APPENDIX 2: SAR Measurement data

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 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.

Appendix 2-2: Measurement data

Step 1: Worst position search

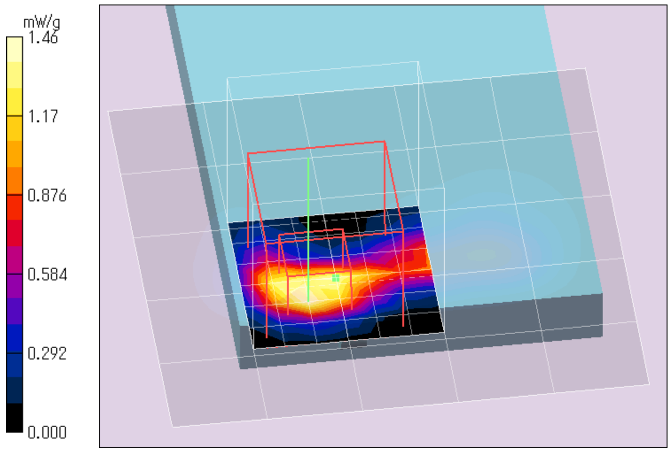
Step 1-1: Rear (separation distance: 0mm) / 2462MHz, 11b(1Mbps)
->Worst SAR(1g) of EUT

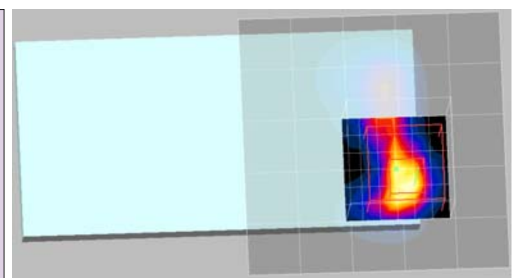
EUT: Digital Media Player; Type: NWZ-F804; Serial: 2000196
Communication System: IEEE 802.11b(1Mbps, DBPSK/DSSS); Frequency: 2462 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used: f = 2462 MHz; σ = 1.93 S/m; ε_r = 50.8; ρ = 1000 kg/m^3

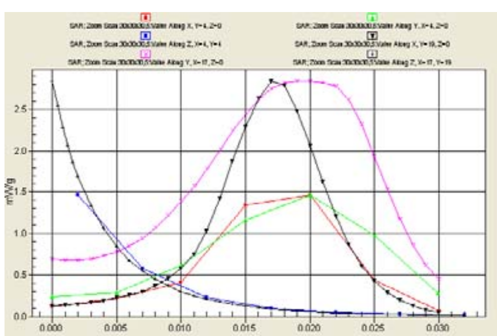
DASY4 Configuration: - Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2012/02/15
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

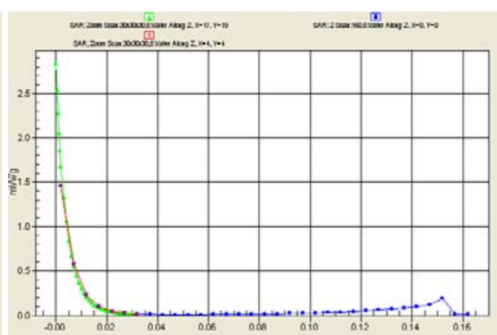
fcc3,rear&touch(d0mm),11b(1m,set15d),m2462(11)/
Area Scan:75x75,15 (6x6x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.56 mW/g
Area Scan:75x75,15 (51x51x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 1.57 mW/g
Z Scan:160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 1.45 mW/g

Zoom Scan:30x30x30,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 28.3 V/m; Power Drift = -0.11 dB, Maximum value of SAR (measured) = 1.46 mW/g
Peak SAR (extrapolated) = 2.85 W/kg
SAR(1 g) = 0.854 mW/g (<-Worst SAR(1g) of EUT)
SAR(10 g) = 0.277 mW/g









Remarks: *. Date tested: 2012/06/18; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*.liquid depth: 155mm; Position: distance of EUT to phantom: 0mm (2mm to liquid); ambient: 24.9deg.C. / 51 %RH,
*.liquid temperature: 23.9(start)/23.8(end)/24.2(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Appendix 2-2: Measurement data (cont'd)
Step 1: Worst position search (cont'd)

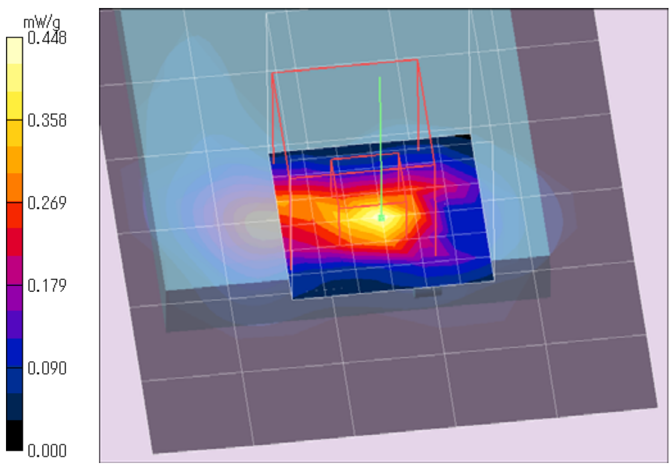
Step 1-2: Front (separation distance: 0mm) / 2462MHz, 11b(1Mbps)

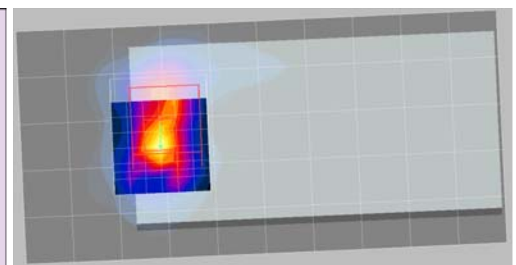
EUT: Digital Media Player; Type: NWZ-F804; Serial: 2000196
Communication System: IEEE 802.11b(1Mbps, DBPSK/DSSS); Frequency: 2462 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used: f = 2462 MHz; σ = 1.93 S/m; ε_r = 50.8; ρ = 1000 kg/m^3

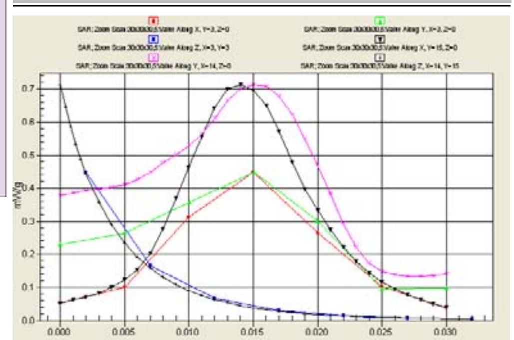
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2012/02/15
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

fcc13,frt&touch(d0mm),11b(1m,set15),h2462(11)/
Area Scan:150x75,15 (11x6x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.299 mW/g
Area Scan:150x75,15 (101x51x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 0.315 mW/g
Z Scan:160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.452 mW/g

Zoom Scan:30x30x30,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 10.2 V/m; Power Drift = 0.008 dB, Maximum value of SAR (measured) = 0.448 mW/g
Peak SAR (extrapolated) = 0.715 W/kg
SAR(1 g) = 0.239 mW/g; SAR(10 g) = 0.095 mW/g







Remarks: *. Date tested: 2012/06/18; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*.liquid depth: 155mm; Position: distance of EUT to phantom: 0mm (2mm to liquid); ambient: 24.9deg.C. / 51 %RH,
*.liquid temperature: 23.7(start)/23.7(end)/24.2(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Appendix 2-2: Measurement data (cont'd)
Step 1: Worst position search (cont'd)

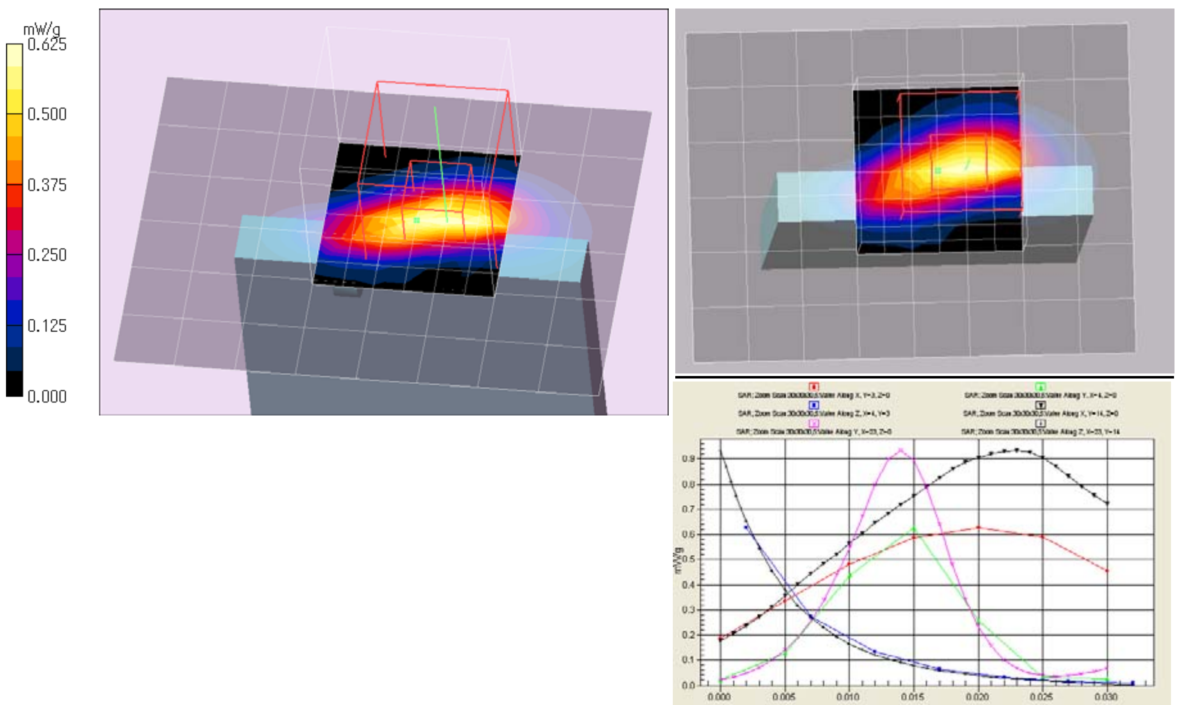
Step 1-3: Top (separation distance: 0mm) / 2462MHz, 11b(1Mbps)

EUT: Digital Media Player; Type: NWZ-F804; Serial: 20000196
Communication System: IEEE 802.11b(1Mbps, DBPSK/DSSS); Frequency: 2462 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used: f = 2462 MHz; σ = 1.93 S/m; ε_r = 50.8; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2012/02/15
- 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

fcc15,top&touch(d0mm),11b(11m,15d),h2462(11)/
Area Scan:80x80x10 (9x7x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.476 mW/g
Area Scan:80x80x10 (81x61x1): Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (interpolated) = 0.653 mW/g
Z Scan:160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.613 mW/g

Zoom Scan:30x30x30,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 11.4 V/m; Power Drift = -0.001 dB, Maximum value of SAR (measured) = 0.625 mW/g
Peak SAR (extrapolated) = 0.935 W/kg
SAR(1 g) = 0.365 mW/g; SAR(10 g) = 0.135 mW/g



Remarks: *. Date tested: 2012/06/18; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*.liquid depth: 155mm; Position: distance of EUT to phantom: 0mm (2mm to liquid); ambient: 24.9deg.C. / 51 %RH,
*.liquid temperature: 23.7(start)/23.6(end)/24.2(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Appendix 2-2: Measurement data (cont'd)
Step 1: Worst position search (cont'd)

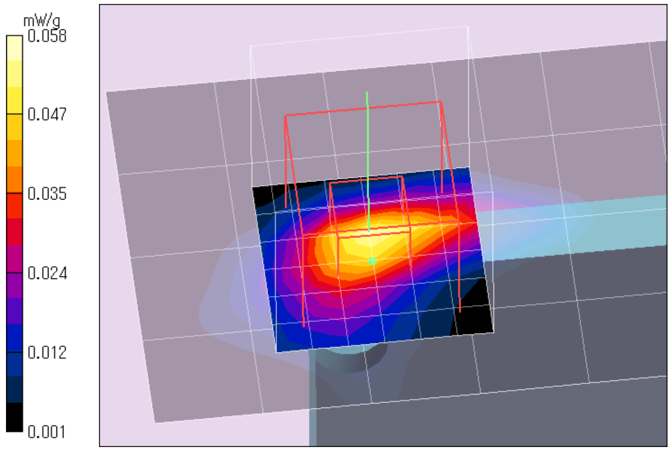
Step 1-4: Left (separation distance: 0mm) / 2462MHz, 11b(1Mbps)

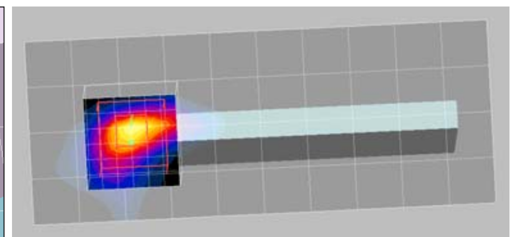
EUT: Digital Media Player; Type: NWZ-F804; Serial: 20000196
Communication System: IEEE 802.11b(1Mbps, DBPSK/DSSS); Frequency: 2462 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used: f = 2462 MHz; σ = 1.93 S/m; ε_r = 50.8; ρ = 1000 kg/m^3

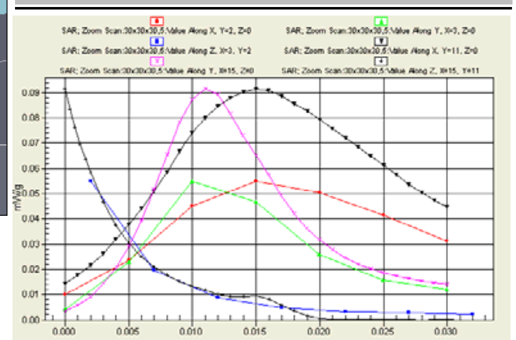
DASY4 Configuration: - Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2012/02/15
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

fcc16,left&touch(d0mm),11b(11m,15d),h2462(11)/
Area Scan:150x60,15 (11x5x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.050 mW/g
Area Scan:150x60,15 (101x41x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 0.077 mW/g
Z Scan:160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 0.058 mW/g

Zoom Scan:30x30x30,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 4.64 V/m; Power Drift = 0.043 dB, Maximum value of SAR (measured) = 0.055 mW/g
Peak SAR (extrapolated) = 0.091 W/kg
SAR(1 g) = 0.032 mW/g; SAR(10 g) = 0.012 mW/g







Remarks: *. Date tested: 2012/06/18; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*.liquid depth: 155mm; Position: distance of EUT to phantom: 0mm (2mm to liquid); ambient: 24.9deg.C. / 51 %RH,
*.liquid temperature: 23.6(start)/23.6(end)/24.2(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

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

Step 2: Change the channels

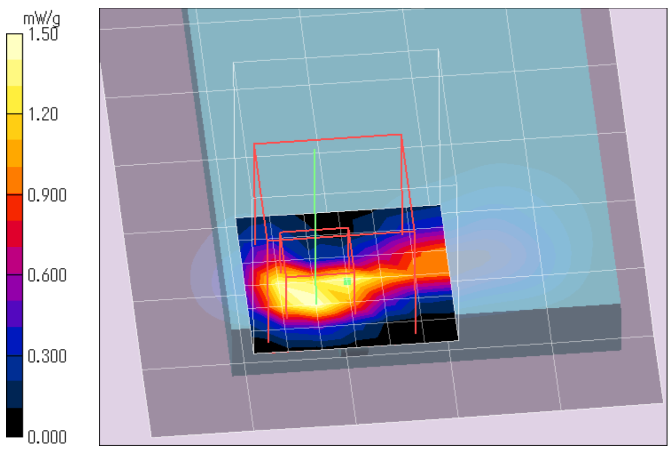
Step 2-1: 2412MHz / 11b(1Mbps), Rear (separation distance: 0mm)

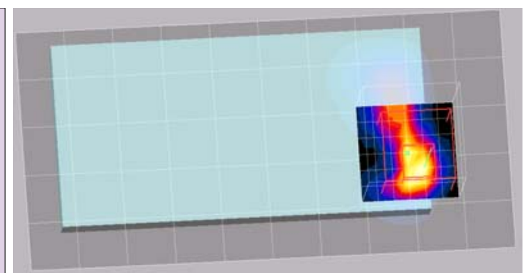
EUT: Digital Media Player; Type: NWZ-F804; Serial: 2000196
Communication System: IEEE 802.11b(1Mbps, DBPSK/DSSS); Frequency: 2412 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used: f = 2412 MHz; σ = 1.85 S/m; ε_r = 50.9; ρ = 1000 kg/m^3

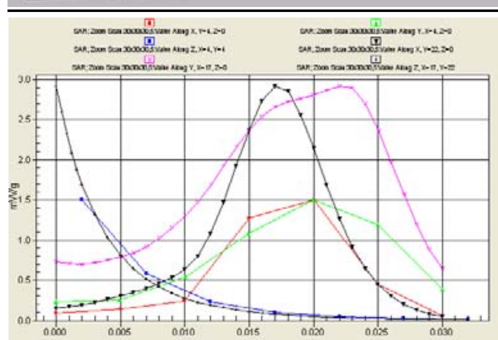
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2012/02/15
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

fcc1b,rear&touch(d0mm),11b(1m,set15d),m2412/
Area Scan:150x75,15 2 (11x6x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.61 mW/g
Area Scan:150x75,15 2 (101x51x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 1.64 mW/g
Z Scan:160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 1.52 mW/g

Zoom Scan:30x30x30,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 29.2 V/m; Power Drift = 0.062 dB, Maximum value of SAR (measured) = 1.50 mW/g
Peak SAR (extrapolated) = 2.92 W/kg
SAR(1 g) = 0.853 mW/g; SAR(10 g) = 0.283 mW/g







Remarks: *. Date tested: 2012/06/18; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*.liquid depth: 155mm; Position: distance of EUT to phantom: 0mm (2mm to liquid); ambient: 24.9deg.C. / 51 %RH,
*.liquid temperature: 24.0(start)/23.9(end)/24.2(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Appendix 2-2: Measurement data (cont'd)
Step 2: Change the channels (cont'd)

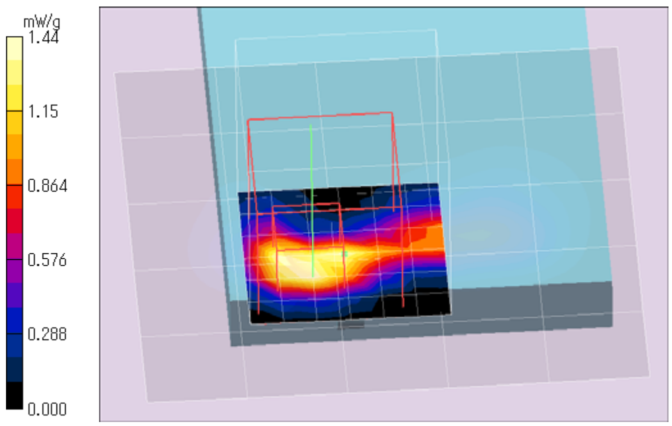
Step 2-2: 2437MHz / 11b(1Mbps), Rear (separation distance: 0mm)

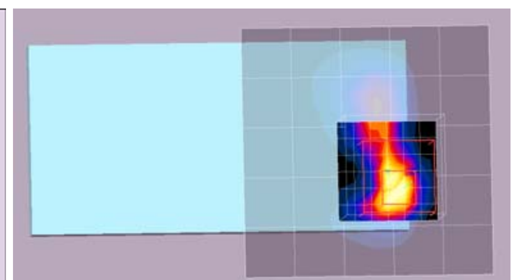
EUT: Digital Media Player; Type: NWZ-F804; Serial: 2000196
Communication System: IEEE 802.11b(1Mbps, DBPSK/DSSS); Frequency: 2437 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used: f = 2437 MHz; σ = 1.89 S/m; ε_r = 50.9; ρ = 1000 kg/m^3

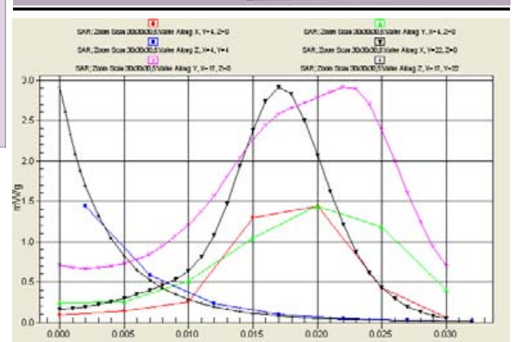
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2012/02/15
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

fcc2,rear&touch(d0mm),11b(1m,set15d),m2437(6)/
Area Scan:75x75,15 (6x6x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.57 mW/g
Area Scan:75x75,15 (51x51x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 1.59 mW/g
Z Scan:160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 1.43 mW/g

Zoom Scan:30x30x30,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 24.6 V/m; Power Drift = -0.023 dB, Maximum value of SAR (measured) = 1.44 mW/g
Peak SAR (extrapolated) = 2.92 W/kg
SAR(1 g) = 0.844 mW/g; SAR(10 g) = 0.276 mW/g







Remarks:
*. Date tested: 2012/06/18; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*.liquid depth: 155mm; Position: distance of EUT to phantom: 0mm (2mm to liquid); ambient: 24.9deg.C. / 51 %RH,
*.liquid temperature: 23.9(start)/23.9(end)/24.2(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

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

Step 3: Change the operation mode and channels

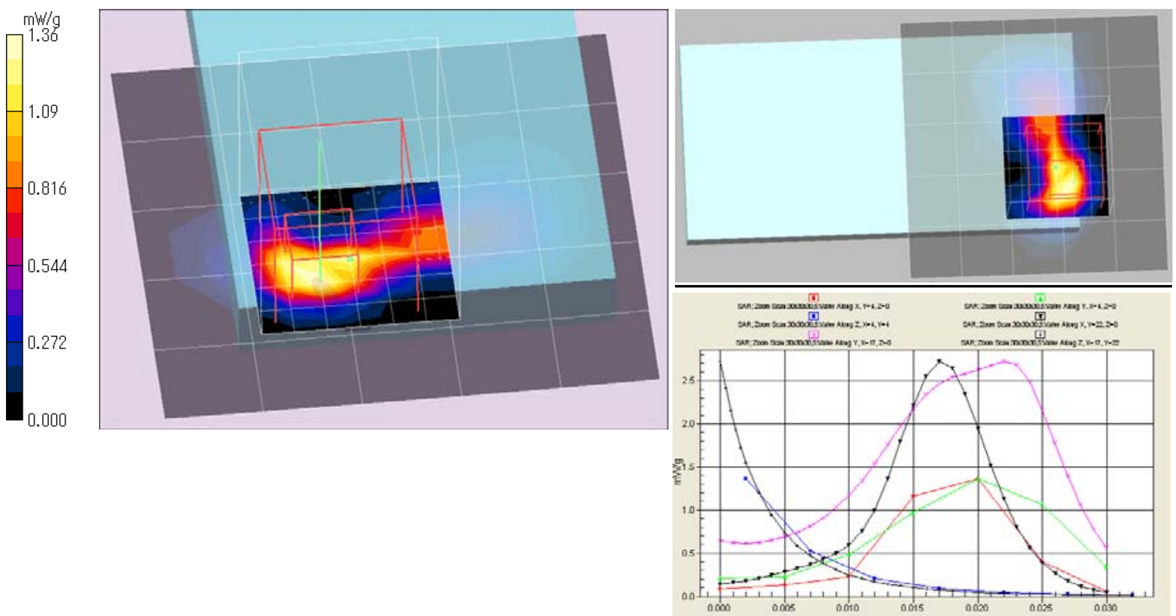
Step 3-1: 11g(6Mbps), 2412MHz / Rear (separation distance: 0mm)

EUT: Digital Media Player; Type: NWZ-F804; Serial: 2000196
Communication System: IEEE 802.11g(6Mbps, BPSK/OFDM); Frequency: 2412 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used: f = 2412 MHz; σ = 1.85 S/m; ε_r = 50.9; ρ = 1000 kg/m^3

DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2012/02/15
- 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

fcc12,rear&touch(d0mm),11g(6m,set15d),m2412(1)/
Area Scan:75x75,15 (6x6x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.50 mW/g
Area Scan:75x75,15 (51x51x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 1.55 mW/g
Z Scan:160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 1.36 mW/g

Zoom Scan:30x30x30,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 27.6 V/m; Power Drift = 0.0066 dB, Maximum value of SAR (measured) = 1.36 mW/g
Peak SAR (extrapolated) = 2.73 W/kg
SAR(1 g) = 0.773 mW/g; SAR(10 g) = 0.255 mW/g



Remarks: *. Date tested: 2012/06/18; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*.liquid depth: 155mm; Position: distance of EUT to phantom: 0mm (2mm to liquid); ambient: 24.9deg.C. / 51 %RH,
*.liquid temperature: 23.7(start)/23.7(end)/24.2(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Appendix 2-2: Measurement data (cont'd)
Step 3: Change the operation mode and channels (cont'd)

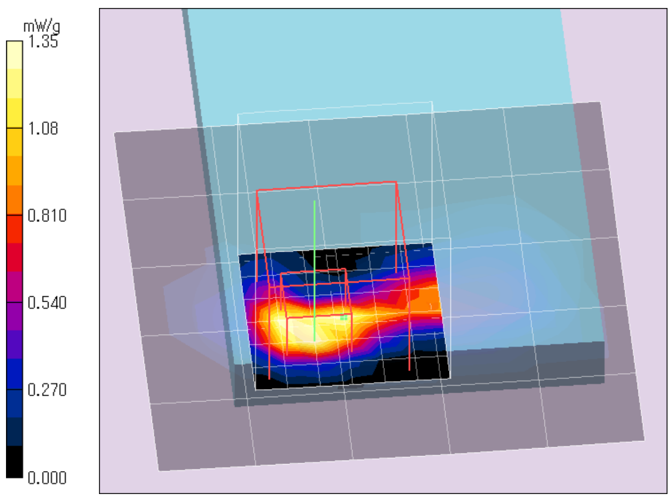
Step 3-2: 11g(6Mbps), 2437MHz / Rear (separation distance: 0mm)

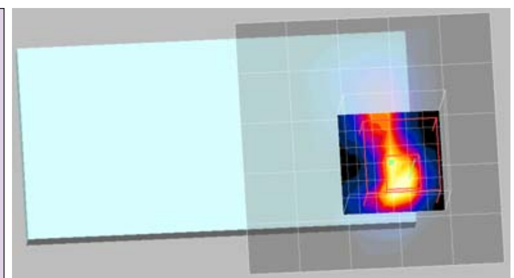
EUT: Digital Media Player; Type: NWZ-F804; Serial: 2000196
Communication System: IEEE 802.11g(6Mbps, BPSK/OFDM); Frequency: 2437 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used: f = 2437 MHz; σ = 1.89 S/m; ε_r = 50.9; ρ = 1000 kg/m^3

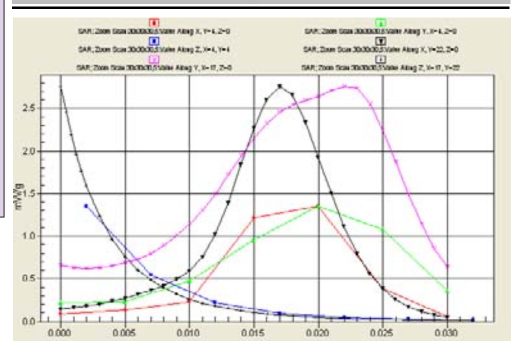
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn626; Calibrated: 2012/02/15
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

fcc11,rear&touch(d0mm),11g(6m,set15d),m2437(6)/
Area Scan:75x75,15 (6x6x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.49 mW/g
Area Scan:75x75,15 (51x51x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 1.51 mW/g
Z Scan:160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 1.34 mW/g

Zoom Scan:30x30x30,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 27.4 V/m; Power Drift = -0.024 dB, Maximum value of SAR (measured) = 1.35 mW/g
Peak SAR (extrapolated) = 2.76 W/kg
SAR(1 g) = 0.787 mW/g; SAR(10 g) = 0.258 mW/g







Remarks: *. Date tested: 2012/06/18; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*.liquid depth: 155mm; Position: distance of EUT to phantom: 0mm (2mm to liquid); ambient: 24.9deg.C. / 51 %RH,
*.liquid temperature: 23.7(start)/23.7(end)/24.2(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Appendix 2-2: Measurement data (cont'd)
Step 3: Change the operation mode and channels (cont'd)

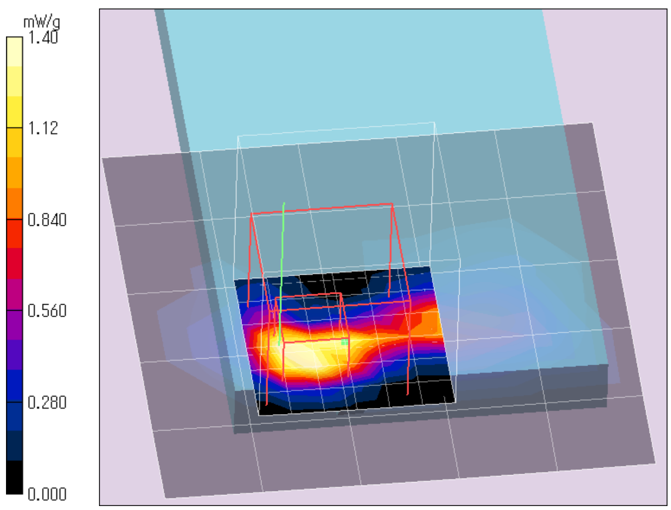
Step 3-3: 11g(6Mbps), 2462MHz / Rear (separation distance: 0mm)

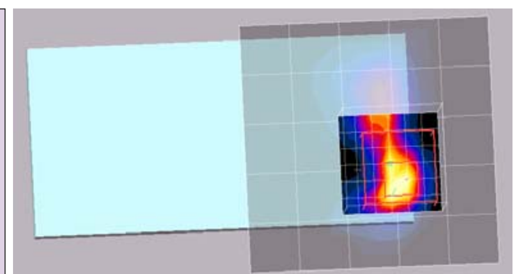
EUT: Digital Media Player; Type: NWZ-F804; Serial: 2000196
Communication System: IEEE 802.11g(6Mbps, BPSK/OFDM); Frequency: 2462 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used: f = 2462 MHz; σ = 1.93 S/m; ε_r = 50.8; ρ = 1000 kg/m^3

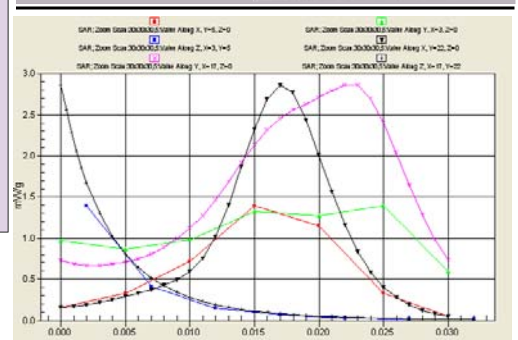
DASY4 Configuration:
- Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2012/02/15
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

fcc10,rear&touch(d0mm),11g(6m,set15d),m2462/
Area Scan:75x75,15 (6x6x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.52 mW/g
Area Scan:75x75,15 (51x51x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 1.53 mW/g
Z Scan:160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 1.39 mW/g

Zoom Scan:30x30x30,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 25.4 V/m; Power Drift = 0.070 dB, Maximum value of SAR (measured) = 1.40 mW/g
Peak SAR (extrapolated) = 2.87 W/kg
SAR(1 g) = 0.821 mW/g; SAR(10 g) = 0.267 mW/g







Remarks: *. Date tested: 2012/06/18; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*.liquid depth: 155mm; Position: distance of EUT to phantom: 0mm (2mm to liquid); ambient: 24.9deg.C. / 51 %RH,
*.liquid temperature: 23.7(start)/23.7(end)/24.2(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

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

Step 4: Repeat worst SAR condition

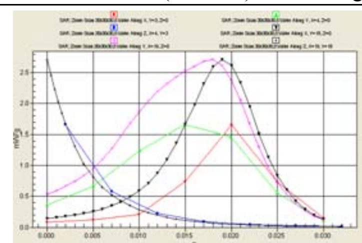
Step 4-1: Rear (separation distance: 0mm), 11b(1Mbps), 2462MHz (*. same condition as step 1-1.)

EUT: Digital Media Player; Type: NWZ-F804; Serial: 2000196
Communication System: IEEE 802.11b(1Mbps, DBPSK/DSSS); Frequency: 2462 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used: f = 2462 MHz; σ = 1.93 S/m; ε_r = 50.8; ρ = 1000 kg/m^3

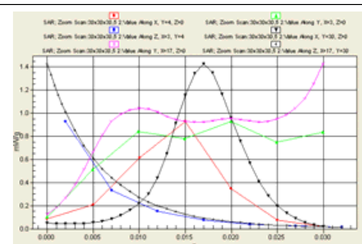
DASY4 Configuration: - Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2012/02/15
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

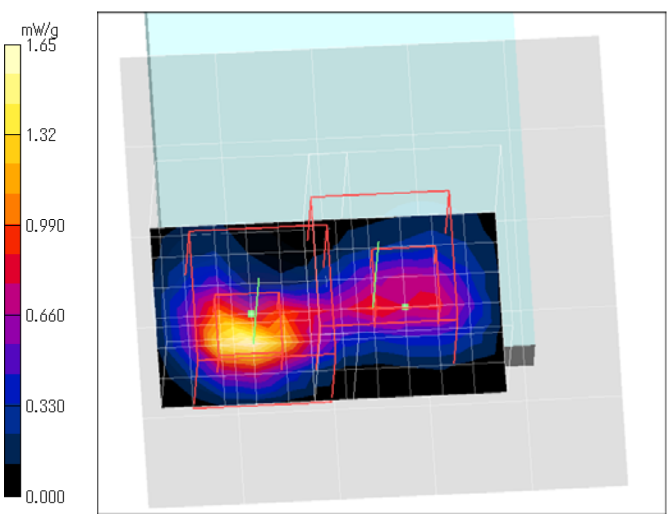
fcc16(re-#3),rear&touch(d0mm),11b(1m,set15d),m2462(11)/
Area Scan:75x75,15 (6x6x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.26 mW/g
Area Scan:75x75,15 (51x51x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 1.40 mW/g
Z Scan:160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 1.66 mW/g

Zoom Scan:30x30x30,5 (7x7x7)/Cube 0(1st-pk):
Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 20.5 V/m; Power Drift = -0.022 dB,
Maximum value of SAR (measured) = 1.65 mW/g
Peak SAR (extrapolated) = 2.72 W/kg
SAR(1 g) = 0.820 mW/g; SAR(10 g) = 0.266 mW/g



Zoom Scan:30x30x30,5 2 (7x7x7)/Cube 1(2nd-pk):
Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 20.5 V/m; Power Drift = -0.022 dB,
Maximum value of SAR (measured) = 0.927 mW/g
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.521 mW/g; SAR(10 g) = 0.210 mW/g





Remarks: *. Date tested: 2012/06/18; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*.liquid depth: 155mm; Position: distance of EUT to phantom: 0mm (2mm to liquid); ambient: 24.9deg.C. / 51 %RH,
*.liquid temperature: 23.7(start)/23.6(end)/24.2(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

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	2012/02/06 * 12
KDAE-01	Data Acquisition Electronics	Schmid&Partner Engineering AG	DAE4	626	SAR	2012/02/15 * 12
KPB-R02	Dosimetric E-Field Probe	Schmid&Partner Engineering AG	EX3DV4	3540	SAR	2011/07/21 * 12
KSDA-01	Dipole Antenna	Schmid&Partner Engineering AG	D2450V2	822	SAR	2012/01/10 * 12
KPFL-01	Flat Phantom	Schmid&Partner Engineering AG	Oval flat phantom ELI 4.0	1059	SAR	2011/10/26 * 12
SSNA-01	Network Analyzer	Agilent	8753ES	US39171777	SAR	2011/12/15 * 12
KEPP-01	Dielectric probe	Agilent	85070E/8710-2036	2540	SAR	2012/02/20 * 12
KSG-08	Signal Generator	Rohde & Schwarz	SMT06	100763	SAR(daily)	2011/06/07 * 12
KPA-12	RF Power Amplifier	MILMEGA	AS2560-50	1018582	SAR(daily)	Pre Check
KCPL-07	Directional Coupler	Pulsar Microwave Corp.	CCS30-B26	0621	SAR(daily)	Pre Check
KPM-06	Power Meter	Rohde & Schwarz	NRVD	101599	SAR(daily)	2011/09/13 * 12
KIU-08	Power sensor	Rohde & Schwarz	NRV-Z4	100372	SAR(daily)	2011/09/13 * 12
KIU-09	Power sensor	Rohde & Schwarz	NRV-Z4	100371	SAR(daily)	2011/09/13 * 12
KPM-05	Power meter	Agilent	E4417A	GB41290718	SAR(daily)	2012/03/22 * 12
KPSS-01	Power sensor	Agilent	E9327A	US40440544	SAR(daily)	2012/03/22 * 12
KAT10-P1	Attenuator	Weinschel	24-10-34	BY5927	SAR(daily)	2012/02/15 * 12
KAT10-CS1	Attenuator	HUBER+SUHNER	6810.17.A	768898-1	SAR(daily)	2012/01/10 * 12
KAT10-CS2	Attenuator	HUBER+SUHNER	6810.17.A	768898-2	SAR(daily)	2012/01/10 * 12
KRU-01	Ruler(300mm)	Shinwa	13134	-	SAR	2012/03/08 * 12
KRU-02	Ruler(150mm,L)	Shinwa	12103	-	SAR	2012/03/08 * 12
KRU-04	Ruler(300mm)	Shinwa	13134	-	SAR	2012/05/29 * 12
KRU-05	Ruler(100x50mm,L)	Shinwa	12101	-	SAR	2012/05/29 * 12
KOS-13	Digtal thermometer	HANNA	Checktemp-2	KOS-13	SAR	2012/01/06 * 12
KOS-14	Thermo-Hygrometer data logger	SATO KEIRYOKI	SK-L200THIIα / SK-LTHIIα-2	015246/08169	SAR	2012/01/06 * 12
SOS-11	Humidity Indicator	A&D	AD-5681	4063424	SAR	2012/02/06 * 12
SSA-04	Spectrum Analyzer	Advantest	R3272	101100994	SAR(moni.)	2011/12/28 * 12
SWTR-03	DI water	MonotaRo	34557433	-	SAR	Pre Check
KSLM245-01	Tissue simulation liqud (2450MHz,body)	Schmid&Partner Engineering AG	SL AAM 245	-	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

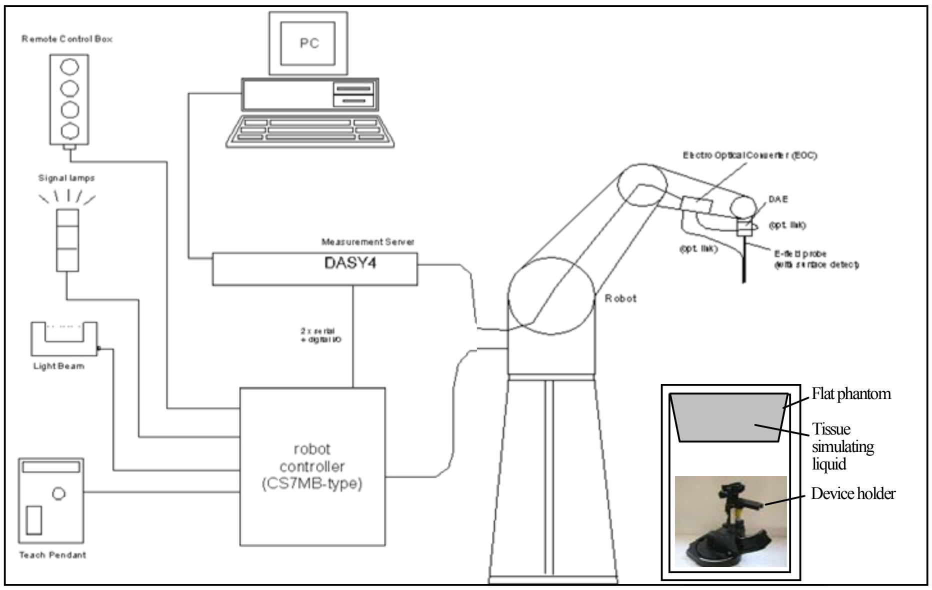
The expiration date of calibration is the end of the expired month.
As for some calibrations performed after the tested dates, those test equipment have been controlled by means of an unbroken chains of calibrations.
All equipment is calibrated with valid calibrations. Each measurement data is traceable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

[Test Item] SAR: Specific Absorption Rate

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 (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) (*. when it was used.)
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


EX3DV4 E-field Probe

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, 3600, 5200, 5300, 5500, 5600, 5800MHz

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

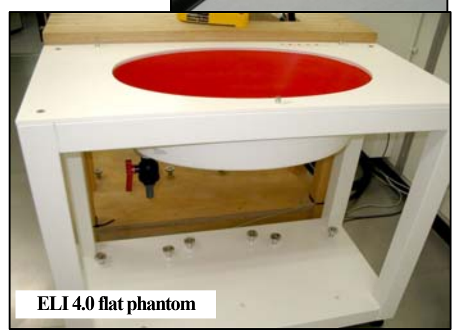
Directivity:
±0.3 dB in HSL (rotation around probe axis)
±0.5 dB in tissue material (rotation normal to probe axis)

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%.

2) Phantom (Flat type)


ELI 4.0 flat phantom

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

3) Device Holder


Device holder

For this measurement, the urethane foam was used as device holder.

In combination with the Twin SAM Phantom V4.0/V4.0c or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Transmitter devices can be easily and accurately positioned.
The low-loss dielectric urethane foam was used for the mounting section of device holder.

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 3GHz)
- •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

Liquid type	☐ / Head, HSL 2450	☒ / Body, MSL 2450
M/N / Control No.	SL AAH 245 / KSLH245-01	SL AAM 245 / KSLM245-01
Ingredient	**Mixture (%)**	**Mixture (%)**
Water	52-75 %	52-75 %
$C_8H_{18}O_3$ (DGBE) (Diethylene glycol monobutyl ether)	25-48%	25-48%
NaCl	<1.0%	<1.0%
Manufacture	Schmid&Partner Engineering AG	Schmid&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		Liq.T.[deg.C.]		Liquid Depth [mm]	Parameters	Target value		Measured	Deviation for #1 (Std.)[%]	Limit [%]	Deviation for #2 (Cal.)[%]	Limit [%]
		Temp [deg.C.]	Humidity [%RH]	Before	After			#1:Std. (*1)	#2:Cal. (*2)					
June 18, 2012	2450	24.3	65	24.2	24.2	155	Relative permittivity: εr [-]	**52.7**	**50.6**	50.86	**-3.5**	±5	**+0.5**	±5
							Conductivity: σ [S/m]	**1.95**	**2.01**	1.909	**-2.1**	±5	**-5.0**	±5

*1. The target value is a parameter defined in OET65, Supplement C.
*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_Jan12, the data sheet was filed in this report.).

***. Decision on Simulated Tissues of 2450MHz**

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 2000MHz, 2450 and 3000MHz. As an intermediate solution, dielectric parameters for the frequencies between 2000 to 2450 MHz and 2450-3000MHz were obtained using linear interpolation. Therefore the dielectric parameters of Wi-Fi frequency of 2.4GHz band which were SAR tested were decided as following.

Standard					*Interpolated*				
f (MHz)	Head Tissue		Body Tissue		f (MHz)	Head Tissue		Body Tissue	
	εr	σ [S/m]	εr	σ [S/m]		εr	σ [S/m]	εr	σ [S/m]
(1800-)2000	**40.0**	**1.40**	**53.3**	**1.52**	*2412*	*39.26*	*1.771*	*52.75*	*1.914*
2450	**39.2**	**1.80**	**52.7**	**1.95**	*2437*	*39.21*	*1.793*	*52.72*	*1.938*
3000	**38.5**	**2.40**	**52.0**	**2.73**	*2462*	*39.18*	*1.819*	*52.68*	*1.967*

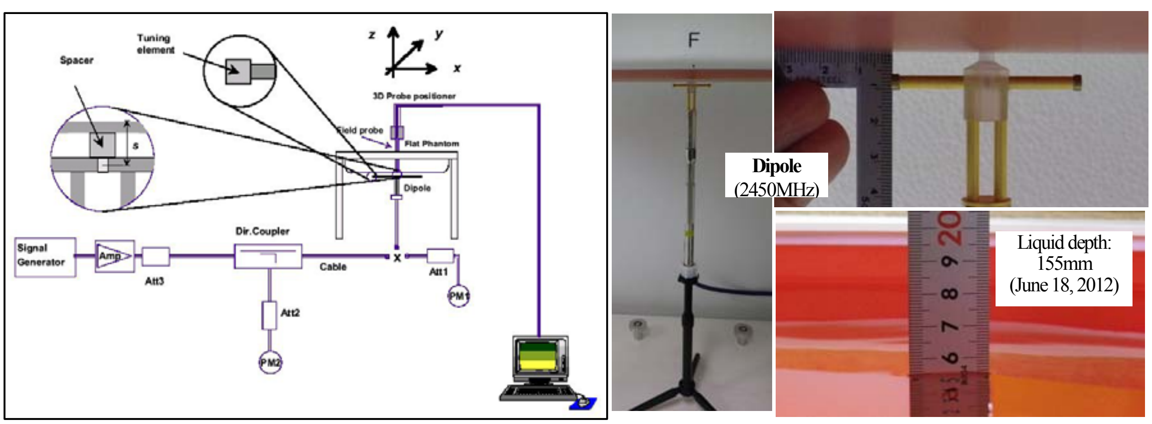
Appendix 3-8: System check data

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 system check results are in the table below.

System check 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 check target & measured: SAR 1g [W/kg] (at 250mW)		Deviation [%]	Limit [%]
			Temp [deg.C.]	Humidity [%RH]	Check	Before	After					Target value	Measured		
June 18, 2012	2450	Body	24.8	55	24.2	24.1	24.1	155	50.9	1.91	0.096	**13.2** (*3)	**12.3**	**-6.8**	±10

Note: Refer to Appendix 3-9 System Check measurement data for the above result representation in plot data.
*3. 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_Jan12, the data sheet was filed in this report.).
*. We performed the system check based on FCC requirement, "The 1g or 10g 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.: 52.1W/kg (-0.6%, vs. standard=52.4W/kg). so we can only use Body liquid validation data for our system check procedure



Test setup for the system performance check

Appendix 3-9: System check measurement data

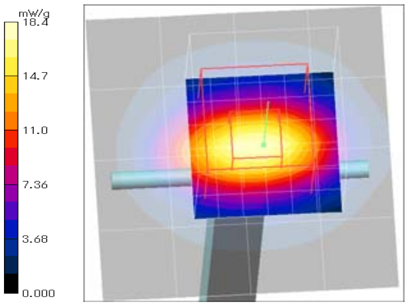
2450MHz system check (Body) / Forward conducted power: 250mW

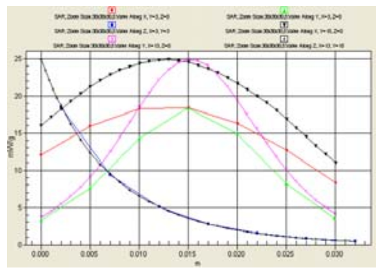
EUT: Dipole 2450 MHz; Type: D2450V2; Serial: 822
Communication System: CW; Frequency: 2450 MHz; Crest Factor: 1.0
Medium: M2450; Medium parameters used: f = 2450 MHz; σ = 1.91 S/m; ε_r = 50.9; ρ = 1000 kg/m^3

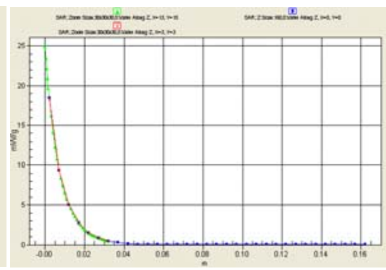
DASY4 Configuration: - Probe: EX3DV4 - SN3540; ConvF(7.64, 7.64, 7.64); Calibrated: 2011/07/21
- Sensor-Surface: 2mm (Mechanical Surface Detection) - Electronics: DAE4 Sn626; Calibrated: 2012/02/15
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1059; Phantom section: Flat Section
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 184

Area Scan:60x60,15 (5x5x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 17.9 mW/g
Area Scan:60x60,15 (41x41x1): Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (interpolated) = 18.8 mW/g
Z Scan:160,5 (1x1x33): Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 18.5 mW/g

Zoom Scan:30x30x30,5 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm;
Reference Value = 97.8 V/m; Power Drift = 0.096 dB, Maximum value of SAR (measured) = 18.4 mW/g
Peak SAR (extrapolated) = 24.9 W/kg (-8.0%, vs. speag-cal.=27.1W/kg)
SAR(1 g) = 12.3 mW/g (-6.8%, vs. speag-cal.=13.2 mW/g); **SAR(10 g) = 5.81 mW/g**







Remarks: *. Date tested: 2012/06/18; Tested by: Hiroshi Naka; Tested place:No.7 shielded room,
*. liquid depth: 155mm; Position: distance of dipole to phantom: 8mm (10mm to liquid); ambient: 24.8 deg.C. / 55 %RH,
*. liquid temperature: 24.1(start)/24.1(end)/24.2(in check) deg.C.; *.White cubic: zoom scan area, Red cubic: big=SAR(10g)/small=SAR(1g)

Appendix 3-10: System check uncertainty

Uncertainty of system validation (v04)	Under 3GHz (v04)	
	1g SAR	10g SAR
Combined measurement uncertainty of the measurement system (k=1)	± 9.5%	± 9.2%
Expanded uncertainty (k=2)	± 19.0%	± 18.4%

	Error Description (Under 3GHz) (v04)	Uncertainty Value	Probability distribution	Divisor	ci (1g)	ci (10g)	ui (1g) (std. uncertainty)	ui (10g) (std. uncertainty)	Vi, veff
A	**Measurement System**								
1	Probe Calibration Error(2.45GHz±100MHz)	±6.0 %	Normal	1	1	1	±6.0 %	±6.0 %	∞
2	Axial isotropy	±4.7 %	Rectangular	√3	0.7	0.7	±1.9 %	±1.9 %	∞
3	Hemispherical isotropy (*flat phantom, <5°)	±9.6 %	Rectangular	√3	0.7	0.7	±3.9 %	±3.9 %	∞
4	Boundary effects	±1.4 %	Rectangular	√3	1	1	±0.8 %	±0.8 %	∞
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	Response Time Error (<5ms/100ms wait)	±0.0 %	Rectangular	√3	1	1	±0.0 %	±0.0 %	∞
8	Integration Time Error(100% duty cycle)	±0.0 %	Rectangular	√3	1	1	±0.0 %	±0.0 %	∞
9	System readout electronics (DAE)	±0.3 %	Normal	1	1	1	±0.3 %	±0.3 %	∞
10	RF ambient conditions-noise (<0.12mW/g)	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
11	RF ambient conditions-reflections (<0.12mW/g)	±3.0 %	Rectangular	√3	1	1	±1.7 %	±1.7 %	∞
12	Probe positioner mechanical tolerance	±1.1 %	Rectangular	√3	1	1	±0.6 %	±0.6 %	∞
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 to liquid distance(10mm±0.2mm,<2deg.)	±2.0 %	Rectangular	√3	1	1	±1.2 %	±1.2 %	∞
16	Drift of output power (measured, <0.2dB)	±2.5 %	Rectangular	√3	1	1	±1.4 %	±1.4 %	∞
C	**Phantom and Setup**								
17	Phantom uncertainty	±2.0 %	Rectangular	√3	1	1	±1.2 %	±1.2 %	∞
18	Liquid conductivity (target) (≤5%)	±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%)	±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						**±9.5 %**	**±9.2 %**	7711
	Expanded Uncertainty (k=2)						**±19.0 %**	**±18.4 %**	

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