

APPENDIX 1 : SAR Measurement data

1. Evaluation procedure

The evaluation was performed with the following procedure:

Step 1: Measurement of the E-field at a fixed location above the ear point or central position of flat phantom was used as a reference value for assessing the power drop.

Step 2: The SAR distribution at the exposed side of head or body position was measured at a distance of each device from the inner surface of the shell. The area covered the entire dimension of the antenna of EUT and the horizontal grid spacing was 15 mm x 15 mm (or 10mm x 10mm for 5GHz band). Based on these data, the area of the maximum absorption was determined by spline interpolation.

Step 3:

Around this point found in the Step 2 (area scan) , a volume of 30mm x 30mm x 30mm or more was assessed by measuring 7 x 7 x 7 points at least, and a volume of 28mm x 28mm x 22.5mm or more was assessed by measuring 8 x 8 x 10 points at least for 5GHz band. And for any secondary peaks found in the Step2 which are within 2dB of maximum peak and not with this Step3 (Zoom scan) is repeated. On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

(1). The data at the surface were extrapolated, since the center of the dipoles is 1mm(EX3DV3) away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.3 mm. The extrapolation was based on a least square algorithm [4]. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

(2). The maximum interpolated value was searched with a straightforward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed by the 3D-Spline interpolation algorithm. The 3D-Spline is composed of three one-dimensional splines with the "Not a knot"-condition (in x, y and z-directions) [4], [5]. The volume was integrated with the trapezoidal-algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.

(3). All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Step 4: Re-measurement of the E-field at the same location as in Step 1.

2. Measurement data

i) PCS1900 Head

SHW-A350K PCS1900(GSM) Left Cheek 1850.2MHz Area Scan

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.30042

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.412$ mho/m; $\epsilon_r = 38.073$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(8.43, 8.43, 8.43); Calibrated: 2011/12/16

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2011/07/20

Phantom: SAM with CRP; Type: SAM;

Measurement SW: DASY52, Version 52.8 (0);

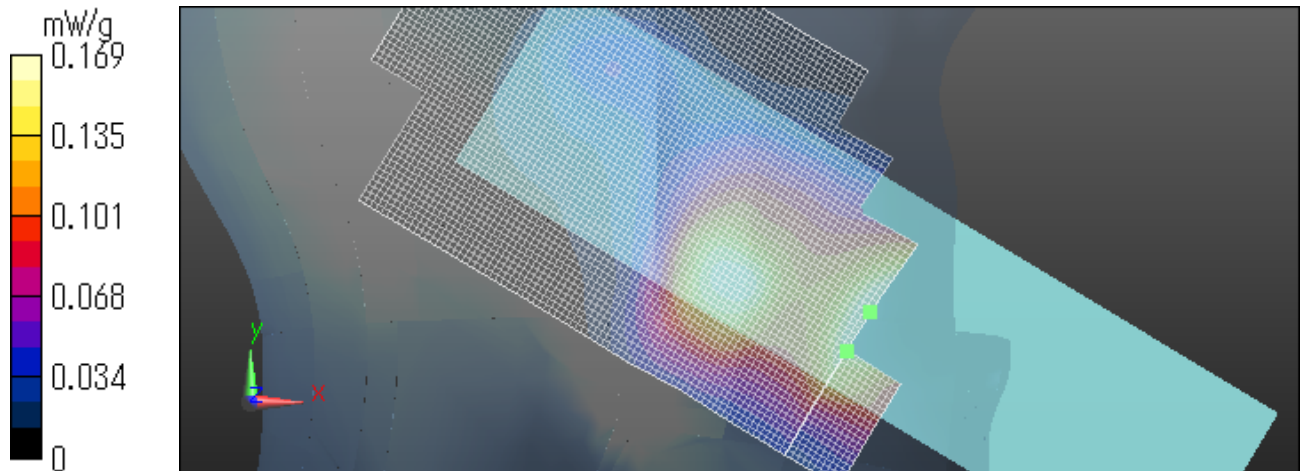
Area Scan (61x101x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.195 mW/g

Date: 2012/04/17

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



SHW-A350K PCS1900(GSM) Left Tilt 1850.2MHz

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.30042

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.412$ mho/m; $\epsilon_r = 38.073$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(8.43, 8.43, 8.43); Calibrated: 2011/12/16

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2011/07/20

Phantom: SAM with CRP; Type: SAM;

Measurement SW: DASY52, Version 52.8 (0);

Area Scan (61x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.138 mW/g

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

Reference Value = 7.151 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 0.1480

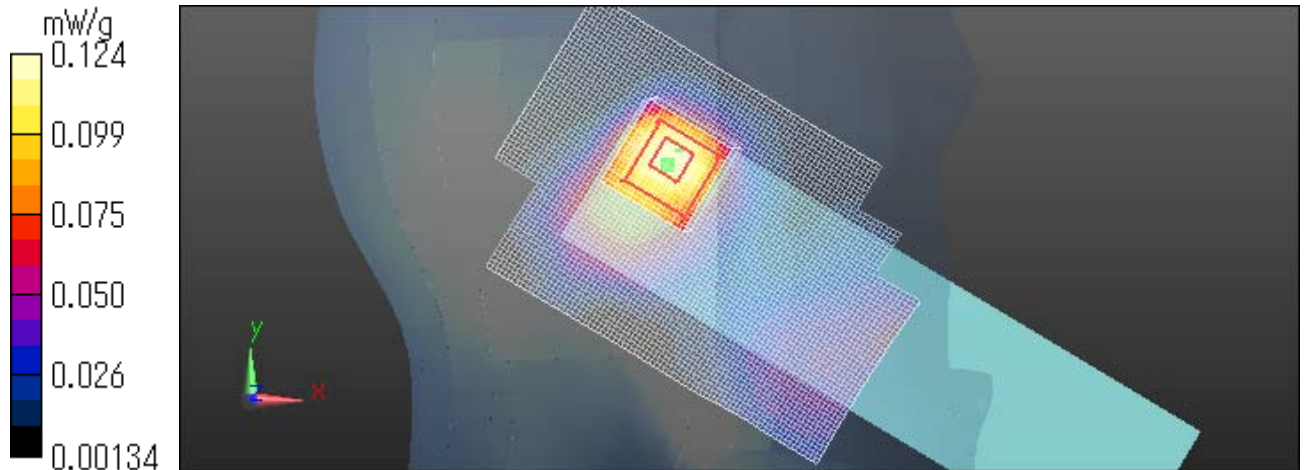
SAR(1 g) = 0.097 mW/g; SAR(10 g) = 0.060 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.124 mW/g

Date: 2012/04/18

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



SHW-A350K PCS1900(GSM) Right Cheek 1850.2MHz Area Scan

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.30042

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.412$ mho/m; $\epsilon_r = 38.073$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(8.43, 8.43, 8.43); Calibrated: 2011/12/16

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2011/07/20

Phantom: SAM with CRP; Type: SAM;

Measurement SW: DASY52, Version 52.8 (0);

Area Scan (61x21x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.138 mW/g

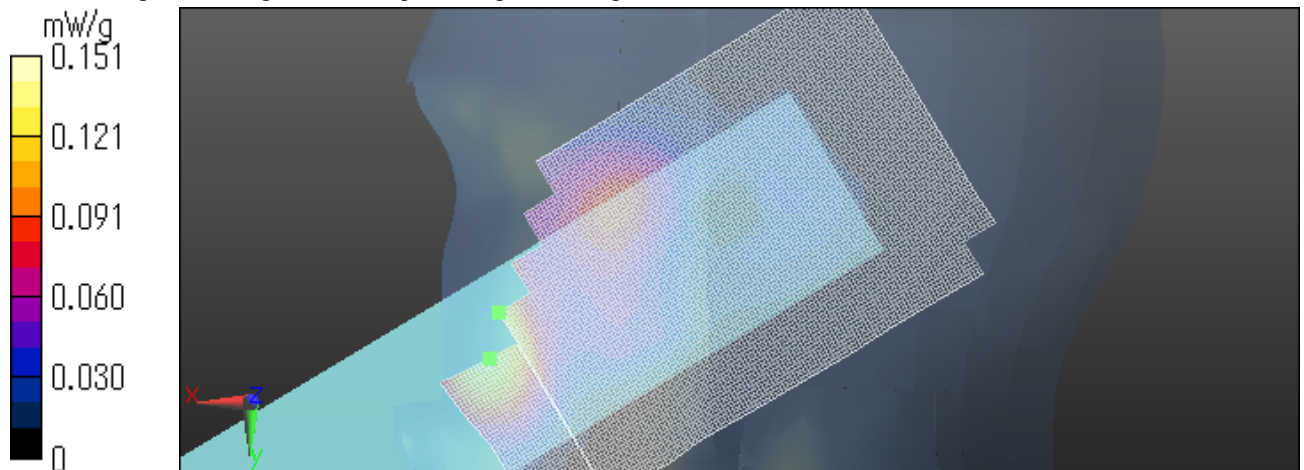
Area Scan (91x131x1): Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.151 mW/g

Date: 2012/04/17

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



SHW-A350K PCS1900(GSM) Right Tilt 1850.2MHz

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.30042

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.412$ mho/m; $\epsilon_r = 38.073$; $\rho = 1000$ kg/m³

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(8.43, 8.43, 8.43); Calibrated: 2011/12/16

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2011/07/20

Phantom: SAM with CRP; Type: SAM;

Measurement SW: DASY52, Version 52.8 (0);

Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.103 mW/g

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

Reference Value = 7.280 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.1160

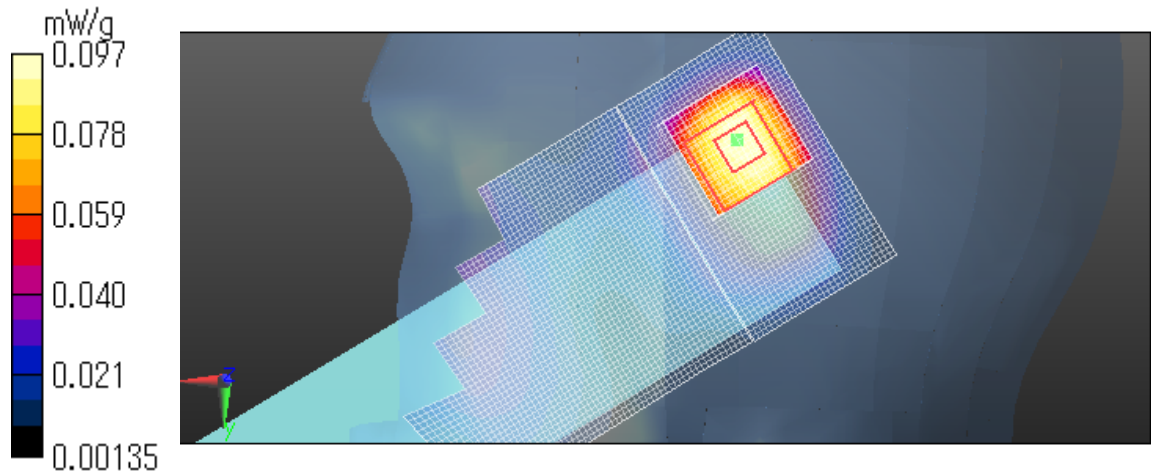
SAR(1 g) = 0.076 mW/g; SAR(10 g) = 0.047 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.097 mW/g

Date: 2012/04/18

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



SHW-A350K PCS1900(GSM) Front (Lower edge 55mm) 1850.2MHz

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:8.30042

Medium parameters used (interpolated): $f = 1850.2 \text{ MHz}$; $\sigma = 1.412 \text{ mho/m}$; $\epsilon_r = 38.073$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(8.43, 8.43, 8.43); Calibrated: 2011/12/16

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2011/07/20

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (0);

Area Scan (101x191x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.035 mW/g

Zoom Scan (7x9x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 3.864 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.0450

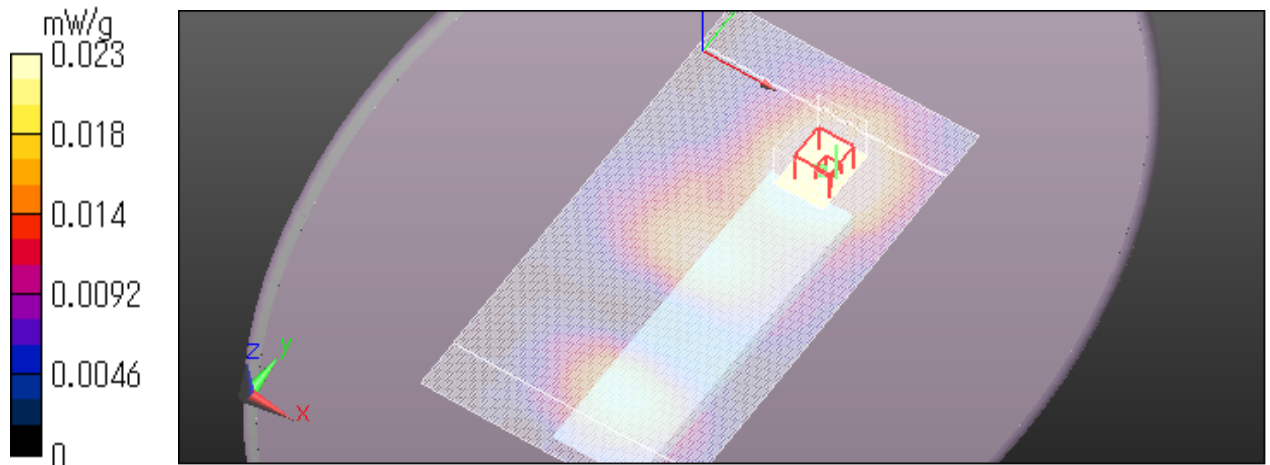
SAR(1 g) = 0.027 mW/g; SAR(10 g) = 0.017 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.036 mW/g

Date: 2012/04/18

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



ii) **PCS1900 Body-worn**

SHW-A350K PCS1900(GPRS 2slots) Rear 15mm 1850.2MHz

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4.19952

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.535$ mho/m; $\epsilon_r = 51.48$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.48, 7.48, 7.48); Calibrated: 2011/12/16

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2011/07/20

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (0);

Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 1.188 mW/g

Zoom Scan (7x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 18.113 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 1.3590

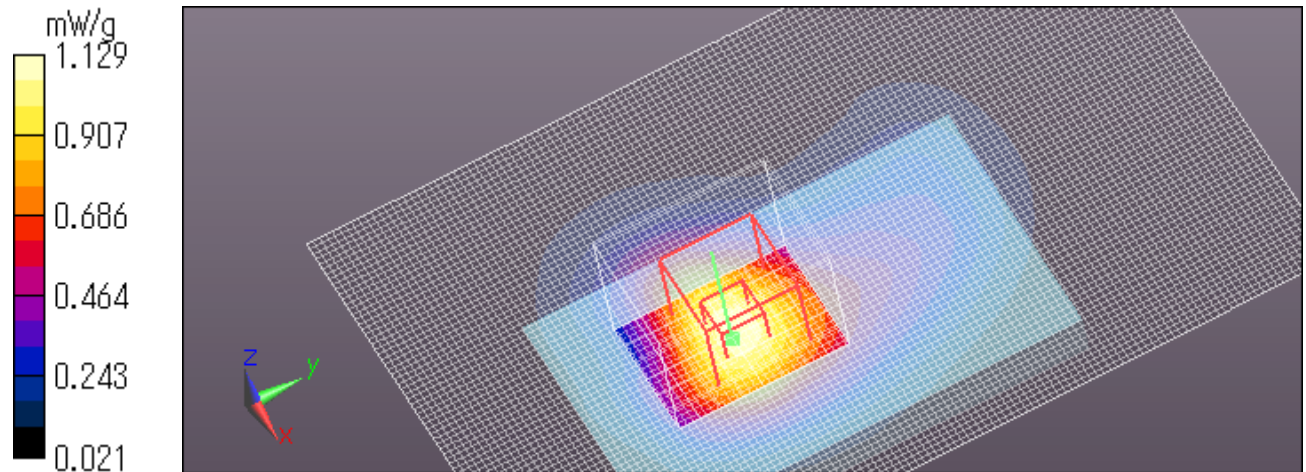
SAR(1 g) = 0.871 mW/g; SAR(10 g) = 0.532 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.129 mW/g

Date: 2012/04/18

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



Z Scan at maximum SAR in PCS1900 band
SHW-A350K PCS1900(GPRS 2slots) Rear 15mm 1850.2MHz

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4.19952

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.535$ mho/m; $\epsilon_r = 51.48$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.48, 7.48, 7.48); Calibrated: 2011/12/16

Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2011/07/20

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (0);

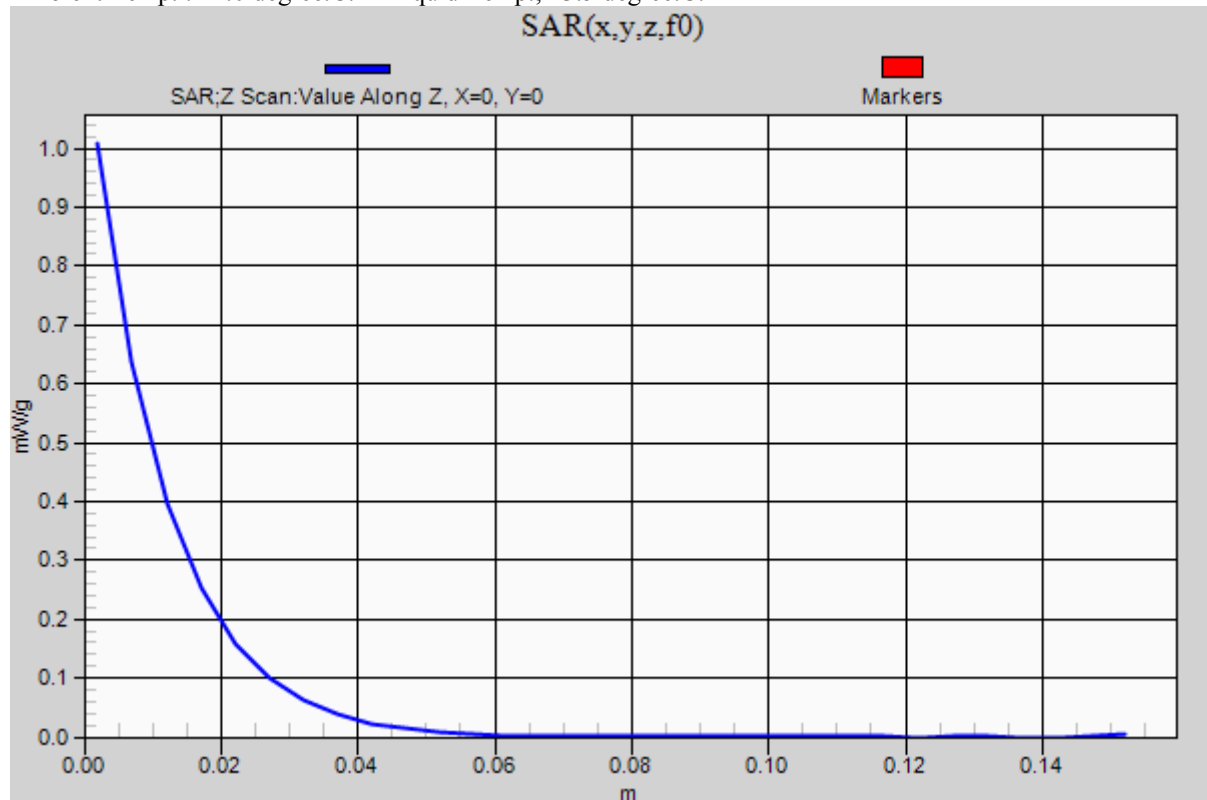
Z Scan (1x1x31): Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 1.008 mW/g

Date: 2012/04/18

Ambient Temp. : 24.0 degree.C. Liquid Temp.: 23.5 degree.C.



SHW-A350K PCS1900(GPRS 2slots) Front 15mm 1850.2MHz

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1850.2 MHz; Duty Cycle: 1:4.19952

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.535$ mho/m; $\epsilon_r = 51.48$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.48, 7.48, 7.48); Calibrated: 2011/12/16

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2011/07/20

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (0);

Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (interpolated) = 0.284 mW/g

Zoom Scan (7x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.282 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.3390

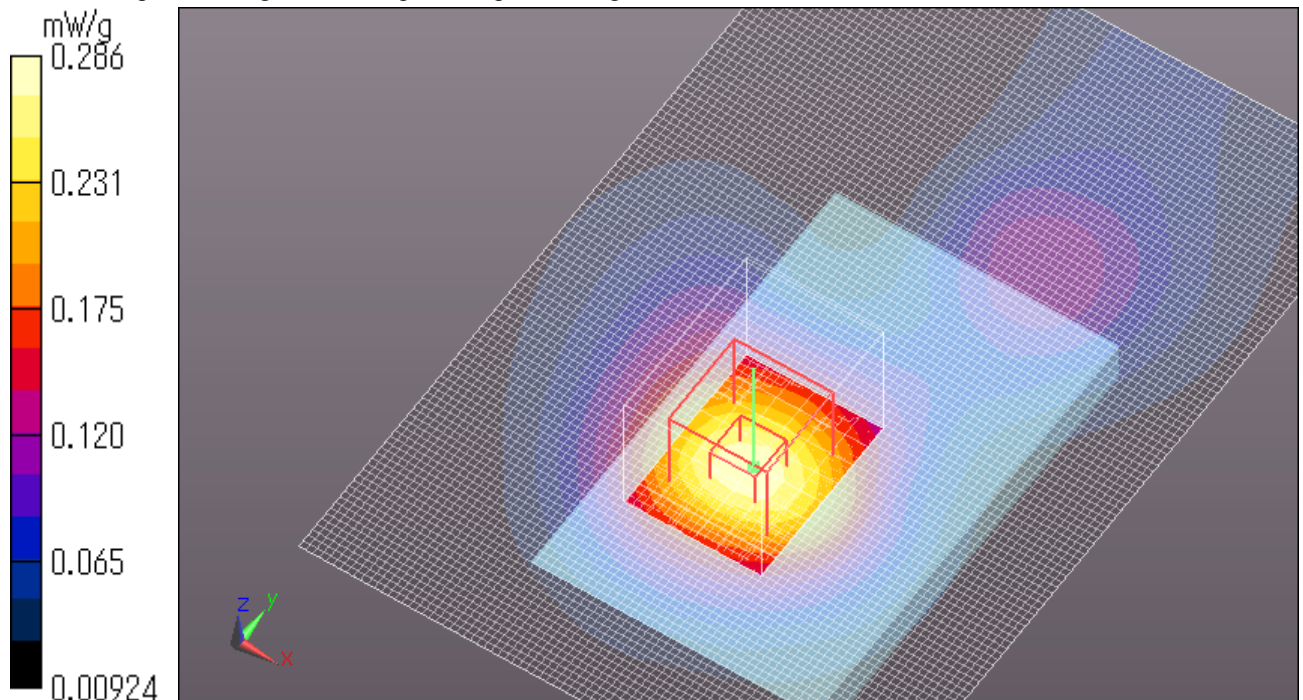
SAR(1 g) = 0.225 mW/g; SAR(10 g) = 0.142 mW/g

[Info: Interpolated medium parameters used for SAR evaluation.](#)

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

Date: 2012/04/18

Ambient Temp. : 24.0 degree.C. Liquid Temp.; 23.5 degree.C.



SHW-A350K PCS1900(GPRS 2slots) Rear 15mm 1880.0MHz

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1880 MHz; Duty Cycle: 1:4.19952

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.565$ mho/m; $\epsilon_r = 51.37$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.48, 7.48, 7.48); Calibrated: 2011/12/16

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2011/07/20

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (0);

Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.928 mW/g

Zoom Scan (7x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.933 V/m; Power Drift = 0.11 dB

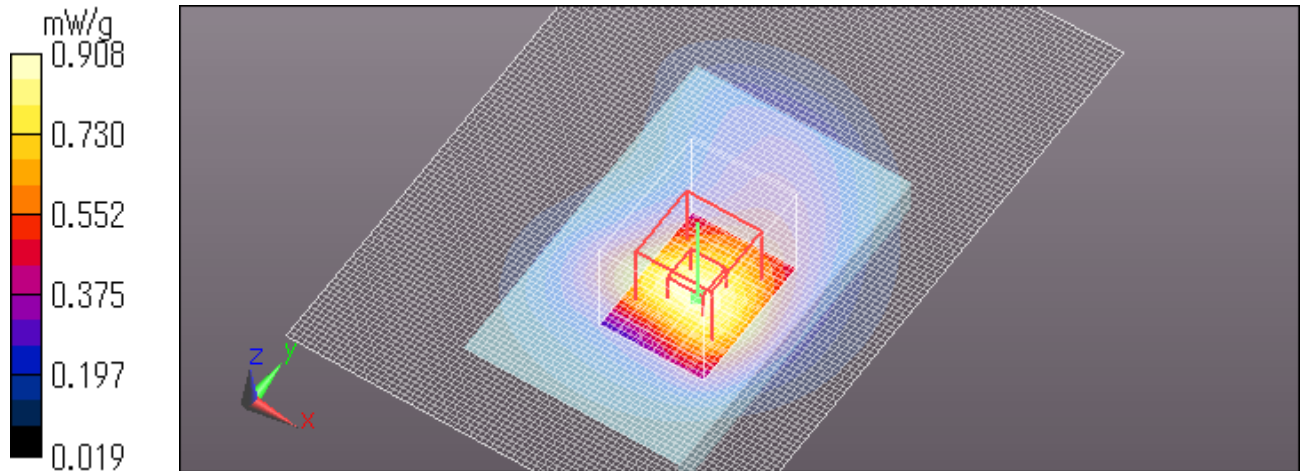
Peak SAR (extrapolated) = 1.0980

SAR(1 g) = 0.691 mW/g; SAR(10 g) = 0.422 mW/g

Maximum value of SAR (measured) = 0.908 mW/g

Date: 2012/04/18

Ambient Temp. : 24.0 degree.C. Liquid Temp.: 23.5 degree.C.



SHW-A350K PCS1900(GPRS 2slots) Rear 15mm 1909.8MHz

Communication System: PCS1900; Communication System Band: PCS1900; Frequency: 1909.8 MHz; Duty Cycle: 1:4.19952

Medium parameters used: $f = 1910$ MHz; $\sigma = 1.594$ mho/m; $\epsilon_r = 51.26$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration

Probe: EX3DV4 - SN3825; ConvF(7.48, 7.48, 7.48); Calibrated: 2011/12/16

Sensor-Surface: 2mm (Mechanical Surface Detection (Locations From Previous Scan Used)), Sensor-Surface: 2mm (Mechanical Surface Detection)

Electronics: DAE4 Sn509; Calibrated: 2011/07/20

Phantom: ELI 4.0; Type: QDOVA001BA;

Measurement SW: DASY52, Version 52.8 (0);

Area Scan (81x121x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.890 mW/g

Zoom Scan (7x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.668 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 1.0210

SAR(1 g) = 0.640 mW/g; SAR(10 g) = 0.387 mW/g

Maximum value of SAR (measured) = 0.842 mW/g

Date: 2012/04/18

Ambient Temp. : 24.0 degree.C. Liquid Temp. : 23.5 degree.C.

