APPENDIX 2: SAR Measurement data

Appendix 2-1: Evaluation procedure

Appendix 2-1: Evaluation procedure

The SAR evaluation was performed with the following procedure:

Step 1: Measurement of the E-field at a fixed location above the 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 suitable horizontal grid spacing of EUT. Based on these data, the area of the maximum absorption was determined by splines interpolation.

Step 3: Around this point found in the Step 2 (area scan), a volume of 30mm(X axis)×30mm(Y axis)×30mm(Z axis) was assessed by measuring 7×7×7 points under 3GHz and a volume of 28mm(X axis)×28mm(Y axis)×22.5mm (Z axis) was assessed by measuring 8×8×6(ratio step method (*1)) points for 3-6GHz frequency band.
And for any secondary peaks found in the Step2 which are within 2dB of maximum peak and not with this Step3 (Zoom scan) is repeated.
On the basis of this data set, the spatial peak SAR value was evaluated under the following procedure:

(1) The data at the surface were extrapolated, since the center of the dipoles is 1mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 2mm. 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 (1g or 10g) 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 (10×10×10) 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 for the assessment of the power drift.

Step 5: Repeat Step 1-Step 4 with other condition or/and setup of EUT.

***1. Ratio step method parameters used;**
The first measurement point: 2mm from the phantom surface, the initial grid separation: 2mm, subsequent graded grid ratio: 1.5
These parameters comply with the requirement of the KDB 865664.
In the section of SAR Scan Procedures-Zoom Scan, in KDB 865664(October 2006 revised, publication date: April 16, 2007): SAR Measurement Requirements for 3-6GHz, the graded grids requirement is as follows;
"When graded grids are used (z), the first measurement point should be within 3mm of the phantom surface for measurements below 4.5GHz and within 2mm at or above 4.5GHz. The initial grid separation, closest to the phantom, should be ≤ 2.0mm. A subsequent graded ration of 1.5 is recommended and less than 2.0 is required. "

Appendix 2-2: Measurement data (Body liquid)

Step 1a: Worst position search / 2.4GHz band

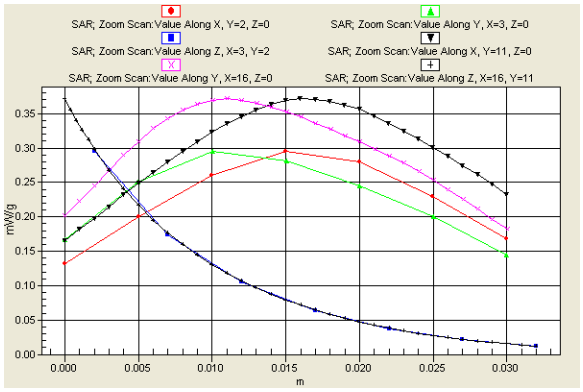
Step 1a-1: Front-touch / Mid.channel: 2437MHz(6ch), 11b(1Mbps)

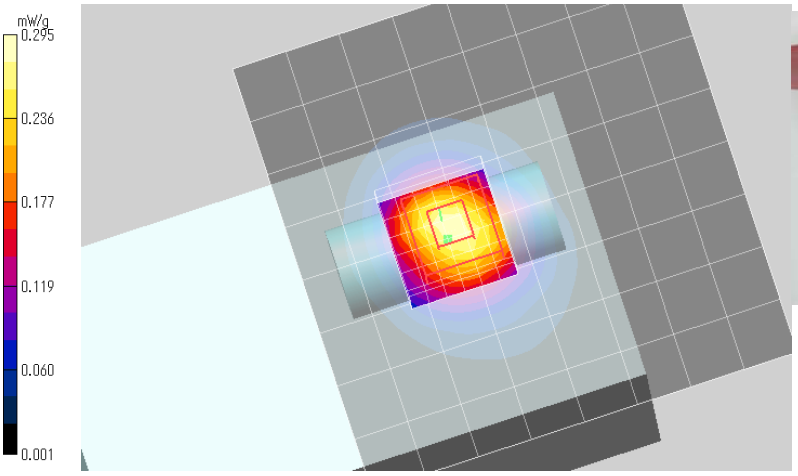
EUT: Wireless Module; Type: CH9-1214; Serial: 06 (Battery=1)
Communication System: 802.11b(DSSS, 1Mbps(lowest data rate)); Frequency: 2437 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used(24.4 deg.C): f = 2450 MHz; σ = 1.91 S/m; ε_r = 50.4; ρ = 1000 kg/m^3

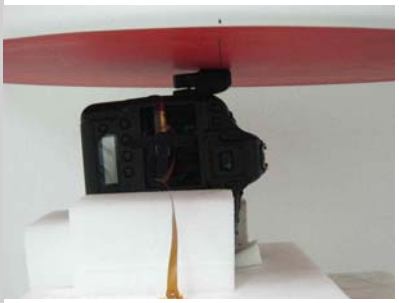
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(8.05, 8.05, 8.05); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#1,side(frt)-touch,d=0,11b(1m),m2437/
Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.269 mW/g
Area Scan (81x81x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 0.279 mW/g

Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 8.31 V/m; Power Drift = -0.158 dB,
Maximum value of SAR (measured) = 0.295 mW/g
Peak SAR (extrapolated) = 0.372 W/kg,
SAR(1 g) = 0.216 mW/g; SAR(10 g) = 0.118 mW/g







Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 159mm
*.ambient: 25.0 deg.C / 54 %RH; liquid temperature: (before) 24.6 deg.C. /(after) 24.4 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 11, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 1a: Worst position search / 2.4GHz band (cont'd)

Step 1a-2: Top-touch / Mid.channel: 2437MHz(6ch), 11b(1Mbps)

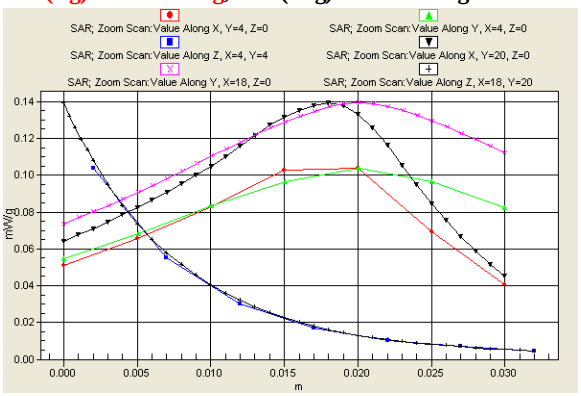
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=2)
Communication System: 802.11b(DSSS, 1Mbps(lowest data rate)); Frequency: 2437 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used (23.8 deg.C): f = 2450 MHz; σ = 1.92 S/m; ε_r = 50.2; ρ = 1000 kg/m^3

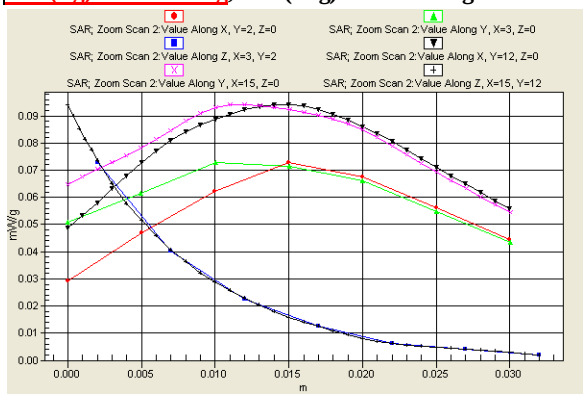
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(8.05, 8.05, 8.05); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

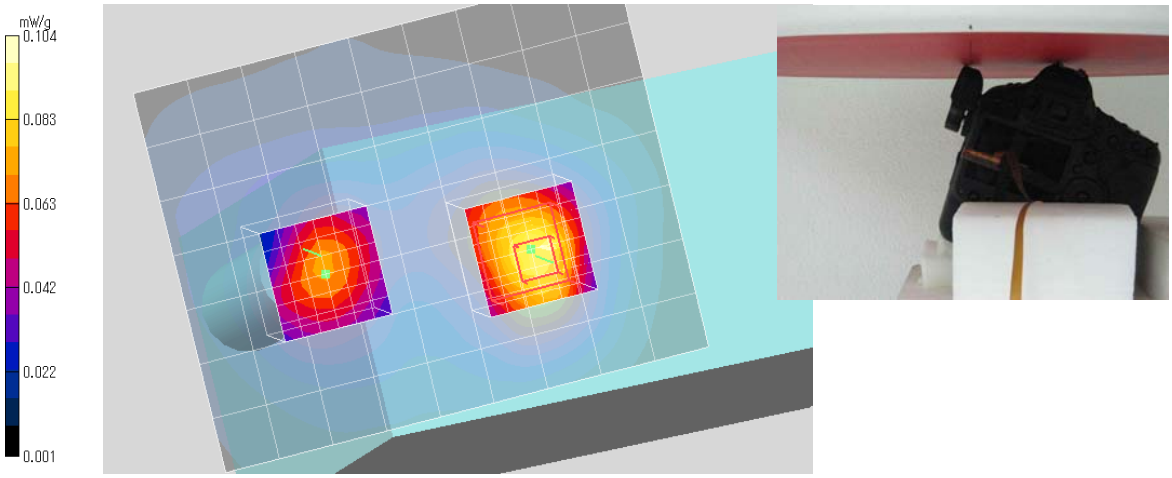
#10,top-touch,d=0,11b(1m),m2437/
Area Scan (10x8x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (measured) = 0.075 mW/g (1st-pk)/ 0.052 mW/g (2nd-pk)
Area Scan (91x71x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (interpolated) = 0.090 mW/g

Zoom Scan (7x7x7)/Cube 1st-peak:
Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 5.34 V/m; Power Drift = -0.193 dB,
Maximum value of SAR (measured) = 0.104 mW/g
Peak SAR (extrapolated) = 0.139 W/kg,
SAR(1 g) = 0.075 mW/g; SAR(10 g) = 0.040 mW/g

Zoom Scan 2 (7x7x7)/Cube 2nd-peak:
Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 5.34 V/m; Power Drift = -0.193 dB,
Maximum value of SAR (measured) = 0.073 mW/g
Peak SAR (extrapolated) = 0.094 W/kg,
SAR(1 g) = 0.052 mW/g; SAR(10 g) = 0.028 mW/g







Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 159mm
*.ambient: 24.0 deg.C / 54 %RH; liquid temperature: (before) 23.6 deg.C. /(after) 23.4 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 12, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 1a: Worst position search / 2.4GHz band (cont'd)

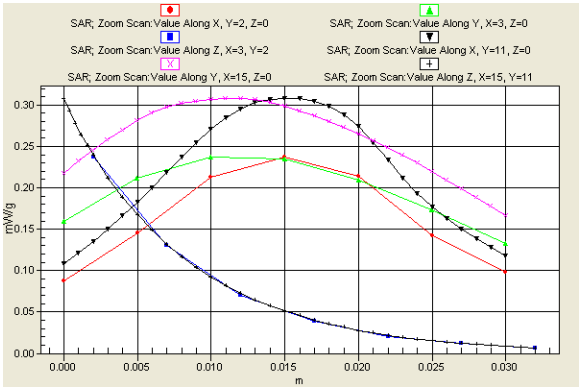
Step 1a-3: Right-touch / Mid.channel: 2437MHz(6ch), 11b(1Mbps)

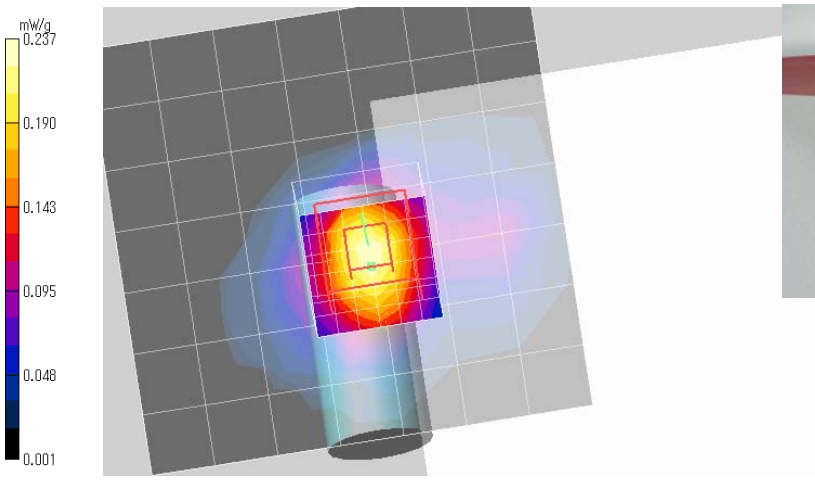
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 802.11b(DSSS, 1Mbps(lowest data rate)); Frequency: 2437 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used (24.4deg.C): f = 2450 MHz; σ = 1.91 S/m; ε_r = 50.4; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(8.05, 8.05, 8.05); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#5,right-touch,d=0,11b(1m),m2437/
Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (measured) = 0.243 mW/g
Area Scan (71x71x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (interpolated) = 0.246 mW/g

Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.98 V/m; Power Drift = -0.2 dB,
Maximum value of SAR (measured) = 0.237 mW/g
Peak SAR (extrapolated) = 0.308 W/kg,
SAR(1 g) = 0.168 mW/g; SAR(10 g) = 0.087 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 159mm
*.ambient: 25.0 deg.C / 54 %RH; liquid temperature: (before) 24.2 deg.C. /(after) 24.1 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 11, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 1a: Worst position search / 2.4GHz band (cont'd)

Step 1a-4: Left-touch / Mid.channel: 2437MHz(6ch), 11b(1Mbps)

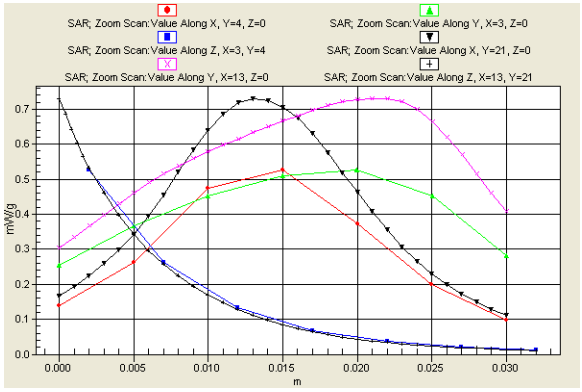
->Worst SAR(1g) of 2.4GHz band

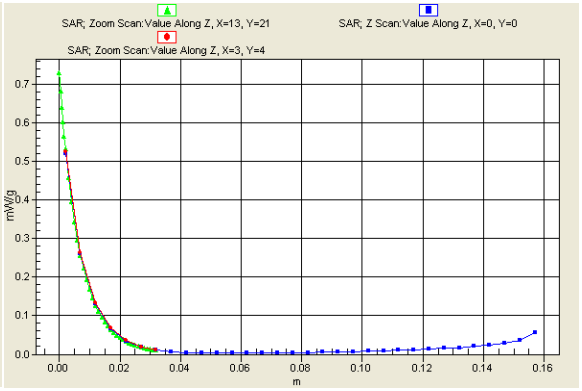
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 802.11b(DSSS, 1Mbps(lowest data rate)); Frequency: 2437 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used (23.8 deg.C): f = 2450 MHz; σ = 1.92 S/m; ε_r = 50.2; ρ = 1000 kg/m^3

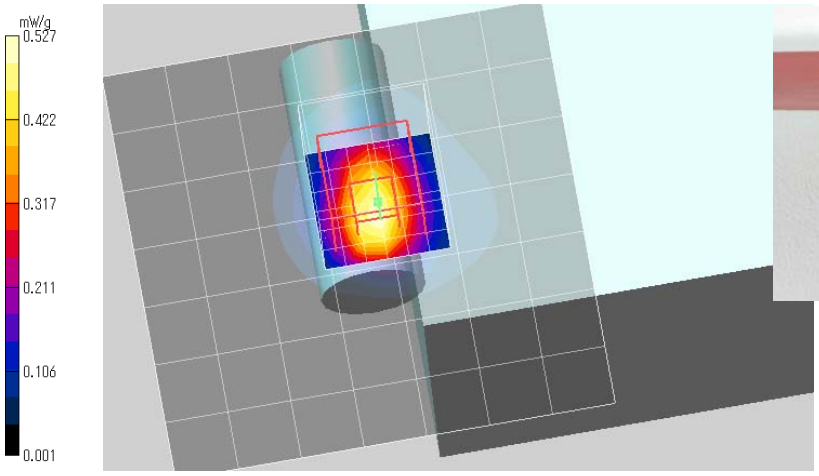
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(8.05, 8.05, 8.05); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#7, left-touch,d=0,11b(1m),m2437/
Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (measured) = 0.465 mW/g
Area Scan (71x71x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (interpolated) = 0.481 mW/g
Z Scan (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm, Maximum value of SAR (measured) = 0.520 mW/g

Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 15.1 V/m; Power Drift = -0.073 dB, Maximum value of SAR (measured) = 0.527 mW/g
Peak SAR (extrapolated) = 0.731 W/kg,
SAR(1 g) = 0.355 mW/g (Worst of 2.4GHz band);
SAR(10 g) = 0.165 mW/g







Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 159mm
*.ambient: 23.3 deg.C / 54 %RH; liquid temperature: (before) 23.8 deg.C. /(after) 23.7 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 12, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)

Step 2a: Change the channel / 2.4GHz band

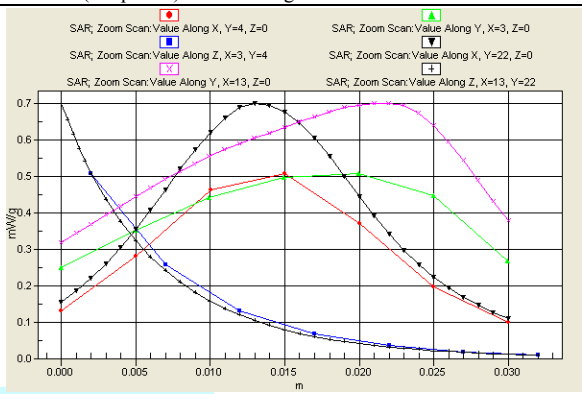
Step 2a-1: Low channel: 2412MHz(1ch), 11b(1Mbps), Left-touch

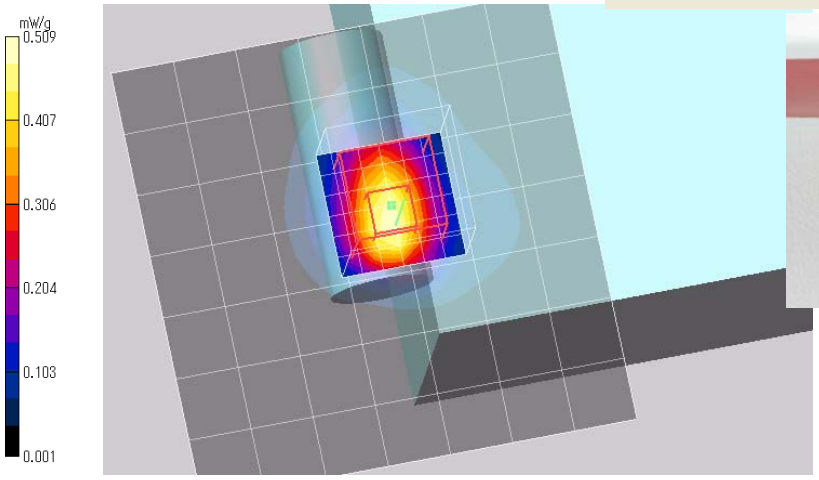
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=2)
Communication System: 802.11b(DSSS, 1Mbps(lowest data rate)); Frequency: 2412 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used(23.8 deg.C): f = 2450 MHz; σ = 1.92 S/m; ε_r = 50.2; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(8.05, 8.05, 8.05); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#8,left-touch,d=0,11b(1m),m2412/
Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (measured) = 0.497 mW/g
Area Scan (71x71x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (interpolated) = 0.513 mW/g

Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 14.8 V/m; Power Drift = 0.002 dB,
Maximum value of SAR (measured) = 0.509 mW/g
Peak SAR (extrapolated) = 0.702 W/kg,
SAR(1 g) = 0.346 mW/g; SAR(10 g) = 0.164 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 159mm
*.ambient: 23.6 deg.C / 54 %RH; liquid temperature: (before) 23.7 deg.C. /(after) 23.7 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 12, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 2a: Change the channel / 2.4GHz band (cont'd)

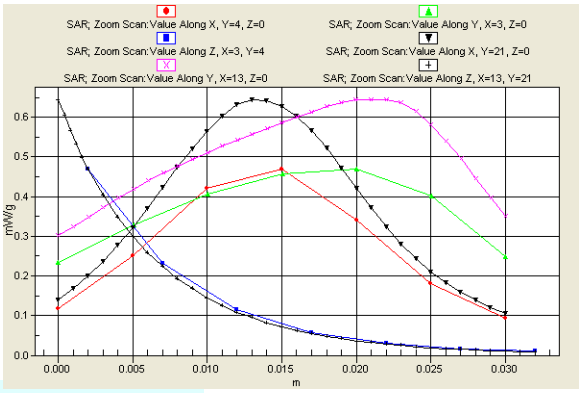
Step 2a-2: High channel: 2462MHz(11ch), 11b(1Mbps), Left-touch

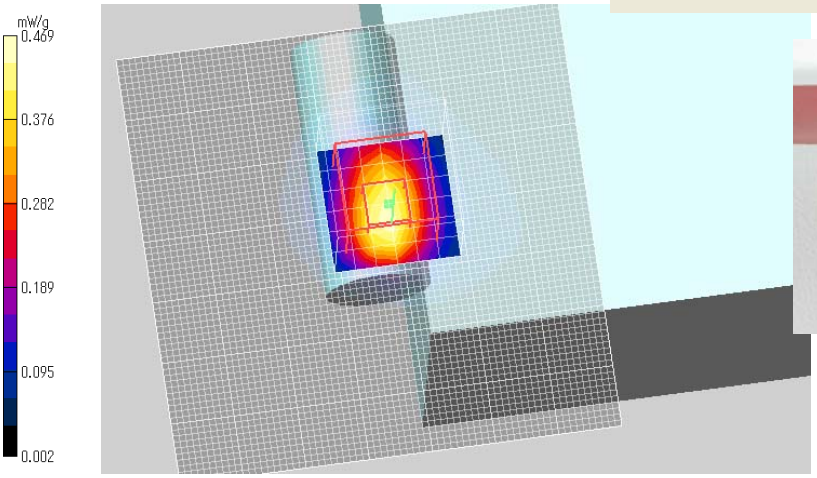
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 802.11b(DSSS, 1Mbps(lowest data rate)); Frequency: 2462 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used (23.8 deg.C): f = 2450 MHz; σ = 1.92 S/m; ε_r = 50.2; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(8.05, 8.05, 8.05); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#9,left-touch,d=0,11b(1m),m2462/
Area Scan (8x8x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (measured) = 0.454 mW/g
Area Scan (71x71x1): Measurement grid: dx=15mm, dy=15mm, Maximum value of SAR (interpolated) = 0.467 mW/g

Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 13.9 V/m; Power Drift = 0.040 dB,
Maximum value of SAR (measured) = 0.469 mW/g
Peak SAR (extrapolated) = 0.645 W/kg,
SAR(1 g) = 0.315 mW/g; SAR(10 g) = 0.148 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 159mm
*.ambient: 24.0 deg.C / 54 %RH; liquid temperature: (before) 23.7 deg.C. /(after) 23.6 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 12, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)

Step 3a: Change the operation mode / 2.4GHz band

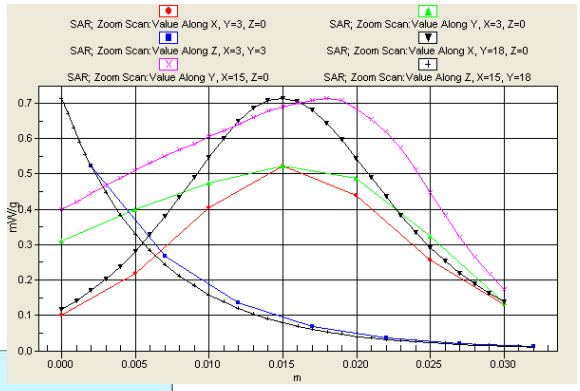
Step 3a-1: 11g(6Mbps), Low channel: 2412MHz(1ch), Left-touch

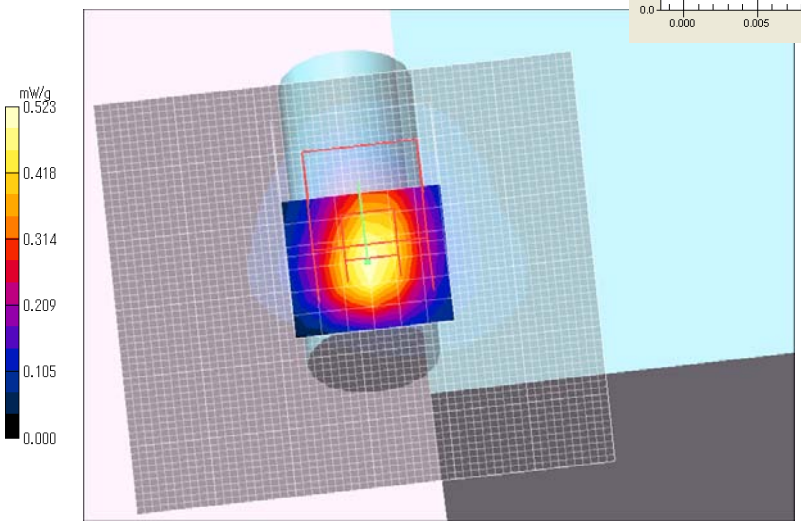
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 802.11g(OFDM, 6Mbps(lowest data rate)); Frequency: 2412 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used(23.8 deg.C): f = 2450 MHz; σ = 1.92 S/m; ε_r = 50.2; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(8.05, 8.05, 8.05); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

#11,left-touch,d=0,11g(6m),m2412/
Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.433 mW/g
Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 0.573 mW/g

Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 15.5 V/m; Power Drift = 0.087 dB,
Maximum value of SAR (measured) = 0.523 mW/g
Peak SAR (extrapolated) = 0.715 W/kg
SAR(1 g) = 0.346 mW/g; SAR(10 g) = 0.162 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 159mm
*.ambient: 24.7 deg.C / 54 %RH; liquid temperature: (before) 23.4 deg.C. /(after) 23.4 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 12, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 3a: Change the operation mode / 2.4GHz band (cont'd)

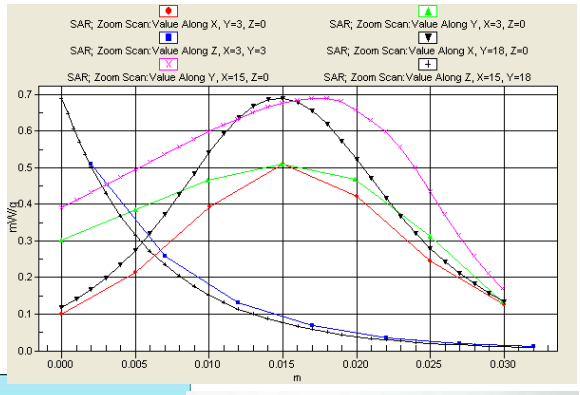
Step 3a-2: 11n(20HT)(MCS0), Low channel: 2412MHz(1ch), Left-touch

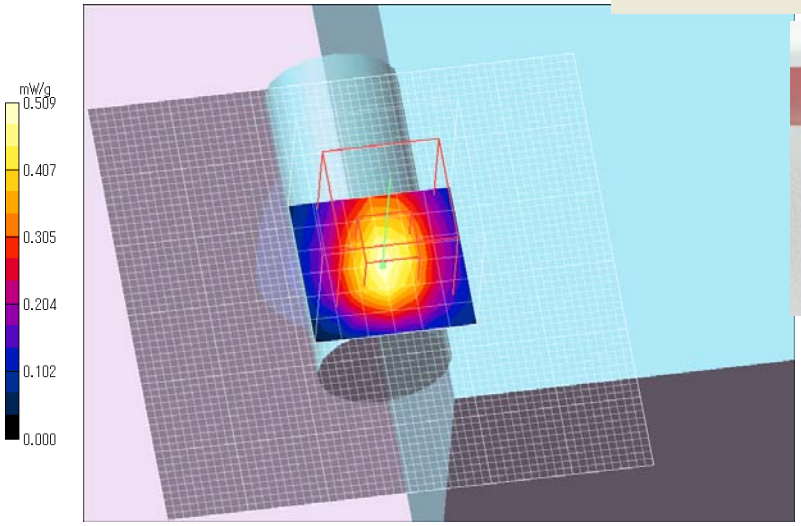
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=2)
Communication System: 802.11n(20HT) (OFDM, MCS0(lowest data rate)); Frequency: 2412 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used(23.8 deg.C): f = 2450 MHz; σ = 1.92 S/m; ε_r = 50.2; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(8.05, 8.05, 8.05); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

#12,left-touch,d=0,11n-20HT(mcs0),m2412/
Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.447 mW/g
Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 0.583 mW/g

Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 15.6 V/m; Power Drift = -0.059 dB,
Maximum value of SAR (measured) = 0.509 mW/g
Peak SAR (extrapolated) = 0.690 W/kg
SAR(1 g) = 0.335 mW/g; SAR(10 g) = 0.157 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 159mm
*.ambient: 24.7 deg.C / 54 %RH; liquid temperature: (before) 23.4 deg.C. /(after) 23.4 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 12, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 3a: Change the operation mode / 2.4GHz band (cont'd)

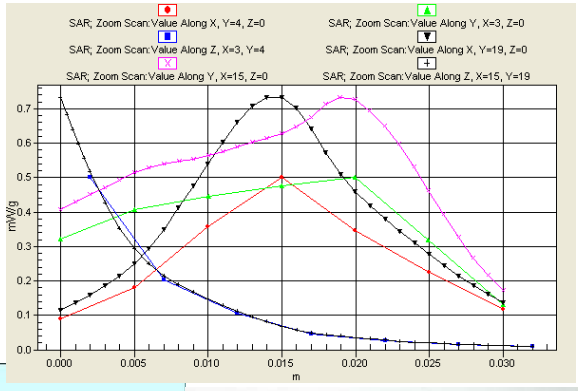
Step 3a-3: 11n(40HT)(MCS0), Low channel: 2422MHz(3ch), Left-touch

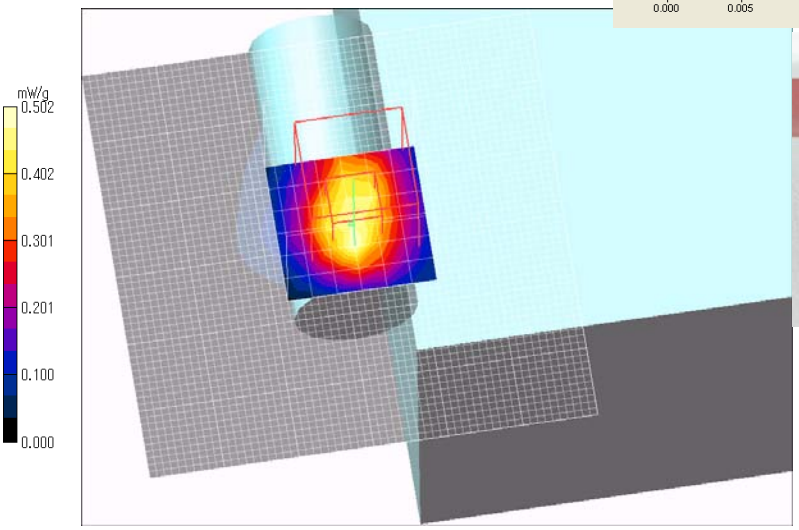
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 8802.11n(40HT) (OFDM, MCS0(lowest data rate)); Frequency: 2422 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used(23.8 deg.C): f = 2450 MHz; σ = 1.92 S/m; ε_r = 50.2; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(8.05, 8.05, 8.05); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 71; Postprocessing SW: SEMCAD, V1.8 Build 184

#13,left-touch,d=0,11n-40HT(mcs0),m2422/
Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.420 mW/g
Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 0.562 mW/g

Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 15.0 V/m; Power Drift = 0.2 dB,
Maximum value of SAR (measured) = 0.502 mW/g
Peak SAR (extrapolated) = 0.734 W/kg
SAR(1 g) = 0.332 mW/g; SAR(10 g) = 0.159 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 159mm
*.ambient: 24.7 deg.C / 54 %RH; liquid temperature: (before) 23.4 deg.C. /(after) 23.4 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 12, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)

Step 1b: Worst position search / 5180-5320MHz band (W52/53 band))

Step 1b-1: Front-touch / default channel(1) (with max. average power of 11a): 5200MHz(40ch), 11a(6Mbps)

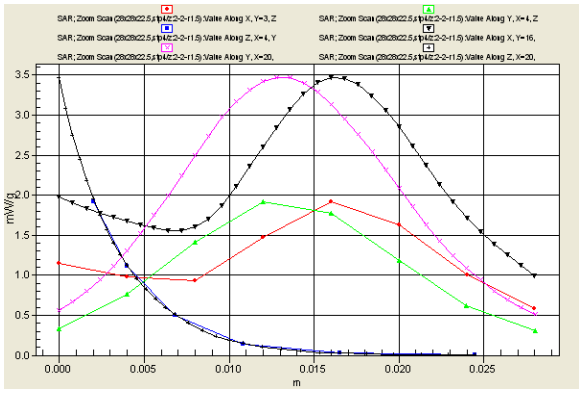
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11a (OFDM, 6Mbps(lowest data rate)); Frequency: 5200 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.2deg.C): f = 5200 MHz; σ = 5.42 S/m; ε_r = 49.1; ρ = 1000 kg/m^3

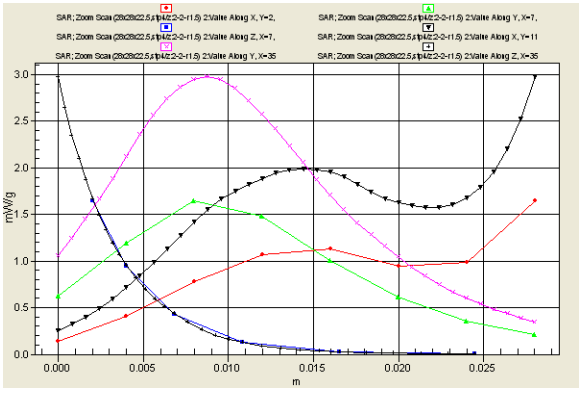
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(4.16, 4.16, 4.16); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

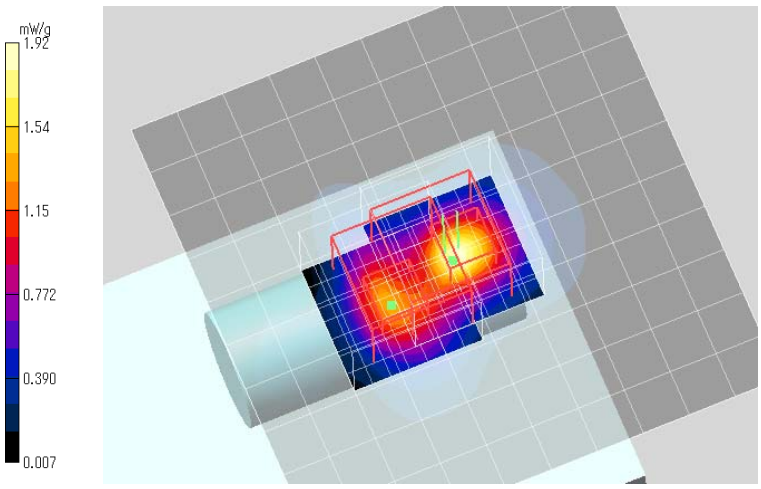
#5,rep-#1,side(frt)-touch(worst-was),d=0,11a(6m),m5200/
Area Scan (11x11x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.91 mW/g
Area Scan (101x101x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.92 mW/g (1st-pk) / 1.33 mW/g (2nd-pk)

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5) (8x8x6)/Cube 1st-peak:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 20.9 V/m; Power Drift = -0.130 dB,
Maximum value of SAR (measured) = 1.92 mW/g
Peak SAR (extrapolated) = 3.47 W/kg,
SAR(1 g) = 0.944 mW/g; SAR(10 g) = 0.318 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5) (8x8x6)/Cube 2nd-peak:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 20.9 V/m; Power Drift = -0.130 dB,
Maximum value of SAR (measured) = 1.65 mW/g
Peak SAR (extrapolated) = 2.98 W/kg,
SAR(1 g) = 0.751 mW/g; SAR(10 g) = 0.286 mW/g







Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 142mm
*.ambient: 25.0 deg.C / 53 %RH; liquid temperature: (before) 23.7 deg.C. /(after) 23.7 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 10, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 1b: Worst position search / 5180-5320MHz band (W52/53 band)) (cont'd)

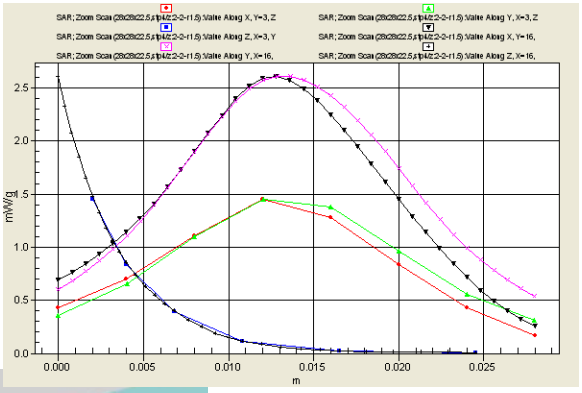
Step 1b-2: Top-touch / default channel(1) (with max. average power of 11a): 5200MHz(40ch), 11a(6Mbps)

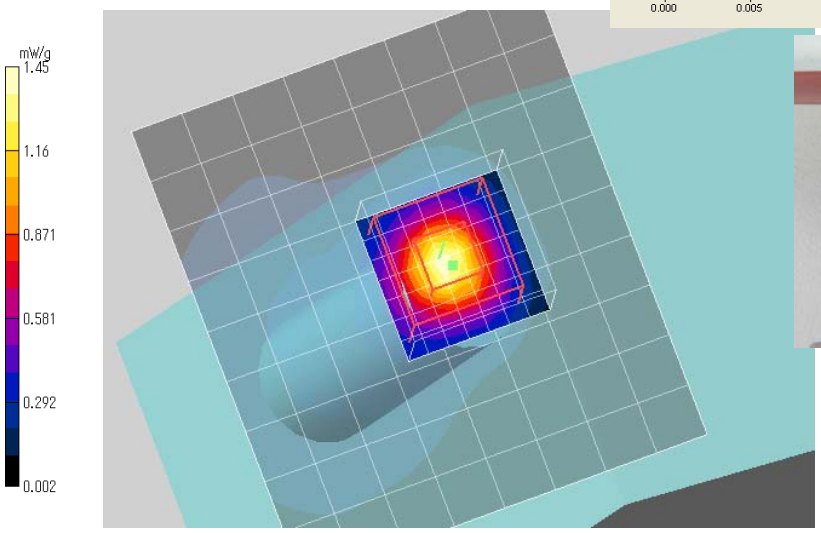
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=2)
Communication System: 11a (OFDM, 6Mbps(lowest data rate)); Frequency: 5200 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used(24.2deg.C): f = 5200 MHz; σ = 5.42 S/m; ε_r = 49.1; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(4.16, 4.16, 4.16); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#6,top-touch,d=0,11a(6m),m5200/
Area Scan (9x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.990 mW/g
Area Scan (81x91x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.28 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5) (8x8x6)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 16.9 V/m; Power Drift = 0.123 dB,
Maximum value of SAR (measured) = 1.45 mW/g
Peak SAR (extrapolated) = 2.61 W/kg,
SAR(1 g) = 0.737 mW/g; SAR(10 g) = 0.238 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 142mm
*.ambient: 25.0 deg.C / 53 %RH; liquid temperature: (before) 23.7 deg.C. /(after) 23.7 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 10, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 1b: Worst position search / 5180-5320MHz band (W52/53 band)) (cont'd)

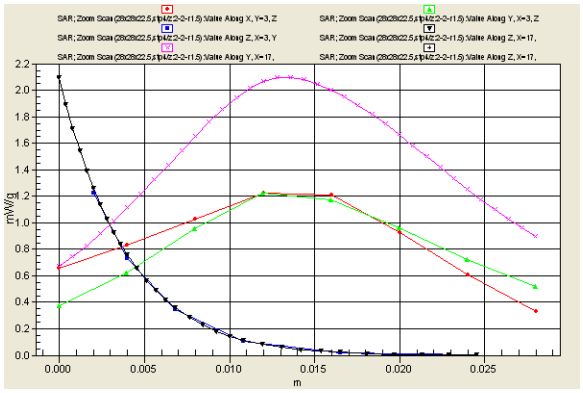
Step 1b-3: Right-touch / default channel(1) (with max. average power of 11a): 5200MHz(40ch), 11a(6Mbps)

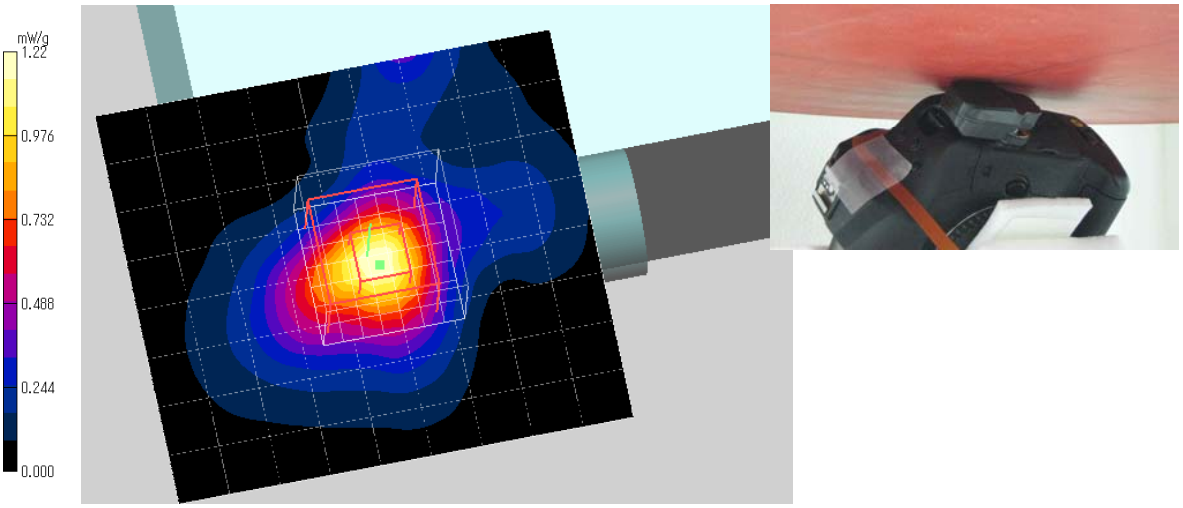
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=2)
Communication System: 11a (OFDM, 6Mbps(lowest data rate)); Frequency: 5200 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used(24.2deg.C): f = 5200 MHz; σ = 5.42 S/m; ε_r = 49.1; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(4.16, 4.16, 4.16); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#7,right-touch,d=0,11a(6m),m5200/
Area Scan (91x81x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.37 mW/g
Area Scan (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.31 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5) (8x8x6) /Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 17.2 V/m; Power Drift = 0.018 dB,
Maximum value of SAR (measured) = 1.22 mW/g
Peak SAR (extrapolated) = 2.10 W/kg,
SAR(1 g) = 0.673 mW/g; SAR(10 g) = 0.245 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 142mm
*.ambient: 24.9 deg.C / 53 %RH; liquid temperature: (before) 23.7 deg.C. /(after) 23.7 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 10, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 1b: Worst position search / 5180-5320MHz band (W52/53 band)) (cont'd)

Step 1b-4: Left-touch / default channel(1) (with max. average power of 11a): 5200MHz(40ch), 11a(6Mbps)

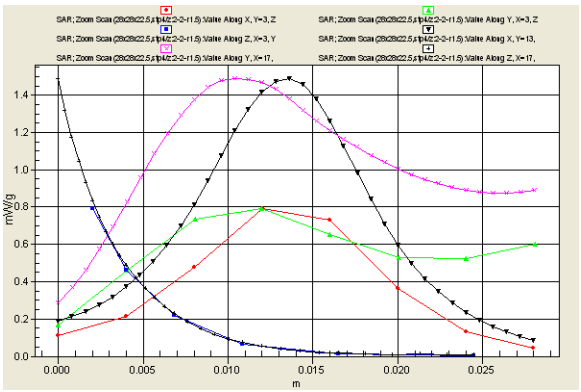
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11a (OFDM, 6Mbps(lowest data rate)); Frequency: 5200 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.2deg.C): f = 5200 MHz; σ = 5.42 S/m; ε_r = 49.1; ρ = 1000 kg/m^3

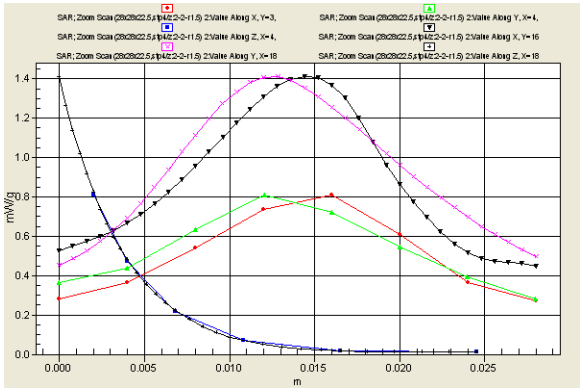
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(4.16, 4.16, 4.16); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

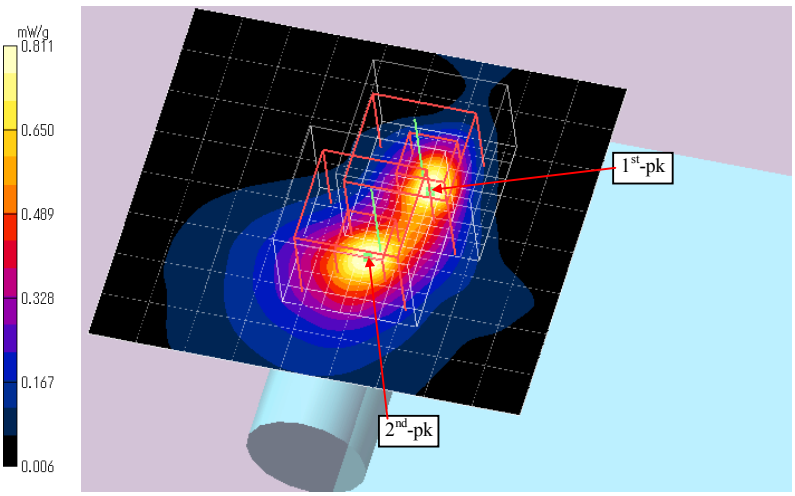
#8,left-touch,d=0,11a(6m),m5200/
Area Scan (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.833 mW/g
Area Scan (91x81x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 0.871 mW/g (1st-pk)/ 0.833 mW/g (2nd-pk)

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 1st-peak:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 7.68 V/m; Power Drift = -0.150 dB,
Maximum value of SAR (measured) = 0.791 mW/g
Peak SAR (extrapolated) = 1.49 W/kg,
SAR(1 g) = 0.398 mW/g; SAR(10 g) = 0.131 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 2nd-peak:
Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 7.68 V/m; Power Drift = -0.150 dB,
Maximum value of SAR (measured) = 0.811 mW/g
Peak SAR (extrapolated) = 1.41 W/kg,
SAR(1 g) = 0.417 mW/g; SAR(10 g) = 0.149 mW/g







Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 142mm
*.ambient: 24.9 deg.C / 53 %RH; liquid temperature: (before) 23.7 deg.C. /(after) 23.7 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 10, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)

Step 2b: Change the channel / 5180-5320MHz band (W52/53 band))

Step 2b-1: default channel(2) (Higher channel of W52 band): 5240MHz(48ch), 11a(6Mbps), Front-touch

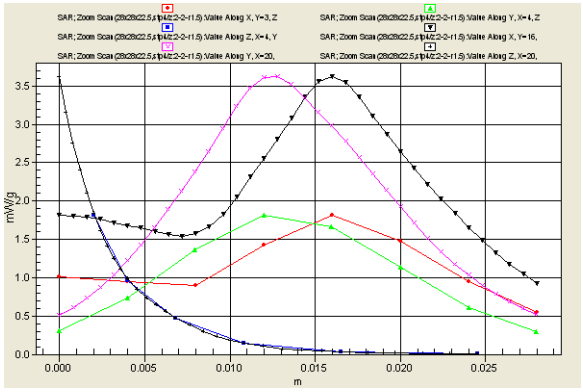
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=2)
Communication System: 11a (OFDM, 6Mbps(lowest data rate)); Frequency: 5240 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.2deg.C): f = 5240 MHz; σ = 5.44 S/m; ε_r = 49.1; ρ = 1000 kg/m^3

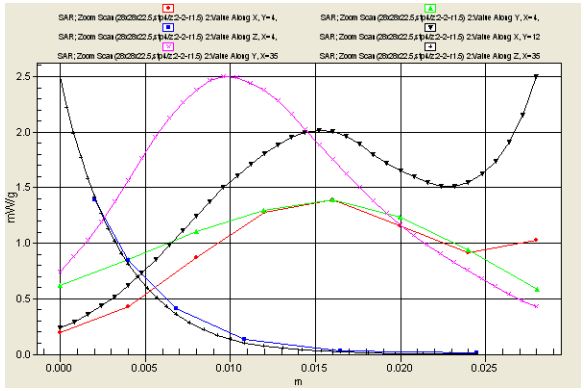
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(4.16, 4.16, 4.16); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

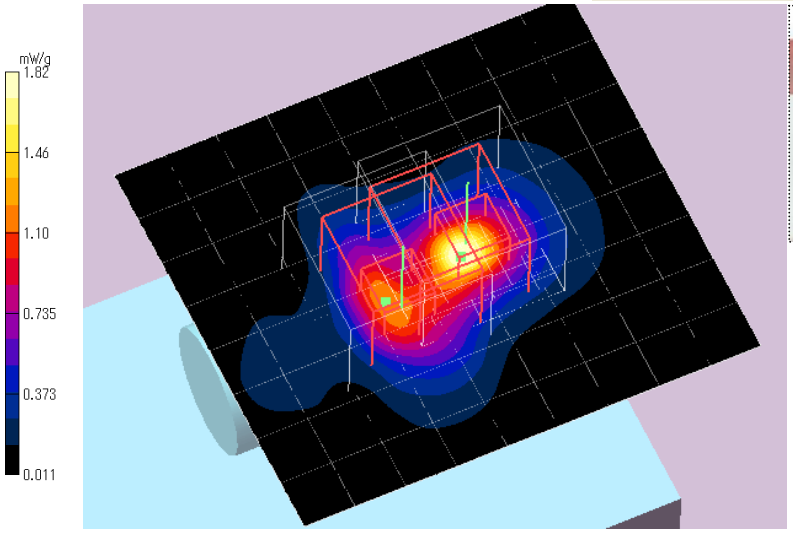
#2,side(frt)-touch(worst-was),d=0,11a(6m),m5240/
Area Scan (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.85 mW/g
Area Scan (91x81x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.87 mW/g (1st-pk) / 1.22 mW/g (2nd-pk)

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 1st-peak:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 19.4 V/m; Power Drift = -0.096 dB,
Maximum value of SAR (measured) = 1.82 mW/g,
Peak SAR (extrapolated) = 3.62 W/kg,
SAR(1 g) = 0.888 mW/g; SAR(10 g) = 0.302 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 2nd-peak:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 19.4 V/m; Power Drift = -0.096 dB,
Maximum value of SAR (measured) = 1.39 mW/g
Peak SAR (extrapolated) = 2.50 W/kg,
SAR(1 g) = 0.740 mW/g; SAR(10 g) = 0.278 mW/g







Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 142mm
*.ambient: 24.9 deg.C / 52 %RH; liquid temperature: (before) 23.8 deg.C. /(after) 23.7 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 10, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 2b: Change the channel / 5180-5320MHz band (W52/53 band)) (cont'd)

Step 2b-2: default channel(3) (Lower channel of W53 band): 5260MHz(52ch), 11a(6Mbps), Front-touch

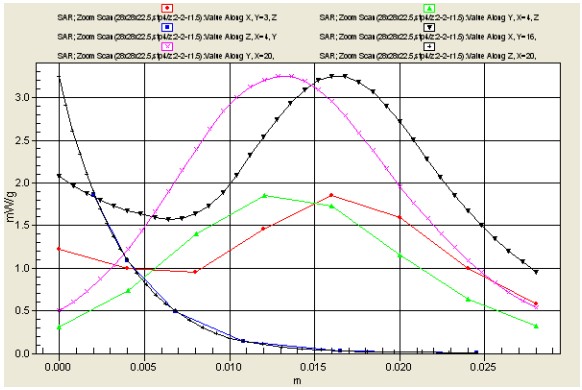
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11a (OFDM, 6Mbps(lowest data rate)); Frequency: 5260 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used(24.2deg.C);: f = 5260 MHz; σ = 5.5 S/m; ε_r = 48.8 ρ = 1000 kg/m^3

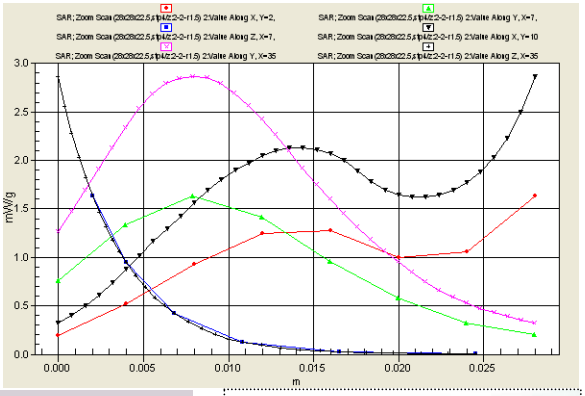
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.8, 3.8, 3.8); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

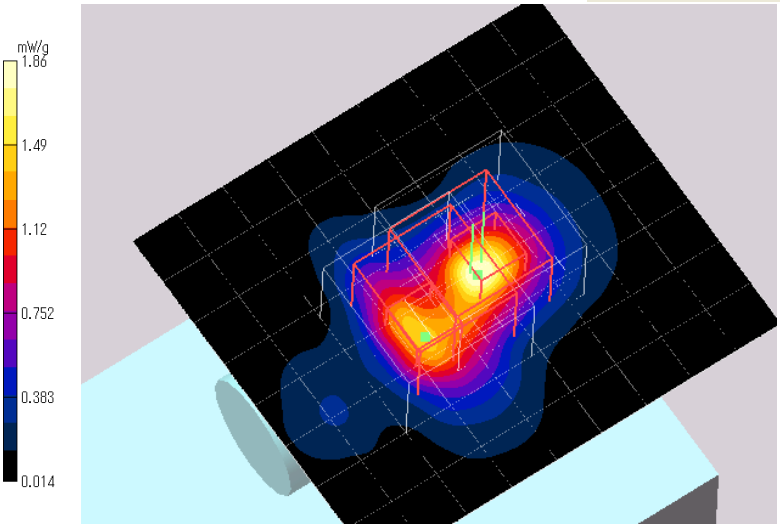
#3,side(frt)-touch(worst-was),d=0,11a(6m),m5260/
Area Scan (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.87 mW/g
Area Scan (91x81x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.90 mW/g (1st-pk) / 1.45 mW/g (2nd-pk)

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 1st-peak:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 20.5 V/m; Power Drift = -0.077 dB,
Maximum value of SAR (measured) = 1.86 mW/g
Peak SAR (extrapolated) = 3.25 W/kg,
SAR(1 g) = 0.919 mW/g; SAR(10 g) = 0.320 mW/g

Zoom Scan (28x28x22.5,stp4/z:2-2-r1.5) (8x8x6)/Cube 2nd-peak:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 20.5 V/m; Power Drift = -0.077 dB,
Maximum value of SAR (measured) = 1.63 mW/g
Peak SAR (extrapolated) = 2.87 W/kg,
SAR(1 g) = 0.804 mW/g; SAR(10 g) = 0.305 mW/g







Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 140mm
*.ambient: 24.9 deg.C / 52 %RH; liquid temperature: (before) 23.8 deg.C. /(after) 23.7 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 10, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 2b: Change the channel / 5180-5320MHz band (W52/53 band)) (cont'd)

Step 2b-3: default channel(4) (Higher channel of W53 band): 5260MHz(52ch), 11a(6Mbps), Front-touch

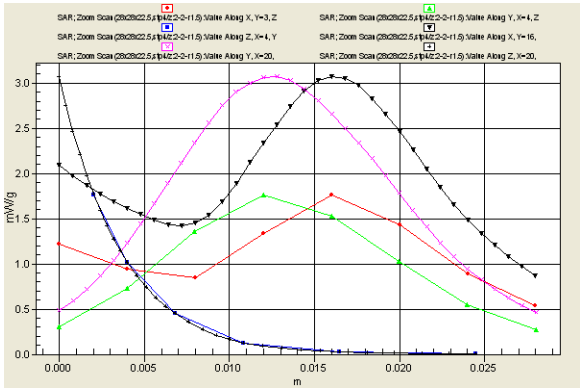
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=2)
Communication System: 11a (OFDM, 6Mbps(lowest data rate)); Frequency: 5320 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used(24.2deg.C): f = 5320 MHz; σ = 5.58 S/m; ε_r = 48.7; ρ = 1000 kg/m^3

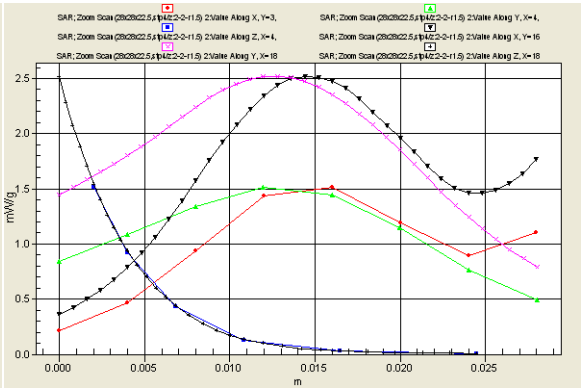
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.8, 3.8, 3.8); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

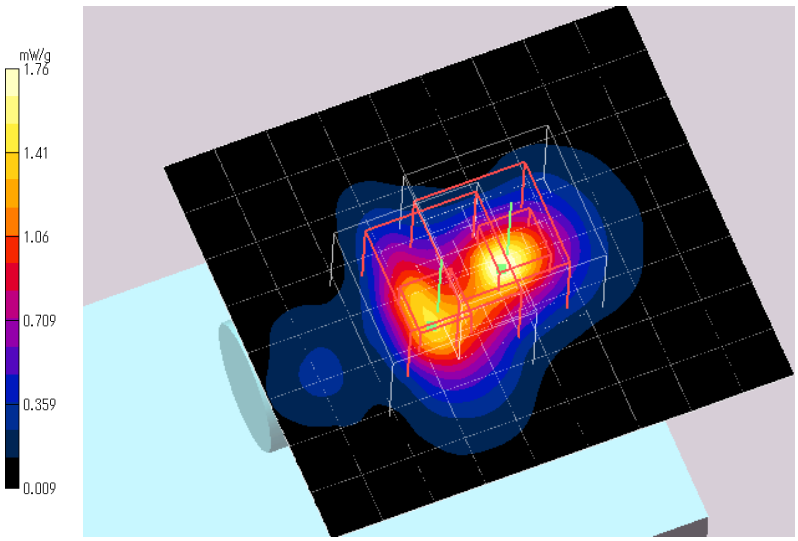
#4,side(frt)-touch(worst-was),d=0,11a(6m),m5320/
Area Scan (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.76 mW/g
Area Scan (91x81x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.78 mW/g (1st-pk) / 1.45 mW/g (2nd-pk)

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5) (8x8x6)/Cube 1st-peak:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 19.7 V/m; Power Drift = -0.114 dB,
Maximum value of SAR (measured) = 1.77 mW/g
Peak SAR (extrapolated) = 3.07 W/kg,
SAR(1 g) = 0.844 mW/g; SAR(10 g) = 0.294 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5) (8x8x6)/Cube 2nd-peak:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 19.7 V/m; Power Drift = -0.114 dB,
Maximum value of SAR (measured) = 1.51 mW/g
Peak SAR (extrapolated) = 2.52 W/kg,
SAR(1 g) = 0.806 mW/g; SAR(10 g) = 0.291 mW/g







Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 142mm
*.ambient: 24.9 deg.C / 52 %RH; liquid temperature: (before) 23.8 deg.C. /(after) 23.7 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 10, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)

Step 3b: Change the operation mode / 5180-5320MHz band (W52/53 band))

Step 3b-1: 11n(20HT)(MCS0), default channel(1) (with max. average power of 11n(20HT)): 5200MHz(40ch), Front-touch

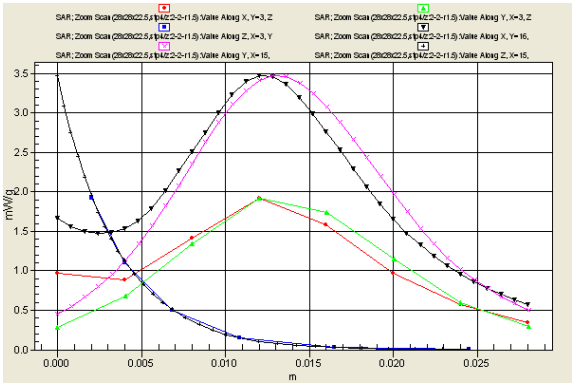
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11n(20HT) (OFDM, MCS0(lowest data rate)); Frequency: 5200 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.3 deg.C): f = 5200 MHz; σ = 5.29 S/m; ε_r = 49.1; ρ = 1000 kg/m^3

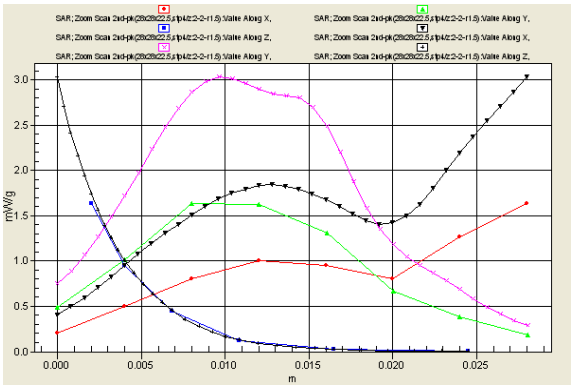
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(4.16, 4.16, 4.16); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

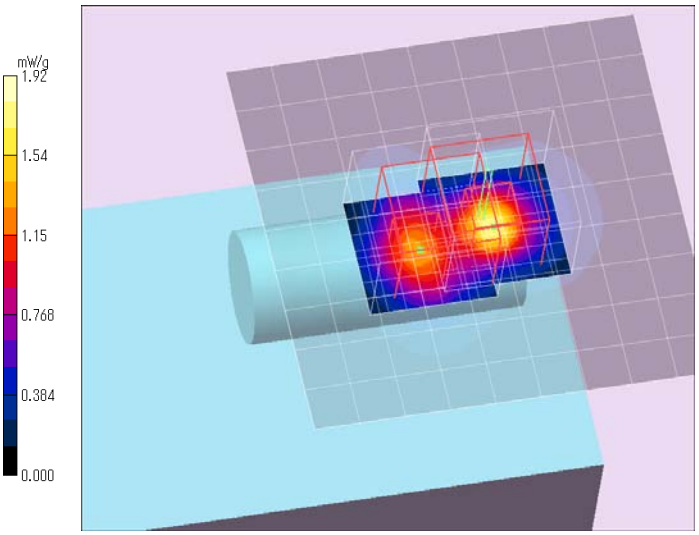
#15,side(frt)-touch,d=0,11n(mcs0),m5200/
Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.58 mW/g
Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.76 mW/g (1st-pk) /1.46 mW/g (2nd-pk)

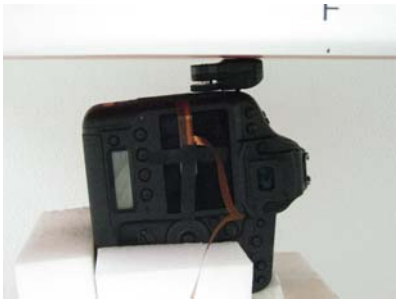
Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube_1st-pk:
Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 19.5 V/m; Power Drift = -0.199 dB,
Maximum value of SAR (measured) = 1.92 mW/g
Peak SAR (extrapolated) = 3.47 W/kg
SAR(1 g) = 0.923 mW/g; SAR(10 g) = 0.291 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube_2nd-pk:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 19.5 V/m; Power Drift = -0.199 dB,
Maximum value of SAR (measured) = 1.63 mW/g
Peak SAR (extrapolated) = 3.04 W/kg
SAR(1 g) = 0.690 mW/g; SAR(10 g) = 0.277 mW/g









Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 139mm
*.ambient: 25.0 deg.C / 48 %RH; liquid temperature: (before) 23.9 deg.C. /(after) 23.8 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 16, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 3b: Change the operation mode / 5180-5320MHz band (W52/53 band)) (cont'd)

Step 3b-2: 11n(40HT)(MCS0), 5190MHz(38ch), Front-touch

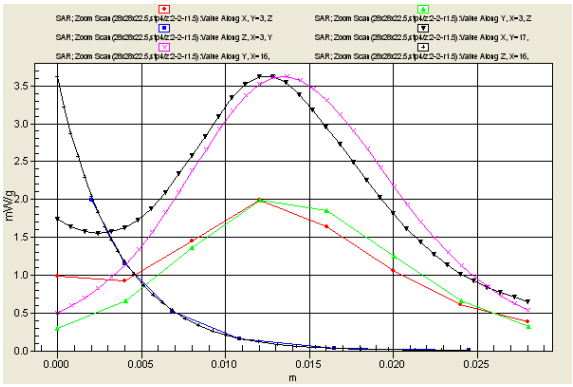
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=2)
Communication System: 11n(40HT) (OFDM, MCS0(lowest data rate)); Frequency: 5190 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.3 deg.C): f = 5190 MHz; σ = 5.32 S/m; ε_r = 49.2; ρ = 1000 kg/m^3

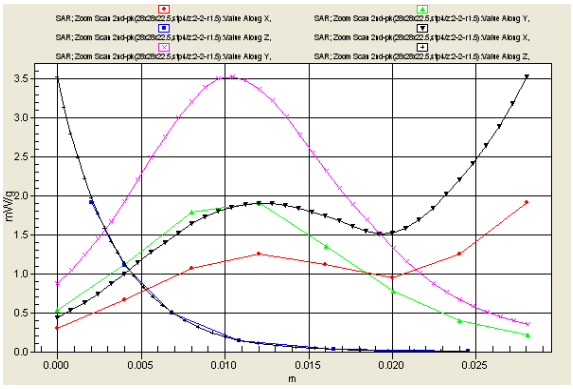
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(4.16, 4.16, 4.16); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

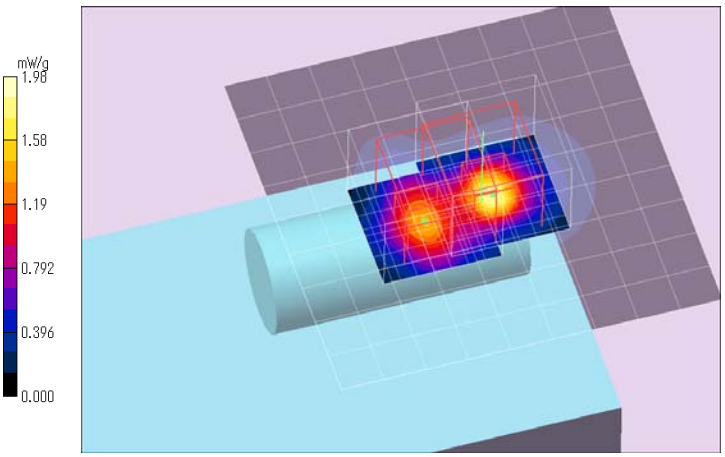
#16,side(frt)-touch,d=0,11n(40HT,mcs0),m5190/
Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.65 mW/g
Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.84 mW/g(1st-pk) / 1.49 mW/g(2nd-pk)

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5) (8x8x6)/Cube_1st-pk:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 20.3 V/m; Power Drift = -0.178 dB,
Maximum value of SAR (measured) = 1.98 mW/g
Peak SAR (extrapolated) = 3.62 W/kg
SAR(1 g) = 0.971 mW/g; SAR(10 g) = 0.309 mW/g)

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube_2nd-pk:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 20.3 V/m; Power Drift = -0.178 dB,
Maximum value of SAR (measured) = 1.91 mW/g
Peak SAR (extrapolated) = 3.53 W/kg
SAR(1 g) = 0.721 mW/g; SAR(10 g) = 0.291 mW/g







Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 139mm
*.ambient: 25.0 deg.C / 48 %RH; liquid temperature: (before) 23.8 deg.C. /(after) 23.8 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 16, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 3b: Change the operation mode / 5180-5320MHz band (W52/53 band)) (cont'd)

Step 3b-3: 11n(40HT)(MCS0), 5230MHz(46ch), Front-touch

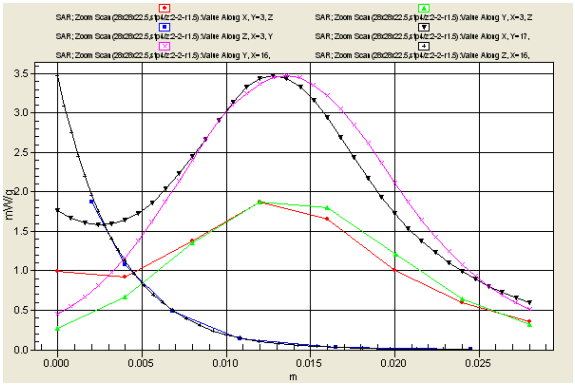
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11n(40HT) (OFDM, MCS0(lowest data rate)); Frequency: 5230 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.3 deg.C): f = 5230 MHz; σ = 5.33 S/m; ε_r = 48.9; ρ = 1000 kg/m^3

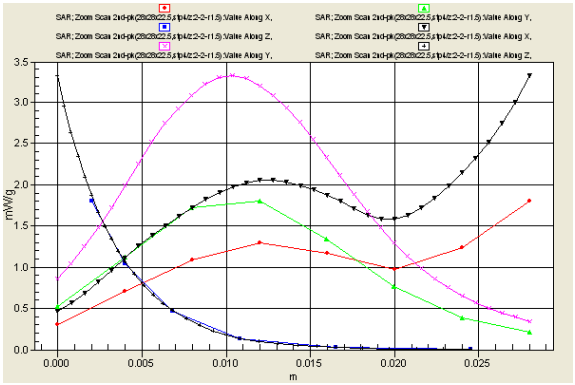
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(4.16, 4.16, 4.16); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

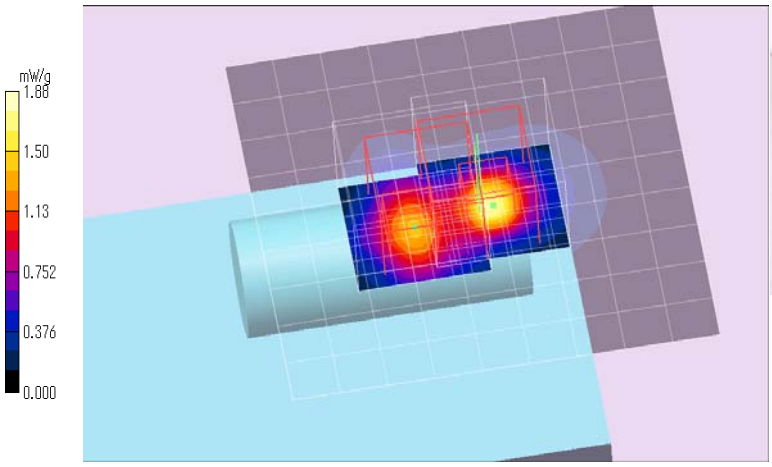
#17, side(frt)-touch,d=0,11n(40HT,mcs0),m5230/
Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.59 mW/g
Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.77 mW/g (1st-pk) / 1.44 mW/g (2nd-pk)

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube_1st-pk:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 20.0 V/m; Power Drift = -0.190 dB,
Maximum value of SAR (measured) = 1.88 mW/g
Peak SAR (extrapolated) = 3.48 W/kg
SAR(1 g) = 0.936 mW/g; SAR(10 g) = 0.299 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube_2nd-pk:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 20.0 V/m; Power Drift = -0.190 dB,
Maximum value of SAR (measured) = 1.81 mW/g
Peak SAR (extrapolated) = 3.32 W/kg
SAR(1 g) = 0.739 mW/g; SAR(10 g) = 0.294 mW/g







Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 139mm
*.ambient: 25.0 deg.C / 48 %RH; liquid temperature: (before) 23.8 deg.C. /(after) 23.9 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 16, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 3b: Change the operation mode / 5180-5320MHz band (W52/53 band)) (cont'd)

Step 3b-4: 11n(40HT)(MCS0), 5270MHz(54ch), Front-touch
->Worst SAR(1g) of 5180-5320MHz band

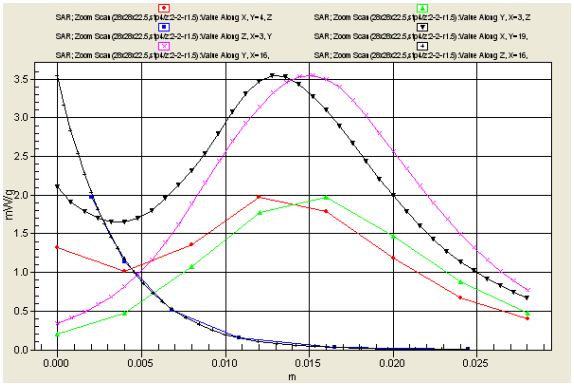
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=2)
Communication System: 11n(40HT) (OFDM, MCS0(lowest data rate)); Frequency: 5270 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.3 deg.C): f = 5270 MHz; σ = 5.43 S/m; ε_r = 48.8; ρ = 1000 kg/m^3

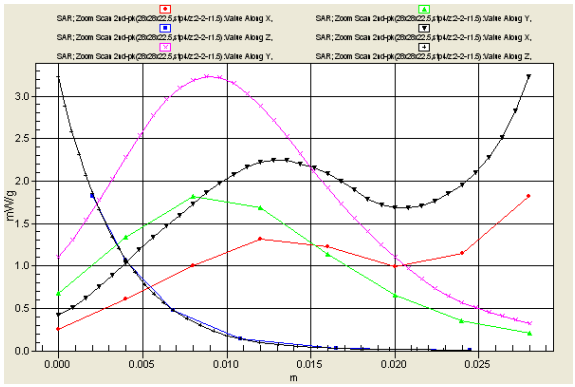
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.8, 3.8, 3.8); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

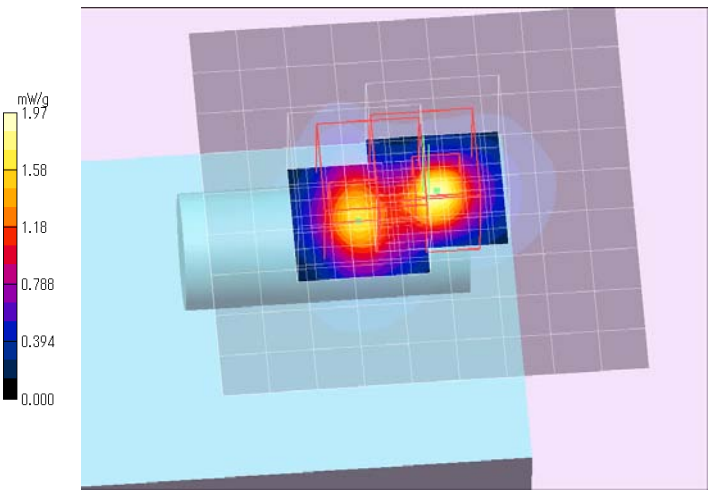
#18, side(frt)-touch,d=0,11n(40HT,mcs0),m5270/
Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.65 mW/g
Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.93 mW/g(1st-pk) / 1.73 mW/g(2nd-pk)
Z Scan (1x1x10) (1st-pk): Measurement grid: dx=20mm, dy=20mm, dz=2mm; Maximum value of SAR (measured) = 1.95 mW/g

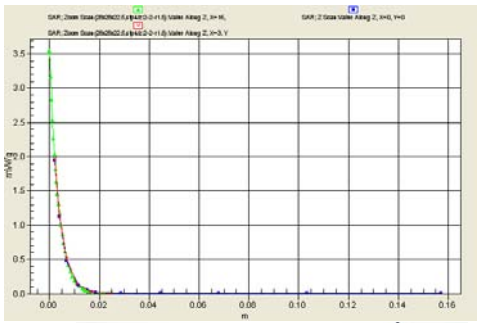
Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube_1st-pk:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 20.0 V/m; Power Drift = -0.071 dB,
Maximum value of SAR (measured) = 1.97 mW/g
Peak SAR (extrapolated) = 3.55 W/kg
SAR(1 g) = 0.973 mW/g (Worst of 5180-5320MHz band); SAR(10 g) = 0.321 mW/g

Zoom Scan (28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube_2nd-pk:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 20.0 V/m; Power Drift = -0.071 dB,
Maximum value of SAR (measured) = 1.82 mW/g
Peak SAR (extrapolated) = 3.23 W/kg
SAR(1 g) = 0.842 mW/g; SAR(10 g) = 0.322 mW/g









Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 139mm
*.ambient: 25.0 deg.C / 48 %RH; liquid temperature: (before) 24.0 deg.C. /(after) 24.1 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 16, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 3b: Change the operation mode / 5180-5320MHz band (W52/53 band)) (cont'd)

Step 3b-5: 11n(40HT)(MCS0), 5310MHz(62ch), Front-touch

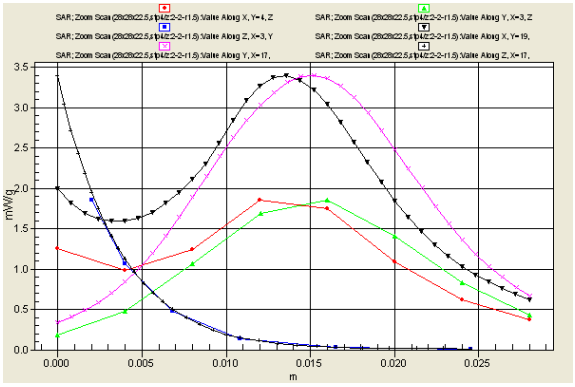
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11n(40HT) (OFDM, MCS0(lowest data rate)); Frequency: 5310 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.3 deg.C): f = 5310 MHz; σ = 5.5 S/m; ε_r = 48.8; ρ = 1000 kg/m^3

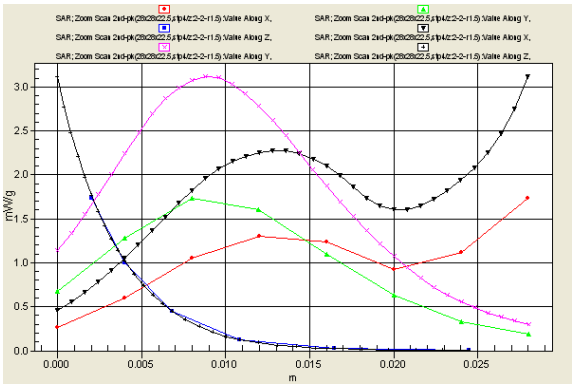
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.8, 3.8, 3.8); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

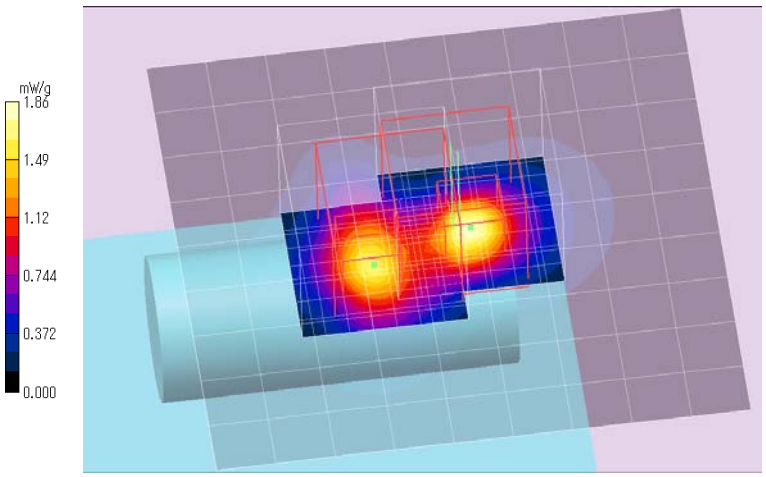
#19, side(frt)-touch,d=0,11n(40HT,mcs0),m5310/
Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.58 mW/g
Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.82 mW/g
Z Scan (1x1x10): Measurement grid: dx=20mm, dy=20mm, dz=2mm; Maximum value of SAR (measured) = 1.79 mW/g

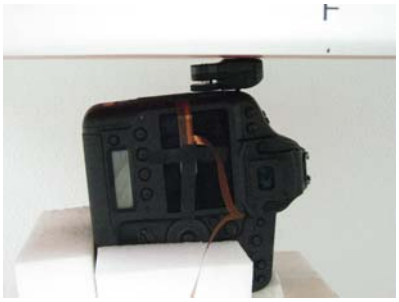
Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube_1st-pk:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 19.6 V/m; Power Drift = -0.116 dB,
Maximum value of SAR (measured) = 1.86 mW/g
Peak SAR (extrapolated) = 3.40 W/kg
SAR(1 g) = 0.926 mW/g; SAR(10 g) = 0.303 mW/g

Zoom Scan (28x28x22.5,stp4/z:2-2-r1.5) (8x8x6)/Cube_2nd-pk:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 19.6 V/m; Power Drift = -0.116 dB,
Maximum value of SAR (measured) = 1.73 mW/g
Peak SAR (extrapolated) = 3.12 W/kg
SAR(1 g) = 0.854 mW/g; SAR(10 g) = 0.320 mW/g









Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 139mm
*.ambient: 25.0 deg.C / 48 %RH; liquid temperature: (before) 24.1 deg.C. /(after) 24.1 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 16, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)

Step 1c: Worst position search / 5745-5825MHz band (W58 band))

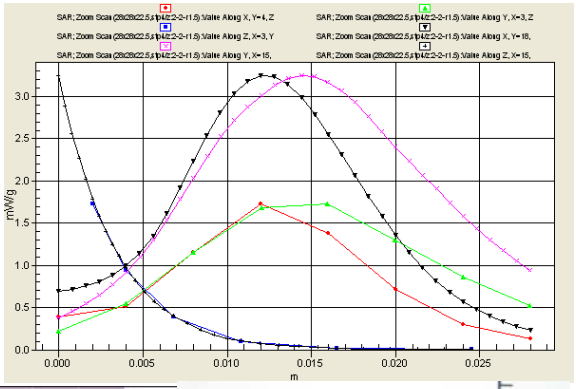
Step 1c-1: Front-touch / default channel(1) (with max. average power of 11a): 5765MHz(153ch), 11a(6Mbps)

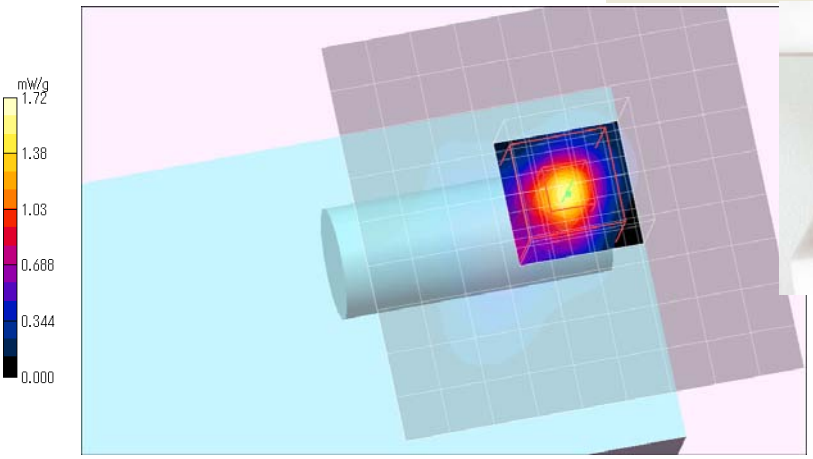
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11a (OFDM, 6Mbps (lowest data rate); Frequency: 5765 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.3 deg.C): f = 5765 MHz; σ = 6.12 S/m; ε_r = 48.1; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#23, side(frt)-touch,d=0,11a(6m),m5765/
Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.31 mW/g
Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.58 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 18.1 V/m; Power Drift = 0.190 dB,
Maximum value of SAR (measured) = 1.72 mW/g
Peak SAR (extrapolated) = 3.25 W/kg
SAR(1 g) = 0.819 mW/g; SAR(10 g) = 0.230 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 139mm
*.ambient: 25.0 deg.C / 48 %RH; liquid temperature: (before) 24.2 deg.C. /(after) 24.2 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 16, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 1c: Worst position search / 5745-5825MHz band (W58 band)) (cont'd)

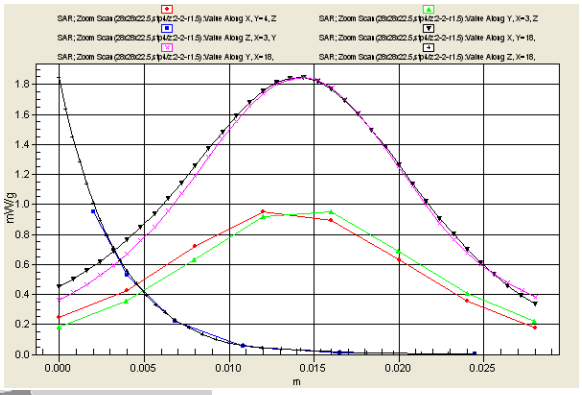
Step 1c-2: Top-touch / default channel(1) (with max. average power of 11a): 5765MHz(153ch), 11a(6Mbps)

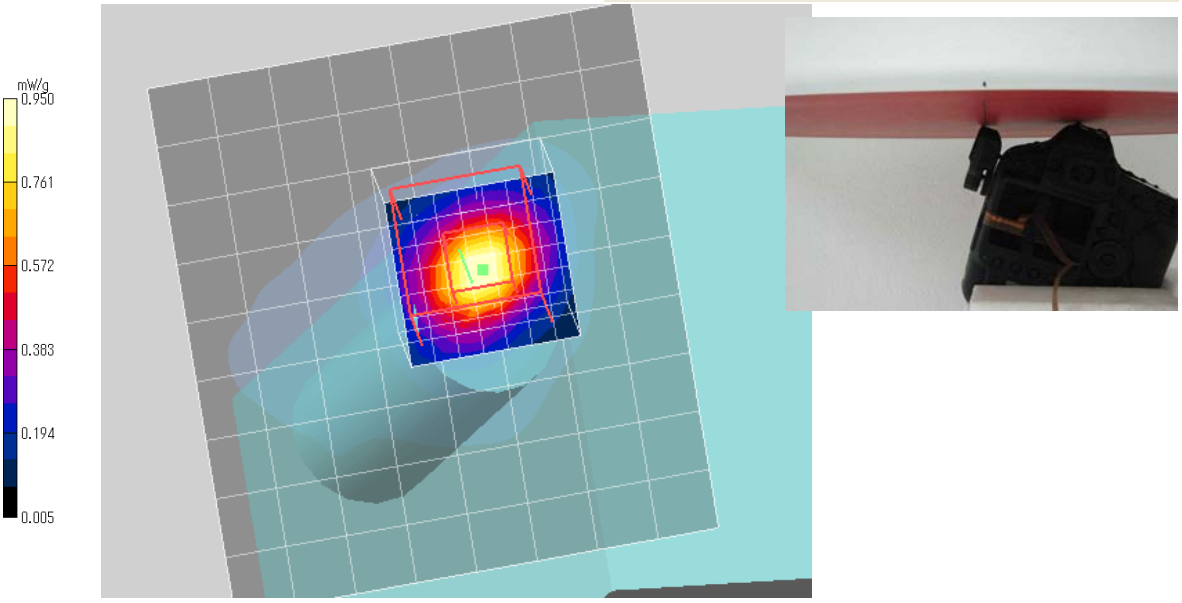
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11a (OFDM, 6Mbps(lowest data rate)); Frequency: 5765 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used(24.4deg.C): f = 5765 MHz; σ = 6.23 S/m; ε_r = 48; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#12,top-touch,d=0,11a(6m),m5765/
Area Scan (9x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.05 mW/g
Area Scan (81x91x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.07 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 12.2 V/m; Power Drift = -0.201 dB,
Maximum value of SAR (measured) = 0.950 mW/g
Peak SAR (extrapolated) = 1.85 W/kg,
SAR(1 g) = 0.487 mW/g; SAR(10 g) = 0.150 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 142mm
*.ambient: 24.8 deg.C / 54 %RH; liquid temperature: (before) 24.0 deg.C. /(after) 24.0 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 11, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 1c: Worst position search / 5745-5825MHz band (W58 band)) (cont'd)

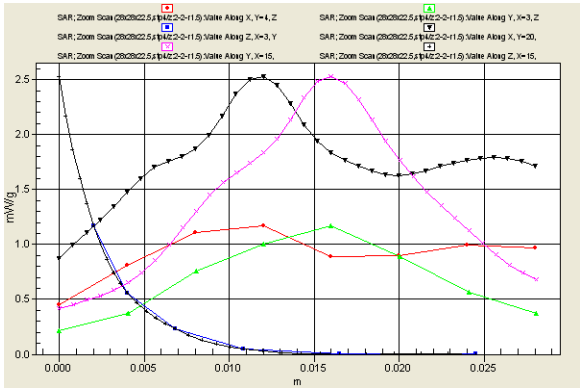
Step 1c-3: Right-touch / default channel(1) (with max. average power of 11a): 5765MHz(153ch), 11a(6Mbps)

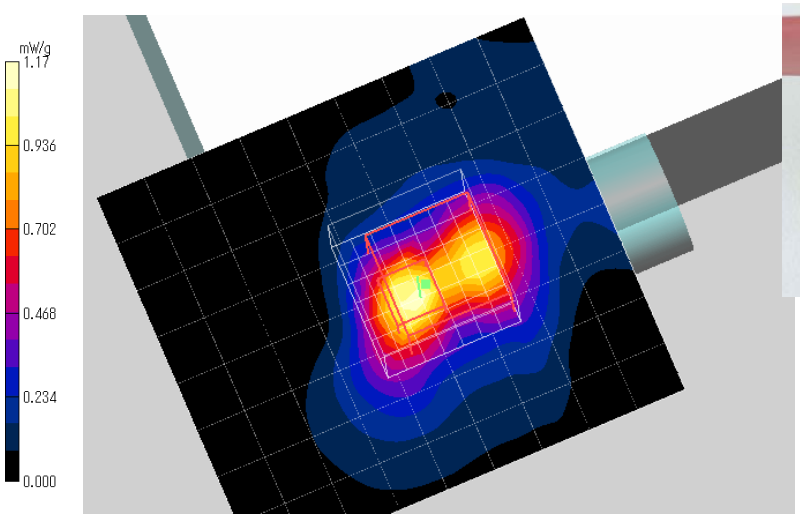
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=2)
Communication System: 11a (OFDM, 6Mbps(lowest data rate)); Frequency: 5765 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used(24.4deg.C): f = 5765 MHz; σ = 6.23 S/m; ε_r = 48; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#13,right-touch,d=0,11a(6m),m5765/
Area Scan (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.12 mW/g
Area Scan (91x81x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.17 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 14.9 V/m; Power Drift = -0.183 dB,
Maximum value of SAR (measured) = 1.17 mW/g
Peak SAR (extrapolated) = 2.53 W/kg,
SAR(1 g) = 0.578 mW/g; SAR(10 g) = 0.213 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 142mm
*.ambient: 24.8 deg.C / 54 %RH; liquid temperature: (before) 24.0 deg.C. /(after) 24.0 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 11, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 1c: Worst position search / 5745-5825MHz band (W58 band)) (cont'd)

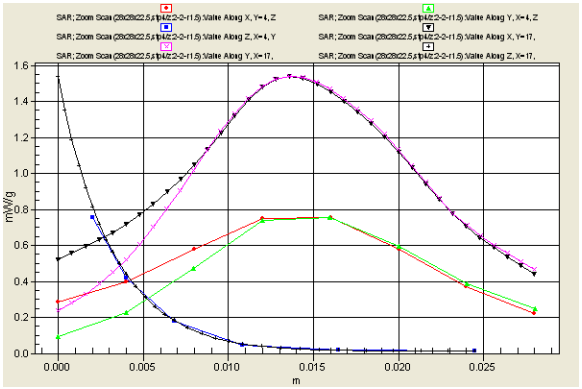
Step 1c-4: Left-touch / default channel(1) (with max. average power of 11a): 5765MHz(153ch), 11a(6Mbps)

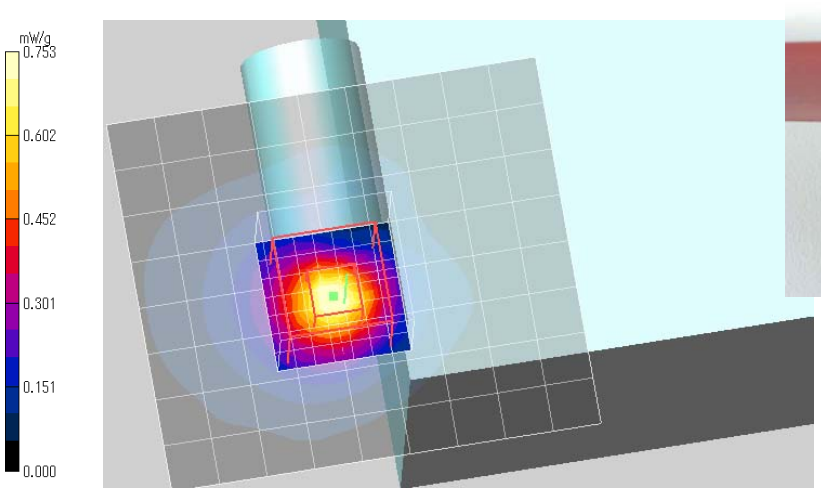
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11a (OFDM, 6Mbps(lowest data rate)); Frequency: 5765 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used(24.4deg.C): f = 5765 MHz; σ = 6.23 S/m; ε_r = 48(24.2deg.C); ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#14,left-touch,d=0,11a(6m),m5765/
Area Scan (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.615 mW/g
Area Scan (91x81x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 0.711 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 9.76 V/m; Power Drift = -0.050 dB,
Maximum value of SAR (measured) = 0.753 mW/g
Peak SAR (extrapolated) = 1.54 W/kg,
SAR(1 g) = 0.401 mW/g; SAR(10 g) = 0.134 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 142mm
*.ambient: 24.9 deg.C / 54 %RH; liquid temperature: (before) 24.0 deg.C. /(after) 24.0 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 11, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)

Step 2c: Change the channel / 5745-5825MHz band (W58 band))

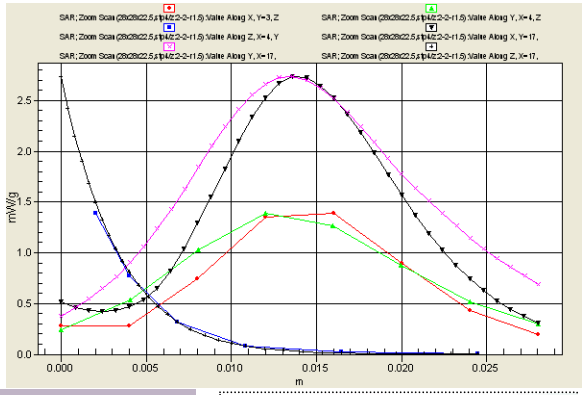
Step 2c-1: default channel(2) (mid.channel of W58 band): 5785MHz(157ch), 11a(6Mbps), Front-touch

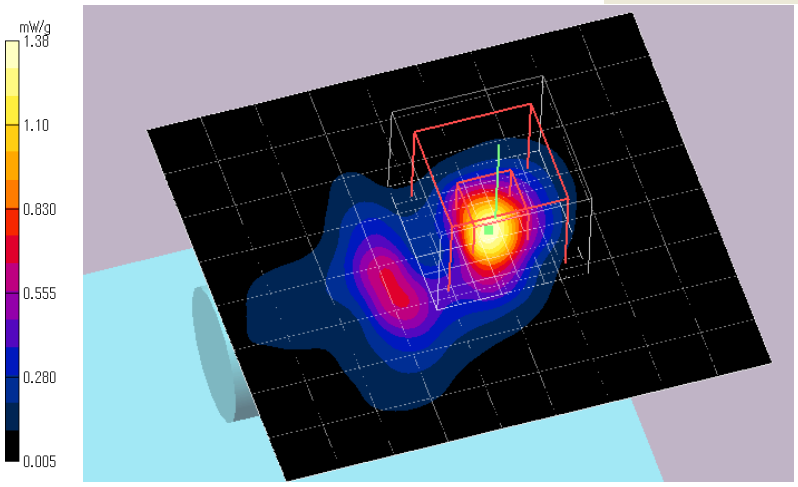
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11a (OFDM, 6Mbps(lowest data rate)); Frequency: 5785 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used(24.2deg.C): f = 5785 MHz; σ = 6.23 S/m; ε_r = 47.9; ρ = 1000 kg/m^3

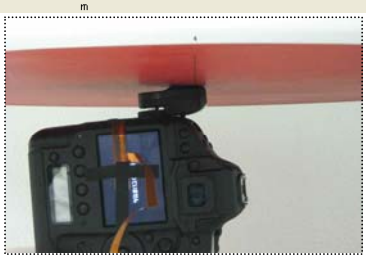
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#10,side(frt)-touch(worst-was),d=0,11a(6m),m5785/
Area Scan (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.32 mW/g
Area Scan (91x81x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.36 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 16.0 V/m; Power Drift = 0.038 dB,
Maximum value of SAR (measured) = 1.38 mW/g
Peak SAR (extrapolated) = 2.74 W/kg,
SAR(1 g) = 0.674 mW/g; SAR(10 g) = 0.184 mW/g







Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 142mm
*.ambient: 24.9 deg.C / 53 %RH; liquid temperature: (before) 23.7 deg.C. /(after) 23.8 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 10, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)
Step 2c: Change the channel / 5745-5825MHz band (W58 band)) (cont'd)

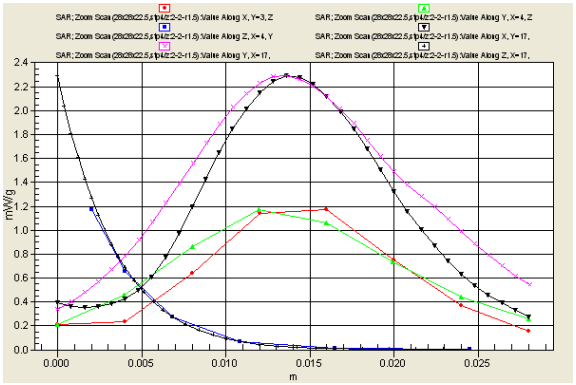
Step 2c-2: default channel(3) (higher channel of W58 band): 5825MHz(165ch), 11a(6Mbps), Front-touch

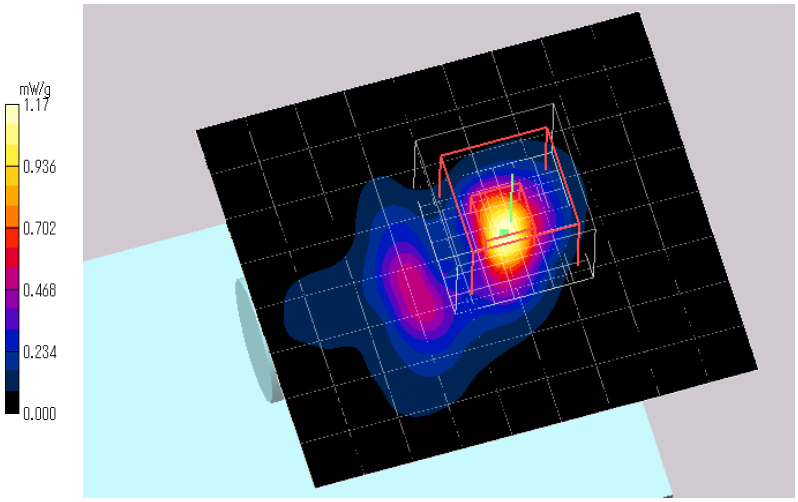
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=2)
Communication System: 11a (OFDM, 6Mbps(lowest data rate)); Frequency: 5825 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used(24.2deg.C): f = 5825 MHz; σ = 6.26 S/m; ε_r = 47.7; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#11,side(frt)-touch(worst-was),d=0,11a(6m),m5825/
Area Scan (10x9x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.11 mW/g
Area Scan (91x81x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.15 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 15.0 V/m; Power Drift = 0.130 dB,
Maximum value of SAR (measured) = 1.17 mW/g
Peak SAR (extrapolated) = 2.30 W/kg,
SAR(1 g) = 0.571 mW/g; SAR(10 g) = 0.156 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 142mm
*.ambient: 24.9 deg.C / 53 %RH; liquid temperature: (before) 23.8 deg.C. /(after) 23.8 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 10, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)

Step 3c: Change the operation model / 5745-5825MHz band (W58 band)) (cont'd)

Step 3c-1: 11n(20HT)(MCS0), 5765MHz(153ch)(with max. average power of 11n(20HT)), Front-touch

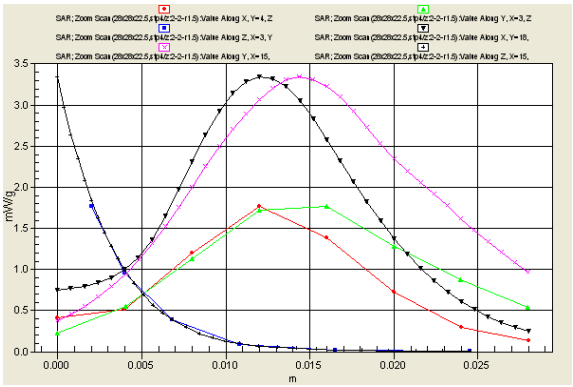
->Worst SAR(1g) of 5745-5825MHz band

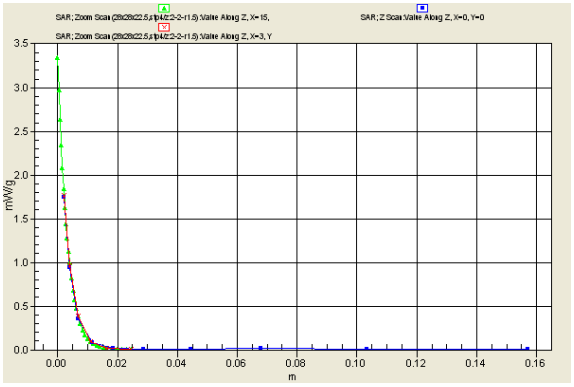
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11n(20HT) (OFDM, MCS0(lowest data rate)); Frequency: 5765 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.3 deg.C): f = 5765 MHz; σ = 6.12 S/m; ε_r = 48.1; ρ = 1000 kg/m^3

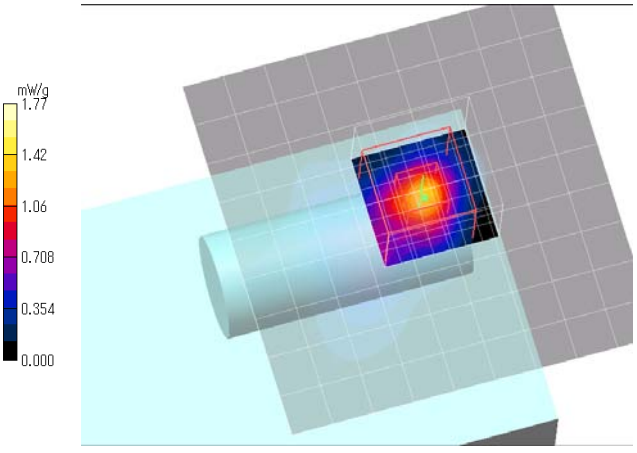
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

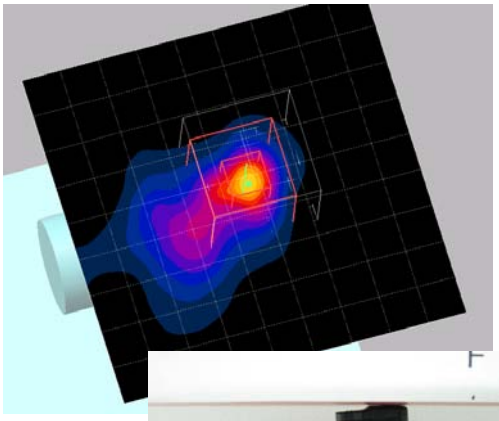
#20, side(frt)-touch,d=0,11n(20HT,mcs0),m5765/
Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.19 mW/g
Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.44 mW/g
Z Scan (1x1x10): Measurement grid: dx=20mm, dy=20mm, dz=2mm; Maximum value of SAR (measured) = 1.74 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 17.9 V/m; Power Drift = 0.2 dB, Maximum value of SAR (measured) = 1.77 mW/g
Peak SAR (extrapolated) = 3.35 W/kg
SAR(1 g) = 0.828 mW/g (Worst of 5745-5825MHz band); SAR(10 g) = 0.233 mW/g









Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 139mm
*.ambient: 25.0 deg.C / 48 %RH; liquid temperature: (before) 24.3 deg.C. /(after) 24.3 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 16, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)

Step 3c: Change the operation model / 5745-5825MHz band (W58 band)) (cont'd)

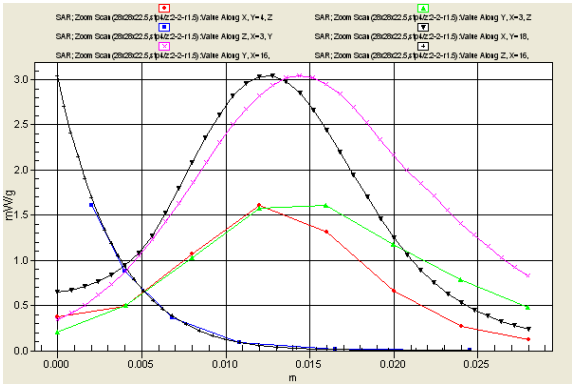
Step 3c-2: 11n(40HT)(MCS0), 5755MHz(151ch)(Lower channel of 11n(40HT)), **Front-touch**

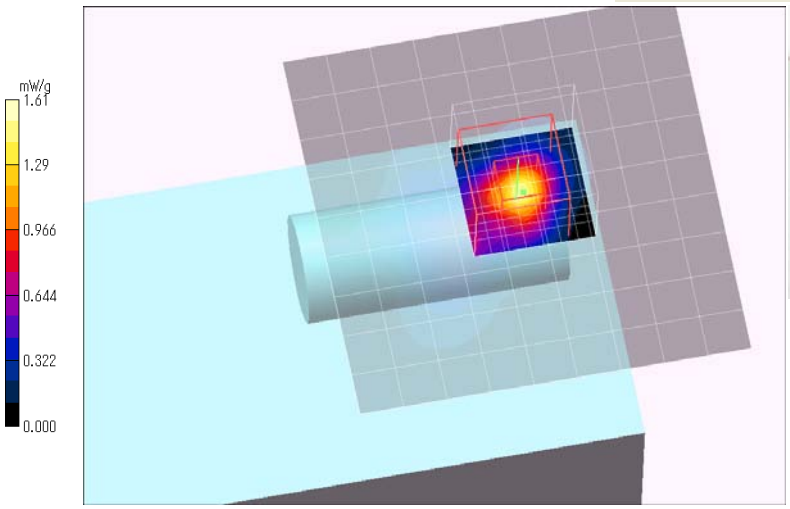
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11n(40HT) (OFDM, MCS0(lowest data rate)); Frequency: 5755 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.3 deg.C): f = 5755 MHz; σ = 6.12 S/m; ε_r = 48.1; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#21, side(frt)-touch,d=0,11n(40HT,mcs0),m5755/
Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.22 mW/g
Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.48 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5) (8x8x6)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 17.8 V/m; Power Drift = 0.081 dB,
Maximum value of SAR (measured) = 1.61 mW/g
Peak SAR (extrapolated) = 3.04 W/kg
SAR(1 g) = 0.767 mW/g; SAR(10 g) = 0.212 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 139mm
*.ambient: 25.0 deg.C / 48 %RH; liquid temperature: (before) 24.3 deg.C. /(after) 24.2 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 16, 2011

Appendix 2-2: Measurement data (Body liquid) (cont'd)

Step 3c: Change the operation model / 5745-5825MHz band (W58 band)) (cont'd)

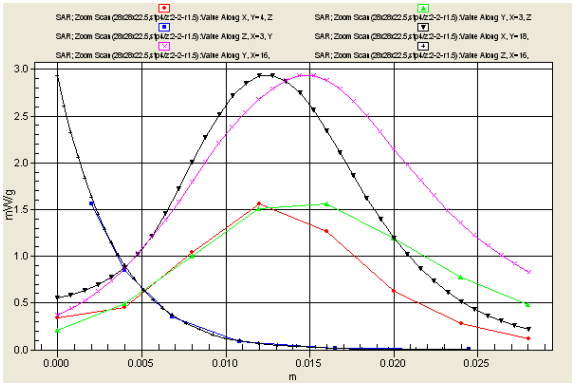
Step 3c-3: 11n(40HT)(MCS0), 5795MHz(159ch)(Higher channel of 11n(40HT)), Front-touch

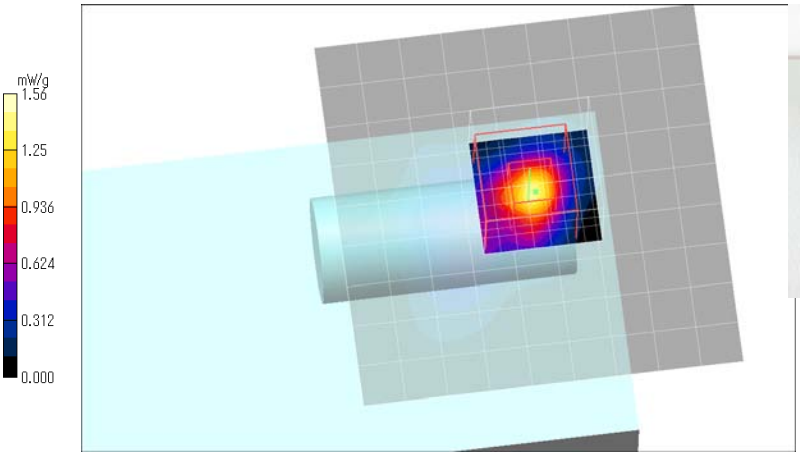
EUT: Wireless Module; Model: CH9-1214; Serial: 06 (Battery=1)
Communication System: 11n(40HT) (OFDM, MCS0(lowest data rate)); Frequency: 5795 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.3 deg.C): f = 5795 MHz; σ = 6.14 S/m; ε_r = 48.1; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

#22, side(frt)–touch,d=0,11n(40HT,mcs0),m5795/
Area Scan (10x10x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.14 mW/g
Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 1.43 mW/g

Zoom Scan(28x28x22.5,stp4/z:2-2-r1.5)(8x8x6)/Cube 0:
Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 17.5 V/m; Power Drift = 0.028 dB,
Maximum value of SAR (measured) = 1.56 mW/g
Peak SAR (extrapolated) = 2.93 W/kg
SAR(1 g) = 0.740 mW/g; SAR(10 g) = 0.207 mW/g





Additional information:
*.position: the distance of EUT to phantom: 0mm (2mm to liquid),, liquid depth: 139mm
*.ambient: 25.0 deg.C / 48 %RH; liquid temperature: (before) 24.2 deg.C. /(after) 24.2 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 16, 2011

APPENDIX 3: Test instruments

Appendix 3-1: Equipment used

Control No.	Instrument	Manufacturer	Model No	Serial No	Test Item	Calibration Date * Interval(month)
COTS-KSAR-01	DASY4	Schmid&Partner Engineering AG	DASY4 V4.7 B80	-	SAR	-
COTS-KSEP-01	Dielectric measurement	Agilent	85070	1	SAR	-
KSAR-01	SAR measurement system	Schmid&Partner Engineering AG	DASY4	1088	SAR	Pre Check
SSRBT-01	SAR robot	Schmid&Partner Engineering AG	RX60B L	F04/5Z71A1/A/01	SAR	2011/02/02 * 12
KDAE-01	Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE4	626	SAR	2011/02/10 * 12
KPB-R02	Dosimetric E-Field Probe	Schmid&Partner Engineering AG	EX3DV4	3540	SAR	2010/07/13 * 12
KSDA-01	Dipole Antenna	Schmid&Partner Engineering AG	D2450V2	822	SAR	2011/01/05 * 24
KSDA-02	Dipole Antenna	Schmid&Partner Engineering AG	D5GHzV2	1070	SAR	2011/02/16 * 24
KPFL-01	Flat Phantom	Schmid&Partner Engineering AG	Oval flat phantom ELI 4.0	1059	SAR	Pre Check
SSNA-01	Network Analyzer	Agilent	8753ES	US39171777	SAR	2011/01/04 * 12
KEPP-01	Dielectric probe	Agilent	8710-2036	2540	SAR	2011/01/16 * 12
KSG-08	Signal Generator	Rohde & Schwarz	SMT06	100763	SAR	2010/06/11 * 12
KPA-12	RF Power Amplifier	MILMEGA	AS2560-50	1018582	SAR	Pre Check
KCPL-07	Directional Coupler	Pulsar Microwave Corp.	CCS30-B26	0621	SAR	Pre Check
KPM-06	Power Meter	Rohde & Schwarz	NRVD	101599	SAR	2010/09/03 * 12
KIU-08	Power sensor	Rohde & Schwarz	NRV-Z4	100372	SAR(Pf)	2010/09/03 * 12
KIU-09	Power sensor	Rohde & Schwarz	NRV-Z4	100371	SAR(dipl)	2010/09/03 * 12
KAT10-P1	Attenuator	Weinschel	24-10-34	BY5927	SAR	2011/02/17 * 12
KAT20-P1	Attenuator	TME	SFA-01AXPJ	-	SAR	2011/02/17 * 12
KRU-01	Ruler(300mm)	Shinwa	13134	-	SAR	2011/03/28 * 12
KRU-02	Ruler(150mm,L)	Shinwa	12103	-	SAR	2011/03/28 * 12
KRU-04	Ruler(300mm)	Shinwa	13134	-	SAR	2010/05/13 * 12
KRU-05	Ruler(100x50mm,L)	Shinwa	12101	-	SAR	2010/05/13 * 12
KOS-13	Digtal thermometer	HANNA	Checktemp-2	KOS-13	SAR	2011/01/19 * 12
KOS-14	Thermo-Hygrometer data logger	SATO KEIRYOKI	SK-L200THIIα / SK-LTHIIα-2	015246/08169	SAR	2011/01/19 * 12
SOS-11	Humidity Indicator	A&D	AD-5681	4063424	SAR	2011/02/23 * 12
KPM-08	Power meter	Anritsu	ML2495A	6K00003356	Ant.pwr	2010/09/22 * 12
KPSS-04	Power sensor	Anritsu	MA2411B	012088	Ant.pwr	2010/09/22 * 12
KAT10-S3	Attenuator	Agilent	8490D 010	50924	Ant.pwr	2010/07/16 * 12
KCC-D23	Microwave cable	Hirose Electric	U.FL-2LP-066J1-A-(200)	-	Ant.pwr	Pre Check
KSA-10	Spectrum Analyzer	Advantest	R3265A	45060268	SAR(moni.)	2011/01/17 * 12
KSLM245-01	Tissue simulation liqud (2450MHz,body)	Schmid&Partner Engineering AG	SL AAM 245	-	SAR	(Daily check) Target value ±5%
KSLM500-R1	Tissue simulation liqud (3.5-5.9GHz,body)	Schmid&Partner Engineering AG	SL AAM 501 AA	110111-1	SAR	(Daily check) Target value ±5%
No.7 Shielded room	SAR shielded room (2.76m(W)x3.76m(D)x2.4m(H))	TDK	-	-	SAR	*(Daily check) Ambient noise: < 12mW/kg*

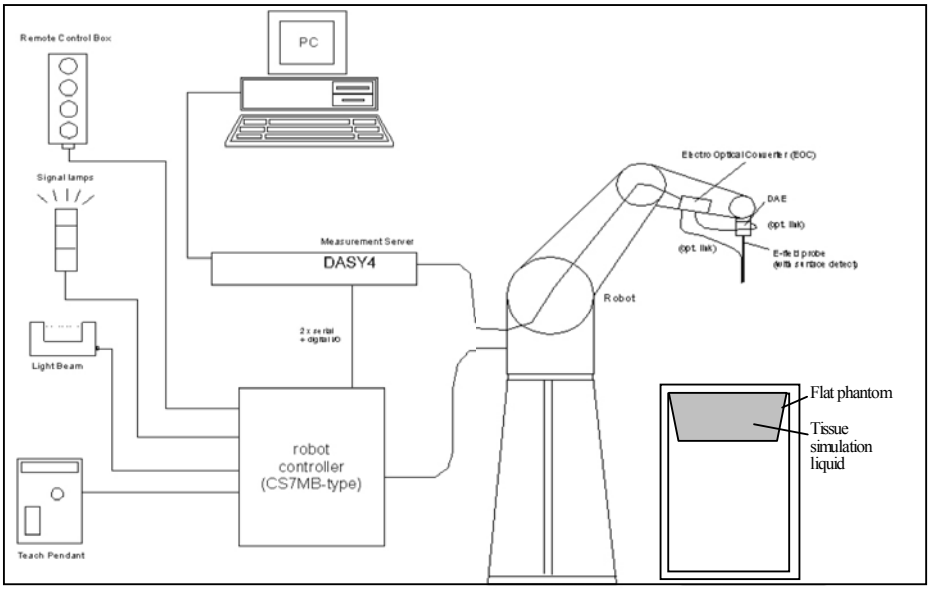
The expiration date of calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.
All equipment is calibrated with valid calibrations. Each measurement data is traceable to the national or international standards.

[Test Item] SAR: Specific Absorption Rate, Ant.pwr: Antenna terminal conducted power

Appendix 3-2: 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 probes 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 +/-10%. The spherical isotropy was evaluated with the procedure described in [3] and found to be better than +/-0.25 dB.

Appendix 3-3: 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 XP.
8	DASY4 software.
9	Remote control with teaches pendant and additional circuitry for robot safety such as warning lamps, etc.
10	The phantom.
11	The device holder for EUT. (low-loss dielectric palette)
12	Tissue simulating liquid mixed according to the given recipes.
13	Validation dipole kits allowing to validate the proper functioning of the system.

Appendix 3-4: System components

1) EX3DV4 Probe Specification

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

Calibration (S/N 3540):
Basic broad band calibration in air.
Conversion Factors(Head and Body): 2450, 2600, 5200, 5300, 5500, 5600, 5800MHz

Frequency:
10 MHz to > 6GHz, Linearity: ±0.2 dB (30MHz to 6GHz)

Directivity:
±0.3 dB in HSL (rotation around probe axis)
±0.5 dB in tissue material (rotation normal to probe axis)

Dynamic Range:
10μW/g to > 100 mW/g; Linearity: ±0.2 dB (noise: typically < 1μW/g)

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

Application:
High precision 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-filed Probe

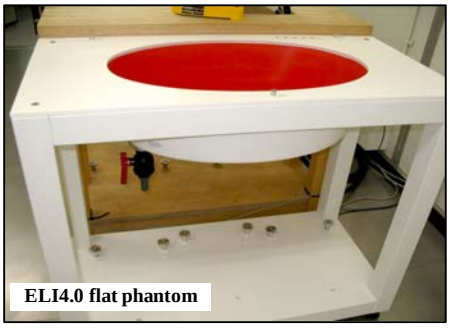
2) Phantom (Flat type)

Construction:
A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom position and measurement grids by manually teaching three points with the robot.

Shell Thickness:
Bottom plate: 2 ±0.2mm

Dimensions:
Bottom elliptical: 600×400mm, Depth: 190mm

Filling Volume:
Approx. 30 liters



ELI4.0 flat phantom

Appendix 3-5: Test system specification

RX60L Robot

•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	:	Schmid & 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	:	1µV to > 200mV (16bit resolution and two range settings: 4mV, 400mV)			
•Input Offset voltage	:	< 1µV (with auto zero)			
•Input Resistance	:	200MΩ	•Battery Power	:	> 10hr of operation (with two 9V battery)
•Dimension :		60×60×68mm	•Manufacture	:	Schmid & Partner Engineering AG

Software

•Item	:	Dosimetric Assessment System DASY4			
•Software version No.	:	DASY4, V4.7 B80	•Manufacture / Origin	:	Schmid & Partner Engineering AG

E-Field Probe

•Model	:	EX3DV4 (sn: 3540)	•Construction	:	Symmetrical design with triangular core
•Frequency :		10MHz to 6GHz	•Linearity :		±0.2dB (30MHz to 6GHz)
•Manufacture	:	Schmid & Partner Engineering AG			

Phantom

•Type	:	ELI 4.0 oval flat phantom	•Shell Material :	Fiberglass
•Shell Thickness	:	Bottom plate: 2 ±0.2mm	•Dimensions :	Bottom elliptical: 600×400mm, Depth: 190mm
•Manufacture	:	Schmid & Partner Engineering AG		

Appendix 3-6: Simulated tissue composition

Ingredient	Mixture (%)
	Body 2450MHz (type: SL AAM 245)
Water 52-	75 %
$C_8H_{18}O_3$(Diethylene glycol monobutyl ether (DGBE))	25-48%
NaCl <	1.0%
Manufacture Schm	id&Partner Engineering AG

Ingredient	Mixture (%)
	Body 5800MHz (type: SL AAM 501 AA)
Water 60-	80 %
Esters, Emulsifiers, Inhibitors	20-40 %
Sodium salt	0-1.5 %
Manufacture Schm	id&Partner Engineering AG

Appendix 3-7: Simulated tissue parameter confirmation

The dielectric parameters were checked prior to assessment using the 85070E dielectric probe kit.
The dielectric parameters measurement is reported in each correspondent section.

Dielectric parameter measurement results

Date	Freq. [MHz]	Ambient Temp [deg.C.]	Ambient Humidity [%RH]	Liq.T.[deg.C.] Before	Liq.T.[deg.C.] After	Liquid Depth [mm]	Parameters	Target value #1:Std. (*1)	Target value #2:Cal. (*2)	Measured	Deviation for #1 (Std.)[%]	Limit [%]	Deviation for #2 (Cal.)[%]	Limit [%] (*2)
May 10, 2011	5200	24.3	52	24.2	24.2	(142)	Relative permittivity: εr [-]	**49.01**	**47.2**	49.07	**+0.1**	±5	**+4.0**	±6
							Conductivity: σ [S/m]	**5.299**	**5.37**	5.416	**+2.2**	±5	**+0.9**	±6
	5800						Relative permittivity: εr [-]	**48.2**	**46.2**	47.88	**-0.7**	±5	**+3.6**	±6
							Conductivity: σ [S/m]	**6.00**	**6.16**	6.237	**+4.0**	±5	**+1.3**	±6
May 11, 2011	5800	24.	9 54	23.9	24.0	(142)	Relative permittivity: εr [-]	**48.2**	**46.2**	48.03	**-0.6**	±5	**+3.7**	±6
							Conductivity: σ [S/m]	**6.00**	**6.16**	6.250	**+4.2**	±5	**+1.5**	±6
May 16, 2011	5200	24.3	52	24.2	24.2	(139)	Relative permittivity: εr [-]	**49.01**	**47.2**	49.06	**+0.1**	±5	**+3.9**	±6
							Conductivity: σ [S/m]	**5.299**	**5.37**	5.292	**-0.1**	±5	**-1.5**	±6
	5800						Relative permittivity: εr [-]	**48.2**	**46.2**	48.03	**-0.3**	±5	**+4.0**	±6
							Conductivity: σ [S/m]	**6.00**	**6.16**	6.142	**+2.4**	±5	**-0.3**	±6
May 11, 2011	2450	24.9	54	23.9	24.0	(159)	Relative permittivity: εr [-]	**52.7**	**52.5**	50.41	**-4.4**	±5	**-4.0**	±6
							Conductivity: σ [S/m]	**1.95**	**1.96**	1.909	**-2.1**	±5	**-2.6**	±6
May 12, 2011		24.9	54	23.9	24.0	(159)	Relative permittivity: εr [-]	**52.7**	**52.5**	50.23	**-4.7**	±5	**-4.3**	±6
							Conductivity: σ [S/m]	**1.95**	**1.96**	1.919	**-1.6**	±5	**-2.1**	±6

*1. The target value is a parameter defined in OET65, Supplement C.
*2 For 5200MHz and 5800MHz, the target value and limit are parameter defined in the calibration data sheet of D5GHzV2 (sn:1070) dipole calibrated by Schmid & Partner Engineering AG (Certification No. D5GHzV2-1070_Feb11, the data sheet was filed in this report.).
For 2450MHz, the target value and limit are parameter defined in the calibration data sheet of D2450V2 (sn:822) dipole calibrated by Schmid & Partner Engineering AG (Certification No. D2450V2-822_Jan11, the data sheet was filed in this report.).

***. Decision on Simulated Tissues of 5200MHz**

In the current standards (e.g., IEEE 1528, 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 5000 to 5800 MHz were obtained using linear interpolation. Furthermore, dielectric parameters for the frequencies above 5800MHz were obtained using linear extrapolation. Therefore the dielectric parameters of 5200MHz (the frequency for the validation) and other SAR tested frequencies in listed below were decided as following.

Standard and interpolated dielectric parameters for head and body tissue simulating liquid in the frequency range 3000 to 5825MHz.

f (MHz)	Head Tissue εr	Head Tissue σ [S/m]	Body Tissue εr	Body Tissue σ [S/m]	Reference
3000	**38.5**	**2.40**	**52.0**	**2.73**	**Standard**
5800	**35.3**	**5.27**	**48.2**	**6.00**	**Standard**
5190 -		-	49.03	5.288	Interpolated
5200 -		-	49.01	5.299	Interpolated
5230 -		-	48.97	5.334	Interpolated
5240 -		-	48.96	5.346	Interpolated
5260 -		-	48.93	5.369	Interpolated
5270 -		-	48.92	5.381	Interpolated
5310 -		-	48.87	5.428	Interpolated
5320 -		-	48.85	5.439	Interpolated
5755 -		-	48.26	5.947	Interpolated
5765 -		-	48.25	5.959	Interpolated
5785 -		-	48.22	5.982	Interpolated
5795 -		-	48.21	5.994	Interpolated
5825 -		-	48.17	6.029	Extrapolated

Appendix 3-8: System validation data

Prior to the SAR assessment of EUT, 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.

System validation results

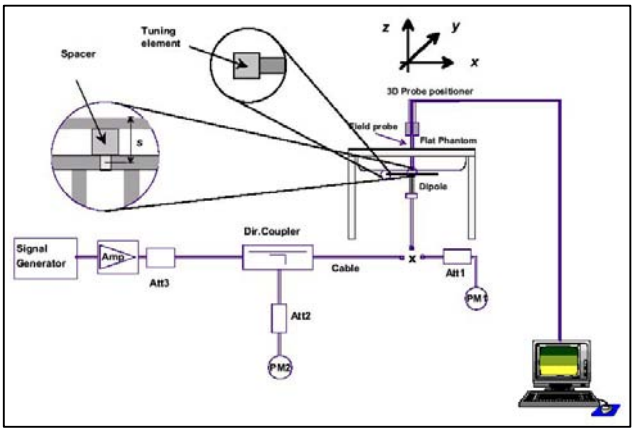
Date	Freq. [MHz]	Liquid Type	Ambient		Liquid Temp. [deg.C.]			Liquid Depth [mm]	Permittivity measured εr [-]	Conductivity measured σ [S/m]]	Power drift [dB]	System dipole validation target & measured			
												SAR 1g [W/kg] (at 1W)		Deviation [%]	Limit [%]
			Temp [deg.C.]	Humidity [%RH]	Check	Before	After					Target value	Measured (*3)		
May10, 2011	5200 B	ody 2	4.4	52	24.2	24.0	23.9	142	49.1	5.42	-0.043	**77.1**(*1)	77.9 (7.79 (at 100mW))	**+1.0**	±10
	5800 B	ody 2	4.4	52	24.2	23.9	23.8	142	47.9	6.24	0.075	**72.4**(*1)	77.1 (7.71 (at 100mW))	**+6.5**	±10
May11, 2011	5800 B	ody 2	4.4	54	24.4	24.2	24.1	142	47.9	6.25	0.097	**72.4**(*1)	79.1 (7.91 (at 100mW))	**+9.3**	±10
May16, 2011	5200 B	ody 2	5.0	46	24.3	24.3	24.3	139	49.1	5.29	-0.081	**77.1**(*1)	74.4 (7.44 (at 100mW))	**-3.5**	±10
	5800 B	ody 2	5.0	46	24.3	24.3	24.2	139	48	6.14	0.006	**72.4**(*1)	77.1 (7.71 (at 100mW))	**+6.5**	±10
May11, 2011	2450 B	ody 2	5.0	54	24.4	23.8	23.7	159	50.4	1.91	-0.045	**50.9**(*2)	47.64 (11.9 (at 250mW))	**-6.5**	±10
May12, 2011	2450 B	ody 2	4.7	54	23.8	23.4	23.4	159	50.2	1.92	0.10	**50.9**(*2)	47.2 (11.8 (at 250mW))	**-7.3**	±10

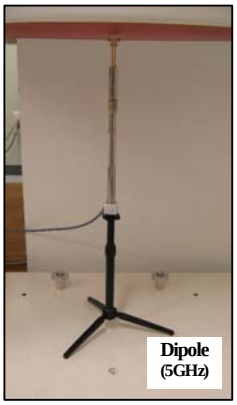
Note: Refer to Appendix 3-10 Validation measurement data for the above result representation in plot data.

*1. The target value is a parameter defined in the calibration data sheet of D5GHzV2(sn:1070) dipole calibrated by Schmid & Partner Engineering AG (Certification No. D5GHzV2-1070_Feb11, the data sheet was filed in this report.).

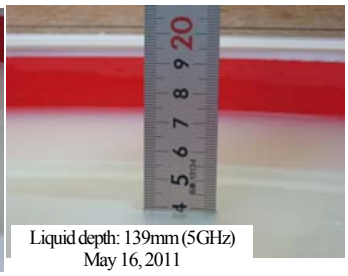
*2. The target value is a parameter defined in the calibration data sheet of D2450V2 (sn:822) dipole calibrated by Schmid & Partner Engineering AG (Certification No. D2450V2-822_Jan11, the data sheet was filed in this report.).
*. We performed the system validation based on FCC requirement, "The 1-g or 10-g SAR values measured using the required tissue dielectric parameters should be within 10% of manufacturer calibrated dipole SAR values. However these manufacturer calibrated dipole target SAR values should be substantially similar to those defined in IEEE Standard 1528." and FCC permits "SAR system verification with the actual liquid used for EUT's SAR measurement, should be the default operating procedures." We confirmed the this dipole manufacture's validation data for head is within 5% against IEEE Standard 1528 (manufacture's cal.: 54.4W/kg (+3.8% vs. std.: 52.4W/kg). so we can only use Body liquid validation data for our system verification

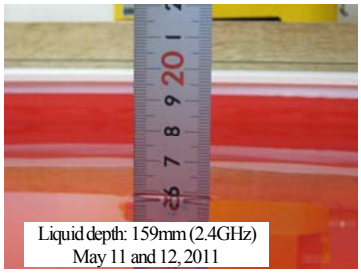
*3. The measurement value was normalized to 1W forward power.






Liquid depth: 142mm (5GHz)
May 10 and 11, 2011


Liquid depth: 139mm (5GHz)
May 16, 2011


Liquid depth: 159mm (2.4GHz)
May 11 and 12, 2011

Test setup for the system performance check

Appendix 3-9: Validation uncertainty

Uncertainty of system check setup	Under 3GHz	
	1g SAR	10g SAR
combined measurement uncertainty of the measurement system (k=1)	± 9.9%	± 9.6%
expanded uncertainty (k=2)	± 19.9%	± 19.3%

	Error Description	Uncertainty Value	Probability distribution	Divisor	ci (1g)	ci (10g)	ui (1g)	ui (10g)	vi, veff
A	**Measurement System**						(std. uncertainty)	(std. uncertainty)	
1	Probe calibration	±5.9 %	Normal	1	1	1	±5.9 %	±5.9 %	∞
2	Axial isotropy ±4	.7 %	Rectangular	√3	0.7	0.7	±1.9 %	±1.9 %	∞
3	Hemispherical isotropy (flat, <5°)	±2.6 %	Rectangular	√3	0.7	0.7	±1.1 %	±1.1 %	∞
4	Boundary effects	±1.0 %	Rectangular	√3	1	1	±1.2 %	±1.2 %	∞
5	Probe linearity	±4.7 %	Rectangular	√3	1	1	±2.7 %	±2.7 %	∞
6	System detection limit	±1.0 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
7	System readout electronics	±0.3 %	Normal	1	1	1	±0.3 %	±0.3 %	∞
8	Response time	±0.0 %	Rectangular	√3	1	1	±0.0 %	±0.0 %	∞
9	Integration time	±0.0 %	Rectangular	√3	1	1	±0.0 %	±0.0 %	∞
10	RF ambient - noise	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
11	RF ambient - reflections	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
12	Probe positioner mechanical tolerance	±0.4 %	Rectangular	√3	1	1	±0.2 %	±0.2 %	∞
13	Probe positioning with respect to phantom shell	±2.9 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
14	Max.SAR evaluation	±1.0 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
B	**Dipole**								
15	Dipole axis to liquid distance	±2.0 %	Rectangular	√3	1	1	±1.2 %	±1.2 %	∞
16	Input power and SAR drift measurement	±4.7 %	Rectangular	√3	1	1	±4.7 %	±4.7 %	3
C	**Phantom and Setup**								
17	Phantom uncertainty	±4.0 %	Rectangular	√3	1	1	±2.3 %	±2.3 %	∞
18	Liquid conductivity (target)	±5.0 %	Rectangular	√3	0.64	0.43	±1.8 %	±1.2 %	∞
19	Liquid conductivity (meas.)	±2.9 %	Normal	1	0.64	0.43	±1.9 %	±1.2 %	3
20	Liquid permittivity (target)	±5.0 %	Rectangular	√3	0.6	0.49	±1.7 %	±1.4 %	∞
21	Liquid permittivity (meas.)	±2.9 %	Normal	1	0.6	0.49	±1.7 %	±1.4 %	3
	Combined Standard Uncertainty						**±9.9** %	**±9.6** %	88
	Expanded Uncertainty (k=2)						**±19.9** %	**±19.3** %	

*. This measurement uncertainty budget is suggested by IEEE 1528 and determined by Schmid & Partner Engineering AG.[6]

Uncertainty of SAR measurement system /Validation	5~6 GHz	
	1g SAR	10g SAR
combined measurement uncertainty of the measurement system (k=1)	± 12.1%	± 11.9%
expanded uncertainty (k=2)	± 24.2%	± 23.7%

	Error Description	Uncertainty Value	Probability distribution	Divisor	ci (1g)	ci (10g)	ui (1g)	ui (10g)	vi, veff
A	**Measurement System**						(std. uncertainty)	(std. uncertainty)	
1	Probe calibration	±6.8 %	Normal	1	1	1	±6.8 %	±6.8 %	∞
2	Axial isotropy	±4.7 %	Rectangular	√3	0.7	0.7	±1.9 %	±1.9 %	∞
3	Hemispherical isotropy (*flat phantom, <5°)	±2.6 %	Rectangular	√3	0.7	0.7	±1.1 %	±1.1 %	∞
4	Boundary effects	±2.0 %	Rectangular	√3	1	1	±1.2 %	±1.2 %	∞
5	Probe linearity	±4.7 %	Rectangular	√3	1	1	±2.7 %	±2.7 %	∞
6	System detection limit	±1.0 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
7	System readout electronics	±0.3 %	Normal	1	1	1	±0.3 %	±0.3 %	∞
8	Response time	±0.8 %	Rectangular	√3	1	1	±0 %	±0 %	∞
9	Integration time	±2.6 %	Rectangular	√3	1	1	±0 %	±0 %	∞
10	RF ambient - noise	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
11	RF ambient - reflections	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
12	Probe positioner mechanical tolerance	±0.8 %	Rectangular	√3	1	1	±0.5 %	±0.5 %	∞
13	Probe positioning with respect to phantom shell	±9.9 %	Rectangular	√3	1	1	±5.7 %	±5.7 %	∞
14	Max.SAR evaluation	±4.0 %	Rectangular	√3	1	1	±2.3 %	±2.3 %	∞
B	**Dipole**								
15	Dipole axis to liquid distance	±2.0 %	Rectangular	√3	1	1	±1.2 %	±1.2%	∞
16	Input power and SAR drift measurement	±4.7 %	Normal	1	1	1	±4.7 %	±4.7 %	∞
C	**Phantom and Setup**								
17	Phantom uncertainty	±4.0 %	Rectangular	√3	1	1	±2.3 %	±2.3 %	∞
18	Liquid conductivity (target)	±5.0 %	Rectangular	√3	0.64	0.43	±1.8 %	±1.2 %	∞
19	Liquid conductivity (meas.)	±3.0 %	Normal	1	0.64	0.43	±1.9 %	±1.3 %	∞
20	Liquid permittivity (target)	±5.0 %	Rectangular	√3	0.6	0.49	±1.7 %	±1.4 %	∞
21	Liquid permittivity (meas.)	±3.2 %	Normal	1	0.6	0.49	±1.9 %	±1.6 %	∞
	Combined Standard Uncertainty						**±12.1** %	**±11.9** %	∞
	Expanded Uncertainty (k=2)						**±24.2** %	**±23.7** %	

*. This measurement uncertainty budget is suggested by Schmid & Partner Engineering AG. [6]

Appendix 3-10: Validation measurement data

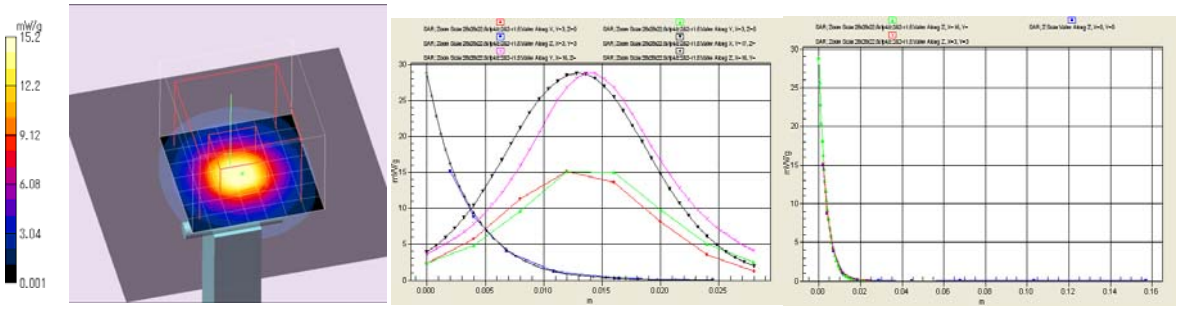
(May 10, 2011) 5200MHz system check (Body) / Forward conducted power: 100mW

EUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1070
Communication System: CW; Frequency: 5200 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used(24.2deg.C): f = 5200 MHz; σ = 5.42 S/m; ε_r = 49.1; ρ = 1000 kg/m^3

DASY4 Configuration: - Probe: EX3DV4 - SN3540; ConvF(4.16, 4.16, 4.16); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Area Scan:60x60,stp10 (61x61x1): Measurement grid: dx=10mm, dy=10mm, Maximum value of SAR (interpolated) = 16.2 mW/g
Z Scan (1x1x10, z:2-2-r1.5): Measurement grid: dx=20mm, dy=20mm, dz=2mm, Maximum value of SAR (measured) = 15.0 mW/g

Zoom Scan:28x28x22.5stp4/z:2&2-r1.5 (8x8x6)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 60.2 V/m; Power Drift = -0.043 dB, Maximum value of SAR (measured) = 15.2 mW/g
Peak SAR (extrapolated) = 28.8 W/kg (-7.3% vs. speag.cal.=31.1 W/kg)
SAR(1 g) = 7.79 mW/g (+1.0% vs.speag-cal.=7.71mW/g); SAR(10 g) = 2.21 mW/g



Additional information:
*.position: the distance of dipole to phantom: 8mm (10mm to liquid), liquid depth: 142mm
*.ambient: 24.4 deg.C / 52 %RH; liquid temperature: (before) 24.0 deg.C. /(after) 23.9 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / / Tested date: May 10, 2011

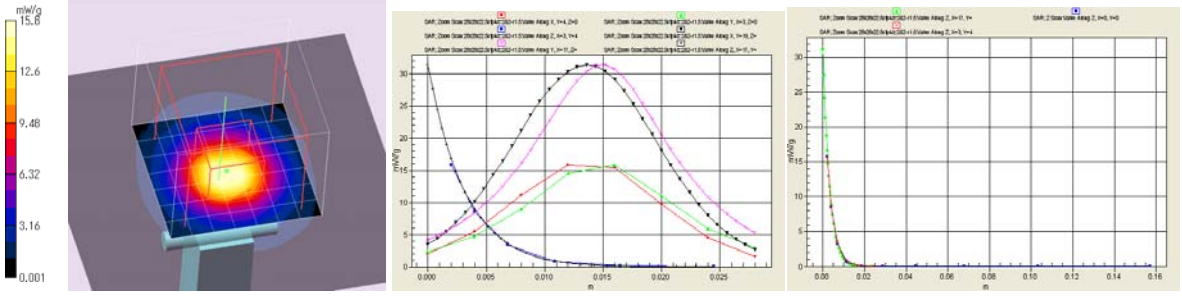
5800MHz system check (Body) / Forward conducted power: 100mW

EUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1070
Communication System: CW; Frequency: 5800 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used(24.2deg.C): f = 5800 MHz; σ = 6.24 S/m; ε_r = 47.9; ρ = 1000 kg/m^3

DASY4 Configuration: - Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Area Scan:60x60,stp10 (61x61x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 16.8 mW/g
Z Scan (1x1x10): Measurement grid: dx=20mm, dy=20mm, dz=2mm; Maximum value of SAR (measured) = 15.7 mW/g

Zoom Scan:28x28x22.5stp4/z:2&2-r1.5 (8x8x6)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 56.8 V/m; Power Drift = 0.075 dB, Maximum value of SAR (measured) = 15.8 mW/g
Peak SAR (extrapolated) = 31.4 W/kg (-4.9% vs. speag.cal.=33 W/kg)
SAR(1 g) = 7.71 mW/g (+6.5% vs.speag cal.=7.24mW/g); SAR(10 g) = 2.17 mW/g



Additional information:
*.position: the distance of dipole to phantom: 8mm (10mm to liquid), liquid depth: 142mm
*.ambient: 24.4 deg.C / 52 %RH; liquid temperature: (before) 23.9 deg.C. /(after) 23.8 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 10, 2011

Appendix 3-10: Validation measurement data (cont'd)

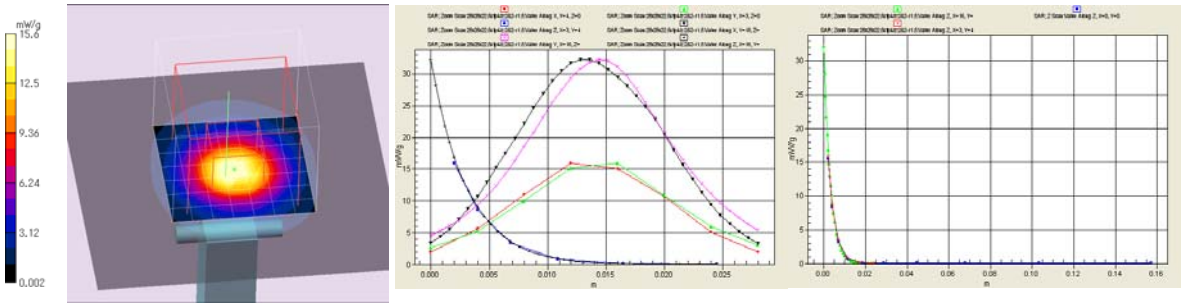
(May 11, 2011) 5800MHz system check (Body) / Forward conducted power: 100mW

EUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1070
Communication System: CW; Frequency: 5800 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.4 deg.C): f = 5800 MHz; σ = 6.25 S/m; ε_r = 47.9; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Area Scan:60x60,stp10 (61x61x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 16.9 mW/g
Z Scan (1x1x10): Measurement grid: dx=20mm, dy=20mm, dz=2mm; Maximum value of SAR (measured) = 15.6 mW/g

Zoom Scan:28x28x22.5stp4/z:2&2-r1.5 (8x8x6) /Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 56.8 V/m; Power Drift = 0.097 dB, Maximum value of SAR (measured) = 15.9 mW/g,
Peak SAR (extrapolated) = 32.2 W/kg (-2.4% vs.speag cal.=33W/kg)
SAR(1 g) = 7.91 mW/g (+9.3% vs.speag cal.=7.24mW/g); SAR(10 g) = 2.26 mW/g



Additional information:
*.position: the distance of dipole to phantom: 8mm (10mm to liquid), liquid depth: 142mm
*.ambient: 24.8 deg.C / 54 %RH; liquid temperature: (before) 24.2 deg.C. /(after) 24.1 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 11, 2011

Appendix 3-10: Validation measurement data (cont'd)

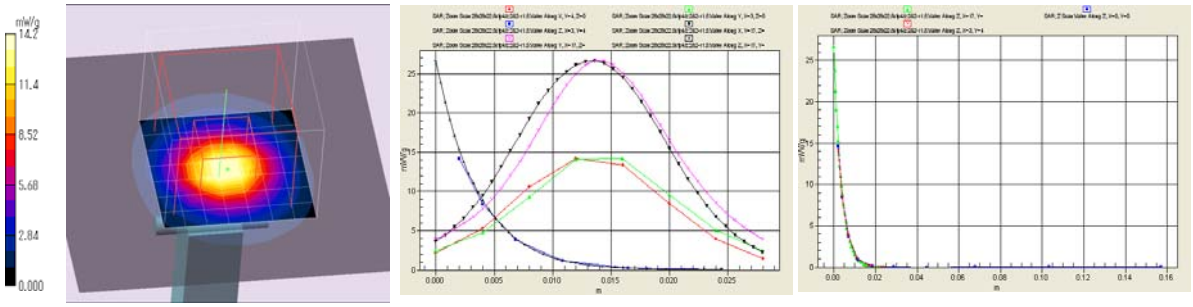
(May 16, 2011) 5200MHz system check (Body) / Forward conducted power: 100mW

EUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1070
Communication System: CW; Frequency: 5200 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.3 deg.C): f = 5200 MHz; σ = 5.29 S/m; ε_r = 49.1; ρ = 1000 kg/m^3

DASY4 Configuration: - Probe: EX3DV4 - SN3540; ConvF(4.16, 4.16, 4.16); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Area Scan:60x60,stp10 (61x61x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 16.3 mW/g
Z Scan (1x1x10): Measurement grid: dx=20mm, dy=20mm, dz=2mm; Maximum value of SAR (measured) = 14.6 mW/g

Zoom Scan:28x28x22.5stp4/z:2&2-r1.5(8x8x6) /Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm;
Reference Value = 60.1 V/m; Power Drift = -0.081 dB, Maximum value of SAR (measured) = 14.2 mW/g
Peak SAR (extrapolated) = 26.7 W/kg (-14.1%, vs.speag cal.=31.1 W/kg)
SAR(1 g) = 7.44 mW/g (-3.5%, vs.speag cal.=7.71mW/g); SAR(10 g) = 2.16 mW/g



Additional information:
*.position: the distance of dipole to phantom: 8mm (10mm to liquid), liquid depth: 139mm
*.ambient: 25 deg.C / 46 %RH; liquid temperature: (before) 24.3 deg.C. /(after) 24.3 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 16, 2011

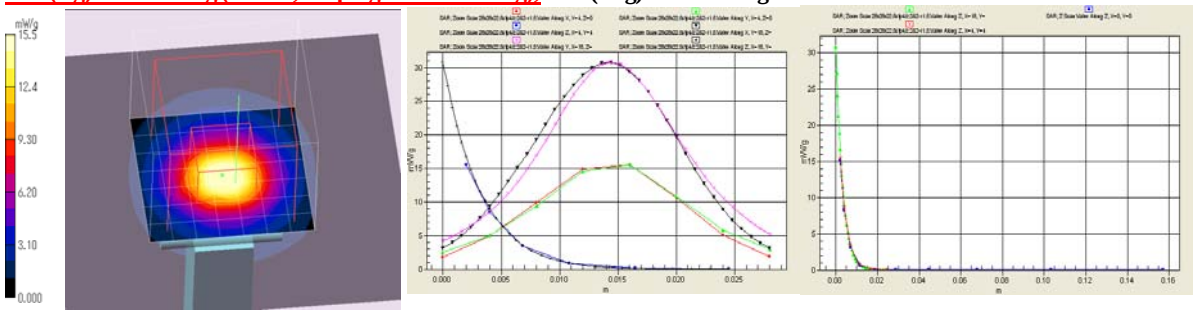
(May 16, 2011) 5800MHz system check (Body) / Forward conducted power: 100mW

EUT: Dipole 5GHz; Type: D5GHzV2; Serial: 1070
Communication System: CW; Frequency: 5800 MHz; Crest Factor: 1.0
Medium: MSL5800; Medium parameters used (24.3 deg.C): f = 5800 MHz; σ = 6.14 S/m; ε_r = 48; ρ = 1000 kg/m^3

DASY4 Configuration: - Probe: EX3DV4 - SN3540; ConvF(3.5, 3.5, 3.5); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Area Scan:60x60,stp10 (61x61x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 16.6 mW/g
Z Scan (1x1x10): Measurement grid: dx=20mm, dy=20mm, dz=2mm; Maximum value of SAR (measured) = 15.1 mW/g

Zoom Scan:28x28x22.5stp4/z:2&2-r1.5 (8x8x6) /Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 57.7 V/m; Power Drift = 0.006 dB, Maximum value of SAR (measured) = 15.5 mW/g
Peak SAR (extrapolated) = 30.8 W/kg (-6.7%, vs.speag cal.=33.0 W/kg)
SAR(1 g) = 7.71 mW/g (+6.5%, vs.speag cal.=7.24mW/g); SAR(10 g) = 2.18 mW/g



Additional information:
*.position: the distance of dipole to phantom: 8mm (10mm to liquid), liquid depth: 139mm
*.ambient: 25 deg.C / 46 %RH; liquid temperature: (before) 24.3 deg.C. /(after) 24.2 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 16, 2011

Appendix 3-10: Validation measurement data (cont'd)

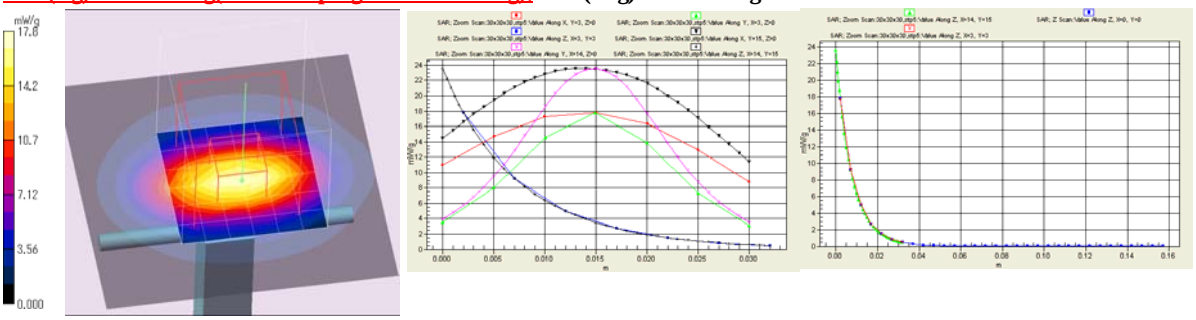
(May 11, 2011) 2450MHz system check (Body) / Forward conducted power: 250mW

EUT: Dipole 2450 MHz; Type: D2450V2; Serial: 822
Communication System: CW; Frequency: 2450 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used (24.4deg.C): f = 2450 MHz; σ = 1.91 S/m); ε_r = 50.4; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(8.05, 8.05, 8.05); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Area Scan:60x60,stp15 (41x41x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 18.2 mW/g
Z Scan (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 17.8 mW/g

Zoom Scan:30x30x30,stp5 (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 99.1 V/m; Power Drift = -0.045 dB, Maximum value of SAR (measured) = 17.8 mW/g
Peak SAR (extrapolated) = 23.6 W/kg (-12.6% vs.speag cal=27W/kg)
SAR(1 g) = 11.9 mW/g(-6.5% vs.speag cal.=12.73mW/g); SAR(10 g) = 5.67 mW/g



Additional information:
*.position: the distance of dipole to phantom: 8mm (10mm to liquid), liquid depth: 159mm
*.ambient: 23.3 deg.C / 54 %RH; liquid temperature: (before) 23.8 deg.C. /(after) 23.7 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 11, 2011

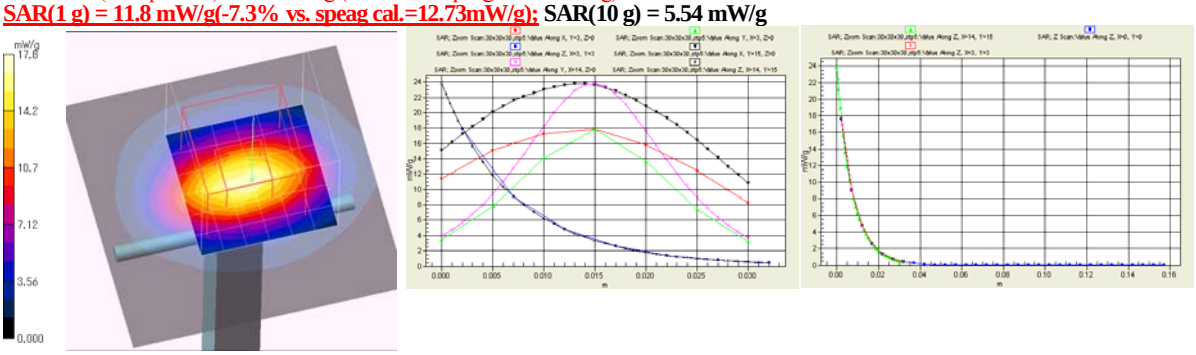
(May 12, 2011) 2450MHz system check (Body) / Forward conducted power: 250mW

EUT: Dipole 2450 MHz; Type: D2450V2; Serial: 822
Communication System: CW; Frequency: 2450 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used (23.8 deg.C): f = 2450 MHz; σ = 1.92 S/m; ε_r = 50.2; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(8.05, 8.05, 8.05); Calibrated: 2010/07/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2011/02/10
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Area Scan:60x60,stp15 (41x41x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 18.1 mW/g
Z Scan (1x1x32): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 17.6 mW/g

Zoom Scan:30x30x30,stp5 (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 92.0 V/m; Power Drift = 0.10 dB, Maximum value of SAR (measured) = 17.8 mW/g
Peak SAR (extrapolated) = 23.8 W/kg (-11.9% vs. speag cal.=27W/kg)
SAR(1 g) = 11.8 mW/g(-7.3% vs. speag cal.=12.73mW/g); SAR(10 g) = 5.54 mW/g



Additional information:
*.position: the distance of dipole to phantom: 8mm (10mm to liquid), liquid depth: 159mm
*.ambient: 24.7 deg.C / 54 %RH; liquid temperature: (before) 23.4 deg.C. /(after) 23.4 deg.C.
*.white cubic: zoom scan area, red big cubic: SAR(10g), red small cubic: SAR(1g)
*.Tested by: Hiroshi Naka / Tested place:No.7 shielded room / Tested date: May 12, 2011

Appendix 3-11: Calibration certificate: Dipole (D2450V2) (sn:822)

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 Accreditation Service (SAS)
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 (PTT)** Certificate No: **D2450V2-822_Jan11**

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 822
Calibration procedure(s)	QA CAL-05.v8 Calibration procedure for dipole validation kits
Calibration date:	January 05, 2011

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 (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 5, 2011

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

Appendix 3-11: Calibration certificate: Dipole (D2450V2) (sn:822) (cont'd)

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

S Schweizerischer Kalibrierdienst
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S Servizio svizzero di taratura
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Accredited by the Swiss Accreditation Service (SAS)
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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) 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
b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
c) 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:

d) DASY4/5 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.

Appendix 3-11: Calibration certificate: Dipole (D2450V2) (sn:822) (cont'd)

Measurement Conditions

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

DASY Version	DASY5	V52.6
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	37.9 ± 6 %	1.74 mho/m ± 6 %
Head TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.5 mW / g
SAR normalized	normalized to 1W	54.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**54.4 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.33 mW / g
SAR normalized	normalized to 1W	25.3 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**25.3 mW /g ± 16.5 % (k=2)**

Appendix 3-11: Calibration certificate: Dipole (D2450V2) (sn:822) (cont'd)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.5 ± 6 %	1.96 mho/m ± 6 %
Body TSL temperature during test	(21.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.8 mW / g
SAR normalized	normalized to 1W	51.2 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**50.9 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.91 mW / g
SAR normalized	normalized to 1W	23.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**23.6 mW / g ± 16.5 % (k=2)**

UL Japan, Inc.
Shonan EMC Lab.
1-22-3 Megumigaoka, Hiratsuka-shi, Kanagawa-ken, 259-1220 JAPAN
Telephone: +81 463 50 6400 / Facsimile: +81 463 50 6401

Appendix 3-11: Calibration certificate: Dipole (D2450V2) (sn:822) (cont'd)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.3 Ω + 3.6 jΩ
Return Loss	- 25.4 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.7 Ω + 5.2 jΩ
Return Loss	- 25.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.159 ns

After long term use with 100W 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	December 11, 2008

Appendix 3-11: Calibration certificate: Dipole (D2450V2) (sn:822) (cont'd)

DASY5 Validation Report for Head TSL

Date/Time: 04.01.2011 14:12:13

Test Laboratory: SPEAG, Zurich, Switzerland

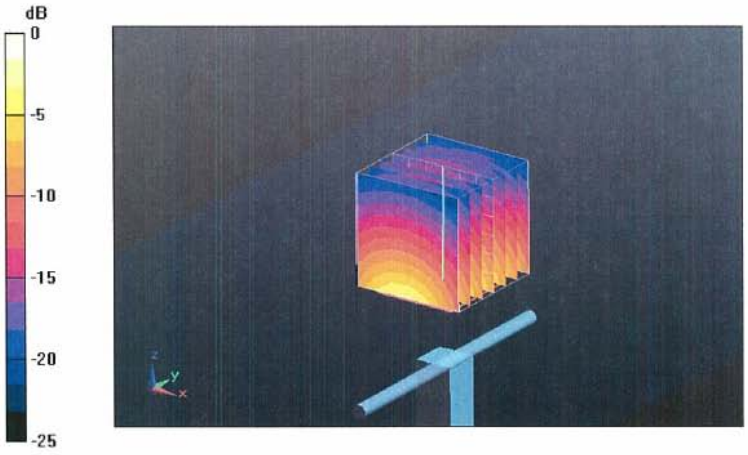
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:822

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: HSL U12 BB
Medium parameters used: f = 2450 MHz; σ = 1.75 mho/m; ε_r = 38.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6 Build (401)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

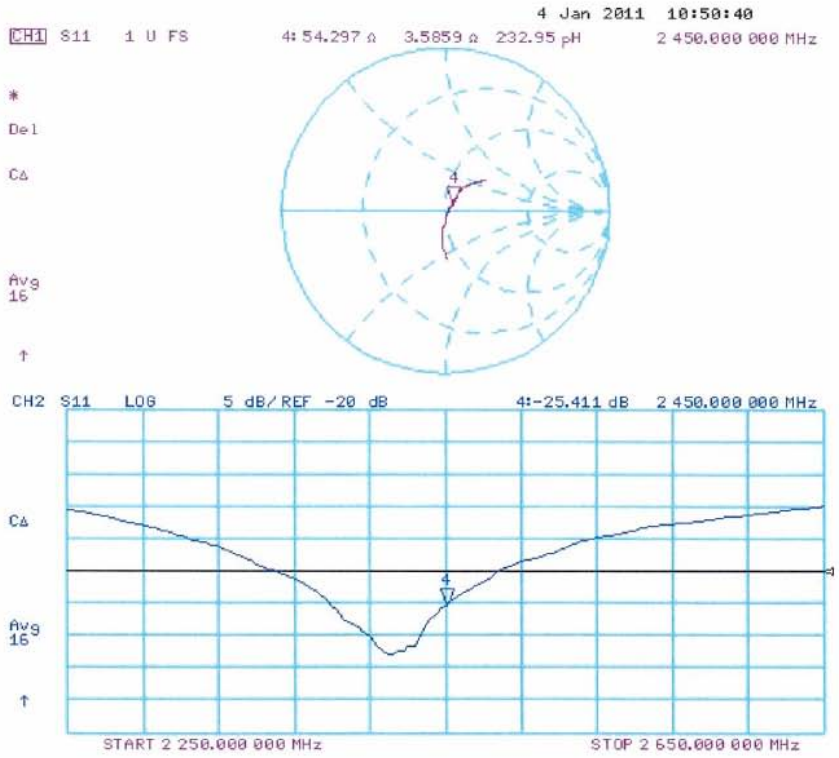
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 103.5 V/m; Power Drift = 0.039 dB
Peak SAR (extrapolated) = 27.7 W/kg
SAR(1 g) = 13.5 mW/g; SAR(10 g) = 6.33 mW/g
Maximum value of SAR (measured) = 17.4 mW/g



0 dB = 17.4mW/g

Appendix 3-11: Calibration certificate: Dipole (D2450V2) (sn:822) (cont'd)

Impedance Measurement Plot for Head TSL



Appendix 3-11: Calibration certificate: Dipole (D2450V2) (sn:822) (cont'd)

DASY5 Validation Report for Body

Date/Time: 05.01.2011 12:40:53

Test Laboratory: SPEAG, Zurich, Switzerland

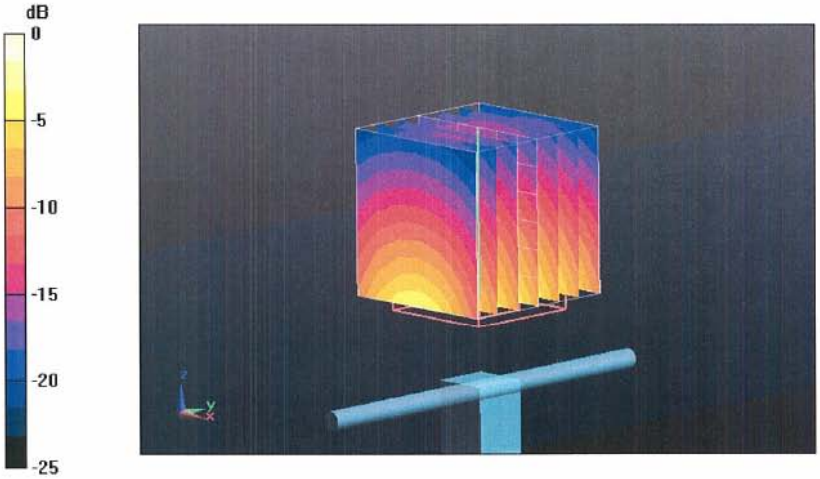
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:822

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: MSL U12 BB
Medium parameters used: f = 2450 MHz; σ = 1.97 mho/m; ε_r = 52.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.31, 4.31, 4.31); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.6 Build (401)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 95.7 V/m; Power Drift = -0.024 dB
Peak SAR (extrapolated) = 27.1 W/kg
SAR(1 g) = 12.8 mW/g; SAR(10 g) = 5.91 mW/g
Maximum value of SAR (measured) = 16.9 mW/g



0 dB = 16.9mW/g

Certificate No: D2450V2-822_Jan11 Page 8 of 9

Appendix 3-11: Calibration certificate: Dipole (D2450V2) (sn:822) (cont'd)

Impedance Measurement Plot for Body TSL