PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 0562M

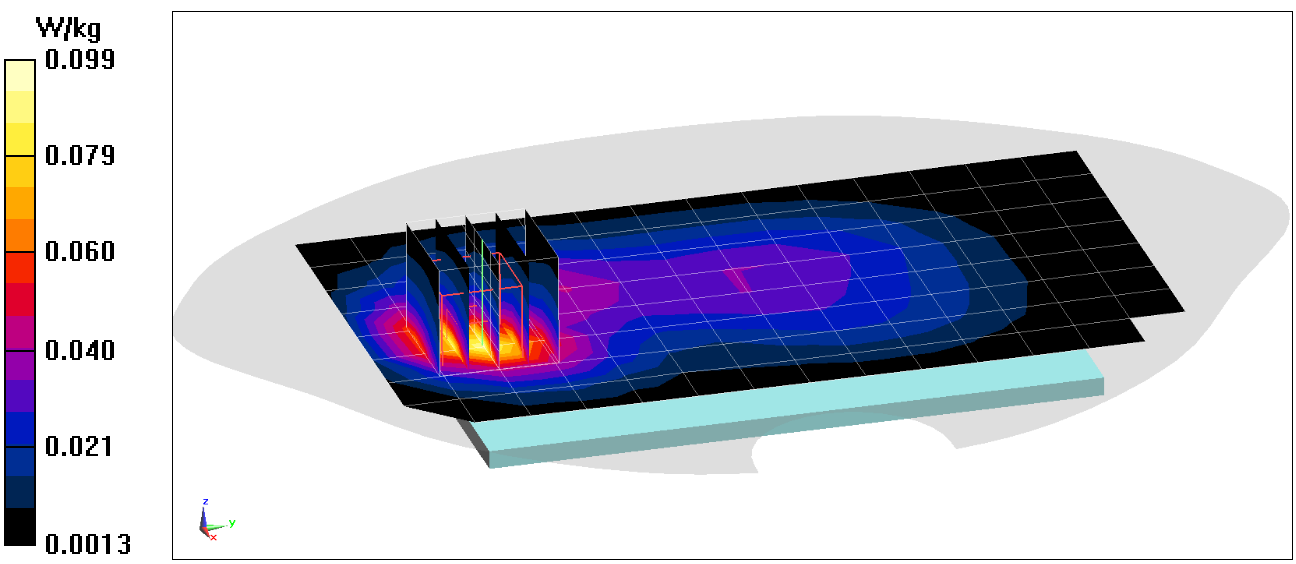
Communication System: UID 0, NR Band n5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.5 MHz; σ = 0.95 S/m; ε_r = 53.898; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11/05/2020; Ambient Temp: 23.5°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN7570; ConvF(9.83, 9.83, 9.83) @ 836.5 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)

Mode: NR Band n5, Body SAR, Back Side, 20 MHz Bandwidth, DFT-s-OFDM QPSK, Ch. 167300, 50 RB, 28 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 8.782 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.121 W/kg
SAR(1 g) = 0.068 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 0562M

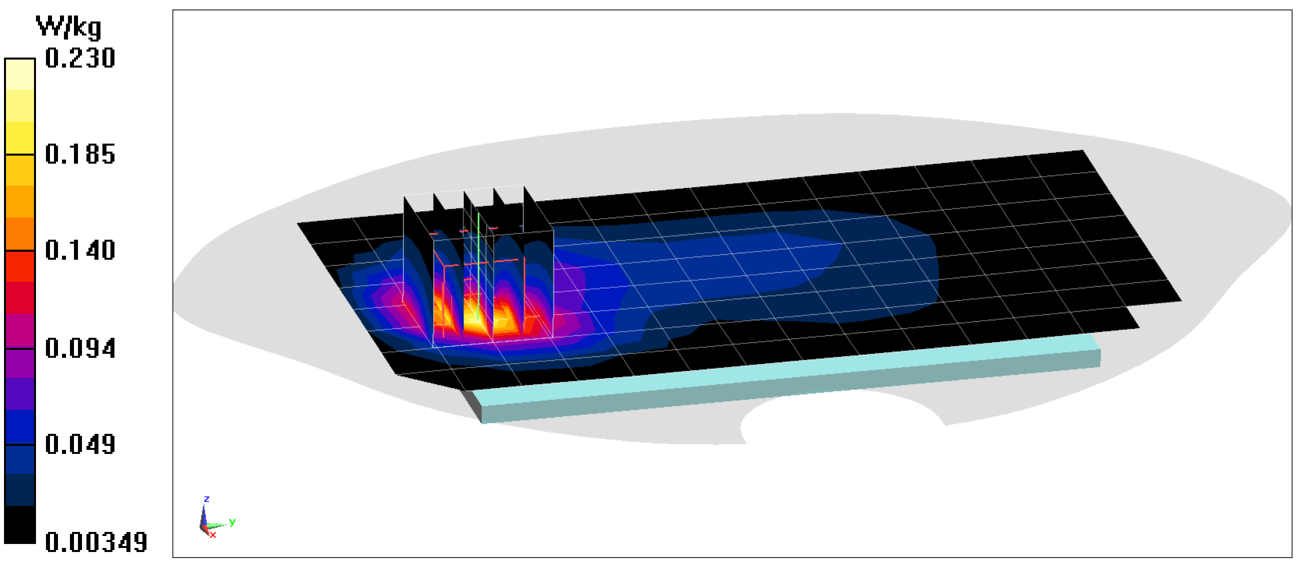
Communication System: UID 0, NR Band n5; Frequency: 836.5 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
f = 836.5 MHz; σ = 0.95 S/m; ε_r = 53.898; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/05/2020; Ambient Temp: 23.5°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN7570; ConvF(9.83, 9.83, 9.83) @ 836.5 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)

Mode: NR Band n5, Body SAR, Back Side, 20 MHz Bandwidth, DFT-s-OFDM QPSK, Ch. 167300, 50 RB, 28 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.40 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.279 W/kg
SAR(1 g) = 0.154 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 1615M

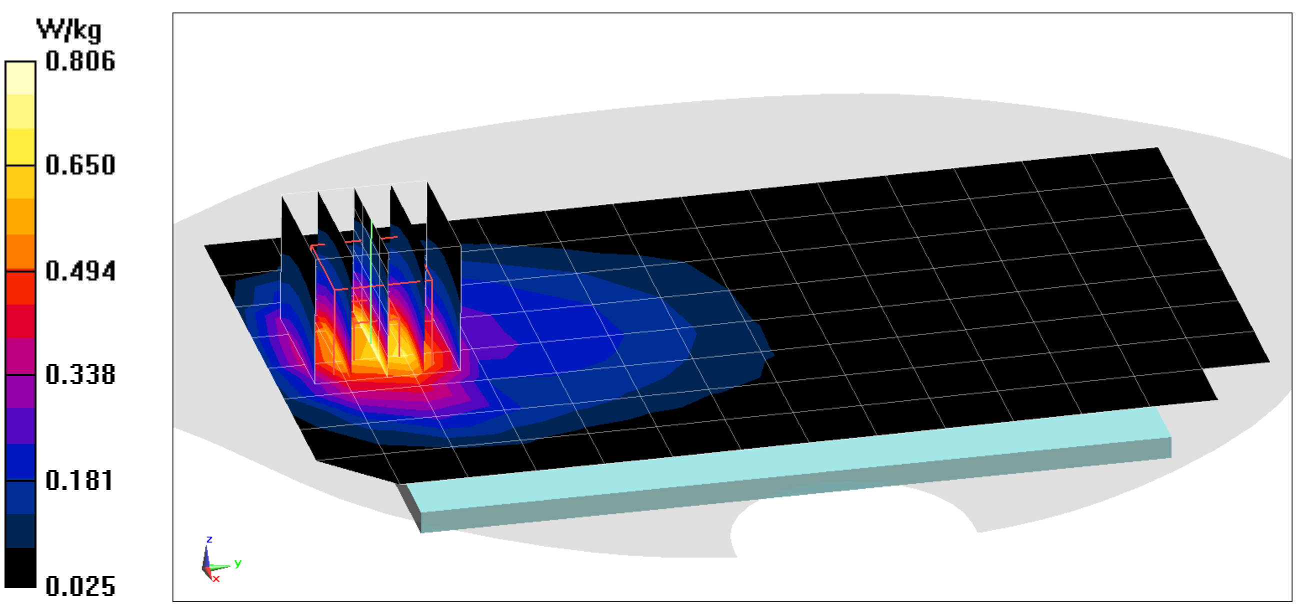
Communication System: UID 0, NR Band n66; Frequency: 1745 MHz; Duty Cycle: 1:1
Medium: 1750 Body; Medium parameters used:
f = 1745 MHz; σ = 1.506 S/m; ε_r = 51.052; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11/19/2020; Ambient Temp: 22.0°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN7357; ConvF(8.17, 8.17, 8.17) @ 1745 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)

Mode: NR Band n66, Body SAR, Back Side, 20 MHz Bandwidth, DFT-s-OFDM QPSK, Ch. 349000, 1 RB, 53 RB Offset

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 20.47 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 0.921 W/kg
SAR(1 g) = 0.576 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 1615M

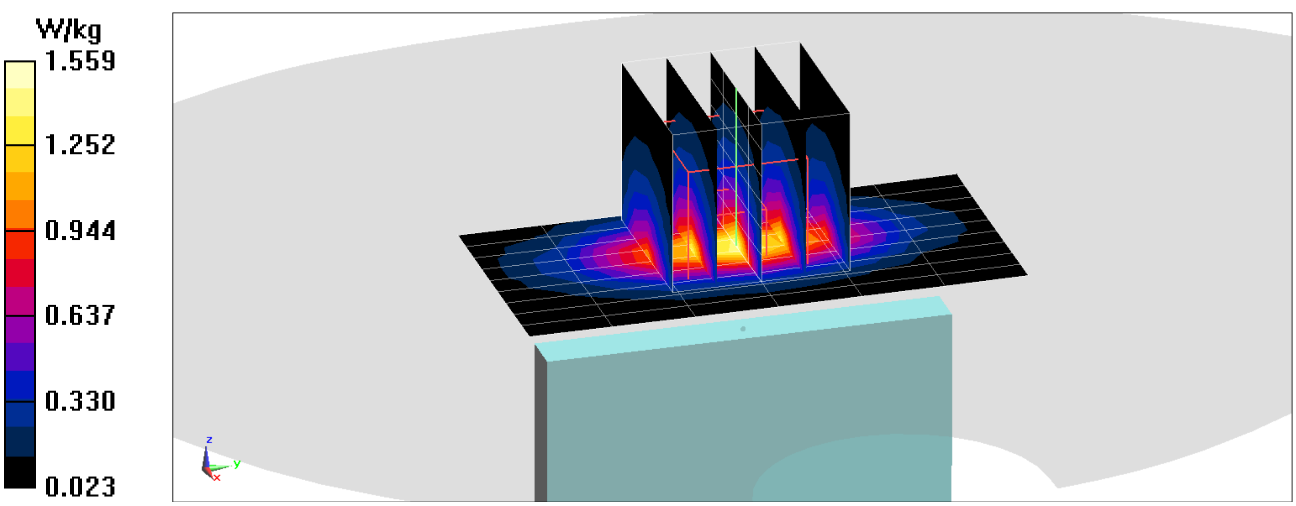
Communication System: UID 0, NR Band n66; Frequency: 1745 MHz, Duty Cycle: 1:1
Medium: 1750 Body; Medium parameters used:
f = 1770 MHz; σ = 1.528 S/m; ε_r = 50.797; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12/02/2020; Ambient Temp: 24.2°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN7357; ConvF(8.17, 8.17, 8.17) @ 1770 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)

Mode: NR Band n66, Body SAR, Bottom Edge, 20 MHz Bandwidth, DFT-s-OFDM QPSK, Ch. 354000, 1 RB, 53 RB Offset

Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 27.75 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 1.82 W/kg
SAR(1 g) = 1.05 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 1590M

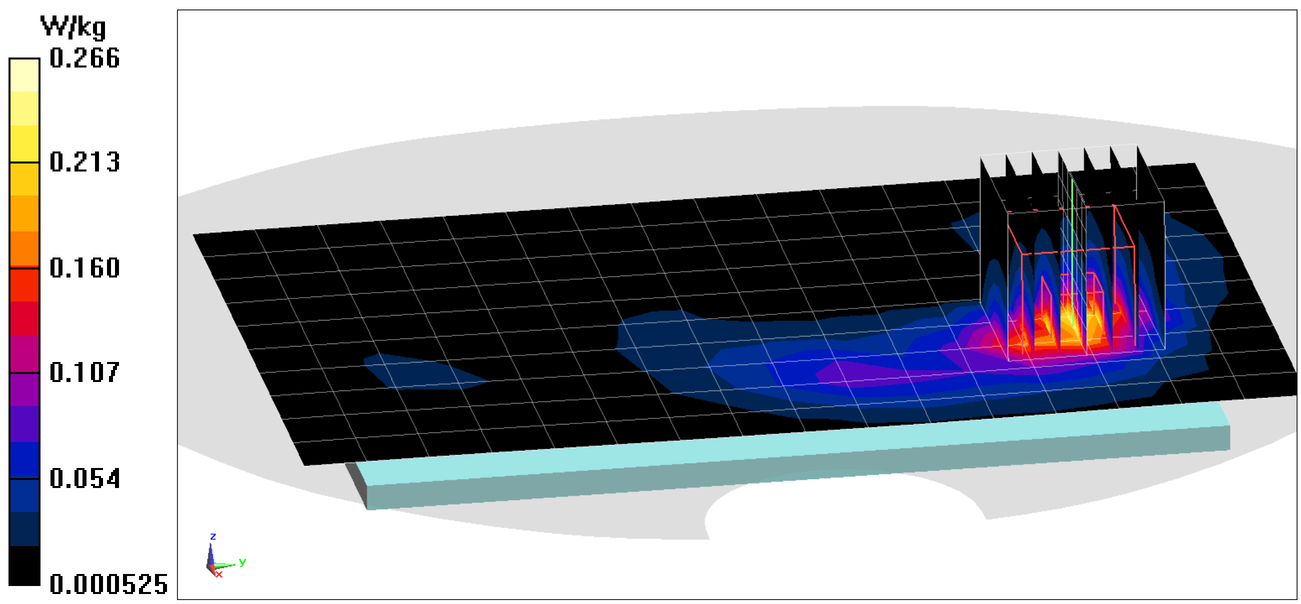
Communication System: UID 0, IEEE 802.11g; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body; Medium parameters used (interpolated):
f = 2437 MHz; σ = 2.018 S/m; ε_r = 52.496; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11/21/2020; Ambient Temp: 22.6°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7409; ConvF(7.24, 7.24, 7.24) @ 2437 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: IEEE 802.11g, MIMO, 20 MHz Bandwidth, Body SAR, Ch 6, 6 Mbps, Back Side

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.608 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 0.326 W/kg
SAR(1 g) = 0.162 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 1615M

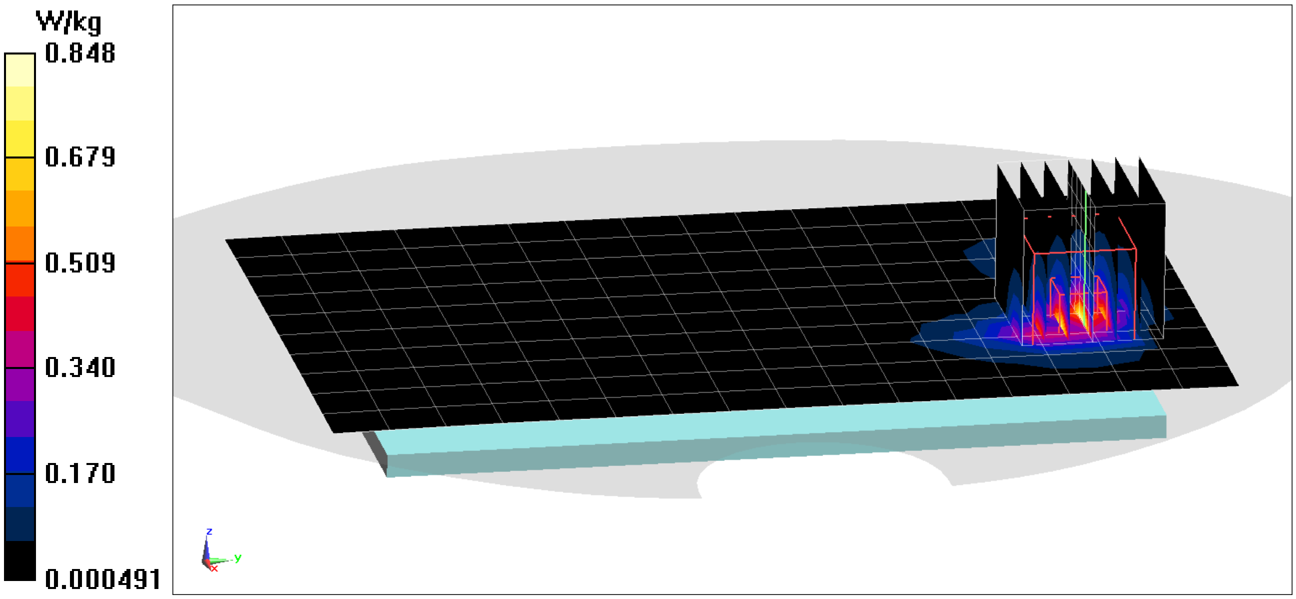
Communication System: UID 0, 802.11b; Frequency: 2462 MHz; Duty Cycle: 1:1
Medium: 2450 Body; Medium parameters used (interpolated):
f = 2462 MHz; σ = 2.033 S/m; ε_r = 51.008; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/16/2020; Ambient Temp: 22.9°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN7308; ConvF(7.41, 7.41, 7.41) @ 2462 MHz; Calibrated: 7/31/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1450; Calibrated: 8/11/2020
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)

Mode: IEEE 802.11b, Antenna 1, 22 MHz Bandwidth, Body SAR, Ch 11, 1 Mbps, Back Side

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.162 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 1.12 W/kg
SAR(1 g) = 0.502 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 1621M

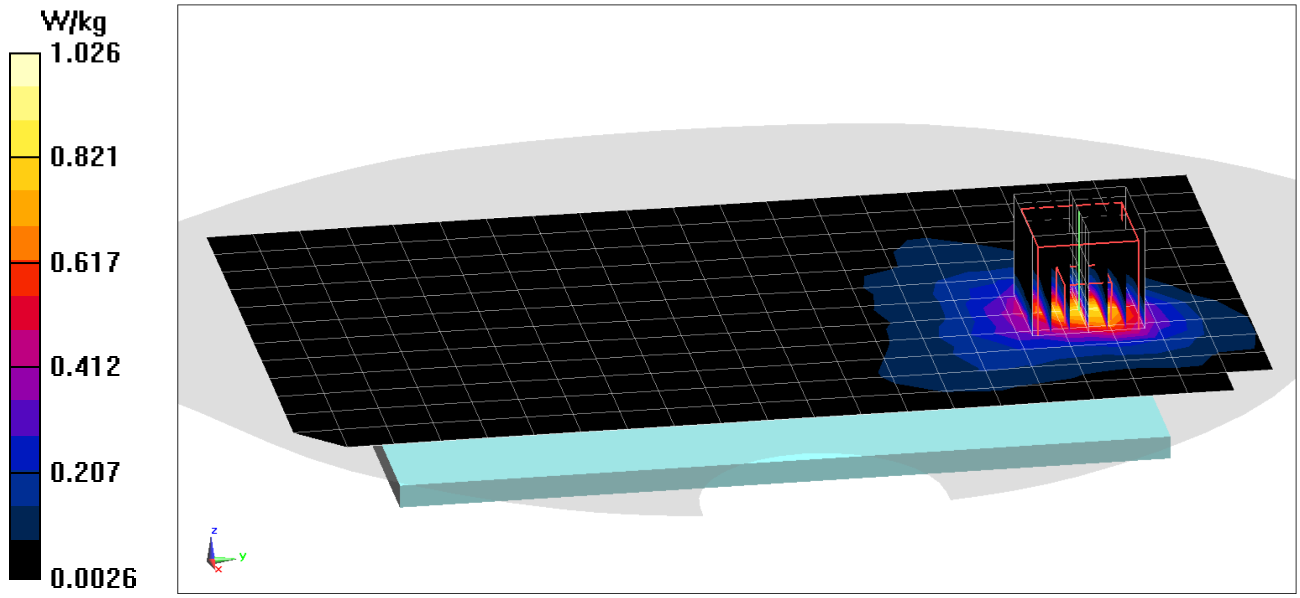
Communication System: UID 0, 802.11n 5.2-5.8 GHz Band; Frequency: 5620 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body; Medium parameters used:
f = 5620 MHz; σ = 5.995 S/m; ε_r = 46.688; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11/15/2020; Ambient Temp: 21.9°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(4.37, 4.37, 4.37) @ 5620 MHz; Calibrated: 6/23/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1583; Calibrated: 5/14/2020
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, UNII-2C, 20 MHz Bandwidth, Body SAR, Ch 124, 13 Mbps, Back Side

Area Scan (13x22x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 8.680 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 1.76 W/kg
SAR(1 g) = 0.425 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 1621M

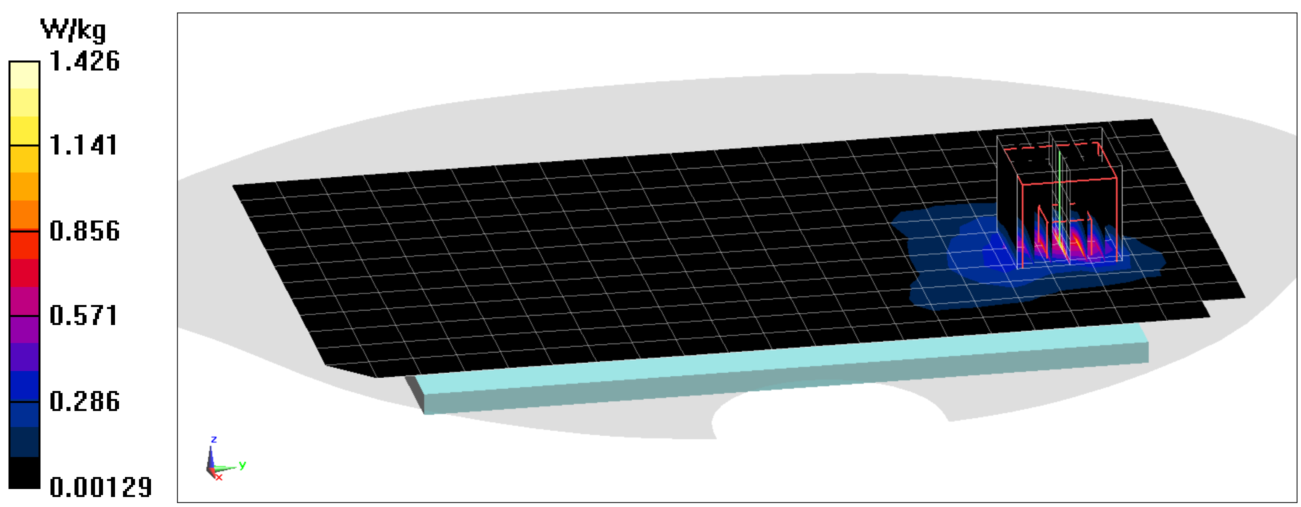
Communication System: UID 0, 802.11n 5.2-5.8 GHz Band; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body; Medium parameters used:
f = 5785 MHz; σ = 6.216 S/m; ε_r = 46.383; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/15/2020; Ambient Temp: 21.9°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(4.56, 4.56, 4.56) @ 5785 MHz; Calibrated: 6/23/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1583; Calibrated: 5/14/2020
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, UNII-3, 20 MHz Bandwidth, Body SAR, Ch 157, 13 Mbps, Back Side

Area Scan (13x22x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 0.7830 V/m; Power Drift = 0.20 dB
Peak SAR (extrapolated) = 2.59 W/kg
SAR(1 g) = 0.542 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 0197M

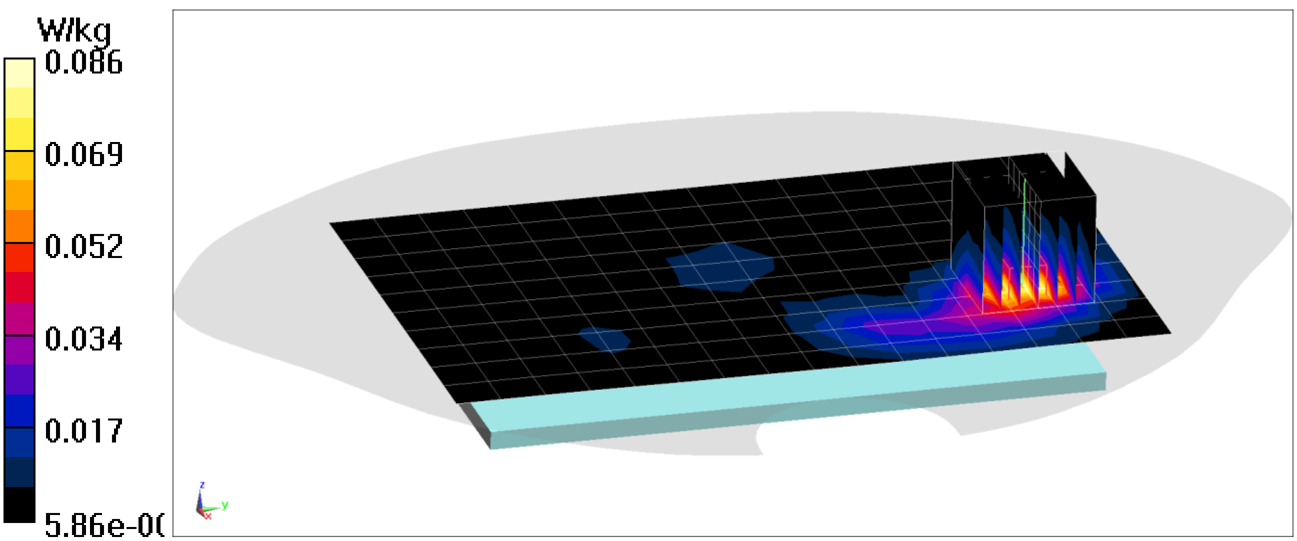
Communication System: UID 0, Bluetooth; Frequency: 2402 MHz; Duty Cycle: 1:1.299
Medium: 2450 Body; Medium parameters used (interpolated):
f = 2402 MHz; σ = 1.988 S/m; ε_r = 51.872; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11/08/2020; Ambient Temp: 22.2°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN7409; ConvF(7.24, 7.24, 7.24) @ 2402 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, Body SAR, Ch 0, 1 Mbps, Back Side

Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 5.631 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.109 W/kg
SAR(1 g) = 0.054 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 0197M

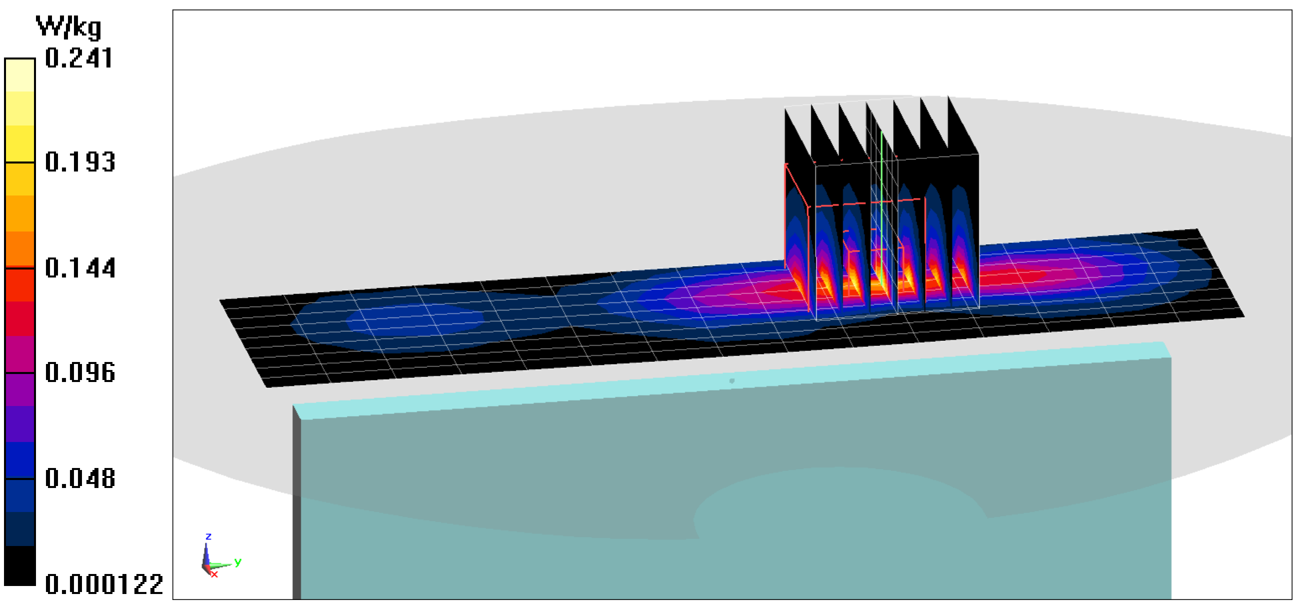
Communication System: UID 0, Bluetooth; Frequency: 2402 MHz; Duty Cycle: 1:1.299
Medium: 2450 Body; Medium parameters used (interpolated):
f = 2402 MHz; σ = 1.988 S/m; ε_r = 51.872; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/08/2020; Ambient Temp: 22.2°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN7409; ConvF(7.24, 7.24, 7.24) @ 2402 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 2, Body SAR, Ch 0, 1 Mbps, Left Edge

Area Scan (10x16x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.759 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.309 W/kg
SAR(1 g) = 0.136 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 0106M

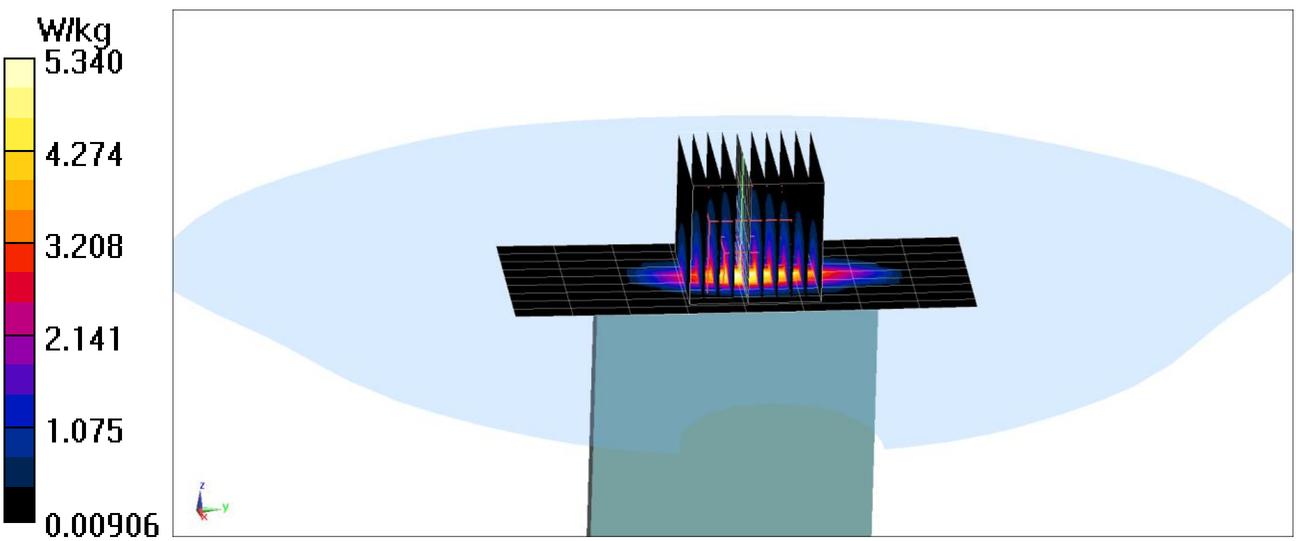
Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:2.76
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.54 S/m; ε_r = 52.742; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0 cm

Test Date: 11/08/2020; Ambient Temp: 22.5°C; Tissue Temp: 22.4°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1880 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)

Mode: GPRS 1900, Phablet SAR, Bottom Edge, Mid.ch, 3 Tx Slots

Area Scan (10x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (10x10x8)/Cube 0: Measurement grid: dx=3.8mm, dy=3.8mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 49.37 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 8.21 W/kg
SAR(10 g) = 1.35 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 0106M

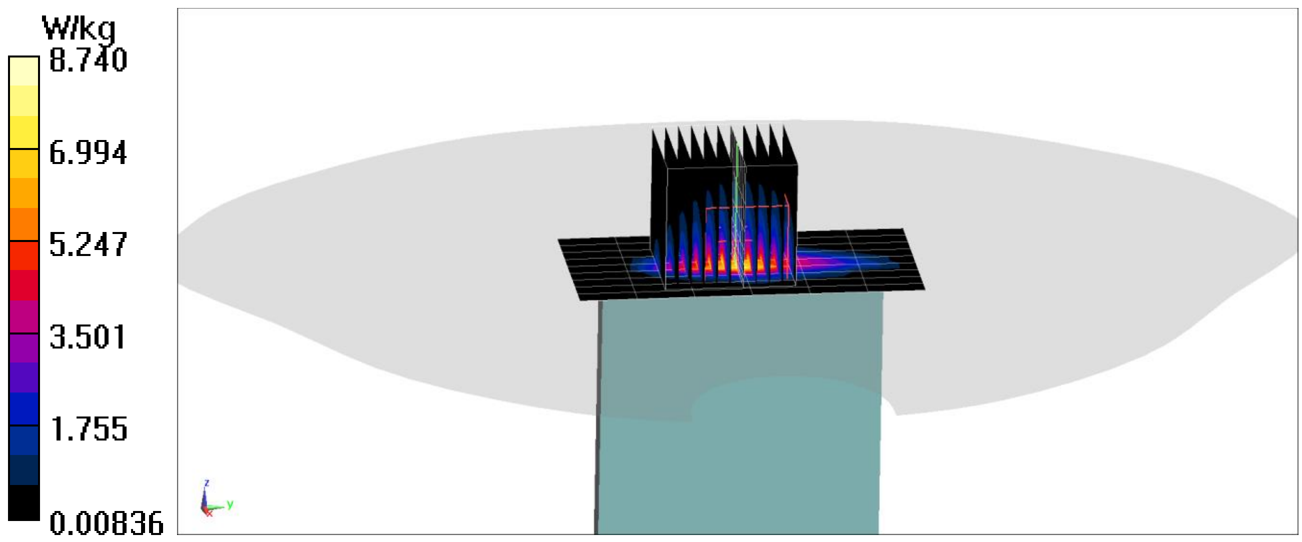
Communication System: UID 0, UMTS; Frequency: 1752.6 MHz; Duty Cycle: 1:1
Medium: 1750 Body; Medium parameters used (interpolated):
f = 1752.6 MHz; σ = 1.538 S/m; ε_r = 51.686; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0 cm

Test Date: 10/28/2020; Ambient Temp: 22.2°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7308; ConvF(8.2, 8.2, 8.2) @ 1752.6 MHz; Calibrated: 7/31/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1450; Calibrated: 8/11/2020
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)

Mode: UMTS 1750, Phablet SAR, Bottom Edge, High.ch

Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (10x11x8)/Cube 0: Measurement grid: dx=3.4mm, dy=3.4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 58.66 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 12.9 W/kg
SAR(10 g) = 2.05 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 0106M

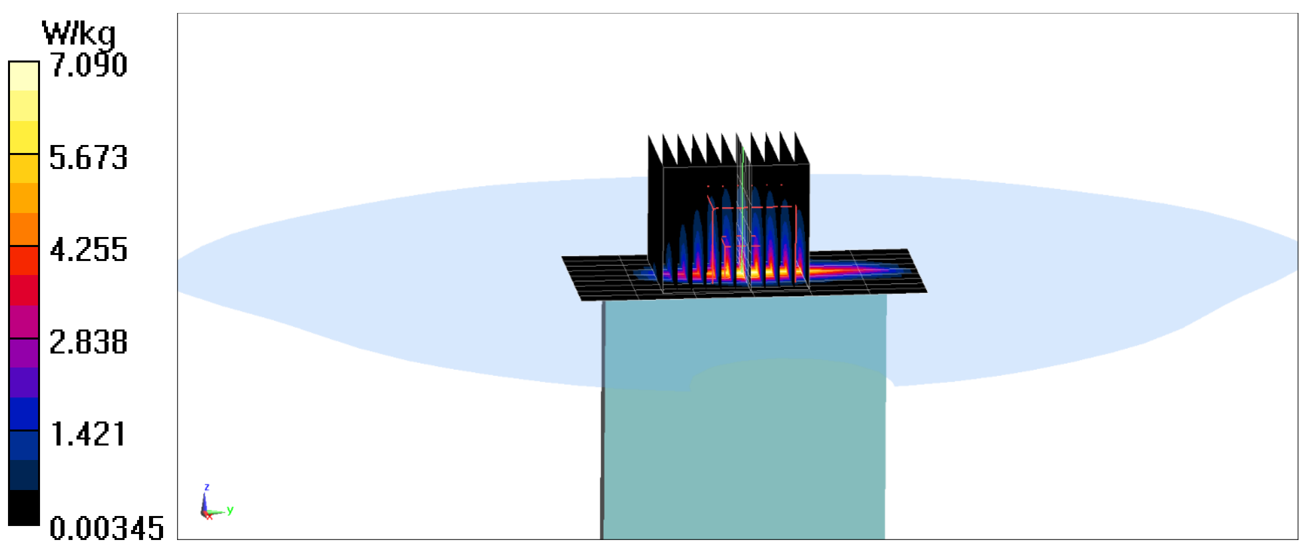
Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
f = 1880 MHz; σ = 1.54 S/m; ε_r = 52.647; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0 cm

Test Date: 10/21/2020; Ambient Temp: 22.0°C; Tissue Temp: 24.6°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1880 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)

Mode: UMTS 1900, Phablet SAR, Bottom Edge, Mid.ch

Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (10x11x8)/Cube 0: Measurement grid: dx=3.8mm, dy=3.8mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 51.98 V/m; Power Drift = 0.04 dB
Peak SAR (extrapolated) = 10.3 W/kg
SAR(10 g) = 1.71 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 1645M

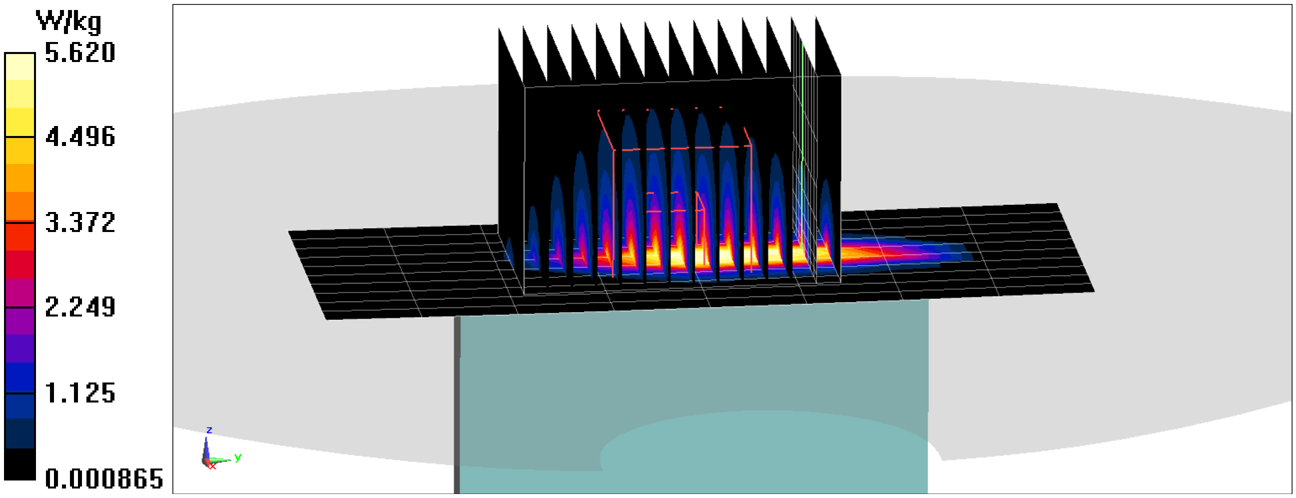
Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1720 MHz; Duty Cycle: 1:1
Medium: 1750 Body; Medium parameters used:
f = 1720 MHz; σ = 1.482 S/m; ε_r = 51.22; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 12/09/2020; Ambient Temp: 24.7°C; Tissue Temp: 24.4°C

Probe: EX3DV4 - SN7357; ConvF(8.17, 8.17, 8.17) @ 1720 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)

Mode: LTE Band 66 (AWS), Body SAR, Bottom Edge, Low.ch, 20 MHz Bandwidth, QPSK, 1 RB, 99 RB Offset

Area Scan (11x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (10x14x8)/Cube 0: Measurement grid: dx=3.8mm, dy=3.8mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 52.49 V/m; Power Drift = -0.03 dB
Peak SAR (extrapolated) = 9.31 W/kg
SAR(10 g) = 1.45 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 0106M

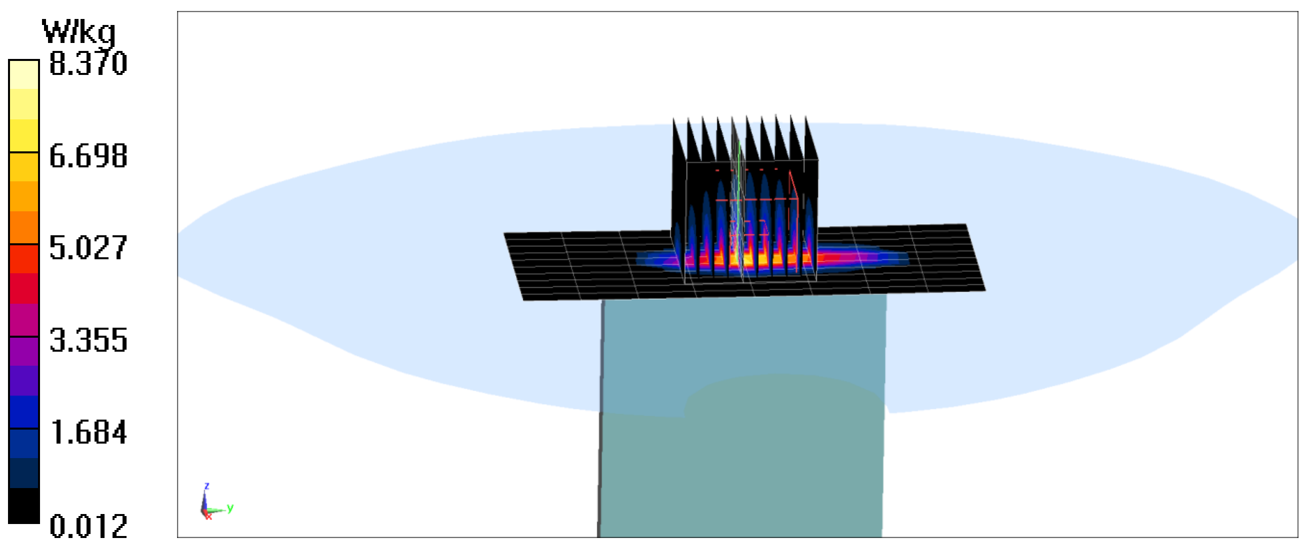
Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1882.5 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
f = 1882.5 MHz; σ = 1.543 S/m; ε_r = 54.338; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0 cm

Test Date: 10/24/2020; Ambient Temp: 22.5°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7571; ConvF(7.56, 7.56, 7.56) @ 1882.5 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)

Mode: LTE Band 25 (PCS), Phablet SAR, Bottom Edge, Mid.ch, 20 MHz Bandwidth, QPSK, 50 RB, 25 RB Offset

Area Scan (11x9x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (10x10x8)/Cube 0: Measurement grid: dx=3.8mm, dy=3.8mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 60.01 V/m; Power Drift = -0.14 dB
Peak SAR (extrapolated) = 13.0 W/kg
SAR(10 g) = 2.03 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 1590M

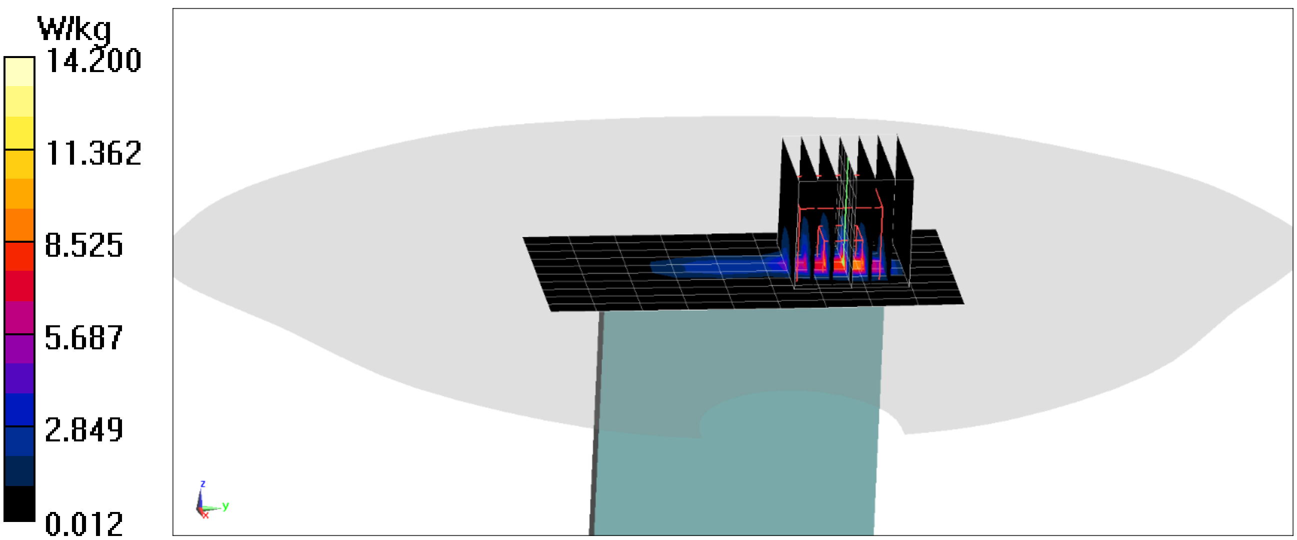
Communication System: UID 0, LTE Band 41 (Class 3); Frequency: 2593 MHz; Duty Cycle: 1:1.58
Medium: 2450 Body; Medium parameters used (interpolated):
f = 2593 MHz; σ = 2.203 S/m; ε_r = 52.067; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0 cm

Test Date: 11/21/2020; Ambient Temp: 22.6°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7409; ConvF(7.12, 7.12, 7.12) @ 2593 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: LTE Band 41, Phablet SAR, Bottom Edge, Mid.ch, 20 MHz Bandwidth, QPSK, 50 RB, 25 RB Offset

Area Scan (11x10x1): Measurement grid: dx=5mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 56.92 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 21.3 W/kg
SAR(10 g) = 1.79 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 0562M

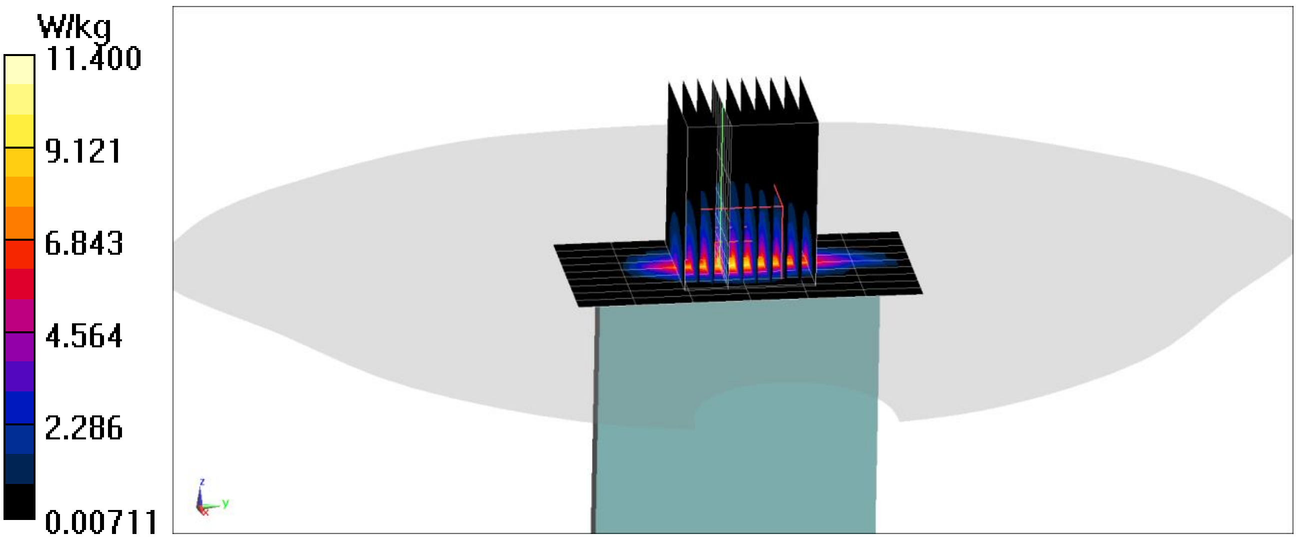
Communication System: UID 0, NR Band n66; Frequency: 1745 MHz; Duty Cycle: 1:1
Medium: 1750 Body; Medium parameters used:
f = 1745 MHz; σ = 1.531 S/m; ε_r = 52.211; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0 cm

Test Date: 11/02/2020; Ambient Temp: 19.8°C; Tissue Temp: 20.4°C

Probe: EX3DV4 - SN7308; ConvF(8.2, 8.2, 8.2) @ 1745 MHz; Calibrated: 7/31/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1450; Calibrated: 8/11/2020
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)

Mode: NR Band n66, Phablet SAR, Bottom Edge, 20 MHz Bandwidth, DFT-s-OFDM QPSK, Ch. 349000, 50 RB, 56 RB Offset

Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm
Zoom Scan (10x10x8)/Cube 0: Measurement grid: dx=3.8mm, dy=3.8mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 63.74 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 16.0 W/kg
SAR(10 g) = 2.7 W/kg



PCTEST

DUT: A3LSMG998B; Type: Portable Handset; Serial: 1621M

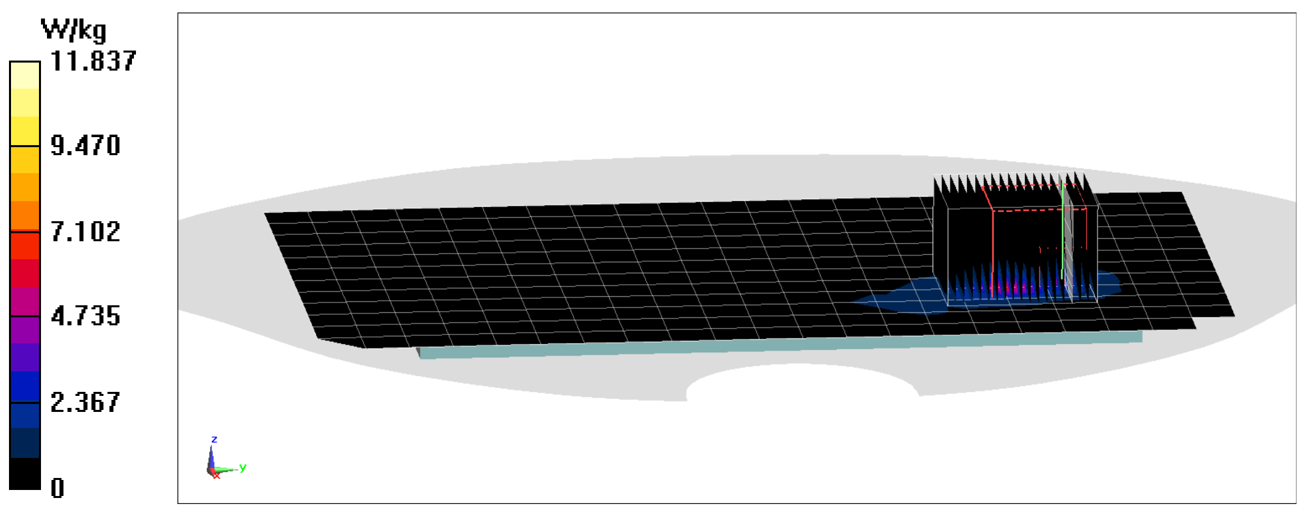
Communication System: UID 0, 802.11n 5.2-5.8 GHz Band; Frequency: 5300 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body; Medium parameters used:
f = 5300 MHz; σ = 5.596 S/m; ε_r = 46.905; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 0 cm

Test Date: 11/22/2020; Ambient Temp: 22.0°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(5.05, 5.05, 5.05) @ 5300 MHz; Calibrated: 6/23/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1583; Calibrated: 5/14/2020
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-2A, 20 MHz Bandwidth, Phablet SAR, Ch 60, 13 Mbps, Back Side

Area Scan (13x22x1): Measurement grid: dx=10mm, dy=10mm
Zoom Scan (17x19x7)/Cube 0: Measurement grid: dx=1.9mm, dy=1.9mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 2.818 V/m; Power Drift = -0.20 dB
Peak SAR (extrapolated) = 21.0 W/kg
SAR(10 g) = 0.927 W/kg



APPENDIX B: SYSTEM VERIFICATION

PCTEST

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

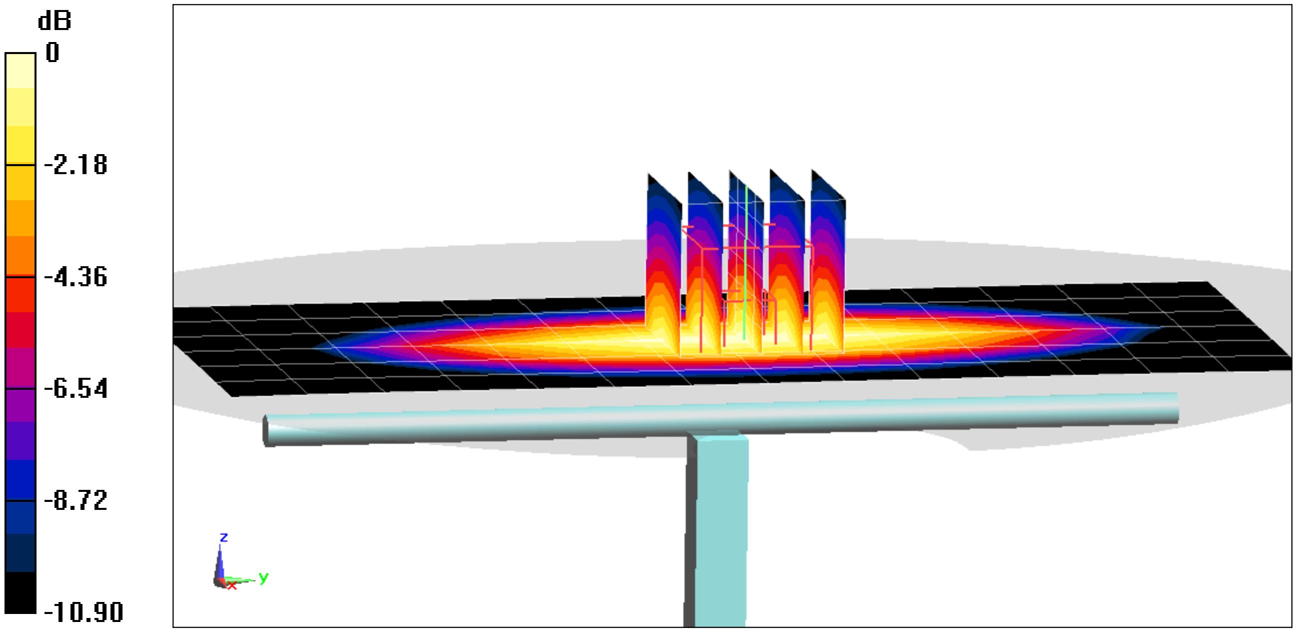
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Head Medium parameters used:
f = 750 MHz; σ = 0.924 S/m; ε_r = 42.383; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 10/27/2020; Ambient Temp: 24.1°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7406; ConvF(10.04, 10.04, 10.04) @ 750 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)

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) = 2.66 W/kg
SAR(1 g) = 1.73 W/kg
Deviation(1 g) = 7.72%



0 dB = 2.35 W/kg = 3.71 dBW/kg

PCTEST

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

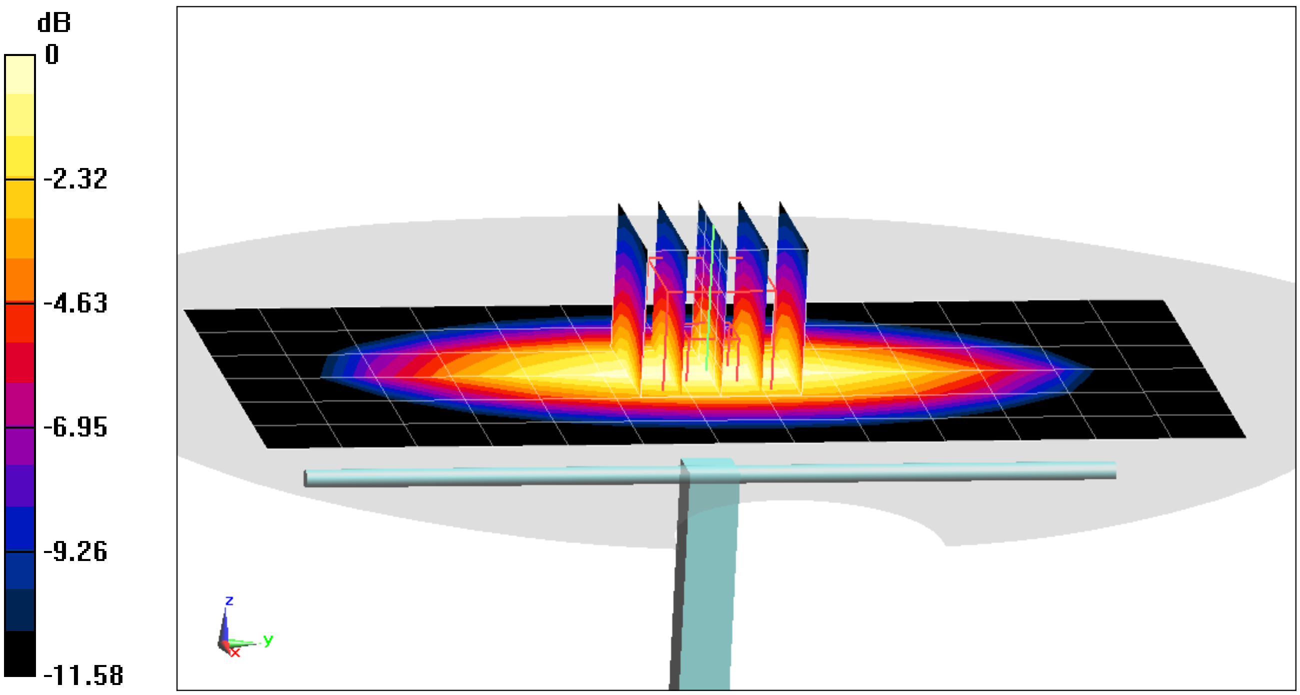
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; $\sigma = 0.931$ S/m; $\varepsilon_r = 40.098$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11/08/2020; Ambient Temp: 22.9°C; Tissue Temp: 22.7°C

Probe: EX3DV4 - SN3589; ConvF(8.58, 8.58, 8.58) @ 835 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)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 3.32 W/kg
SAR(1 g) = 2 W/kg
Deviation(1 g) = 6.04%



0 dB = 2.82 W/kg = 4.50 dBW/kg

PCTEST

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

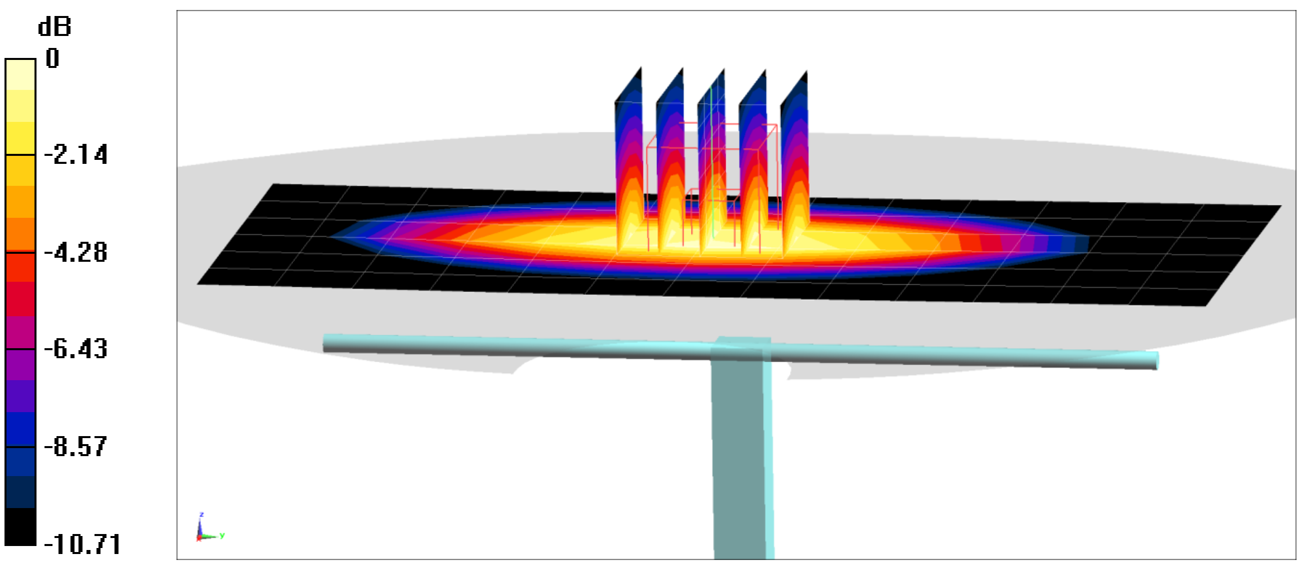
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Head Medium parameters used:
f = 835 MHz; σ = 0.893 S/m; ε_r = 41.193; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11/18/2020; Ambient Temp: 22.7°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN7488; ConvF(10.21, 10.21, 10.21) @ 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=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.91 W/kg
SAR(1 g) = 1.92 W/kg
Deviation(1 g) = 1.91%



0 dB = 2.58 W/kg = 4.12 dBW/kg

PCTEST

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

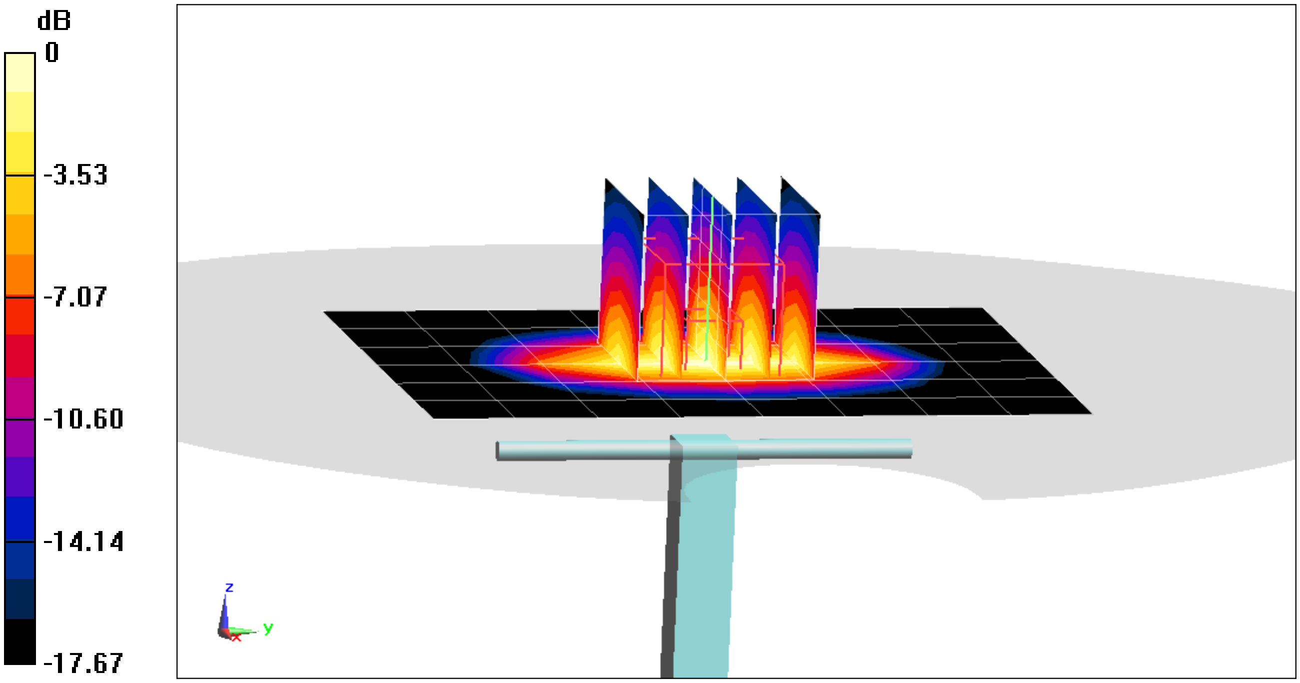
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Head Medium parameters used:
f = 1750 MHz; σ = 1.368 S/m; ε_r = 38.173; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/10/2020; Ambient Temp: 23.0°C; Tissue Temp: 22.2°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) = 6.76 W/kg
SAR(1 g) = 3.59 W/kg
Deviation(1 g) = -0.83%



0 dB = 5.64 W/kg = 7.51 dBW/kg

PCTEST

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

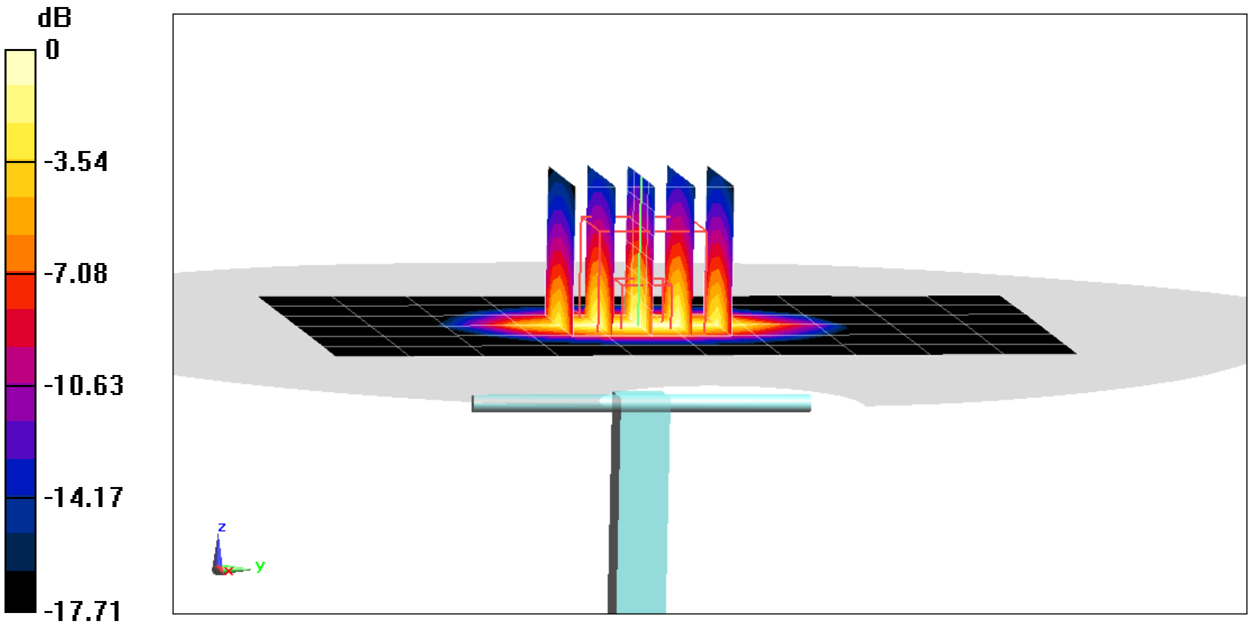
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Head Medium parameters used:
f = 1900 MHz; σ = 1.399 S/m; ε_r = 40.288; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 10/21/2020; Ambient Temp: 24.6°C; Tissue Temp: 24.5°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=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.55 W/kg
SAR(1 g) = 4.14 W/kg
Deviation(1 g) = 5.88%



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

PCTEST

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

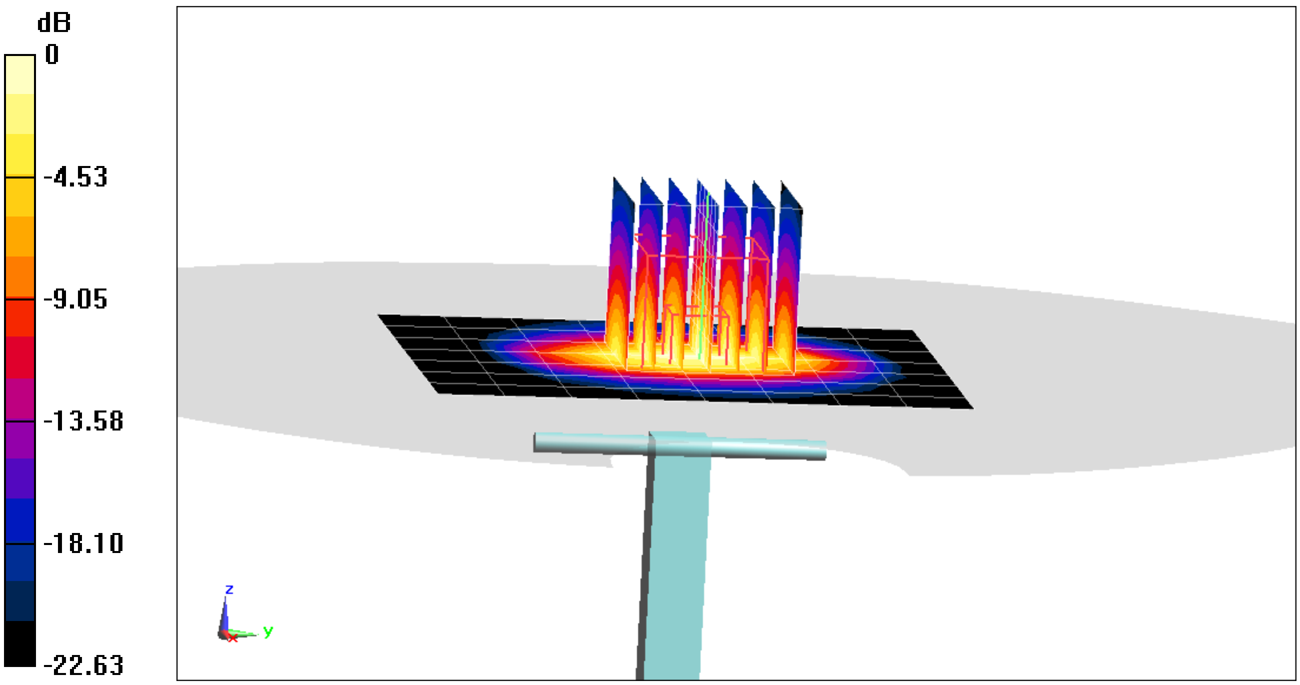
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2450 MHz; σ = 1.829 S/m; ε_r = 37.557; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/11/2020; Ambient Temp: 22.7°C; Tissue Temp: 22.5°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=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) = 5.42 W/kg
Deviation(1 g) = 3.63%



0 dB = 9.18 W/kg = 9.63 dBW/kg

PCTEST

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

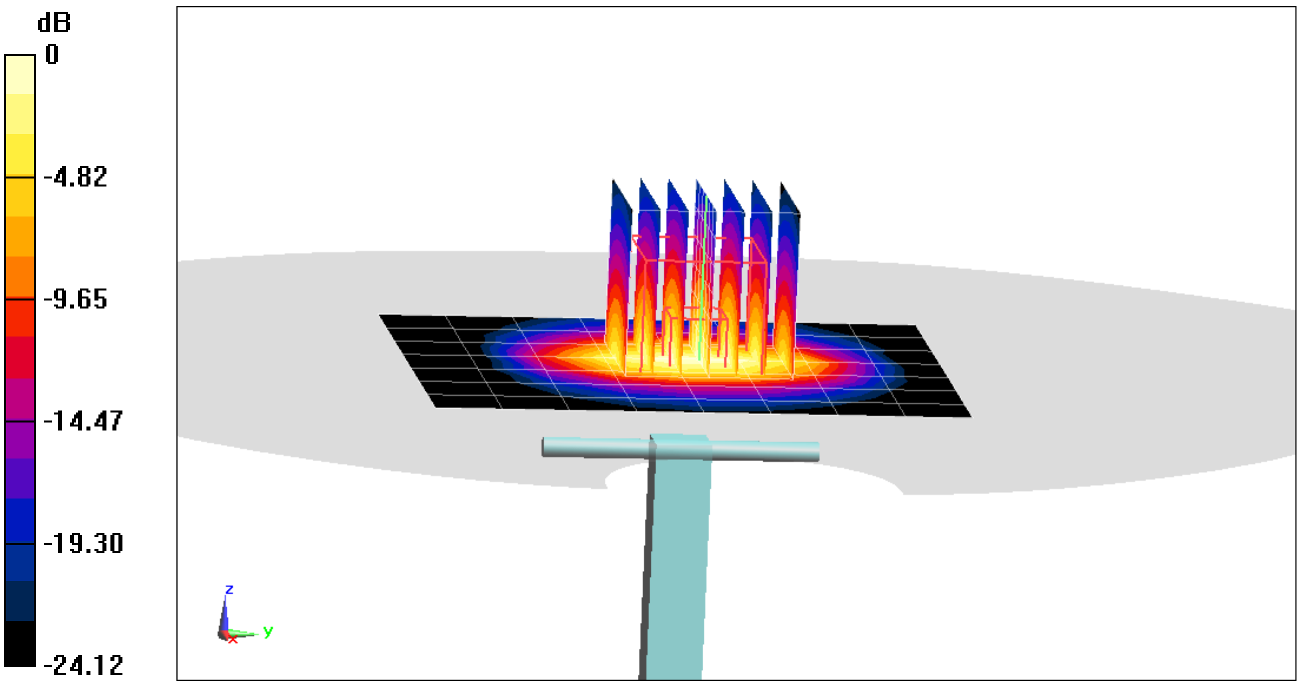
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2450 Head Medium parameters used:
f = 2600 MHz; σ = 1.974 S/m; ε_r = 37.157; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/15/2020; Ambient Temp: 23.4°C; Tissue Temp: 22.2°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=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) = 5.82 W/kg
Deviation(1 g) = 4.11%



0 dB = 10.1 W/kg = 10.04 dBW/kg

PCTEST

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

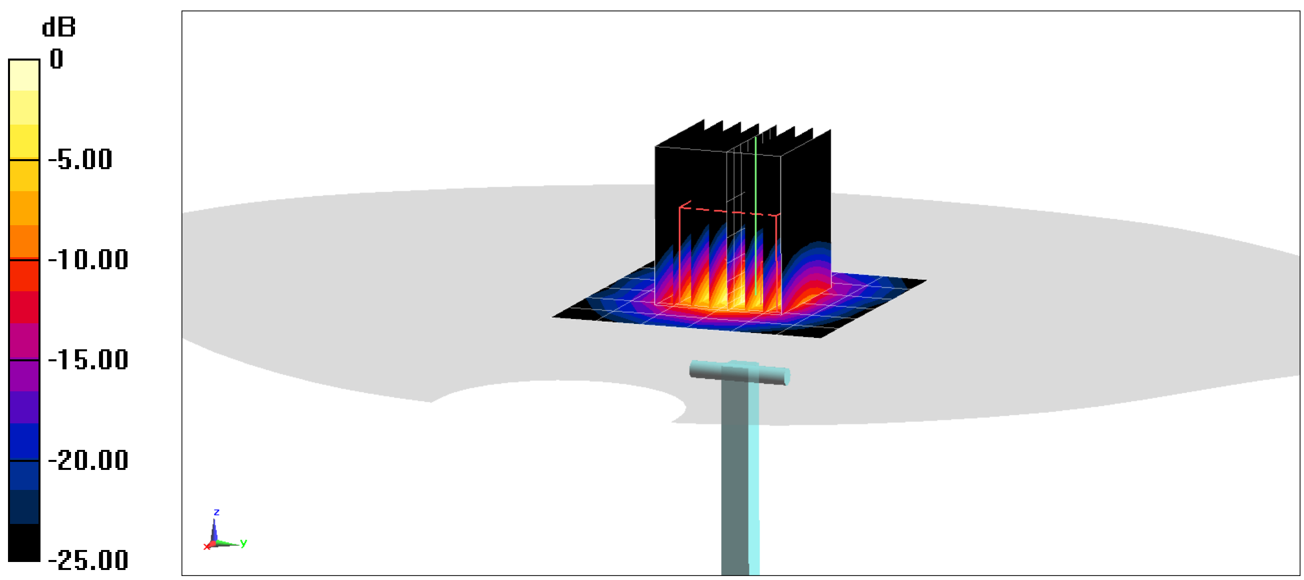
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Head Medium parameters used:
f = 5250 MHz; σ = 4.615 S/m; ε_r = 34.74; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/09/2020; Ambient Temp: 23.5°C; Tissue Temp: 23.5°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) = 15.3 W/kg
SAR(1 g) = 3.88 W/kg
Deviation(1 g) = -2.02%



0 dB = 9.15 W/kg = 9.61 dBW/kg

PCTEST

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

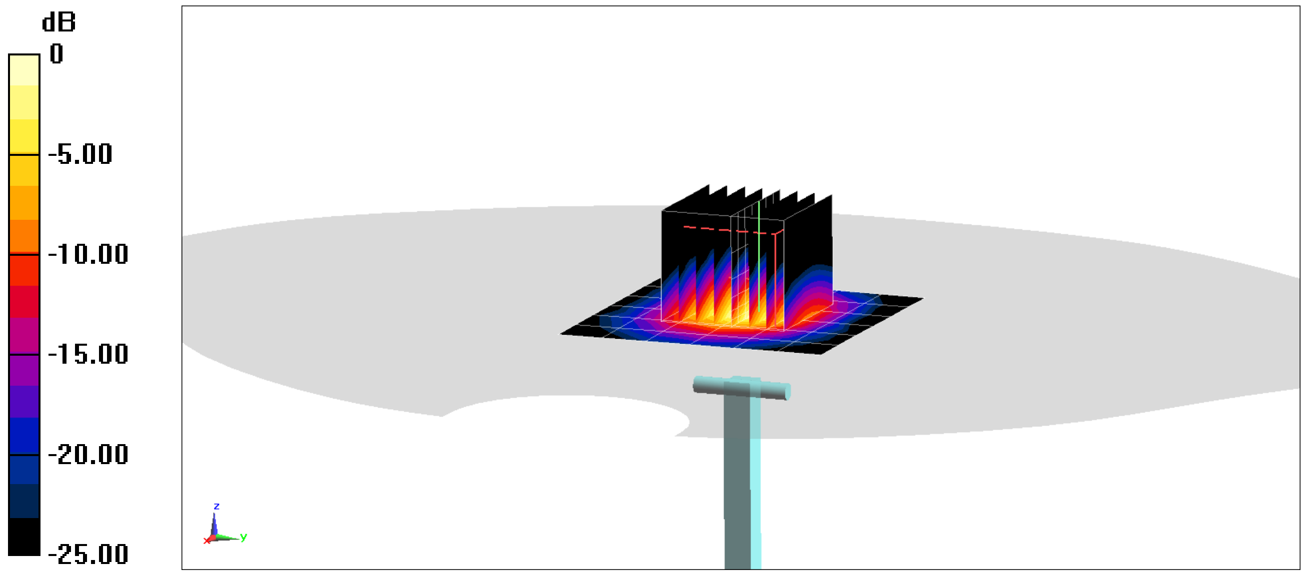
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Head Medium parameters used:
f = 5600 MHz; σ = 5 S/m; ε_r = 34.099; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/09/2020; Ambient Temp: 23.5°C; Tissue Temp: 23.5°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 (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Peak SAR (extrapolated) = 16.5 W/kg
SAR(1 g) = 3.82 W/kg
Deviation(1 g) = -9.16%



0 dB = 9.07 W/kg = 9.58 dBW/kg

PCTEST

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

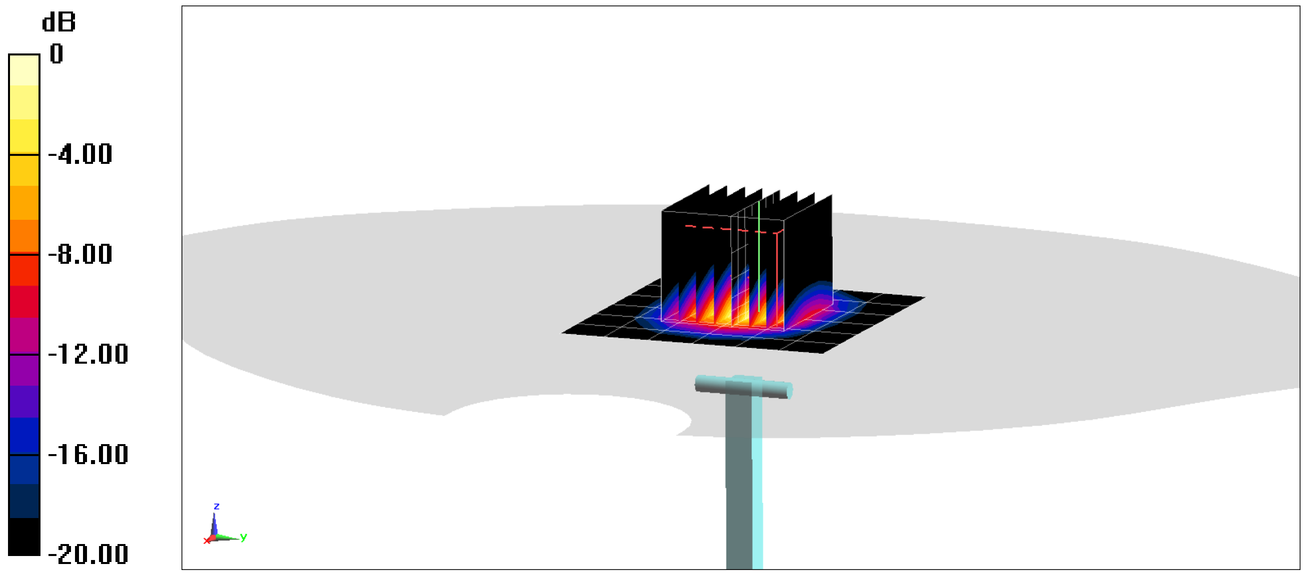
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Head Medium parameters used:
f = 5750 MHz; σ = 5.18 S/m; ε_r = 33.871; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/09/2020; Ambient Temp: 23.5°C; Tissue Temp: 23.5°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 (8x8x7)/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) = 4 W/kg
Deviation(1 g) = -0.62%



0 dB = 9.80 W/kg = 9.91 dBW/kg

PCTEST

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

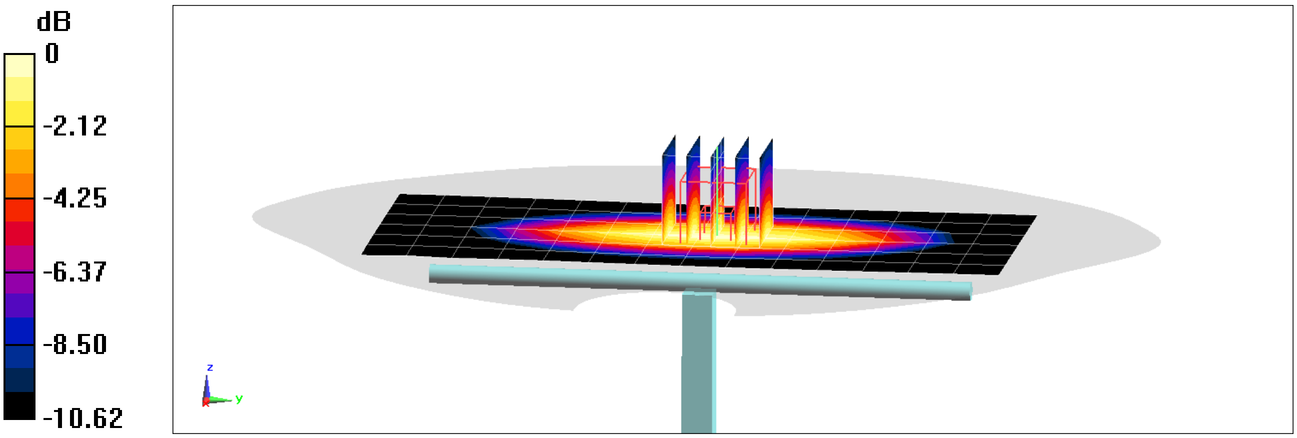
Communication System: UID 0, CW; Frequency: 750 MHz; Duty Cycle: 1:1
Medium: 750 Body Medium parameters used:
f = 750 MHz; $\sigma = 0.987$ S/m; $\varepsilon_r = 53.193$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11/04/2020; Ambient Temp: 22.6°C; Tissue Temp:21.5°C

Probe: EX3DV4 - SN7547; ConvF(9.98, 9.98, 9.98) @ 750 MHz; Calibrated: 8/19/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 8/12/2020
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)

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) = 2.75 W/kg
SAR(1 g) = 1.8 W/kg
Deviation(1 g) = 6.76%



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

PCTEST

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

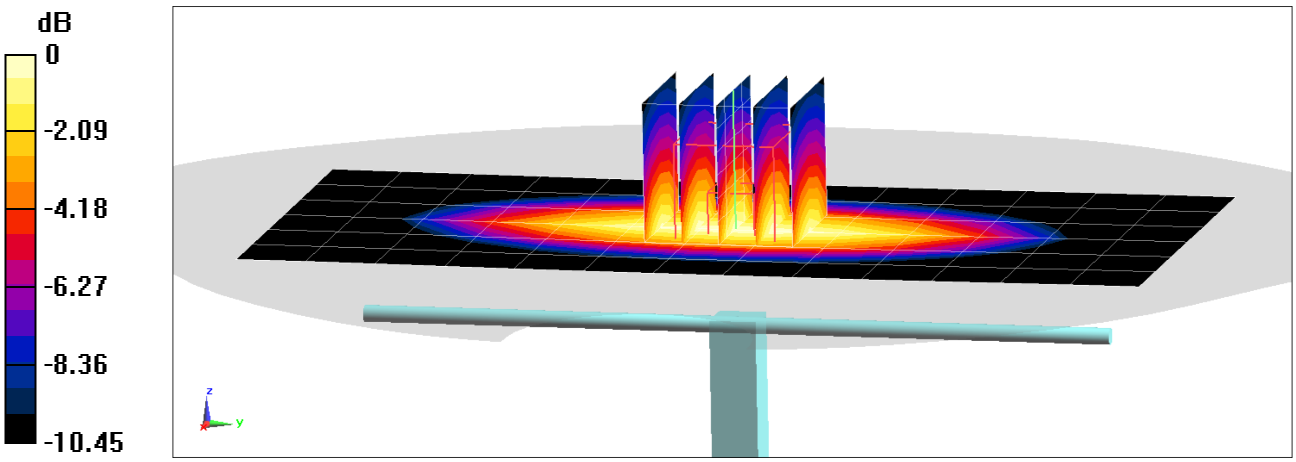
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.951 S/m; ε_r = 53.901; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 10/27/2020; Ambient Temp: 24.9°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN7570; ConvF(9.83, 9.83, 9.83) @ 835 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)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.90 W/kg
SAR(1 g) = 1.94 W/kg
Deviation(1 g) = -0.51%



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

PCTEST

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

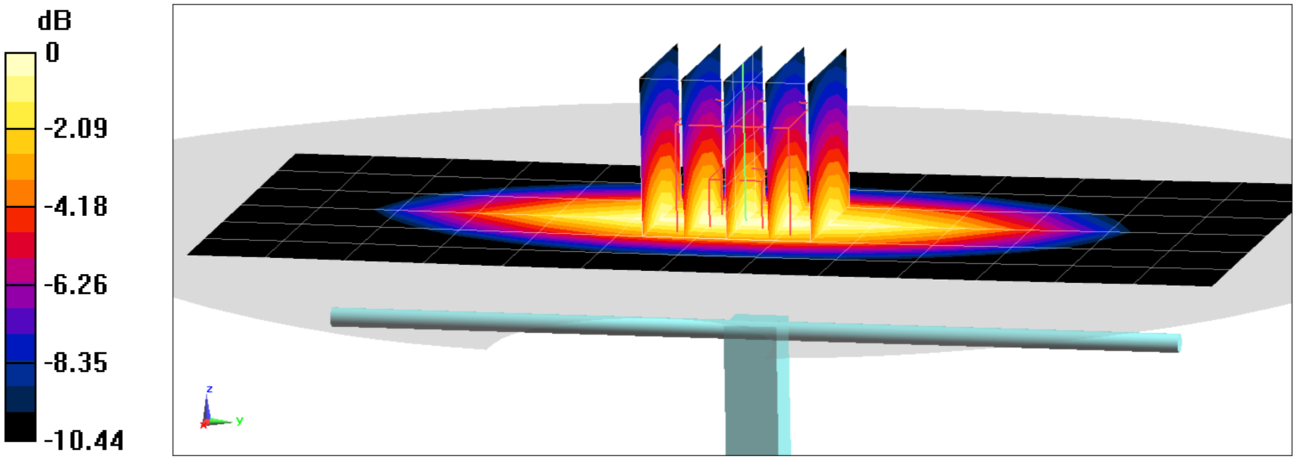
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.951 S/m; ε_r = 55.191; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 10/29/2020; Ambient Temp: 24.8°C; Tissue Temp: 23.9°C

Probe: EX3DV4 - SN7570; ConvF(9.83, 9.83, 9.83) @ 835 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)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.92 W/kg
SAR(1 g) = 1.95 W/kg
Deviation(1 g) = 0.00%



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

PCTEST

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

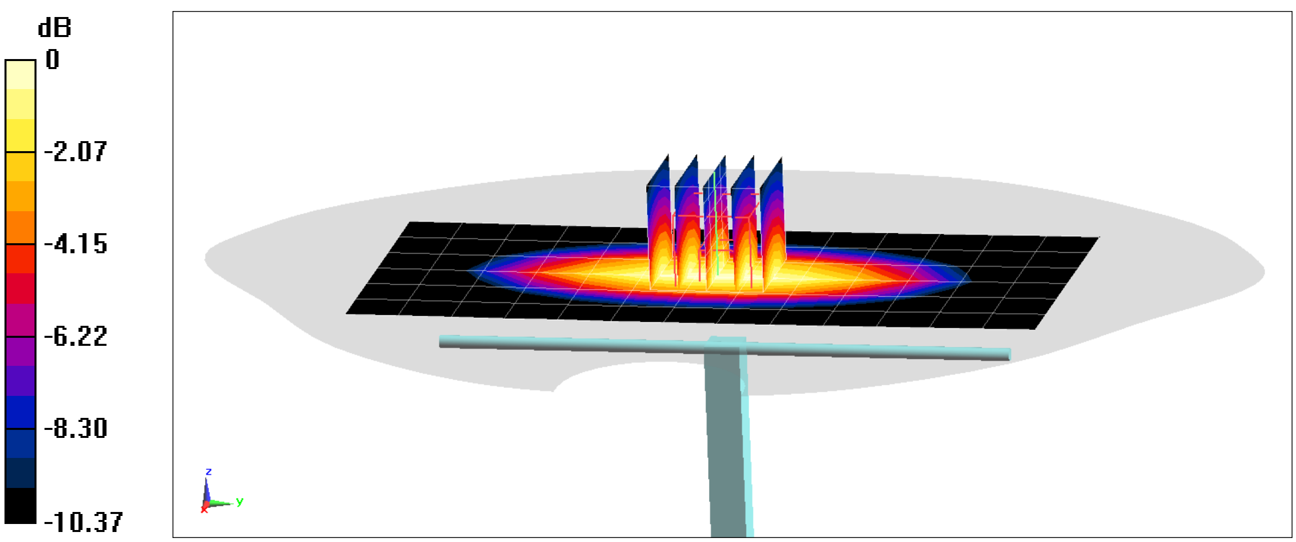
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.949 S/m; ε_r = 53.914; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11/05/2020; Ambient Temp: 23.5°C; Tissue Temp: 23.1°C

Probe: EX3DV4 - SN7570; ConvF(9.83, 9.83, 9.83) @ 835 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)

835 MHz System Verification at 23.0 dBm (200 mW)

Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.96 W/kg
SAR(1 g) = 1.99 W/kg
Deviation(1 g) = 2.05%



0 dB = 2.65 W/kg = 4.23 dBW/kg

PCTEST

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

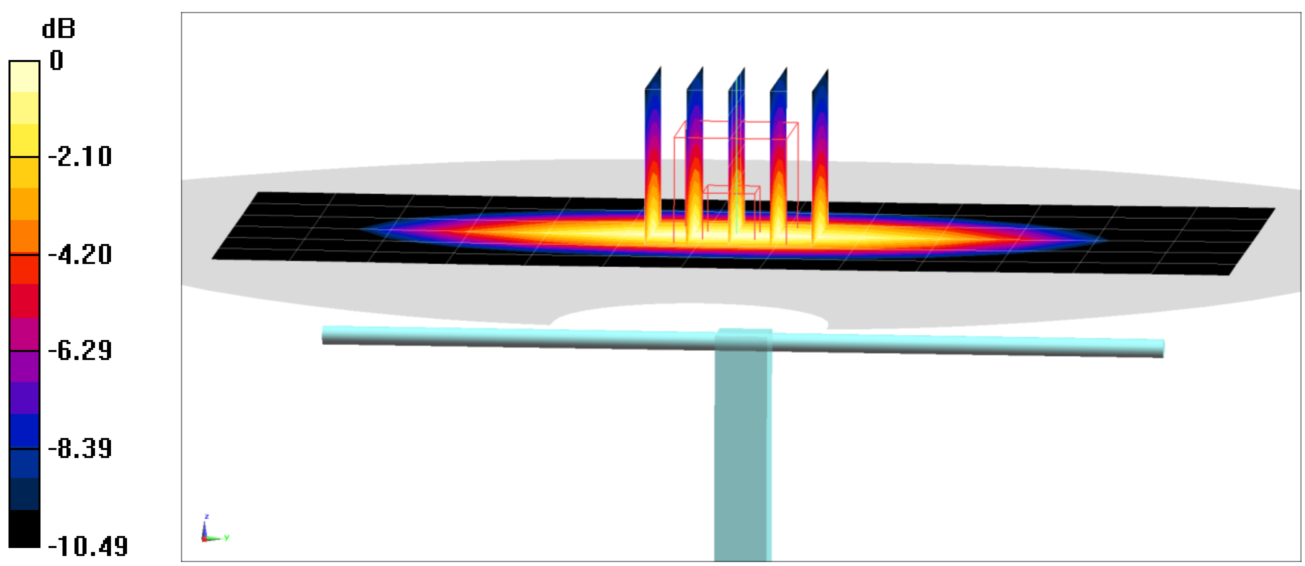
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.948 S/m; ε_r = 54.721; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 11/09/2020; Ambient Temp: 22.3°C; Tissue Temp: 21.9°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=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.90 W/kg
SAR(1 g) = 1.91 W/kg
Deviation(1 g) = 0.84%



0 dB = 2.55 W/kg = 4.07 dBW/kg

PCTEST

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

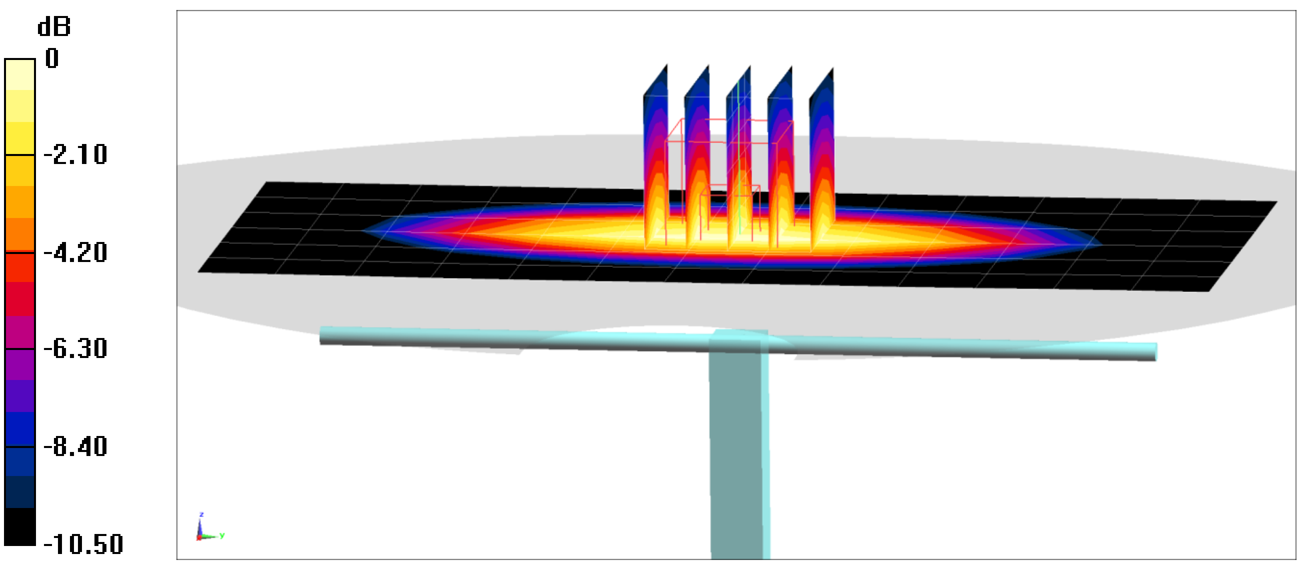
Communication System: UID 0, CW; Frequency: 835 MHz; Duty Cycle: 1:1
Medium: 835 Body Medium parameters used:
f = 835 MHz; σ = 0.951 S/m; ε_r = 54.096; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.5 cm

Test Date: 12/08/2020; Ambient Temp: 23.4°C; Tissue Temp: 22.2°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=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 2.73 W/kg
SAR(1 g) = 1.8 W/kg
Deviation(1 g) = -4.96%



0 dB = 2.41 W/kg = 3.82 dBW/kg

PCTEST

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

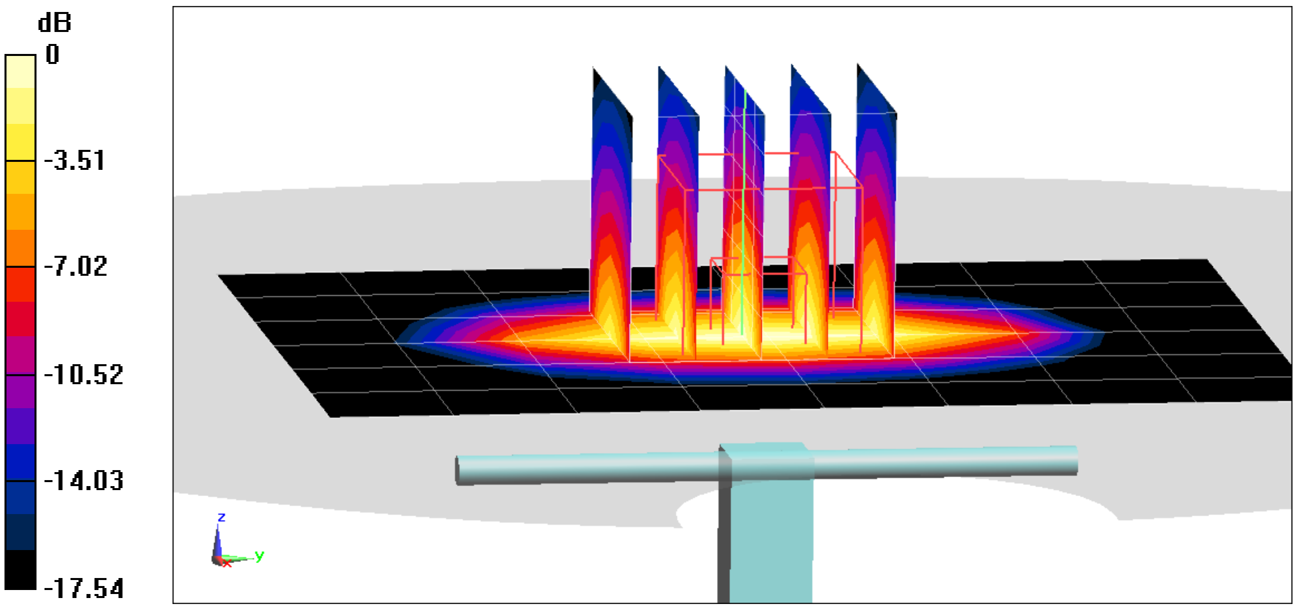
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.535 S/m; ε_r = 51.697; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 10/28/2020; Ambient Temp: 22.2°C; Tissue Temp: 21.5°C

Probe: EX3DV4 - SN7308; ConvF(8.2, 8.2, 8.2) @ 1750 MHz; Calibrated: 7/31/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1450; Calibrated: 8/11/2020
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)

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) = 7.25 W/kg
SAR(1 g) = 3.84 W/kg; SAR(10 g) = 2.01 W/kg
Deviation(1 g) = 4.92%; Deviation(10 g) = 3.61%



0 dB = 5.99 W/kg = 7.77 dBW/kg

PCTEST

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

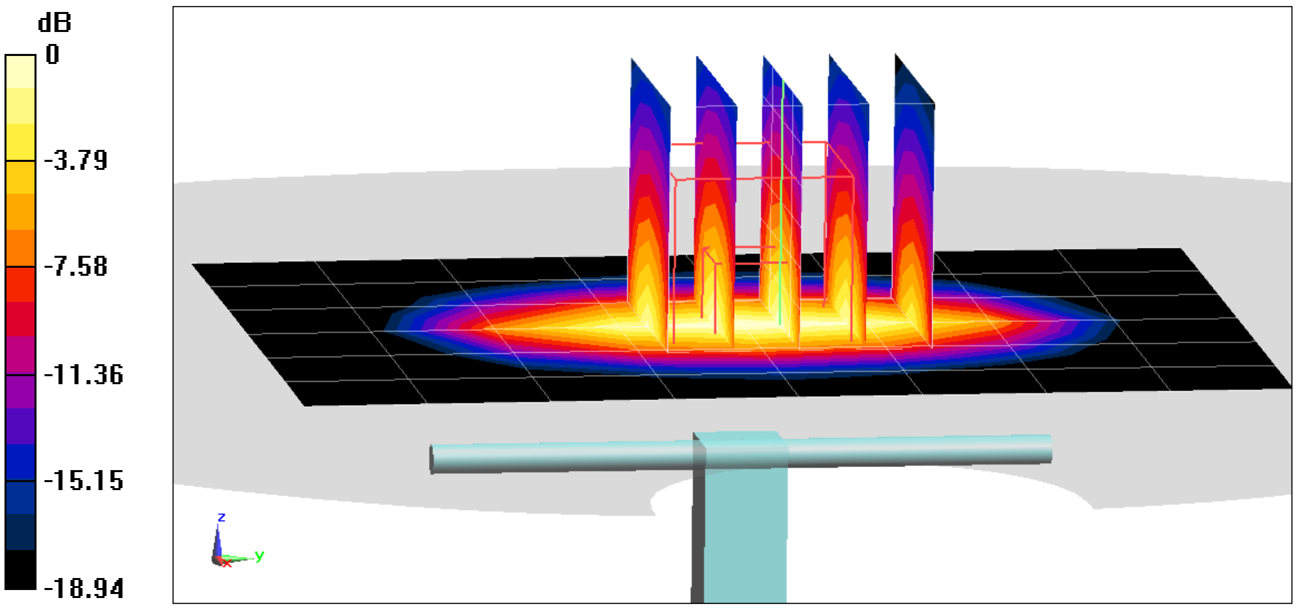
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.536 S/m; ε_r = 52.187; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/02/2020; Ambient Temp: 19.8°C; Tissue Temp: 20.4°C

Probe: EX3DV4 - SN7308; ConvF(8.2, 8.2, 8.2) @ 1750 MHz; Calibrated: 7/31/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1450; Calibrated: 8/11/2020
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)

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) = 7.27 W/kg
SAR(10 g) = 1.97 W/kg
Deviation(10 g) = 1.55%



0 dB = 5.91 W/kg = 7.72 dBW/kg

PCTEST

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

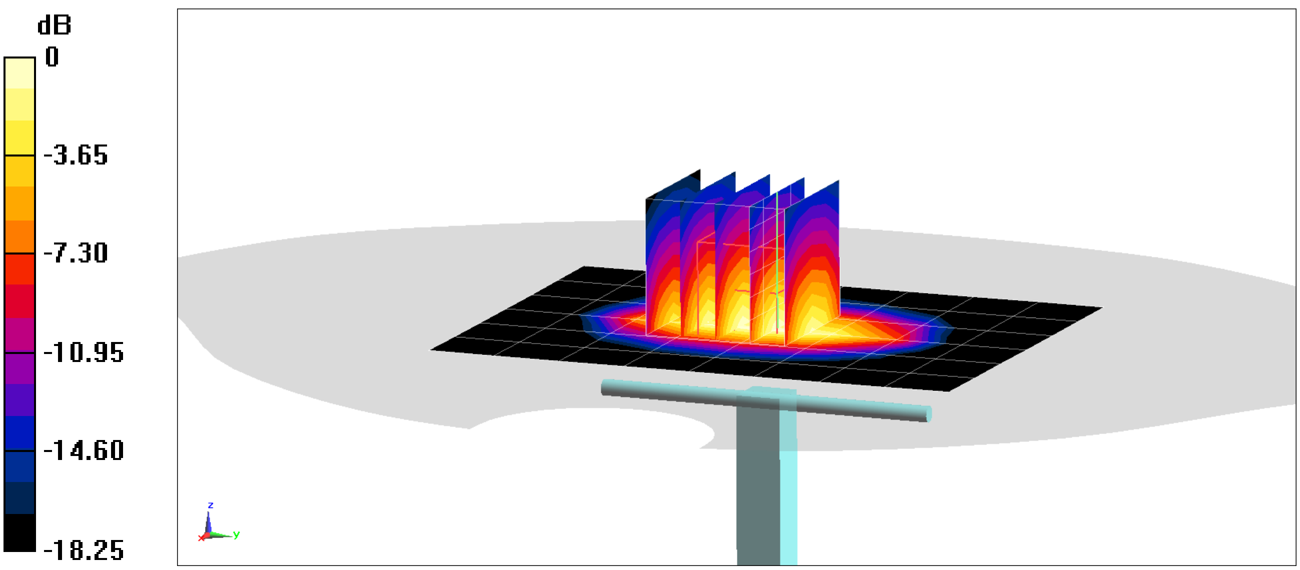
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.534 S/m; ε_r = 51.138; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/16/2020; Ambient Temp: 23.0°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7357; ConvF(8.17, 8.17, 8.17) @ 1750 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 20; Type: QD 000 P40 CD; Serial: 1759
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) = 7.13 W/kg
SAR(1 g) = 3.93 W/kg;
Deviation(1 g) = 5.08%



0 dB = 5.98 W/kg = 7.77 dBW/kg

PCTEST

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

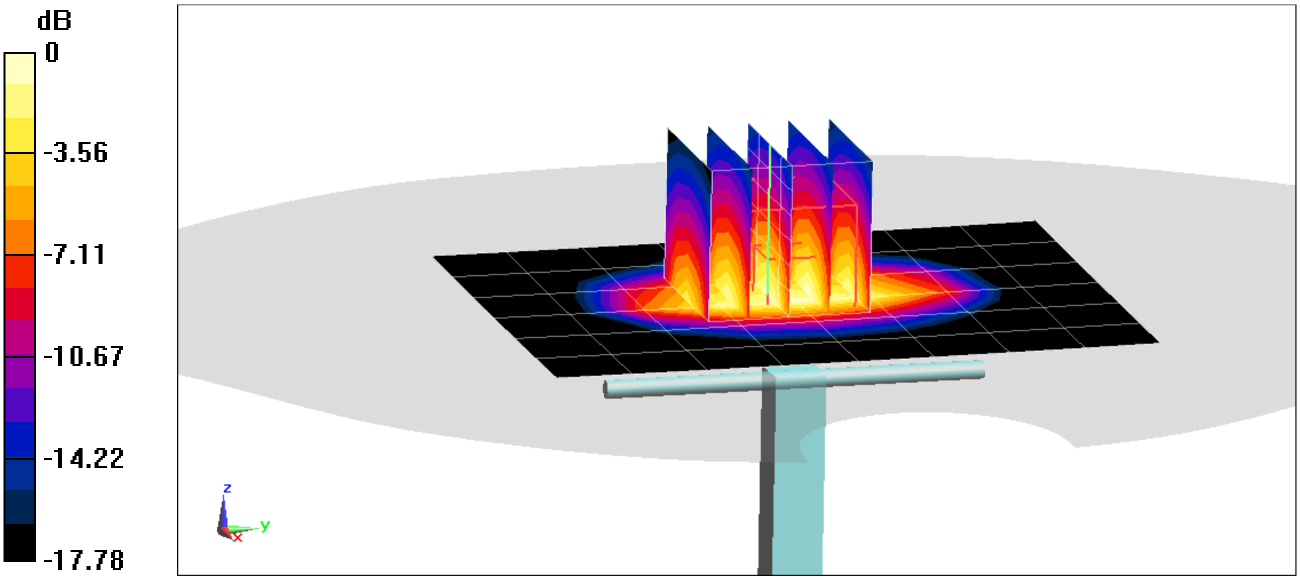
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.512 S/m; ε_r = 51.036; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/19/2020; Ambient Temp: 22.0°C; Tissue Temp: 23.3°C

Probe: EX3DV4 - SN7357; ConvF(8.17, 8.17, 8.17) @ 1750 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)

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) = 6.86 W/kg
SAR(1 g) = 3.77 W/kg
Deviation(1 g) = 0.80%



0 dB = 5.74 W/kg = 7.59 dBW/kg

PCTEST

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

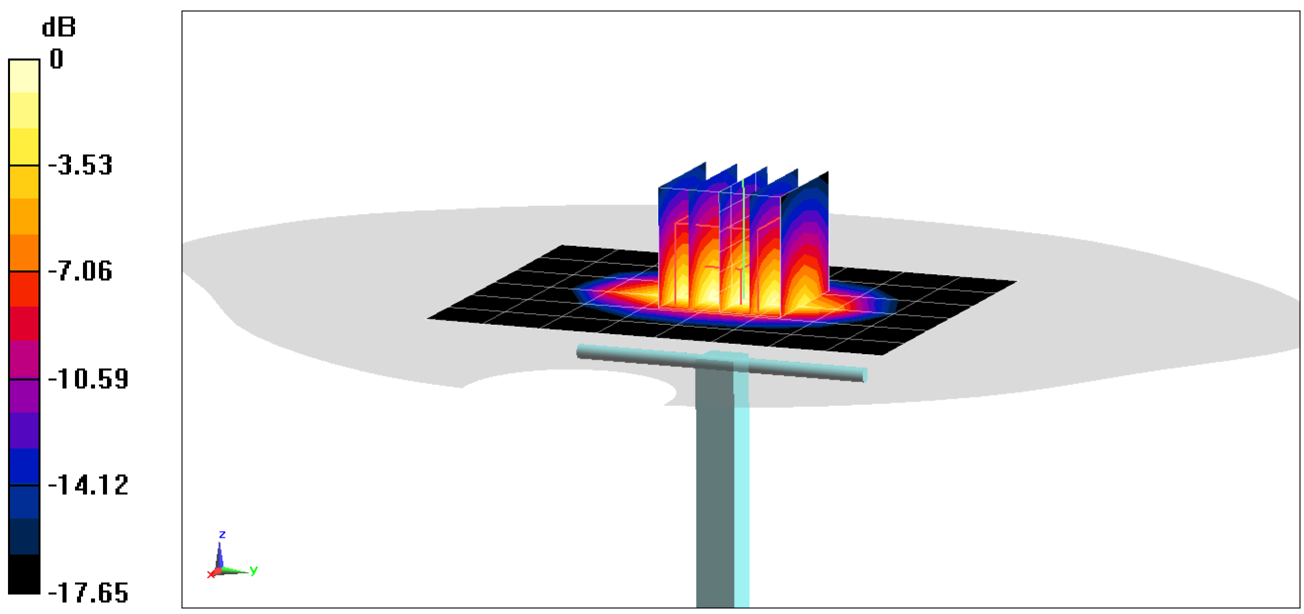
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.508 S/m; ε_r = 50.869; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12/02/2020; Ambient Temp: 24.2°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN7357; ConvF(8.17, 8.17, 8.17) @ 1750 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)

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) = 6.93 W/kg
SAR(1 g) = 3.84 W/kg
Deviation(1 g) = 4.92%



0 dB = 5.82 W/kg = 7.65 dBW/kg

PCTEST

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

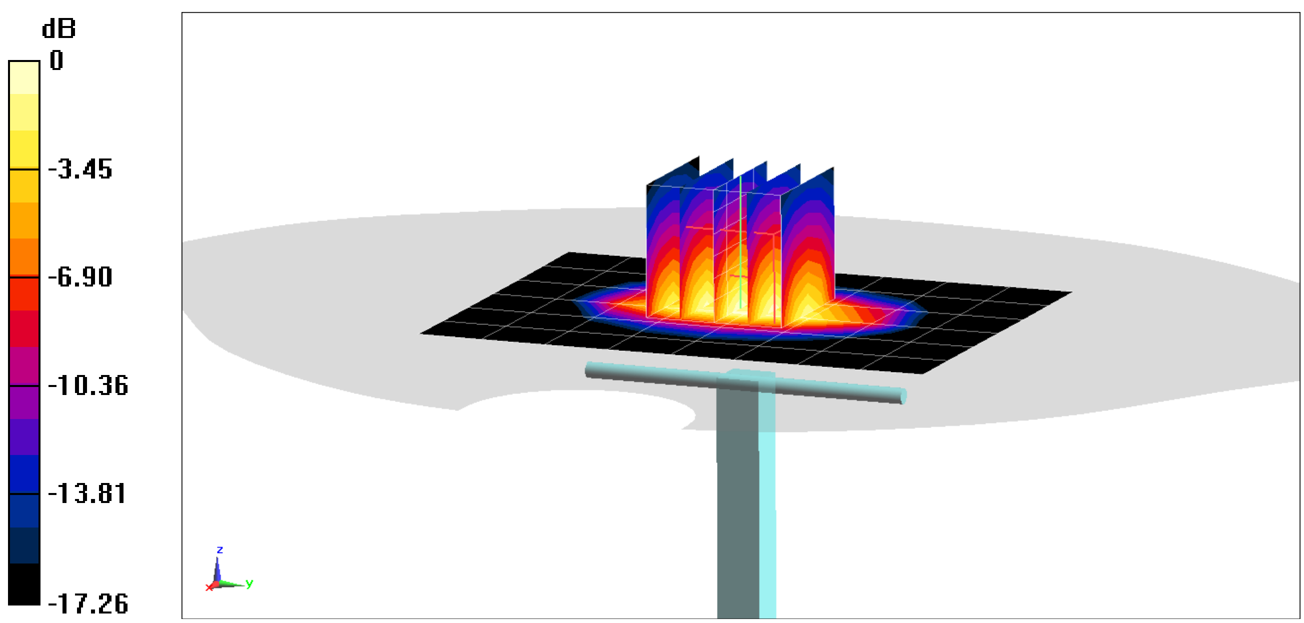
Communication System: UID 0, CW; Frequency: 1750 MHz; Duty Cycle: 1:1
Medium: 1750 Body Medium parameters used:
f = 1750 MHz; σ = 1.517 S/m; ε_r = 51.089; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12/09/2020; Ambient Temp: 24.7°C; Tissue Temp: 24.4°C

Probe: EX3DV4 - SN7357; ConvF(8.17, 8.17, 8.17) @ 1750 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)

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) = 7.03 W/kg
SAR(1 g) = 3.95 W/kg; SAR(10 g) = 2.09 W/kg
Deviation(1 g) = 5.61%; Deviation(10 g) = 5.03%



0 dB = 5.98 W/kg = 7.77 dBW/kg

PCTEST

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

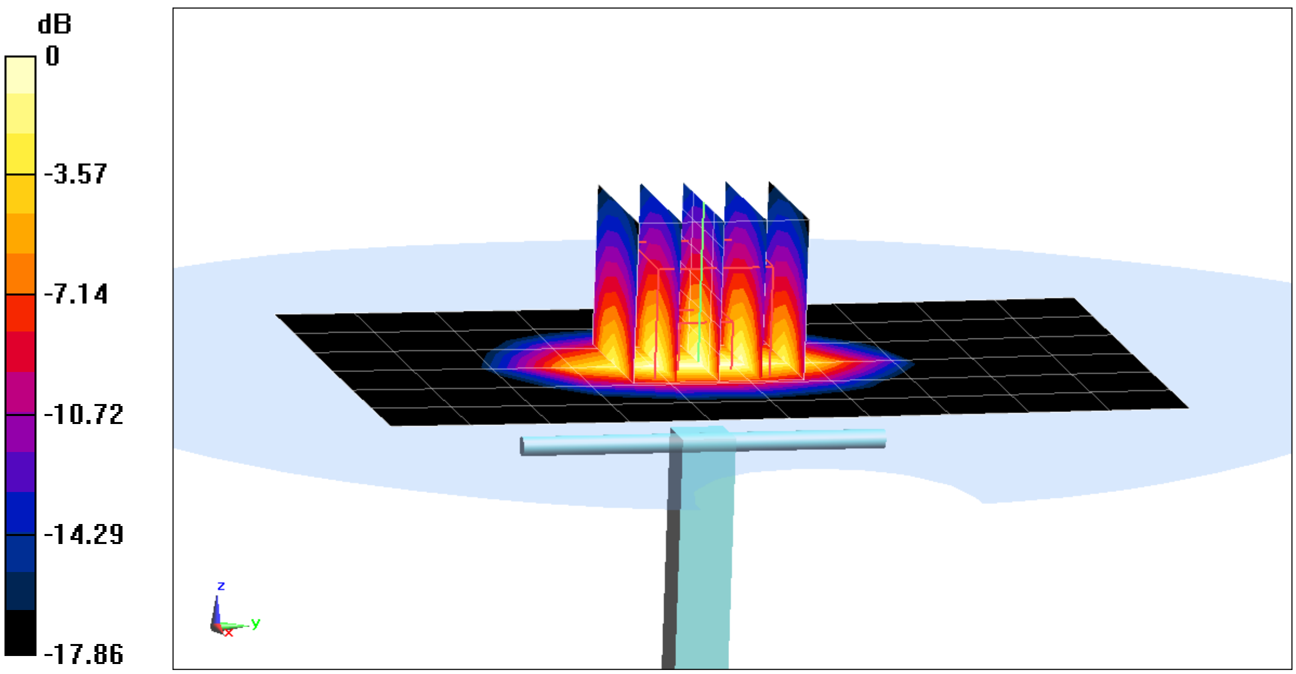
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1900 MHz; $\sigma = 1.563$ S/m; $\varepsilon_r = 52.585$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 10/21/2020; Ambient Temp: 22.0°C; Tissue Temp: 24.6°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=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.73 W/kg
SAR(1 g) = 4.15 W/kg; SAR(10 g) = 2.14 W/kg
Deviation(1 g) = 5.87%; Deviation(10 g) = 3.88%



0 dB = 6.49 W/kg = 8.12 dBW/kg

PCTEST

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

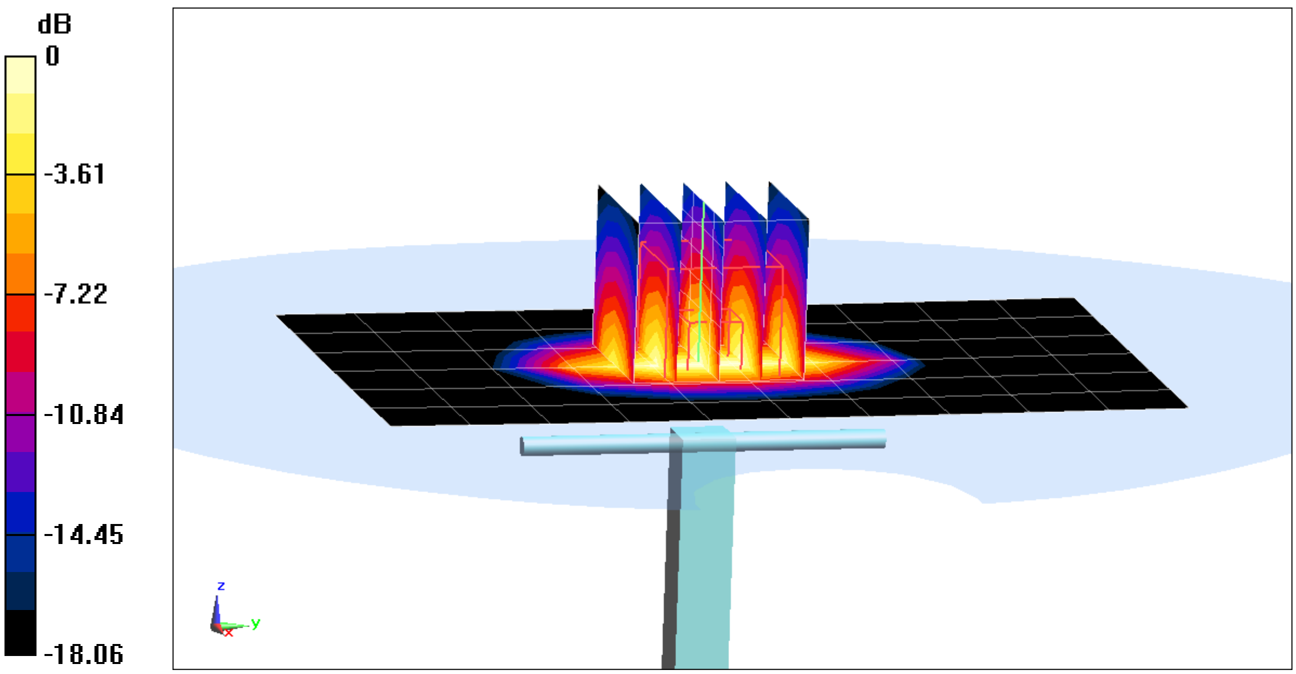
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1900 MHz; σ = 1.563 S/m; ε_r = 54.273; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 10/24/2020; Ambient Temp: 22.5°C; Tissue Temp: 22.2°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=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.68 W/kg
SAR(1 g) = 4.17 W/kg; SAR(10 g) = 2.14 W/kg
Deviation(1 g) = 6.38%; Deviation(10 g) = 3.88%



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

PCTEST

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

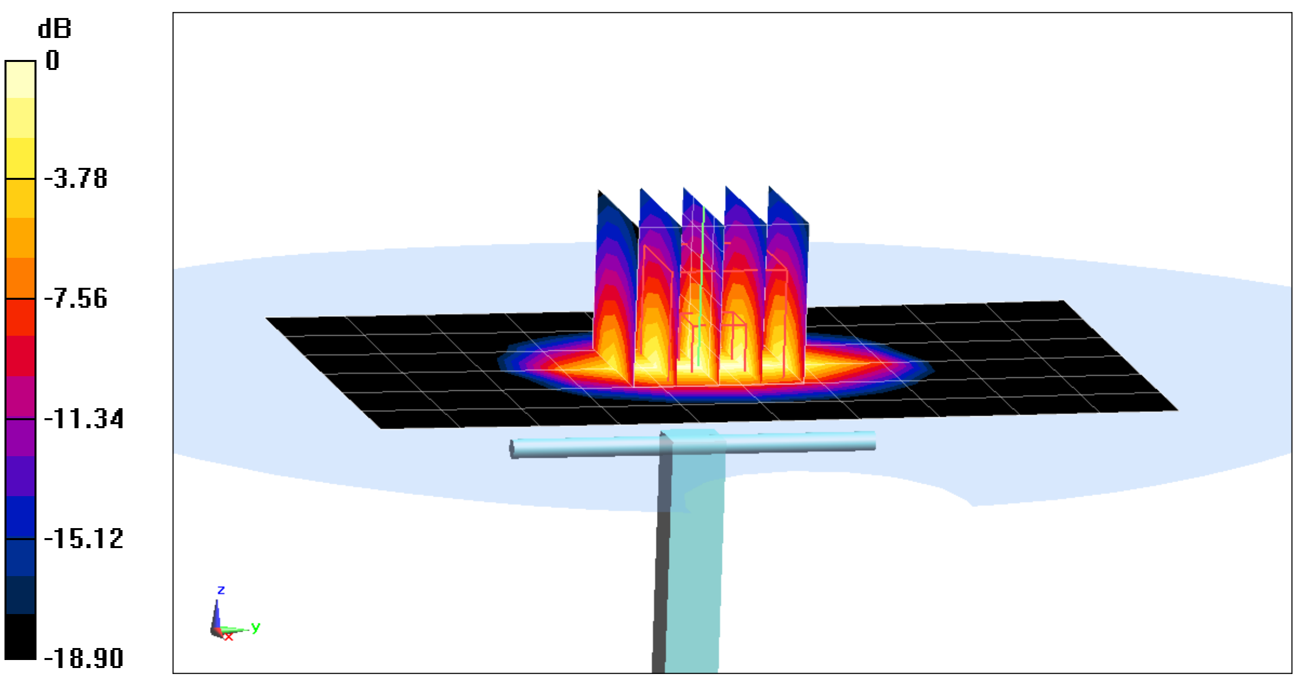
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1900 MHz; σ = 1.563 S/m; ε_r = 52.677; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/08/2020; Ambient Temp: 22.5°C; Tissue Temp: 22.4°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=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.53 W/kg
SAR(1 g) = 4.07 W/kg; SAR(10 g) = 2.08 W/kg
Deviation(1 g) = 3.30%; Deviation(10 g) = 0.48%



0 dB = 6.27 W/kg = 7.97 dBW/kg

PCTEST

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

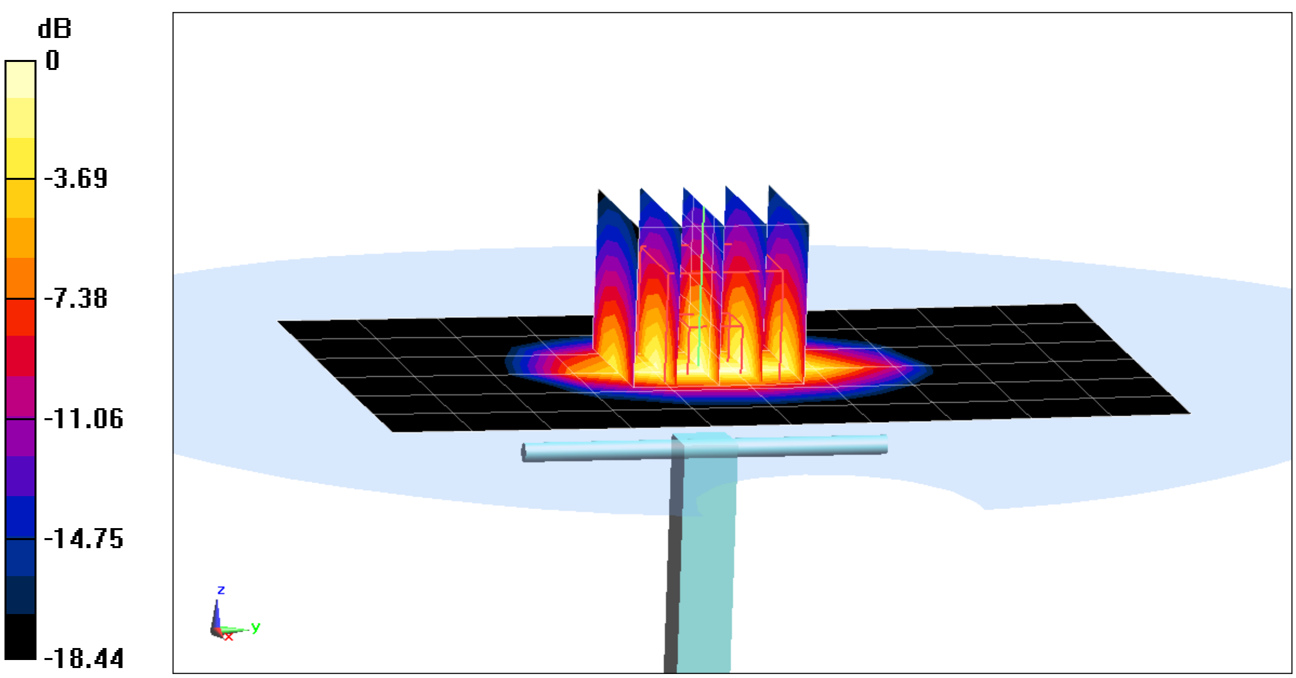
Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1
Medium: 1900 Body Medium parameters used:
f = 1900 MHz; σ = 1.561 S/m; ε_r = 52.634; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 12/03/2020; Ambient Temp: 24.5°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN7410; ConvF(7.76, 7.76, 7.76) @ 1900 MHz; Calibrated: 7/20/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/15/2020
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=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Peak SAR (extrapolated) = 7.65 W/kg
SAR(1 g) = 4.22 W/kg
Deviation(1 g) = 7.11%



0 dB = 6.48 W/kg = 8.12 dBW/kg

PCTEST

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

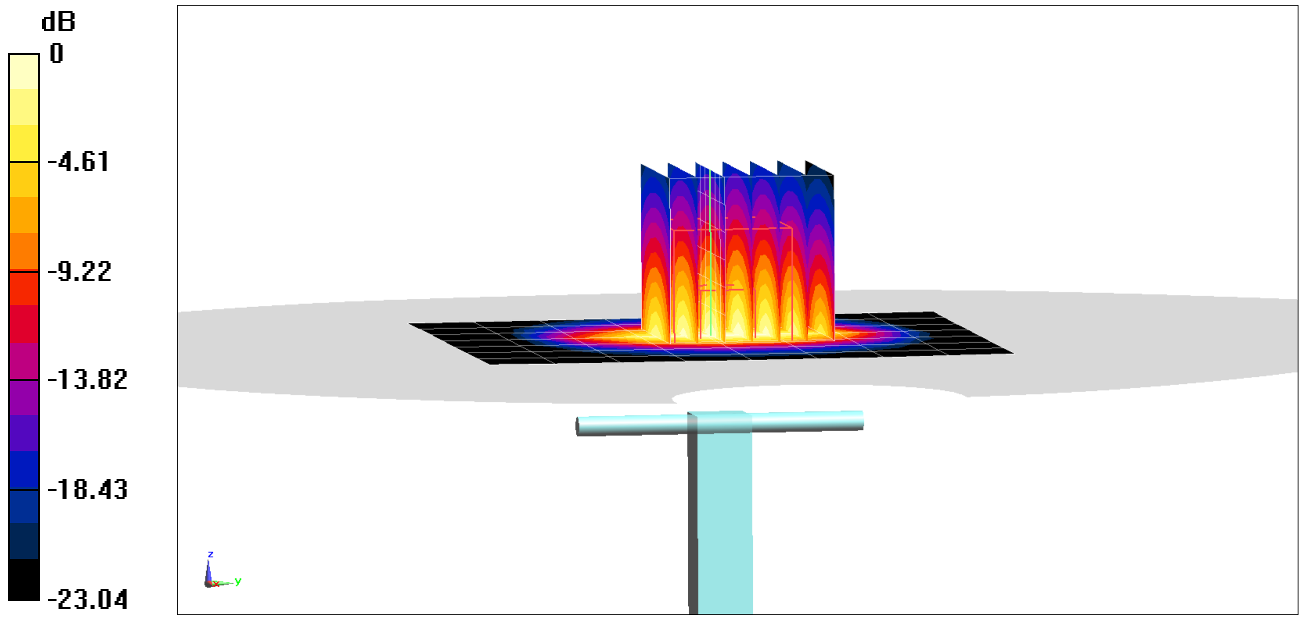
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.045 S/m; ε_r = 51.711; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/08/2020; Ambient Temp: 22.2°C; Tissue Temp: 23.1°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) = 10.7 W/kg
SAR(1 g) = 5.11 W/kg
Deviation(1 g) = 0.39%



0 dB = 8.51 W/kg = 9.30 dBW/kg

PCTEST

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

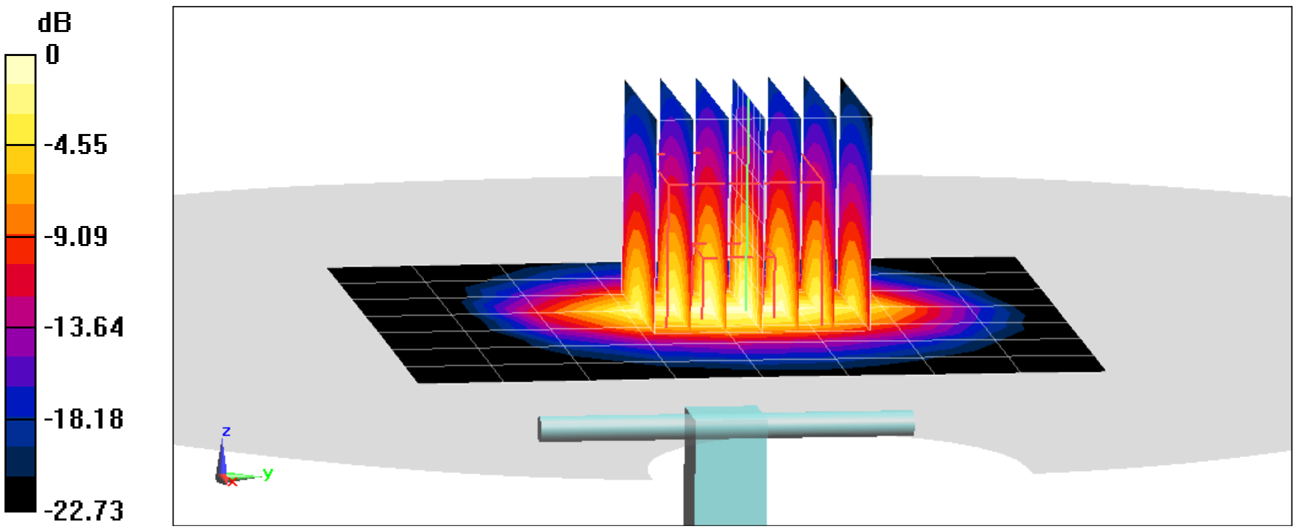
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.017 S/m; ε_r = 51.048; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/16/2020; Ambient Temp: 22.9°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN7308; ConvF(7.41, 7.41, 7.41) @ 2450 MHz; Calibrated: 7/31/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1450; Calibrated: 8/11/2020
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)

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) = 10.6 W/kg
SAR(1 g) = 4.95 W/kg
Deviation(1 g) = 0.20%



0 dB = 8.37 W/kg = 9.23 dBW/kg

PCTEST

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

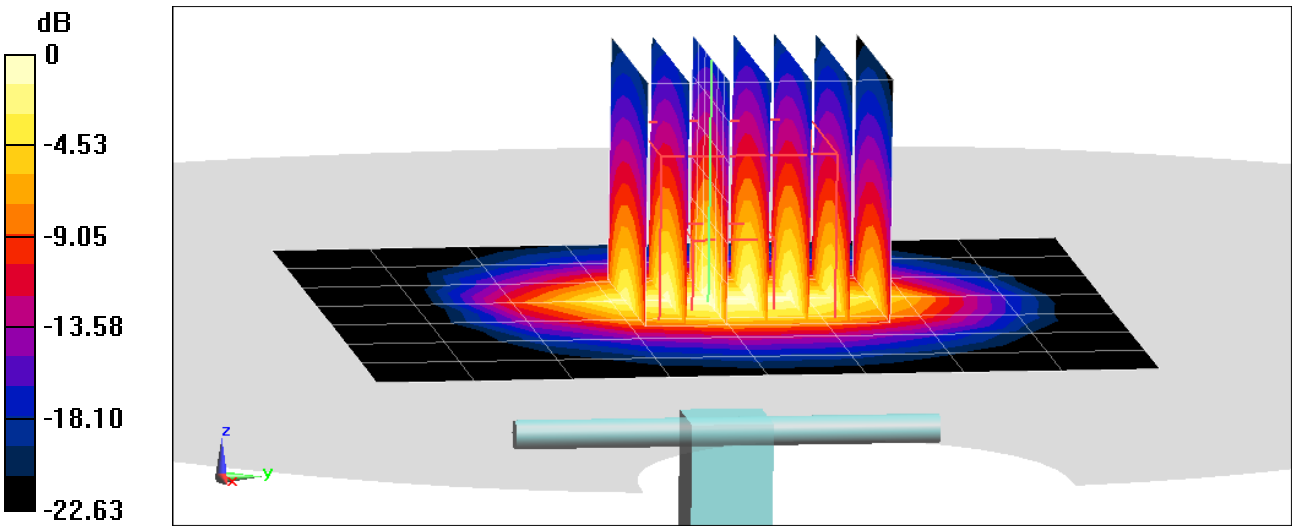
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 1.972 S/m; ε_r = 52.02; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/19/2020; Ambient Temp: 24.9°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN7308; ConvF(7.41, 7.41, 7.41) @ 2450 MHz; Calibrated: 7/31/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1450; Calibrated: 8/11/2020
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)

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) = 4.8 W/kg
Deviation(1 g) = -2.83%



0 dB = 8.07 W/kg = 9.07 dBW/kg

PCTEST

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

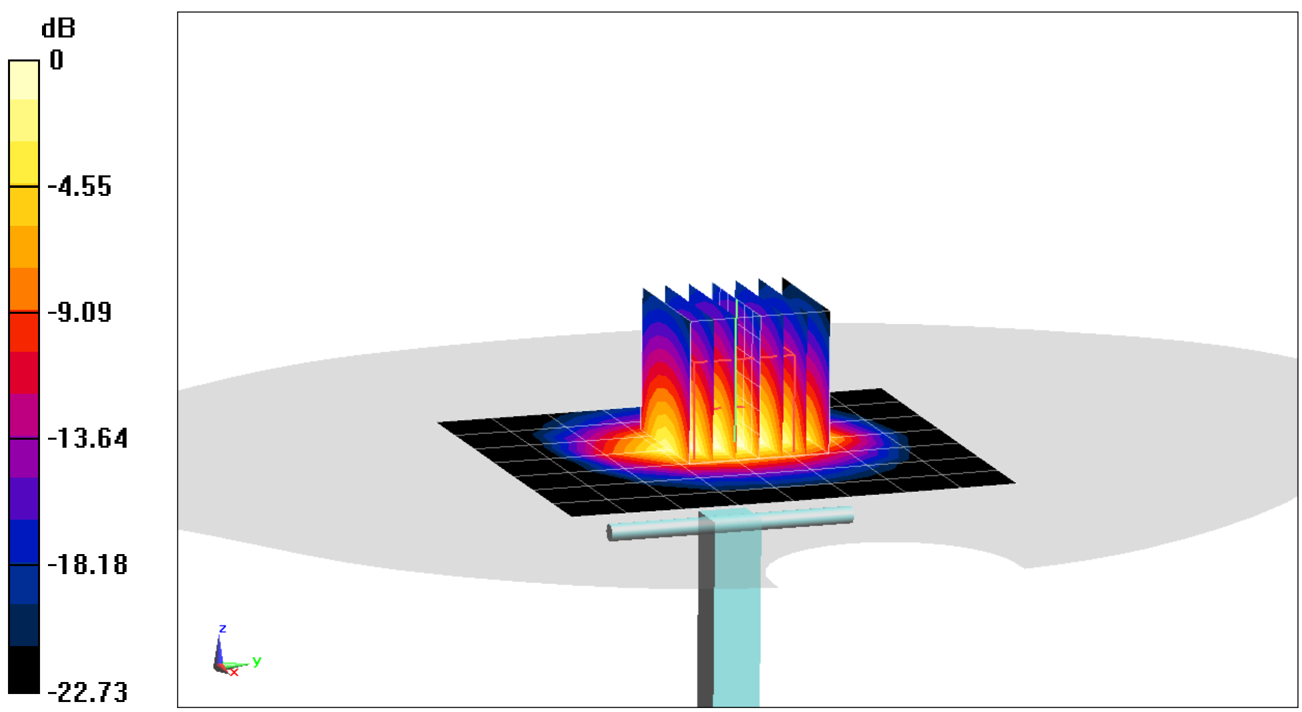
Communication System: UID 0, CW; Frequency: 2450 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2450 MHz; σ = 2.033 S/m; ε_r = 52.458; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/21/2020; Ambient Temp: 22.6°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) = 10.7 W/kg
SAR(1 g) = 5.12 W/kg; SAR(10 g) = 2.35 W/kg
Deviation(1 g) = 0.59%; Deviation(10 g) = -2.89%



0 dB = 8.52 W/kg = 9.30 dBW/kg

PCTEST

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

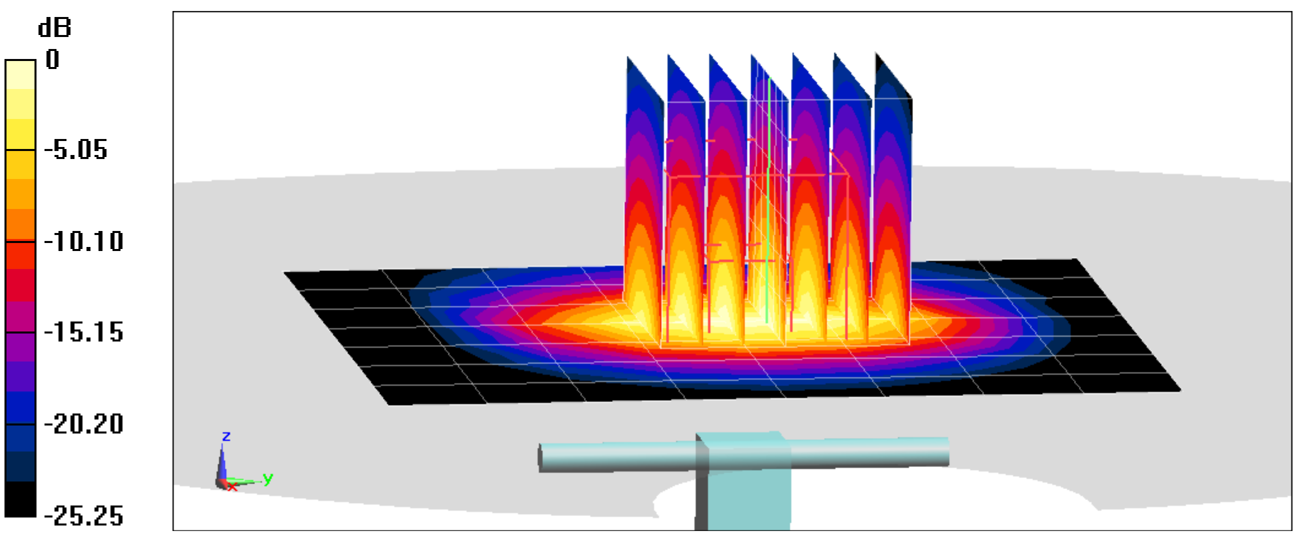
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2600 MHz; $\sigma = 2.177$ S/m; $\varepsilon_r = 51.469$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/19/2020; Ambient Temp: 24.9°C; Tissue Temp: 22.6°C

Probe: EX3DV4 - SN7308; ConvF(7.37, 7.37, 7.37) @ 2600 MHz; Calibrated: 7/31/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1450; Calibrated: 8/11/2020
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)

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) = 12.4 W/kg
SAR(1 g) = 5.45 W/kg
Deviation(1 g) = -1.98%



0 dB = 9.53 W/kg = 9.79 dBW/kg

PCTEST

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

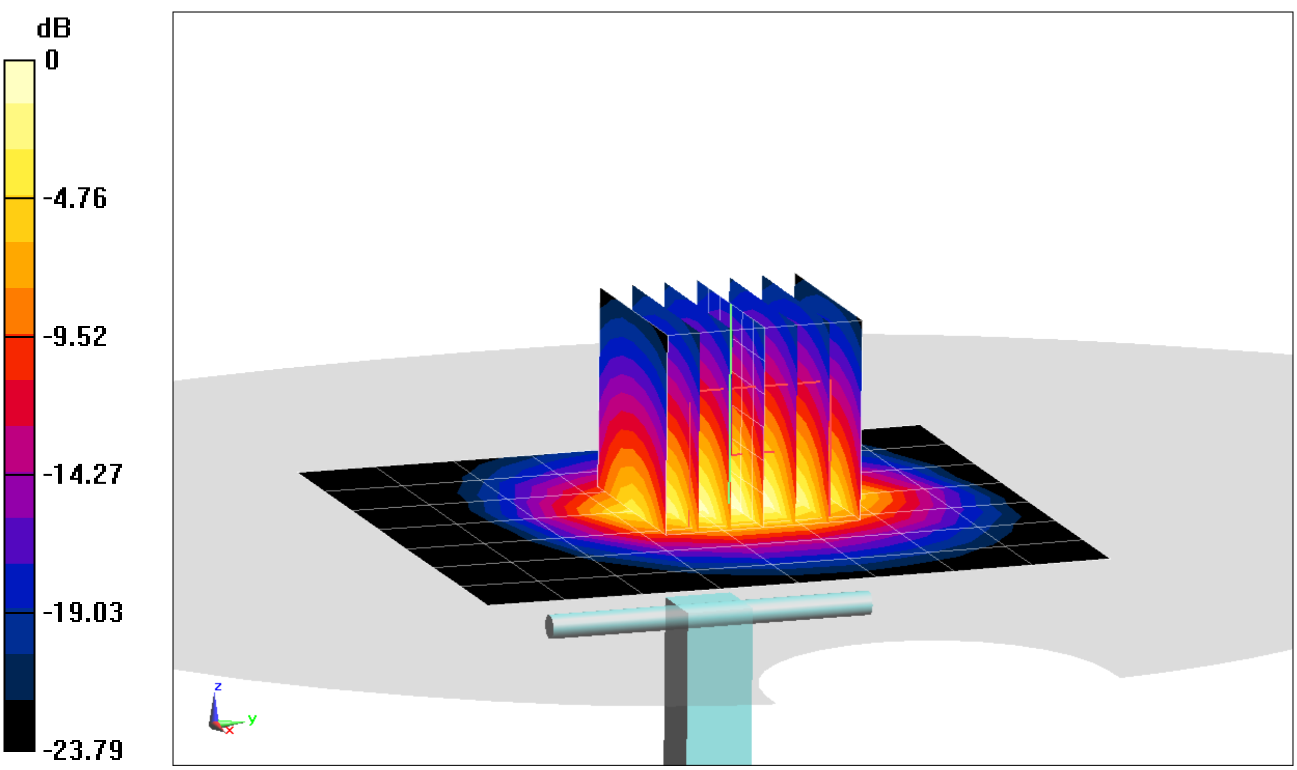
Communication System: UID 0, CW; Frequency: 2600 MHz; Duty Cycle: 1:1
Medium: 2450 Body Medium parameters used:
f = 2600 MHz; $\sigma = 2.211$ S/m; $\varepsilon_r = 52.047$; $\rho = 1000$ kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/21/2020; Ambient Temp: 22.6°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=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 11.4 W/kg
SAR(10 g) = 2.29 W/kg
Deviation(10 g) = -7.29%



0 dB = 8.92 W/kg = 9.50 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

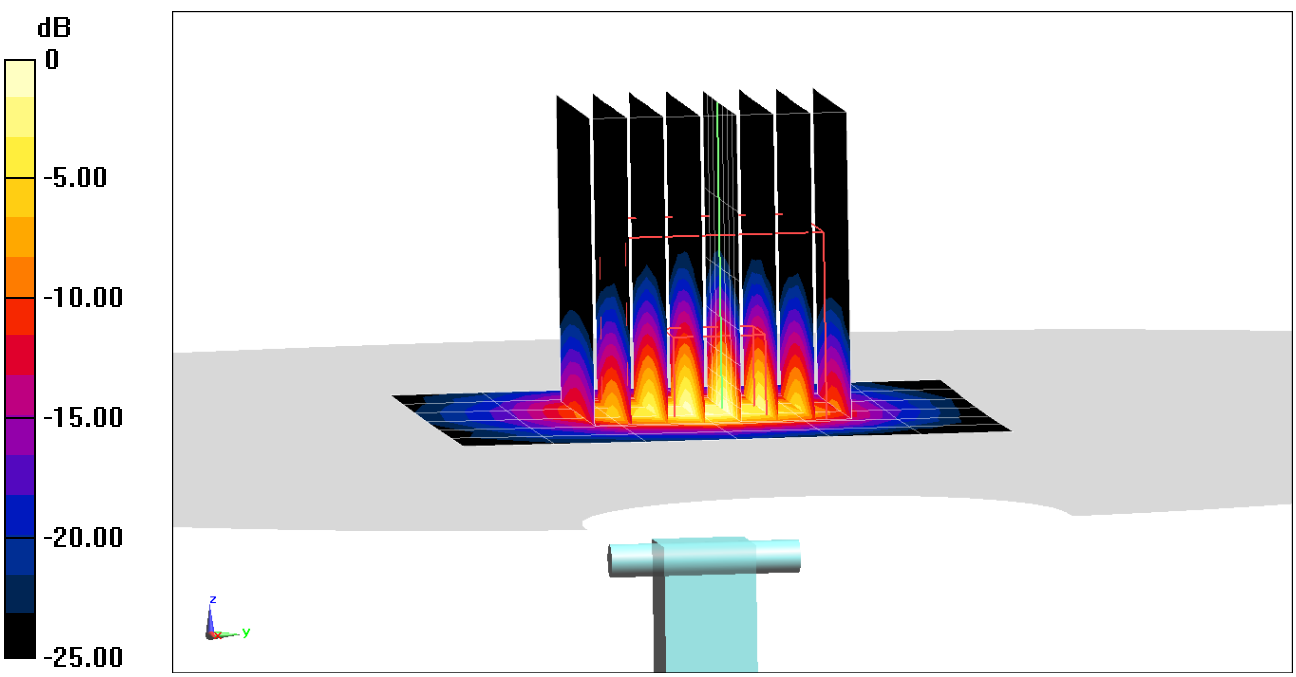
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body Medium parameters used:
f = 5250 MHz; σ = 5.505 S/m; ε_r = 47.282; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/15/2020; Ambient Temp: 21.9°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(5.05, 5.05, 5.05) @ 5250 MHz; Calibrated: 6/23/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1583; Calibrated: 5/14/2020
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) = 14.8 W/kg
SAR(1 g) = 3.53 W/kg
Deviation(1 g) = -6.61%



0 dB = 8.53 W/kg = 9.31 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

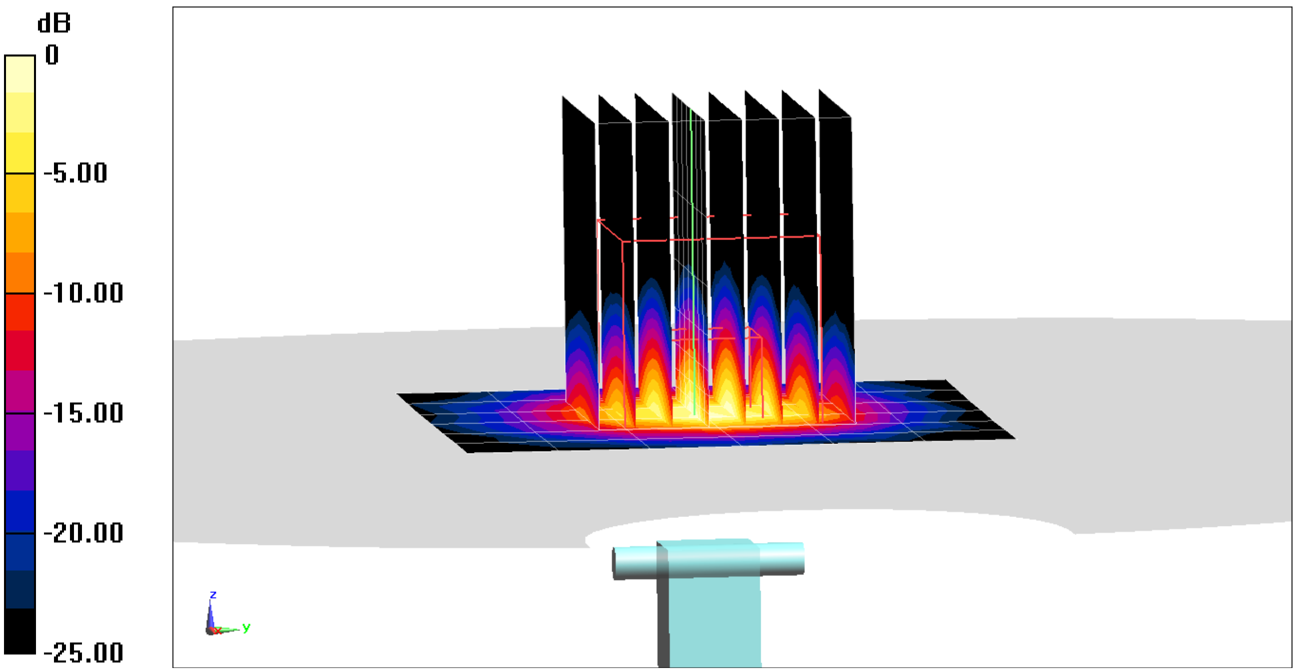
Communication System: UID 0, CW; Frequency: 5600 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body Medium parameters used:
f = 5600 MHz; σ = 5.964 S/m; ε_r = 46.695; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/15/2020; Ambient Temp: 21.9°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(4.37, 4.37, 4.37) @ 5600 MHz; Calibrated: 6/23/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1583; Calibrated: 5/14/2020
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) = 16.8 W/kg
SAR(1 g) = 3.75 W/kg
Deviation(1 g) = -4.46%



0 dB = 9.03 W/kg = 9.56 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

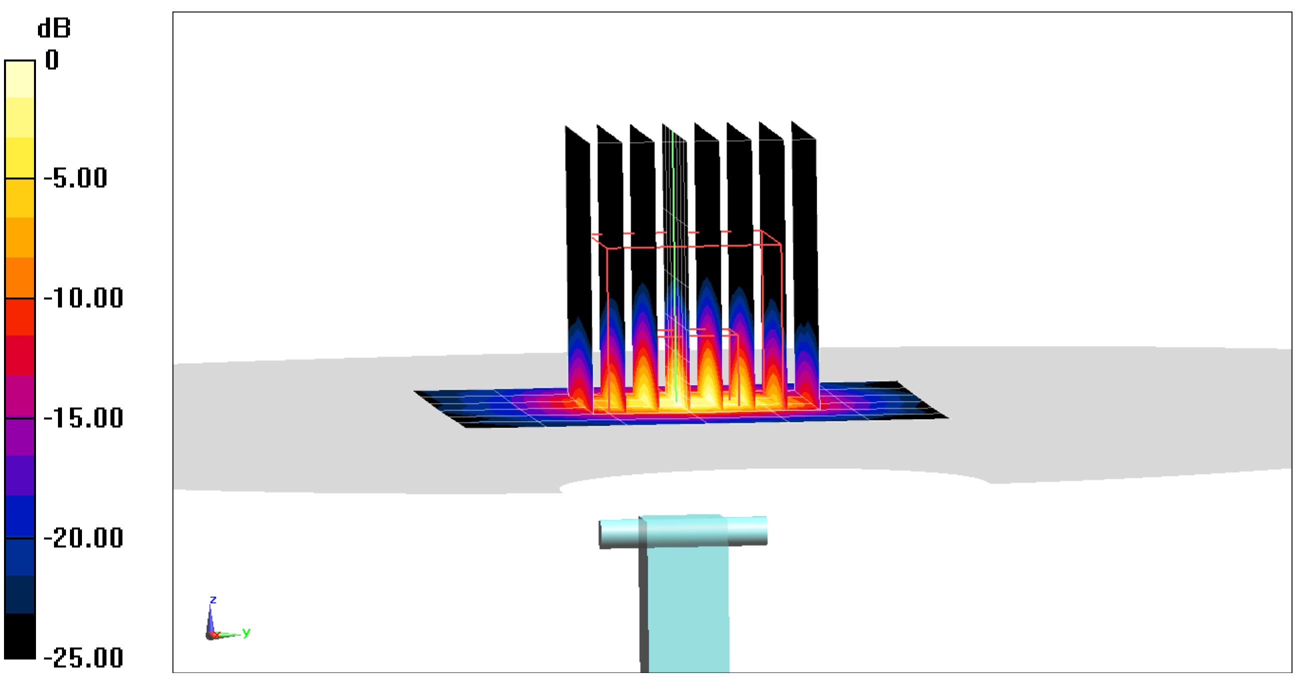
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body Medium parameters used:
f = 5750 MHz; σ = 6.176 S/m; ε_r = 46.473; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/15/2020; Ambient Temp: 21.9°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7406; ConvF(4.56, 4.56, 4.56) @ 5750 MHz; Calibrated: 6/23/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1583; Calibrated: 5/14/2020
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) = 16.8 W/kg
SAR(1 g) = 3.6 W/kg
Deviation(1 g) = -5.14%



0 dB = 9.01 W/kg = 9.55 dBW/kg

PCTEST

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

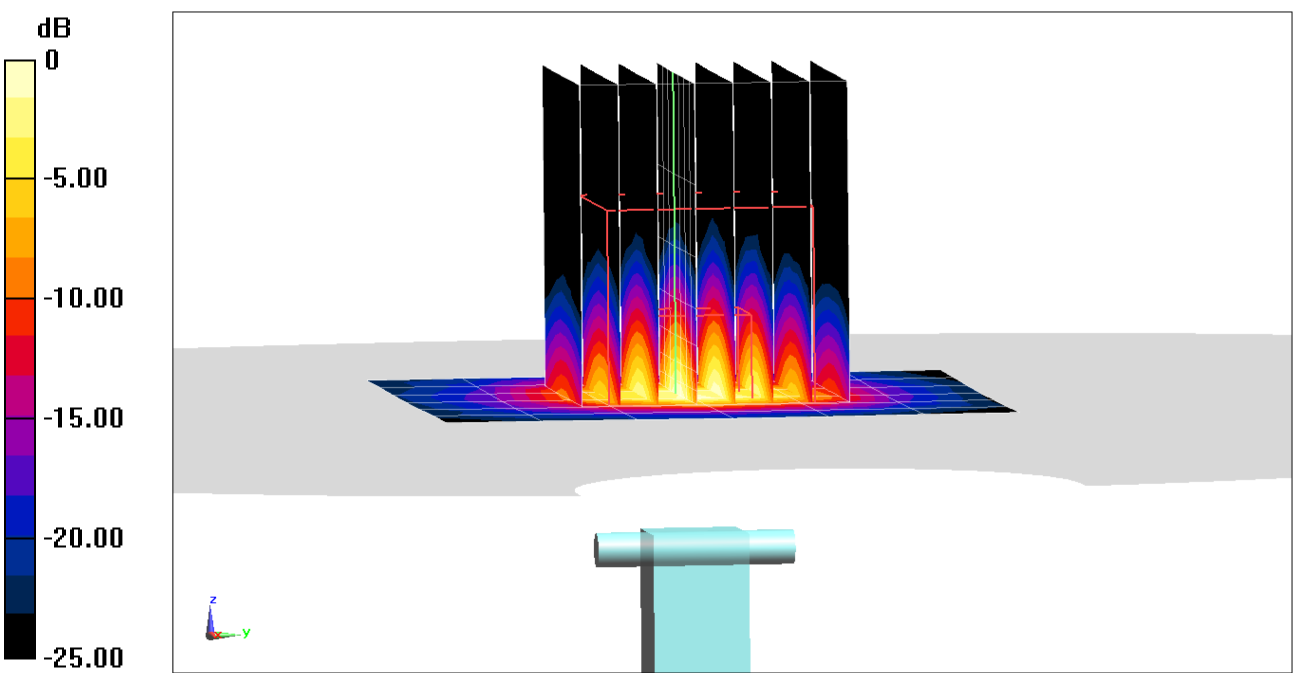
Communication System: UID 0, CW; Frequency: 5250 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body Medium parameters used:
f = 5250 MHz; σ = 5.532 S/m; ε_r = 46.984; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/22/2020; Ambient Temp: 22.0°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(5.05, 5.05, 5.05) @ 5250 MHz; Calibrated: 6/23/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1583; Calibrated: 5/14/2020
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) = 14.4 W/kg
SAR(10 g) = 0.995 W/kg
Deviation(10 g) = -6.13%



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

DUT: Dipole 5 GHz; Type: D5GHzV2; Serial: 1237

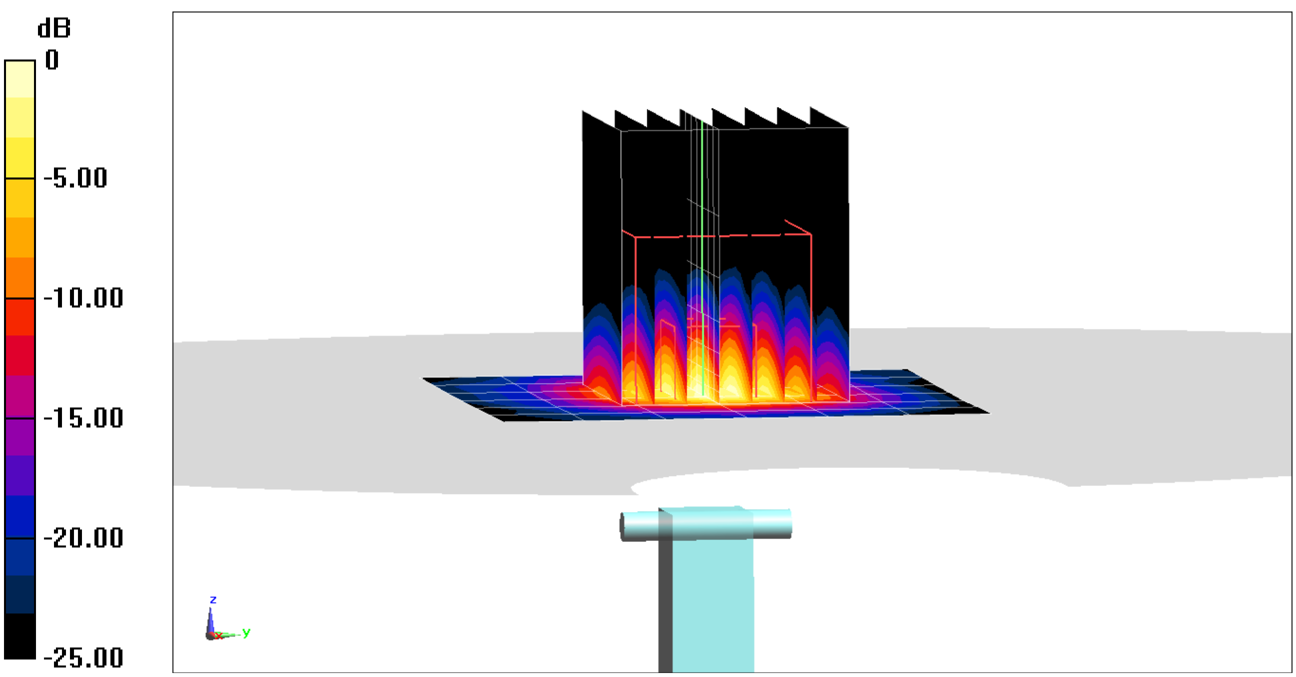
Communication System: UID 0, CW; Frequency: 5750 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body Medium parameters used:
f = 5750 MHz; σ = 6.218 S/m; ε_r = 46.134; ρ = 1000 kg/m^3
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 11/22/2020; Ambient Temp: 22.0°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7406; ConvF(4.56, 4.56, 4.56) @ 5750 MHz; Calibrated: 6/23/2020
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1583; Calibrated: 5/14/2020
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) = 16.8 W/kg
SAR(10 g) = 0.981 W/kg
Deviation(10 g) = -7.45%



0 dB = 8.86 W/kg = 9.47 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):

$$Y = \frac{j2\omega\varepsilon_r\varepsilon_0}{\left[\ln(b/a)\right]^2}\int_a^b\int_a^b\int_0^\pi \cos\phi' \frac{\exp\left[-j\omega r(\mu_0\varepsilon_r'\varepsilon_0)^{1/2}\right]}{r} d\phi' d\rho' d\rho$$

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, > C_{16}** 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 D-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.

Schmid & Partner Engineering AG

s p e a g

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 44 245 9700, Fax +41 44 245 9779
info@speag.com, http://www.speag.com

Measurement Certificate / Material Test

Item Name	**Body Tissue Simulating Liquid (MBBL600-6000V6)**
Product No.	SL AAM U16 BC (Batch: 200803-1)
Manufacturer	SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the KDB 865664 compliance standard.

Test Condition

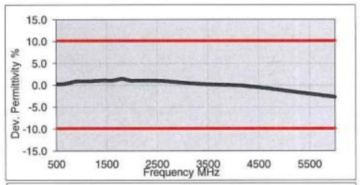
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	6-Aug-20
Operator	CL

Additional Information

TSL Density	
TSL Heat-capacity	

Results

	Measured			Target		Diff.to Target [%]	
f [MHz]	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
600	56.3	26.8	0.89	56.1	0.95	0.3	-6.3
750	55.8	22.6	0.94	55.5	0.96	0.5	-2.1
800	55.7	21.6	0.96	55.3	0.97	0.7	-1.0
825	55.7	21.1	0.97	55.2	0.98	0.8	-1.0
835	55.7	20.9	0.98	55.1	0.99	1.0	-0.5
850	55.6	20.7	0.98	55.2	0.99	0.8	-1.0
900	55.5	19.9	1.00	55.0	1.05	0.9	-4.8
1400	54.7	15.9	1.24	54.1	1.28	1.1	-3.1
1450	54.6	15.8	1.27	54.0	1.30	1.1	-2.3
1600	54.4	15.3	1.36	53.8	1.39	1.1	-2.2
1625	54.4	15.3	1.38	53.8	1.41	1.2	-2.1
1640	54.4	15.2	1.39	53.7	1.42	1.3	-2.1
1650	54.3	15.2	1.39	53.7	1.43	1.1	-2.8
1700	54.2	15.1	1.43	53.6	1.46	1.2	-2.1
1750	54.2	15.0	1.46	53.4	1.49	1.4	-2.0
1800	54.1	14.9	1.50	53.3	1.52	1.5	-1.3
1810	54.1	14.9	1.51	53.3	1.52	1.5	-0.7
1825	54.1	14.9	1.52	53.3	1.52	1.5	0.0
1850	54.0	14.9	1.53	53.3	1.52	1.3	0.7
1900	54.0	14.8	1.57	53.3	1.52	1.3	3.3
1950	53.9	14.8	1.60	53.3	1.52	1.1	5.3
2000	53.8	14.8	1.64	53.3	1.52	0.9	7.9
2050	53.8	14.7	1.68	53.2	1.57	1.1	7.0
2100	53.7	14.7	1.72	53.2	1.62	1.0	6.2
2150	53.7	14.7	1.76	53.1	1.66	1.1	6.0
2200	53.6	14.7	1.80	53.0	1.71	1.1	5.3
2250	53.5	14.8	1.85	53.0	1.76	1.0	5.1
2300	53.5	14.8	1.89	52.9	1.81	1.1	4.4
2350	53.4	14.8	1.94	52.8	1.85	1.1	4.9
2400	53.3	14.8	1.98	52.8	1.90	1.0	4.2
2450	53.3	14.9	2.03	52.7	1.95	1.1	4.1
2500	53.2	14.9	2.07	52.6	2.02	1.1	2.5
2550	53.1	15.0	2.12	52.6	2.09	1.0	1.4
2600	53.0	15.0	2.17	52.5	2.16	0.9	0.5
3500	51.4	16.0	3.11	51.3	3.31	0.2	-6.0
3700	51.1	16.2	3.34	51.1	3.55	0.1	-5.9
5200	48.3	18.7	5.42	49.0	5.30	-1.5	2.3
5250	48.2	18.8	5.50	49.0	5.36	-1.6	2.5
5300	48.1	18.9	5.57	48.9	5.42	-1.7	2.8
5500	47.7	19.2	5.86	48.6	5.65	-2.0	3.8
5600	47.5	19.3	6.01	48.5	5.77	-2.1	4.2
5700	47.3	19.4	6.16	48.3	5.88	-2.3	4.8
5800	47.0	19.6	6.32	48.2	6.00	-2.4	5.3
6000	46.6	19.8	6.62	47.9	6.23	-2.7	6.3
6500							
7000							
7500							
8000							
8500							
9000							
9500							
10000							



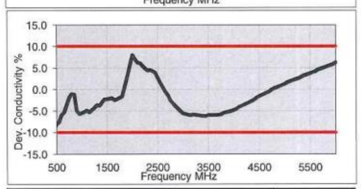


Figure C-2
600 – 5800 MHz Body Tissue Equivalent Matter

Schmid & Partner Engineering AG **s p e a g**

Zeughausstrasse 43, 8004 Zurich, Switzerland
Phone +41 44 245 9700, Fax +41 44 245 9779
info@speag.com, http://www.speag.com

Measurement Certificate / Material Test

Item Name	**Head Tissue Simulating Liquid (HBBL600-10000V6)**
Product No.	SL AAH U16 BC (Batch: 200805-4)
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

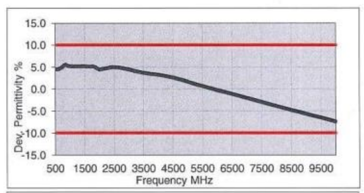
Ambient Condition	22°C ; 30% humidity
TSL Temperature	22°C
Test Date	6-Aug-20
Operator	CL

Additional Information

TSL Density	
TSL Heat-capacity	

Results

	Measured			Target		Diff.to Target [%]	
f [MHz]	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
600	44.7	25.7	0.86	42.7	0.88	4.6	-2.5
750	44.1	21.7	0.90	41.9	0.89	5.1	0.7
800	44.0	20.7	0.92	41.7	0.90	5.6	2.5
825	43.9	20.3	0.93	41.6	0.91	5.6	2.6
835	43.9	20.1	0.94	41.5	0.91	5.7	3.1
850	43.8	19.9	0.94	41.5	0.92	5.5	2.6
900	43.7	19.1	0.96	41.5	0.97	5.3	-1.0
1400	42.7	15.1	1.18	40.6	1.18	5.2	0.0
1450	42.6	14.9	1.20	40.5	1.20	5.2	0.0
1600	42.4	14.4	1.28	40.3	1.28	5.2	-0.3
1625	42.4	14.4	1.30	40.3	1.30	5.3	0.1
1640	42.4	14.3	1.31	40.3	1.31	5.3	0.3
1650	42.3	14.3	1.31	40.2	1.31	5.1	-0.2
1700	42.2	14.2	1.34	40.2	1.34	5.1	-0.2
1750	42.2	14.1	1.37	40.1	1.37	5.3	-0.1
1800	42.1	14.0	1.40	40.0	1.40	5.3	0.0
1810	42.1	14.0	1.41	40.0	1.40	5.3	0.7
1825	42.1	13.9	1.42	40.0	1.40	5.3	1.4
1850	42.0	13.9	1.43	40.0	1.40	5.0	2.1
1900	41.9	13.8	1.46	40.0	1.40	4.7	4.3
1950	41.9	13.8	1.49	40.0	1.40	4.7	6.4
2000	41.8	13.7	1.53	40.0	1.40	4.5	9.3
2050	41.7	13.7	1.56	39.9	1.44	4.5	8.0
2100	41.7	13.7	1.60	39.8	1.49	4.7	7.5
2150	41.6	13.6	1.63	39.7	1.53	4.7	6.3
2200	41.5	13.6	1.67	39.6	1.58	4.7	5.8
2250	41.5	13.6	1.70	39.6	1.62	4.9	4.8
2300	41.4	13.6	1.74	39.5	1.67	4.9	4.4
2350	41.3	13.6	1.78	39.4	1.71	4.9	4.0
2400	41.2	13.6	1.82	39.3	1.76	4.9	3.7
2450	41.2	13.6	1.85	39.2	1.80	5.1	2.8
2500	41.1	13.6	1.89	39.1	1.85	5.0	1.9
2550	41.0	13.7	1.94	39.1	1.91	4.9	1.6
2600	40.9	13.7	1.98	39.0	1.96	4.8	0.8
3500	39.4	14.2	2.77	37.9	2.91	3.7	-5.1
3700	39.0	14.3	2.95	37.7	3.12	3.5	-5.3
5200	36.4	15.9	4.61	36.0	4.66	1.3	-1.0
5250	36.4	16.0	4.67	35.9	4.71	1.2	-0.9
5300	36.3	16.0	4.72	35.9	4.76	1.1	-0.7
5500	35.9	16.2	4.96	35.6	4.96	0.7	-0.1
5600	35.7	16.3	5.07	35.5	5.07	0.5	0.2
5700	35.5	16.4	5.19	35.4	5.17	0.3	0.4
5800	35.4	16.5	5.31	35.3	5.27	0.1	0.7
6000	35.0	16.6	5.54	35.1	5.48	-0.2	1.2
6500	34.1	17.1	6.17	34.5	6.07	-1.1	1.6
7000	33.2	17.4	6.78	33.9	6.65	-2.0	2.0
7500	32.3	17.7	7.40	33.3	7.24	-2.9	2.2
8000	31.5	18.0	8.01	32.7	7.84	-3.8	2.2
8500	30.6	18.2	8.63	32.1	8.45	-4.7	2.1
9000	29.8	18.4	9.24	31.5	9.08	-5.6	1.8
9500	29.0	18.6	9.84	31.0	9.71	-6.5	1.3
10000	28.1	18.8	10.44	30.4	10.36	-7.4	0.8



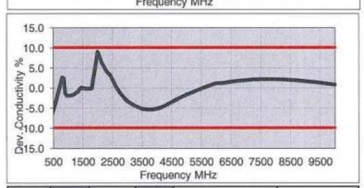


Figure C-3
600 – 5800 MHz Head Tissue Equivalent Matter

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. (σ)	Perm. (εr)	CW VALIDATION			MOD. VALIDATION		
								SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
L	750	8/14/2020	7406	750	Head	0.868	43.769	PASS	PASS	PASS	N/A	N/A	N/A
E	835	2/20/2020	3589	835	Head	0.922	43.402	PASS	PASS	PASS	GMSK	PASS	N/A
D	835	3/16/2020	7488	835	Head	0.907	42.124	PASS	PASS	PASS	GMSK	PASS	N/A
E	1750	2/20/2020	3589	1750	Head	1.390	41.519	PASS	PASS	PASS	N/A	N/A	N/A
L	1900	7/7/2020	7406	1900	Head	1.403	40.885	PASS	PASS	PASS	GMSK	PASS	N/A
E	2450	2/5/2020	3589	2450	Head	1.823	38.835	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
E	2600	2/5/2020	3589	2600	Head	1.933	38.635	PASS	PASS	PASS	TDD	PASS	N/A
H	5250	5/7/2020	7357	5250	Head	4.644	35.120	PASS	PASS	PASS	OFDM	N/A	PASS
H	5600	5/7/2020	7357	5600	Head	5.030	34.510	PASS	PASS	PASS	OFDM	N/A	PASS
H	5750	5/7/2020	7357	5750	Head	5.207	34.260	PASS	PASS	PASS	OFDM	N/A	PASS
O	750	9/9/2020	7547	750	Body	0.948	54.670	PASS	PASS	PASS	N/A	N/A	N/A
I	835	10/12/2020	7570	835	Body	0.946	52.840	PASS	PASS	PASS	GMSK	PASS	N/A
D	835	2/20/2020	7488	835	Body	1.001	53.450	PASS	PASS	PASS	GMSK	PASS	N/A
P	1750	9/8/2020	7308	1750	Body	1.478	52.860	PASS	PASS	PASS	N/A	N/A	N/A
H	1750	5/14/2020	7357	1750	Body	1.531	51.700	PASS	PASS	PASS	N/A	N/A	N/A
J	1900	1/1/2020	7571	1900	Body	1.579	51.919	PASS	PASS	PASS	GMSK	PASS	N/A
J	1900	12/3/2020	7410	1900	Body	1.561	52.634	PASS	PASS	PASS	GMSK	PASS	N/A
K	2450	7/7/2020	7409	2450	Body	2.018	51.180	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
P	2450	9/9/2020	7308	2450	Body	2.028	52.650	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
P	2600	9/8/2020	7308	2600	Body	2.171	52.410	PASS	PASS	PASS	TDD	PASS	N/A
G	5250	11/2/2020	7406	5250	Body	5.533	47.080	PASS	PASS	PASS	OFDM	N/A	PASS
G	5600	11/2/2020	7406	5600	Body	6.006	46.430	PASS	PASS	PASS	OFDM	N/A	PASS
G	5750	11/2/2020	7406	5750	Body	6.210	46.185	PASS	PASS	PASS	OFDM	N/A	PASS

Table D-2
SAR System Validation Summary – 10g

SAR System	Freq. (MHz)	Date	Probe SN	Probe Cal Point		Cond. (σ)	Perm. (εr)	CW VALIDATION			MOD. VALIDATION		
								SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
P	1750	9/8/2020	7308	1750	Body	1.478	52.860	PASS	PASS	PASS	N/A	N/A	N/A
H	1750	5/14/2020	7357	1750	Body	1.531	51.700	PASS	PASS	PASS	N/A	N/A	N/A
J	1900	1/1/2020	7571	1900	Body	1.579	51.919	PASS	PASS	PASS	GMSK	PASS	N/A
K	2450	7/7/2020	7409	2450	Body	2.018	51.180	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
K	2600	7/8/2020	7409	2600	Body	2.194	50.730	PASS	PASS	PASS	TDD	PASS	N/A
G	5250	11/2/2020	7406	5250	Body	5.533	47.080	PASS	PASS	PASS	OFDM	N/A	PASS
G	5750	11/2/2020	7406	5750	Body	6.210	46.185	PASS	PASS	PASS	OFDM	N/A	PASS

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.

1.1 LTE Downlink Only Carrier Aggregation Test Reduction Methodology

SAR test exclusion for LTE downlink Carrier Aggregation is determined by power measurements according to the number of component carriers (CCs) supported by the product implementation. Per April 2018 TCBC Workshop Notes, the following test reduction methodology was applied to determine the combinations required for conducted power measurements.

LTE DLCA Test Reduction Methodology:

- The supported combinations were arranged by the number of component carriers in columns.
- Any limitations on the PCC or SCC for each combination were identified alongside the combination (e.g. CA_2A-2A-4A-12A, but B12 can only be configured as a SCC).
- Power measurements were performed for "supersets" (LTE CA combinations with multiple components carriers) and any "subsets" (LTE CA combinations with fewer component carriers) that were not completely covered by the supersets.
- Only subsets that have the exact same components as a superset were excluded for measurement.
- When there were certain restrictions on component carriers that existed in the superset that were not applied for the subset, the subset configuration was additionally evaluated.
- Both inter-band and intra-band downlink carrier aggregation scenarios were considered.
- Downlink CA combinations for SISO and 4x4 Downlink MIMO operations were measured independently, per May 2017 TCBC Workshop notes.

Table 1 – Example of Exclusion Table for SISO Configurations

Index	2CC	Supported Channel Bandwidth [MHz]		Restriction	Completely Covered by Measurement Superset
		CC1	CC2		
2CC #1	CA_2C	5, 10, 15, 20	5, 10, 15, 20		3CC #4
2CC #2	CA_2A-5A	5, 10, 15, 20	5, 10		4CC #1
2CC #3	CA_2A-12A	5, 10, 15, 20	5, 10		3CC #3
2CC #4	CA_2A-13A	5, 10, 15, 20	10		3CC #9
2CC #5	CA_2A-17A	5, 10	5, 10		No
2CC #6	CA_2A-30A	5, 10, 15, 20	5, 10		3CC #14
2CC #8	CA_2A-66A (2)	5, 10, 15, 20	5, 10, 15, 20		5CC #1
2CC #9	CA_2A-71A	5, 10, 15, 20	5, 10, 15, 20		3CC #10
2CC #10	CA_4A-4A	5, 10, 15, 20	5, 10, 15, 20		3CC #6
2CC #11	CA_4A-5A (1)	5, 10, 15, 20	5, 10		4CC #1
2CC #12	CA_4A-12A (4)	5, 10, 15, 20	5, 10		3CC #8
2CC #13	CA_4A-13A	5, 10, 15, 20	10		3CC #9
2CC #14	CA_4A-17A	5, 10	5, 10	B17 SCC Only	No
2CC #15	CA_5B	5, 10	5, 10		5CC #1
2CC #16	CA_5A-25A	5, 10	5, 10, 15, 20		No
2CC #17	CA_7C	15, 20	15, 20		No
2CC #18	CA_7A-7A (1)	5, 10, 15, 20	5, 10, 15, 20		No
2CC #19	CA_7A-12A	5, 10, 15, 20	5, 10		3CC #12
2CC #20	CA_12B	5	5, 10		3CC #13
2CC #21	CA_12A-25A	5, 10	5, 10, 15, 20		No
2CC #22	CA_12A-30A	5, 10	5, 10		3CC #14
2CC #23	CA_41A-41A (1)	5, 10, 15, 20	5, 10, 15, 20		No

Index	3CC	Supported Channel Bandwidth [MHz]			Restriction	Completely Covered by Measurement Superset
		CC1	CC2	CC3		
3CC #1	CA_2A-2A-4A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		4CC #1
3CC #2	CA_2A-2A-5A	5, 10, 15, 20	5, 10, 15, 20	5, 10		4CC #1
3CC #3	CA_2A-2A-12A	5, 10, 15, 20	5, 10, 15, 20	5, 10		No
3CC #4	CA_2C-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #5	CA_2A-2A-71A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #6	CA_2A-4A-4A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #7	CA_2A-4A-5A	5, 10, 15, 20	5, 10, 15, 20	5, 10		4CC #1
3CC #8	CA_2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20	5, 10		No
3CC #9	CA_2A-4A-13A	5, 10, 15, 20	5, 10, 15, 20	10		No
3CC #10	CA_2A-4A-71A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #11	CA_2A-5B	5, 10, 15, 20	5, 10	5, 10		4CC #5
3CC #12	CA_2A-7A-12A	5, 10, 15, 20	5, 10, 15, 20	5, 10		No
3CC #13	CA_2A-12B	5, 10, 15, 20	5	5, 10		No
3CC #14	CA_2A-12A-30A	5, 10, 15, 20	5, 10	5, 10		No
3CC #15	CA_4A-4A-5A	5, 10, 15, 20	5, 10, 15, 20	5, 10		No
3CC #16	CA_5B-30A	5, 10	5, 10	5, 10		5CC #1
3CC #17	CA_5B-66A	5, 10	5, 10	5, 10, 15, 20		5CC #1
3CC #18	CA_5A-30A-66A	5, 10	5, 10	5, 10, 15, 20		4CC #9
3CC #19	CA_12A-66C	5, 10	5, 10, 15, 20	5, 10, 15, 20		No
3CC #20	CA_30A-66A-66A	5, 10	5, 10, 15, 20	5, 10, 15, 20		4CC #9
3CC #21	CA_41D	10, 15, 20	10, 15, 20	10, 15, 20		No
3CC #22	CA_41A-41C	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #23	CA_66D	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #24	CA_66A-66C	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No

Index	4CC	Supported Channel Bandwidth [MHz]				Restriction	Completely Covered by Measurement Superset
		CC1	CC2	CC3	CC4		
4CC #1	CA_2A-2A-4A-5A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20	5, 10		No
4CC #2	CA_2A-2A-4A-12A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20	5, 10	B12 SCC Only	No
4CC #3	CA_2A-2A-5A-30A	5, 10, 15, 20	5, 10, 15, 20	5, 10	5, 10		No
4CC #4	CA_2A-2A-5A-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10	5, 10, 15, 20		No
4CC #5	CA_2A-5B-30A	5, 10, 15, 20	5, 10	5, 10	5, 10		5CC #1
4CC #6	CA_2A-5B-66A	5, 10, 15, 20	5, 10	5, 10	5, 10, 15, 20		5CC #1
4CC #7	CA_5B-30A-66A	5, 10	5, 10	5, 10	5, 10		5CC #1
4CC #8	CA_5B-66A-66A	5, 10	5, 10	5, 10, 15, 20	5, 10, 15, 20		5CC #2
4CC #9	CA_5A-30A-66A-66A	5, 10	5, 10	5, 10, 15, 20	5, 10, 15, 20		No
4CC #10	CA_41E	15, 20	15, 20	15, 20	20		No

Index	5CC	Supported Channel Bandwidth [MHz]					Restriction	Completely Covered by Measurement Superset
		CC1	CC2	CC3	CC4	CC5		
5CC #1	CA_2A-5B-30A-66A	5, 10, 15, 20	5, 10	5, 10	5, 10	5, 10, 15, 20		No
5CC #2	CA_2A-5B-66A-66A	5, 10, 15, 20	5, 10	5, 10	5, 10, 15, 20	5, 10, 15, 20		No

Table 2 – Example of Exclusion Table for 4x4 Downlink MIMO Configurations

Index	2CC	Supported Channel Bandwidth [MHz]		Restriction	Completely Covered by Measurement Superset
		CC1	CC2		
2CC #M1	CA_[2C]	5, 10, 15, 20	5, 10, 15, 20		3CC #M6
2CC #M2	CA_[2A]-2A	5, 10, 15, 20	5, 10, 15, 20		3CC #M1
2CC #M3	CA_[2A]-[2A]	5, 10, 15, 20	5, 10, 15, 20		No
2CC #M4	CA_[2A]-4A (2)	5, 10, 15, 20	5, 10, 15, 20		3CC #M1
2CC #M5	CA_[2A]-[4A] (2)	5, 10, 15, 20	5, 10, 15, 20		No
2CC #M6	CA_[2A]-5A	5, 10, 15, 20	5, 10		4CC #M3
2CC #M7	CA_[2A]-12A (1)	5, 10, 15, 20	3, 5, 10		No
2CC #M8	CA_[2A]-13A	5, 10, 15, 20	10		3CC #M4
2CC #M9	CA_[2A]-17A	5, 10	5, 10		No
2CC #M10	CA_[2A]-29A (2)	5, 10, 15, 20	5, 10	B29 SCC Only	3CC #M12
2CC #M11	CA_[2A]-30A	5, 10, 15, 20	5, 10		3CC #M5
2CC #M12	CA_[2A]-66A (2)	5, 10, 15, 20	5, 10, 15, 20		4CC #M1
2CC #M13	CA_2A-[66A] (2)	5, 10, 15, 20	5, 10, 15, 20		4CC #M2
2CC #M14	CA_[2A]-[66A] (2)	5, 10, 15, 20	5, 10, 15, 20		No
2CC #M15	CA_[2A]-71A	5, 10, 15, 20	5, 10, 15, 20		3CC #M11
2CC #M16	CA_5A-[66A]	5, 10	5, 10, 15, 20		3CC #M16
2CC #M17	CA_12A-[66A] (4)	5, 10	5, 10, 15, 20		3CC #M17
2CC #M18	CA_13A-[66A]	5, 10	5, 10, 15, 20		3CC #M19
2CC #M19	CA_30A-[66A]	5, 10	5, 10, 15, 20		3CC #M20
2CC #M20	CA_[66B]	5, 10, 15	5, 10, 15		4CC #M4
2CC #M21	CA_[66C]	5, 10, 15, 20	5, 10, 15, 20		4CC #M6
2CC #M22	CA_[66A]-66A	5, 10, 15, 20	5, 10, 15, 20		3CC #M28
2CC #M23	CA_[66A]-[66A]	5, 10, 15, 20	5, 10, 15, 20		No

Index	3CC	Supported Channel Bandwidth [MHz]			Restriction	Completely Covered by Measurement Superset
		CC1	CC2	CC3		
3CC #M1	CA_[2A]-2A-4A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #M2	CA_[2A]-2A-5A	5, 10, 15, 20	5, 10, 15, 20	5, 10		No
3CC #M3	CA_[2A]-2A-12A	5, 10, 15, 20	5, 10, 15, 20	5, 10		No
3CC #M4	CA_[2A]-2A-13A	5, 10, 15, 20	5, 10, 15, 20	10		No
3CC #M5	CA_[2A]-2A-30A	5, 10, 15, 20	5, 10, 15, 20	5, 10		No
3CC #M6	CA_[2C]-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #M7	CA_2C-[66A]	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #M8	CA_[2C]-[66A]	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #M9	CA_[2A]-2A-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #M10	CA_2A-2A-[66A]	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #M11	CA_[2A]-2A-71A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #M12	CA_[2A]-4A-29A	5, 10, 15, 20	5, 10, 15, 20	5, 10	B29 SCC Only	No
3CC #M13	CA_[2A]-4A-71A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #M14	CA_[2A]-5B	5, 10, 15, 20	5, 10	5, 10		4CC #M1
3CC #M15	CA_[2A]-5A-66A	5, 10, 15, 20	5, 10	5, 10, 15, 20		No
3CC #M16	CA_2A-5A-[66A]	5, 10, 15, 20	5, 10	5, 10, 15, 20		No
3CC #M17	CA_2A-12A-[66A]	5, 10, 15, 20	5, 10	5, 10, 15, 20		No
3CC #M18	CA_[2A]-13A-66A	5, 10, 15, 20	5, 10	5, 10, 15, 20		No
3CC #M19	CA_2A-13A-[66A]	5, 10, 15, 20	5, 10	5, 10, 15, 20		No
3CC #M20	CA_2A-30A-[66A]	5, 10, 15, 20	5, 10	5, 10, 15, 20		No
3CC #M21	CA_[2A]-66B	5, 10, 15, 20	5, 10, 15	5, 10, 15		4CC #M3
3CC #M22	CA_2A-[66B]	5, 10, 15, 20	5, 10, 15	5, 10, 15		4CC #M4
3CC #M23	CA_[2A]-[66B]	5, 10, 15, 20	5, 10, 15	5, 10, 15		No
3CC #M24	CA_[2A]-66C	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		4CC #M5
3CC #M25	CA_2A-[66C]	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		4CC #M6
3CC #M26	CA_[2A]-[66C]	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #M27	CA_[2A]-66A-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #M28	CA_2A-[66A]-66A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No
3CC #M29	CA_[2A]-66A-71A	5, 10, 15, 20	5, 10, 15, 20	5, 10, 15, 20		No

Index	4CC	Supported Channel Bandwidth [MHz]				Restriction	Completely Covered by Measurement Superset
		CC1	CC2	CC3	CC4		
4CC #M1	CA_[2A]-5B-66A	5, 10, 15, 20	5, 10	5, 10	5, 10, 15, 20		No
4CC #M2	CA_2A-5B-[66A]	5, 10, 15, 20	5, 10	5, 10	5, 10, 15, 20		No
4CC #M3	CA_[2A]-5A-66B	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15		No
4CC #M4	CA_2A-5A-[66B]	5, 10, 15, 20	5, 10	5, 10, 15	5, 10, 15		No
4CC #M5	CA_[2A]-5A-66C	5, 10, 15, 20	5, 10	5, 10, 15, 20	5, 10, 15, 20		No
4CC #M6	CA_2A-5A-[66C]	5, 10, 15, 20	5, 10	5, 10, 15, 20	5, 10, 15, 20		No

Note: [CC] indicates component carrier with 4x4 DL MIMO antenna configuration

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.

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)ii) 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.

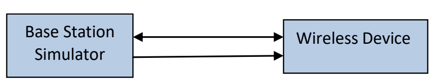


Figure 1
DL CA Power Measurement Setup

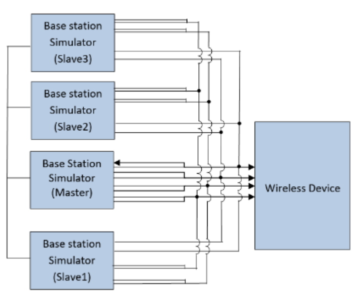


Figure 2
DL CA with DL 4x4 MIMO Power Measurement Setup

1.3 Downlink Carrier Aggregation RF Conducted Powers

1.3.1 LTE Band 12 as PCC

Table 1
Maximum Output Powers

	PCC									SCC 1				SCC 2				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]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-12A (1)	LTE B12	5	23035	701.5	QPSK	1	0	5035	731.5	LTE B2	20	900	1960	-	-	-	-	25.03	25.02
CA_4A-12A (1)	LTE B12	5	23035	701.5	QPSK	1	0	5035	731.5	LTE B4	20	2175	2132.5	-	-	-	-	25.06	25.02
CA_4A-12A (2)	LTE B12	5	23035	701.5	QPSK	1	0	5035	731.5	LTE B4	20	2175	2132.5	-	-	-	-	25.06	25.02
CA_12A-66A (1)	LTE B12	5	23035	701.5	QPSK	1	0	5035	731.5	LTE B66	20	66786	2145	-	-	-	-	25.07	25.02
CA_12A-66A (2)	LTE B12	5	23035	701.5	QPSK	1	0	5035	731.5	LTE B66	20	66786	2145	-	-	-	-	25.07	25.02
CA_4A-4A-12A	LTE B12	5	23035	701.5	QPSK	1	0	5035	731.5	LTE B4	20	2175	2132.5	LTE B4	10	2350	2150	25.05	25.02
CA_12A-66A-66A	LTE B12	5	23035	701.5	QPSK	1	0	5035	731.5	LTE B66	20	66786	2145	LTE B66	20	67236	2190	25.04	25.02

1.3.2 LTE Band 13 as PCC

Table 2
Maximum Output Powers

	PCC									SCC 1				SCC 2				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]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-4A-13A	LTE B13	10	23230	782	QPSK	1	0	5230	751	LTE B2	20	900	1960	LTE B4	20	2175	2132.5	24.56	24.53

1.3.3 LTE Band 26 as PCC

Table 3
Maximum Output Powers

	PCC									SCC 1				SCC 2				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]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_26A-41A	LTE B26	15	26865	831.5	QPSK	1	0	8865	876.5	LTE B41	20	40620	2593	-	-	-	-	24.91	24.92
CA_26A-41C	LTE B26	15	26865	831.5	QPSK	1	0	8865	876.5	LTE B41	20	40620	2593	LTE B41	20	40422	2573.2	24.91	24.92

1.3.4 LTE Band 66 as PCC

Table 4
Maximum Output Powers

	PCC									SCC 1				SCC 2				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]	LTE Tx.Power with DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_2A-66A	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	LTE B2	20	900	1960	-	-	-	-	24.40	24.36
CA_12A-66A (1)	LTE B66	1.4	132322	1745	QPSK	1	0	66786	2145	LTE B12	10	5095	737.5	-	-	-	-	24.45	24.42
CA_12A-66A (2)	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	LTE B12	10	5095	737.5	-	-	-	-	24.44	24.36
CA_66B	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	LTE B66	5	66693	2135.7	-	-	-	-	24.11	24.36
CA_66C	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	LTE B66	20	66615	2127.9	-	-	-	-	24.39	24.36
CA_5A-66A-66A	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	LTE B66	20	67236	2190	LTE B5	10	2525	881.5	24.39	24.36
CA_12A-66A-66A	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	LTE B66	20	67236	2190	LTE B12	10	5095	737.5	24.45	24.36

1.3.5 LTE Band 41 as PCC

Table 5
Maximum Output Powers

	PCC									SCC 1				SCC 2			
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]
CA_41A-41A (1)	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	41490	2680	-	-	-	-
CA_41A-41C	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680
CA_41C-41A	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40737	2604.7	LTE B41	20	41490	2680
CA_41C-41C	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40476	2578.6	LTE B41	20	41292	2660.2
CA_41A-41D	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	41094	2640.4	LTE B41	20	41292	2660.2
CA_41D-41A	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40476	2578.6	LTE B41	20	40764	2607.4
CA_41E	LTE B41	15	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40449	2575.9	LTE B41	20	40791	2610.1
CA_41C-41D	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40476	2578.6	LTE B41	20	41094	2640.4
CA_41D-41C	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	LTE B41	20	40476	2578.6	LTE B41	20	40764	2607.4

	SCC 3				SCC 4				SCC 5				SCC 6				Power	
Combination	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 DL CA Enabled (dBm)	LTE Single Carrier Tx Power (dBm)
CA_41A-41A (1)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.41	24.35
CA_41A-41C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.40	24.35
CA_41C-41A	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.39	24.35
CA_41C-41C	LTE B41	20	41490	2680	-	-	-	-	-	-	-	-	-	-	-	-	24.24	24.21
CA_41A-41D	LTE B41	20	41490	2680	-	-	-	-	-	-	-	-	-	-	-	-	24.34	24.35
CA_41D-41A	LTE B41	20	41490	2680	-	-	-	-	-	-	-	-	-	-	-	-	24.23	24.21
CA_41E	LTE B41	20	40989	2629.9	-	-	-	-	-	-	-	-	-	-	-	-	24.16	24.14
CA_41C-41D	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	-	-	-	-	-	-	-	-	24.24	24.21
CA_41D-41C	LTE B41	20	41292	2660.2	LTE B41	20	41490	2680	-	-	-	-	-	-	-	-	24.26	24.21

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 6
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	1.4	132322	1745	QPSK	1	0	24.39	24.42	24.0
41	5	40620	2593	QPSK	1	0	24.32	24.35	24.0

1.4.2 LTE Band 12 as PCC

Table 7
Maximum Output Powers

	PCC										SCC 1					SCC 2					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 (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	LTE Single Carrier Tx Power (dBm)
CA_[4A]-12A (1)	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	2x2	LTE B4	20	2175	2132.5	4x4	-	-	-	-	-	25.45	25.37
CA_[4A]-12A (2)	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	2x2	LTE B4	20	2175	2132.5	4x4	-	-	-	-	-	25.45	25.37
CA_12A-[66A] (1)	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	2x2	LTE B66	20	66786	2145	4x4	-	-	-	-	-	25.46	25.37
CA_12A-[66A] (2)	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	2x2	LTE B66	20	66786	2145	4x4	-	-	-	-	-	25.46	25.37
CA_[4A]-4A-12A	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	2x2	LTE B4	20	2175	2132.5	4x4	LTE B4	10	2350	2150	2x2	25.44	25.37
CA_[4A]-[4A]-12A	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	2x2	LTE B4	20	2175	2132.5	4x4	LTE B4	10	2350	2150	4x4	25.42	25.37
CA_12A-[66A]-66A	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	2x2	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	2x2	25.41	25.37
CA_12A-[66A]-[66A]	LTE B12	10	23095	707.5	QPSK	1	0	5095	737.5	2x2	LTE B66	20	66786	2145	4x4	LTE B66	20	67236	2190	4x4	25.45	25.37

1.4.3 LTE Band 13 as PCC

Table 8
Maximum Output Powers

	PCC										SCC 1					SCC 2					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 (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	LTE Single Carrier Tx Power (dBm)
CA_2A-[4A]-13A	LTE B13	10	23230	782	QPSK	1	0	5230	751	2x2	LTE B2	20	900	1960	2x2	LTE B4	20	2175	2132.5	4x4	24.57	24.53

1.4.4 LTE Band 26 as PCC

Table 9
Maximum Output Powers

	PCC										SCC 1					SCC 2					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 (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	LTE Single Carrier Tx Power (dBm)
CA_26A-[41A]	LTE B26	15	26865	831.5	QPSK	1	0	8865	876.5	2x2	LTE B41	20	40620	2593	4x4	-	-	-	-	-	24.97	24.92
CA_26A-[41C]	LTE B26	15	26865	831.5	QPSK	1	0	8865	876.5	2x2	LTE B41	20	40620	2593	4x4	LTE B41	20	40422	2573.2	4x4	24.92	24.92

1.4.5 LTE Band 66 as PCC

Table 10
Maximum Output Powers

	PCC										SCC 1					SCC 2					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 (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	LTE Single Carrier Tx Power (dBm)
CA_2A-[66A]	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	4x4	LTE B2	20	900	1960	2x2	-	-	-	-	-	24.34	24.36
CA_12A-[66A] (1)	LTE B66	1.4	132322	1745	QPSK	1	0	66786	2145	4x4	LTE B12	10	5095	737.5	2x2	-	-	-	-	-	24.41	24.42
CA_12A-[66A] (2)	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	4x4	LTE B12	10	5095	737.5	2x2	-	-	-	-	-	24.39	24.36
CA_5A-[66A]-66A	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	4x4	LTE B66	20	67236	2190	2x2	LTE B5	10	2525	881.5	2x2	24.38	24.36
CA_5A-66A-[66A]	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	2x2	LTE B66	20	67236	2190	4x4	LTE B5	10	2525	881.5	2x2	24.39	24.36
CA_5A-[66A]-[66A]	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	4x4	LTE B66	20	67236	2190	4x4	LTE B5	10	2525	881.5	2x2	24.39	24.36
CA_12A-[66A]-66A	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	4x4	LTE B66	20	67236	2190	2x2	LTE B12	10	5095	737.5	2x2	24.41	24.36
CA_12A-66A-[66A]	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	2x2	LTE B66	20	67236	2190	4x4	LTE B12	10	5095	737.5	2x2	24.40	24.36
CA_12A-[66A]-[66A]	LTE B66	15	132322	1745	QPSK	1	0	66786	2145	4x4	LTE B66	20	67236	2190	4x4	LTE B12	10	5095	737.5	2x2	24.41	24.36

1.4.6 LTE Band 41 as PCC

Table 11
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) Ch.	PCC (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.	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	LTE Single Carrier Tx Power (dBm)
CA_[41A]-41A (1)	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	41490	2680	2x2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.33	24.35
CA_41A-[41A] (1)	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	2x2	LTE B41	20	41490	2680	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.32	24.35
CA_[41A]-[41A] (1)	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	41490	2680	4x4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24.35	24.35
CA_[41A]-41C	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	41292	2660.2	2x2	LTE B41	20	41490	2680	2x2	-	-	-	-	-	-	-	-	-	-	24.36	24.35
CA_41C-[41A]	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	2x2	LTE B41	20	40737	2604.7	2x2	LTE B41	20	41490	2680	4x4	-	-	-	-	-	-	-	-	-	-	24.44	24.35
CA_41A-[41C]	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	2x2	LTE B41	20	41292	2660.2	4x4	LTE B41	20	41490	2680	4x4	-	-	-	-	-	-	-	-	-	-	24.34	24.35
CA_[41C]-41A	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	40737	2604.7	4x4	LTE B41	20	41490	2680	2x2	-	-	-	-	-	-	-	-	-	-	24.33	24.35
CA_[41A]-[41C]	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	41292	2660.2	4x4	LTE B41	20	41490	2680	4x4	-	-	-	-	-	-	-	-	-	-	24.35	24.35
CA_[41C]-[41A]	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	40737	2604.7	4x4	LTE B41	20	41490	2680	4x4	-	-	-	-	-	-	-	-	-	-	24.34	24.35
CA_[41C]-41C	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	40476	2578.6	4x4	LTE B41	20	41292	2660.2	2x2	LTE B41	20	41490	2680	2x2	-	-	-	-	-	24.20	24.21
CA_41C-[41C]	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	2x2	LTE B41	20	40476	2578.6	2x2	LTE B41	20	41292	2660.2	4x4	LTE B41	20	41490	2680	4x4	-	-	-	-	-	24.34	24.21
CA_[41C]-[41C]	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	40476	2578.6	4x4	LTE B41	20	41292	2660.2	4x4	LTE B41	20	41490	2680	4x4	-	-	-	-	-	24.22	24.21
CA_[41A]-41D	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	41094	2640.4	2x2	LTE B41	20	41292	2660.2	2x2	LTE B41	20	41490	2680	2x2	-	-	-	-	-	24.35	24.35
CA_41D-[41A]	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	2x2	LTE B41	20	40476	2578.6	2x2	LTE B41	20	40764	2607.4	2x2	LTE B41	20	41490	2680	4x4	-	-	-	-	-	24.31	24.21
CA_41A-[41D]	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	2x2	LTE B41	20	41094	2640.4	4x4	LTE B41	20	41292	2660.2	4x4	LTE B41	20	41490	2680	4x4	-	-	-	-	-	24.44	24.35
CA_[41D]-41A	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	40476	2578.6	4x4	LTE B41	20	40764	2607.4	4x4	LTE B41	20	41490	2680	2x2	-	-	-	-	-	24.24	24.21
CA_[41A]-[41D]	LTE B41	5	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	41094	2640.4	4x4	LTE B41	20	41292	2660.2	4x4	LTE B41	20	41490	2680	4x4	-	-	-	-	-	24.34	24.35
CA_[41D]-[41A]	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	40476	2578.6	4x4	LTE B41	20	40764	2607.4	4x4	LTE B41	20	41490	2680	4x4	-	-	-	-	-	24.23	24.21
CA_[41E]	LTE B41	15	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	40449	2575.9	4x4	LTE B41	20	40791	2610.1	4x4	LTE B41	20	40989	2629.9	4x4	-	-	-	-	-	24.16	24.14
CA_[41C]-41D	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	40476	2578.6	4x4	LTE B41	20	41094	2640.4	2x2	LTE B41	20	41292	2660.2	2x2	LTE B41	20	41490	2680	2x2	24.24	24.21
CA_41D-[41C]	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	2x2	LTE B41	20	40476	2578.6	2x2	LTE B41	20	40764	2607.4	2x2	LTE B41	20	41292	2660.2	4x4	LTE B41	20	41490	2680	4x4	24.28	24.21
CA_41C-[41D]	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	2x2	LTE B41	20	40476	2578.6	2x2	LTE B41	20	41094	2640.4	4x4	LTE B41	20	41292	2660.2	4x4	LTE B41	20	41490	2680	4x4	24.34	24.21
CA_[41D]-41C	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	40476	2578.6	4x4	LTE B41	20	40764	2607.4	4x4	LTE B41	20	41292	2660.2	2x2	LTE B41	20	41490	2680	2x2	24.29	24.21
CA_[41C]-[41D]	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	40476	2578.6	4x4	LTE B41	20	41094	2640.4	4x4	LTE B41	20	41292	2660.2	4x4	LTE B41	20	41490	2680	4x4	24.32	24.21
CA_[41D]-[41C]	LTE B41	10	40620	2593	QPSK	1	0	40620	2593	4x4	LTE B41	20	40476	2578.6	4x4	LTE B41	20	40764	2607.4	4x4	LTE B41	20	41292	2660.2	4x4	LTE B41	20	41490	2680	4x4	24.27	24.21

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.

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.

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-2 for more details).

4. Steps 1 through 3 were repeated for all distance-based power reduction mechanisms.

G.3 Main Antenna Verification Summary

Table G-1
Power Measurement Verification for Main Antenna

Mechanism(s)		Mode/Band	Conducted Power (dBm)		
1st	2nd		Un-triggered (Max)	Mechanism #1 (Reduced)	Mechanism #2 (Reduced)
Hotspot On		GPRS 1900 3 Tx Slot	25.80	23.81	
Grip		GPRS 1900 3 Tx Slot	25.78	23.82	
Hotspot On	Grip	GPRS 1900 3 Tx Slot	25.78	23.82	23.84
Grip	Hotspot On	GPRS 1900 3 Tx Slot	25.79	23.85	23.86
Hotspot On		UMTS 1750	24.90	21.50	
Grip		UMTS 1750	24.89	21.44	
Hotspot On	Grip	UMTS 1750	24.89	21.46	21.50
Grip	Hotspot On	UMTS 1750	24.91	21.45	21.49
Hotspot On		UMTS 1900	24.33	21.65	
Grip		UMTS 1900	24.45	21.61	
Hotspot On	Grip	UMTS 1900	24.51	21.63	21.62
Grip	Hotspot On	UMTS 1900	24.43	21.64	21.64
Hotspot On		LTE FDD Band 66	24.00	21.00	
Grip		LTE FDD Band 66	24.01	20.95	
Hotspot On	Grip	LTE FDD Band 66	23.97	20.94	20.90
Grip	Hotspot On	LTE FDD Band 66	24.00	20.91	20.97
Hotspot On		LTE FDD Band 4	23.95	20.88	
Grip		LTE FDD Band 4	23.94	20.81	
Hotspot On	Grip	LTE FDD Band 4	23.99	20.85	20.80
Grip	Hotspot On	LTE FDD Band 4	23.96	20.80	20.82
Hotspot On		LTE FDD Band 25	24.00	21.00	
Grip		LTE FDD Band 25	24.00	20.98	
Hotspot On	Grip	LTE FDD Band 25	23.97	20.99	20.96
Grip	Hotspot On	LTE FDD Band 25	23.98	20.95	20.95
Hotspot On		LTE FDD Band 2	23.88	20.82	
Grip		LTE FDD Band 2	23.86	20.83	
Hotspot On	Grip	LTE FDD Band 2	23.86	20.85	20.81
Grip	Hotspot On	LTE FDD Band 2	23.87	20.83	20.85
Hotspot On		LTE TDD Band 41 (PC3)	24.00	23.15	
Grip		LTE TDD Band 41 (PC3)	24.02	23.12	
Hotspot On	Grip	LTE TDD Band 41 (PC3)	23.99	23.14	23.13
Grip	Hotspot On	LTE TDD Band 41 (PC3)	24.00	23.11	23.14
Hotspot On		LTE TDD Band 41 (PC2)	26.11	23.09	
Grip		LTE TDD Band 41 (PC2)	26.10	23.10	
Hotspot On	Grip	LTE TDD Band 41 (PC2)	26.08	23.09	23.09
Grip	Hotspot On	LTE TDD Band 41 (PC2)	26.10	23.07	23.11
NR Active		LTE FDD Band 5	24.98	21.55	
Hotspot On		NR FDD Band n66	25.00	21.98	
Grip		NR FDD Band n66	25.00	21.99	
Hotspot On	Grip	NR FDD Band n66	24.99	22.00	21.98
Grip	Hotspot On	NR FDD Band n66	24.99	21.99	22.00

Table G-2
Distance Measurement Verification for Main Antenna

Mechanism(s)	Test Condition	Band	Distance Measurements (mm)		Minimum Distance per Manufacturer (mm)
			Moving Toward	Moving Away	
Grip	Phablet - Back Side	Mid	10	12	8
Grip	Phablet - Back Side	High	10	12	8
Grip	Phablet - Front Side	Mid	8	10	7
Grip	Phablet - Front Side	High	8	10	7
Grip	Phablet - Bottom Edge	Mid	12	13	12
Grip	Phablet - Bottom Edge	High	12	13	12

*Note: Mid band refers to: GSM1900, UMTS B2/4, LTE B2/4/25/66, NR n66; High band refers to: LTE B41 PC3/PC2

G.4 WIFI Verification Summary

Table G-3
Power Measurement Verification WIFI – Ant 1

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
1st		Un-triggered (Max)	Mechanism #1 (Reduced)
Held-to-Ear	802.11b	17.20	15.14

Table G-4
Power Measurement Verification WIFI – Ant 2

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
1st		Un-triggered (Max)	Mechanism #1 (Reduced)
Held-to-Ear	802.11b	17.62	15.08

Table G-5
Power Measurement Verification WIFI – MIMO

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
1st		Un-triggered (Max)	Mechanism #1 (Reduced)
Held-to-Ear	802.11g	20.12	18.95
Held-to-Ear	802.11a	20.01	16.42
Held-to-Ear	802.11n (5GHz, 20MHz BW)	19.87	16.41
Held-to-Ear	802.11ac (20MHz BW)	19.71	16.56
Held-to-Ear	802.11n (5GHz, 40MHz BW)	18.81	16.48
Held-to-Ear	802.11ac (40MHz BW)	18.98	16.70
Held-to-Ear	802.11ac (80MHz BW)	17.85	16.45

*Note: 802.11ax WIFI modes were not evaluated due to equipment limitations

APPENDIX H: IEEE 802.11AX RU SAR EXCLUSION

H.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 FCC Guidance, 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.

The 160 MHz channel is divided into two parts for 802.11ax RU operations, the lower 80 MHz and the upper 80 MHz section. In the tables in this appendix, 80L stands for the lower 80 MHz of the 160 MHz channel, and 80U(or H) stands for the upper 80 MHz of the 160 MHz channel.

H.2 IEEE 802.11ax RU Target Powers

H.2.1 Maximum 802.11ax RU WLAN Output Power

Mode	Band	MIMO											
		26T		52T		106T		242T		484T		996T	
Maximum/Nominal Power		Nominal	Max	Nominal	Max	Nominal	Max	Nominal	Max	Nominal	Max	Nominal	Max
2.4GHz		19 ch12 : 16 ch13 : 13.5	20 ch12 : 17 ch13 : 14.5	19 ch12 : 16 ch13 : 13.5	20 ch12 : 17 ch13 : 14.5	19 ch12 : 16 ch13 : 13.5	20 ch12 : 17 ch13 : 14.5	19 ch1 : 17 ch11 : 14.5 ch12 : 14.5 ch13 : 13.5	20 ch1 : 18 ch11 : 15.5 ch12 : 15.5 ch13 : 14.5				
5GHz (20MHz)	5200MHz	12	13	14.5	15.5	17	18	20 Ch36 : 19.5	21 ch36 : 20.5				
	5300MHz	12	13	14.5	15.5	17	18	20 ch64 : 17.5	21 ch64 : 18.5				
	5500MHz	12	13	14.5	15.5	17	18	20	21				
	5800MHz	19	20	19	20	19	20	19	20				
5GHz (40MHz)	5200MHz	12.5	13.5	15	16	18	19	19	20	19 ch38 : 15.5	20 ch38 : 16.5		
	5300MHz	12.5	13.5	15	16	18	19	19	20	19 ch62 : 16	20 ch62 : 17		
	5500MHz	12.5	13.5	15	16	18	19	19	20	19 ch102 : 16.5	20 ch102 : 17.5		
	5800MHz	17	18	18	19	18	19	18	19	18	19		
5GHz (80MHz)	5200MHz	12	13	15	16	18	19	18	19	17	18	15.5	16.5
	5300MHz	12	13	15	16	18	19	18	19	16.5	17.5	15.5	16.5
	5500MHz	12	13	15	16	18	19	18	19	18 ch106 : 17	19 ch106 : 18	18 ch106 : 15	19 ch106 : 16
	5800MHz	17	18	18	19	18	19	18	19	18	19	18	19
5GHz (160MHz)	5250MHz	12	13	15	16	17	18	17	18	16.5	17.5	15.5	16.5
	5570MHz	12	13	15	16	17	18	17	18	17	18	15	16
6GHz (20MHz)	U-NII-5	1	2	4	5	7	8	8.5	9.5				
	U-NII-6	1	2	4	5	7	8	8.5	9.5				
	U-NII-7	1	2	4	5	7	8	11	12				
	U-NII-8	1	2	4	5	7	8	11	12				
6GHz (40MHz)		1	2	4	5	7	8	11	12	11	12		
6GHz (80MHz)		1	2	4	5	7	8	11	12	11	12	11	12
6GHz (160MHz)		1	2	4	5	7	8	11	12	11	12	11	12

H.2.2 Reduced 802.11ax RU WLAN Output Power – RCV Active or During Conditions with Simultaneous 2.4 GHz WLAN and 5 or 6 GHz WLAN

Mode	Band	MIMO											
		26T		52T		106T		242T		484T		996T	
Maximum/Nominal Power		Nominal	Max	Nominal	Max	Nominal	Max	Nominal	Max	Nominal	Max	Nominal	Max
2.4GHz		19 ch12 : 16 ch13 : 13.5	20 ch12 : 17 ch13 : 14.5	19 ch12 : 16 ch13 : 13.5	20 ch12 : 17 ch13 : 14.5	19 ch12 : 16 ch13 : 13.5	20 ch12 : 17 ch13 : 14.5	19 ch1 : 17 ch11 : 14.5 ch12 : 14.5 ch13 : 13.5	20 ch1 : 18 ch11 : 15.5 ch12 : 15.5 ch13 : 14.5				
5GHz (20MHz)	5200MHz	12	13	14.5	15.5	16	17	16	17				
	5300MHz	12	13	14.5	15.5	16	17	16	17				
	5500MHz	12	13	14.5	15.5	16	17	16	17				
	5800MHz	16	17	16	17	16	17	16	17				
5GHz (40MHz)	5200MHz	12.5	13.5	15	16	16	17	16	17	16 ch38 : 15.5	17 ch38 : 16.5		
	5300MHz	12.5	13.5	15	16	16	17	16	17	16	17		
	5500MHz	12.5	13.5	15	16	16	17	16	17	16	17		
	5800MHz	16	17	16	17	16	17	16	17	16	17		
5GHz (80MHz)	5200MHz	12	13	15	16	16	17	16	17	16	17	15.5	16.5
	5300MHz	12	13	15	16	16	17	16	17	16	17	15.5	16.5
	5500MHz	12	13	15	16	16	17	16	17	16	17	16 ch106 : 15	17 ch106 : 16
	5800MHz	16	17	16	17	16	17	16	17	16	17	16	17
5GHz (160MHz)	5250MHz	12	13	15	16	16	17	16	17	16	17	15.5	16.5
	5570MHz	12	13	15	16	16	17	16	17	16	17	15	16
6GHz (20MHz)	U-NII-5	1	2	4	5	7	8	8.5	9.5				
	U-NII-6	1	2	4	5	7	8	8.5	9.5				
	U-NII-7	1	2	4	5	7	8	11	12				
	U-NII-8	1	2	4	5	7	8	11	12				
6GHz (40MHz)		1	2	4	5	7	8	11	12	11	12		
6GHz (80MHz)		1	2	4	5	7	8	11	12	11	12	11	12
6GHz (160MHz)		1	2	4	5	7	8	11	12	11	12	11	12

H.2.3 Reduced 802.11ax RU WLAN Output Power – RCV Active During Conditions with Simultaneous 2.4 GHz WLAN and 5 or 6 GHz WLAN

Mode	Band	MIMO											
		26T		52T		106T		242T		484T		996T	
Maximum/Nominal Power		Nominal	Max	Nominal	Max	Nominal	Max	Nominal	Max	Nominal	Max	Nominal	Max
2.4GHz		16 ch13 : 13.5	17 ch13 : 14.5	16 ch13 : 13.5	17 ch13 : 14.5	16 ch13 : 13.5	17 ch13 : 14.5	16 ch11 : 14.5 ch12 : 14.5 ch13 : 13.5	17 ch11 : 15.5 ch12 : 15.5 ch13 : 14.5				
5GHz (20MHz)	5200MHz	12	13	14.5	15.5	16	17	16	17				
	5300MHz	12	13	14.5	15.5	16	17	16	17				
	5500MHz	12	13	14.5	15.5	16	17	16	17				
	5800MHz	16	17	16	17	16	17	16	17				
5GHz (40MHz)	5200MHz	12.5	13.5	15	16	16	17	16	17	16 ch38 : 15.5	17 ch38 : 16.5		
	5300MHz	12.5	13.5	15	16	16	17	16	17	16	17		
	5500MHz	12.5	13.5	15	16	16	17	16	17	16	17		
	5800MHz	16	17	16	17	16	17	16	17	16	17		
5GHz (80MHz)	5200MHz	12	13	15	16	16	17	16	17	16	17	15.5	16.5
	5300MHz	12	13	15	16	16	17	16	17	16	17	15.5	16.5
	5500MHz	12	13	15	16	16	17	16	17	16	17	16 ch106 : 15	17 ch106 : 16
	5800MHz	16	17	16	17	16	17	16	17	16	17	16	17
5GHz (160MHz)	5250MHz	12	13	15	16	16	17	16	17	16	17	15.5	16.5
	5570MHz	12	13	15	16	16	17	16	17	16	17	15	16
6GHz (20MHz)	U-NII-5	1	2	4	5	7	8	8.5	9.5				
	U-NII-6	1	2	4	5	7	8	8.5	9.5				
	U-NII-7	1	2	4	5	7	8	11	12				
	U-NII-8	1	2	4	5	7	8	11	12				
6GHz (40MHz)		1	2	4	5	7	8	11	12	11	12		
6GHz (80MHz)		1	2	4	5	7	8	11	12	11	12	11	12
6GHz (160MHz)		1	2	4	5	7	8	11	12	11	12	11	12

H.3 IEEE 802.11ax Measured Powers

Table 1
Maximum 2.4 GHz 802.11ax RU Output Power – MIMO

Freq [MHz]	Channel	Tones	RU Index	Conducted Power [dBm] Antenna-1 AVG	Conducted Power [dBm] Antenna-2 AVG	Conducted Power [dBm] MIMO AVG
2412	1	26T	0	16.94	16.97	19.97
			4	17.18	16.75	19.98
			8	16.91	17.02	19.98
2437	6	26T	0	16.41	16.37	19.40
			4	16.77	16.72	19.76
			8	16.95	16.73	19.85
2462	11	26T	0	16.27	16.25	19.27
			4	16.23	16.02	19.14
			8	16.51	16.67	19.60
2467	12	26T	0	13.99	13.88	16.95
			4	13.57	14.24	16.93
			8	12.53	13.52	16.06
2472	13	26T	0	11.09	10.68	13.90
			4	10.80	11.06	13.94
			8	10.45	11.02	13.75

Freq [MHz]	Channel	Tones	RU Index	Conducted Power [dBm] Antenna-1 AVG	Conducted Power [dBm] Antenna-2 AVG	Conducted Power [dBm] MIMO AVG
2412	1	52T	37	16.74	16.45	19.61
			38	16.87	16.39	19.65
			40	16.17	16.12	19.16
2437	6	52T	37	16.94	17.01	19.99
			38	16.71	16.69	19.71
			40	17.01	16.92	19.98
2462	11	52T	37	17.04	16.91	19.99
			38	16.92	16.69	19.82
			40	16.95	16.87	19.92
2467	12	52T	37	13.73	13.77	16.76
			38	13.92	14.01	16.98
			40	13.43	14.44	16.97
2472	13	52T	37	10.61	10.58	13.61
			38	11.12	10.80	13.97
			40	10.68	11.24	13.98

Freq [MHz]	Channel	Tones	RU Index	Conducted Power [dBm] Antenna-1 AVG	Conducted Power [dBm] Antenna-2 AVG	Conducted Power [dBm] MIMO AVG
2412	1	106T	53	16.39	16.02	19.22
			54	16.71	16.58	19.66
2437	6	106T	53	16.45	16.42	19.45
			54	16.85	16.81	19.84
2462	11	106T	53	16.48	16.39	19.45
			54	16.62	16.43	19.54
2467	12	106T	53	13.81	13.97	16.90
			54	13.16	14.01	16.62
2472	13	106T	53	10.79	11.12	13.97
			54	11.53	11.39	14.47

Freq [MHz]	Channel	Tones	RU Index	Conducted Power [dBm] Antenna-1 AVG	Conducted Power [dBm] Antenna-2 AVG	Conducted Power [dBm] MIMO AVG
2412	1	242T	61	14.36	14.76	17.57
2417	2	242T	61	16.57	16.81	19.70
2437	6	242T	61	16.43	16.29	19.37
2457	10	242T	61	16.47	16.74	19.62
2462	11	242T	61	12.17	12.37	15.28
2467	12	242T	61	11.78	12.27	15.04
2472	13	242T	61	11.01	10.95	13.99

Table 2
Maximum 5 GHz 802.11ax RU Output Power – MIMO

BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 0			RU Index: 4			RU Index: 8		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
20MHz BW	1	5180	36	26T	9.01	9.87	12.47	8.96	9.72	12.37	9.15	9.78	12.49
		5200	40	26T	9.01	9.81	12.44	8.81	9.68	12.28	9.19	9.75	12.49
		5240	48	26T	9.11	9.69	12.42	8.95	9.49	12.24	9.29	9.75	12.54
	2A	5260	52	26T	8.98	9.54	12.28	8.84	9.34	12.11	9.28	9.54	12.42
		5280	56	26T	9.07	9.42	12.26	8.84	9.22	12.04	9.21	9.45	12.34
		5320	64	26T	9.28	9.32	12.31	9.29	9.11	12.21	9.41	9.22	12.33
	2C	5500	100	26T	9.15	9.41	12.29	8.87	9.21	12.05	9.20	9.45	12.34
		5600	120	26T	9.23	9.44	12.35	9.06	9.07	12.08	9.41	9.60	12.52
		5720	144	26T	9.46	9.41	12.45	9.25	9.27	12.27	9.33	9.54	12.45
	3	5745	149	26T	17.14	16.67	19.92	16.58	16.18	19.39	17.08	16.74	19.92
		5785	157	26T	17.21	16.64	19.94	16.55	16.32	19.45	17.07	16.75	19.92
		5825	165	26T	17.12	16.66	19.91	16.62	16.15	19.40	17.05	16.68	19.88

BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 37			RU Index: 39			RU Index: 40		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
20MHz BW	1	5180	36	52T	11.35	12.57	15.01	11.75	12.89	15.37	11.64	12.58	15.15
		5200	40	52T	11.46	12.41	14.97	11.90	12.66	15.31	11.64	12.34	15.01
		5240	48	52T	11.53	12.21	14.89	12.08	12.70	15.41	11.67	12.45	15.09
	2A	5260	52	52T	11.41	12.03	14.74	11.84	12.40	15.14	11.57	12.08	14.84
		5280	56	52T	11.50	12.08	14.81	11.91	12.30	15.12	11.67	12.08	14.89
		5320	64	52T	11.57	11.85	14.72	12.07	12.25	15.17	11.87	11.89	14.89
	2C	5500	100	52T	11.64	12.03	14.85	11.84	12.39	15.13	11.64	12.08	14.88
		5600	120	52T	11.57	12.05	14.83	12.04	12.15	15.11	11.73	11.83	14.79
		5720	144	52T	11.83	12.20	15.03	12.19	12.34	15.28	11.84	11.95	14.91
	3	5745	149	52T	16.24	15.96	19.11	16.41	16.12	19.28	17.14	16.69	19.93
		5785	157	52T	16.32	15.98	19.16	16.45	16.21	19.34	17.15	16.75	19.96
		5825	165	52T	16.24	15.92	19.09	16.47	16.07	19.28	17.14	16.69	19.93

BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 53			RU Index: 54			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
20MHz BW	1	5180	36	106T	14.22	15.25	17.78	14.40	15.27	17.87			
		5200	40	106T	14.21	15.10	17.69	14.41	15.20	17.83			
		5240	48	106T	14.54	15.02	17.80	14.58	14.91	17.76			
	2A	5260	52	106T	14.17	15.01	17.62	14.25	15.07	17.69			
		5280	56	106T	14.21	14.72	17.48	14.28	14.87	17.60			
		5320	64	106T	14.55	14.73	17.65	14.67	14.81	17.75			
	2C	5500	100	106T	14.15	15.01	17.61	14.23	14.92	17.60			
		5600	120	106T	14.37	14.89	17.65	14.45	14.78	17.63			
		5720	144	106T	14.57	15.11	17.86	14.50	14.95	17.74			
	3	5745	149	106T	16.31	15.91	19.12	16.19	15.93	19.07			
		5785	157	106T	16.34	16.02	19.19	16.21	15.96	19.10			
		5825	165	106T	16.36	15.91	19.15	16.23	16.01	19.13			

BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 61			N/A			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
20MHz BW	1	5180	36	242T	17.14	17.31	20.24						
		5200	40	242T	17.16	17.11	20.15						
		5240	48	242T	17.32	17.02	20.18						
	2A	5260	52	242T	17.02	17.15	20.10						
		5280	56	242T	17.87	18.08	20.99						
		5320	64	242T	15.16	15.06	18.12						
	2C	5500	100	242T	17.81	18.13	20.98						
		5600	120	242T	17.89	18.03	20.97						
		5720	144	242T	17.01	17.28	20.16						
	3	5745	149	242T	16.36	16.01	19.20						
		5785	157	242T	16.28	15.92	19.11						
		5825	165	242T	16.31	15.91	19.12						

40MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 0			RU Index: 8			RU Index: 17		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
1	5190	38	26T	9.14	10.37	12.81	9.63	10.68	13.20	9.36	10.41	12.93
	5230	46	26T	9.27	10.14	12.74	9.80	10.48	13.16	9.64	10.28	12.98
2A	5270	54	26T	9.33	9.80	12.58	9.76	10.14	12.96	9.35	9.83	12.61
	5310	62	26T	9.46	9.71	12.60	9.94	9.77	12.87	9.75	9.84	12.81
2C	5510	102	26T	9.36	9.80	12.60	9.75	10.10	12.94	9.55	9.86	12.72
	5590	118	26T	9.54	9.75	12.66	9.88	9.90	12.90	9.54	9.86	12.71
	5710	142	26T	9.63	9.84	12.75	9.94	9.89	12.93	9.70	9.92	12.82
3	5755	151	26T	14.35	14.41	17.39	14.33	14.32	17.34	14.32	14.43	17.39
	5795	159	26T	14.34	14.47	17.42	14.39	14.41	17.41	14.26	14.55	17.42

40MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 37			RU Index: 40			RU Index: 44		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
1	5190	38	52T	12.01	12.93	15.50	12.09	13.18	15.68	12.40	13.20	15.83
	5230	46	52T	12.23	12.67	15.47	12.28	12.84	15.58	12.53	13.00	15.78
2A	5270	54	52T	12.11	12.59	15.37	12.08	12.66	15.39	12.25	12.55	15.41
	5310	62	52T	12.34	12.41	15.39	12.02	12.47	15.26	12.66	12.64	15.66
2C	5510	102	52T	12.15	12.65	15.42	12.12	12.53	15.34	12.23	12.71	15.49
	5590	118	52T	12.28	12.61	15.46	12.29	12.49	15.40	12.35	12.59	15.48
	5710	142	52T	12.30	12.61	15.47	12.17	12.47	15.33	12.35	12.69	15.53
3	5755	151	52T	15.82	15.63	18.74	15.35	15.22	18.30	15.83	15.46	18.66
	5795	159	52T	15.97	15.56	18.78	15.43	15.28	18.37	15.98	15.54	18.78

40MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 53			RU Index: 54			RU Index: 56		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
1	5190	38	106T	15.00	16.02	18.55	14.81	15.76	18.32	15.42	16.21	18.84
	5230	46	106T	15.33	15.91	18.64	14.92	15.43	18.19	15.62	16.09	18.87
2A	5270	54	106T	15.11	15.72	18.44	14.83	15.36	18.11	15.33	15.81	18.59
	5310	62	106T	15.35	15.50	18.44	14.89	15.15	18.03	15.54	15.69	18.63
2C	5510	102	106T	15.15	15.65	18.42	15.59	16.28	18.96	15.26	15.89	18.60
	5590	118	106T	15.36	15.72	18.55	15.68	16.12	18.92	15.47	15.72	18.61
	5710	142	106T	15.14	15.84	18.51	14.85	15.27	18.08	15.32	16.04	18.71
3	5755	151	106T	16.04	15.82	18.94	15.36	15.24	18.31	15.85	15.08	18.49
	5795	159	106T	16.13	15.81	18.98	15.45	15.27	18.37	15.85	15.31	18.60

40MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 61			RU Index: 62			N/A		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
1	5190	38	242T	16.03	16.26	19.16	16.24	16.37	19.32			
	5230	46	242T	16.25	16.11	19.19	16.32	16.20	19.27			
2A	5270	54	242T	16.91	16.97	19.95	16.97	16.98	19.99			
	5310	62	242T	17.16	16.74	19.97	16.31	15.90	19.12			
2C	5510	102	242T	16.73	17.11	19.93	16.83	17.12	19.99			
	5590	118	242T	16.85	17.04	19.96	16.07	16.15	19.12			
	5710	142	242T	16.81	17.12	19.98	16.15	16.27	19.22			
3	5755	151	242T	15.88	15.39	18.65	16.06	15.36	18.73			
	5795	159	242T	16.03	15.36	18.72	16.21	15.30	18.79			

40MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 65			N/A			N/A		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
1	5190	38	484T	13.48	12.84	16.18						
	5230	46	484T	16.97	16.84	19.92						
2A	5270	54	484T	16.67	16.65	19.67						
	5310	62	484T	13.87	13.94	16.92						
2C	5510	102	484T	13.92	13.46	16.71						
	5590	118	484T	16.67	16.73	19.71						
	5710	142	484T	16.76	16.78	19.78						
3	5755	151	484T	15.92	15.28	18.62						
	5795	159	484T	15.98	15.25	18.64						

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 0			RU Index: 18			RU Index: 36		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1	5210	42	26T	9.18	10.22	12.74	8.86	9.66	12.29	9.53	10.14	12.86
	2A	5290	58	26T	9.32	9.87	12.61	9.04	9.30	12.18	9.65	9.94	12.81
	2C	5530	106	26T	9.48	9.78	12.64	9.59	9.94	12.78	9.44	9.64	12.55
		5610	122	26T	9.77	9.65	12.72	9.06	8.95	12.02	9.77	9.51	12.65
		5690	138	26T	9.65	9.78	12.73	9.23	9.24	12.25	9.71	9.89	12.81
	3	5775	155	26T	14.01	14.17	17.10	14.78	15.15	17.98	13.84	14.42	17.15

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 37			RU Index: 44			RU Index: 52		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1	5210	42	52T	11.75	12.79	15.31	12.70	13.24	15.99	12.30	12.69	15.51
	2A	5290	58	52T	12.09	12.57	15.35	12.81	13.11	15.97	12.35	12.67	15.52
	2C	5530	106	52T	12.04	12.44	15.25	12.45	12.94	15.71	12.02	12.35	15.20
		5610	122	52T	12.18	12.30	15.25	12.82	12.64	15.74	12.35	12.19	15.28
		5690	138	52T	12.25	12.49	15.38	12.71	12.85	15.79	12.41	12.56	15.50
	3	5775	155	52T	15.27	15.51	18.40	15.76	15.97	18.88	15.17	15.59	18.40

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 53			RU Index: 56			RU Index: 60		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1	5210	42	106T	15.57	15.61	18.60	16.02	15.93	18.99	15.89	15.59	18.75
	2A	5290	58	106T	15.59	15.48	18.55	16.07	15.87	18.98	15.71	15.46	18.60
	2C	5530	106	106T	15.29	15.51	18.41	15.67	15.77	18.73	15.27	15.32	18.31
		5610	122	106T	15.54	15.33	18.45	15.93	15.56	18.76	15.85	15.29	18.59
		5690	138	106T	15.63	15.48	18.57	15.96	15.86	18.92	15.71	15.73	18.73
	3	5775	155	106T	15.54	15.65	18.61	15.83	16.09	18.97	15.42	15.89	18.67

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 61			RU Index: 62			RU Index: 64		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1	5210	42	242T	15.94	16.01	18.99	15.32	15.41	18.38	15.17	15.01	18.10
	2A	5290	58	242T	15.95	15.96	18.97	15.42	15.29	18.37	15.98	15.94	18.97
	2C	5530	106	242T	15.61	15.89	18.76	15.92	15.98	18.96	15.74	15.78	18.77
		5610	122	242T	15.85	15.69	18.78	15.96	15.77	18.88	16.12	15.63	18.89
		5690	138	242T	15.97	15.82	18.91	15.93	16.01	18.98	15.98	15.97	18.99
	3	5775	155	242T	15.85	16.01	18.94	15.18	15.41	18.31	15.69	16.24	18.98

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 65			RU Index: 66			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1	5210	42	484T	15.12	14.63	17.89	15.02	14.90	17.97			
	2A	5290	58	484T	13.93	13.84	16.90	13.98	13.96	16.98			
	2C	5530	106	484T	14.93	14.19	17.59	14.91	14.32	17.64			
		5610	122	484T	15.57	15.42	18.51	15.74	15.46	18.61			
		5690	138	484T	15.71	15.67	18.70	15.81	15.78	18.81			
	3	5775	155	484T	15.69	16.03	18.87	15.79	16.15	18.98			

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 67			N/A			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1	5210	42	996T	13.21	12.94	16.09						
	2A	5290	58	996T	12.87	12.66	15.78						
	2C	5530	106	996T	12.94	12.43	15.70						
		5610	122	996T	15.61	15.33	18.48						
		5690	138	996T	15.71	15.54	18.64						
	3	5775	155	996T	15.83	15.79	18.82						

	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
160MHz BW 80L					RU Index: 0			RU Index: 18			RU Index: 36		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1 / 2A	5250	50	26T	9.52	9.45	12.50	9.94	9.73	12.85	9.74	9.43	12.60
	2C	5570	114	26T	10.52	9.13	12.89	10.03	8.60	12.38	10.51	9.05	12.85
160MHz BW 80L	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 37			RU Index: 44			RU Index: 52		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1 / 2A	5250	50	52T	12.72	12.69	15.72	12.33	12.06	15.21	13.00	12.57	15.80
	2C	5570	114	52T	12.77	11.72	15.29	13.17	11.73	15.52	12.94	11.42	15.26
160MHz BW 80L	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 53			RU Index: 56			RU Index: 60		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1 / 2A	5250	50	106T	14.50	14.48	17.50	14.93	14.66	17.81	14.87	14.42	17.66
	2C	5570	114	106T	14.46	13.48	17.01	14.88	13.64	17.31	14.68	13.35	17.08
160MHz BW 80L	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 61			RU Index: 62			RU Index: 64		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1 / 2A	5250	50	242T	14.72	14.62	17.68	14.30	14.06	17.19	14.79	14.30	17.56
	2C	5570	114	242T	14.69	13.72	17.24	15.22	14.14	17.72	14.75	13.44	17.15
160MHz BW 80L	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 65			RU Index: 66			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1 / 2A	5250	50	484T	13.96	14.09	17.04	13.36	13.70	16.54			
	2C	5570	114	484T	14.82	13.65	17.28	15.53	14.22	17.93			
160MHz BW 80L	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 67			N/A			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1 / 2A	5250	50	996T	12.56	13.08	15.84						
	2C	5570	114	996T	13.15	12.42	15.81						

	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
160MHz BW 80U					RU Index: 0			RU Index: 18			RU Index: 36		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1 / 2A	5250	50	26T	9.63	9.29	12.47	9.97	9.39	12.70	9.74	9.04	12.41
	2C	5570	114	26T	10.62	9.01	12.90	9.97	8.49	12.30	10.42	8.85	12.72
160MHz BW 80U	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 37			RU Index: 44			RU Index: 52		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1 / 2A	5250	50	52T	12.91	12.48	15.71	12.82	12.14	15.50	12.93	12.36	15.66
	2C	5570	114	52T	12.99	11.43	15.29	13.62	12.12	15.94	12.68	11.48	15.13
160MHz BW 80U	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 53			RU Index: 56			RU Index: 60		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1 / 2A	5250	50	106T	14.84	14.32	17.60	14.76	14.42	17.60	14.86	14.12	17.52
	2C	5570	114	106T	14.75	13.34	17.11	15.51	14.37	17.99	15.35	14.53	17.97
160MHz BW 80U	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 61			RU Index: 62			RU Index: 64		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1 / 2A	5250	50	242T	14.81	14.25	17.55	14.62	13.99	17.33	14.85	14.34	17.61
	2C	5570	114	242T	14.67	13.37	17.08	15.42	14.27	17.89	14.61	13.56	17.13
160MHz BW 80U	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 65			RU Index: 66			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1 / 2A	5250	50	484T	14.47	13.98	17.24	14.17	13.63	16.92			
	2C	5570	114	484T	15.60	14.24	17.98	15.42	14.42	17.96			
160MHz BW 80U	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 67			N/A			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	1 / 2A	5250	50	996T	13.19	13.41	16.31						
	2C	5570	114	996T	12.61	11.95	15.30						

Table 3
Maximum 6 GHz 802.11ax RU Output Power – MIMO

20MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 0			RU Index: 4			RU Index: 8		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
5	5935	2	26T	-1.31	-1.42	1.65	-0.91	-1.42	1.85	-1.62	-1.72	1.34
	6175	45	26T	-0.89	-1.45	1.85	-1.09	-1.72	1.62	-1.32	-2.11	1.31
	6415	93	26T	-1.14	-1.58	1.66	-1.12	-1.37	1.77	-1.43	-1.69	1.45
6	6435	97	26T	-0.47	-2.13	1.79	-0.41	-1.82	1.95	-0.85	-2.03	1.61
	6475	105	26T	-0.83	-1.45	1.88	-0.42	-1.78	1.96	-0.73	-1.67	1.84
	6515	113	26T	-1.04	-1.73	1.64	-0.51	-1.82	1.89	-0.67	-2.03	1.71
7	6535	117	26T	-1.29	-1.72	1.51	-1.03	-1.43	1.78	-1.22	-1.67	1.57
	6695	149	26T	-1.43	-1.45	1.57	-1.24	-1.12	1.83	-1.58	-1.77	1.34
	6875	185	26T	-1.35	-1.53	1.57	-0.95	-1.21	1.93	-1.48	-1.71	1.42
8	6895	189	26T	-1.37	-1.25	1.70	-1.15	-0.93	1.97	-1.41	-1.63	1.49
	6995	209	26T	-1.23	-1.22	1.79	-1.13	-1.04	1.93	-1.47	-1.43	1.56
	7115	233	26T	-1.25	-1.16	1.81	-0.96	-1.15	1.96	-1.52	-1.32	1.59

20MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 37			RU Index: 39			RU Index: 40		
				1.55	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
5	5935	2	52T	1.55	1.13	4.36	1.86	1.77	4.83	1.52	1.49	4.52
	6175	45	52T	1.64	0.96	4.32	2.04	1.43	4.76	1.62	1.33	4.49
	6415	93	52T	1.69	1.27	4.50	2.02	1.87	4.96	1.98	1.52	4.77
6	6435	97	52T	1.92	1.12	4.55	2.17	1.53	4.87	2.04	1.03	4.57
	6475	105	52T	2.16	0.76	4.53	2.03	1.87	4.96	2.17	1.01	4.64
	6515	113	52T	1.93	1.31	4.64	2.21	1.42	4.84	1.95	1.41	4.70
7	6535	117	52T	1.58	1.39	4.50	1.84	1.97	4.92	1.71	1.35	4.54
	6695	149	52T	1.83	1.07	4.48	1.85	1.78	4.83	1.74	1.21	4.49
	6875	185	52T	1.72	1.02	4.39	2.15	1.32	4.77	1.65	1.13	4.41
8	6895	189	52T	1.75	1.42	4.60	2.02	1.86	4.95	1.95	1.46	4.72
	6995	209	52T	1.66	1.75	4.72	1.91	1.85	4.89	1.64	1.76	4.71
	7115	233	52T	1.78	1.25	4.53	1.83	2.05	4.95	1.72	1.54	4.64

20MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 53			RU Index: 54			N/A		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
5	5935	2	106T	4.51	4.21	7.37	4.88	4.51	7.71			
	6175	45	106T	4.82	3.89	7.39	4.96	4.32	7.66			
	6415	93	106T	5.06	3.71	7.45	5.21	4.31	7.79			
6	6435	97	106T	5.21	4.18	7.74	5.46	4.18	7.88			
	6475	105	106T	5.11	4.03	7.61	5.32	4.21	7.81			
	6515	113	106T	5.27	3.85	7.63	5.31	3.95	7.69			
7	6535	117	106T	4.57	4.35	7.47	4.96	4.42	7.71			
	6695	153	106T	4.72	4.36	7.55	4.81	4.45	7.64			
	6875	185	106T	4.58	4.03	7.32	4.73	4.56	7.66			
8	6895	189	106T	4.93	4.36	7.66	5.02	4.53	7.79			
	6995	209	106T	4.91	4.23	7.59	4.81	4.93	7.88			
	7115	233	106T	4.83	4.71	7.78	4.92	4.67	7.81			

20MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 61			N/A			N/A		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
5	5935	2	242T	6.23	6.29	9.27						
	6175	45	242T	5.35	6.72	9.10						
	6415	93	242T	6.31	6.24	9.29						
6	6435	97	242T	5.74	6.64	9.22						
	6475	105	242T	5.74	7.11	9.49						
	6495	109	242T	5.72	6.36	9.06						
	6515	113	242T	5.77	6.72	9.28						
7	6535	117	242T	9.13	8.54	11.86						
	6695	149	242T	9.07	8.51	11.81						
	6875	185	242T	8.93	8.67	11.81						
8	6995	209	242T	9.05	8.64	11.86						
	7115	233	242T	8.87	8.38	11.64						

40MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 0			RU Index: 8			RU Index: 17		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
5	5965	3	26T	-1.42	-1.31	1.65	-1.02	-1.25	1.88	-1.18	-1.39	1.73
	6165	43	26T	-1.24	-1.63	1.58	-1.37	-1.34	1.66	-1.21	-1.78	1.52
	6405	91	26T	-1.25	-1.42	1.68	-1.34	-1.47	1.61	-1.08	-1.51	1.72
6	6445	99	26T	-0.89	-1.41	1.87	-0.54	-1.85	1.86	-0.92	-1.84	1.65
	6485	107	26T	-0.96	-1.87	1.62	-0.78	-1.82	1.74	-0.83	-1.72	1.76
	6525	115	26T	-0.91	-1.73	1.71	-0.72	-1.95	1.72	-0.93	-1.85	1.64
7	6565	123	26T	-1.23	-1.54	1.63	-0.93	-1.25	1.92	-1.08	-1.42	1.76
	6725	155	26T	-1.29	-1.57	1.58	-1.17	-1.44	1.71	-1.15	-1.34	1.77
	6845	179	26T	-1.48	-2.23	1.17	-0.90	-1.50	1.82	-1.58	-2.26	1.10
8	6885	187	26T	-1.37	-1.34	1.66	-1.46	-1.35	1.61	-1.42	-1.39	1.61
	7005	211	26T	-1.25	-1.22	1.78	-1.32	-1.35	1.68	-1.22	-1.04	1.88
	7085	227	26T	-1.25	-1.39	1.69	-1.54	-1.31	1.59	-1.61	-1.38	1.52

40MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 37			RU Index: 40			RU Index: 44		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
5	5965	3	52T	1.88	1.74	4.82	2.04	1.65	4.86	1.74	1.85	4.81
	6165	43	52T	1.78	1.65	4.73	1.65	1.42	4.55	1.96	1.43	4.71
	6405	91	52T	1.25	1.54	4.41	1.61	1.48	4.56	1.89	1.28	4.61
6	6445	99	52T	1.87	1.57	4.73	2.08	1.25	4.70	2.22	1.28	4.79
	6485	107	52T	1.76	1.44	4.61	2.23	1.28	4.79	1.11	1.21	4.17
	6525	115	52T	1.85	1.47	4.67	2.19	1.18	4.72	2.09	1.31	4.73
7	6565	123	52T	2.12	1.62	4.89	2.13	1.13	4.67	1.88	1.68	4.79
	6725	155	52T	2.28	1.58	4.95	1.97	1.85	4.92	1.88	1.62	4.76
	6845	179	52T	1.59	0.95	4.29	2.05	1.51	4.80	1.78	0.68	4.28
8	6885	187	52T	1.72	1.79	4.77	1.55	1.64	4.61	1.79	1.85	4.83
	7005	211	52T	1.69	1.54	4.63	1.69	1.58	4.65	1.74	1.91	4.84
	7085	227	52T	1.66	1.89	4.79	1.69	1.55	4.63	1.73	1.88	4.82

40MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 53			RU Index: 54			RU Index: 56		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
5	5965	3	106T	5.16	4.58	7.89	5.15	4.73	7.96	4.96	4.81	7.90
	6165	43	106T	5.13	4.47	7.82	5.19	4.21	7.74	5.19	4.62	7.92
	6405	91	106T	5.35	4.38	7.90	4.64	4.51	7.59	5.28	4.62	7.97
6	6445	99	106T	5.27	4.28	7.81	5.64	3.82	7.83	5.37	4.02	7.76
	6485	107	106T	5.09	4.12	7.64	5.31	4.43	7.90	5.12	4.03	7.62
	6525	115	106T	5.42	4.08	7.81	5.45	4.37	7.95	5.13	3.84	7.54
7	6565	123	106T	4.81	4.62	7.73	5.02	4.71	7.88	4.43	4.11	7.28
	6725	155	106T	4.67	4.52	7.61	4.98	4.92	7.96	4.27	4.37	7.33
	6845	179	106T	4.80	3.88	7.37	5.34	4.22	7.83	4.76	3.94	7.38
8	6885	187	106T	4.62	4.51	7.58	4.65	4.72	7.70	4.05	4.89	7.50
	7005	211	106T	4.42	4.12	7.28	4.97	4.82	7.91	4.36	4.05	7.22
	7085	227	106T	4.18	4.61	7.41	4.89	4.61	7.76	4.45	4.32	7.40

40MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 61			RU Index: 62			N/A		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
5	5965	3	242T	9.28	8.66	11.99	9.25	8.58	11.94			
	6165	43	242T	9.13	8.43	11.80	9.12	8.37	11.77			
	6405	91	242T	9.08	8.19	11.67	9.21	8.28	11.78			
6	6445	99	242T	9.58	8.26	11.98	9.62	8.24	11.99			
	6485	107	242T	9.58	8.27	11.98	9.51	8.38	11.99			
	6525	115	242T	9.54	8.34	11.99	9.56	8.32	11.99			
7	6565	123	242T	9.18	8.61	11.91	9.13	8.67	11.92			
	6725	155	242T	9.08	8.72	11.91	9.09	8.69	11.90			
	6845	179	242T	7.93	8.20	11.08	8.20	8.36	11.29			
8	6885	187	242T	8.84	8.91	11.89	9.12	8.75	11.95			
	7005	211	242T	9.08	8.65	11.88	9.05	8.74	11.91			
	7085	227	242T	9.07	8.73	11.91	9.04	8.72	11.89			

40MHz BW

Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
				RU Index: 65			N/A			N/A		
				ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
5	5965	3	484T	8.78	8.19	11.51						
	6165	43	484T	8.73	7.98	11.38						
	6405	91	484T	8.75	7.75	11.29						
6	6445	99	484T	9.14	7.85	11.55						
	6485	107	484T	9.15	7.92	11.59						
	6525	115	484T	9.10	7.95	11.57						
7	6565	123	484T	8.72	8.43	11.59						
	6725	155	484T	8.59	8.12	11.37						
	6845	179	484T	7.98	8.39	11.20						
8	6885	187	484T	8.63	8.19	11.43						
	6925	195	484T	8.79	8.10	11.47						
	7005	211	484T	8.65	7.92	11.31						
	7085	227	484T	8.57	7.98	11.30						

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 0			RU Index: 18			RU Index: 36		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	5985	7	26T	-1.75	-0.96	1.67	-1.46	-1.57	1.50	-2.03	-0.97	1.54
		6145	39	26T	-1.55	-1.34	1.57	-1.17	-1.86	1.51	-1.12	-1.54	1.69
		6385	87	26T	-1.36	-1.09	1.79	-1.23	-1.37	1.71	-1.12	-0.98	1.96
	6	6465	103	26T	-0.94	-1.63	1.74	-1.21	-1.87	1.48	-0.73	-2.01	1.69
	7	6545	119	26T	-1.42	-1.16	1.72	-1.76	-1.57	1.35	-2.06	-1.41	1.29
		6705	151	26T	-1.31	-0.87	1.93	-1.72	-1.77	1.27	-1.24	-1.02	1.88
		6865	183	26T	-1.24	-0.85	1.97	-1.52	-1.64	1.43	-1.44	-0.92	1.84
	8	6945	199	26T	-1.17	-1.40	1.73	-1.76	-1.73	1.27	-0.85	-1.67	1.77
		7025	215	26T	-2.07	-1.52	1.22	-1.48	-1.17	1.69	-1.18	-1.02	1.91

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 37			RU Index: 44			RU Index: 52		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	5985	7	52T	1.73	2.01	4.88	1.79	1.72	4.77	1.42	1.91	4.68
		6145	39	52T	1.72	1.47	4.61	1.47	1.35	4.42	1.75	1.89	4.83
		6385	87	52T	1.71	1.84	4.79	1.41	1.59	4.51	1.21	1.82	4.54
	6	6465	103	52T	2.25	1.52	4.91	1.81	1.93	4.88	2.12	1.58	4.87
	7	6545	119	52T	1.49	2.08	4.81	1.37	2.04	4.73	1.82	1.88	4.86
		6705	151	52T	1.69	1.82	4.77	1.51	1.89	4.71	1.82	2.07	4.96
		6865	183	52T	1.75	2.06	4.92	1.86	1.55	4.72	1.91	1.93	4.93
	8	6945	199	52T	1.47	1.35	4.42	1.82	1.92	4.88	1.83	1.56	4.71
		7025	215	52T	1.31	1.47	4.40	1.39	1.88	4.65	1.72	1.99	4.87

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 53			RU Index: 56			RU Index: 60		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	5985	7	106T	4.78	4.83	7.82	4.34	4.93	7.66	4.62	4.91	7.78
		6145	39	106T	4.47	4.95	7.73	3.92	4.83	7.41	5.02	4.71	7.88
		6385	87	106T	5.02	4.84	7.94	4.91	4.62	7.78	4.92	4.27	7.62
	6	6465	103	106T	5.12	3.75	7.50	5.49	4.28	7.94	5.04	3.92	7.53
	7	6545	119	106T	4.43	4.26	7.36	4.54	4.87	7.72	4.36	4.24	7.31
		6705	151	106T	4.43	4.07	7.26	4.55	4.47	7.52	4.16	4.72	7.46
		6865	183	106T	4.02	4.53	7.29	4.52	4.71	7.63	3.82	4.47	7.17
	8	6945	199	106T	4.27	4.45	7.37	4.46	5.15	7.83	3.98	4.91	7.48
		7025	215	106T	4.31	4.57	7.45	4.24	4.85	7.57	3.83	4.92	7.42

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 61			RU Index: 62			RU Index: 64		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	5985	7	242T	8.67	8.85	11.77	8.51	8.75	11.64	8.62	8.73	11.69
		6145	39	242T	8.45	8.49	11.48	8.37	8.38	11.39	8.36	8.45	11.42
		6385	87	242T	8.35	8.47	11.42	8.26	8.29	11.29	8.35	8.61	11.49
	6	6465	103	242T	8.91	8.65	11.79	8.87	8.35	11.63	8.89	8.57	11.74
	7	6545	119	242T	8.11	8.78	11.47	7.96	8.71	11.36	8.04	8.76	11.43
		6705	151	242T	7.98	8.87	11.46	7.82	8.93	11.42	8.04	8.69	11.39
		6865	183	242T	8.07	8.91	11.52	8.32	8.67	11.51	8.02	8.78	11.43
	8	6945	199	242T	8.33	9.01	11.69	8.39	8.74	11.58	8.34	9.09	11.74
		7025	215	242T	8.27	8.85	11.58	8.22	8.45	11.35	8.19	8.92	11.58

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 65			RU Index: 66			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	5985	7	484T	8.17	9.15	11.70	8.34	9.18	11.79			
		6145	39	484T	8.19	8.81	11.52	8.26	8.82	11.56			
		6385	87	484T	8.34	8.74	11.55	8.52	8.82	11.68			
	6	6465	103	484T	8.62	7.87	11.27	8.78	8.09	11.46			
	7	6545	119	484T	8.82	9.11	11.98	8.14	8.37	11.27			
		6705	151	484T	8.17	8.43	11.31	8.12	8.34	11.24			
		6865	183	484T	8.31	8.32	11.33	8.34	8.21	11.29			
	8	6945	199	484T	8.43	8.25	11.35	8.55	8.36	11.47			
		7025	215	484T	8.33	8.06	11.21	8.23	8.12	11.19			

80MHz BW	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 67			N/A			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	5985	7	996T	7.96	8.63	11.32						
		6145	39	996T	8.96	8.98	11.98						
		6385	87	996T	8.86	8.97	11.93						
	6	6465	103	996T	8.57	8.28	11.44						
	7	6545	119	996T	8.27	8.51	11.40						
		6705	151	996T	8.38	8.63	11.52						
		6865	183	996T	8.34	8.43	11.40						
	8	6945	199	996T	8.39	8.54	11.48						
		7025	215	996T	8.29	8.41	11.36						

160MHz BW 80L	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 0			RU Index: 18			RU Index: 36		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	6025	15	26T	-1.54	-1.09	1.70	-1.98	-1.19	1.44	-2.15	-1.53	1.18
		6185	47	26T	-1.97	-1.12	1.49	-2.12	-1.13	1.41	-1.89	-1.04	1.57
		6345	79	26T	-1.52	-1.44	1.53	-1.72	-1.61	1.35	-2.03	-1.83	1.08
	6	6505	111	26T	-1.24	-1.69	1.55	-1.15	-1.71	1.59	-1.52	-1.92	1.29
	7	6665	143	26T	-1.89	-1.87	1.13	-1.84	-2.00	1.09	-1.24	-1.55	1.62
		6825	175	26T	-1.90	-1.89	1.12	-1.84	-2.02	1.08	-1.02	-1.06	1.97
	8	6985	207	26T	-1.60	-1.35	1.54	-1.55	-1.68	1.40	-1.55	-1.80	1.34

160MHz BW 80L	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 37			RU Index: 44			RU Index: 52		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	6025	15	52T	1.28	2.00	4.67	1.49	2.38	4.97	0.94	2.14	4.59
		6185	47	52T	1.22	2.21	4.75	1.37	2.31	4.88	0.94	1.91	4.46
		6345	79	52T	1.70	1.99	4.86	1.47	1.69	4.59	1.25	1.05	4.16
	6	6505	111	52T	1.57	1.47	4.53	1.42	1.36	4.40	1.38	1.10	4.25
	7	6665	143	52T	1.15	0.98	4.08	1.35	0.85	4.12	1.81	1.37	4.61
		6825	175	52T	1.18	1.12	4.16	1.33	1.07	4.21	1.94	1.89	4.93
	8	6985	207	52T	1.18	1.22	4.21	1.84	1.88	4.87	1.61	1.28	4.46

160MHz BW 80L	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 53			RU Index: 56			RU Index: 60		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	6025	15	106T	3.91	4.80	7.39	4.34	4.51	7.44	4.12	4.97	7.58
		6185	47	106T	3.57	4.95	7.32	3.85	5.32	7.66	3.54	4.84	7.25
		6345	79	106T	4.26	4.49	7.39	4.78	4.80	7.80	4.16	4.26	7.22
	6	6505	111	106T	4.38	4.35	7.38	4.47	4.36	7.43	4.31	4.04	7.19
	7	6665	143	106T	4.93	4.85	7.90	4.31	3.98	7.16	5.11	4.63	7.89
		6825	175	106T	4.43	4.71	7.58	4.94	4.74	7.85	4.61	4.67	7.65
	8	6985	207	106T	4.11	4.42	7.28	4.24	4.21	7.24	4.35	4.42	7.40

160MHz BW 80L	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 61			RU Index: 62			RU Index: 64		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	6025	15	242T	8.42	9.39	11.94	8.61	8.78	11.71	8.53	8.98	11.77
		6185	47	242T	7.84	9.09	11.52	8.25	8.97	11.64	8.08	8.96	11.55
		6345	79	242T	8.21	8.67	11.46	9.03	8.87	11.96	8.24	8.11	11.19
	6	6505	111	242T	8.63	8.48	11.57	8.55	8.40	11.49	8.61	8.49	11.56
	7	6665	143	242T	8.87	9.01	11.95	8.61	8.55	11.59	8.72	8.73	11.74
		6825	175	242T	8.57	9.28	11.95	8.73	8.88	11.82	8.72	8.64	11.69
	8	6985	207	242T	8.18	8.68	11.45	8.35	8.88	11.63	8.06	8.41	11.25

160MHz BW 80L	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 65			RU Index: 66			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	6025	15	484T	8.09	8.69	11.41	8.12	8.81	11.49			
		6185	47	484T	7.72	8.69	11.24	8.18	9.07	11.66			
		6345	79	484T	8.81	8.85	11.84	8.45	8.77	11.62			
	6	6505	111	484T	9.04	8.72	11.89	8.58	8.28	11.44			
	7	6665	143	484T	8.74	8.23	11.50	8.74	8.83	11.80			
		6825	175	484T	8.45	8.72	11.60	8.73	9.04	11.90			
	8	6985	207	484T	8.35	8.68	11.53	8.19	8.26	11.24			

160MHz BW 80L	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 67(L)			N/A			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	6025	15	996T	8.03	8.84	11.46						
		6185	47	996T	7.89	8.90	11.43						
		6345	79	996T	8.86	8.62	11.75						
	6	6505	111	996T	8.74	8.78	11.77						
	7	6665	143	996T	8.76	8.43	11.61						
		6825	175	996T	8.85	9.09	11.98						
	8	6985	207	996T	9.01	8.65	11.84						

160MHz BW 80U	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 0			RU Index: 18			RU Index: 36		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	6025	15	26T	-1.72	-0.64	1.86	-1.82	-0.93	1.66	-2.40	-1.24	1.23
		6185	47	26T	-2.02	-1.17	1.44	-2.04	-1.09	1.47	-1.92	-1.03	1.56
		6345	79	26T	-1.44	-1.13	1.73	-1.58	-1.57	1.44	-1.02	-1.26	1.87
	6	6505	111	26T	-1.12	-1.39	1.76	-1.51	-1.90	1.31	-1.73	-1.95	1.17
	7	6665	143	26T	-0.78	-1.34	1.96	-1.03	-1.21	1.89	-0.94	-1.37	1.86
		6825	175	26T	-1.60	-1.91	1.26	-1.81	-1.53	1.34	-1.28	-1.51	1.62
	8	6985	207	26T	-1.35	-1.38	1.65	-1.81	-1.62	1.30	-1.51	-1.08	1.72

160MHz BW 80U	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 37			RU Index: 44			RU Index: 52		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	6025	15	52T	1.06	2.10	4.62	0.67	1.91	4.34	1.27	2.47	4.92
		6185	47	52T	0.86	1.90	4.42	0.80	1.44	4.14	0.74	1.79	4.31
		6345	79	52T	1.63	1.54	4.60	1.08	1.00	4.05	1.32	1.01	4.18
	6	6505	111	52T	1.48	1.33	4.42	1.28	0.90	4.10	1.41	1.33	4.38
	7	6665	143	52T	2.25	1.65	4.97	1.52	1.09	4.32	1.77	1.78	4.79
		6825	175	52T	1.11	1.21	4.17	1.78	1.51	4.66	1.43	1.58	4.52
	8	6985	207	52T	1.36	1.56	4.47	1.76	1.17	4.49	0.94	1.27	4.12

160MHz BW 80U	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 53			RU Index: 56			RU Index: 60		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	6025	15	106T	3.83	4.54	7.21	3.91	4.86	7.42	3.83	5.13	7.54
		6185	47	106T	3.85	5.14	7.55	3.51	4.71	7.16	3.38	4.77	7.14
		6345	79	106T	4.16	4.41	7.30	4.08	4.36	7.23	4.51	3.92	7.24
	6	6505	111	106T	4.54	4.21	7.39	4.29	4.06	7.19	4.54	3.94	7.26
	7	6665	143	106T	5.09	4.61	7.87	4.82	4.08	7.48	4.59	4.36	7.49
		6825	175	106T	4.97	4.76	7.88	4.87	4.42	7.66	4.81	4.72	7.78
	8	6985	207	106T	4.41	4.52	7.48	4.23	4.17	7.21	4.18	4.67	7.44

160MHz BW 80U	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 61			RU Index: 62			RU Index: 64		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	6025	15	242T	8.32	8.82	11.59	8.14	8.84	11.51	8.26	9.49	11.93
		6185	47	242T	8.01	9.10	11.60	7.95	9.01	11.52	7.61	8.96	11.35
		6345	79	242T	8.37	8.61	11.50	8.25	8.14	11.21	8.22	8.14	11.19
	6	6505	111	242T	8.62	8.05	11.35	8.46	8.01	11.25	8.29	8.44	11.38
	7	6665	143	242T	8.87	8.42	11.66	8.78	8.47	11.64	8.77	8.81	11.80
		6825	175	242T	8.98	8.97	11.99	8.87	8.86	11.87	8.84	9.03	11.95
	8	6985	207	242T	7.84	8.35	11.11	8.43	8.95	11.71	8.58	9.26	11.94

160MHz BW 80U	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 65			RU Index: 66			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	6025	15	484T	8.60	9.27	11.96	7.84	8.54	11.21			
		6185	47	484T	7.86	9.05	11.51	8.58	9.28	11.95			
		6345	79	484T	8.49	8.10	11.31	9.01	8.73	11.88			
	6	6505	111	484T	8.66	8.04	11.37	8.84	8.26	11.57			
	7	6665	143	484T	9.01	8.89	11.96	8.65	8.24	11.46			
		6825	175	484T	8.89	8.91	11.91	8.75	8.90	11.84			
	8	6985	207	484T	7.98	8.38	11.19	8.47	8.76	11.63			

160MHz BW 80U	Band	Freq [MHz]	Channel	Tones	Average Conducted Power (dBm)								
					RU Index: 67(U)			N/A			N/A		
					ANT1	ANT2	MIMO	ANT1	ANT2	MIMO	ANT1	ANT2	MIMO
	5	6025	15	996T	8.44	9.42	11.97						
		6185	47	996T	7.78	8.64	11.24						
		6345	79	996T	8.33	8.32	11.34						
	6	6505	111	996T	8.44	8.20	11.33						
	7	6665	143	996T	8.16	8.18	11.18						
		6825	175	996T	8.44	9.05	11.77						
	8	6985	207	996T	8.22	8.40	11.32						

APPENDIX I: PROBE AND DIPOLE CALIBRATION CERTIFICATES

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

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

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

Accreditation No.: SCS 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

BN ✓ 10-30-2018

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). BN ✓
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. 10-20-2019

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%. BN ✓ 10-23-20

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

	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: October 22, 2018

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
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 ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.8 ± 6 %	0.89 mho/m ± 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 ± 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 ± 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 ± 0.2) °C	55.1 ± 6 %	0.96 mho/m ± 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 ± 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 ± 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 jΩ
Return Loss	- 25.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.6 Ω - 4.2 jΩ
Return Loss	- 27.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.032 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	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

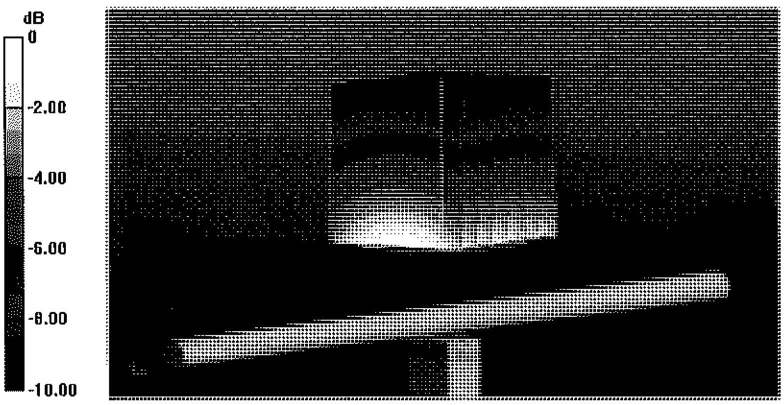
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.89 S/m; ε_r = 40.8; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.22, 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)

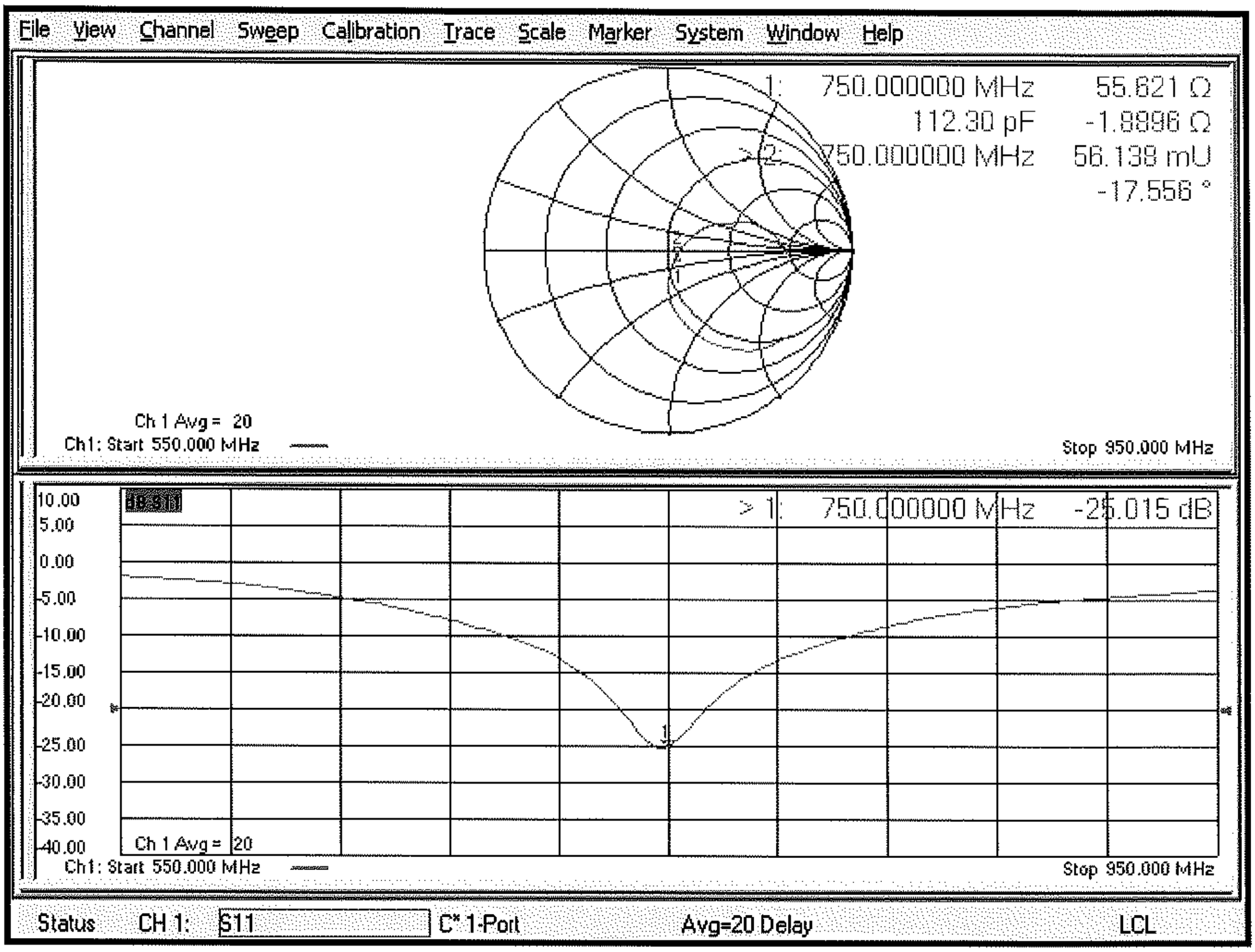
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
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

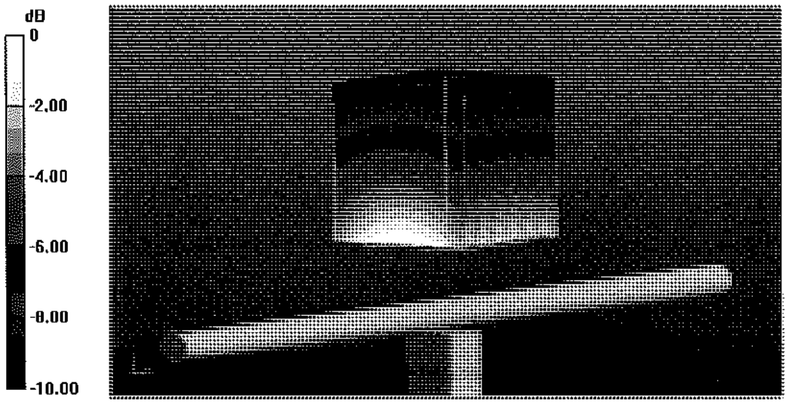
Communication System: UID 0 - CW; Frequency: 750 MHz
Medium parameters used: f = 750 MHz; σ = 0.96 S/m; ε_r = 55.1; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(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)

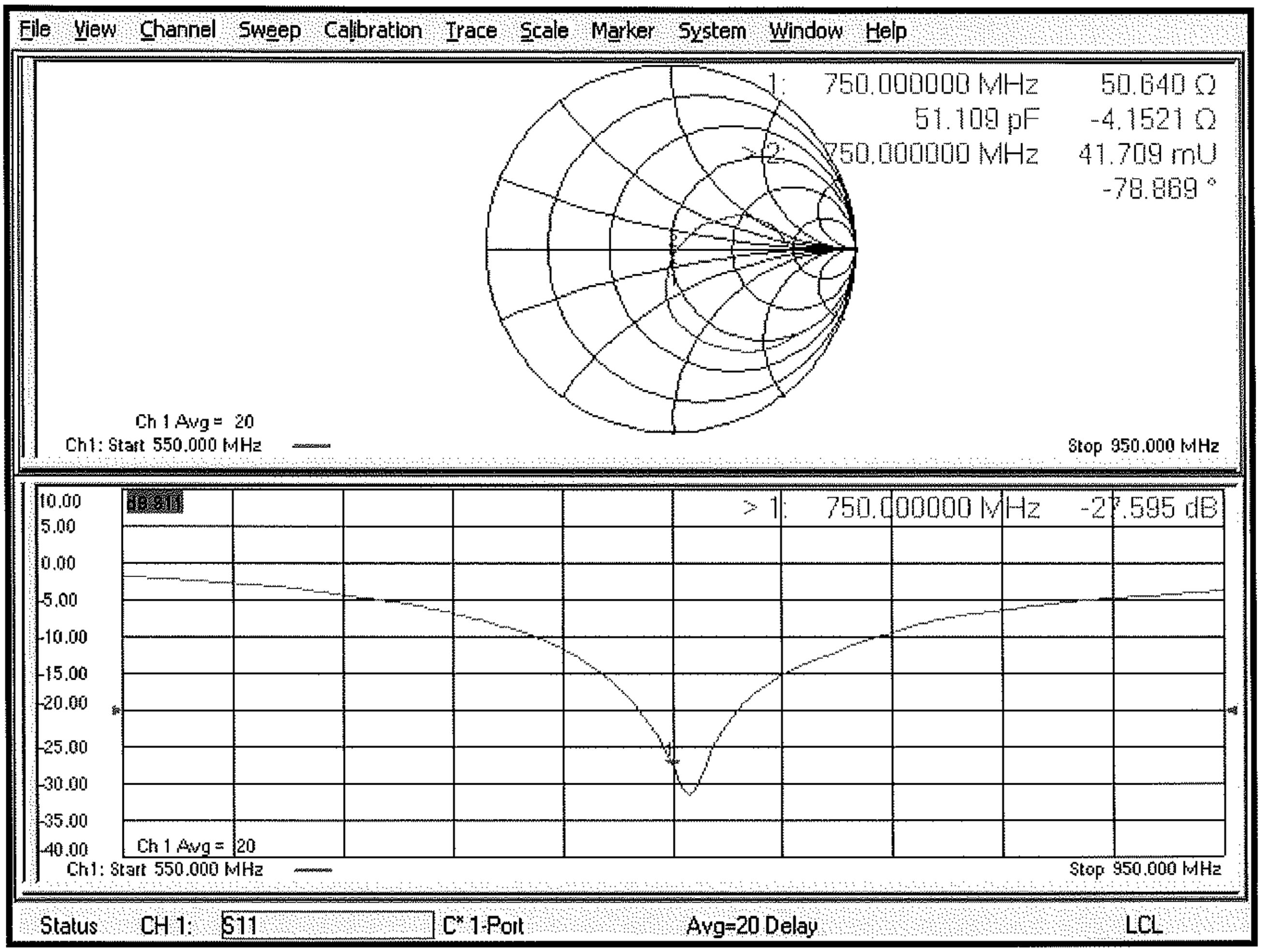
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
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 = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Team Lead Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

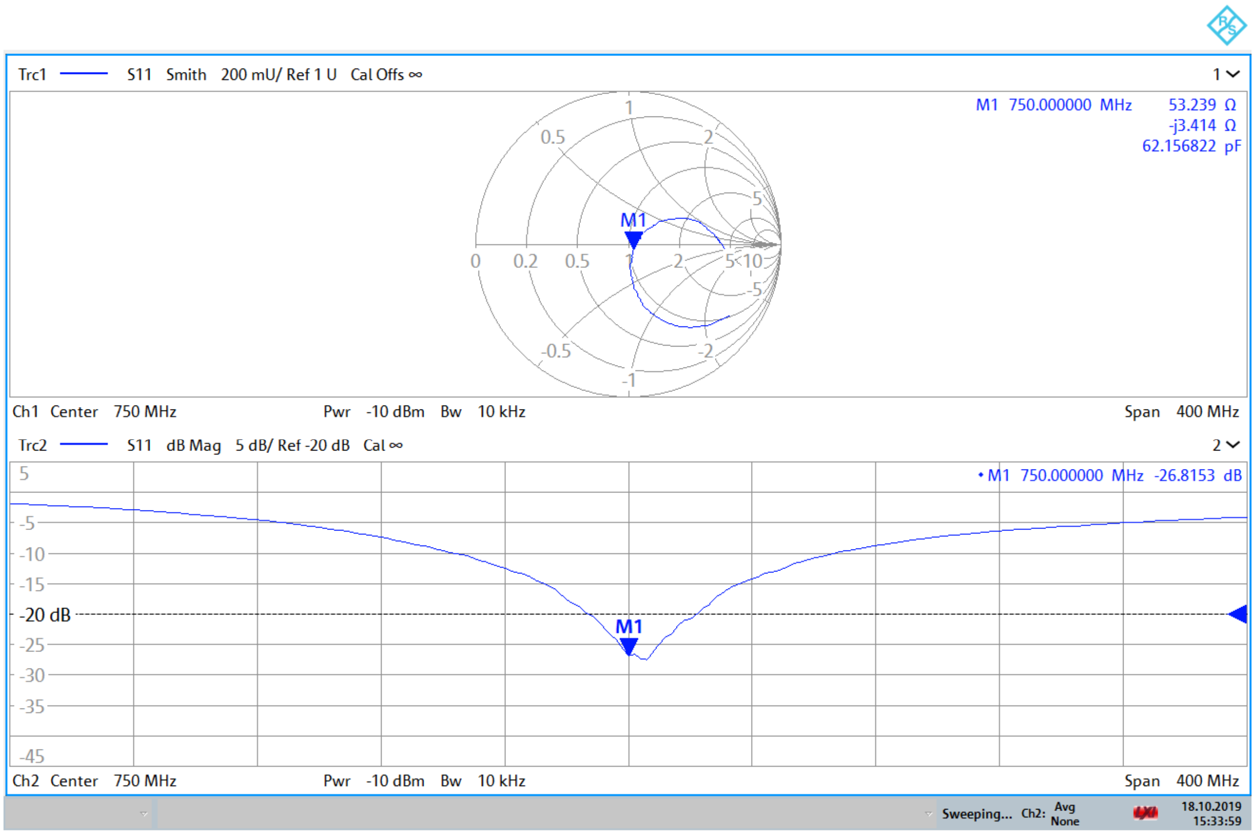
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

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	2.66%	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	-1.60%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



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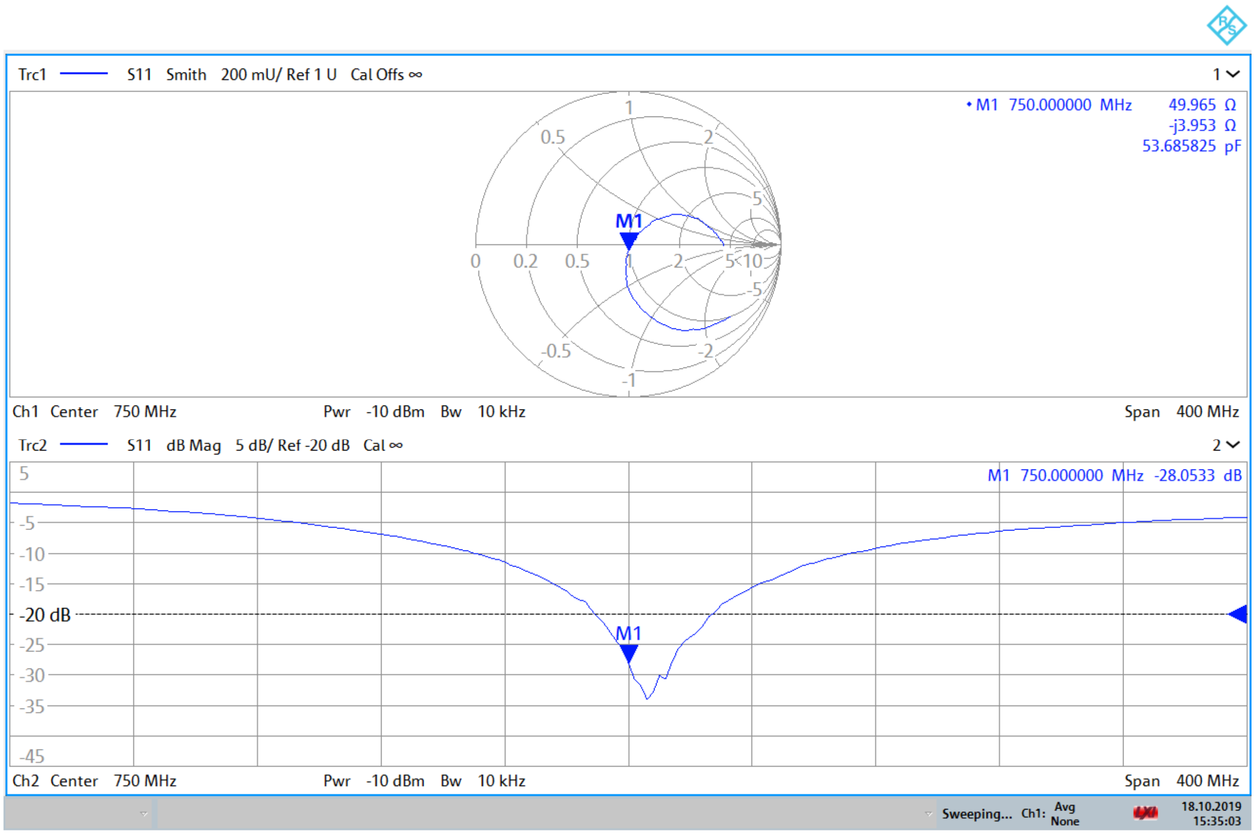
Impedance & Return-Loss Measurement Plot for Body TSL



15:35:04 18.10.2019

Certification of Calibration

Object	D750V2 – SN: 1161
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Extension Calibration date:	10/18/2020
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	11/29/2018	Biennial	11/29/2020	181766816
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Agilent	85033E	3.5mm Standard Calibration Kit	6/6/2020	Annual	6/6/2021	MY53402352
Rohde & Schwarz	ZNLE6	Vector Network Analyzer	9/29/2020	Annual	9/29/2021	101307
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/12/2020	Annual	5/12/2021	1070
Anritsu	MA2411B	Pulse Power Sensor	8/12/2020	Annual	8/12/2021	1207364
Anritsu	MA2411B	Pulse Power Sensor	9/22/2020	Annual	9/22/2021	1315051
Anritsu	ML2495A	Power Meter	1/15/2020	Annual	1/15/2021	1328004
Anritsu	ML2495A	Power Meter	12/17/2019	Annual	12/17/2020	941001
Agilent	N5182A	MXG Vector Signal Generator	5/13/2020	Annual	5/13/2021	MY47420603
Pasternack	NC-100	Torque Wrench	8/4/2020	Biennial	8/4/2022	N/A
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
SPEAG	EX3DV4	SAR Probe	6/23/2020	Annual	6/23/2021	7406
SPEAG	EX3DV4	SAR Probe	8/19/2020	Annual	8/19/2021	7547
SPEAG	DAE4	Dasy Data Acquisition Electronics	8/12/2020	Annual	8/12/2021	1323
SPEAG	DAE4	Dasy Data Acquisition Electronics	5/14/2020	Annual	5/14/2021	1583

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

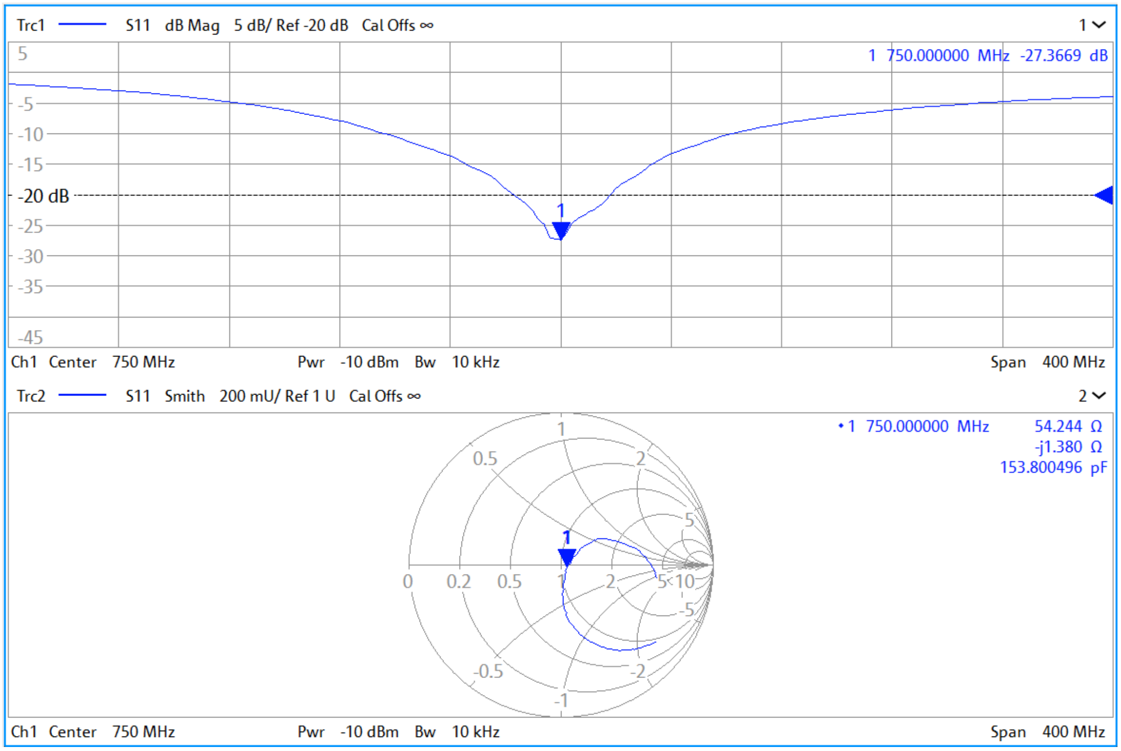
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

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.

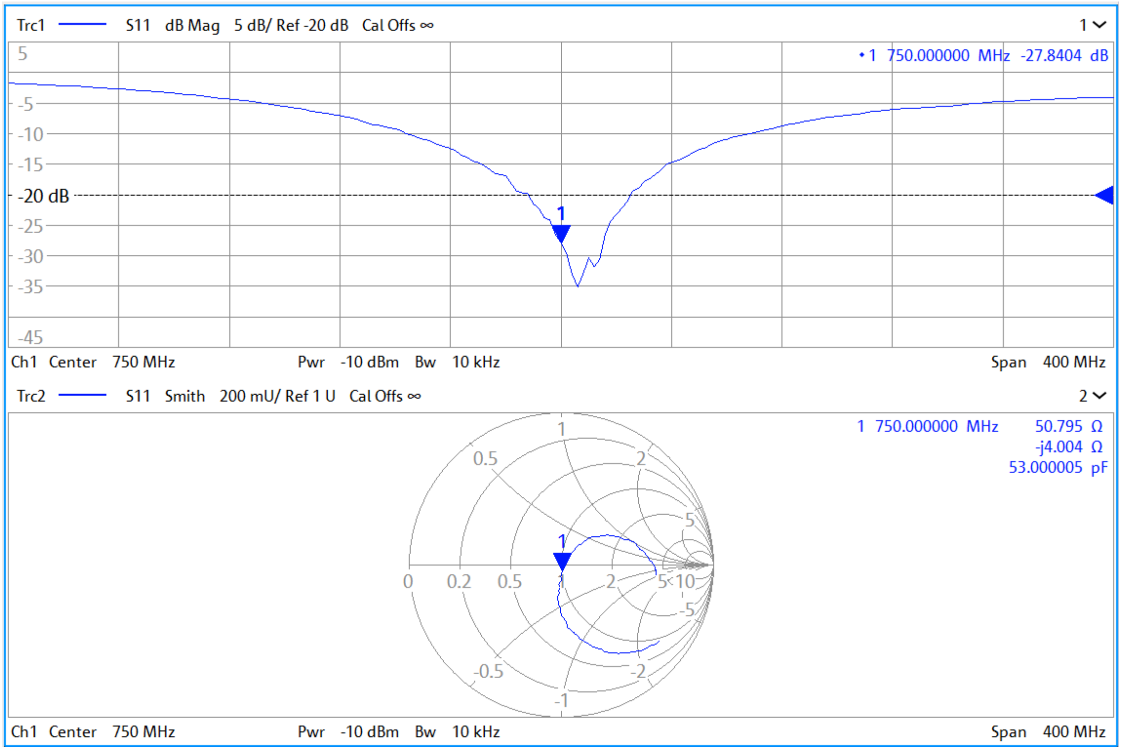
The following dipole was checked to pass the above 3 requirements to have 3-year calibration period from the calibration date:

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	10/18/2020	1.032	1.61	1.73	7.72%	1.05	1.12	6.46%	55.6	54.2	1.4	-1.9	-1.4	0.5	-25.0	-27.4	-9.50%	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	10/18/2020	1.032	1.69	1.80	6.76%	1.11	1.18	6.31%	50.6	50.8	0.2	-4.2	-4.0	0.2	-27.6	-27.8	-0.90%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL



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

S **Schweizerischer Kalibrierdienst**
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Servizio svizzero di taratura
S **Swiss Calibration Service**

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

Accreditation No.: SCS 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
BN ✓ 10-23-20

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

	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	[signature]
Approved by:	Katja Pokovic	Technical Manager	[signature]

Issued: October 22, 2018

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

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

Accreditation No.: **SCS 0108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
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 ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.6 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.39 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.43 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.54 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.10 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.9 ± 6 %	0.98 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.46 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.75 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.61 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.40 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.6 Ω - 2.4 jΩ
Return Loss	- 32.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	45.0 Ω - 6.7 jΩ
Return Loss	- 21.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.397 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 22, 2011

DASY5 Validation Report for Head TSL

Date: 19.10.2018

Test Laboratory: The name of your organization

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

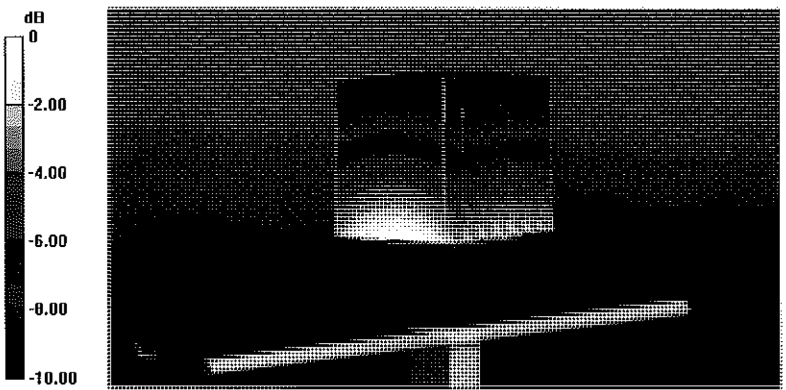
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.91 S/m; ε_r = 40.6; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.9, 9.9, 9.9) @ 835 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)

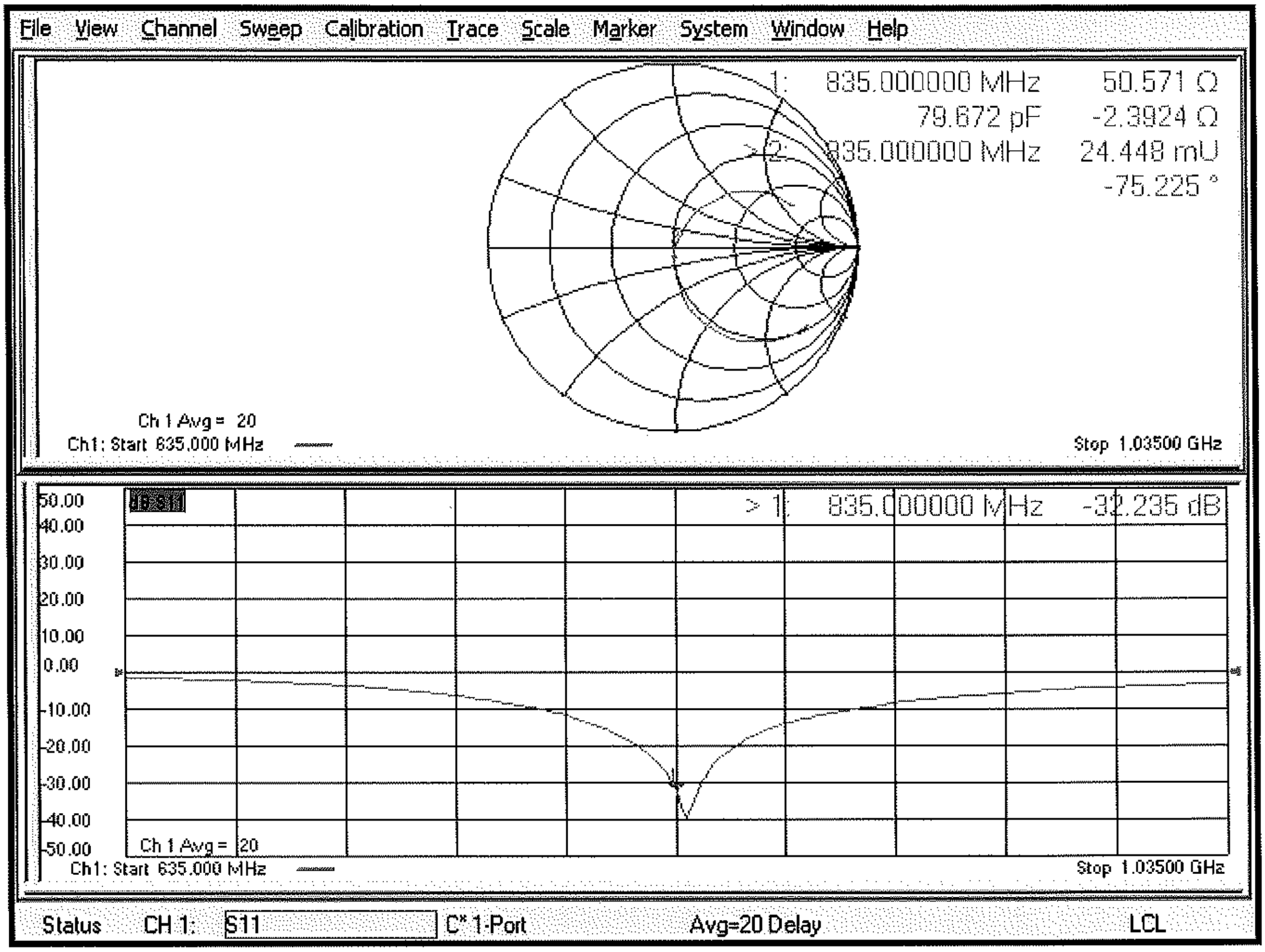
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 63.02 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.68 W/kg
SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.54 W/kg
Maximum value of SAR (measured) = 3.24 W/kg



0 dB = 3.24 W/kg = 5.11 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 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d133

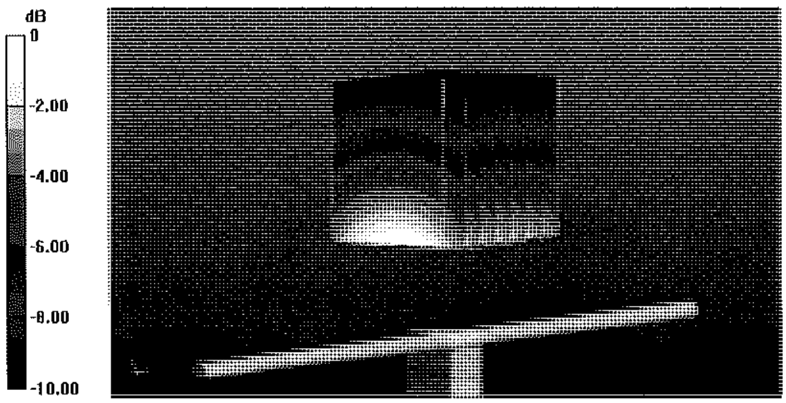
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.98 S/m; ε_r = 54.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.05, 10.05, 10.05) @ 835 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)

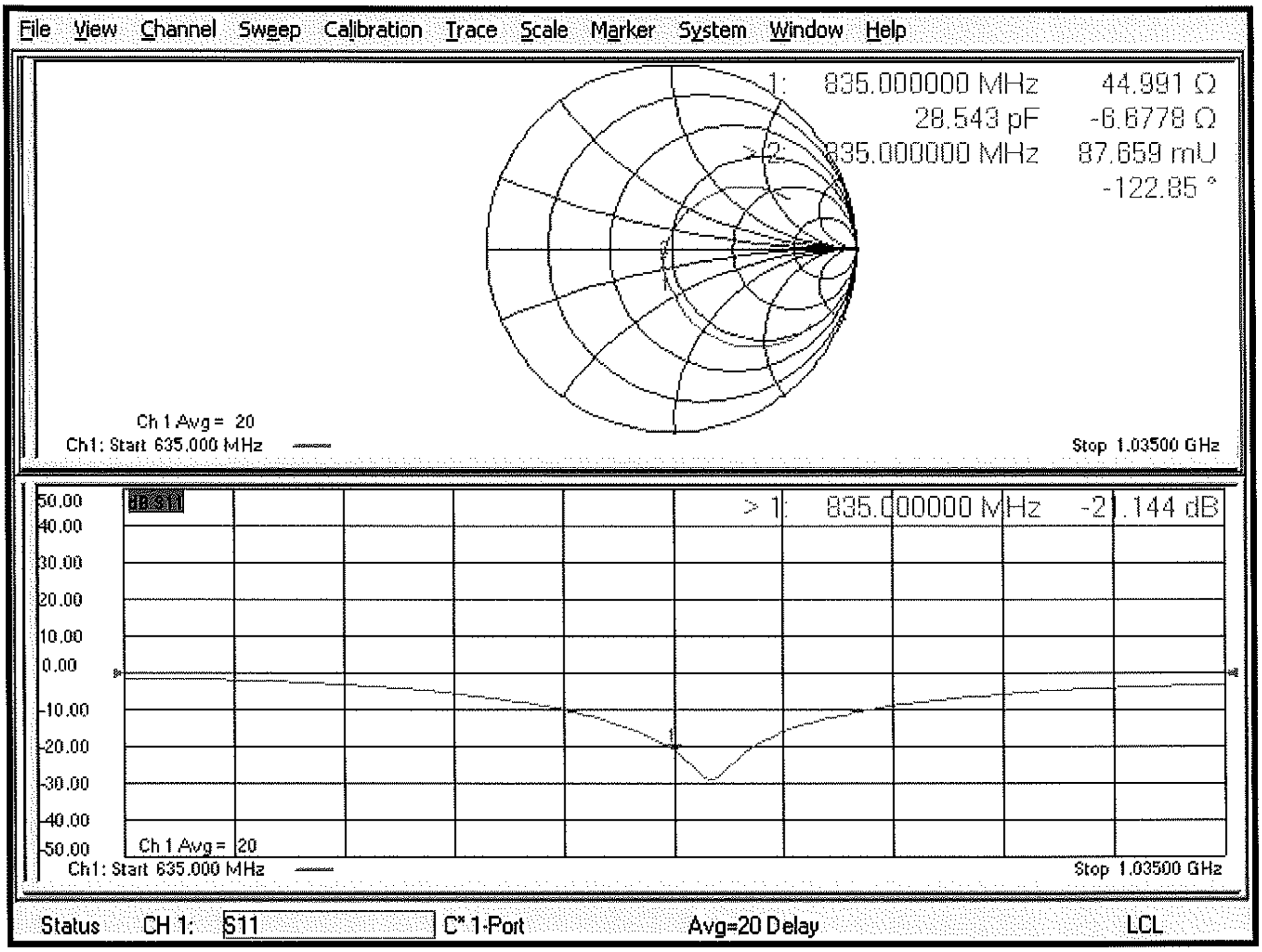
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 61.61 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 3.69 W/kg
SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.61 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 Body TSL



Certification of Calibration

Object D835V2 – SN:4d133

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extended Calibration date: October 18, 2019

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 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	9/19/2019	Annual	9/19/2020	7551
SPEAG	EX3DV4	SAR Probe	4/24/2019	Annual	4/24/2020	7357
SPEAG	DAE4	Dasy Data Acquisition Electronics	9/17/2019	Annual	9/17/2020	1333
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 = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Team Lead Engineer	Brodie Halbfoster
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

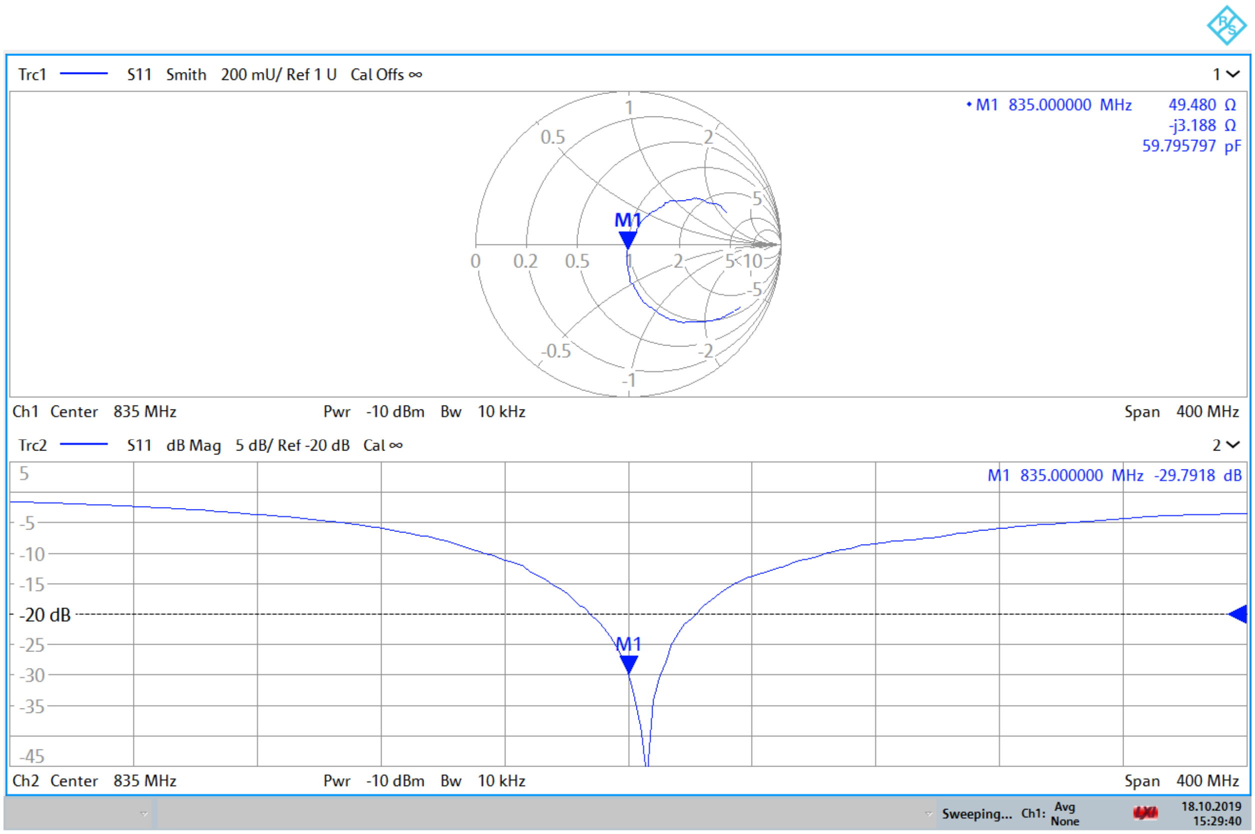
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

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	1.397	1.886	2.03	7.64%	1.22	1.32	8.20%	50.6	49.5	1.1	-2.4	-3.2	0.8	-32.2	-29.8	7.50%	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	1.397	1.95	2.07	6.15%	1.28	1.36	6.25%	45	45.1	0.1	-6.7	-5.1	1.6	-21.1	-22.6	-6.90%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



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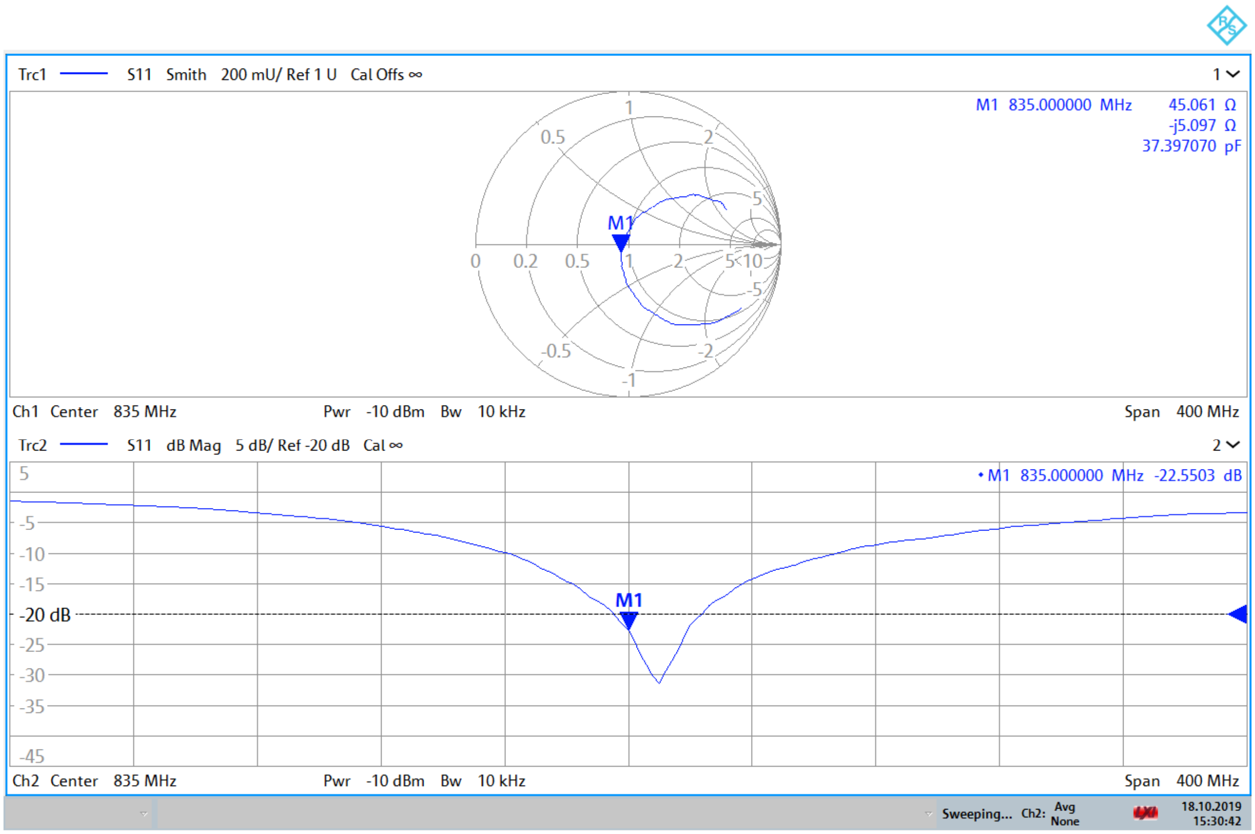
Impedance & Return-Loss Measurement Plot for Body TSL



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Object:	Date Issued:	Page 4 of 4
D835V2 – SN:4d133	10/18/2019	

Certification of Calibration

Object	D835V2 – SN: 4d133
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Extension Calibration date:	10/18/2020
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	11/29/2018	Biennial	11/29/2020	181766816
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Agilent	85033E	3.5mm Standard Calibration Kit	6/6/2020	Annual	6/6/2021	MY53402352
Rohde & Schwarz	ZNLE6	Vector Network Analyzer	9/29/2020	Annual	9/29/2021	101307
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
SPEAG	DAK-3.5	Dielectric Assessment Kit	5/12/2020	Annual	5/12/2021	1070
Anritsu	MA2411B	Pulse Power Sensor	8/12/2020	Annual	8/12/2021	1207364
Anritsu	MA2411B	Pulse Power Sensor	9/22/2020	Annual	9/22/2021	1315051
Anritsu	ML2495A	Power Meter	1/15/2020	Annual	1/15/2021	1328004
Anritsu	ML2495A	Power Meter	12/17/2019	Annual	12/17/2020	941001
Agilent	N5182A	MXG Vector Signal Generator	5/13/2020	Annual	5/13/2021	MY47420603
Pasternack	NC-100	Torque Wrench	8/4/2020	Biennial	8/4/2022	N/A
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	1/21/2020	Annual	1/21/2021	3589
SPEAG	EX3DV4	SAR Probe	12/11/2019	Annual	12/11/2020	7570
SPEAG	DAE4	Dasy Data Acquisition Electronics	3/12/2020	Annual	3/12/2021	1368
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/23/2020	Annual	1/13/2021	1558

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

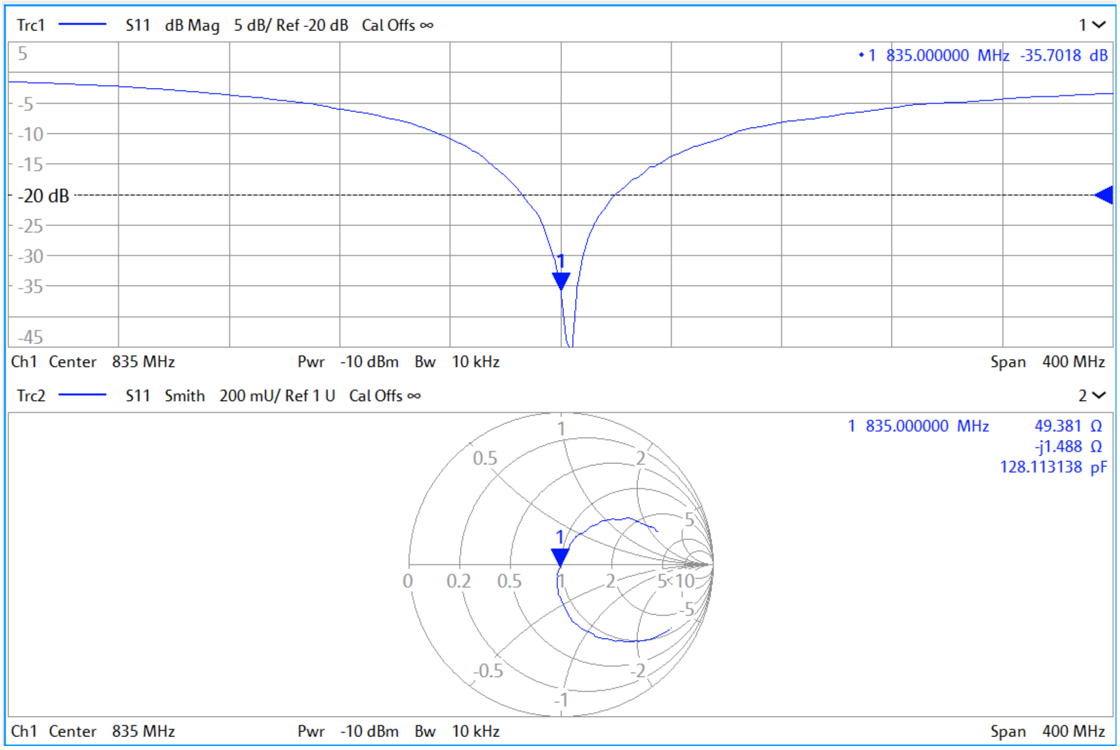
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

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.

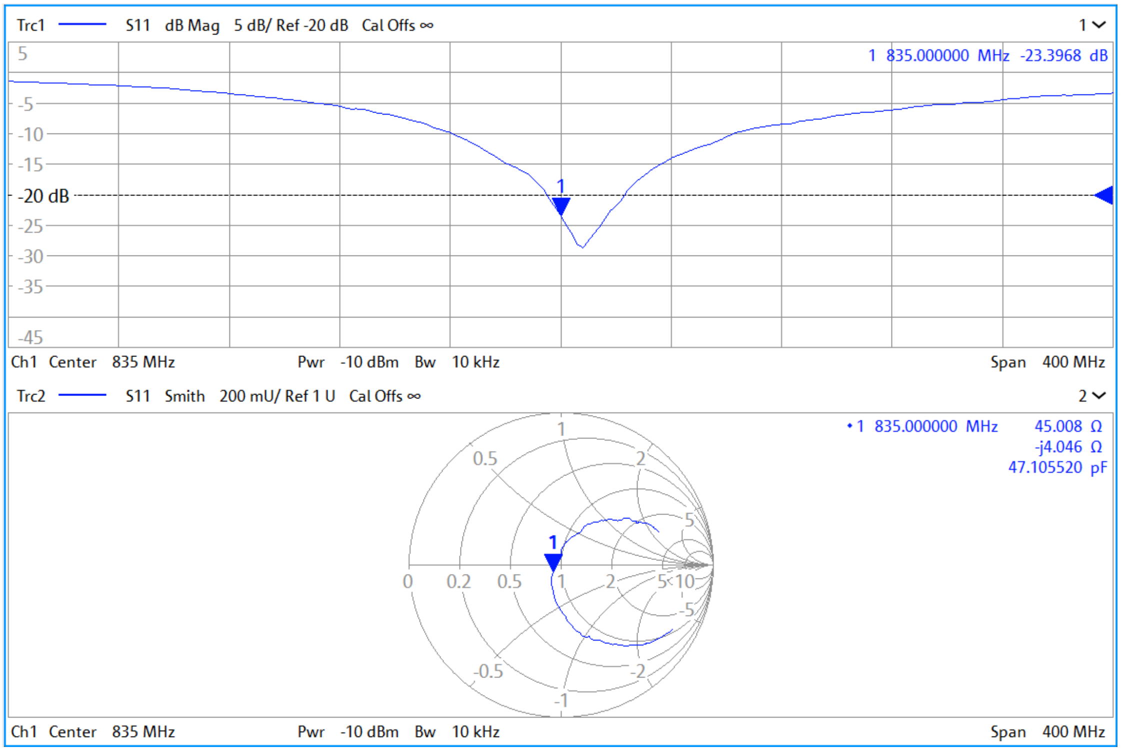
The following dipole was checked to pass the above 3 requirements to have 3-year calibration period from the calibration date:

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	10/18/2020	1.397	1.886	2.00	6.04%	1.22	1.28	4.92%	50.6	49.4	1.2	-2.4	-1.5	0.9	-32.2	-35.7	-10.90%	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	10/18/2020	1.397	1.95	1.85	-5.13%	1.28	1.22	-4.69%	45.0	45.0	0.0	-6.7	-4.0	2.7	-21.1	-23.4	-10.90%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL



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

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

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

Accreditation No.: SCS 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

BN✓ 04-12-2019
BN✓ Extended 04-30-2020

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 ± 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	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

	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	[signature]
Approved by:	Katja Pokovic	Technical Manager	[signature]

Issued: March 13, 2019

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
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 ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.9 ± 6 %	0.91 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**9.42 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.54 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**6.13 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	54.3 ± 6 %	1.01 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.45 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**9.47 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.61 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**6.27 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.4 Ω - 2.6 jΩ
Return Loss	- 30.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.8 Ω - 6.1 jΩ
Return Loss	- 22.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.387 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

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

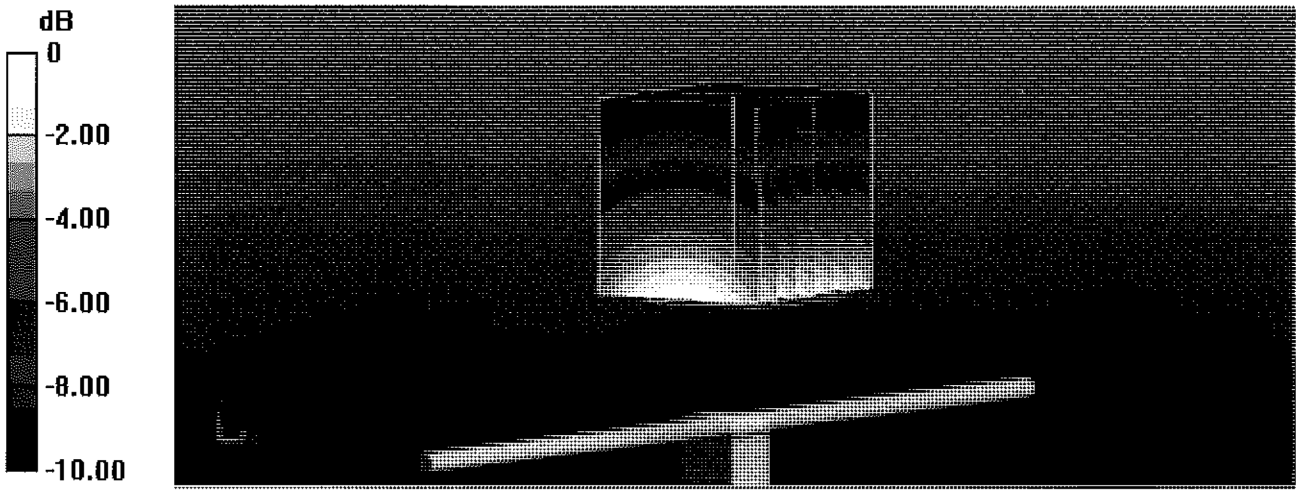
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 0.91 S/m; ε_r = 41.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10, 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)

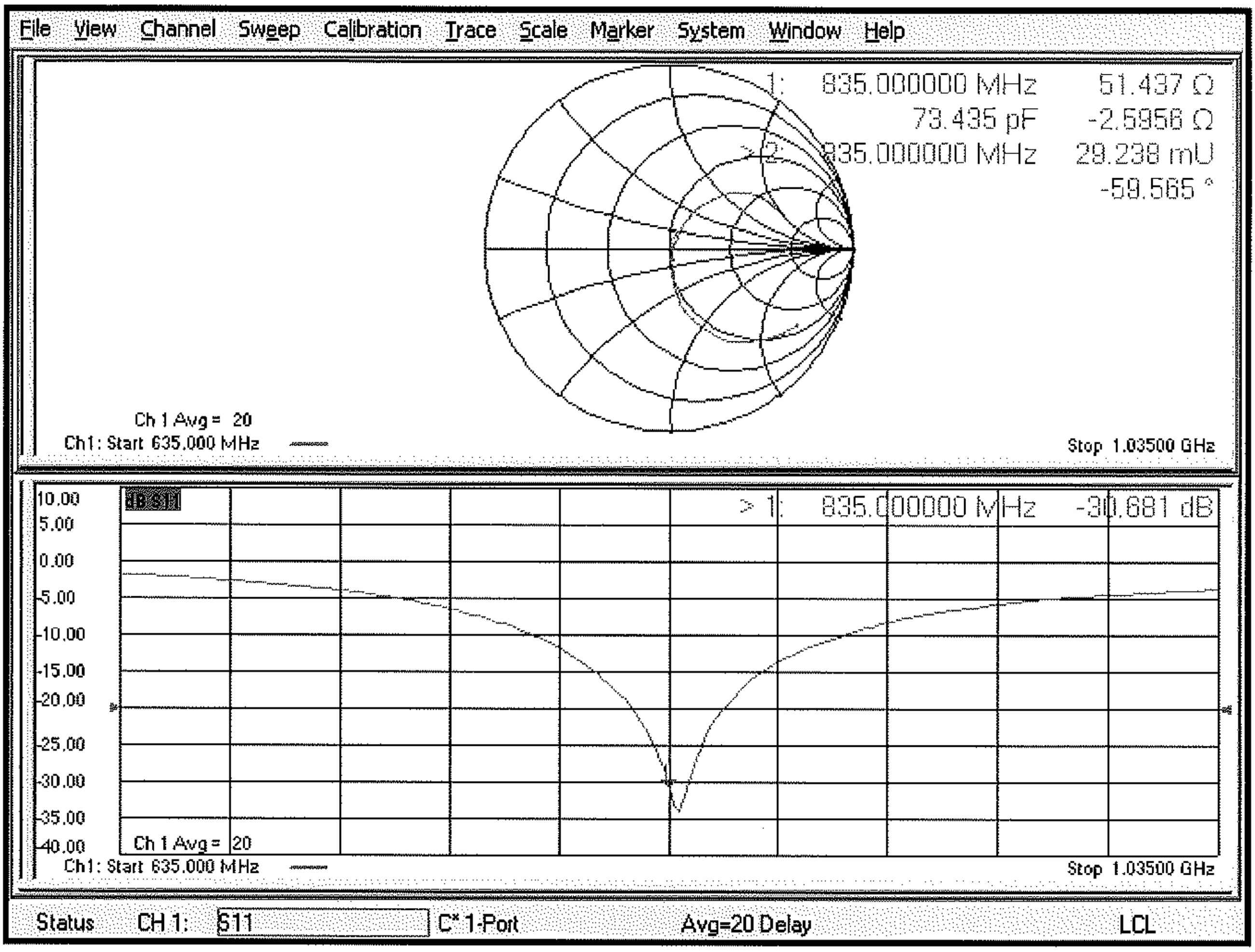
Dipole Calibration for Head Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
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

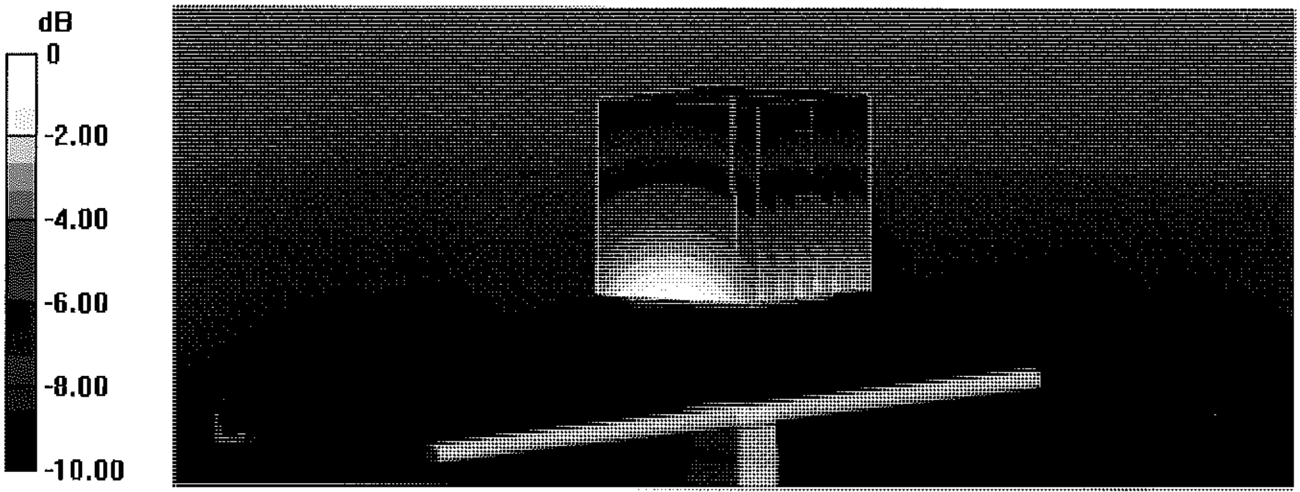
Communication System: UID 0 - CW; Frequency: 835 MHz
Medium parameters used: f = 835 MHz; σ = 1.01 S/m; ε_r = 54.3; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.15, 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)

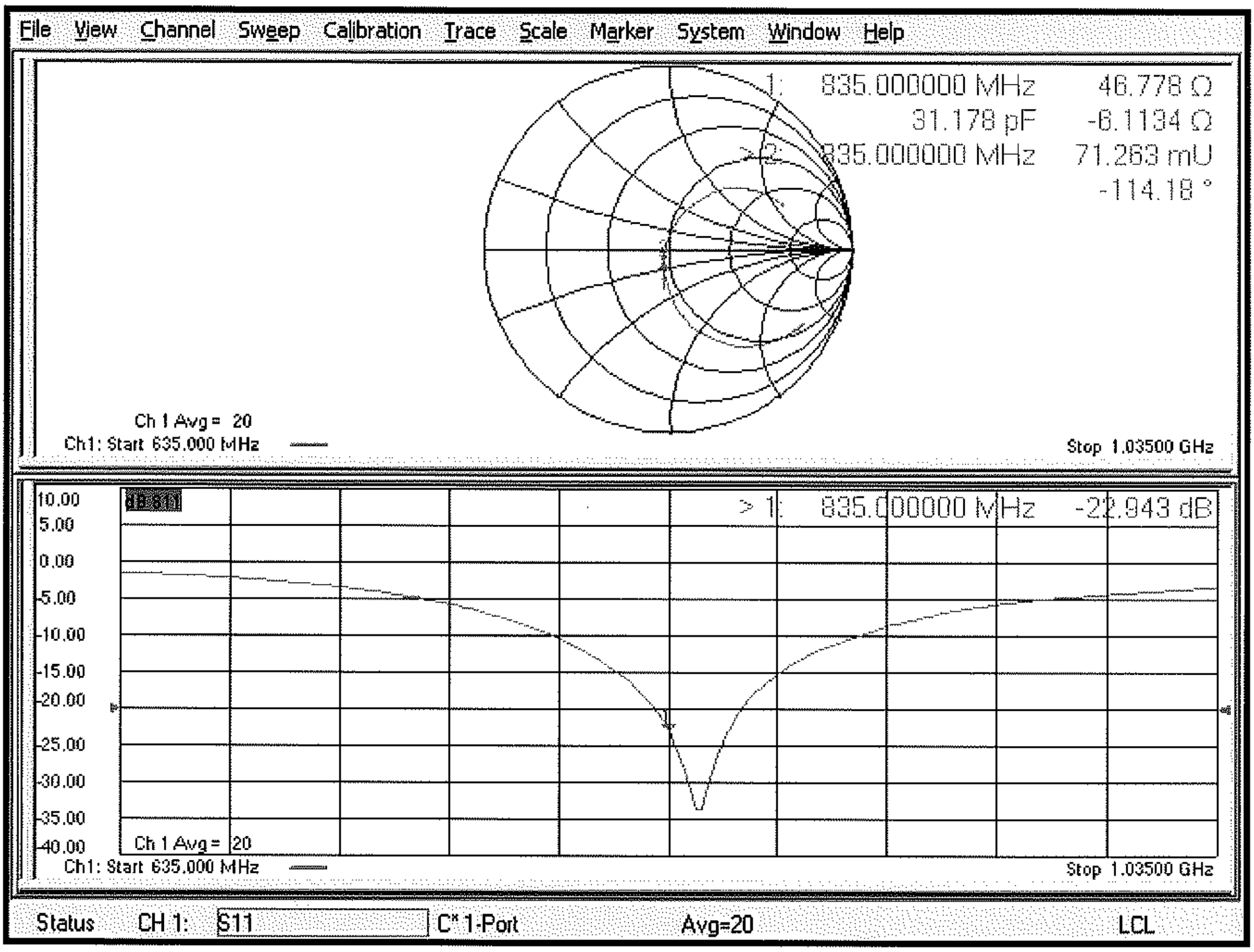
Dipole Calibration for Body Tissue/Pin=250 mW, d=15mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
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



PCTEST
7185 Oakland Mills Road, Columbia, MD 21046 USA
Tel. +1.410.290.6652 / Fax +1.410.290.6654
http://www.pctest.com

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 = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

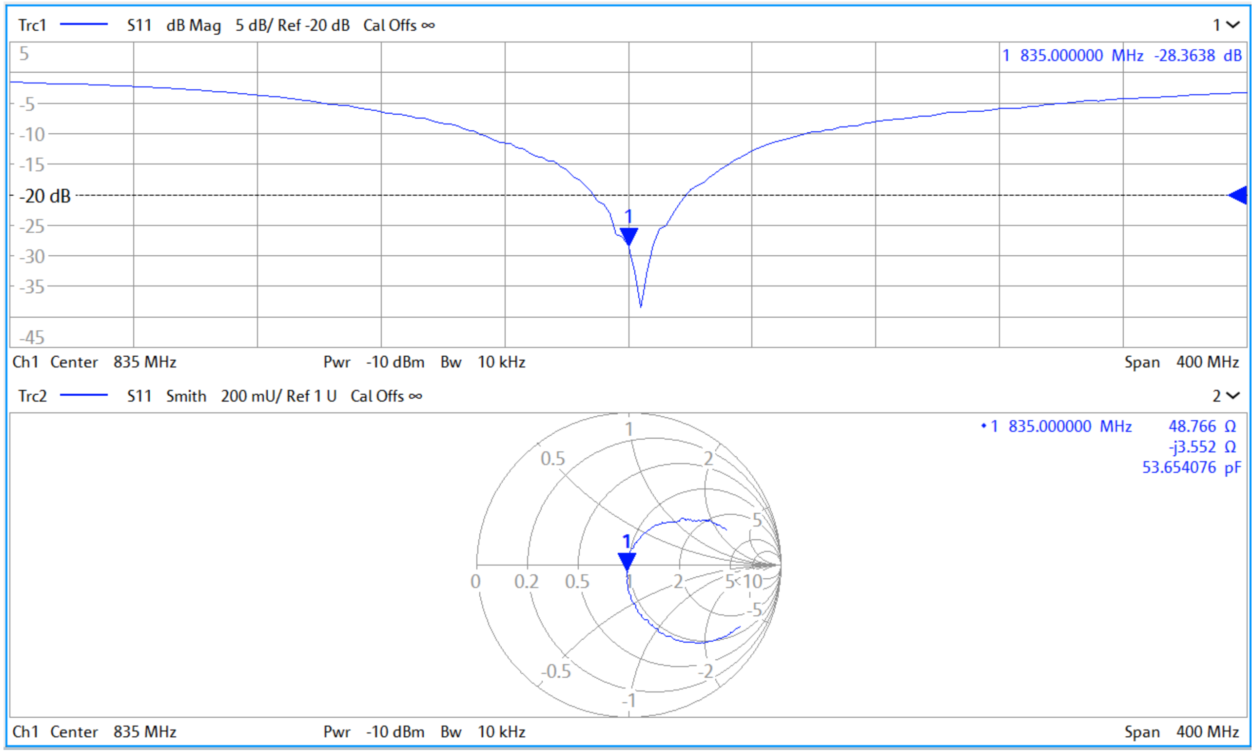
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

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.

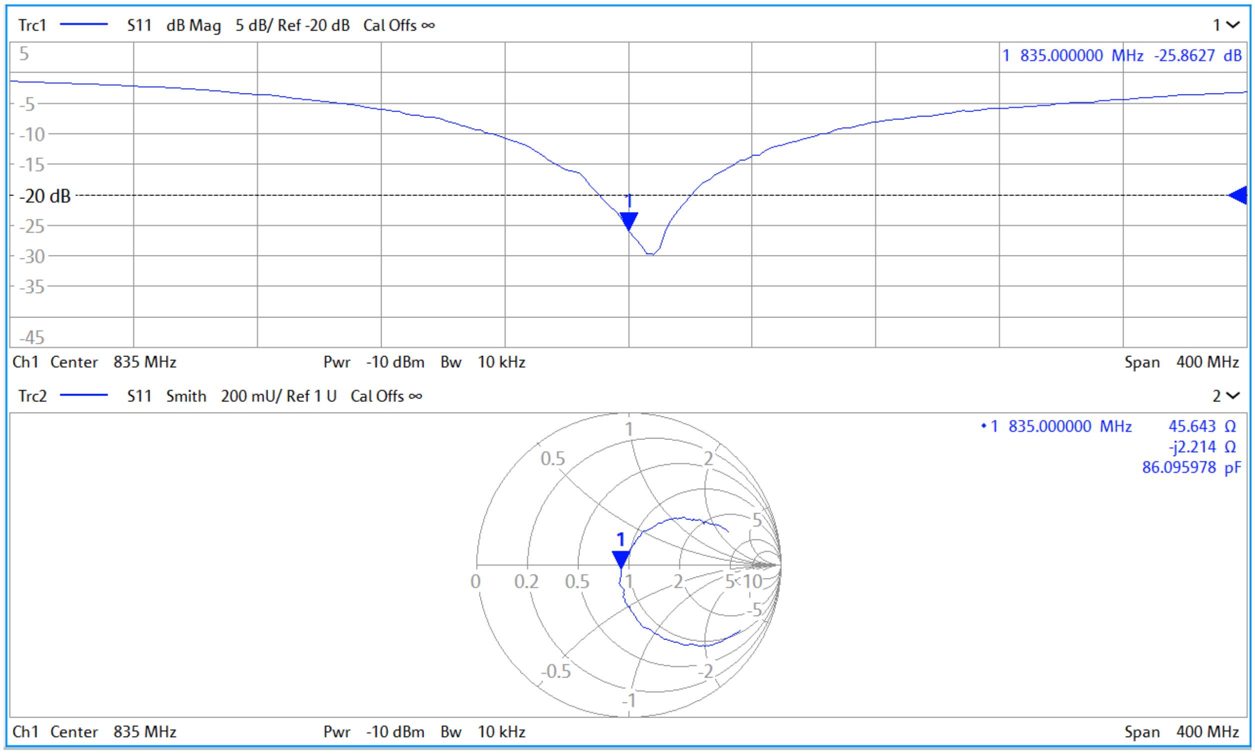
The following dipole was checked to pass the above 3 requirements to have 2-year calibration period from the calibration date:

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 Head (10g) W/kg @ 20.0 dBm	Measured Head 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	48.8	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



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

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

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

Accreditation No.: SCS 0108

Client PC Test

Certificate No: **D1765V2-1008_May18**

CALIBRATION CERTIFICATE

Object	D1765V2 - SN:1008
Calibration procedure(s)	QA CAL-05.v10 Calibration procedure for dipole validation kits above 700 MHz
Calibration date:	May 23, 2018

BN ✓ 7/16/2018
BN ✓ 05/20/2019
BN ✓ 05/29/2020 Extended

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	26-Oct-17 (No. DAE4-601_Oct17)	Oct-18

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

	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	[signature]
Approved by:	Katja Pokovic	Technical Manager	[signature]

Issued: May 23, 2018

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.1
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5.0 mm	
Frequency	1750 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.1	1.37 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	39.0 ± 6 %	1.34 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	8.94 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**36.2 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.71 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.0 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.4	1.49 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.2 ± 6 %	1.46 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.21 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**37.4 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	4.92 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**19.9 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	47.7 Ω - 6.5 jΩ
Return Loss	- 23.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	43.3 Ω - 6.0 jΩ
Return Loss	- 20.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.210 ns

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.
No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	October 06, 2005

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

SAR result with SAM Head (Top)

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.26 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**37.4 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.95 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**19.9 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	9.47 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**38.2 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.06 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.4 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	9.26 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**37.4 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.02 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.2 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	7.12 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**28.7 W/kg ± 17.5 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.01 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**16.1 W/kg ± 16.9 % (k=2)**

DASY5 Validation Report for Head TSL

Date: 15.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1765 MHz; Type: D1765V2; Serial: D1765V2 - SN:1008

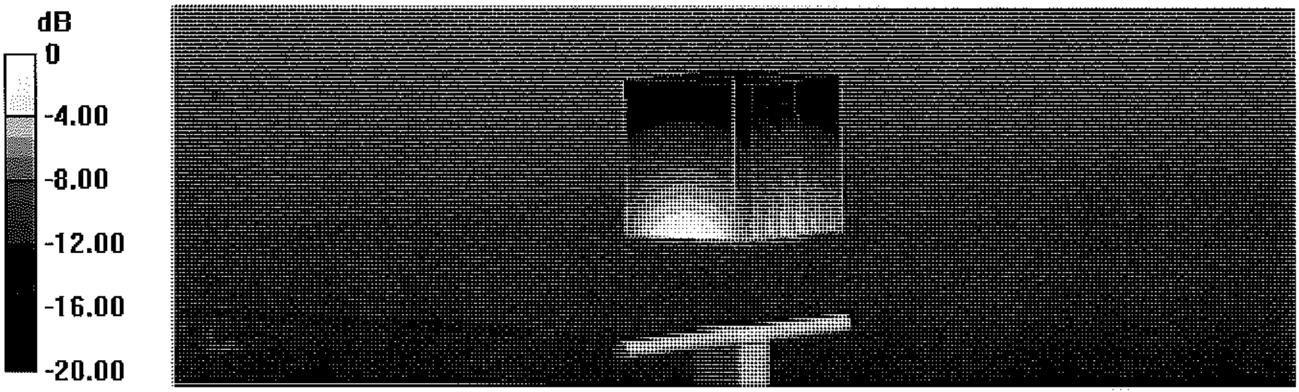
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.34 S/m; ε_r = 39; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.5, 8.5, 8.5) @ 1750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

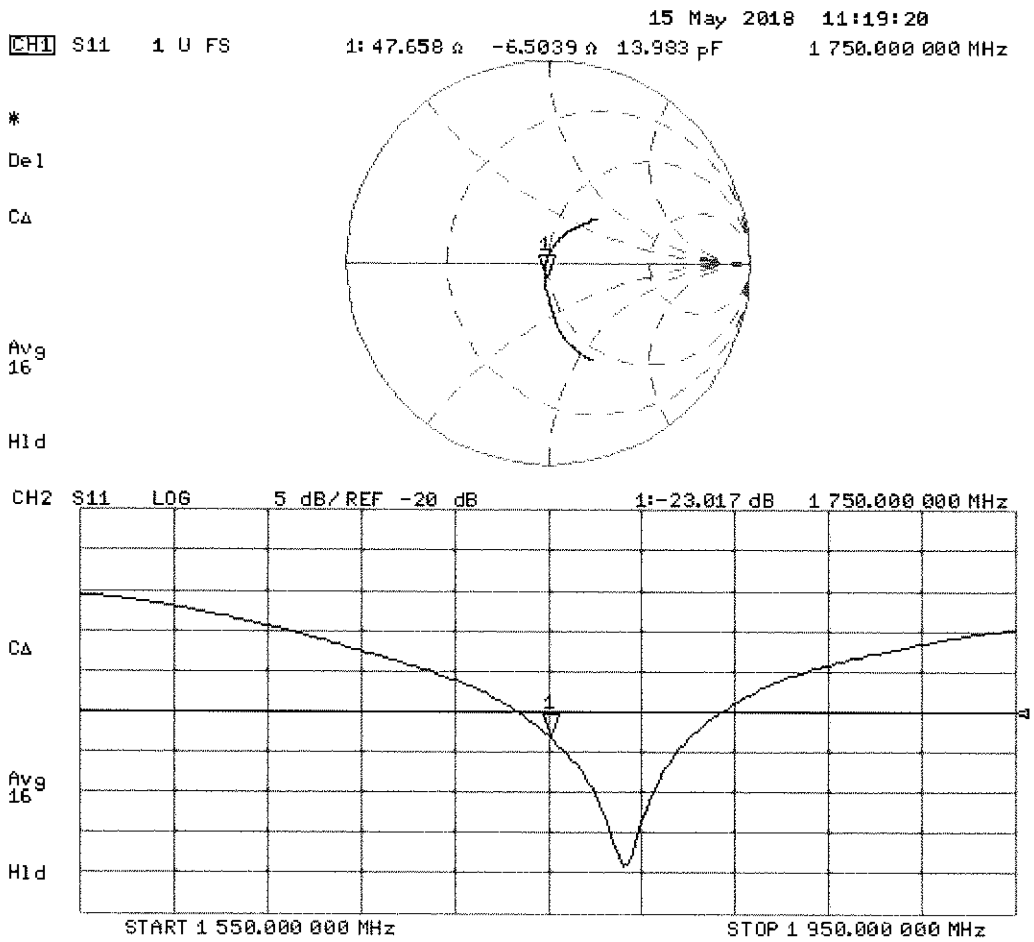
Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 106.6 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 16.4 W/kg
SAR(1 g) = 8.94 W/kg; SAR(10 g) = 4.71 W/kg
Maximum value of SAR (measured) = 13.8 W/kg



0 dB = 13.8 W/kg = 11.40 dBW/kg

Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date: 15.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1765 MHz; Type: D1765V2; Serial: D1765V2 - SN:1008

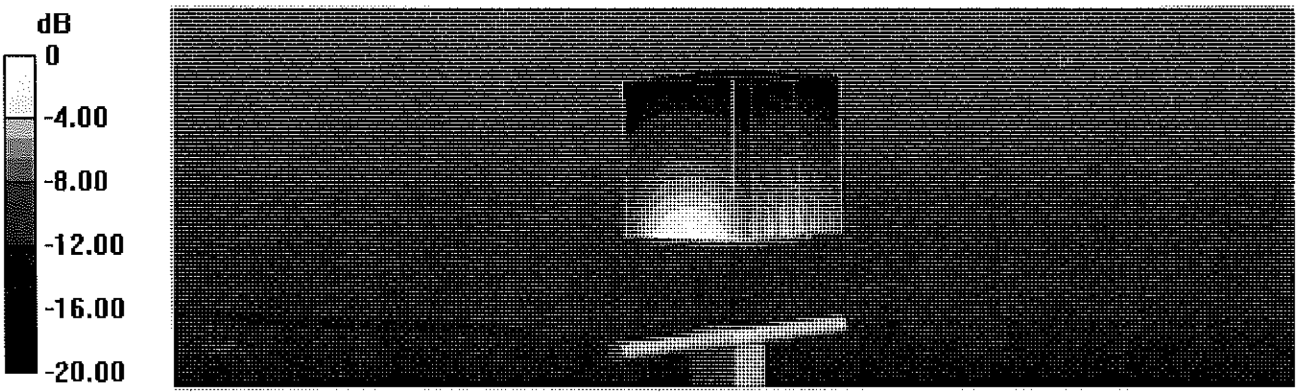
Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.46 S/m; ε_r = 53.2; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.35, 8.35, 8.35) @ 1750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: Flat Phantom 5.0 (back); Type: QD 000 P50 AA; Serial: 1002
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

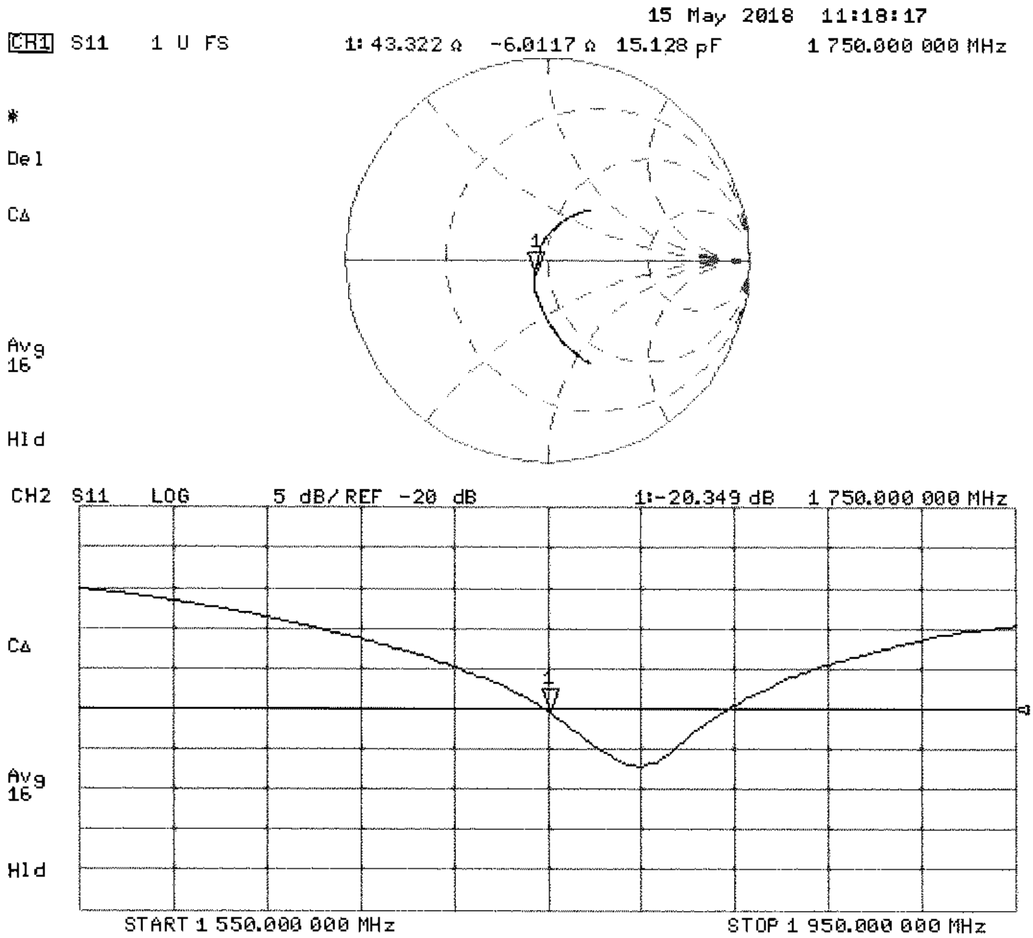
Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 102.4 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 16.1 W/kg
SAR(1 g) = 9.21 W/kg; SAR(10 g) = 4.92 W/kg
Maximum value of SAR (measured) = 13.7 W/kg



0 dB = 13.7 W/kg = 11.37 dBW/kg

Impedance Measurement Plot for Body TSL



DASY5 Validation Report for SAM Head

Date: 23.05.2018

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1765 MHz; Type: D1765V2; Serial: D1765V2 - SN:1008

Communication System: UID 0 - CW; Frequency: 1750 MHz
Medium parameters used: f = 1750 MHz; σ = 1.37 S/m; ε_r = 41.8; ρ = 1000 kg/m^3
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

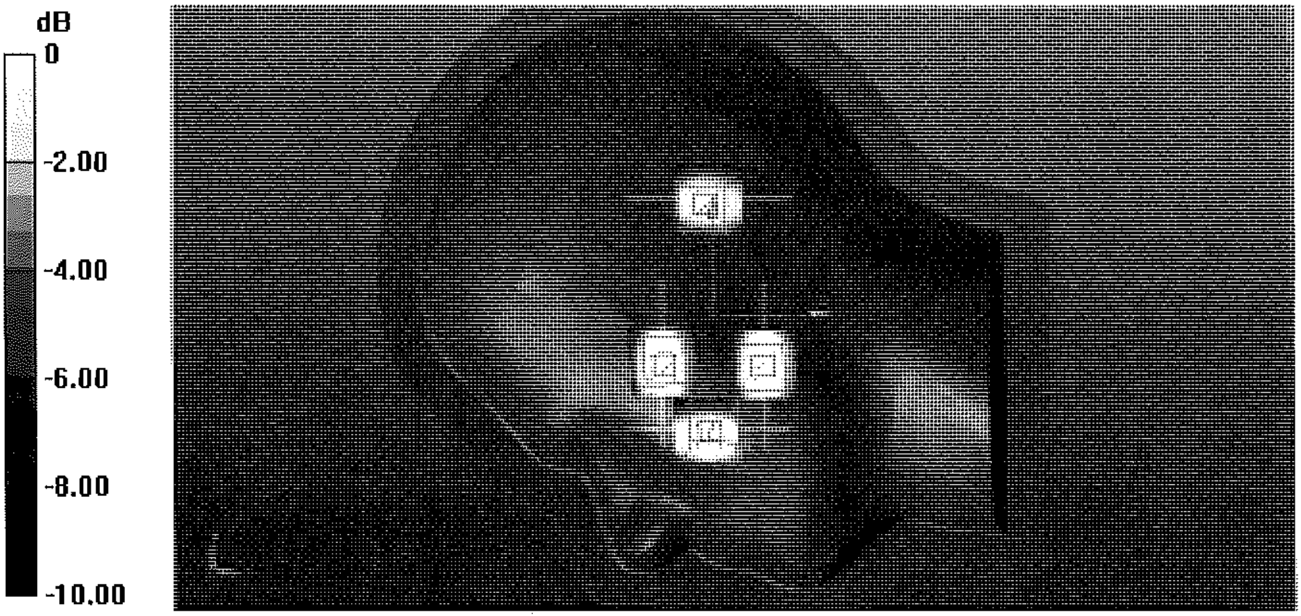
- Probe: EX3DV4 - SN7349; ConvF(8.5, 8.5, 8.5) @ 1750 MHz; Calibrated: 30.12.2017
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 26.10.2017
- Phantom: SAM Head
- DASY52 52.10.1(1476); SEMCAD X 14.6.11(7439)

SAM/Head/Top/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 105.8 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 16.4 W/kg
SAR(1 g) = 9.26 W/kg; SAR(10 g) = 4.95 W/kg
Maximum value of SAR (measured) = 13.9 W/kg

SAM/Head/Mouth/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.2 V/m; Power Drift = -0.04 dB
Peak SAR (extrapolated) = 16.6 W/kg
SAR(1 g) = 9.47 W/kg; SAR(10 g) = 5.06 W/kg
Maximum value of SAR (measured) = 13.7 W/kg

SAM/Head/Neck/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 104.7 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 15.8 W/kg
SAR(1 g) = 9.26 W/kg; SAR(10 g) = 5.02 W/kg
Maximum value of SAR (measured) = 13.8 W/kg

SAM/Head/Ear/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.46 V/m; Power Drift = -0.02 dB
Peak SAR (extrapolated) = 11.8 W/kg
SAR(1 g) = 7.12 W/kg; SAR(10 g) = 4.01 W/kg
Maximum value of SAR (measured) = 10.3 W/kg



0 dB = 10.3 W/kg = 10.13 dBW/kg

Certification of Calibration

Object D1765V2 – SN: 1008

Calibration procedure(s) Procedure for Calibration Extension for SAR Dipoles.

Extension Calibration date: 5/17/2019

Description: SAR Validation Dipole at 1750 MHz.

Calibration Equipment used:

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
Agilent	8753ES	S-Parameter Network Analyzer	3/11/2019	Annual	3/11/2020	US39170122
Agilent	N5182A	MXG Vector Signal Generator	11/28/2018	Annual	11/28/2019	MY47420603
Amplifier Research	15S1G6	Amplifier	CBT	N/A	CBT	433971
Anritsu	MA2411B	Pulse Power Sensor	11/20/2018	Annual	11/20/2019	1027293
Anritsu	MA2411B	Pulse Power Sensor	10/30/2018	Annual	10/30/2019	1126066
Anritsu	ML2495A	Power Meter	10/21/2018	Annual	10/21/2019	941001
Control Company	4040	Therm./ Clock/ Humidity Monitor	10/9/2018	Biennial	10/9/2020	181647811
Control Company	4352	Ultra Long Stem Thermometer	6/6/2018	Biennial	6/6/2020	181334678
Keysight	772D	Dual Directional Coupler	CBT	N/A	CBT	MY52180215
Keysight Technologies	85033E	Standard Mechanical Calibration Kit (DC to 9GHz, 3.5mm)	6/4/2018	Annual	6/4/2019	MY53401181
MiniCircuits	VLF-6000+	Low Pass Filter	CBT	N/A	CBT	N/A
Mini-Circuits	BW-N20W5+	DC to 18 GHz Precision Fixed 20 dB Attenuator	CBT	N/A	CBT	N/A
Narda	4772-3	Attenuator (3dB)	CBT	N/A	CBT	9406
Pasternack	PE2209-10	Bidirectional Coupler	CBT	N/A	CBT	N/A
Seekonk	NC-100	Torque Wrench	7/11/2018	Annual	7/11/2019	N/A
SPEAG	EX3DV4	SAR Probe	6/25/2018	Annual	6/25/2019	7409
SPEAG	DAE4	Dasy Data Acquisition Electronics	6/18/2018	Annual	6/18/2019	1334
SPEAG	EX3DV4	SAR Probe	2/19/2019	Annual	2/19/2020	3914
SPEAG	DAE4	Dasy Data Acquisition Electronics	2/14/2019	Annual	2/14/2020	1272
SPEAG	DAK-3.5	Dielectric Assessment Kit	9/11/2018	Annual	9/11/2019	1091

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

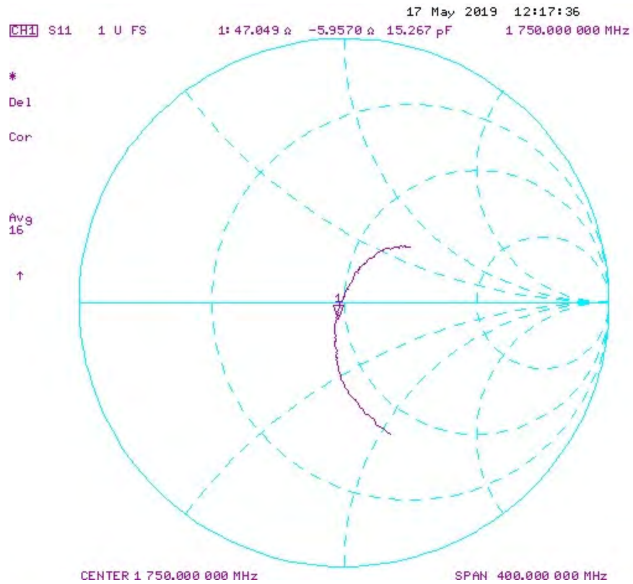
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

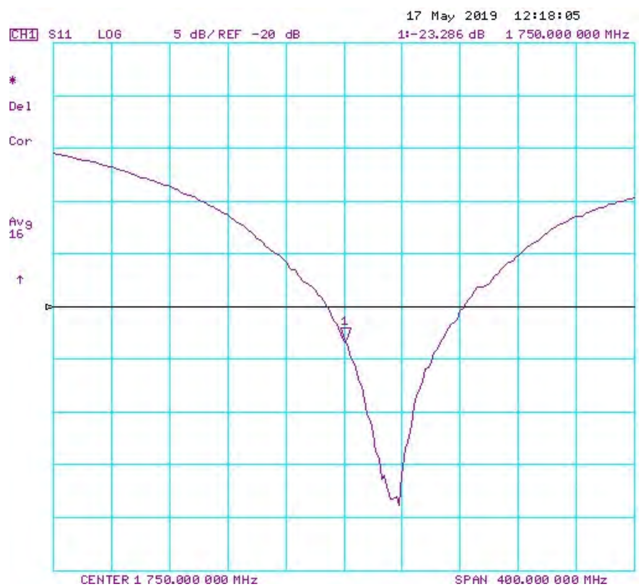
1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does 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:

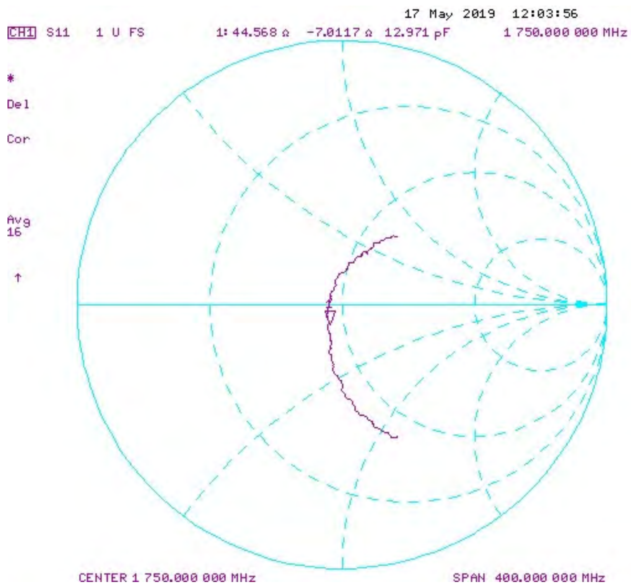
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 20.0 dBm	Measured Head SAR (1g) W/kg @ 20.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 20.0 dBm	Measured Head SAR (10g) W/kg @ 20.0 dBm	Deviation 10g (%)	Certificate Impedance 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
5/23/2018	5/17/2019	1.21	3.62	3.63	0.28%	1.9	1.92	1.05%	47.7	47	0.7	-6.5	-6	0.5	-23	-23.3	-1.20%	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
5/23/2018	5/17/2019	1.21	3.74	3.95	5.61%	1.99	2.08	4.52%	43.3	44.6	1.3	-6	-7	1	-20.3	-20.5	-0.90%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL





Impedance & Return-Loss Measurement Plot for Body TSL



Certification of Calibration

Object	D1765V2 – SN: 1008
Calibration procedure(s)	Procedure for Calibration Extension for SAR Dipoles.
Extension Calibration date:	5/23/2020
Description:	SAR Validation Dipole at 1750 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 (8" lb)	5/23/2018	Biennial	5/23/2020	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	4/21/2020	Annual	4/21/2021	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	3/12/2020	Annual	3/12/2021	1368

Measurement Uncertainty = ±23% (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halbfoster	Test Engineer	BRODIE HALBFOSTER
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	KOK

DIPOLE CALIBRATION EXTENSION

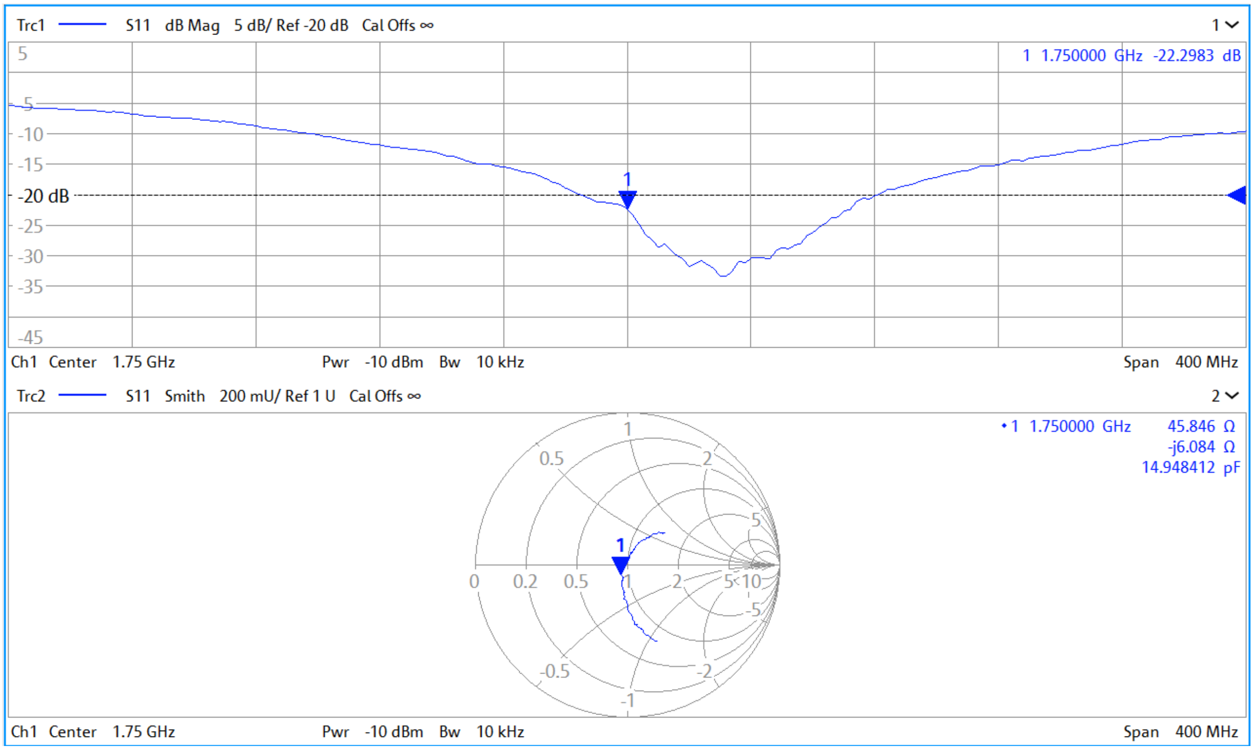
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

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.

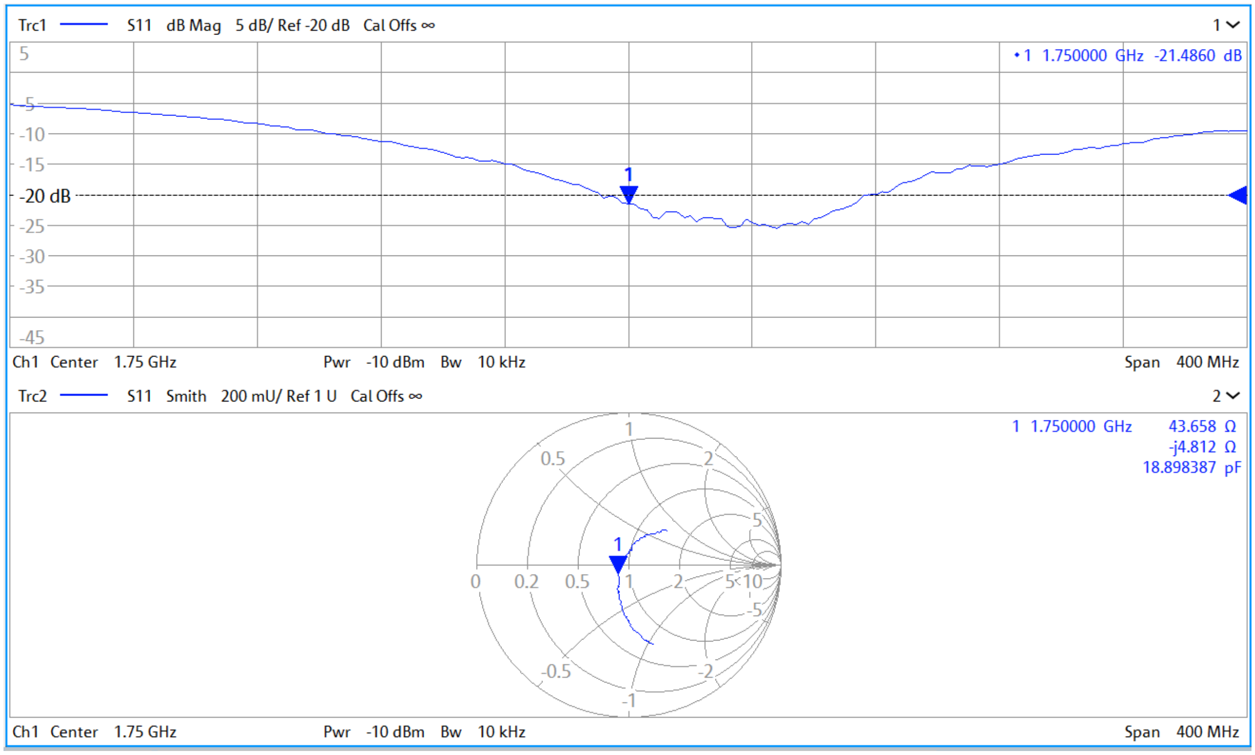
The following dipole was checked to pass the above 3 requirements to have 3-year calibration period from the calibration date:

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 Head (10g) W/kg @ 20.0 dBm	Measured Head 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
5/23/2018	5/23/2020	1.21	3.62	3.65	0.83%	1.90	1.94	2.11%	47.7	45.9	1.9	-6.5	-6.1	0.4	-23	-22.3	3.10%	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
5/23/2018	5/23/2020	1.21	3.74	4.00	6.95%	1.99	2.12	6.53%	43.3	43.7	0.4	-6.0	-4.8	1.2	-20.3	-21.5	-5.80%	PASS

Impedance & Return-Loss Measurement Plot for Head TSL



Impedance & Return-Loss Measurement Plot for Body TSL



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

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

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

Accreditation No.: SCS 0108

Client PC Test

Certificate No: D1900V2-5d148_Feb19

CALIBRATION CERTIFICATE

Object	D1900V2 - SN:5d148
Calibration procedure(s)	QA CAL-05.v11 Calibration Procedure for SAR Validation Sources between 0.7-3 GHz
Calibration date:	February 21, 2019

BN ✓ 03-01-19
BN ✓ 02-26-2020

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 ± 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	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

	Name	Function	Signature
Calibrated by:	Manu Seitz	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: February 21, 2019

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

e) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	40.9 ± 6 %	1.38 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm^3 (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.65 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**39.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.05 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	**20.4 W/kg ± 16.5 % (k=2)**

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	**Permittivity**	**Conductivity**
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.6 ± 6 %	1.47 mho/m ± 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm^3 (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	9.56 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**39.1 W/kg ± 17.0 % (k=2)**

SAR averaged over 10 cm^3 (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.05 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	**20.5 W/kg ± 16.5 % (k=2)**

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.8 Ω + 6.8 jΩ
Return Loss	- 23.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.4 Ω + 7.8 jΩ
Return Loss	- 21.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.170 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

DASY5 Validation Report for Head TSL

Date: 21.02.2019

Test Laboratory: SPEAG, Zurich, Switzerland

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

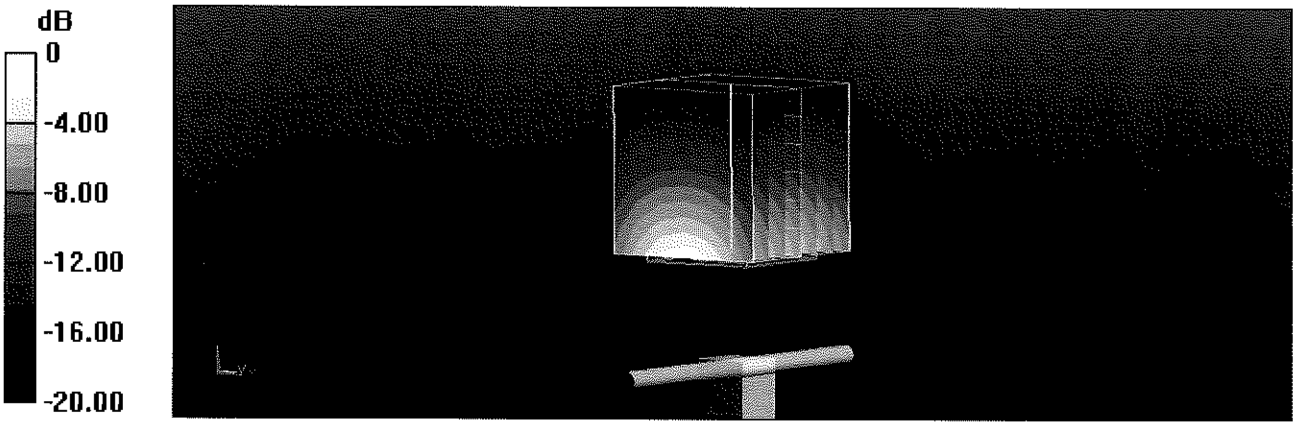
Communication System: UID 0 - CW; Frequency: 1900 MHz
Medium parameters used: f = 1900 MHz; σ = 1.38 S/m; ε_r = 40.9; ρ = 1000 kg/m^3
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(8.26, 8.26, 8.26) @ 1900 MHz; Calibrated: 31.12.2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: Flat Phantom 5.0 (front); Type: QD 000 P50 AA; Serial: 1001
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 109.4 V/m; Power Drift = 0.01 dB
Peak SAR (extrapolated) = 17.8 W/kg
SAR(1 g) = 9.65 W/kg; SAR(10 g) = 5.05 W/kg
Maximum value of SAR (measured) = 15.0 W/kg



0 dB = 15.0 W/kg = 11.76 dBW/kg