

# **Appendix for the Report**

## **Dosimetric Assessment of the Portable Device Datalogic SKORPIO X3 (Model No. 3) Contains FCC ID: U4G004W Contains IC: 3862E-004W**

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

## **SAR Distribution Plots**

May 22, 2012

**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. This report shall not be reproduced except in full without the written approval of the testing laboratory.

## Table of Contents

1	SAR DISTRIBUTION PLOTS, IEEE 802.11 B/G HEAD.....	3
2	SAR DISTRIBUTION PLOTS, IEEE 802.11 A HEAD (5800 MHZ RANGE) .....	4
3	SAR DISTRIBUTION PLOTS, IEEE 802.11 B/G BODY.....	5
4	SAR DISTRIBUTION PLOTS, IEEE 802.11 A BODY (5800 MHZ RANGE).....	7
5	SAR Z-AXIS SCANS (VALIDATION) .....	8
6	SAR Z-AXIS SCANS (MEASUREMENTS).....	10

# 1 SAR Distribution Plots, IEEE 802.11 b/g Head

Test Laboratory: Imst GmbH, DASY Yellow (II); File Name: [X3\\_012\\_ywlm\\_2\\_CH6\\_b\\_std\\_bat.da4](#)

DUT: Datalogic; Type: Scorpio X3; Serial: A12P00012

Program Name: IEEE 802.11 b

Communication System: WLAN 2450; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.81$  mho/m;  $\epsilon_r = 39.7$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3536; ConvF(7.45, 7.45, 7.45); Calibrated: 26.09.2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 21.09.2011
- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilted Left/Area Scan (9x15x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.064 mW/g

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

Reference Value = 6.02 V/m; Power Drift = -0.121 dB

Peak SAR (extrapolated) = 0.129 W/kg

**SAR(1 g) = 0.066 mW/g; SAR(10 g) = 0.033 mW/g**

Maximum value of SAR (measured) = 0.073 mW/g

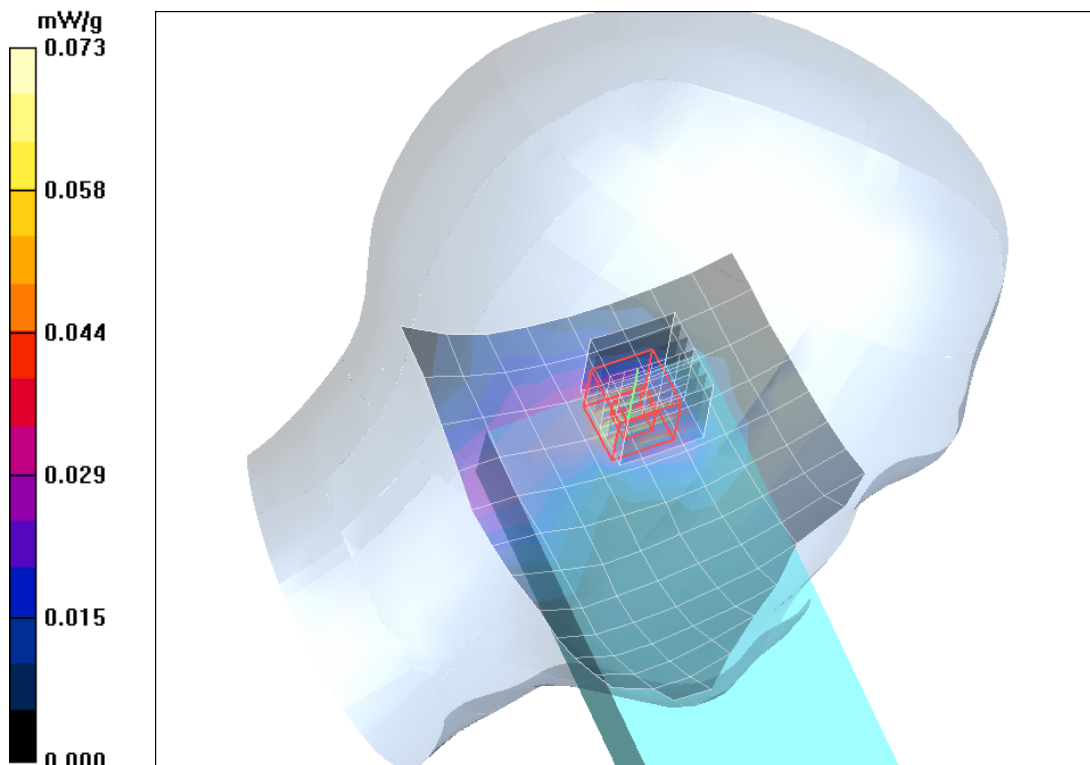


Fig. 1: SAR distribution for IEEE 802.11 b, channel 6, cheek position, left side of head, standard battery (May 18, 2012; Ambient Temperature: 22.4° C; Liquid Temperature: 22.3° C).

## 2 SAR Distribution Plots, IEEE 802.11 a Head (5800 MHz Range)

Test Laboratory: IMST GmbH, DASY Blue (I); File Name: [X3\\_012\\_bwl\\_m\\_2\\_CH149\\_a\\_sdt\\_bat.da4](#)

DUT: Datalogic; Type: Scorpio X3; Serial: A12P00054

Program Name: IEEE 802.11 a

Communication System: 5 GHz ; Frequency: 5745 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 5745$  MHz;  $\sigma = 5.39$  mho/m;  $\epsilon_r = 34$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3536; ConvF(4.53, 4.53, 4.53); Calibrated: 26.09.2011

- Sensor-Surface: 2mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn631; Calibrated: 21.09.2011

- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Tilted Left/Area Scan (12x23x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.305 mW/g

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

Reference Value = 7.75 V/m; Power Drift = 0.077 dB

Peak SAR (extrapolated) = 0.531 W/kg

**SAR(1 g) = 0.168 mW/g; SAR(10 g) = 0.061 mW/g**

Maximum value of SAR (measured) = 0.321 mW/g

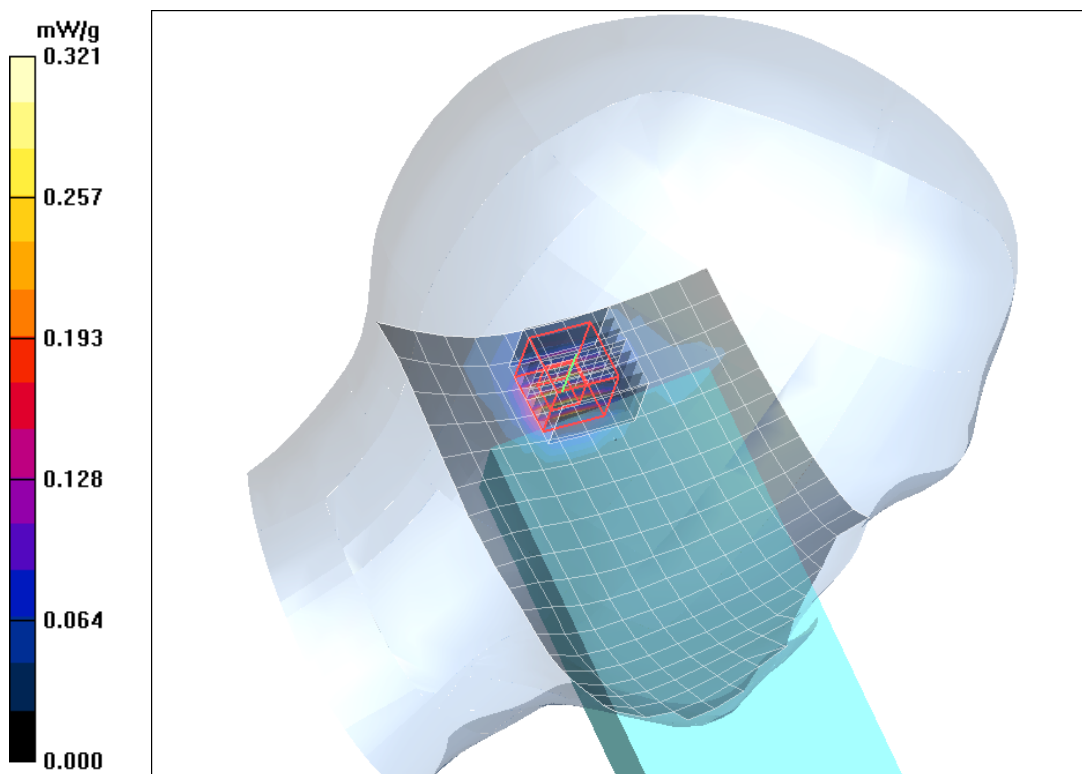


Fig. 2: SAR distribution for IEEE 802.11 a, channel 149, tilted position, left side of head, standard battery (May 21, 2012; Ambient Temperature: 21.8° C; Liquid Temperature: 21.5° C).

### 3 SAR Distribution Plots, IEEE 802.11 b/g Body

Test Laboratory: Imst GmbH, DASY Yellow (II); File Name:

[X3\\_012\\_ywhm\\_2\\_ch6\\_dspl\\_down\\_0mm\\_b\\_std\\_bat.da4](#)

DUT: Datalogic; Type: Scorpio X3; Serial: A12P00054

Program Name: IEEE 802.11 b

Communication System: WLAN 2450; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.96$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3536; ConvF(7.42, 7.42, 7.42); Calibrated: 26.09.2011

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn631; Calibrated: 21.09.2011

- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body Worn/Area Scan (9x16x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.155 mW/g

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

Reference Value = 3.54 V/m; Power Drift = 0.137 dB

Peak SAR (extrapolated) = 0.370 W/kg

**SAR(1 g) = 0.176 mW/g; SAR(10 g) = 0.077 mW/g**

Maximum value of SAR (measured) = 0.200 mW/g

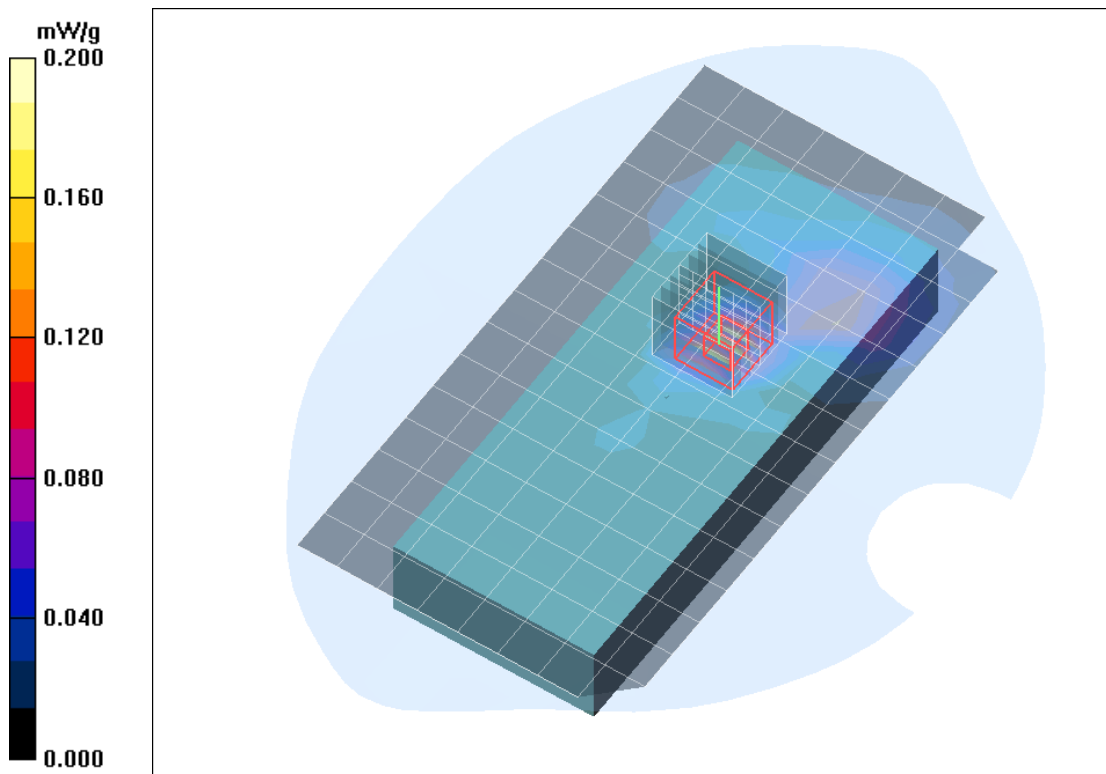


Fig. 3: SAR distribution for IEEE 802.11 b, channel 6, body worn configuration, position 2, standard battery (May 15, 2012; Ambient Temperature: 22.7° C; Liquid Temperature: 22.3° C).

Test Laboratory: Imst GmbH, DASY Yellow (II); File Name:

[X3\\_012\\_ywhm\\_2\\_ch6\\_dspl\\_down\\_0mm\\_b\\_std\\_bat\\_clip.da4](#)

DUT: Datalogic; Type: Scorpio X3; Serial: A12P00012

Program Name: IEEE 802.11 b

Communication System: WLAN 2450; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 2437$  MHz;  $\sigma = 1.96$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3536; ConvF(7.42, 7.42, 7.42); Calibrated: 26.09.2011

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn631; Calibrated: 21.09.2011

- Phantom: SAM Glycol 1340; Type: QD 000 P40 CB; Serial: TP-1340

- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body Worn/Area Scan (9x16x1):** Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.117 mW/g

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

Reference Value = 3.61 V/m; Power Drift = 0.106 dB

Peak SAR (extrapolated) = 0.208 W/kg

**SAR(1 g) = 0.106 mW/g; SAR(10 g) = 0.047 mW/g**

Maximum value of SAR (measured) = 0.122 mW/g

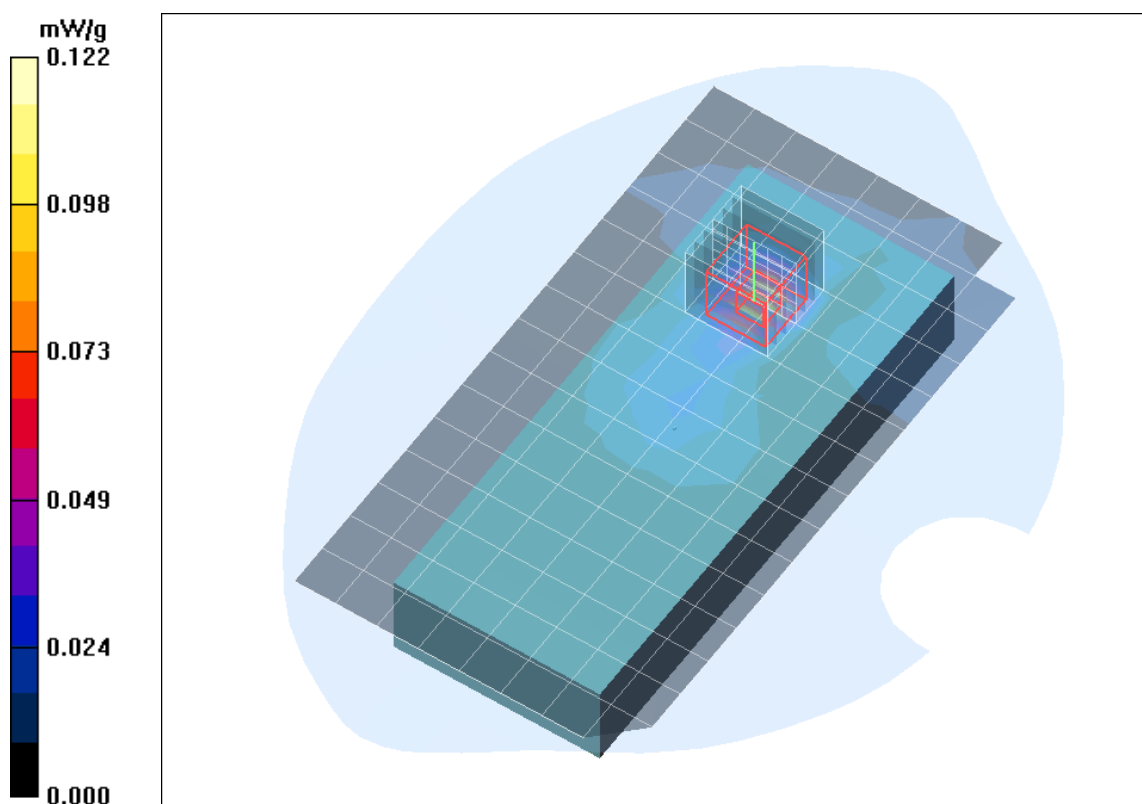


Fig. 4: SAR distribution for IEEE 802.11 b, channel 6, body worn configuration, position 2, standard battery and clip (May 15, 2012; Ambient Temperature: 22.7° C; Liquid Temperature: 22.3° C).

## 4 SAR Distribution Plots, IEEE 802.11 a Body (5800 MHz Range)

Test Laboratory: IMST GmbH, DASY Blue (I); File Name:  
[X3\\_012\\_bwhm\\_2\\_ch149\\_dspl\\_down\\_0mm\\_a\\_std-bat.da4](#)

DUT: Datalogic; Type: Scorpio X3; Serial: A12P00012  
 Program Name: IEEE 802.11 a

Communication System: 5 GHz ; Frequency: 5745 MHz; Duty Cycle: 1:1  
 Medium parameters used:  $f = 5745$  MHz;  $\sigma = 6.07$  mho/m;  $\epsilon_r = 48.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>  
 Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3536; ConvF(4.03, 4.03, 4.03); Calibrated: 26.09.2011
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn631; Calibrated: 21.09.2011
- Phantom: SAM Glycol 1176; Type: Speag; Serial: 1176
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

**Body Worn/Area Scan (13x23x1):** Measurement grid: dx=10mm, dy=10mm

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

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

Reference Value = 7.75 V/m; Power Drift = -0.069 dB

Peak SAR (extrapolated) = 0.506 W/kg

**SAR(1 g) = 0.151 mW/g; SAR(10 g) = 0.054 mW/g**

Maximum value of SAR (measured) = 0.299 mW/g

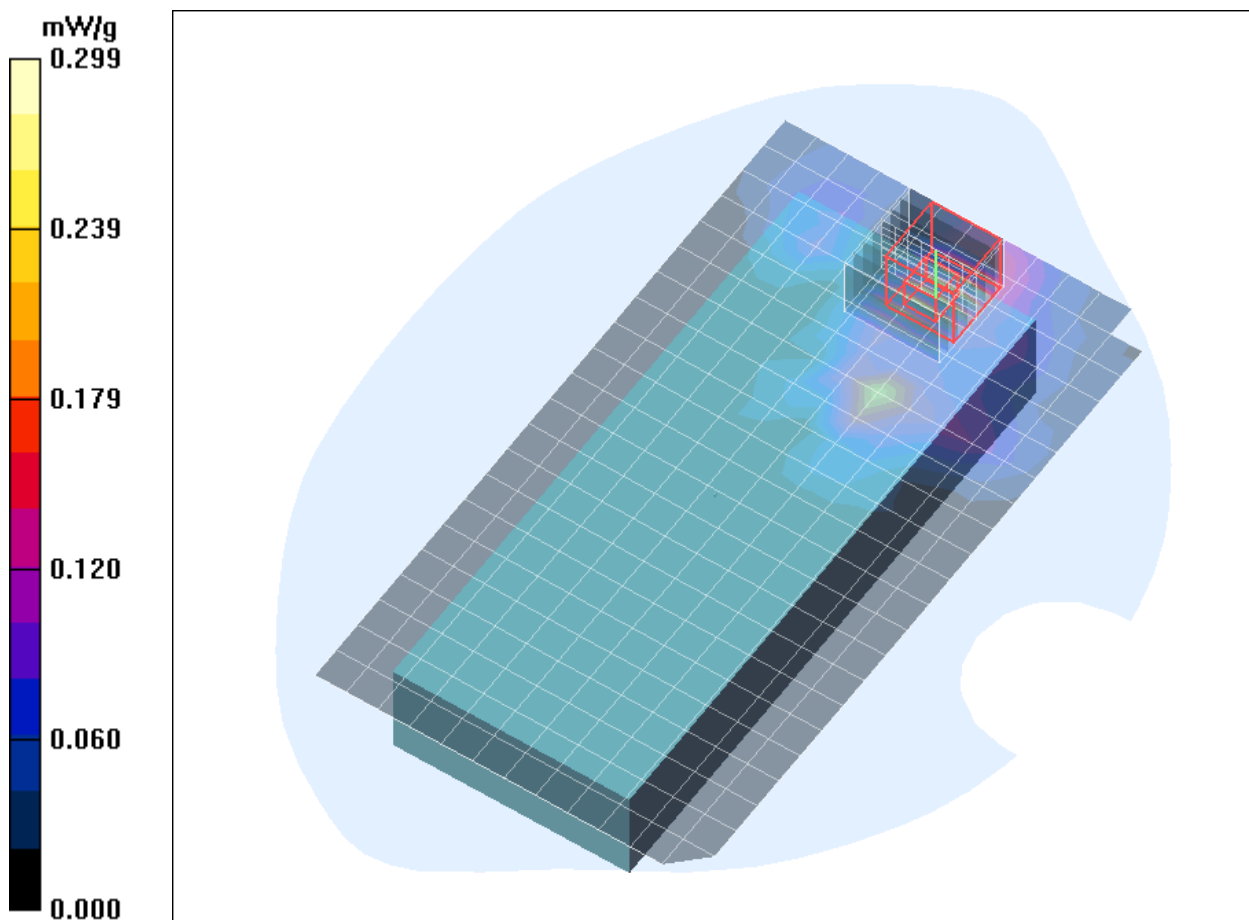


Fig. 5: SAR distribution for IEEE 802.11 a, channel 149, body worn configuration, position 2, standard battery (May 18, 2012; Ambient Temperature: 22.7° C; Liquid Temperature: 22.3° C).

## 5 SAR Z-axis Scans (Validation)

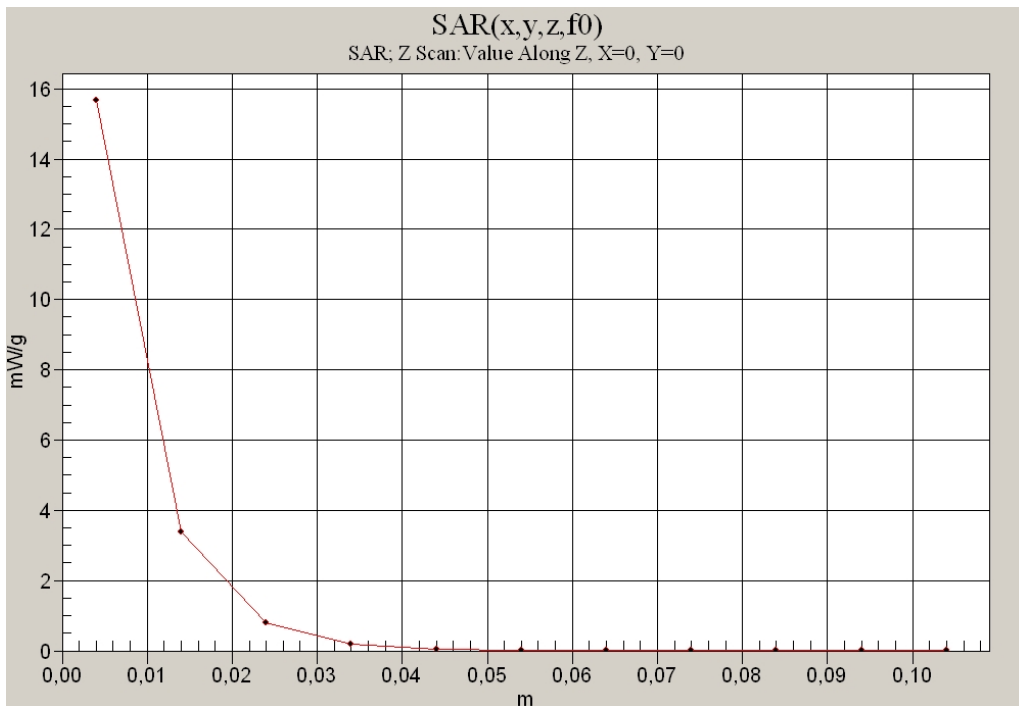


Fig. 6: SAR versus liquid depth, 2450 MHz, head (May 18, 2012; Ambient Temperature: 22.4° C; Liquid Temperature: 22.3° C).

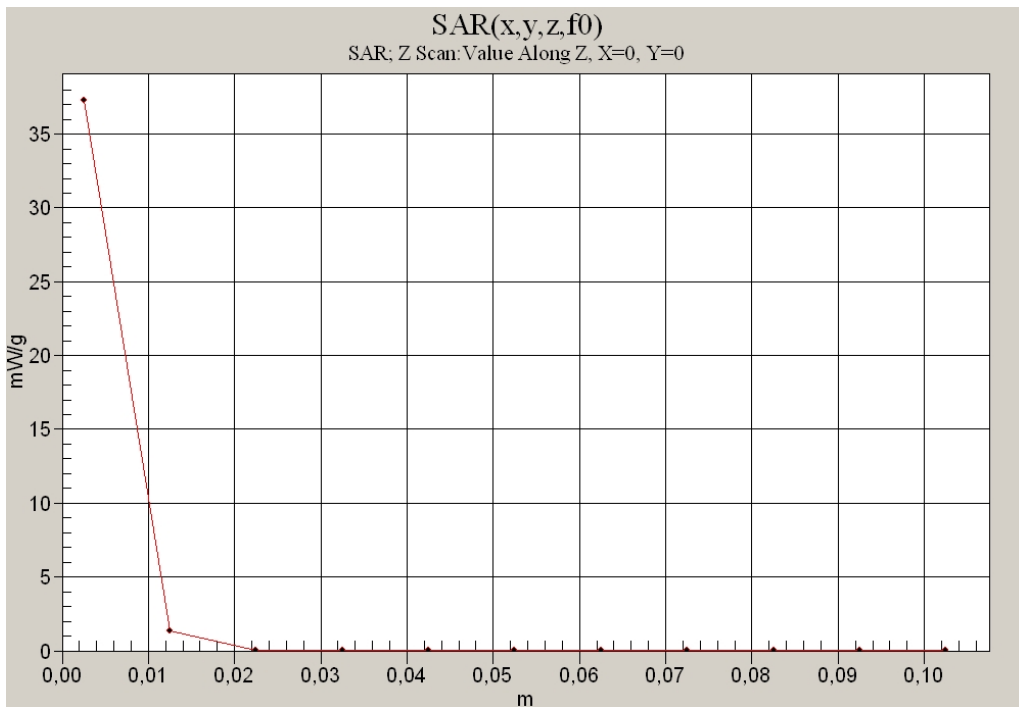


Fig. 7: SAR versus liquid depth, 5800 MHz, head (May 21, 2012; Ambient Temperature: 21.8° C; Liquid Temperature: 21.5° C).



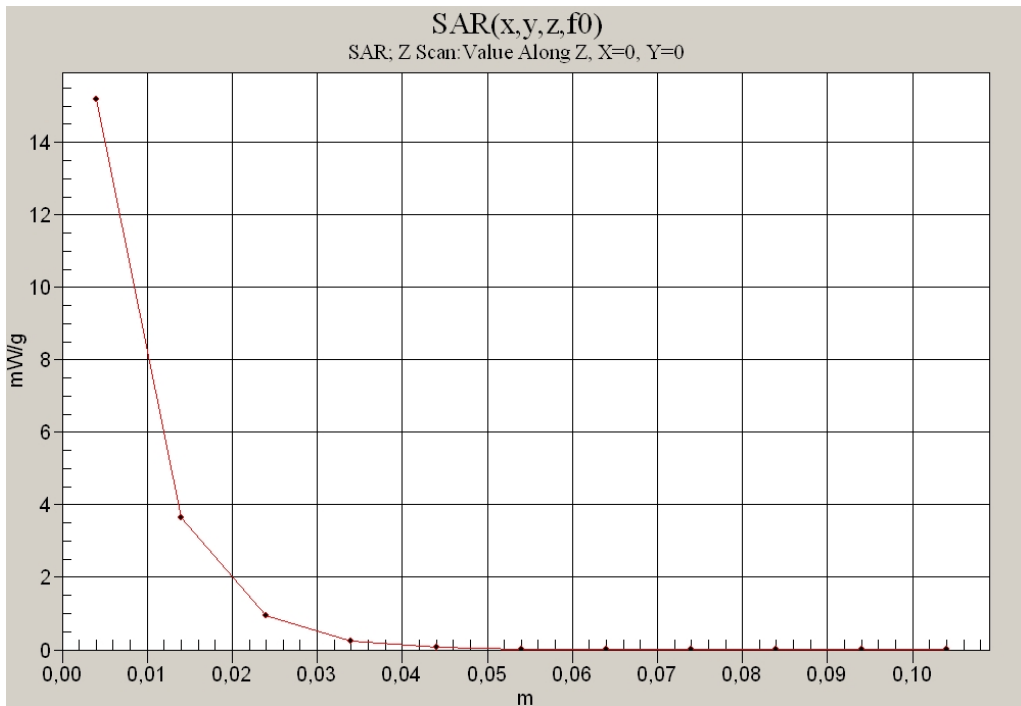


Fig. 8: SAR versus liquid depth, 2450 MHz, body (May 15, 2012; Ambient Temperature: 22.5° C; Liquid Temperature: 22.2° C).

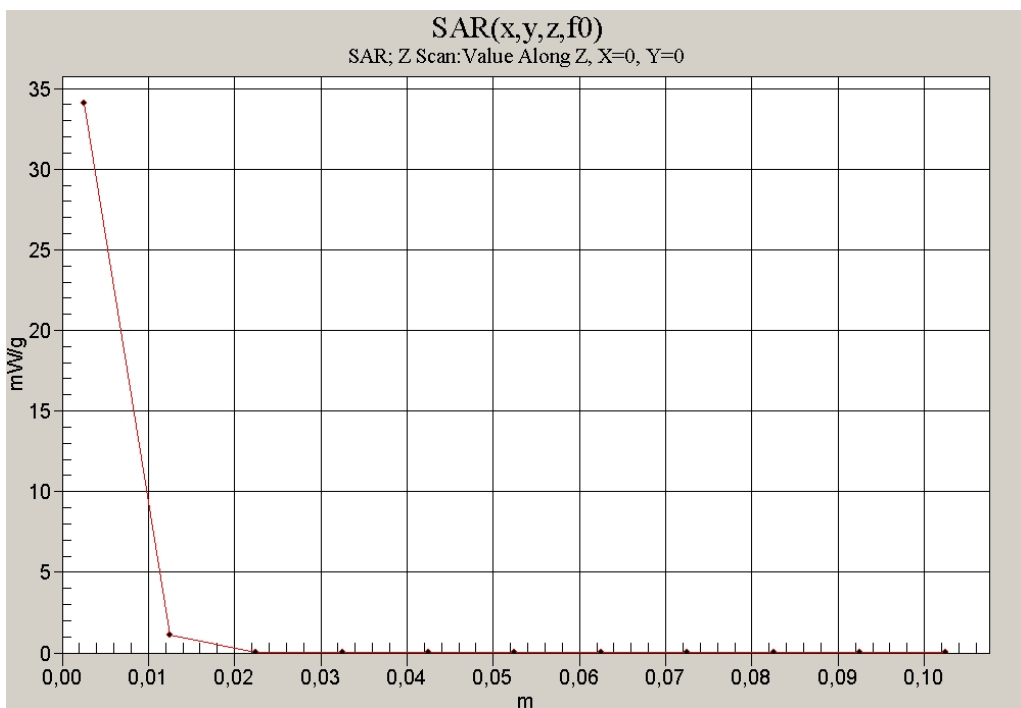


Fig. 9: SAR versus liquid depth, 5800 MHz, body (May 18, 2012; Ambient Temperature: 21.6° C; Liquid Temperature: 21.2° C).

## 6 SAR Z-axis Scans (Measurements)

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

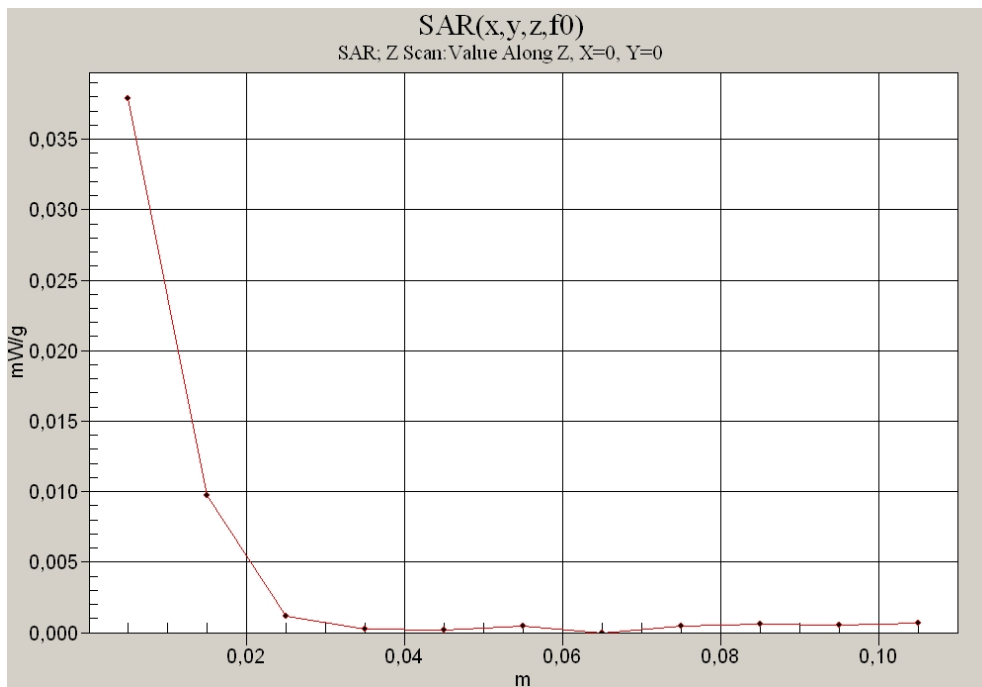


Fig. 10: SAR versus liquid depth, head: IEEE 802.11 b, channel 6, tilted position, left side of head, standard battery (May 18, 2012; Ambient Temperature: 22.4° C; Liquid Temperature : 22.3° C).

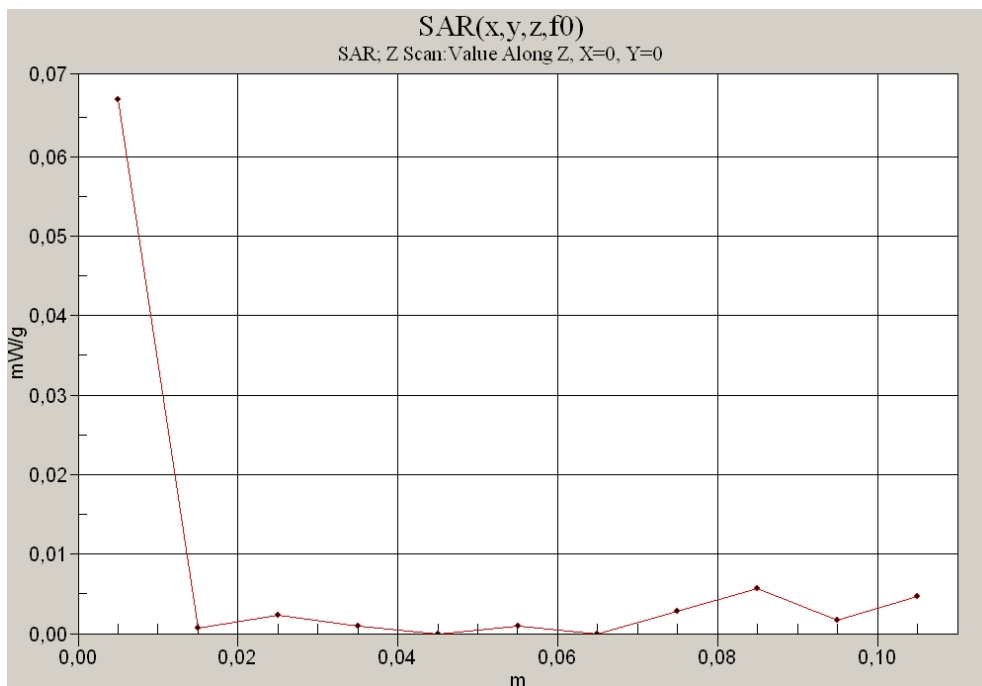


Fig. 11: SAR versus liquid depth, head: IEEE 802.11 a channel 149, tilted position, left side of head, standard battery (May 21, 2012; Ambient Temperature: 21.8° C; Liquid Temperature : 21.5° C).

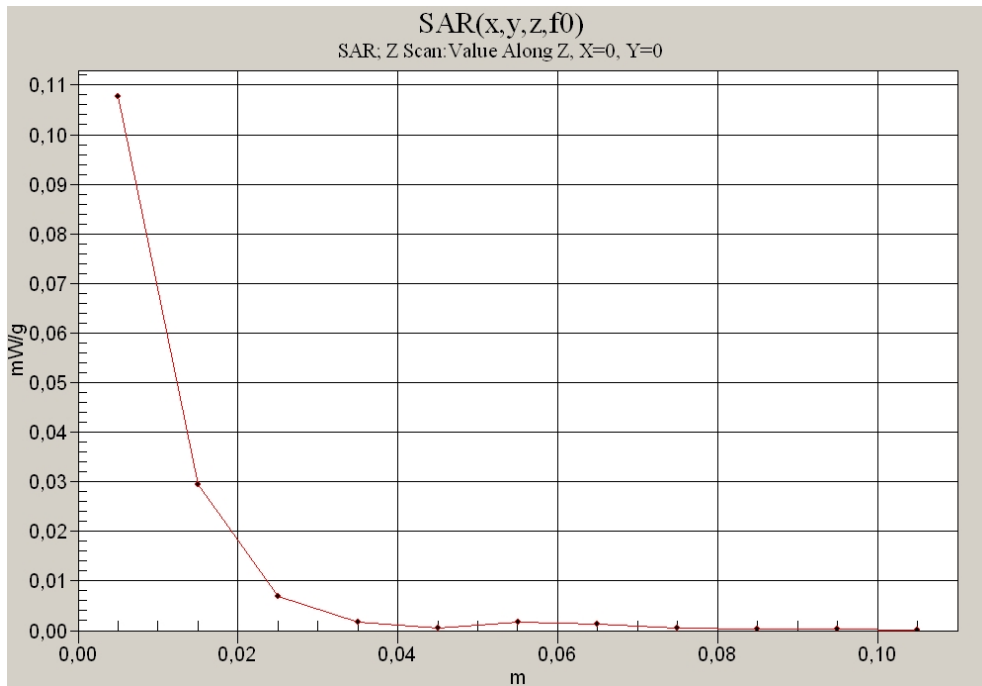


Fig. 12: SAR versus liquid depth, body: IEEE 802.11 b, channel 6, position 2 standard battery (May 15, 2012; Ambient Temperature: 22.7° C; Liquid Temperature: 22.3° C).

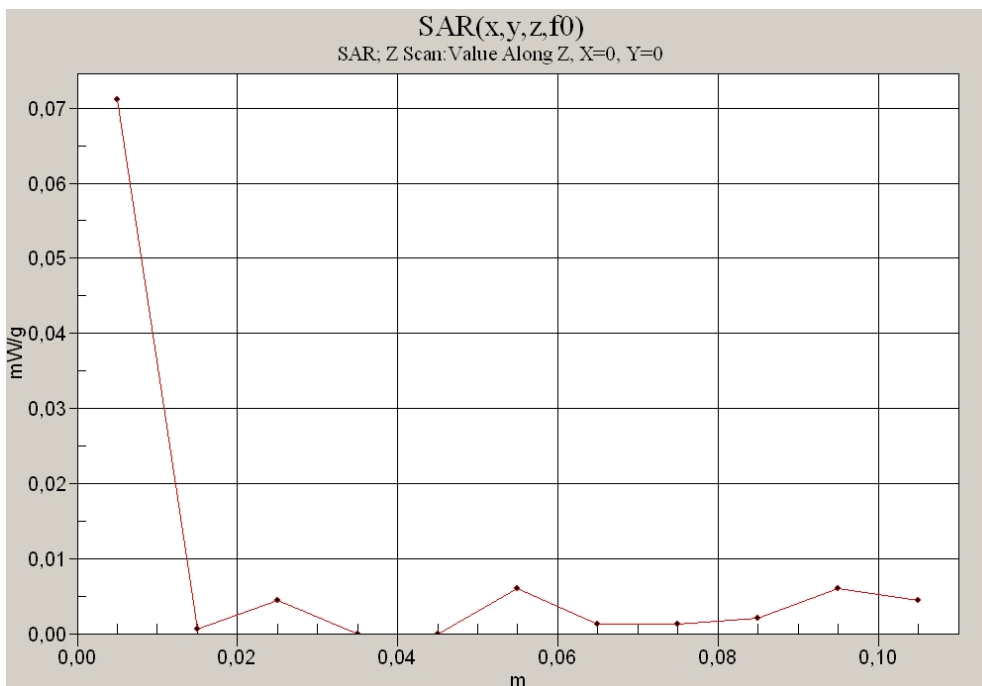


Fig. 13: SAR versus liquid depth, body: IEEE 802.11 a, channel 149, position 2, standard battery (May 18, 2012; Ambient Temperature: 21.6°C; Liquid Temperature: 21.2°C).