

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 835 Muscle ($\sigma = 0.92$ mho/m, $\epsilon_r = 57.26$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 02-02-2009; Ambient Temp: 22.6°C; Tissue Temp: 22.1 °C

Probe: EX3DV4 - SN3589; ConvF(8.32, 8.32, 8.32); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: Cellular CDMA, Tablet position, Left side, LCD Flip, Mid.ch

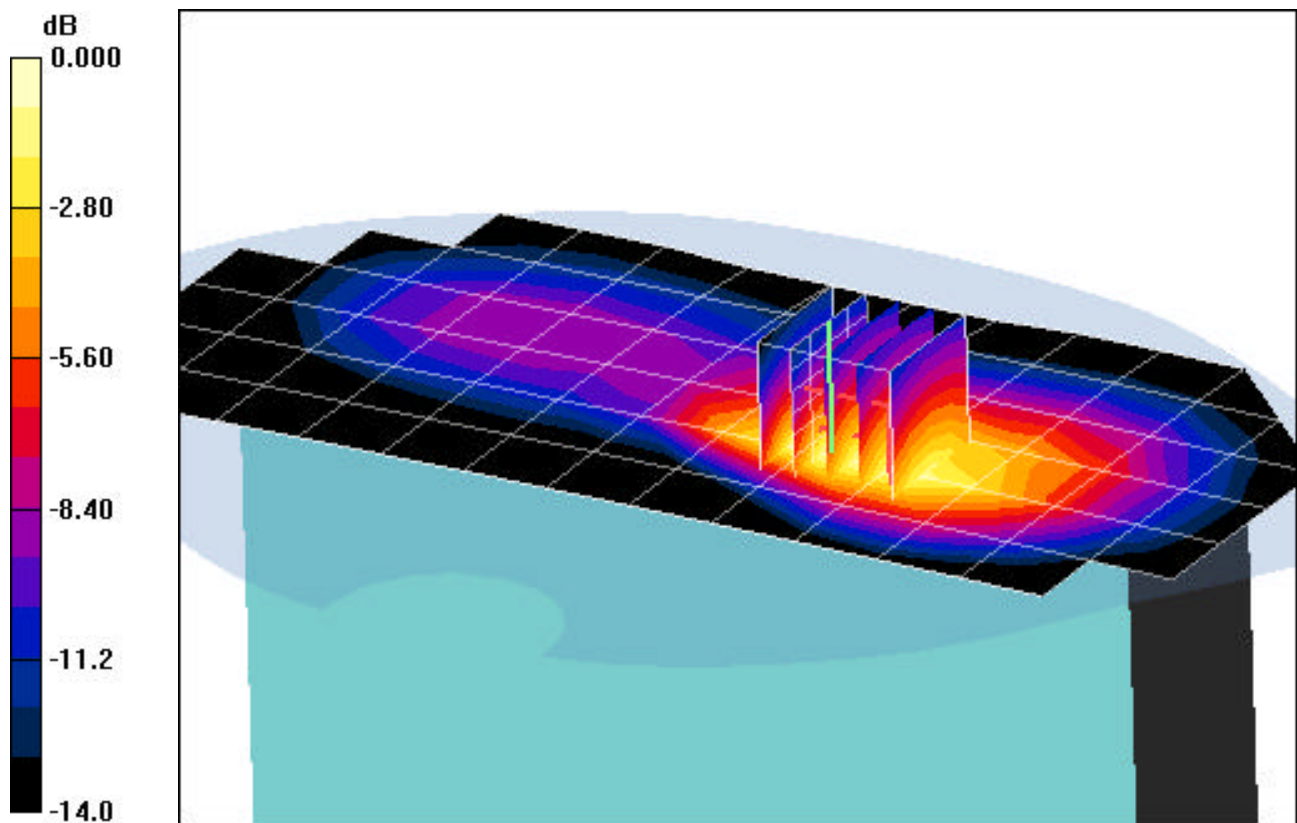
Area Scan (7x16x1): Measurement grid: dx=20mm, dy=20mm

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

Reference Value = 15.2 V/m

Peak SAR (extrapolated) = 1.69 W/kg

SAR(1 g) = 0.976 mW/g; SAR(10 g) = 0.592 mW/g



0 dB = 1.21mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 835 Muscle ($\sigma = 0.92$ mho/m, $\epsilon_r = 57.26$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 02-02-2009; Ambient Temp: 22.6°C; Tissue Temp: 22.1 °C

Probe: EX3DV4 - SN3589; ConvF(8.32, 8.32, 8.32); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: Cellular CDMA, Tablet position, Top side, LCD Flip, Mid.ch

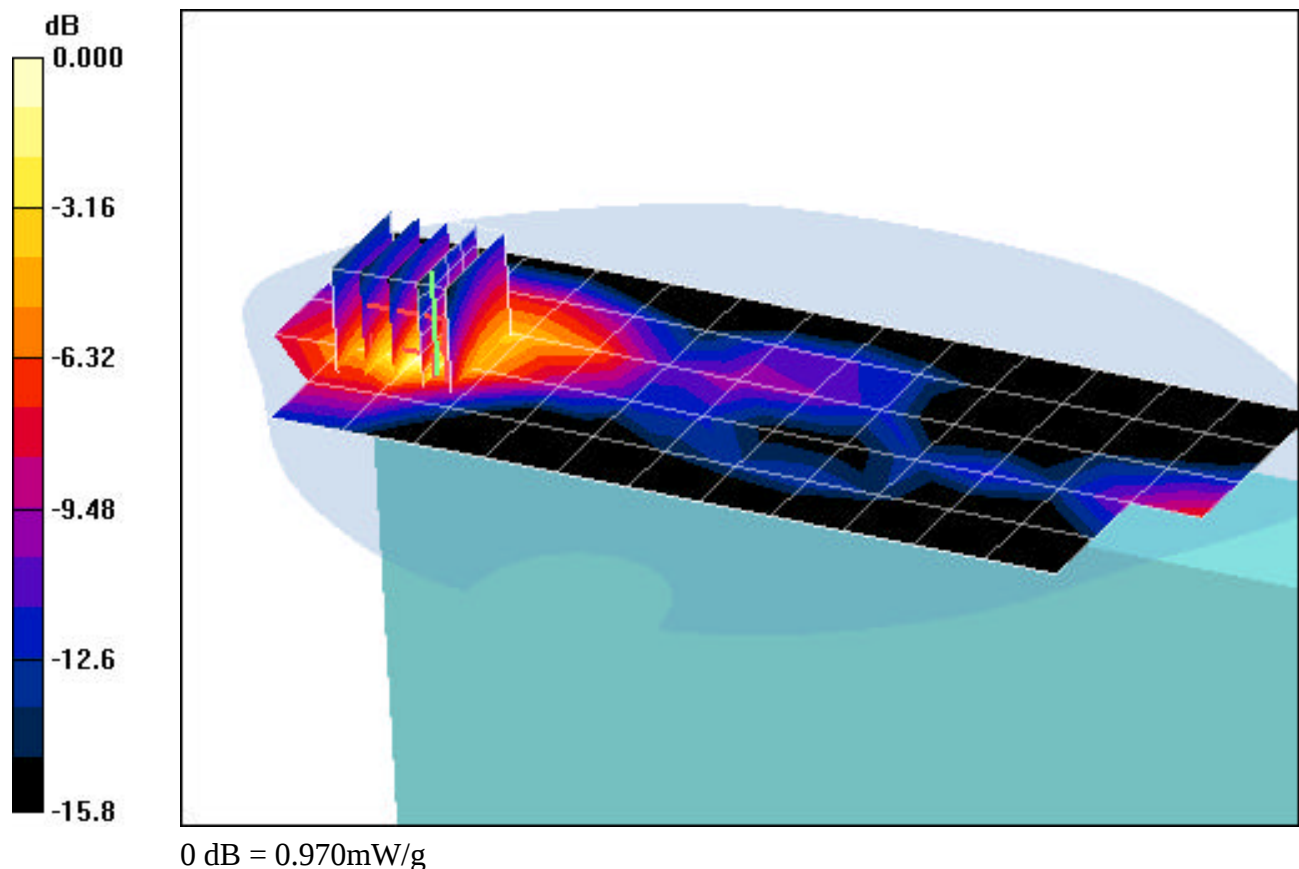
Area Scan (6x16x1): Measurement grid: dx=20mm, dy=20mm

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

Reference Value = 6.31 V/m

Peak SAR (extrapolated) = 2.00 W/kg

SAR(1 g) = 0.766 mW/g; SAR(10 g) = 0.382 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 835 Muscle ($\sigma = 0.92$ mho/m, $\epsilon_r = 57.26$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 02-02-2009; Ambient Temp: 22.6°C; Tissue Temp: 22.1 °C

Probe: EX3DV4 - SN3589; ConvF(8.32, 8.32, 8.32); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: Cellular CDMA, Tablet position, Bottom side, LCD Flip, Mid.ch

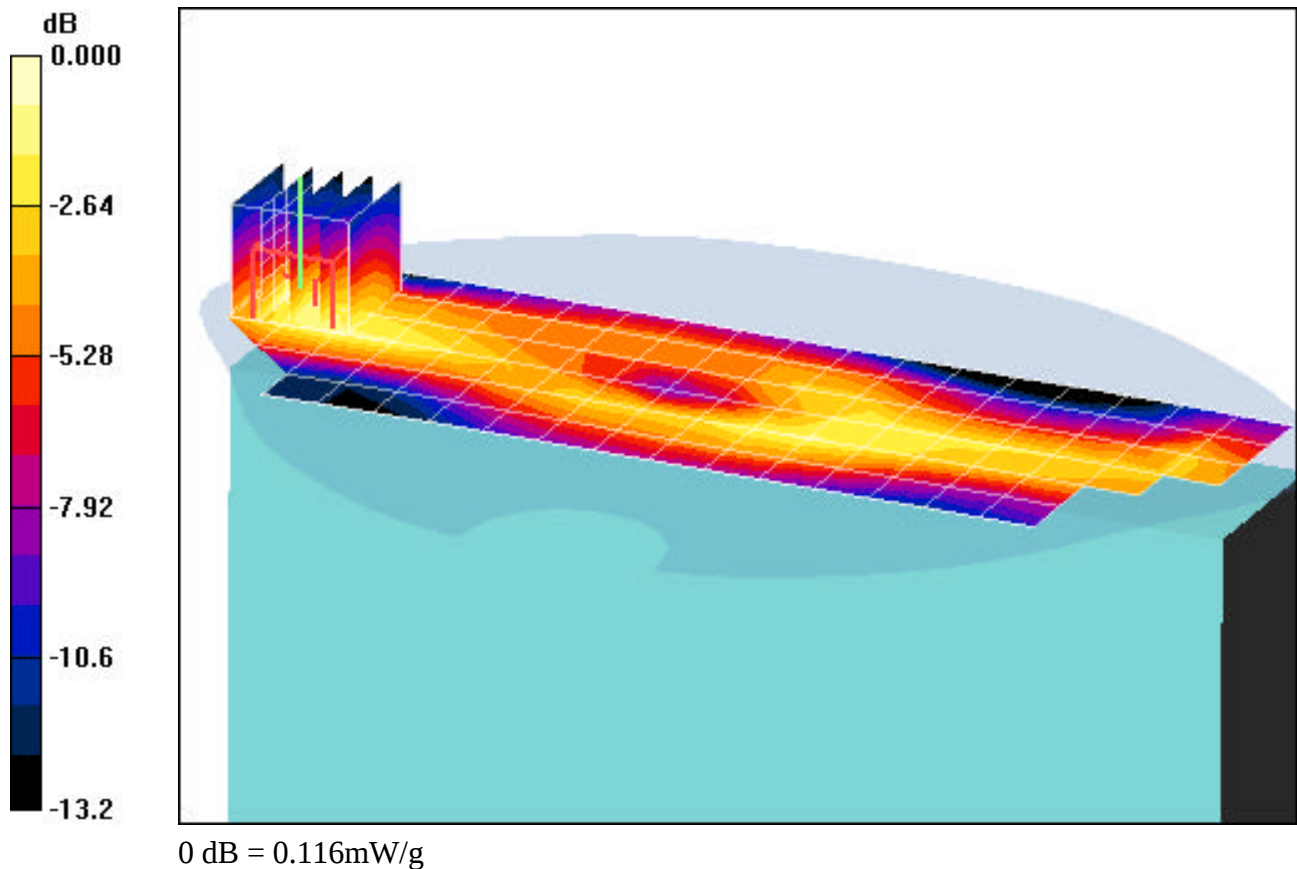
Area Scan (7x21x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 4.43 V/m

Peak SAR (extrapolated) = 0.230 W/kg

SAR(1 g) = 0.097 mW/g; SAR(10 g) = 0.053 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 835 Muscle ($\sigma = 0.92$ mho/m, $\epsilon_r = 57.26$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 02-02-2009; Ambient Temp: 22.6°C; Tissue Temp: 22.1 °C

Probe: EX3DV4 - SN3589; ConvF(8.32, 8.32, 8.32); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: Cellular EVDO Rev. 0, Laptop position, LCD Flip, Mid.ch

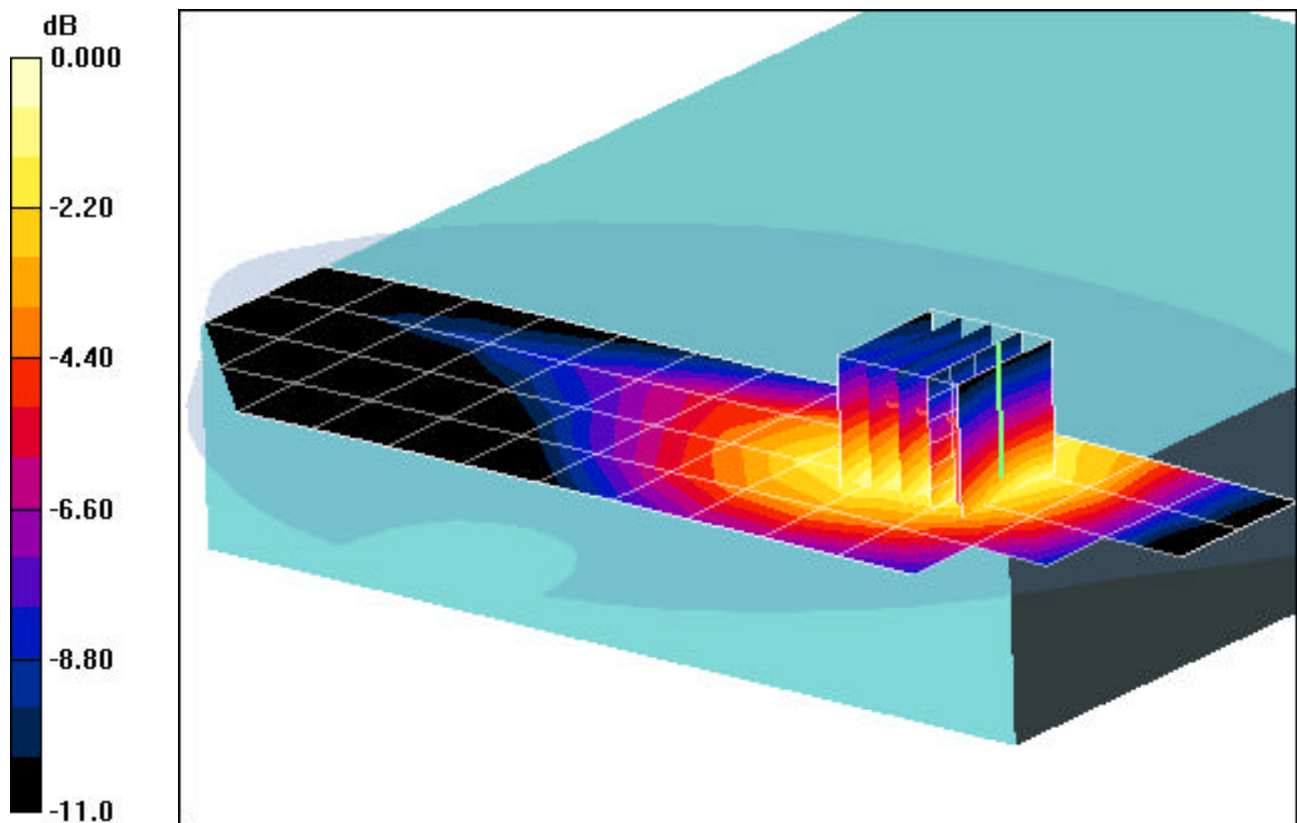
Area Scan (5x14x1): Measurement grid: dx=20mm, dy=20mm

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

Reference Value = 8.88 V/m

Peak SAR (extrapolated) = 0.289 W/kg

SAR(1 g) = 0.181 mW/g; SAR(10 g) = 0.119 mW/g



0 dB = 0.213mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 835 Muscle ($\sigma = 0.92$ mho/m, $\epsilon_r = 57.26$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 02-02-2009; Ambient Temp: 22.6°C; Tissue Temp: 22.1 °C

Probe: EX3DV4 - SN3589; ConvF(8.32, 8.32, 8.32); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: Cellular EVDO Rev. 0, Tablet position, Left side, LCD Flip, Mid.ch

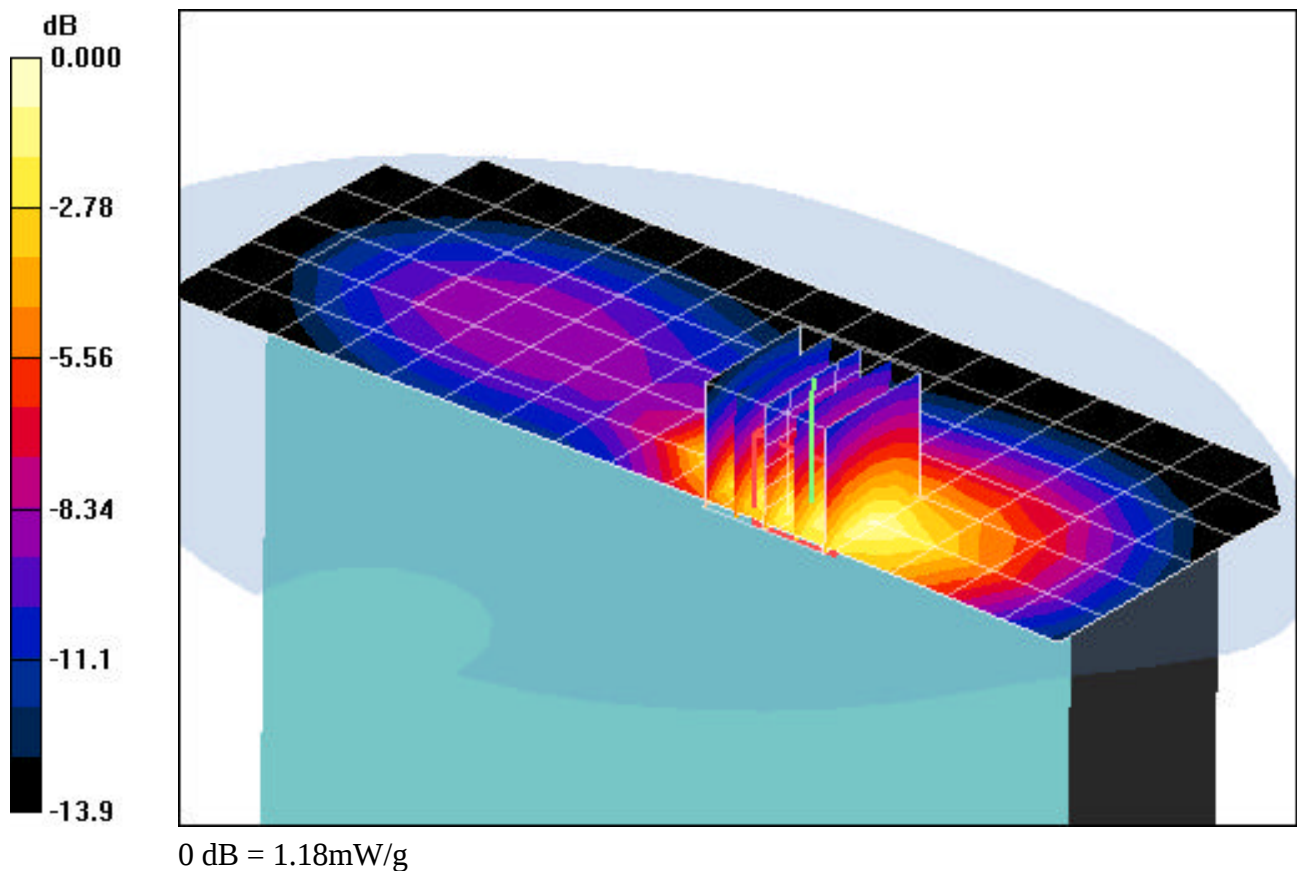
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 15.5 V/m

Peak SAR (extrapolated) = 1.60 W/kg

SAR(1 g) = 0.970 mW/g; SAR(10 g) = 0.598 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 835 Muscle ($\sigma = 0.92$ mho/m, $\epsilon_r = 57.26$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 02-02-2009; Ambient Temp: 22.6°C; Tissue Temp: 22.1 °C

Probe: EX3DV4 - SN3589; ConvF(8.32, 8.32, 8.32); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: Cellular EVDO Rev. 0, Tablet position, Top side, LCD Flip, Mid.ch

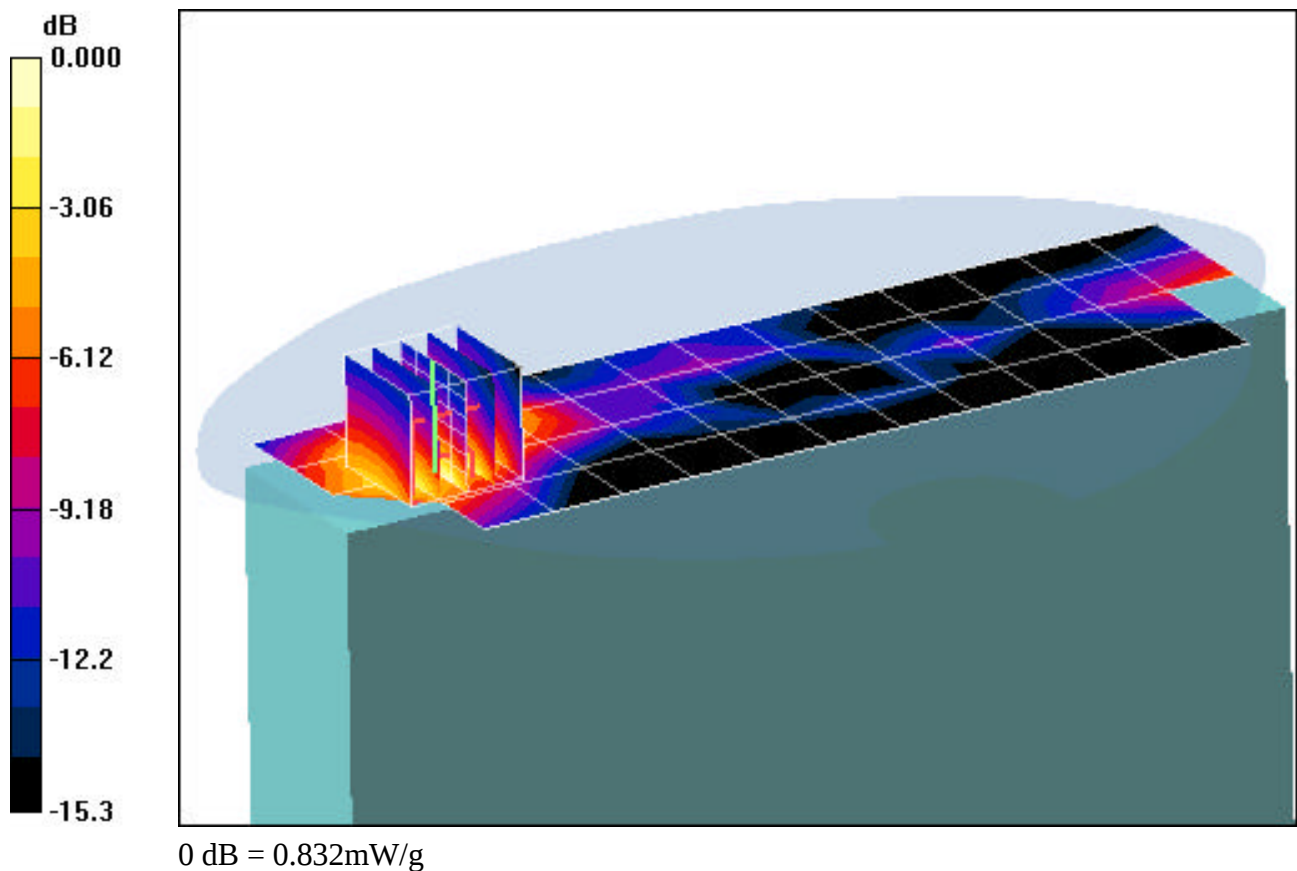
Area Scan (5x16x1): Measurement grid: dx=20mm, dy=20mm

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

Reference Value = 5.73 V/m

Peak SAR (extrapolated) = 1.47 W/kg

SAR(1 g) = 0.647 mW/g; SAR(10 g) = 0.340 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 835 Muscle ($\sigma = 0.92$ mho/m, $\epsilon_r = 57.26$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 02-02-2009; Ambient Temp: 22.6°C; Tissue Temp: 22.1 °C

Probe: EX3DV4 - SN3589; ConvF(8.32, 8.32, 8.32); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: Cellular EVDO Rev. 0, Tablet position, Bottom side, LCD Flip, Mid.ch

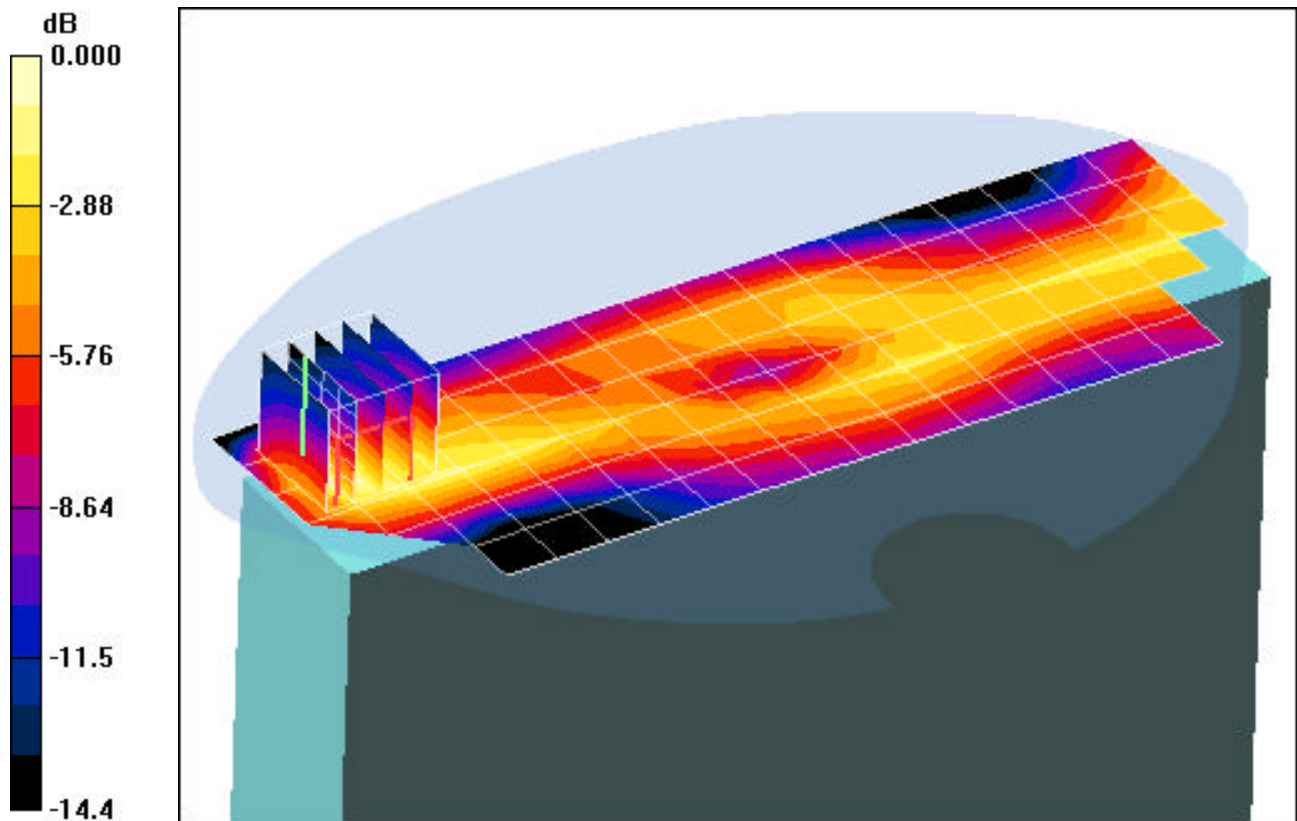
Area Scan (7x21x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 3.41 V/m

Peak SAR (extrapolated) = 0.277 W/kg

SAR(1 g) = 0.100 mW/g; SAR(10 g) = 0.052 mW/g



0 dB = 0.131mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 1900 Muscle ($\sigma = 1.59$ mho/m, $\epsilon_r = 53.30$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-30-2009; Ambient Temp: 23.3°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3589; ConvF(6.88, 6.88, 6.88); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: PCS CDMA, Laptop position, LCD Flip, Mid.ch

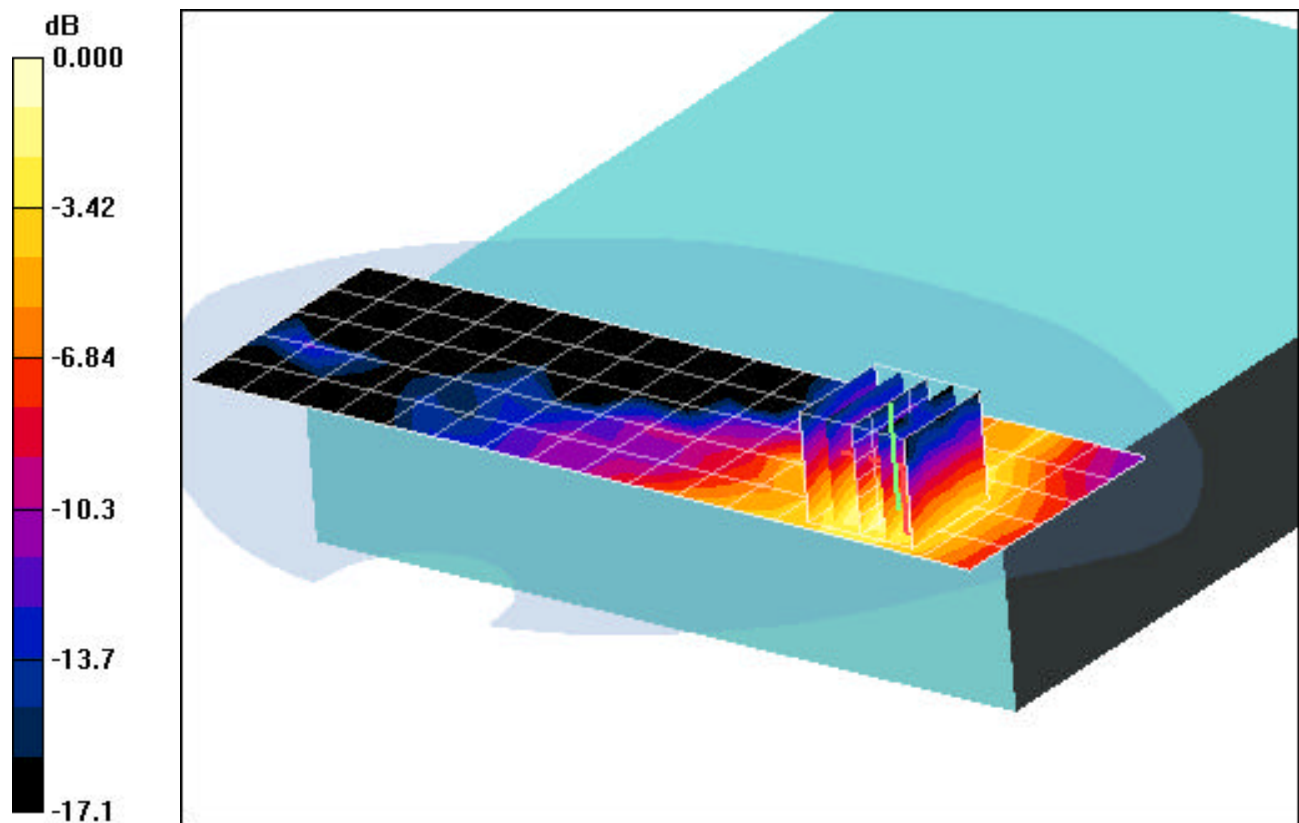
Area Scan (6x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 2.75 V/m

Peak SAR (extrapolated) = 0.181 W/kg

SAR(1 g) = 0.099 mW/g; SAR(10 g) = 0.055 mW/g



0 dB = 0.127mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3.; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 1900 Muscle ($\sigma = 1.59$ mho/m, $\epsilon_r = 53.30$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-30-2009; Ambient Temp: 23.3°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3589; ConvF(6.88, 6.88, 6.88); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: PCS CDMA, Tablet position, Left side, LCD Flip, Mid.ch

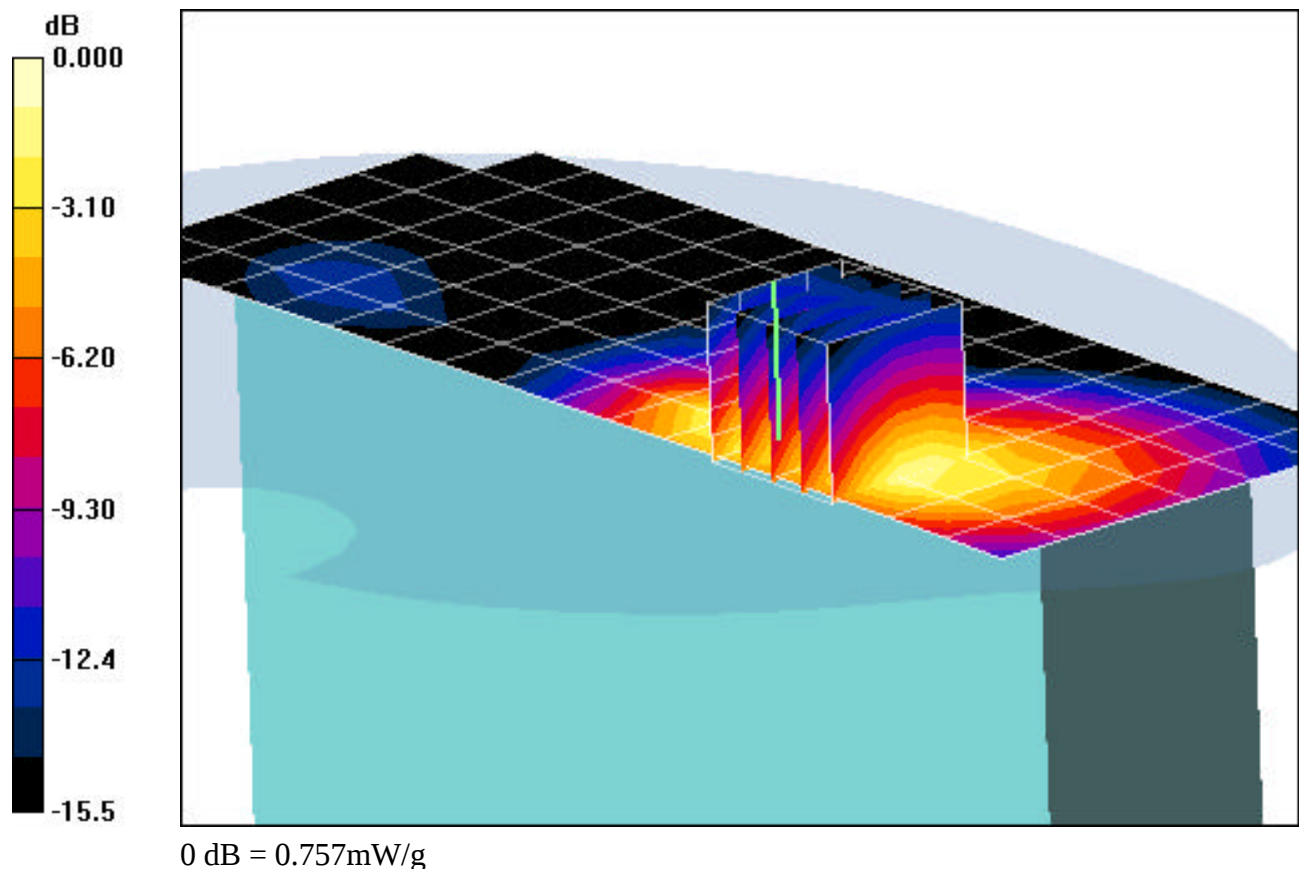
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 7.22 V/m

Peak SAR (extrapolated) = 1.09 W/kg

SAR(1 g) = 0.634 mW/g; SAR(10 g) = 0.358 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 1900 Muscle ($\sigma = 1.59$ mho/m, $\epsilon_r = 53.30$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-30-2009; Ambient Temp: 23.3°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3589; ConvF(6.88, 6.88, 6.88); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: PCS CDMA, Tablet position, Top side, LCD Flip, Mid.ch

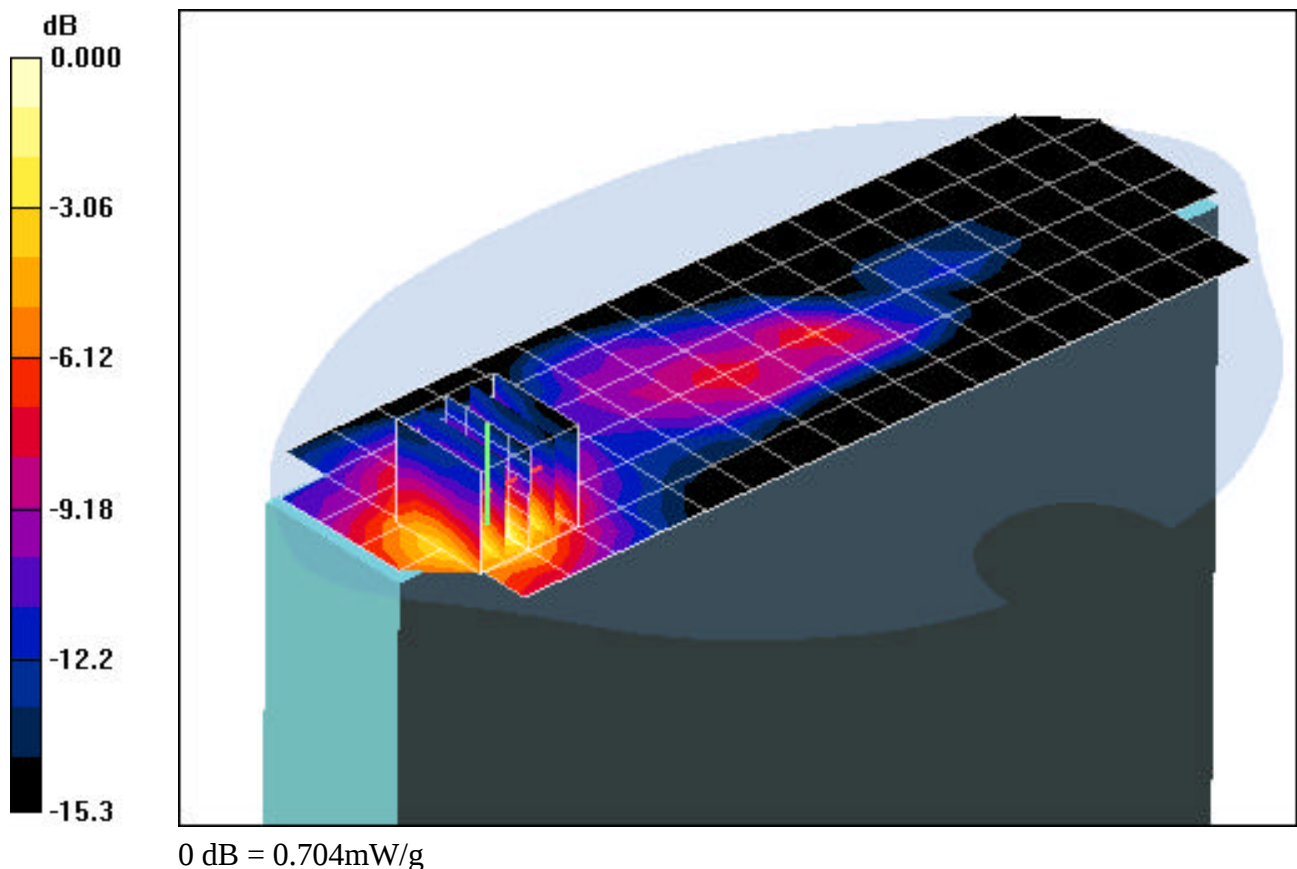
Area Scan (7x21x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 6.73 V/m

Peak SAR (extrapolated) = 1.06 W/kg

SAR(1 g) = 0.555 mW/g; SAR(10 g) = 0.293 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 1900 Muscle ($\sigma = 1.59$ mho/m, $\epsilon_r = 53.30$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-30-2009; Ambient Temp: 23.3°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3589; ConvF(6.88, 6.88, 6.88); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: PCS CDMA, Tablet position, Bottom side, LCD Flip, Mid.ch

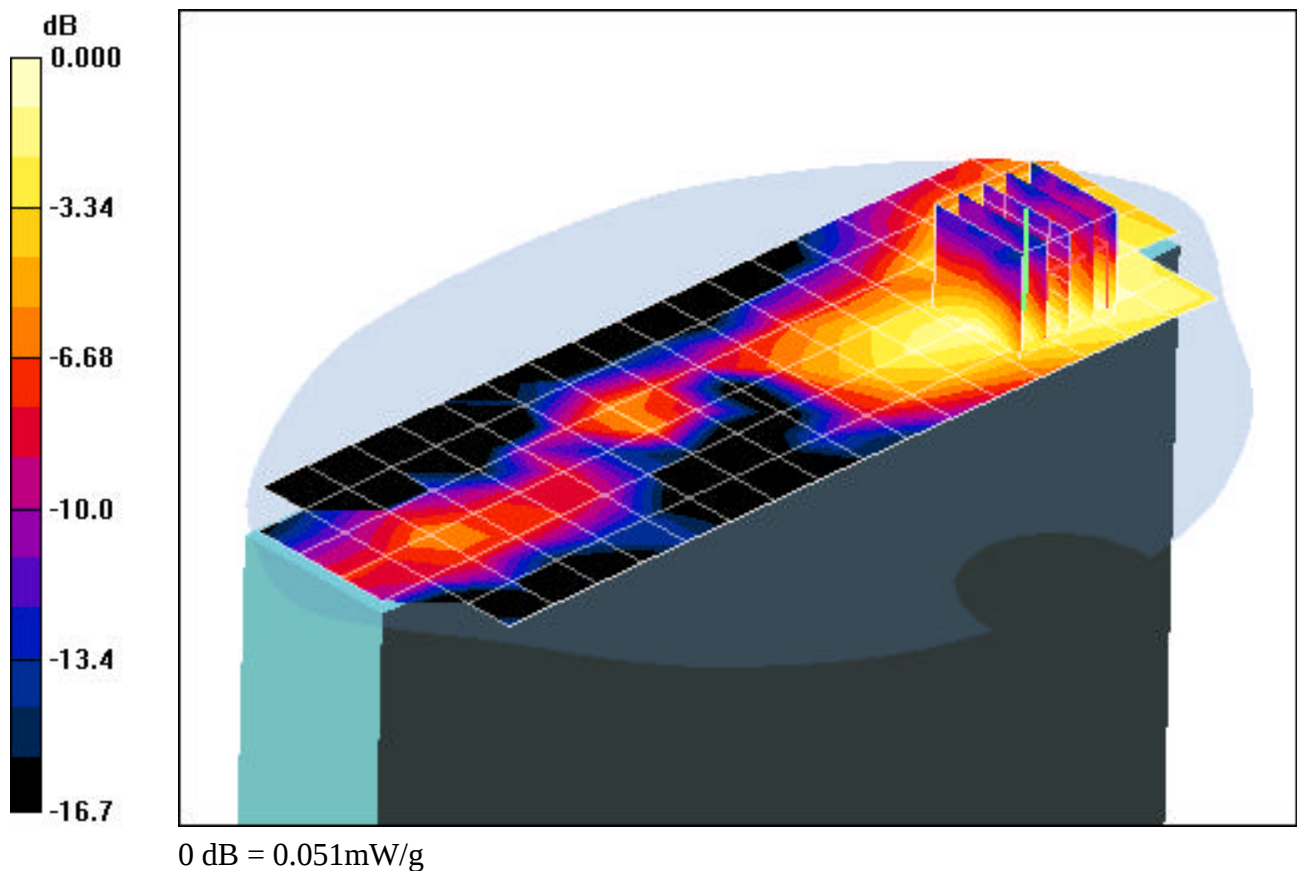
Area Scan (7x21x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 2.47 V/m

Peak SAR (extrapolated) = 0.075 W/kg

SAR(1 g) = 0.045 mW/g; SAR(10 g) = 0.031 mW/g



PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 1900 Muscle ($\sigma = 1.59$ mho/m, $\epsilon_r = 53.30$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-30-2009; Ambient Temp: 23.3°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3589; ConvF(6.88, 6.88, 6.88); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: PCS EVDO Rev.0, Laptop position, LCD Flip, Mid.ch

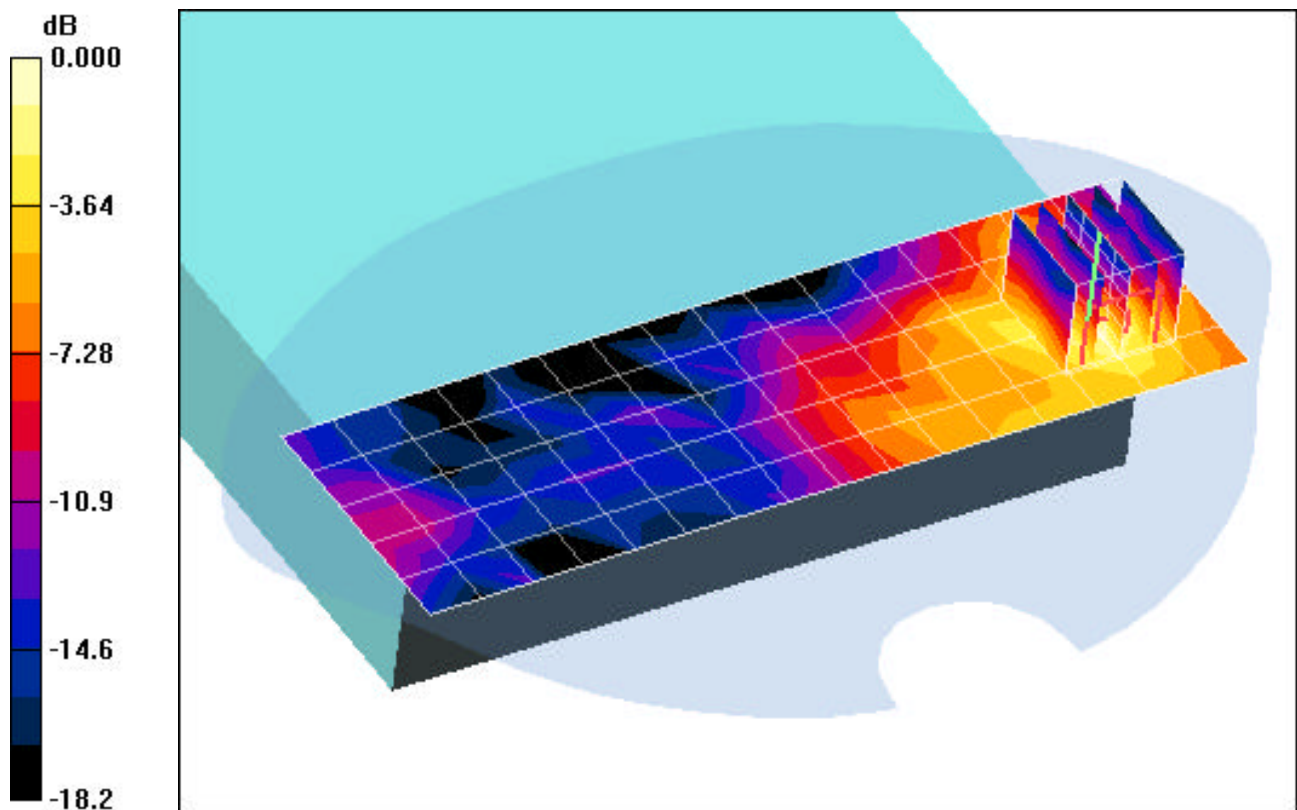
Area Scan (6x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 2.38 V/m

Peak SAR (extrapolated) = 0.137 W/kg

SAR(1 g) = 0.071 mW/g; SAR(10 g) = 0.037 mW/g



0 dB = 0.091mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 1900 Muscle ($\sigma = 1.59$ mho/m, $\epsilon_r = 53.30$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-30-2009; Ambient Temp: 23.3°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3589; ConvF(6.88, 6.88, 6.88); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: PCS EVDO Rev.0, Tablet position, Left side, LCD Flip, Mid.ch

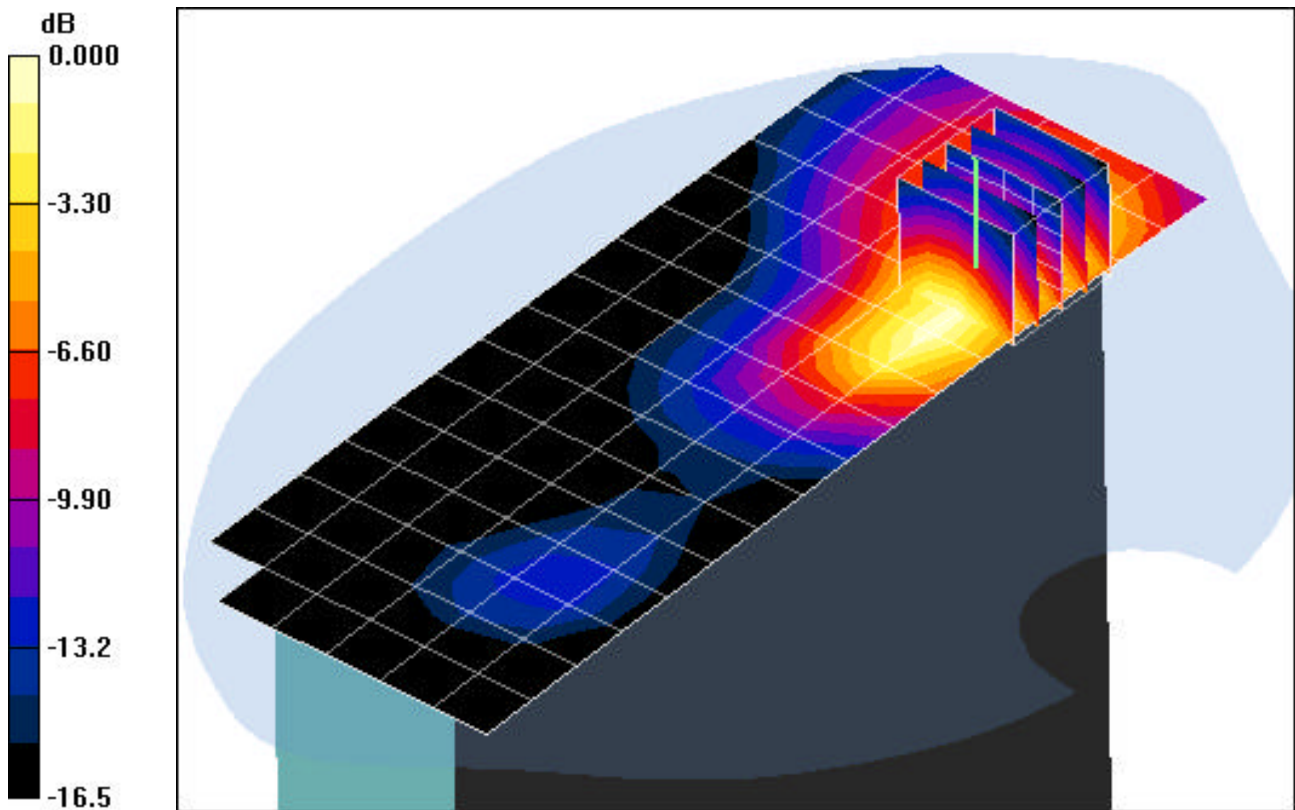
Area Scan (7x17x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 22.5 V/m

Peak SAR (extrapolated) = 1.14 W/kg

SAR(1 g) = 0.659 mW/g; SAR(10 g) = 0.369 mW/g



0 dB = 0.777mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN - HEX: 6087F50D

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

Medium: 1900 Muscle ($\sigma = 1.59$ mho/m, $\epsilon_r = 53.30$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-30-2009; Ambient Temp: 23.3°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3589; ConvF(6.88, 6.88, 6.88); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: PCS EVDO Rev.0, Tablet position, Top side, LCD Flip, Mid.ch

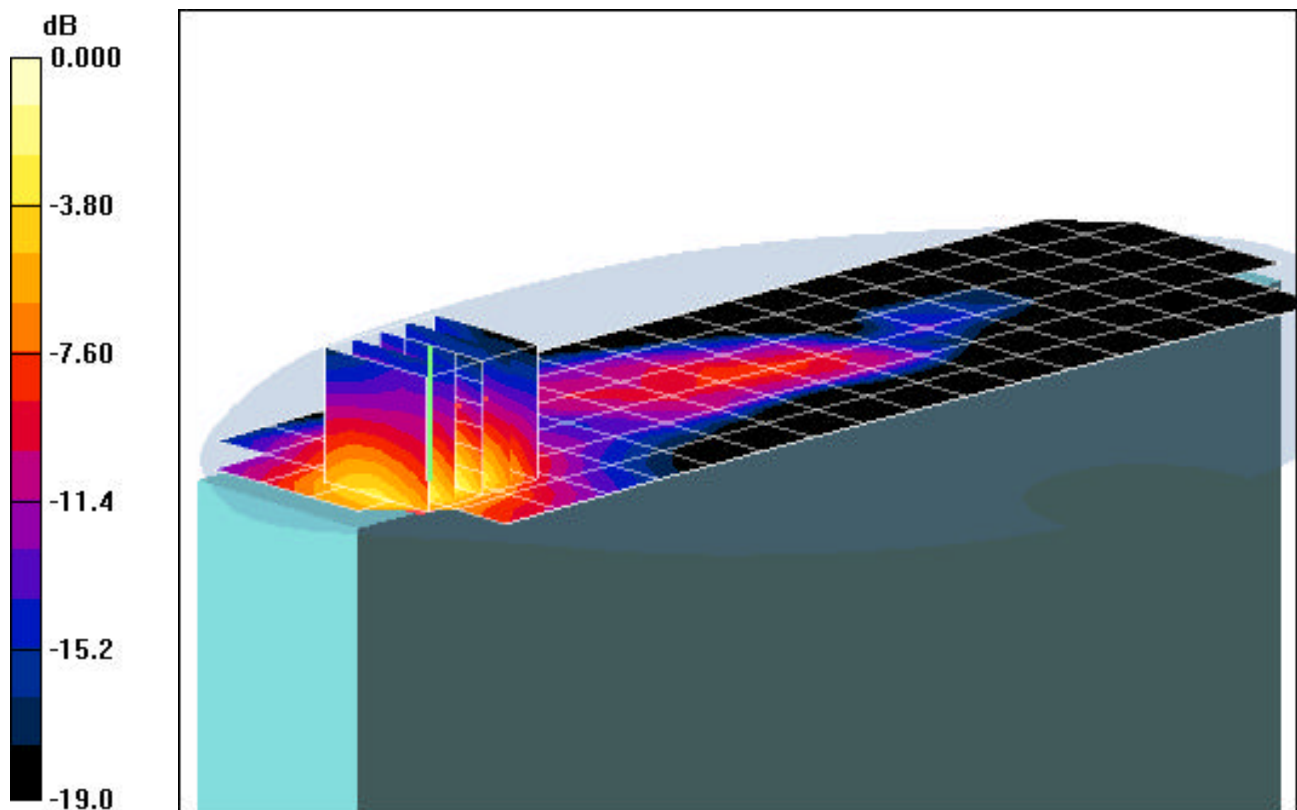
Area Scan (7x21x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 7.69 V/m

Peak SAR (extrapolated) = 1.21 W/kg

SAR(1 g) = 0.598 mW/g; SAR(10 g) = 0.304 mW/g



0 dB = 0.765mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: CF-19mk3; Type: Laptop/Tablet PC with 802.11abgn, BT and EVDO; Serial: ESN-HEX: 6087F50D

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

Medium: 1900 Muscle ($\sigma = 1.59$ mho/m, $\epsilon_r = 53.30$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 01-30-2009; Ambient Temp: 23.3°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3589; ConvF(6.88, 6.88, 6.88); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

Mode: PCS EVDO Rev.0, Tablet position, Bottom side, LCD Flip, Mid.ch

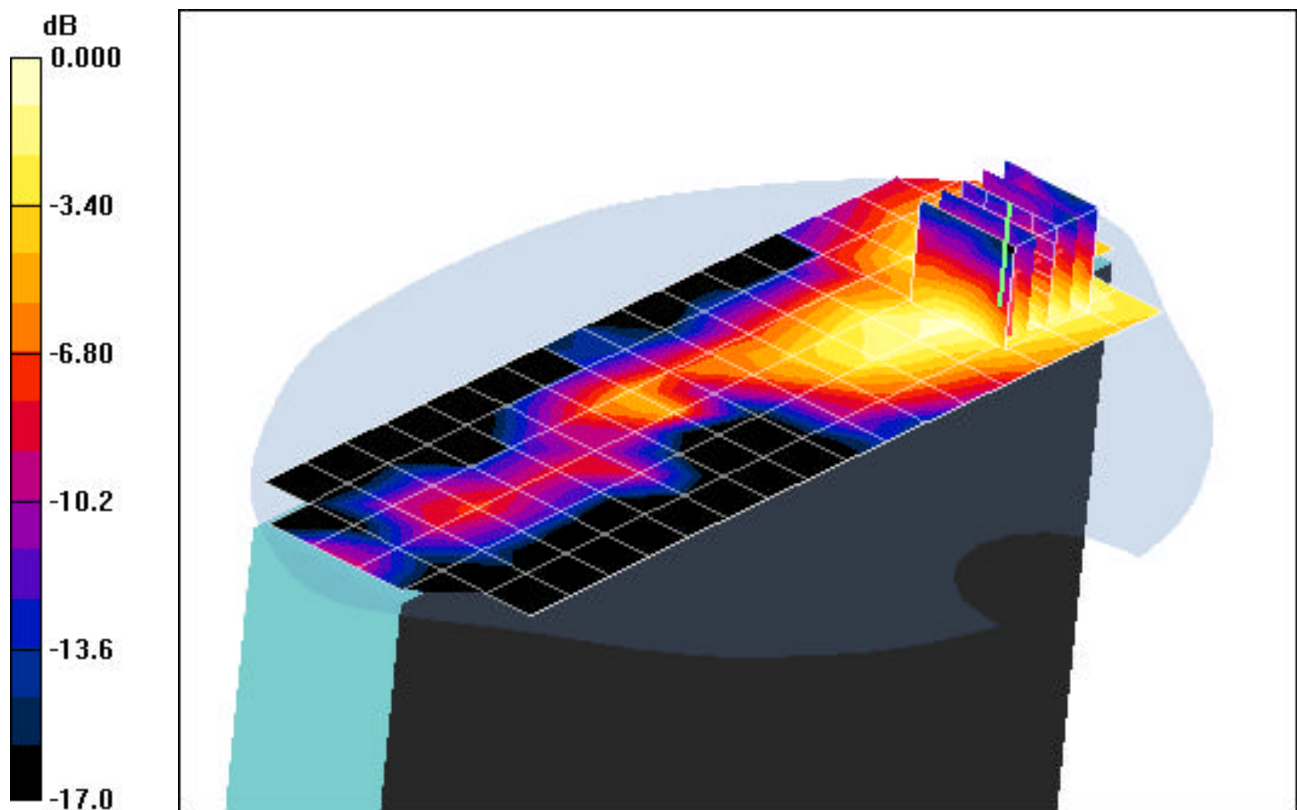
Area Scan (7x21x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 0.965 V/m

Peak SAR (extrapolated) = 0.070 W/kg

SAR(1 g) = 0.040 mW/g; SAR(10 g) = 0.024 mW/g



0 dB = 0.048mW/g

APPENDIX B: DIPOLE VALIDATION

PCTEST ENGINEERING LABORATORY, INC.

DUT: 2450MHz SAR Validation Dipole; Type: D2450V2; Serial: 797

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

Medium: 2450 Brain ($\sigma = 1.78$ mho/m, $\epsilon_r = 39.82$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-16-2008; Ambient Temp: 23.4°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3561; ConvF(6.38, 6.38, 6.38); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/30/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

2450MHz Dipole Validation

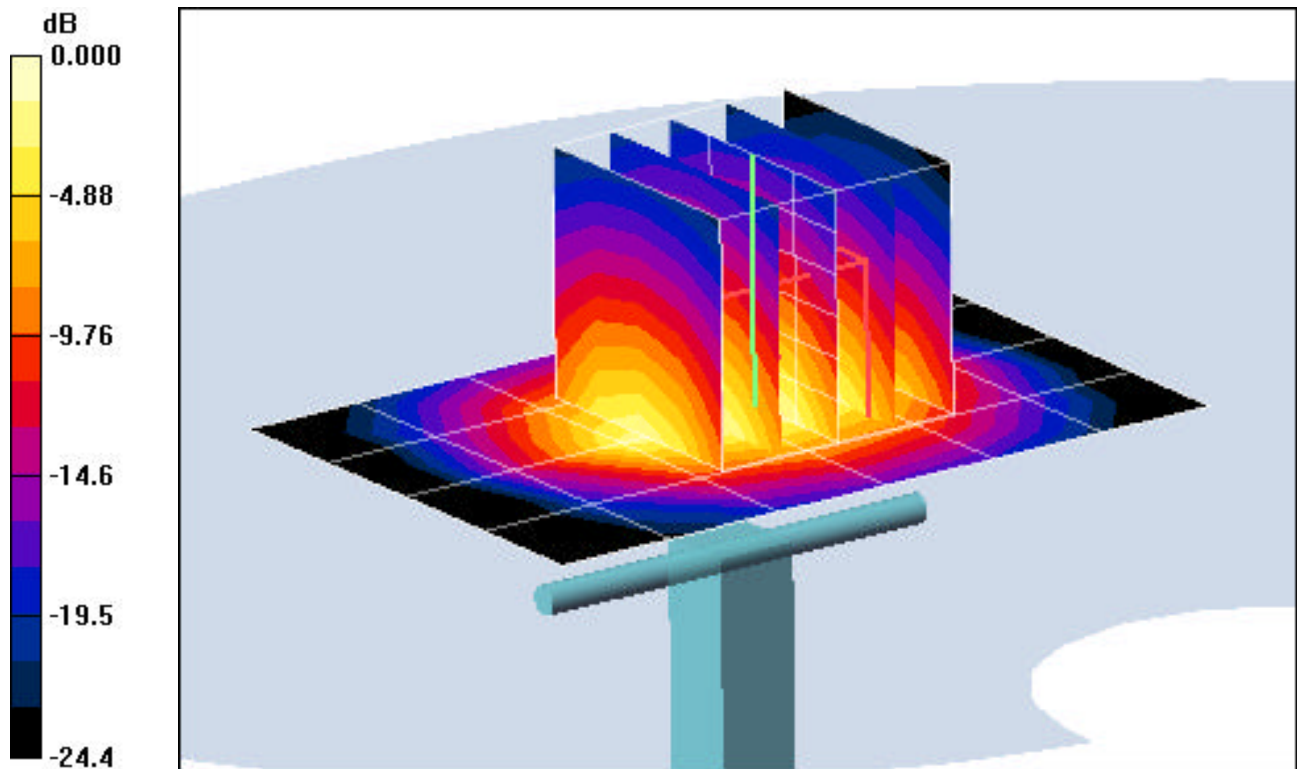
Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

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

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 5.69 mW/g; SAR(10 g) = 2.58 mW/g

Deviation = + 5.18 %



0 dB = 7.40mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: 2450MHz SAR Validation Dipole; Type: D2450V2; Serial: 797

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

Medium: 2450 Brain ($\sigma = 1.78$ mho/m, $\epsilon_r = 39.82$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-17-2008; Ambient Temp: 23.5°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN3561; ConvF(6.38, 6.38, 6.38); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/30/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

2450MHz Dipole Validation

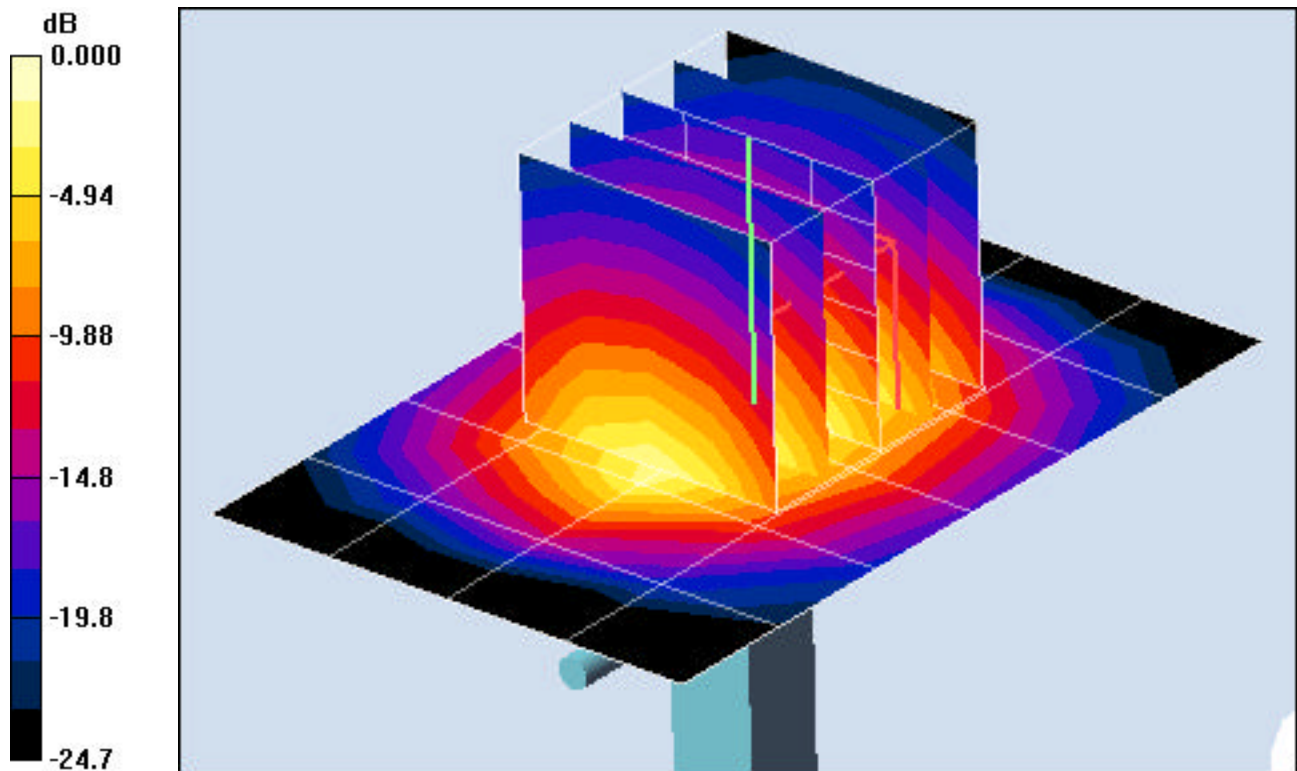
Area Scan (5x7x1): Measurement grid: dx=15mm, dy=15mm

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

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 5.66 mW/g; SAR(10 g) = 2.57 mW/g

Deviation = + 4.62 %



0 dB = 7.38mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: 5GHz SAR Validation Dipole; Type: D5GHzV2; Serial: 1007

Communication System: CW; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium: 5300 Muscle ($\sigma = 5.54$ mho/m, $\epsilon_r = 51.16$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-18-2008; Ambient Temp: 23.2°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(3.96, 3.96, 3.96); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/30/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

5200MHz Dipole Validation

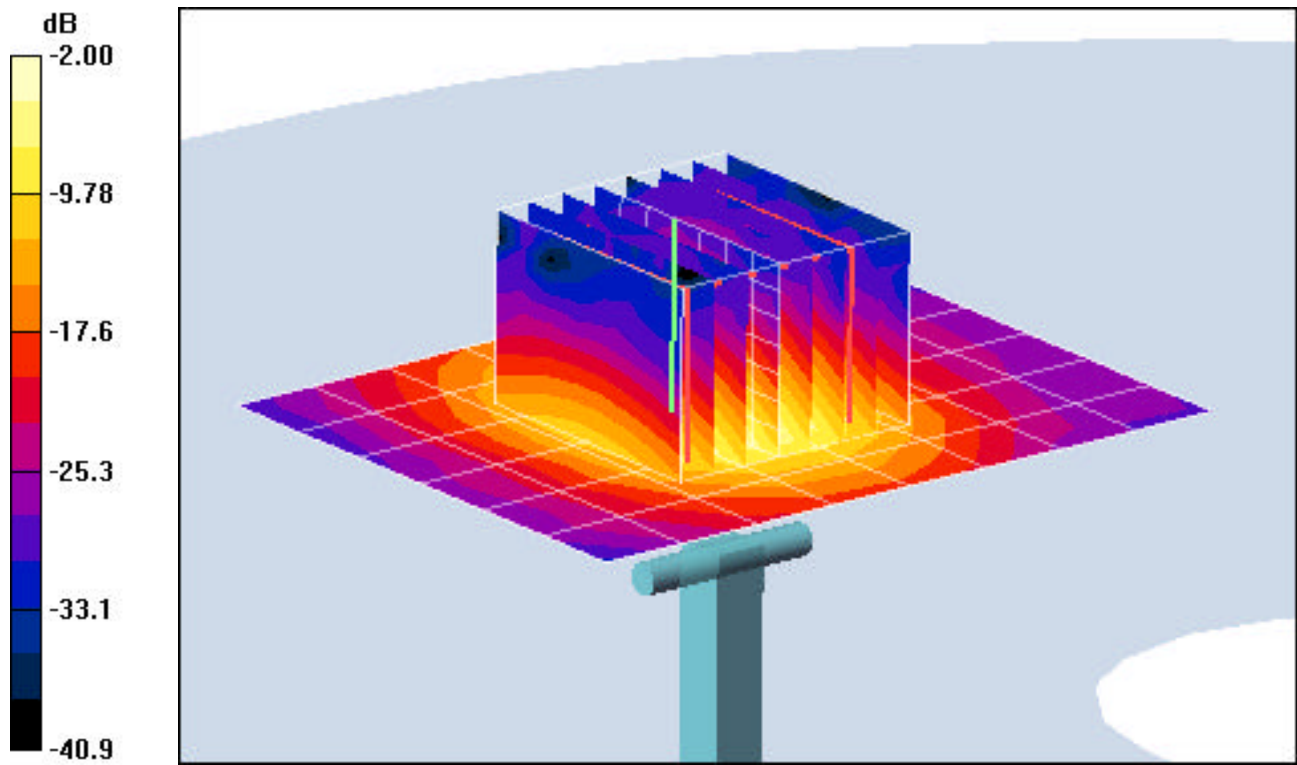
Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm

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

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 7.43 mW/g; SAR(10 g) = 2.08 mW/g

Deviation = + 2.77 %



0 dB = 10.9mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: 5GHz SAR Validation Dipole; Type: D5GHzV2; Serial: 1007

Communication System: CW; Frequency: 5500 MHz; Duty Cycle: 1:1

Medium: 5500 Muscle ($\sigma = 5.79$ mho/m, $\epsilon_r = 50.83$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-19-2008; Ambient Temp: 23.5°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3561; ConvF(3.69, 3.69, 3.69); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/30/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

5500MHz Dipole Validation

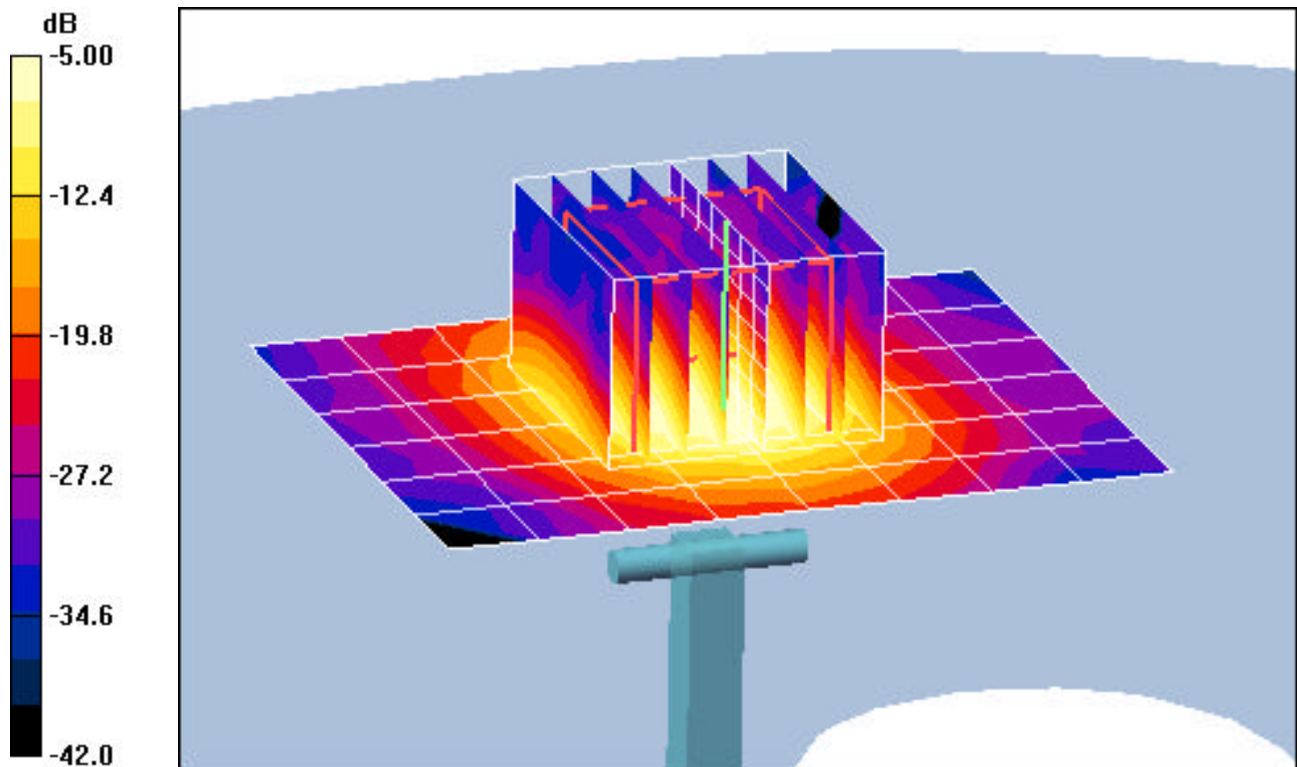
Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm

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

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 8.01 mW/g; SAR(10 g) = 2.23 mW/g

Deviation = + 4.30 %



0 dB = 11.4mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: 5GHz SAR Validation Dipole; Type: D5GHzV2; Serial: 1007

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

Medium: 5800 Muscle ($\sigma = 6.20$ mho/m, $\epsilon_r = 49.68$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 09-20-2008; Ambient Temp: 23.4°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3561; ConvF(3.65, 3.65, 3.65); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/30/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

5800MHz Dipole Validation

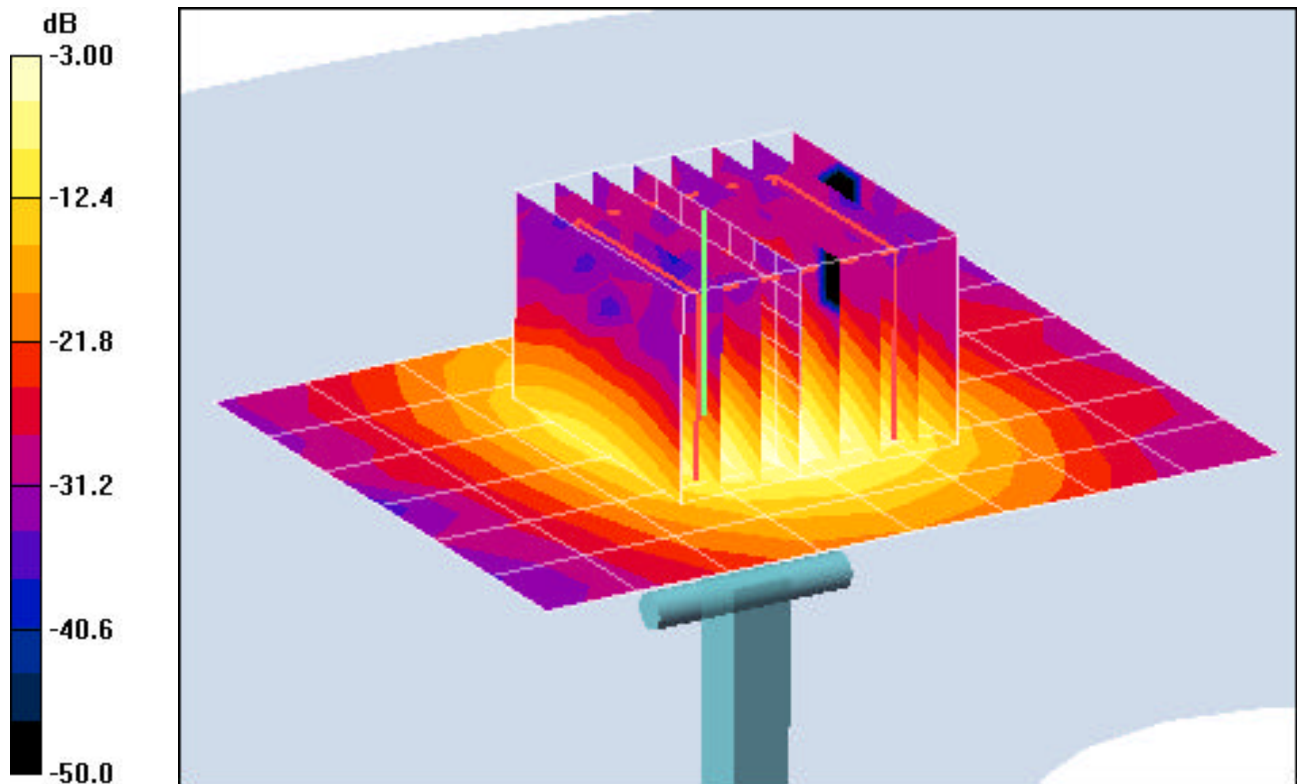
Area Scan (7x9x1): Measurement grid: dx=10mm, dy=10mm

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

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 7.19 mW/g; SAR(10 g) = 1.99 mW/g

Deviation = + 6.84 %



0 dB = 9.81mW/g

PCTEST ENGINEERING LABORATORY, INC.

DUT: SAR Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d047

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

Medium: 835 Brain ($\sigma = 0.88$ mho/m, $\epsilon_r = 40.64$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-02-2009; Ambient Temp: 22.1°C; Tissue Temp: 21.8 °C

Probe: EX3DV4 - SN3589; ConvF(8.33, 8.33, 8.33); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1406

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

835 MHz SAR Validation

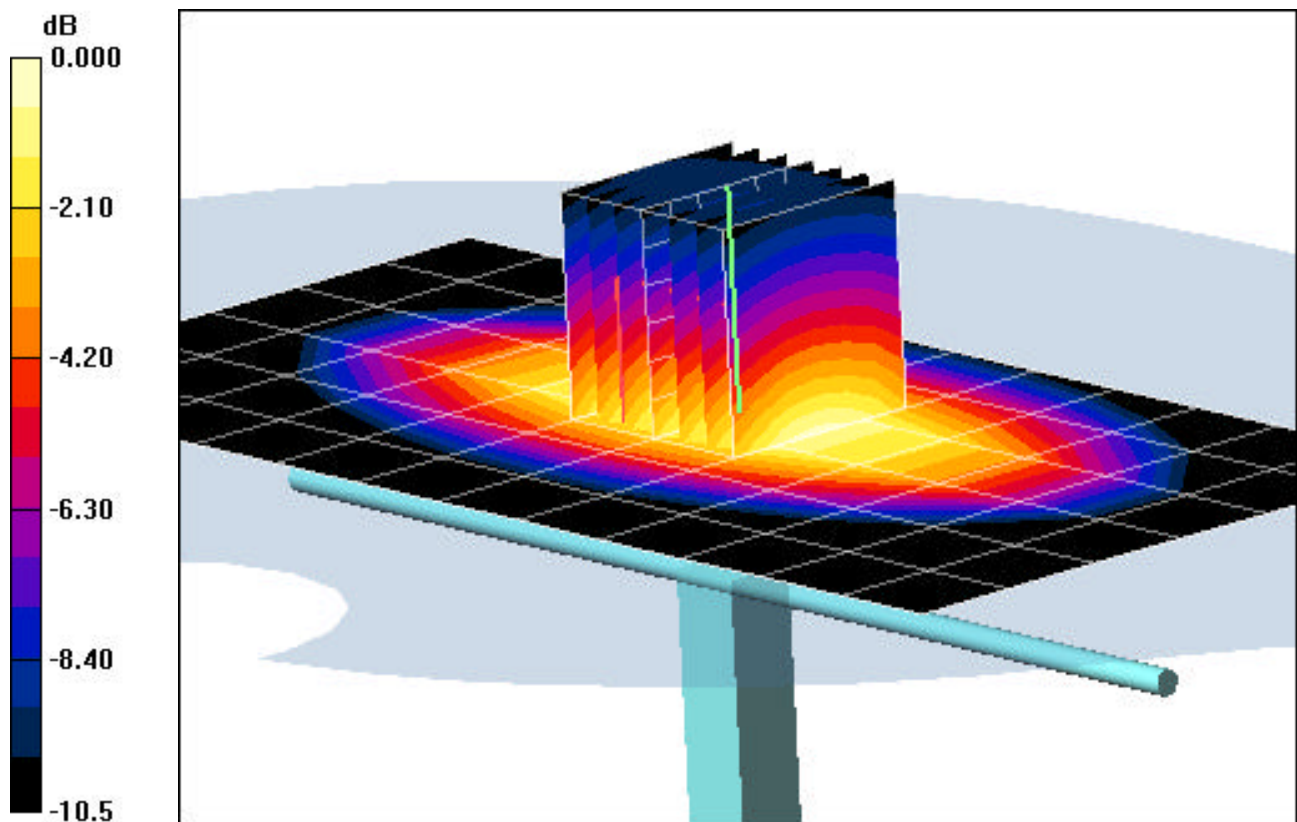
Area Scan (7x13x1): Measurement grid: dx=15mm, dy=15mm

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

Input Power = 24.0 dBm (250 mW)

SAR(1 g) = 2.41 mW/g; SAR(10 g) = 1.57 mW/g

Deviation = 5.24 %



0 dB = 2.83mW/g

PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 1900 Brain ($\sigma = 1.37$ mho/m, $\epsilon_r = 39.59$, $\rho = 1000$ kg/m³)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 01-30-2009; Ambient Temp: 22.7°C; Tissue Temp: 22.0 °C

Probe: EX3DV4 - SN3589; ConvF(7.5, 7.5, 7.5); Calibrated: 6/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn704; Calibrated: 6/26/2008

Phantom: SAM Sub; Type: SAM 4.0; Serial: TP-1403

Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

1900Mhz SAR Validation

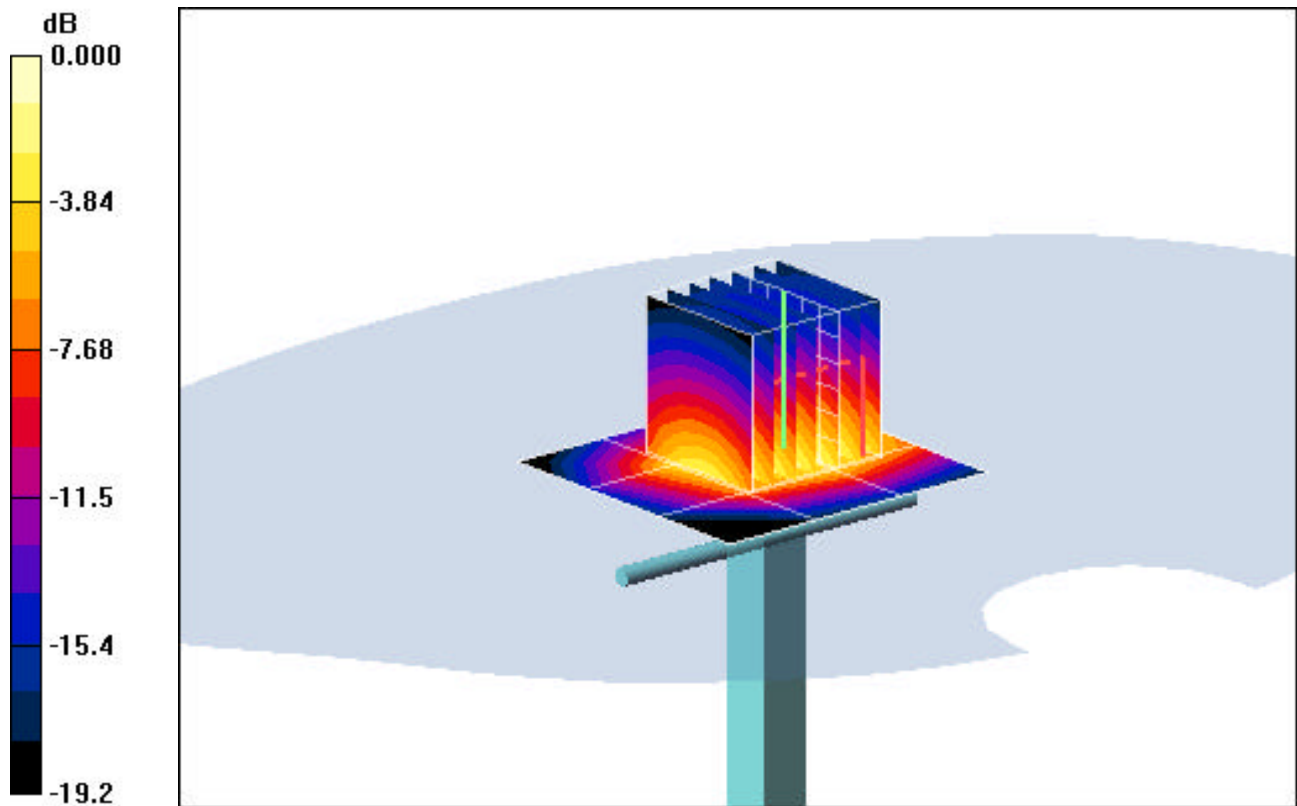
Area Scan (4x4x1): Measurement grid: dx=20mm, dy=20mm

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

Input Power = 20.0 dBm (100 mW)

SAR(1 g) = 4.00 mW/g; SAR(10 g) = 2.01 mW/g

Deviation = 0.25 %



0 dB = 5.03mW/g

APPENDIX C: PROBE CALIBRATION



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Client **PC Test**

Certificate No: **EX3-3561_Aug08**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3561**

Calibration procedure(s) **QA CAL-01.v6, QA CAL-14.v3 and QA CAL-23.v3
Calibration procedure for dosimetric E-field probes**

Calibration date: **August 26, 2008**

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 (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	1-Jul-08 (No. 217-00865)	Jul-09
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	1-Jul-08 (No. 217-00866)	Jul-09
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 660	3-Sep-07 (No. DAE4-660_Sep07)	Sep-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

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

Issued: August 26, 2008

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



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	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
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

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 E²-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 version 4.4 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:3561

Manufactured:	February 14, 2005
Last calibrated:	August 30, 2007
Recalibrated:	August 26, 2008

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: EX3DV4 SN:3561

Sensitivity in Free Space^A

NormX	0.43 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$
NormY	0.48 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	0.43 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression^B

DCP X	84 mV
DCP Y	87 mV
DCP Z	90 mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL **835 MHz** **Typical SAR gradient: 5 % per mm**

Sensor Center to Phantom Surface Distance		2.0 mm	3.0 mm
SAR _{be} [%]	Without Correction Algorithm	8.9	4.7
SAR _{be} [%]	With Correction Algorithm	0.6	0.3

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

Sensor Center to Phantom Surface Distance		2.0 mm	3.0 mm
SAR _{be} [%]	Without Correction Algorithm	7.8	3.9
SAR _{be} [%]	With Correction Algorithm	0.8	0.1

Sensor Offset

Probe Tip to Sensor Center **1.0 mm**

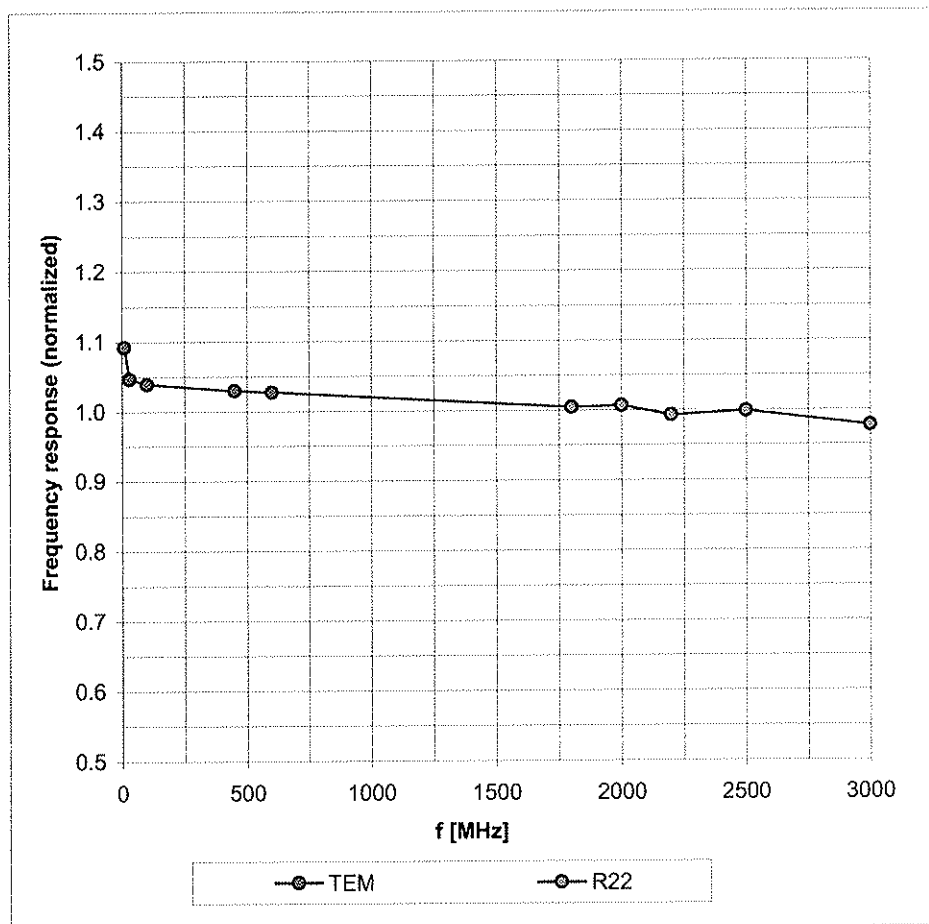
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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

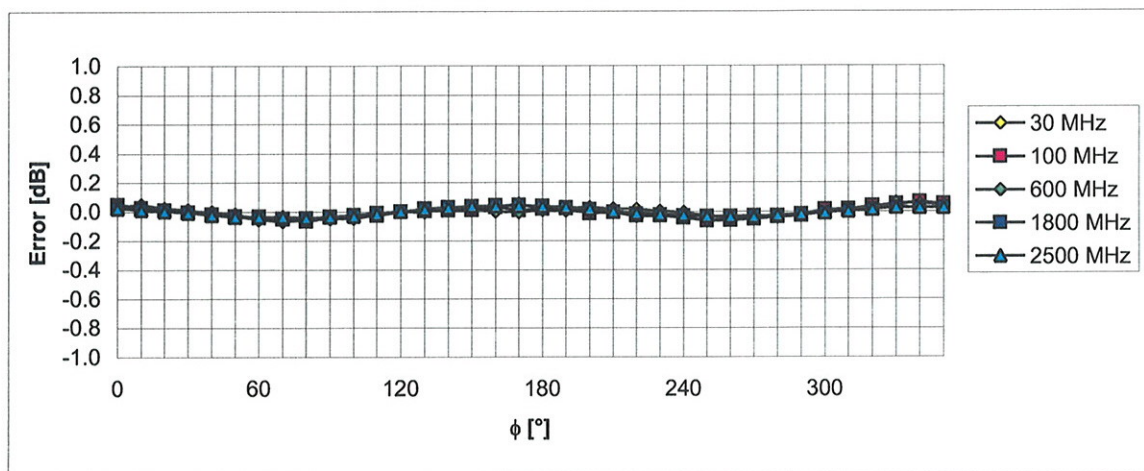
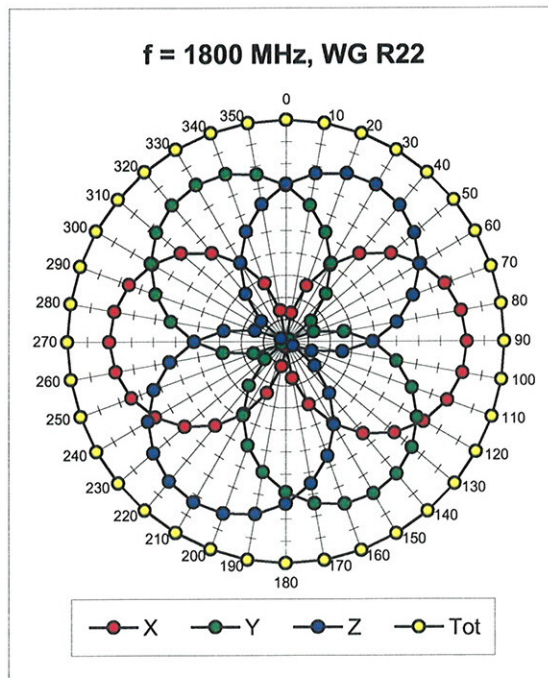
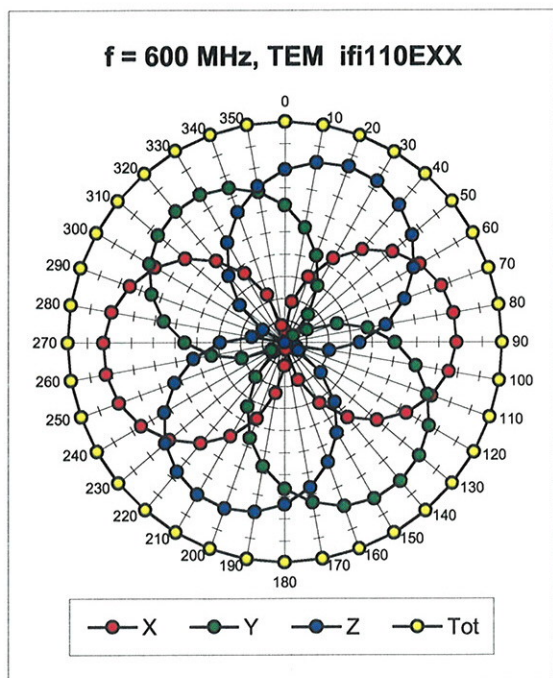
^B Numerical linearization parameter: uncertainty not required.

Frequency Response of E-Field

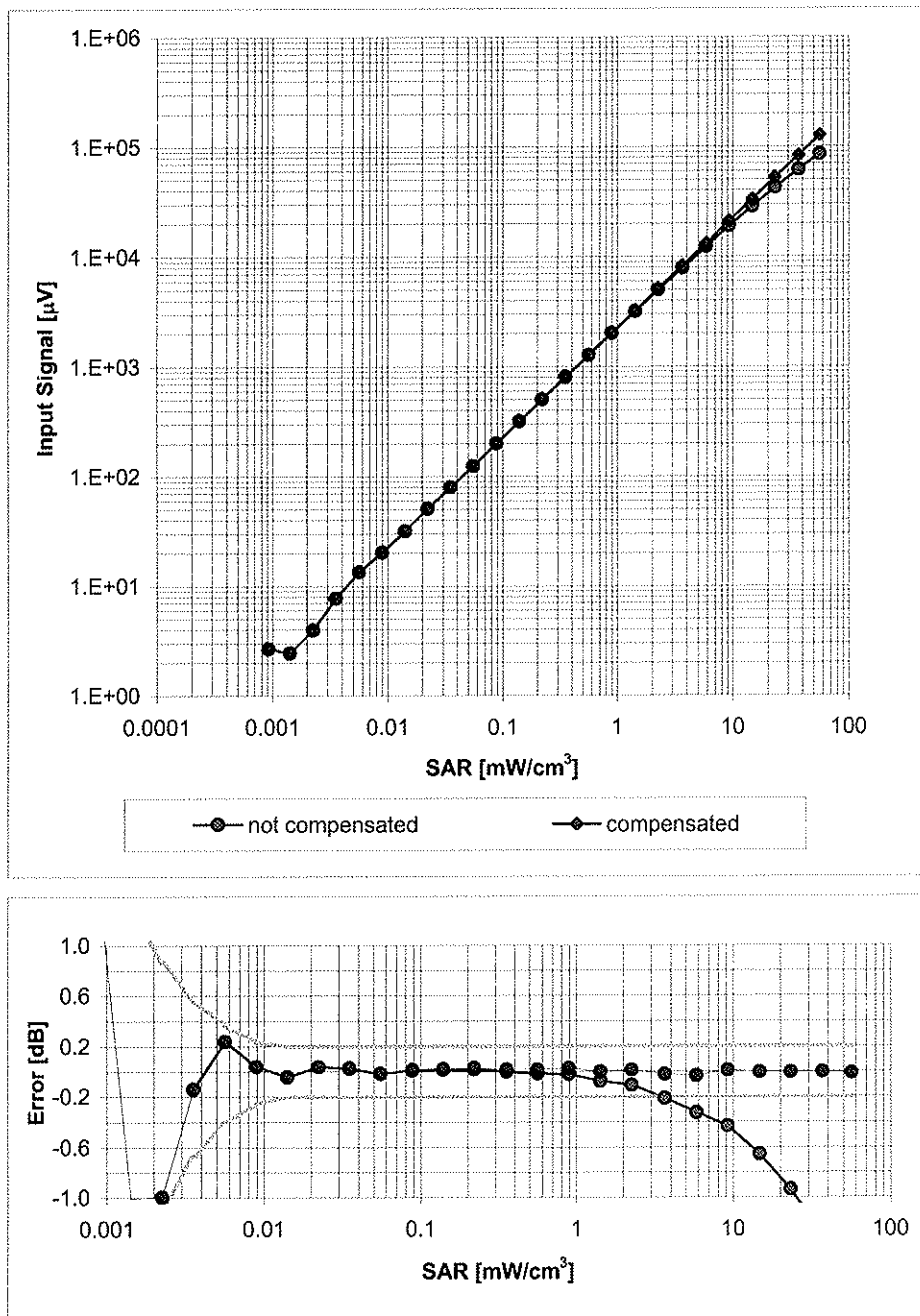
(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

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

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



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

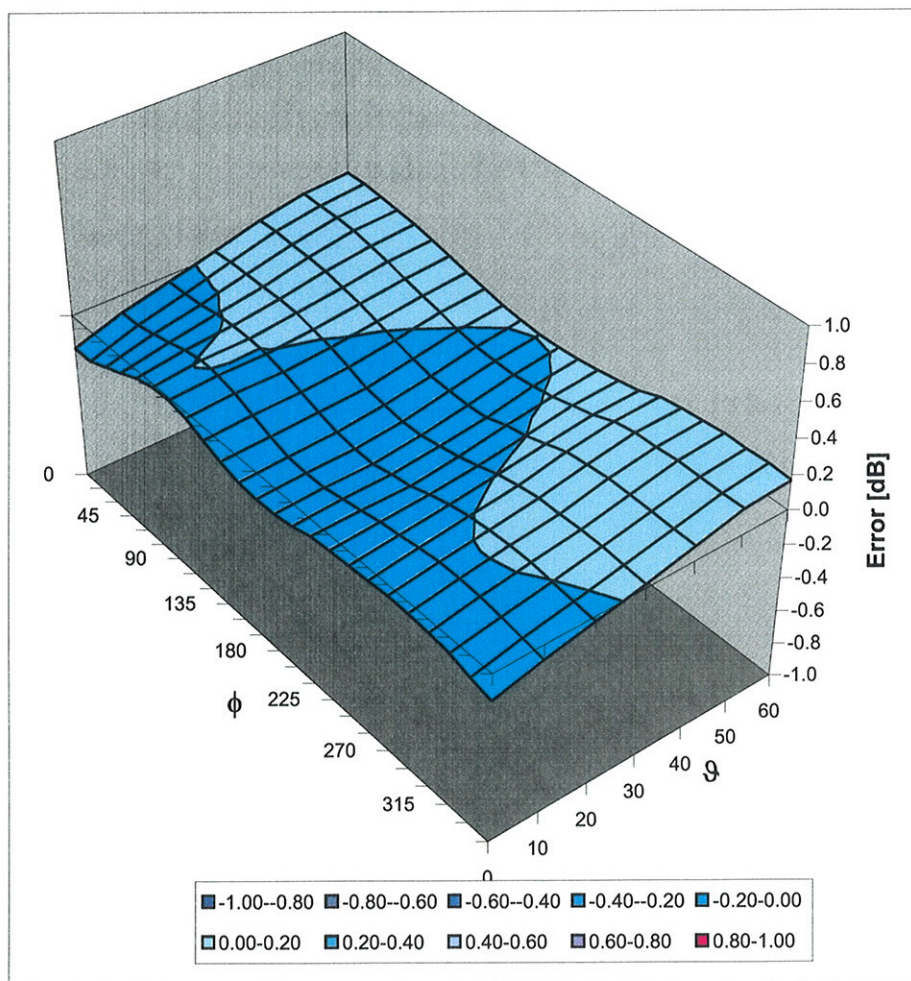
Conversion Factor Assessment

f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.50	0.75	8.22 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.50	0.70	7.01 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.66	0.63	6.38 ± 11.0% (k=2)
2600	± 50 / ± 100	Head	39.0 ± 5%	1.96 ± 5%	0.63	0.67	6.41 ± 11.0% (k=2)
4950	± 50 / ± 100	Head	36.3 ± 5%	4.40 ± 5%	0.43	1.60	4.84 ± 13.1% (k=2)
5200	± 50 / ± 100	Head	36.0 ± 5%	4.66 ± 5%	0.40	1.60	4.51 ± 13.1% (k=2)
5300	± 50 / ± 100	Head	35.9 ± 5%	4.76 ± 5%	0.40	1.60	4.29 ± 13.1% (k=2)
5500	± 50 / ± 100	Head	35.6 ± 5%	4.96 ± 5%	0.45	1.60	4.15 ± 13.1% (k=2)
5600	± 50 / ± 100	Head	35.5 ± 5%	5.07 ± 5%	0.45	1.60	3.97 ± 13.1% (k=2)
5800	± 50 / ± 100	Head	35.3 ± 5%	5.27 ± 5%	0.45	1.60	4.09 ± 13.1% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.50	0.80	8.13 ± 11.0% (k=2)
1640	± 50 / ± 100	Body	53.8 ± 5%	1.40 ± 5%	0.50	0.75	7.33 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.70	0.65	6.70 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.80	0.66	6.16 ± 11.0% (k=2)
2600	± 50 / ± 100	Body	52.5 ± 5%	2.16 ± 5%	0.76	0.69	6.22 ± 11.0% (k=2)
4950	± 50 / ± 100	Body	49.4 ± 5%	5.01 ± 5%	0.45	1.75	4.23 ± 13.1% (k=2)
5200	± 50 / ± 100	Body	49.0 ± 5%	5.30 ± 5%	0.50	1.75	3.96 ± 13.1% (k=2)
5300	± 50 / ± 100	Body	48.5 ± 5%	5.42 ± 5%	0.50	1.75	3.83 ± 13.1% (k=2)
5500	± 50 / ± 100	Body	48.6 ± 5%	5.65 ± 5%	0.50	1.75	3.69 ± 13.1% (k=2)
5600	± 50 / ± 100	Body	48.5 ± 5%	5.77 ± 5%	0.50	1.75	3.73 ± 13.1% (k=2)
5800	± 50 / ± 100	Body	48.2 ± 5%	6.00 ± 5%	0.45	1.75	3.65 ± 13.1% (k=2)

^c 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 (ϕ , ϑ), $f = 900$ MHz



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



Accredited by the Swiss Accreditation Service (SAS)
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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **PC Test**

Certificate No: **EX3-3589_Jun08**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3589**

Calibration procedure(s) **QA CAL-01.v6, QA CAL-14.v3 and QA CAL-23.v3
 Calibration procedure for dosimetric E-field probes**

Calibration date: **June 26, 2008**

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 ± 3)°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41495277	1-Apr-08 (No. 217-00788)	Apr-09
Power sensor E4412A	MY41498087	1-Apr-08 (No. 217-00788)	Apr-09
Reference 3 dB Attenuator	SN: S5054 (3c)	8-Aug-07 (No. 217-00719)	Aug-08
Reference 20 dB Attenuator	SN: S5086 (20b)	31-Mar-08 (No. 217-00787)	Apr-09
Reference 30 dB Attenuator	SN: S5129 (30b)	8-Aug-07 (No. 217-00720)	Aug-08
Reference Probe ES3DV2	SN: 3013	2-Jan-08 (No. ES3-3013_Jan08)	Jan-09
DAE4	SN: 660	3-Sep-07 (No. DAE4-660_Sep07)	Sep-08

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-07)	In house check: Oct-08

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

Issued: June 26, 2008

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



Accredited by the Swiss Accreditation Service (SAS)
 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
ConvF	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
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

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 E²-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 version 4.4 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:3589

Manufactured:	March 30, 2006
Last calibrated:	May 28, 2007
Recalibrated:	June 26, 2008

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: EX3DV4 SN:3589

Sensitivity in Free Space^A

Diode Compression^B

NormX	0.47 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP X	96 mV
NormY	0.38 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Y	96 mV
NormZ	0.37 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Z	96 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	10.3	5.7
SAR _{be} [%]	With Correction Algorithm	0.8	0.5

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

Sensor Center to Phantom Surface Distance		2.0 mm	3.0 mm
SAR _{be} [%]	Without Correction Algorithm	7.7	3.6
SAR _{be} [%]	With Correction Algorithm	0.3	0.3

Sensor Offset

Probe Tip to Sensor Center **1.0 mm**

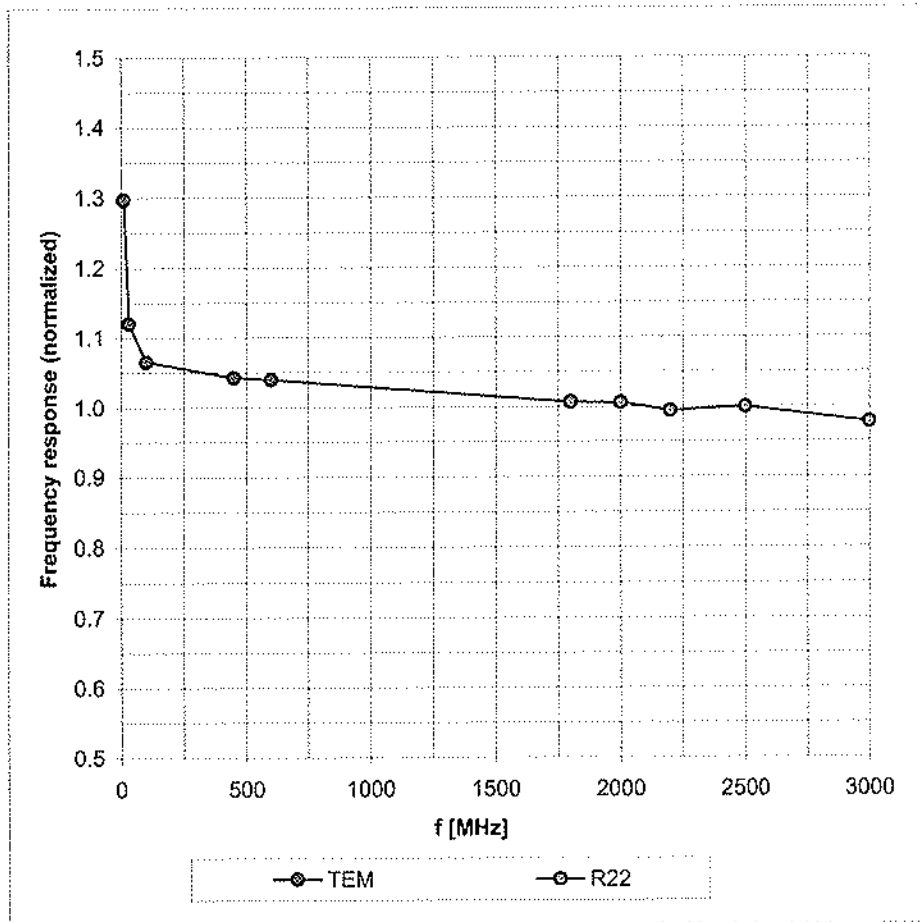
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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

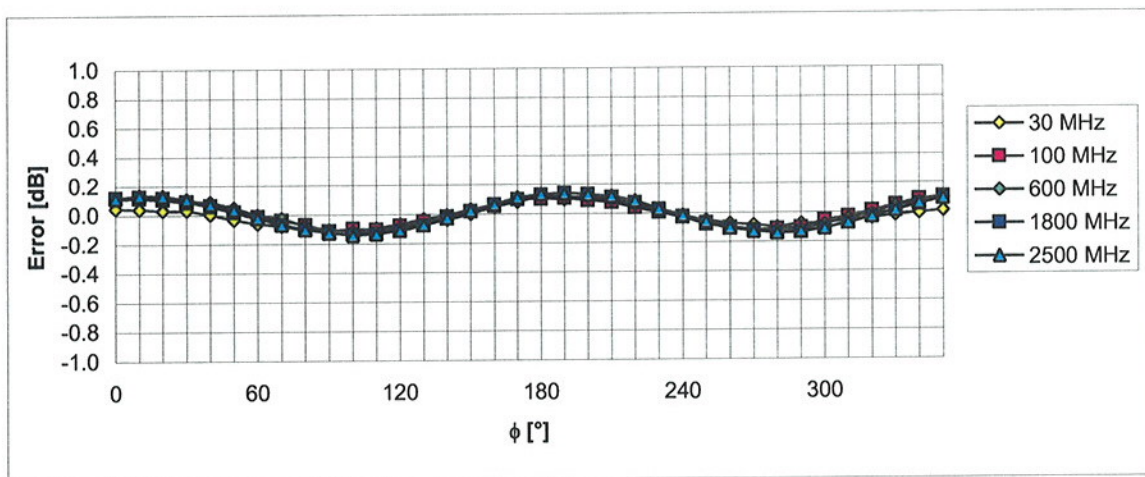
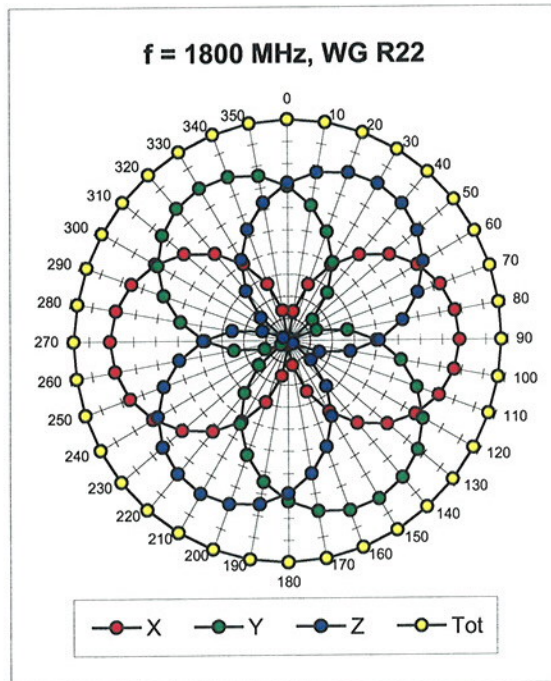
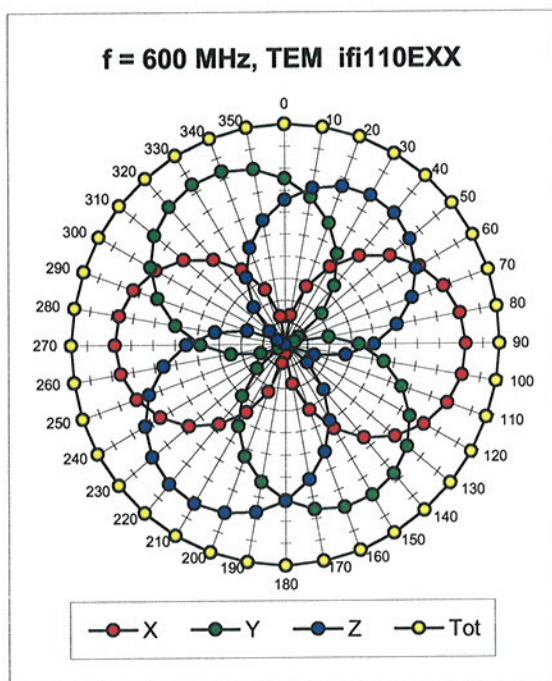
^B Numerical linearization parameter: uncertainty not required.

Frequency Response of E-Field

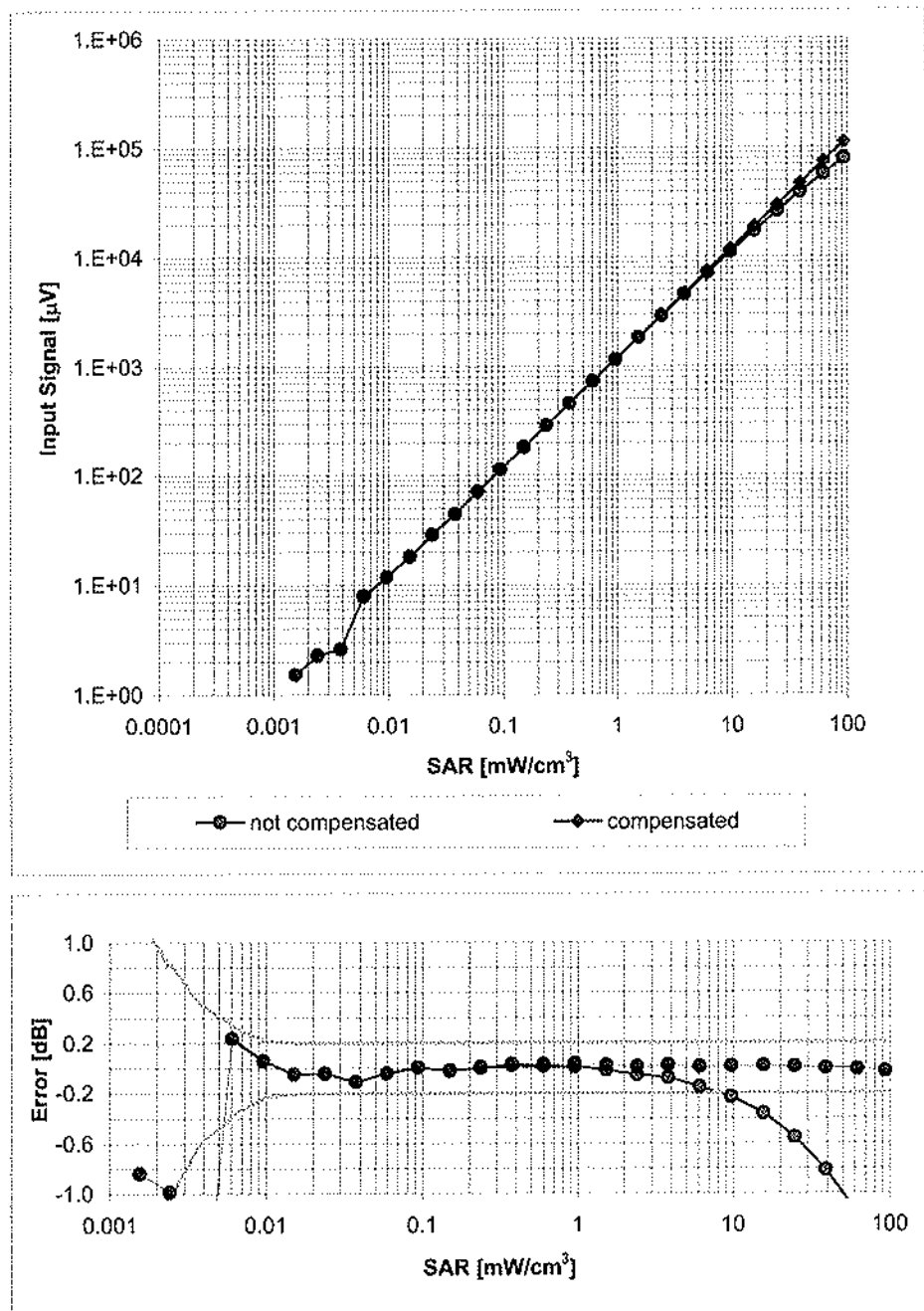
(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

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

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



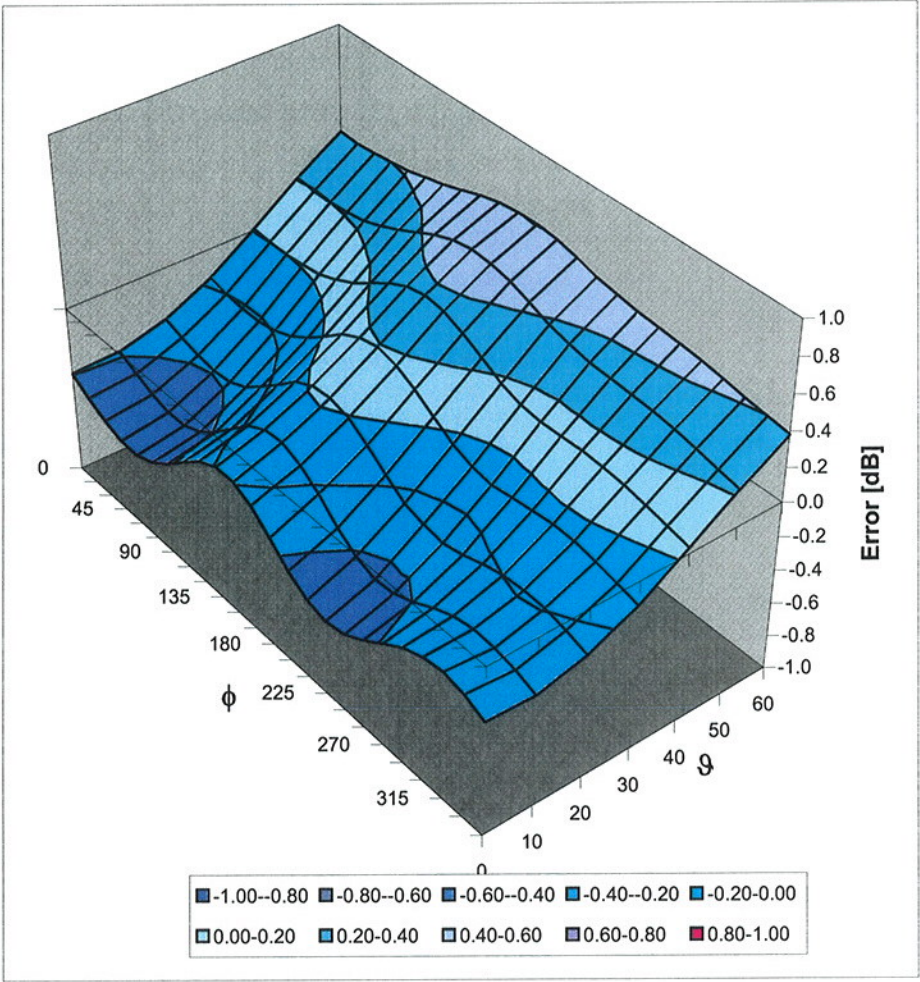
Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment

f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.81	0.67	8.33 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.51	0.70	7.50 ± 11.0% (k=2)
2300	± 50 / ± 100	Head	39.4 ± 5%	1.71 ± 5%	0.47	0.72	6.85 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.69	0.61	6.58 ± 11.0% (k=2)
2600	± 50 / ± 100	Head	39.0 ± 5%	1.96 ± 5%	0.36	0.83	6.51 ± 11.0% (k=2)
4950	± 50 / ± 100	Head	36.3 ± 5%	4.40 ± 5%	0.30	1.70	4.72 ± 13.1% (k=2)
5200	± 50 / ± 100	Head	36.0 ± 5%	4.66 ± 5%	0.33	1.75	4.67 ± 13.1% (k=2)
5300	± 50 / ± 100	Head	35.9 ± 5%	4.76 ± 5%	0.36	1.75	4.51 ± 13.1% (k=2)
5500	± 50 / ± 100	Head	35.6 ± 5%	4.96 ± 5%	0.38	1.75	4.42 ± 13.1% (k=2)
5600	± 50 / ± 100	Head	35.5 ± 5%	5.07 ± 5%	0.38	1.75	4.45 ± 13.1% (k=2)
5800	± 50 / ± 100	Head	35.3 ± 5%	5.27 ± 5%	0.38	1.75	4.40 ± 13.1% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.75	0.68	8.32 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.43	0.78	6.88 ± 11.0% (k=2)
2300	± 50 / ± 100	Body	52.8 ± 5%	1.85 ± 5%	0.43	0.88	6.51 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.46	0.86	6.27 ± 11.0% (k=2)
2600	± 50 / ± 100	Body	52.5 ± 5%	2.16 ± 5%	0.64	0.69	6.24 ± 11.0% (k=2)
4950	± 50 / ± 100	Body	49.4 ± 5%	5.01 ± 5%	0.35	1.75	4.09 ± 13.1% (k=2)
5200	± 50 / ± 100	Body	49.0 ± 5%	5.30 ± 5%	0.34	1.75	4.16 ± 13.1% (k=2)
5300	± 50 / ± 100	Body	48.5 ± 5%	5.42 ± 5%	0.42	1.75	3.86 ± 13.1% (k=2)
5500	± 50 / ± 100	Body	48.6 ± 5%	5.65 ± 5%	0.38	1.75	4.13 ± 13.1% (k=2)
5600	± 50 / ± 100	Body	48.5 ± 5%	5.77 ± 5%	0.28	1.75	4.22 ± 13.1% (k=2)
5800	± 50 / ± 100	Body	48.2 ± 5%	6.00 ± 5%	0.38	1.75	4.09 ± 13.1% (k=2)

^c 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 (ϕ , ϑ), $f = 900 \text{ MHz}$



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