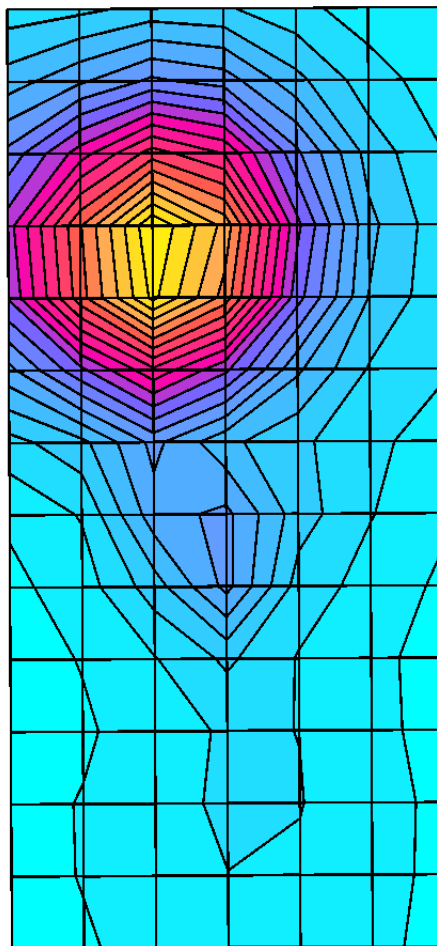
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58$  mho/m  $\epsilon_r = 50.9$   $\rho = 1.00$  g/cm<sup>3</sup>

Cube 7x7x7: SAR (1g): 0.290 mW/g, SAR (10g): 0.182 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 11.0 (10.8, 11.2) [mm]

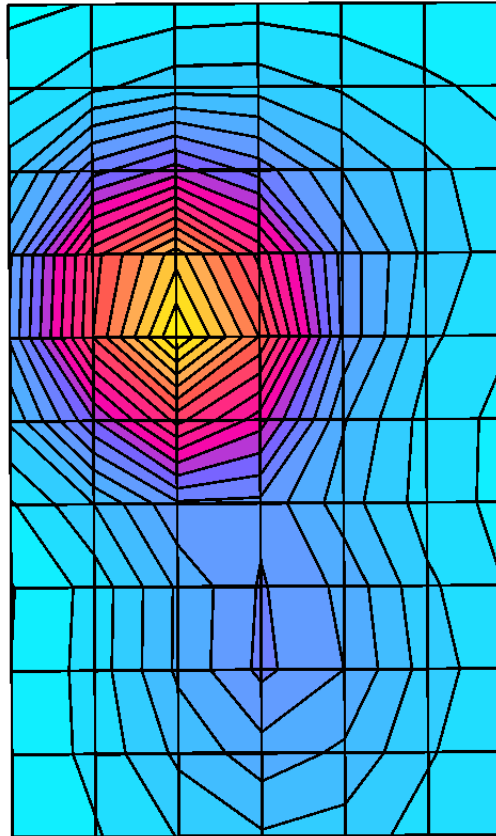
Powerdrift: -0.02 dB



## 338CA46B

Ch# 600 / Pwr Step: ALWAYS UP      Antenna Position: Ret  
Type of Modulation: CDMA 1900      Battery Model #: SNN5695A  
Accessory Model # = SYN9766 CASE AND SYN8631A WISHBONE CLIP

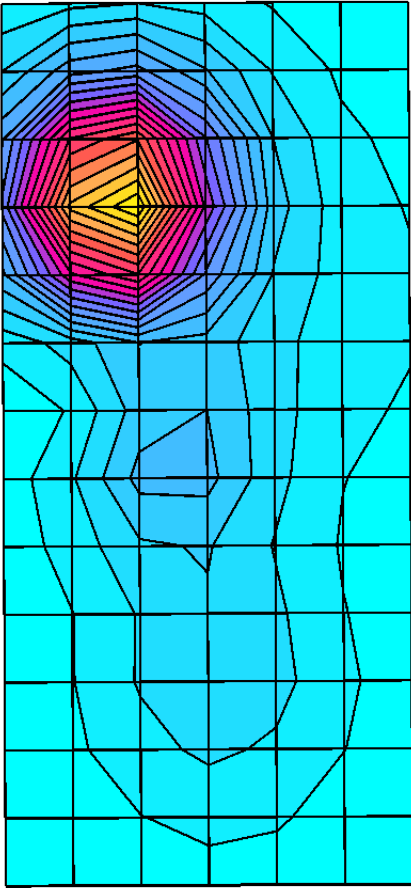
R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1880 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58$  mho/m  $\epsilon_r = 51.3$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.694 mW/g, SAR (10g): 0.425 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 10.5 (10.3, 11.0) [mm]  
Powerdrift: -0.07 dB



338CA46B

Ch# 600 / Pwr Step: ALWAYS UP      Antenna Position: Ext  
Type of Modulation: CDMA 1900      Battery Model #: SNN5695A  
Accessory Model # = SYN9766 CASE AND SYN8631A WISHBONE CLIP

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1880 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58$  mho/m  $\epsilon_r = 51.3$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.689 mW/g, SAR (10g): 0.411 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 10.7 (10.4, 11.2) [mm]  
Powerdrift: -0.04 dB

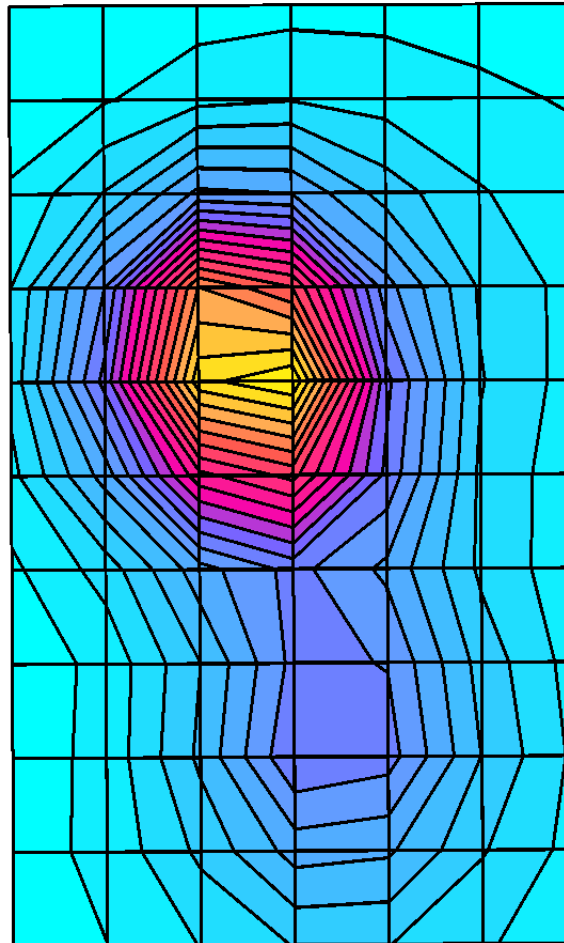


## 338CA46B

Ch# 600 / Pwr Step: ALWAYS UP  
Type of Modulation: 1900 CDMA  
Accessory Model # = SYN0912A Plastic Holder

Antenna Position: RET  
Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1880 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58$  mho/m  $\epsilon_r = 50.9$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 1.16 mW/g, SAR (10g): 0.692 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 10.0 (9.6, 10.6) [mm]  
Powerdrift: -0.10 dB

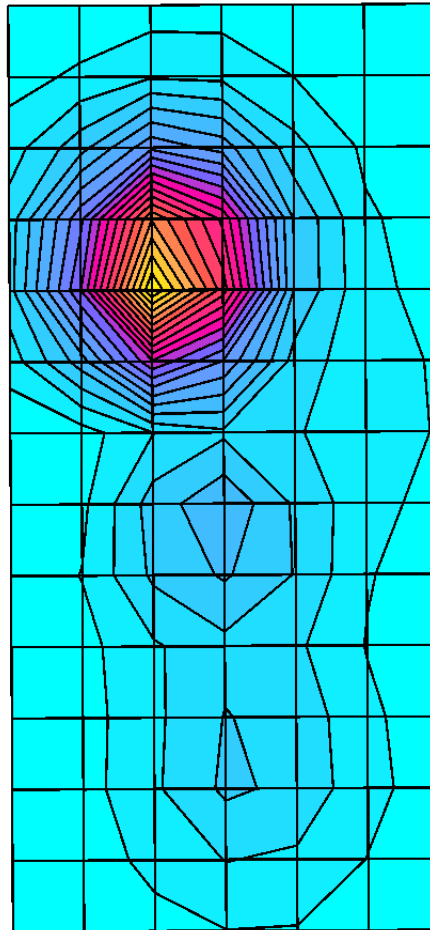


## 338CA46B

Ch# 600 / Pwr Step: ALWAYS UP  
Type of Modulation: 1900 CDMA  
Accessory Model # = SYN0912A Plastic Holder

Antenna Position: EXT  
Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1880 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58$  mho/m  $\epsilon_r = 50.9$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 1.09 mW/g, SAR (10g): 0.631 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 10.2 (9.9, 10.7) [mm]  
Powerdrift: 0.12 dB

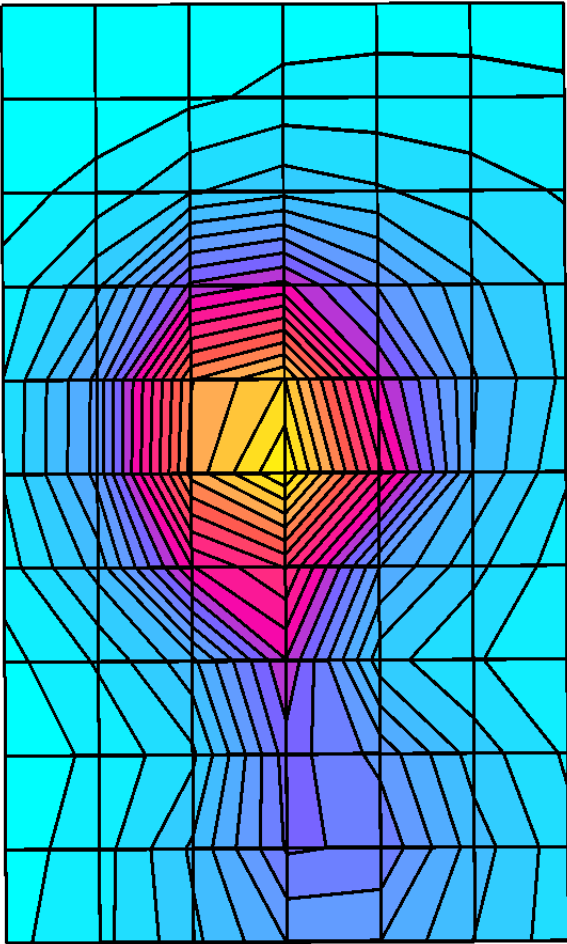


338CA46B

Ch# 600 / Pwr Step:always up  
Type of Modulation:1900 cdma  
Accessory Model # = CHYN4459 LEATHER CASE

Antenna Position:RET  
Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1880 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58 \text{ mho/m}$   $\epsilon_r = 50.9$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 7x7x7: SAR (1g): 0.980 mW/g, SAR (10g): 0.591 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 10.5 (10.0, 11.2) [mm]  
Powerdrift: -0.13 dB



338CA46B

Ch# 600 / Pwr Step:always up

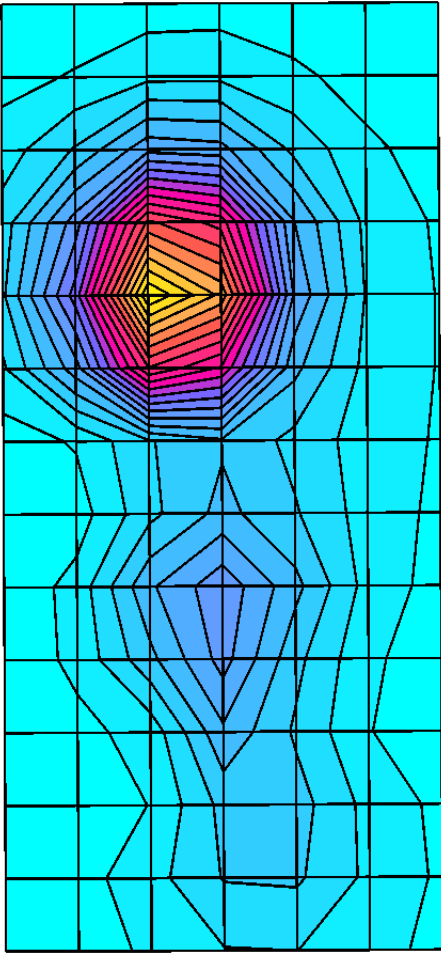
Type of Modulation:1900 cdma

Accessory Model # = CHYN4459 LEATHER CASE

Antenna PositionEXT

Battery Model #: SNN5695A

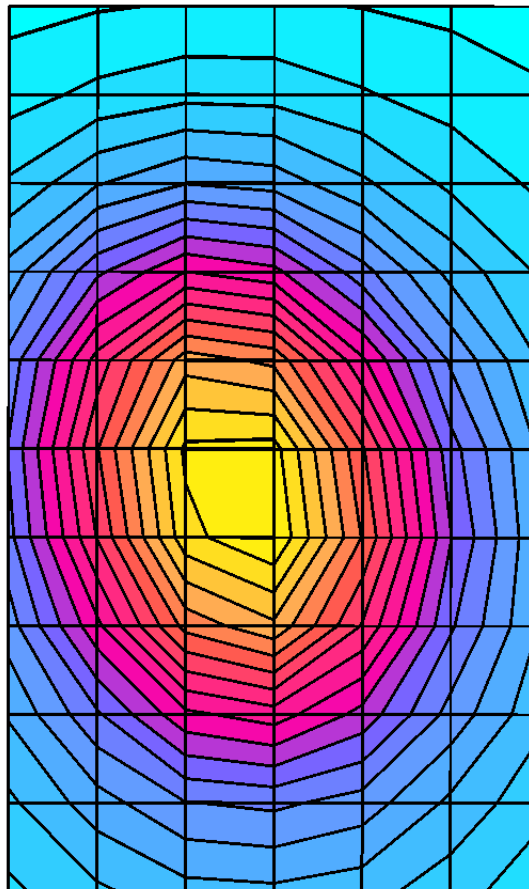
R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1880 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58 \text{ mho/m}$   $\epsilon_r = 50.9$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 7x7x7: SAR (1g): 0.983 mW/g, SAR (10g): 0.577 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 10.3 (9.9, 11.0) [mm]  
Powerdrift: -0.00 dB



## 338CA46B

Ch# 384 / Pwr Step: ALWAYS UP      Antenna Position: RET.  
Type of Modulation: CDMA 800      Battery Model #: SNN5695A  
Accessory Model # = SYN9766 CASE AND SYN8763A UNIVERSAL CLIP

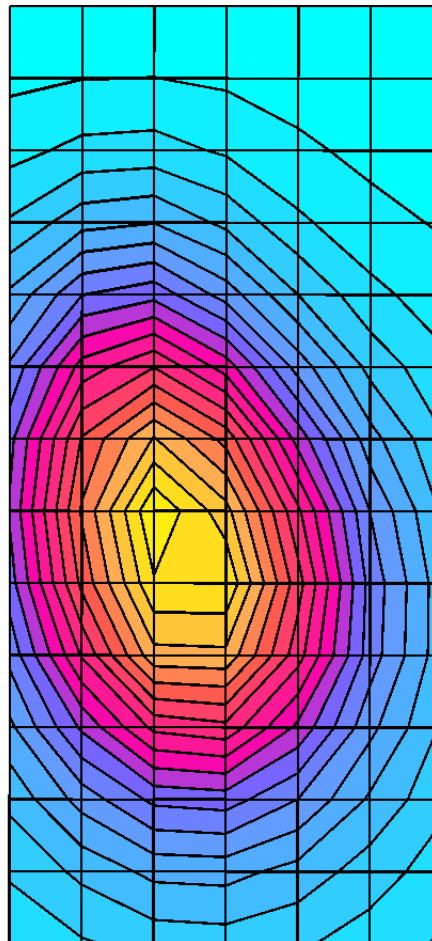
R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 837 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 53.8$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.220 mW/g, SAR (10g): 0.162 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 19.0 (17.4, 20.4) [mm]  
Powerdrift: 0.11 dB



## 338CA46B

Ch# 384 / Pwr Step: ALWAYS UP      Antenna Position: Ext  
Type of Modulation: CDMA 800      Battery Model #: SNN5695A  
Accessory Model # = SYN9766 CASE AND SYN8763A UNIVERSAL CLIP

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 837 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 53.8$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.239 mW/g, SAR (10g): 0.175 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 18.0 (17.9, 18.4) [mm]  
Powerdrift: 0.07 dB



338CA46B

Ch# 384 / Pwr Step: ALWAYS UP

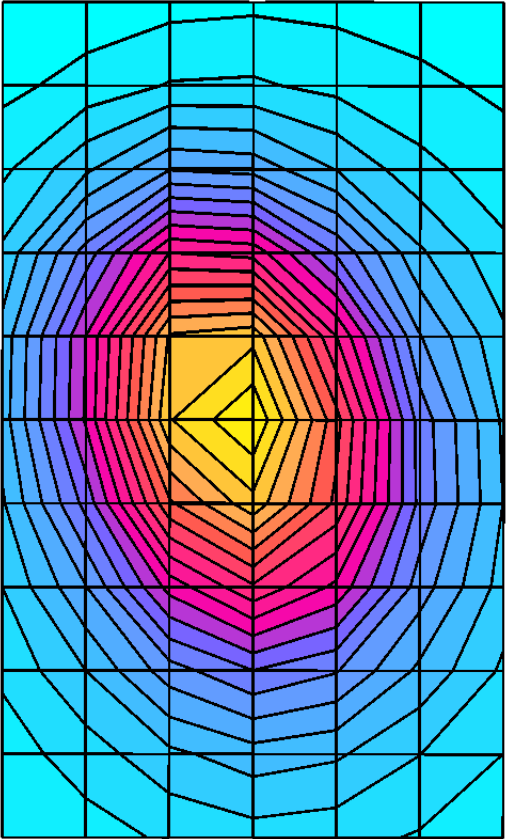
Antenna Position: RET.

Type of Modulation: 800 CDMA

Battery Model #: SNN5695A

Accessory Model # = SYN9766 CASE and SYN8631A WISHBONE CLIP

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 837 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 55.4$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.369 mW/g, SAR (10g): 0.265 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 17.2 (16.4, 17.9) [mm]  
Powerdrift: 0.09 dB



338CA46B

Ch# 384 / Pwr Step: ALWAYS UP

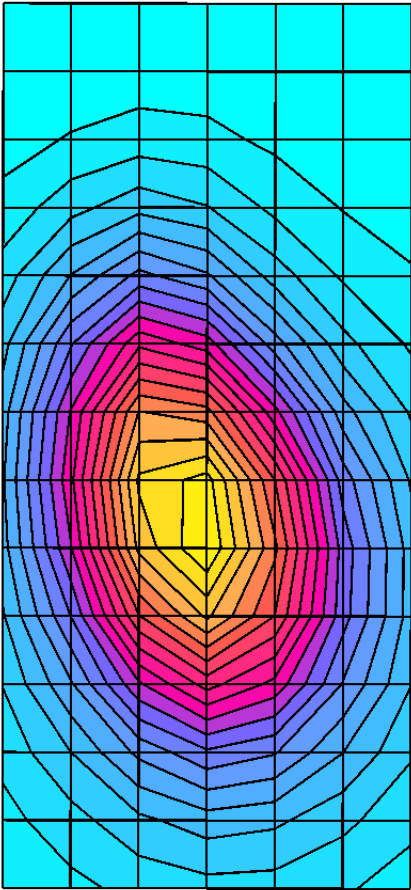
Antenna Position: EXT.

Type of Modulation: 800 CDMA

Battery Model #: SNN5695A

Accessory Model # = SYN9766 CASE and SYN8631A WISHBONE CLIP

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 837 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 55.4$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.396 mW/g, SAR (10g): 0.286 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 17.1 (15.9, 18.3) [mm]  
Powerdrift: 0.12 dB

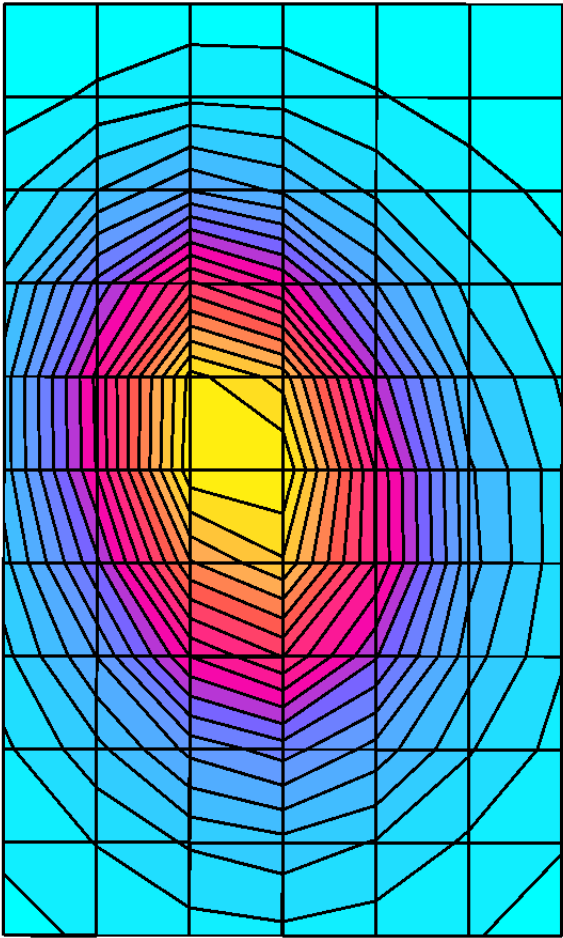


338CA46B

Ch# 384 / Pwr Step: ALWAYS UP  
Type of Modulation: 800 CDMA  
Accessory Model # = SYN0912A Plastic Holder

Antenna Position: RET  
Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 837 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 54.5$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.609 mW/g, SAR (10g): 0.429 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 16.1 (14.7, 17.4) [mm]  
Powerdrift: 0.09 dB

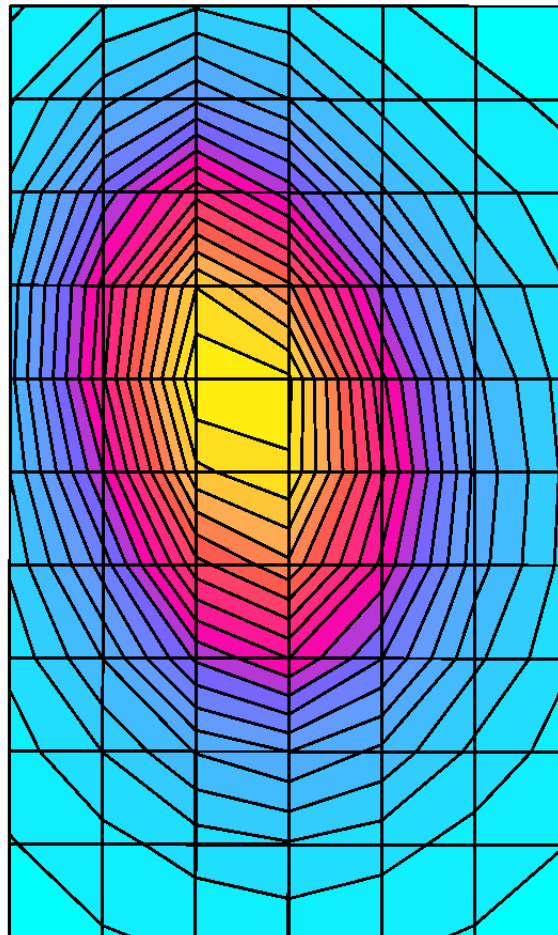


## 338CA46B

Ch# 384 / Pwr Step: ALWAYS UP  
Type of Modulation: 800 CDMA  
Accessory Model # = SYN0912A Plastic Holder

Antenna Position: EXT  
Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 837 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 54.5$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.594 mW/g, SAR (10g): 0.419 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 15.7 (14.9, 16.5) [mm]  
Powerdrift: 0.06 dB

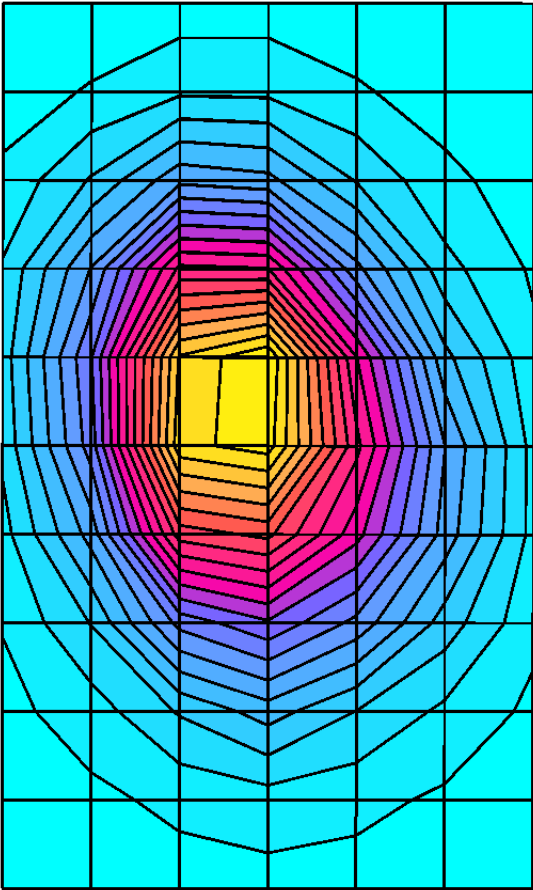


338CA46B

Ch# 384 / Pwr Step: ALWAYS UP  
Type of Modulation: 800 CDMA  
Accessory Model # = CHYN4459 Pouch

Antenna Position: RET.  
Battery Model #:SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 837 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 55.4$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.811 mW/g, SAR (10g): 0.514 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 12.6 (12.2, 13.3) [mm]  
Powerdrift: 0.03 dB



338CA46B

Ch# 384 / Pwr Step: ALWAYS UP

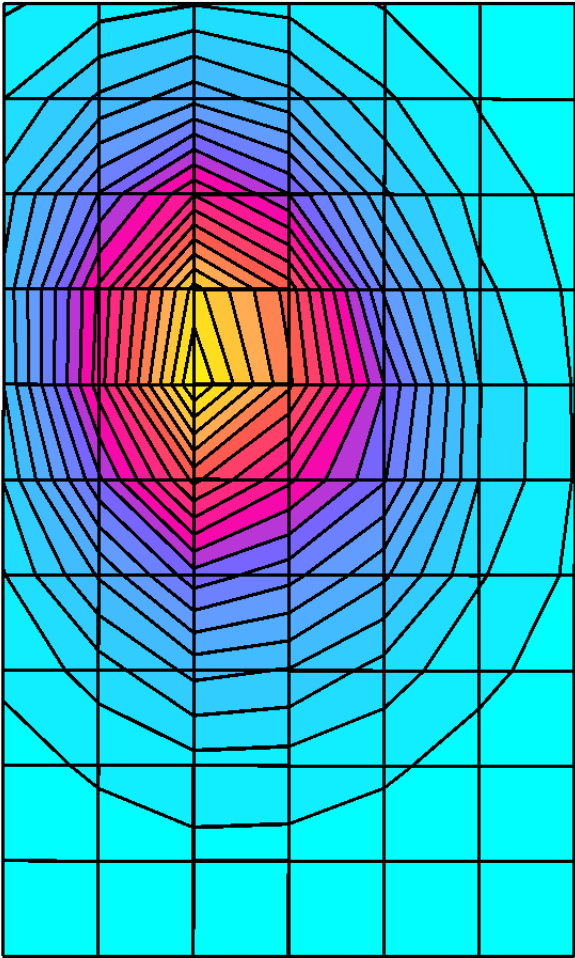
Antenna Position: Ret

Type of Modulation: CDMA 800

Battery Model #: Eng. Sample Ext Batt

Accessory Model # = CHYN4459A Pouch

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 837 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 53.8$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.614 mW/g, SAR (10g): 0.391 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 12.6 (11.5, 13.9) [mm]  
Powerdrift: -0.02 dB

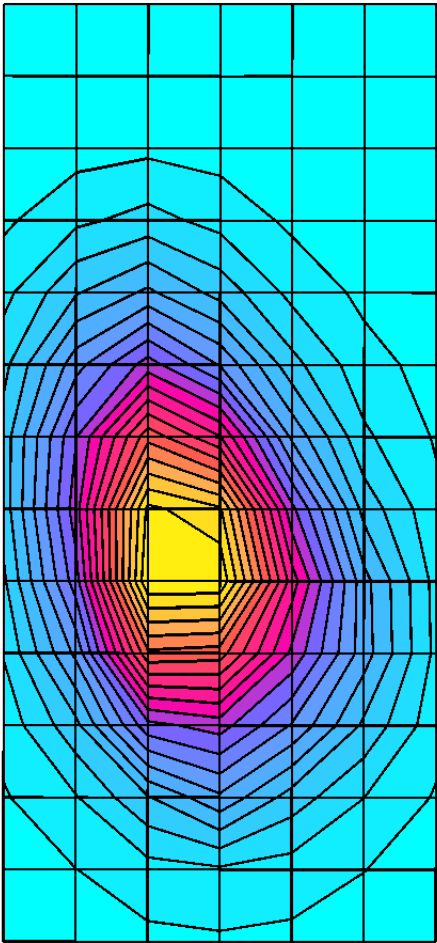


338CA46B

Ch# 384 / Pwr Step: ALWAYS UP  
Type of Modulation: 800 CDMA  
Accessory Model # = CHYN4459 Pouch

Antenna Position: EXT.  
Battery Model #:SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 837 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 55.4$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.833 mW/g, SAR (10g): 0.531 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 12.2 (10.8, 14.0) [mm]  
Powerdrift: 0.05 dB



## 338CA46B

Ch# 384 / Pwr Step: ALWAYS UP

Antenna Position: Ext

Type of Modulation: CDMA 800

Battery Model #: Eng. Sample Ext Batt

Accessory Model # = CHYN4459A Pouch

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 837 MHz

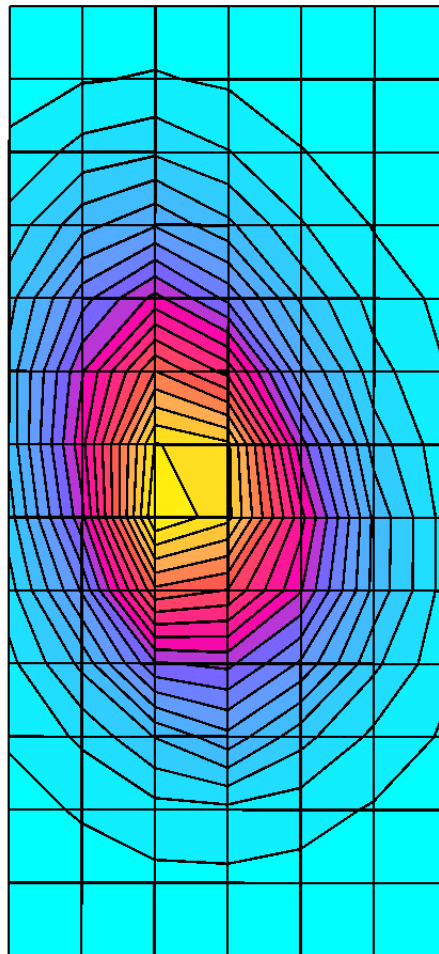
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 53.8$   $\rho = 1.00$  g/cm<sup>3</sup>

Cube 7x7x7: SAR (1g): 0.701 mW/g, SAR (10g): 0.451 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 12.6 (11.5, 14.0) [mm]

Powerdrift: -0.01 dB



338CA46B

Ch# 25 / Pwr Step:always up

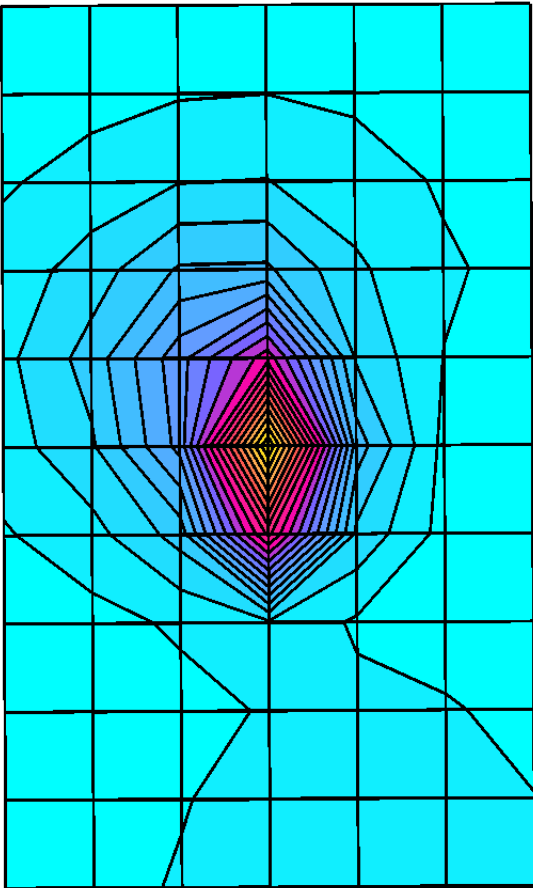
Antenna Position: ret

Type of Modulation:1900 cdma

Battery Model #: SNN5695A

Accessory Model # = SYN8763B UNIVERSAL CLIP

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1851 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58 \text{ mho/m}$   $\epsilon_r = 50.9$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 7x7x7: SAR (1g): 1.29 mW/g, SAR (10g): 0.658 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 9.1 (8.9, 9.6) [mm]  
Powerdrift: -0.15 dB



## 338CA46B

Ch# 25 / Pwr Step: ALWAYS UP

Antenna Position: RET

Type of Modulation: 1900 CDMA

Battery Model #: EXT BATTERY

Accessory Model # = SYN9766 CASE SYN8763A UNIVERSAL BELT CLIP

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1851 MHz

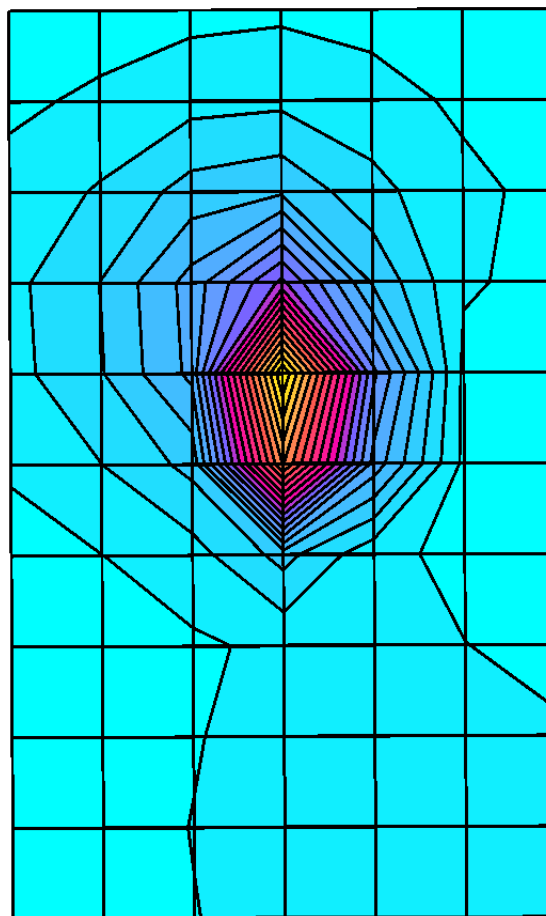
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58$  mho/m  $\epsilon_r = 50.9$   $\rho = 1.00$  g/cm<sup>3</sup>

Cube 7x7x7: SAR (1g): 1.34 mW/g, SAR (10g): 0.667 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 9.2 (9.1, 9.6) [mm]

Powerdrift: -0.05 dB



## 338CA46B

Ch# 25 / Pwr Step: ALWAYS UP

Type of Modulation: 1900 CDMA

Accessory Model # = SYN0912A Plastic Holder

Antenna Position: RET

Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1851 MHz

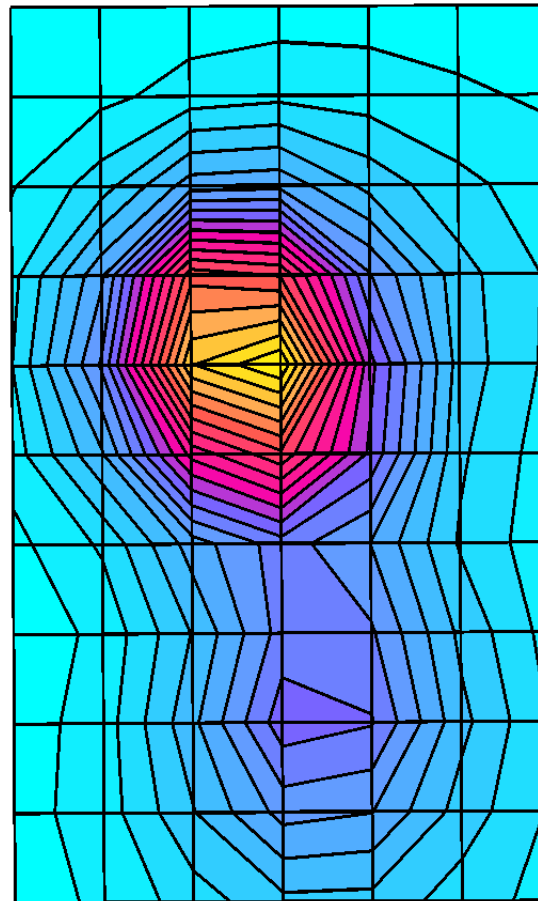
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58$  mho/m  $\epsilon_r = 50.9$   $\rho = 1.00$  g/cm<sup>3</sup>

Cube 7x7x7: SAR (1g): 1.18 mW/g, SAR (10g): 0.713 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 10.4 (10.0, 10.9) [mm]

Powerdrift: -0.04 dB



## 338CA46B

Ch# 25 / Pwr Step: ALWAYS UP

Type of Modulation: 1900 CDMA

Accessory Model # = SYN0912A Plastic Holder

Antenna Position: EXT

Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1851 MHz

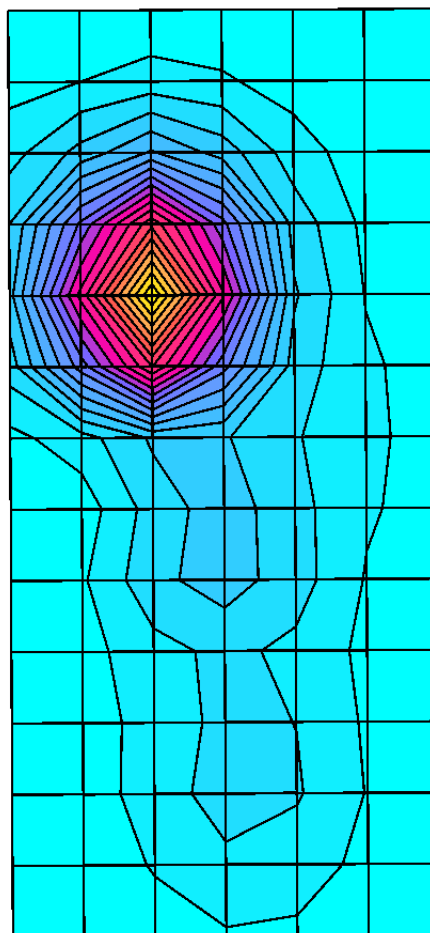
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58$  mho/m  $\epsilon_r = 50.9$   $\rho = 1.00$  g/cm<sup>3</sup>

Cube 7x7x7: SAR (1g): 1.00 mW/g, SAR (10g): 0.582 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 10.4 (10.0, 10.9) [mm]

Powerdrift: 0.02 dB



338CA46B

Ch# 25 / Pwr Step:always up

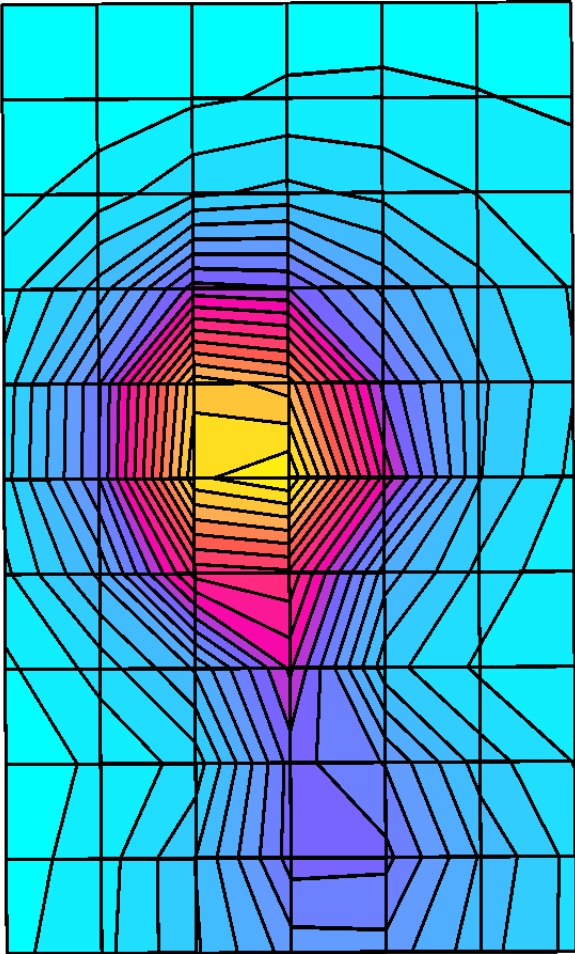
Antenna Position:RET

Type of Modulation:1900 cdma

Battery Model #: SNN5695A

Accessory Model # = CHYN4459 LEATHER CASE

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1851 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58 \text{ mho/m}$   $\epsilon_r = 50.9$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 7x7x7: SAR (1g): 1.05 mW/g, SAR (10g): 0.632 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 10.8 (10.4, 11.3) [mm]  
Powerdrift: -0.06 dB

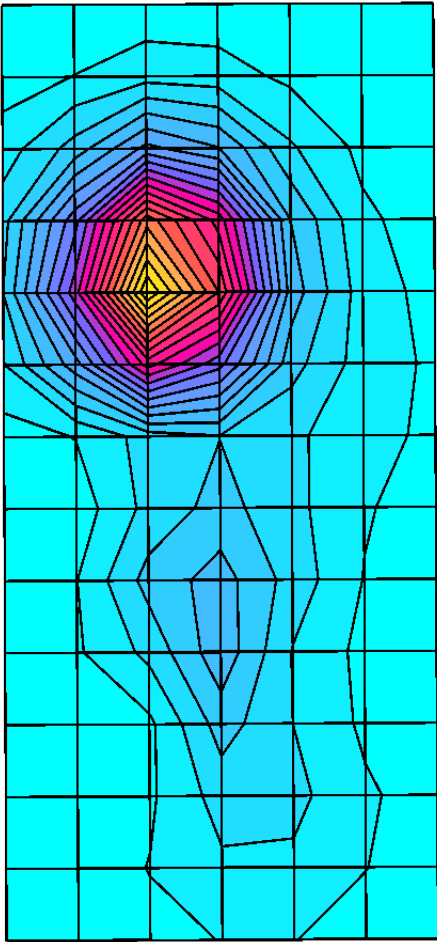


338CA46B

Ch# 25 / Pwr Step: ALWAYS UP  
Type of Modulation:1900 CDMA  
Accessory Model # = CHYN4459 LEATHER CASE

Antenna Position: EXT  
Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1851 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58 \text{ mho/m}$   $\epsilon_r = 50.9$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 7x7x7: SAR (1g): 1.01 mW/g, SAR (10g): 0.595 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 10.6 (10.2, 11.1) [mm]  
Powerdrift: -0.04 dB

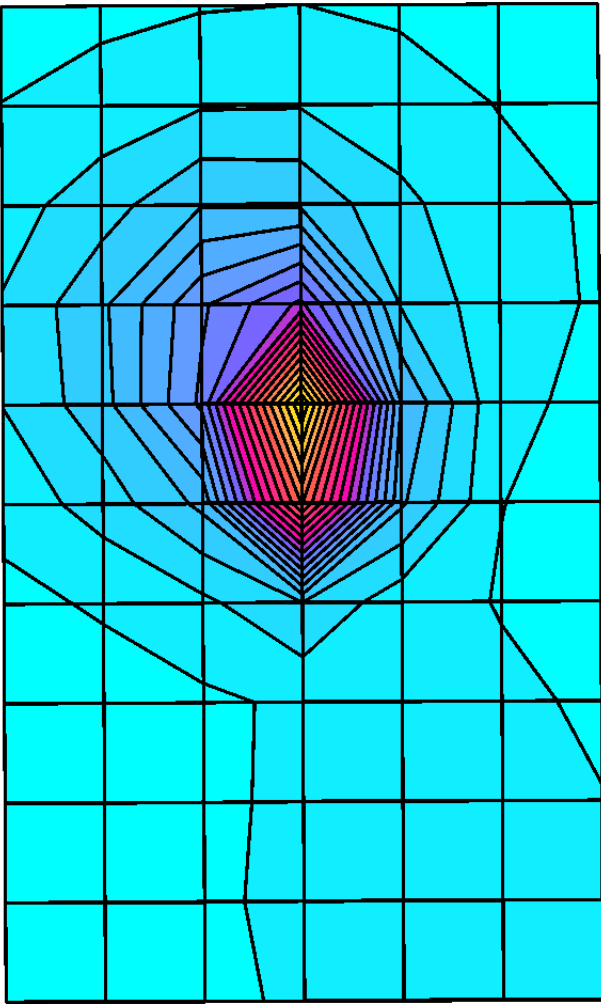


338CA46B

Ch# 1175 / Pwr Step:always up  
Type of Modulation:1900 cdma  
Accessory Model # = SYN8763B UNIVERSAL CLIP

Antenna Position: ret  
Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1910 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58 \text{ mho/m}$   $\epsilon_r = 50.9$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 7x7x7: SAR (1g): 0.964 mW/g, SAR (10g): 0.489 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 8.9 (8.6, 9.5) [mm]  
Powerdrift: -0.23 dB



338CA46B

Ch# 1175 / Pwr Step: ALWAYS UP

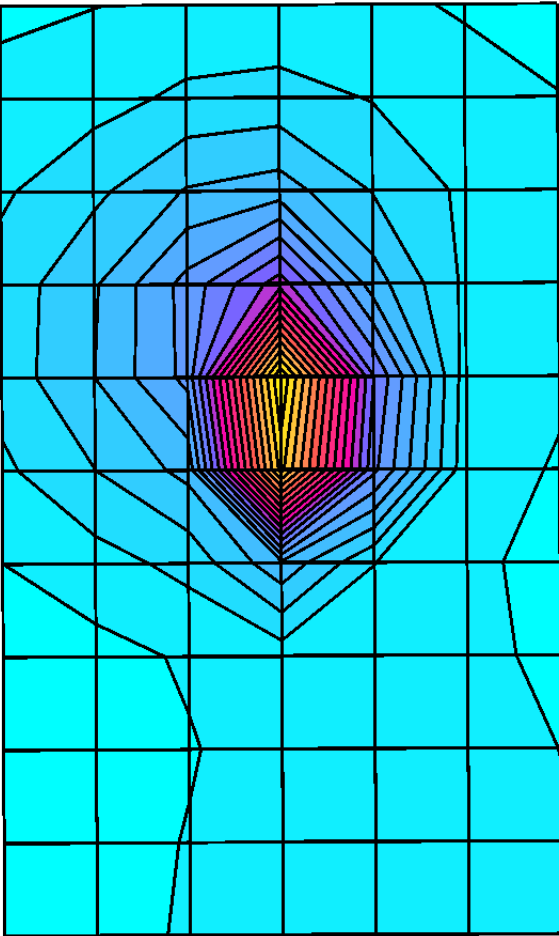
Antenna Position: RET

Type of Modulation:1900 CDMA

Battery Model #: EXT BATTERY

Accessory Model # = SYN9766 CASE   SYN8763A UNIVERSAL BELT CLIP

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1910 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58 \text{ mho/m}$   $\epsilon_r = 50.9$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 7x7x7: SAR (1g): 0.839 mW/g, SAR (10g): 0.424 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 9.3 (9.1, 9.7) [mm]  
Powerdrift: -0.11 dB



## 338CA46B

Ch# 1175 / Pwr Step: ALWAYS UP

Type of Modulation: 1900 CDMA

Accessory Model # = SYN0912A Plastic Holder

Antenna Position: RET

Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1910 MHz

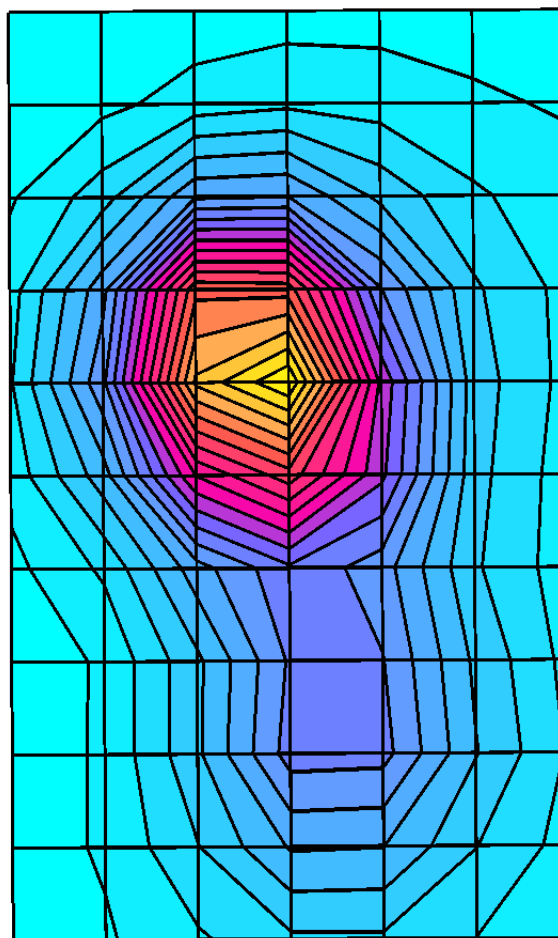
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58$  mho/m  $\epsilon_r = 50.9$   $\rho = 1.00$  g/cm<sup>3</sup>

Cube 7x7x7: SAR (1g): 0.920 mW/g, SAR (10g): 0.552 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 10.0 (10.0, 10.2) [mm]

Powerdrift: -0.26 dB



## 338CA46B

Ch# 1175 / Pwr Step: ALWAYS UP

Type of Modulation: 1900 CDMA

Accessory Model # = SYN0912A Plastic Holder

Antenna Position: EXT

Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1910 MHz

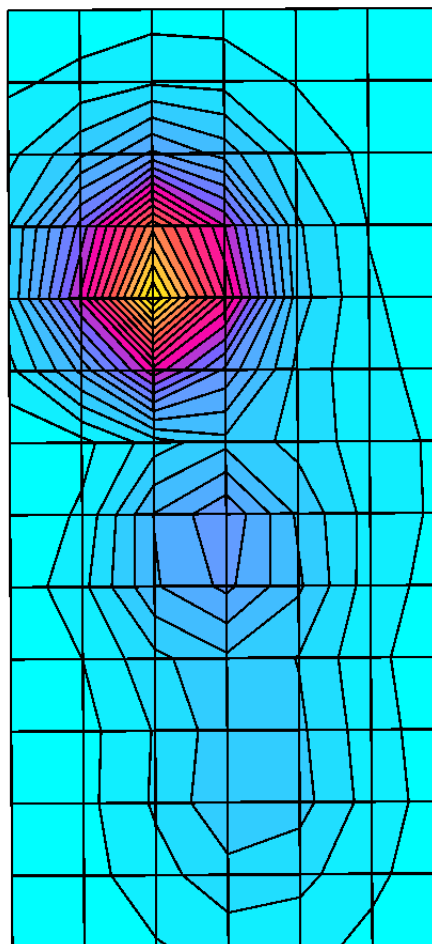
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58$  mho/m  $\epsilon_r = 50.9$   $\rho = 1.00$  g/cm<sup>3</sup>

Cube 7x7x7: SAR (1g): 1.07 mW/g, SAR (10g): 0.612 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 9.8 (9.4, 10.5) [mm]

Powerdrift: -0.08 dB

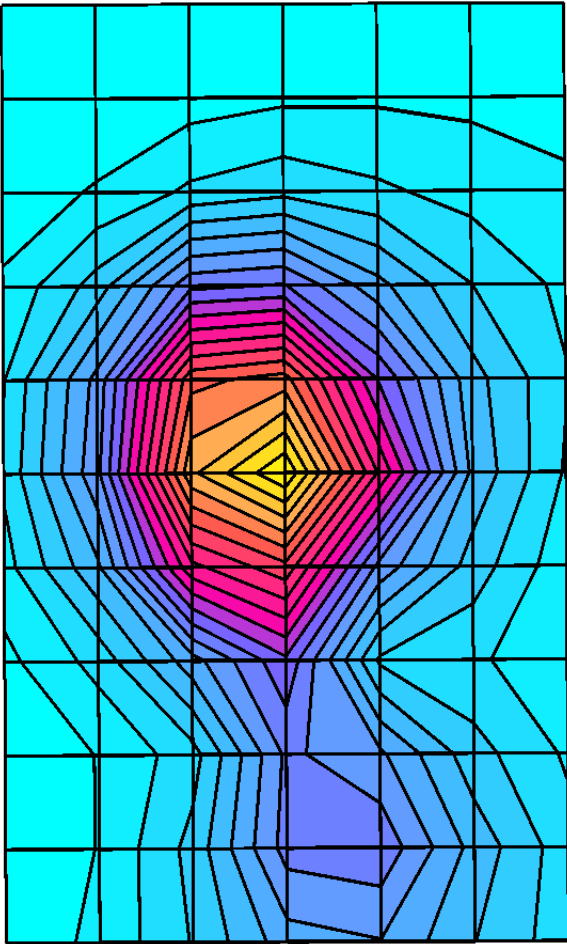


338CA46B

Ch# 1175 / Pwr Step:always up  
Type of Modulation:1900 cdma  
Accessory Model # = CHYN4459 LEATHER CASE

Antenna Position:RET  
Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1910 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58 \text{ mho/m}$   $\epsilon_r = 50.9$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 7x7x7: SAR (1g): 0.791 mW/g, SAR (10g): 0.472 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Penetration depth: 10.1 (9.7, 10.7) [mm]  
Powerdrift: -0.15 dB



## 338CA46B

Ch# 1175 / Pwr Step: ALWAYS UP

Type of Modulation: 1900 CDMA

Accessory Model # = CHYN4459 LEATHER CASE

Antenna Position: EXT

Battery Model #: SNN5695A

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 2 Section; Position: (0°,0°); Frequency: 1910 MHz

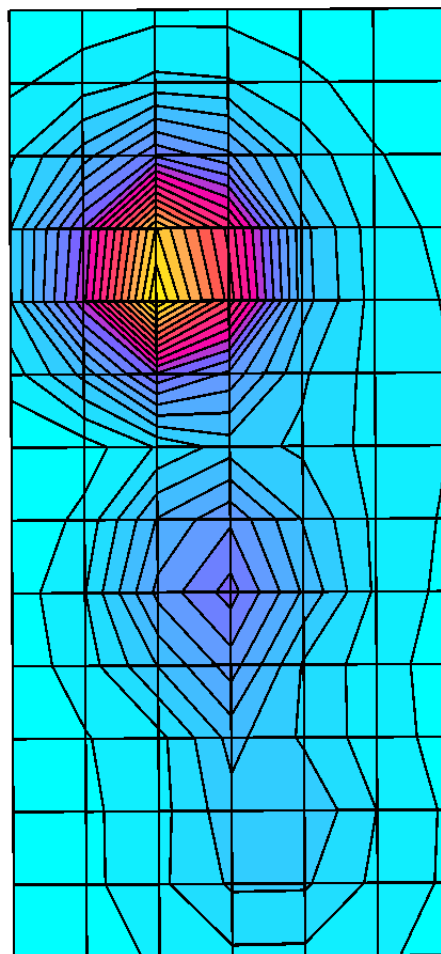
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(4.70,4.70,4.70); Crest factor: 1.0; 1880 MHz Head & Body:  $\sigma = 1.58$  mho/m  $\epsilon_r = 50.9$   $\rho = 1.00$  g/cm<sup>3</sup>

Cube 7x7x7: SAR (1g): 0.984 mW/g, SAR (10g): 0.569 mW/g, (Worst-case extrapolation)

Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0

Penetration depth: 10.0 (9.8, 10.5) [mm]

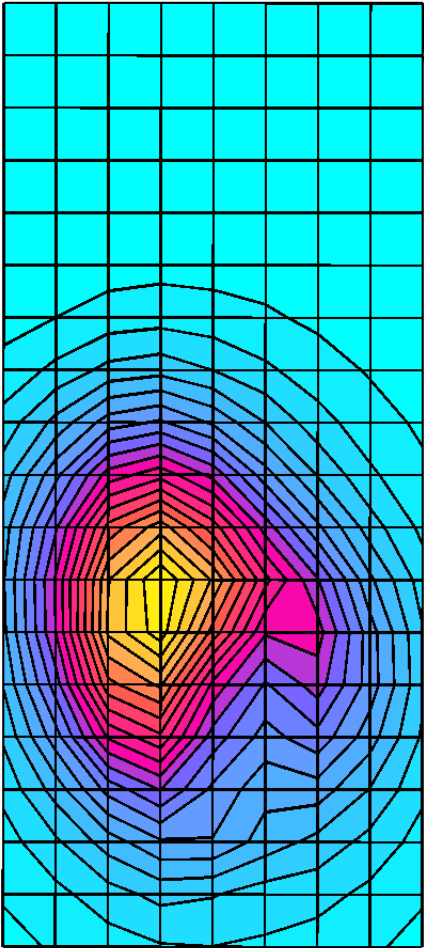
Powerdrift: -0.06 dB



338CA46B

Ch# 1013 / Pwr Step: ALWAYS UP      Antenna Position: Retracted  
Type of Modulation: 800 CDMA      Battery Model #: SNN5695A  
Accessory Model # =Leather Pouch CHYN4459

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 825 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 55.4$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.651 mW/g, SAR (10g): 0.417 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0  
Penetration depth: 12.4 (11.5, 13.7) [mm]  
Powerdrift: 0.06 dB



338CA46B

Ch# 777 / Pwr Step: ALWAYS UP

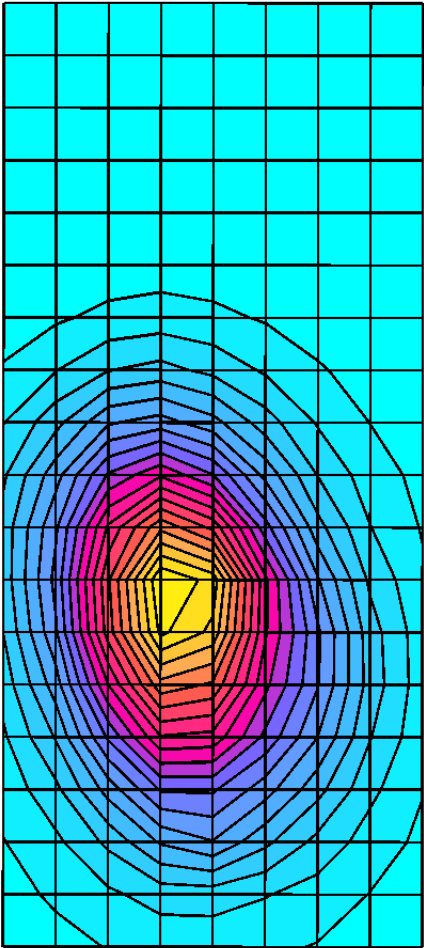
Antenna Position: Retracted

Type of Modulation: 800 CDMA

Battery Model #: SNN5695A

Accessory Model # =Leather Pouch CHYN4459

R1 Amy Twin Phantom Rev.4 (22Aug02) Phantom; section 1 Section; Position: (0°,0°); Frequency: 848 MHz  
Probe: ES3DV3 - SN3037 - FCC Body; ConvF(5.90,5.90,5.90); Crest factor: 1.0; 835 MHz Head & Body:  $\sigma = 0.98$  mho/m  $\epsilon_r = 55.4$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 7x7x7: SAR (1g): 0.827 mW/g, SAR (10g): 0.515 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 10.0, Dy = 10.0, Dz = 10.0  
Penetration depth: 11.9 (10.6, 13.6) [mm]  
Powerdrift: -0.14 dB



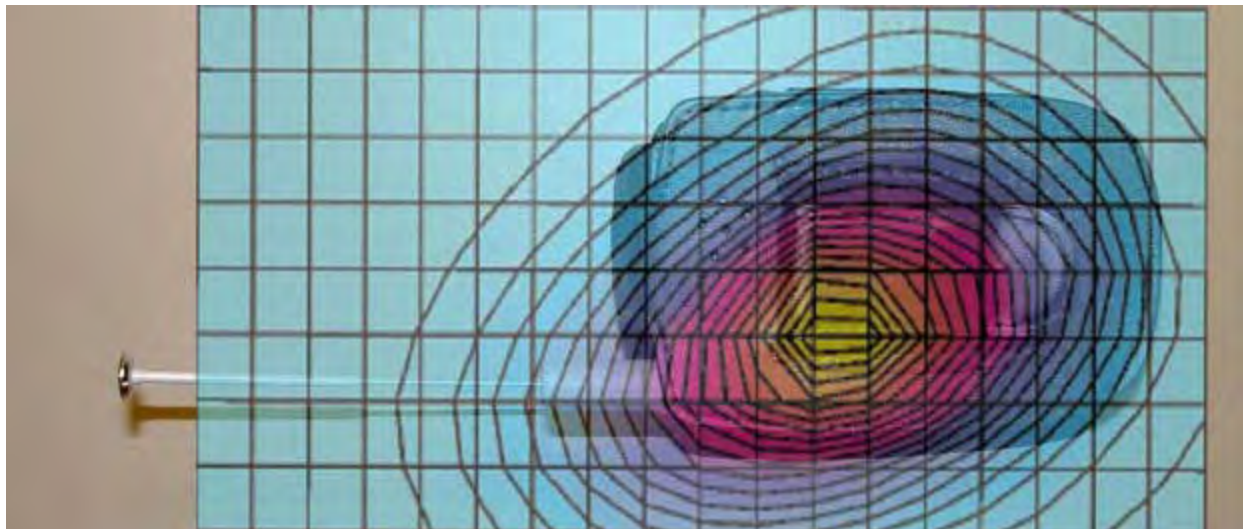


Figure 9. Typical 800 MHz Body-Worn Contour Overlaid on Phone with Antenna Extended

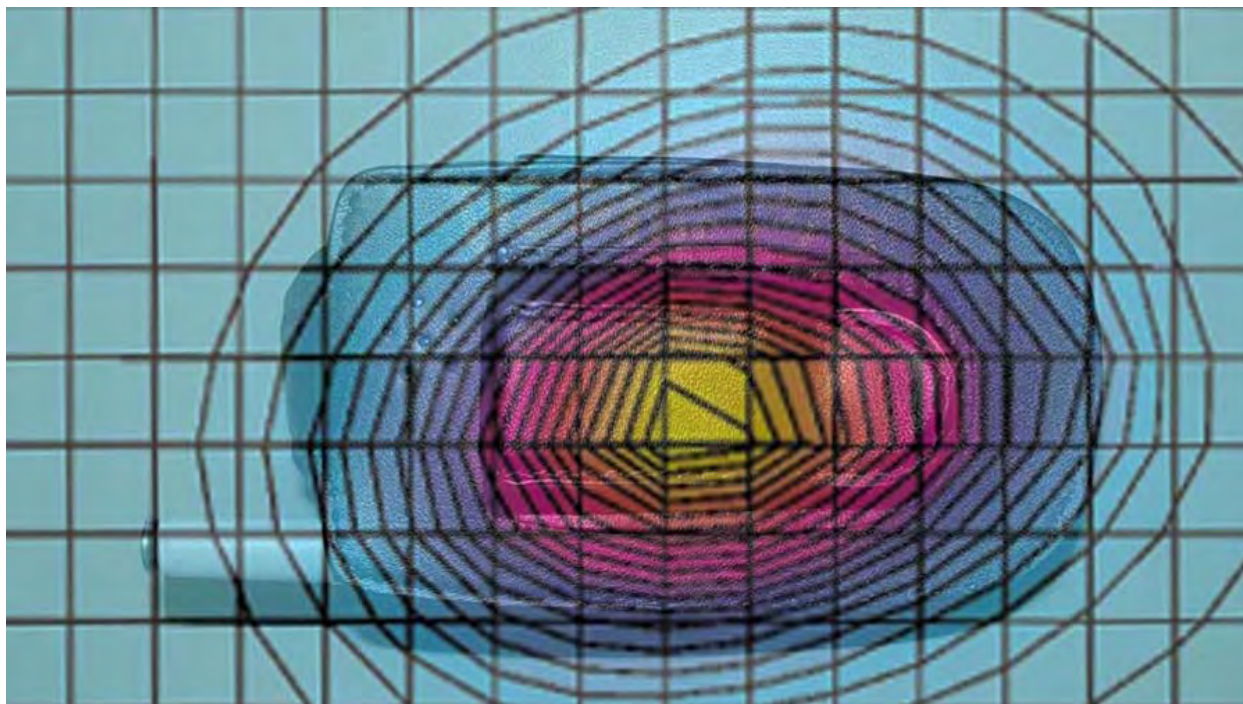


Figure 10. Typical 800 MHz Body-Worn Contour Overlaid on Phone with Antenna Retracted

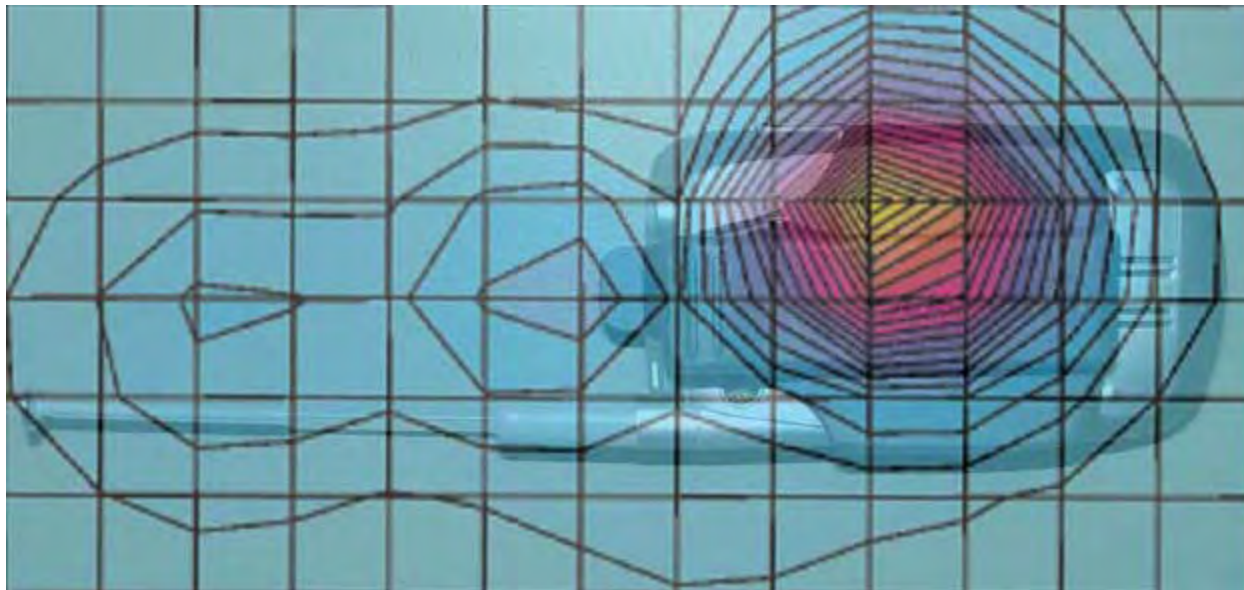


Figure 11. Typical 1900 MHz Body-Worn Contour Overlaid on Phone with Antenna Extended

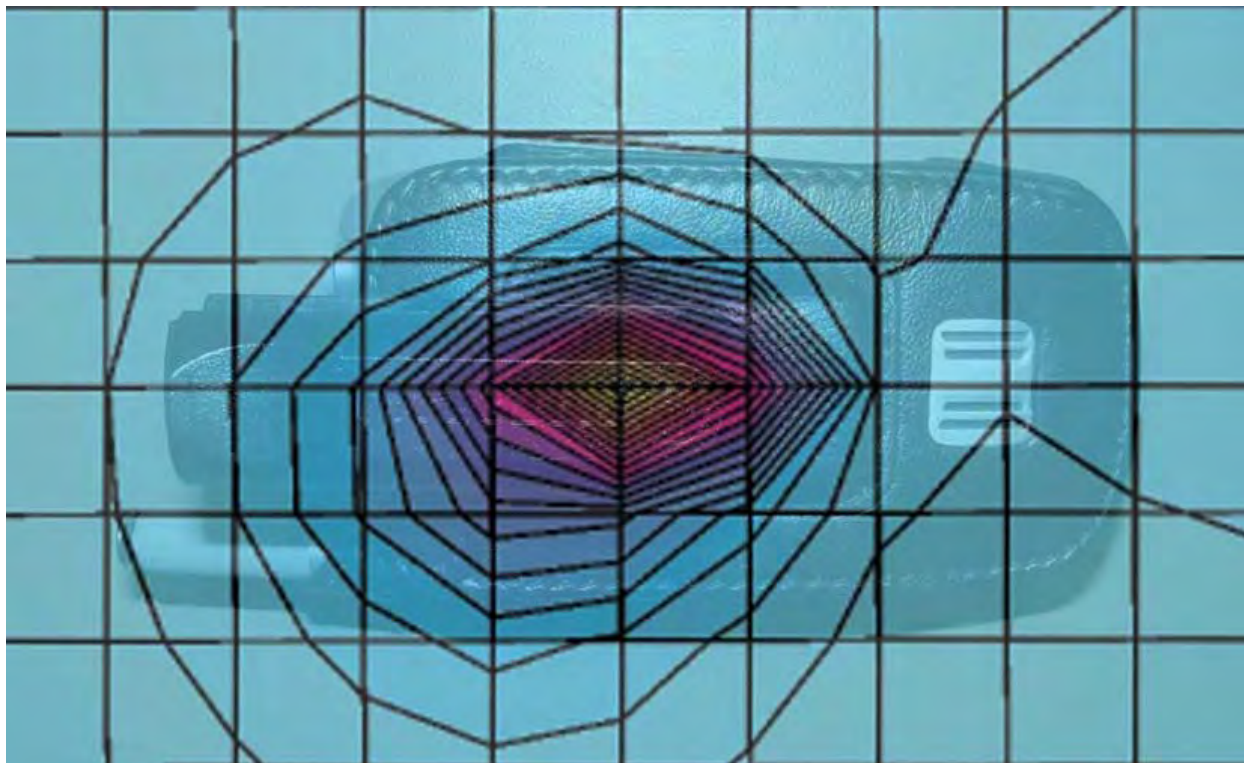


Figure 12. Typical 1900 MHz Body-Worn Contour Overlaid on Phone with Antenna Retracted

**Appendix 4**

**Probe Calibration Certificate**

Client

Motorola MRO

## CALIBRATION CERTIFICATE

Object(s)

ES3DV3 - SN 3037

Calibration procedure(s)

QA CAL-01 v2

Calibration procedure for dosimetric E-field probes

Calibration date:

October 10, 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  |
|-----------------------------------|----------------|-------------------------------------------|------------------------|
| Power meter EPM E4419B            | GB41293874     | 2-Apr-03 (METAS, No 252-0250)             | Apr-04                 |
| Power sensor E4412A               | MY41495277     | 2-Apr-03 (METAS, No 252-0250)             | Apr-04                 |
| Reference 20 dB Attenuator        | SN: 5086 (20b) | 3-Apr-03 (METAS No. 251-0340)             | Apr-04                 |
| Fluke Process Calibrator Type 702 | SN: 6295803    | 8-Sep-03 (Sintrel SCS No. E-030020)       | Sep-04                 |
| Power sensor HP 8481A             | MY41092180     | 18-Sep-02 (Agilent, No. 20020918)         | In house check: Oct 03 |
| RF generator HP 8684C             | US3642U01700   | 4-Aug-99 (SPEAG, in house check Aug-02)   | In house check: Aug-05 |
| Network Analyzer HP 8753E         | US37390585     | 18-Oct-01 (Agilent, No. 24BR1033101)      | In house check: Oct 03 |

Calibrated by:

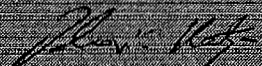
Name

Katja Pokovic

Function

Laboratory Director

Signature



Approved by:

Fin Bornholt

R&D Director



Date issued: October 10, 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 ES3DV3

## SN:3037

Manufactured: August 21, 2003  
Last calibration: October 10, 2003

**Calibrated for DASY Systems**

(Note: non-compatible with DASY2 system!)

# DASY - Parameters of Probe: ES3DV3 SN:3037

## Sensitivity in Free Space

## Diode Compression

|       |                                          |       |     |    |
|-------|------------------------------------------|-------|-----|----|
| NormX | 1.13 $\mu\text{V}/(\text{V}/\text{m})^2$ | DCP X | 100 | mV |
| NormY | 0.85 $\mu\text{V}/(\text{V}/\text{m})^2$ | DCP Y | 100 | mV |
| NormZ | 0.95 $\mu\text{V}/(\text{V}/\text{m})^2$ | DCP Z | 100 | mV |

## Sensitivity in Tissue Simulating Liquid

Head 900 MHz  $\epsilon_r = 41.5 \pm 5\%$   $\sigma = 0.97 \pm 5\%$  mho/m  
Valid for f=800-1000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

|         |                       |                  |      |
|---------|-----------------------|------------------|------|
| ConvF X | 6.1 $\pm 9.5\%$ (k=2) | Boundary effect: |      |
| ConvF Y | 6.1 $\pm 9.5\%$ (k=2) | Alpha            | 0.31 |
| ConvF Z | 6.1 $\pm 9.5\%$ (k=2) | Depth            | 1.75 |

Head 1800 MHz  $\epsilon_r = 40.0 \pm 5\%$   $\sigma = 1.40 \pm 5\%$  mho/m  
Valid for f=1710-1910 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

|         |                       |                  |      |
|---------|-----------------------|------------------|------|
| ConvF X | 4.9 $\pm 9.5\%$ (k=2) | Boundary effect: |      |
| ConvF Y | 4.9 $\pm 9.5\%$ (k=2) | Alpha            | 0.24 |
| ConvF Z | 4.9 $\pm 9.5\%$ (k=2) | Depth            | 2.68 |

## Boundary Effect

Head 900 MHz Typical SAR gradient: 5 % per mm

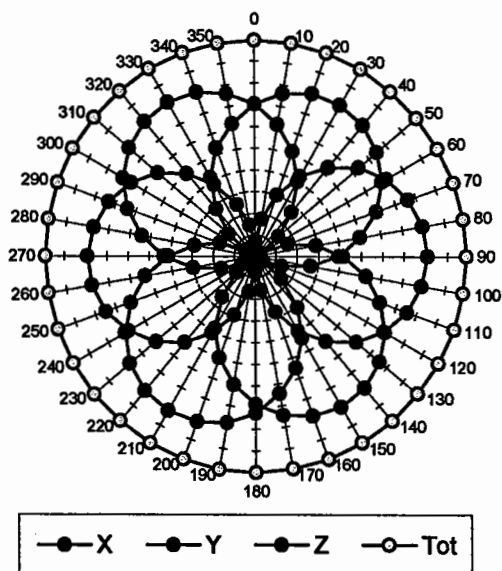
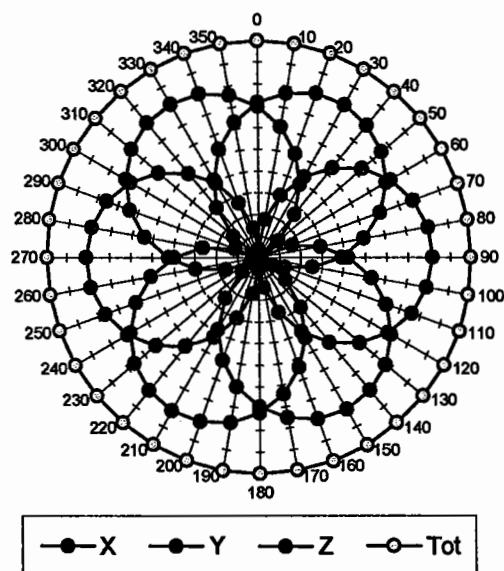
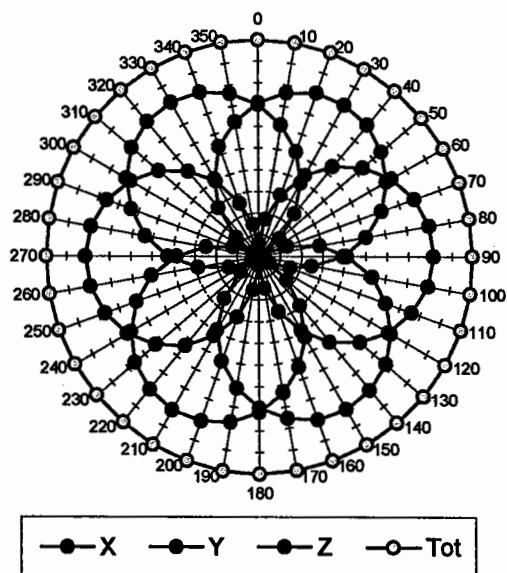
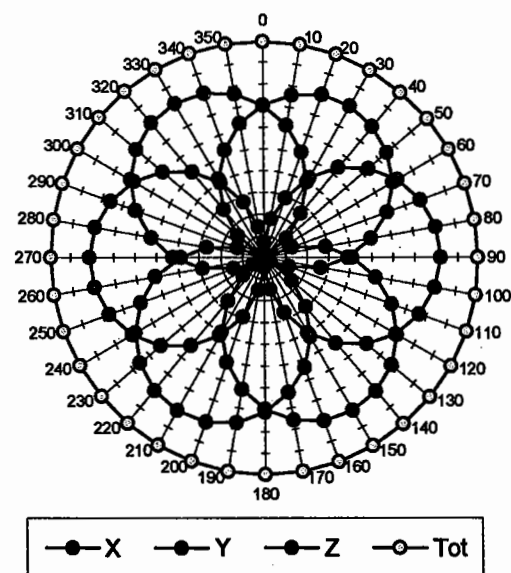
|                                                    |      |      |
|----------------------------------------------------|------|------|
| Probe Tip to Boundary                              | 1 mm | 2 mm |
| SAR <sub>be</sub> [%] Without Correction Algorithm | 6.0  | 3.0  |
| SAR <sub>be</sub> [%] With Correction Algorithm    | 0.1  | 0.3  |

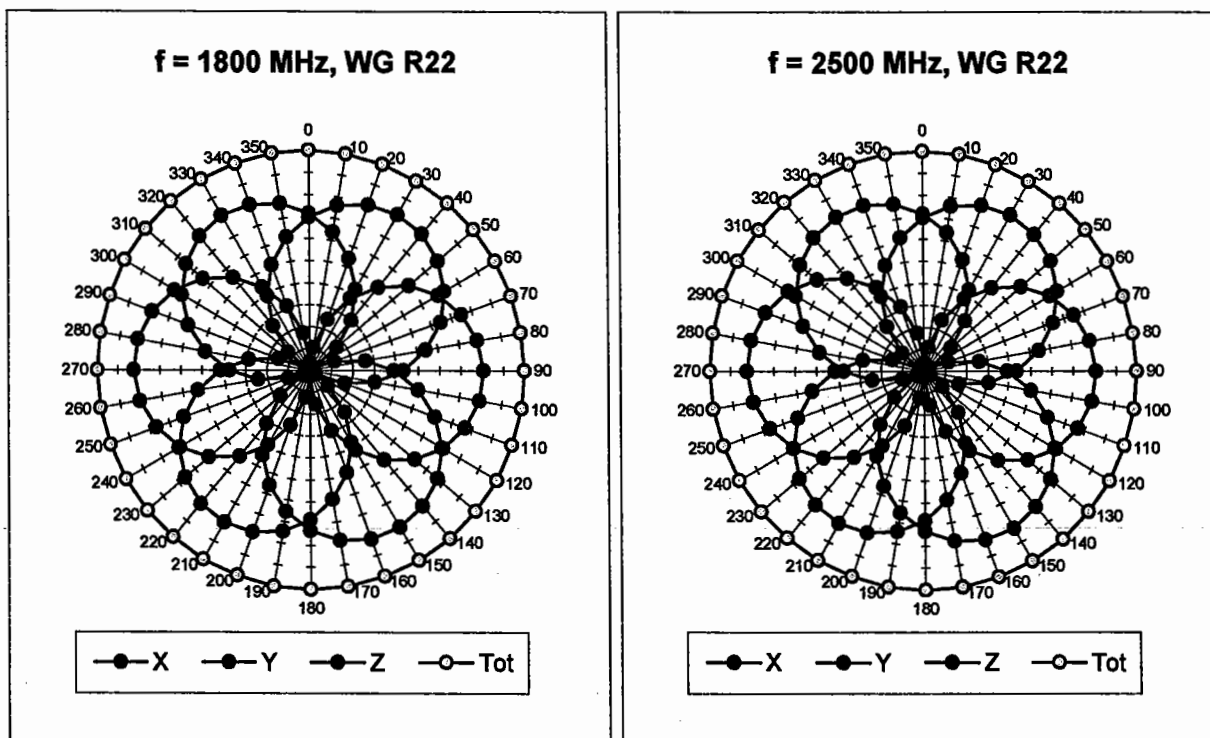
Head 1800 MHz Typical SAR gradient: 10 % per mm

|                                                    |      |      |
|----------------------------------------------------|------|------|
| Probe Tip to Boundary                              | 1 mm | 2 mm |
| SAR <sub>be</sub> [%] Without Correction Algorithm | 8.5  | 5.5  |
| SAR <sub>be</sub> [%] With Correction Algorithm    | 0.1  | 0.2  |

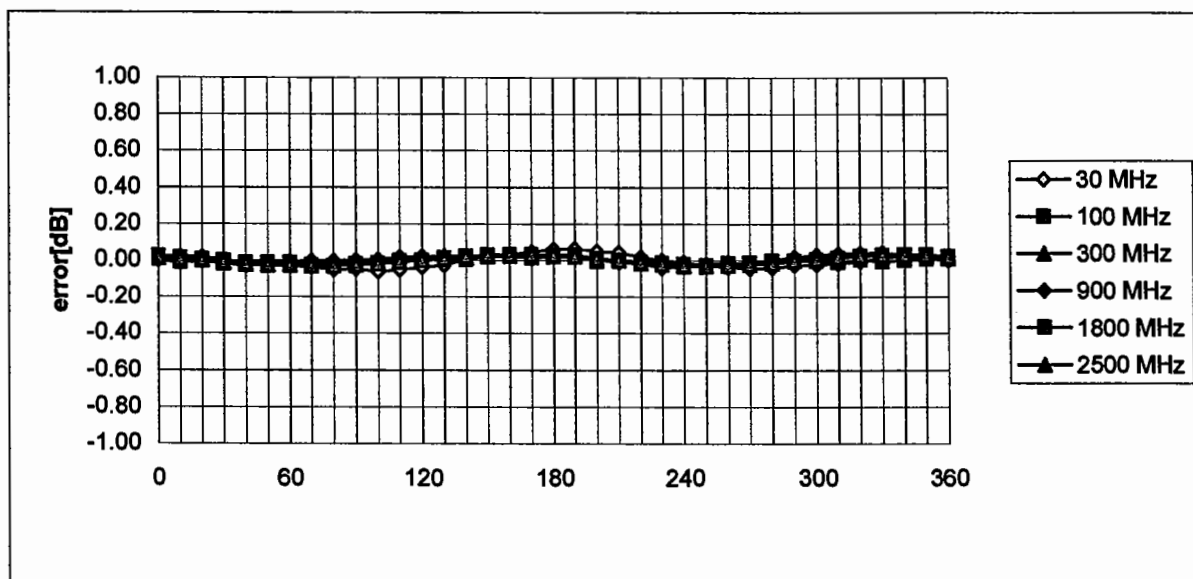
## Sensor Offset

Probe Tip to Sensor Center 2.0 mm

Receiving Pattern ( $\phi$ ,  $\theta = 0^\circ$ ) $f = 30 \text{ MHz}$ , TEM cell ifi110 $f = 100 \text{ MHz}$ , TEM cell ifi110 $f = 300 \text{ MHz}$ , TEM cell ifi110 $f = 900 \text{ MHz}$ , TEM cell ifi110

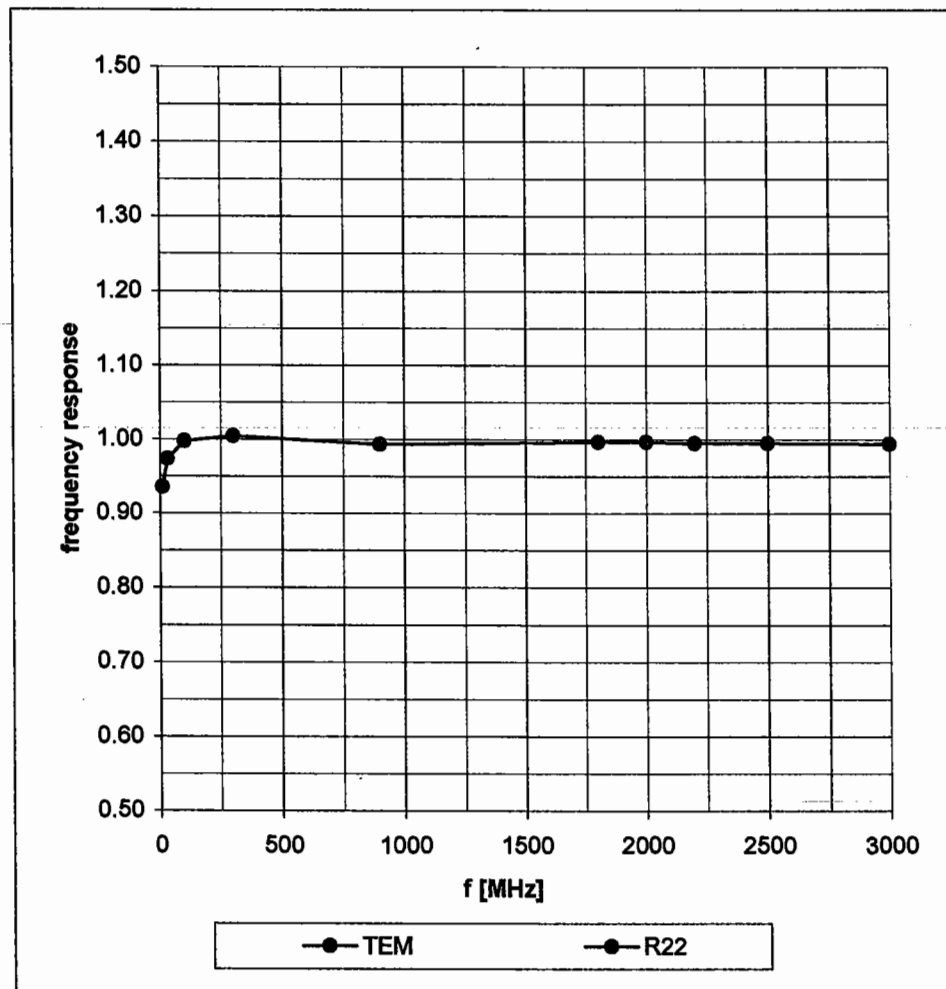


### Isotropy Error ( $\phi$ ), $\theta = 0^\circ$

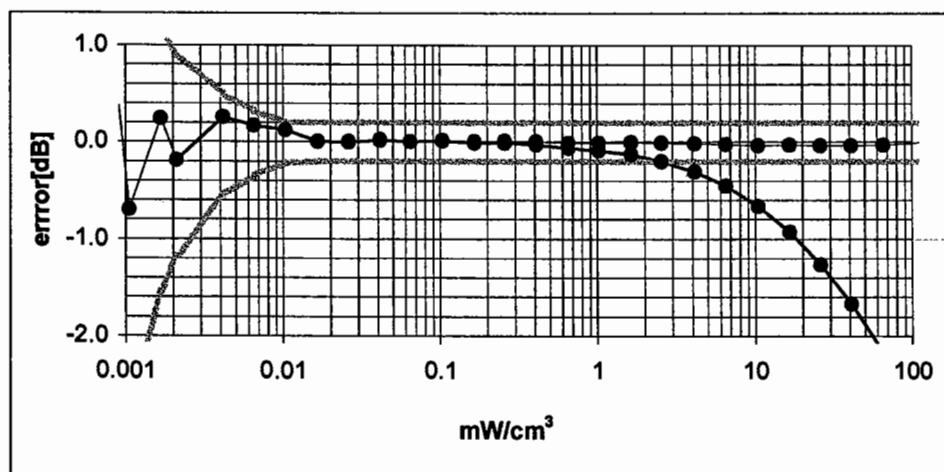
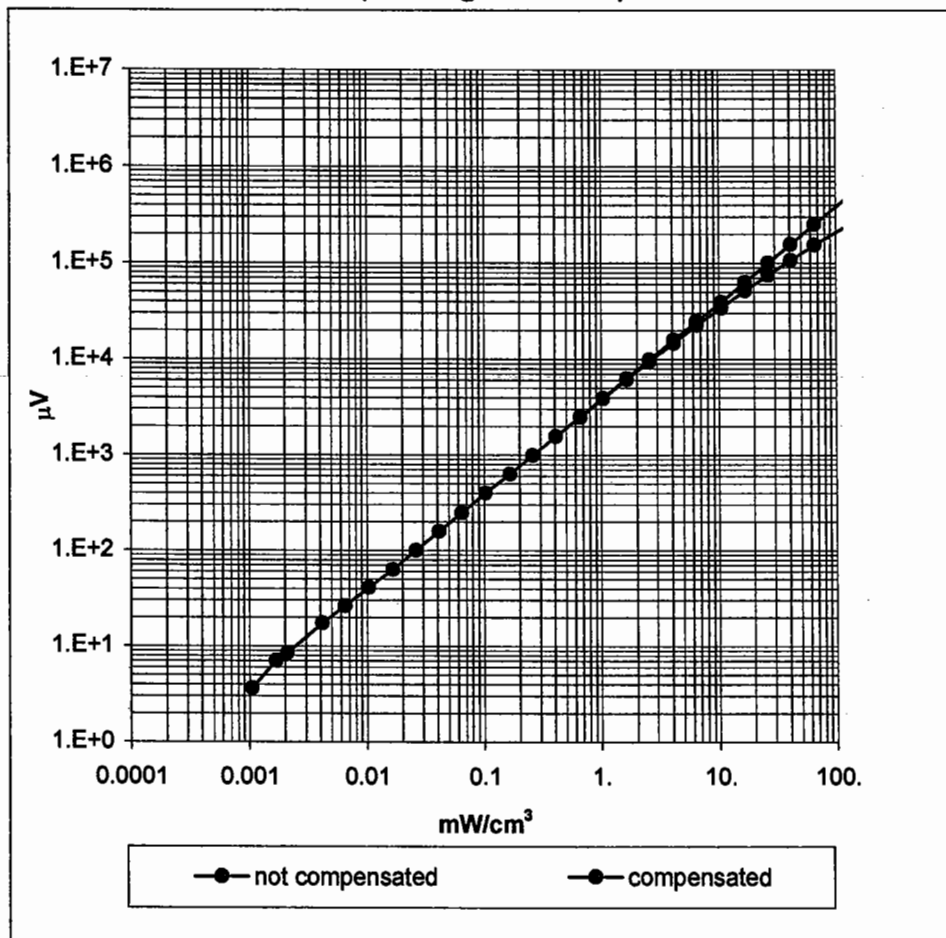


# Frequency Response of E-Field

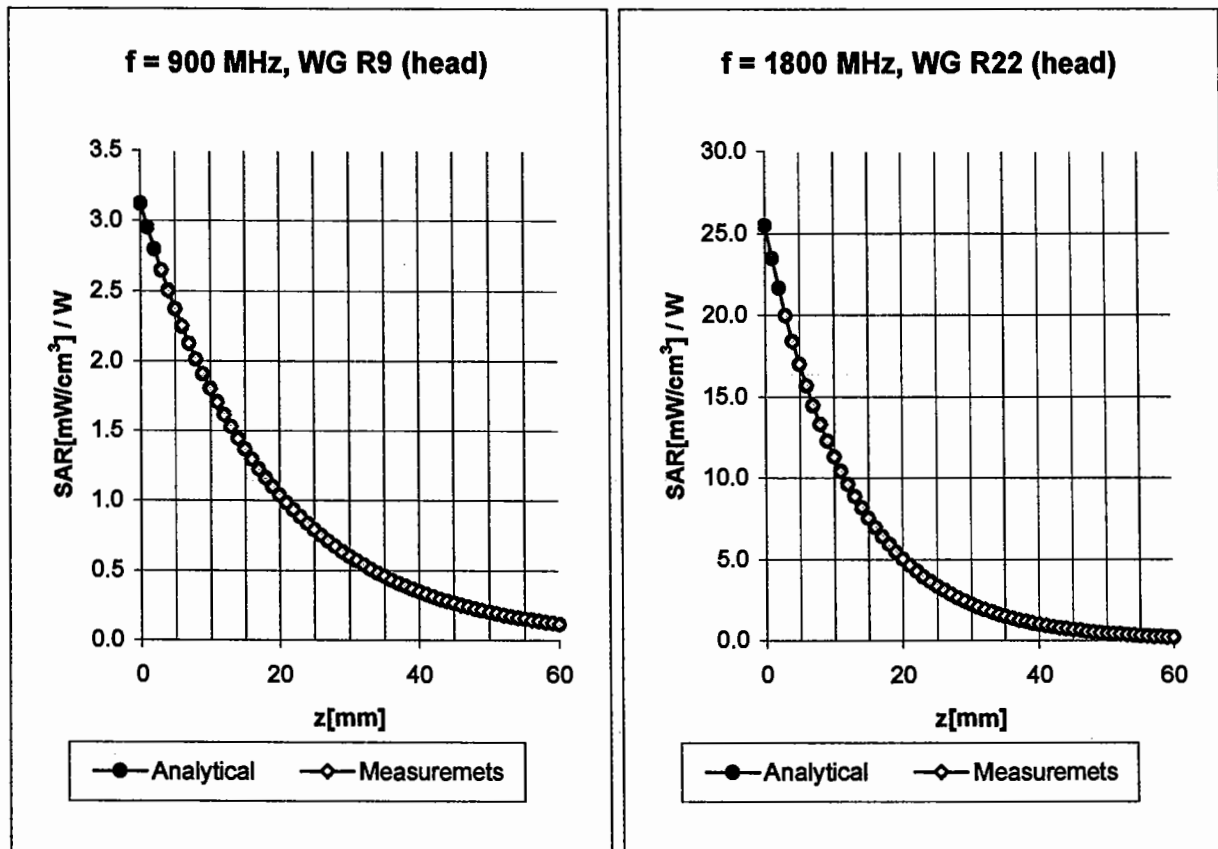
( TEM-Cell:ifi110, Waveguide R22)



# Dynamic Range $f(\text{SAR}_{\text{brain}})$ ( Waveguide R22 )



## Conversion Factor Assessment



**Head                      900 MHz                       $\epsilon_r = 41.5 \pm 5\%$                        $\sigma = 0.97 \pm 5\%$  mho/m**

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

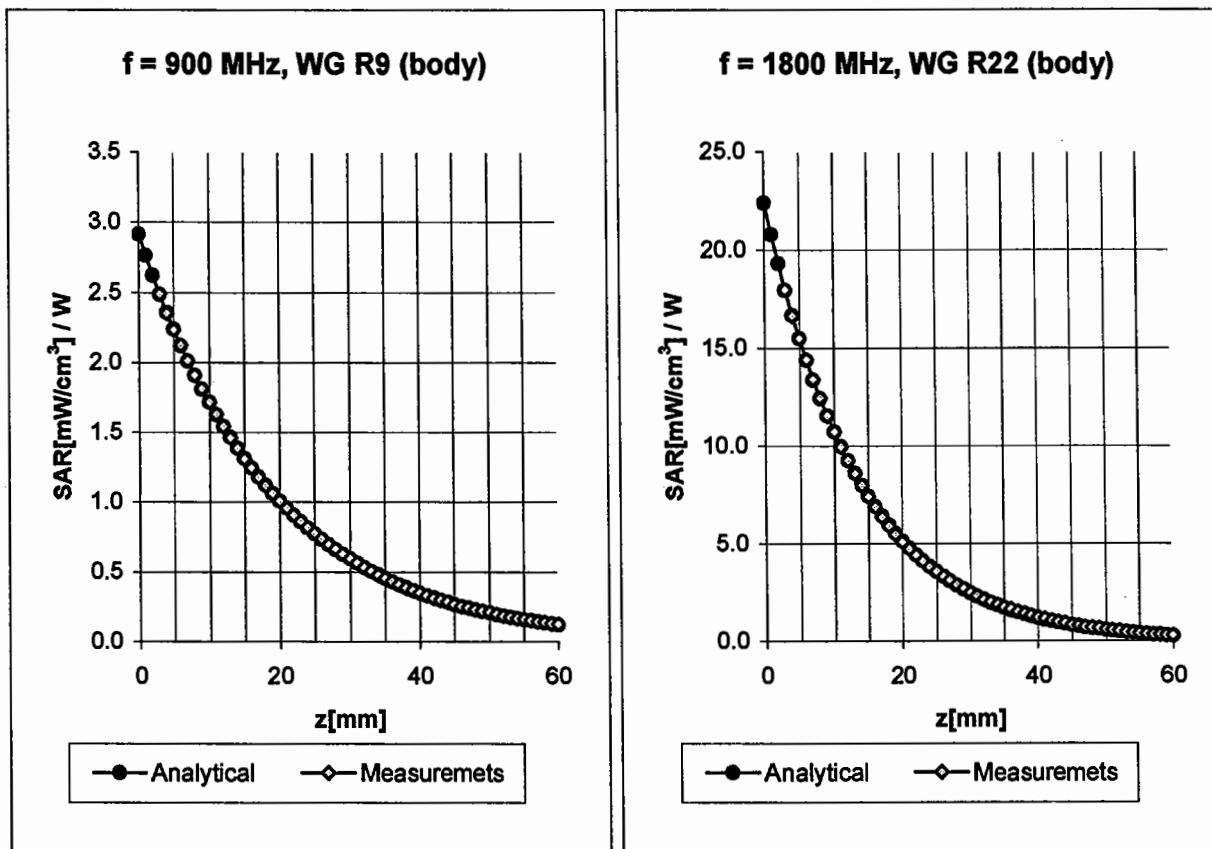
|         |                              |                   |
|---------|------------------------------|-------------------|
| ConvF X | <b>6.1</b> $\pm 9.5\%$ (k=2) | Boundary effect:  |
| ConvF Y | <b>6.1</b> $\pm 9.5\%$ (k=2) | Alpha <b>0.31</b> |
| ConvF Z | <b>6.1</b> $\pm 9.5\%$ (k=2) | Depth <b>1.75</b> |

**Head                      1800 MHz                       $\epsilon_r = 40.0 \pm 5\%$                        $\sigma = 1.40 \pm 5\%$  mho/m**

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

|         |                              |                   |
|---------|------------------------------|-------------------|
| ConvF X | <b>4.9</b> $\pm 9.5\%$ (k=2) | Boundary effect:  |
| ConvF Y | <b>4.9</b> $\pm 9.5\%$ (k=2) | Alpha <b>0.24</b> |
| ConvF Z | <b>4.9</b> $\pm 9.5\%$ (k=2) | Depth <b>2.68</b> |

## Conversion Factor Assessment



**Body**                      **900 MHz**                       $\epsilon_r = 55.0 \pm 5\%$                        $\sigma = 1.05 \pm 5\% \text{ mho/m}$

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

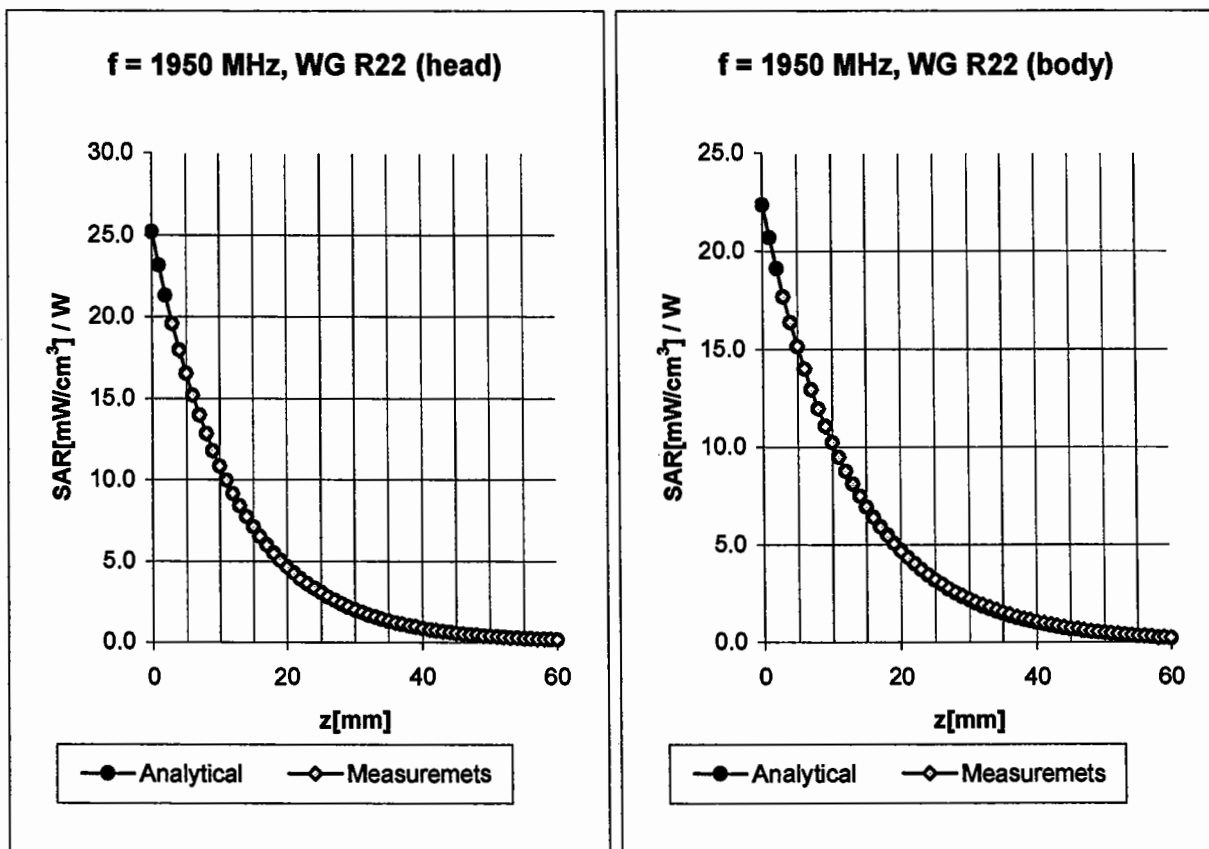
|         |                              |                  |             |
|---------|------------------------------|------------------|-------------|
| ConvF X | <b>5.9</b> $\pm 9.5\%$ (k=2) | Boundary effect: |             |
| ConvF Y | <b>5.9</b> $\pm 9.5\%$ (k=2) | Alpha            | <b>0.29</b> |
| ConvF Z | <b>5.9</b> $\pm 9.5\%$ (k=2) | Depth            | <b>1.91</b> |

**Body**                      **1800 MHz**                       $\epsilon_r = 53.3 \pm 5\%$                        $\sigma = 1.52 \pm 5\% \text{ mho/m}$

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

|         |                              |                  |             |
|---------|------------------------------|------------------|-------------|
| ConvF X | <b>4.7</b> $\pm 9.5\%$ (k=2) | Boundary effect: |             |
| ConvF Y | <b>4.7</b> $\pm 9.5\%$ (k=2) | Alpha            | <b>0.25</b> |
| ConvF Z | <b>4.7</b> $\pm 9.5\%$ (k=2) | Depth            | <b>2.80</b> |

## Conversion Factor Assessment



**Head**      **1950 MHz**       $\epsilon_r = 40.0 \pm 5\%$        $\sigma = 1.40 \pm 5\% \text{ mho/m}$

Valid for f=1900-2000 MHz with Head Tissue Simulating Liquid according to EN 50361, P1528-200X

|         |                              |                   |
|---------|------------------------------|-------------------|
| ConvF X | <b>4.7</b> $\pm 9.5\%$ (k=2) | Boundary effect:  |
| ConvF Y | <b>4.7</b> $\pm 9.5\%$ (k=2) | Alpha <b>0.28</b> |
| ConvF Z | <b>4.7</b> $\pm 9.5\%$ (k=2) | Depth <b>2.26</b> |

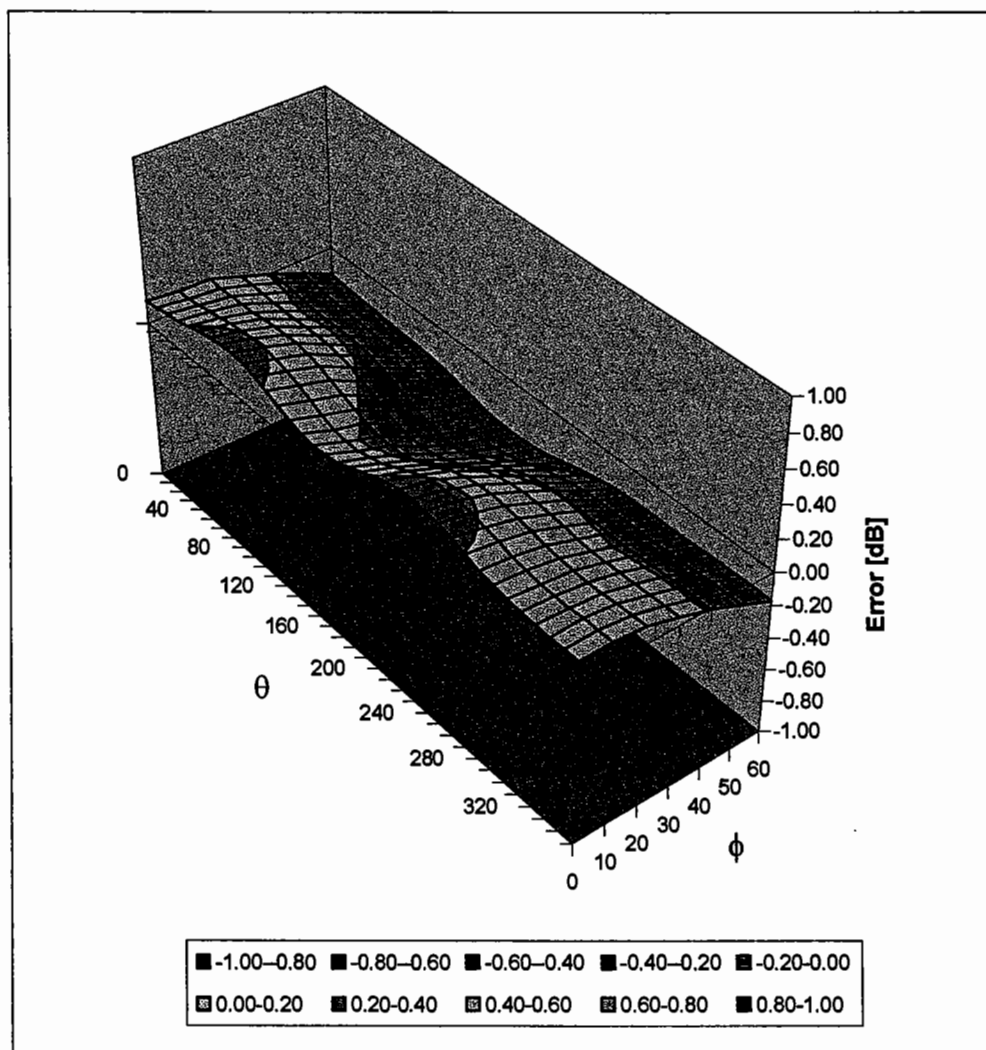
**Body**      **1950 MHz**       $\epsilon_r = 53.3 \pm 5\%$        $\sigma = 1.52 \pm 5\% \text{ mho/m}$

Valid for f=1900-2000 MHz with Body Tissue Simulating Liquid according to OET 65 Suppl. C

|         |                              |                   |
|---------|------------------------------|-------------------|
| ConvF X | <b>4.5</b> $\pm 9.5\%$ (k=2) | Boundary effect:  |
| ConvF Y | <b>4.5</b> $\pm 9.5\%$ (k=2) | Alpha <b>0.31</b> |
| ConvF Z | <b>4.5</b> $\pm 9.5\%$ (k=2) | Depth <b>2.24</b> |

# Deviation from Isotropy in HSL

Error ( $\theta\phi$ ),  $f = 900$  MHz



## **Appendix 5**

### **Dipole Characterization Certificate**

# Certification of System Performance Check Targets

Based on APP-0396

-Historical Data-

|                                                                         | 835MHz                                         | 900MHz                                         | 1800MHz                                         | 1900MHz                                         |        |
|-------------------------------------------------------------------------|------------------------------------------------|------------------------------------------------|-------------------------------------------------|-------------------------------------------------|--------|
| IEEE1528 Target:<br>Advanced Extrapolation                              | 9.5                                            | 10.8                                           | 38.1                                            | 39.7                                            | (W/kg) |
| Measurement Uncertainty<br>(k=1):                                       | 9.0%                                           | 9.0%                                           | 9.0%                                            | 9.0%                                            |        |
|                                                                         |                                                |                                                |                                                 |                                                 |        |
| Measurement Period:                                                     | 1-July-03 to 1-Apr-04                          | 1-July-03 to 1-Apr-04                          | 1-July-03 to 1-Apr-04                           | 1-July-03 to 1-Apr-04                           |        |
| # of tests performed:                                                   | 214                                            | 1148                                           | 1135                                            | 62                                              |        |
| Grand Average:<br>Worst Case Extrapolation                              | 10.0                                           | 11.4                                           | 40.7                                            | 42.0                                            | (W/kg) |
| % Delta<br>(Average - IEEE1528 Target)                                  | 5.3%                                           | 5.6%                                           | 6.8%                                            | 5.8%                                            |        |
|                                                                         |                                                |                                                |                                                 |                                                 |        |
| Is % Delta <= Measurement<br>Uncertainty?                               | Yes                                            | Yes                                            | Yes                                             | Yes                                             |        |
| Accept/Reject <u>Average</u> as new<br>system performance check target? | ACCEPT                                         | ACCEPT                                         | ACCEPT                                          | ACCEPT                                          |        |
|                                                                         | Applicable<br>835MHz Dipole<br>Serial Numbers: | Applicable<br>900MHz Dipole<br>Serial Numbers: | Applicable 1800MHz<br>Dipole Serial<br>Numbers: | Applicable 1900MHz<br>Dipole Serial<br>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, 55                                         | 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    | 10.0              | 41.5 ± 5%    | 0.90 ± 5%          |
| 900MHz    | 11.4              | 41.5 ± 5%    | 0.97 ± 5%          |
| 1800MHz   | 40.7              | 40.0 ± 5%    | 1.40 ± 5%          |
| 1900MHz   | 42.0              | 40.0 ± 5%    | 1.40 ± 5%          |

=====

-Approvals-

Submitted by: 

Marge Kaunas

 Date: 

2-Apr-04

Signed: 

Marge Kaunas

Comments: 

Spreadsheet detailing all historical measurements available upon request.

Approved by: 

Mark Douglas

 Date: 

2-Apr-04

Signed: 

Mark Douglas

Comments: 

Targets and associated simulant properties are derived from the IEEE 1528 standard.

=====

## **Appendix 6**

### **Measurement Uncertainty Budget**

| Uncertainty Budget for Device Under Test                                        |          |               |                |                   |                               |                                |                                      |                                       |                      |
|---------------------------------------------------------------------------------|----------|---------------|----------------|-------------------|-------------------------------|--------------------------------|--------------------------------------|---------------------------------------|----------------------|
| <i>a</i>                                                                        | <i>b</i> | <i>c</i>      | <i>d</i>       | <i>e = f(d,k)</i> | <i>f</i>                      | <i>g</i>                       | <i>h =<br/>c x f / e</i>             | <i>i =<br/>c x g / e</i>              | <i>k</i>             |
| Uncertainty Component                                                           | Sec.     | Tol.<br>(± %) | Prob.<br>Dist. | Div.              | <i>c<sub>i</sub></i><br>(1 g) | <i>c<sub>i</sub></i><br>(10 g) | 1 g<br><i>u<sub>i</sub></i><br>(± %) | 10 g<br><i>u<sub>i</sub></i><br>(± %) | <i>v<sub>i</sub></i> |
| <b>Measurement System</b>                                                       |          |               |                |                   |                               |                                |                                      |                                       |                      |
| 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                                   | ∞                    |
| <b>Test sample Related</b>                                                      |          |               |                |                   |                               |                                |                                      |                                       |                      |
| 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                                   | ∞                    |
| <b>Phantom and Tissue Parameters</b>                                            |          |               |                |                   |                               |                                |                                      |                                       |                      |
| 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                                   | ∞                    |
| <b>Combined Standard Uncertainty</b>                                            |          |               | RSS            |                   |                               |                                | 11.72                                | 11.09                                 | 1363                 |
| <b>Expanded Uncertainty</b><br>(95% CONFIDENCE LEVEL)                           |          |               | <i>k</i> = 2   |                   |                               |                                | 22.98                                | 21.75                                 |                      |

**Uncertainty Budget for System Performance Check (dipole & flat phantom)**

| <i>a</i>                                                                        | <i>b</i> | <i>c</i>      | <i>d</i>       | $e = f(d, k)$ | <i>f</i>                      | <i>g</i>                       | $h = c \times f / e$                 | $i = c \times g / e$                  | <i>k</i>             |
|---------------------------------------------------------------------------------|----------|---------------|----------------|---------------|-------------------------------|--------------------------------|--------------------------------------|---------------------------------------|----------------------|
| Uncertainty Component                                                           | Sec.     | Tol.<br>(± %) | Prob.<br>Dist. | Div.          | <i>c<sub>i</sub></i><br>(1 g) | <i>c<sub>i</sub></i><br>(10 g) | 1 g<br><i>u<sub>i</sub></i><br>(± %) | 10 g<br><i>u<sub>i</sub></i><br>(± %) | <i>v<sub>i</sub></i> |
| <b>Measurement System</b>                                                       |          |               |                |               |                               |                                |                                      |                                       |                      |
| 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                                   | ∞                    |
| <b>Dipole</b>                                                                   |          |               |                |               |                               |                                |                                      |                                       |                      |
| 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                                   | ∞                    |
| <b>Phantom and Tissue Parameters</b>                                            |          |               |                |               |                               |                                |                                      |                                       |                      |
| 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                                   | ∞                    |
| <b>Combined Standard Uncertainty</b>                                            |          |               | RSS            |               |                               |                                | 10.16                                | 9.43                                  | 99999                |
| <b>Expanded Uncertainty</b><br>(95% CONFIDENCE LEVEL)                           |          |               | <i>k</i> =2    |               |                               |                                | 19.92                                | 18.48                                 |                      |

## **Appendix 7**

### **Photographs of the device under test**



Figure 13. Front of Phone with Antenna Retracted



Figure 14. Front of Phone with Antenna Extended



Figure 15.Back of Phone with Antenna Retracted



Figure 16.Back of Phone with Antenna Extended



Figure 17.Open Phone with Antenna Retracted



Figure 18.Open Phone with Antenna Extended



Figure 19. Side View; Phone in CHYN4459A with Antenna Retracted



Figure 20. Side View; Phone in CHYN4459A with Antenna Extended



Figure 21. Side View; Phone in SYN0912A with Antenna Retracted



Figure 22. Side View; Phone in SYN0912A with Antenna Extended



Figure 23. Side View; Phone in SYN9766A and SYN8631A with Antenna Retracted



Figure 23. Side View; Phone in SYN9766A and SYN8631A with Antenna Extended



Figure 25. Side View; Phone in SYN9766A and SYN8763A with Antenna Retracted



Figure 26. Side View; Phone in SYN9766A and SYN8763A with Antenna Extended



Figure 27. Phone Against the Head with Antenna Retracted (Front View – Cheek Touch)



Figure 28. Phone Against the Head with Antenna Retracted (Back View – Cheek Touch)



Figure 29. Phone Against the Head with Antenna Extended (Front View – Cheek Touch)



Figure 30. Phone Against the Head with Antenna Extended (Back View – Cheek Touch)



Figure 31. Phone Against the Head with Antenna Retracted (Front View – 15°Tilt)



Figure 32. Phone Against the Head with Antenna Retracted (Back View – 15°Tilt)



Figure 33. Phone Against the Head with Antenna Extended (Front View – 15°Tilt)



Figure 34. Phone Against the Head with Antenna Extended (Back View – 15°Tilt)



Figure 35. Phone in CHYN4459A Against the Flat Phantom with Antenna Retracted



Figure 36. Phone in CHYN4459A Against the Flat Phantom with Antenna Extended