

## **APPENDIX A: SAR TEST DATA**

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: Cellular CDMA; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.87$  mho/m,  $\epsilon_r = 42.53$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 12-22-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3561; ConvF(7.91, 7.91, 7.91); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Right Head, Touch, Ch.0777, Fixed Antenna, Standard Battery**

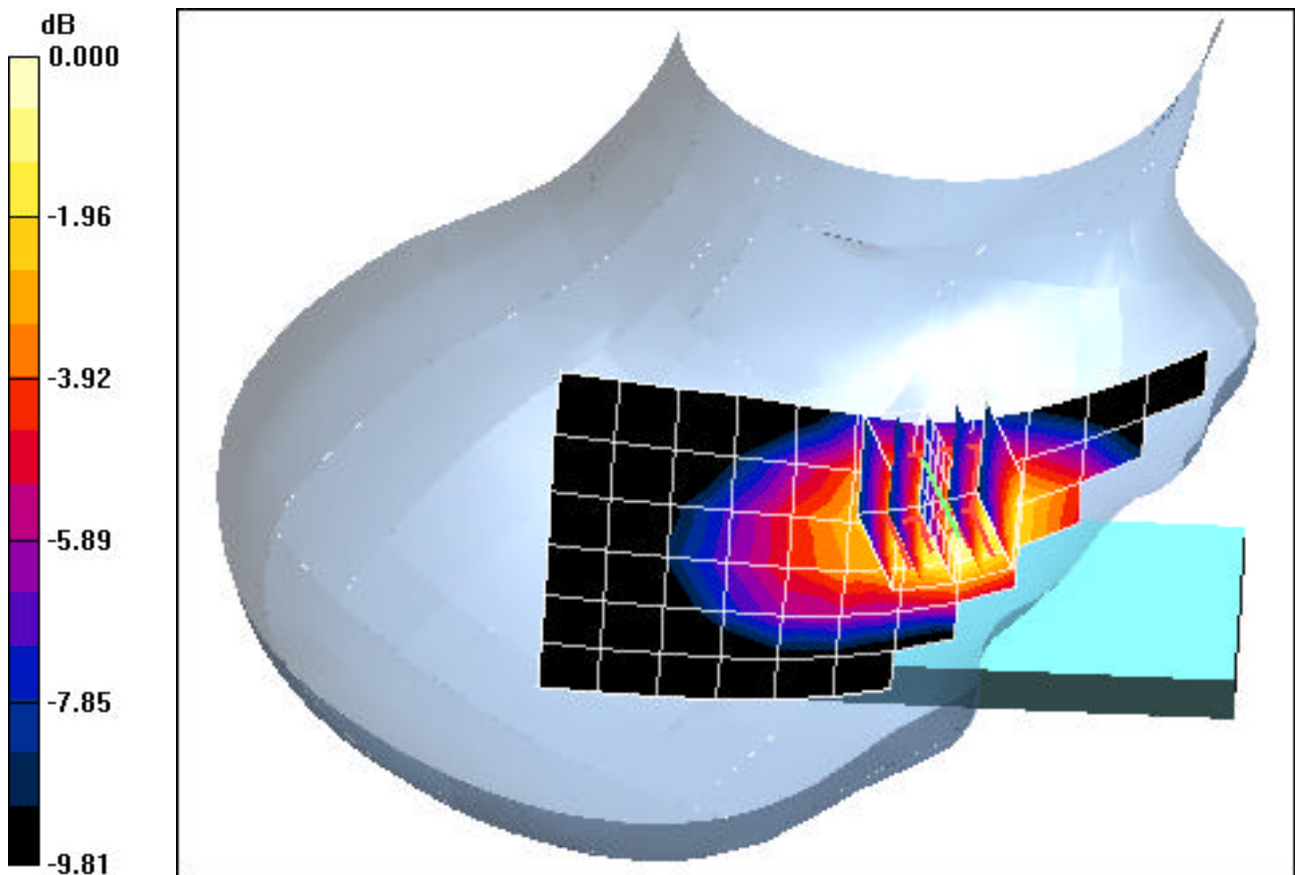
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.1 V/m

Peak SAR (extrapolated) = 1.66 W/kg

**SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.737 mW/g**



0 dB = 1.31mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: Cellular CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.87$  mho/m,  $\epsilon_r = 42.53$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 12-22-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3561; ConvF(7.91, 7.91, 7.91); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Right Head, Tilt, Ch.0384, Fixed Antenna, Standard Battery**

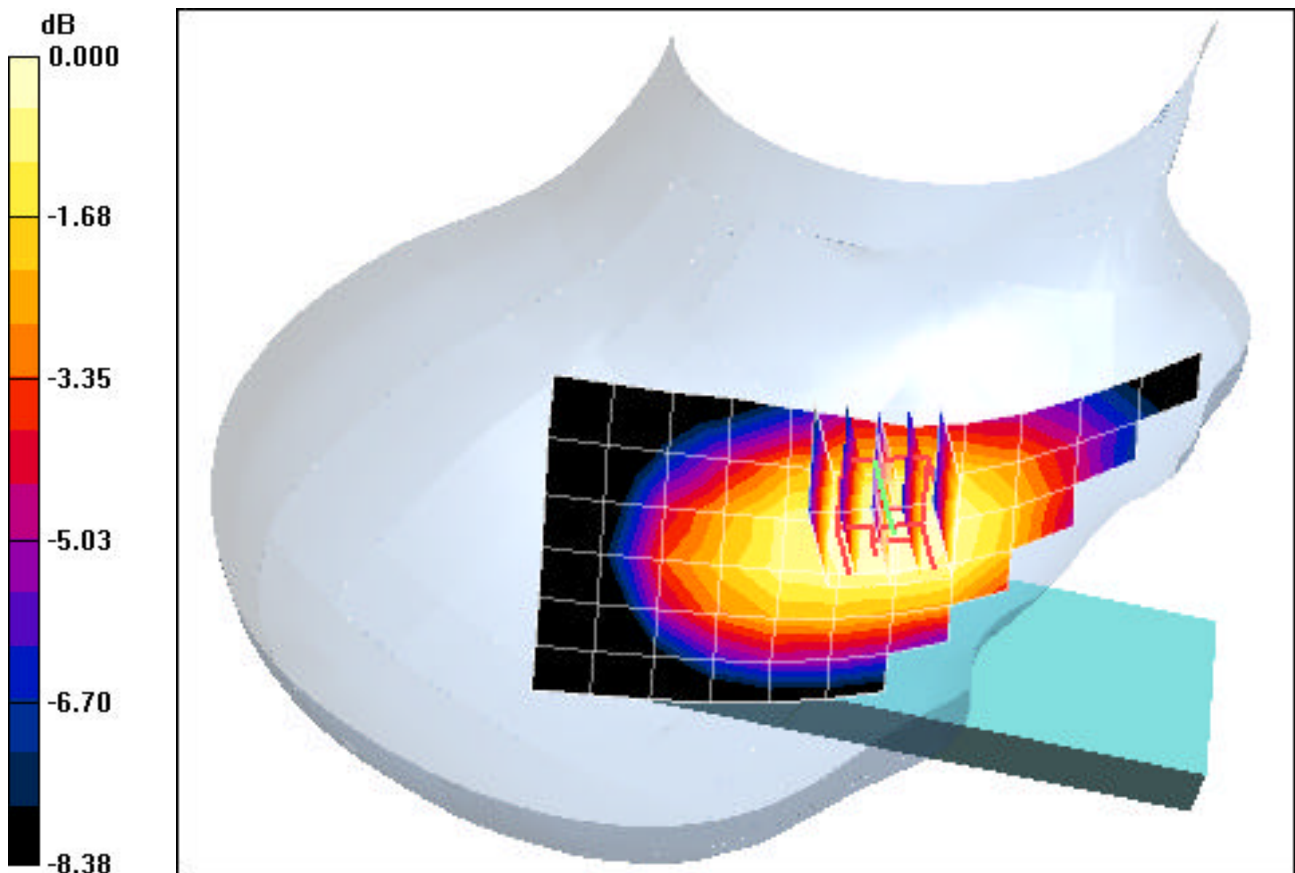
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.4 V/m

Peak SAR (extrapolated) = 0.304 W/kg

**SAR(1 g) = 0.239 mW/g; SAR(10 g) = 0.183 mW/g**



0 dB = 0.262mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: Cellular CDMA; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.87$  mho/m,  $\epsilon_r = 42.53$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 12-22-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3561; ConvF(7.91, 7.91, 7.91); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Left Head, Touch, Ch.0777, Fixed Antenna, Standard Battery**

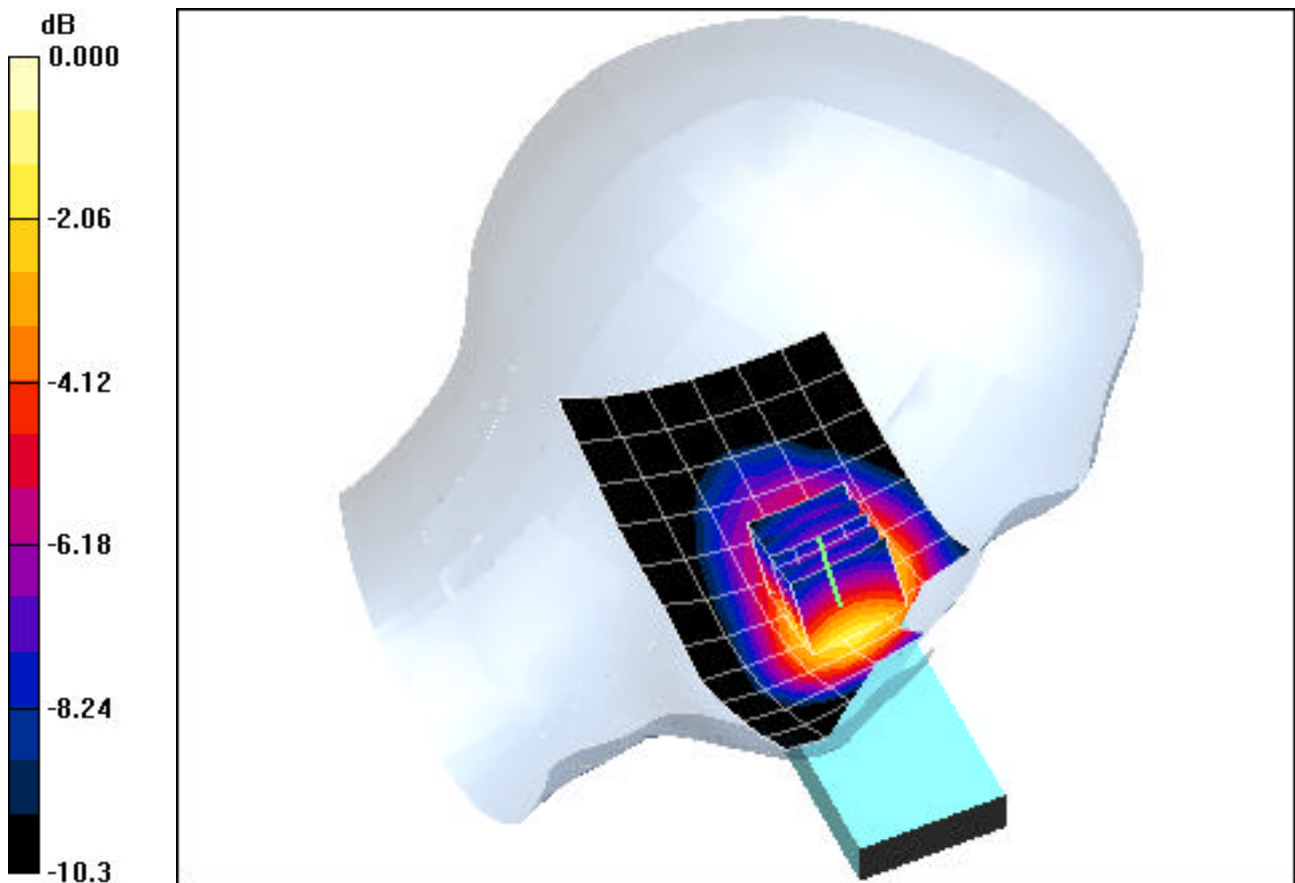
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.9 V/m

Peak SAR (extrapolated) = 1.63 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.757 mW/g



0 dB = 1.31mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: Cellular CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.87$  mho/m,  $\epsilon_r = 42.53$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 12-22-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3561; ConvF(7.91, 7.91, 7.91); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Left Head, Tilt, Ch.0384, Fixed Antenna, Standard Battery**

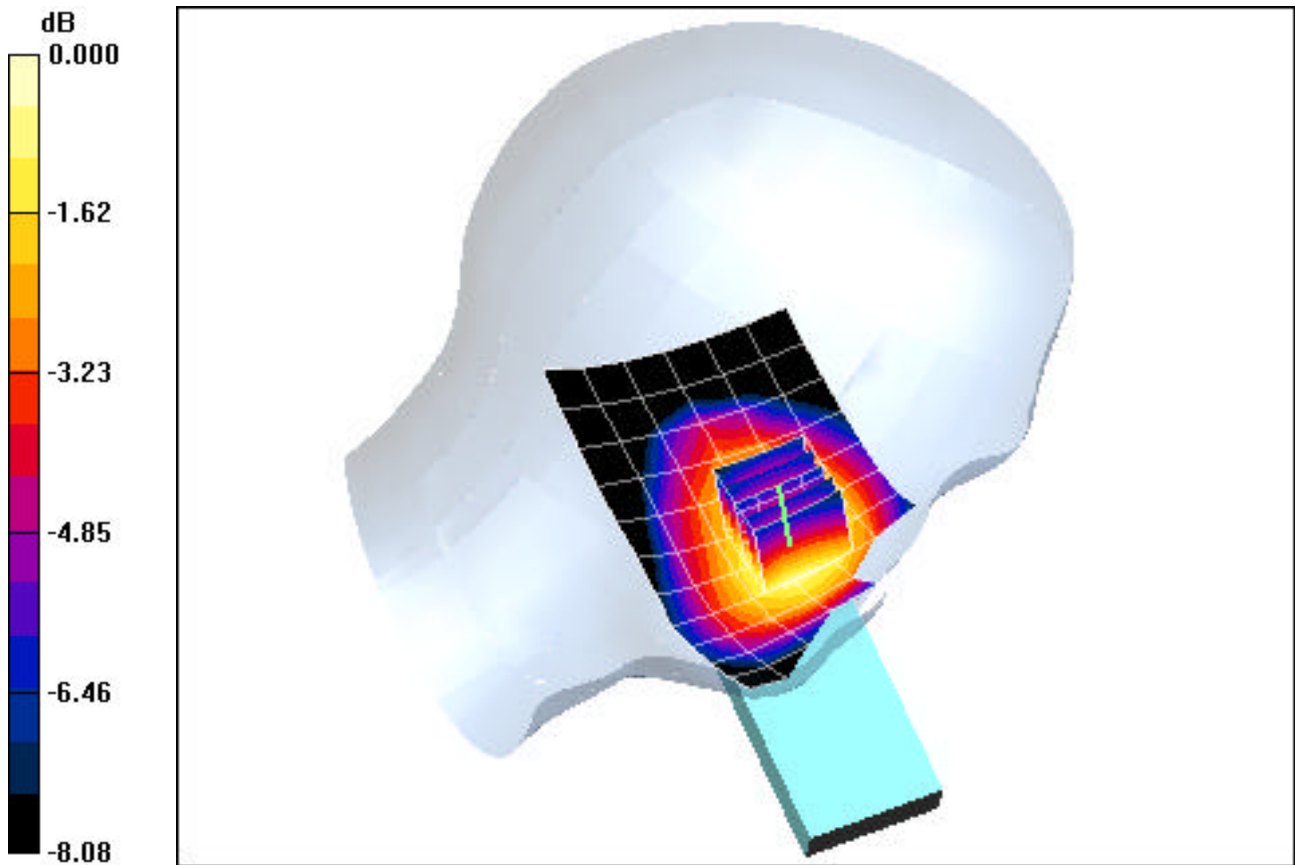
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.94 V/m

Peak SAR (extrapolated) = 0.312 W/kg

**SAR(1 g) = 0.241 mW/g; SAR(10 g) = 0.181 mW/g**



0 dB = 0.267mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: PCS CDMA; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium: 1900 Brain ( $\sigma = 1.45$  mho/m,  $\epsilon_r = 40.42$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 12-22-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN3561; ConvF(7.04, 7.04, 7.04); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Right Head, Touch, Ch.1175, Fixed Antenna, Standard Battery**

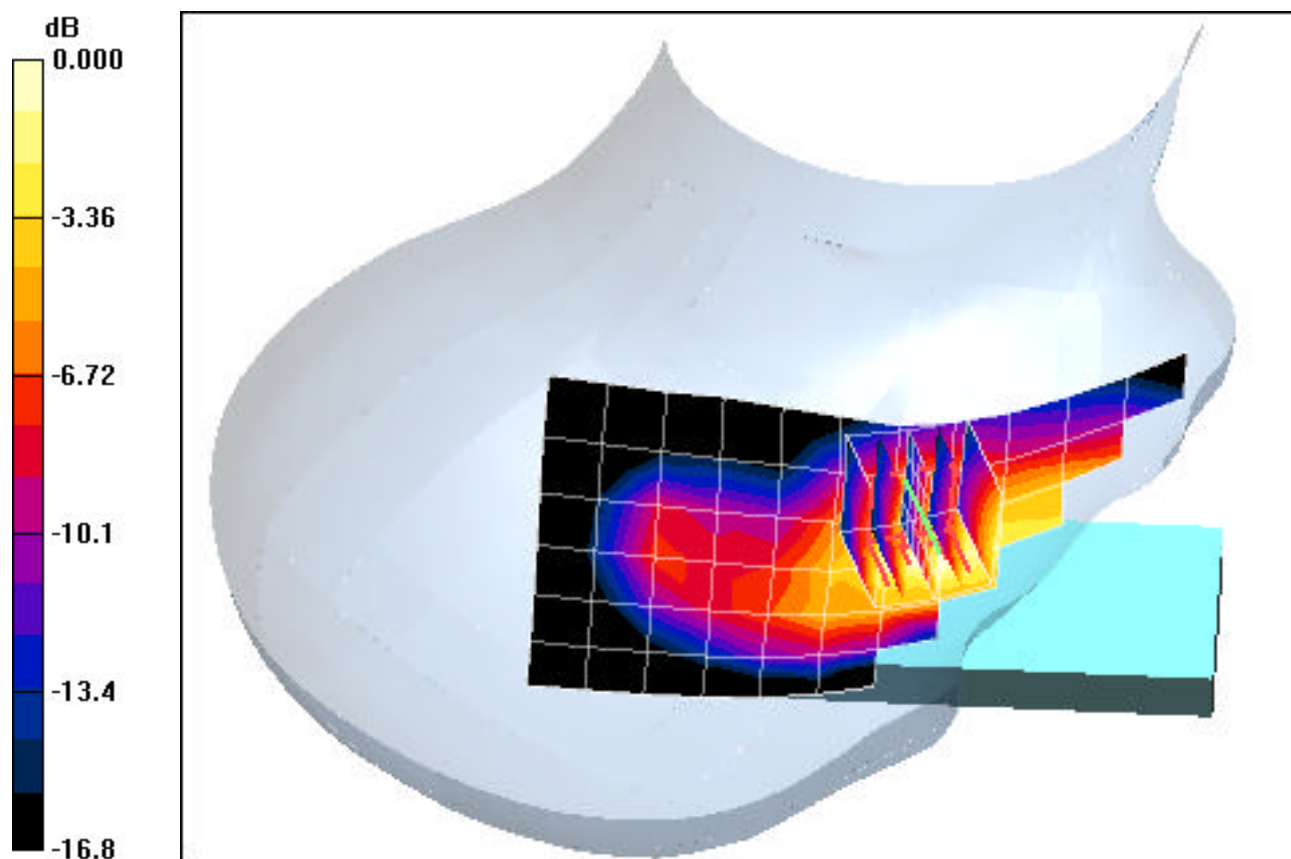
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.8 V/m

Peak SAR (extrapolated) = 1.84 W/kg

**SAR(1 g) = 1.02 mW/g; SAR(10 g) = 0.556 mW/g**



0 dB = 1.24mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: PCS CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Brain ( $\sigma = 1.45$  mho/m,  $\epsilon_r = 40.42$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 12-22-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN3561; ConvF(7.04, 7.04, 7.04); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Right Head, Tilt, Ch.0600, Fixed Antenna, Standard Battery**

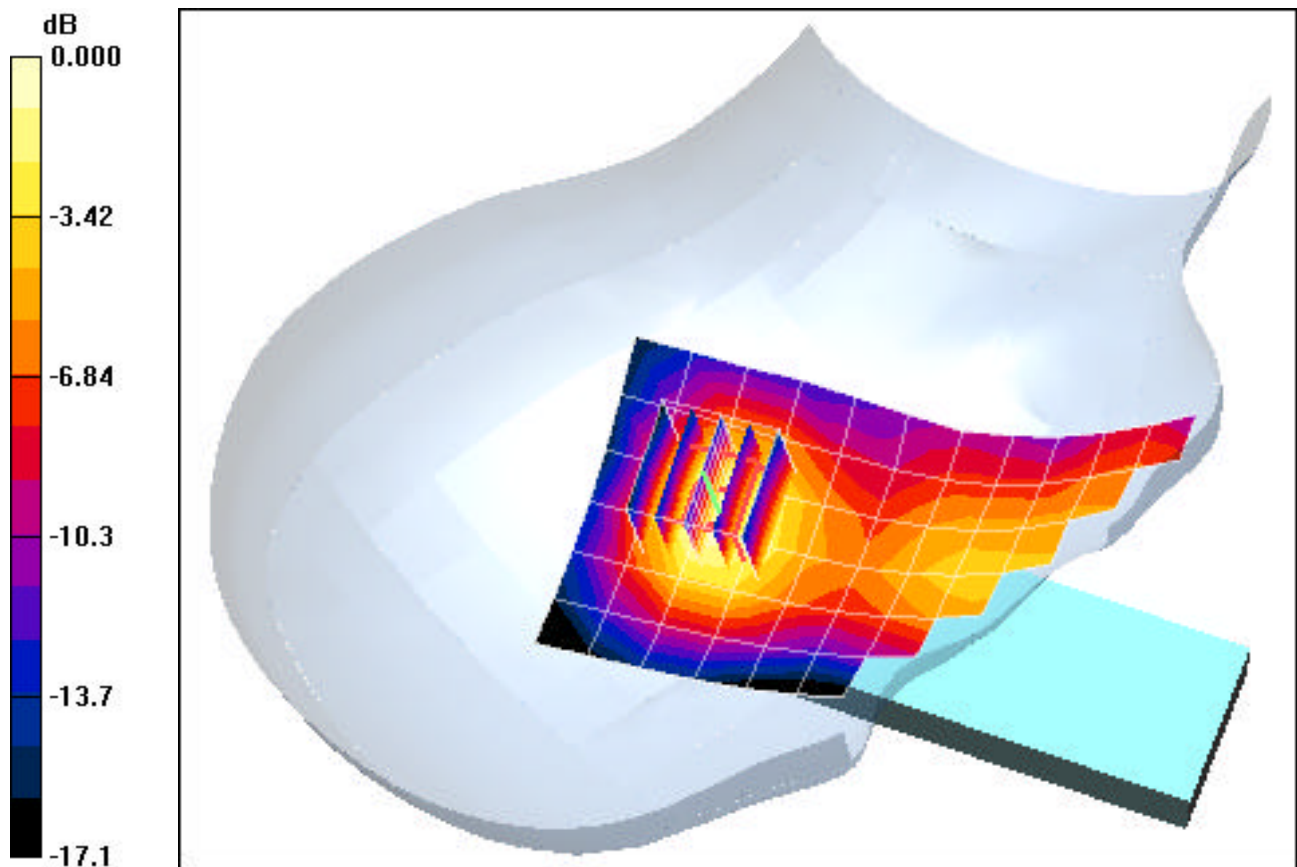
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.3 V/m

Peak SAR (extrapolated) = 0.335 W/kg

SAR(1 g) = 0.205 mW/g; SAR(10 g) = 0.117 mW/g



0 dB = 0.246mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: PCS CDMA; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium: 1900 Brain ( $\sigma = 1.45$  mho/m,  $\epsilon_r = 40.42$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 12-22-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN3561; ConvF(7.04, 7.04, 7.04); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Left Head, Touch, Ch.1175, Fixed Antenna, Standard Battery**

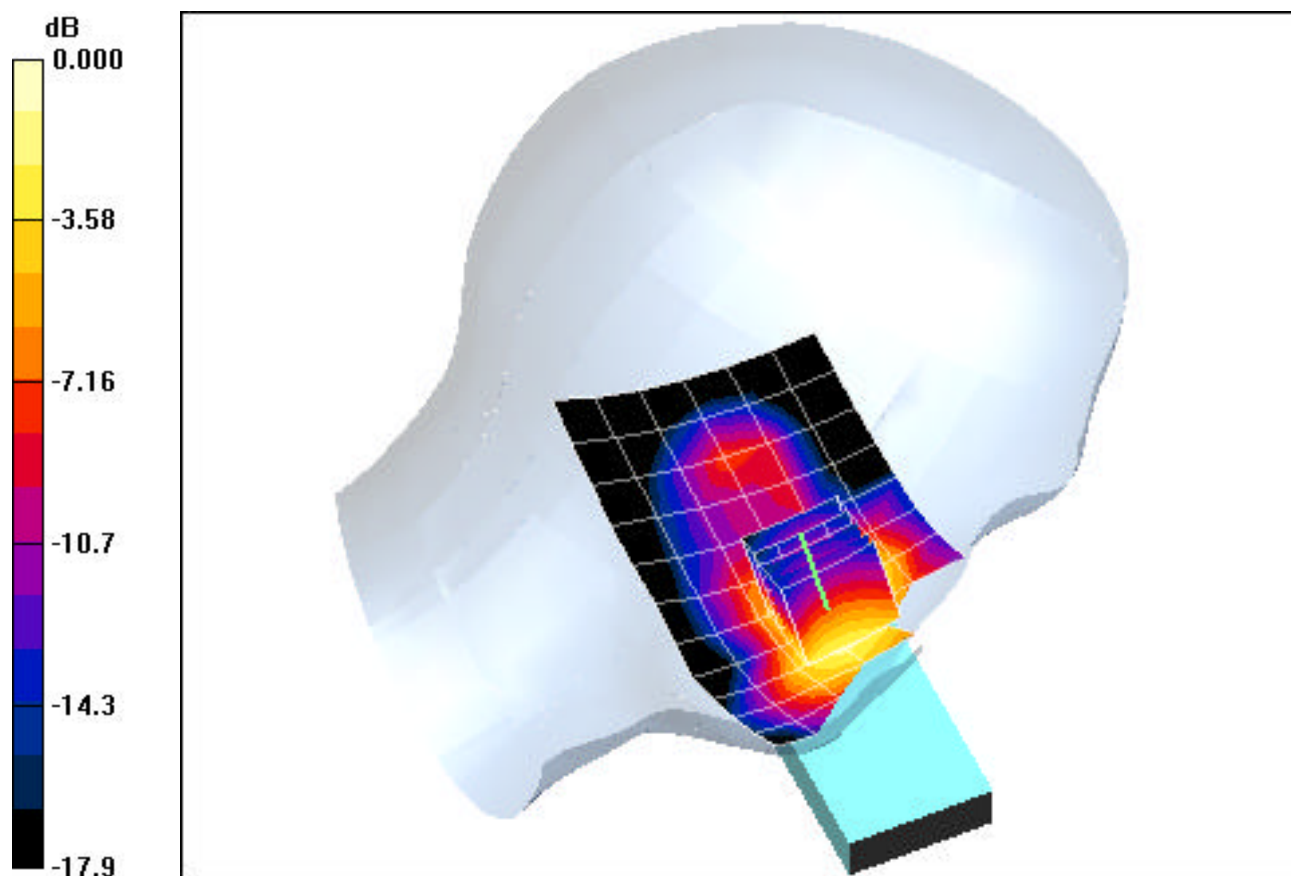
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.8 V/m

Peak SAR (extrapolated) = 1.84 W/kg

SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.604 mW/g



0 dB = 1.30mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: PCS CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Brain ( $\sigma = 1.45$  mho/m,  $\epsilon_r = 40.42$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 12-22-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN3561; ConvF(7.04, 7.04, 7.04); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Left Head, Tilt, Ch.0600, Fixed Antenna, Standard Battery**

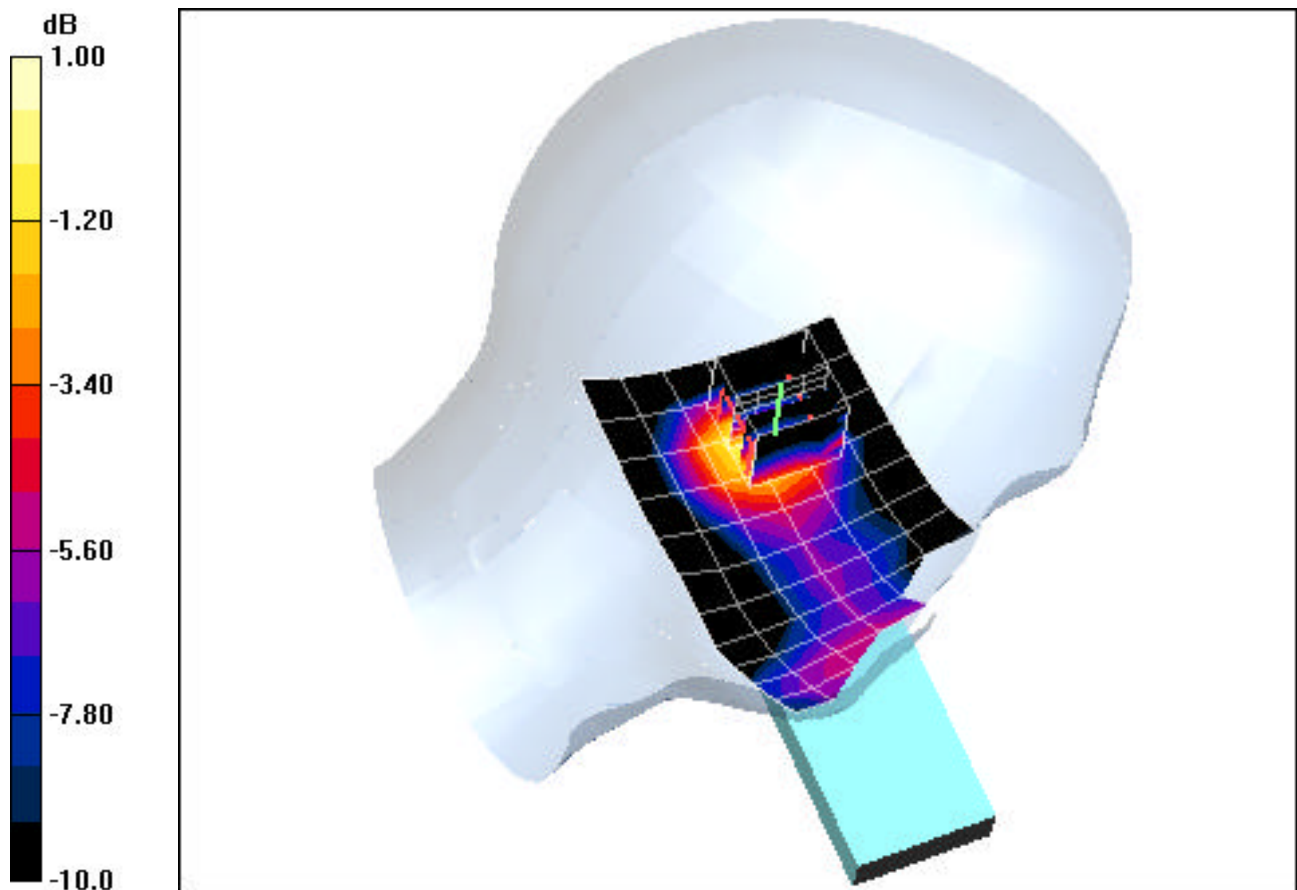
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.7 V/m

Peak SAR (extrapolated) = 0.378 W/kg

**SAR(1 g) = 0.244 mW/g; SAR(10 g) = 0.143 mW/g**



0 dB = 0.286mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Brain ( $\sigma = 1.45$  mho/m,  $\epsilon_r = 40.42$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 12-23-2005; Ambient Temp: 23.3°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3561; ConvF(7.04, 7.04, 7.04); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

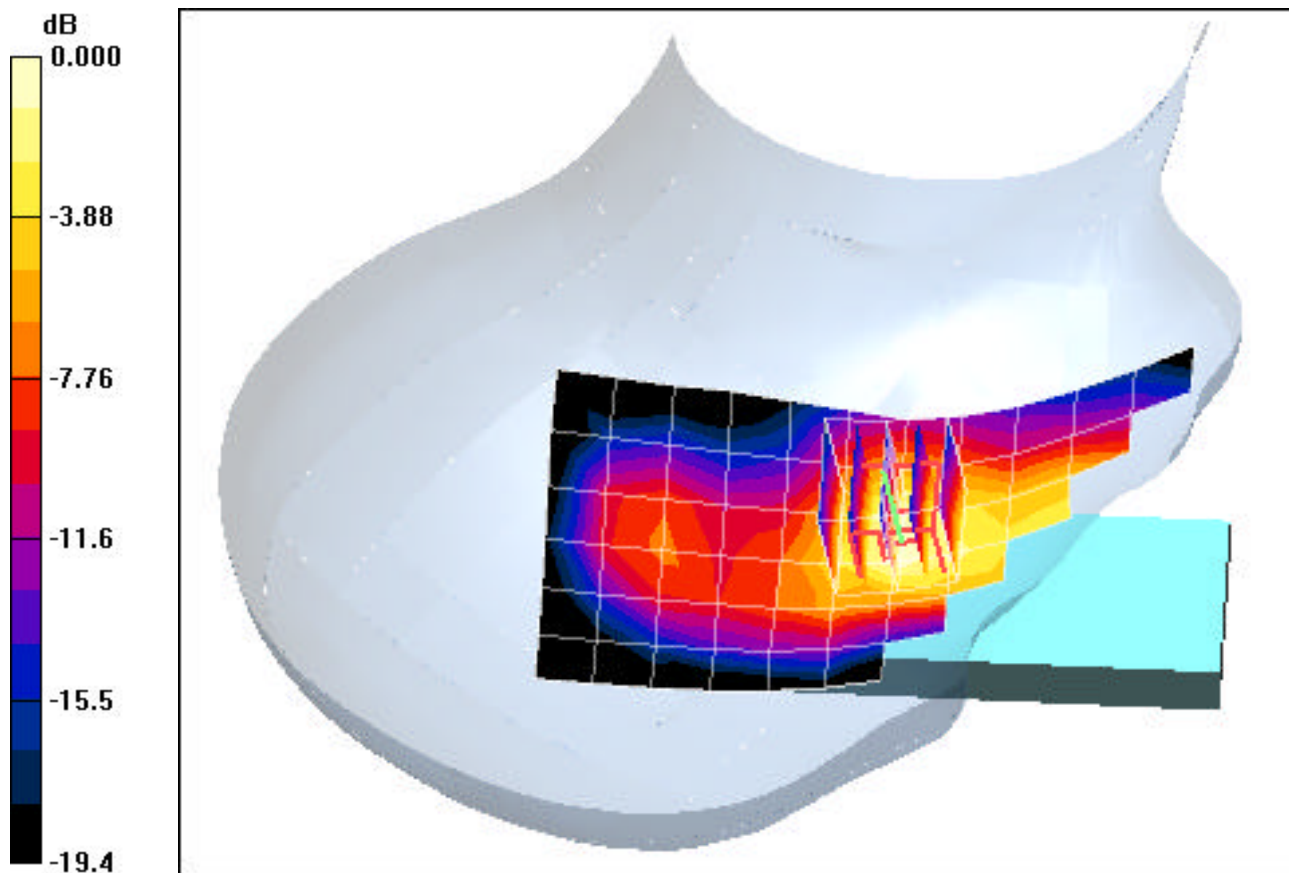
**Right Head, Touch, Ch.0661, Fixed Antenna, Standard Battery**

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.67 V/m

Peak SAR (extrapolated) = 0.450 W/kg

**SAR(1 g) = 0.249 mW/g; SAR(10 g) = 0.131 mW/g**



# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Brain ( $\sigma = 1.45$  mho/m,  $\epsilon_r = 40.42$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 12-23-2005; Ambient Temp: 23.3°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3561; ConvF(7.04, 7.04, 7.04); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Right Head, Tilt, Ch.0661, Fixed Antenna, Standard Battery**

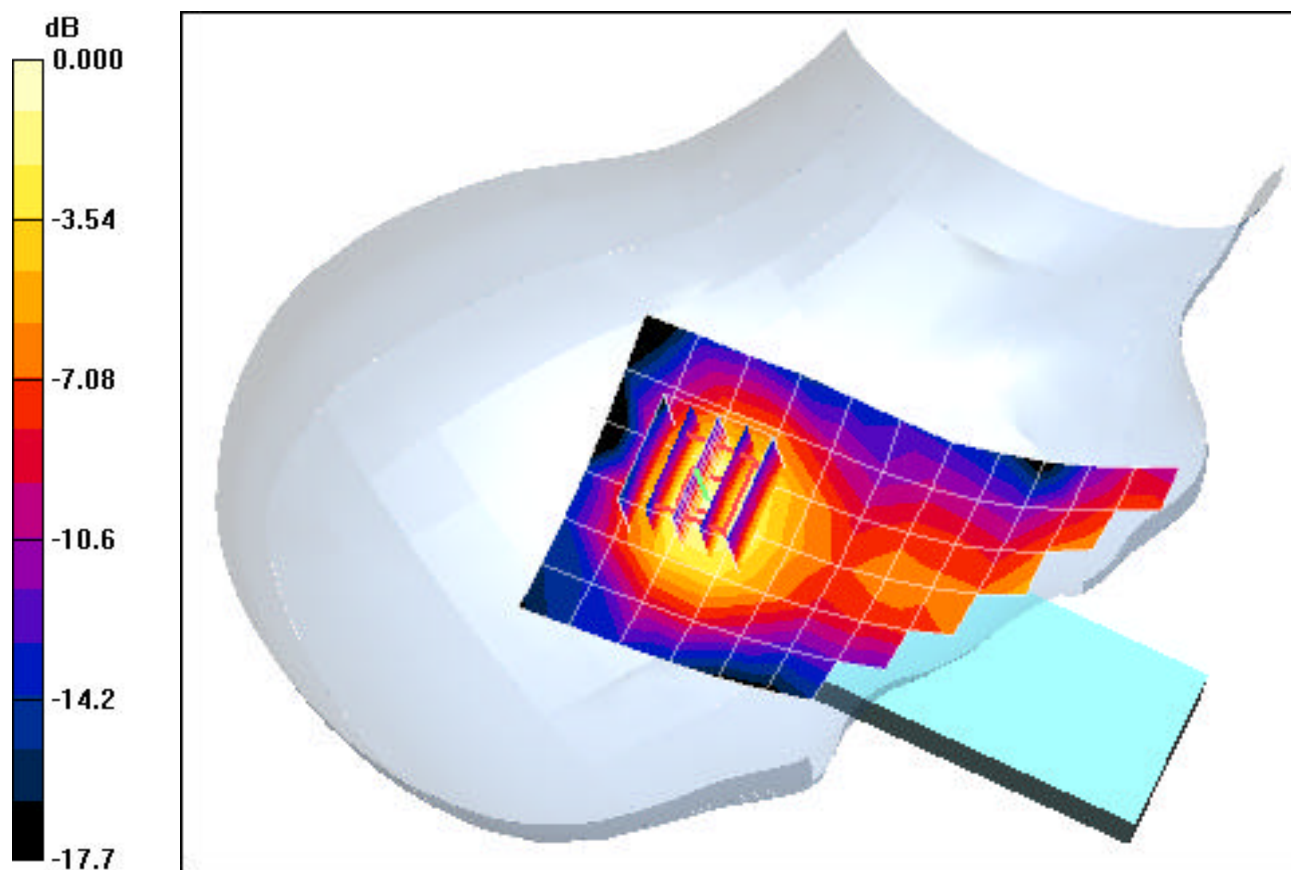
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.42 V/m

Peak SAR (extrapolated) = 0.114 W/kg

**SAR(1 g) = 0.068 mW/g; SAR(10 g) = 0.038 mW/g**



0 dB = 0.082mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Brain ( $\sigma = 1.45$  mho/m,  $\epsilon_r = 40.42$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 12-23-2005; Ambient Temp: 23.3°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3561; ConvF(7.04, 7.04, 7.04); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Left Head, Touch, Ch.0661, Fixed Antenna, Standard Battery**

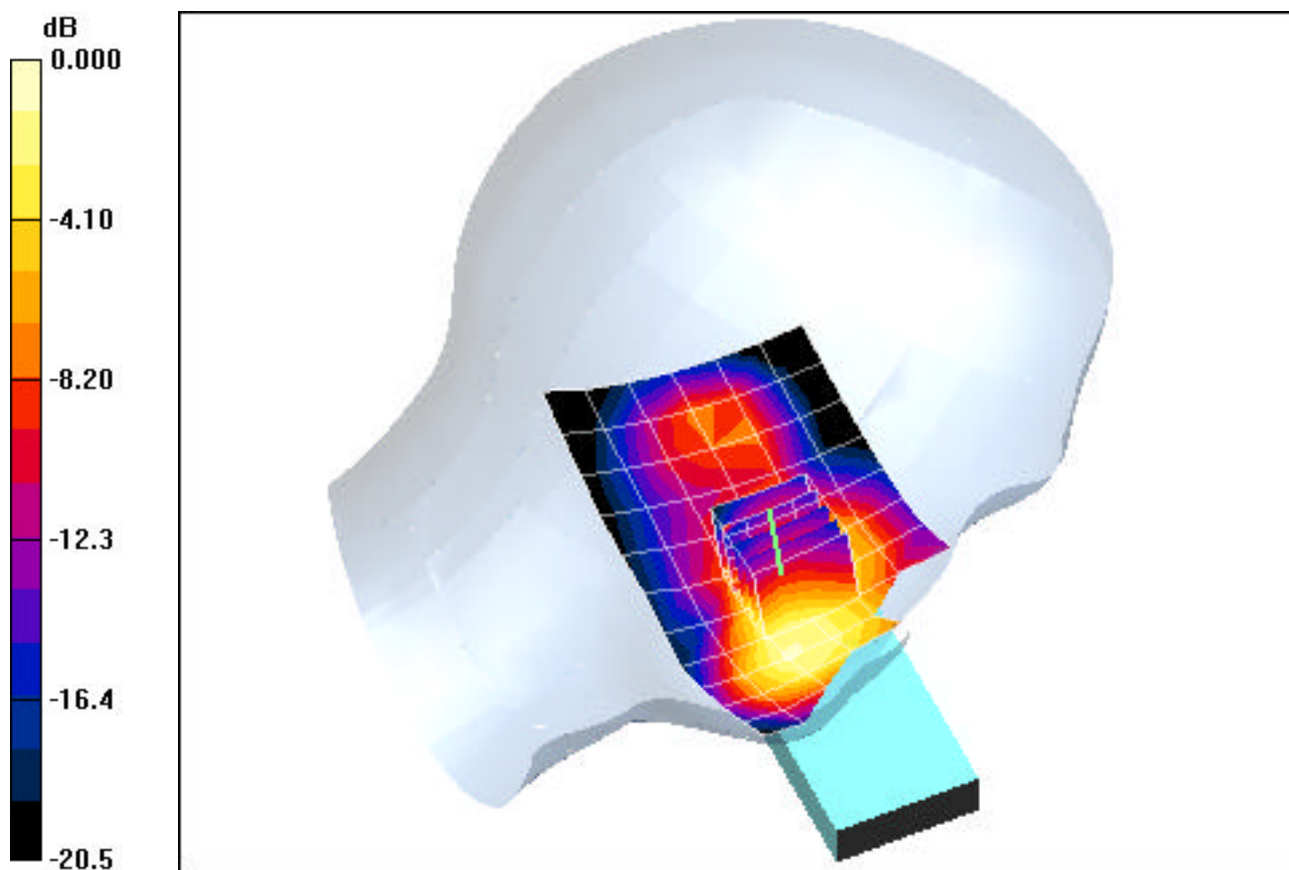
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.68 V/m

Peak SAR (extrapolated) = 0.498 W/kg

**SAR(1 g) = 0.272 mW/g; SAR(10 g) = 0.142 mW/g**



0 dB = 0.326mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Brain ( $\sigma = 1.45$  mho/m,  $\epsilon_r = 40.42$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 12-23-2005; Ambient Temp: 23.3°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3561; ConvF(7.04, 7.04, 7.04); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Left Head, Tilt, Ch.0661, Fixed Antenna, Standard Battery**

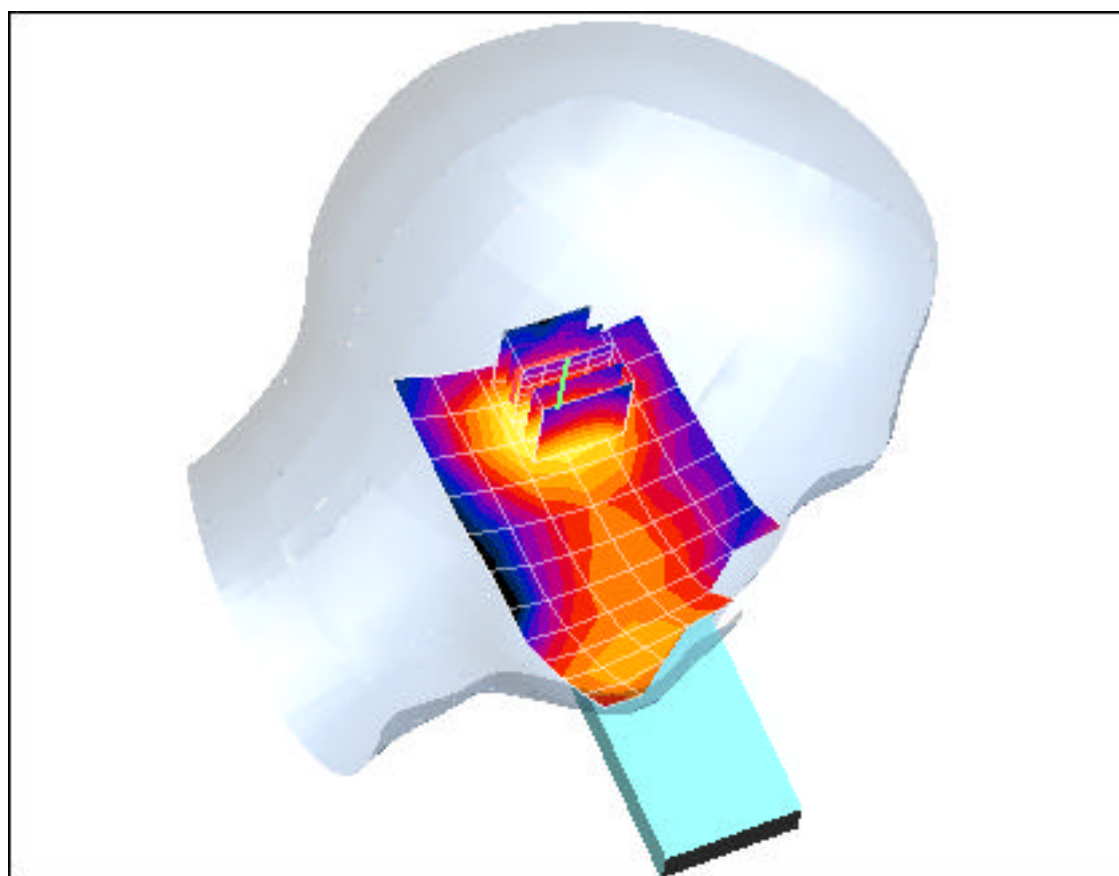
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.67 V/m

Peak SAR (extrapolated) = 0.107 W/kg

**SAR(1 g) = 0.065 mW/g; SAR(10 g) = 0.037 mW/g**



0 dB = 0.079mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: Cellular CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: 835 Muscle ( $\sigma = 0.99$  mho/m,  $\epsilon_r = 54.81$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.5cm. from DUT to Flat Phantom

Test Date: 12-23-2005; Ambient Temp: 23.3°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3561; ConvF(7.9, 7.9, 7.9); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP:1357

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Body, No Beltclip, Ch.0384, Fixed Antenna, Standard Battery**

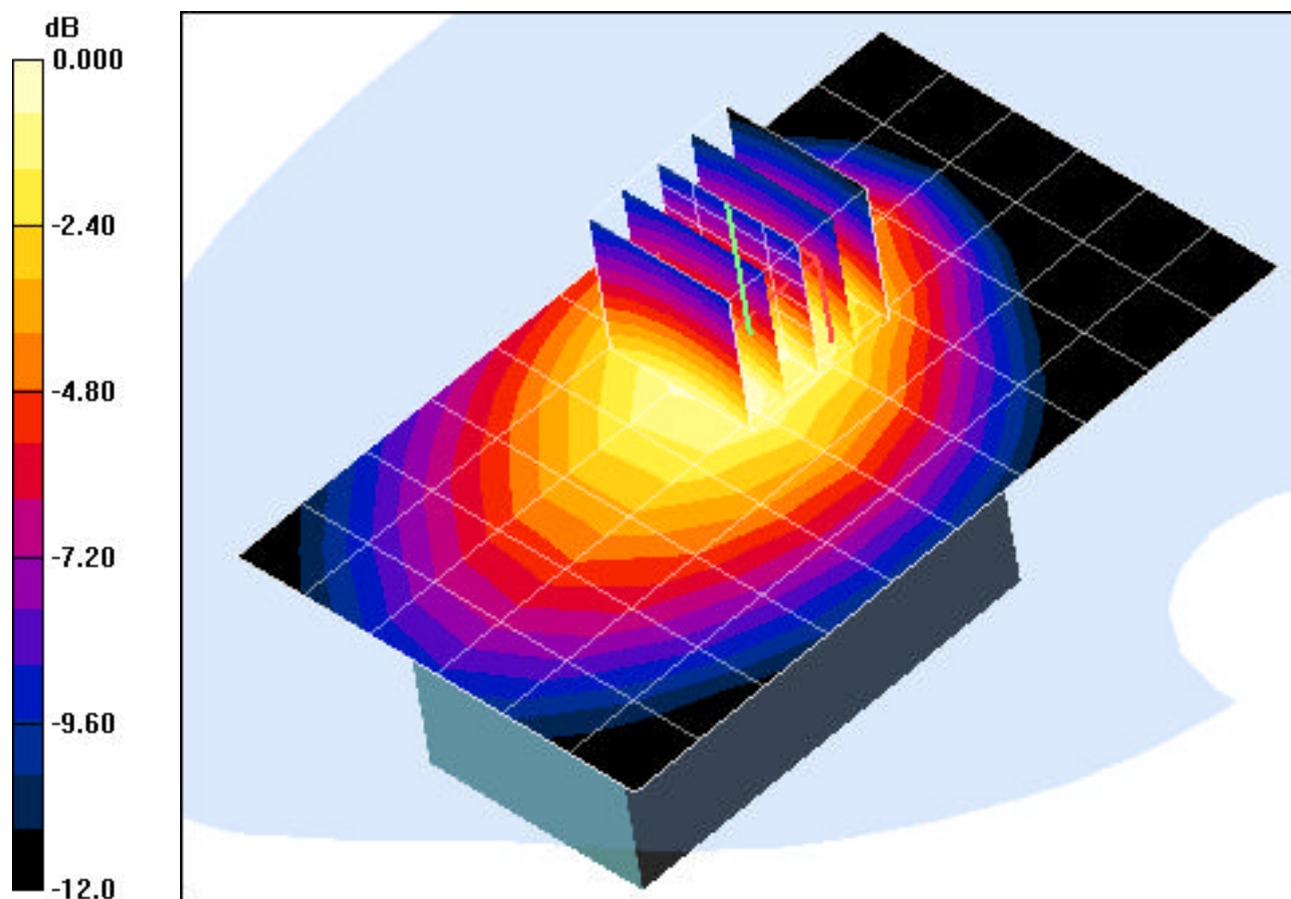
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.5 V/m

Peak SAR (extrapolated) = 0.874 W/kg

**SAR(1 g) = 0.602 mW/g; SAR(10 g) = 0.404 mW/g**



0 dB = 0.696mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: PCS CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Muscle ( $\sigma = 1.57$  mho/m,  $\epsilon_r = 53.34$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.5cm. from DUT to Flat Phantom

Test Date: 12-23-2005; Ambient Temp: 23.3°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3561; ConvF(6.48, 6.48, 6.48); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP:1357

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

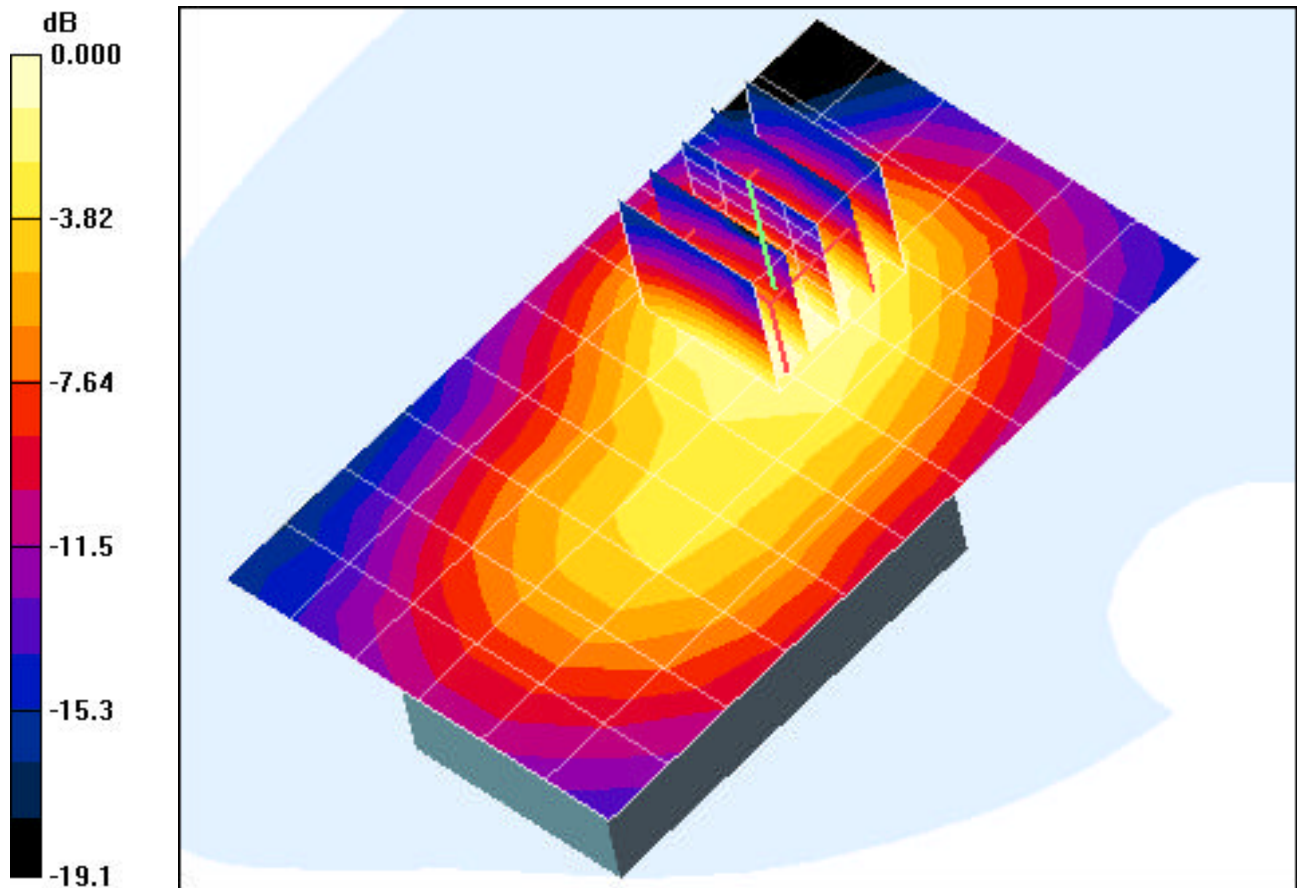
**Body, No Beltclip, Ch.0600, Fixed Antenna, Standard Battery**

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.0 V/m

Peak SAR (extrapolated) = 0.366 W/kg

**SAR(1 g) = 0.210 mW/g; SAR(10 g) = 0.119 mW/g**



0 dB = 0.258mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: GSM1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium: 1900 Muscle ( $\sigma = 1.57$  mho/m,  $\epsilon_r = 53.34$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.5cm. from DUT to Flat Phantom

Test Date: 12-23-2005; Ambient Temp: 23.3°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3561; ConvF(6.48, 6.48, 6.48); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP:1357

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Body, No Beltclip, Ch.0661, Fixed Antenna, Standard Battery**

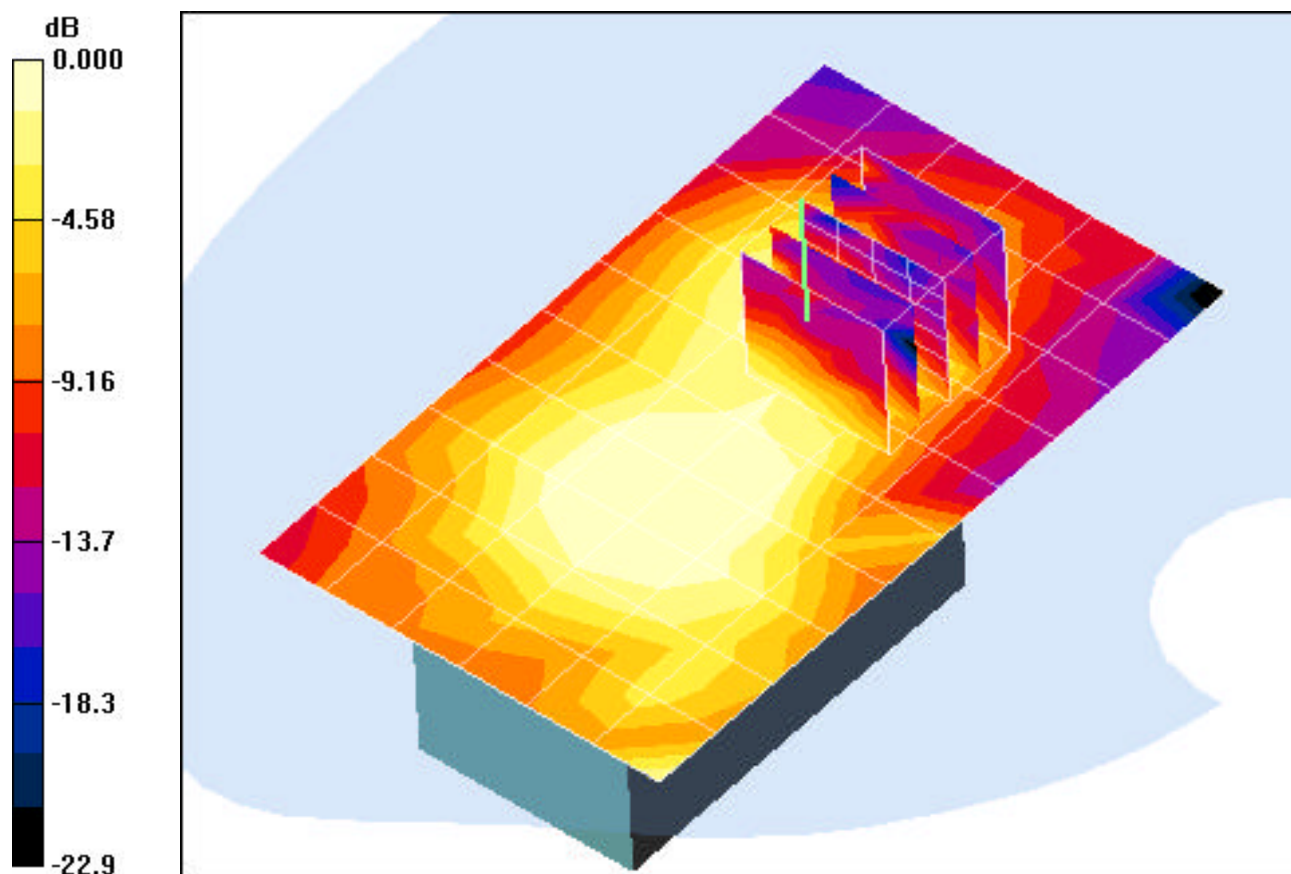
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.83 V/m

Peak SAR (extrapolated) = 0.111 W/kg

**SAR(1 g) = 0.058 mW/g; SAR(10 g) = 0.027 mW/g**



0 dB = 0.080mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: Cellular CDMA; Frequency: 848.31 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.87$  mho/m,  $\epsilon_r = 42.53$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 12-22-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3561; ConvF(7.91, 7.91, 7.91); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Left Head, Touch, Ch.0777, Fixed Antenna, Standard Battery**

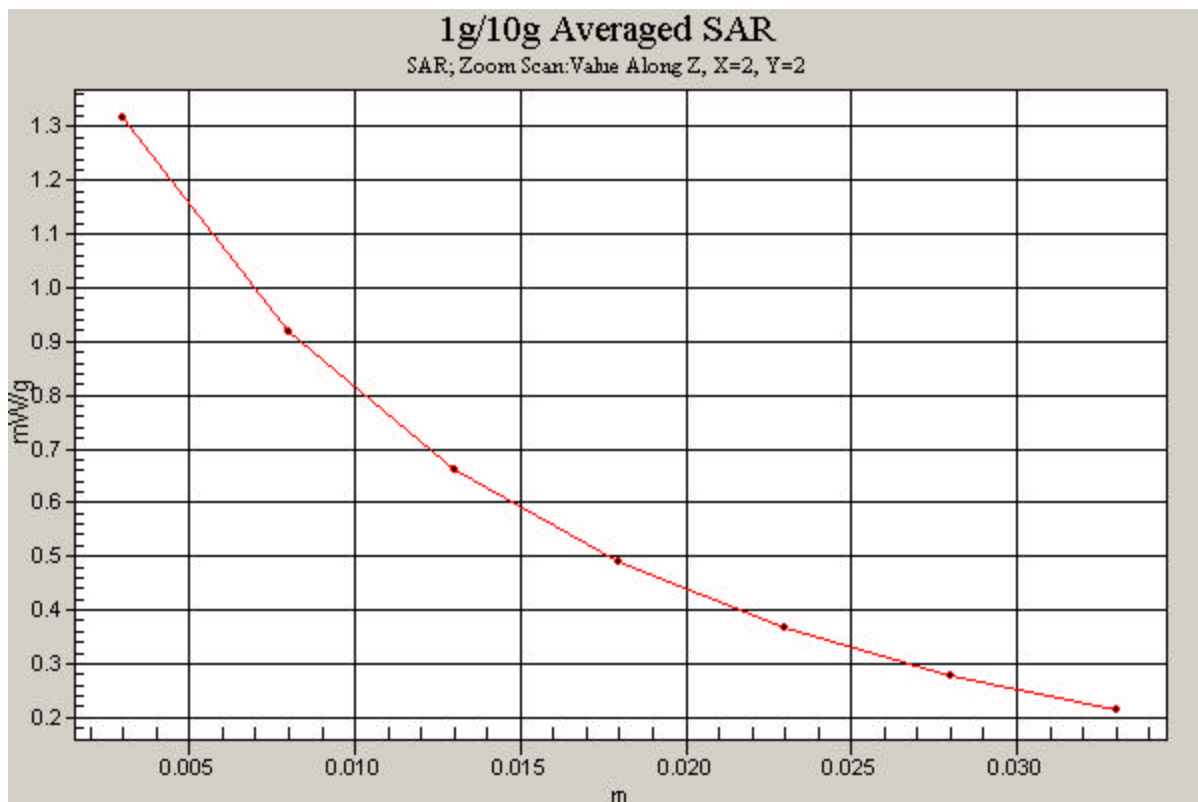
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.9 V/m

Peak SAR (extrapolated) = 1.63 W/kg

**SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.757 mW/g**



# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: PCS CDMA; Frequency: 1908.75 MHz; Duty Cycle: 1:1

Medium: 1900 Brain ( $\sigma = 1.45$  mho/m,  $\epsilon_r = 40.42$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 12-22-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN3561; ConvF(7.04, 7.04, 7.04); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Left Head, Touch, Ch.1175, Fixed Antenna, Standard Battery**

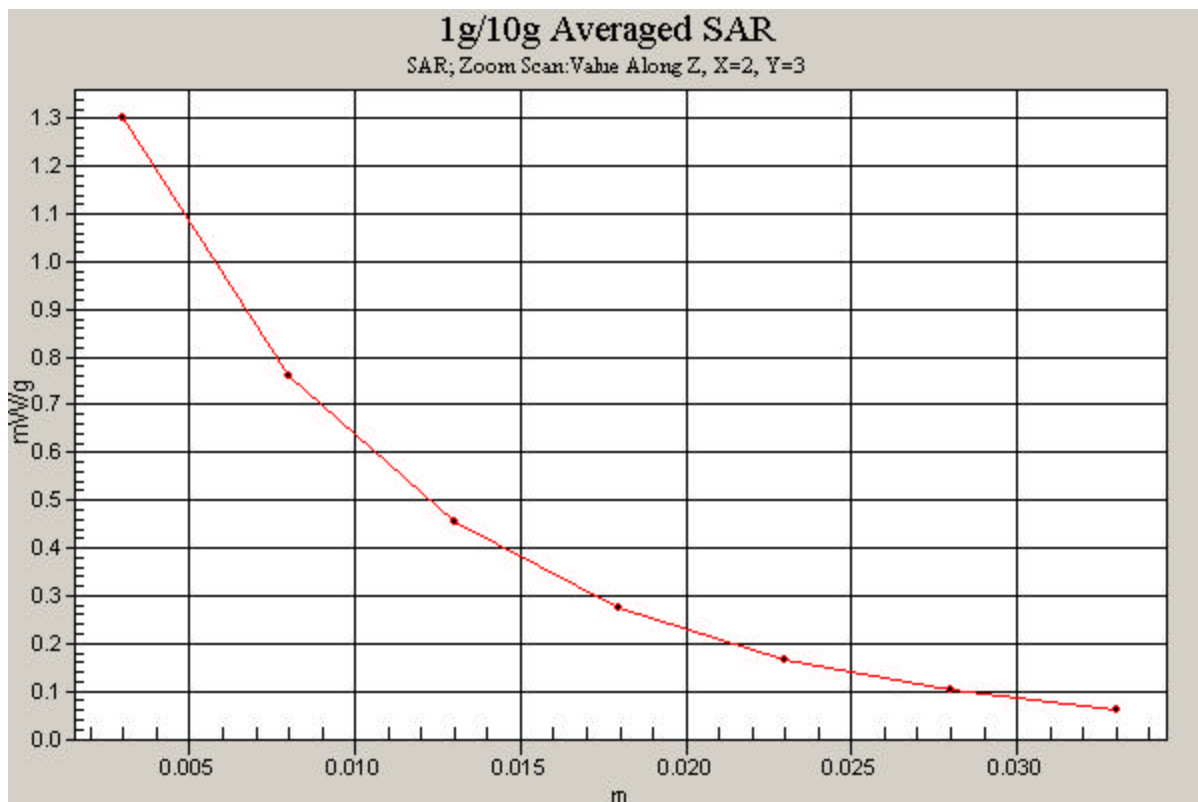
**Area Scan (7x14x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.8 V/m

Peak SAR (extrapolated) = 1.84 W/kg

**SAR(1 g) = 1.07 mW/g; SAR(10 g) = 0.604 mW/g**



# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: Cellular CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1

Medium: 835 Muscle ( $\sigma = 0.99$  mho/m,  $\epsilon_r = 54.81$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.5cm. from DUT to Flat Phantom

Test Date: 12-23-2005; Ambient Temp: 23.3°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3561; ConvF(7.9, 7.9, 7.9); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP:1357

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Body, No Beltclip, Ch.0384, Fixed Antenna, Standard Battery**

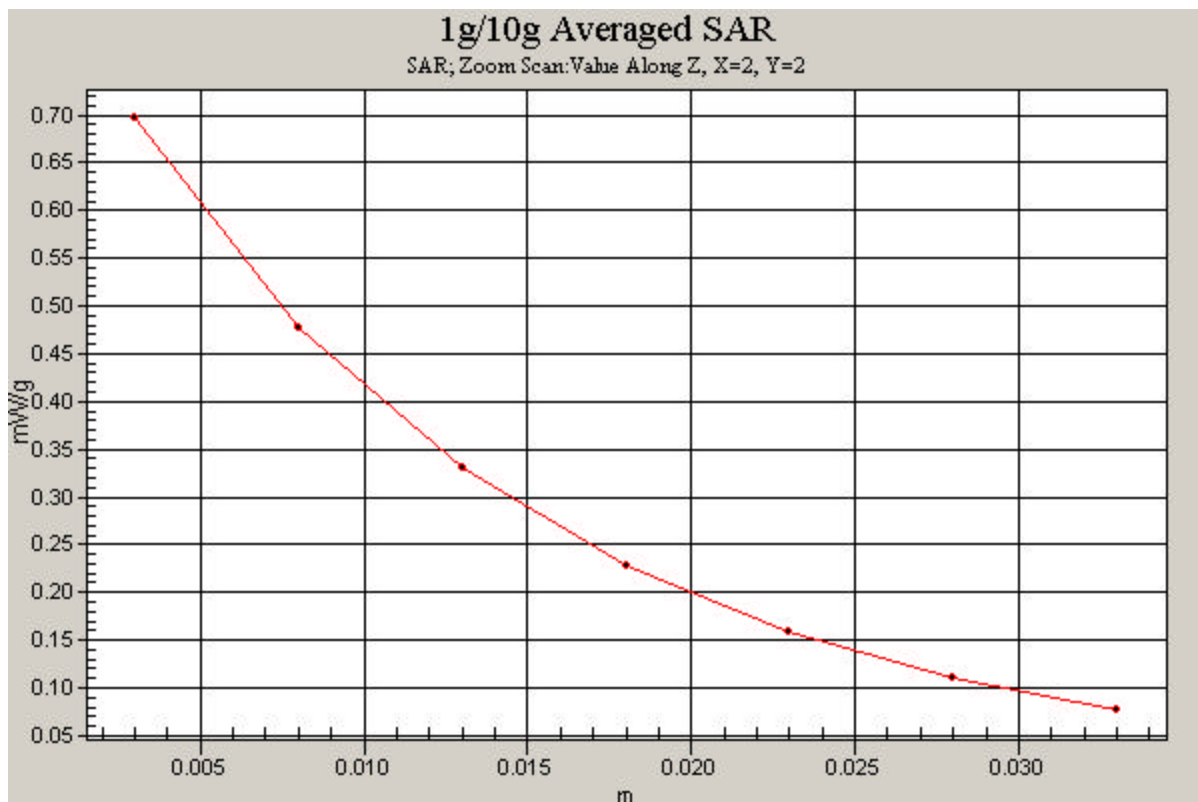
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.5 V/m

Peak SAR (extrapolated) = 0.874 W/kg

**SAR(1 g) = 0.602 mW/g; SAR(10 g) = 0.404 mW/g**



# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Samsung SCH-W379; Type: Tri Mode Phone; Serial: FC-148-D**

Communication System: PCS CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Muscle ( $\sigma = 1.57$  mho/m,  $\epsilon_r = 53.34$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.5cm. from DUT to Flat Phantom

Test Date: 12-23-2005; Ambient Temp: 23.3°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3561; ConvF(6.48, 6.48, 6.48); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP:1357

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

**Body, No Beltclip, Ch.0600, Fixed Antenna, Standard Battery**

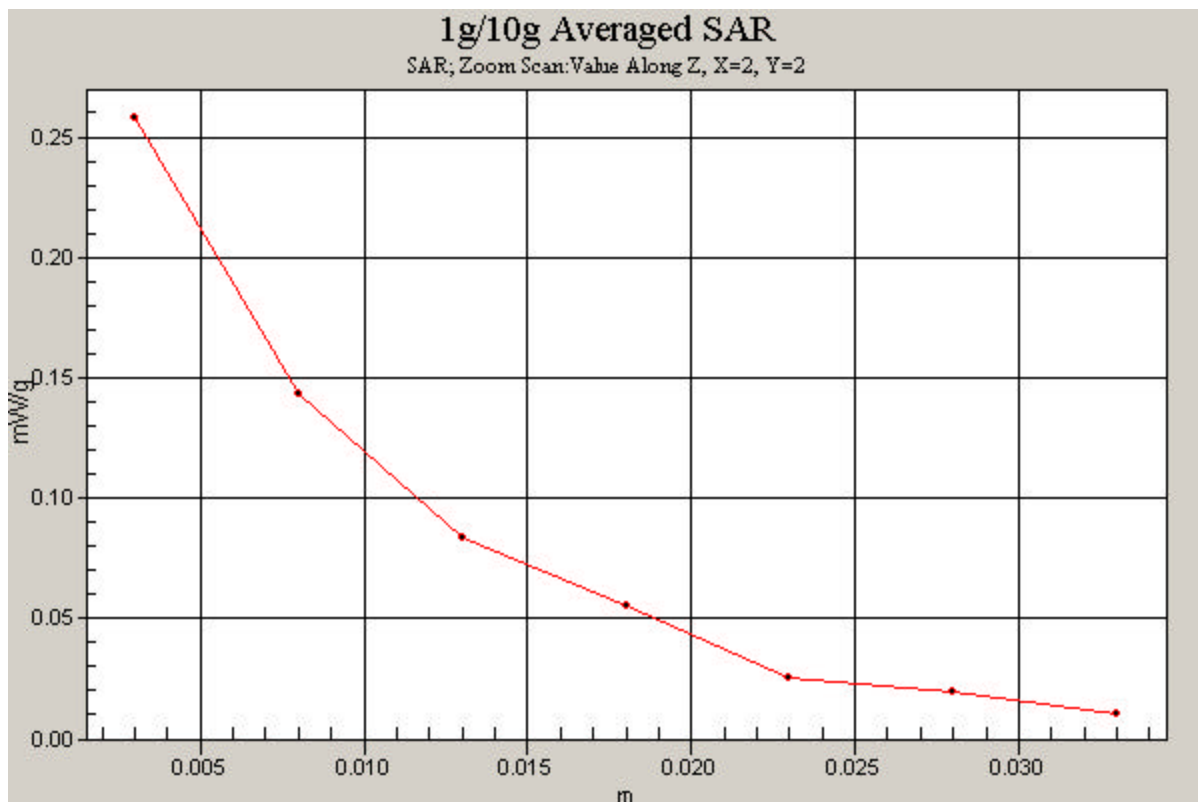
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.0 V/m

Peak SAR (extrapolated) = 0.366 W/kg

**SAR(1 g) = 0.210 mW/g; SAR(10 g) = 0.119 mW/g**



## **APPENDIX B: DIPOLE VALIDATION**

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Dipole 835 MHz; Type: D835V2; Serial: 406**

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.87$  mho/m,  $\epsilon_r = 42.53$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section

Test Date: 12-22-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3561; ConvF(7.91, 7.91, 7.91); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

## 835MHz Dipole Validation

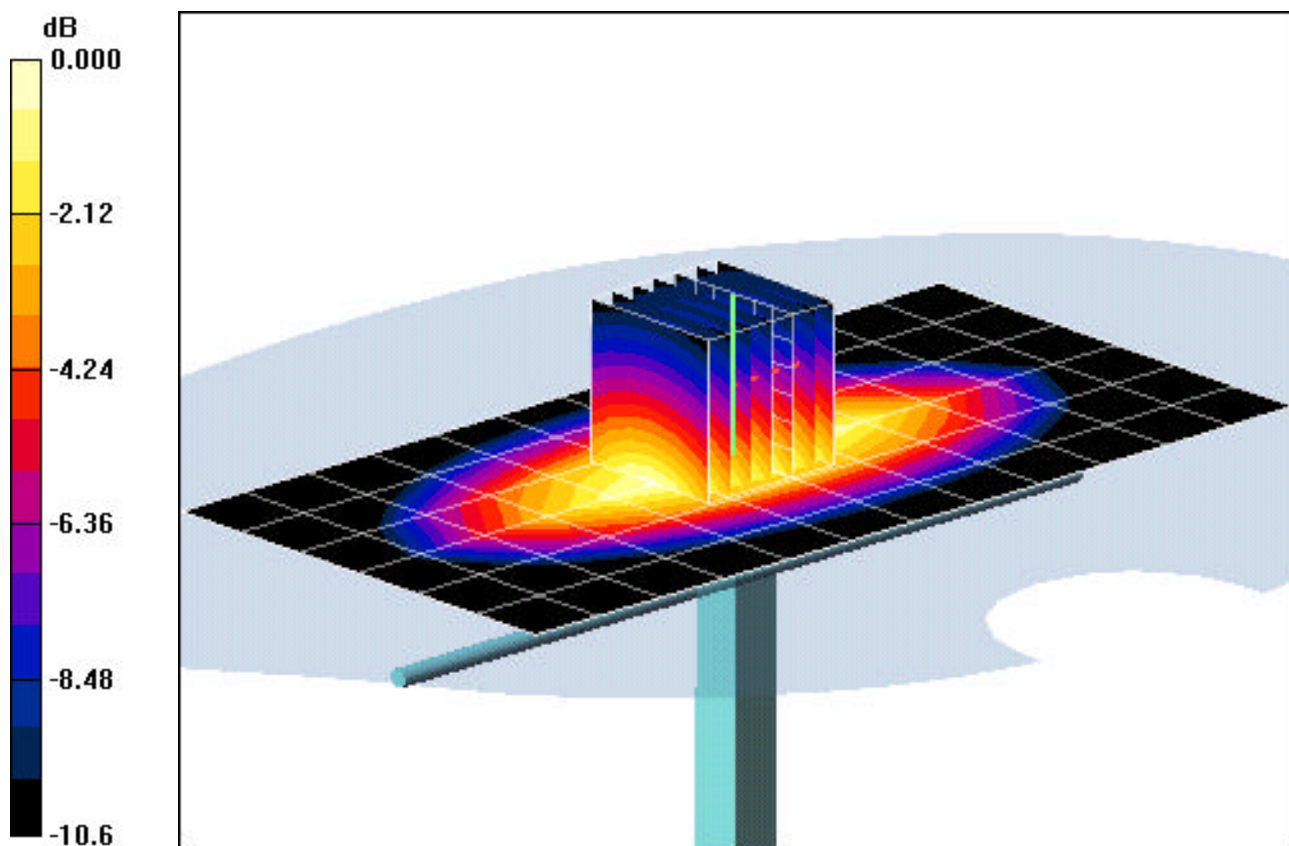
**Area Scan (7x13x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Input Power = 24.0 dBm (250 mW)

**SAR(1 g) = 2.49 mW/g; SAR(10 g) = 1.78 mW/g**

Target SAR(1g) = 2.375 mW/g; Deviation = + 4.84 %



0 dB = 2.96mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 502**

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Brain ( $\sigma = 1.45$  mho/m,  $\epsilon_r = 40.42$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section

Test Date: 12-22-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN3561; ConvF(7.04, 7.04, 7.04); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM with CRP; Type: SAM; Serial: TP1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

## 1900MHz Dipole Validation

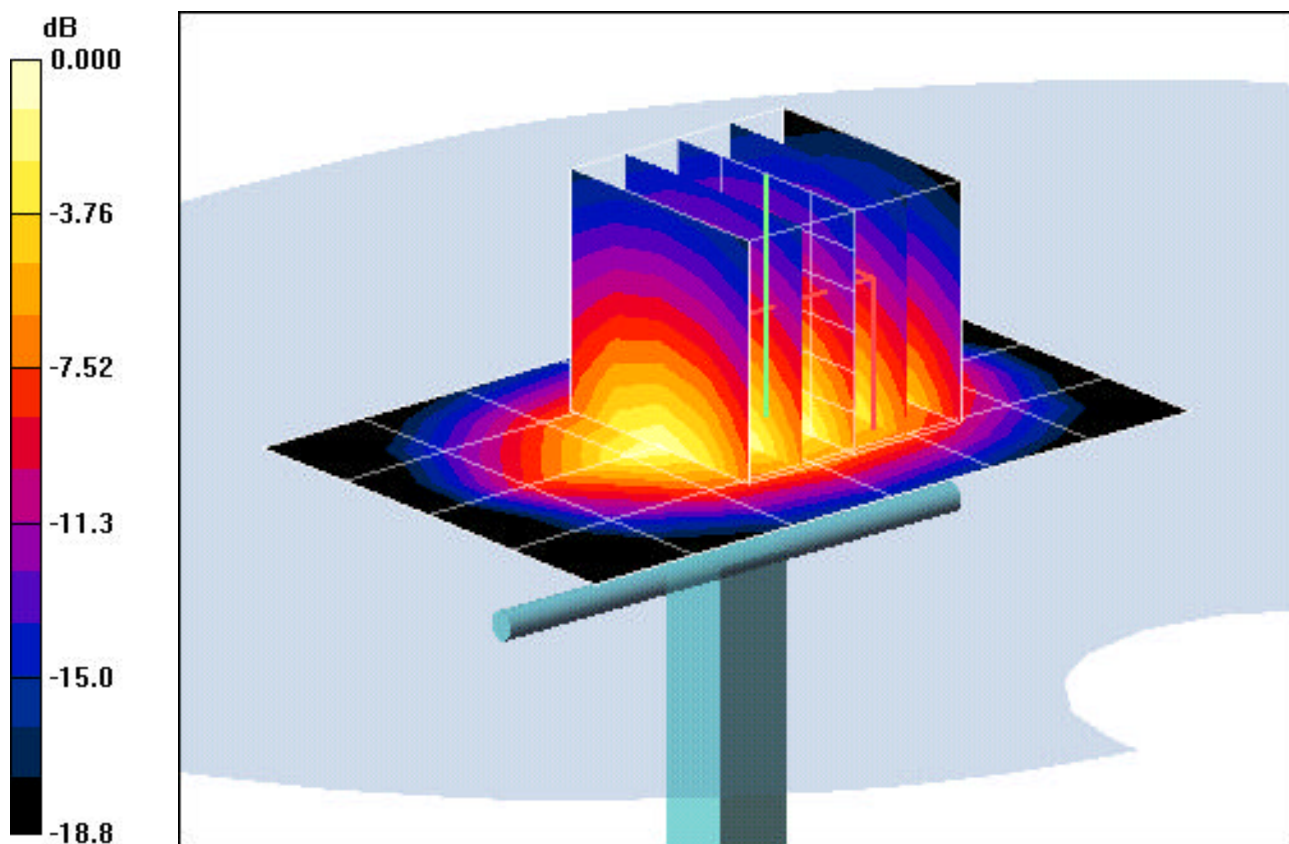
**Area Scan (5x7x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power = 20.0 dBm (100 mW)

**SAR(1 g) = 3.82 mW/g; SAR(10 g) = 2.12 mW/g**

Target SAR(1g) = 3.97 mW/g; Deviation = -3.77 %



0 dB = 4.89mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Dipole 835 MHz; Type: D835V2; Serial: 406**

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.87$  mho/m,  $\epsilon_r = 42.53$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section

Test Date: 12-23-2005; Ambient Temp: 23.3°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN3561; ConvF(7.91, 7.91, 7.91); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM Main; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

## 835MHz Dipole Validation

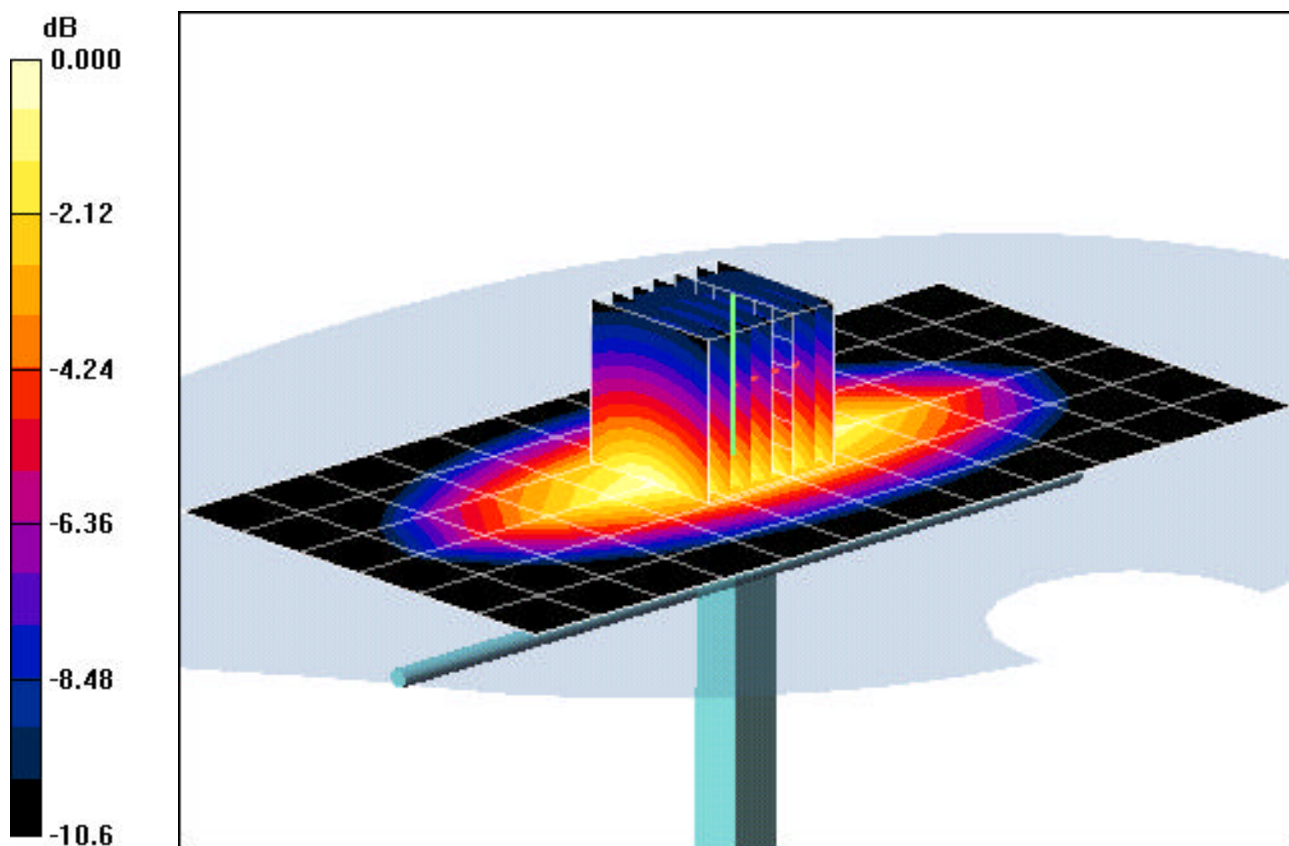
**Area Scan (7x13x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Input Power = 24.0 dBm (250 mW)

**SAR(1 g) = 2.51 mW/g; SAR(10 g) = 1.84 mW/g**

Target SAR(1g) = 2.375 mW/g; Deviation = + 5.68 %



0 dB = 2.98mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 502**

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: 1900 Brain ( $\sigma = 1.45$  mho/m,  $\epsilon_r = 40.42$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section

Test Date: 12-23-2005; Ambient Temp: 23.3°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3561; ConvF(7.04, 7.04, 7.04); Calibrated: 8/24/2005

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 9/13/2005

Phantom: SAM with CRP; Type: SAM; Serial: TP1197

Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 159

## 1900MHz Dipole Validation

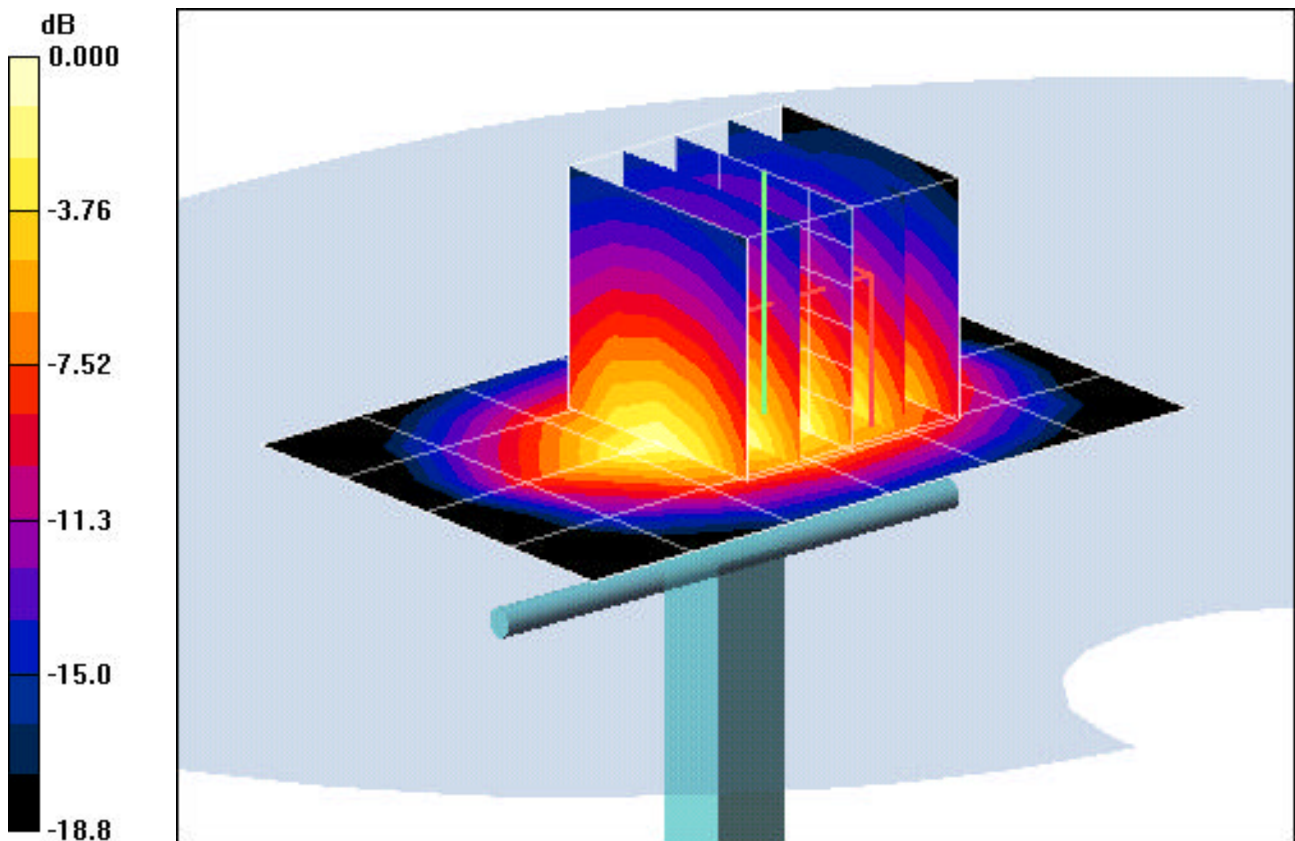
**Area Scan (5x7x1):** Measurement grid: dx=15mm, dy=15mm

**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Input Power = 20.0 dBm (100 mW)

**SAR(1 g) = 3.85 mW/g; SAR(10 g) = 2.19 mW/g**

Target SAR(1g) = 3.97 mW/g; Deviation = -3.02 %



0 dB = 4.92mW/g

## **APPENDIX C: PROBE CALIBRATION**



Accredited by the Swiss Federal Office of Metrology and Accreditation  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **PC Test**

Certificate No: **EX3-3561\_Aug05**

## CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3561**

Calibration procedure(s) **QA CAL-01 v5 and QA CAL-14 v2  
Calibration procedure for dosimetric E-field probes**

Calibration date: **August 24, 2005**

Condition of the calibrated item **In Tolerance**

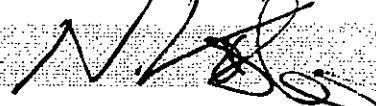
This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards          | ID #            | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|----------------------------|-----------------|-------------------------------------------|-----------------------|
| Power meter E4419B         | GB41293874      | 3-May-05 (METAS, No. 251-00466)           | May-06                |
| Power sensor E4412A        | MY41495277      | 3-May-05 (METAS, No. 251-00466)           | May-06                |
| Power sensor E4412A        | MY41498087      | 3-May-05 (METAS, No. 251-00466)           | May-06                |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 11-Aug-05 (METAS, No. 251-00499)          | Aug-06                |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 3-May-05 (METAS, No. 251-00467)           | May-06                |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 11-Aug-05 (METAS, No. 251-00500)          | Aug-06                |
| Reference Probe ES3DV2     | SN: 3013        | 7-Jan-05 (SPEAG, No. ES3-3013_Jan05)      | Jan-06                |
| DAE4                       | SN: 654         | 29-Nov-04 (SPEAG, No. DAE4-654_Nov04)     | Nov-05                |

| Secondary Standards       | ID #         | Check Date (in house)                    | Scheduled Check        |
|---------------------------|--------------|------------------------------------------|------------------------|
| RF generator HP 8648C     | US3642U01700 | 4-Aug-99 (SPEAG, in house check Dec-03)  | In house check: Dec-05 |
| Network Analyzer HP 8753E | US37390585   | 18-Oct-01 (SPEAG, in house check Nov-04) | In house check: Nov 05 |

|                |               |                   |                                                                                       |
|----------------|---------------|-------------------|---------------------------------------------------------------------------------------|
|                | Name          | Function          | Signature                                                                             |
| Calibrated by: | Katja Pokovic | Technical Manager |  |
| Approved by:   | Niels Kuster  | Quality Manager   |  |

Issued: August 24, 2005

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.



Accredited by the Swiss Federal Office of Metrology and Accreditation  
The Swiss Accreditation Service is one of the signatories to the EA  
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

### Glossary:

|                          |                                                                                                                                                      |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                      | tissue simulating liquid                                                                                                                             |
| NORM <sub>x,y,z</sub>    | sensitivity in free space                                                                                                                            |
| ConF                     | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                           |
| DCP                      | diode compression point                                                                                                                              |
| Polarization $\varphi$   | $\varphi$ rotation around probe axis                                                                                                                 |
| Polarization $\vartheta$ | $\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis |

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

### Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not effect the E<sup>2</sup>-field uncertainty inside TSL (see below *ConvF*).
- NORM(f)<sub>x,y,z</sub>** = NORM<sub>x,y,z</sub> \* *frequency\_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- DCP<sub>x,y,z</sub>**: DCP are numerical linearization parameters assessed based on the data of power sweep (no uncertainty required). DCP does not depend on frequency nor media.
- ConvF and Boundary Effect Parameters**: Assessed in flat phantom using E-field (or Temperature Transfer Standard for  $f \leq 800$  MHz) and inside waveguide using analytical field distributions based on power measurements for  $f > 800$  MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM<sub>x,y,z</sub> \* *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  MHz.
- Spherical isotropy (3D deviation from isotropy)**: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset**: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

# Probe EX3DV4

## SN:3561

|               |                   |
|---------------|-------------------|
| Manufactured: | February 14, 2005 |
| Calibrated:   | August 24, 2005   |

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

## DASY - Parameters of Probe: EX3DV4 SN:3561

### Sensitivity in Free Space<sup>A</sup>

### Diode Compression<sup>B</sup>

|       |                      |                                     |       |              |
|-------|----------------------|-------------------------------------|-------|--------------|
| NormX | <b>0.430</b> ± 10.1% | $\mu\text{V}/(\text{V}/\text{m})^2$ | DCP X | <b>90</b> mV |
| NormY | <b>0.470</b> ± 10.1% | $\mu\text{V}/(\text{V}/\text{m})^2$ | DCP Y | <b>90</b> mV |
| NormZ | <b>0.430</b> ± 10.1% | $\mu\text{V}/(\text{V}/\text{m})^2$ | DCP Z | <b>90</b> mV |

### Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

### Boundary Effect

**TSL                      900 MHz      Typical SAR gradient: 5 % per mm**

|                                           |                              |               |               |
|-------------------------------------------|------------------------------|---------------|---------------|
| Sensor Center to Phantom Surface Distance |                              | <b>2.0 mm</b> | <b>3.0 mm</b> |
| SAR <sub>be</sub> [%]                     | Without Correction Algorithm | 3.8           | 1.5           |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 0.0           | 0.0           |

**TSL                      1810 MHz      Typical SAR gradient: 10 % per mm**

|                                           |                              |               |               |
|-------------------------------------------|------------------------------|---------------|---------------|
| Sensor Center to Phantom Surface Distance |                              | <b>2.0 mm</b> | <b>3.0 mm</b> |
| SAR <sub>be</sub> [%]                     | Without Correction Algorithm | 4.7           | 2.8           |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 1.1           | 0.8           |

### Sensor Offset

Probe Tip to Sensor Center                      **1.0 mm**

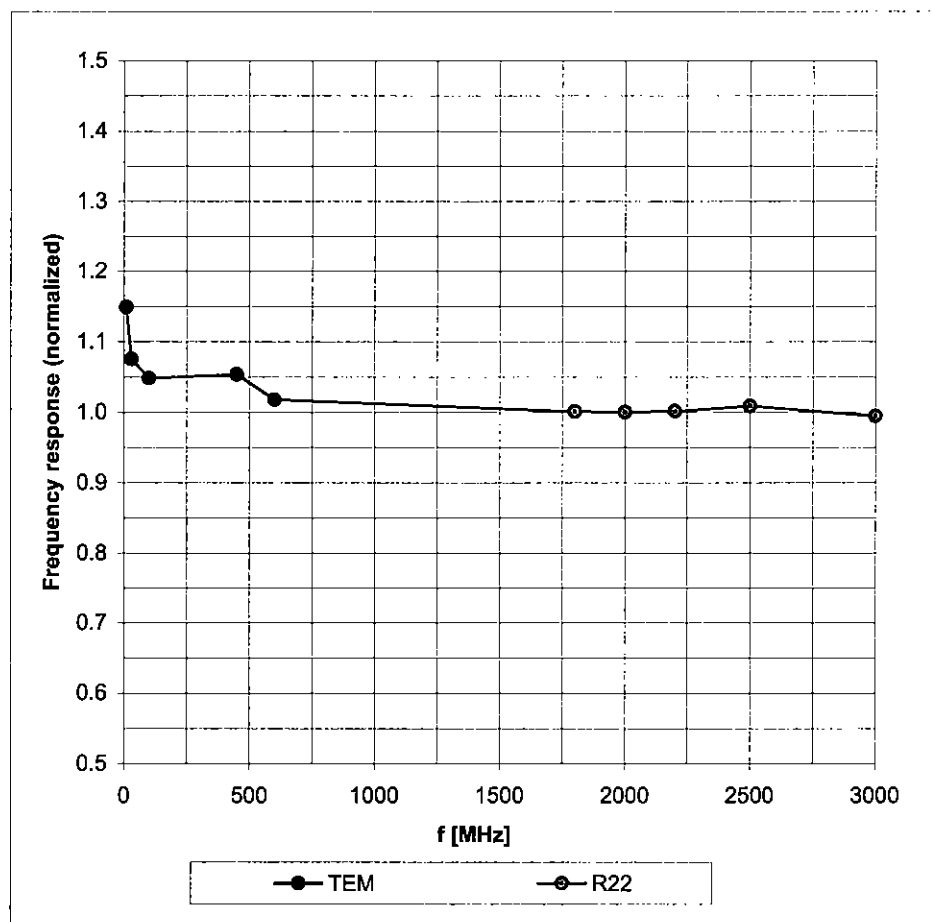
**The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.**

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).

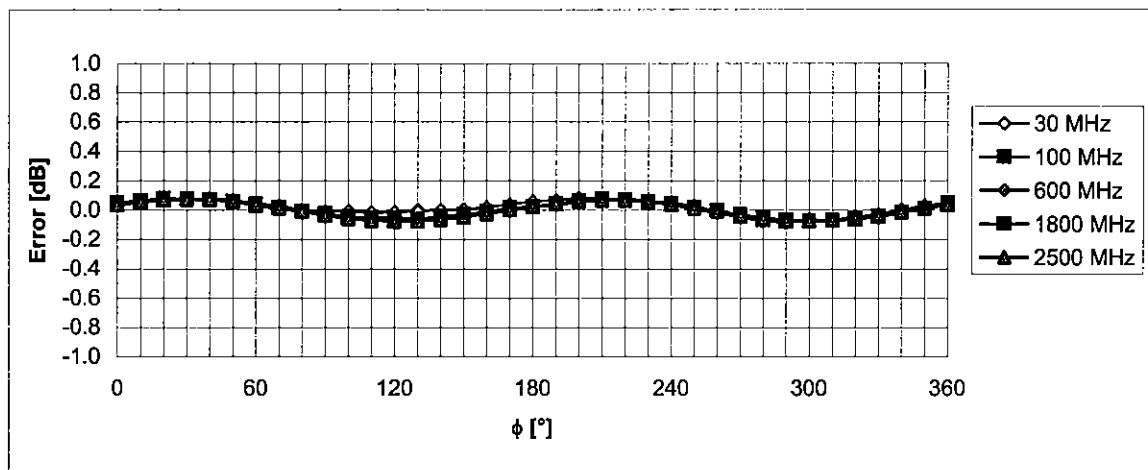
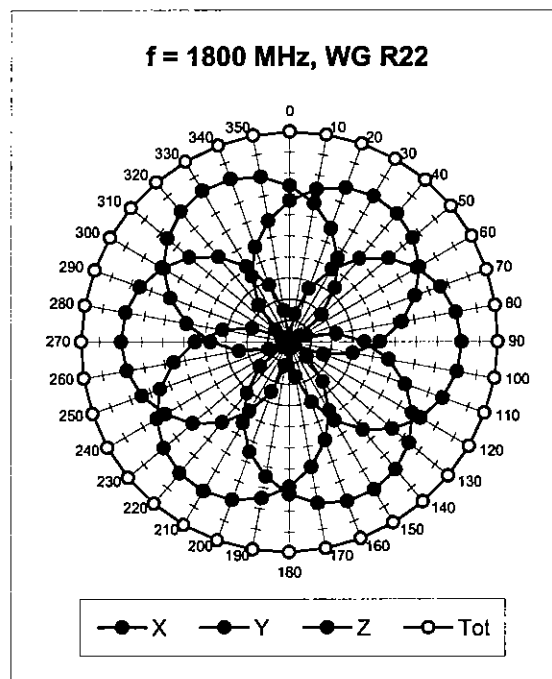
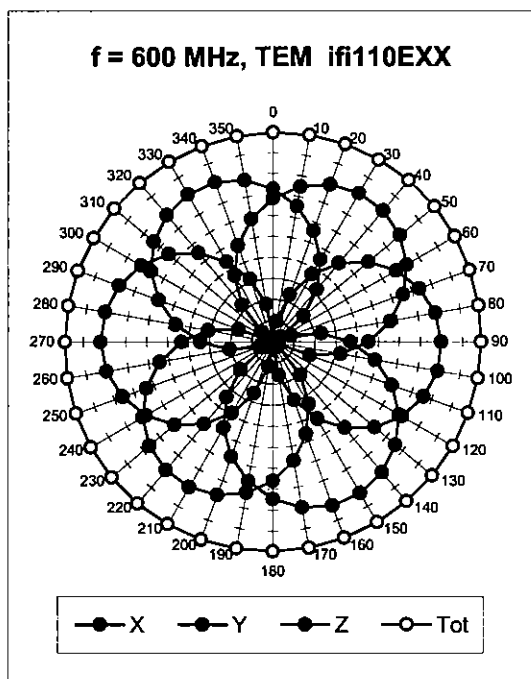
<sup>B</sup> Numerical linearization parameter: uncertainty not required.

## Frequency Response of E-Field

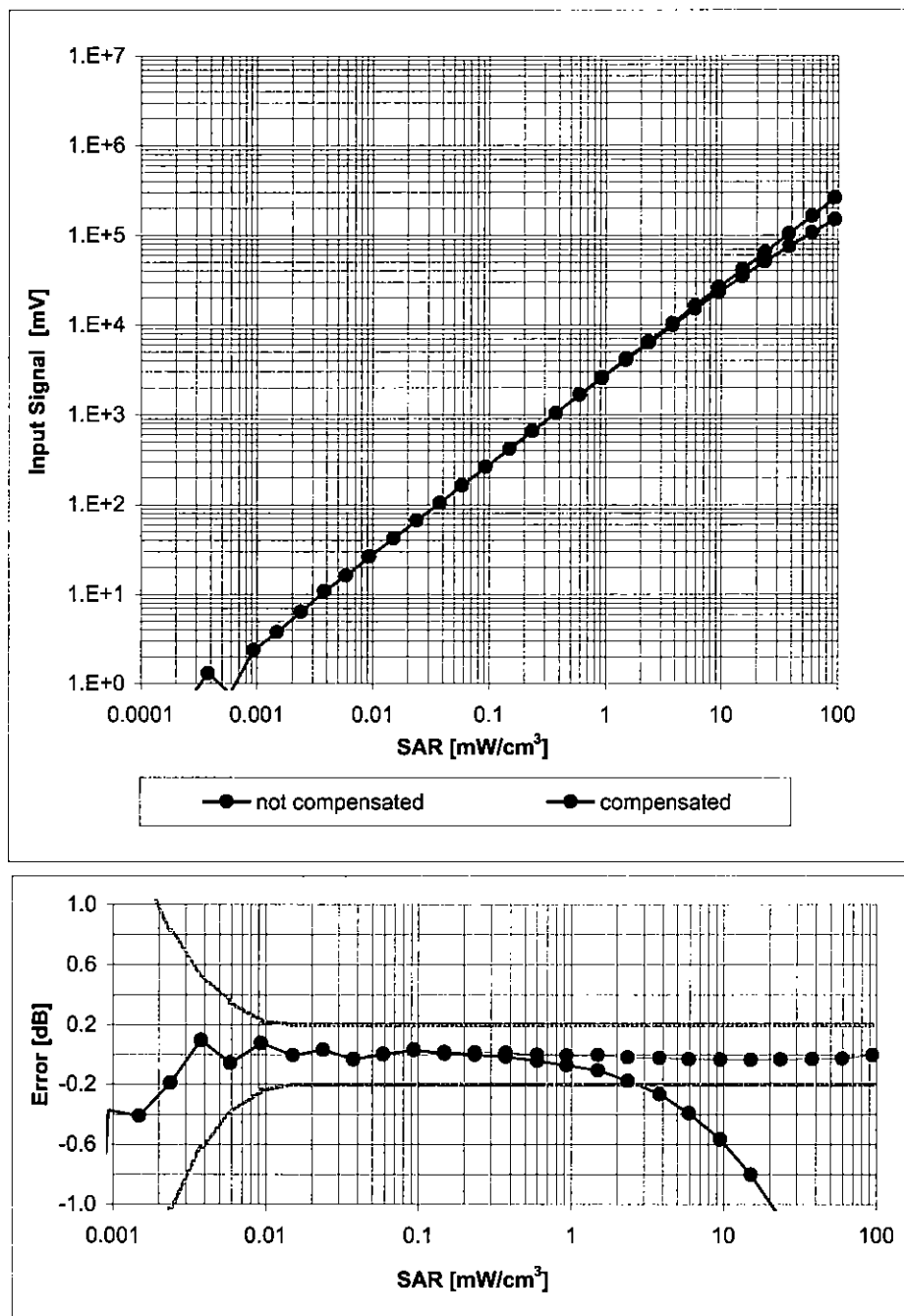
(TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

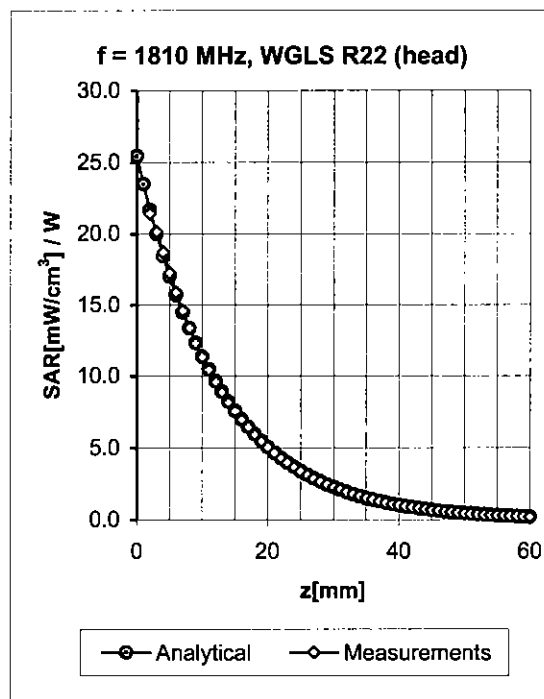
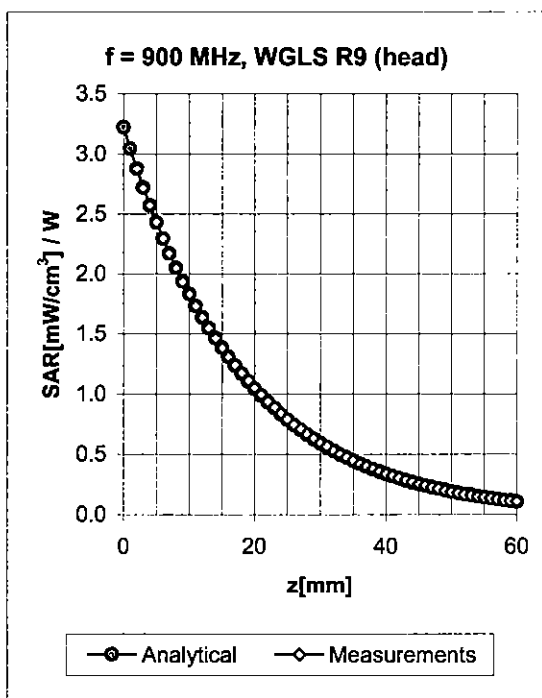
Receiving Pattern ( $\phi$ ),  $\theta = 0^\circ$ Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

# Dynamic Range $f(\text{SAR}_{\text{head}})$ (Waveguide R22, $f = 1800 \text{ MHz}$ )



Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

## Conversion Factor Assessment

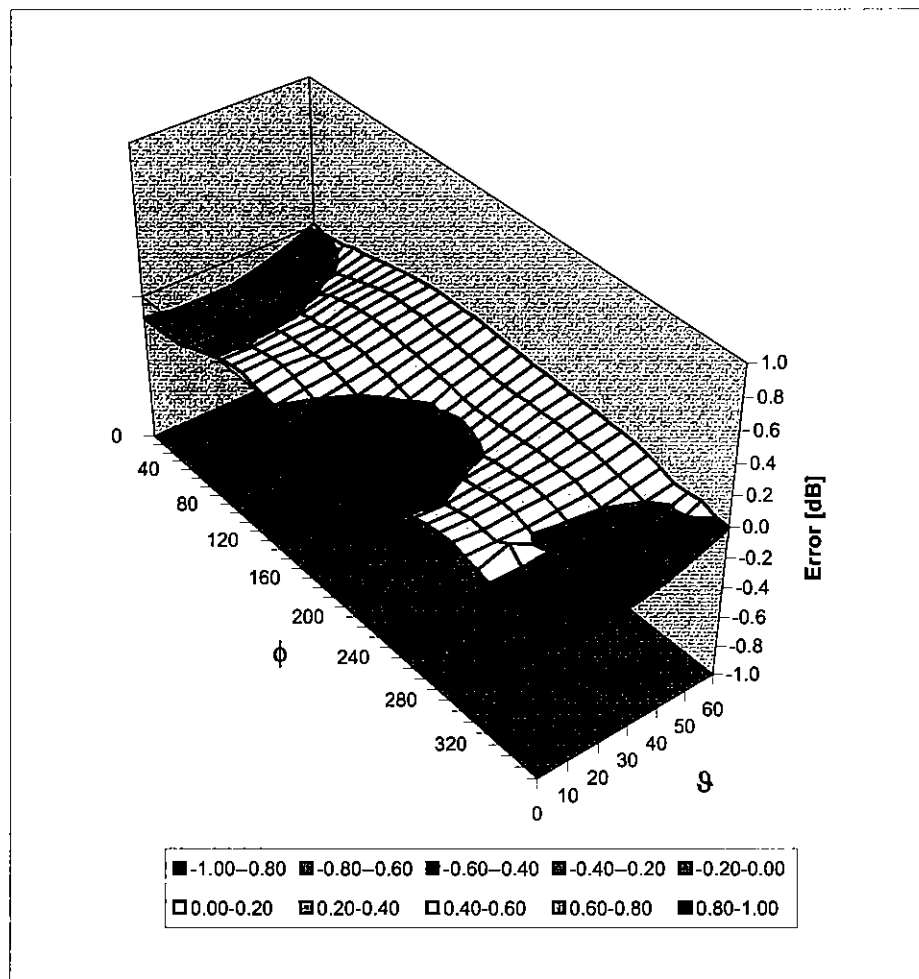


| f [MHz] | Validity [MHz] <sup>c</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 900     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.97 ± 5%    | 0.21  | 1.13  | 7.91 ± 11.0% (k=2) |
| 1810    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.47  | 0.94  | 7.04 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Head | 39.2 ± 5%    | 1.80 ± 5%    | 0.61  | 0.71  | 6.37 ± 11.8% (k=2) |
| 900     | ± 50 / ± 100                | Body | 55.0 ± 5%    | 1.05 ± 5%    | 0.32  | 0.93  | 7.90 ± 11.0% (k=2) |
| 1810    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.34  | 1.60  | 6.48 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Body | 52.7 ± 5%    | 1.95 ± 5%    | 0.75  | 0.62  | 6.30 ± 11.8% (k=2) |

<sup>c</sup> The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

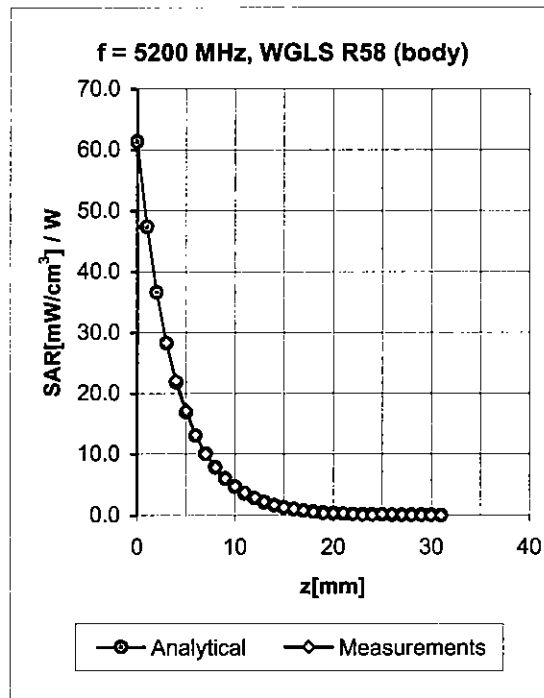
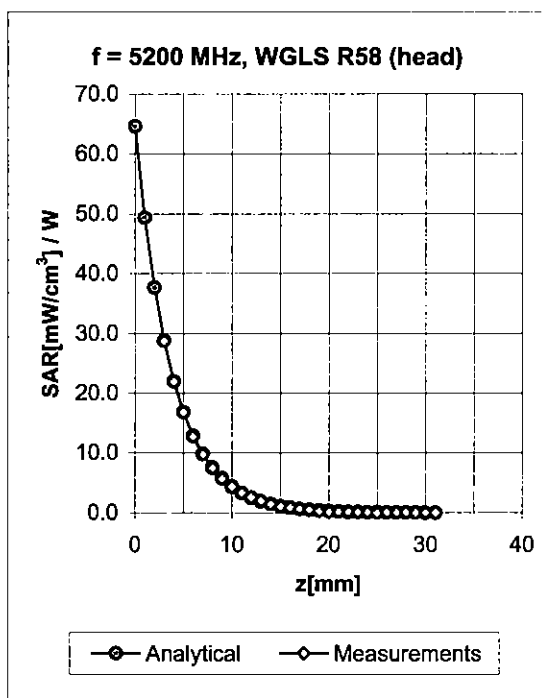
## Deviation from Isotropy in HSL

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



Uncertainty of Spherical Isotropy Assessment:  $\pm 2.6\%$  ( $k=2$ )

# Appendix<sup>D</sup>



| f [MHz] <sup>D</sup> | Validity [MHz] | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|----------------------|----------------|------|--------------|--------------|-------|-------|--------------------|
| 5200                 | ± 50           | Head | 36.0 ± 5%    | 4.76 ± 5%    | 0.49  | 1.36  | 4.26 ± 13.6% (k=2) |
| 5800                 | ± 50           | Head | 35.3 ± 5%    | 5.27 ± 5%    | 0.52  | 1.42  | 3.75 ± 13.6% (k=2) |
| 5200                 | ± 50           | Body | 49.0 ± 5%    | 5.30 ± 5%    | 0.50  | 1.63  | 4.10 ± 13.6% (k=2) |
| 5800                 | ± 50           | Body | 48.2 ± 5%    | 6.00 ± 5%    | 0.49  | 1.70  | 3.63 ± 13.6% (k=2) |

<sup>D</sup> Accreditation for ConvF assessment above 3000 MHz is currently applied for.