

57_LTE Band 12_10M QPSK_1RB_0Offset_Back_5mm_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; $\sigma = 0.866$ S/m; $\epsilon_r = 42.37$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C ; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(10.83, 10.83, 10.83); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch23095/Area Scan (81x81x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.831 W/kg

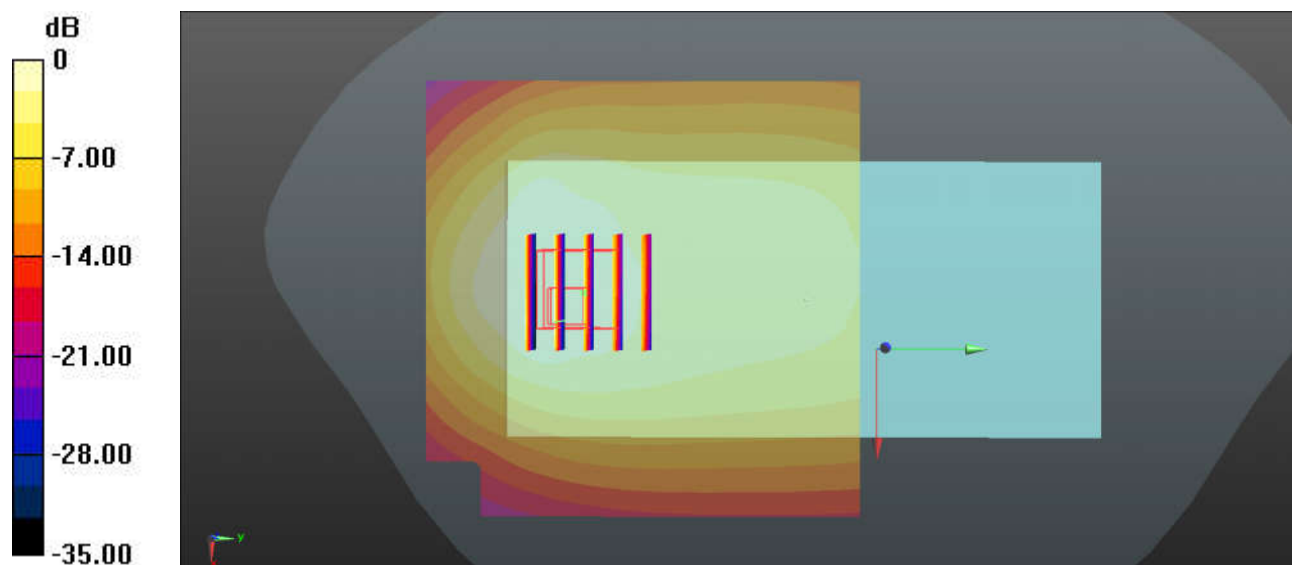
Ch23095/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 19.81 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 1.53 W/kg

SAR(1 g) = 0.732 W/kg; SAR(10 g) = 0.425 W/kg

Maximum value of SAR (measured) = 0.924 W/kg



0 dB = 0.831 W/kg = -0.80 dBW/kg

58_LTE Band 13_10M QPSK_1RB_0Offset_Back_5mm_Ch23230

Communication System: UID 0, LTE-FDD (0); Frequency: 782 MHz; Duty Cycle: 1:1

Medium: HSL_750 Medium parameters used: $f = 782$ MHz; $\sigma = 0.929$ S/m; $\epsilon_r = 41.366$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(10.83, 10.83, 10.83); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch23230/Area Scan (81x81x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 0.917 W/kg

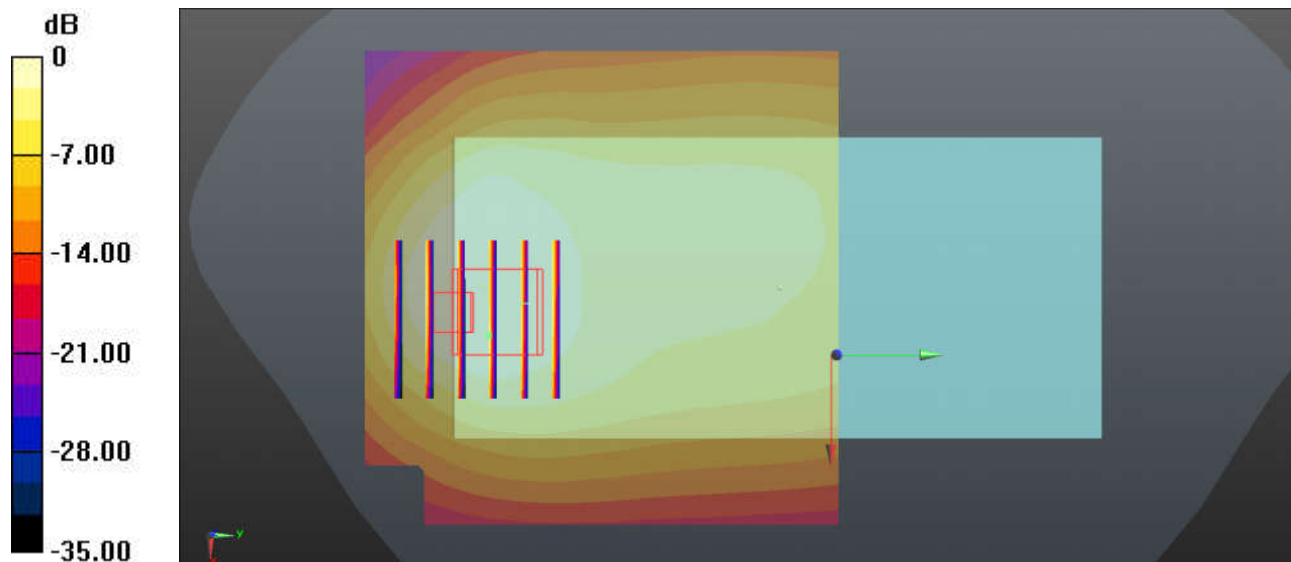
Ch23230/Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 19.04 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.56 W/kg

SAR(1 g) = 0.727 W/kg; SAR(10 g) = 0.415 W/kg

Maximum value of SAR (measured) = 0.924 W/kg



0 dB = 0.917 W/kg = -0.38 dBW/kg

59_LTE Band 14_10M QPSK_1RB_0Offset_Back_5mm_Ch23330

Communication System: UID 0, LTE-FDD (0); Frequency: 793 MHz; Duty Cycle: 1:1

Medium: HSL_750 Medium parameters used: $f = 793$ MHz; $\sigma = 0.941$ S/m; $\epsilon_r = 41.254$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(10.83, 10.83, 10.83); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch23330/Area Scan (81x81x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 1.05 W/kg

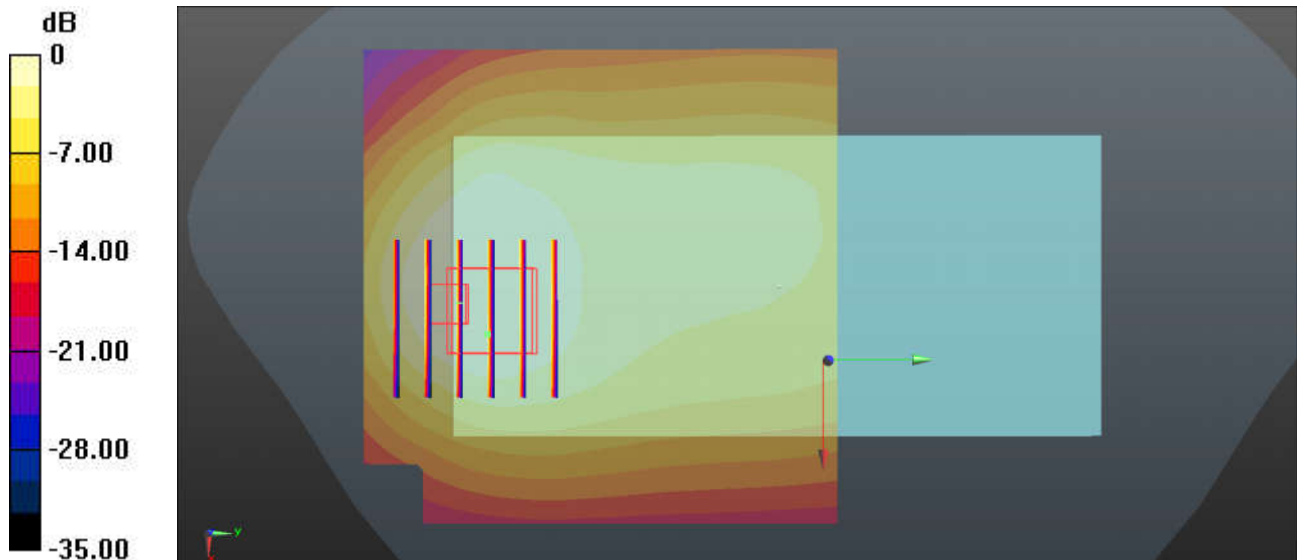
Ch23330/Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 20.04 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.81 W/kg

SAR(1 g) = 0.857 W/kg; SAR(10 g) = 0.479 W/kg

Maximum value of SAR (measured) = 1.09 W/kg



0 dB = 1.05 W/kg = 0.21 dBW/kg

60_LTE Band 26_15M QPSK_1RB_0Offset_Back_5mm_Ch26865

Communication System: UID 0, LTE-FDD (0); Frequency: 831.5 MHz; Duty Cycle: 1:1

Medium: HSL_850 Medium parameters used: $f = 831.5$ MHz; $\sigma = 0.925$ S/m; $\epsilon_r = 42.258$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C ; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(10.48, 10.48, 10.48); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch26865/Area Scan (81x81x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 1.43 W/kg

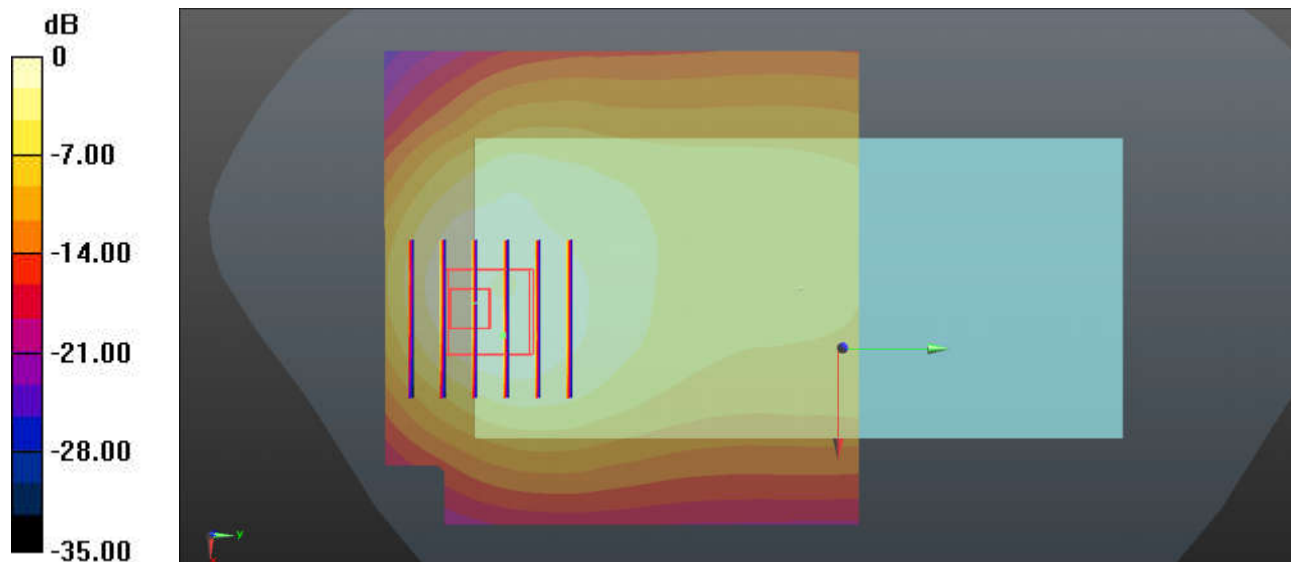
Ch26865/Zoom Scan (6x6x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 19.08 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 2.43 W/kg

SAR(1 g) = 1.18 W/kg; SAR(10 g) = 0.637 W/kg

Maximum value of SAR (measured) = 1.56 W/kg



0 dB = 1.43 W/kg = 1.55 dBW/kg

61_LTE Band 66_20M QPSK_50RB_0Offset_Back_5mm_Ch132572

Communication System: UID 0, LTE-FDD (0); Frequency: 1770 MHz; Duty Cycle: 1:1

Medium: HSL_1750 Medium parameters used: $f = 1770$ MHz; $\sigma = 1.401$ S/m; $\epsilon_r = 39.629$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.91, 8.91, 8.91); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch132572/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.20 W/kg

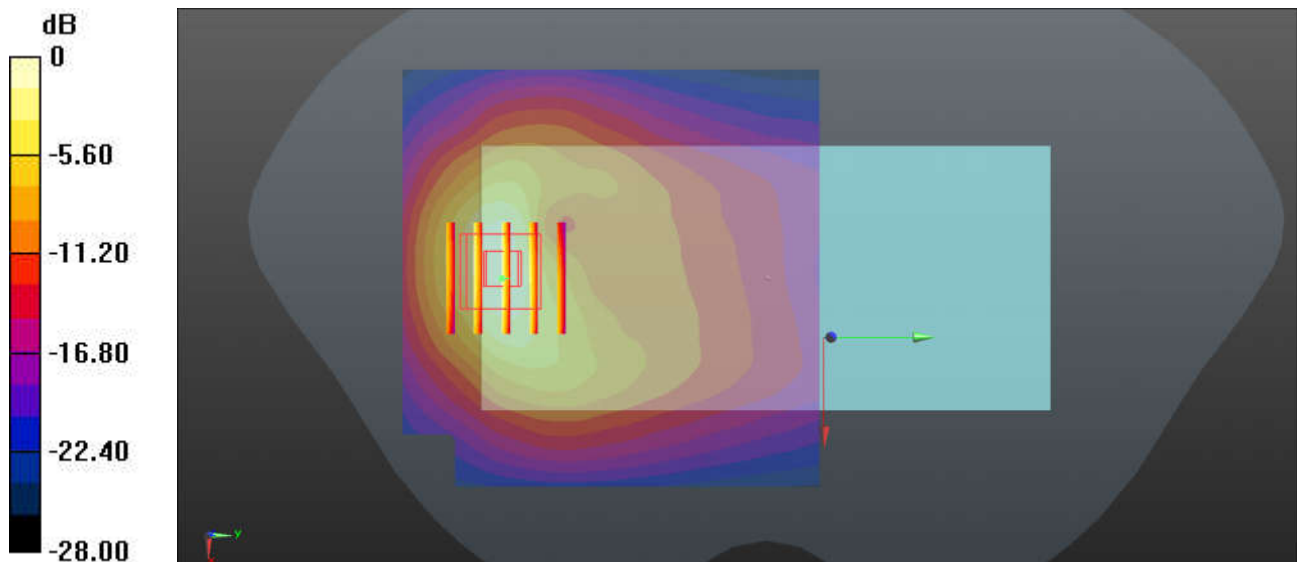
Ch132572/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.015 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 1.68 W/kg

SAR(1 g) = 0.985 W/kg; SAR(10 g) = 0.519 W/kg

Maximum value of SAR (measured) = 1.21 W/kg



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

62_LTE Band 25_20M QPSK_50RB_24Offset_Back_5mm_Ch26590

Communication System: UID 0, LTE-FDD (0); Frequency: 1905 MHz; Duty Cycle: 1:1

Medium: HSL_1900 Medium parameters used: $f = 1905$ MHz; $\sigma = 1.432$ S/m; $\epsilon_r = 38.705$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.5, 8.5, 8.5); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch26590/Area Scan (81x81x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 1.18 W/kg

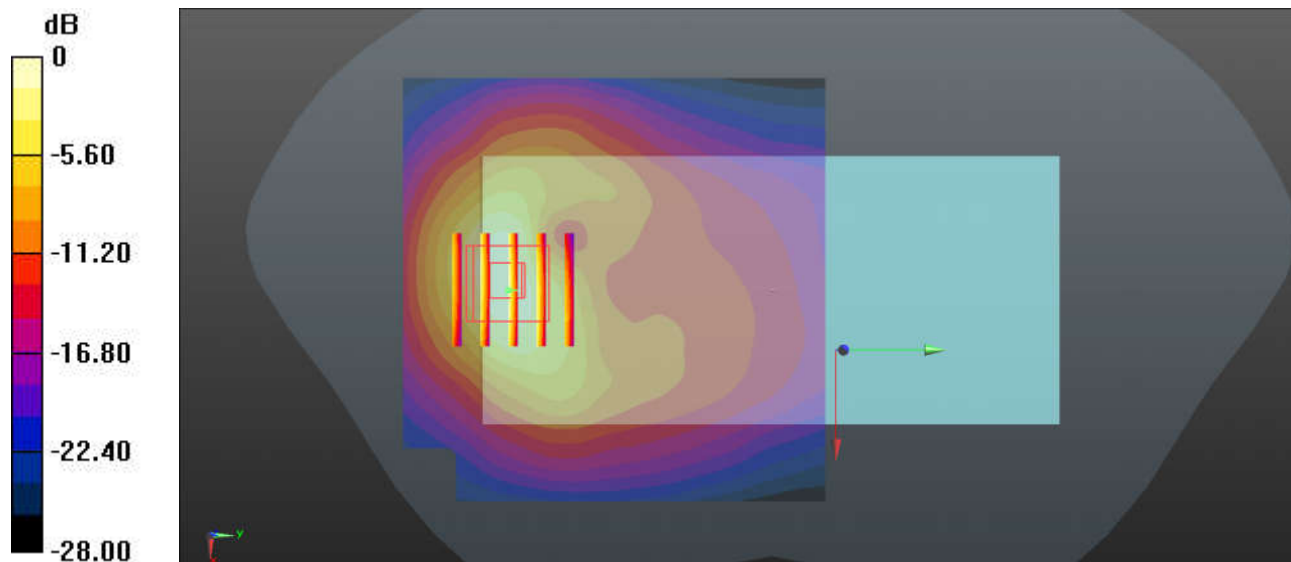
Ch26590/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 6.269 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.71 W/kg

SAR(1 g) = 0.955 W/kg; SAR(10 g) = 0.491 W/kg

Maximum value of SAR (measured) = 1.18 W/kg



0 dB = 1.18 W/kg = 0.72 dBW/kg

63_LTE Band 30_10M QPSK_1RB_0Offset_Back_5mm_Ch27710

Communication System: UID 0, LTE-FDD (0); Frequency: 2310 MHz; Duty Cycle: 1:1

Medium: HSL_2300 Medium parameters used: $f = 2310$ MHz; $\sigma = 1.692$ S/m; $\epsilon_r = 38.988$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.99, 7.99, 7.99); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch27710/Area Scan (91x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 2.09 W/kg

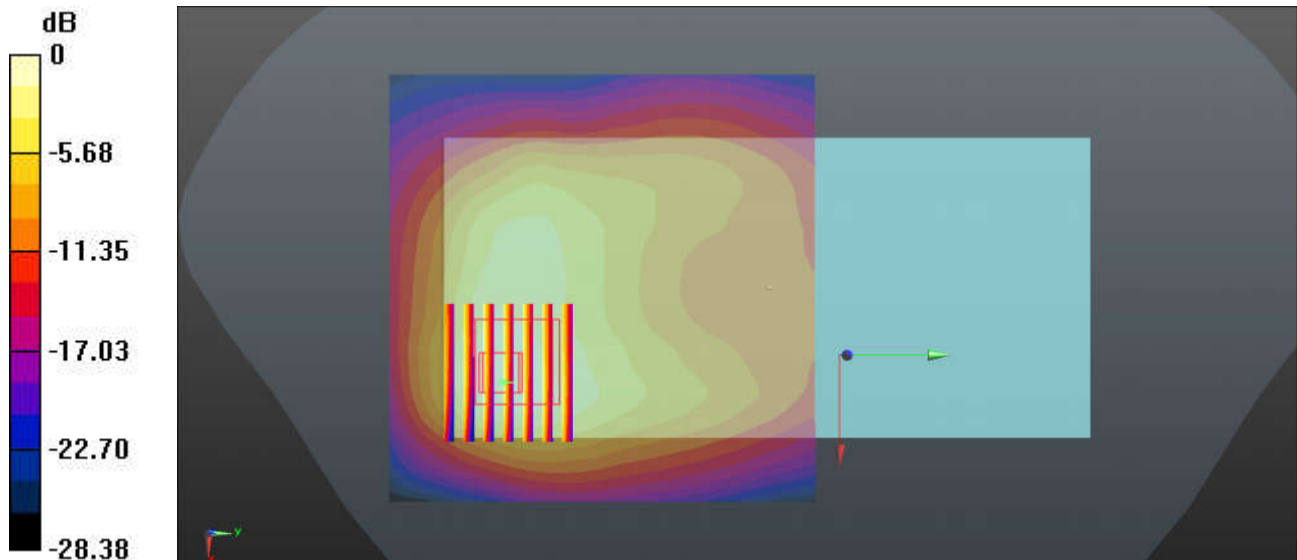
Ch27710/Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 10.07 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 2.41 W/kg

SAR(1 g) = 1.15 W/kg; SAR(10 g) = 0.599 W/kg

Maximum value of SAR (measured) = 1.90 W/kg



0 dB = 2.09 W/kg = 3.20 dBW/kg

64_LTE Band 7_20M QPSK_50RB_0Offset_Back_5mm_Ch21350

Communication System: UID 0, LTE-FDD (0); Frequency: 2560 MHz; Duty Cycle: 1:1

Medium: HSL_2600 Medium parameters used: $f = 2560$ MHz; $\sigma = 1.978$ S/m; $\epsilon_r = 37.943$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.38, 7.38, 7.38); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- 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) = 2.17 W/kg

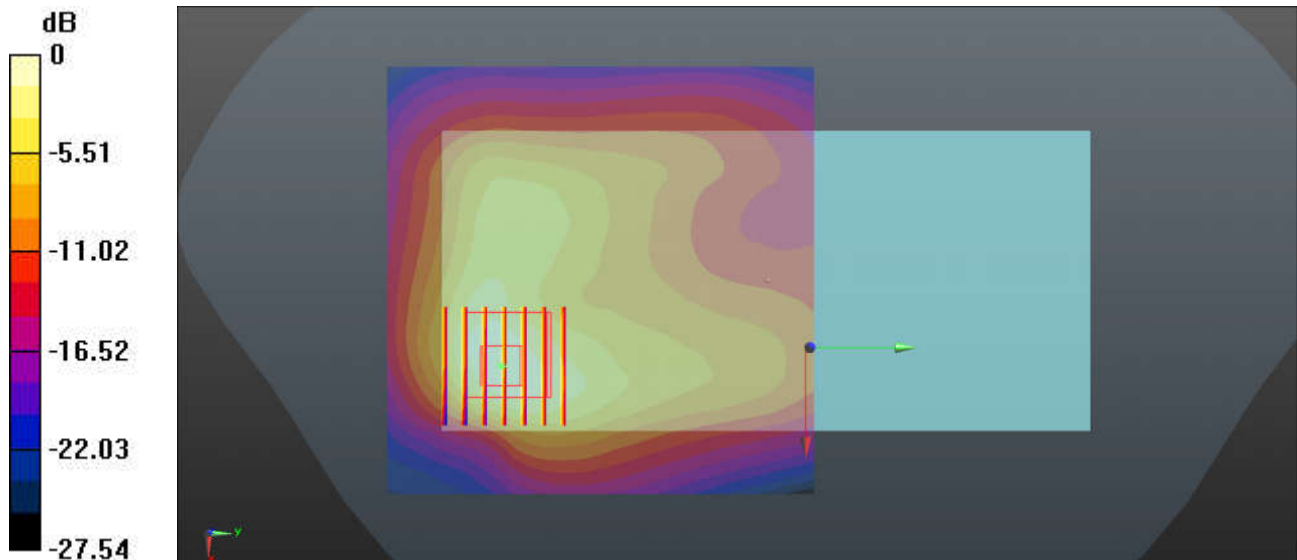
Ch21350/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 9.247 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 2.97 W/kg

SAR(1 g) = 1.16 W/kg; SAR(10 g) = 0.519 W/kg

Maximum value of SAR (measured) = 2.15 W/kg



0 dB = 2.17 W/kg = 3.36 dBW/kg

65_LTE Band 41_20M QPSK_1RB_0Offset_Back_5mm_Ch41055

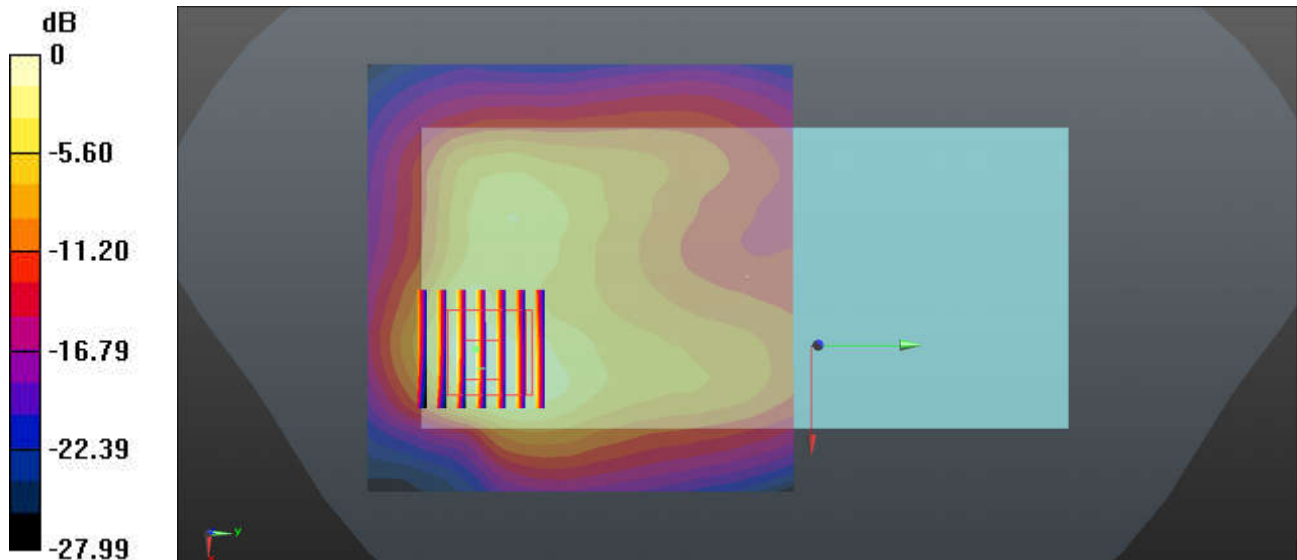
Communication System: UID 0, LTE-TDD (0); Frequency: 2636.5 MHz; Duty Cycle: 1:1.59
Medium: HSL_2600 Medium parameters used: $f = 2636.5$ MHz; $\sigma = 2.066$ S/m; $\epsilon_r = 37.634$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.3 °C; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.38, 7.38, 7.38); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch41055/Area Scan (91x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm
Maximum value of SAR (interpolated) = 1.98 W/kg

Ch41055/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.004 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 2.82 W/kg
SAR(1 g) = 1.07 W/kg; SAR(10 g) = 0.462 W/kg
Maximum value of SAR (measured) = 2.05 W/kg



0 dB = 1.98 W/kg = 2.97 dBW/kg

66_LTE Band 41(HPUE)_20M QPSK_1RB_0Offset_Back_5mm_Ch40185

Communication System: UID 0, LTE-TDD (0); Frequency: 2549.5 MHz; Duty Cycle: 1:2.311
Medium: HSL_2600 Medium parameters used: $f = 2549.5$ MHz; $\sigma = 1.965$ S/m; $\epsilon_r = 37.975$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.3 °C; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.38, 7.38, 7.38); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch40185/Area Scan (91x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 1.84 W/kg

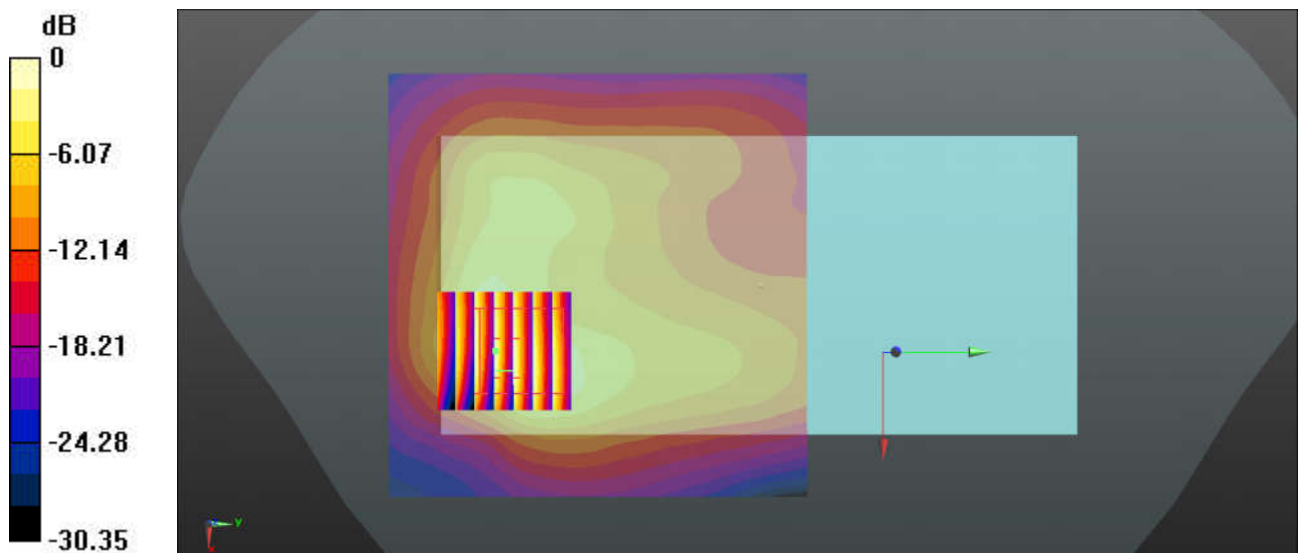
Ch40185/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.170 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 2.46 W/kg

SAR(1 g) = 0.949 W/kg; SAR(10 g) = 0.422 W/kg

Maximum value of SAR (measured) = 1.69 W/kg



67_WLAN 2.4GHz_802.11b 1Mbps_Back_5mm_Ant 1_Ch6

Communication System: UID 0, 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: HSL_2450 Medium parameters used: $f = 2437$ MHz; $\sigma = 1.767$ S/m; $\epsilon_r = 40.709$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C ; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(7.5, 7.5, 7.5) @ 2437 MHz; Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch6/Area Scan (91x71x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 1.19 W/kg

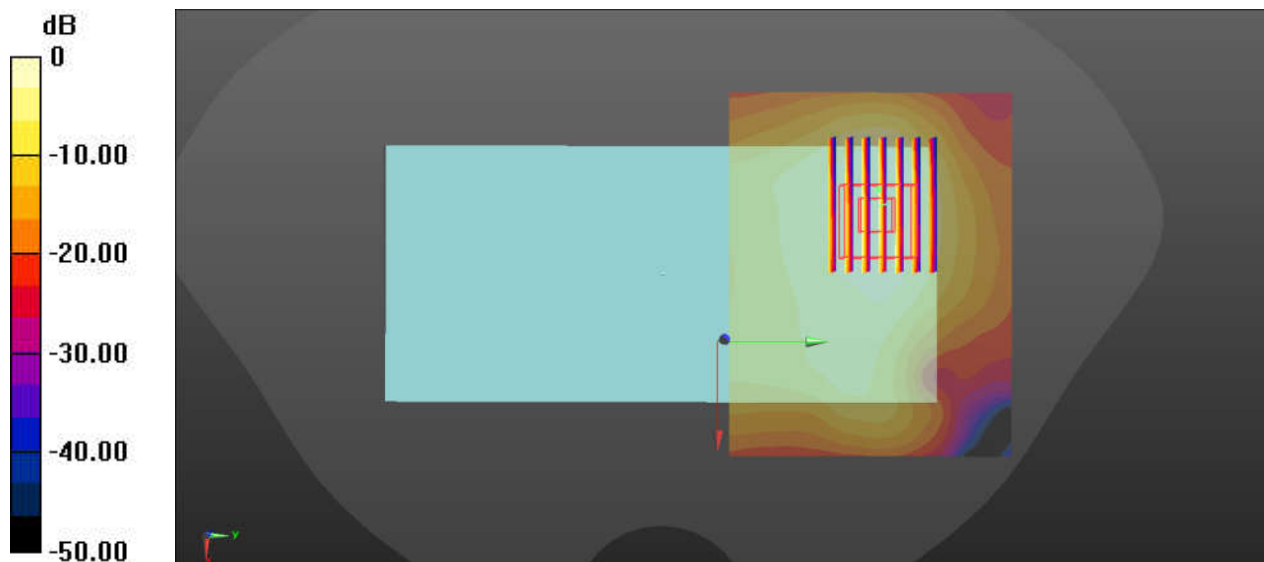
Ch6/Zoom Scan (9x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.644 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 1.31 W/kg

SAR(1 g) = 0.704 W/kg; SAR(10 g) = 0.373 W/kg

Maximum value of SAR (measured) = 1.09 W/kg



0 dB = 1.19 W/kg = 0.76 dBW/kg

68_WLAN5.2GHz_802.11n-HT40 MCS0_Back_5mm_Ant 1_Ch38

Communication System: UID 0, 802.11n (0); Frequency: 5190 MHz; Duty Cycle: 1:1.038

Medium: HSL_5000 Medium parameters used: $f = 5190$ MHz; $\sigma = 4.521$ S/m; $\epsilon_r = 36.525$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C ; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(5.19, 5.19, 5.19); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch38/Area Scan (101x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.01 W/kg

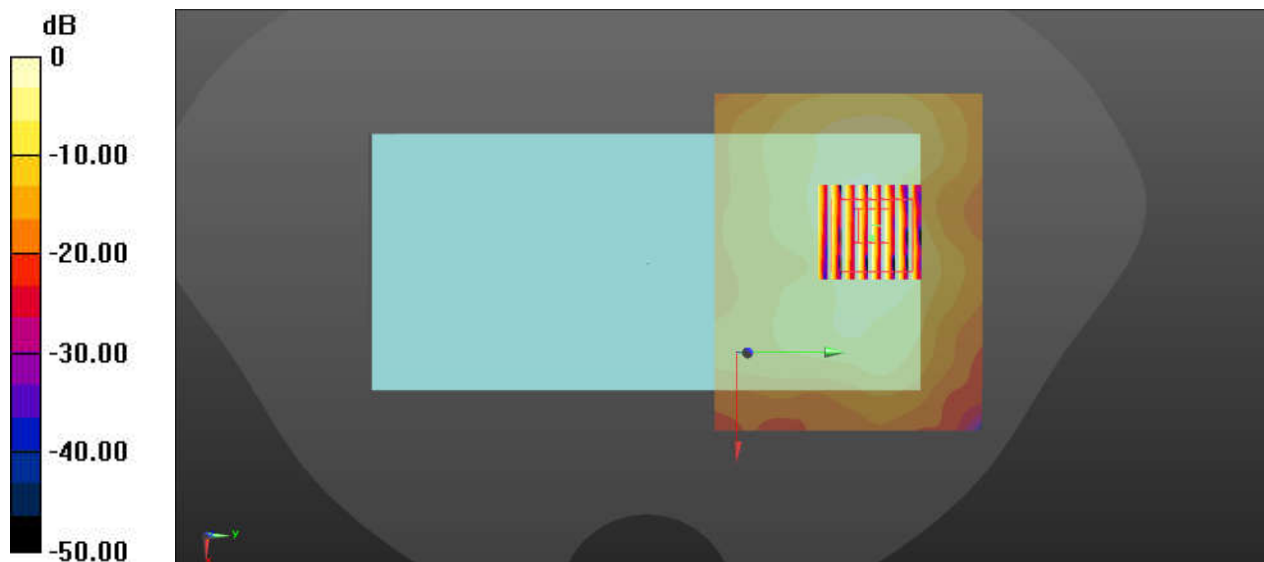
Ch38/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 0 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 2.90 W/kg

SAR(1 g) = 0.829 W/kg; SAR(10 g) = 0.314 W/kg

Maximum value of SAR (measured) = 1.80 W/kg



69_WLAN5.3GHz_802.11n-HT40 MCS0_Back_5mm_Ant 1_Ch54

Communication System: UID 0, 802.11n (0); Frequency: 5270 MHz; Duty Cycle: 1:1.038
Medium: HSL_5000 Medium parameters used: $f = 5270$ MHz; $\sigma = 4.623$ S/m; $\epsilon_r = 36.391$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.2 °C ; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(5.19, 5.19, 5.19); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch54/Area Scan (101x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.33 W/kg

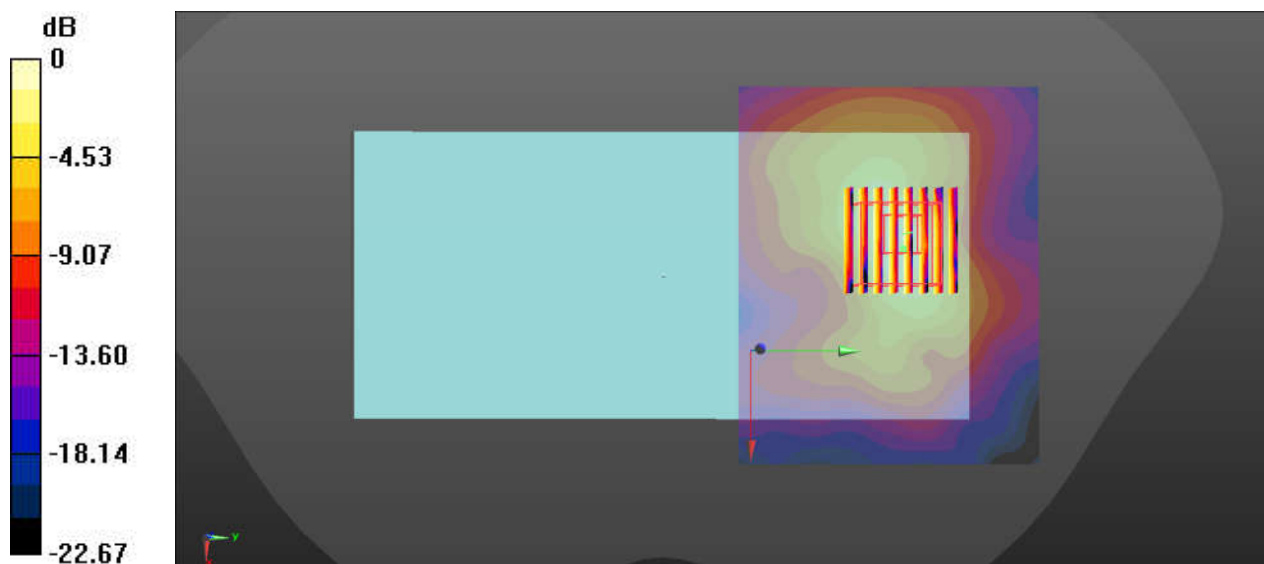
Ch54/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 2.644 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 3.52 W/kg

SAR(1 g) = 0.954 W/kg; SAR(10 g) = 0.353 W/kg

Maximum value of SAR (measured) = 2.18 W/kg



0 dB = 2.33 W/kg = 3.67 dBW/kg

70_WLAN5.5GHz_802.11n-HT40 MCS0_Back_5mm_Ant 1_Ch134

Communication System: UID 0, 802.11n (0); Frequency: 5670 MHz; Duty Cycle: 1:1.038

Medium: HSL_5000 Medium parameters used: $f = 5670$ MHz; $\sigma = 5.075$ S/m; $\epsilon_r = 35.726$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(4.92, 4.92, 4.92); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch134/Area Scan (101x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 1.92 W/kg

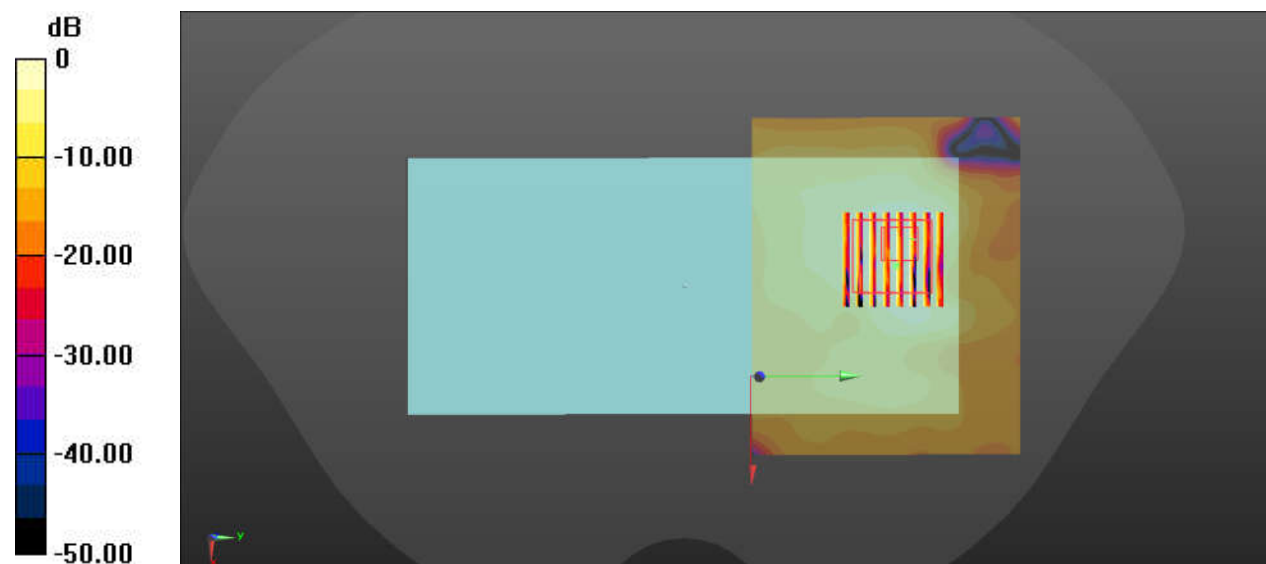
Ch134/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 3.530 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 3.78 W/kg

SAR(1 g) = 0.856 W/kg; SAR(10 g) = 0.328 W/kg

Maximum value of SAR (measured) = 2.09 W/kg



0 dB = 1.92 W/kg = 2.83 dBW/kg

71_WLAN5.8GHz_802.11n-HT20 MCS0_Back_5mm_Ant 1_Ch151

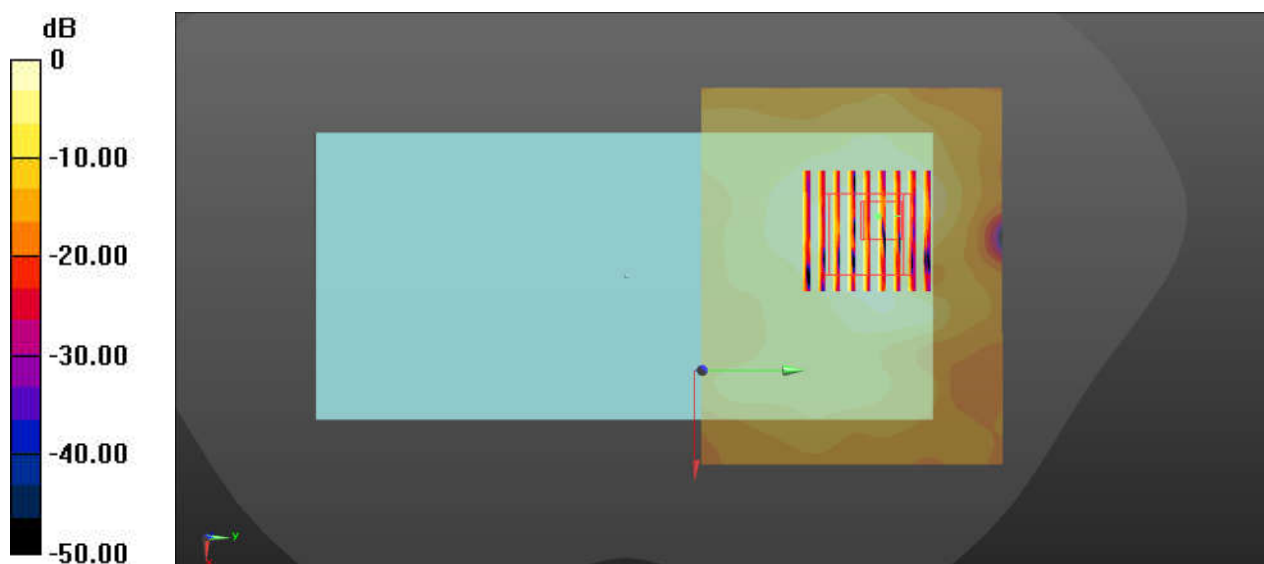
Communication System: UID 0, 802.11n (0); Frequency: 5795 MHz; Duty Cycle: 1:1.038
Medium: HSL_5000 Medium parameters used: $f = 5795$ MHz; $\sigma = 5.207$ S/m; $\epsilon_r = 35.516$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(5.17, 5.17, 5.17); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch159/Area Scan (101x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.78 W/kg

Ch159/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 3.204 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 3.75 W/kg
SAR(1 g) = 0.772 W/kg; SAR(10 g) = 0.292 W/kg
Maximum value of SAR (measured) = 2.00 W/kg



0 dB = 1.78 W/kg = 2.50 dBW/kg

72_ Bluetooth _1Mbps_Back_5mm_Ant 1_Ch39

Communication System: UID 0, Bluetooth (0); Frequency: 2441 MHz; Duty Cycle: 1:1.305

Medium: HSL_2450 Medium parameters used: $f = 2441$ MHz; $\sigma = 1.771$ S/m; $\epsilon_r = 40.697$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(7.5, 7.5, 7.5); Calibrated: 2019/5/27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch39/Area Scan (91x71x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 0.0562 W/kg

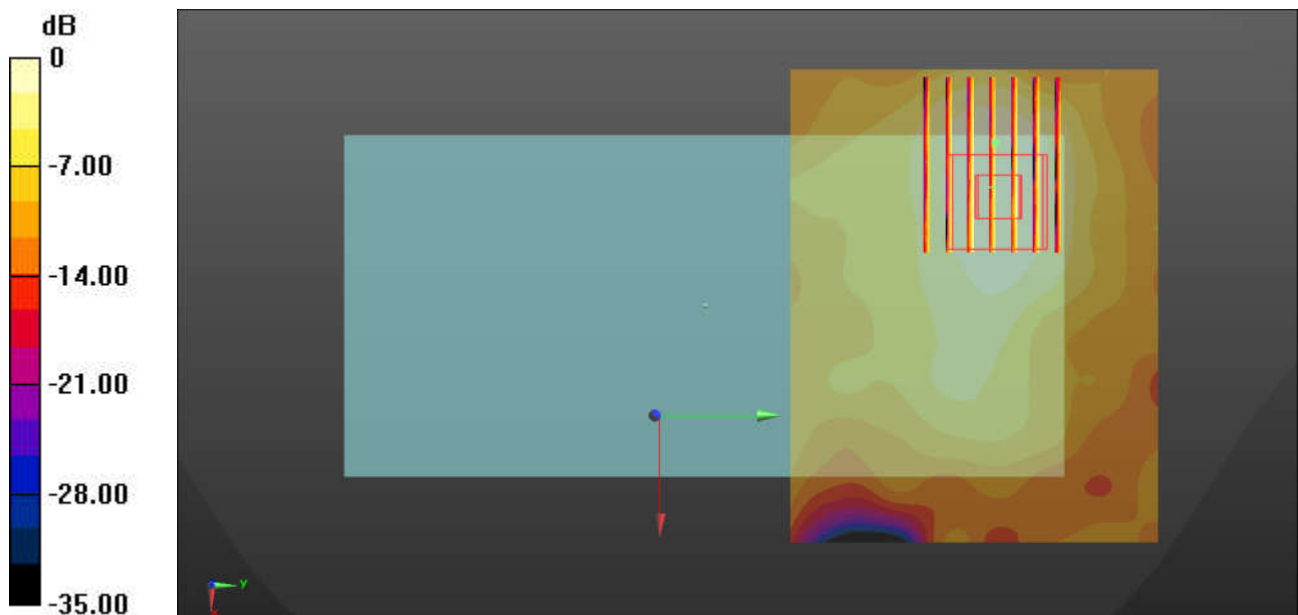
Ch39/Zoom Scan (9x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 1.640 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.0630 W/kg

SAR(1 g) = 0.03 W/kg; SAR(10 g) = 0.016 W/kg

Maximum value of SAR (measured) = 0.0511 W/kg



0 dB = 0.0562 W/kg = -12.50 dBW/kg

73_GSM850_GPRS 4 Tx slots_Front_0mm_Ch128

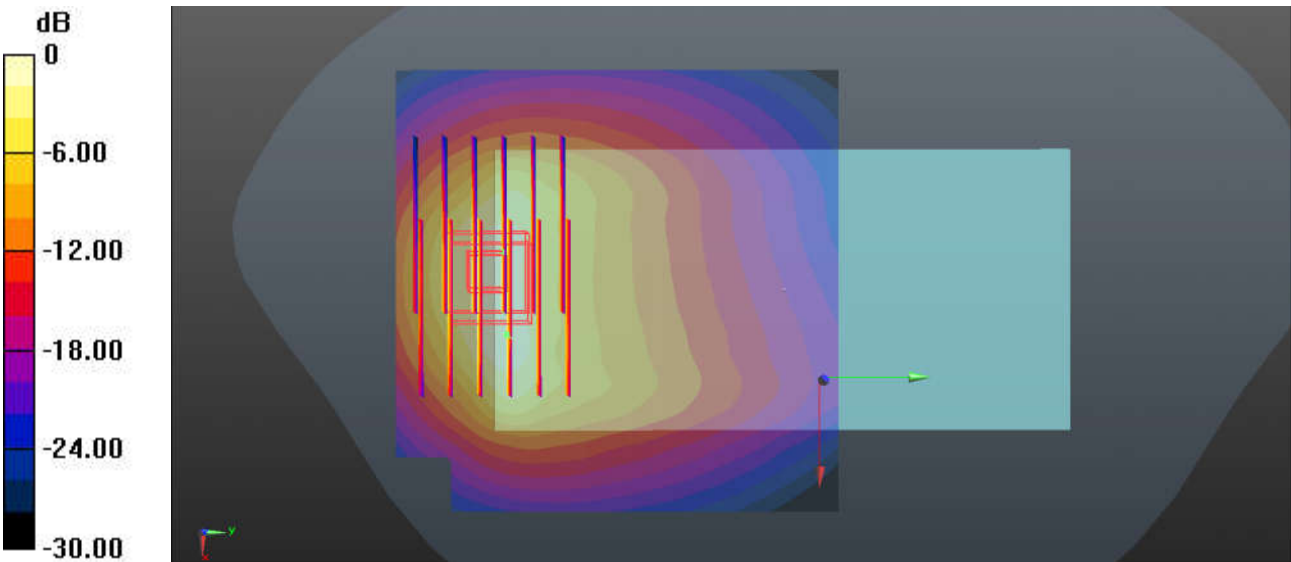
Communication System: UID 0, GSM850-4UP (0); Frequency: 824.2 MHz;Duty Cycle: 1:2.08
Medium: HSL_850 Medium parameters used: $f = 824.2\text{ MHz}$; $\sigma = 0.918\text{ S/m}$; $\epsilon_r = 42.339$; $\rho = 1000\text{ kg/m}^3$
Ambient Temperature : $23.2\text{ }^{\circ}\text{C}$; Liquid Temperature : $22.9\text{ }^{\circ}\text{C}$

- DASY5 Configuration:
- Probe: EX3DV4 - SN3935; ConvF(10.48, 10.48, 10.48); Calibrated: 2018.11.26
 - Sensor-Surface: 1.4mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn690; Calibrated: 2019.1.23
 - Phantom: SAM2; Type: SAM; Serial: TP-1754
 - Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch128/Area Scan (81x81x1): Interpolated grid: $dx=1.500\text{ mm}$, $dy=1.500\text{ mm}$
Maximum value of SAR (interpolated) = 4.14 W/kg

Ch128/Zoom Scan (7x6x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 8.781 V/m ; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 5.72 W/kg
SAR(1 g) = 2.33 W/kg ; SAR(10 g) = 1.21 W/kg
Maximum value of SAR (measured) = 4.01 W/kg

Ch128/Zoom Scan (7x6x7)/Cube 1: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$
Reference Value = 8.781 V/m ; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 5.80 W/kg
SAR(1 g) = 2.39 W/kg ; SAR(10 g) = 1.22 W/kg
Maximum value of SAR (measured) = 4.23 W/kg



0 dB = 4.14 W/kg = 6.17 dBW/kg

74_GSM1900_GPRS 3 Tx slots_Bottom Side_0mm_Ch512

Communication System: UID 0, PCS-3UP (0); Frequency: 1850.2 MHz; Duty Cycle: 1:2.77

Medium: HSL_1900 Medium parameters used: $f = 1850.2$ MHz; $\sigma = 1.377$ S/m; $\epsilon_r = 38.955$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.5, 8.5, 8.5); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch512/Area Scan (41x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 8.11 W/kg

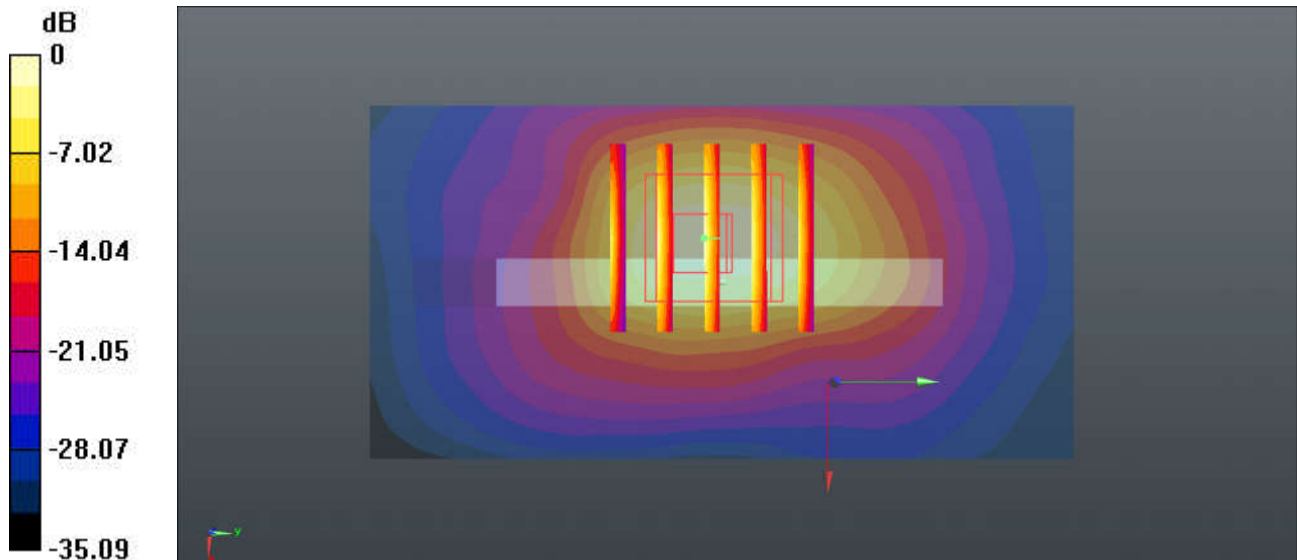
Ch512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 0.9690 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 13.0 W/kg

SAR(1 g) = 5.82 W/kg; SAR(10 g) = 2.49 W/kg

Maximum value of SAR (measured) = 8.25 W/kg



0 dB = 8.11 W/kg = 9.09 dBW/kg

75_WCDMA V_RMC 12.2Kbps_Back_0mm_Ch4182

Communication System: UID 0, WCDMA (0); Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium: HSL_850 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.93$ S/m; $\epsilon_r = 42.205$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(10.48, 10.48, 10.48); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch4182/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 5.13 W/kg

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 0.5960 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 8.67 W/kg

SAR(1 g) = 3.35 W/kg; SAR(10 g) = 1.64 W/kg

Maximum value of SAR (measured) = 4.28 W/kg

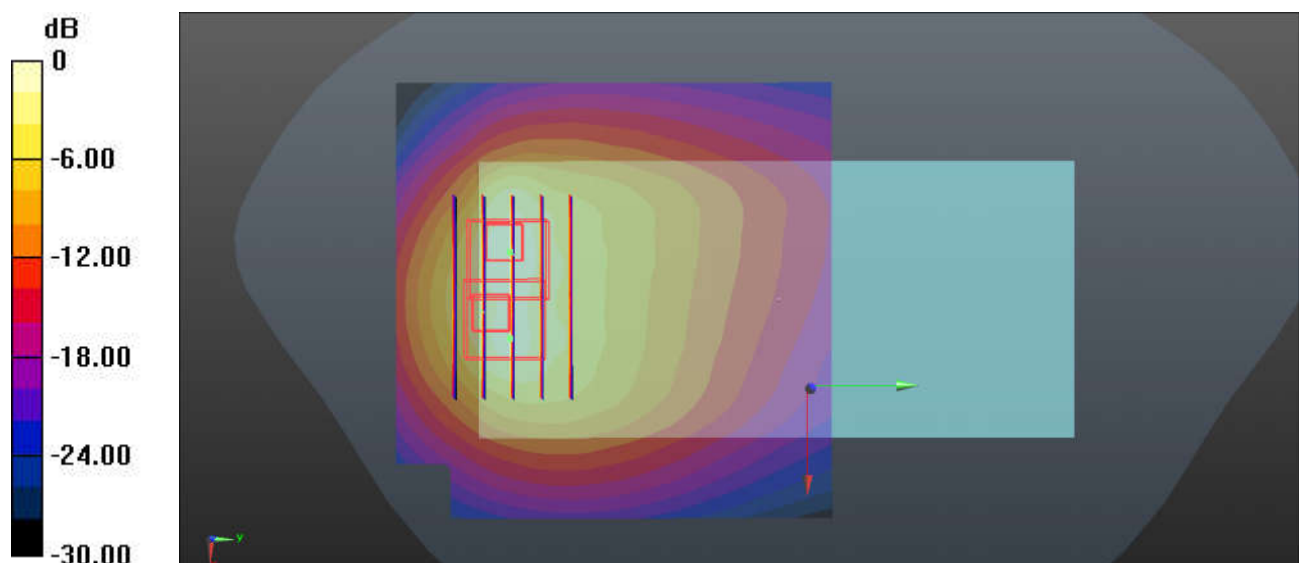
Ch4182/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 0.5960 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 6.66 W/kg

SAR(1 g) = 2.88 W/kg; SAR(10 g) = 1.52 W/kg

Maximum value of SAR (measured) = 3.74 W/kg



0 dB = 5.13 W/kg = 7.10 dBW/kg

76_WCDMA IV_RMC 12.2Kbps_Bottom Side_0mm_Ch1312

Communication System: UID 0, WCDMA (0); Frequency: 1712.4 MHz; Duty Cycle: 1:1

Medium: HSL_1750 Medium parameters used: $f = 1712.4$ MHz; $\sigma = 1.342$ S/m; $\epsilon_r = 39.889$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.91, 8.91, 8.91); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch1312/Area Scan (41x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 7.78 W/kg

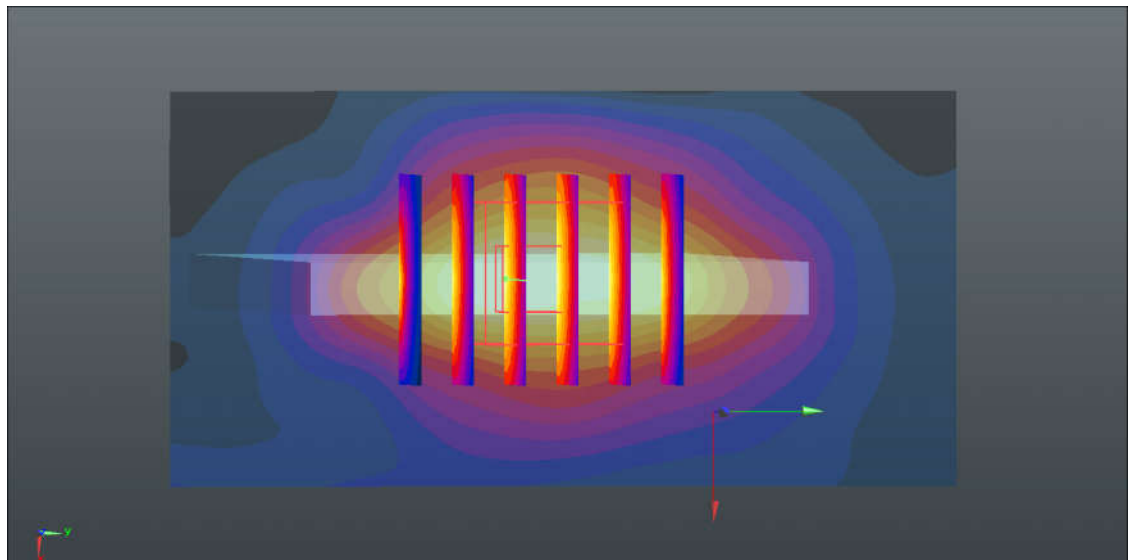
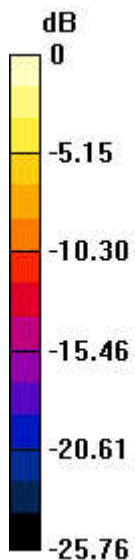
Ch1312/Zoom Scan (5x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 69.02 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 10.2 W/kg

SAR(1 g) = 4.56 W/kg; SAR(10 g) = 2.25 W/kg

Maximum value of SAR (measured) = 6.48 W/kg



0 dB = 7.78 W/kg = 8.91 dBW/kg

77_WCDMA II_RMC 12.2Kbps_Bottom Side_0mm_Ch9262

Communication System: UID 0, WCDMA (0); Frequency: 1852.4 MHz; Duty Cycle: 1:1

Medium: HSL_1900 Medium parameters used: $f = 1852.4$ MHz; $\sigma = 1.379$ S/m; $\epsilon_r = 38.946$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.5, 8.5, 8.5); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch9262/Area Scan (41x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 6.89 W/kg

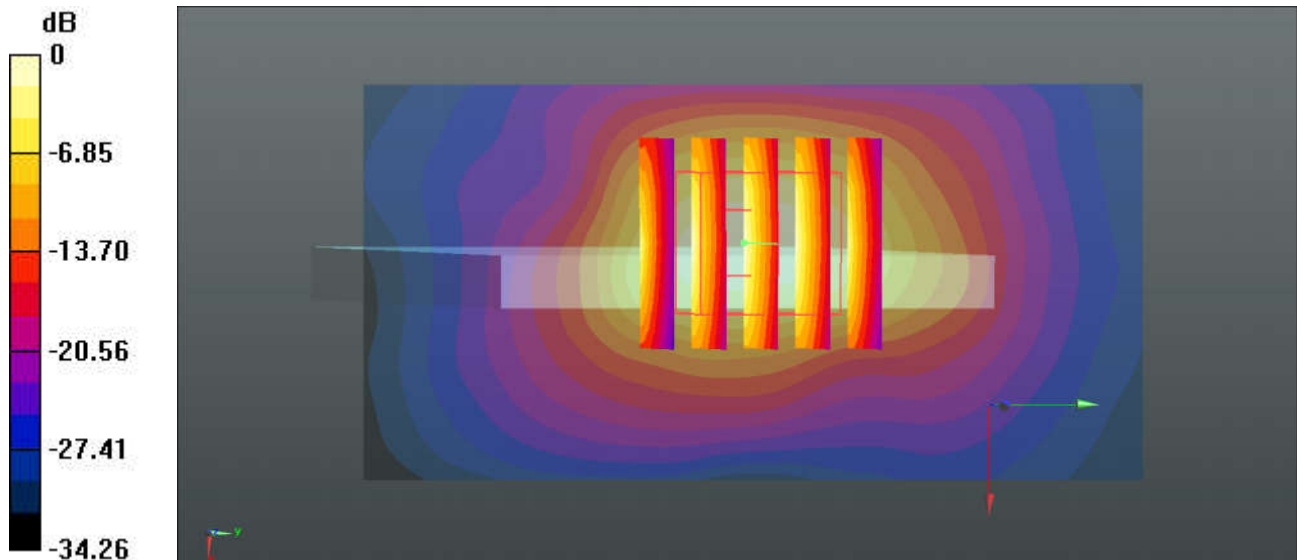
Ch9262/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.418 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 11.9 W/kg

SAR(1 g) = 5.12 W/kg; SAR(10 g) = 2.18 W/kg

Maximum value of SAR (measured) = 7.27 W/kg



0 dB = 6.89 W/kg = 8.38 dBW/kg

78_CDMA2000 BC10_RTAP 153.6Kbps_Back_0mm_Ch580

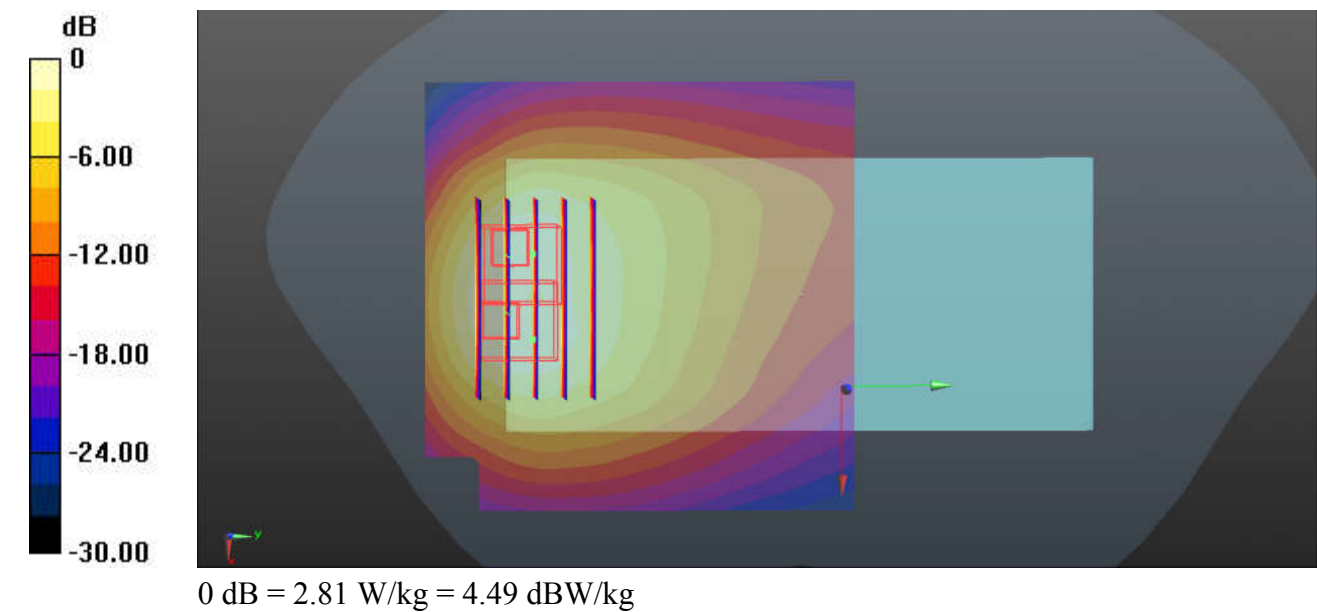
Communication System: UID 0, CDMA (0); Frequency: 820.5 MHz;Duty Cycle: 1:1
 Medium: HSL_850 Medium parameters used: f = 820.5 MHz; $\sigma = 0.914$ S/m; $\epsilon_r = 42.388$; $\rho = 1000$ kg/m³
 Ambient Temperature : 23.2 °C; Liquid Temperature : 22.9 °C

- DASY5 Configuration:
- Probe: EX3DV4 - SN3935; ConvF(10.48, 10.48, 10.48); Calibrated: 2018.11.26
 - Sensor-Surface: 1.4mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn690; Calibrated: 2019.1.23
 - Phantom: SAM2; Type: SAM; Serial: TP-1754
 - Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch580/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
 Maximum value of SAR (interpolated) = 2.81 W/kg

Ch580/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 13.55 V/m; Power Drift = 0.06 dB
 Peak SAR (extrapolated) = 7.08 W/kg
SAR(1 g) = 2.79 W/kg; SAR(10 g) = 1.42 W/kg
 Maximum value of SAR (measured) = 3.73 W/kg

Ch580/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
 Reference Value = 13.55 V/m; Power Drift = 0.06 dB
 Peak SAR (extrapolated) = 6.86 W/kg
SAR(1 g) = 2.69 W/kg; SAR(10 g) = 1.36 W/kg
 Maximum value of SAR (measured) = 3.67 W/kg



79_CDMA2000 BC0_RTAP 153.6Kbps_Back_0mm_Ch384

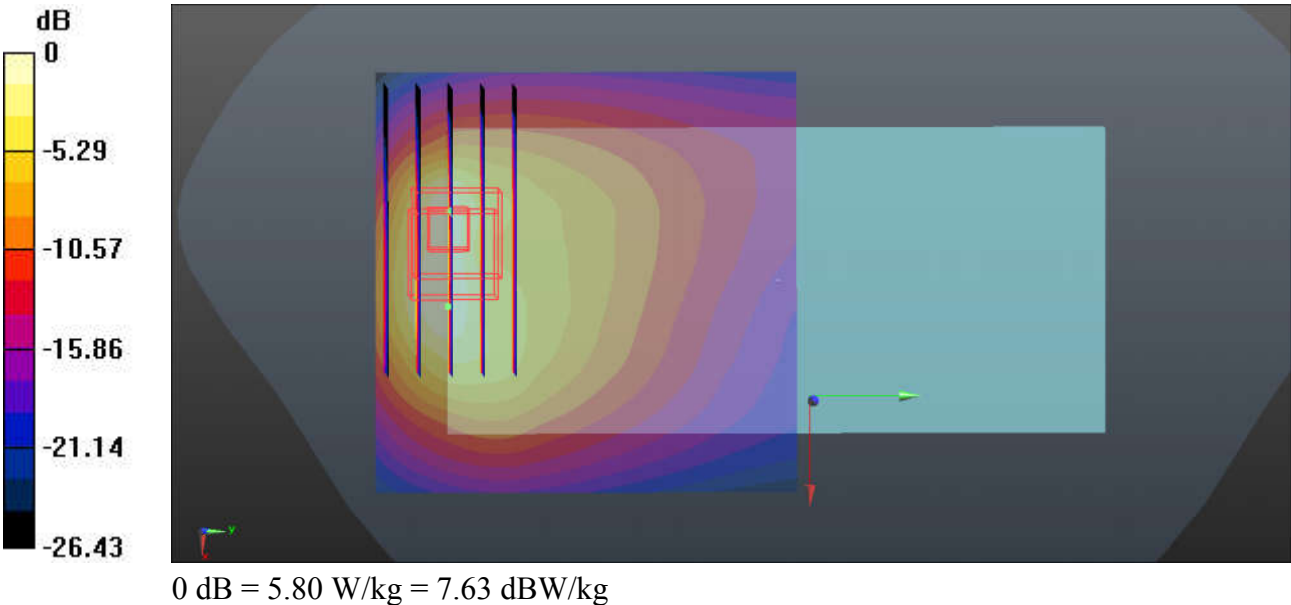
Communication System: UID 0, CDMA (0); Frequency: 836.52 MHz;Duty Cycle: 1:1
Medium: HSL_850 Medium parameters used: f = 836.52 MHz; $\sigma = 0.931$ S/m; $\epsilon_r = 42.2$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.2 °C ; Liquid Temperature : 22.9 °C

- DASY5 Configuration:
- Probe: EX3DV4 - SN3935; ConvF(10.48, 10.48, 10.48); Calibrated: 2018.11.26
 - Sensor-Surface: 1.4mm (Mechanical Surface Detection)
 - Electronics: DAE4 Sn690; Calibrated: 2019.1.23
 - Phantom: SAM2; Type: SAM; Serial: TP-1754
 - 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) = 5.80 W/kg

Ch384/Zoom Scan (7x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.07 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 8.83 W/kg
SAR(1 g) = 2.86 W/kg; SAR(10 g) = 1.36 W/kg
Maximum value of SAR (measured) = 6.21 W/kg

Ch384/Zoom Scan (7x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.07 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 8.42 W/kg
SAR(1 g) = 2.81 W/kg; SAR(10 g) = 1.32 W/kg
Maximum value of SAR (measured) = 6.03 W/kg



80_CDMA2000 BC1_RTAP 153.6Kbps_Bottom Side_0mm_Ch25

Communication System: UID 0, CDMA (0); Frequency: 1851.25 MHz; Duty Cycle: 1:1

Medium: HSL_1900 Medium parameters used: $f = 1851.25$ MHz; $\sigma = 1.378$ S/m; $\epsilon_r = 38.95$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.5, 8.5, 8.5); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch25/Area Scan (41x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 11.9 W/kg

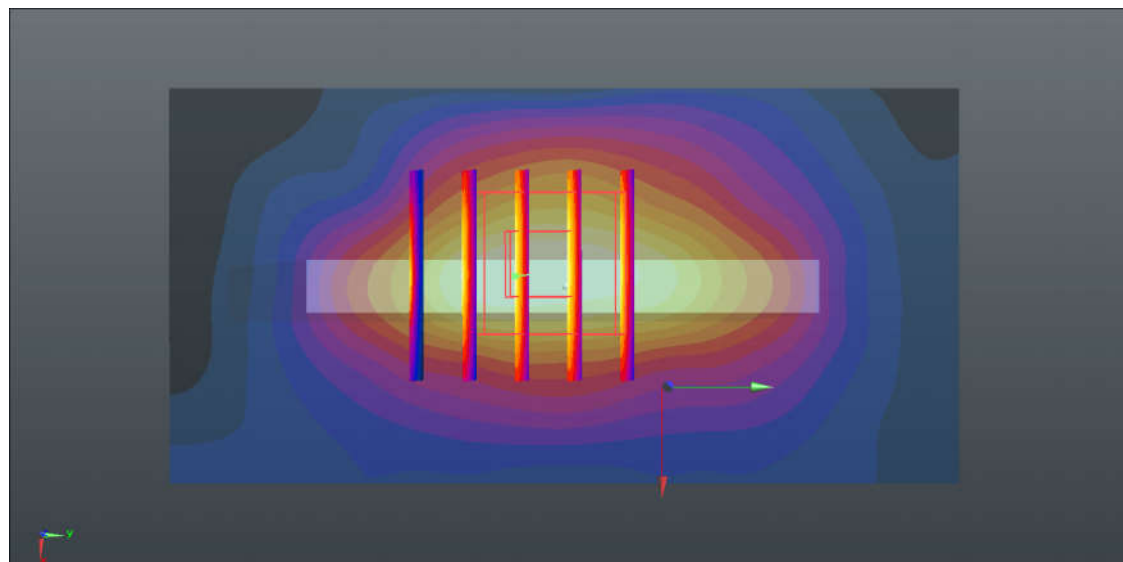
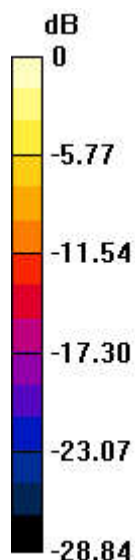
Ch25/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 89.39 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 15.7 W/kg

SAR(1 g) = 6.21 W/kg; SAR(10 g) = 2.62 W/kg

Maximum value of SAR (measured) = 12.0 W/kg



0 dB = 11.9 W/kg = 10.76 dBW/kg

81_LTE Band 26_15M QPSK_1RB_0Offset_Back_0mm_Ch26865

Communication System: UID 0, LTE-FDD (0); Frequency: 831.5 MHz; Duty Cycle: 1:1

Medium: HSL_850 Medium parameters used: $f = 831.5$ MHz; $\sigma = 0.925$ S/m; $\epsilon_r = 42.258$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(10.48, 10.48, 10.48); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch26865/Area Scan (81x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 2.90 W/kg

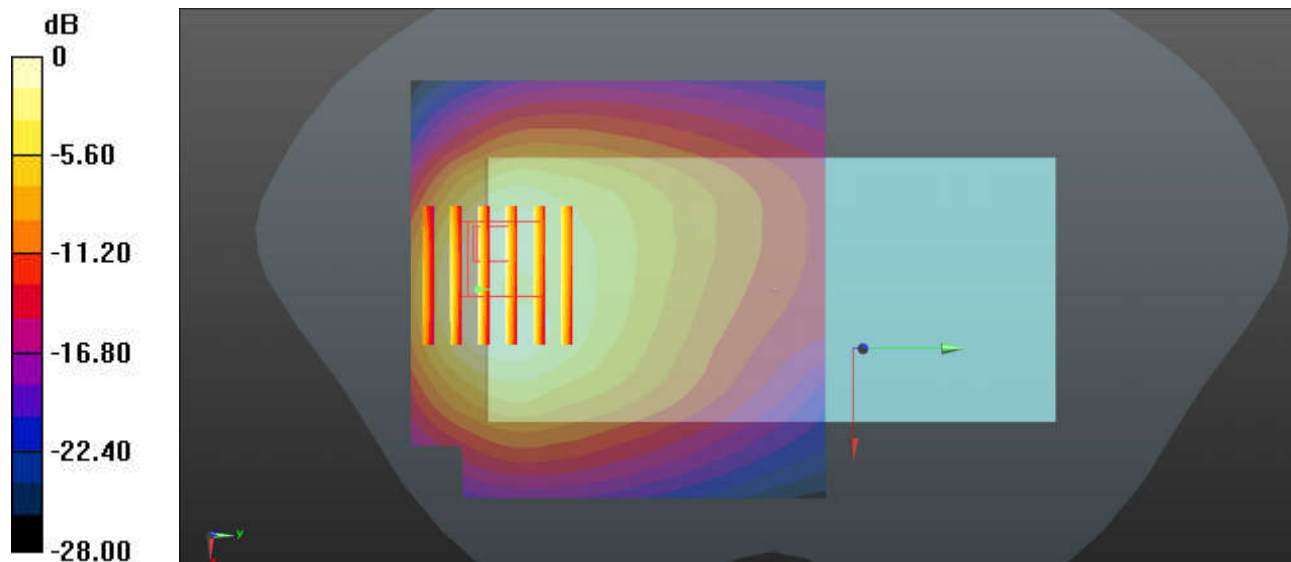
Ch26865/Zoom Scan (6x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.70 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 5.85 W/kg

SAR(1 g) = 2.56 W/kg; SAR(10 g) = 1.35 W/kg

Maximum value of SAR (measured) = 3.37 W/kg



0 dB = 2.90 W/kg = 4.62 dBW/kg

82_LTE Band 66_20M QPSK_50RB_0Offset_Bottom Side_0mm_Ch132072

Communication System: UID 0, LTE-FDD (0); Frequency: 1720 MHz; Duty Cycle: 1:1

Medium: HSL_1750 Medium parameters used: $f = 1720$ MHz; $\sigma = 1.349$ S/m; $\epsilon_r = 39.854$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.91, 8.91, 8.91); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch132072/Area Scan (41x81x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 10.7 W/kg

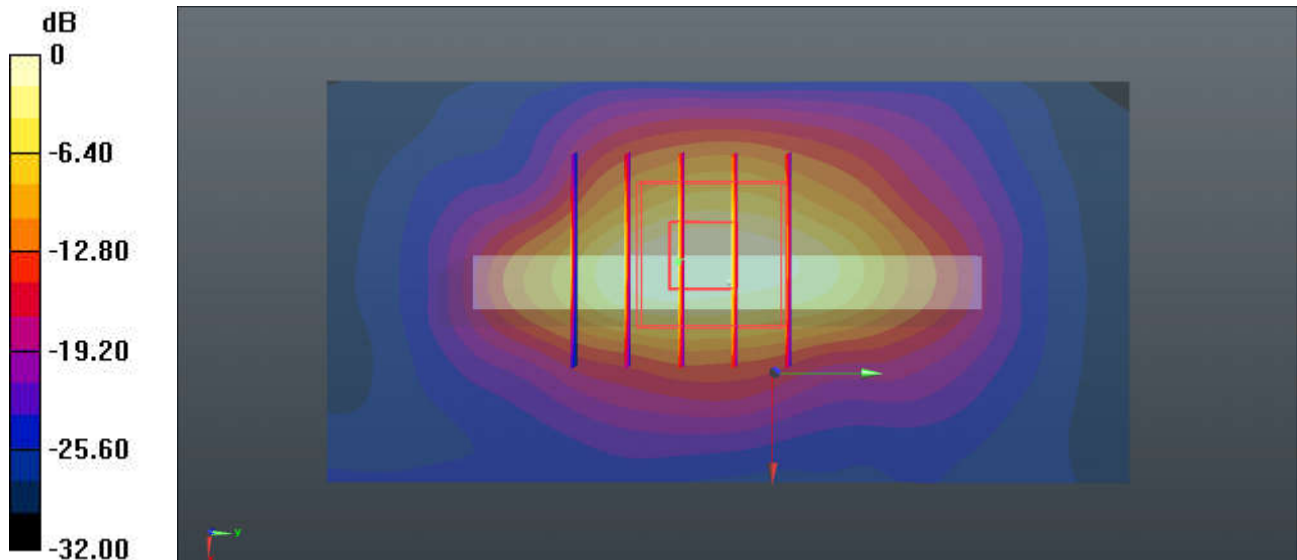
Ch132072/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 79.32 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 14.0 W/kg

SAR(1 g) = 5.72 W/kg; SAR(10 g) = 2.44 W/kg

Maximum value of SAR (measured) = 11.3 W/kg



0 dB = 10.7 W/kg = 10.29 dBW/kg

83_LTE Band 25_20M QPSK_1RB_0Offset_Bottom Side_0mm_Ch26140

Communication System: UID 0, LTE-FDD (0); Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: HSL_1900 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.387$ S/m; $\epsilon_r = 38.92$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.9 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.5, 8.5, 8.5); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1754
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch26340/Area Scan (41x81x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 11.1 W/kg

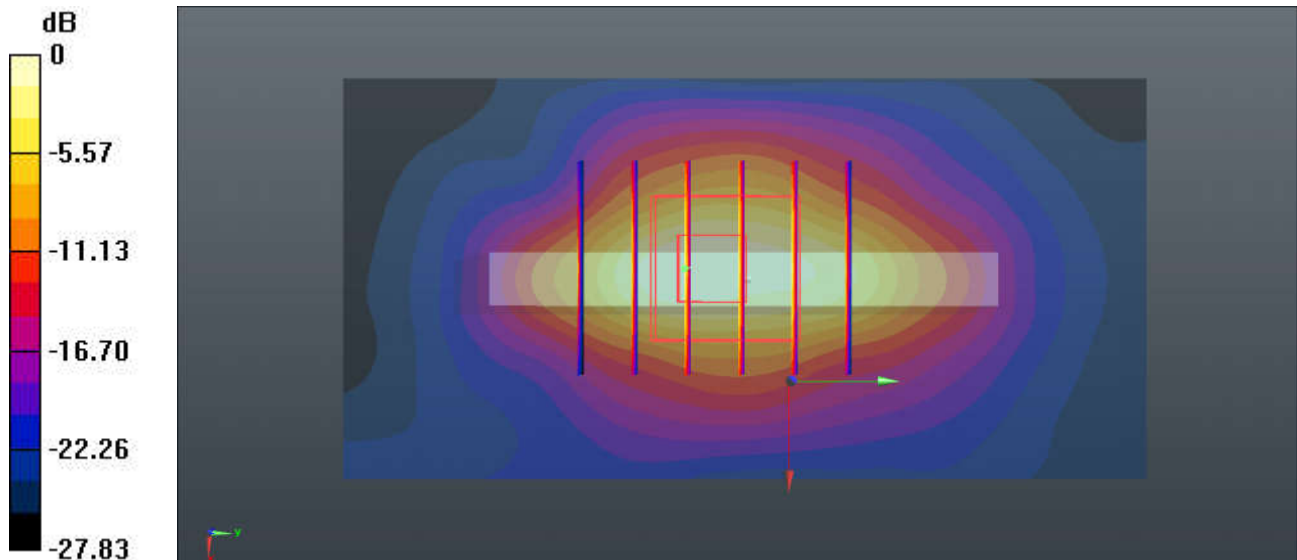
Ch26340/Zoom Scan (5x6x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 82.27 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 14.8 W/kg

SAR(1 g) = 6.57 W/kg; SAR(10 g) = 2.91 W/kg

Maximum value of SAR (measured) = 9.25 W/kg



0 dB = 11.1 W/kg = 10.45 dBW/kg

84_LTE Band 30_10M QPSK_1RB_0Offset_Back_0mm_Ch27710

Communication System: UID 0, LTE-FDD (0); Frequency: 2310 MHz; Duty Cycle: 1:1

Medium: HSL_2300 Medium parameters used: $f = 2310$ MHz; $\sigma = 1.692$ S/m; $\epsilon_r = 38.988$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.99, 7.99, 7.99); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch27710/Area Scan (91x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 10.4 W/kg

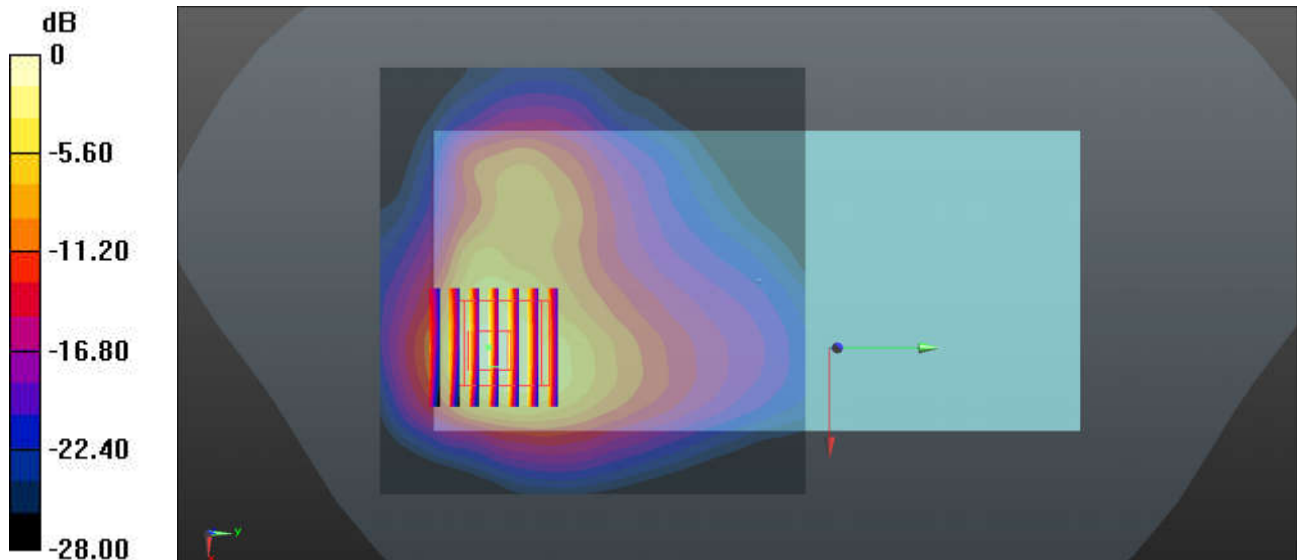
Ch27710/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.295 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 12.6 W/kg

SAR(1 g) = 5.11 W/kg; SAR(10 g) = 2.26 W/kg

Maximum value of SAR (measured) = 8.73 W/kg



0 dB = 10.4 W/kg = 10.17 dBW/kg

85_LTE Band 7_20M QPSK_1RB_0Offset_Back_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; $\sigma = 1.946$ S/m; $\epsilon_r = 38.035$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.38, 7.38, 7.38); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch21100/Area Scan (91x91x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 10.3 W/kg

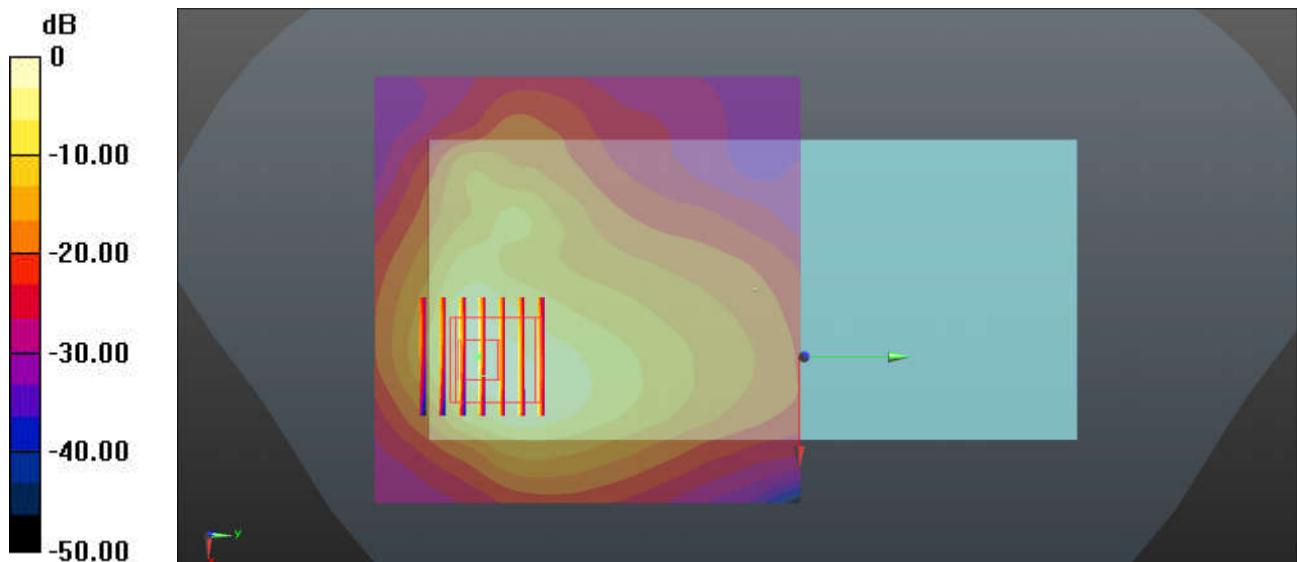
Ch21100/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 8.648 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 13.6 W/kg

SAR(1 g) = 4.86 W/kg; SAR(10 g) = 2.09 W/kg

Maximum value of SAR (measured) = 9.35 W/kg



86_LTE Band 41_20M QPSK_1RB_0Offset_Back_0mm_Ch39750

Communication System: UID 0, LTE-TDD (0); Frequency: 2506 MHz; Duty Cycle: 1:1.59
Medium: HSL_2600 Medium parameters used: $f = 2506$ MHz; $\sigma = 1.913$ S/m; $\epsilon_r = 38.164$; $\rho = 1000$ kg/m³
Ambient Temperature : 23.3 °C ; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.38, 7.38, 7.38); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM2; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch39750/Area Scan (91x91x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 8.80 W/kg

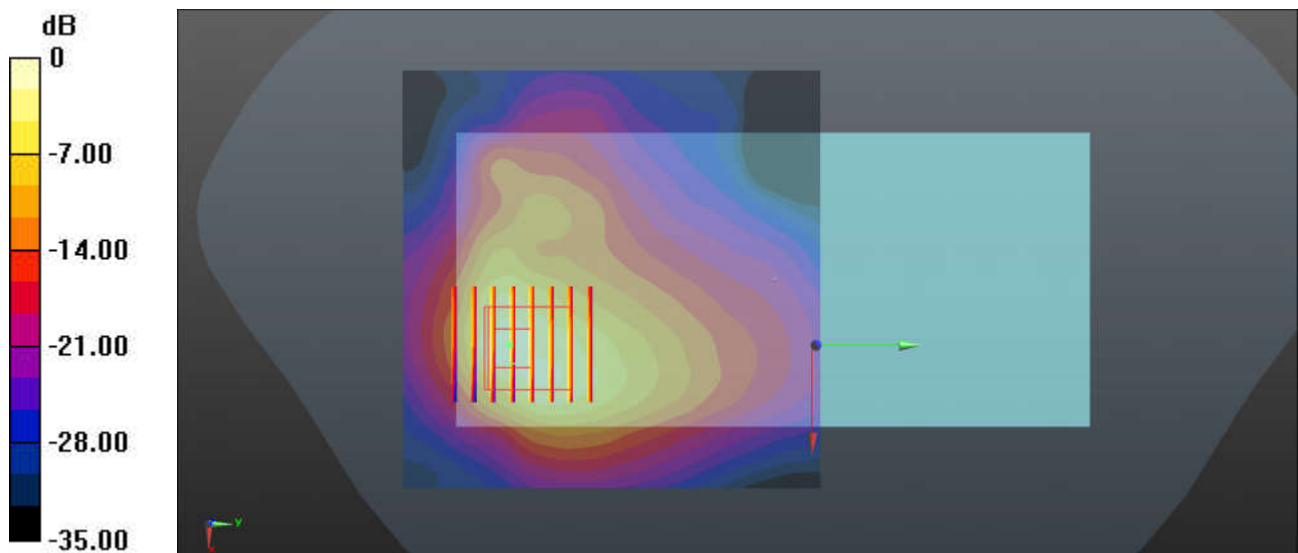
Ch39750/Zoom Scan (7x8x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 1.868 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 11.9 W/kg

SAR(1 g) = 4.18 W/kg; SAR(10 g) = 1.79 W/kg

Maximum value of SAR (measured) = 8.04 W/kg



0 dB = 8.80 W/kg = 9.44 dBW/kg

87_LTE Band 41(HPUE)_20M QPSK_1RB_0Offset_Back_0mm_Ch40185

Communication System: UID 0, LTE-TDD (0); Frequency: 2549.5 MHz; Duty Cycle: 1:1.2.331

Medium: HSL_2600 Medium parameters used: $f = 2549.5$ MHz; $\sigma = 1.965$ S/m; $\epsilon_r = 37.975$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.6 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.38, 7.38, 7.38); Calibrated: 2018.11.26
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch40185/Area Scan (91x91x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 11.7 W/kg

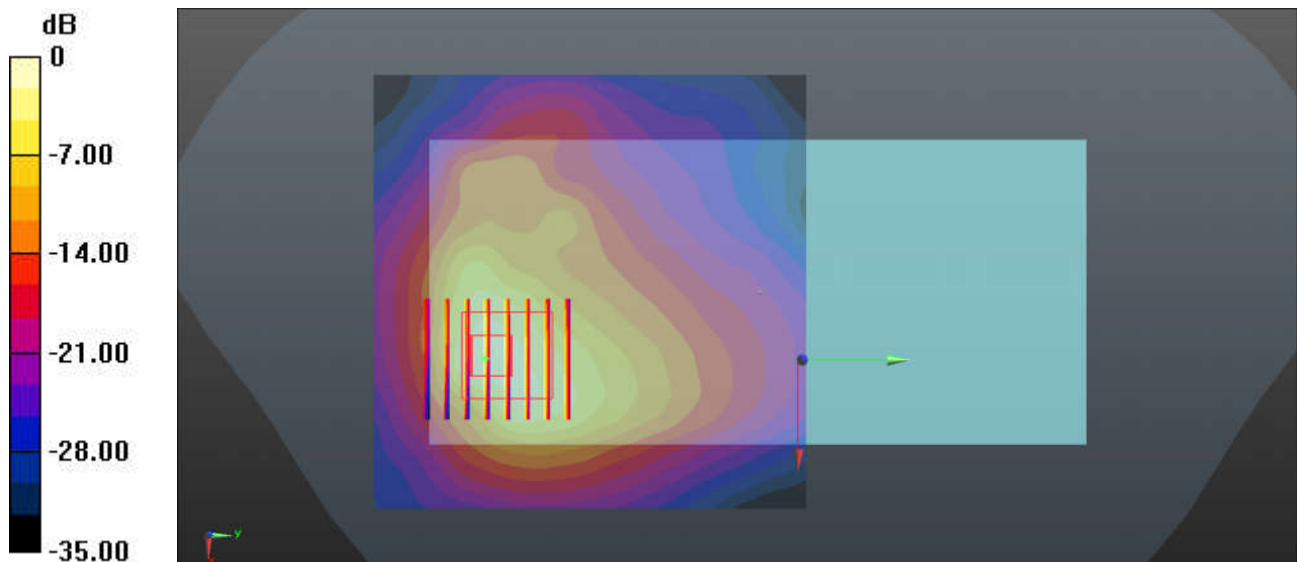
Ch40185/Zoom Scan (7x8x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 7.509 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 17.4 W/kg

SAR(1 g) = 6.26 W/kg; SAR(10 g) = 2.73 W/kg

Maximum value of SAR (measured) = 11.4 W/kg



0 dB = 11.7 W/kg = 10.68 dBW/kg

88_WLAN 2.4GHz_802.11b 1Mbps_Top Side_0mm_Ch6

Communication System: UID 0, 802.11b (0); Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: HSL_2450 Medium parameters used: $f = 2437$ MHz; $\sigma = 1.681$ S/m; $\epsilon_r = 40.234$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(7.5, 7.5, 7.5); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch6/Area Scan (51x81x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 4.71 W/kg

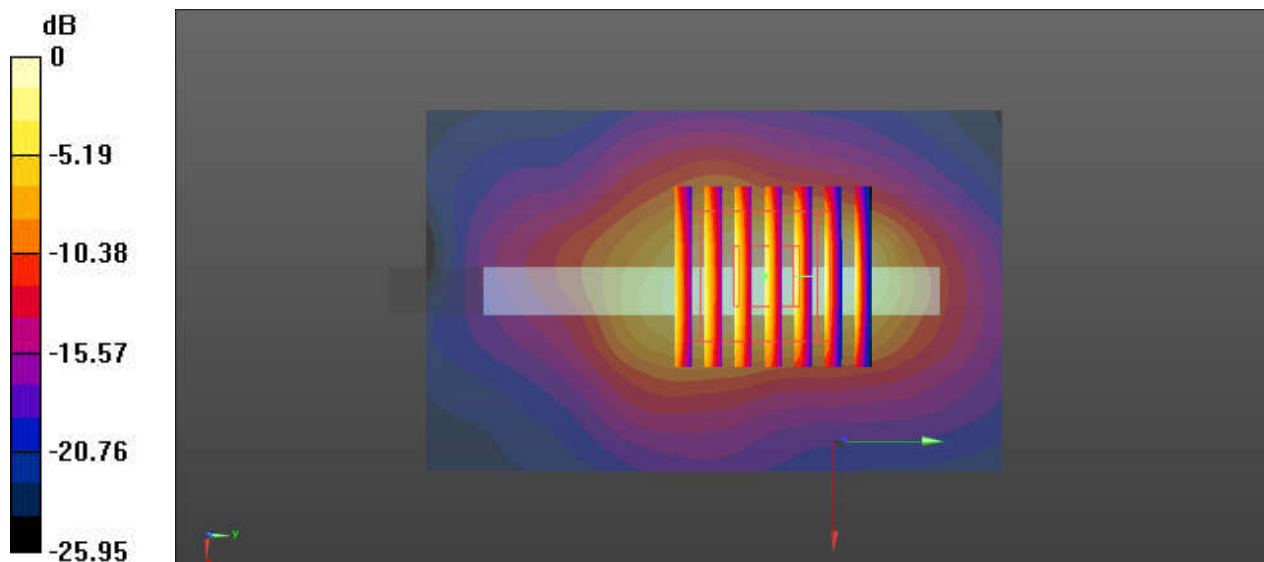
Ch6/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 49.07 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 7.20 W/kg

SAR(1 g) = 2.98 W/kg; SAR(10 g) = 1.32 W/kg

Maximum value of SAR (measured) = 5.45 W/kg



0 dB = 4.71 W/kg = 6.73 dBW/kg

89_WLAN5.2GHz_802.11n-HT40 MCS0_Back_0mm_Ant 1_Ch46

Communication System: UID 0, 802.11n (0); Frequency: 5230 MHz; Duty Cycle: 1:1.038

Medium: HSL_5000 Medium parameters used: $f = 5230$ MHz; $\sigma = 4.569$ S/m; $\epsilon_r = 36.451$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C ; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(5.19, 5.19, 5.19); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch46/Area Scan (101x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 14.8 W/kg

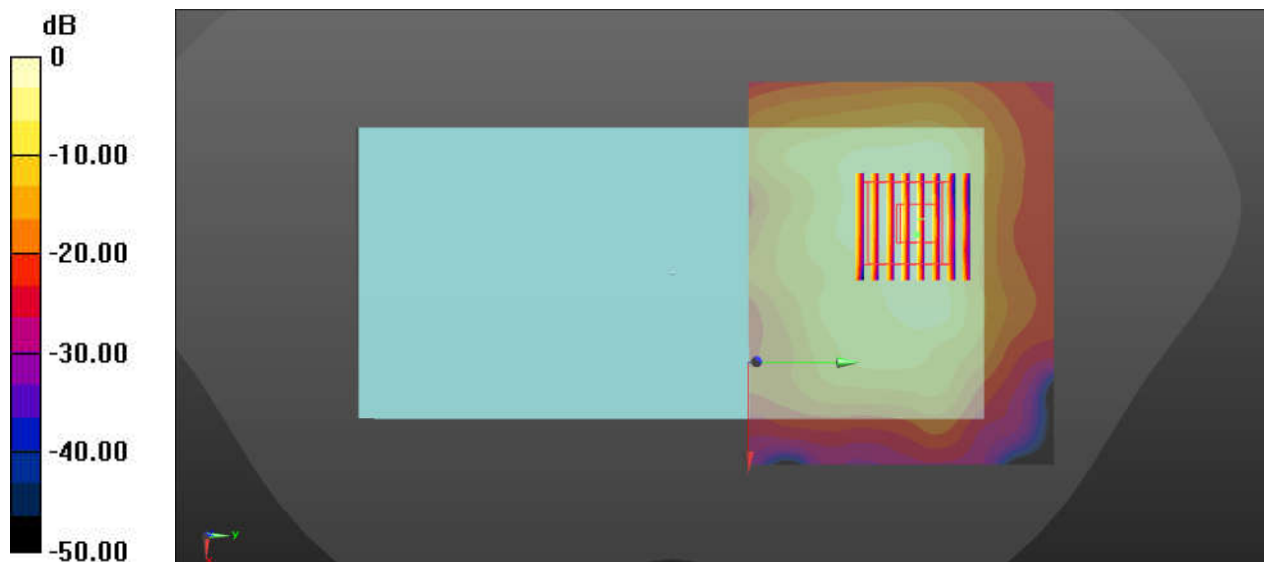
Ch46/Zoom Scan (8x8x7)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=1.4$ mm

Reference Value = 2.588 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 40.1 W/kg

SAR(1 g) = 7.97 W/kg; SAR(10 g) = 2.47 W/kg

Maximum value of SAR (measured) = 19.7 W/kg



0 dB = 14.8 W/kg = 11.70 dBW/kg

90_WLAN5.3GHz_802.11n-HT40 MCS0_Back_0mm_Ant 1_Ch62

Communication System: UID 0, 802.11n (0); Frequency: 5310 MHz; Duty Cycle: 1:1.038

Medium: HSL_5000 Medium parameters used: $f = 5310$ MHz; $\sigma = 4.663$ S/m; $\epsilon_r = 36.308$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.2 °C; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(5.19, 5.19, 5.19); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch62/Area Scan (101x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 22.7 W/kg

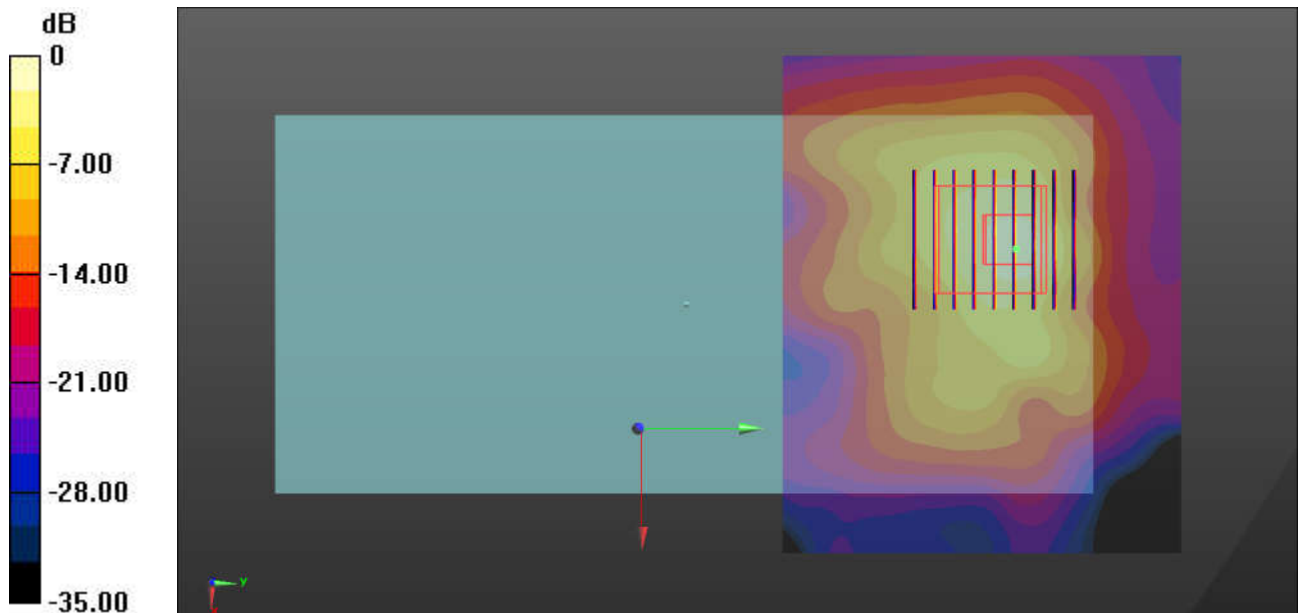
Ch62/Zoom Scan (8x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 2.492 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 46.8 W/kg

SAR(1 g) = 8.52 W/kg; SAR(10 g) = 2.53 W/kg

Maximum value of SAR (measured) = 21.7 W/kg



0 dB = 21.7 W/kg = 13.36 dBW/kg

91_WLAN5.5GHz_802.11n-HT40 MCS0_Back_0mm_Ant 1_Ch134

Communication System: UID 0, 802.11n (0); Frequency: 5670 MHz; Duty Cycle: 1:1.038

Medium: HSL_5000 Medium parameters used: $f = 5670$ MHz; $\sigma = 5.075$ S/m; $\epsilon_r = 35.726$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.7 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(4.92, 4.92, 4.92); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch134/Area Scan (101x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Maximum value of SAR (interpolated) = 18.4 W/kg

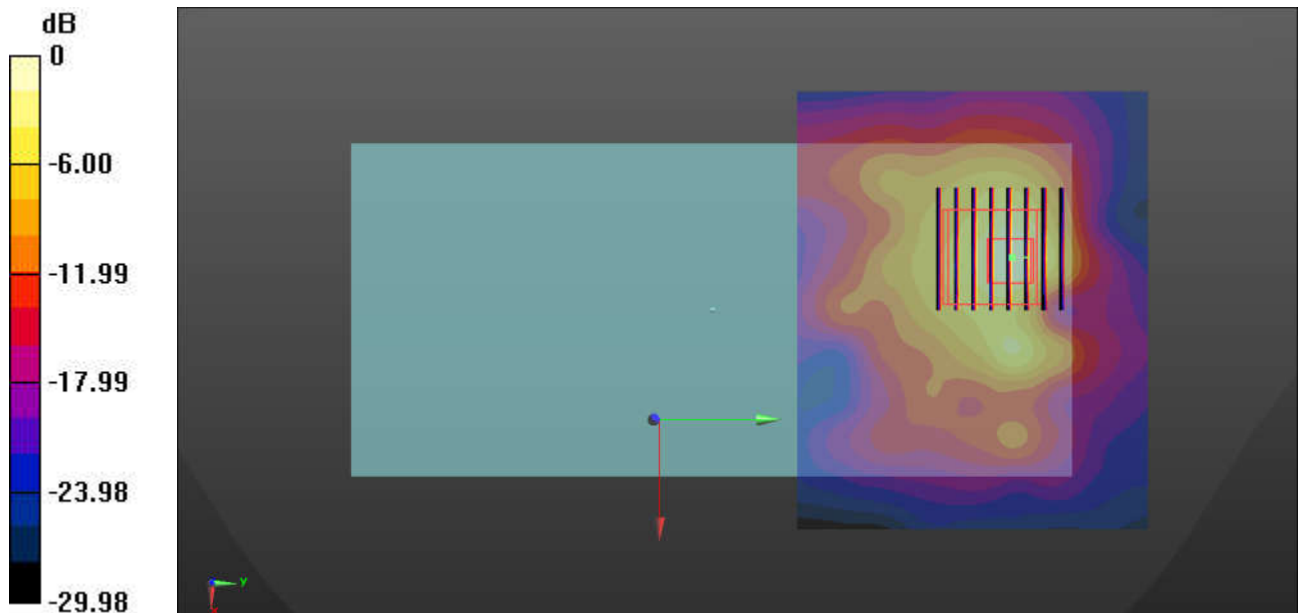
Ch134/Zoom Scan (8x8x7)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=1.4$ mm

Reference Value = 1.680 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 39.3 W/kg

SAR(1 g) = 6.68 W/kg; SAR(10 g) = 1.98 W/kg

Maximum value of SAR (measured) = 17.8 W/kg



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

92_WLAN5GHz_802.11n-HT40 MCS0_Back_0mm_Ant 1_Ch159

Communication System: UID 0, 802.11n (0); Frequency: 5795 MHz; Duty Cycle: 1:1.038

Medium: HSL_5000 Medium parameters used: $f = 5795$ MHz; $\sigma = 5.206$ S/m; $\epsilon_r = 35.517$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.3 °C; Liquid Temperature : 22.8 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3857; ConvF(5.17, 5.17, 5.17); Calibrated: 2019.5.27
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn690; Calibrated: 2019.1.23
- Phantom: SAM1; Type: SAM; Serial: TP-1697
- Measurement SW: DASY52, Version 52.10 (1); SEMCAD X Version 14.6.11 (7439)

Ch159/Area Scan (101x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 19.8 W/kg

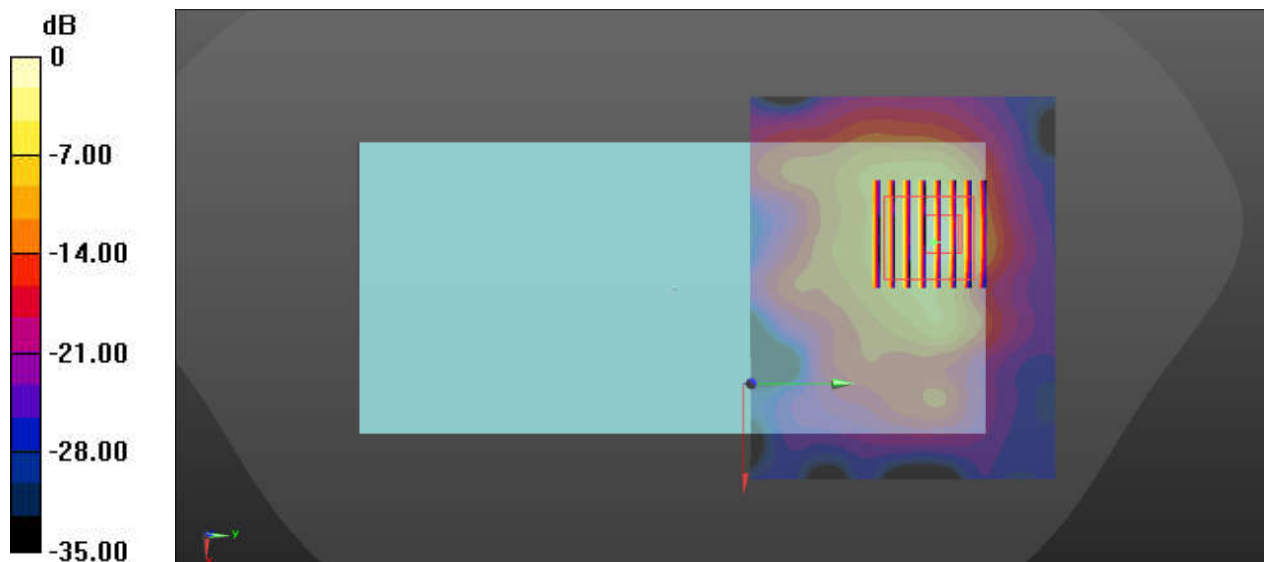
Ch159/Zoom Scan (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 1.685 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 42.7 W/kg

SAR(1 g) = 6.67 W/kg; SAR(10 g) = 1.84 W/kg

Maximum value of SAR (measured) = 18.9 W/kg



0 dB = 19.8 W/kg = 12.97 dBW/kg



Appendix C. Supplemental Tuner Head & Body SAR Results

The results are shown as follows.

Head (Antenna #0, Slave ID=6)																			
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
GSM850	GPRS 4 Tx slots	251	848.8	N/A	N/A	Right Cheek	0mm	0.288	Auto-Tune	0	15	30	45	60	75	90	105	120	135
									0.254	0.0282	0.387	0.273	0.023	0.317	0.052	0.007	0.214	0.035	0.005
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
GSM1900	GPRS 3 Tx slots	810	1909.8	N/A	N/A	Left Cheek	0mm	0.128	Auto-Tune	1	16	31	46	61	76	91	106	121	136
									0.179	0.038	0.095	0.094	0.097	0.088	0.097	0.061	0.096	0.072	0.063
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
WCDMA V	RMC 12.2Kbps	4233	846.6	N/A	N/A	Right Cheek	0mm	0.342	Auto-Tune	2	17	32	47	62	77	92	107	122	137
									0.296	0.036	0.341	0.259	0.137	0.361	0.164	0.033	0.362	0.128	0.057
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
WCDMA IV	RMC 12.2Kbps	1513	1752.6	N/A	N/A	Left Cheek	0mm	0.192	Auto-Tune	3	18	33	48	63	78	93	108	123	138
									0.259	0.14	0.095	0.202	0.165	0.213	0.177	0.156	0.071	0.067	0.073
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
WCDMA II	RMC 12.2Kbps	9538	1907.6	N/A	N/A	Left Cheek	0mm	0.224	Auto-Tune	4	19	34	49	64	79	94	109	124	139
									0.317	0.122	0.0754	0.194	0.021	0.204	0.208	0.19	0.114	0.161	0.148
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
CDMA2000 BC10	RC3 SO55	580	820.5	N/A	N/A	Right Cheek	0mm	0.302	Auto-Tune	5	20	35	50	65	80	95	110	125	140
									0.353	0.12	0.049	0.308	0.221	0.187	0.293	0.132	0.014	0.109	0.091
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
CDMA2000 BC0	RC3 SO55	384	836.52	N/A	N/A	Right Cheek	0mm	0.393	Auto-Tune	6	21	36	51	66	81	96	111	126	141
									0.475	0.178	0.106	0.026	0.351	0.232	0.043	0.252	0.049	0.017	0.186
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
CDMA2000 BC1	RC3 SO55	1175	1908.75	N/A	N/A	Left Cheek	0mm	0.169	Auto-Tune	7	22	37	52	67	82	97	112	127	142
									0.224	0.127	0.111	0.116	0.213	0.208	0.176	0.193	0.181	0.106	0.152
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 71	QPSK	133322	683	1	0	Right Cheek	0mm	0.219	Auto-Tune	8	23	38	53	68	83	98	113	128	143
									0.250	0.104	0.158	0.198	0.013	0.052	0.017	0.015	0.016	0.110	0.003
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 12	QPSK	23095	707.5	1	0	Right Cheek	0mm	0.245	Auto-Tune	9	24	39	54	69	84	99	114	129	
									0.265	0.009	0.146	0.067	0.184	0.037	0.131	0.002	0.015	0.035	
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 13	QPSK	23230	782	1	0	Right Cheek	0mm	0.254	Auto-Tune	10	25	40	55	70	85	100	115	130	
									0.277	0.233	0.132	0.112	0.039	0.087	0.101	0.178	0.036	0.028	
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 14	QPSK	23330	793	1	0	Right Cheek	0mm	0.288	Auto-Tune	11	26	41	56	71	86	101	116	131	
									0.313	0.286	0.193	0.122	0.045	0.081	0.097	0.176	0.066	0.031	
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 26	QPSK	26865	831.5	1	0	Right Cheek	0mm	0.272	Auto-Tune		27	42	57	72	87	102	117	132	
									0.314	0.163	0.071	0.219	0.087	0.013	0.219	0.138	0.015	0.124	
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 66	QPSK	132072	1720	1	0	Left Cheek	0mm	0.206	Auto-Tune	13	28	43	58	73	88	103	118	133	
									0.255	0.135	0.161	0.129	0.120	0.072	0.051	0.052	0.043	0.041	
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 25	QPSK	26590	1905	1	0	Left Cheek	0mm	0.219	Auto-Tune	14	29	44	59	74	89	104	119	134	
									0.279	0.170	0.168	0.178	0.159	0.132	0.186	0.187	0.134	0.190	

Body (Antenna #0, Slave ID=6)																			
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
									Auto-Tune	0	15	30	45	60	75	90	105	120	135
GSM850	GPRS 4 Tx slots	251	848.8	N/A	N/A	Back	5mm	1.15	1.71	0.056	1.63	1.212	0.092	1.62	0.255	0.04	1.156	0.16	0.027
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
GSM1900	GPRS 3 Tx slots	810	1909.8	N/A	N/A	Bottom Side	5mm	1.05	1.52	0.387	0.878	0.865	0.853	0.836	0.823	0.561	0.744	0.497	0.482
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
WCDMA V	RMC 12.2Kbps	4233	846.6	N/A	N/A	Back	5mm	1.16	1.46	0.214	0.968	0.823	1.217	0.623	0.200	0.753	0.7674	0.701	0.061
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
WCDMA IV	RMC 12.2Kbps	1513	1752.6	N/A	N/A	Bottom Side	5mm	1.13	1.58	0.994	0.857	1.05	0.956	1.185	0.992	0.967	0.715	0.639	0.66
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
WCDMA II	RMC 12.2Kbps	9538	1907.6	N/A	N/A	Bottom Side	5mm	1.16	1.7	0.818	0.613	1.141	1.21	1.187	1.23	1.118	0.755	0.85	0.836
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
CDMA2000 BC10	RTAP 153.6Kbps	476	817.9	N/A	N/A	Back	5mm	1.11	1.41	0.473	0.171	1.401	1.071	0.708	1.405	0.633	0.056	0.61	0.379
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
CDMA2000 BC0	RTAP 153.6Kbps	1013	824.7	N/A	N/A	Back	5mm	1.18	2.12	0.896	0.509	0.107	1.579	0.971	0.147	1.102	0.182	0.046	0.72
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
CDMA2000 BC1	RC3 SO32 (F+SCH)	1175	1908.75	N/A	N/A	Bottom Side	5mm	1.03	1.51	0.801	0.645	0.75	1.471	1.343	1.09	1.37	0.878	0.465	0.678
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 71	QPSK	133322	683	1	0	Back	5mm	0.757	0.945	0.024	0.725	0.635	0.047	0.198	0.074	0.126	0.058	0.475	0.049
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 12	QPSK	23095	707.5	1	0	Back	5mm	0.732	0.831	0.067	0.812	0.339	0.093	0.206	0.696	0.029	0.126	0.160	
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 13	QPSK	23230	782	1	0	Back	5mm	0.727	0.917	0.914	0.758	0.543	0.217	0.607	0.601	0.744	0.264	0.194	
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 14	QPSK	23330	793	1	0	Back	5mm	0.857	1.050	1.042	0.997	0.712	0.241	0.547	0.558	0.705	0.993	0.199	
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 26	QPSK	26865	831.5	1	0	Back	5mm	1.18	1.430	0.718	0.030	1.009	0.417	0.059	0.887	0.483	0.052	0.463	
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 66	QPSK	132072	1720	1	0	Bottom Side	5mm	1.08	1.500	1.079	1.248	0.788	0.786	0.658	0.507	0.518	0.499	0.481	
Mode	Service/ Modulation	Channel	Frequency (MHz)	RB Size	RB Offset	Test Position	Spacing	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)										
LTE Band 25	QPSK	26590	1905	1	0	Bottom Side	5mm	0.946	1.370	0.728	0.708	0.753	0.673	0.548	1.010	0.632	0.457	0.410	

Mode	Service/Modulation	Channel	Frequency (MHz)	RF Line	BS Offset	Test Position	Spacing	Measured Uplink (MHz)	(Antenna ID, Slave ID=0)																							
									Rate/Tone	Carrier value of Tone Sample (MHz)																						
										0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20		
GMSK2	GPRS Tx data	40	940	N/A	N/A	Back	Gsm	1.0	1.70	0.000	0.000	0.043	0.075	0.106	0.137	0.168	0.199	0.230	0.261	0.292	0.323	0.354	0.385	0.416	0.447	0.478	0.509	0.540	0.571	0.602		
										21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
										0.000	0.000	0.043	0.075	0.106	0.137	0.168	0.199	0.230	0.261	0.292	0.323	0.354	0.385	0.416	0.447	0.478	0.509	0.540	0.571	0.602		
										42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62		
										0.000	0.048	0.124	0.200	0.276	0.352	0.428	0.504	0.580	0.656	0.732	0.808	0.884	0.960	1.036	1.112	1.188	1.264	1.340	1.416	1.492	1.568	
										84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GMSK3	GPRS Tx data	800	1800.0	N/A	N/A	Bottom Side	Gsm	1.0	1.52	0.000	0.000	0.043	0.075	0.106	0.137	0.168	0.199	0.230	0.261	0.292	0.323	0.354	0.385	0.416	0.447	0.478	0.509	0.540	0.571	0.602		
										21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
										0.000	0.000	0.043	0.075	0.106	0.137	0.168	0.199	0.230	0.261	0.292	0.323	0.354	0.385	0.416	0.447	0.478	0.509	0.540	0.571	0.602		
										42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62		
										0.000	0.048	0.124	0.200	0.276	0.352	0.428	0.504	0.580	0.656	0.732	0.808	0.884	0.960	1.036	1.112	1.188	1.264	1.340	1.416	1.492	1.568	
										84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GMSK4	BAC 12.2kps	4210	846.6	N/A	N/A	Back	Gsm	1.0	1.46	0.000	0.000	0.043	0.075	0.106	0.137	0.168	0.199	0.230	0.261	0.292	0.323	0.354	0.385	0.416	0.447	0.478	0.509	0.540	0.571	0.602		
										21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
										0.000	0.000	0.043	0.075	0.106	0.137	0.168	0.199	0.230	0.261	0.292	0.323	0.354	0.385	0.416	0.447	0.478	0.509	0.540	0.571	0.602		
										42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62		
										0.000	0.048	0.124	0.200	0.276	0.352	0.428	0.504	0.580	0.656	0.732	0.808	0.884	0.960	1.036	1.112	1.188	1.264	1.340	1.416	1.492	1.568	
										84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GMSK5	BAC 12.2kps	4210	846.6	N/A	N/A	Back	Gsm	1.0	1.46	0.000	0.000	0.043	0.075	0.106	0.137	0.168	0.199	0.230	0.261	0.292	0.323	0.354	0.385	0.416	0.447	0.478	0.509	0.540	0.571	0.602		
										21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
										0.000	0.000	0.043	0.075	0.106	0.137	0.168	0.199	0.230	0.261	0.292	0.323	0.354	0.385	0.416	0.447	0.478	0.509	0.540	0.571	0.602		
										42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62		
										0.000	0.048	0.124	0.200	0.276	0.352	0.428	0.504	0.580	0.656	0.732	0.808	0.884	0.960	1.036	1.112	1.188	1.264	1.340	1.416	1.492	1.568	
										84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GMSK6	BAC 12.2kps	4210	846.6	N/A	N/A	Back	Gsm	1.0	1.46	0.000	0.000	0.043	0.075	0.106	0.137	0.168	0.199	0.230	0.261	0.292	0.323	0.354	0.385	0.416	0.447	0.478	0.509	0.540	0.571	0.602		
										21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41		
										0.000	0.000	0.043	0.075	0.106	0.137	0.168	0.199	0.230	0.261	0.292	0.323	0.354	0.385	0.416	0.447	0.478	0.509	0.540	0.571	0.602		
										42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62		
										0.000	0.048	0.124	0.200	0.276	0.352	0.428	0.504	0.580	0.656	0.732	0.808	0.884	0.960	1.036	1.112	1.188	1.264	1.340	1.416	1.492	1.568	
										84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
										0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
GMSK7	BAC 12.2kps	4210	846.6	N/A	N/A																											



Appendix D. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.



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中国认可
国际互认
校准
CALIBRATION
CNAS L0570

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Tel: +86-10-62304633-2079 Fax: +86-10-62304633-2504
E-mail: cttl@chinattl.com http://www.chinattl.cn

Client

Sporton

Certificate No: **Z19-60081**

CALIBRATION CERTIFICATE

Object

D750V3 - SN: 1087

Calibration Procedure(s)

FF-Z11-003-01

Calibration Procedures for dipole validation kits

Calibration date:

March 27, 2019

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(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Power sensor NRP8S	104291	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Reference Probe EX3DV4	SN 3617	31-Jan-19(SPEAG,No.EX3-3617_Jan19)	Jan-20
DAE4	SN 1331	06-Feb-19(SPEAG,No.DAE4-1331_Feb19)	Feb-20
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	23-Jan-19 (CTTL, No.J19X00336)	Jan-20
NetworkAnalyzer E5071C	MY46110673	24-Jan-19 (CTTL, No.J19X00547)	Jan-20

	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 29, 2019

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 / NORM _{x,y,z}
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- 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
- 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
- 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
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

- 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	52.10.2.1495
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 $\pm$ 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 $\pm$ 0.2) °C	43.0 $\pm$ 6 %	0.90 mho/m $\pm$ 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	2.10 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.36 W/kg $\pm$ 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.42 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.65 W/kg $\pm$ 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 $\pm$ 0.2) °C	56.9 $\pm$ 6 %	0.94 mho/m $\pm$ 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	2.09 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	8.58 W/kg $\pm$ 18.8 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.41 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	5.75 W/kg $\pm$ 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- 2.59jΩ
Return Loss	- 29.3dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.6Ω- 3.86jΩ
Return Loss	- 27.7dB

General Antenna Parameters and Design

Electrical Delay (one direction)	0.898 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: 03.26.2019

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; $\sigma = 0.903$ S/m; $\epsilon_r = 43.01$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(10.03, 10.03, 10.03) @ 750 MHz; Calibrated: 1/31/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2/6/2019
- Phantom: MFP_V5.1C ; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

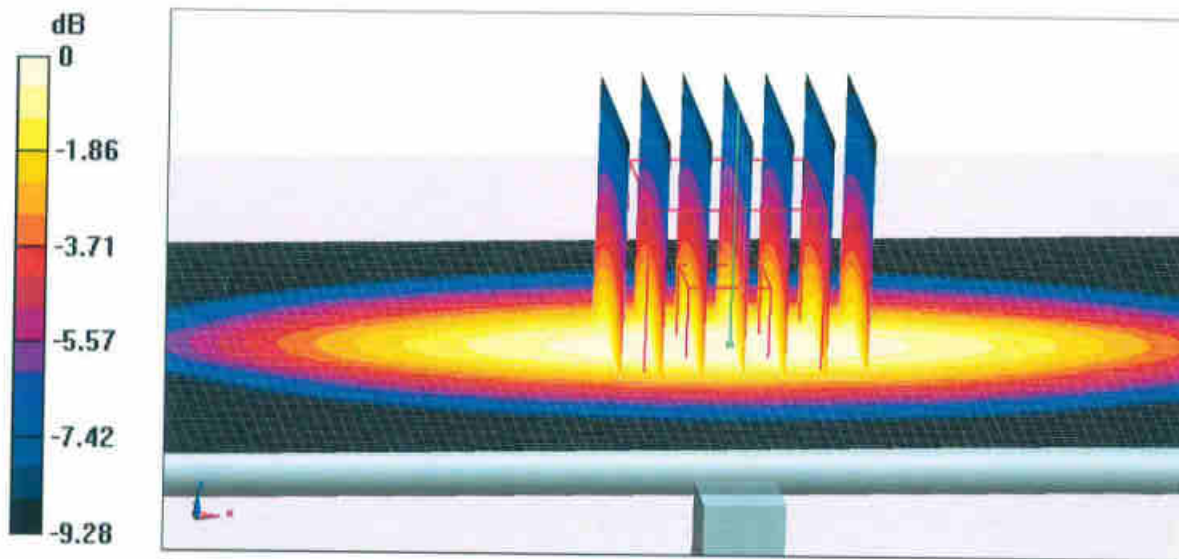
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 55.05 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.00 W/kg

SAR(1 g) = 2.1 W/kg; SAR(10 g) = 1.42 W/kg

Maximum value of SAR (measured) = 2.72 W/kg



0 dB = 2.72 W/kg = 4.35 dBW/kg

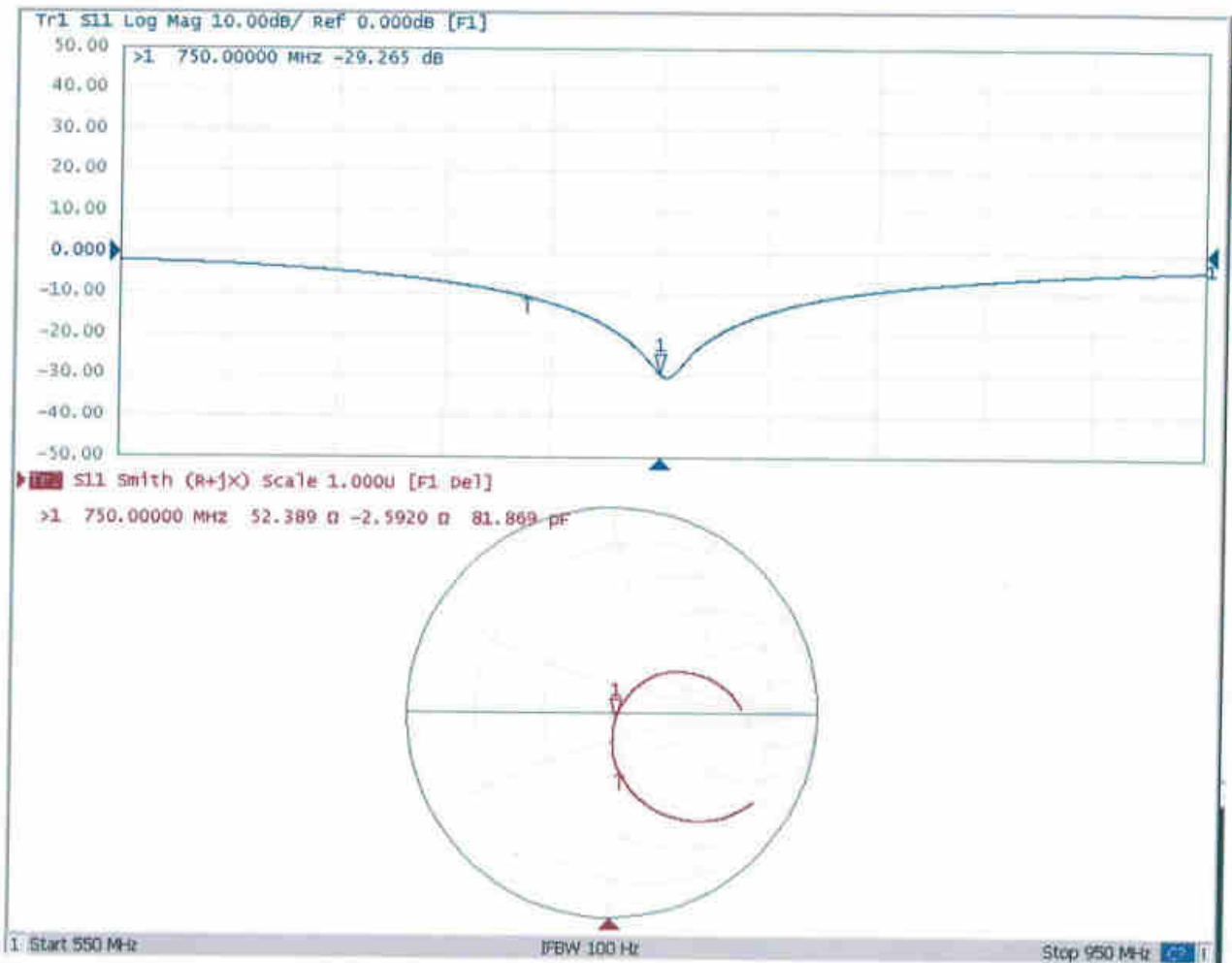


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Impedance Measurement Plot for Head TSL





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DASY5 Validation Report for Body TSL

Date: 03.26.2019

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; $\sigma = 0.935$ S/m; $\epsilon_r = 56.85$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.85, 9.85, 9.85) @ 750 MHz; Calibrated: 1/31/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2/6/2019
- Phantom: MFP_V5.1C ; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

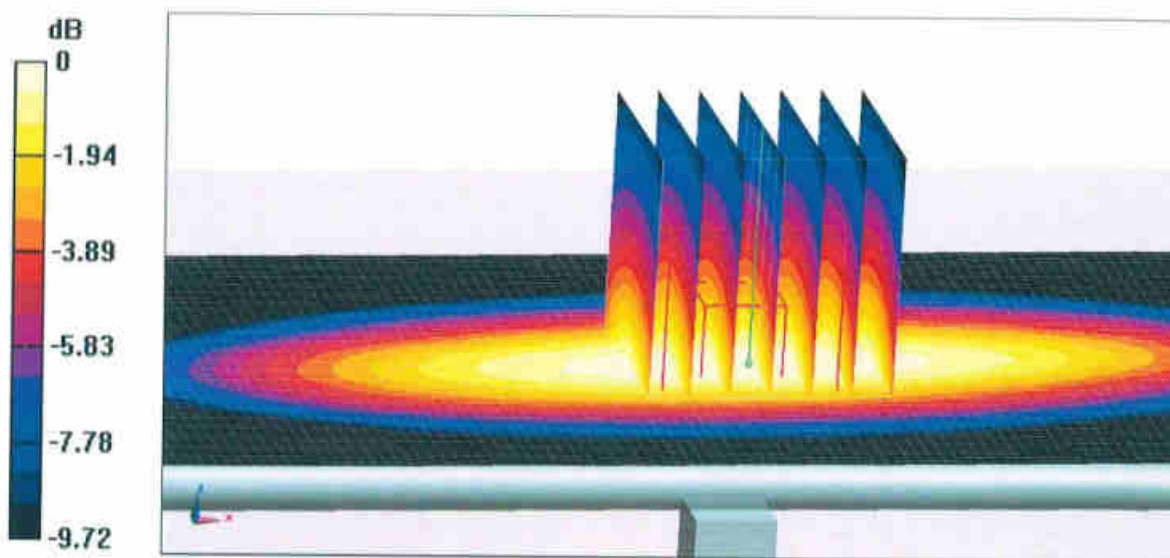
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.71 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.08 W/kg

SAR(1 g) = 2.09 W/kg; SAR(10 g) = 1.41 W/kg

Maximum value of SAR (measured) = 2.75 W/kg



0 dB = 2.75 W/kg = 4.39 dBW/kg

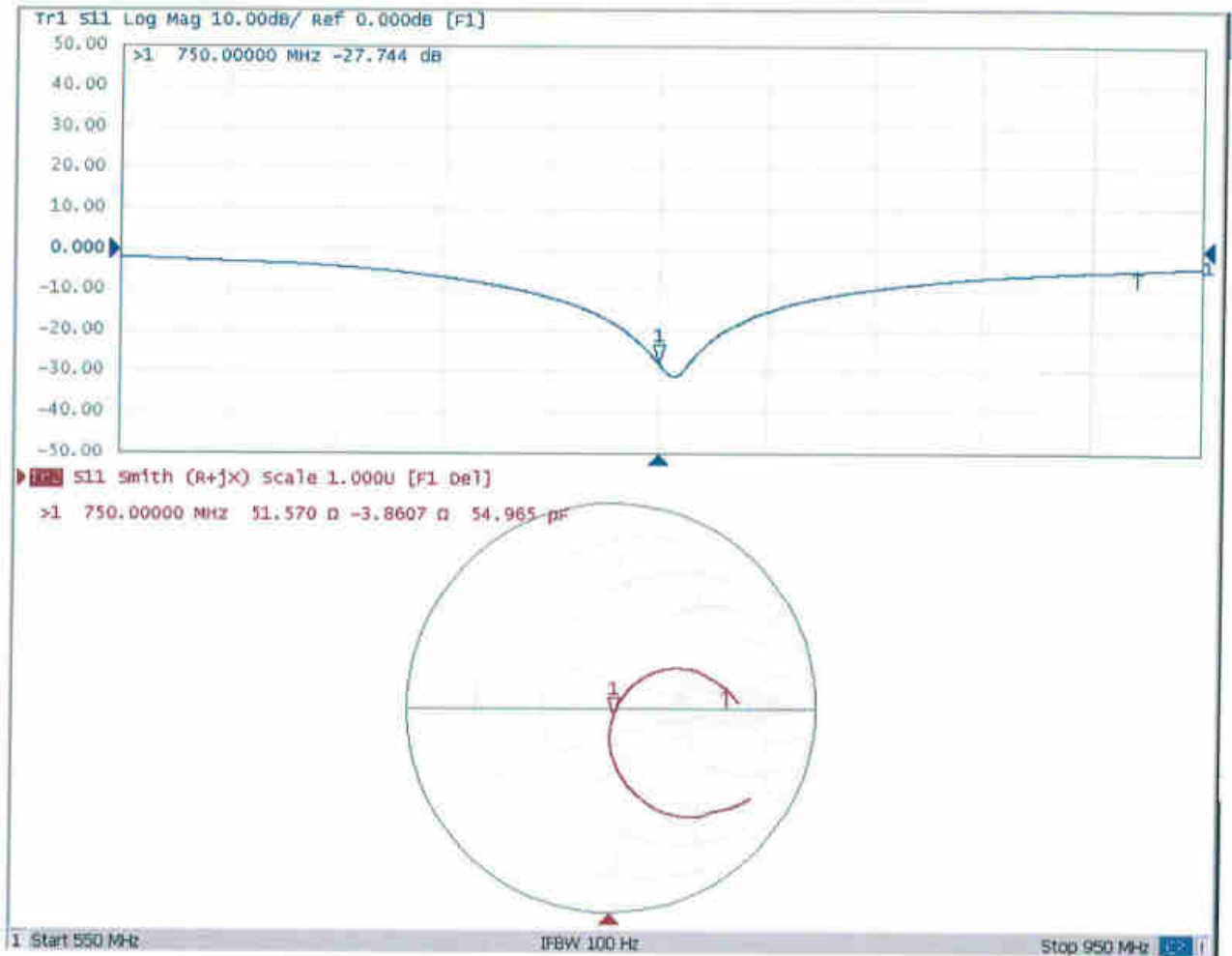


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Impedance Measurement Plot for Body TSL





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Client **Sporton**

Certificate No: **Z19-60082**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 4d151**

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

Calibration date: **March 27, 2019**

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(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	106277	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Power sensor NRP8S	104291	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Reference Probe EX3DV4	SN 3617	31-Jan-19(SPEAG,No.EX3-3617_Jan19)	Jan-20
DAE4	SN 1331	06-Feb-19(SPEAG,No.DAE4-1331_Feb19)	Feb-20
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	23-Jan-19 (CTTL, No.J19X00336)	Jan-20
NetworkAnalyzer E5071C	MY46110673	24-Jan-19 (CTTL, No.J19X00547)	Jan-20

	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 30, 2019

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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:

- 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
- 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
- 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
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

- 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	52.10.2.1495
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	835 MHz $\pm$ 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 $\pm$ 0.2) °C	42.7 $\pm$ 6 %	0.93 mho/m $\pm$ 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	2.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.30 W/kg $\pm$ 18.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.56 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.16 W/kg $\pm$ 18.7 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	56.7 $\pm$ 6 %	0.94 mho/m $\pm$ 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	2.32 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	9.53 W /kg $\pm$ 18.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.52 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	6.20 W/kg $\pm$ 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	50.8Ω- 3.28jΩ
Return Loss	- 29.5dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.7Ω- 3.98jΩ
Return Loss	- 25.5dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.253 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

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DASY5 Validation Report for Head TSL

Date: 03.26.2019

Test Laboratory: CTTL, Beijing, China

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

Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835$ MHz; $\sigma = 0.925$ S/m; $\epsilon_r = 42.68$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.75, 9.75, 9.75) @ 835 MHz; Calibrated: 1/31/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2/6/2019
- Phantom: MFP_V5.1C ; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

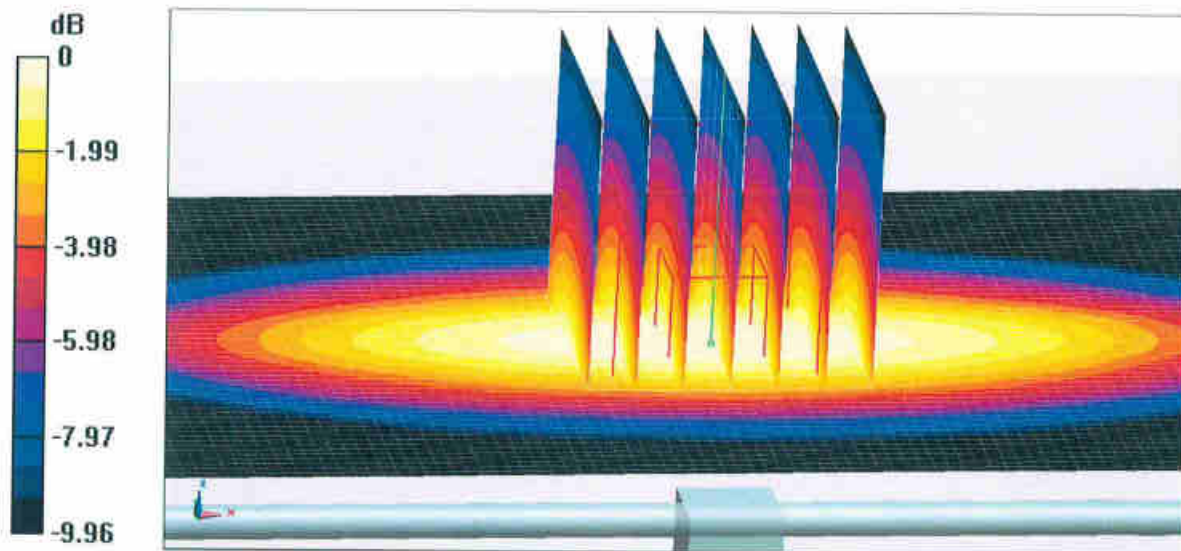
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.34 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 3.55 W/kg

SAR(1 g) = 2.36 W/kg; SAR(10 g) = 1.56 W/kg

Maximum value of SAR (measured) = 3.14 W/kg



0 dB = 3.14 W/kg = 4.97 dBW/kg

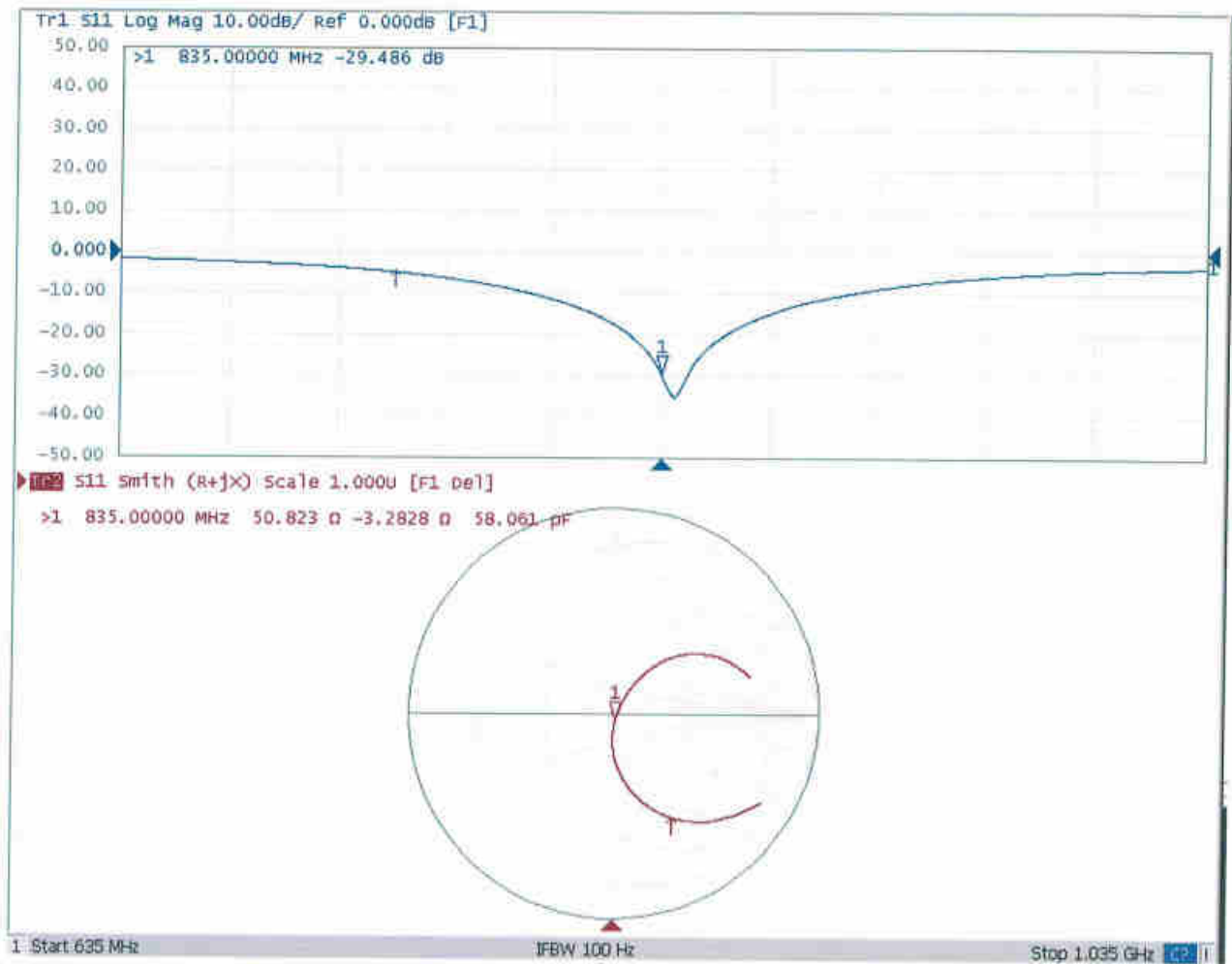


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Impedance Measurement Plot for Head TSL





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DASY5 Validation Report for Body TSL

Date: 03.26.2019

Test Laboratory: CTTL, Beijing, China

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

Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835$ MHz; $\sigma = 0.944$ S/m; $\epsilon_r = 56.66$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.61, 9.61, 9.61) @ 835 MHz; Calibrated: 1/31/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2/6/2019
- Phantom: MFP_V5.1C ; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

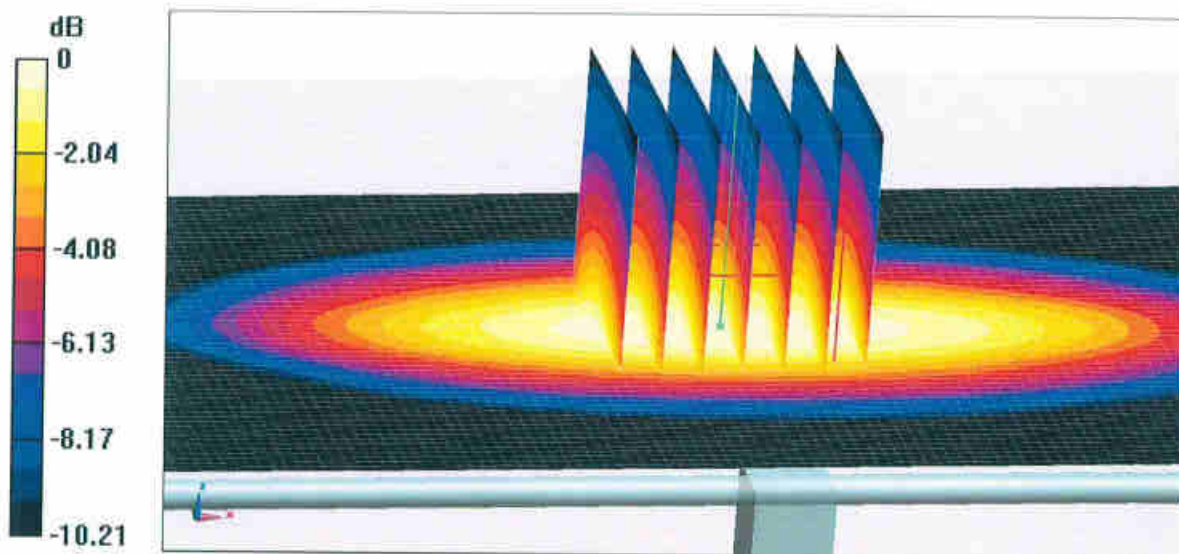
Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.03 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 3.53 W/kg

SAR(1 g) = 2.32 W/kg; SAR(10 g) = 1.52 W/kg

Maximum value of SAR (measured) = 3.12 W/kg



0 dB = 3.12 W/kg = 4.94 dBW/kg

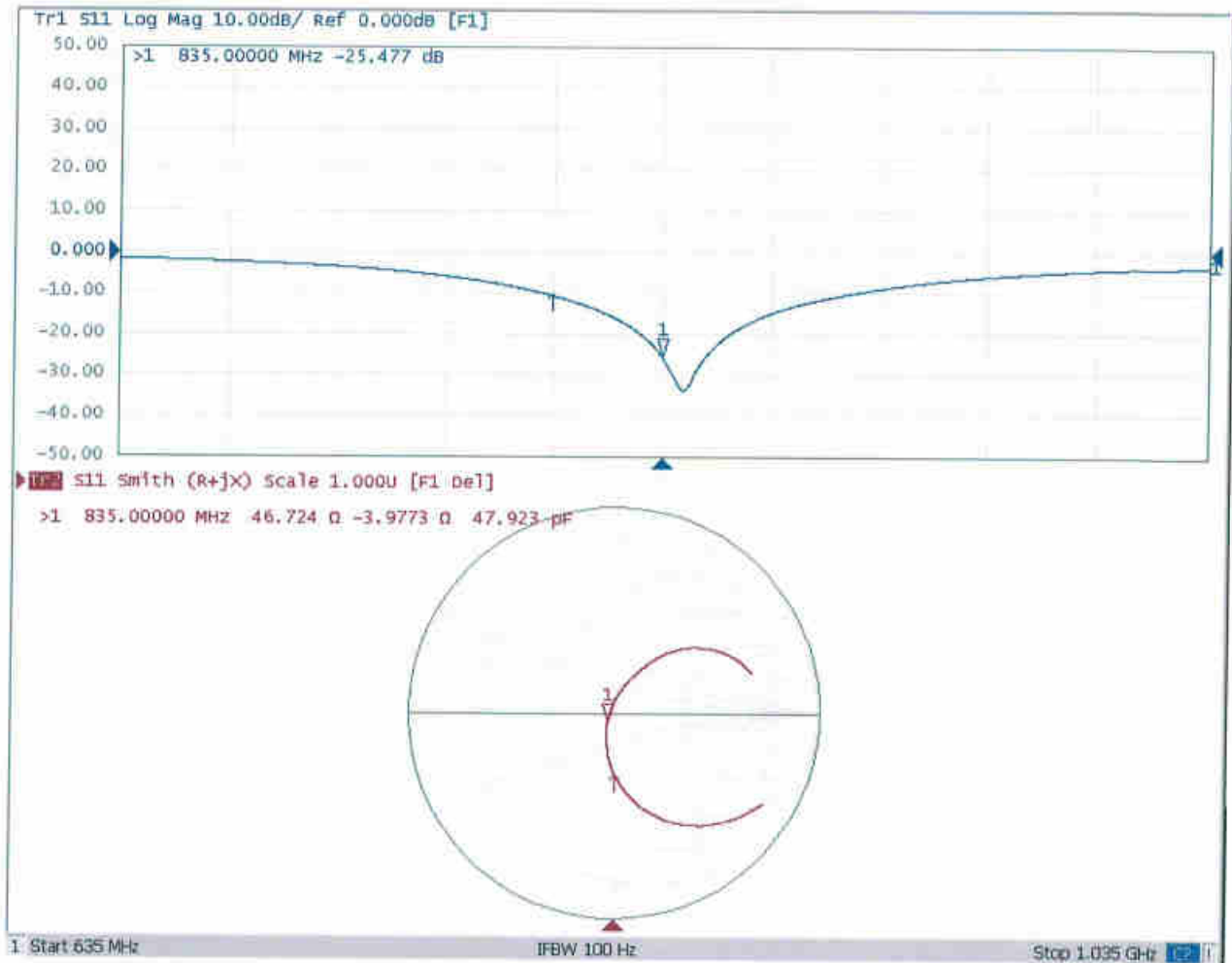


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Impedance Measurement Plot for Body TSL





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Client

Sporton

Certificate No:

Z19-60084

CALIBRATION CERTIFICATE

Object **D1750V2 - SN: 1090**

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

Calibration date: **March 27, 2019**

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 NRP2	106277	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Power sensor NRP8S	104291	20-Aug-18 (CTTL, No.J18X06862)	Aug-19
Reference Probe EX3DV4	SN 3617	31-Jan-19(SPEAG,No.EX3-3617_Jan19)	Jan-20
DAE4	SN 1331	06-Feb-19(SPEAG,No.DAE4-1331_Feb19)	Feb-20
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	23-Jan-19 (CTTL, No.J19X00336)	Jan-20
NetworkAnalyzer E5071C	MY46110673	24-Jan-19 (CTTL, No.J19X00547)	Jan-20

	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 29, 2019

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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:

- 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
- 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
- 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
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

Additional Documentation:

- 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	52.10.2.1495
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 $\pm$ 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 $\pm$ 0.2) °C	41.3 $\pm$ 6 %	1.37 mho/m $\pm$ 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	9.04 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	36.4 W/kg $\pm$ 18.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	4.79 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	19.2 W/kg $\pm$ 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 $\pm$ 0.2) °C	55.0 $\pm$ 6 %	1.45 mho/m $\pm$ 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	9.21 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	37.7 W/kg $\pm$ 18.8 % (k=2)
SAR averaged over 10 cm^3 (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	4.89 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	19.9 W/kg $\pm$ 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- 2.34 jΩ
Return Loss	- 29.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	43.9Ω- 2.19 jΩ
Return Loss	- 23.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.085 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

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DASY5 Validation Report for Head TSL

Date: 03.26.2019

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; $\sigma = 1.37$ S/m; $\epsilon_r = 41.27$; $\rho = 1000$ kg/m³

Phantom section: Right Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(8.38, 8.38, 8.38) @ 1750 MHz; Calibrated: 1/31/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2/6/2019
- Phantom: MFP_V5.1C ; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:

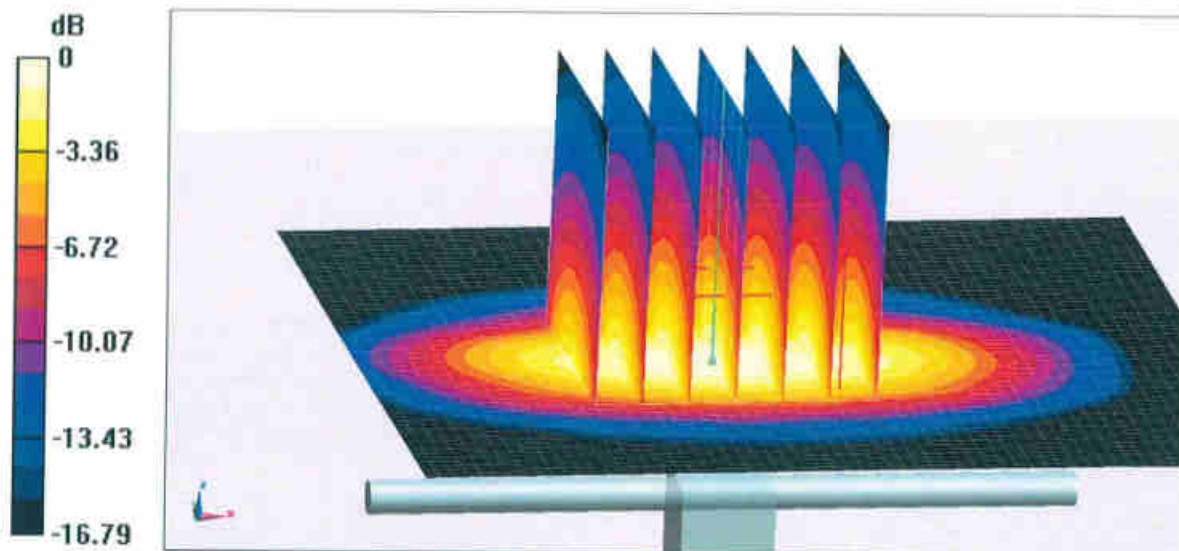
$dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 89.03 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 17.1 W/kg

SAR(1 g) = 9.04 W/kg; SAR(10 g) = 4.79 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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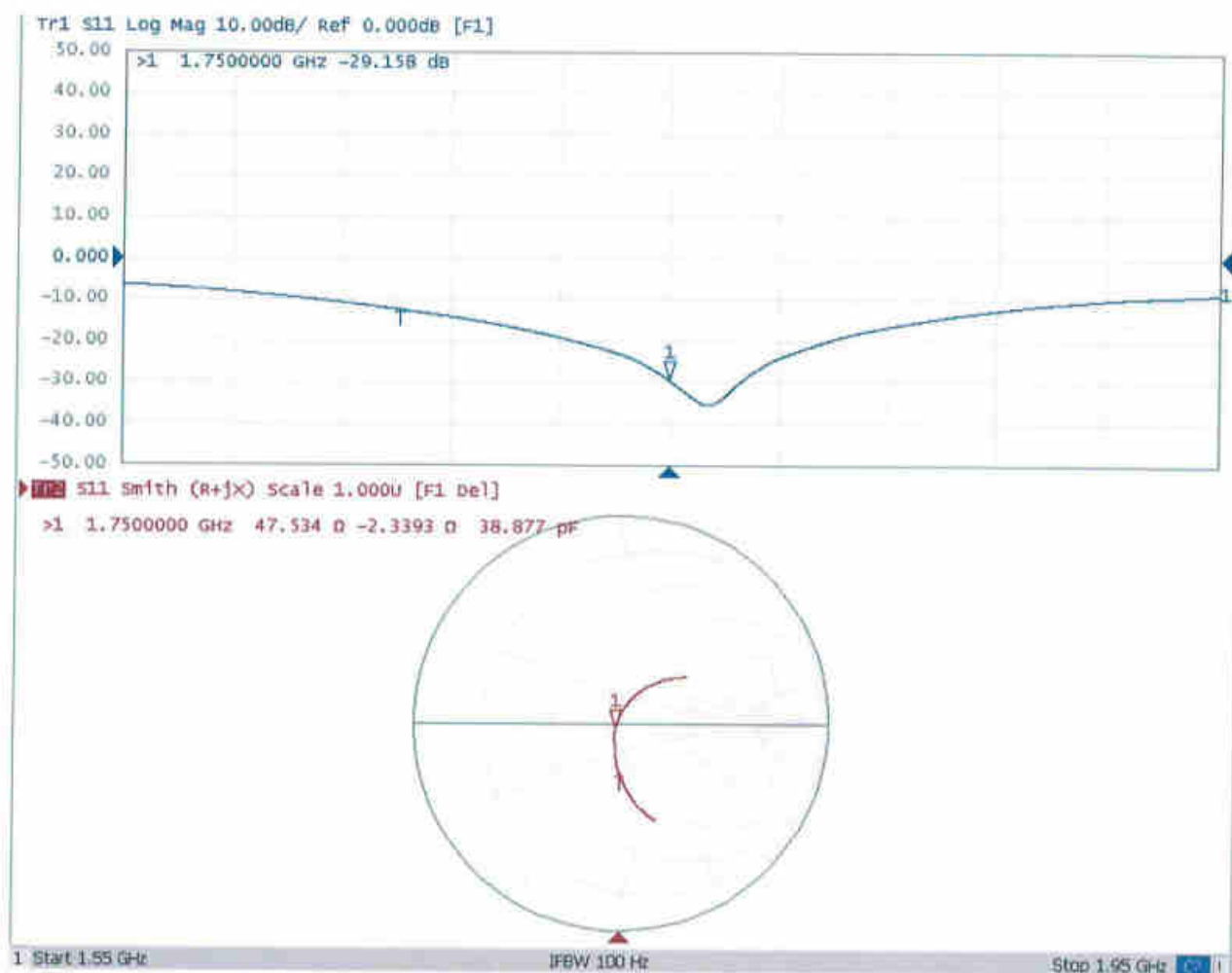
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Impedance Measurement Plot for Head TSL





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E-mail: cttl@chinattl.com

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DASY5 Validation Report for Body TSL

Date: 03.26.2019

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; $\sigma = 1.449$ S/m; $\epsilon_r = 54.97$; $\rho = 1000$ kg/m³

Phantom section: Center Section

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(8.03, 8.03, 8.03) @ 1750 MHz; Calibrated: 1/31/2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1331; Calibrated: 2/6/2019
- Phantom: MFP_V5.1C ; Type: QD 000 P51CA; Serial: 1062
- Measurement SW: DASY52, Version 52.10 (2); SEMCAD X Version 14.6.12 (7450)

System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:

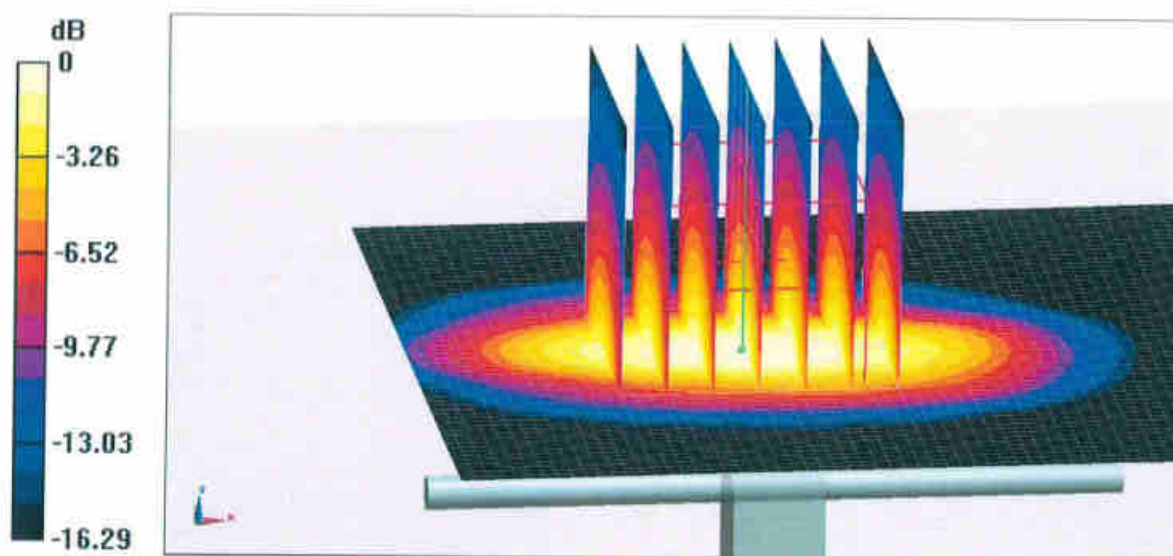
$dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 93.13 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 16.8 W/kg

SAR(1 g) = 9.21 W/kg; SAR(10 g) = 4.89 W/kg

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



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



In Collaboration with

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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

Impedance Measurement Plot for Body TSL

