Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

System Check_Body_5750MHz

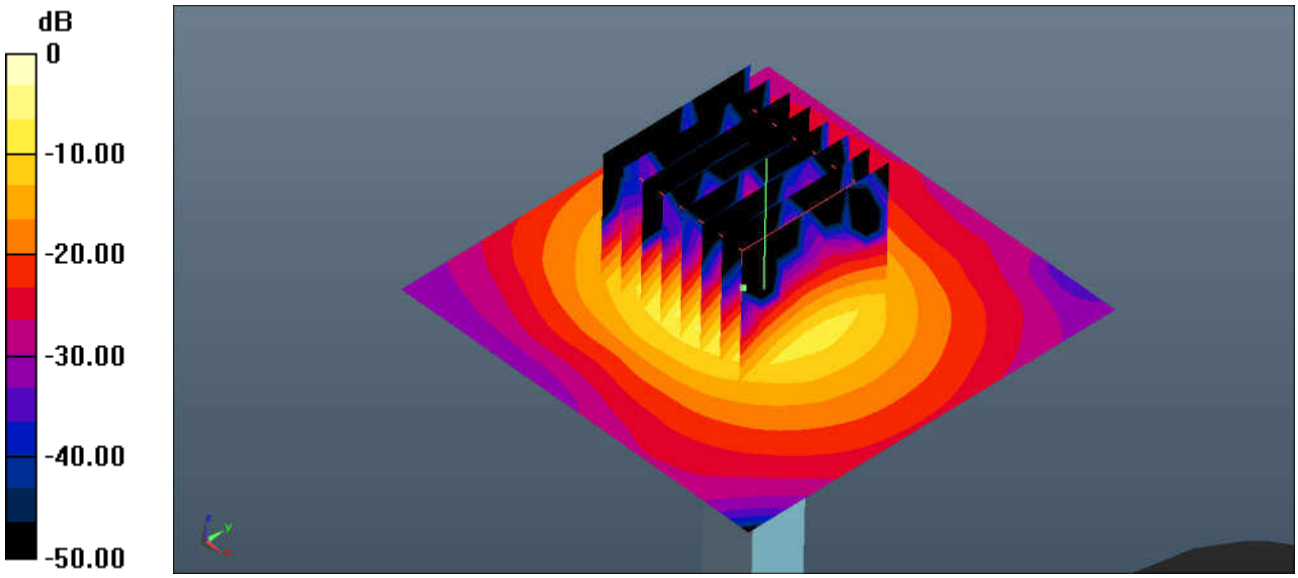
DUT: D5GHzV2-SN:1006

Communication System: UID 0, CW (0); Frequency: 5750 MHz;Duty Cycle: 1:1
Medium: MSL_5000 Medium parameters used: f = 5750 MHz; σ = 6.159 S/m; ε_r = 46.686; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.31, 4.31, 4.31); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Pin=100mW/Area Scan (71x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.0 W/kg

Pin=100mW/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 34.81 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 31.9 W/kg
SAR(1 g) = 8.02 W/kg; SAR(10 g) = 2.21 W/kg
Maximum value of SAR (measured) = 18.4 W/kg



0 dB = 18.4 W/kg = 12.65 dBW/kg

Appendix B. Plots of High SAR Measurement

The plots are shown as follows.

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.10

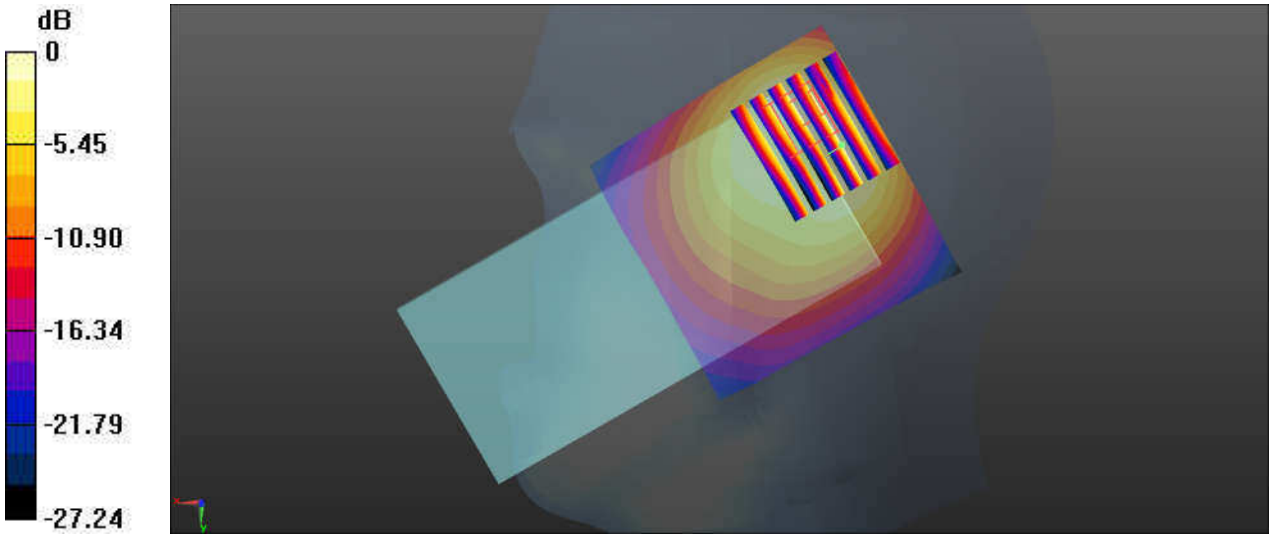
01_GSM850_GPRS 4 Tx slots_Right Cheek_0mm_Ch189

Communication System: UID 0, GSM850 (0); Frequency: 836.4 MHz;Duty Cycle: 1:2.08
Medium: HSL_835 Medium parameters used: f = 836.4 MHz; σ = 0.947 S/m; ε_r = 42.744; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.01, 9.01, 9.01); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch189/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.953 W/kg

Ch189/Zoom Scan (7x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.85 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 1.66 W/kg
SAR(1 g) = 0.803 W/kg; SAR(10 g) = 0.430 W/kg
Maximum value of SAR (measured) = 0.978 W/kg



0 dB = 0.953 W/kg = -0.21 dBW/kg

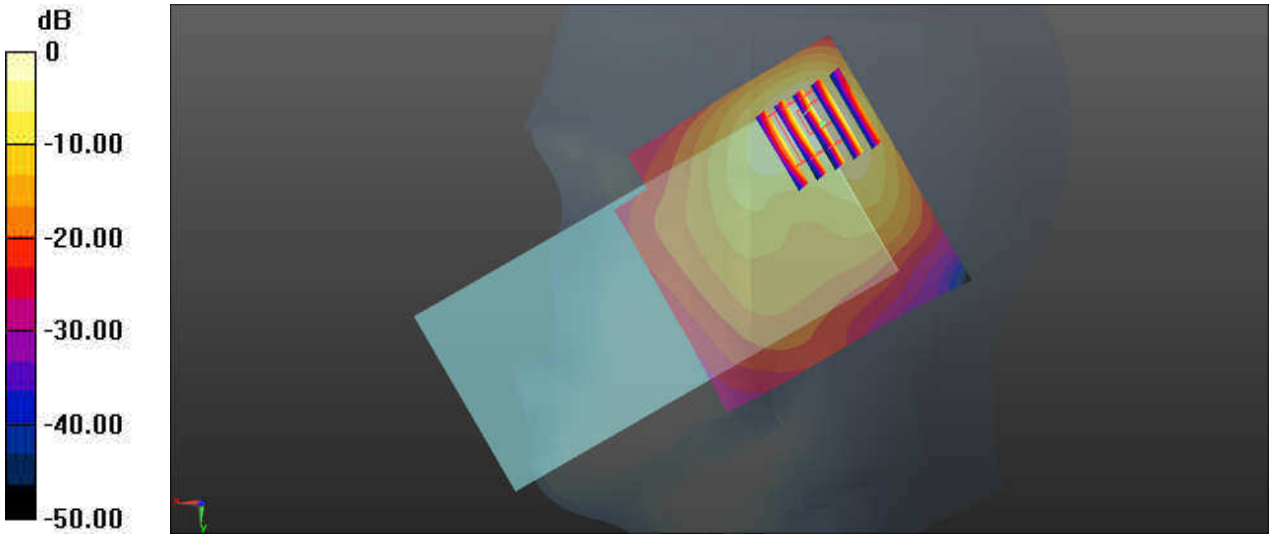
02_GSM1900_GPRS 4 Tx slots_Right Cheek_0mm_Ch661

Communication System: UID 0, PCS (0); Frequency: 1880 MHz;Duty Cycle: 1:2.08
Medium: HSL_1900 Medium parameters used: f = 1880 MHz; σ = 1.352 S/m; ε_r = 39.804; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.4, 7.4, 7.4); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch661/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.37 W/kg

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.624 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.95 W/kg
SAR(1 g) = 0.711 W/kg; SAR(10 g) = 0.339 W/kg
Maximum value of SAR (measured) = 1.22 W/kg



0 dB = 1.37 W/kg = 1.37 dBW/kg

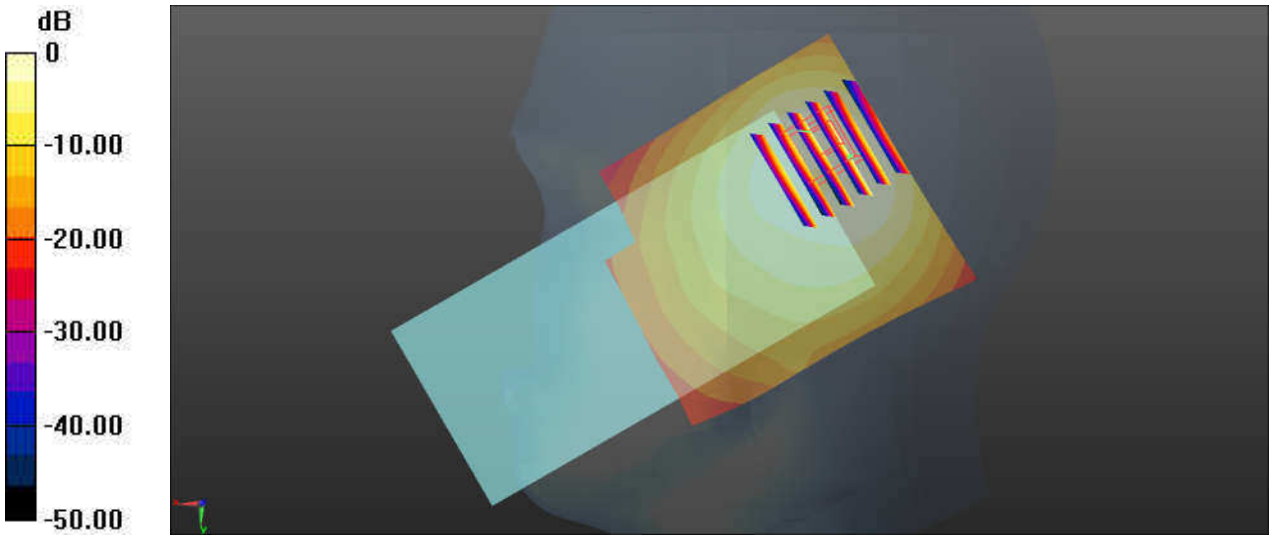
03_WCDMA V_RMC 12.2Kbps_Right Cheek_0mm_Ch4182

Communication System: UID 0, WCDMA (0); Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: HSL_835 Medium parameters used: f = 836.4 MHz; σ = 0.947 S/m; ε_r = 42.744; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.01, 9.01, 9.01); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch4182/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.741 W/kg

Ch4182/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 21.21 V/m; Power Drift = 0.16 dB
Peak SAR (extrapolated) = 1.29 W/kg
SAR(1 g) = 0.626 W/kg; SAR(10 g) = 0.340 W/kg
Maximum value of SAR (measured) = 0.782 W/kg



0 dB = 0.741 W/kg = -1.30 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.10

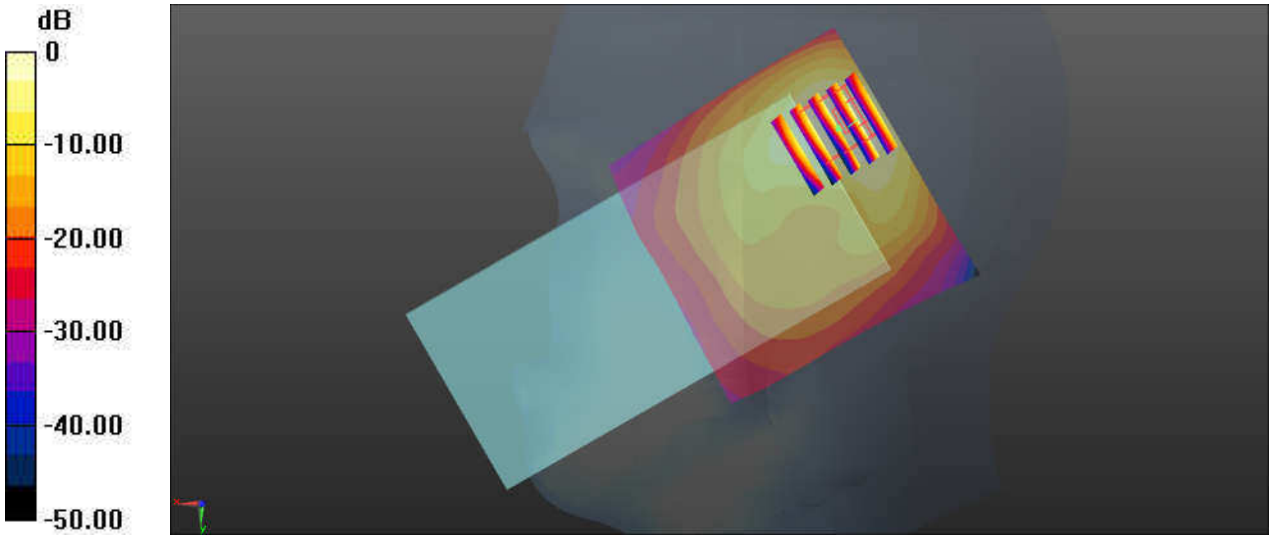
04_WCDMA IV_RMC 12.2Kbps_Right Cheek_0mm_Ch1513

Communication System: UID 0, WCDMA (0); Frequency: 1752.6 MHz;Duty Cycle: 1:1
Medium: HSL_1750 Medium parameters used: f = 1752.6 MHz; σ = 1.349 S/m; ε_r = 40.226; ρ = 1000kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.79, 7.79, 7.79); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch1513/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.20 W/kg

Ch1513/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.188 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.78 W/kg
SAR(1 g) = 0.771 W/kg; SAR(10 g) = 0.378 W/kg
Maximum value of SAR (measured) = 1.08 W/kg



0 dB = 1.20 W/kg = 0.79 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.11

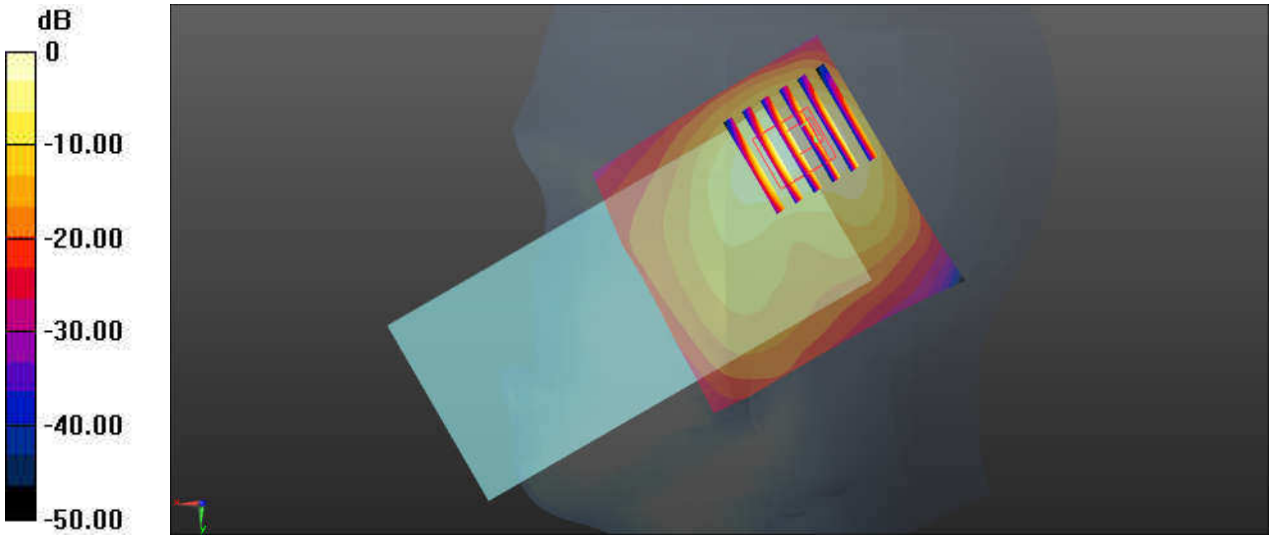
05_WCDMA II_RMC 12.2Kbps_Right Cheek_0mm_Ch9538

Communication System: UID 0, WCDMA (0); Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: f = 1907.6 MHz; σ = 1.381 S/m; ε_r = 39.699; ρ = 1000kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.4, 7.4, 7.4); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch9538/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.16 W/kg

Ch9538/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.70 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 1.46 W/kg
SAR(1 g) = 0.671 W/kg; SAR(10 g) = 0.351 W/kg
Maximum value of SAR (measured) = 0.805 W/kg



0 dB = 1.16 W/kg = 0.64 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.10

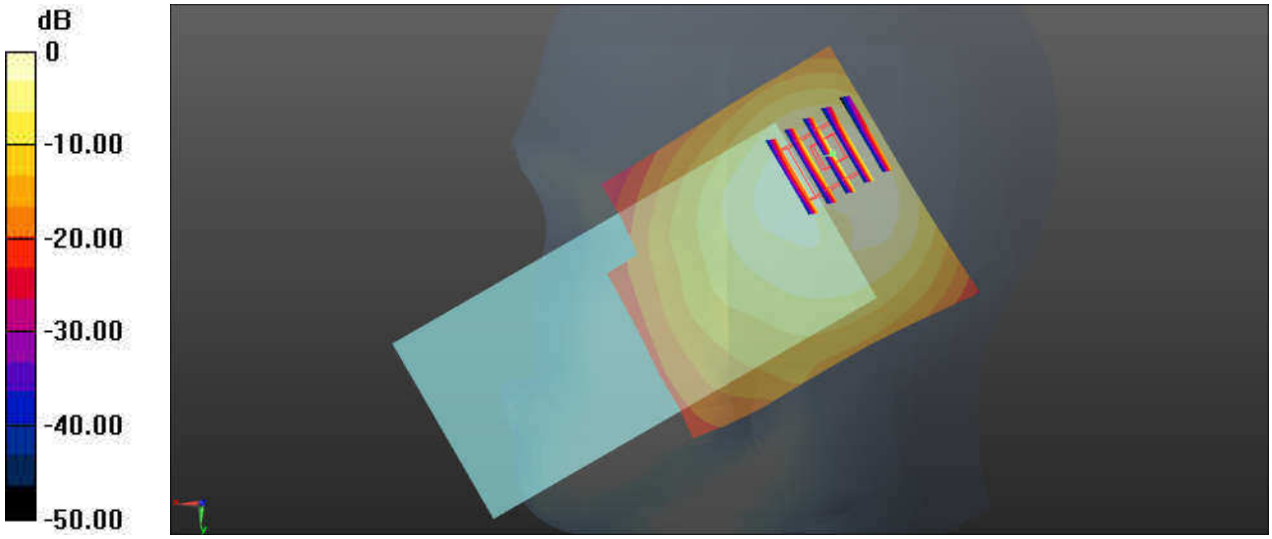
06_CDMA2000 BC0_RC3 SO55_Right Cheek_0mm_Ch777

Communication System: UID 0, CDMA (0); Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: HSL_835 Medium parameters used: f = 848.31 MHz; σ = 0.959 S/m; ε_r = 42.597; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.01, 9.01, 9.01); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch777/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.886 W/kg

Ch777/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 4.028 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.74 W/kg
SAR(1 g) = 0.860 W/kg; SAR(10 g) = 0.416 W/kg
Maximum value of SAR (measured) = 1.05 W/kg



0 dB = 0.886 W/kg = -0.53 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.9

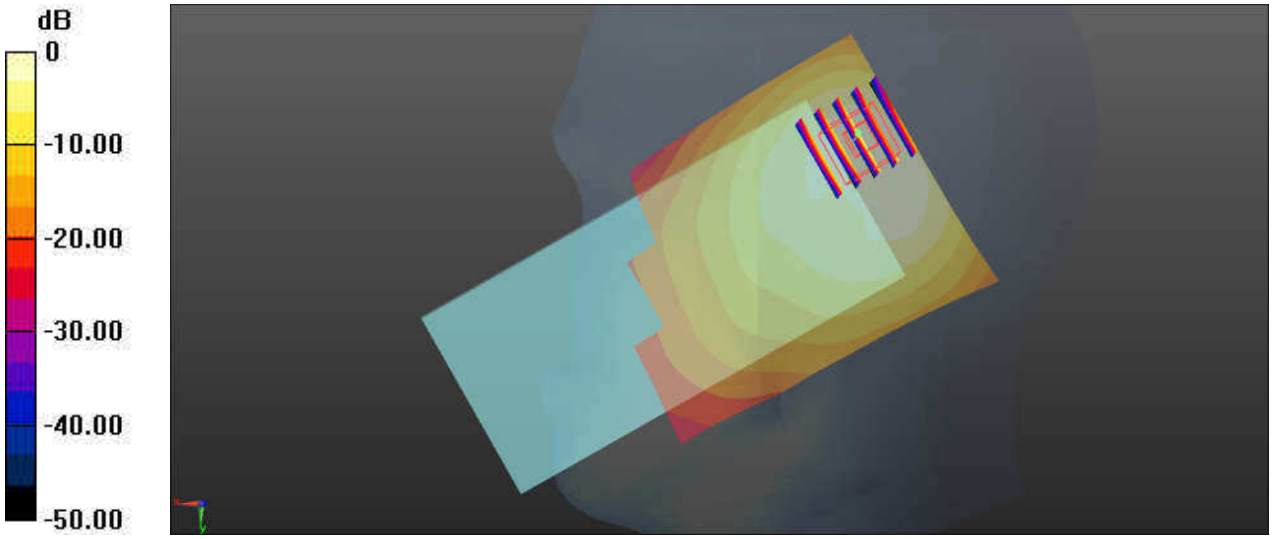
07_LTE Band 12_10M_QPSK_1RB_49Offset_Right Cheek_0mm_Ch23095

Communication System: UID 0, LTE-FDD (0); Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: HSL_750 Medium parameters used: f = 707.5 MHz; σ = 0.864 S/m; ε_r = 42.662; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.27, 9.27, 9.27); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch23095/Area Scan (71x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.922 W/kg

Ch23095/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.01 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.48 W/kg
SAR(1 g) = 0.683 W/kg; SAR(10 g) = 0.362 W/kg
Maximum value of SAR (measured) = 0.927 W/kg



0 dB = 0.922 W/kg = -0.35 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.10

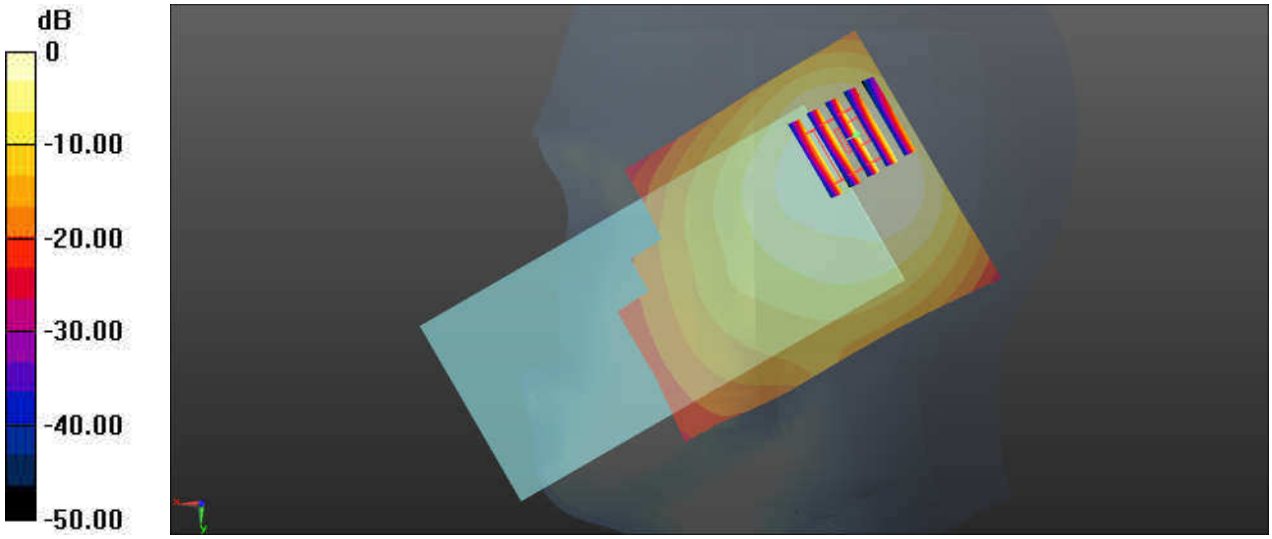
08_LTE Band 5_10M_QPSK_1RB_49Offset_Right Cheek_0mm_Ch20525

Communication System: UID 0, LTE-FDD (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: HSL_835 Medium parameters used: f = 836.5 MHz; σ = 0.947 S/m; ε_r = 42.743; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.01, 9.01, 9.01); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch20525/Area Scan (71x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.773 W/kg

Ch20525/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.88 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 0.673 W/kg; SAR(10 g) = 0.358 W/kg
Maximum value of SAR (measured) = 0.909 W/kg



0 dB = 0.773 W/kg = -1.12 dBW/kg

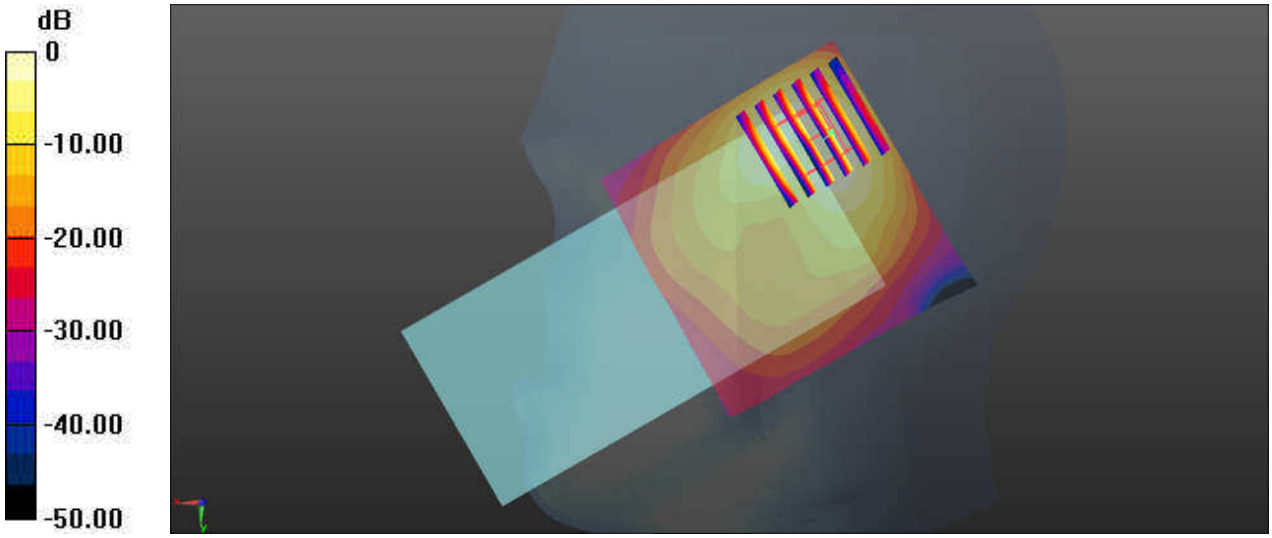
09_LTE Band 4_20M_QPSK_1RB_0Offset_Right Cheek_0mm_Ch20175

Communication System: UID 0, LTE-FDD (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: HSL_1750 Medium parameters used: f = 1732.5 MHz; σ = 1.331 S/m; ε_r = 40.296; ρ = 1000kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.79, 7.79, 7.79); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch20175/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.765 W/kg

Ch20175/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 9.784 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.585 W/kg; SAR(10 g) = 0.293 W/kg
Maximum value of SAR (measured) = 0.836 W/kg



0 dB = 0.765 W/kg = -1.16 dBW/kg

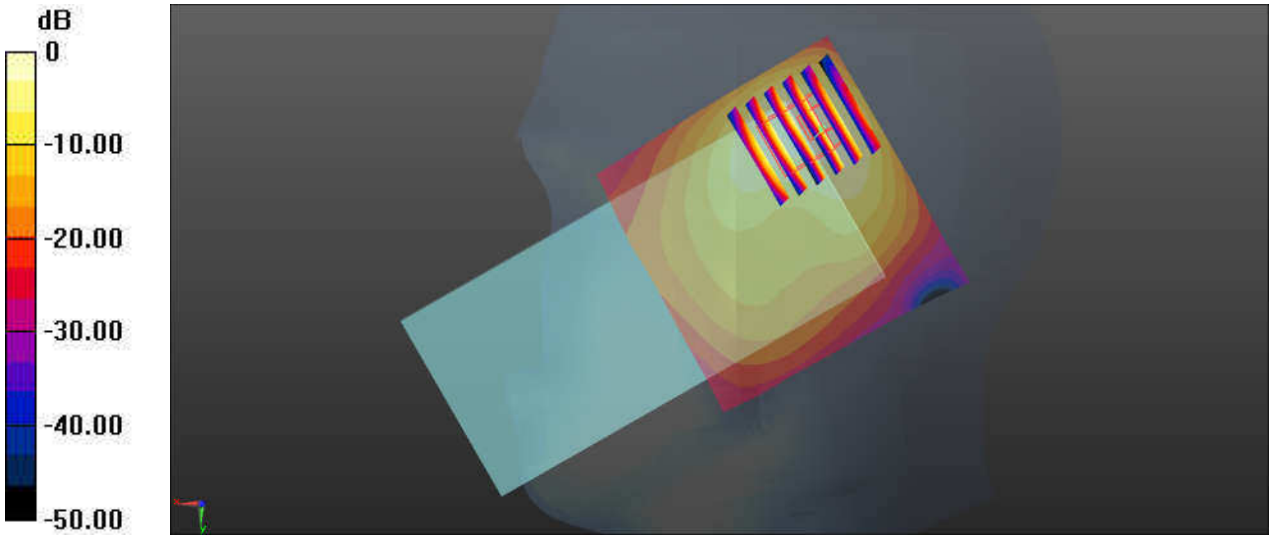
10_LTE Band 2_20M_QPSK_1RB_0Offset_Right Cheek_0mm_Ch18700

Communication System: UID 0, LTE-FDD (0); Frequency: 1860 MHz;Duty Cycle: 1:1
Medium: HSL_1900 Medium parameters used: f = 1860 MHz; σ = 1.333 S/m; ε_r = 39.877; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.4, 7.4, 7.4); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch18700/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.865 W/kg

Ch18700/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 10.66 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.40 W/kg
SAR(1 g) = 0.604 W/kg; SAR(10 g) = 0.304 W/kg
Maximum value of SAR (measured) = 0.826 W/kg



0 dB = 0.865 W/kg = -0.63 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.15

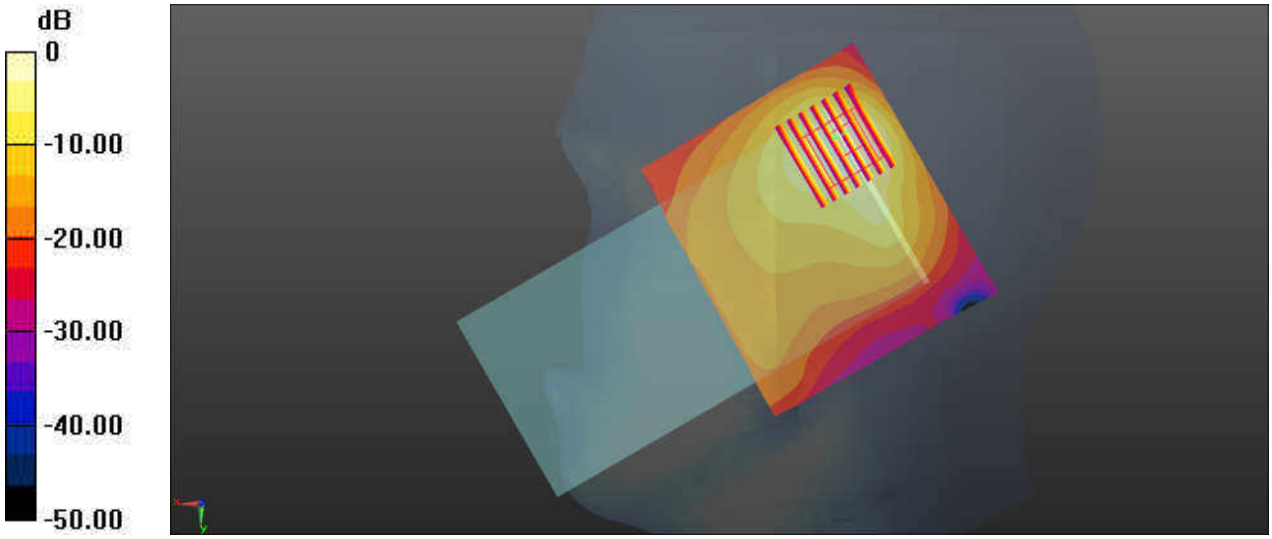
11_LTE Band 7 _20M_QPSK_1RB_0Offset_Right Tilted_0mm_Ch21100

Communication System: UID 0, LTE-FDD (0); Frequency: 2535 MHz;Duty Cycle: 1:1
Medium: HSL_2600 Medium parameters used: f = 2535 MHz; σ = 1.935 S/m; ε_r = 37.902; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(6.86, 6.86, 6.86); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2018.12.3
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch21100/Area Scan (91x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.994 W/kg

Ch21100/Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.79 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 2.30 W/kg
SAR(1 g) = 0.742 W/kg; SAR(10 g) = 0.313 W/kg
Maximum value of SAR (measured) = 1.11 W/kg



0 dB = 0.994 W/kg = -0.03 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.15

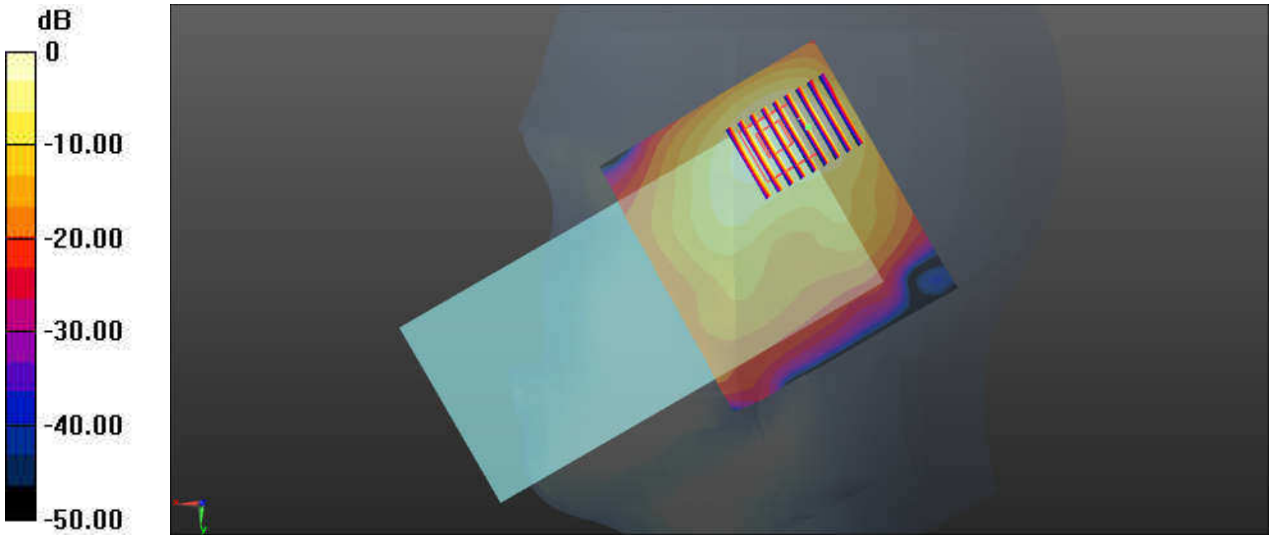
12_LTE Band 38 _20M_QPSK_1RB_0Offset_Right Cheek_0mm_Ch38000

Communication System: UID 0, LTE-TDD (0); Frequency: 2595 MHz;Duty Cycle: 1:1.59
Medium: HSL_2600 Medium parameters used: f = 2595 MHz; σ = 2.006 S/m; ε_r = 37.677; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(6.86, 6.86, 6.86); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2018.12.3
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch38000/Area Scan (91x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.654 W/kg

Ch38000/Zoom Scan (7x9x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.011 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 1.21 W/kg
SAR(1 g) = 0.493 W/kg; SAR(10 g) = 0.233 W/kg
Maximum value of SAR (measured) = 0.626 W/kg



0 dB = 0.654 W/kg = -1.84 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.13

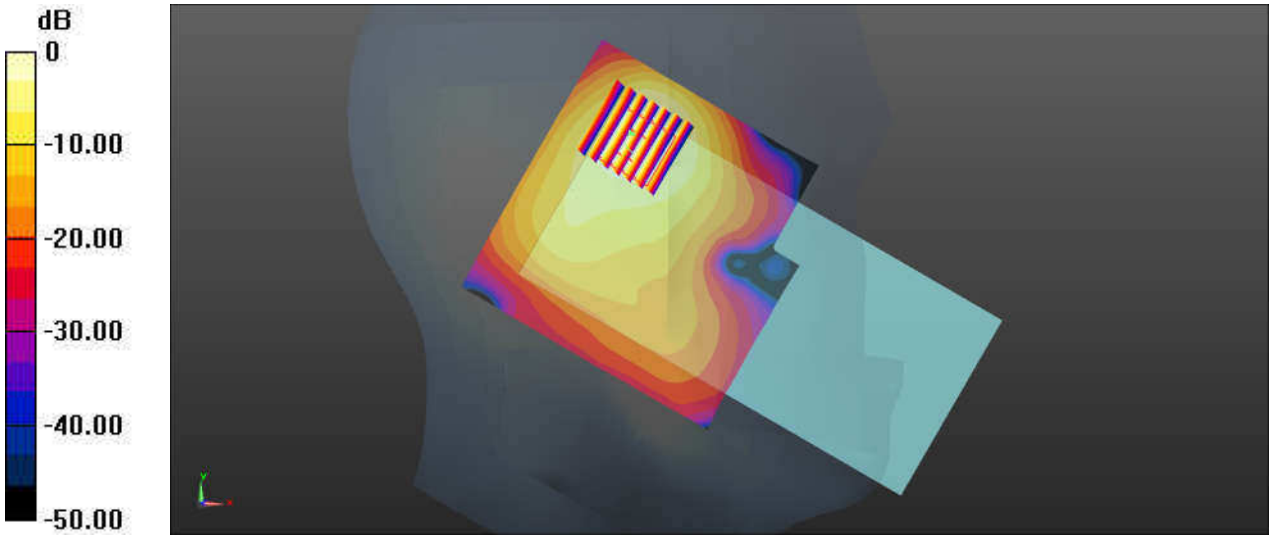
13_WLAN 2.4GHz_802.11b 1Mbps_Left Cheek_Ant 1_0mm_Ch1

Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: HSL_2450 Medium parameters used: f = 2412 MHz; σ = 1.798 S/m; ε_r = 38.4; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.08, 7.08, 7.08); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch1/Area Scan (91x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.854 W/kg

Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.83 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 1.36 W/kg
SAR(1 g) = 0.649 W/kg; SAR(10 g) = 0.313 W/kg
Maximum value of SAR (measured) = 0.829 W/kg



0 dB = 0.854 W/kg = -0.69 dBW/kg

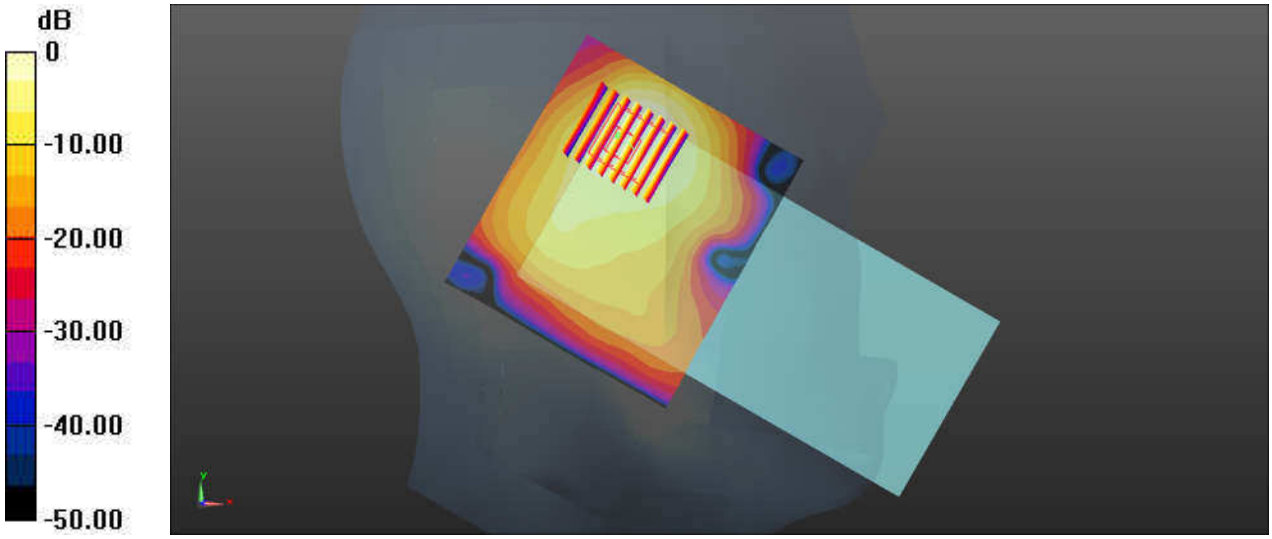
14_WLAN 2.4GHz_802.11b 1Mbps_Left Cheek_Ant 1+2_0mm_Ch1

Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: HSL_2450 Medium parameters used: f = 2412 MHz; σ = 1.798 S/m; ε_r = 38.4; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.08, 7.08, 7.08); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch1/Area Scan (91x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.462 W/kg

Ch1/Zoom Scan (7x8x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.642 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.862 W/kg
SAR(1 g) = 0.369 W/kg; SAR(10 g) = 0.178 W/kg
Maximum value of SAR (measured) = 0.466 W/kg



0 dB = 0.462 W/kg = -3.35 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.16

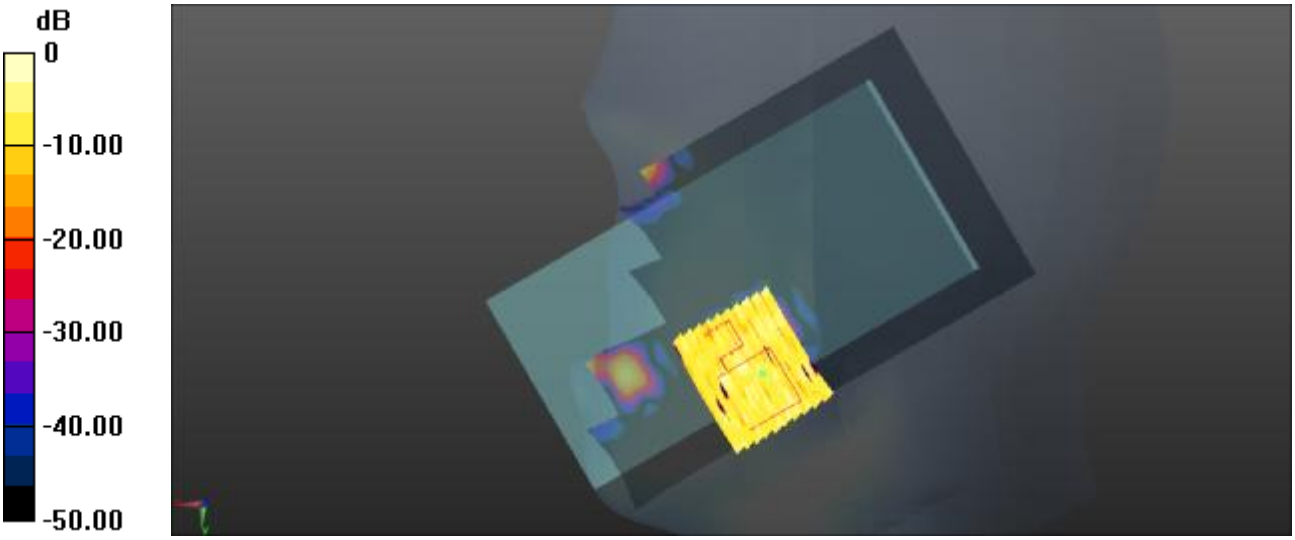
15_WLAN5.3GHz_802.11a 6Mbps_Right Tilted_0mm_Ant 2_Ch60

Communication System: UID 0, 802.11a (0); Frequency: 5300 MHz;Duty Cycle: 1:1.019
Medium: HSL_5000 Medium parameters used: f = 5300 MHz; σ = 4.718 S/m; ε_r = 35.146; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(5.2, 5.2, 5.2); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch60/Area Scan (101x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0363 W/kg

Ch60/Zoom Scan (12x10x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 0 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 2.95 W/kg
SAR(1 g) = 0.00272 W/kg; SAR(10 g) = 0.00101 W/kg
Maximum value of SAR (measured) = 0.0322 W/kg



0 dB = 0.0363 W/kg = -14.40 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.16

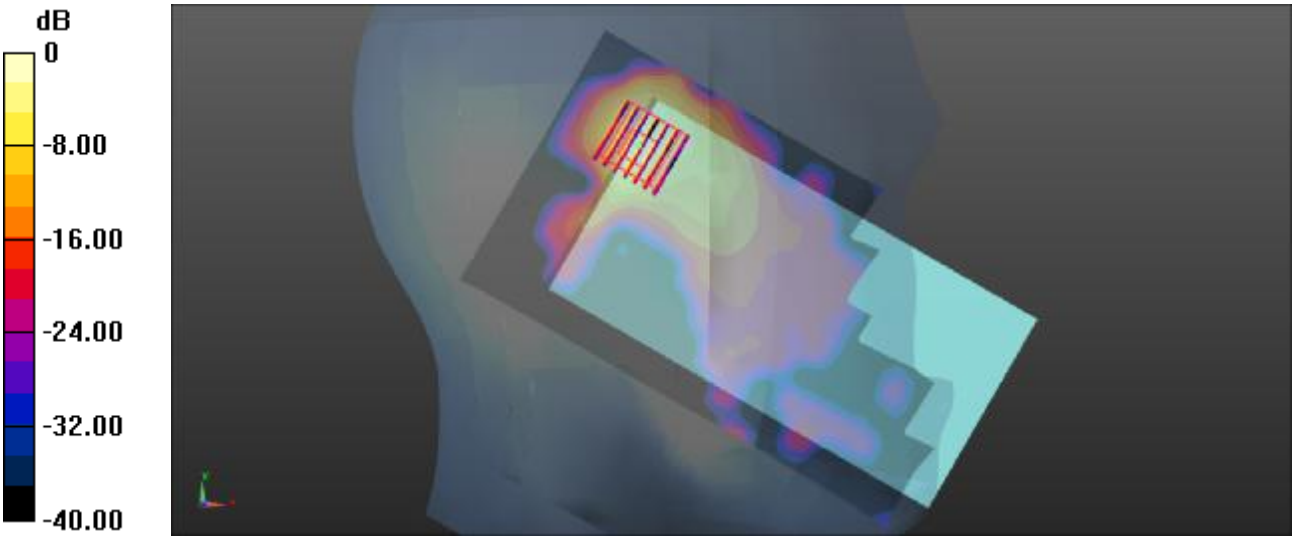
16_WLAN5.3GHz_802.11a 6Mbps_Left Tilted_0mm_Ant 1+2_Ch52

Communication System: UID 0, 802.11a (0); Frequency: 5260 MHz;Duty Cycle: 1:1.019
Medium: HSL_5000 Medium parameters used: f = 5260 MHz; σ = 4.684 S/m; ε_r = 35.223; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(5.2, 5.2, 5.2); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch52/Area Scan (101x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.51 W/kg

Ch52/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 4.617 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 2.41 W/kg
SAR(1 g) = 0.592 W/kg; SAR(10 g) = 0.179 W/kg
Maximum value of SAR (measured) = 1.42 W/kg



0 dB = 1.51 W/kg = 1.79 dBW/kg

17_WLAN5.5GHz_802.11a 6Mbps_Left Cheek_0mm_Ant 2_Ch100

Communication System: UID 0, 802.11a (0); Frequency: 5500 MHz;Duty Cycle: 1:1.019
Medium: HSL_5000 Medium parameters used: f = 5500 MHz; σ = 4.915 S/m; ε_r = 34.85; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.94, 4.94, 4.94); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch100/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0587 W/kg

Ch100/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 1.864 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.0330 W/kg
SAR(1 g) = 0.012 W/kg; SAR(10 g) = 0.00404 W/kg
Maximum value of SAR (measured) = 0.0316 W/kg

0 dB = 0.0316 W/kg = -15.00 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.14

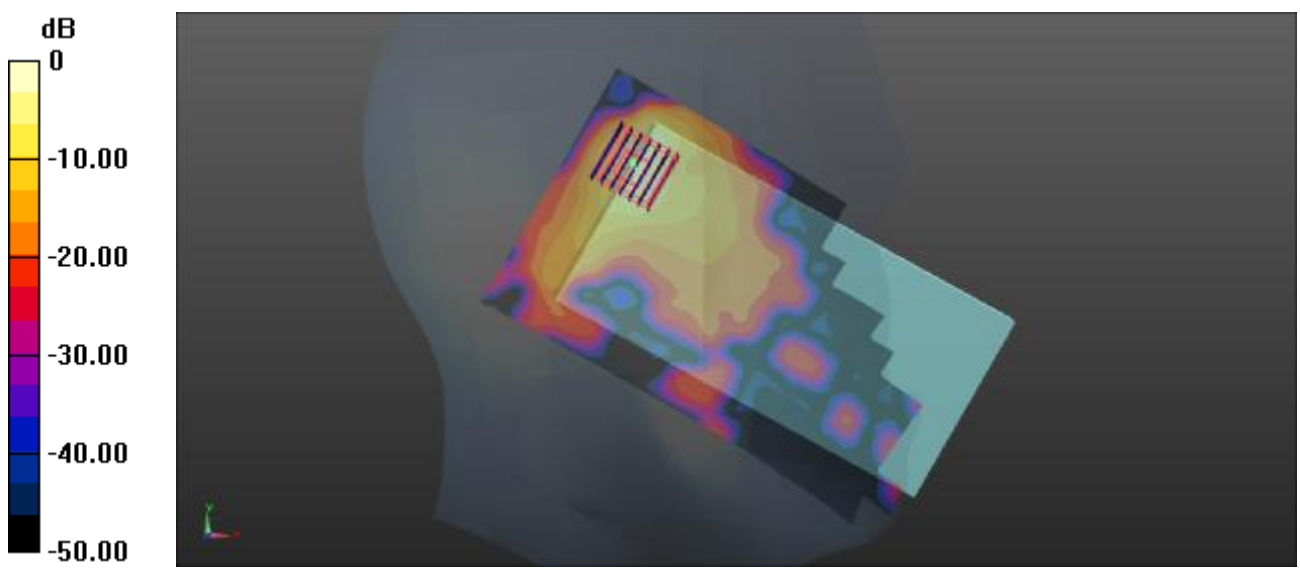
18_WLAN5.5GHz_802.11a 6Mbps_Left Tilted_0mm_Ant 1+2_Ch140

Communication System: UID 0, 802.11a (0); Frequency: 5700 MHz;Duty Cycle: 1:1.019
Medium: HSL_5000 Medium parameters used: f = 5700 MHz; σ = 5.124 S/m; ε_r = 34.543; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.94, 4.94, 4.94); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch140/Area Scan (101x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.82 W/kg

Ch140/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 6.350 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 3.01 W/kg
SAR(1 g) = 0.612 W/kg; SAR(10 g) = 0.176 W/kg
Maximum value of SAR (measured) = 1.60 W/kg



0 dB = 1.82 W/kg = 2.60 dBW/kg

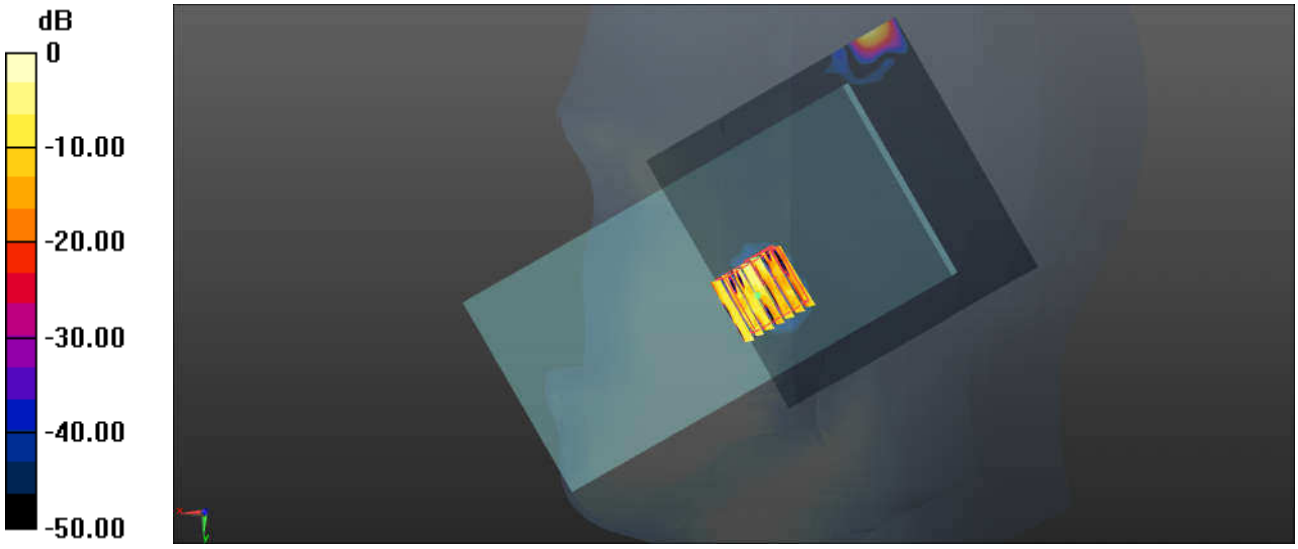
19_WLAN5.8GHz_802.11a 6Mbps_Right Tilted_0mm_Ant 2_Ch161

Communication System: UID 0, 802.11a (0); Frequency: 5805 MHz;Duty Cycle: 1:1.019
Medium: HSL_5000 Medium parameters used: f = 5805 MHz; σ = 5.254 S/m; ε_r = 34.35; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(5.23, 5.23, 5.23); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch161/Area Scan (101x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.0456 W/kg

Ch161/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 0 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.116 W/kg
SAR(1 g) = 0.000608 W/kg; SAR(10 g) = 3.86e-005 W/kg
Maximum value of SAR (measured) = 0.108 W/kg



0 dB = 0.108 W/kg = -9.67 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.16

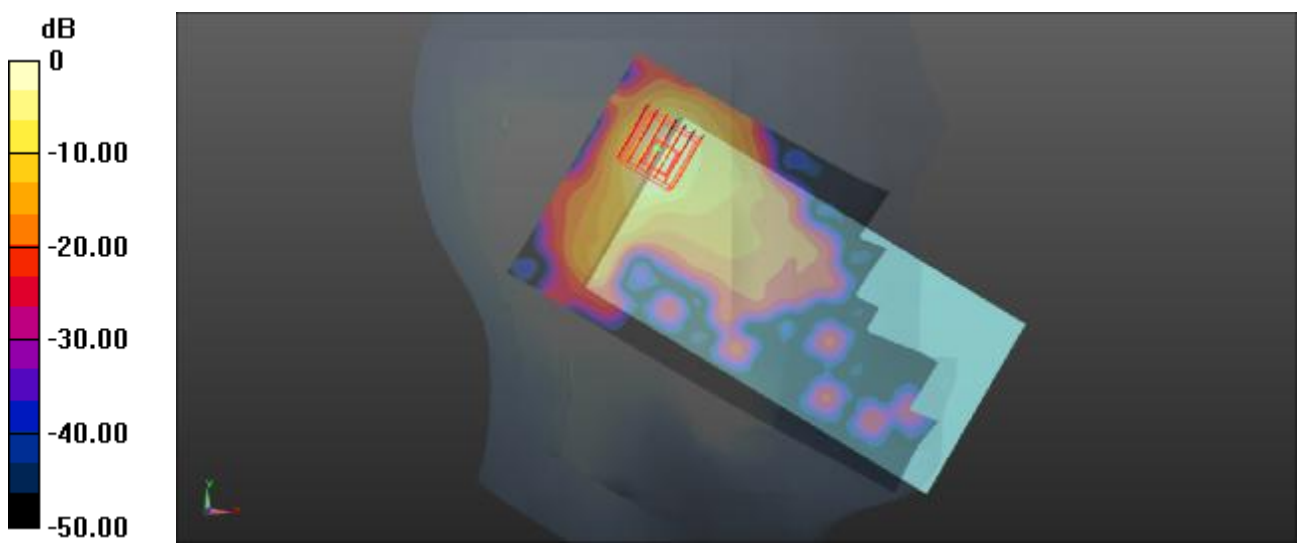
20_WLAN5.8GHz_802.11a 6Mbps_Left Tilted_0mm_Ant 1+2_Ch157

Communication System: UID 0, 802.11a (0); Frequency: 5785 MHz;Duty Cycle: 1:1.019
Medium: HSL_5000 Medium parameters used: f = 5785 MHz; σ = 5.217 S/m; ε_r = 34.42; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(5.23, 5.23, 5.23); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch157/Area Scan (101x181x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.57 W/kg

Ch157/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 0.5470 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 3.07 W/kg
SAR(1 g) = 0.595 W/kg; SAR(10 g) = 0.164 W/kg
Maximum value of SAR (measured) = 1.54 W/kg



0 dB = 1.57 W/kg = 1.96 dBW/kg

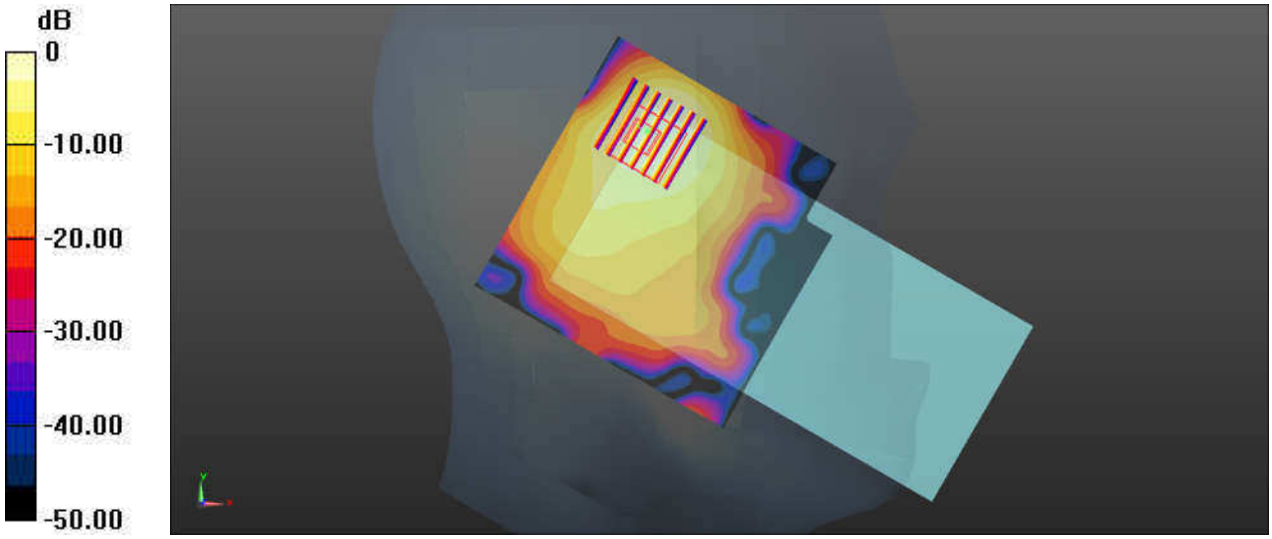
21_ Bluetooth _1Mbps_Left Cheek_0mm_Ch78

Communication System: UID 0, Bluetooth (0); Frequency: 2480 MHz;Duty Cycle: 1:1.30
Medium: HSL_2450 Medium parameters used: f = 2480 MHz; σ = 1.873 S/m; ε_r = 38.135; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.08, 7.08, 7.08); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch78/Area Scan (91x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.336 W/kg

Ch78/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 6.690 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.388 W/kg
SAR(1 g) = 0.185 W/kg; SAR(10 g) = 0.086 W/kg
Maximum value of SAR (measured) = 0.290 W/kg



0 dB = 0.336 W/kg = -4.74 dBW/kg

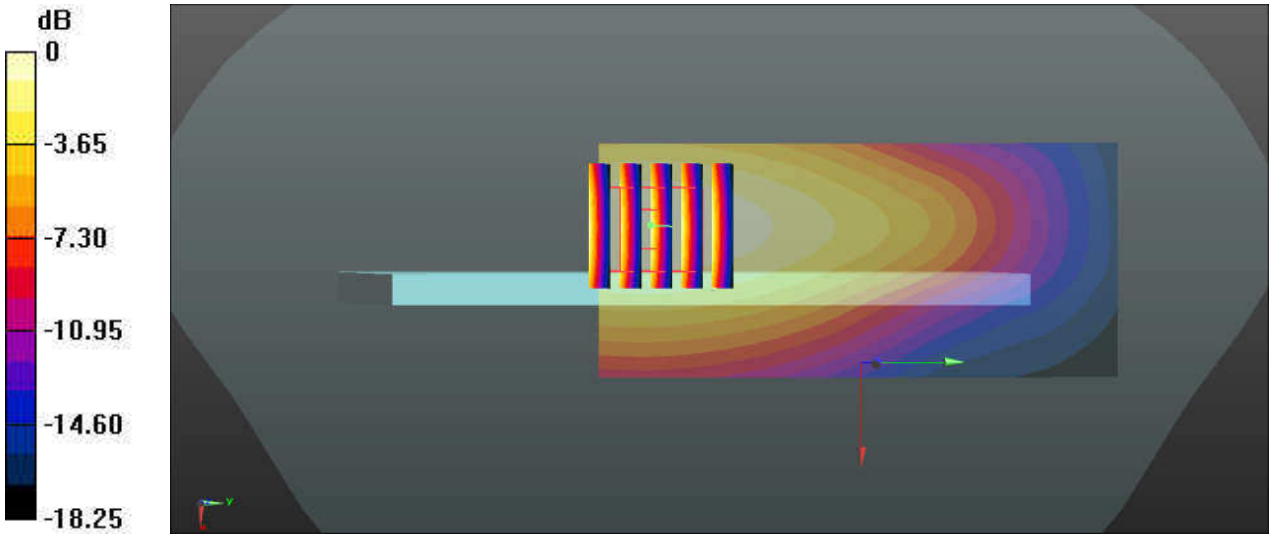
22_GSM850_GPRS 4 Tx slots_Right Side_10mm_Ch251

Communication System: UID 0, GSM850 (0); Frequency: 848.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_835 Medium parameters used: f = 848.8 MHz; σ = 1.022 S/m; ε_r = 54.224; ρ = 1000kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.03, 9.03, 9.03); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch251/Area Scan (41x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.496 W/kg

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.95 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.573 W/kg
SAR(1 g) = 0.378 W/kg; SAR(10 g) = 0.259 W/kg
Maximum value of SAR (measured) = 0.502 W/kg



0 dB = 0.496 W/kg = -3.05 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.11

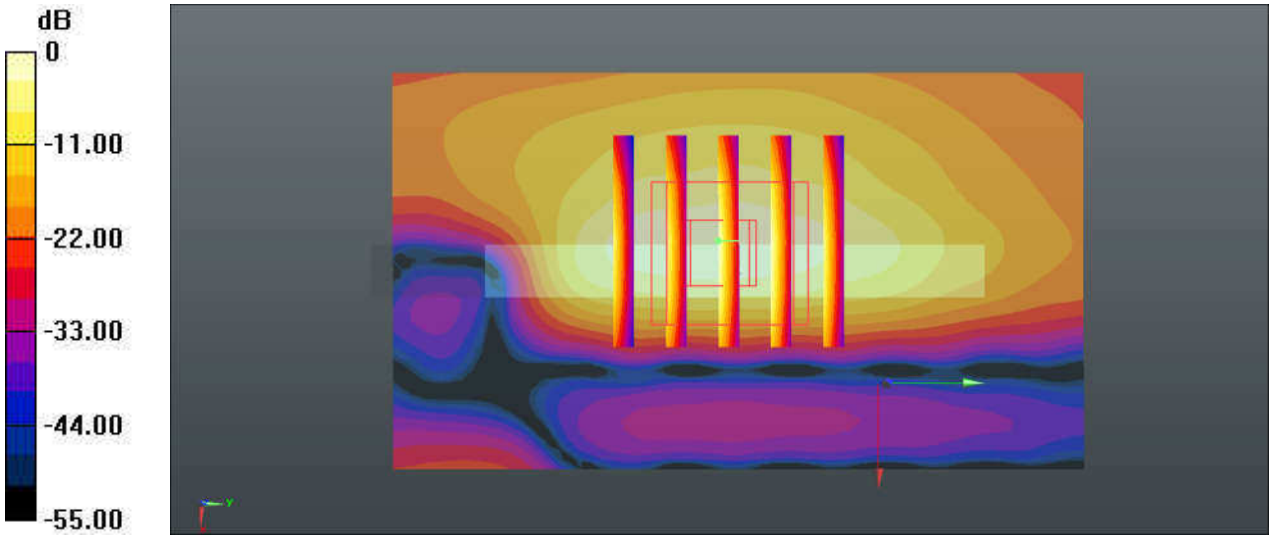
23_GSM1900_GPRS 4 Tx slots_Bottom Side_10mm_Ch810

Communication System: UID 0, PCS (0); Frequency: 1909.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_1900 Medium parameters used: f = 1909.8 MHz; σ = 1.536 S/m; ε_r = 51.547; ρ = 1000kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.07, 7.07, 7.07); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch810/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.63 W/kg

Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.727 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.35 W/kg
SAR(1 g) = 0.763 W/kg; SAR(10 g) = 0.390 W/kg
Maximum value of SAR (measured) = 0.934 W/kg



0 dB = 1.63 W/kg = 2.12 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.9

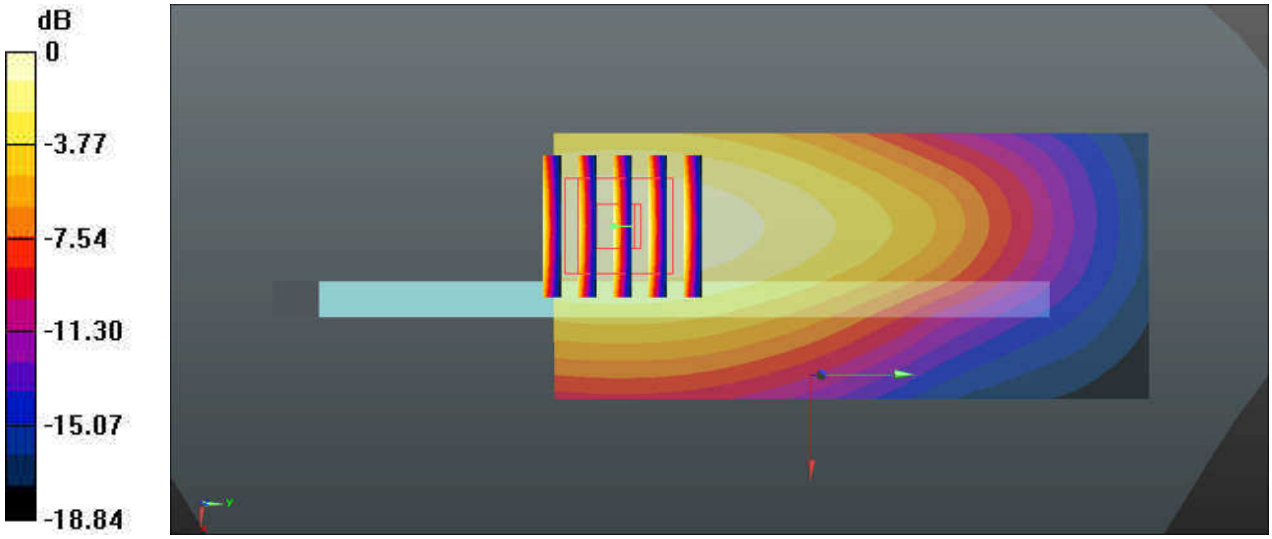
24_WCDMA V_RMC 12.2Kbps_Right Side_10mm_Ch4182

Communication System: UID 0, WCDMA (0); Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: MSL_835 Medium parameters used: f = 836.4 MHz; σ = 1.008 S/m; ε_r = 54.317; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.03, 9.03, 9.03); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch4182/Area Scan (41x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.609 W/kg

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 25.51 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.700 W/kg
SAR(1 g) = 0.463 W/kg; SAR(10 g) = 0.317 W/kg
Maximum value of SAR (measured) = 0.614 W/kg



0 dB = 0.609 W/kg = -2.15 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.10

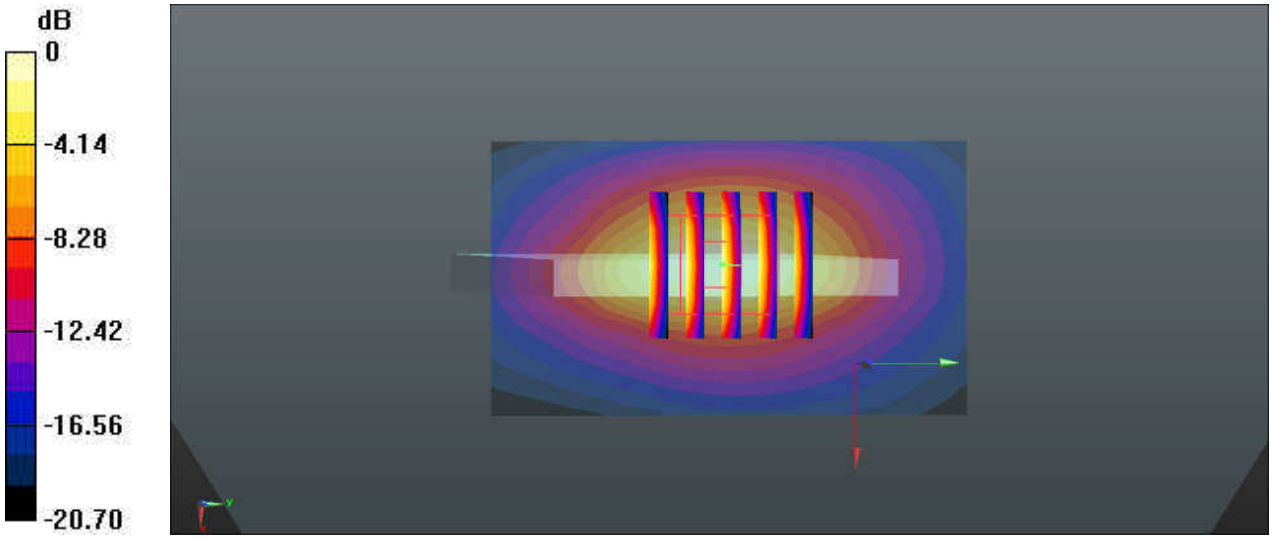
25_WCDMA IV_RMC 12.2Kbps_Bottom Side _10mm_Ch1513

Communication System: UID 0, WCDMA (0); Frequency: 1752.6 MHz;Duty Cycle: 1:1
Medium: MSL_1750 Medium parameters used: f = 1752.6 MHz; σ = 1.524 S/m; ε_r = 54.068; ρ = 1000kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.41, 7.41, 7.41); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch1513/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.953 W/kg

Ch1513/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.619 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 1.18 W/kg
SAR(1 g) = 0.705 W/kg; SAR(10 g) = 0.371 W/kg
Maximum value of SAR (measured) = 0.881 W/kg



0 dB = 0.953 W/kg = -0.21 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.11

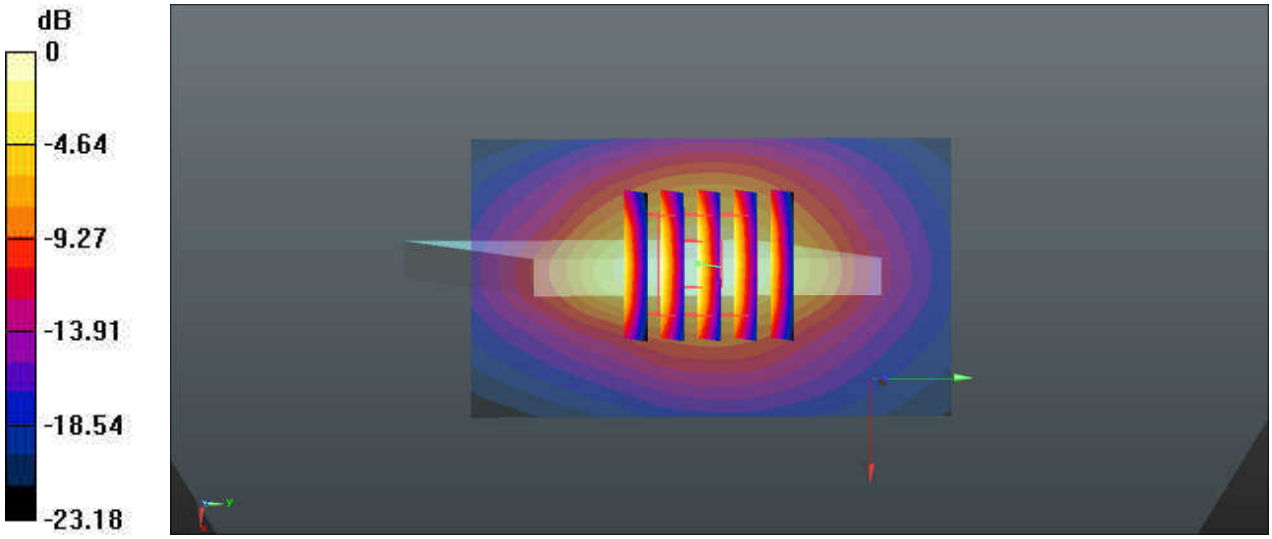
26_WCDMA II_RMC 12.2Kbps_Bottom Side_10mm_Ch9538

Communication System: UID 0, WCDMA (0); Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900 Medium parameters used: f = 1907.6 MHz; σ = 1.534 S/m; ε_r = 51.553; ρ = 1000kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.07, 7.07, 7.07); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch9538/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 1.22 W/kg

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.799 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.57 W/kg
SAR(1 g) = 0.895 W/kg; SAR(10 g) = 0.458 W/kg
Maximum value of SAR (measured) = 1.13 W/kg



0 dB = 1.22 W/kg = 0.86 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.9

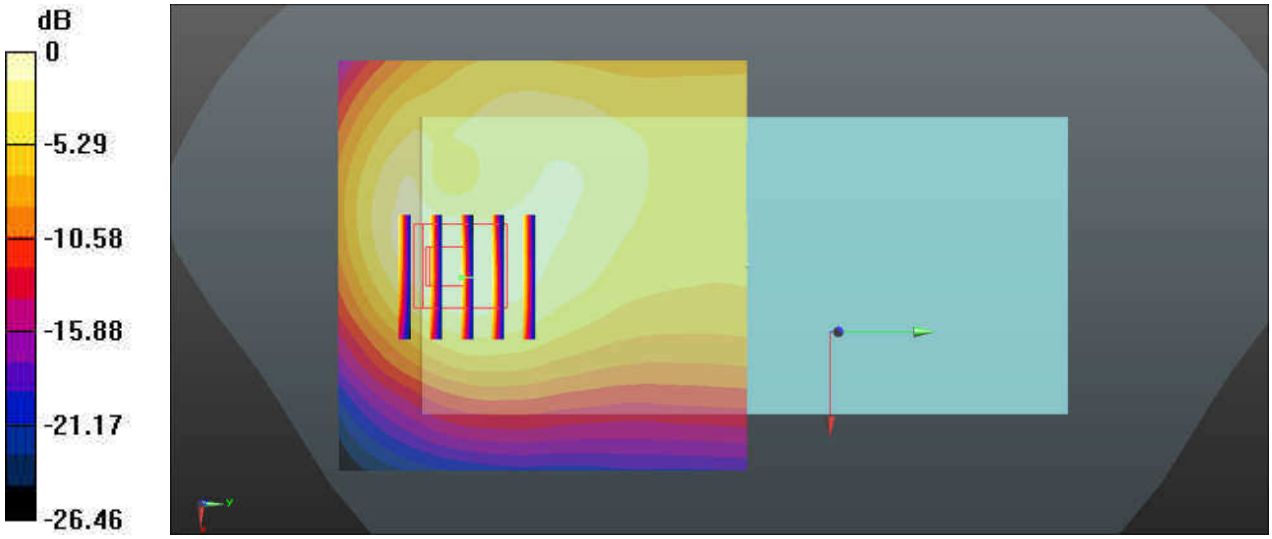
27_CDMA2000 BC0_RTAP 153.6Kbps_Back_10mm_Ch384

Communication System: UID 0, CDMA (0); Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: MSL_835 Medium parameters used: f = 836.52 MHz; σ = 1.009 S/m; ε_r = 54.312; ρ = 1000kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.03, 9.03, 9.03); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch384/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.408 W/kg

Ch384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.70 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.608 W/kg
SAR(1 g) = 0.342 W/kg; SAR(10 g) = 0.198 W/kg
Maximum value of SAR (measured) = 0.412 W/kg



0 dB = 0.408 W/kg = -3.89 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.9

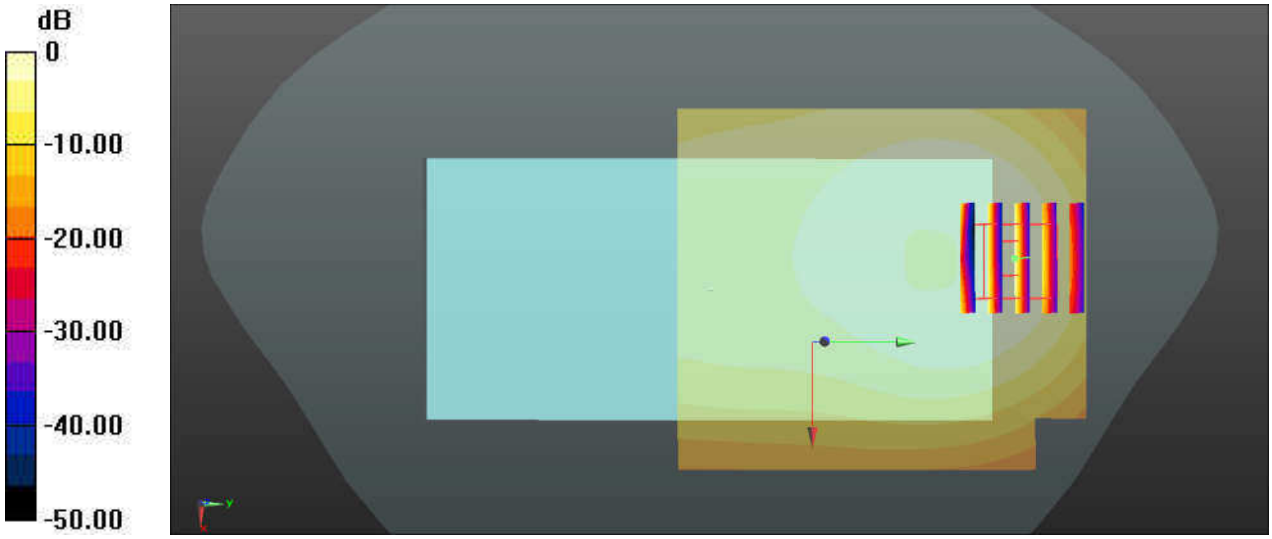
28_LTE Band 12_10M_QPSK_1RB_49Offset_Back_10mm_Ch23095

Communication System: UID 0, LTE-FDD (0); Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: MSL_750 Medium parameters used: f = 707.5 MHz; σ = 0.947 S/m; ε_r = 57.398; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.31, 9.31, 9.31); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch23095/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.301 W/kg

Ch23095/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.91 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.490 W/kg
SAR(1 g) = 0.278 W/kg; SAR(10 g) = 0.160 W/kg
Maximum value of SAR (measured) = 0.331 W/kg



0 dB = 0.301 W/kg = -5.21 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.9

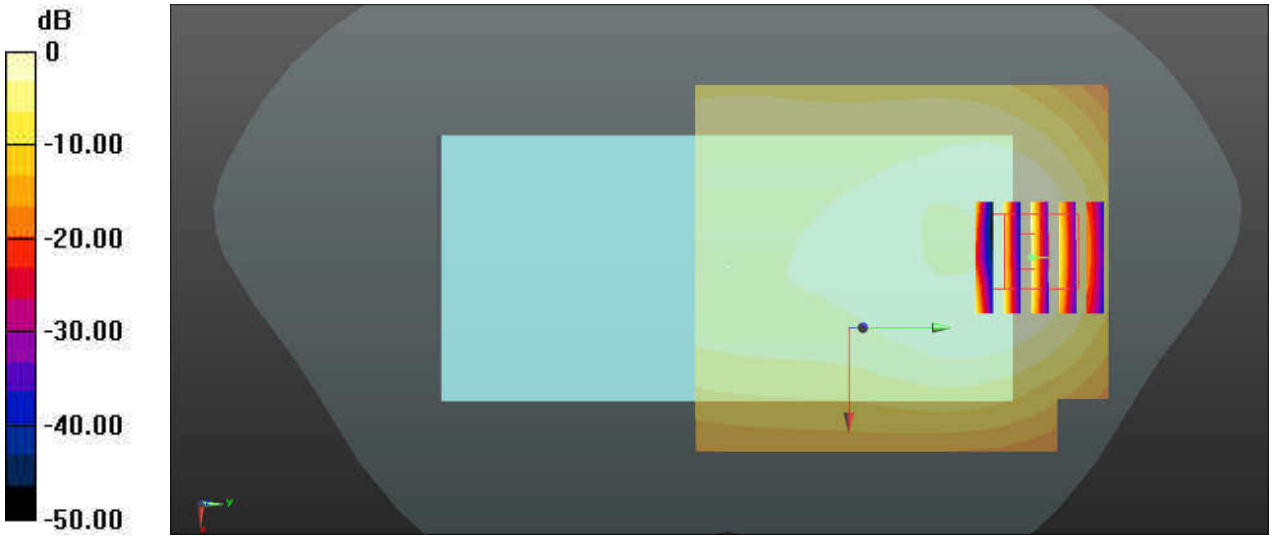
29_LTE Band 5_10M_QPSK_1RB_49Offset_Back_10mm_Ch20525

Communication System: UID 0, LTE-FDD (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: MSL_835 Medium parameters used: f = 836.5 MHz; σ = 1.008 S/m; ε_r = 54.316; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.03, 9.03, 9.03); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch20525/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.261 W/kg

Ch20525/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.02 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.411 W/kg
SAR(1 g) = 0.238 W/kg; SAR(10 g) = 0.134 W/kg
Maximum value of SAR (measured) = 0.290 W/kg



0 dB = 0.261 W/kg = -5.83 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.10

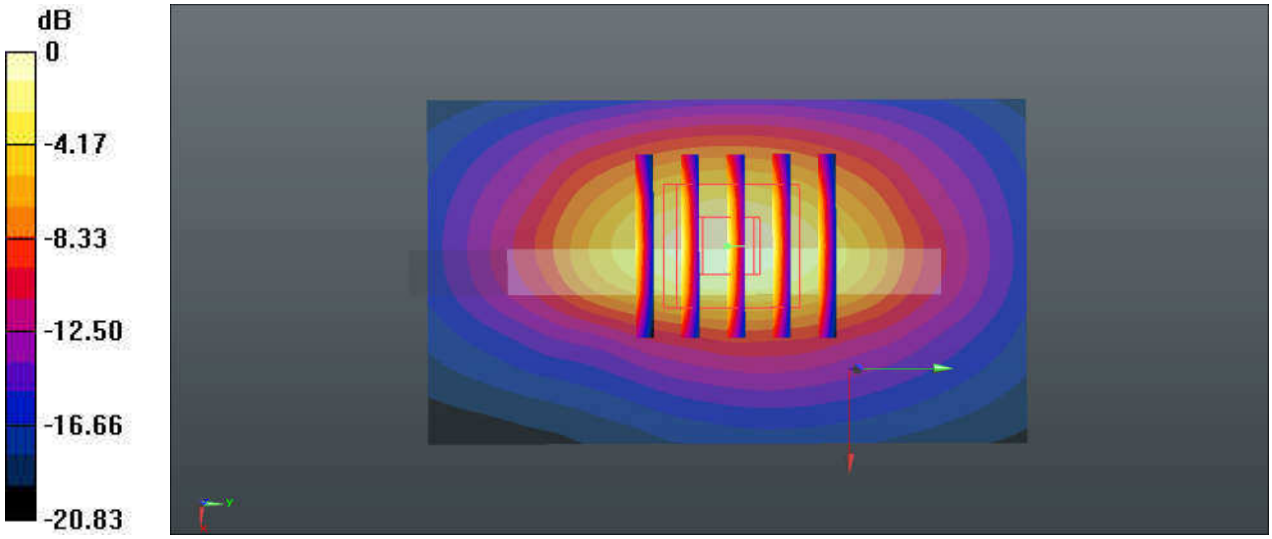
30_LTE Band 4_20M_QPSK_50RB_0Offset_Bottom Side_10mm_Ch20175

Communication System: UID 0, LTE-FDD (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: MSL_1750 Medium parameters used: f = 1732.5 MHz; σ = 1.504 S/m; ε_r = 54.131; ρ = 1000kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.41, 7.41, 7.41); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch20175/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.910 W/kg

Ch20175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.587 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.653 W/kg; SAR(10 g) = 0.346 W/kg
Maximum value of SAR (measured) = 0.819 W/kg



0 dB = 0.910 W/kg = -0.41 dBW/kg

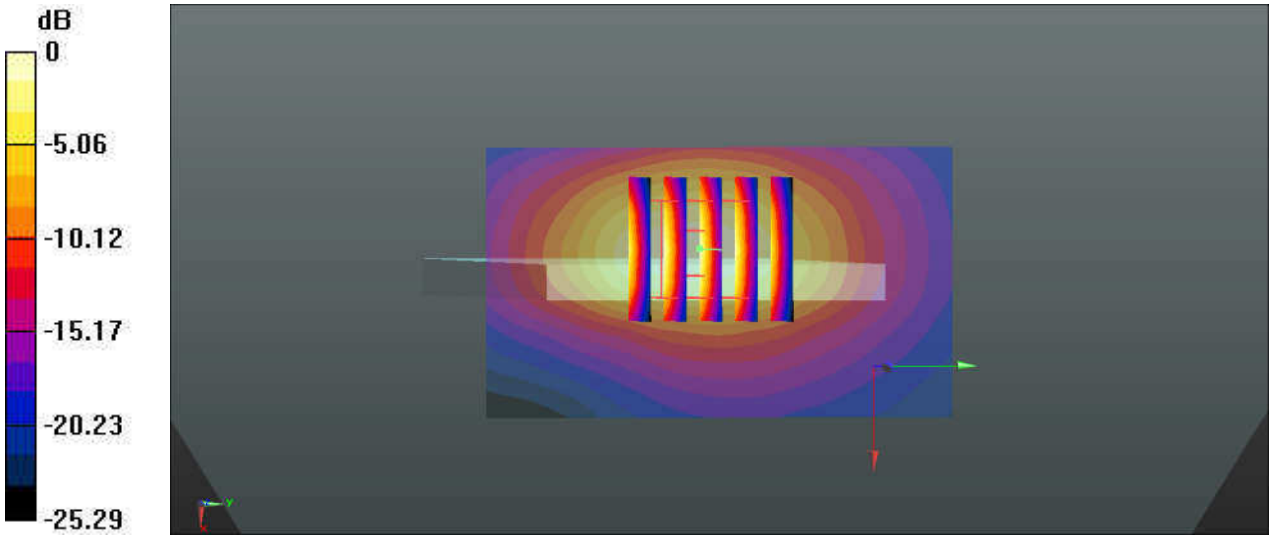
31_LTE Band 2_20M_QPSK_100RB_0Offset_Bottom Side_10mm_Ch18700

Communication System: UID 0, LTE-FDD (0); Frequency: 1860 MHz;Duty Cycle: 1:1
Medium: MSL_1900 Medium parameters used: f = 1860 MHz; σ = 1.481 S/m; ε_r = 51.706; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.07, 7.07, 7.07); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch18700/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.898 W/kg

Ch18700/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 5.225 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.668 W/kg; SAR(10 g) = 0.353 W/kg
Maximum value of SAR (measured) = 0.829 W/kg



0 dB = 0.898 W/kg = -0.47 dBW/kg

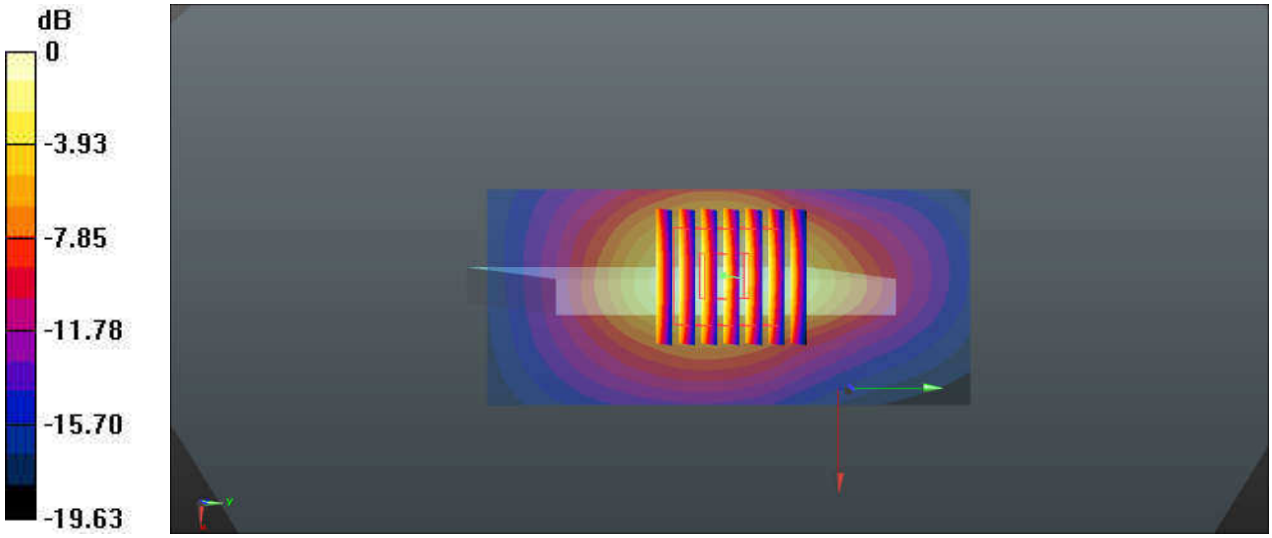
32_LTE Band 7 _20M_QPSK_100RB_0Offset_Bottom Side_10mm_Ch21350

Communication System: UID 0, LTE-FDD (0); Frequency: 2560 MHz;Duty Cycle: 1:1
Medium: MSL_2600 Medium parameters used: f = 2560 MHz; σ = 2.162 S/m; ε_r = 53.067; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(6.7, 6.7, 6.7); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2018.12.3
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch21350/Area Scan (41x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.11 W/kg

Ch21350/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 10.52 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.64 W/kg
SAR(1 g) = 0.819 W/kg; SAR(10 g) = 0.396 W/kg
Maximum value of SAR (measured) = 1.05 W/kg



0 dB = 1.11 W/kg = 0.45 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.15

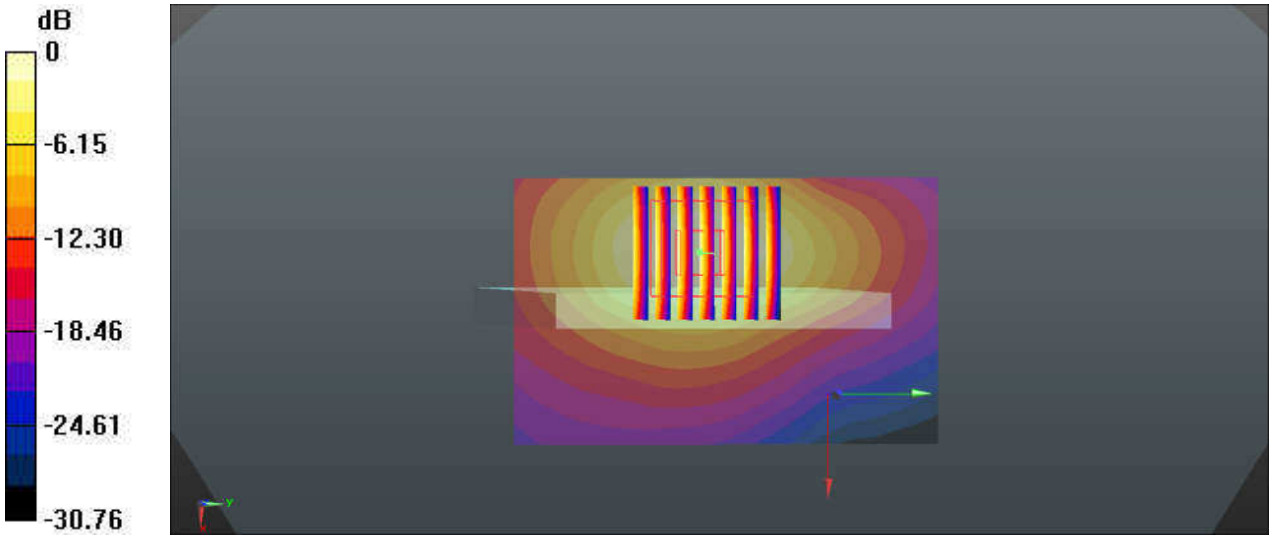
33_LTE Band 38 _20M_QPSK_50RB_0Offset_Bottom Side_10mm_Ch38000

Communication System: UID 0, LTE-TDD (0); Frequency: 2595 MHz;Duty Cycle: 1:1.59
Medium: MSL_2600 Medium parameters used: f = 2595 MHz; σ = 2.21 S/m; ε_r = 52.93; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(6.7, 6.7, 6.7); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2018.12.3
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch38000/Area Scan (51x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.977 W/kg

Ch38000/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.79 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.50 W/kg
SAR(1 g) = 0.726 W/kg; SAR(10 g) = 0.347 W/kg
Maximum value of SAR (measured) = 0.946 W/kg



0 dB = 0.977 W/kg = -0.10 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.13

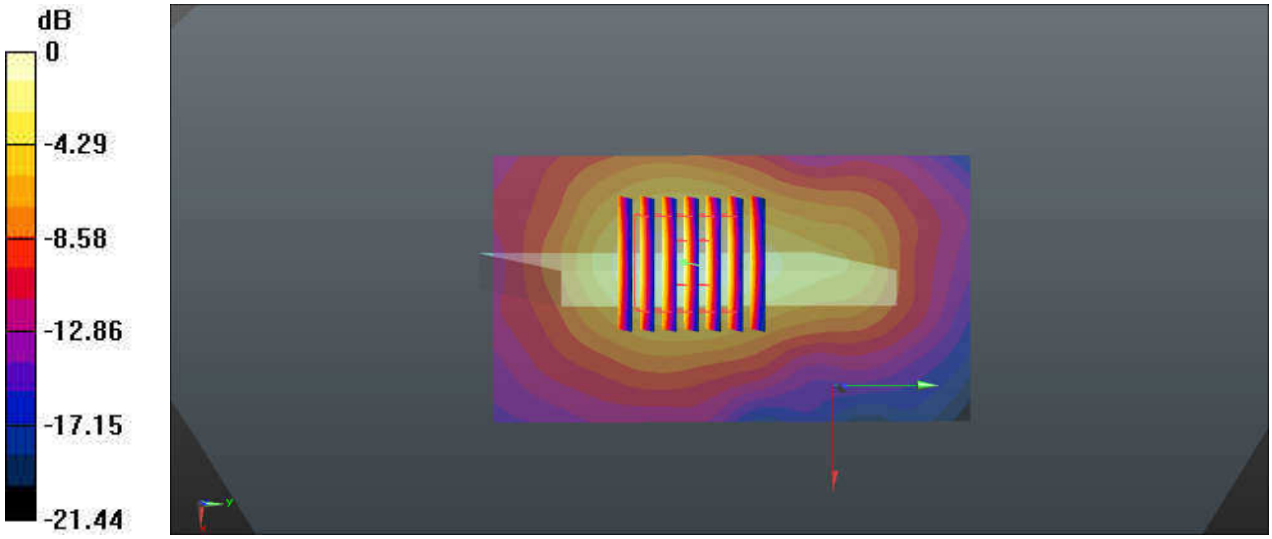
34_WLAN 2.4GHz _802.11b 1Mbps_Top Side_Ant 1_10mm_Ch1

Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2412 MHz; σ = 1.958 S/m; ε_r = 53.591; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.02, 7.02, 7.02); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch1/Area Scan (51x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.158 W/kg

Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.921 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.233 W/kg
SAR(1 g) = 0.125 W/kg; SAR(10 g) = 0.065 W/kg
Maximum value of SAR (measured) = 0.158 W/kg



0 dB = 0.158 W/kg = -8.01 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.13

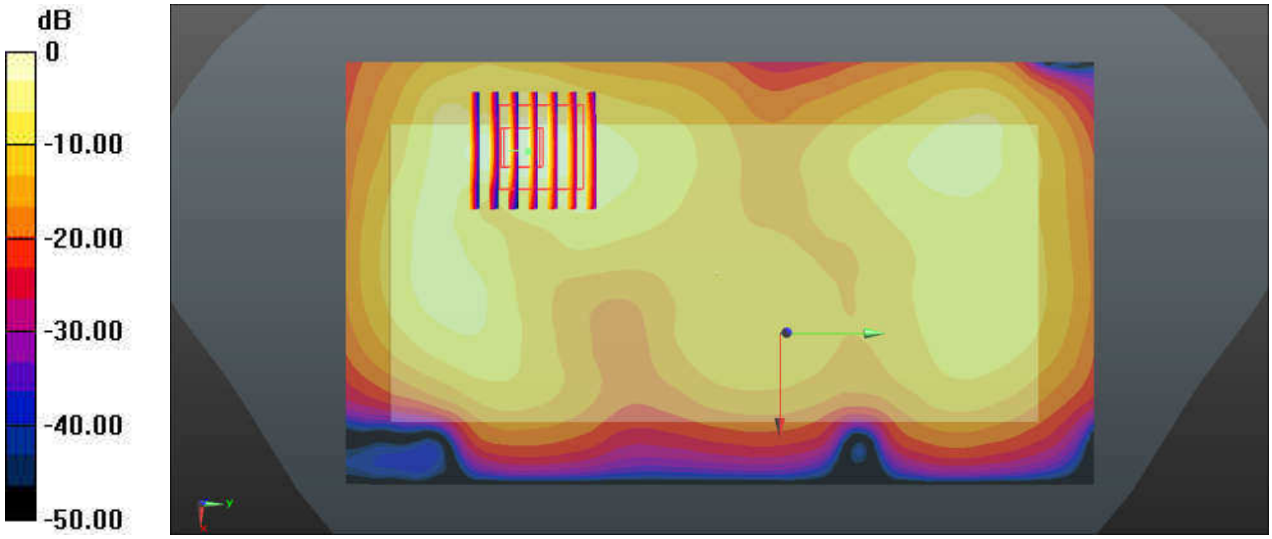
35_WLAN 2.4GHz _802.11b 1Mbps_Back_Ant 1+2_10mm_Ch1

Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2412 MHz; σ = 1.958 S/m; ε_r = 53.591; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.02, 7.02, 7.02); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch1/Area Scan (91x161x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.597 W/kg

Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.524 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.461 W/kg; SAR(10 g) = 0.167 W/kg
Maximum value of SAR (measured) = 0.691 W/kg



0 dB = 0.597 W/kg = -2.24 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

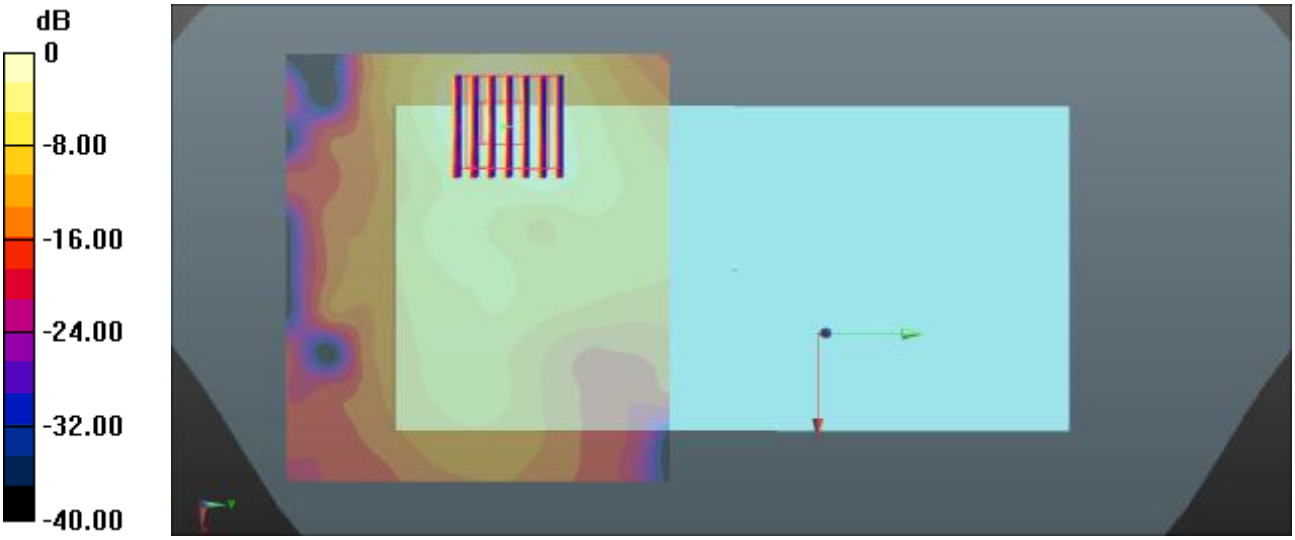
36_WLAN5.2GHz_802.11a 6Mbps_Back_10mm_Ant 2_Ch48

Communication System: UID 0, 802.11a (0); Frequency: 5240 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5240 MHz; σ = 5.484 S/m; ε_r = 47.566; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.4, 4.4, 4.4); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch48/Area Scan (101x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.33 W/kg

Ch48/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 3.141 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 2.29 W/kg
SAR(1 g) = 0.599 W/kg; SAR(10 g) = 0.205 W/kg
Maximum value of SAR (measured) = 1.42 W/kg



0 dB = 1.33 W/kg = 1.24 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

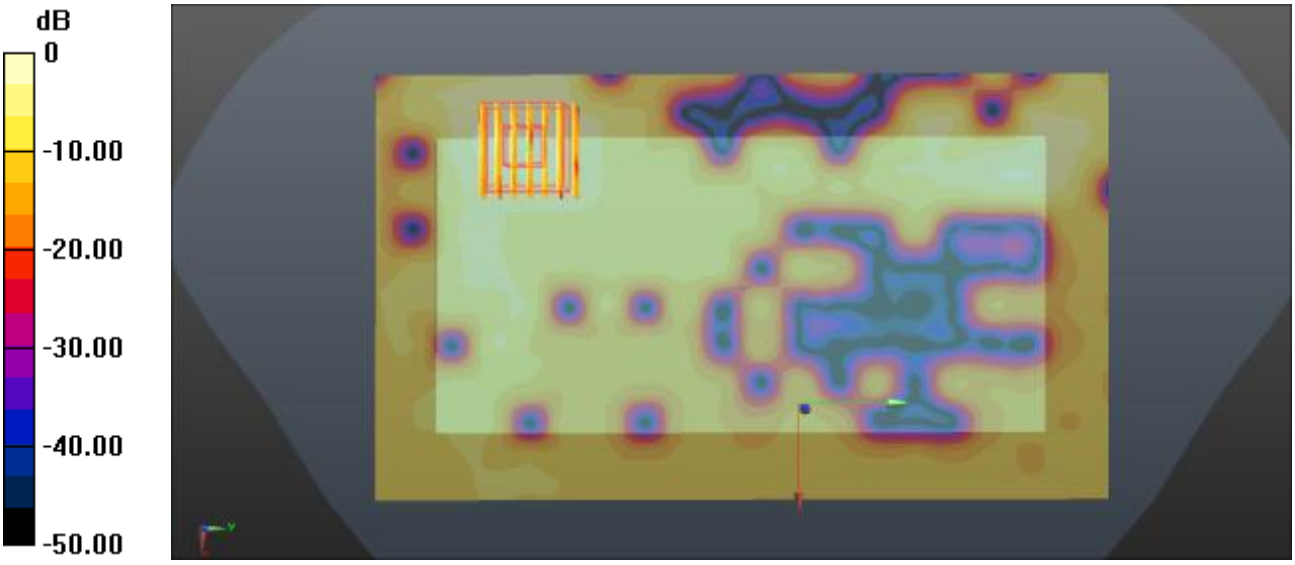
37_WLAN5.2GHz_802.11a 6Mbps_Back_10mm_Ant 1+2_Ch44

Communication System: UID 0, 802.11a (0); Frequency: 5220 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5220 MHz; σ = 5.459 S/m; ε_r = 47.608; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.4, 4.4, 4.4); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch44/Area Scan (111x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.606 W/kg

Ch44/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 12.41 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.976 W/kg
SAR(1 g) = 0.260 W/kg; SAR(10 g) = 0.086 W/kg
Maximum value of SAR (measured) = 0.621 W/kg



0 dB = 0.606 W/kg = -2.18 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

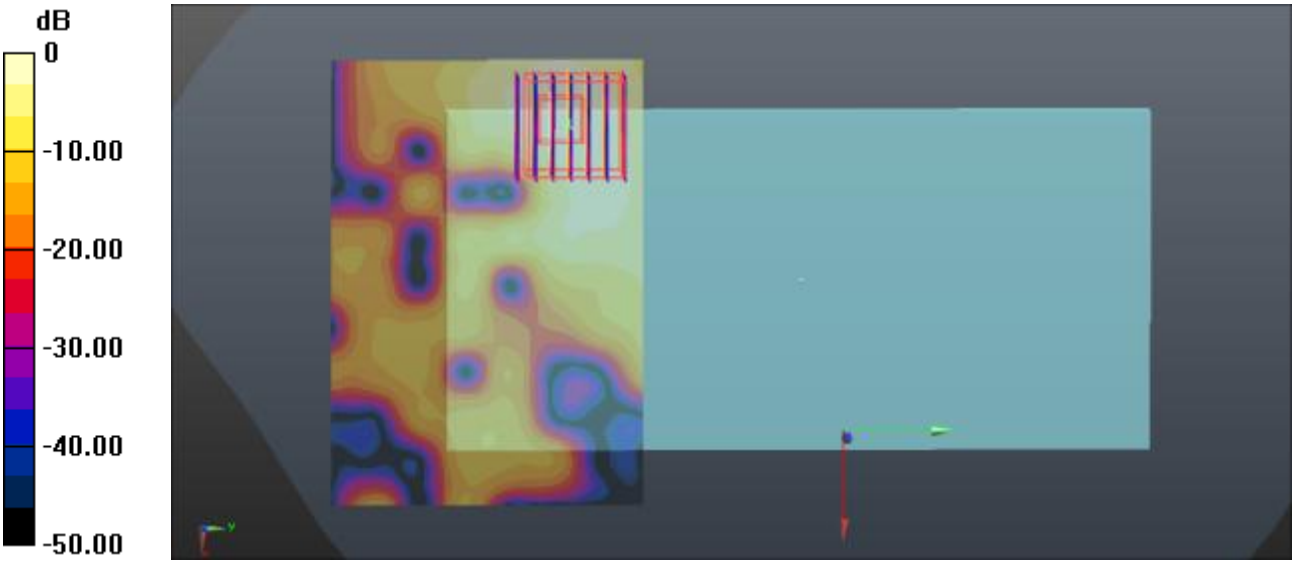
38_WLAN5.8GHz_802.11a 6Mbps_Back_10mm_Ant 2_Ch161

Communication System: UID 0, 802.11a (0); Frequency: 5805 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5805 MHz; σ = 6.27 S/m; ε_r = 46.575; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.31, 4.31, 4.31); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch161/Area Scan (101x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.379 W/kg

Ch161/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 9.193 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.684 W/kg
SAR(1 g) = 0.161 W/kg; SAR(10 g) = 0.055 W/kg
Maximum value of SAR (measured) = 0.412 W/kg



0 dB = 0.379 W/kg = -4.21 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

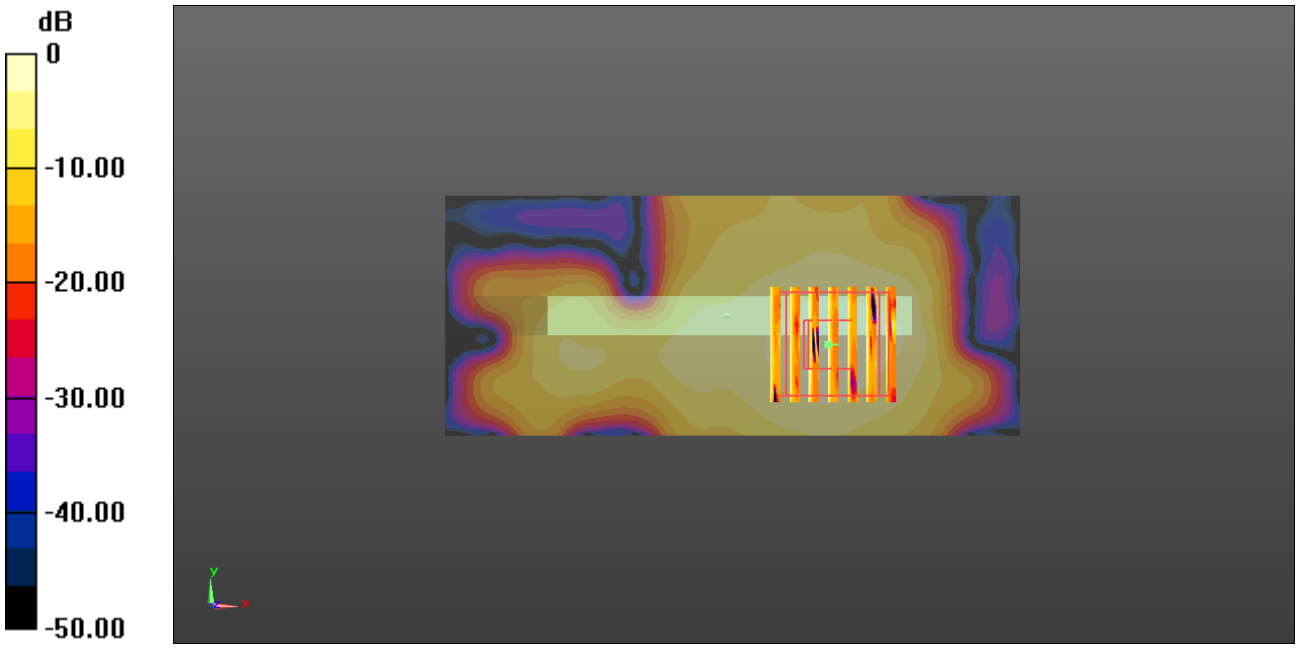
39_WLAN5.8GHz_802.11a 6Mbps_Top Side_10mm_Ant 1+2_Ch157

Communication System: UID 0, WIFI (0); Frequency: 5785 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5785 MHz; σ = 6.212 S/m; ε_r = 46.613; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.31, 4.31, 4.31); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch157/Area Scan (51x121x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.370 W/kg

Ch157/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 8.423 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.650 W/kg
SAR(1 g) = 0.120 W/kg; SAR(10 g) = 0.040 W/kg
Maximum value of SAR (measured) = 0.359 W/kg



0 dB = 0.359 W/kg = -4.45 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.13

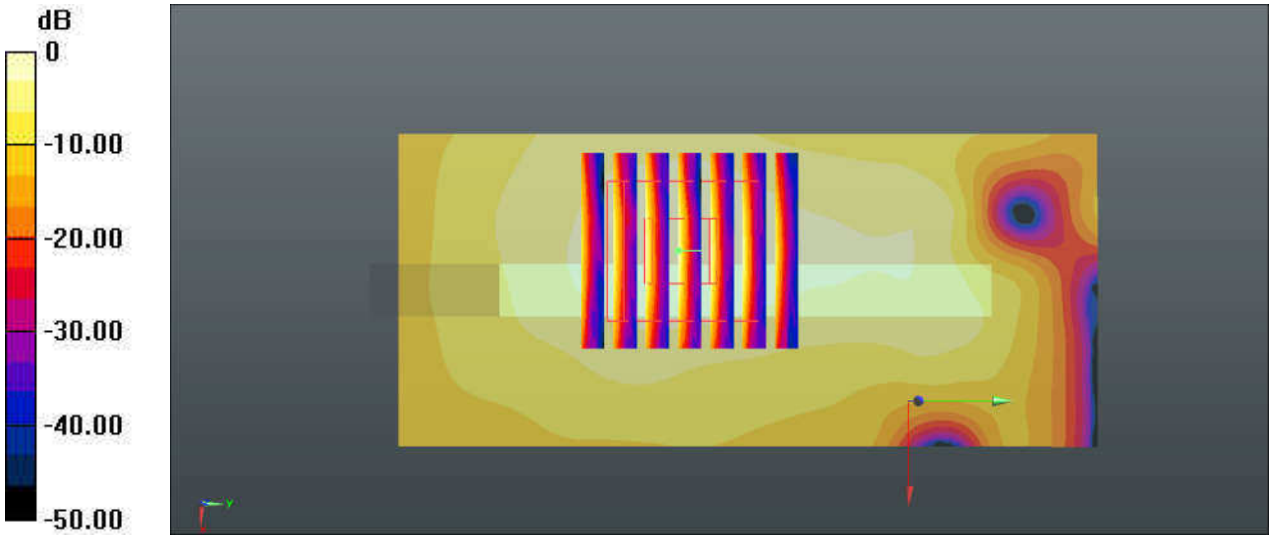
40_ Bluetooth _1Mbps_Top Side_10mm_Ch78

Communication System: UID 0, Bluetooth (0); Frequency: 2480 MHz;Duty Cycle: 1:1.30
Medium: MSL_2450 Medium parameters used: f = 2480 MHz; σ = 2.048 S/m; ε_r = 53.347; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.02, 7.02, 7.02); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch78/Area Scan (41x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0618 W/kg

Ch78/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.500 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.0780 W/kg
SAR(1 g) = 0.040 W/kg; SAR(10 g) = 0.021 W/kg
Maximum value of SAR (measured) = 0.0631 W/kg



0 dB = 0.0618 W/kg = -12.09 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.9

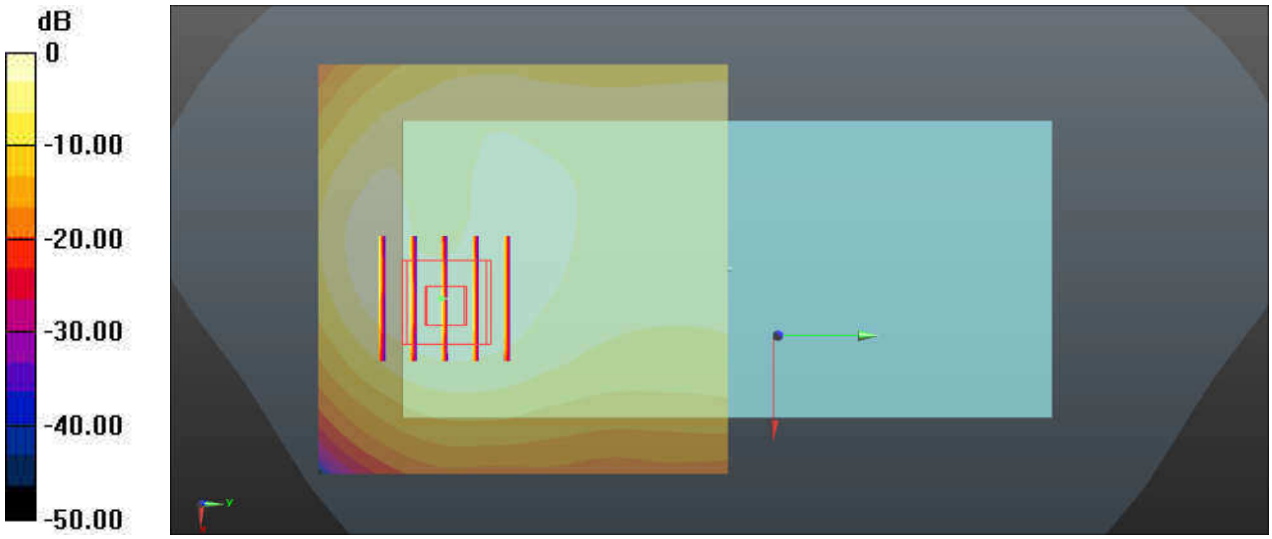
41_GSM850_GPRS 4 Tx slots_Back_10mm_Ch251

Communication System: UID 0, GSM850 (0); Frequency: 848.8 MHz;Duty Cycle: 1:2.08
Medium: MSL_835 Medium parameters used: f = 848.8 MHz; σ = 1.022 S/m; ε_r = 54.224; ρ = 1000kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.03, 9.03, 9.03); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch251/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.505 W/kg

Ch251/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 22.72 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.602 W/kg
SAR(1 g) = 0.331 W/kg; SAR(10 g) = 0.196 W/kg
Maximum value of SAR (measured) = 0.492 W/kg



0 dB = 0.505 W/kg = -2.97 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.11

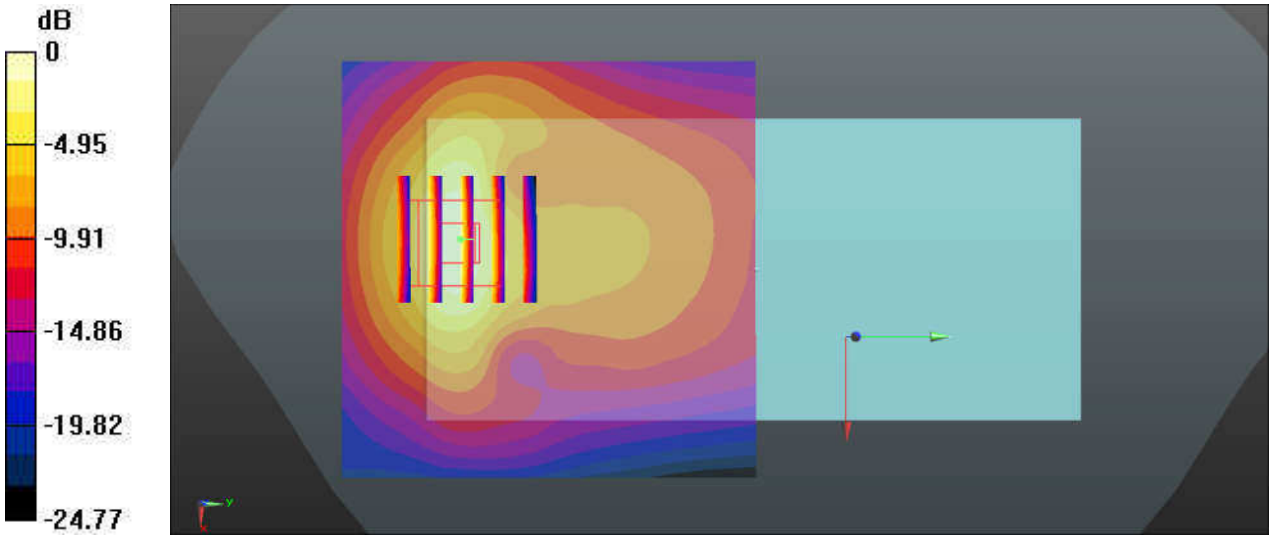
42_GSM1900_GPRS 4 Tx slots_Back_10mm_Ch661

Communication System: UID 0, PCS (0); Frequency: 1880 MHz;Duty Cycle: 1:2.08
Medium: MSL_1900 Medium parameters used: f = 1880 MHz; σ = 1.502 S/m; ε_r = 51.644; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.07, 7.07, 7.07); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch661/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.518 W/kg

Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.340 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.713 W/kg
SAR(1 g) = 0.408 W/kg; SAR(10 g) = 0.217 W/kg
Maximum value of SAR (measured) = 0.513 W/kg



0 dB = 0.518 W/kg = -2.86 dBW/kg

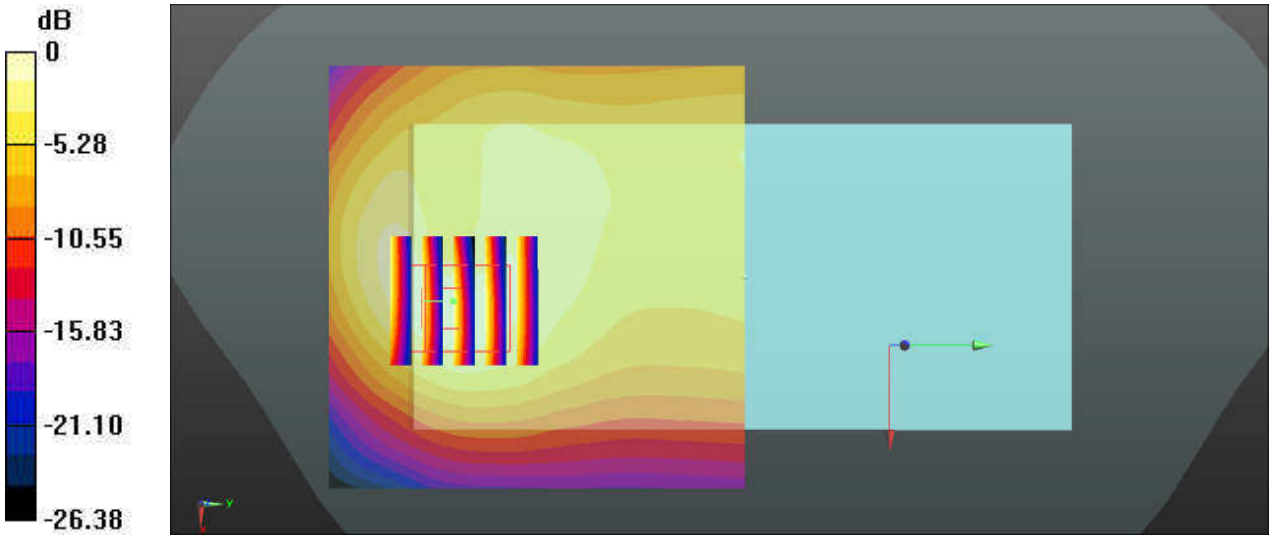
43_WCDMA V_RMC 12.2Kbps_Back_10mm_Ch4182

Communication System: UID 0, WCDMA (0); Frequency: 836.4 MHz;Duty Cycle: 1:1
Medium: MSL_835 Medium parameters used: f = 836.4 MHz; σ = 1.008 S/m; ε_r = 54.317; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.03, 9.03, 9.03); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch4182/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.554 W/kg

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 23.76 V/m; Power Drift = -0.10 dB
Peak SAR (extrapolated) = 0.671 W/kg
SAR(1 g) = 0.364 W/kg; SAR(10 g) = 0.213 W/kg
Maximum value of SAR (measured) = 0.537 W/kg



0 dB = 0.554 W/kg = -2.56 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.10

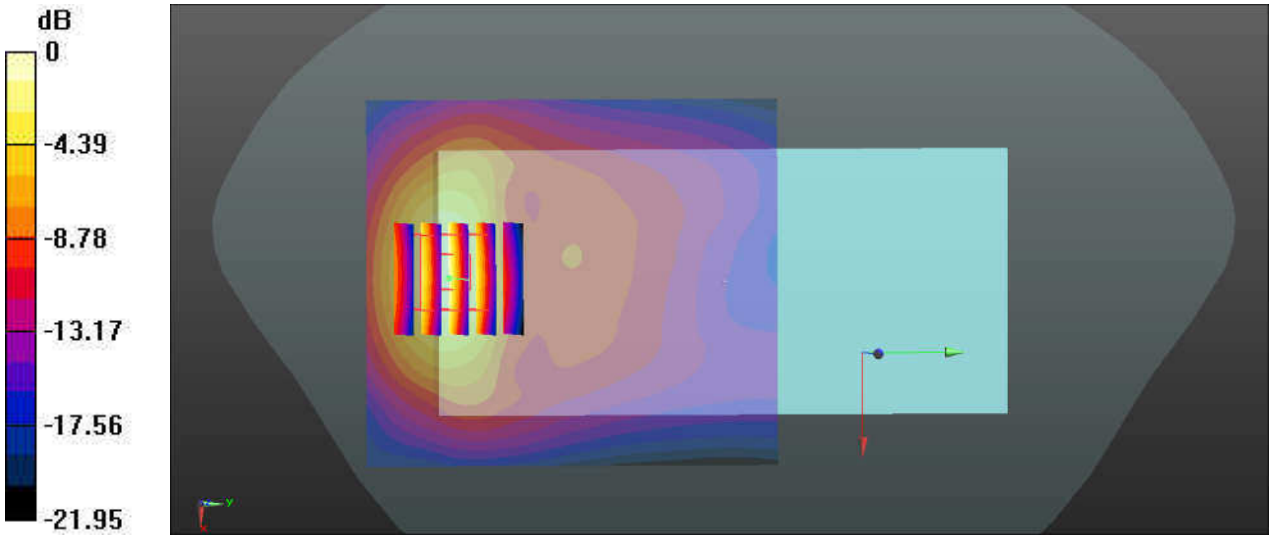
44_WCDMA IV_RMC 12.2Kbps_Back_10mm_Ch1413

Communication System: UID 0, WCDMA (0); Frequency: 1732.6 MHz;Duty Cycle: 1:1
Medium: MSL_1750 Medium parameters used: f = 1732.6 MHz; σ = 1.504 S/m; ε_r = 54.131; ρ = 1000kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.41, 7.41, 7.41); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch1413/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.629 W/kg

Ch1413/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.9550 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.829 W/kg
SAR(1 g) = 0.508 W/kg; SAR(10 g) = 0.280 W/kg
Maximum value of SAR (measured) = 0.625 W/kg



0 dB = 0.629 W/kg = -2.01 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.11

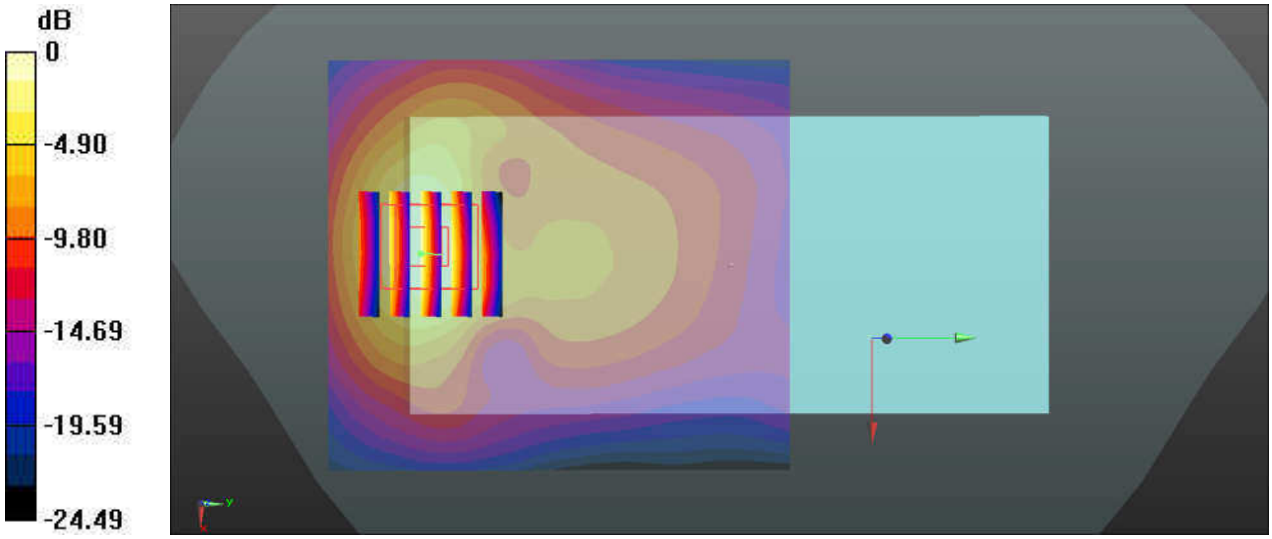
45_WCDMA II_RMC 12.2Kbps_Back_10mm_Ch9538

Communication System: UID 0, WCDMA (0); Frequency: 1907.6 MHz;Duty Cycle: 1:1
Medium: MSL_1900 Medium parameters used: f = 1907.6 MHz; σ = 1.534 S/m; ε_r = 51.553; ρ = 1000kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.07, 7.07, 7.07); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch9538/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.642 W/kg

Ch9538/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 0.9810 V/m; Power Drift = 0.11 dB
Peak SAR (extrapolated) = 0.901 W/kg
SAR(1 g) = 0.522 W/kg; SAR(10 g) = 0.277 W/kg
Maximum value of SAR (measured) = 0.646 W/kg



0 dB = 0.642 W/kg = -1.92 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.9

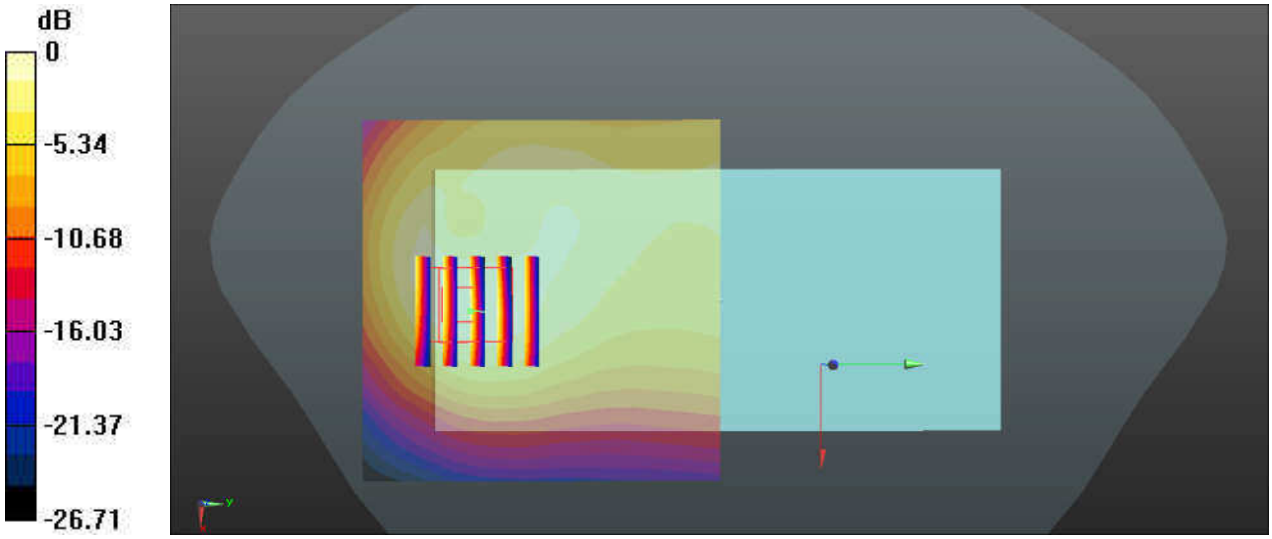
46_CDMA2000 BC0_RC3 SO32 (F+SCH) _Back_10mm_Ch384

Communication System: UID 0, CDMA (0); Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: MSL_835 Medium parameters used: f = 836.52 MHz; σ = 1.009 S/m; ε_r = 54.312; ρ = 1000kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.03, 9.03, 9.03); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch384/Area Scan (71x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.363 W/kg

Ch384/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.85 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.536 W/kg
SAR(1 g) = 0.303 W/kg; SAR(10 g) = 0.175 W/kg
Maximum value of SAR (measured) = 0.368 W/kg



0 dB = 0.363 W/kg = -4.40 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.9

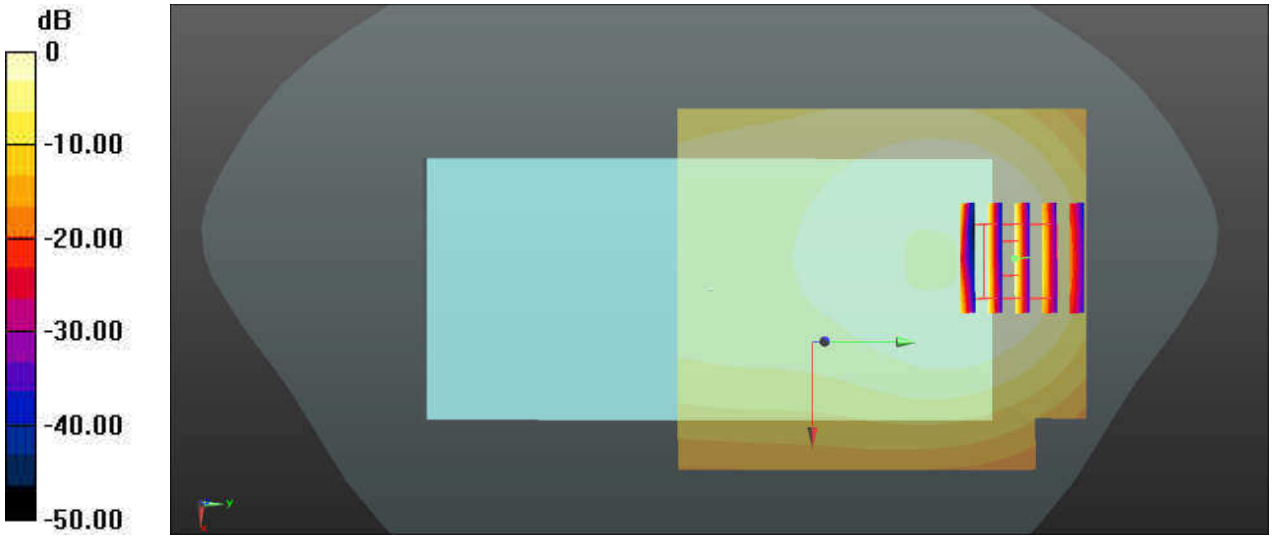
47_LTE Band 12_10M_QPSK_1RB_49Offset_Back_10mm_Ch23095

Communication System: UID 0, LTE-FDD (0); Frequency: 707.5 MHz;Duty Cycle: 1:1
Medium: MSL_750 Medium parameters used: f = 707.5 MHz; σ = 0.947 S/m; ε_r = 57.398; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.31, 9.31, 9.31); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch23095/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.301 W/kg

Ch23095/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.91 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 0.490 W/kg
SAR(1 g) = 0.278 W/kg; SAR(10 g) = 0.160 W/kg
Maximum value of SAR (measured) = 0.331 W/kg



0 dB = 0.301 W/kg = -5.21 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.9

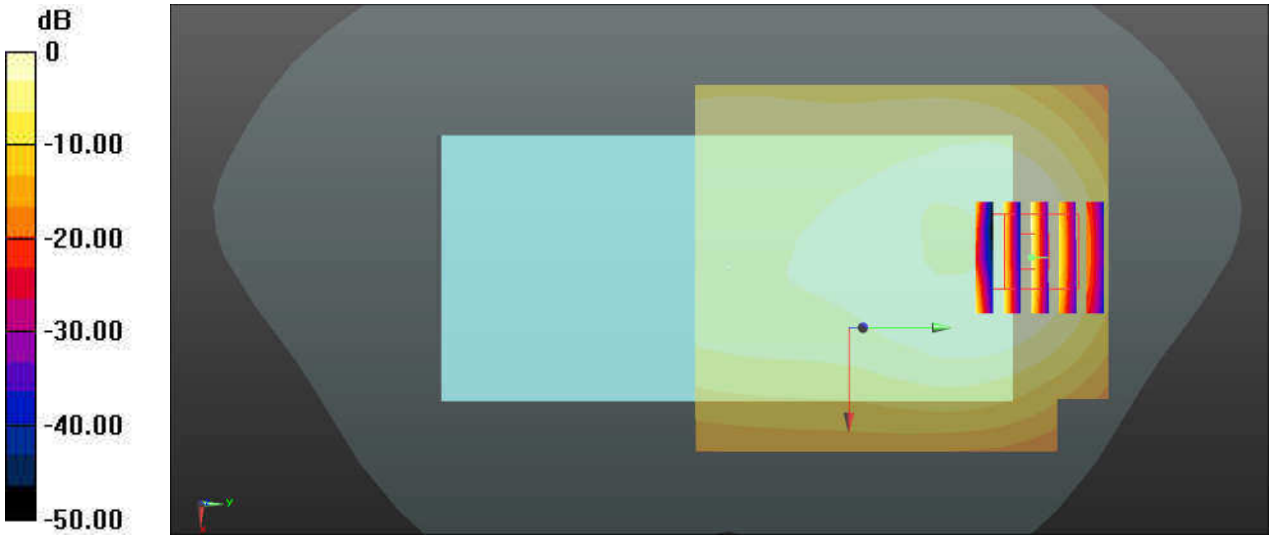
48_LTE Band 5_10M_QPSK_1RB_49Offset_Back_10mm_Ch20525

Communication System: UID 0, LTE-FDD (0); Frequency: 836.5 MHz;Duty Cycle: 1:1
Medium: MSL_835 Medium parameters used: f = 836.5 MHz; σ = 1.008 S/m; ε_r = 54.316; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(9.03, 9.03, 9.03); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM1; Type: SAM; Serial: TP-1842
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch20525/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.261 W/kg

Ch20525/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 11.02 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.411 W/kg
SAR(1 g) = 0.238 W/kg; SAR(10 g) = 0.134 W/kg
Maximum value of SAR (measured) = 0.290 W/kg



0 dB = 0.261 W/kg = -5.83 dBW/kg

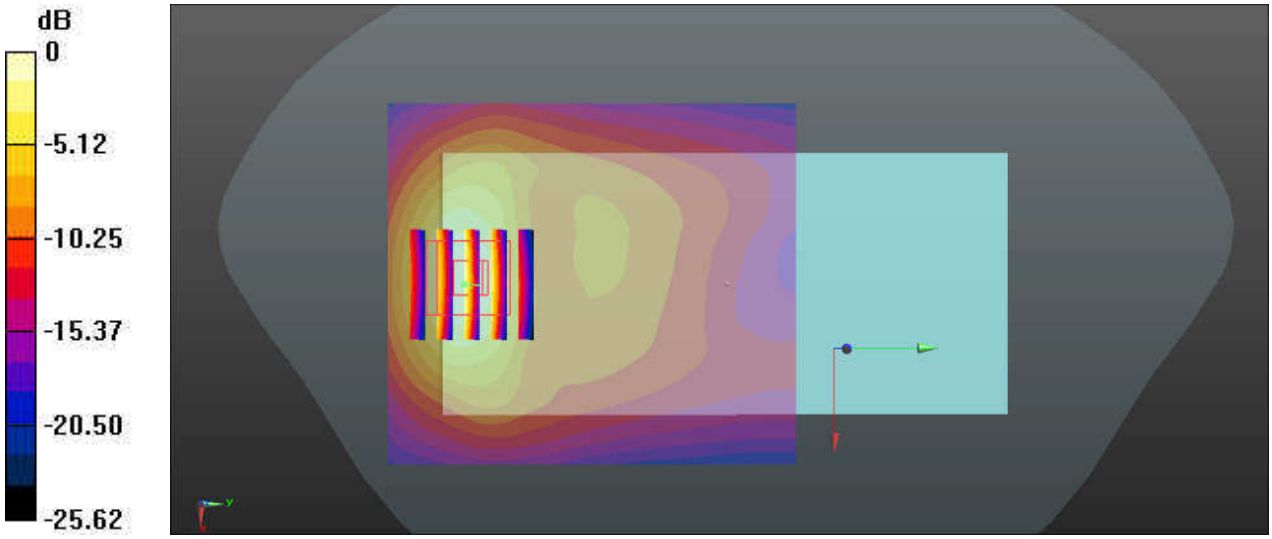
49_LTE Band 4_20M_QPSK_1RB_0Offset_Back_10mm_Ch20175

Communication System: UID 0, LTE-FDD (0); Frequency: 1732.5 MHz;Duty Cycle: 1:1
Medium: MSL_1750 Medium parameters used: f = 1732.5 MHz; σ = 1.504 S/m; ε_r = 54.131; ρ = 1000kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.41, 7.41, 7.41); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch20175/Area Scan (71x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.464 W/kg

Ch20175/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 2.511 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.617 W/kg
SAR(1 g) = 0.381 W/kg; SAR(10 g) = 0.212 W/kg
Maximum value of SAR (measured) = 0.464 W/kg



0 dB = 0.464 W/kg = -3.33 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.11

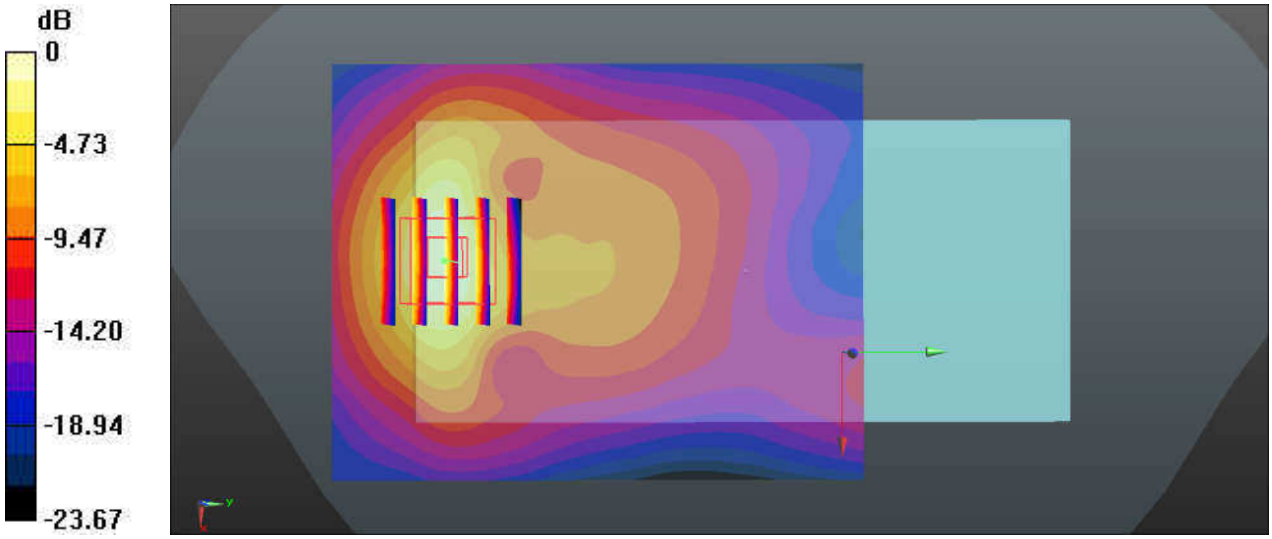
50_LTE Band 2_20M_QPSK_50RB_0Offset_Back_10mm_Ch18700

Communication System: UID 0, LTE-FDD (0); Frequency: 1860 MHz;Duty Cycle: 1:1
Medium: MSL_1900 Medium parameters used: f = 1860 MHz; σ = 1.481 S/m; ε_r = 51.706; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.8 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.07, 7.07, 7.07); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch18700/Area Scan (71x91x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.442 W/kg

Ch18700/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 1.907 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 0.583 W/kg
SAR(1 g) = 0.344 W/kg; SAR(10 g) = 0.186 W/kg
Maximum value of SAR (measured) = 0.429 W/kg



0 dB = 0.442 W/kg = -3.55 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.15

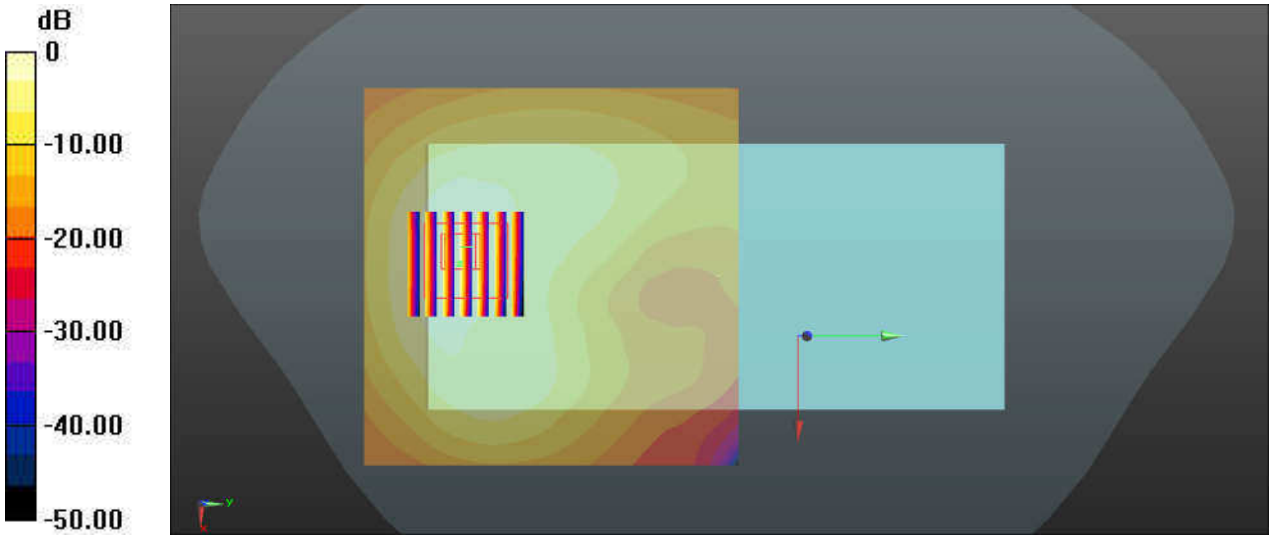
51_LTE Band 7 _20M_QPSK_50RB_0Offset_Back_10mm_Ch21350

Communication System: UID 0, LTE-FDD (0); Frequency: 2560 MHz;Duty Cycle: 1:1
Medium: MSL_2600 Medium parameters used: f = 2560 MHz; σ = 2.162 S/m; ε_r = 53.067; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(6.7, 6.7, 6.7); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2018.12.3
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch21350/Area Scan (91x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.509 W/kg

Ch21350/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.059 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.776 W/kg
SAR(1 g) = 0.404 W/kg; SAR(10 g) = 0.215 W/kg
Maximum value of SAR (measured) = 0.510 W/kg



0 dB = 0.509 W/kg = -2.93 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.15

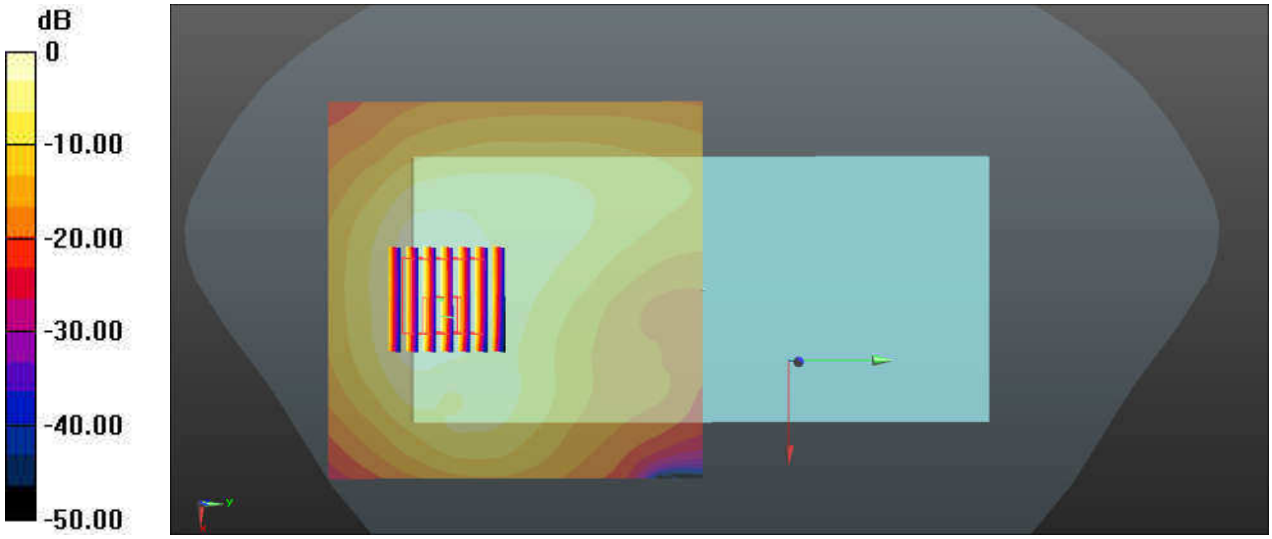
52_LTE Band 38 _20M_QPSK_1RB_0Offset_Back_10mm_Ch38000

Communication System: UID 0, LTE-TDD (0); Frequency: 2595 MHz;Duty Cycle: 1:1.59
Medium: MSL_2600 Medium parameters used: f = 2595 MHz; σ = 2.21 S/m; ε_r = 52.93; ρ = 1000 kg/m^3
Ambient Temperature：23.2 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(6.7, 6.7, 6.7); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1338; Calibrated: 2018.12.3
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch38000/Area Scan (91x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.698 W/kg

Ch38000/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 0.857 W/kg
SAR(1 g) = 0.443 W/kg; SAR(10 g) = 0.234 W/kg
Maximum value of SAR (measured) = 0.697 W/kg



0 dB = 0.698 W/kg = -1.56 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.13

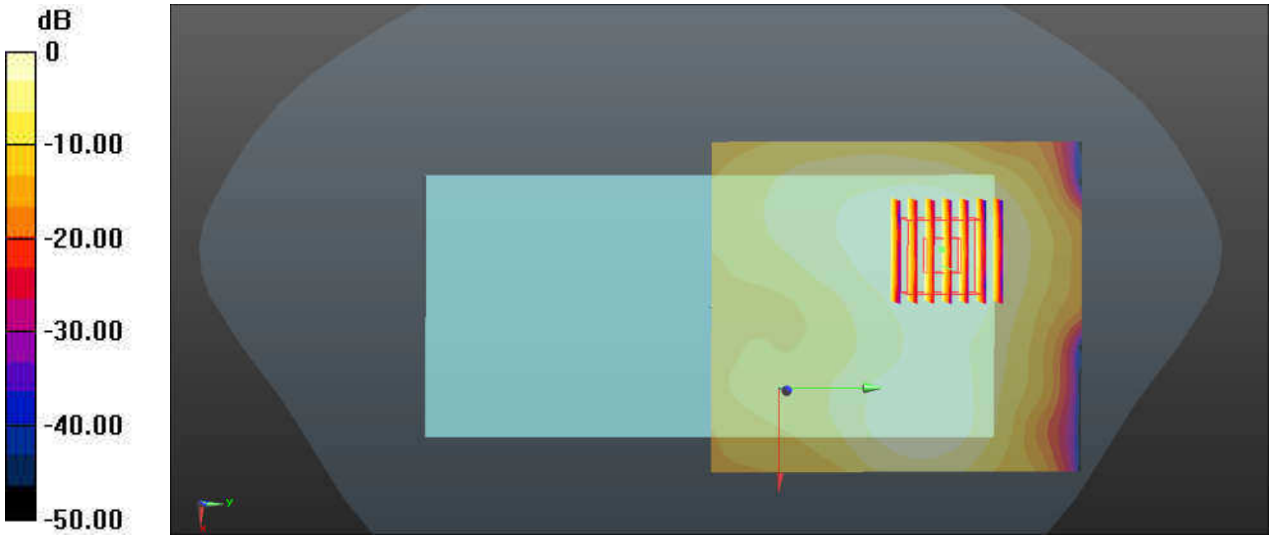
53_WLAN 2.4GHz _802.11b 1Mbps_Front_Ant 1_10mm_Ch1

Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2412 MHz; σ = 1.958 S/m; ε_r = 53.591; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.02, 7.02, 7.02); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch1/Area Scan (81x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.103 W/kg

Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 3.186 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.147 W/kg
SAR(1 g) = 0.085 W/kg; SAR(10 g) = 0.048 W/kg
Maximum value of SAR (measured) = 0.104 W/kg



0 dB = 0.103 W/kg = -9.87 dBW/kg

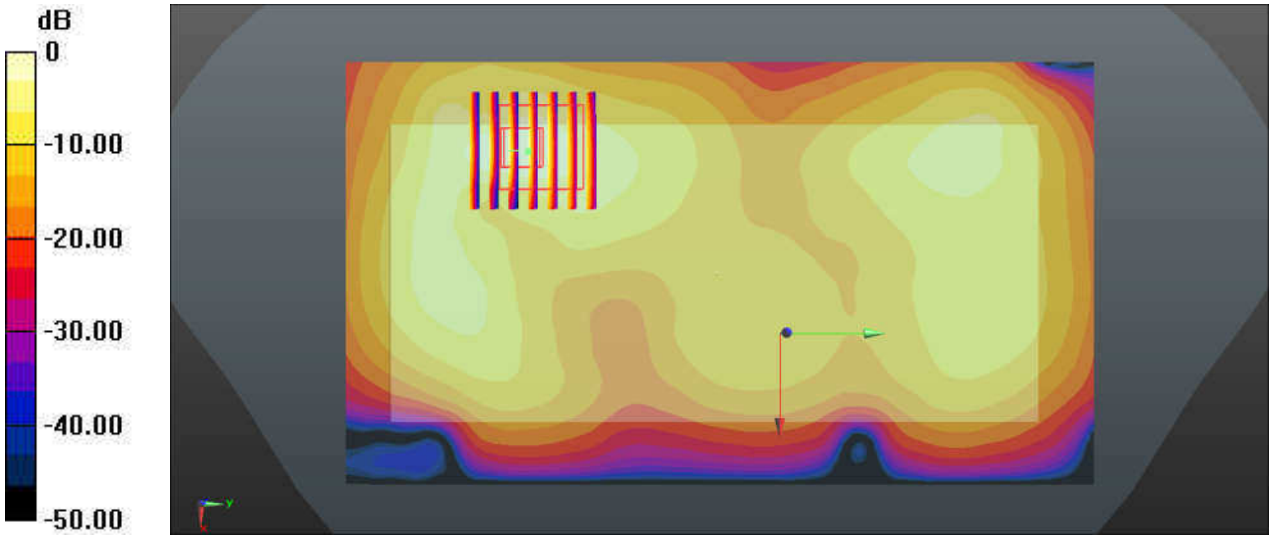
54_WLAN 2.4GHz _802.11b 1Mbps_Back_Ant 1+2_10mm_Ch1

Communication System: UID 0, 802.11b (0); Frequency: 2412 MHz;Duty Cycle: 1:1
Medium: MSL_2450 Medium parameters used: f = 2412 MHz; σ = 1.958 S/m; ε_r = 53.591; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.02, 7.02, 7.02); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch1/Area Scan (91x161x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.597 W/kg

Ch1/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.524 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 1.33 W/kg
SAR(1 g) = 0.461 W/kg; SAR(10 g) = 0.167 W/kg
Maximum value of SAR (measured) = 0.691 W/kg



0 dB = 0.597 W/kg = -2.24 dBW/kg

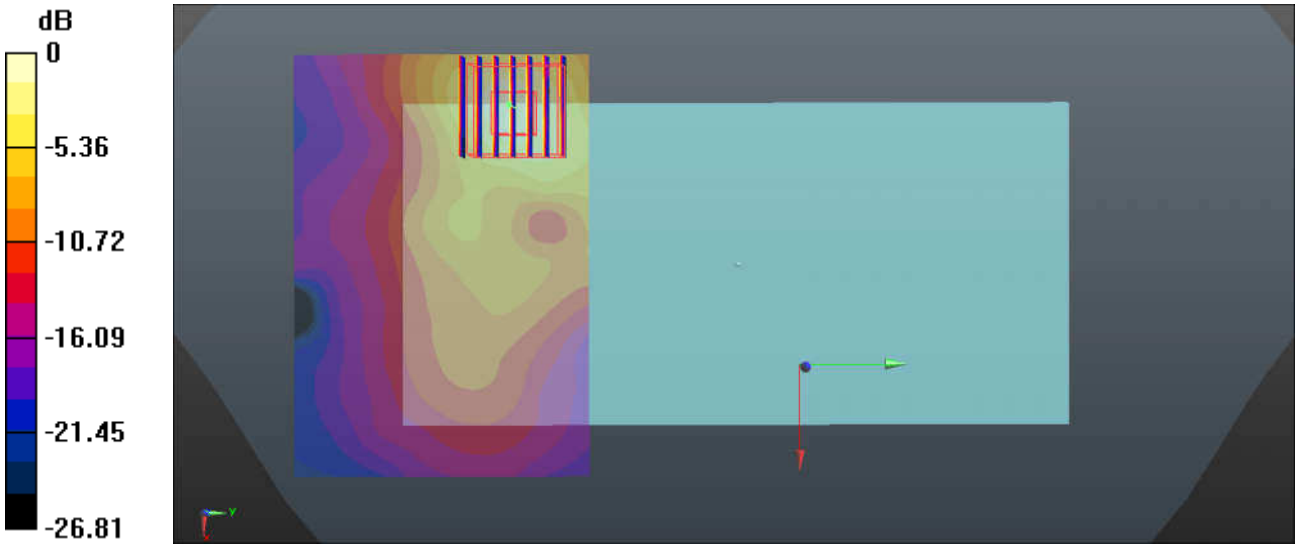
55_WLAN5.3GHz_802.11a 6Mbps_Back_10mm_Ant 2_Ch60

Communication System: UID 0, 802.11a (0); Frequency: 5300 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5300 MHz; σ = 5.562 S/m; ε_r = 47.458; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.4, 4.4, 4.4); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch60/Area Scan (101x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.74 W/kg

Ch60/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 20.94 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 3.16 W/kg
SAR(1 g) = 0.797 W/kg; SAR(10 g) = 0.268 W/kg
Maximum value of SAR (measured) = 1.86 W/kg



0 dB = 1.86 W/kg = 2.70 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

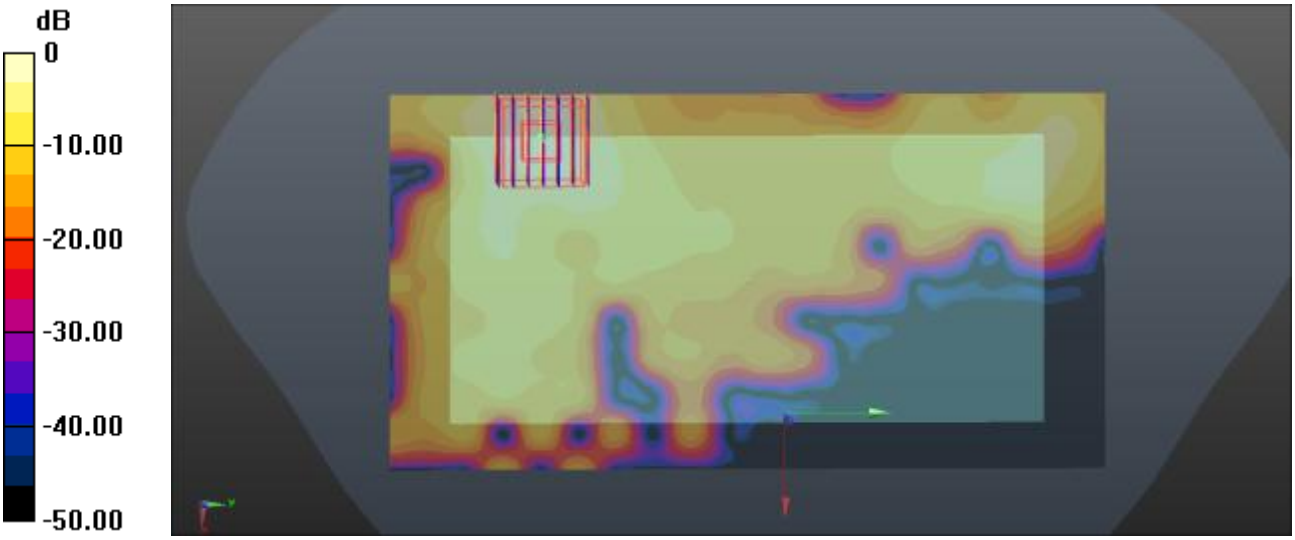
56_WLAN5.3GHz_802.11a 6Mbps_Back_10mm_Ant 1+2_Ch52

Communication System: UID 0, 802.11a (0); Frequency: 5260 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5260 MHz; σ = 5.512 S/m; ε_r = 47.527; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.4, 4.4, 4.4); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch52/Area Scan (101x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.541 W/kg

Ch52/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 1.980 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 0.879 W/kg
SAR(1 g) = 0.234 W/kg; SAR(10 g) = 0.078 W/kg
Maximum value of SAR (measured) = 0.542 W/kg



0 dB = 0.541 W/kg = -2.67 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

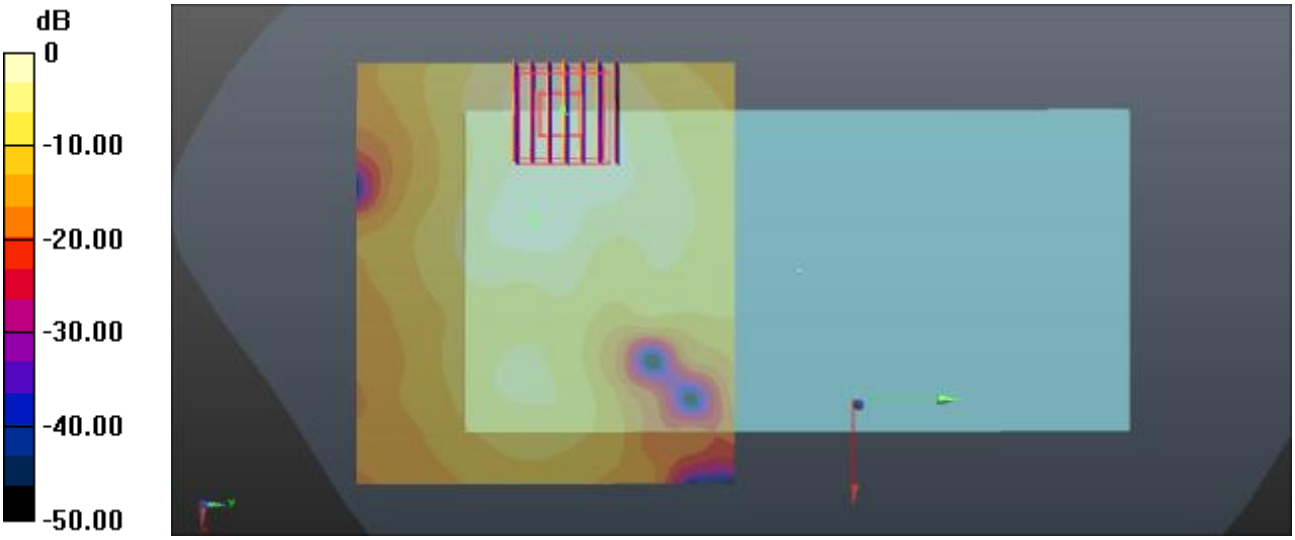
57_WLAN5.5GHz_802.11a 6Mbps_Back_10mm_Ant 2_Ch100

Communication System: UID 0, 802.11a (0); Frequency: 5500 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5500 MHz; σ = 5.818 S/m; ε_r = 47.108; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(3.98, 3.98, 3.98); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch100/Area Scan (101x91x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.42 W/kg

Ch100/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 1.378 V/m; Power Drift = -0.11 dB
Peak SAR (extrapolated) = 2.48 W/kg
SAR(1 g) = 0.607 W/kg; SAR(10 g) = 0.217 W/kg
Maximum value of SAR (measured) = 1.46 W/kg



0 dB = 1.42 W/kg = 1.52 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

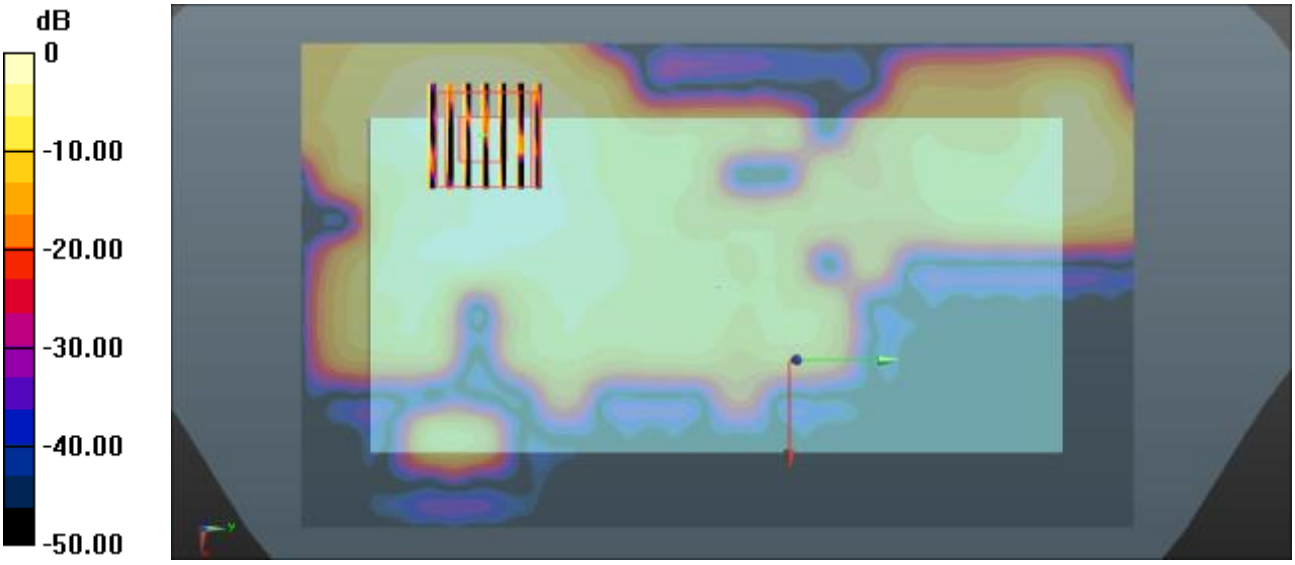
58_WLAN5.5GHz_802.11a 6Mbps_Back_10mm_Ant 1+2_Ch140

Communication System: UID 0, 802.11a (0); Frequency: 5700 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5700 MHz; σ = 6.097 S/m; ε_r = 46.762; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(3.98, 3.98, 3.98); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch140/Area Scan (111x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.356 W/kg

Ch140/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 8.836 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 0.574 W/kg
SAR(1 g) = 0.130 W/kg; SAR(10 g) = 0.045 W/kg
Maximum value of SAR (measured) = 0.351 W/kg



0 dB = 0.356 W/kg = -4.49 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

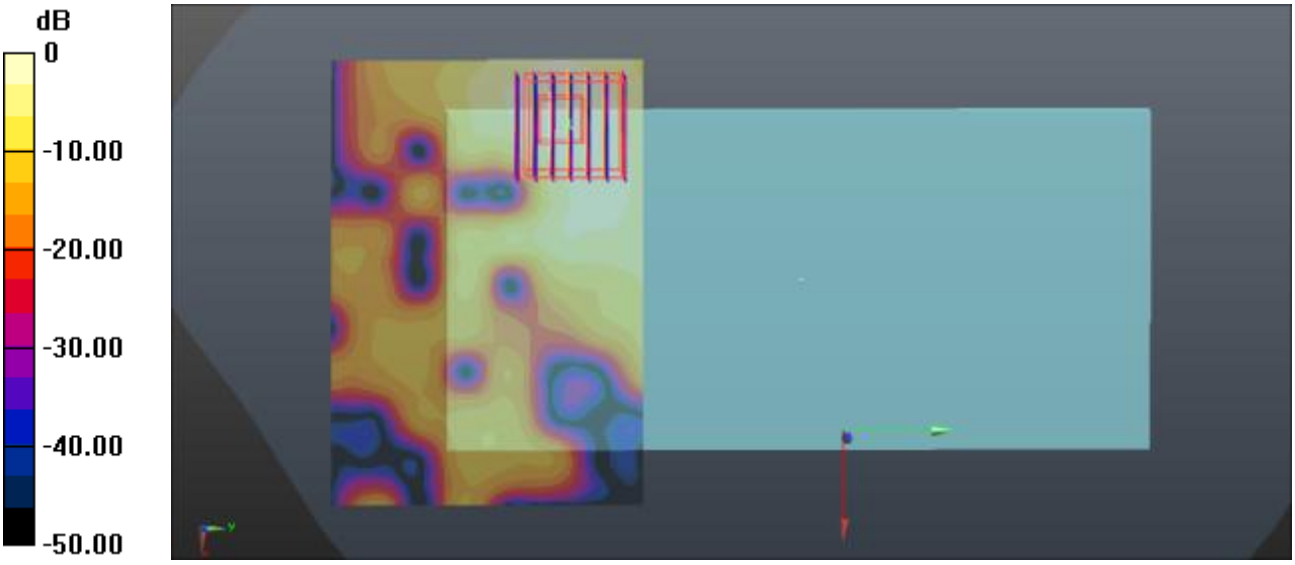
59_WLAN5.8GHz_802.11a 6Mbps_Back_10mm_Ant 2_Ch165

Communication System: UID 0, 802.11a (0); Frequency: 5825 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5825 MHz; σ = 6.27 S/m; ε_r = 46.575; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.31, 4.31, 4.31); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch165/Area Scan (101x71x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.379 W/kg

Ch165/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 9.193 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.684 W/kg
SAR(1 g) = 0.161 W/kg; SAR(10 g) = 0.055 W/kg
Maximum value of SAR (measured) = 0.412 W/kg



0 dB = 0.379 W/kg = -4.21 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

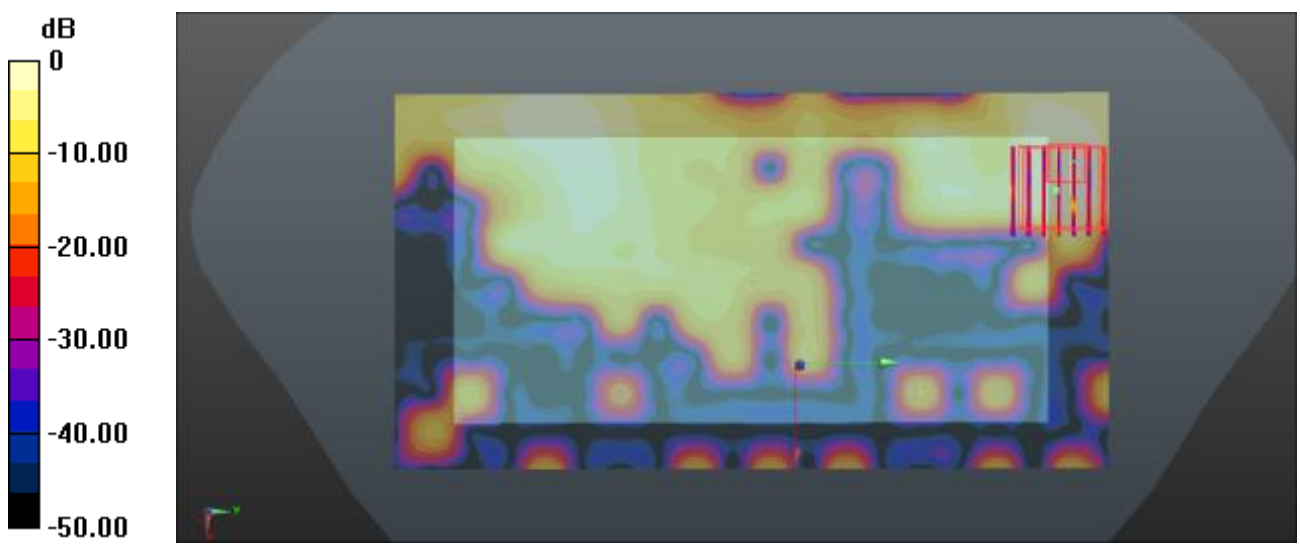
60_WLAN5.8GHz_802.11a 6Mbps_Back_10mm_Ant 1+2_Ch157

Communication System: UID 0, 802.11a (0); Frequency: 5785 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5785 MHz; σ = 6.212 S/m; ε_r = 46.613; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.31, 4.31, 4.31); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch157/Area Scan (101x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.178 W/kg

Ch157/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 2.100 V/m; Power Drift = -0.09 dB
Peak SAR (extrapolated) = 0.340 W/kg
SAR(1 g) = 0.055 W/kg; SAR(10 g) = 0.020 W/kg
Maximum value of SAR (measured) = 0.146 W/kg



0 dB = 0.178 W/kg = -7.50 dBW/kg

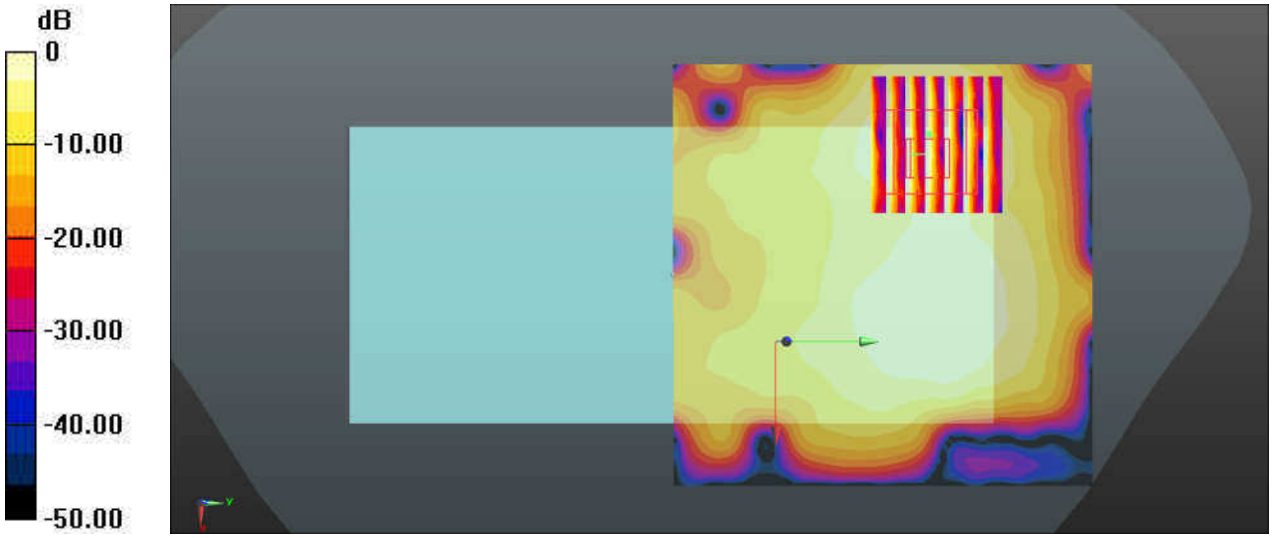
61_ Bluetooth _1Mbps_Back_10mm_Ch78

Communication System: UID 0, Bluetooth (0); Frequency: 2480 MHz;Duty Cycle: 1:1.30
Medium: MSL_2450 Medium parameters used: f = 2480 MHz; σ = 2.048 S/m; ε_r = 53.347; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃； Liquid Temperature：22.6 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3843; ConvF(7.02, 7.02, 7.02); Calibrated: 2018.9.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2018.5.28
- Phantom: SAM2; Type: SAM; Serial: TP-1542
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch78/Area Scan (91x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 0.0499 W/kg

Ch78/Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.176 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 0.0580 W/kg
SAR(1 g) = 0.029 W/kg; SAR(10 g) = 0.016 W/kg
Maximum value of SAR (measured) = 0.0453 W/kg



0 dB = 0.0499 W/kg = -13.02 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

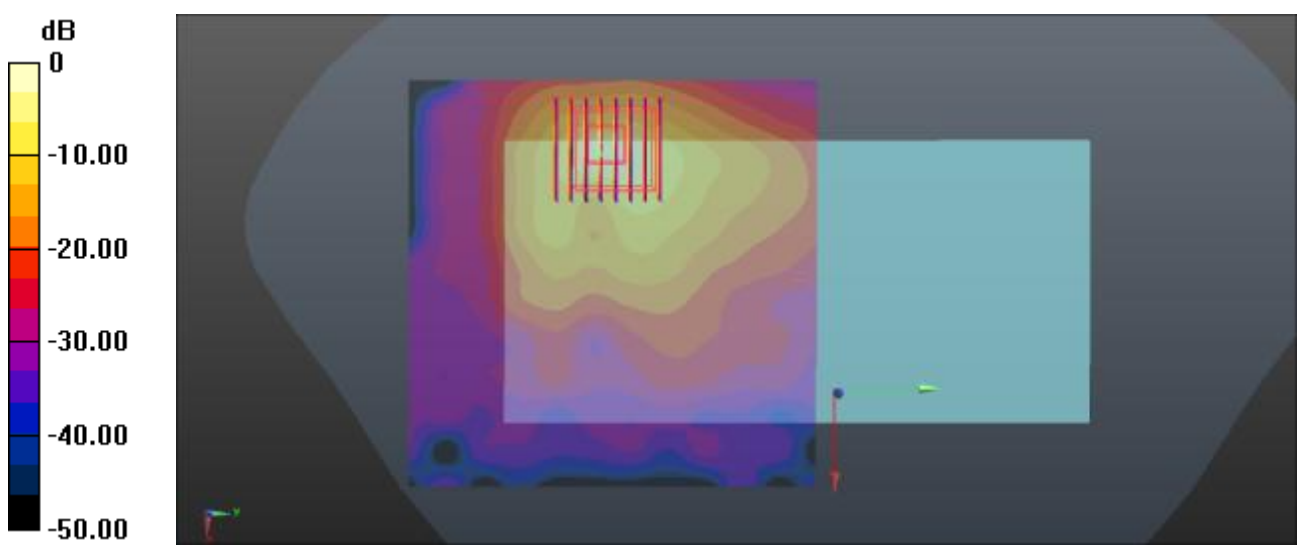
62_WLAN5.3GHz_802.11a 6Mbps_Back_0mm_Ant 2_Ch60

Communication System: UID 0, 802.11a (0); Frequency: 5300 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5300 MHz; σ = 5.562 S/m; ε_r = 47.457; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.4, 4.4, 4.4); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch60/Area Scan (111x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 35.7 W/kg

Ch60/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 4.827 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 75.0 W/kg
SAR(1 g) = 11.2 W/kg; SAR(10 g) = 2.49 W/kg
Maximum value of SAR (measured) = 33.4 W/kg



0 dB = 35.7 W/kg = 15.53 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

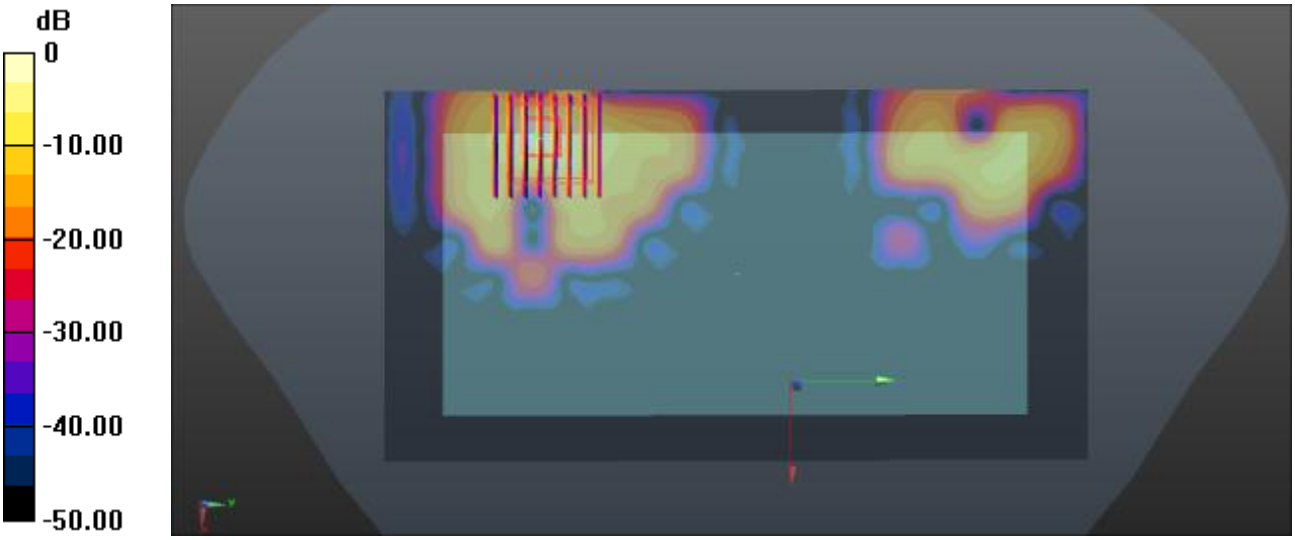
63_WLAN5.3GHz_802.11a 6Mbps_Back_0mm_Ant 1+2_Ch52

Communication System: UID 0, 802.11a (0); Frequency: 5260 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5260 MHz; σ = 5.511 S/m; ε_r = 47.526; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.4, 4.4, 4.4); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch52/Area Scan (101x191x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 11.2 W/kg

Ch52/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 2.341 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 25.1 W/kg
SAR(1 g) = 3.93 W/kg; SAR(10 g) = 0.851 W/kg
Maximum value of SAR (measured) = 13.2 W/kg



0 dB = 11.2 W/kg = 10.49 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

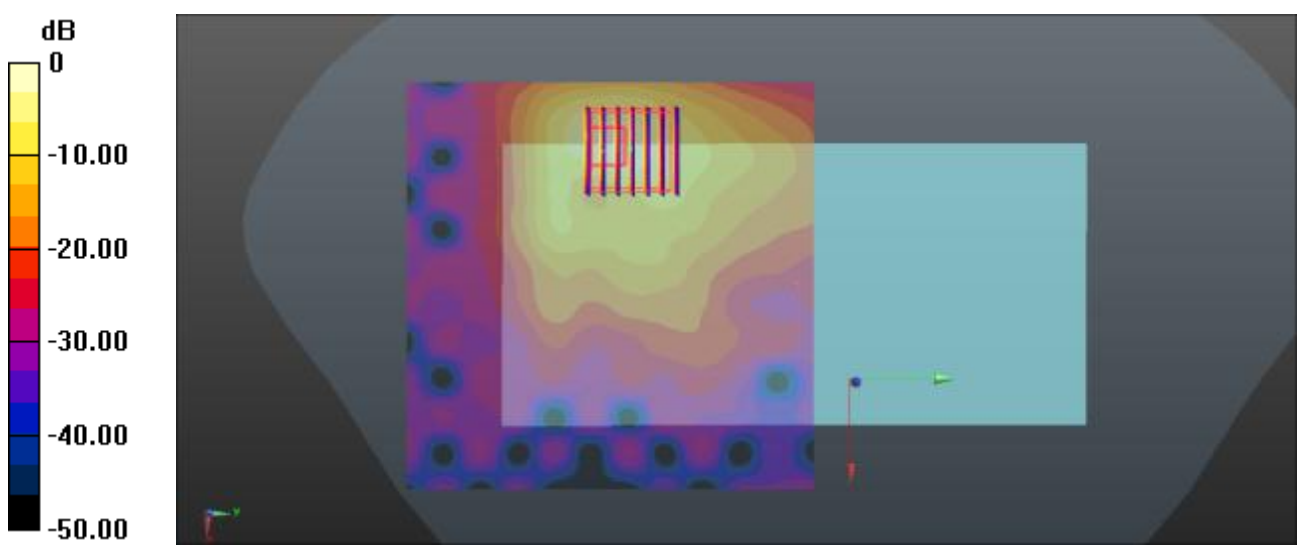
64_WLAN5.5GHz_802.11a 6Mbps_Back_0mm_Ant 2_Ch100

Communication System: UID 0, 802.11a (0); Frequency: 5500 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5500 MHz; σ = 5.818 S/m; ε_r = 47.106; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(3.98, 3.98, 3.98); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch100/Area Scan (111x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 17.7 W/kg

Ch100/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 8.787 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 45.1 W/kg
SAR(1 g) = 7.13 W/kg; SAR(10 g) = 1.6 W/kg
Maximum value of SAR (measured) = 21.2 W/kg



0 dB = 17.7 W/kg = 12.48 dBW/kg

Test Laboratory: Sporton International Inc. SAR/HAC Testing Lab Date: 2018.12.17

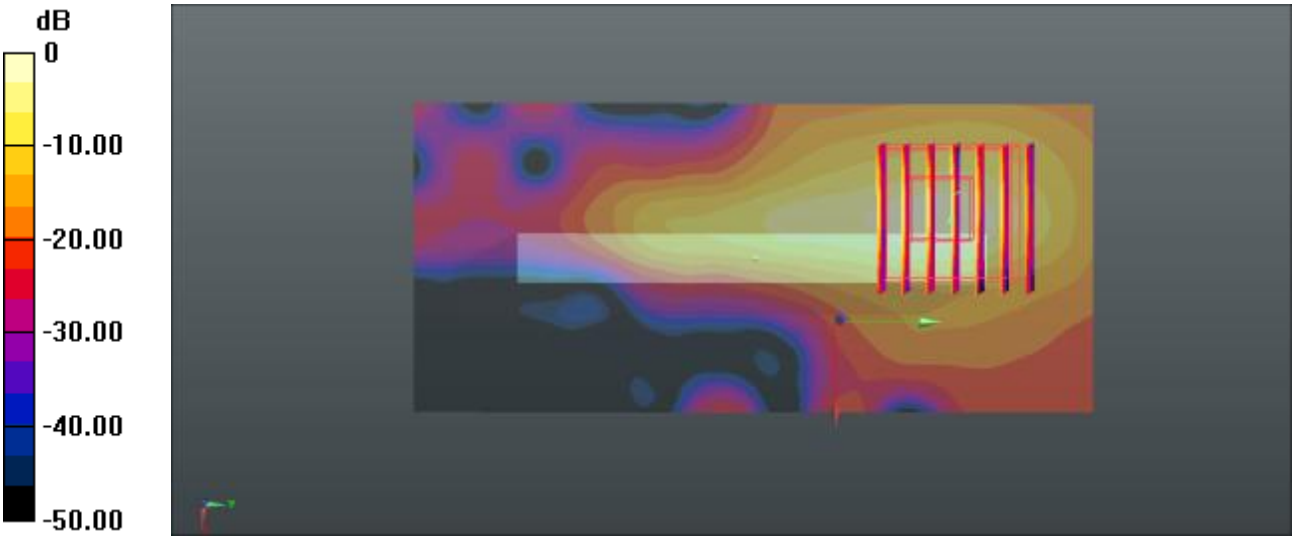
65_WLAN5.5GHz_802.11a 6Mbps_Top Side_0mm_Ant 1+2_Ch140

Communication System: UID 0, 802.11a (0); Frequency: 5700 MHz;Duty Cycle: 1:1.019
Medium: MSL_5000 Medium parameters used: f = 5700 MHz; σ = 6.097 S/m; ε_r = 46.761; ρ = 1000 kg/m^3
Ambient Temperature：23.3 ℃; Liquid Temperature：22.7 ℃

DASY5 Configuration:
- Probe: EX3DV4 - SN3857; ConvF(4.31, 4.31, 4.31); Calibrated: 2018.5.31
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2018.4.19
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch140/Area Scan (51x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 5.57 W/kg

Ch140/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 1.755 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 16.9 W/kg
SAR(1 g) = 2.36 W/kg; SAR(10 g) = 0.522 W/kg
Maximum value of SAR (measured) = 6.67 W/kg



0 dB = 5.57 W/kg = 7.46 dBW/kg

Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.

In Collaboration with
speag
CALIBRATION LABORATORY
Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China
Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com http://www.chinattl.cn

中国认可
国际互认
校准
CALIBRATION
CNAS L0570

Client **Sporton** **Certificate No: Z18-60046**

CALIBRATION CERTIFICATE

Object	D750V3 - SN: 1087
Calibration Procedure(s)	FF-Z11-003-01 Calibration Procedures for dipole validation kits
Calibration date:	March 21, 2018

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	102083	01-Nov-17 (CTTL, No.J17X08756)	Oct-18
Power sensor NRV-Z5	100542	01-Nov-17 (CTTL, No.J17X08756)	Oct-18
Reference Probe EX3DV4	SN 7464	12-Sep-17(SPEAG,No.EX3-7464_Sep17)	Sep-18
DAE4	SN 1525	02-Oct-17(SPEAG,No.DAE4-1525_Oct17)	Oct-18
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	23-Jan-18 (CTTL, No.J18X00560)	Jan-19
NetworkAnalyzer E5239A	MY55491241	29-Jun-17 (CTTL, No.J18X00561)	Jun-18

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: March 24, 2018

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

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Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) 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.

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%.

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Measurement Conditions

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

DASY Version	DASY52	52.10.0.1446
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.3 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.08 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**8.25 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.40 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**5.56 mW /g ± 18.7 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.8 ± 6 %	0.97 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.16 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**8.57 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.45 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**5.77 mW /g ±18.7 % (k=2)**

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.4Ω- 3.42jΩ
Return Loss	- 27.8dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.2Ω- 3.21jΩ
Return Loss	- 29.5dB

General Antenna Parameters and Design

Electrical Delay (one direction)	0.943 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
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

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DASY5 Validation Report for Head TSL Date: 03.21.2018

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1087

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 750 MHz; σ = 0.902 S/m; ε_r = 42.33; ρ = 1000 kg/m^3

Phantom section: Center Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(10.57, 10.57, 10.57); Calibrated: 9/12/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1525; Calibrated: 10/2/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

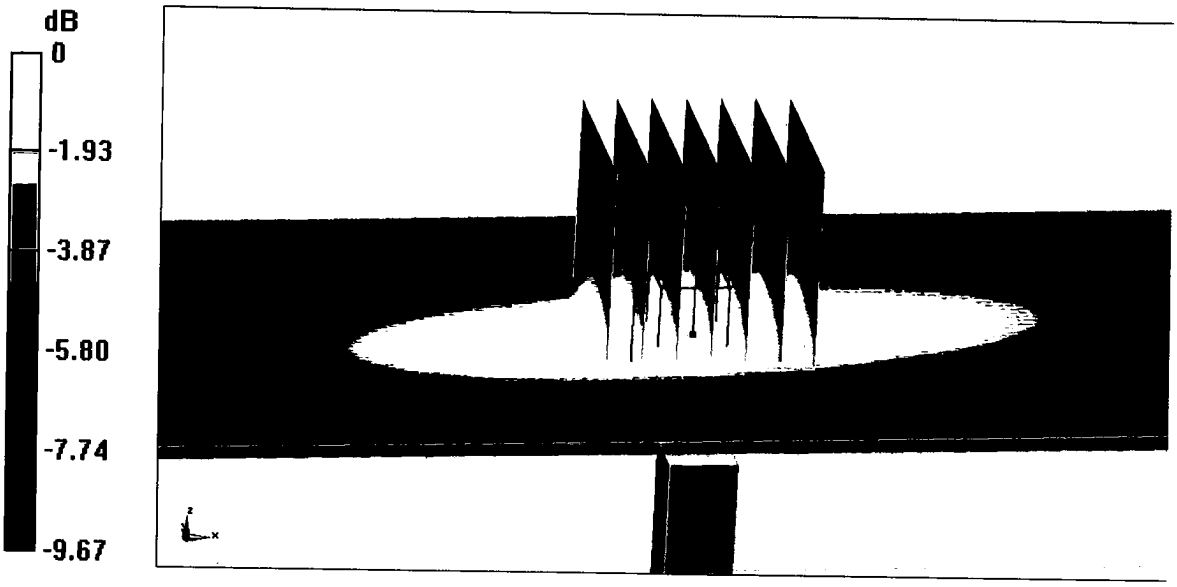
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 54.28 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 3.06 W/kg

SAR(1 g) = 2.08 W/kg; SAR(10 g) = 1.4 W/kg

Maximum value of SAR (measured) = 2.74 W/kg



0 dB = 2.74 W/kg = 4.38 dBW/kg

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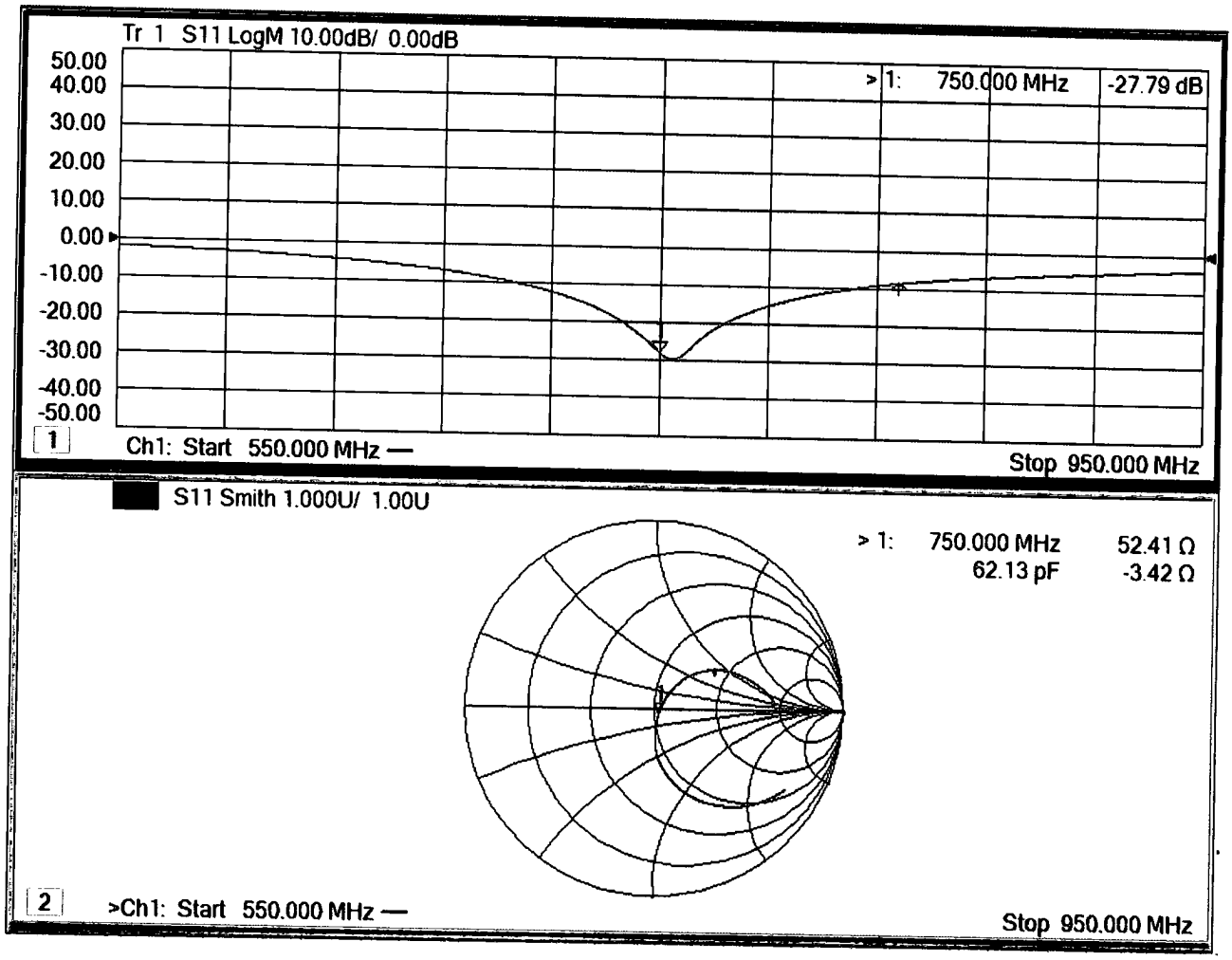
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL Date: 03.21.2018

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN: 1087

Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 750 MHz; σ = 0.966 S/m; ε_r = 54.78; ρ = 1000 kg/m^3

Phantom section: Left Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(10.63, 10.63, 10.63); Calibrated: 9/12/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1525; Calibrated: 10/2/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

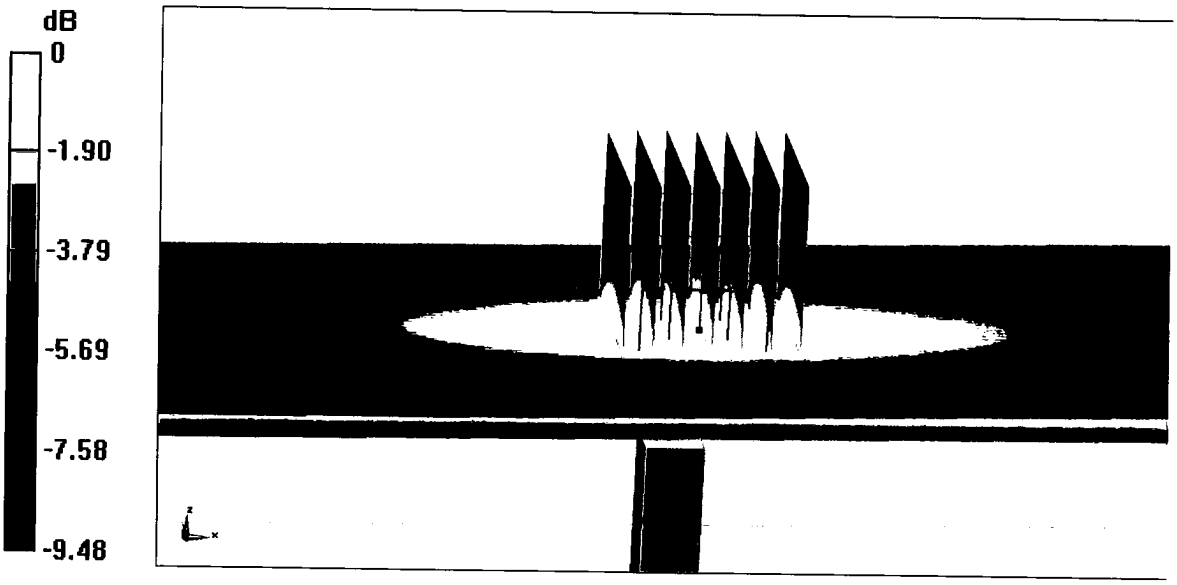
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.31 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 3.15 W/kg

SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.45 W/kg

Maximum value of SAR (measured) = 2.83 W/kg



0 dB = 2.83 W/kg = 4.52 dBW/kg

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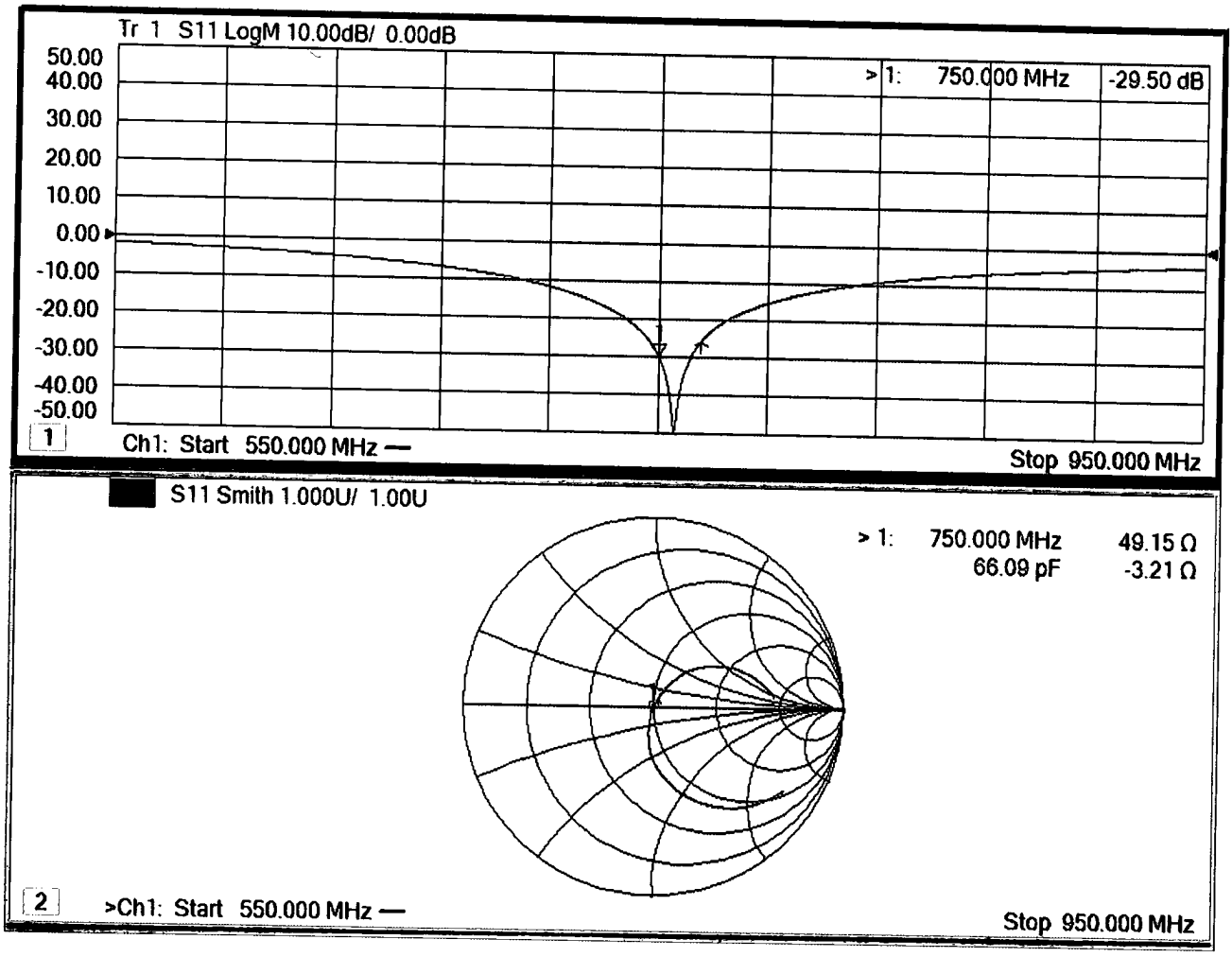
Impedance Measurement Plot for Body TSL



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

Accreditation No.: SCS 0108

Client Sporton (Auden)

Certificate No: D835V2-4d151_Mar18

CALIBRATION CERTIFICATE

Object	D835V2 - SN:4d151
Calibration procedure(s)	QA CAL-05.v10 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	March 26, 2018

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 NRP	SN: 104778	04-Apr-17 (No. 217-02521/02522)	Apr-18
Power sensor NRP-Z91	SN: 103244	04-Apr-17 (No. 217-02521)	Apr-18
Power sensor NRP-Z91	SN: 103245	04-Apr-17 (No. 217-02522)	Apr-18
Reference 20 dB Attenuator	SN: 5058 (20k)	07-Apr-17 (No. 217-02528)	Apr-18
Type-N mismatch combination	SN: 5047.2 / 06327	07-Apr-17 (No. 217-02529)	Apr-18
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-16)	In house check: Oct-18
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-16)	In house check: Oct-18
Network Analyzer HP 8753E	SN: US37390585	18-Oct-01 (in house check Oct-17)	In house check: Oct-18

	Name	Function	Signature
Calibrated by:	Michael Weber	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 26, 2018

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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 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
c) IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
d) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

e) 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.

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%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
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	41.1 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.44 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.66 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.57 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.23 W/kg ± 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	54.5 ± 6 %	0.99 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.44 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.58 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.60 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.31 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.3 Ω - 2.3 jΩ
Return Loss	- 31.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.4 Ω - 4.8 jΩ
Return Loss	- 25.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.392 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
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	March 27, 2012

DASY5 Validation Report for Head TSL

Date: 26.03.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d151

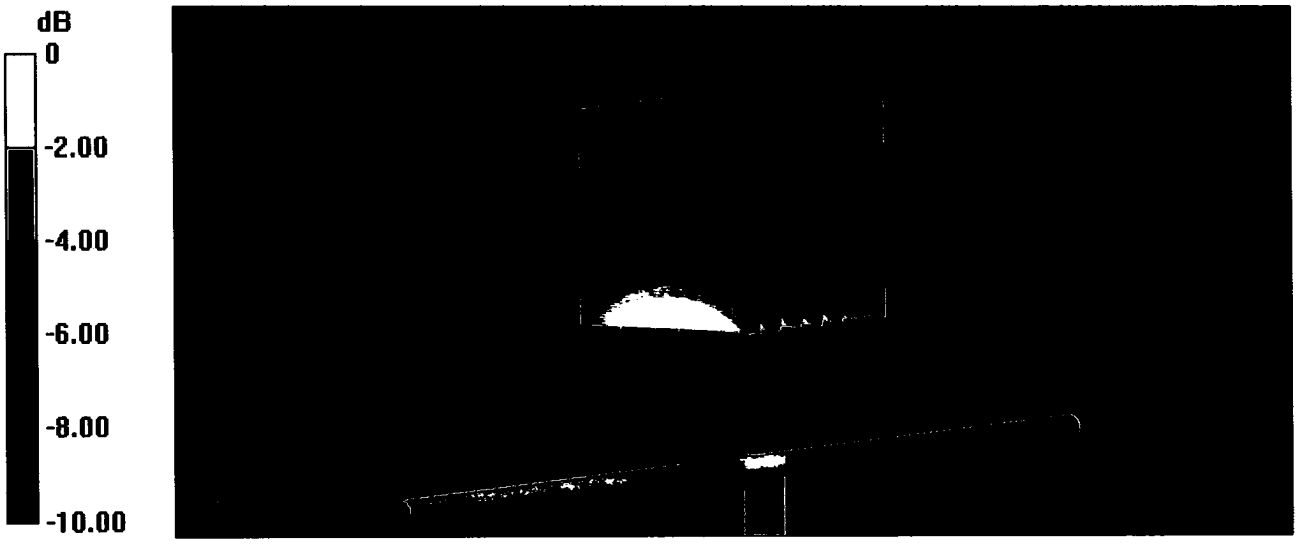
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.91 S/m; ε_r = 41.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.9, 9.9, 9.9); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

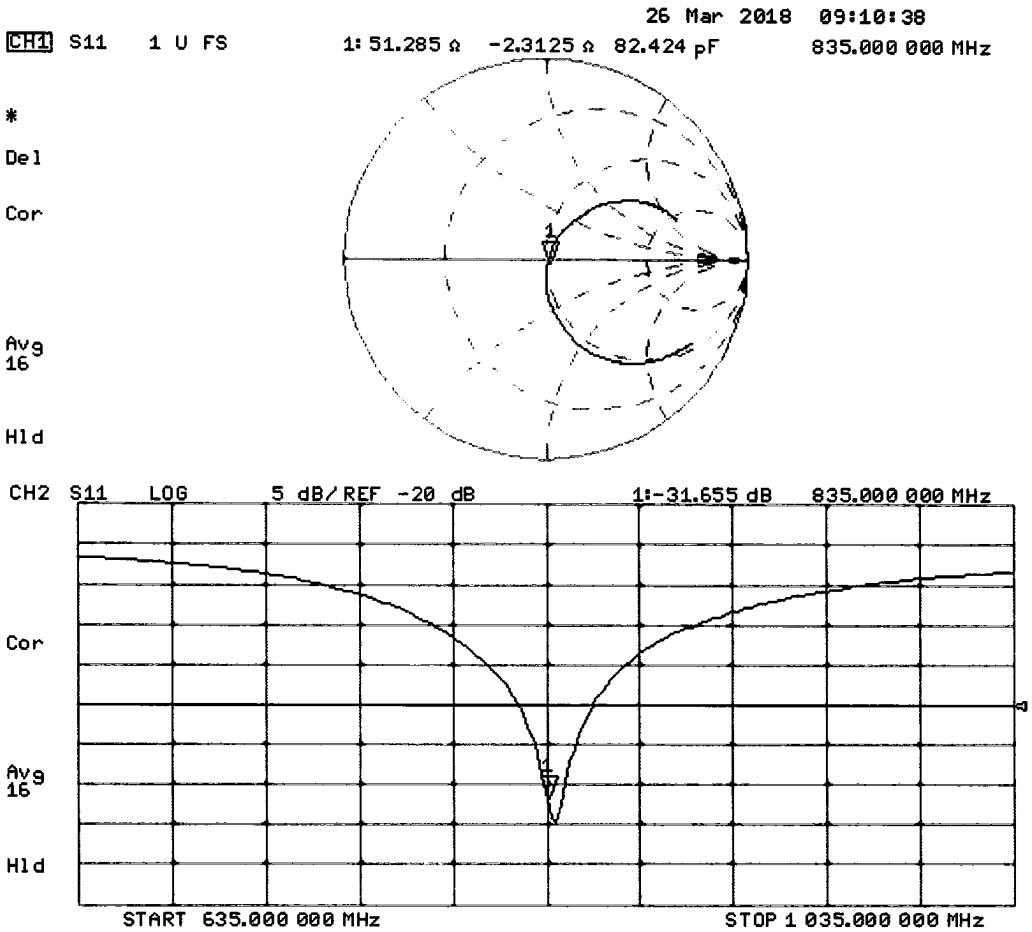
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 63.64 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.78 W/kg
SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.57 W/kg
Maximum value of SAR (measured) = 3.32 W/kg



0 dB = 3.32 W/kg = 5.21 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 26.03.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d151

Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.99 S/m; ε_r = 54.5; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

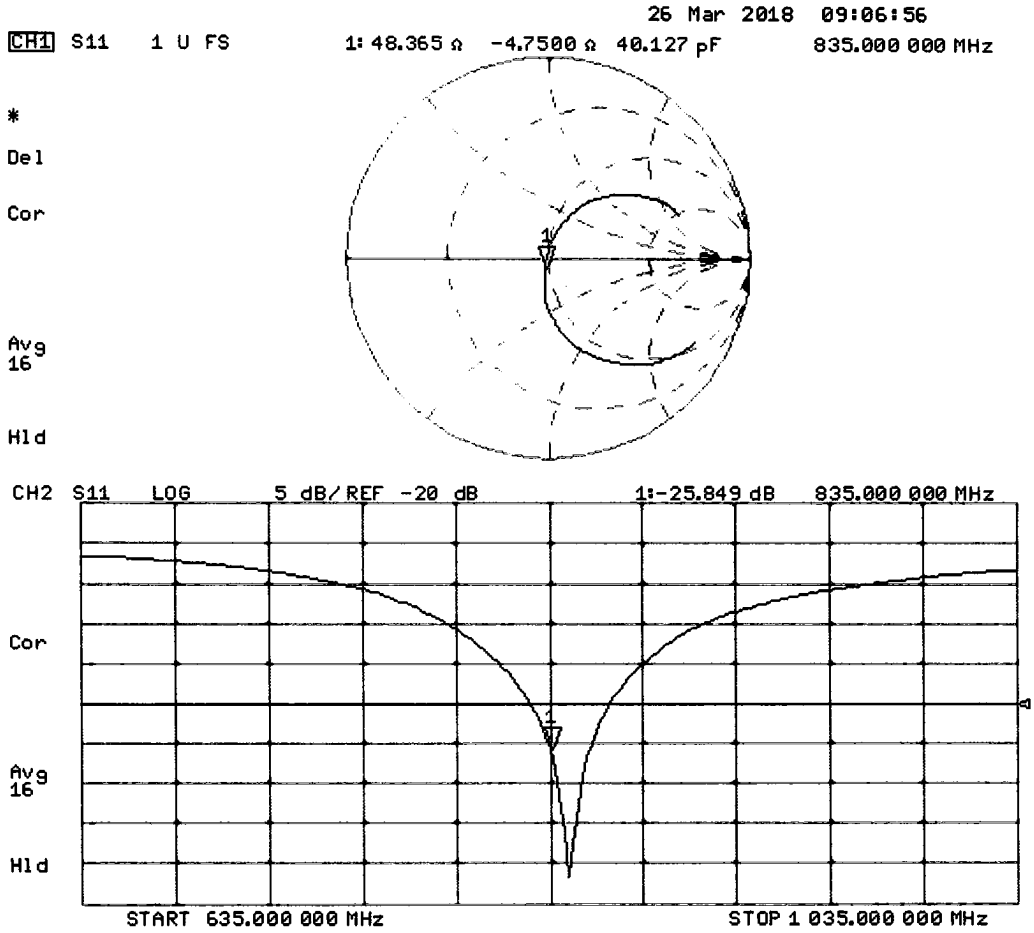
- Probe: EX3DV4 - SN7349; ConvF(10.05, 10.05, 10.05); Calibrated: 30.12.2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.0(1446); SEMCAD X 14.6.10(7417)

Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 60.45 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 3.64 W/kg
SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.6 W/kg
Maximum value of SAR (measured) = 3.21 W/kg

0 dB = 3.21 W/kg = 5.07 dBW/kg

Impedance Measurement Plot for Body TSL



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CNAS L0570

Client **Sporton** **Certificate No: Z18-60048**

CALIBRATION CERTIFICATE

Object: D1750V2 - SN: 1090

Calibration Procedure(s): FF-Z11-003-01
Calibration Procedures for dipole validation kits

Calibration date: March 23, 2018

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	102083	01-Nov-17 (CTTL, No.J17X08756)	Oct-18
Power sensor NRV-Z5	100542	01-Nov-17 (CTTL, No.J17X08756)	Oct-18
Reference Probe EX3DV4	SN 7464	12-Sep-17(SPEAG,No.EX3-7464_Sep17)	Sep-18
DAE4	SN 1525	02-Oct-17(SPEAG,No.DAE4-1525_Oct17)	Oct-18
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	23-Jan-18 (CTTL, No.J18X00560)	Jan-19
NetworkAnalyzer E5239A	MY55491241	29-Jun-17 (CTTL, No.J18X00561)	Jun-18

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: March 27, 2018

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Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) 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.

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%.

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Measurement Conditions

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

DASY Version	DASY52	52.10.0.1446
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.9 ± 6 %	1.33 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.26 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**37.4 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	4.97 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**20.0 mW /g ± 18.7 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.0 ± 6 %	1.45 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.27 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**37.5 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	4.94 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**19.9 mW /g ± 18.7 % (k=2)**

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	47.5Ω- 1.57 jΩ
Return Loss	- 30.3 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	43.9Ω- 2.10 jΩ
Return Loss	- 23.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.126 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
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

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DASY5 Validation Report for Head TSL Date: 03.23.2018

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1090

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1750 MHz; σ = 1.332 S/m; εr = 38.93; ρ = 1000 kg/m3

Phantom section: Center Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(8.7, 8.7, 8.7); Calibrated: 9/12/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1525; Calibrated: 10/2/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

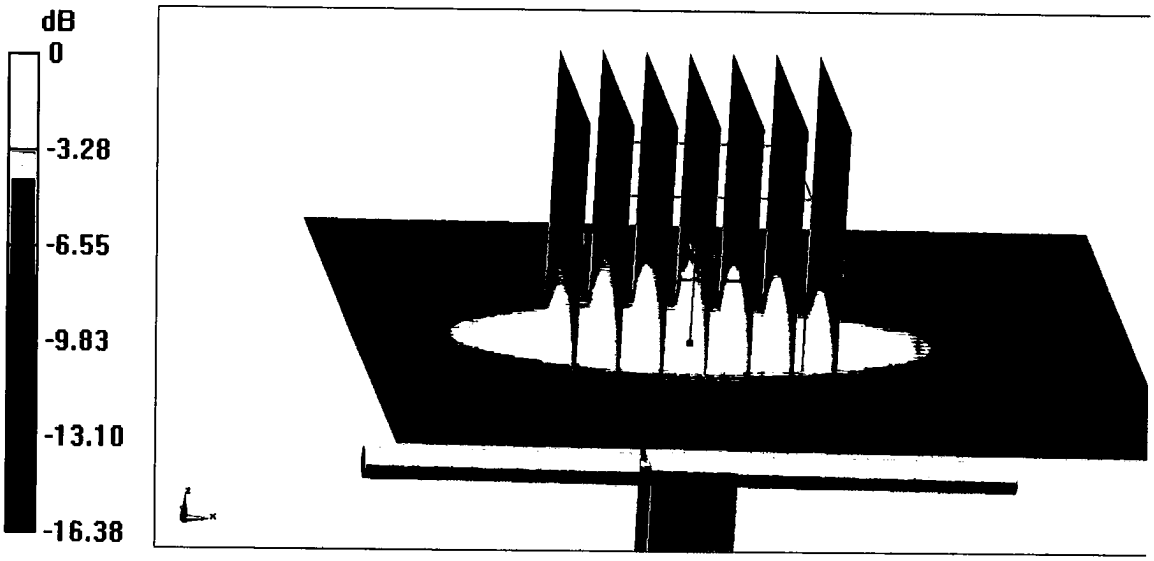
System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.7 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 16.9 W/kg

SAR(1 g) = 9.26 W/kg; SAR(10 g) = 4.97 W/kg

Maximum value of SAR (measured) = 14.2 W/kg



0 dB = 14.2 W/kg = 11.52 dBW/kg

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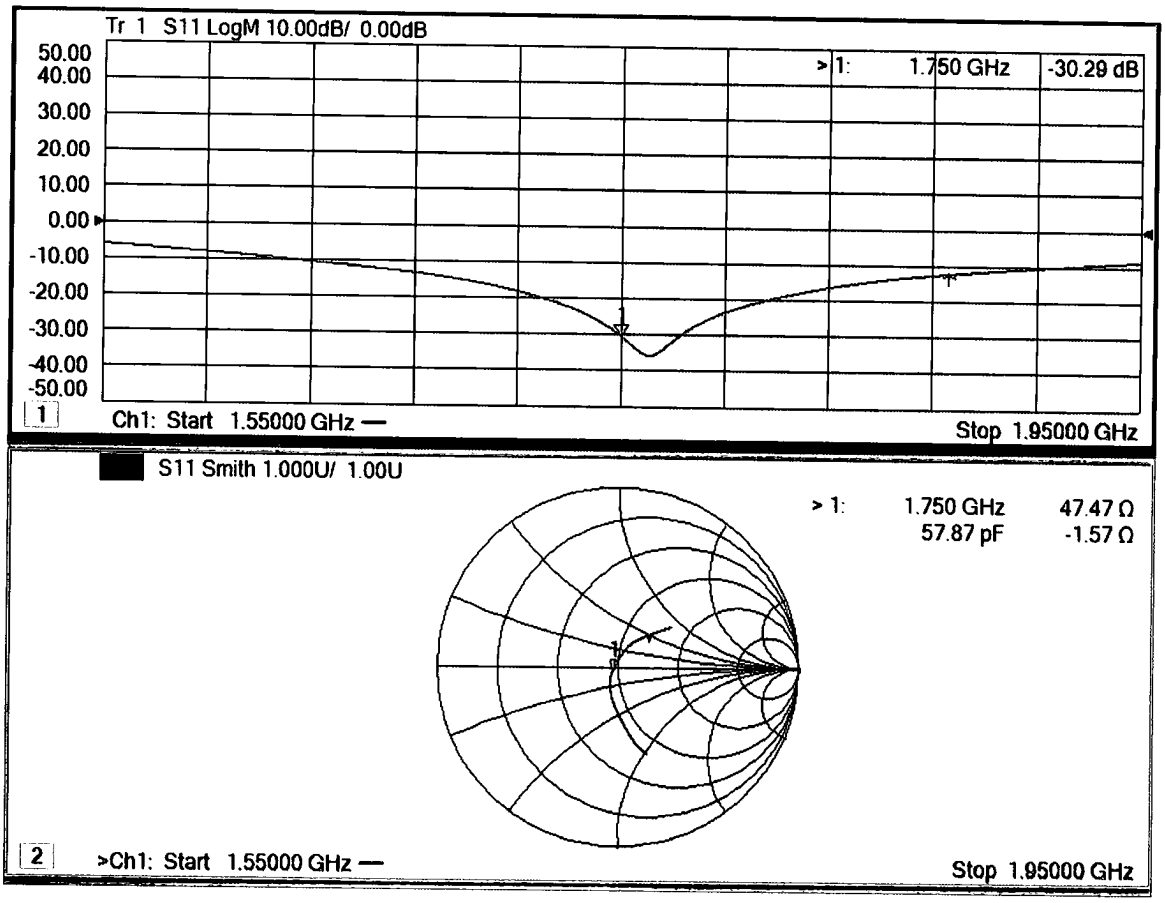
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL Date: 03.23.2018

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: D1750V2 - SN: 1090

Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1750 MHz; σ = 1.447 S/m; ε_r = 51.98; ρ = 1000 kg/m^3

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(8.6, 8.6, 8.6); Calibrated: 9/12/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1525; Calibrated: 10/2/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

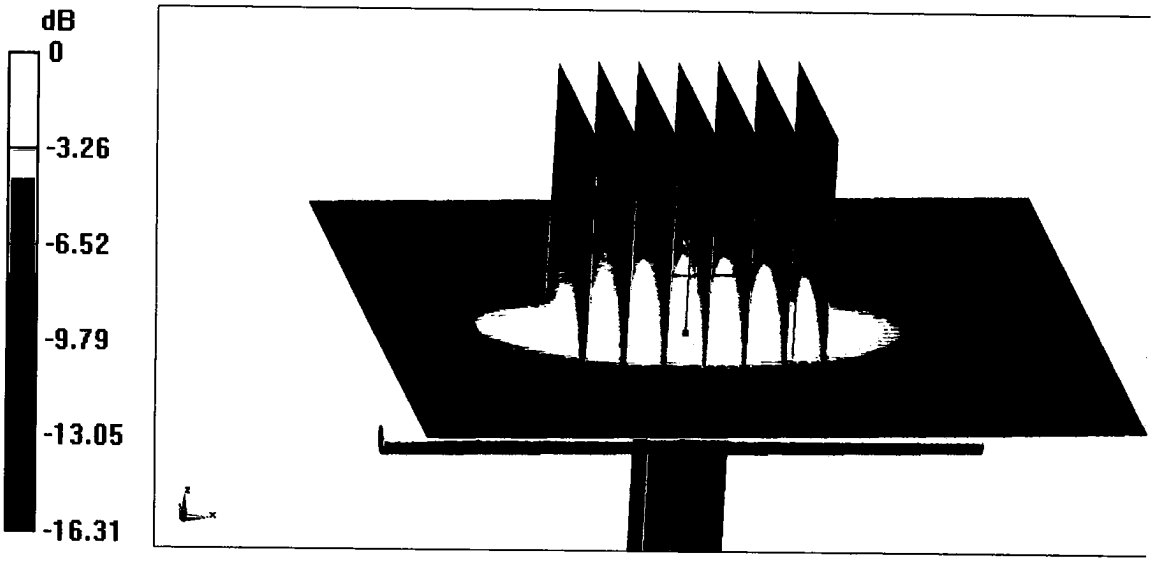
System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 90.23 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 16.7 W/kg

SAR(1 g) = 9.27 W/kg; SAR(10 g) = 4.94 W/kg

Maximum value of SAR (measured) = 14.1 W/kg



0 dB = 14.1 W/kg = 11.49 dBW/kg

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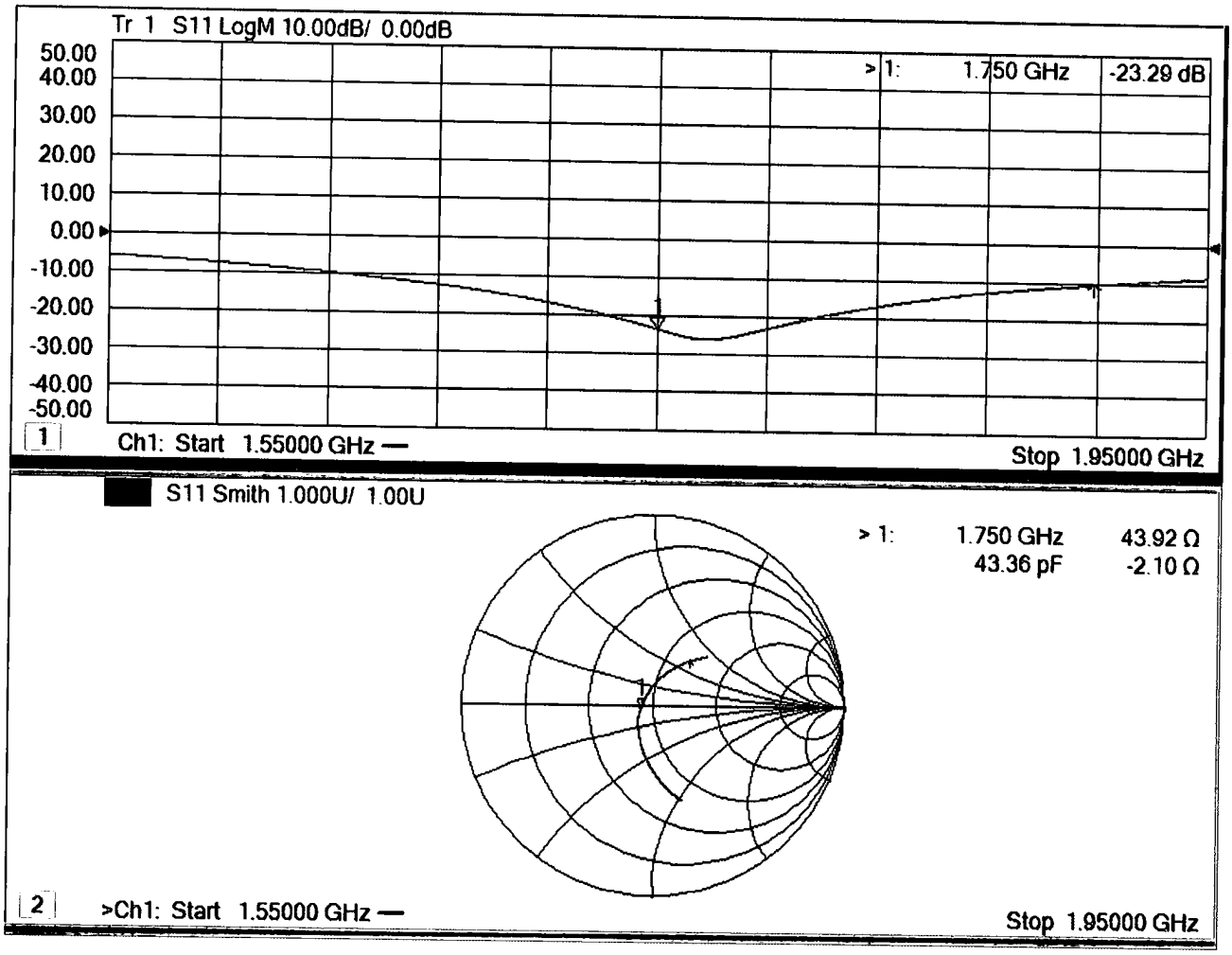
Impedance Measurement Plot for Body TSL



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CNAS L0570

Client **Sporton** **Certificate No: Z18-60049**

CALIBRATION CERTIFICATE

Object	D1900V2 - SN: 5d170
Calibration Procedure(s)	FF-Z11-003-01 Calibration Procedures for dipole validation kits
Calibration date:	March 25, 2018

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	102083	01-Nov-17 (CTTL, No.J17X08756)	Oct-18
Power sensor NRV-Z5	100542	01-Nov-17 (CTTL, No.J17X08756)	Oct-18
Reference Probe EX3DV4	SN 7464	12-Sep-17(SPEAG,No.EX3-7464_Sep17)	Sep-18
DAE4	SN 1525	02-Oct-17(SPEAG,No.DAE4-1525_Oct17)	Oct-18
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	23-Jan-18 (CTTL, No.J18X00560)	Jan-19
NetworkAnalyzer E5239A	MY55491241	29-Jun-17 (CTTL, No.J18X00561)	Jun-18

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: March 27, 2018

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

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lossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016
c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) 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.

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%.

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Measurement Conditions

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

DASY Version	DASY52	52.10.0.1446
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
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	38.9 ± 6 %	1.39 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.97 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**39.9 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.14 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**20.6 mW /g ± 18.7 % (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	54.7 ± 6 %	1.49 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.98 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**40.7 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.17 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**20.9 mW /g ± 18.7 % (k=2)**

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Appendix (Additional assessments outside the scope of CNAS L0570)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.6Ω+ 4.18jΩ
Return Loss	- 26.4dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.1Ω+ 4.53jΩ
Return Loss	- 26.0dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.107 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. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
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

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DASY5 Validation Report for Head TSL Date: 03.23.2018

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d170

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.386 S/m; εr = 38.9; ρ = 1000 kg/m3

Phantom section: Center Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(8.39, 8.39, 8.39); Calibrated: 9/12/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1525; Calibrated: 10/2/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

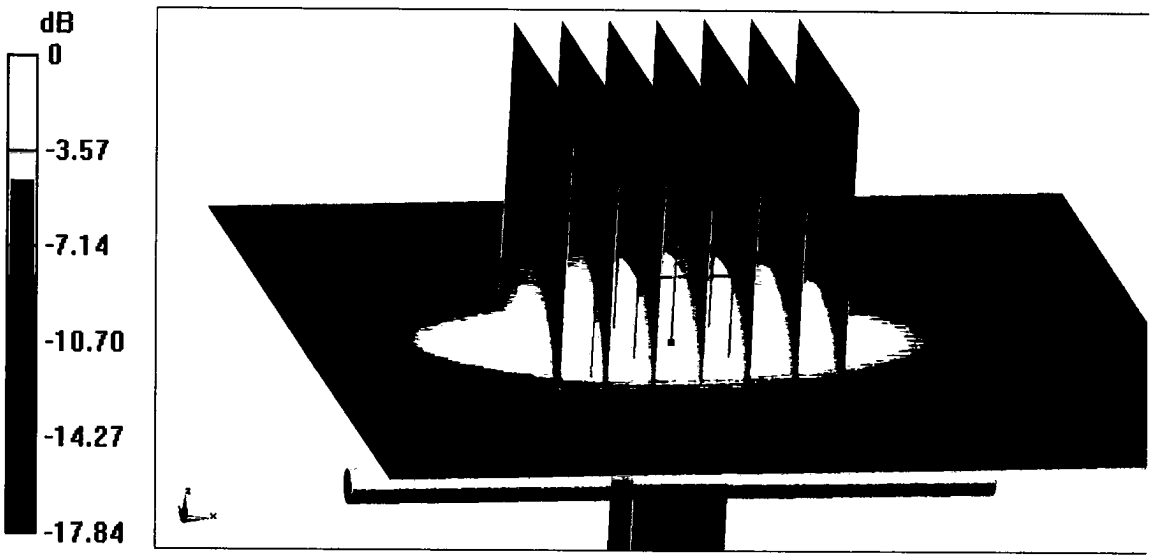
System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 101.9 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 19.1 W/kg

SAR(1 g) = 9.97 W/kg; SAR(10 g) = 5.14 W/kg

Maximum value of SAR (measured) = 15.8 W/kg



0 dB = 15.8 W/kg = 11.99 dBW/kg

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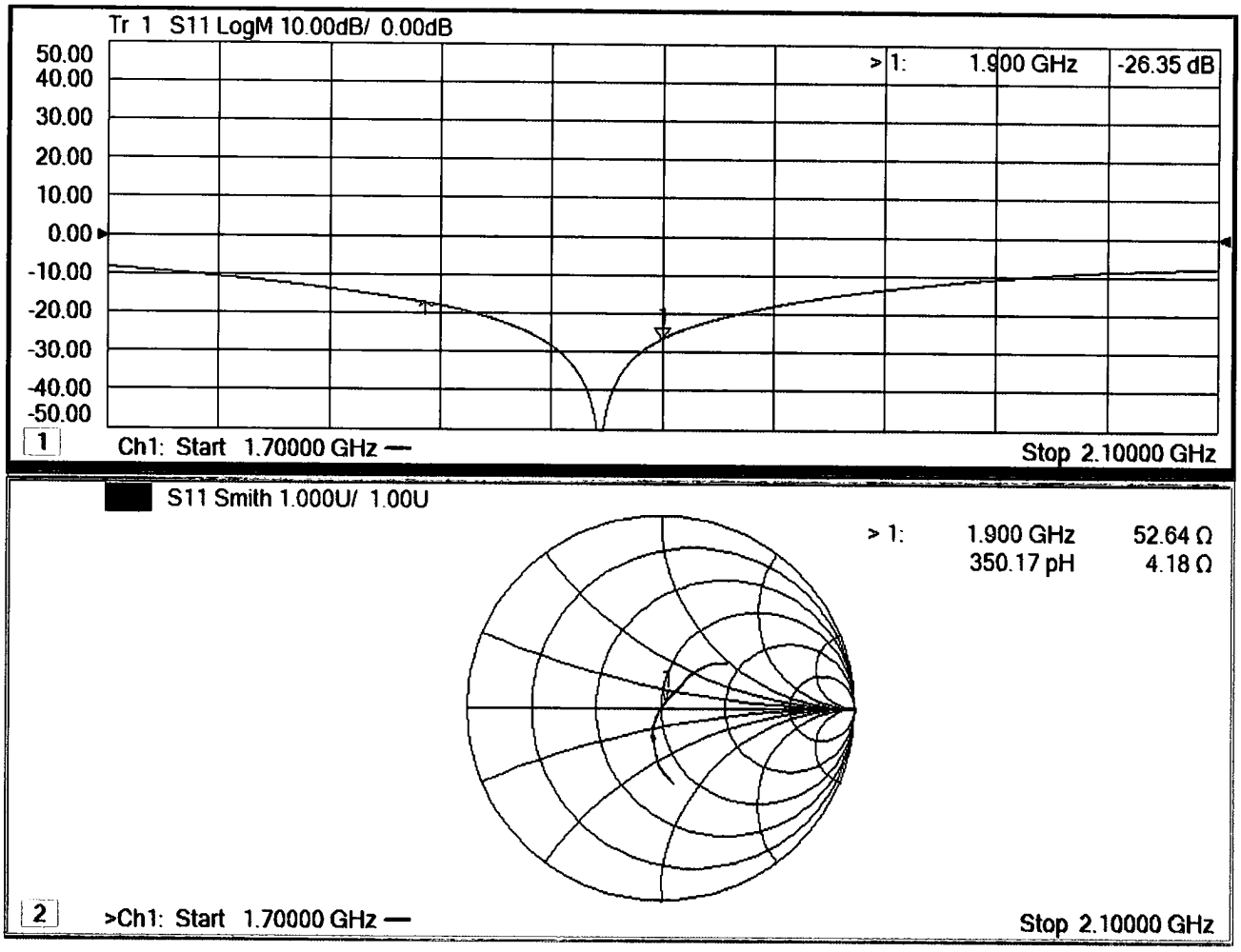
Impedance Measurement Plot for Head TSL



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DASY5 Validation Report for Body TSL Date: 03.25.2018

Test Laboratory: CTTL, Beijing, China

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d170

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: f = 1900 MHz; σ = 1.488 S/m; ε_r = 54.73; ρ = 1000 kg/m^3

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN7464; ConvF(8.32, 8.32, 8.32); Calibrated: 9/12/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1525; Calibrated: 10/2/2017
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.10 (0); SEMCAD X Version 14.6.10 (7417)

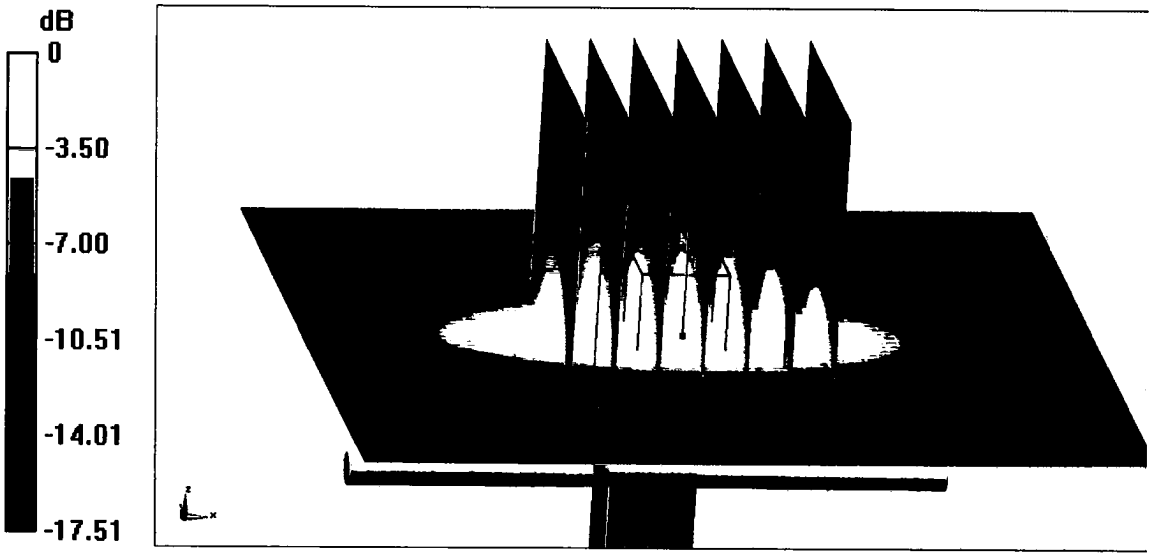
System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 98.38 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 18.4 W/kg

SAR(1 g) = 9.98 W/kg; SAR(10 g) = 5.17 W/kg

Maximum value of SAR (measured) = 15.5 W/kg



0 dB = 15.5 W/kg = 11.90 dBW/kg

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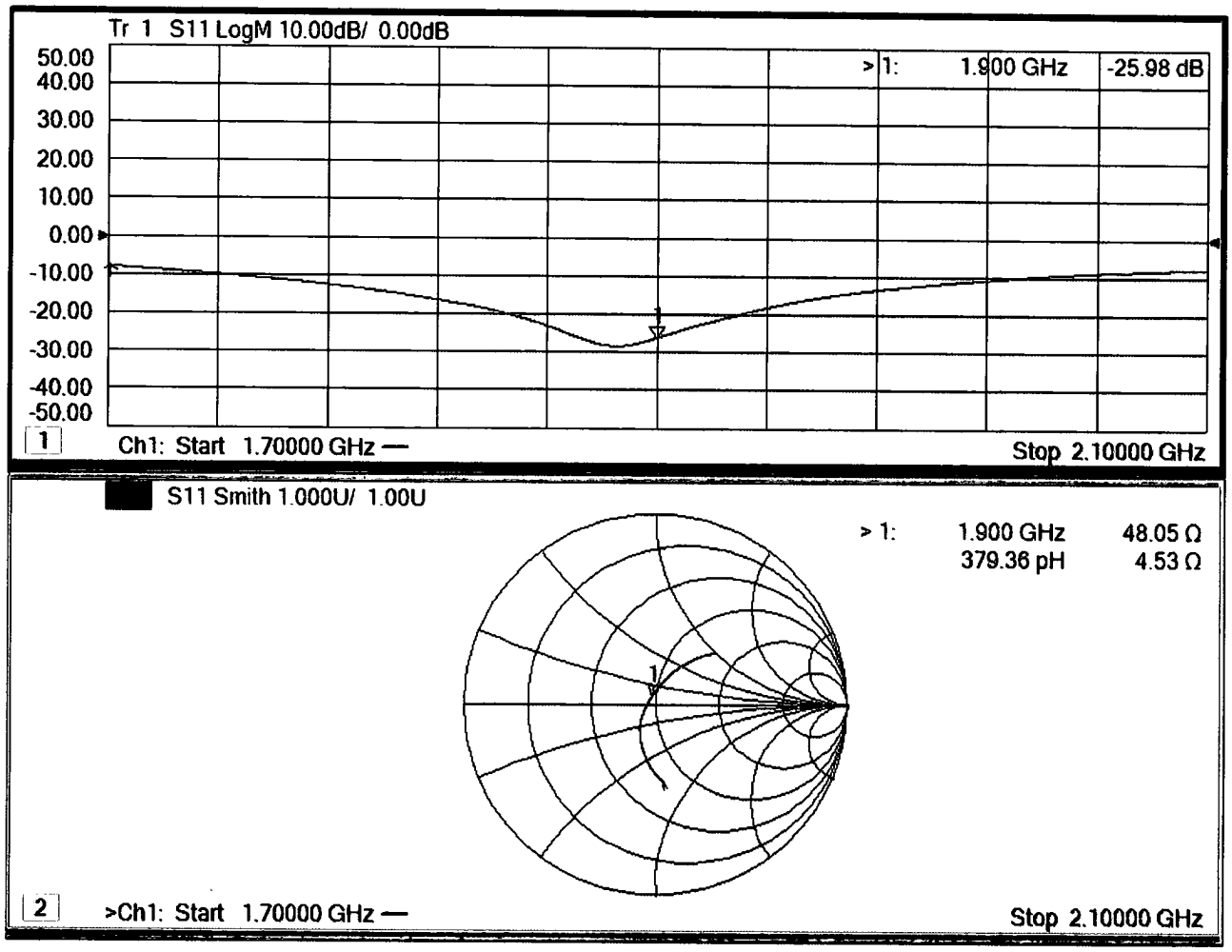
Impedance Measurement Plot for Body TSL



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CNAS L0570

Client **Sporton** **Certificate No: Z18-60045**

CALIBRATION CERTIFICATE

Object: D2450V2 - SN: 908

Calibration Procedure(s): FF-Z11-003-01
Calibration Procedures for dipole validation kits

Calibration date: March 22, 2018

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)℃ and humidity<70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRVD	102083	01-Nov-17 (CTTL, No.J17X08756)	Oct-18
Power sensor NRV-Z5	100542	01-Nov-17 (CTTL, No.J17X08756)	Oct-18
Reference Probe EX3DV4	SN 7464	12-Sep-17(SPEAG,No.EX3-7464_Sep17)	Sep-18
DAE4	SN 1525	02-Oct-17(SPEAG,No.DAE4-1525_Oct17)	Oct-18
Secondary Standards	**ID #**	**Cal Date(Calibrated by, Certificate No.)**	**Scheduled Calibration**
Signal Generator E4438C	MY49071430	23-Jan-18 (CTTL, No.J18X00560)	Jan-19
NetworkAnalyzer E5239A	MY55491241	29-Jun-17 (CTTL, No.J18X00561)	Jun-18

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Lin Hao	SAR Test Engineer	
Approved by:	Qi Dianyuan	SAR Project Leader	

Issued: March 25, 2018

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

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Glossary:

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

Calibration is Performed According to the Following Standards:

a) IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013

b) IEC 62209-1, "Measurement procedure for assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices- Part 1: Device used next to the ear (Frequency range of 300MHz to 6GHz)", July 2016

c) IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010

d) KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

e) 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.

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%.

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Measurement Conditions

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

DASY Version	DASY52	52.10.0.1446
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.3 ± 6 %	1.84 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**51.8 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	6.04 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	**24.1 mW /g ± 18.7 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	51.3 ± 6 %	2.00 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	12.9 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**50.7 mW /g ± 18.8 % (k=2)**
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.92 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	**23.4 mW /g ± 18.7 % (k=2)**