Appendix A. Plots of System Performance Check

The plots are shown as follows.

System Check_Head_2450MHz_110315

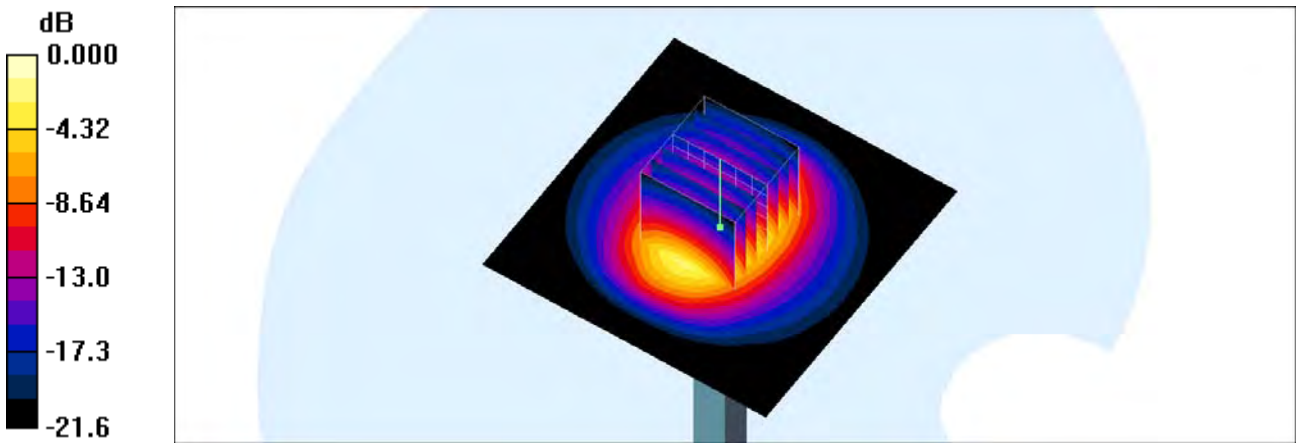
DUT: Dipole 2450 MHz

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: HSL_2450_110315 Medium parameters used: f = 2450 MHz; σ = 1.84 mho/m; ε_r = 38.6; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.5, 4.5, 4.5); Calibrated: 2007/8/28
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2007/9/17
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 5.80 mW/g

Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.7 V/m; Power Drift = 0.067 dB
Peak SAR (extrapolated) = 11.0 W/kg
SAR(1 g) = 5.08 mW/g; SAR(10 g) = 2.38 mW/g
Maximum value of SAR (measured) = 5.77 mW/g



0 dB = 5.77mW/g

System Check_Body_2450MHz_110315

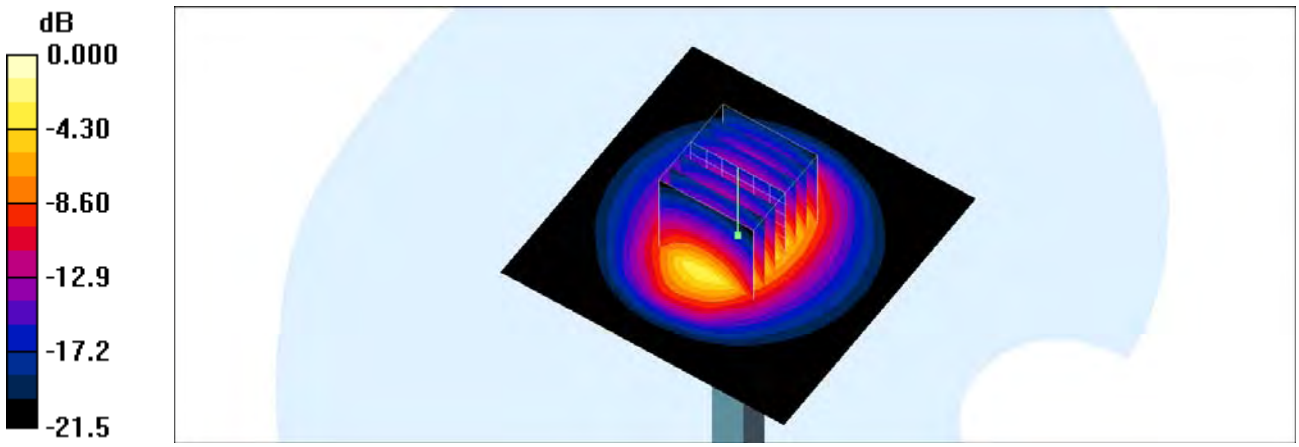
DUT: Dipole 2450 MHz

Communication System: CW; Frequency: 2450 MHz;Duty Cycle: 1:1
Medium: MSL_2450_110315 Medium parameters used: f = 2450 MHz; σ = 1.93 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(3.96, 3.96, 3.96); Calibrated: 2009/5/26
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2008/11/12
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 6.01 mW/g

Pin=100mW/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.4 V/m; Power Drift = 0.012 dB
Peak SAR (extrapolated) = 12.4 W/kg
SAR(1 g) = 5.24 mW/g; SAR(10 g) = 2.4 mW/g
Maximum value of SAR (measured) = 5.80 mW/g



0 dB = 5.80mW/g

System Check_Head_5200MHz_110312

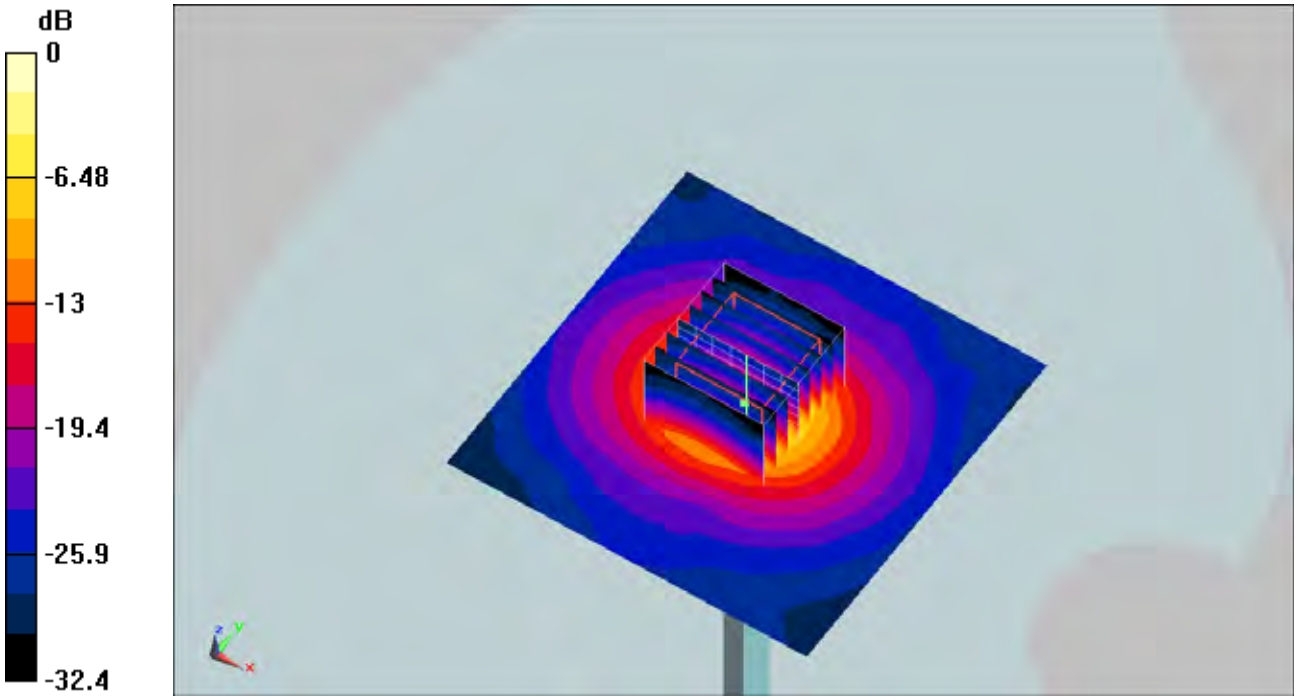
DUT: Dipole 5GHz

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: HSL_5G_110312 Medium parameters used: f = 5200 MHz; σ = 4.81 mho/m; ε_r = 35.4; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(4.83, 4.83, 4.83); Calibrated: 2010/9/20
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: SAM-Back; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 13.3 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 55.1 V/m; Power Drift = -0.026 dB
Peak SAR (extrapolated) = 31.5 W/kg
SAR(1 g) = 7.87 mW/g; SAR(10 g) = 2.19 mW/g
Maximum value of SAR (measured) = 13.2 mW/g



0 dB = 13.2mW/g

System Check_Body_5200MHz_110326

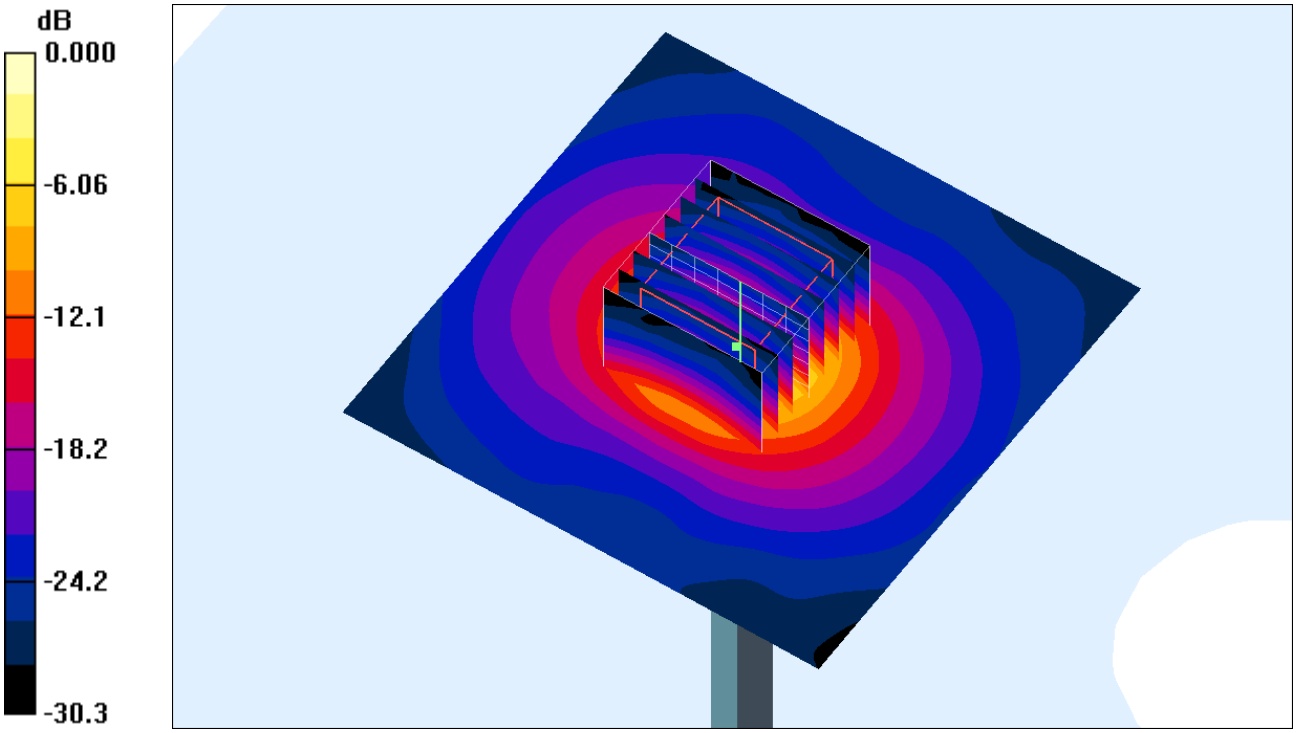
DUT: Dipole 5GHz

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: MSL_5G_110326 Medium parameters used: f = 5200 MHz; σ = 5.13 mho/m; ε_r = 47.5; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.8 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(3.87, 3.87, 3.87); Calibrated: 2010/9/20
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2010/8/18
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 15.8 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 60.3 V/m; Power Drift = -0.032 dB
Peak SAR (extrapolated) = 27.3 W/kg
SAR(1 g) = 8.23 mW/g; SAR(10 g) = 2.21 mW/g
Maximum value of SAR (measured) = 14.1 mW/g



0 dB = 14.1mW/g

System Check_Body_5200MHz_110327

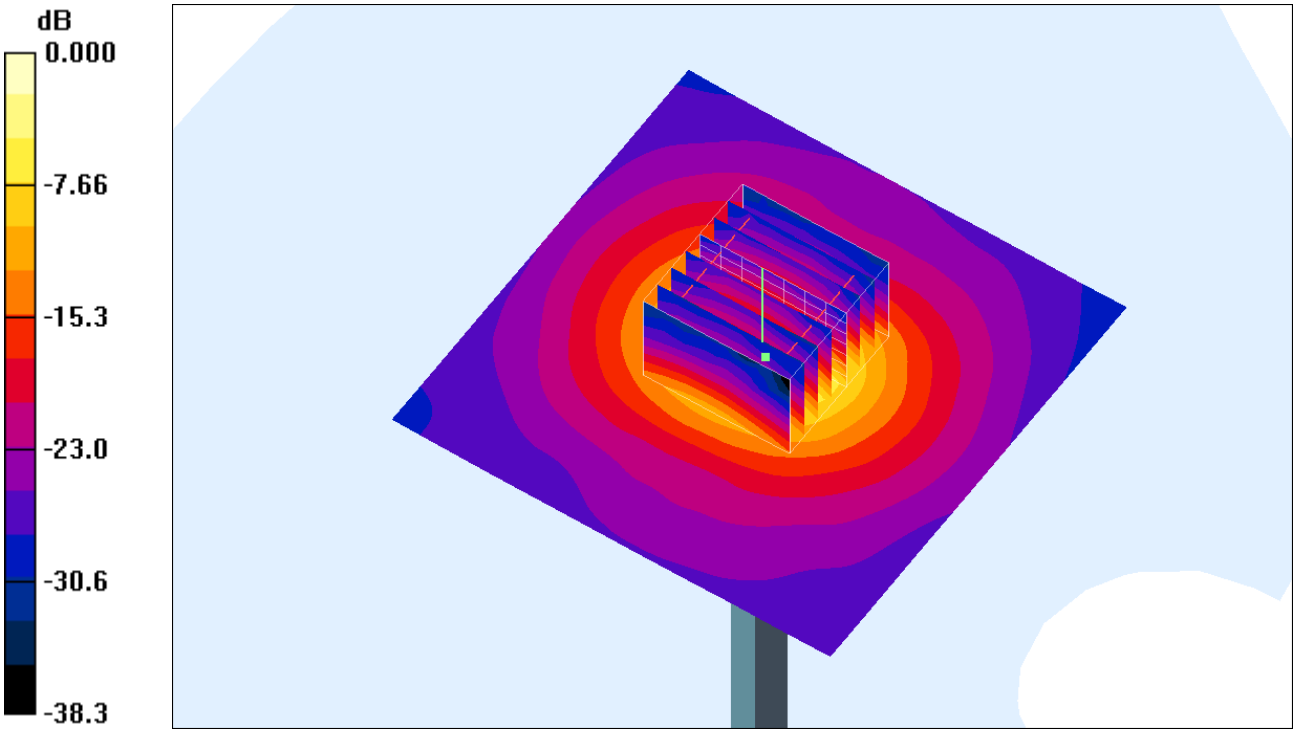
DUT: Dipole 5GHz

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: MSL_5G_110327 Medium parameters used: f = 5200 MHz; σ = 5.15 mho/m; ε_r = 47.4; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(3.87, 3.87, 3.87); Calibrated: 2010/9/20
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2010/8/18
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 14.7 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 57.1 V/m; Power Drift = -0.002 dB
Peak SAR (extrapolated) = 26.4 W/kg
SAR(1 g) = 8.12 mW/g; SAR(10 g) = 2.34 mW/g
Maximum value of SAR (measured) = 14.1 mW/g



0 dB = 14.1mW/g

System Check_Body_5200MHz_110329

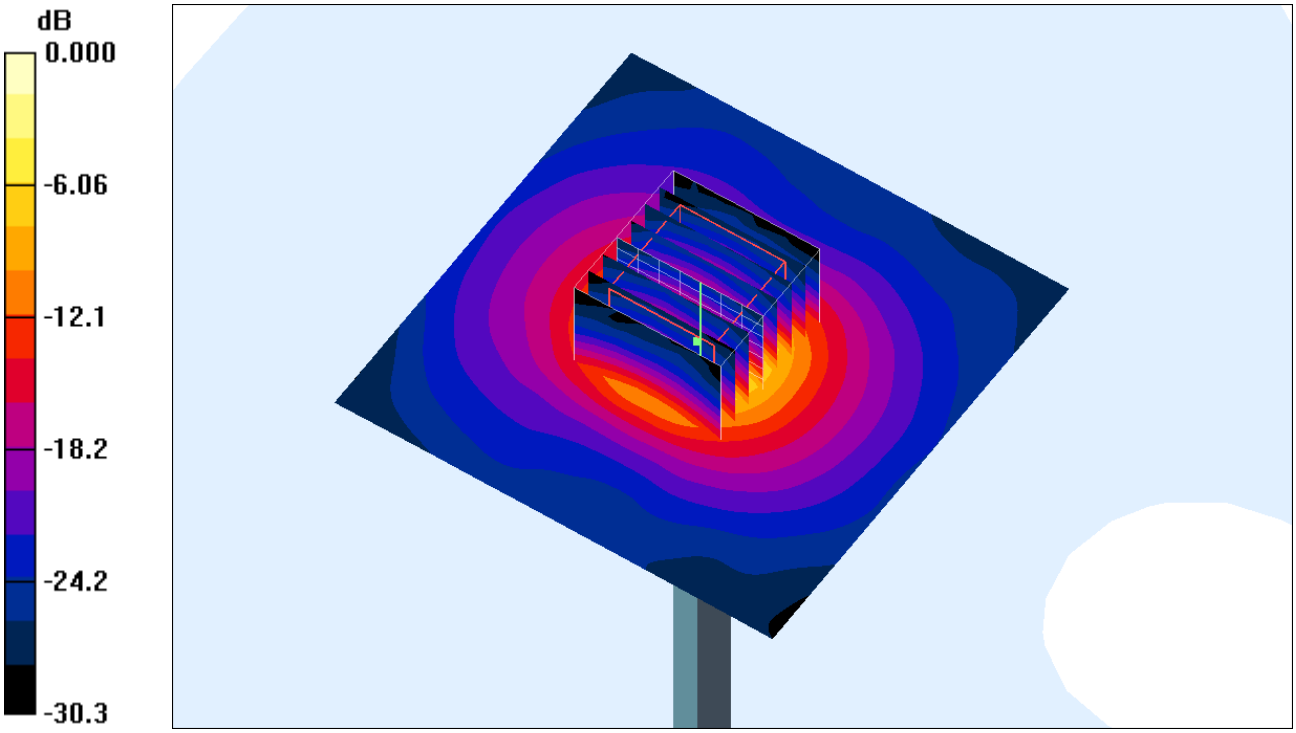
DUT: Dipole 5GHz

Communication System: CW; Frequency: 5200 MHz;Duty Cycle: 1:1
Medium: MSL_5G_110329 Medium parameters used: f = 5200 MHz; σ = 5.28 mho/m; ε_r = 47.5; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(3.87, 3.87, 3.87); Calibrated: 2010/9/20
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2010/8/18
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 16.3 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 60.3 V/m; Power Drift = -0.032 dB
Peak SAR (extrapolated) = 28.1 W/kg
SAR(1 g) = 8.28 mW/g; SAR(10 g) = 2.08 mW/g
Maximum value of SAR (measured) = 14.5 mW/g



0 dB = 14.5mW/g

System Check_Head_5500MHz_110312

DUT: Dipole 5GHz

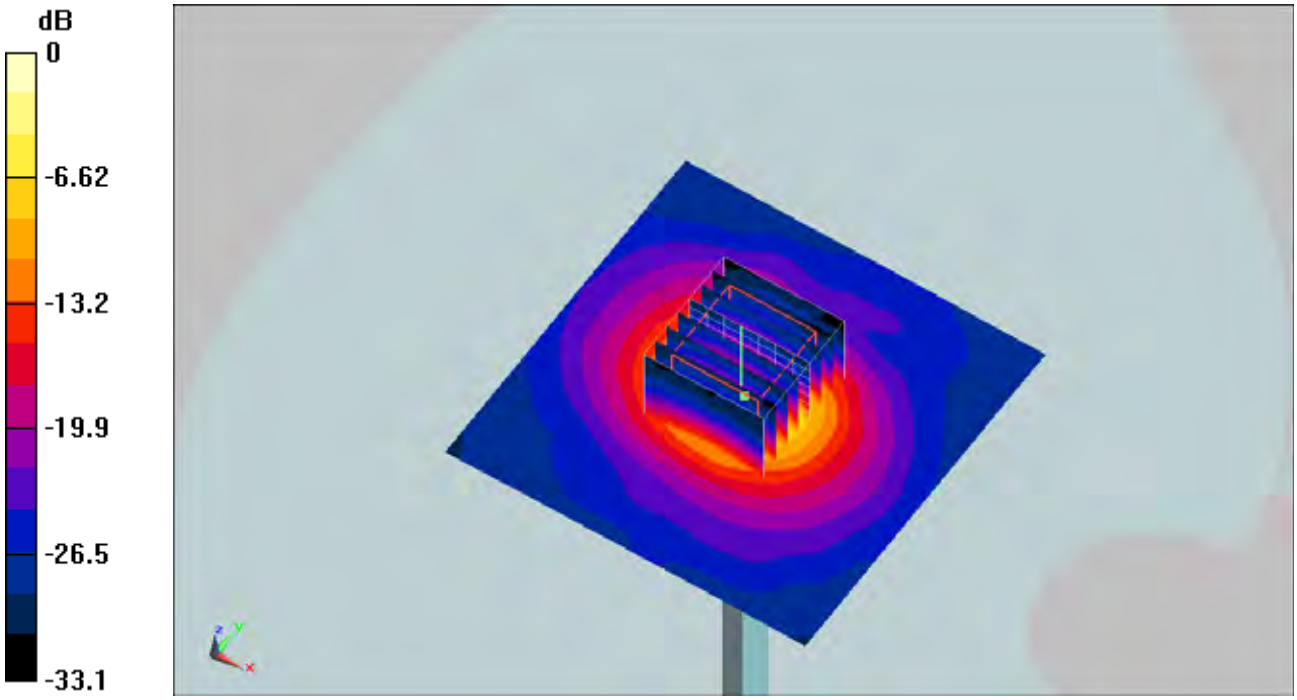
Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: HSL_5G_110312 Medium parameters used: f = 5500 MHz; σ = 5.13 mho/m; ε_r = 35; ρ = 1000 kg/m^3

Ambient Temperature：22.3 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(4.46, 4.46, 4.46); Calibrated: 2010/9/20
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: SAM - Front; Type: SAM; Serial: TP-1446
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 14.9 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 55.4 V/m; Power Drift = 0.159 dB
Peak SAR (extrapolated) = 33.4 W/kg
SAR(1 g) = 8.19 mW/g; SAR(10 g) = 2.29 mW/g
Maximum value of SAR (measured) = 14 mW/g



0 dB = 14mW/g

System Check_Body_5500MHz_110319

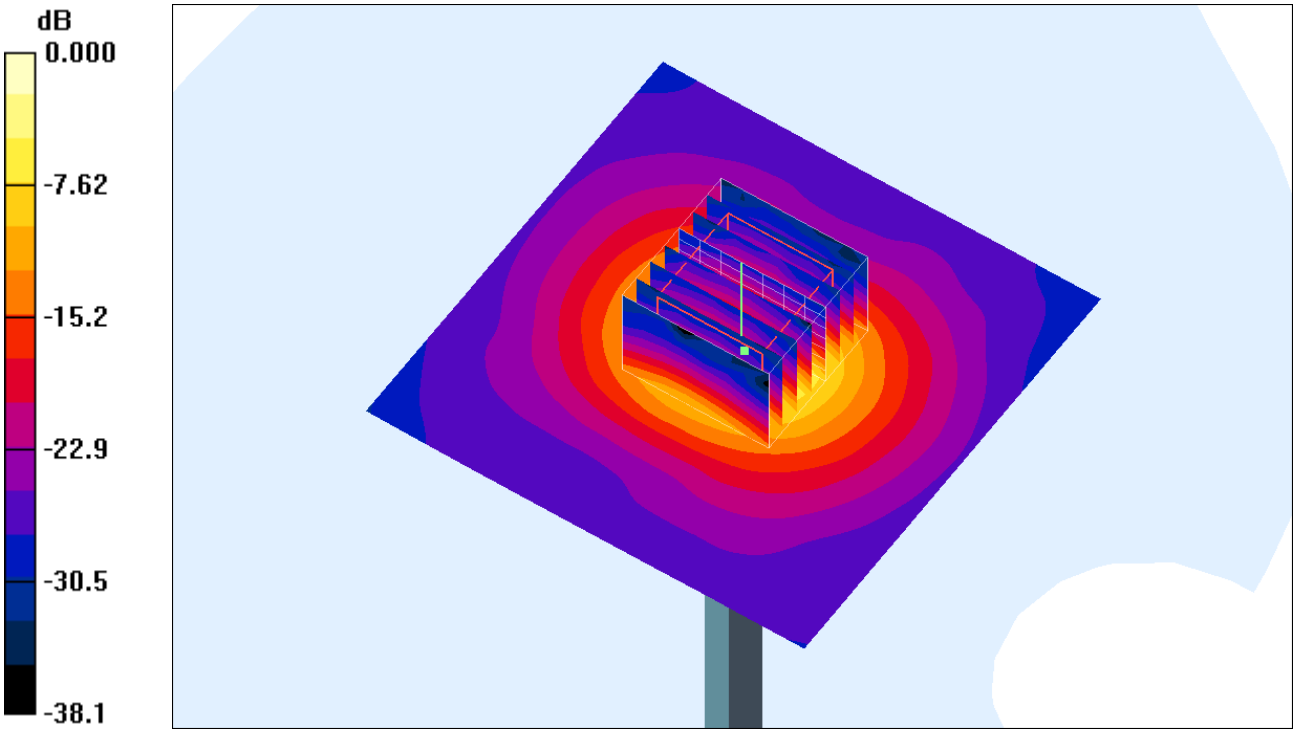
DUT: Dipole 5GHz

Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: MSL_5G_110319 Medium parameters used: f = 5500 MHz; σ = 5.67 mho/m; ε_r = 47; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(3.44, 3.44, 3.44); Calibrated: 2010/9/20
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2010/8/18
- Phantom: SAM_Left; Type: SAM; Serial: TP-1150
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 16.9 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 59.3 V/m; Power Drift = -0.039 dB
Peak SAR (extrapolated) = 30.8 W/kg
SAR(1 g) = 8.78 mW/g; SAR(10 g) = 2.14 mW/g
Maximum value of SAR (measured) = 15.8 mW/g



0 dB = 15.8mW/g

System Check_Body_5500MHz_110326

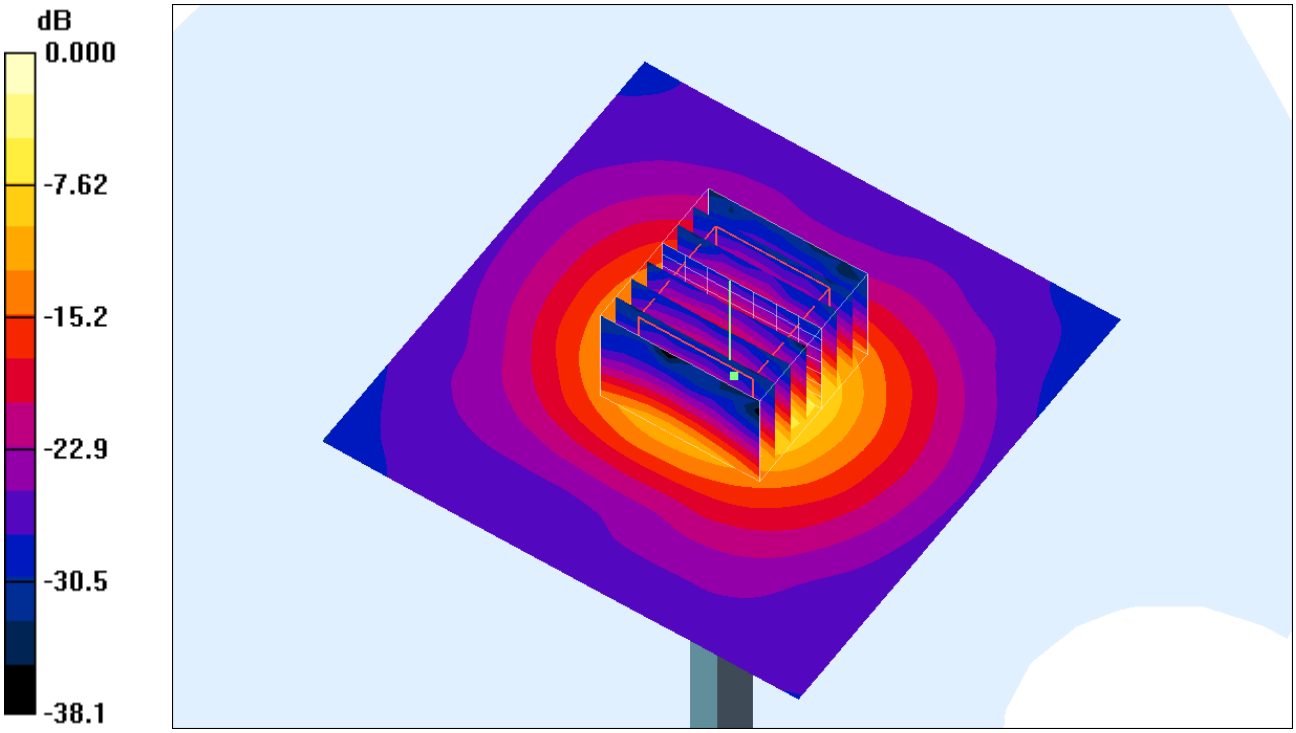
DUT: Dipole 5GHz

Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: MSL_5G_110326 Medium parameters used: f = 5500 MHz; σ = 5.51 mho/m; ε_r = 47; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.8 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(3.44, 3.44, 3.44); Calibrated: 2010/9/20
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2010/8/18
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 16.4 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 59.3 V/m; Power Drift = -0.039 dB
Peak SAR (extrapolated) = 29.9 W/kg
SAR(1 g) = 8.7 mW/g; SAR(10 g) = 2.26 mW/g
Maximum value of SAR (measured) = 15.3 mW/g



0 dB = 15.3mW/g

System Check_Body_5500MHz_110329

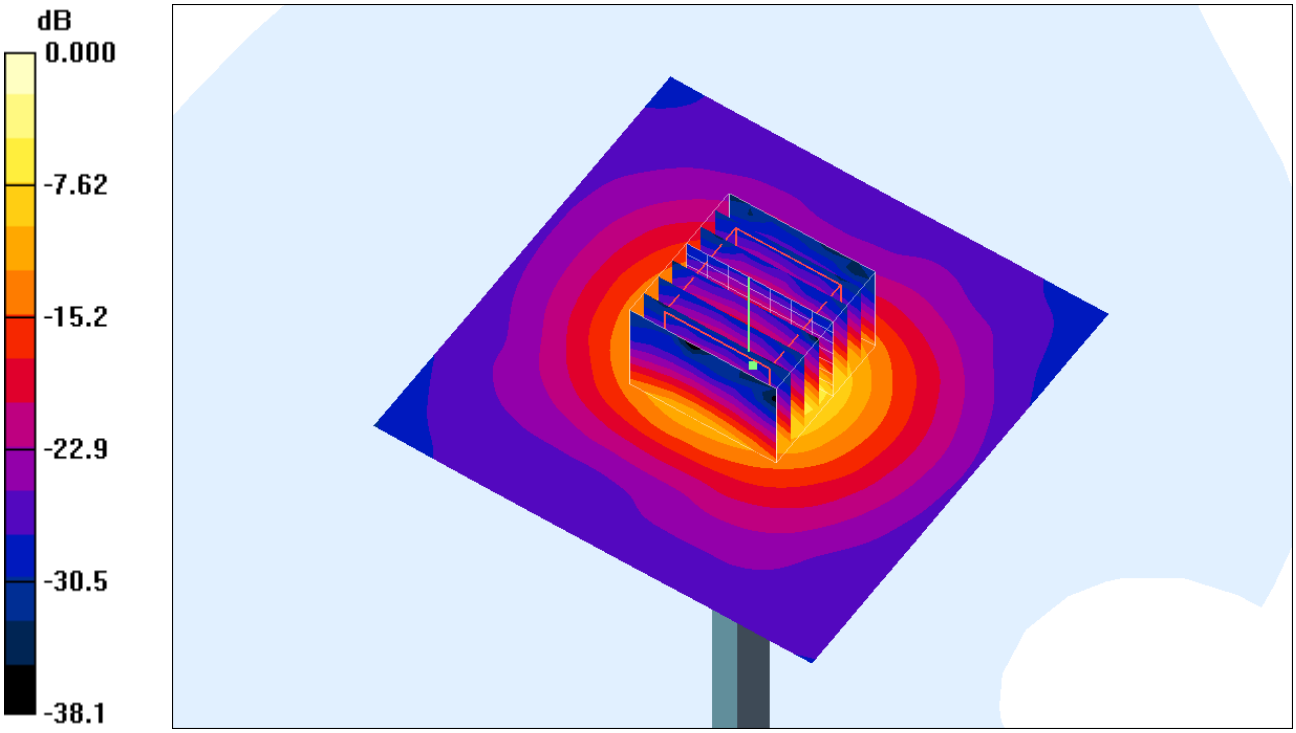
DUT: Dipole 5GHz

Communication System: CW; Frequency: 5500 MHz;Duty Cycle: 1:1
Medium: MSL_5G_110329 Medium parameters used: f = 5500 MHz; σ = 5.68 mho/m; ε_r = 47; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(3.44, 3.44, 3.44); Calibrated: 2010/9/20
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2010/8/18
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 16.9 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 59.3 V/m; Power Drift = -0.039 dB
Peak SAR (extrapolated) = 30.8 W/kg
SAR(1 g) = 8.75 mW/g; SAR(10 g) = 2.11 mW/g
Maximum value of SAR (measured) = 15.8 mW/g



0 dB = 15.8mW/g

System Check_Head_5800MHz_110312

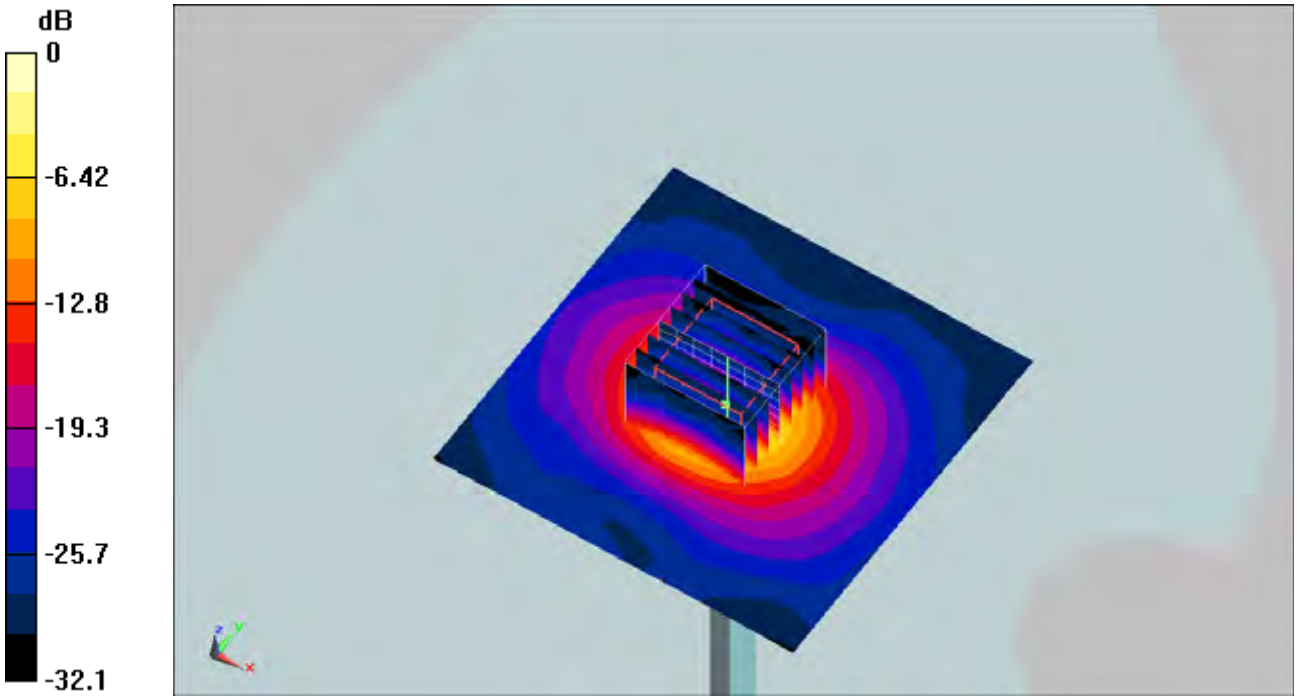
DUT: Dipole 5GHz

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: HSL_5G_110312 Medium parameters used: f = 5800 MHz; σ = 5.42 mho/m; ε_r = 34.3; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.4 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(4.22, 4.22, 4.22); Calibrated: 2010/9/20
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: SAM - Front; Type: SAM; Serial: TP-1446
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 14.6 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 54.8 V/m; Power Drift = 0.098 dB
Peak SAR (extrapolated) = 34.3 W/kg
SAR(1 g) = 8.09 mW/g; SAR(10 g) = 2.26 mW/g
Maximum value of SAR (measured) = 14 mW/g



0 dB = 14mW/g

System Check_Body_5800MHz_110326

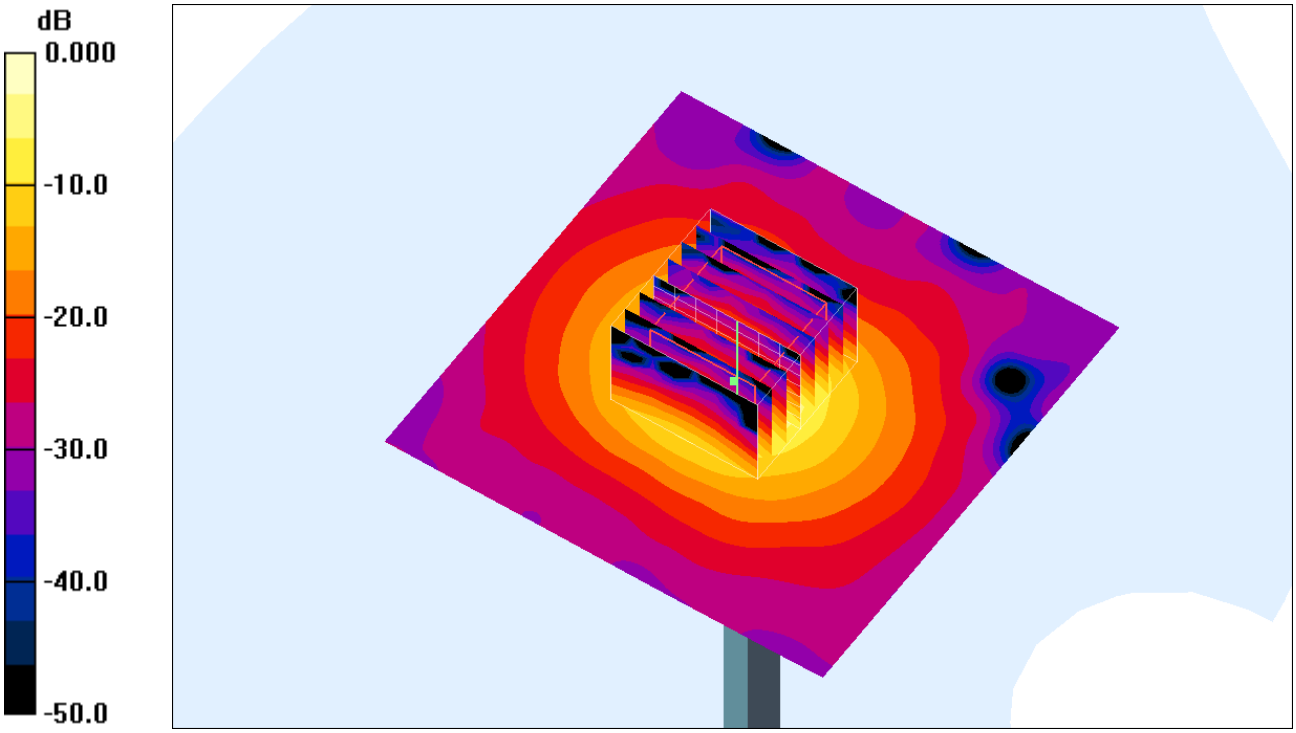
DUT: Dipole 5GHz

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: MSL_5G_110326 Medium parameters used: f = 5800 MHz; σ = 5.98 mho/m; ε_r = 46.5; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.8 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(3.59, 3.59, 3.59); Calibrated: 2010/7/16
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2010/8/18
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 12.1 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 50.0 V/m; Power Drift = 0.218 dB
Peak SAR (extrapolated) = 23.7 W/kg
SAR(1 g) = 6.93 mW/g; SAR(10 g) = 1.93 mW/g
Maximum value of SAR (measured) = 12.5 mW/g



0 dB = 12.5mW/g

System Check_Body_5800MHz_110329

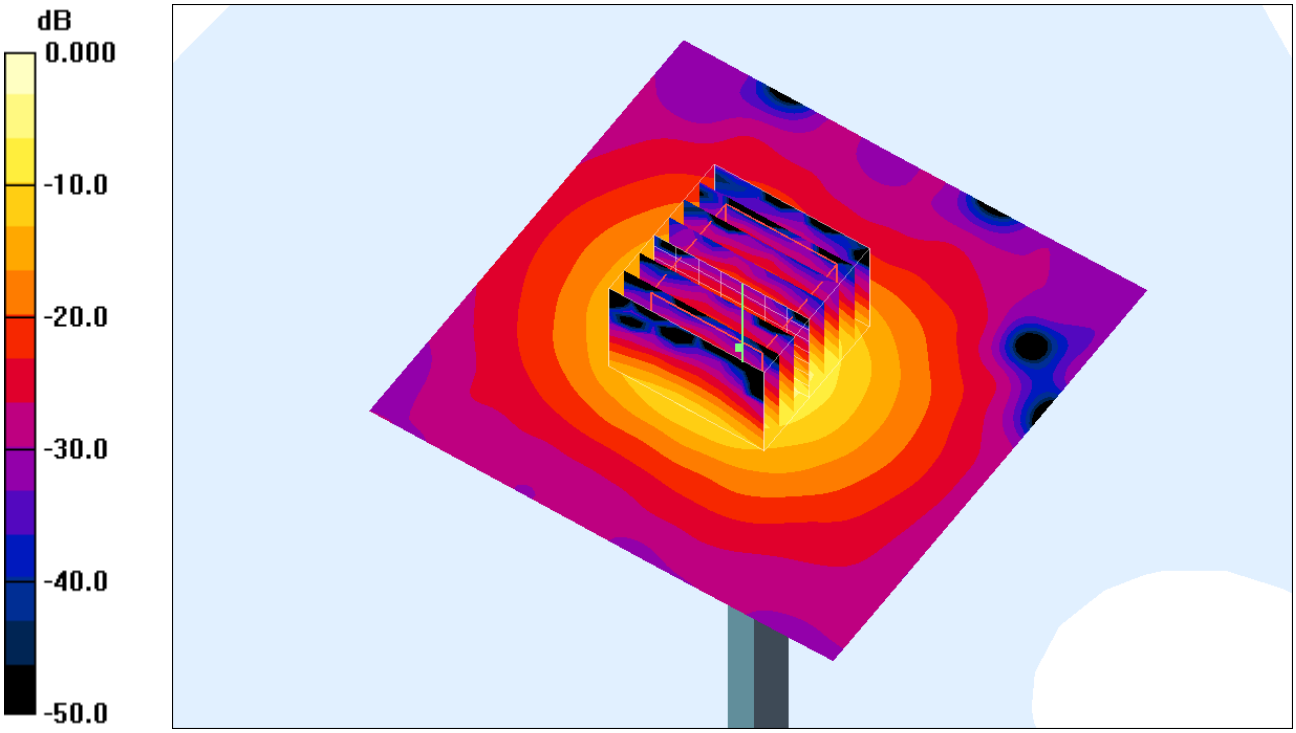
DUT: Dipole 5GHz

Communication System: CW; Frequency: 5800 MHz;Duty Cycle: 1:1
Medium: MSL_5G_110329 Medium parameters used: f = 5800 MHz; σ = 6.18 mho/m; ε_r = 46.4; ρ = 1000 kg/m^3
Ambient Temperature：22.3 ℃; Liquid Temperature：21.5 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(3.59, 3.59, 3.59); Calibrated: 2010/7/16
- Sensor-Surface: 2.5mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2010/8/18
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Pin=100mW/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 12.5 mW/g

Pin=100mW/Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4.3mm, dy=4.3mm, dz=3mm
Reference Value = 50.0 V/m; Power Drift = 0.218 dB
Peak SAR (extrapolated) = 24.5 W/kg
SAR(1 g) = 7.16 mW/g; SAR(10 g) = 2 mW/g
Maximum value of SAR (measured) = 12.9 mW/g



0 dB = 12.9mW/g

Appendix B. Plots of SAR Measurement

The plots are shown as follows.

#22 802.11b_Right Cheek_Ch1_Battery1_Slide Off

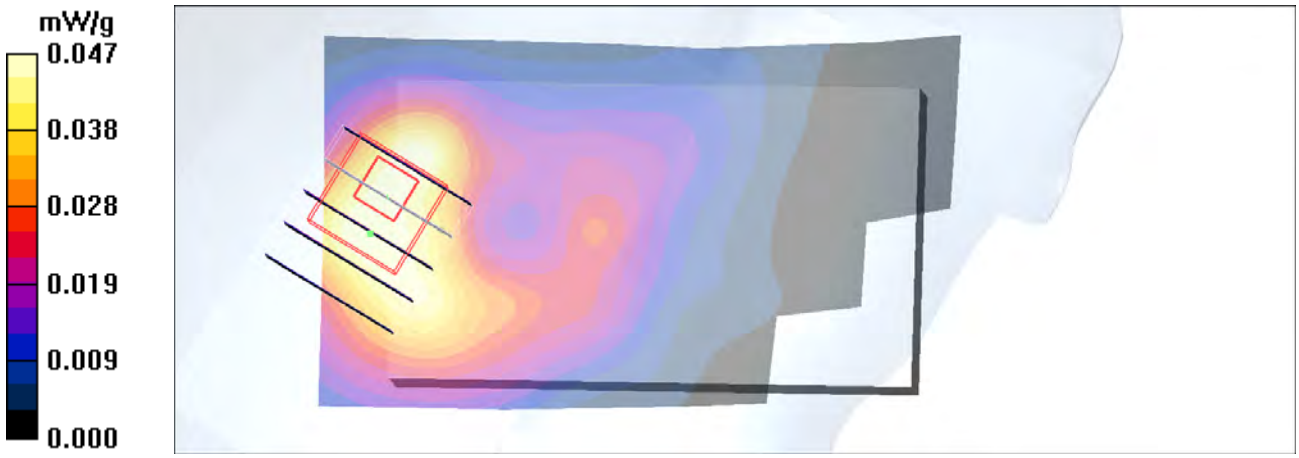
DUT: 121417

Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: HSL_2450_110315 Medium parameters used: f = 2412 MHz; σ = 1.8 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.5, 4.5, 4.5); Calibrated: 2010/5/18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.047 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.10 V/m; Power Drift = -0.130 dB
Peak SAR (extrapolated) = 0.115 W/kg
SAR(1 g) = 0.054 mW/g; SAR(10 g) = 0.026 mW/g
Maximum value of SAR (measured) = 0.060 mW/g



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/15

#24 802.11b_Right Tilted_Ch1_Battery1_Slide Off

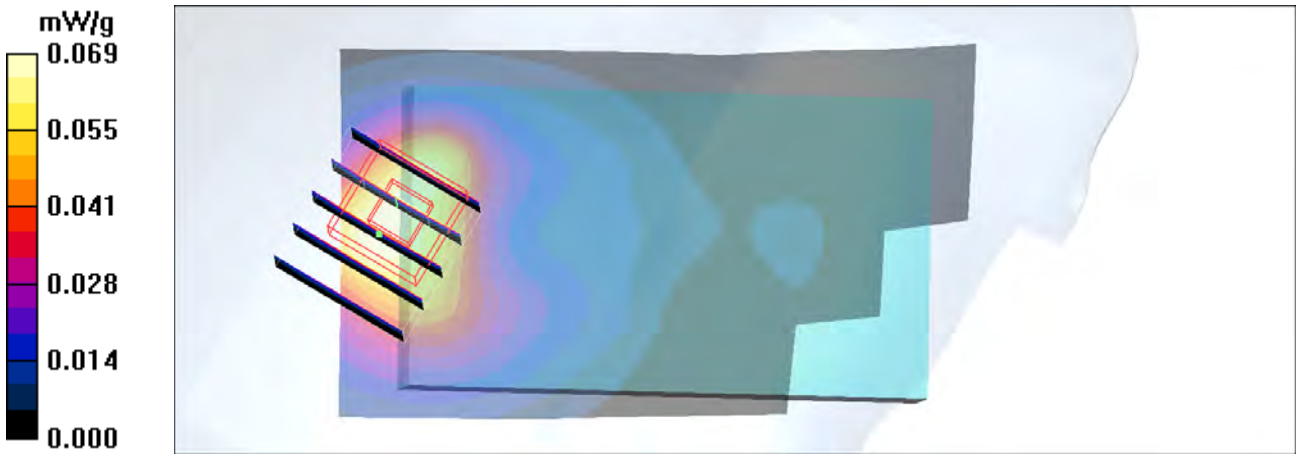
DUT: 121417

Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: HSL_2450_110315 Medium parameters used: f = 2412 MHz; σ = 1.8 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.5, 4.5, 4.5); Calibrated: 2010/5/18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.069 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.44 V/m; Power Drift = 0.058 dB
Peak SAR (extrapolated) = 0.195 W/kg
SAR(1 g) = 0.083 mW/g; SAR(10 g) = 0.039 mW/g
Maximum value of SAR (measured) = 0.087 mW/g



#24 802.11b_Right Tilted_Ch1_Battery1_Slide Off_2D

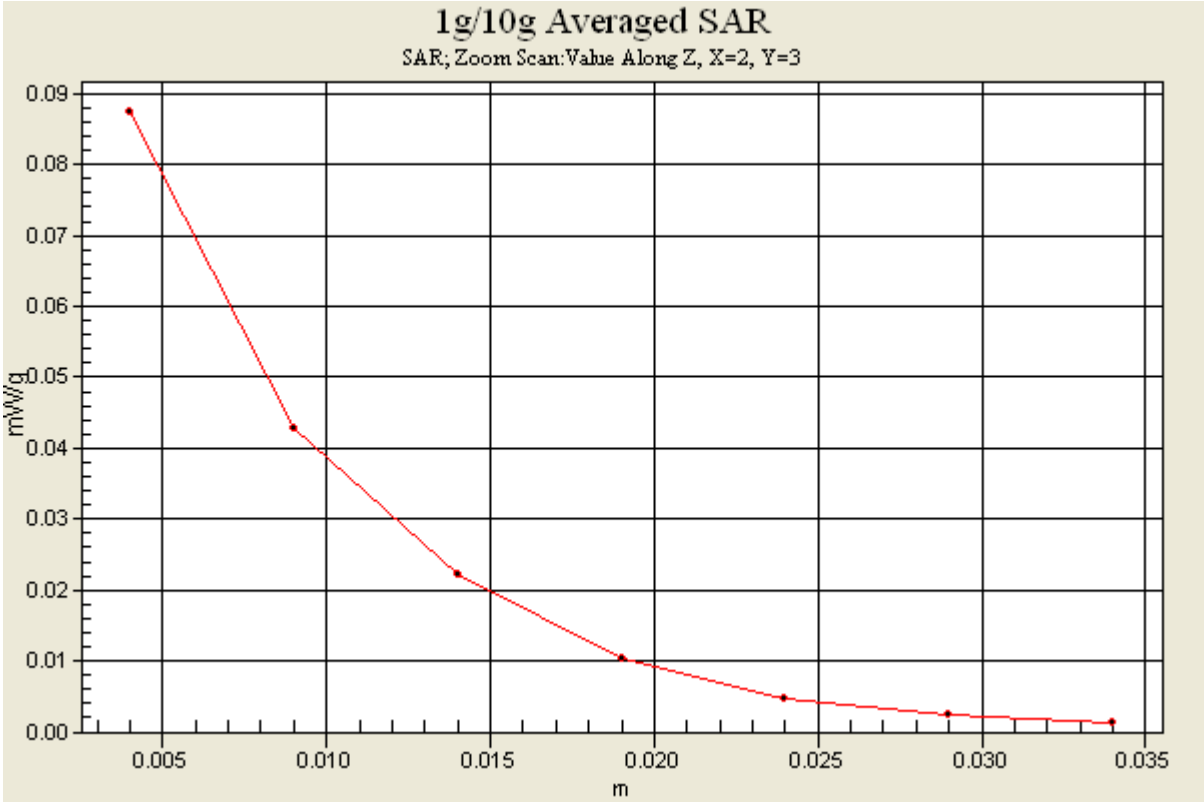
DUT: 121417

Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: HSL_2450_110315 Medium parameters used: f = 2412 MHz; σ = 1.8 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.5, 4.5, 4.5); Calibrated: 2010/5/18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.069 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.44 V/m; Power Drift = 0.058 dB
Peak SAR (extrapolated) = 0.195 W/kg
SAR(1 g) = 0.083 mW/g; SAR(10 g) = 0.039 mW/g
Maximum value of SAR (measured) = 0.087 mW/g



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/15

#25 802.11b_Left Cheek_Ch1_Battery1_Slide Off

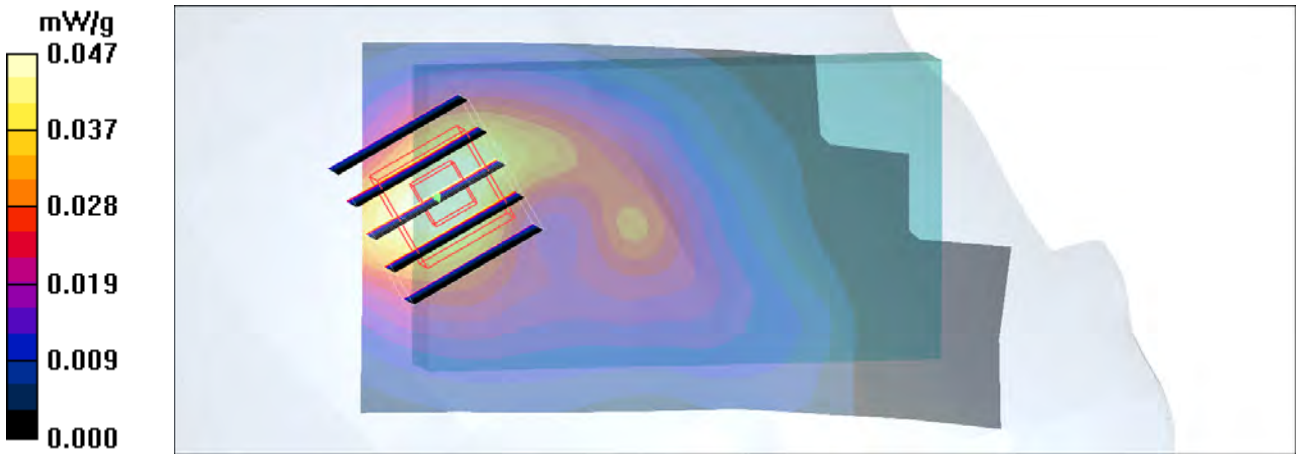
DUT: 121417

Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: HSL_2450_110315 Medium parameters used: f = 2412 MHz; σ = 1.8 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.5, 4.5, 4.5); Calibrated: 2010/5/18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.047 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.60 V/m; Power Drift = 0.159 dB
Peak SAR (extrapolated) = 0.121 W/kg
SAR(1 g) = 0.058 mW/g; SAR(10 g) = 0.029 mW/g
Maximum value of SAR (measured) = 0.062 mW/g



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/15

#26 802.11b_Left Tilted_Ch1_Battery1_Slide Off

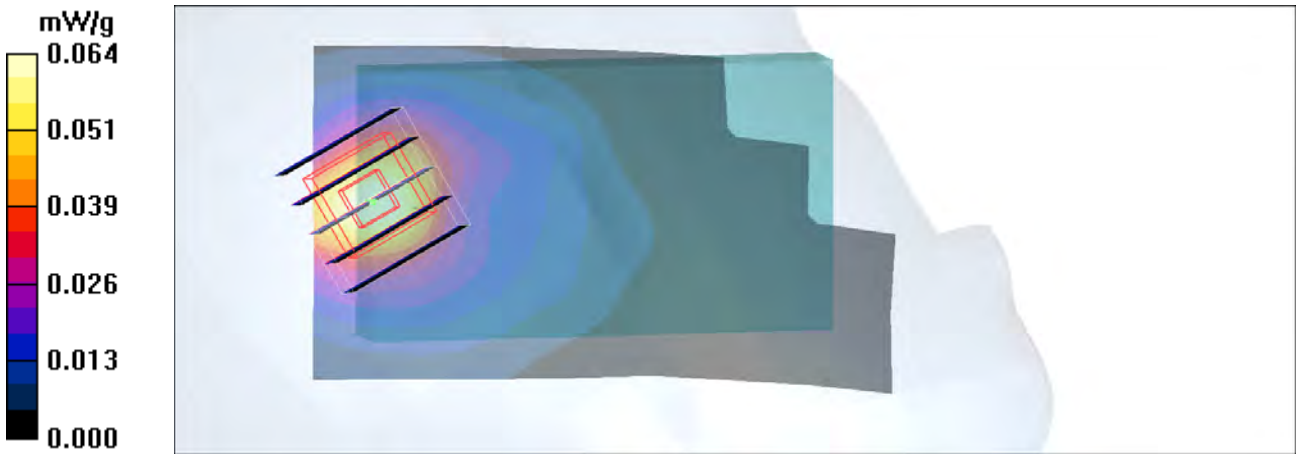
DUT: 121417

Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: HSL_2450_110315 Medium parameters used: f = 2412 MHz; σ = 1.8 mho/m; ε_r = 38.7; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.5, 4.5, 4.5); Calibrated: 2010/5/18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.064 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.04 V/m; Power Drift = -0.032 dB
Peak SAR (extrapolated) = 0.179 W/kg
SAR(1 g) = 0.077 mW/g; SAR(10 g) = 0.036 mW/g
Maximum value of SAR (measured) = 0.084 mW/g



#01 802.11a_Right Cheek_Ch104_Battery1_Slide Off

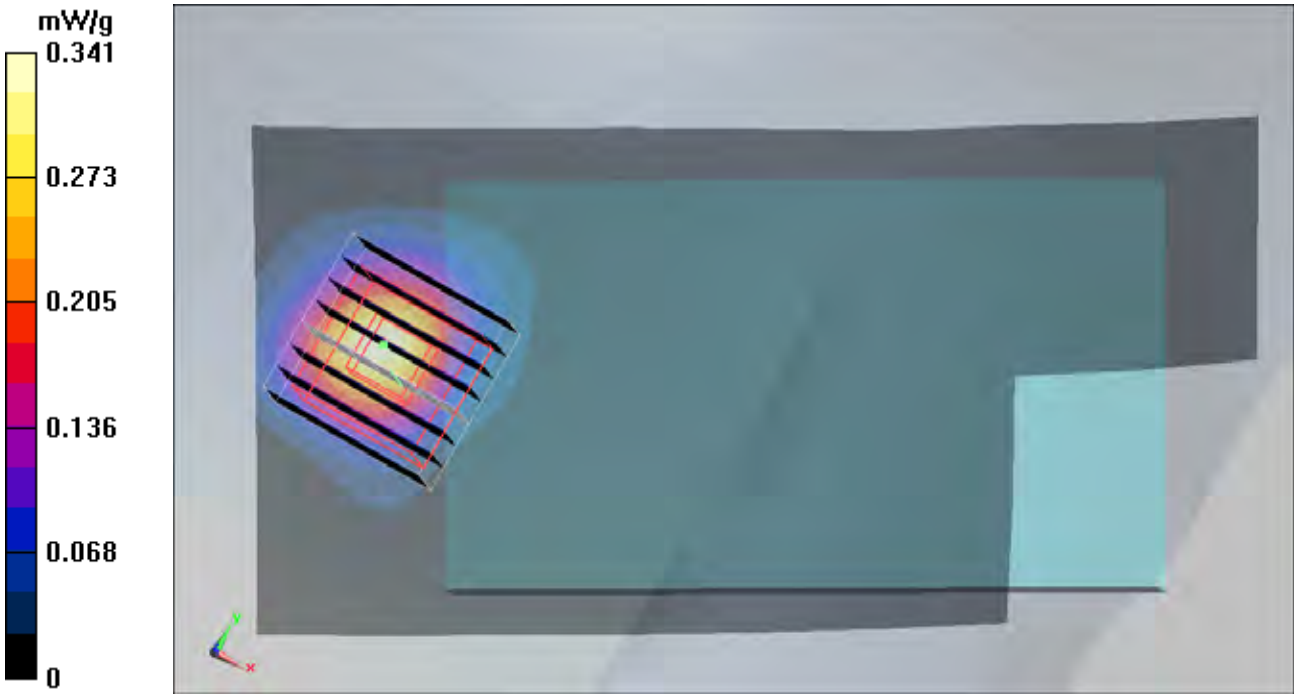
DUT: 121417

Communication System: 802.11a; Frequency: 5520 MHz;Duty Cycle: 1:1
Medium: HSL_5G_110312 Medium parameters used: f = 5520 MHz; σ = 5.15 mho/m; ε_r = 34.9; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(4.46, 4.46, 4.46); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: SAM - Front; Type: SAM; Serial: TP-1446
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch104/Area Scan (81x161x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.341 mW/g

Ch104/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 1.41 V/m; Power Drift = 0.126 dB
Peak SAR (extrapolated) = 0.532 W/kg
SAR(1 g) = 0.153 mW/g; SAR(10 g) = 0.053 mW/g
Maximum value of SAR (measured) = 0.293 mW/g


mW/g
0.341
0.273
0.205
0.136
0.068
0

#03 802.11a_Right Tilted_Ch104_Battery1_Slide Off

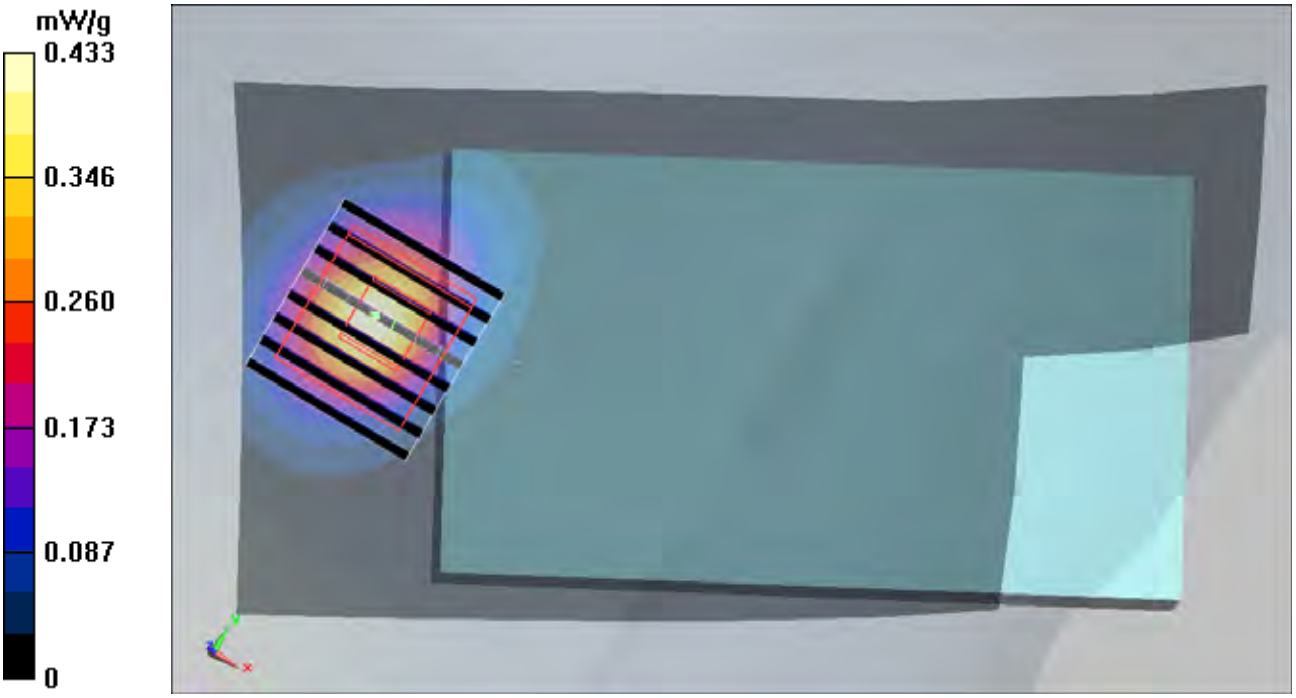
DUT: 121417

Communication System: 802.11a; Frequency: 5520 MHz;Duty Cycle: 1:1
Medium: HSL_5G_110312 Medium parameters used: f = 5520 MHz; σ = 5.15 mho/m; ε_r = 34.9; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(4.46, 4.46, 4.46); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: SAM - Front; Type: SAM; Serial: TP-1446
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch104/Area Scan (81x161x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.433 mW/g

Ch104/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 1.28 V/m; Power Drift = 0.144 dB
Peak SAR (extrapolated) = 0.632 W/kg
SAR(1 g) = 0.186 mW/g; SAR(10 g) = 0.064 mW/g
Maximum value of SAR (measured) = 0.366 mW/g


mW/g
0.433
0.346
0.260
0.173
0.087
0

#04 802.11a_Left Cheek_Ch104_Battery1_Slide Off

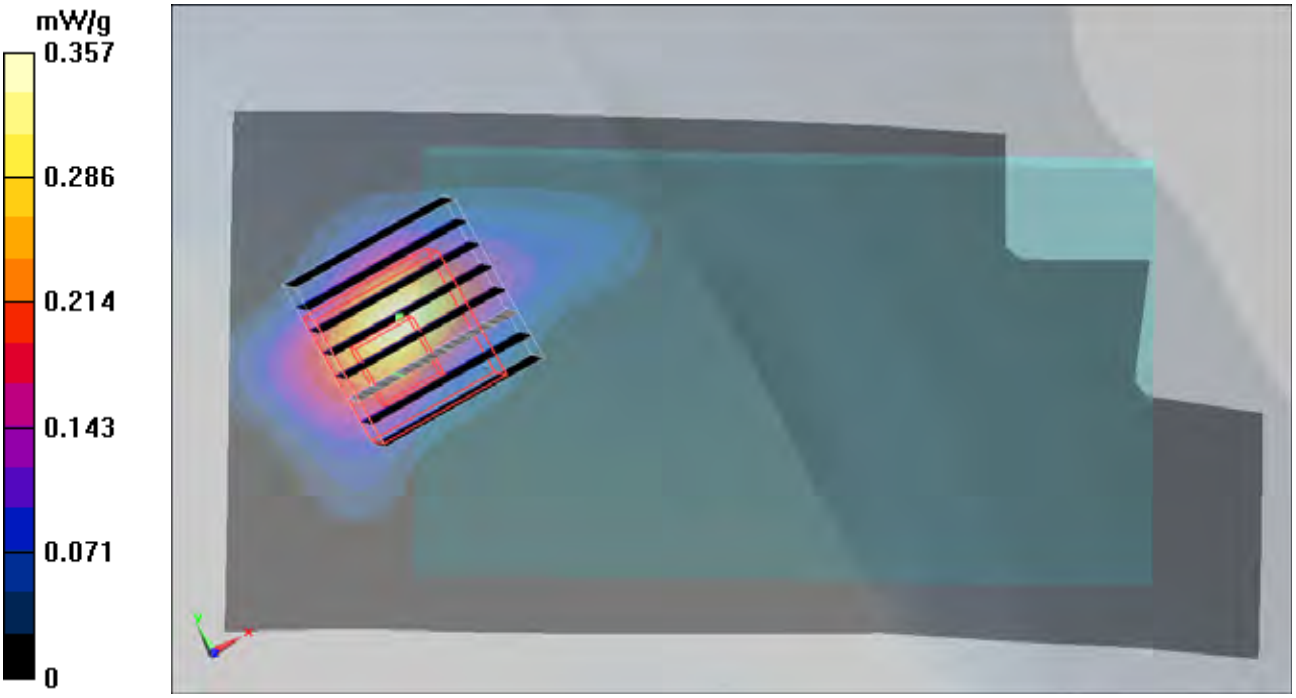
DUT: 121417

Communication System: 802.11a; Frequency: 5520 MHz;Duty Cycle: 1:1
Medium: HSL_5G_110312 Medium parameters used : f = 5520 MHz; σ = 5.15 mho/m; ε_r = 34.9; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(4.46, 4.46, 4.46); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: SAM - Front; Type: SAM; Serial: TP-1446
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch104/Area Scan (81x161x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.357 mW/g

Ch104/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 2.32 V/m; Power Drift = 0.142 dB
Peak SAR (extrapolated) = 0.486 W/kg
SAR(1 g) = 0.145 mW/g; SAR(10 g) = 0.051 mW/g
Maximum value of SAR (measured) = 0.280 mW/g


mW/g
0.357
0.286
0.214
0.143
0.071
0

#19 802.11a_Left Tilted_Ch157_Battery1_Slide Off

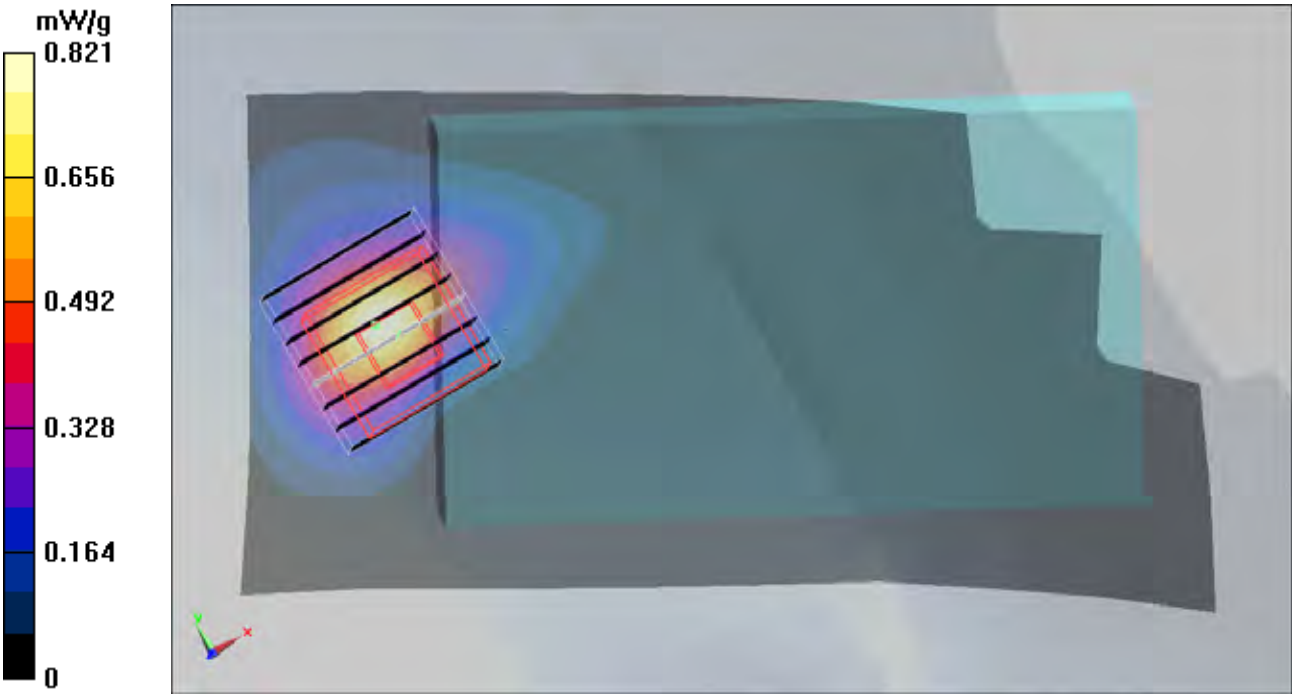
DUT: 121417

Communication System: 802.11a; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: HSL_5G_110312 Medium parameters used : f = 5785 MHz; σ = 5.41 mho/m; ε_r = 34.4; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(4.22, 4.22, 4.22); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: SAM - Front; Type: SAM; Serial: TP-1446
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch157/Area Scan (81x161x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.821 mW/g

Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 4.07 V/m; Power Drift = -0.193 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.407 mW/g; SAR(10 g) = 0.145 mW/g
Maximum value of SAR (measured) = 0.774 mW/g


mW/g
0.821
0.656
0.492
0.328
0.164
0

#19 802.11a_Left Tilted_Ch157_Battery1_Slide Off_2D

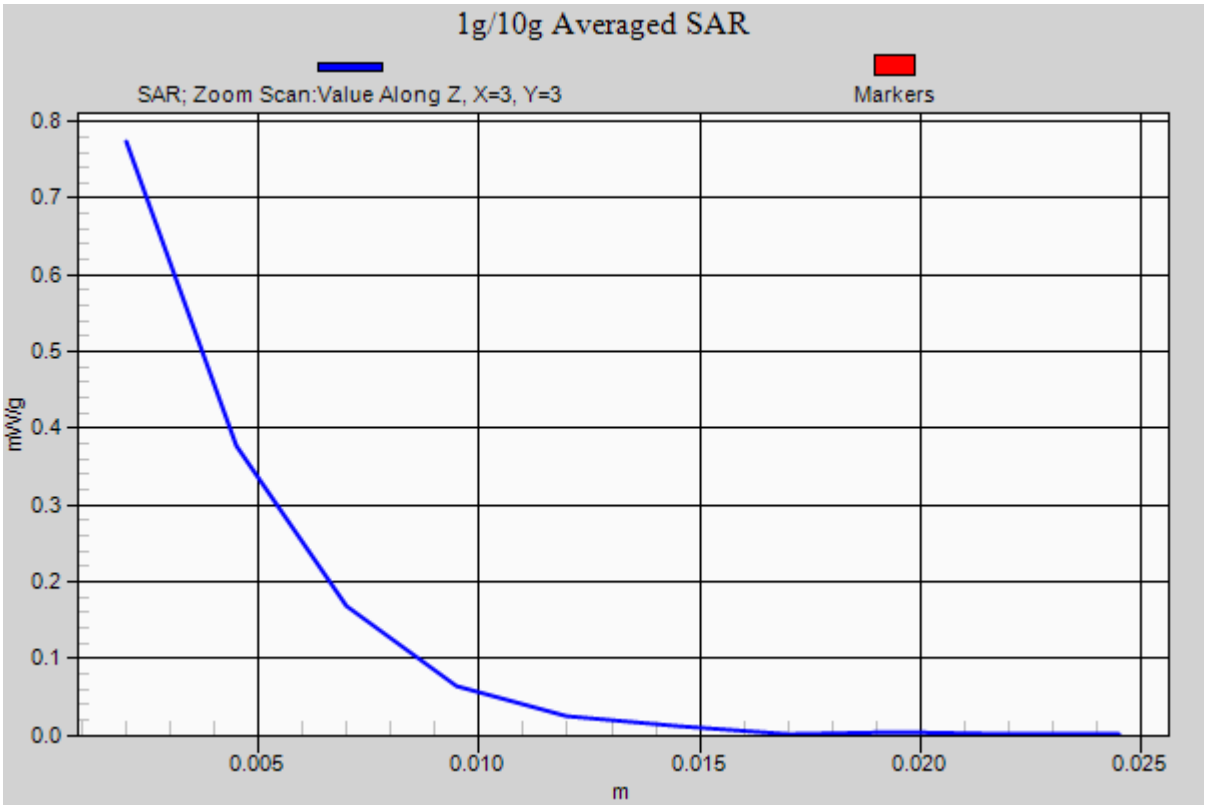
DUT: 121417

Communication System: 802.11a; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: HSL_5G_110312 Medium parameters used : f = 5785 MHz; σ = 5.41 mho/m; ε_r = 34.4; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(4.22, 4.22, 4.22); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: SAM - Front; Type: SAM; Serial: TP-1446
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch157/Area Scan (81x161x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.821 mW/g

Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 4.07 V/m; Power Drift = -0.193 dB
Peak SAR (extrapolated) = 1.32 W/kg
SAR(1 g) = 0.407 mW/g; SAR(10 g) = 0.145 mW/g
Maximum value of SAR (measured) = 0.774 mW/g



#33 802.11b_Face_1cm_Ch1_Battery1_Slide Off

DUT: 121417

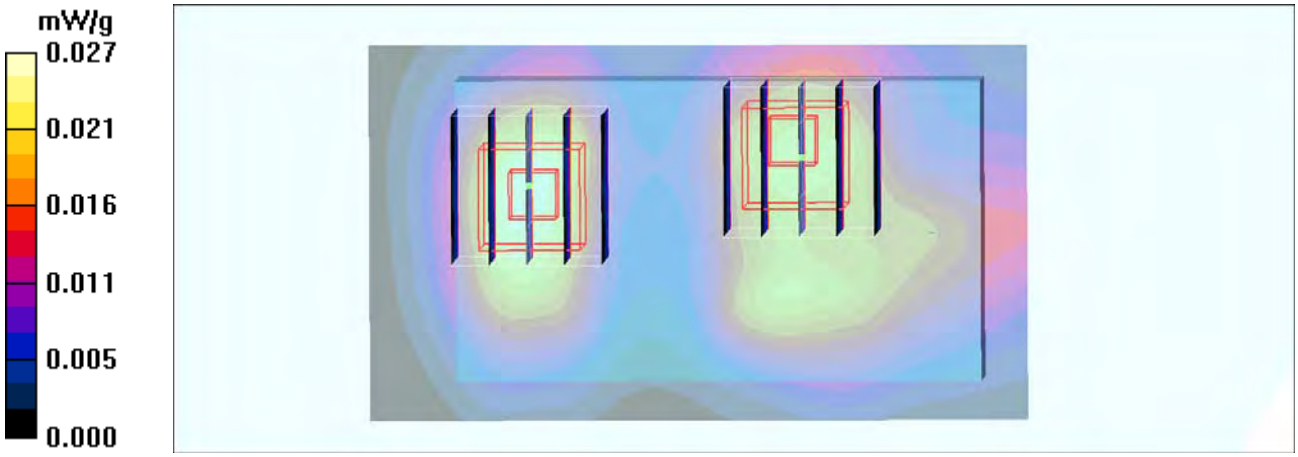
Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_110315 Medium parameters used: f = 2412 MHz; σ = 1.87 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.03, 4.03, 4.03); Calibrated: 2010/5/18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.027 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.38 V/m; Power Drift = 0.001 dB
Peak SAR (extrapolated) = 0.047 W/kg
SAR(1 g) = 0.023 mW/g; SAR(10 g) = 0.014 mW/g
Maximum value of SAR (measured) = 0.025 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.38 V/m; Power Drift = 0.001 dB
Peak SAR (extrapolated) = 0.044 W/kg
SAR(1 g) = 0.023 mW/g; SAR(10 g) = 0.013 mW/g
Maximum value of SAR (measured) = 0.024 mW/g



#31 802.11b_Bottom_1cm_Ch1_Battery1_Slide Off

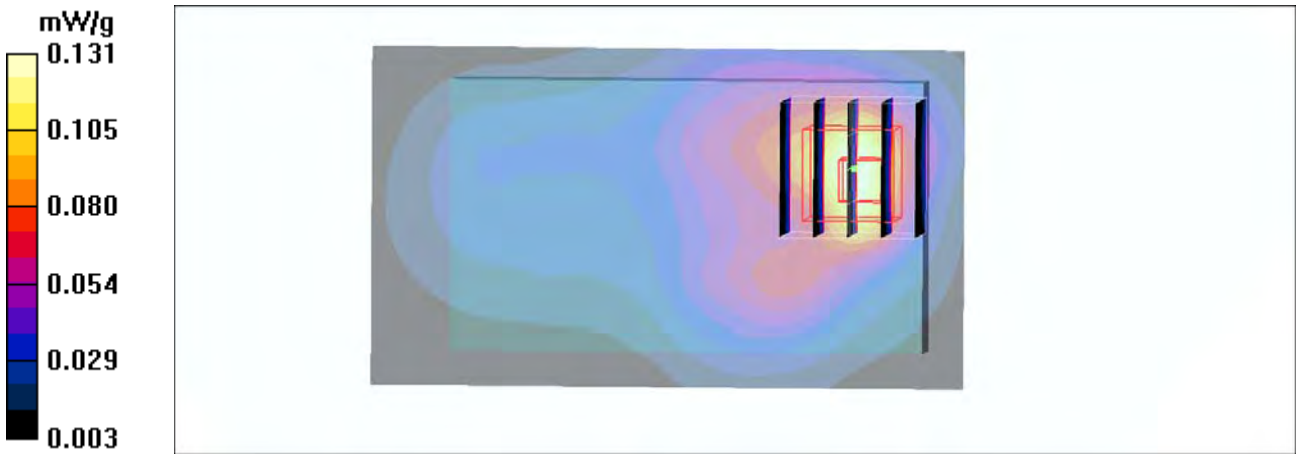
DUT: 121417

Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_110315 Medium parameters used: f = 2412 MHz; σ = 1.87 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.03, 4.03, 4.03); Calibrated: 2010/5/18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.131 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.69 V/m; Power Drift = 0.121 dB
Peak SAR (extrapolated) = 0.330 W/kg
SAR(1 g) = 0.144 mW/g; SAR(10 g) = 0.069 mW/g
Maximum value of SAR (measured) = 0.150 mW/g



#31 802.11b_Bottom_1cm_Ch1_Battery1_Slide Off_2D

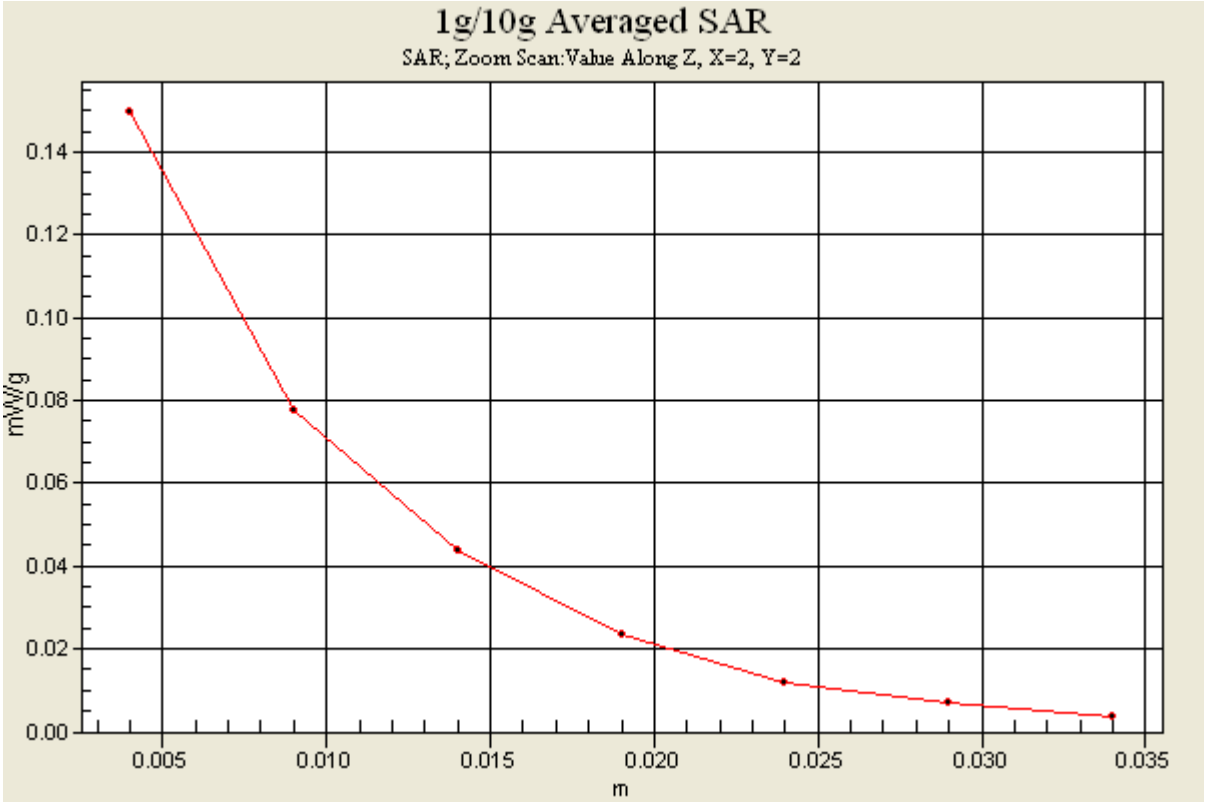
DUT: 121417

Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_110315 Medium parameters used: f = 2412 MHz; σ = 1.87 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Ambient Temperature：22.4 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.03, 4.03, 4.03); Calibrated: 2010/5/18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.131 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.69 V/m; Power Drift = 0.117 dB
Peak SAR (extrapolated) = 0.330 W/kg
SAR(1 g) = 0.144 mW/g; SAR(10 g) = 0.069 mW/g
Maximum value of SAR (measured) = 0.150 mW/g



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/15

#37 802.11b_Left Side_1cm_Ch1_Battery1_Slide Off

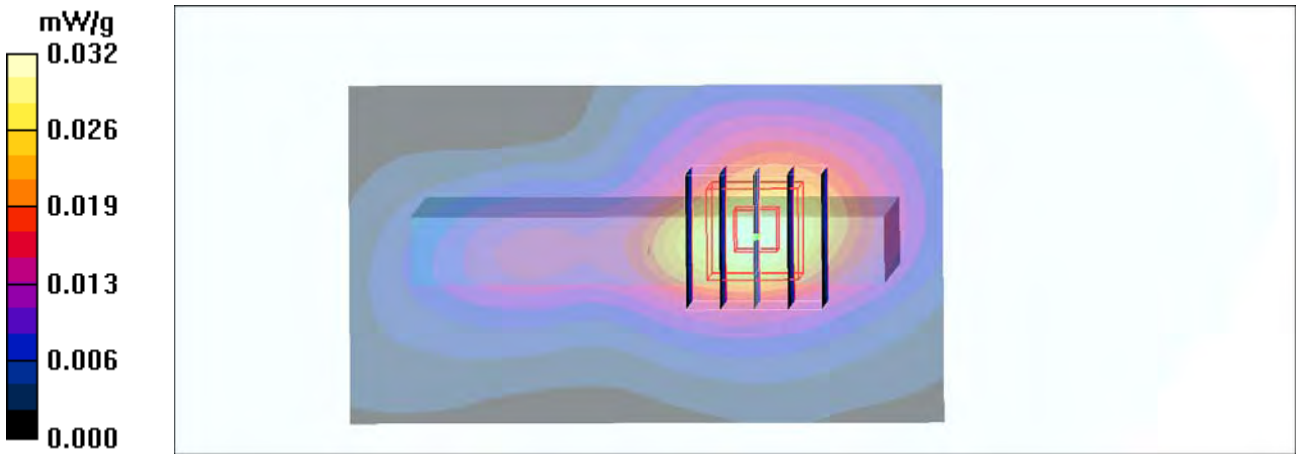
DUT: 121417

Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_110315 Medium parameters used: f = 2412 MHz; σ = 1.87 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.03, 4.03, 4.03); Calibrated: 2010/5/18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.032 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 3.13 V/m; Power Drift = -0.130 dB
Peak SAR (extrapolated) = 0.065 W/kg
SAR(1 g) = 0.031 mW/g; SAR(10 g) = 0.017 mW/g
Maximum value of SAR (measured) = 0.034 mW/g



#36 802.11b_Right Side_1cm_Ch1_Battery1_Slide Off

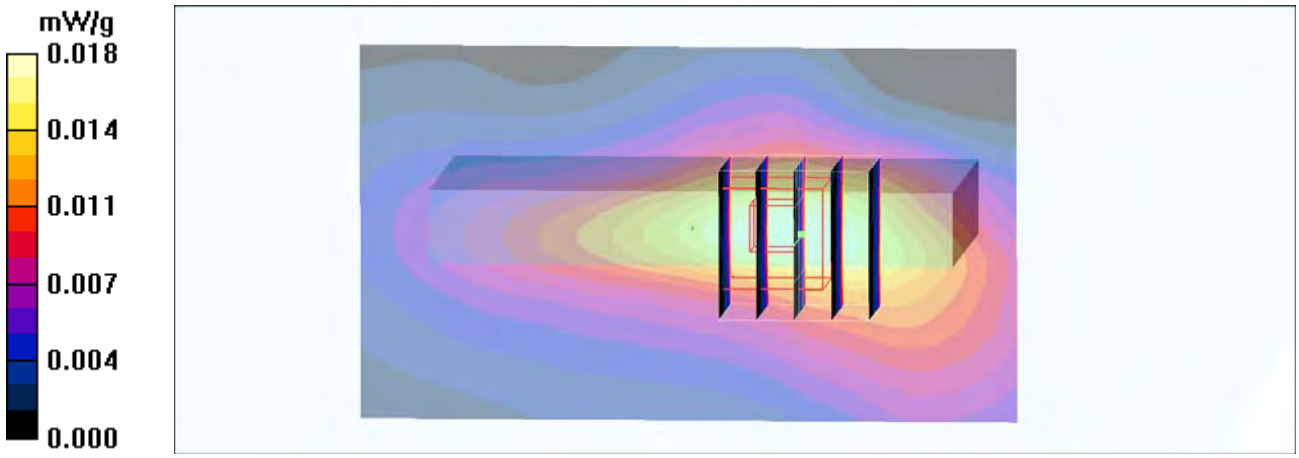
DUT: 121417

Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_110315 Medium parameters used: f = 2412 MHz; σ = 1.87 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.03, 4.03, 4.03); Calibrated: 2010/5/18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.018 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.88 V/m; Power Drift = -0.143 dB
Peak SAR (extrapolated) = 0.038 W/kg
SAR(1 g) = 0.017 mW/g; SAR(10 g) = 0.00881 mW/g
Maximum value of SAR (measured) = 0.018 mW/g



Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2011/3/15

#34 802.11b_Top Side_1cm_Ch1_Battery1_Slide Off

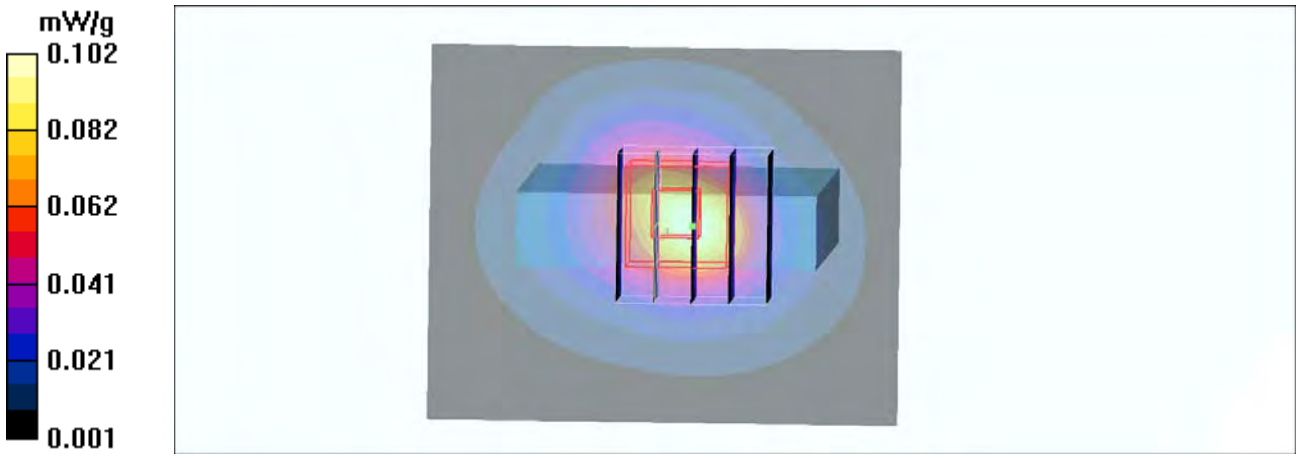
DUT: 121417

Communication System: 802.11b ; Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450_110315 Medium parameters used: f = 2412 MHz; σ = 1.87 mho/m; ε_r = 53.4; ρ = 1000 kg/m^3
Ambient Temperature：22.5 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1787; ConvF(4.03, 4.03, 4.03); Calibrated: 2010/5/18
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: SAM-Left; Type: QD 000 P40 C; Serial: TP-1477
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch1/Area Scan (41x51x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.102 mW/g

Ch1/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 7.81 V/m; Power Drift = 0.087 dB
Peak SAR (extrapolated) = 0.294 W/kg
SAR(1 g) = 0.118 mW/g; SAR(10 g) = 0.054 mW/g
Maximum value of SAR (measured) = 0.121 mW/g



#58 802.11a_Face_1.5cm_Ch104_Battery1_Slide Off_Earphone

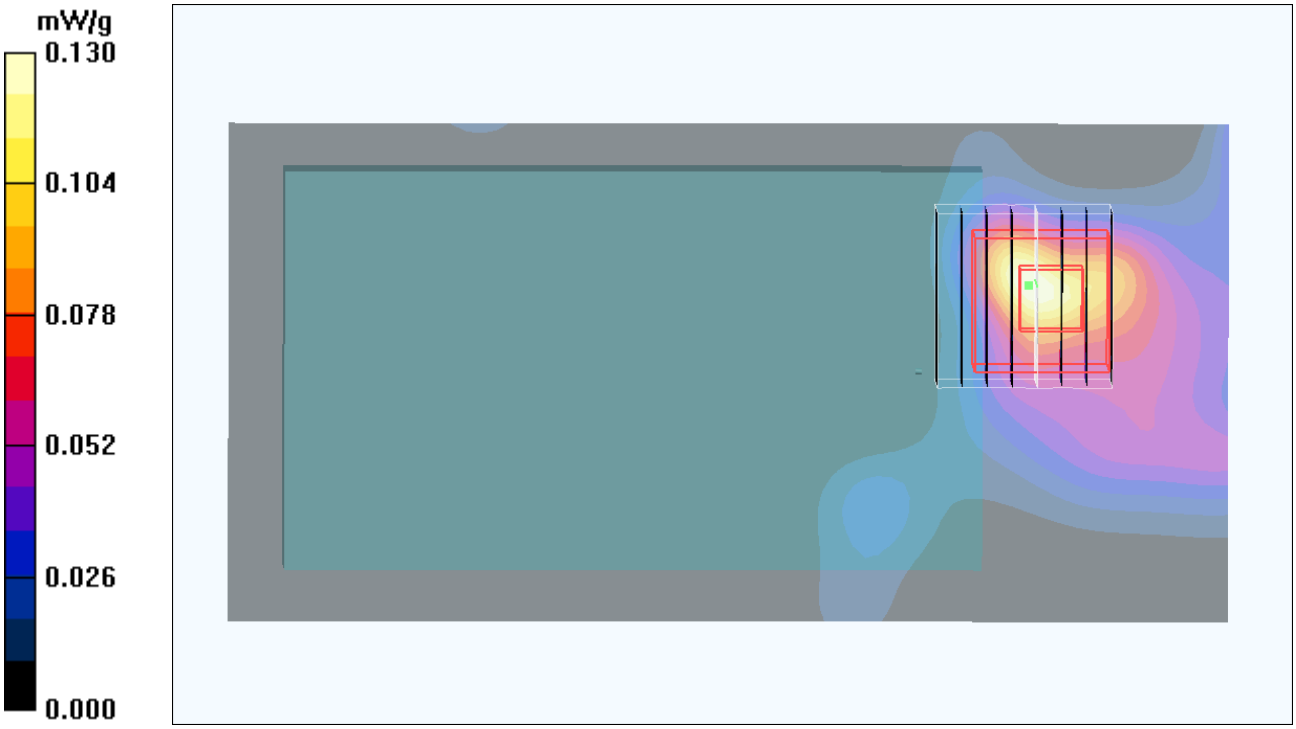
DUT: 121417

Communication System: 802.11a; Frequency: 5520 MHz;Duty Cycle: 1:1
Medium: MSL_5G_110319 Medium parameters used : f = 5520 MHz; σ = 5.71 mho/m; ε_r = 47; ρ = 1000 kg/m^3
Ambient Temperature：21.0 ℃; Liquid Temperature：21.6 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(3.44, 3.44, 3.44); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2010/8/18
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch104/Area Scan (41x81x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.130 mW/g

Ch104/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.000 V/m; Power Drift = 0.179 dB
Peak SAR (extrapolated) = 0.114 W/kg
SAR(1 g) = 0.046 mW/g; SAR(10 g) = 0.017 mW/g
Maximum value of SAR (measured) = 0.078 mW/g


mW/g
0.130
0.104
0.078
0.052
0.026
0.000

#67 802.11a_Bottom_1.5cm_Ch157_Battery1_Slide Off

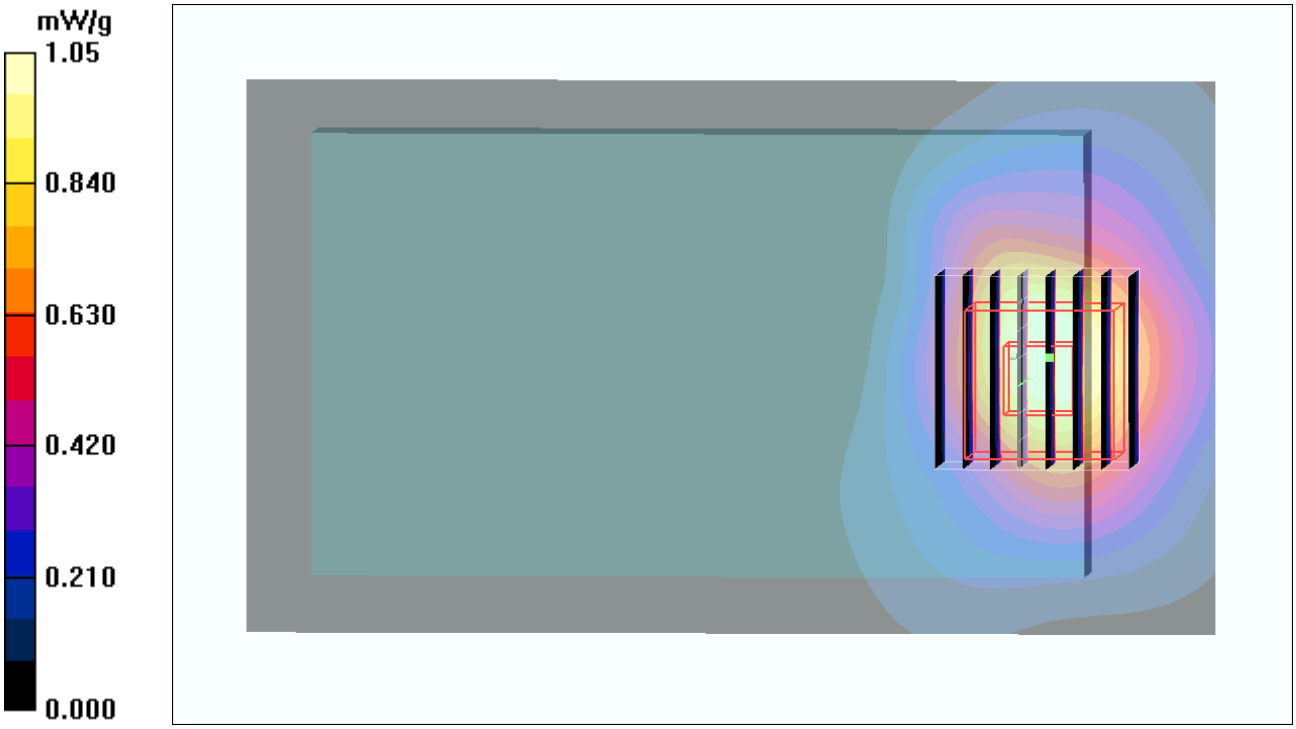
DUT: 121417

Communication System: 802.11a; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: MSL_5G_110326 Medium parameters used : f = 5785 MHz; σ = 5.97 mho/m; ε_r = 46.6; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2010/8/18
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch157/Area Scan (81x141x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.05 mW/g

Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.853 V/m; Power Drift = -0.132 dB
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 0.703 mW/g; SAR(10 g) = 0.298 mW/g
Maximum value of SAR (measured) = 1.15 mW/g


mW/g
1.05
0.840
0.630
0.420
0.210
0.000

#67 802.11a_Bottom_1.5cm_Ch157_Battery1_Slide Off_2D

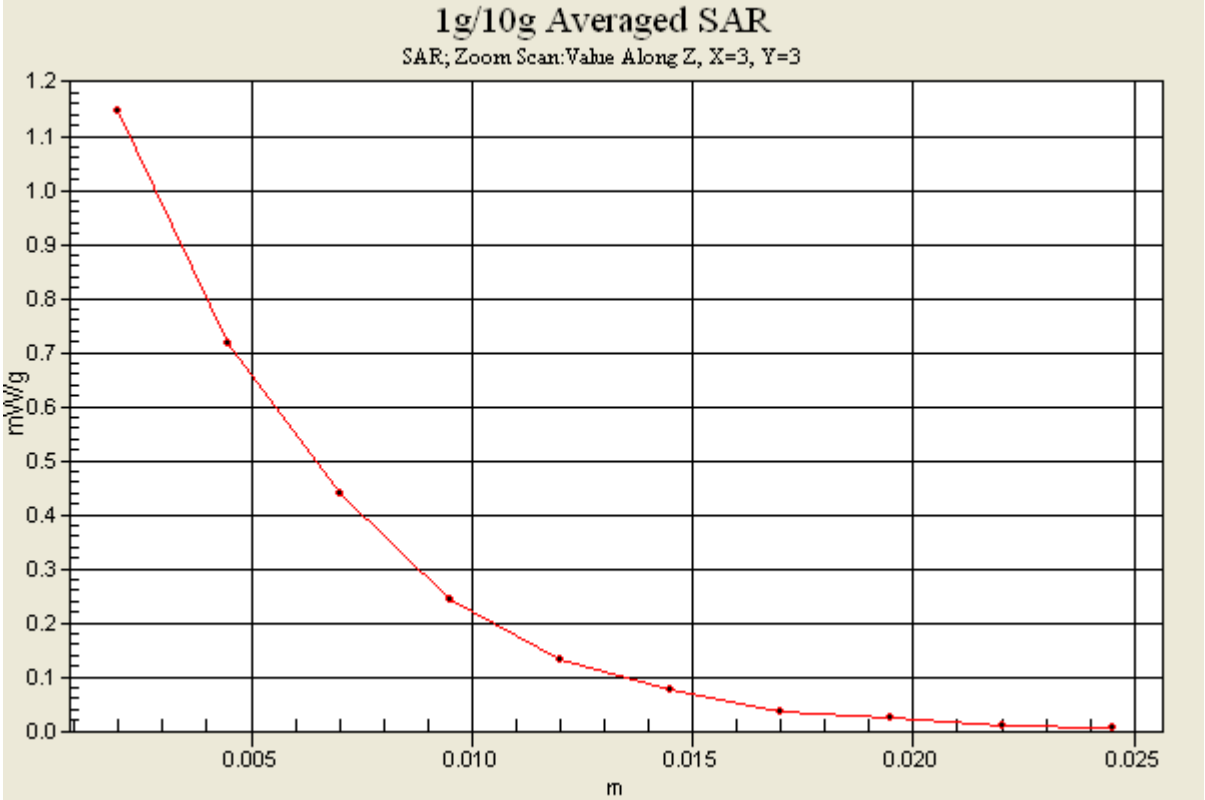
DUT: 121417

Communication System: 802.11a; Frequency: 5785 MHz;Duty Cycle: 1:1
Medium: MSL_5G_110326 Medium parameters used : f = 5785 MHz; σ = 5.97 mho/m; ε_r = 46.6; ρ = 1000 kg/m^3
Ambient Temperature：22.6 ℃; Liquid Temperature：21.4 ℃

DASY4 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2010/8/18
- Phantom: SAM_Right; Type: SAM; Serial: TP-1303
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Ch157/Area Scan (81x141x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.05 mW/g

Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 0.853 V/m; Power Drift = -0.132 dB
Peak SAR (extrapolated) = 1.69 W/kg
SAR(1 g) = 0.703 mW/g; SAR(10 g) = 0.298 mW/g
Maximum value of SAR (measured) = 1.15 mW/g


1g/10g Averaged SAR
SAR; Zoom Scan:Value Along Z, X=3, Y=3
mW/g
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.005
0.010
0.015
0.020
0.025
m

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.

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: D2450V2-735_Jun10

CALIBRATION CERTIFICATE

Object	D2450V2 - SN: 735
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date	June 17, 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 EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
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-09)	In house check: Oct-10

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

Issued: June 21, 2010

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**

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.

Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
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	38.9 ± 6 %	1.78 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 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	13.0 mW / g
SAR normalized	normalized to 1W	52.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**52.2 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.10 mW / g
SAR normalized	normalized to 1W	24.4 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**24.4 mW /g ± 16.5 % (k=2)**

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	52.7 ± 6 %	1.96 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	13.4 mW / g
SAR normalized	normalized to 1W	53.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**53.5 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.28 mW / g
SAR normalized	normalized to 1W	25.1 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**25.1 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.8 Ω + 3.4 jΩ
Return Loss	- 26.1 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.5 Ω + 3.7 jΩ
Return Loss	- 28.5 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.154 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	May 07, 2003

DASY5 Validation Report for Head TSL

Date/Time: 16.06.2010 10:56:25

Test Laboratory: SPEAG, Zurich, Switzerland

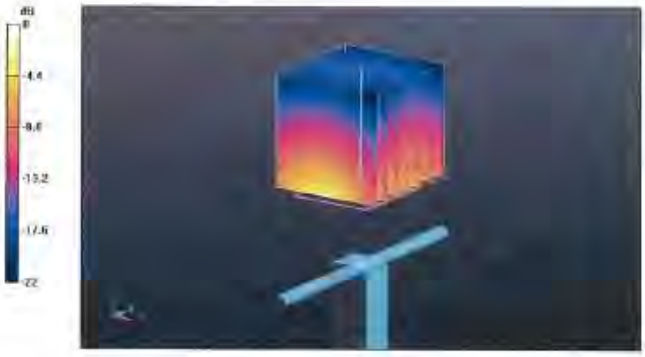
DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:735

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: HSL U11 BB
Medium parameters used: f = 2450 MHz; σ = 1.78 mho/m; ε_r = 38.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

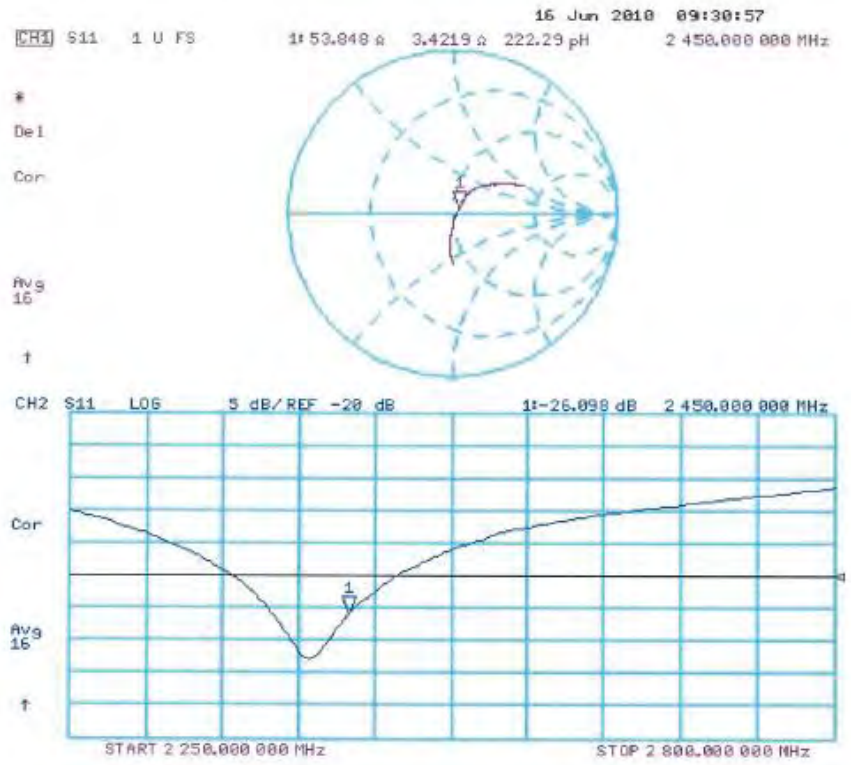
- Probe: ES3DV3 - SN3205; ConvF (4.53, 4.53, 4.53); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Head/d=10mm, Pin=250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 100.3 V/m; Power Drift = 0.046 dB
Peak SAR (extrapolated) = 26.6 W/kg
SAR(1 g) = 13 mW/g; SAR(10 g) = 6.1 mW/g
Maximum value of SAR (measured) = 16.6 mW/g



0 dB = 16.6mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body

Date/Time: 17.06.2010 11:28:23

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:735

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: MSL U11 BB
Medium parameters used: f = 2450 MHz; σ = 1.96 mho/m; ε_r = 52.7; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

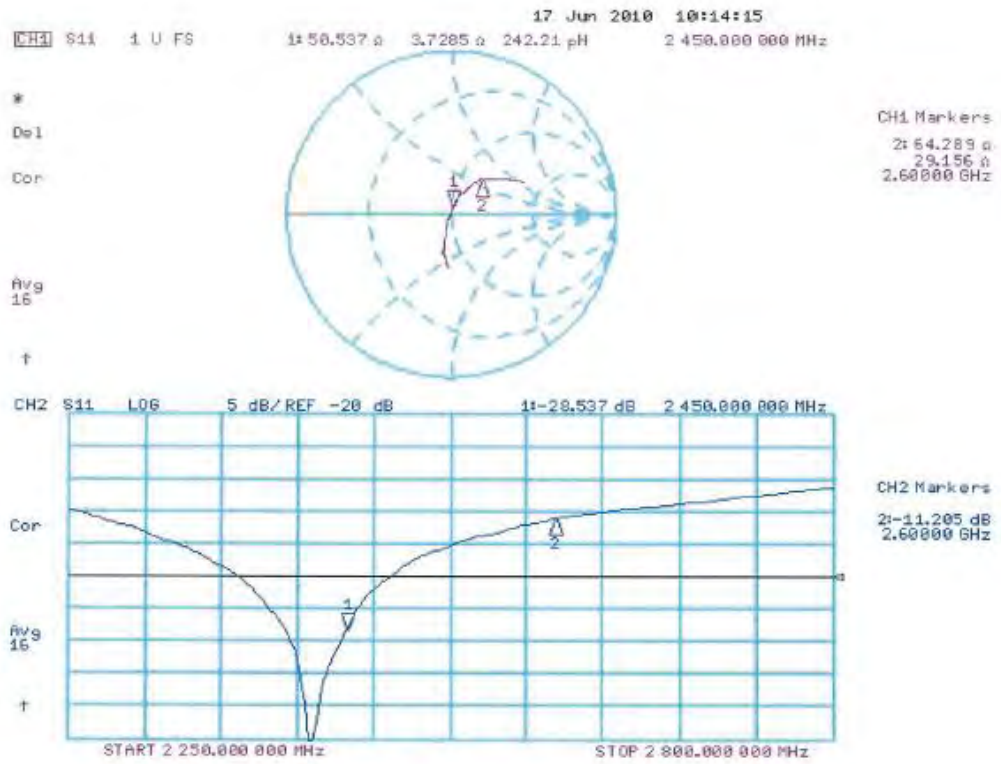
DASY5 Configuration:

- 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, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

Body/d=10mm, Pin250 mW, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 94.8 V/m; Power Drift = 0.073 dB
Peak SAR (extrapolated) = 27.7 W/kg
SAR(1 g) = 13.4 mW/g; SAR(10 g) = 6.28 mW/g
Maximum value of SAR (measured) = 16.7 mW/g

0 dB = 16.7mW/g

Impedance Measurement Plot for Body TSL



Calibration Laboratory of
Schmid & Partner
Engineering AG
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Accreditation No.: SCS 108

Client **Auden**

Certificate No: D5GHzV2-1040_Jun10

CALIBRATION CERTIFICATE

Object	D5GHzV2 - SN: 1040
Calibration procedure(s)	QA CAL-22.v1 Calibration procedure for dipole validation kits between 3-6 GHz
Calibration date:	June 23, 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 EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
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 EX3DV4	SN: 3503	05-Mar-10 (No. EX3-3503_Mar10)	Mar-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-09)	In house check: Oct-10

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

Issued: June 23, 2010

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEC Std 62209 Part 2, "Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation, and Procedures"; Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for including accessories and multiple transmitters", Draft Version 0.9, December 2004

b) Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

c) DASY4/5 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.

Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Area Scan resolution	dx, dy = 10 mm	
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 2.5 mm	
Frequency	5200 MHz ± 1 MHz 5500 MHz ± 1 MHz 5800 MHz ± 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	36.5 ± 6 %	4.57 mho/m ± 6 %
Head TSL temperature during test	(22.5 ± 0.2) °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	condition	
SAR measured	100 mW input power	8.23 mW / g
SAR normalized	normalized to 1W	82.3 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**82.5 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.35 mW / g
SAR normalized	normalized to 1W	23.5 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**23.5 mW / g ± 19.5 % (k=2)**

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.9 ± 6 %	4.84 mho/m ± 6 %
Head TSL temperature during test	(22.5 ± 0.2) °C	----	----

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	condition	
SAR measured	100 mW input power	8.79 mW / g
SAR normalized	normalized to 1W	87.9 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**88.0 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.48 mW / g
SAR normalized	normalized to 1W	24.8 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**24.8 mW / g ± 19.5 % (k=2)**

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	35.4 ± 6 %	5.09 mho/m ± 6 %
Head TSL temperature during test	(22.5 ± 0.2) °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Head TSL	condition	
SAR measured	100 mW input power	8.13 mW / g
SAR normalized	normalized to 1W	81.3 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**81.2 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.30 mW / g
SAR normalized	normalized to 1W	23.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**23.0 mW / g ± 19.5 % (k=2)**

Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	49.0 ± 6 %	5.47 mho/m ± 6 %
Body TSL temperature during test	(22.5 ± 0.2) °C	----	----

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	condition	
SAR measured	100 mW input power	7.57 mW / g
SAR normalized	normalized to 1W	7.57 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**75.7 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.11 mW / g
SAR normalized	normalized to 1W	21.1 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**21.1 mW / g ± 19.5 % (k=2)**

Body TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.6	5.65 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	48.3 ± 6 %	5.83 mho/m ± 6 %
Body TSL temperature during test	(22.5 ± 0.2) °C	----	----

SAR result with Body TSL at 5500 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	condition	
SAR measured	100 mW input power	8.04 mW / g
SAR normalized	normalized to 1W	80.4 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**80.3 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.23 mW / g
SAR normalized	normalized to 1W	22.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**22.3 mW / g ± 19.5 % (k=2)**

Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.7 ± 6 %	6.18 mho/m ± 6 %
Body TSL temperature during test	(22.5 ± 0.2) °C	----	----

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm^3 (1 g) of Body TSL	condition	
SAR measured	100 mW input power	6.93 mW / g
SAR normalized	normalized to 1W	69.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**69.2 mW / g ± 19.9 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	100 mW input power	1.92 mW / g
SAR normalized	normalized to 1W	19.2 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**19.2 mW / g ± 19.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	49.9 Ω - 7.6 jΩ
Return Loss	-22.4 dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	52.5 Ω - 5.4 jΩ
Return Loss	-24.8 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	55.9 Ω -1.7 jΩ
Return Loss	-24.7 dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	51.0 Ω - 4.9 jΩ
Return Loss	-26.1 dB

Antenna Parameters with Body TSL at 5500 MHz

Impedance, transformed to feed point	53.9 Ω - 3.4 jΩ
Return Loss	-26.1 dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	56.9 Ω - 2.2 jΩ
Return Loss	-23.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.211 ns

After long term use with 40 W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	December 30, 2005

DASY5 Validation Report for Head TSL

Date/Time: 22.06.2010 12:12:25

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN:1040

Communication System: CW; Frequency: 5200 MHz, Frequency: 5500 MHz, Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: HSL 5000
Medium parameters used: f = 5200 MHz; σ = 4.56 mho/m; ε_r = 36.5; ρ = 1000 kg/m^3 , Medium parameters used: f = 5500 MHz; σ = 4.82 mho/m; ε_r = 35.9; ρ = 1000 kg/m^3 , Medium parameters used: f = 5800 MHz; σ = 5.07 mho/m; ε_r = 35.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

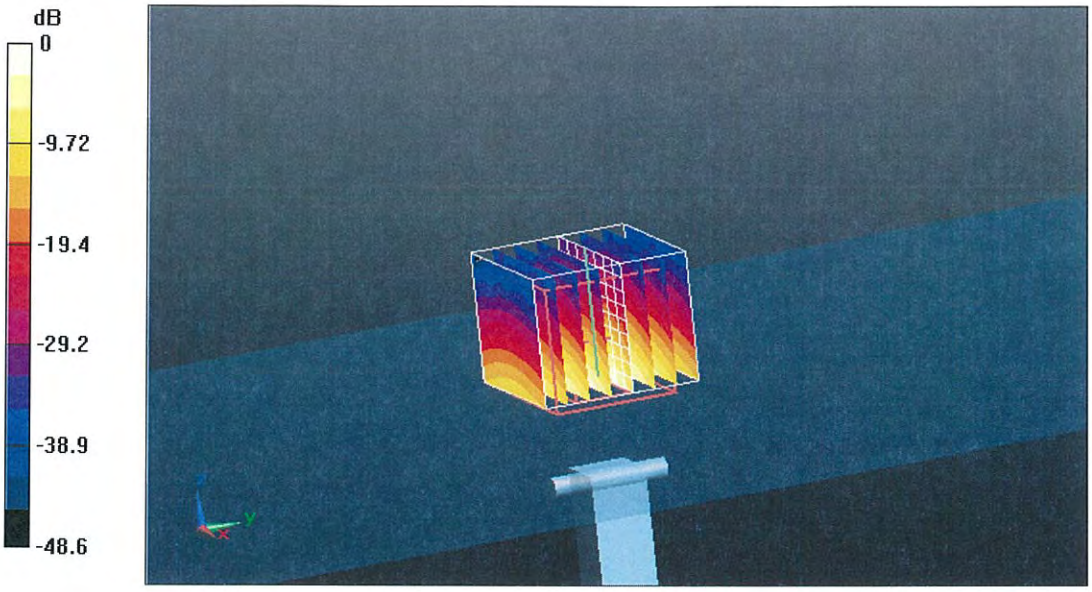
DASY5 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.36, 5.36, 5.36), ConvF(4.85, 4.85, 4.85), ConvF(4.74, 4.74, 4.74); Calibrated: 05.03.2010
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

D5GHzV2 Dipole (Head)/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 62.2 V/m; Power Drift = 0.079 dB
Peak SAR (extrapolated) = 31.1 W/kg
SAR(1 g) = 8.23 mW/g; SAR(10 g) = 2.35 mW/g
Maximum value of SAR (measured) = 16 mW/g

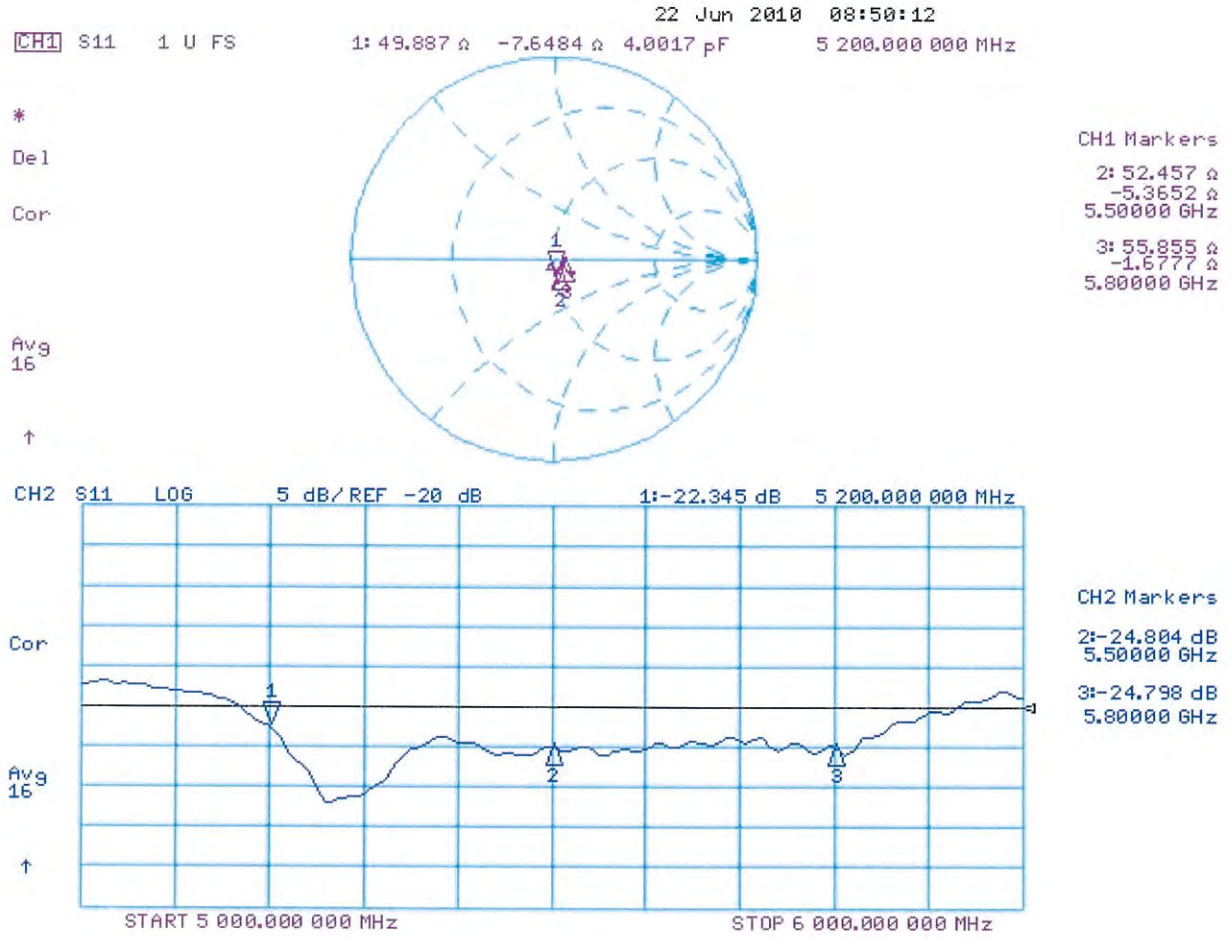
D5GHzV2 Dipole (Head)/d=10mm, Pin=100mW, f=5500 MHz/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 62.7 V/m; Power Drift = 0.090 dB
Peak SAR (extrapolated) = 35.2 W/kg
SAR(1 g) = 8.79 mW/g; SAR(10 g) = 2.48 mW/g
Maximum value of SAR (measured) = 17.3 mW/g

D5GHzV2 Dipole (Head)/d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 59.6 V/m; Power Drift = 0.078 dB
Peak SAR (extrapolated) = 33.7 W/kg
SAR(1 g) = 8.13 mW/g; SAR(10 g) = 2.3 mW/g
Maximum value of SAR (measured) = 16.2 mW/g



0 dB = 16.2mW/g

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 23.06.2010 12:48:48

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN:1040

Communication System: CW; Frequency: 5200 MHz, Frequency: 5500 MHz, Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: MSL 5000 MHz
Medium parameters used: f = 5200 MHz; σ = 5.44 mho/m; ε_r = 49; ρ = 1000 kg/m^3 , Medium parameters used: f = 5500 MHz; σ = 5.8 mho/m; ε_r = 48.3; ρ = 1000 kg/m^3 , Medium parameters used: f = 5800 MHz; σ = 6.14 mho/m; ε_r = 47.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

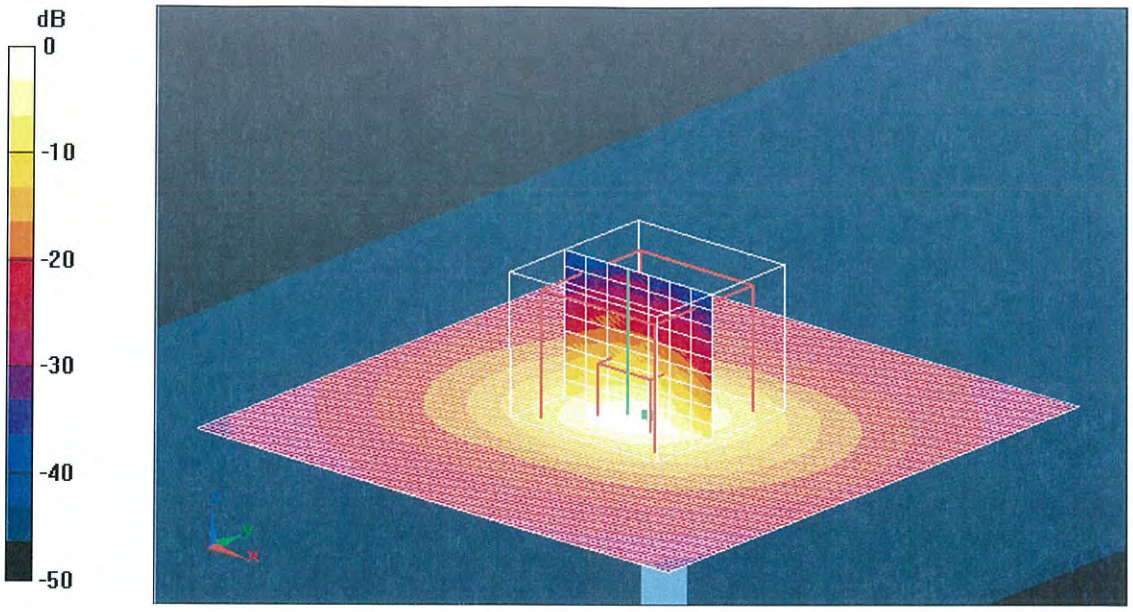
DASY5 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.88, 4.88, 4.88), ConvF(4.37, 4.37, 4.37), ConvF(4.57, 4.57, 4.57); Calibrated: 05.03.2010
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

D5GHzV2 Dipole (Body)/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 58.4 V/m; Power Drift = -0.057 dB
Peak SAR (extrapolated) = 28.8 W/kg
SAR(1 g) = 7.57 mW/g; SAR(10 g) = 2.11 mW/g
Maximum value of SAR (measured) = 14.8 mW/g

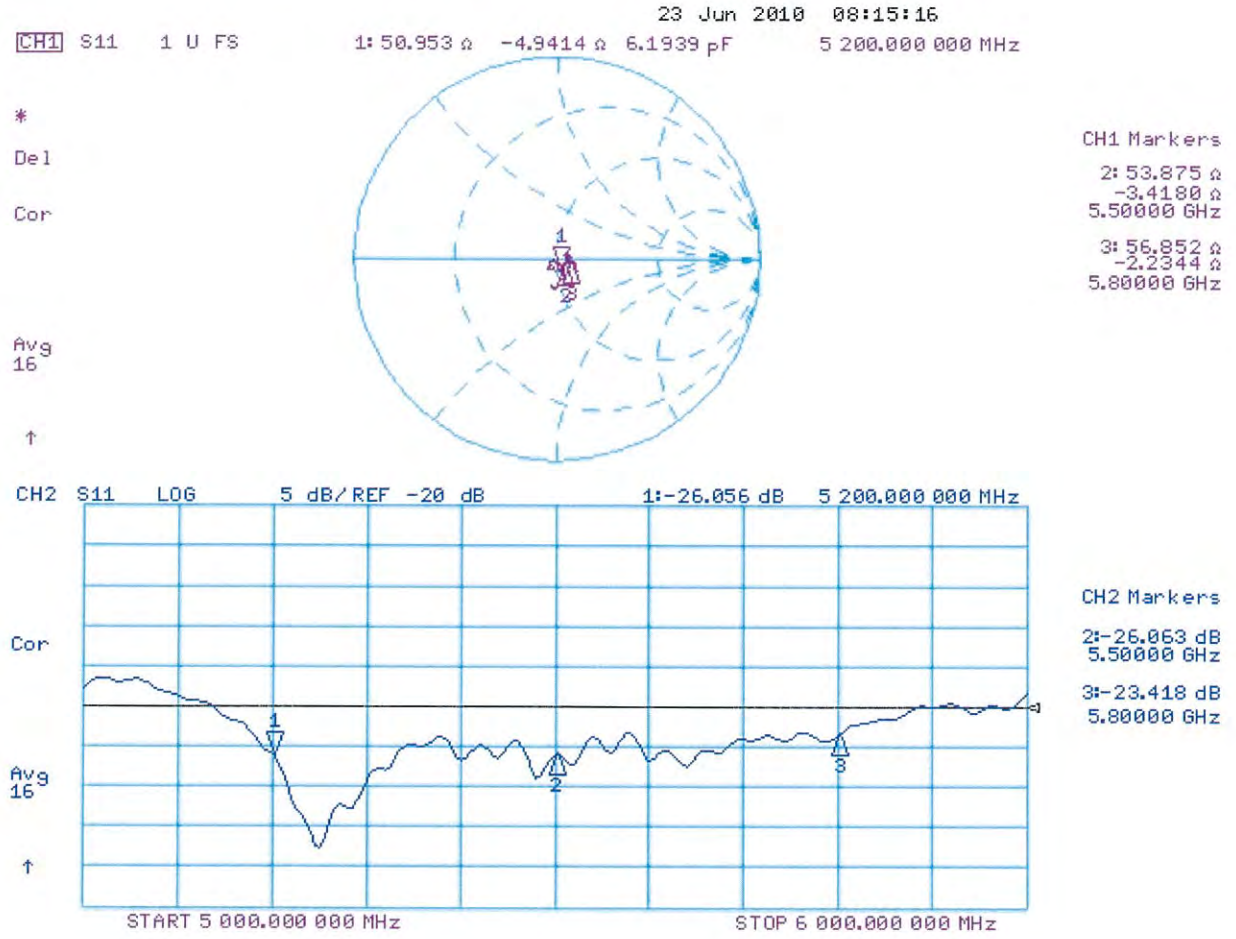
D5GHzV2 Dipole (Body)/d=10mm, Pin=100mW, f=5500 MHz/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 58.9 V/m; Power Drift = -0.052 dB
Peak SAR (extrapolated) = 32.5 W/kg
SAR(1 g) = 8.04 mW/g; SAR(10 g) = 2.23 mW/g
Maximum value of SAR (measured) = 15.9 mW/g

D5GHzV2 Dipole (Body)/d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm
Reference Value = 53.2 V/m; Power Drift = -0.037 dB
Peak SAR (extrapolated) = 29.8 W/kg
SAR(1 g) = 6.93 mW/g; SAR(10 g) = 1.92 mW/g
Maximum value of SAR (measured) = 14 mW/g



0 dB = 14mW/g

Impedance Measurement Plot for Body TSL



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Accreditation No.: SCS 108

Client **Sporton (Auden)**

Certificate No: DAE3-577_Jan11

CALIBRATION CERTIFICATE

Object	DAE3 - SD 000 D03 AA - SN: 577
Calibration procedure(s)	QA CAL-06.v22 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	January 13, 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
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-10 (No:10376)	Sep-11
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	07-Jun-10 (in house check)	In house check: Jun-11

	Name	Function	Signature
Calibrated by:	Andrea Guntli	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: January 13, 2011

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Accreditation No.: **SCS 108**

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1... ...+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.389 ± 0.1% (k=2)	403.857 ± 0.1% (k=2)	404.295 ± 0.1% (k=2)
Low Range	3.93277 ± 0.7% (k=2)	3.93544 ± 0.7% (k=2)	3.95803 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	102.0 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200005.8	1.57	0.00
Channel X	+ Input	20004.13	3.33	0.02
Channel X	- Input	-19995.53	4.67	-0.02
Channel Y	+ Input	200003.4	0.31	0.00
Channel Y	+ Input	19999.89	0.09	0.00
Channel Y	- Input	-20000.18	-0.28	0.00
Channel Z	+ Input	200002.7	0.22	0.00
Channel Z	+ Input	19999.37	-0.63	-0.00
Channel Z	- Input	-19999.27	0.43	-0.00

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.0	-0.14	-0.01
Channel X	+ Input	199.95	-0.05	-0.03
Channel X	- Input	-200.10	-0.10	0.05
Channel Y	+ Input	2000.0	-0.12	-0.01
Channel Y	+ Input	199.43	-0.57	-0.29
Channel Y	- Input	-201.05	-1.25	0.63
Channel Z	+ Input	1999.5	-0.28	-0.01
Channel Z	+ Input	198.64	-1.56	-0.78
Channel Z	- Input	-200.91	-0.81	0.40

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	14.61	12.98
	- 200	-11.87	-13.38
Channel Y	200	-6.98	-7.04
	- 200	5.39	5.42
Channel Z	200	-1.74	-1.94
	- 200	0.61	0.35

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	3.35	0.10
Channel Y	200	2.66	-	2.41
Channel Z	200	2.57	0.13	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15969	16221
Channel Y	15855	15246
Channel Z	16222	17974

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	-1.07	-4.93	0.31	0.67
Channel Y	-0.69	-1.59	0.48	0.40
Channel Z	-1.47	-2.56	-0.81	0.32

6. Input Offset Current

Nominal input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

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Accreditation No.: SCS 108

Client **Sporton (Auden)**

Certificate No: DAE4-778_Oct10

CALIBRATION CERTIFICATE

Object	DAE4 - SD 000 D04 BJ - SN: 778
Calibration procedure(s)	QA CAL-06.v22 Calibration procedure for the data acquisition electronics (DAE)
Calibration date:	October 22, 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
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-10 (No:10376)	Sep-11
Secondary Standards	**ID #**	**Check Date (in house)**	**Scheduled Check**
Calibrator Box V1.1	SE UMS 006 AB 1004	07-Jun-10 (in house check)	In house check: Jun-11

	Name	Function	Signature
Calibrated by:	Eric Hainfeld	Technician	
Approved by:	Fin Bomholt	R&D Director	

Issued: October 22, 2010

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Accreditation No.: SCS 108

Glossary

DAE	data acquisition electronics
Connector angle	information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
  - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
  - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
  - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
  - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
  - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
  - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
  - *Input resistance:* Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
  - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
  - *Power consumption:* Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range:	1LSB =	6.1μV ,	full range =	-100...+300 mV
Low Range:	1LSB =	61nV ,	full range =	-1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.679 ± 0.1% (k=2)	403.480 ± 0.1% (k=2)	405.025 ± 0.1% (k=2)
Low Range	3.98633 ± 0.7% (k=2)	3.96375 ± 0.7% (k=2)	3.99940 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	64.5 ° ± 1 °

Appendix

1. DC Voltage Linearity

High Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	200004.4	1.89	0.00
Channel X	+ Input	20001.11	1.41	0.01
Channel X	- Input	-19998.36	1.54	-0.01
Channel Y	+ Input	199996.1	3.42	0.00
Channel Y	+ Input	19999.75	0.35	0.00
Channel Y	- Input	-19999.92	-0.12	0.00
Channel Z	+ Input	200002.7	1.29	0.00
Channel Z	+ Input	19996.85	-2.55	-0.01
Channel Z	- Input	-20004.31	-4.61	0.02

Low Range		Reading (μV)	Difference (μV)	Error (%)
Channel X	+ Input	2000.0	0.09	0.00
Channel X	+ Input	200.02	0.02	0.01
Channel X	- Input	-198.62	1.48	-0.74
Channel Y	+ Input	1999.6	-0.58	-0.03
Channel Y	+ Input	199.13	-0.57	-0.29
Channel Y	- Input	-200.71	-0.61	0.31
Channel Z	+ Input	2000.1	-0.01	-0.00
Channel Z	+ Input	198.96	-1.14	-0.57
Channel Z	- Input	-200.98	-0.98	0.49

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	-5.28	-6.07
	- 200	6.79	6.12
Channel Y	200	-1.80	-1.60
	- 200	0.97	0.35
Channel Z	200	-9.76	-9.86
	- 200	7.56	7.61

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	1.86	-0.66
Channel Y	200	2.28	-	2.89
Channel Z	200	1.68	-0.15	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	16056	16950
Channel Y	16153	13741
Channel Z	16441	16086

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec
Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	0.32	-2.35	2.08	0.55
Channel Y	-1.83	-2.96	-0.72	0.47
Channel Z	-1.93	-3.00	-0.90	0.45

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

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Accreditation No.: **SCS 108**

Client **Sporton (Auden)**

Certificate No: **ET3-1787_May10**

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1787
Calibration procedure(s)	QA CAL-01.v6, QA CAL-23.v3 and QA CAL-25.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	May 18, 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-09)	In house check: Oct10

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

Issued: May 22, 2010

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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 ET3DV6

SN:1787

Manufactured:	May 28, 2003
Last calibrated:	May 26, 2009
Recalibrated:	May 18, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1787 May 18, 2010

DASY/EASY - Parameters of Probe: ET3DV6 SN:1787

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (μV/(V/m)^2)[A]	1.60	1.79	2.10	± 10.1%
DCP (mV)[B]	92.4	95.5	91.0	

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	300.0	± 1.5%
			Y	0.00	0.00	1.00	300.0	
			Z	0.00	0.00	1.00	300.0	

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.

ET3DV6 SN:1787 May 18, 2010

DASY/EASY - Parameters of Probe: ET3DV6 SN:1787

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	41.5 ± 5%	0.90 ± 5%	6.56	6.56	6.56	0.52	1.96 ± 11.0%
835	± 50 / ± 100	41.9 ± 5%	0.89 ± 5%	6.21	6.21	6.21	0.42	2.23 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	5.36	5.36	5.36	0.49	1.18 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	5.09	5.09	5.09	0.66	2.20 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.50	4.50	4.50	0.99	1.63 ± 11.0%

[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.

ET3DV6 SN:1787 May 18, 2010

DASY/EASY - Parameters of Probe: ET3DV6 SN:1787

Calibration Parameter Determined in Body Tissue Simulating Media

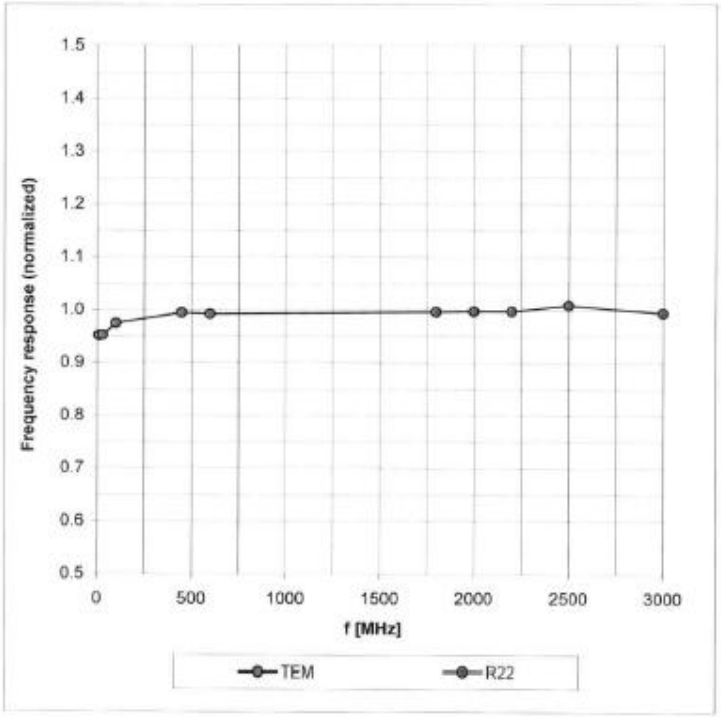
f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
750	± 50 / ± 100	55.5 ± 5%	0.96 ± 5%	6.22	6.22	6.22	0.48	2.20 ± 11.0%
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	6.12	6.12	6.12	0.39	2.45 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	4.72	4.72	4.72	0.63	2.90 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.47	4.47	4.47	0.88	2.39 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.03	4.03	4.03	0.99	1.35 ± 11.0%

[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.

ET3DV6 SN:1787 May 18, 2010

Frequency Response of E-Field

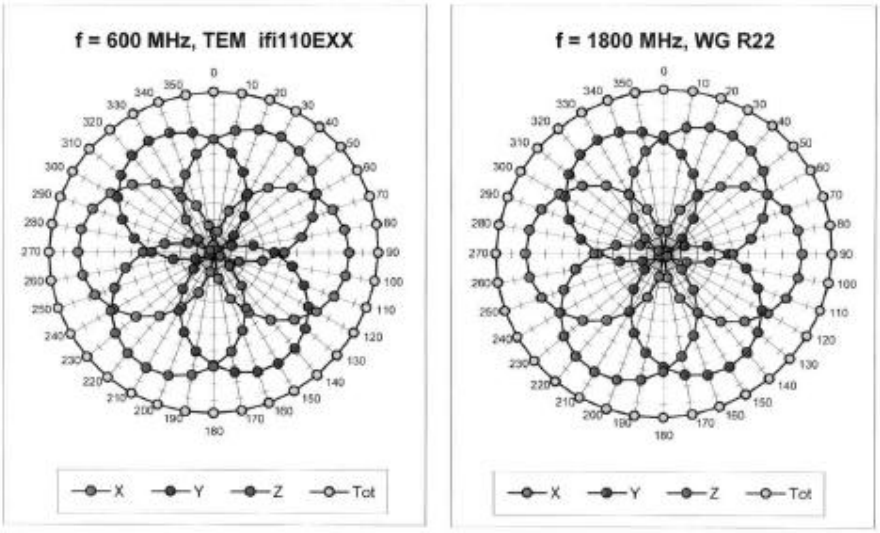
(TEM-Cell:ifi110 EXX, Waveguide: R22)

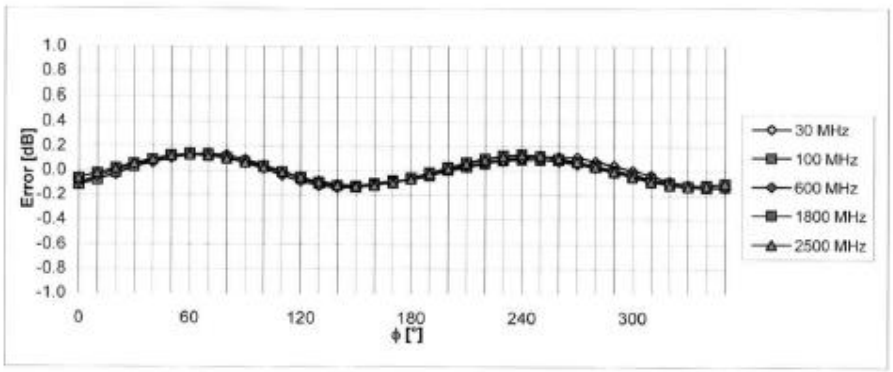


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

ET3DV6 SN:1787 May 18, 2010

Receiving Pattern (ϕ), ϑ = 0°





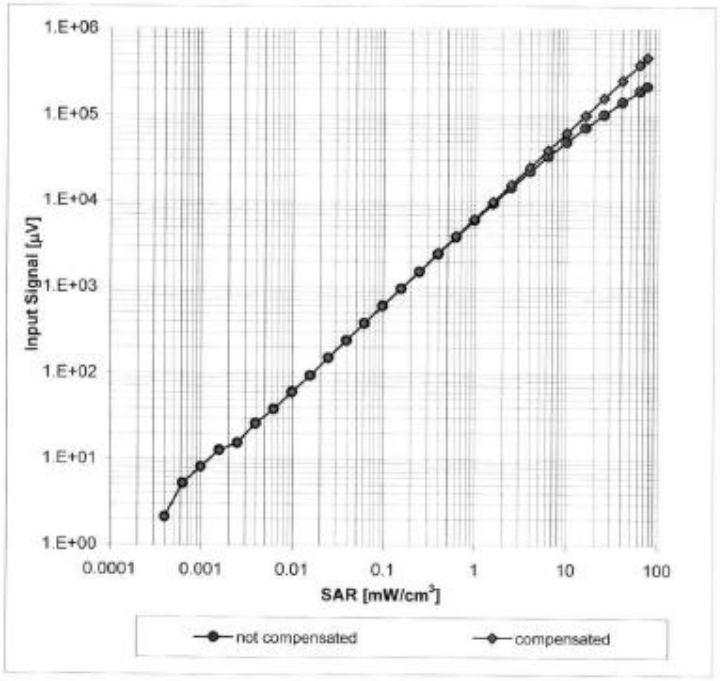
Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

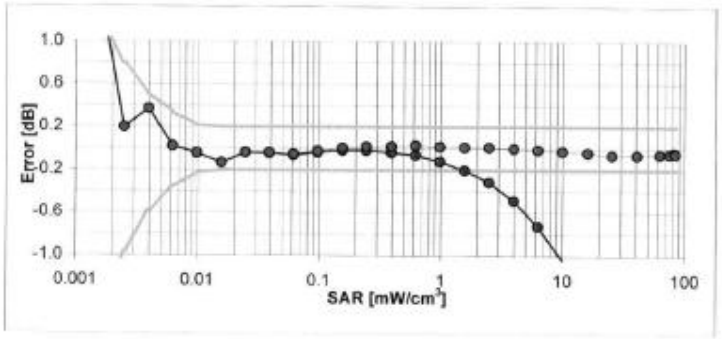
ET3DV6 SN:1787

May 18, 2010

Dynamic Range f(SAR_{head})

(Waveguide R22, f = 1800 MHz)

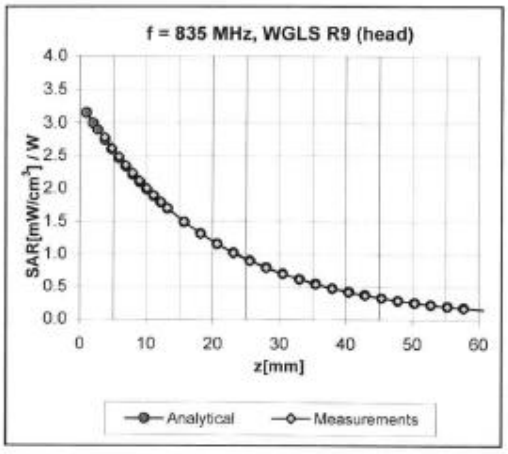


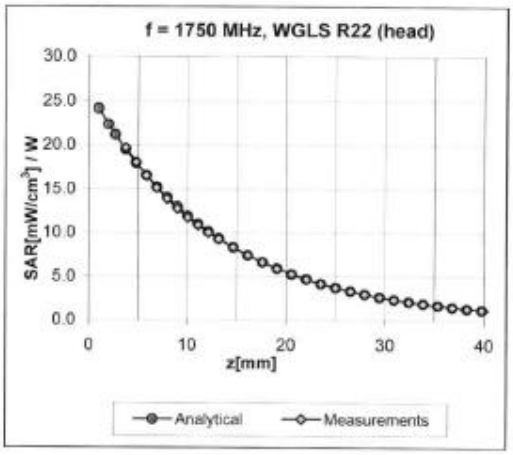


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

ET3DV6 SN:1787 May 18, 2010

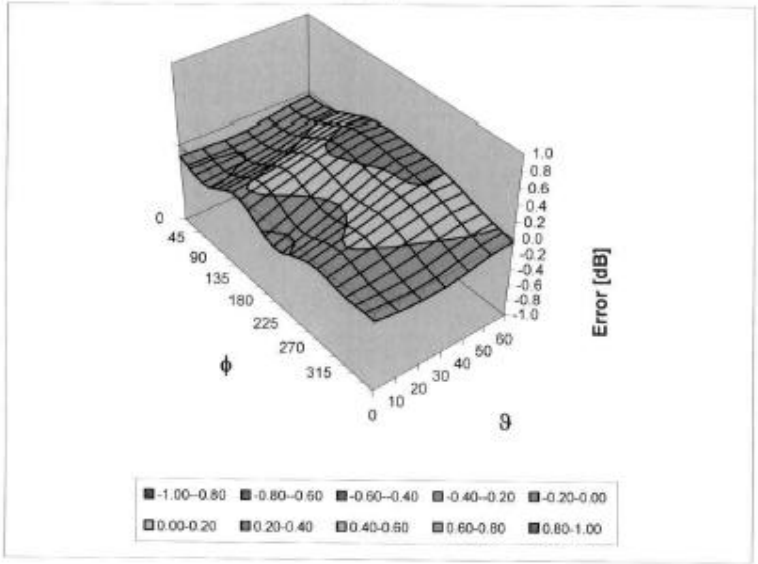
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

ET3DV6 SN:1787 May 18, 2010

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	10 mm
Tip Diameter	6.8 mm
Probe Tip to Sensor X Calibration Point	2.7 mm
Probe Tip to Sensor Y Calibration Point	2.7 mm
Probe Tip to Sensor Z Calibration Point	2.7 mm
Recommended Measurement Distance from Surface	4 mm

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Accreditation No.: SCS 108

Client **Sporton (Auden)**

Certificate No: **EX3-3731_Sep10**

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3731
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:	September 20, 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-09)	In house check: Oct10

	Name	Function	Signature
Calibrated by:	Katja Pokovic	Technical Manager	
Approved by:	Fin Bomholt	R&D Director	

Issued: September 22, 2010

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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:3731

Manufactured:	October 19, 2009
Last calibrated:	July 16, 2010
Repaired:	September 8, 2010
Recalibrated:	September 20, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

EX3DV4 SN:3731 September 20, 2010

DASY/EASY - Parameters of Probe: EX3DV4 SN:3731

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu V/(V/m)^2$)[A]	0.51	0.53	0.56	± 10.1%
DCP (mV)[B]	87.1	87.4	87.7	

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	300	± 1.5%
			Y	0.00	0.00	1.00	300	
			Z	0.00	0.00	1.00	300	

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 rectangular distribution and is expressed for the square of the field value.

EX3DV4 SN:3731 September 20, 2010

DASY/EASY - Parameters of Probe: EX3DV4 SN:3731

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)
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	8.85	8.85	8.85	0.60	0.69 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	7.46	7.46	7.46	0.75	0.60 ± 11.0%
2300	± 50 / ± 100	39.5 ± 5%	1.67 ± 5%	7.16	7.16	7.16	0.47	0.71 ± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	6.88	6.88	6.88	0.31	0.95 ± 11.0%
3500	± 50 / ± 100	37.9 ± 5%	2.91 ± 5%	6.60	6.60	6.60	0.20	1.50 ± 13.1%
5200	± 50 / ± 100	36.0 ± 5%	4.66 ± 5%	4.83	4.83	4.83	0.35	1.90 ± 13.1%
5300	± 50 / ± 100	35.9 ± 5%	4.76 ± 5%	4.46	4.46	4.46	0.38	1.90 ± 13.1%
5500	± 50 / ± 100	35.6 ± 5%	4.96 ± 5%	4.46	4.46	4.46	0.42	1.90 ± 13.1%
5600	± 50 / ± 100	35.5 ± 5%	5.07 ± 5%	4.07	4.07	4.07	0.48	1.90 ± 13.1%
5800	± 50 / ± 100	35.3 ± 5%	5.27 ± 5%	4.22	4.22	4.22	0.50	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.

EX3DV4 SN:3731 September 20, 2010

DASY/EASY - Parameters of Probe: EX3DV4 SN:3731

Calibration Parameter Determined in Body Tissue Simulating Media

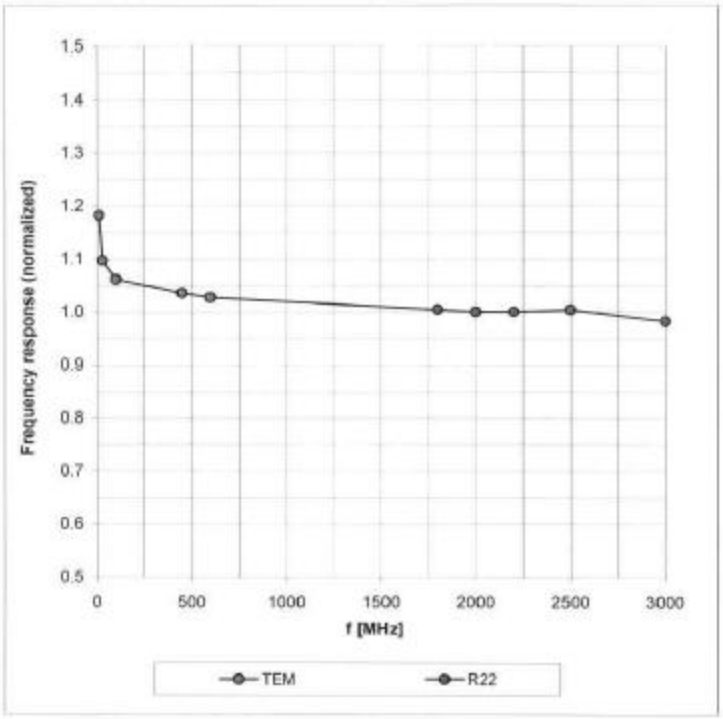
f [MHz]	Validity [MHz][C]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	8.84	8.84	8.84	0.49	0.79 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	7.13	7.13	7.13	0.65	0.66 ± 11.0%
2300	± 50 / ± 100	52.8 ± 5%	1.85 ± 5%	7.12	7.12	7.12	0.37	0.88 ± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	6.85	6.85	6.85	0.32	0.97 ± 11.0%
3500	± 50 / ± 100	51.3 ± 5%	3.31 ± 5%	6.02	6.02	6.02	0.30	1.43 ± 13.1%
5200	± 50 / ± 100	49.0 ± 5%	5.30 ± 5%	3.87	3.87	3.87	0.60	1.95 ± 13.1%
5300	± 50 / ± 100	48.9 ± 5%	5.42 ± 5%	3.63	3.63	3.63	0.60	1.95 ± 13.1%
5500	± 50 / ± 100	48.6 ± 5%	5.65 ± 5%	3.44	3.44	3.44	0.63	1.95 ± 13.1%
5600	± 50 / ± 100	48.5 ± 5%	5.77 ± 5%	3.20	3.20	3.20	0.65	1.95 ± 13.1%
5800	± 50 / ± 100	48.2 ± 5%	6.00 ± 5%	3.55	3.55	3.55	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.

EX3DV4 SN:3731 September 20, 2010

Frequency Response of E-Field

(TEM-Cell:ifi110 EXX, Waveguide: R22)



Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

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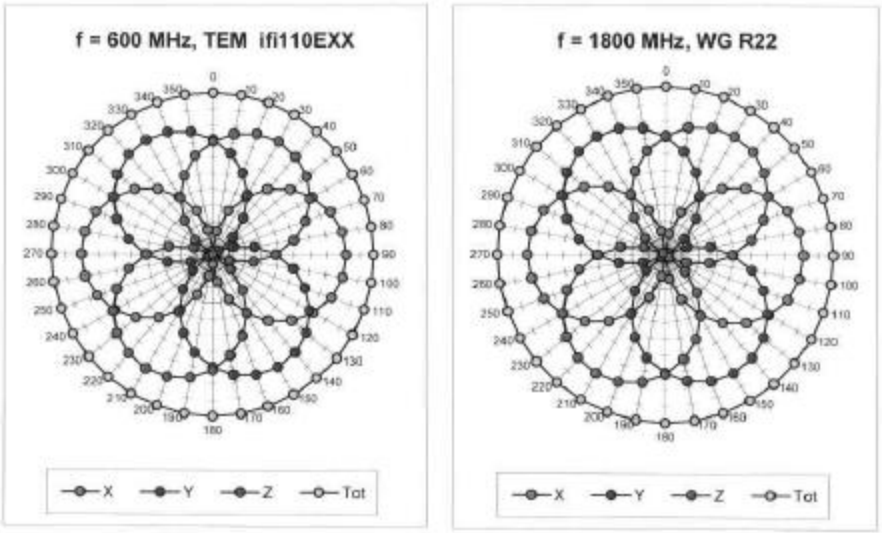
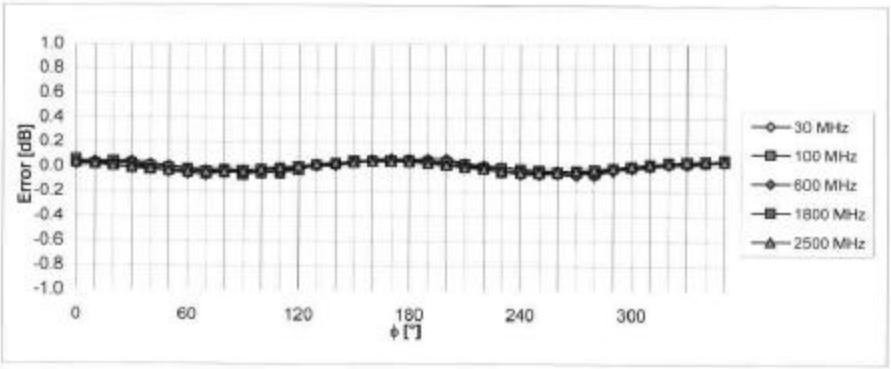
Receiving Pattern (ϕ), ϑ = 0°





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

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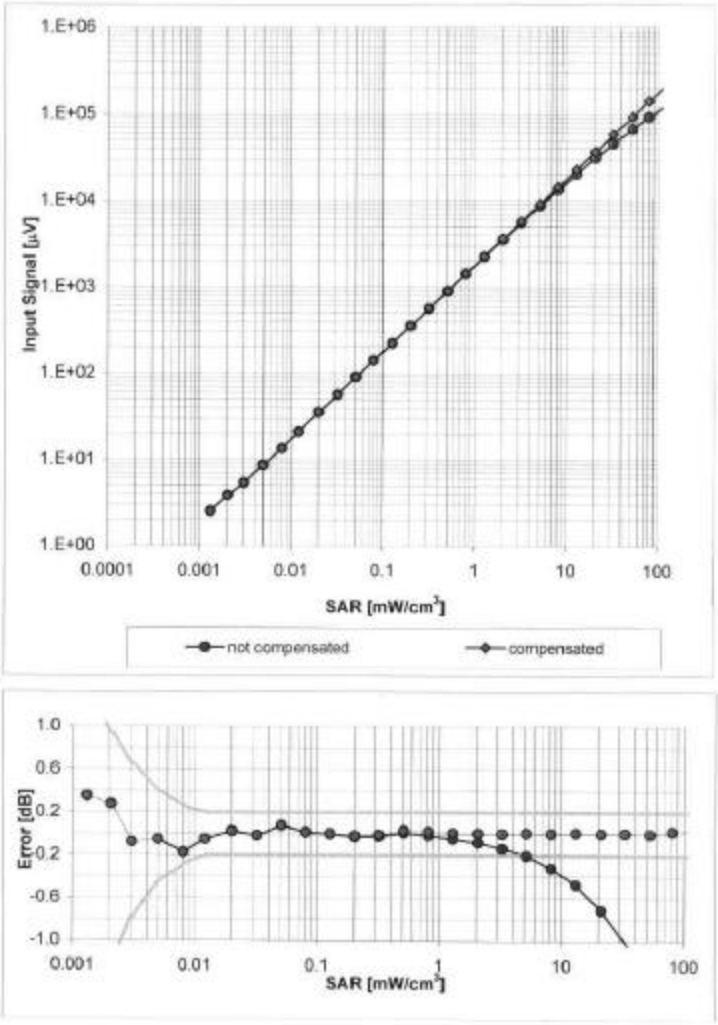
Dynamic Range f(SAR_{head})

(Waveguide R22, f = 1800 MHz)



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

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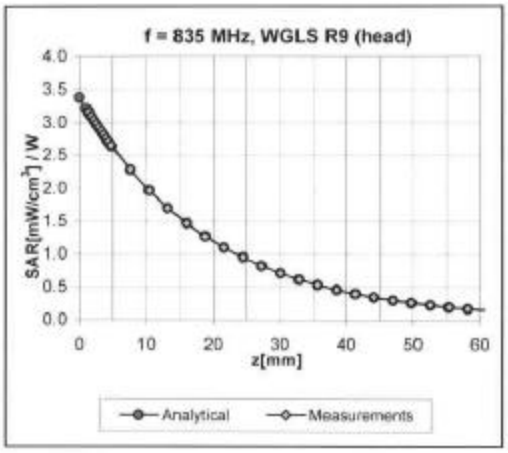
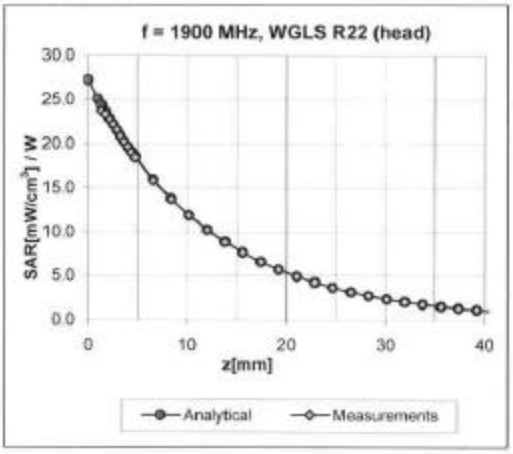
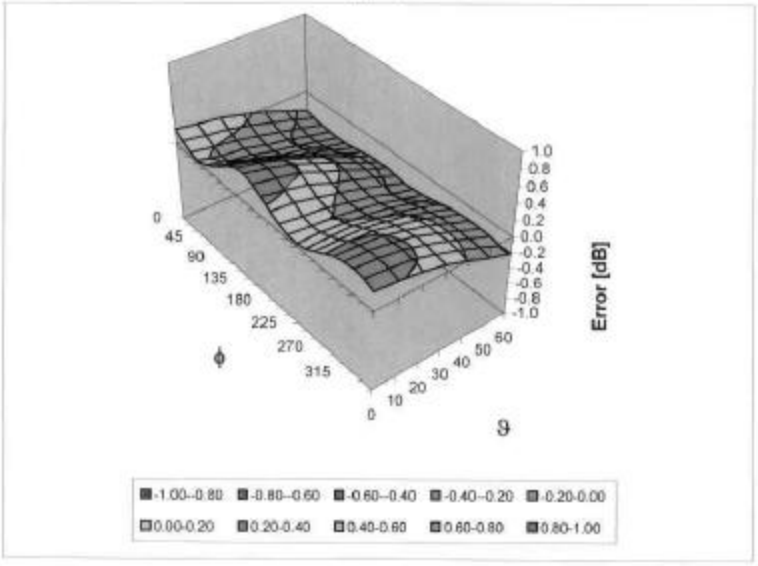
Conversion Factor Assessment





Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: ± 2.6% (k=2)

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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