#13 GSM1900_GPRS12_Face_1cm_Ch810_Battery1

DUT: 130815

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110420 Medium parameters used: f = 1910 MHz; σ = 1.55 mho/m; ε_r = 52.4; ρ

= 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch810/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
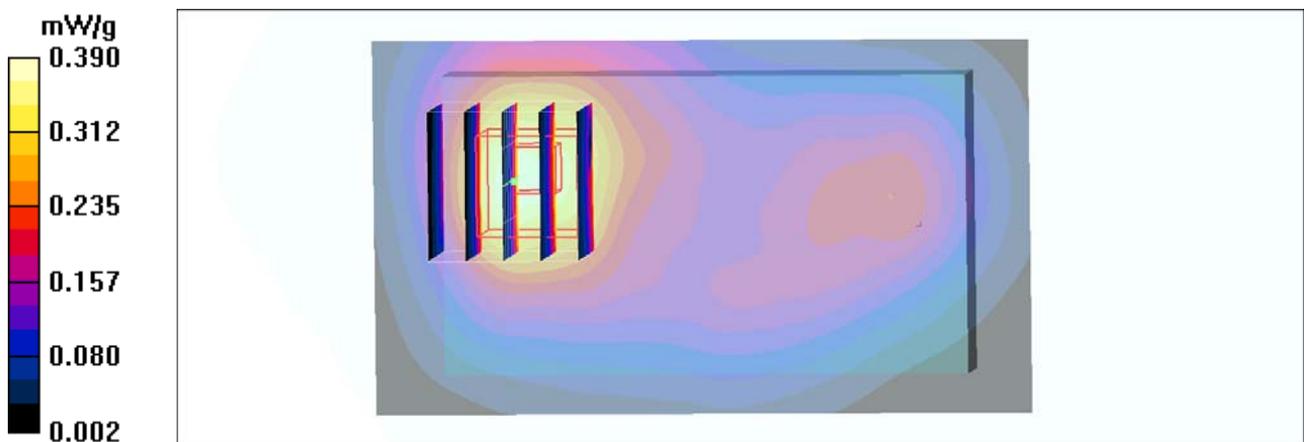Maximum value of SAR (interpolated) = 0.390 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.0 V/m; Power Drift = -0.126 dB
Peak SAR (extrapolated) = 0.743 W/kg
SAR(1 g) = 0.351 mW/g; SAR(10 g) = 0.223 mW/g
Maximum value of SAR (measured) = 0.371 mW/g

#14 GSM1900_GPRS12_Bottom_1cm_Ch810_Battery1

DUT: 130815

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110420 Medium parameters used: f = 1910 MHz; σ = 1.55 mho/m; ε_r = 52.4; ρ

= 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch810/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
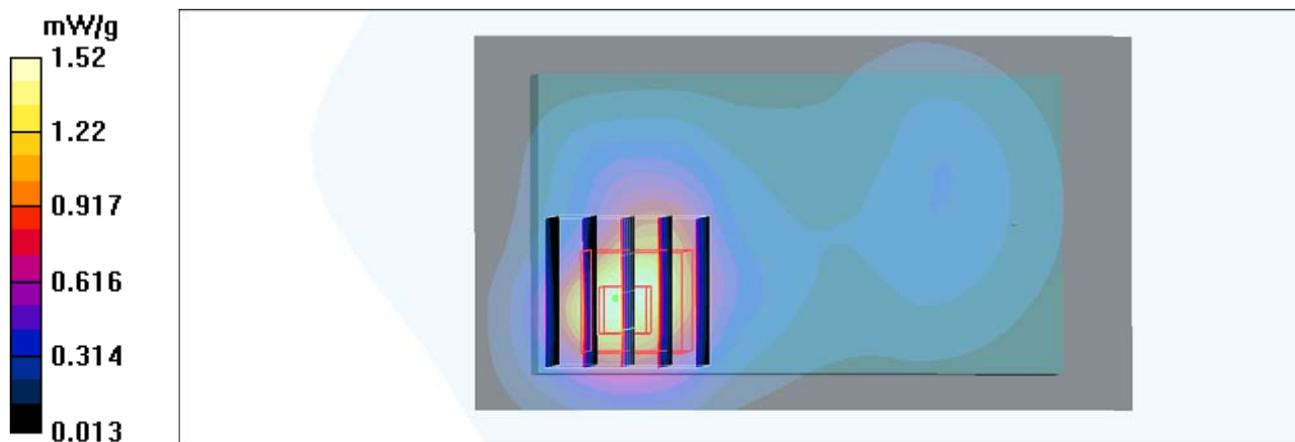Maximum value of SAR (interpolated) = 1.52 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.8 V/m; Power Drift = -0.044 dB
Peak SAR (extrapolated) = 1.72 W/kg
SAR(1 g) = 1.23 mW/g; SAR(10 g) = 0.718 mW/g
Maximum value of SAR (measured) = 1.32 mW/g

#15 GSM1900_GPRS12_Left Side_1cm_Ch810_Battery1

DUT: 130815

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110420 Medium parameters used: f = 1910 MHz; σ = 1.55 mho/m; ε_r = 52.4; ρ

= 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch810/Area Scan (31x71x1): Measurement grid: dx=20mm, dy=20mm
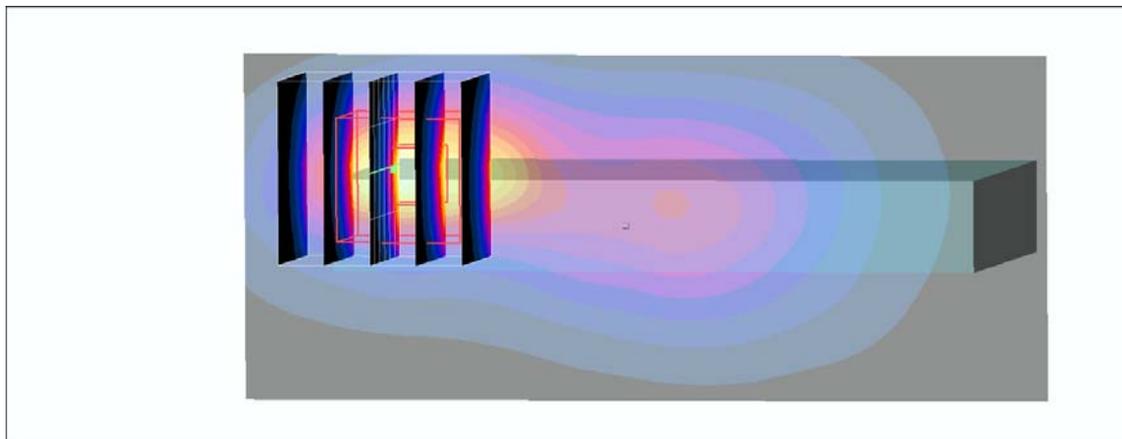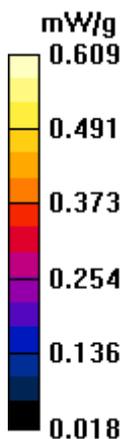Maximum value of SAR (interpolated) = 0.609 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.4 V/m; Power Drift = -0.150 dB
Peak SAR (extrapolated) = 0.836 W/kg
SAR(1 g) = 0.543 mW/g; SAR(10 g) = 0.302 mW/g
Maximum value of SAR (measured) = 0.600 mW/g

#16 GSM1900_GPRS12_Right Side_1cm_Ch810_Battery1

DUT: 130815

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110420 Medium parameters used: f = 1910 MHz; σ = 1.55 mho/m; ε_r = 52.4; ρ
= 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch810/Area Scan (31x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.122 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.10 V/m; Power Drift = -0.103 dB
Peak SAR (extrapolated) = 0.145 W/kg
SAR(1 g) = 0.101 mW/g; SAR(10 g) = 0.064 mW/g
Maximum value of SAR (measured) = 0.110 mW/g
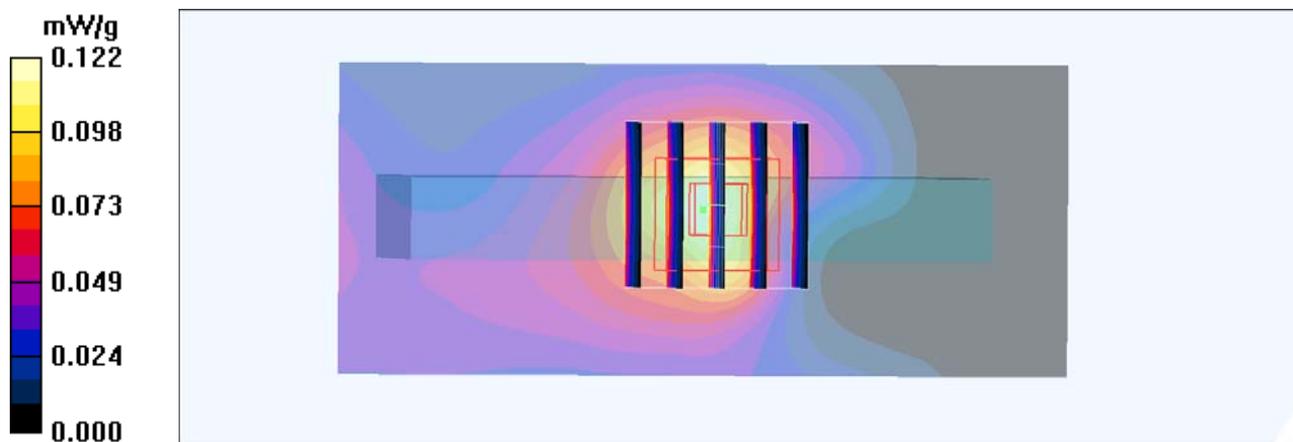
#18 GSM1900_GPRS12_Down Side_1cm_Ch810_Battery1

DUT: 130815

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110420 Medium parameters used: f = 1910 MHz; σ = 1.55 mho/m; ε_r = 52.4; ρ

= 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch810/Area Scan (31x61x1): Measurement grid: dx=20mm, dy=20mm
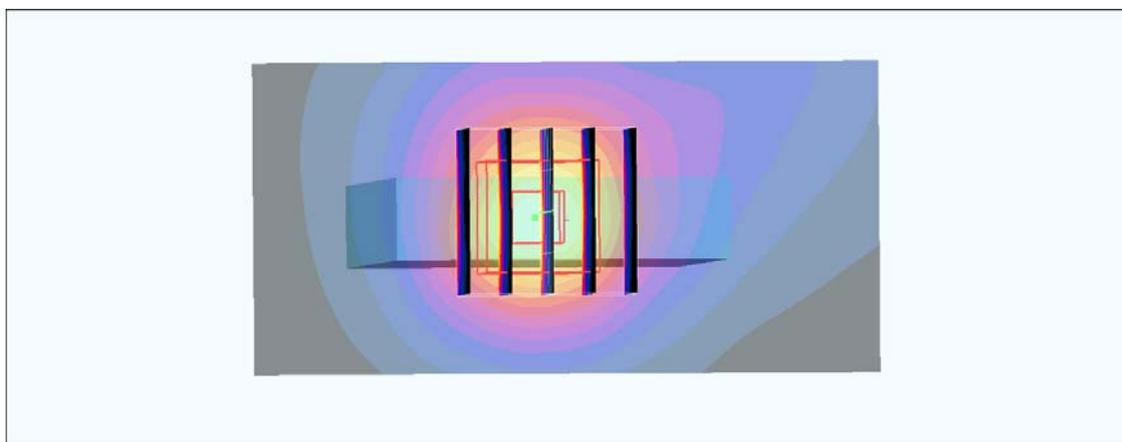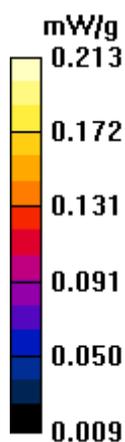Maximum value of SAR (interpolated) = 0.213 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.7 V/m; Power Drift = 0.056 dB
Peak SAR (extrapolated) = 0.306 W/kg
SAR(1 g) = 0.206 mW/g; SAR(10 g) = 0.122 mW/g
Maximum value of SAR (measured) = 0.229 mW/g

#31 GSM1900_GPRS12_Botttom_1cm_Ch512_Battery1

DUT: 130815

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110421 Medium parameters used: f = 1850.2 MHz; σ = 1.5 mho/m; ε_r = 52.5; ρ = 1000

kg/m^3
Ambient Temperature 22.4   ; Liquid Temperature 21.1

DASY5 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- 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

Ch512/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.17 mW/g

Ch512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.9 V/m; Power Drift = -0.126 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 1.01 mW/g; SAR(10 g) = 0.584 mW/g
Maximum value of SAR (measured) = 1.15 mW/g
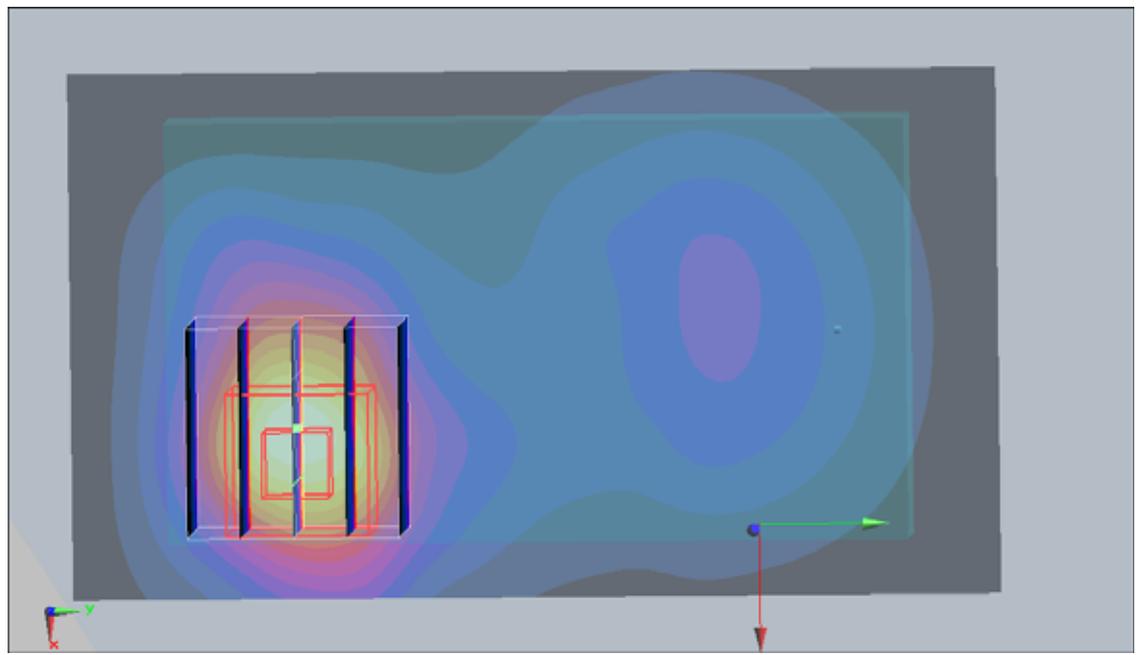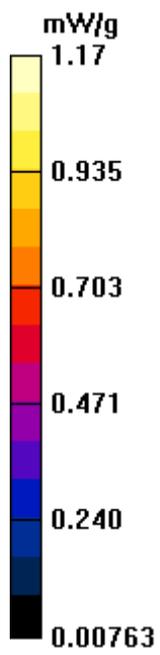
#32 GSM1900_GPRS12_Botttom_1cm_Ch661_Battery1

DUT: 130815

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110421 Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.5; ρ = 1000

kg/m^3
Ambient Temperature 22.6   ; Liquid Temperature 21.1

DASY5 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- 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

Ch661/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.54 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.9 V/m; Power Drift = -0.135 dB
Peak SAR (extrapolated) = 1.89 W/kg
SAR(1 g) = 1.3 mW/g; SAR(10 g) = 0.774 mW/g
Maximum value of SAR (measured) = 1.44 mW/g
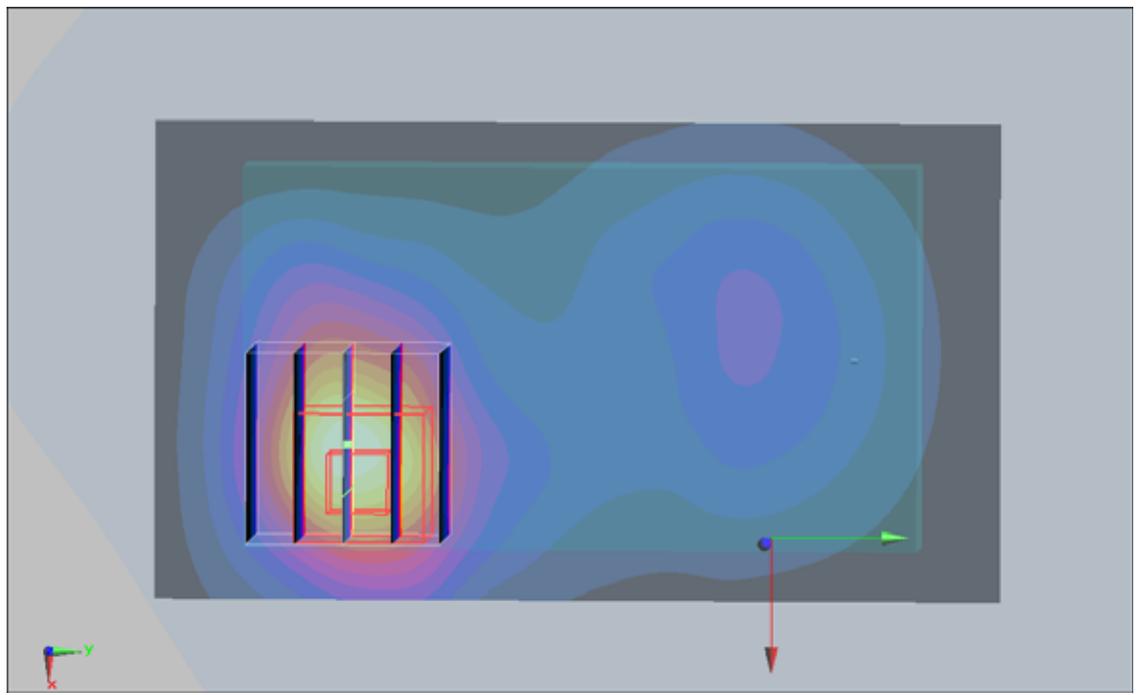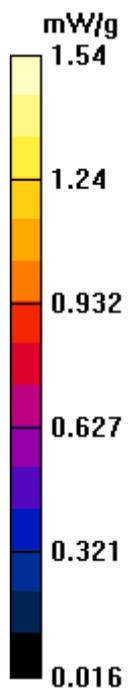
#60 GSM1900_GPRS12_Botttom_1cm_Ch661_Battery2

DUT: 130815

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110421 Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Ambient Temperature 22.5 ; Liquid Temperature 21.1

DASY5 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- 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

Ch661/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.74 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.2 V/m; Power Drift = -0.129 dB
Peak SAR (extrapolated) = 1.83 W/kg
SAR(1 g) = 1.26 mW/g; SAR(10 g) = 0.752 mW/g
Maximum value of SAR (measured) = 1.4 mW/g
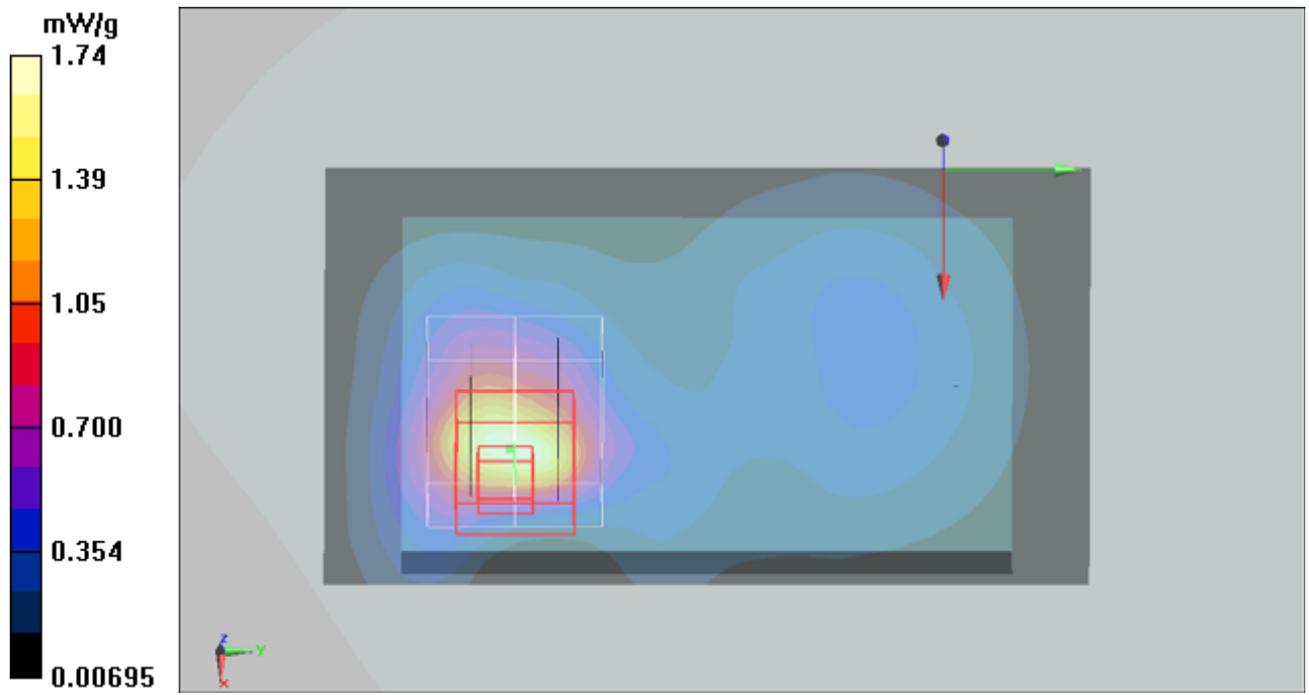
#61 GSM1900_GPRS12_Botttom_1cm_Ch512_Battery2

DUT: 130815

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110421 Medium parameters used (interpolated): f = 1850.2 MHz; σ = 1.5 mho/m; ε_r =

52.5; ρ = 1000 kg/m^3
Ambient Temperature 22.5 ; Liquid Temperature 21.1

DASY5 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- 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

Ch512/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.05 mW/g

Ch512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.2 V/m; Power Drift = -0.129 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.884 mW/g; SAR(10 g) = 0.536 mW/g
Maximum value of SAR (measured) = 0.964 mW/g

#62 GSM1900_GPRS12_Botttom_1cm_Ch810_Battery2

DUT: 130815

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110421 Medium parameters used: f = 1910 MHz; σ = 1.57 mho/m; ϵ_r = 52.3; ρ = 1000

kg/m^3
Ambient Temperature 22.5 ; Liquid Temperature 21.1

DASY5 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- 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

Ch810/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.56 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.1 V/m; Power Drift = -0.00498 dB
Peak SAR (extrapolated) = 2.13 W/kg
SAR(1 g) = 1.41 mW/g; SAR(10 g) = 0.832 mW/g
Maximum value of SAR (measured) = 1.57 mW/g

#62 GSM1900_GPRS12_Botttom_1cm_Ch810_Battery2_2D

DUT: 130815

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110421 Medium parameters used: f = 1910 MHz; σ = 1.57 mho/m; ε_r = 52.3; ρ = 1000

kg/m^3
Ambient Temperature 22.5 ; Liquid Temperature 21.1

DASY5 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- 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

Ch810/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
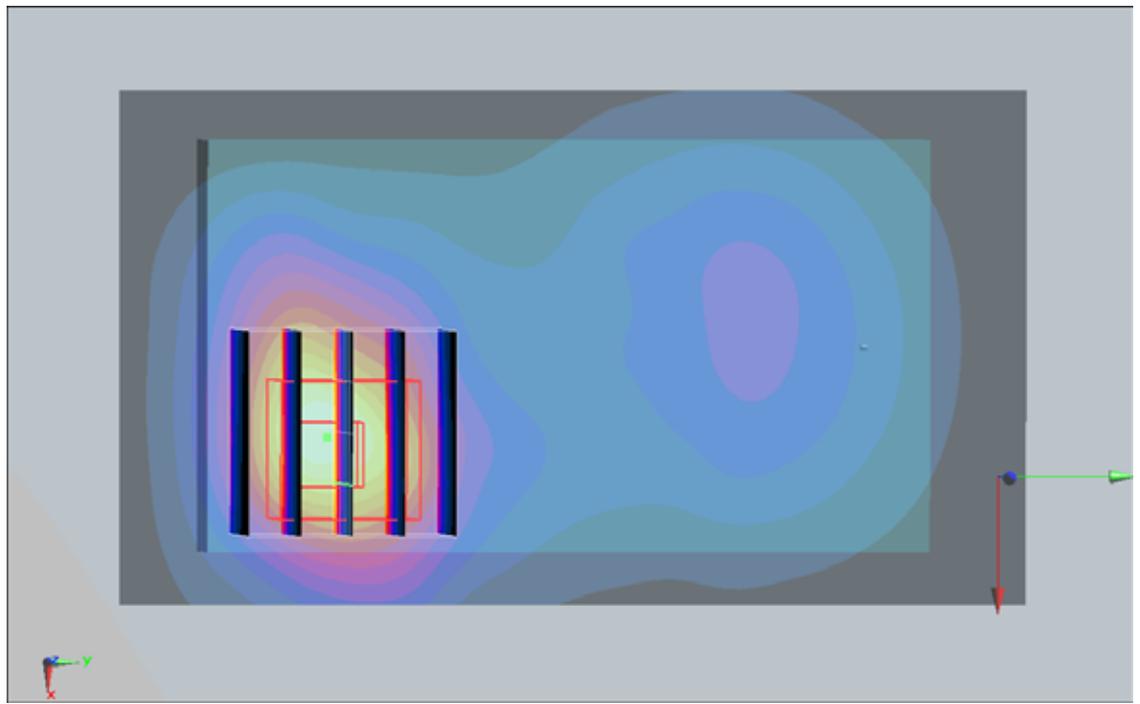Maximum value of SAR (interpolated) = 1.56 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.1 V/m; Power Drift = -0.00498 dB
Peak SAR (extrapolated) = 2.13 W/kg
SAR(1 g) = 1.41 mW/g; SAR(10 g) = 0.832 mW/g
Maximum value of SAR (measured) = 1.57 mW/g

1g/10g Averaged SAR

SAR; Zoom Scan:Value Along Z, X=1, Y=2

Markers
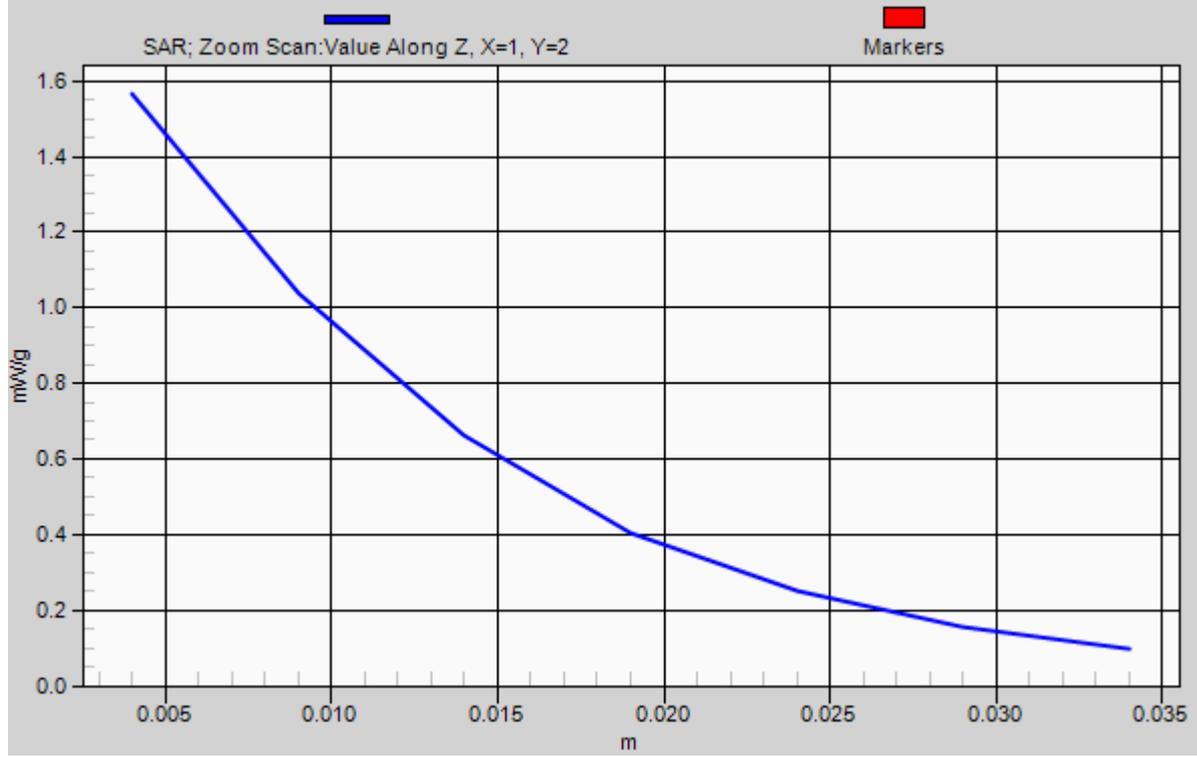
#63 GSM1900_GPRS12_Botttom_1cm_Ch661_Battery1_Earphone

DUT: 130815

Communication System: PCS; Frequency: 1880 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110421 Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Ambient Temperature 22.5 ; Liquid Temperature 21.1

DASY5 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- 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

Ch661/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
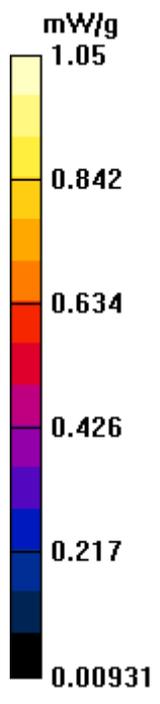Maximum value of SAR (interpolated) = 1.01 mW/g

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.7 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.925 mW/g; SAR(10 g) = 0.550 mW/g
Maximum value of SAR (measured) = 1.03 mW/g
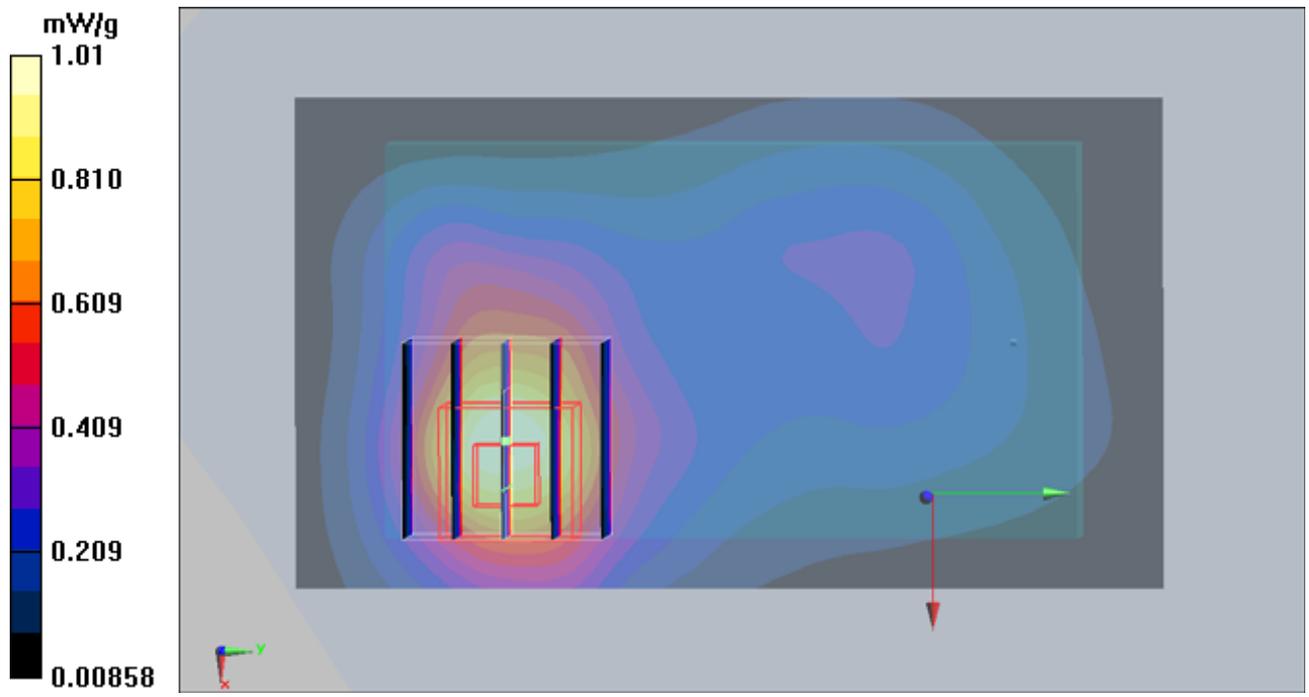
#64 GSM1900_GPRS12_Botttom_1cm_Ch512_Battery1_Earphone

DUT: 130815

Communication System: PCS; Frequency: 1850.2 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110421 Medium parameters used : f = 1850.2 MHz; σ = 1.5 mho/m; ε_r = 52.5; ρ = 1000

kg/m^3
Ambient Temperature   22.5   ; Liquid Temperature   21.1

DASY5 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- 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

Ch512/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
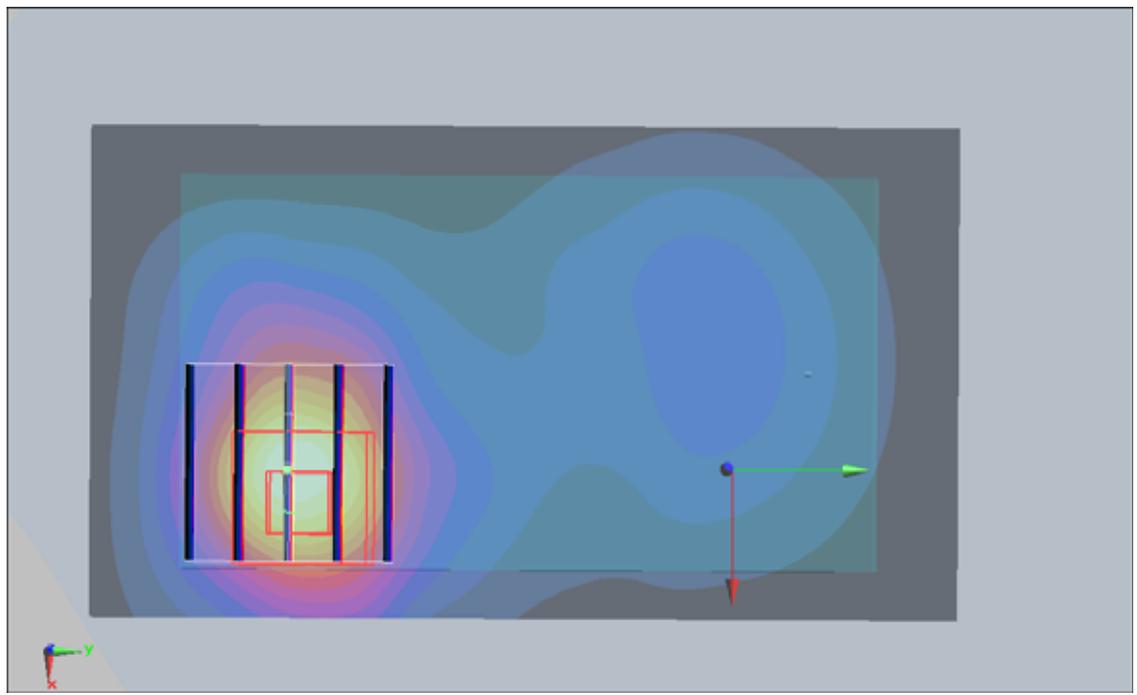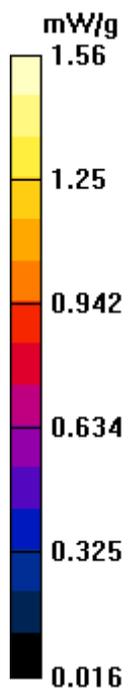Maximum value of SAR (interpolated) = 0.851 mW/g

Ch512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = -0.021 dB
Peak SAR (extrapolated) = 1.43 W/kg
SAR(1 g) = 0.869 mW/g; SAR(10 g) = 0.463 mW/g
Maximum value of SAR (measured) = 0.829 mW/g

#65 GSM1900_GPRS12_Botttom_1cm_Ch810_Battery1_Earphone

DUT: 130815

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110421 Medium parameters used: f = 1910 MHz; σ = 1.57 mho/m; ε_r = 52.3; ρ = 1000

kg/m^3
Ambient Temperature 22.5 ; Liquid Temperature 21.1

DASY5 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- 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

Ch810/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.35 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.8 V/m; Power Drift = -0.080 dB
Peak SAR (extrapolated) = 1.47 W/kg
SAR(1 g) = 1.2 mW/g; SAR(10 g) = 0.687 mW/g
Maximum value of SAR (measured) = 1.34 mW/g
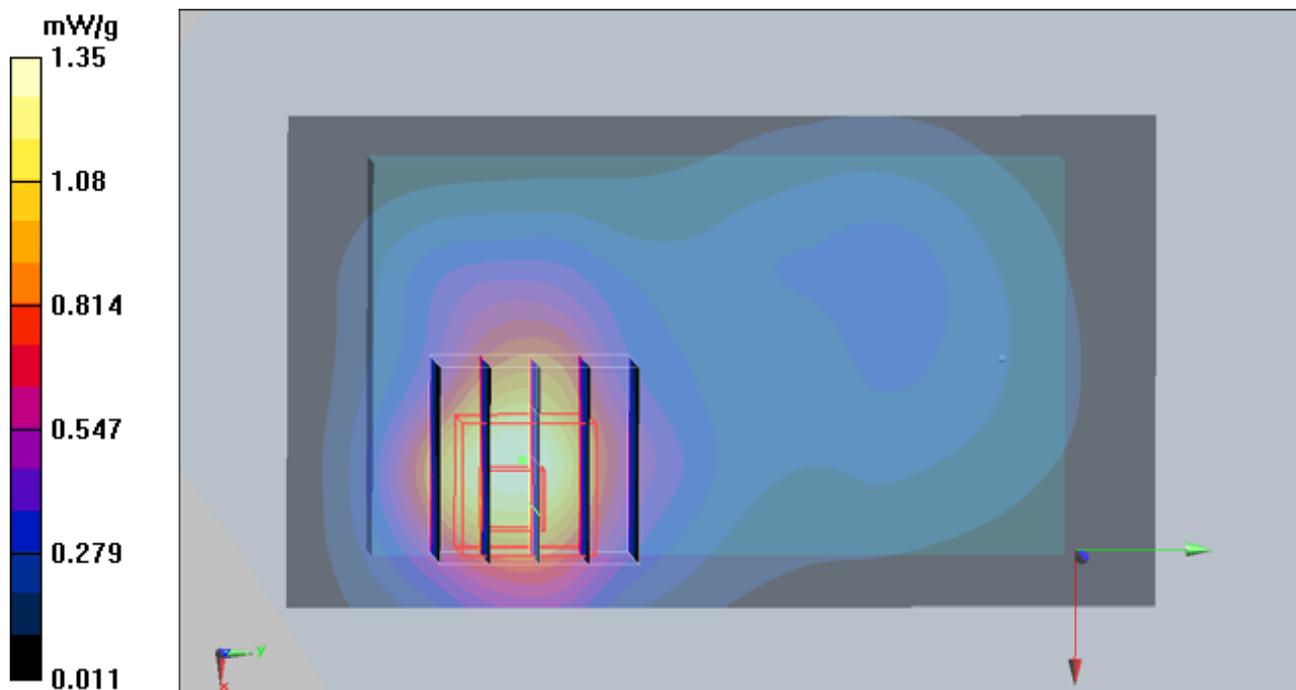
#126 GSM1900_GPRS12_Botttom_1.5cm_Ch810_Battery2_Earphone

DUT: 130815

Communication System: PCS; Frequency: 1909.8 MHz;Duty Cycle: 1:2
Medium: MSL_1900_110506 Medium parameters used: f = 1910 MHz; σ = 1.55 mho/m; ε_r = 53.4; ρ = 1000

kg/m^3
Ambient Temperature   22.7   ; Liquid Temperature   21.4

DASY5 Configuration:
- Probe: EX3DV4 - SN3697; ConvF(7.26, 7.26, 7.26); Calibrated: 2010/11/23
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch810/Area Scan (51x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.751 mW/g

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.53 V/m; Power Drift = 0.057 dB
Peak SAR (extrapolated) = 1.07 W/kg
SAR(1 g) = 0.677 mW/g; SAR(10 g) = 0.405 mW/g
Maximum value of SAR (measured) = 0.734 mW/g
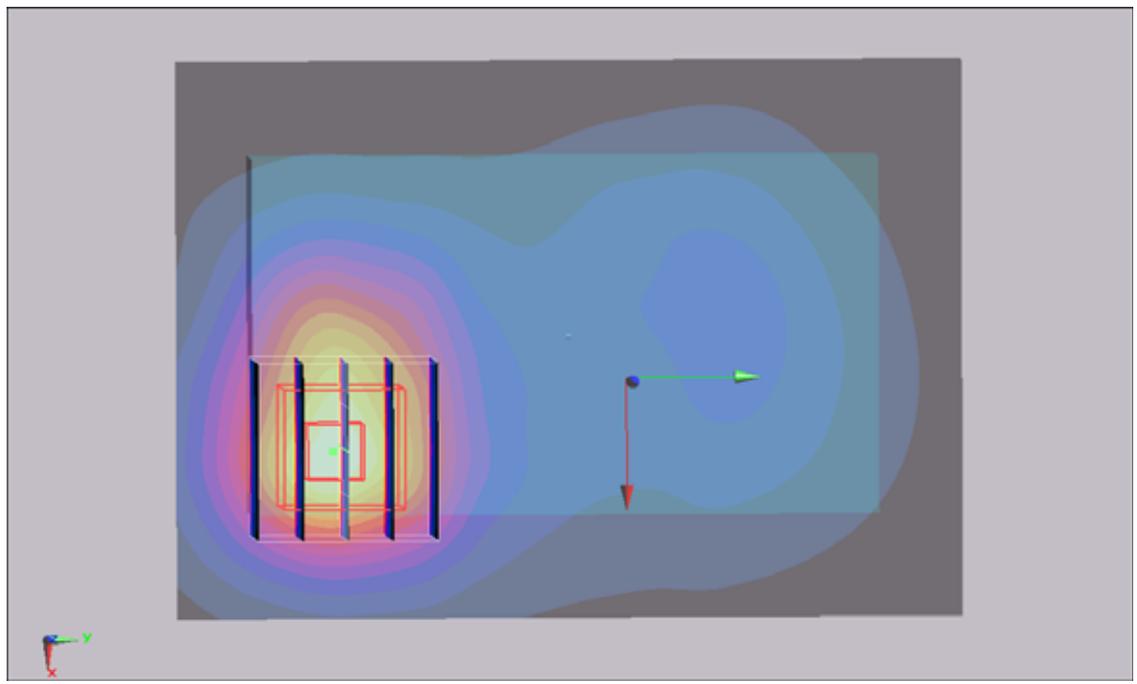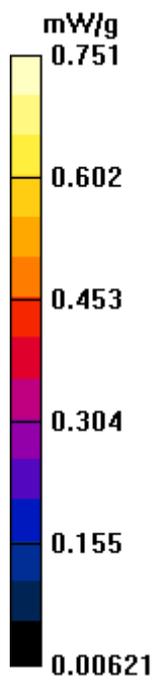
#01 WCDMA II_RMC12.2K_Face_1cm_Ch9262_Battery1

DUT: 130815

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110420 Medium parameters used : f = 1852.4 MHz; σ = 1.49 mho/m; ε_r = 52.7;

ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch9262/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
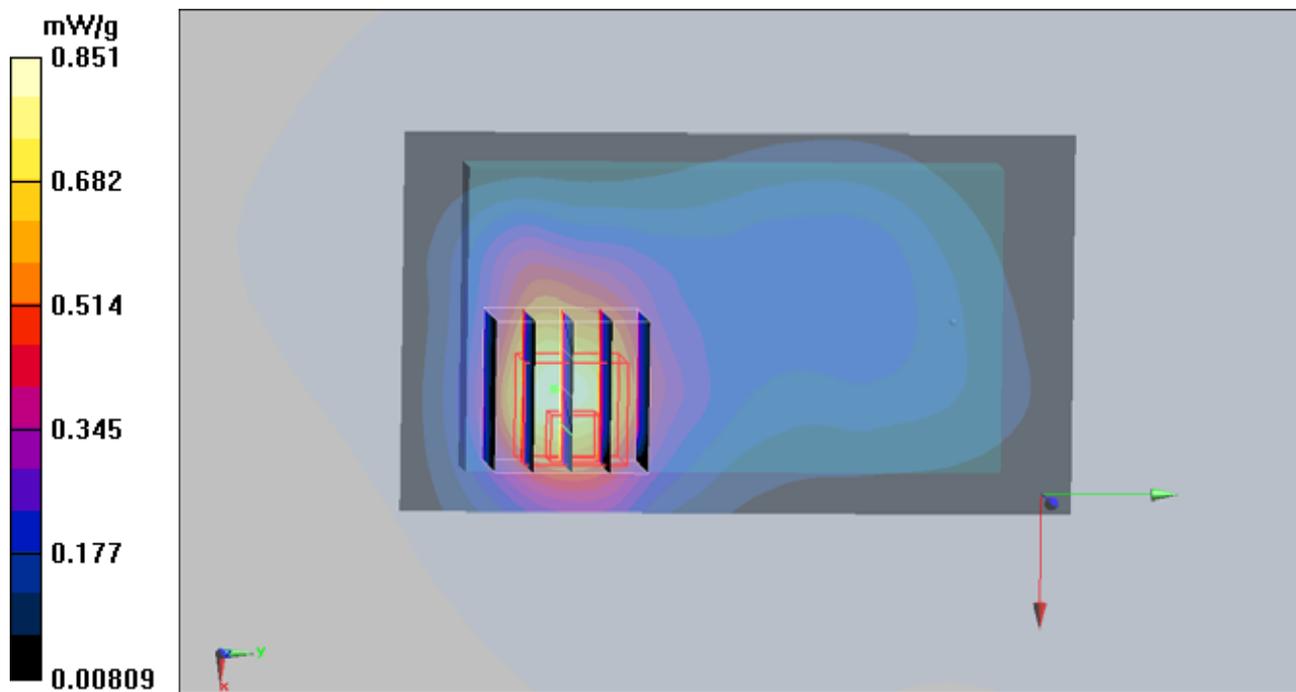Maximum value of SAR (interpolated) = 0.258 mW/g

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.6 V/m; Power Drift = -0.102 dB
Peak SAR (extrapolated) = 0.325 W/kg
SAR(1 g) = 0.223 mW/g; SAR(10 g) = 0.141 mW/g
Maximum value of SAR (measured) = 0.243 mW/g

#02 WCDMA II_RMC12.2K_Bottom_1cm_Ch9262_Battery1

DUT: 130815

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110420 Medium parameters used : f = 1852.4 MHz; σ = 1.49 mho/m; ε_r = 52.7;

ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch9262/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.10 mW/g

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.6 V/m; Power Drift = 0.053 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.912 mW/g; SAR(10 g) = 0.552 mW/g
Maximum value of SAR (measured) = 0.984 mW/g
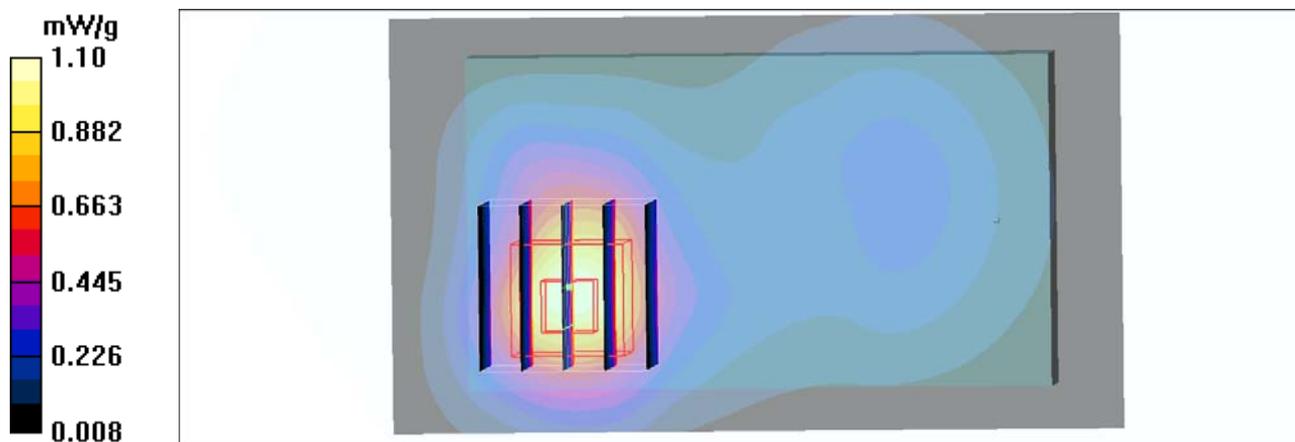
#03 WCDMA II_RMC12.2K_Left Side_1cm_Ch9262_Battery1

DUT: 130815

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110420 Medium parameters used : f = 1852.4 MHz; σ = 1.49 mho/m; ε_r = 52.7;

ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch9262/Area Scan (31x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.381 mW/g

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.0 V/m; Power Drift = 0.101 dB
Peak SAR (extrapolated) = 0.613 W/kg
SAR(1 g) = 0.405 mW/g; SAR(10 g) = 0.223 mW/g
Maximum value of SAR (measured) = 0.466 mW/g

Ch9262/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.0 V/m; Power Drift = 0.101 dB
Peak SAR (extrapolated) = 0.345 W/kg
SAR(1 g) = 0.251 mW/g; SAR(10 g) = 0.161 mW/g
Maximum value of SAR (measured) = 0.264 mW/g
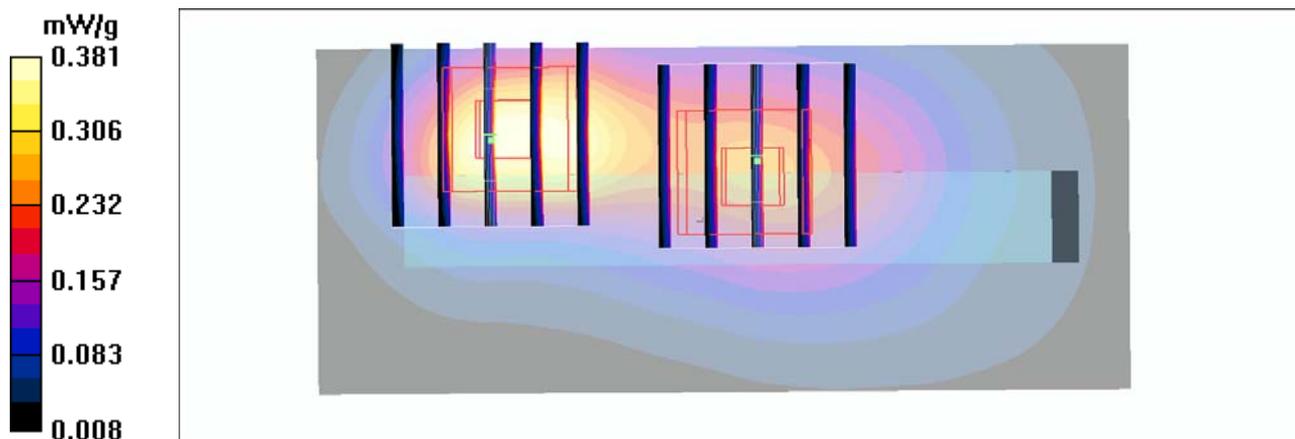
#04 WCDMA II_RMC12.2K_Right Side_1cm_Ch9262_Battery1

DUT: 130815

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110420 Medium parameters used : f = 1852.4 MHz; σ = 1.49 mho/m; ε_r = 52.7;

ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch9262/Area Scan (31x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.066 mW/g

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 6.95 V/m; Power Drift = -0.079 dB
Peak SAR (extrapolated) = 0.084 W/kg
SAR(1 g) = 0.058 mW/g; SAR(10 g) = 0.036 mW/g
Maximum value of SAR (measured) = 0.063 mW/g
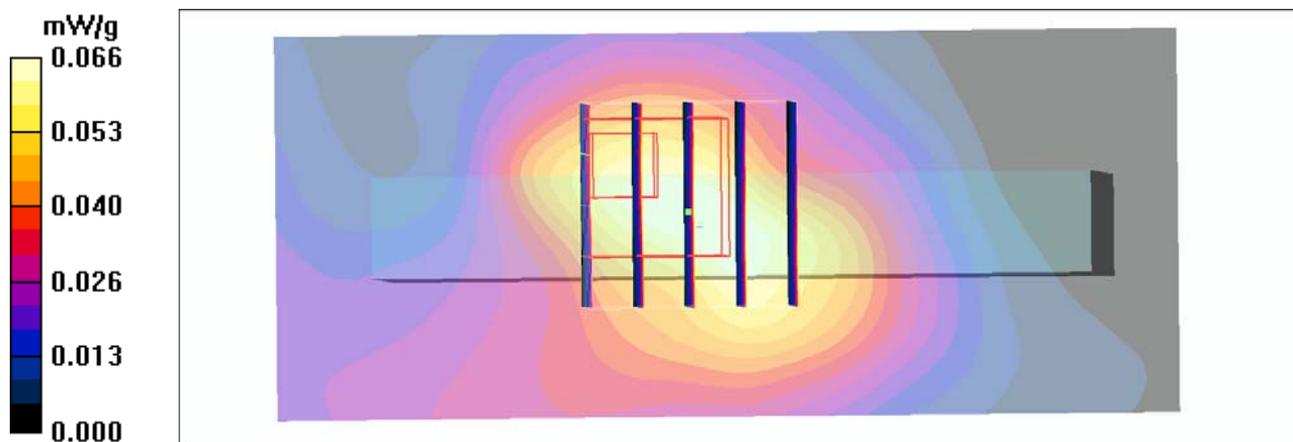
#06 WCDMA II_RMC12.2K_Down Side_1cm_Ch9262_Battery1

DUT: 130815

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110420 Medium parameters used : f = 1852.4 MHz; σ = 1.49 mho/m; ε_r = 52.7;

ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch9262/Area Scan (31x61x1): Measurement grid: dx=20mm, dy=20mm
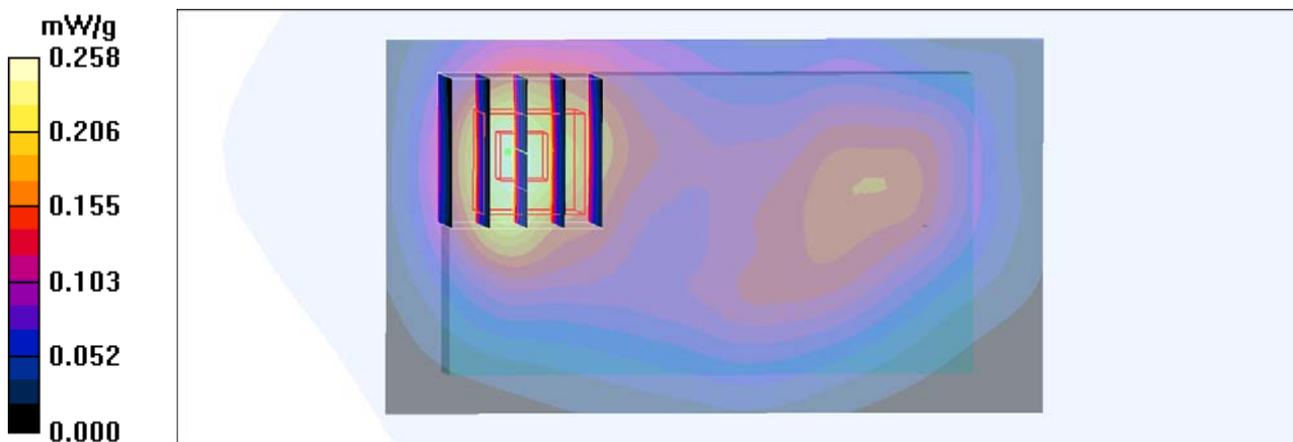Maximum value of SAR (interpolated) = 0.245 mW/g

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 14.0 V/m; Power Drift = 0.032 dB
Peak SAR (extrapolated) = 0.332 W/kg
SAR(1 g) = 0.232 mW/g; SAR(10 g) = 0.140 mW/g
Maximum value of SAR (measured) = 0.261 mW/g
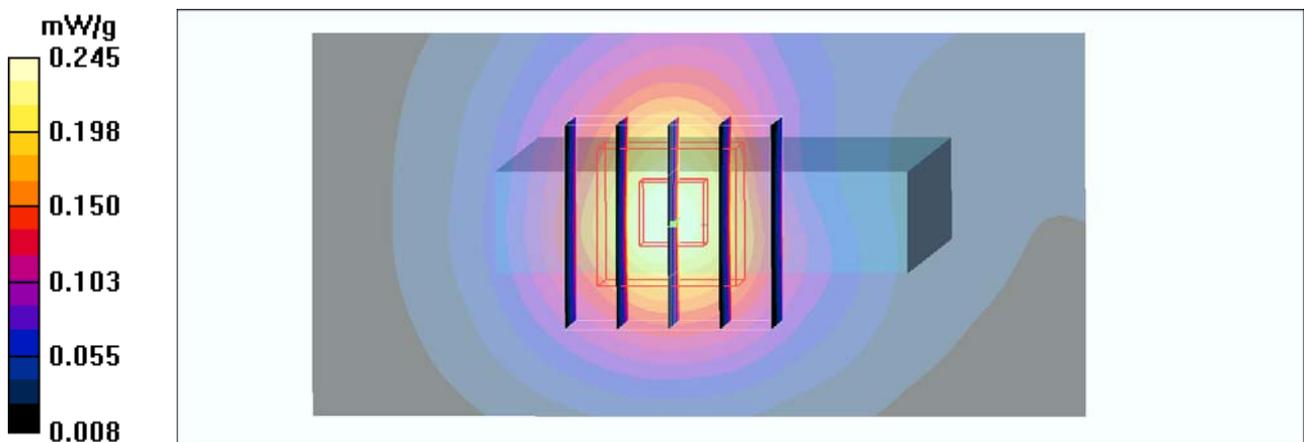
#07 WCDMA II_RMC12.2K_Bottom_1cm_Ch9400_Battery1

DUT: 130815

Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110420 Medium parameters used: f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.6; ρ

= 1000 kg/m³
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch9400/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.10 mW/g

Ch9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 12.0 V/m; Power Drift = -0.101 dB
Peak SAR (extrapolated) = 1.37 W/kg
SAR(1 g) = 0.903 mW/g; SAR(10 g) = 0.545 mW/g
Maximum value of SAR (measured) = 0.961 mW/g
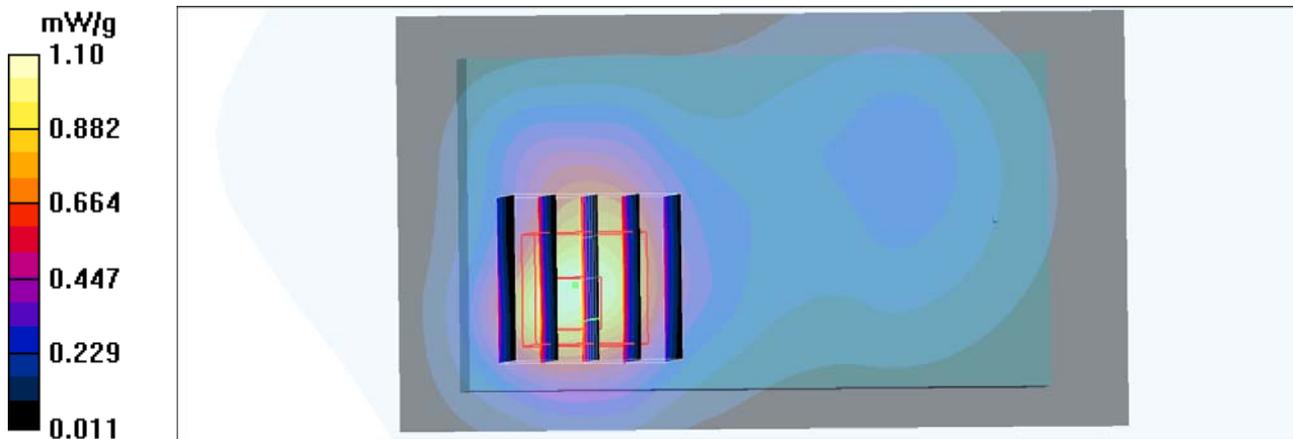
#08 WCDMA II_RMC12.2K_Bottom_1cm_Ch9538_Battery1

DUT: 130815

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110420 Medium parameters used: f = 1908 MHz; σ = 1.55 mho/m; ε_r = 52.4; ρ

= 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch9538/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.24 mW/g

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.9 V/m; Power Drift = 0.093 dB
Peak SAR (extrapolated) = 1.57 W/kg
SAR(1 g) = 1.03 mW/g; SAR(10 g) = 0.605 mW/g
Maximum value of SAR (measured) = 1.09 mW/g
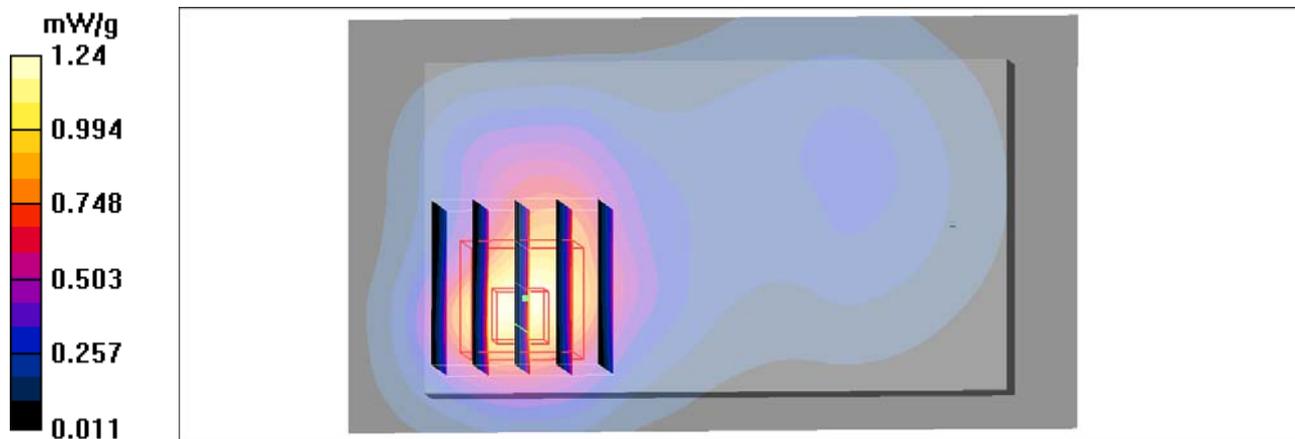
#09 WCDMA II_RMC12.2K_Bottom_1cm_Ch9538_Battery2

DUT: 130815

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110420 Medium parameters used: f = 1908 MHz; σ = 1.55 mho/m; $ε_r$ = 52.4; ρ

= 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch9538/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.46 mW/g

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.87 V/m; Power Drift = -0.031 dB
Peak SAR (extrapolated) = 1.73 W/kg
SAR(1 g) = 1.15 mW/g; SAR(10 g) = 0.679 mW/g
Maximum value of SAR (measured) = 1.21 mW/g
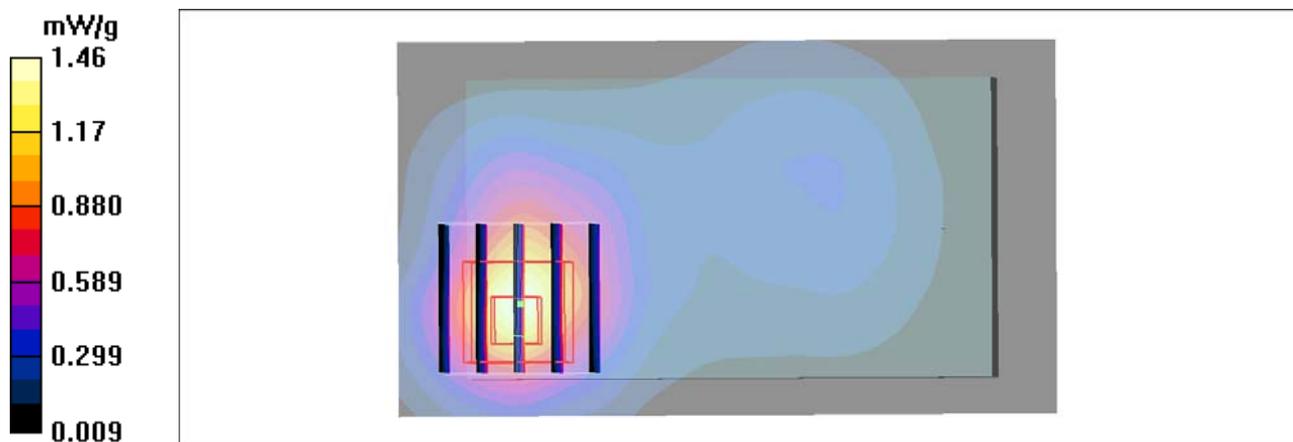
#19 WCDMA II_RMC12.2K_Bottom_1cm_Ch9262_Battery2

DUT: 130815

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110421 Medium parameters used : f = 1852.4 MHz; σ = 1.5 mho/m; ε_r = 52.5; ρ = 1000

kg/m^3
Ambient Temperature   22.2   ; Liquid Temperature   21.1

DASY5 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- 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

Ch9262/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.19 mW/g

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.8 V/m; Power Drift = -0.164 dB
Peak SAR (extrapolated) = 1.52 W/kg
SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.625 mW/g
Maximum value of SAR (measured) = 1.13 mW/g
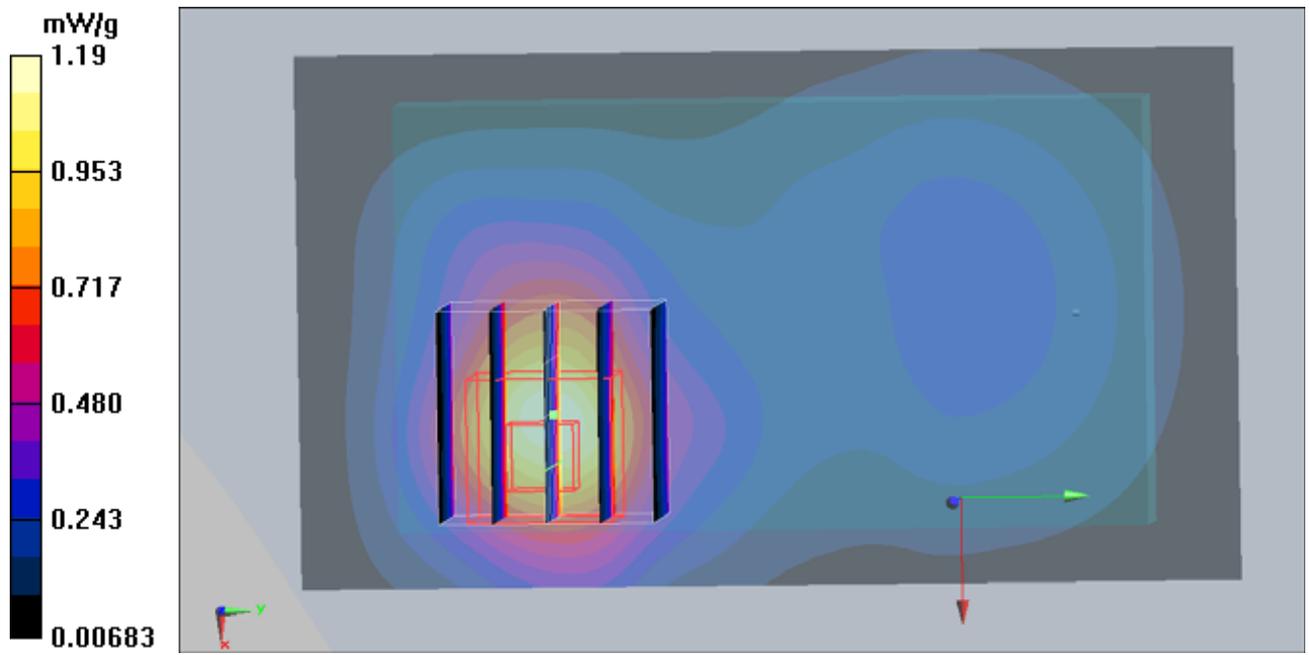
#20 WCDMA II_RMC12.2K_Bottom_1cm_Ch9400_Battery2

DUT: 130815

Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110421 Medium parameters used: f = 1880 MHz; σ = 1.54 mho/m; ε_r = 52.5; ρ = 1000 kg/m^3
Ambient Temperature 22.2   ; Liquid Temperature   21.1

DASY5 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- 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

Ch9400/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.34 mW/g

Ch9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13 V/m; Power Drift = -0.075 dB
Peak SAR (extrapolated) = 1.74 W/kg
SAR(1 g) = 1.19 mW/g; SAR(10 g) = 0.697 mW/g
Maximum value of SAR (measured) = 1.3 mW/g

#10 WCDMA II_RMC12.2K_Bottom_1cm_Ch9538_Battery2_Earphone

DUT: 130815

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110420 Medium parameters used: f = 1908 MHz; σ = 1.55 mho/m; ε_r = 52.4; ρ

= 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch9538/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.52 mW/g

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.68 V/m; Power Drift = -0.060 dB
Peak SAR (extrapolated) = 1.88 W/kg
SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.717 mW/g
Maximum value of SAR (measured) = 1.28 mW/g

#10 WCDMA II_RMC12.2K_Bottom_1cm_Ch9538_Battery2_Earphone_2D

DUT: 130815

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110420 Medium parameters used: f = 1908 MHz; σ = 1.55 mho/m; ε_r = 52.4; ρ = 1000

kg/m^3
Ambient Temperature 22.2 ; Liquid Temperature 21.2

DASY5 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: SAM-Right; Type: QD 000 P40 C; Serial: TP-1383
- Measurement SW: DASY4, V4.7 Build 80; SEMCAD X Version 13.4 Build 125

Ch9538/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.52 mW/g

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.68 V/m; Power Drift = -0.060 dB
Peak SAR (extrapolated) = 1.88 W/kg
SAR(1 g) = 1.21 mW/g; SAR(10 g) = 0.717 mW/g
Maximum value of SAR (measured) = 1.28 mW/g

1g/10g Averaged SAR
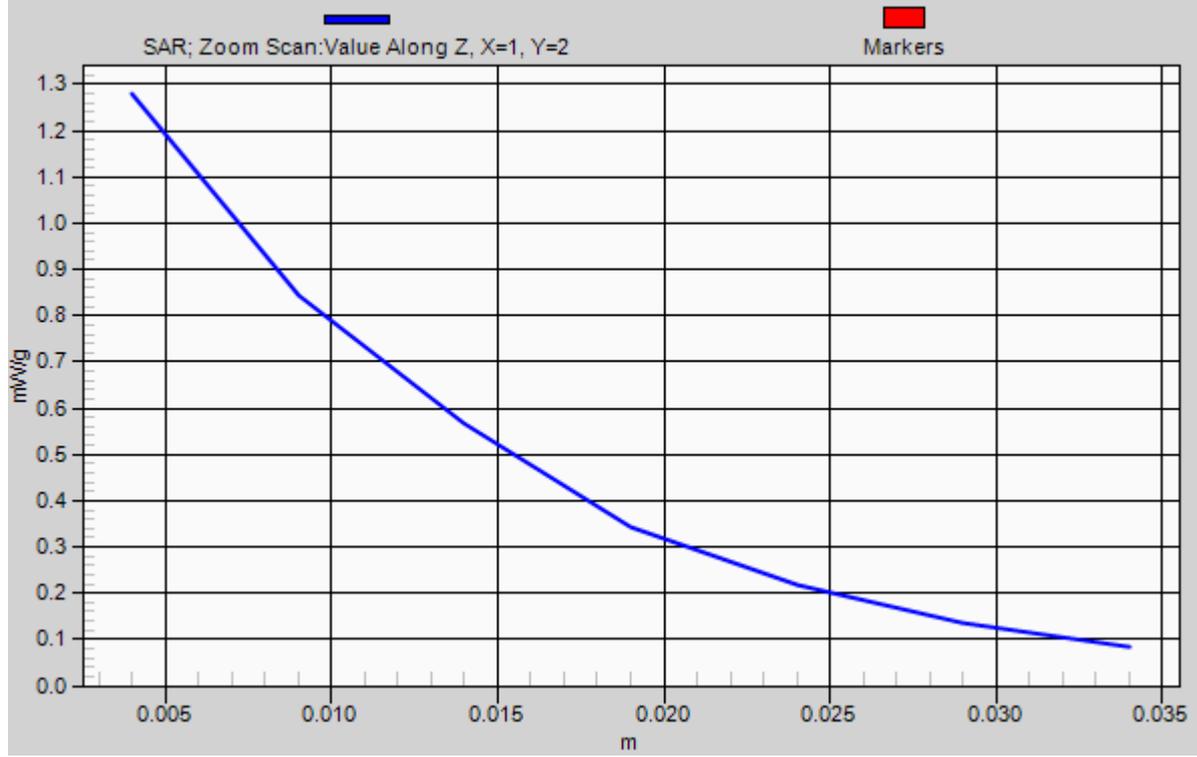
#11 WCDMA II_RMC12.2K_Bottom_1cm_Ch9400_Battery2_Earphone

DUT: 130815

Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110420 Medium parameters used: f = 1880 MHz; σ = 1.52 mho/m; ε_r = 52.6; ρ

= 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch9400/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.34 mW/g

Ch9400/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.04 V/m; Power Drift = -0.055 dB
Peak SAR (extrapolated) = 1.54 W/kg
SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.634 mW/g
Maximum value of SAR (measured) = 1.11 mW/g
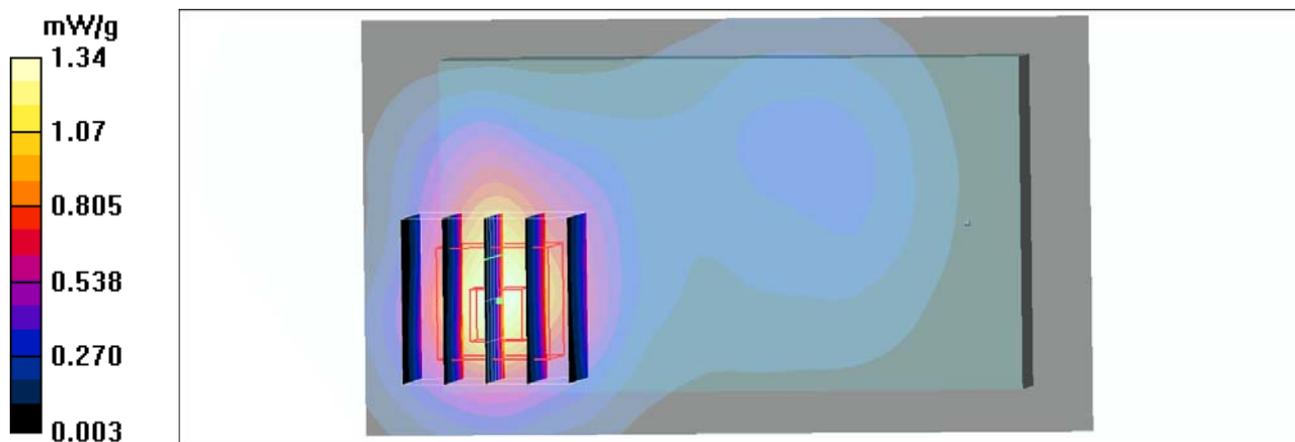
#12 WCDMA II_RMC12.2K_Bottom_1cm_Ch9262_Battery2_Earphone

DUT: 130815

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110420 Medium parameters used : f = 1852.4 MHz; σ = 1.49 mho/m; ε_r = 52.7;

ρ = 1000 kg/m^3
Ambient Temperature：22.2 ℃；Liquid Temperature：21.2 ℃

DASY4 Configuration:
- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- 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

Ch9262/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 1.22 mW/g

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.35 V/m; Power Drift = 0.064 dB
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.949 mW/g; SAR(10 g) = 0.570 mW/g
Maximum value of SAR (measured) = 1.06 mW/g
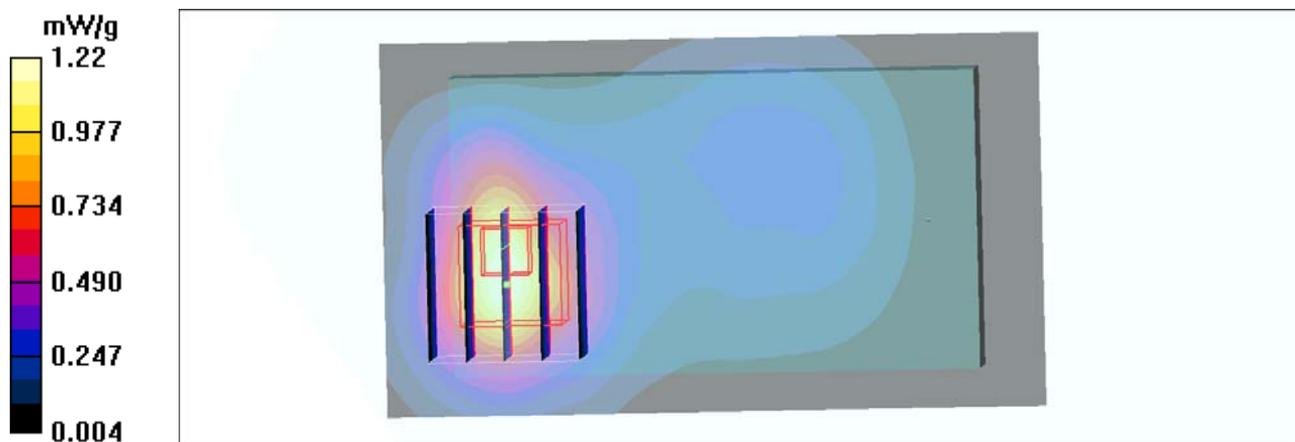
#129 WCDMA II_RMC 12.2K_Botttom_1.5cm_Ch9538_Battery1_Earphone

DUT: 130815

Communication System: WCDMA; Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110506 Medium parameters used: f = 1908 MHz; σ = 1.55 mho/m; ε_r = 53.5; ρ = 1000

kg/m^3
Ambient Temperature 22.6 ; Liquid Temperature 21.4

DASY5 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(7.13, 7.13, 7.13); Calibrated: 2010/9/20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch9538/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
Maximum value of SAR (interpolated) = 0.946 mW/g

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.46 V/m; Power Drift = -0.015 dB
Peak SAR (extrapolated) = 1.28 W/kg
SAR(1 g) = 0.801 mW/g; SAR(10 g) = 0.478 mW/g
Maximum value of SAR (measured) = 0.860 mW/g
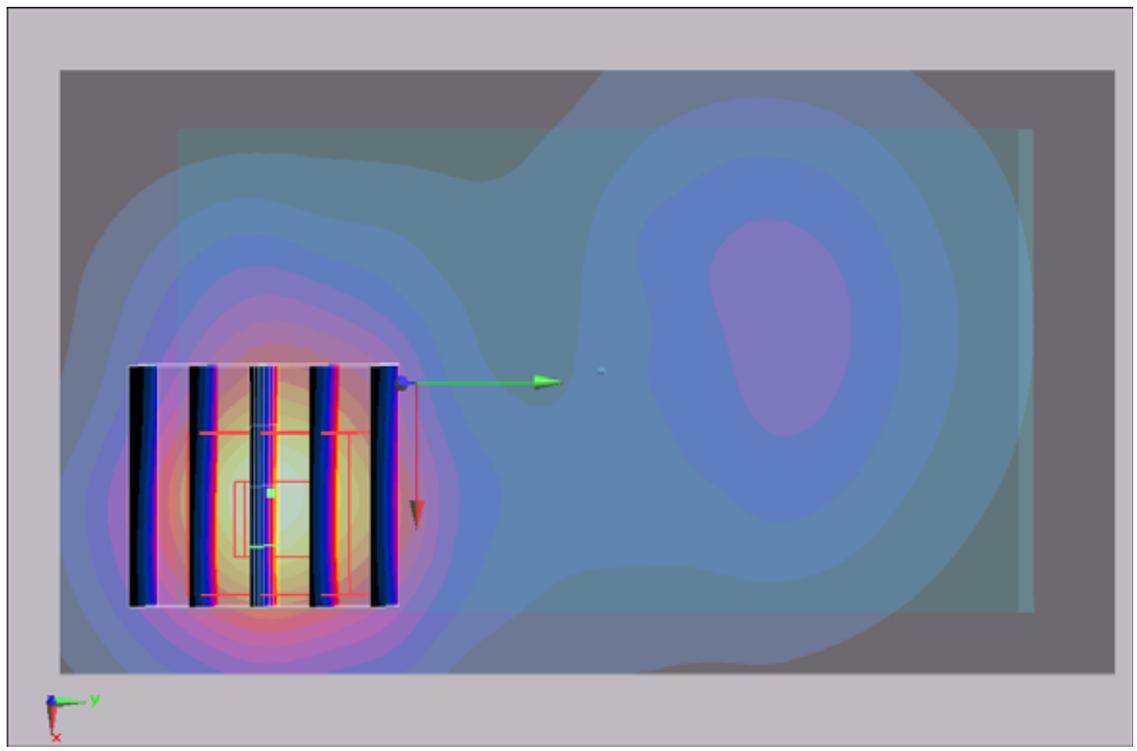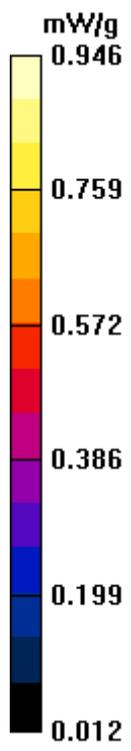
#130 WCDMA II_RMC 12.2K_Botttom_1.5cm_Ch9262_Battery1_Earphone

DUT: 130815

Communication System: WCDMA; Frequency: 1852.4 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110506 Medium parameters used : f = 1852.4 MHz; σ = 1.48 mho/m; ε$_r$ = 53.6; ρ = 1000

kg/m^3
Ambient Temperature 22.7 ; Liquid Temperature 21.4

DASY5 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(7.13, 7.13, 7.13); Calibrated: 2010/9/20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch9262/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
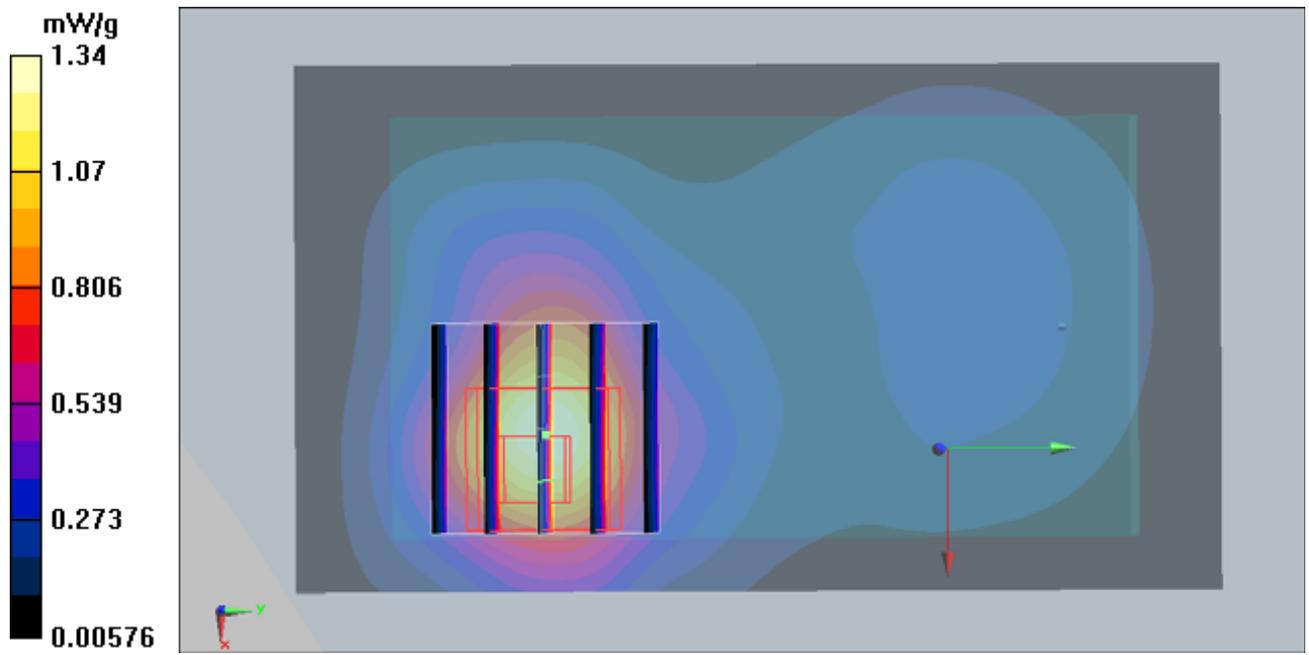Maximum value of SAR (interpolated) = 0.751 mW/g

Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.1 V/m; Power Drift = 0.024 dB
Peak SAR (extrapolated) = 0.971 W/kg
SAR(1 g) = 0.609 mW/g; SAR(10 g) = 0.375 mW/g
Maximum value of SAR (measured) = 0.658 mW/g
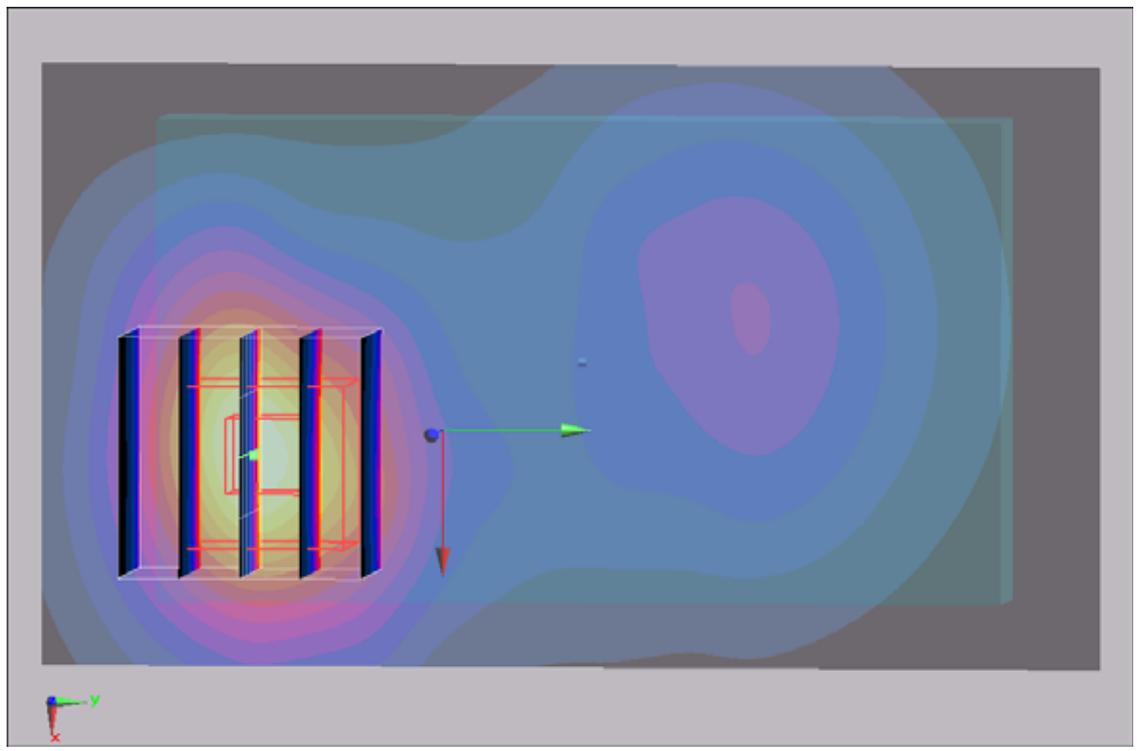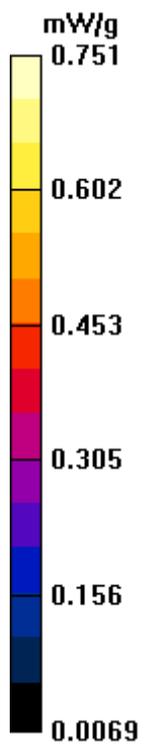
#131 WCDMA II_RMC 12.2K_Botttom_1.5cm_Ch9400_Battery1_Earphone

DUT: 130815

Communication System: WCDMA; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL_1900_110506 Medium parameters used: f = 1880 MHz; σ = 1.51 mho/m; ε_r = 53.5; ρ = 1000

kg/m^3
Ambient Temperature 22.6 ; Liquid Temperature 21.4

DASY5 Configuration:
- Probe: EX3DV4 - SN3731; ConvF(7.13, 7.13, 7.13); Calibrated: 2010/9/20
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn577; Calibrated: 2011/1/13
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch9400/Area Scan (41x71x1): Measurement grid: dx=20mm, dy=20mm
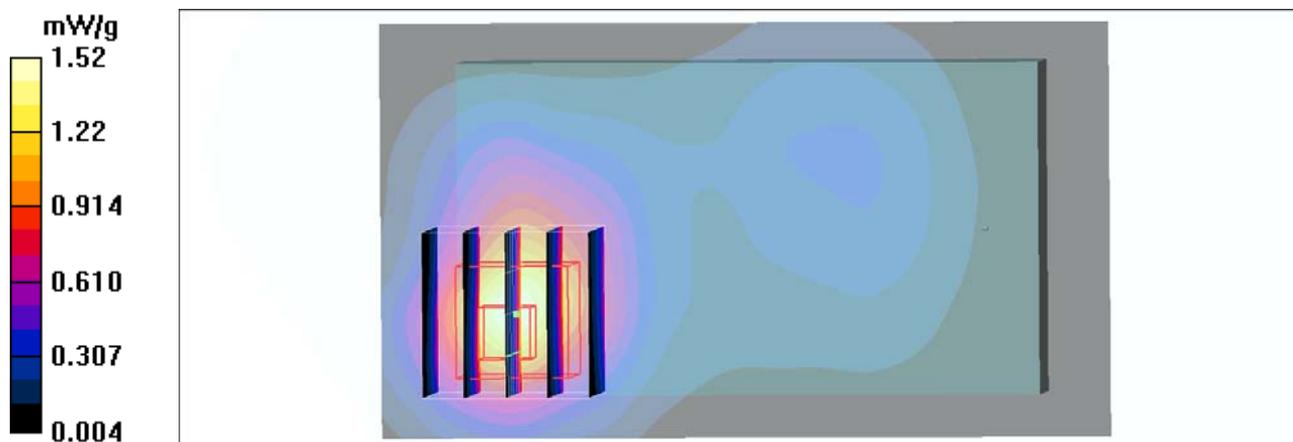Maximum value of SAR (interpolated) = 0.775 mW/g

**Ch9400/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.3 V/m; Power Drift = 0.095 dB
Peak SAR (extrapolated) = 1 W/kg
SAR(1 g) = 0.632 mW/g; SAR(10 g) = 0.388 mW/g
Maximum value of SAR (measured) = 0.682 mW/g
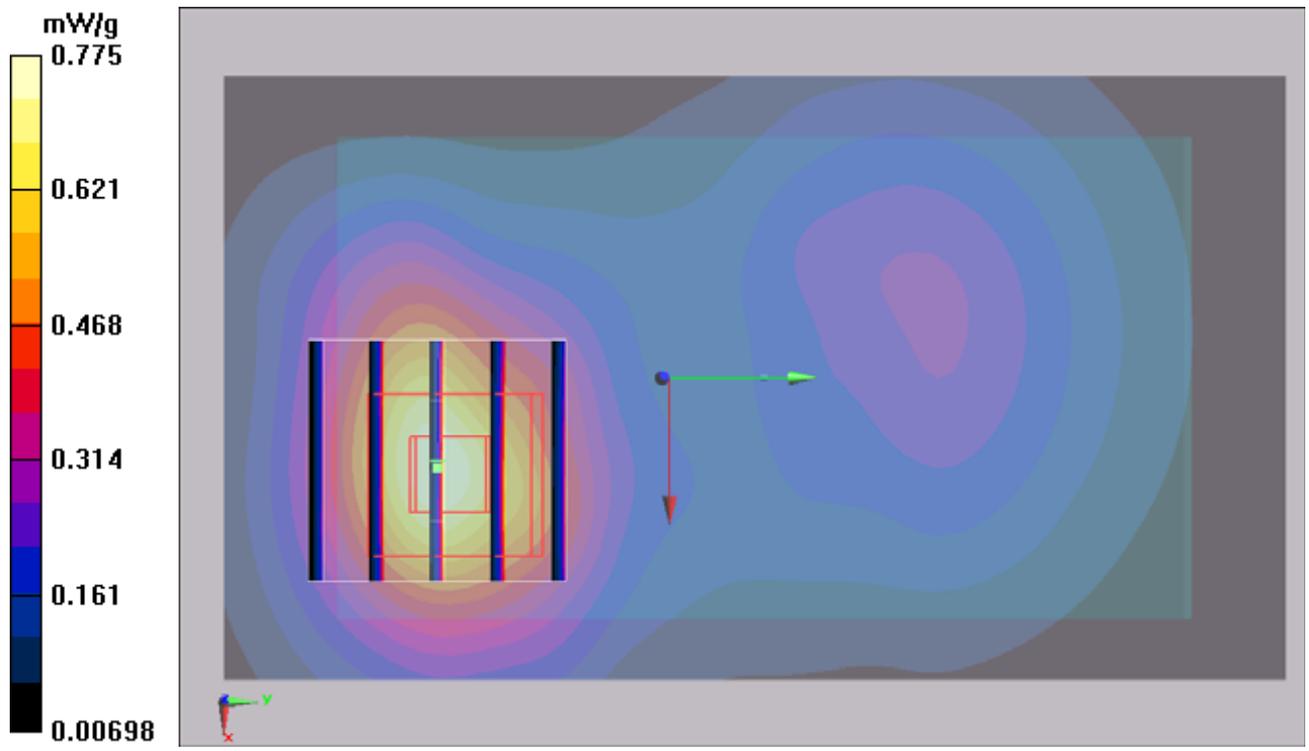
Appendix C.   DASY Calibration Certificate

The DASY calibration certificates are shown as follows.

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

ilac-MRA

SWISS CALIBRATION

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

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Client   **ATL (Auden)**   Certificate No: **D835V2-4d082_Jul10**

CALIBRATION CERTIFICATE

Object	D835V2 - SN: 4d082
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	July 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 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:	Dimce Iliev	Laboratory Technician	*D. Xiev*
Approved by:	Katja Pokovic	Technical Manager	*(signature)*

Issued: July 20, 2010

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

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

ilac-MRA

SWISS CALIBRATION

S   Schweizerischer Kalibrierdienst
C   Service suisse d'étalonnage
C   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.

Calibration Certificate of DASY

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	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.0 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature during test	(23.1 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.40 mW / g
SAR normalized	normalized to 1W	9.60 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.65 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.56 mW / g
SAR normalized	normalized to 1W	6.24 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.26 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	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.0 ± 6 %	1.01 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	2.58 mW / g
SAR normalized	normalized to 1W	10.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**10.0 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.69 mW / g
SAR normalized	normalized to 1W	6.76 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**6.60 mW / g ± 16.5 % (k=2)**

SPORTON INTERNATIONAL INC.

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.7 Ω - 3.2 jΩ
Return Loss	- 29.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.3 Ω - 4.6 jΩ
Return Loss	- 26.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.389ns

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	October 17, 2008

DASY5 Validation Report for Head TSL

Date/Time: 20.07.2010 15:48:57

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: HSL900
Medium parameters used: f = 835 MHz; σ = 0.9 mho/m; ε_r = 42.4; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.03, 6.03, 6.03); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; 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)

Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement
grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 57.1 V/m; Power Drift = 0.020 dB
Peak SAR (extrapolated) = 3.63 W/kg
SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.56 mW/g
Maximum value of SAR (measured) = 2.8 mW/g

0 dB = 2.8mW/g

Certificate No: D835V2-4d082_Jul10   Page 6 of 9

Impedance Measurement Plot for Head TSL

SPORTON INTERNATIONAL INC.
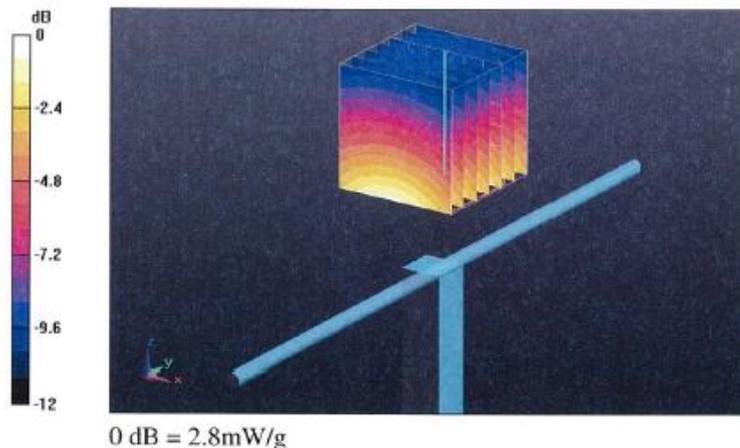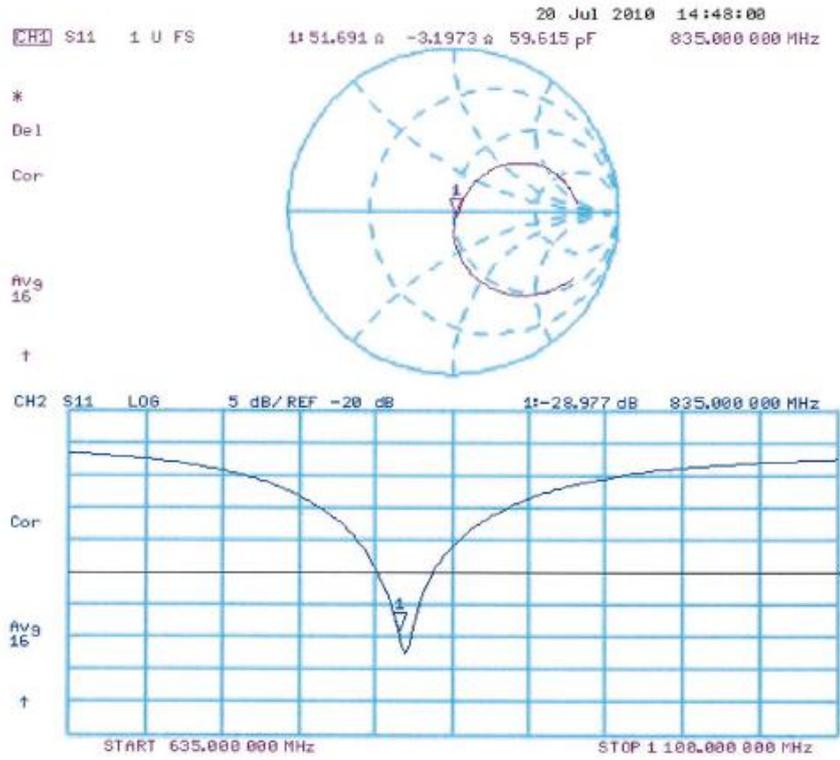
DASY5 Validation Report for Body

Date/Time: 20.07.2010 12:03:13

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: MSL900
Medium parameters used: f = 835 MHz; σ = 1.01 mho/m; ε_r = 55; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.86, 5.86, 5.86); Calibrated: 30.04.2010

- Sensor-Surface: 3mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn601; Calibrated: 10.06.2010

- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; 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)

Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement
grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.1 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 3.81 W/kg
SAR(1 g) = 2.58 mW/g; SAR(10 g) = 1.69 mW/g
Maximum value of SAR (measured) = 2.98 mW/g
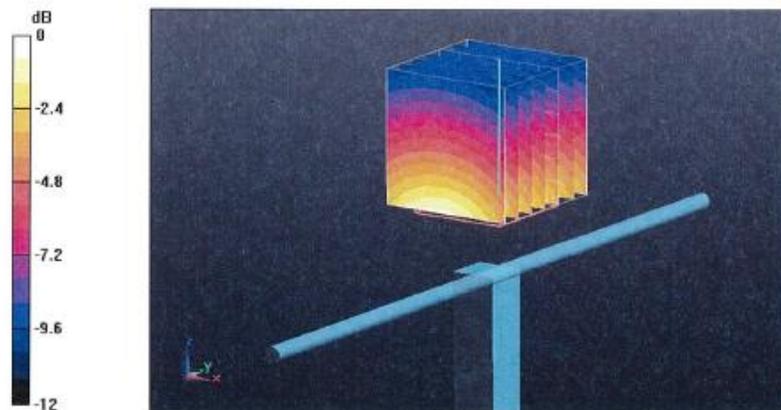
0 dB = 2.98mW/g

Impedance Measurement Plot for Body TSL
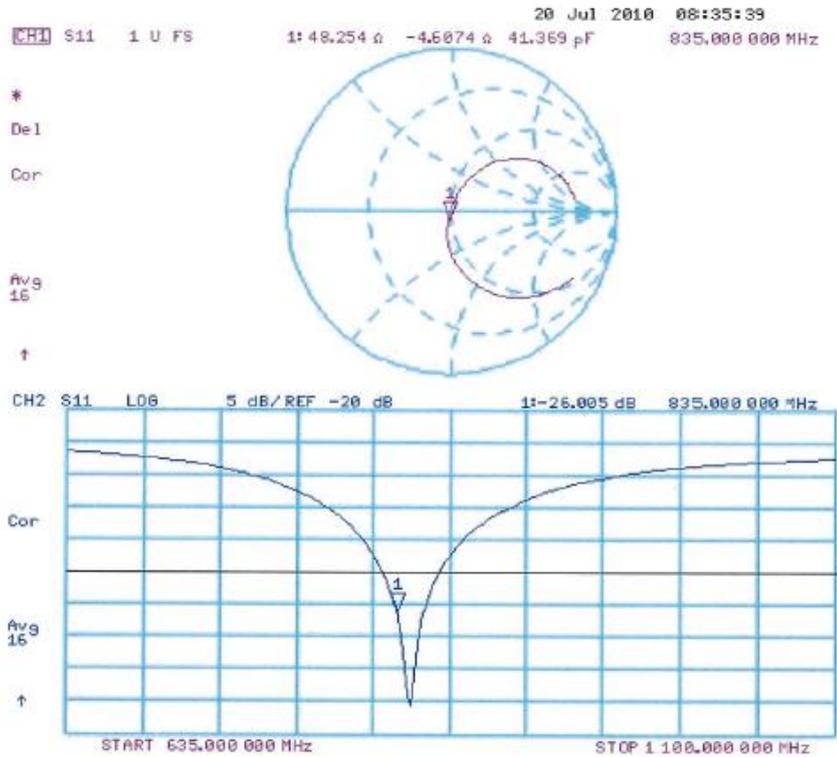
20 Jul 2010 08:35:39

CH1 S11 1 U FS 1: 48.254 Ω -4.6074 Ω 41.369 pF 835.000 000 MHz

CH2 S11 LOG 5 dB/REF -20 dB 1:-26.005 dB 835.000 000 MHz

START 635.000 000 MHz STOP 1 100.000 000 MHz

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

ilac-MRA

SWISS CALIBRATION

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: **D1900V2-5d018_Jun10**

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d018
Calibration procedure(s)	QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date:	June 15, 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 anc 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:	Dimce Iliev	Laboratory Technician	*D. Iliev*
Approved by:	Katja Pokovic	Technical Manager	*K. Pokovic*

Issued: June 17, 2010

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

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

ilac-MRA

SWISS CALIBRATION

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
C 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.

Certificate No: D1900V2-5d018_Jun10   Page 2 of 9

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
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.6 ± 6 %	1.44 mho/m ± 6 %
Head TSL temperature during test	(22.5 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.0 mW / g
SAR normalized	normalized to 1W	40.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**39.2 mW /g ± 17.0 % (k=2)**

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.22 mW / g
SAR normalized	normalized to 1W	20.9 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**20.7 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	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.4 ± 6 %	1.54 mho/m ± 6 %
Body TSL temperature during test	(21.7 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.3 mW / g
SAR normalized	normalized to 1W	41.2 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**40.9 mW / g ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.52 mW / g
SAR normalized	normalized to 1W	22.1 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**22.0 mW / g ± 16.5 % (k=2)**

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.1 Ω + 2.6 jΩ
Return Loss	- 29.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.4 Ω + 3.2 jΩ
Return Loss	- 27.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.194 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	June 04, 2002

DASY5 Validation Report for Head TSL

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d018

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: HSL U11 BB
Medium parameters used: f = 1900 MHz; σ = 1.44 mho/m; ε_r = 39.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); 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)

Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement
grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.7 V/m; Power Drift = 0.022 dB
Peak SAR (extrapolated) = 18.4 W/kg
SAR(1 g) = 10 mW/g; SAR(10 g) = 5.22 mW/g
Maximum value of SAR (measured) = 12.6 mW/g
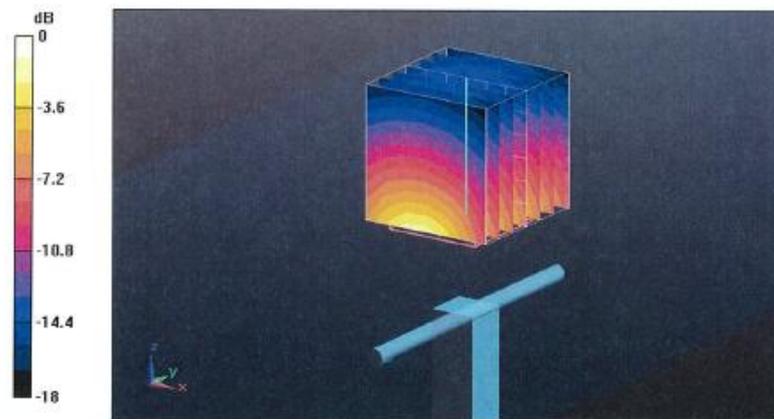
0 dB = 12.6mW/g

Impedance Measurement Plot for Head TSL
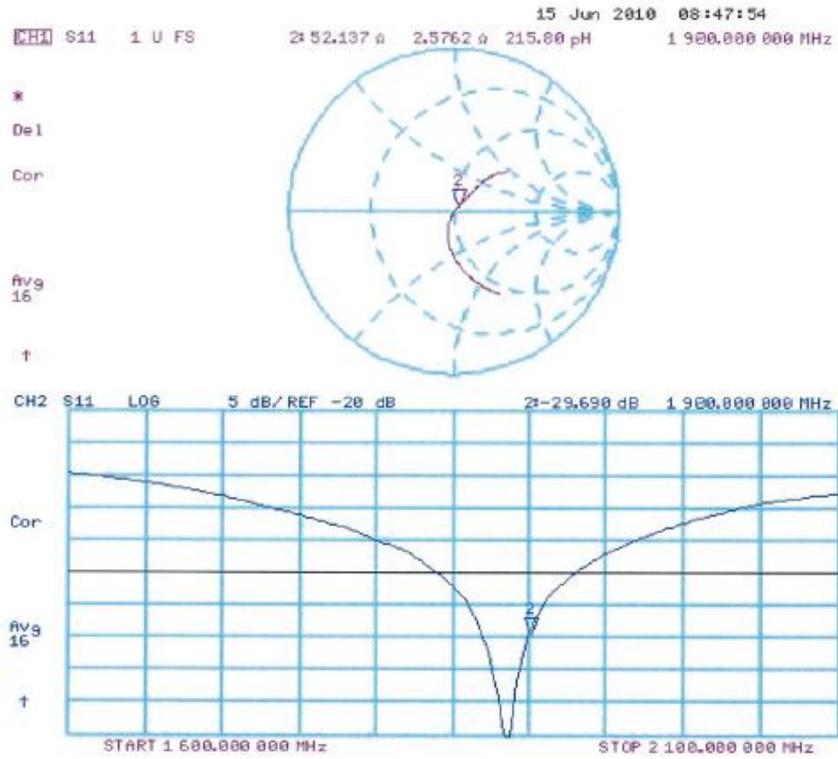
DASY5 Validation Report for Body

Date/Time: 15.06.2010 14:14:27

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d018

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: MSL U11 BB
Medium parameters used: f = 1900 MHz; σ = 1.54 mho/m; ε_r = 53.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); 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)

Pin250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement
grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.1 V/m; Power Drift = 0.055 dB
Peak SAR (extrapolated) = 17.3 W/kg
SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.52 mW/g
Maximum value of SAR (measured) = 12.8 mW/g

0 dB = 12.8mW/g
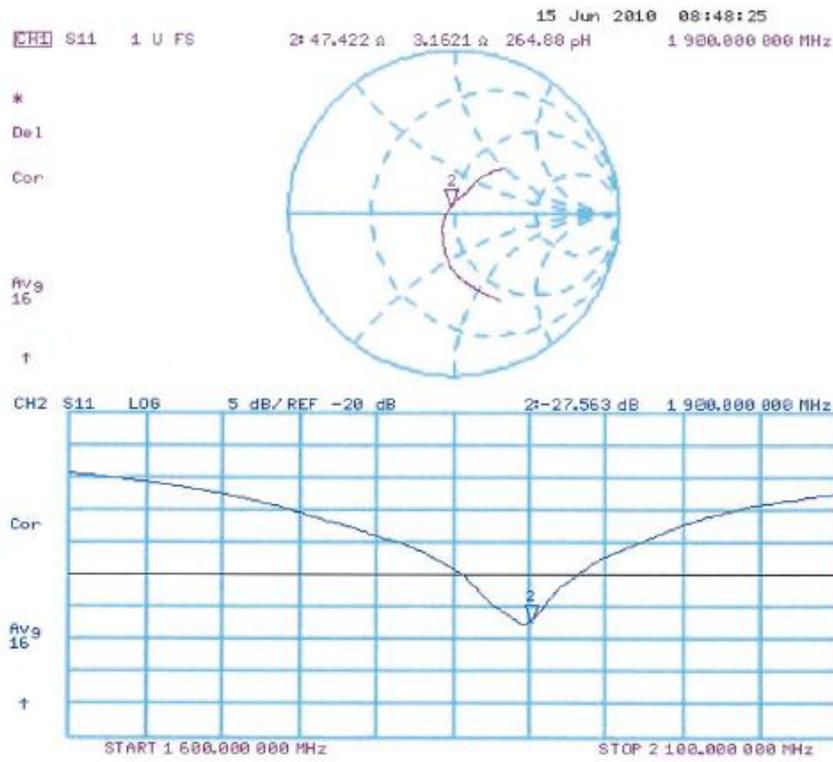
SPORTON INTERNATIONAL INC.

Impedance Measurement Plot for Body TSL

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

ilac-MRA

SWISS CALIBRATION

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

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

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 $(22 \pm 3)°C$ 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

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

Certificate No: DAE3-577_Jan11   Page 1 of 5

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

ilac-MRA

SWISS CALIBRATION

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

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.

SPORTON INTERNATIONAL INC.

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

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

ilac-MRA

SWISS CALIBRATION

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	**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

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

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

ilac-MRA

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
C 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
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 °

SPORTON INTERNATIONAL INC.

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

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

ilac-MRA

SWISS CALIBRATION

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
   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   **Sporton (Auden)**

Certificate No: **ET3-1788_Sep10**

CALIBRATION CERTIFICATE

Object	ET3DV6 - SN:1788
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:	September 21, 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: September 22, 2010

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

Calibration Laboratory of

Schmid & Partner
  Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland

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

Accredited by the Swiss Accreditation Service (SAS)

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003

b) IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

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

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

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

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

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

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

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

Probe ET3DV6

SN:1788

Manufactured:	May 28, 2003
Last calibrated:	September 23, 2009
Recalibrated:	September 21, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1788

September 21, 2010

DASY/EASY - Parameters of Probe: ET3DV6 SN:1788

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm (μV/(V/m)^2)^A	1.76	1.69	1.76	$\pm$ 10.1%
DCP (mV)^B	91.6	91.0	95.1	

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	$\pm$ 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.

Certificate No: ET3-1788_Sep10   Page 4 of 11

ET3DV6 SN:1788   September 21, 2010

DASY/EASY - Parameters of Probe: ET3DV6 SN:1788

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%	6.23	6.23	6.23	0.41	2.32 ± 11.0%
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	6.11	6.11	6.11	0.29	2.85 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	5.29	5.29	5.29	0.51	2.51 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	5.03	5.03	5.03	0.66	2.25 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.35	4.35	4.35	0.99	1.69 ± 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.

SPORTON INTERNATIONAL INC.

September 21, 2010

DASY/EASY - Parameters of Probe: ET3DV6 SN:1788

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%	5.99	5.99	5.99	0.35	2.62 ± 11.0%
900	± 50 / ± 100	55.0 ± 5%	1.05 ± 5%	6.07	6.07	6.07	0.32	2.87 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	4.67	4.67	4.67	0.61	3.09 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.39	4.39	4.39	0.83	2.56 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.04	4.04	4.04	0.99	1.40 ± 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.

SPORTON INTERNATIONAL INC.

ET3DV6 SN:1788   September 21, 2010

Frequency Response of E-Field
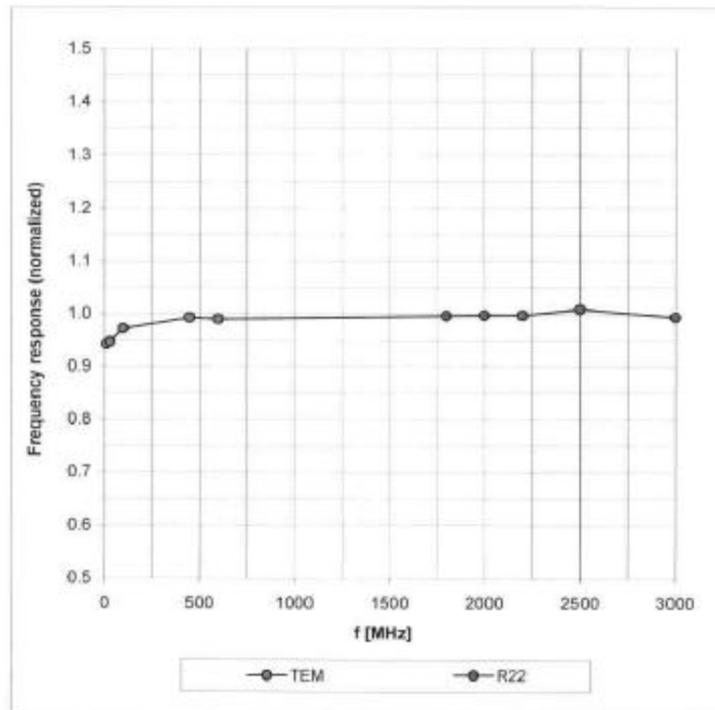
(TEM-Cell:ifi110 EXX, Waveguide: R22)

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

SPORTON INTERNATIONAL INC.

Receiving Pattern (φ), ϑ = 0°

f = 600 MHz, TEM ifi110EXX

f = 1800 MHz, WG R22

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

SPORTON INTERNATIONAL INC.

Dynamic Range f(SAR$_{head}$)
(Waveguide R22, f = 1800 MHz)

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

SPORTON INTERNATIONAL INC.
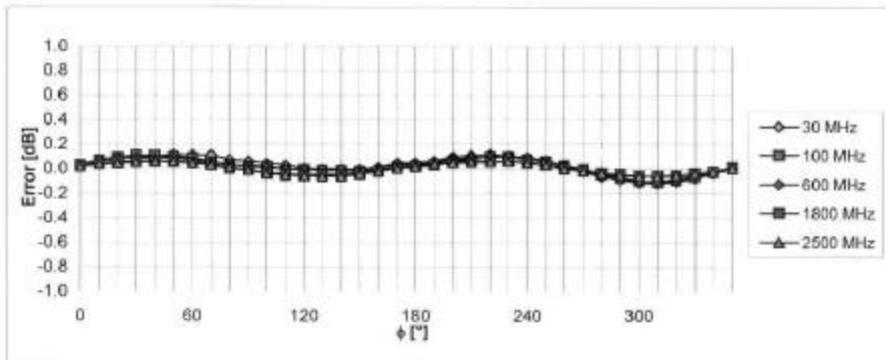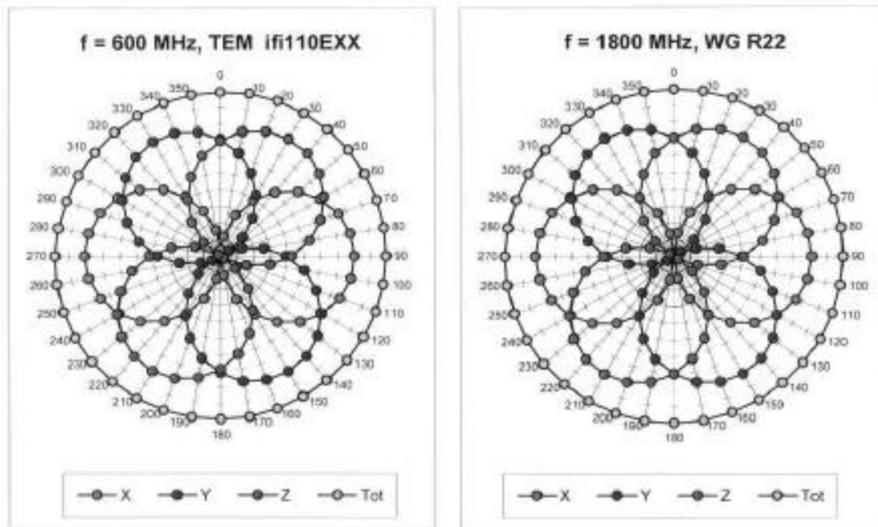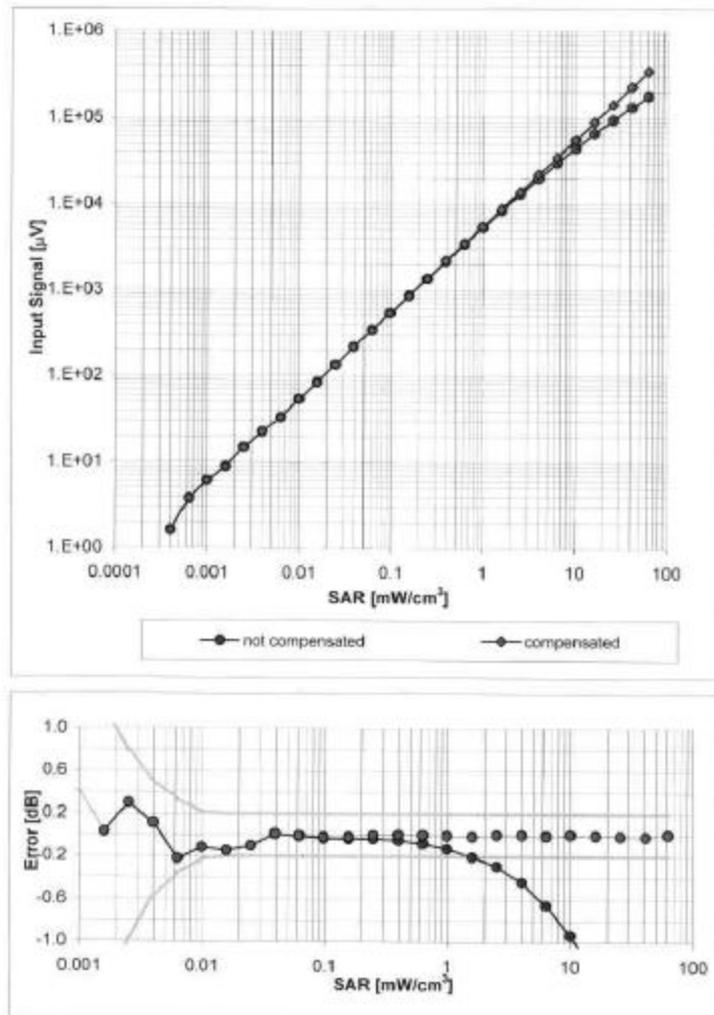
ET3DV6 SN:1788   September 21, 2010

Conversion Factor Assessment
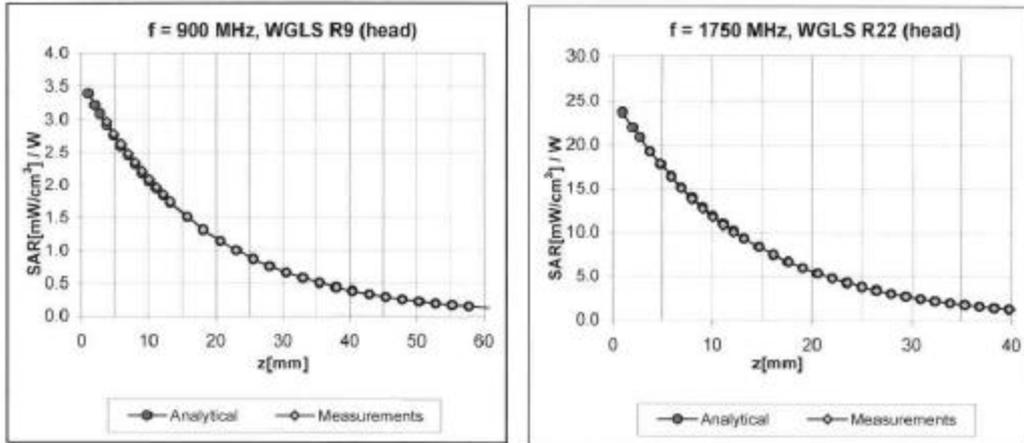
Deviation from Isotropy in HSL
Error (ϕ, ϑ), f = 900 MHz

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

SPORTON INTERNATIONAL INC.
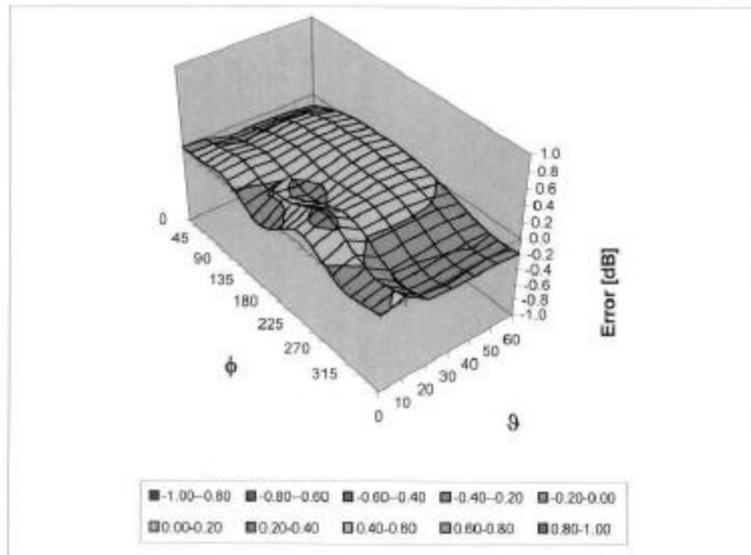
ET3DV6 SN:1788   September 21, 2010

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

SPORTON INTERNATIONAL INC.

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

ilac-MRA

SWISS CALIBRATION

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

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

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

ilac-MRA

SWISS CALIBRATION

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

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

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.

SPORTON INTERNATIONAL INC.

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 E²-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.

SPORTON INTERNATIONAL INC.

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.

SPORTON INTERNATIONAL INC.

Frequency Response of E-Field

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

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

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

f = 600 MHz, TEM ifi110EXX

f = 1800 MHz, WG R22

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

Dynamic Range f(SAR$_{head}$)
(Waveguide R22, f = 1800 MHz)

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

SPORTON INTERNATIONAL INC.

EX3DV4 SN:3731   September 20, 2010

Conversion Factor Assessment

f = 835 MHz, WGLS R9 (head)

f = 1900 MHz, WGLS R22 (head)

Deviation from Isotropy in HSL

Error (φ, ϑ), f = 900 MHz

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

SPORTON INTERNATIONAL INC.

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

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

ilac-MRA

SWISS CALIBRATION

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
C 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   **Sporton CN (Auden)**

Certificate No: EX3-3697_Nov10

CALIBRATION CERTIFICATE

Object	EX3DV4 - SN:3697
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:	November 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 E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30 Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

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

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

Issued: November 23, 2010

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

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

ilac-MRA

SWISS CALIBRATION

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

Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: SCS 108

The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

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:3697

Manufactured: April 22, 2009
Last calibrated: November 23, 2009
Recalibrated: November 23, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 SN:3697

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm $(\mu V/(V/m)^2)^A$	0.42	0.45	0.47	± 10.1%
DCP $(mV)^B$	92.3	94.5	94.0	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	120.0	± 3.4 %
			Y	0.00	0.00	1.00	140.0	
			Z	0.00	0.00	1.00	110.0	

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

EX3DV4 SN:3697   November 23, 2010

DASY/EASY - Parameters of Probe: EX3DV4 SN:3697

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%	8.67	8.67	8.67	0.71	0.62 ± 11.0%
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	8.51	8.51	8.51	0.60	0.69 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	7.47	7.47	7.47	0.38	0.81 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	7.39	7.39	7.39	0.68	0.59 ± 11.0%
2300	± 50 / ± 100	39.5 ± 5%	1.67 ± 5%	7.06	7.06	7.06	0.56	0.66 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	6.77	6.77	6.77	0.38	0.82 ± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	6.72	6.72	6.72	0.25	1.12 ± 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.

DASY/EASY - Parameters of Probe: EX3DV4 SN:3697

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%	8.65	8.65	8.65	0.58	0.71 ± 11.0%
900	± 50 / ± 100	55.0 ± 5%	1.05 ± 5%	8.54	8.54	8.54	0.40	0.86 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	7.41	7.41	7.41	0.54	0.77 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	7.26	7.26	7.26	0.41	0.84 ± 11.0%
2300	± 50 / ± 100	52.8 ± 5%	1.85 ± 5%	7.13	7.13	7.13	0.27	0.89 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	7.02	7.02	7.02	0.45	0.76 ± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	6.93	6.93	6.93	0.32	1.02 ± 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.

Frequency Response of E-Field

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

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

SPORTON INTERNATIONAL INC.
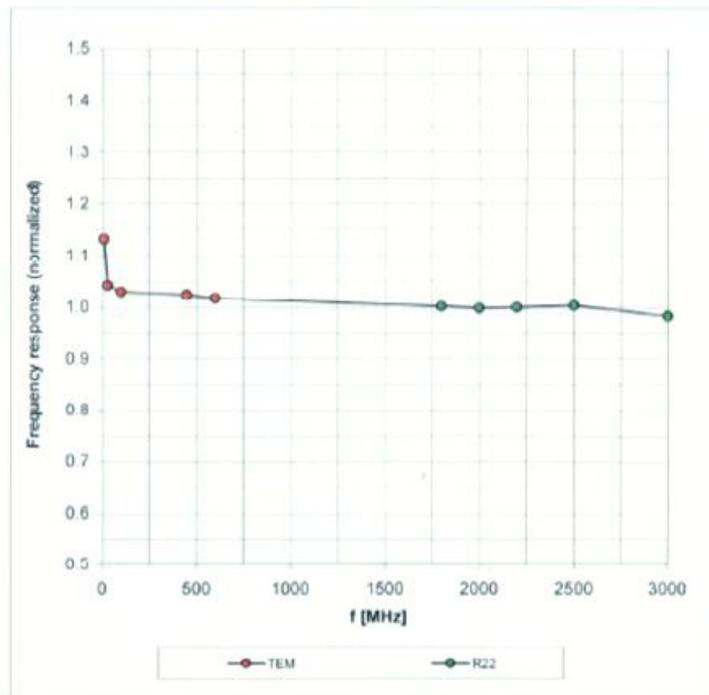
EX3DV4 SN:3697

November 23, 2010

Receiving Pattern (φ), θ = 0°

f = 600 MHz, TEM ifi110EXX

f = 1800 MHz, WG R22

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

Calibration Certificate of DASY

Dynamic Range f(SAR$_{head}$)

(Waveguide R22, f = 1800 MHz)

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

SPORTON INTERNATIONAL INC.

EX3DV4 SN:3697

November 23, 2010

Conversion Factor Assessment

f = 900 MHz, WGLS R9 (head)

f = 1750 MHz, WGLS R22 (head)

Deviation from Isotropy in HSL

Error (φ, ϑ), f = 900 MHz

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

SPORTON INTERNATIONAL INC.

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

Appendix D.   FCC 3G SAR Measurement Procedures

Conducted Output Power:

The EUT was tested according to the requirements of the FCC 3G procedures and the TS 34.121. The EUT's WCDMA and HSPA function is Release 6 version supporting HSDPA Category 10, and HSUPA Category 6. A detailed analysis of the output power for all WCDMA, HSPDA, and HSPA (HSUPA & HSDPA) modes is provided in the tables below. According to the FCC 3G procedures, handsets with both HSDPA and HSUPA should be tested according to Release 6 HSPA test procedures, and the function. Device was tested according to procedure KDB941225 - section Release 6 HSPA Data Devices as documented/evaluated in the following table. Power values for HSPA are configurations in WCDMA.

WCDMA SAR Test mode - Conducted Power				
Mode	**Setup**	Cell band (850)		
		CH4132	**CH4182**	**CH4233**
		826.4(MHz)	**836.4 (MHz)**	**846.6 (MHz)**
WCDMA	**RMC 12.2Kbps**	23.20	22.77	22.89
HSDPA	**Subtest 1**	23.24	23.41	23.45
	Subtest 2	23.25	23.52	23.55
	Subtest 3	22.86	23.00	23.11
	Subtest 4	22.87	23.01	23.09
HSUPA	**Subtest 1**	23.17	22.90	23.08
	Subtest 2	21.88	22.12	22.12
	Subtest 3	22.25	22.27	22.12
	Subtest 4	22.02	22.30	22.29
	Subtest 5	23.19	22.84	23.07

SPORTON INTERNATIONAL INC.
TEL : 886-3-327-3456
FAX : 886-3-328-4978
FCC ID : B94HHF30CE

Page Number   : D1 of D7
Report Issued Date : May 24, 2011
Report Version   : Rev. 01

WCDMA Setup Configuration:

    a.   The EUT was connected to Base Station referred to the drawing of Setup Configuration.

    b.   The RF path losses were compensated into the measurements.

    c.   A call was established between EUT and Base Station with following setting

        i.   Data rates: Varied from RMC 12.2Kbps

        ii.   RMC Test Loop = Loop Mode 1

        iii.   Power Ctrl Mode = All Up bits

    d.   The transmitted maximum output power was recorded.

Setup Configuration

SPORTON INTERNATIONAL INC.

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : B94HHF30CE

Page Number   : D2 of D7

Report Issued Date : May 24, 2011

Report Version   : Rev. 01
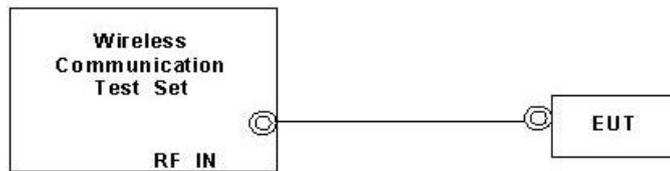
HSDPA Setup Configuration:

a.   The EUT was connected to Base Station referred to the drawing of Setup Configuration.

b.   The RF path losses were compensated into the measurements.

c.   A call was established between EUT and Base Station with following setting:

   i.   Set Gain Factors (β_c and β_d) and parameters were set according to each

   ii.   Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121

   iii.   Set RMC12.2Kbps + HSDPA mode.

   iv.   Set Cell Power = -86 dBm

   v.   Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)

   vi.   Select HSDPA Uplink Parameters

   vii.   Set DeltaACK, DeltaNACK and DeltaCQI = 8

   viii.   Set Ack-Nack Repetition Factor to 3

   ix.   Set CQI Feedback Cycle (k) to 4 ms

   x.   Set CQI Repetition Factor to 2

   xi.   Power Ctrl Mode = All Up bits

d.   The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .

Note 2:   For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c , and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c .

Note 3:   CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4:   For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

Setup Configuration

HSPA (HSUPA & HSPDA) Setup Configuration:

a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.

b. The RF path losses were compensated into the measurements.

c. A call was established between EUT and Base Station with following setting * :

 i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK

 ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121

 iii. Set Cell Power = -86 dBm

 iv. Set Channel Type = 12.2k + HSPA

 v. Set UE Target Power

 vi. Power Ctrl Mode= Alternating bits

 vii. Set and observe the E-TFCI

 viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI

d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c =24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.

Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

Note: For details settings in the Agilent 8960 test equipment, please refer to the user guide " HSUPA Measurement Guide with 8960 V7.5.0 Release 7 (2007-06) Ver.: v.02.18"

SPORTON INTERNATIONAL INC.
TEL : 886-3-327-3456
FAX : 886-3-328-4978
FCC ID : B94HHF30CE

Page Number : D4 of D7
Report Issued Date : May 24, 2011
Report Version : Rev. 01

```
                          Call Setup Screen
┌───────────────┬──────────────────────────────────────┬────────────────┐
│ Call Control  │      Active Cell Operating Mode       │  Call Parms    │
├───────────────┤                                       ├────────────────┤
│               │  ┌────────────────────────────────┐   │ Cell Power     │
│   Channel     │  │        UE Information           │   │    -86.00      │
│ (UARFCN) Info │  │ IMSI:                           │   │ dBm/3.84 MHz   │
│               │  │ IMEI:                           │   │ Channel Type   │
├───────────────┤  │ Power Class:                    │   │  12.2k + HSPA  │
│    Cell       │  └────────────────────────────────┘   │                │
│ Parameters  ▽ │  ┌────────────────────────────────┐   │                │
│               │  │ UE Expected Open Loop Transmit Power│ Paging Service│
├───────────────┤  │ Initial PRACH TX Power: -11.70 dBm │ RB Test Mode  │
│  Generator    │  │ Initial DPCCH TX Power:  -0.56 dBm │                │
│    Info       │  └────────────────────────────────┘   │                │
├───────────────┤  ┌──────────────────────┬─────────┐   ├────────────────┤
│               │  │   Uplink Parameters   │  Value  │   │                │
│   Uplink      │  │ PRACH Preambles       │    64   │▲  │    HSPA        │
│ Parameters  ▽ │  │ PRACH Ramping Cycles(MMAX)│  2  │   │  Parameters    │
│               │  │ Available Subchannels (Bit Mask)│000000000001│       │
├───────────────┤  │ Uplink DPCH Scrambling Code│  0 │   ├────────────────┤
│   UE Rep      │  │ Uplink DPCH Bc/Bd Control │Manual│  │  34.121 Preset │
│   Meas        │  │ Manual Uplink DPCH Bc     │  11  │  │ Call Configs ▽ │
│               │  │ Manual Uplink DPCH Bd     │  15  │  │                │
├───────────────┤  │ Maximum Uplink Transmit Power Level│21 dBm│         │
│    Close      │  └──────────────────────┴─────────┘   │    Channel     │
│    Menu       │  ┌──────────┬─────────────────────┐   │ (UARFCN) Parms │
├───────────────┤  │          │ Active Cell         │Sys Type: UTRA FDD│
│               │  │          │   Idle              │                │
│    2 of 4     │  │          │ IntRef Offset       │   1 of 3       │
└───────────────┴──────────────────────────────────────┴────────────────┘
```

Example for HSPA Subtest 1, and other subtests following table, C11.1.3

(Gain Factors (β_c = 11 and β_d = 15))

```
                          Call Setup Screen
┌───────────────┬──────────────────────────────────────┬────────────────┐
│ Call Control  │      Active Cell Operating Mode       │ Serving Grant  │
├───────────────┤                                       ├────────────────┤
│               │  ┌────────────────────────────────┐   │ AG Mode        │
│  Additional   │  │        UE Information           │   │  Single Shot   │
│  Screens      │  │ IMSI:                           │   │                │
│               │  │ IMEI:                           │   │ Single Shot AG │
├───────────────┤  │ Power Class:                    │   │ 20: (119/15)^2 │
│    Cell       │  └────────────────────────────────┘   │                │
│ Parameters  ▽ │  ┌────────────────────────────────┐   │                │
│               │  │ UE Expected Open Loop Transmit Power│               │
├───────────────┤  │ Initial PRACH TX Power: -11.70 dBm │ Send Single Shot│
│  Generator    │  │ Initial DPCCH TX Power:  -0.56 dBm │ Absolute Grant │
│    Info       │  └────────────────────────────────┘   │                │
├───────────────┤  ┌────────────────────────────────┐   │                │
│               │  │      Call Processing Status     │   │                │
│   Uplink      │  │ Current Service Type:    None   │   │ Send Relative  │
│ Parameters  ▽ │  │ MM Status:   ┌─Abs Single Shot AG─┐ │ Grant Up       │
│               │  │ GMM State:   │Index 15: (67/15)^2│▲│               │
├───────────────┤  │ Current DPCH │Index 16: (75/15)^2│ │               │
│   UE Rep      │  ├──────────────│Index 17: (84/15)^2│─┤ Send Relative  │
│   Meas        │  │  HSUPA In    │Index 18: (95/15)^2│ │ Grant Down     │
│               │  │ UE Rep E-DCH │Index 19: (106/15)^2│DSCH Cat: ----  │
├───────────────┤  │ Last Received│Index 20: (119/15)^2│Ratio: ---- %   │
│ Trig Output Setup│ Throughput:  └────────────────────┘---- kbps      │
│ Sys Frame Clock│  │ ACKs Transmitted          smitted: ----  │ Return │
├───────────────┤  └────────────────────────────────┘   │                │
│               │  ┌──────────┬─────────────────────┐   │                │
│    2 of 4     │  │          │ Active Cell         │Sys Type: UTRA FDD│
│               │  │          │   Idle              │                │
│               │  │          │ IntRef Offset       │   1 of 2       │
└───────────────┴──────────────────────────────────────┴────────────────┘
```

Example: AG – Index = 20 for HSPA subtest 1

SPORTON INTERNATIONAL INC.

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : B94HHF30CE

Page Number   : D5 of D7

Report Issued Date : May 24, 2011

Report Version   : Rev. 01

```
                          Call Setup Screen
┌──────────────┬────────────────────────────────────┬──────────────────┐
│ Screen Ctrl  │    Recorded E-TFCI Information      │  E-TFCI Record   │
│              │                                     ├──────────────────┤
│              │                                     │ E-TFCI Rec Count │
│  Channel     │ ┌─────────────────────────────────┐ │       15         │
│ (UARFCN) Info│ │      E-TFCI Recording State     │ │                  │
│              │ │            Idle                 │ │                  │
│              │ └─────────────────────────────────┘ │                  │
│   HSPA       │                                     │ Start Recording  │
│ Information  │ ┌─────────────────────────────────┐ │ E-TFCI Values    │
│              │ │     Recorded E-TFCI Values      │ │                  │
│              │ │  1:  75  11:  75  21: ----  31: ---- 41: ---- │        │
│              │ │  2:  75  12:  75  22: ----  32: ---- 42: ---- │        │
│ E-TFCI       │ │  3:  75  13:  75  23: ----  33: ---- 43: ---- │        │
│ Recording    │ │  4:  75  14:  75  24: ----  34: ---- 44: ---- │        │
│ Information  │ │  5:  75  15:  75  25: ----  35: ---- 45: ---- │        │
│              │ │  6:  75  16: ---- 26: ----  36: ---- 46: ---- │        │
│              │ │  7:  75  17: ---- 27: ----  37: ---- 47: ---- │Send Step Up│
│              │ │  8:  75  18: ---- 28: ----  38: ---- 48: ---- │TPC Bit Pattern│
│              │ │  9:  75  19: ---- 29: ----  39: ---- 49: ---- │        │
│  Clear       │ │ 10:  75  20: ---- 30: ----  40: ---- 50: ---- │Send Step Down│
│  UE Info     │ │                                 │ │TPC Bit Pattern│
│              │ │          15/15                  │ │                  │
│  Return      │ └─────────────────────────────────┘ │    Return        │
├──────────────┼────────┬──────────┬────────────────┼──────────────────┤
│              │ ▤Background│Active Cell│ Sys Type: UTRA FDD │             │
│              │        │ Connected│                │                  │
│              │        │IntRef│Offset│               │                  │
└──────────────┴────────┴──────────┴────────────────┴──────────────────┘
```

Example: Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1

Reference:

[1]   941225 D01 SAR test for 3G devices v02, SAR Measurement Procedures for 3G Devices CDMA 2000/Ev-Do/WCDMA/HSDPA/HSPA Oct. 2007 Laboratory Division Office of Engineering and Technology Federal Communications Commission

[2.]   TS 34.121 Universal Mobile Telecommunications System (UMTS); Terminal Conformance Specification, Radio Transmission and Reception (FDD)

[3.]   HSUPA Measurement Guide with 8960 V7.5.0 Release 7 (2007-06) Ver.: v.02.18

SPORTON INTERNATIONAL INC.   Page Number   : D7 of D7
TEL : 886-3-327-3456   Report Issued Date : May 24, 2011
FAX : 886-3-328-4978   Report Version   : Rev. 01
FCC ID : B94HHF30CE