

## **APPENDIX A: SAR Test Plots**

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN**  
**IMEI: 004401200315352**

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.92$  mho/m,  $\epsilon_r = 40.04$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 02-25-2009; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.22, 8.22, 8.22); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: WCDMA850, Right Head, Touch, Mid ch, Standard Battery, Touch Style**

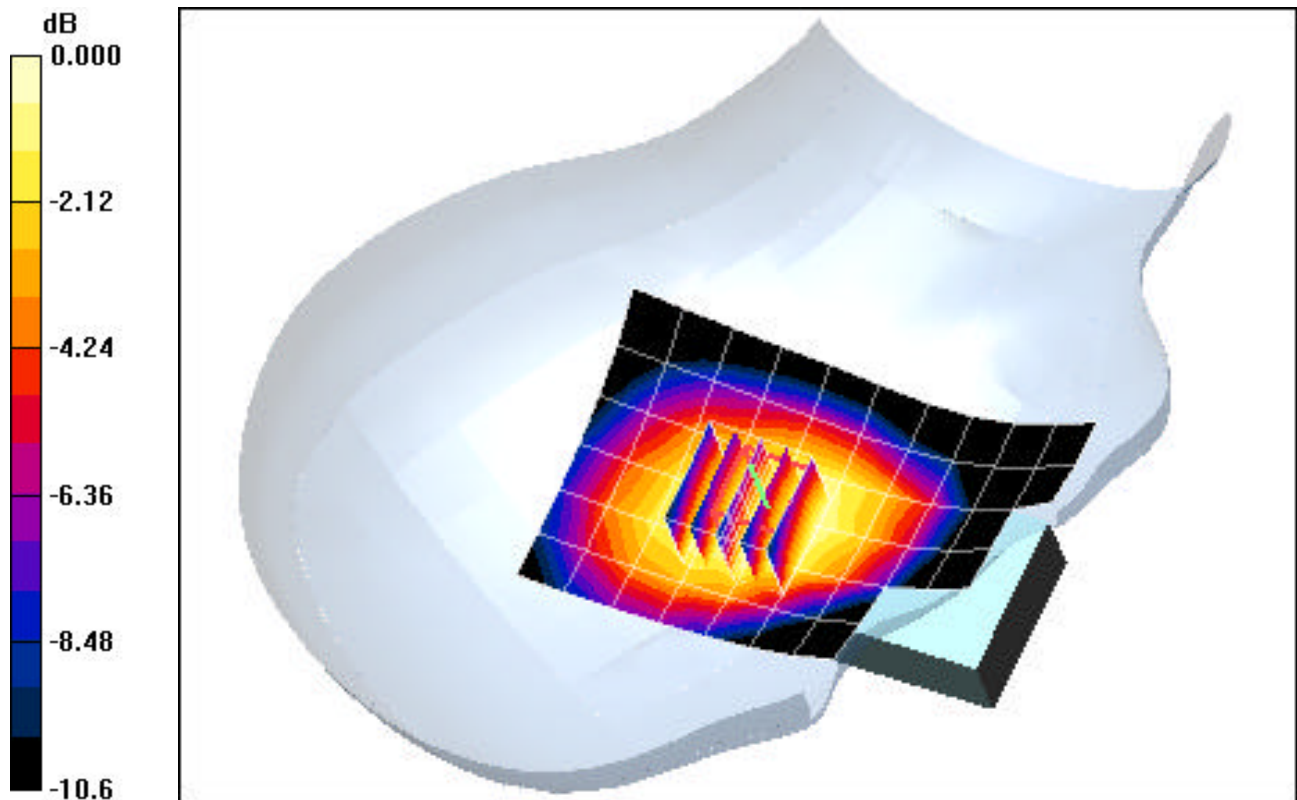
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 20.8 V/m

Peak SAR (extrapolated) = 0.474 W/kg

**SAR(1 g) = 0.377 mW/g; SAR(10 g) = 0.281 mW/g**



0 dB = 0.410mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.92$  mho/m,  $\epsilon_r = 40.04$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 02-25-2009; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.22, 8.22, 8.22); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: WCDMA850, Right Head, Tilt Mid ch, Standard Battery, Touch Style**

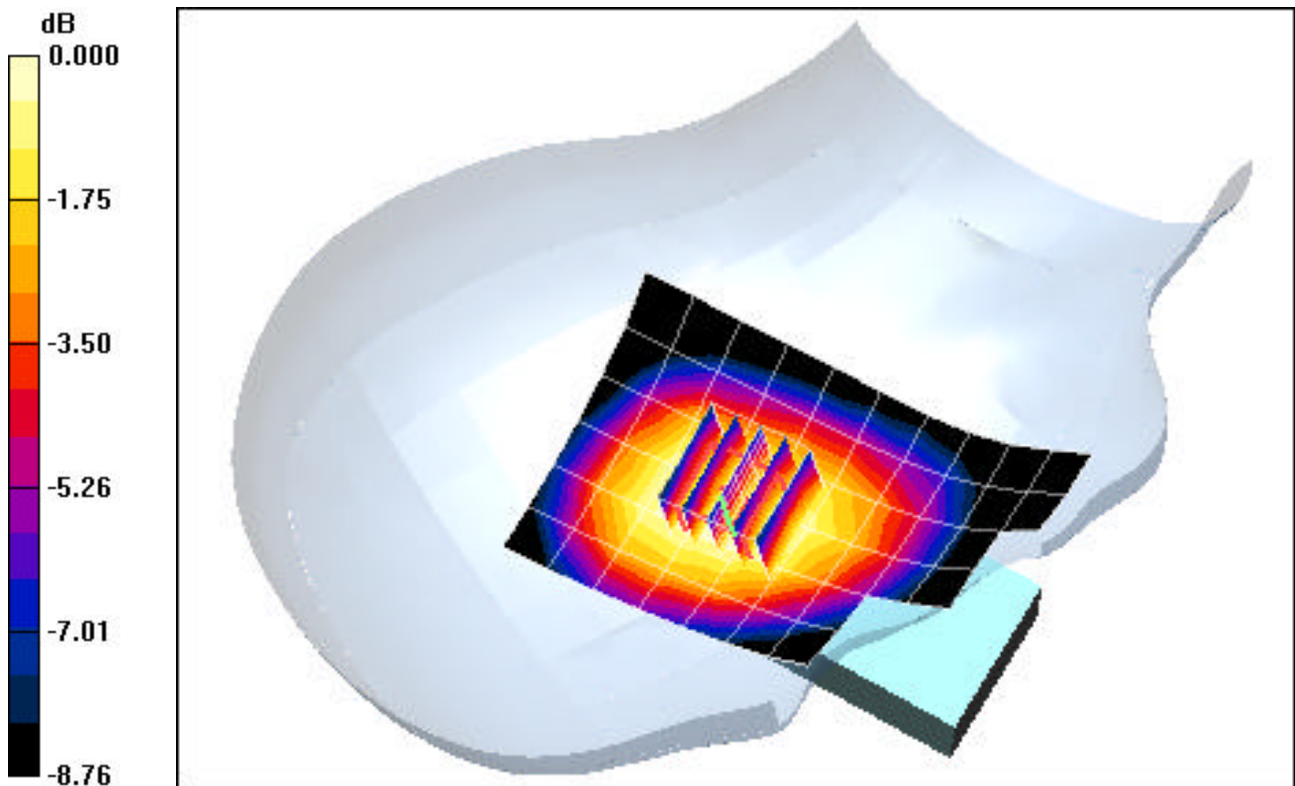
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 18.3 V/m

Peak SAR (extrapolated) = 0.362 W/kg

**SAR(1 g) = 0.286 mW/g; SAR(10 g) = 0.213 mW/g**



0 dB = 0.311mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN**  
**IMEI: 004401200315352**

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.92$  mho/m,  $\epsilon_r = 40.04$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 02-25-2009; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.22, 8.22, 8.22); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: WCDMA850, Left Head, Touch, Mid ch, Standard Battery, Touch Style**

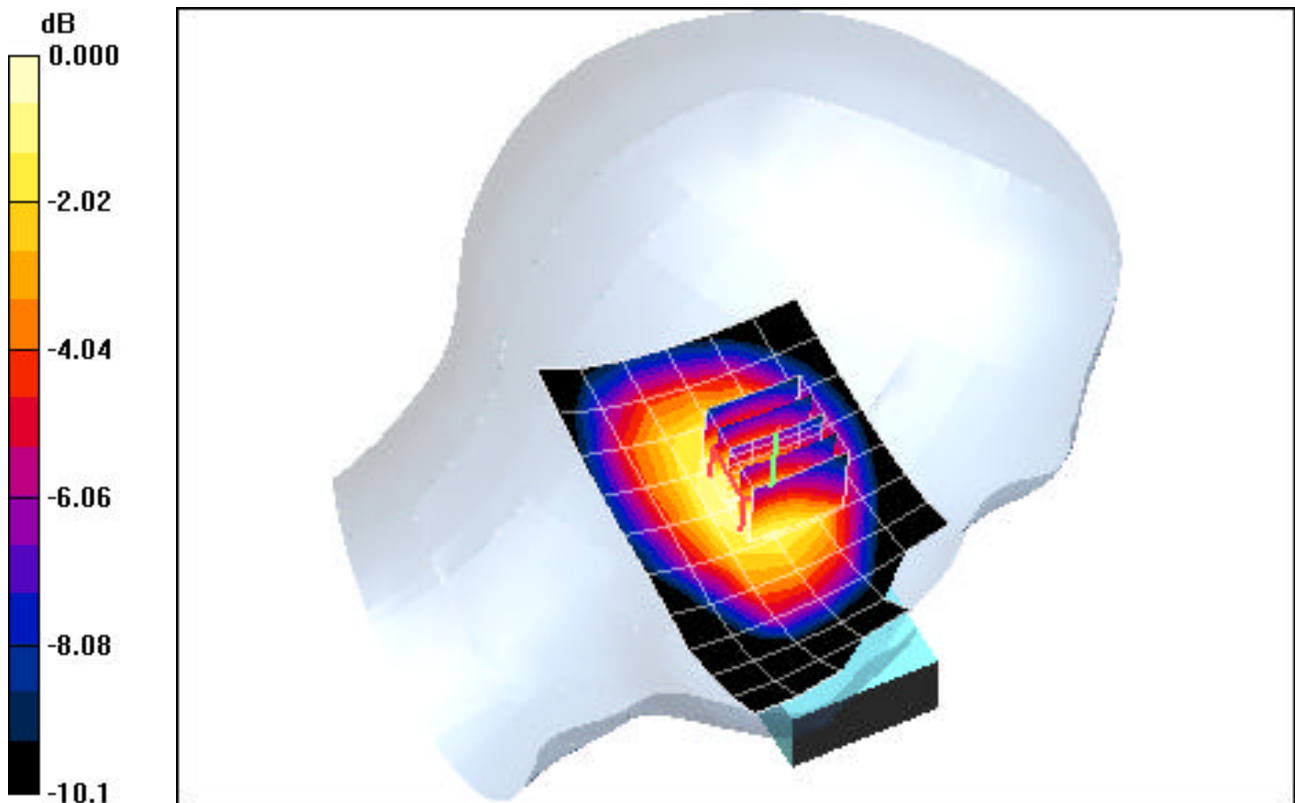
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 19.7 V/m

Peak SAR (extrapolated) = 0.432 W/kg

**SAR(1 g) = 0.344 mW/g; SAR(10 g) = 0.258 mW/g**



0 dB = 0.374mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN**  
**IMEI: 004401200315352**

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.92$  mho/m,  $\epsilon_r = 40.04$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 02-25-2009; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.22, 8.22, 8.22); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: WCDMA850, Left Head, Tilt Mid ch, Standard Battery, Touch Style**

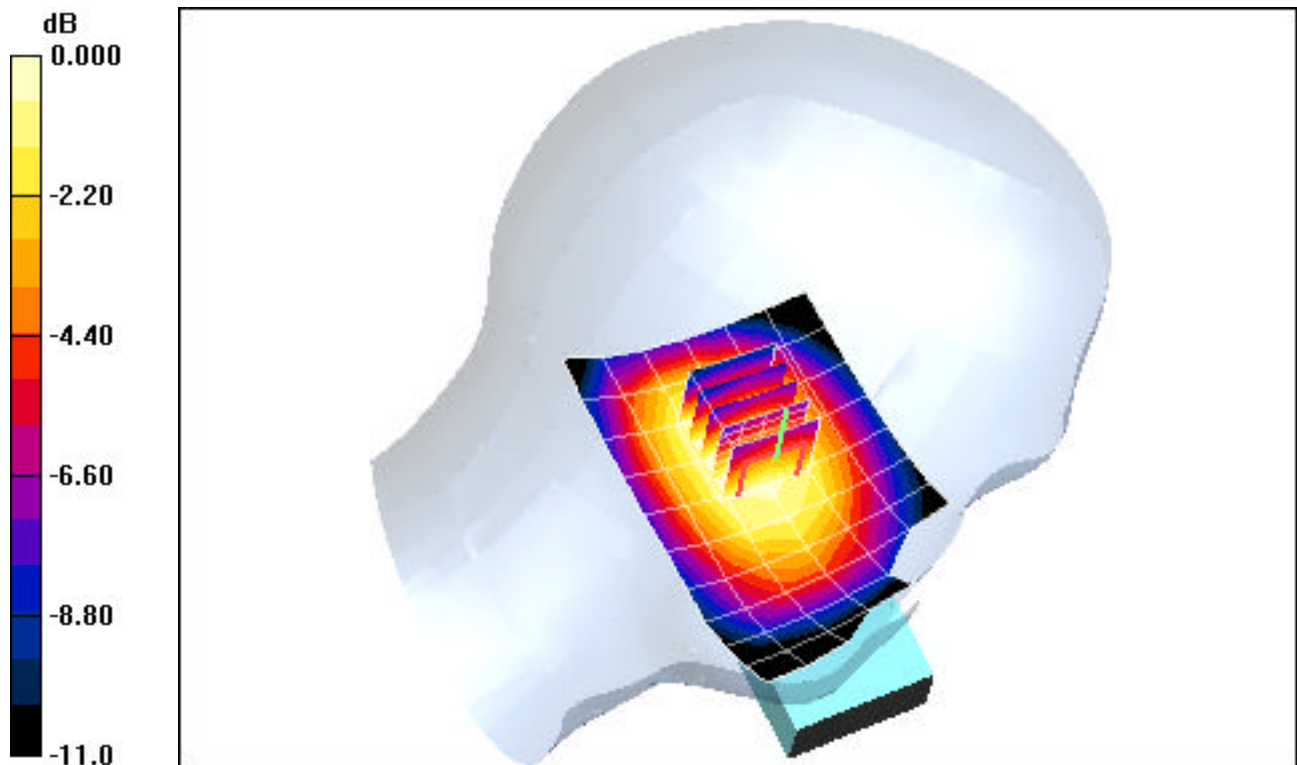
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 16.9 V/m

Peak SAR (extrapolated) = 0.348 W/kg

**SAR(1 g) = 0.239 mW/g; SAR(10 g) = 0.179 mW/g**



0 dB = 0.263mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN**  
**IMEI: 004401200315352**

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.92$  mho/m,  $\epsilon_r = 40.04$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 02-25-2009; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.22, 8.22, 8.22); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: WCDMA850, Right Head, Touch, Mid ch, Standard Battery, i-Mode Style**

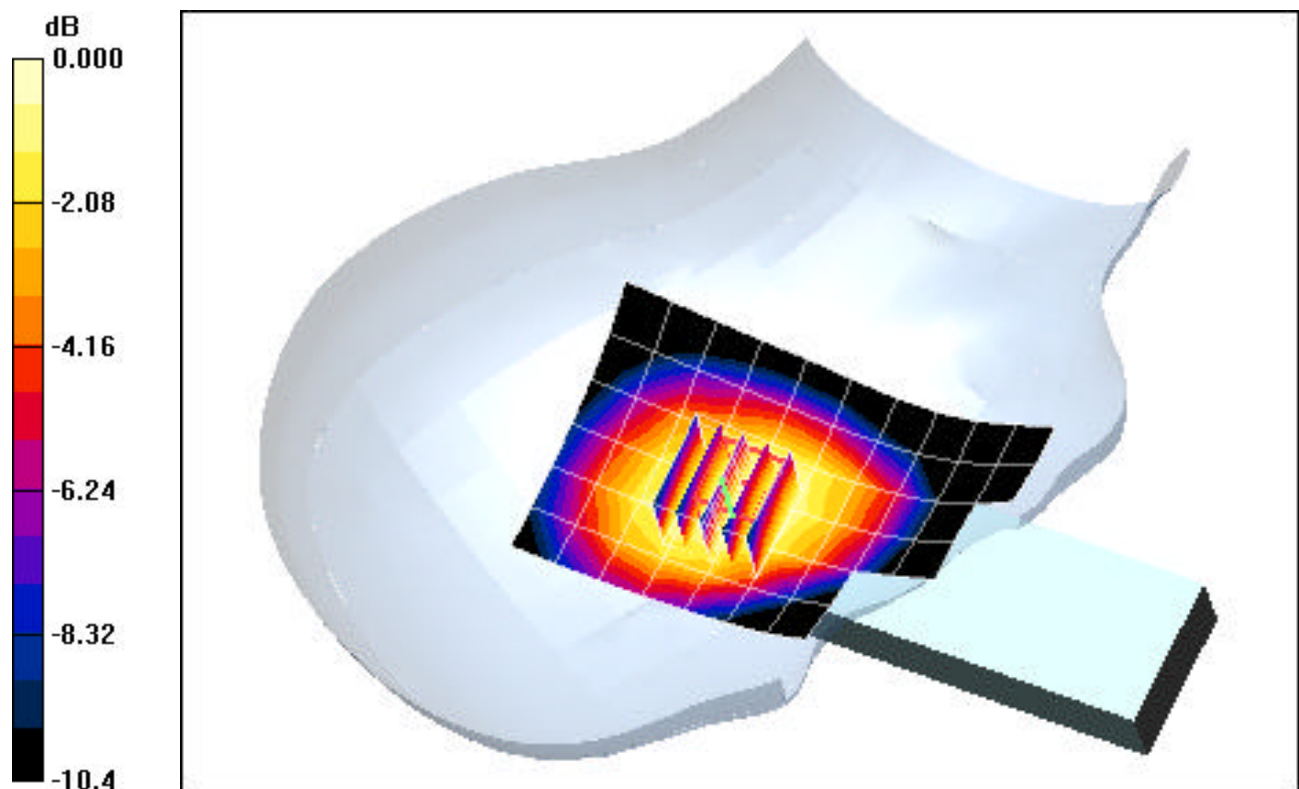
**Area Scan (7x15x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 19.6 V/m

Peak SAR (extrapolated) = 0.459 W/kg

**SAR(1 g) = 0.341 mW/g; SAR(10 g) = 0.257 mW/g**



0 dB = 0.370mW/g



# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN**  
**IMEI: 004401200315352**

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.92$  mho/m,  $\epsilon_r = 40.04$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 02-25-2009; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.22, 8.22, 8.22); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: WCDMA850, Right Head, Tilt Mid ch, Standard Battery, i-Mode Style**

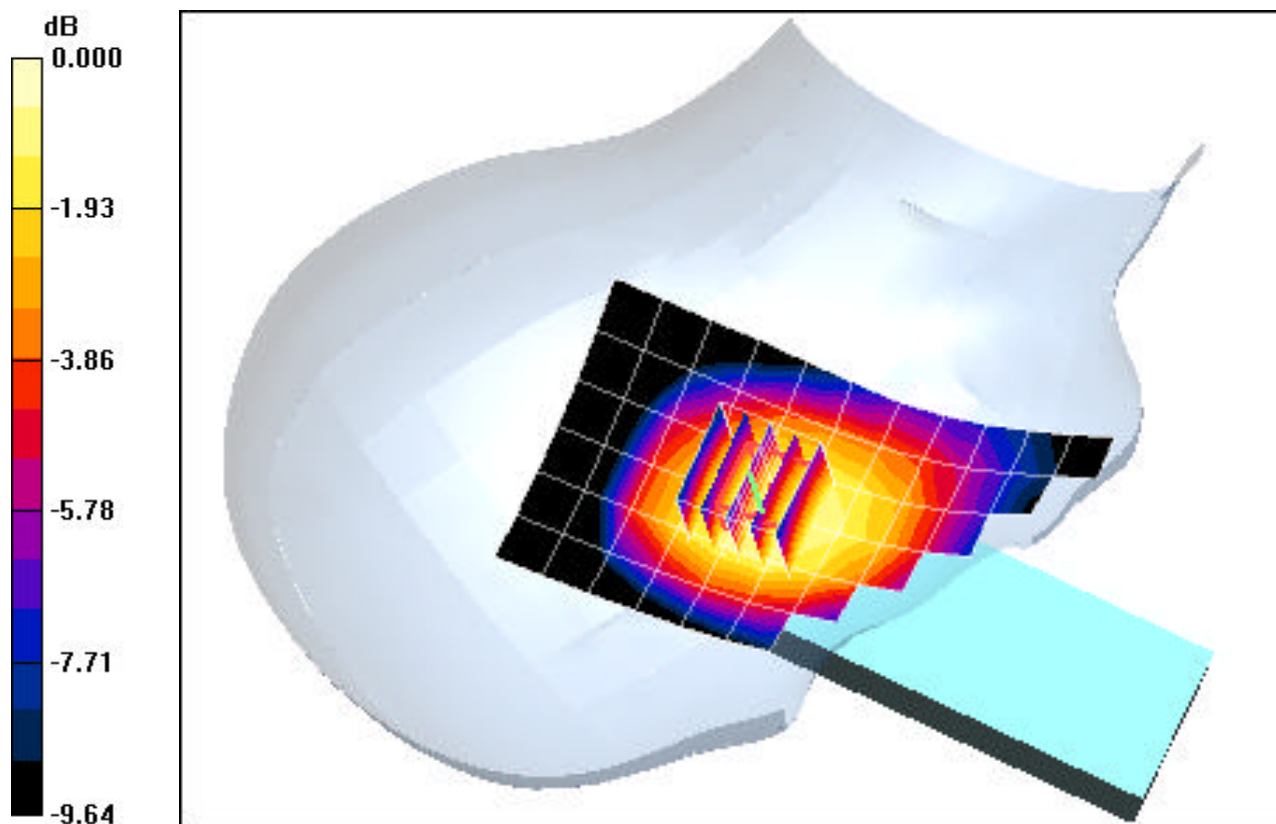
**Area Scan (7x15x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 14.1 V/m

Peak SAR (extrapolated) = 0.226 W/kg

**SAR(1 g) = 0.179 mW/g; SAR(10 g) = 0.135 mW/g**



0 dB = 0.196mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.92$  mho/m,  $\epsilon_r = 40.04$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 02-25-2009; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.22, 8.22, 8.22); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: WCDMA850, Left Head, Touch, Mid ch, Standard Battery, i-Mode Style**

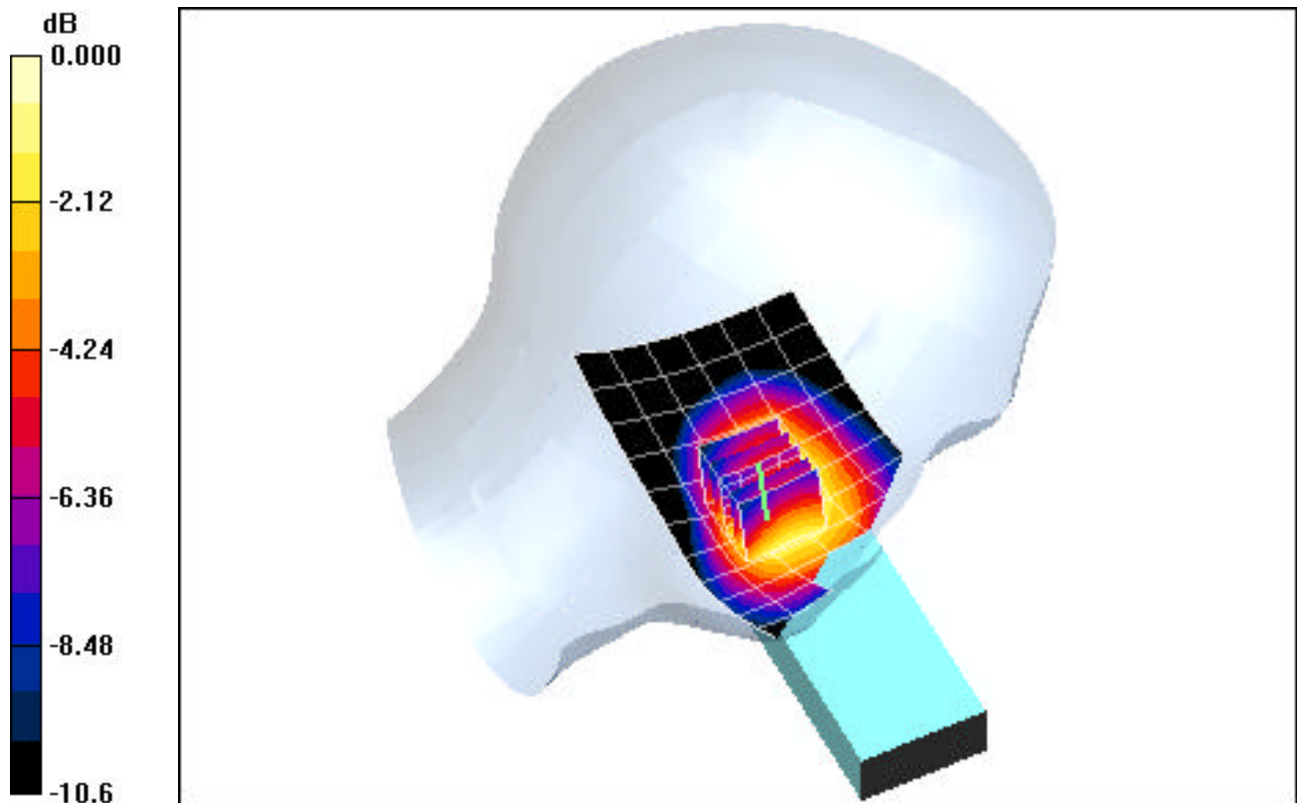
**Area Scan (7x15x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 18.6 V/m

Peak SAR (extrapolated) = 0.423 W/kg

**SAR(1 g) = 0.335 mW/g; SAR(10 g) = 0.248 mW/g**



0 dB = 0.371mW/g



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**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.92$  mho/m,  $\epsilon_r = 40.04$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 02-25-2009; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.22, 8.22, 8.22); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: WCDMA850, Left Head, Tilt Mid ch, Standard Battery, i-Mode Style**

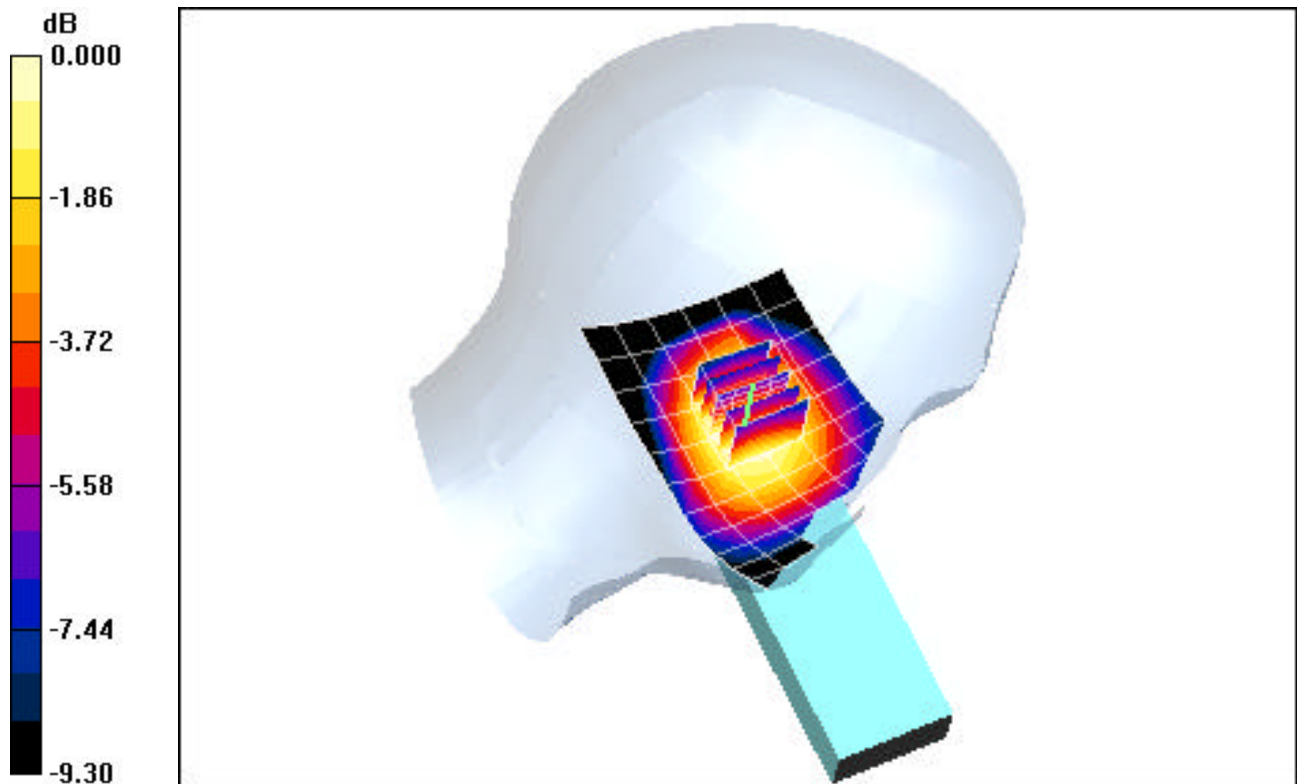
**Area Scan (7x15x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 14.3 V/m

Peak SAR (extrapolated) = 0.205 W/kg

**SAR(1 g) = 0.161 mW/g; SAR(10 g) = 0.120 mW/g**



0 dB = 0.177mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

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

Medium: 1900 Brain ( $\sigma = 1.41$  mho/m,  $\epsilon_r = 39.41$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 02-24-2009; Ambient Temp: 24.3.°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3561; ConvF(7.01, 7.01, 7.01); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: GSM1900, Right Head, Touch, Mid ch, Standard Battery, Touch Style**

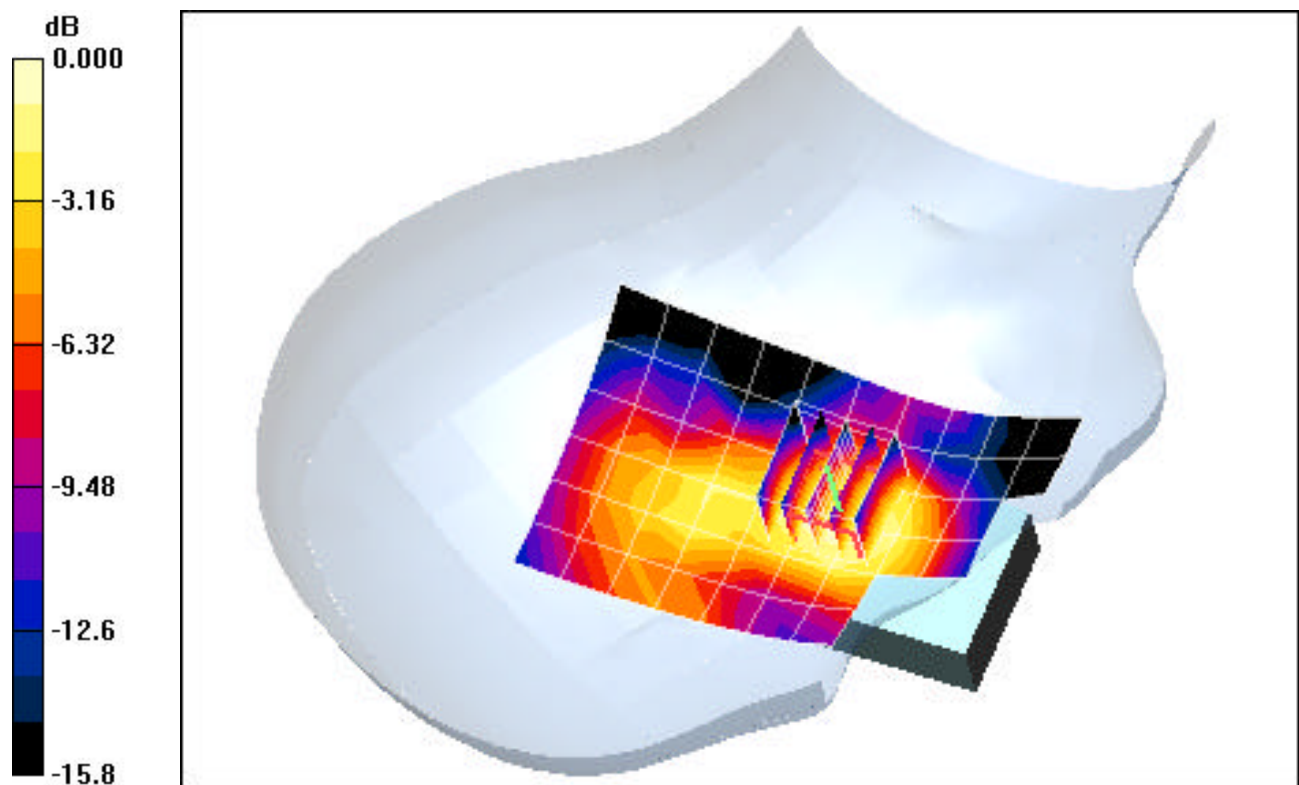
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 15.4 V/m

Peak SAR (extrapolated) = 0.459 W/kg

**SAR(1 g) = 0.328 mW/g; SAR(10 g) = 0.214 mW/g**



0 dB = 0.371mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

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

Medium: 1900 Brain ( $\sigma = 1.41$  mho/m,  $\epsilon_r = 39.41$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 02-24-2009; Ambient Temp: 24.3.°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3561; ConvF(7.01, 7.01, 7.01); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: GSM1900, Right Head, Tilt, Mid ch, Standard Battery, Touch Style**

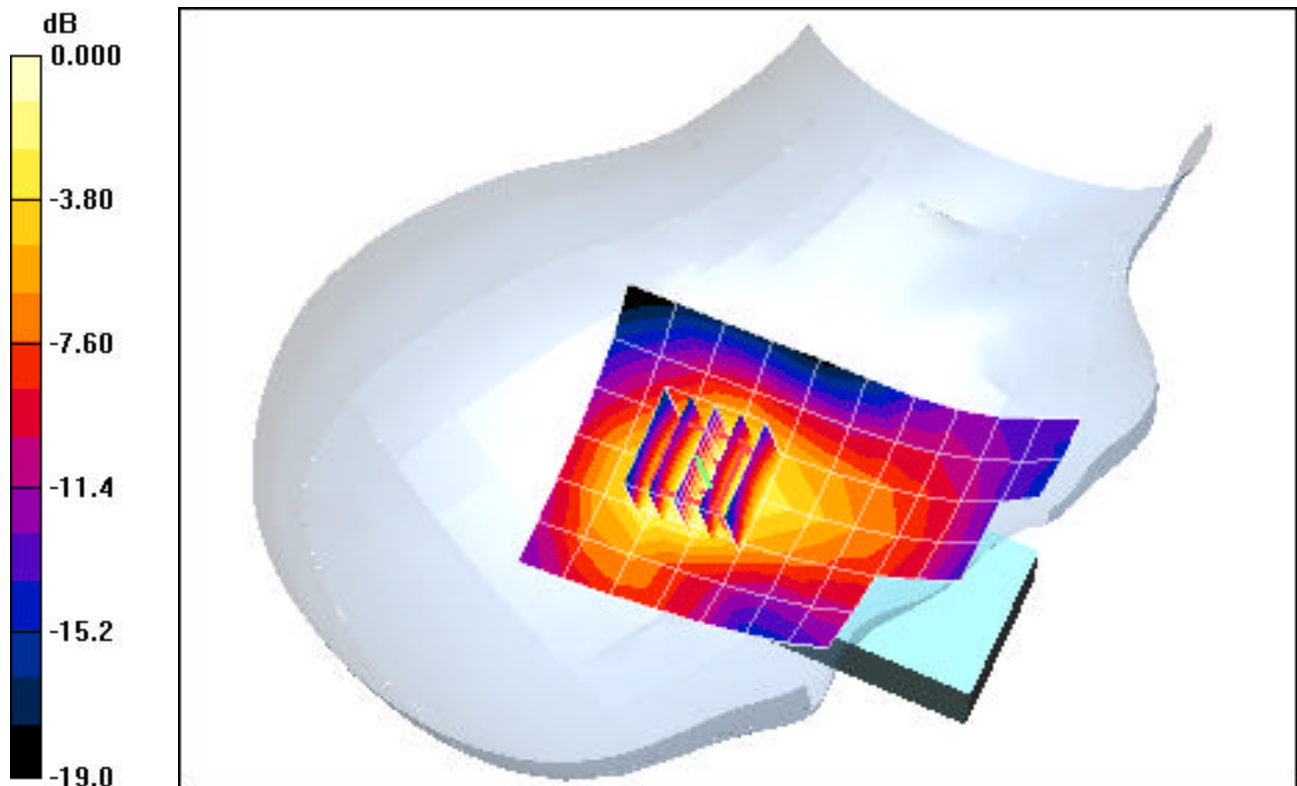
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 15.4 V/m

Peak SAR (extrapolated) = 0.490 W/kg

**SAR(1 g) = 0.308 mW/g; SAR(10 g) = 0.180 mW/g**



0 dB = 0.376mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

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

Medium: 1900 Brain ( $\sigma = 1.41$  mho/m,  $\epsilon_r = 39.41$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 02-24-2009; Ambient Temp: 24.3.°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3561; ConvF(7.01, 7.01, 7.01); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: GSM1900, Left Head, Touch, Mid ch, Standard Battery, Touch Style**

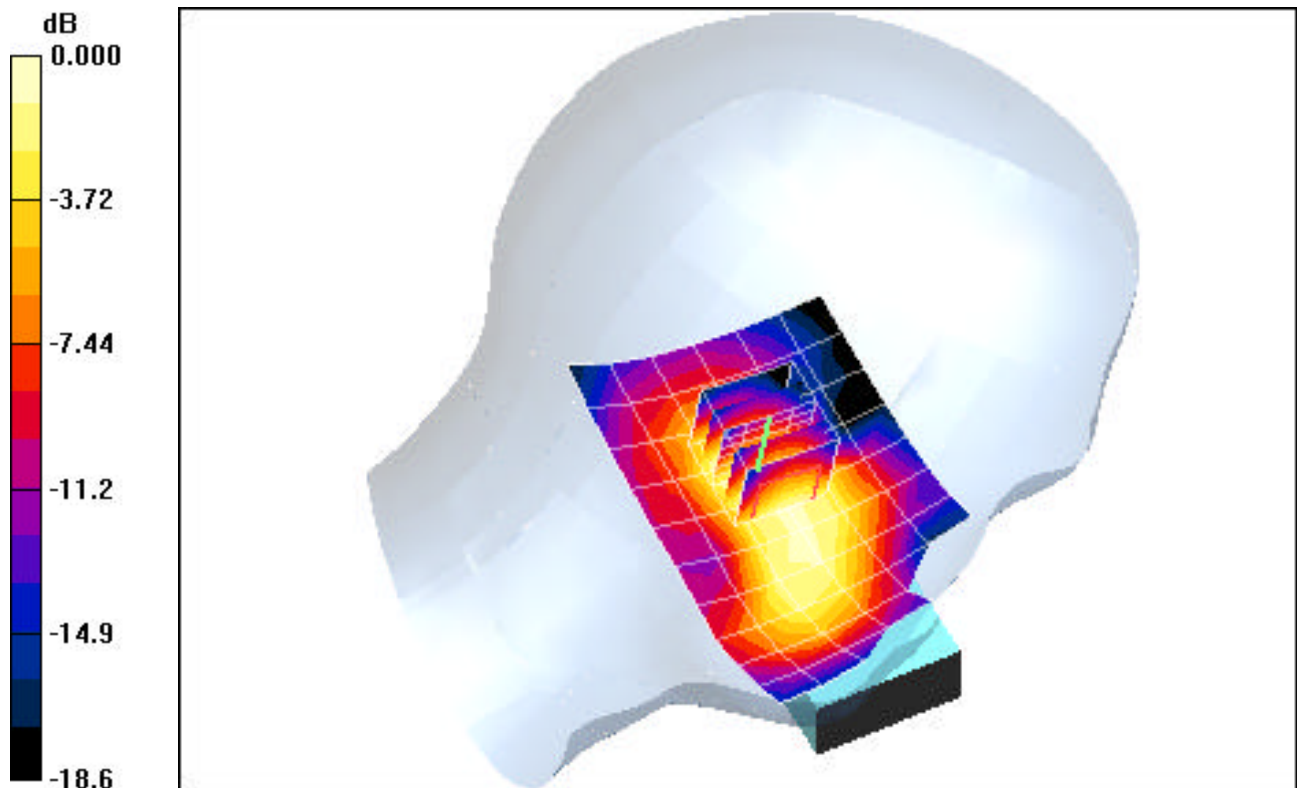
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 16.4 V/m

Peak SAR (extrapolated) = 0.580 W/kg

**SAR(1 g) = 0.361 mW/g; SAR(10 g) = 0.223 mW/g**



0 dB = 0.417mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

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

Medium: 1900 Brain ( $\sigma = 1.41$  mho/m,  $\epsilon_r = 39.41$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 02-24-2009; Ambient Temp: 24.3.°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3561; ConvF(7.01, 7.01, 7.01); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: GSM1900, Left Head, Tilt, Mid ch, Standard Battery, Touch Style**

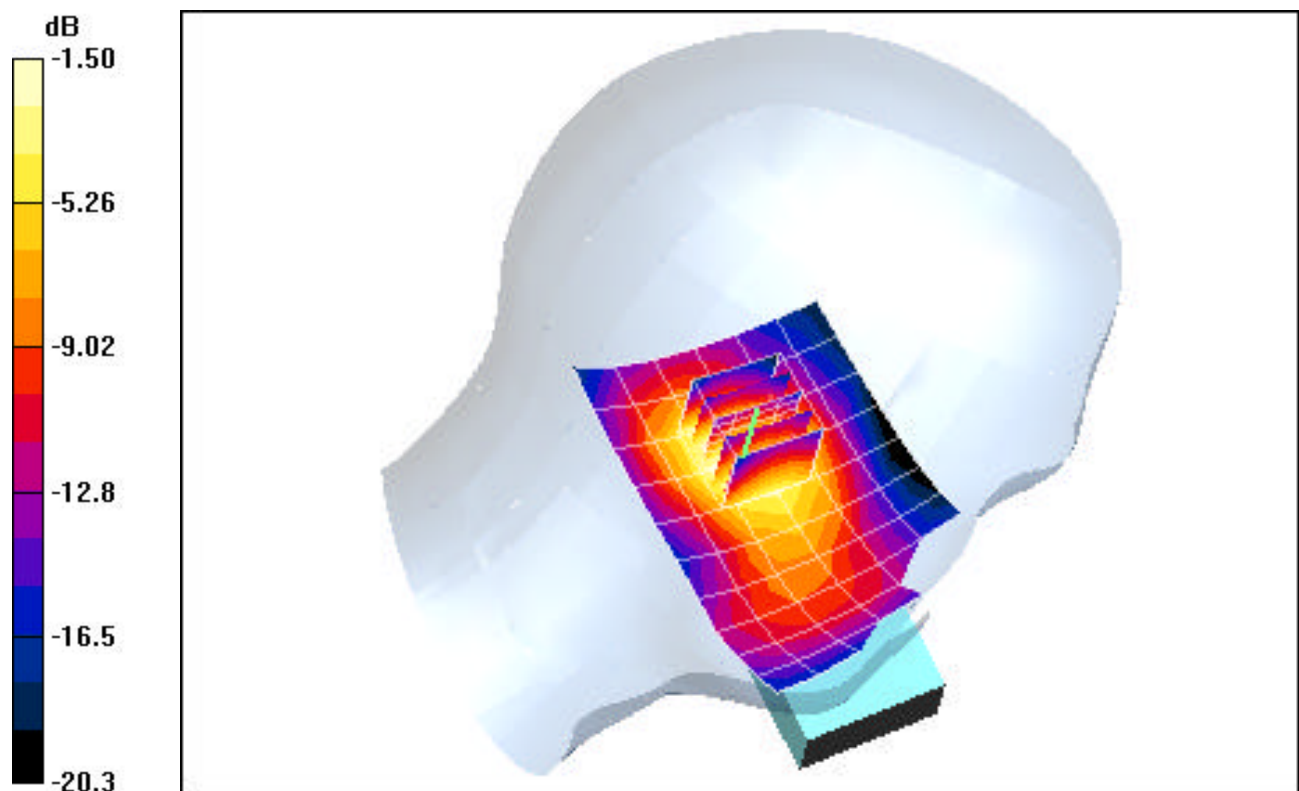
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 18.9 V/m

Peak SAR (extrapolated) = 0.801 W/kg

**SAR(1 g) = 0.487 mW/g; SAR(10 g) = 0.270 mW/g**



0 dB = 0.583mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

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

Medium: 1900 Brain ( $\sigma = 1.41$  mho/m,  $\epsilon_r = 39.41$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 02-24-2009; Ambient Temp: 24.3.°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3561; ConvF(7.01, 7.01, 7.01); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: GSM1900, Right Head, Touch, Mid ch, Standard Battery, i-Mode Style**

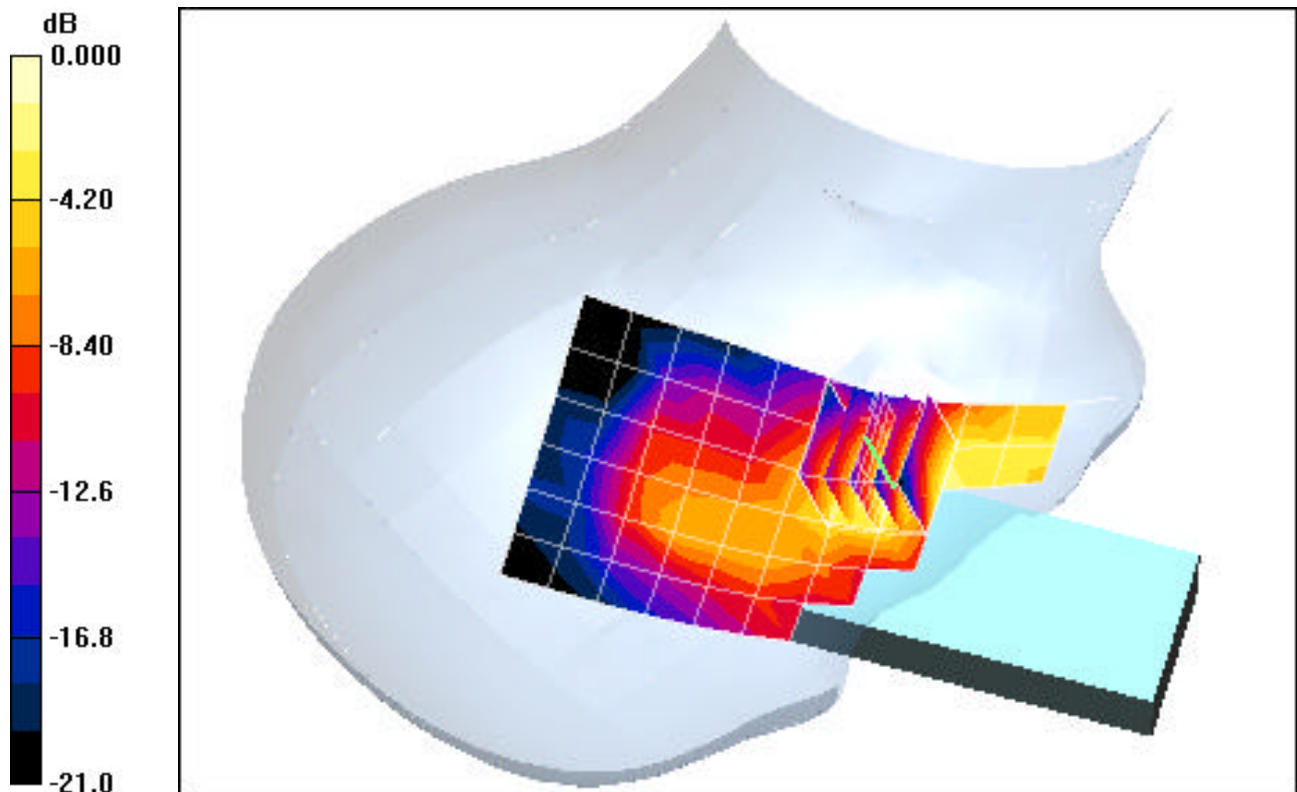
**Area Scan (7x15x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 11.7 V/m

Peak SAR (extrapolated) = 0.300 W/kg

**SAR(1 g) = 0.180 mW/g; SAR(10 g) = 0.101 mW/g**



0 dB = 0.212mW/g



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**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

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

Medium: 1900 Brain ( $\sigma = 1.41$  mho/m,  $\epsilon_r = 39.41$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 02-24-2009; Ambient Temp: 24.3.°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3561; ConvF(7.01, 7.01, 7.01); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: GSM1900, Right Head, Tilt, Mid ch, Standard Battery, i-Mode Style**

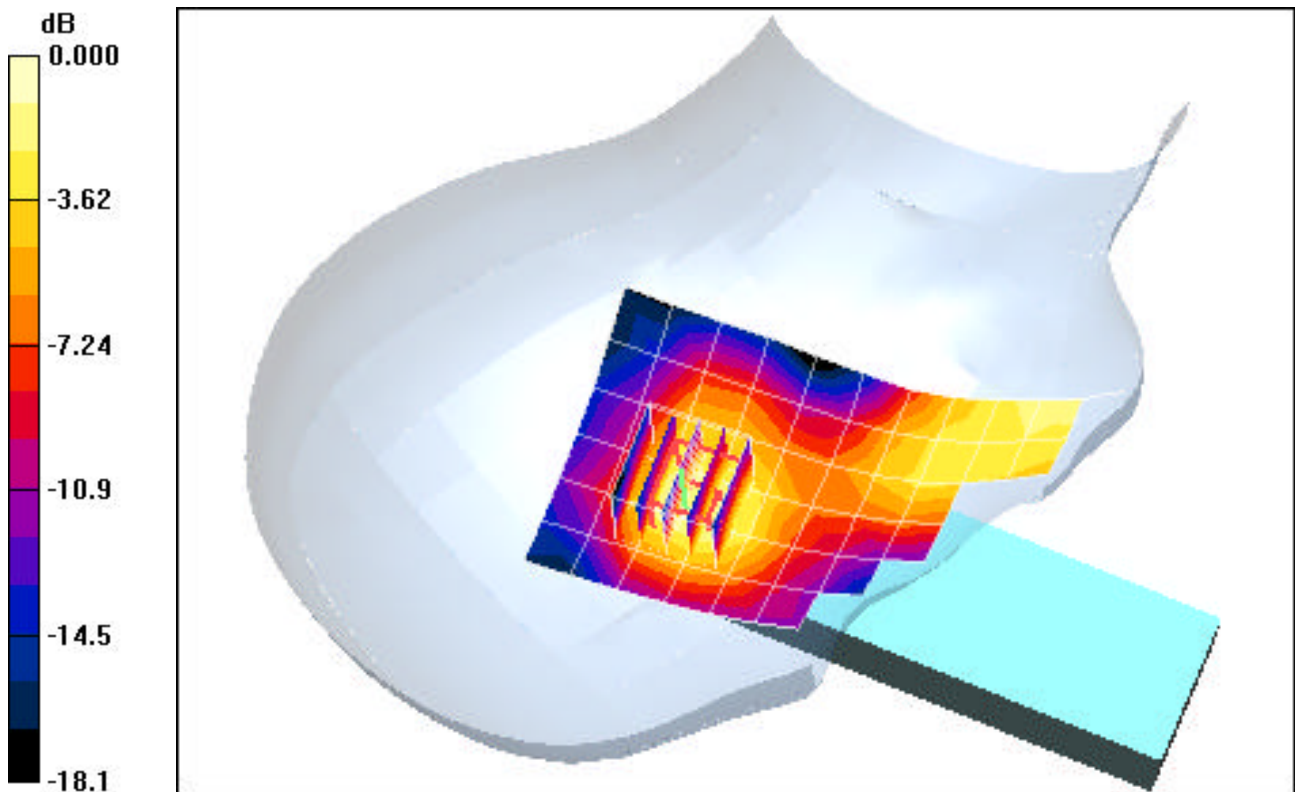
**Area Scan (7x15x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 6.71 V/m

Peak SAR (extrapolated) = 0.094 W/kg

**SAR(1 g) = 0.059 mW/g; SAR(10 g) = 0.035 mW/g**



0 dB = 0.071mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

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

Medium: 1900 Brain ( $\sigma = 1.41$  mho/m,  $\epsilon_r = 39.41$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 02-24-2009; Ambient Temp: 24.3.°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3561; ConvF(7.01, 7.01, 7.01); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: GSM1900, Left Head, Touch, Mid ch, Standard Battery, i-Mode Style**

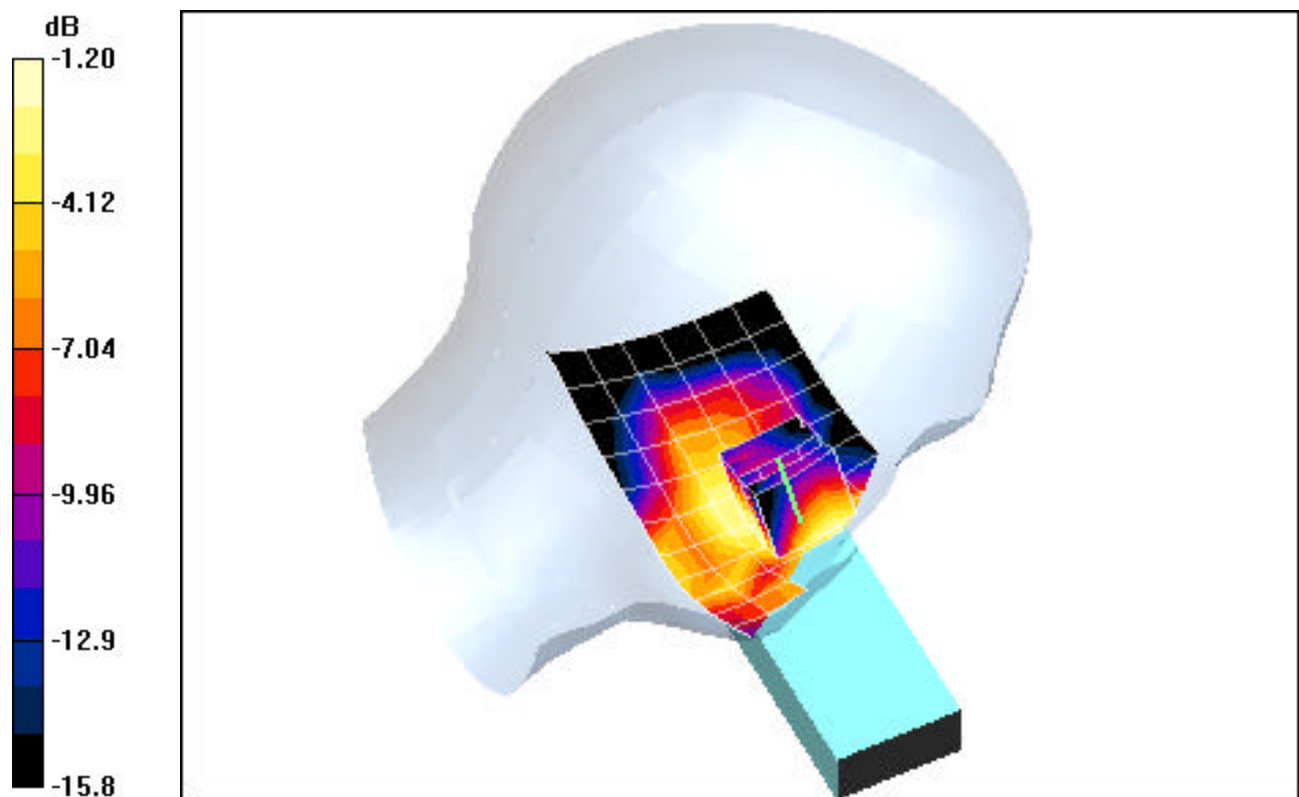
**Area Scan (7x15x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 9.01 V/m

Peak SAR (extrapolated) = 0.180 W/kg

**SAR(1 g) = 0.117 mW/g; SAR(10 g) = 0.070 mW/g**



0 dB = 0.140mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

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

Medium: 1900 Brain ( $\sigma = 1.41$  mho/m,  $\epsilon_r = 39.41$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 02-24-2009; Ambient Temp: 24.3.°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3561; ConvF(7.01, 7.01, 7.01); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: GSM1900, Left Head, Tilt, Mid ch, Standard Battery, i-Mode Style**

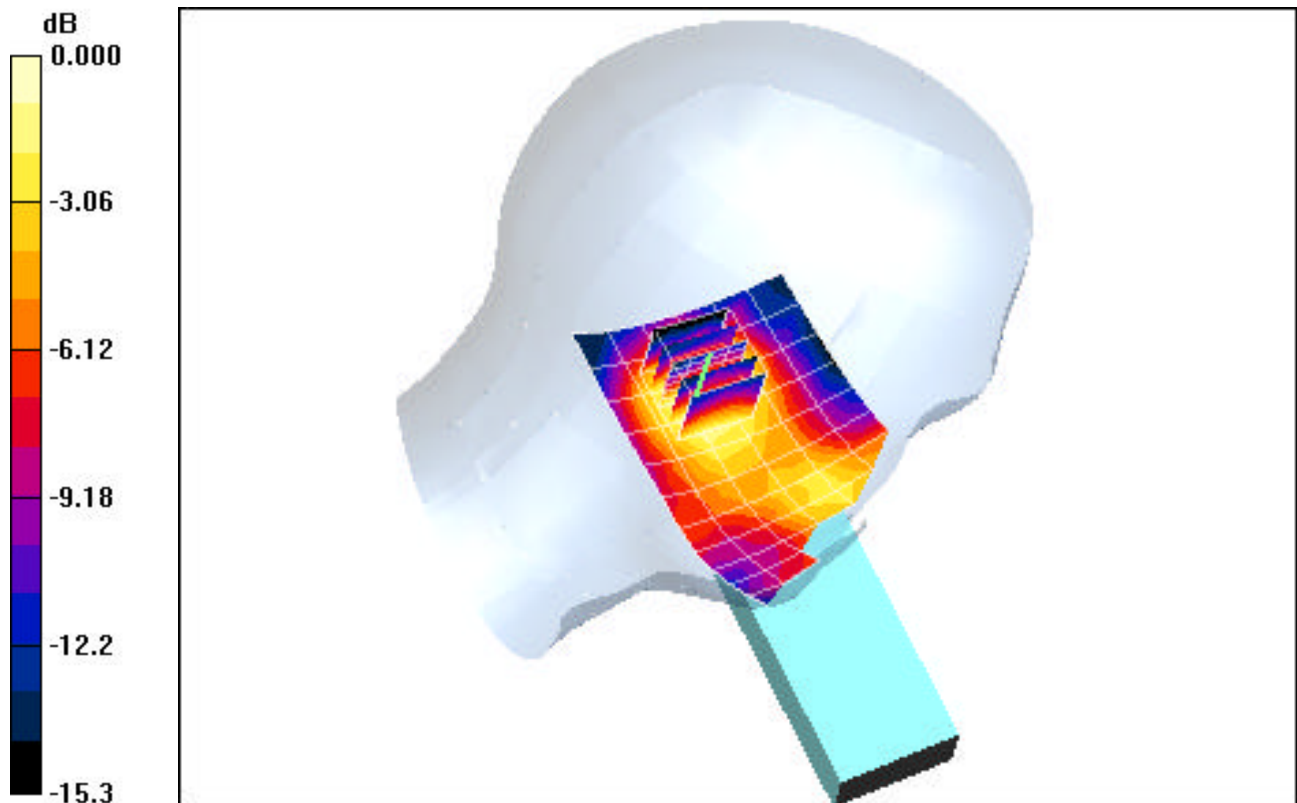
**Area Scan (7x15x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 5.67 V/m

Peak SAR (extrapolated) = 0.075 W/kg

**SAR(1 g) = 0.048 mW/g; SAR(10 g) = 0.030 mW/g**



0 dB = 0.057mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN**  
**IMEI: 004401200315352**

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

Medium: 2450 Brain ( $\sigma = 1.89$  mho/m,  $\epsilon_r = 39.54$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 03-04-2009; Ambient Temp: 24.3°C; Tissue Temp: 22.6°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: 1/21/2009

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

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

**Mode: IEEE 802.11b, Right Head, Touch, Mid ch, 1Mbps, Standard Battery, Touch Style**

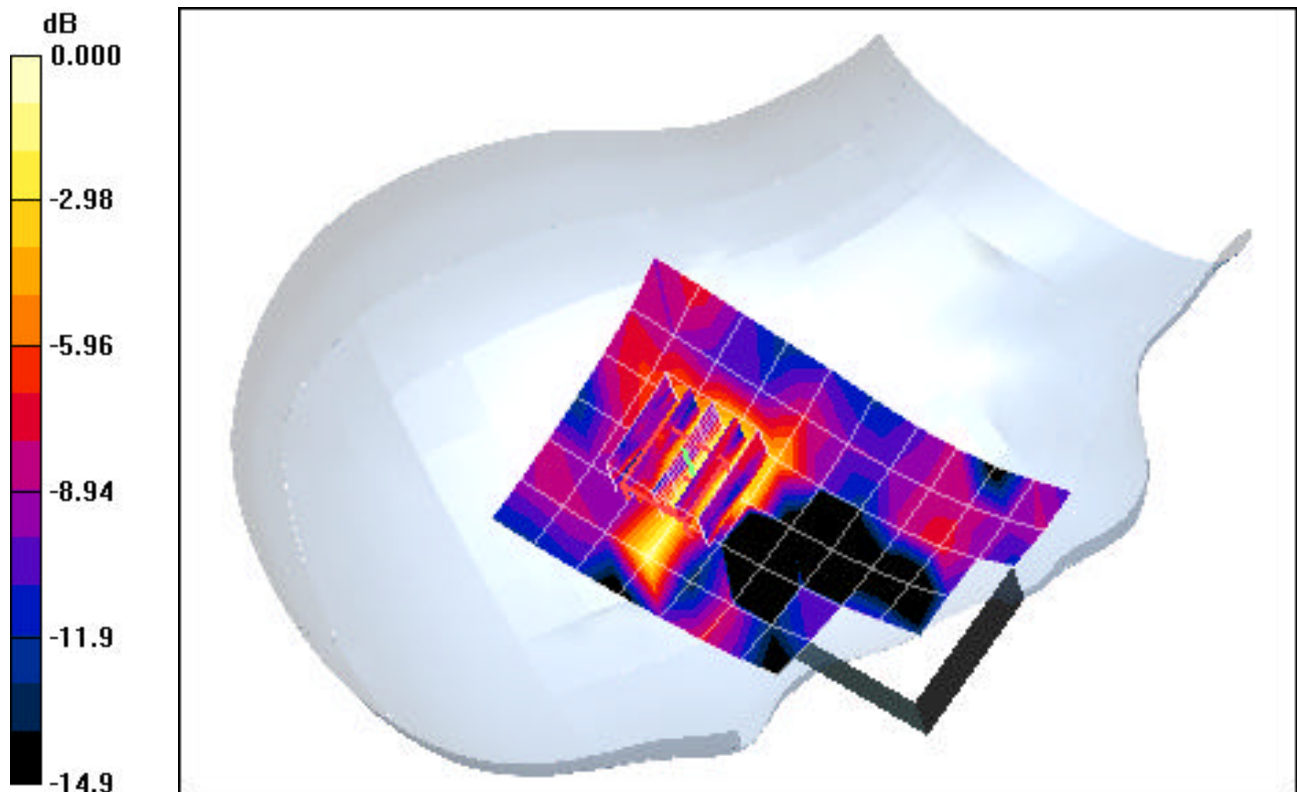
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 2.40 V/m

Peak SAR (extrapolated) = 0.017 W/kg

**SAR(1 g) = 0.00677 mW/g; SAR(10 g) = 0.00207 mW/g**



0 dB = 0.013mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

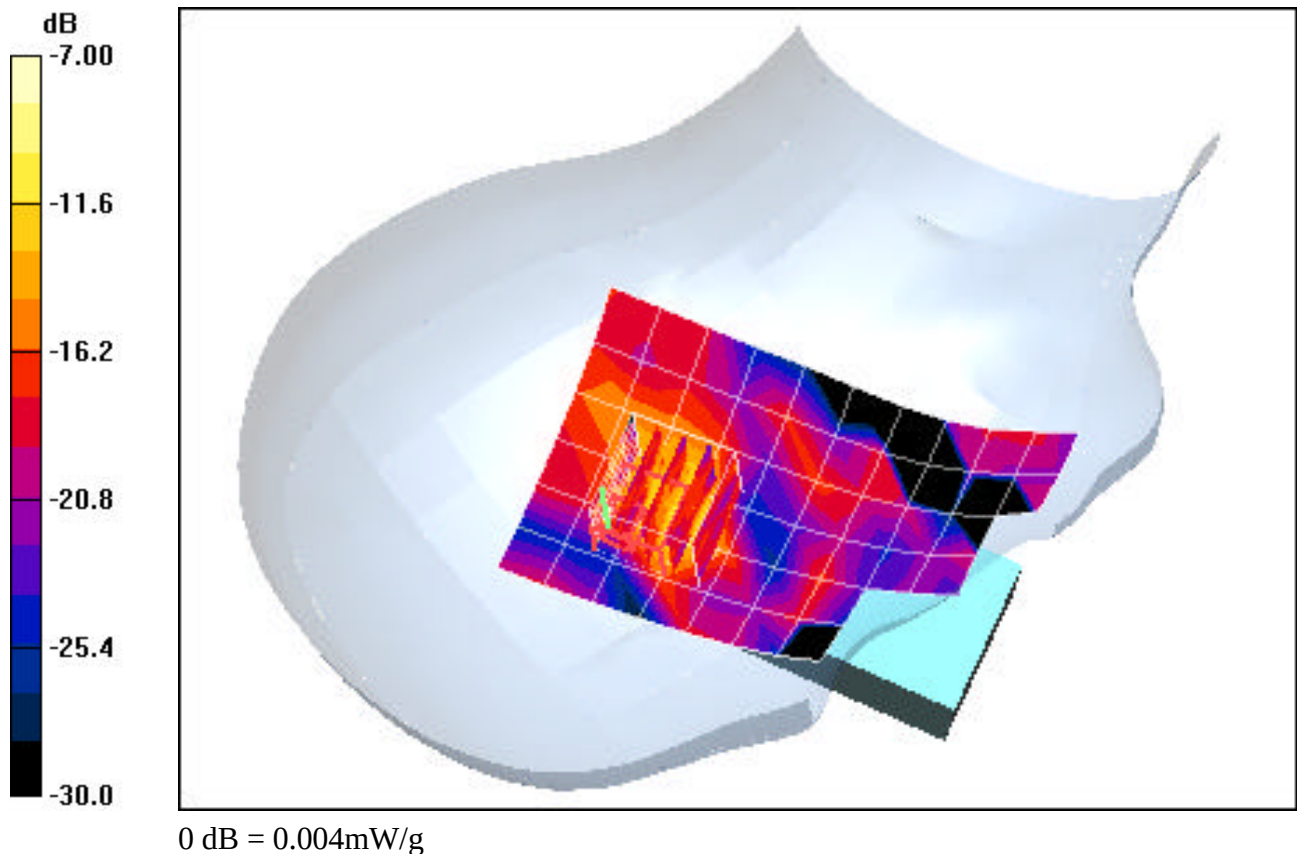
Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1  
Medium: 2450 Brain ( $\sigma = 1.89$  mho/m,  $\epsilon_r = 39.54$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Right Section

Test Date: 03-04-2009; Ambient Temp: 24.3°C; Tissue Temp: 22.6°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: 1/21/2009  
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114  
Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

**Mode: IEEE 802.11b, Right Head, Tilt, Mid ch, 1Mbps, Standard Battery, Touch Style**

**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm  
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 2.06 V/m  
Peak SAR (extrapolated) = 0.004 W/kg  
**SAR(1 g) = 0.00129 mW/g; SAR(10 g) = 0.00042 mW/g**



# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

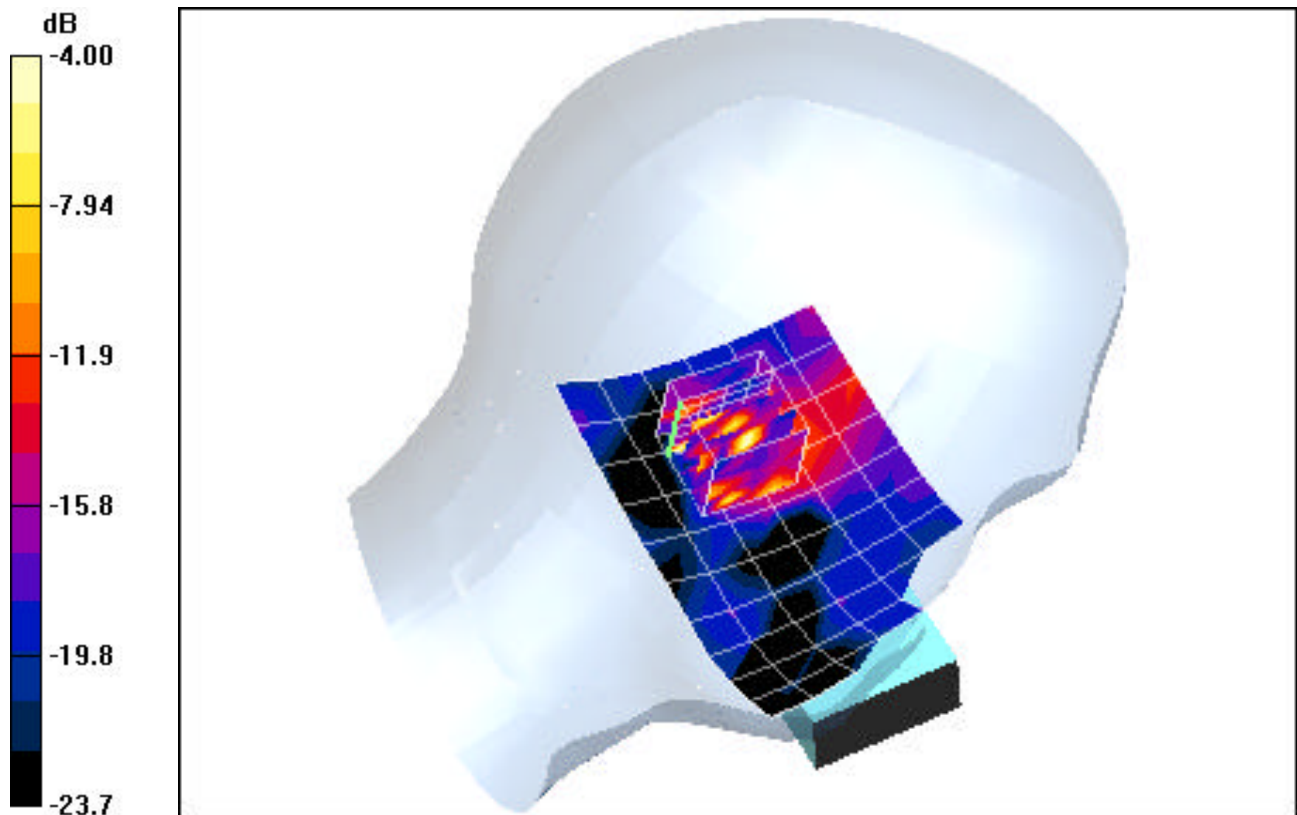
Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1  
Medium: 2450 Brain ( $\sigma = 1.89$  mho/m,  $\epsilon_r = 39.54$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Left Section

Test Date: 03-04-2009; Ambient Temp: 24.3°C; Tissue Temp: 22.6°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: 1/21/2009  
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114  
Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

**Mode: IEEE 802.11b, Left Head, Touch, Mid ch, 1Mbps, Standard Battery, Touch Style**

**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm  
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 2.24 V/m  
Peak SAR (extrapolated) = 0.036 W/kg  
**SAR(1 g) = 0.00933 mW/g; SAR(10 g) = 0.00248 mW/g**



0 dB = 0.108mW/g



# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

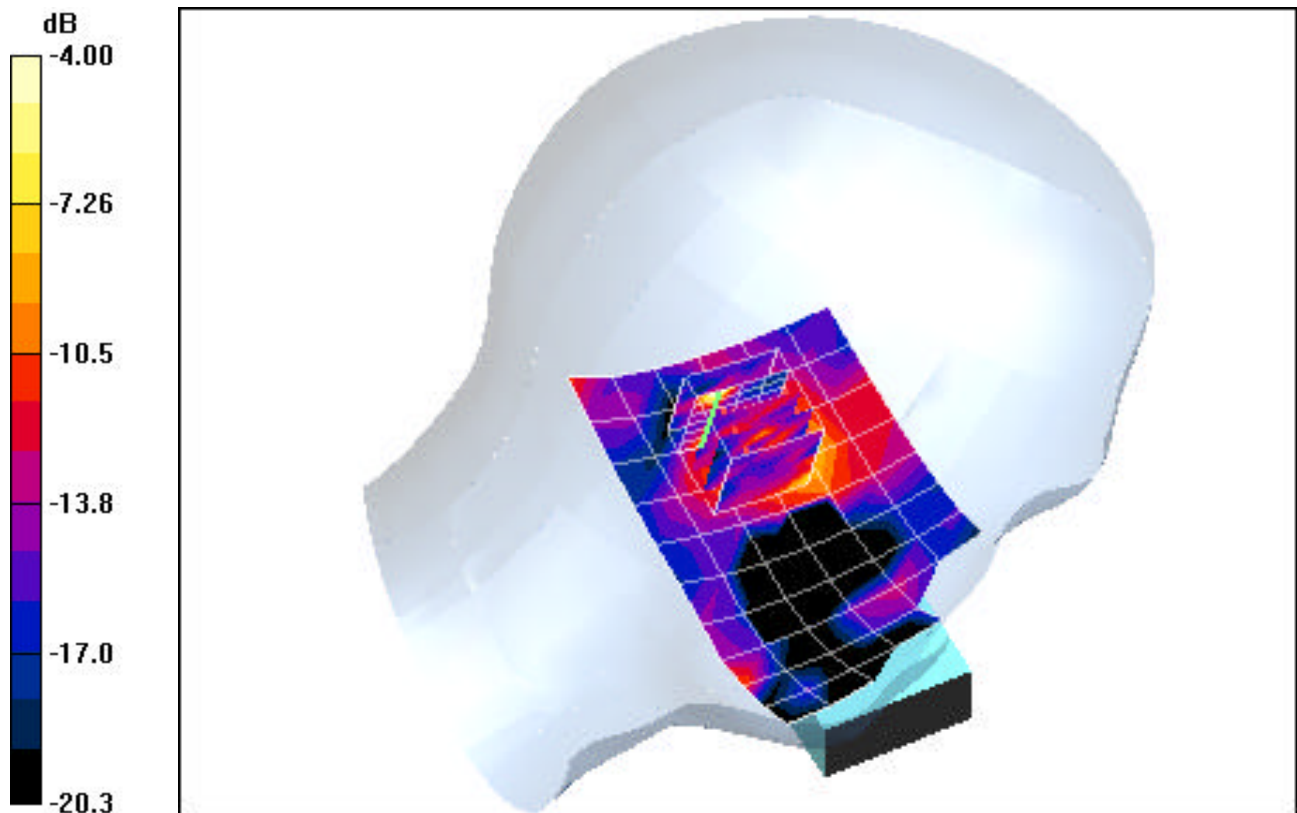
Communication System: IEEE 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1  
Medium: 2450 Brain ( $\sigma = 1.89$  mho/m,  $\epsilon_r = 39.54$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Left Section

Test Date: 03-04-2009; Ambient Temp: 24.3°C; Tissue Temp: 22.6°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: 1/21/2009  
Phantom: SAM Main; Type: SAM 4.0; Serial: TP-1114  
Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 172

**Mode: IEEE 802.11b, Left Head, Tilt, Mid ch, 1Mbps, Standard Battery. Touch Style**

**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm  
**Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 1.99 V/m  
Peak SAR (extrapolated) = 0.013 W/kg  
**SAR(1 g) = 0.00724 mW/g; SAR(10 g) = 0.00382 mW/g**



0 dB = 0.047mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Muscle ( $\sigma = 1.02$  mho/m,  $\epsilon_r = 56.62$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-25-2009; Ambient Temp: 24.3°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3561; ConvF(8.13, 8.13, 8.13); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: WCDMA850, Body SAR, Back Side, Mid ch, Standard Battery**

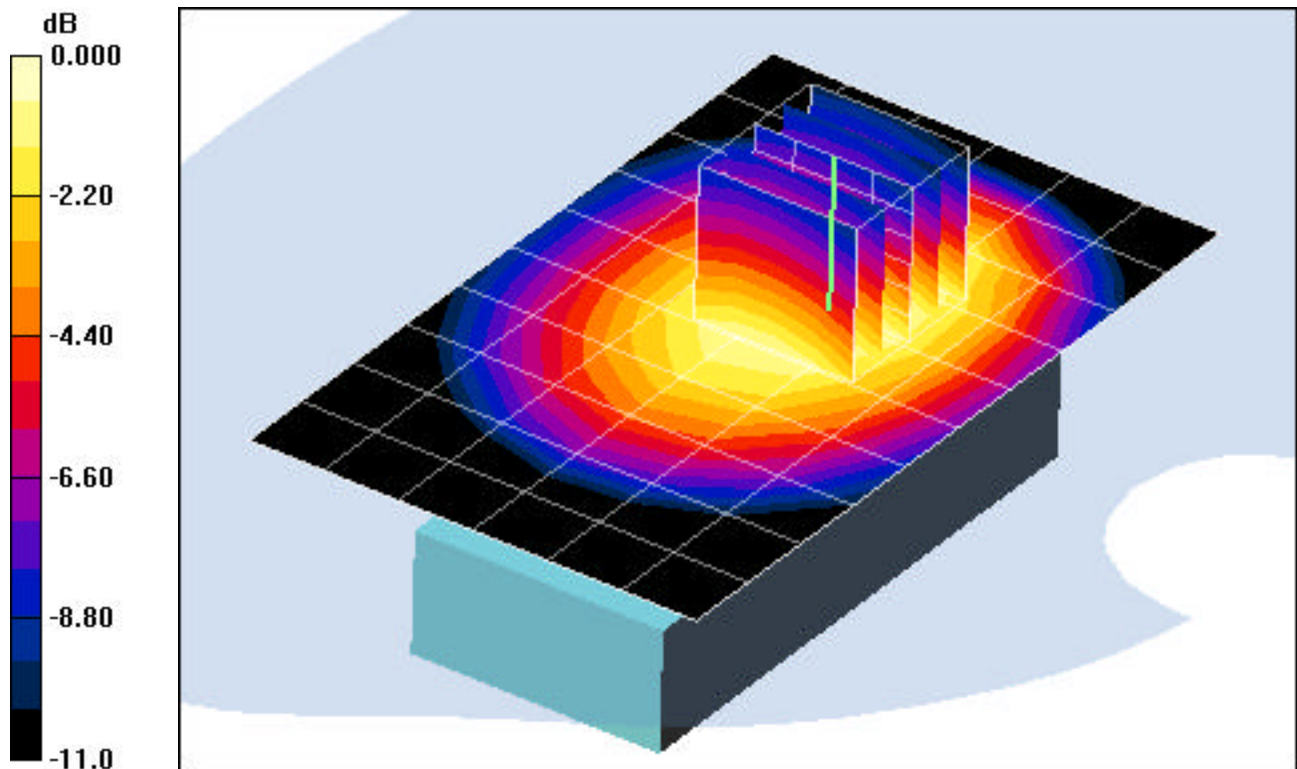
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 20.6 V/m

Peak SAR (extrapolated) = 0.551 W/kg

**SAR(1 g) = 0.393 mW/g; SAR(10 g) = 0.273 mW/g**



0 dB = 0.449mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

Communication System: GSM1900 GPRS; 1 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:8.3  
Medium: 1900 Muscle ( $\sigma = 1.55$  mho/m,  $\epsilon_r = 54.65$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-24-2009; Ambient Temp: 24.5.°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(6.7, 6.7, 6.7); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: GSM1900 GPRS, Body SAR, Back Side, Mid ch, Standard Battery, 1Tx Slot**

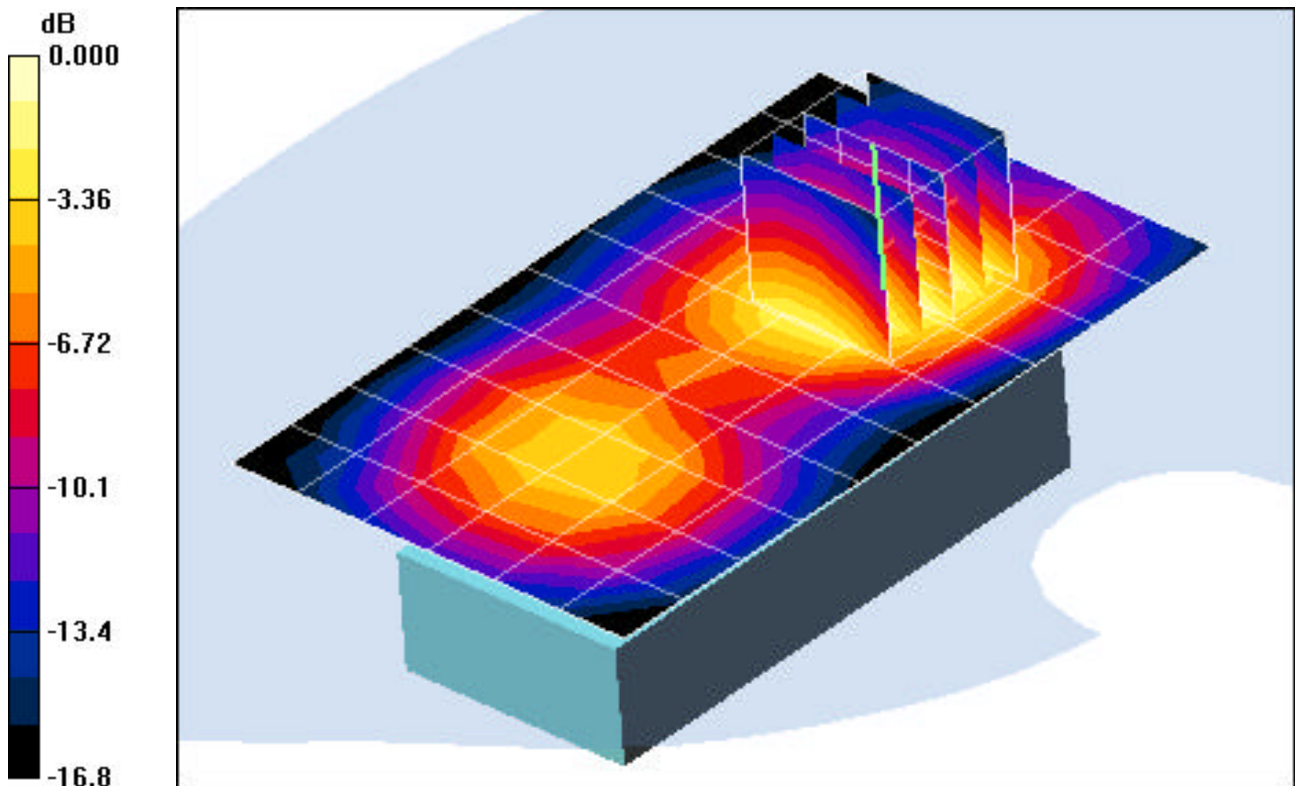
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 17.4 V/m

Peak SAR (extrapolated) = 0.745 W/kg

**SAR(1 g) = 0.456 mW/g; SAR(10 g) = 0.265 mW/g**



0 dB = 0.541mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

Communication System: IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium: 2450 Muscle ( $\sigma = 2.00$  mho/m,  $\epsilon_r = 51.21$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-26-2009; Ambient Temp: 24.4°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: IEEE 802.11b, Body SAR, Back Side, Low ch, 1Mbps, Standard Battery**

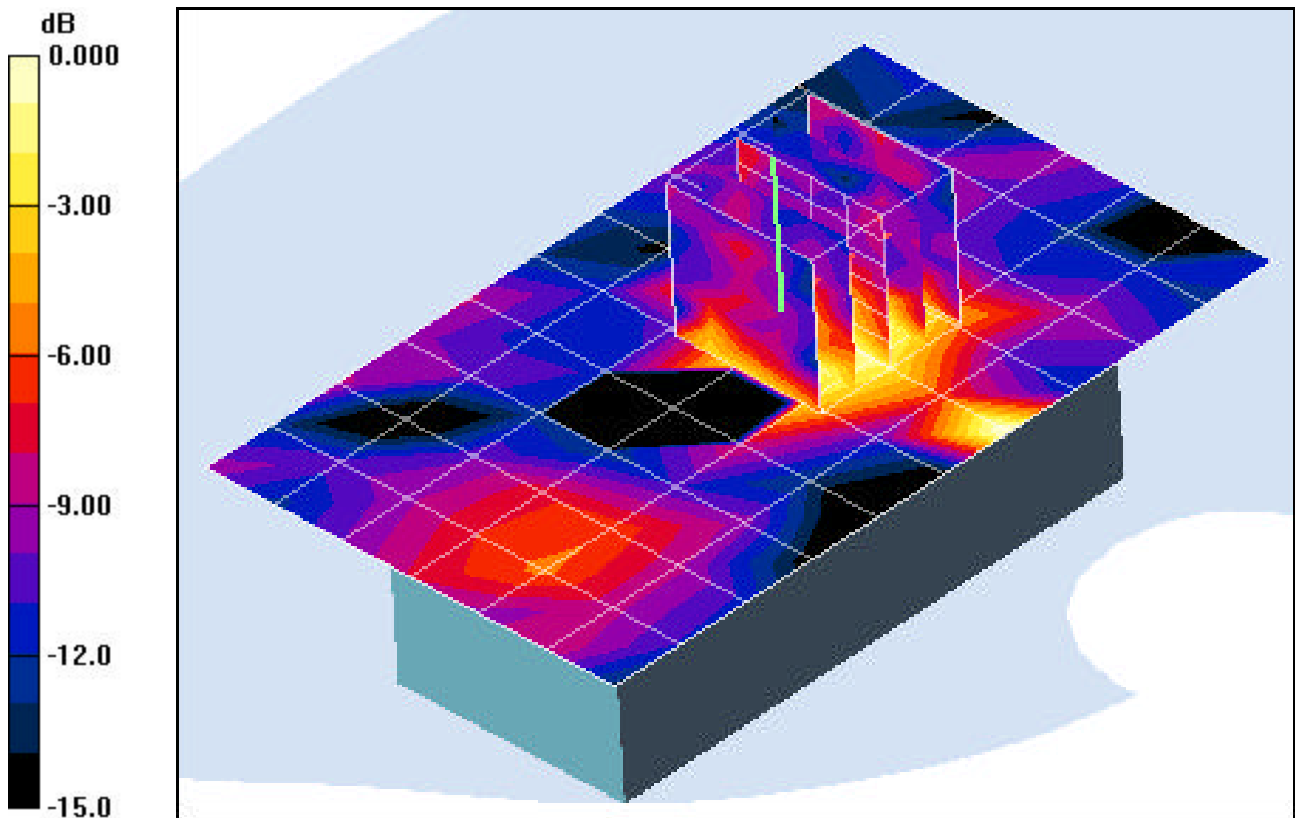
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 0.843 V/m

Peak SAR (extrapolated) = 0.038 W/kg

**SAR(1 g) = 0.014 mW/g; SAR(10 g) = 0.00675 mW/g**



0 dB = 0.017mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN**  
**IMEI: 004401200315352**

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Brain ( $\sigma = 0.92$  mho/m,  $\epsilon_r = 40.04$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Right Section

Test Date: 02-25-2009; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.22, 8.22, 8.22); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: WCDMA850, Right Head, Touch, Mid ch, Standard Battery, Slide Down**

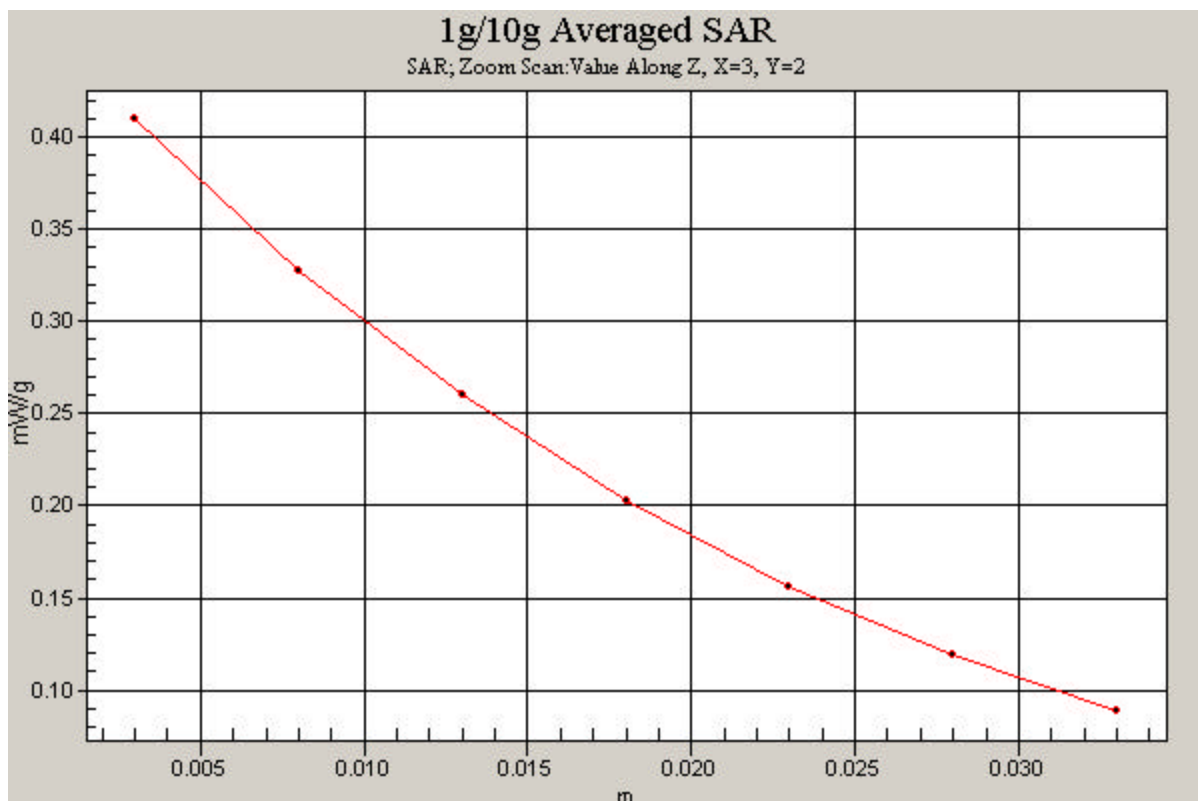
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 20.8 V/m

Peak SAR (extrapolated) = 0.474 W/kg

**SAR(1 g) = 0.377 mW/g; SAR(10 g) = 0.281 mW/g**



# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN**  
**IMEI: 004401200315352**

Communication System: WCDMA850; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Muscle ( $\sigma = 1.02$  mho/m,  $\epsilon_r = 56.62$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-25-2009; Ambient Temp: 24.3°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN3561; ConvF(8.13, 8.13, 8.13); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: WCDMA850, Body SAR, Back Side, Mid ch, Standard Battery**

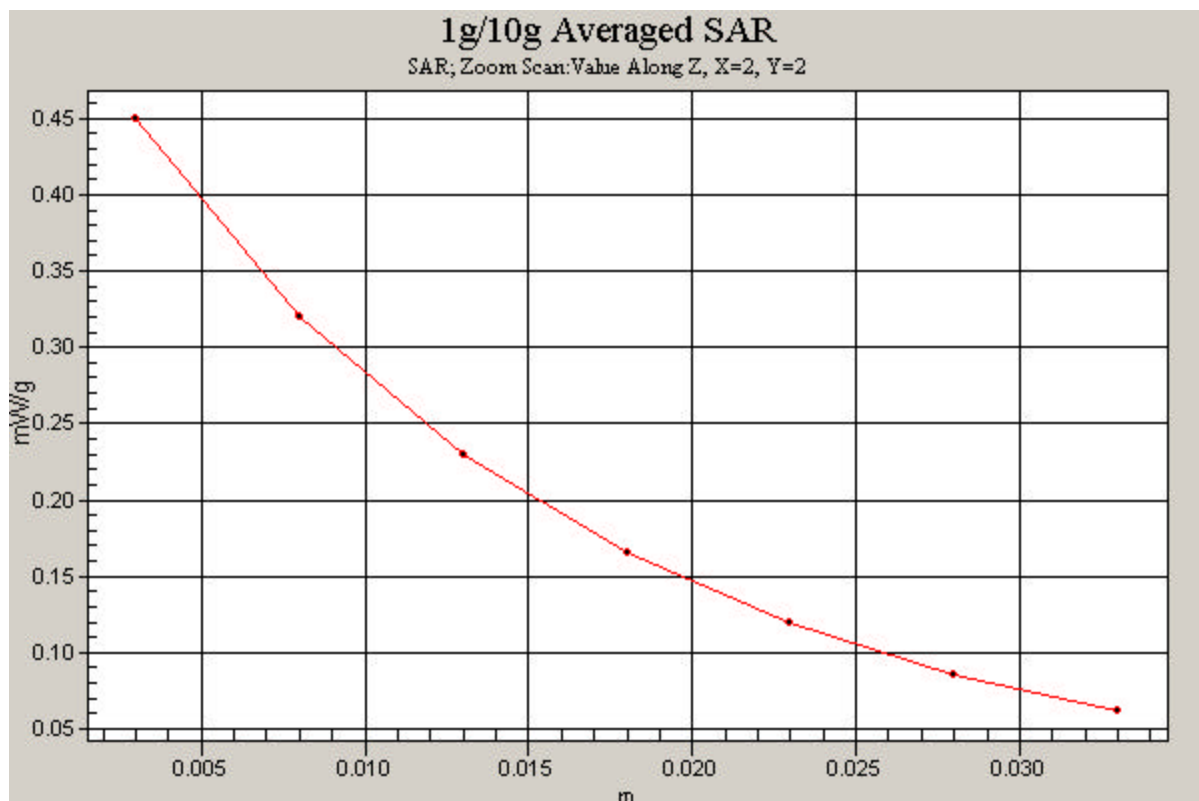
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 20.6 V/m

Peak SAR (extrapolated) = 0.551 W/kg

**SAR(1 g) = 0.393 mW/g; SAR(10 g) = 0.273 mW/g**





# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN**  
**IMEI: 004401200315352**

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

Medium: 1900 Brain ( $\sigma = 1.41$  mho/m,  $\epsilon_r = 39.41$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Left Section

Test Date: 02-24-2009; Ambient Temp: 24.3.°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3561; ConvF(7.01, 7.01, 7.01); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: GSM1900, Left Head, Tilt, Mid ch, Standard Battery, Slide Down**

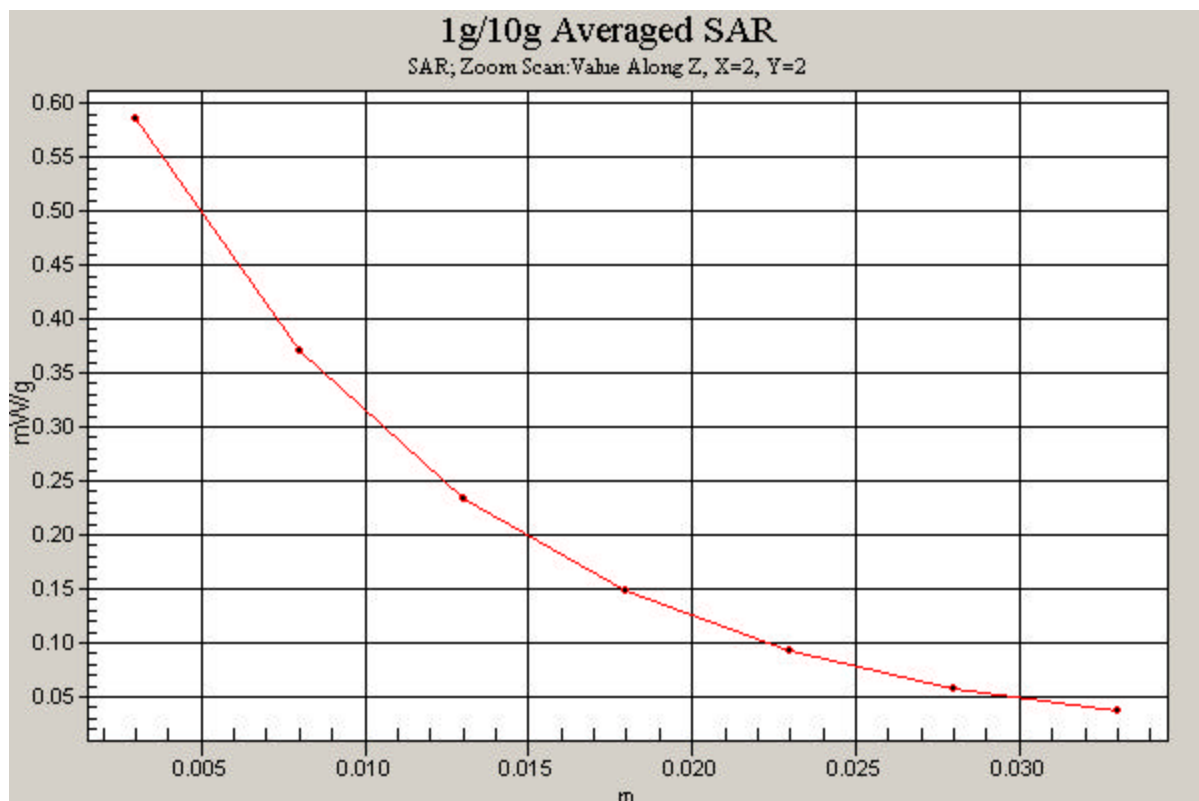
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 18.9 V/m

Peak SAR (extrapolated) = 0.801 W/kg

**SAR(1 g) = 0.487 mW/g; SAR(10 g) = 0.270 mW/g**



# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN**  
**IMEI: 004401200315352**

Communication System: GSM1900 GPRS; 1 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:8.3  
Medium: 1900 Muscle ( $\sigma = 1.55$  mho/m,  $\epsilon_r = 54.65$ ,  $\rho = 1000$  kg/m<sup>3</sup>)  
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-24-2009; Ambient Temp: 24.5.°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(6.7, 6.7, 6.7); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: GSM1900 GPRS, Body SAR, Back Side, Mid ch, Standard Battery, 1Tx Slot**

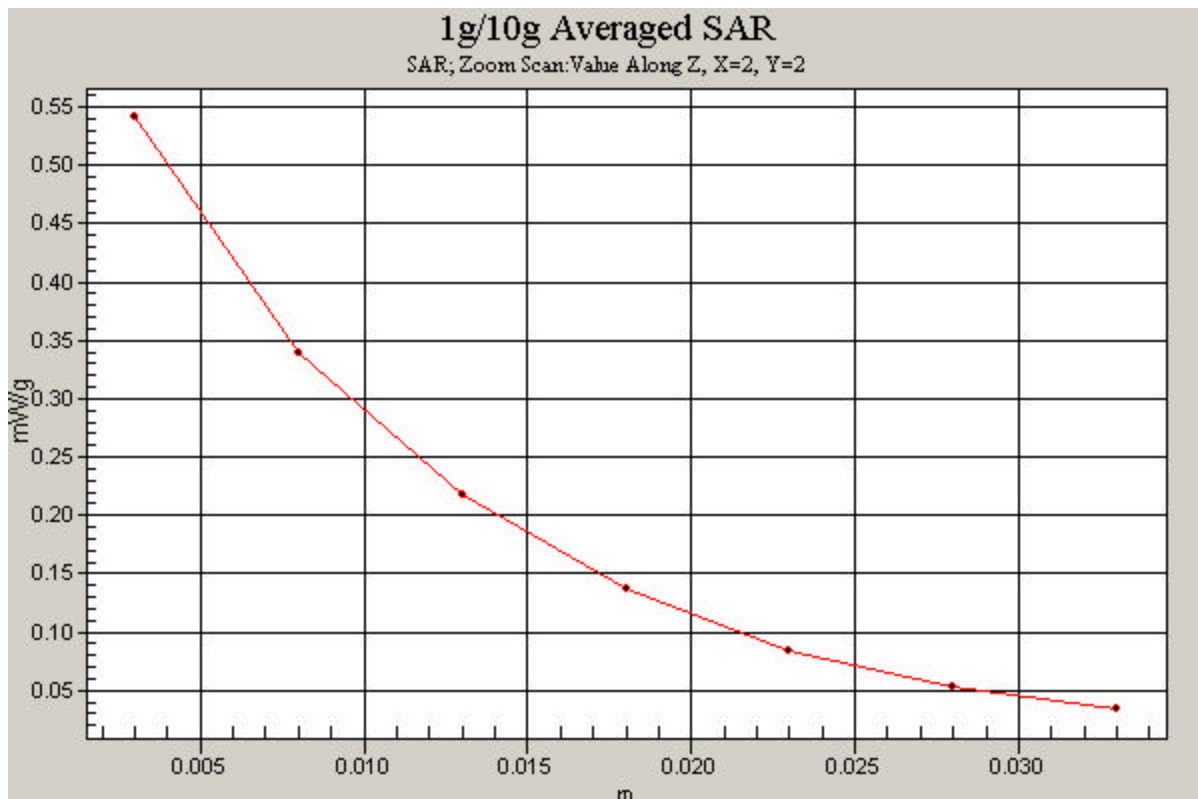
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 17.4 V/m

Peak SAR (extrapolated) = 0.745 W/kg

**SAR(1 g) = 0.456 mW/g; SAR(10 g) = 0.265 mW/g**



# PCTEST ENGINEERING LABORATORY, INC.

**DUT: KMP7N4S1 -1A; Type: WCDMA850/GSM GPRS1900 Phone with Bluetooth and WLAN  
IMEI: 004401200315352**

Communication System: IEEE 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

Medium: 2450 Muscle ( $\sigma = 2.00$  mho/m,  $\epsilon_r = 51.21$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-26-2009; Ambient Temp: 24.4°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

**Mode: IEEE 802.11b, Body SAR, Back Side, Low ch, 1Mbps, Standard Battery**

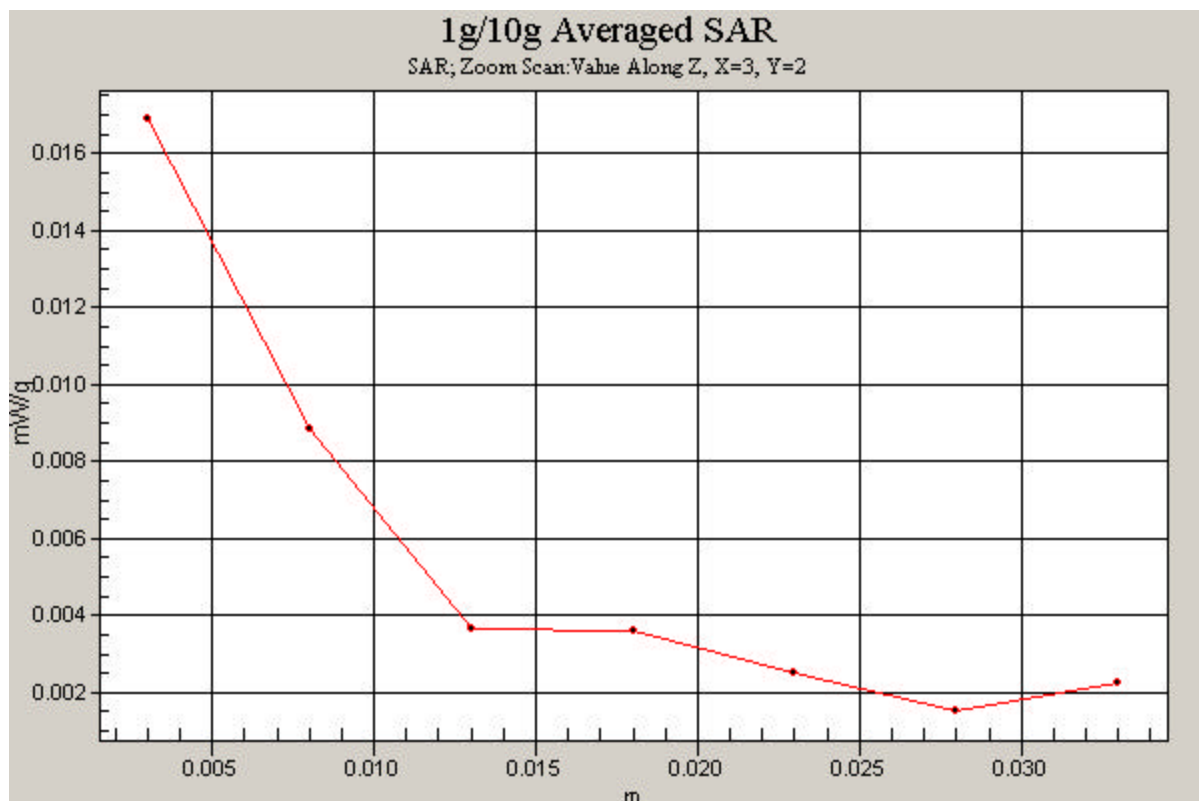
**Area Scan (7x11x1):** Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 0.843 V/m

Peak SAR (extrapolated) = 0.038 W/kg

**SAR(1 g) = 0.014 mW/g; SAR(10 g) = 0.00675 mW/g**



# PCTEST ENGINEERING LABORATORY, INC.

**DUT: 2450MHz SAR Validation Dipole; Type: D2450V2; Serial: 719**

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

Medium: 2450 Brain ( $\sigma = 1.89$  mho/m,  $\epsilon_r = 39.54$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-04-2009; Ambient Temp: 24.3°C; Tissue Temp: 22.6°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: 1/21/2009

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

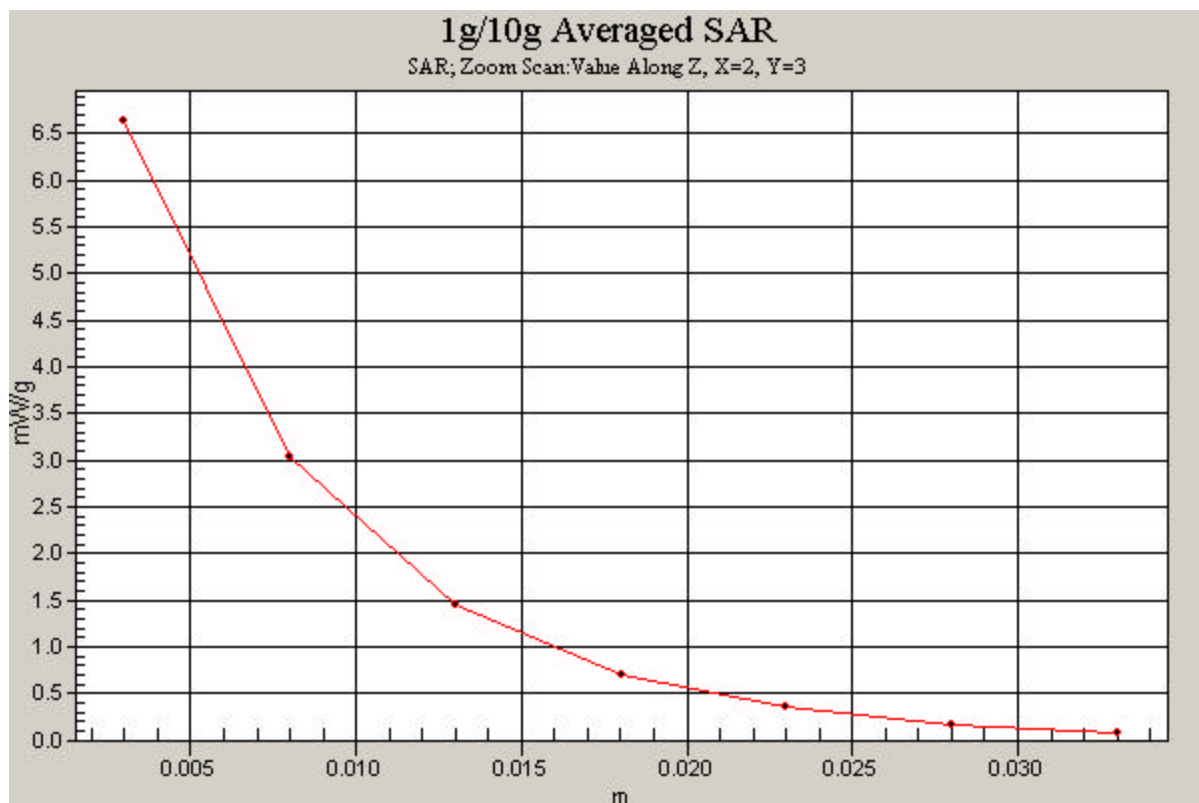
**Area Scan (5x7x1):** Measurement grid: dx=15mm, dy=15mm

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

Input Power = 20.0 dBm (100 mW)

**SAR(1 g) = 5.18 mW/g; SAR(10 g) = 2.31 mW/g**

Deviation = + 0.97 %



## **APPENDIX B: DIPOLE VALIDATION**

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: 835MHz SAR Validation Dipole; Type: D835V2; Serial: 4d026**

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

Medium: 835 Brain ( $\sigma = 0.92$  mho/m,  $\epsilon_r = 40.04$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-25-2009; Ambient Temp: 24.2°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN3561; ConvF(8.22, 8.22, 8.22); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

## 835MHz Dipole Validation

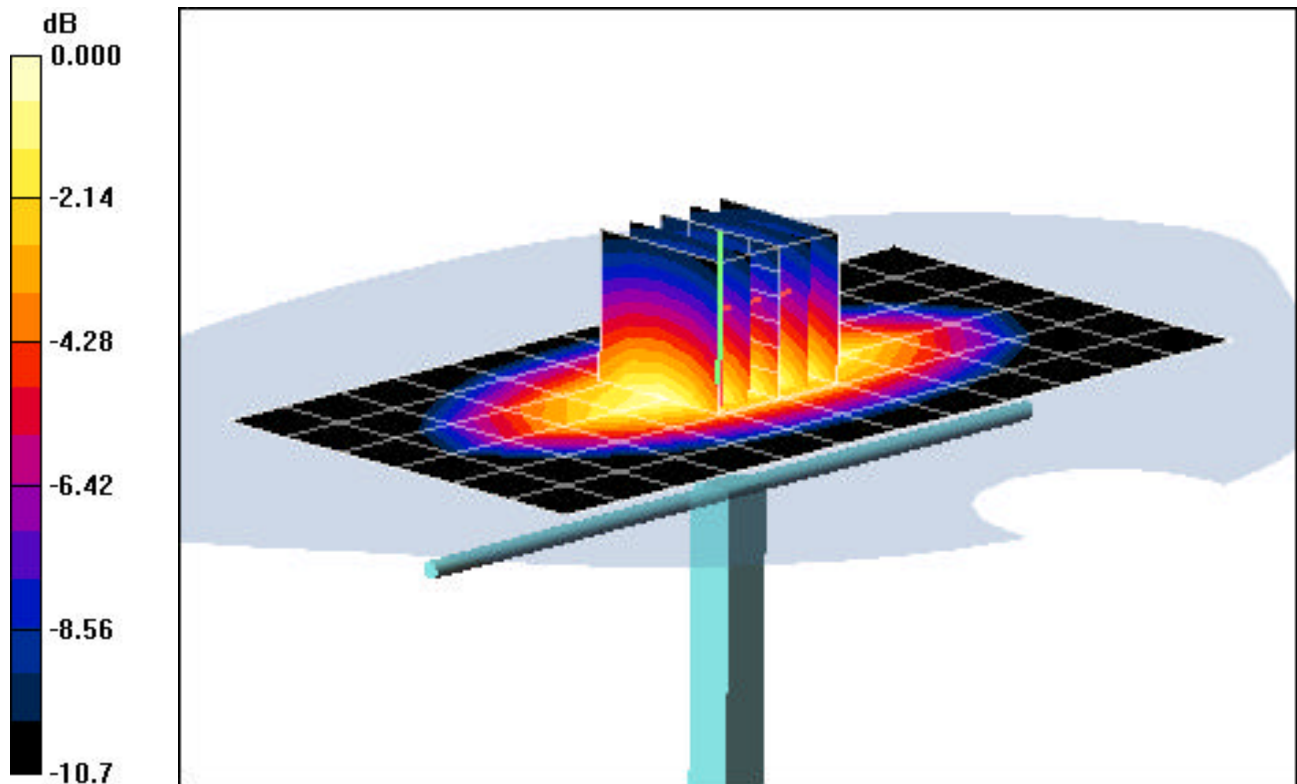
**Area Scan (7x13x1):** Measurement grid: dx=15mm, dy=15mm

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

Input Power = 20.0 dBm (100 mW)

**SAR(1 g) = 0.956 mW/g; SAR(10 g) = 0.622 mW/g**

Deviation = + 6.10 %



0 dB = 1.12mW/g



# PCTEST ENGINEERING LABORATORY, INC.

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

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

Medium: 1900 Brain ( $\sigma = 1.41$  mho/m,  $\epsilon_r = 39.41$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2009; Ambient Temp: 24.3.°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3561; ConvF(7.01, 7.01, 7.01); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

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

## 1900MHz Dipole Validation

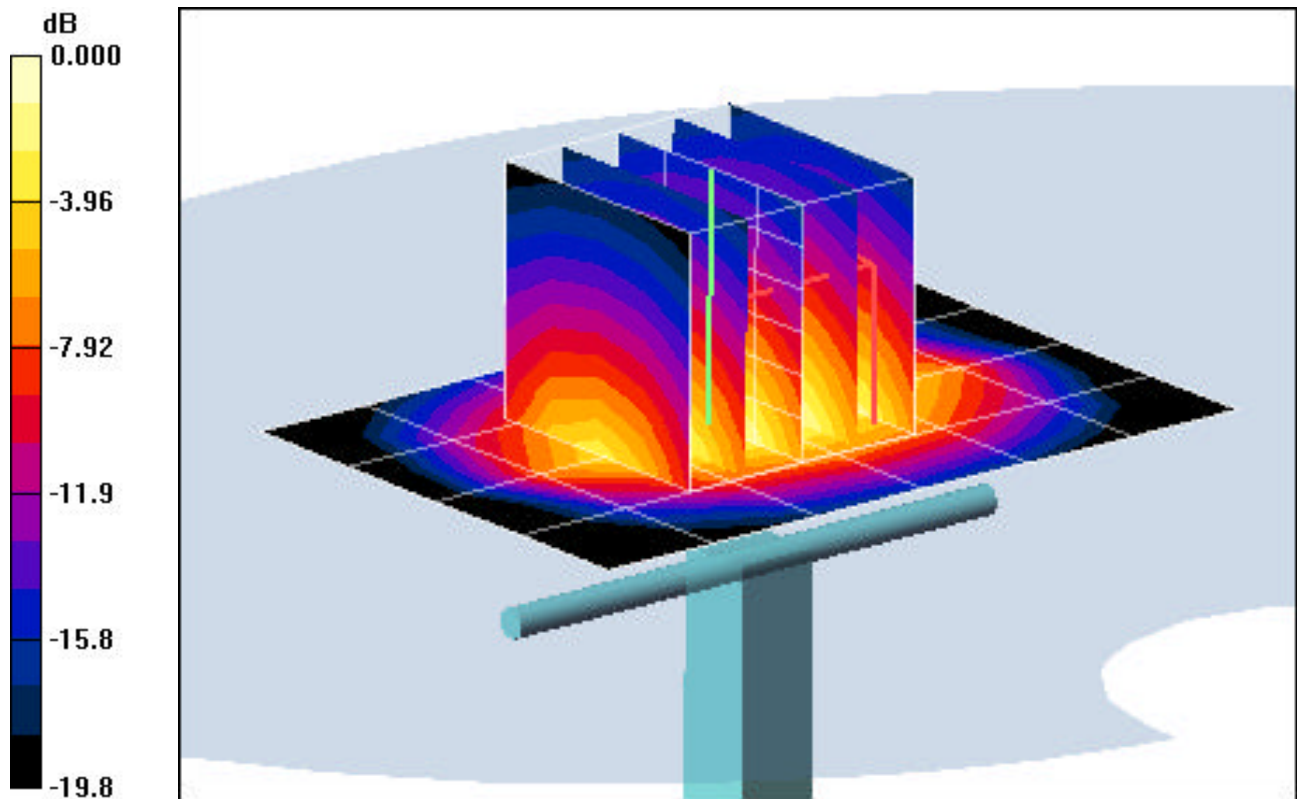
**Area Scan (5x7x1):** Measurement grid: dx=15mm, dy=15mm

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

Input Power = 20.0 dBm (100 mW)

**SAR(1 g) = 4.15 mW/g; SAR(10 g) = 2.09 mW/g**

Deviation = + 4.01 %



0 dB = 5.21mW/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 Muscle ( $\sigma = 2.00$  mho/m,  $\epsilon_r = 51.21$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-26-2009; Ambient Temp: 24.4°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN3561; ConvF(6.16, 6.16, 6.16); Calibrated: 8/26/2008

Sensor-Surface: 3mm (Mechanical Surface Detection)

Electronics: DAE4 Sn649; Calibrated: 1/21/2009

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

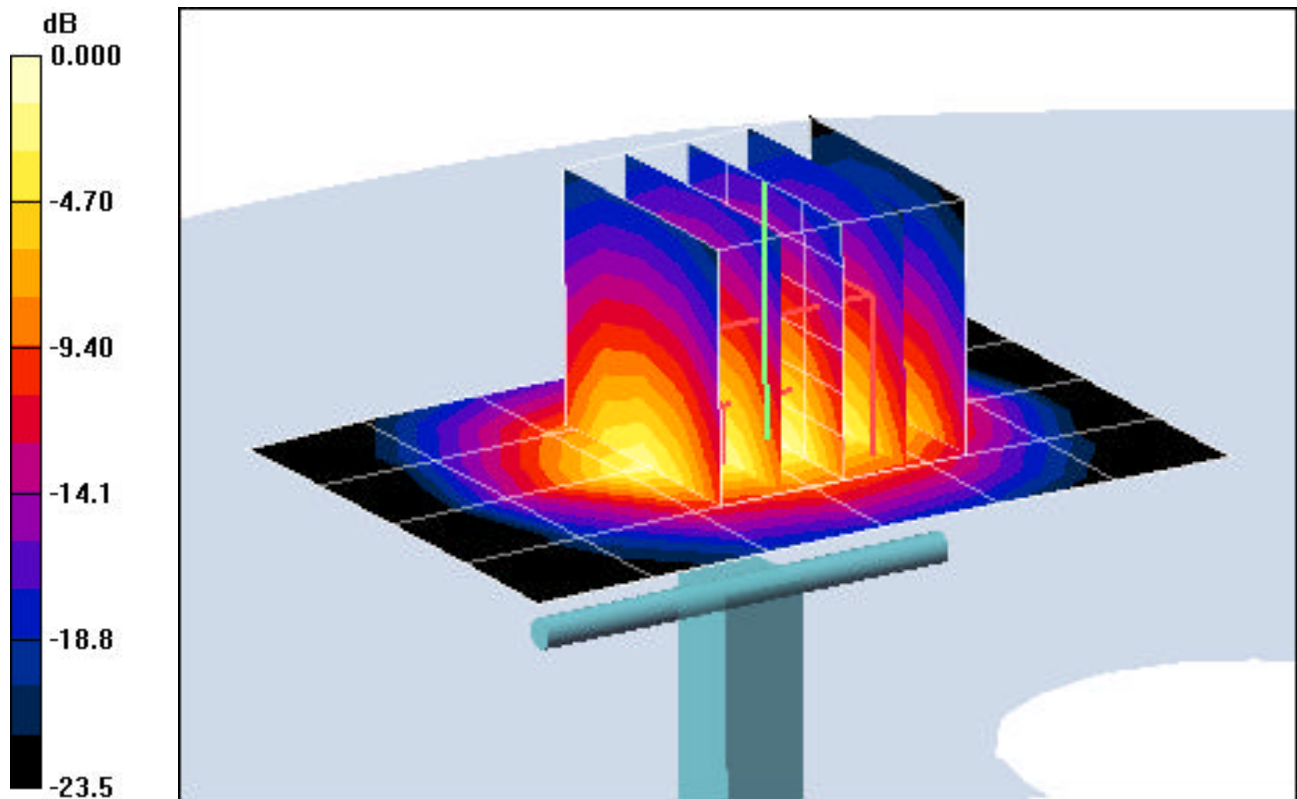
**Area Scan (5x7x1):** Measurement grid: dx=15mm, dy=15mm

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

Input Power = 20.0 dBm (100 mW)

**SAR(1 g) = 5.39 mW/g; SAR(10 g) = 2.45 mW/g**

Deviation = + 1.70 %



0 dB = 7.00mW/g

# PCTEST ENGINEERING LABORATORY, INC.

**DUT: 2450MHz SAR Validation Dipole; Type: D2450V2; Serial: 719**

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

Medium: 2450 Brain ( $\sigma = 1.89$  mho/m,  $\epsilon_r = 39.54$ ,  $\rho = 1000$  kg/m<sup>3</sup>)

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-04-2009; Ambient Temp: 24.3°C; Tissue Temp: 22.6°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: 1/21/2009

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

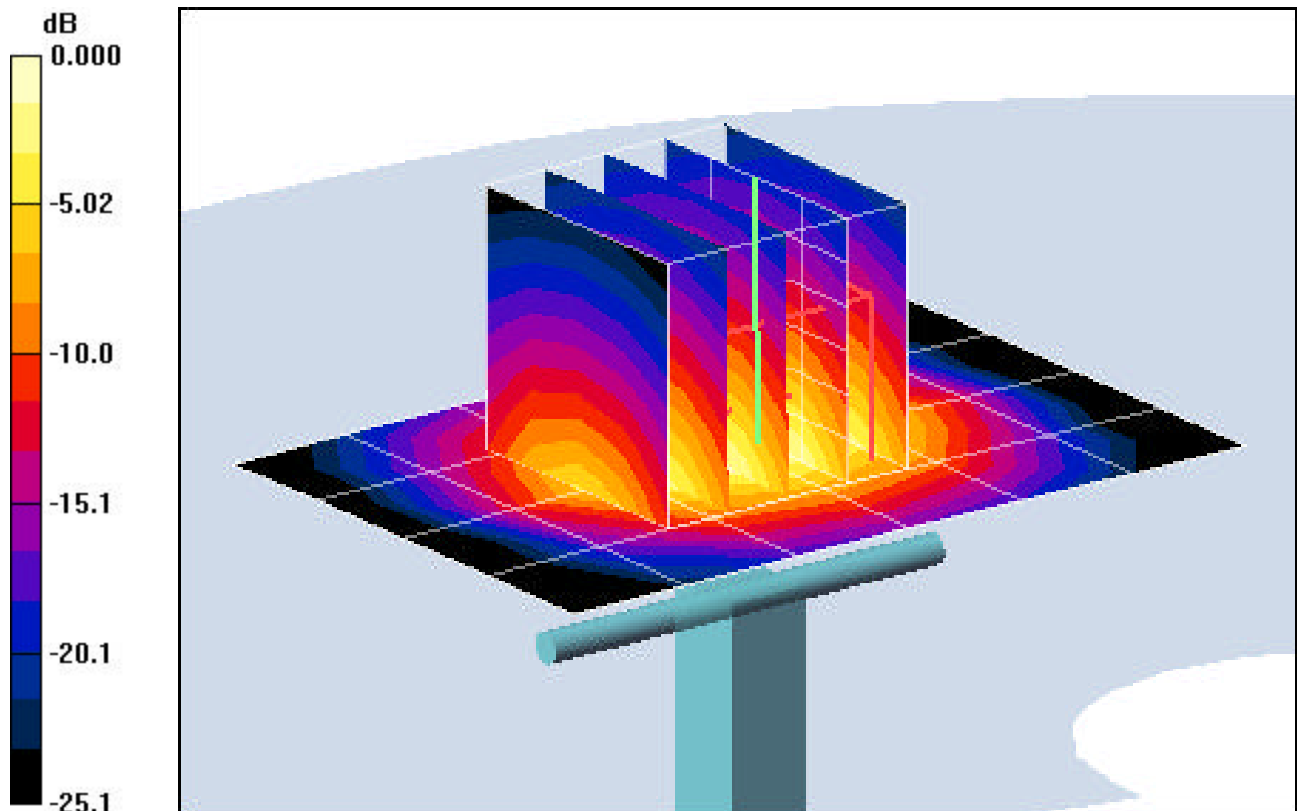
**Area Scan (5x7x1):** Measurement grid: dx=15mm, dy=15mm

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

Input Power = 20.0 dBm (100 mW)

**SAR(1 g) = 5.18 mW/g; SAR(10 g) = 2.31 mW/g**

Deviation = + 0.97 %



0 dB = 6.64mW/g

## **APPENDIX C: PROBE and Dipole 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 <sub>x,y,z</sub>    | sensitivity in free space                                                                                                                            |
| ConvF                    | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                           |
| DCP                      | diode compression point                                                                                                                              |
| Polarization $\phi$      | $\phi$ 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
- 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<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 |
| 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<sup>A</sup>

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

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

|       |              |
|-------|--------------|
| DCP X | <b>84</b> mV |
| DCP Y | <b>87</b> mV |
| DCP Z | <b>90</b> 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 |                              | <b>2.0 mm</b> | <b>3.0 mm</b> |
| SAR <sub>be</sub> [%]                     | Without Correction Algorithm | 8.9           | 4.7           |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 0.6           | 0.3           |

**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 | 7.8           | 3.9           |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 0.8           | 0.1           |

### Sensor Offset

Probe Tip to Sensor Center                      **1.0 mm**

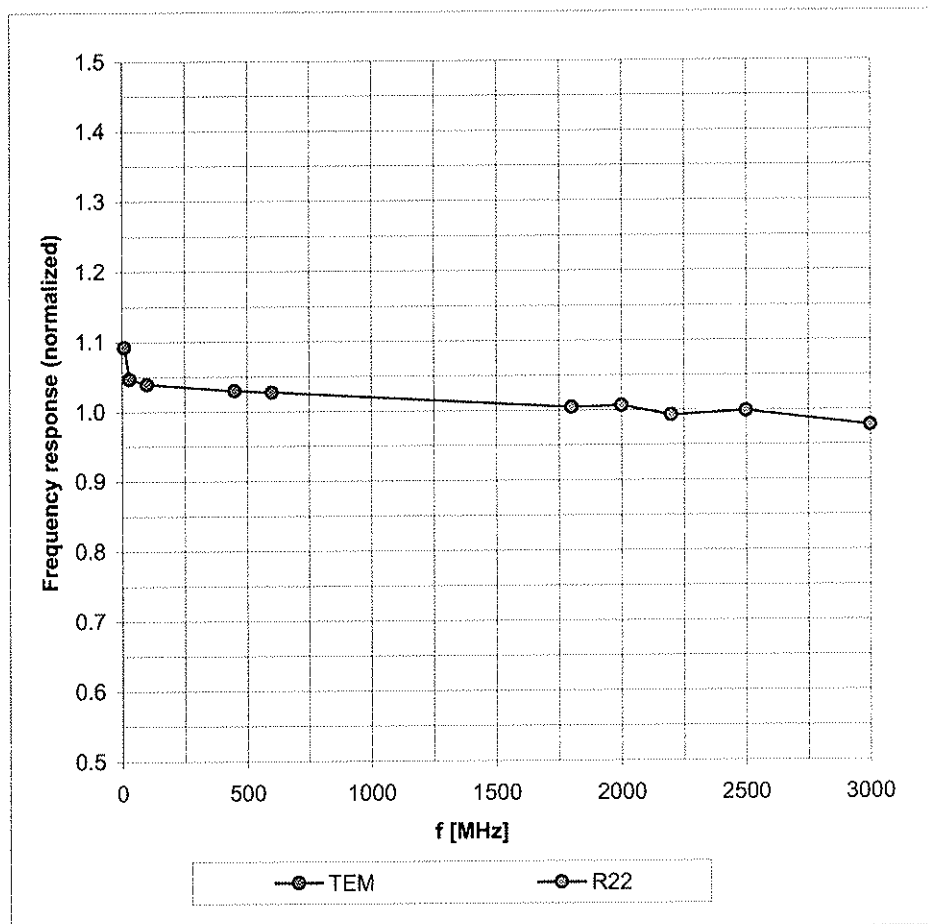
**The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.**

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

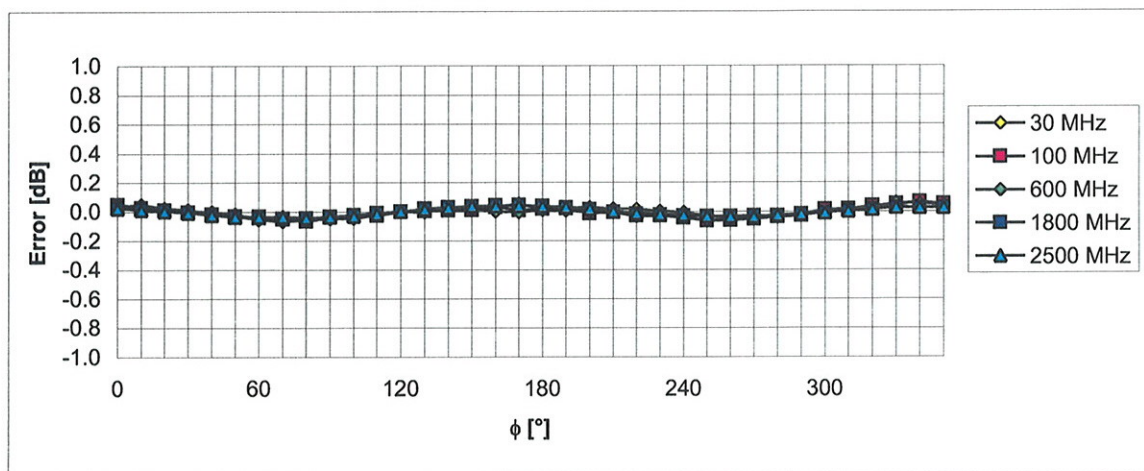
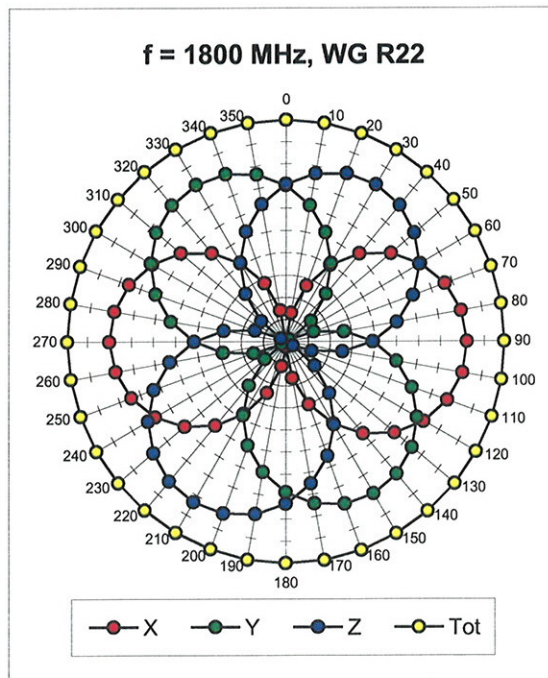
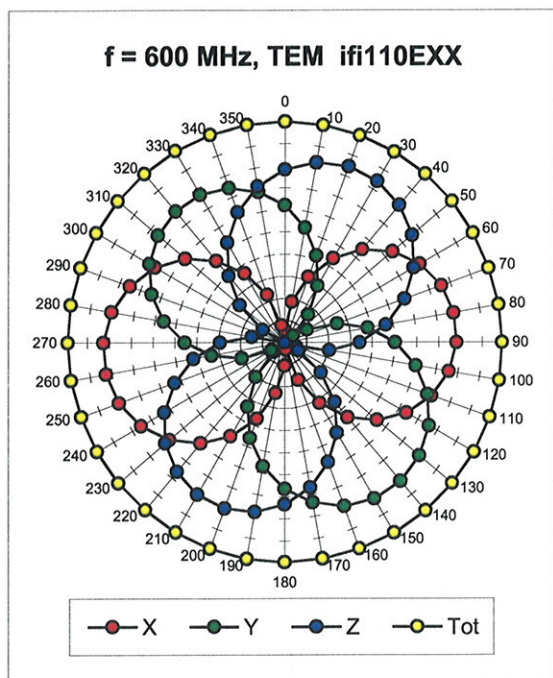
<sup>B</sup> Numerical linearization parameter: uncertainty not required.

## Frequency Response of E-Field

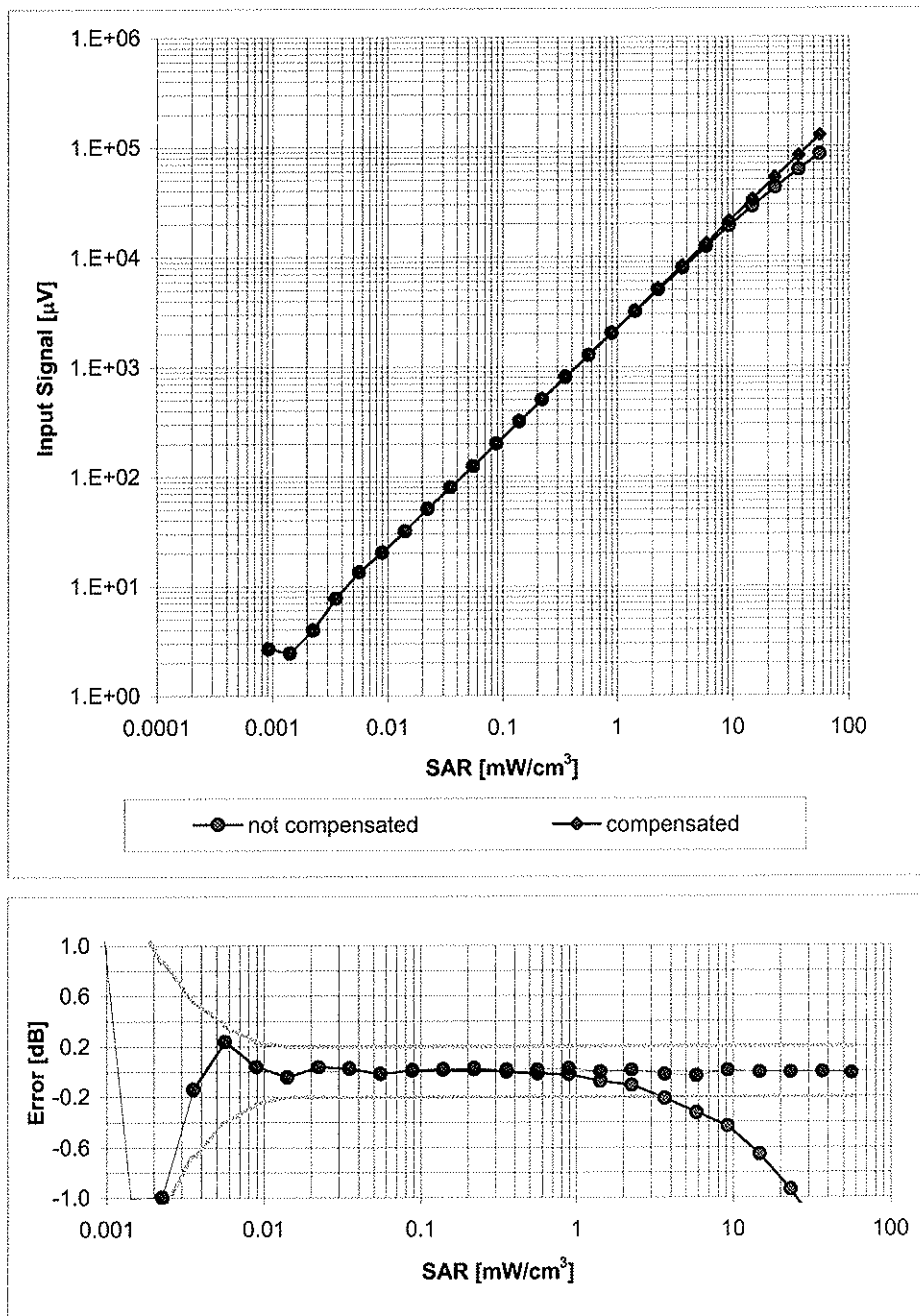
(TEM-Cell:ifi110 EXX, Waveguide: R22)



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

Receiving Pattern ( $\phi$ ),  $\vartheta = 0^\circ$ 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

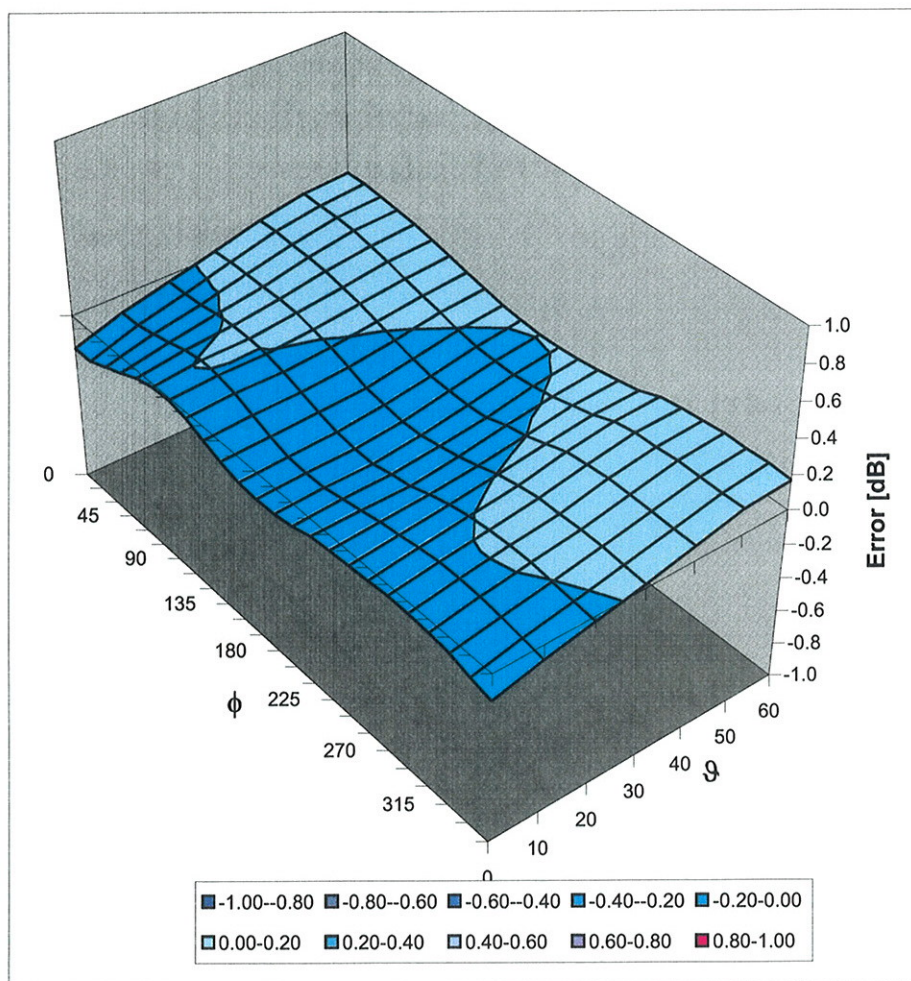
| f [MHz] | Validity [MHz] <sup>c</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 835     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.90 ± 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) |

<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 ( $\phi$ ,  $\vartheta$ ),  $f = 900$  MHz



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