

PCTEST

DUT: A3LSMF916U; Type: Portable Handset; Serial: 0876M

Communication System: UID 0, IEEE 802.11n; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body; Medium parameters used:

$f = 5785 \text{ MHz}$; $\sigma = 6.187 \text{ S/m}$; $\epsilon_r = 46.154$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 07/19/2020; Ambient Temp: 21.1°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN7538; ConvF(4.17, 4.17, 4.17) @ 5785 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

**Mode: IEEE 802.11n, MIMO, U-NII-3, 20 MHz Bandwidth,
UMPC Extremity SAR, Ch 157, 13 Mbps, Top Edge**

Area Scan (10x19x1): Measurement grid: $dx=5\text{mm}$, $dy=10\text{mm}$

Zoom Scan (17x17x8)/Cube 0: Measurement grid: $dx=1.9\text{mm}$, $dy=1.9\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

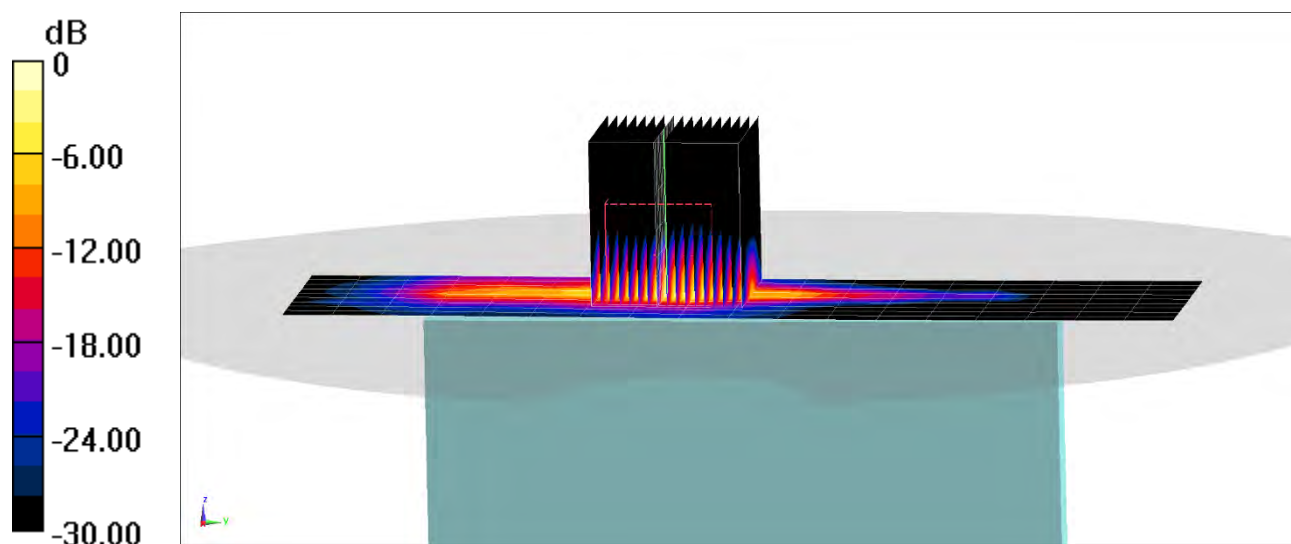
Reference Value = 40.68 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 77.2 W/kg

SAR(10 g) = 1.94 W/kg

Smallest distance from peaks to all points 3 dB below = 3.4 mm

Ratio of SAR at M2 to SAR at M1 = 52.7%



0 dB = 30.9 W/kg = 14.90 dBW/kg

PCTEST

DUT: A3LSMF916U; Type: Portable Handset; Serial: 1356M

Communication System: UID 0, Bluetooth; Frequency: 2441 MHz; Duty Cycle: 1:1.284

Medium: 2450 Body; Medium parameters used (interpolated):

$f = 2441 \text{ MHz}$; $\sigma = 2.035 \text{ S/m}$; $\epsilon_r = 51.318$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 07/27/2020; Ambient Temp: 22.4°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7409; ConvF(7.24, 7.24, 7.24) @ 2441 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

Mode: Bluetooth, Antenna 1, UMPC Extremity SAR, Ch 39, 1 Mbps, Top Edge

Area Scan (10x13x1): Measurement grid: $dx=5\text{mm}$, $dy=12\text{mm}$

Zoom Scan (14x14x8)/Cube 0: Measurement grid: $dx=2.4\text{mm}$, $dy=2.4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

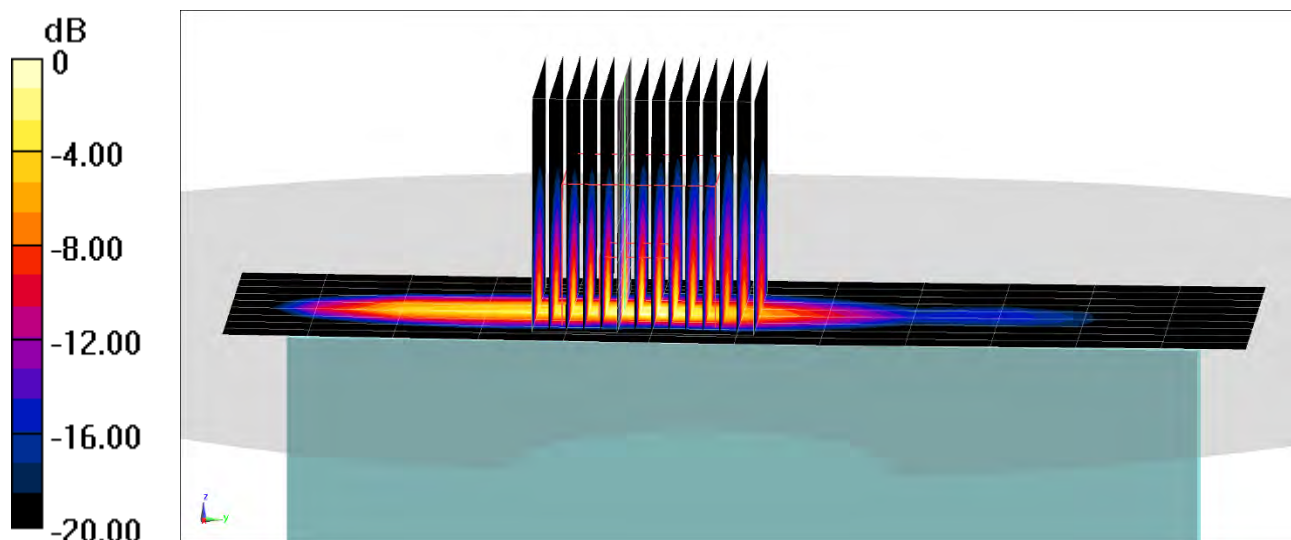
Reference Value = 35.90 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 10.9 W/kg

SAR(10 g) = 0.619 W/kg

Smallest distance from peaks to all points 3 dB below = 3.4 mm

Ratio of SAR at M2 to SAR at M1 = 66.2%



0 dB = 5.37 W/kg = 7.30 dBW/kg

APPENDIX B: SYSTEM VERIFICATION

PCTEST

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1003

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

Medium: 750 Head Medium parameters used:

$f = 750 \text{ MHz}$; $\sigma = 0.883 \text{ S/m}$; $\epsilon_r = 43.064$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07/05/2020; Ambient Temp: 20.3°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN3589; ConvF(8.7, 8.7, 8.7) @ 750 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1647

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

750 MHz System Verification at 23.0 dBm (200 mW)

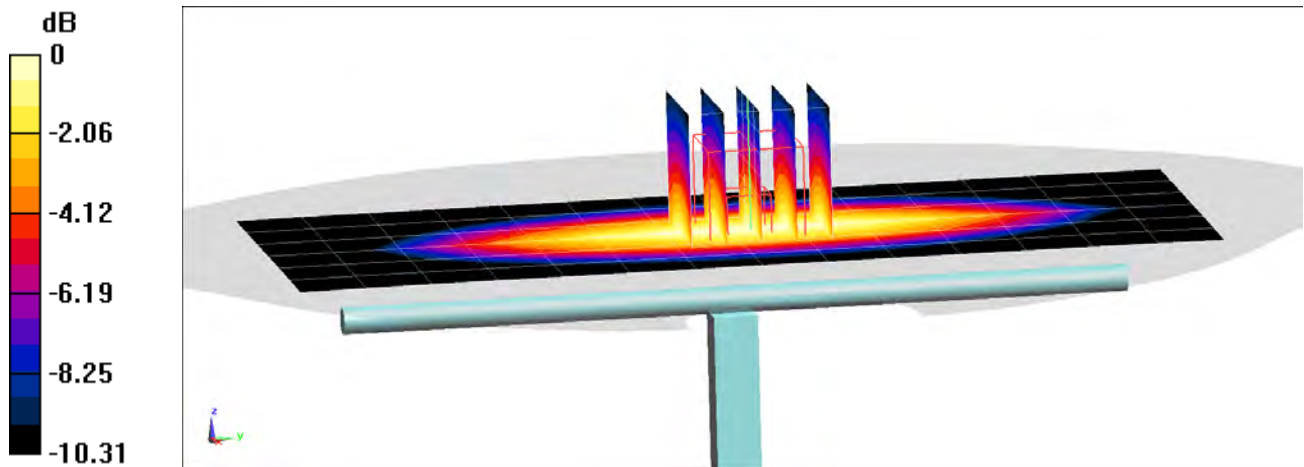
Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.54 W/kg

SAR(1 g) = 1.67 W/kg

Deviation(1 g) = -4.90%



0 dB = 2.23 W/kg = 3.48 dBW/kg

PCTEST

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1003

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

Medium: 750 Head Medium parameters used:

$f = 750 \text{ MHz}$; $\sigma = 0.873 \text{ S/m}$; $\epsilon_r = 43.074$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07/23/2020; Ambient Temp: 22.9°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3589; ConvF(8.7, 8.7, 8.7) @ 750 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1647

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

750 MHz System Verification at 23.0 dBm (200 mW)

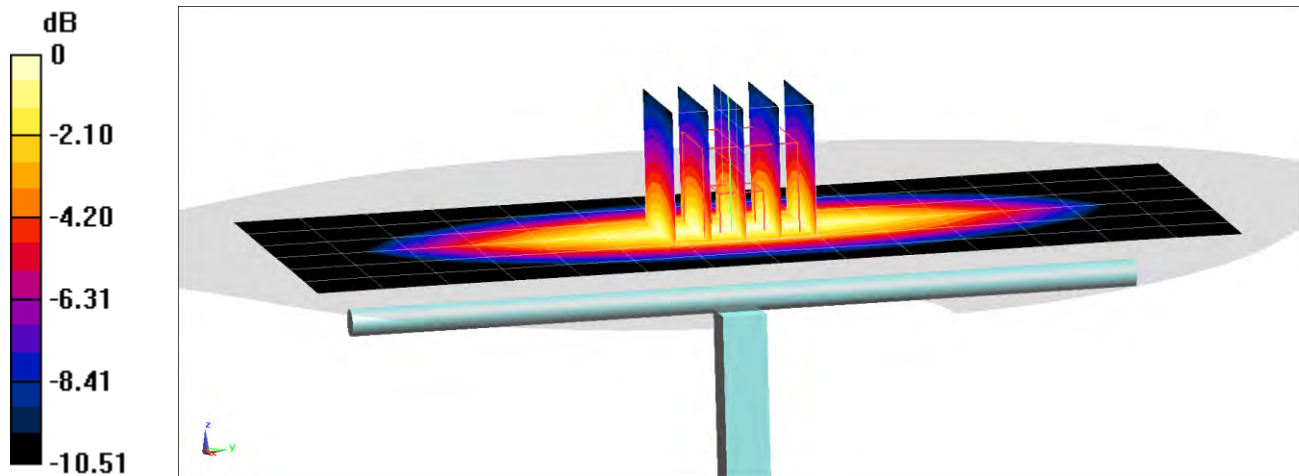
Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.53 W/kg

SAR(1 g) = 1.63 W/kg

Deviation(1 g) = -7.18%



PCTEST

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d132

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

Medium: 835 Head Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.906 \text{ S/m}$; $\epsilon_r = 41.748$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 06/29/2020; Ambient Temp: 23.1°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7410; ConvF(9.88, 9.88, 9.88) @ 835 MHz; Calibrated: 7/16/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 7/11/2019

Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1966

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

835 MHz System Verification at 23.0 dBm (200 mW)

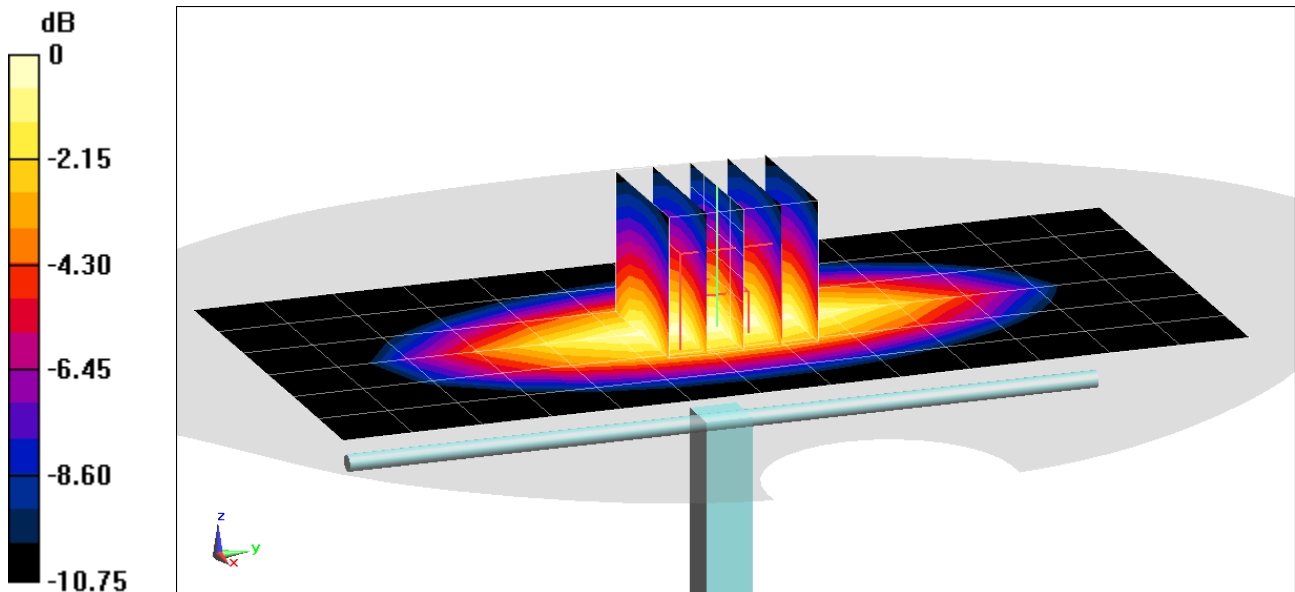
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.87 W/kg

SAR(1 g) = 1.92 W/kg

Deviation(1 g) = -0.52%



PCTEST

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d132

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

Medium: 835 Head Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.903 \text{ S/m}$; $\epsilon_r = 42.758$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07/06/2020; Ambient Temp: 24.9°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(9.61, 9.61, 9.61) @ 835 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1583; Calibrated: 5/14/2020

Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1966

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

835 MHz System Verification at 23.0 dBm (200 mW)

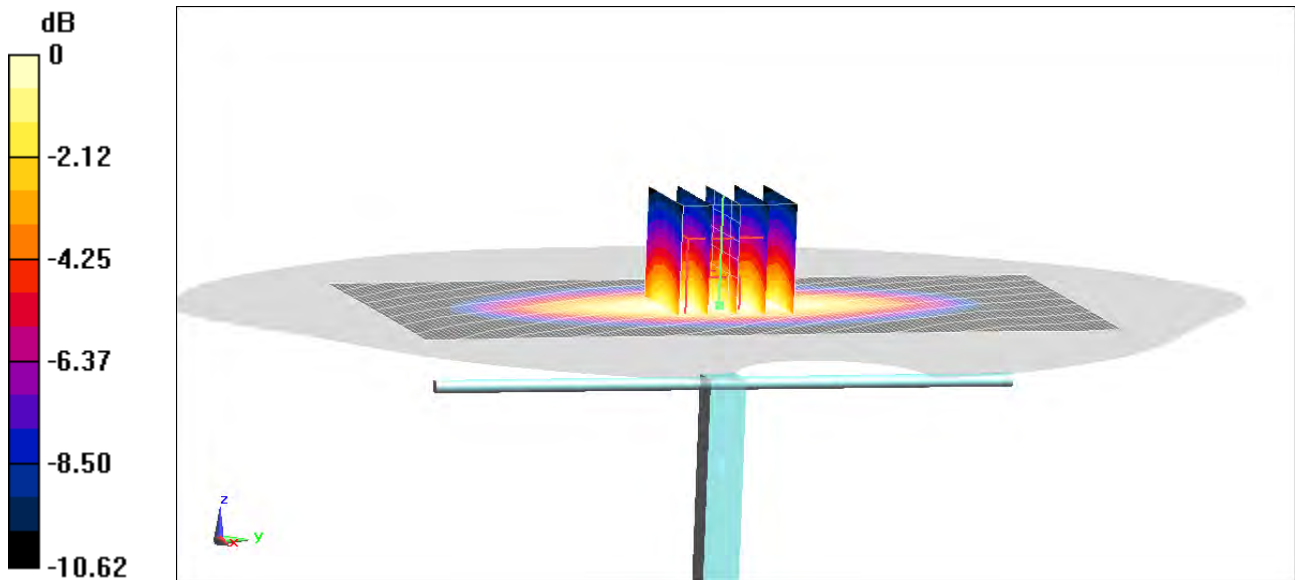
Area Scan (61x131x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

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

Peak SAR (extrapolated) = 2.91 W/kg

SAR(1 g) = 1.93 W/kg

Deviation(1 g) = 0.00%



0 dB = 2.59 W/kg = 4.13 dBW/kg

PCTEST

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1150

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

Medium: 1750 Head Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.314 \text{ S/m}$; $\epsilon_r = 40.794$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/02/2020; Ambient Temp: 23.1°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3589; ConvF(7.55, 7.55, 7.55) @ 1750 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1647

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

1750 MHz System Verification at 20.0 dBm (100 mW)

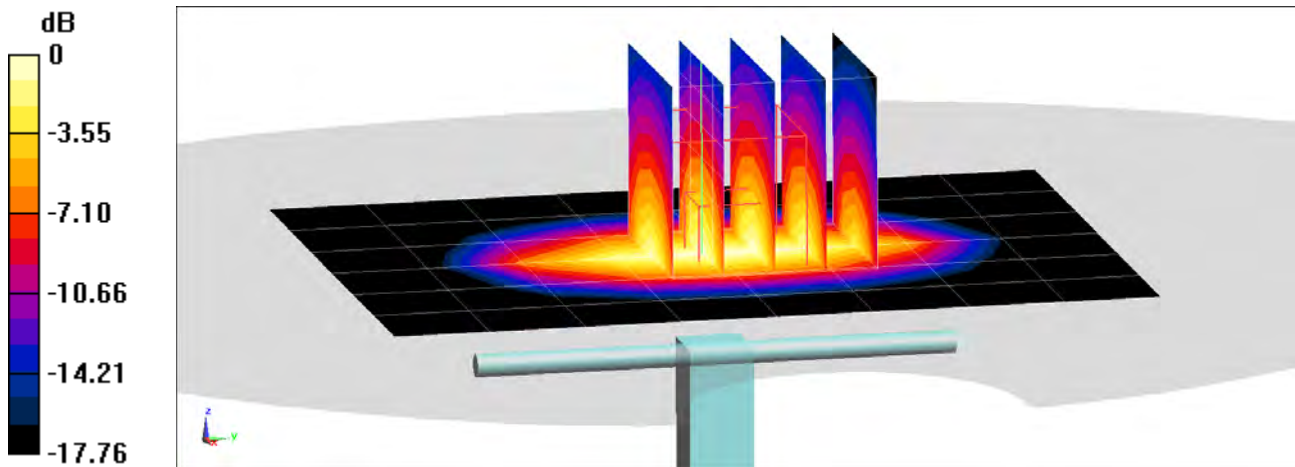
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.05 W/kg

SAR(1 g) = 3.39 W/kg

Deviation(1 g) = -7.12%



PCTEST

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1150

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

Medium: 1750 Head Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.321 \text{ S/m}$; $\epsilon_r = 41.025$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/11/2020; Ambient Temp: 23.1°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(8.32, 8.32, 8.32) @ 1750 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1583; Calibrated: 5/14/2020

Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1966

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

1750 MHz System Verification at 20.0 dBm (100 mW)

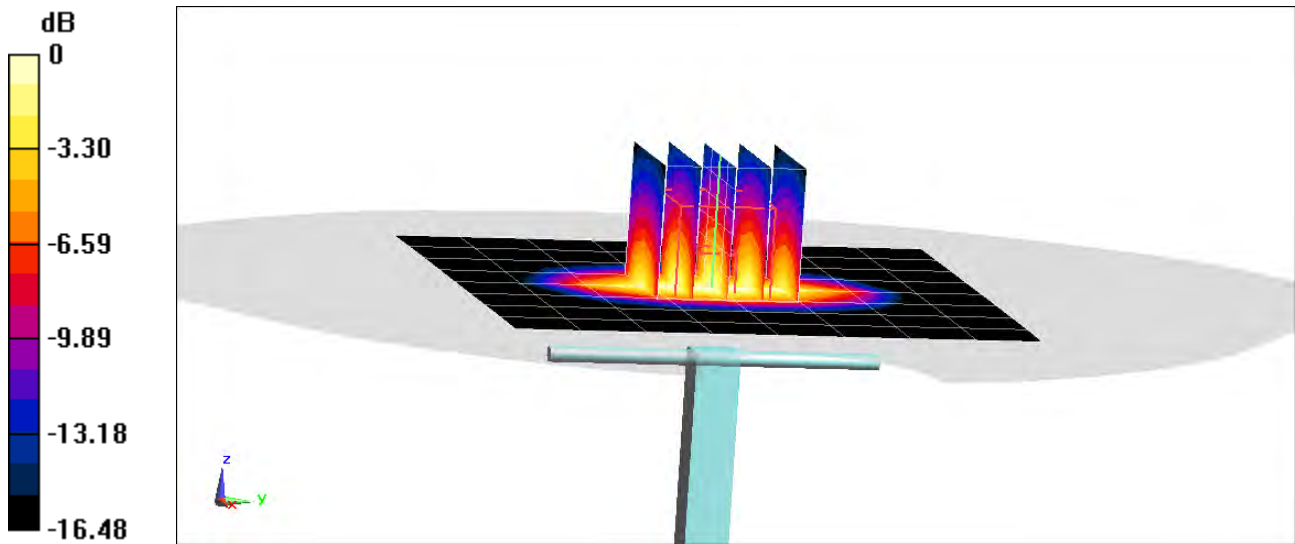
Area Scan (9x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.84 W/kg

SAR(1 g) = 3.76 W/kg

Deviation(1 g) = 3.01%



0 dB = 5.76 W/kg = 7.60 dBW/kg

PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d148

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

Medium: 1900 Head Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.371 \text{ S/m}$; $\epsilon_r = 40.081$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/03/2020; Ambient Temp: 23.4°C; Tissue Temp: 21.3°C

Probe: EX3DV4 - SN7410; ConvF(8.11, 8.11, 8.11) @ 1900 MHz; Calibrated: 7/16/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 7/11/2019

Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1966

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

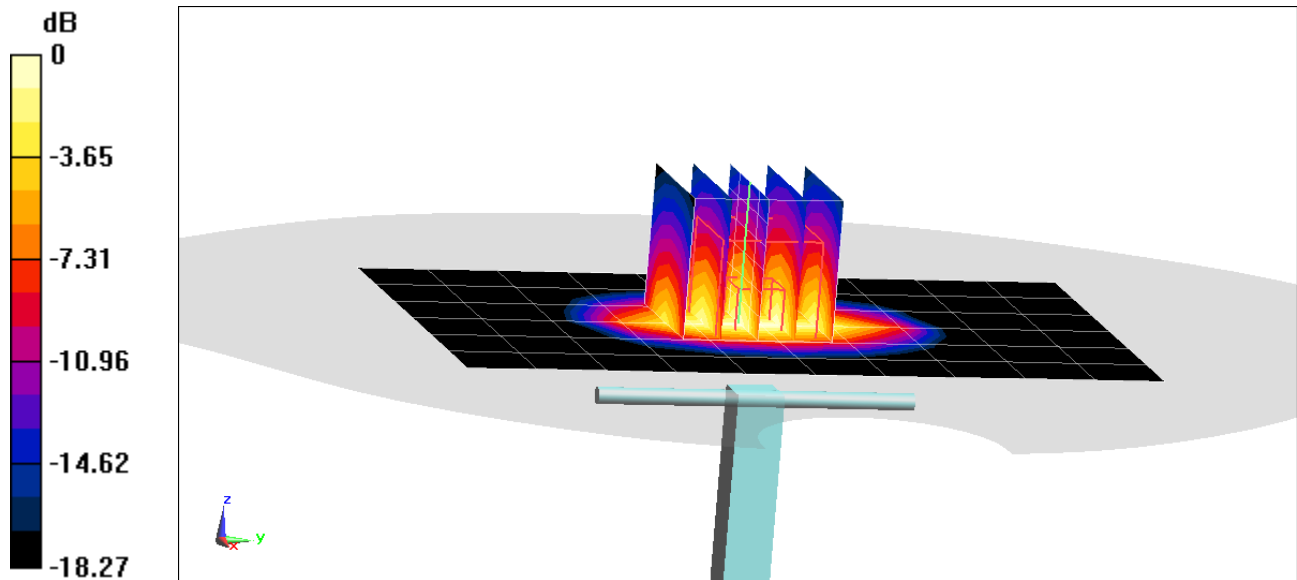
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.59 W/kg

SAR(1 g) = 4.17 W/kg

Deviation(1 g) = 6.65%



PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d148

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

Medium: 1900 Head Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.373 \text{ S/m}$; $\epsilon_r = 41.464$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/05/2020; Ambient Temp: 24.6°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(7.96, 7.96, 7.96) @ 1900 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1583; Calibrated: 5/14/2020

Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1966

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

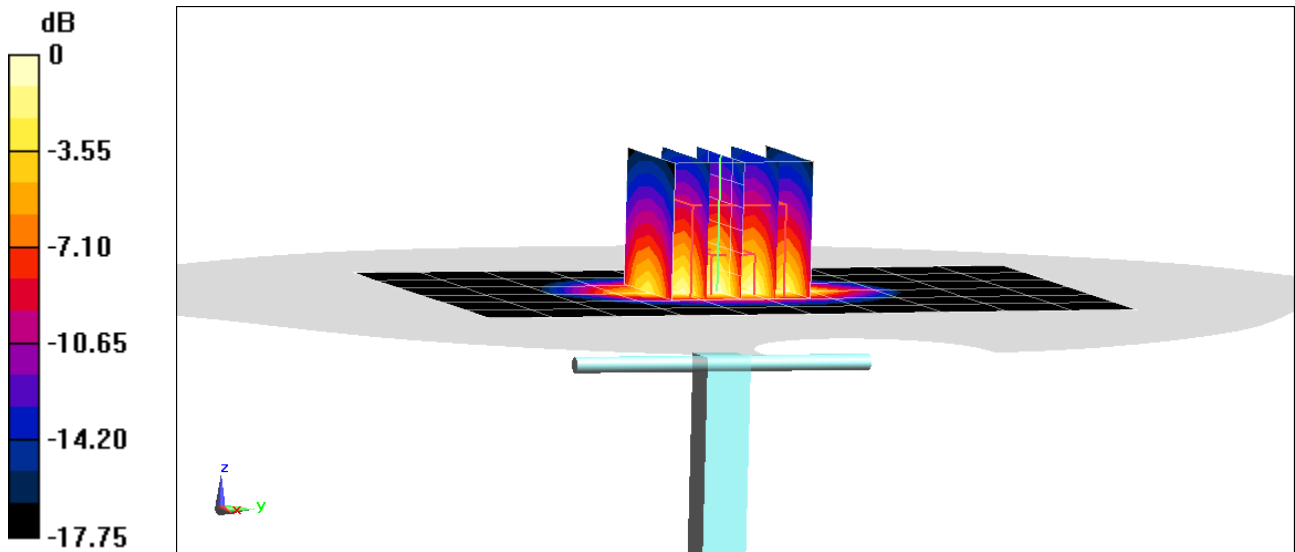
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.72 W/kg

SAR(1 g) = 4.23 W/kg

Deviation(1 g) = 8.18%



PCTEST

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: 1073

Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1

Medium: 2300 Head; Medium parameters used:

$f = 2300 \text{ MHz}$; $\sigma = 1.636 \text{ S/m}$; $\epsilon_r = 40.799$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/17/2020; Ambient Temp: 22.7°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7551; ConvF(7.74, 7.74, 7.74) @ 2300 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 9/17/2019

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2300 MHz System Verification at 20.0 dBm (100 mW)

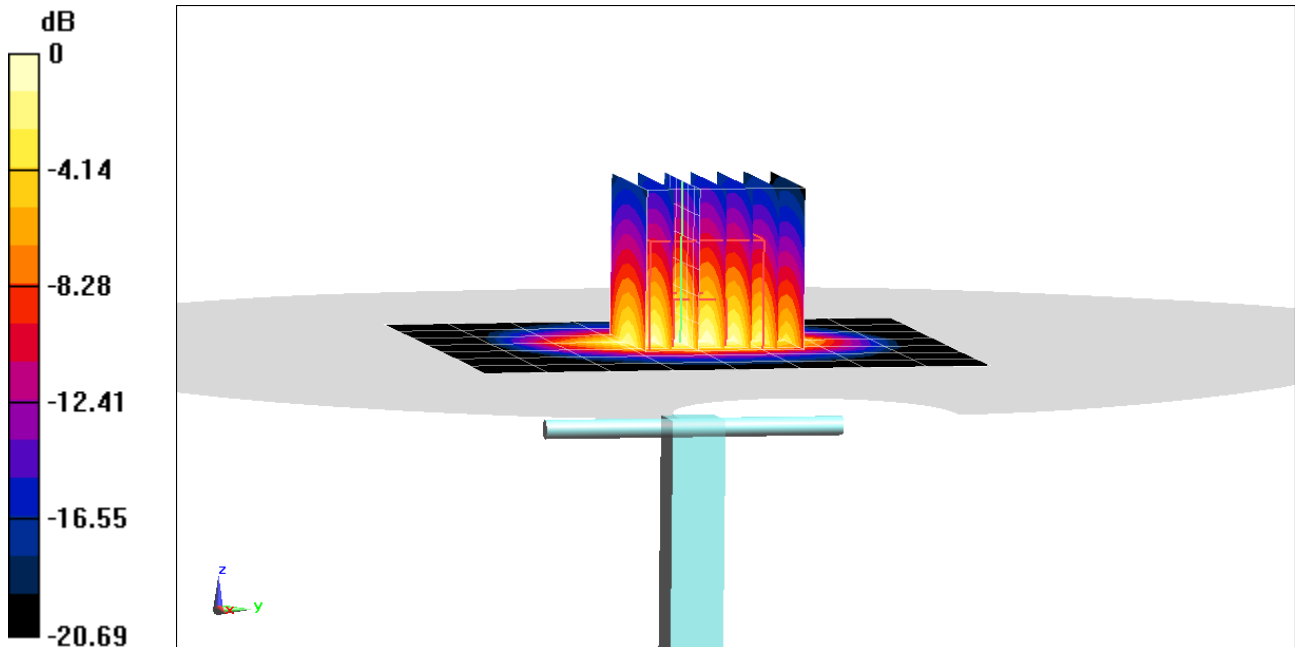
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 9.41 W/kg

SAR(1 g) = 4.69 W/kg

Deviation(1 g) = -4.67%



0 dB = 7.59 W/kg = 8.80 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.821 \text{ S/m}$; $\epsilon_r = 41.109$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06/28/2020; Ambient Temp: 22.9°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3589; ConvF(6.85, 6.85, 6.85) @ 2450 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1647

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

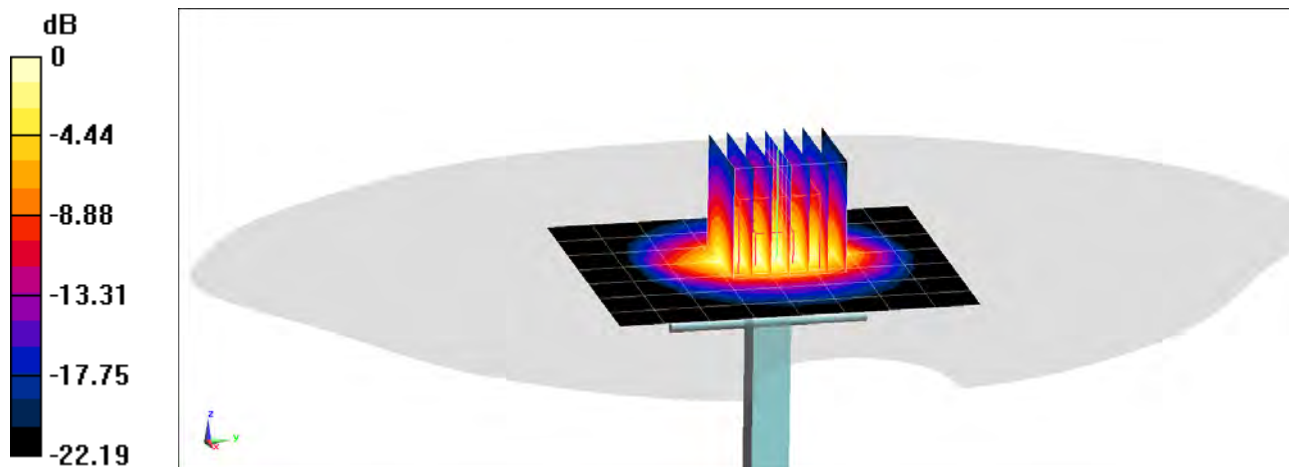
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 11.1 W/kg

SAR(1 g) = 5.34 W/kg

Deviation(1 g) = 0.56%



0 dB = 8.95 W/kg = 9.52 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 797

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.788 \text{ S/m}$; $\epsilon_r = 40.696$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/20/2020; Ambient Temp: 22.7°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN3589; ConvF(6.85, 6.85, 6.85) @ 2450 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1647

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

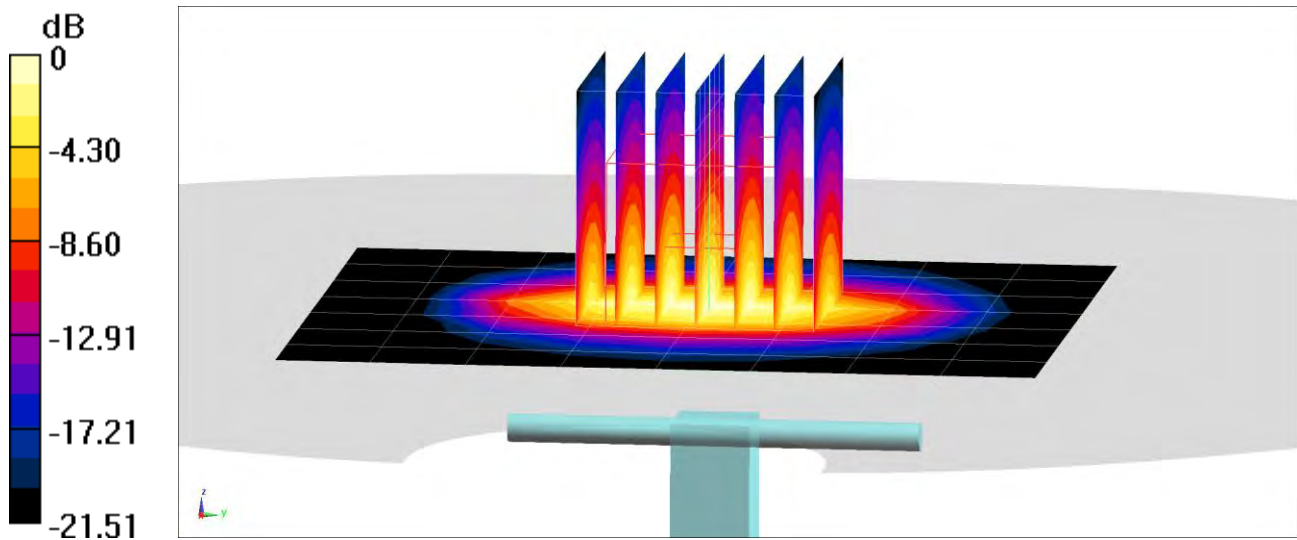
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 10.8 W/kg

SAR(1 g) = 5.11 W/kg

Deviation(1 g) = -3.04%



PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Head Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.867 \text{ S/m}$; $\epsilon_r = 38.764$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/04/2020; Ambient Temp: 22.8°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3589; ConvF(6.85, 6.85, 6.85) @ 2450 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1647

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

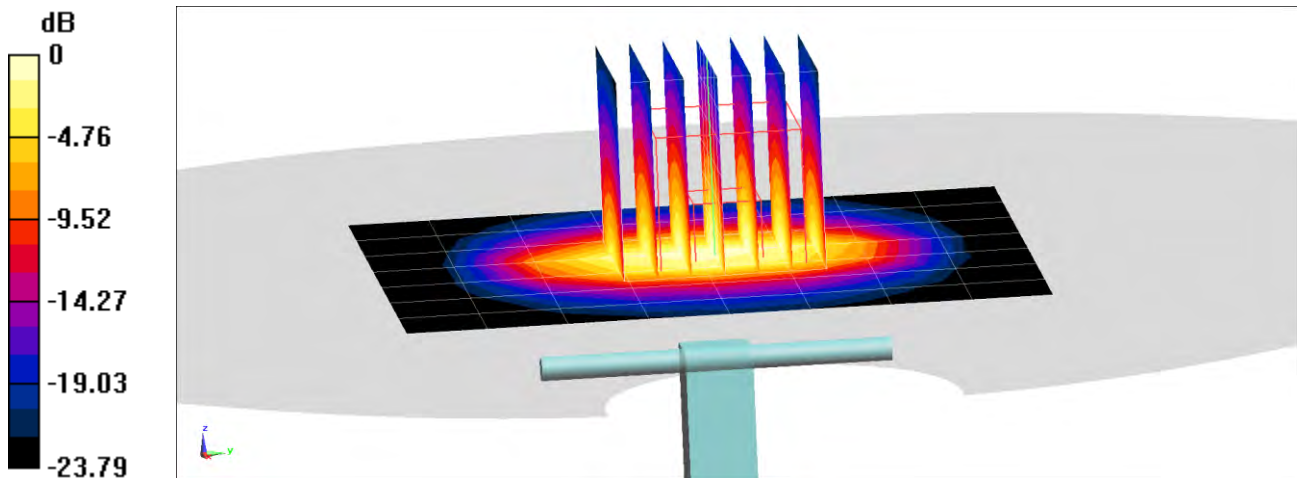
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 11.7 W/kg

SAR(1 g) = 5.28 W/kg

Deviation(1 g) = -0.56%



PCTEST

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1064

Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: 2600 Head Medium parameters used:

$f = 2600 \text{ MHz}$; $\sigma = 1.941 \text{ S/m}$; $\epsilon_r = 40.903$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06/28/2020; Ambient Temp: 22.9°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN3589; ConvF(6.6, 6.6, 6.6) @ 2600 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1647

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

2600 MHz System Verification at 20.0 dBm (100 mW)

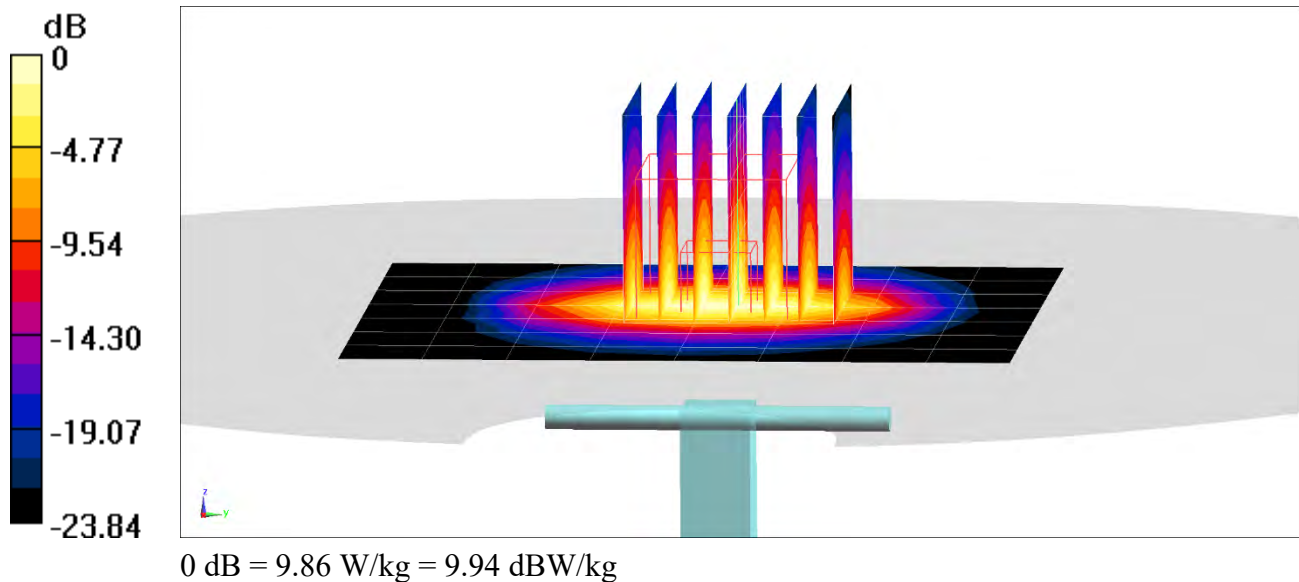
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 12.6 W/kg

SAR(1 g) = 5.8 W/kg

Deviation(1 g) = -0.17%



PCTEST

DUT: Dipole 3500 MHz; Type: D3500V2; Serial: 1059

Communication System: UID 0, CW; Frequency: 3500 MHz; Duty Cycle: 1:1

Medium: 3600 Head Medium parameters used:

$f = 3500 \text{ MHz}$; $\sigma = 2.872 \text{ S/m}$; $\epsilon_r = 39.373$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/24/2020; Ambient Temp: 22.8°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7488; ConvF(7.3, 7.3, 7.3) @ 3500 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1530; Calibrated: 1/13/2020

Phantom: Twin-SAM V4.0 left 20; Type: QD 000 P40 CC; Serial: 1687

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

3500 MHz System Verification at 20.0 dBm (100 mW)

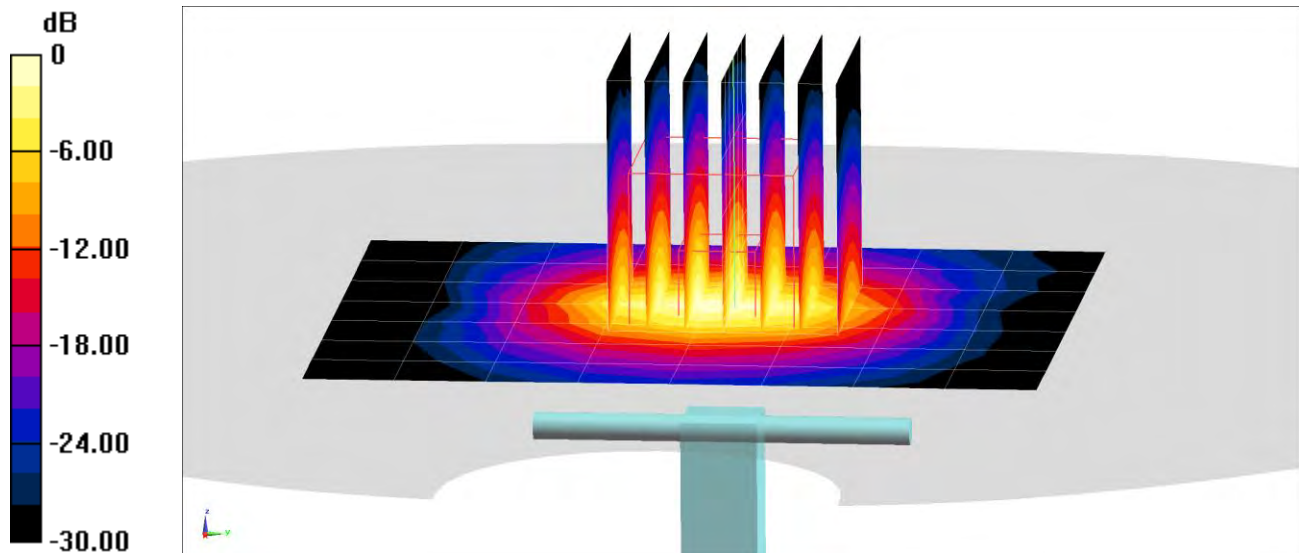
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x7x8)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Peak SAR (extrapolated) = 16.9 W/kg

SAR(1 g) = 6.18 W/kg

Deviation(1 g) = -4.33%



0 dB = 12.0 W/kg = 10.79 dBW/kg

PCTEST

DUT: Dipole 3700 MHz; Type: D3700V2; Serial: 1018

Communication System: UID 0, CW; Frequency: 3700 MHz; Duty Cycle: 1:1

Medium: 3600 Head Medium parameters used:

$f = 3700 \text{ MHz}$; $\sigma = 3.037 \text{ S/m}$; $\epsilon_r = 39.104$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/24/2020; Ambient Temp: 22.8°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7488; ConvF(7.2, 7.2, 7.2) @ 3700 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1530; Calibrated: 1/13/2020

Phantom: Twin-SAM V4.0 left 20; Type: QD 000 P40 CC; Serial: 1687

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

3700 MHz System Verification at 20.0 dBm (100 mW)

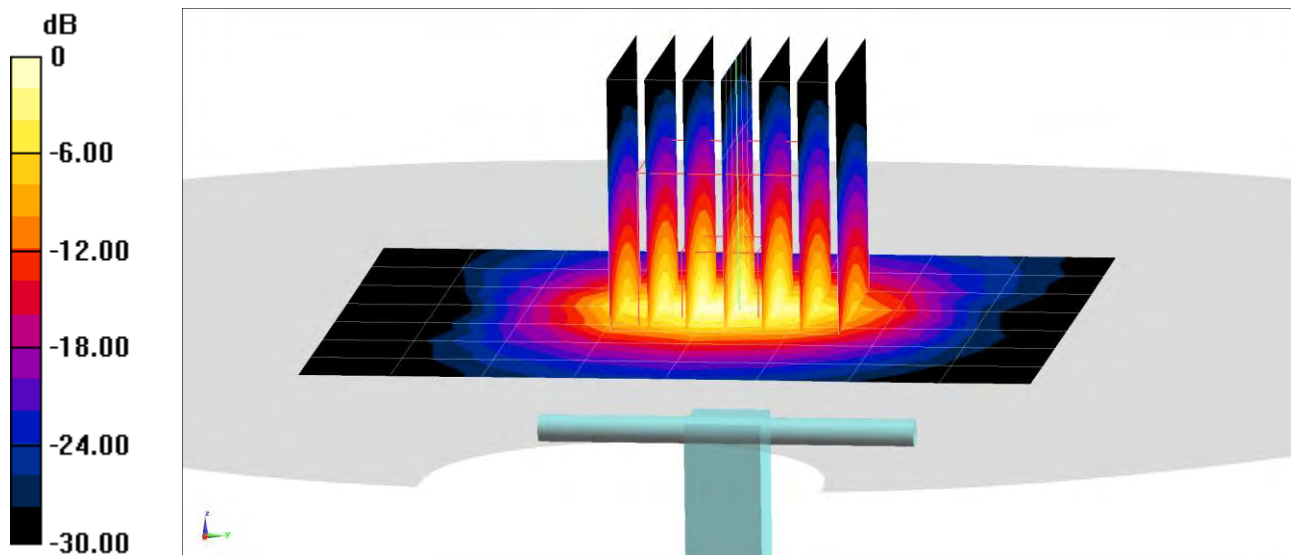
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x7x8)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.1 W/kg

SAR(1 g) = 6.34 W/kg

Deviation(1 g) = -3.65%



PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1057

Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Head Medium parameters used:

$f = 5250 \text{ MHz}$; $\sigma = 4.583 \text{ S/m}$; $\epsilon_r = 36.641$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/13/2020; Ambient Temp: 21.7°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7357; ConvF(5.5, 5.5, 5.5) @ 5250 MHz; Calibrated: 4/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/15/2020

Phantom: Twin-SAM V5.0 Left 20; Type: QD 000 P40 CD; Serial: 1715

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5250 MHz System Verification at 17.0 dBm (50 mW)

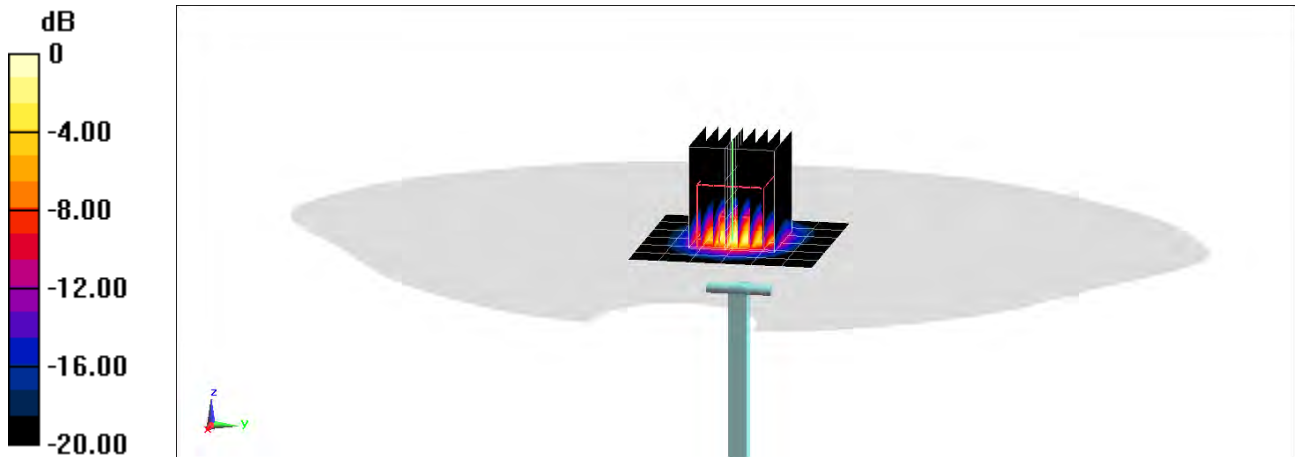
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 15.6 W/kg

SAR(1 g) = 3.82 W/kg

Deviation(1 g) = -3.54%



0 dB = 9.27 W/kg = 9.67 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1057

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Head Medium parameters used:

$f = 5600$ MHz; $\sigma = 4.938$ S/m; $\epsilon_r = 35.953$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/13/2020; Ambient Temp: 21.7°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7357; ConvF(4.93, 4.93, 4.93) @ 5600 MHz; Calibrated: 4/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/15/2020

Phantom: Twin-SAM V5.0 Left 20; Type: QD 000 P40 CD; Serial: 1715

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5600 MHz System Verification at 17.0 dBm (50 mW)

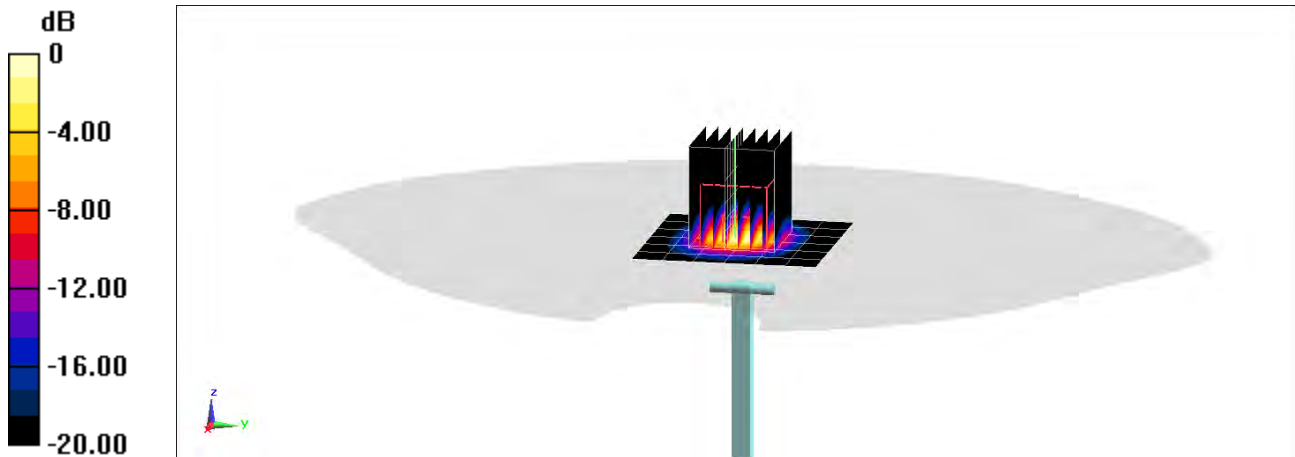
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 17.0 W/kg

SAR(1 g) = 3.87 W/kg

Deviation(1 g) = -7.97%



0 dB = 9.47 W/kg = 9.76 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1057

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Head Medium parameters used:

$f = 5750 \text{ MHz}$; $\sigma = 5.092 \text{ S/m}$; $\epsilon_r = 35.667$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/13/2020; Ambient Temp: 21.7°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7357; ConvF(5.05, 5.05, 5.05) @ 5750 MHz; Calibrated: 4/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/15/2020

Phantom: Twin-SAM V5.0 Left 20; Type: QD 000 P40 CD; Serial: 1715

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5750 MHz System Verification at 17.0 dBm (50 mW)

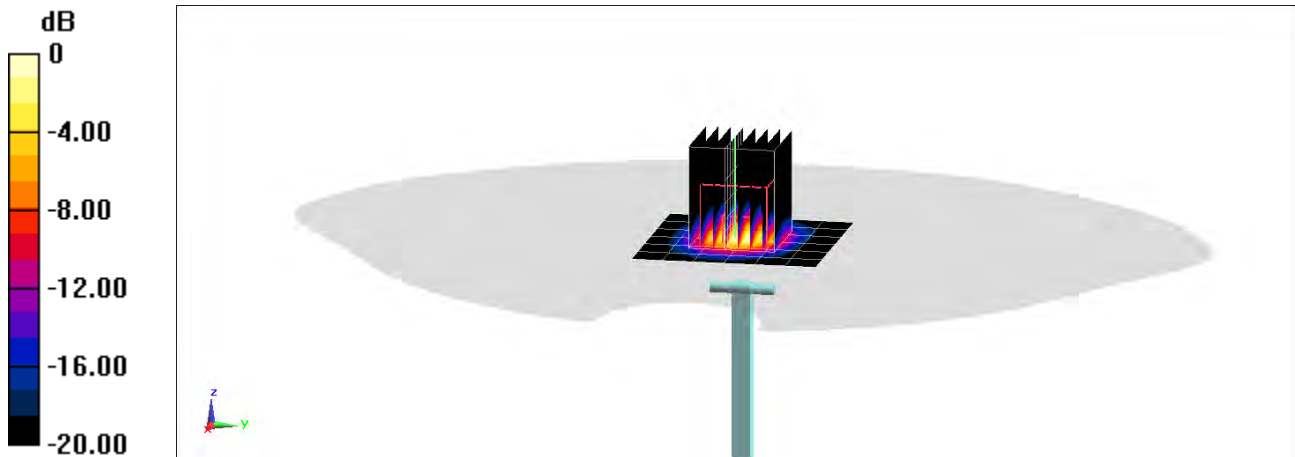
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 17.7 W/kg

SAR(1 g) = 3.89 W/kg

Deviation(1 g) = -3.35%



0 dB = 9.65 W/kg = 9.85 dBW/kg

PCTEST

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1054

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

Medium: 750 Body Medium parameters used:

$f = 750 \text{ MHz}$; $\sigma = 0.955 \text{ S/m}$; $\epsilon_r = 53.959$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07/01/2020; Ambient Temp: 23.7°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7410; ConvF(10.01, 10.01, 10.01) @ 750 MHz; Calibrated: 7/16/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1322; Calibrated: 7/11/2019

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

750 MHz System Verification at 23.0 dBm (200 mW)

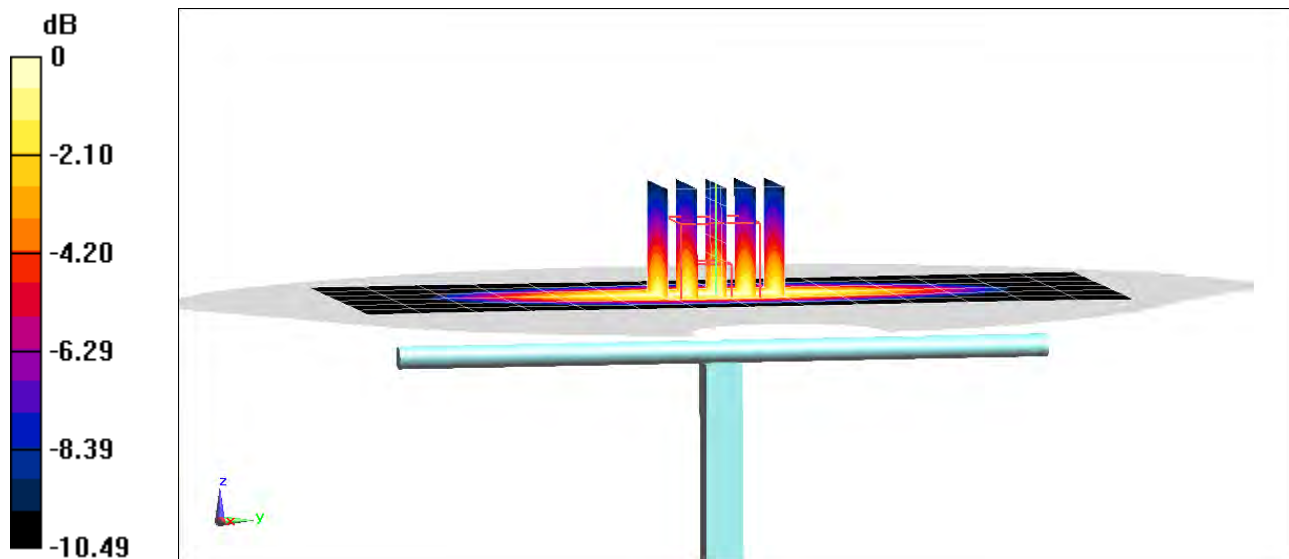
Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.74 W/kg

SAR(1 g) = 1.8 W/kg; SAR(10 g) = 1.19 W/kg

Deviation(1 g) = 5.51%; Deviation(10 g) = 5.68%



0 dB = 2.42 W/kg = 3.84 dBW/kg

PCTEST

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1054

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

Medium: 750 Body; Medium parameters used:

$f = 750 \text{ MHz}$; $\sigma = 0.951 \text{ S/m}$; $\epsilon_r = 54.099$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07/21/2020; Ambient Temp: 23.9°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7551; ConvF(10.09, 10.09, 10.09) @ 750 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 9/17/2019

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

750 MHz System Verification at 23.0 dBm (200 mW)

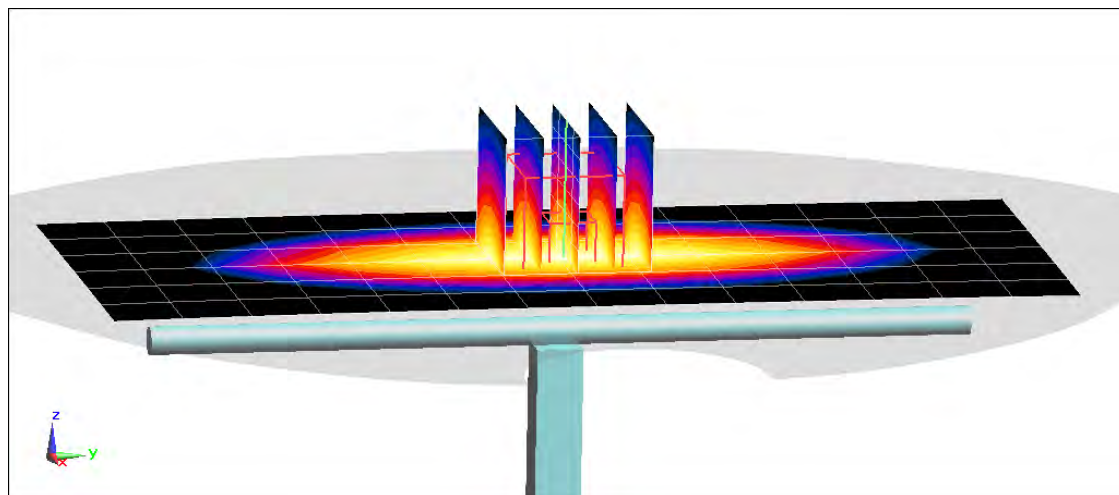
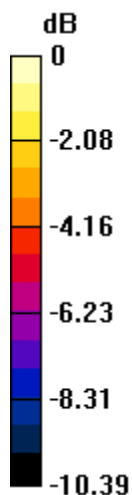
Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.62 W/kg

SAR(1 g) = 1.71 W/kg

Deviation(1 g) = 0.23%



0 dB = 2.30 W/kg = 3.62 dBW/kg

PCTEST

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1054

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

Medium: 750 Body; Medium parameters used:

$f = 750 \text{ MHz}$; $\sigma = 0.967 \text{ S/m}$; $\epsilon_r = 53.555$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07/26/2020; Ambient Temp: 21.7°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN7551; ConvF(10.09, 10.09, 10.09) @ 750 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 9/17/2019

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

750 MHz System Verification at 23.0 dBm (200 mW)

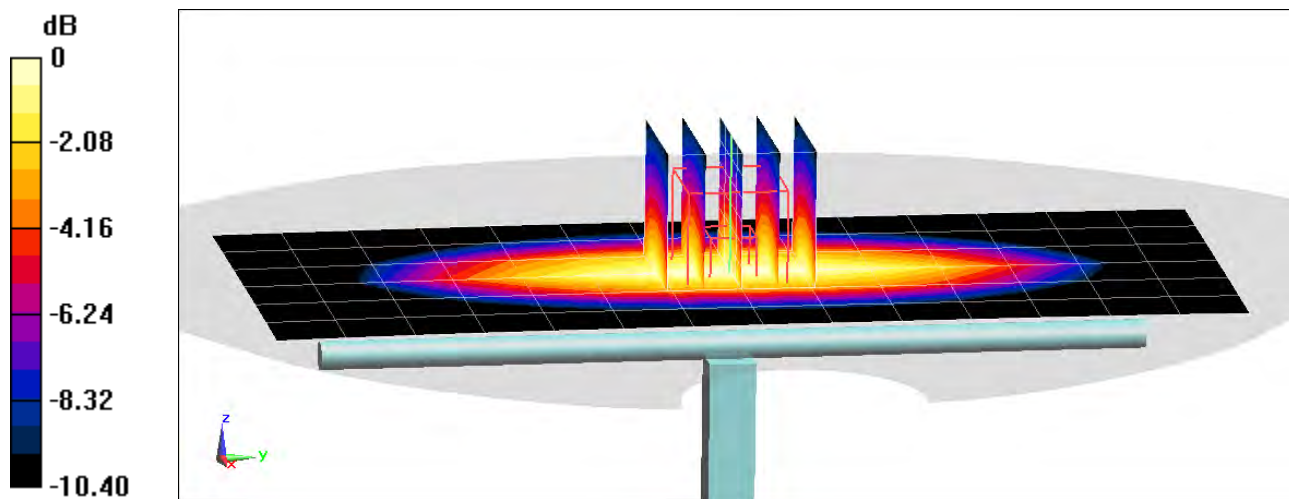
Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.68 W/kg

SAR(1 g) = 1.76 W/kg

Deviation(1 g) = 3.17%



0 dB = 2.36 W/kg = 3.73 dBW/kg

PCTEST

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1054

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

Medium: 750 Body; Medium parameters used:

$f = 750 \text{ MHz}$; $\sigma = 0.969 \text{ S/m}$; $\epsilon_r = 53.19$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07/28/2020; Ambient Temp: 21.5°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7551; ConvF(10.09, 10.09, 10.09) @ 750 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 9/17/2019

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

750 MHz System Verification at 23.0 dBm (200 mW)

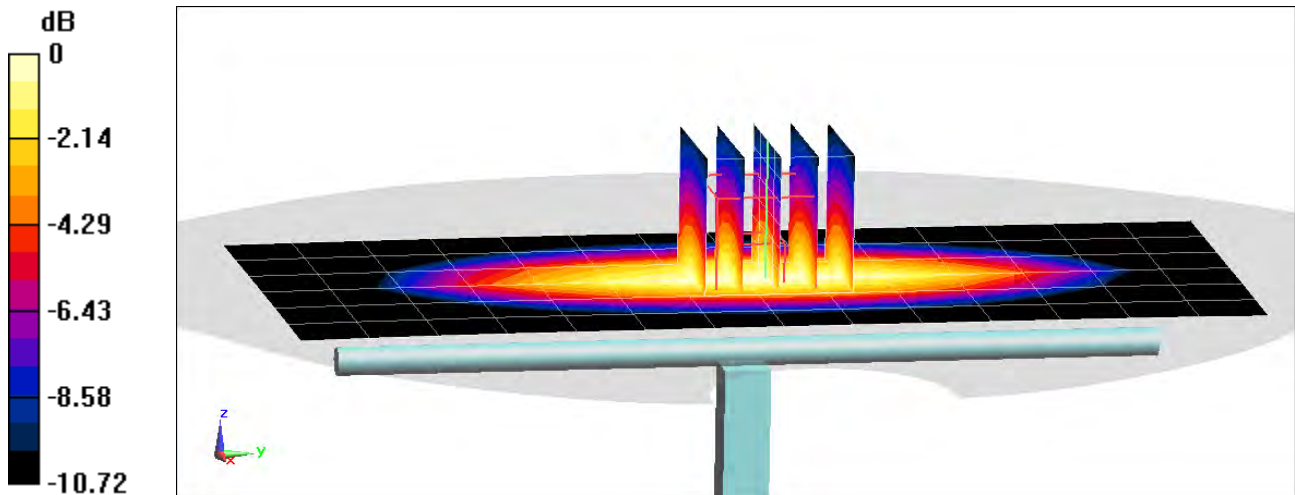
Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.77 W/kg

SAR(1 g) = 1.76 W/kg

Deviation(1 g) = 3.17%



0 dB = 2.40 W/kg = 3.80 dBW/kg

PCTEST

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1054

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

Medium: 750 Body; Medium parameters used:

$f = 750 \text{ MHz}$; $\sigma = 0.964 \text{ S/m}$; $\epsilon_r = 53.772$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07/30/2020; Ambient Temp: 23.5°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7551; ConvF(10.09, 10.09, 10.09) @ 750 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 9/17/2019

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

750 MHz System Verification at 23.0 dBm (200 mW)

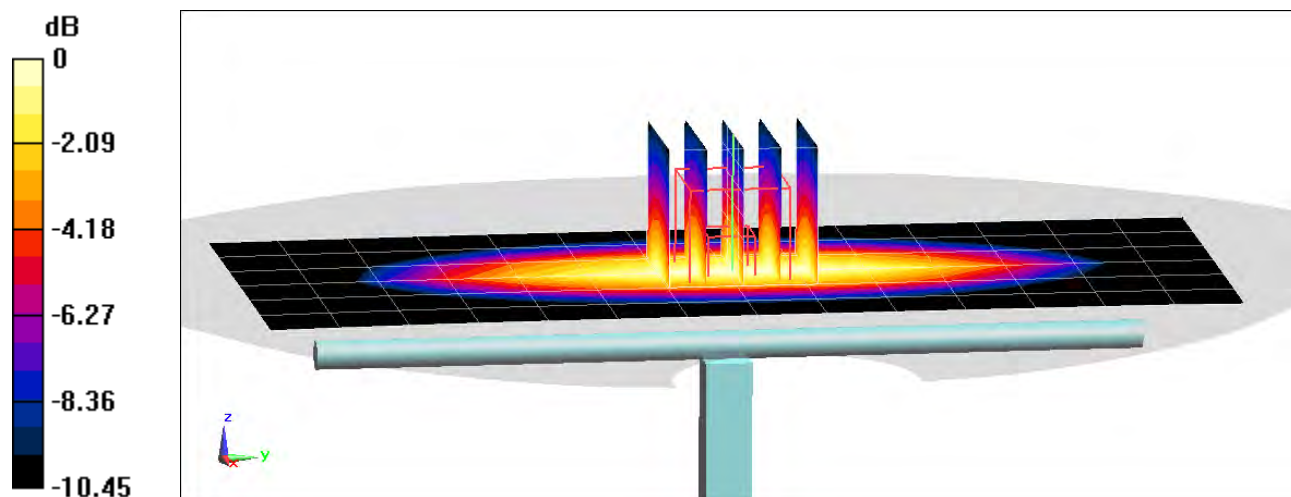
Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 2.65 W/kg

SAR(1 g) = 1.71 W/kg; SAR(10 g) = 1.13 W/kg

Deviation(1 g) = 0.23%; Deviation(10 g) = 0.36%



0 dB = 2.31 W/kg = 3.64 dBW/kg

PCTEST

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1054

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

Medium: 750 Body; Medium parameters used:

$f = 750 \text{ MHz}$; $\sigma = 0.973 \text{ S/m}$; $\epsilon_r = 53.556$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 08/03/2020; Ambient Temp: 23.9°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7551; ConvF(10.09, 10.09, 10.09) @ 750 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 9/17/2019

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

750 MHz System Verification at 23.0 dBm (200 mW)

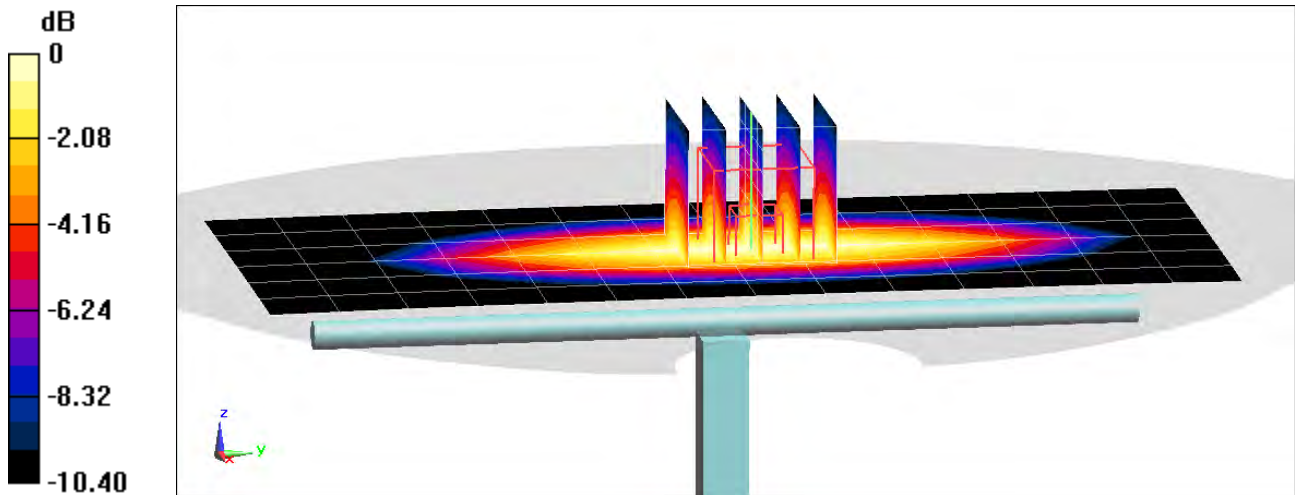
Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.74 W/kg

SAR(1 g) = 1.78 W/kg; SAR(10 g) = 1.17 W/kg

Deviation(1 g) = 4.34%; Deviation(10 g) = 3.91%



0 dB = 2.40 W/kg = 3.80 dBW/kg

PCTEST

DUT: Dipole 750 MHz; Type: D750V3; Serial: 1161

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

Medium: 750 Body Medium parameters used:

$f = 750 \text{ MHz}$; $\sigma = 0.947 \text{ S/m}$; $\epsilon_r = 53.467$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 08/24/2020; Ambient Temp: 23.1°C; Tissue Temp: 21.7°C

Probe: EX3DV4 - SN3589; ConvF(8.49, 8.49, 8.49) @ 750 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1558; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1647

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

750 MHz System Verification at 23.0 dBm (200 mW)

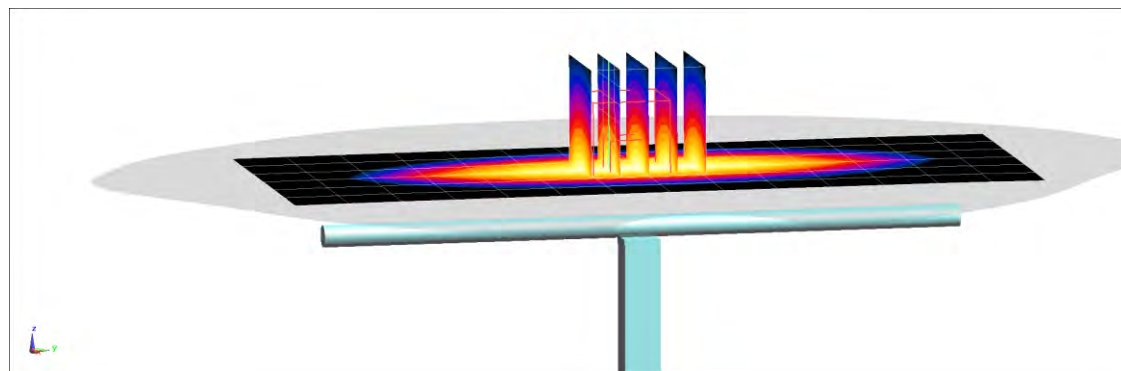
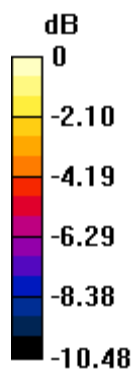
Area Scan (7x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.77 W/kg

SAR(10 g) = 1.18 W/kg

Deviation(10 g) = 6.31%



0 dB = 2.42 W/kg = 3.84 dBW/kg

PCTEST

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d047

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

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.96 \text{ S/m}$; $\epsilon_r = 54.305$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07/19/2020; Ambient Temp: 22.1°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7488; ConvF(11.04, 11.04, 11.04) @ 835 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1530; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1646

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

835 MHz System Verification at 23.0 dBm (200 mW)

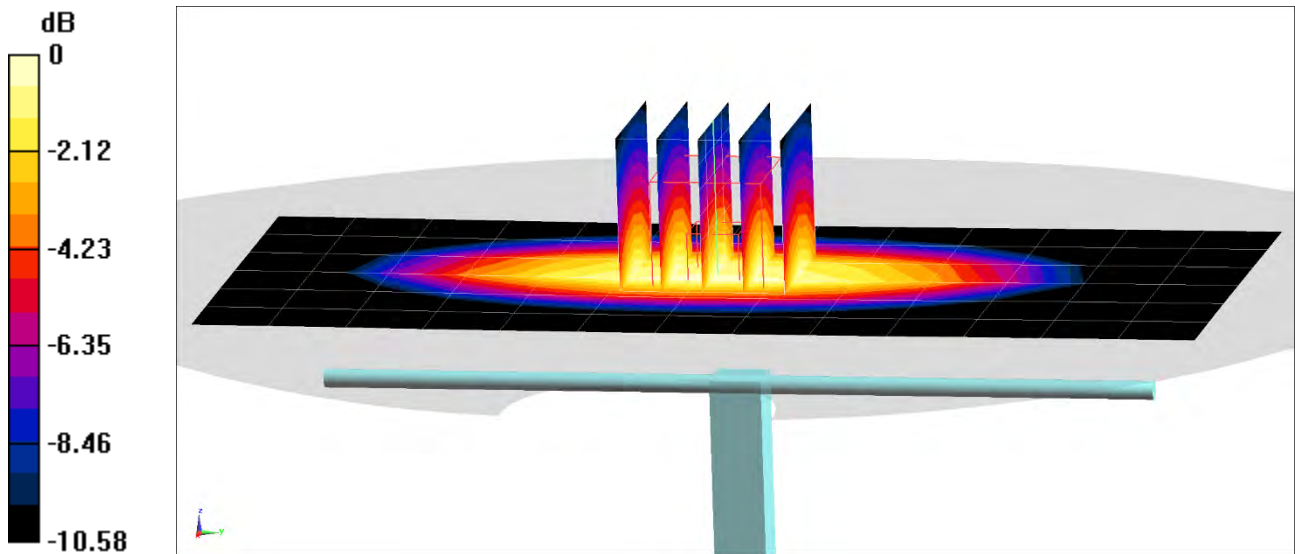
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.80 W/kg

SAR(1 g) = 1.82 W/kg

Deviation(1 g) = -3.91%



0 dB = 2.45 W/kg = 3.89 dBW/kg

PCTEST

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d047

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

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.955 \text{ S/m}$; $\epsilon_r = 53.949$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07/30/2020; Ambient Temp: 23.1°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN7488; ConvF(11.04, 11.04, 11.04) @ 835 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1530; Calibrated: 1/13/2020

Phantom: Twin-SAM V4.0 Left 30; Type: QD 000 P40 CC; Serial: 1687

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

835 MHz System Verification at 23.0 dBm (200 mW)

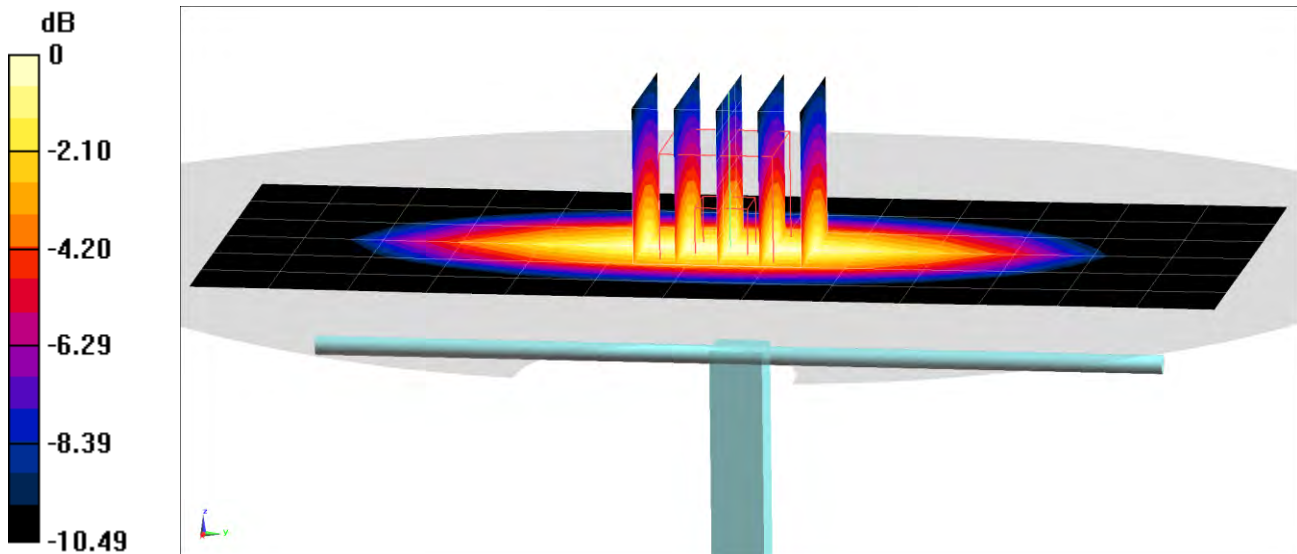
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.88 W/kg

SAR(1 g) = 1.9 W/kg

Deviation(1 g) = 0.32%



0 dB = 2.54 W/kg = 4.05 dBW/kg

PCTEST

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d132

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

Medium: 835 Body; Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.997 \text{ S/m}$; $\epsilon_r = 53.562$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 07/30/2020; Ambient Temp: 23.5°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7551; ConvF(9.92, 9.92, 9.92) @ 835 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 9/17/2019

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

835 MHz System Verification at 23.0 dBm (200 mW)

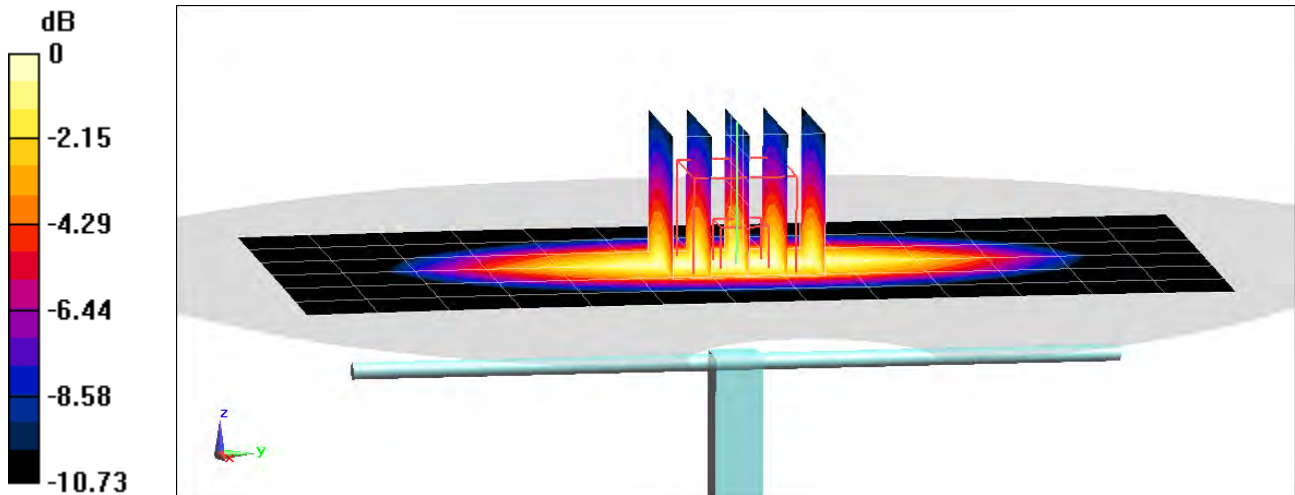
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 3.30 W/kg

SAR(10 g) = 1.4 W/kg

Deviation(10 g) = 5.42%



PCTEST

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d047

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

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.967 \text{ S/m}$; $\epsilon_r = 53.62$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 08/02/2020; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7488; ConvF(11.04, 11.04, 11.04) @ 835 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1530; Calibrated: 1/13/2020

Phantom: Twin-SAM V4.0 Left 30; Type: QD 000 P40 CC; Serial: 1687

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

835 MHz System Verification at 23.0 dBm (200 mW)

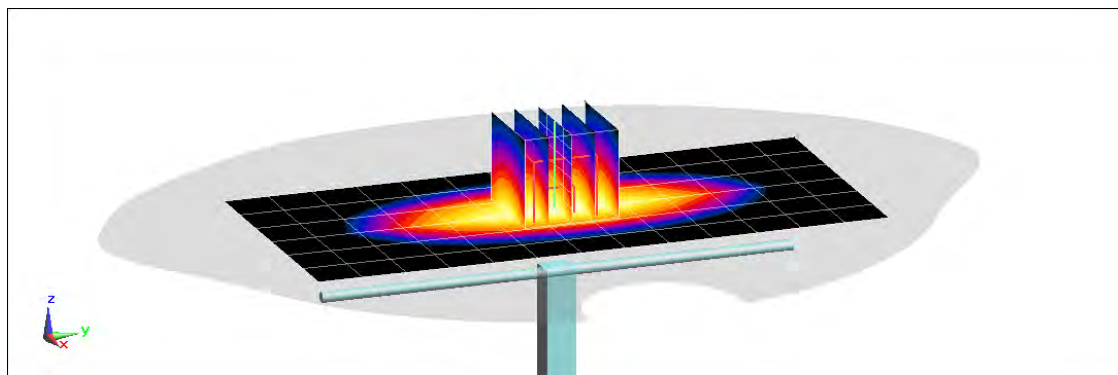
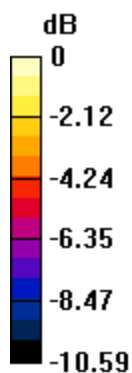
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 3.03 W/kg

SAR(1 g) = 1.98 W/kg

Deviation(1 g) = 4.54%



0 dB = 2.67 W/kg = 4.27 dBW/kg

PCTEST

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d132

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

Medium: 835 Body; Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 1.002 \text{ S/m}$; $\epsilon_r = 52.962$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 08/04/2020; Ambient Temp: 22.0°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN7551; ConvF(9.92, 9.92, 9.92) @ 835 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 9/17/2019

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

835 MHz System Verification at 23.0 dBm (200 mW)

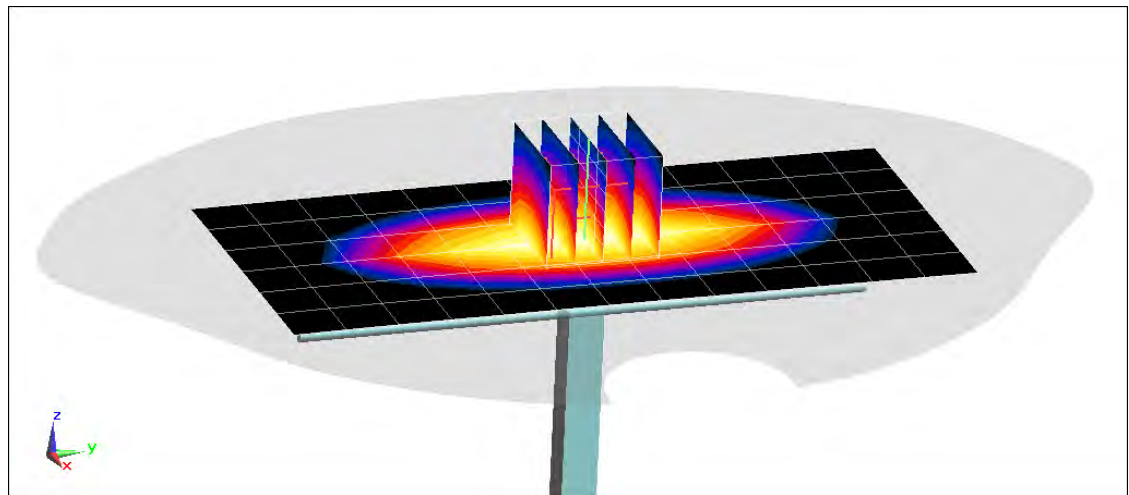
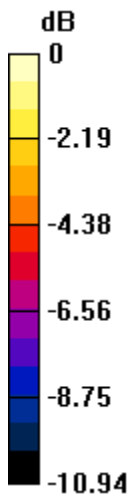
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 3.11 W/kg

SAR(1 g) = 1.99 W/kg; SAR(10 g) = 1.29 W/kg

Deviation(1 g) = -0.10%; Deviation(10 g) = -2.86%



0 dB = 2.71 W/kg = 4.33 dBW/kg

PCTEST

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d132

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

Medium: 835 Body; Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.952 \text{ S/m}$; $\epsilon_r = 54.633$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 08/07/2020; Ambient Temp: 23.7°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7551; ConvF(9.92, 9.92, 9.92) @ 835 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1333; Calibrated: 9/17/2019

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

835 MHz System Verification at 23.0 dBm (200 mW)

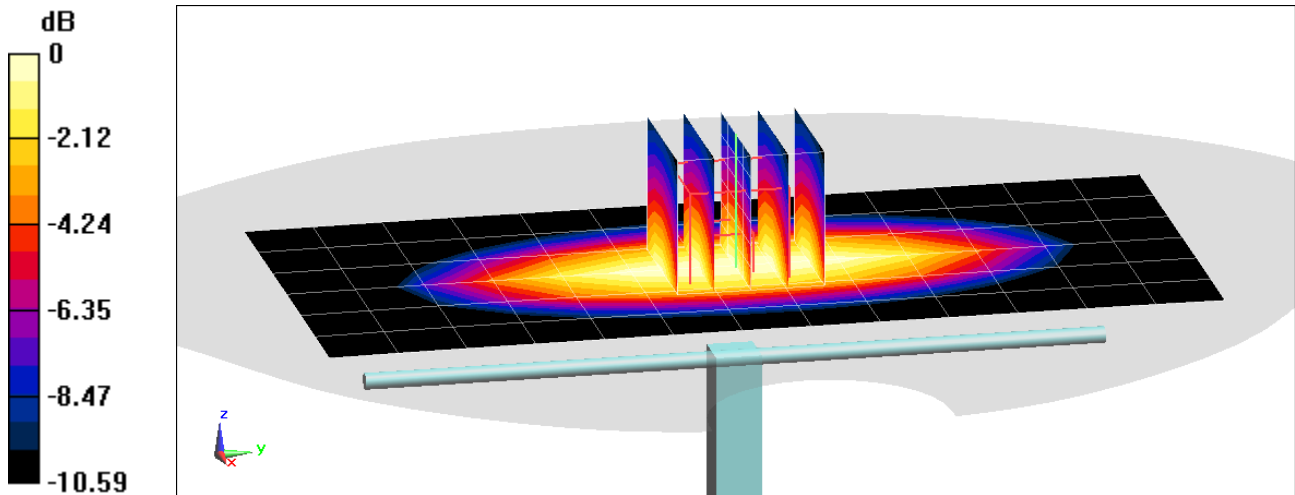
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 3.06 W/kg

SAR(1 g) = 2 W/kg; SAR(10 g) = 1.32 W/kg

Deviation(1 g) = 0.40%; Deviation(10 g) = -0.60%



0 dB = 2.64 W/kg = 4.22 dBW/kg

PCTEST

DUT: Dipole 835 MHz; Type: D835V2; Serial: 4d133

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

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.956 \text{ S/m}$; $\epsilon_r = 53.169$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 08/10/2020; Ambient Temp: 24.1°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN7488; ConvF(11.04, 11.04, 11.04) @ 835 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1530; Calibrated: 1/13/2020

Phantom: Twin-SAM V4.0 Left 30; Type: QD 000 P40 CC; Serial: 1687

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

835 MHz System Verification at 23.0 dBm (200 mW)

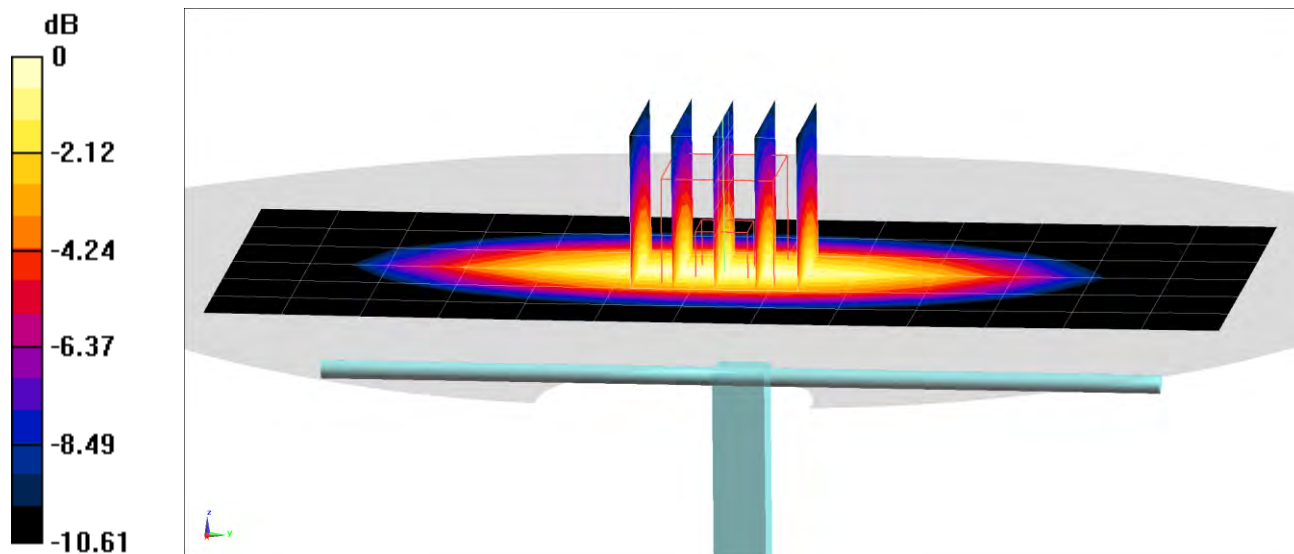
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.90 W/kg

SAR(1 g) = 1.91 W/kg; SAR(10 g) = 1.25 W/kg

Deviation(1 g) = -2.05%; Deviation(10 g) = -2.34%



0 dB = 2.56 W/kg = 4.08 dBW/kg

PCTEST

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

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

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.507 \text{ S/m}$; $\epsilon_r = 51.327$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/01/2020; Ambient Temp: 20.7°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7570; ConvF(8.48, 8.48, 8.48) @ 1750 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/12/2020

Phantom: Right Back Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1692

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

1750 MHz System Verification at 20.0 dBm (100 mW)

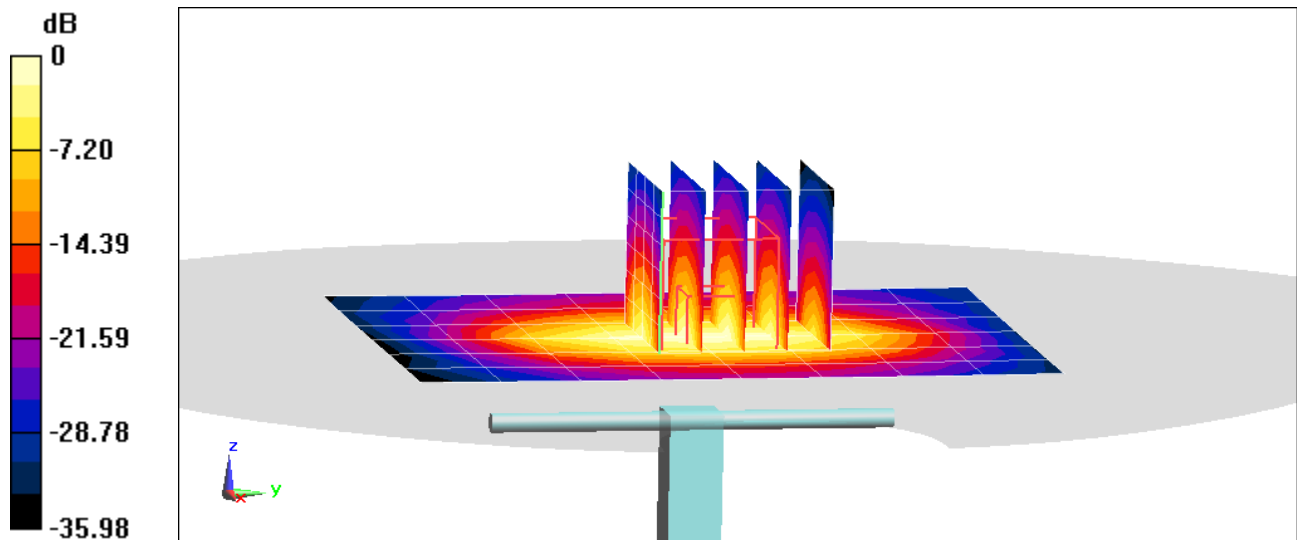
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.29 W/kg

SAR(1 g) = 3.47 W/kg; SAR(10 g) = 1.85 W/kg

Deviation(1 g) = -7.22%; Deviation(10 g) = -7.04%



0 dB = 5.26 W/kg = 7.21 dBW/kg

PCTEST

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

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

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.515 \text{ S/m}$; $\epsilon_r = 50.982$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/16/2020; Ambient Temp: 21.9°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN7570; ConvF(8.48, 8.48, 8.48) @ 1750 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/12/2020

Phantom: Right Back Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1692

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1750 MHz System Verification at 20.0 dBm (100 mW)

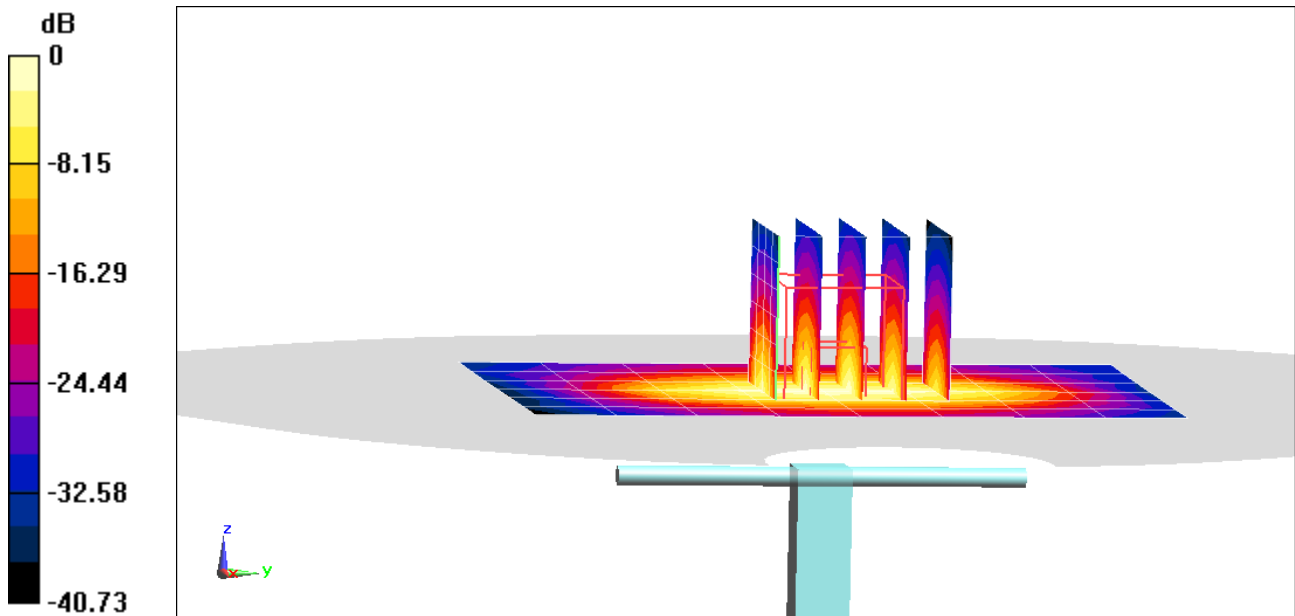
Area Scan (7x9x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.17 W/kg

SAR(1 g) = 3.94 W/kg

Deviation(1 g) = 5.35%



0 dB = 6.01 W/kg = 7.79 dBW/kg

PCTEST

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

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

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.532 \text{ S/m}$; $\epsilon_r = 51.829$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/20/2020; Ambient Temp: 20.9°C; Tissue Temp: 21.2°C

Probe: EX3DV4 - SN7570; ConvF(8.48, 8.48, 8.48) @ 1750 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/12/2020

Phantom: Right Back Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1692

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1750 MHz System Verification at 20.0 dBm (100 mW)

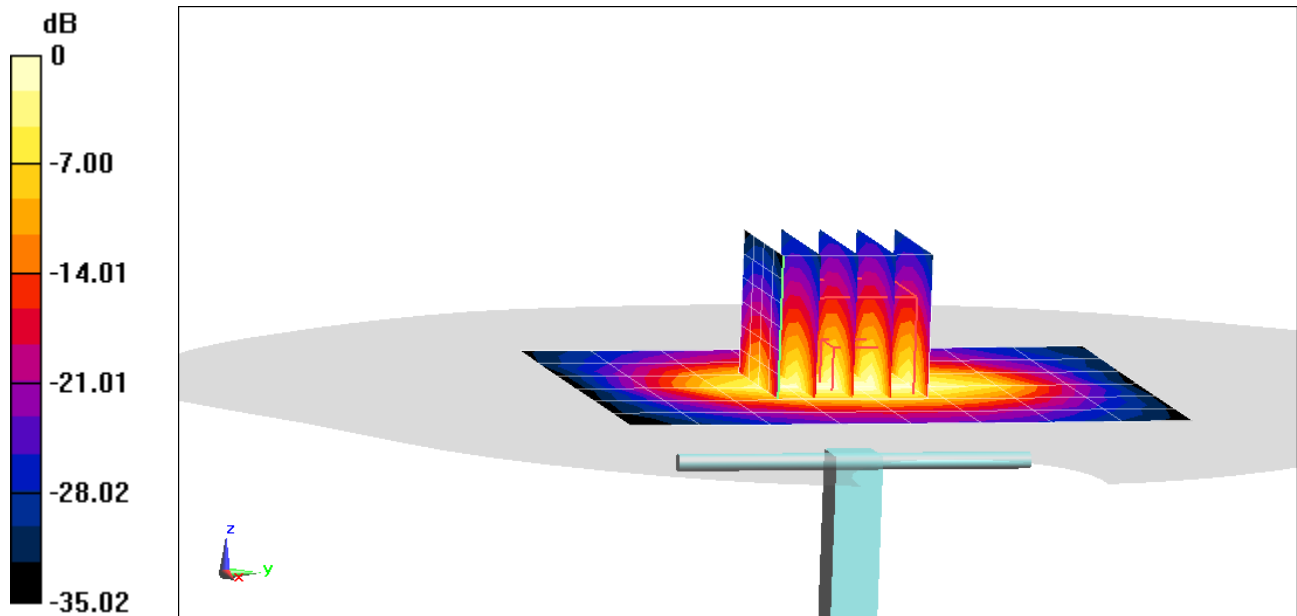
Area Scan (7x9x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.23 W/kg

SAR(10 g) = 2.05 W/kg

Deviation(10 g) = 3.02%



PCTEST

DUT: Dipole 1750 MHz; Type: D1765V2; Serial: 1008

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

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.526 \text{ S/m}$; $\epsilon_r = 51.434$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/22/2020; Ambient Temp: 21.2°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7570; ConvF(8.48, 8.48, 8.48) @ 1750 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1368; Calibrated: 3/12/2020

Phantom: Right Back Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1692

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1750 MHz System Verification at 20.0 dBm (100 mW)

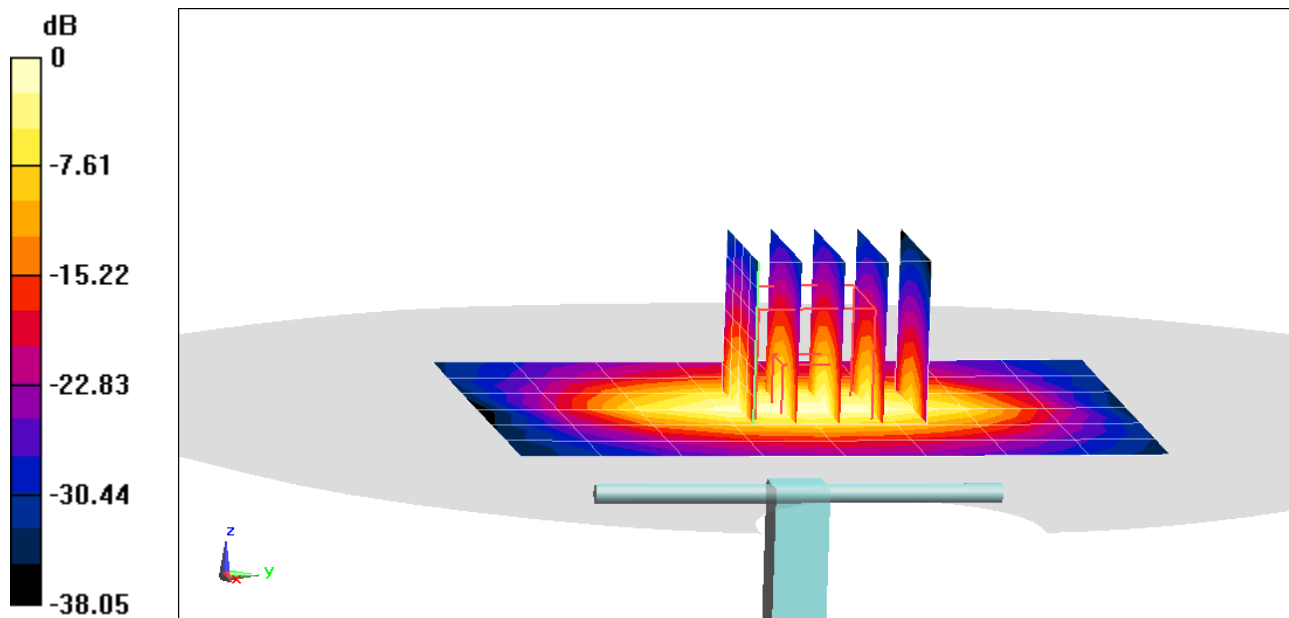
Area Scan (7x9x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.39 W/kg

SAR(1 g) = 3.98 W/kg; SAR(10 g) = 2.08 W/kg

Deviation(1 g) = 6.42%; Deviation(10 g) = 4.52%



PCTEST

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1150

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

Medium: 1750 Body; Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.522 \text{ S/m}$; $\epsilon_r = 51.137$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/23/2020; Ambient Temp: 23.7°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7406; ConvF(7.96, 7.96, 7.96) @ 1750 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1583; Calibrated: 5/14/2020

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

1750 MHz System Verification at 20.0 dBm (100 mW)

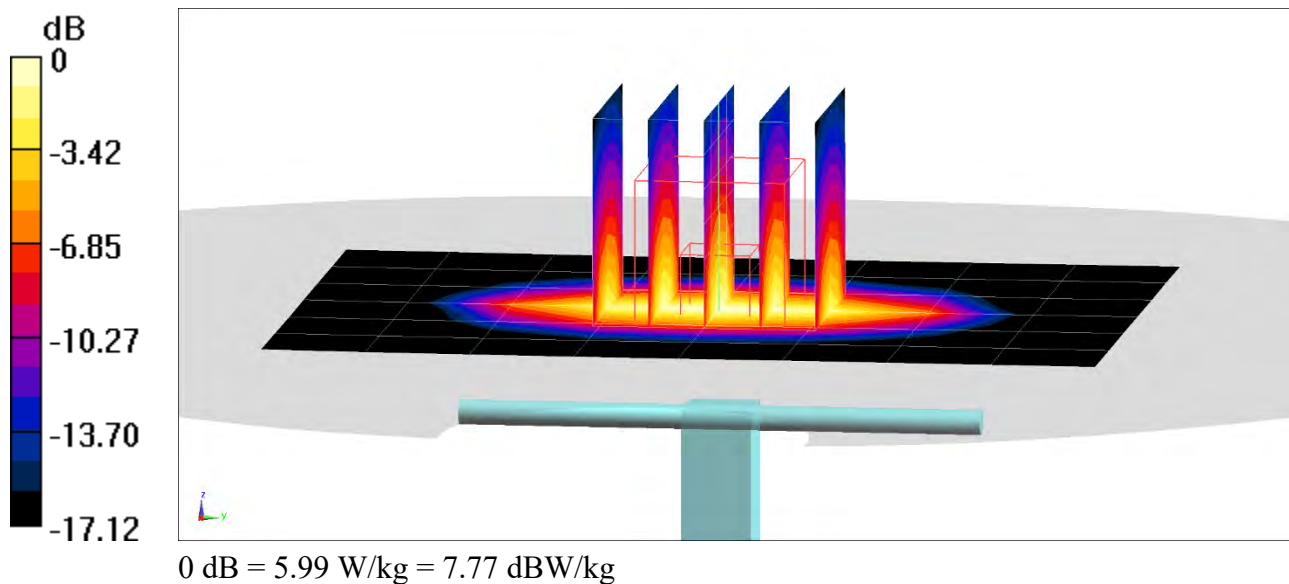
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 7.09 W/kg

SAR(1 g) = 3.87 W/kg; SAR(10 g) = 2.04 W/kg

Deviation(1 g) = 5.74%; Deviation(10 g) = 5.15%



PCTEST

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1148

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

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.514 \text{ S/m}$; $\epsilon_r = 51.115$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/26/2020; Ambient Temp: 22.5°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7406; ConvF(7.96, 7.96, 7.96) @ 1750 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1583; Calibrated: 5/14/2020

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1750 MHz System Verification at 20.0 dBm (100 mW)

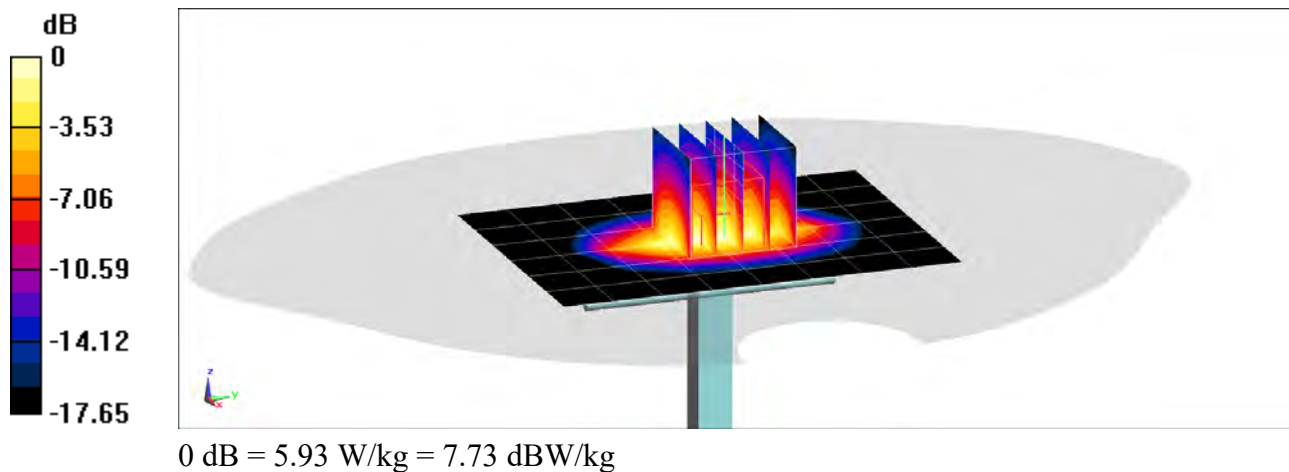
Area Scan (7x9x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.15 W/kg

SAR(1 g) = 3.89 W/kg

Deviation(1 g) = 7.16%



PCTEST

DUT: Dipole 1750 MHz; Type: D1750V2; Serial: 1148

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

Medium: 1750 Body Medium parameters used:

$f = 1750 \text{ MHz}$; $\sigma = 1.493 \text{ S/m}$; $\epsilon_r = 51.117$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/29/2020; Ambient Temp: 23.1°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(7.96, 7.96, 7.96) @ 1750 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1583; Calibrated: 5/14/2020

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1630

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1750 MHz System Verification at 20.0 dBm (100 mW)

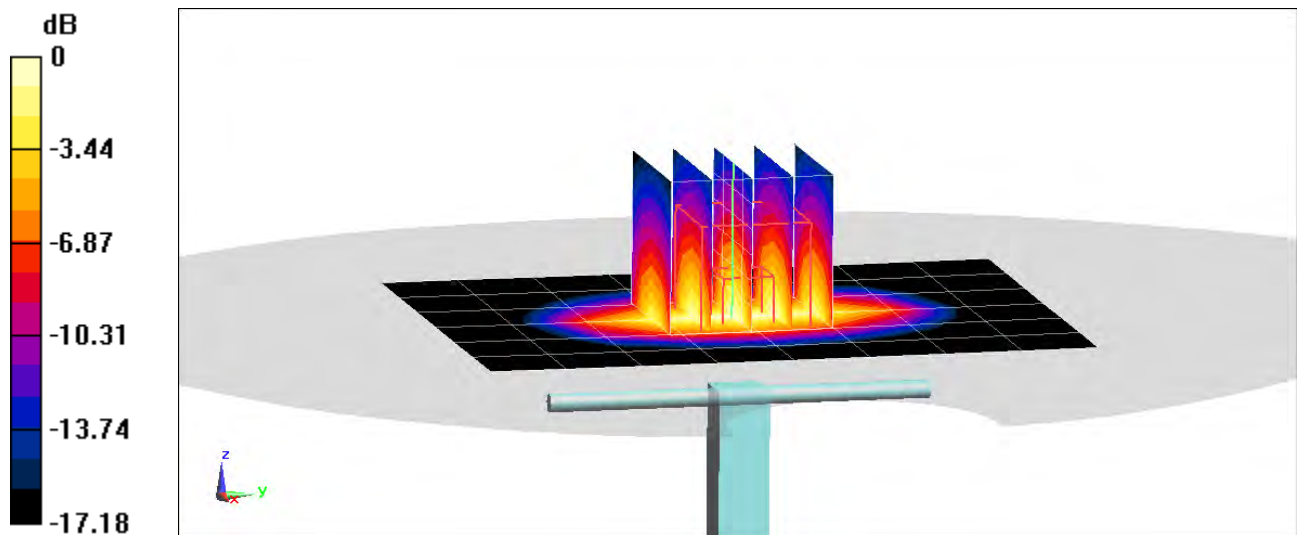
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.39 W/kg

SAR(10 g) = 1.93 W/kg

Deviation(10 g) = 0.00%



0 dB = 5.34 W/kg = 7.28 dBW/kg

PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d149

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

Medium: 1900 Body Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.583 \text{ S/m}$; $\epsilon_r = 51.289$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 06/29/2020; Ambient Temp: 22.5°C; Tissue Temp: 23.8°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1900 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1533; Calibrated: 12/5/2019

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

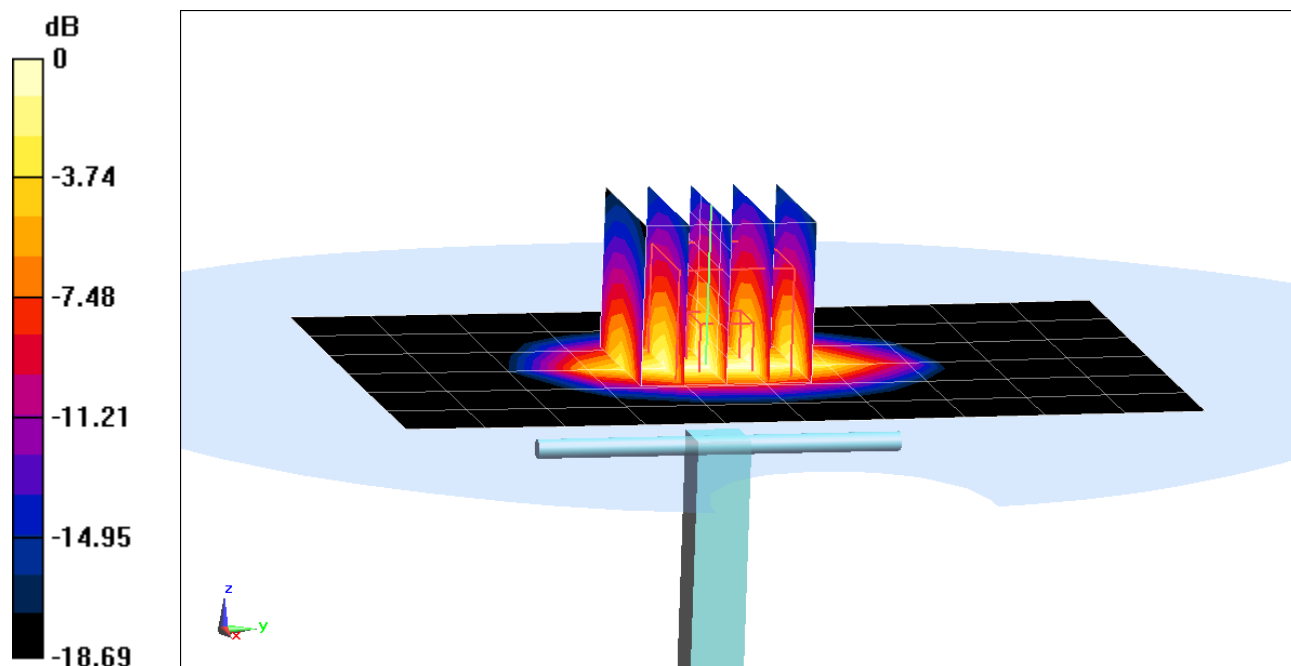
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.91 W/kg

SAR(1 g) = 4.28 W/kg

Deviation(1 g) = 8.63%



0 dB = 6.61 W/kg = 8.20 dBW/kg

PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d149

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

Medium: 1900 Body Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.584 \text{ S/m}$; $\epsilon_r = 52.325$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/01/2020; Ambient Temp: 23.0°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1900 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1533; Calibrated: 12/5/2019

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

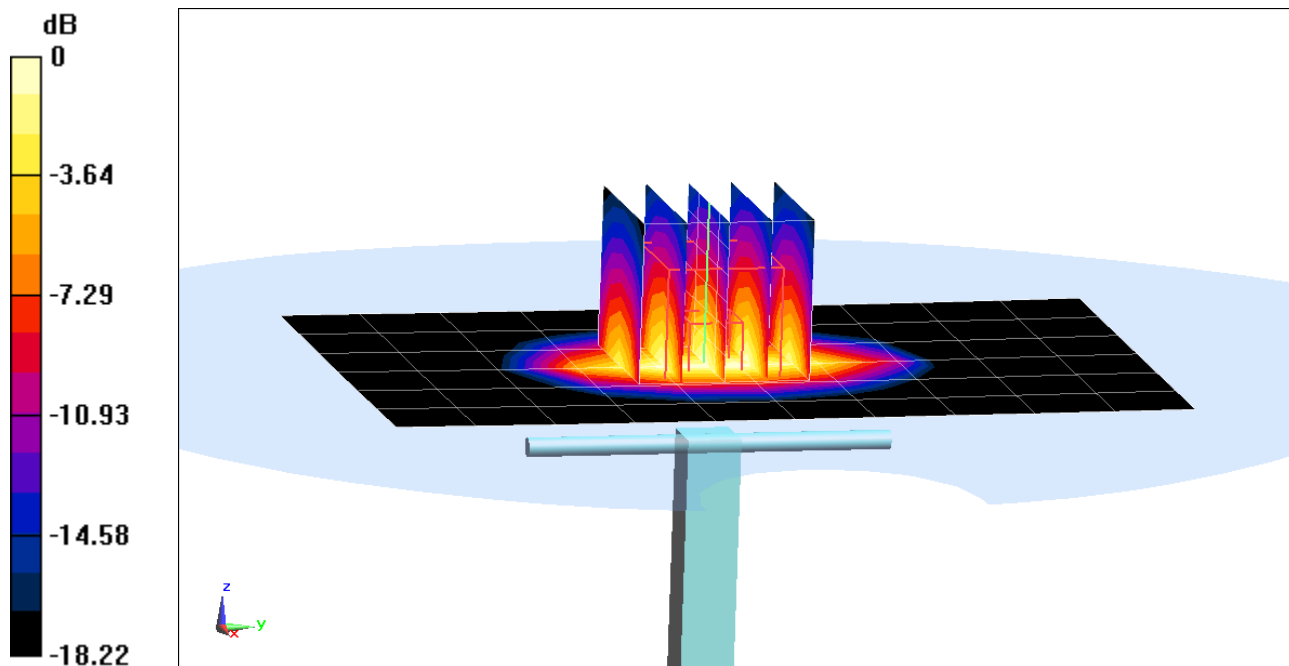
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.89 W/kg

SAR(1 g) = 4.2 W/kg; SAR(10 g) = 2.16 W/kg

Deviation(1 g) = 6.60%; Deviation(10 g) = 4.35%



0 dB = 6.58 W/kg = 8.18 dBW/kg

PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

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

Medium: 1900 Body Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.575 \text{ S/m}$; $\epsilon_r = 51.624$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/06/2020; Ambient Temp: 22.5°C; Tissue Temp: 23.0°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1900 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1533; Calibrated: 12/5/2019

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

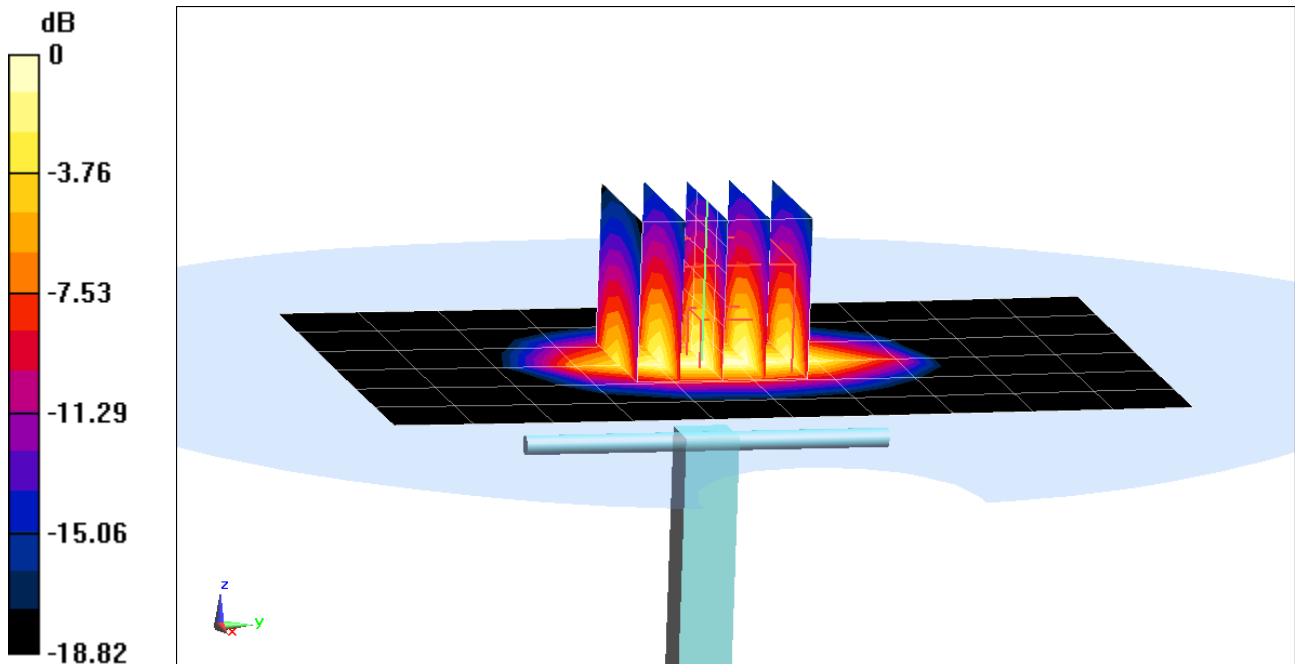
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.87 W/kg

SAR(1 g) = 4.26 W/kg; SAR(10 g) = 2.19 W/kg

Deviation(1 g) = 8.67%; Deviation(10 g) = 6.31%



0 dB = 6.54 W/kg = 8.16 dBW/kg

PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

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

Medium: 1900 Body Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.562 \text{ S/m}$; $\epsilon_r = 52.779$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/11/2020; Ambient Temp: 23.4°C; Tissue Temp: 23.6°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1900 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1533; Calibrated: 12/5/2019

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

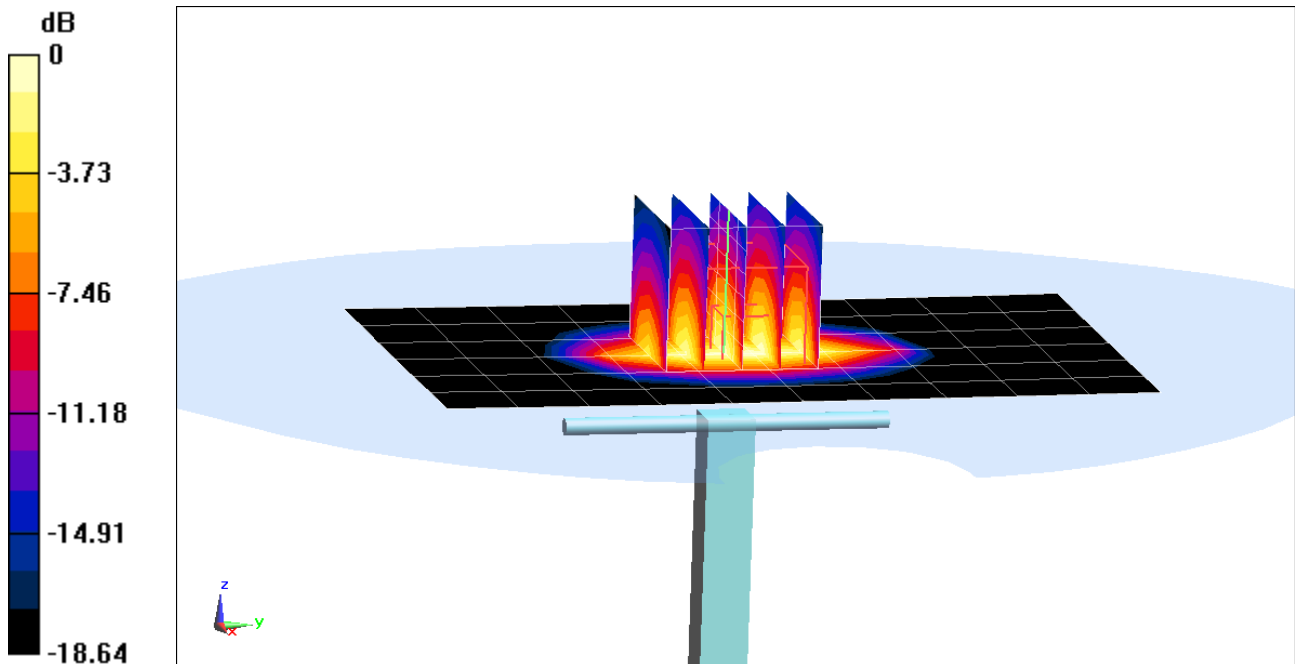
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.90 W/kg

SAR(1 g) = 4.23 W/kg; SAR(10 g) = 2.18 W/kg

Deviation(1 g) = 7.91%; Deviation(10 g) = 5.83%



0 dB = 6.47 W/kg = 8.11 dBW/kg

PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

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

Medium: 1900 Body Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.556 \text{ S/m}$; $\epsilon_r = 52.729$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/14/2020; Ambient Temp: 24.0°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1900 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1533; Calibrated: 12/5/2019

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

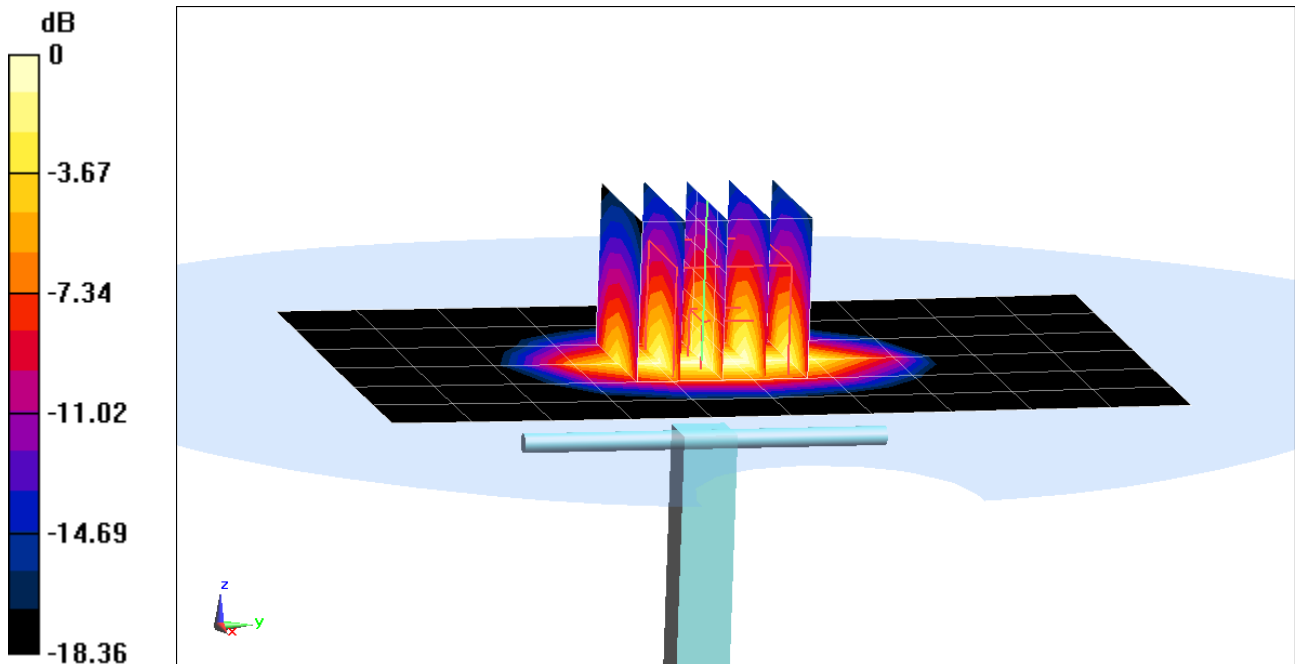
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.81 W/kg

SAR(1 g) = 4.16 W/kg; SAR(10 g) = 2.14 W/kg

Deviation(1 g) = 6.12%; Deviation(10 g) = 3.88%



0 dB = 6.39 W/kg = 8.06 dBW/kg

PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

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

Medium: 1900 Body Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.555 \text{ S/m}$; $\epsilon_r = 53.847$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/17/2020; Ambient Temp: 23.1°C; Tissue Temp: 23.6°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1900 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1533; Calibrated: 12/5/2019

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

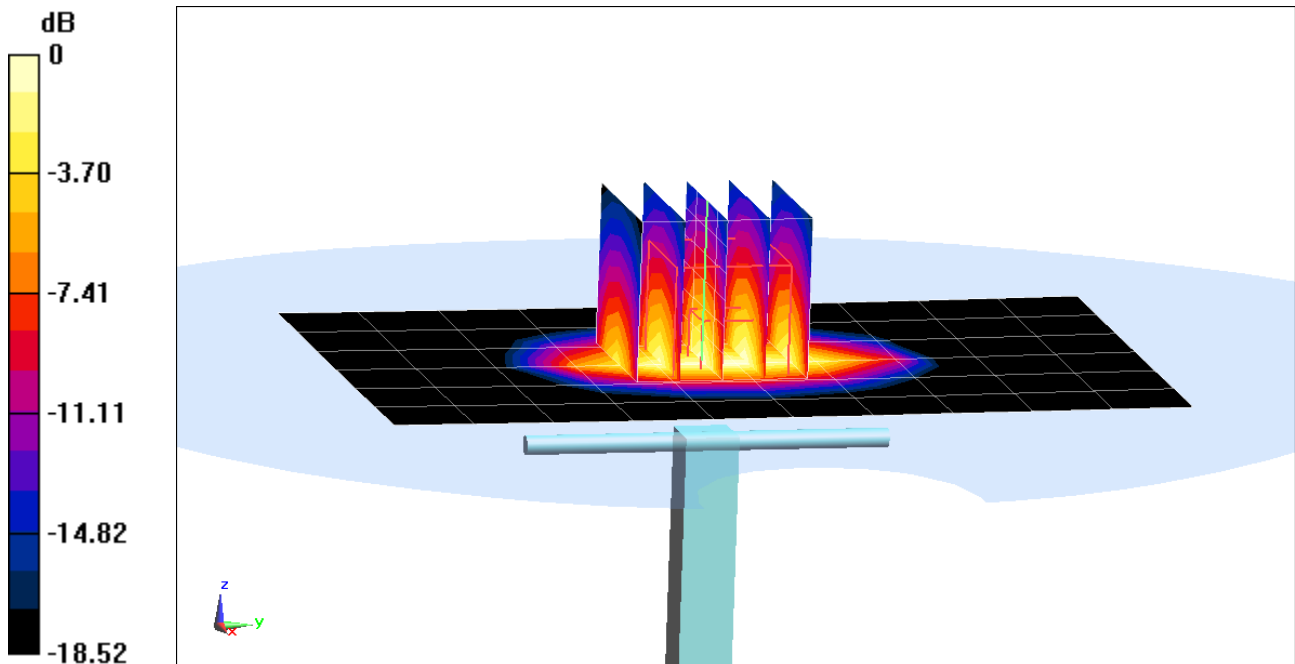
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.93 W/kg

SAR(1 g) = 4.23 W/kg; SAR(10 g) = 2.18 W/kg

Deviation(1 g) = 7.91%; Deviation(10 g) = 5.83%



PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

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

Medium: 1900 Body Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.554 \text{ S/m}$; $\epsilon_r = 54.033$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/20/2020; Ambient Temp: 22.5°C; Tissue Temp: 23.7°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1900 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1533; Calibrated: 12/5/2019

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

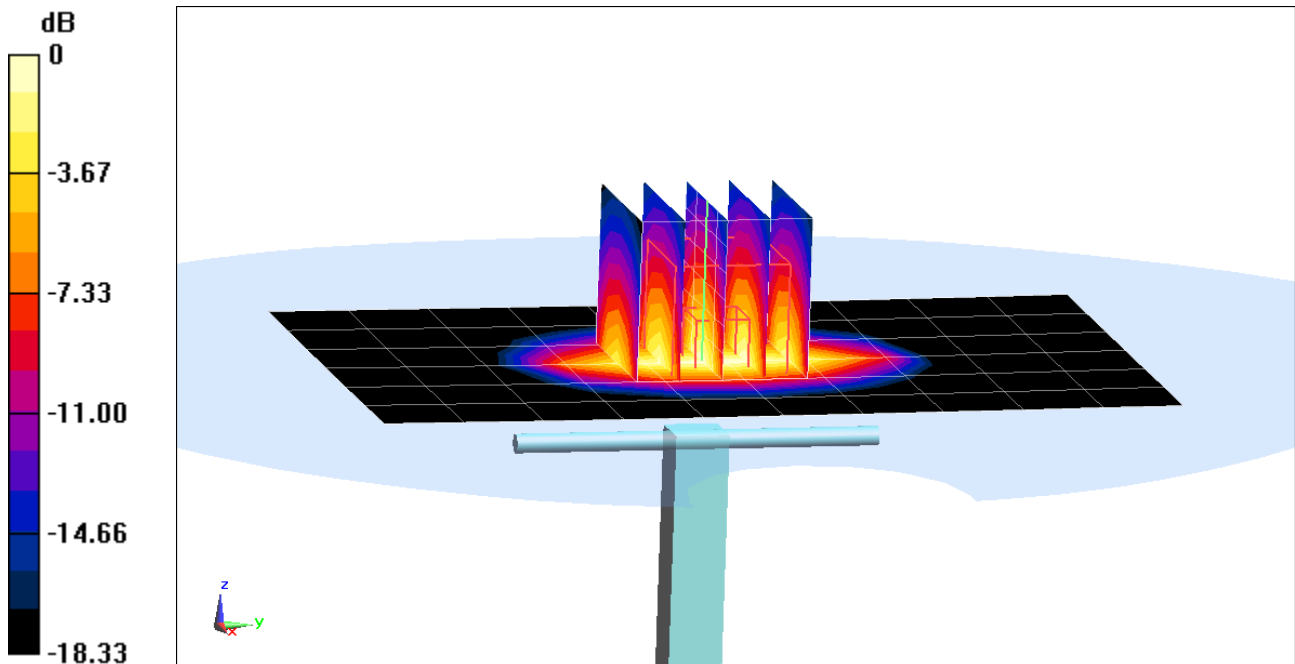
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.71 W/kg

SAR(10 g) = 2.14 W/kg

Deviation(10 g) = 3.88%



0 dB = 6.35 W/kg = 8.03 dBW/kg

PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

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

Medium: 1900 Body Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.521 \text{ S/m}$; $\epsilon_r = 52.81$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/27/2020; Ambient Temp: 22.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1900 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1533; Calibrated: 12/5/2019

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

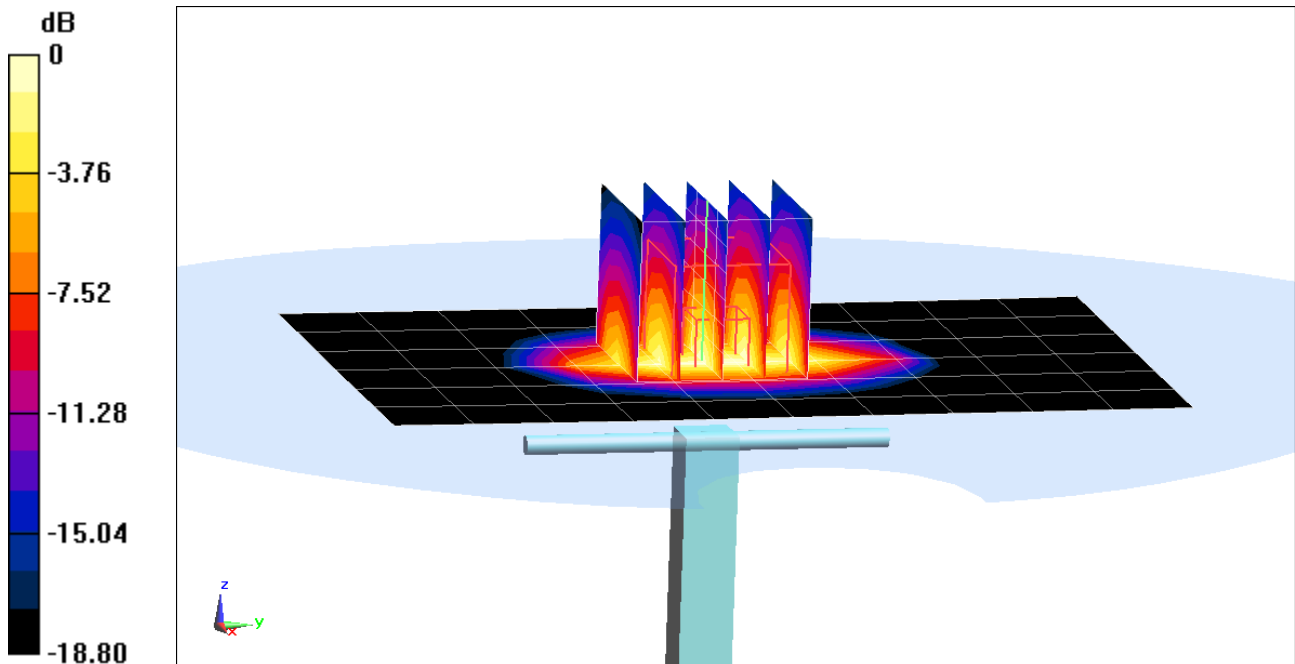
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.71 W/kg

SAR(10 g) = 2.15 W/kg

Deviation(10 g) = 4.37%



0 dB = 6.43 W/kg = 8.08 dBW/kg

PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d149

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

Medium: 1900 Body Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.55 \text{ S/m}$; $\epsilon_r = 51.06$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/30/2020; Ambient Temp: 24.0°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN7357; ConvF(7.8, 7.8, 7.8) @ 1900 MHz; Calibrated: 4/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/15/2020

Phantom: Twin-SAM V5.0 Right 30; Type: QD 000 P40 CD; Serial: 1759

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

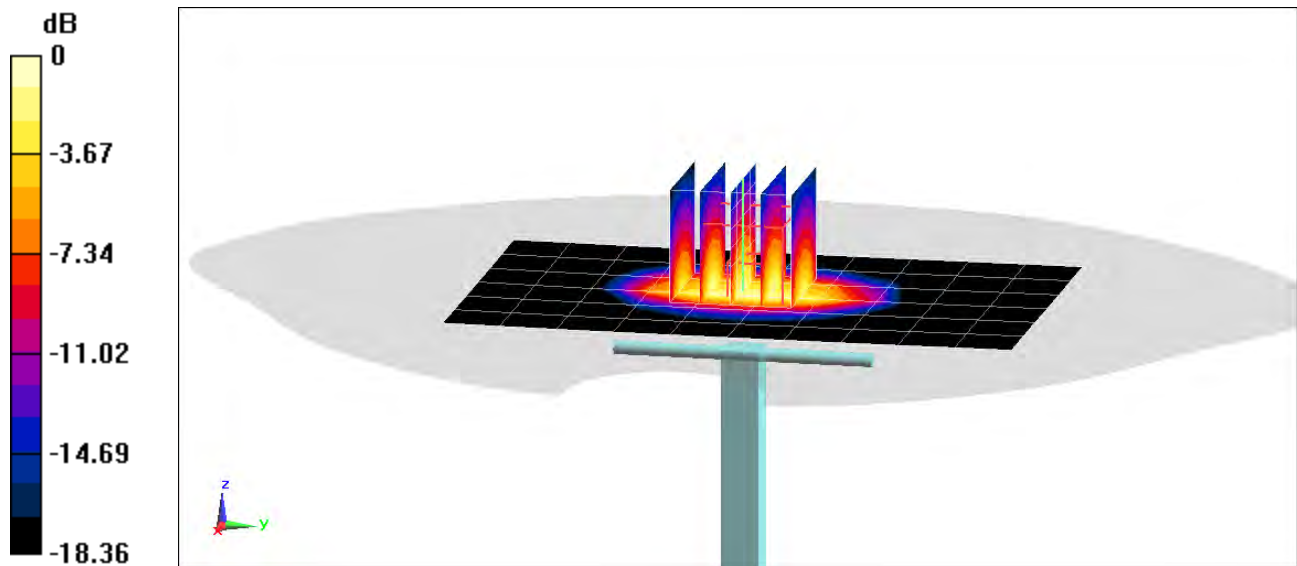
Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 7.79 W/kg

SAR(10 g) = 2.17 W/kg

Deviation(10 g) = 4.83%



0 dB = 6.53 W/kg = 8.15 dBW/kg

PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

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

Medium: 1900 Body Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.562 \text{ S/m}$; $\epsilon_r = 51.999$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/30/2020; Ambient Temp: 21.7°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1900 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1533; Calibrated: 12/5/2019

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

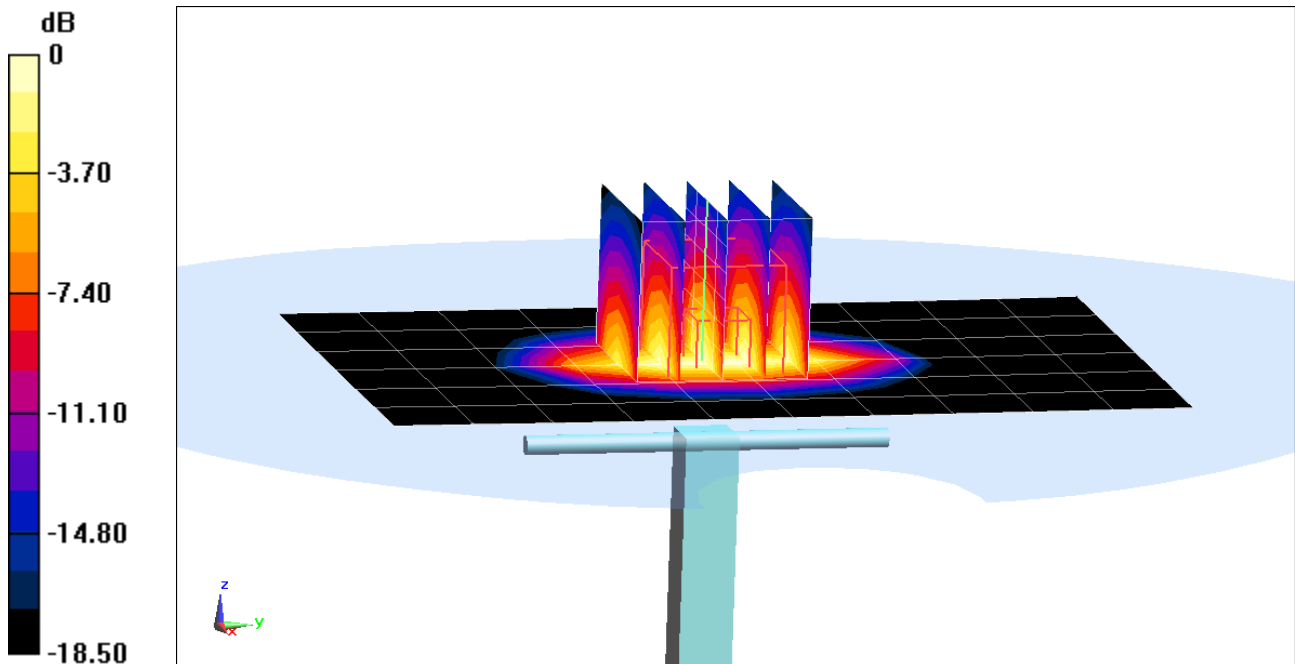
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.46 W/kg

SAR(10 g) = 2.06 W/kg

Deviation(10 g) = 0.00%



0 dB = 6.25 W/kg = 7.96 dBW/kg

PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d080

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

Medium: 1900 Body Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.539 \text{ S/m}$; $\epsilon_r = 51.711$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/03/2020; Ambient Temp: 21.1°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1900 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1533; Calibrated: 12/5/2019

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

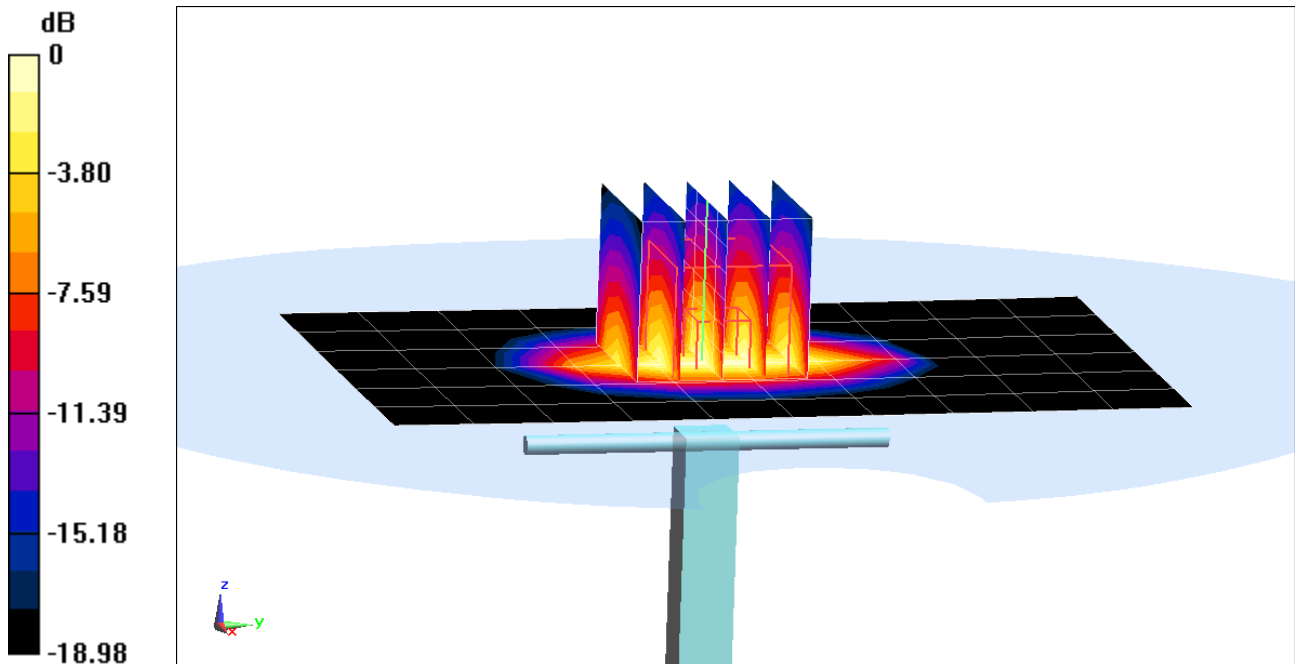
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.88 W/kg

SAR(10 g) = 2.08 W/kg

Deviation(10 g) = 0.97%



0 dB = 6.46 W/kg = 8.10 dBW/kg

PCTEST

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: 5d149

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

Medium: 1900 Body Medium parameters used:

$f = 1900 \text{ MHz}$; $\sigma = 1.541 \text{ S/m}$; $\epsilon_r = 52.348$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0

Test Date: 08/06/2020; Ambient Temp: 22.1°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1900 MHz; Calibrated: 12/11/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1533; Calibrated: 12/5/2019

Phantom: SAM Left; Type: QD000P40CC; Serial: TP: 1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

1900 MHz System Verification at 20.0 dBm (100 mW)

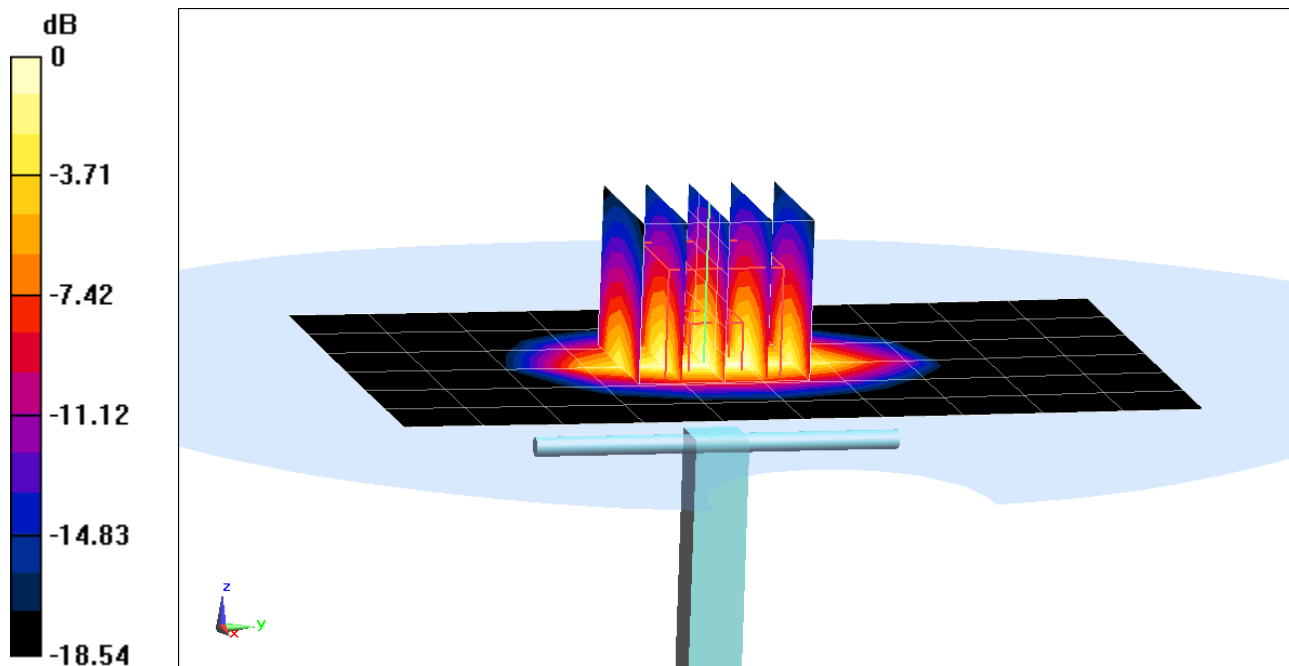
Area Scan (7x11x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 7.87 W/kg

SAR(1 g) = 4.23 W/kg

Deviation(1 g) = 7.36%



0 dB = 6.62 W/kg = 8.21 dBW/kg

PCTEST

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: 1073

Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2300 \text{ MHz}$; $\sigma = 1.824 \text{ S/m}$; $\epsilon_r = 51.87$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/11/2020; Ambient Temp: 23.5°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7409; ConvF(7.5, 7.5, 7.5) @ 2300 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2300 MHz System Verification at 20.0 dBm (100 mW)

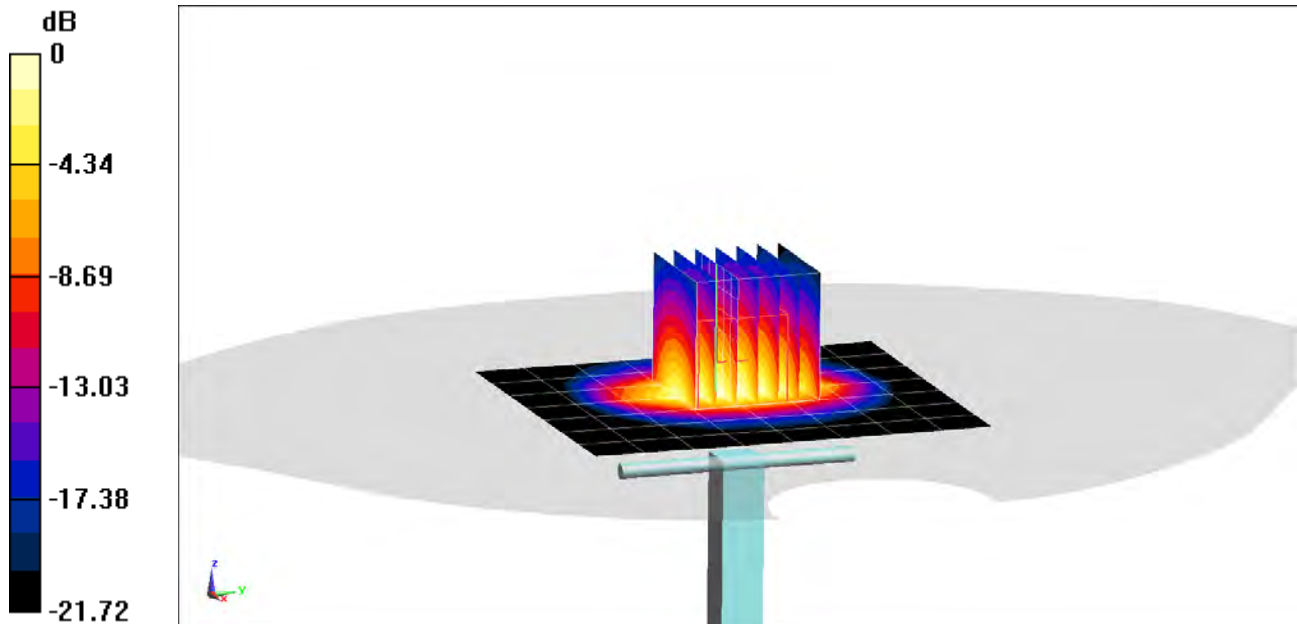
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 10.3 W/kg

SAR(1 g) = 5.07 W/kg; SAR(10 g) = 2.39 W/kg

Deviation(1 g) = 6.29%; Deviation(10 g) = 3.02%



0 dB = 8.08 W/kg = 9.07 dBW/kg

PCTEST

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: 1073

Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1

Medium: 2300 Body Medium parameters used:

$f = 2300 \text{ MHz}$; $\sigma = 1.87 \text{ S/m}$; $\epsilon_r = 51.376$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/14/2020; Ambient Temp: 23.0°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN7409; ConvF(7.5, 7.5, 7.5) @ 2300 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2300 MHz System Verification at 20.0 dBm (100 mW)

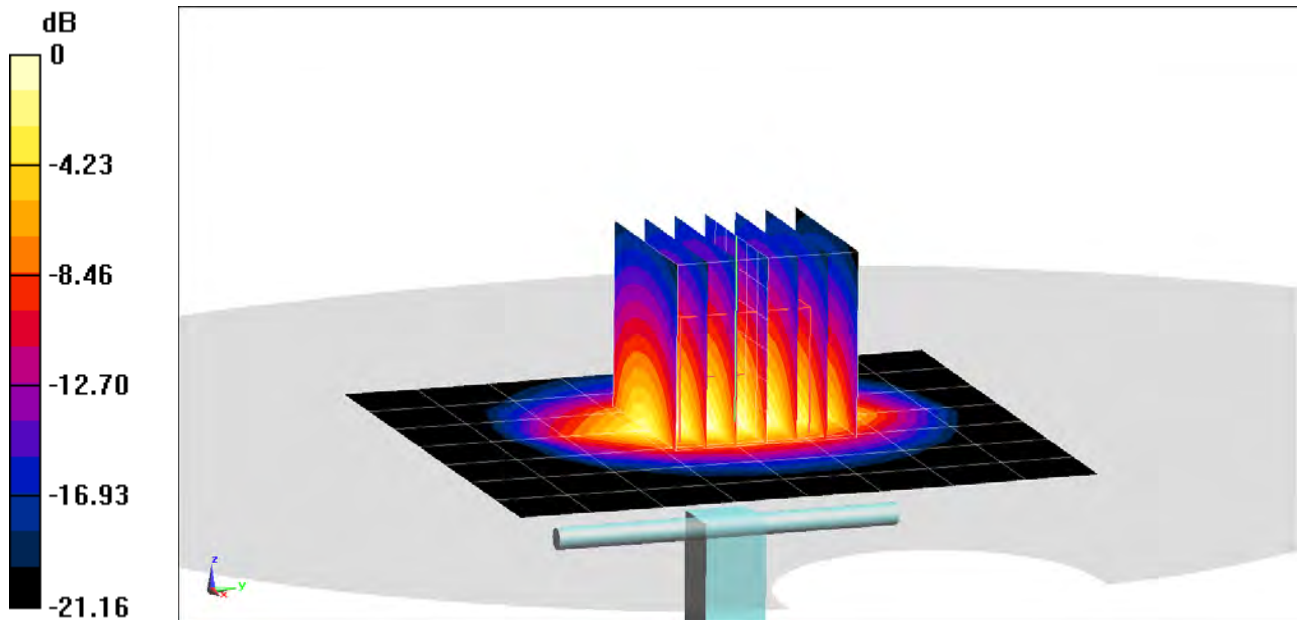
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 10.1 W/kg

SAR(1 g) = 5.02 W/kg; SAR(10 g) = 2.38 W/kg

Deviation(1 g) = 5.24%; Deviation(10 g) = 2.59%



0 dB = 8.17 W/kg = 9.12 dBW/kg

PCTEST

DUT: Dipole 2300 MHz; Type: D2300V2; Serial: 1073

Communication System: UID 0, CW; Frequency: 2300 MHz; Duty Cycle: 1:1

Medium: 2300 Body Medium parameters used:

$f = 2300 \text{ MHz}$; $\sigma = 1.875 \text{ S/m}$; $\epsilon_r = 53.389$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/17/2020; Ambient Temp: 22.0°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7409; ConvF(7.5, 7.5, 7.5) @ 2300 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2300 MHz System Verification at 20.0 dBm (100 mW)

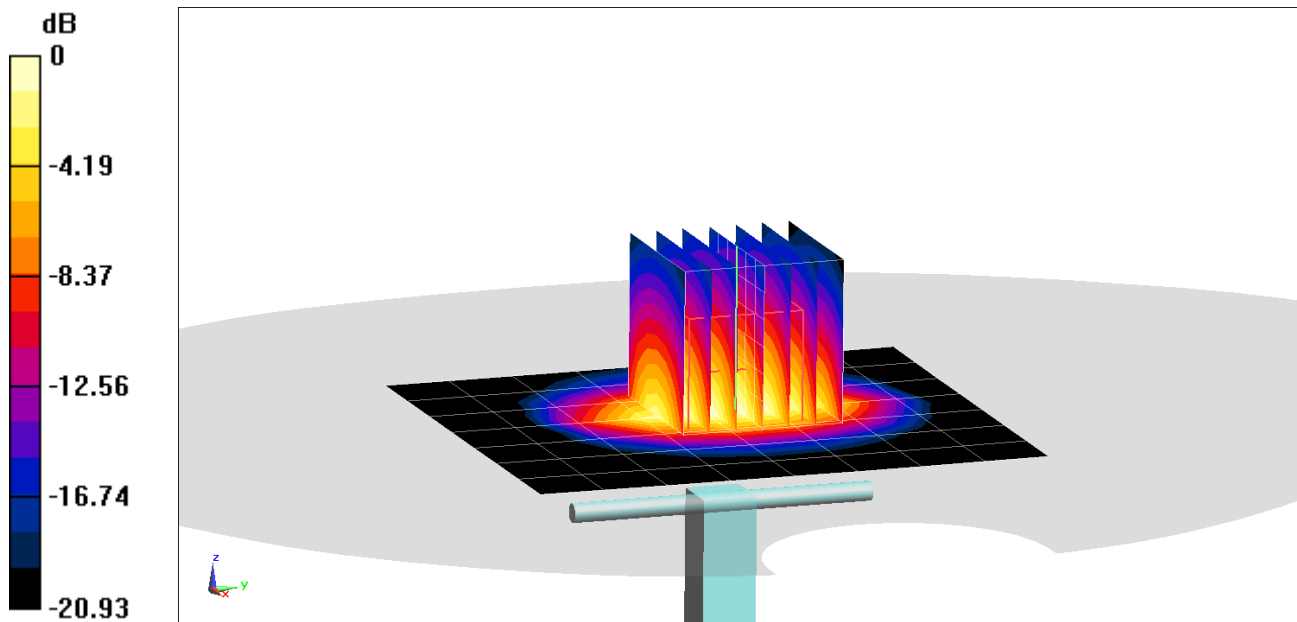
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 10.3 W/kg

SAR(1 g) = 5.12 W/kg; SAR(10 g) = 2.43 W/kg

Deviation(1 g) = 7.34%; Deviation(10 g) = 4.74%



0 dB = 8.32 W/kg = 9.20 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 981

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.99 \text{ S/m}$; $\epsilon_r = 51.778$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/12/2020; Ambient Temp: 22.5°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN7552; ConvF(7.47, 7.47, 7.47) @ 2450 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1449; Calibrated: 9/12/2019

Phantom: Left Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

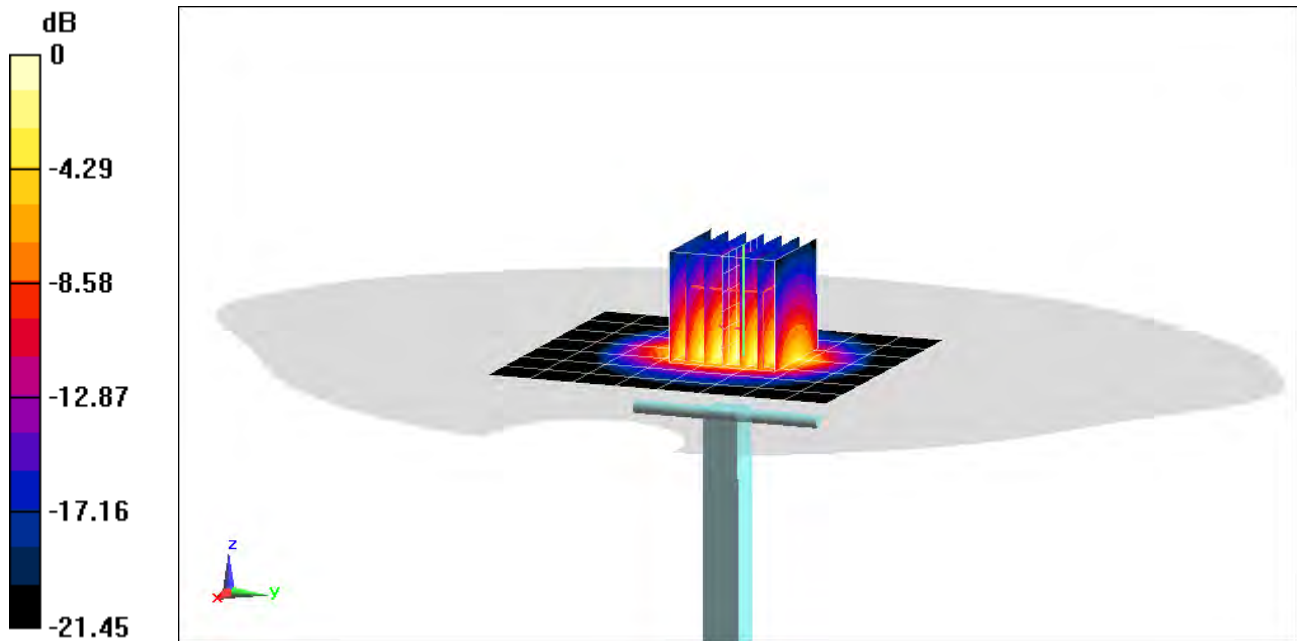
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 10.4 W/kg

SAR(1 g) = 5.11 W/kg

Deviation(1 g) = 0.39%



0 dB = 8.47 W/kg = 9.28 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450$ MHz; $\sigma = 2.034$ S/m; $\epsilon_r = 51.503$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/20/2020; Ambient Temp: 23.6°C; Tissue Temp: 23.6°C

Probe: EX3DV4 - SN7409; ConvF(7.24, 7.24, 7.24) @ 2450 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

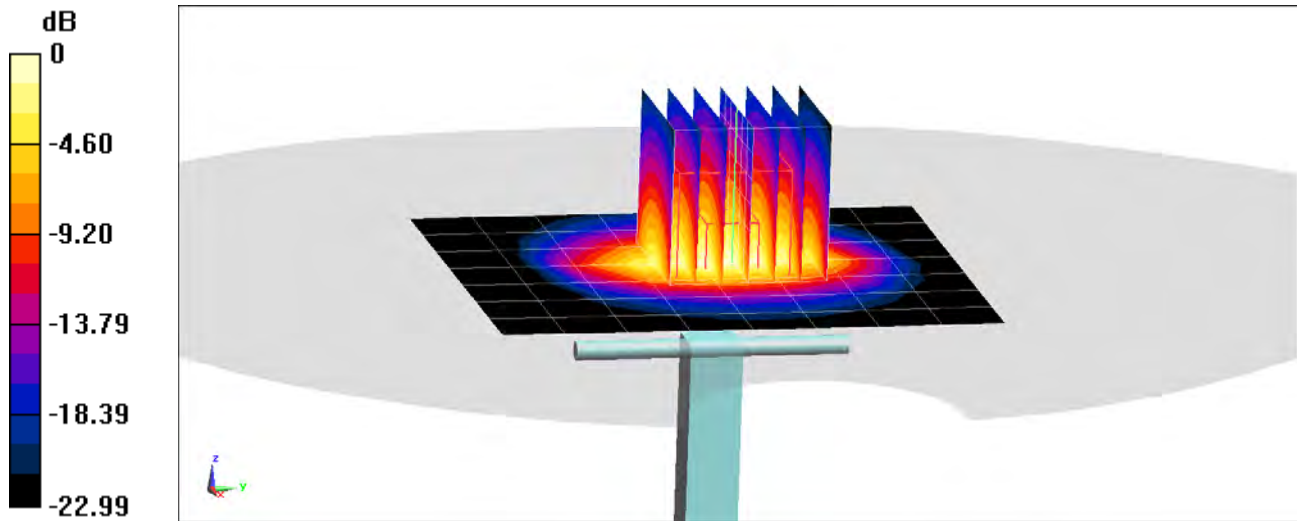
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 11.3 W/kg

SAR(1 g) = 5.29 W/kg

Deviation(1 g) = 4.13%



0 dB = 8.98 W/kg = 9.53 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450$ MHz; $\sigma = 2.027$ S/m; $\epsilon_r = 50.733$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/23/2020; Ambient Temp: 22.4°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN7409; ConvF(7.24, 7.24, 7.24) @ 2450 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

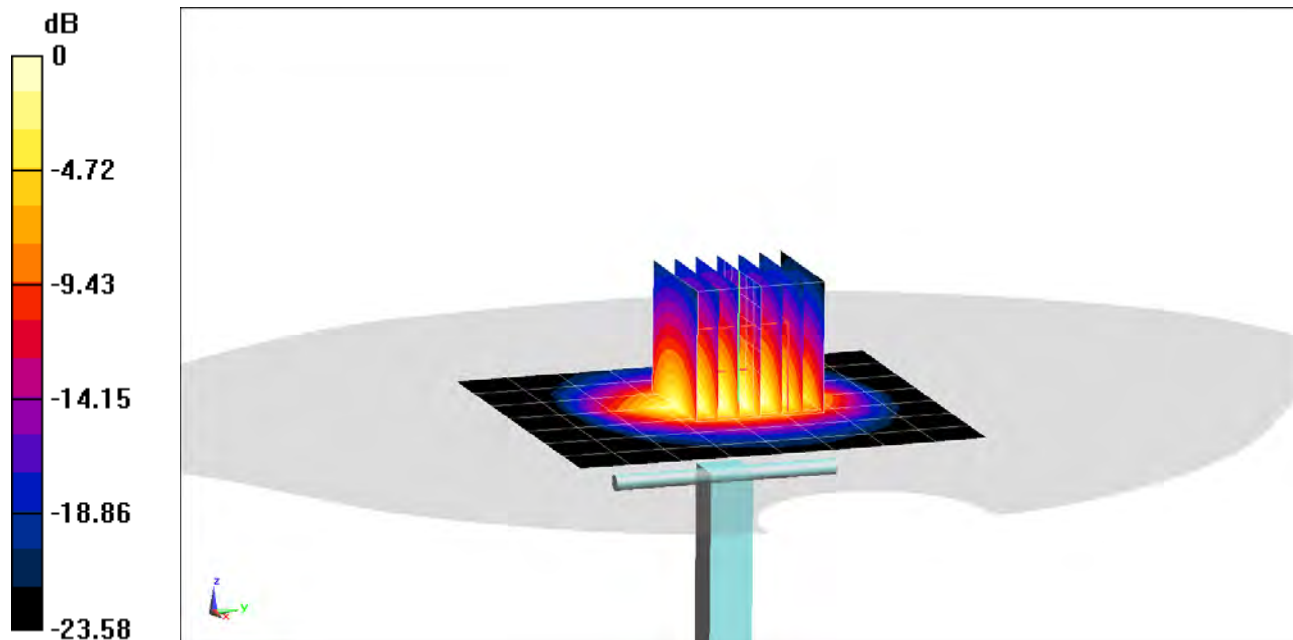
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 11.4 W/kg

SAR(1 g) = 5.37 W/kg; SAR(10 g) = 2.45 W/kg

Deviation(1 g) = 5.71%; Deviation(10 g) = 2.08%



0 dB = 9.08 W/kg = 9.58 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 2.046 \text{ S/m}$; $\epsilon_r = 51.291$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/27/2020; Ambient Temp: 22.4°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7409; ConvF(7.24, 7.24, 7.24) @ 2450 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

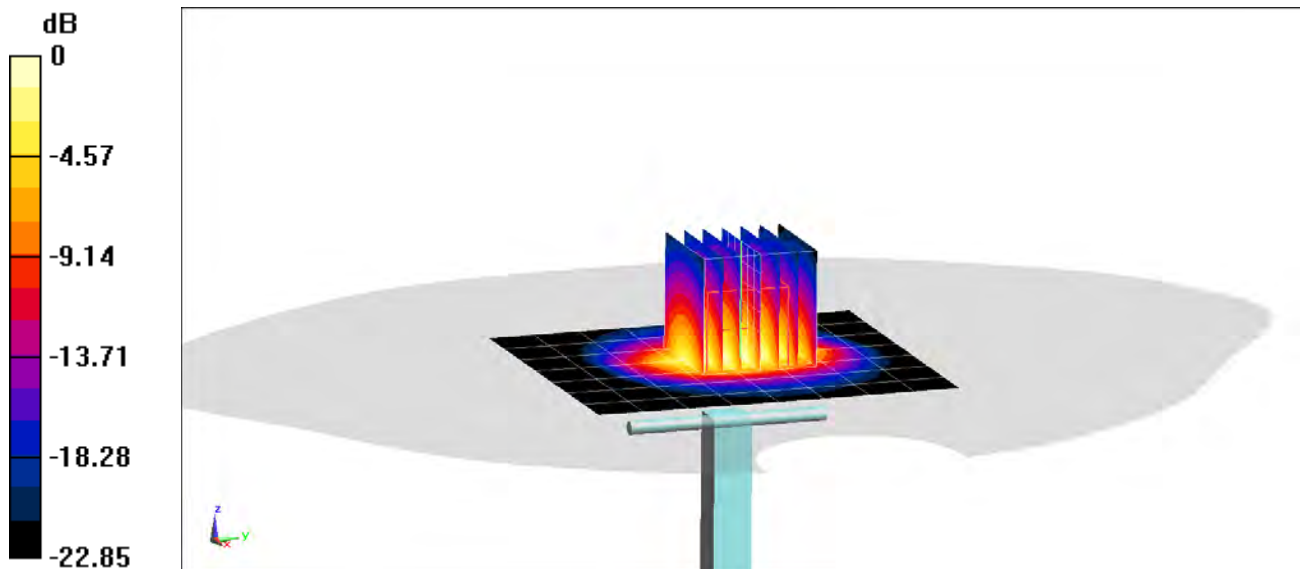
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 11.4 W/kg

SAR(10 g) = 2.47 W/kg

Deviation(10 g) = 2.92%



0 dB = 9.04 W/kg = 9.56 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 981

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.99 \text{ S/m}$; $\epsilon_r = 51.723$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/27/2020; Ambient Temp: 24.5°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN7552; ConvF(7.47, 7.47, 7.47) @ 2450 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1449; Calibrated: 9/12/2019

Phantom: Left Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

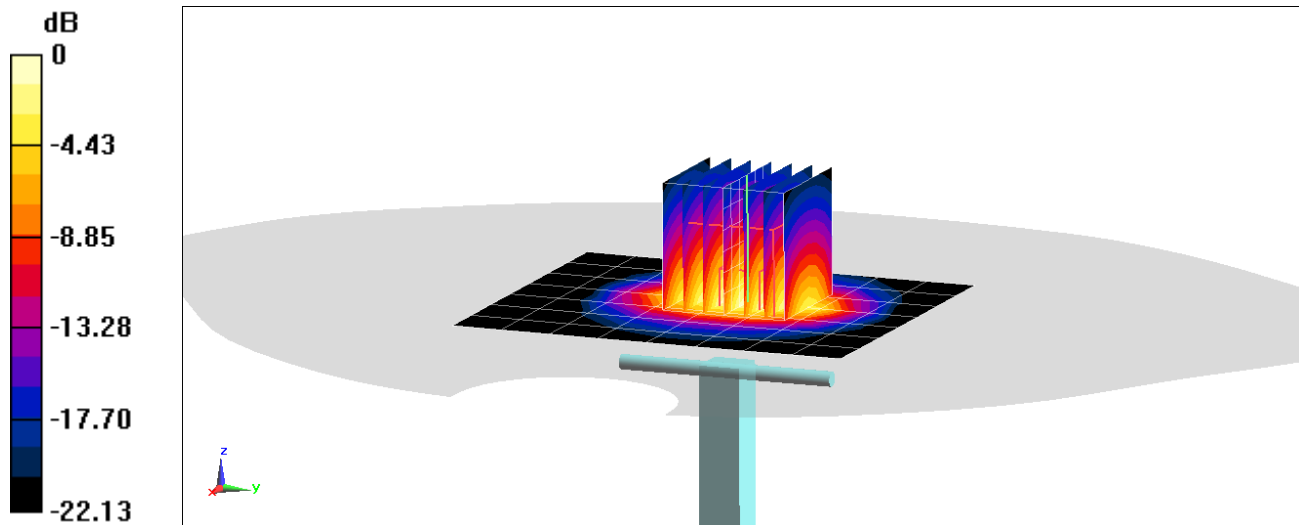
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 10.8 W/kg

SAR(1 g) = 5.17 W/kg

Deviation(1 g) = 1.57%



0 dB = 8.72 W/kg = 9.41 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 981

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.992 \text{ S/m}$; $\epsilon_r = 50.79$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/30/2020; Ambient Temp: 24.5°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN7552; ConvF(7.47, 7.47, 7.47) @ 2450 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1449; Calibrated: 9/12/2019

Phantom: Left Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

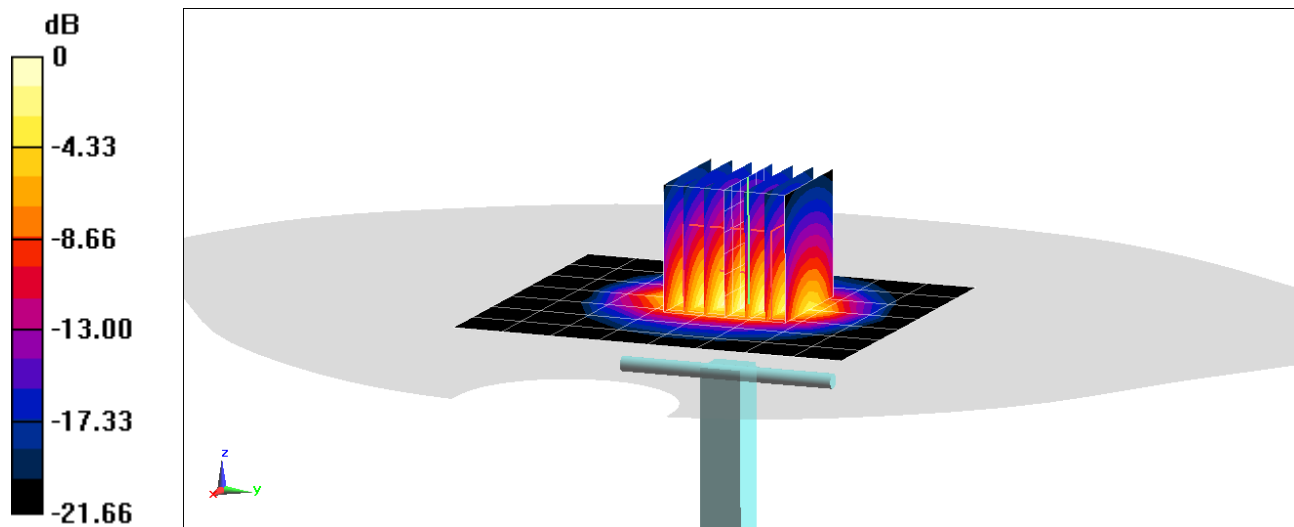
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 10.5 W/kg

SAR(1 g) = 5.12 W/kg

Deviation(1 g) = 0.59%



0 dB = 8.54 W/kg = 9.31 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450$ MHz; $\sigma = 2.045$ S/m; $\epsilon_r = 51.557$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/31/2020; Ambient Temp: 23.1°C; Tissue Temp: 24.0°C

Probe: EX3DV4 - SN7409; ConvF(7.24, 7.24, 7.24) @ 2450 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

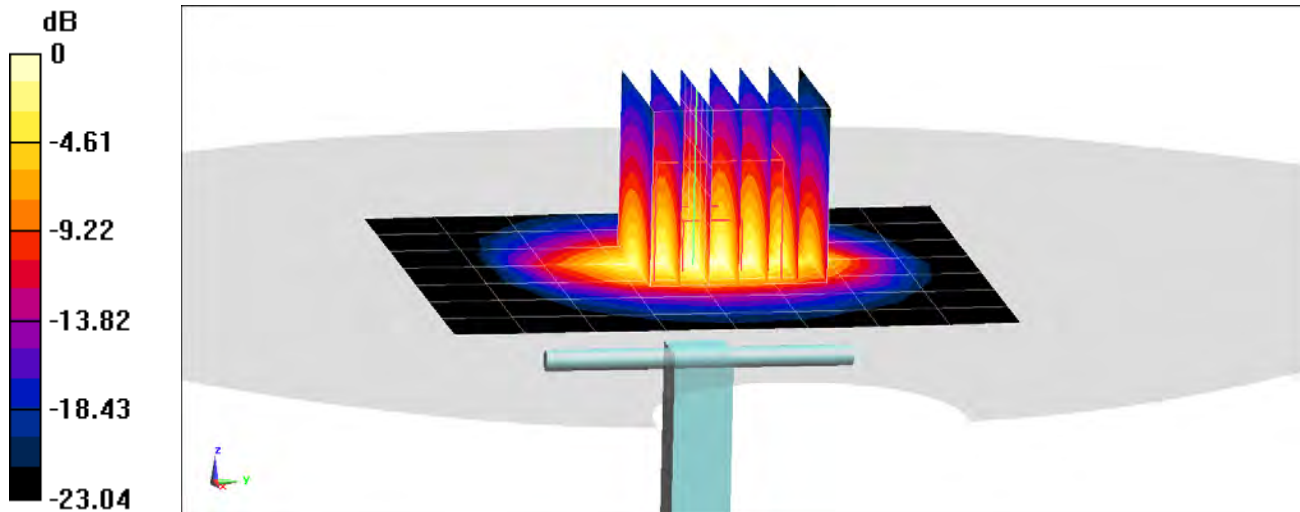
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 11.3 W/kg

SAR(1 g) = 5.37 W/kg

Deviation(1 g) = 5.71%



0 dB = 8.96 W/kg = 9.52 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 719

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 2.029 \text{ S/m}$; $\epsilon_r = 52.269$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/03/2020; Ambient Temp: 22.0°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7409; ConvF(7.24, 7.24, 7.24) @ 2450 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

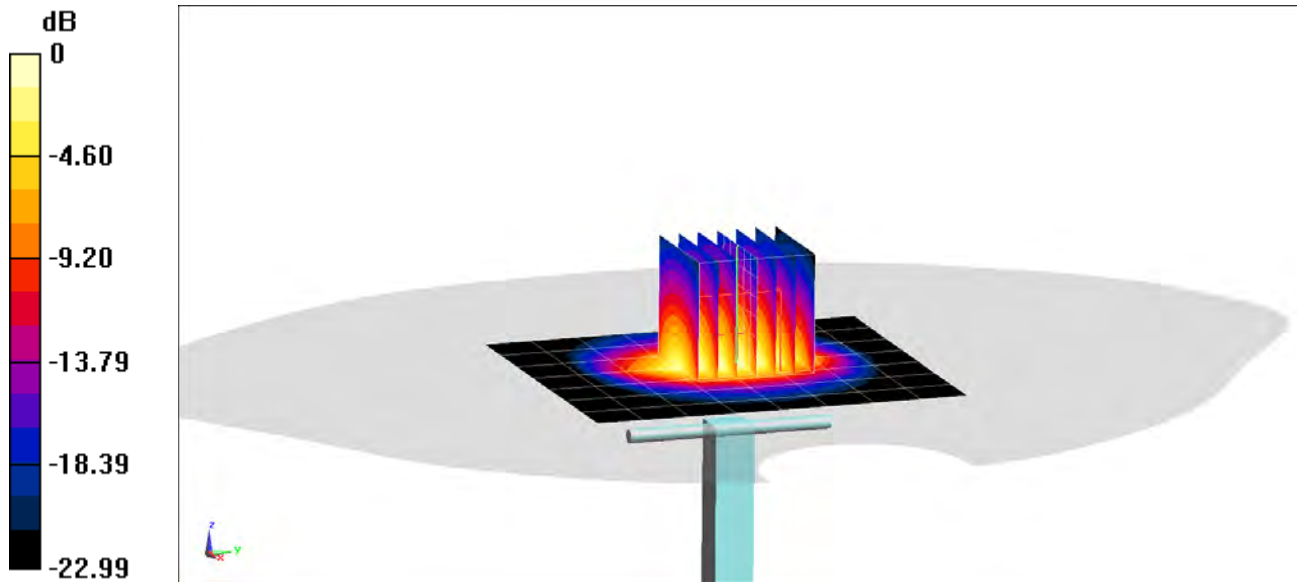
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 11.1 W/kg

SAR(1 g) = 5.3 W/kg; SAR(10 g) = 2.43 W/kg

Deviation(1 g) = 4.33%; Deviation(10 g) = 1.25%



0 dB = 8.85 W/kg = 9.47 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 981

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 2.026 \text{ S/m}$; $\epsilon_r = 51.539$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/03/2020; Ambient Temp: 23.1°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN7552; ConvF(7.47, 7.47, 7.47) @ 2450 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1449; Calibrated: 9/12/2019

Phantom: Left Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

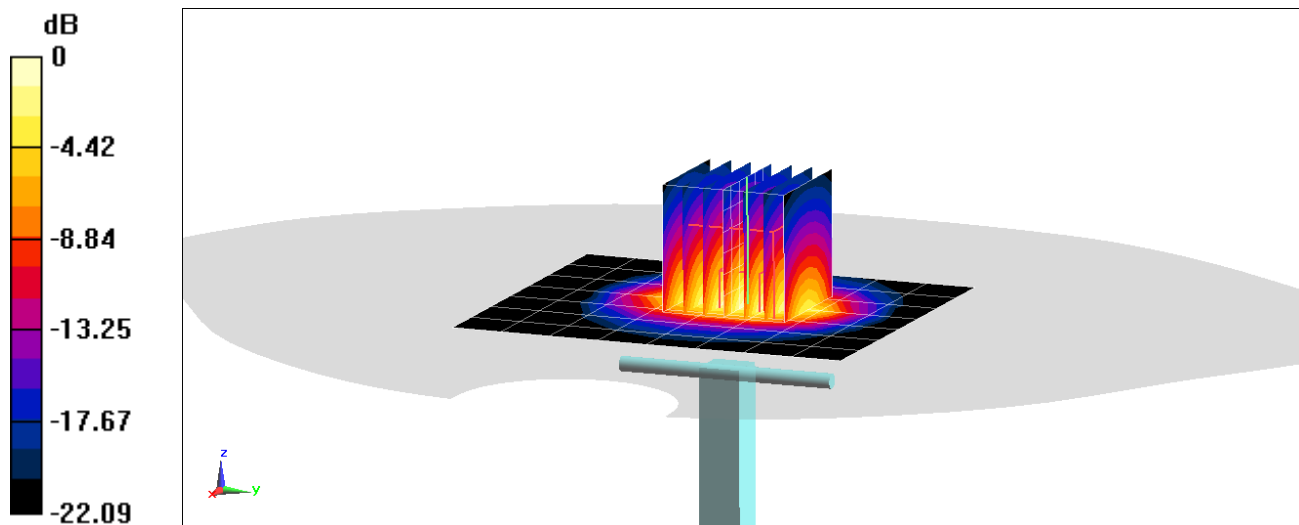
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 10.3 W/kg

SAR(1 g) = 4.93 W/kg; SAR(10 g) = 2.26 W/kg

Deviation(1 g) = -3.14%; Deviation(10 g) = -6.61%



0 dB = 8.29 W/kg = 9.19 dBW/kg

PCTEST

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: 797

Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 2.044 \text{ S/m}$; $\epsilon_r = 51.681$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/10/2020; Ambient Temp: 23.0°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7552; ConvF(7.47, 7.47, 7.47) @ 2450 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1449; Calibrated: 9/12/2019

Phantom: Left Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

2450 MHz System Verification at 20.0 dBm (100 mW)

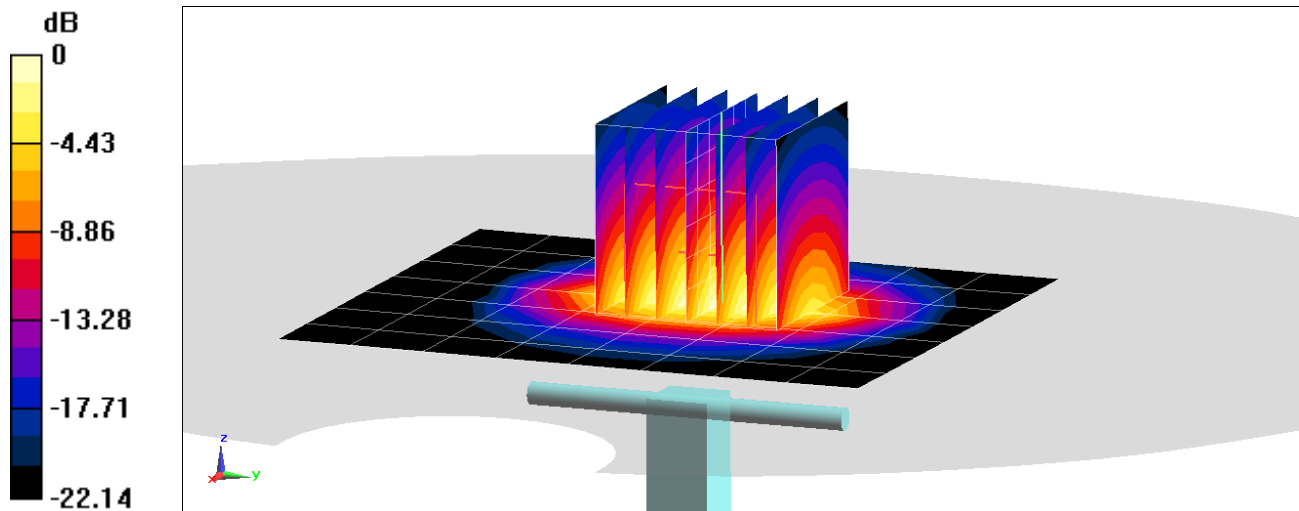
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 10.1 W/kg

SAR(1 g) = 4.88 W/kg; SAR(10 g) = 2.25 W/kg

Deviation(1 g) = -4.50%; Deviation(10 g) = -7.02%



0 dB = 8.19 W/kg = 9.13 dBW/kg

PCTEST

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1064

Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: 2600 Body Medium parameters used:

$f = 2600 \text{ MHz}$; $\sigma = 2.216 \text{ S/m}$; $\epsilon_r = 51.051$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/20/2020; Ambient Temp: 23.6°C; Tissue Temp: 23.6°C

Probe: EX3DV4 - SN7409; ConvF(7.12, 7.12, 7.12) @ 2600 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2600 MHz System Verification at 20.0 dBm (100 mW)

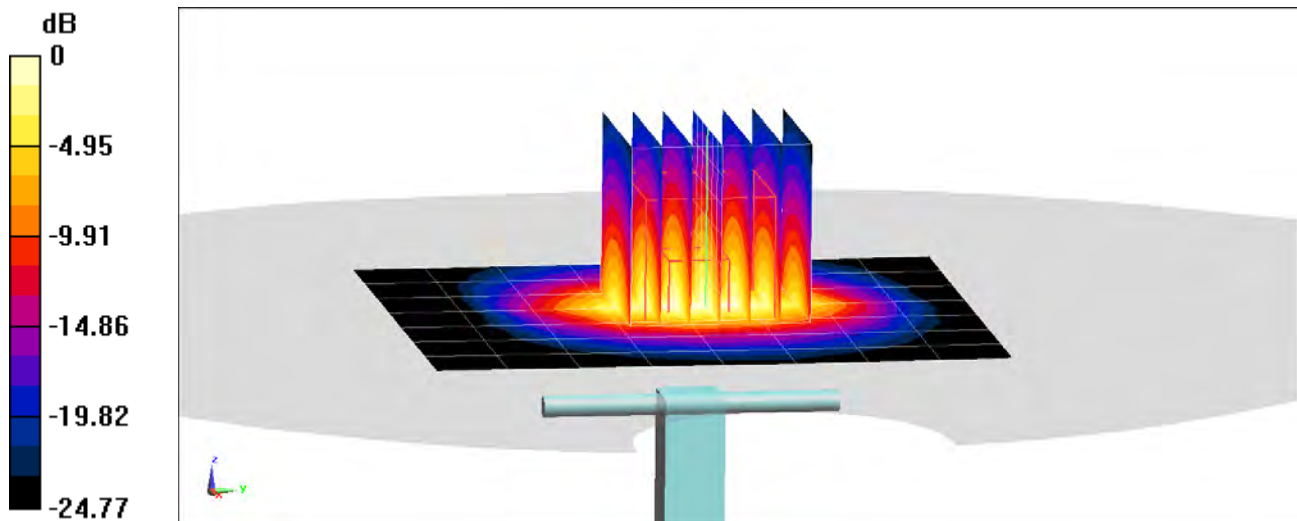
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 12.7 W/kg

SAR(1 g) = 5.63 W/kg

Deviation(1 g) = 1.26%



PCTEST

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1064

Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: 2600 Body; Medium parameters used:

$f = 2600 \text{ MHz}$; $\sigma = 2.201 \text{ S/m}$; $\epsilon_r = 50.296$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/23/2020; Ambient Temp: 22.4°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN7409; ConvF(7.12, 7.12, 7.12) @ 2600 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2600 MHz System Verification at 20.0 dBm (100 mW)

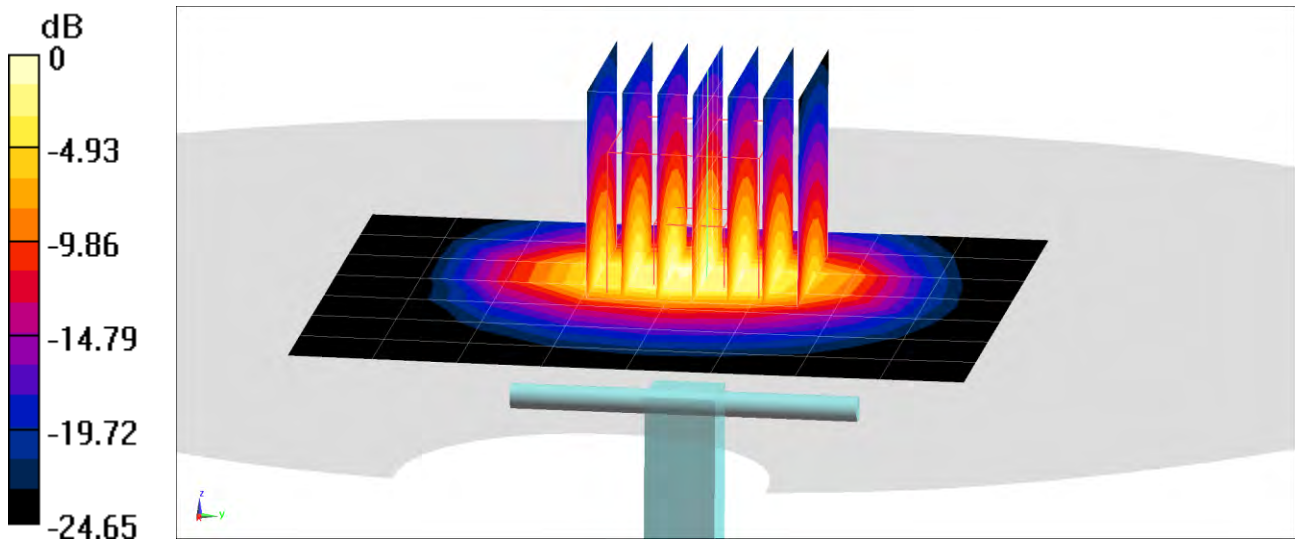
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 12.5 W/kg

SAR(10 g) = 2.42 W/kg

Deviation(1 g) = -3.20%



0 dB = 9.60 W/kg = 9.82 dBW/kg

PCTEST

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1004

Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: 2600 Body Medium parameters used:

$f = 2600$ MHz; $\sigma = 2.189$ S/m; $\epsilon_r = 51.129$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/27/2020; Ambient Temp: 24.5°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN7552; ConvF(7.19, 7.19, 7.19) @ 2600 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1449; Calibrated: 9/12/2019

Phantom: Left Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2600 MHz System Verification at 20.0 dBm (100 mW)

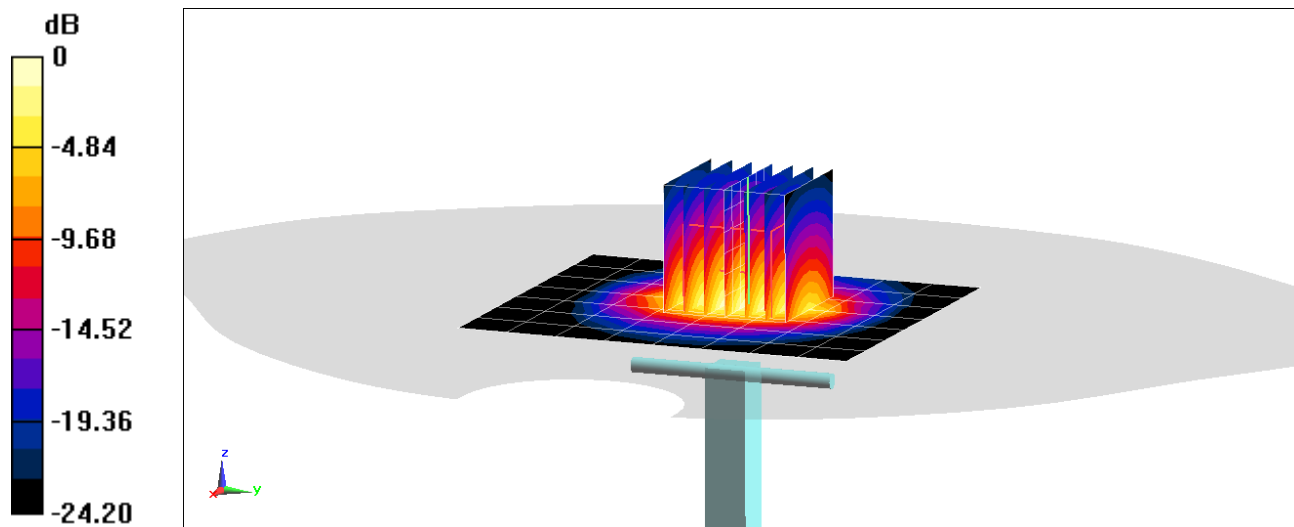
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 12.8 W/kg

SAR(1 g) = 5.77 W/kg

Deviation(1 g) = 5.29%



0 dB = 10.0 W/kg = 10.00 dBW/kg

PCTEST

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1004

Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: 2600 Body Medium parameters used:

$f = 2600 \text{ MHz}$; $\sigma = 2.202 \text{ S/m}$; $\epsilon_r = 50.211$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/30/2020; Ambient Temp: 24.5°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN7552; ConvF(7.19, 7.19, 7.19) @ 2600 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1449; Calibrated: 9/12/2019

Phantom: Left Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7483)

2600 MHz System Verification at 20.0 dBm (100 mW)

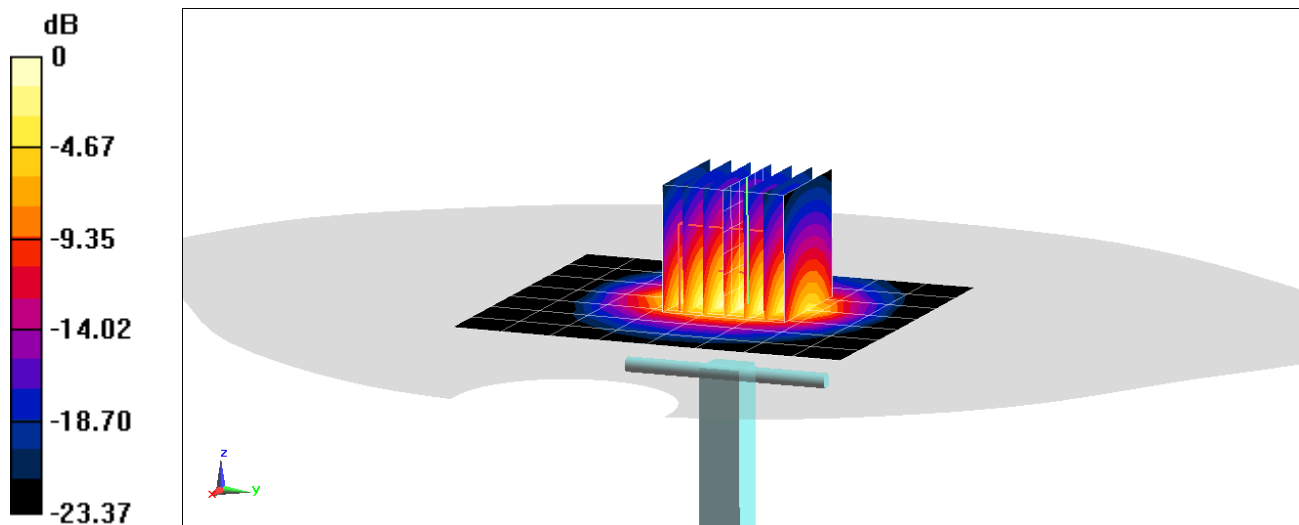
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 11.7 W/kg

SAR(1 g) = 5.42 W/kg; SAR(10 g) = 2.44 W/kg

Deviation(1 g) = -1.09%; Deviation(10 g) = -1.21%



0 dB = 9.16 W/kg = 9.62 dBW/kg

PCTEST

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1064

Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: 2600 Body Medium parameters used:

$f = 2600$ MHz; $\sigma = 2.214$ S/m; $\epsilon_r = 51.127$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/31/2020; Ambient Temp: 23.1°C; Tissue Temp: 24.0°C

Probe: EX3DV4 - SN7409; ConvF(7.12, 7.12, 7.12) @ 2600 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2600 MHz System Verification at 20.0 dBm (100 mW)

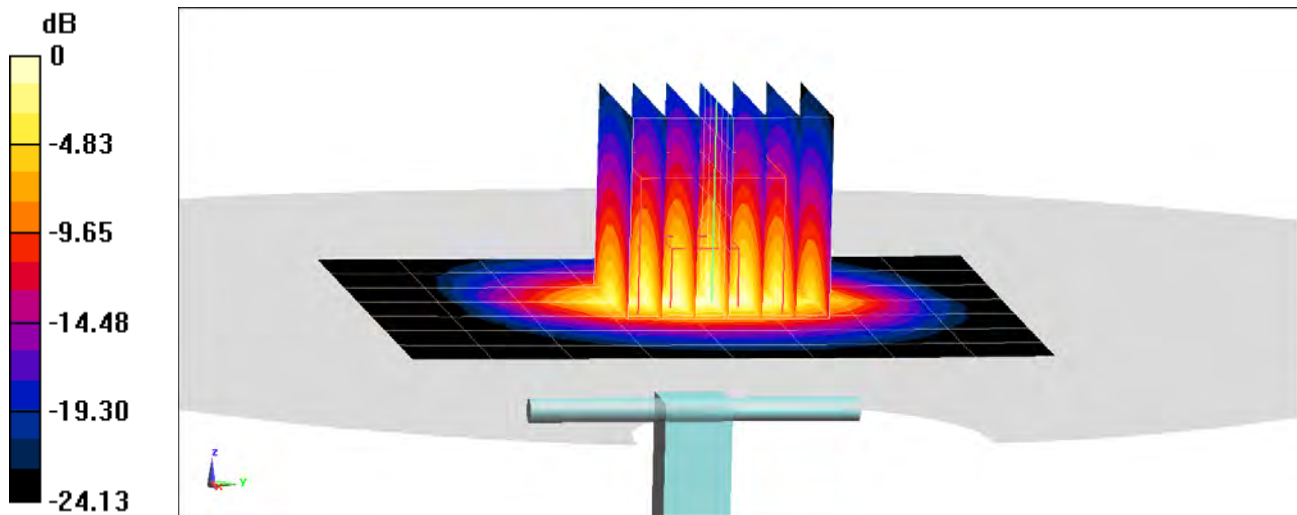
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 12.7 W/kg

SAR(1 g) = 5.61 W/kg

Deviation(1 g) = 0.90%



0 dB = 9.82 W/kg = 9.92 dBW/kg

PCTEST

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1064

Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: 2450 Body Medium parameters used:

$f = 2600 \text{ MHz}$; $\sigma = 2.21 \text{ S/m}$; $\epsilon_r = 51.841$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/03/2020; Ambient Temp: 22.0°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7409; ConvF(7.12, 7.12, 7.12) @ 2600 MHz; Calibrated: 6/23/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/18/2020

Phantom: LeftTwin-SAM V5.0; Type: QD 000 P40 CD; Serial: TP1375

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2600 MHz System Verification at 20.0 dBm (100 mW)

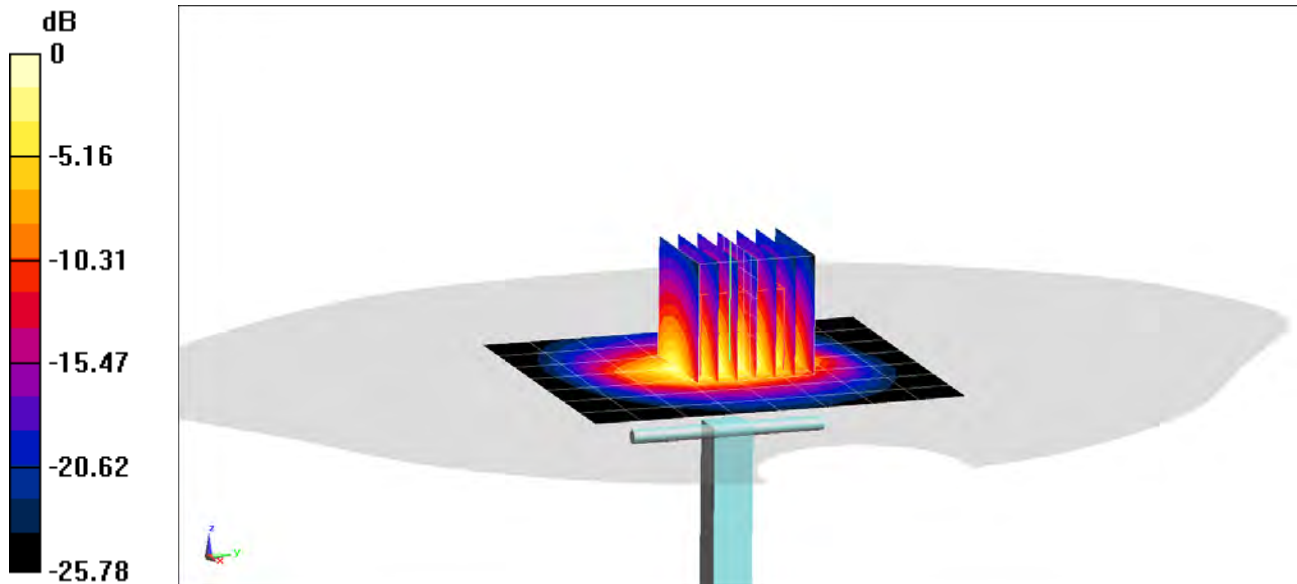
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

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

Peak SAR (extrapolated) = 12.2 W/kg

SAR(1 g) = 5.47 W/kg; SAR(10 g) = 2.4 W/kg

Deviation(1 g) = -1.62%; Deviation(10 g) = -4.00%



0 dB = 9.40 W/kg = 9.73 dBW/kg

PCTEST

DUT: Dipole 2600 MHz; Type: D2600V2; Serial: 1004

Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1

Medium: 2600 Body Medium parameters used:

$f = 2600$ MHz; $\sigma = 2.233$ S/m; $\epsilon_r = 50.936$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/03/2020; Ambient Temp: 23.1°C; Tissue Temp: 22.8°C

Probe: EX3DV4 - SN7552; ConvF(7.19, 7.19, 7.19) @ 2600 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1449; Calibrated: 9/12/2019

Phantom: Left Twin-SAM V5.0 (30); Type: QD 000 P40 CD; Serial: 1792

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

2600 MHz System Verification at 20.0 dBm (100 mW)

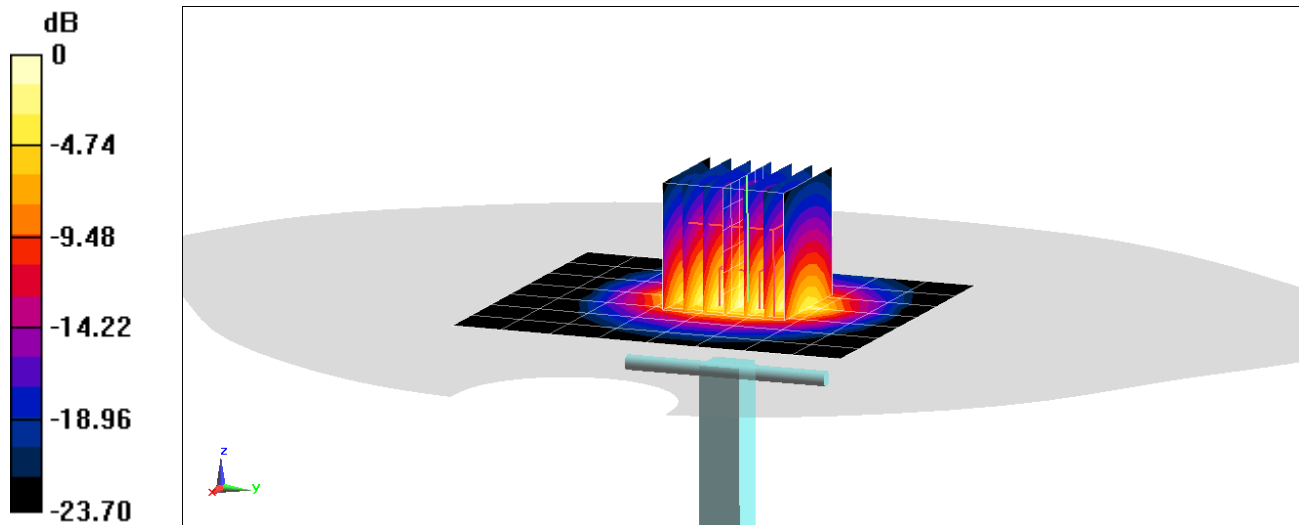
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 11.5 W/kg

SAR(10 g) = 2.34 W/kg

Deviation(10 g) = -5.26%



0 dB = 9.13 W/kg = 9.60 dBW/kg

PCTEST

DUT: Dipole 3500 MHz; Type: D3500V2; Serial: 1059

Communication System: UID 0, CW; Frequency: 3500 MHz; Duty Cycle: 1:1

Medium: 3600 Body Medium parameters used:

$f = 3500$ MHz; $\sigma = 3.392$ S/m; $\epsilon_r = 49.974$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/27/2020; Ambient Temp: 22.4°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN7488; ConvF(7, 7, 7) @ 3500 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1530; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1646

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

3500 MHz System Verification at 20.0 dBm (100 mW)

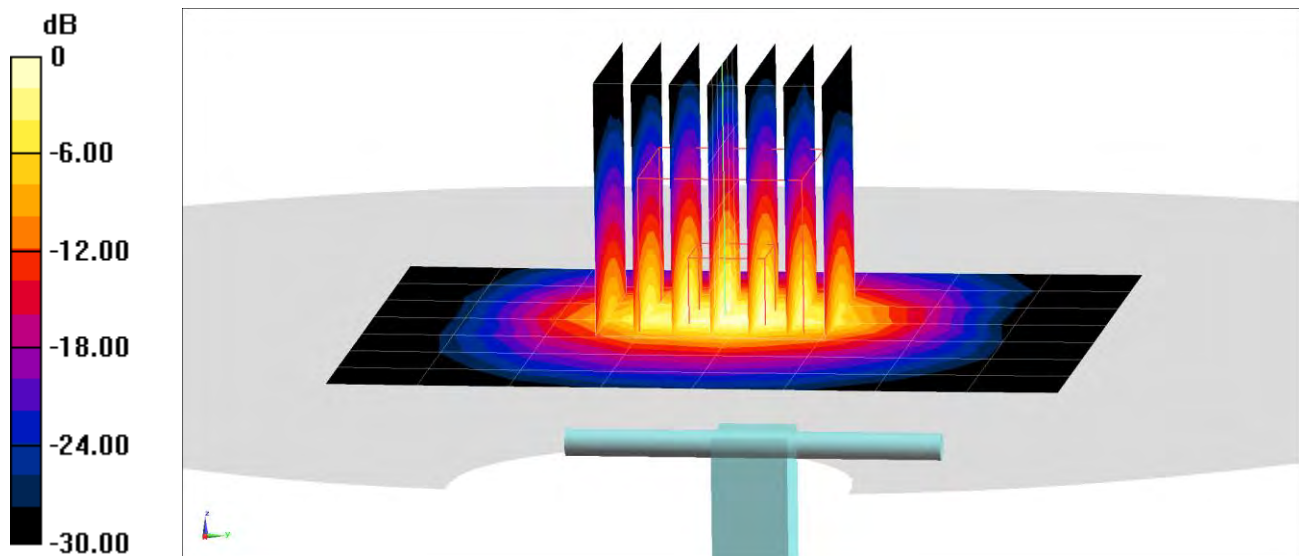
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 17.1 W/kg

SAR(1 g) = 6.53 W/kg

Deviation(1 g) = 0.31%



PCTEST

DUT: Dipole 3700 MHz; Type: D3700V2; Serial: 1018

Communication System: UID 0, CW; Frequency: 3700 MHz; Duty Cycle: 1:1

Medium: 3600 Body Medium parameters used:

$f = 3700$ MHz; $\sigma = 3.604$ S/m; $\epsilon_r = 49.678$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/27/2020; Ambient Temp: 22.4°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN7488; ConvF(6.85, 6.85, 6.85) @ 3700 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1530; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1646

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

3700 MHz System Verification at 20.0 dBm (100 mW)

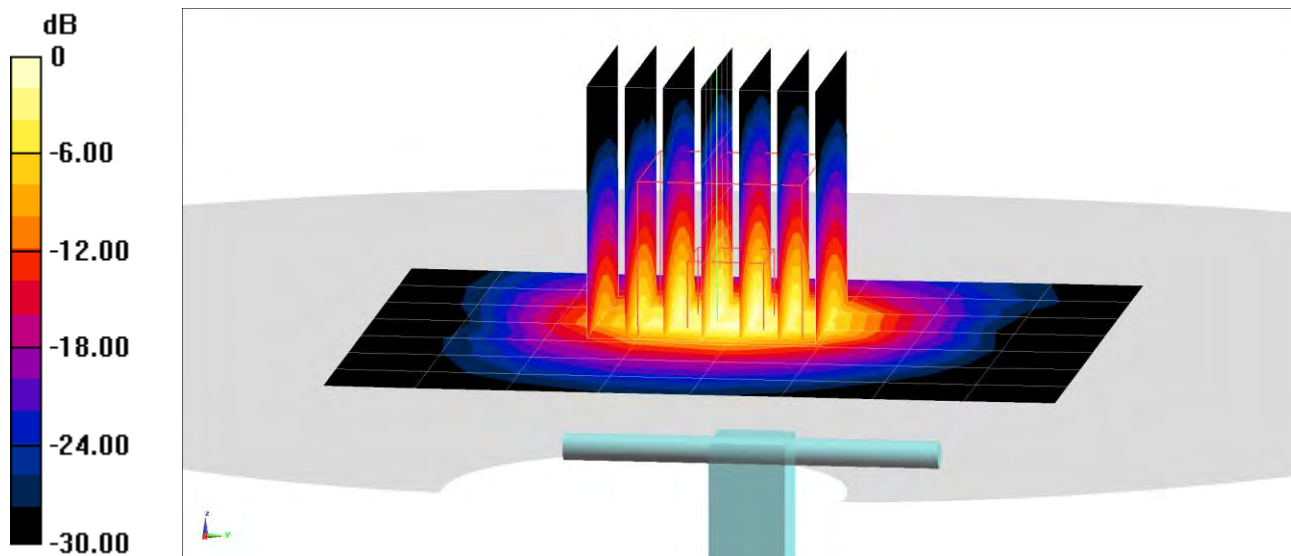
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.1 W/kg

SAR(1 g) = 6.61 W/kg

Deviation(1 g) = 2.80%



0 dB = 13.1 W/kg = 11.17 dBW/kg

PCTEST

DUT: Dipole 3500 MHz; Type: D3500V2; Serial: 1059

Communication System: UID 0, CW; Frequency: 3500 MHz; Duty Cycle: 1:1

Medium: 3600 Body Medium parameters used:

$f = 3500 \text{ MHz}$; $\sigma = 3.373 \text{ S/m}$; $\epsilon_r = 49.517$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/04/2020; Ambient Temp: 23.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7488; ConvF(7, 7, 7) @ 3500 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1530; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1646

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

3500 MHz System Verification at 20.0 dBm (100 mW)

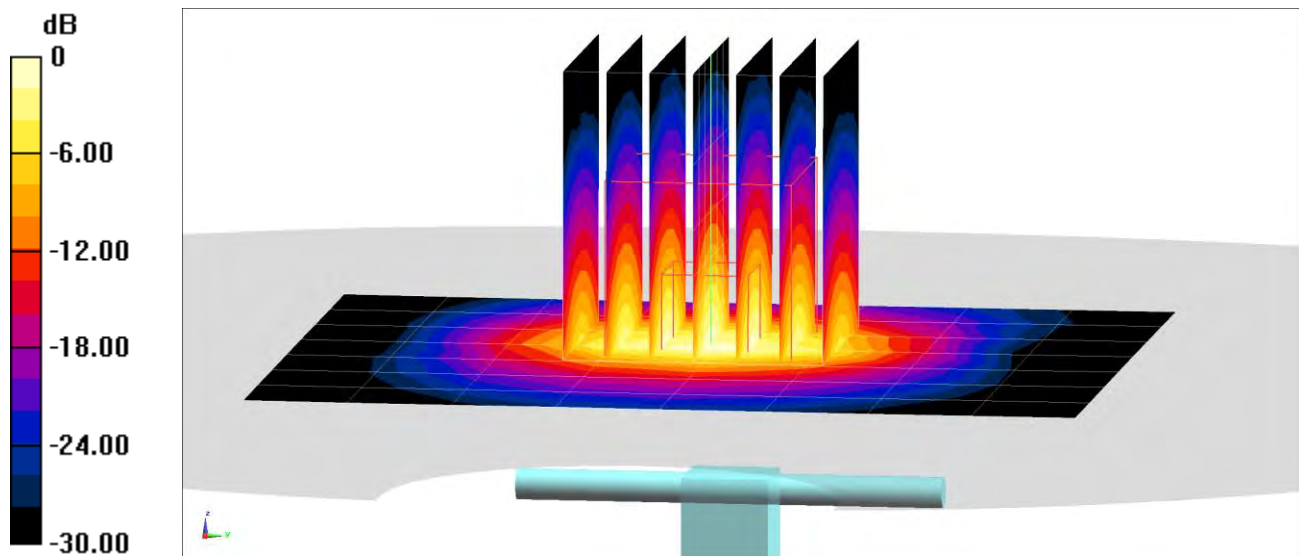
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x7x8)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Peak SAR (extrapolated) = 16.7 W/kg

SAR(1 g) = 6.42 W/kg; SAR(10 g) = 2.4 W/kg

Deviation(1 g) = -1.38%; Deviation(10 g) = -0.83%



PCTEST

DUT: Dipole 3700 MHz; Type: D3700V2; Serial: 1018

Communication System: UID 0, CW; Frequency: 3700 MHz; Duty Cycle: 1:1

Medium: 3600 Body Medium parameters used:

$f = 3700 \text{ MHz}$; $\sigma = 3.58 \text{ S/m}$; $\epsilon_r = 49.214$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 08/04/2020; Ambient Temp: 23.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7488; ConvF(6.85, 6.85, 6.85) @ 3700 MHz; Calibrated: 1/21/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1530; Calibrated: 1/13/2020

Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1646

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

3700 MHz System Verification at 20.0 dBm (100 mW)

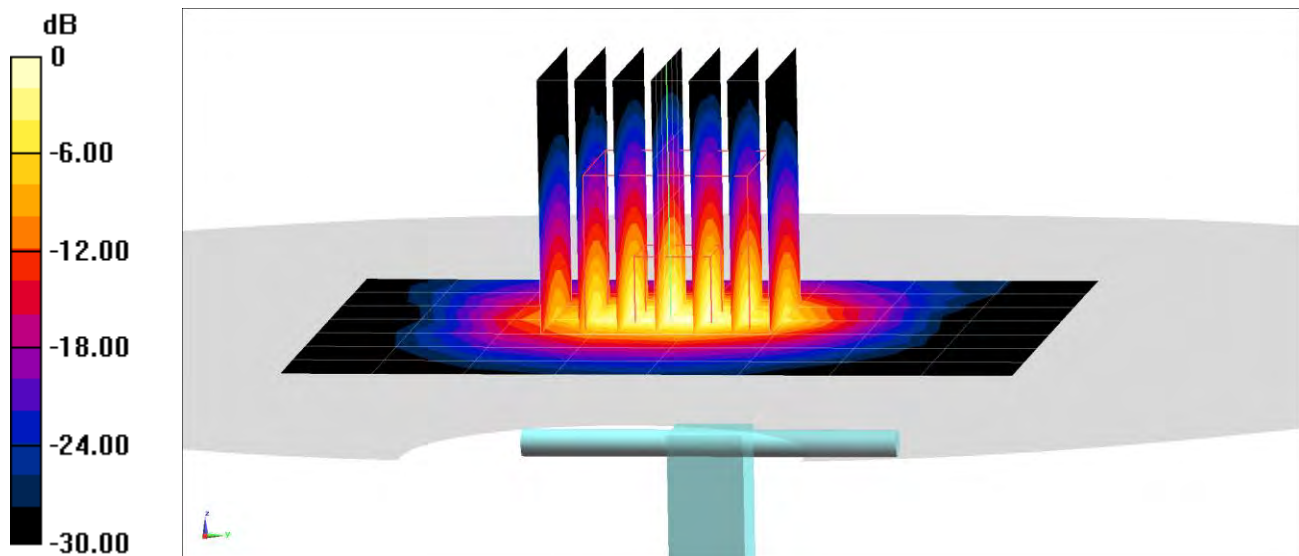
Area Scan (8x9x1): Measurement grid: $dx=12\text{mm}$, $dy=12\text{mm}$

Zoom Scan (7x7x8)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.5 W/kg

SAR(1 g) = 6.76 W/kg; SAR(10 g) = 2.44 W/kg

Deviation(1 g) = 5.13%; Deviation(10 g) = 5.63%



0 dB = 13.5 W/kg = 11.30 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body Medium parameters used:

$f = 5250$ MHz; $\sigma = 5.434$ S/m; $\epsilon_r = 46.826$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/05/2020; Ambient Temp: 24.0°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7538; ConvF(4.6, 4.6, 4.6) @ 5250 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5250 MHz System Verification at 17.0 dBm (50 mW)

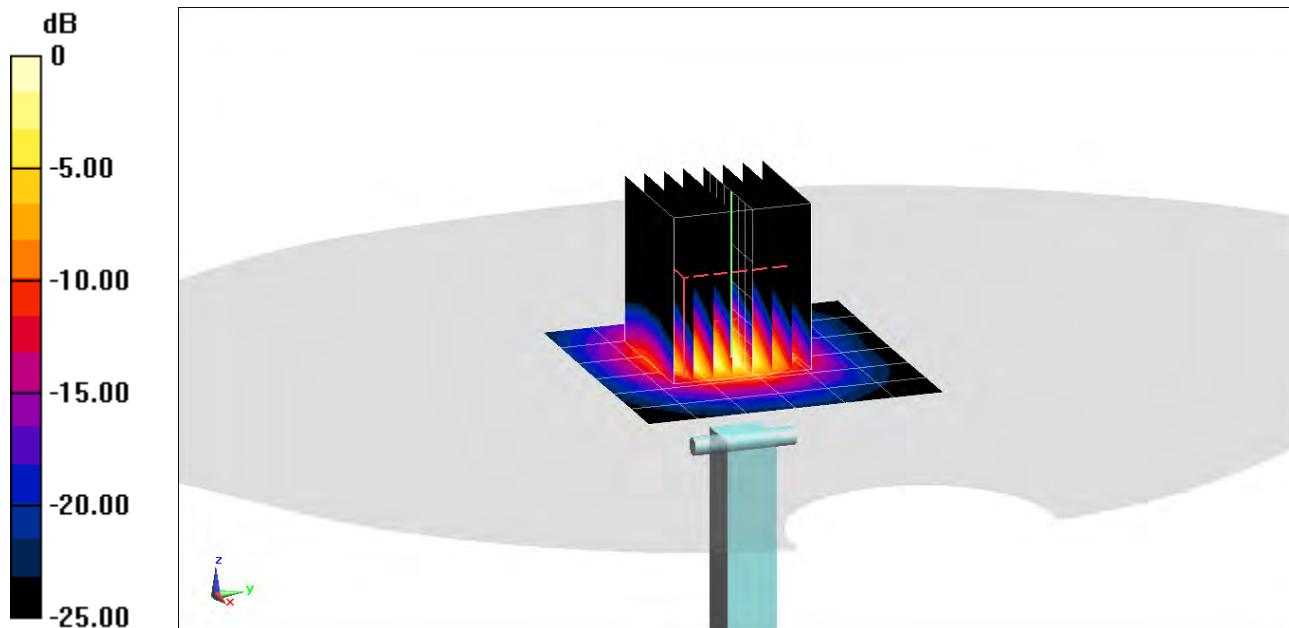
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 15.4 W/kg

SAR(1 g) = 3.81 W/kg

Deviation(1 g) = 0.79%



0 dB = 8.88 W/kg = 9.48 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body Medium parameters used:

$f = 5600$ MHz; $\sigma = 5.891$ S/m; $\epsilon_r = 46.256$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/05/2020; Ambient Temp: 24.0°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7538; ConvF(4.09, 4.09, 4.09) @ 5600 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5600 MHz System Verification at 17.0 dBm (50 mW)

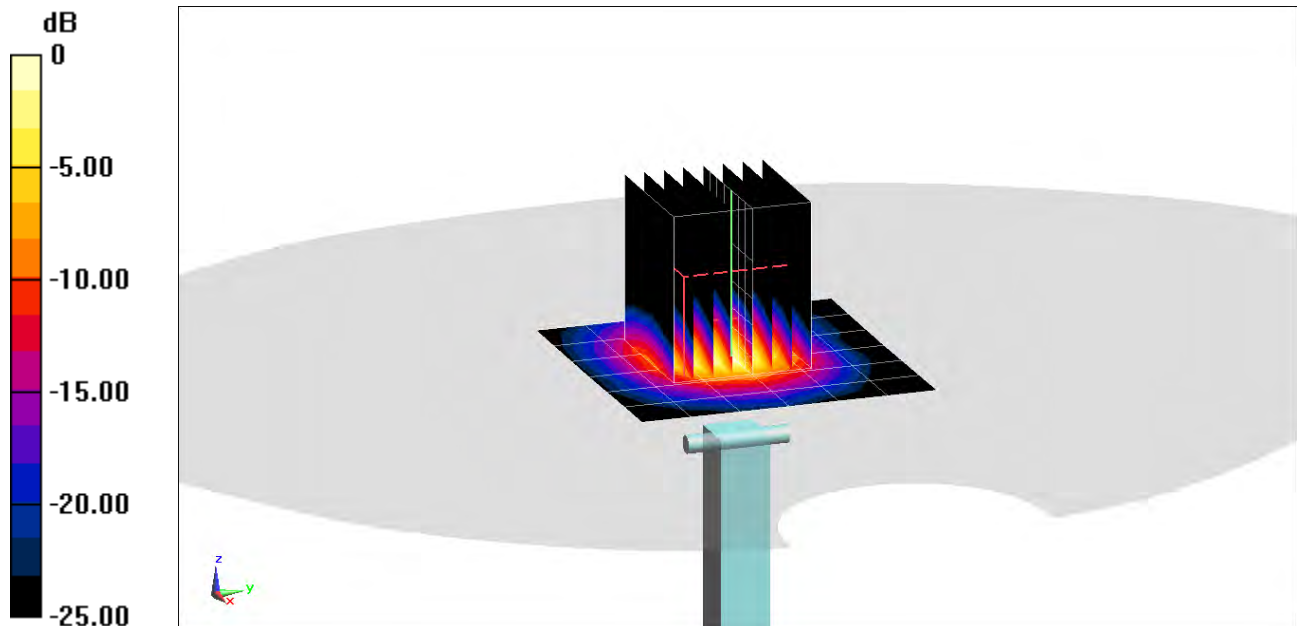
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.2 W/kg

SAR(1 g) = 3.99 W/kg

Deviation(1 g) = 1.66%



0 dB = 9.80 W/kg = 9.91 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body Medium parameters used:

$f = 5750 \text{ MHz}$; $\sigma = 6.096 \text{ S/m}$; $\epsilon_r = 46.02$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/05/2020; Ambient Temp: 24.0°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7538; ConvF(4.17, 4.17, 4.17) @ 5750 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5750 MHz System Verification at 17.0 dBm (50 mW)

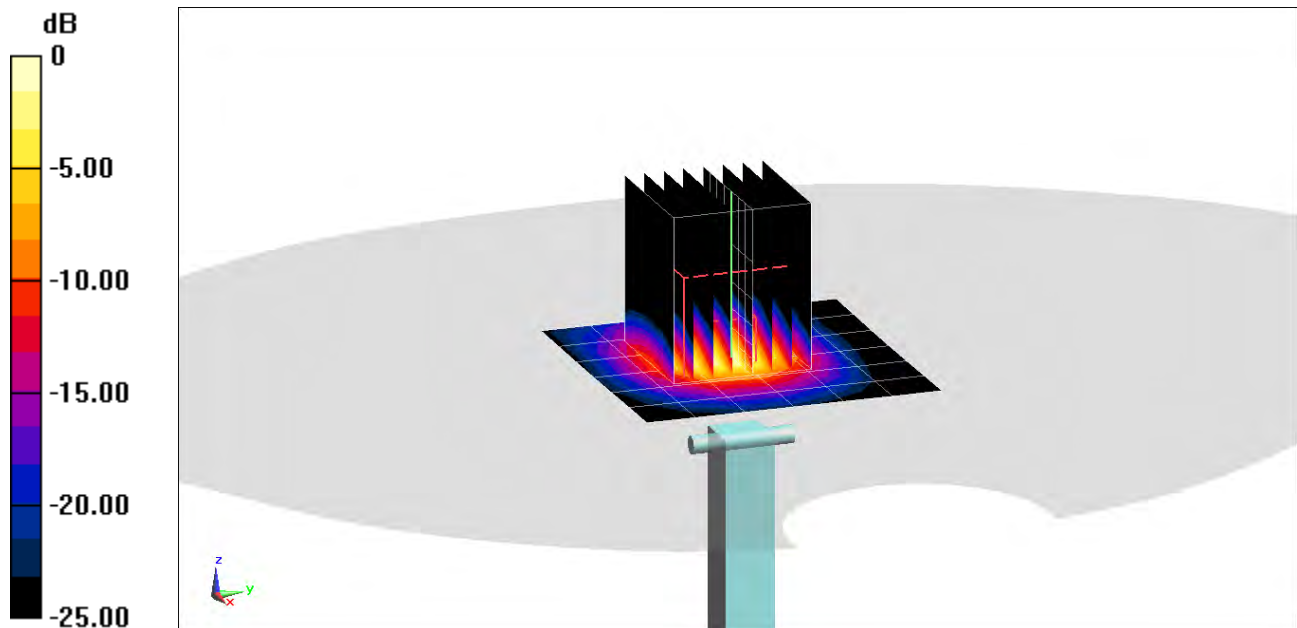
Area Scan (7x7x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (8x8x8)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Peak SAR (extrapolated) = 17.3 W/kg

SAR(1 g) = 3.66 W/kg

Deviation(1 g) = -3.56%



0 dB = 9.17 W/kg = 9.62 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body Medium parameters used:

$f = 5250 \text{ MHz}$; $\sigma = 5.46 \text{ S/m}$; $\epsilon_r = 46.788$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/13/2020; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7538; ConvF(4.6, 4.6, 4.6) @ 5250 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5250 MHz System Verification at 17.0 dBm (50 mW)

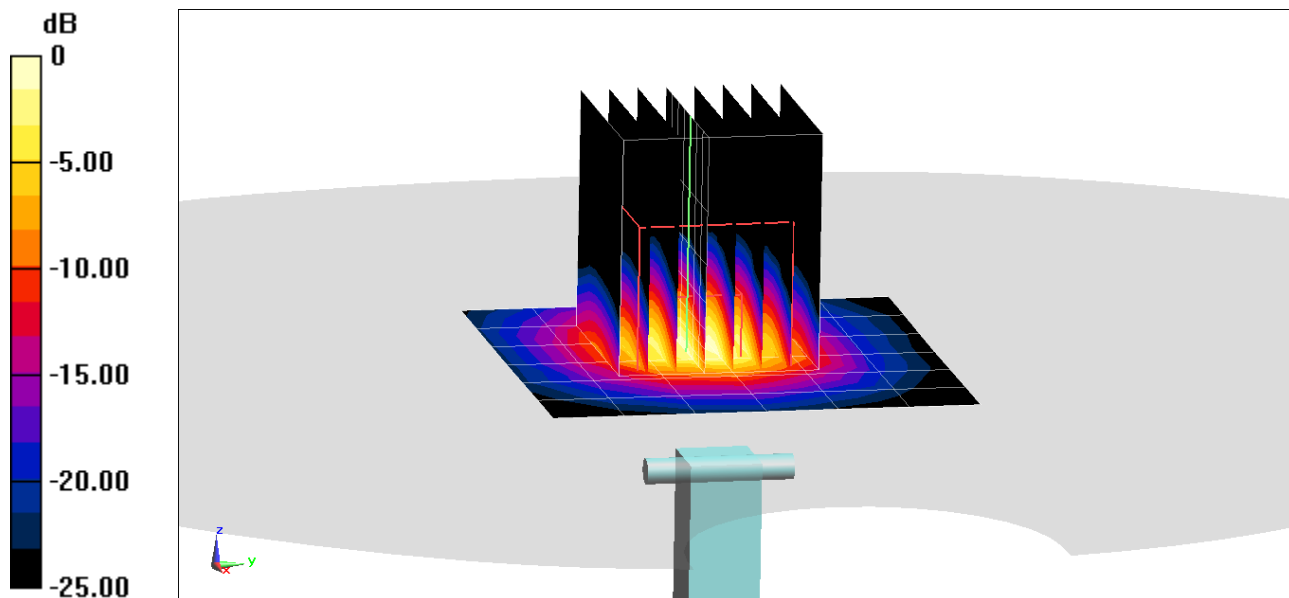
Area Scan (7x7x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (8x8x8)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Peak SAR (extrapolated) = 14.7 W/kg

SAR(1 g) = 3.66 W/kg

Deviation(1 g) = -3.17%



0 dB = 8.42 W/kg = 9.25 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body Medium parameters used:

$f = 5600$ MHz; $\sigma = 5.929$ S/m; $\epsilon_r = 46.207$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/13/2020; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7538; ConvF(4.09, 4.09, 4.09) @ 5600 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5600 MHz System Verification at 17.0 dBm (50 mW)

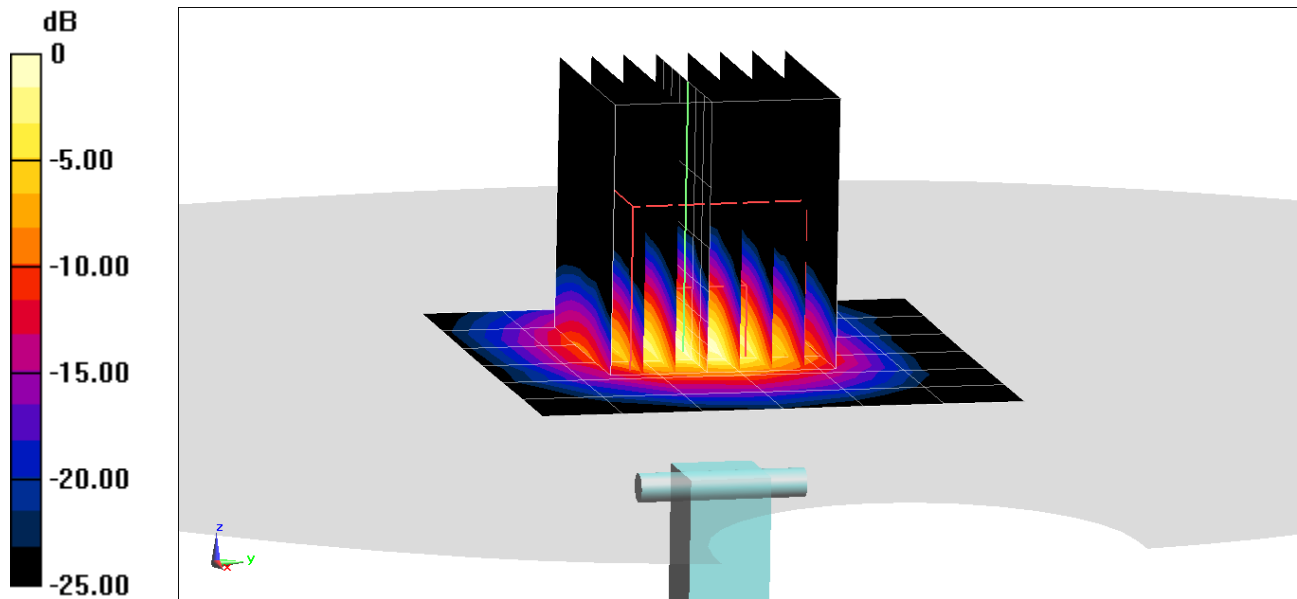
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 16.6 W/kg

SAR(1 g) = 3.79 W/kg

Deviation(1 g) = -3.44%



0 dB = 9.10 W/kg = 9.59 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body Medium parameters used:

$f = 5750 \text{ MHz}$; $\sigma = 6.107 \text{ S/m}$; $\epsilon_r = 45.951$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/13/2020; Ambient Temp: 23.0°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7538; ConvF(4.17, 4.17, 4.17) @ 5750 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5750 MHz System Verification at 17.0 dBm (50 mW)

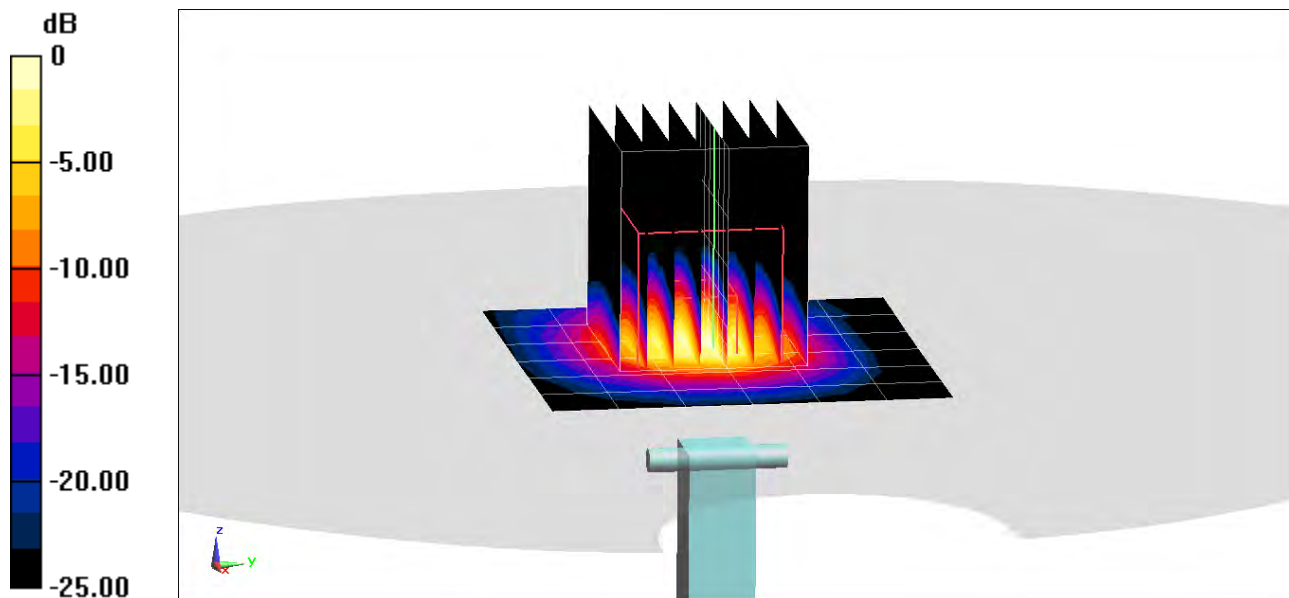
Area Scan (7x7x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (8x8x8)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Peak SAR (extrapolated) = 16.8 W/kg

SAR(1 g) = 3.66 W/kg

Deviation(1 g) = -3.56%



0 dB = 8.94 W/kg = 9.51 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body Medium parameters used:

$f = 5250$ MHz; $\sigma = 5.469$ S/m; $\epsilon_r = 47.002$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/19/2020; Ambient Temp: 21.1°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN7538; ConvF(4.6, 4.6, 4.6) @ 5250 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5250 MHz System Verification at 17.0 dBm (50 mW)

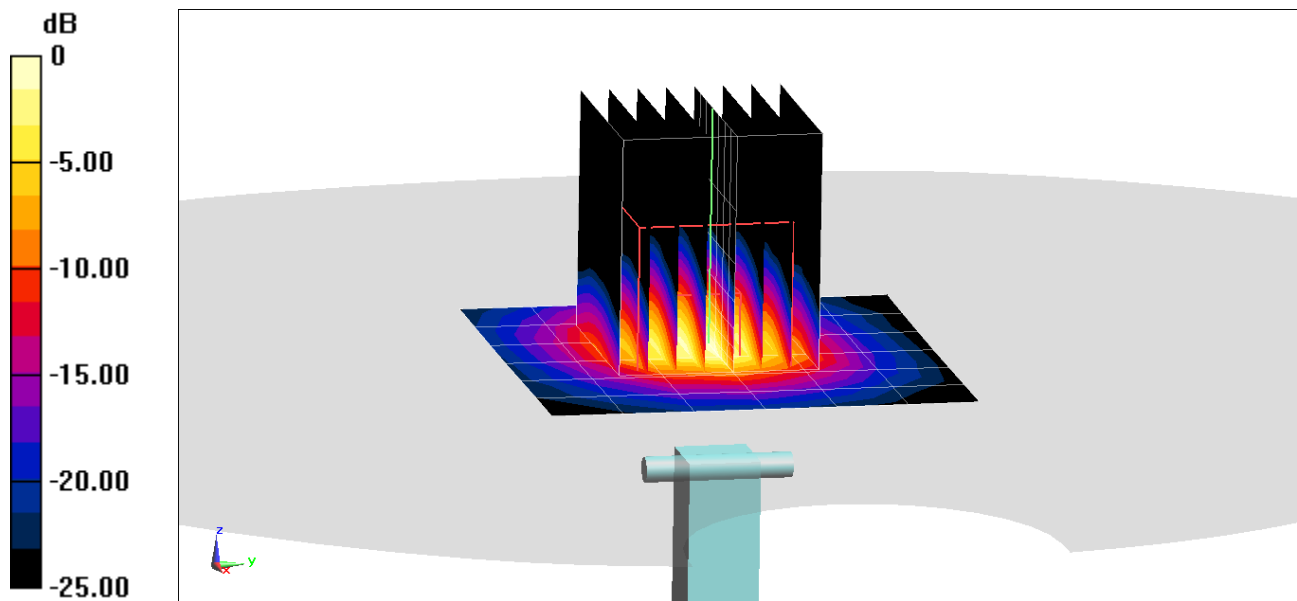
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 15.1 W/kg

SAR(10 g) = 1.03 W/kg

Deviation(10 g) = -2.83%



0 dB = 8.67 W/kg = 9.38 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body Medium parameters used:

$f = 5600$ MHz; $\sigma = 5.937$ S/m; $\epsilon_r = 46.434$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/19/2020; Ambient Temp: 21.1°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN7538; ConvF(4.09, 4.09, 4.09) @ 5600 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5600 MHz System Verification at 17.0 dBm (50 mW)

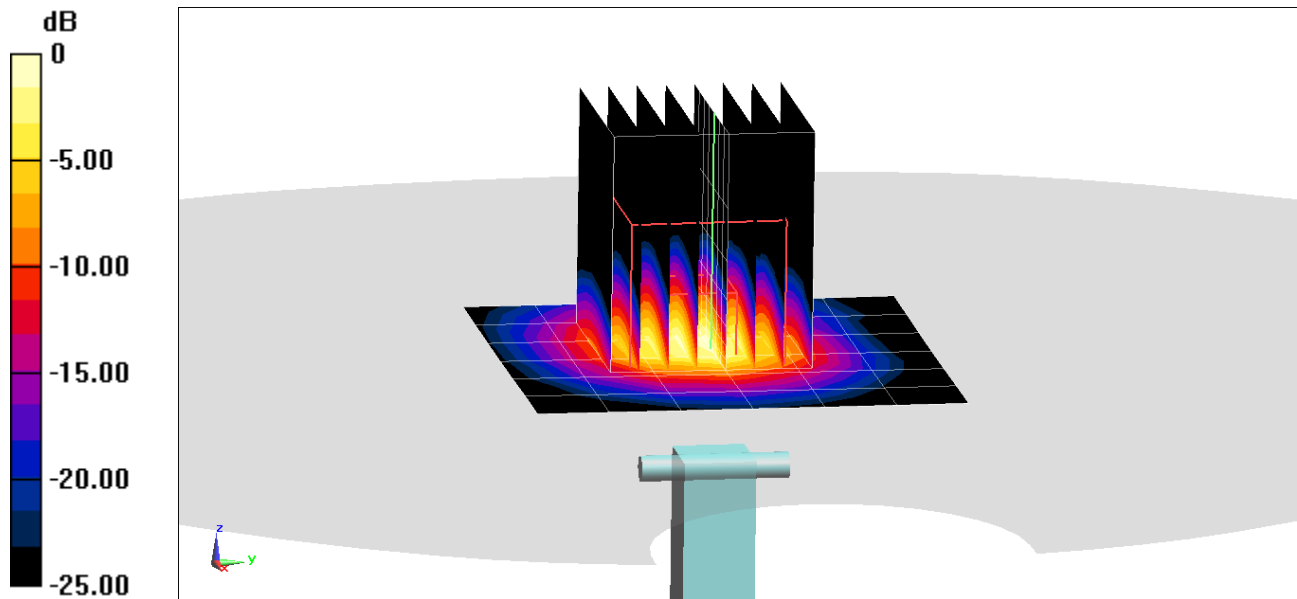
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 17.8 W/kg

SAR(10 g) = 1.1 W/kg

Deviation(10 g) = 0.00%



PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body Medium parameters used:

$f = 5750$ MHz; $\sigma = 6.143$ S/m; $\epsilon_r = 46.198$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/19/2020; Ambient Temp: 21.1°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN7538; ConvF(4.17, 4.17, 4.17) @ 5750 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5750 MHz System Verification at 17.0 dBm (50 mW)

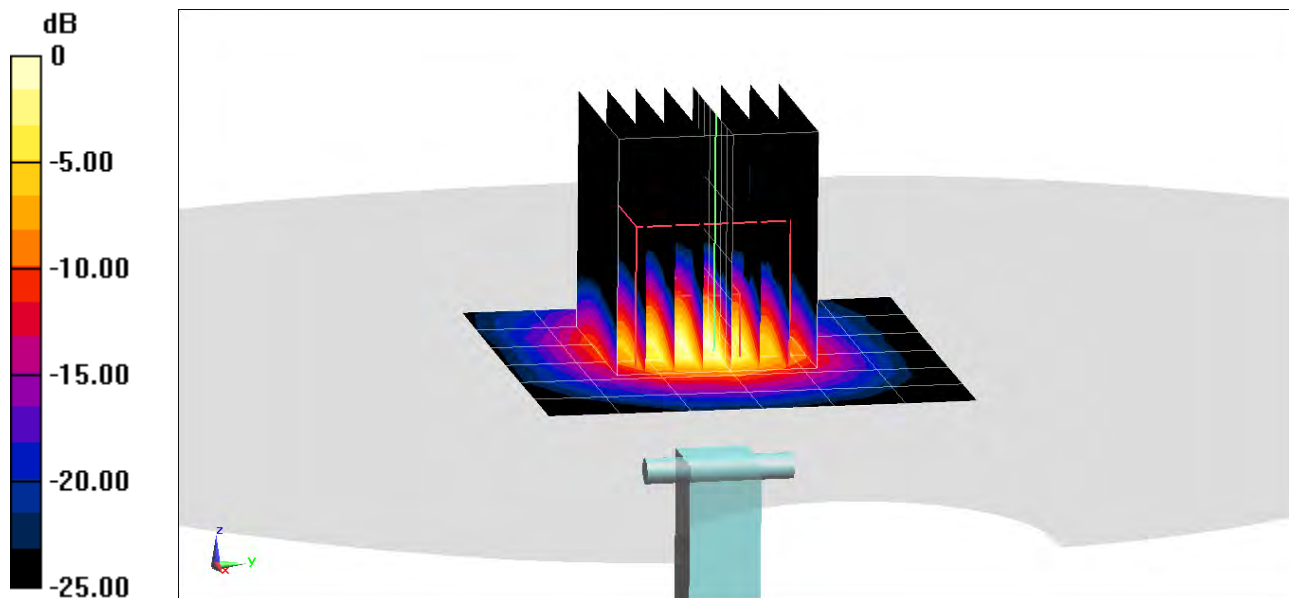
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 17.3 W/kg

SAR(10 g) = 1.01 W/kg

Deviation(10 g) = -4.72%



0 dB = 8.97 W/kg = 9.53 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body Medium parameters used:

$f = 5250 \text{ MHz}$; $\sigma = 5.467 \text{ S/m}$; $\epsilon_r = 46.929$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/27/2020; Ambient Temp: 21.9°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7538; ConvF(4.6, 4.6, 4.6) @ 5250 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5250 MHz System Verification at 17.0 dBm (50 mW)

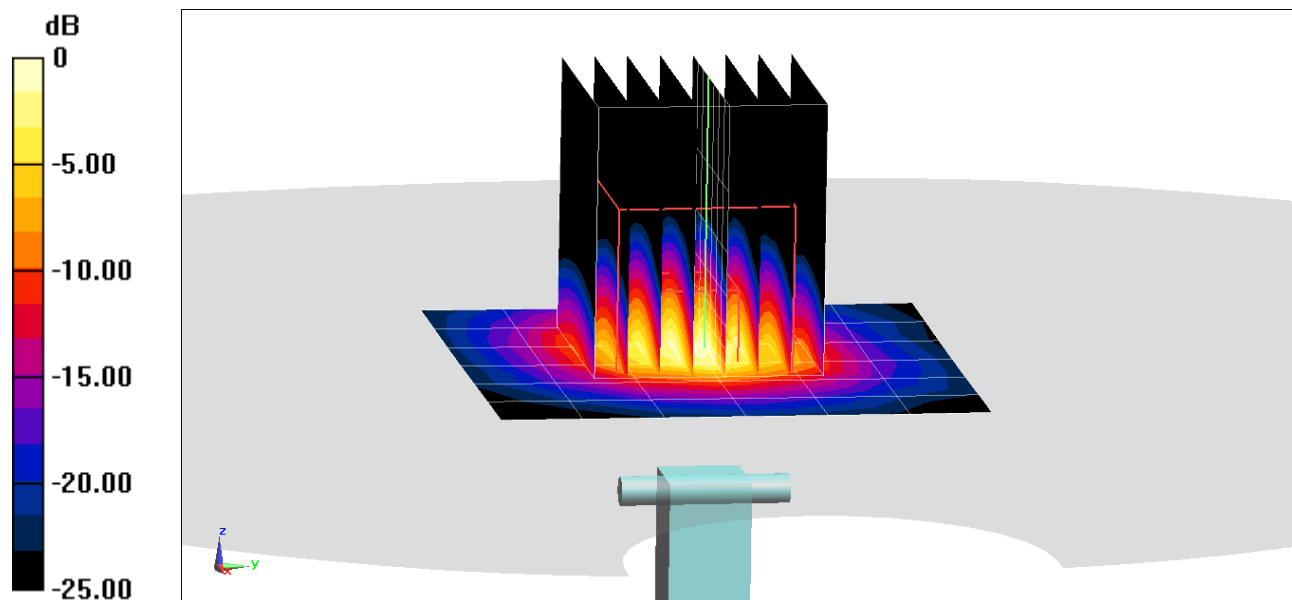
Area Scan (7x7x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (8x8x8)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Peak SAR (extrapolated) = 15.2 W/kg

SAR(10 g) = 1.03 W/kg

Deviation(10 g) = -2.83%



0 dB = 8.70 W/kg = 9.40 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body Medium parameters used:

$f = 5600$ MHz; $\sigma = 5.931$ S/m; $\epsilon_r = 46.352$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/27/2020; Ambient Temp: 21.9°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7538; ConvF(4.09, 4.09, 4.09) @ 5600 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5600 MHz System Verification at 17.0 dBm (50 mW)

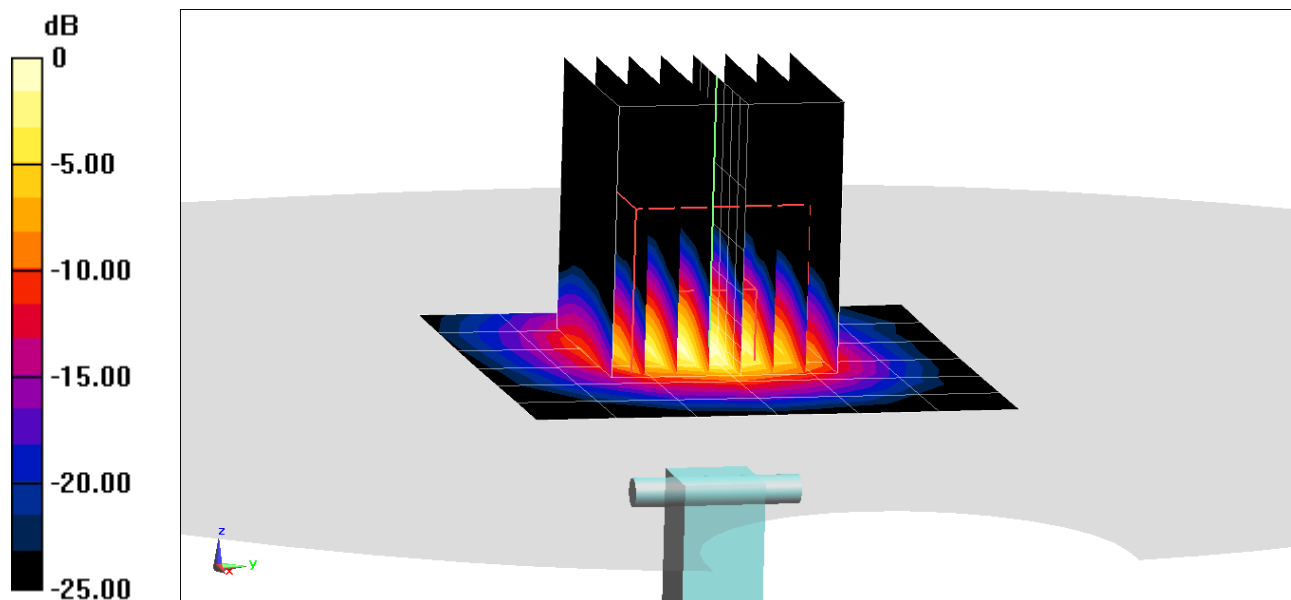
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.0 W/kg

SAR(10 g) = 1.11 W/kg

Deviation(10 g) = 0.91%



0 dB = 9.74 W/kg = 9.89 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body Medium parameters used:

$f = 5750$ MHz; $\sigma = 6.139$ S/m; $\epsilon_r = 46.119$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 07/27/2020; Ambient Temp: 21.9°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7538; ConvF(4.17, 4.17, 4.17) @ 5750 MHz; Calibrated: 5/18/2020

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/20/2020

Phantom: Front; Type: QD 000 P40 CD; Serial: 1686

Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

5750 MHz System Verification at 17.0 dBm (50 mW)

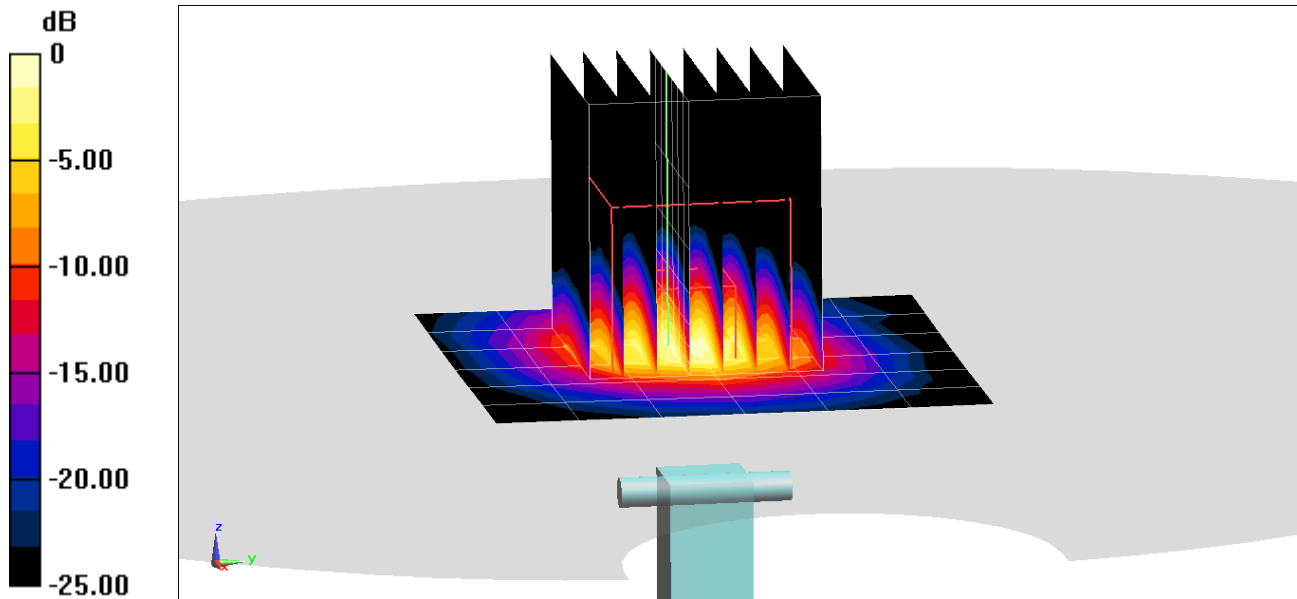
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (8x8x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Peak SAR (extrapolated) = 18.1 W/kg

SAR(10 g) = 1.05 W/kg

Deviation(10 g) = -0.94%



0 dB = 9.40 W/kg = 9.73 dBW/kg

APPENDIX C: SAR TISSUE SPECIFICATIONS

Measurement Procedure for Tissue verification:

- 1) The network analyzer and probe system was configured and calibrated.
- 2) The probe was immersed in the tissue. The tissue was placed in a nonmetallic container. Trapped air bubbles beneath the flange were minimized by placing the probe at a slight angle.
- 3) The complex admittance with respect to the probe aperture was measured
- 4) The complex relative permittivity ϵ' can be calculated from the below equation (Pournaropoulos and Misra):

$$Y = \frac{j2\omega\epsilon_r\epsilon_0}{[\ln(b/a)]^2} \int_a^b \int_a^b \int_0^\pi \cos\phi' \frac{\exp[-j\omega r(\mu_0\epsilon_r'\epsilon_0)^{1/2}]}{r} d\phi' d\rho' d\rho$$

where Y is the admittance of the probe in contact with the sample, the primed and unprimed coordinates refer to source and observation points, respectively, $r^2 = \rho^2 + \rho'^2 - 2\rho\rho'\cos\phi'$, ω is the angular frequency, and $j = \sqrt{-1}$.

3 Composition / Information on ingredients

3.2 Mixtures

Description: Aqueous solution with surfactants and inhibitors

Declarable, or hazardous components:

CAS: 107-21-1 EINECS: 203-473-3 Reg.nr.: 01-2119456816-28-0000	Ethanediol STOT RE 2, H373; Acute Tox. 4, H302	>1.0-4.9%
CAS: 68608-26-4 EINECS: 271-781-5 Reg.nr.: 01-2119527859-22-0000	Sodium petroleum sulfonate Eye Irrit. 2, H319	< 2.9%
CAS: 107-41-5 EINECS: 203-489-0 Reg.nr.: 01-2119539582-35-0000	Hexylene Glycol / 2-Methyl-pentane-2,4-diol Skin Irrit. 2, H315; Eye Irrit. 2, H319	< 2.9%
CAS: 68920-66-1 NLP: 500-236-9 Reg.nr.: 01-2119489407-26-0000	Alkoxylated alcohol, > C₁₈ Aquatic Chronic 2, H411; Skin Irrit. 2, H315; Eye Irrit. 2, H319	< 2.0%

Additional information:

For the wording of the listed risk phrases refer to section 16.

Not mentioned CAS-, EINECS- or registration numbers are to be regarded as Proprietary/Confidential.

The specific chemical identity and/or exact percentage concentration of proprietary components is withheld as a trade secret.

Figure C-1

Note: Liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

FCC ID: A3LSMF916U	 PCTEST Protest to be tested	SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 06/28/20-08/24/20	DUT Type: Portable Handset			APPENDIX C: Page 1 of 3

Measurement Certificate / Material Test

Item Name **Body Tissue Simulating Liquid (MBBL600-6000V6)**
 Product No. **SL AAM U16 BC (Batch: 181029-1)**
 Manufacturer **SPEAG**

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the KDB 865864 compliance standard.

Test Condition

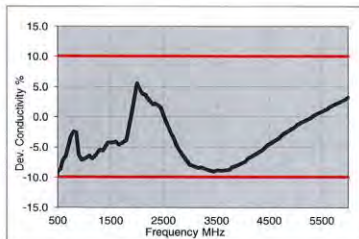
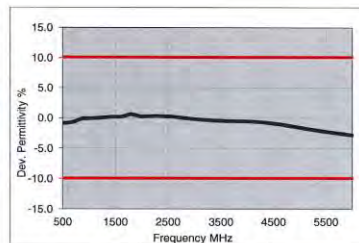
Ambient Condition **22°C ; 30% humidity**
 TSL Temperature **22°C**
 Test Date **30-Oct-18**
 Operator **CL**

Additional Information

TSL Density
 TSL Heat-capacity

Results

f [MHz]	Measured			Target		Diff. to Target [%]	
	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
800	55.1	21.3	0.95	55.3	0.97	-0.4	-2.1
825	55.1	20.8	0.96	55.2	0.98	-0.3	-2.0
835	55.1	20.6	0.96	55.1	0.99	0.0	-2.5
850	55.1	20.4	0.96	55.2	0.99	-0.1	-3.0
900	55.0	19.7	0.98	55.0	1.05	0.0	-6.7
1400	54.2	15.6	1.22	54.1	1.28	0.2	-4.7
1450	54.1	15.4	1.24	54.0	1.30	0.2	-4.6
1500	54.1	15.3	1.27	53.9	1.33	0.3	-4.5
1550	54.0	15.1	1.30	53.9	1.36	0.2	-4.4
1600	53.9	15.0	1.33	53.8	1.39	0.2	-4.3
1625	53.9	14.9	1.35	53.8	1.41	0.3	-4.3
1640	53.9	14.9	1.36	53.7	1.42	0.3	-4.2
1650	53.8	14.9	1.36	53.7	1.43	0.2	-4.9
1700	53.8	14.8	1.40	53.6	1.46	0.4	-4.1
1750	53.7	14.7	1.43	53.4	1.49	0.5	-4.0
1800	53.7	14.6	1.46	53.3	1.52	0.8	-3.9
1810	53.7	14.6	1.47	53.3	1.52	0.8	-3.3
1825	53.7	14.6	1.48	53.3	1.52	0.8	-2.6
1850	53.6	14.5	1.50	53.3	1.52	0.6	-1.3
1900	53.5	14.5	1.53	53.3	1.52	0.4	0.7
1950	53.5	14.5	1.57	53.3	1.52	0.4	3.3
2000	53.4	14.4	1.60	53.3	1.52	0.2	5.3
2050	53.4	14.4	1.64	53.2	1.57	0.3	4.5
2100	53.3	14.4	1.68	53.2	1.62	0.2	3.7
2150	53.3	14.4	1.72	53.1	1.66	0.4	3.6
2200	53.2	14.4	1.76	53.0	1.71	0.3	2.9
2250	53.1	14.4	1.81	53.0	1.76	0.2	2.8
2300	53.1	14.4	1.85	52.9	1.81	0.4	2.2
2350	53.0	14.5	1.89	52.8	1.85	0.3	2.2
2400	52.9	14.5	1.94	52.8	1.90	0.2	2.1
2450	52.9	14.5	1.98	52.7	1.95	0.4	1.5
2500	52.8	14.6	2.03	52.6	2.02	0.3	0.5
2550	52.7	14.6	2.07	52.6	2.09	0.2	-1.0
2600	52.6	14.7	2.12	52.5	2.16	0.2	-1.9



3500	51.1	15.5	3.02	51.3	3.31	-0.4	-8.8
3700	50.8	15.7	3.24	51.1	3.55	-0.5	-8.8
4200	48.1	18.2	5.27	49.0	5.30	-1.8	-0.6
4250	48.0	18.3	5.34	49.0	5.36	-1.9	-0.4
4300	47.9	18.4	5.41	48.9	5.42	-2.0	-0.2
4500	47.5	18.6	5.70	48.6	5.65	-2.2	0.8
4600	47.3	18.8	5.84	48.5	5.77	-2.3	1.3
4700	47.1	18.9	5.99	48.3	5.88	-2.5	1.8
4800	47.0	19.0	6.14	48.2	6.00	-2.6	2.3

TSL Dielectric Parameters

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Figure C-2
 600 – 5800 MHz Body Tissue Equivalent Matter

FCC ID: A3LSMF916U	 Prepared by the partner of	SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 06/28/20-08/24/20	DUT Type: Portable Handset			APPENDIX C: Page 2 of 3

Measurement Certificate / Material Test

Item Name	Head Tissue Simulating Liquid (HBBL600-10000V6)
Product No.	SL AAH U16 BC (Batch: 181031-2)
Manufacturer	SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the IEEE 1528 and IEC 62209 compliance standards.

Test Condition

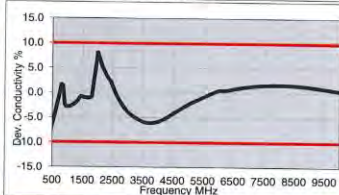
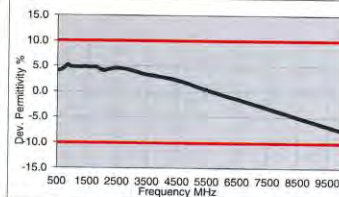
Ambient Condition 22°C ; 30% humidity
 TSL Temperature 22°C
 Test Date 31-Oct-18
 Operator CL

Additional Information

TSL Density
 TSL Heat-capacity

Results

f [MHz]	Measured			Target		Diff.to Target [%]	
	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
800	43.8	20.5	0.91	41.7	0.90	5.1	1.4
825	43.8	20.1	0.92	41.6	0.91	5.3	1.5
835	43.8	19.9	0.93	41.5	0.91	5.4	2.0
850	43.7	19.7	0.93	41.5	0.92	5.3	1.5
900	43.5	18.9	0.95	41.5	0.97	4.8	-2.1
1400	42.5	15.0	1.17	40.6	1.18	4.7	-0.8
1450	42.5	14.8	1.19	40.5	1.20	4.9	-0.8
1600	42.2	14.3	1.27	40.3	1.28	4.7	-1.1
1625	42.2	14.2	1.29	40.3	1.30	4.8	-0.7
1640	42.2	14.2	1.30	40.3	1.31	4.8	-0.5
1650	42.1	14.2	1.30	40.2	1.31	4.6	-1.0
1700	42.1	14.0	1.33	40.2	1.34	4.8	-0.9
1750	42.0	13.9	1.36	40.1	1.37	4.8	-0.8
1800	41.9	13.9	1.39	40.0	1.40	4.7	-0.7
1810	41.9	13.8	1.40	40.0	1.40	4.7	0.0
1825	41.9	13.8	1.41	40.0	1.40	4.7	0.7
1850	41.8	13.8	1.42	40.0	1.40	4.5	1.4
1900	41.8	13.7	1.45	40.0	1.40	4.5	3.6
1950	41.7	13.7	1.48	40.0	1.40	4.3	5.7
2000	41.6	13.6	1.51	40.0	1.40	4.0	7.9
2050	41.6	13.6	1.55	39.9	1.44	4.2	7.3
2100	41.5	13.5	1.58	39.8	1.49	4.2	6.1
2150	41.4	13.5	1.62	39.7	1.53	4.2	5.7
2200	41.4	13.5	1.65	39.6	1.58	4.4	4.6
2250	41.3	13.5	1.69	39.6	1.62	4.4	4.2
2300	41.2	13.5	1.72	39.5	1.67	4.4	3.2
2350	41.1	13.5	1.76	39.4	1.71	4.4	2.9
2400	41.1	13.5	1.80	39.3	1.76	4.6	2.5
2450	41.0	13.5	1.84	39.2	1.80	4.6	2.2
2500	40.9	13.5	1.88	39.1	1.85	4.5	1.4
2550	40.8	13.5	1.92	39.1	1.91	4.4	0.6
2600	40.8	13.6	1.95	39.0	1.96	4.6	-0.2
3500	39.2	14.1	2.74	37.9	2.91	3.3	-5.8
3700	38.9	14.2	2.93	37.7	3.12	3.1	-6.1



5200	36.3	15.8	4.57	35.0	4.66	0.9	-1.7
5250	36.2	15.9	4.63	35.9	4.71	0.8	-1.6
5300	36.1	15.9	4.69	35.9	4.76	0.7	-1.4
5500	35.8	16.1	4.92	35.6	4.96	0.3	-0.9
5600	35.6	16.2	5.04	35.5	5.07	0.1	-0.6
5700	35.4	16.2	5.15	35.4	5.17	0.0	-0.3
5800	35.2	16.3	5.27	35.3	5.27	-0.2	0.0
6000	34.9	16.5	5.50	35.1	5.48	-0.6	0.5
6500	34.0	16.9	6.12	34.5	6.07	-1.4	0.9
7000	33.1	17.3	6.74	33.9	6.65	-2.3	1.3
7600	32.2	17.6	7.36	33.3	7.24	-3.2	1.6
8000	31.4	17.9	7.97	32.7	7.84	-4.1	1.7
8500	30.5	18.2	8.59	32.1	8.45	-5.0	1.6
9000	29.7	18.4	9.20	31.5	9.08	-5.9	1.3
9500	28.9	18.5	9.80	31.0	9.71	-6.8	0.9
10000	28.1	18.7	10.40	30.4	10.36	-7.6	0.4

TSL Dielectric Parameters

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Figure C-3
 600 – 5800 MHz Head Tissue Equivalent Matter

FCC ID: A3LSMF916U		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 06/28/20-08/24/20	DUT Type: Portable Handset			APPENDIX C: Page 3 of 3

APPENDIX D: SAR SYSTEM VALIDATION

Per FCC KDB Publication 865664 D02v01r02, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

Table D-1
SAR System Validation Summary – 1g

SAR SYSTEM #	FREQ. [MHz]	DATE	PROBE SN	PROBE CAL. POINT	COND.	PERM.	CW VALIDATION			MOD. VALIDATION		
					(σ)	(ε _r)	SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
E	750	2/20/2020	3589	750	Head	0.889	43.647	PASS	PASS	PASS	N/A	N/A
L	835	9/24/2019	7410	835	Head	0.911	42.199	PASS	PASS	PASS	GMSK	PASS
L	835	7/6/2020	7406	835	Head	0.903	42.76	PASS	PASS	PASS	GMSK	PASS
E	1750	2/20/2020	3589	1750	Head	1.390	41.519	PASS	PASS	PASS	N/A	N/A
L	1750	7/11/2020	7406	1750	Head	1.321	41.025	PASS	PASS	PASS	N/A	N/A
L	1900	9/24/2019	7410	1900	Head	1.442	39.947	PASS	PASS	PASS	GMSK	PASS
L	1900	7/7/2020	7406	1900	Head	1.403	40.885	PASS	PASS	PASS	GMSK	PASS
P	2300	10/8/2019	7551	2300	Head	1.742	39.398	PASS	PASS	PASS	N/A	N/A
E	2450	2/5/2020	3589	2450	Head	1.823	38.835	PASS	PASS	PASS	OFDM/TDD	PASS
E	2600	2/5/2020	3589	2600	Head	1.933	38.635	PASS	PASS	PASS	TDD	PASS
D	3500	2/4/2020	7488	3500	Head	2.882	36.886	PASS	PASS	PASS	TDD	PASS
D	3700	2/4/2020	7488	3700	Head	3.037	36.597	PASS	PASS	PASS	TDD	PASS
H	5250	5/7/2020	7357	5250	Head	4.644	35.12	PASS	PASS	PASS	OFDM	N/A
H	5600	5/7/2020	7357	5600	Head	5.03	34.51	PASS	PASS	PASS	OFDM	N/A
H	5750	5/7/2020	7357	5750	Head	5.207	34.26	PASS	PASS	PASS	OFDM	N/A
L	750	8/20/2019	7410	750	Body	0.941	54.921	PASS	PASS	PASS	N/A	N/A
P	750	9/26/2019	7551	750	Body	0.959	54.287	PASS	PASS	PASS	N/A	N/A
D	835	2/20/2020	7488	835	Body	1.001	53.45	PASS	PASS	PASS	GMSK	PASS
P	835	9/26/2019	7551	835	Body	0.991	54.104	PASS	PASS	PASS	GMSK	PASS
I	1750	6/17/2020	7570	1750	Body	1.518	52.03	PASS	PASS	PASS	N/A	N/A
L	1750	7/20/2020	7406	1750	Body	1.507	51.756	PASS	PASS	PASS	N/A	N/A
J	1900	1/1/2020	7571	1900	Body	1.579	51.919	PASS	PASS	PASS	GMSK	PASS
K	2300	7/7/2020	7409	2300	Body	1.85	51.59	PASS	PASS	PASS	N/A	N/A
O	2450	5/27/2020	7552	2450	Body	2.038	55.028	PASS	PASS	PASS	OFDM/TDD	PASS
K	2450	7/7/2020	7409	2450	Body	2.018	51.18	PASS	PASS	PASS	OFDM/TDD	PASS
K	2600	7/8/2020	7409	2600	Body	2.194	50.73	PASS	PASS	PASS	TDD	PASS
O	2600	5/27/2020	7552	2600	Body	2.183	54.825	PASS	PASS	PASS	TDD	PASS
D	3500	2/12/2020	7488	3500	Body	3.373	50.003	PASS	PASS	PASS	TDD	PASS
D	3700	2/12/2020	7488	3700	Body	3.585	49.719	PASS	PASS	PASS	TDD	PASS
G	5250	6/8/2020	7538	5250	Body	5.400	47.530	PASS	PASS	PASS	OFDM	N/A
G	5600	6/8/2020	7538	5600	Body	5.857	46.970	PASS	PASS	PASS	OFDM	N/A
G	5750	6/8/2020	7538	5750	Body	6.061	46.723	PASS	PASS	PASS	OFDM	N/A

FCC ID: A3LSMF916U		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 06/28/20-08/24/20	DUT Type: Portable Handset	APPENDIX D: Page 1 of 2		

Table D-2
SAR System Validation Summary – 10g

SAR SYSTEM #	FREQ. [MHz]	DATE	PROBE SN	PROBE CAL. POINT	COND.	PERM.	CW VALIDATION			MOD. VALIDATION		
					(σ)	(εr)	SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
L	750	8/20/2019	7410	750	Body	0.941	54.921	PASS	PASS	PASS	N/A	N/A
P	750	9/26/2019	7551	750	Body	0.959	54.287	PASS	PASS	PASS	N/A	N/A
E	750	2/21/2020	3589	750	Body	0.965	53.65	PASS	PASS	PASS	N/A	N/A
P	835	9/26/2019	7551	835	Body	0.991	54.104	PASS	PASS	PASS	GMSK	PASS
D	835	2/20/2020	7488	835	Body	1.001	53.45	PASS	PASS	PASS	GMSK	PASS
I	1750	6/17/2020	7570	1750	Body	1.518	52.03	PASS	PASS	PASS	N/A	N/A
L	1750	7/20/2020	7406	1750	Body	1.507	51.756	PASS	PASS	PASS	N/A	N/A
J	1900	1/1/2020	7571	1900	Body	1.579	51.919	PASS	PASS	PASS	GMSK	PASS
H	1900	6/1/2020	7357	1900	Body	1.555	51.21	PASS	PASS	PASS	GMSK	PASS
K	2300	7/7/2020	7409	2300	Body	1.85	51.59	PASS	PASS	PASS	N/A	N/A
K	2450	7/7/2020	7409	2450	Body	2.018	51.18	PASS	PASS	PASS	OFDM/TDD	PASS
O	2450	5/27/2020	7552	2450	Body	2.038	55.028	PASS	PASS	PASS	OFDM/TDD	PASS
K	2600	7/8/2020	7409	2600	Body	2.194	50.73	PASS	PASS	PASS	TDD	PASS
O	2600	5/27/2020	7552	2600	Body	2.183	54.825	PASS	PASS	PASS	TDD	PASS
D	3500	2/12/2020	7488	3500	Body	3.373	50.003	PASS	PASS	PASS	TDD	PASS
D	3700	2/12/2020	7488	3700	Body	3.585	49.719	PASS	PASS	PASS	TDD	PASS
G	5250	6/8/2020	7538	5250	Body	5.400	47.530	PASS	PASS	PASS	OFDM	N/A
G	5600	6/8/2020	7538	5600	Body	5.857	46.970	PASS	PASS	PASS	OFDM	N/A
G	5750	6/8/2020	7538	5750	Body	6.061	46.723	PASS	PASS	PASS	OFDM	N/A

NOTE: While the probes have been calibrated for both CW and modulated signals, all measurements were performed using communication systems calibrated for CW signals only. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01r04 for scenarios when CW probe calibrations are used with other signal types. SAR systems were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to FCC KDB Publication 865664 D01v01r04.

FCC ID: A3LSMF916U	 PCTEST Protest to be passed	SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 06/28/20-08/24/20	DUT Type: Portable Handset	APPENDIX D: Page 2 of 2		

1.2 LTE Downlink Only Carrier Aggregation Test Selection and Setup

SAR test exclusion for LTE downlink Carrier Aggregation is determined by power measurements according to the number component carriers (CCs) supported by the product implementation. For those configurations required by April 2018 TCBC Workshop Notes, conducted power measurements with LTE Carrier Aggregation (CA) (downlink only) active are made in accordance to KDB Publication 941225 D05Av01r02. The RRC connection is only handled by one cell, the primary component carrier (PCC) for downlink and uplink communications. After making a data connection to the PCC, the UE device adds secondary component carrier(s) (SCC) on the downlink only. All uplink communications and acknowledgements remain identical to specifications when downlink carrier aggregation is inactive on the PCC. Additional conducted output powers are measured with the downlink carrier aggregation active for the configuration with highest measured maximum conducted power with downlink carrier aggregation inactive measured among the channel bandwidth, modulation, and RB combinations in each frequency band.

This device supports LAA with downlink carrier aggregation only. It uses carrier aggregation in the downlink to combine LTE in the unlicensed spectrum (i.e. LTE Band 46) with LTE in the licensed band (served as PCC). All uplink communications and acknowledgements on the PCC remain identical to specifications when downlink carrier aggregation is inactive.

Per FCC KDB Publication 941225 D05Av01r02, no SAR measurements are required for carrier aggregation configurations when the maximum average output power with downlink only carrier aggregation active is not more than 0.25 dB higher than the average output power with downlink only carrier aggregation inactive. All bands required for SAR testing per FCC KDB procedures were considered. Based on the measured maximum powers below, no additional SAR tests were required for DLCA SAR configurations.

General PCC and SCC configuration selection procedure

- PCC uplink channel, channel bandwidth, modulation and RB configurations were selected based on section C)3)b)iii) of KDB 941225 D05 V01r02. The downlink PCC channel was paired with the selected PCC uplink channel according to normal configurations without carrier aggregation.
- To maximize aggregated bandwidth, highest channel bandwidth available for that CA combination was selected for SCC. For inter-band CA, the SCC downlink channels were selected near the middle of their transmission bands. For contiguous intra-band CA, the downlink channel spacing between the component carriers was set to multiple of 300 kHz less than the nominal channel spacing defined in section 5.4.1A of 3GPP TS 36.521. For non-contiguous intra-band CA, the downlink channel spacing between the component carriers was set to be larger than the nominal channel spacing and provided maximum separation between the component carriers.
- All selected PCC and SCC(s) remained fully within the uplink/downlink transmission band of the respective component carrier.

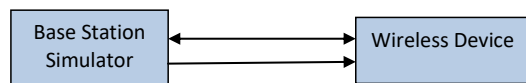


Figure 1
DL CA Power Measurement Setup

FCC ID: A3LSMF916U	 Proud to be part of 	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 06/28/20-08/24/20	DUT Type: Portable Handset			APPENDIX F: Page 2 of 15

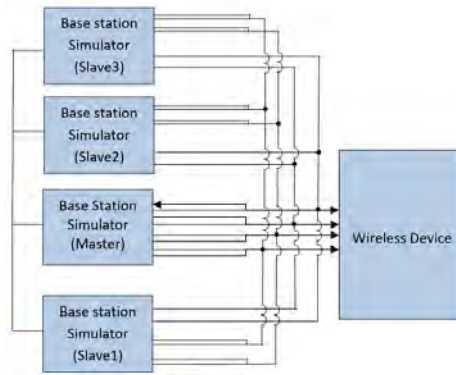


Figure 2
DL CA with DL 4x4 MIMO Power Measurement Setup

1.3 Downlink Carrier Aggregation RF Conducted Powers

1.3.1 LTE Band 71 as PCC

Table 1
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC				SCC 1				SCC 2				SCC 3				Power	
						PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA 4A-4A-71A	LTE B71	20	13297	680.5	QPSK	1	0	68761	634.5	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	-	-	-	-	24.70	24.67
CA 4B4-4B4-71A	LTE B71	20	13297	680.5	QPSK	1	0	68761	634.5	LTE B4B	20	55960	3625	LTE B4B	20	55640	3690	-	-	-	-	24.62	24.67
CA 4B4-71A	LTE B71	20	13297	680.5	QPSK	1	0	68761	634.5	LTE B4B	20	55960	3625	LTE B4B	20	55188	3644.8	-	-	-	-	24.36	24.67
CA 2A-2A-4A-71A	LTE B71	20	13297	680.5	QPSK	1	0	68761	634.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	24.68	24.67
CA 2A-2A-66A-71A	LTE B71	20	13297	680.5	QPSK	1	0	68761	634.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6B	20	66786	2145	24.70	24.67
CA 2A-66A-66A-71A	LTE B71	20	13297	680.5	QPSK	1	0	68761	634.5	LTE B2	20	900	1960	LTE B6B	20	66786	2145	LTE B6B	20	67236	2190	24.70	24.67
CA 2A-66C-71A	LTE B71	20	13297	680.5	QPSK	1	0	68761	634.5	LTE B2	20	900	1960	LTE B6B	20	66786	2145	LTE B6B	20	66684	2164.8	24.71	24.67

1.3.2 LTE Band 12 as PCC

Table 2
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC				SCC 1				SCC 2				SCC 3				Power	
						PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA 2A-12A (1)	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	-	-	-	-	-	-	-	-	25.01	25.10
CA 4A-12A (1)	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	25.13	25.10
CA 4A-12A (2)	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4	20	2175	2132.5	-	-	-	-	-	-	-	-	25.13	25.10
CA 12A-2A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	-	-	-	-	-	-	-	-	25.06	25.10
CA 12A-4A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4B	20	55960	5537.5	-	-	-	-	-	-	-	-	25.06	25.10
CA 12A-66A (1)	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B6B	20	66786	2145	-	-	-	-	-	-	-	-	25.08	25.10
CA 12A-66A (2)	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B6B	20	66786	2145	-	-	-	-	-	-	-	-	25.08	25.10
CA 4A-4A-12A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	-	-	-	-	25.55	25.35
CA 12A-4C	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4B	20	55467	5517.7	-	-	-	-	-	-	-	-	25.09	25.10
CA 12A-12A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B4	20	2175	2132.5	25.20	25.10
CA 2A-2A-12A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6B	20	66984	2164.8	25.13	25.10
CA 2A-12A-66C	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B6B	20	66786	2145	LTE B6B	20	66984	2164.8	25.13	25.10
CA 12A-4C	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B4B	20	55467	5517.7	LTE B4B	20	55467	5517.7	LTE B4B	20	55467	5517.7	25.20	25.10
CA 2A-2A-12A-30A-66A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B3B	20	6620	2355	25.17	25.10
CA 2A-2A-12A-66A-66A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B6B	20	66786	2145	25.20	25.10
CA 2A-12A-30A-66A-66A	LTE B12	10	23095	707.5	QPSK	1	49	5095	737.5	LTE B2	20	900	1960	LTE B3B	20	6620	2355	LTE B6B	20	67236	2190	25.14	25.10

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1.3.3 LTE Band 13 as PCC

Table 3
Maximum Output Powers

[illegible]

1.3.4 LTE Band 14 as PCC

Table 4
Maximum Output Powers

		PCC								SCC 1				SCC 2				SCC 3				SCC 4				Power	
Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC [DL] Channel	PCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	LTE Tx Power with DC CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA 2A-2A-10A-20A-60A	LTE B14	5	23330	793	QPSK	1	12	5130	763	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B3	10	18620	2355	LTE B3	20	66786	2145	24.08	24.15
CA 2A-2A-14A-40A-60A	LTE B14	5	23330	793	QPSK	1	12	5130	763	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B3	20	66786	2145	LTE B3	20	67236	2145	24.11	24.15
CA 2A-2A-10A-60A-60A	LTE B14	5	23330	793	QPSK	1	12	5130	763	LTE B2	20	900	1960	LTE B2	20	700	1940	LTE B3	20	66786	2145	LTE B3	20	67236	2145	24.11	24.15

1.3.5 LTE Band 26 as PCC

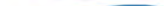
Table 5
Maximum Output Powers

Combination	PCC										SCC 1				SCC 2				SCC 3				Power	
	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC (UL) Freq. [MHz]	Mod.	PCC UL#1 RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power (dBm)	
CA_25A_25A-26A	LTE B26	3	26B65	831.5	QPSK	1	14	8B65	876.5	LTE B25	20	8365	1982.5	LTE B25	20	8590	1985	-	-	-	-	24.44	24.61	
CA_26A_26A-41A	LTE B26	15	26B65	831.5	QPSK	1	36	8B65	876.5	LTE B25	20	8365	1982.5	LTE B41	20	40620	2593	-	-	-	-	24.87	24.74	
CA_26A-41C	LTE B26	15	26B65	831.5	QPSK	1	36	8B65	876.5	LTE B41	20	40620	2593	LTE B41	20	40422	2573.2	-	-	-	-	24.64	24.74	
CA_25A-26A-41C	LTE B26	15	26B65	831.5	QPSK	1	36	8B65	876.5	LTE B25	20	8140	1940	LTE B41	20	40620	2593	LTE B41	20	40422	2573.2	24.54	24.74	

1.3.6 LTE Band 5 as PCC

Table 6
Maximum Output Powers

[illegible]

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1.3.7 LTE Band 66 as PCC

Table 7
Maximum Output Powers

[illegible]

1.3.8 LTE Band 25 as PCC

Table 8
Maximum Output Powers

[illegible]

1.3.9 LTE Band 30 as PCC

Table 9
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch	Mod.	PCC				SCC 1				SCC 2				SCC 3				SCC 4				LTE Tx Power with CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]
					PCC UL RB	PCC UL RB Offset	PCC [DL] Channel	PCC [DL] Freq. [MHz]	SCC Band	SCC [DL] Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC [DL] Channel	SCC [DL] Freq. [MHz]			
CA 2A-2A-2A-3A	LTE E830	5	27710	2310	QPSK	1	12	9820	2355	LTE E82	20	1960	LTE E82	20	700	1940	LTE E820	10	9715	722.5	20	68785	2145	23.61	23.94	
CA 2A-2A-3A-3A	LTE E830	5	27710	2310	QPSK	1	12	9820	2355	LTE E82	20	1960	LTE E820	10	9715	722.5	LTE E805	20	68785	2145	20	68785	2145	23.61	23.94	
CA 2A-2A-3A-6A	LTE E830	5	27710	2310	QPSK	1	12	9820	2355	LTE E82	20	1960	LTE E820	10	9715	722.5	LTE E805	20	68785	2145	20	68785	2145	23.61	23.94	
CA 2A-2A-3A-6A	LTE E830	5	27710	2310	QPSK	1	12	9820	2355	LTE E82	20	1960	LTE E82	20	700	1940	LTE E815	10	9725	881.5	LTE E805	20	68785	2145	23.61	23.94
CA 2A-2A-1A-3A-6A	LTE E830	5	27710	2310	QPSK	1	12	9820	2355	LTE E82	20	1960	LTE E82	20	700	1940	LTE E812	10	9725	717.5	LTE E805	20	68785	2145	23.64	23.94
CA 2A-2A-1A-3A-6A	LTE E830	5	27710	2310	QPSK	1	12	9820	2355	LTE E82	20	1960	LTE E82	20	700	1940	LTE E814	10	9725	717.5	LTE E805	20	68785	2145	23.64	23.94
CA 2A-3A-3A-6A-6A	LTE E830	5	27710	2310	QPSK	1	12	9820	2355	LTE E82	20	1960	LTE E82	20	700	1940	LTE E815	10	9725	881.5	LTE E805	20	68785	2145	23.64	23.94
CA 2A-3A-3A-6A	LTE E830	5	27710	2310	QPSK	1	12	9820	2355	LTE E82	20	1960	LTE E82	20	700	1940	LTE E815	10	9725	881.5	LTE E805	20	68785	2145	23.64	23.94
CA 2A-3A-3A-6A-6A	LTE E830	5	27710	2310	QPSK	1	12	9820	2355	LTE E82	20	1960	LTE E82	20	700	1940	LTE E814	10	9725	717.5	LTE E805	20	68785	2145	23.64	23.94
CA 2A-1A-3A-6A-6A	LTE E830	5	27710	2310	QPSK	1	12	9820	2355	LTE E82	20	1960	LTE E82	20	700	1940	LTE E814	10	9725	717.5	LTE E805	20	68785	2145	23.64	23.94
CA 2A-1A-3A-6A-6A	LTE E830	5	27710	2310	QPSK	1	12	9820	2355	LTE E82	20	1960	LTE E82	20	700	1940	LTE E814	10	9725	717.5	LTE E805	20	68785	2145	23.64	23.94

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1.3.10 LTE Band 41 as PCC

Table 10
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC		Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC 1		SCC 2		SCC 3		SCC 4		Power	
				PCC (UL) Freq. [MHz]	PCC (UL) Mod.						SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]
CA 41A-41A (1)	LTE B41	20	41490	2680	QPSK	1	50		41490	2680	LTE B41	20	39750	2500	-	-	-	-	24.20	24.43
CA 41A-41C	LTE B41	20	41490	2680	QPSK	1	50		41490	2680	LTE B41	20	39940	2525.8	LTE B41	20	39750	2500	24.41	24.43
CA 41C-41A	LTE B41	20	41490	2680	QPSK	1	50		41490	2680	LTE B41	20	41250	2600.2	LTE B41	20	39750	2500	24.40	24.43
CA 41A-41D	LTE B41	20	41490	2680	QPSK	1	50		41490	2680	LTE B41	20	40140	2545.6	LTE B41	20	39940	2525.8	24.42	24.43
CA 41D-41A	LTE B41	20	41490	2680	QPSK	1	50		41490	2680	LTE B41	20	41250	2600.2	LTE B41	20	39750	2500	24.40	24.43
CA 41C-41C	LTE B41	20	41490	2680	QPSK	1	50		41490	2680	LTE B41	20	41250	2600.2	LTE B41	20	39750	2500	24.38	24.43
CA 41E	LTE B41	20	41490	2680	QPSK	1	50		41490	2680	LTE B41	20	41250	2600.2	LTE B41	20	41040	2640.4	24.43	24.43
CA 41C-41D	LTE B41	20	41490	2680	QPSK	1	50		41490	2680	LTE B41	20	41250	2600.2	LTE B41	20	40140	2545.6	24.43	24.43
CA 41E-41C	LTE B41	20	41490	2680	QPSK	1	50		41490	2680	LTE B41	20	41250	2600.2	LTE B41	20	39940	2525.8	24.42	24.43

1.3.11 LTE Band 48 as PCC

Table 11
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC (UL) Ch.	PCC		Mod.	PCC UL RB	PCC UL RB Offset	PCC (DL) Channel	PCC (DL) Freq. [MHz]	SCC 1		SCC 2		SCC 3		SCC 4		Power	
				PCC (UL) Freq. [MHz]	PCC (UL) Mod.						SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	SCC Band	SCC BW [MHz]	SCC (DL) Channel	SCC (DL) Freq. [MHz]	LTE Tx Power with DL CA Enabled [dBm]	LTE Single Carrier Tx Power [dBm]
CA 48A-48A	LTE B48	5	56715	3697.5	QPSK	1	24		56715	3697.5	LTE B48	20	55340	3500	-	-	-	-	24.44	24.40
CA 48A-48C	LTE B48	5	56715	3697.5	QPSK	1	24		56715	3697.5	LTE B48	20	55340	3500	LTE B48	20	55538	3579.8	24.44	24.40
CA 48C-48A	LTE B48	5	56715	3697.5	QPSK	1	24		56715	3697.5	LTE B48	20	55340	3500	LTE B48	20	55340	3500	24.39	24.40
CA 48A-48D	LTE B48	5	56715	3697.5	QPSK	1	24		56715	3697.5	LTE B48	20	55340	3500	LTE B48	20	55538	3579.8	24.39	24.40
CA 48D-48A	LTE B48	5	56715	3697.5	QPSK	1	24		56715	3697.5	LTE B48	20	55340	3500	LTE B48	20	55340	3500	24.35	24.40
CA 48C-48C	LTE B48	5	56715	3697.5	QPSK	1	24		56715	3697.5	LTE B48	20	55340	3500	LTE B48	20	55538	3579.8	24.40	24.40
CA 48C-48D	LTE B48	5	56715	3697.5	QPSK	1	24		56715	3697.5	LTE B48	20	55340	3500	LTE B48	20	55538	3579.8	24.37	24.40
CA 48D-48C	LTE B48	5	56715	3697.5	QPSK	1	24		56715	3697.5	LTE B48	20	55340	3500	LTE B48	20	55340	3500	24.40	24.40
CA 48F	LTE B48	5	56715	3697.5	QPSK	1	24		56715	3697.5	LTE B48	20	55340	3500	LTE B48	20	55538	3579.8	24.40	24.40

1.4 DL CA with DL 4x4 MIMO RF Conduction Powers

This device supports downlink 4x4 MIMO operations for some LTE bands. Uplink transmission is limited to a single output stream. When carrier aggregation was applicable, the general test selection and setup procedures described in Section 1.2 were applied.

Per May 2017 TCB Workshop Notes, SAR for 4x4 DL MIMO was not needed since the maximum average output power in 4x4 DL MIMO mode was not more than 0.25 dB higher than the maximum output power with 4x4 DL MIMO inactive. Additionally, SAR for 4x4 MIMO Downlink Carrier Aggregation was not needed since the maximum average output power in 4x4 MIMO Downlink Carrier Aggregation mode was not more than 0.25 dB higher than the maximum output power with 4x4 MIMO Downlink and downlink carrier aggregation inactive.

1.4.1 LTE 4x4 MIMO DL Standalone Powers

Table 12
Maximum Output Powers

LTE Band	Bandwidth [MHz]	Channel	Frequency [MHz]	Modulation	RB Size	RB Offset	4x4 DL MIMO Tx. Power [dBm]	Single Antenna Tx. Power [dBm]	Target Power [dBm]
66	20	132572	1770	QPSK	1	99	24.26	24.30	24.0
25	15	26115	1857.5	QPSK	1	36	24.75	24.58	24.5
30	5	27710	2310	QPSK	1	12	23.90	23.94	24.0
41	20	41490	2680	QPSK	1	50	24.47	24.43	24.0
48	5	56715	3697.5	QPSK	1	24	24.32	24.40	24.0

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1.4.4 LTE Band 13 as PCC

Table 15
Maximum Output Powers

[illegible]

1.4.5 LTE Band 14 as PCC

Table 16
Maximum Output Powers

Combination		PCB Band	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	Mod.	SCC 1										SCC 2										SCC 3										SCC 4										Power																																																																																																																																																																																																																																																																																																																																																																																																																													
						PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]			PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. 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[MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. [MHz]]	PCB BW [MHz]	PCC [dB] [Freq. 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FCC ID: A3LSMF916U

Test Dates:
06/28/20-08/24/20

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SAR EVALUATION REPORT



Reviewed by:

Quality Manager

APPENDIX F:

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REV 21.3 M

02/15/2019

1.4.6 LTE Band 5 as PCC

Table 17
Maximum Output Powers

Combination	PCC Band	PCC [Hz]	PCC [Ch]	PCC [Ant]	Mod.	PCC										SCC 1										SCC 2										SCC 3										SCC 4										SCC 5										SCC 6										SCC 7										SCC 8										SCC 9										SCC 10										SCC 11										SCC 12										SCC 13										SCC 14										SCC 15										SCC 16										SCC 17										SCC 18										SCC 19										SCC 20										SCC 21										SCC 22										SCC 23										SCC 24										SCC 25										SCC 26										SCC 27										SCC 28										SCC 29										SCC 30										SCC 31										SCC 32										SCC 33										SCC 34										SCC 35										SCC 36										SCC 37										SCC 38										SCC 39										SCC 40										SCC 41										SCC 42										SCC 43										SCC 44										SCC 45										SCC 46										SCC 47										SCC 48										SCC 49										SCC 50										SCC 51										SCC 52										SCC 53										SCC 54										SCC 55										SCC 56										SCC 57										SCC 58										SCC 59										SCC 60										SCC 61										SCC 62										SCC 63										SCC 64										SCC 65										SCC 66										SCC 67										SCC 68										SCC 69										SCC 70										SCC 71										SCC 72										SCC 73										SCC 74										SCC 75										SCC 76										SCC 77										SCC 78										SCC 79										SCC 80										SCC 81										SCC 82										SCC 83										SCC 84										SCC 85										SCC 86										SCC 87										SCC 88										SCC 89										SCC 90										SCC 91										SCC 92										SCC 93										SCC 94										SCC 95										SCC 96										SCC 97										SCC 98										SCC 99										SCC 100										SCC 101										SCC 102										SCC 103										SCC 104										SCC 105										SCC 106										SCC 107										SCC 108										SCC 109										SCC 110										SCC 111										SCC 112										SCC 113										SCC 114										SCC 115										SCC 116										SCC 117										SCC 118										SCC 119										SCC 120										SCC 121										SCC 122										SCC 123										SCC 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1.4.8 LTE Band 66 as PCC

Table 19
Maximum Output Powers

Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL RB	PCC UL sub offset	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	PCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	LTE Tx Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)		
CA [2A]-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.12	24.30		
CA [2A]-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	2x2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.43	24.30		
CA [2A]-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.47	24.30		
CA [2A]-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B12	20	5095	737.5	2x2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.37	24.30		
CA [2A]-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B12	20	5095	737.5	2x2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.37	24.30		
CA 5A-46A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B5	10	5235	881.5	2x2	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	-	-	-	-	24.33	24.30	
CA 13A-46A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B13	10	5230	751	2x2	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	-	-	-	-	24.48	24.30	
CA 46A-66A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B66	20	66536	2120	2x2	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	-	-	-	-	24.35	24.30	
CA 46A-66A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B66	20	66536	2120	4x4	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	-	-	-	-	24.24	24.30	
CA 46A-66A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B66	20	66536	2120	4x4	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	-	-	-	-	24.45	24.30	
CA 66A-66C	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B66	20	66734	2139.8	2x2	LTE B66	20	66536	2120	2x2	-	-	-	-	-	-	-	-	-	-	-	-	24.37	24.30
CA 66C-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B66	20	66638	2150.2	2x2	LTE B66	20	66536	2120	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.22	24.30
CA 66A-66C	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B66	20	66734	2139.8	2x2	LTE B66	20	66536	2120	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.26	24.30
CA 66C-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B66	20	66638	2150.2	4x4	LTE B66	20	66536	2120	2x2	-	-	-	-	-	-	-	-	-	-	-	-	24.42	24.30
CA 66A-66C	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B66	20	66734	2139.8	4x4	LTE B66	20	66536	2120	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.43	24.30
CA 66C-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B66	20	66638	2150.2	4x4	LTE B66	20	66536	2120	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.41	24.30
CA [2A]-2A-66A-71A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.46	24.30	
CA [2A]-2A-66A-71A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	2x2	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.26	24.30
CA [2A]-2A-66A-71A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B2	20	900	1960	4x4	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.45	24.30
CA [2A]-2A-66A-71A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	900	1960	2x2	-	-	-	-	-	-	-	-	-	-	-	-	24.37	24.30
CA [2A]-2A-66A-71A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	4x4	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.26	24.30
CA [2A]-12A-66C	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B6	20	66638	2150.2	2x2	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.42	24.30
CA 2A-12A-66C	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B66	20	66638	2150.2	4x4	LTE B2	20	900	1960	2x2	-	-	-	-	-	-	-	-	-	-	-	-	24.14	24.30
CA [2A]-12A-66C	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B66	20	66638	2150.2	4x4	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.06	24.30
CA [2A]-13A-66C	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B66	20	66638	2150.2	2x2	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.10	24.30
CA [2A]-13A-66C	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B66	20	66638	2150.2	4x4	LTE B2	20	900	1960	2x2	-	-	-	-	-	-	-	-	-	-	-	-	24.13	24.30
CA [2A]-13A-66C	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B66	20	66638	2150.2	4x4	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.14	24.30
CA [2A]-29A-30A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B2	20	900	1960	4x4	LTE B28	10	9715	722.5	2x2	LTE B30	10	9820	2355	2x2	-	-	-	-	-	-	-	24.48	24.30
CA 2A-29A-30A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	2x2	LTE B28	10	9715	722.5	2x2	LTE B30	10	9820	2355	2x2	-	-	-	-	-	-	-	24.28	24.30
CA 2A-29A-30A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B2	20	900	1960	4x4	LTE B28	10	9715	722.5	2x2	LTE B30	10	9820	2355	2x2	-	-	-	-	-	-	-	24.40	24.30
CA [2A]-29A-30A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B2	20	900	1960	4x4	LTE B28	10	9715	722.5	2x2	LTE B30	10	9820	2355	2x2	-	-	-	-	-	-	-	24.28	24.30
CA [2A]-29A-30A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	2x2	LTE B28	10	9715	722.5	2x2	LTE B30	10	9820	2355	2x2	-	-	-	-	-	-	-	24.10	24.30
CA [2A]-29A-30A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	4x4	LTE B28	10	9715	722.5	2x2	LTE B30	10	9820	2355	2x2	-	-	-	-	-	-	-	24.08	24.30
CA [2A]-30A-66A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B66	20	66536	2120	4x4	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.10	24.30
CA [2A]-30A-66A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B66	20	66536	2120	4x4	LTE B2	20	900	1960	4x4	-	-	-	-	-	-	-	-	-	-	-	-	24.06	24.30
CA [2A]-46A-46A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	2x2	LTE B48	20	50665	5537.5	2x2	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	24.11	24.30
CA [2A]-46A-46A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	2x2	LTE B48	20	50665	5537.5	2x2	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	24.13	24.30
CA [2A]-46A-46A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B2	20	900	1960	4x4	LTE B48	20	50665	5537.5	2x2	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	24.38	24.30
CA [2A]-46A-46A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B2	20	900	1960	4x4	LTE B48	20	50665	5537.5	2x2	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	24.35	24.30
CA 2A-46A-46A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	2x2	LTE B48	20	50665	5537.5	2x2	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	24.15	24.30
CA 2A-46A-46A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	2x2	LTE B48	20	50665	5537.5	2x2	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	24.28	24.30
CA [2A]-46A-46A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	2x2	LTE B2	20	900	1960	4x4	LTE B48	20	50665	5537.5	2x2	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	24.26	24.30
CA [2A]-46A-46A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170	4x4	LTE B2	20	900	1960	4x4	LTE B48	20	50665	5537.5	2x2	LTE B48	20	50665	5537.5	2x2	-	-	-	-	-	-	-	24.18	24.30
CA [2A]-46A-46A-66A	LTE B66	20	132572	1770	QPSK	1	99	67036	2170																									

Maximum Output Powers

[illegible]

FCC ID: A3LSMF916U

Test Dates:

06/28/20-08/24/20



DUT Type

Portable Handset

SAR EVALUATION REPORT



Reviewed by:

Quality Manager

APPENDIX F:

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Table 21

[illegible]

FCC ID: A3LSMF916L

Test Dates:

06/28/20-08/24/20



DUT Type

Portable Handset

SAR EVALUATION REPORT



Reviewed by:

Quality Manager

APPENDIX F:

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Table 22

Commodity	FCC Reg.	FCC Reg. (MHz)	FCC Reg. (MHz)	FCC Reg. (MHz)	SEC				SEC 1				SEC 2				SEC 3				SEC 4				SEC 5				SEC 6				SEC 7				SEC 8				SEC 9				SEC 10				SEC 11				SEC 12				SEC 13				SEC 14				SEC 15				SEC 16				SEC 17				SEC 18				SEC 19				SEC 20				SEC 21				SEC 22				SEC 23				SEC 24				SEC 25				SEC 26				SEC 27				SEC 28				SEC 29				SEC 30				SEC 31				SEC 32				SEC 33				SEC 34				SEC 35				SEC 36				SEC 37				SEC 38				SEC 39				SEC 40				SEC 41				SEC 42				SEC 43				SEC 44				SEC 45				SEC 46				SEC 47				SEC 48				SEC 49				SEC 50				SEC 51				SEC 52				SEC 53				SEC 54				SEC 55				SEC 56				SEC 57				SEC 58				SEC 59				SEC 60				SEC 61				SEC 62				SEC 63				SEC 64				SEC 65				SEC 66				SEC 67				SEC 68				SEC 69				SEC 70				SEC 71				SEC 72				SEC 73				SEC 74				SEC 75				SEC 76				SEC 77				SEC 78				SEC 79				SEC 80				SEC 81				SEC 82				SEC 83				SEC 84				SEC 85				SEC 86				SEC 87				SEC 88				SEC 89				SEC 90				SEC 91				SEC 92				SEC 93				SEC 94				SEC 95				SEC 96				SEC 97				SEC 98				SEC 99				SEC 100				SEC 101				SEC 102				SEC 103				SEC 104				SEC 105				SEC 106				SEC 107				SEC 108				SEC 109				SEC 110				SEC 111				SEC 112				SEC 113				SEC 114				SEC 115				SEC 116				SEC 117				SEC 118				SEC 119				SEC 120				SEC 121				SEC 122				SEC 123				SEC 124				SEC 125				SEC 126				SEC 127				SEC 128				SEC 129				SEC 130				SEC 131				SEC 132				SEC 133				SEC 134				SEC 135				SEC 136				SEC 137				SEC 138				SEC 139				SEC 140				SEC 141				SEC 142				SEC 143				SEC 144				SEC 145				SEC 146				SEC 147				SEC 148				SEC 149				SEC 150				SEC 151				SEC 152				SEC 153				SEC 154				SEC 155				SEC 156				SEC 157				SEC 158				SEC 159				SEC 160				SEC 161				SEC 162				SEC 163				SEC 164				SEC 165				SEC 166				SEC 167				SEC 168				SEC 169				SEC 170				SEC 171				SEC 172				SEC 173				SEC 174				SEC 175				SEC 176				SEC 177				SEC 178				SEC 179				SEC 180				SEC 181				SEC 182				SEC 183				SEC 184				SEC 185				SEC 186				SEC 187				SEC 188				SEC 189				SEC 190				SEC 191				SEC 192				SEC 193				SEC 194				SEC 195				SEC 196				SEC 197				SEC 198				SEC 199				SEC 200				SEC 201				SEC 202				SEC 203				SEC 204				SEC 205				SEC 206				SEC 207				SEC 208				SEC 209				SEC 210				SEC 211				SEC 212				SEC 213				SEC 214				SEC 215				SEC 216				SEC 217				SEC 218				SEC 219				SEC 220				SEC 221				SEC 222				SEC 223				SEC 224				SEC 225				SEC 226				SEC 227				SEC 228				SEC 229				SEC 230				SEC 231				SEC 232				SEC 233				SEC 234				SEC 235				SEC 236				SEC 237				SEC 238				SEC 239				SEC 240				SEC 241				SEC 242				SEC 243				SEC 244				SEC 245				SEC 246				SEC 247				SEC 248				SEC 249				SEC 250				SEC 251				SEC 252				SEC 253				SEC 254				SEC 255				SEC 256				SEC 257				SEC 258				SEC 259				SEC 260				SEC 261				SEC 262				SEC 263				SEC 264				SEC 265				SEC 266				SEC 267				SEC 268				SEC 269				SEC 270				SEC 271				SEC 272				SEC 273				SEC 274				SEC 275				SEC 276				SEC 277				SEC 278				SEC 279				SEC 280				SEC 281				SEC 282				SEC 283				SEC 284				SEC 285				SEC 286				SEC 287				SEC 288				SEC 289				SEC 290				SEC 291				SEC 292				SEC 293				SEC 294				SEC 295				SEC 296				SEC 297				SEC 298				SEC 299				SEC 300				SEC 301				SEC 302				SEC 303				SEC 304				SEC 305				SEC 306				SEC 307				SEC 308				SEC 309				SEC 310				SEC 311				SEC 312				SEC 313				SEC 314				SEC 315				SEC 316				SEC 317				SEC 318				SEC 319				SEC 320				SEC 321				SEC 322				SEC 323				SEC 324				SEC 325				SEC 326				SEC 327				SEC 328				SEC 329				SEC 330				SEC 331				SEC 332				SEC 333				SEC 334				SEC 335				SEC 336				SEC 337				SEC 338				SEC 339				SEC 340				SEC 341				SEC 342				SEC 343				SEC 344				SEC 345				SEC 346				SEC 347				SEC 348				SEC 349				SEC 350				SEC 351				SEC 352				SEC 353				SEC 354				SEC 355				SEC 356				SEC 357				SEC 358				SEC 359				SEC 360				SEC 361				SEC 362				SEC 363				SEC 364				SEC 365				SEC 366				SEC 367				SEC 368				SEC 369				SEC 370				SEC 371				SEC 372				SEC 373				SEC 374				SEC 375				SEC 376				SEC 377				SEC 378				SEC 379				SEC 380				SEC 381				SEC 382				SEC 383				SEC 384				SEC 385				SEC 386				SEC 387				SEC 388				SEC 389				SEC 390				SEC 391				SEC 392				SEC 393				SEC 394				SEC 395				SEC 396				SEC 397				SEC 398				SEC 399				SEC 400				SEC 401				SEC 402				SEC 403				SEC 404				SEC 405				SEC 406				SEC 407				SEC 408				SEC 409				SEC 410				SEC 411				SEC 412				SEC 413				SEC 414				SEC 415				SEC 416				SEC 417				SEC 418				SEC 419				SEC 420				SEC 421				SEC 422				SEC 423				SEC 424				SEC 425				SEC 426				SEC 427				SEC 428				SEC 429				SEC 430				SEC 431				SEC 432				SEC 433				SEC 434				SEC 435				SEC 436				SEC 437				SEC 438				SEC 439				SEC 440				SEC 441				SEC 442				SEC 443				SEC 444				SEC 445				SEC 446				SEC 447				SEC 448				SEC 449				SEC 450				SEC 451				SEC 452				SEC 453				SEC 454				SEC 455				SEC 456				SEC 457				SEC 458				SEC 459				SEC 460				SEC 461				SEC 462				SEC 463				SEC 464				SEC 465				SEC 466				SEC 467				SEC 468				SEC 469				SEC 470				SEC 471				SEC 472				SEC 473				SEC 474				SEC 475				SEC 476				SEC 477				SEC 478				SEC 479				SEC 480				SEC 481				SEC 482				SEC 483				SEC 484				SEC 485				SEC 486				SEC 487				SEC 488				SEC 489				SEC 490				SEC 491				SEC 492				SEC 493				SEC 494				SEC 495				SEC 496				SEC 497				SEC 498				SEC 499				SEC 500				SEC 501				SEC 502				SEC 503				SEC 504				SEC 505				SEC 506				SEC 507				SEC 508				SEC 509				SEC 510				SEC 511				SEC 512				SEC 513				SEC 514				SEC 515				SEC 516				SEC 517				SEC 518				SEC 519				SEC 520				SEC 521				SEC 522				SEC 523				SEC 524				SEC 525				SEC 526				SEC 527				SEC 528				SEC 529				SEC 530				SEC 531				SEC 532				SEC 533				SEC 534				SEC 535				SEC 536				SEC 537				SEC 538				SEC 539				SEC 540				SEC 541				SEC 542				SEC 543				SEC 544				SEC 545				SEC 546				SEC 547				SEC 548				SEC 549				SEC 550				SEC 551				SEC 552				SEC 553				SEC 554				SEC 555				SEC 556				SEC 557				SEC 558				SEC 559				SEC 560				SEC 561				SEC 562				SEC 563				SEC 564				SEC 565				SEC 566				SEC 567				SEC 568				SEC 569				SEC 570				SEC 571				SEC 572				SEC 573				SEC 574				SEC 575				SEC 576				SEC 577				SEC 578				SEC 579				SEC 580				SEC 581				SEC 582				SEC 583				SEC 584				SEC 585				SEC 586				SEC 587				SEC 588				SEC 589				SEC 590				SEC 591				SEC 592				SEC 593				SEC 594				SEC 595				SEC 596				SEC 597				SEC 598				SEC 599				SEC 600				SEC 601				SEC 602				SEC 603				SEC 604				SEC 605				SEC 606				SEC 607				SEC 608				SEC 609				SEC 610				SEC 611				SEC 612				SEC 613				SEC 614				SEC 615				SEC 616				SEC 617				SEC 618				SEC 619				SEC 620				SEC 621				SEC 622				SEC 623				SEC 624				SEC 625				SEC 626				SEC 627				SEC 628				SEC 629				SEC 630				SEC 631				SEC 632				SEC 633				SEC 634				SEC 635				SEC 636				SEC 637				SEC 638				SEC 639				SEC 640				SEC 641				SEC 642				SEC 643				SEC 644				SEC 645				SEC 646				SEC 647				SEC 648				SEC 649				SEC 650				SEC 651				SEC 652				SEC 653				SEC 654				SEC 655				SEC 656				SEC 657				SEC 658				SEC 659				SEC 660				SEC 661				SEC 662				SEC 663				SEC 664				SEC 665				SEC 666				SEC 667				SEC 668				SEC 669				SEC 670				SEC 671				SEC 672				SEC 673				SEC 674				SEC 675				SEC 676				SEC 677				SEC 678				SEC 679				SEC 680				SEC 681				SEC 682				SEC 683				SEC 684				SEC 685				SEC 686				SEC 687				SEC 688				SEC 689				SEC 690				SEC 691				SEC 692				SEC 693				SEC 694				SEC 695				SEC 696				SEC 697				SEC 698				SEC 699				SEC 700				SEC 701				SEC 702				SEC 703				SEC 704				SEC 705				SEC 706				SEC 707				SEC 708				SEC 709				SEC 710				SEC 711				SEC 712				SEC 713				SEC 714				SEC 715				SEC 716				SEC 717				SEC 718				SEC 719				SEC 720				SEC 721				SEC 722				SEC 723				SEC 724				SEC 725				SEC 726				SEC 727				SEC 728				SEC 729				SEC 730				SEC 731				SEC 732				SEC 733				SEC 734				SEC 735				SEC 736				SEC 737				SEC 738				SEC 739				SEC 740				SEC 741				SEC 742				SEC 743				SEC 744				SEC 745				SEC 746				SEC 747				SEC 748				SEC 749				SEC 750				SEC 751				SEC 752				SEC 753				SEC 754				SEC 755				SEC 756				SEC 757				SEC 758				SEC 759				SEC 760				SEC 761				SEC 762				SEC 763				SEC 764				SEC 765				SEC 766				SEC 767				SEC 768				SEC 769				SEC 770				SEC 771				SEC 772				SEC 773				SEC 774				SEC 775				SEC 776				SEC 777				SEC 778				SEC 779				SEC 780				SEC 781				SEC 782				SEC 783				SEC 784				SEC 785				SEC 786				SEC 787				SEC 788				SEC 789				SEC 790				SEC 791				SEC 792				SEC 793				SEC 794				SEC 795				SEC 796				SEC 797				SEC 798				SEC 799				SEC 800				SEC 801				SEC 802				SEC 803				SEC 804				SEC 805				SEC 806				SEC 807				SEC 808				SEC 809				SEC 810				SEC 811				SEC 812				SEC 813				SEC 814				SEC 815				SEC 816				SEC 817				SEC 818				SEC 819				SEC 820				SEC 821				SEC 822				SEC 823				SEC 824				SEC 825				SEC 826				SEC 827				SEC 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1.4.9 LTE Band 25 as PCC

Table 23

[illegible]

FCC ID: A3LSMF916U	 PCTEST Proud to be part of the element	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 06/28/20-08/24/20	DUT Type: Portable Handset	APPENDIX F: Page 13 of 15		

1.4.10 LTE Band 30 as PCC

Table 24
Maximum Output Powers

[illegible]

1.4.11 LTE Band 41 as PCC

Table 25
Maximum Output Powers

PCC														SCC 3				SCC 2				SCC 1				SCC 4				Power
Combination	PCC Band	PCC BW [MHz]	PCC Ch. [LA/C]	PCC (LA) Freq. [MHz]	Mod.	PCC IBL	PCC UB	PCC IBL Offset	PCC (DL) Ch.	PCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC Ch. [LA/C]	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC Ch. [LA/C]	SCC (DL) Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC Ch. [LA/C]	SCC (DL) Freq. [MHz]	DL Ant. Config.	UL to Power with RLA Enabled (dBm)	UL to Power with RLA Disabled (dBm)	UL Single Carrier Tx Power (dBm)	
CA 141A141A(1)	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 141A141A(1)	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 141A141A(1)	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 141A141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41D141A	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41D141A	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	20	39750	2506	444	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41C141C	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	242	LTE B41	20	39750	2506	242	-	-	-	-	-	-	-	-	-	-	-	-	24.30	24.43	
CA 41A141D	LTE B41	20	41400	2480	QPSK	1	50	41400	2480	444	LTE B41	2																		

FCC ID: A3I SMF916L



SAR EVALUATION REPORT



Reviewed by:

Quality Manager

APPENDIX F:

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02/15/2019

1.4.12 LTE Band 48 as PCC

Table 26
Maximum Output Powers

[illegible]

1.5 Downlink Carrier Aggregation with Uplink Carrier Aggregation enabled

This device supports uplink carrier aggregation (ULCA) with additional Carrier Aggregation configurations active in the downlink. Power measurements were performed with ULCA active and additional CA configurations active in the downlink for the configuration per Fall 2017 TCB Workshop Notes.

Per FCC Guidance, additional SAR measurements for these configurations were not required since their maximum output power was not more than 0.25 dB higher than the maximum output power for with only ULCA active.

1.5.1 DL Carrier Aggregation RF Conducted Powers

Table 27
Maximum Output Powers

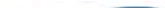
Combination	PCC										SSC 1										SSC 2										SSC 3										SSC 4										Power	
	PCF Band	PCF BW [MHz]	PCF (DL) Ch. [MHz]	PCF (UL) RB	PCF UL RB Offset	PCF (DL) Channel	PCF (DL) Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC (UL) Ch. [MHz]	SSC (UL) Freq. [MHz]	Mod.	SSC UL RB	SSC UL RB Offset	SSC (DL) Channel	SSC (DL) Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC (DL) Channel	SSC (DL) Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC (DL) Channel	SSC (DL) Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC (DL) Channel	SSC (DL) Freq. [MHz]	SSC Band	SSC BW [MHz]	SSC (DL) Channel	SSC (DL) Freq. [MHz]	ULCA with HARQ-CC (dBm)	ULCA Tx Power (dBm)																		
CA 41C-41A	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41D	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41E	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41F	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41G	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41H	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41I	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41J	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41K	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41L	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41M	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41N	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41O	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41P	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41Q	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41R	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41S	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41T	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41U	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41V	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41W	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41X	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41Y	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		
CA 41C-41Z	LTE-B41	20	41400	2680	0	CPICH	1	0	41400	2680	LTE-B41	20	41200	2660.2	CPICH	1	0	41200	2660.2	LTE-B41	20	41000	2640.2	CPICH	1	0	41000	2620.2	LTE-B41	20	40800	2600.2	24.50	24.50																		

1.5.2 DL Carrier Aggregation with DL 4x4 MIMO RF Conducted Powers

Note: 4x4 DL MIMO is only operating in the downlink. Uplink transmission is limited to a single output stream for each component carrier of ULCA.

Table 28
Maximum Output Powers

Combination	PCC										SCC 1										Power					
	PCC Band	PCC Bandwidth [MHz]	PCC [UL] Channel	PCC [UL] Frequency [MHz]	Modulation	PCC UL RB	PCC UL RB Offset	PCC [DL] Channel	PCC [DL] Frequency [MHz]	DL Ant. Config.	SCC Band	SCC Bandwidth [MHz]	PCC [UL] Channel	PCC [UL] Frequency [MHz]	Modulation	PCC UL RB	PCC UL RB Offset	SCC [DL] Channel	SCC [DL] Frequency [MHz]	DL Ant. Config.	ULCA Tx Power with add'l CA on DL Config.	ULCA Tx Power [dBm]	LTE Single Carrier Tx Power [dBm]			
CA {60B}	LTE B66	10	136262	1775	QPSK	1	0	67086	2175	4x4	LTE B66	10	132523	1765.1	QPSK	1	49	66987	2165.1	4x4	24.00	24.00	24.00			
CA {66C}	LTE B66	20	132572	1770	QPSK	1	0	67036	2170	4x4	LTE B66	20	123274	1750.2	QPSK	1	99	66838	2150.2	4x4	23.85	23.85	23.85			
																							Power			
Combination	PCC Band	PCC BW [MHz]	PCC [UL] Ch.	PCC [UL] Freq. [MHz]	Mod.	PCC UL RB	PCC UL RB Offset	PCC [DL] Ch.	PCC [DL] Freq. [MHz]	DL Ant. Config.	SCC Band	SCC BW [MHz]	SCC [UL] Ch.	SCC [UL] Freq. [MHz]	Mod.	SCC UL RB	SCC UL RB Offset	SCC [DL] Ch.	SCC [DL] Freq. [MHz]	DL Ant. Config.	ULCA Tx Power with add'l CA on DL Config.	ULCA Tx Power [dBm]	LTE Single Carrier Tx Power [dBm]			
CA {41C}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	2x2	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41202	2902.1	QPSK	1	99	41202	2902.1	4x4	24.00	24.00	24.00			
CA {41C-41N}	LTE B41	20	41490	2880	QPSK	1	0	41490	2880	4x4	LTE B41	20	41													

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APPENDIX G POWER REDUCTION VERIFICATION

Per the May 2017 TCBC Workshop Notes, demonstration of proper functioning of the power reduction mechanisms is required to support the corresponding SAR configurations. The verification process was divided into two parts: (1) evaluation of output power levels for individual or multiple triggering mechanisms and (2) evaluation of the triggering distances for proximity-based sensors.

G.1 Power Verification Procedure

The power verification was performed according to the following procedure:

1. A base station simulator was used to establish a conducted RF connection and the output power was monitored. The power measurements were confirmed to be within expected tolerances for all states before and after a power reduction mechanism was triggered. For licensed modes, the device state index as displayed on the device UI was recorded before and after the mechanism was triggered.
2. Step 1 was repeated for all relevant modes and frequency bands for the mechanism being investigated.
3. Steps 1 and 2 were repeated for all individual power reduction mechanisms and combinations thereof. For the combination cases, one mechanism was switched to a 'triggered' state at a time; powers were confirmed to be within tolerances after each additional mechanism was activated.

G.2 Distance Verification Procedure

The distance verification procedure was performed according to the following procedure:

1. A base station simulator was used to establish an RF connection and to monitor the power levels. The device being tested was placed below the relevant section of the phantom with the relevant side or edge of the device facing toward the phantom. For licensed modes, the device state index on the device UI was monitored to determine the triggering state.
2. The device was moved toward and away from the phantom to determine the distance at which the mechanism triggers and the output power is reduced, per KDB Publication 616217 D04v01r02 and FCC Guidance. Each applicable test position was evaluated. The distances were confirmed to be the same or larger (more conservative) than the minimum distances provided by the manufacturer.
3. Steps 1 and 2 were repeated for low, mid, and high bands, as appropriate (see note below Table G-3 and G-4 for more details).
4. Steps 1 through 3 were repeated for all distance-based power reduction mechanisms.

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G.3 Main Antenna Verification Summary

Table G-1
Power Measurement Verification for Main Antenna Folder Closed

Mechanism(s)		Mode/Band	Device State Index		
1st	2nd		Un-triggered (Max)	Mechanism #1 (Reduced)	Mechanism #2 (Reduced)
Hotspot On		PCS CDMA	0	6	
Grip		PCS CDMA	0	2	
Hotspot On	Grip	PCS CDMA	0	6	2
Grip	Hotspot On	PCS CDMA	0	2	2
Hotspot On		GPRS 1900	0	6	
Grip		GPRS 1900	0	2	
Hotspot On	Grip	GPRS 1900	0	6	2
Grip	Hotspot On	GPRS 1900	0	2	2
Hotspot On		UMTS 1750	0	6	
Grip		UMTS 1750	0	2	
Hotspot On	Grip	UMTS 1750	0	6	2
Grip	Hotspot On	UMTS 1750	0	2	2
Hotspot On		UMTS 1900	0	6	
Grip		UMTS 1900	0	2	
Hotspot On	Grip	UMTS 1900	0	6	2
Grip	Hotspot On	UMTS 1900	0	2	2
Hotspot On		LTE FDD Band 66	0	6	
Grip		LTE FDD Band 66	0	2	
Hotspot On	Grip	LTE FDD Band 66	0	6	2
Grip	Hotspot On	LTE FDD Band 66	0	2	2
Hotspot On		LTE FDD Band 4	0	6	
Grip		LTE FDD Band 4	0	2	
Hotspot On	Grip	LTE FDD Band 4	0	6	2
Grip	Hotspot On	LTE FDD Band 4	0	2	2
Hotspot On		LTE FDD Band 25	0	6	
Grip		LTE FDD Band 25	0	2	
Hotspot On	Grip	LTE FDD Band 25	0	6	2
Grip	Hotspot On	LTE FDD Band 25	0	2	2
Hotspot On		LTE FDD Band 2	0	6	
Grip		LTE FDD Band 2	0	2	
Hotspot On	Grip	LTE FDD Band 2	0	6	2
Grip	Hotspot On	LTE FDD Band 2	0	2	2
Hotspot On		LTE FDD Band 30	0	6	
Grip		LTE FDD Band 30	0	2	
Hotspot On	Grip	LTE FDD Band 30	0	6	2
Grip	Hotspot On	LTE FDD Band 30	0	2	2
Hotspot On		LTE FDD Band 7	0	6	
Grip		LTE FDD Band 7	0	2	
Hotspot On	Grip	LTE FDD Band 7	0	6	2
Grip	Hotspot On	LTE FDD Band 7	0	2	2
Hotspot On		LTE TDD Band 41 (PC3)	0	6	
Grip		LTE TDD Band 41 (PC3)	0	2	
Hotspot On	Grip	LTE TDD Band 41 (PC3)	0	6	2
Grip	Hotspot On	LTE TDD Band 41 (PC3)	0	2	2
Hotspot On		LTE TDD Band 41 (PC2)	0	6	
Grip		LTE TDD Band 41 (PC2)	0	2	
Hotspot On	Grip	LTE TDD Band 41 (PC2)	0	6	2
Grip	Hotspot On	LTE TDD Band 41 (PC2)	0	2	2
Hotspot On		LTE TDD Band 38	0	6	
Grip		LTE TDD Band 38	0	2	
Hotspot On	Grip	LTE TDD Band 38	0	6	2
Grip	Hotspot On	LTE TDD Band 38	0	2	2
Hotspot On		NR FDD Band n66	0	6	
Grip		NR FDD Band n66	0	2	
Hotspot On	Grip	NR FDD Band n66	0	6	2
Grip	Hotspot On	NR FDD Band n66	0	2	2
Hotspot On		NR FDD Band n25	0	6	
Grip		NR FDD Band n25	0	2	
Hotspot On	Grip	NR FDD Band n25	0	6	2
Grip	Hotspot On	NR FDD Band n25	0	2	2
Hotspot On		NR FDD Band n2	0	6	
Grip		NR FDD Band n2	0	2	
Hotspot On	Grip	NR FDD Band n2	0	6	2
Grip	Hotspot On	NR FDD Band n2	0	2	2
Held-to-Ear		LTE TDD Band 48	0	4	

*Note: This device uses different Device State Indices (DSI) to configure different time averaged power levels based on certain exposure scenarios. For this device in the closed configuration, DSI = 2 represents the case when the grip sensor is active, DSI = 4 represents the case where the device is held to ear, and DSI = 6 represents the case when hotspot mode is active. DSI = 0 is configured when the device cannot detect the use condition.

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Table G-2
Power Measurement Verification for Main Antenna Folder Open

Mechanism(s)		Mode/Band	Device State Index		
1st	2nd		Un-triggered (Max)	Mechanism #1 (Reduced)	Mechanism #2 (Reduced)
Hotspot On		PCS CDMA	0	5	
Grip		PCS CDMA	0	1	
Hotspot On	Grip	PCS CDMA	0	5	1
Grip	Hotspot On	PCS CDMA	0	1	1
Hotspot On		GPRS 1900	0	5	
Grip		GPRS 1900	0	1	
Hotspot On	Grip	GPRS 1900	0	5	1
Grip	Hotspot On	GPRS 1900	0	1	1
Hotspot On		UMTS 1750	0	5	
Grip		UMTS 1750	0	1	
Hotspot On	Grip	UMTS 1750	0	5	1
Grip	Hotspot On	UMTS 1750	0	1	1
Hotspot On		UMTS 1900	0	5	
Grip		UMTS 1900	0	1	
Hotspot On	Grip	UMTS 1900	0	5	1
Grip	Hotspot On	UMTS 1900	0	1	1
Hotspot On		LTE FDD Band 66	0	5	
Grip		LTE FDD Band 66	0	1	
Hotspot On	Grip	LTE FDD Band 66	0	5	1
Grip	Hotspot On	LTE FDD Band 66	0	1	1
Hotspot On		LTE FDD Band 4	0	5	
Grip		LTE FDD Band 4	0	1	
Hotspot On	Grip	LTE FDD Band 4	0	5	1
Grip	Hotspot On	LTE FDD Band 4	0	1	1
Hotspot On		LTE FDD Band 25	0	5	
Grip		LTE FDD Band 25	0	1	
Hotspot On	Grip	LTE FDD Band 25	0	5	1
Grip	Hotspot On	LTE FDD Band 25	0	1	1
Hotspot On		LTE FDD Band 2	0	5	
Grip		LTE FDD Band 2	0	1	
Hotspot On	Grip	LTE FDD Band 2	0	5	1
Grip	Hotspot On	LTE FDD Band 2	0	1	1
Hotspot On		LTE FDD Band 30	0	5	
Grip		LTE FDD Band 30	0	1	
Hotspot On	Grip	LTE FDD Band 30	0	5	1
Grip	Hotspot On	LTE FDD Band 30	0	1	1
Hotspot On		LTE FDD Band 7	0	5	
Grip		LTE FDD Band 7	0	1	
Hotspot On	Grip	LTE FDD Band 7	0	5	1
Grip	Hotspot On	LTE FDD Band 7	0	1	1
Hotspot On		LTE TDD Band 41 (PC3)	0	5	
Grip		LTE TDD Band 41 (PC3)	0	1	
Hotspot On	Grip	LTE TDD Band 41 (PC3)	0	5	1
Grip	Hotspot On	LTE TDD Band 41 (PC3)	0	1	1
Hotspot On		LTE TDD Band 41 (PC2)	0	5	
Grip		LTE TDD Band 41 (PC2)	0	1	
Hotspot On	Grip	LTE TDD Band 41 (PC2)	0	5	1
Grip	Hotspot On	LTE TDD Band 41 (PC2)	0	1	1
Hotspot On		LTE TDD Band 38	0	5	
Grip		LTE TDD Band 38	0	1	
Hotspot On	Grip	LTE TDD Band 38	0	5	1
Grip	Hotspot On	LTE TDD Band 38	0	1	1
Hotspot On		NR FDD Band n66	0	5	
Grip		NR FDD Band n66	0	1	
Hotspot On	Grip	NR FDD Band n66	0	5	1
Grip	Hotspot On	NR FDD Band n66	0	1	1
Hotspot On		NR FDD Band n25	0	5	
Grip		NR FDD Band n25	0	1	
Hotspot On	Grip	NR FDD Band n25	0	5	1
Grip	Hotspot On	NR FDD Band n25	0	1	1
Hotspot On		NR FDD Band n2	0	5	
Grip		NR FDD Band n2	0	1	
Hotspot On	Grip	NR FDD Band n2	0	5	1
Grip	Hotspot On	NR FDD Band n2	0	1	1
Held-to-Ear		LTE TDD Band 48	0	3	

*Note: This device uses different Device State Indices (DSI) to configure different time averaged power levels based on certain exposure scenarios. For this device in the open configuration, DSI = 1 represents the case when the grip sensor is active, DSI = 3 represents the case where the device is held to ear, and DSI = 5 represents the case when hotspot mode is active. DSI = 0 is configured when the device cannot detect the use condition.

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Table G-3
Distance Measurement Verification for Main Antenna Folder Closed

Mechanism(s)	Test Condition	Band	Distance Measurements (mm)		Minimum Distance per Manufacturer (mm)
			Moving Toward	Moving Away	
Grip - Closed	Phablet - Back Side	Mid	14	20	11
Grip - Closed	Phablet - Back Side	High	14	20	11
Grip - Closed	Phablet - Bottom Edge	Mid	14	20	13
Grip - Closed	Phablet - Bottom Edge	High	14	20	13

*Note: Mid band refers to: CDMA BC1, GSM1900, UMTS B2/4, LTE B2/4/25/66, NR Band n66/2/25; High band refers to: LTE B7/30/38/41

Table G-4
Distance Measurement Verification for Main Antenna Folder Open

Mechanism(s)	Test Condition	Band	Distance Measurements (mm)		Minimum Distance per Manufacturer (mm)
			Moving Toward	Moving Away	
Grip - Open	UMPC - Back Side	Mid	16	21	13
Grip - Open	UMPC - Back Side	High	16	21	13
Grip - Open	UMPC - Front Side	Mid	12	17	10
Grip - Open	UMPC - Front Side	High	12	17	10
Grip - Open	UMPC - Bottom Edge	Mid	17	24	17
Grip - Open	UMPC - Bottom Edge	High	17	24	17

*Note: Mid band refers to: CDMA BC1, GSM1900, UMTS B2/4, LTE B2/4/25/66, NR Band n66/2/25; High band refers to: LTE B7/30/38/41

G.4 WIFI Verification Summary

Table G-5
Power Measurement Verification WIFI Antenna 1 Held to Ear

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
		Un-triggered (Max)	Mechanism #1 (Reduced)
1st			
Held-to-Ear	802.11b	18.23	12.15
Held-to-Ear	802.11g	17.38	12.06
Held-to-Ear	802.11n (2.4GHz)	17.45	12.16
Held-to-Ear	802.11a	16.45	9.07
Held-to-Ear	802.11n (5GHz, 20MHz BW)	16.25	9.12
Held-to-Ear	802.11ac (20MHz BW)	16.05	9.06
Held-to-Ear	802.11n (5GHz, 40MHz BW)	16.88	9.26
Held-to-Ear	802.11ac (40MHz BW)	16.33	10.36
Held-to-Ear	802.11ac (80MHz BW)	15.05	11.00

*Note: IEEE801.11ax and MIMO WIFI modes were not evaluated due to equipment limitations.

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Table G-6
Power Measurement Verification WIFI Antenna 2 Held to Ear

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
1st		Un-triggered (Max)	Mechanism #1 (Reduced)
Held-to-Ear	802.11b	17.88	12.11
Held-to-Ear	802.11g	17.30	11.84
Held-to-Ear	802.11n (2.4GHz)	17.20	11.93
Held-to-Ear	802.11a	17.16	9.86
Held-to-Ear	802.11n (5GHz, 20MHz BW)	16.85	9.66
Held-to-Ear	802.11ac (20MHz BW)	16.26	9.14
Held-to-Ear	802.11n (5GHz, 40MHz BW)	16.29	10.93
Held-to-Ear	802.11ac (40MHz BW)	15.60	11.00
Held-to-Ear	802.11ac (80MHz BW)	14.54	10.95

*Note: IEEE801.11ax and MIMO WIFI modes were not evaluated due to equipment limitations.

Table G-7
Power Measurement Verification WIFI Antenna 1 with NR Active

Mode/Band	Conducted Power (dBm)		
	Un-triggered (Max)	Mechanism #1 NR Active (Reduced)	Mechanism #2 RCV and NR Active (Reduced)
802.11b	17.85	11.95	11.74
802.11g	16.91	11.79	11.82
802.11n (2.4GHz)	16.79	12.13	11.78
802.11a	17.13	9.78	9.87
802.11n (5GHz, 20MHz BW)	17.14	9.69	9.92
802.11ac (20MHz BW)	17.11	9.70	9.79
802.11n (5GHz, 40MHz BW)	16.02	9.73	9.82
802.11ac (40MHz BW)	15.98	9.82	9.90
802.11ac (80MHz BW)	14.91	9.85	9.78

*Note: IEEE801.11ax and MIMO WIFI modes were not evaluated due to equipment limitations.

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Table G-8
Power Measurement Verification WIFI Antenna 2 with NR Active

Mode/Band	Conducted Power (dBm)		
	Un-triggered (Max)	Mechanism #1 NR Active (Reduced)	Mechanism #2 RCV and NR Active (Reduced)
802.11b	18.15	11.89	12.03
802.11g	17.21	12.17	11.99
802.11n (2.4GHz)	17.14	11.95	12.12
802.11a	16.82	9.54	9.79
802.11n (5GHz, 20MHz BW)	16.90	9.79	9.67
802.11ac (20MHz BW)	16.84	9.86	9.77
802.11n (5GHz, 40MHz BW)	15.93	9.92	9.62
802.11ac (40MHz BW)	15.87	9.72	9.71
802.11ac (80MHz BW)	14.65	9.76	9.83

*Note: IEEE801.11ax and MIMO WIFI modes were not evaluated due to equipment limitations.

Table G-9
Power Measurement Verification WIFI Antenna 1 with Bluetooth

Mode/Band	Conducted Power (dBm)	
	Un-triggered (Max)	Mechanism #1 Bluetooth Active (Reduced)
802.11a	17.13	13.13
802.11n (5GHz, 20MHz BW)	17.14	13.27
802.11ac (20MHz BW)	17.11	13.31
802.11n (5GHz, 40MHz BW)	16.02	12.99
802.11ac (40MHz BW)	15.98	13.12
802.11ac (80MHz BW)	14.91	13.08

*Note: IEEE801.11ax and MIMO WIFI modes were not evaluated due to equipment limitations.

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Table G-10
Power Measurement Verification WIFI Antenna 2 with Bluetooth

Mode/Band	Conducted Power (dBm)	
	Un-triggered (Max)	Mechanism #1 Bluetooth Active (Reduced)
802.11a	16.82	12.84
802.11n (5GHz, 20MHz BW)	16.90	12.77
802.11ac (20MHz BW)	16.84	12.82
802.11n (5GHz, 40MHz BW)	15.93	12.74
802.11ac (40MHz BW)	15.87	12.85
802.11ac (80MHz BW)	14.65	12.91

*Note: IEEE801.11ax and MIMO WIFI modes were not evaluated due to equipment limitations.

G.5 Bluetooth Verification Summary

Table G-11
Power Measurement Verification Bluetooth Antenna 1 Held to Ear

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
1st		Un-triggered (Max)	Mechanism #1 (Reduced)
Held-to-Ear	Bluetooth	18.52	13.60

Table G-12
Power Measurement Verification Bluetooth Antenna 2 Held to Ear

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
1st		Un-triggered (Max)	Mechanism #1 (Reduced)
Held-to-Ear	Bluetooth	18.17	13.55

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APPENDIX H: IEEE 802.11AX RU SAR EXCLUSION

1.1 IEEE 802.11ax RU SAR Exclusion

To make the most efficient use of the additional available subcarriers (data tones), IEEE 802.11ax can utilize Orthogonal Frequency-Division Multiple Access (OFDMA) which divides the existing 802.11 channels into smaller subchannels called Resource Units (RUs). Possible RU sizes are: 26T, 52T, 106T, 242T, 484T and 996T.

Per April 2019 TCB workshop notes, 802.11ax was considered a higher order 802.11 mode when compared to a/b/g/n/ac to apply KDB Publication 248227 D01v02r02 for OFDM mode selection. Therefore, SAR tests were not required for 802.11ax based on the maximum allowed output powers of OFDM modes and the reported SAR values. Per FCC Guidance, maximum conducted powers were performed for each RU size to demonstrate that the output powers would not be higher than the other OFDM 802.11 modes.

1.2 IEEE 802.11ax RU Target Powers

1.2.1 Maximum 802.11ax RU WLAN Output Power

IEEE 802.11ax RU (in dBm)																
SISO									MIMO							
Antenna 1 & Antenna 2																
	2.4G		5G 20MHz		5G 40MHz		5G 80MHz		2.4G		5G 20MHz		5G 40MHz		5G 80MHz	
	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
26T	14.0	15.0	8.0	9.0	8.0	9.0	8.0	9.0	17.0	18.0	11.0	12.0	11.0	12.0	11.0	12.0
52T	15.0	16.0	10.0	11.0	9.0	10.0	9.0	10.0	18.0	19.0	13.0	14.0	12.0	13.0	12.0	13.0
106T	15.5	16.5	12.0	13.0	11.0	12.0	10.0	11.0	18.5	19.5	15.0	16.0	14.0	15.0	13.0	14.0
242T	16.0	17.0	13.0	14.0	13.0	14.0	11.0	12.0	19.0	20.0	16.0	17.0	16.0	17.0	14.0	15.0
484T					13.0	14.0	13.0	14.0					16.0	17.0	16.0	17.0
996T							13.0	14.0							16.0	17.0

1.2.2 Reduced 802.11ax RU WLAN Output Power

The below table is applicable in the following conditions:

- RCV active
- RCV active during simultaneous conditions with 2.4 GHz WLAN and 5 GHz WLAN
- RCV active during simultaneous conditions with 5G NR mmWave
- RCV active during simultaneous conditions with 5G NR mmWave and 2.4 GHz WLAN and/or 5 GHz WLAN
- Simultaneous conditions with 5G NR mmWave

IEEE 802.11ax RU (in dBm)																
SISO									MIMO							
Antenna 1 & Antenna 2																
	2.4G		5G 20MHz		5G 40MHz		5G 80MHz		2.4G		5G 20MHz		5G 40MHz		5G 80MHz	
	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum	Nominal	Maximum
26T	12.0	13.0	8.0	9.0	8.0	9.0	8.0	9.0	15.0	16.0	11.0	12.0	11.0	12.0	11.0	12.0
52T	12.0	13.0	10.0	11.0	9.0	10.0	9.0	10.0	15.0	16.0	13.0	14.0	12.0	13.0	12.0	13.0
106T	12.0	13.0	10.0	11.0	10.0	11.0	10.0	11.0	15.0	16.0	13.0	14.0	13.0	14.0	13.0	14.0
242T	12.0	13.0	10.0	11.0	10.0	11.0	10.0	11.0	15.0	16.0	13.0	14.0	13.0	14.0	13.0	14.0
484T					10.0	11.0	10.0	11.0					13.0	14.0	13.0	14.0
996T							10.0	11.0							13.0	14.0

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1.3 IEEE 802.11ax Measured Powers

Table 1
Maximum 2.4 GHz 802.11ax RU Output Power – Ant 1

Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)	Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)
2412	1	26T	0	14.99	2412	1	52T	37	15.51
			4	14.88				38	15.77
			8	14.42				40	15.57
2437	6	26T	0	14.66	2437	6	52T	37	15.89
			4	14.99				38	15.65
			8	14.93				40	15.87
2462	11	26T	0	14.54	2462	11	52T	37	15.78
			4	14.82				38	15.74
			8	14.75				40	15.73
Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)					
2412	1	106T	53	16.26	2412	1	242T	61	16.99
			54	16.37					
2437	6	106T	53	16.22	2437	6	242T	61	16.78
			54	16.01					
2462	11	106T	53	16.30	2462	11	242T	61	16.97
			54	16.02					

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Table 2
Maximum 2.4 GHz 802.11ax RU Output Power – Ant 2

Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)	Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)																											
2412	1	26T	0	14.78	2412	1	52T	37	15.59																											
			4	14.91				38	15.85																											
			8	14.68				40	15.99																											
2437	6	26T	0	14.51	2437	6	52T	37	15.85																											
			4	14.73				38	15.87																											
			8	14.72				40	15.95																											
2462	11	26T	0	14.93	2462	11	52T	37	15.87																											
			4	14.84				38	15.97																											
			8	14.79				40	15.61																											
Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)																																
2412	1	106T	53	16.07	Freq [MHz]	Channel	Tones	RU Index	Avg Conducted Powers (dBm)																											
			54	16.35						2437	6	106T	53	16.23	2412	1	242T	61	16.91	54	16.47	2437	6	242T	61	16.71	2462	11	106T	53	16.27	2462	11	242T	61	16.94
2437	6	106T	53	16.23	2412	1	242T	61	16.91																											
			54	16.47	2437	6	242T	61	16.71																											
2462	11	106T	53	16.27	2462	11	242T	61	16.94																											
			54	16.32																																

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Table 3
Maximum 5 GHz 802.11ax RU Output Power – Ant 1

20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					37	39	40						0	4	8
	1	5180	36	52T	10.53	10.60	10.54		1	5180	36	26T	8.97	8.74	8.99
		5200	40	52T	10.57	10.65	10.58			5200	40	26T	8.91	8.67	8.96
		5240	48	52T	10.42	10.49	10.44			5240	48	26T	8.92	8.47	8.34
	2A	5260	52	52T	10.61	10.73	10.70		2A	5260	52	26T	8.48	8.66	8.59
		5280	56	52T	10.48	10.55	10.49			5280	56	26T	8.79	8.88	8.78
		5320	64	52T	10.75	10.83	10.77			5320	64	26T	8.70	8.91	8.75
	2C	5500	100	52T	10.98	10.99	10.99		2C	5500	100	26T	8.99	8.68	8.97
		5600	120	52T	10.78	10.86	10.81			5600	120	26T	8.70	8.29	8.72
		5720	144	52T	10.99	10.99	10.99			5720	144	26T	8.99	8.76	8.74
3	5745	149	52T	10.78	10.95	10.83	3	5745	149	26T	8.74	8.96	8.89		
	5785	157	52T	10.43	10.59	10.50		5785	157	26T	8.99	8.74	8.99		
	5825	165	52T	10.61	10.29	10.27		5825	165	26T	8.69	8.88	8.75		

20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					53	54	N/A						61	N/A	N/A
	1	5180	36	106T	12.67	12.66			1	5180	36	242T	13.90		
		5200	40	106T	12.52	12.51				5200	40	242T	13.86		
		5240	48	106T	12.88	12.85				5240	48	242T	13.87		
	2A	5260	52	106T	12.58	12.51			2A	5260	52	242T	13.92		
		5280	56	106T	12.49	12.61				5280	56	242T	13.97		
		5320	64	106T	12.61	12.62				5320	64	242T	13.79		
	2C	5500	100	106T	12.78	12.70			2C	5500	100	242T	13.73		
		5600	120	106T	12.67	12.65				5600	120	242T	13.65		
		5720	144	106T	12.85	12.76				5720	144	242T	13.78		
3	5745	149	106T	12.90	12.91		3	5745	149	242T	13.71				
	5785	157	106T	12.61	12.67			5785	157	242T	13.69				
	5825	165	106T	12.44	12.43			5825	165	242T	13.66				

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					0	8	17						37	40	44
	1	5190	38	26T	8.71	8.86	8.58		1	5190	38	52T	9.85	9.75	9.86
		5230	46	26T	8.68	8.71	8.24			5230	46	52T	9.79	9.62	9.75
		5270	54	26T	8.99	8.99	8.63			5270	54	52T	9.71	9.54	9.77
	2A	5310	62	26T	8.47	8.47	8.55		2A	5310	62	52T	9.76	9.82	9.86
		5510	102	26T	8.53	8.60	8.74			5510	102	52T	9.98	9.89	9.87
		5590	118	26T	8.42	8.25	8.46			5590	118	52T	9.78	9.66	9.81
	2C	5710	142	26T	8.92	8.96	8.99		2C	5710	142	52T	9.56	9.95	9.56
		5755	151	26T	8.77	8.79	8.40			5755	151	52T	9.62	9.56	9.72
		5795	159	26T	8.58	8.33	8.40			5795	159	52T	9.87	9.81	9.94

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					53	54	56						61	62	N/A
	1	5190	38	106T	11.85	11.70	11.94		1	5190	38	242T	13.56	13.54	
		5230	46	106T	11.61	11.96	11.63			5230	46	242T	13.79	13.73	
		5270	54	106T	11.85	11.70	11.90			5270	54	242T	13.55	13.56	
	2A	5310	62	106T	11.97	11.80	11.94		2A	5310	62	242T	13.99	13.99	
		5510	102	106T	11.76	11.40	11.62			5510	102	242T	13.69	13.63	
		5590	118	106T	11.84	11.63	11.78			5590	118	242T	13.58	13.48	
	2C	5710	142	106T	11.71	11.89	11.99		2C	5710	142	242T	13.74	13.81	
		5755	151	106T	11.74	11.59	11.90			5755	151	242T	13.97	13.98	
		5795	159	106T	11.65	11.93	11.74			5795	159	242T	13.53	13.59	

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index		
					65	N/A	N/A
	1	5190	38	484T	13.92		
		5230	46	484T	13.95		
		5270	54	484T	13.99		
	2A	5310	62	484T	13.87		
		5510	102	484T	13.68		
		5590	118	484T	13.70		
	2C	5710	142	484T	13.83		
		5755	151	484T	13.64		
		5795	159	484T	13.69		

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80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					0	18	36						37	44	52
	1	5210	42	26T	8.99	8.96	8.81		1	5210	42	52T	9.99	9.91	9.97
2A	5290	58	26T	8.86	8.65	8.83	2A	5290	58	52T	9.84	9.61	9.84		
	5530	106	26T	8.93	8.78	8.84	2C	5530	106	52T	9.61	9.34	9.49		
	5610	122	26T	8.70	8.46	8.61		5610	122	52T	9.76	9.46	9.69		
	5690	138	26T	8.80	8.60	8.87		5690	138	52T	9.68	9.56	9.23		
3	5775	155	26T	8.92	8.90	8.99	3	5775	155	52T	9.48	9.30	9.61		

80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					53	56	60						61	62	64
	1	5210	42	106T	10.69	10.44	10.66		1	5210	42	242T	11.90	11.69	11.87
2A	5290	58	106T	10.54	10.27	10.45	2A	5290	58	242T	11.83	11.61	11.57		
	5530	106	106T	10.56	10.29	10.41	2C	5530	106	242T	11.77	11.94	11.62		
2C	5610	122	106T	10.73	10.92	10.91		5610	122	242T	11.78	11.82	11.63		
	5690	138	106T	10.67	10.45	10.61		5690	138	242T	11.82	11.37	11.82		
3	5775	155	106T	10.53	10.80	10.63	3	5775	155	242T	11.68	11.89	11.82		

80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					65	66	N/A						67	N/A	N/A
	1	5210	42	484T	13.56	13.38			1	5210	42	996T	13.94		
2A	5290	58	484T	13.52	13.72		2A	5290	58	996T	13.84				
	5530	106	484T	13.72	13.56		2C	5530	106	996T	13.97				
2C	5610	122	484T	13.80	13.76			5610	122	996T	13.92				
	5690	138	484T	13.69	13.65			5690	138	996T	13.89				
3	5775	155	484T	13.71	13.76		3	5775	155	996T	13.81				

Table 4
Maximum 5 GHz 802.11ax RU Output Power – Ant 2

20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					0	4	8						37	39	40
1	1	5180	36	26T	8.66	8.81	8.68	1	5180	36	52T	10.58	10.70	10.64	
		5200	40	26T	8.95	8.62	8.54			5200	40	52T	10.55	10.71	10.67
		5240	48	26T	8.83	8.53	8.95				5240	48	52T	10.90	10.98
	2A	5260	52	26T	8.88	8.99	8.86	2A	5260			52	52T	10.90	10.92
		5280	56	26T	8.62	8.79	8.65		5280	56		52T	10.73	10.77	10.71
		5320	64	26T	8.68	8.71	8.63			5320	64	52T	10.85	10.97	10.87
	2C	5500	100	26T	8.55	8.70	8.64	2C			5500	100	52T	10.64	10.79
		5600	120	26T	8.97	8.69	8.58		5600		120	52T	10.99	10.68	10.61
		5720	144	26T	8.51	8.75	8.66			5720	144	52T	10.56	10.69	10.65
	3	5745	149	26T	8.97	8.71	8.68	3			5745	149	52T	10.84	10.98
		5785	157	26T	8.75	8.94	8.93		5785		157	52T	10.83	10.99	10.99
		5825	165	26T	8.93	8.99	8.95			5825	165	52T	10.99	10.70	10.61

20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			20MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					53	54	N/A						61	N/A	N/A
1	1	5180	36	106T	12.90	12.89		1	5180	36	242T	13.71			
		5200	40	106T	12.85	12.93				5200	40	242T	13.63		
		5240	48	106T	12.60	12.57					5240	48	242T	13.99	
	2A	5260	52	106T	12.58	12.99		2A	5260			52	242T	13.99	
		5280	56	106T	12.92	12.81			5280	56		242T	13.94		
		5320	64	106T	12.99	12.94				5320	64	242T	13.84		
	2C	5500	100	106T	12.86	12.85		2C			5500	100	242T	13.77	
		5600	120	106T	12.71	12.67			5600		120	242T	13.64		
		5720	144	106T	12.75	12.68				5720	144	242T	13.87		
	3	5745	149	106T	12.95	12.95		3			5745	149	242T	13.67	
		5785	157	106T	12.62	12.65			5785		157	242T	13.64		
		5825	165	106T	12.73	12.80				5825	165	242T	13.61		

FCC ID: A3LSMF916U	 SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 06/28/20-08/24/20	DUT Type: Portable Handset		APPENDIX H: Page 5 of 6

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					0	8	17						37	40	44
	1	5190	38	26T	8.88	8.99	8.99		5190	38	52T	9.76	9.56	9.79	
2A	5230	46	26T	8.54	8.57	8.70	5230	46	52T	9.81	9.72	9.78			
	5270	54	26T	8.57	8.88	8.72	5270	54	52T	9.75	9.58	9.60			
2C	5310	62	26T	8.84	8.94	8.90	5310	62	52T	9.67	9.48	9.78			
	5510	102	26T	8.70	8.82	8.85	5510	102	52T	9.58	9.94	9.77			
3	5590	118	26T	8.82	8.73	8.88	5590	118	52T	9.70	9.71	9.85			
	5710	142	26T	8.68	8.81	8.89	5710	142	52T	9.90	9.88	9.57			
	5755	151	26T	8.64	8.61	8.85	5755	151	52T	9.68	9.73	9.82			
	5795	159	26T	8.64	8.67	8.78	5795	159	52T	9.89	9.84	9.99			

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					53	54	56						61	62	N/A
	1	5190	38	106T	11.64	11.86	11.68		5190	38	242T	13.92	13.96		
2A	5230	46	106T	11.95	11.75	11.86	5230	46	242T	13.99	13.99				
	5270	54	106T	11.80	11.60	11.78	5270	54	242T	13.86	13.72				
2C	5310	62	106T	11.93	11.70	11.96	5310	62	242T	13.91	13.88				
	5510	102	106T	11.63	11.96	11.73	5510	102	242T	13.82	13.85				
3	5590	118	106T	11.57	11.77	11.57	5590	118	242T	13.73	13.65				
	5710	142	106T	11.56	11.90	11.70	5710	142	242T	13.88	13.97				
	5755	151	106T	11.80	11.99	11.89	5755	151	242T	13.87	13.62				
	5795	159	106T	11.55	11.89	11.67	5795	159	242T	13.85	13.93				

40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			40MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					65	N/A	N/A						65	N/A	N/A
	1	5190	38	484T	13.70				1	5190	38	484T	13.70		
		5230	46	484T	13.99					5230	46	484T	13.99		
	2A	5270	54	484T	13.96				2A	5270	54	484T	13.96		
		5310	62	484T	13.82					5310	62	484T	13.82		
	2C	5510	102	484T	13.67				2C	5510	102	484T	13.67		
		5590	118	484T	13.65					5590	118	484T	13.65		
	3	5710	142	484T	13.99				3	5710	142	484T	13.99		
		5755	151	484T	13.67					5755	151	484T	13.67		
		5795	159	484T	13.64					5795	159	484T	13.64		

80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					0	18	36						37	44	52
	1	5210	42	26T	8.43	8.74	8.46		5210	42	52T	9.54	9.95	9.88	
2A	5290	58	26T	8.99	8.98	8.77	5290	58	52T	9.68	9.81	9.66			
	5530	106	26T	8.96	8.94	8.72	5530	106	52T	9.67	9.71	9.95			
2C	5610	122	26T	8.95	8.86	8.62	5610	122	52T	9.59	9.89	9.62			
	5690	138	26T	8.54	8.75	8.99	5690	138	52T	9.65	9.59	9.99			
3	5775	155	26T	8.93	8.95	8.73	5775	155	52T	9.45	9.94	9.81			

80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					53	56	60						61	62	64
	1	5210	42	106T	10.99	10.85	10.65		5210	42	242T	11.72	11.87	11.80	
2A	5290	58	106T	10.90	10.76	10.99	5290	58	242T	11.57	11.78	11.72			
	5530	106	106T	10.99	10.92	10.74	5530	106	242T	11.66	11.81	11.85			
2C	5610	122	106T	10.55	10.79	10.57	5610	122	242T	11.61	11.73	11.59			
	5690	138	106T	10.73	10.59	10.98	5690	138	242T	11.90	11.54	11.55			
3	5775	155	106T	10.99	10.94	10.85	5775	155	242T	11.68	11.91	11.88			

80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)			80MHz BW	Band	Freq [MHz]	Channel	Tones	Avg Conducted Power (dBm)		
					RU Index								RU Index		
					65	66	N/A						67	N/A	N/A
	1	5210	42	484T	13.80	13.77			5210	42	996T	13.96			
2A	5290	58	484T	13.77	13.75		5290	58	996T	13.98					
	5530	106	484T	13.84	13.83		5530	106	996T	13.98					
2C	5610	122	484T	13.57	13.55		5610	122	996T	13.99					
	5690	138	484T	13.78	13.94		5690	138	996T	13.99					
3	5775	155	484T	13.99	13.54		5775	155	996T	13.65					

FCC ID: A3LSMF916U	 PCTEST Proud to be part of the Samsung ecosystem	SAR EVALUATION REPORT		Reviewed by: Quality Manager
Test Dates: 06/28/20-08/24/20	DUT Type: Portable Handset			APPENDIX H: Page 6 of 6

APPENDIX I: PROBE AND DIPOLE CALIBRATION CERTIFICATES



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

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D750V3-1003_Mar20**

CALIBRATION CERTIFICATE

Object **D750V3 - SN:1003**

Calibration procedure(s) **QA CAL-05.v11**
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz

Calibration date: **March 16, 2020**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-19 (No. 217-02894)	Apr-20
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-19 (No. 217-02895)	Apr-20
Reference Probe EX3DV4	SN: 7349	31-Dec-19 (No. EX3-7349_Dec19)	Dec-20
DAE4	SN: 601	27-Dec-19 (No. DAE4-601_Dec19)	Dec-20

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

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

Issued: March 16, 2020

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



Accredited by the Swiss Accreditation Service (SAS)

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

Accreditation No.: **SCS 0108**

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 the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "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%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
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	42.5 $\pm$ 6 %	0.88 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.17 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.78 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.43 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.77 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	54.7 $\pm$ 6 %	0.96 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.16 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	8.61 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.42 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	5.67 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.9 Ω - 0.1 j Ω
Return Loss	- 26.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	51.8 Ω - 2.4 j Ω
Return Loss	- 30.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.043 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: 16.03.2020

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1003

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.88 \text{ S/m}$; $\epsilon_r = 42.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.07, 10.07, 10.07) @ 750 MHz; Calibrated: 31.12.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.12.2019
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

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

Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 60.72 V/m; Power Drift = -0.04 dB

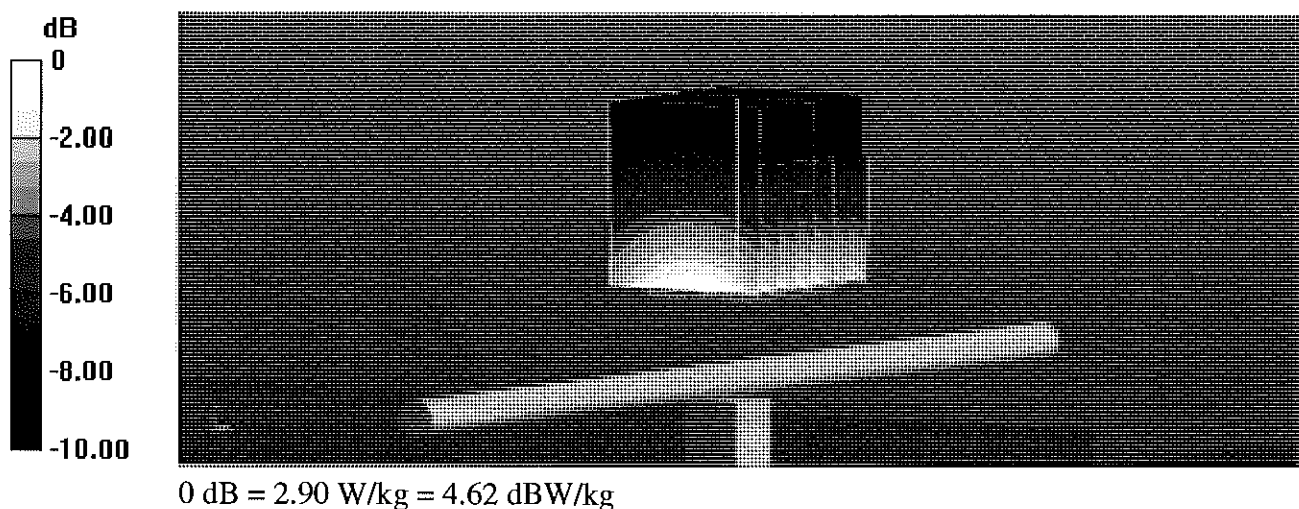
Peak SAR (extrapolated) = 3.27 W/kg

SAR(1 g) = 2.17 W/kg; SAR(10 g) = 1.43 W/kg

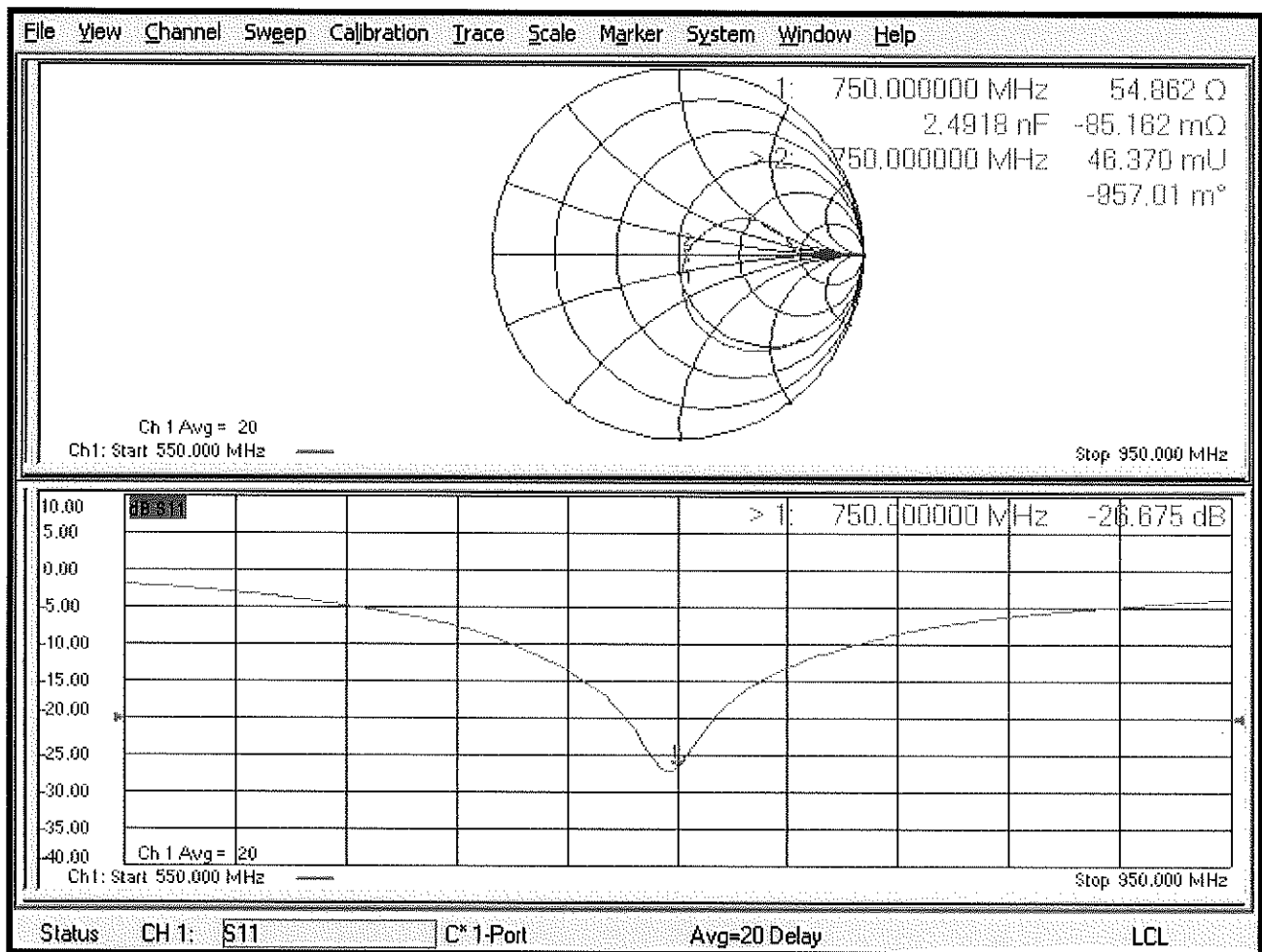
Smallest distance from peaks to all points 3 dB below = 16.5 mm

Ratio of SAR at M2 to SAR at M1 = 66.2%

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



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 16.03.2020

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1003

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750$ MHz; $\sigma = 0.96$ S/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.61, 10.61, 10.61) @ 750 MHz; Calibrated: 31.12.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.12.2019
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.60 V/m; Power Drift = -0.06 dB

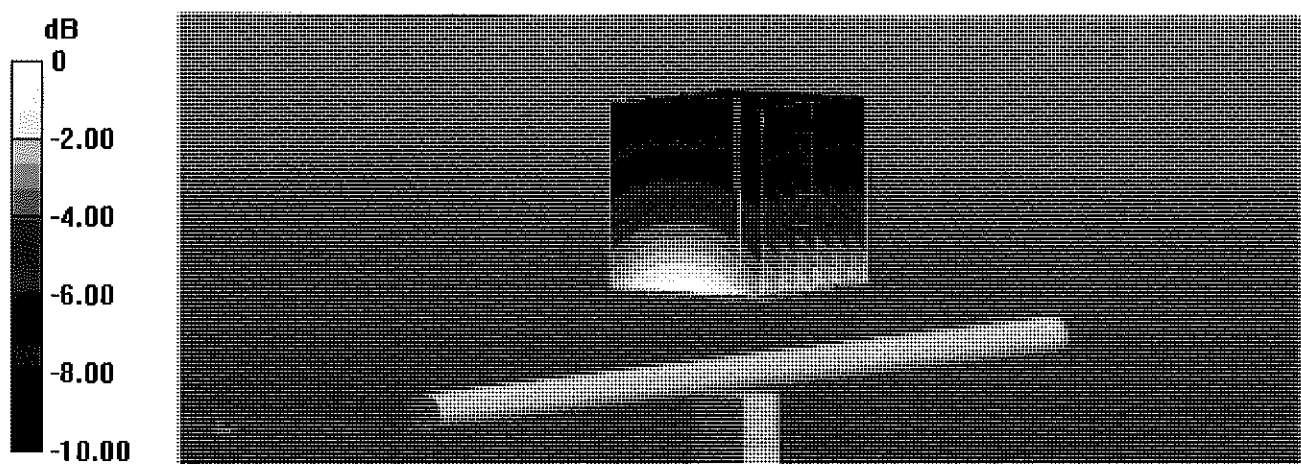
Peak SAR (extrapolated) = 3.23 W/kg

SAR(1 g) = 2.16 W/kg; SAR(10 g) = 1.42 W/kg

Smallest distance from peaks to all points 3 dB below = 21.2 mm

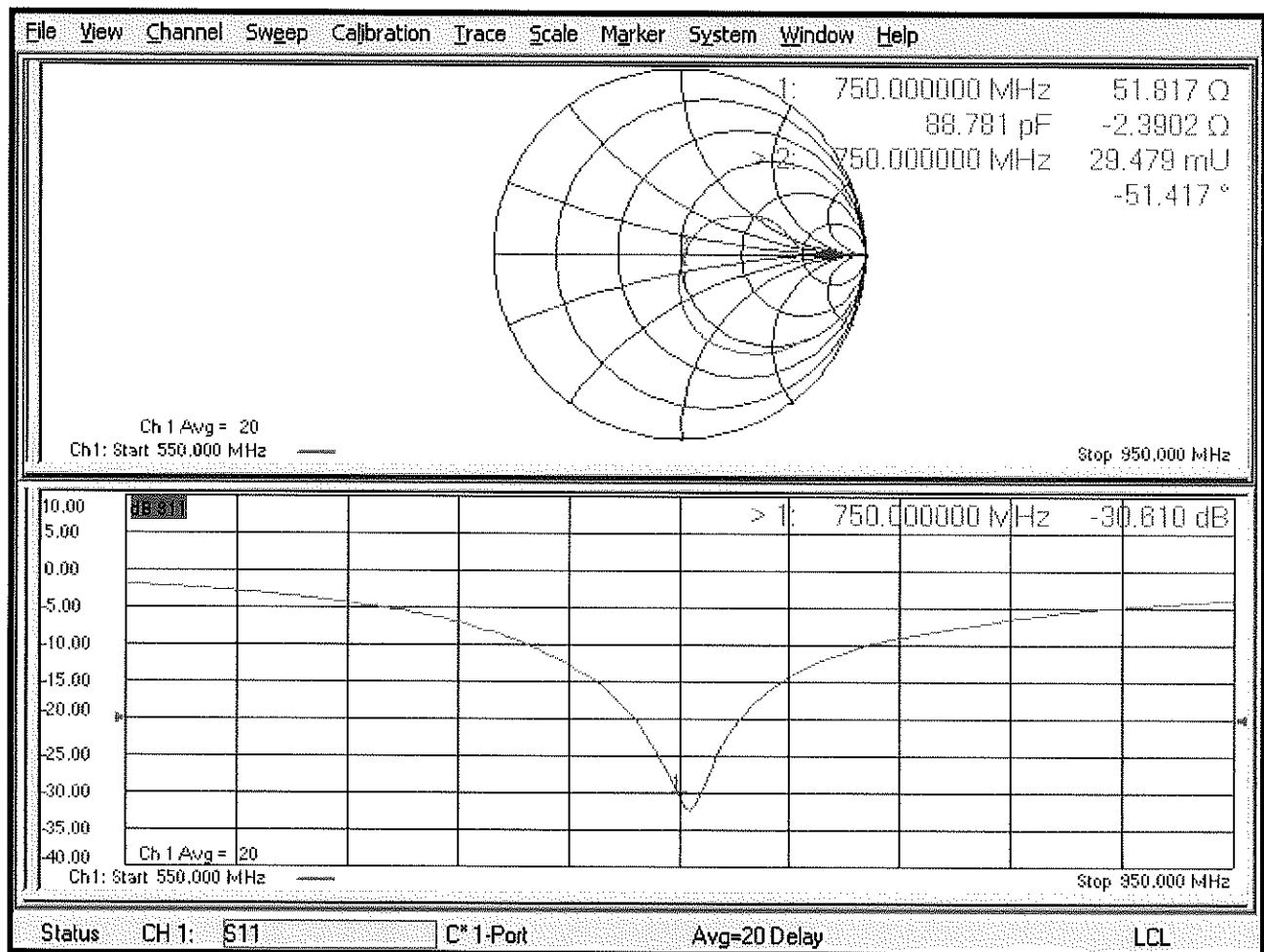
Ratio of SAR at M2 to SAR at M1 = 66.6%

Maximum value of SAR (measured) = 2.87 W/kg



0 dB = 2.87 W/kg = 4.58 dBW/kg

Impedance Measurement Plot for Body TSL





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Accreditation No.: **SCS 0108**

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Client **PC Test**

Certificate No: **D750V3-1054_Mar20**

CALIBRATION CERTIFICATE

Object **D750V3 - SN:1054**

Calibration procedure(s) **QA CAL-05.v11**
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz

Calibration date: **March 11, 2020**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-19 (No. 217-02894)	Apr-20
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-19 (No. 217-02895)	Apr-20
Reference Probe EX3DV4	SN: 7349	31-Dec-19 (No. EX3-7349_Dec19)	Dec-20
DAE4	SN: 601	27-Dec-19 (No. DAE4-601_Dec19)	Dec-20

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

Calibrated by: **Claudio Leubler** **Laboratory Technician**

Approved by: **Katja Pokovic** **Technical Manager**

Signature

Issued: March 19, 2020

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



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

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 the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "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%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
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	42.5 $\pm$ 6 %	0.88 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.13 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.63 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.41 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.69 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	54.7 $\pm$ 6 %	0.96 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.14 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	8.53 W/kg $\pm$ 17.0 % (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	5.63 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.6 Ω - 1.9 j Ω
Return Loss	- 28.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.8 Ω - 4.7 j Ω
Return Loss	- 26.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.035 ns
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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: 11.03.2020

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1054

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.88 \text{ S/m}$; $\epsilon_r = 42.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.07, 10.07, 10.07) @ 750 MHz; Calibrated: 31.12.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.12.2019
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

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

Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 59.98 V/m; Power Drift = -0.01 dB

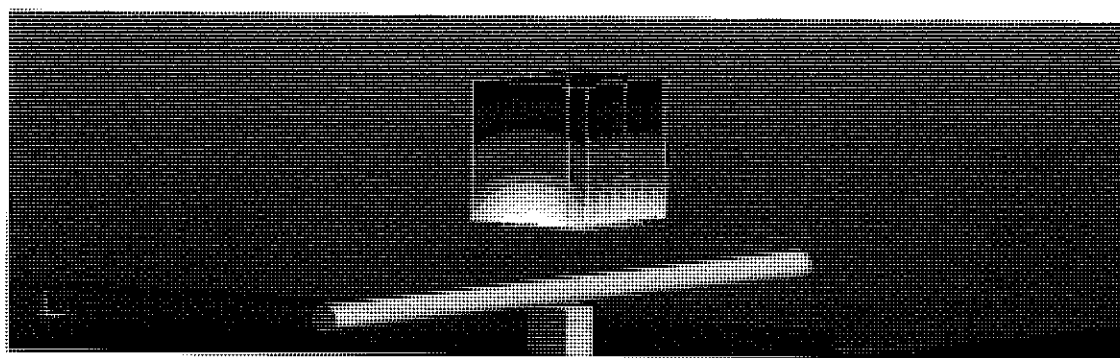
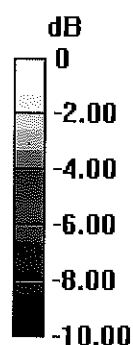
Peak SAR (extrapolated) = 3.19 W/kg

SAR(1 g) = 2.13 W/kg; SAR(10 g) = 1.41 W/kg

Smallest distance from peaks to all points 3 dB below = 17.1 mm

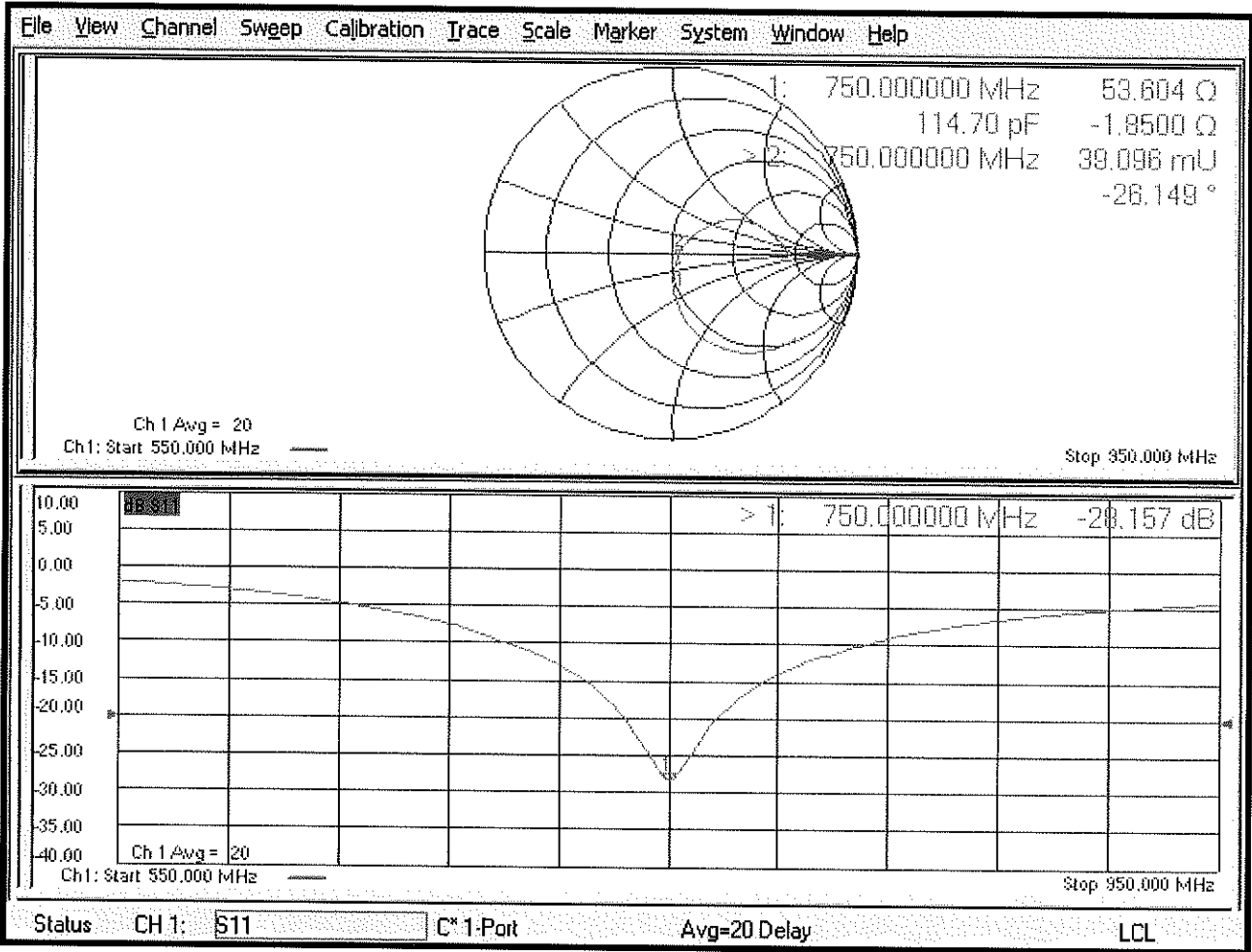
Ratio of SAR at M2 to SAR at M1 = 66.8%

Maximum value of SAR (measured) = 2.82 W/kg



0 dB = 2.82 W/kg = 4.50 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 11.03.2020

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1054

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750$ MHz; $\sigma = 0.96$ S/m; $\epsilon_r = 54.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.61, 10.61, 10.61) @ 750 MHz; Calibrated: 31.12.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.12.2019
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)

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

Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.15 V/m; Power Drift = -0.02 dB

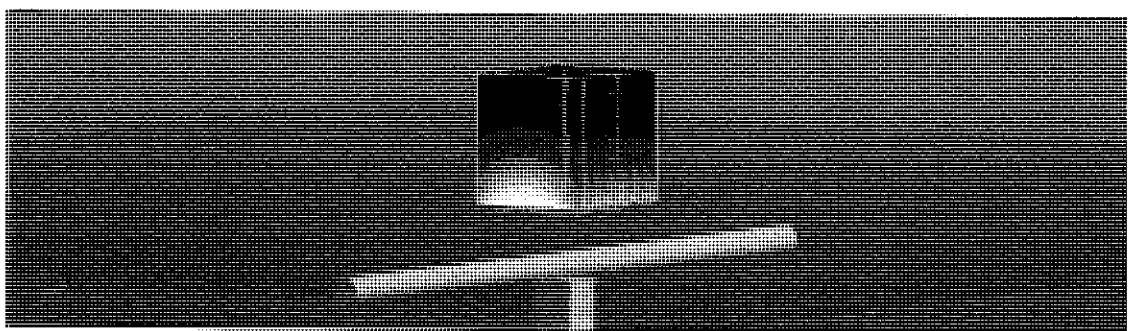
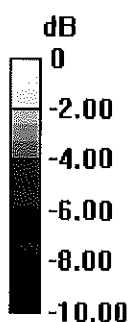
Peak SAR (extrapolated) = 3.22 W/kg

SAR(1 g) = 2.14 W/kg; SAR(10 g) = 1.41 W/kg

Smallest distance from peaks to all points 3 dB below = 16.1 mm

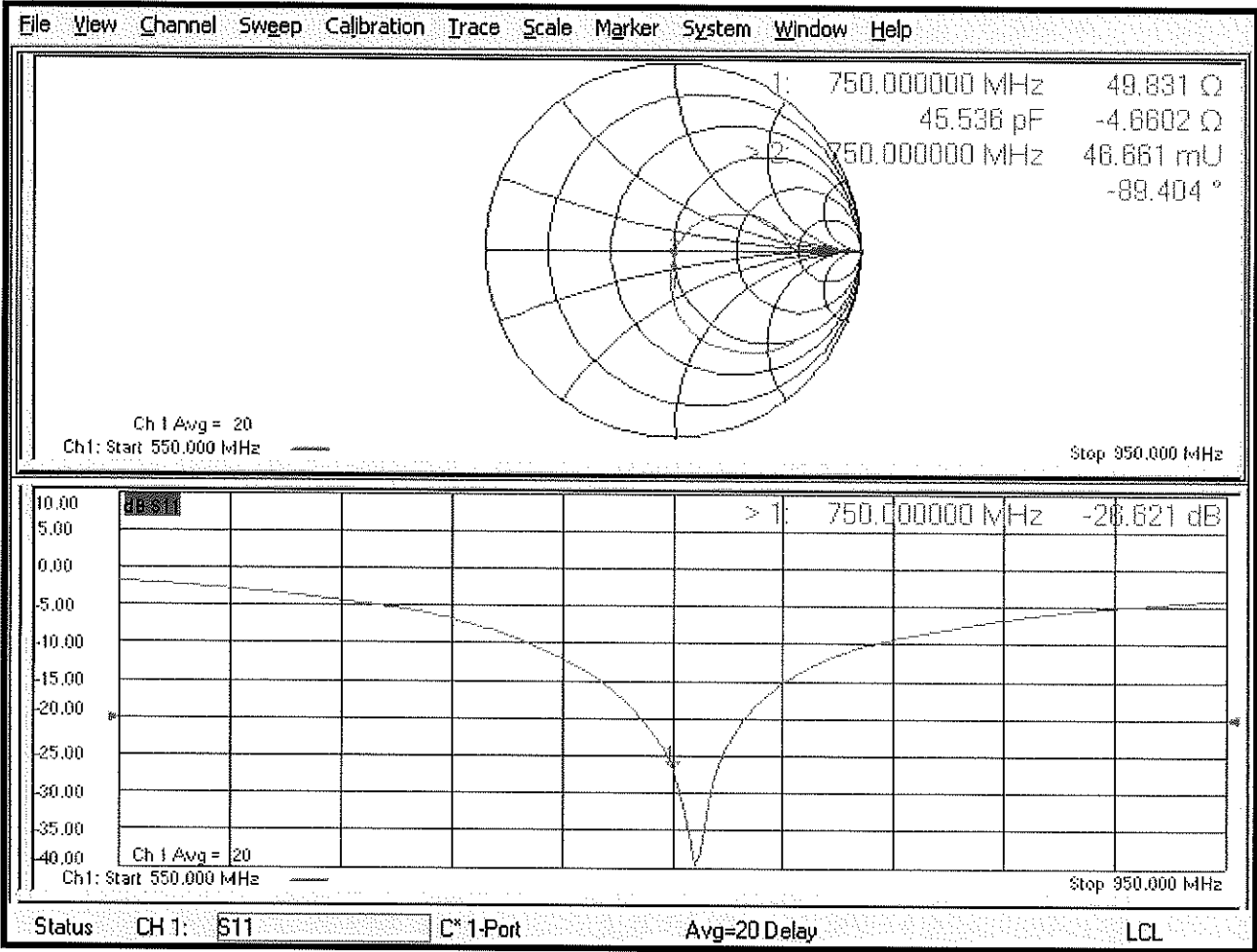
Ratio of SAR at M2 to SAR at M1 = 66.7%

Maximum value of SAR (measured) = 2.85 W/kg



0 dB = 2.85 W/kg = 4.55 dBW/kg

Impedance Measurement Plot for Body TSL



Appendix: Transfer Calibration at Four Validation Locations on SAM Head¹

Evaluation Condition

Phantom	SAM Head Phantom	For usage with cSAR3DV2-R/L
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SAR result with SAM Head (Top $\cong$ C0)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR for nominal Head TSL parameters	normalized to 1W	7.66 W/kg $\pm$ 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR for nominal Head TSL parameters	normalized to 1W	5.14 W/kg $\pm$ 16.9 % (k=2)

SAR result with SAM Head (Mouth $\cong$ F90)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR for nominal Head TSL parameters	normalized to 1W	8.42 W/kg $\pm$ 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR for nominal Head TSL parameters	normalized to 1W	5.69 W/kg $\pm$ 16.9 % (k=2)

SAR result with SAM Head (Neck $\cong$ H0)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR for nominal Head TSL parameters	normalized to 1W	7.89 W/kg $\pm$ 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR for nominal Head TSL parameters	normalized to 1W	5.40 W/kg $\pm$ 16.9 % (k=2)

SAR result with SAM Head (Ear $\cong$ D90)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR for nominal Head TSL parameters	normalized to 1W	6.82 W/kg $\pm$ 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR for nominal Head TSL parameters	normalized to 1W	4.63 W/kg $\pm$ 16.9 % (k=2)

¹ Additional assessments outside the current scope of SCS 0108



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

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D750V3-1161_Oct18**

CALIBRATION CERTIFICATE

Object **D750V3 - SN:1161**

Calibration procedure(s) **QA CAL-05.v10**
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **October 19, 2018**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

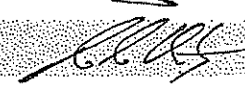
All calibrations have been conducted in the closed laboratory facility: environment temperature $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	04-Oct-18 (No. DAE4-601_Oct18)	Oct-19

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

Calibrated by: **Manu Seitz** **Laboratory Technician** 

Approved by: **Katja Pokovic** **Technical Manager** 

Issued: October 22, 2018

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



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Accreditation No.: **SCS 0108**

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

Glossary:

TSL	tissue simulating liquid
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 the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "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%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
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	40.8 $\pm$ 6 %	0.89 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.02 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.03 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.32 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.26 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	55.1 $\pm$ 6 %	0.96 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.11 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	8.43 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.39 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	5.55 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	55.6 Ω - 1.9 j Ω
Return Loss	- 25.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.6 Ω - 4.2 j Ω
Return Loss	- 27.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.032 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 19, 2015

DASY5 Validation Report for Head TSL

Date: 19.10.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1161

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.89 \text{ S/m}$; $\epsilon_r = 40.8$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.22, 10.22, 10.22) @ 750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

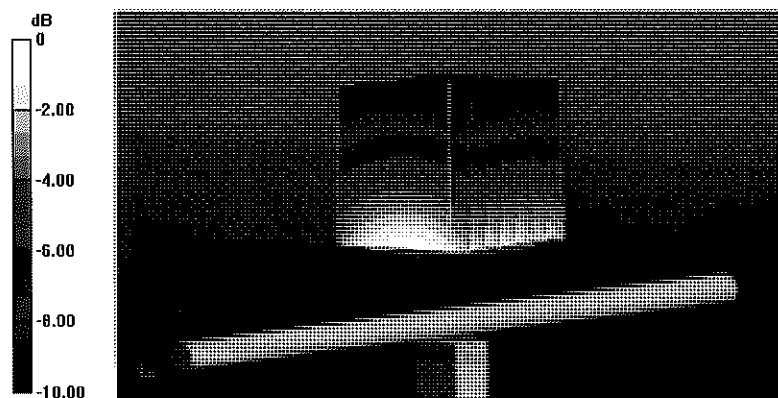
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 58.51 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.04 W/kg

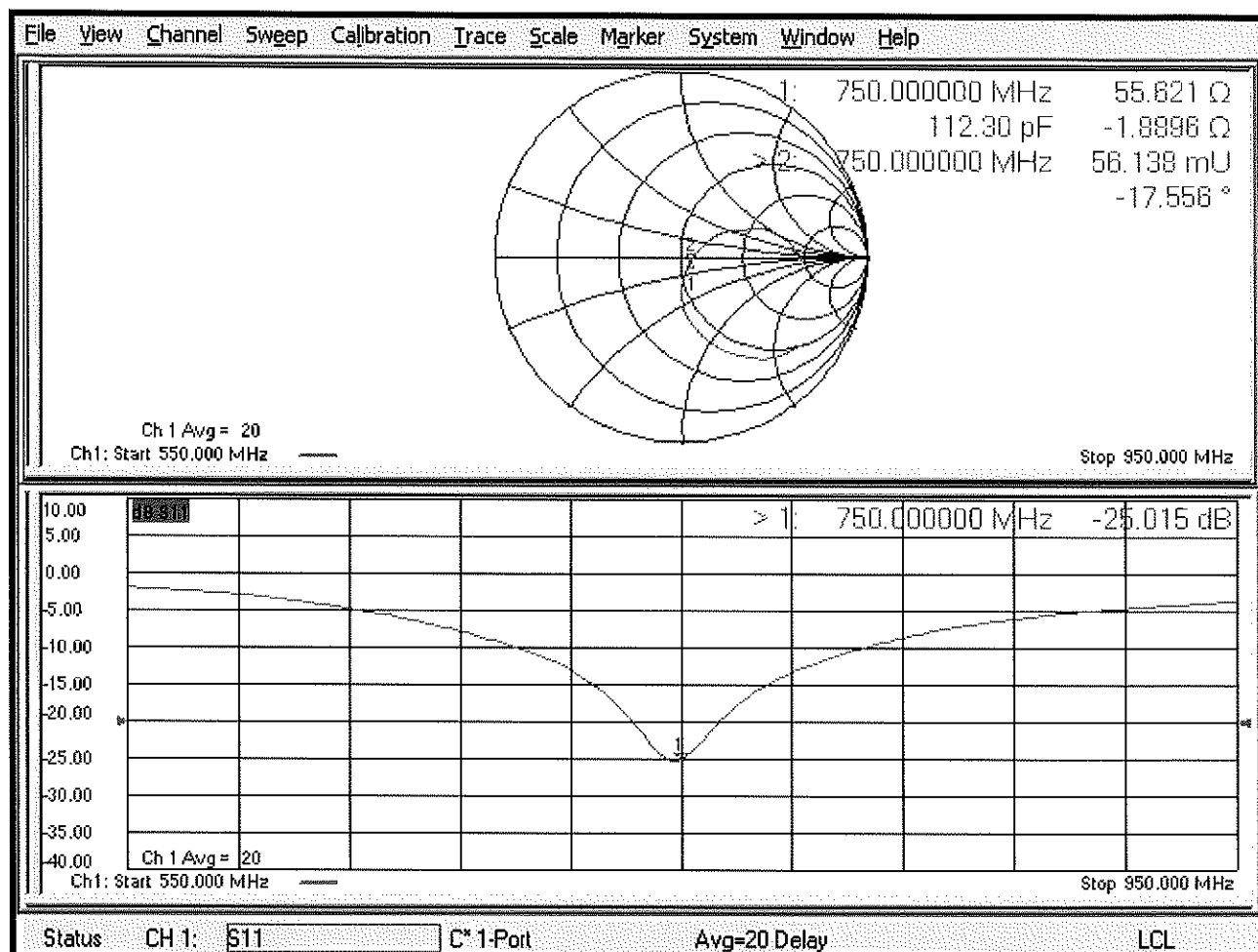
SAR(1 g) = 2.02 W/kg; SAR(10 g) = 1.32 W/kg

Maximum value of SAR (measured) = 2.70 W/kg



0 dB = 2.70 W/kg = 4.31 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 19.10.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 750 MHz; Type: D750V3; Serial: D750V3 - SN:1161

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.96 \text{ S/m}$; $\epsilon_r = 55.1$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.19, 10.19, 10.19) @ 750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

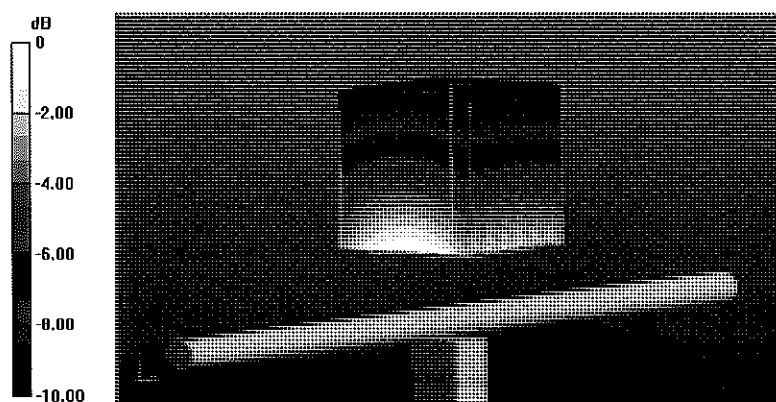
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 57.57 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.18 W/kg

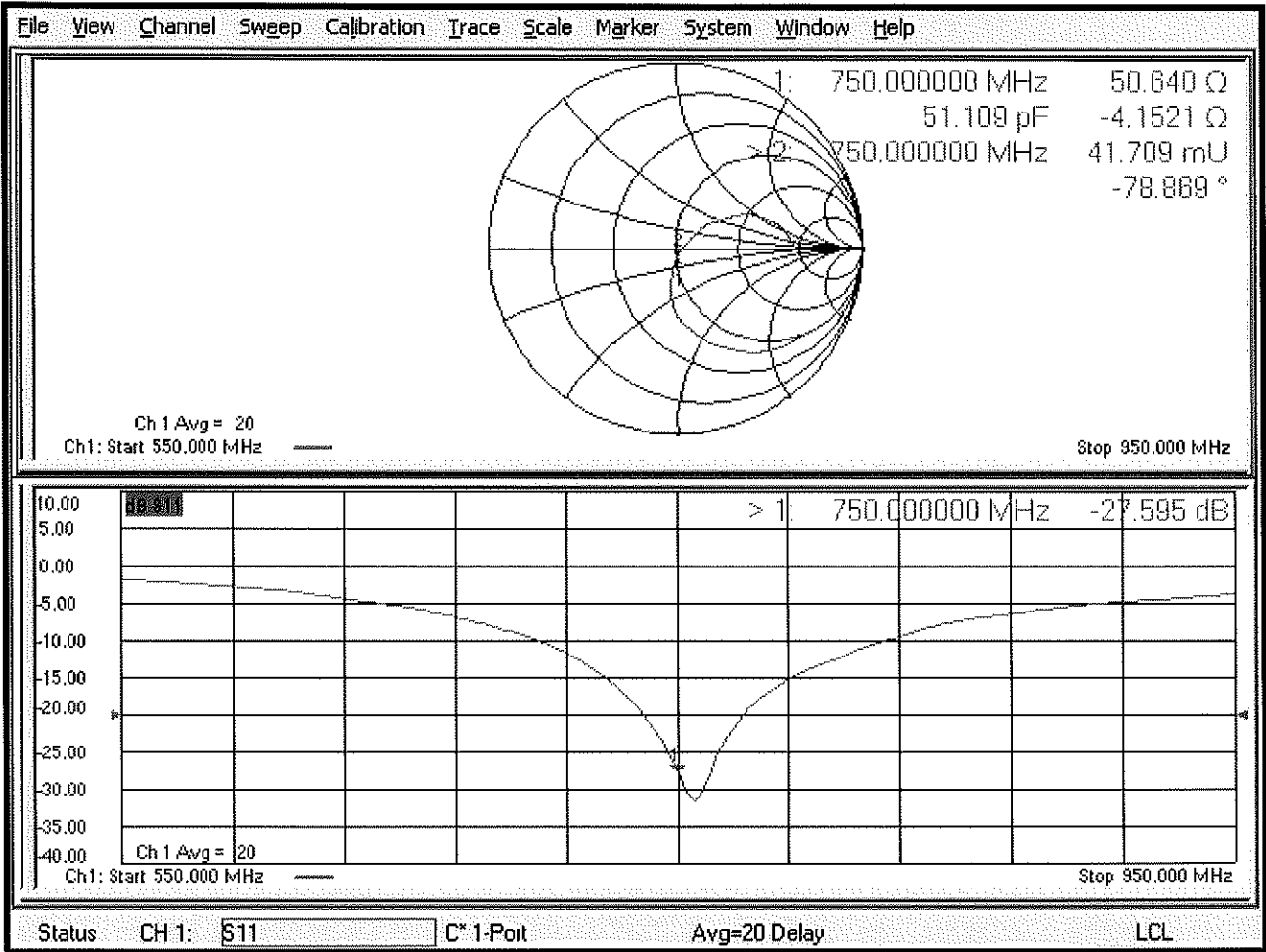
SAR(1 g) = 2.11 W/kg; SAR(10 g) = 1.39 W/kg

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



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

Impedance Measurement Plot for Body TSL



Certification of Calibration

Object D750V3 – SN:1161

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extended Calibration date: October 18, 2019

Description: SAR Validation Dipole at 750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	6/29/2019	Biennial	6/29/2021	192291470
Control Company	4352	Ultra Long Stem Thermometer	8/2/2018	Biennial	8/2/2020	181334684
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	7/2/2019	Annual	7/2/2020	MY53401181
Rohde & Schwarz	ZNLE6	Vector Network Analyzer	10/11/2019	Annual	10/11/2020	101307
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAKS-3.5	Portable Dielectric Assessment Kit	8/13/2019	Annual	8/13/2020	1041
Anritsu	MA2411B	Pulse Power Sensor	8/14/2019	Annual	8/14/2020	1315051
Anritsu	MA2411B	Pulse Power Sensor	8/8/2019	Annual	8/8/2020	1339008
Anritsu	ML2495A	Power Meter	11/20/2018	Annual	11/20/2019	1039008
Agilent	N5182A	MXG Vector Signal Generator	8/19/2019	Annual	8/19/2020	MY47420837
Seekonk	NC-100	Torque Wrench	5/9/2018	Biennial	5/9/2020	22217
Mini-Circuits	NLP-2950+	Low Pass Filter DC to 2700 MHz	CBT	N/A	CBT	N/A
MiniCircuits	ZHDC-16-63-S+	Bidirectional Coupler	CBT	N/A	CBT	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
SPEAG	EX3DV4	SAR Probe	4/24/2019	Annual	4/24/2020	7357
SPEAG	EX3DV4	SAR Probe	7/16/2019	Annual	7/16/2020	7410
SPEAG	DAE4	Dasy Data Acquisition Electronics	7/11/2019	Annual	7/11/2020	1322
SPEAG	DAE4	Dasy Data Acquisition Electronics	4/18/2019	Annual	4/18/2020	1407

Note: CBT (Calibrated Before Testing). Prior to testing, the measurement paths containing a cable, amplifier, attenuator, coupler or filter were connected to a calibrated source (i.e. a signal generator) to determine the losses of the measurement path.

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halfoster	Team Lead Engineer	<i>BRODIE HALFOSTER</i>
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	<i>KOK</i>

DIPOLE CALIBRATION EXTENSION

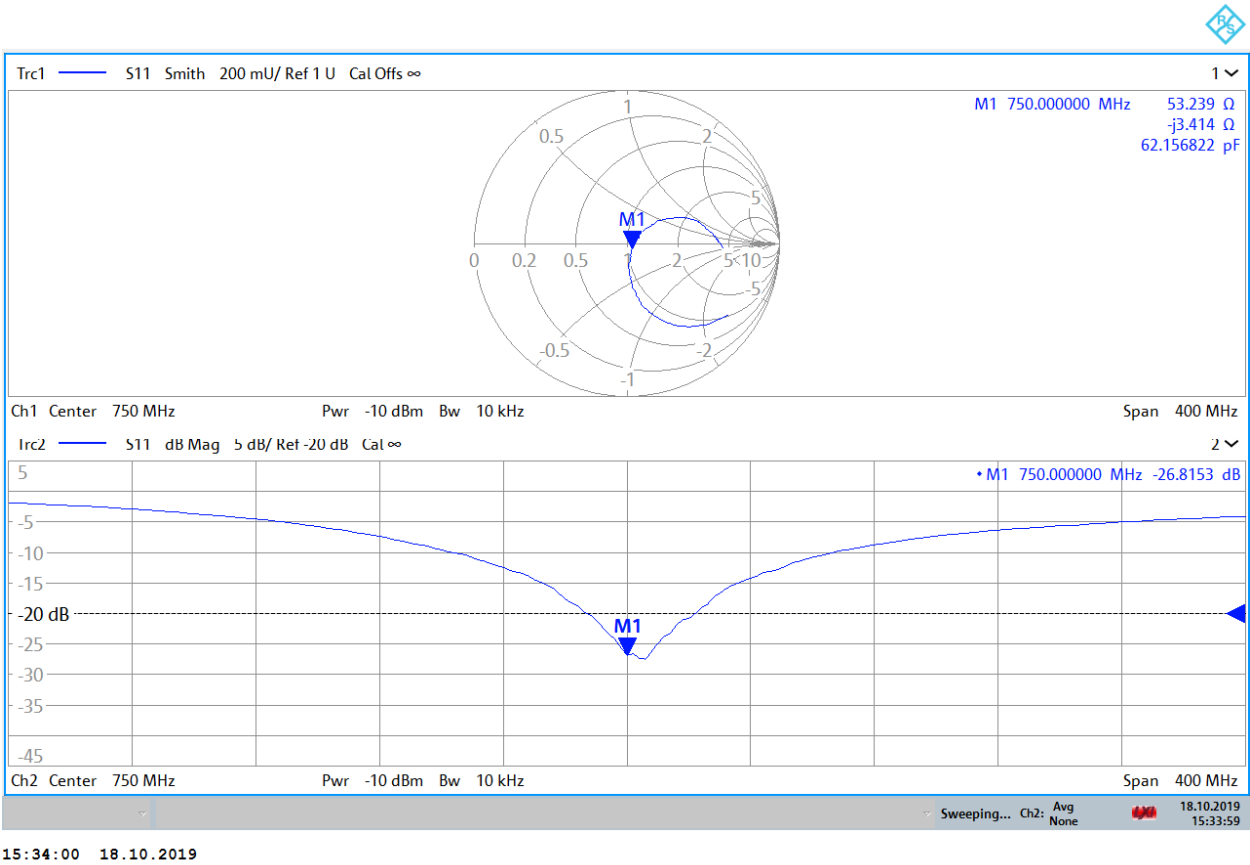
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

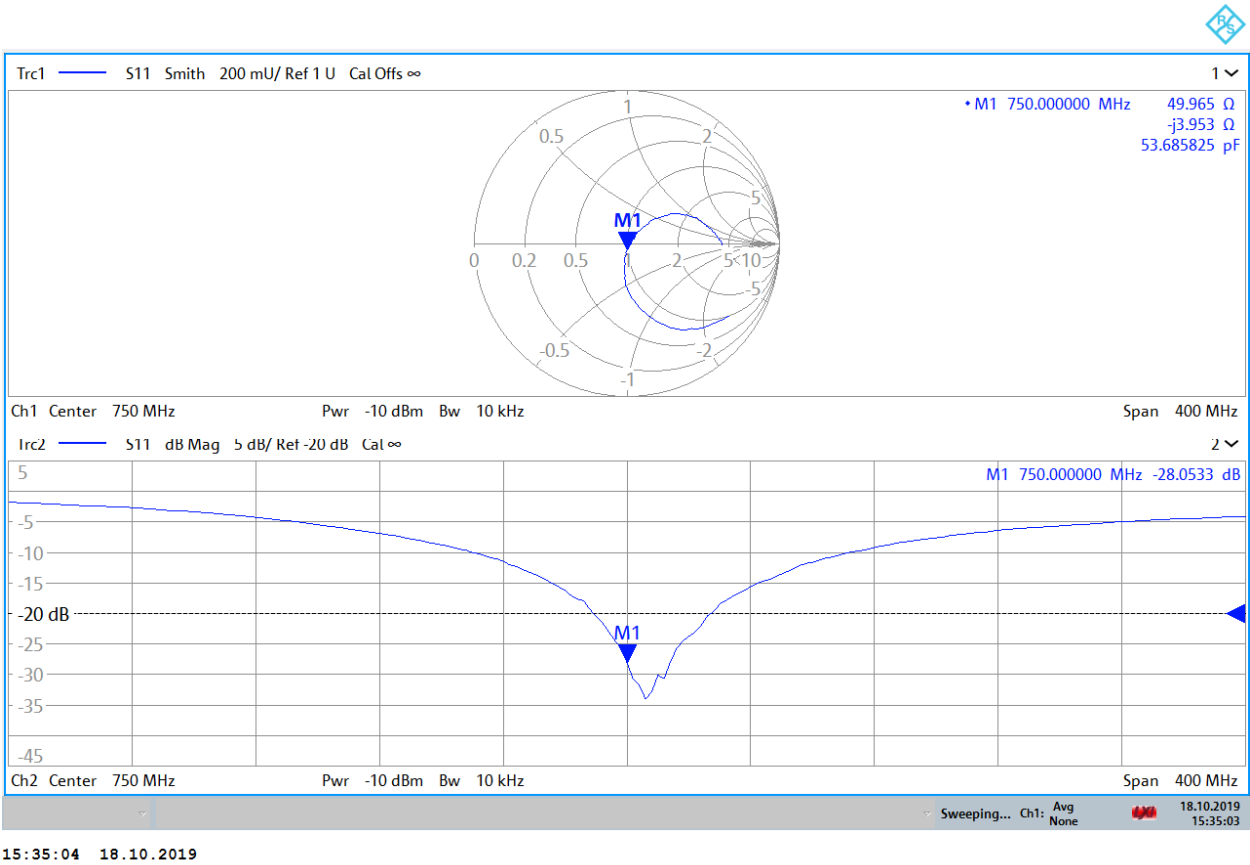
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 23.0 dBm	Measured Head SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 23.0 dBm	Measured Head SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
10/19/2018	10/18/2019	1.032	1.61	1.64	2.12%	1.05	1.08	2.86%	55.6	53.2	2.4	-1.9	-3.4	1.5	-25	-26.8	-7.30%	PASS
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 23.0 dBm	Measured Body SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 23.0 dBm	Measured Body SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
10/19/2018	10/18/2019	1.032	1.69	1.76	4.39%	1.11	1.17	5.41%	50.6	50	0.6	-4.2	-4	0.2	-27.6	-28.1	-1.80%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





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

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D835V2-4d047_Mar19**

CALIBRATION CERTIFICATE

Object **D835V2 - SN:4d047**

Calibration procedure(s) **QA-CAL-05.v11**
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz

Calibration date: **March 13, 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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	31-Dec-18 (No. EX3-7349_Dec18)	Dec-19
DAE4	SN: 601	04-Oct-18 (No. DAE4-601_Oct18)	Oct-19

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	07-Oct-15 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

Calibrated by:	Name Manu Seitz	Function Laboratory Technician	Signature
Approved by:	Katja Pokovic	Technical Manager	

Issued: March 13, 2019

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



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

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Multilateral Agreement for the recognition of calibration certificates

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 the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "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%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz $\pm$ 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	41.9 $\pm$ 6 %	0.91 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.42 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.54 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.13 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	54.3 $\pm$ 6 %	1.01 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.45 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	9.47 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.61 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	6.27 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.4 Ω - 2.6 j Ω
Return Loss	- 30.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.8 Ω - 6.1 j Ω
Return Loss	- 22.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.387 ns
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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: 13.03.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d047

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.91 \text{ S/m}$; $\epsilon_r = 41.9$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10, 10, 10) @ 835 MHz; Calibrated: 31.12.2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

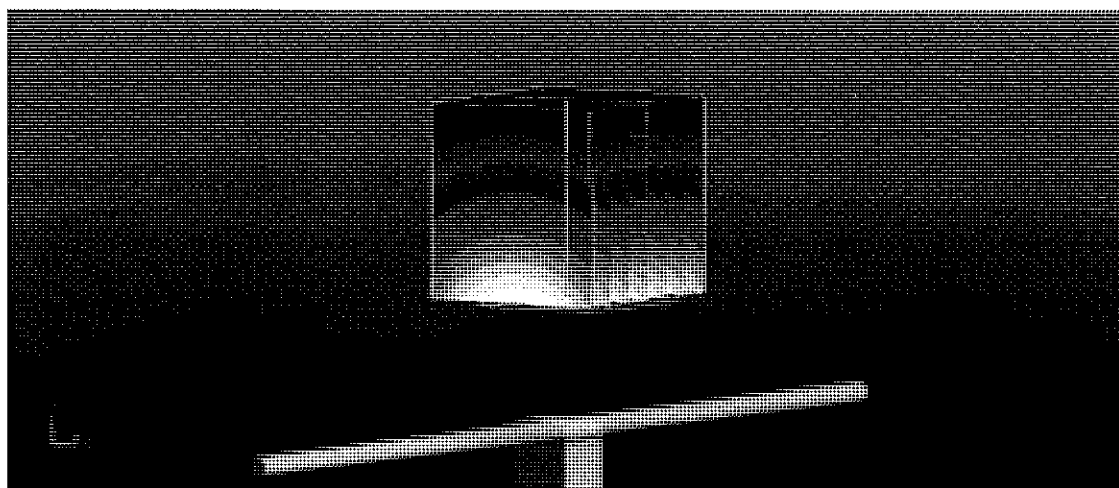
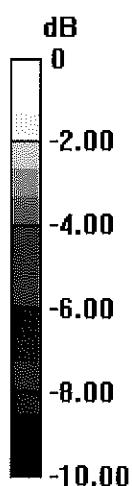
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 62.48 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 3.60 W/kg

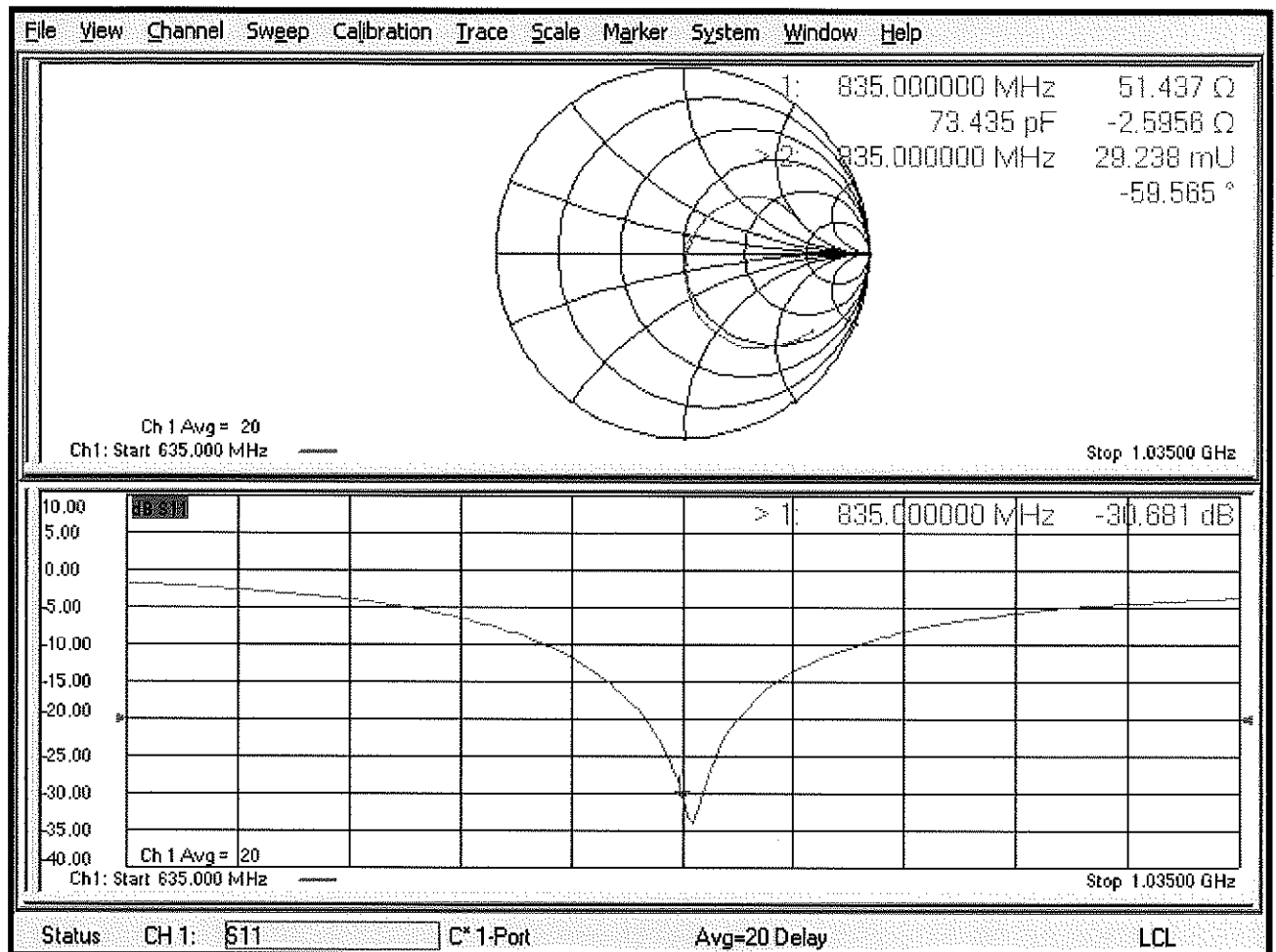
SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.54 W/kg

Maximum value of SAR (measured) = 3.18 W/kg



0 dB = 3.18 W/kg = 5.02 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 13.03.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d047

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 1.01 \text{ S/m}$; $\epsilon_r = 54.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.15, 10.15, 10.15) @ 835 MHz; Calibrated: 31.12.2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

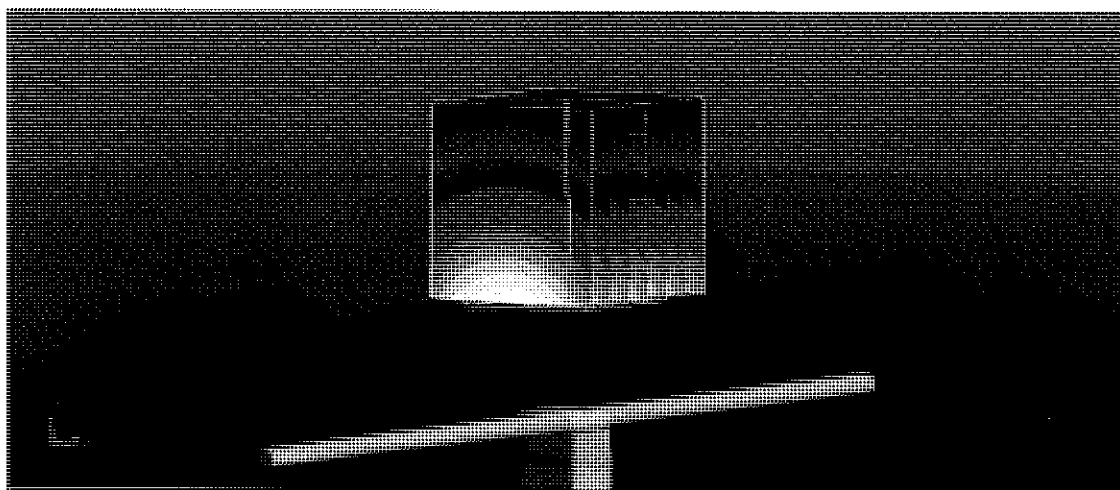
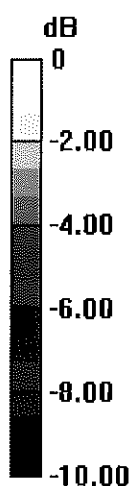
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 60.49 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.58 W/kg

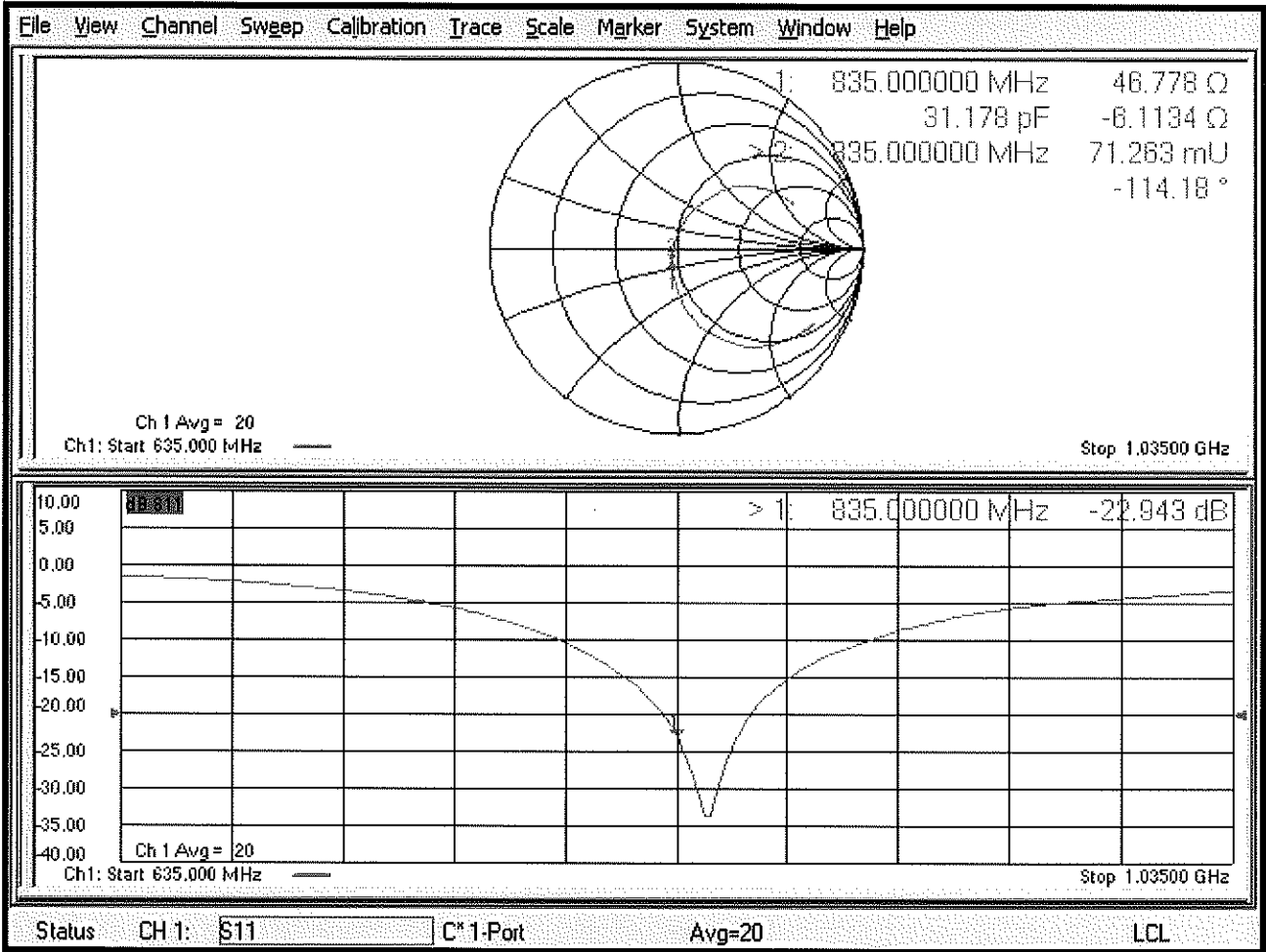
SAR(1 g) = 2.45 W/kg; SAR(10 g) = 1.61 W/kg

Maximum value of SAR (measured) = 3.23 W/kg



0 dB = 3.23 W/kg = 5.09 dBW/kg

Impedance Measurement Plot for Body TSL



Certification of Calibration

Object D835V2 – SN: 4d047

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extension Calibration date: 3/13/2020

Description: SAR Validation Dipole at 835 MHz

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Control Company	4040	Therm./Clock/Humidity Monitor	6/29/2019	Biennial	6/29/2021	192291470
Control Company	4352	Ultra Long Stem Thermometer	8/2/2018	Biennial	8/2/2020	181334684
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	7/2/2019	Annual	7/2/2020	MY53401181
Rohde & Schwarz	ZNLE6	Vector Network Analyzer	10/11/2019	Annual	10/11/2020	101307
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAKS-3.5	Portable DAK	9/10/2019	Annual	9/10/2020	1045
Anritsu	MA2411B	Pulse Power Sensor	8/14/2019	Annual	8/14/2020	1315051
Anritsu	MA2411B	Pulse Power Sensor	8/8/2019	Annual	8/8/2020	1339008
Anritsu	ML2495A	Power Meter	12/17/2019	Annual	12/17/2020	941001
Agilent	N5182A	MXG Vector Signal Generator	8/19/2019	Annual	8/19/2020	MY47420837
Seekonk	NC-100	Torque Wrench	5/9/2018	Biennial	5/9/2020	22217
MiniCircuits	ZHDC-16-63-S+	Bidirectional Coupler	CBT	N/A	CBT	N/A
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
SPEAG	EX3DV4	SAR Probe	9/19/2019	Annual	9/19/2020	7551
SPEAG	EX3DV4	SAR Probe	1/21/2020	Annual	1/21/2021	7488
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/17/2019	Annual	9/17/2020	1333
SPEAG	DAE4	Dasy Data Acquisition Electronics	1/13/2020	Annual	1/13/2021	1530

Measurement Uncertainty = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halfoster	Test Engineer	<i>BRODIE HALFOSTER</i>
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	<i>KOK</i>

DIPOLE CALIBRATION EXTENSION

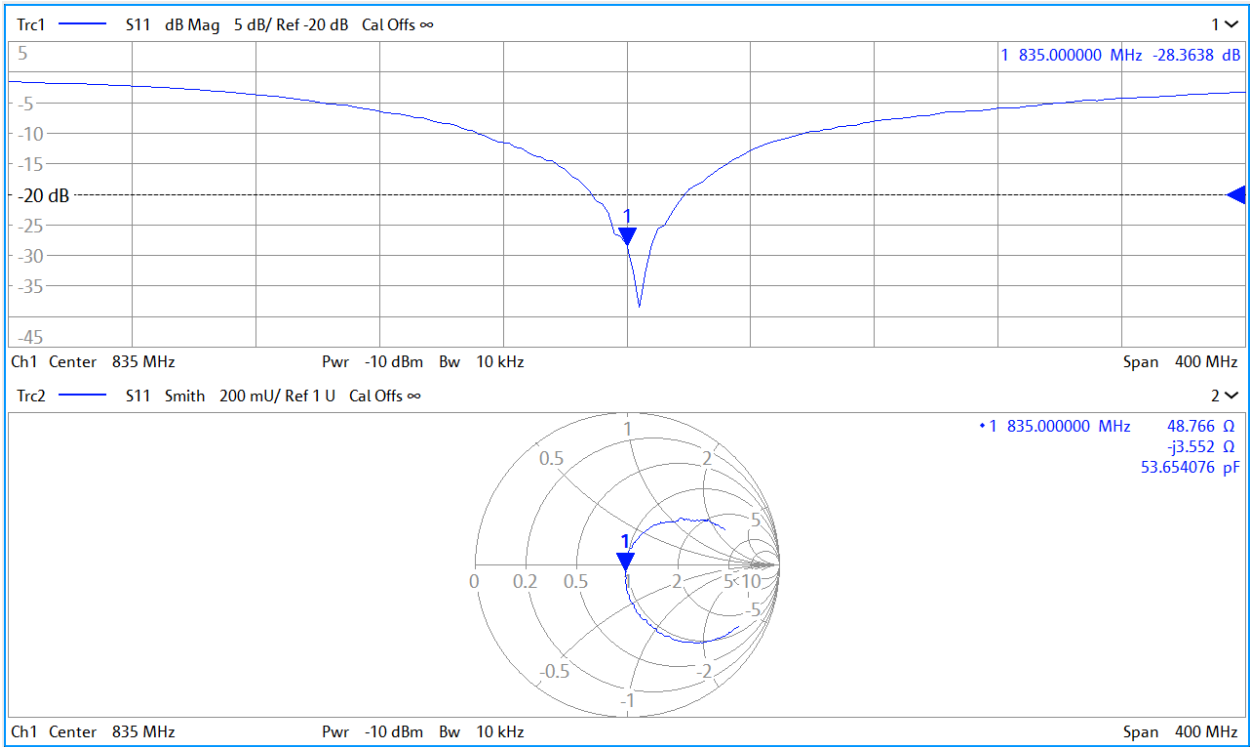
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

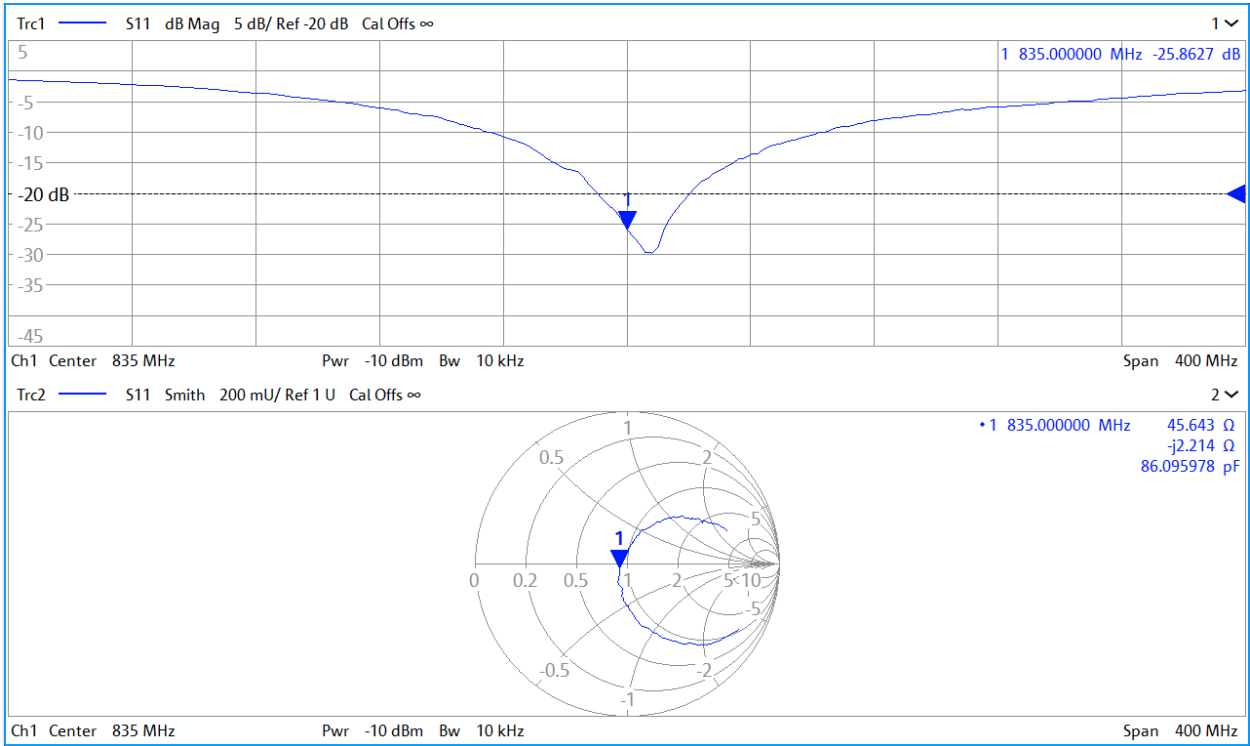
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 20.0 dBm	Measured Head SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	Measured Body SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
3/13/2019	3/13/2020	1.387	1.884	1.87	-0.74%	1.226	1.22	-0.49%	51.4	49.8	2.6	-2.6	-3.6	1.0	-30.7	-28.4	7.60%	PASS
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Body (1g) W/kg @ 20.0 dBm	Measured Body SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Body (10g) W/kg @ 20.0 dBm	Measured Body SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance Body (Ohm) Real	Measured Impedance Body (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Body (Ohm) Imaginary	Measured Impedance Body (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Body (dB)	Measured Return Loss Body (dB)	Deviation (%)	PASS/FAIL
3/13/2019	3/13/2020	1.387	1.894	1.91	0.84%	1.254	1.26	0.48%	46.8	45.6	1.2	-6.1	-2.2	3.9	-22.9	-25.9	-12.90%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL





Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

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 Multilateral Agreement for the recognition of calibration certificates

Client **PC Test**

Certificate No: **D835V2-4d132_Jan19**

CALIBRATION CERTIFICATE

Object **D835V2 - SN:4d132**

Calibration procedure(s) **QA CAL-05.v11**
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz

BN ✓
02/06/2019

Calibration date: **January 22, 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 $(22 \pm 3)^{\circ}\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	31-Dec-18 (No. EX3-7349_Dec18)	Dec-19
DAE4	SN: 601	04-Oct-18 (No. DAE4-601_Oct18)	Oct-19

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

Calibrated by: **Leif Klysner** **Laboratory Technician**

Signature

Leif Klysner

Approved by: **Katja Pokovic** **Technical Manager**

Katja Pokovic

Issued: January 22, 2019

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



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Accreditation No.: **SCS 0108**

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 the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "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%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5.0 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	41.3 $\pm$ 6 %	0.92 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.44 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.59 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.58 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.23 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	54.6 $\pm$ 6 %	0.99 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.46 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	9.67 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.61 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	6.35 W/kg $\pm$ 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	49.6 Ω - 3.6 j Ω
Return Loss	- 28.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.4 Ω - 6.2 j Ω
Return Loss	- 23.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.387 ns
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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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Appendix (Additional assessments outside the scope of SCS 0108)

Measurement Conditions

DASY system configuration, as far as not given on page 1 and 3.

Phantom	SAM Head Phantom	For usage with cSAR3DV2-R/L
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SAR result with SAM Head (Top)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.35 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.38 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.57 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.26 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Mouth)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.47 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.86 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.65 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.58 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Neck)

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	9.42 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.60 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.38 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Ear)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.02 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.06 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.36 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.42 W/kg ± 16.9 % (k=2)

DASY5 Validation Report for Head TSL

Date: 17.01.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d132

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.92 \text{ S/m}$; $\epsilon_r = 41.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10, 10, 10) @ 835 MHz; Calibrated: 31.12.2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

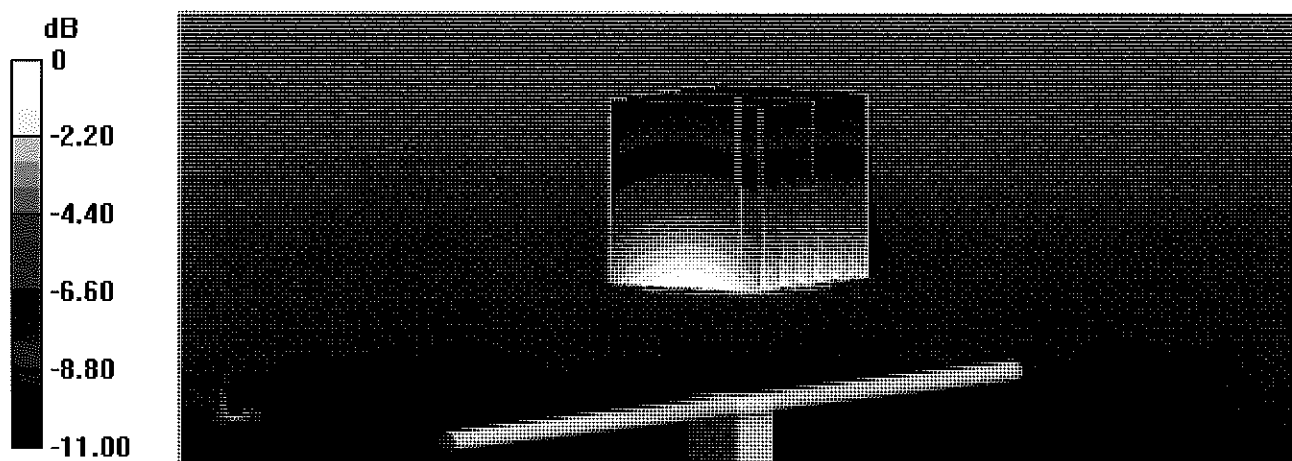
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 34.24 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 3.73 W/kg

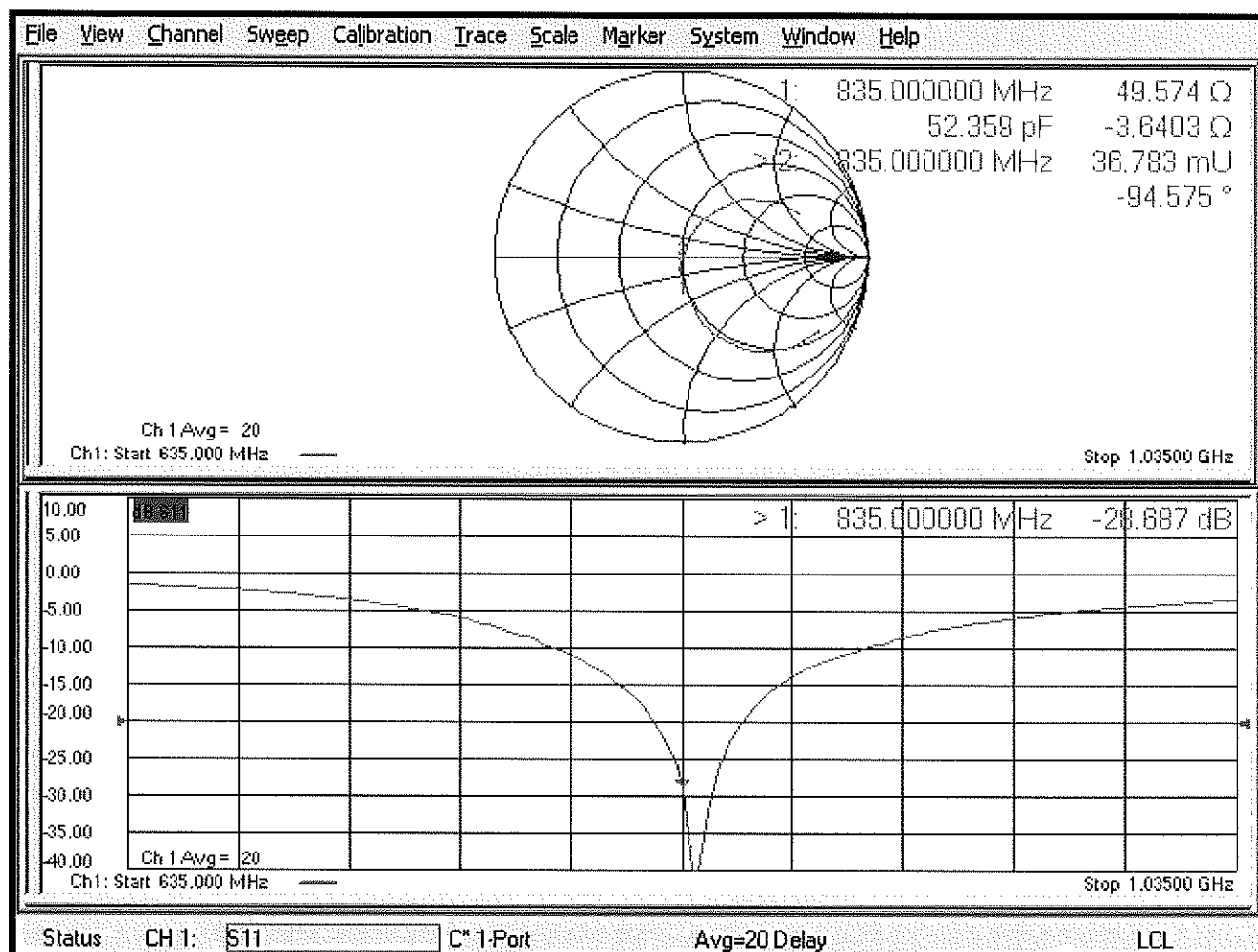
SAR(1 g) = 2.44 W/kg; SAR(10 g) = 1.58 W/kg

Maximum value of SAR (measured) = 3.28 W/kg



0 dB = 3.28 W/kg = 5.16 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 17.01.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d132

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.99 \text{ S/m}$; $\epsilon_r = 54.6$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.15, 10.15, 10.15) @ 835 MHz; Calibrated: 31.12.2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

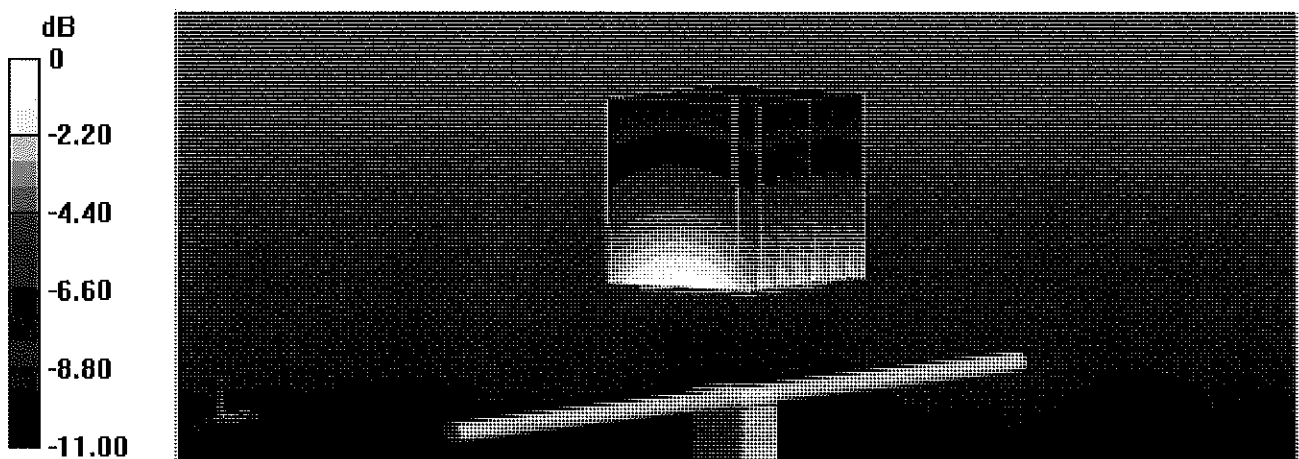
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 63.32 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 3.64 W/kg

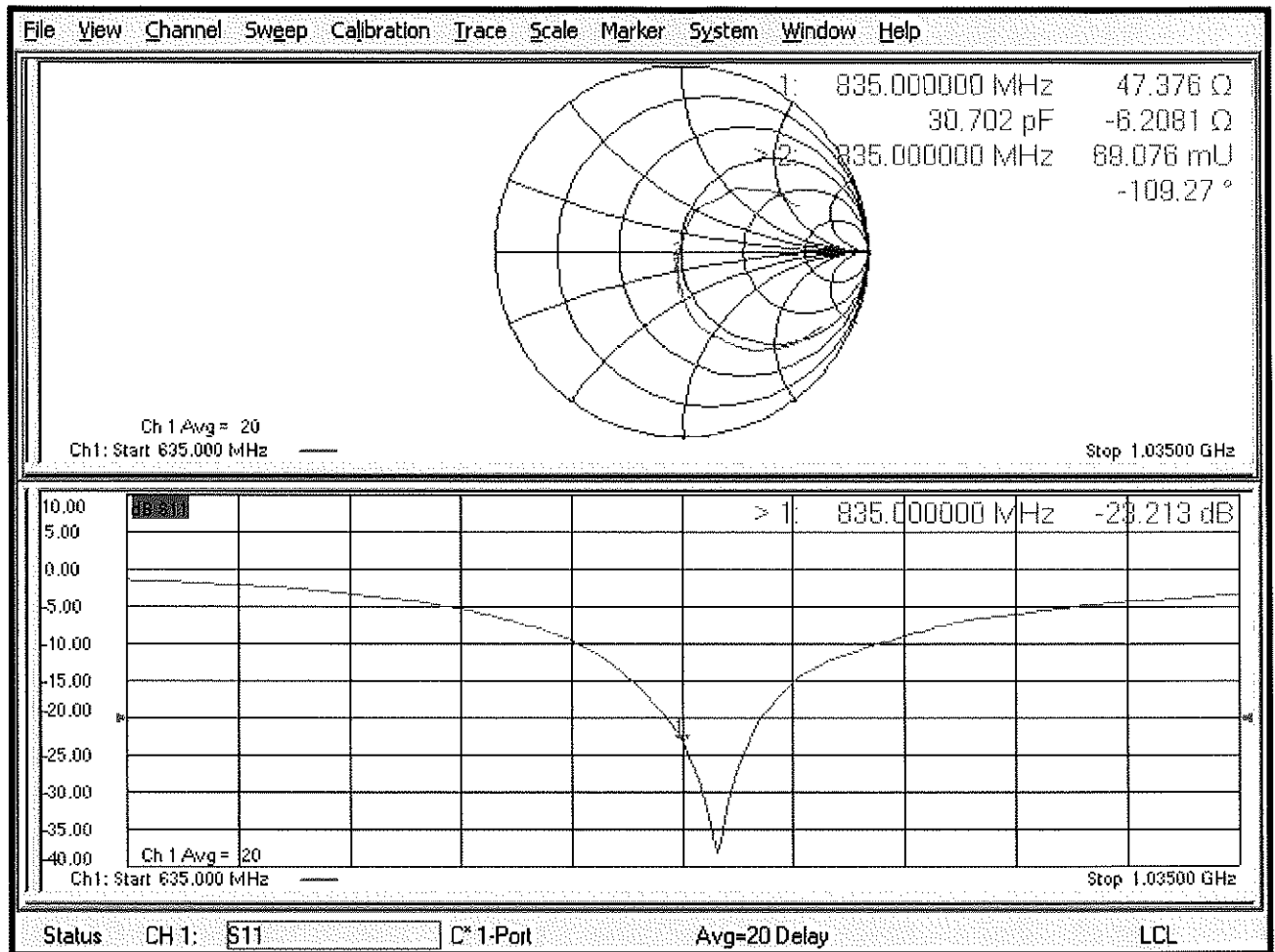
SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.61 W/kg

Maximum value of SAR (measured) = 3.26 W/kg



0 dB = 3.26 W/kg = 5.13 dBW/kg

Impedance Measurement Plot for Body TSL



DASY5 Validation Report for SAM Head

Date: 22.01.2019

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d132

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.92 \text{ S/m}$; $\epsilon_r = 44.4$; $\rho = 1000 \text{ kg/m}^3$

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10, 10, 10) @ 835 MHz; Calibrated: 31.12.2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: SAM Head
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

SAM/Head/Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 61.32 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 3.51 W/kg

SAR(1 g) = 2.35 W/kg; SAR(10 g) = 1.57 W/kg

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

SAM/Head/Mouth/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 62.25 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 3.67 W/kg

SAR(1 g) = 2.47 W/kg; SAR(10 g) = 1.65 W/kg

Maximum value of SAR (measured) = 3.24 W/kg

SAM/Head/Neck/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 60.69 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 3.43 W/kg

SAR(1 g) = 2.36 W/kg; SAR(10 g) = 1.6 W/kg

Maximum value of SAR (measured) = 3.08 W/kg

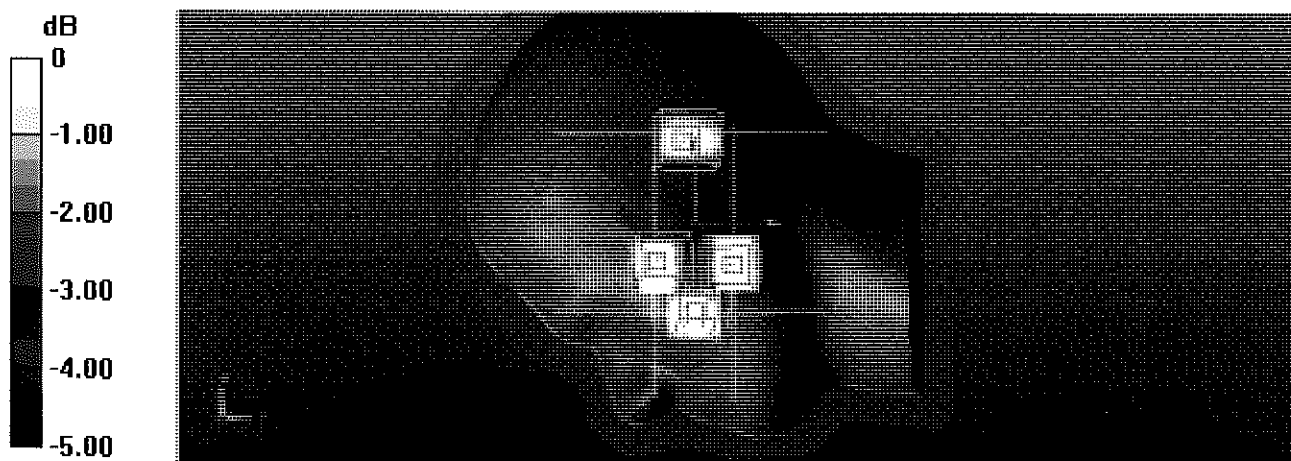
SAM/Head/Ear/Zoom Scan (8x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 55.79 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 2.94 W/kg

SAR(1 g) = 2.02 W/kg; SAR(10 g) = 1.36 W/kg

Maximum value of SAR (measured) = 2.62 W/kg





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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D835V2-4d133_Oct18**

CALIBRATION CERTIFICATE

Object **D835V2 - SN:4d133**

Calibration procedure(s) **QA CAL-05.v10**
Calibration procedure for dipole validation kits above 700 MHz

Calibration date: **October 19, 2018**

BN ✓
10/30/2018
BN ✓
10-20-2019

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 (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	30-Dec-17 (No. EX3-7349_Dec17)	Dec-18
DAE4	SN: 601	04-Oct-18 (No. DAE4-601_Oct18)	Oct-19
Secondary Standards	ID #	Check Date (In house)	Scheduled Check
Power meter EPM-442A	SN: GB37480704	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

Calibrated by: **Manu Seitz** **Laboratory Technician**

Approved by: **Kolja Pokovic** **Technical Manager**

Signature

Issued: October 22, 2018

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



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

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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 the assessment of Specific Absorption Rate (SAR) from hand-held and body-mounted devices used next to the ear (frequency range of 300 MHz to 6 GHz)", July 2016
- IEC 62209-2, "Procedure to determine the Specific Absorption Rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)", March 2010
- KDB 865664, "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%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz $\pm$ 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	40.6 $\pm$ 6 %	0.91 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.39 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.43 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.54 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.10 W/kg $\pm$ 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	54.9 $\pm$ 6 %	0.98 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.46 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	9.75 W/kg $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.61 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	6.40 W/kg $\pm$ 16.5 % (k=2)