

APPENDIX 2 : 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 10 mm x 10 mm. 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 28mm x 28mm x 20mm was assessed by measuring 8 x 8 x 11 points. And for any secondary peaks found in the Step2 which are within 2dB of maximum peak (level more than ambient noise (≥ 0.012 W/kg)) 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 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.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

2. Measurement data

S1613-01A/ANT.A/Top/battery small/5260MHz/11a BPSK (9Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200$ MHz; $\sigma = 5.54$ mho/m; $\epsilon_r = 48.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x121x1): Measurement grid: $dx=10$ mm, $dy=10$ mm

Maximum value of SAR (interpolated) = 0.257 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=2$ mm

Reference Value = 3.21 V/m; Power Drift = -0.168 dB

Peak SAR (extrapolated) = 0.613 W/kg

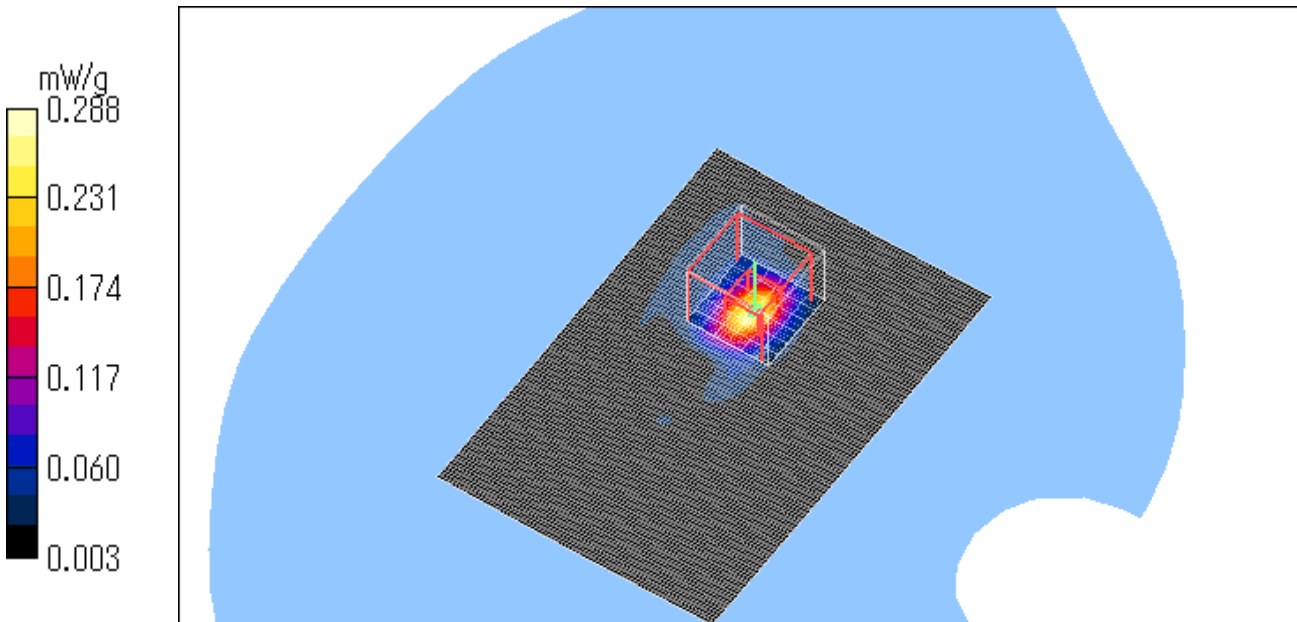
SAR(1 g) = 0.136 mW/g; SAR(10 g) = 0.040 mW/g

Maximum value of SAR (measured) = 0.288 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5260MHz/11a QPSK (12Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.161 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 2.47 V/m ; Power Drift = -0.136 dB

Peak SAR (extrapolated) = 0.401 W/kg

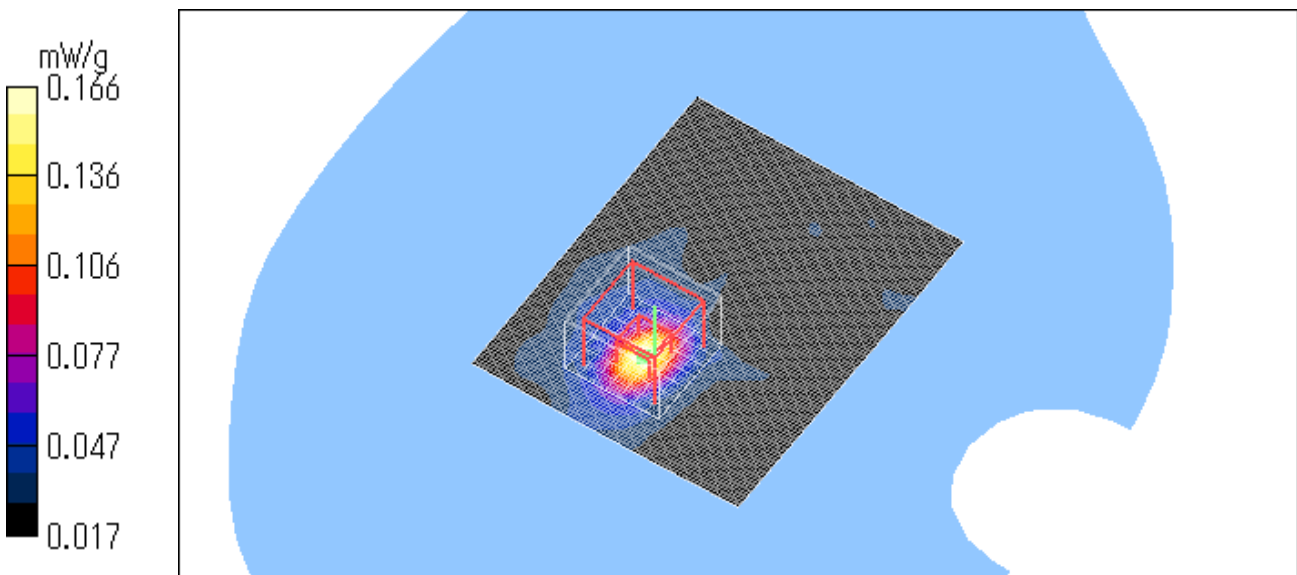
SAR(1 g) = 0.098 mW/g ; SAR(10 g) = 0.046 mW/g

Maximum value of SAR (measured) = 0.166 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.C

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5260MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.291 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 2.04 V/m ; Power Drift = 0.196 dB

Peak SAR (extrapolated) = 0.586 W/kg

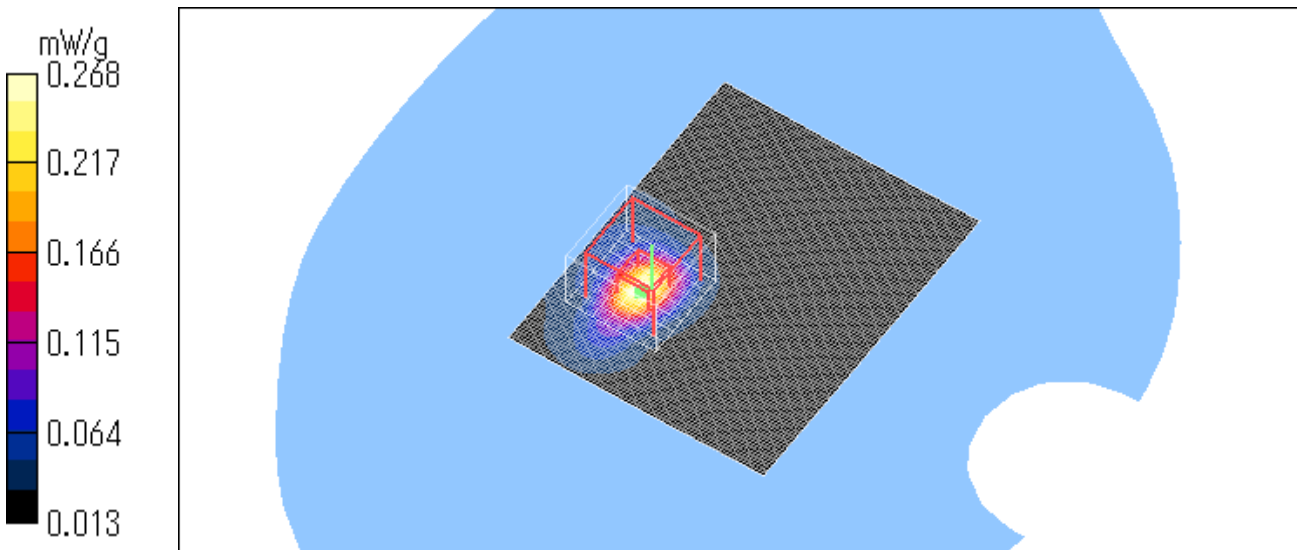
SAR(1 g) = 0.151 mW/g ; SAR(10 g) = 0.057 mW/g

Maximum value of SAR (measured) = 0.268 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0°C

Liquid Temperature = Before 24.3°C , After 24.3°C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5260MHz/11a 64QAM (54Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.235 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.93 V/m ; Power Drift = 0.108 dB

Peak SAR (extrapolated) = 0.536 W/kg

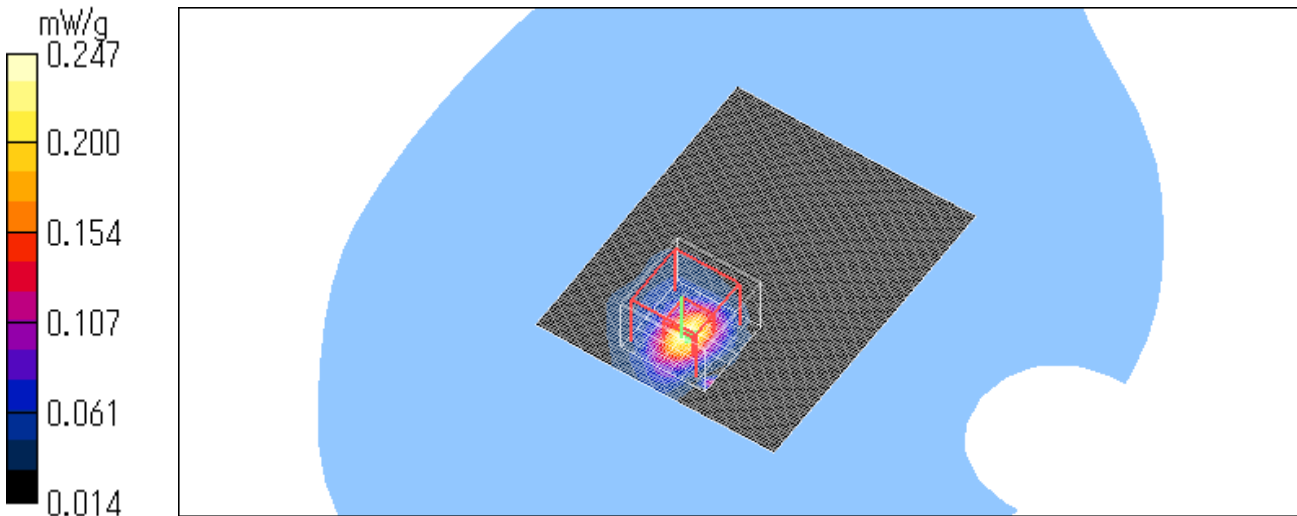
SAR(1 g) = 0.128 mW/g ; SAR(10 g) = 0.047 mW/g

Maximum value of SAR (measured) = 0.247 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery large/5260MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.048 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 2.57 V/m; Power Drift = 0.135 dB

Peak SAR (extrapolated) = 0.033 W/kg

SAR(1 g) = 0.019 mW/g; SAR(10 g) = 0.014 mW/g

Maximum value of SAR (measured) = 0.025 mW/g

Zoom Scan (8x8x11)/Cube 1: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 2.57 V/m; Power Drift = 0.135 dB

Peak SAR (extrapolated) = 0.086 W/kg

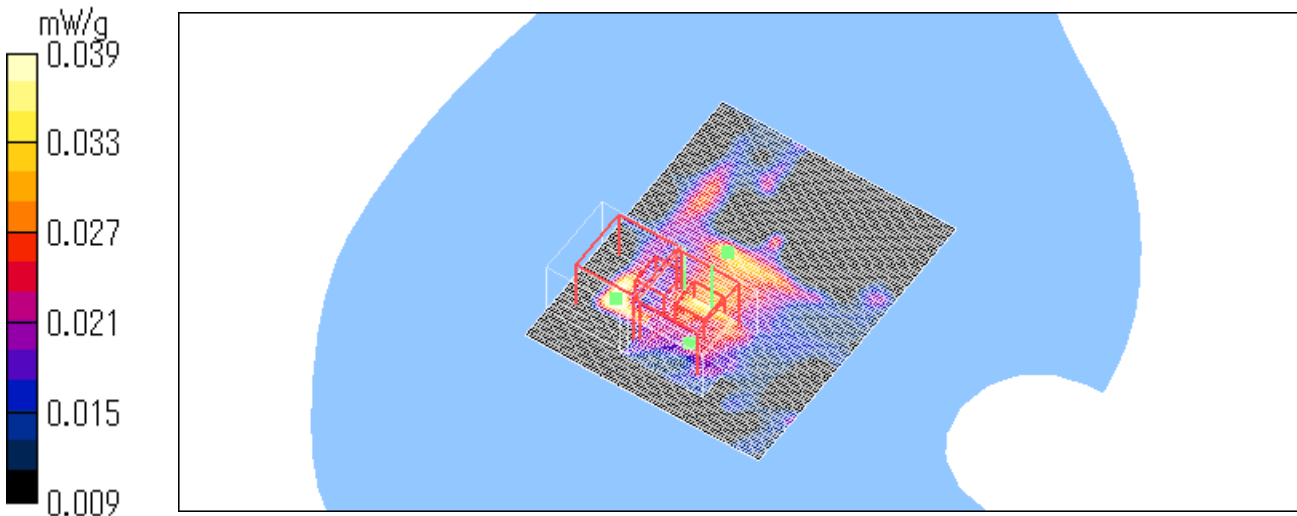
SAR(1 g) = 0.022 mW/g; SAR(10 g) = 0.016 mW/g

Maximum value of SAR (measured) = 0.039 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0 degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Rear/battery small/5260MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.038 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.62 V/m ; Power Drift = 0.115 dB

Peak SAR (extrapolated) = 0.039 W/kg

SAR(1 g) = 0.020 mW/g ; SAR(10 g) = 0.017 mW/g

Maximum value of SAR (measured) = 0.028 mW/g

Zoom Scan (8x8x11)/Cube 1: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.62 V/m ; Power Drift = 0.115 dB

Peak SAR (extrapolated) = 0.027 W/kg

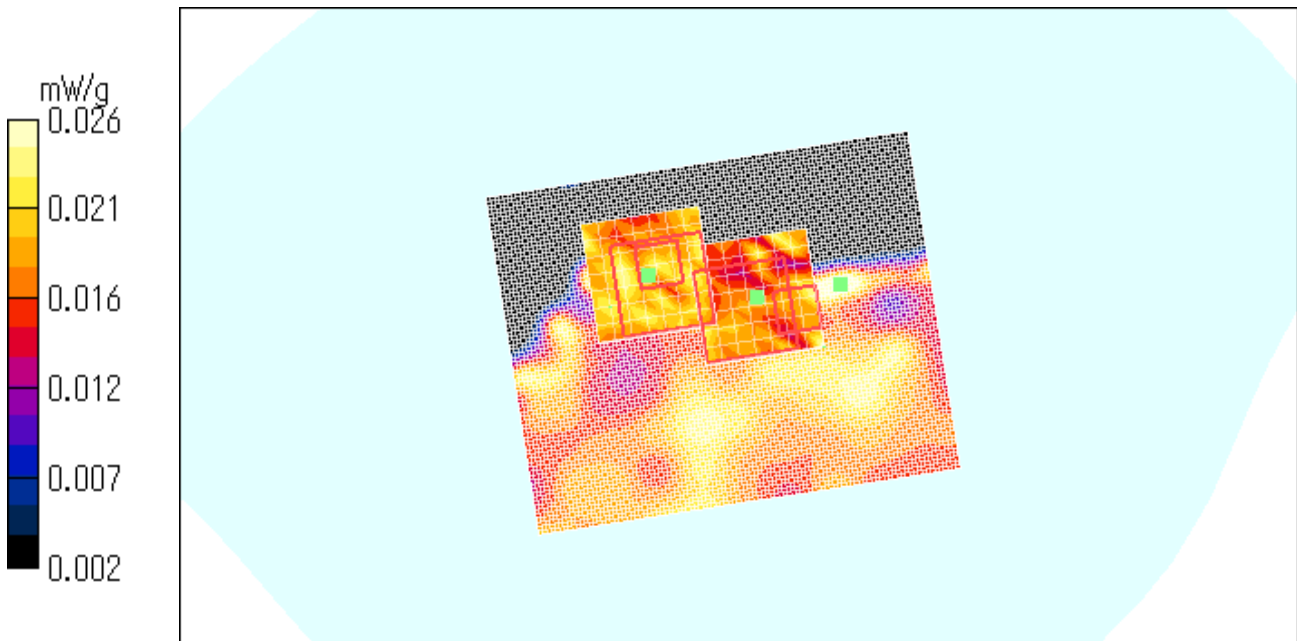
SAR(1 g) = 0.019 mW/g ; SAR(10 g) = 0.014 mW/g

Maximum value of SAR (measured) = 0.026 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.C

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5180MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.262 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 2.17 V/m ; Power Drift = 0.194 dB

Peak SAR (extrapolated) = 0.485 W/kg

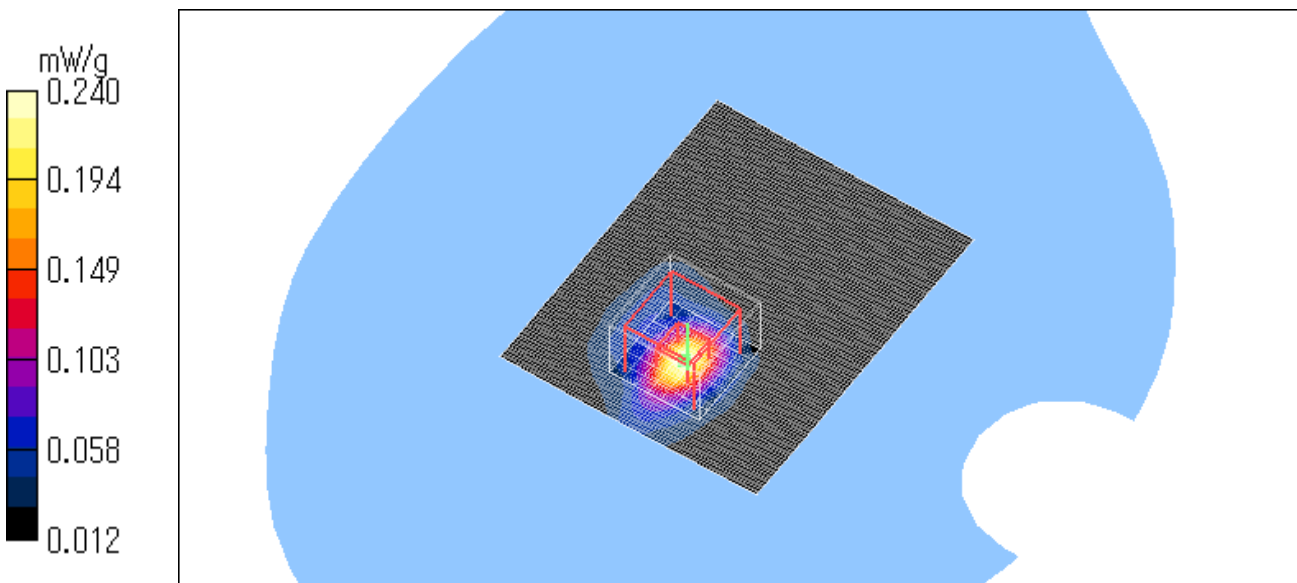
SAR(1 g) = 0.133 mW/g ; SAR(10 g) = 0.052 mW/g

Maximum value of SAR (measured) = 0.240 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0 degree.C

Liquid Temperature = Before 24.1 degree.C , After 24.1 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5320MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.427 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 2.68 V/m ; Power Drift = 0.133 dB

Peak SAR (extrapolated) = 0.839 W/kg

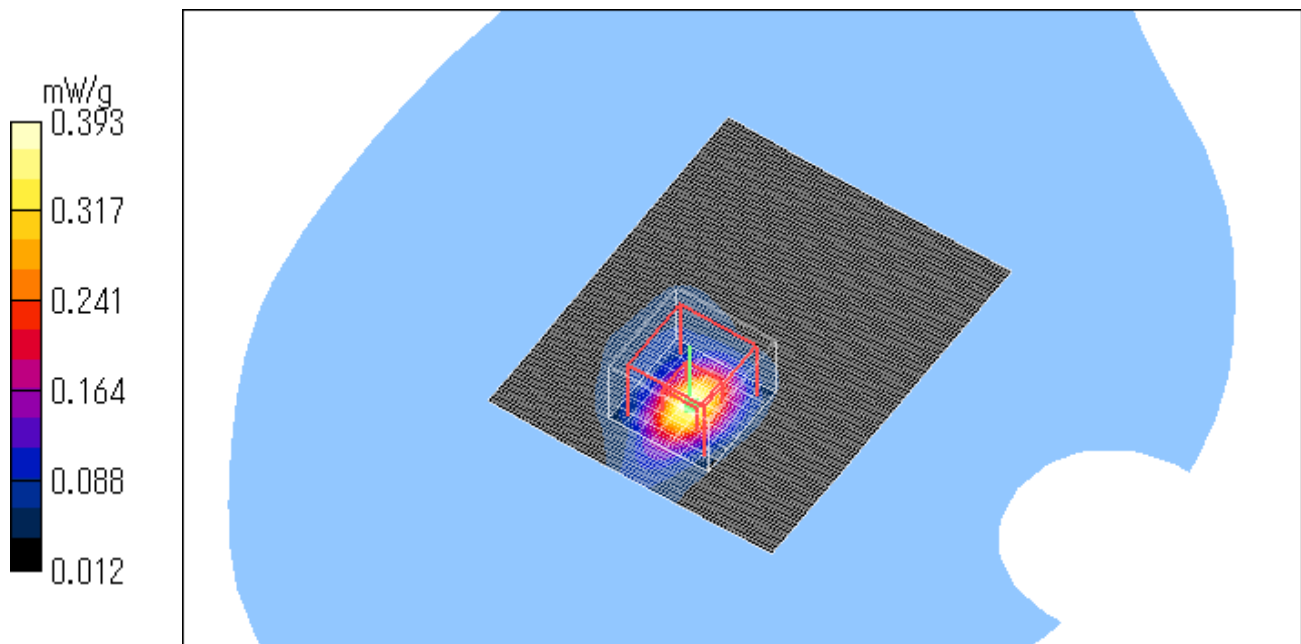
SAR(1 g) = 0.213 mW/g ; SAR(10 g) = 0.076 mW/g

Maximum value of SAR (measured) = 0.393 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Z-axis scan at max SAR location

S1613-01A/ANT.A/Top/battery small/5320MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200$ MHz; $\sigma = 5.54$ mho/m; $\epsilon_r = 48.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

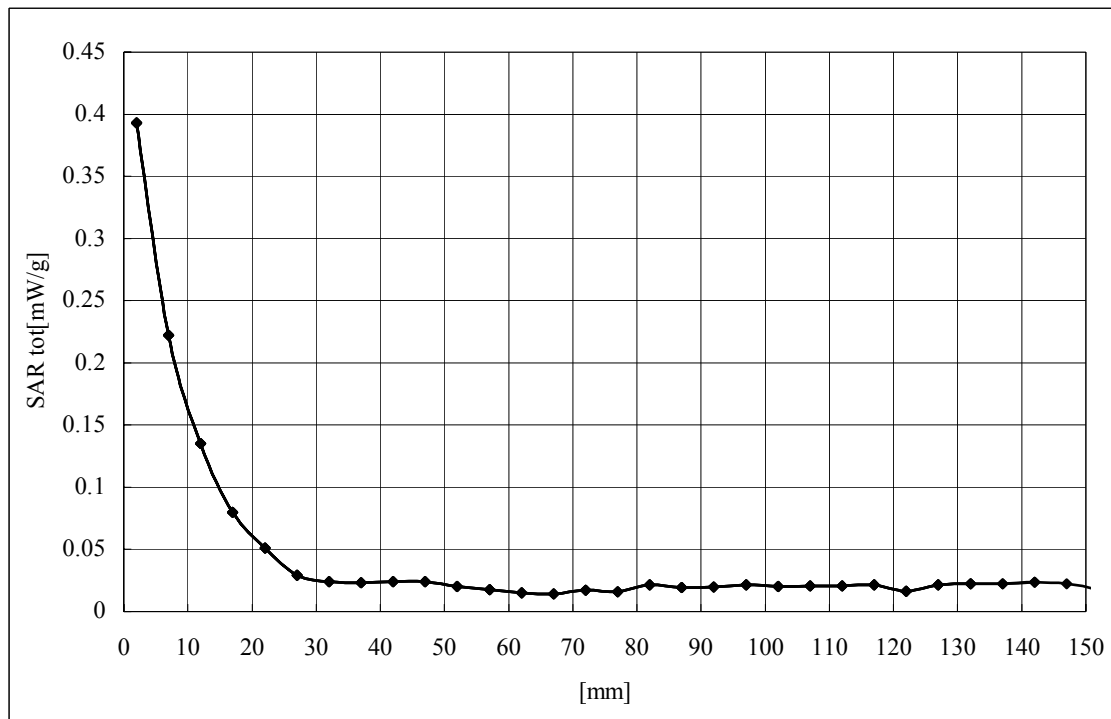
DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5260MHz/11a BPSK (9Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.178 mW/g

Zoom Scan (7x7x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 5.36 V/m ; Power Drift = -0.140 dB

Peak SAR (extrapolated) = 0.289 W/kg

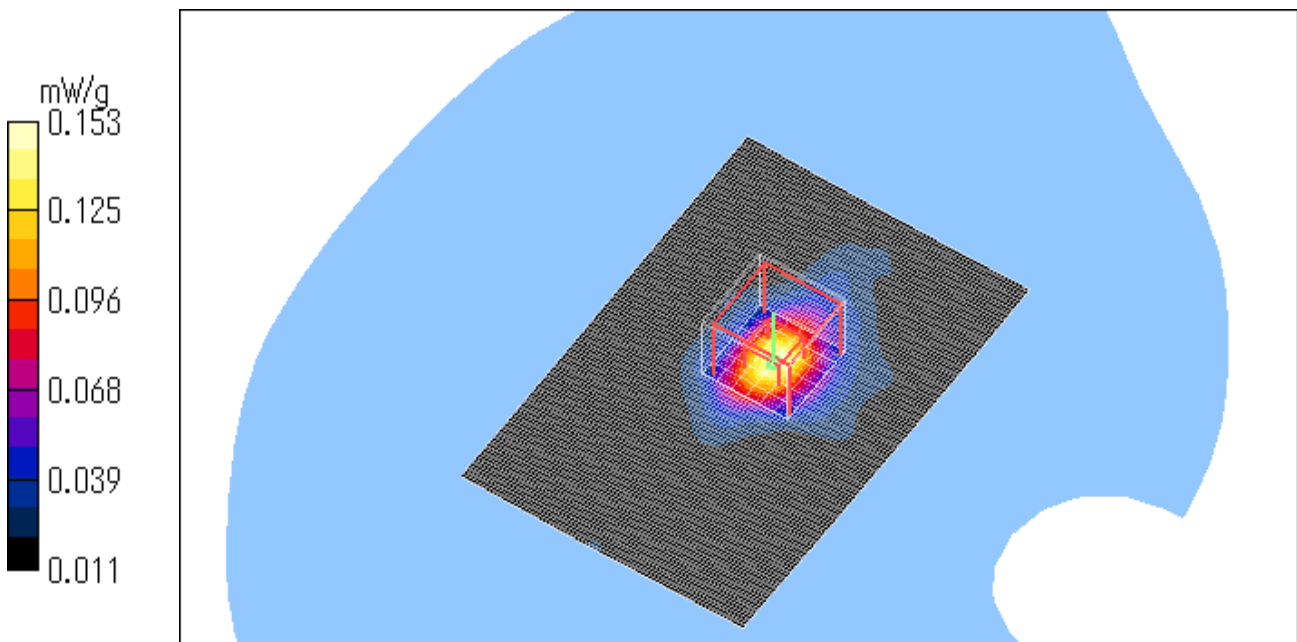
SAR(1 g) = 0.087 mW/g ; SAR(10 g) = 0.037 mW/g

Maximum value of SAR (measured) = 0.153 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.0 degree.C , After 24.0 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5260MHz/11a QPSK (12Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.162 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 5.35 V/m ; Power Drift = -0.184 dB

Peak SAR (extrapolated) = 0.336 W/kg

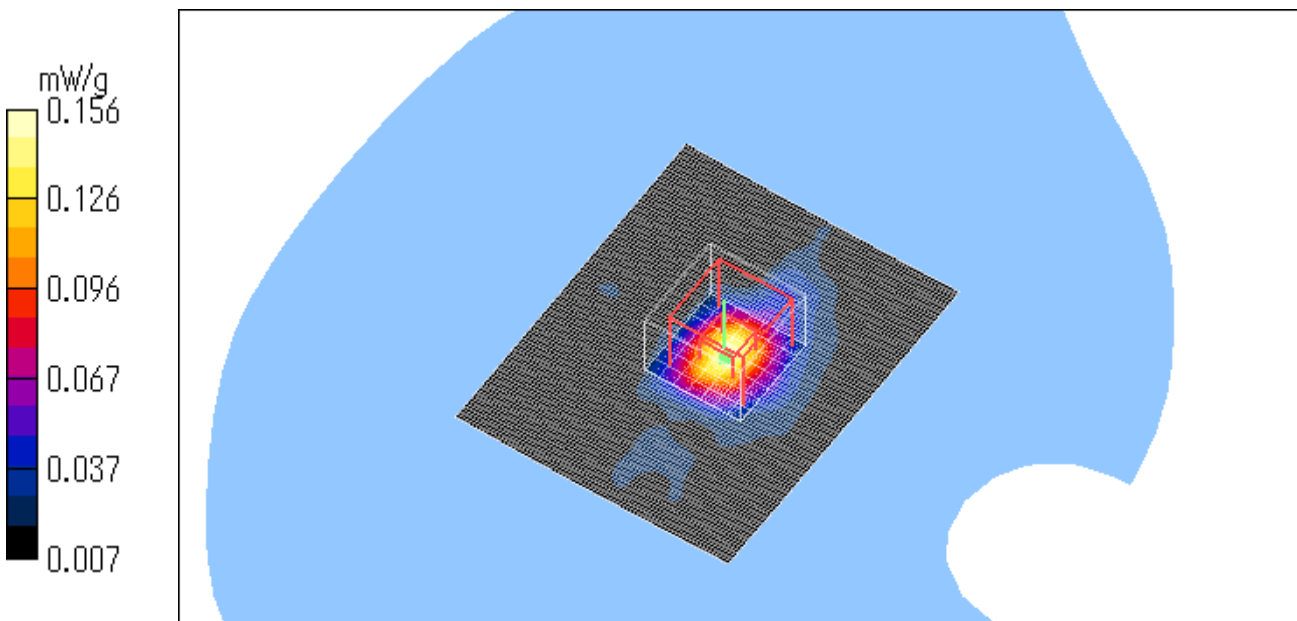
SAR(1 g) = 0.091 mW/g ; SAR(10 g) = 0.041 mW/g

Maximum value of SAR (measured) = 0.156 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5260MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.233 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 5.79 V/m ; Power Drift = -0.116 dB

Peak SAR (extrapolated) = 0.444 W/kg

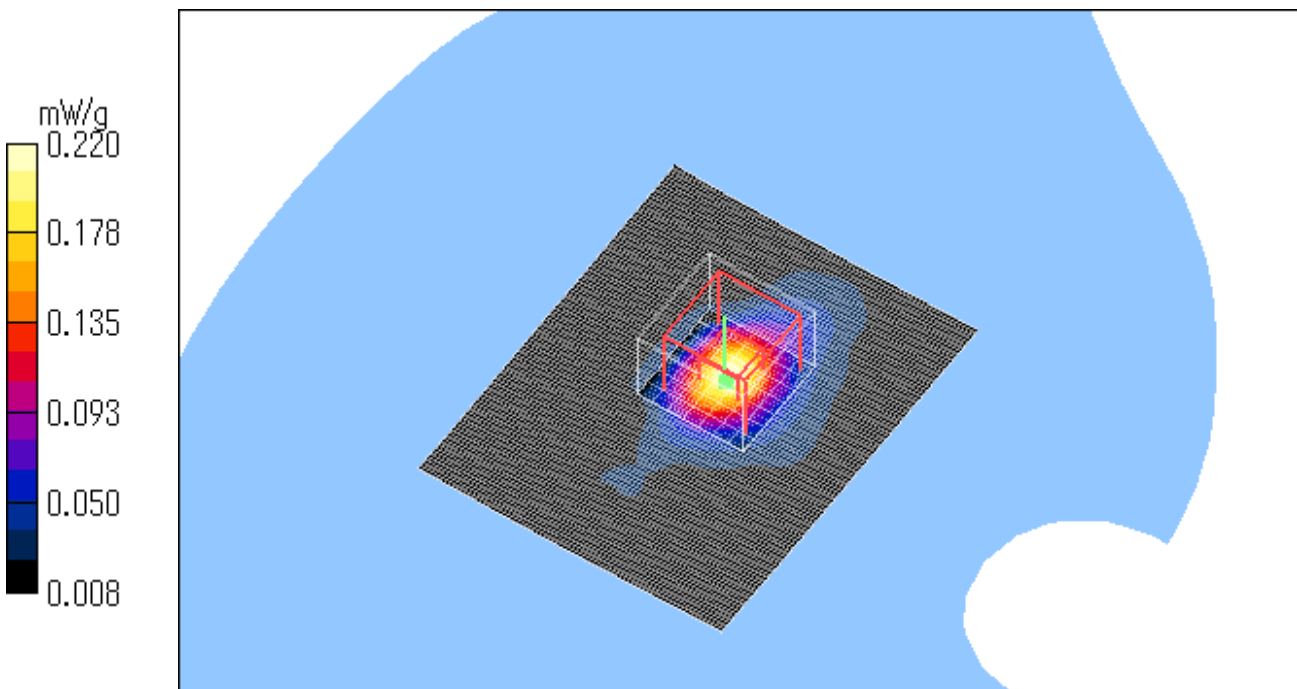
SAR(1 g) = 0.123 mW/g ; SAR(10 g) = 0.050 mW/g

Maximum value of SAR (measured) = 0.220 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0°C

Liquid Temperature = Before 24.0°C , After 24.0°C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5260MHz/11a 64QAM (54Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x81x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.181 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 6.42 V/m ; Power Drift = -0.160 dB

Peak SAR (extrapolated) = 0.314 W/kg

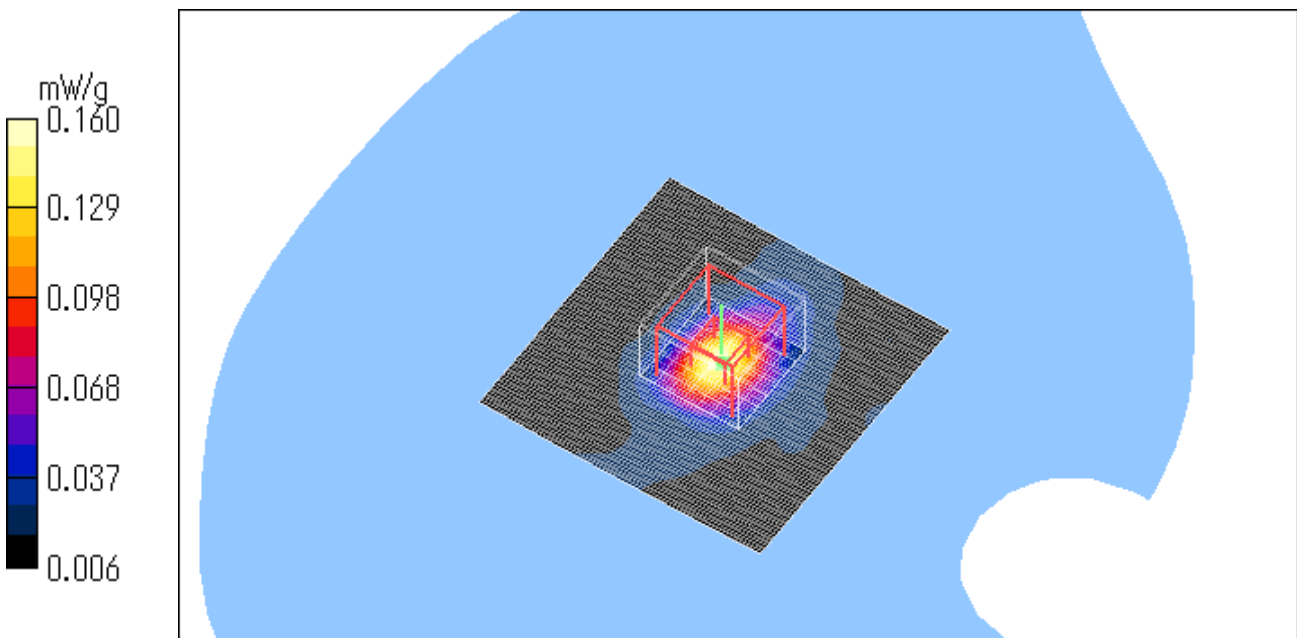
SAR(1 g) = 0.093 mW/g ; SAR(10 g) = 0.041 mW/g

Maximum value of SAR (measured) = 0.160 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery large/5260MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x81x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

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

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 6.57 V/m ; Power Drift = -0.109 dB

Peak SAR (extrapolated) = 0.385 W/kg

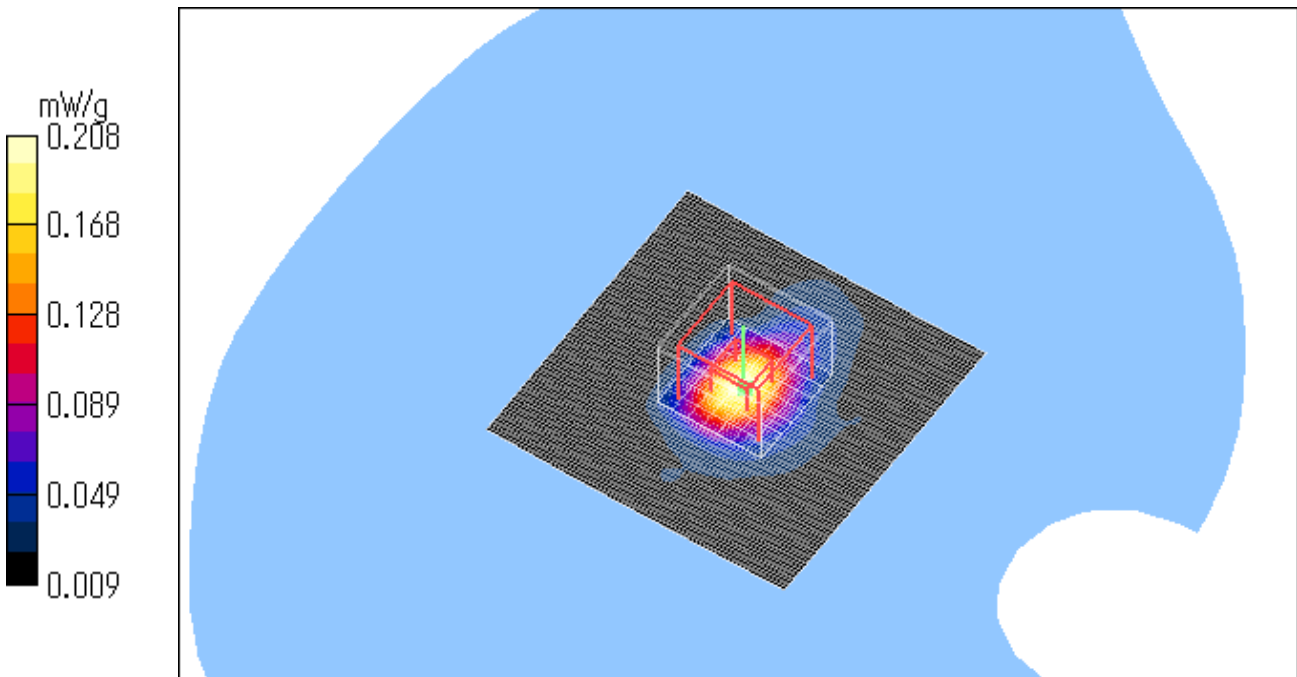
SAR(1 g) = 0.119 mW/g ; SAR(10 g) = 0.051 mW/g

Maximum value of SAR (measured) = 0.208 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0°C

Liquid Temperature = Before 24.3°C , After 24.3°C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Rear/battery small/5260MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x81x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.047 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.73 V/m ; Power Drift = 0.198 dB

Peak SAR (extrapolated) = 0.052 W/kg

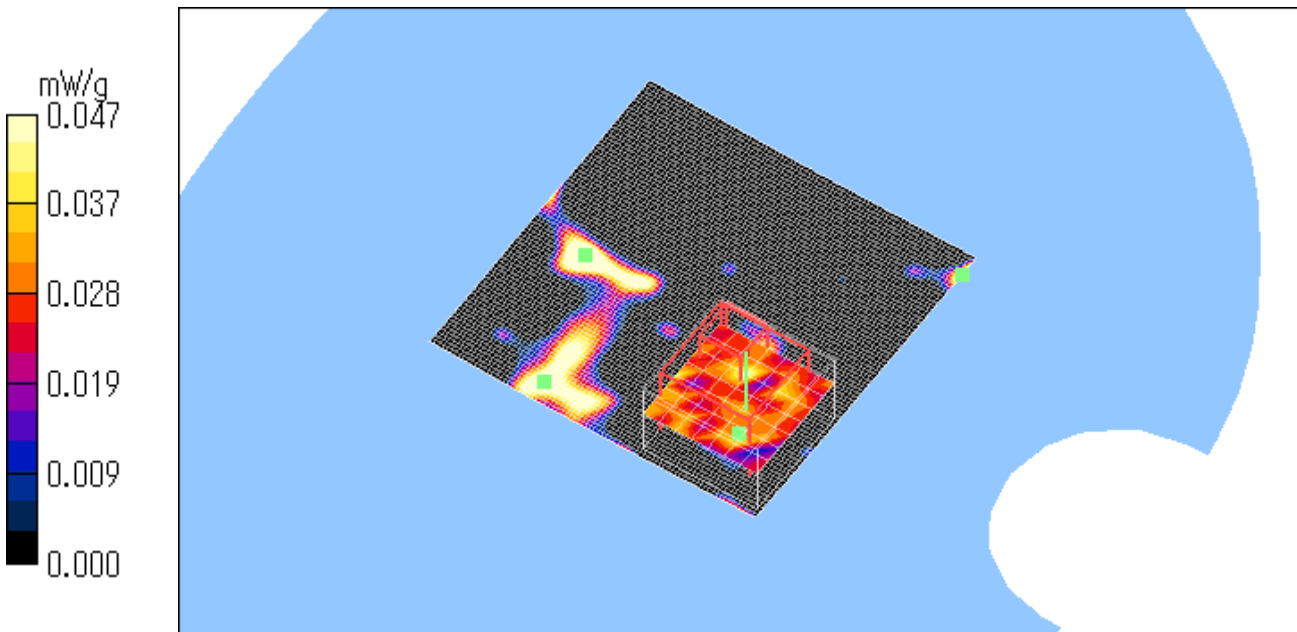
SAR(1 g) = 0.021 mW/g ; SAR(10 g) = 0.018 mW/g

Maximum value of SAR (measured) = 0.028 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Top/battery small/5260MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.038 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.84 V/m ; Power Drift = 0.194 dB

Peak SAR (extrapolated) = 0.024 W/kg

SAR(1 g) = 0.015 mW/g ; SAR(10 g) = 0.012 mW/g

Maximum value of SAR (measured) = 0.024 mW/g

Zoom Scan (8x8x11)/Cube 1: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.84 V/m ; Power Drift = 0.194 dB

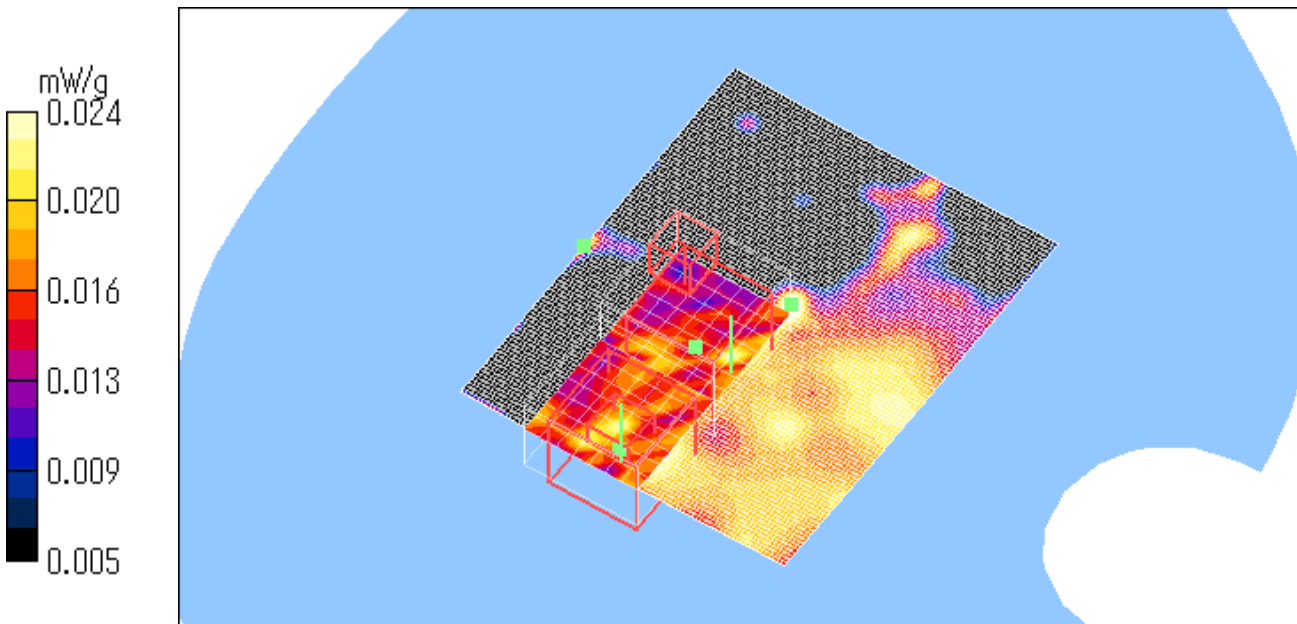
Peak SAR (extrapolated) = 0.047 W/kg

SAR(1 g) = 0.017 mW/g ; SAR(10 g) = 0.013 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.C

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5180MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x81x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.171 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 5.81 V/m ; Power Drift = -0.139 dB

Peak SAR (extrapolated) = 0.322 W/kg

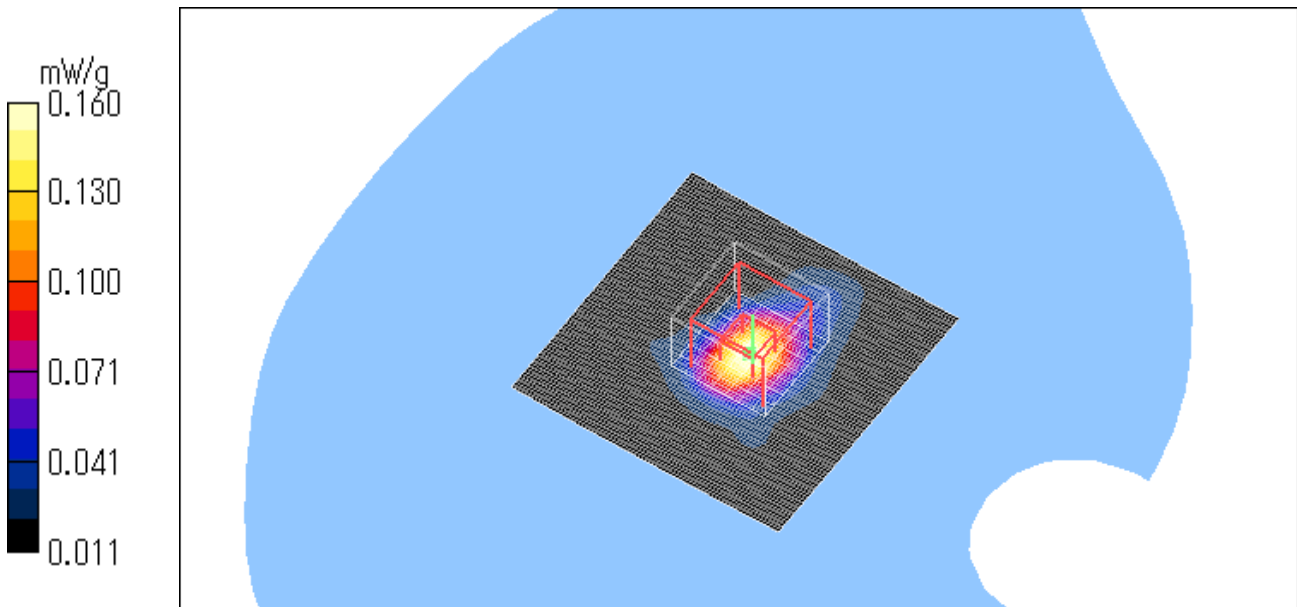
SAR(1 g) = 0.097 mW/g ; SAR(10 g) = 0.043 mW/g

Maximum value of SAR (measured) = 0.160 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5320MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x81x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.320 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 7.96 V/m ; Power Drift = -0.002 dB

Peak SAR (extrapolated) = 0.628 W/kg

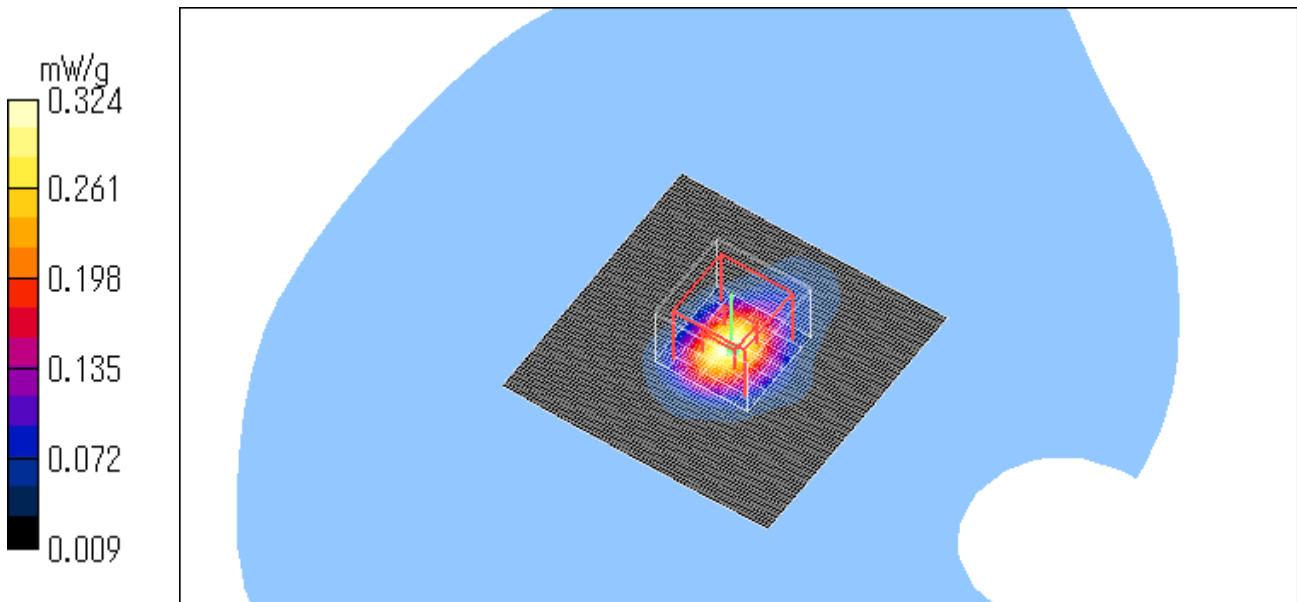
SAR(1 g) = 0.181 mW/g ; SAR(10 g) = 0.072 mW/g

Maximum value of SAR (measured) = 0.324 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5600MHz/11a BPSK (9Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.429 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 8.31 V/m ; Power Drift = 0.185 dB

Peak SAR (extrapolated) = 0.899 W/kg

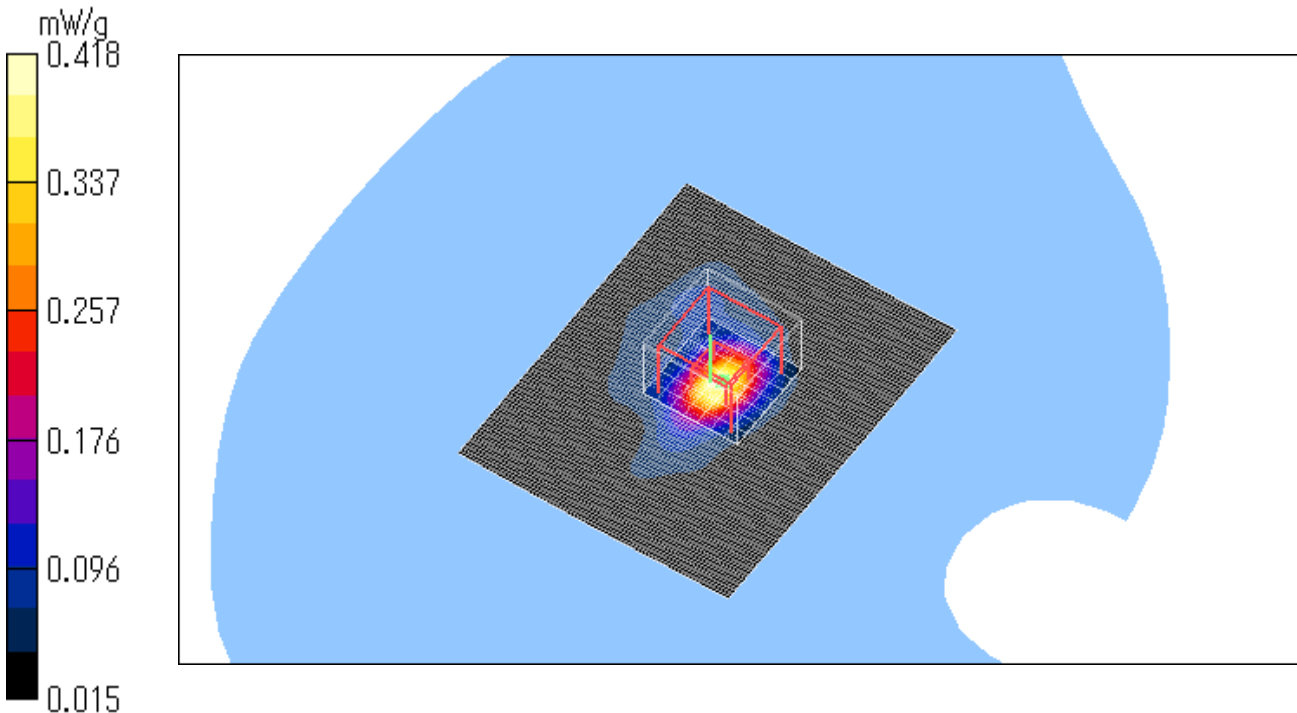
SAR(1 g) = 0.222 mW/g ; SAR(10 g) = 0.082 mW/g

Maximum value of SAR (measured) = 0.418 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5600MHz/11a QPSK (18Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.352 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 8.39 V/m ; Power Drift = -0.199 dB

Peak SAR (extrapolated) = 0.601 W/kg

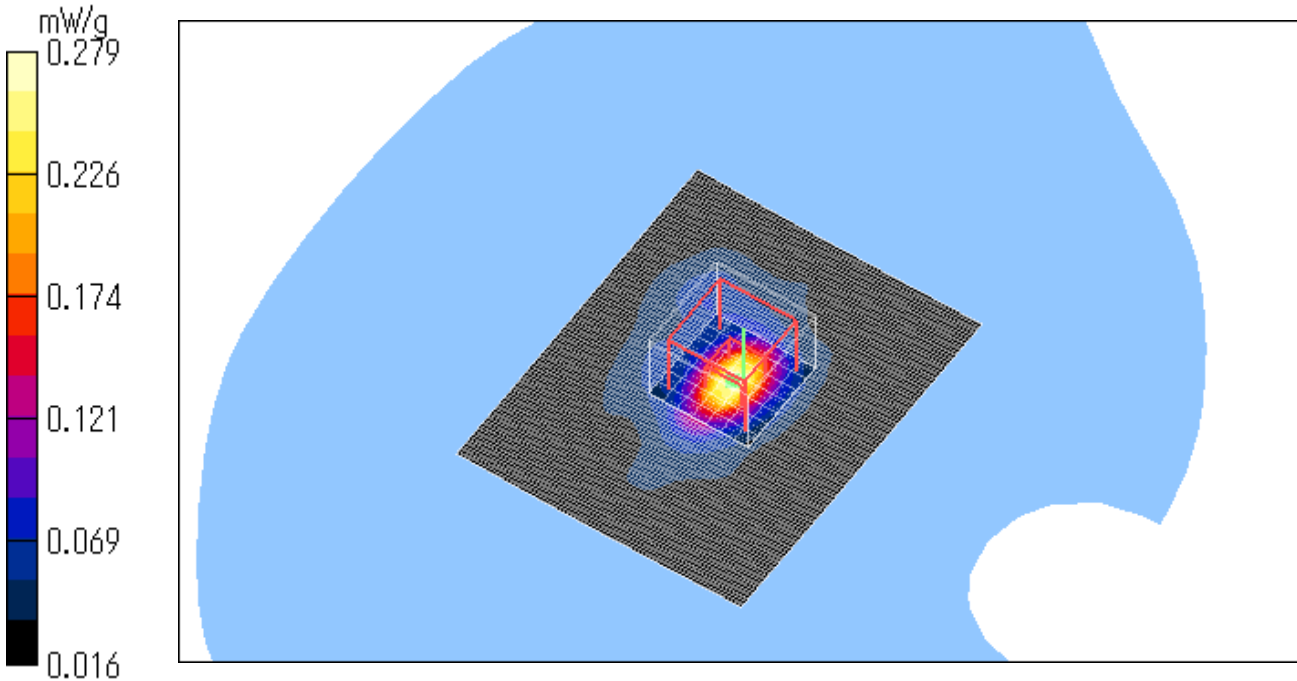
SAR(1 g) = 0.152 mW/g ; SAR(10 g) = 0.062 mW/g

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

Test Date = 07/03/07

Ambient Temperature = 25.0°C

Liquid Temperature = Before 24.3°C , After 24.3°C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5600MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.424 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 8.51 V/m ; Power Drift = 0.180 dB

Peak SAR (extrapolated) = 0.907 W/kg

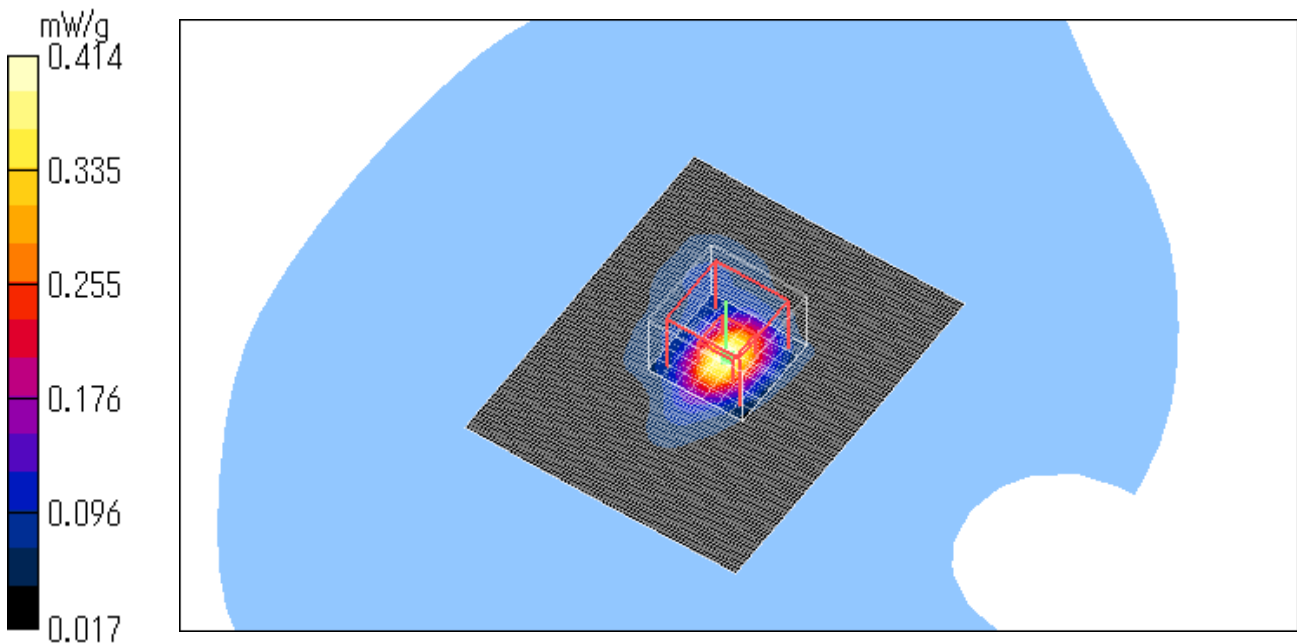
SAR(1 g) = 0.224 mW/g ; SAR(10 g) = 0.082 mW/g

Maximum value of SAR (measured) = 0.414 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5600MHz/11a 64QAM (54Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.395 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 8.41 V/m ; Power Drift = 0.004 dB

Peak SAR (extrapolated) = 0.873 W/kg

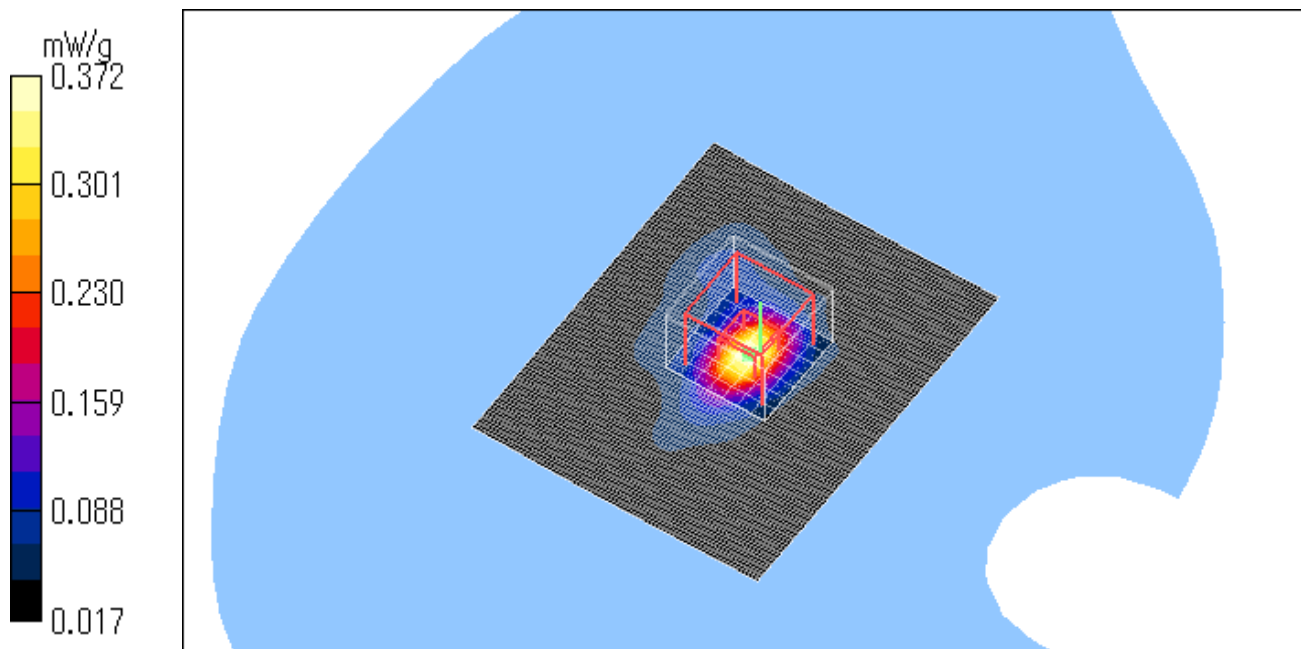
SAR(1 g) = 0.205 mW/g ; SAR(10 g) = 0.076 mW/g

Maximum value of SAR (measured) = 0.372 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Rear/battery small/5600MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (121x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.054 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.87 V/m; Power Drift = 0.145 dB

Peak SAR (extrapolated) = 0.127 W/kg

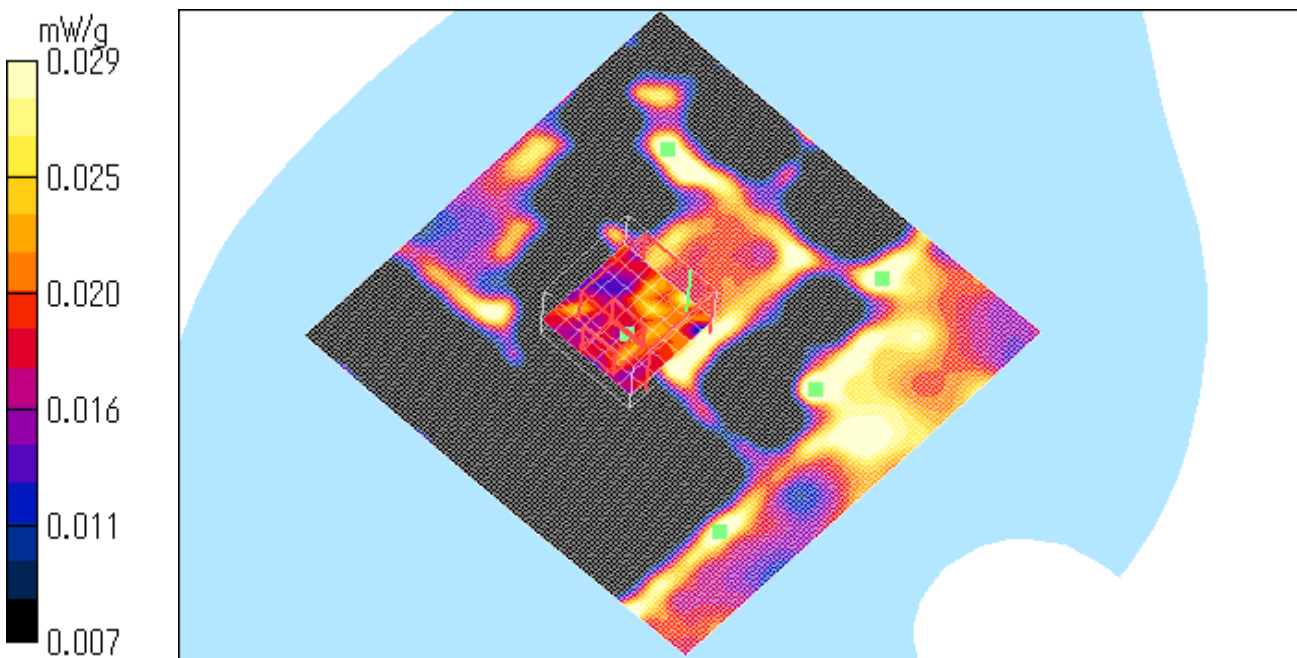
SAR(1 g) = 0.022 mW/g; SAR(10 g) = 0.018 mW/g

Maximum value of SAR (measured) = 0.029 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5500MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.556 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 9.80 V/m ; Power Drift = 0.180 dB

Peak SAR (extrapolated) = 1.16 W/kg

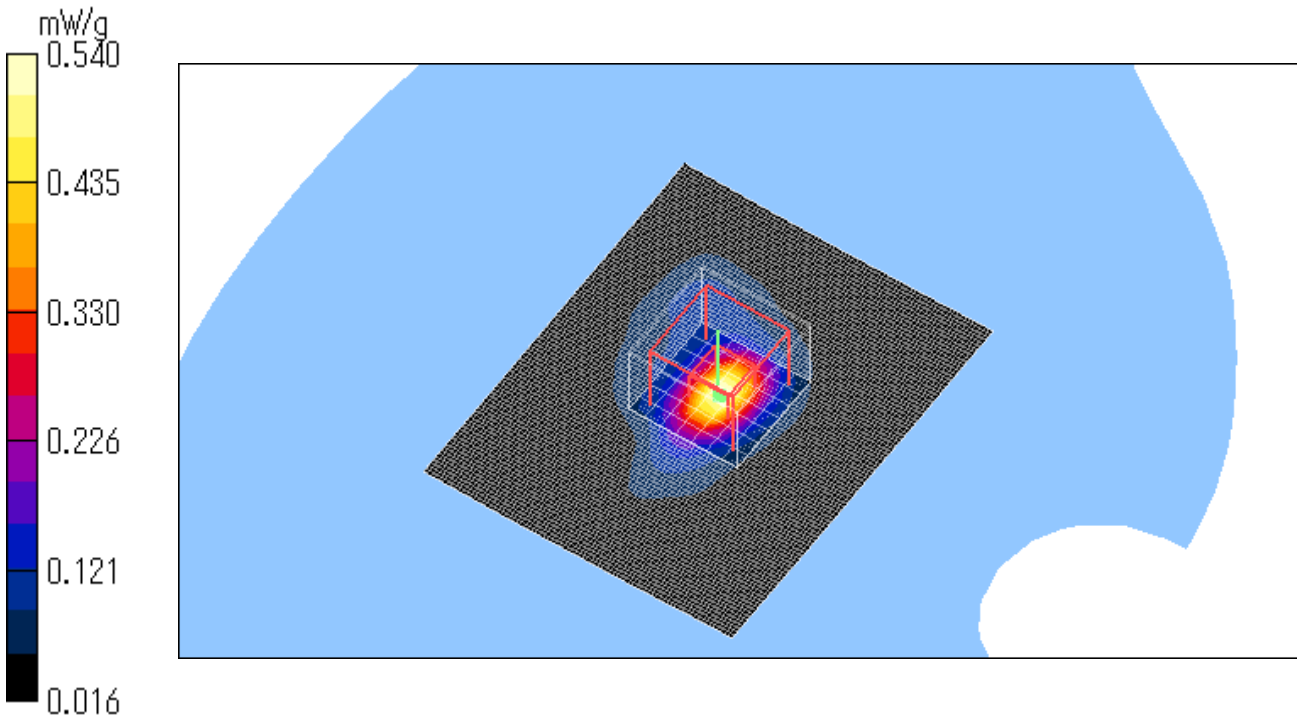
SAR(1 g) = 0.288 mW/g ; SAR(10 g) = 0.099 mW/g

Maximum value of SAR (measured) = 0.540 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Z-axis scan at max SAR location

S1613-01A/ANT.A/Top/battery small/5500MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600$ MHz; $\sigma = 6.03$ mho/m; $\epsilon_r = 47.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

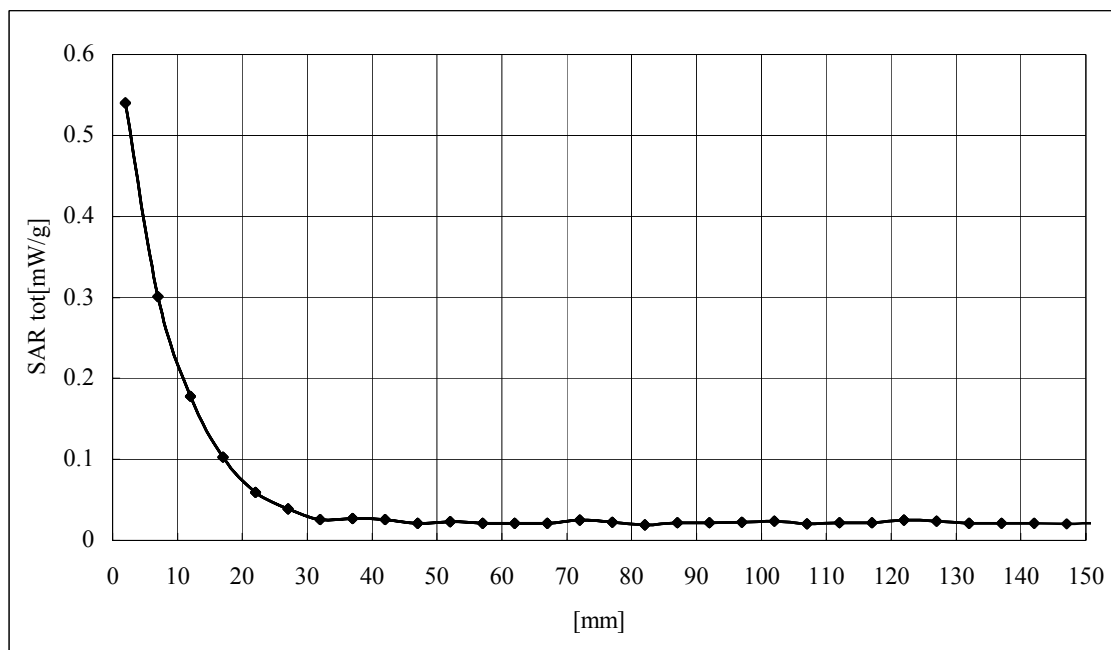
DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5700MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.541 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 9.40 V/m; Power Drift = 0.128 dB

Peak SAR (extrapolated) = 1.04 W/kg

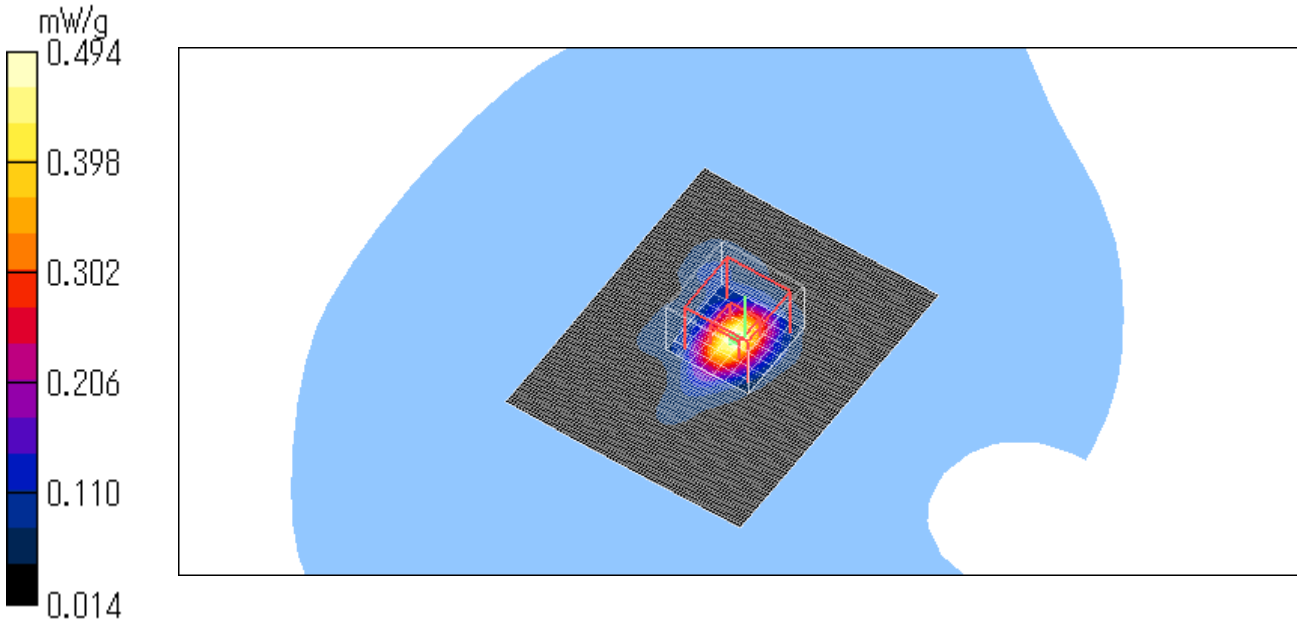
SAR(1 g) = 0.265 mW/g; SAR(10 g) = 0.093 mW/g

Maximum value of SAR (measured) = 0.494 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5600MHz/11a BPSK (9Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600$ MHz; $\sigma = 6.03$ mho/m; $\epsilon_r = 47.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10$ mm, $dy=10$ mm

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

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=2$ mm

Reference Value = 4.06 V/m; Power Drift = 0.193 dB

Peak SAR (extrapolated) = 0.578 W/kg

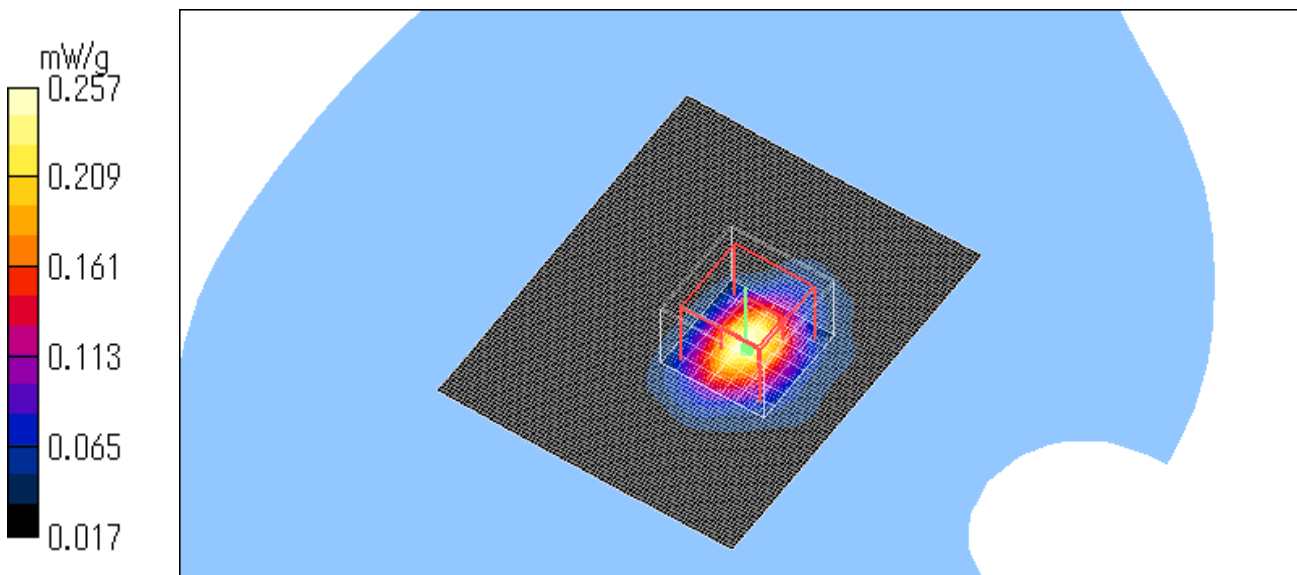
SAR(1 g) = 0.147 mW/g; SAR(10 g) = 0.065 mW/g

Maximum value of SAR (measured) = 0.257 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5600MHz/11a QPSK (12Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.241 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 3.40 V/m ; Power Drift = 0.132 dB

Peak SAR (extrapolated) = 0.534 W/kg

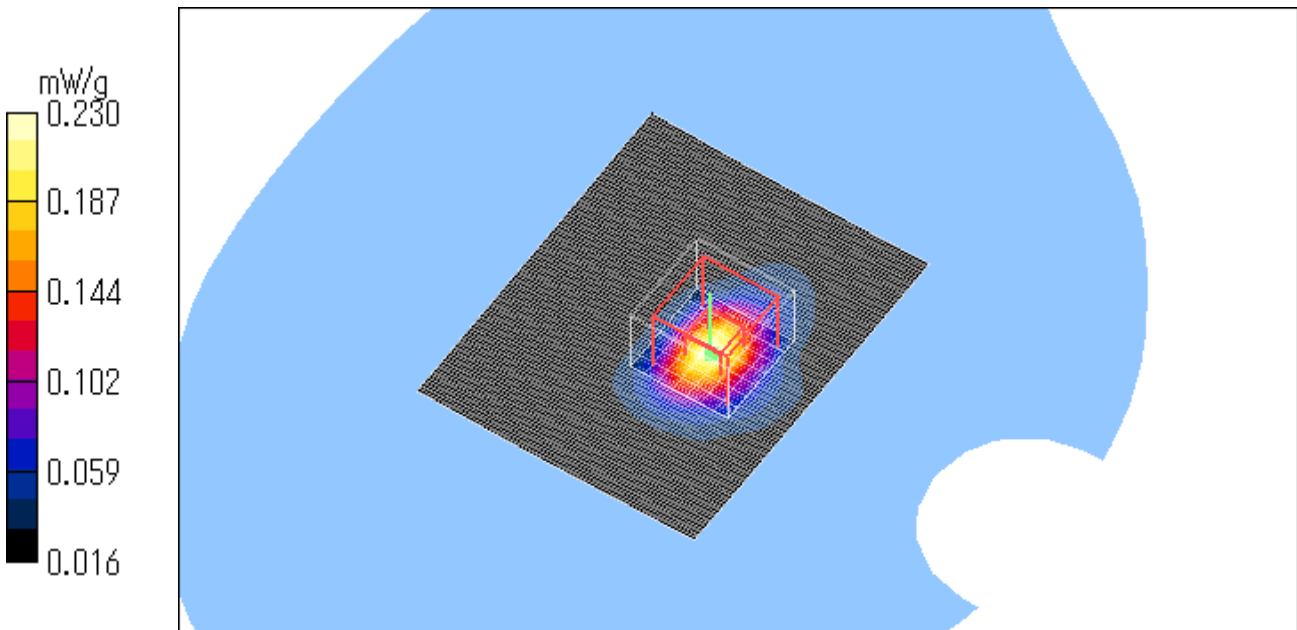
SAR(1 g) = 0.133 mW/g ; SAR(10 g) = 0.060 mW/g

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

Test Date = 07/03/07

Ambient Temperature = 25.0degree.C

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5600MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.301 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 6.03 V/m ; Power Drift = 0.182 dB

Peak SAR (extrapolated) = 0.699 W/kg

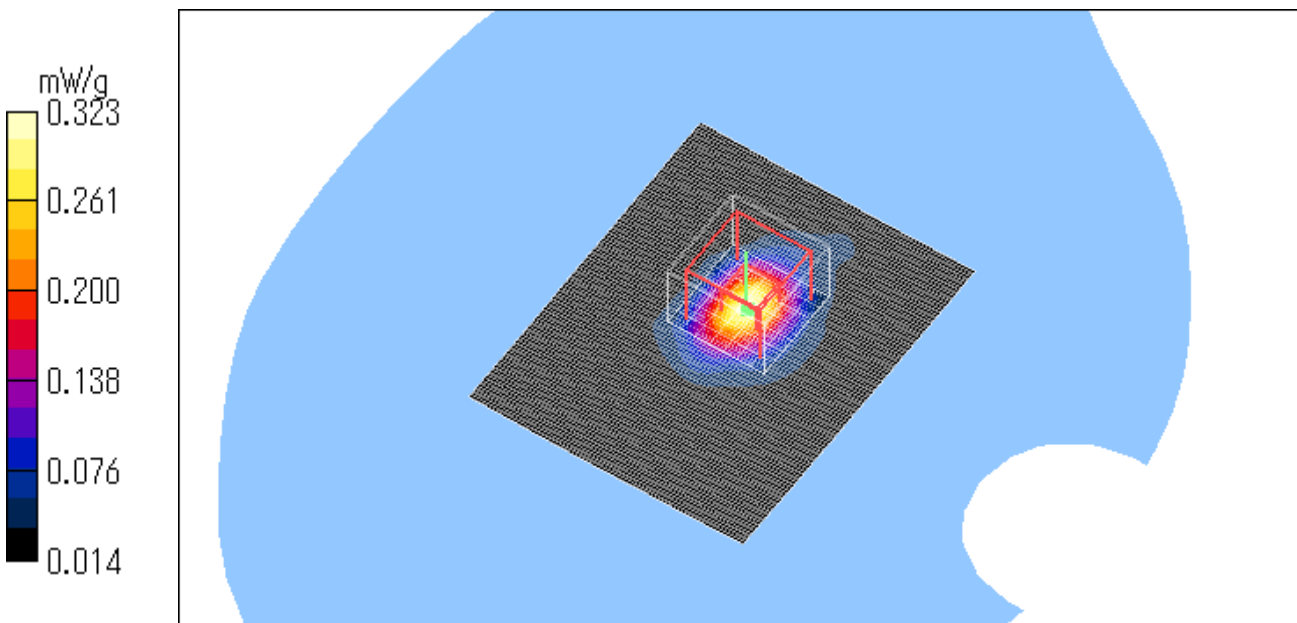
SAR(1 g) = 0.176 mW/g ; SAR(10 g) = 0.071 mW/g

Maximum value of SAR (measured) = 0.323 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5600MHz/11a 64QAM (54Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x81x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

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

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 5.86 V/m ; Power Drift = -0.167 dB

Peak SAR (extrapolated) = 0.542 W/kg

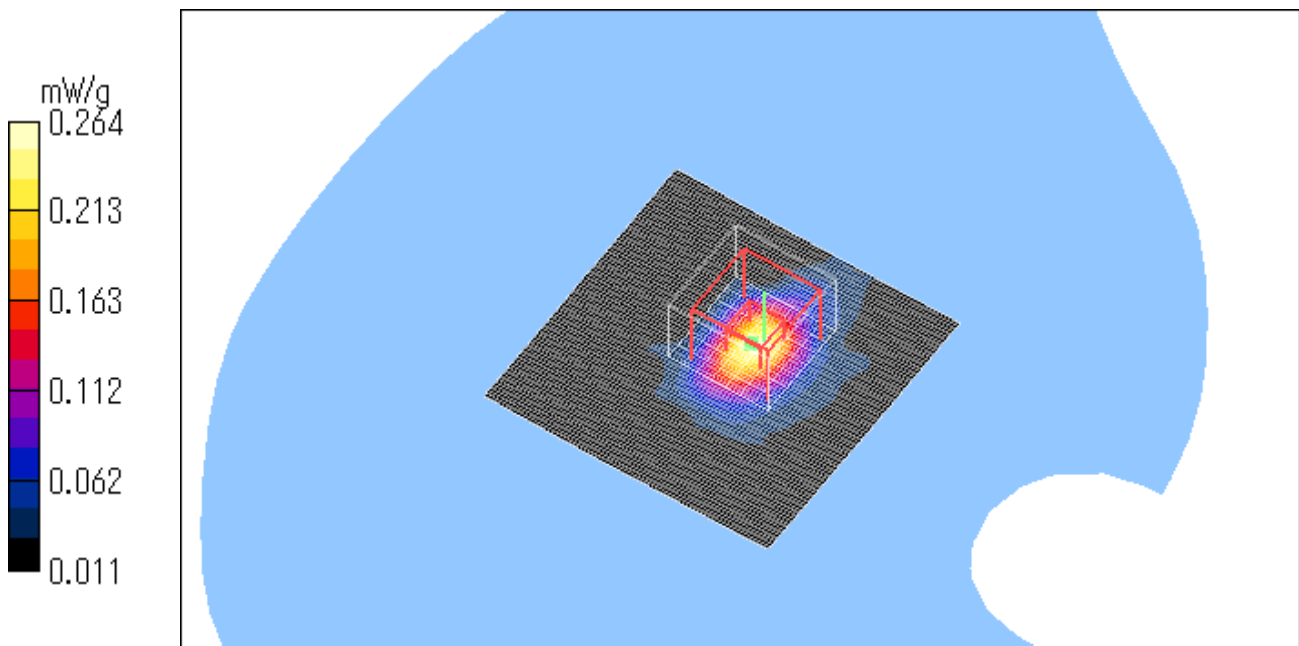
SAR(1 g) = 0.144 mW/g ; SAR(10 g) = 0.060 mW/g

Maximum value of SAR (measured) = 0.264 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Rear/battery small/5600MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (121x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.045 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.82 V/m ; Power Drift = -0.102 dB

Peak SAR (extrapolated) = 0.064 W/kg

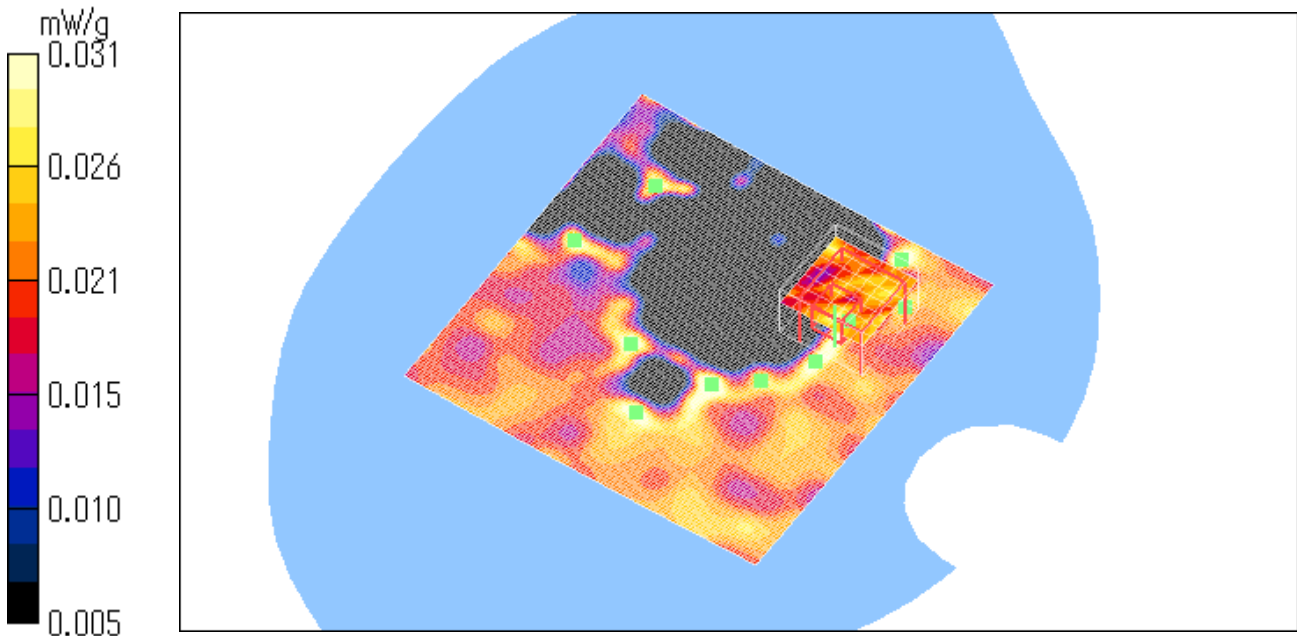
SAR(1 g) = 0.024 mW/g ; SAR(10 g) = 0.019 mW/g

Maximum value of SAR (measured) = 0.031 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.C

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Top/battery small/5600MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x81x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.057 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.97 V/m ; Power Drift = 0.155 dB

Peak SAR (extrapolated) = 0.061 W/kg

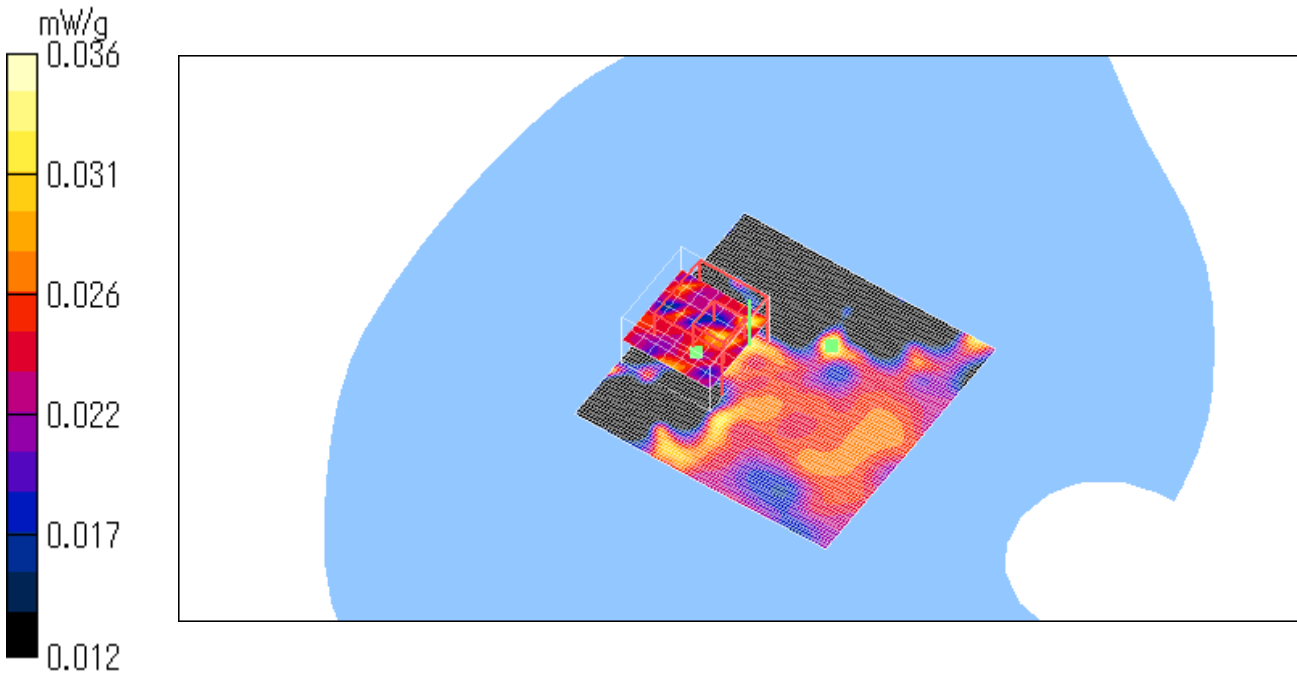
SAR(1 g) = 0.026 mW/g ; SAR(10 g) = 0.020 mW/g

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

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.4 degree.C , After 24.4 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5500MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x81x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.278 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 6.46 V/m ; Power Drift = -0.185 dB

Peak SAR (extrapolated) = 0.533 W/kg

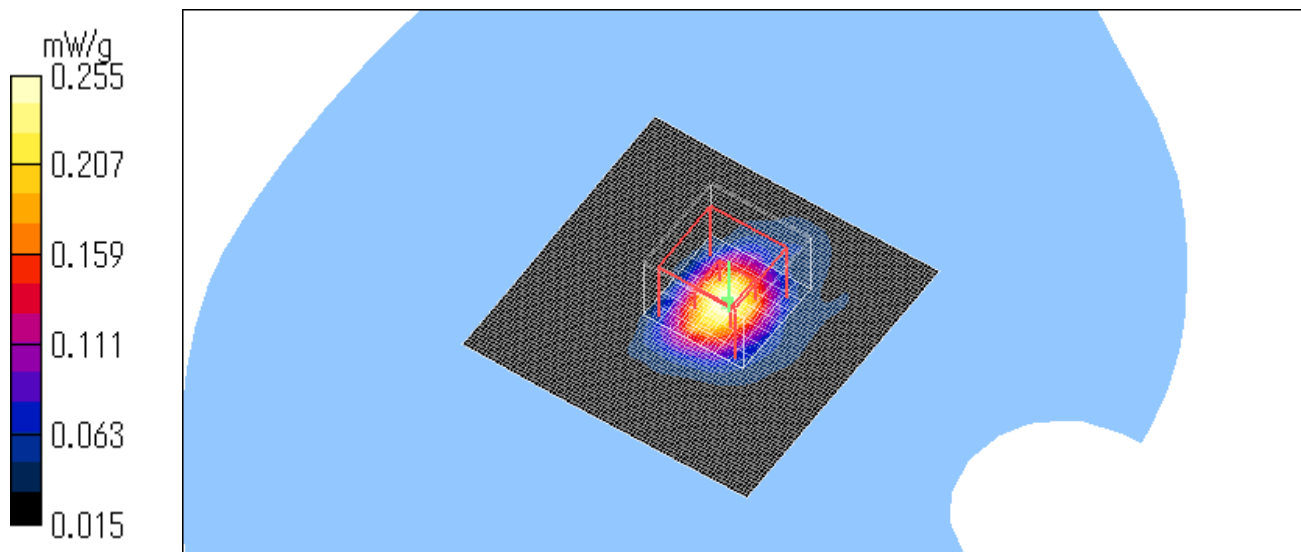
SAR(1 g) = 0.144 mW/g ; SAR(10 g) = 0.062 mW/g

Maximum value of SAR (measured) = 0.255 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.4 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5700MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5600 Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.03 \text{ mho/m}$; $\epsilon_r = 47.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.13, 4.13, 4.13); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x81x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.335 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 7.61 V/m ; Power Drift = 0.188 dB

Peak SAR (extrapolated) = 0.735 W/kg

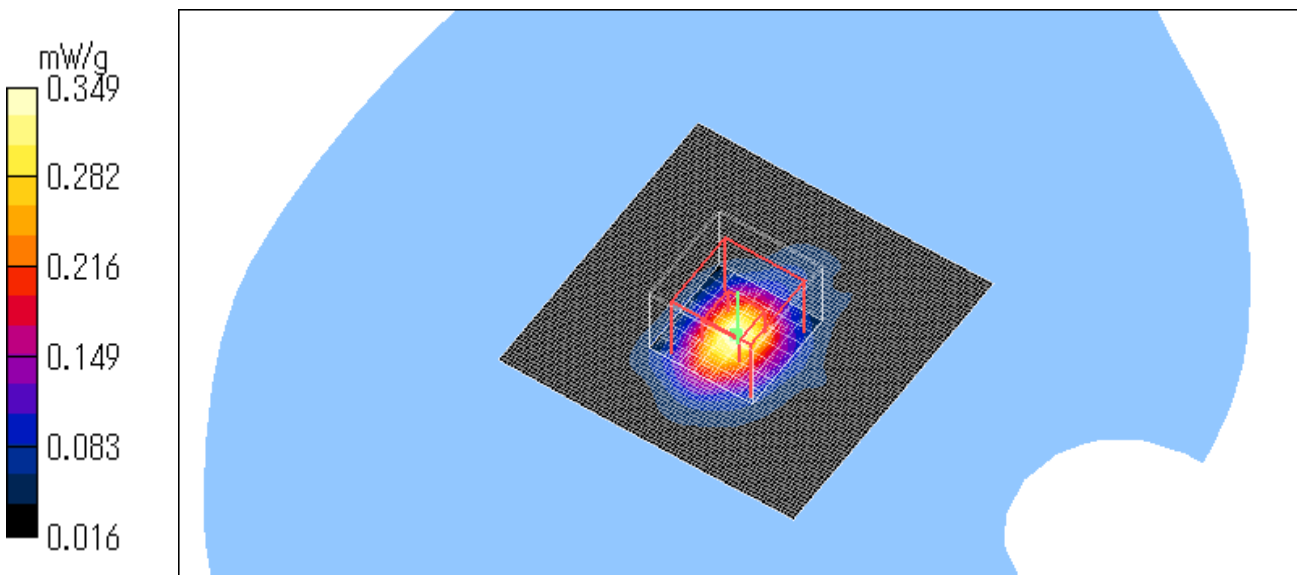
SAR(1 g) = 0.191 mW/g ; SAR(10 g) = 0.077 mW/g

Maximum value of SAR (measured) = 0.349 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5765MHz/11a BPSK (6Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.843 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 11.3 V/m ; Power Drift = 0.188 dB

Peak SAR (extrapolated) = 1.83 W/kg

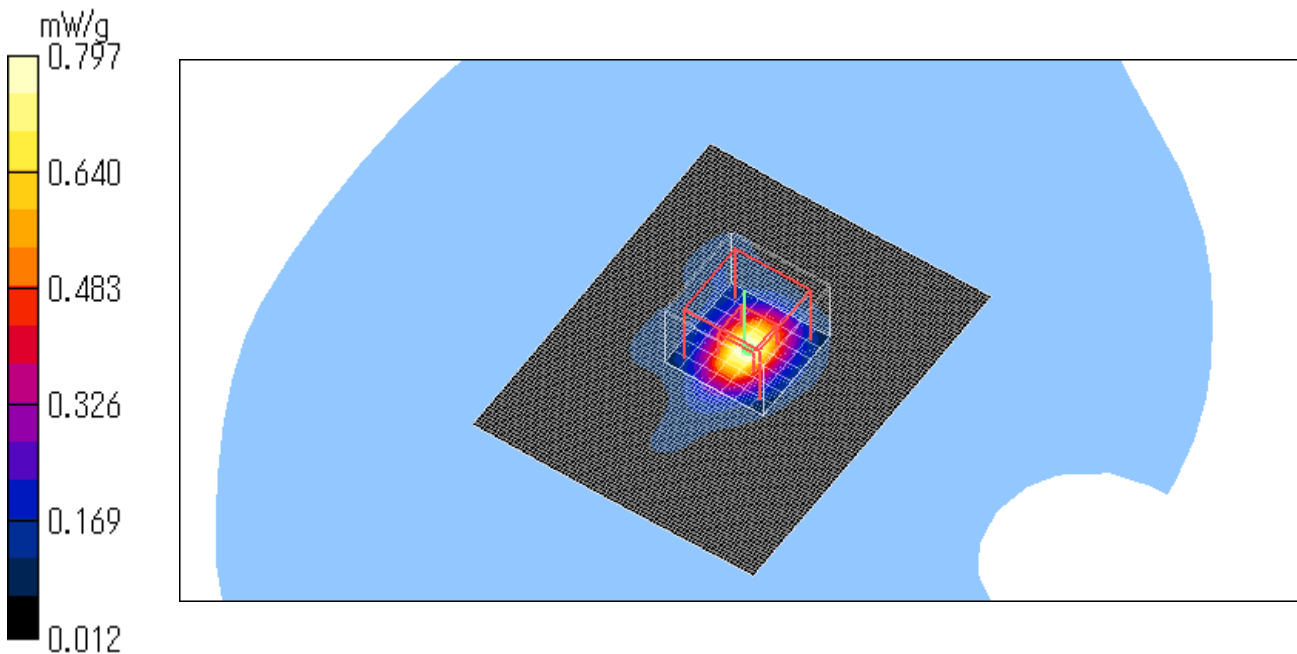
SAR(1 g) = 0.426 mW/g ; SAR(10 g) = 0.139 mW/g

Maximum value of SAR (measured) = 0.797 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5765MHz/11a QPSK (12Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.957 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 12.3 V/m ; Power Drift = -0.006 dB

Peak SAR (extrapolated) = 1.99 W/kg

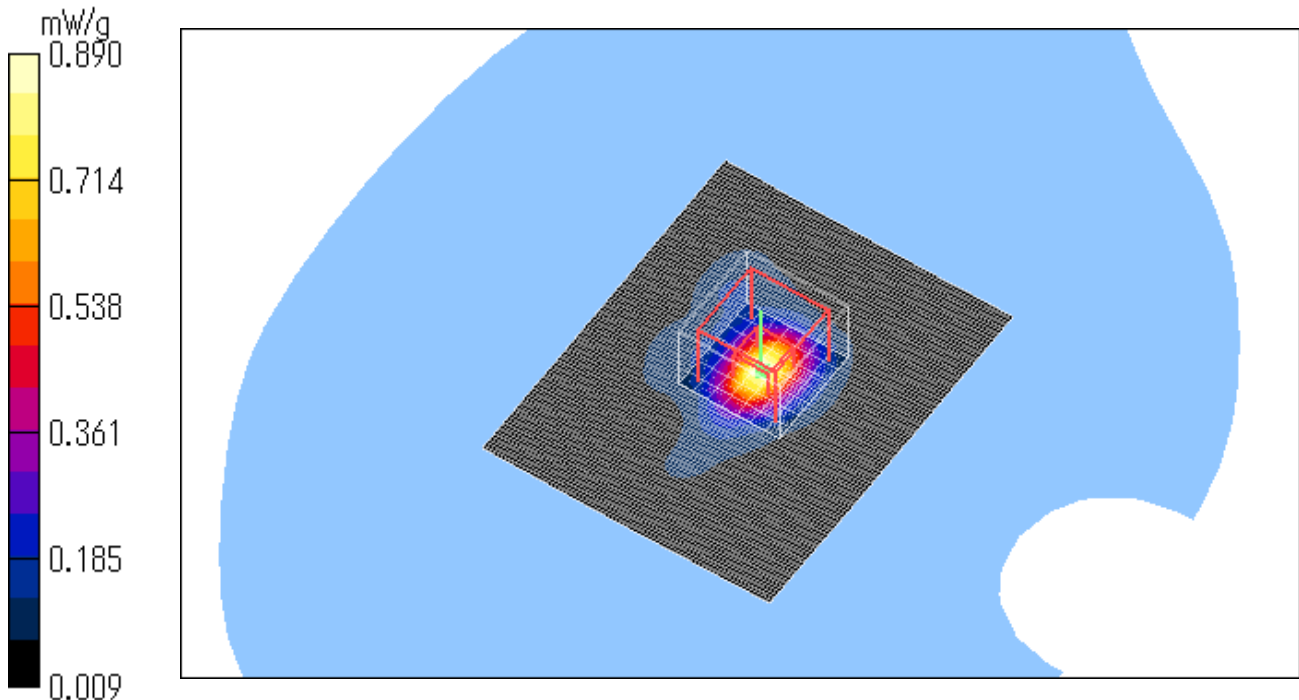
SAR(1 g) = 0.462 mW/g ; SAR(10 g) = 0.153 mW/g

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

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5765MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.947 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 11.9 V/m ; Power Drift = 0.037 dB

Peak SAR (extrapolated) = 2.04 W/kg

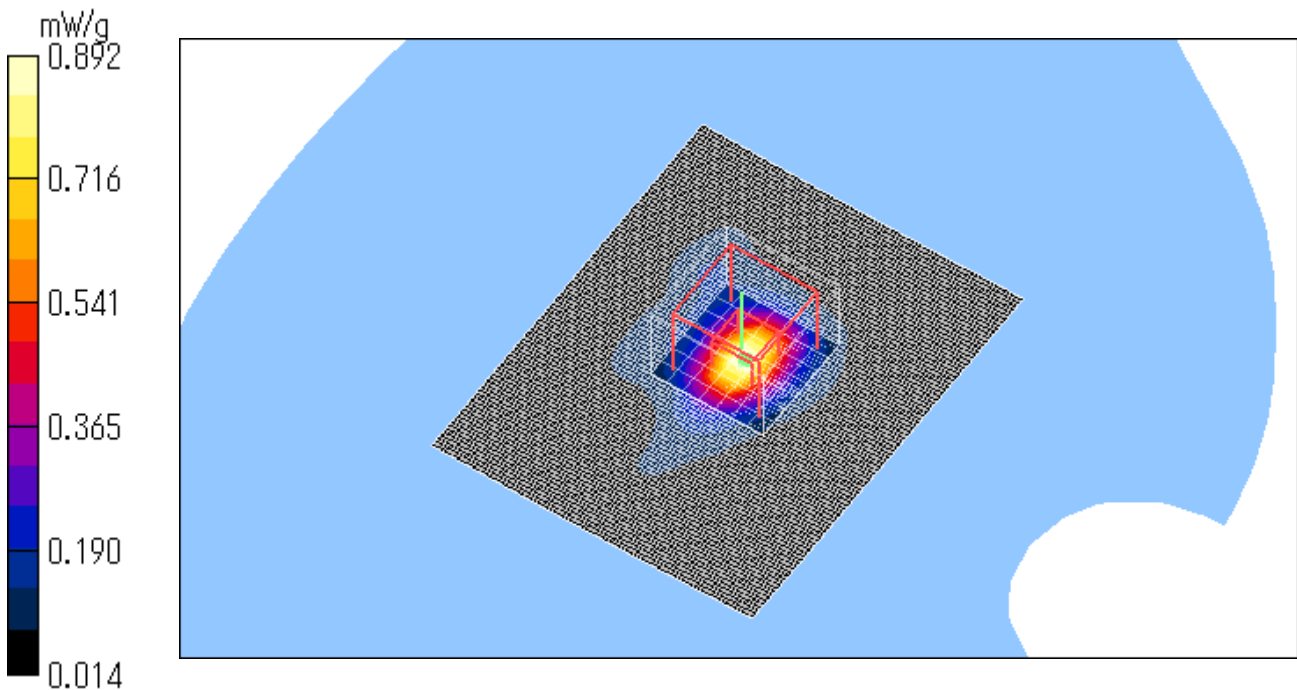
SAR(1 g) = 0.469 mW/g ; SAR(10 g) = 0.155 mW/g

Maximum value of SAR (measured) = 0.892 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5765MHz/11a 64QAM (54Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.857 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 11.4 V/m ; Power Drift = -0.081 dB

Peak SAR (extrapolated) = 1.70 W/kg

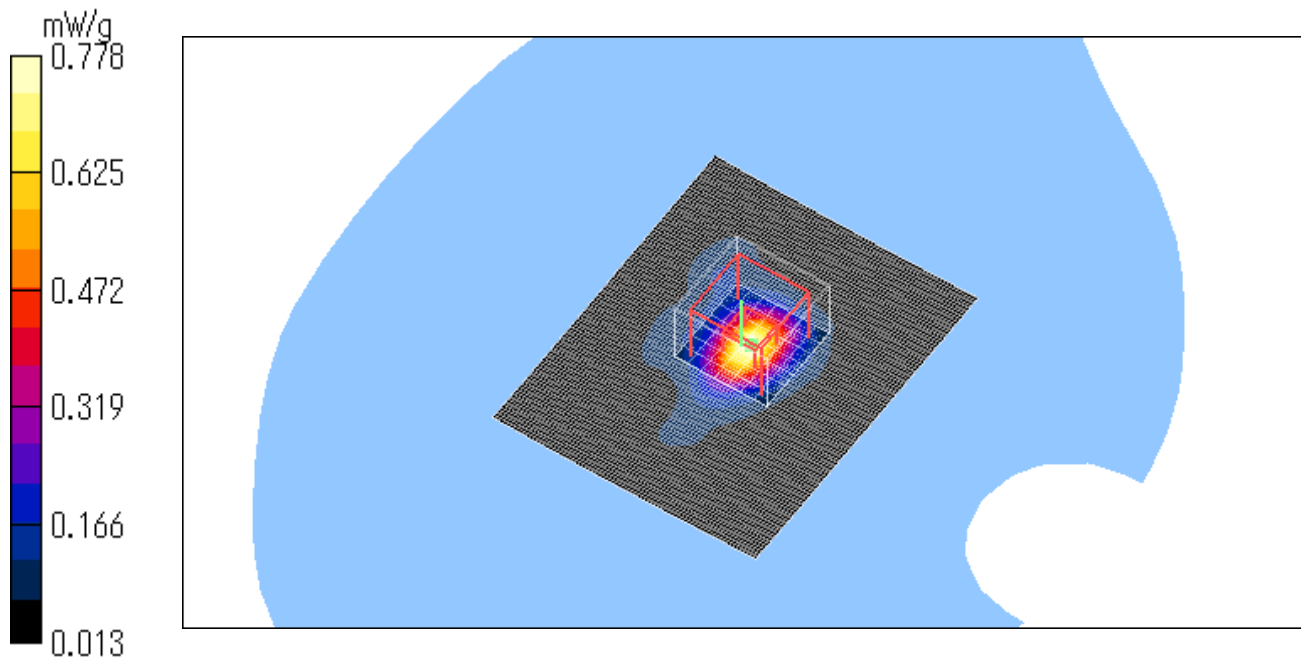
SAR(1 g) = 0.410 mW/g ; SAR(10 g) = 0.138 mW/g

Maximum value of SAR (measured) = 0.778 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Rear/battery small/5765MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (121x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.047 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.43 V/m ; Power Drift = 0.198 dB

Peak SAR (extrapolated) = 0.051 W/kg

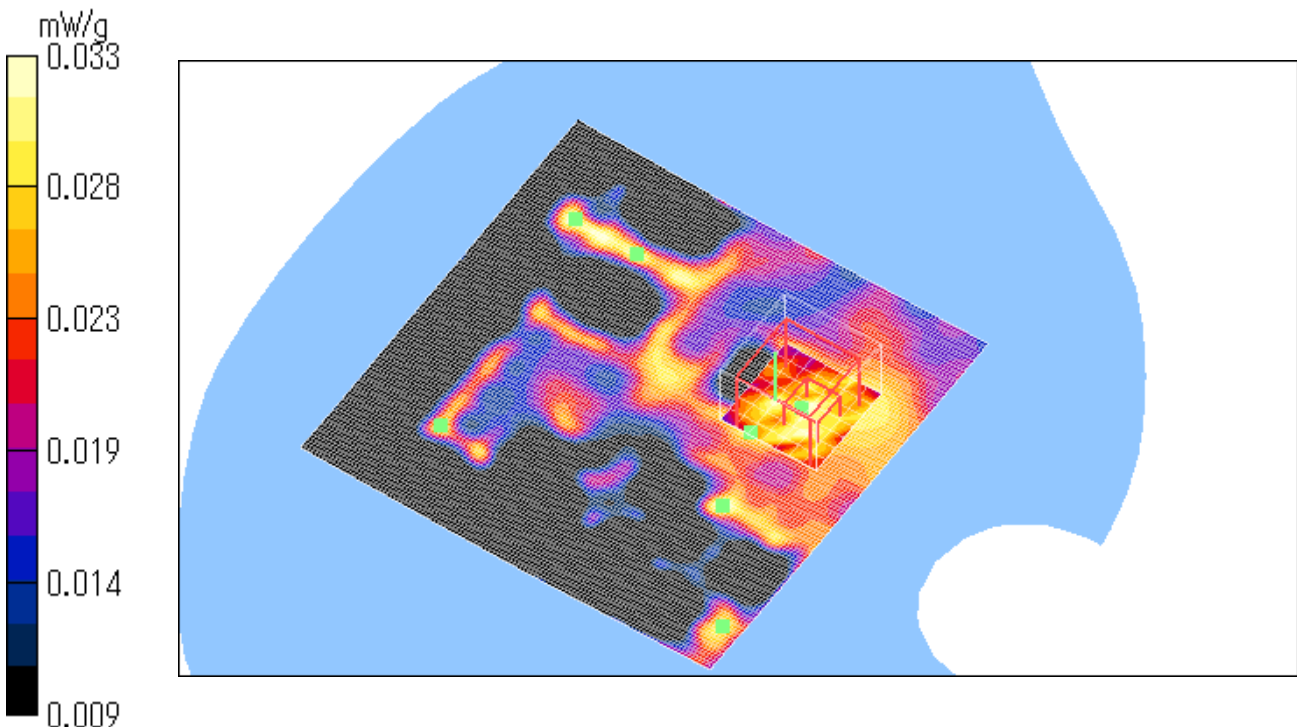
SAR(1 g) = 0.027 mW/g ; SAR(10 g) = 0.021 mW/g

Maximum value of SAR (measured) = 0.033 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5745MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.972 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 12.2 V/m ; Power Drift = 0.028 dB

Peak SAR (extrapolated) = 2.00 W/kg

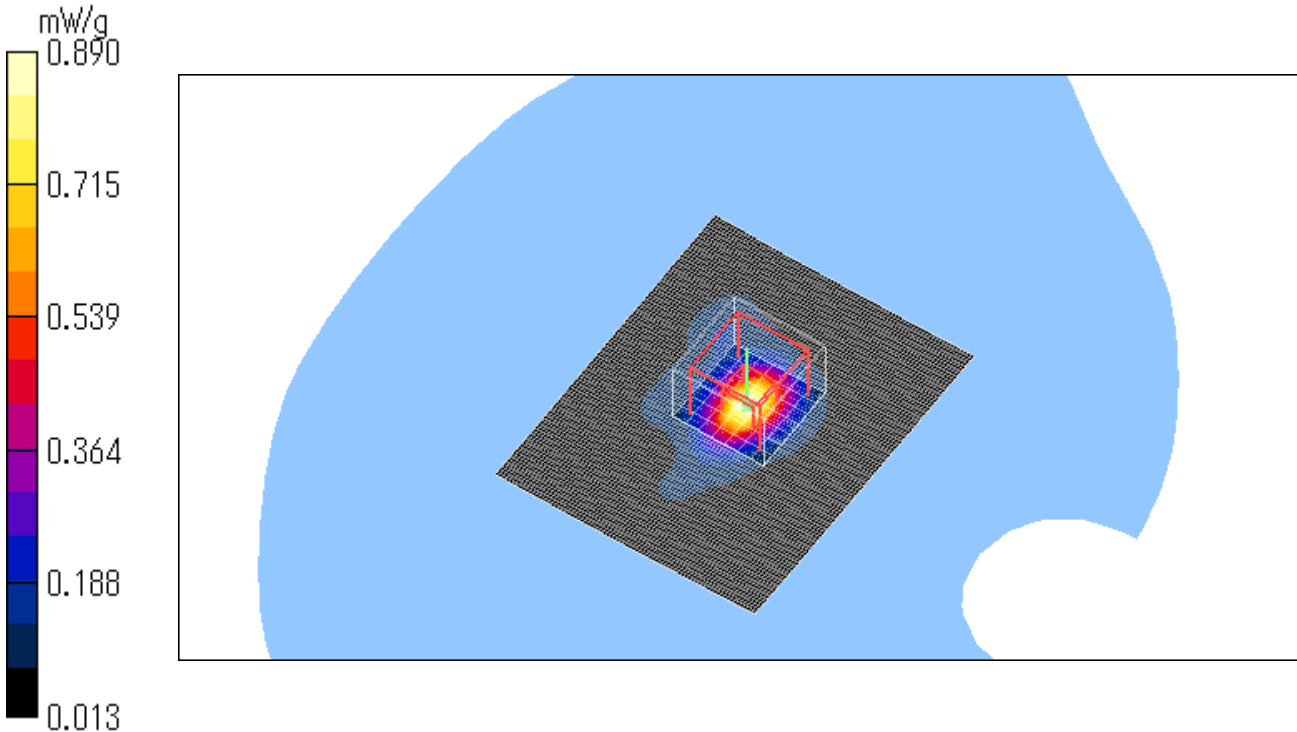
SAR(1 g) = 0.475 mW/g ; SAR(10 g) = 0.156 mW/g

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

Test Date = 07/04/07

Ambient Temperature = 25.0degree.C

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Z-axis scan at max SAR location

S1613-01A/ANT.A/Top/battery small/5745MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800$ MHz; $\sigma = 6.27$ mho/m; $\epsilon_r = 46.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

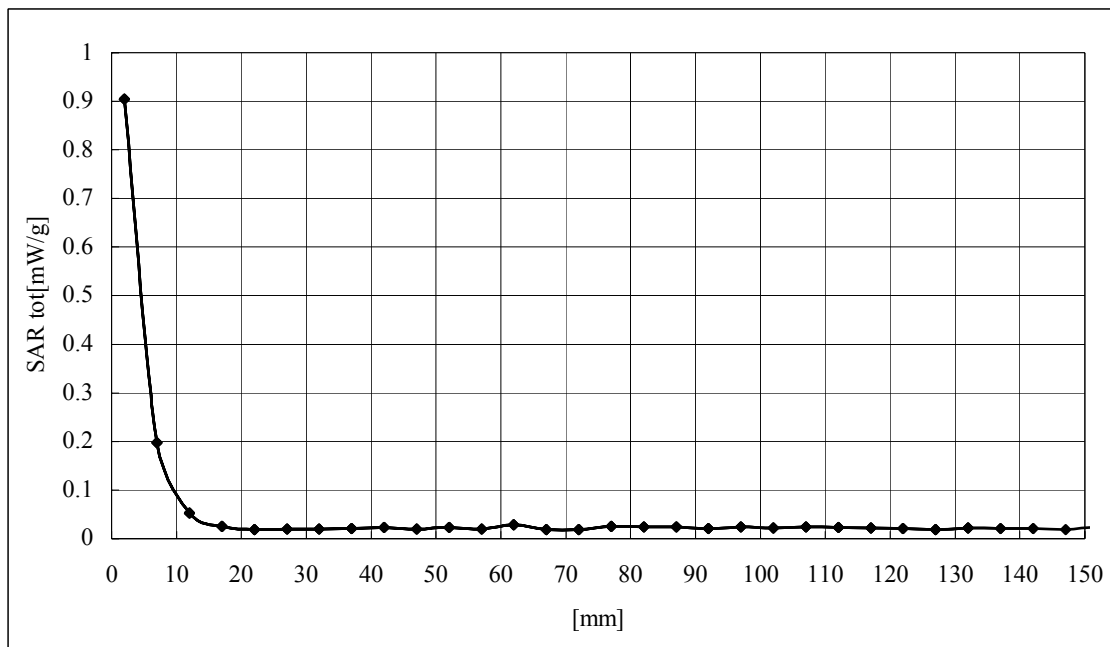
DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5825MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.601 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 9.38 V/m ; Power Drift = 0.026 dB

Peak SAR (extrapolated) = 1.24 W/kg

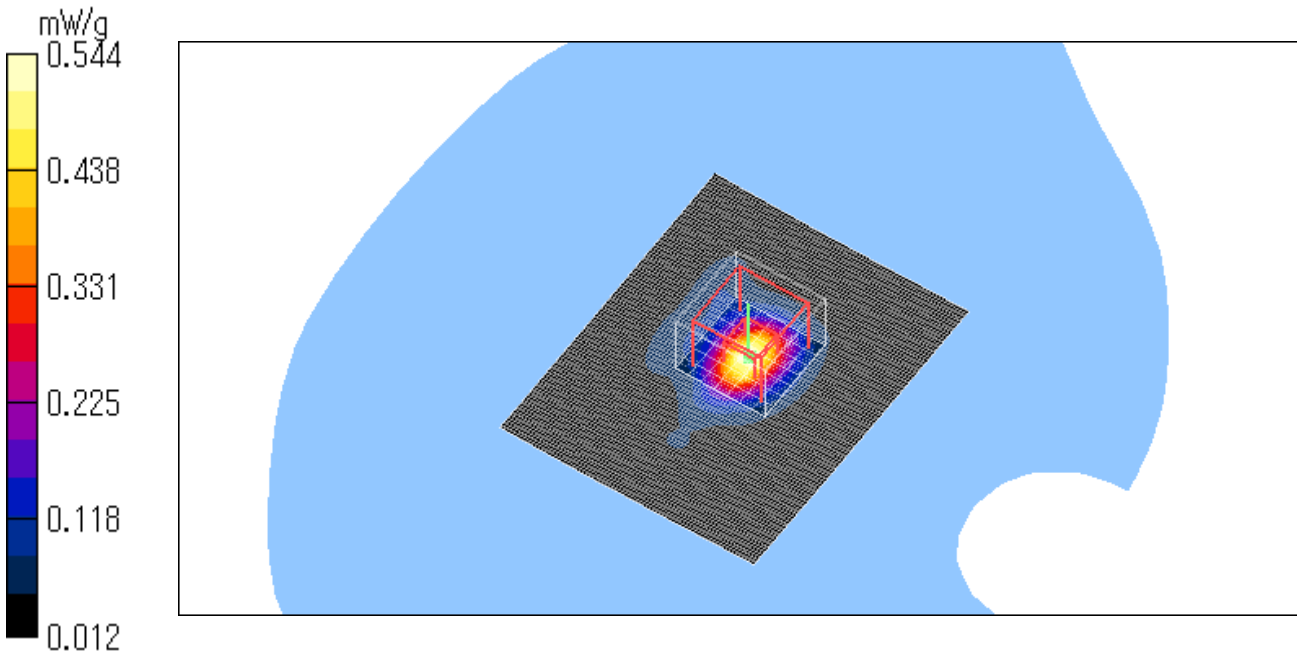
SAR(1 g) = 0.293 mW/g ; SAR(10 g) = 0.102 mW/g

Maximum value of SAR (measured) = 0.544 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.3 degree.C , After 24.3 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5765MHz/11a BPSK (6Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.451 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 5.70 V/m ; Power Drift = 0.142 dB

Peak SAR (extrapolated) = 1.04 W/kg

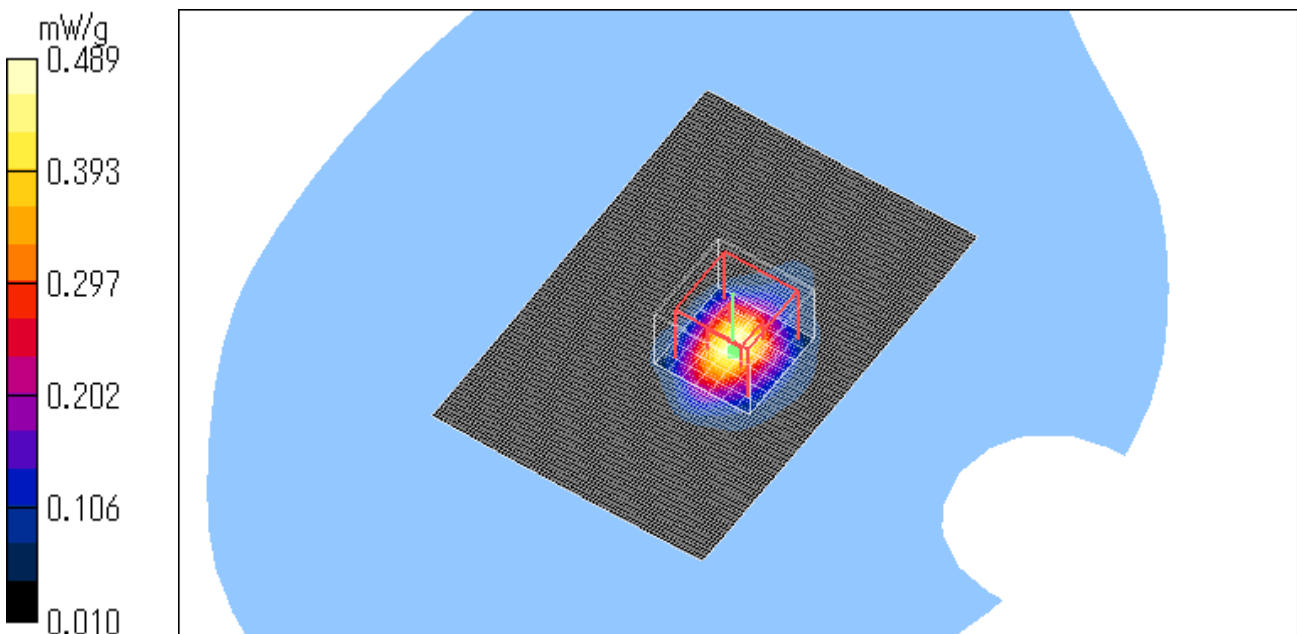
SAR(1 g) = 0.261 mW/g ; SAR(10 g) = 0.096 mW/g

Maximum value of SAR (measured) = 0.489 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.4 degree.C , After 24.4 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5765MHz/11a QPSK (12Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.449 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 7.20 V/m ; Power Drift = -0.031 dB

Peak SAR (extrapolated) = 0.927 W/kg

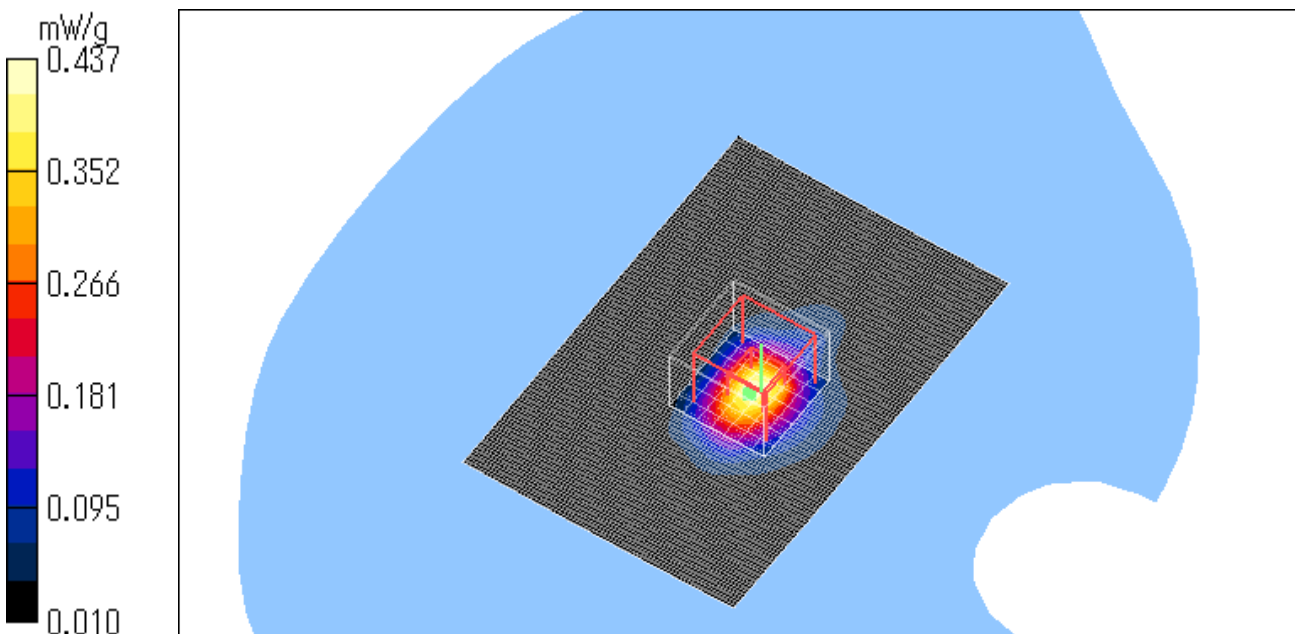
SAR(1 g) = 0.236 mW/g ; SAR(10 g) = 0.088 mW/g

Maximum value of SAR (measured) = 0.437 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.4 degree.C , After 24.4 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5765MHz/11a 16QAM (24Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800$ MHz; $\sigma = 6.27$ mho/m; $\epsilon_r = 46.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x121x1): Measurement grid: $dx=10$ mm, $dy=10$ mm

Maximum value of SAR (interpolated) = 0.443 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=2$ mm

Reference Value = 7.87 V/m; Power Drift = 0.187 dB

Peak SAR (extrapolated) = 0.970 W/kg

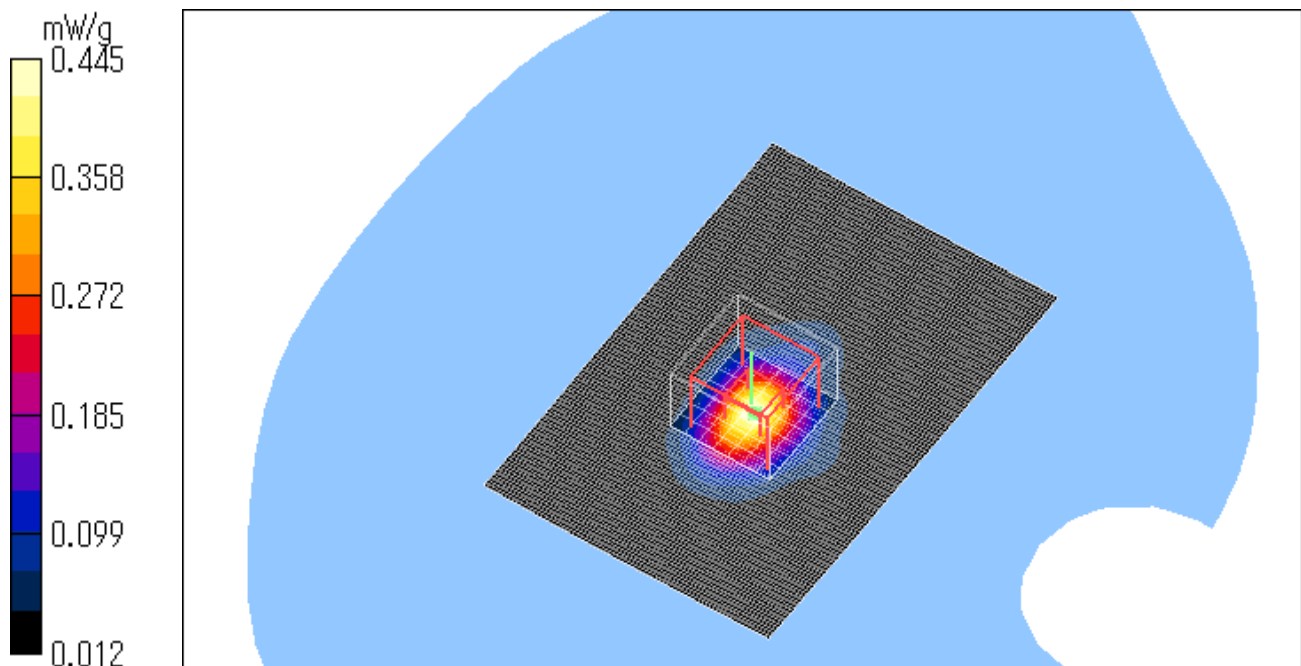
SAR(1 g) = 0.243 mW/g; SAR(10 g) = 0.090 mW/g

Maximum value of SAR (measured) = 0.445 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.4 degree.C , After 24.4 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5765MHz/11a 64QAM (54Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.445 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 7.91 V/m ; Power Drift = -0.011 dB

Peak SAR (extrapolated) = 0.958 W/kg

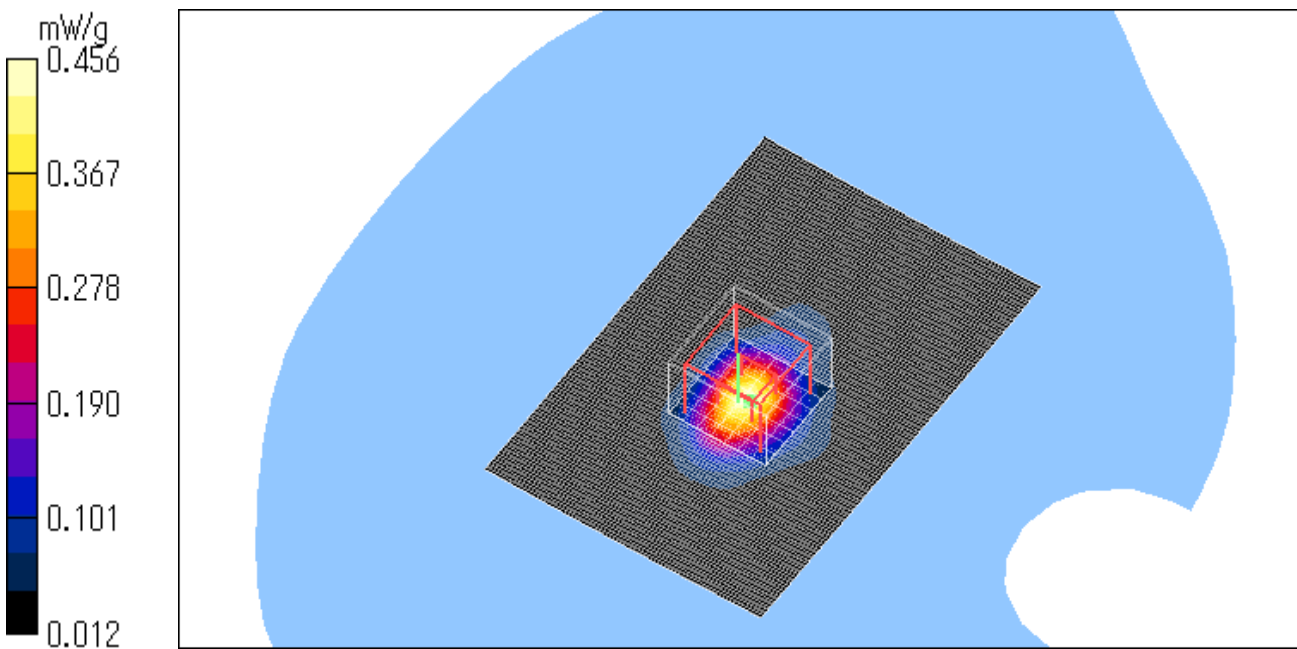
SAR(1 g) = 0.242 mW/g ; SAR(10 g) = 0.091 mW/g

Maximum value of SAR (measured) = 0.456 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.4 degree.C , After 24.4 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Rear/battery small/5765MHz/11a BPSK (6Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (121x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.049 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 1.25 V/m; Power Drift = 0.188 dB

Peak SAR (extrapolated) = 0.073 W/kg

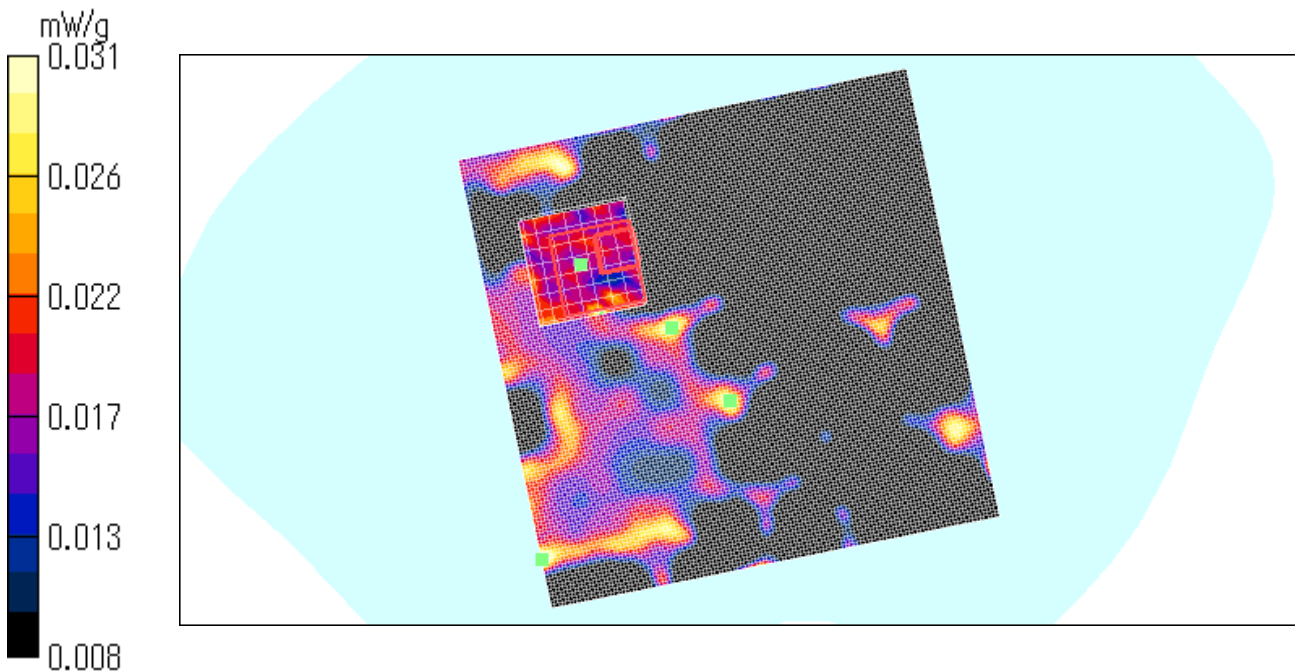
SAR(1 g) = 0.022 mW/g; SAR(10 g) = 0.018 mW/g

Maximum value of SAR (measured) = 0.031 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.4 degree.C , After 24.4 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Top/battery small/5765MHz/11a BPSK (6Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (101x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.043 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 2.05 V/m ; Power Drift = 0.141 dB

Peak SAR (extrapolated) = 0.088 W/kg

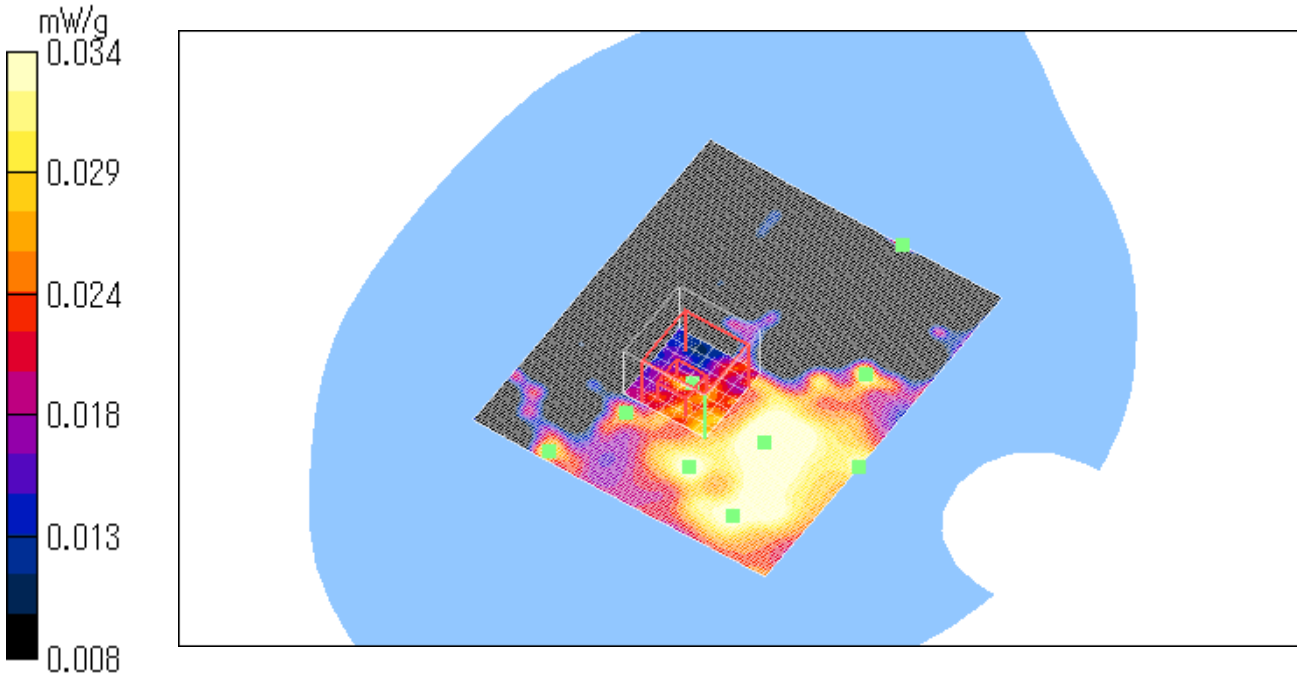
SAR(1 g) = 0.022 mW/g ; SAR(10 g) = 0.017 mW/g

Maximum value of SAR (measured) = 0.034 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.4 degree.C , After 24.4 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5745MHz/11a BPSK (6Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.505 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 8.42 V/m ; Power Drift = 0.029 dB

Peak SAR (extrapolated) = 1.11 W/kg

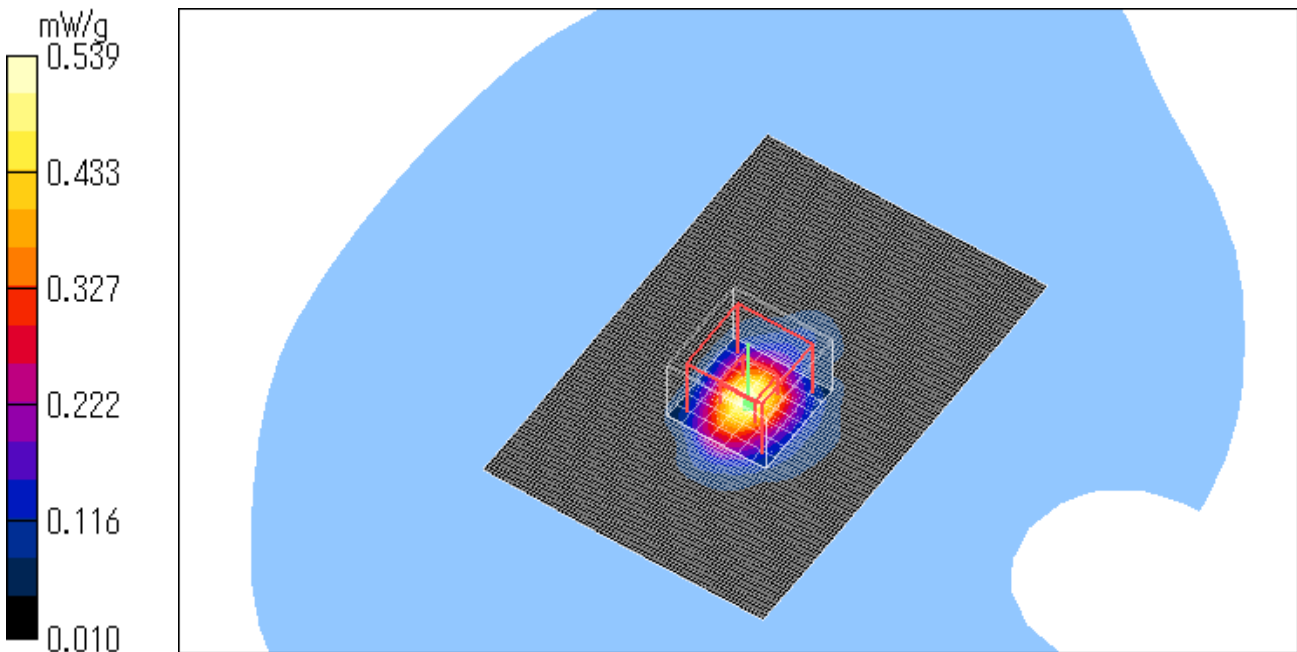
SAR(1 g) = 0.284 mW/g ; SAR(10 g) = 0.103 mW/g

Maximum value of SAR (measured) = 0.539 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.c

Liquid Temperature = Before 24.4 degree.C , After 24.4 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.B/Side/battery small/5825MHz/11a BPSK (6Mbps)

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.278 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 6.58 V/m ; Power Drift = -0.159 dB

Peak SAR (extrapolated) = 0.601 W/kg

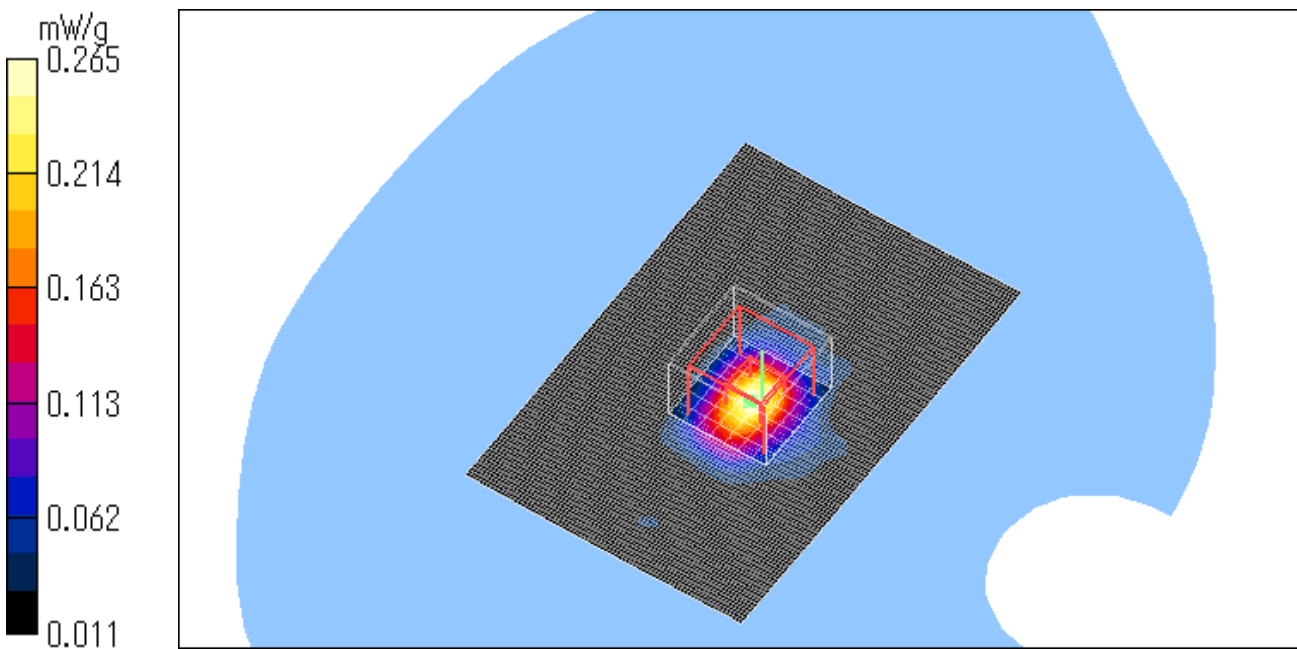
SAR(1 g) = 0.144 mW/g ; SAR(10 g) = 0.057 mW/g

Maximum value of SAR (measured) = 0.265 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0degree.C

Liquid Temperature = Before 24.4 degree.C , After 24.4 degree.C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5745MHz/11a 16QAM (24Mbps)/Separation 5mm

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.412 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 4.20 V/m ; Power Drift = -0.198 dB

Peak SAR (extrapolated) = 1.08 W/kg

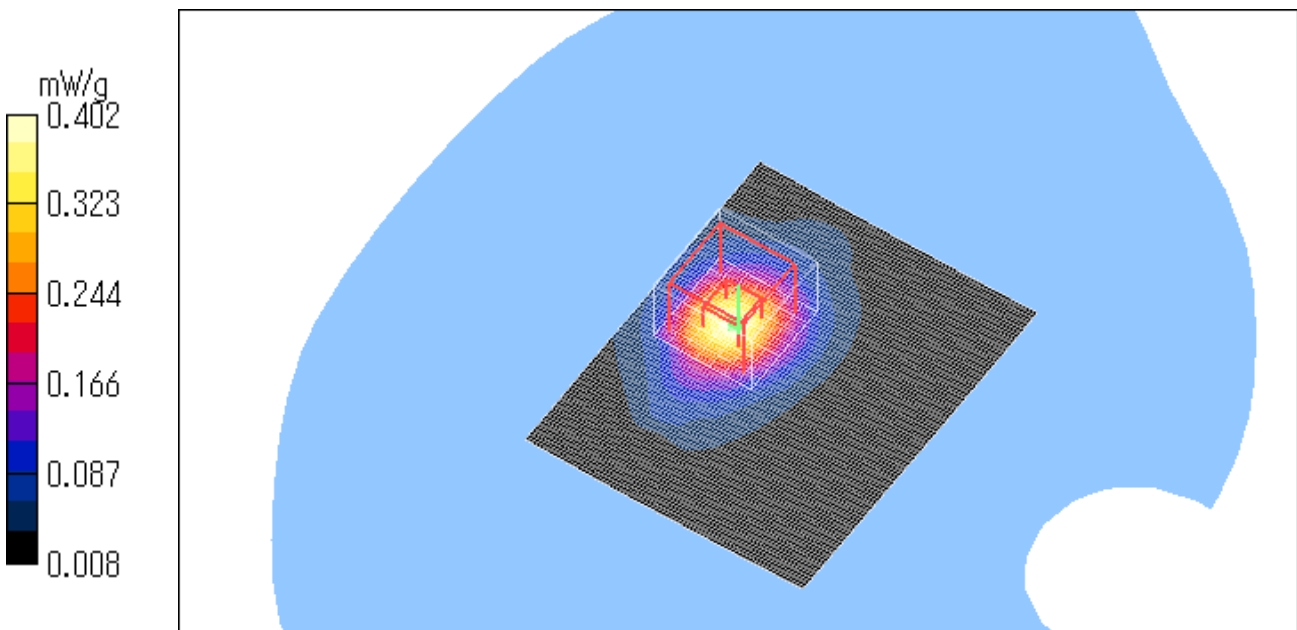
SAR(1 g) = 0.214 mW/g ; SAR(10 g) = 0.085 mW/g

Maximum value of SAR (measured) = 0.402 mW/g

Test Date = 07/04/07

Ambient Temperature = 24.5°C

Liquid Temperature = Before 24.1°C , After 24.1°C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5745MHz/11a 16QAM (24Mbps)/Separation 10mm

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (81x101x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.211 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 4.77 V/m ; Power Drift = -0.144 dB

Peak SAR (extrapolated) = 0.567 W/kg

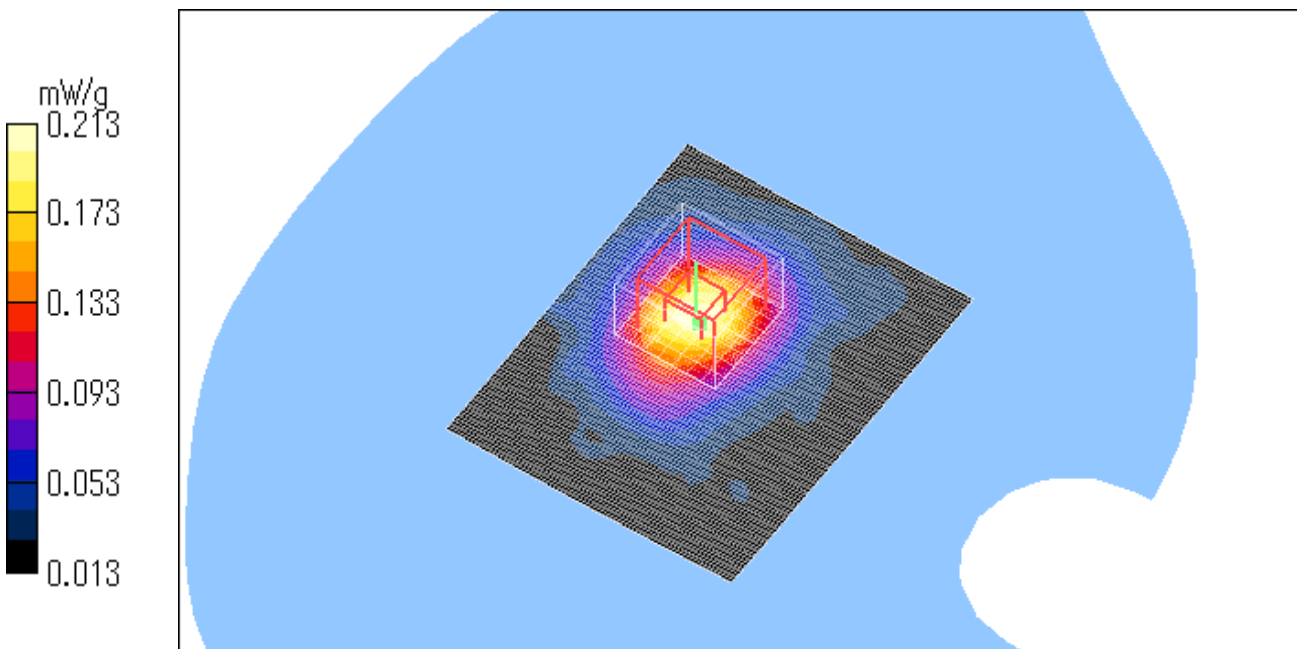
SAR(1 g) = 0.122 mW/g ; SAR(10 g) = 0.056 mW/g

Maximum value of SAR (measured) = 0.213 mW/g

Test Date = 07/04/07

Ambient Temperature = 24.5°C

Liquid Temperature = Before 24.1°C , After 24.1°C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

S1613-01A/ANT.A/Top/battery small/5745MHz/11a 16QAM (24Mbps)/Separration 15mm

Crest factor : 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (101x121x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.108 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 2.77 V/m ; Power Drift = -0.192 dB

Peak SAR (extrapolated) = 0.416 W/kg

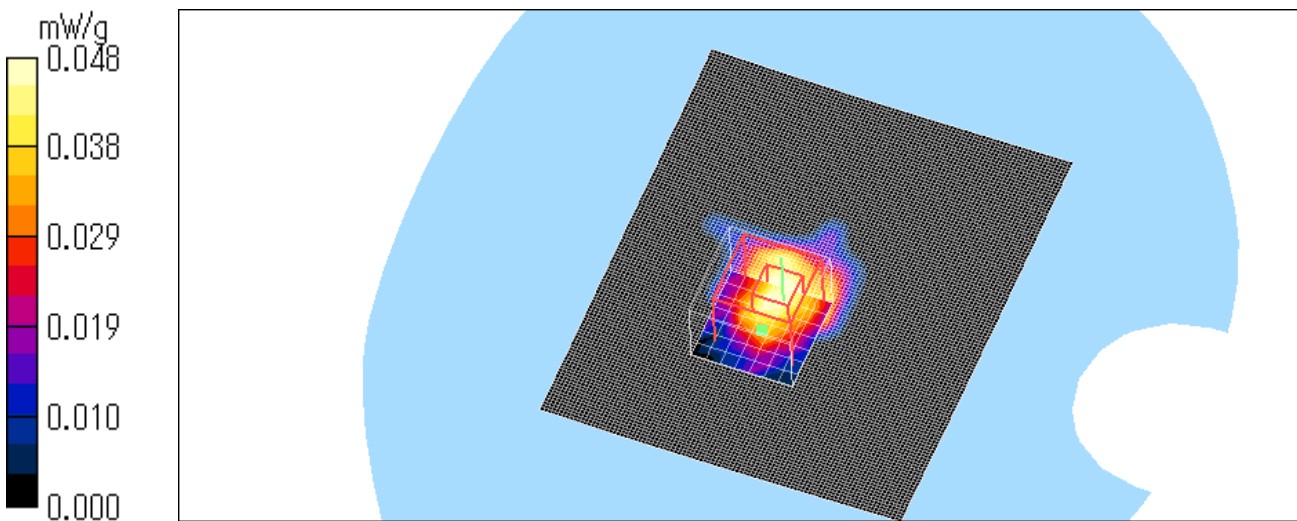
SAR(1 g) = 0.036 mW/g ; SAR(10 g) = 0.010 mW/g

Maximum value of SAR (measured) = 0.048 mW/g

Test Date = 07/04/07

Ambient Temperature = 24.5°C

Liquid Temperature = Before 24.3°C , After 24.3°C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

APPENDIX 3 : Test instruments

1. Equipment used

Control No.	Name of Equipment	Manufacture	Model number	Serial number	Calibration	
					Last Cal	due date
MPM-08	Power Meter	Anritsu	ML2495A	6K00003338	2006/09/20	2007/09/30
MPSE-11	Power sensor	Anritsu	MA2411B	011737	2006/09/20	2007/09/30
MCC-37	Microwave Cable	Hirose Electric	U.FL-2LP-066-A-(200)	-	2006/11/13	2007/11/30
MAT-24	Attenuator(10dB)(above1GHz)	Agilent	8493C	71389	2007/06/28	2008/06/30
MDA-08	Dipole Antenna	Schmid&Partner Engineering AG	D5GHzV2	1020	2007/06/14	2009/06/30
MPM-01	Power Meter	Agilent	8449B	3008A01671	2007/02/15	2008/02/29
MPSE-01	Power sensor	Agilent	E9300B	US40010300	2006/12/20	2007/12/31
MPSE-03	Power sensor	Agilent	E9327A	US40440576	2007/01/10	2008/01/31
MSG-01	Signal Genelator	Rohde & Schwarz	SMR40	100023	2007/01/18	2008/01/31
MAT-15	Attenuator(30dB)	Agilent	US40010300	08498-60012	2006/12/20	2007/12/31
MRFA-08	Pre Amplifier	TSJ	TCBP0206	-	2007/03/02	2008/03/31
MHDC-12	Directional Coupler	Hewlett Packard	772D	2839A0016	-	-
MNA-01	Network Analyzer	Agilent	E8358A	US41080381	2006/02/10	2009/02/28
MRENT-50	Dosimetric E-Field Probe	Schmid&Partner Engineering AG	EX3DV4	3540	2007/01/19	2008/01/31
MRENT-51	Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE3 V1	518	2006/08/31	2008/08/31
MSTW-16	SAR measurement System	Schmid&Partner Engineering AG	DASY4	1021834	-	-
MPS-01	SAM Phantom	Schmid&Partner Engineering AG	SAM Twin Phantom V4.0	1196	-	-
MDPK-01	Dielectric probe kit	Agilent	85070D	-	-	-
MOS-05	Thermo-Hygrometer	Custom	CTH-190	810201	2006/04/25	2008/04/30
MOS-10	Digtal thermometer	HANNA	Checktemp-2	MOS-10	2007/03/23	2009/03/31
-	Body 5800MHz	-	-	-	Daily check Target value $\pm$ 5%	
-	SAR room	-	-	-	Daily check Ambient Noise<0.012W/kg	

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

2. Dosimetry assessment setup

These measurements were performed with the automated near-field scanning system DASY4 from Schmid & Partner Engineering AG (SPEAG). The system is based on a high precision robot (working range greater than 0.9 m), which positions the probes with a positional repeatability of better than ± 0.02 mm. Special E- and H-field probes have been developed for measurements close to material discontinuity, the sensors of which are directly loaded with a Schottky diode and connected via highly resistive lines to the data acquisition unit. The SAR measurements were conducted with the dosimetry probe EX3DV4, SN: 3540 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation. The probe has been calibrated according to the procedure described in [2] with accuracy of better than $\pm 10\%$. The spherical isotropy was evaluated with the procedure described in [3] and found to be better than ± 0.25 dB. The phantom used was the SAM Twin Phantom as described in FCC supplement C, IEEE P1528 and CENELEC EN50361.

UL Japan, Inc.

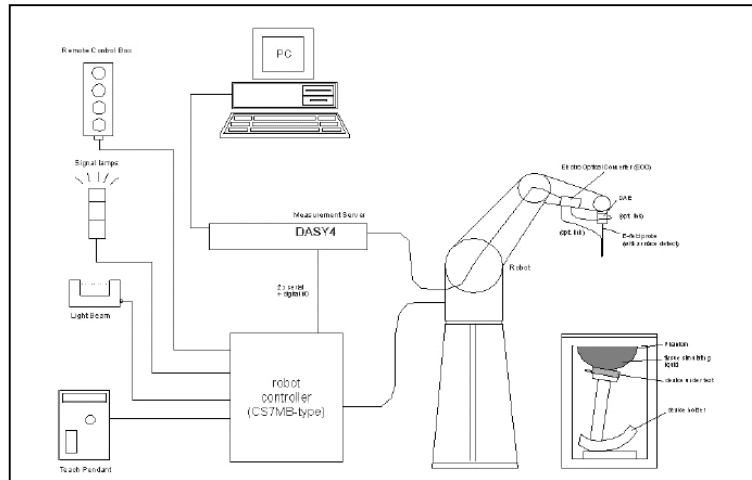
Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

3. Configuration and peripherals



The DASY4 system for performing compliance tests consist of the following items:

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software.
An arm extension for accommodating the data acquisition electronics (DAE).
2. A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
3. A data acquisition electronic (DAE), which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
4. The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection.
The EOC is connected to the measurement server.
5. The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
6. A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
7. A computer operating Windows 2000.
8. DASY4 software.
9. Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.
10. The SAM twin phantom enabling testing left-hand and right-hand usage.
11. The device holder for handheld mobile phones.
12. Tissue simulating liquid mixed according to the given recipes.
13. Validation dipole kits allowing to validate the proper functioning of the system.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

4. System components

4-a EX3DV4 Probe Specification

Construction:

Symmetrical design with triangular core
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g., glycol ether)

Calibration(S/N 3540):

Basic Broad Band Calibration in air : 10-3000 MHz
Conversion Factors(Head and Body): 450MHz,900 MHz,1810MHz,2450MHz,
5.2GHz,5.5GHz,5.8GHz

Frequency:

10 MHz to > 6GHz; Linearity: +/-0.2 dB(30 MHz to 3 GHz)

Directivity:

+/-0.3 dB in HSL (rotation around probe axis)
+/-0.5 dB in tissue material (rotation normal probe axis)

Dynamic Range:

10uW/g to > 100 mW/g;Linearity: +/-0.2 dB(noise: typically < 1uW/g)

Dimensions:

Overall length: 330 mm (Tip: 20 mm)
Tip diameter: 2.5mm (Body: 12 mm)
Typical distance from probe tip to dipole centers: 1 mm

Application:

Highprecision dosimetric measurement in any exposure scenario
(e.g., very strong gradient fields).Only probe which enables compliance
testing for frequencies up to 6GHz with precision of better 30%.



EX3DV4 E-field Probe

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

SAM Twin Phantom

Construction:

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528-200X, CENELEC EN 50361 and IEC 62209. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points with the robot.

Shell Thickness:

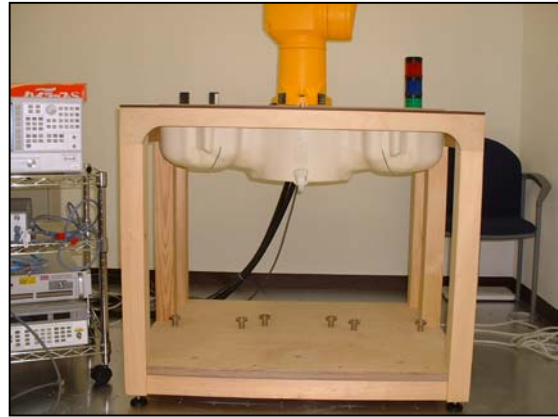
2 +/-0.2 mm

Filling Volume:

Approx. 25 liters

Dimensions:

(H x L x W): 810 x 1000 x 500 mm



SAM Twin Phantom

Device Holder for Transmitters

In combination with the SAM Twin Phantom V4.0, the Mounting Device enables the rotation of the mounted transmitter in spherical coordinates whereby the rotation points is the ear opening. The devices can be easily, accurately, and repeatedly positioned according to the FCC and CENELEC specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).

* Note: A simulating human hand is not used due to the complex anatomical and geometrical structure of the hand that may produced infinite number of configurations. To produce the worst-case condition (the hand absorbs antenna output power), the hand is omitted during the tests.



Device Holder

Device holder couldn't be used at this SAR measurement.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

5. Test system specifications

Robot RX60L

Number of Axes	:	6
Payload	:	1.6 kg
Reach	:	800mm
Repeatability	:	+/-0.025mm
Control Unit	:	CS7M
Programming Language	:	V+
Manufacture	:	Stäubli Unimation Corp. Robot Model: RX60

DASY4 Measurement server

Features:	:	166MHz low power Pentium MMX 32MB chipdisk and 64MB RAM Serial link to DAE (with watchdog supervision) 16 Bit A/D converter for surface detection system Two serial links to robot (one for real-time communication which is supervised by watchdog) Ethernet link to PC (with watchdog supervision) Emergency stop relay for robot safety chain Two expansion slots for future applications
Manufacture	:	Schimid & Partner Engineering AG

Data Acquisition Electronic (DAE)

Features	:	Signal amplifier, multiplexer, A/D converter and control logic Serial optical link for communication with DASY4 embedded system (fully remote controlled) 2 step probe touch detector for mechanical surface detection and emergency robot stop (not in -R version)
Measurement Range	:	1 μ V to > 200 mV (16 bit resolution and two range settings: 4mV, 400mV)
Input Offset voltage	:	< 1 μ V (with auto zero)
Input Resistance	:	200 M Ω
Battery Power	:	> 10 h of operation (with two 9 V battery)
Dimension	:	60 x 60 x 68 mm
Manufacture	:	Schimid & Partner Engineering AG

Software

Item	:	Dosimetric Assesment System DASY4
Type No.	:	SD 000 401A, SD 000 402A
Software version No.	:	4.6
Manufacture / Origin	:	Schimid & Partner Engineering AG

E-Field Probe

Model	:	EX3DV4
Serial No.	:	3540
Construction	:	Symmetrical design with triangular core
Frequency	:	10 MHz to 6 GHz
Linearity	:	+/-0.2 dB (30 MHz to 3 GHz)
Manufacture	:	Schimid & Partner Engineering AG

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Phantom

Type : SAM Twin Phantom V4.0
Shell Material : Fiberglass
Thickness : 2.0 +/-0.2 mm
Volume : Approx. 25 liters
Manufacture : Schimid & Partner Engineering AG

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

6. Simulated Tissues Composition of 5GHz

Ingredient	MiXTURE(%)	
	Head 5800MHz	Muscle 5800MHz
Water	64.0	78.0
Mineral Oil	18.0	11.0
Emulsifiers	15.0	9.0
Additives and salt	3.0	2.0

7. Validation Measurement

Simulated tissue liquid parameter

7-a Simulated Tissue Liquid Parameter confirmation

The dielectric parameters were checked prior to assessment using the HP85070D dielectric probe kit.
The dielectric parameters measurement are reported in each correspondent section.

7-b Body 5GHz

Type of liquid : Muscle 5GHz
Ambient temperature (deg.c) : 25.0(3-July), 25.0(4-July)
Relative Humidity (%) : 55(3-July), 57(4-July)
Liquid depth (cm) : 15.0

DIELECTRIC PARAMETERS MEASUREMENT RESULTS								
Date	Frequency	Liquid Temp [deg.c]		Parameters	Target Value	Measured	Deviation [%]	Limit [%]
		Before	After					
3-Jul	5200	24.3	24.3	Relative Permittivity ϵ_r *1	49.0	48.9	-0.2	+/-5
				Coductivity σ [mho/m] *1	5.30	5.54	4.5	+/-5
3-Jul	5200	24.3	24.3	Relative Permittivity ϵ_r *2	47.3	48.9	3.4	+/-10
				Coductivity σ [mho/m] *2	5.30	5.54	4.5	+/-10
3-Jul	5500	24.3	24.3	Relative Permittivity ϵ_r *1	48.6	47.4	-2.5	+/-5
				Coductivity σ [mho/m] *1	5.65	5.88	4.1	+/-5
3-Jul	5500	24.3	24.3	Relative Permittivity ϵ_r *2	46.7	47.4	1.5	+/-10
				Coductivity σ [mho/m] *2	5.69	5.88	3.3	+/-10
3-Jul	5600	24.3	24.3	Relative Permittivity ϵ_r *1	48.5	47.1	-2.9	+/-5
				Coductivity σ [mho/m] *1	5.77	6.03	4.5	+/-5
4-Jul	5800	24.3	24.3	Relative Permittivity ϵ_r *1	48.2	46.4	-3.7	+/-5
				Coductivity σ [mho/m] *1	6.00	6.27	4.5	+/-5
4-Jul	5800	24.3	24.3	Relative Permittivity ϵ_r *2	46.3	46.4	0.2	+/-10
				Coductivity σ [mho/m] *2	6.07	6.27	3.3	+/-10

*1 The target values is a parameter defined in FCC OET 65.

*2 The target value is the calibrated dipole TSL parameters. (D5GHzV2,S/N: 1020)

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

7-c Decision on Simulated Tissues of 5200MHz, 5600MHz and 5800MHz

In the current standards (e.g., IEEE P1528, OET 65 Supplement C), the dielectric parameters suggested for head and body tissue simulating liquid are given at 3000MHz and 5800MHz. As an intermediate solution, dielectric parameters for the frequencies between 5000MHz to 5800 MHz were obtained using linear interpolation.

Therefore the dielectric parameters of 5200MHz, 5500MHz, 5600MHz and 5800MHz were decided as following.

(5200MHz Body Tissue/ Relative Permittivity ϵ_r : **49.0**, Conductivity σ : **5.30**)

(5500MHz Body Tissue/ Relative Permittivity ϵ_r : **48.6**, Conductivity σ : **5.65**)

(5600MHz Body Tissue/ Relative Permittivity ϵ_r : **48.5**, Conductivity σ : **5.77**)

(5800MHz Body Tissue/ Relative Permittivity ϵ_r : **48.2**, Conductivity σ : **6.00**)

(The frequency for the validation)

f (MHz)	Head Tissue		Body Tissue		Reference
	ϵ_r	σ [mho/m]	Er	σ [mho/m]	
3000	38.5	2.40	52.0	2.73	Standard
5800	35.3	5.27	48.2	6.00	Standard
5000	36.2	4.45	49.3	5.07	Interpolated
5100	36.1	4.55	49.1	5.18	Interpolated
5200	36.0	4.66	49.0	5.30	Interpolated
5300	35.9	4.76	48.9	5.42	Interpolated
5400	35.8	4.86	48.7	5.53	Interpolated
5500	35.6	4.96	48.6	5.65	Interpolated
5600	35.5	5.07	48.5	5.77	Interpolated
5700	35.4	5.17	48.3	5.88	Interpolated

Standard and interpolated dielectric parameters for head and body tissue simulating liquid in the frequency range 3000 to 5800MHz.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

8. System validation data

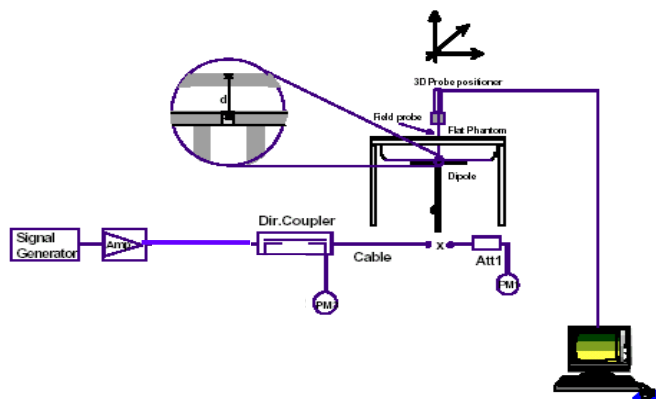
Prior to the assessment, the system validation kit was used to test whether the system was operating within its specifications of +/-10%. The validation results are in the table below. Please refer to APPENDIX3.

8-a System validation of 5GHz

Type of liquid : Muscle 5GHz
Ambient temperature (deg.c.) : 25.0(3-July), 25.0(4-July)
Relative Humidity (%) : 55(3-July), 57(4-July)
Liquid depth (cm) : 15.0
Dipole : D5GHzV2; Serial: 1039
Power : 250mW

SYSTEM PERFORMANCE CHECK											
Liquid (Muscle 5GHz)								System dipole validation target & measured			
Date	Frequency	Liquid Temp [deg.c.]		Relative Permittivity ϵ_r		Conductivity σ [mho/m]		SAR 1g [W/kg]		Deviation [%]	Limit [%]
		Before	After	Target	Measured	Target	Measured	Target	Measured		
3-Jul	5200	24.4	24.4	49.0	48.9	5.30	5.54	20.1	21.6	7.5	+/-10
3-Jul	5500	24.4	24.4	48.6	47.4	5.65	5.88	20.7	20.9	1.0	+/-10
4-Jul	5800	24.4	24.4	48.2	46.4	6.00	6.27	18.8	19.0	1.1	+/-10

Note: Please refer to Attachment for the result representation in plot format



Test system for the system performance check setup diagram



5100-5800MHz
Systemperformance check setup

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

9. Validation uncertainty

The uncertainty budget has been determined for the DASY4 measurement system according to the SPEAG documents[6][7] and is given in the following Table.

Error Description	Uncertainty value $\pm$ %	Probability distribution	divisor	(ci) 1g	Standard Uncertainty (1g)	vi or veff
Measurement System						
Probe calibration	± 6.8	Normal	1	1	± 6.8	∞
Axial isotropy of the probe	± 4.7	Rectangular	$\sqrt{3}$	1	± 2.7	∞
Spherical isotropy of the probe	± 9.6	Rectangular	0	0	0	∞
Boundary effects	± 2.0	Rectangular	$\sqrt{3}$	1	± 1.2	∞
Probe linearity	± 4.7	Rectangular	$\sqrt{3}$	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	$\sqrt{3}$	1	± 0.6	∞
Readout electronics	± 0.3	Normal	1	1	± 0.3	∞
Response time	0	Rectangular	$\sqrt{3}$	1	0	∞
Integration time	0	Rectangular	$\sqrt{3}$	1	0	∞
RF ambient Noise	± 3.0	Rectangular	$\sqrt{3}$	1	± 1.7	∞
RF ambient Reflections	± 3.0	Rectangular	$\sqrt{3}$	1	± 1.7	∞
Probe Positioner	± 0.8	Rectangular	$\sqrt{3}$	1	± 0.5	∞
Probe positioning	± 9.9	Rectangular	1	1	± 5.7	∞
Algorithms for Max.SAR Eval.	± 4.0	Rectangular	$\sqrt{3}$	1	± 2.3	∞
Dipole						
Dipole Axis to Liquid Distance	± 2.0	Rectangular	$\sqrt{3}$	1	± 1.2	∞
Input power and SAR drift meas.	± 4.7	Rectangular	$\sqrt{3}$	1	± 2.7	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	$\sqrt{3}$	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	$\sqrt{3}$	0.64	± 1.8	∞
Liquid conductivity (meas.)	± 5.0	Rectangular	1	0.64	± 3.2	∞
Liquid permittivity (target)	± 5.0	Rectangular	$\sqrt{3}$	0.6	± 1.7	∞
Liquid permittivity (meas.)	± 5.0	Rectangular	1	0.6	± 3.0	∞
Combined Standard Uncertainty					± 12.08	
Expanded Uncertainty (k=2)					± 24.16	

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

10. Validation Measurement data

5200MHz System Validation / Dipole 5GHz / Forward Conducted Power : 250mW

Dipole 5GHz; Type:D5GHzV2; Serial: 1020

Communication System: CW; Frequency: 5200MHz; Crest factor: 1

Medium: M5200 Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.54 \text{ mho/m}$; $\epsilon_r = 48.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.41, 4.41, 4.41); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (61x61x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 45.2 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 94.5 V/m ; Power Drift = 0.032 dB

Peak SAR (extrapolated) = 88.9 W/kg

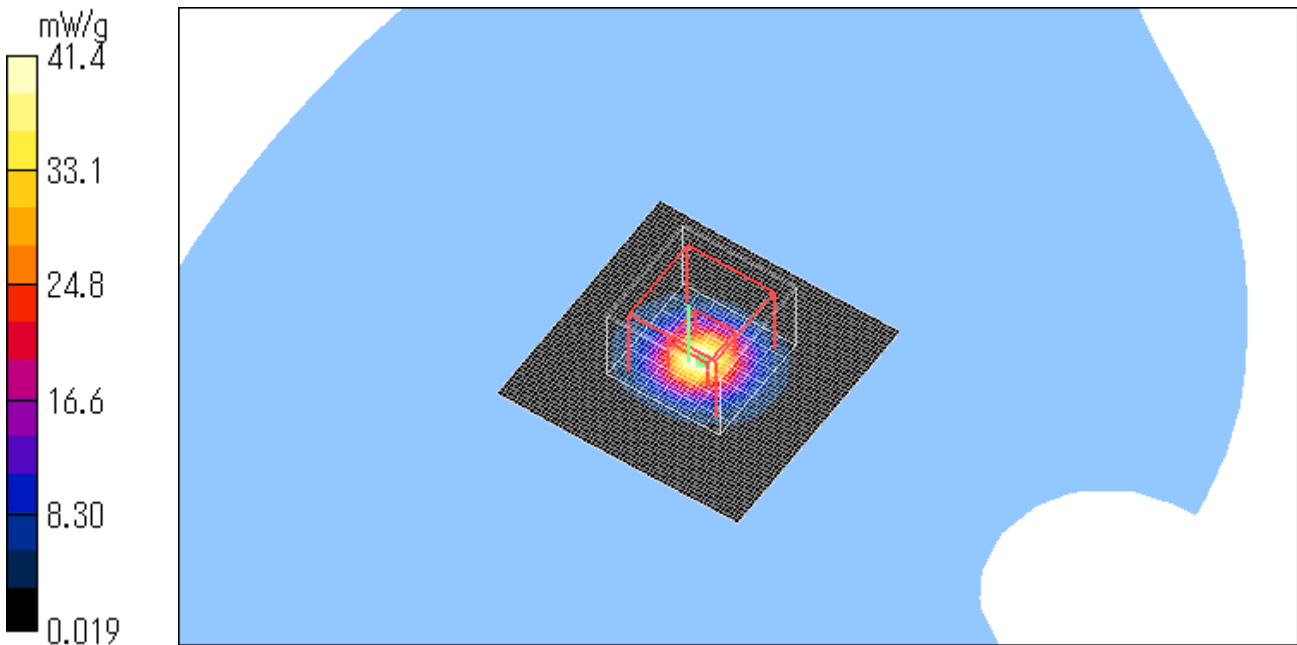
SAR(1 g) = 21.6 mW/g ; SAR(10 g) = 6.07 mW/g

Maximum value of SAR (measured) = 41.4 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0°C

Liquid Temperature = Before 24.4°C , After 24.4°C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

5500MHz System Validation / Dipole 5GHz / Forward Conducted Power : 250mW

Dipole 5GHz; Type:D5GHzV2; Serial: 1020

Communication System: CW; Frequency: 5500MHz; Crest factor: 1

Medium: M5500 Medium parameters used: $f = 5500 \text{ MHz}$; $\sigma = 5.88 \text{ mho/m}$; $\epsilon_r = 47.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (61x61x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 42.9 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 91.6 V/m ; Power Drift = 0.087 dB

Peak SAR (extrapolated) = 90.8 W/kg

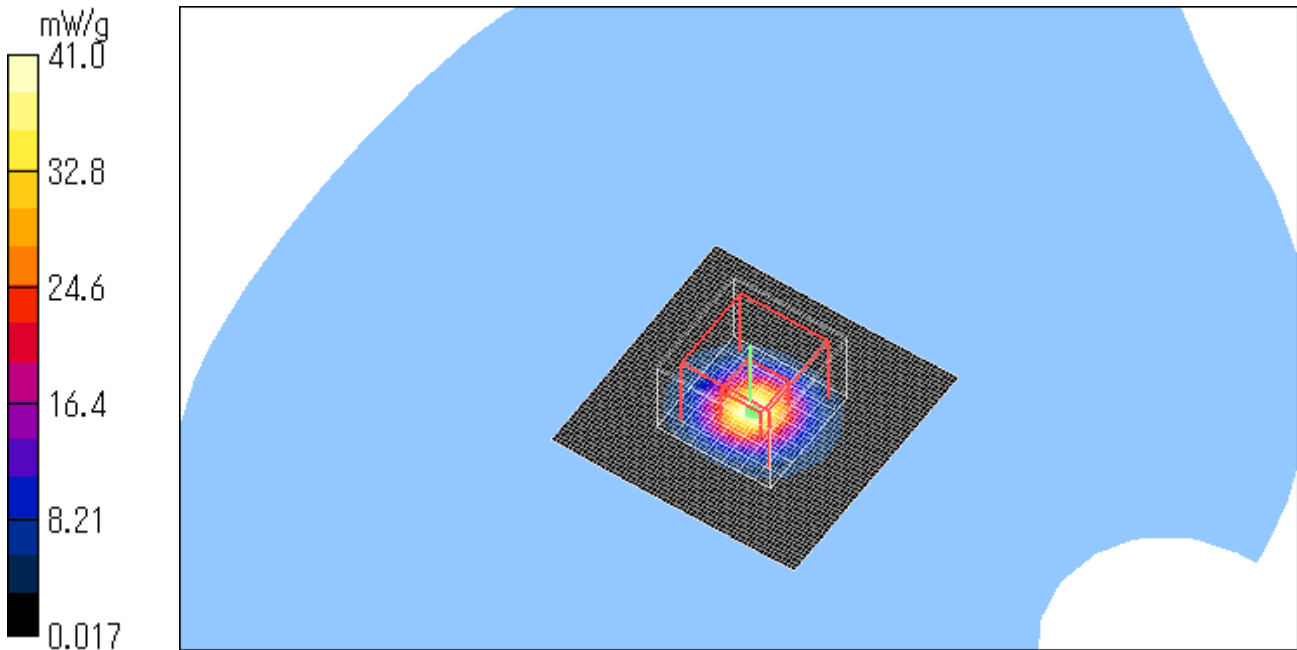
SAR(1 g) = 20.9 mW/g ; SAR(10 g) = 5.83 mW/g

Maximum value of SAR (measured) = 41.0 mW/g

Test Date = 07/03/07

Ambient Temperature = 25.0°C

Liquid Temperature = Before 24.4°C , After 24.4°C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

5800MHz System Validation / Dipole 5GHz / Forward Conducted Power : 250mW

Dipole 5GHz; Type:D5GHzV2; Serial: 1020

Communication System: CW; Frequency: 5800MHz; Crest factor: 1

Medium: M5800 Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.27 \text{ mho/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: EX3DV4 - SN3540; ConvF(4.23, 4.23, 4.23); Calibrated: 2007/01/19

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

- Phantom: SAM 1196

- Measurement SW: DASY4, V4.6 Build 23; Postprocessing SW: SEMCAD, V1.8 Build 160

Area Scan (61x61x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 38.9 mW/g

Zoom Scan (8x8x11)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2\text{mm}$

Reference Value = 83.5 V/m ; Power Drift = 0.060 dB

Peak SAR (extrapolated) = 89.3 W/kg

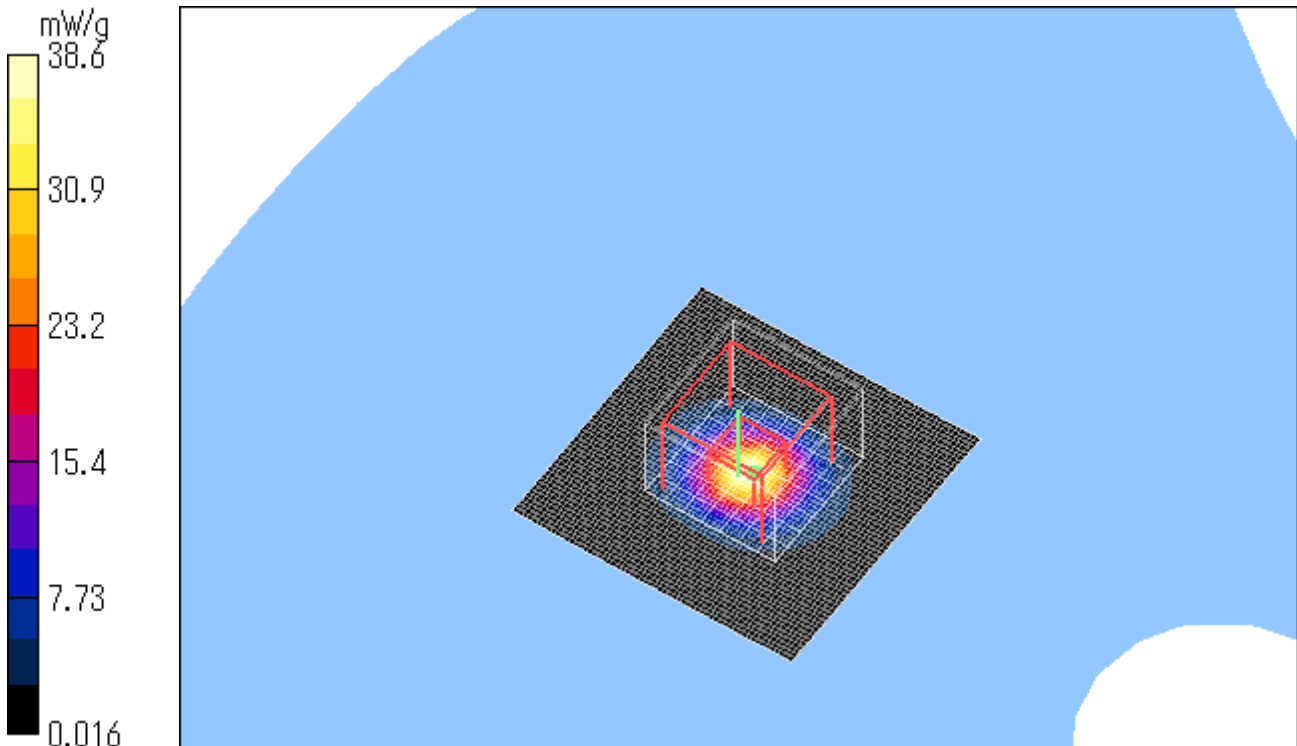
SAR(1 g) = 19 mW/g ; SAR(10 g) = 5.25 mW/g

Maximum value of SAR (measured) = 38.6 mW/g

Test Date = 07/04/07

Ambient Temperature = 25.0°C

Liquid Temperature = Before 24.4°C , After 24.4°C



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

11. System Validation Dipole (D5GHzV2,S/N: 1020)

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
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 **UL Japan (MTT)**

Certificate No: **D5GHzV2-1020_Jun07**

CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN: 1020**

Calibration procedure(s) **QA CAL-22.v1**
Calibration procedure for dipole validation kits between 3-6 GHz

Calibration date: **June 14, 2007**

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 ± 3)°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	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41495277	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Power sensor E4412A	MY41498087	29-Mar-07 (METAS, No. 217-00670)	Mar-08
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-07 (METAS, No. 217-00671)	Mar-08
Reference 10 dB Attenuator	SN: 5047.2 (10r)	10-Aug-06 (METAS, No 217-00591)	Aug-07
Reference Probe EX3DV4	SN: 3503	9-Mar-07 (SPEAG, No. EX3-3503_Mar07)	Mar-08
DAE4	SN 601	30-Jan-07 (SPEAG, No. DAE4-601_Jan07)	Jan-08
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

	Name	Function	Signature
Calibrated by:	Claudio Leubler	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: June 18, 2007

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

Certificate No: D5GHzV2-1020_Jun07

Page 1 of 11

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL tissue simulating liquid
ConvF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) IEC Std 62209 Part 2, "Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation, and Procedures"; Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for including accessories and multiple transmitters", Draft Version 0.9, December 2004
- b) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- c) DASY4 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY4	V4.7
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Area Scan resolution	dx, dy = 10 mm	
Zoom Scan Resolution	dx, dy = 4. mm, dz = 2.5 mm	
Frequency	5200 MHz $\pm$ 1 MHz 5500 MHz $\pm$ 1 MHz 5800 MHz $\pm$ 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	36.0 $\pm$ 6 %	4.45 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.0 $\pm$ 0.2) °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	19.4 mW / g
SAR normalized	normalized to 1W	77.6 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	77.6 mW / g $\pm$ 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.46 mW / g
SAR normalized	normalized to 1W	21.8 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	21.7 mW / g $\pm$ 19.5 % (k=2)

¹ Correction to nominal TSL parameters according to c), chapter "SAR Sensitivities"

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.5 ± 6 %	4.75 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	19.5 mW / g
SAR normalized	normalized to 1W	78.0 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	77.8 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.46 mW / g
SAR normalized	normalized to 1W	21.8 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	21.7 mW / g ± 19.5 % (k=2)

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.0 ± 6 %	5.03 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	250 mW input power	19.5 mW / g
SAR normalized	normalized to 1W	78.0 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	77.7 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.43 mW / g
SAR normalized	normalized to 1W	21.7 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	21.6 mW / g ± 19.5 % (k=2)

¹ Correction to nominal TSL parameters according to c), chapter "SAR Sensitivities"

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.4 ± 6 %	5.23 mho/m ± 6 %
Body TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	250 mW input power	20.1 mW / g
SAR normalized	normalized to 1W	80.4 mW / g
SAR for nominal Body TSL parameters ¹	normalized to 1W	79.5 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.68 mW / g
SAR normalized	normalized to 1W	22.7 mW / g
SAR for nominal Body TSL parameters ¹	normalized to 1W	22.5 mW / g ± 19.5 % (k=2)

Body TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.6	5.56 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.8 ± 6 %	5.61 mho/m ± 6 %
Body TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Body TSL at 5500 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	250 mW input power	20.7 mW / g
SAR normalized	normalized to 1W	82.8 mW / g
SAR for nominal Body TSL parameters ¹	normalized to 1W	81.8 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.83 mW / g
SAR normalized	normalized to 1W	23.3 mW / g
SAR for nominal Body TSL parameters ¹	normalized to 1W	23.1 mW / g ± 19.5 % (k=2)

¹ Correction to nominal TSL parameters according to c), chapter "SAR Sensitivities"

Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.2 ± 6 %	5.98 mho/m ± 6 %
Body TSL temperature during test	(21.0 ± 0.2) °C	-----	-----

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	250 mW input power	18.8 mW / g
SAR normalized	normalized to 1W	75.2mW / g
SAR for nominal Body TSL parameters ¹	normalized to 1W	74.2 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.28 mW / g
SAR normalized	normalized to 1W	21.1 mW / g
SAR for nominal Body TSL parameters ¹	normalized to 1W	20.9 mW / g ± 19.5 % (k=2)

¹ Correction to nominal TSL parameters according to c), chapter "SAR Sensitivities"

Appendix

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	48.7 Ω - 10.4 j Ω
Return Loss	-19.5 dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	49.9 Ω - 2.7 j Ω
Return Loss	-31.2 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	56.9 Ω - 0.2 j Ω
Return Loss	-23.8 dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	49.0 Ω - 9.3 j Ω
Return Loss	-20.5 dB

Antenna Parameters with Body TSL at 5500 MHz

Impedance, transformed to feed point	49.8 Ω - 1.6 j Ω
Return Loss	-35.8 dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	58.2 Ω + 1.6 j Ω
Return Loss	-22.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.199 ns
----------------------------------	----------

After long term use with 40 W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	February 05, 2004

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

DASY4 Validation Report for Head TSL

Date/Time: 14.06.2007 15:27:00

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHz; Serial: D5GHzV2 - SN:1020

Communication System: CW-5GHz;

Frequency: 5200 MHz; Frequency: 5500 MHz; Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: HSL 5800 MHz;

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.45$ mho/m; $\epsilon_r = 36$; $\rho = 1000$ kg/m³

Medium parameters used: $f = 5500$ MHz; $\sigma = 4.75$ mho/m; $\epsilon_r = 35.5$; $\rho = 1000$ kg/m³

Medium parameters used: $f = 5800$ MHz; $\sigma = 5.03$ mho/m; $\epsilon_r = 35$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.56, 5.56, 5.56)ConvF(5.2, 5.2, 5.2)ConvF(4.97, 4.97, 4.97); Calibrated: 09.03.2007
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=10mm, Pin=250mW, f=5200 MHz/Zoom Scan (8x8x8), dist=2mm (8x8x8)/Cube 0:

Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm

Reference Value = 76.3 V/m; Power Drift = 0.188 dB

Peak SAR (extrapolated) = 74.7 W/kg

SAR(1 g) = 19.4 mW/g; SAR(10 g) = 5.46 mW/g

Maximum value of SAR (measured) = 38.4 mW/g

d=10mm, Pin=250mW, f=5500 MHz/Zoom Scan (8x8x10), dist=2mm 2 (8x8x10)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 74.0 V/m; Power Drift = 0.241 dB

Peak SAR (extrapolated) = 78.4 W/kg

SAR(1 g) = 19.5 mW/g; SAR(10 g) = 5.46 mW/g

Maximum value of SAR (measured) = 38.5 mW/g

d=10mm, Pin=250mW, f=5800 MHz/Zoom Scan (8x8x10), dist=2mm (8x8x10)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 72.6 V/m; Power Drift = 0.046 dB

Peak SAR (extrapolated) = 81.7 W/kg

SAR(1 g) = 19.5 mW/g; SAR(10 g) = 5.43 mW/g

Maximum value of SAR (measured) = 38.2 mW/g

UL Japan, Inc.

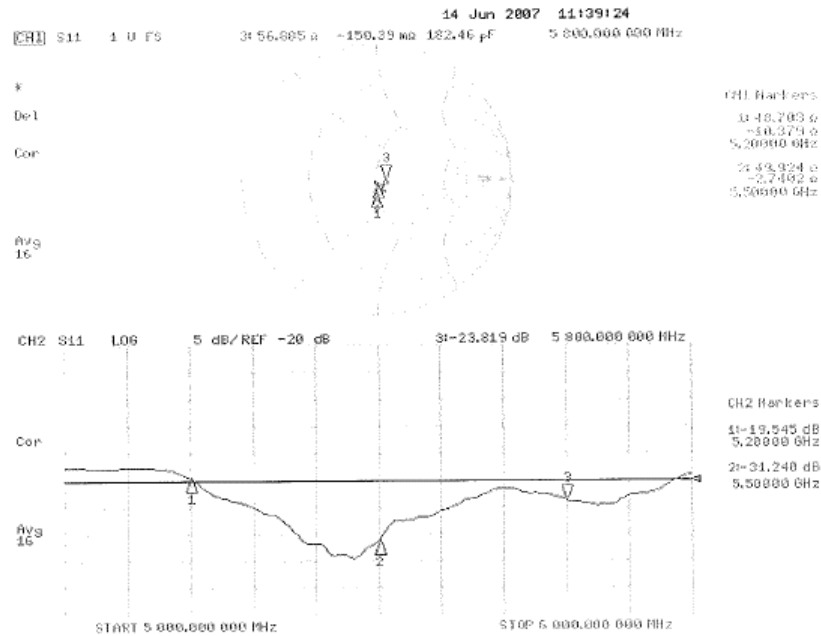
Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Impedance Measurement Plot for Head TSL



UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

DASY4 Validation Report for Body TSL

Date/Time: 14.06.2007 18:18:25

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHz; Serial: D5GHzV2 - SN:1020

Communication System: CW-5GHz;

Frequency: 5200 MHz; Frequency: 5500 MHz; Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: MSL 5800 MHz;

Medium parameters used: $f = 5200$ MHz; $\sigma = 5.3$ mho/m; $\epsilon_r = 47.3$; $\rho = 1000$ kg/m³

Medium parameters used: $f = 5500$ MHz; $\sigma = 5.69$ mho/m; $\epsilon_r = 46.7$; $\rho = 1000$ kg/m³

Medium parameters used: $f = 5800$ MHz; $\sigma = 6.07$ mho/m; $\epsilon_r = 46.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.96, 4.96, 4.96)ConvF(4.63, 4.63, 4.63)ConvF(4.76, 4.76, 4.76); Calibrated: 09.03.2007
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.01.2007
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

d=10mm, Pin=250mW, f=5200 MHz, NEW zoom scan settings/Zoom Scan (8x8x10),

dist=2mm (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 77.8 V/m; Power Drift = 0.166 dB

Peak SAR (extrapolated) = 72.7 W/kg

SAR(1 g) = 20.1 mW/g; SAR(10 g) = 5.68 mW/g

Maximum value of SAR (measured) = 39.4 mW/g

d=10mm, Pin=250mW, f=5500 MHz/Zoom Scan (8x8x10), dist=2mm 2 (8x8x10)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 76.1 V/m; Power Drift = 0.043 dB

Peak SAR (extrapolated) = 80.3 W/kg

SAR(1 g) = 20.7 mW/g; SAR(10 g) = 5.83 mW/g

Maximum value of SAR (measured) = 41.2 mW/g

d=10mm, Pin=250mW, f=5800 MHz/Zoom Scan (8x8x10), dist=2mm (8x8x10)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 69.9 V/m; Power Drift = 0.074 dB

Peak SAR (extrapolated) = 76.8 W/kg

SAR(1 g) = 18.8 mW/g; SAR(10 g) = 5.28 mW/g

Maximum value of SAR (measured) = 37.9 mW/g

UL Japan, Inc.

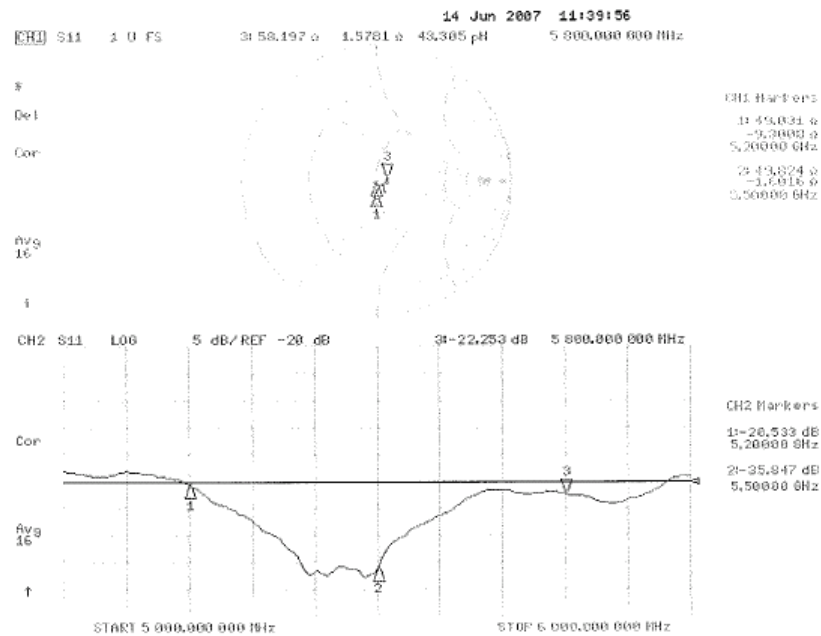
Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

Impedance Measurement Plot for Body TSL



12. Dosimetric E-Field Probe Calibration (EX3DV4,S/N: 3540)

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
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 **MTT**

Certificate No: **EX3-3540_Jan07**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3540**

Calibration procedure(s) **QA CAL-01.v5, QA CAL-12.v4 and QA CAL-14.v3
Calibration procedure for dosimetric E-field probes**

Calibration date: **January 19, 2007**

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 ± 3)°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-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41495277	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41498087	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-06 (METAS, No. 217-00592)	Aug-07
Reference 20 dB Attenuator	SN: S5086 (20b)	4-Apr-06 (METAS, No. 251-00558)	Apr-07
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-06 (METAS, No. 217-00593)	Aug-07
Reference Probe ES3DV2	SN: 3013	4-Jan-07 (SPEAG, No. ES3-3013_Jan07)	Jan-08
DAE4	SN: 654	21-Jun-06 (SPEAG, No. DAE4-654_Jun06)	Jun-07
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

Calibrated by:	Name Katja Pokovic	Function Technical Manager	Signature
Approved by:	Name Niels Kuster	Function Quality Manager	Signature

Issued: January 19, 2007

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

Certificate No: EX3-3540_Jan07

Page 1 of 9

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Federal Office of Metrology and Accreditation
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
Polarization ϕ	ϕ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ 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_{x,y,z}**: Assessed for E-field polarization $\theta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not effect the E²-field uncertainty inside TSL (see below *ConvF*).
- NORM(*f*)_{x,y,z}** = NORM_{x,y,z} * *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_{x,y,z}**: 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_{x,y,z} * *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 ± 50 MHz to ± 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.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

EX3DV4 SN:3540

January 19, 2007

Probe EX3DV4

SN:3540

Manufactured:	August 23, 2005
Last calibrated:	January 18, 2006
Recalibrated:	January 19, 2007

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

EX3DV4 SN:3540

January 19, 2007

DASY - Parameters of Probe: EX3DV4 SN:3540

Sensitivity in Free Space^A

Diode Compression^B

NormX	0.440 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP X	92 mV
NormY	0.500 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Y	91 mV
NormZ	0.580 ± 10.1%	$\mu\text{V}/(\text{V}/\text{m})^2$	DCP Z	93 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		2.0 mm	3.0 mm
SAR _{be} [%]	Without Correction Algorithm	3.5	1.3
SAR _{be} [%]	With Correction Algorithm	0.2	0.5

TSL 1810 MHz Typical SAR gradient: 10 % per mm

Sensor Center to Phantom Surface Distance		2.0 mm	3.0 mm
SAR _{be} [%]	Without Correction Algorithm	4.4	2.5
SAR _{be} [%]	With Correction Algorithm	1.0	0.6

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%.

^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL (see Page 8).

^B Numerical linearization parameter: uncertainty not required.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

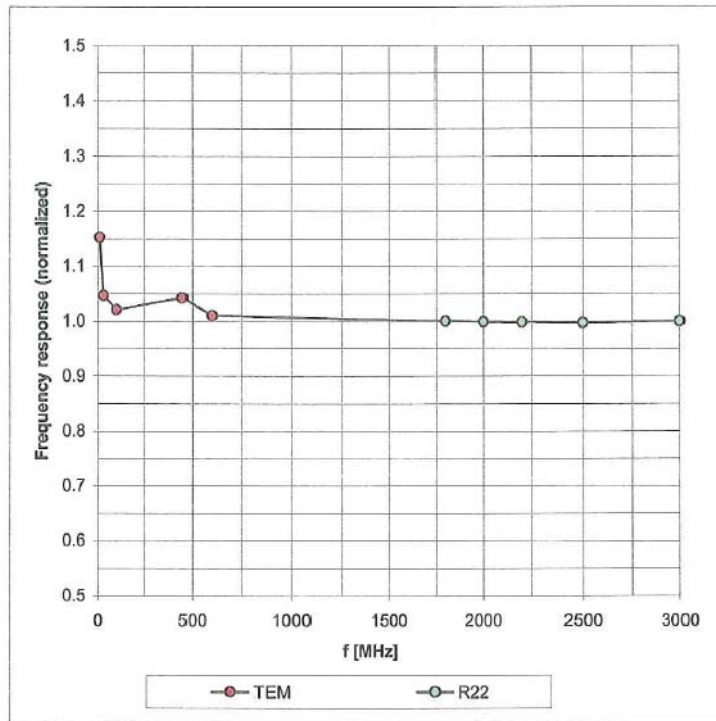
Facsimile : +81 596 24 8124

EX3DV4 SN:3540

January 19, 2007

Frequency Response of E-Field

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



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

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

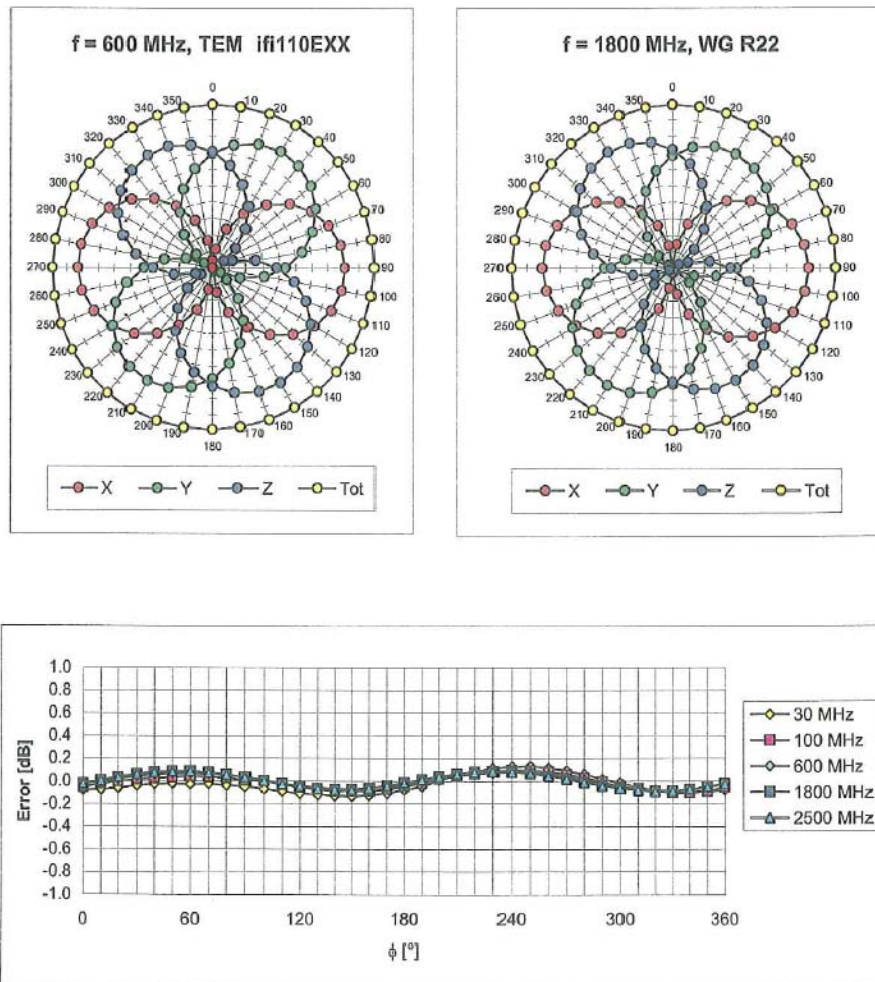
Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

EX3DV4 SN:3540

January 19, 2007

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



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

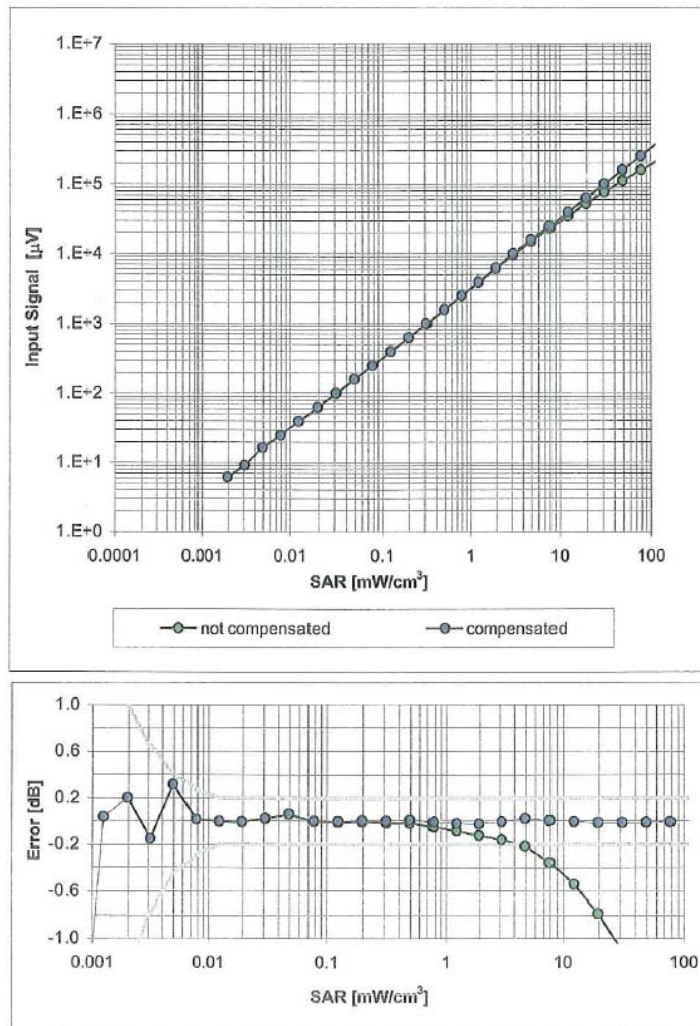
Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

EX3DV4 SN:3540

January 19, 2007

Dynamic Range f(SAR_{head})
(Waveguide R22, f = 1800 MHz)



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

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

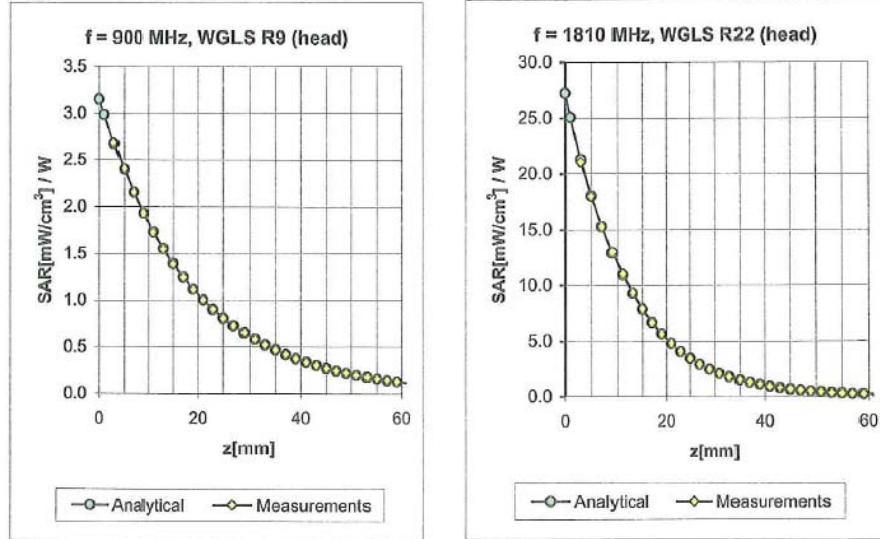
Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

EX3DV4 SN:3540

January 19, 2007

Conversion Factor Assessment



f [MHz]	Validity [MHz] ^c	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
450	± 50 / ± 100	Head	43.5 ± 5%	0.87 ± 5%	0.40	0.71	10.60 ± 13.3% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.50	0.80	10.07 ± 11.0% (k=2)
1810	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.21	1.27	8.62 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.32	1.14	7.76 ± 11.8% (k=2)
5200	± 50 / ± 100	Head	36.0 ± 5%	4.66 ± 5%	0.36	1.60	4.96 ± 13.1% (k=2)
5500	± 50 / ± 100	Head	35.6 ± 5%	4.96 ± 5%	0.35	1.60	4.77 ± 13.1% (k=2)
5800	± 50 / ± 100	Head	35.3 ± 5%	5.27 ± 5%	0.36	1.60	4.69 ± 13.1% (k=2)
450	± 50 / ± 100	Body	56.7 ± 5%	0.94 ± 5%	0.71	0.40	11.61 ± 13.3% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.45	0.90	10.06 ± 11.0% (k=2)
1810	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.15	1.36	8.46 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.35	1.00	7.80 ± 11.8% (k=2)
5200	± 50 / ± 100	Body	49.0 ± 5%	5.30 ± 5%	0.35	1.60	4.41 ± 13.1% (k=2)
5500	± 50 / ± 100	Body	48.6 ± 5%	5.65 ± 5%	0.35	1.60	4.13 ± 13.1% (k=2)
5800	± 50 / ± 100	Body	48.2 ± 5%	6.00 ± 5%	0.32	1.70	4.23 ± 13.1% (k=2)

^c 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.

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

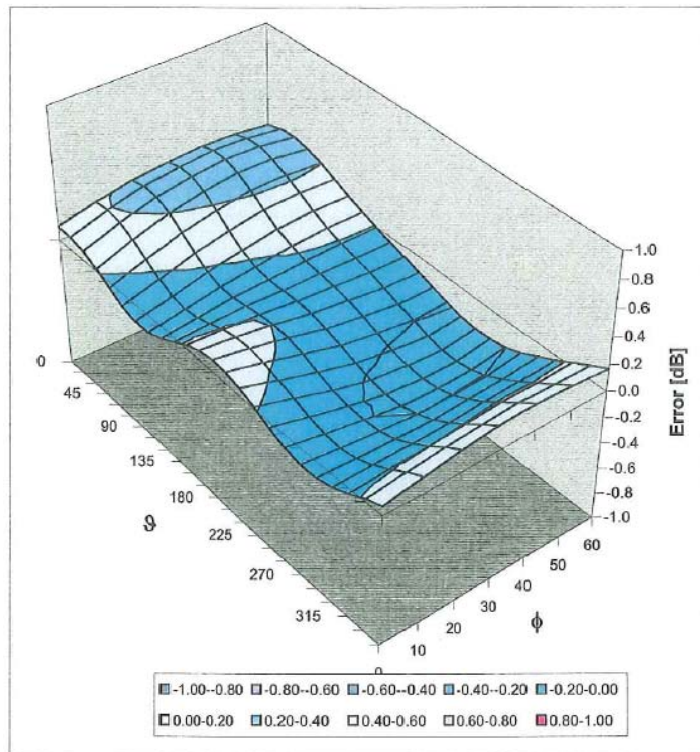
Facsimile : +81 596 24 8124

EX3DV4 SN:3540

January 19, 2007

Deviation from Isotropy in HSL

Error (ϕ , θ), $f = 900$ MHz



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

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124

13. References

- [1]ANSI, ANSI/IEEE C95.1-1992: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz, The Institute of Electrical and Electronics Engineers, Inc., New York, NY 10017, 1992.
- [2] Katja Pokovic, Thomas Schmid, and Niels Kuster, "Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequencies", in ICECOM '97, Dubrovnik, October 15-17, 1997, pp. 120-124.
- [3] Katja Pokovic, Thomas Schmid, and Niels Kuster, "E- field probe with improved isotropy in brain simulating liquids", in Proceedings of the ELMAR, Zadar, Croatia, 23-25 June, 1996, pp.172-175.
- [4] W. Gander, Computermathematik, Birkhaeuser, Basel, 1992.
- [5] W. H. Press, S. A. Teukolsky, W. T. Vetterling, and B. P. Flannery, Numerical Recipes in C, The Art of Scientific Computing, Second Edition, Cambridge University Press, 1992.
- [6]SPEAG uncertainty document for DASY 4 System from SPEAG (Shimid & Partner Engineering AG).
- [7]SPEAG uncertainty document for "the 5-6GHz Extension" from SPEAG (Shimid & Partner Engineering AG).

UL Japan, Inc.

Head Office EMC Lab.

4383-326 Asama-cho, Ise-shi, Mie-ken 516-0021 JAPAN

Telephone : +81 596 24 8116

Facsimile : +81 596 24 8124