

APPENDIX A: SAR TEST DATA

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

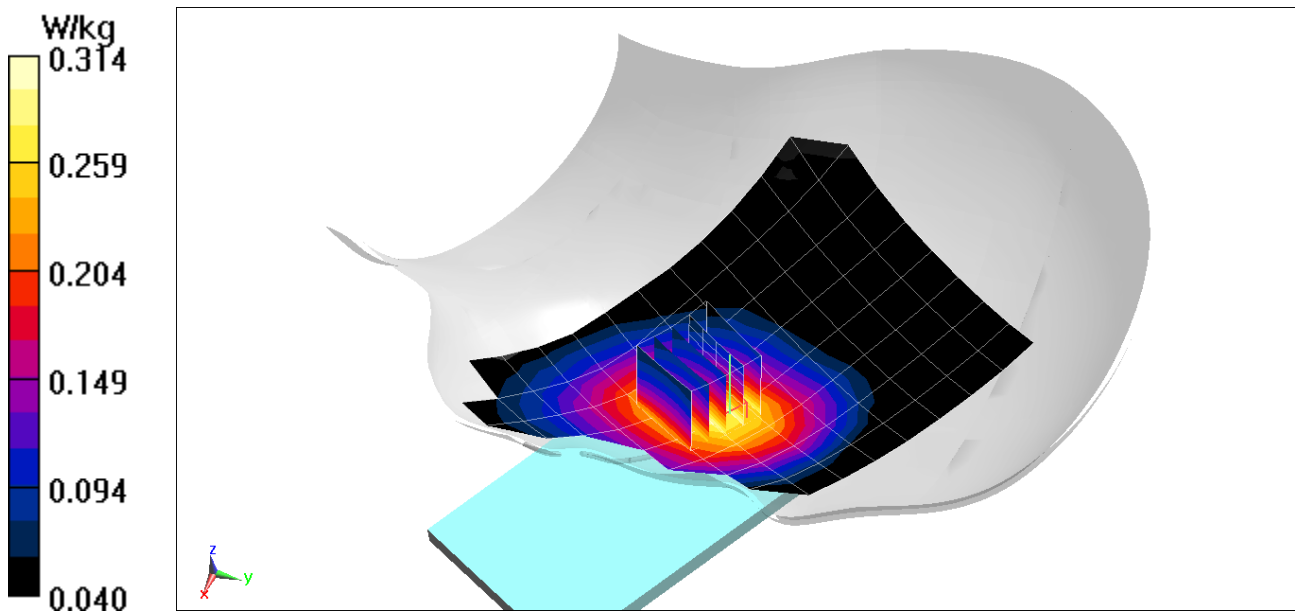
Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:2.76
Medium: 835 Head; Medium parameters used (interpolated):
 $f = 836.6$ MHz; $\sigma = 0.881$ S/m; $\epsilon_r = 39.718$; $\rho = 1000$ kg/m³
Phantom section: Left Section

Test Date: 03-10-2020; Ambient Temp: 22.7°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7406; ConvF(9.78, 9.78, 9.78) @ 836.6 MHz; Calibrated: 5/16/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 5/8/2019
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)

Mode: GPRS 850, Left Head, Cheek, Mid.ch, 3 Tx slots

Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 16.92 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 0.336 W/kg
SAR(1 g) = 0.271 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04823

Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:2.76

Medium: 1900 Head; Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.428 \text{ S/m}$; $\epsilon_r = 39.552$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 03-11-2020; Ambient Temp: 23.1°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN7409; ConvF(8.01, 8.01, 8.01) @ 1880 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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

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

Mode: GPRS 1900, Right Head, Cheek, Mid.ch, 3 Tx slots

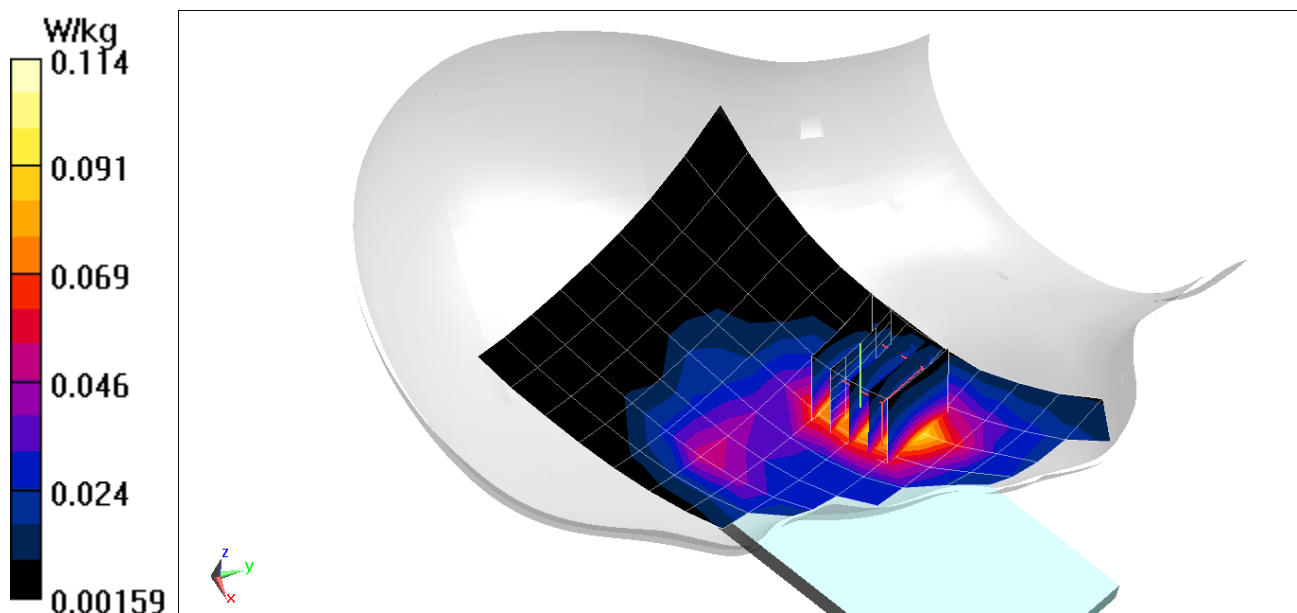
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 7.637 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 0.140 W/kg

SAR(1 g) = 0.084 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Head; Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.887 \text{ S/m}$; $\epsilon_r = 40.274$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Left Section

Test Date: 03-05-2020; Ambient Temp: 23.0°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7406; ConvF(9.78, 9.78, 9.78) @ 836.6 MHz; Calibrated: 5/16/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/8/2019

Phantom: Twin-SAM V5.0 Left 30; Type: QD 000 P40 CD; Serial: 1715

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

Mode: UMTS 850, Left Head, Cheek, Mid.ch

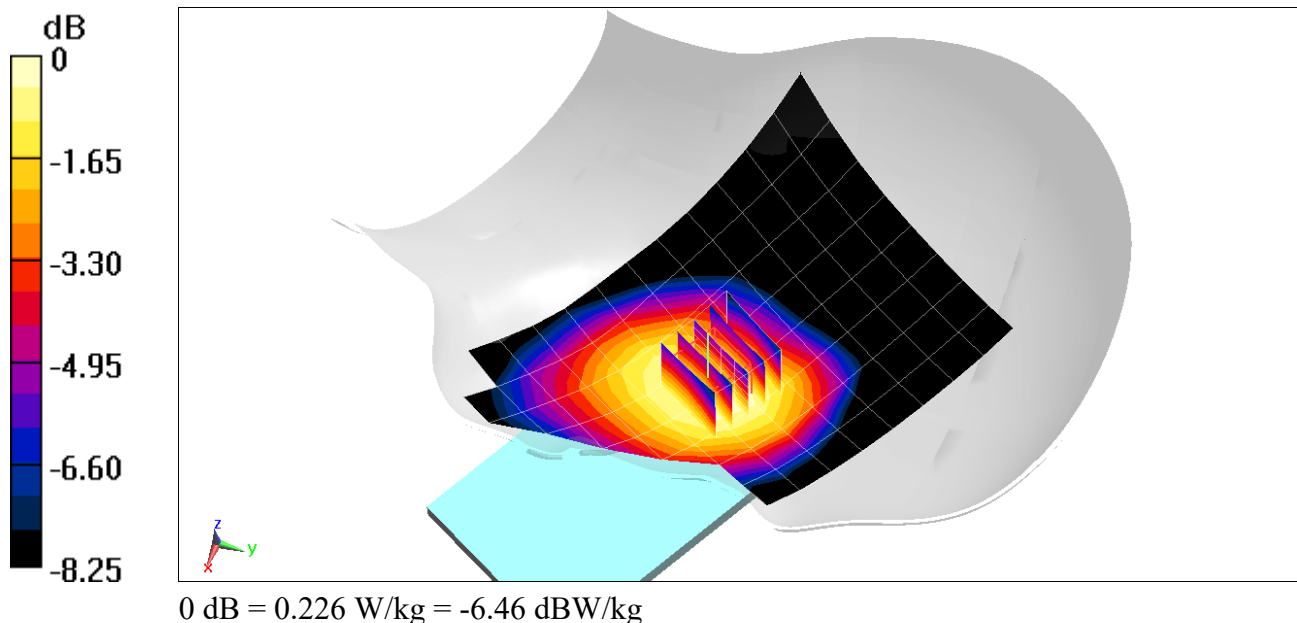
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 15.15 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.246 W/kg

SAR(1 g) = 0.194 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04823

Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750Head; Medium parameters used (interpolated):
 $f = 1732.4$ MHz; $\sigma = 1.351$ S/m; $\epsilon_r = 39.013$; $\rho = 1000$ kg/m³
Phantom section: Right Section

Test Date: 03-02-2020; Ambient Temp: 22.2°C; Tissue Temp: 20.1°C

Probe: EX3DV4 - SN7410; ConvF(8.46, 8.46, 8.46) @ 1732.4 MHz; Calibrated: 7/16/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2019
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1966
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

Mode: UMTS 1750, Right Head, Cheek, Mid.ch

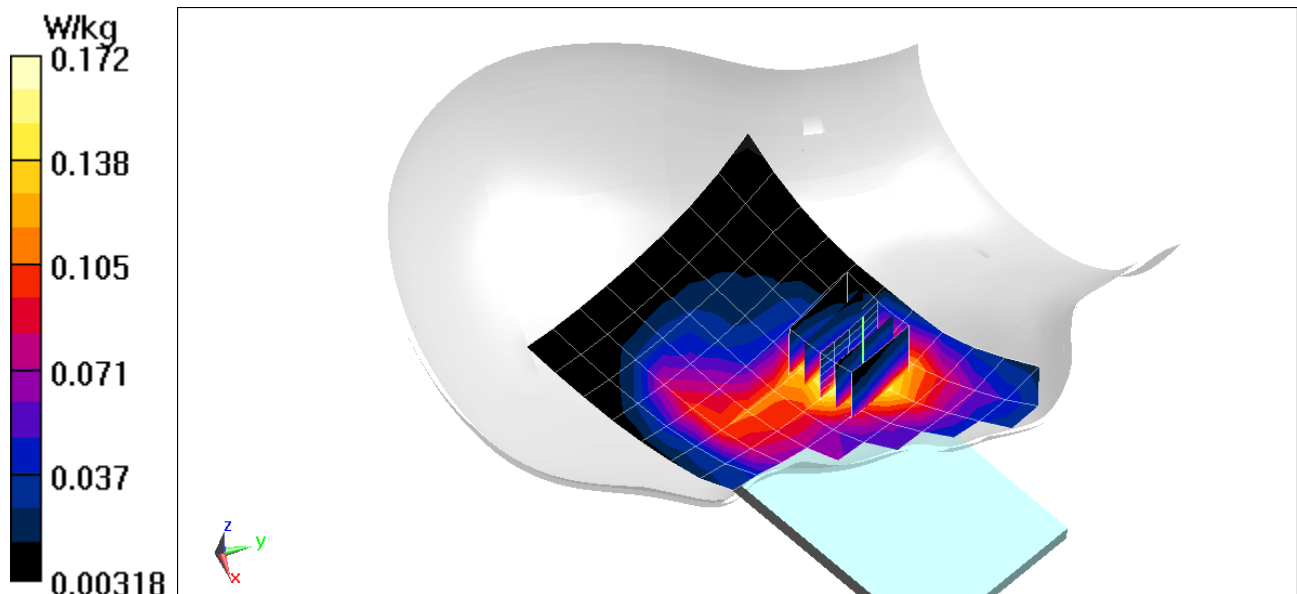
Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 9.855 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.198 W/kg

SAR(1 g) = 0.128 W/kg



0 dB = 0.172 W/kg = -7.64 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, UMTS; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head; Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.418 \text{ S/m}$; $\epsilon_r = 39.244$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 03-02-2020; Ambient Temp: 22.3°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7409; ConvF(8.01, 8.01, 8.01) @ 1880 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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

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

Mode: UMTS 1900, Right Head, Cheek, Mid.ch

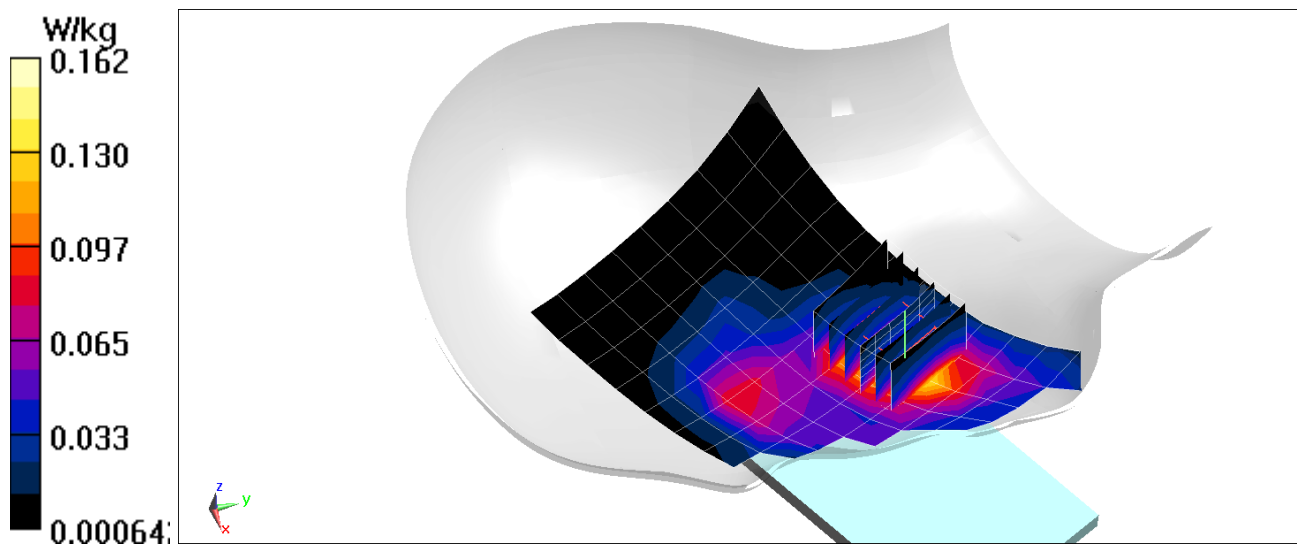
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 9.416 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.192 W/kg

SAR(1 g) = 0.121 W/kg



0 dB = 0.162 W/kg = -7.90 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, Cellular CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
 $f = 820.1$ MHz; $\sigma = 0.864$ S/m; $\epsilon_r = 39.937$; $\rho = 1000$ kg/m³
Phantom section: Right Section

Test Date: 03-10-2020; Ambient Temp: 22.7°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7406; ConvF(9.78, 9.78, 9.78) @ 820.1 MHz; Calibrated: 5/16/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 5/8/2019
Phantom: Twin-SAM V5.0 Left 30; Type: QD 000 P40 CD; Serial: 1715
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

Mode: Cell. CDMA, BC 10, Right Head, Cheek, Mid.ch

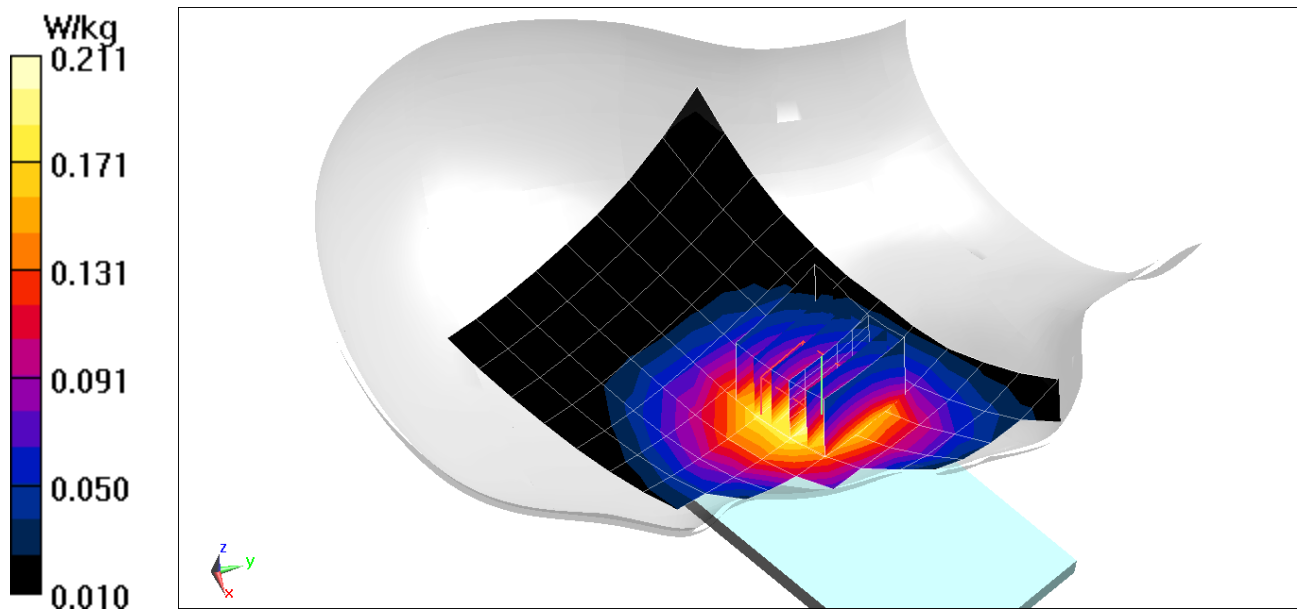
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 14.48 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.228 W/kg

SAR(1 g) = 0.180 W/kg;



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, Cellular CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
 $f = 836.52$ MHz; $\sigma = 0.881$ S/m; $\epsilon_r = 39.719$; $\rho = 1000$ kg/m³
Phantom section: Left Section

Test Date: 03-10-2020; Ambient Temp: 22.7°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7406; ConvF(9.78, 9.78, 9.78) @ 836.52 MHz; Calibrated: 5/16/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 5/8/2019
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)

Mode: Cell. CDMA, BC 0, Left Head, Cheek, Mid.ch

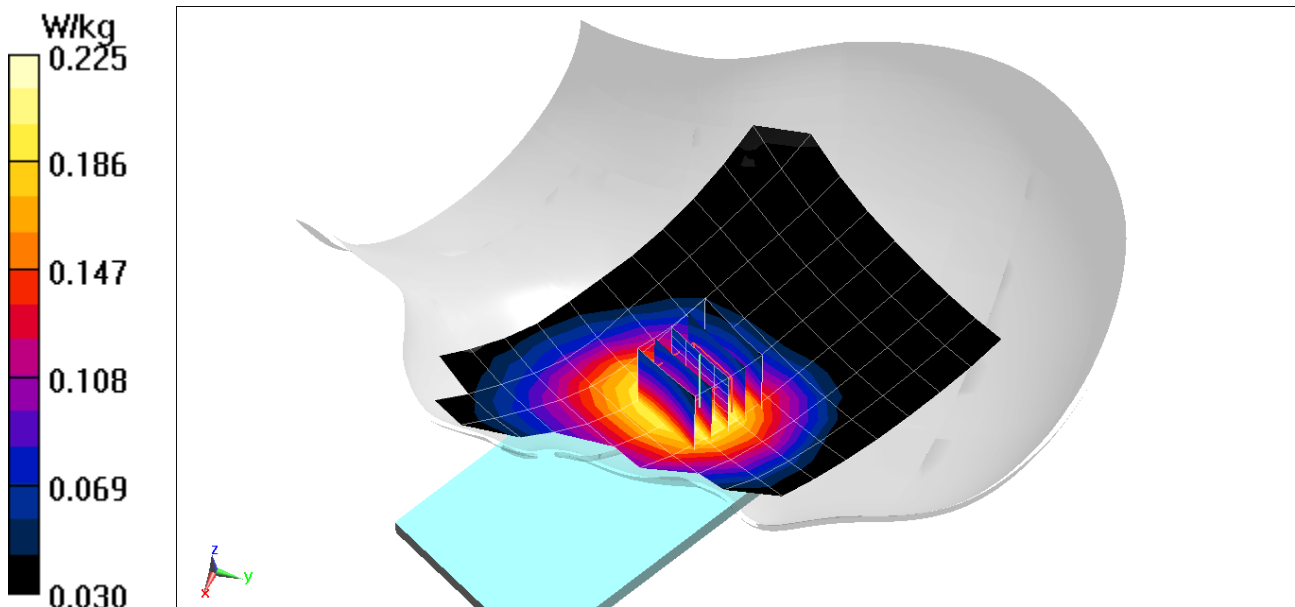
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 15.13 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.248 W/kg

SAR(1 g) = 0.194 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04823

Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Head; Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.428 \text{ S/m}$; $\epsilon_r = 39.552$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 03-11-2020; Ambient Temp: 23.1°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN7409; ConvF(8.01, 8.01, 8.01) @ 1880 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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

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

Mode: PCS CDMA, Right Head, Cheek, Mid.ch

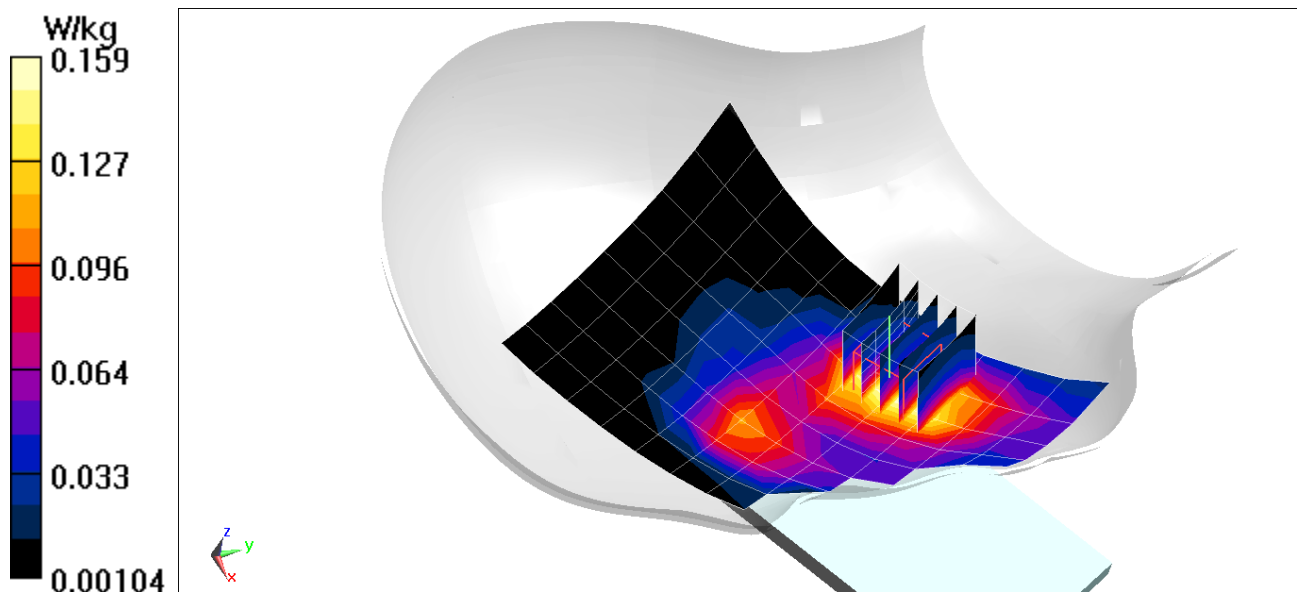
Area Scan (9x15x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Reference Value = 9.300 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.186 W/kg

SAR(1 g) = 0.121 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04823

Communication System: UID 0, LTE Band 71; Frequency: 680.5 MHz; Duty Cycle: 1:1
Medium: 700 Head; Medium parameters used (interpolated):
 $f = 680.5$ MHz; $\sigma = 0.844$ S/m; $\epsilon_r = 40.662$; $\rho = 1000$ kg/m³
Phantom section: Left Section

Test Date: 02-26-2020; Ambient Temp: 21.2°C; Tissue Temp: 20.40°C

Probe: EX3DV4 - SN7410; ConvF(9.95, 9.95, 9.95) @ 680.5 MHz; Calibrated: 7/16/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2019
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1966
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

**Mode: LTE Band 71, Left Head, Cheek, Mid.ch, 20 MHz Bandwidth
QPSK, 1 RB, 50 RB Offset**

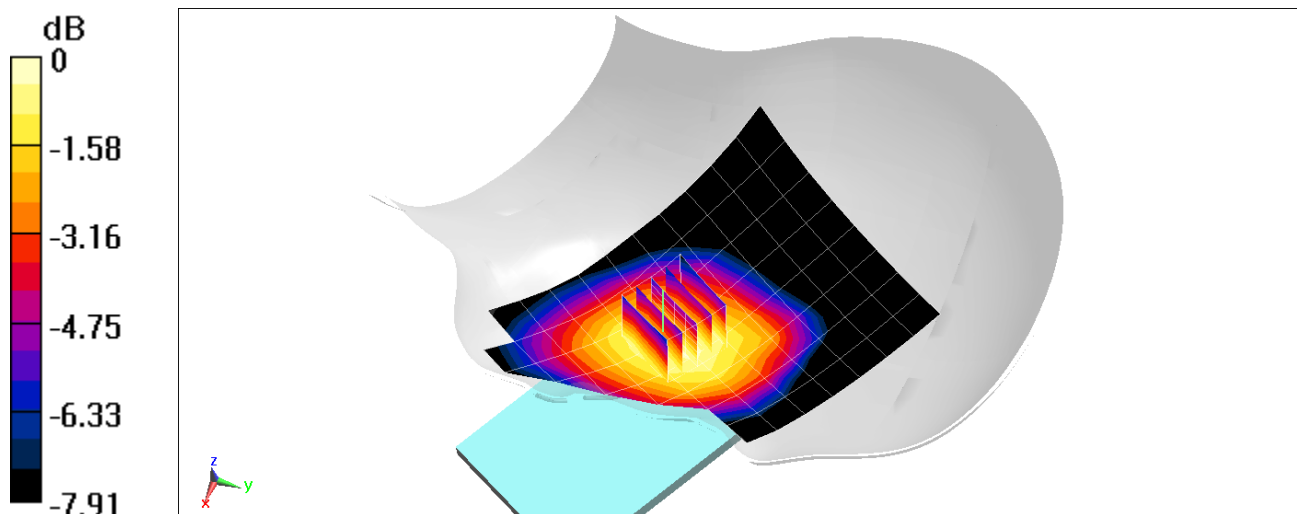
Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 14.29 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.186 W/kg

SAR(1 g) = 0.155 W/kg



0 dB = 0.177 W/kg = -7.52 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04823

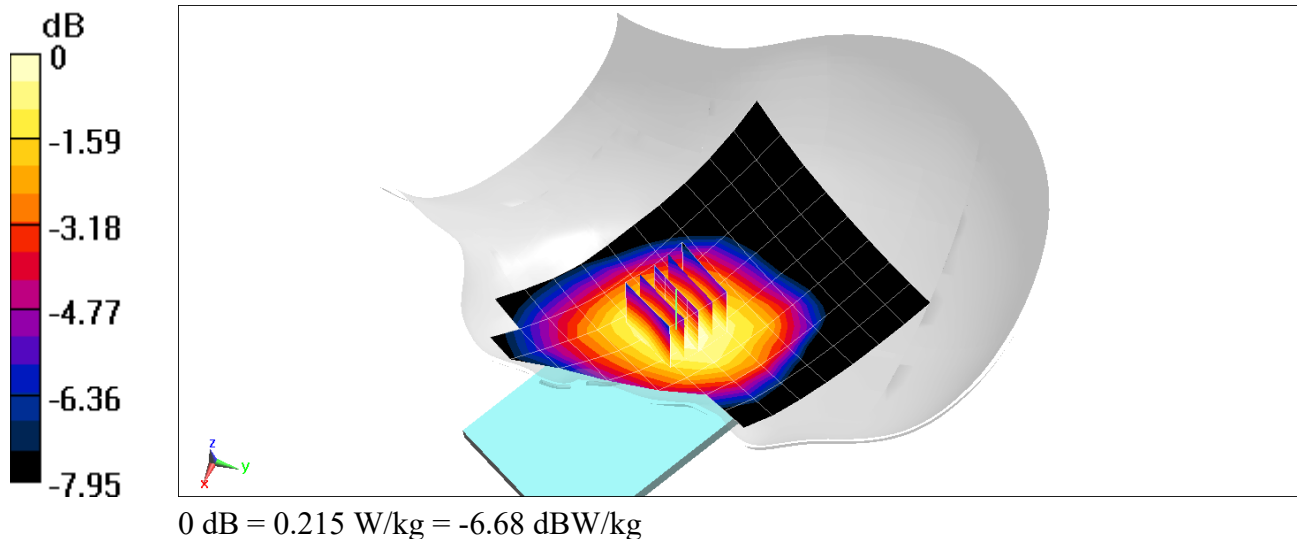
Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 700 Head; Medium parameters used (interpolated):
 $f = 707.5 \text{ MHz}$; $\sigma = 0.853 \text{ S/m}$; $\epsilon_r = 40.581$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

Test Date: 02-26-2020; Ambient Temp: 21.2°C; Tissue Temp: 20.40°C

Probe: EX3DV4 - SN7410; ConvF(9.95, 9.95, 9.95) @ 707.5 MHz; Calibrated: 7/16/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2019
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1966
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

**Mode: LTE Band 12, Left Head, Cheek, Mid.ch, QPSK, 10 MHz Bandwidth
1 RB, 25 RB Offset**

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 15.69 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 0.223 W/kg
SAR(1 g) = 0.192 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04823

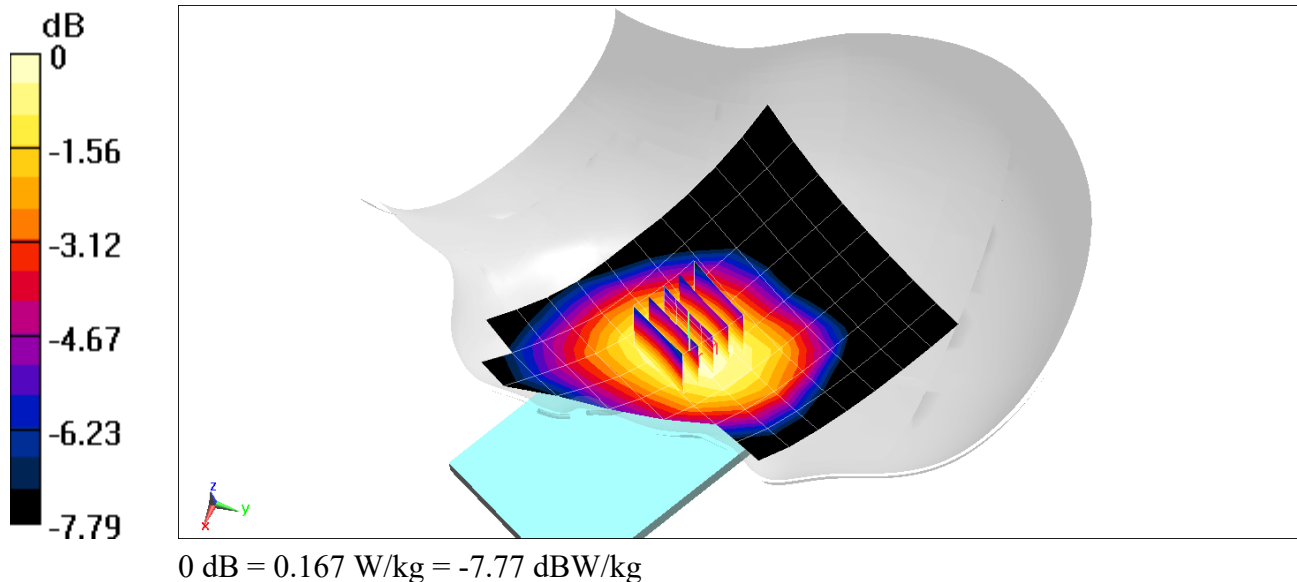
Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1
Medium: 700 Head; Medium parameters used (interpolated):
 $f = 782 \text{ MHz}$; $\sigma = 0.88 \text{ S/m}$; $\epsilon_r = 40.362$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

Test Date: 02-26-2020; Ambient Temp: 21.2°C; Tissue Temp: 20.40°C

Probe: EX3DV4 - SN7410; ConvF(9.95, 9.95, 9.95) @ 782 MHz; Calibrated: 7/16/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2019
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1966
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

**Mode: LTE Band 13, Left Head, Cheek, Mid.ch, QPSK, 10 MHz Bandwidth
1 RB, 25 RB Offset**

Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm
Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm
Reference Value = 13.67 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 0.174 W/kg
SAR(1 g) = 0.149 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04807

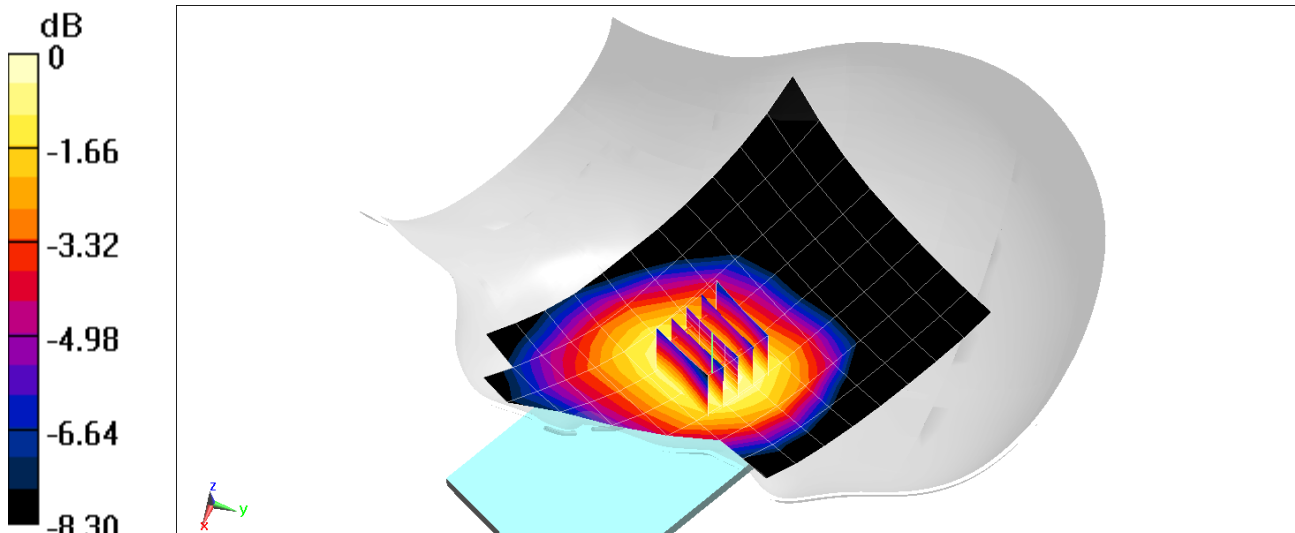
Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Head; Medium parameters used (interpolated):
 $f = 831.5 \text{ MHz}$; $\sigma = 0.917 \text{ S/m}$; $\epsilon_r = 40.671$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

Test Date: 02-28-2020; Ambient Temp:21.8°C; Tissue Temp: 20.0°C

Probe: EX3DV4 - SN7410; ConvF(9.88, 9.88, 9.88) @ 831.5 MHz; Calibrated: 7/16/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1322; Calibrated: 7/11/2019
Phantom: Twin-SAM V8.0; Type: QD 000 P41 Ax; Serial: 1966
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

**Mode: LTE Band 26 (Cell.), Left Head, Cheek, Mid.ch, 15 MHz Bandwidth
QPSK, 1 RB, 36 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 = 14.63 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 0.214 W/kg
SAR(1 g) = 0.172 W/kg



0 dB = 0.202 W/kg = -6.95 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04823

Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1745 MHz; Duty Cycle: 1:1

Medium: 1750Head; Medium parameters used:

$f = 1745 \text{ MHz}$; $\sigma = 1.359 \text{ S/m}$; $\epsilon_r = 38.991$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 03-02-2020; Ambient Temp: 22.2°C; Tissue Temp: 20.1°C

Probe: EX3DV4 - SN7410; ConvF(8.46, 8.46, 8.46) @ 1745 MHz; Calibrated: 7/16/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

**Mode: LTE Band 66 (AWS), Right Head, Cheek, Mid.ch, 20 MHz Bandwidth
QPSK, 1 RB, 50 RB Offset**

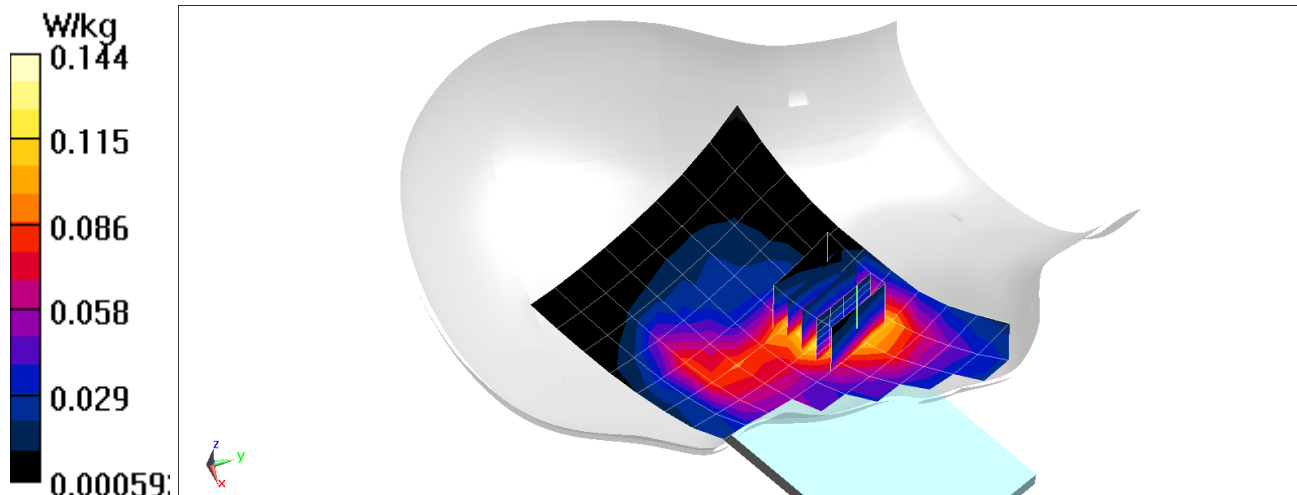
Area Scan (9x13x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 9.816 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.167 W/kg

SAR(1 g) = 0.108 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1905 MHz; Duty Cycle: 1:1

Medium: 1900 Head; Medium parameters used:

$f = 1905 \text{ MHz}$; $\sigma = 1.452 \text{ S/m}$; $\epsilon_r = 38.356$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Right Section

Test Date: 02-28-2020; Ambient Temp: 22.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7409; ConvF(8.01, 8.01, 8.01) @ 1905 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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

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

**Mode: LTE Band 25 (PCS), Right Head, Cheek, High.ch, 20 MHz Bandwidth
QPSK, 1 RB, 50 RB Offset**

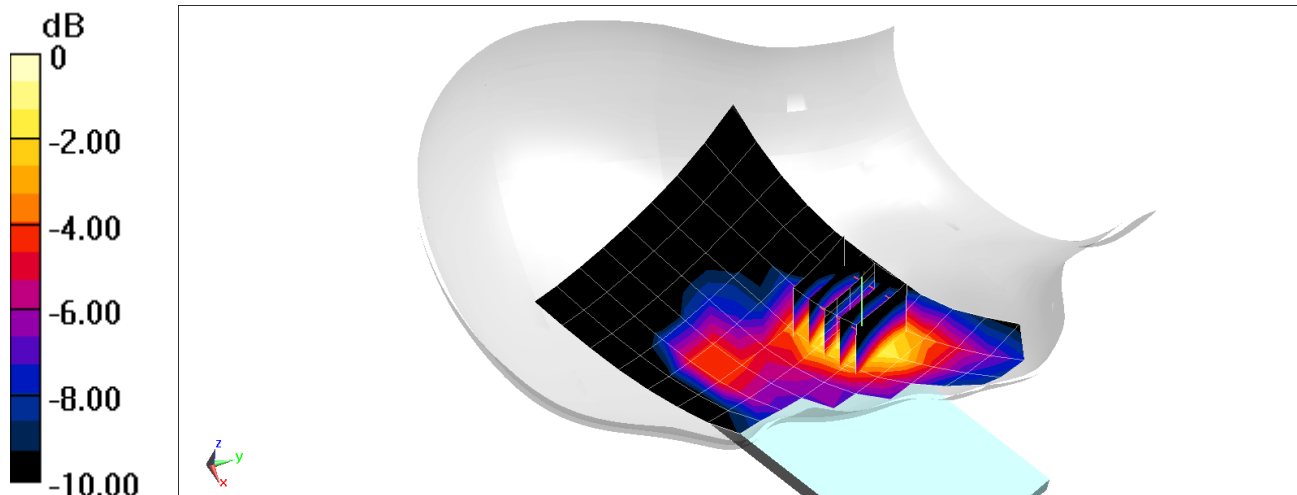
Area Scan (9x14x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 12.09 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 0.325 W/kg

SAR(1 g) = 0.202 W/kg



0 dB = 0.270 W/kg = -5.69 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

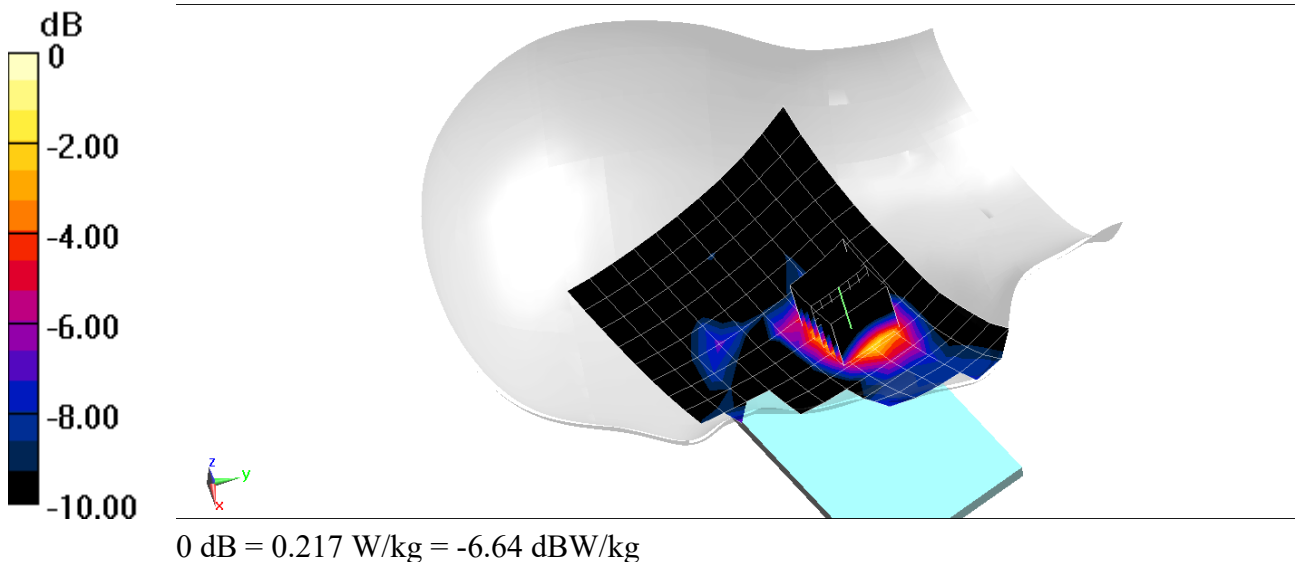
Communication System: UID 0, _LTE Band 41 (Class 2); Frequency: 2506 MHz; Duty Cycle: 1:2.31
Medium: 2450 Head; Medium parameters used (interpolated):
 $f = 2506$ MHz; $\sigma = 1.908$ S/m; $\epsilon_r = 38.506$; $\rho = 1000$ kg/m³
Phantom section: Right Section

Test Date: 03-10-2020; Ambient Temp: 23.7°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN3589; ConvF(6.85, 6.85, 6.85) @ 2506 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)

**Mode: LTE Band 41 PC2, Right Head, Cheek, Low.ch, 20 MHz Bandwidth
QPSK, 1 RB, 50 RB Offset**

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.835 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.260 W/kg
SAR(1 g) = 0.146 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04930

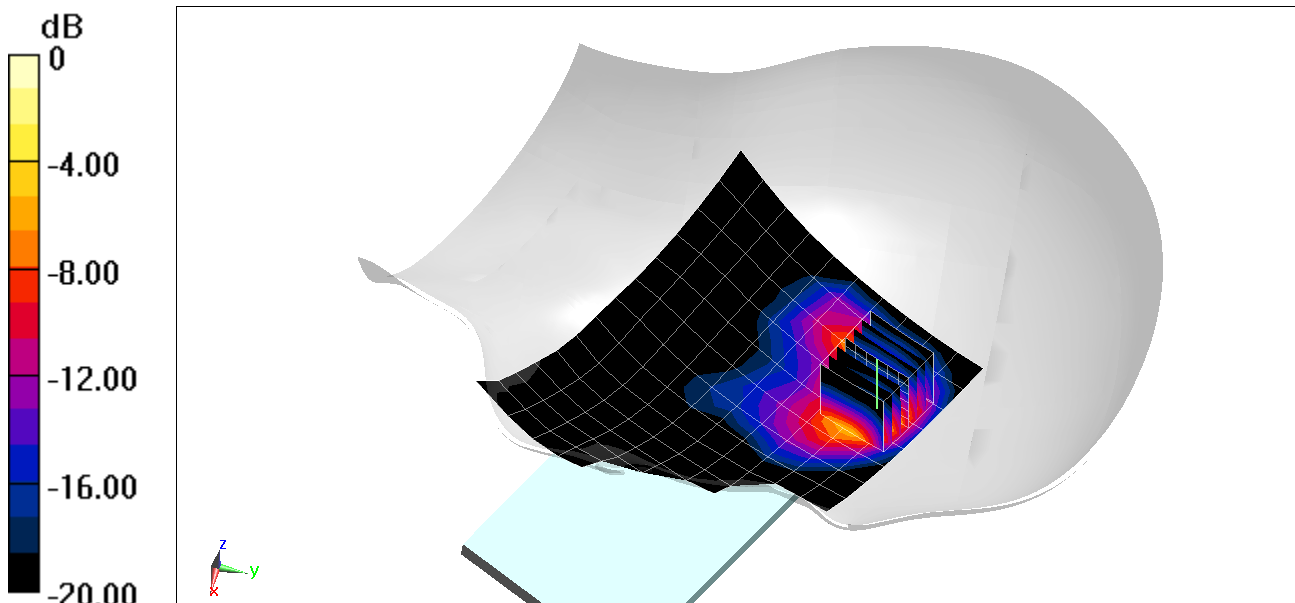
Communication System: UID 0, 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Head; Medium parameters used (interpolated):
 $f = 2437$ MHz; $\sigma = 1.852$ S/m; $\epsilon_r = 38.627$; $\rho = 1000$ kg/m³
Phantom section: Left Section

Test Date: 03-10-2020; Ambient Temp: 23.7°C; Tissue Temp: 23.4°C

Probe: EX3DV4 - SN3589; ConvF(6.85, 6.85, 6.85) @ 2437 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)

Mode: IEEE 802.11b, 22 MHz Bandwidth, Left Head, Cheek, Ch 6, 1 Mbps

Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm
Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 8.499 V/m; Power Drift = -0.18 dB
Peak SAR (extrapolated) = 2.81 W/kg
SAR(1 g) = 1.06 W/kg



0 dB = 2.13 W/kg = 3.28 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04930

Communication System: UID 0, 802.11n 5.2-5.8 GHz Band; Frequency: 5795 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Head; Medium parameters used:
 $f = 5795 \text{ MHz}$; $\sigma = 5.21 \text{ S/m}$; $\epsilon_r = 33.976$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Left Section

Test Date: 02-24-2020; Ambient Temp: 23.0°C; Tissue Temp: 20.3°C

Probe: EX3DV4 - SN7406; ConvF(5.23, 5.23, 5.23) @ 5795 MHz; Calibrated: 5/16/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn728; Calibrated: 5/8/2019
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)

Mode: IEEE 802.11n, U-NII-3, 40 MHz Bandwidth, Left Head, Cheek, Ch 159, 13.5 Mbps

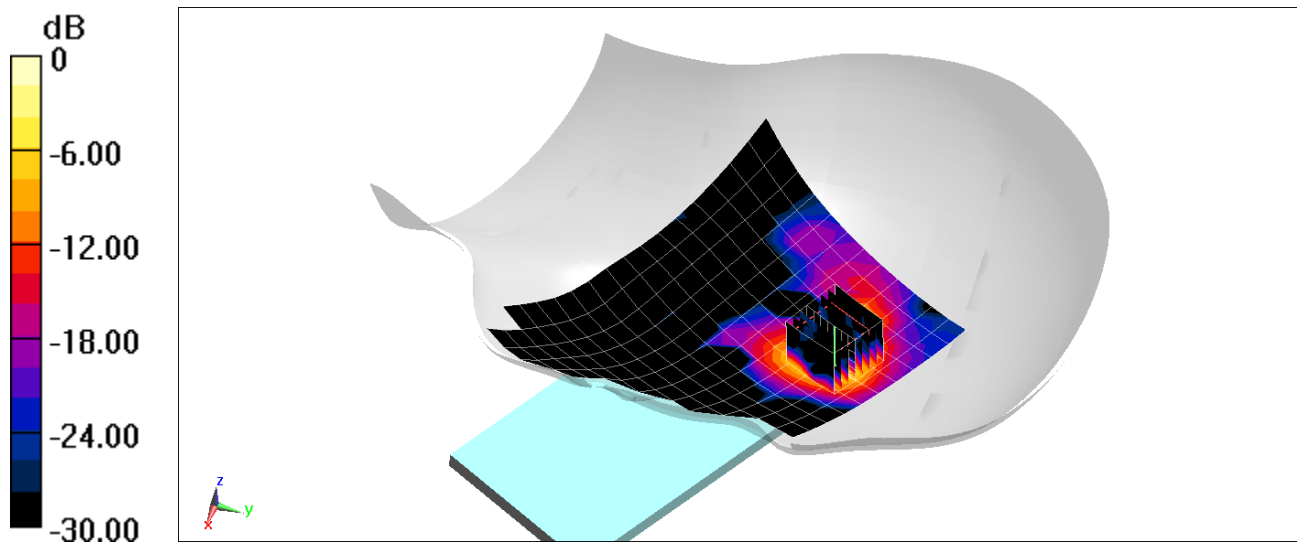
Area Scan (13x23x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Zoom Scan (8x8x7)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=1.4\text{mm}$; Graded Ratio: 1.4

Reference Value = 0.4240 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 3.81 W/kg

SAR(1 g) = 0.618 W/kg



0 dB = 1.95 W/kg = 2.90 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04922

Communication System: UID 0, Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1.305

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

$f = 2480$ MHz; $\sigma = 1.851$ S/m; $\epsilon_r = 38.378$; $\rho = 1000$ kg/m³

Phantom section: Left Section

Test Date: 03-02-2020; Ambient Temp: 22.5°C; Tissue Temp: 23.5°C

Probe: EX3DV4 - SN3589; ConvF(6.85, 6.85, 6.85) @ 2480 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)

Mode: Bluetooth, Left Head, Cheek, Ch 78, 1 Mbps

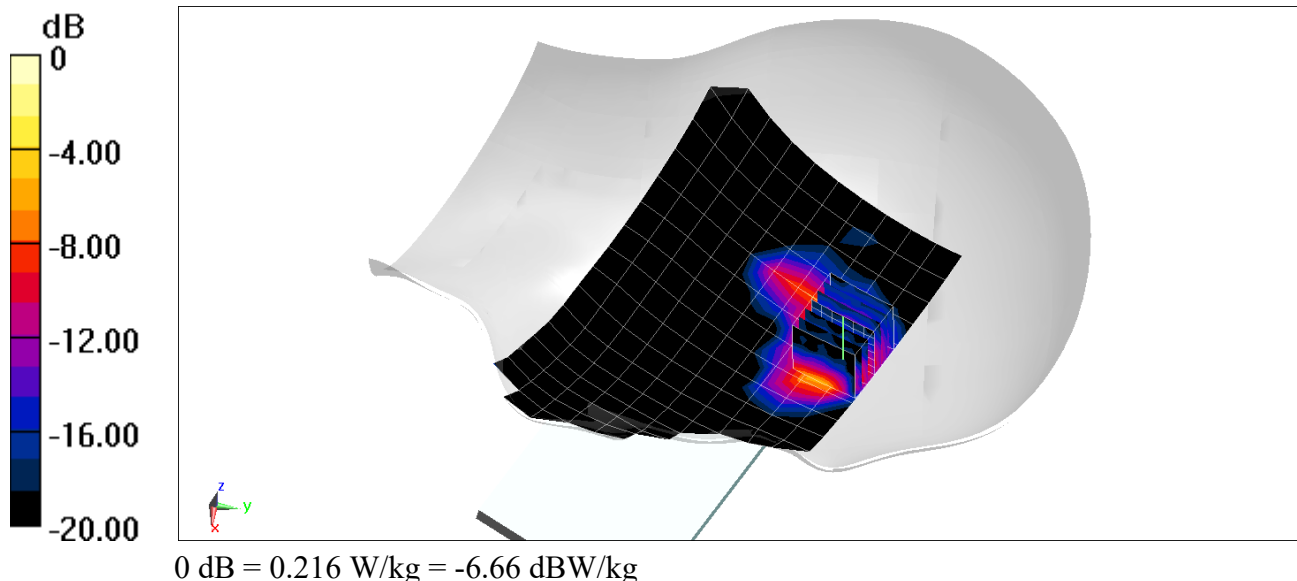
Area Scan (11x19x1): Measurement grid: dx=12mm, dy=12mm

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

Reference Value = 8.485 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 0.293 W/kg

SAR(1 g) = 0.114 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 836.6 MHz; Duty Cycle: 1:2.76

Medium: 835 Body; Medium parameters used (interpolated):

$f = 836.6$ MHz; $\sigma = 0.964$ S/m; $\epsilon_r = 53.91$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-09-2020; Ambient Temp: 21.6°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN7488; ConvF(11.04, 11.04, 11.04) @ 836.6 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)

Mode: GPRS 850, Body SAR, Back side, Mid.ch, 3 Tx Slots

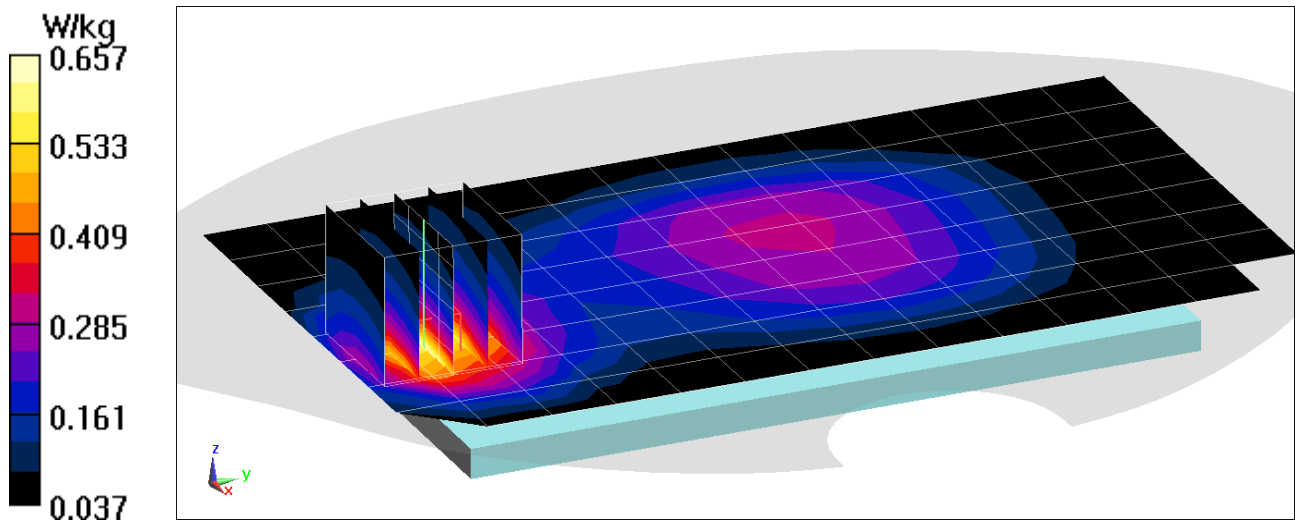
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 22.95 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.759 W/kg

SAR(1 g) = 0.473 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 1880 MHz; Duty Cycle: 1:2.76

Medium: 1900 Body; Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.552 \text{ S/m}$; $\epsilon_r = 51.904$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-11-2020; Ambient Temp: 23.0°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1880 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

Mode: GPRS 1900, Body SAR, Back side, Mid.ch, 3 Tx Slots

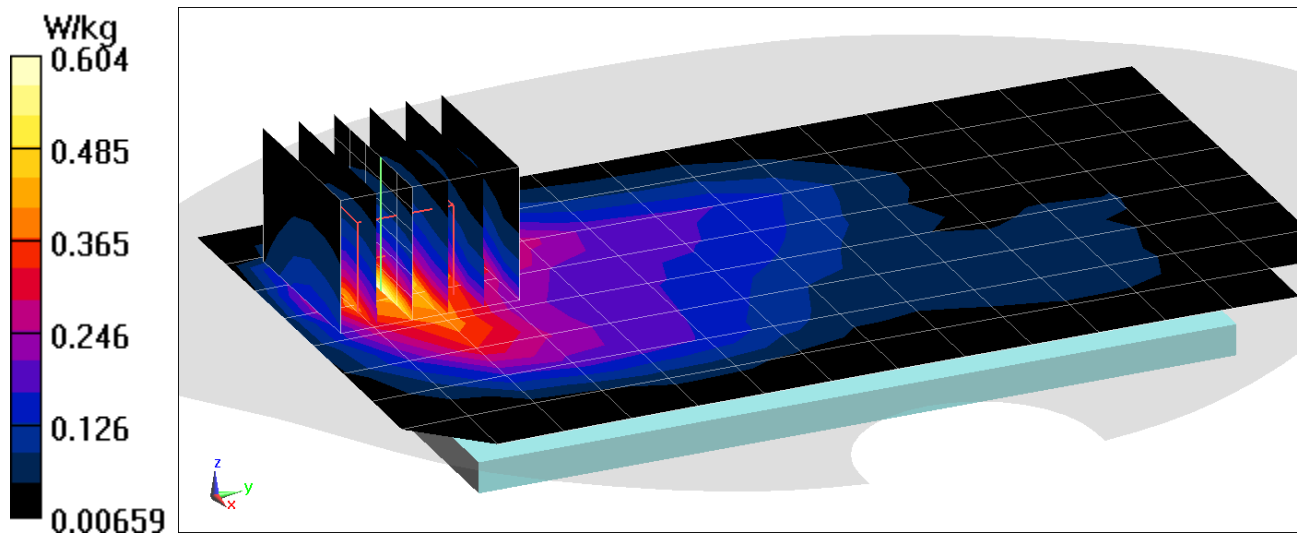
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 15.76 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.726 W/kg

SAR(1 g) = 0.409 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, GSM GPRS; 3 Tx slots; Frequency: 1850.2 MHz; Duty Cycle: 1:2.76

Medium parameters used (interpolated):

$f = 1850.2$ MHz; $\sigma = 1.518$ S/m; $\epsilon_r = 52.006$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-11-2020; Ambient Temp: 23.0°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1850.2 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

Mode: GPRS 1900, Body SAR, Bottom Edge, Low.ch, 3 Tx Slots

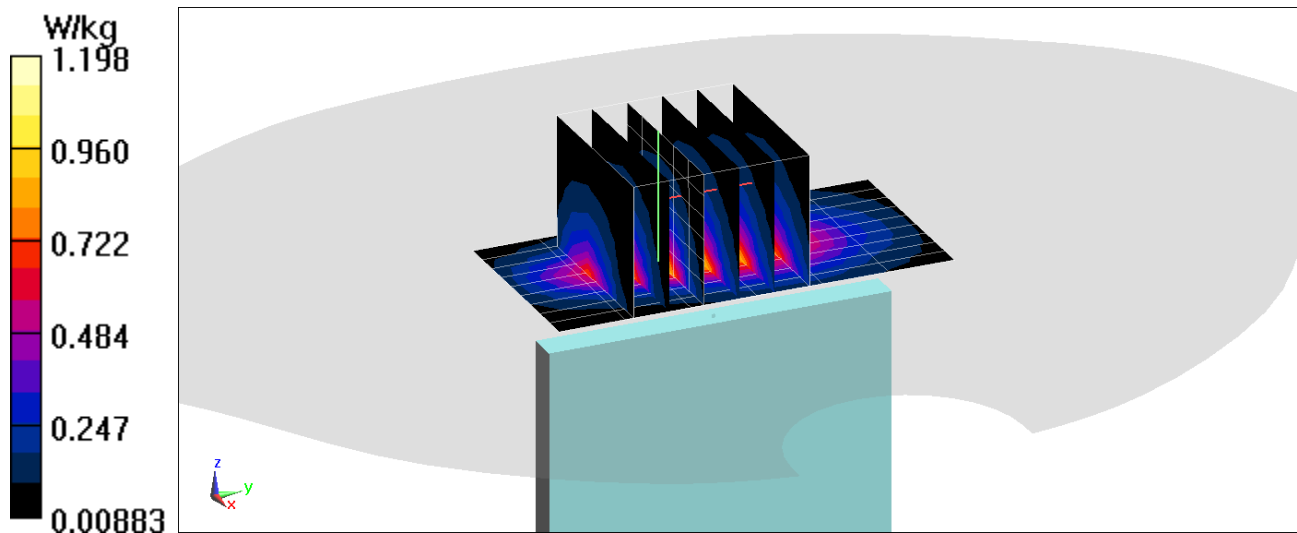
Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 24.22 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 1.42 W/kg

SAR(1 g) = 0.785 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04807

Communication System: UID 0, UMTS; Frequency: 836.6 MHz; Duty Cycle: 1:1

Medium: 835 Body; Medium parameters used (interpolated):

$f = 836.6 \text{ MHz}$; $\sigma = 0.961 \text{ S/m}$; $\epsilon_r = 53.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2020; Ambient Temp: 23.1°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN7551; ConvF(9.92, 9.92, 9.92) @ 836.6 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

Mode: UMTS 850, Body SAR, Back side, Mid.ch

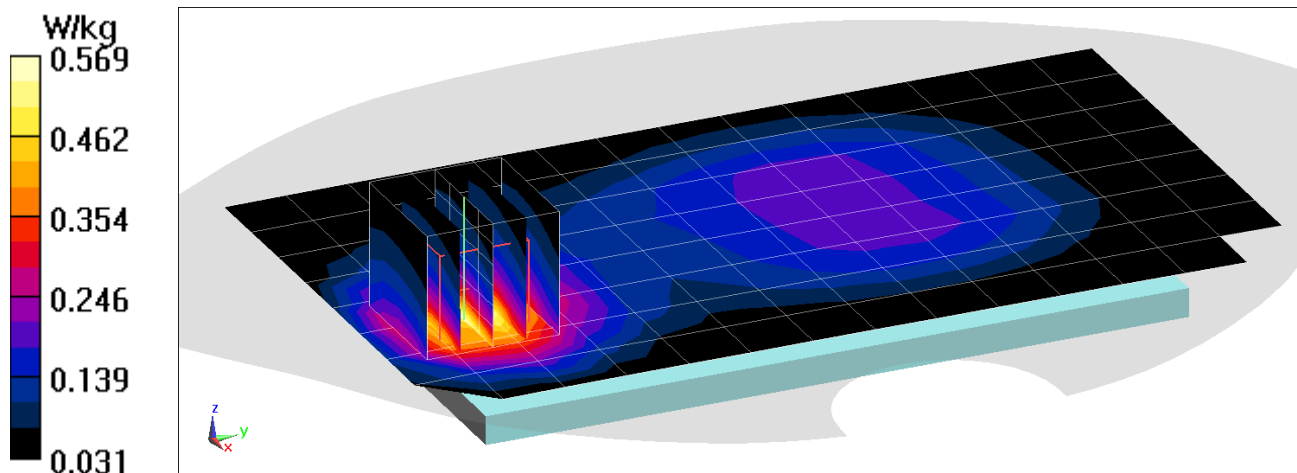
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 21.01 V/m; Power Drift = 0.04 dB

Peak SAR (extrapolated) = 0.660 W/kg

SAR(1 g) = 0.407 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body; Medium parameters used (interpolated):
 $f = 1732.4 \text{ MHz}$; $\sigma = 1.448 \text{ S/m}$; $\epsilon_r = 55.781$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-02-2020; Ambient Temp: 22.8°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7357; ConvF(8.26, 8.26, 8.26) @ 1732.4 MHz; Calibrated: 4/24/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/18/2019
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: UMTS 1750, Body SAR, Back side, Mid.ch

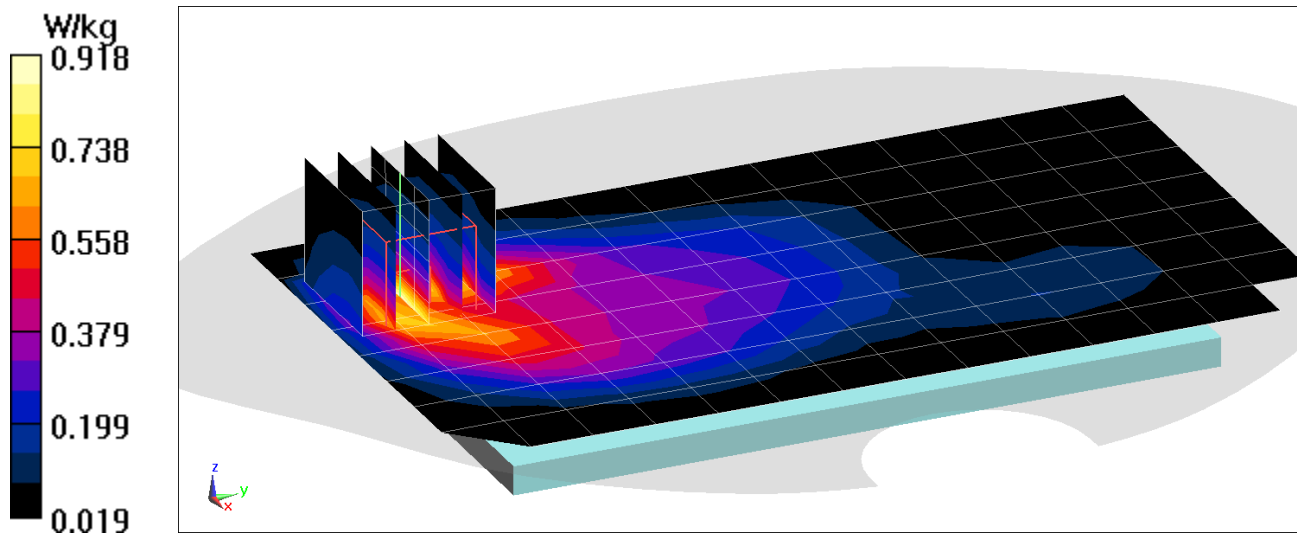
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 22.07 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 1.07 W/kg

SAR(1 g) = 0.622 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, UMTS; Frequency: 1732.4 MHz; Duty Cycle: 1:1
Medium: 1750 Body; Medium parameters used (interpolated):
 $f = 1732.4$ MHz; $\sigma = 1.448$ S/m; $\epsilon_r = 55.781$; $\rho = 1000$ kg/m³
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-02-2020; Ambient Temp: 22.8°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7357; ConvF(8.26, 8.26, 8.26) @ 1732.4 MHz; Calibrated: 4/24/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1407; Calibrated: 4/18/2019
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: UMTS 1750, Body SAR, Bottom Edge, Mid.ch

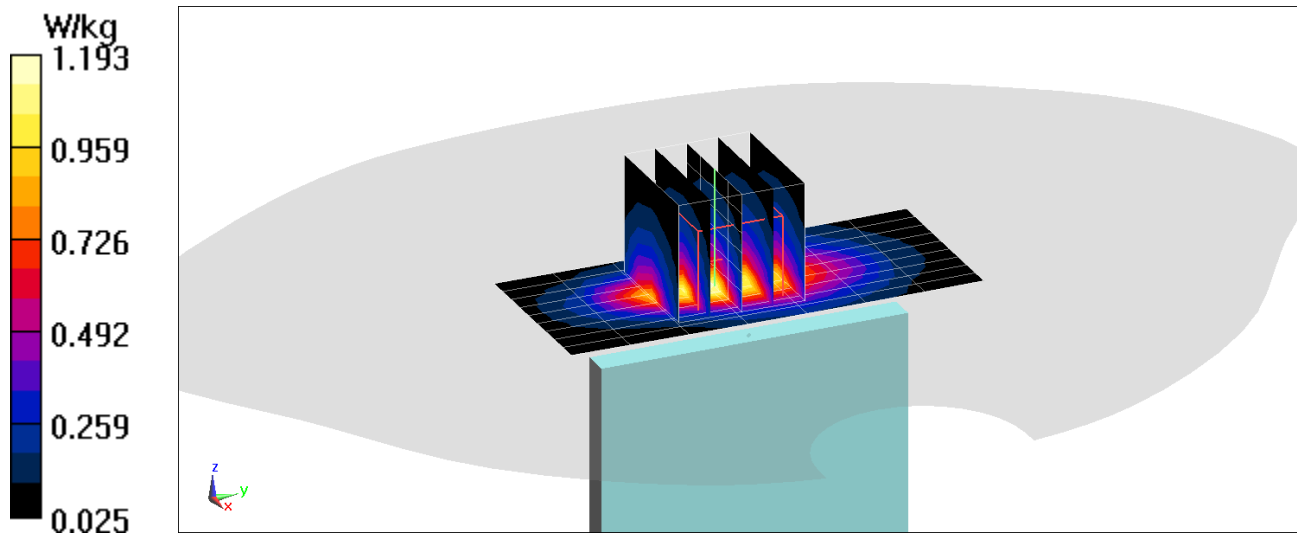
Area Scan (10x8x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 24.77 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 1.39 W/kg

SAR(1 g) = 0.809 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04807

Communication System: UID 0, UMTS; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
 $f = 1852.4$ MHz; $\sigma = 1.477$ S/m; $\epsilon_r = 52.311$; $\rho = 1000$ kg/m³
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-09-2020; Ambient Temp: 22.0°C; Tissue Temp: 24.5°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1852.4 MHz; Calibrated: 9/19/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/17/2019
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

Mode: UMTS 1900, Body SAR, Back side, Low.ch

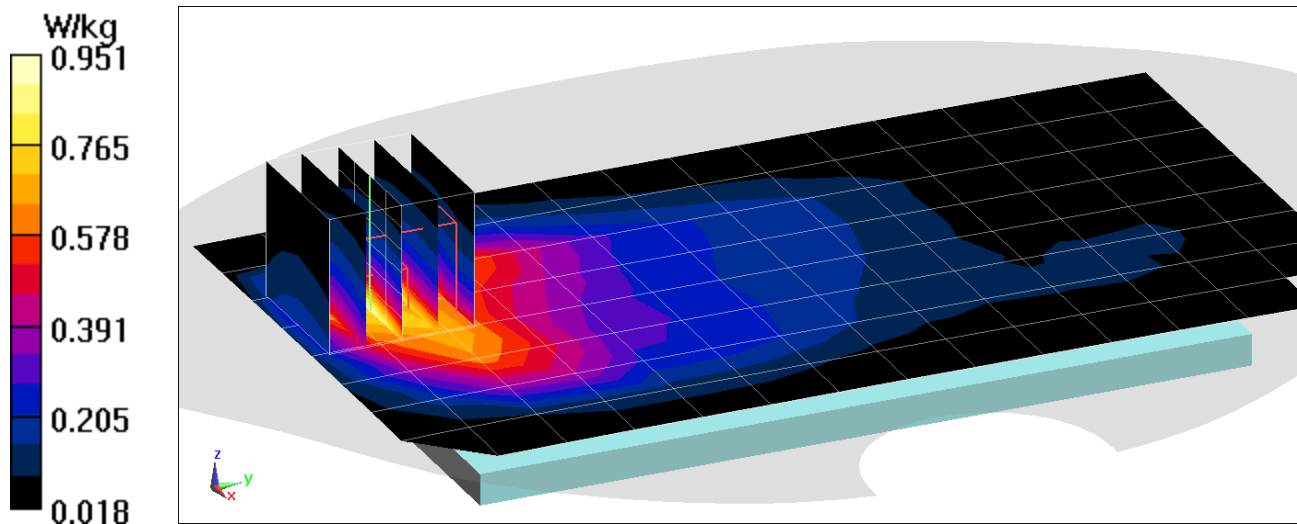
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 22.17 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 1.13 W/kg

SAR(1 g) = 0.662 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04807

Communication System: UID 0, UMTS; Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
 $f = 1852.4 \text{ MHz}$; $\sigma = 1.477 \text{ S/m}$; $\epsilon_r = 52.311$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-09-2020; Ambient Temp: 22.0°C; Tissue Temp: 24.5°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1852.4 MHz; Calibrated: 9/19/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/17/2019
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

Mode: UMTS 1900, Body SAR, Bottom Edge, Low.ch

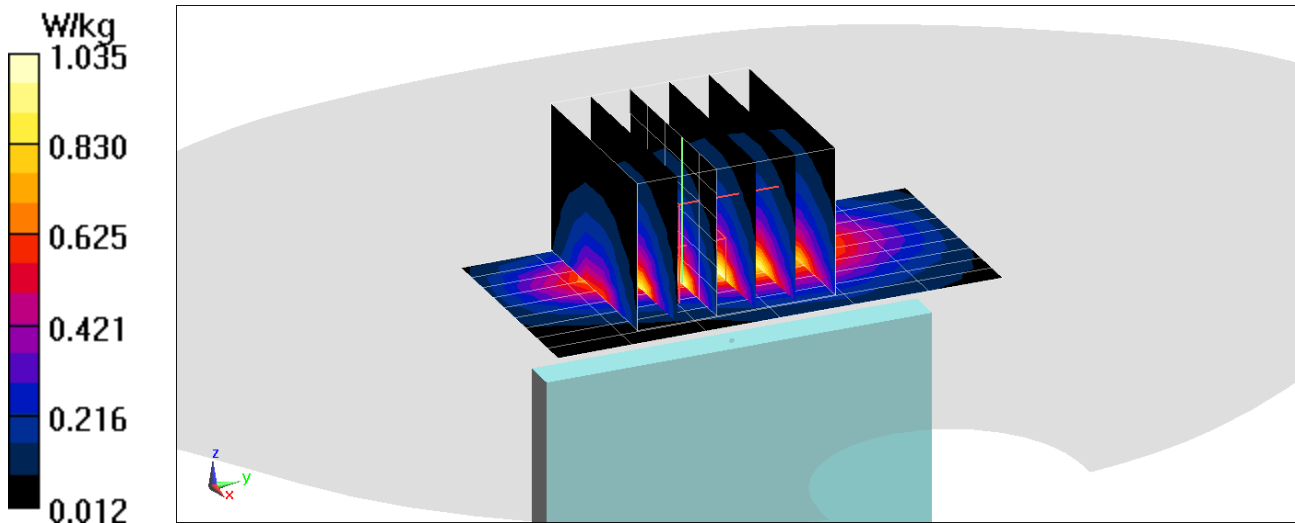
Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 22.22 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 1.35 W/kg

SAR(1 g) = 0.748 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
 $f = 820.1$ MHz; $\sigma = 0.943$ S/m; $\epsilon_r = 53.402$; $\rho = 1000$ kg/m³
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-11-2020; Ambient Temp: 21.9°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7488; ConvF(11.04, 11.04, 11.04) @ 820.1 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)

Mode: Cell. CDMA BC10, Body SAR, Back side, Mid.ch

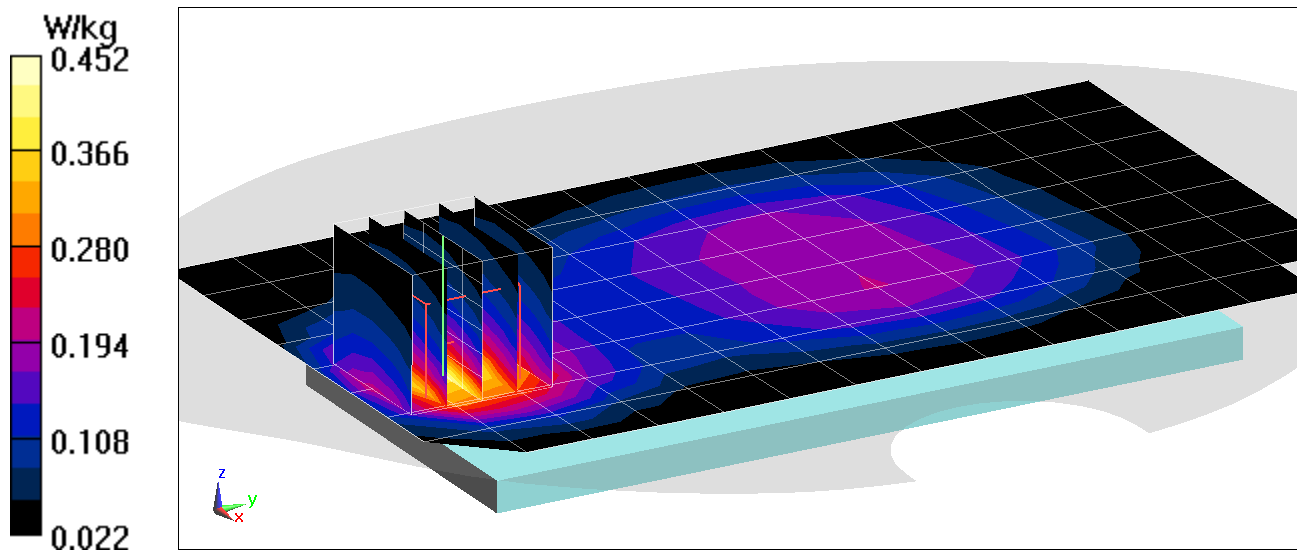
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 19.35 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.520 W/kg

SAR(1 g) = 0.324 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, CDMA; Frequency: 820.1 MHz; Duty Cycle: 1:1

Medium: 835 Body; Medium parameters used (interpolated):

$f = 820.1 \text{ MHz}$; $\sigma = 0.943 \text{ S/m}$; $\epsilon_r = 53.402$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-11-2020; Ambient Temp: 21.9°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7488; ConvF(11.04, 11.04, 11.04) @ 820.1 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)

Mode: Cell. EVDO BC10, Body SAR, Back side, Mid.ch

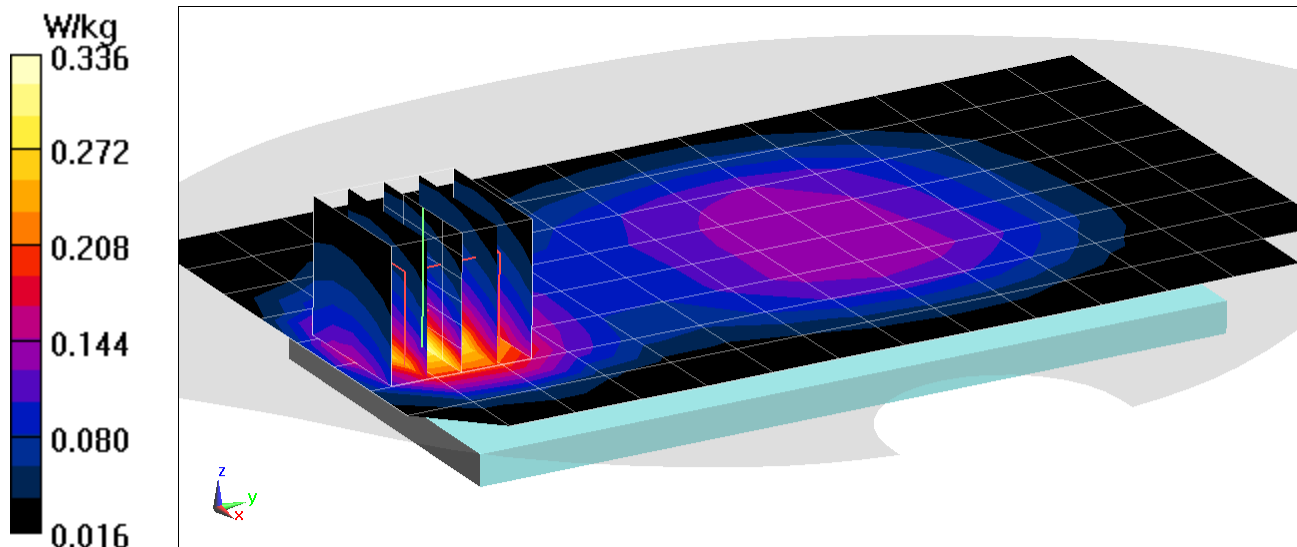
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 16.52 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.389 W/kg

SAR(1 g) = 0.245 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
 $f = 836.52 \text{ MHz}$; $\sigma = 0.96 \text{ S/m}$; $\epsilon_r = 53.237$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-11-2020; Ambient Temp: 21.9°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN7488; ConvF(11.04, 11.04, 11.04) @ 836.52 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)

Mode: Cell. CDMA, BC 0, Body SAR, Back side, Mid.ch

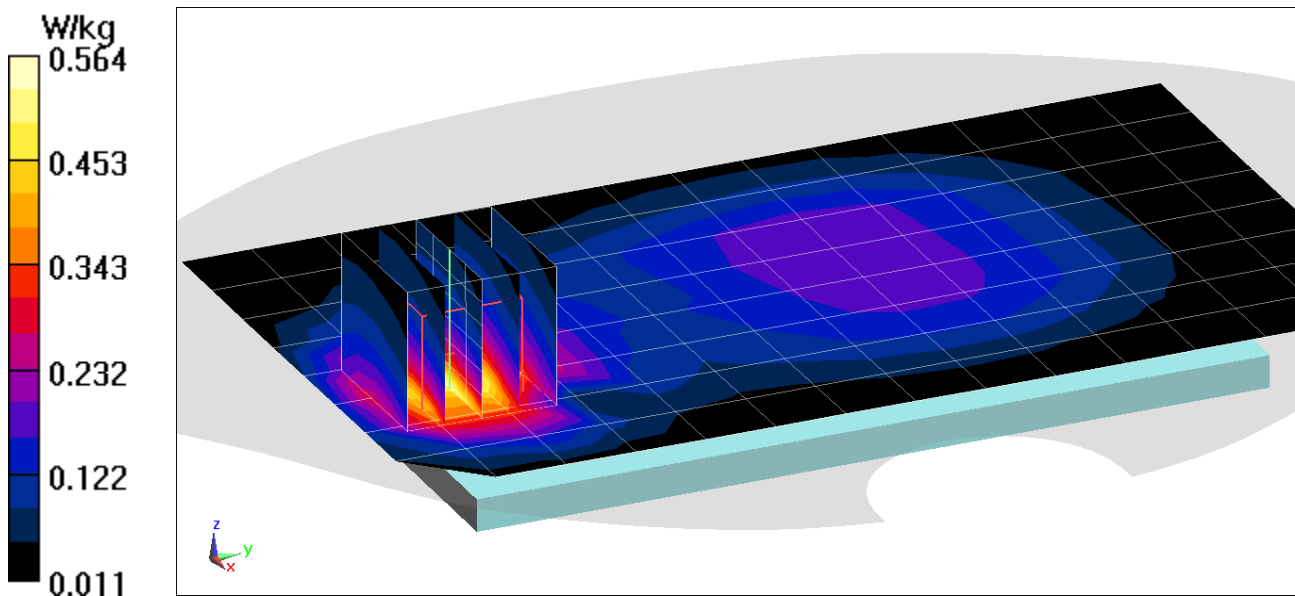
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 21.23 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.651 W/kg

SAR(1 g) = 0.408 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, CDMA; Frequency: 836.52 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
 $f = 836.52$ MHz; $\sigma = 0.964$ S/m; $\epsilon_r = 53.911$; $\rho = 1000$ kg/m³
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-09-2020; Ambient Temp: 21.6°C; Tissue Temp: 21.0°C

Probe: EX3DV4 - SN7488; ConvF(11.04, 11.04, 11.04) @ 836.52 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)

Mode: Cell. EVDO, BC 0, Body SAR, Bottom Edge, Mid.ch

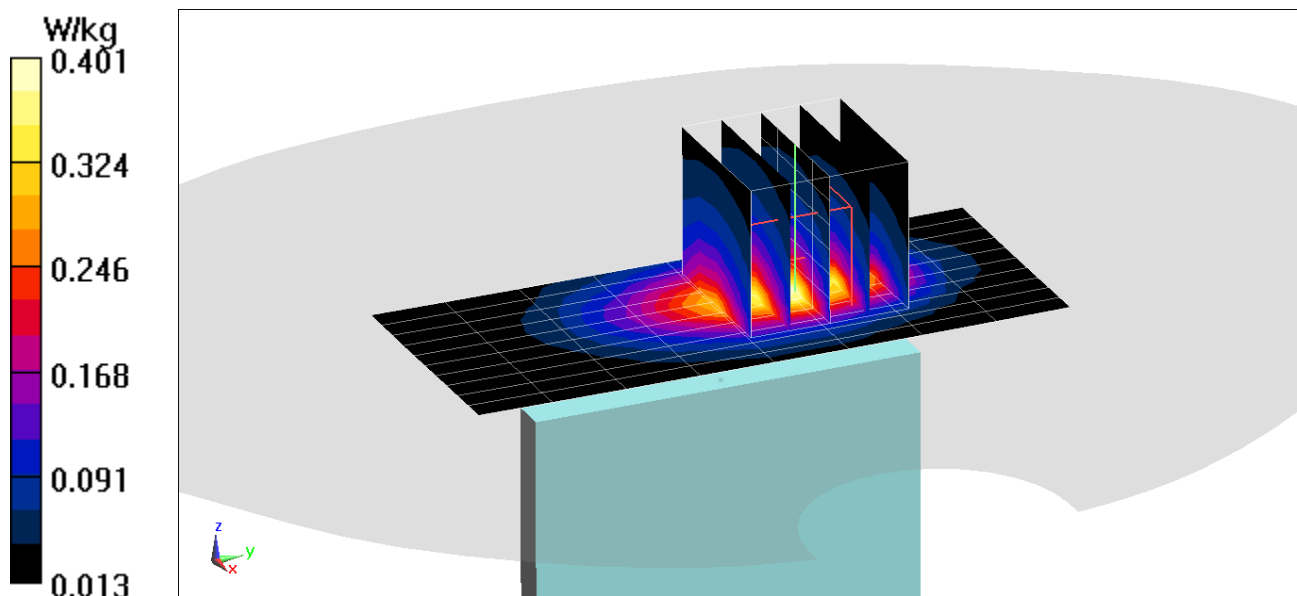
Area Scan (11x9x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 17.41 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.478 W/kg

SAR(1 g) = 0.274 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, CDMA; Frequency: 1851.25 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
 $f = 1851.25 \text{ MHz}$; $\sigma = 1.52 \text{ S/m}$; $\epsilon_r = 52.003$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-11-2020; Ambient Temp: 23.0°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1851.25 MHz; Calibrated: 9/19/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/17/2019
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

Mode: PCS CDMA, Body SAR, Back side, Low.ch

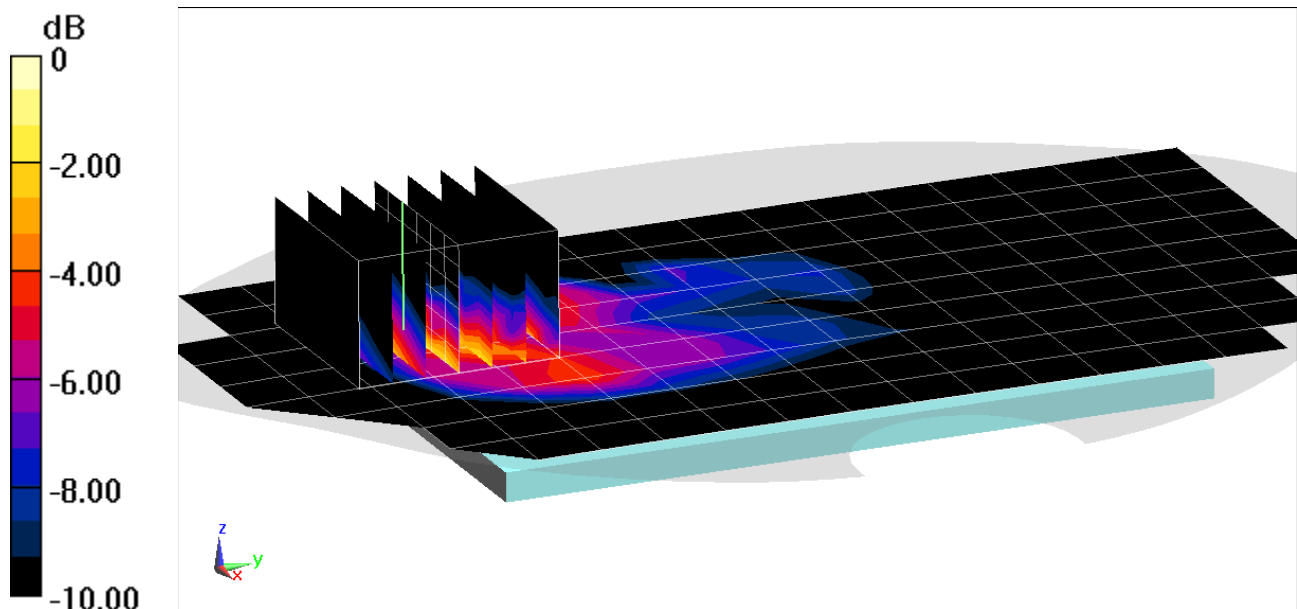
Area Scan (10x18x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 22.96 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 1.36 W/kg

SAR(1 g) = 0.761 W/kg



0 dB = 1.13 W/kg = 0.53 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, CDMA; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: 1900 Body; Medium parameters used:

$f = 1880 \text{ MHz}$; $\sigma = 1.552 \text{ S/m}$; $\epsilon_r = 51.904$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-11-2020; Ambient Temp: 23.0°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1880 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

Mode: PCS EVDO, Body SAR, Bottom Edge, Mid.ch

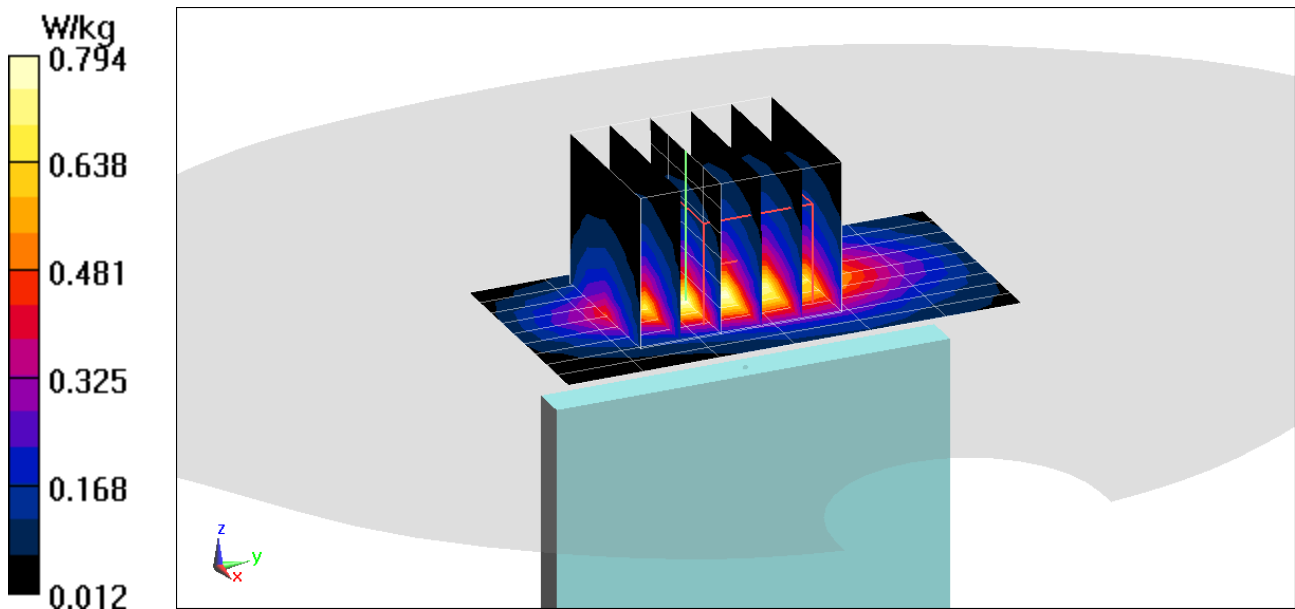
Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 19.36 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.951 W/kg

SAR(1 g) = 0.533 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, LTE Band 71; Frequency: 680.5 MHz; Duty Cycle: 1:1
Medium: 700 Body; Medium parameters used (interpolated):
 $f = 680.5 \text{ MHz}$; $\sigma = 0.952 \text{ S/m}$; $\epsilon_r = 53.313$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-26-2020; Ambient Temp: 22.7°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3589; ConvF(8.49, 8.49, 8.49) @ 680.5 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)

**Mode: LTE Band 71, Body SAR, Back side, Mid.ch, 20 MHz Bandwidth
QPSK, 1 RB, 50 RB Offset**

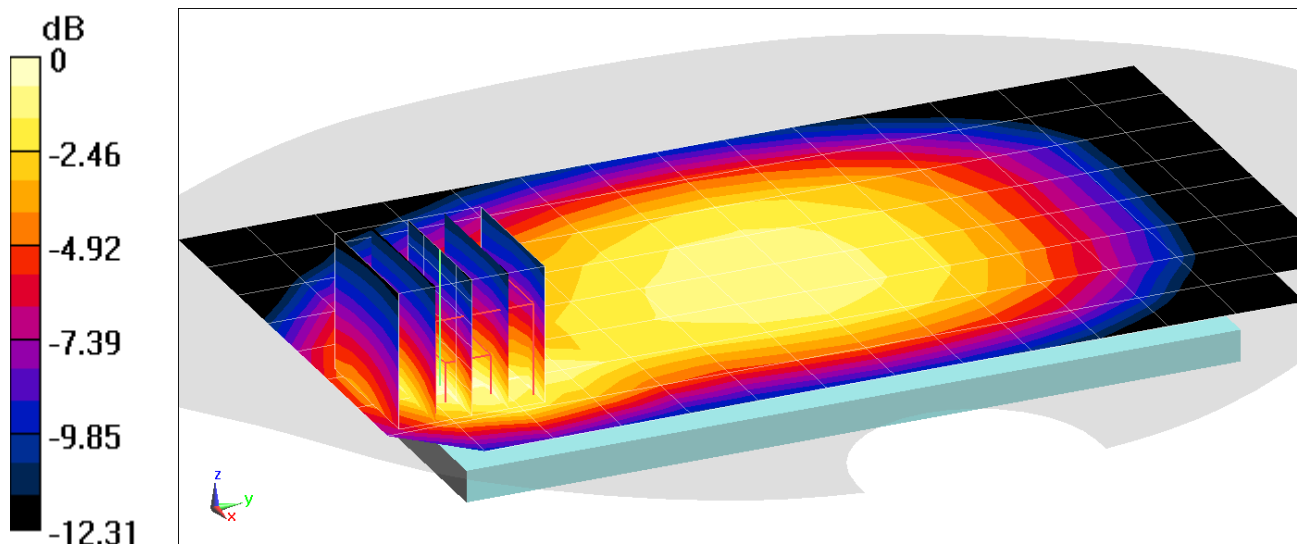
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 17.68 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.501 W/kg

SAR(1 g) = 0.280 W/kg



0 dB = 0.413 W/kg = -3.84 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, LTE Band 71; Frequency: 680.5 MHz; Duty Cycle: 1:1
Medium: 700 Body; Medium parameters used (interpolated):
 $f = 680.5 \text{ MHz}$; $\sigma = 0.952 \text{ S/m}$; $\epsilon_r = 53.313$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section: Space: 1.0 cm

Test Date: 02-26-2020; Ambient Temp: 22.7°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3589; ConvF(8.49, 8.49, 8.49) @ 680.5 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)

**Mode: LTE Band 71, Body SAR, Left Edge, Mid.ch, 20 MHz Bandwidth
QPSK, 1 RB, 50 RB Offset**

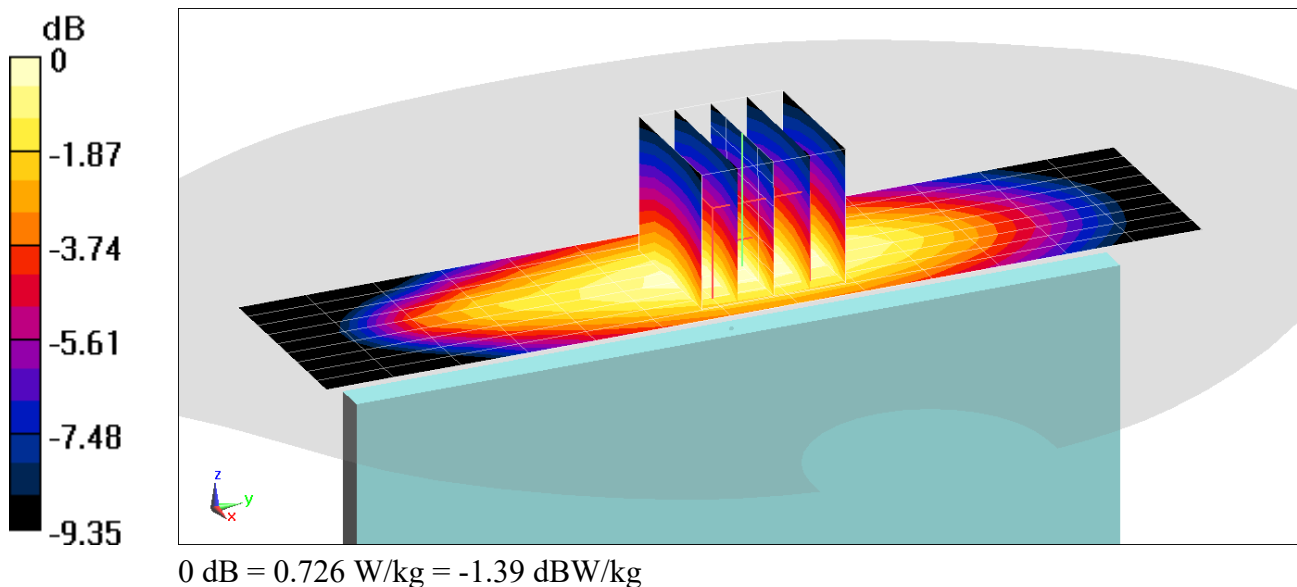
Area Scan (10x14x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 24.28 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.836 W/kg

SAR(1 g) = 0.544 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 700 Body; Medium parameters used (interpolated):
 $f = 707.5$ MHz; $\sigma = 0.961$ S/m; $\epsilon_r = 53.237$; $\rho = 1000$ kg/m³
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-26-2020; Ambient Temp: 22.7°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3589; ConvF(8.49, 8.49, 8.49) @ 707.5 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)

**Mode: LTE Band 12, Body SAR, Back side, Mid.ch, 10 MHz Bandwidth
QPSK, 1 RB, 25 RB Offset**

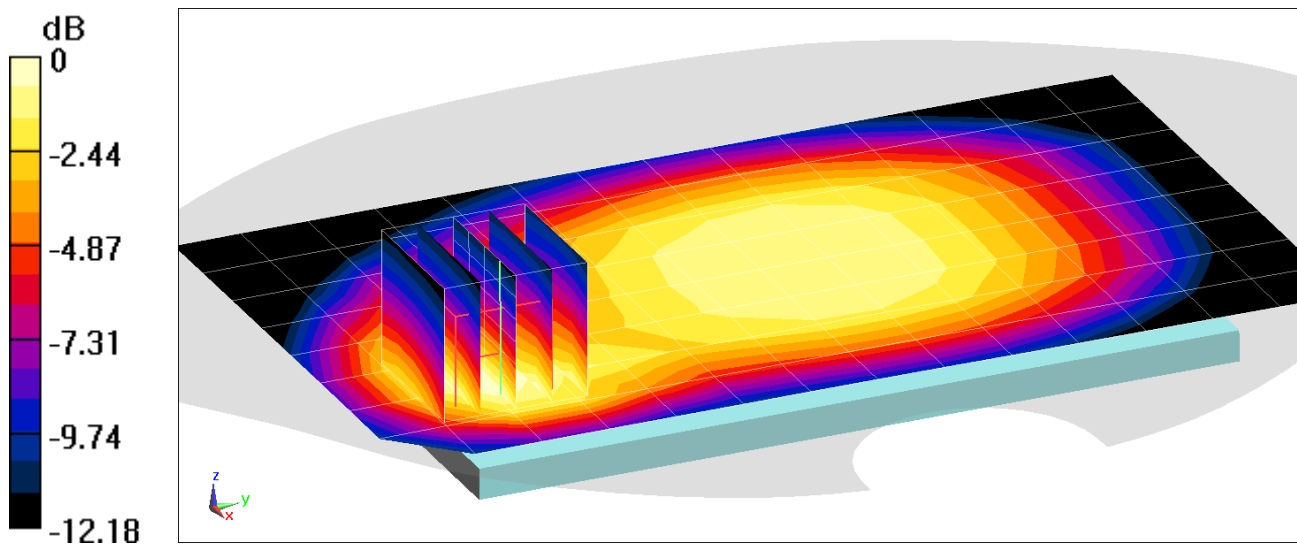
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 17.85 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.528 W/kg

SAR(1 g) = 0.299 W/kg



0 dB = 0.428 W/kg = -3.69 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, LTE Band 12; Frequency: 707.5 MHz; Duty Cycle: 1:1
Medium: 700 Body; Medium parameters used (interpolated):
 $f = 707.5$ MHz; $\sigma = 0.961$ S/m; $\epsilon_r = 53.237$; $\rho = 1000$ kg/m³
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-26-2020; Ambient Temp: 22.7°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3589; ConvF(8.49, 8.49, 8.49) @ 707.5 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)

**Mode: LTE Band 12, Body SAR, Left Edge, Mid.ch, 10 MHz Bandwidth
QPSK, 1 RB, 25 RB Offset**

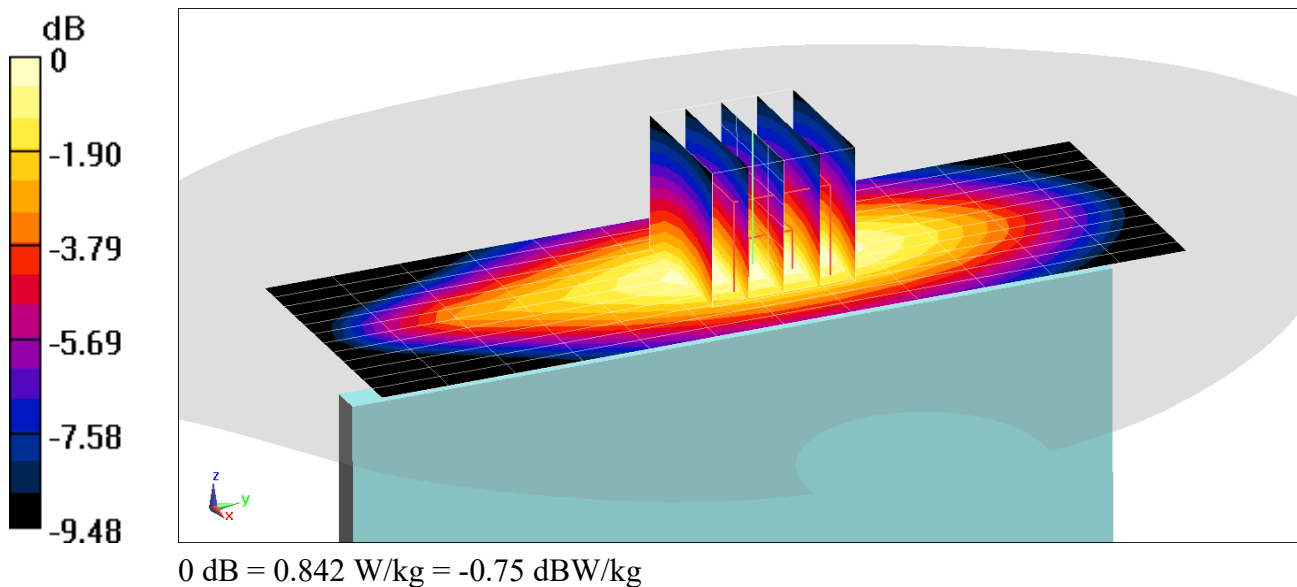
Area Scan (13x13x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 26.02 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.969 W/kg

SAR(1 g) = 0.636 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1

Medium: 700 Body; Medium parameters used (interpolated):

$f = 782 \text{ MHz}$; $\sigma = 0.988 \text{ S/m}$; $\epsilon_r = 53.039$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-26-2020; Ambient Temp: 22.7°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3589; ConvF(8.49, 8.49, 8.49) @ 782 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)

**Mode: LTE Band 13, Body SAR, Back side, Mid.ch, 10 MHz Bandwidth
QPSK, 1 RB, 25 RB Offset**

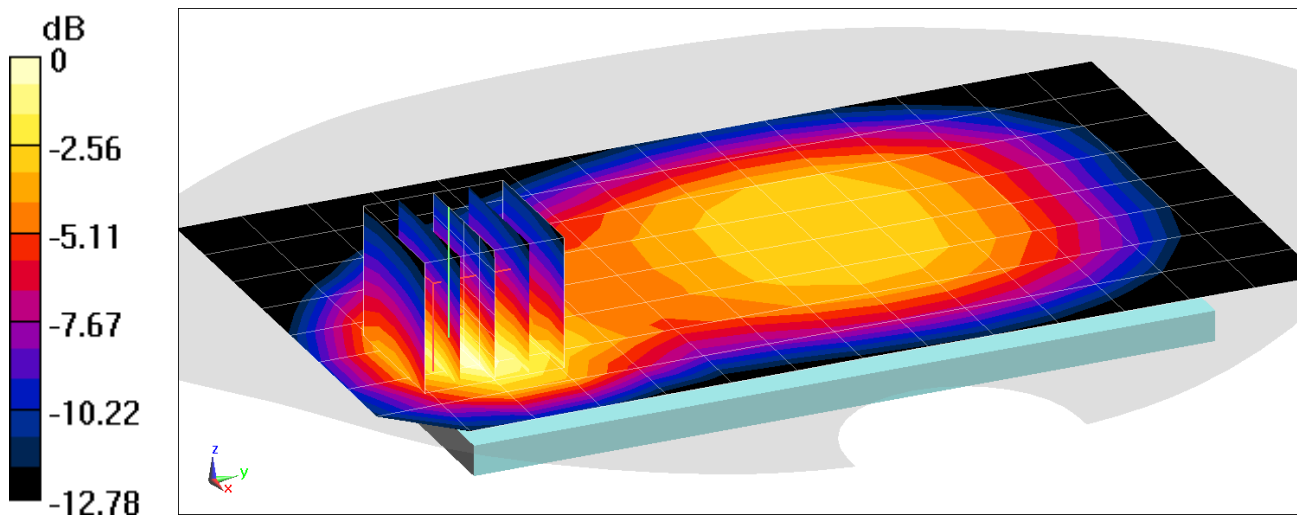
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 17.65 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.514 W/kg

SAR(1 g) = 0.296 W/kg



0 dB = 0.430 W/kg = -3.67 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04815

Communication System: UID 0, LTE Band 13; Frequency: 782 MHz; Duty Cycle: 1:1

Medium: 700 Body; Medium parameters used (interpolated):

$f = 782 \text{ MHz}$; $\sigma = 0.988 \text{ S/m}$; $\epsilon_r = 53.039$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-26-2020; Ambient Temp: 22.7°C; Tissue Temp: 21.4°C

Probe: EX3DV4 - SN3589; ConvF(8.49, 8.49, 8.49) @ 782 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)

**Mode: LTE Band 13, Body SAR, Bottom Edge, Mid.ch, 10 MHz Bandwidth
QPSK, 1 RB, 25 RB Offset**

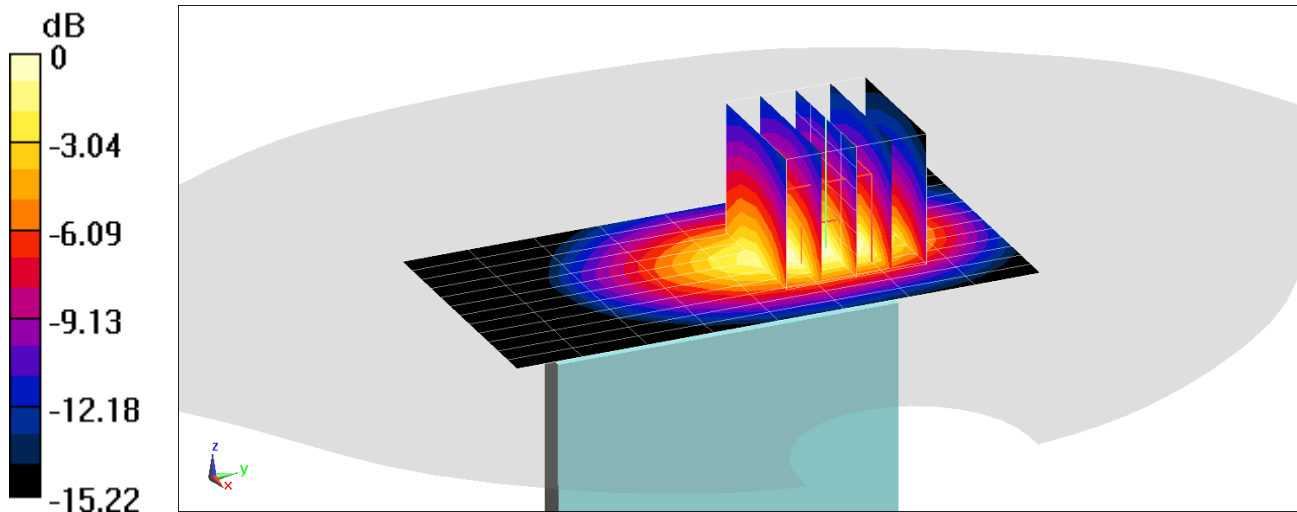
Area Scan (13x9x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 18.81 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.625 W/kg

SAR(1 g) = 0.329 W/kg



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

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04807

Communication System: UID 0, LTE Band 26; Frequency: 831.5 MHz; Duty Cycle: 1:1
Medium: 835 Body; Medium parameters used (interpolated):
 $f = 831.5 \text{ MHz}$; $\sigma = 0.955 \text{ S/m}$; $\epsilon_r = 53.456$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-27-2020; Ambient Temp: 23.1°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN7551; ConvF(9.92, 9.92, 9.92) @ 831.5 MHz; Calibrated: 9/19/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/17/2019
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

**Mode: LTE Band 26 (Cell.), Body SAR, Back side, Mid.ch, 15 MHz Bandwidth
QPSK, 1 RB, 36 RB Offset**

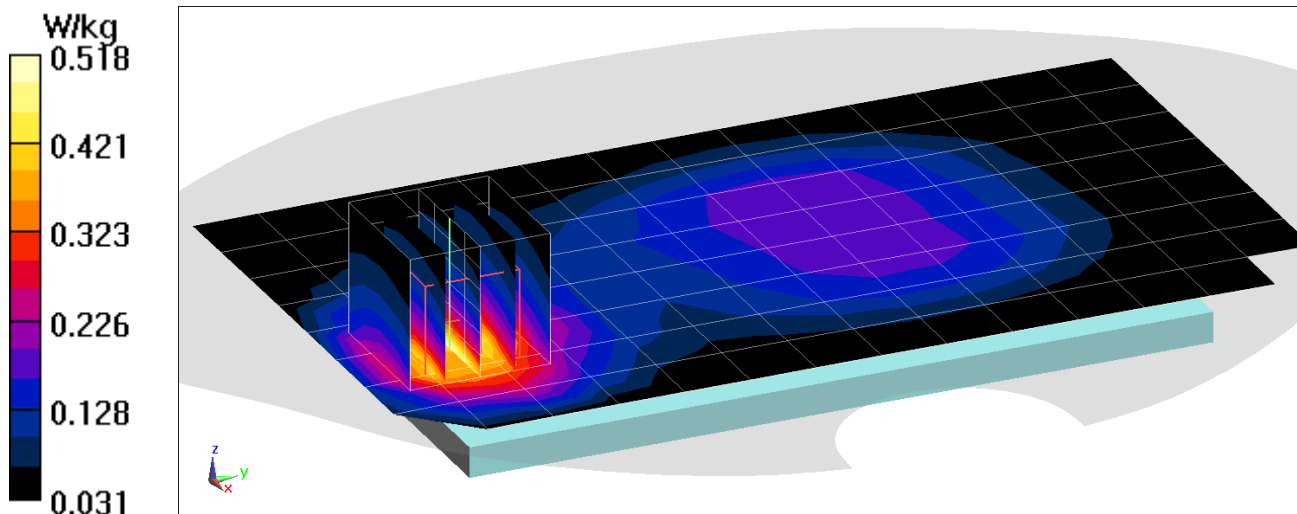
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 20.46 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.597 W/kg

SAR(1 g) = 0.371 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1745 MHz; Duty Cycle: 1:1

Medium: 1750 Body; Medium parameters used:

$f = 1745 \text{ MHz}$; $\sigma = 1.463 \text{ S/m}$; $\epsilon_r = 55.744$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-02-2020; Ambient Temp: 22.8°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7357; ConvF(8.26, 8.26, 8.26) @ 1745 MHz; Calibrated: 4/24/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/18/2019

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: LTE Band 66 (AWS), Body SAR, Back side, Mid.ch, 20 MHz Bandwidth
QPSK, 1 RB, 50 RB Offset**

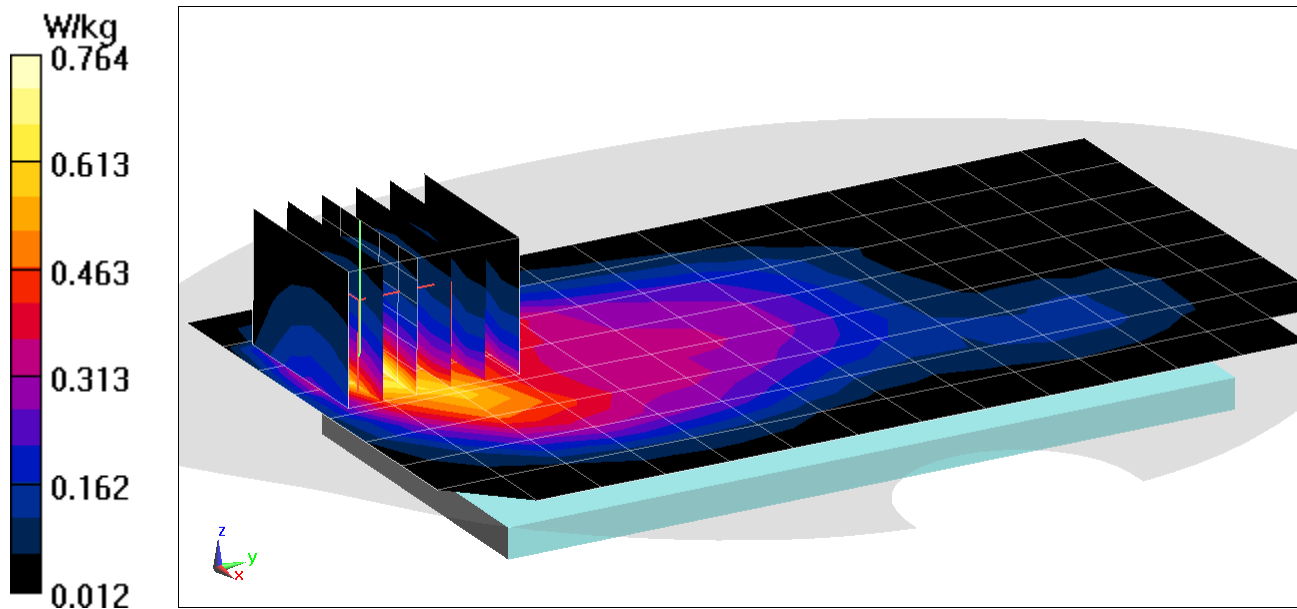
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 18.94 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.917 W/kg

SAR(1 g) = 0.531 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1770 MHz; Duty Cycle: 1:1

Medium: 1750 Body; Medium parameters used:

$f = 1770$ MHz; $\sigma = 1.508$ S/m; $\epsilon_r = 55.852$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-04-2020; Ambient Temp: 23.1°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7357; ConvF(8.26, 8.26, 8.26) @ 1770 MHz; Calibrated: 4/24/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/18/2019

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: LTE Band 66 (AWS), Body SAR, Bottom Edge, High.ch, 20 MHz Bandwidth
QPSK, 1 RB, 50 RB Offset**

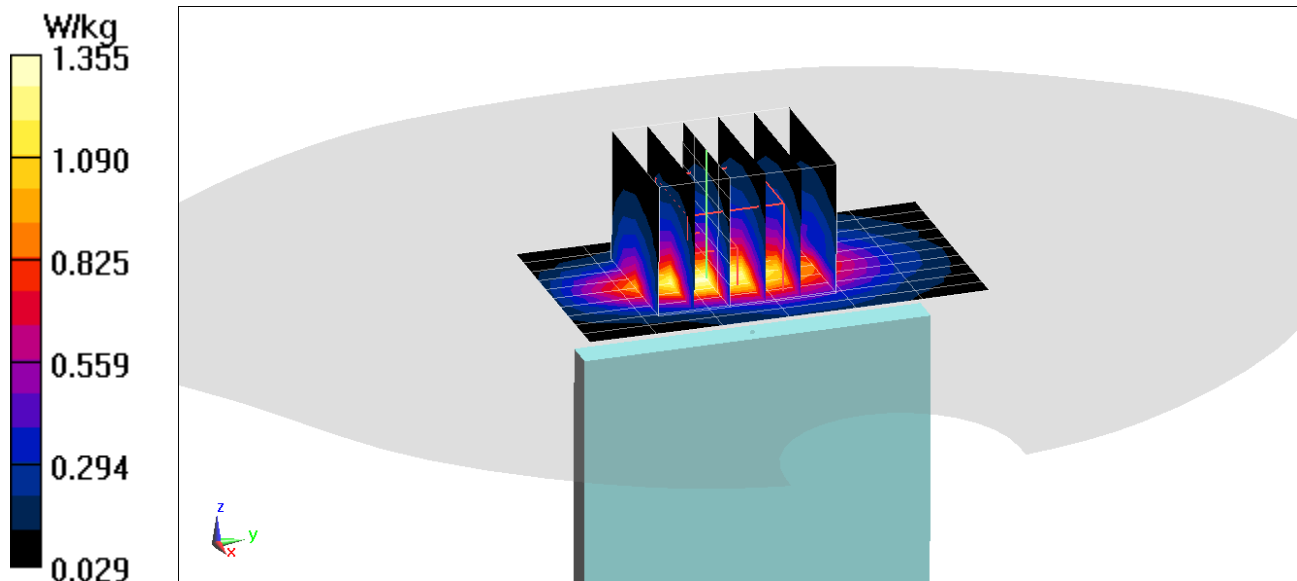
Area Scan (11x7x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 25.83 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 1.59 W/kg

SAR(1 g) = 0.920 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04807

Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used:
 $f = 1860 \text{ MHz}$; $\sigma = 1.485 \text{ S/m}$; $\epsilon_r = 52.289$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-09-2020; Ambient Temp: 22.0°C; Tissue Temp: 24.5°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1860 MHz; Calibrated: 9/19/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/17/2019
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

**Mode: LTE Band 25 (PCS), Body SAR, Back side, Low.ch, 20 MHz Bandwidth
QPSK, 1 RB, 50 RB Offset**

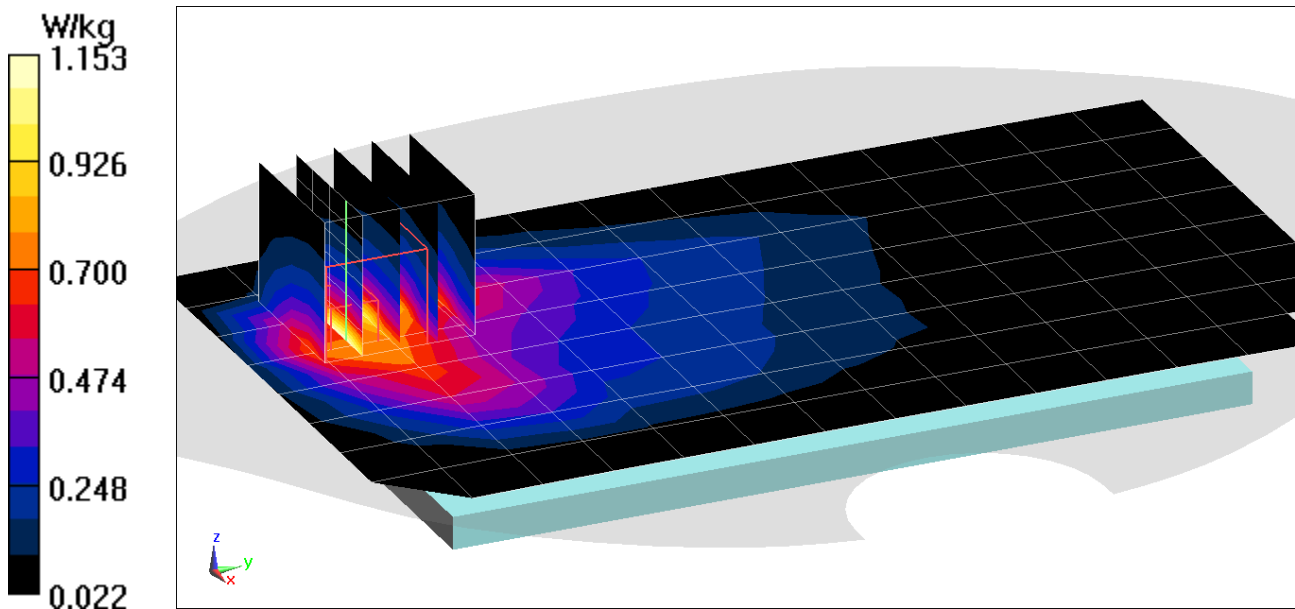
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 22.08 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 1.40 W/kg

SAR(1 g) = 0.768 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04807

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; $\sigma = 1.508$ S/m; $\epsilon_r = 52.223$; $\rho = 1000$ kg/m³
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-09-2020; Ambient Temp: 22.0°C; Tissue Temp: 24.5°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1882.5 MHz; Calibrated: 9/19/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/17/2019
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

**Mode: LTE Band 25 (PCS), Body SAR, Bottom Edge, Mid.ch, 20 MHz Bandwidth
QPSK, 1 RB, 50 RB Offset**

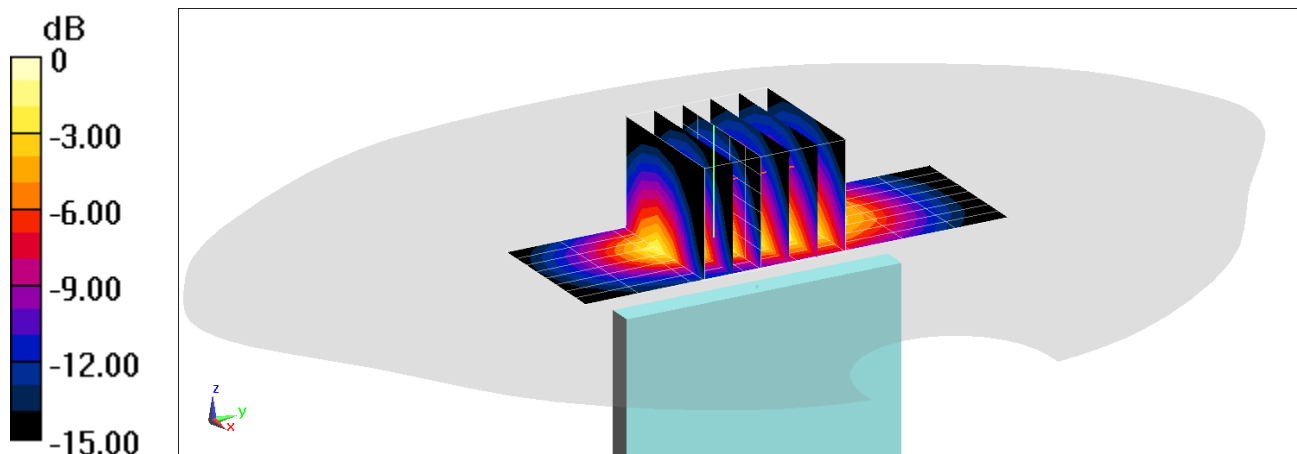
Area Scan (9x9x1): Measurement grid: dx=5mm, dy=15mm

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

Reference Value = 22.21 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 1.27 W/kg

SAR(1 g) = 0.704 W/kg



0 dB = 1.07 W/kg = 0.29 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, LTE Band 41 (Class 2); Frequency: 2506 MHz; Duty Cycle: 1:2.31

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

$f = 2506$ MHz; $\sigma = 2.091$ S/m; $\epsilon_r = 51.879$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-09-2020; Ambient Temp: 20.9°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN7357; ConvF(7.59, 7.59, 7.59) @ 2506 MHz; Calibrated: 4/24/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/18/2019

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: LTE Band 41 PC2, Body SAR, Back side, Low.ch, 20 MHz Bandwidth
QPSK, 1 RB, 50 RB Offset**

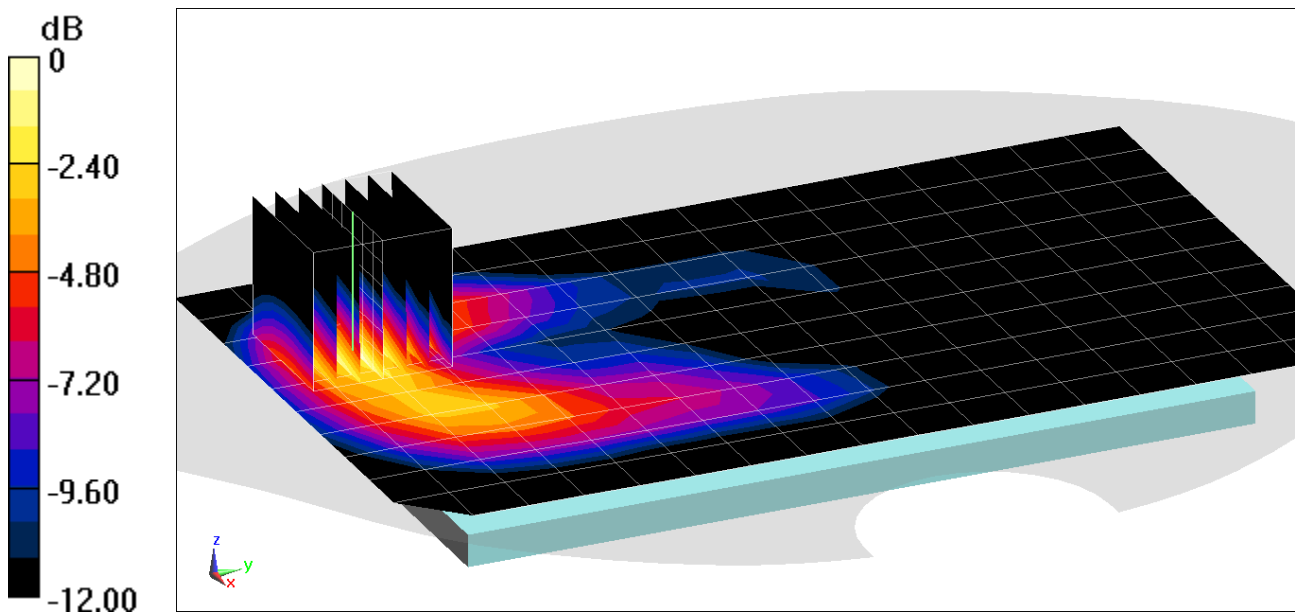
Area Scan (11x18x1): Measurement grid: dx=12mm, dy=12mm

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

Reference Value = 17.18 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 1.10 W/kg

SAR(1 g) = 0.545 W/kg



0 dB = 0.876 W/kg = -0.57 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, LTE Band 41 (Class 2); Frequency: 2593 MHz; Duty Cycle: 1:2.31

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

$f = 2593$ MHz; $\sigma = 2.215$ S/m; $\epsilon_r = 51.562$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-09-2020; Ambient Temp: 20.9°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN7357; ConvF(7.39, 7.39, 7.39) @ 2593 MHz; Calibrated: 4/24/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/18/2019

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: LTE Band 41 PC2, Body SAR, Bottom Edge, Mid.ch, 20 MHz Bandwidth
QPSK, 50 RB, 50 RB Offset**

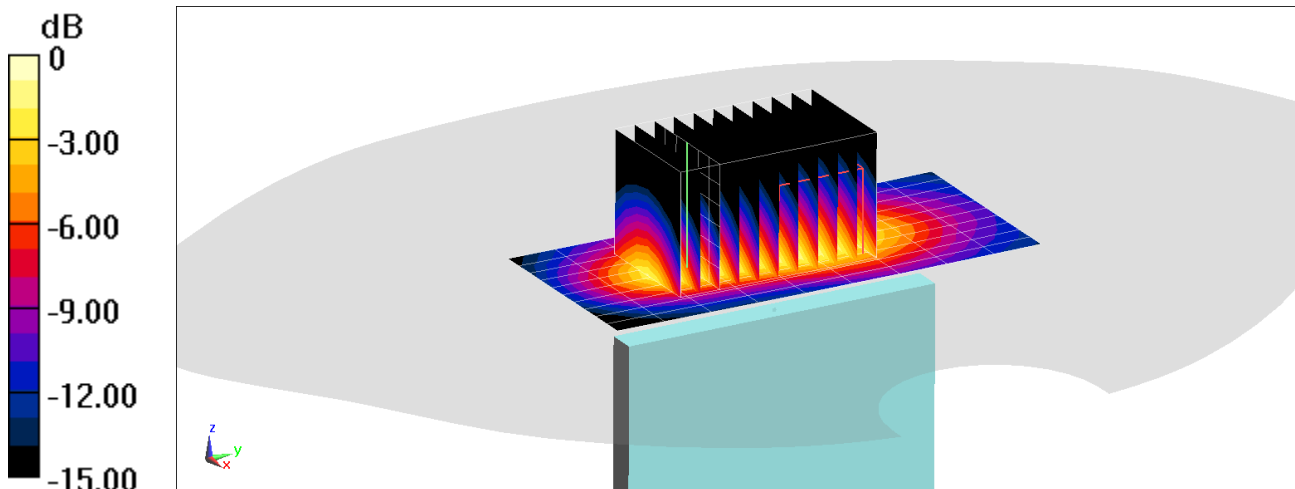
Area Scan (11x10x1): Measurement grid: dx=5mm, dy=12mm

Zoom Scan (7x11x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 14.95 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 0.998 W/kg

SAR(1 g) = 0.480 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04930

Communication System: UID 0, 802.11b; Frequency: 2437 MHz; Duty Cycle: 1:1
Medium: 2450 Body; Medium parameters used (interpolated):
 $f = 2437 \text{ MHz}$; $\sigma = 2.024 \text{ S/m}$; $\epsilon_r = 52.039$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-02-2020; Ambient Temp: 23.0°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7547; ConvF(7.3, 7.3, 7.3) @ 2437 MHz; Calibrated: 7/15/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 7/11/2019
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 802.11b, 22 MHz Bandwidth, Body SAR, Ch 6, 1 Mbps, Back Side

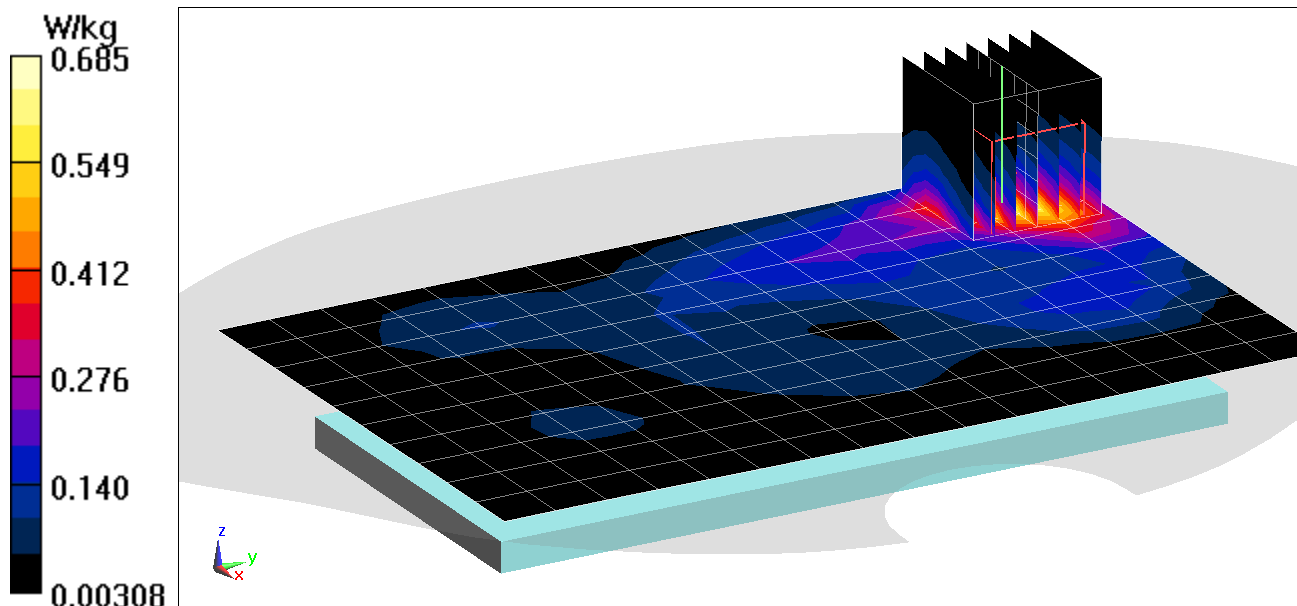
Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm

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

Reference Value = 5.214 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 0.845 W/kg

SAR(1 g) = 0.432 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04930

Communication System: UID 0, 802.11b; Frequency: 2412 MHz; Duty Cycle: 1:1

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

$f = 2412$ MHz; $\sigma = 1.994$ S/m; $\epsilon_r = 52.118$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-02-2020; Ambient Temp: 23.0°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7547; ConvF(7.3, 7.3, 7.3) @ 2412 MHz; Calibrated: 7/15/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 7/11/2019

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 802.11b, 22 MHz Bandwidth, Body SAR, Ch 1, 1 Mbps, Right Edge

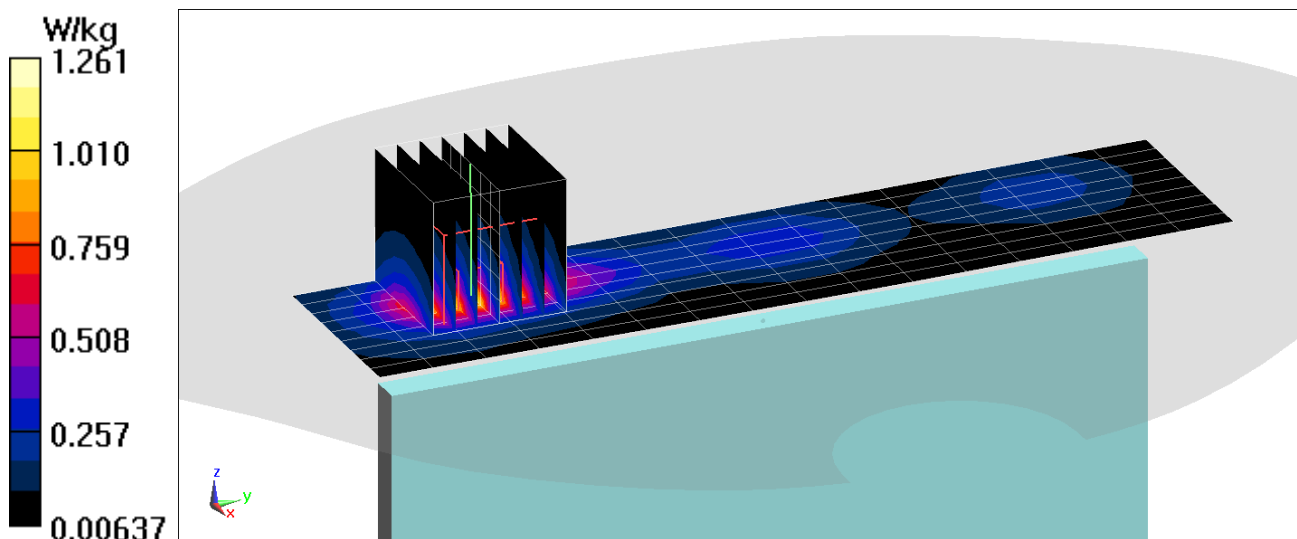
Area Scan (10x17x1): Measurement grid: dx=5mm, dy=12mm

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

Reference Value = 9.466 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 1.54 W/kg

SAR(1 g) = 0.762 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04922

Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5825 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body; Medium parameters used:
 $f = 5825 \text{ MHz}$; $\sigma = 6.287 \text{ S/m}$; $\epsilon_r = 46.269$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2020; Ambient Temp: 23.7°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7409; ConvF(4.23, 4.23, 4.23) @ 5825 MHz; Calibrated: 6/19/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/20/2019
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 802.11a, UNII-3, 20 MHz Bandwidth
Body SAR, Ch 165, 6 Mbps, Back Side

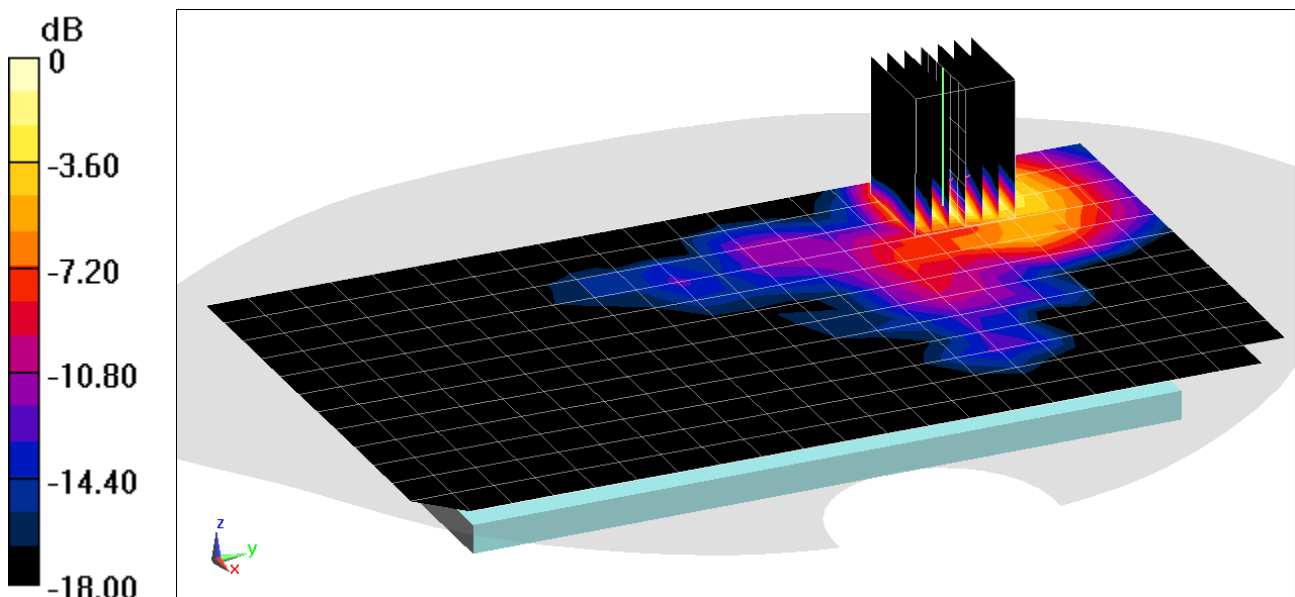
Area Scan (13x22x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 1.817 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 2.88 W/kg

SAR(1 g) = 0.670 W/kg



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

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04922

Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5825 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body; Medium parameters used:

$f = 5825$ MHz; $\sigma = 6.287$ S/m; $\epsilon_r = 46.269$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2020; Ambient Temp: 23.7°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7409; ConvF(4.23, 4.23, 4.23) @ 5825 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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 802.11a, U-NII-3, 20 MHz Bandwidth
Body SAR, Ch 165, 6 Mbps, Right Edge**

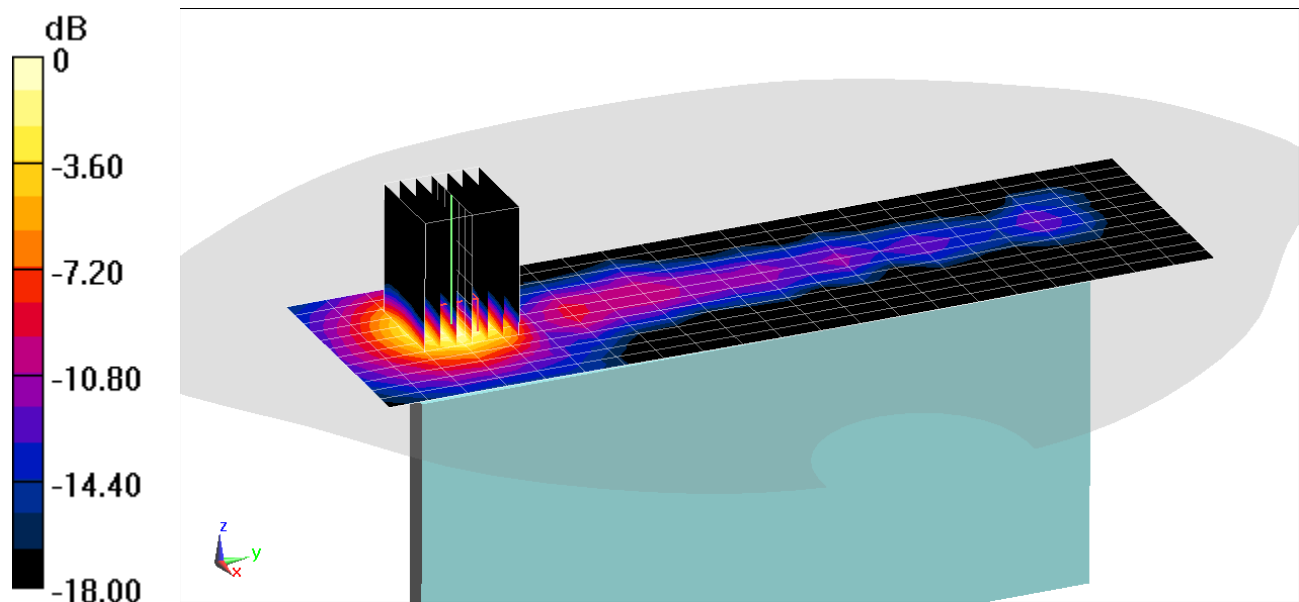
Area Scan (13x22x1): Measurement grid: dx=5mm, dy=10mm

Zoom Scan (7x7x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 3.213 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 3.58 W/kg

SAR(1 g) = 0.824 W/kg



0 dB = 1.99 W/kg = 2.99 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04930

Communication System: UID 0, Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1.305

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

$f = 2480$ MHz; $\sigma = 2.067$ S/m; $\epsilon_r = 51.653$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-28-2020; Ambient Temp: 23.0°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN7547; ConvF(7.3, 7.3, 7.3) @ 2480 MHz; Calibrated: 7/15/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 7/11/2019

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, Body SAR, Ch 78, 1 Mbps, Back Side

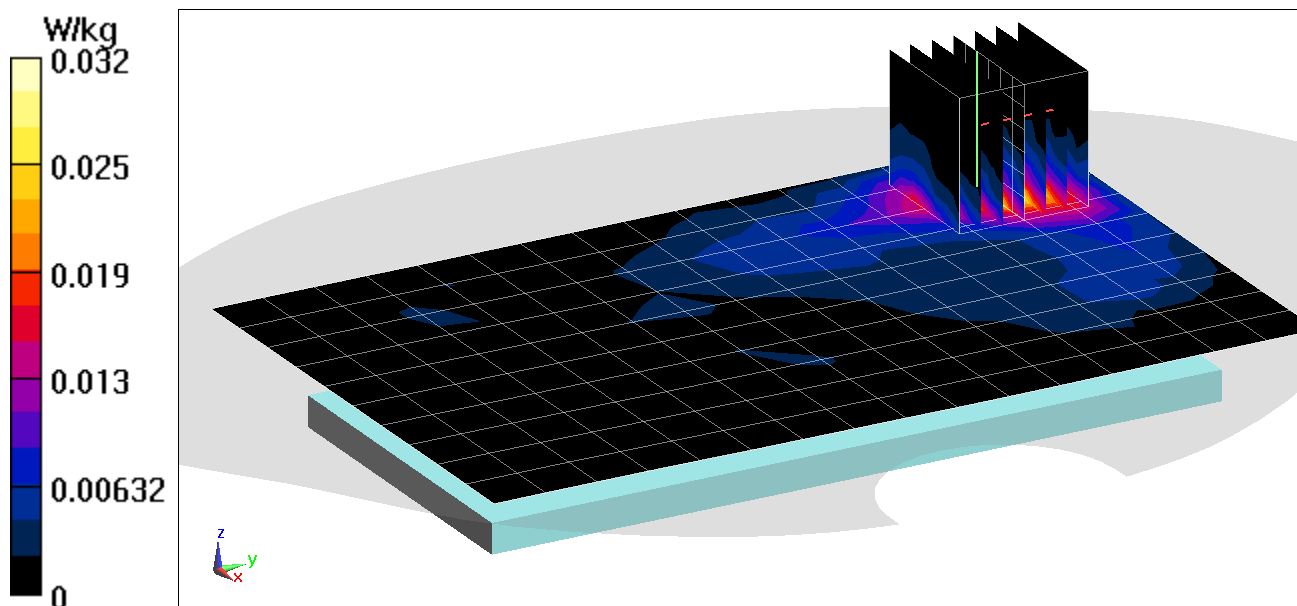
Area Scan (11x17x1): Measurement grid: dx=12mm, dy=12mm

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

Reference Value = 3.248 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 0.0410 W/kg

SAR(1 g) = 0.019 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04930

Communication System: UID 0, Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1.305

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

$f = 2480$ MHz; $\sigma = 2.067$ S/m; $\epsilon_r = 51.653$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-28-2020; Ambient Temp: 23.0°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN7547; ConvF(7.3, 7.3, 7.3) @ 2480 MHz; Calibrated: 7/15/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 7/11/2019

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, Body SAR, Ch 78, 1 Mbps, Right Edge

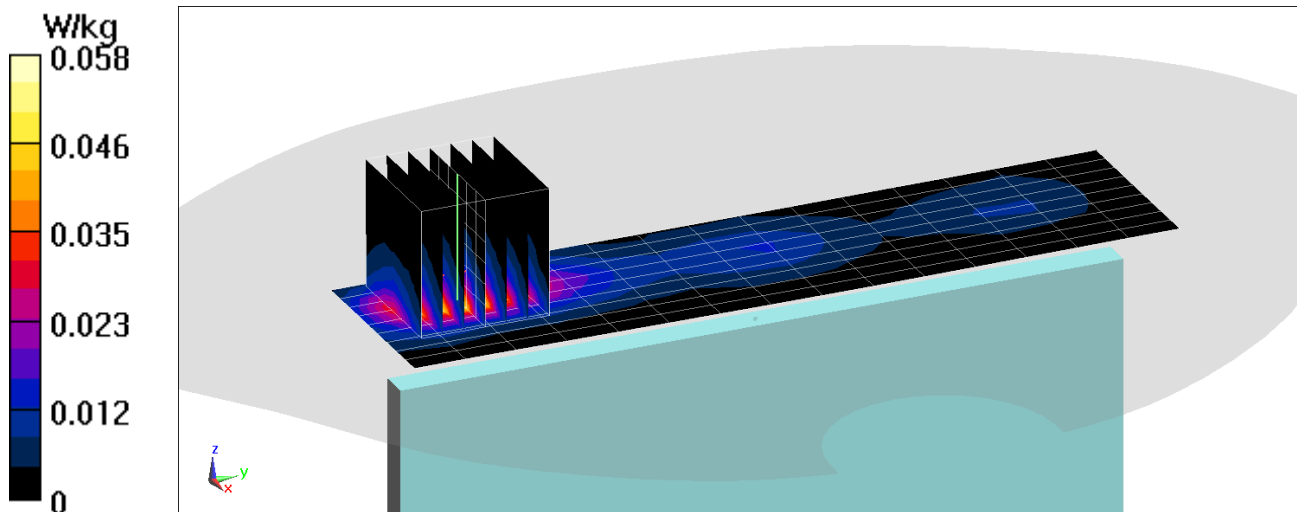
Area Scan (10x16x1): Measurement grid: dx=5mm, dy=12mm

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

Reference Value = 4.413 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.0720 W/kg

SAR(1 g) = 0.035 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, Frequency: 1752.6 MHz; Duty Cycle: 1:1

Medium: 1750 Body; Medium parameters used (interpolated):

$f = 1752.6$ MHz; $\sigma = 1.472$ S/m; $\epsilon_r = 55.719$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-02-2020; Ambient Temp: 22.8°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7357; ConvF(8.26, 8.26, 8.26) @ 1752.6 MHz; Calibrated: 4/24/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/18/2019

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

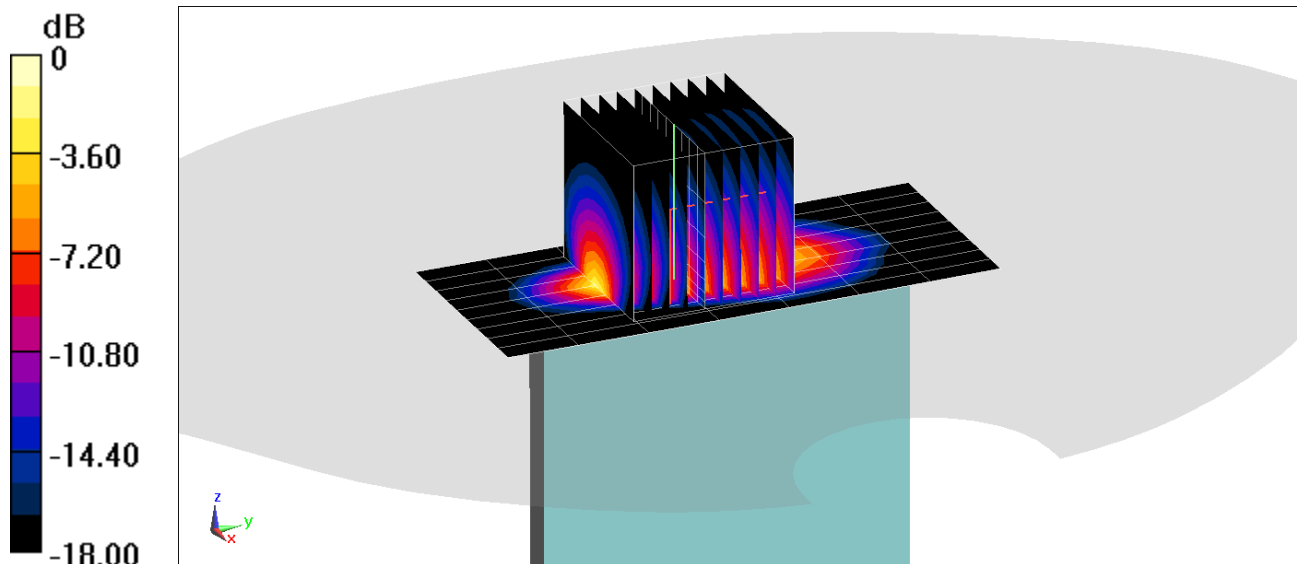
Area Scan (10x8x1): Measurement grid: dx=5mm, dy=15mm

Zoom Scan (10x10x8)/Cube 0: Measurement grid: dx=3.8mm, dy=3.8mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 71.61 V/m; Power Drift = -0.20 dB

Peak SAR (extrapolated) = 21.7 W/kg

SAR(10 g) = 2.76 W/kg



0 dB = 13.0 W/kg = 11.14 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04807

Communication System: UID 0, UMTS, Frequency: 1852.4 MHz; Duty Cycle: 1:1
Medium: 1900 Body; Medium parameters used (interpolated):
 $f = 1852.4 \text{ MHz}$; $\sigma = 1.477 \text{ S/m}$; $\epsilon_r = 52.311$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-09-2020; Ambient Temp: 22.0°C; Tissue Temp: 24.5°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1852.4 MHz; Calibrated: 9/19/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1333; Calibrated: 9/17/2019
Phantom: Twin-SAM V5.0; Type: QD 000 P40 CD; Serial: 1792
Measurement SW: DASY52, Version 52.10 (4);SEMCAD X Version 14.6.14 (7483)

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

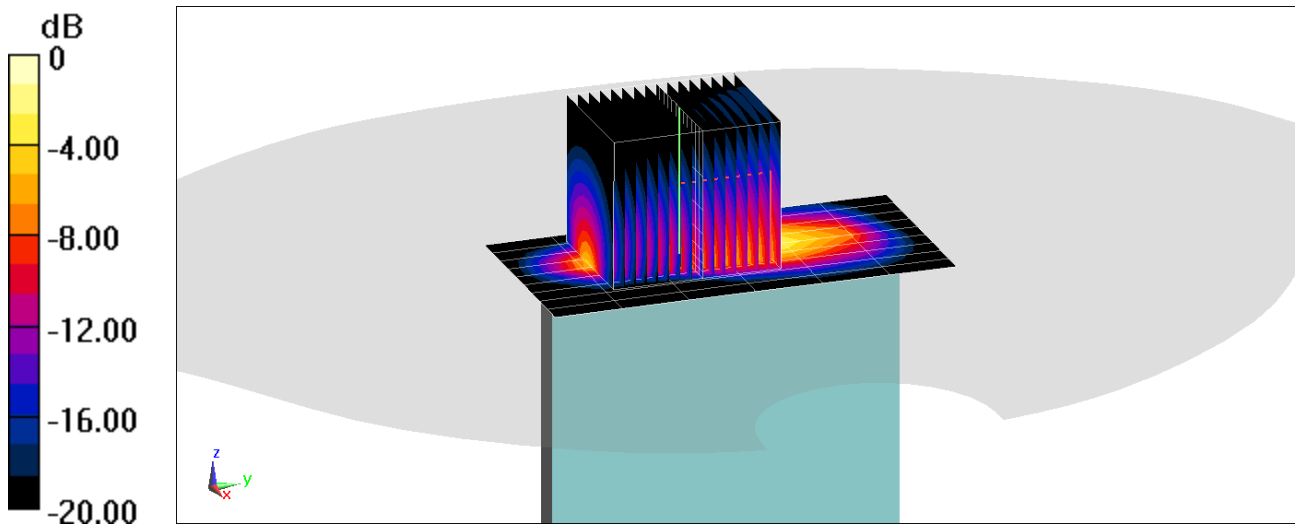
Area Scan (10x7x1): Measurement grid: dx=5mm, dy=15mm

Zoom Scan (13x16x8)/Cube 0: Measurement grid: dx=2.5mm, dy=2.5mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 71.01 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 23.0 W/kg

SAR(10 g) = 2.57 W/kg



0 dB = 13.5 W/kg = 11.30 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

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

Medium parameters used (interpolated):

$f = 1851.25$ MHz; $\sigma = 1.52$ S/m; $\epsilon_r = 52.003$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-11-2020; Ambient Temp: 23.0°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1851.25 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

Mode: PCS EVDO, Phablet SAR, Back side, Low.ch

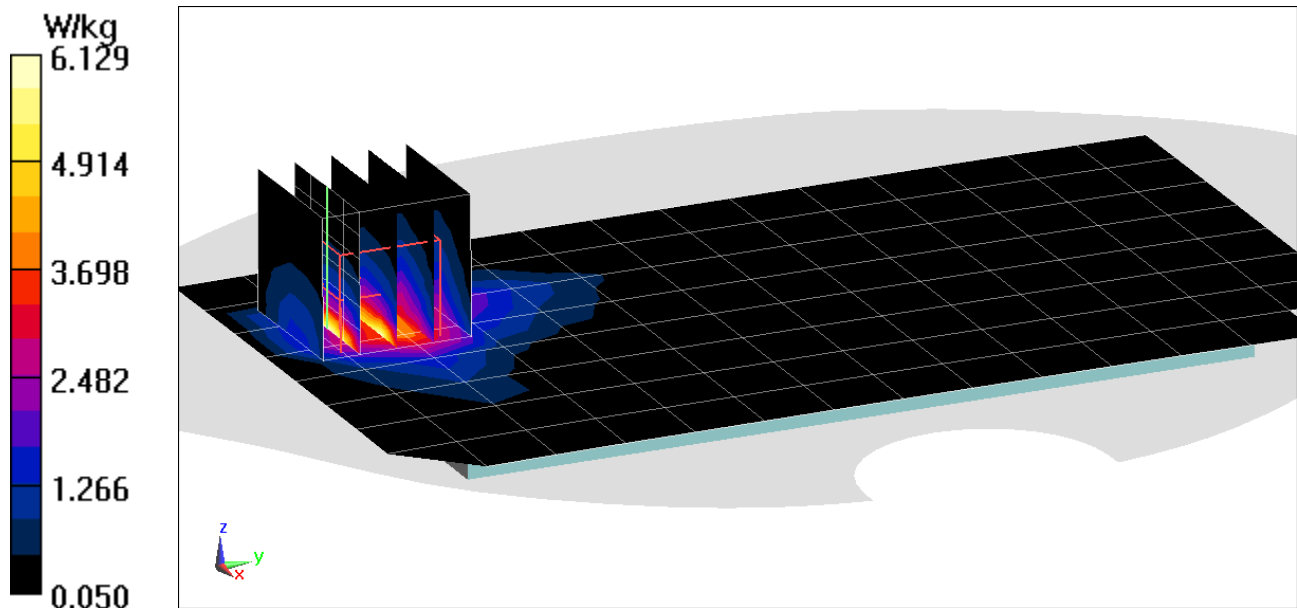
Area Scan (9x15x1): Measurement grid: dx=15mm, dy=15mm

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

Reference Value = 46.00 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 9.00 W/kg

SAR(10 g) = 1.9 W/kg



PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

Communication System: UID 0, LTE Band 66 (AWS); Frequency: 1720 MHz; Duty Cycle: 1:1

Medium: 1750 Body; Medium parameters used:

$f = 1720$ MHz; $\sigma = 1.434$ S/m; $\epsilon_r = 55.818$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-02-2020; Ambient Temp: 22.8°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7357; ConvF(8.26, 8.26, 8.26) @ 1720 MHz; Calibrated: 4/24/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/18/2019

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: LTE Band 66 (AWS), Phablet SAR, Bottom Edge, Low.ch, 20 MHz Bandwidth
QPSK, 50 RB, 25 RB Offset**

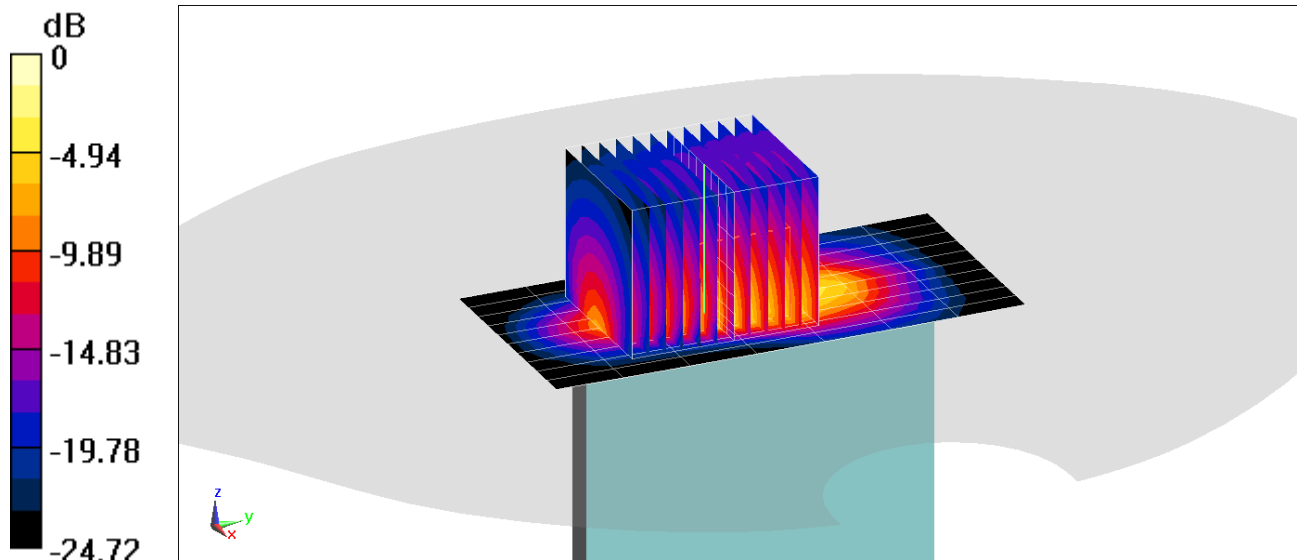
Area Scan (11x8x1): Measurement grid: dx=5mm, dy=15mm

Zoom Scan (10x12x8)/Cube 0: Measurement grid: dx=3.8mm, dy=3.8mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 68.11 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 20.4 W/kg

SAR(10 g) = 2.64 W/kg



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

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04807

Communication System: UID 0, LTE Band 25 (PCS); Frequency: 1860 MHz; Duty Cycle: 1:1

Medium: 1900 Body; Medium parameters used:

$f = 1860 \text{ MHz}$; $\sigma = 1.485 \text{ S/m}$; $\epsilon_r = 52.289$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-09-2020; Ambient Temp: 22.0°C; Tissue Temp: 24.5°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1860 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

**Mode: LTE Band 25 (PCS), Phablet SAR, Bottom Edge, Low.ch, 20 MHz Bandwidth
QPSK, 1 RB, 50 RB Offset**

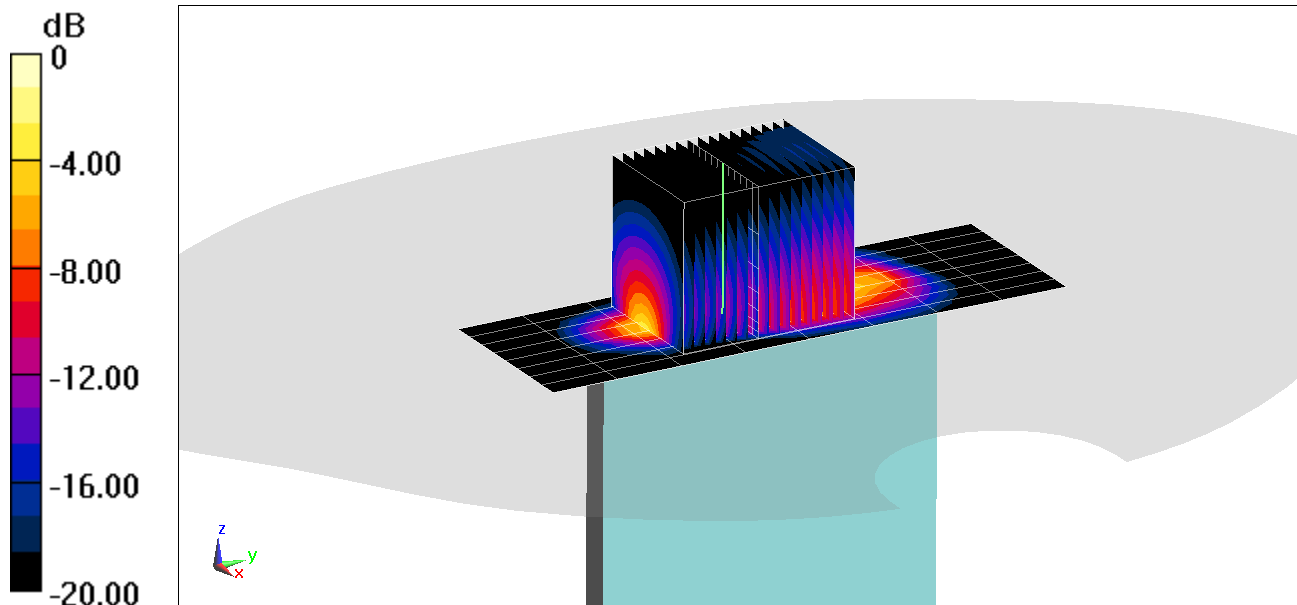
Area Scan (9x9x1): Measurement grid: dx=5mm, dy=15mm

Zoom Scan (13x17x8)/Cube 0: Measurement grid: dx=2.5mm, dy=2.5mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 69.18 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 21.4 W/kg

SAR(10 g) = 2.59 W/kg



0 dB = 12.5 W/kg = 10.97 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04831

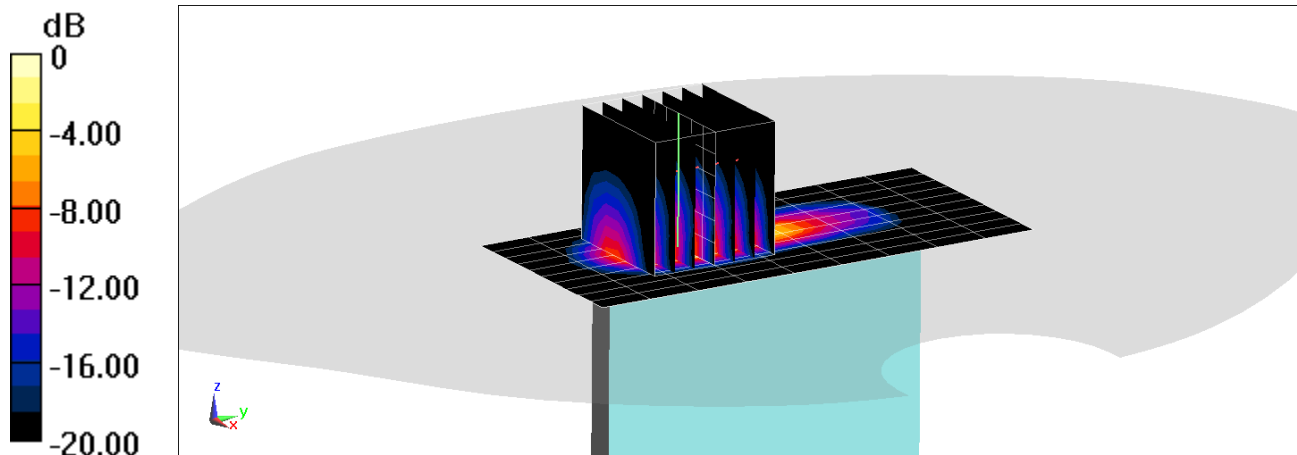
Communication System: UID 0, LTE Band 41 (Class 2); Frequency: 2636.5 MHz; Duty Cycle: 1:2.31
Medium: 2450 Body; Medium parameters used (interpolated):
 $f = 2636.5$ MHz; $\sigma = 2.25$ S/m; $\epsilon_r = 51.084$; $\rho = 1000$ kg/m³
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 03-19-2020; Ambient Temp: 22.7°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7547; ConvF(7.18, 7.18, 7.18) @ 2636.5 MHz; Calibrated: 7/15/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1323; Calibrated: 7/11/2019
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 PC2, Phablet SAR, Bottom Edge, Mid-High.ch, 20 MHz Bandwidth
QPSK, 50 RB, 0 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 = 70.02 V/m; Power Drift = -0.19 dB
Peak SAR (extrapolated) = 26.7 W/kg
SAR(10 g) = 2.89 W/kg



0 dB = 17.0 W/kg = 12.30 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04922

Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5260 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body; Medium parameters used:
 $f = 5260$ MHz; $\sigma = 5.517$ S/m; $\epsilon_r = 47.213$; $\rho = 1000$ kg/m³
Phantom section: Flat Section; Space: 0.0 cm

Test Date: 02-24-2020; Ambient Temp: 23.7°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7409; ConvF(4.7, 4.7, 4.7) @ 5260 MHz; Calibrated: 6/19/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/20/2019
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 802.11a, U-NII-2A, 20 MHz Bandwidth, Phablet SAR, Ch 52, 6 Mbps, Back Side

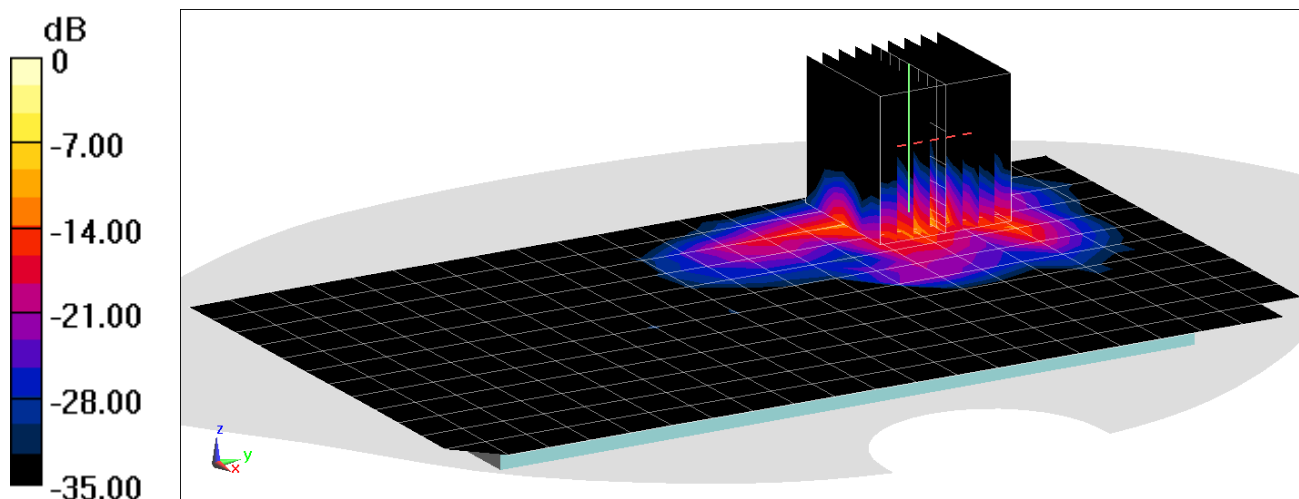
Area Scan (13x22x1): Measurement grid: dx=10mm, dy=10mm

Zoom Scan (9x9x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4

Reference Value = 8.886 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 60.9 W/kg

SAR(10 g) = 1.72 W/kg



0 dB = 33.9 W/kg = 15.30 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04930

Communication System: UID 0, Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1.305

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

$f = 2480$ MHz; $\sigma = 2.072$ S/m; $\epsilon_r = 52.097$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-16-2020; Ambient Temp: 23.2°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7547; ConvF(7.3, 7.3, 7.3) @ 2480 MHz; Calibrated: 7/15/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 7/11/2019

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)

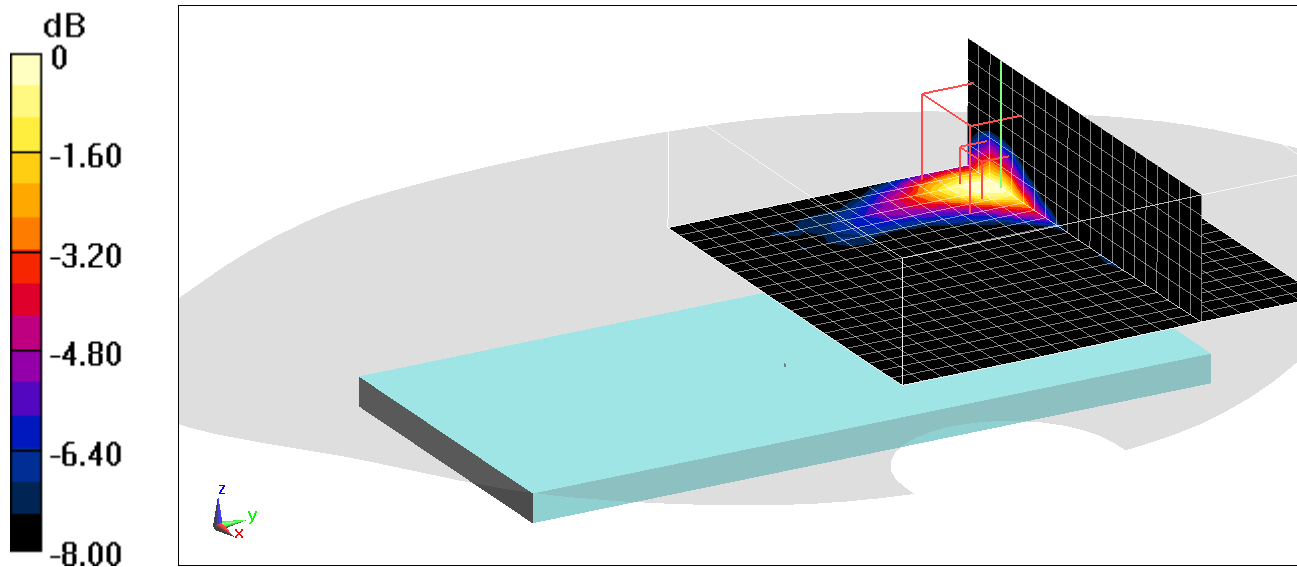
Mode: Bluetooth, Body SAR, Ch 78, 1 Mbps, Back Side

Zoom Scan (22x22x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 0.8090 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.0450 W/kg

SAR(1 g) = 0.021 W/kg



0 dB = 0.0350 W/kg = -14.56 dBW/kg

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset; Serial: 04922

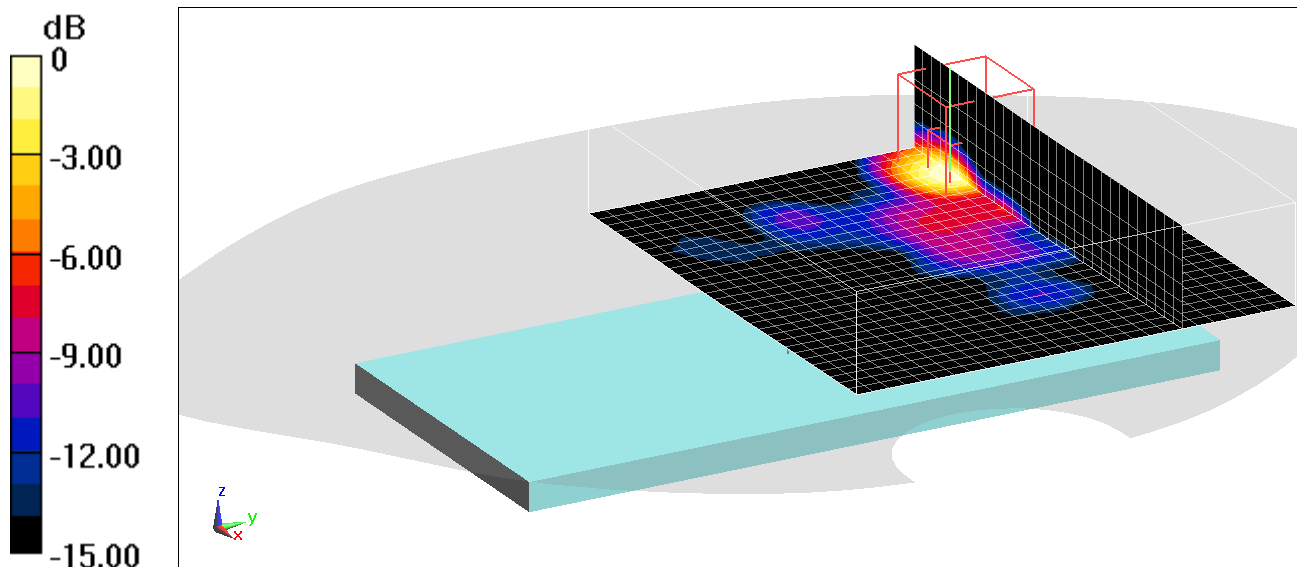
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz; Duty Cycle: 1:1
Medium: 5200-5800 Body; Medium parameters used:
 $f = 5785 \text{ MHz}$; $\sigma = 6.24 \text{ S/m}$; $\epsilon_r = 46.462$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-17-2020; Ambient Temp: 22.8°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN7409; ConvF(4.23, 4.23, 4.23) @ 5785 MHz; Calibrated: 6/19/2019
Sensor-Surface: 1.4mm (Mechanical Surface Detection)
Electronics: DAE4 Sn1334; Calibrated: 6/20/2019
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 802.11a, UNII-3, 20 MHz Bandwidth, Body SAR,
Ch 157, 6 Mbps, Back Side**

Zoom Scan (31x28x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm; Graded Ratio: 1.4
Reference Value = 1.103 V/m; Power Drift = -0.06 dB
Peak SAR (extrapolated) = 3.30 W/kg
SAR(1 g) = 0.563 W/kg



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

PCTEST

DUT: ZNFQ730TM; Type: Portable Handset

Mode: Bluetooth, Body SAR, Ch 78, 1 Mbps, Back Side, Scaling Factor: 1.481

Communication System: UID 0, Bluetooth; Frequency: 2480 MHz; Duty Cycle: 1:1.305

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

$f = 2480$ MHz; $\sigma = 2.072$ S/m; $\epsilon_r = 52.097$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Mode: IEEE 802.11a, UNII-3, 20 MHz Bandwidth,

Body SAR, Ch 157, 6 Mbps, Back Side, Scaling Factor: 1.365

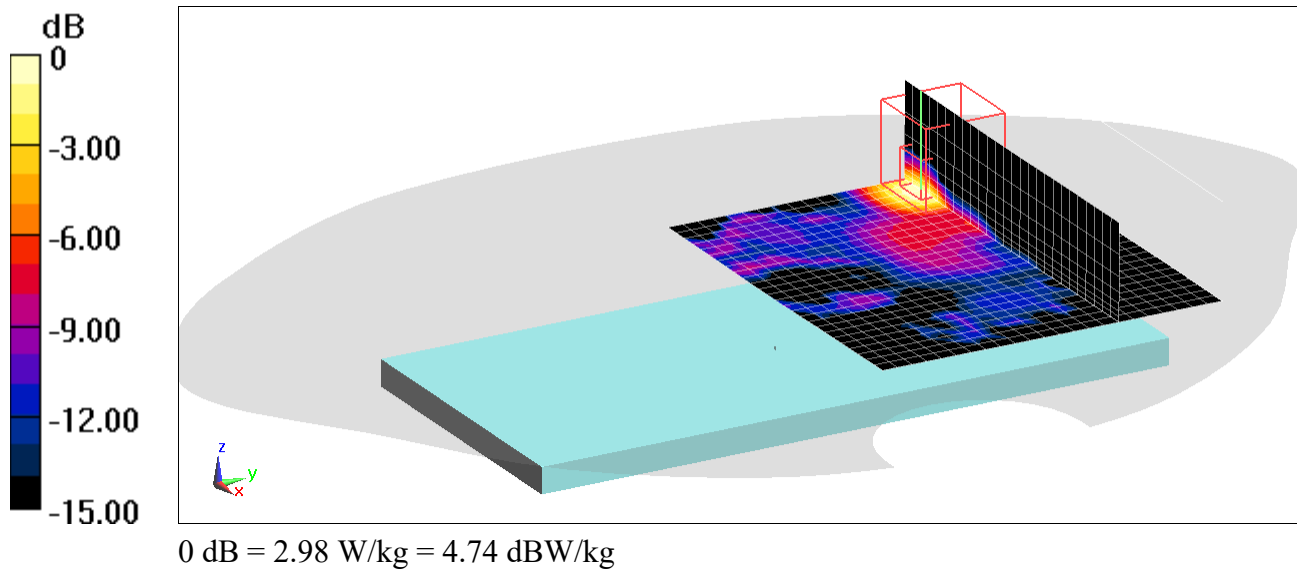
Communication System: UID 0, 802.11a 5.2-5.8 GHz Band; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: 5200-5800 Body; Medium parameters used:

$f = 5785$ MHz; $\sigma = 6.24$ S/m; $\epsilon_r = 46.462$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

**Multi Band Result:
SAR (1 g) = 0.787 W/kg**



APPENDIX B: SYSTEM VERIFICATION

PCTEST

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

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

Medium: 700 Head Medium parameters used:

$f = 750 \text{ MHz}$; $\sigma = 0.868 \text{ S/m}$; $\epsilon_r = 40.444$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5cm

Test Date: 02-26-2020; Ambient Temp: 21.2°C; Tissue Temp: 20.4°C

Probe: EX3DV4 - SN7410; ConvF(9.95, 9.95, 9.95) @ 750 MHz; Calibrated: 7/16/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

750 MHz System Verification at 23.0 dBm (200 mW)

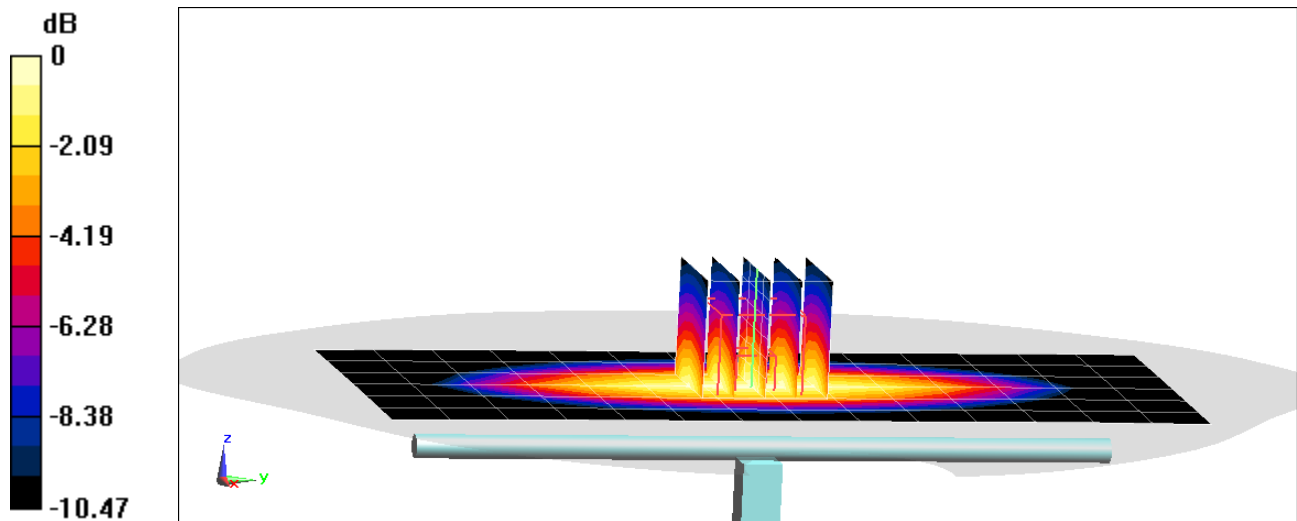
Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 2.49 W/kg

SAR(1 g) = 1.68 W/kg

Deviation(1 g) = 1.33%



0 dB = 2.23 W/kg = 3.48 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:

$f = 835 \text{ MHz}$; $\sigma = 0.918 \text{ S/m}$; $\epsilon_r = 40.658$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-28-2020; Ambient Temp: 21.8°C; Tissue Temp: 20.0°C

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

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

835 MHz System Verification at 23.0 dBm (200 mW)

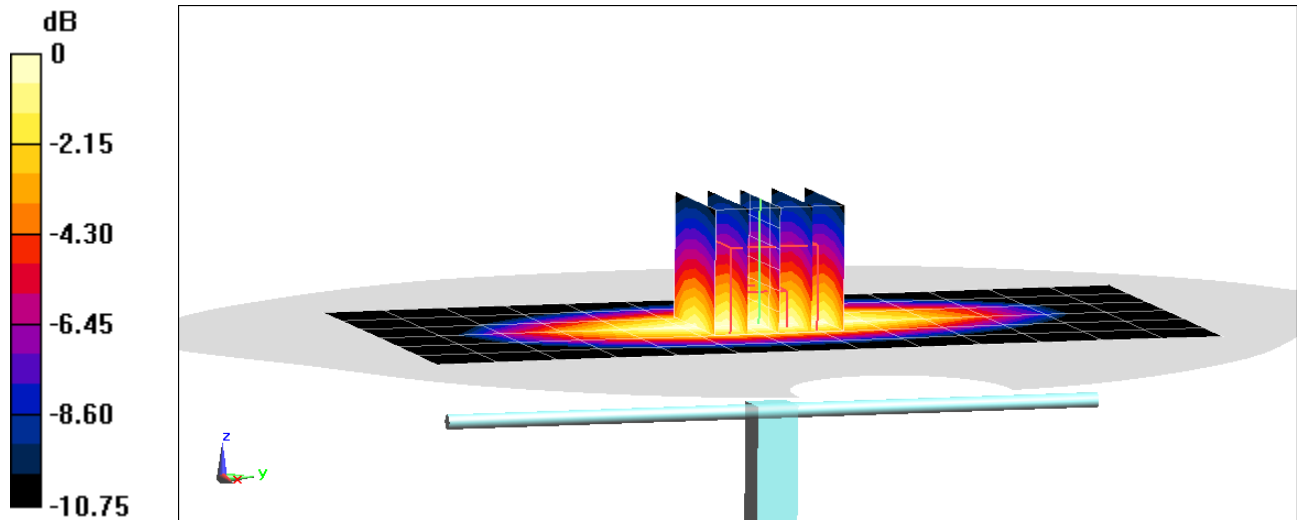
Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 2.97 W/kg

SAR(1 g) = 1.99 W/kg

Deviation(1 g) = 5.51%



0 dB = 2.65 W/kg = 4.23 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:

$f = 835 \text{ MHz}$; $\sigma = 0.885 \text{ S/m}$; $\epsilon_r = 40.295$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-05-2020; Ambient Temp: 23.0°C; Tissue Temp: 21.9°C

Probe: EX3DV4 - SN7406; ConvF(9.78, 9.78, 9.78) @ 835 MHz; Calibrated: 5/16/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/8/2019

Phantom: Twin-SAM V5.0 Left 30; Type: QD 000 P40 CD; Serial: 1715

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

835 MHz System Verification at 23.0 dBm (200 mW)

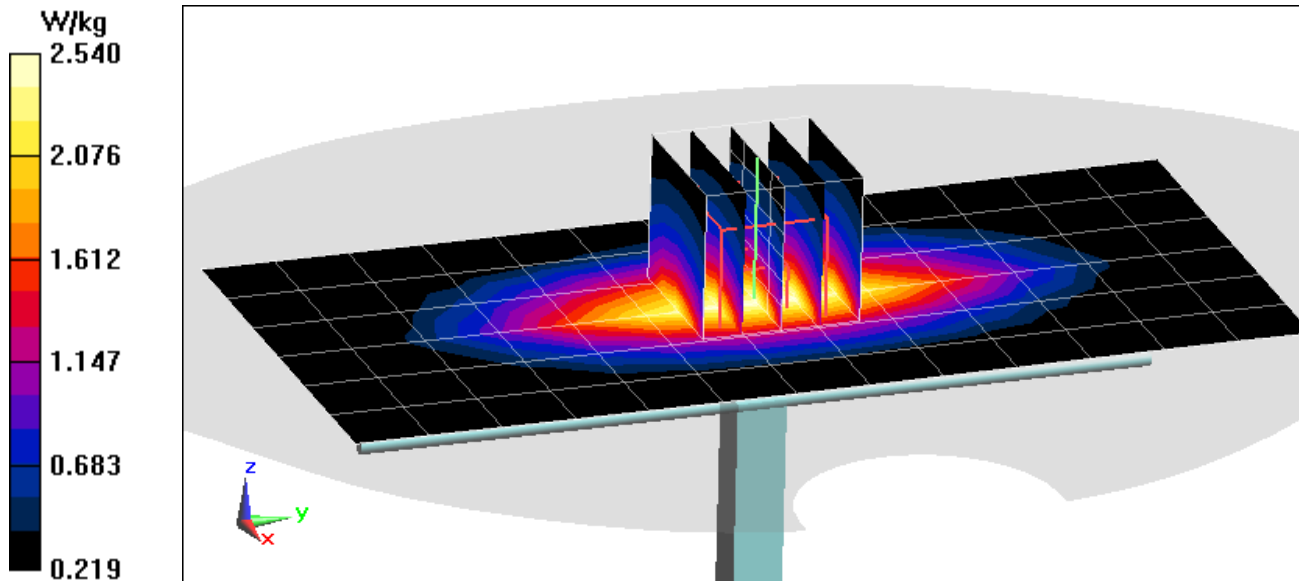
Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 2.88 W/kg

SAR(1 g) = 1.89 W/kg

Deviation(1 g) = 0.21%



PCTEST

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

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

Medium: 835 Head Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.879 \text{ S/m}$; $\epsilon_r = 39.739$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-10-2020; Ambient Temp: 22.7°C; Tissue Temp: 20.6°C

Probe: EX3DV4 - SN7406; ConvF(9.78, 9.78, 9.78) @ 835 MHz; Calibrated: 5/16/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/8/2019

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)

835 MHz System Verification at 23.0 dBm (200 mW)

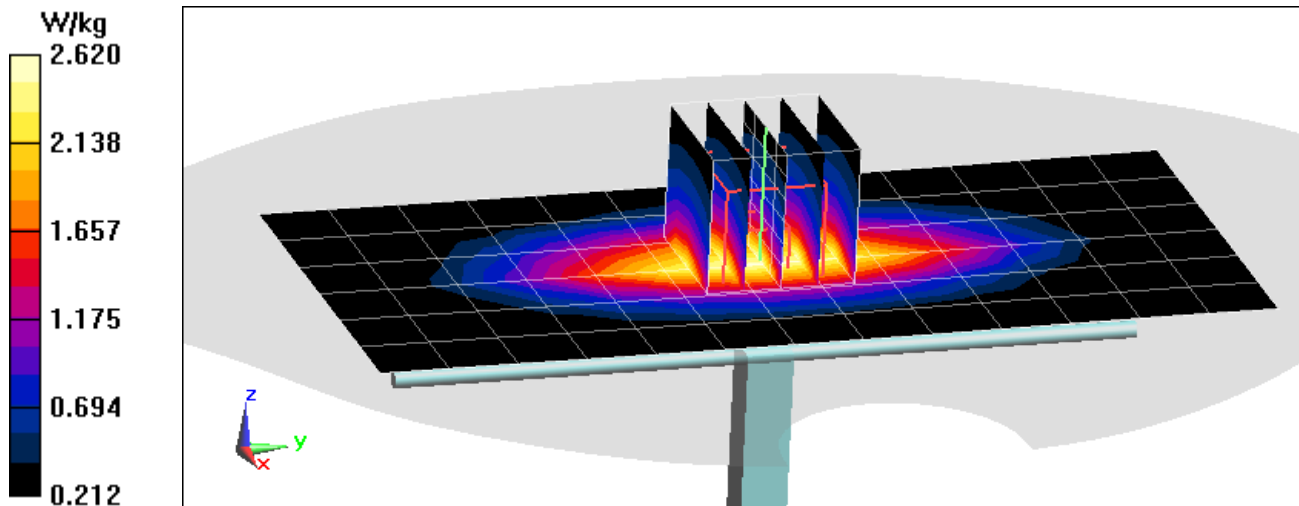
Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 3.03 W/kg

SAR(1 g) = 1.92 W/kg

Deviation(1 g) = -0.52%



PCTEST

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

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

Medium: 1750Head Medium parameters used:

$f = 1750$ MHz; $\sigma = 1.362$ S/m; $\epsilon_r = 38.982$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-02-2020; Ambient Temp: 22.2°C; Tissue Temp: 20.1°C

Probe: EX3DV4 - SN7410; ConvF(8.46, 8.46, 8.46) @ 1750 MHz; Calibrated: 7/16/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

1750 MHz System Verification at 20.0 dBm (100 mW)

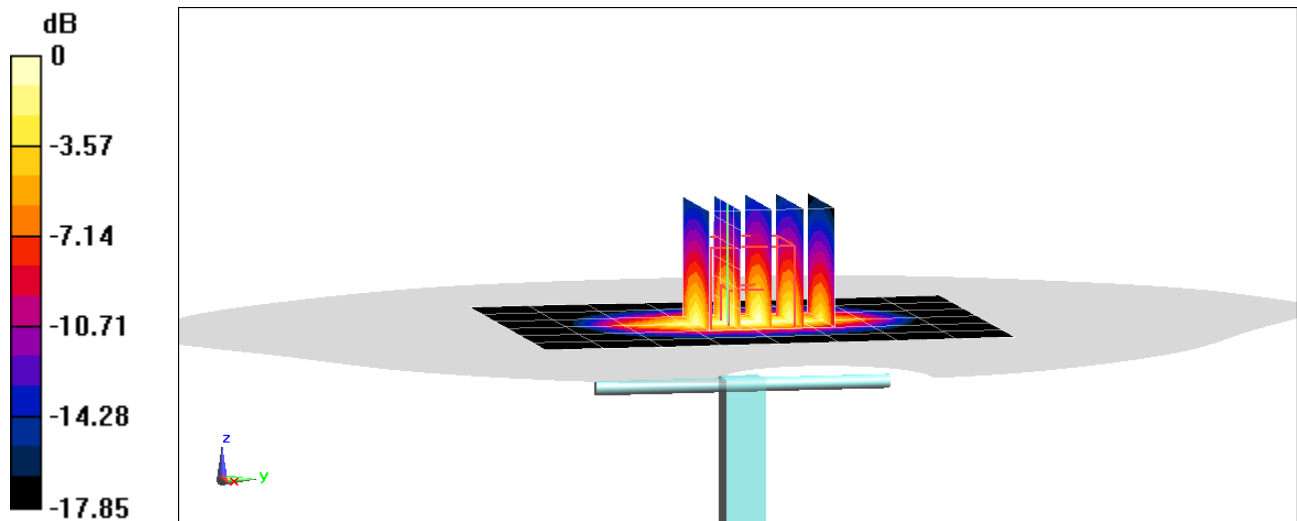
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.91 W/kg

SAR(1 g) = 3.76 W/kg

Deviation(1 g) = 3.01%



0 dB = 5.71 W/kg = 7.57 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 Head Medium parameters used:

$f = 1900$ MHz; $\sigma = 1.447$ S/m; $\epsilon_r = 38.379$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-28-2020; Ambient Temp: 22.7°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7409; ConvF(8.01, 8.01, 8.01) @ 1900 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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

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

1900 MHz System Verification at 20.0 dBm (100 mW)

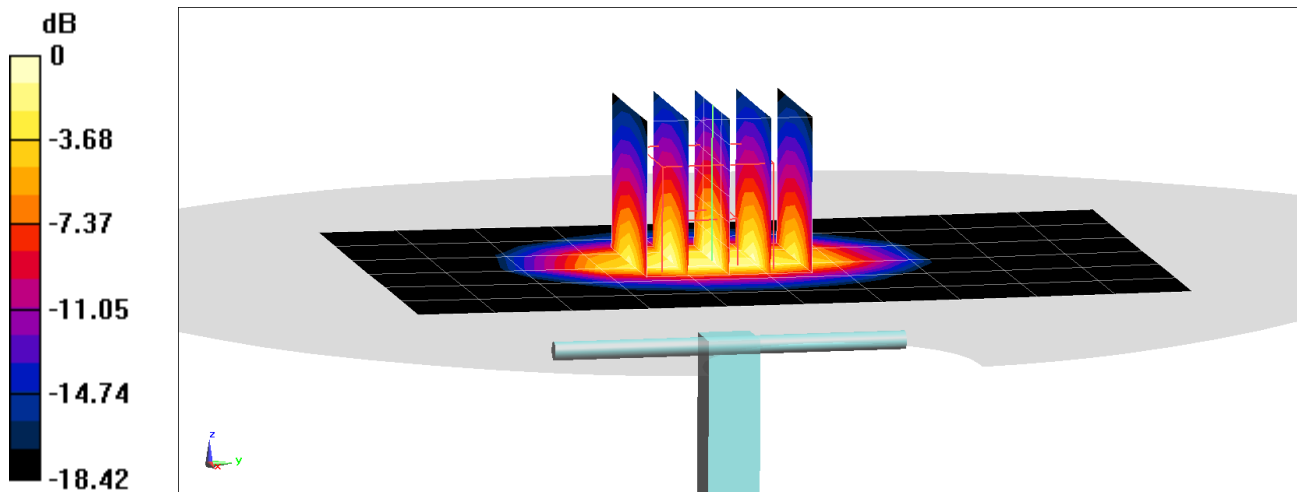
Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 7.72 W/kg

SAR(1 g) = 4 W/kg

Deviation(1 g) = 1.78%;



0 dB = 6.39 W/kg = 8.06 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 Head Medium parameters used:

$f = 1900$ MHz; $\sigma = 1.439$ S/m; $\epsilon_r = 39.154$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-02-2020; Ambient Temp: 22.3°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7409; ConvF(8.01, 8.01, 8.01) @ 1900 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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

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

1900 MHz System Verification at 20.0 dBm (100 mW)

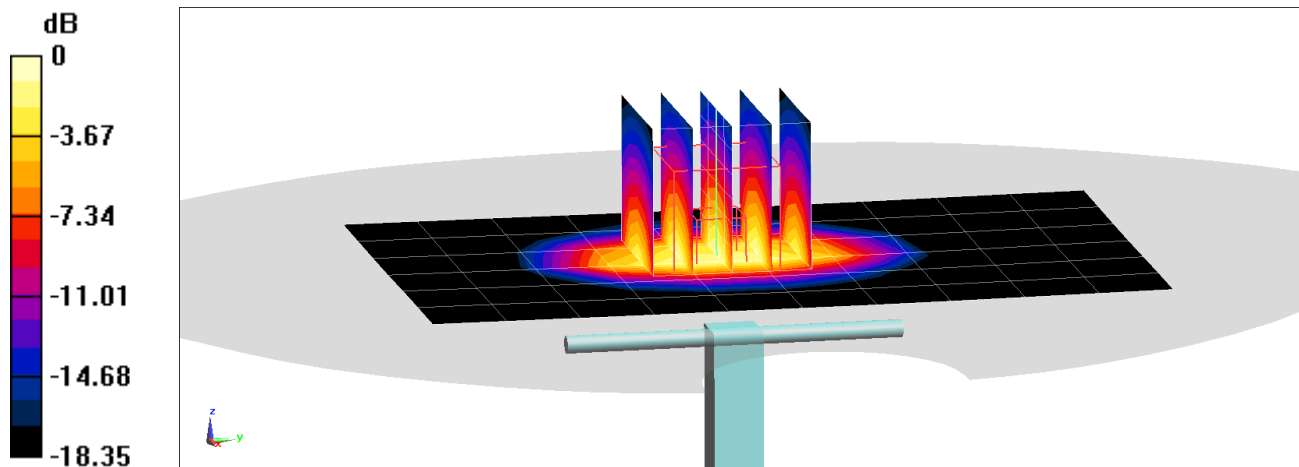
Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 7.98 W/kg

SAR(1 g) = 4.05 W/kg

Deviation(1 g) = 3.05%



0 dB = 6.53 W/kg = 8.15 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 Head Medium parameters used:

$f = 1900$ MHz; $\sigma = 1.449$ S/m; $\epsilon_r = 39.458$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-11-2020; Ambient Temp: 23.1°C; Tissue Temp: 21.6°C

Probe: EX3DV4 - SN7409; ConvF(8.01, 8.01, 8.01) @ 1900 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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

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

1900 MHz System Verification at 20.0 dBm (100 mW)

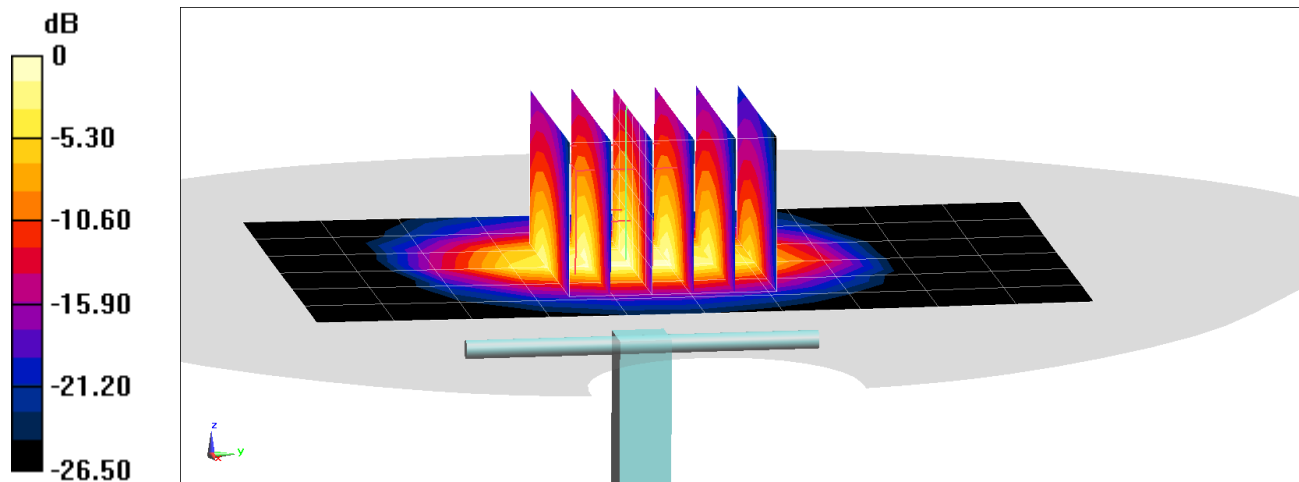
Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

Zoom Scan (7x6x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Peak SAR (extrapolated) = 7.99 W/kg

SAR(1 g) = 4.18 W/kg

Deviation(1 g) = 6.36%



0 dB = 6.67 W/kg = 8.24 dBW/kg

PCTEST

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

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

Medium: 2450 Head Medium parameters used:

$f = 2450$ MHz; $\sigma = 1.829$ S/m; $\epsilon_r = 38.432$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-02-2020; Ambient Temp: 22.5°C; Tissue Temp: 23.5°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)

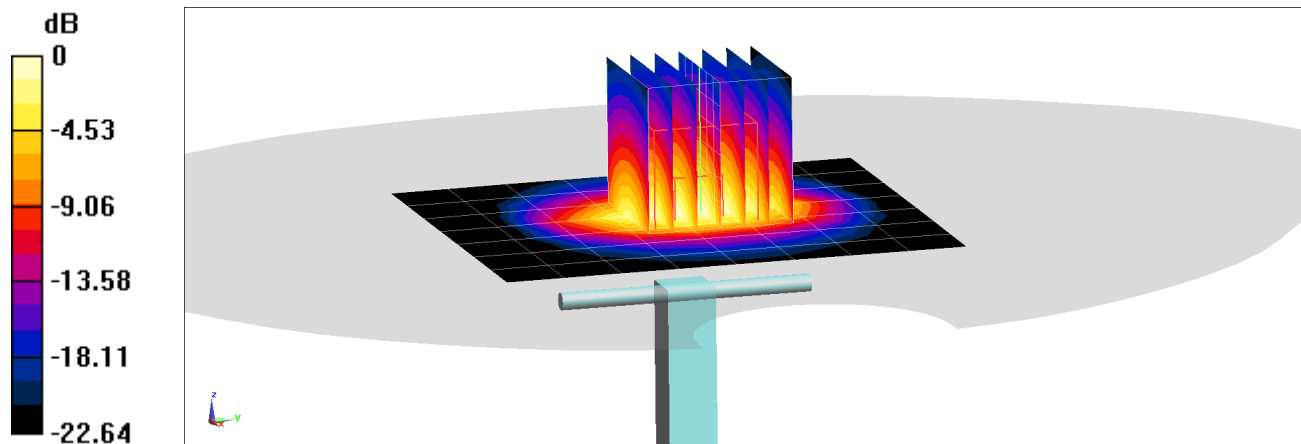
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 10.9 W/kg

SAR(1 g) = 5.19 W/kg

Deviation(1 g) = -2.26%



0 dB = 8.75 W/kg = 9.42 dBW/kg

PCTEST

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

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

Medium: 2450 Head Medium parameters used:

$f = 2450$ MHz; $\sigma = 1.863$ S/m; $\epsilon_r = 38.607$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-10-2020; Ambient Temp: 23.7°C; Tissue Temp: 23.4°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)

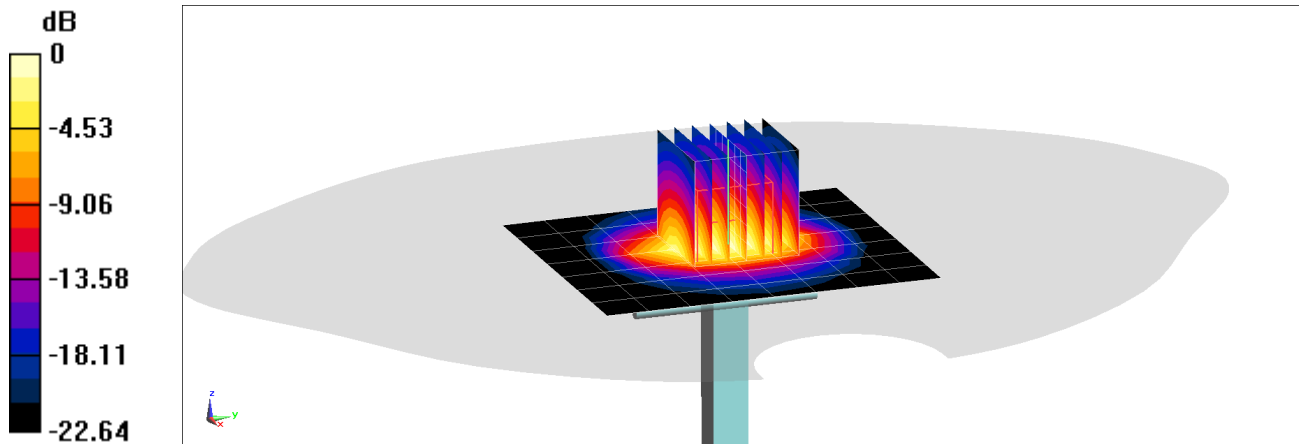
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 11.0 W/kg

SAR(1 g) = 5.2 W/kg

Deviation(1 g) = -1.33%



0 dB = 8.78 W/kg = 9.43 dBW/kg

PCTEST

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

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

Medium: 2450 Head Medium parameters used:

$f = 2450 \text{ MHz}$; $\sigma = 1.82 \text{ S/m}$; $\epsilon_r = 37.557$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-17-2020; Ambient Temp: 22.8°C; Tissue Temp: 22.1°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)

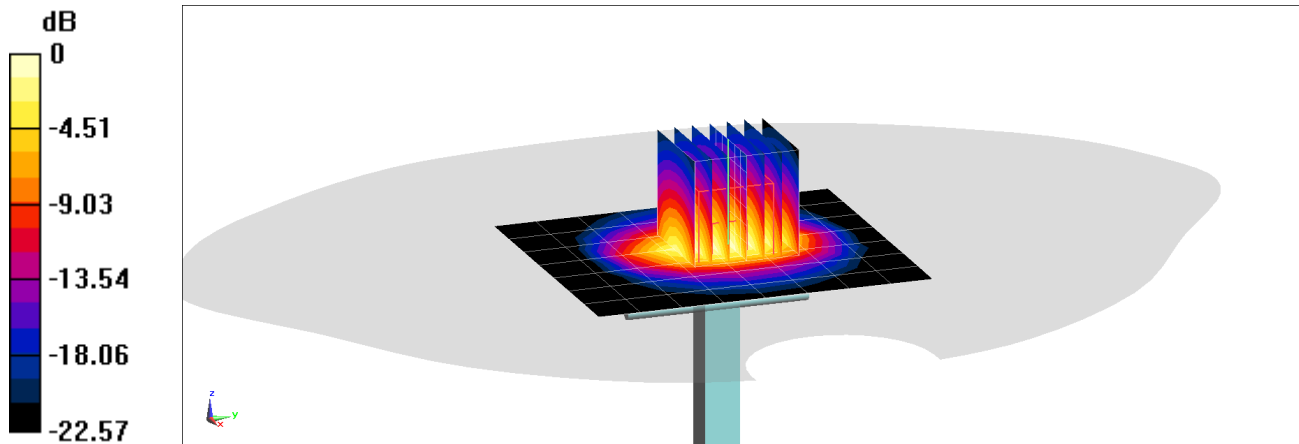
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 11.3 W/kg

SAR(1 g) = 5.39 W/kg

Deviation(1 g) = 1.51%



0 dB = 9.05 W/kg = 9.57 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; $\sigma = 4.592$ S/m; $\epsilon_r = 34.919$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2020; Ambient Temp: 23.0°C; Tissue Temp: 20.3°C

Probe: EX3DV4 - SN7406; ConvF(5.54, 5.54, 5.54) @ 5250 MHz; Calibrated: 5/16/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/8/2019

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)

5250 MHz System Verification at 17.0 dBm (50 mW)

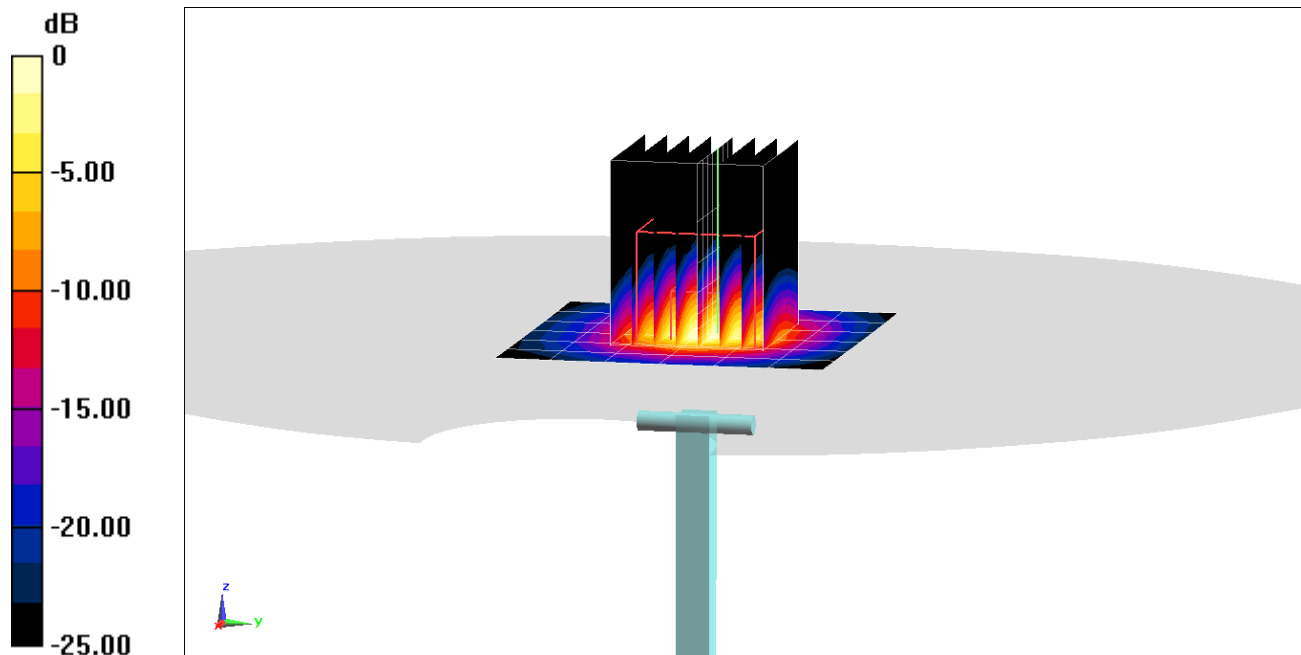
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 15.6 W/kg

SAR(1 g) = 3.71 W/kg

Deviation(1 g) = -6.31%



0 dB = 8.70 W/kg = 9.40 dBW/kg

PCTEST

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

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

Medium: 5200-5800 Head; Medium parameters used:

$f = 5600$ MHz; $\sigma = 4.989$ S/m; $\epsilon_r = 34.292$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2020; Ambient Temp: 23.0°C; Tissue Temp: 20.3°C

Probe: EX3DV4 - SN7406; ConvF(4.94, 4.94, 4.94) @ 5600 MHz; Calibrated: 5/16/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/8/2019

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)

5600 MHz System Verification at 17.0 dBm (50 mW)

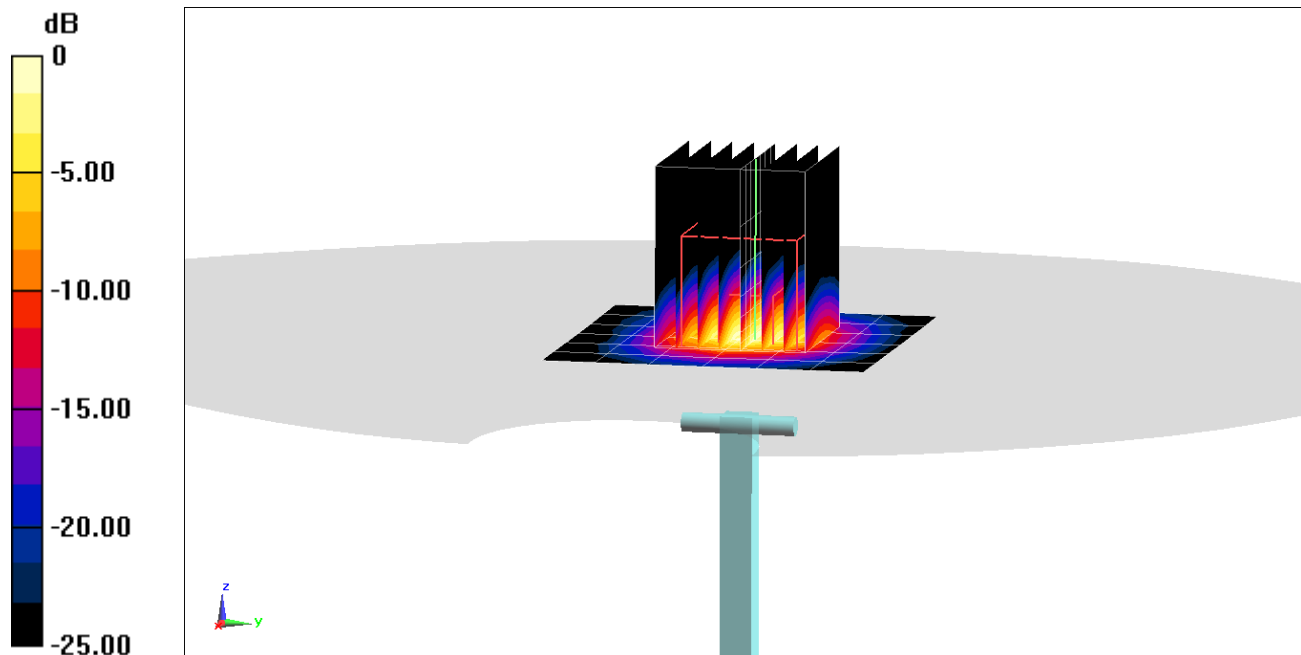
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 17.5 W/kg

SAR(1 g) = 3.9 W/kg

Deviation(1 g) = -7.25%



0 dB = 9.51 W/kg = 9.78 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; $\sigma = 5.168$ S/m; $\epsilon_r = 34.041$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2020; Ambient Temp: 23.0°C; Tissue Temp: 20.3°C

Probe: EX3DV4 - SN7406; ConvF(5.23, 5.23, 5.23) @ 5750 MHz; Calibrated: 5/16/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn728; Calibrated: 5/8/2019

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)

5750 MHz System Verification at 17.0 dBm (50 mW)

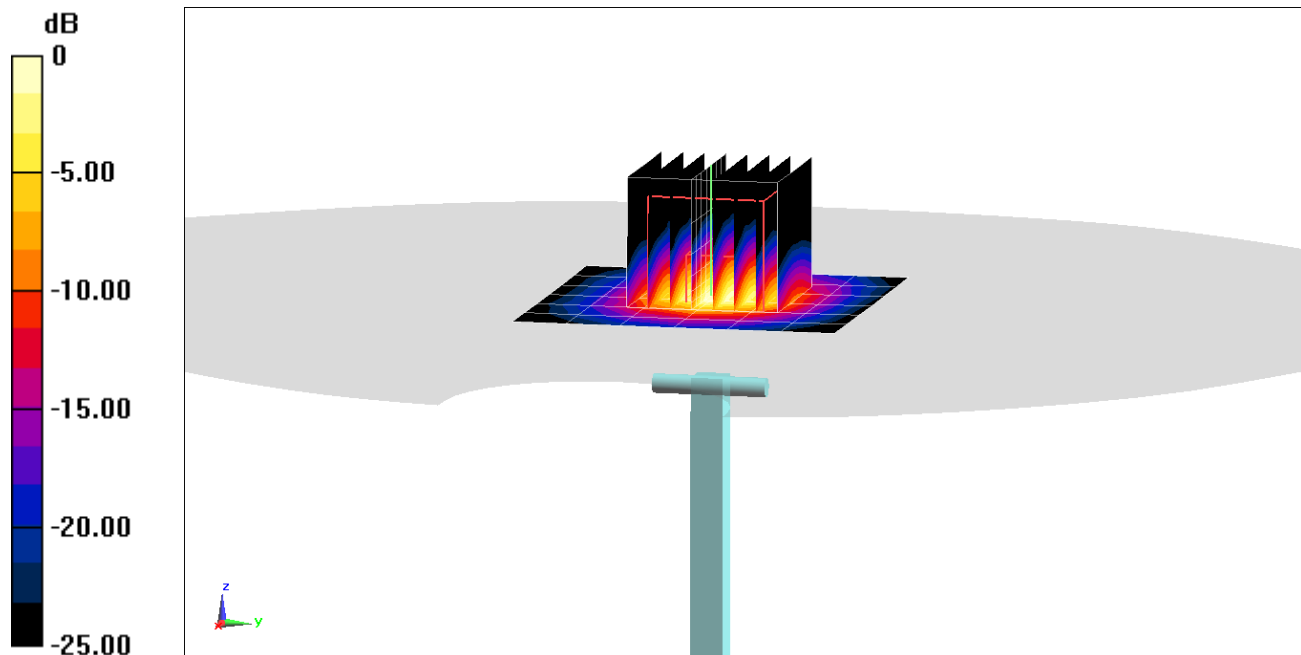
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 17.9 W/kg

SAR(1 g) = 3.81 W/kg

Deviation(1 g) = -5.34%



PCTEST

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

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

Medium: 700 Body Medium parameters used:

$f = 750 \text{ MHz}$; $\sigma = 0.977 \text{ S/m}$; $\epsilon_r = 53.132$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-26-2020; Ambient Temp: 22.7°C; Tissue Temp: 21.4°C

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

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

750 MHz System Verification at 23.0 dBm (200 mW)

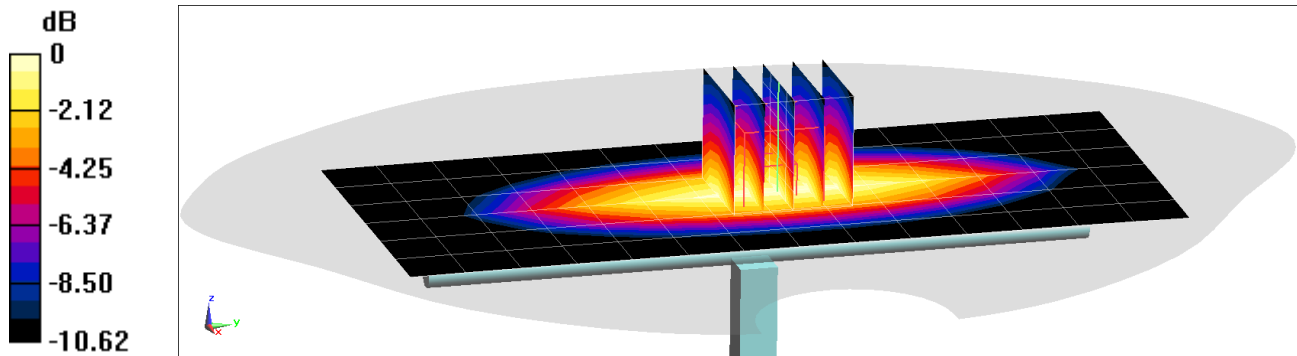
Area Scan (7x15x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 2.85 W/kg

SAR(1 g) = 1.81 W/kg

Deviation(1 g) = 5.85%



0 dB = 2.47 W/kg = 3.93 dBW/kg

PCTEST

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

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

Medium: 835 Body; Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.959 \text{ S/m}$; $\epsilon_r = 53.418$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 02-27-2020; Ambient Temp: 23.1°C; Tissue Temp: 21.1°C

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

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

835 MHz System Verification at 23.0 dBm (200 mW)

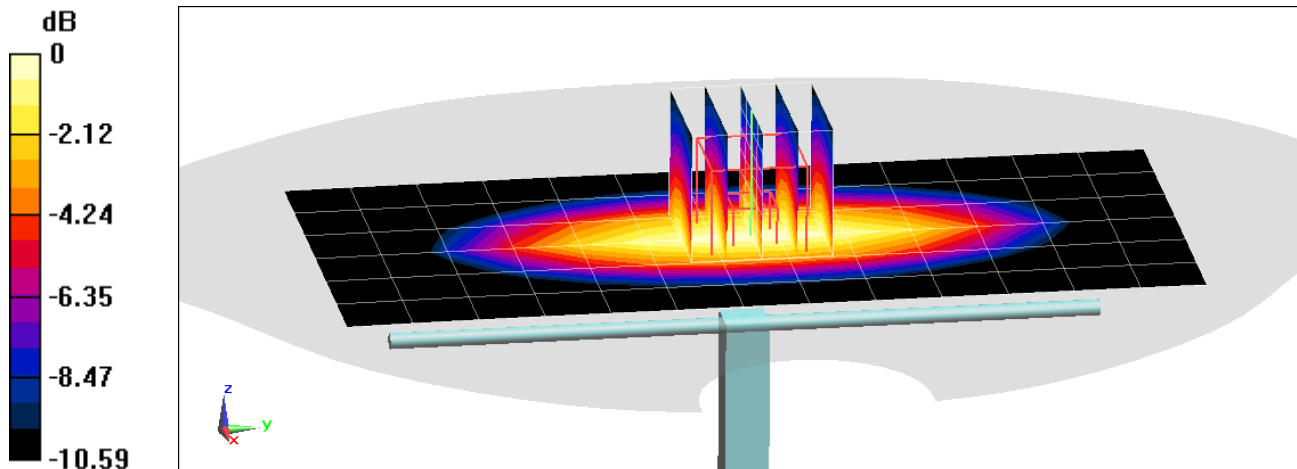
Area Scan (7x14x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 3.19 W/kg

SAR(1 g) = 2.03 W/kg

Deviation(1 g) = 4.10%



0 dB = 2.77 W/kg = 4.42 dBW/kg

PCTEST

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

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

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.962 \text{ S/m}$; $\epsilon_r = 53.927$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-09-2020; Ambient Temp: 21.6°C; Tissue Temp: 21.0°C

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

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

835 MHz System Verification at 23.0 dBm (200 mW)

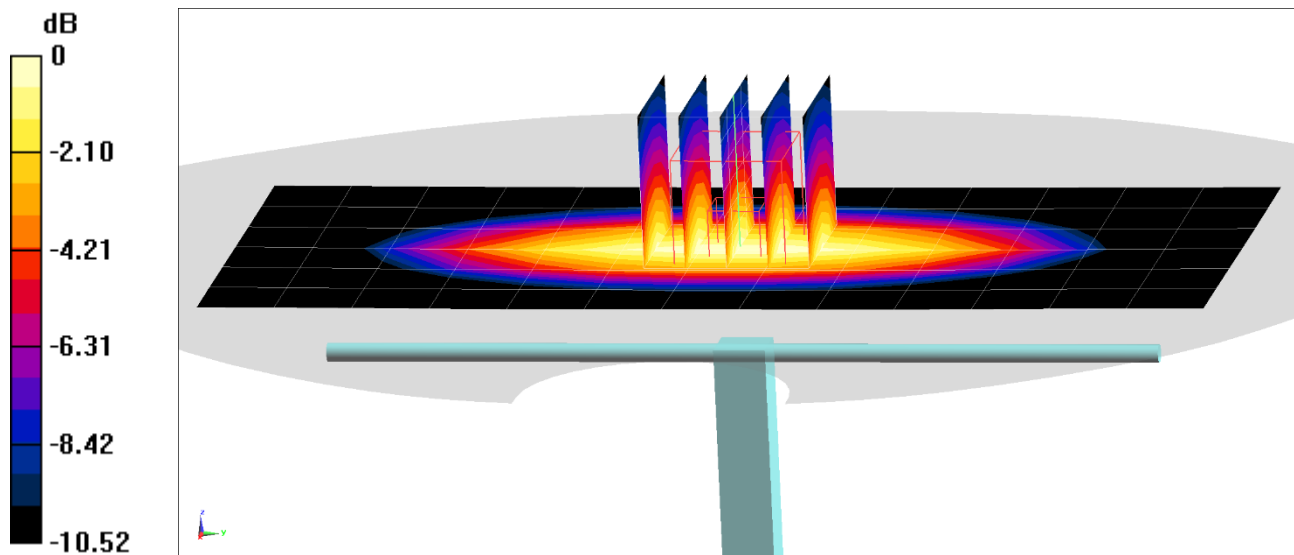
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.77 W/kg

SAR(1 g) = 1.83 W/kg

Deviation(1 g) = -3.38%



0 dB = 2.44 W/kg = 3.87 dBW/kg

PCTEST

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

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

Medium: 835 Body Medium parameters used:

$f = 835 \text{ MHz}$; $\sigma = 0.959 \text{ S/m}$; $\epsilon_r = 53.252$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section; Space: 1.5 cm

Test Date: 03-11-2020; Ambient Temp: 21.9°C; Tissue Temp: 21.4°C

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

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

835 MHz System Verification at 23.0 dBm (200 mW)

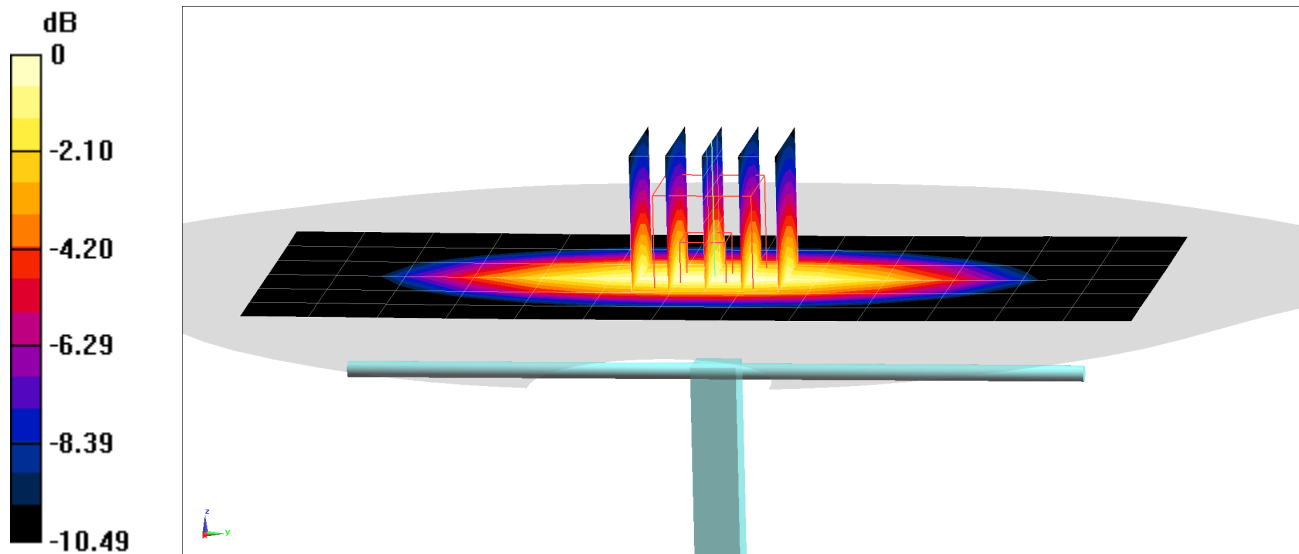
Area Scan (7x14x1): Measurement grid: $dx=15\text{mm}$, $dy=15\text{mm}$

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

Peak SAR (extrapolated) = 2.75 W/kg

SAR(1 g) = 1.81 W/kg

Deviation(1 g) = -4.44%



0 dB = 2.43 W/kg = 3.86 dBW/kg

PCTEST

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

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

Medium: 1750 Body; Medium parameters used:

$f = 1750$ MHz; $\sigma = 1.469$ S/m; $\epsilon_r = 55.727$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-02-2020; Ambient Temp: 22.8°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7357; ConvF(8.26, 8.26, 8.26) @ 1750 MHz; Calibrated: 4/24/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/18/2019

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

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

1750 MHz System Verification at 20.0 dBm (100 mW)

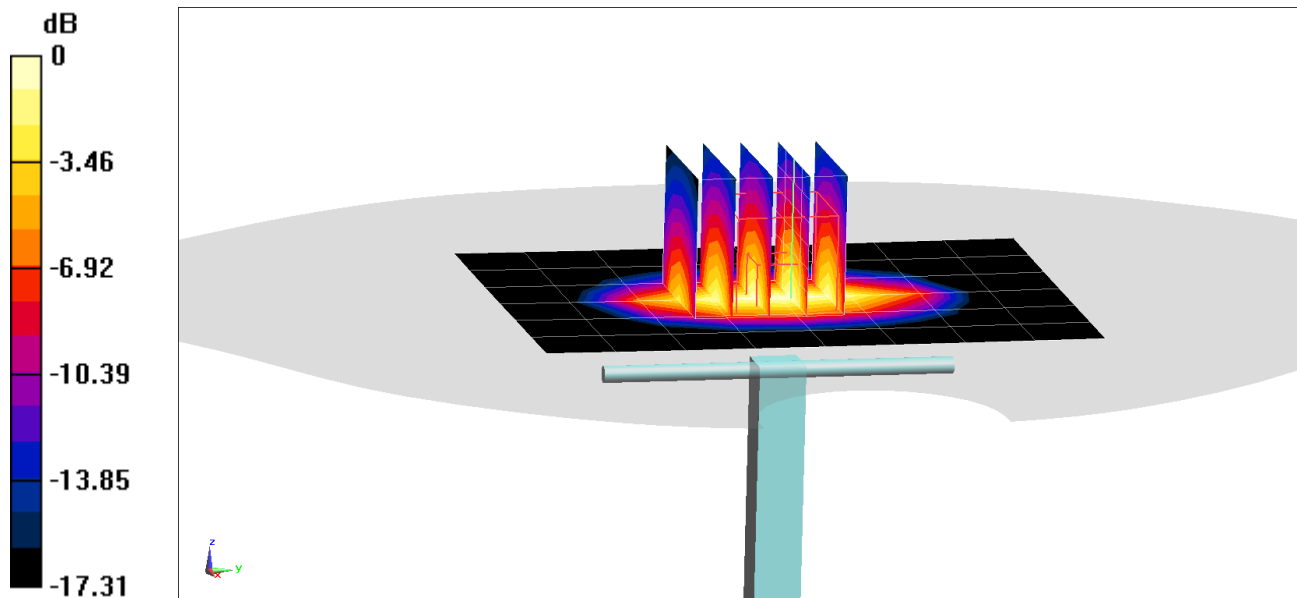
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 7.17 W/kg

SAR(1 g) = 3.91 W/kg; SAR(10 g) = 2.08 W/kg

Deviation(1 g) = 3.71%; Deviation(10 g) = 5.05%



0 dB = 5.97 W/kg = 7.76 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; $\sigma = 1.486$ S/m; $\epsilon_r = 55.921$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-04-2020; Ambient Temp: 23.1°C; Tissue Temp: 22.0°C

Probe: EX3DV4 - SN7357; ConvF(8.26, 8.26, 8.26) @ 1750 MHz; Calibrated: 4/24/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/18/2019

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

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

1750 MHz System Verification at 20.0 dBm (100 mW)

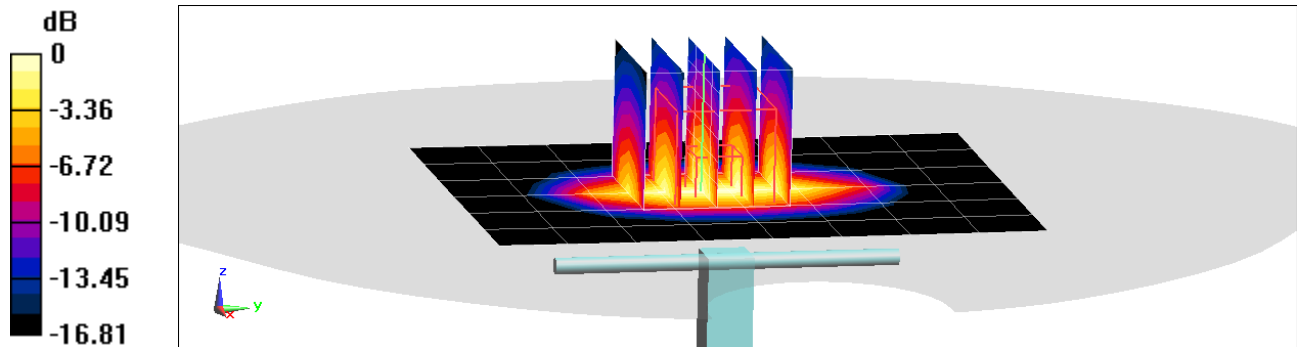
Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 6.89 W/kg

SAR(1 g) = 3.86 W/kg

Deviation(1 g) = 5.46%



0 dB = 5.78 W/kg = 7.62 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; $\sigma = 1.526$ S/m; $\epsilon_r = 52.168$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-09-2020; Ambient Temp: 22.0°C; Tissue Temp: 24.5°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1900 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

1900 MHz System Verification at 20.0 dBm (100 mW)

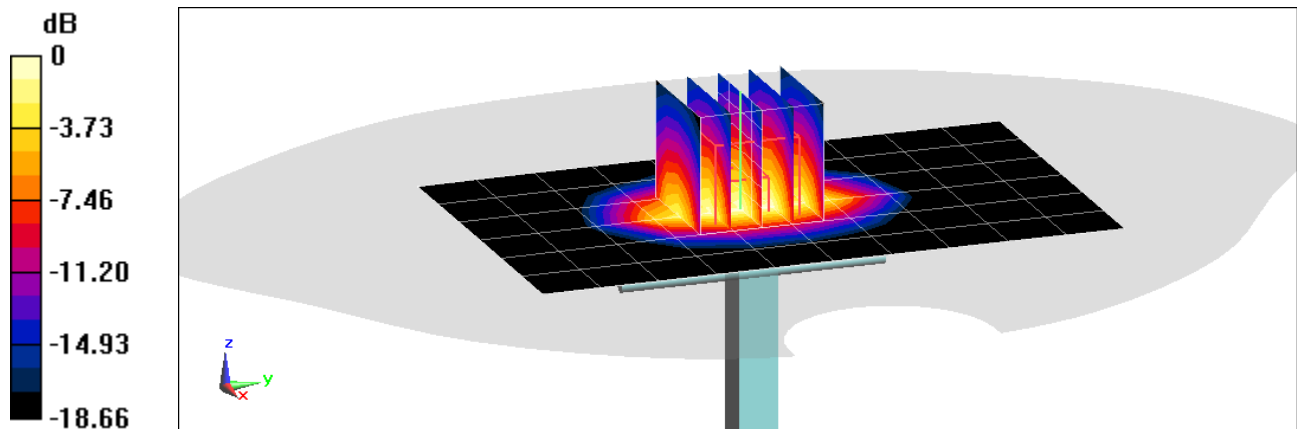
Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 7.24 W/kg

SAR(1 g) = 3.89 W/kg; SAR(10 g) = 1.99 W/kg

Deviation(1 g) = -1.27%; Deviation(10 g) = -3.86%



0 dB = 6.06 W/kg = 7.82 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 Body; Medium parameters used:

$f = 1900$ MHz; $\sigma = 1.575$ S/m; $\epsilon_r = 51.824$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-11-2020; Ambient Temp: 23.0°C; Tissue Temp: 21.8°C

Probe: EX3DV4 - SN7551; ConvF(7.69, 7.69, 7.69) @ 1900 MHz; Calibrated: 9/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

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

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

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

1900 MHz System Verification at 20.0 dBm (100 mW)

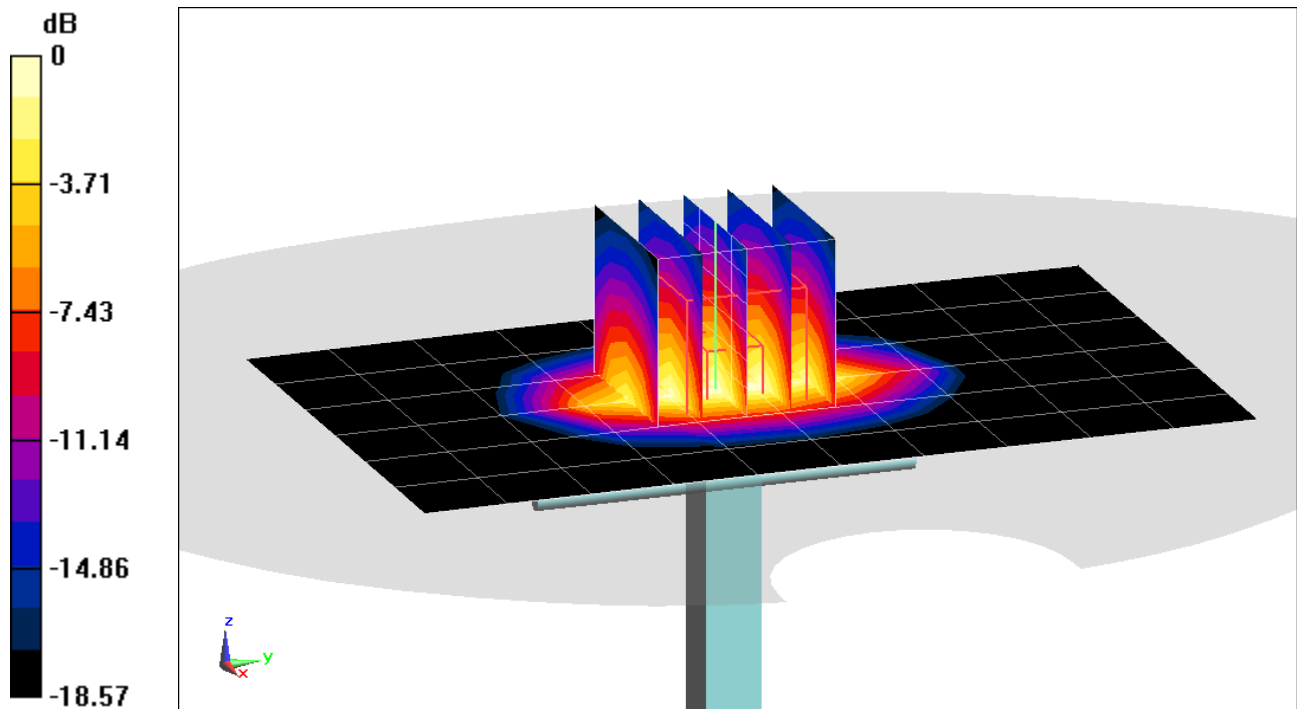
Area Scan (7x11x1): Measurement grid: dx=15mm, dy=15mm

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

Peak SAR (extrapolated) = 7.75 W/kg

SAR(1 g) = 4.15 W/kg; SAR(10 g) = 2.12 W/kg

Deviation(1 g) = 6.14%; Deviation(10 g) = 3.41%



0 dB = 6.49 W/kg = 8.12 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; $\sigma = 2.032$ S/m; $\epsilon_r = 51.738$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-28-2020; Ambient Temp: 23.0°C; Tissue Temp: 23.2°C

Probe: EX3DV4 - SN7547; ConvF(7.3, 7.3, 7.3) @ 2450 MHz; Calibrated: 7/15/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 7/11/2019

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)

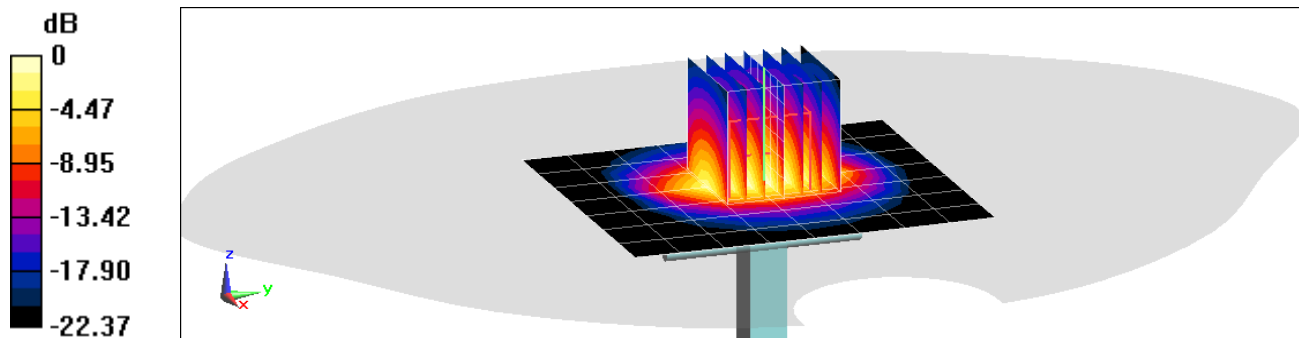
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 10.4 W/kg

SAR(1 g) = 5.07 W/kg

Deviation(1 g) = -0.78%



0 dB = 8.36 W/kg = 9.22 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; $\sigma = 2.039$ S/m; $\epsilon_r = 51.998$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-02-2020; Ambient Temp: 23.0°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7547; ConvF(7.3, 7.3, 7.3) @ 2450 MHz; Calibrated: 7/15/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 7/11/2019

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)

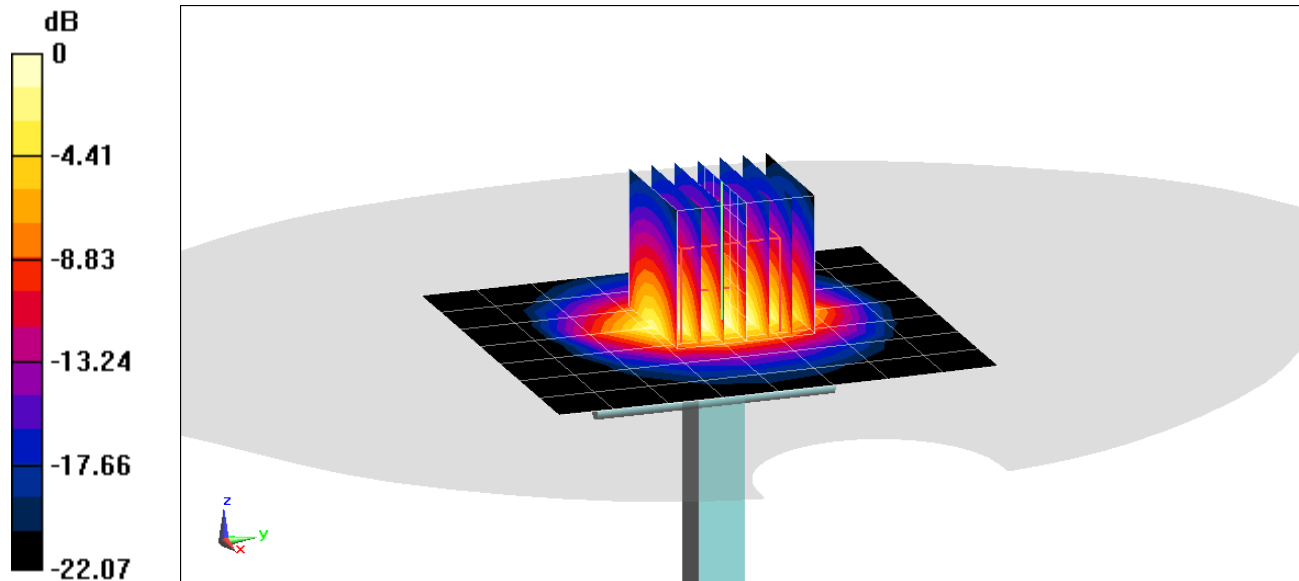
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 10.5 W/kg

SAR(1 g) = 5.07 W/kg

Deviation(1 g) = -0.78%



0 dB = 8.40 W/kg = 9.24 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; $\sigma = 2.014$ S/m; $\epsilon_r = 52.082$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-09-2020; Ambient Temp: 20.9°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN7357; ConvF(7.59, 7.59, 7.59) @ 2450 MHz; Calibrated: 4/24/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/18/2019

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)

2450 MHz System Verification at 20.0 dBm (100 mW)

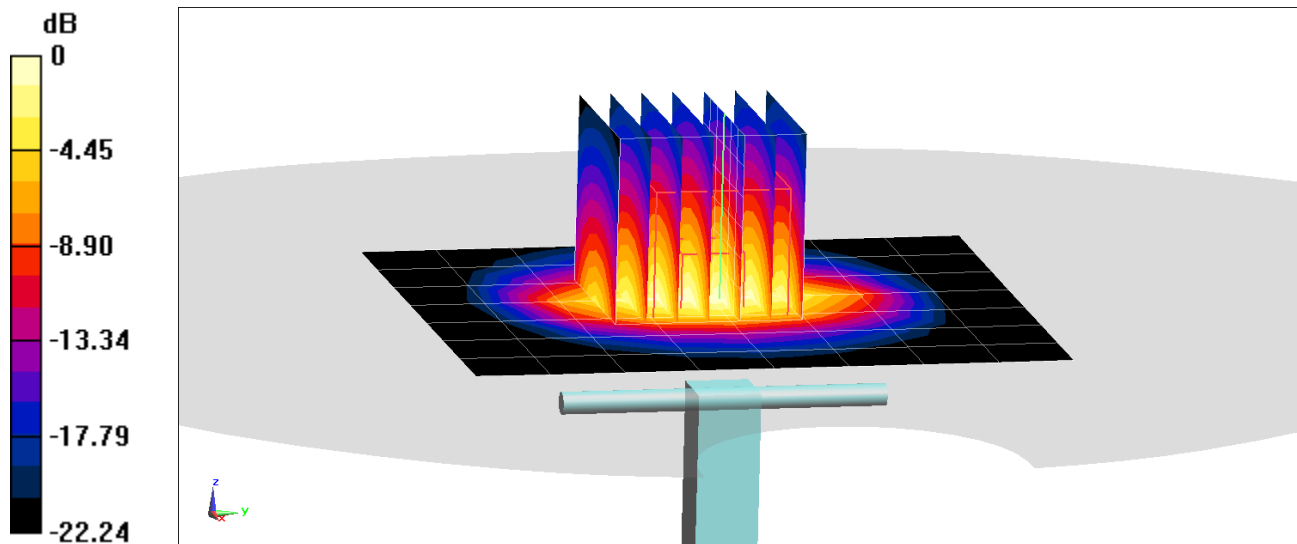
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 10.8 W/kg

SAR(1 g) = 5.11 W/kg

Deviation(1 g) = 0.00%



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; $\sigma = 2.036$ S/m; $\epsilon_r = 52.194$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-16-2020; Ambient Temp: 23.2°C; Tissue Temp: 22.5°C

Probe: EX3DV4 - SN7547; ConvF(7.3, 7.3, 7.3) @ 2450 MHz; Calibrated: 7/15/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 7/11/2019

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)

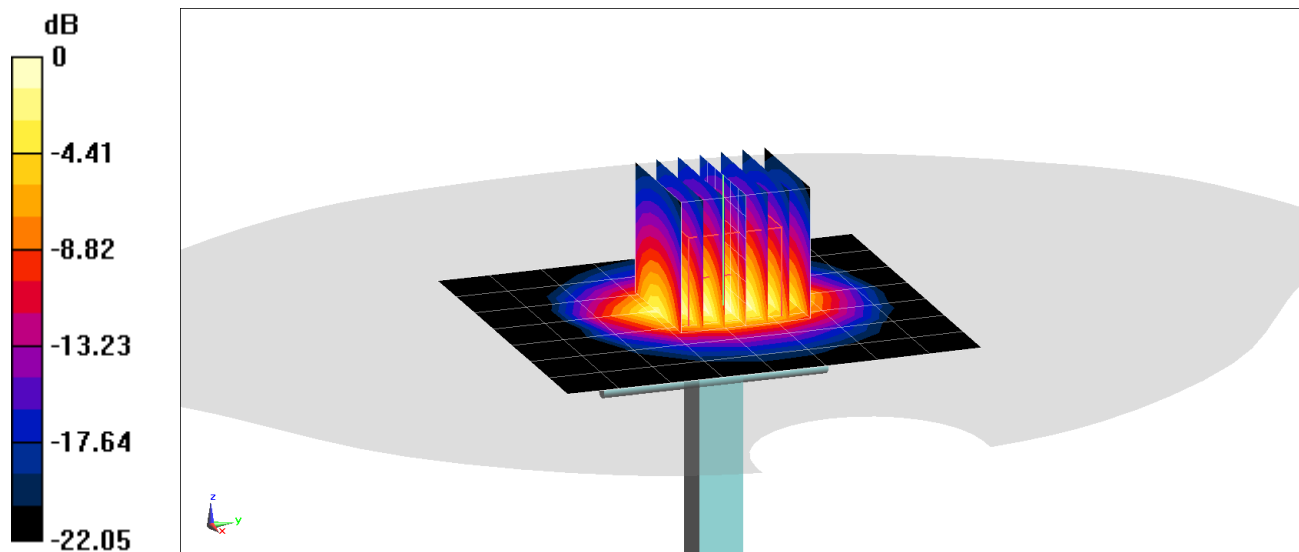
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 10.4 W/kg

SAR(1 g) = 5.05 W/kg

Deviation(1 g) = -1.17%



0 dB = 8.36 W/kg = 9.22 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; $\sigma = 2.032$ S/m; $\epsilon_r = 51.617$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-19-2020; Ambient Temp: 22.7°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7547; ConvF(7.3, 7.3, 7.3) @ 2450 MHz; Calibrated: 7/15/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 7/11/2019

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)

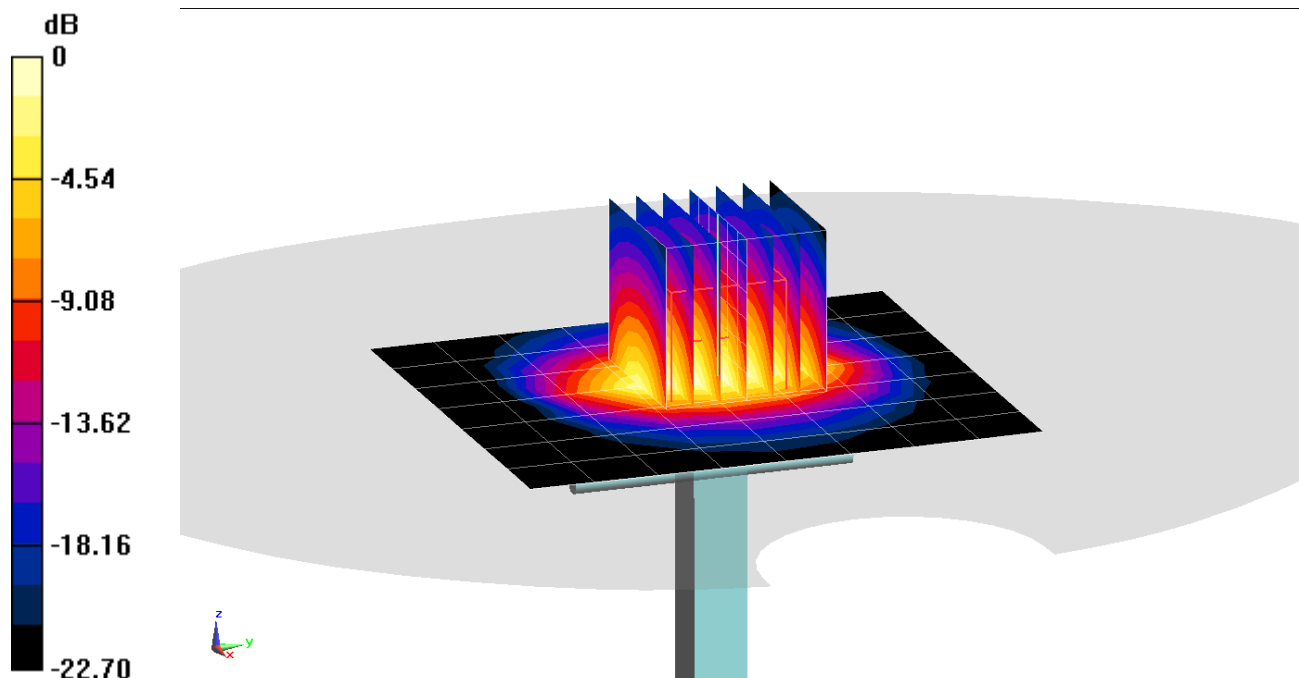
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 10.6 W/kg

SAR(10 g) = 2.33 W/kg

Deviation(10 g) = -3.72%



0 dB = 8.46 W/kg = 9.27 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; $\sigma = 2.224$ S/m; $\epsilon_r = 51.535$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-09-2020; Ambient Temp: 20.9°C; Tissue Temp: 21.1°C

Probe: EX3DV4 - SN7357; ConvF(7.39, 7.39, 7.39) @ 2600 MHz; Calibrated: 4/24/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1407; Calibrated: 4/18/2019

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)

2600 MHz System Verification at 20.0 dBm (100 mW)

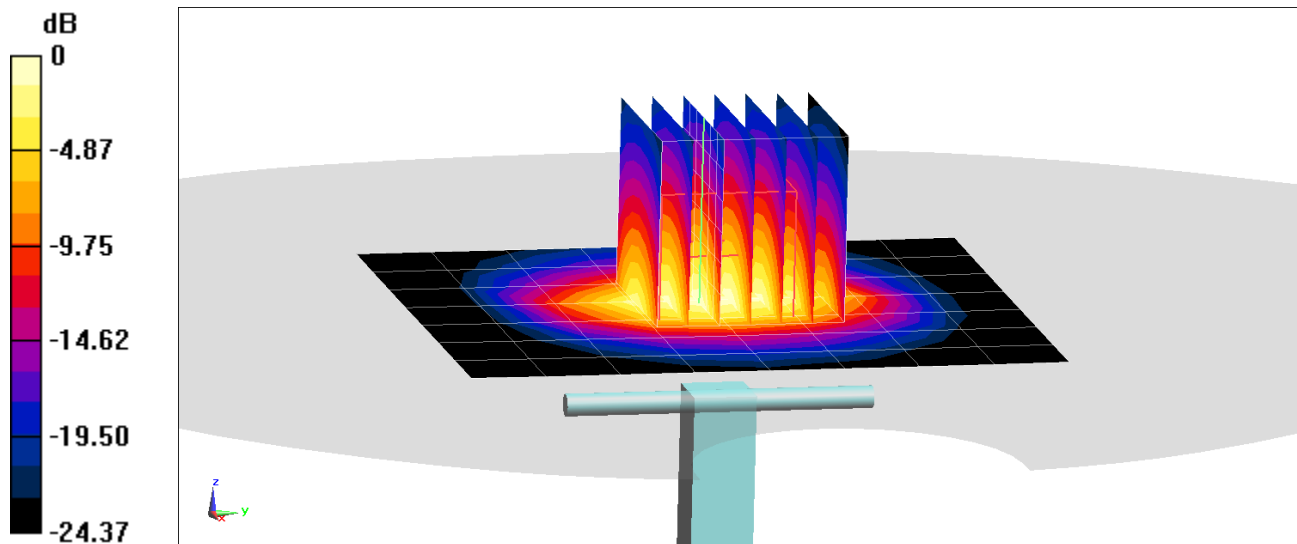
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 12.8 W/kg

SAR(1 g) = 5.7 W/kg

Deviation(1 g) = 4.01%



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; $\sigma = 2.205$ S/m; $\epsilon_r = 51.195$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-19-2020; Ambient Temp: 22.7°C; Tissue Temp: 22.1°C

Probe: EX3DV4 - SN7547; ConvF(7.18, 7.18, 7.18) @ 2600 MHz; Calibrated: 7/15/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1323; Calibrated: 7/11/2019

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

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

2600 MHz System Verification at 20.0 dBm (100 mW)

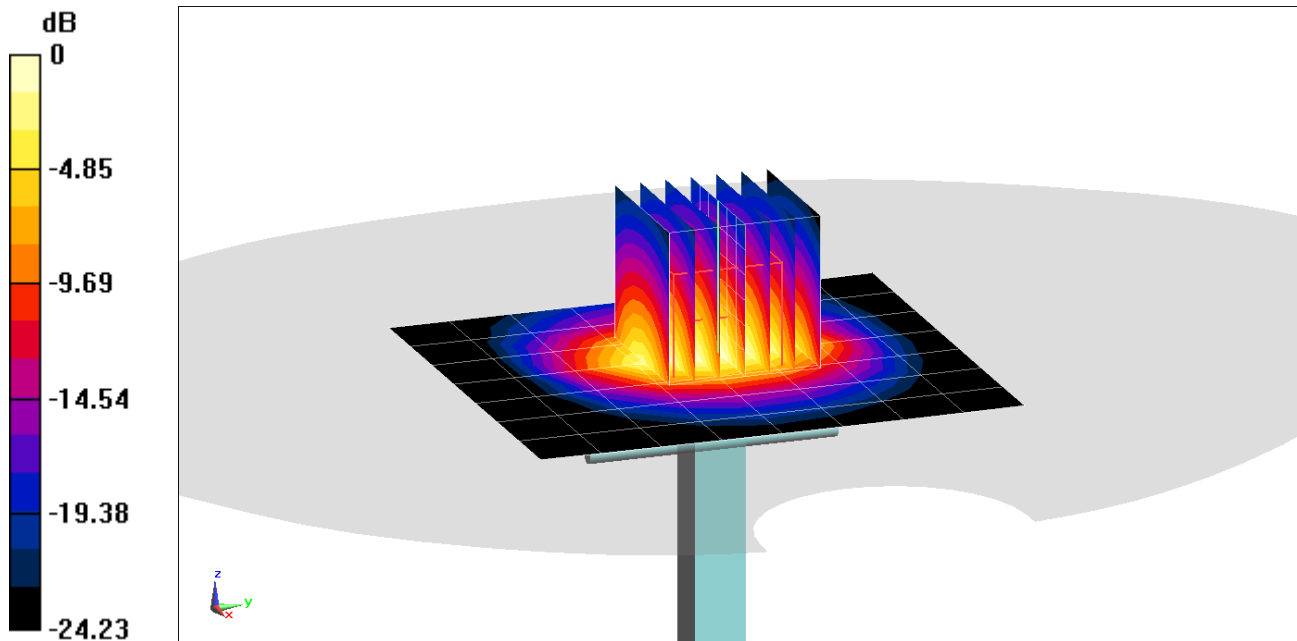
Area Scan (8x9x1): Measurement grid: dx=12mm, dy=12mm

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

Peak SAR (extrapolated) = 12.0 W/kg

SAR(10 g) = 2.4 W/kg

Deviation(10 g) = -2.83%



PCTEST

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

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

Medium: 5200-5800 Body Medium parameters used:

$f = 5250$ MHz; $\sigma = 5.501$ S/m; $\epsilon_r = 47.219$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2020; Ambient Temp: 23.7°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7409; ConvF(4.7, 4.7, 4.7) @ 5250 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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)

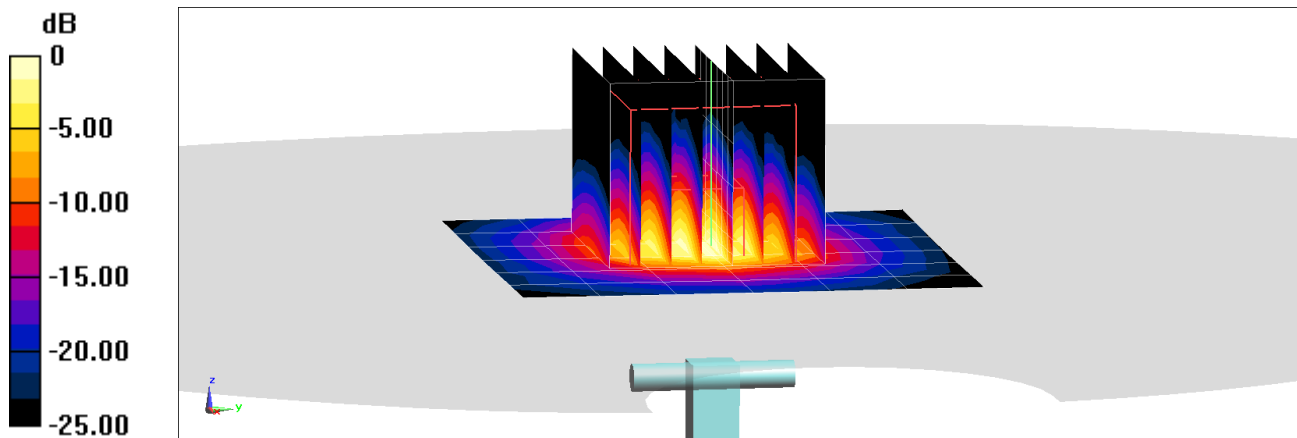
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 16.2 W/kg

SAR(1 g) = 3.79 W/kg; SAR(10 g) = 1.06 W/kg

Deviation(1 g) = -0.13%; Deviation(10 g) = 0.47%



0 dB = 8.99 W/kg = 9.54 dBW/kg

PCTEST

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

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

Medium: 5200-5800 Body Medium parameters used:

$f = 5250$ MHz; $\sigma = 5.522$ S/m; $\epsilon_r = 47.383$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-17-2020; Ambient Temp: 22.8°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN7409; ConvF(4.7, 4.7, 4.7) @ 5250 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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)

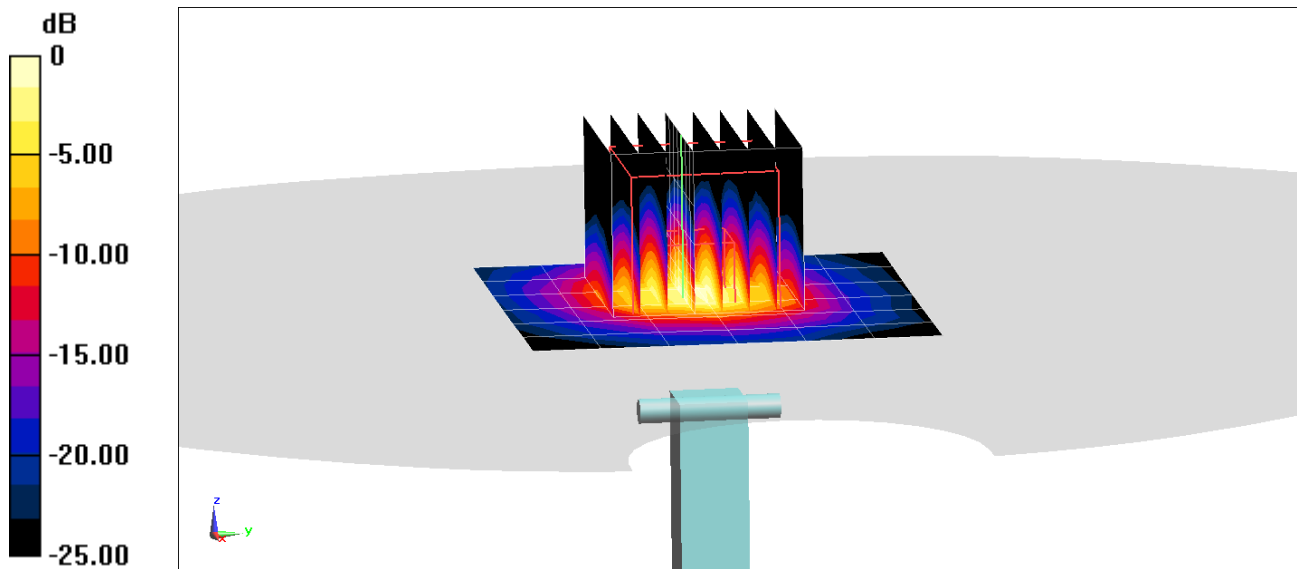
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 15.4 W/kg

SAR(1 g) = 3.7 W/kg

Deviation(1 g) = -2.12%



PCTEST

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

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

Medium: 5200-5800 Body Medium parameters used:

$f = 5600$ MHz; $\sigma = 5.976$ S/m; $\epsilon_r = 46.635$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2020; Ambient Temp: 23.7°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7409; ConvF(4.22, 4.22, 4.22) @ 5600 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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)

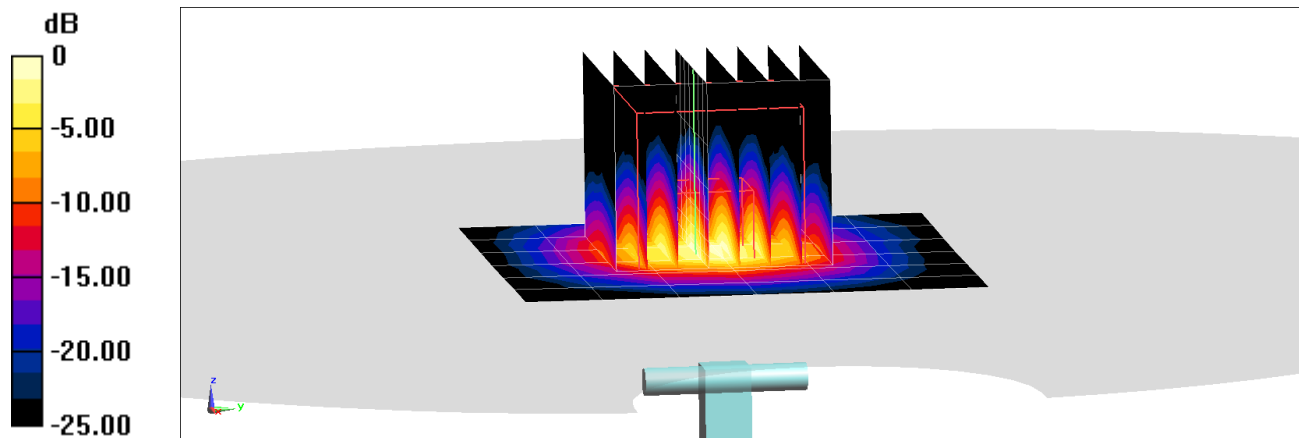
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 17.9 W/kg

SAR(1 g) = 4.01 W/kg; SAR(10 g) = 1.11 W/kg

Deviation(1 g) = 0.38%; Deviation(10 g) = -0.45%



0 dB = 9.79 W/kg = 9.91 dBW/kg

PCTEST

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

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

Medium: 5200-5800 Body Medium parameters used:

$f = 5600$ MHz; $\sigma = 5.99$ S/m; $\epsilon_r = 46.757$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-17-2020; Ambient Temp: 22.8°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN7409; ConvF(4.22, 4.22, 4.22) @ 5600 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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)

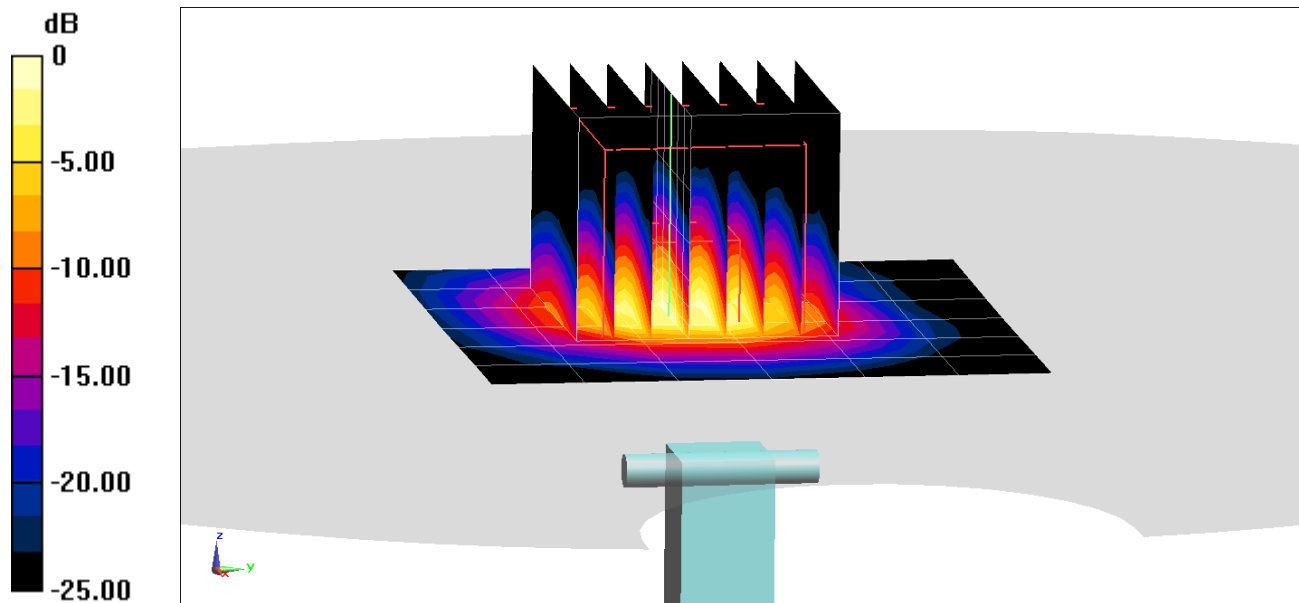
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 18.1 W/kg

SAR(1 g) = 3.93 W/kg

Deviation(1 g) = 0.13%



0 dB = 9.57 W/kg = 9.81 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 Body Medium parameters used:

$f = 5750$ MHz; $\sigma = 6.183$ S/m; $\epsilon_r = 46.403$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 02-24-2020; Ambient Temp: 23.7°C; Tissue Temp: 22.2°C

Probe: EX3DV4 - SN7409; ConvF(4.23, 4.23, 4.23) @ 5750 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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)

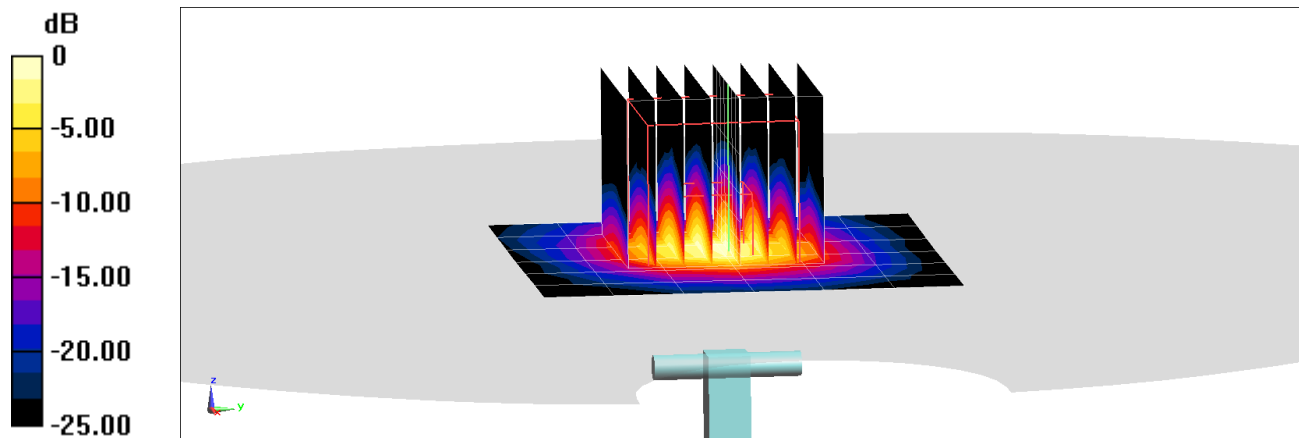
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 17.6 W/kg

SAR(1 g) = 3.76 W/kg; SAR(10 g) = 1.03 W/kg

Deviation(1 g) = -1.96%; Deviation(10 g) = -2.83%



0 dB = 9.23 W/kg = 9.65 dBW/kg

PCTEST

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

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

Medium: 5200-5800 Body Medium parameters used:

$f = 5750$ MHz; $\sigma = 6.21$ S/m; $\epsilon_r = 46.477$; $\rho = 1000$ kg/m³

Phantom section: Flat Section; Space: 1.0 cm

Test Date: 03-17-2020; Ambient Temp: 22.8°C; Tissue Temp: 22.3°C

Probe: EX3DV4 - SN7409; ConvF(4.23, 4.23, 4.23) @ 5750 MHz; Calibrated: 6/19/2019

Sensor-Surface: 1.4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1334; Calibrated: 6/20/2019

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

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

5750 MHz System Verification at 17.0 dBm (50 mW)

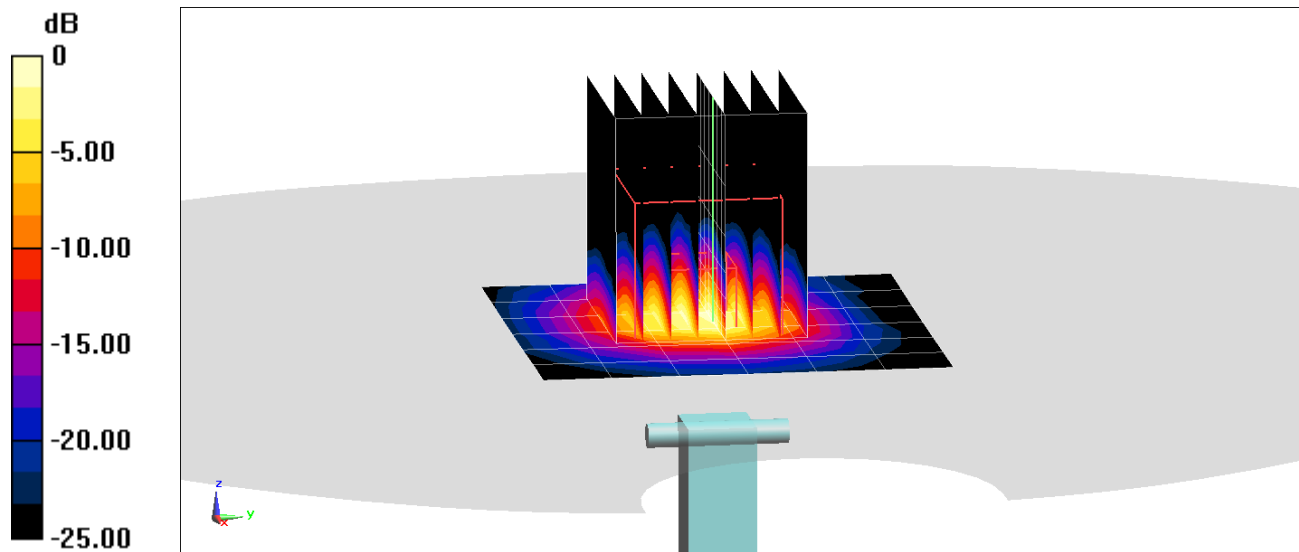
Area Scan (7x7x1): Measurement grid: dx=10mm, dy=10mm

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

Peak SAR (extrapolated) = 18.1 W/kg

SAR(1 g) = 3.74 W/kg

Deviation(1 g) = -1.45%



APPENDIX C: SAR TISSUE SPECIFICATIONS

Measurement Procedure for Tissue verification:

- 1) The network analyzer and probe system was configured and calibrated.
- 2) The probe was immersed in the tissue. The tissue was placed in a nonmetallic container. Trapped air bubbles beneath the flange were minimized by placing the probe at a slight angle.
- 3) The complex admittance with respect to the probe aperture was measured
- 4) The complex relative permittivity ϵ' can be calculated from the below equation (Pournaropoulos and Misra):

$$Y = \frac{j2\omega\epsilon_r\epsilon_0}{[\ln(b/a)]^2} \int_a^b \int_a^b \int_0^\pi \cos\phi' \frac{\exp[-j\omega r(\mu_0\epsilon_r'\epsilon_0)^{1/2}]}{r} d\phi' d\rho' d\rho$$

where Y is the admittance of the probe in contact with the sample, the primed and unprimed coordinates refer to source and observation points, respectively, $r^2 = \rho^2 + \rho'^2 - 2\rho\rho' \cos\phi'$, ω is the angular frequency, and $j = \sqrt{-1}$.

3 Composition / Information on ingredients

3.2 Mixtures

Description: Aqueous solution with surfactants and inhibitors

Declarable, or hazardous components:



CAS: 107-21-1 EINECS: 203-473-3 Reg.nr.: 01-2119456816-28-0000	Ethandiol 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	Alkoxyated alcohol, > C₁₆ Aquatic Chronic 2, H411; Skin Irrit. 2, H315; Eye Irrit. 2, H319	< 2.0%

Additional information:

For the wording of the listed risk phrases refer to section 16.
Not mentioned CAS-, EINECS- or registration numbers are to be regarded as Proprietary/Confidential.
The specific chemical identity and/or exact percentage concentration of proprietary components is withheld as a trade secret.

Figure C-1

Note: Liquid recipes are proprietary SPEAG. Since the composition is approximate to the actual liquids utilized, the manufacturer tissue-equivalent liquid data sheets are provided below.

FCC ID ZNFQ730TM		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 02/24/20 - 03/19/20	DUT Type: Portable Handset			APPENDIX C: Page 1 of 3

Measurement Certificate / Material Test

Item Name	Body Tissue Simulating Liquid (MBBL600-6000V6)
Product No.	SL AAM U16 BC (Batch: 181029-1)
Manufacturer	SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the KDB 865864 compliance standard.

Test Condition

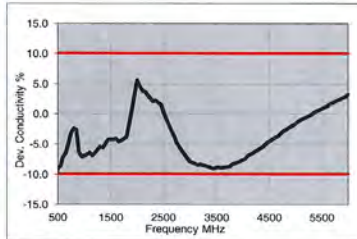
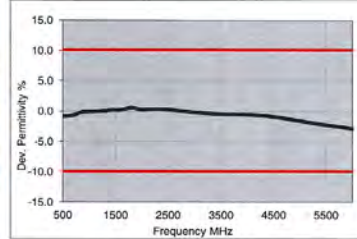
Ambient Condition 22°C ; 30% humidity
 TSL Temperature 22°C
 Test Date 30-Oct-18
 Operator CL

Additional Information

TSL Density
 TSL Heat-capacity

Results

f [MHz]	Measured			Target		Diff.to Target [%]	
	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
800	55.1	21.3	0.95	55.3	0.97	-0.4	-2.1
825	55.1	20.8	0.96	55.2	0.98	-0.3	-2.0
835	55.1	20.6	0.96	55.1	0.99	0.0	-2.5
850	55.1	20.4	0.96	55.2	0.99	-0.1	-3.0
900	55.0	19.7	0.98	55.0	1.05	0.0	-6.7
1400	54.2	15.6	1.22	54.1	1.28	0.2	-4.7
1450	54.1	15.4	1.24	54.0	1.30	0.2	-4.6
1500	54.1	15.3	1.27	53.9	1.33	0.3	-4.5
1550	54.0	15.1	1.30	53.9	1.36	0.2	-4.4
1600	53.9	15.0	1.33	53.8	1.39	0.2	-4.3
1625	53.9	14.9	1.35	53.8	1.41	0.3	-4.3
1640	53.9	14.9	1.36	53.7	1.42	0.3	-4.2
1650	53.8	14.9	1.38	53.7	1.43	0.2	-4.9
1700	53.8	14.8	1.40	53.6	1.46	0.4	-4.1
1750	53.7	14.7	1.43	53.4	1.49	0.5	-4.0
1800	53.7	14.6	1.46	53.3	1.52	0.6	-3.9
1810	53.7	14.6	1.47	53.3	1.52	0.6	-3.3
1825	53.7	14.6	1.48	53.3	1.52	0.6	-2.6
1850	53.6	14.5	1.50	53.3	1.52	0.6	-1.3
1900	53.5	14.5	1.53	53.3	1.52	0.4	0.7
1950	53.5	14.5	1.57	53.3	1.52	0.4	3.3
2000	53.4	14.4	1.60	53.3	1.52	0.2	5.3
2050	53.4	14.4	1.64	53.2	1.57	0.3	4.5
2100	53.3	14.4	1.68	53.2	1.62	0.2	3.7
2150	53.3	14.4	1.72	53.1	1.68	0.4	3.6
2200	53.2	14.4	1.76	53.0	1.71	0.3	2.9
2250	53.1	14.4	1.81	53.0	1.76	0.2	2.8
2300	53.1	14.4	1.85	52.9	1.81	0.4	2.2
2350	53.0	14.5	1.89	52.8	1.85	0.3	2.2
2400	52.9	14.5	1.94	52.8	1.90	0.2	2.1
2450	52.9	14.5	1.98	52.7	1.95	0.4	1.5
2500	52.8	14.6	2.03	52.6	2.02	0.3	0.5
2550	52.7	14.6	2.07	52.6	2.09	0.2	-1.0
2600	52.6	14.7	2.12	52.5	2.16	0.2	-1.9



3500	51.1	15.5	3.02	51.3	3.31	-0.4	-8.8
3700	50.8	15.7	3.24	51.1	3.55	-0.5	-8.8
5200	48.1	18.2	5.27	49.0	5.30	-1.8	-0.6
5250	48.0	18.3	5.34	49.0	5.36	-1.9	-0.4
5300	47.9	18.4	5.41	48.9	5.42	-2.0	-0.2
5500	47.5	18.6	5.70	48.6	5.65	-2.2	0.8
5600	47.3	18.8	5.84	48.5	5.77	-2.3	1.3
5700	47.1	18.9	5.99	48.3	5.88	-2.5	1.8
5800	47.0	19.0	6.14	48.2	6.00	-2.6	2.3

TSL Dielectric Parameters

1

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

FCC ID ZNFQ730TM		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 02/24/20 - 03/19/20	DUT Type: Portable Handset			APPENDIX C: Page 2 of 3

Measurement Certificate / Material Test

Item Name	Head Tissue Simulating Liquid (HBBL600-10000V6)
Product No.	SL AAH U16 BC (Batch: 181031-2)
Manufacturer	SPEAG

Measurement Method

TSL dielectric parameters measured using calibrated DAK probe.

Target Parameters

Target parameters as defined in the IEEE 1528 and IEC 62209 compliance standards.

Test Condition

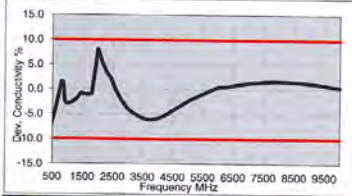
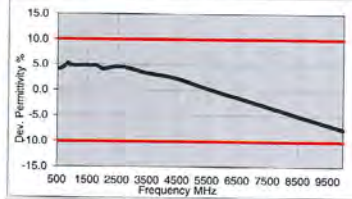
Ambient Condition 22°C ; 30% humidity
 TSL Temperature 22°C
 Test Date 31-Oct-18
 Operator CL

Additional Information

TSL Density
 TSL Heat-capacity

Results

f [MHz]	Measured			Target		Diff.to Target [%]	
	e'	e''	sigma	eps	sigma	Δ-eps	Δ-sigma
800	43.8	20.5	0.91	41.7	0.90	5.1	1.4
825	43.8	20.1	0.92	41.6	0.91	5.3	1.5
850	43.8	19.9	0.93	41.5	0.91	5.4	2.0
880	43.7	19.7	0.93	41.5	0.92	5.3	1.5
900	43.5	19.9	0.95	41.5	0.97	4.8	-2.1
1400	42.5	15.0	1.17	40.6	1.18	4.7	-0.8
1450	42.5	14.8	1.19	40.5	1.20	4.9	-0.8
1600	42.2	14.3	1.27	40.3	1.28	4.7	-1.1
1625	42.2	14.2	1.29	40.3	1.30	4.8	-0.7
1640	42.2	14.2	1.30	40.3	1.31	4.8	-0.5
1650	42.1	14.2	1.30	40.2	1.31	4.6	-1.0
1700	42.1	14.0	1.33	40.2	1.34	4.8	-0.9
1750	42.0	13.9	1.36	40.1	1.37	4.8	-0.8
1800	41.9	13.9	1.39	40.0	1.40	4.7	-0.7
1810	41.9	13.8	1.40	40.0	1.40	4.7	0.0
1825	41.9	13.8	1.41	40.0	1.40	4.7	0.7
1850	41.8	13.8	1.42	40.0	1.40	4.5	1.4
1900	41.8	13.7	1.45	40.0	1.40	4.5	3.6
1950	41.7	13.7	1.48	40.0	1.40	4.3	5.7
2000	41.6	13.6	1.51	40.0	1.40	4.0	7.9
2050	41.6	13.6	1.55	39.9	1.44	4.2	7.3
2100	41.5	13.5	1.58	39.8	1.49	4.2	6.1
2150	41.4	13.5	1.62	39.7	1.53	4.2	5.7
2200	41.4	13.5	1.65	39.6	1.58	4.4	4.6
2250	41.3	13.5	1.69	39.6	1.62	4.4	4.2
2300	41.2	13.5	1.72	39.5	1.67	4.4	3.2
2350	41.1	13.5	1.76	39.4	1.71	4.4	2.9
2400	41.1	13.5	1.80	39.3	1.76	4.6	2.5
2450	41.0	13.5	1.84	39.2	1.80	4.6	2.2
2500	40.9	13.5	1.88	39.1	1.85	4.5	1.4
2550	40.8	13.5	1.92	39.1	1.91	4.4	0.6
2600	40.8	13.6	1.95	39.0	1.96	4.6	-0.2
3500	39.2	14.1	2.74	37.9	2.91	3.3	-5.8
3700	38.9	14.2	2.93	37.7	3.12	9.1	-6.1



5200	36.3	15.8	4.57	36.0	4.66	0.9	-1.7
5250	36.2	15.9	4.63	35.9	4.71	0.8	-1.6
5300	36.1	15.9	4.69	35.9	4.76	0.7	-1.4
5500	35.8	16.1	4.92	35.6	4.96	0.3	-0.9
5600	35.6	16.2	5.04	35.5	5.07	0.1	-0.6
5700	35.4	16.2	5.15	35.4	5.17	0.0	-0.3
5800	35.2	16.3	5.27	35.3	5.27	-0.2	0.0
6000	34.9	16.5	5.50	35.1	5.48	-0.6	0.5
6500	34.0	16.9	6.12	34.5	6.07	-1.4	0.9
7000	33.1	17.3	6.74	33.9	6.65	-2.3	1.3
7500	32.2	17.6	7.36	33.3	7.24	-3.2	1.6
8000	31.4	17.9	7.97	32.7	7.84	-4.1	1.7
8500	30.5	18.2	8.59	32.1	8.45	-5.0	1.6
9000	29.7	18.4	9.20	31.5	9.08	-5.9	1.3
9500	28.9	18.5	9.80	31.0	9.71	-6.8	0.9
10000	28.1	18.7	10.40	30.4	10.36	-7.6	0.4

TSL Dielectric Parameters

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



FCC ID ZNFQ730TM		SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 02/24/20 - 03/19/20	DUT Type: Portable Handset			APPENDIX C: Page 3 of 3

APPENDIX D: SAR SYSTEM VALIDATION

Per FCC KDB Publication 865664 D02v01r02, SAR system validation status should be documented to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media. A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

**Table D-1
SAR System Validation Summary – 1g**



SAR System	Freq. (MHz)	Date	Probe SN	Probe Cal Point		Cond. (σ)	Perm. (ϵ_r)	CW VALIDATION			MOD. VALIDATION		
								SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
L	750	9/24/2019	7410	750	Head	0.878	42.471	PASS	PASS	PASS	N/A	N/A	N/A
L	835	9/24/2019	7410	835	Head	0.911	42.199	PASS	PASS	PASS	GMSK	PASS	N/A
H	835	3/2/2020	7406	835	Head	0.878	39.760	PASS	PASS	PASS	GMSK	PASS	N/A
L	1750	9/24/2019	7410	1750	Head	1.351	40.190	PASS	PASS	PASS	N/A	N/A	N/A
G	1900	7/3/2019	7409	1900	Head	1.460	40.732	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
H	5250	12/7/2019	7406	5250	Head	4.709	35.885	PASS	PASS	PASS	OFDM	N/A	PASS
H	5600	12/7/2019	7406	5600	Head	5.120	35.211	PASS	PASS	PASS	OFDM	N/A	PASS
H	5750	12/7/2019	7406	5750	Head	5.309	34.961	PASS	PASS	PASS	OFDM	N/A	PASS
E	750	2/21/2020	3589	750	Body	0.965	53.650	PASS	PASS	PASS	N/A	N/A	N/A
P	835	9/26/2019	7551	835	Body	0.991	54.104	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
I	1750	5/21/2019	7357	1750	Body	1.442	55.384	PASS	PASS	PASS	N/A	N/A	N/A
P	1900	10/8/2019	7551	1900	Body	1.542	51.760	PASS	PASS	PASS	GMSK	PASS	N/A
K	2450	9/6/2019	7547	2450	Body	1.996	51.898	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
I	2450	5/16/2019	7357	2450	Body	2.014	53.910	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
I	2600	5/15/2019	7357	2600	Body	2.162	53.620	PASS	PASS	PASS	TDD	PASS	N/A
G	5250	10/4/2019	7409	5250	Body	5.223	47.070	PASS	PASS	PASS	OFDM	N/A	PASS
G	5600	10/7/2019	7409	5600	Body	5.884	47.080	PASS	PASS	PASS	OFDM	N/A	PASS
G	5750	10/7/2019	7409	5750	Body	6.111	46.780	PASS	PASS	PASS	OFDM	N/A	PASS

FCC ID: ZNFQ730TM	 PCTEST <small>Proud to be part of element</small>	SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 02/24/20 - 03/19/20	DUT Type: Portable Handset			APPENDIX D: Page 1 of 2

**Table D-2
SAR System Validation Summary – 10g**

SAR System	Freq. (MHz)	Date	Probe SN	Probe Cal Point		Cond. (σ)	Perm. (ϵ_r)	CW VALIDATION			MOD. VALIDATION		
								SENSITIVITY	PROBE LINEARITY	PROBE ISOTROPY	MOD. TYPE	DUTY FACTOR	PAR
I	1750	5/21/2019	7357	1750	Body	1.442	55.384	PASS	PASS	PASS	N/A	N/A	N/A
P	1900	10/8/2019	7551	1900	Body	1.542	51.760	PASS	PASS	PASS	GMSK	PASS	N/A
K	2450	9/6/2019	7547	2450	Body	1.996	51.898	PASS	PASS	PASS	OFDM/TDD	PASS	PASS
K	2600	9/5/2019	7547	2600	Body	2.716	52.040	PASS	PASS	PASS	TDD	PASS	N/A
G	5250	10/4/2019	7409	5250	Body	5.223	47.070	PASS	PASS	PASS	OFDM	N/A	PASS
G	5600	10/7/2019	7409	5600	Body	5.884	47.080	PASS	PASS	PASS	OFDM	N/A	PASS
G	5750	10/7/2019	7409	5750	Body	6.111	46.780	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.

FCC ID: ZNFQ730TM	 PCTEST <small>Proud to be part of element</small>	SAR EVALUATION REPORT		Approved by: Quality Manager
Test Dates: 02/24/20 - 03/19/20	DUT Type: Portable Handset			APPENDIX D: Page 2 of 2

APPENDIX F: 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.

F.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.

F.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 mid as appropriate (see note below Table F-2 for more details).
4. Steps 1 through 3 were repeated for all distance-based power reduction mechanisms.

FCC ID: ZNFQ730TM	 PCTEST Proud to be part of  element	SAR EVALUATION REPORT	 LG	Reviewed by: Quality Manager
Test Dates: 02/24/20 – 03/19/20	DUT Type: Portable Handset			APPENDIX F: Page 1 of 3

F.3 Main Antenna Verification Summary

**Table F-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)
Grip		UMTS 1750	24.50	22.88	
Grip	Hotspot On	UMTS 1750	24.37	22.94	22.94
Hotspot On		UMTS 1750	24.40	22.88	
Hotspot On	Grip	UMTS 1750	24.41	22.99	23.00
Grip		UMTS 1900	24.56	22.93	
Grip	Hotspot On	UMTS 1900	24.40	23.00	22.99
Hotspot On		UMTS 1900	24.53	23.06	
Hotspot On	Grip	UMTS 1900	24.46	23.06	23.11
Grip		PCS CDMA	24.03	22.54	
Grip	Hotspot On	PCS CDMA	24.07	22.53	22.52
Hotspot On		PCS CDMA	24.06	22.52	
Hotspot On	Grip	PCS CDMA	24.05	22.51	22.52
Grip		LTE FDD Band 66	24.16	22.57	
Grip	Hotspot On	LTE FDD Band 66	24.22	22.68	22.71
Hotspot On		LTE FDD Band 66	24.15	22.58	
Hotspot On	Grip	LTE FDD Band 66	24.17	22.69	22.78
Grip		LTE FDD Band 4	23.99	22.48	
Grip	Hotspot On	LTE FDD Band 4	24.03	22.53	22.42
Hotspot On		LTE FDD Band 4	24.03	22.51	
Hotspot On	Grip	LTE FDD Band 4	24.00	22.48	22.57
Grip		LTE FDD Band 25	24.02	22.45	
Grip	Hotspot On	LTE FDD Band 25	23.91	22.47	22.44
Hotspot On		LTE FDD Band 25	23.94	22.52	
Hotspot On	Grip	LTE FDD Band 25	24.00	22.58	22.47
Grip		LTE FDD Band 2	23.91	22.35	
Grip	Hotspot On	LTE FDD Band 2	23.90	22.39	22.42
Hotspot On		LTE FDD Band 2	23.94	22.43	
Hotspot On	Grip	LTE FDD Band 2	24.00	22.45	22.42
Grip		LTE TDD Band 41 (PC3)	24.26	23.27	
Grip	Hotspot On	LTE TDD Band 41 (PC3)	24.29	23.31	23.17
Hotspot On		LTE TDD Band 41 (PC3)	24.31	23.22	
Hotspot On	Grip	LTE TDD Band 41 (PC3)	24.28	23.18	23.20
Grip		LTE TDD Band 41 (PC2)	26.51	25.11	
Grip	Hotspot On	LTE TDD Band 41 (PC2)	26.48	24.98	25.08
Hotspot On		LTE TDD Band 41 (PC2)	26.43	24.95	
Hotspot On	Grip	LTE TDD Band 41 (PC2)	26.47	24.93	25.12

**Table F-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	2	3	2
Grip	Phablet - Front Side	Mid	3	4	3
Grip	Phablet - Bottom Edge	Mid	6	7	6

*Note: Mid band refers to: CDMA BC1, UMTS B2/4, LTE B2/4/25/66; High band refers to: LTE B41 PC3/PC2

FCC ID: ZNFQ730TM	 PCTEST Proud to be part of element	SAR EVALUATION REPORT	 LG	Reviewed by: Quality Manager
Test Dates: 02/24/20 – 03/19/20	DUT Type: Portable Handset		APPENDIX F: Page 2 of 3	

F.4 WIFI Verification Summary

**Table F-3
Power Measurement Verification WIFI**

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
		Un-triggered (Max)	Mechanism #1 (Reduced)
Held-to-Ear	802.11b	20.82	17.43
Held-to-Ear	802.11g	19.05	17.63
Held-to-Ear	802.11n (2.4GHz)	18.02	17.67
Held-to-Ear	802.11a	18.79	15.30
Held-to-Ear	802.11n (5GHz, 20MHz BW)	17.97	14.98
Held-to-Ear	802.11n (5GHz, 40MHz BW)	18.42	15.60
Held-to-Ear	802.11ac (20MHz BW)	17.62	15.10
Held-to-Ear	802.11ac (40MHz BW)	18.25	15.84

FCC ID: ZNFQ730TM	 PCTEST <small>Proud to be part of element</small>	SAR EVALUATION REPORT	 LG	Reviewed by: Quality Manager
Test Dates: 02/24/20 – 03/19/20	DUT Type: Portable Handset		APPENDIX F: Page 3 of 3	

APPENDIX G: PROBE AND DIPOLE CALIBRATION CERTIFICATES



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

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D750V3-1054_Mar19/2**

CALIBRATION CERTIFICATE (Replacement of No:D750V3-1154_Mar19)

Object **D750V3 - SN:1054**

Calibration procedure(s) **QA CAL-05.v11
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz**

*BNV
4-29-2019*

Calibration date: **March 18, 2019**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP	SN: 104778	04-Apr-18 (No. 217-02672/02673)	Apr-19
Power sensor NRP-Z91	SN: 103244	04-Apr-18 (No. 217-02672)	Apr-19
Power sensor NRP-Z91	SN: 103245	04-Apr-18 (No. 217-02673)	Apr-19
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-18 (No. 217-02682)	Apr-19
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-18 (No. 217-02683)	Apr-19
Reference Probe EX3DV4	SN: 7349	31-Dec-18 (No. EX3-7349_Dec18)	Dec-19
DAE4	SN: 601	04-Oct-18 (No. DAE4-601_Oct18)	Oct-19
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	07-Oct-15 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-18)	In house check: Oct-19

Calibrated by: **Manu Seitz** **Manu Seitz** **Manu Seitz**
Name Function Signature
Laboratory Technician

Approved by: **Katja Pokovic** **Katja Pokovic** **Katja Pokovic**
Technical Manager

Issued: April 12, 2019

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



Accredited by the Swiss Accreditation Service (SAS)

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

Accreditation No.: **SCS 0108**

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5.0 mm	
Frequency	750 MHz \pm 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.9	0.89 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	42.1 \pm 6 %	0.89 mho/m \pm 6 %
Head TSL temperature change during test	< 0.5 °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.07 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.29 W/kg \pm 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.37 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.48 W/kg \pm 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.5	0.96 mho/m
Measured Body TSL parameters	(22.0 \pm 0.2) °C	54.5 \pm 6 %	0.98 mho/m \pm 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.18 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	8.55 W/kg \pm 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.44 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	5.67 W/kg \pm 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	54.5 Ω - 0.3 j Ω
Return Loss	- 27.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	50.2 Ω - 3.0 j Ω
Return Loss	- 30.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.035 ns
----------------------------------	----------

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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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	1.93 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	7.72 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.31 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.23 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Mouth)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.05 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.20 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.39 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.55 W/kg ± 16.9 % (k=2)

SAR result with SAM Head (Neck)

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.00 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	8.00 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.38 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	5.51 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	1.66 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.64 W/kg ± 17.5 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.14 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	4.55 W/kg ± 16.9 % (k=2)

DASY5 Validation Report for Head TSL

Date: 13.03.2019

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750$ MHz; $\sigma = 0.89$ S/m; $\epsilon_r = 42.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.32, 10.32, 10.32) @ 750 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:

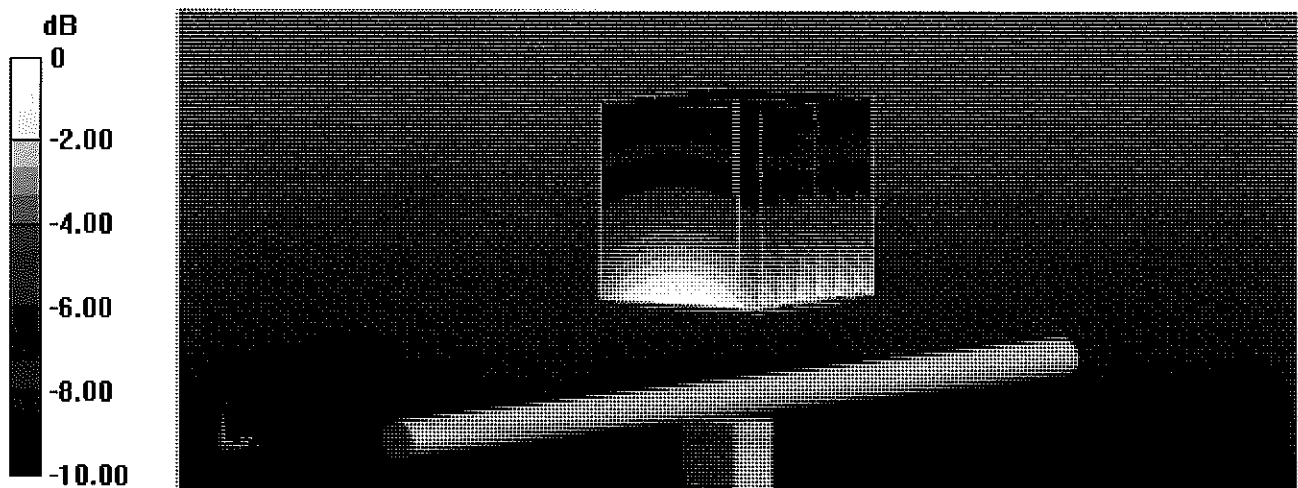
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 58.96 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 3.06 W/kg

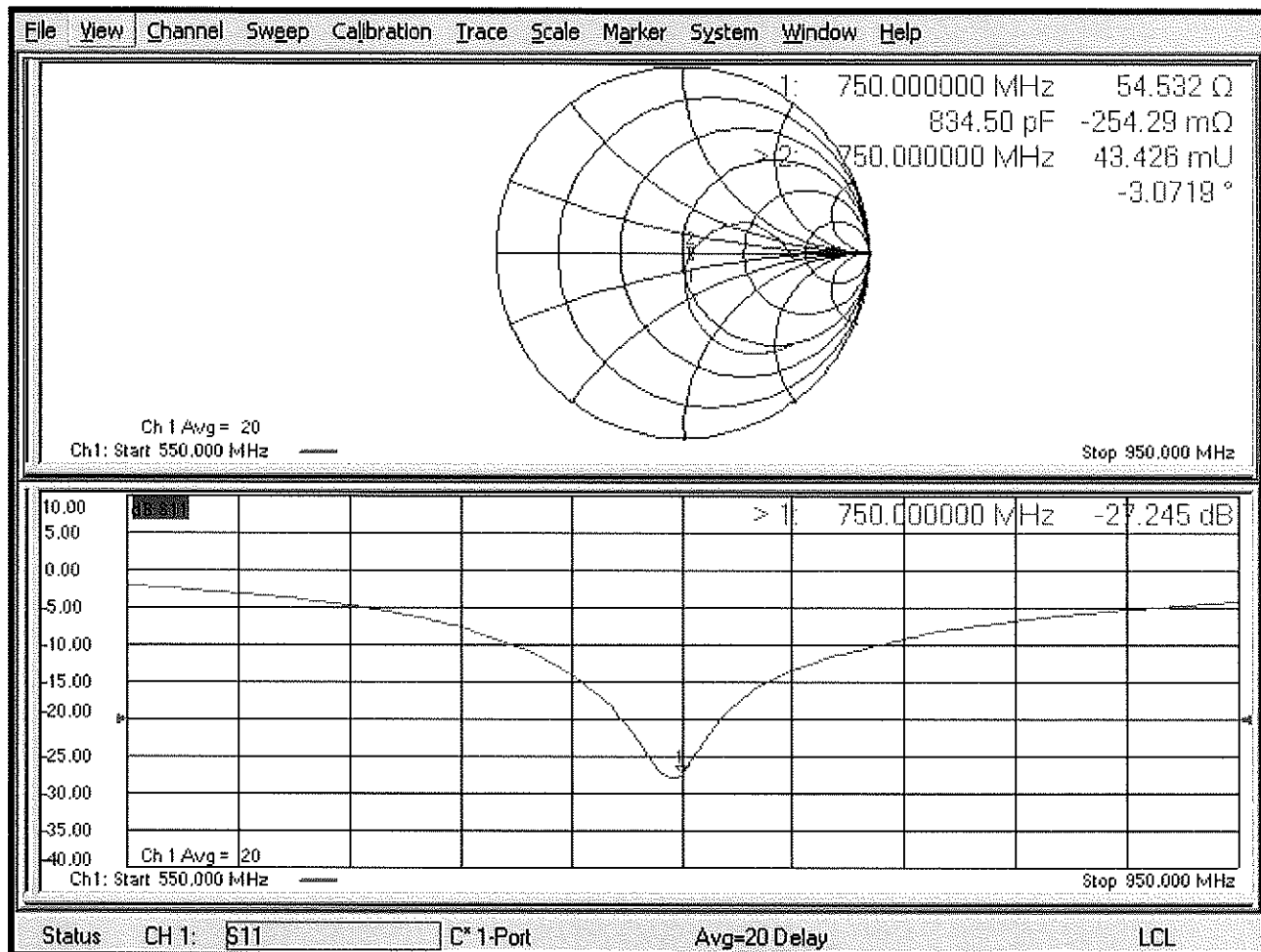
SAR(1 g) = 2.07 W/kg; SAR(10 g) = 1.37 W/kg

Maximum value of SAR (measured) = 2.73 W/kg



0 dB = 2.73 W/kg = 4.36 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 750 MHz; Type: D750V3; Serial: D750V3 - SN:1054

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750$ MHz; $\sigma = 0.98$ S/m; $\epsilon_r = 54.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.29, 10.29, 10.29) @ 750 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:

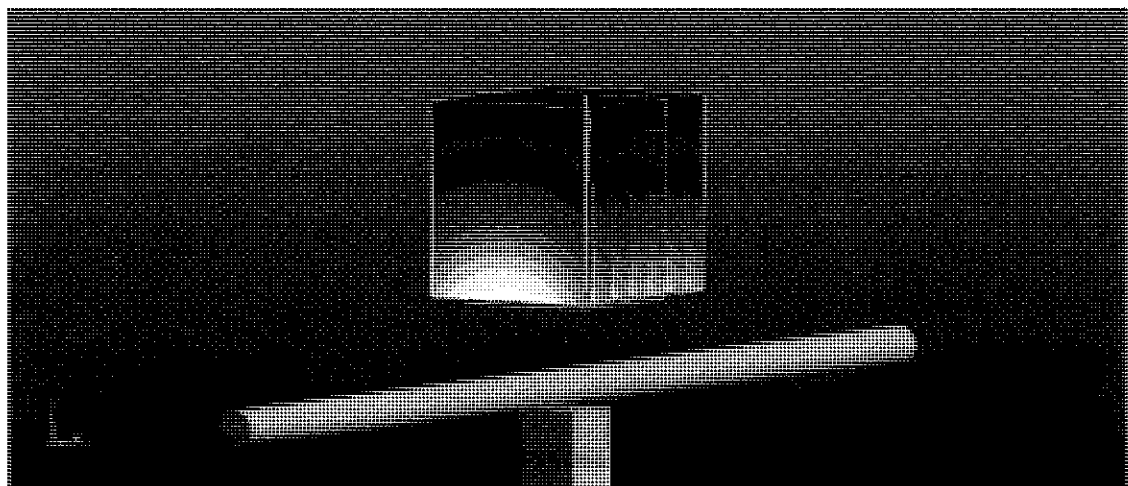
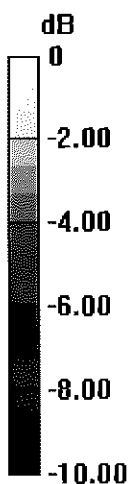
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.37 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.19 W/kg

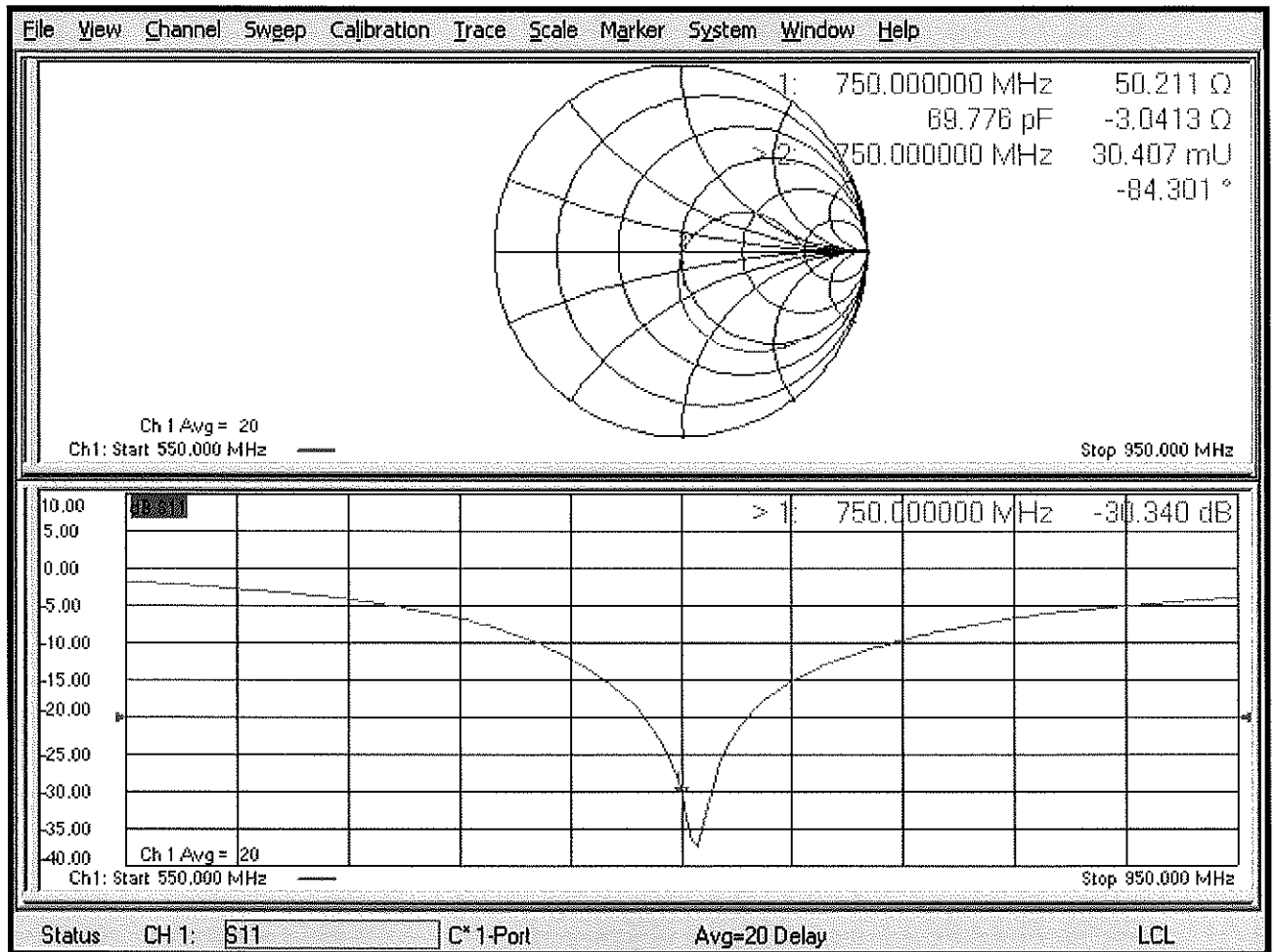
SAR(1 g) = 2.18 W/kg; SAR(10 g) = 1.44 W/kg

Maximum value of SAR (measured) = 2.87 W/kg



0 dB = 2.87 W/kg = 4.58 dBW/kg

Impedance Measurement Plot for Body TSL



DASY5 Validation Report for SAM Head

Date: 18.03.2019

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 750 MHz

Medium parameters used: $f = 750$ MHz; $\sigma = 0.904$ S/m; $\epsilon_r = 44.22$; $\rho = 1000$ kg/m³

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.32, 10.32, 10.32) @ 750 MHz; Calibrated: 31.12.2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: SAM Head
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

Reference Value = 55.66 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 2.80 W/kg

SAR(1 g) = 1.93 W/kg; SAR(10 g) = 1.31 W/kg

Maximum value of SAR (measured) = 2.52 W/kg

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

Reference Value = 57.68 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 2.98 W/kg

SAR(1 g) = 2.05 W/kg; SAR(10 g) = 1.39 W/kg

Maximum value of SAR (measured) = 2.68 W/kg

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

Reference Value = 56.23 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 2.82 W/kg

SAR(1 g) = 2 W/kg; SAR(10 g) = 1.38 W/kg

Maximum value of SAR (measured) = 2.56 W/kg

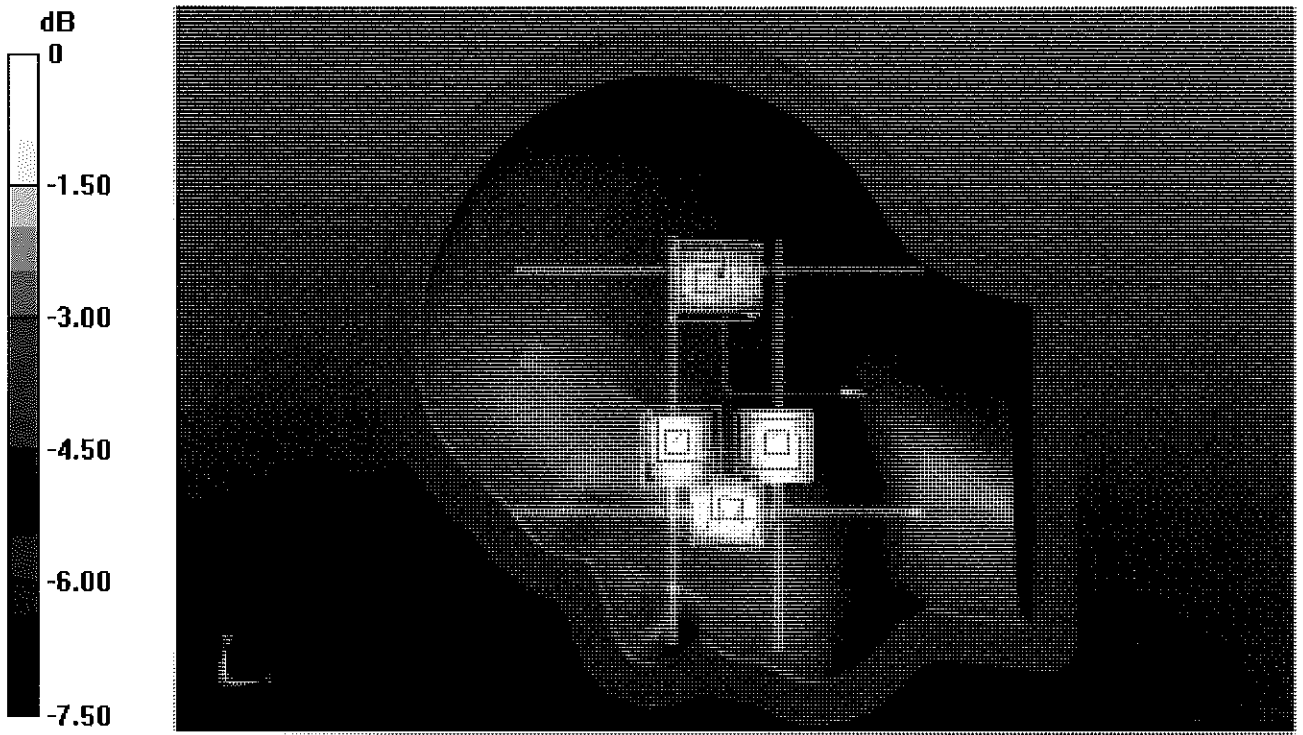
SAM Right/Head/Ear/Zoom Scan (8x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 50.76 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 2.32 W/kg

SAR(1 g) = 1.66 W/kg; SAR(10 g) = 1.14 W/kg

Maximum value of SAR (measured) = 2.11 W/kg



0 dB = 2.11 W/kg = 3.24 dBW/kg



Accredited by the Swiss Accreditation Service (SAS)
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D835V2-4d133_Oct18**

CALIBRATION CERTIFICATE

Object **D835V2 - SN:4d133**

Calibration procedure(s) **QA CAL-05.v10
Calibration procedure for dipole validation kits above 700 MHz**

*BN ✓
10/30/2018
BN ✓
10-20-2019*

Calibration date: **October 19, 2018**

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

All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 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	
Approved by:	Kaija Pokovic	Technical Manager	

Issued: October 22, 2018

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



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

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

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz \pm 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

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

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.39 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.43 W/kg \pm 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.54 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.10 W/kg \pm 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

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

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.46 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	9.75 W/kg \pm 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.61 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	6.40 W/kg \pm 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

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

Antenna Parameters with Body TSL

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

General Antenna Parameters and Design

Electrical Delay (one direction)	1.397 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	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; $\sigma = 0.91$ S/m; $\epsilon_r = 40.6$; $\rho = 1000$ kg/m³

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:

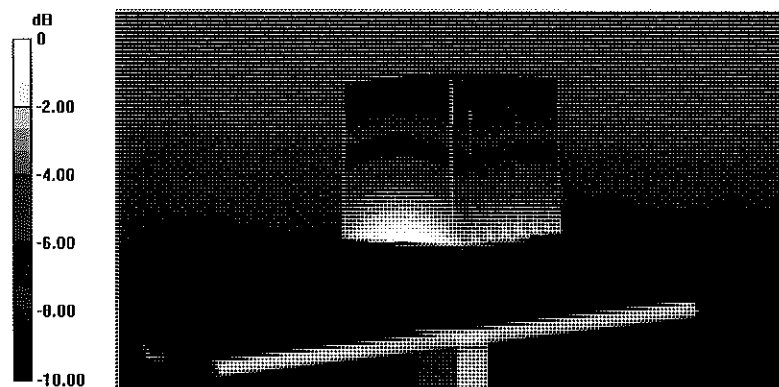
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 63.02 V/m; Power Drift = -0.02 dB

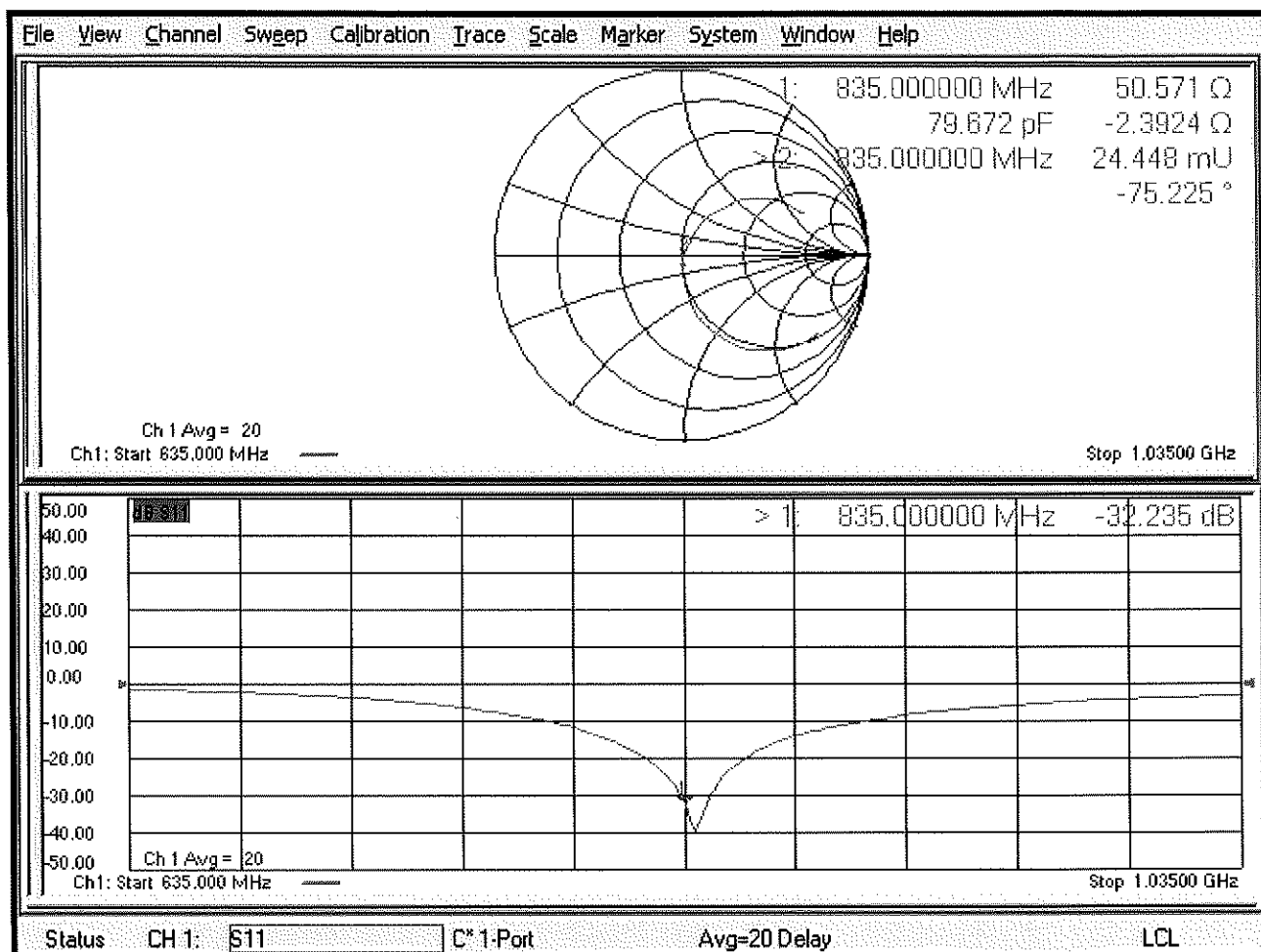
Peak SAR (extrapolated) = 3.68 W/kg

SAR(1 g) = 2.39 W/kg; SAR(10 g) = 1.54 W/kg

Maximum value of SAR (measured) = 3.24 W/kg



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; $\sigma = 0.98$ S/m; $\epsilon_r = 54.9$; $\rho = 1000$ kg/m³

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:

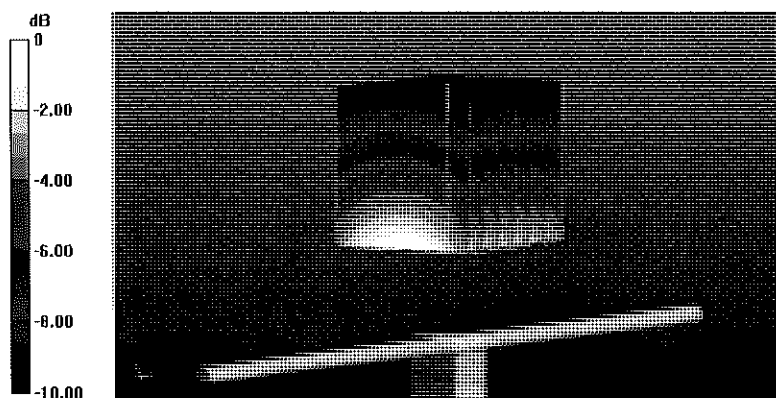
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 61.61 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.69 W/kg

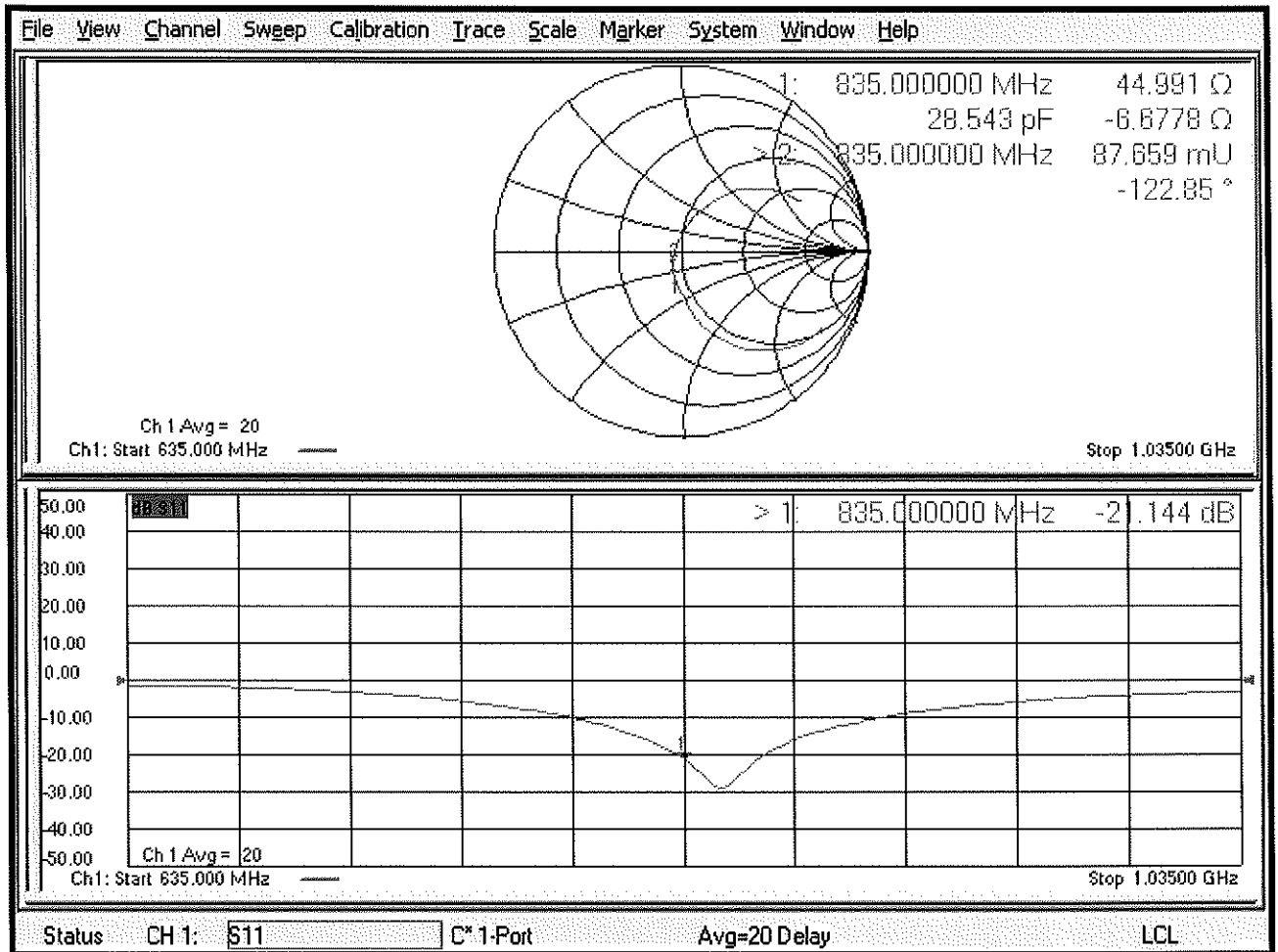
SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.61 W/kg

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 = $\pm 23\%$ (k=2)

	Name	Function	Signature
Calibrated By:	Brodie Halfoster	Team Lead Engineer	<i>BRODIE HALFOSTER</i>
Approved By:	Kaitlin O'Keefe	Senior Technical Manager	<i>KOK</i>

DIPOLE CALIBRATION EXTENSION

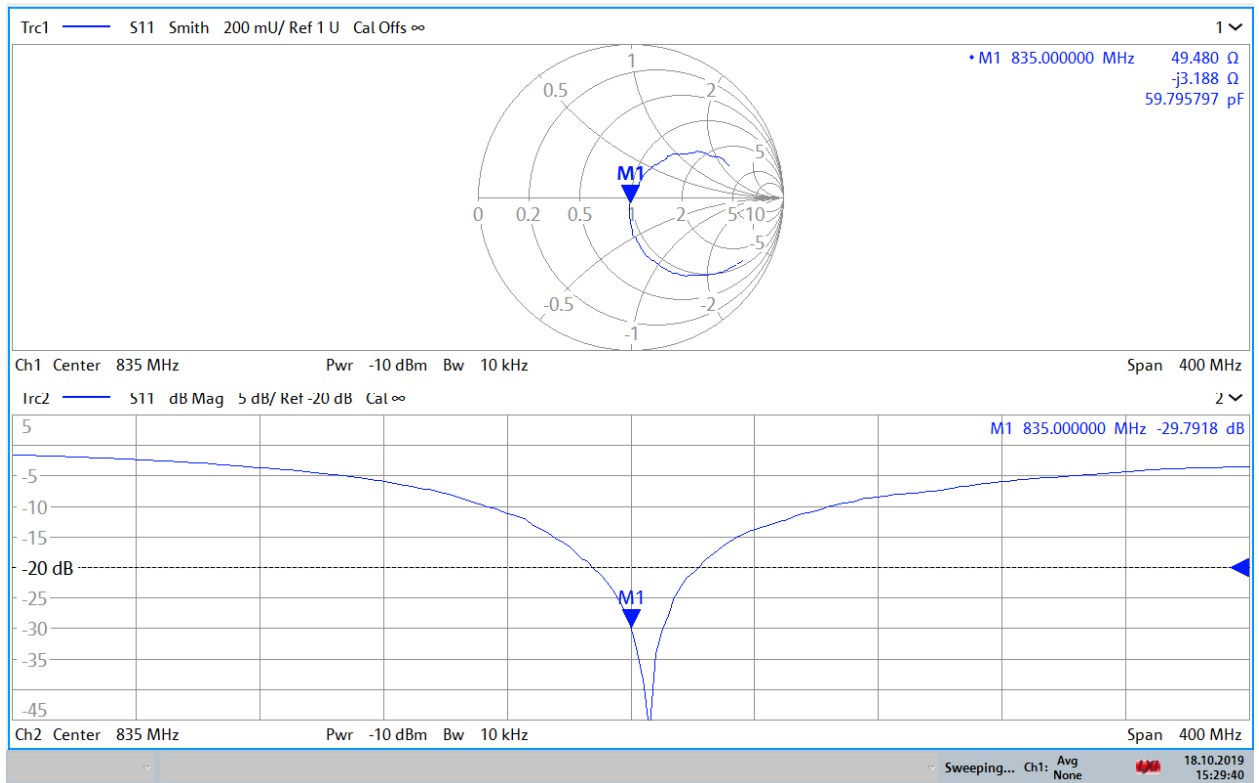
Per KDB 865664 D01, calibration intervals of up to three years may be considered for reference dipoles when it is demonstrated that the SAR target, impedance and return loss of a dipole have remained stable according to the following requirements:

1. The measured SAR does not deviate more than 10% from the target on the calibration certificate.
2. The return-loss does not deviate more than 20% from the previous measurement and meets the required 20dB minimum return-loss requirement.
3. The measurement of real or imaginary parts of impedance does not deviate more than 5Ω from the previous measurement.

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

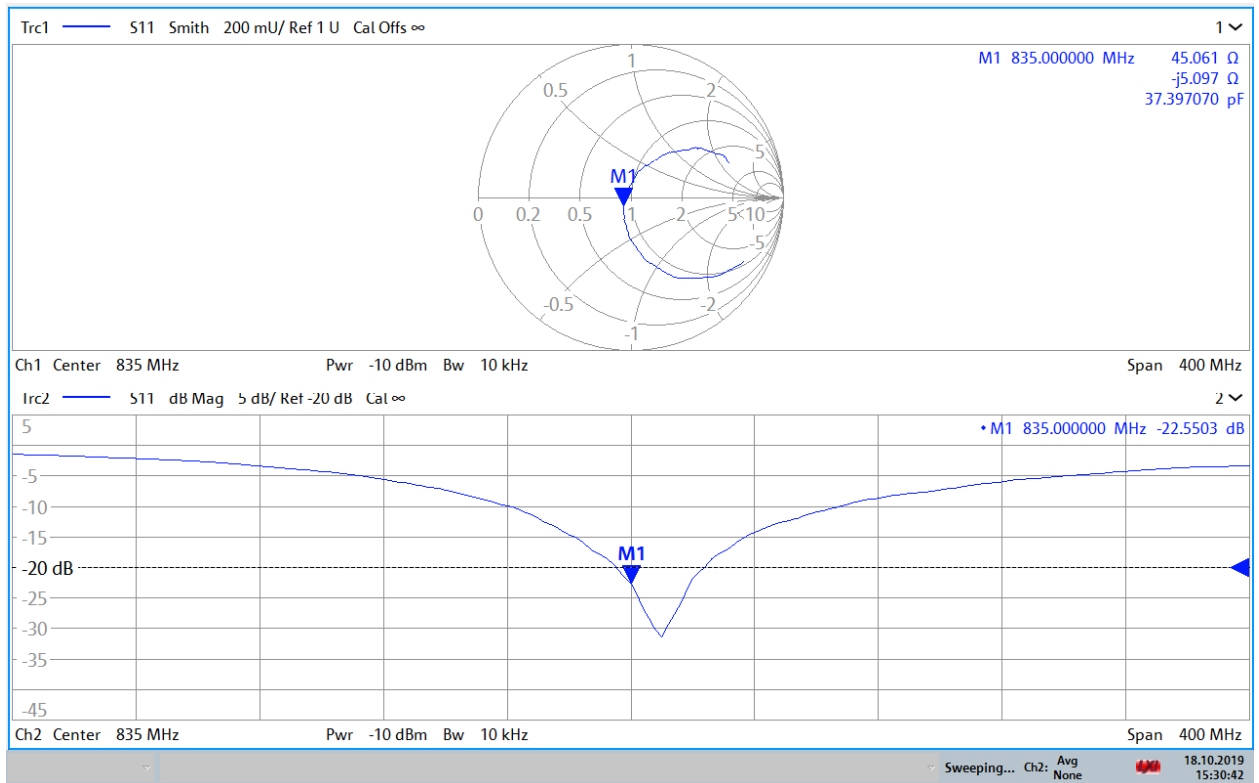
Calibration Date	Extension Date	Certificate Electrical Delay (ns)	Certificate SAR Target Head (1g) W/kg @ 23.0 dBm	Measured Head SAR (1g) W/kg @ 23.0 dBm	Deviation 1g (%)	Certificate SAR Target Head (10g) W/kg @ 23.0 dBm	Measured Head SAR (10g) W/kg @ 23.0 dBm	Deviation 10g (%)	Certificate Impedance Head (Ohm) Real	Measured Impedance Head (Ohm) Real	Difference (Ohm) Real	Certificate Impedance Head (Ohm) Imaginary	Measured Impedance Head (Ohm) Imaginary	Difference (Ohm) Imaginary	Certificate Return Loss Head (dB)	Measured Return Loss Head (dB)	Deviation (%)	PASS/FAIL
10/19/2018	10/18/2019	1.397	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	1.96	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



15:29:41 18.10.2019

Impedance & Return-Loss Measurement Plot for Body TSL



15:30:43 18.10.2019



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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

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

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

Issued: March 13, 2019

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



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 0108**

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

Glossary:

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

Calibration is Performed According to the Following Standards:

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

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

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

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

Measurement Conditions

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

DASY Version	DASY5	V52.10.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	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 cm³ (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 cm³ (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 cm³ (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 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.61 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	6.27 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 j Ω
Return Loss	- 30.7 dB

Antenna Parameters with Body TSL

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

General Antenna Parameters and Design

Electrical Delay (one direction)	1.387 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 13.03.2019

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 0.91$ S/m; $\epsilon_r = 41.9$; $\rho = 1000$ kg/m³

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:

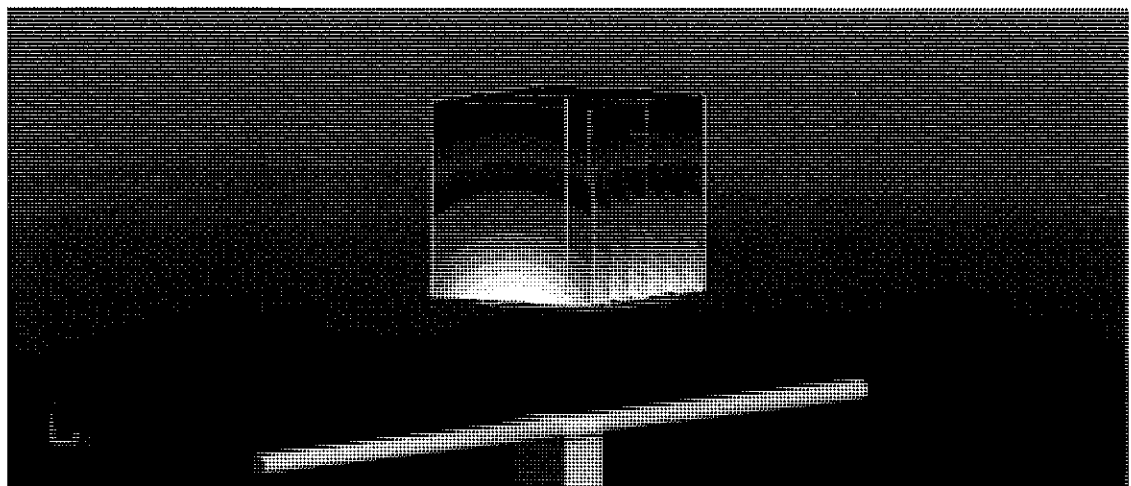
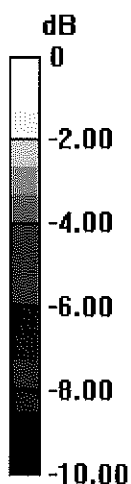
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 62.48 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 3.60 W/kg

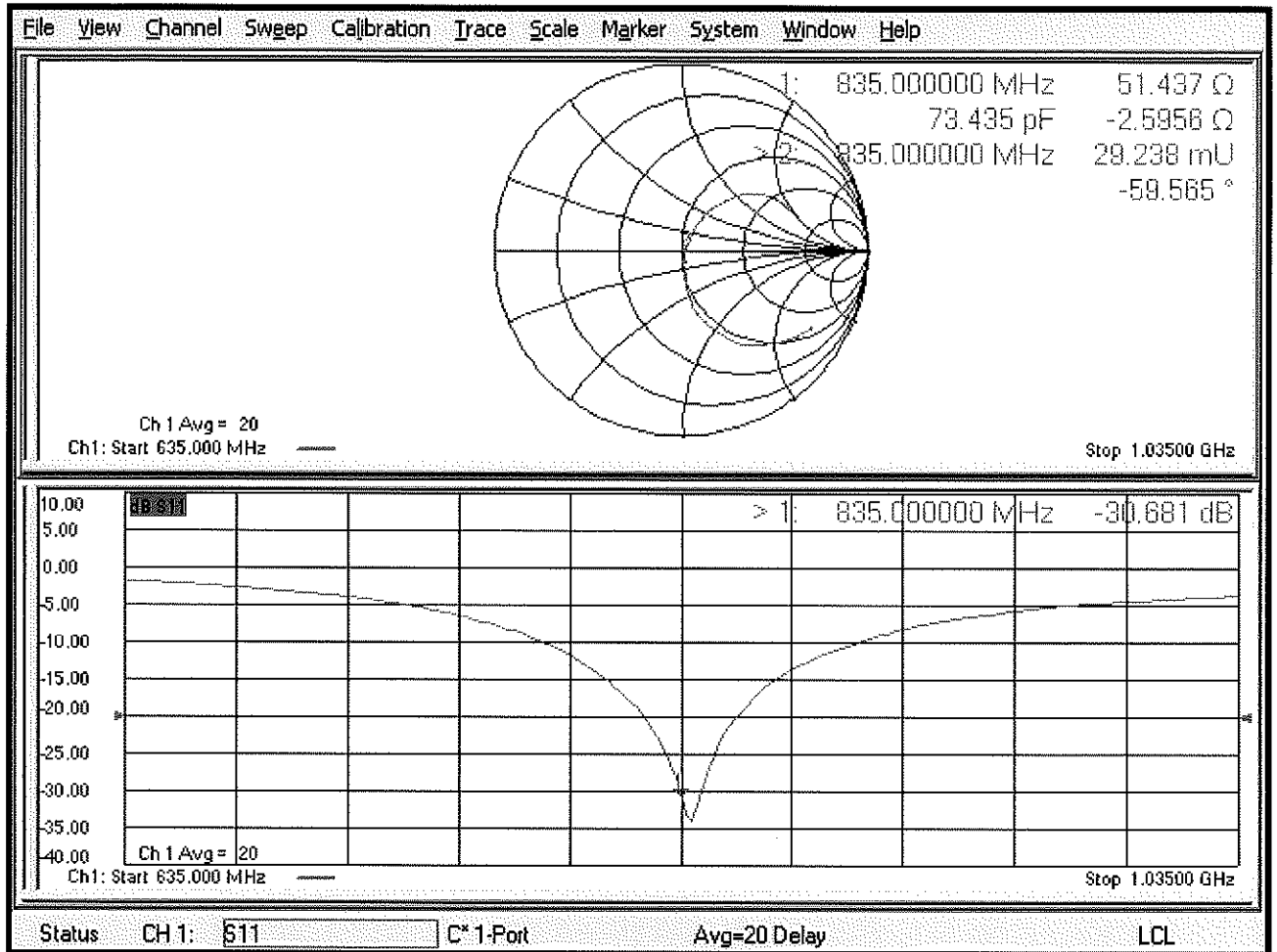
SAR(1 g) = 2.37 W/kg; SAR(10 g) = 1.54 W/kg

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: $f = 835 \text{ MHz}$; $\sigma = 1.01 \text{ S/m}$; $\epsilon_r = 54.3$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(10.15, 10.15, 10.15) @ 835 MHz; Calibrated: 31.12.2018
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 04.10.2018
- Phantom: Flat Phantom 4.9 (Back); Type: QD 00R P49 AA; Serial: 1005
- DASY52 52.10.2(1495); SEMCAD X 14.6.12(7450)

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

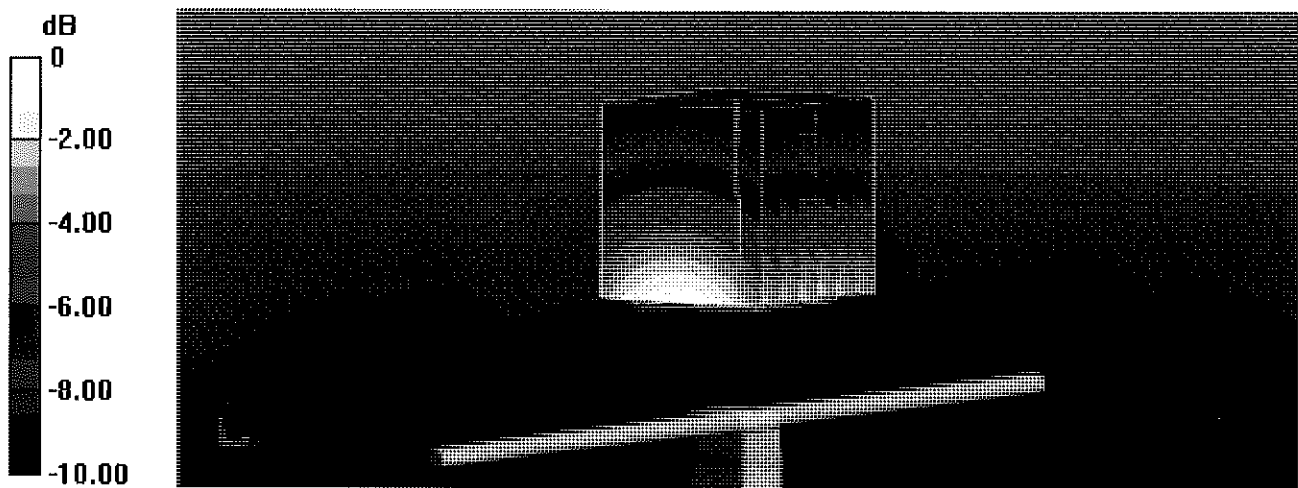
Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 60.49 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.58 W/kg

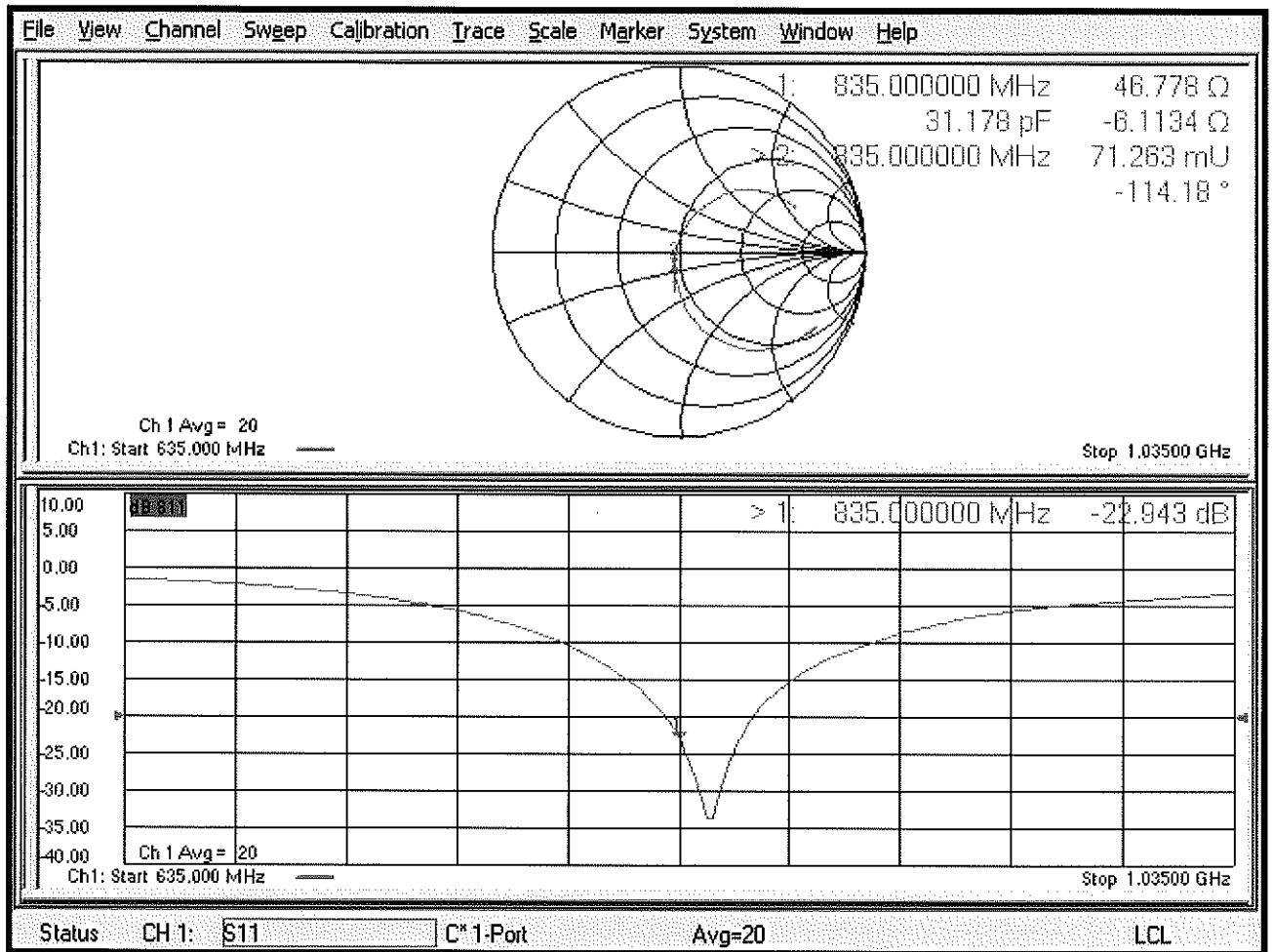
SAR(1 g) = 2.45 W/kg; SAR(10 g) = 1.61 W/kg

Maximum value of SAR (measured) = 3.23 W/kg



0 dB = 3.23 W/kg = 5.09 dBW/kg

Impedance Measurement Plot for Body TSL





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **PC Test**

Certificate No: **D835V2-4d132_Jan20**

CALIBRATION CERTIFICATE

Object **D835V2 - SN:4d132**

Calibration procedure(s) **QA CAL 05 V1
Calibration Procedure for SAR Validation Sources between 0.7-3 GHz**

Calibration date: **January 13, 2020**

*BN ✓
02-05-2020*

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	03-Apr-19 (No. 217-02892/02893)	Apr-20
Power sensor NRP-Z91	SN: 103244	03-Apr-19 (No. 217-02892)	Apr-20
Power sensor NRP-Z91	SN: 103245	03-Apr-19 (No. 217-02893)	Apr-20
Reference 20 dB Attenuator	SN: 5058 (20k)	04-Apr-19 (No. 217-02894)	Apr-20
Type-N mismatch combination	SN: 5047.2 / 06327	04-Apr-19 (No. 217-02895)	Apr-20
Reference Probe EX3DV4	SN: 7349	31-Dec-19 (No. EX3-7349_Dec19)	Dec-20
DAE4	SN: 601	27-Dec-19 (No. DAE4-601_Dec19)	Dec-20

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB39512475	30-Oct-14 (in house check Feb-19)	In house check: Oct-20
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
Power sensor HP 8481A	SN: MY41092317	07-Oct-15 (in house check Oct-18)	In house check: Oct-20
RF generator R&S SMT-06	SN: 100972	15-Jun-15 (in house check Oct-18)	In house check: Oct-20
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-19)	In house check: Oct-20

Calibrated by: **Leif Klysner** (Name) / **Laboratory Technician** (Function) / *Leif Klysner* (Signature)

Approved by: **Katja Pokovic** (Name) / **Technical Manager** (Function) / *Katja Pokovic* (Signature)

Issued: January 21, 2020

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



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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	V52.10.3
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz \pm 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	42.6 \pm 6 %	0.91 mho/m \pm 6 %
Head TSL temperature change during test	< 0.5 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.42 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	9.65 W/kg \pm 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.58 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	6.30 W/kg \pm 16.5 % (k=2)

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 \pm 0.2) °C	55.1 \pm 6 %	0.99 mho/m \pm 6 %
Body TSL temperature change during test	< 0.5 °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.53 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	9.96 W/kg \pm 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.68 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	6.64 W/kg \pm 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	50.4 Ω - 3.1 j Ω
Return Loss	- 30.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.7 Ω - 5.5 j Ω
Return Loss	- 24.8 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.385 ns
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After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured.

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPEAG
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DASY5 Validation Report for Head TSL

Date: 13.01.2020

Test Laboratory: SPEAG, Zurich, Switzerland

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

Communication System: UID 0 - CW; Frequency: 835 MHz

Medium parameters used: $f = 835$ MHz; $\sigma = 0.91$ S/m; $\epsilon_r = 42.6$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN7349; ConvF(9.89, 9.89, 9.89) @ 835 MHz; Calibrated: 31.12.2019
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 27.12.2019
- Phantom: Flat Phantom 4.9 (front); Type: QD 00L P49 AA; Serial: 1001
- DASY52 52.10.3(1513); SEMCAD X 14.6.13(7474)

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 = 62.94 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 3.60 W/kg

SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.58 W/kg

Smallest distance from peaks to all points 3 dB below = 16 mm

Ratio of SAR at M2 to SAR at M1 = 67.1%

Maximum value of SAR (measured) = 3.20 W/kg

