

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Muscle ($\sigma = 1.92$ mho/m, $\epsilon_r = 53.23$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-30-2005; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3550; ConvF(6.27, 6.27, 6.27); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11b, Bystander position, LCD Flip, ch.06, 5.5Mbps, Aux antenna

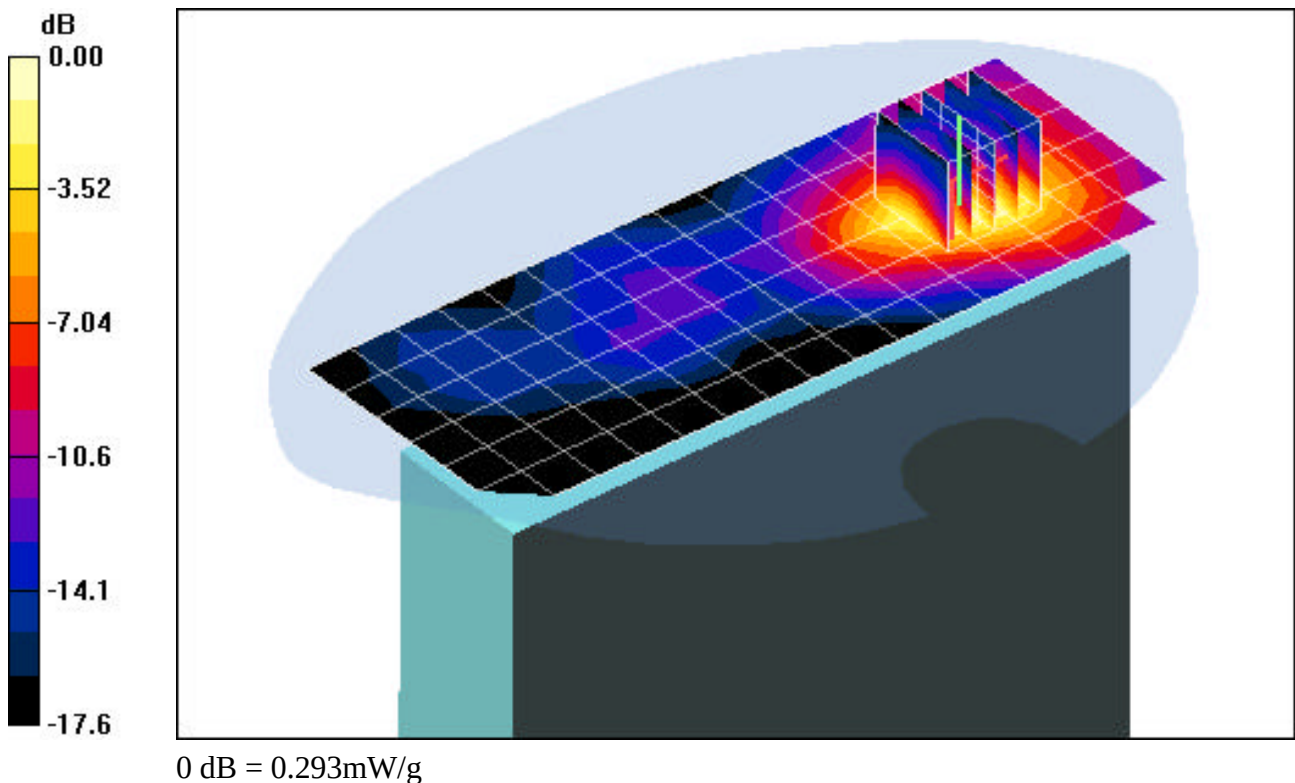
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 1.96 V/m

Peak SAR (extrapolated) = 0.434 W/kg

SAR(1 g) = 0.237 mW/g; SAR(10 g) = 0.125 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11g; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Muscle ($\sigma = 1.92$ mho/m, $\epsilon_r = 53.23$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-30-2005; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3550; ConvF(6.27, 6.27, 6.27); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11g, Laptop Position, LCD Flip, ch.06, 12Mbps, Main antenna

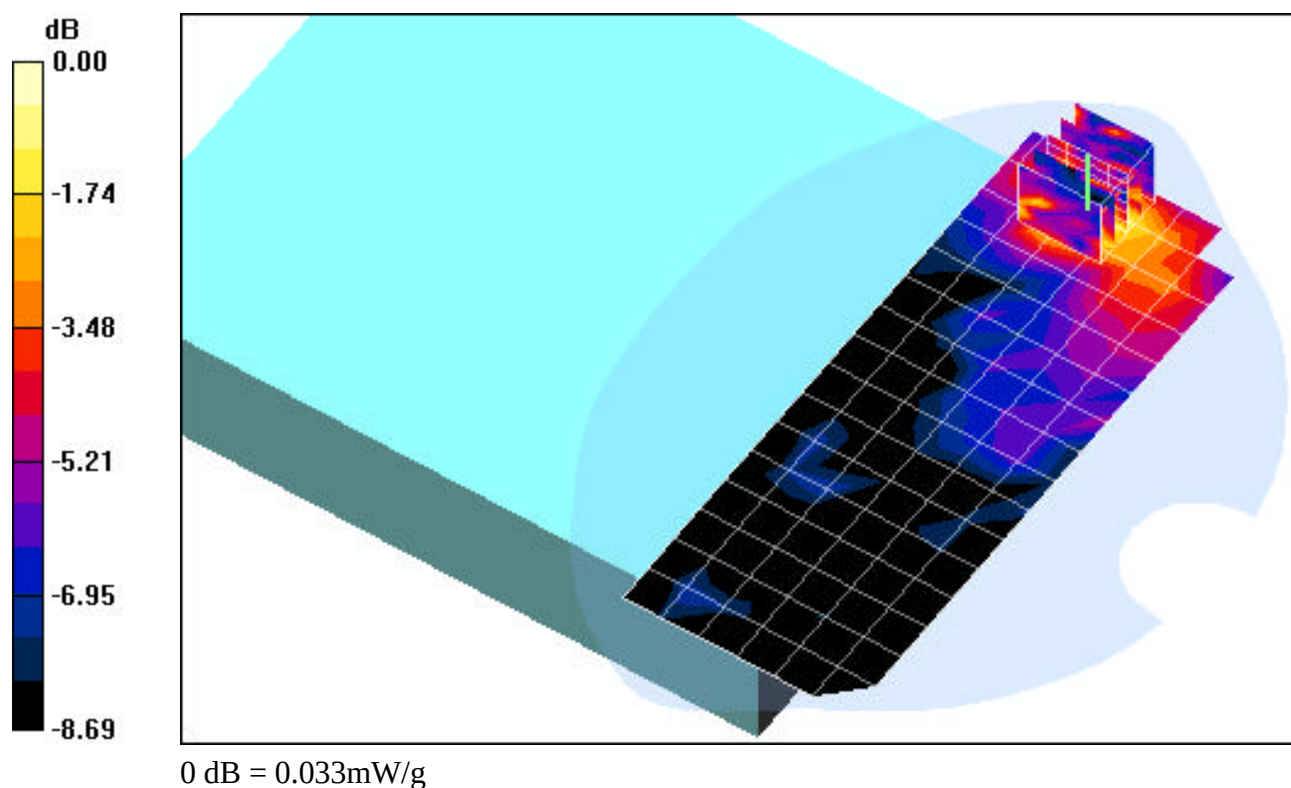
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 1.44 V/m

Peak SAR (extrapolated) = 0.072 W/kg

SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.013 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11g; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Muscle ($\sigma = 1.92$ mho/m, $\epsilon_r = 53.23$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-30-2005; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3550; ConvF(6.27, 6.27, 6.27); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11g, Bystander position, LCD Open, ch.06, 12Mbps, Main antenna

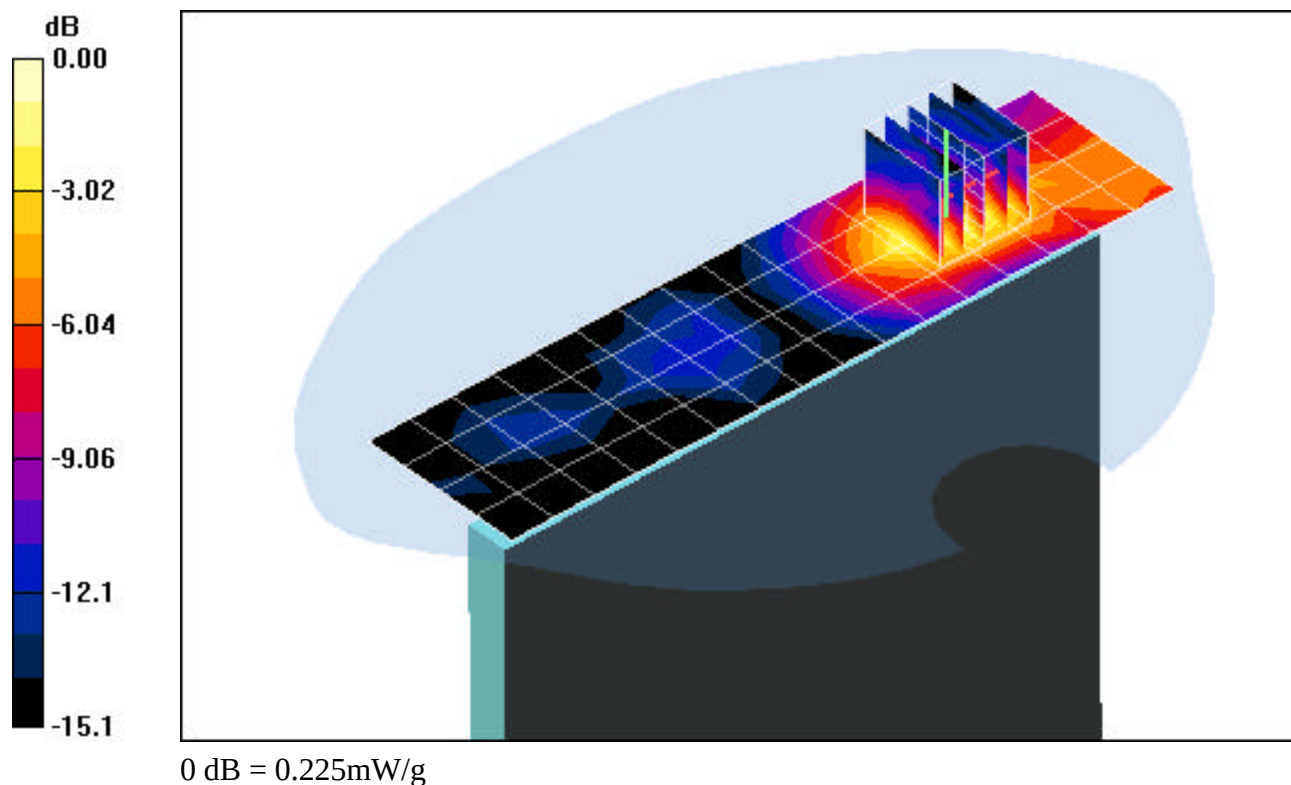
Area Scan (5x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 1.88 V/m

Peak SAR (extrapolated) = 0.335 W/kg

SAR(1 g) = 0.180 mW/g; SAR(10 g) = 0.095 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11g; Frequency: 2462 MHz; Duty Cycle: 1:1

Medium: 2450 Muscle ($\sigma = 1.92$ mho/m, $\epsilon_r = 53.23$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-30-2005; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3550; ConvF(6.27, 6.27, 6.27); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11g, Bystander position, LCD Flip, ch.06, 12Mbps, Aux antenna

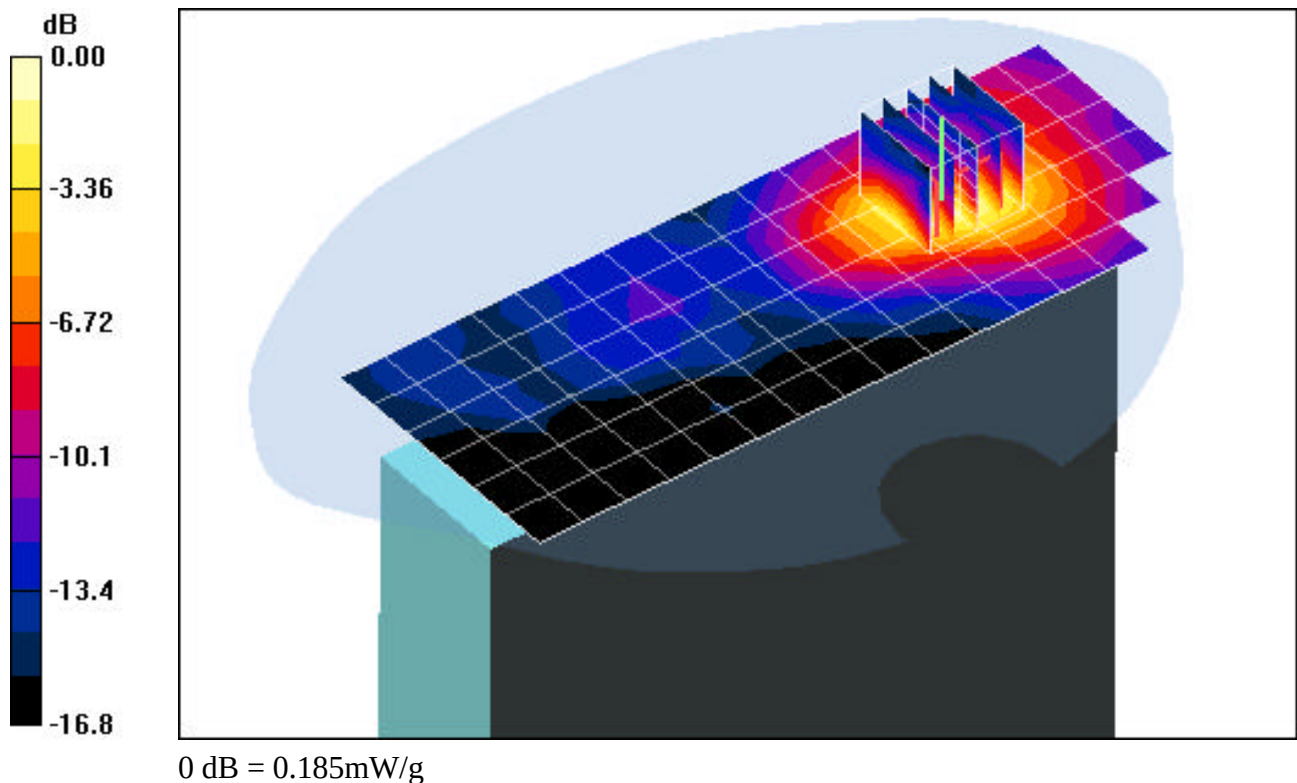
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 1.85 V/m

Peak SAR (extrapolated) = 0.265 W/kg

SAR(1 g) = 0.136 mW/g; SAR(10 g) = 0.075 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11a WLAN; Frequency: 5260 MHz; Duty Cycle: 1:1

Medium: 5300 Muscle ($\sigma = 5.48 \text{ mho/m}$, $\epsilon_r = 48.92$, $\rho = 1000 \text{ kg/m}^3$)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-31-2005; Ambient Temp: 22.9°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN3550; ConvF(3.72, 3.72, 3.72); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11a, Laptop position, LCD Flip, ch.52, 12Mbps, Main antenna

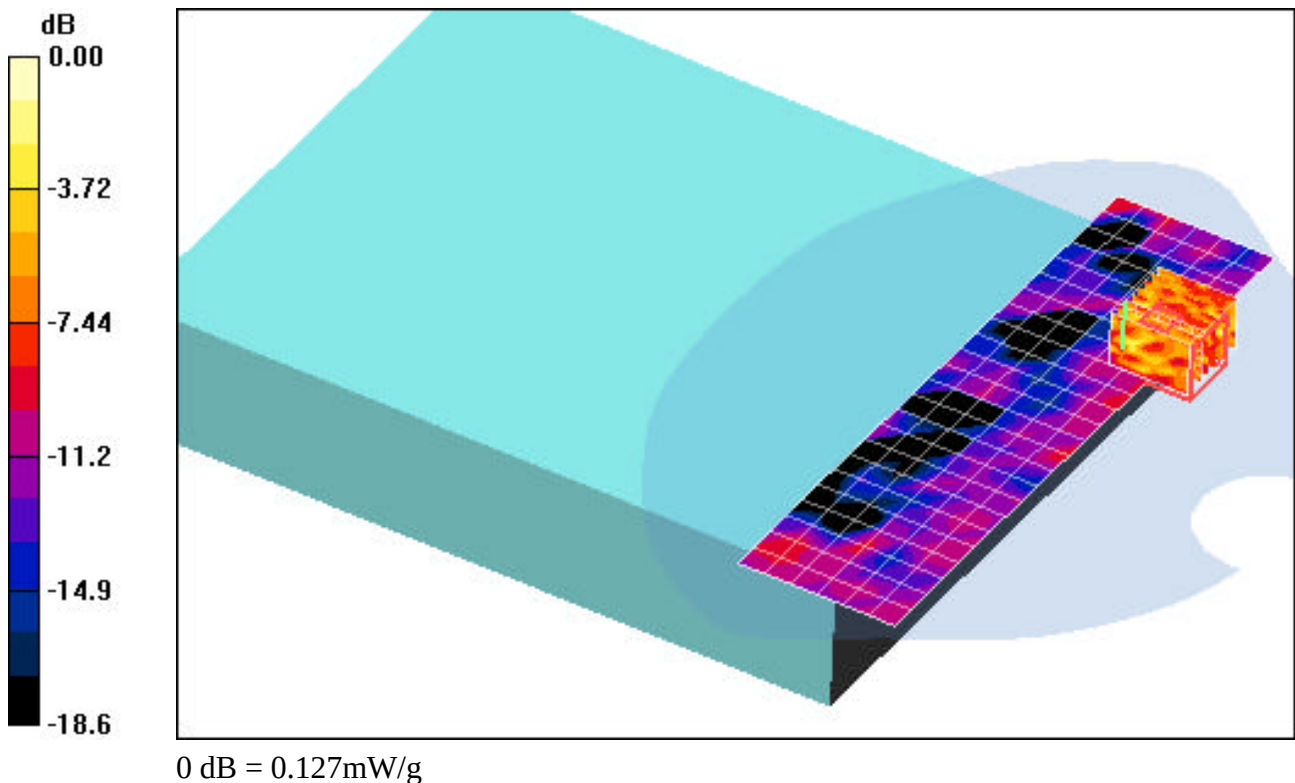
Area Scan (7x25x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 1.21 V/m

Peak SAR (extrapolated) = 0.126 W/kg

SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.014 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11a WLAN; Frequency: 5260 MHz; Duty Cycle: 1:1

Medium: 5300 Muscle ($\sigma = 5.48$ mho/m, $\epsilon_r = 48.92$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-31-2005; Ambient Temp: 22.9°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN3550; ConvF(3.72, 3.72, 3.72); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11a, Bystander position, LCD Open, ch.52, 12Mbps, Aux antenna

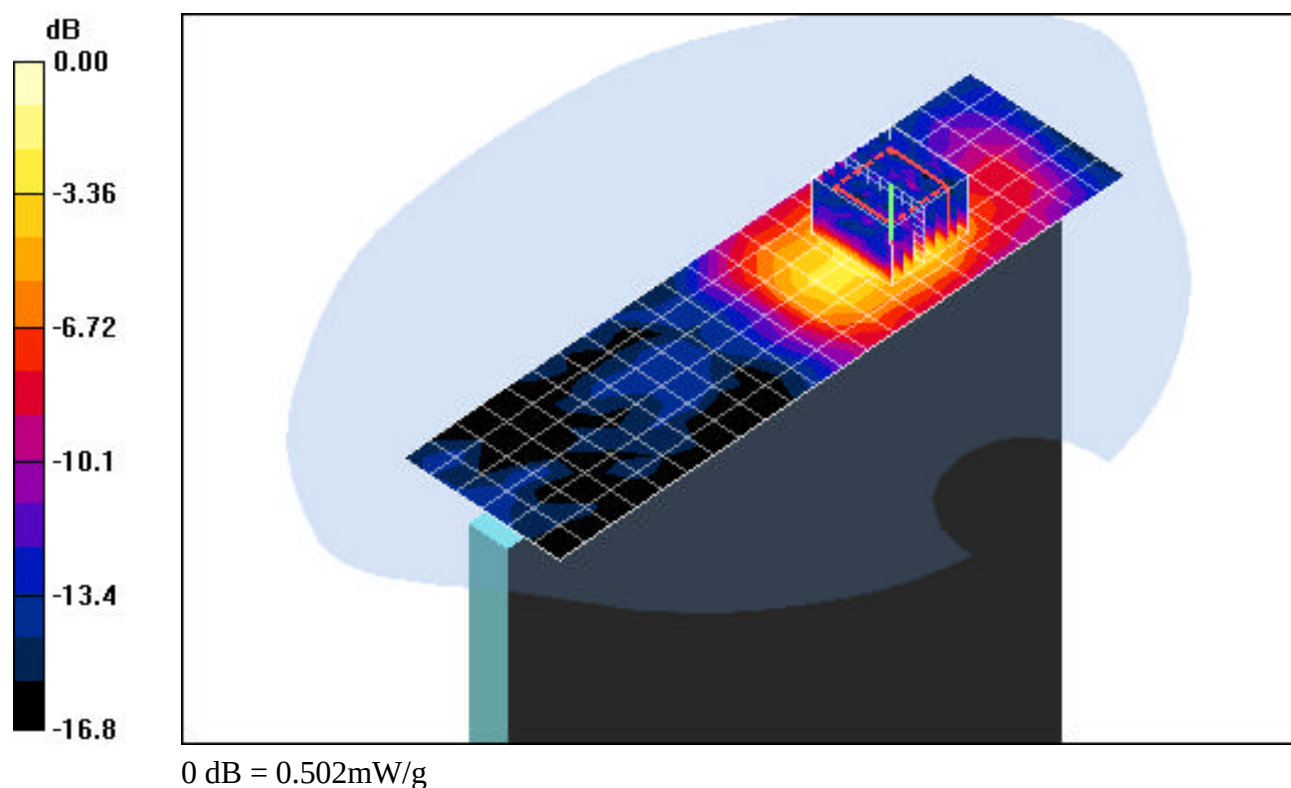
Area Scan (7x23x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 2.70 V/m

Peak SAR (extrapolated) = 1.28 W/kg

SAR(1 g) = 0.362 mW/g; SAR(10 g) = 0.151 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11a WLAN; Frequency: 5260 MHz; Duty Cycle: 1:1

Medium: 5300 Muscle ($\sigma = 5.48$ mho/m, $\epsilon_r = 48.92$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-31-2005; Ambient Temp: 22.9°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN3550; ConvF(3.72, 3.72, 3.72); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11a, Bystander position, LCD Flip, ch.52, 12Mbps, Aux antenna

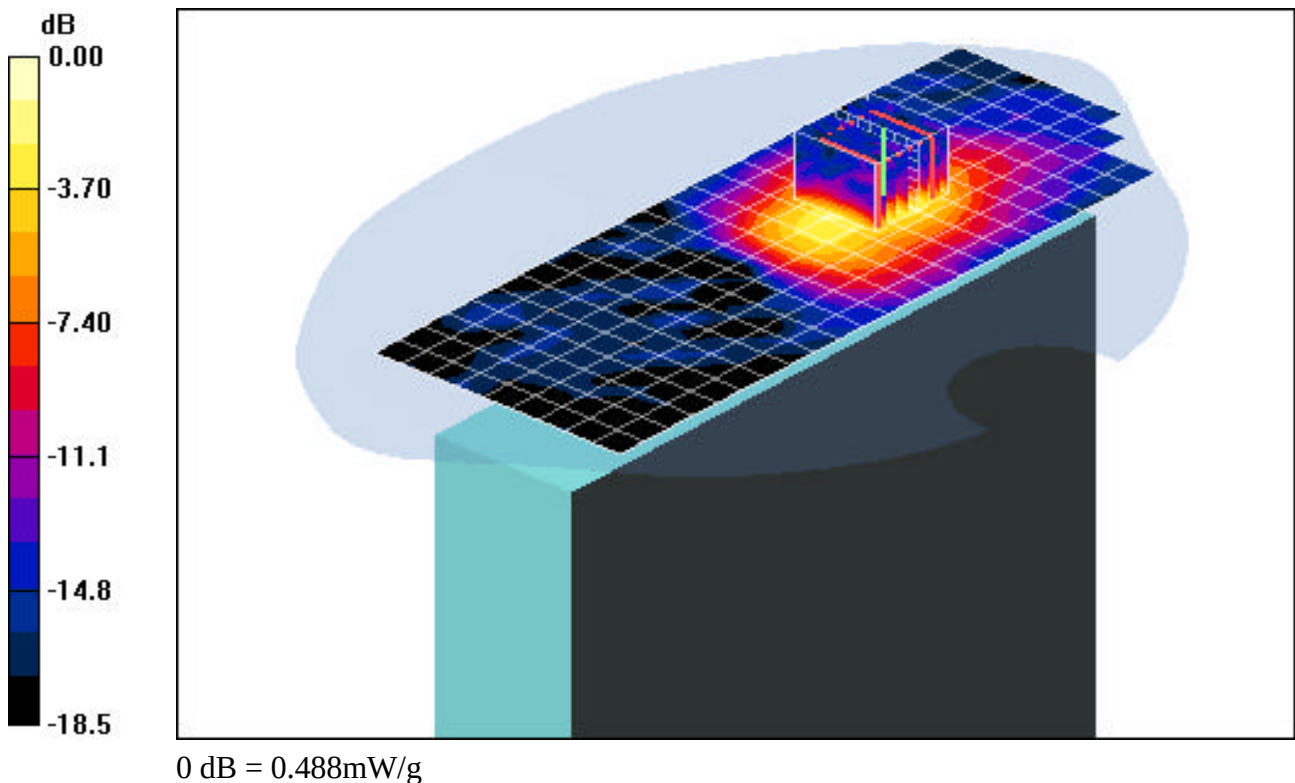
Area Scan (10x25x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 2.19 V/m

Peak SAR (extrapolated) = 1.16 W/kg

SAR(1 g) = 0.348 mW/g; SAR(10 g) = 0.125 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11a WLAN; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: 5800 Muscle ($\sigma = 5.85$ mho/m, $\epsilon_r = 47.95$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-31-2005; Ambient Temp: 23.3°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3550; ConvF(3.48, 3.48, 3.48); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11a, Laptop position, LCD Flip, ch.157, 12Mbps, Main antenna

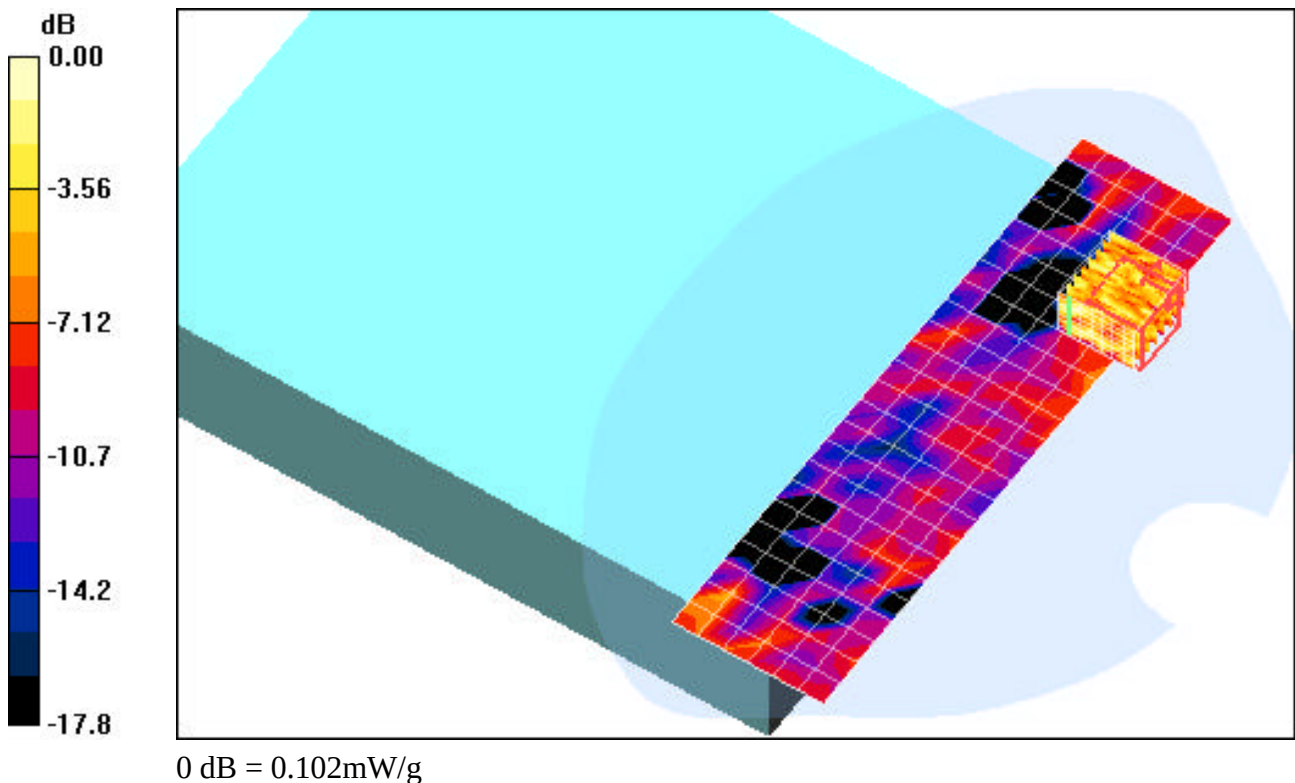
Area Scan (7x25x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 1.05 V/m

Peak SAR (extrapolated) = 0.115 W/kg

SAR(1 g) = 0.030 mW/g; SAR(10 g) = 0.017 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11a WLAN; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: 5800 Muscle ($\sigma = 5.85$ mho/m, $\epsilon_r = 47.95$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-31-2005; Ambient Temp: 23.3°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3550; ConvF(3.48, 3.48, 3.48); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11a, Bystander position, LCD Open, ch.157, 12Mbps, Aux antenna

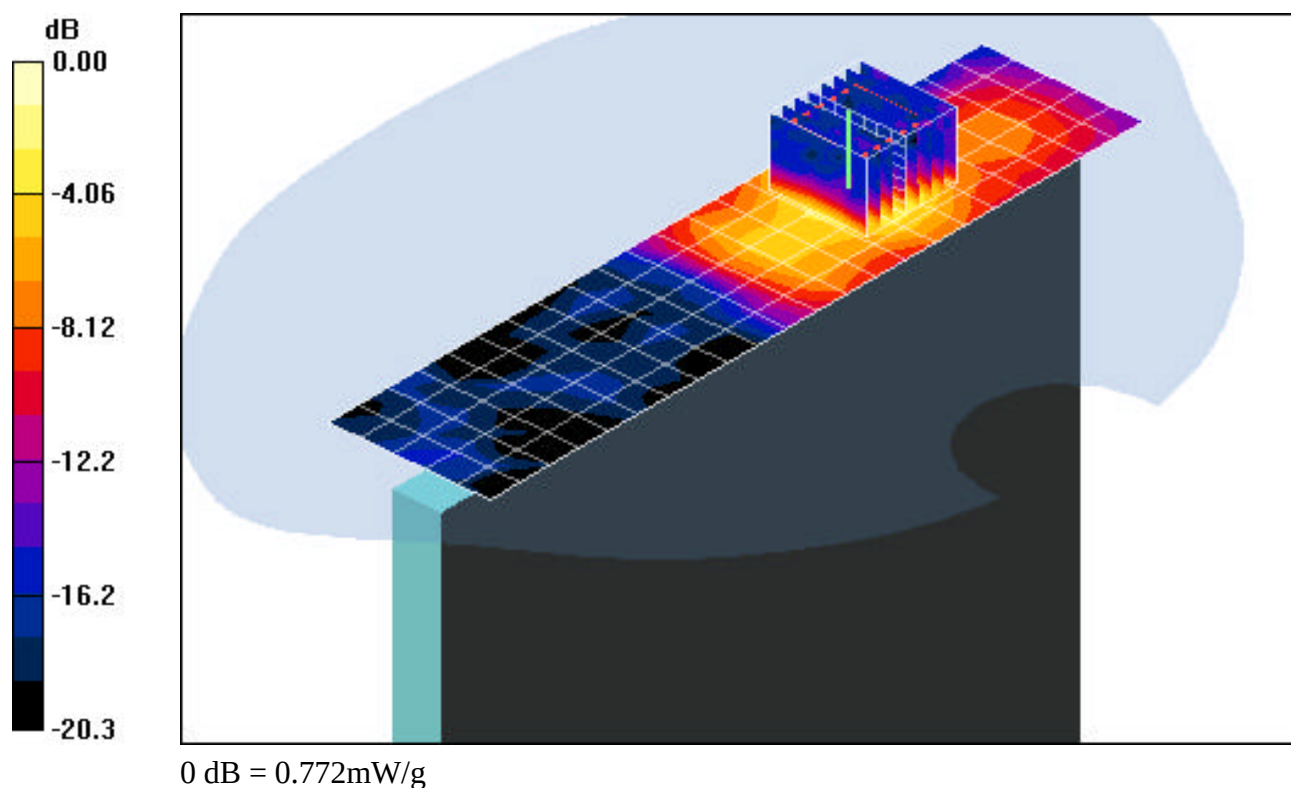
Area Scan (6x23x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 4.42 V/m

Peak SAR (extrapolated) = 2.75 W/kg

SAR(1 g) = 0.567 mW/g; SAR(10 g) = 0.223 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11a WLAN; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: 5800 Muscle ($\sigma = 5.85 \text{ mho/m}$, $\epsilon_r = 47.95$, $\rho = 1000 \text{ kg/m}^3$)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-31-2005; Ambient Temp: 23.3°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3550; ConvF(3.48, 3.48, 3.48); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11a, Bystander position, LCD Flip, ch.157, 12Mbps, Aux antenna

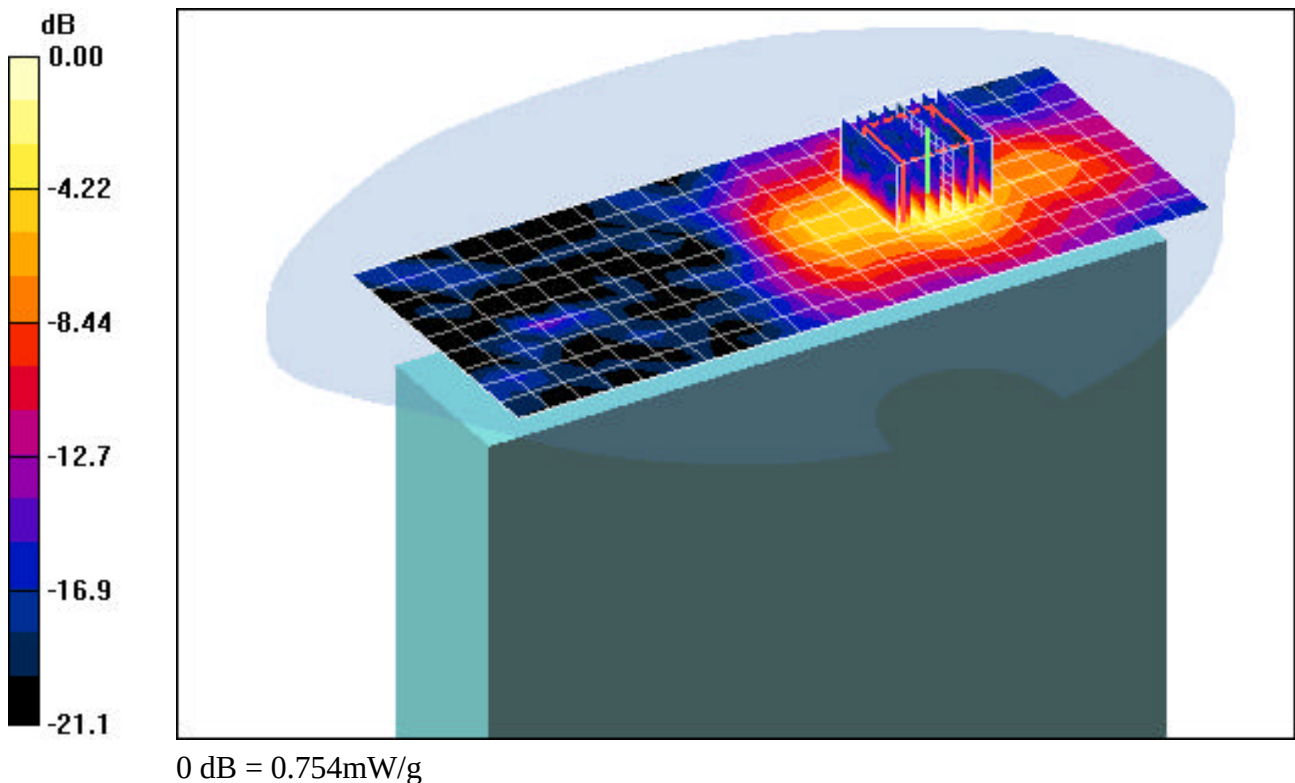
Area Scan (10x23x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 4.71 V/m

Peak SAR (extrapolated) = 2.07 W/kg

SAR(1 g) = 0.556 mW/g; SAR(10 g) = 0.224 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1

Medium: 2450 Muscle ($\sigma = 1.92$ mho/m, $\epsilon_r = 53.23$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-30-2005; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3550; ConvF(6.27, 6.27, 6.27); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: Bluetooth, Laptop position, LCD Flip, ch.39

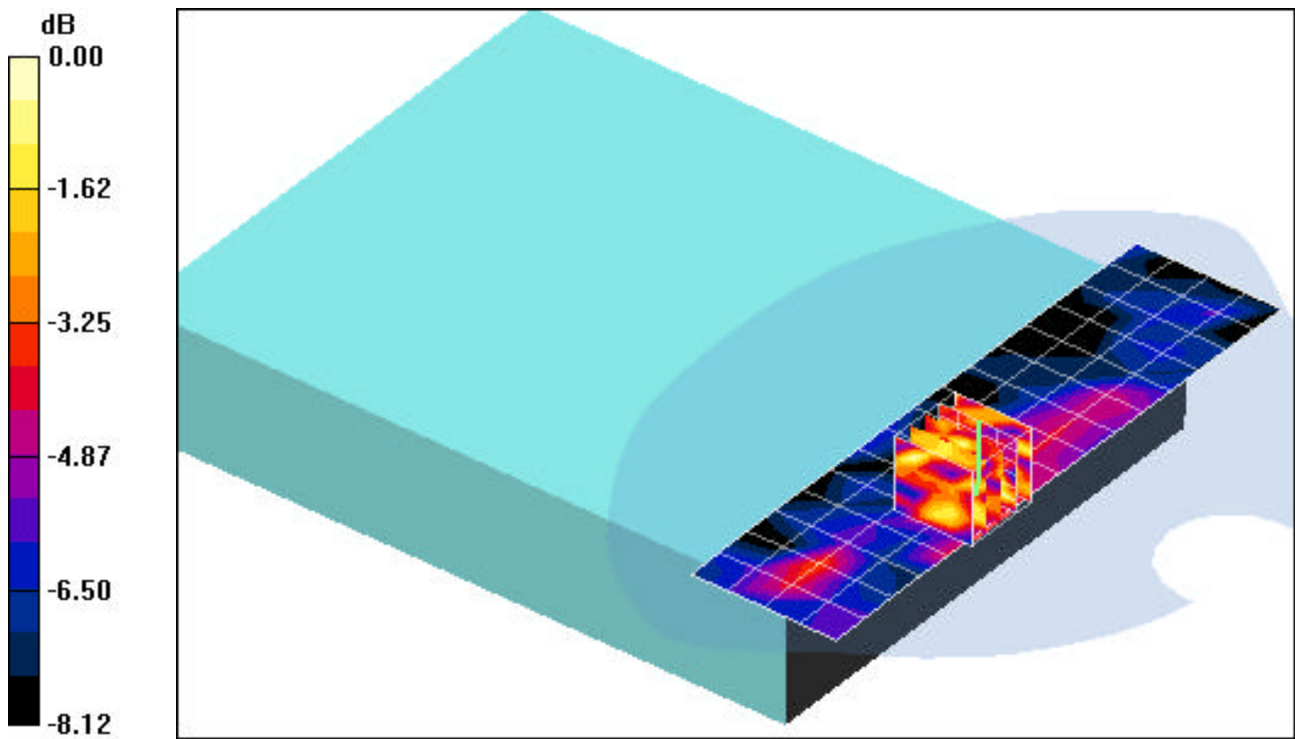
Area Scan (5x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 1.43 V/m

Peak SAR (extrapolated) = 0.034 W/kg

SAR(1 g) = 0.00892 mW/g; SAR(10 g) = 0.00474 mW/g



0 dB = 0.021mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1

Medium: 2450 Muscle ($\sigma = 1.92$ mho/m, $\epsilon_r = 53.23$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-30-2005; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3550; ConvF(6.27, 6.27, 6.27); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: Bluetooth, Bystander position, LCD Open, ch.39

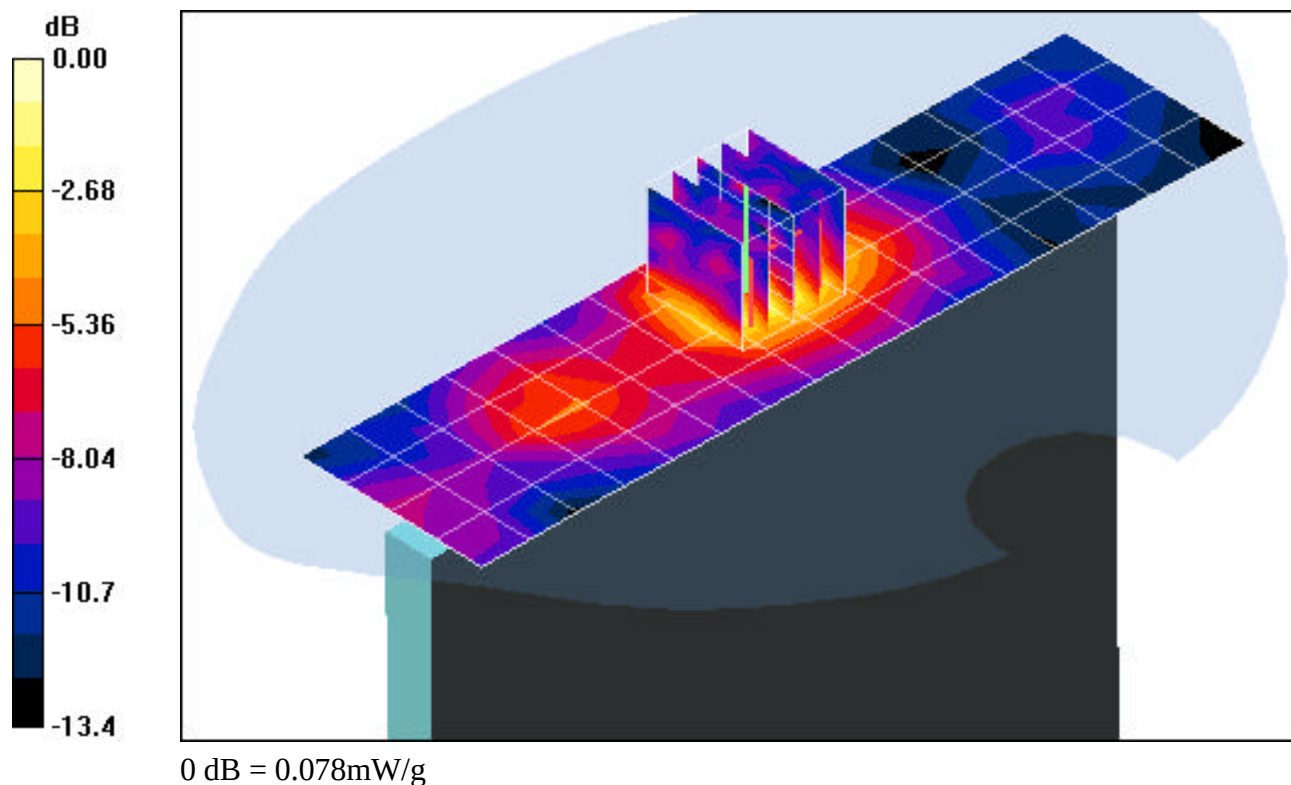
Area Scan (5x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 5.75 V/m

Peak SAR (extrapolated) = 0.116 W/kg

SAR(1 g) = 0.062 mW/g; SAR(10 g) = 0.034 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1

Medium: 2450 Muscle ($\sigma = 1.92$ mho/m, $\epsilon_r = 53.23$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-30-2005; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3550; ConvF(6.27, 6.27, 6.27); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: Bluetooth, Bystander position, LCD Flip, ch.39

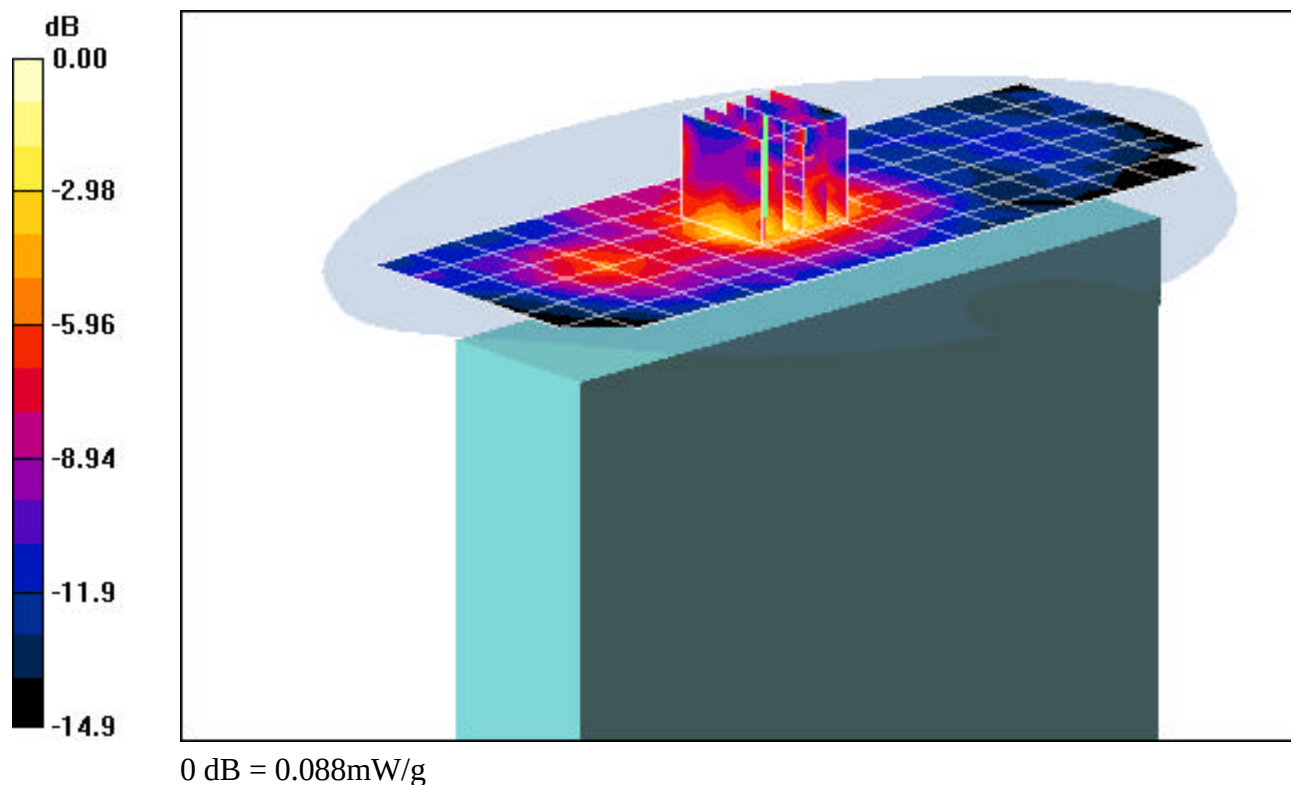
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 4.93 V/m

Peak SAR (extrapolated) = 0.120 W/kg

SAR(1 g) = 0.068 mW/g; SAR(10 g) = 0.032 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF -18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: GSM 850 GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium: 835 Muscle ($\sigma = 0.98$ mho/m, $\epsilon_r = 53.94$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 04-01-2005; Ambient Temp: 23.1°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3550; ConvF(7.99, 7.99, 7.99); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: GSM850 EGPRS, ch.190 + IEEE 802.11b, ch.06, 5.5Mbps, Aux antenna

Bystander position, LCD Flip

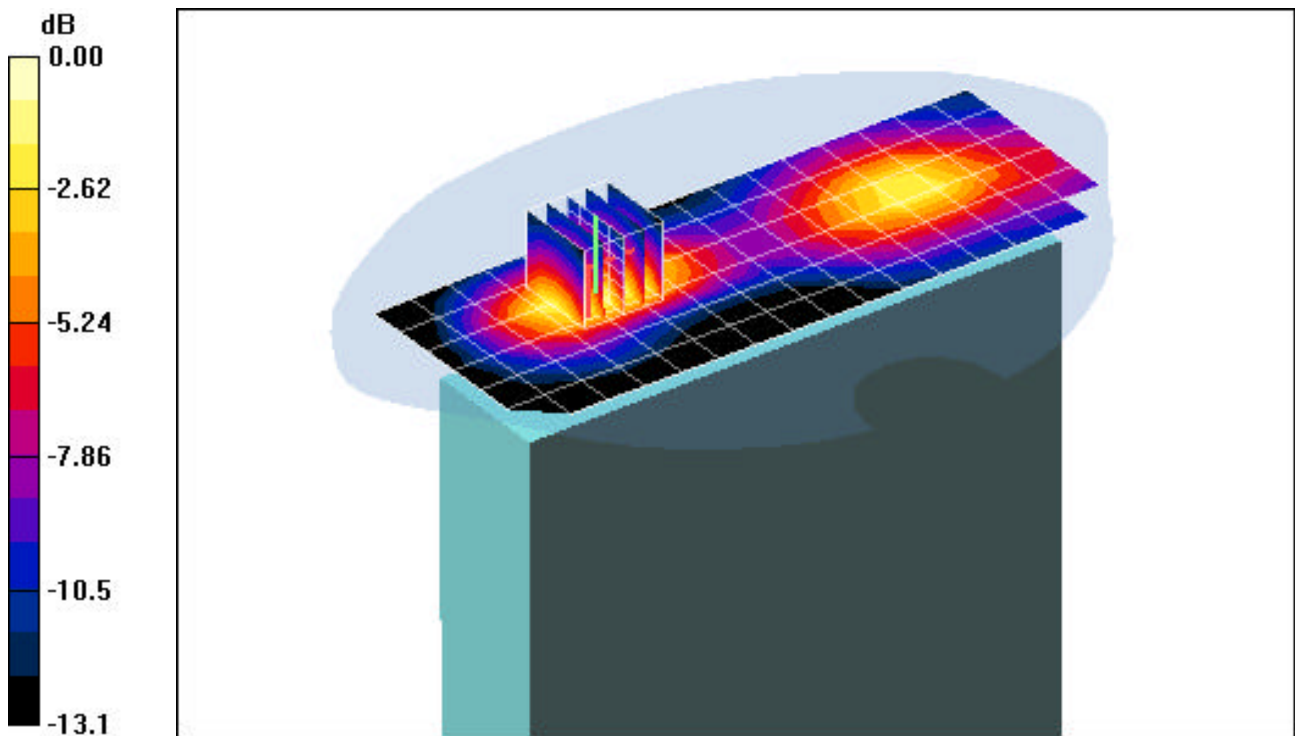
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 6.47 V/m

Peak SAR (extrapolated) = 0.420 W/kg

SAR(1 g) = 0.259 mW/g; SAR(10 g) = 0.153 mW/g



0 dB = 0.313mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF -18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: GSM 850 GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium: 835 Muscle ($\sigma = 0.98$ mho/m, $\epsilon_r = 53.94$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 04-01-2005; Ambient Temp: 23.1°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN3550; ConvF(7.99, 7.99, 7.99); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: GSM850 EGPRS, ch.190 + IEEE 802.11a, ch.157, 12Mbps, Aux antenna

Bystander position, LCD Flip

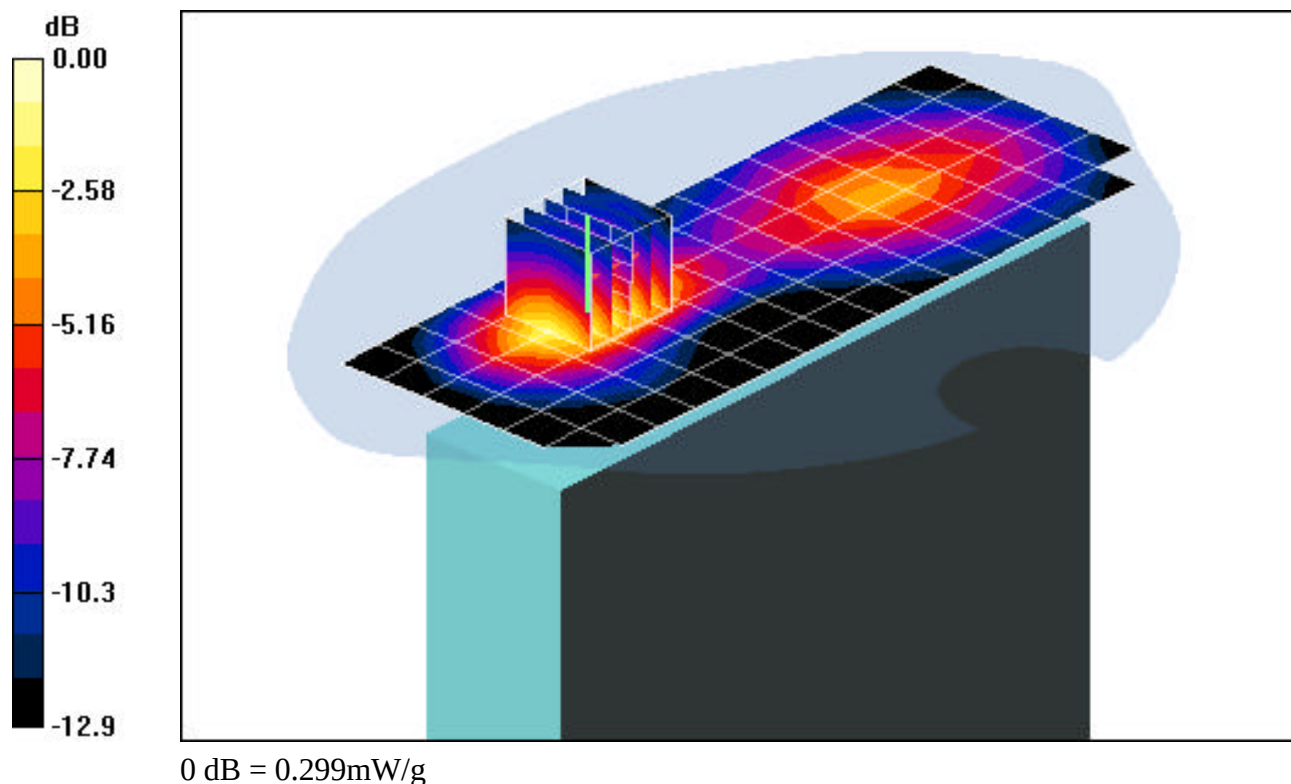
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 6.15 V/m

Peak SAR (extrapolated) = 0.402 W/kg

SAR(1 g) = 0.250 mW/g; SAR(10 g) = 0.150 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: PCS GSM GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15

Medium: 1900 Muscle ($\sigma = 1.57$ mho/m, $\epsilon_r = 52.78$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 04-04-2005; Ambient Temp: 22.8°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3550; ConvF(6.35, 6.35, 6.35); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: GSM1900 EGPRS, ch.661 + IEEE 802.11b, ch.06, 5.Mbps, Aux antenna

Bystander position, LCD Flip

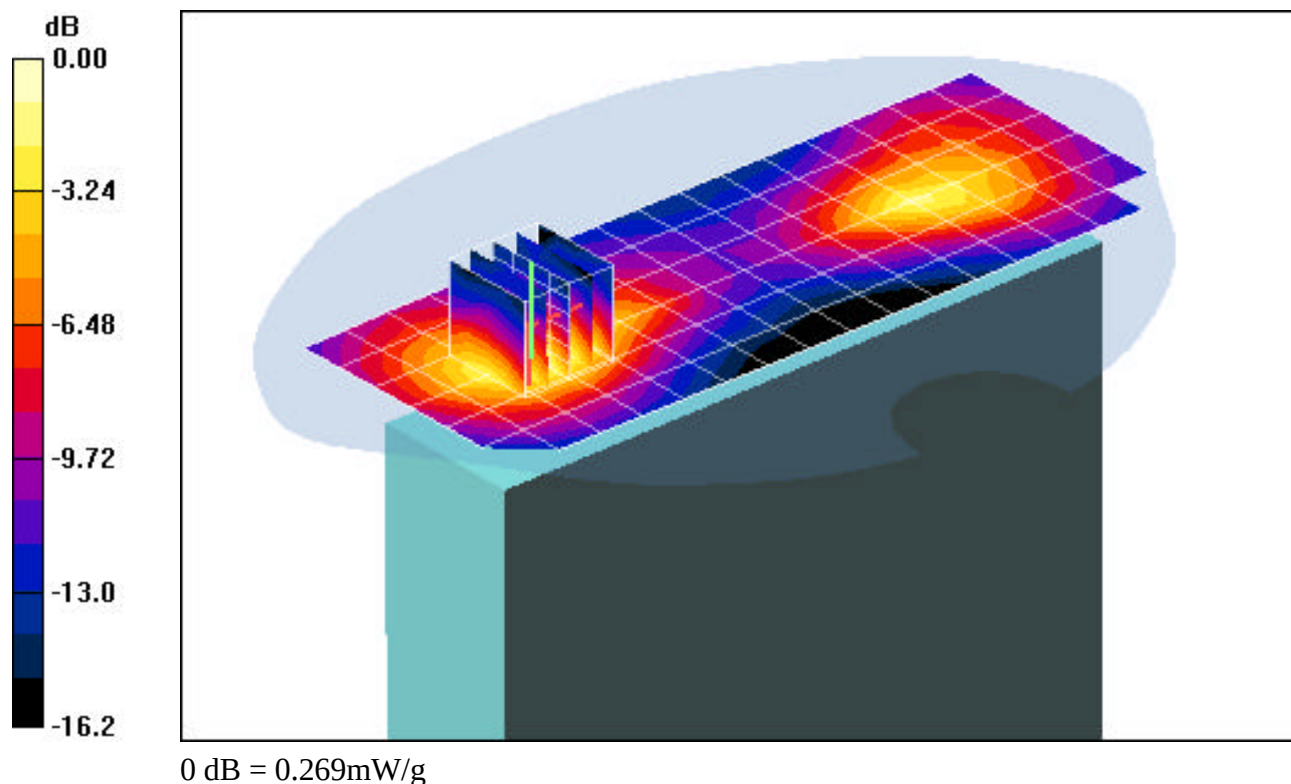
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 3.87 V/m

Peak SAR (extrapolated) = 0.373 W/kg

SAR(1 g) = 0.215 mW/g; SAR(10 g) = 0.116 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF -18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: PCS GSM GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15

Medium: 1900 Muscle ($\sigma = 1.57$ mho/m, $\epsilon_r = 52.78$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 04-04-2005; Ambient Temp: 22.8°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3550; ConvF(6.35, 6.35, 6.35); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: GSM1900 EGPRS, ch.661 + IEEE 802.11a, ch.157, 12Mbps, Aux antenna

Bystander position, LCD Flip

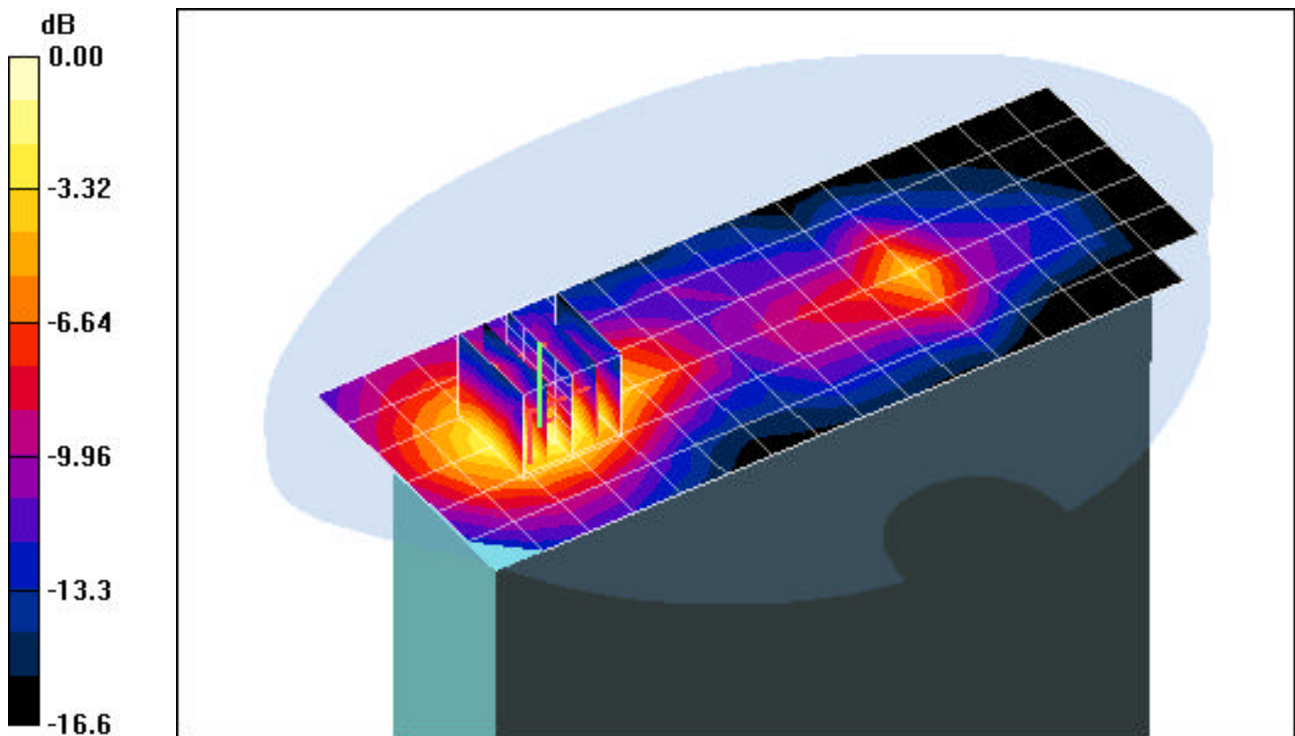
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 3.99 V/m

Peak SAR (extrapolated) = 0.375 W/kg

SAR(1 g) = 0.211 mW/g; SAR(10 g) = 0.114 mW/g



0 dB = 0.264mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Muscle ($\sigma = 1.92$ mho/m, $\epsilon_r = 53.23$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-30-2005; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3550; ConvF(6.27, 6.27, 6.27); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11b, ch.06, 5.5Mbps, Main antenna + Bluetooth, ch.39

Bystander position, LCD Open

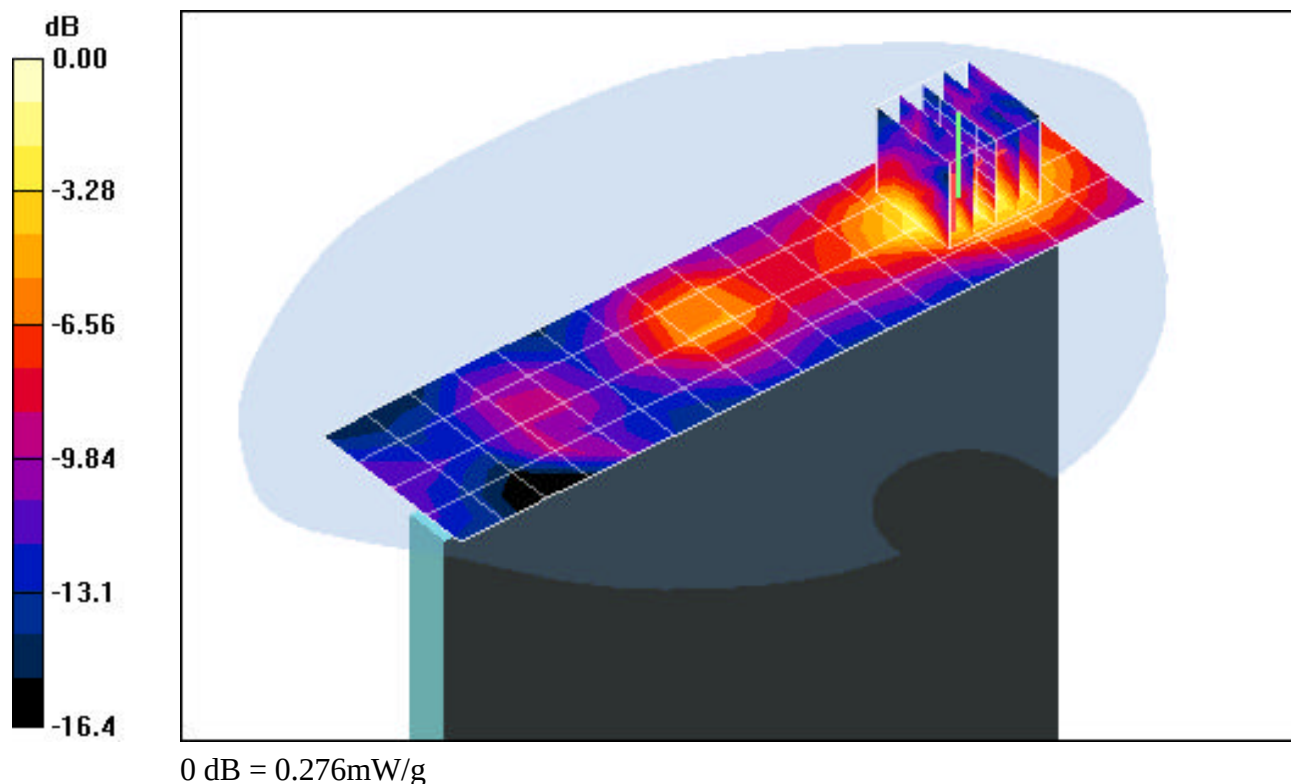
Area Scan (5x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 6.33 V/m

Peak SAR (extrapolated) = 0.424 W/kg

SAR(1 g) = 0.219 mW/g; SAR(10 g) = 0.116 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11a WLAN; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: 5800 Muscle ($\sigma = 5.85$ mho/m, $\epsilon_r = 47.95$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-31-2005; Ambient Temp: 23.3°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3550; ConvF(3.48, 3.48, 3.48); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11a, ch.157, 12Mbps, Main antenna + Bluetooth, ch.39

Bystander position, LCD Open

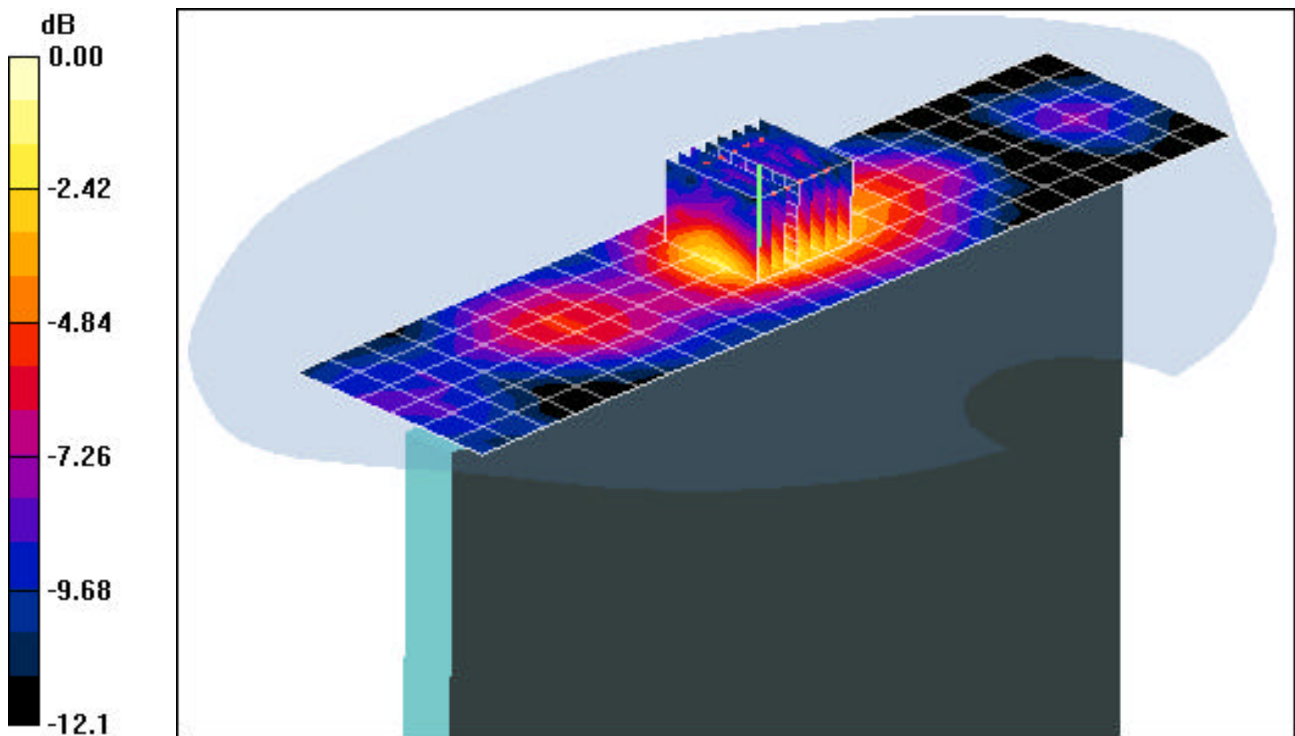
Area Scan (7x25x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 10.1 V/m

Peak SAR (extrapolated) = 0.702 W/kg

SAR(1 g) = 0.472 mW/g; SAR(10 g) = 0.262 mW/g



0 dB = 0.581mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: GSM 850 GPRS; 2 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:4.15

Medium: 835 Muscle ($\sigma = 0.98$ mho/m, $\epsilon_r = 53.94$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-28-2005; Ambient Temp: 22.6°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN3550; ConvF(7.99, 7.99, 7.99); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: GSM850 EGPRS, Bystander position, LCD Flip, ch.190

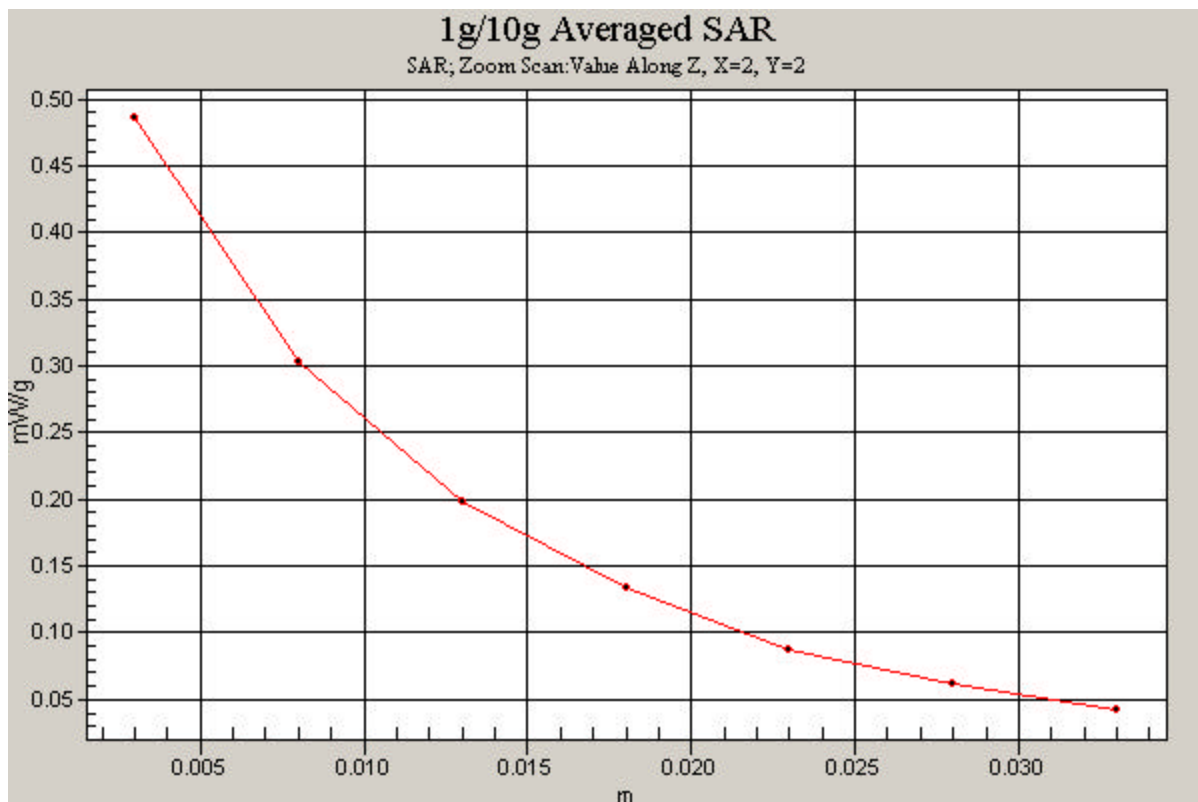
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 6.22 V/m

Peak SAR (extrapolated) = 0.655 W/kg

SAR(1 g) = 0.403 mW/g; SAR(10 g) = 0.240 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: PCS GSM GPRS; 2 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:4.15

Medium: 1900 Muscle ($\sigma = 1.57$ mho/m, $\epsilon_r = 52.78$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-29-2005; Ambient Temp: 22.8°C; Tissue Temp: 20.4°C

Probe: EX3DV4 - SN3550; ConvF(6.35, 6.35, 6.35); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: GSM1900 EGPRS, Bystander position, LCD Flip, ch.661

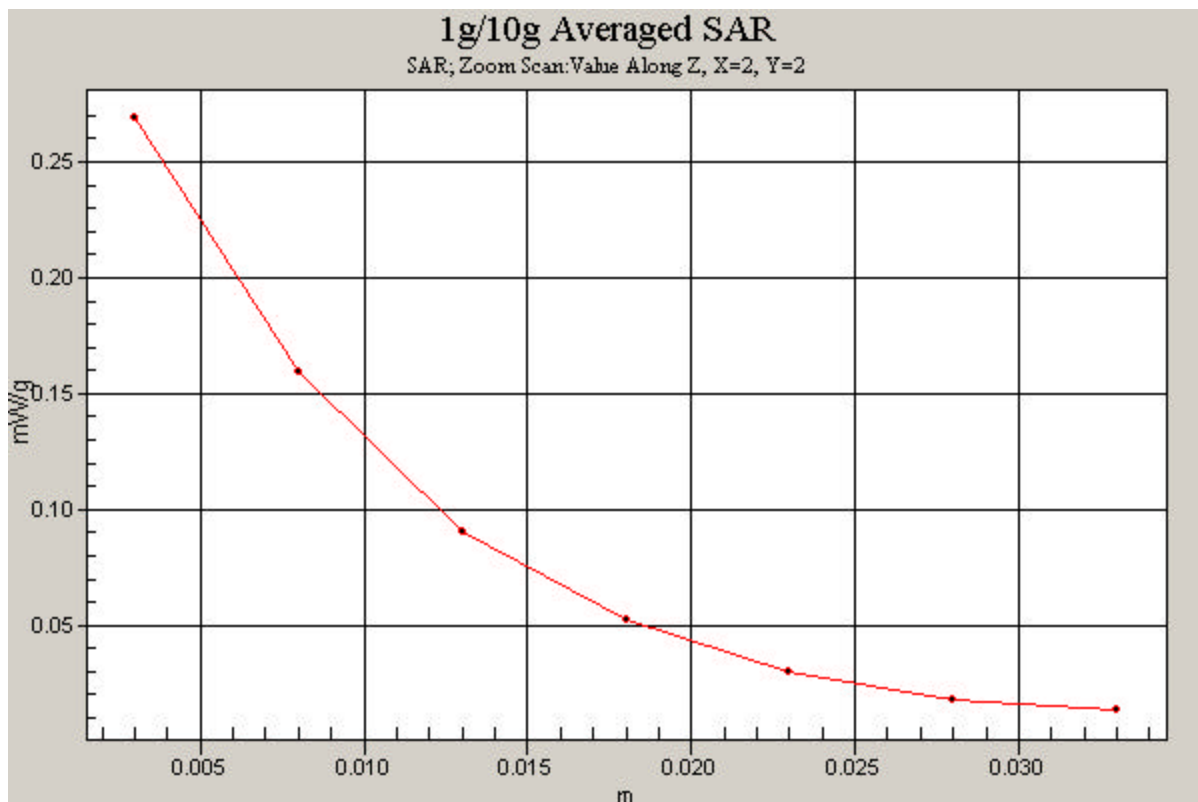
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 2.82 V/m

Peak SAR (extrapolated) = 0.362 W/kg

SAR(1 g) = 0.214 mW/g; SAR(10 g) = 0.117 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Muscle ($\sigma = 1.92$ mho/m, $\epsilon_r = 53.23$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-30-2005; Ambient Temp: 22.5°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN3550; ConvF(6.27, 6.27, 6.27); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11b, Bystander position, LCD Open, ch.06, 5.5Mbps, Main antenna

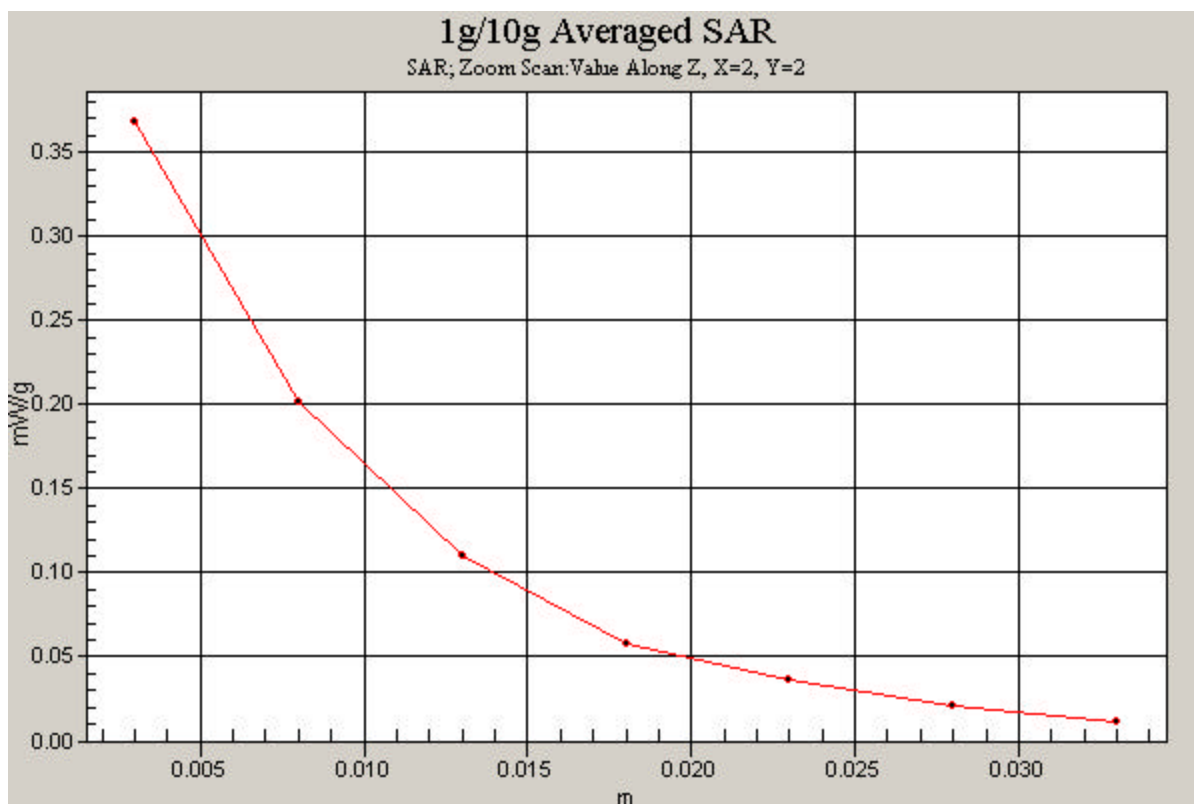
Area Scan (5x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 2.45 V/m

Peak SAR (extrapolated) = 0.549 W/kg

SAR(1 g) = 0.301 mW/g; SAR(10 g) = 0.156 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11a WLAN; Frequency: 5260 MHz; Duty Cycle: 1:1

Medium: 5300 Muscle ($\sigma = 5.48$ mho/m, $\epsilon_r = 48.92$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-31-2005; Ambient Temp: 22.9°C; Tissue Temp: 20.2°C

Probe: EX3DV4 - SN3550; ConvF(3.72, 3.72, 3.72); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11a, Bystander position, LCD Open, ch.52, 12Mbps, Aux antenna

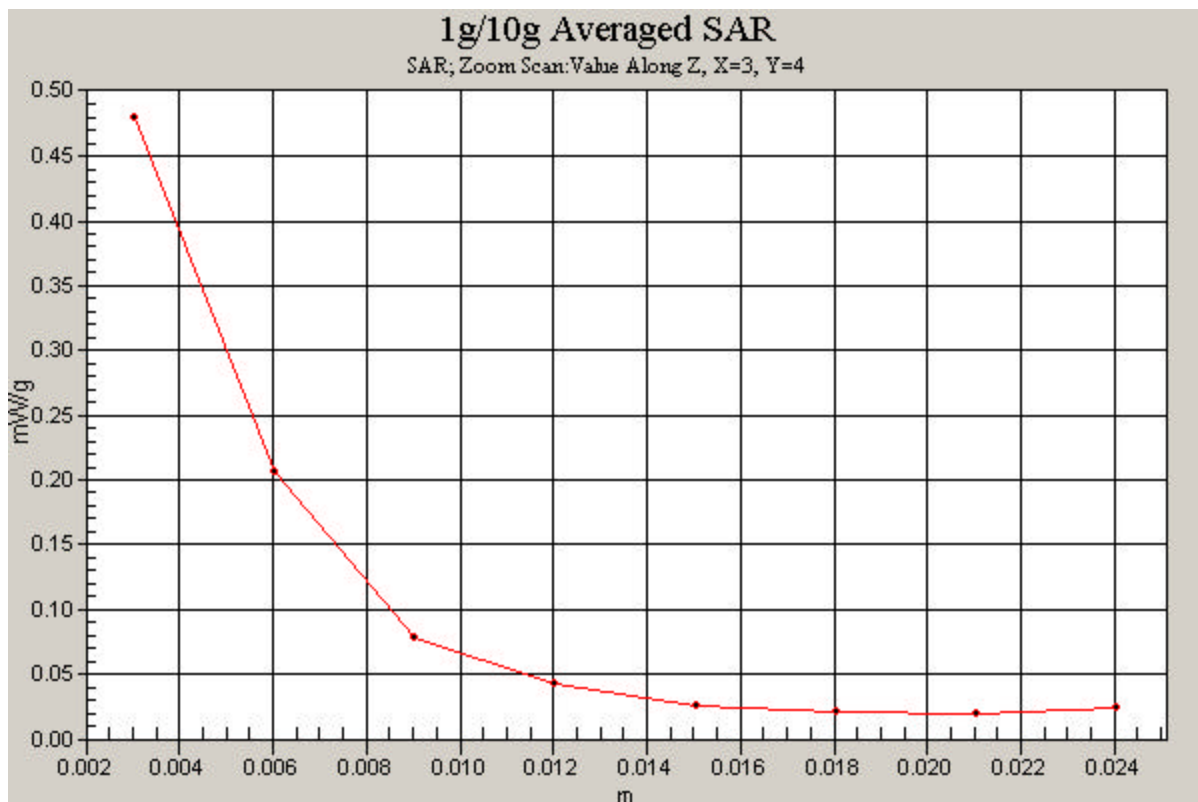
Area Scan (7x23x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 2.70 V/m

Peak SAR (extrapolated) = 1.28 W/kg

SAR(1 g) = 0.362 mW/g; SAR(10 g) = 0.151 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-18; Type: Panasonic Notebook PC with WLAN, EGPRS & Bluetooth; Serial: DVT 3

Communication System: IEEE 802.11a WLAN; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: 5800 Muscle ($\sigma = 5.85 \text{ mho/m}$, $\epsilon_r = 47.95$, $\rho = 1000 \text{ kg/m}^3$)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-31-2005; Ambient Temp: 23.3°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3550; ConvF(3.48, 3.48, 3.48); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

Mode: IEEE 802.11a, Bystander position, LCD Open, ch.157, 12Mbps, Aux antenna

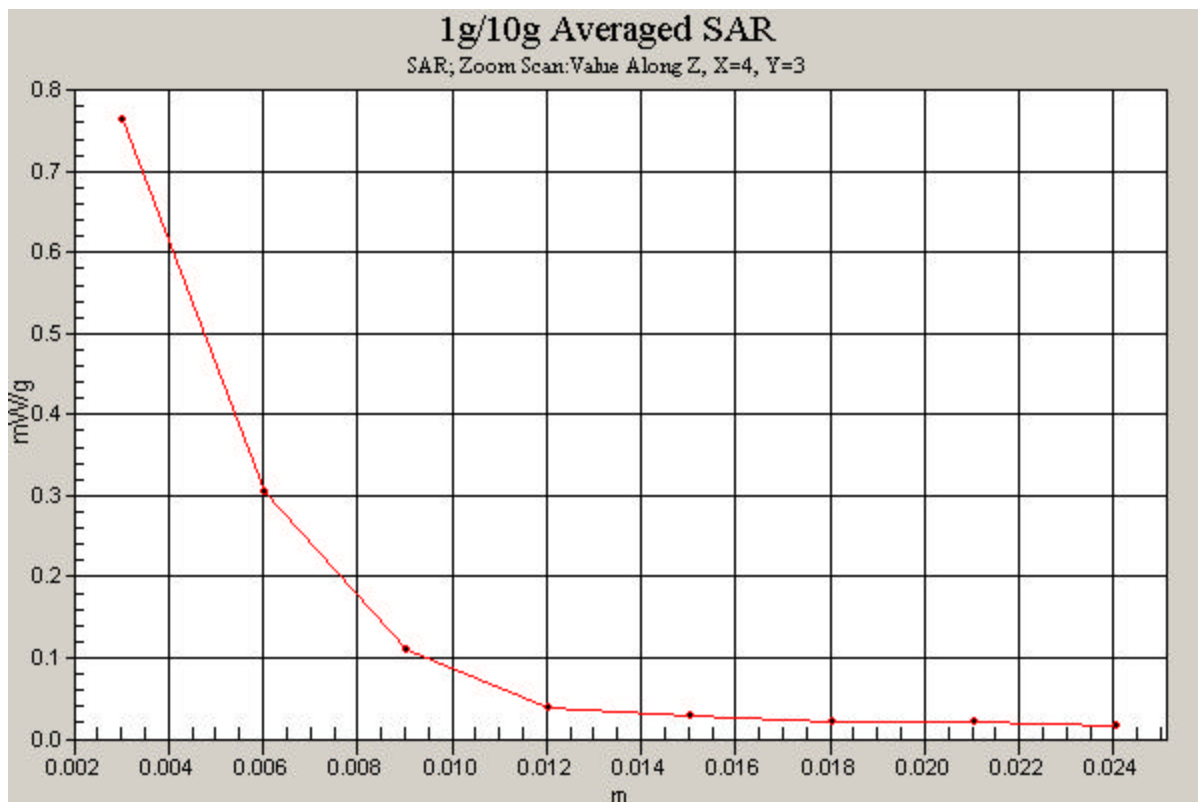
Area Scan (6x23x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 4.42V/m

Peak SAR (extrapolated) = 2.75 W/kg

SAR(1 g) = 0.567 mW/g; SAR(10 g) = 0.223 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 ($\sigma = 0.88$ mho/m, $\epsilon_r = 40.65$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-28-2005; Ambient Temp: 23.3°C; Tissue Temp: 20.5°C

Probe: EX3DV4 - SN3550; ConvF(8.12, 8.12, 8.12); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

835MHz Dipole Validation

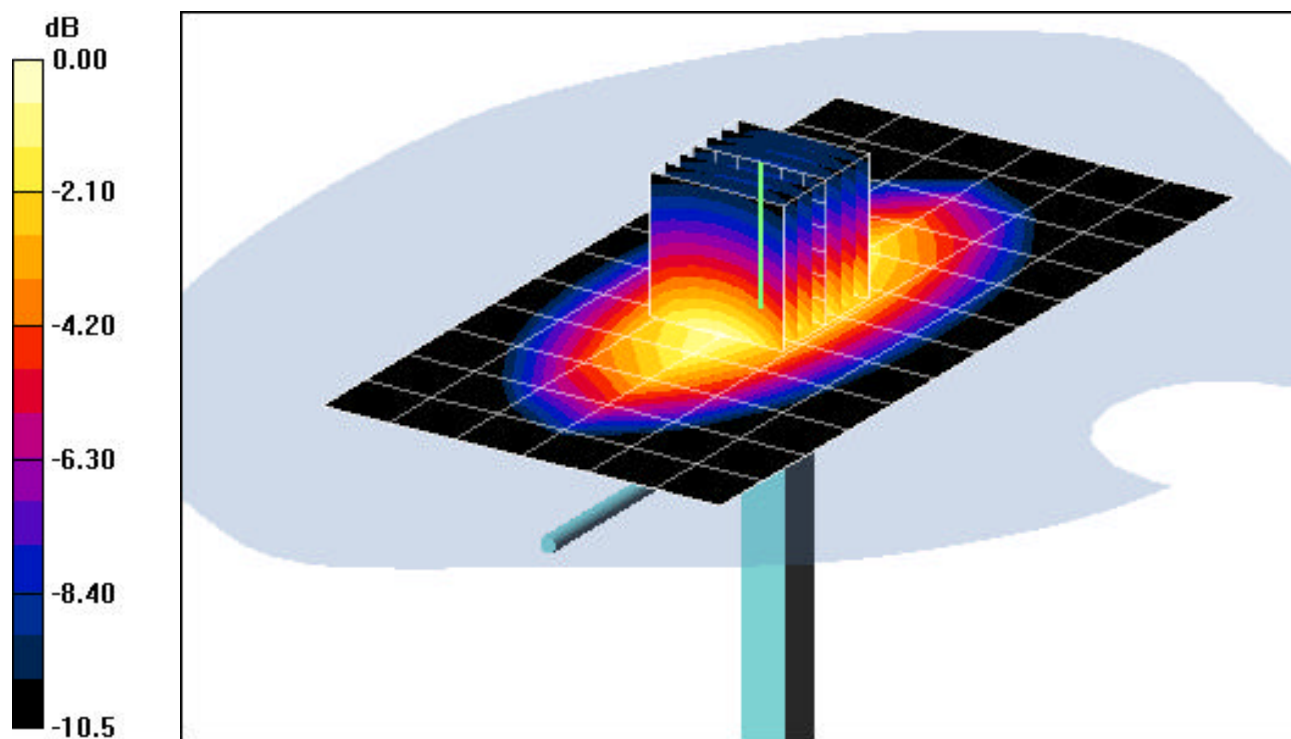
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

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

Input Power = 24.0 dBm (250 mW)

SAR(1 g) = 2.23 mW/g; SAR(10 g) = 1.45 mW/g

Target SAR(1g) = 2.375 mW/g; Deviation = -6.10 %



0 dB = 2.61mW/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 ($\sigma = 0.88$ mho/m, $\epsilon_r = 40.65$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 04-01-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN3550; ConvF(8.12, 8.12, 8.12); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

835MHz Dipole Validation

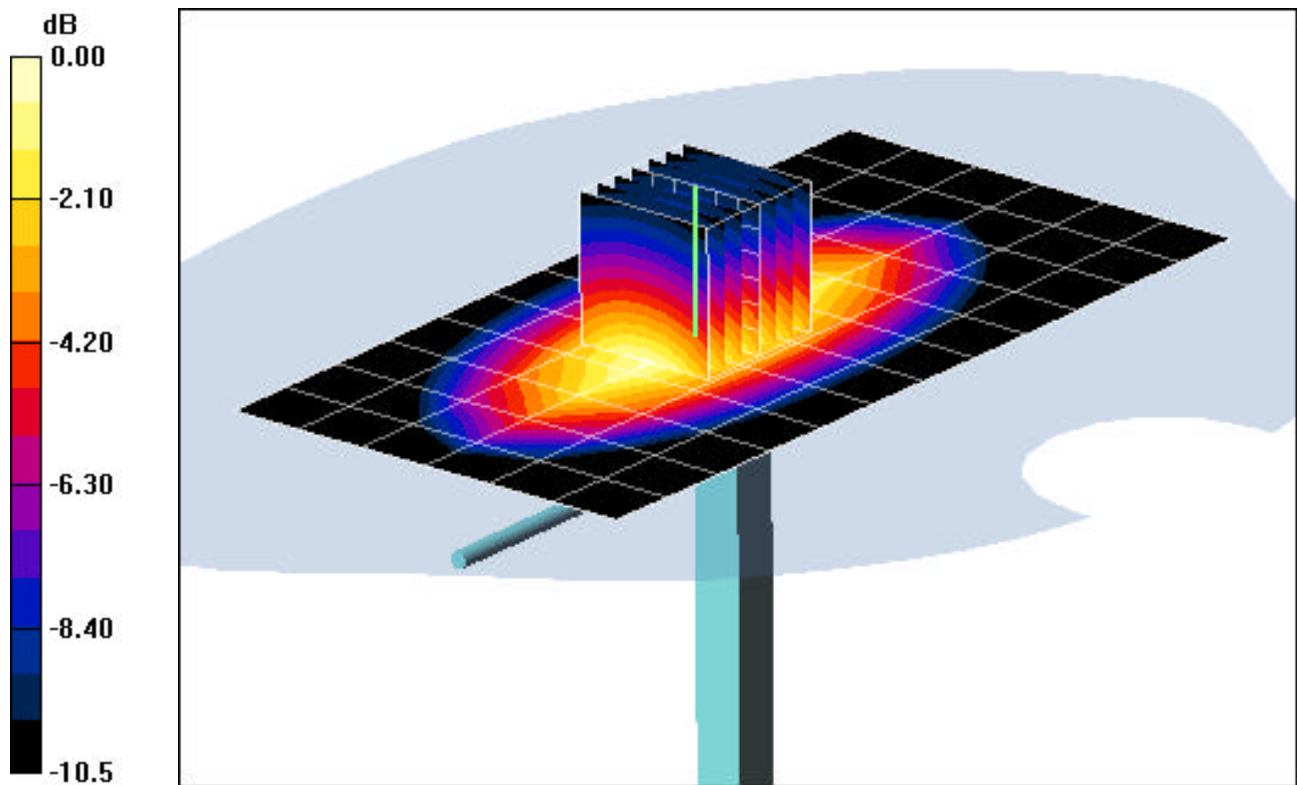
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

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

Input Power = 24.0 dBm (250 mW)

SAR(1 g) = 2.38 mW/g; SAR(10 g) = 1.54 mW/g

Target SAR(1g) = 2.375 mW/g; Deviation = +0.21 %



0 dB = 2.80mW/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 ($\sigma = 1.44$ mho/m, $\epsilon_r = 40.80$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-29-2005; Ambient Temp: 22.7°C; Tissue Temp: 20.1°C

Probe: EX3DV4 - SN3550; ConvF(6.75, 6.75, 6.75); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

1900MHz Dipole Validation

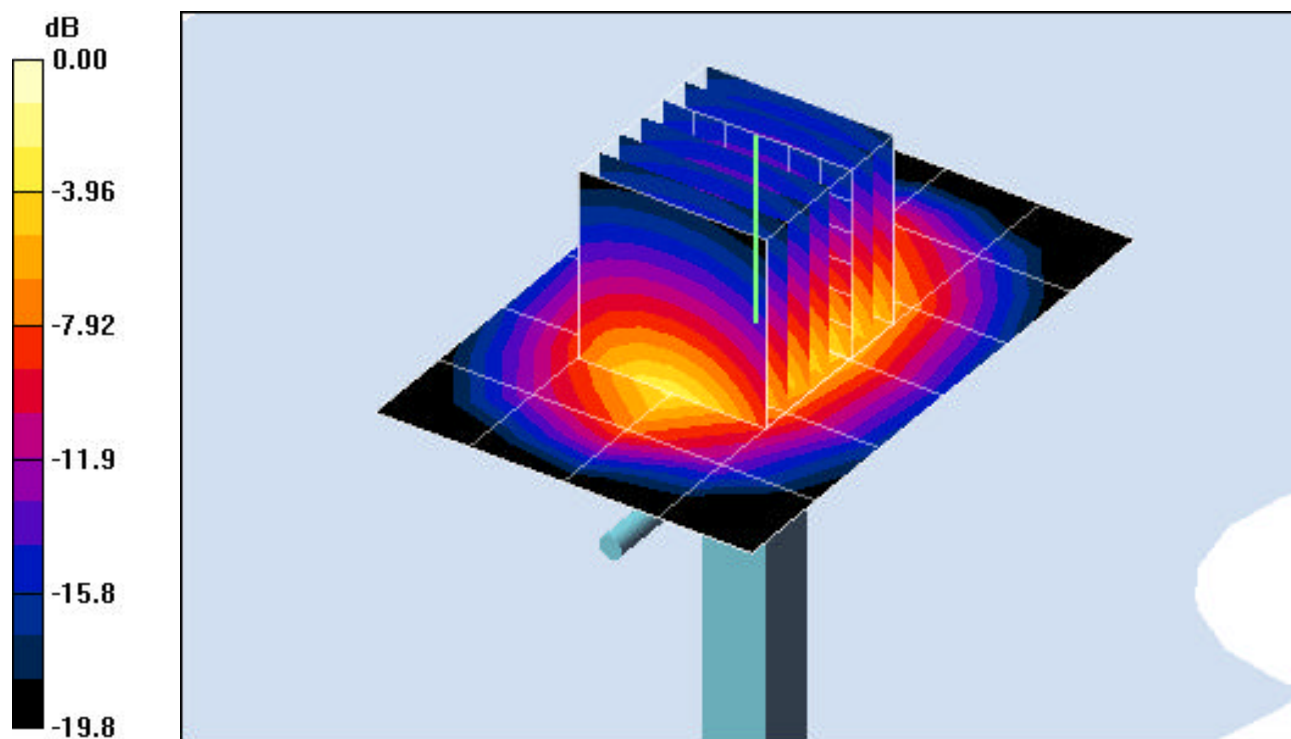
Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

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

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 3.99 mW/g; SAR(10 g) = 1.98 mW/g

Target SAR(1g) = 3.97 mW/g; Deviation = +0.50 %



0 dB = 5.17mW/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 ($\sigma = 1.44$ mho/m, $\epsilon_r = 40.80$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 04-04-2005; Ambient Temp: 23.3°C; Tissue Temp: 20.8°C

Probe: EX3DV4 - SN3550; ConvF(6.75, 6.75, 6.75); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

1900MHz Dipole Validation

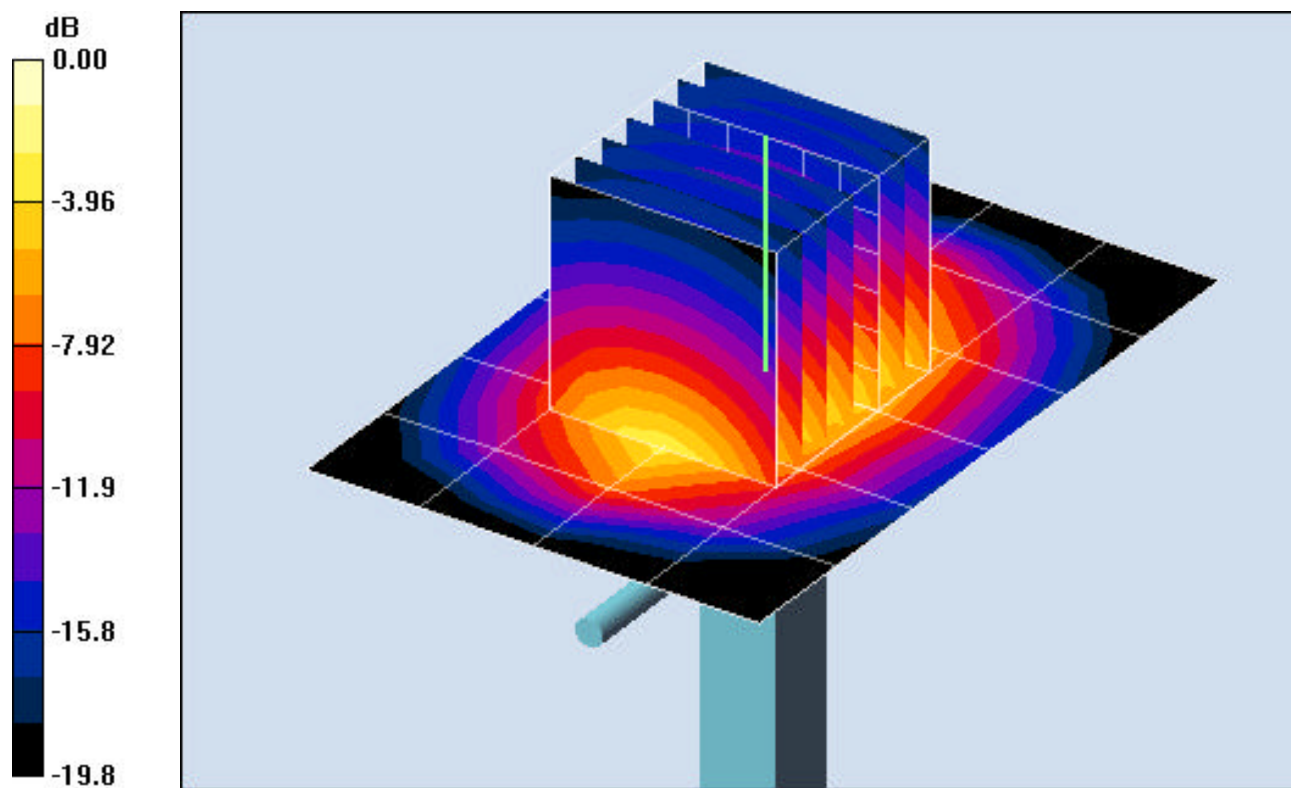
Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

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

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 3.93 mW/g; SAR(10 g) = 1.96 mW/g

Target SAR(1g) = 3.97 mW/g; Deviation = -1.00 %



0 dB = 5.07mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:719

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Brain ($\sigma = 1.82$ mho/m, $\epsilon_r = 39.52$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-30-2005; Ambient Temp: 22.9°C; Tissue Temp: 20.7°C

Probe: EX3DV4 - SN3550; ConvF(6.33, 6.33, 6.33); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

2450MHz Dipole Validation

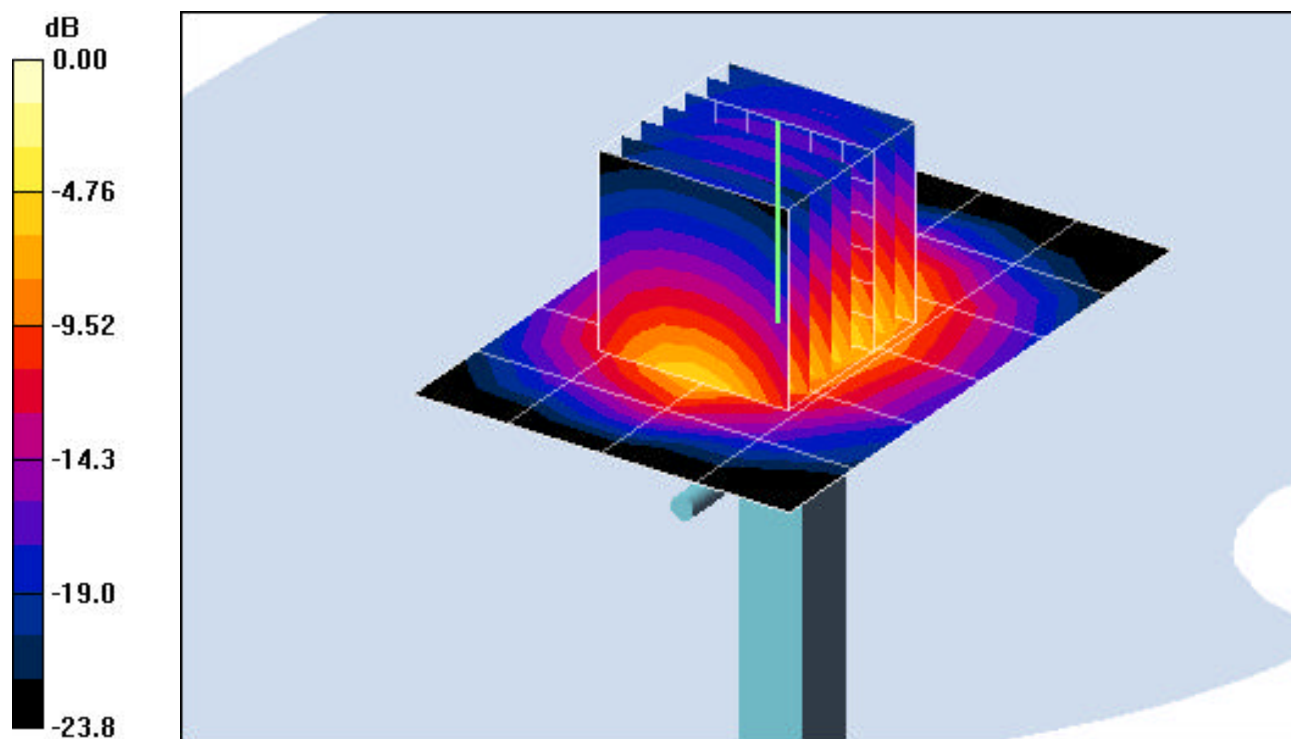
Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

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

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 5.13 mW/g; SAR(10 g) = 2.3 mW/g

Target SAR(1g) = 5.24 mW/g; Deviation = -2.09 %



0 dB = 6.91mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: Dipole 5800 MHz; Type: D5GHzV2; Serial: 1007

Communication System: CW; Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: 5800 Brain ($\sigma = 5.36$ mho/m, $\epsilon_r = 36.33$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-31-2005; Ambient Temp: 23.2°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN3550; ConvF(3.74, 3.74, 3.74); Calibrated: 10/26/2004

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn637; Calibrated: 9/22/2004

Phantom: SAM 12b; Type: SAM 4.0; Serial: TP:1197

Measurement SW: DASY4, V4.4 Build 3; Postprocessing SW: SEMCAD, V1.8 Build 130

5800MHz Dipole Validation

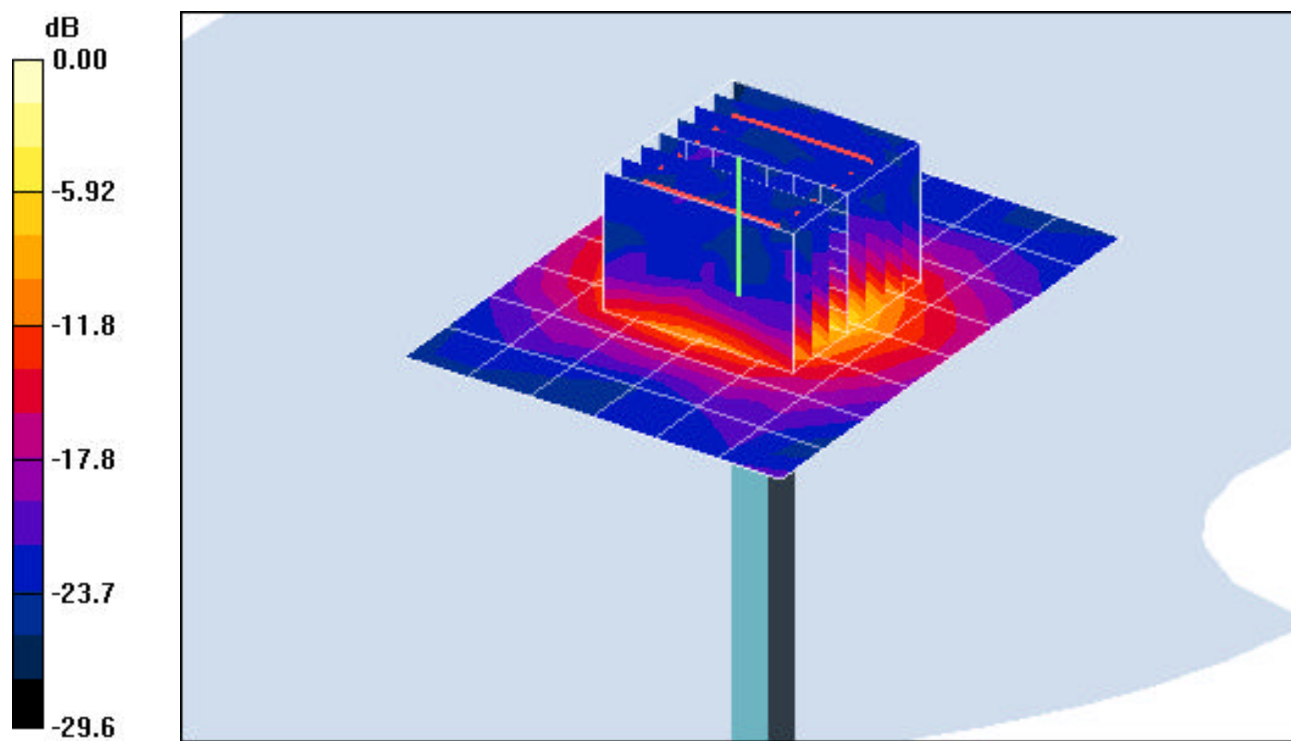
Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Input Power = 14.0 dBm (25 mW)

SAR(1 g) = 2.2 mW/g; SAR(10 g) = 0.615 mW/g

Target SAR(1g) = 2.25 mW/g; Deviation = -2.22 %



0 dB = 3.01mW/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: **EX3-3550_Oct04**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3550**

Calibration procedure(s) **QA CAL-01.v5 and QA CAL-12.v4
Calibration procedure for dosimetric E-field probes**

Calibration date: **October 26, 2004**

Condition of the calibrated item **In Tolerance**

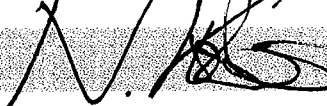
This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^\circ\text{C}$ 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	5-May-04 (METAS, No. 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No. 251-00388)	May-05
Reference 3 dB Attenuator	SN: S5054 (3c)	3-Apr-03 (METAS, No. 251-00403)	Aug-05
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-04 (METAS, No. 251-00389)	May-05
Reference 30 dB Attenuator	SN: S5129 (30b)	3-Apr-03 (METAS, No. 251-00404)	Aug-05
Reference Probe ES3DV2	SN:3013	8-Jan-04 (SPEAG, No. ES3-3013_Jan04)	Jan-05
DAE4	SN: 617	26-May-04 (SPEAG, No. DAE4-617_May04)	May-05

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
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-03)	In house check: Nov 04

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

Issued: October 30, 2004

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 _{x,y,z}	sensitivity in free space
ConF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
Polarization ϕ	ϕ rotation around probe axis
Polarization ϑ	ϑ 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_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E^2 -field uncertainty inside TSL (see below *ConvF*).
- NORM(f)_{x,y,z} = NORM_{x,y,z} * 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_{x,y,z}**: 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_{x,y,z} * *ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY 4.3 B17 and higher which allows extending the validity from ± 50 MHz to ± 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:3550

Manufactured:	May 19, 2004
Calibrated:	October 26, 2004

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: EX3DV4 SN:3550

Sensitivity in Free Space^A

Diode Compression^B

NormX	0.47 ± 9.9%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP X	92 mV
NormY	0.49 ± 9.9%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Y	92 mV
NormZ	0.47 ± 9.9%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Z	92 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		2.0 mm	3.0 mm
SAR _{be} [%]	Without Correction Algorithm	3.8	1.1
SAR _{be} [%]	With Correction Algorithm	0.1	0.4

TSL 1750 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		2.0 mm	3.0 mm
SAR _{be} [%]	Without Correction Algorithm	4.8	2.4
SAR _{be} [%]	With Correction Algorithm	0.8	0.9

Sensor Offset

Probe Tip to Sensor Center **1.0 mm**

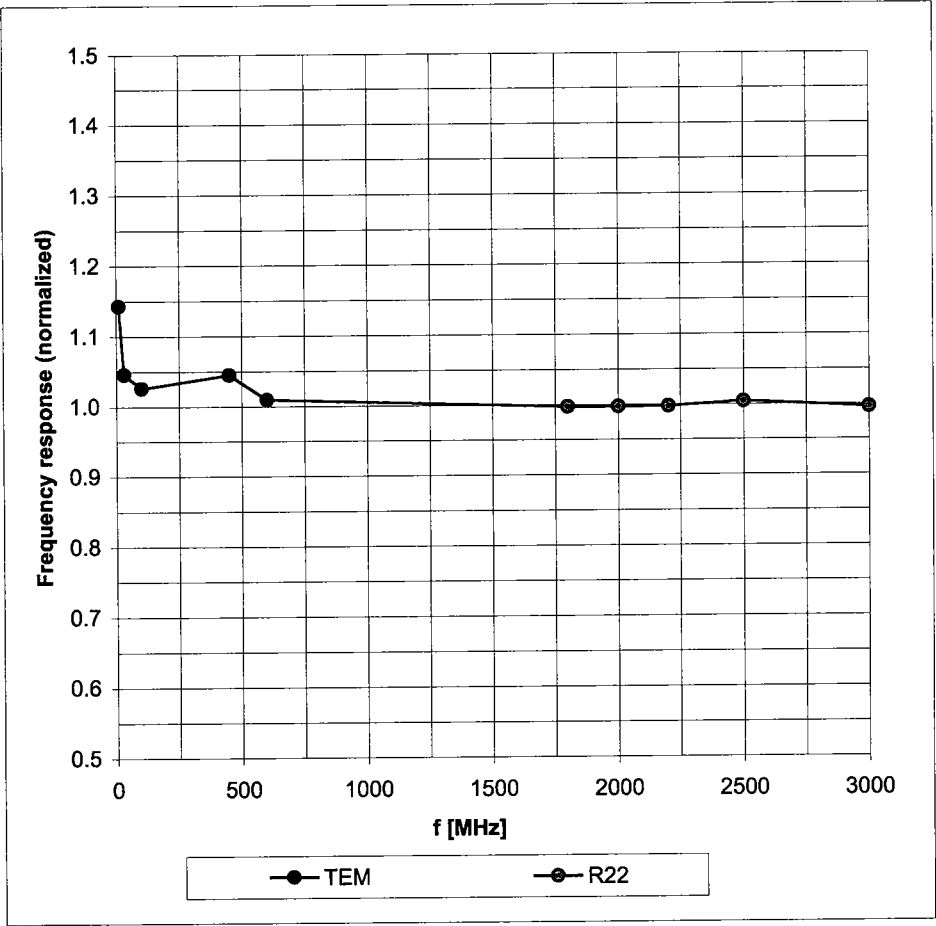
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 8).

^B Numerical linearization parameter: uncertainty not required.

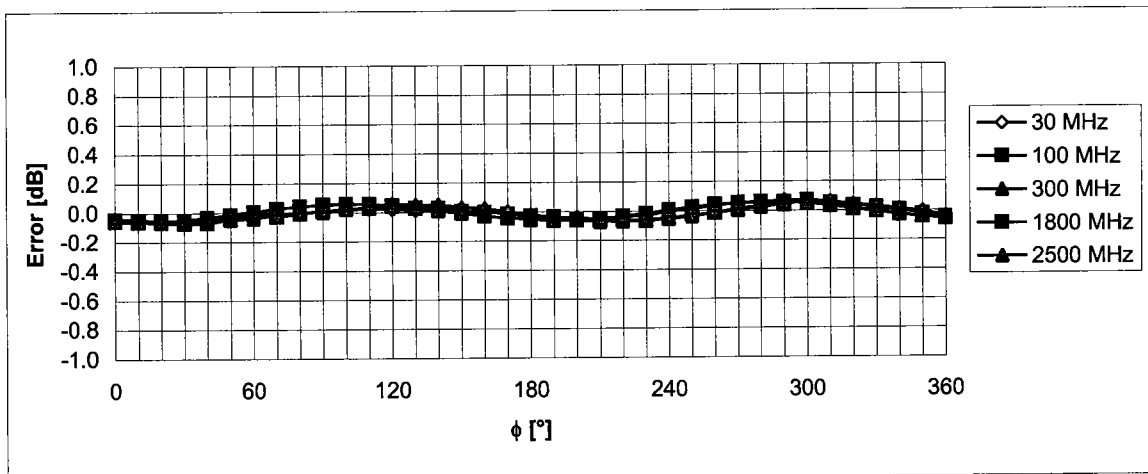
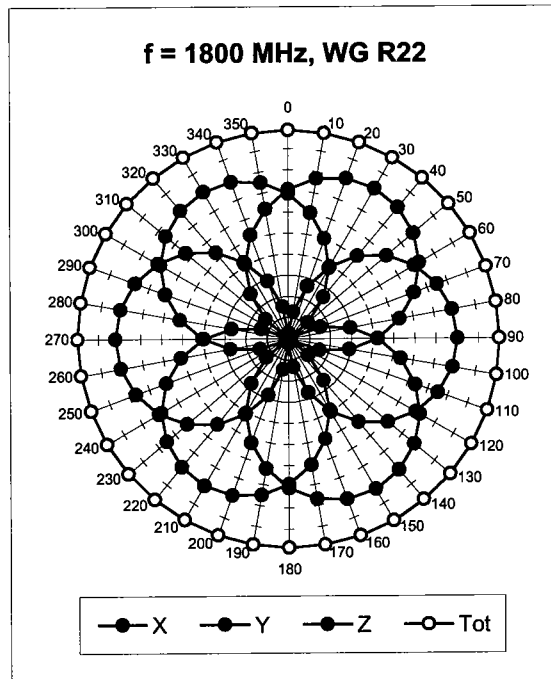
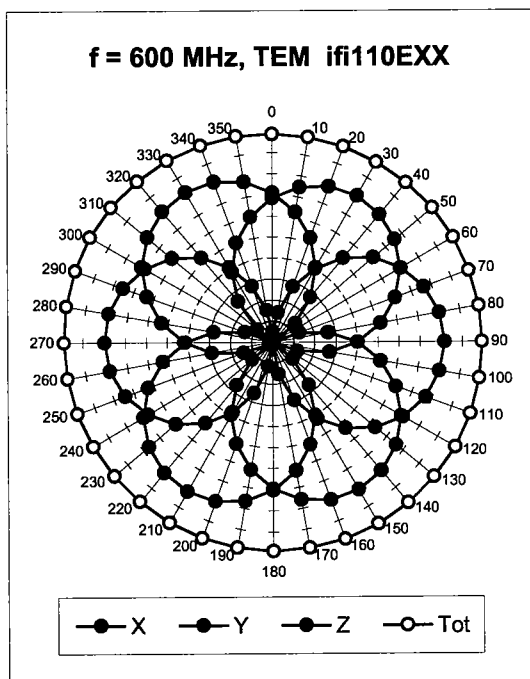
Frequency Response of E-Field

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



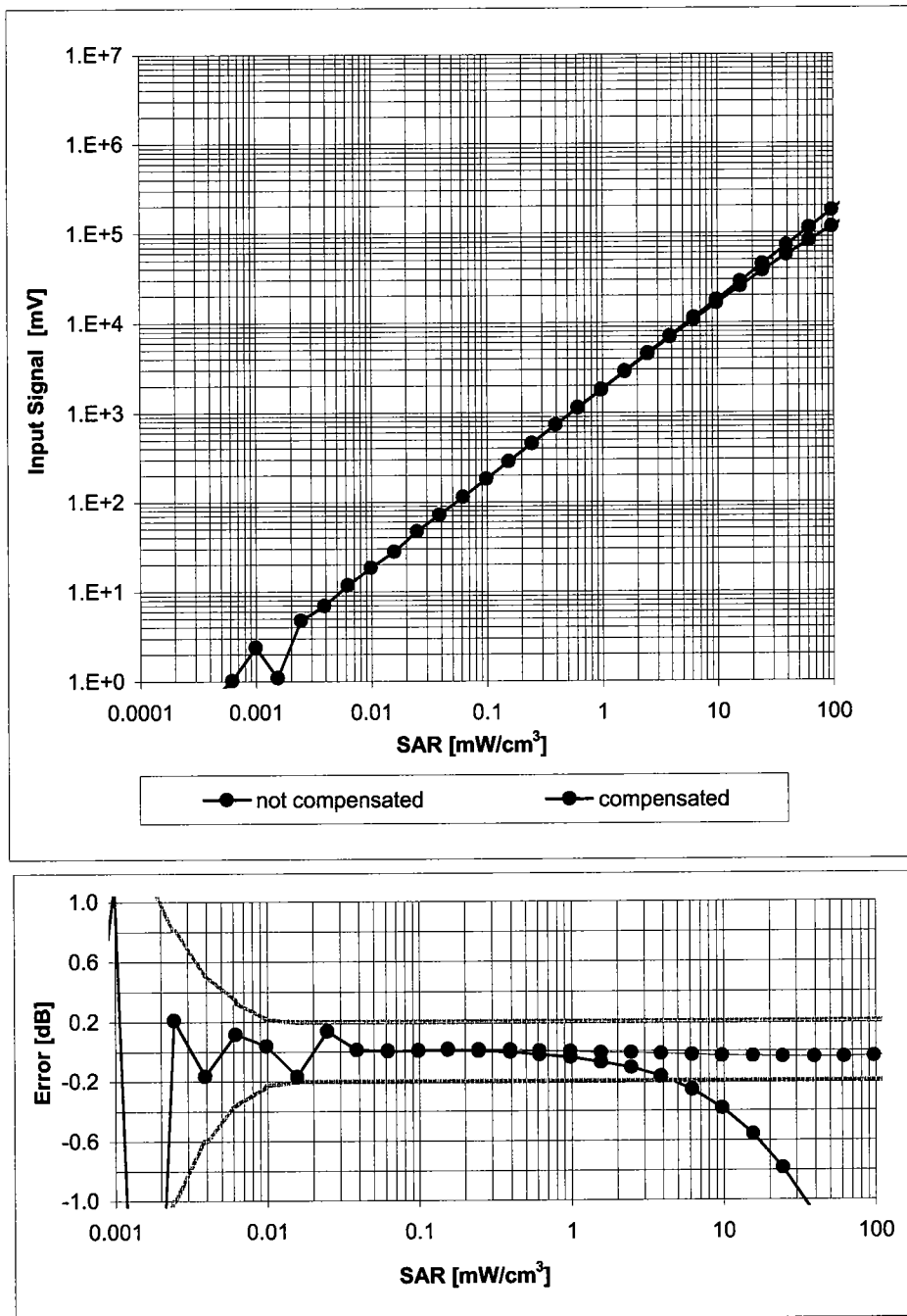
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

Receiving Pattern (ϕ), $\theta = 0^\circ$



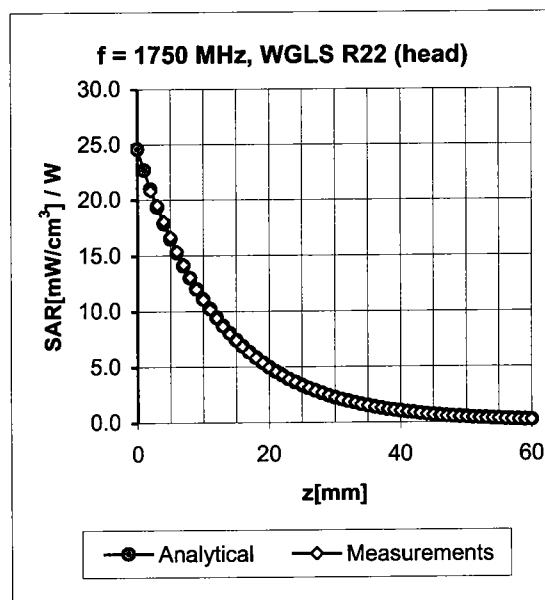
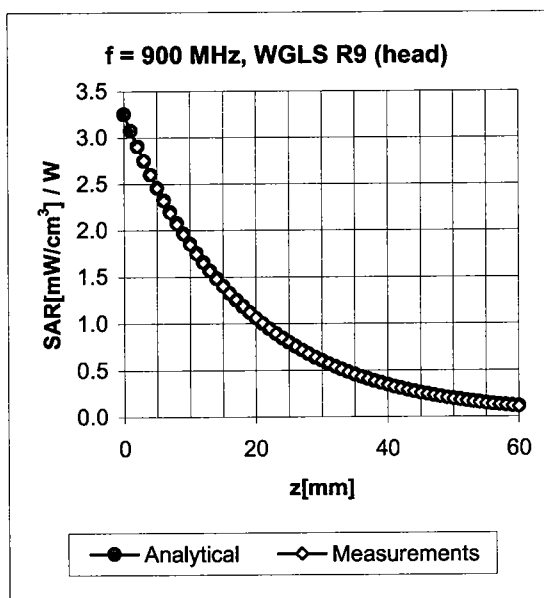
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

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

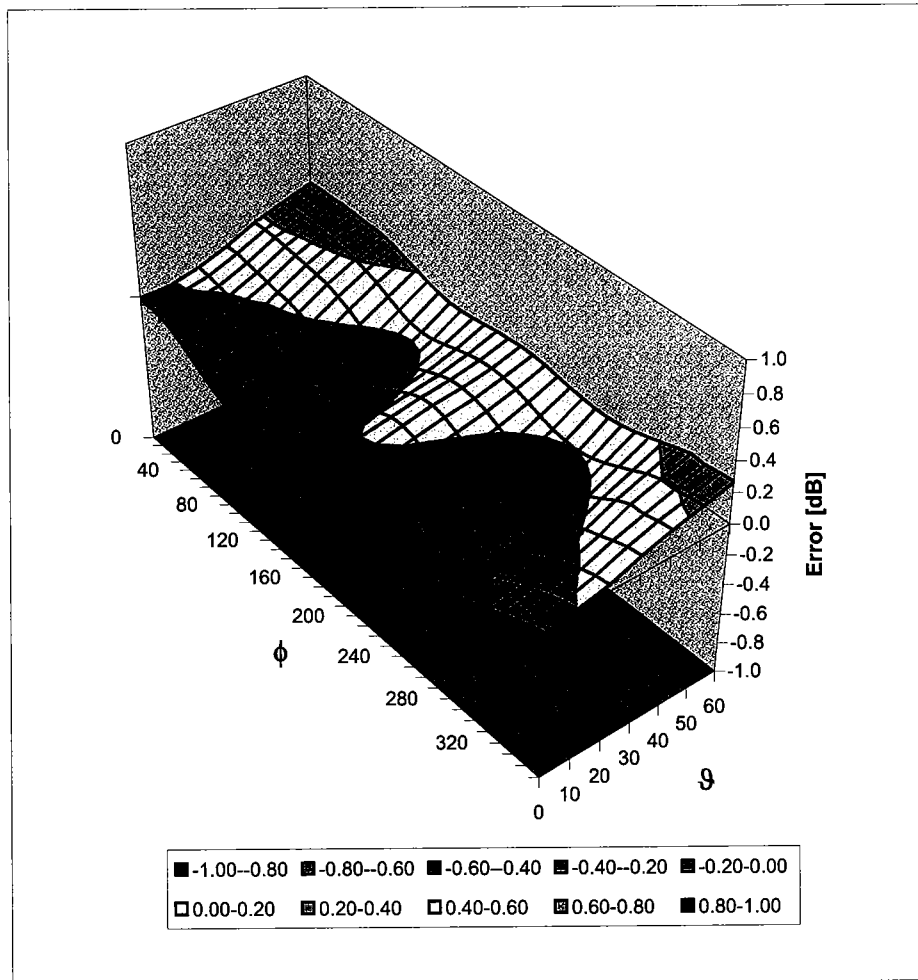


f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
450	± 50 / ± 100	Head	43.5 ± 5%	0.87 ± 5%	-0.03	2.33	8.28 ± 13.3% (k=2)
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.92	0.65	8.12 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.97	0.62	7.76 ± 11.0% (k=2)
1640	± 50 / ± 100	Head	40.3 ± 5%	1.29 ± 5%	0.69	0.73	7.28 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.64	0.80	6.97 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.54	0.96	6.75 ± 11.0% (k=2)
1950	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.57	0.88	6.62 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.61	0.78	6.33 ± 11.8% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	-0.08	2.62	8.05 ± 13.3% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.98	0.65	7.99 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	1.01	0.63	7.75 ± 11.0% (k=2)
1640	± 50 / ± 100	Body	53.8 ± 5%	1.40 ± 5%	0.58	0.99	6.82 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.50	1.16	6.48 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.47	1.32	6.35 ± 11.0% (k=2)
1950	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.64	0.83	6.53 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.83	0.64	6.27 ± 11.8% (k=2)

^c The validity of ± 100 MHz only applies for DASY 4.3 B17 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.

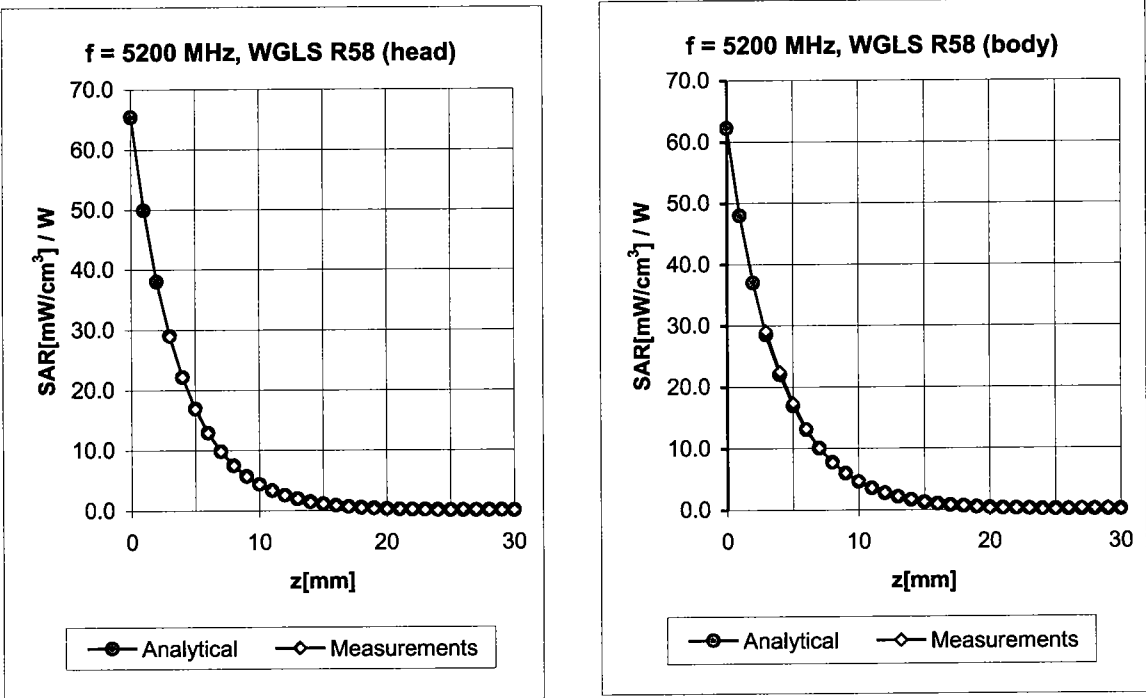
Deviation from Isotropy in HSL

Error (ϕ , ϑ), $f = 900$ MHz



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

Appendix^D



f [MHz] ^D	Validity [MHz]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
5200	± 50	Head	36.0 ± 5%	4.76 ± 5%	0.45	1.80	4.17 ± 13.6% (k=2)
5500	± 50	Head	35.6 ± 5%	4.96 ± 5%	0.47	1.80	3.77 ± 13.6% (k=2)
5800	± 50	Head	35.3 ± 5%	5.27 ± 5%	0.48	1.80	3.74 ± 13.6% (k=2)
5200	± 50	Body	49.0 ± 5%	5.30 ± 5%	0.50	1.90	3.72 ± 13.6% (k=2)
5500	± 50	Body	48.6 ± 5%	5.65 ± 5%	0.50	1.95	3.47 ± 13.6% (k=2)
5800	± 50	Body	48.2 ± 5%	6.00 ± 5%	0.50	1.95	3.48 ± 13.6% (k=2)

^D Accreditation for ConvF assessment above 3000 MHz is currently applied for. Accreditation is expected at the beginning of 2005.