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# **Appendix for the Report**

## **Dosimetric Assessment of the Benefon TPG 80EG (FCC ID: QFPTGP80EG)**

### **According to the FCC Requirements**

### **SAR Distribution Plots**

June 26, 2006  
**IMST GmbH**  
**Carl-Friedrich-Gauß-Str. 2**  
**D-47475 Kamp-Lintfort**

Customer  
**7layers AG**  
**Borsigstrasse 11**  
**D-40880 Ratingen**

The test results only relate to the items tested.  
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## 1 SAR Distribution Plots, PCS 1900 Head

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: [722bplm\\_1.da4](#)

DUT: Benefon; Type: twig; Serial: 352021002696771

Program Name: Cheek Left

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.44$  mho/m;  $\epsilon_r = 41$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3536; ConvF(8.25, 8.25, 8.25); Calibrated: 23.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 09.03.2006
- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

**Cheek Left/Area Scan (6x11x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.230 mW/g

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

Reference Value = 12.9 V/m; Power Drift = -0.171dB

Peak SAR (extrapolated) = 0.364 W/kg

**SAR(1 g) = 0.214 mW/g; SAR(10 g) = 0.119 mW/g**

Maximum value of SAR (measured) = 0.238 mW/g

**Cheek Left/Zoom Scan (7x7x7)/Cube 1:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.9 V/m; Power Drift = -0.171dB

Peak SAR (extrapolated) = 0.204 W/kg

**SAR(1 g) = 0.134 mW/g; SAR(10 g) = 0.090 mW/g**

Maximum value of SAR (measured) = 0.143 mW/g

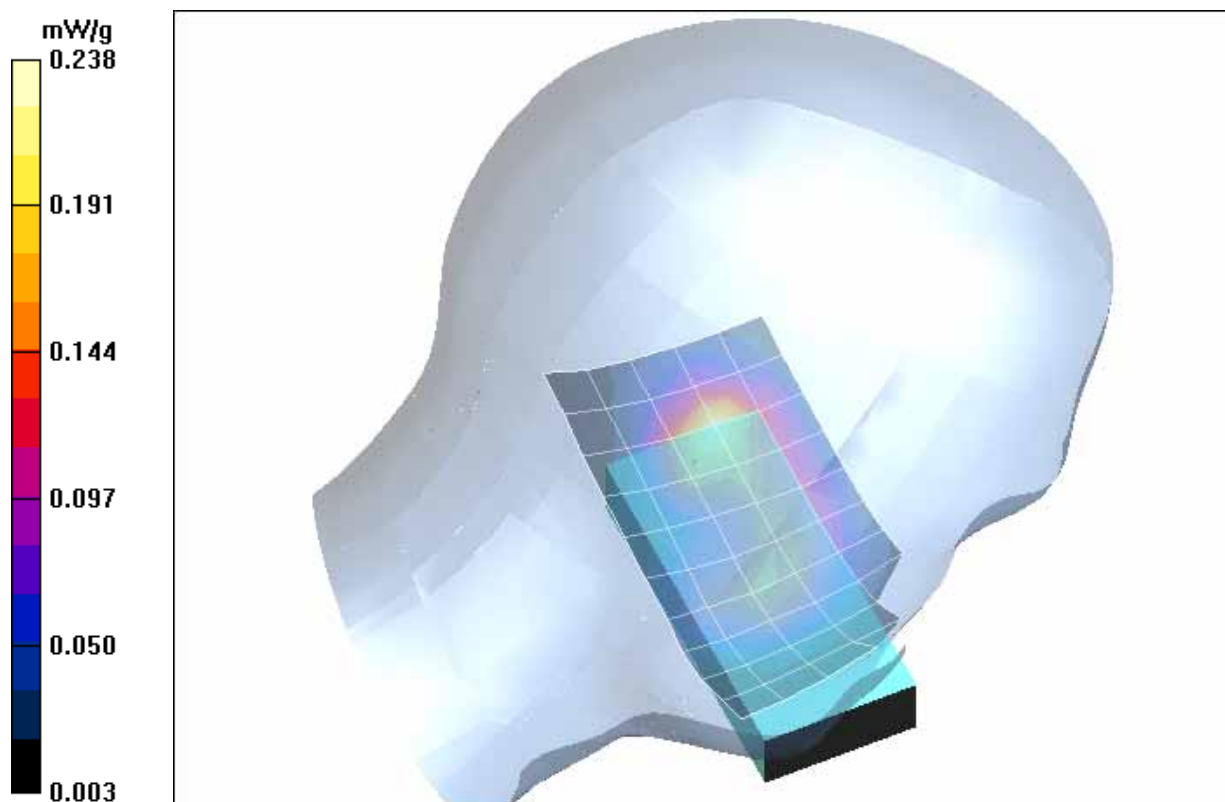


Fig. 1: SAR distribution for PCS 1900, channel 661, cheek position, left side of head (May 31, 2006; Ambient Temperature: 21.5° C; Liquid Temperature : 20.3° C).

**Test Laboratory:** IMST GmbH, DASY Blue (I); **File Name:** [722bplm 2.da4](#)

**DUT:** Benefon; **Type:** twig; **Serial:** 352021002696771

**Program Name:** Tilted Left

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.44$  mho/m;  $\epsilon_r = 41$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3536; ConvF(8.25, 8.25, 8.25); Calibrated: 23.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 09.03.2006
- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

**Tilted Left/Area Scan (6x11x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.205 mW/g

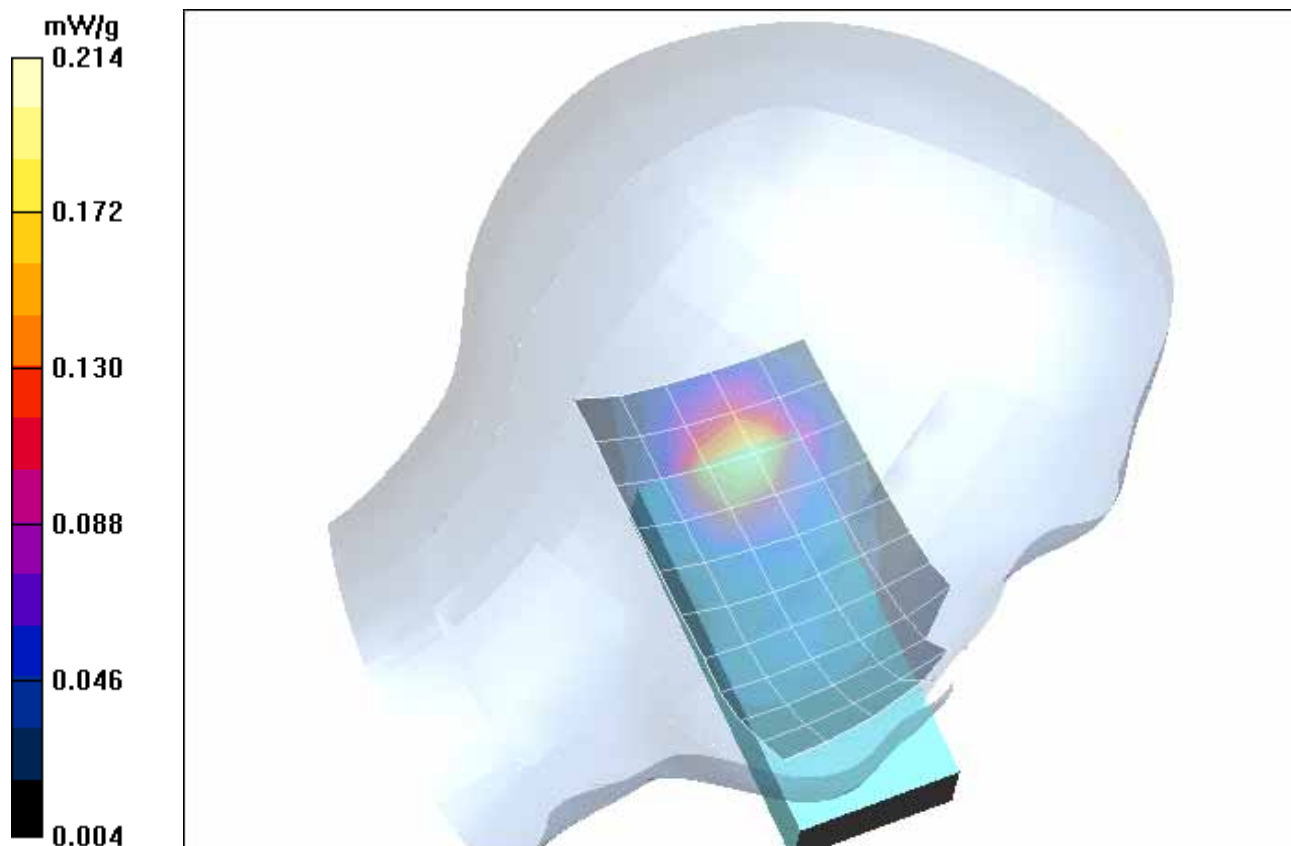
**Tilted Left/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 12.3 V/m; Power Drift = -0.109 dB

Peak SAR (extrapolated) = 0.323 W/kg

**SAR(1 g) = 0.194 mW/g; SAR(10 g) = 0.109 mW/g**

Maximum value of SAR (measured) = 0.214 mW/g



**Fig. 2:** SAR distribution for PCS 1900, channel 661, tilted position, left side of head (May 31, 2006; Ambient Temperature: 21.5° C; Liquid Temperature : 20.4° C).

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: [722bprm\\_1.da4](#)

DUT: Benefon; Type: twig; Serial: 352021002696771

Program Name: Cheek Right

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.44$  mho/m;  $\epsilon_r = 41$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3536; ConvF(8.25, 8.25, 8.25); Calibrated: 23.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 09.03.2006
- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

**Cheek Right/Area Scan (6x11x1):** Measurement grid:  $dx=15$ mm,  $dy=15$ mm

Maximum value of SAR (measured) = 0.274 mW/g

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

Reference Value = 12.1 V/m; Power Drift = -0.186 dB

Peak SAR (extrapolated) = 0.425 W/kg

**SAR(1 g) = 0.259 mW/g; SAR(10 g) = 0.143 mW/g**

Maximum value of SAR (measured) = 0.280 mW/g

**Cheek Right/Zoom Scan (7x7x7)/Cube 1:** Measurement grid:  $dx=5$ mm,  $dy=5$ mm,  $dz=5$ mm

Reference Value = 12.1 V/m; Power Drift = -0.186 dB

Peak SAR (extrapolated) = 0.199 W/kg

**SAR(1 g) = 0.141 mW/g; SAR(10 g) = 0.092 mW/g**

Maximum value of SAR (measured) = 0.150 mW/g

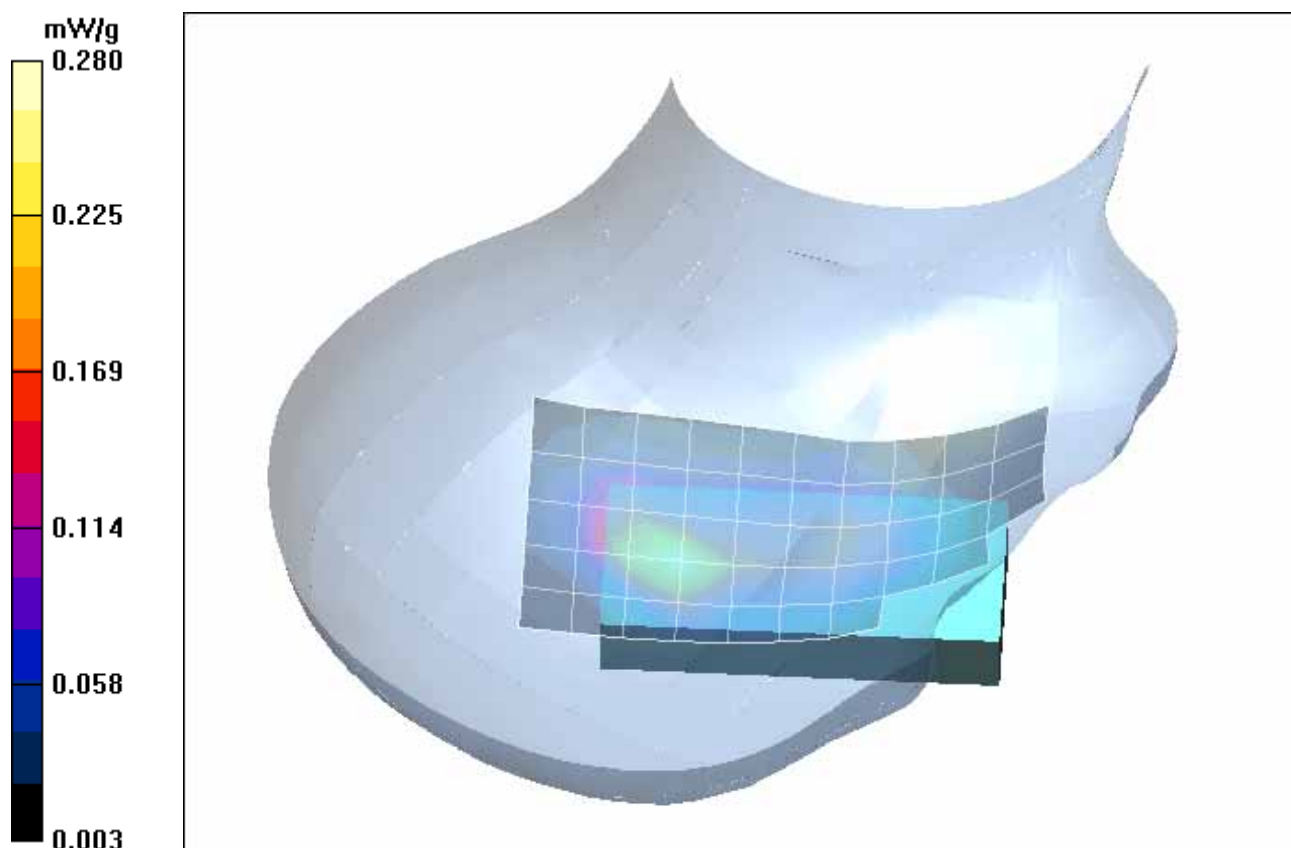


Fig. 3: SAR distribution for PCS 1900, channel 661, cheek position, right side of head (May 31, 2006; Ambient Temperature: 21.5° C; Liquid Temperature : 20.4° C).

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: [722bprm 2.da4](#)

DUT: Benefon; Type: twig; Serial: 352021002696771

Program Name: Tilted Right

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.44$  mho/m;  $\epsilon_r = 41$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3536; ConvF(8.25, 8.25, 8.25); Calibrated: 23.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 09.03.2006
- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

**Tilted Right/Area Scan (6x10x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.203 mW/g

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

Reference Value = 11.8 V/m; Power Drift = -0.023 dB

Peak SAR (extrapolated) = 0.302 W/kg

**SAR(1 g) = 0.194 mW/g; SAR(10 g) = 0.109 mW/g**

Maximum value of SAR (measured) = 0.216 mW/g

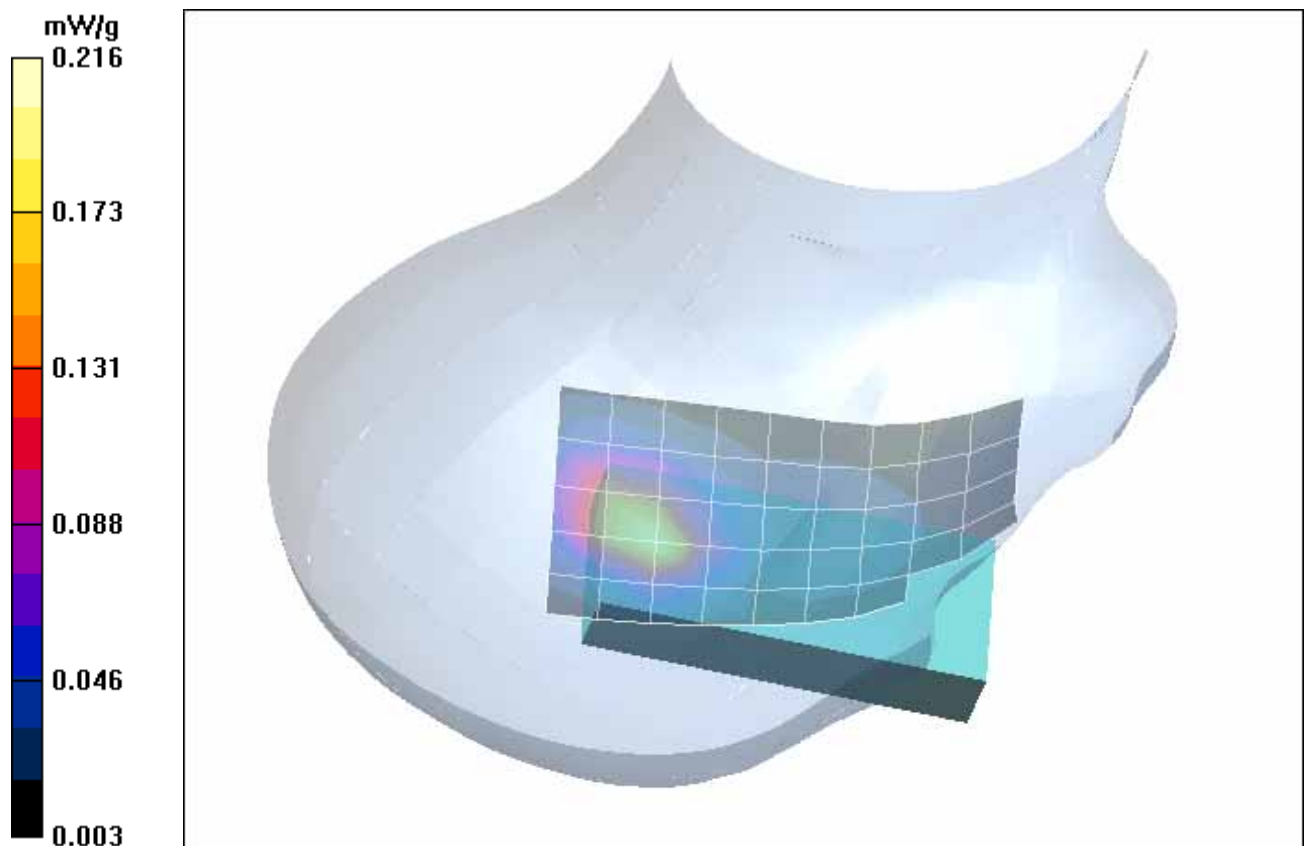


Fig. 4: SAR distribution for PCS 1900, channel 661, tilted position, right side of head (May 31, 2006; Ambient Temperature: 21.6 °C; Liquid Temperature : 20.4° C)

## 2 SAR Distribution Plots, PCS 1900 Head with Bluetooth activated

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: [722bprm\\_1\\_bluetooth.da4](#)

DUT: Benefon; Type: twig; Serial: 352021002696771

Program Name: Cheek Right

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.44$  mho/m;  $\epsilon_r = 41$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3536; ConvF(8.25, 8.25, 8.25); Calibrated: 23.09.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn335; Calibrated: 09.03.2006
- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

**Cheek Right/Area Scan (6x11x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.256 mW/g

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

Reference Value = 11.9 V/m; Power Drift = -0.102 dB

Peak SAR (extrapolated) = 0.407 W/kg

**SAR(1 g) = 0.252 mW/g; SAR(10 g) = 0.138 mW/g**

Maximum value of SAR (measured) = 0.279 mW/g

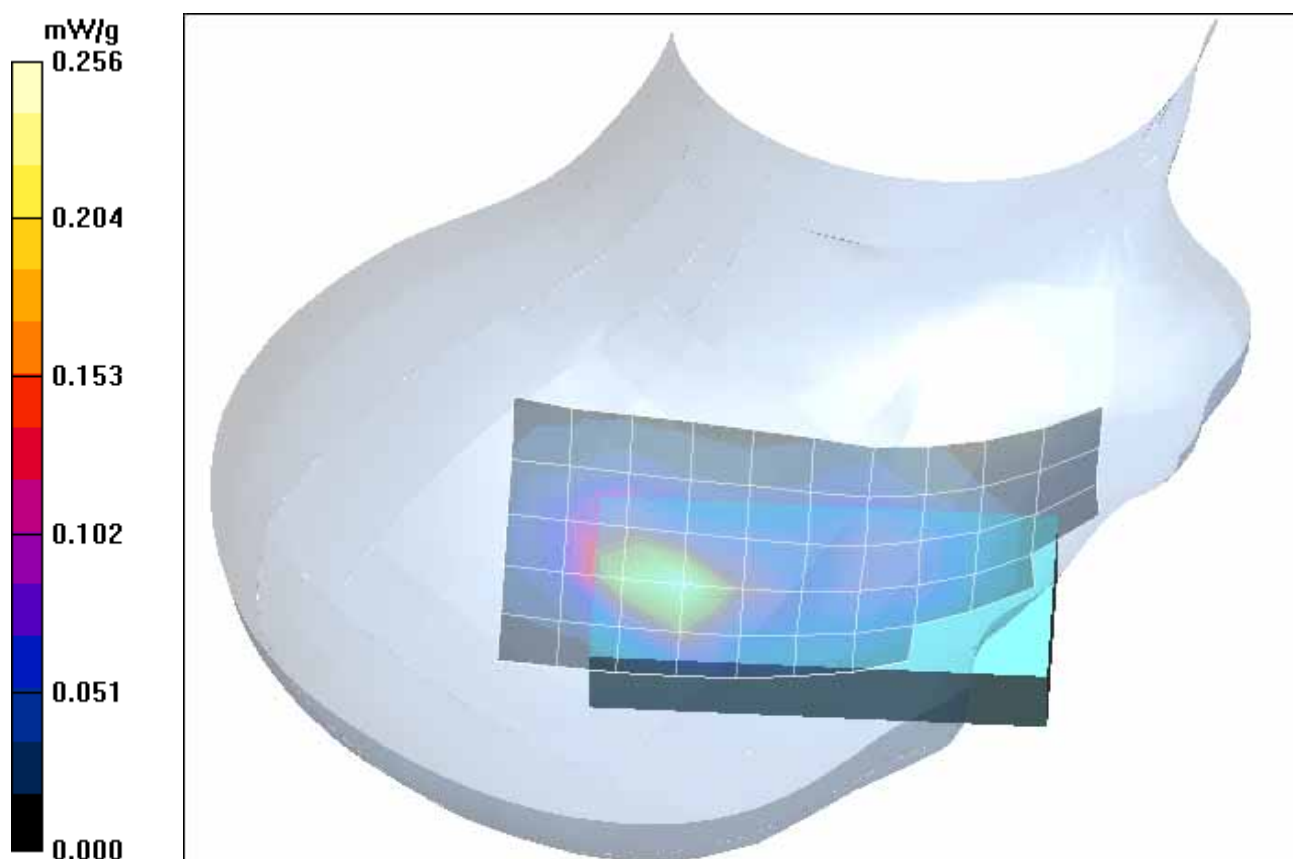


Fig. 5: SAR distribution for PCS 1900, channel 661, cheek position, right side of head (May 31, 2006; Ambient Temperature: 21.6° C; Liquid Temperature : 20.3° C).



### 3 SAR Distribution Plots, PCS 1900 Body in GSM mode

Test Laboratory: The name of your organization; File Name: [722yphm\\_1.da4](#)

DUT: Benefon; Type: twig; Serial: 352021002696771

Program Name: Body Worn

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 51.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(4.47, 4.47, 4.47); Calibrated: 15.02.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 07.07.2005
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

**Body Worn/Area Scan (8x12x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.263 mW/g

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

Reference Value = 10.5 V/m; Power Drift = -0.133 dB

Peak SAR (extrapolated) = 0.381 W/kg

**SAR(1 g) = 0.246 mW/g; SAR(10 g) = 0.148 mW/g**

Maximum value of SAR (measured) = 0.269 mW/g

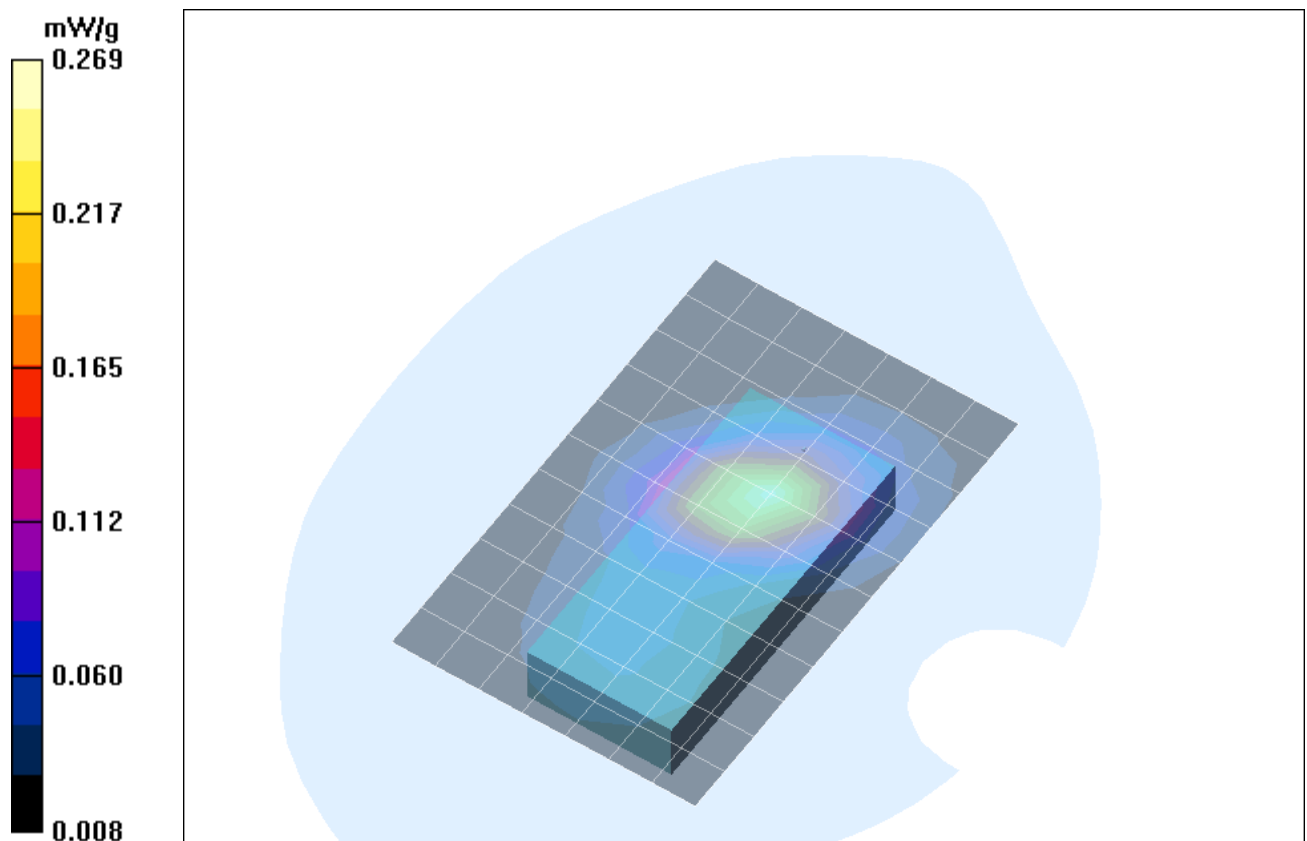


Fig. 6: SAR distribution for PCS 1900, channel 661, body worn configuration, antenna towards the phantom, without accessory and 25 mm distance (June 07, 2006; Ambient Temperature: 22.1° C; Liquid Temperature: 20.9° C).



**Test Laboratory:** The name of your organization; **File Name:** [722yphm\\_2.da4](#)

**DUT:** Benefon; **Type:** twig; **Serial:** 352021002696771

**Program Name:** Body Worn

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 51.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(4.47, 4.47, 4.47); Calibrated: 15.02.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 07.07.2005
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

**Body Worn/Area Scan (8x12x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.286 mW/g

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

Reference Value = 11.0 V/m; Power Drift = -0.091 dB

Peak SAR (extrapolated) = 0.408 W/kg

**SAR(1 g) = 0.270 mW/g; SAR(10 g) = 0.163 mW/g**

Maximum value of SAR (measured) = 0.293 mW/g

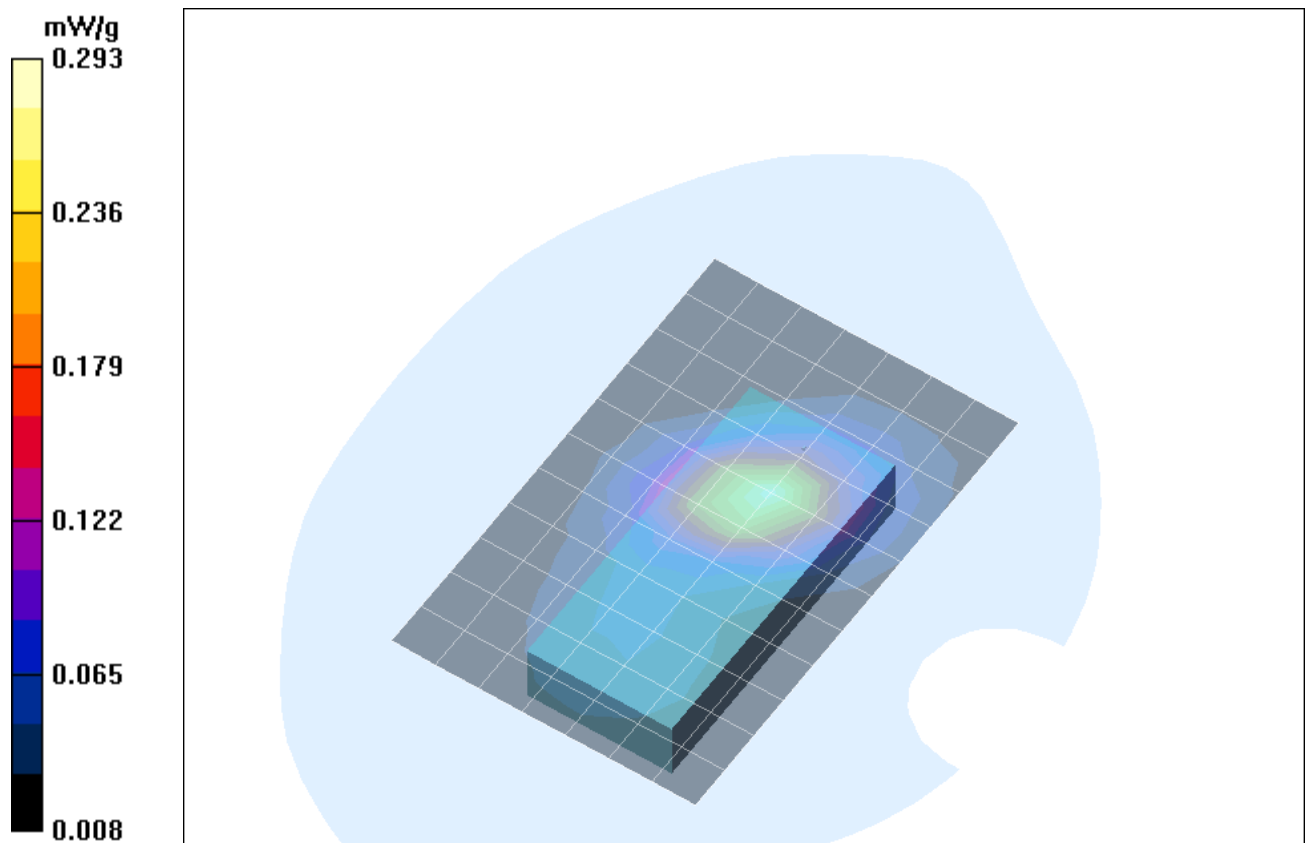


Fig. 7: SAR distribution for PCS 1900, channel 661, body worn configuration, antenna towards the phantom, with Bluetooth activated and 25 mm distance (June 07, 2006; Ambient Temperature: 21.9° C; Liquid Temperature: 20.9° C).

**Test Laboratory:** The name of your organization; File Name: [722yphm\\_3.da4](#)

**DUT:** Benefon; Type: twig; Serial: 352021002696771

**Program Name:** Body Worn

Communication System: GSM 1900; Frequency: 1880 MHz; Duty Cycle: 1:8.3

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 51.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(4.47, 4.47, 4.47); Calibrated: 15.02.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 07.07.2005
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

**Body Worn/Area Scan (8x12x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.283 mW/g

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

Reference Value = 11.3 V/m; Power Drift = -0.073 dB

Peak SAR (extrapolated) = 0.500 W/kg

**SAR(1 g) = 0.274 mW/g; SAR(10 g) = 0.165 mW/g**

Maximum value of SAR (measured) = 0.292 mW/g

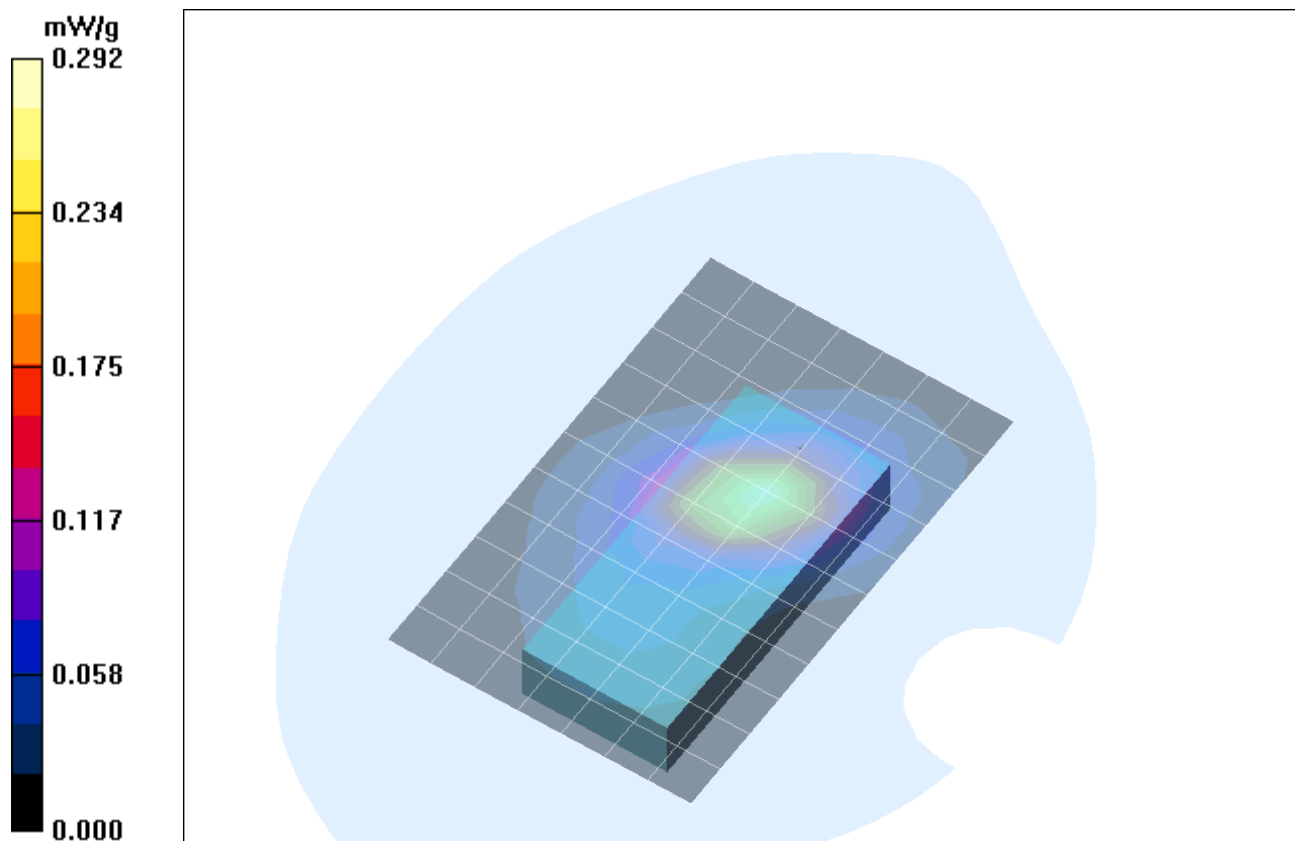


Fig. 8: SAR distribution for PCS 1900, channel 661, body worn configuration, antenna towards the phantom, with headset and 25 mm distance (June 07, 2006; Ambient Temperature: 21.9° C; Liquid Temperature: 20.9° C).

## 4 SAR Distribution Plots, PCS 1900 Body in GPRS mode

Test Laboratory: The name of your organization; File Name: [722yphm\\_4.da4](#)

DUT: Benefon; Type: twig; Serial: 352021002696771

Program Name: Body Worn

Communication System: GPRS 1900; Frequency: 1880 MHz; Duty Cycle: 1:4

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 51.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(4.47, 4.47, 4.47); Calibrated: 15.02.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 07.07.2005
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

**Body Worn/Area Scan (8x12x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.545 mW/g

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

Reference Value = 12.5 V/m; Power Drift = -0.110 dB

Peak SAR (extrapolated) = 0.758 W/kg

**SAR(1 g) = 0.500 mW/g; SAR(10 g) = 0.302 mW/g**

Maximum value of SAR (measured) = 0.546 mW/g

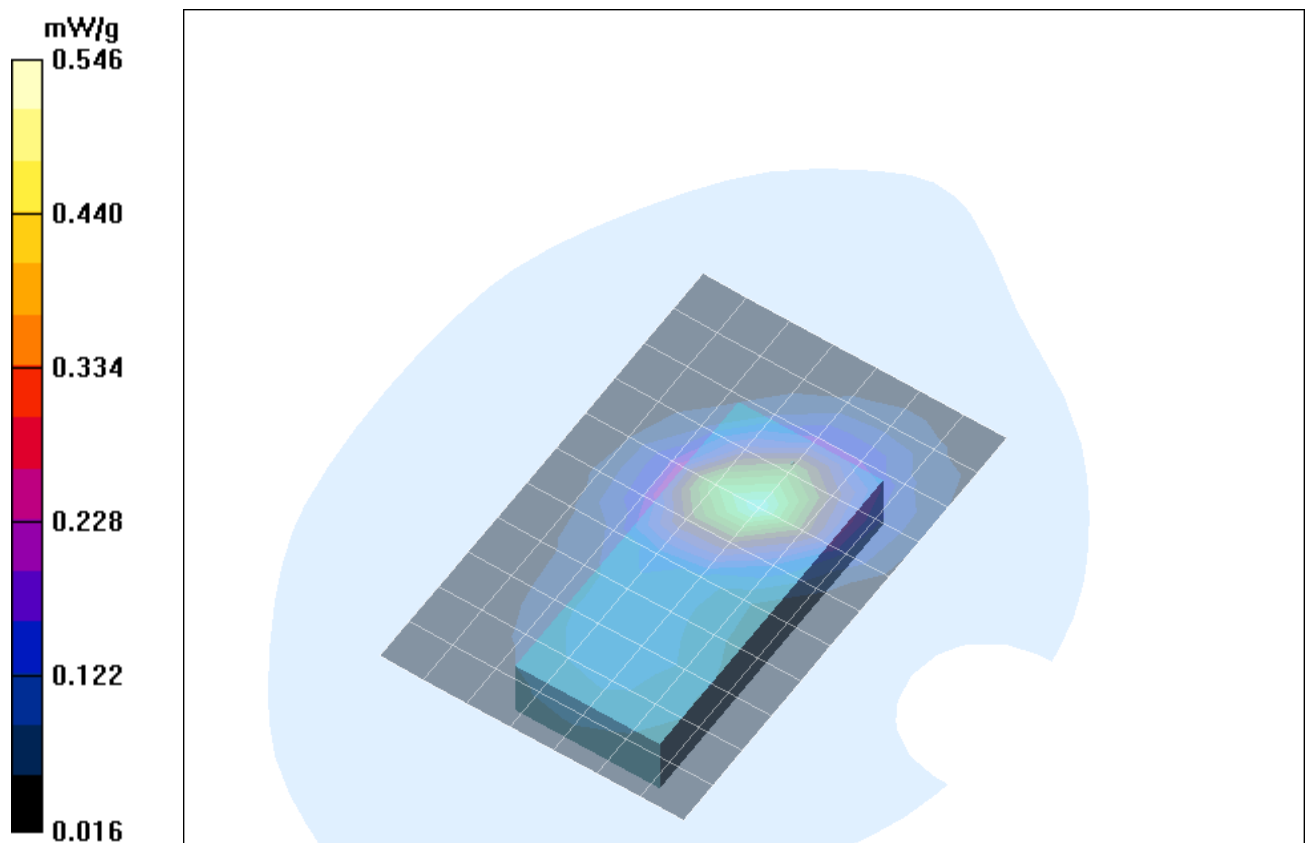


Fig. 9: SAR distribution for GPRS 1900, channel 661, body worn configuration, antenna towards the phantom, without accessory and 25 mm distance (June 07, 2006; Ambient Temperature: 22.0° C; Liquid Temperature: 20.9° C).

**Test Laboratory:** The name of your organization; File Name: [722yphm 5.da4](#)

**DUT:** Benefon; Type: twig; Serial: 352021002696771

**Program Name:** Body Worn

Communication System: GPRS 1900; Frequency: 1880 MHz; Duty Cycle: 1:4

Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.54$  mho/m;  $\epsilon_r = 51.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6R - SN1669; ConvF(4.47, 4.47, 4.47); Calibrated: 15.02.2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 07.07.2005
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 161

**Body Worn/Area Scan (8x12x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.652 mW/g

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

Reference Value = 14.3 V/m; Power Drift = -0.137 dB

Peak SAR (extrapolated) = 0.907 W/kg

**SAR(1 g) = 0.587 mW/g; SAR(10 g) = 0.351 mW/g**

Maximum value of SAR (measured) = 0.645 mW/g

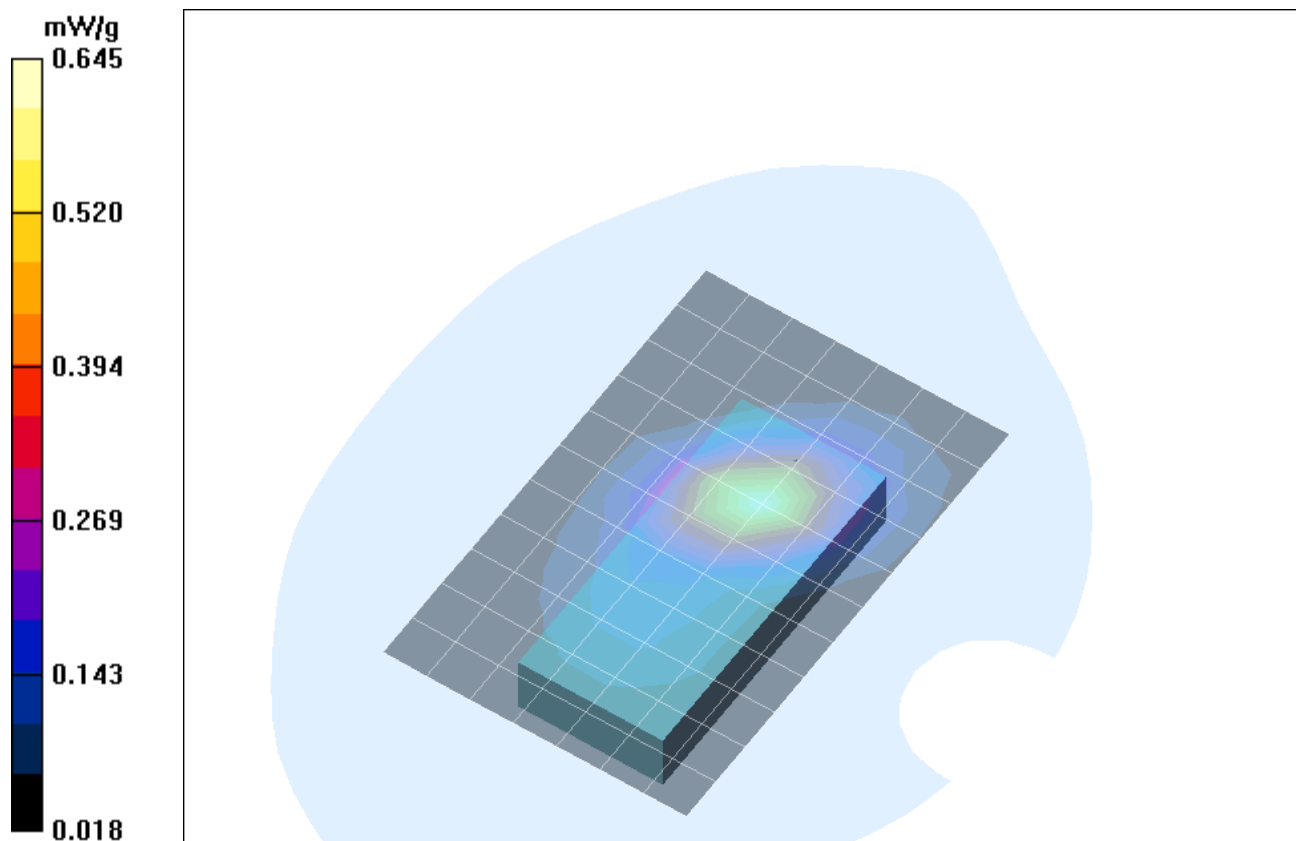


Fig. 10: SAR distribution for GPRS 1900, channel 661, body worn configuration, antenna towards the phantom, with data cable and 25 mm distance (June 07, 2006; Ambient Temperature: 21.9° C; Liquid Temperature: 20.9° C).

## 5 SAR z-axis scans (Validation)

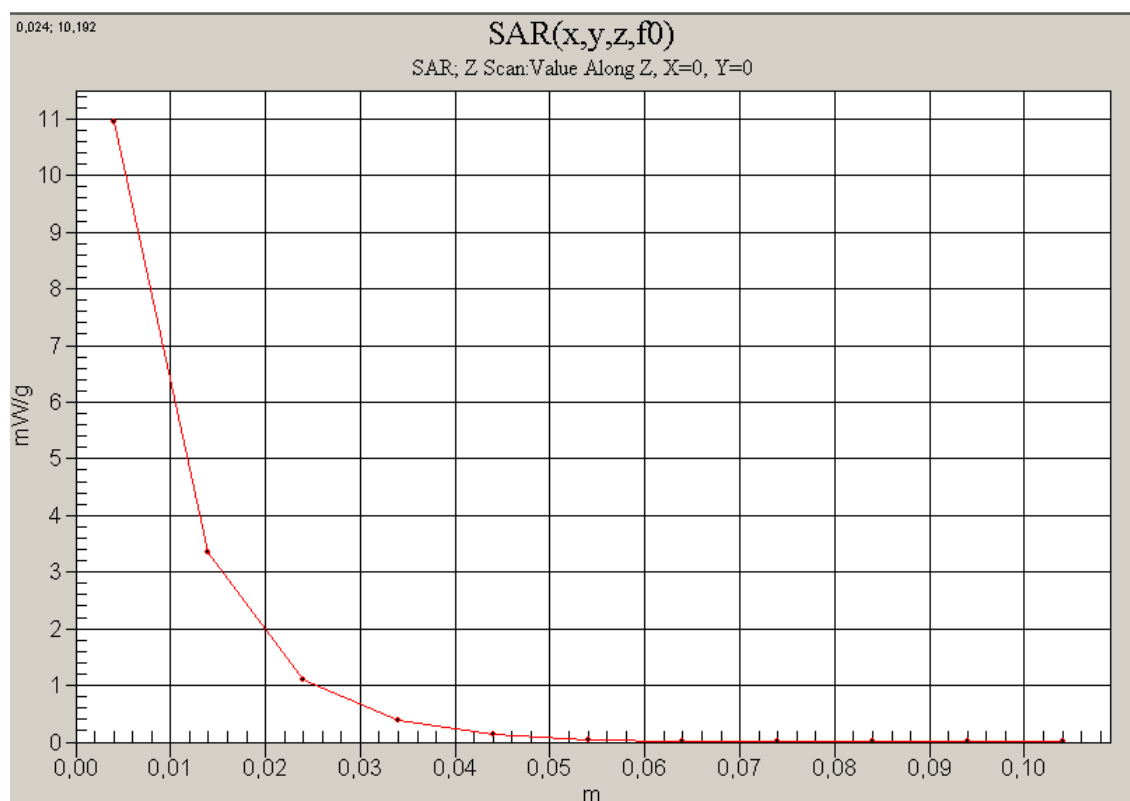


Fig. 11: SAR versus liquid depth, 1900 MHz, head (May 31, 2006; Ambient Temperature: 20.8° C; Liquid Temperature : 20.1° C).

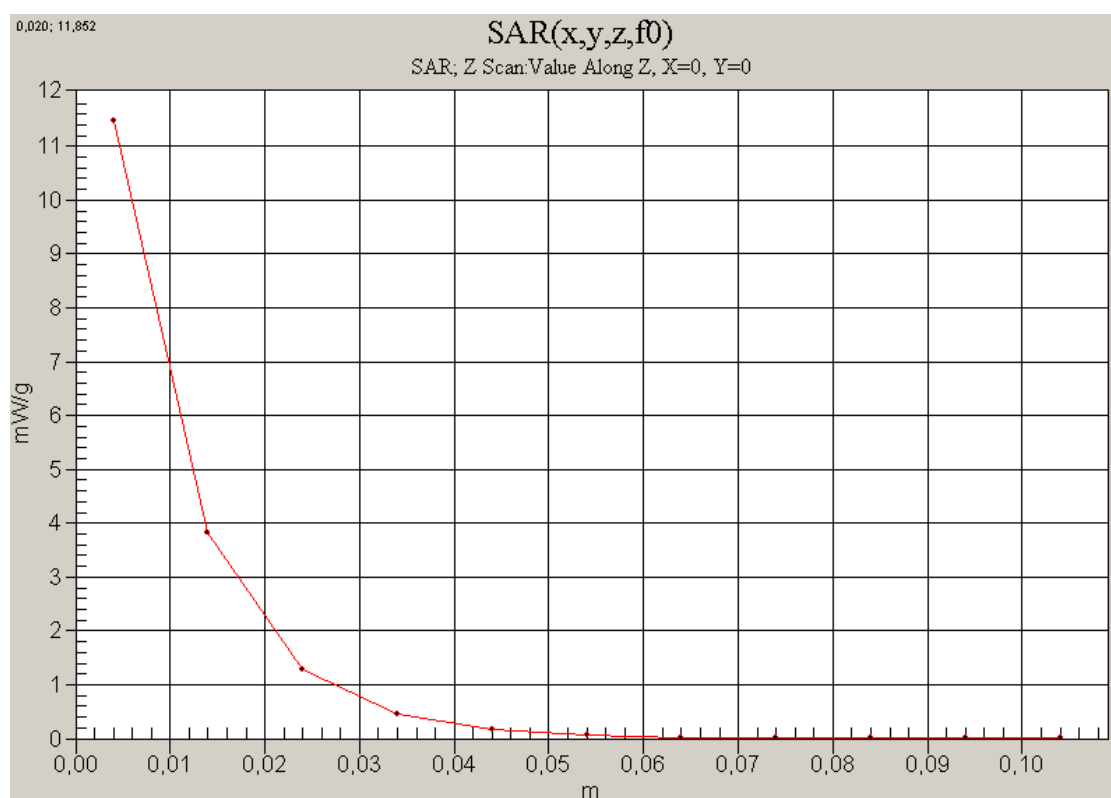


Fig. 12: SAR versus liquid depth, 1900 MHz, body (June 07, 2006; Ambient Temperature: 22.2° C; Liquid Temperature : 21.0° C).

## 6 SAR z-axis scans (Measurements)

The following pictures show the plots of SAR versus liquid depth for the worst case values.

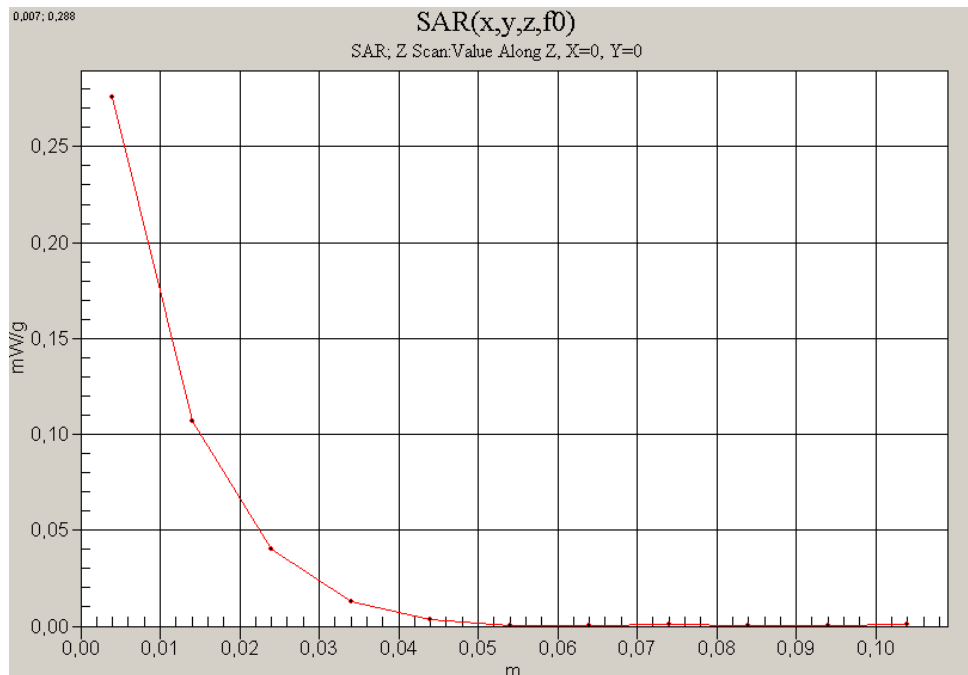


Fig. 13: SAR versus liquid depth, head: PCS 1900, channel 661, cheek position, right side of head (May 31, 2006; Ambient Temperature: 21.5° C; Liquid Temperature : 20.4° C).

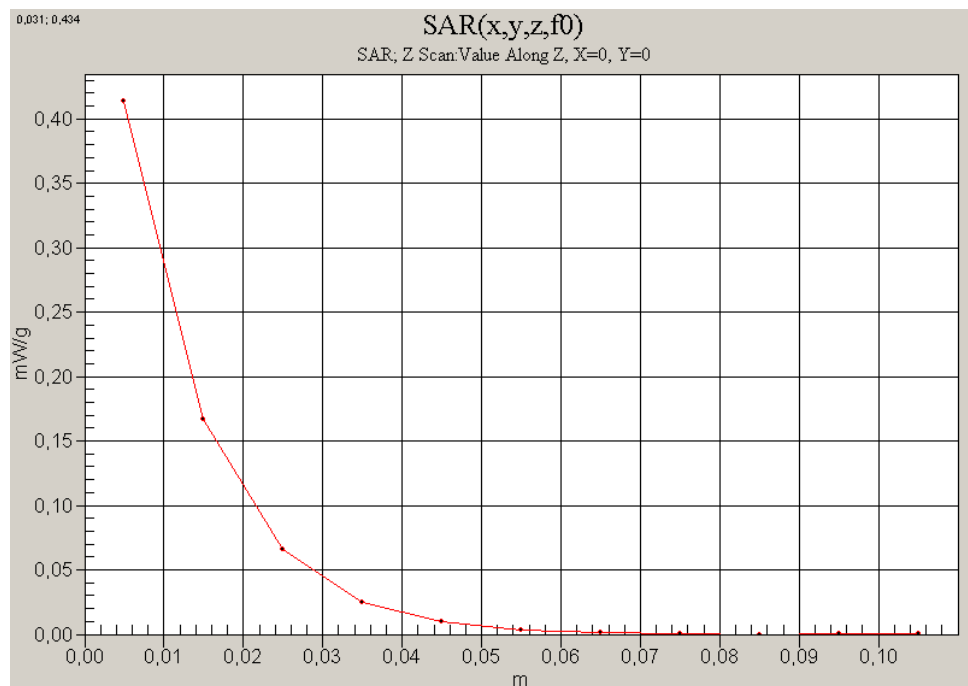


Fig. 14: SAR versus liquid depth, body: GPRS 1900, channel 661, data cable and 25 mm distance (June 07, 2006; Ambient Temperature: 22.0° C; Liquid Temperature: 20.9° C).