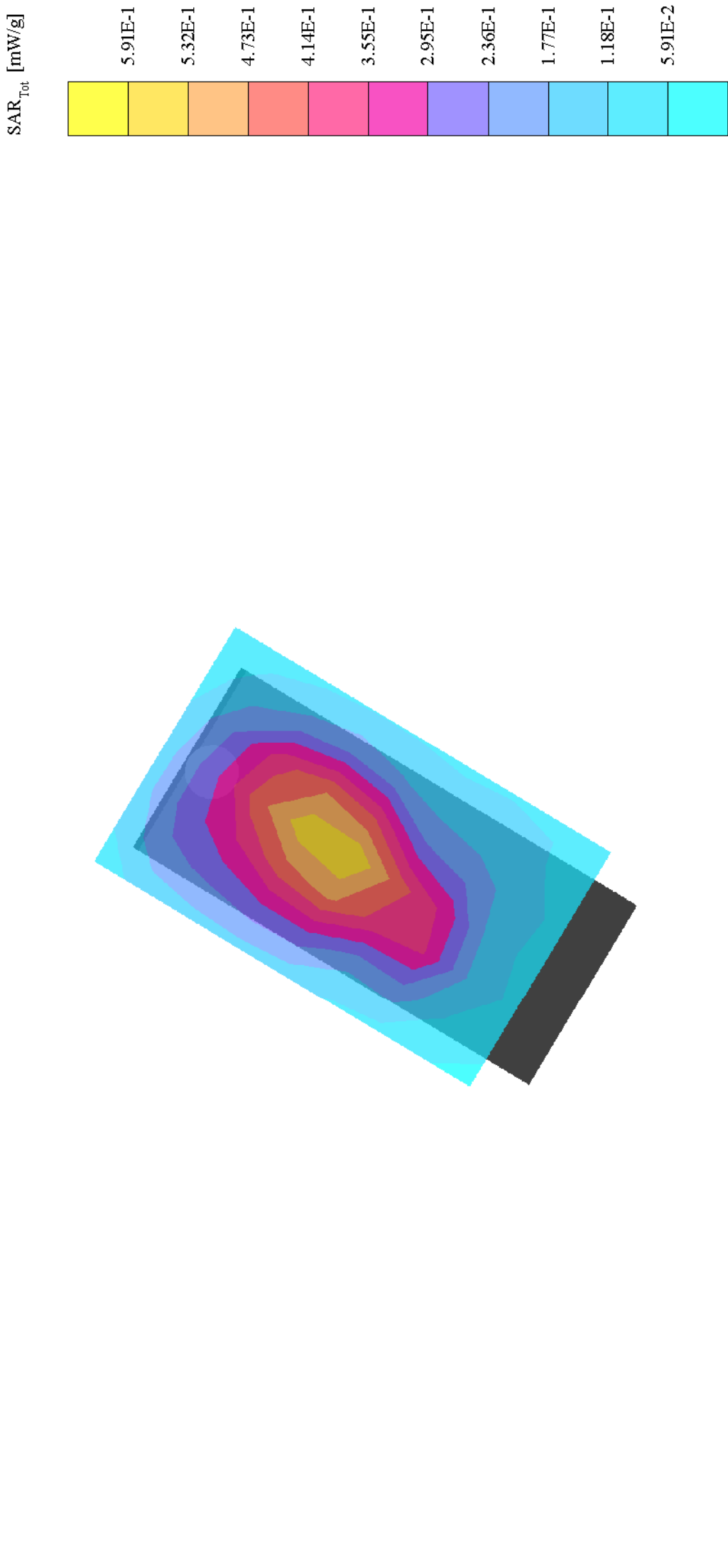


PY7AF052051

SAM 3 Phantom; Left Hand Section; Position: (93°,59°), Frequency: 824 MHz  
Probe: ET3DV6 - SN1585; ConvF(6.95,6.95,6.95); Crest factor: 8.3; Head 835-900MHz:  $\sigma = 0.86 \text{ mho/m}$   $\epsilon_r = 40.2$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 5x5x7: SAR (1g): 0.550 mW/g, SAR (10g): 0.354 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 12.0, Dy = 10.0, Dz = 10.0  
Powerdrift: 0.09 dB  
Helen:PY7AF052051;S/N:BD3050HQLB/FP2,Frequency 824.2MHz(ch128),Left  
Hand Side,Cheek(93°) Phone Position, meas. Power=32.8dBm, Nom.Power=33.0dBm;  
ambien temprature 22(c-degree)and humidity 22%;Date:060224



# D1900 V2

SAM 4 Phantom; Flat Section; Position: (90° 90°); Frequency: 1900 MHz

Probe: ET3DV6 - SN1585; ConvF(4.62,4.62,4.62); Crest factor: 1.0; Muscle 1900:  $\sigma = 1.56 \text{ mho/m}$   $\epsilon_r = 51.2$   $\rho = 1.00 \text{ g/cm}^3$

Cubes (2): SAR (1g): 4.14 mW/g  $\pm$  0.03 dB, SAR (10g): 2.13 mW/g  $\pm$  0.04 dB, (Worst-case extrapolation)

Coarse: Dx = 17.0, Dy = 17.0, Dz = 17.0

Powerdrift: -0.04 dB

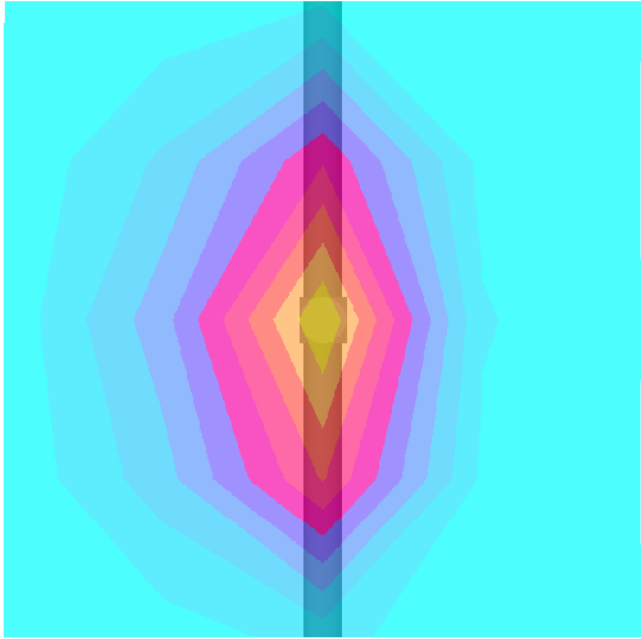
P=100mW, d=10mm, 1900MHz dipol D1900V2 s/n 5d002

Target values: 1g mass 39.6 mW/g, 10g mass 20.9 mW/g

Measured values: 1g mass 41.4mW/g(+4.3%), 10g mass 21.3mW/g(+1.9%)

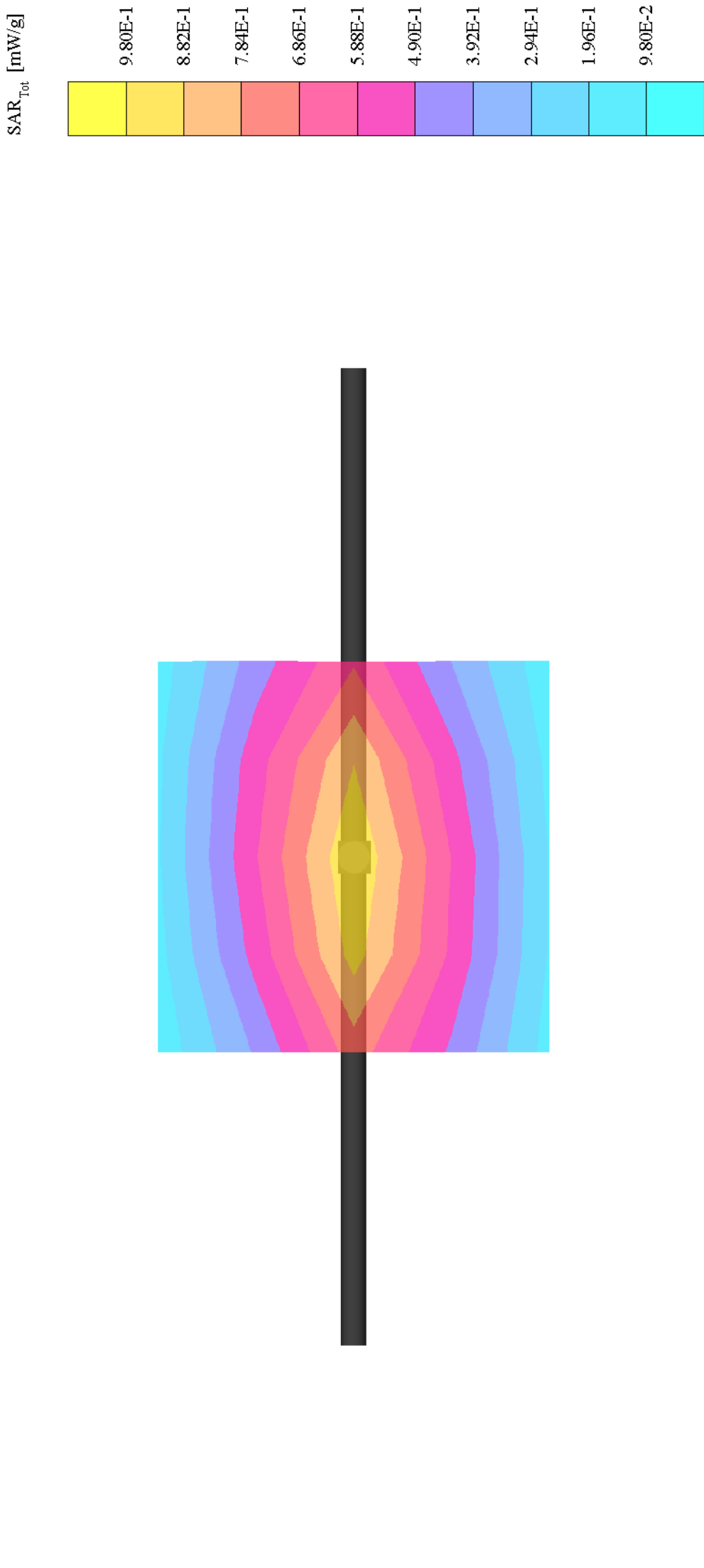
LIQUID'S Temperature 22C, Ambeint Temperature 24C ,humidity 22%

SAR<sub>Tot</sub> [mW/g]



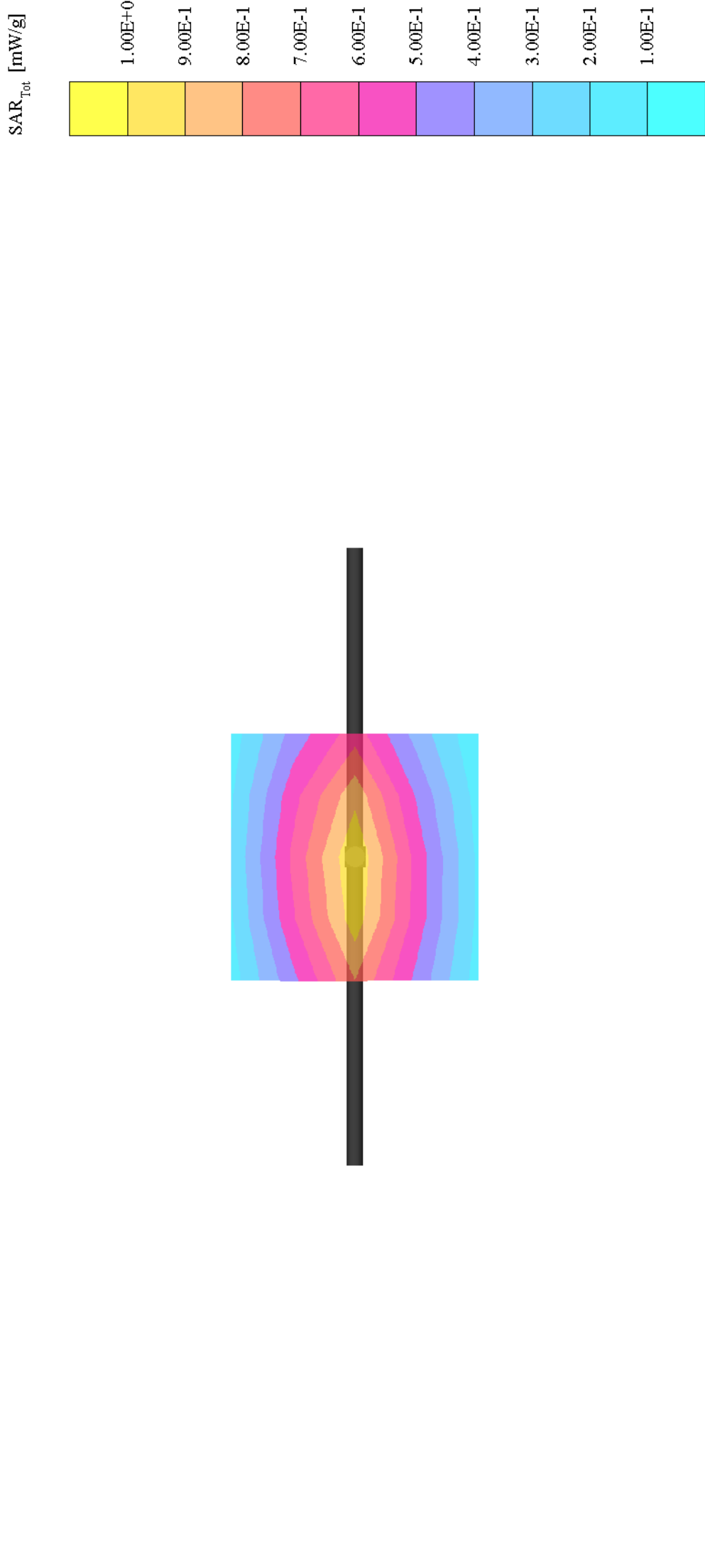
# D835 V2

SAM 3 Phantom; Flat Section; Position: (90° 90°); Frequency : 835 MHz  
Probe: ET3DV6 - SN1585; ConvF(6.95,6.95,6.95); Crest factor: 1.0; Head 835-900MHz:  $\sigma = 0.86 \text{ mho/m}$   $\epsilon_r = 40.2$   $\rho = 1.00 \text{ g/cm}^3$   
Cubes (2): SAR (1g): 0.900 mW/g  $\pm 0.02 \text{ dB}$ , SAR (10g): 0.581 mW/g  $\pm 0.03 \text{ dB}$ , (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Powerdrift: -0.02 dB  
P=100mW, d=15mm, 835MHz dipole D835V2 s/n 484  
Target values: 1g mass 9.08 mW/g, 10g mass 5.96 mW/g  
Measured values: 1g mass9.00mW/g(-0.9%), 10g mass 5.81mW/g(-2.6%)  
LIQUID'S Temperature 22C, Ambeint Temperature 24C ,humidity 22%



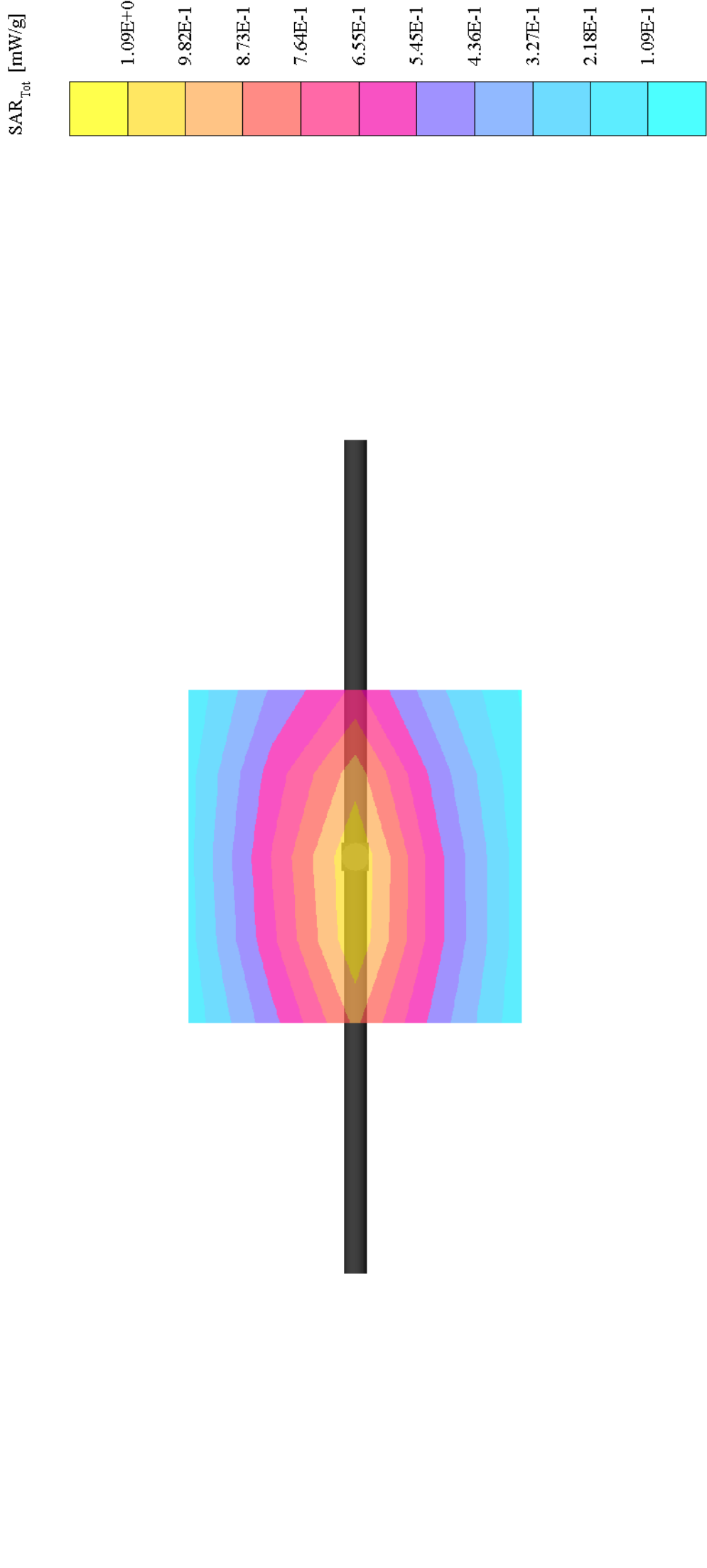
# D835 V2

SAM 3 Phantom; Flat Section; Position: (90° 90°); Frequency : 835 MHz  
Probe: ET3DV6 - SN1585; ConvF(6.95,6.95,6.95); Crest factor: 1.0; Head 835-900MHz:  $\sigma = 0.86 \text{ mho/m}$   $\epsilon_r = 40.2$   $\rho = 1.00 \text{ g/cm}^3$   
Cubes (2): SAR (1g): 0.925 mW/g  $\pm 0.03 \text{ dB}$ , SAR (10g): 0.597 mW/g  $\pm 0.02 \text{ dB}$ , (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Powerdrift: -0.03 dB  
P=100mW, d=15mm, 835MHz dipole D835V2 s/n 484  
Target values: 1g mass 9.08 mW/g, 10g mass 5.96 mW/g  
Measured values: 1g mass 9.25mW/g(+1.9%), 10g mass 5.97mW/g(+0.2%)  
LIQUID'S Temperature 22C, Ambeint Temperature 24C ,humidity 22%



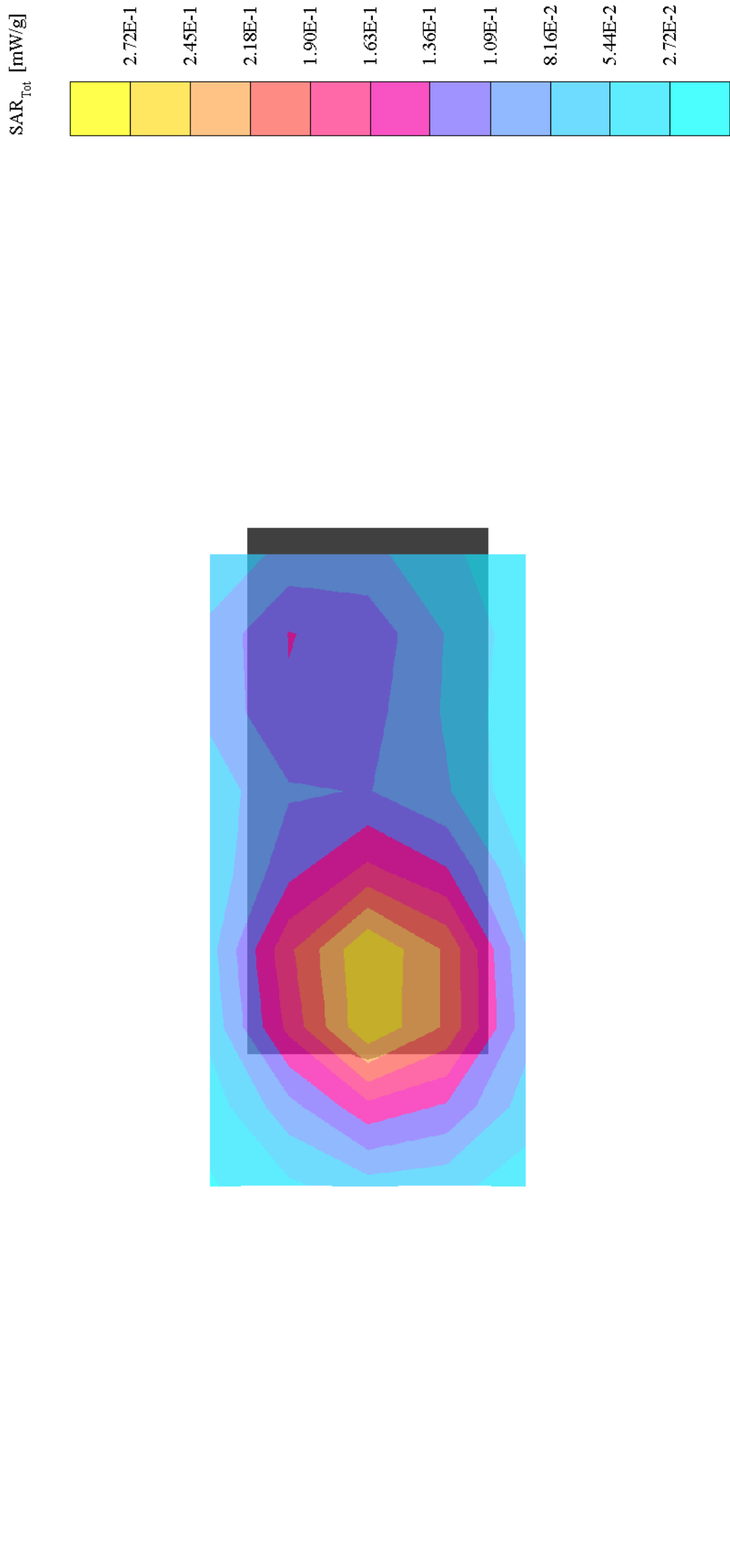
# D835 V2

SAM 3 Phantom; Flat Section; Position: (90°, 90°); Frequency: 835 MHz  
Probe: ET3DV6 - SN1585; ConvF(6.65,6.65); Crest factor: 1.0; Muscle 835:  $\sigma = 1.01 \text{ mho/m}$   $\epsilon_r = 55.4 \rho = 1.00 \text{ g/cm}^3$   
Cubes (2): SAR (1g): 1.01 mW/g  $\pm 0.03 \text{ dB}$ , SAR (10g): 0.649 mW/g  $\pm 0.03 \text{ dB}$ , (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Powerdrift: -0.01 dB  
P=100mW, d=15mm, 835MHz dipole D835V2 s/n 484  
Target values: 1g mass 9.48mW/g, 10g mass 6.24mW/g  
Measured values: 1g mass 10.1mW/g(+6.5%), 10g mass 6.49mW/g(+4%)  
LIQUID'S Temperature 22C, Ambeint Temperature 22C ,humidity 22%



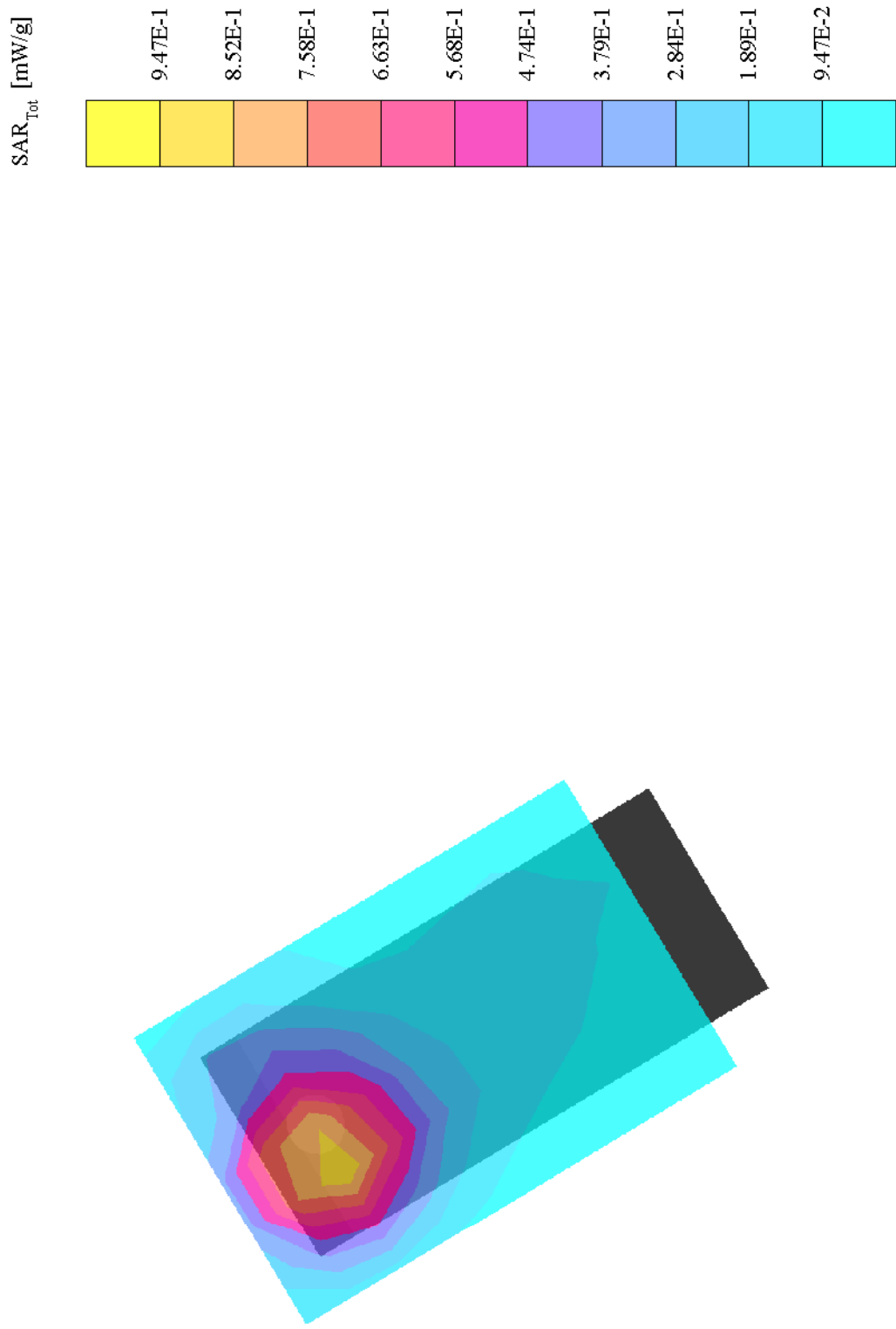
PY7AF052051

SAM 4 Phantom; Flat Section; Position: (270°, 90°); Frequency: 1910 MHz  
Probe: ET3DV6 - SN1585; ConvF(4.62,4.62,4.62); Crest factor: 4.0; Muscle 1900:  $\sigma = 1.56 \text{ mho/m}$   $\epsilon_r = 51.2$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 5x5x7: SAR (1g): 0.269 mW/g, SAR (10g): 0.161 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Powerdrift: -0.02 dB  
Helen: PY7AF052051; S/N: BD3050HQLB/FP2, Frequency 1910MHz(ch81.0), FrontPhone + 1.5mm distance from flat section of phantom, meas. Power=26.2dBm, Nom.Power=27dBm; ambien temprature 22(c-degree)and humidity 22%, BlueTooth;EGPRS Measurement;Date:060220



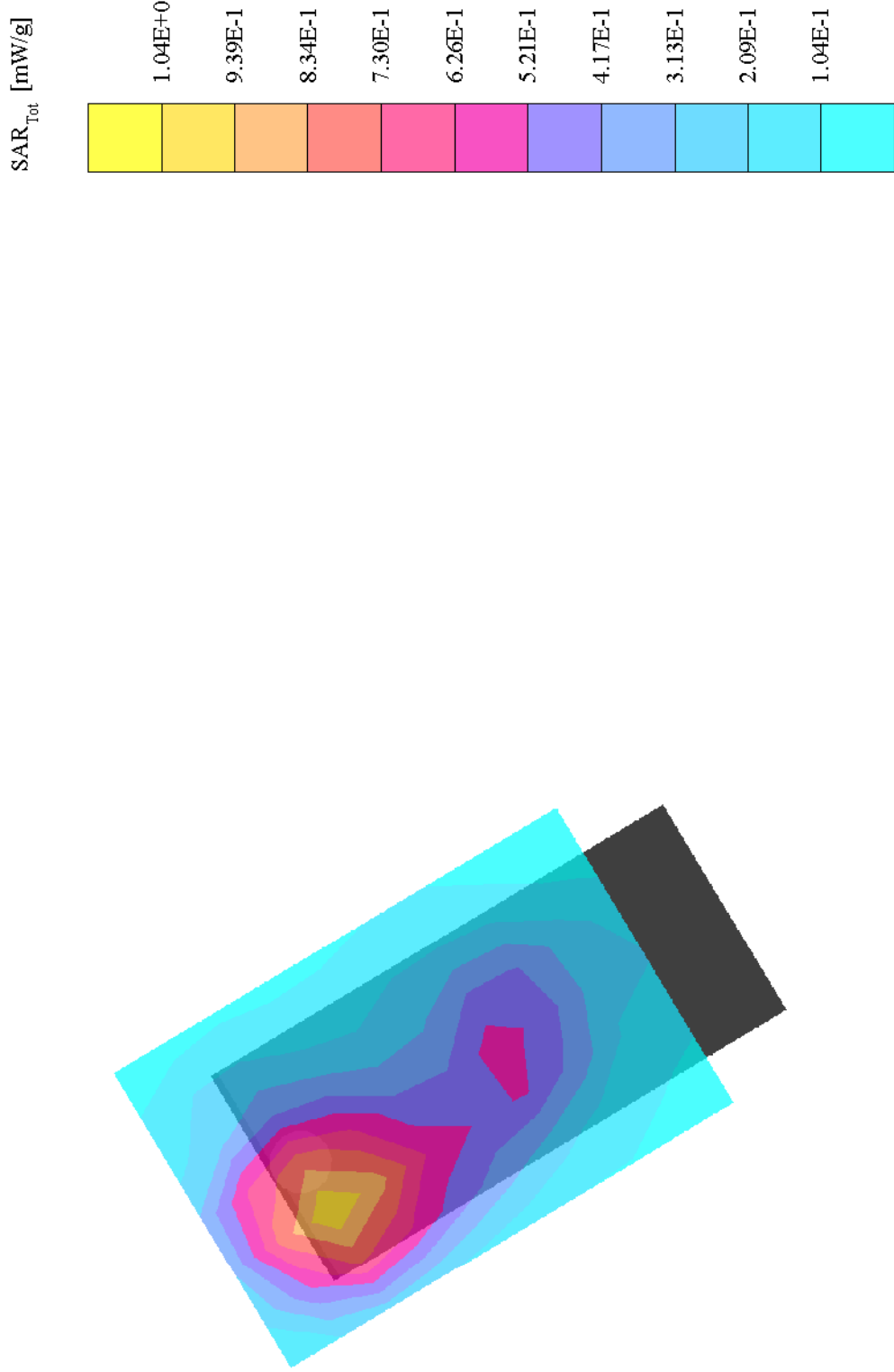
PY7AF052051

SAM 4 Phantom; Righ Hand Section; Position: (108°,301°); Frequency: 1850 MHz  
Probe: ET3DV6 - SN1585; ConvF(5.03,5.03,5.03); Crest factor: 8.3; Head 1900MHz:  $\sigma = 1.47 \text{ mho/m}$   $\epsilon_r = 39.7$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 5x5x7: SAR (1g): 0.857 mW/g, SAR (10g): 0.472 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 11.0, Dy = 11.0, Dz = 10.0  
Powerdrift: -0.16 dB  
Helen:PY7AF052051;S/N:BD3050HQLB/FP2,Frequency 1850MHz(ch512),Right  
Hand Side,Tilt(108°) Phone Position, meas. Power=30.3dBm, Nom.Power=30.5dBm;  
ambien temprature 22(c-degree)and humidity 22%; ;Date:060221



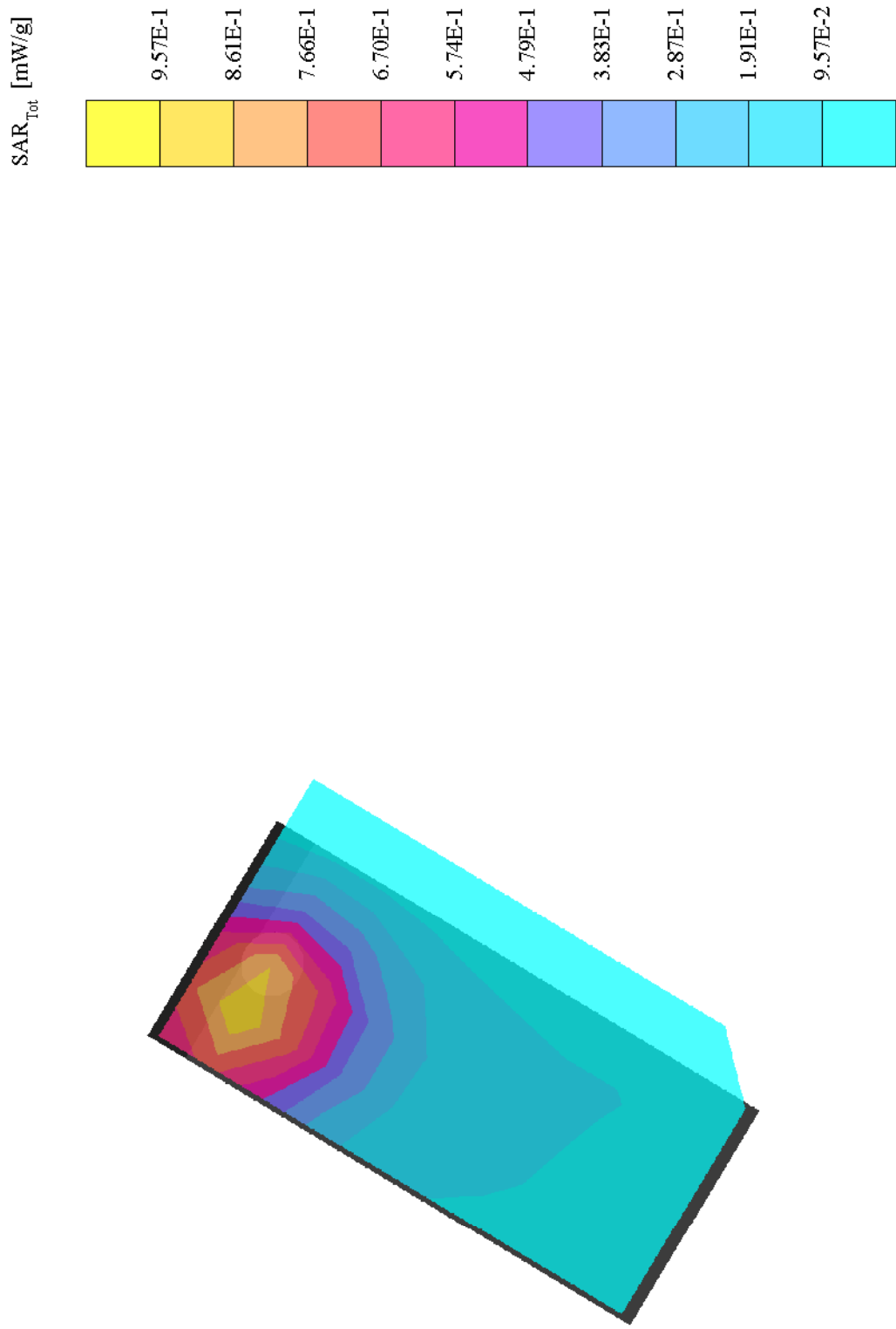
PY7AF052051

SAM 4 Phantom; Righ Hand Section; Position: (93°,301°); Frequency: 1850 MHz  
Probe: ET3DV6 - SN1585; ConvF(5.03,5.03,5.03); Crest factor: 8.3; Head 1900MHz:  $\sigma = 1.47 \text{ mho/m}$   $\epsilon_r = 39.7$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 5x5x7: SAR (1g): 0.944 mW/g, SAR (10g): 0.522 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 11.0, Dy = 11.0, Dz = 10.0  
Powerdrift: -0.01 dB  
Helen:PY7AF052051;S/N:BD3050HQLB/FP2,Frequency 1850MHz(ch512),Right  
Hand Side,Cheek(93°) Phone Position, meas. Power=30.3dBm, Nom.Power=30.5dBm;  
ambient temperature 22(c-degree)and humidity 22%, ;Date:060221



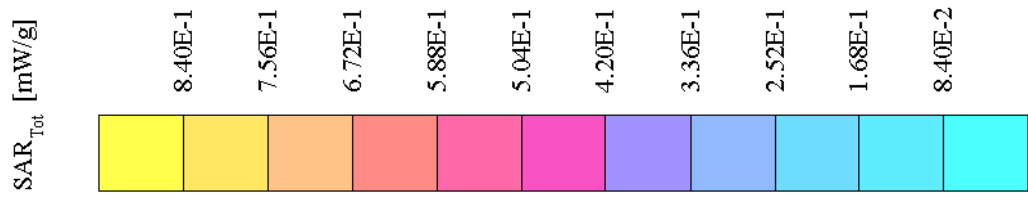
PY7AF052051

SAM 4 Phantom; Left Hand Section; Position: (108°,59°); Frequency: 1850 MHz  
Probe: ET3DV6 - SN1585; ConvF(5.03,5.03,5.03); Crest factor: 8.3; Head 1900MHz:  $\sigma = 1.47 \text{ mho/m}$   $\epsilon_r = 39.7$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 5x5x7: SAR (1g): 0.881 mW/g, SAR (10g): 0.493 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 11.0, Dy = 11.0, Dz = 11.0  
Powerdrift: -0.05 dB  
Helen:PY7AF052051;S/N:BD3050HQLB/FP2,Frequency 1850MHz(ch512),Left  
Hand Side,Tilt(108°) Phone Position, meas. Power=30.3dBm, Nom.Power=30.5dBm;  
ambien temprature 22(c-degree)and humidity 22%; ;Date:060221



PY7AF052051

SAM 4 Phantom; Left Hand Section; Position: (93°,59°), Frequency: 1850 MHz  
Probe: ET3DV6 - SN1585; ConvF(5.03,5.03,5.03); Crest factor: 8.3; Head 1900MHz:  $\sigma = 1.47 \text{ mho/m}$   $\epsilon_r = 39.7$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 5x5x7: SAR (1g): 0.793 mW/g, SAR (10g): 0.461 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 11.0, Dy = 11.0, Dz = 11.0  
Powerdrift: -0.01 dB  
Helen:PY7AF052051;S/N:BD3050HQLB/FP2,Frequency 1850MHz(ch512),Left  
Hand Side,Cheek(93°) Phone Position, meas. Power=30.3dBm, Nom.Power=30.5dBm;  
ambien temprature 22(c-degree)and humidity 22%;Date:060221



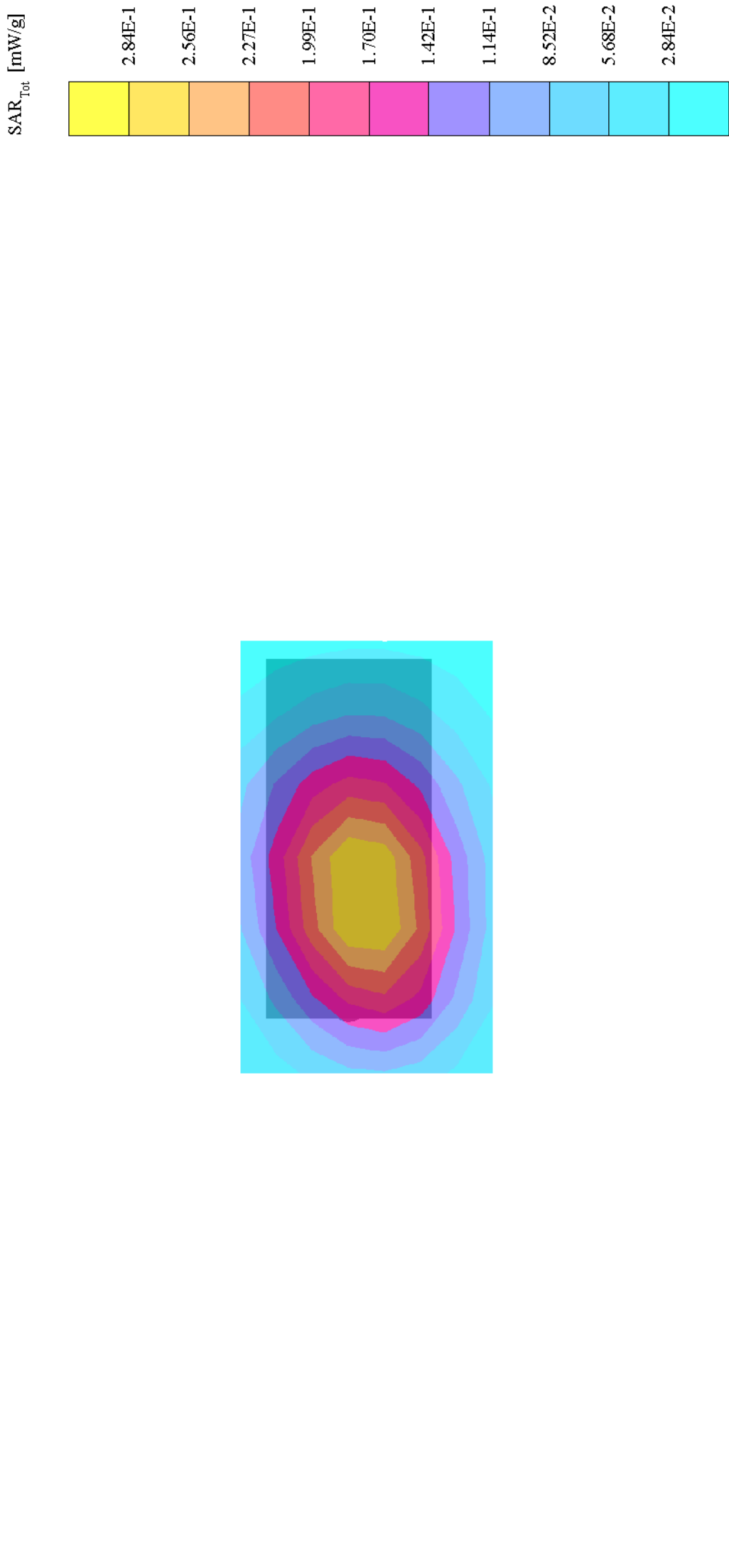
PY7AF052051

SAM 4 Phantom; Flat Section; Position: (270°, 90°); Frequency: 1850 MHz  
Probe: ET3DV6 - SN1585; ConvF(4.62,4.62,4.62); Crest factor: 8.3; Muscle 1900:  $\sigma = 1.56 \text{ mho/m}$   $\epsilon_r = 51.2$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 5x5x7: SAR (1g): 1.12 mW/g, SAR (10g): 0.611 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0  
Powerdrift: -0.04 dB  
Helen: PY7AF052051; S/N: BD3050HQLB/FP2, Frequency 1850MHz(ch512), Back Phone +  
1.5mm distance from flat section of phantom, meas. Power=30.3dBm, Nom.Power=30.5dBm;  
ambien temprature 22(c-degree)and humidity 22%, BlueTooth; Date: 060220



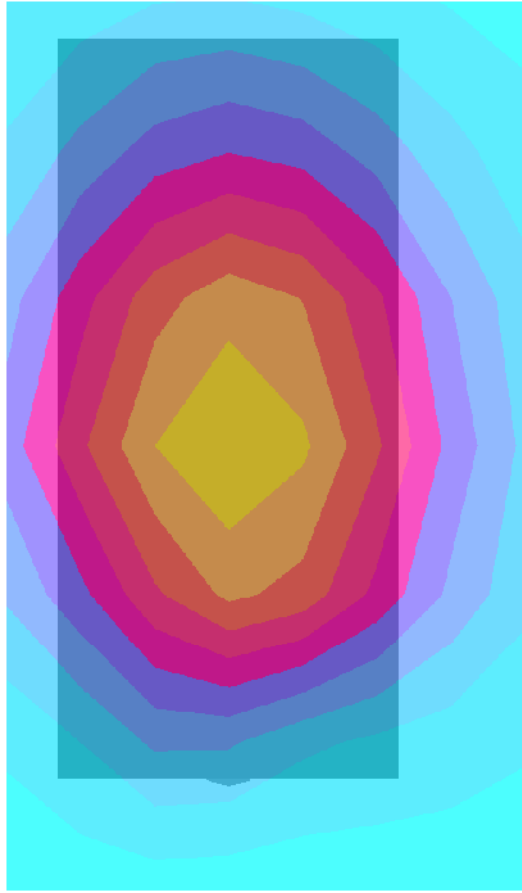
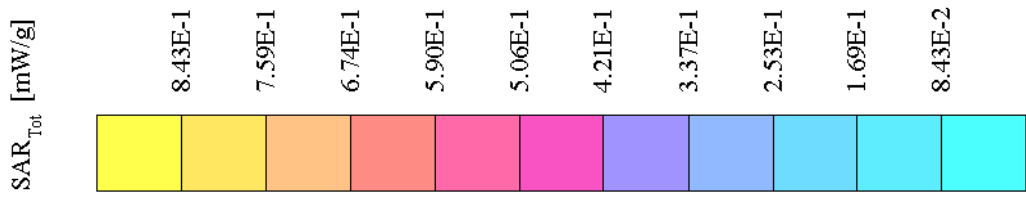
PY7AF052051

SAM 3 Phantom; Flat Section; Position: (270°, 90°); Frequency: 849 MHz  
Probe: ET3DV6 - SN1585; ConvF(6.65,6.65); Crest factor: 4.0; Muscle 835:  $\sigma = 1.01 \text{ mho/m}$   $\epsilon_r = 55.4$   $\rho = 1.00 \text{ g/cm}^3$   
Cube 5x5x7: SAR (1g): 0.278 mW/g, SAR (10g): 0.193 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 10.0, Dy = 20.0, Dz = 10.0  
Powerdrift: -0.03 dB  
Helen: PY7AF052051; S/N: BD3050HQLB/FP2, Frequency 848MHz(ch251), Front Phone +  
1.5mm distance from flat section of phantom, meas. Power=32.8dBm, Nom.Power=33.0dBm;  
ambien temprature 22(c-degree)and humidity 22%EGPRS Measurement ;Date:060220



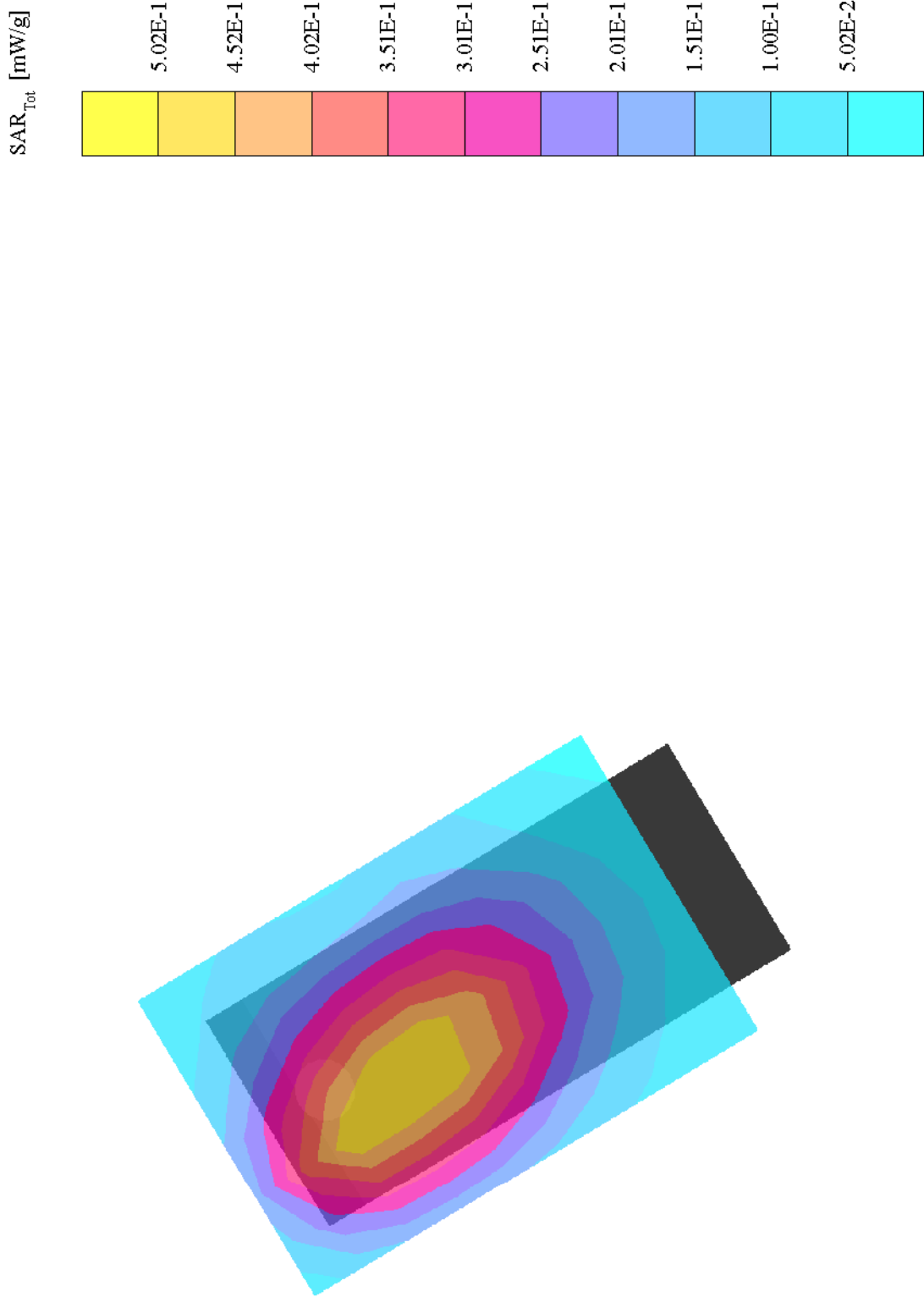
PY7AF052051

SAM 3 Phantom; Flat Section; Position: (270°, 90°); Frequency: 849 MHz  
Probe: ET3DV6 - SN1585; ConvF(6.65,6.65,6.65); Crest factor: 8.0; Muscle 835:  $\sigma = 1.01$  mho/m  $\epsilon_r = 55.4$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 5x5x7: SAR (1g): 0.780 mW/g, SAR (10g): 0.552 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 10.0, Dy = 20.0, Dz = 10.0  
Powerdrift: -0.09 dB  
Helen: PY7AF052051; S/N: BD3050HQLB/FP2, Frequency 848MHz(ch251), Back Phone +  
1.5mm distance from flat section of phantom, meas. Power=32.9dBm, Nom.Power=33.0dBm;  
ambien temprature 22(c-degree)and humidity 22%



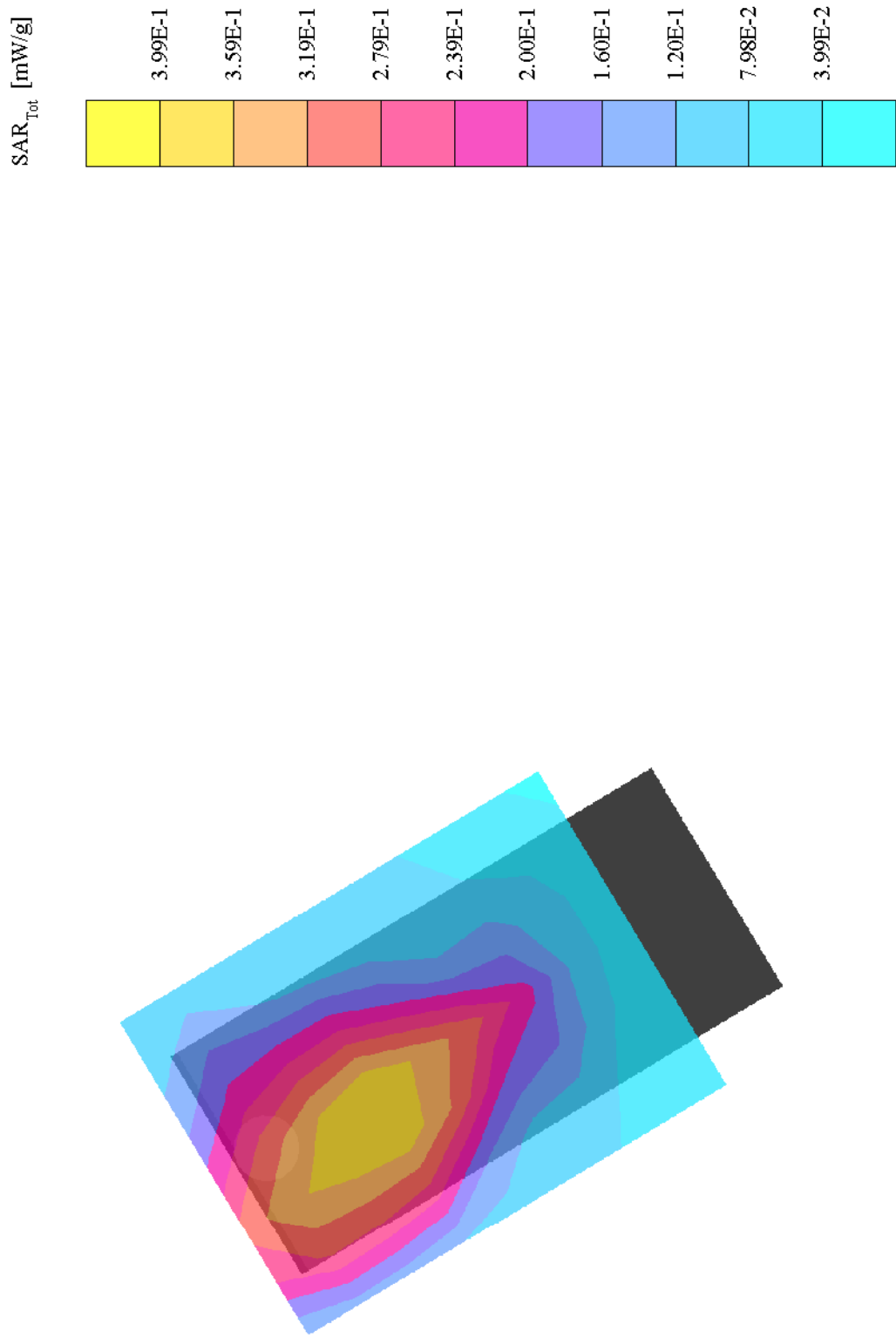
PY7AF052051

SAM 3 Phantom; Righ Hand Section; Position: (108°,301°); Frequency: 824 MHz  
Probe: ET3DV6 - SN1585; ConvF(6.95,6.95,6.95); Crest factor: 8.3; Head 835-900MHz:  $\sigma = 0.86$  mho/m  $\epsilon_r = 40.2$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cubes (2): SAR (1g): 0.478 mW/g  $\pm$  0.00 dB, SAR (10g): 0.316 mW/g  $\pm$  0.08 dB, (Worst-case extrapolation)  
Coarse: Dx = 11.0, Dy = 11.0, Dz = 11.0  
Powerdrift: -0.03 dB



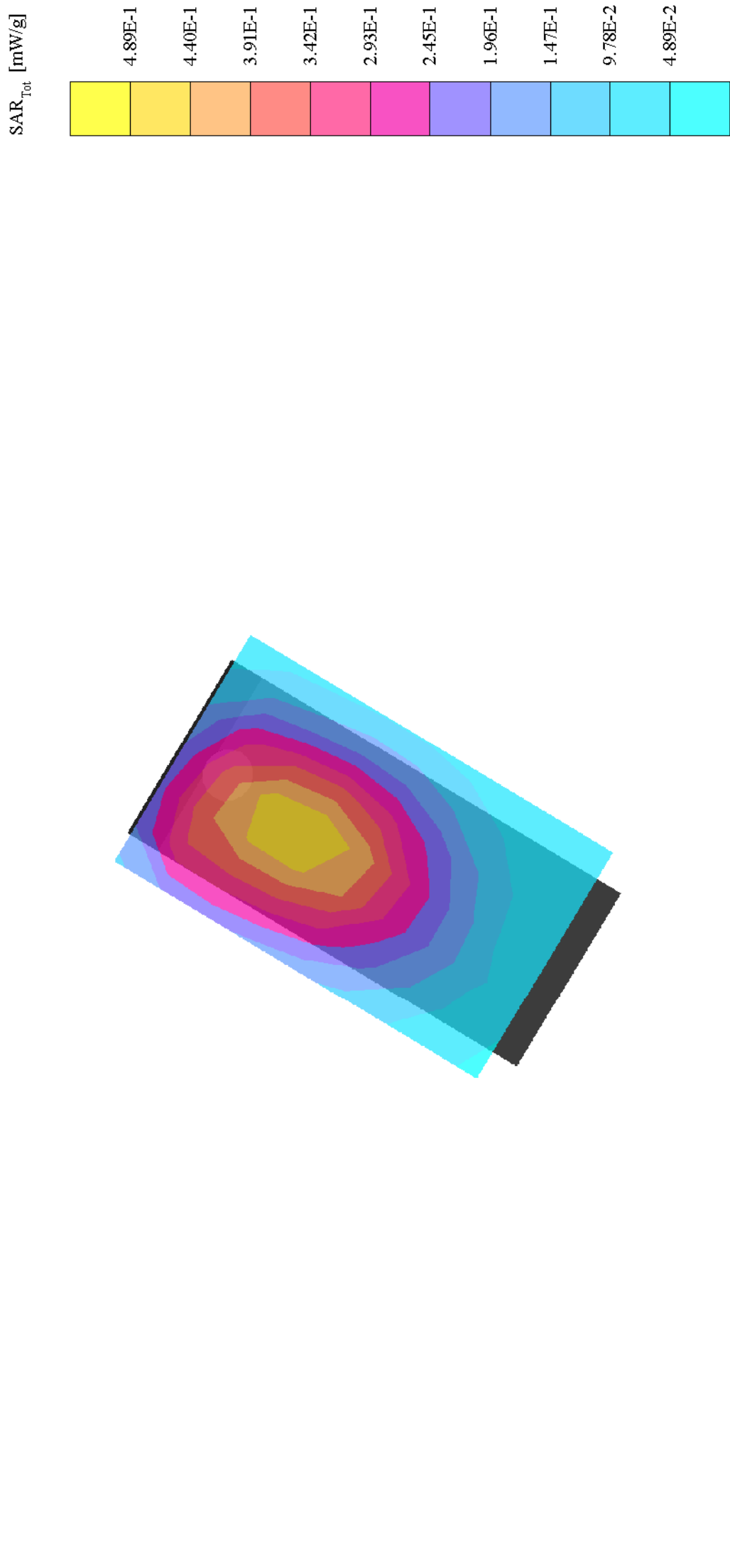
PY7AF052051

SAM 3 Phantom; Righ Hand Section; Position: (93°,301°); Frequency: 824 MHz  
Probe: ET3DV6 - SN1585; ConvF(6.95,6.95,6.95); Crest factor: 8.0; Head 835-900MHz:  $\sigma = 0.86$  mho/m  $\epsilon_r = 40.2$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 5x5x7: SAR (1g): 0.397 mW/g, SAR (10g): 0.259 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 11.0, Dy = 11.0, Dz = 11.0  
Powerdrift: -0.10 dB  
Helen: PY7AF052051; S/N: BD3050HQLB/FP2, Frequency 824.2MHz(ch128), Right  
Hand Side, Cheek(93°) Phone Position, meas. Power=32.8dBm, Nom.Power=33.0dBm;  
ambien temprature 22(c-degree)and humidity 22%; ;Date:060223



PY7AF052051

SAM 3 Phantom; Left Hand Section; Position: (108°,59°); Frequency: 824 MHz  
Probe: ET3DV6 - SN1585; ConvF(6.95,6.95,6.95); Crest factor: 8.3; Head 835-900MHz:  $\sigma = 0.86$  mho/m  $\epsilon_r = 40.2$   $\rho = 1.00$  g/cm<sup>3</sup>  
Cube 5x5x7: SAR (1g): 0.469 mW/g, SAR (10g): 0.319 mW/g, (Worst-case extrapolation)  
Coarse: Dx = 12.0, Dy = 10.0, Dz = 10.0  
Powerdrift: -0.00 dB  
Helen: PY7AF052051; S/N: BD3050HQLB/FP2, Frequency 824.2MHz(ch128), Left  
Hand Side, Tilt(108°) Phone Position, meas. Power=32.8dBm, Nom.Power=33.0dBm;  
ambien temprature 22(c-degree)and humidity 22%; ;Date:060224



# D1900 V2

SAM 4 Phantom; Flat Section; Position: (90° 90°); Frequency: 1900 MHz

Probe: ET3DV6 - SN1585; ConvF(5.03,5.03,5.03); Crest factor: 1.0; Head 1900MHz:  $\sigma = 1.47 \text{ mho/m}$   $\epsilon_r = 39.7$   $\rho = 1.00 \text{ g/cm}^3$

Cubes (2): SAR (1g): 4.05 mW/g  $\pm 0.02 \text{ dB}$ , SAR (10g): 2.07 mW/g  $\pm 0.04 \text{ dB}$ , (Worst-case extrapolation)

Coarse: Dx = 17.0, Dy = 17.0, Dz = 17.0

Powerdrift: -0.02 dB

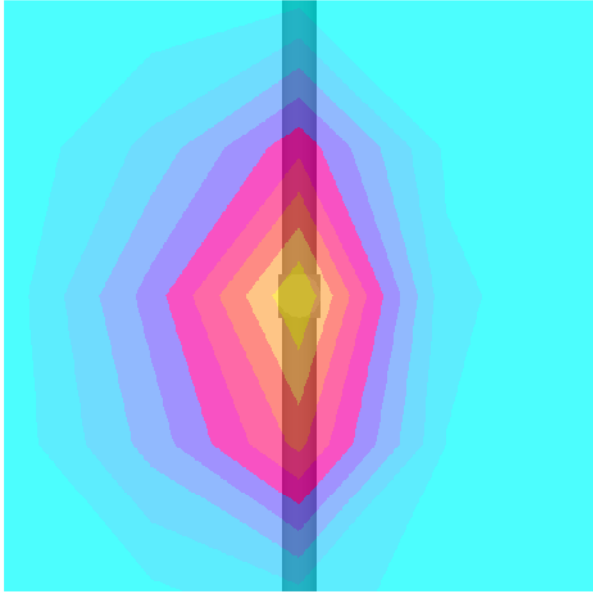
P=100mW, d=10mm, 1900MHz dipol D1900V2 s/n 5d002

Target values: 1g mass 39.2 mW/g, 10g mass 20.6 mW/g

Measured values: 1g mass 40.5mW/g(+3.3%), 10g mass 20.7mW/g(+0.5%)

LIQUID'S Temprature 23C, Ambeint Temprature 22C ,humidity 25%)

SAR<sub>Tot</sub> [mW/g]



## DASY4 Validation Report for Body TSL

Date/Time: 15.03.2005 15:20:32

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d002**

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

Medium: MSL 1900 MHz;

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.57$  mho/m;  $\epsilon_r = 52.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.43, 4.43, 4.43); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 5.0; Type: QD000P50AA; Serial: 1001;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

**Pin = 250 mW; d = 10 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 11.4 mW/g

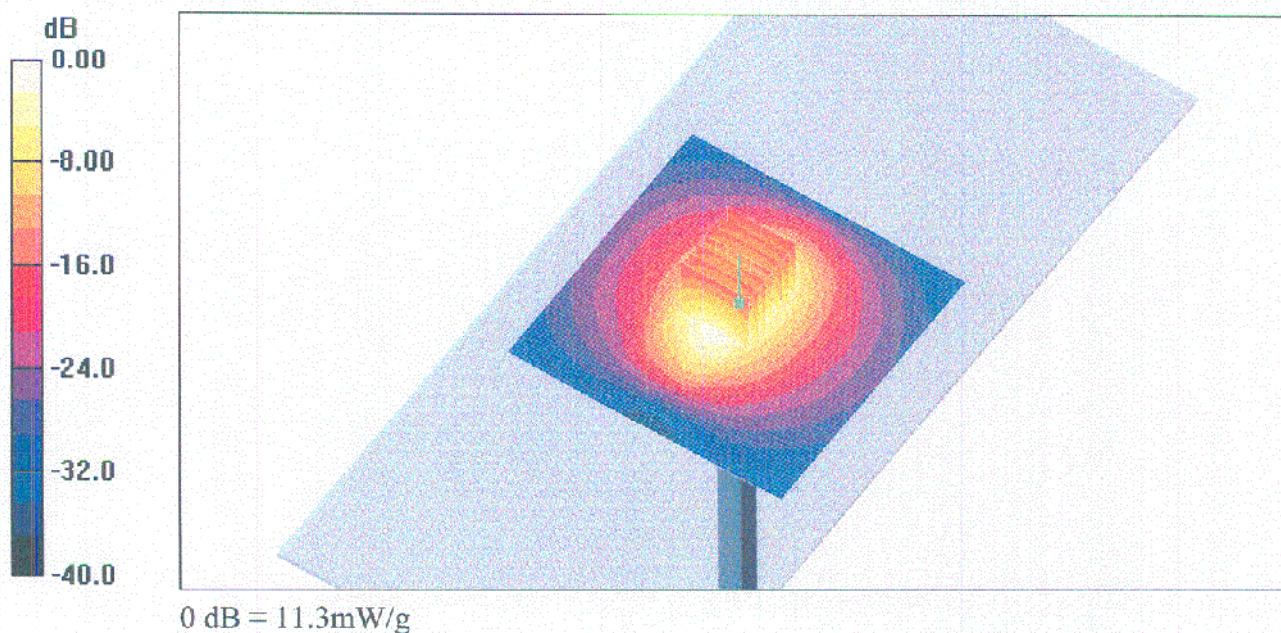
**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 87.3 V/m; Power Drift = 0.061 dB

Peak SAR (extrapolated) = 16.8 W/kg

**SAR(1 g) = 9.91 mW/g; SAR(10 g) = 5.23 mW/g**

Maximum value of SAR (measured) = 11.3 mW/g



## DASY4 Validation Report for Head TSL

Date/Time: 08.03.2005 10:35:22

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN484**

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

Medium: HSL 835 MHz;

Medium parameters used:  $f = 835 \text{ MHz}$ ;  $\sigma = 0.91 \text{ mho/m}$ ;  $\epsilon_r = 42$ ;  $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

### DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(6.24, 6.24, 6.24); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 144

**Pin = 250 mW; d = 15 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 2.46 mW/g

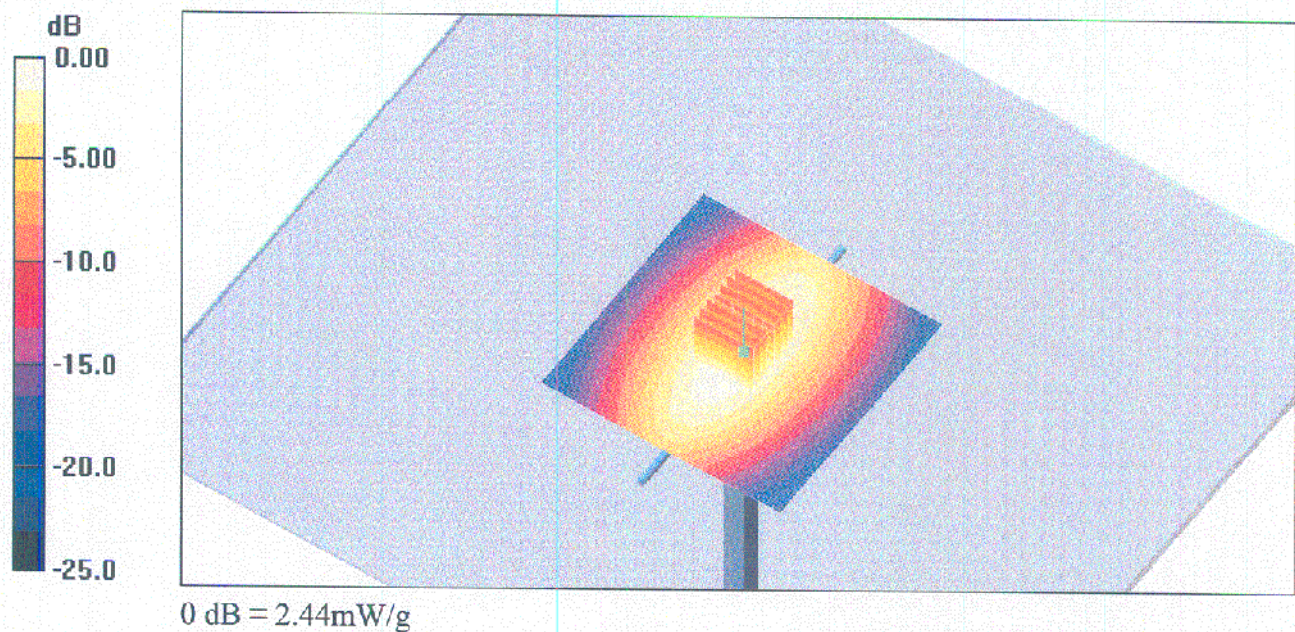
**Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.0 V/m; Power Drift = 0.015 dB

Peak SAR (extrapolated) = 3.29 W/kg

**SAR(1 g) = 2.27 mW/g; SAR(10 g) = 1.49 mW/g**

Maximum value of SAR (measured) = 2.44 mW/g



## DASY4 Validation Report for Body TSL

Date/Time: 14.03.2005 10:51:59

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN484**

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

Medium: M900;

Medium parameters used:  $f = 835$  MHz;  $\sigma = 1.01$  mho/m;  $\epsilon_r = 54.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(5.98, 5.98, 5.98); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

**Pin = 250 mW; d = 15 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 2.57 mW/g

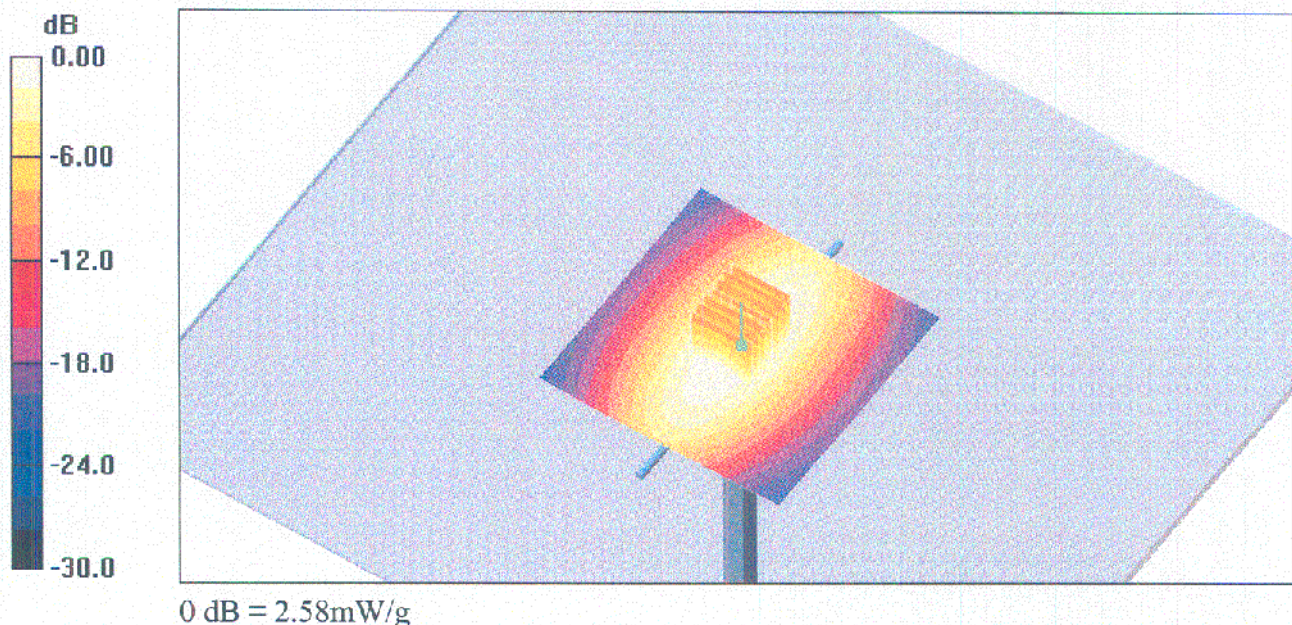
**Pin = 250 mW; d = 15 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 52.6 V/m; Power Drift = 0.025 dB

Peak SAR (extrapolated) = 3.36 W/kg

**SAR(1 g) = 2.37 mW/g; SAR(10 g) = 1.56 mW/g**

Maximum value of SAR (measured) = 2.58 mW/g



## DASY4 Validation Report for Head TSL

Date/Time: 09.03.2005 15:20:45

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d002**

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

Medium: HSL 1900 MHz;

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.46$  mho/m;  $\epsilon_r = 39.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507; ConvF(4.96, 4.96, 4.96); Calibrated: 26.10.2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.01.2005
- Phantom: Flat Phantom 5.0; Type: QD000P50AA; Serial: 1001;
- Measurement SW: DASY4, V4.5 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 146

**Pin = 250 mW; d = 10 mm/Area Scan (81x81x1):** Measurement grid: dx=15mm, dy=15mm  
Maximum value of SAR (interpolated) = 11.4 mW/g

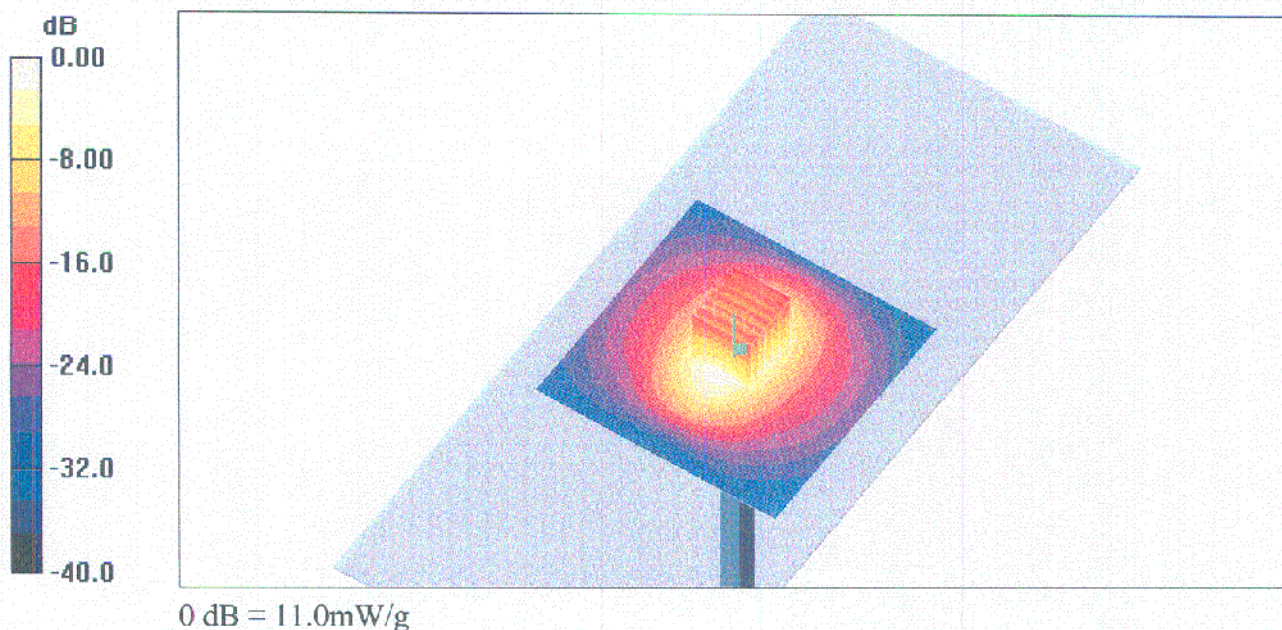
**Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 91.4 V/m; Power Drift = 0.037 dB

Peak SAR (extrapolated) = 16.9 W/kg

**SAR(1 g) = 9.81 mW/g; SAR(10 g) = 5.15 mW/g**

Maximum value of SAR (measured) = 11.0 mW/g





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

Accreditation No.: **SCS 108**

Client **Sony Ericsson Lund**

Certificate No: **ET3-1585\_Mar05**

## CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1585**

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

Calibration date: **March 16, 2005**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

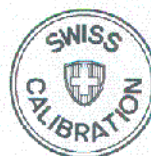
| Primary Standards          | ID #            | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|----------------------------|-----------------|-------------------------------------------|-----------------------|
| Power meter E4419B         | GB41293874      | 5-May-04 (METAS, No. 251-00388)           | May-05                |
| Power sensor E4412A        | MY41495277      | 5-May-04 (METAS, No. 251-00388)           | May-05                |
| Reference 3 dB Attenuator  | SN: S5054 (3c)  | 10-Aug-04 (METAS, No. 251-00403)          | Aug-05                |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 3-May-04 (METAS, No. 251-00389)           | May-05                |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 10-Aug-04 (METAS, No. 251-00404)          | Aug-05                |
| Reference Probe ES3DV2     | SN: 3013        | 7-Jan-05 (SPEAG, No. ES3-3013_Jan05)      | Jan-06                |
| DAE4                       | SN: 617         | 19-Jan-05 (SPEAG, No. DAE4-617_Jan05)     | Jan-06                |

| Secondary Standards       | ID #         | Check Date (in house)                    | Scheduled Check        |
|---------------------------|--------------|------------------------------------------|------------------------|
| Power sensor HP 8481A     | MY41092180   | 18-Sep-02 (SPEAG, in house check Oct-03) | In house check: Oct 05 |
| RF generator HP 8648C     | US3642U01700 | 4-Aug-99 (SPEAG, in house check Dec-03)  | In house check: Dec-05 |
| Network Analyzer HP 8753E | US37390585   | 18-Oct-01 (SPEAG, in house check Nov-04) | In house check: Nov 05 |

|                | Name          | Function              | Signature |
|----------------|---------------|-----------------------|-----------|
| Calibrated by: | Nico Vetterli | Laboratory Technician |           |
| Approved by:   | Katja Pokovic | Technical Manager     |           |

Issued: March 16, 2005

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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

### Glossary:

|                          |                                                                                                                                                      |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| TSL                      | tissue simulating liquid                                                                                                                             |
| NORM <sub>x,y,z</sub>    | sensitivity in free space                                                                                                                            |
| 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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

### Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not effect the  $E^2$ -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 ET3DV6

## SN:1585

|                  |                |
|------------------|----------------|
| Manufactured:    | May 7, 2001    |
| Last calibrated: | March 18, 2004 |
| Recalibrated:    | March 16, 2005 |

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

## DASY - Parameters of Probe: ET3DV6 SN:1585

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

|       |                     |                                     |
|-------|---------------------|-------------------------------------|
| NormX | <b>1.85</b> ± 10.1% | $\mu\text{V}/(\text{V}/\text{m})^2$ |
| NormY | <b>1.72</b> ± 10.1% | $\mu\text{V}/(\text{V}/\text{m})^2$ |
| NormZ | <b>1.90</b> ± 10.1% | $\mu\text{V}/(\text{V}/\text{m})^2$ |

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

|       |              |
|-------|--------------|
| DCP X | <b>93</b> mV |
| DCP Y | <b>93</b> mV |
| DCP Z | <b>93</b> mV |

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

Please see Page 8.

### Boundary Effect

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

|                                           |                              |               |               |
|-------------------------------------------|------------------------------|---------------|---------------|
| Sensor Center to Phantom Surface Distance |                              | <b>3.7 mm</b> | <b>4.7 mm</b> |
| SAR <sub>be</sub> [%]                     | Without Correction Algorithm | 7.8           | 4.0           |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 0.4           | 0.1           |

**TSL**                      **1750 MHz**      **Typical SAR gradient: 10 % per mm**

|                                           |                              |               |               |
|-------------------------------------------|------------------------------|---------------|---------------|
| Sensor Center to Phantom Surface Distance |                              | <b>3.7 mm</b> | <b>4.7 mm</b> |
| SAR <sub>be</sub> [%]                     | Without Correction Algorithm | 12.7          | 8.7           |
| SAR <sub>be</sub> [%]                     | With Correction Algorithm    | 0.4           | 0.3           |

### Sensor Offset

Probe Tip to Sensor Center                      **2.7 mm**

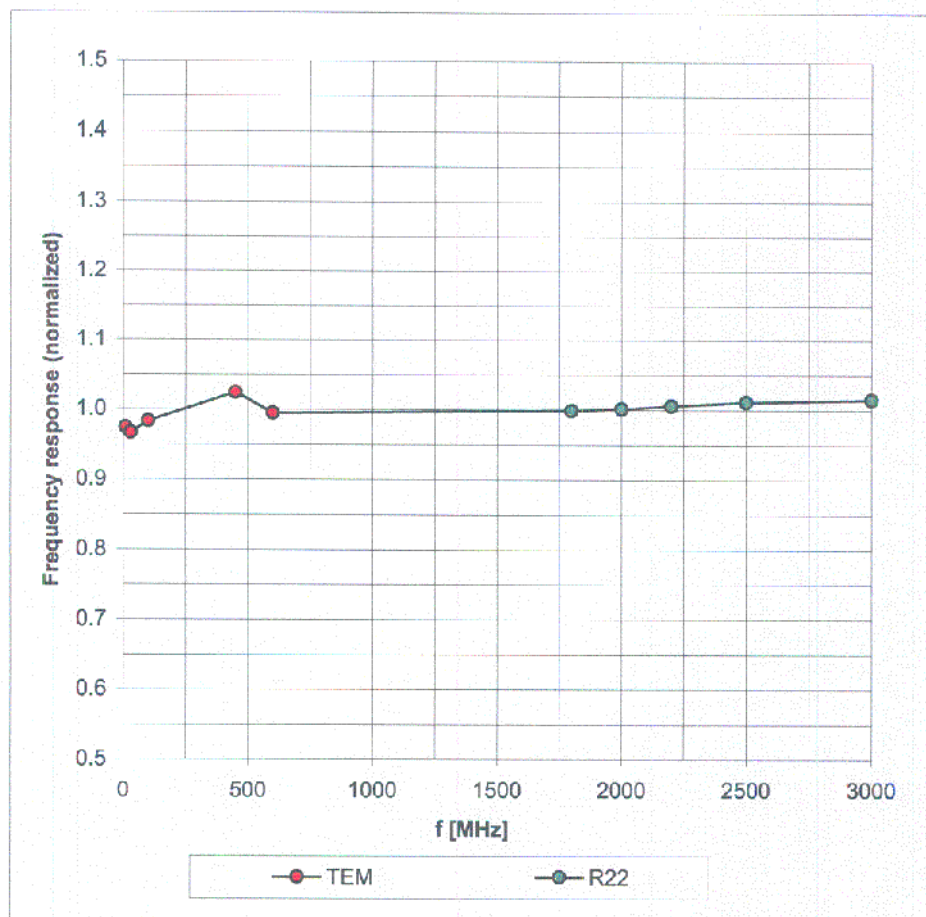
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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

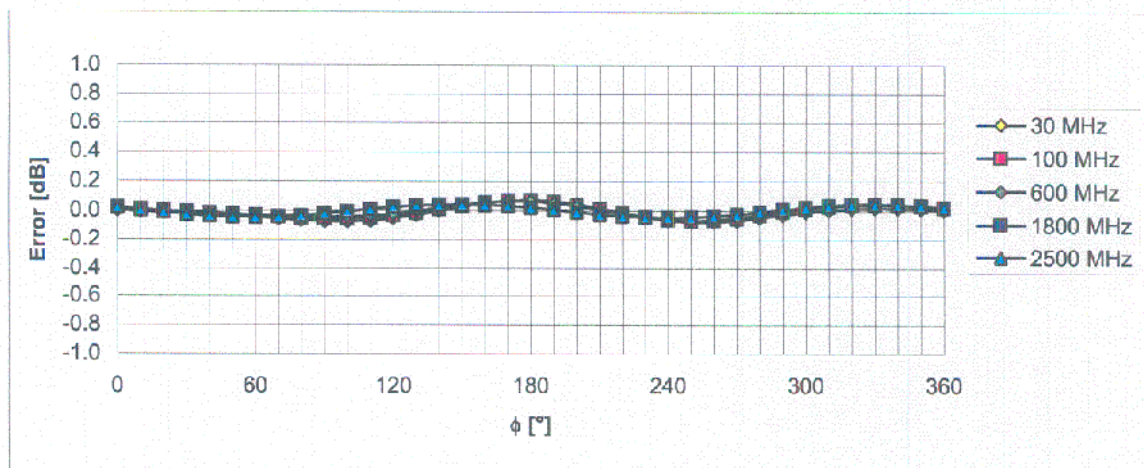
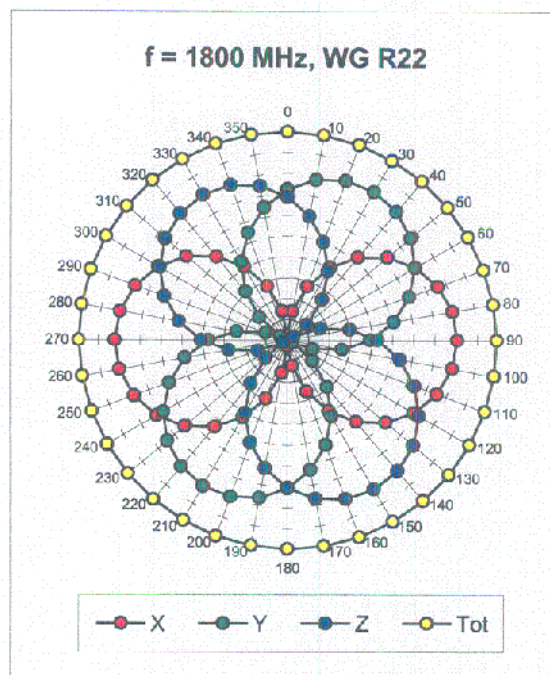
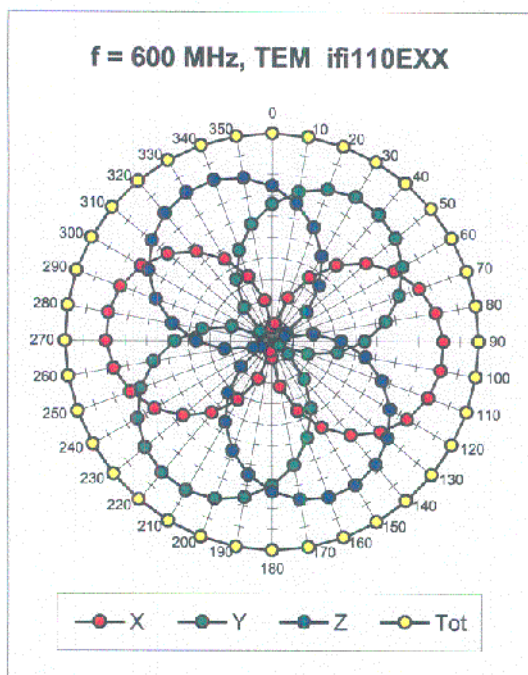
<sup>B</sup> Numerical linearization parameter: uncertainty not required.

## Frequency Response of E-Field

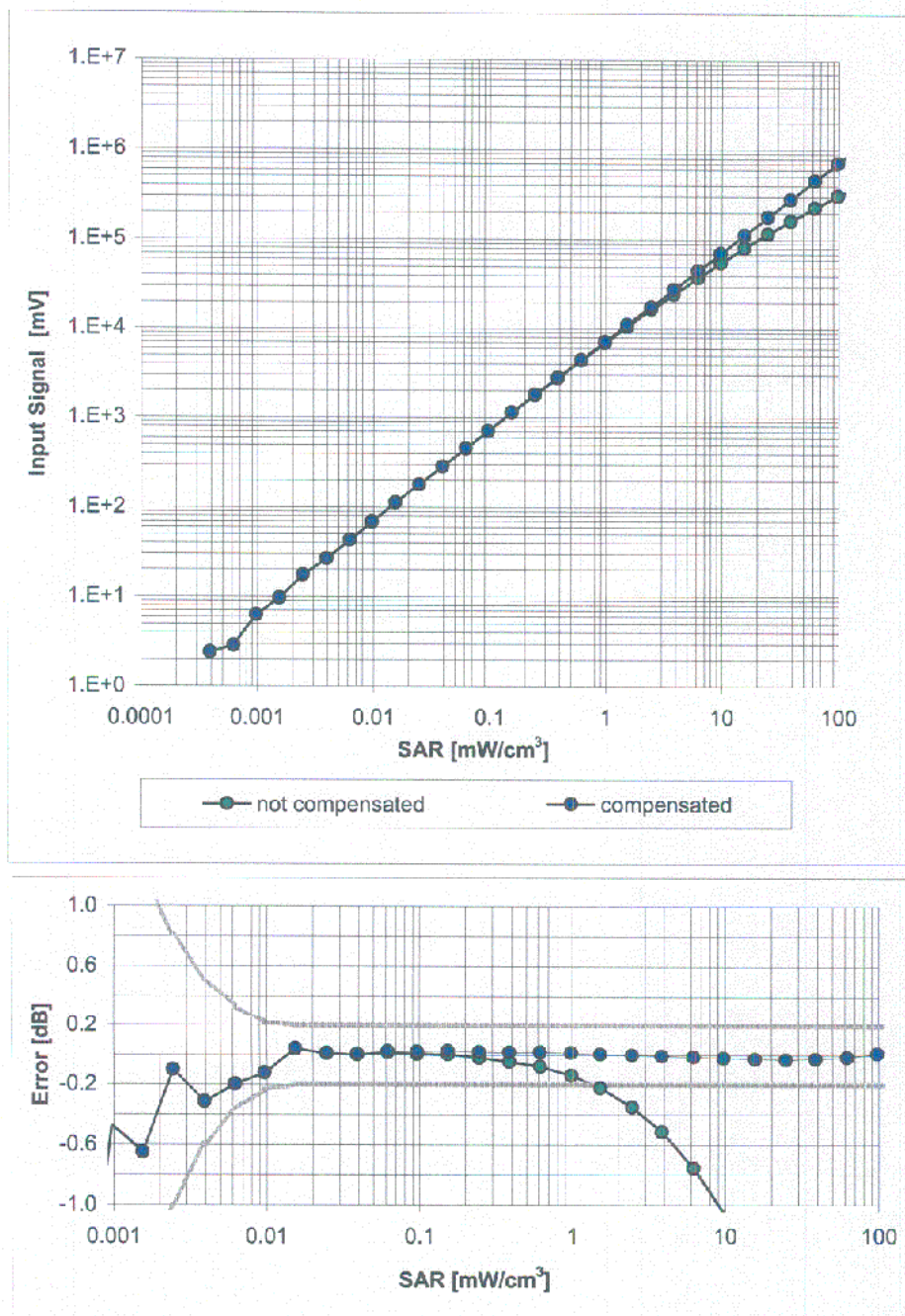
(TEM-Cell: Ifi110 EXX, Waveguide: R22)



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

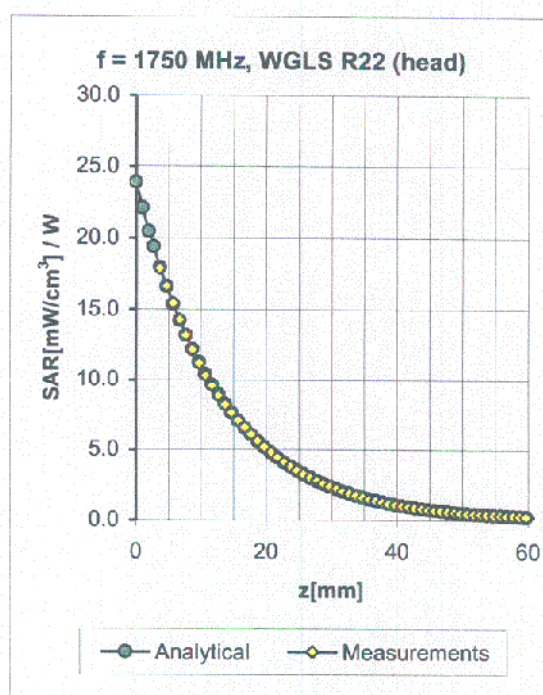
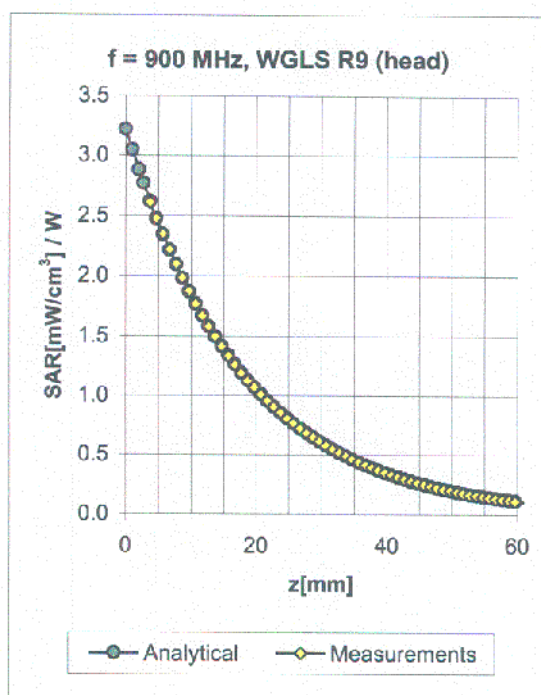
Receiving Pattern ( $\phi$ ),  $\theta = 0^\circ$ Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

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



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

## Conversion Factor Assessment

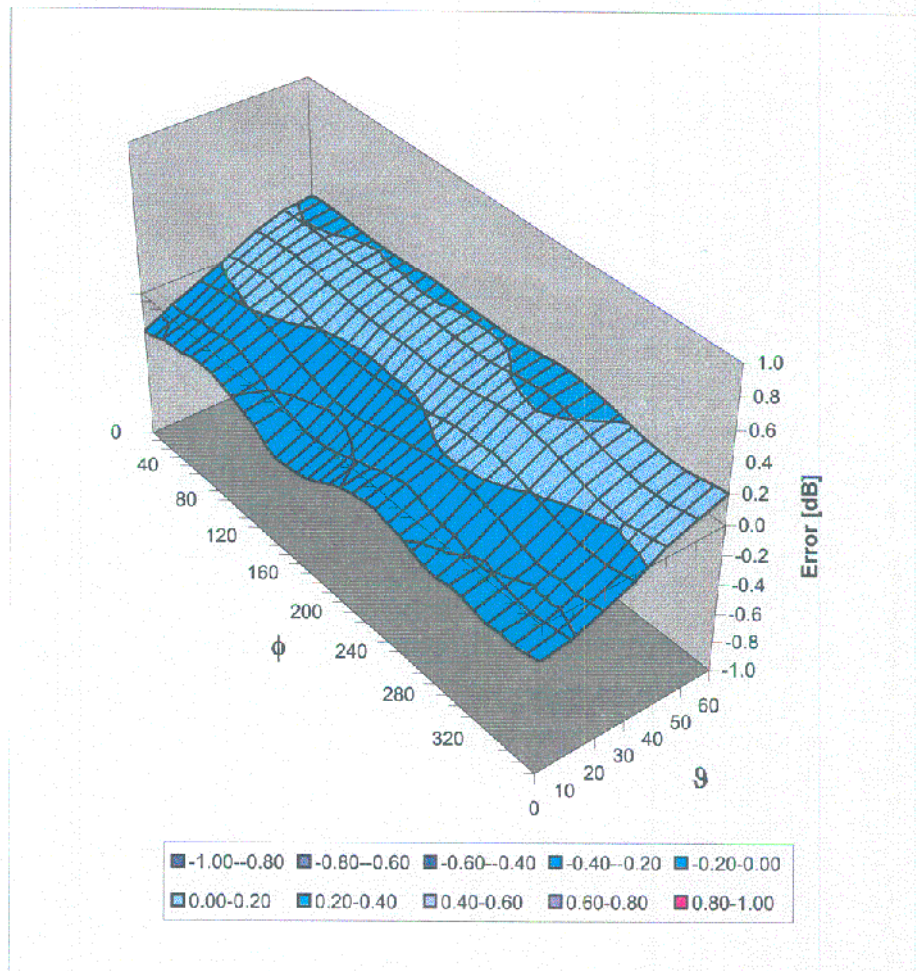


| f [MHz] | Validity [MHz] <sup>c</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 835     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.90 ± 5%    | 0.99  | 1.46  | 6.95 ± 11.0% (k=2) |
| 900     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.97 ± 5%    | 0.91  | 1.49  | 6.73 ± 11.0% (k=2) |
| 1750    | ± 50 / ± 100                | Head | 40.1 ± 5%    | 1.37 ± 5%    | 0.53  | 2.45  | 5.30 ± 11.0% (k=2) |
| 1900    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.51  | 2.64  | 5.03 ± 11.0% (k=2) |
| 2000    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.51  | 2.70  | 4.87 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Head | 39.2 ± 5%    | 1.80 ± 5%    | 0.59  | 2.38  | 4.60 ± 11.8% (k=2) |
|         |                             |      |              |              |       |       |                    |
| 835     | ± 50 / ± 100                | Body | 55.2 ± 5%    | 0.97 ± 5%    | 0.96  | 1.54  | 6.65 ± 11.0% (k=2) |
| 1900    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.50  | 2.96  | 4.62 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Body | 52.7 ± 5%    | 1.95 ± 5%    | 0.58  | 2.20  | 4.16 ± 11.8% (k=2) |

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

## Deviation from Isotropy in HSL

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



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