APPENDIX A: TEST DATA

Product Name: Mobile Phone ; Model Number: F-09C

Liquid Level Photo

Tissue 2450MHz D=150mm

Date/Time: 2011/3/3 10:48:50

M01-Right Head-Cheek-11b-Ch11 / Slider off

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1
Medium: HSL2450 Medium parameters used : f = 2462 MHz; σ = 1.86 mho/m; εr = 40.13; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Cheek ; Modulation type: DBPSK

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(7.11, 7.11, 7.11); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Touch position - High/Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
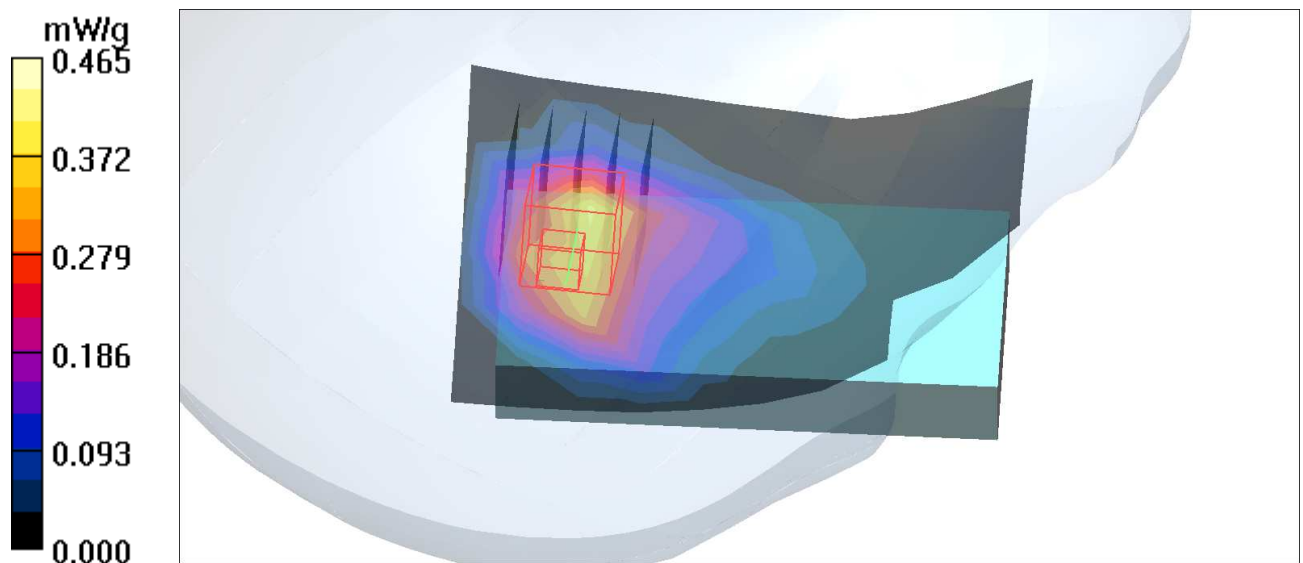Maximum value of SAR (measured) = 0.383 mW/g

Touch position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.2 V/m; Power Drift = 0.117 dB
Peak SAR (extrapolated) = 0.632 W/kg
SAR(1 g) = 0.306 mW/g; SAR(10 g) = 0.155 mW/g
Maximum value of SAR (measured) = 0.465 mW/g

M02-Right Head-Tilt-11b-Ch11 / Slider off

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1
Medium: HSL2450 Medium parameters used : f = 2462 MHz; σ = 1.86 mho/m; εr = 40.13; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Tilt ; Modulation type: DBPSK

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(7.11, 7.11, 7.11); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt position - High/Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
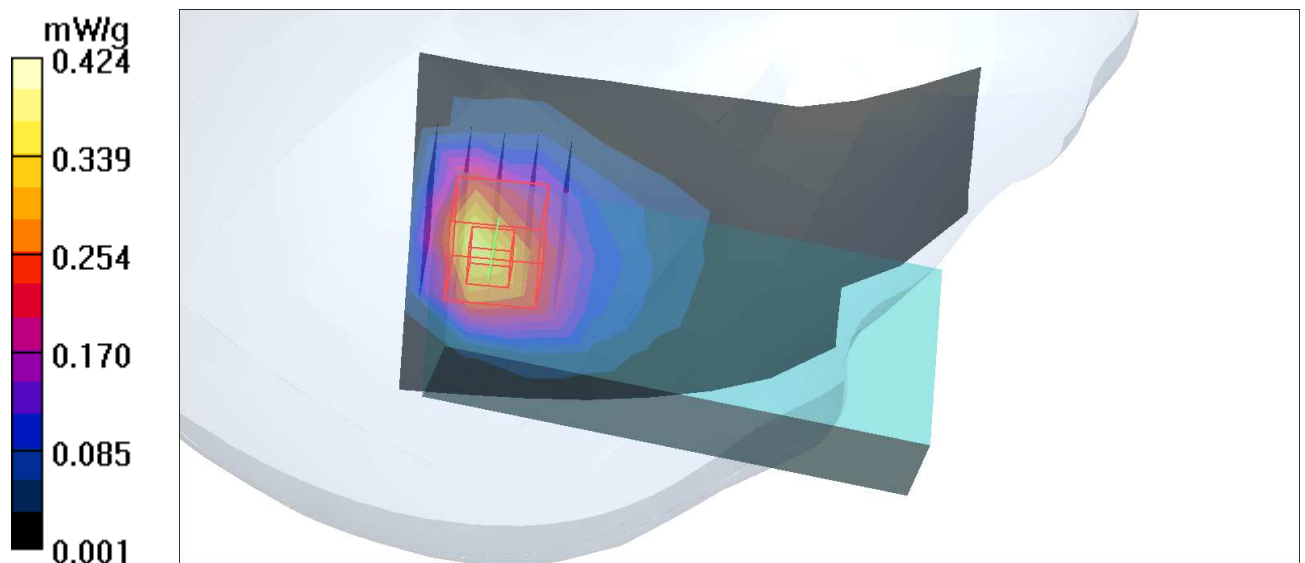.Maximum value of SAR (measured) = 0.380 mW/g

Tilt position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.6 V/m; Power Drift = 0.105 dB
Peak SAR (extrapolated) = 0.590 W/kg
SAR(1 g) = 0.294 mW/g; SAR(10 g) = 0.142 mW/g
Maximum value of SAR (measured) = 0.424 mW/g

M03-Left Head-Cheek-11b-Ch11 / Slider off

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1
Medium: HSL2450 Medium parameters used : f = 2462 MHz; σ = 1.86 mho/m; εr = 40.13; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: DBPSK

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(7.11, 7.11, 7.11); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Touch position - High/Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
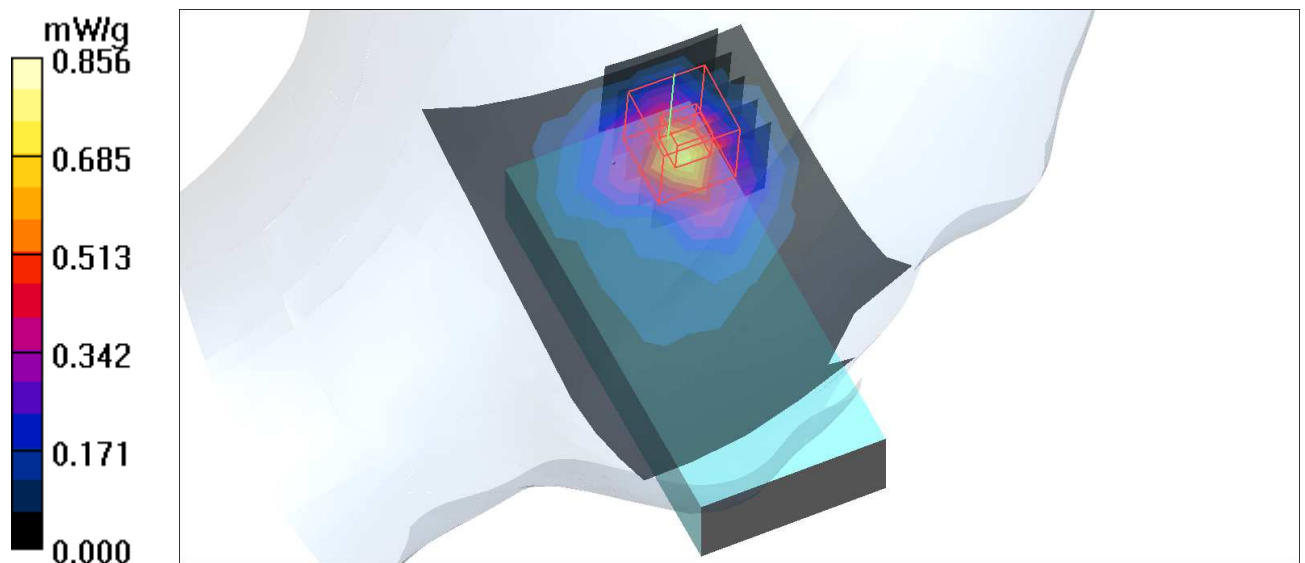Maximum value of SAR (measured) = 0.750 mW/g

Touch position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.7 V/m; Power Drift = -0.022 dB
Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 0.566 mW/g; SAR(10 g) = 0.244 mW/g
Maximum value of SAR (measured) = 0.856 mW/g

M04-Left Head-Tilt-11b-Ch11 / Slider off

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1
Medium: HSL2450 Medium parameters used : f = 2462 MHz; σ = 1.86 mho/m; εr = 40.13; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Tilt ; Modulation type: DBPSK

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(7.11, 7.11, 7.11); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt position - High/Area Scan (7x10x1): Measurement grid: dx=15mm, dy=15mm
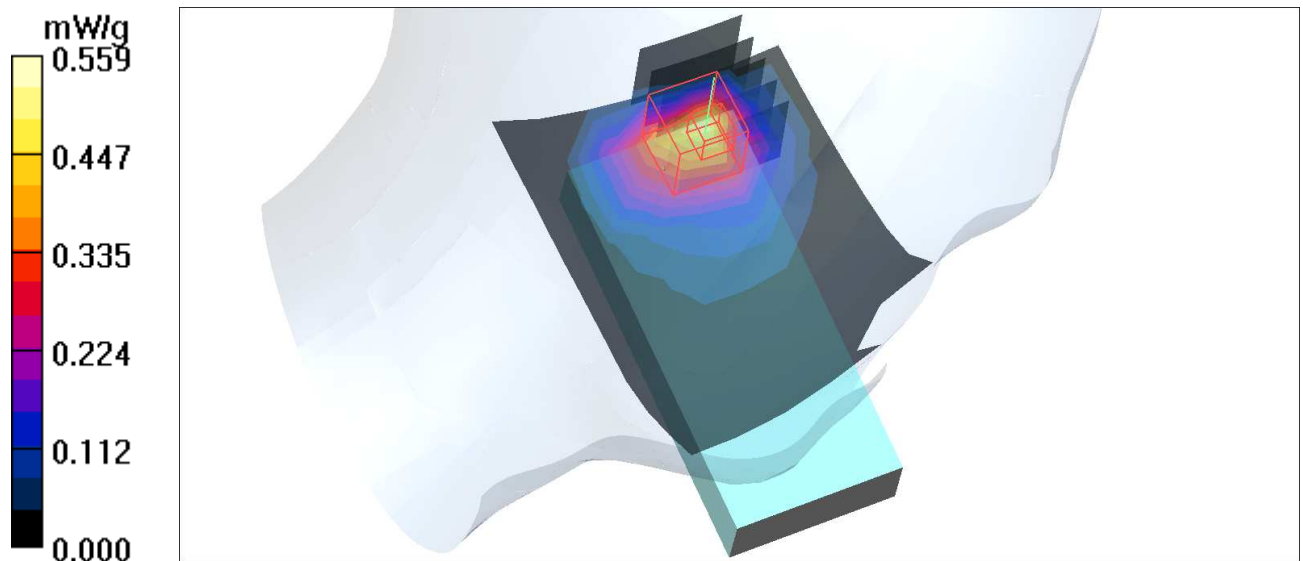Maximum value of SAR (measured) = 0.520 mW/g

Tilt position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.9 V/m; Power Drift = 0.078 dB
Peak SAR (extrapolated) = 0.895 W/kg
SAR(1 g) = 0.342 mW/g; SAR(10 g) = 0.159 mW/g
Maximum value of SAR (measured) = 0.559 mW/g

Date/Time: 2011/3/3 13:11:00

M05-Right Head-Cheek-11b-Ch11 / Slider on

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1
Medium: HSL2450 Medium parameters used : f = 2462 MHz; σ = 1.86 mho/m; εr = 40.13; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Cheek ; Modulation type: DBPSK

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(7.11, 7.11, 7.11); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Touch position - High/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
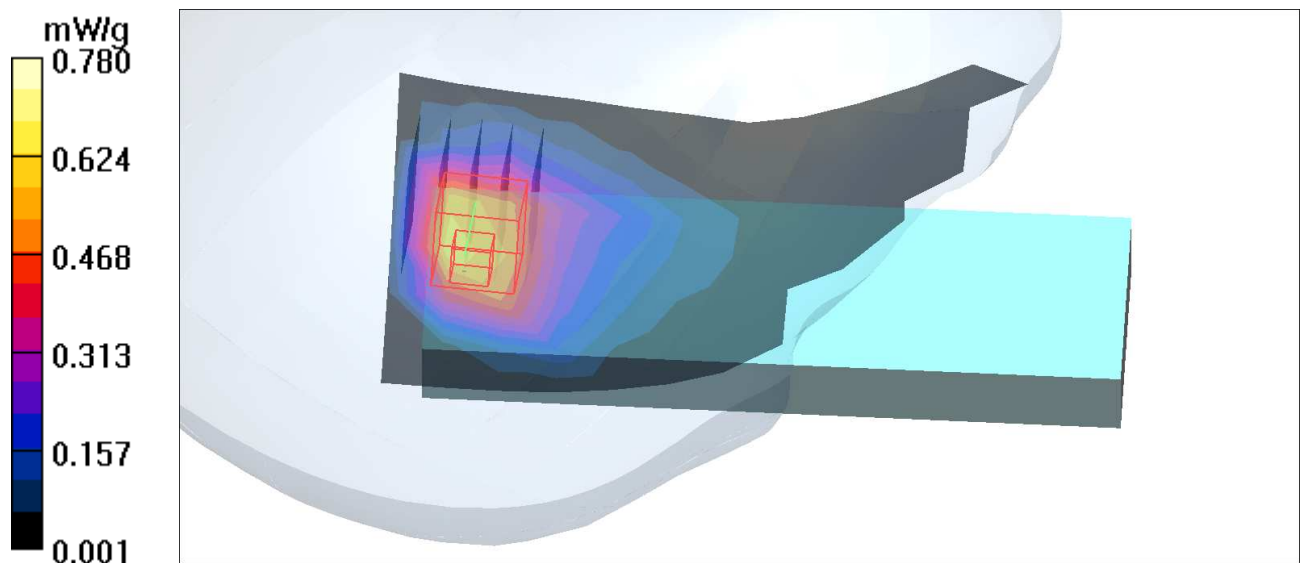Maximum value of SAR (measured) = 0.619 mW/g

Touch position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.1 V/m; Power Drift = 0.149 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.518 mW/g; SAR(10 g) = 0.255 mW/g
Maximum value of SAR (measured) = 0.780 mW/g

Date/Time: 2011/3/3 13:25:39

M06-Right Head-Tilt-11b-Ch11 / Slider on

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1
Medium: HSL2450 Medium parameters used : f = 2462 MHz; σ = 1.86 mho/m; εr = 40.13; ρ = 1000 kg/m^3
Phantom section: Right Section ; DUT test position : Tilt ; Modulation type: DBPSK

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(7.11, 7.11, 7.11); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt position - High/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
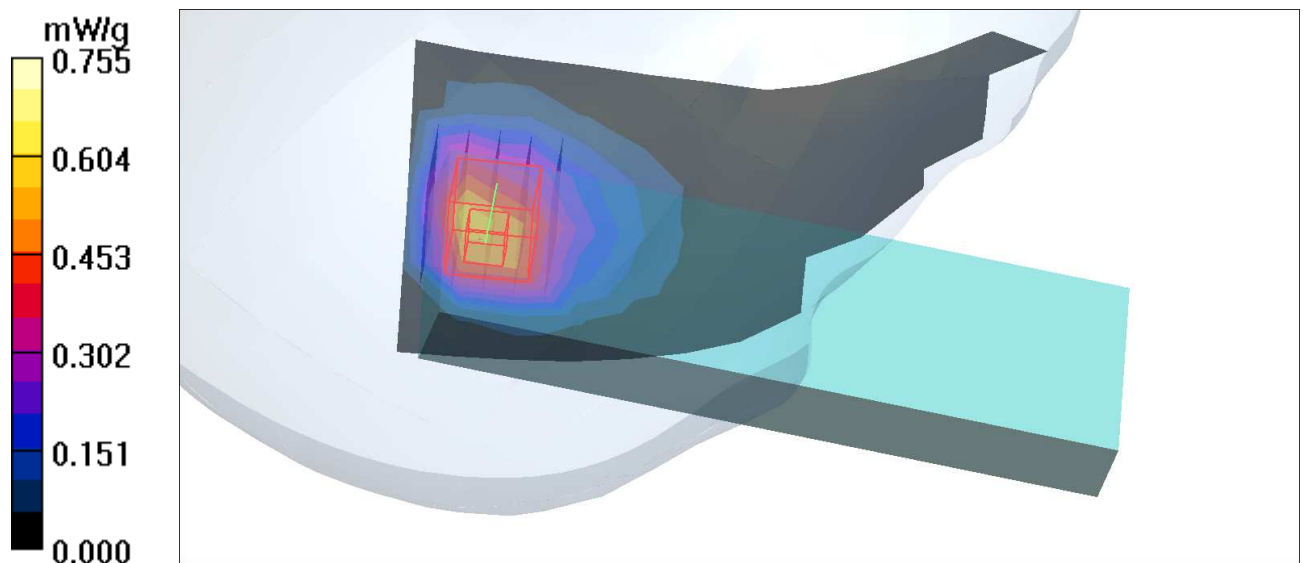Maximum value of SAR (measured) = 0.552 mW/g

Tilt position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 18.5 V/m; Power Drift = 0.124 dB
Peak SAR (extrapolated) = 1.02 W/kg
SAR(1 g) = 0.500 mW/g; SAR(10 g) = 0.242 mW/g
Maximum value of SAR (measured) = 0.755 mW/g

Date/Time: 2011/3/3 15:00:51

M07-Left Head-Cheek-11b-Ch1 / Slider on

Communication System: 802.11b ; Frequency: 2412 MHz ; Duty Cycle: 1:1
Medium: HSL2450 Medium parameters used: f = 2412 MHz; σ = 1.79 mho/m; ε_r = 40.43; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: DBPSK

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(7.11, 7.11, 7.11); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Touch position - Low/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
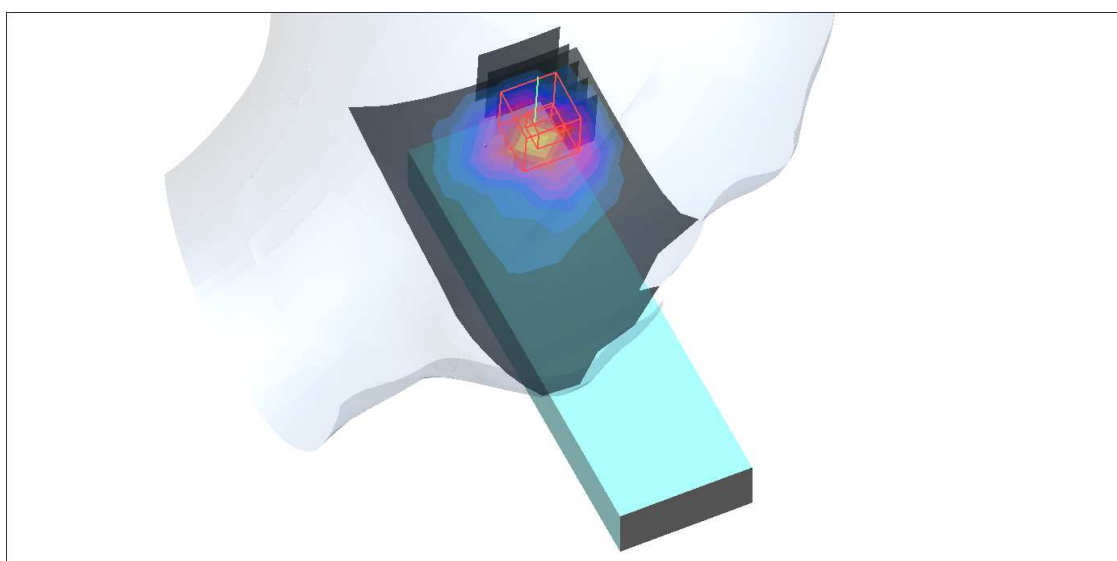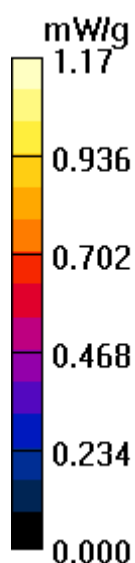Maximum value of SAR (measured) = 0.894 mW/g

Touch position - Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.3 V/m; Power Drift = 0.099 dB
Peak SAR (extrapolated) = 1.82 W/kg
SAR(1 g) = 0.741 mW/g; SAR(10 g) = 0.334 mW/g
Maximum value of SAR (measured) = 1.17 mW/g

Date/Time: 2011/3/3 15:42:14

M07-Left Head-Cheek-11b-Ch6 / Slider on

Communication System: 802.11b ; Frequency: 2437 MHz ; Duty Cycle: 1:1
Medium: HSL2450 Medium parameters used : f = 2437 MHz; σ = 1.82 mho/m; ε_r = 40.34; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: DBPSK

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(7.11, 7.11, 7.11); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Touch position - Mid/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
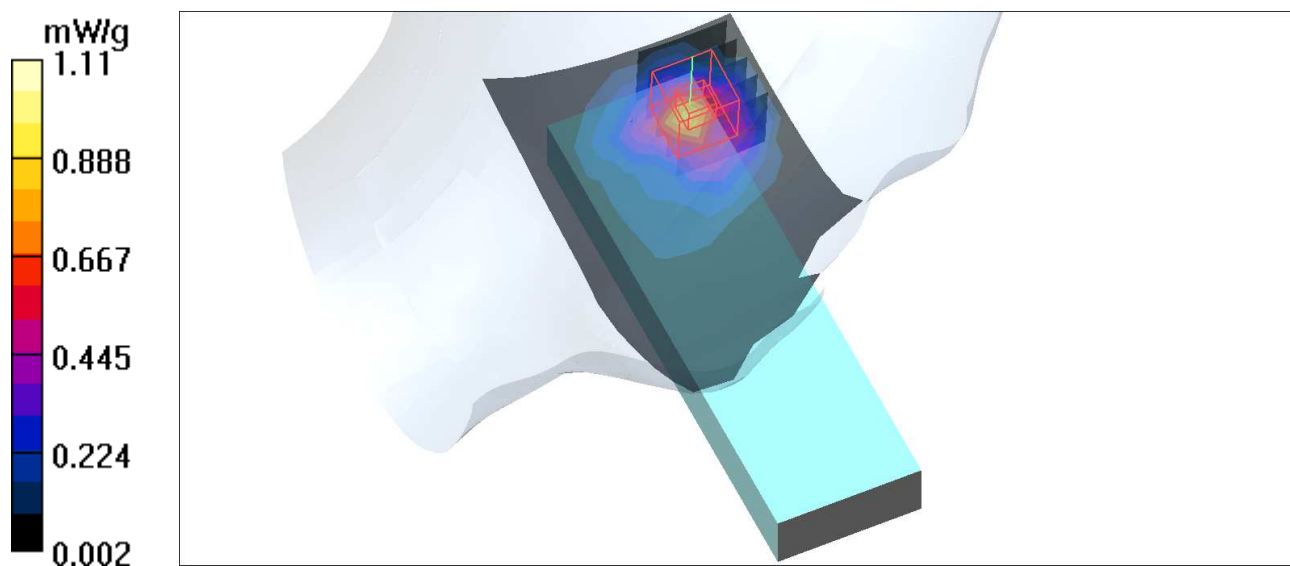Maximum value of SAR (measured) = 0.898 mW/g

Touch position - Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.4 V/m; Power Drift = 0.001 dB
Peak SAR (extrapolated) = 1.62 W/kg
SAR(1 g) = 0.672 mW/g; SAR(10 g) = 0.299 mW/g
Maximum value of SAR (measured) = 1.11 mW/g

M07-Left Head-Cheek-11b-Ch11 / Slider on

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1
Medium: HSL2450 Medium parameters used : f = 2462 MHz; σ = 1.86 mho/m; εr = 40.13; ρ = 1000 kg/m^3
Phantom section: Left Section ; DUT test position : Cheek ; Modulation type: DBPSK

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(7.11, 7.11, 7.11); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Touch position - High/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
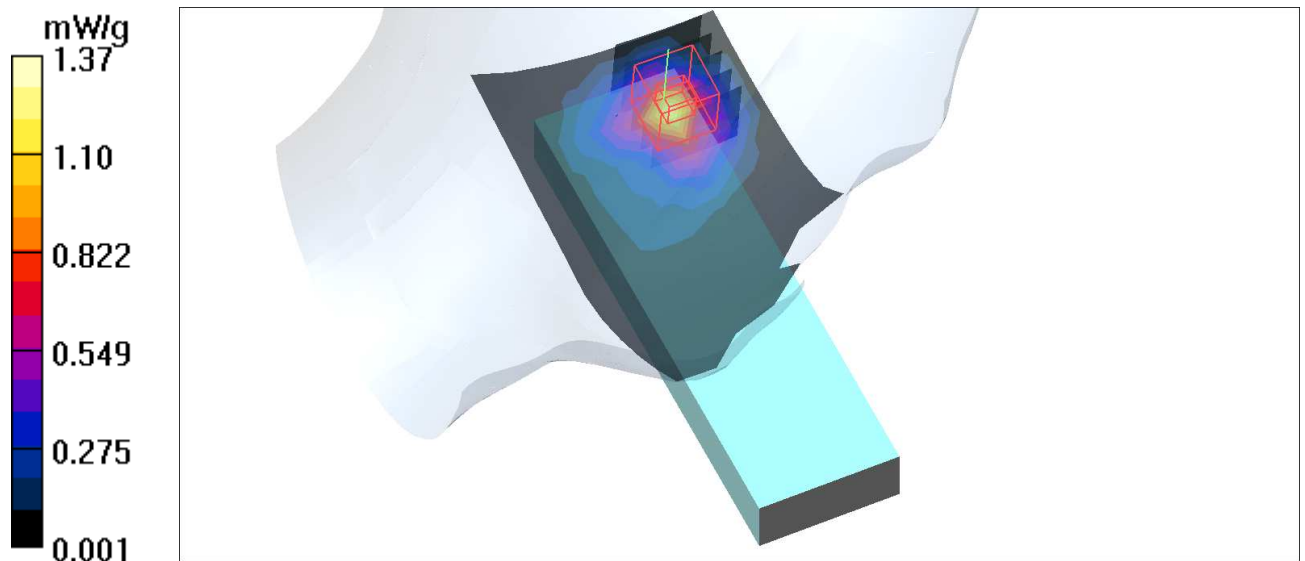Maximum value of SAR (measured) = 1.26 mW/g

Touch position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
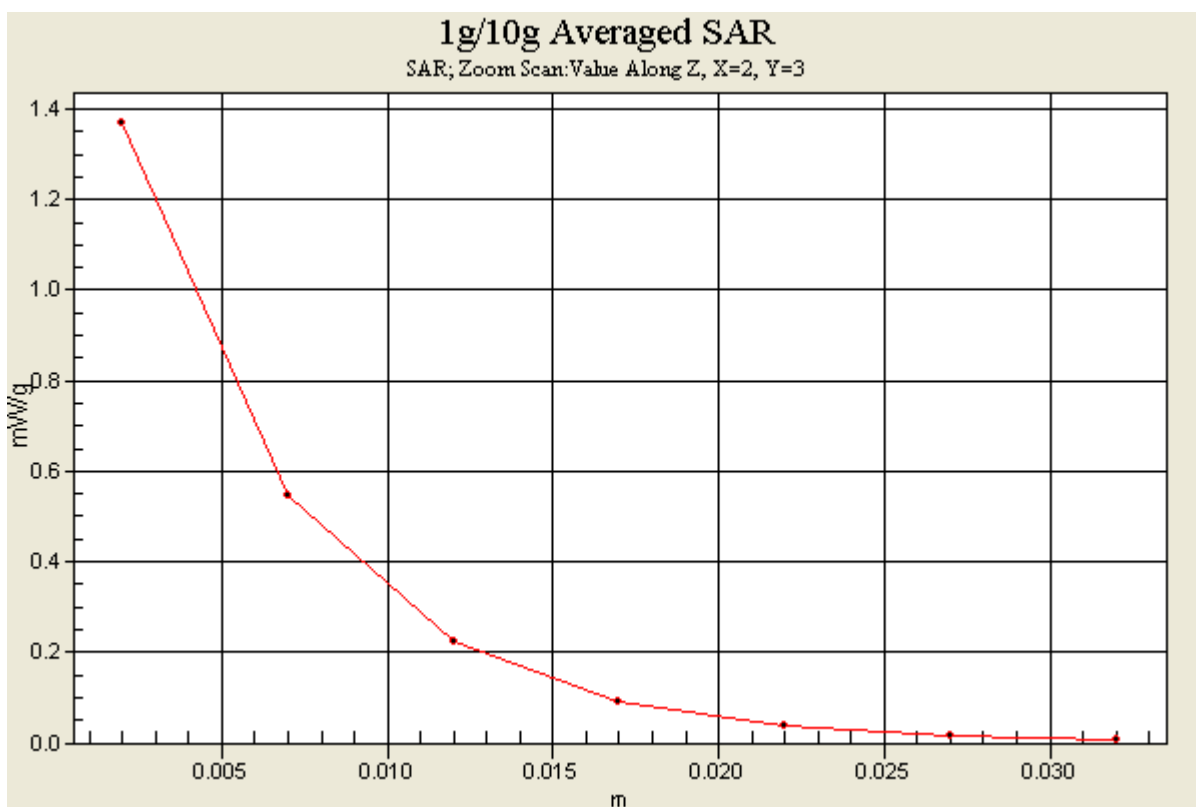Reference Value = 16.8 V/m; Power Drift = -0.113 dB
Peak SAR (extrapolated) = 2.26 W/kg
SAR(1 g) = 0.899 mW/g; SAR(10 g) = 0.394 mW/g
Maximum value of SAR (measured) = 1.37 mW/g

1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=2, Y=3

Date/Time: 2011/3/3 14:17:58

M08-Left Head-Tilt-11b-Ch11 / Slider on

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1
Medium: HSL2450 Medium parameters used : f = 2462 MHz; σ = 1.86 mho/m; εr = 40.13; ρ = 1000 kg/m³
Phantom section: Left Section ; DUT test position : Tilt ; Modulation type: DBPSK

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(7.11, 7.11, 7.11); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Tilt position - High/Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
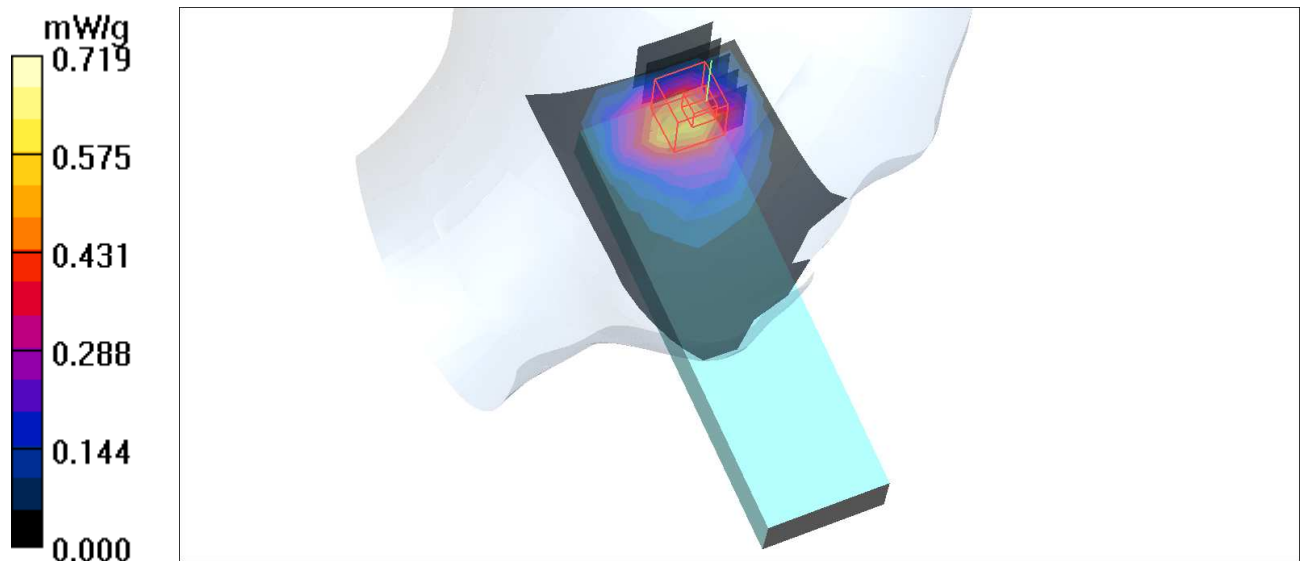Maximum value of SAR (measured) = 0.560 mW/g

Tilt position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 17.5 V/m; Power Drift = -0.028 dB
Peak SAR (extrapolated) = 1.22 W/kg
SAR(1 g) = 0.474 mW/g; SAR(10 g) = 0.219 mW/g
Maximum value of SAR (measured) = 0.719 mW/g

M09-Body-11b-Ch11 / Slider off

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1
Medium: MSL2450 Medium parameters used: f = 2462 MHz; σ = 2.02 mho/m; εr = 54.03; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: DBPSK
Separation Distance : 15 mm (The Bottom side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(6.91, 6.91, 6.91); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - High/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.019 mW/g
Body Position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.76 V/m; Power Drift = -0.159 dB
Peak SAR (extrapolated) = 0.021 W/kg
SAR(1 g) = 0.00808 mW/g; SAR(10 g) = 0.00341 mW/g
Maximum value of SAR (measured) = 0.012 mW/g
Body Position - High/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.76 V/m; Power Drift = -0.159 dB
Peak SAR (extrapolated) = 0.034 W/kg
SAR(1 g) = 0.014 mW/g; SAR(10 g) = 0.00549 mW/g
Maximum value of SAR (measured) = 0.020 mW/g

Date/Time: 2011/3/3 18:22:30

M10-Body-11b-Ch11 / Slider off

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1
Medium: MSL2450 Medium parameters used: f = 2462 MHz; σ = 2.02 mho/m; εr = 54.03; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: DBPSK
Separation Distance : 15 mm (The Front side of the EUT to the Phantom)
DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(6.91, 6.91, 6.91); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - High/Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm
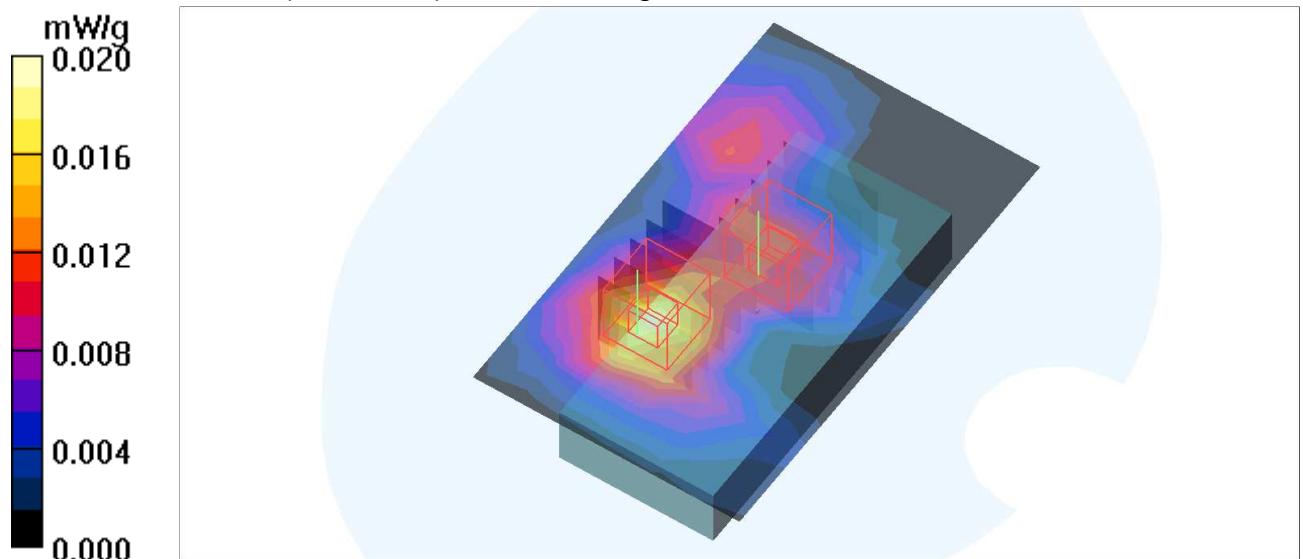Maximum value of SAR (measured) = 0.037 mW/g
Body Position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.35 V/m; Power Drift = 0.185 dB
Peak SAR (extrapolated) = 0.054 W/kg
SAR(1 g) = 0.029 mW/g; SAR(10 g) = 0.016 mW/g
Maximum value of SAR (measured) = 0.041 mW/g
Body Position - High/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.35 V/m; Power Drift = 0.185 dB
Peak SAR (extrapolated) = 0.057 W/kg
SAR(1 g) = 0.025 mW/g; SAR(10 g) = 0.013 mW/g

Date/Time: 2011/3/3 18:45:07

M11-Body-11b-Ch11 / Slider on

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1
Medium: MSL2450 Medium parameters used: f = 2462 MHz; σ = 2.02 mho/m; εr = 54.03; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: DBPSK
Separation Distance : 15 mm (The Bottom side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(6.91, 6.91, 6.91); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

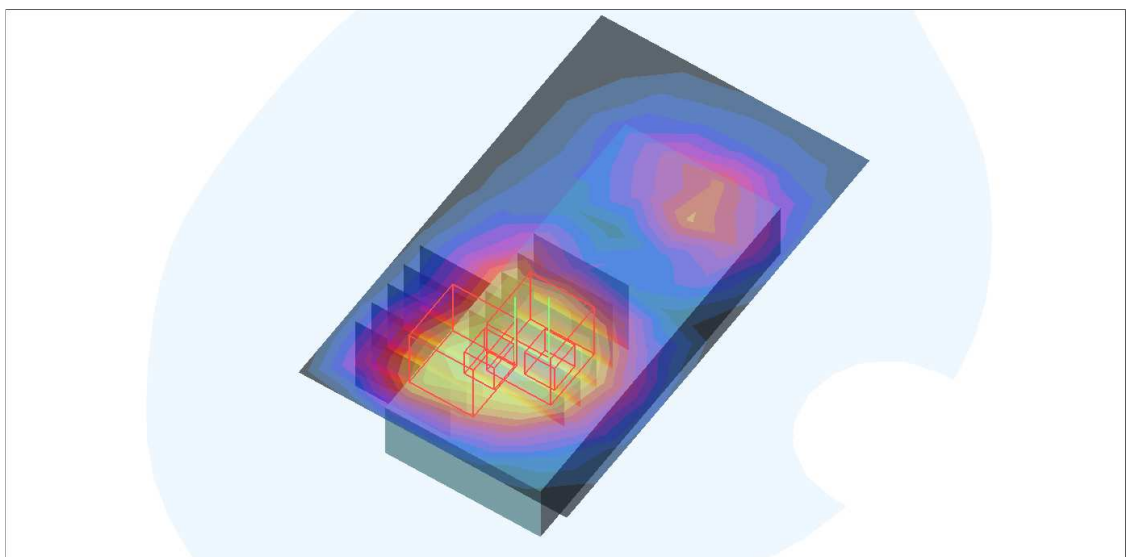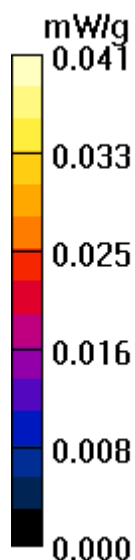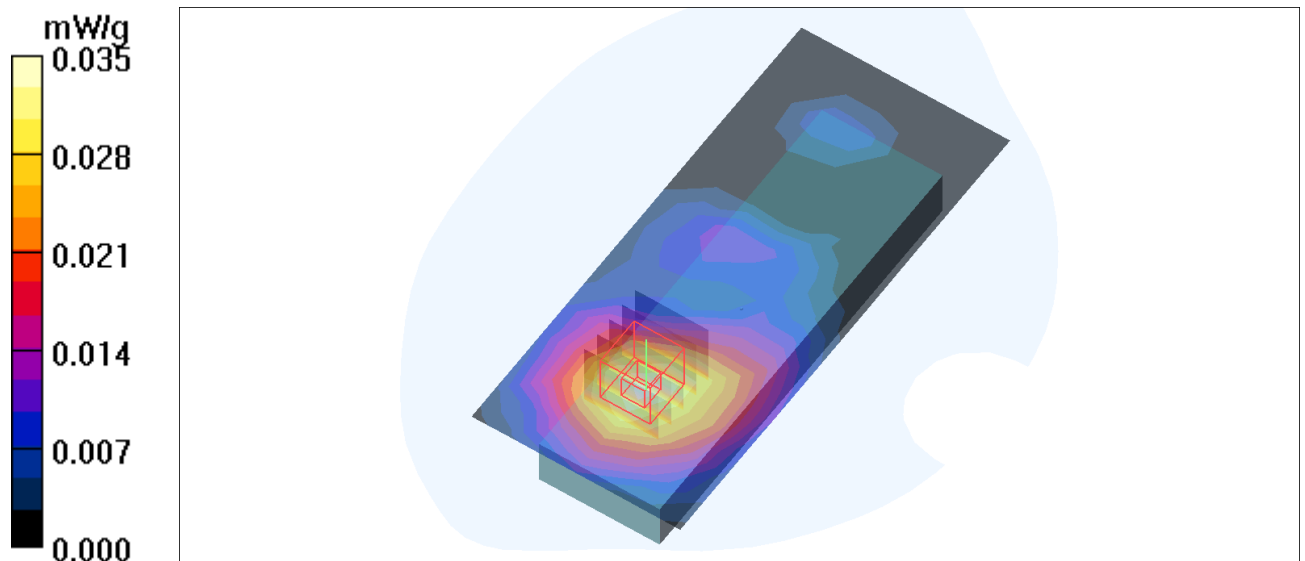**Body Position - High/Area Scan (7x15x1):** Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.035 mW/g

Body Position - High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.83 V/m; Power Drift = 0.116 dB
Peak SAR (extrapolated) = 0.047 W/kg
SAR(1 g) = 0.024 mW/g; SAR(10 g) = 0.012 mW/g

Date/Time: 2011/3/3 19:03:34

M12-Body-11b-Ch11 / Slider on

Communication System: 802.11b ; Frequency: 2462 MHz ; Duty Cycle: 1:1
Medium: MSL2450 Medium parameters used: f = 2462 MHz; σ = 2.02 mho/m; εr = 54.03; ρ = 1000 kg/m^3
Phantom section: Flat Section ; DUT test position : Body ; Modulation Type: DBPSK
Separation Distance : 15 mm (The Front side of the EUT to the Phantom)

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(6.91, 6.91, 6.91); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Body Position - High_Front/Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm
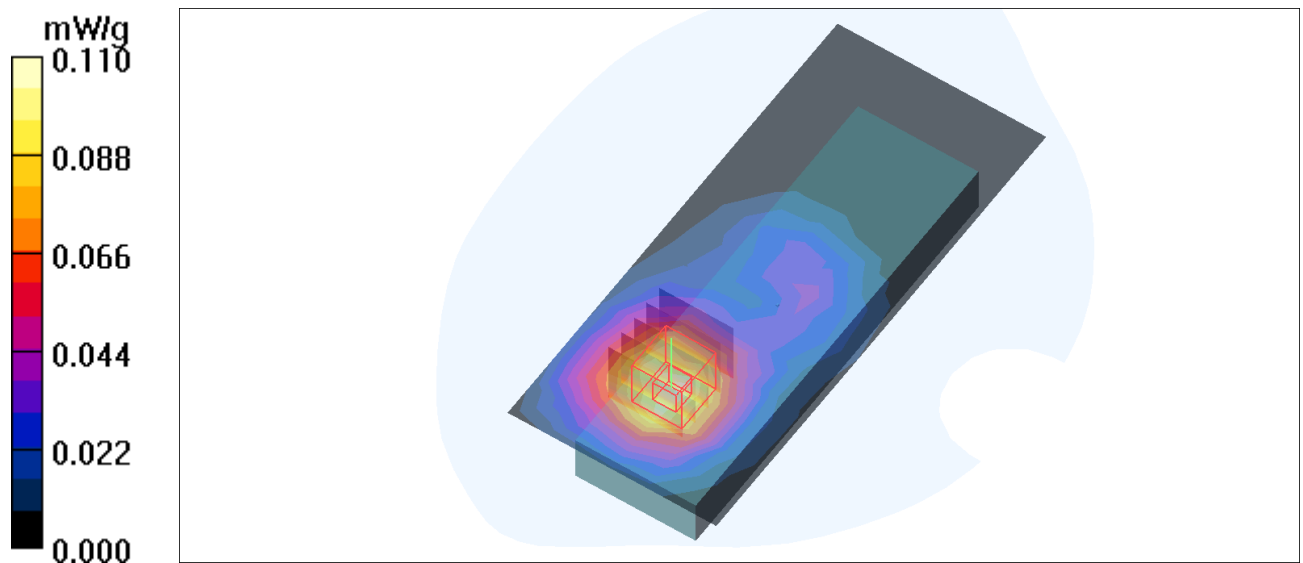Maximum value of SAR (measured) = 0.106 mW/g

Body Position - High_Front/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.04 V/m; Power Drift = 0.142 dB
Peak SAR (extrapolated) = 0.145 W/kg
SAR(1 g) = 0.077 mW/g; SAR(10 g) = 0.043 mW/g
Maximum value of SAR (measured) = 0.110 mW/g

Date/Time: 2011/3/3 10:11:31

SystemPerformanceCheck-D2450V2-HSL2450MHz

DUT: Dipole 2450 MHz ; Type: D2450V2 ; Serial: D2450V2 - SN:716 ; Test Frequency: 2450 MHz

Communication System: CW ; Frequency: 2450 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: HSL2450;Medium parameters used: f = 2450 MHz; σ = 1.85 mho/m; ε_r = 40.16; ρ = 1000 kg/m^3 ; Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feet point of the dipole to the Phantom)Air temp. : 22.3 degrees ; Liquid temp. : 21.6 degrees

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(7.11, 7.11, 7.11); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 15.1 mW/g

d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 105.5 V/m; Power Drift = 0.023 dB
Peak SAR (extrapolated) = 29.2 W/kg
SAR(1 g) = 13.1 mW/g; SAR(10 g) = 6.05 mW/g
Maximum value of SAR (measured) = 20.8 mW/g

Date/Time: 2011/3/3 16:35:10
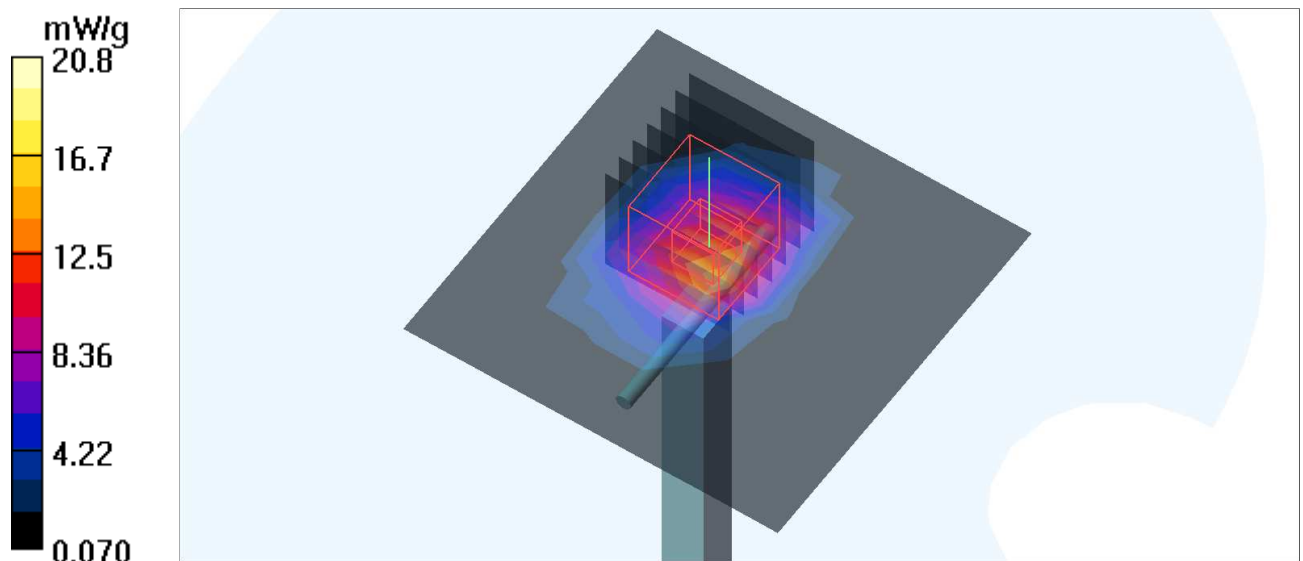
SystemPerformanceCheck-D2450V2-MSL2450MHz

DUT: Dipole 2450 MHz ; Type: D2450V2 ; Serial: D2450V2 - SN:716 ; Test Frequency: 2450 MHz

Communication System: CW ; Frequency: 2450 MHz; Duty Cycle: 1:1; Modulation type: CW
Medium: MSL2450;Medium parameters used: f = 2450 MHz; σ = 2.01 mho/m; ε_r = 54.18; ρ = 1000 kg/m^3 ; Liquid level : 150 mm
Phantom section: Flat Section ; Separation distance : 10 mm (The feet point of the dipole to the Phantom)Air temp. : 22.6 degrees ; Liquid temp. : 21.7 degrees

DASY4 Configuration:

- Probe: EX3DV4 - SN3753; ConvF(6.91, 6.91, 6.91); Calibrated: 2010/12/13
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn579; Calibrated: 2010/9/20
- Phantom: SAM Twin Phantom V4.0; Type: QD 000 P40 CA; Serial: TP 1202
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

d=10mm, Pin=250mW/Area Scan (7x7x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 18.3 mW/g

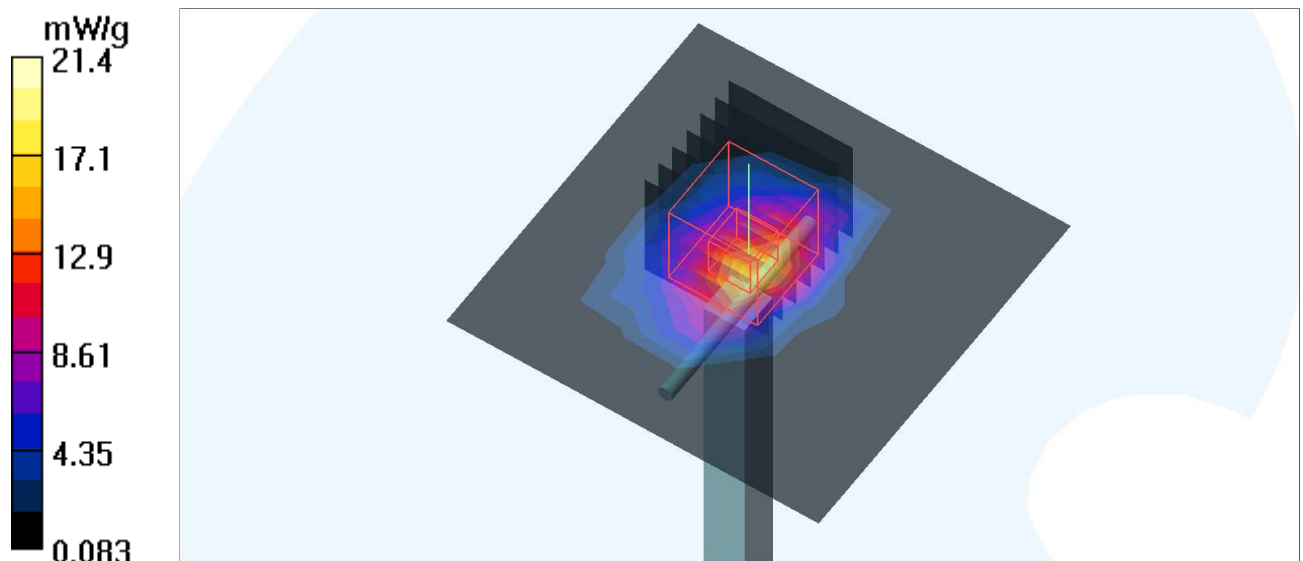**d=10mm, Pin=250mW/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 110.1 V/m; Power Drift = -0.106 dB
Peak SAR (extrapolated) = 29.3 W/kg
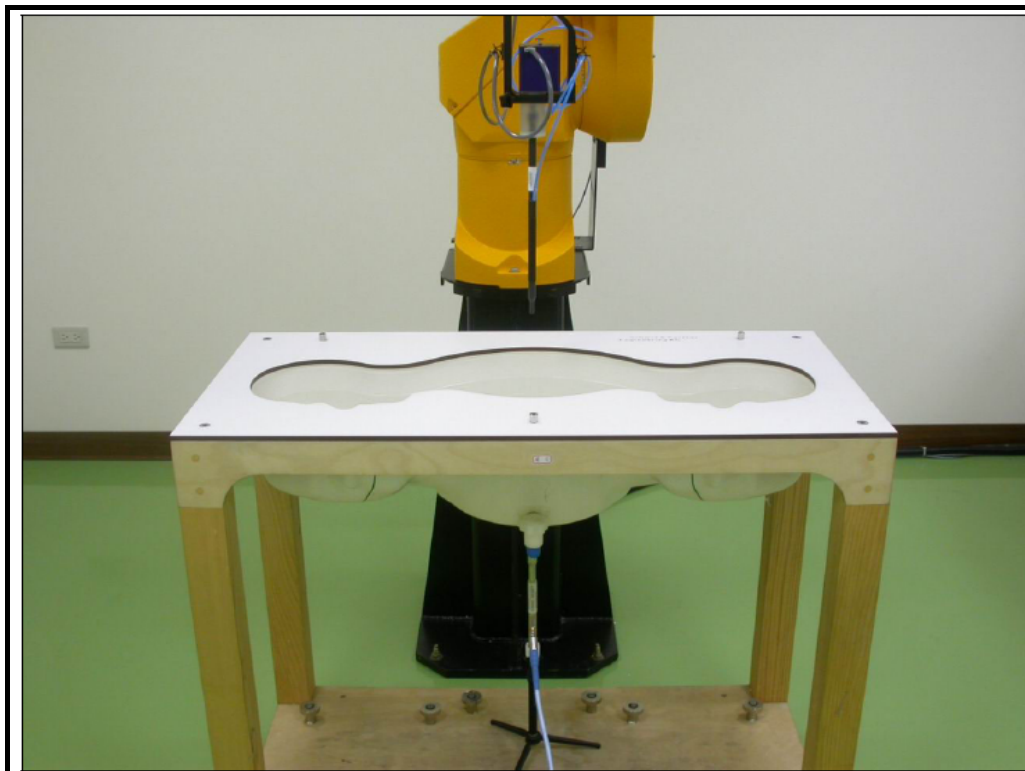**SAR(1 g) = 13.8 mW/g; SAR(10 g) = 6.33 mW/g**
Maximum value of SAR (measured) = 21.4 mW/g

18

APPENDIX B: BV ADT SAR MEASUREMENT SYSTEM

APPENDIX C: PHOTOGRAPHS OF SYSTEM VALIDATION

APPENDIX D: SYSTEM CERTIFICATE & CALIBRATION

D1: SAM PHANTOM

Certificate of conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 CA
Series No	TP-1150 and higher
Manufacturer / Origin	Untersee Composites Hauptstr. 69 CH-8559 Fruthwilen Switzerland

Tests

The series production process used allows the limitation to test of first articles.
Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series units (called samples).

Test	Requirement	Details	Units tested
Shape	Compliance with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness	Compliant with the requirements according to the standards	2mm +/- 0.2mm in specific areas	First article, Samples
Material parameters	Dielectric parameters for required frequencies	200 MHz – 3 GHz Relative permittivity < 5 Loss tangent < 0.05.	Material sample TP 104-5
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards	Liquid type HSL 1800 and others according to the standard.	Pre-series, First article

Standards

[1] CENELEC EN 50361
[2] IEEE P1528-200x draft 6.5
[3] IEC PT 62209 draft 0.9
(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standard [1] and draft standards [2] and [3].

Date   28.02.2002

Signature / Stamp

F. Bernhult

D2: DOSIMETRIC E-FIELD PROBE

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	Auden	Certificate No: EX3-3753_Dec10

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3753
Calibration procedure(s)	QA CAL-01 v6, QA CAL-14 v3, QA CAL-23 v3 and QA CAL-25 v2 Calibration procedure for dosimetric E-field probes
Calibration date:	December 13, 2010

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 E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-10)	In house check: Oct-11

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Niels Kuster	Quality Manager	

Issued: December 14, 2010

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

Calibration Laboratory of

Schmid & Partner
  Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S   Schweizerischer Kalibrierdienst
C   Service suisse d'étalonnage
    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**

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConvF	sensitivity in TSL / NORMx,y,z
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization ϑ	ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis

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

Methods Applied and Interpretation of Parameters:

*   *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).

*   *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.

*   *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.

*   *Ax,y,z; Bx,y,z; Cx,y,z; VRx,y,z:* A, B, C are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.

*   *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.

*   *Spherical isotropy (3D deviation from isotropy):* in a field of low gradients realized using a flat phantom exposed by a patch antenna.

*   *Sensor Offset:* The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.

Probe EX3DV4

SN:3753

Manufactured: March 16, 2010
Calibrated: December 13, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 SN:3753

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm $(\mu V/(V/m)^2)^A$	0.34	0.49	0.52	± 10.1%
DCP $(mV)^B$	99.3	98.8	103.0	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	120.2	± 2.9 %
			Y	0.00	0.00	1.00	111.7	
			Z	0.00	0.00	1.00	118.9	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^{A} The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Pages 5 and 6).

^{B} Numerical linearization parameter: uncertainty not required.

^{E} Uncertainty is determined using the maximum deviation from linear response applying recatangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 SN:3753

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz]c	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
750	± 50 / ± 100	41.9 ± 5%	0.89 ± 5%	9.52	9.52	9.52	0.52	0.72 ± 11.0%
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	9.06	9.06	9.06	0.58	0.70 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	8.25	8.25	8.25	0.67	0.64 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	7.90	7.90	7.90	0.54	0.71 ± 11.0%
2000	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	7.82	7.82	7.82	0.62	0.65 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	7.11	7.11	7.11	0.38	0.83 ± 11.0%
5200	± 50 / ± 100	36.0 ± 5%	4.66 ± 5%	4.96	4.96	4.96	0.32	1.90 ± 13.1%
5300	± 50 / ± 100	35.9 ± 5%	4.76 ± 5%	4.69	4.69	4.69	0.40	1.90 ± 13.1%
5500	± 50 / ± 100	35.6 ± 5%	4.96 ± 5%	4.43	4.43	4.43	0.45	1.90 ± 13.1%
5600	± 50 / ± 100	35.5 ± 5%	5.07 ± 5%	4.44	4.44	4.44	0.45	1.90 ± 13.1%
5800	± 50 / ± 100	35.3 ± 5%	5.27 ± 5%	4.32	4.32	4.32	0.45	1.90 ± 13.1%

c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

DASY/EASY - Parameters of Probe: EX3DV4 SN:3753

Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz][c]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
750	± 50 / ± 100	55.5 ± 5%	0.96 ± 5%	9.25	9.25	9.25	0.54	0.74 ± 11.0%
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	9.07	9.07	9.07	0.55	0.73 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	7.48	7.48	7.48	0.32	1.19 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	7.17	7.17	7.17	0.55	0.96 ± 11.0%
2000	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	7.22	7.22	7.22	0.96	0.52 ± 11.0%
2300	± 50 / ± 100	52.8 ± 5%	1.85 ± 5%	7.11	7.11	7.11	0.54	0.75 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	6.91	6.91	6.91	0.54	0.88 ± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	6.86	6.86	6.86	0.97	0.34 ± 11.0%
3500	± 50 / ± 100	51.3 ± 5%	3.31 ± 5%	6.19	6.19	6.19	0.35	1.20 ± 13.1%
5200	± 50 / ± 100	49.0 ± 5%	5.30 ± 5%	4.21	4.21	4.21	0.55	1.95 ± 13.1%
5300	± 50 / ± 100	48.9 ± 5%	5.42 ± 5%	4.02	4.02	4.02	0.55	1.95 ± 13.1%
5500	± 50 / ± 100	48.6 ± 5%	5.65 ± 5%	3.69	3.69	3.69	0.55	1.95 ± 13.1%
5600	± 50 / ± 100	48.5 ± 5%	5.77 ± 5%	3.41	3.41	3.41	0.60	1.95 ± 13.1%
5800	± 50 / ± 100	48.2 ± 5%	6.00 ± 5%	3.90	3.90	3.90	0.60	1.95 ± 13.1%

[c] The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.
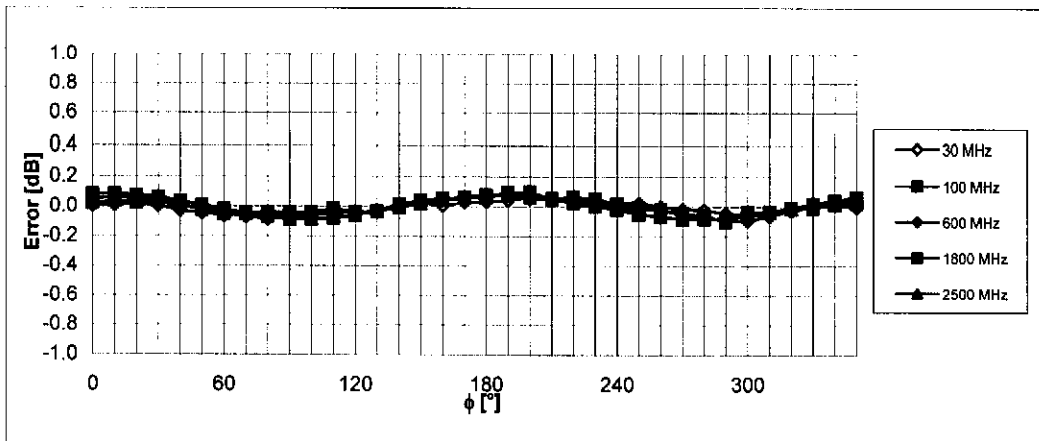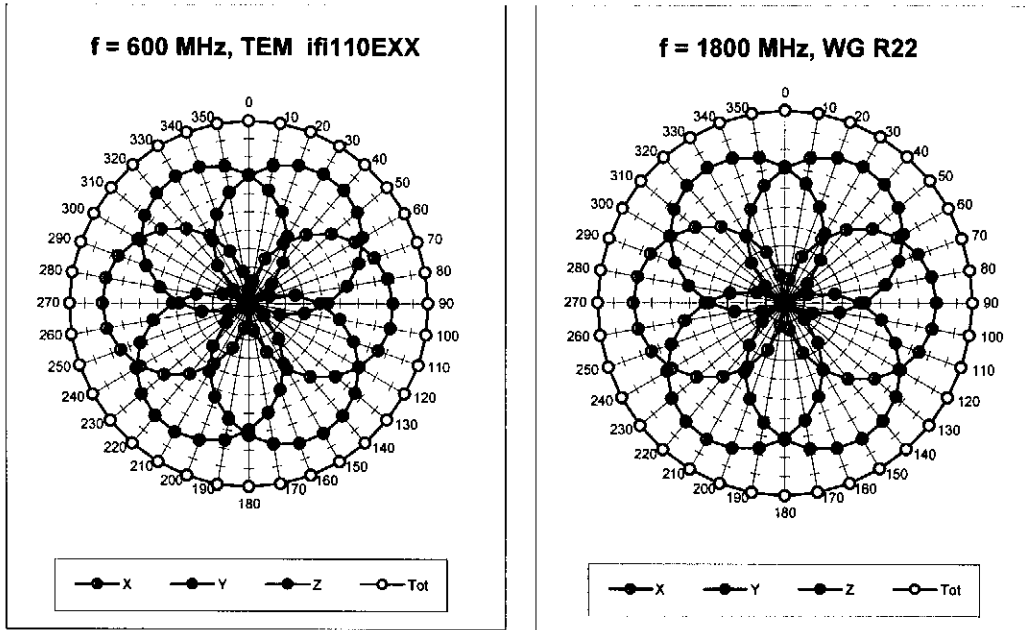
Frequency Response of E-Field

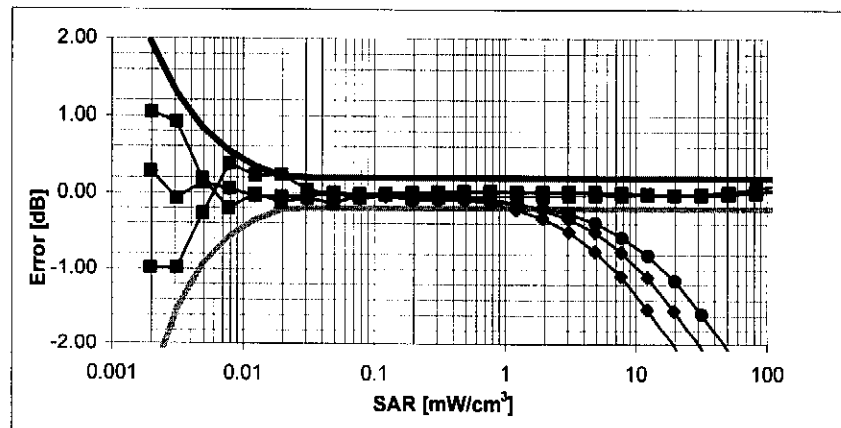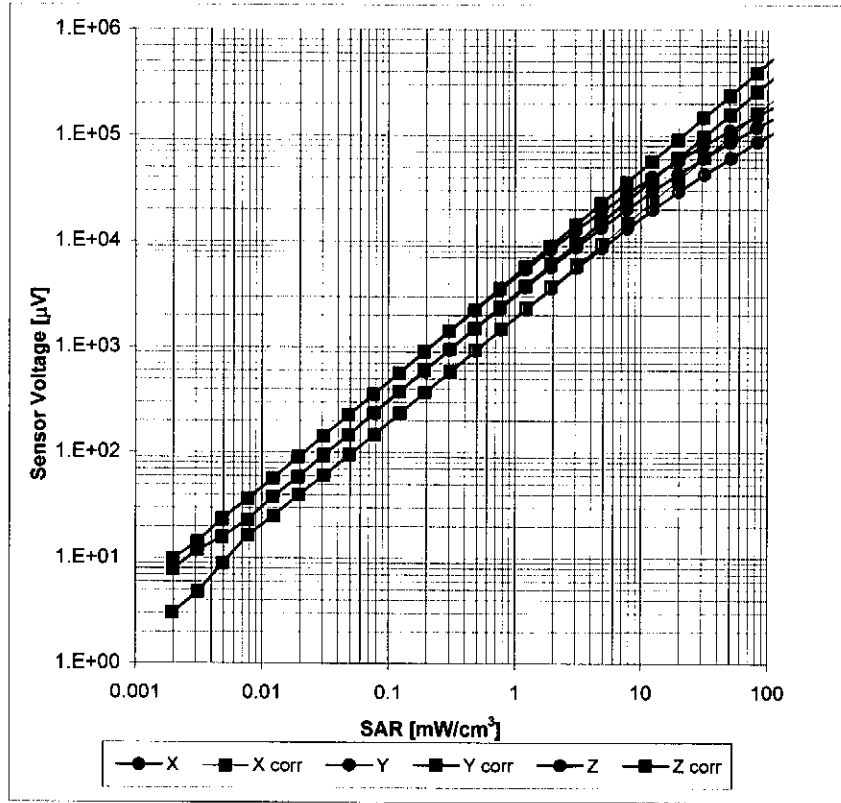## (TEM-Cell:ifi110 EXX, Waveguide: R22)
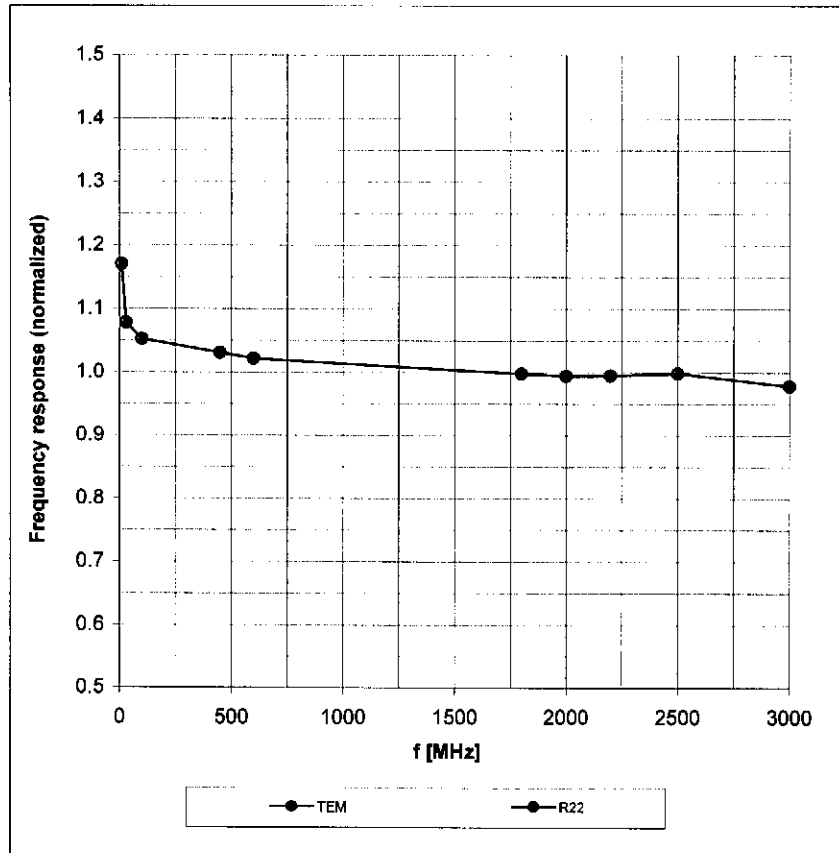
Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), $\vartheta = 0°$

f = 600 MHz, TEM ifi110EXX

f = 1800 MHz, WG R22

Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR$_{head}$)
(TEM cell, f = 900 MHz)

Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment

f = 750 MHz, WGLS R9 (head)

f = 5800 MHz, WGLS R58 (head)
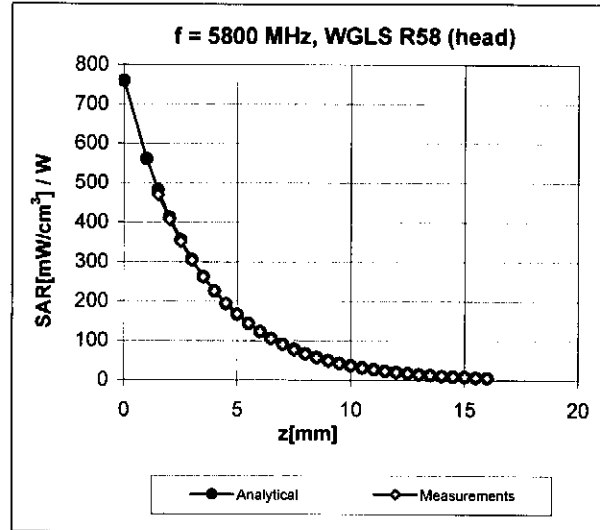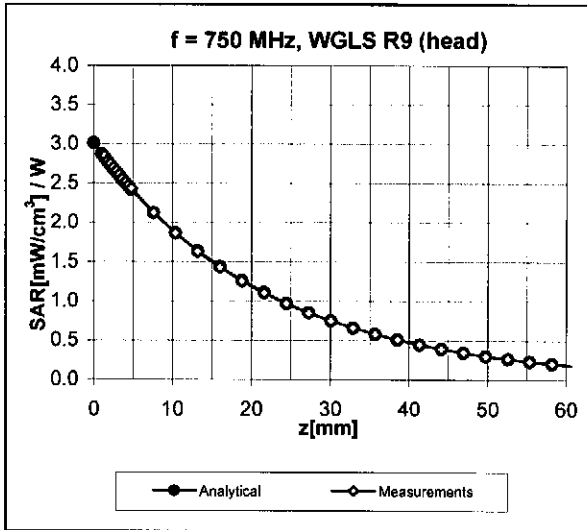
Deviation from Isotropy in HSL

Error (φ, ϑ), f = 900 MHz
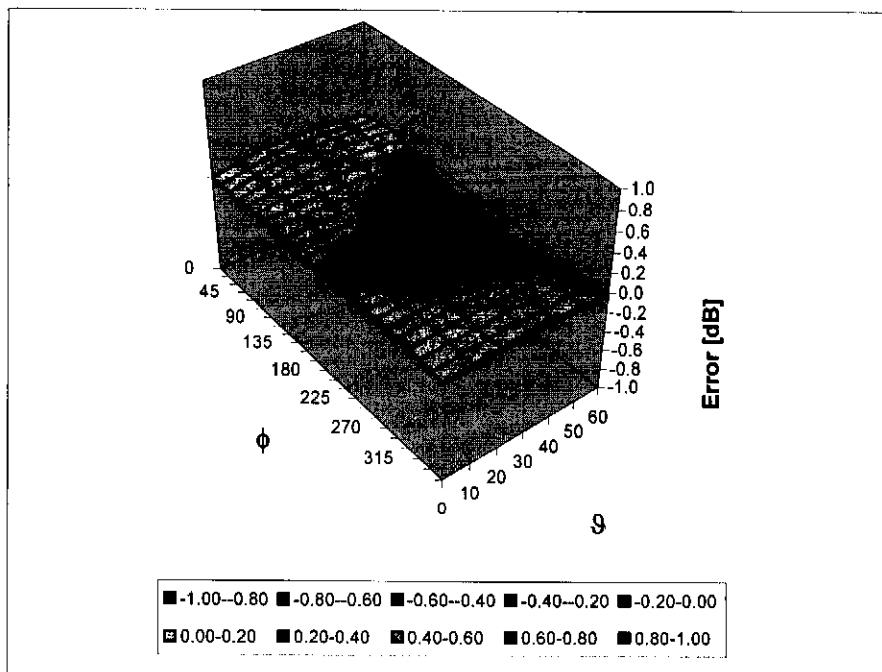
Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm