

Head TSL parameters at 5300 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Head TSL parameters | 22.0 °C | 35.9 | 4.76 mho/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 34.4 ± 6 % | 4.63 mho/m ± 6 % |
| Head TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Head TSL at 5300 MHz

| | | |
|---|--------------------|-----------------------------------|
| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
| SAR measured | 100 mW input power | 8.38 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 83.0 W / kg ± 19.9 % (k=2) |

| | | |
|---|--------------------|---------------------------------|
| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
| SAR measured | 100 mW input power | 2.40 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 23.7 W/kg ± 19.5 % (k=2) |

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Head TSL parameters | 22.0 °C | 35.6 | 4.96 mho/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 34.2 ± 6 % | 4.83 mho/m ± 6 % |
| Head TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Head TSL at 5500 MHz

| | | |
|---|--------------------|---------------------------------|
| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
| SAR measured | 100 mW input power | 8.21 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 81.3 W/kg ± 19.9 % (k=2) |

| | | |
|---|--------------------|---------------------------------|
| SAR averaged over 10 cm ³ (10 g) of Head TSL | condition | |
| SAR measured | 100 mW input power | 2.34 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 23.1 W/kg ± 19.5 % (k=2) |

Head TSL parameters at 5600 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Head TSL parameters | 22.0 °C | 35.5 | 5.07 mho/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 34.0 ± 6 % | 4.93 mho/m ± 6 % |
| Head TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Head TSL at 5600 MHz

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|---------------------------------|
| SAR measured | 100 mW input power | 8.38 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 82.9 W/kg ± 19.9 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | Condition | |
|---|--------------------|---------------------------------|
| SAR measured | 100 mW input power | 2.39 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 23.6 W/kg ± 19.5 % (k=2) |

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Head TSL parameters | 22.0 °C | 35.3 | 5.27 mho/m |
| Measured Head TSL parameters | (22.0 ± 0.2) °C | 33.7 ± 6 % | 5.14 mho/m ± 6 % |
| Head TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Head TSL at 5800 MHz

| SAR averaged over 1 cm ³ (1 g) of Head TSL | Condition | |
|---|--------------------|---------------------------------|
| SAR measured | 100 mW input power | 7.96 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 78.8 W/kg ± 19.9 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Head TSL | Condition | |
|---|--------------------|---------------------------------|
| SAR measured | 100 mW input power | 2.26 W/kg |
| SAR for nominal Head TSL parameters | normalized to 1W | 22.3 W/kg ± 19.5 % (k=2) |

Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Body TSL parameters | 22.0 °C | 49.0 | 5.30 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 47.5 ± 6 % | 5.45 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Body TSL at 5200 MHz

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 7.48 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 74.4 W/kg ± 19.9 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 2.10 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 20.9 W/kg ± 19.5 % (k=2) |

Body TSL parameters at 5300 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Body TSL parameters | 22.0 °C | 48.9 | 5.42 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 47.3 ± 6 % | 5.59 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Body TSL at 5300 MHz

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 7.69 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 76.5 W/kg ± 19.9 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|--------------------------|
| SAR measured | 100 mW input power | 2.17 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 21.5 W/kg ± 19.5 % (k=2) |

Body TSL parameters at 5500 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Body TSL parameters | 22.0 °C | 48.6 | 5.65 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 47.0 ± 6 % | 5.86 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Body TSL at 5500 MHz

| | | |
|---|--------------------|--------------------------|
| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
| SAR measured | 100 mW input power | 8.03 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 79.9 W/kg ± 19.9 % (k=2) |

| | | |
|---|--------------------|--------------------------|
| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
| SAR measured | 100 mW input power | 2.23 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 22.1 W/kg ± 19.5 % (k=2) |

Body TSL parameters at 5600 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Body TSL parameters | 22.0 °C | 48.5 | 5.77 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 46.8 ± 6 % | 6.00 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Body TSL at 5600 MHz

| | | |
|---|--------------------|--------------------------|
| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
| SAR measured | 100 mW input power | 7.95 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 79.1 W/kg ± 19.9 % (k=2) |

| | | |
|---|--------------------|--------------------------|
| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
| SAR measured | 100 mW input power | 2.23 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 22.1 W/kg ± 19.5 % (k=2) |

Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|---|-----------------|--------------|------------------|
| Nominal Body TSL parameters | 22.0 °C | 48.2 | 6.00 mho/m |
| Measured Body TSL parameters | (22.0 ± 0.2) °C | 46.4 ± 6 % | 6.29 mho/m ± 6 % |
| Body TSL temperature change during test | < 0.5 °C | ---- | ---- |

SAR result with Body TSL at 5800 MHz

| SAR averaged over 1 cm ³ (1 g) of Body TSL | Condition | |
|---|--------------------|---------------------------------|
| SAR measured | 100 mW input power | 7.66 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 76.2 W/kg ± 19.9 % (k=2) |

| SAR averaged over 10 cm ³ (10 g) of Body TSL | condition | |
|---|--------------------|---------------------------------|
| SAR measured | 100 mW input power | 2.13 W/kg |
| SAR for nominal Body TSL parameters | normalized to 1W | 21.1 W/kg ± 19.5 % (k=2) |

Appendix (Additional assessments outside the scope of SCS 0108)**Antenna Parameters with Head TSL at 5200 MHz**

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 47.1 Ω - 5.8 $j\Omega$ |
| Return Loss | - 23.6 dB |

Antenna Parameters with Head TSL at 5300 MHz

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 50.5 Ω - 3.2 $j\Omega$ |
| Return Loss | - 29.8 dB |

Antenna Parameters with Head TSL at 5500 MHz

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 49.0 Ω + 2.5 $j\Omega$ |
| Return Loss | - 31.2 dB |

Antenna Parameters with Head TSL at 5600 MHz

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 50.0 Ω + 0.6 $j\Omega$ |
| Return Loss | - 44.1 dB |

Antenna Parameters with Head TSL at 5800 MHz

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 55.6 Ω + 1.9 $j\Omega$ |
| Return Loss | - 25.1 dB |

Antenna Parameters with Body TSL at 5200 MHz

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 48.6 Ω - 3.4 $j\Omega$ |
| Return Loss | - 28.6 dB |

Antenna Parameters with Body TSL at 5300 MHz

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 49.6 Ω - 2.4 $j\Omega$ |
| Return Loss | - 32.3 dB |

Antenna Parameters with Body TSL at 5500 MHz

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 49.5 Ω + 2.5 $j\Omega$ |
| Return Loss | - 31.7 dB |

Antenna Parameters with Body TSL at 5600 MHz

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 50.8 Ω + 2.5 $j\Omega$ |
| Return Loss | - 31.7 dB |

Antenna Parameters with Body TSL at 5800 MHz

| | |
|--------------------------------------|-------------------------------|
| Impedance, transformed to feed point | 56.0 Ω + 3.0 $j\Omega$ |
| Return Loss | - 24.0 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.191 ns |
|----------------------------------|----------|

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard.

No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

| | |
|-----------------|--------------|
| Manufactured by | SPEAG |
| Manufactured on | May 04, 2015 |

DASY5 Validation Report for Head TSL

Date: 21.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1238

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5500 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz

Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 4.54 \text{ S/m}$; $\epsilon_r = 34.6$; $\rho = 1000 \text{ kg/m}^3$ Medium parameters used: $f = 5300 \text{ MHz}$; $\sigma = 4.63 \text{ S/m}$; $\epsilon_r = 34.4$; $\rho = 1000 \text{ kg/m}^3$ Medium parameters used: $f = 5500 \text{ MHz}$; $\sigma = 4.83 \text{ S/m}$; $\epsilon_r = 34.2$; $\rho = 1000 \text{ kg/m}^3$ Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 4.93 \text{ S/m}$; $\epsilon_r = 34.0$; $\rho = 1000 \text{ kg/m}^3$ Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 5.14 \text{ S/m}$; $\epsilon_r = 33.7$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.59, 5.59, 5.59); Calibrated: 30.06.2016, ConvF(5.14, 5.14, 5.14); Calibrated: 30.06.2016, ConvF(5.02, 5.02, 5.02); Calibrated: 30.06.2016, ConvF(4.89, 4.89, 4.89); Calibrated: 30.06.2016, ConvF(4.85, 4.85, 4.85); Calibrated: 30.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 70.35 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 27.9 W/kg

SAR(1 g) = 7.76 W/kg; SAR(10 g) = 2.22 W/kg

Maximum value of SAR (measured) = 17.9 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 72.80 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 31.1 W/kg

SAR(1 g) = 8.38 W/kg; SAR(10 g) = 2.4 W/kg

Maximum value of SAR (measured) = 19.5 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 70.90 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 31.9 W/kg

SAR(1 g) = 8.21 W/kg; SAR(10 g) = 2.34 W/kg

Maximum value of SAR (measured) = 19.5 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan,**dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 71.51 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 32.8 W/kg

SAR(1 g) = 8.38 W/kg; SAR(10 g) = 2.39 W/kg

Maximum value of SAR (measured) = 20.0 W/kg

Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan,**dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

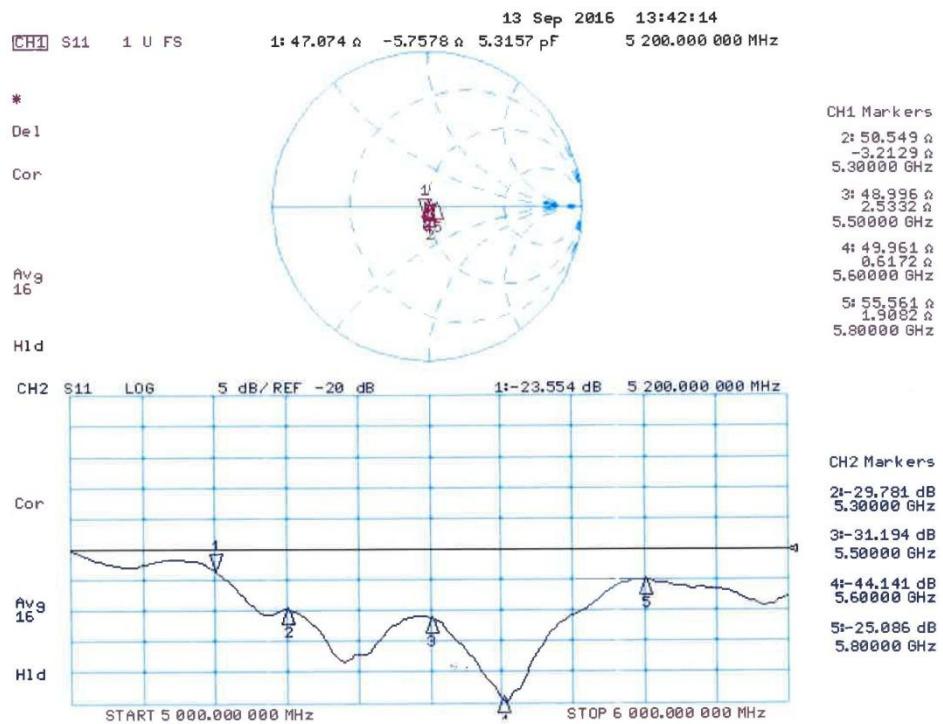
Reference Value = 69.07 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 32.5 W/kg

SAR(1 g) = 7.96 W/kg; SAR(10 g) = 2.26 W/kg

Maximum value of SAR (measured) = 19.4 W/kg



Impedance Measurement Plot for Head TSL

DASY5 Validation Report for Body TSL

Date: 20.09.2016

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole D5GHzV2; Type: D5GHzV2; Serial: D5GHzV2 - SN:1238

Communication System: UID 0 - CW; Frequency: 5200 MHz, Frequency: 5300 MHz, Frequency: 5500 MHz, Frequency: 5600 MHz, Frequency: 5800 MHz

Medium parameters used: $f = 5200 \text{ MHz}$; $\sigma = 5.45 \text{ S/m}$; $\epsilon_r = 47.5$; $\rho = 1000 \text{ kg/m}^3$ Medium parameters used: $f = 5300 \text{ MHz}$; $\sigma = 5.59 \text{ S/m}$; $\epsilon_r = 47.3$; $\rho = 1000 \text{ kg/m}^3$ Medium parameters used: $f = 5500 \text{ MHz}$; $\sigma = 5.86 \text{ S/m}$; $\epsilon_r = 47.0$; $\rho = 1000 \text{ kg/m}^3$ Medium parameters used: $f = 5600 \text{ MHz}$; $\sigma = 6.00 \text{ S/m}$; $\epsilon_r = 46.8$; $\rho = 1000 \text{ kg/m}^3$ Medium parameters used: $f = 5800 \text{ MHz}$; $\sigma = 6.29 \text{ S/m}$; $\epsilon_r = 46.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY5 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.99, 4.99, 4.99); Calibrated: 30.06.2016, ConvF(4.75, 4.75, 4.75); Calibrated: 30.06.2016, ConvF(4.4, 4.4, 4.4); Calibrated: 30.06.2016, ConvF(4.35, 4.35, 4.35); Calibrated: 30.06.2016, ConvF(4.27, 4.27, 4.27); Calibrated: 30.06.2016;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 30.12.2015
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1258); SEMCAD X 14.6.10(7372)

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5200MHz/Zoom Scan,**dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 66.67 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 27.8 W/kg

SAR(1 g) = 7.48 W/kg; SAR(10 g) = 2.1 W/kg

Maximum value of SAR (measured) = 17.3 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5300 MHz/Zoom Scan,**dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 67.01 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 29.4 W/kg

SAR(1 g) = 7.69 W/kg; SAR(10 g) = 2.17 W/kg

Maximum value of SAR (measured) = 18.0 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan,**dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 67.20 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 32.4 W/kg

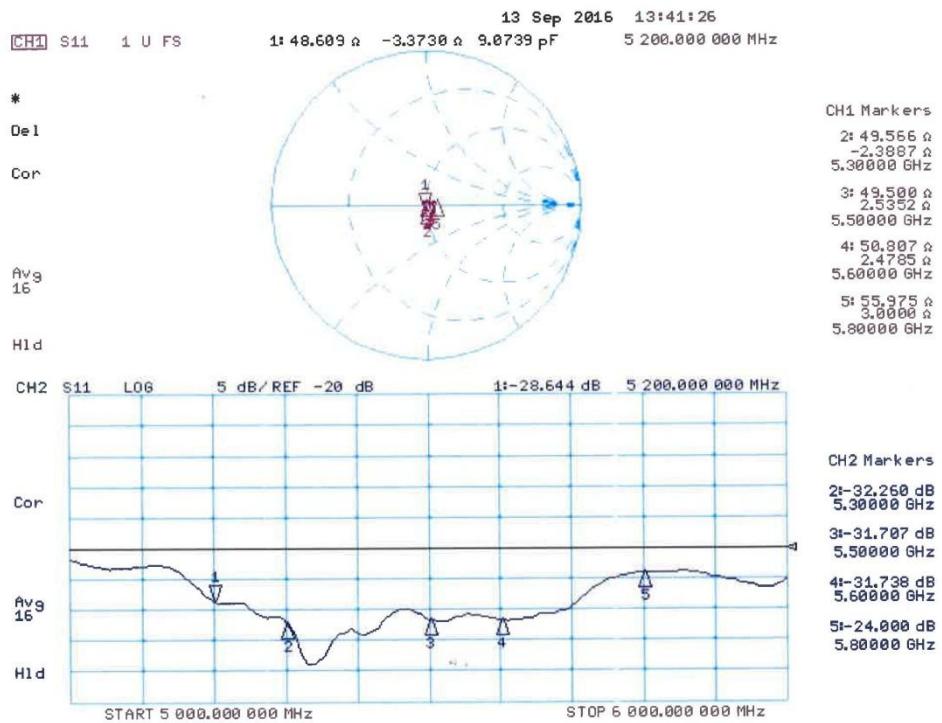
SAR(1 g) = 8.03 W/kg; SAR(10 g) = 2.23 W/kg

Maximum value of SAR (measured) = 19.2 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 66.47 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 32.7 W/kg
SAR(1 g) = 7.95 W/kg; SAR(10 g) = 2.23 W/kg
Maximum value of SAR (measured) = 19.1 W/kg

Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5800 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 64.40 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 33.2 W/kg
SAR(1 g) = 7.66 W/kg; SAR(10 g) = 2.13 W/kg
Maximum value of SAR (measured) = 18.8 W/kg



Impedance Measurement Plot for Body TSL

ANNEX J Extended Calibration SAR Dipole

Referring to KDB865664 D01, if dipoles are verified in return loss ($<-20\text{dBm}$, within 20% of prior calibration), and in impedance (within 5 ohm of prior calibration), the annual calibration is not necessary and the calibration interval can be extended.

Justification of Extended Calibration SAR Dipole D835V2– serial no.4d057

| Head | | | | | | |
|---------------------|------------------|-----------|----------------------|-------------|----------------------------|--------------|
| Date of Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (johm) | Delta (johm) |
| 2015-10-22 | -29.8 | | 49.2 | | -3.12 | |
| 2016-10-20 | -26.7 | 10.4 | 47.5 | -1.7 | -5.74 | -2.62 |
| 2017-10-18 | -26.2 | 12.1 | 47.9 | -1.3 | -5.32 | -2.20 |

| Body | | | | | | |
|---------------------|------------------|-----------|----------------------|-------------|----------------------------|--------------|
| Date of Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (johm) | Delta (johm) |
| 2015-10-22 | -24.7 | | 48.1 | | -5.38 | |
| 2016-10-20 | -22.4 | 9.3 | 46.7 | 1.4 | -4.86 | 0.52 |
| 2017-10-18 | -22.9 | 7.3 | 46.4 | 1.7 | -4.79 | 0.59 |

Justification of Extended Calibration SAR Dipole D1900V2– serial no.5d088

| Head | | | | | | |
|---------------------|------------------|-----------|----------------------|-------------|----------------------------|--------------|
| Date of Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (johm) | Delta (johm) |
| 2015-10-4 | -22.4 | | 52.7 | | 7.33 | |
| 2016-9-28 | -25.3 | -12.9 | 50.8 | -1.9 | 5.82 | 1.51 |
| 2017-9-25 | -24.9 | -11.2 | 51.2 | -1.5 | 6.22 | 1.11 |

| Body | | | | | | |
|---------------------|------------------|-----------|----------------------|-------------|----------------------------|--------------|
| Date of Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (johm) | Delta (johm) |
| 2015-10-4 | -25.4 | | 50.9 | | 5.36 | |
| 2016-9-28 | -23.7 | 6.7 | 48.9 | -2.0 | 2.74 | -2.62 |
| 2017-9-25 | -23.2 | 8.7 | 48.3 | -2.6 | 3.84 | -1.52 |

Justification of Extended Calibration SAR Dipole D2450V2– serial no.873

| Head | | | | | | |
|---------------------|------------------|-----------|----------------------|-------------|----------------------------|--------------|
| Date of Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (johm) | Delta (johm) |
| 2015-10-30 | -26.6 | | 53.4 | | 3.42 | |
| 2016-10-20 | -25.1 | 5.6 | 55.1 | 1.7 | 2.91 | 0.51 |
| 2017-10-18 | -25.7 | 3.4 | 54.6 | 0.8 | 3.04 | 0.38 |

| Body | | | | | | |
|---------------------|------------------|-----------|----------------------|-------------|----------------------------|--------------|
| Date of Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (johm) | Delta (johm) |
| 2015-10-30 | -23.7 | | 50.5 | | 6.53 | |
| 2016-10-20 | -24.9 | 5.1 | 49.2 | 1.3 | 7.28 | 0.75 |
| 2017-10-18 | -25.5 | 7.6 | 49.6 | 0.9 | 7.11 | 0.58 |

Justification of Extended Calibration SAR Dipole D2550V2– serial no.1010

| Head | | | | | | |
|---------------------|------------------|-----------|----------------------|-------------|----------------------------|--------------|
| Date of Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (johm) | Delta (johm) |
| 2015-7-24 | -29.5 | | 52.8 | | -2.0 | |
| 2016-7-22 | -26.4 | 10.5 | 51.1 | 1.7 | -2.62 | -0.62 |
| 2017-7-21 | -27.3 | 7.5 | 53.9 | 1.1 | -3.84 | -1.84 |

| Body | | | | | | |
|---------------------|------------------|-----------|----------------------|-------------|----------------------------|--------------|
| Date of Measurement | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (johm) | Delta (johm) |
| 2015-7-24 | -36.6 | | 50.0 | | -1.5 | |
| 2016-7-22 | -34.2 | 6.6 | 52.8 | 2.8 | -2.67 | -1.17 |
| 2017-7-21 | -37.5 | -2.5 | 52.4 | 2.4 | -3.11 | -1.61 |

Justification of Extended Calibration SAR Dipole D5GHzV2– serial no.1238

| Head | | | | | | | |
|---------------------|-----------|------------------|-----------|----------------------|-------------|----------------------------|--------------|
| Date of Measurement | Frequency | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (johm) | Delta (johm) |
| 2016-9-21 | 5200MHz | -23.6 | | 47.1 | | 5.8 | |
| 2017-9-20 | 5200MHz | -21.7 | 8.1 | 48.3 | 1.2 | 2.38 | 2.42 |
| 2016-9-21 | 5300MHz | -29.8 | | 50.5 | | 3.2 | |
| 2017-9-20 | 5300MHz | -27.8 | 6.7 | 51.9 | 1.4 | 4.51 | 1.31 |
| 2016-9-21 | 5500MHz | -31.2 | | 49.0 | | 2.5 | |
| 2017-9-20 | 5500MHz | -29.5 | 5.4 | 50.3 | 1.3 | 1.24 | 1.26 |
| 2016-9-21 | 5600MHz | -44.1 | | 50.0 | | 0.6 | |
| 2017-9-20 | 5600MHz | -42.6 | 3.4 | 51.5 | 1.5 | 2.55 | 1.95 |
| 2016-9-21 | 5800MHz | -25.1 | | 55.6 | | 1.9 | |
| 2017-9-20 | 5800MHz | -23.8 | 5.2 | 56.9 | 1.3 | 3.04 | 1.14 |

| Body | | | | | | | |
|---------------------|-----------|------------------|-----------|----------------------|-------------|----------------------------|--------------|
| Date of Measurement | Frequency | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (johm) | Delta (johm) |
| 2016-9-21 | 5200MHz | -28.6 | | 48.6 | | 3.4 | |
| 2017-9-20 | 5200MHz | -26.4 | 7.7 | 50.0 | 1.4 | 3.72 | 0.32 |
| 2016-9-21 | 5300MHz | -32.3 | | 49.6 | | 2.4 | |
| 2017-9-20 | 5300MHz | -30.5 | 5.6 | 51.3 | 1.7 | 3.64 | 1.24 |
| 2016-9-21 | 5500MHz | -31.7 | | 49.5 | | 2.5 | |
| 2017-9-20 | 5500MHz | -29.8 | 6.0 | 51.4 | 1.9 | 4.25 | 1.75 |
| 2016-9-21 | 5600MHz | -31.7 | | 50.8 | | 2.5 | |
| 2017-9-20 | 5600MHz | -29.5 | 6.9 | 52.3 | 1.5 | 2.91 | 0.41 |
| 2016-9-21 | 5800MHz | -24.0 | | 56.0 | | 3.0 | |
| 2017-9-20 | 5800MHz | -22.8 | 5.0 | 57.3 | 1.3 | 4.23 | 1.23 |

The Return-Loss is <-20dB, and within 20% of prior calibration; the impedance is within 5 ohm of prior calibration. Therefore the value result should support extended c.

ANNEX K Spot Check Test

As the test lab for TA-1075 from HMD Global Oy, we, Shenzhen Academy of Information and Communications Technology, declare on our sole responsibility that, according to "Justification Letter" provided by applicant, only the Spot check test should be performed. The test results are as below.

K.1 Internal Identification of EUT used during the spot check test

| EUT ID* | IMEI | HW Version | SW Version |
|---------|-----------------|------------|------------|
| EUT5 | 004402971272533 | 0401 | 00WW_0_266 |

K.2 Measurement results

SAR Values (GSM850)

| Frequency | | Test Position | | SAR(1g) (W/kg) | | | | |
|-----------|-----|---------------|-------------|-----------------|--------------|---------------|--|--|
| MHz | Ch. | | | Spot check data | | Original data | | |
| | | | | Measured SAR | Reported SAR | | | |
| 836.6 | 190 | Head | Right Touch | 0.164 | 0.21 | 0.12 | | |
| 836.6 | 190 | Body | Front | 0.260 | 0.29 | 0.23 | | |

SAR Values (GSM1900)

| Frequency | | Test Position | | SAR(1g) (W/kg) | | | | |
|-----------|-----|---------------|------------|-----------------|--------------|---------------|--|--|
| MHz | Ch. | | | Spot check data | | Original data | | |
| | | | | Measured SAR | Reported SAR | | | |
| 1880 | 661 | Head | Left Touch | 0.121 | 0.17 | 0.17 | | |
| 1850.2 | 512 | Body | Bottom | 1.12 | 1.25 | 1.34 | | |

SAR Values (WCDMA 850)

| Frequency | | Test Position | | SAR(1g) (W/kg) | | | | |
|-----------|------|---------------|-------------|-----------------|--------------|---------------|--|--|
| MHz | Ch. | | | Spot check data | | Original data | | |
| | | | | Measured SAR | Reported SAR | | | |
| 836.4 | 4182 | Head | Right Touch | 0.262 | 0.29 | 0.24 | | |
| 836.4 | 4182 | Body | Front | 0.422 | 0.46 | 0.56 | | |

SAR Values (LTE-Band 5)

| Frequency | | Test Position | | SAR(1g) (W/kg) | | | | |
|-----------|-------|---------------|-------------|-----------------|--------------|---------------|--|--|
| MHz | Ch. | | | Spot check data | | Original data | | |
| | | | | Measured SAR | Reported SAR | | | |
| 836.5 | 20525 | Head | Right Touch | 0.277 | 0.34 | 0.35 | | |
| 836.5 | 20525 | Body | Front | 0.440 | 0.53 | 0.55 | | |

SAR Values (LTE-Band 7)

| Frequency | | Test Position | | SAR(1g) (W/kg) | | | | |
|-----------|-------|---------------|------------|-----------------|--------------|---------------|--|--|
| MHz | Ch. | | | Spot check data | | Original data | | |
| | | | | Measured SAR | Reported SAR | | | |
| 2535 | 21100 | Head | Left Touch | 0.142 | 0.17 | 0.25 | | |
| 2535 | 21100 | Body | Bottom | 0.480 | 0.59 | 0.50 | | |

SAR Values (LTE-Band 38)

| Frequency | | Test Position | | SAR(1g) (W/kg) | | | | |
|-----------|-------|---------------|------------|-----------------|--------------|---------------|--|--|
| MHz | Ch. | | | Spot check data | | Original data | | |
| | | | | Measured SAR | Reported SAR | | | |
| 2595 | 38000 | Head | Left Touch | 0.079 | 0.10 | 0.14 | | |
| 2595 | 38000 | Body | Bottom | 0.296 | 0.36 | 0.32 | | |

SAR Values (WLAN 2.4G)

| Frequency | | Test Position | | SAR(1g) (W/kg) | | | | |
|-----------|-----|---------------|------------|-----------------|--------------|---------------|--|--|
| MHz | Ch. | | | Spot check data | | Original data | | |
| | | | | Measured SAR | Reported SAR | | | |
| 2462 | 11 | Head | Left Touch | 0.625 | 0.73 | 0.82 | | |
| 2437 | 6 | Body | Top | 0.072 | 0.08 | 0.18 | | |

GSM850 Head

Date: 2018-5-8

Electronics: DAE4 Sn786

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.892$ S/m; $\epsilon_r = 41.709$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, GSM (0) Frequency: 836.6 MHz Duty Cycle: 1:8.30042

Probe: EX3DV4 – SN3633 ConvF (9.33, 9.33, 9.33);

Right Cheek Mid/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.175 W/kg

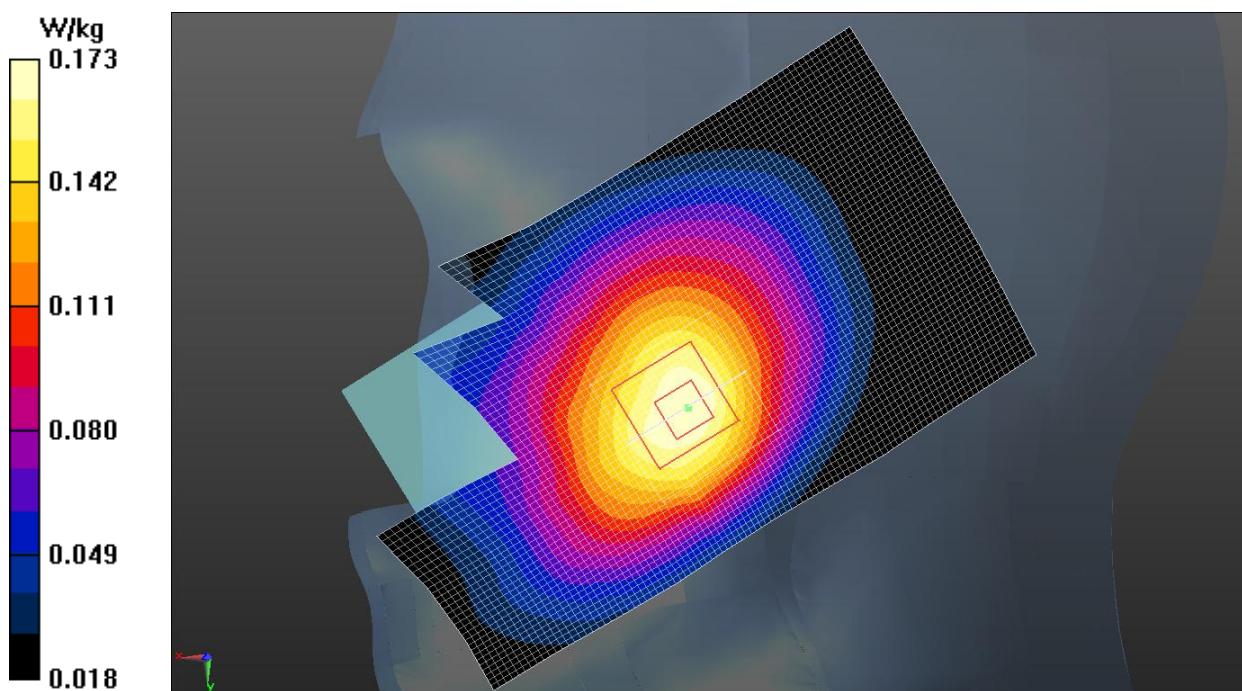
Right Cheek Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.145 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.213 W/kg

SAR(1 g) = 0.164 W/kg; SAR(10 g) = 0.123 W/kg

Maximum value of SAR (measured) = 0.173 W/kg



GSM850 Body

Date: 2018-5-8

Electronics: DAE4 Sn786

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 836.6$ MHz; $\sigma = 0.99$ S/m; $\epsilon_r = 52.671$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, GPRS 4Txslot (0) Frequency: 836.6 MHz Duty Cycle: 1:2

Probe: EX3DV4 – SN3633 ConvF (9.69, 9.69, 9.69);

Front side Mid/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.264 W/kg

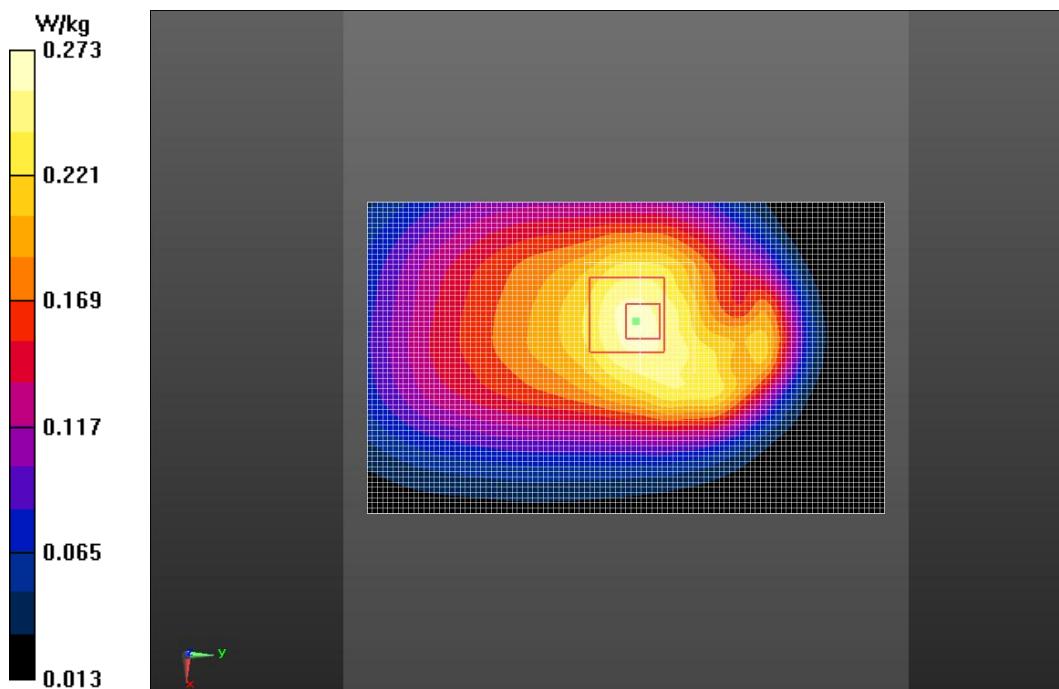
Front side Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.90 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 0.370 W/kg

SAR(1 g) = 0.260 W/kg; SAR(10 g) = 0.184 W/kg

Maximum value of SAR (measured) = 0.273 W/kg



GSM1900 Head

Date: 2018-5-2

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.399$ S/m; $\epsilon_r = 39.745$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, GSM (0) Frequency: 1880 MHz Duty Cycle: 1:8.3

Probe: EX3DV4 – SN3633 ConvF (7.81, 7.81, 7.81);

Left Cheek Mid/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.131 W/kg

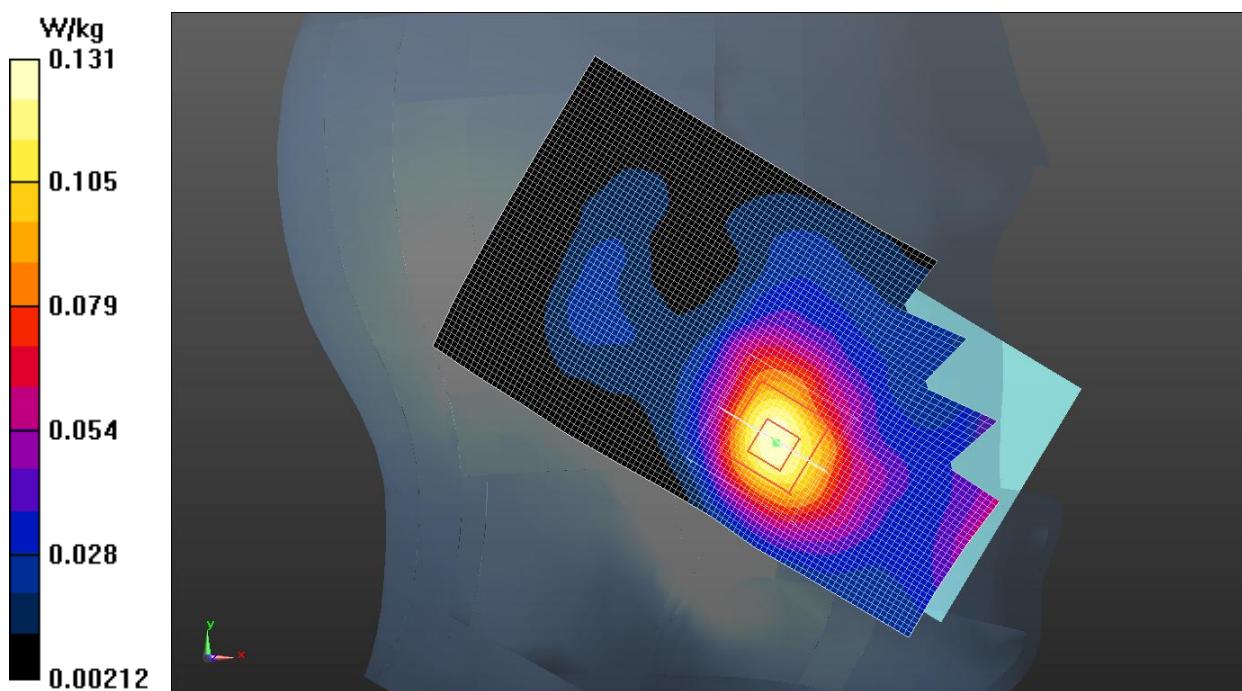
Left Cheek Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.064 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.181 W/kg

SAR(1 g) = 0.121 W/kg; SAR(10 g) = 0.076 W/kg

Maximum value of SAR (measured) = 0.131 W/kg



GSM1900 Body

Date: 2018-5-14

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used (interpolated): $f = 1850.2$ MHz; $\sigma = 1.532$ S/m; $\epsilon_r = 53.064$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, GPRS 3Txslot (0) Frequency: 1850.2 MHz Duty Cycle: 1:2.67

Probe: EX3DV4 – SN3633 ConvF (7.75, 7.75, 7.75);

Bottom Side Low /Area Scan (61x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.48 W/kg

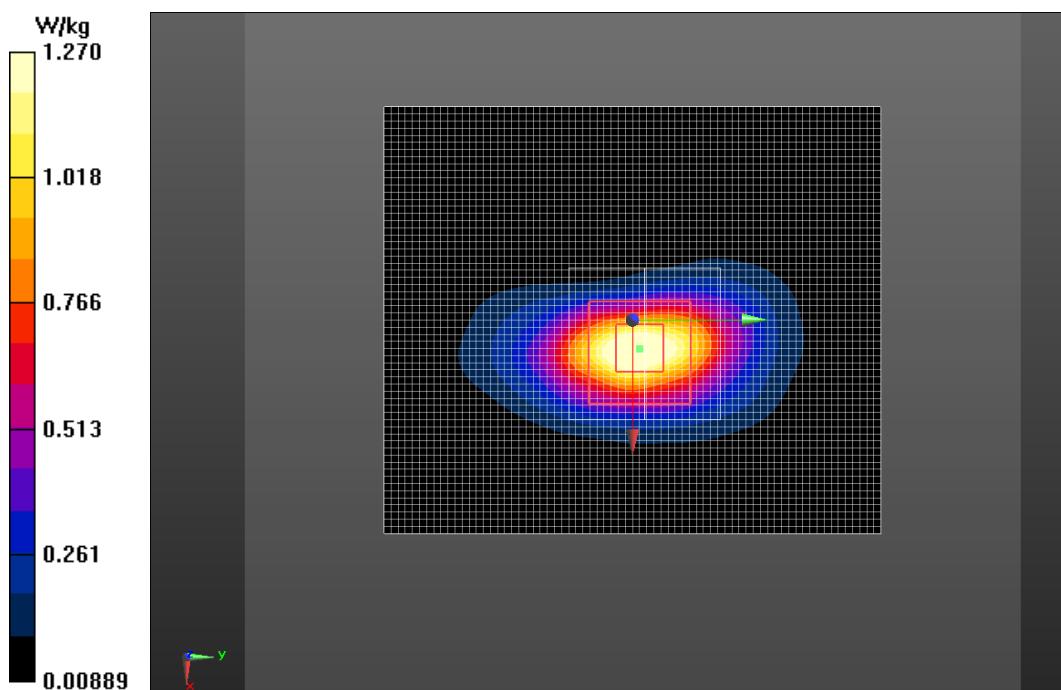
Bottom Side Low /Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

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

Peak SAR (extrapolated) = 2.03 W/kg

SAR(1 g) = 1.12 W/kg; SAR(10 g) = 0.562 W/kg

Maximum value of SAR (measured) = 1.27 W/kg



WCDMA850 Head

Date: 2018-5-8

Electronics: DAE4 Sn786

Medium: Head 835 MHz

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.892$ S/m; $\epsilon_r = 41.711$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

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

Probe: EX3DV4 – SN3633 ConvF (9.33, 9.33, 9.33);

Right Cheek Mid/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.287 W/kg

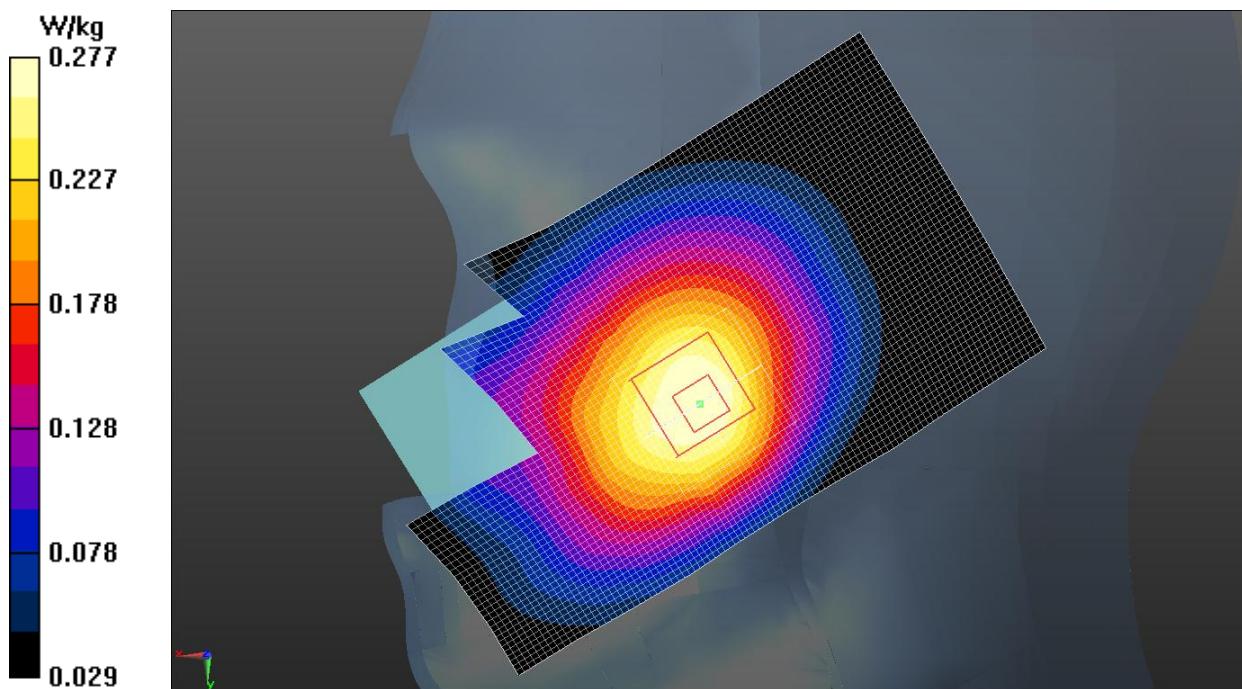
Right Cheek Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.009 V/m; Power Drift = 0.16 dB

Peak SAR (extrapolated) = 0.340 W/kg

SAR(1 g) = 0.262 W/kg; SAR(10 g) = 0.197 W/kg

Maximum value of SAR (measured) = 0.277 W/kg



WCDMA850 Body

Date: 2018-5-8

Electronics: DAE4 Sn786

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.99$ S/m; $\epsilon_r = 52.673$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

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

Probe: EX3DV4 – SN3633 ConvF (9.69, 9.69, 9.69);

Front side Mid/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.448 W/kg

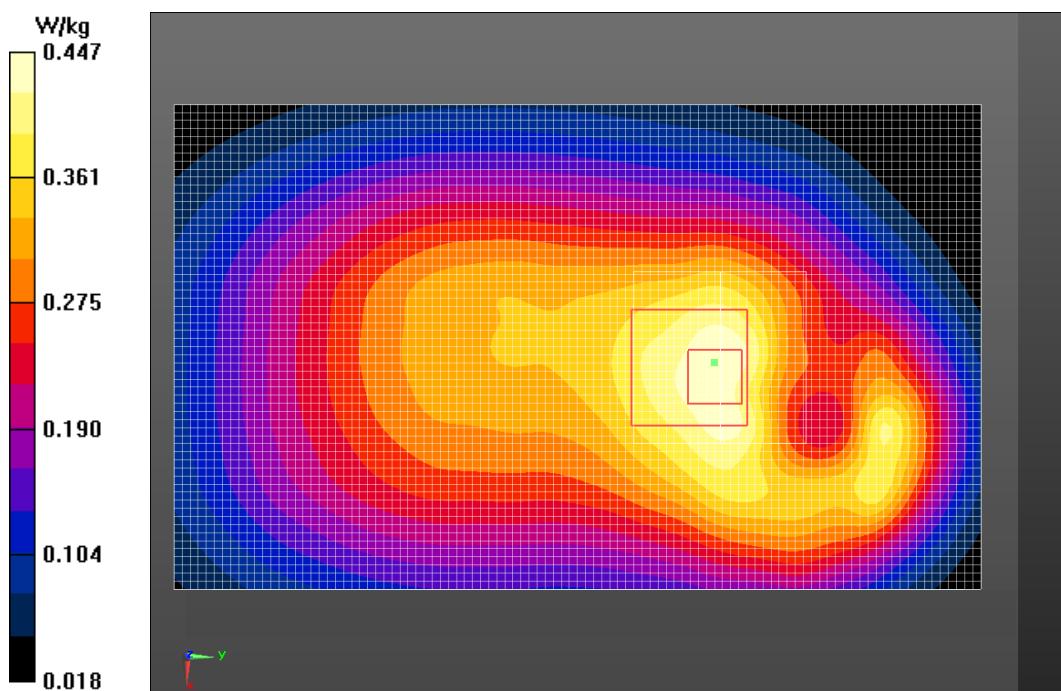
Front side Mid/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 18.78 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.596 W/kg

SAR(1 g) = 0.422 W/kg; SAR(10 g) = 0.300 W/kg

Maximum value of SAR (measured) = 0.447 W/kg



LTE Band 5 Head

Date: 2018-5-8

Electronics: DAE4 Sn786

Medium: Head 835 MHz

Medium parameters used (extrapolated): $f = 836.5$ MHz; $\sigma = 0.892$ S/m; $\epsilon_r = 41.710$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, LTE_FDD (0) Frequency: 836.5 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (9.33, 9.33, 9.33);

Right Cheek Mid 1RB_Low/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.306 W/kg

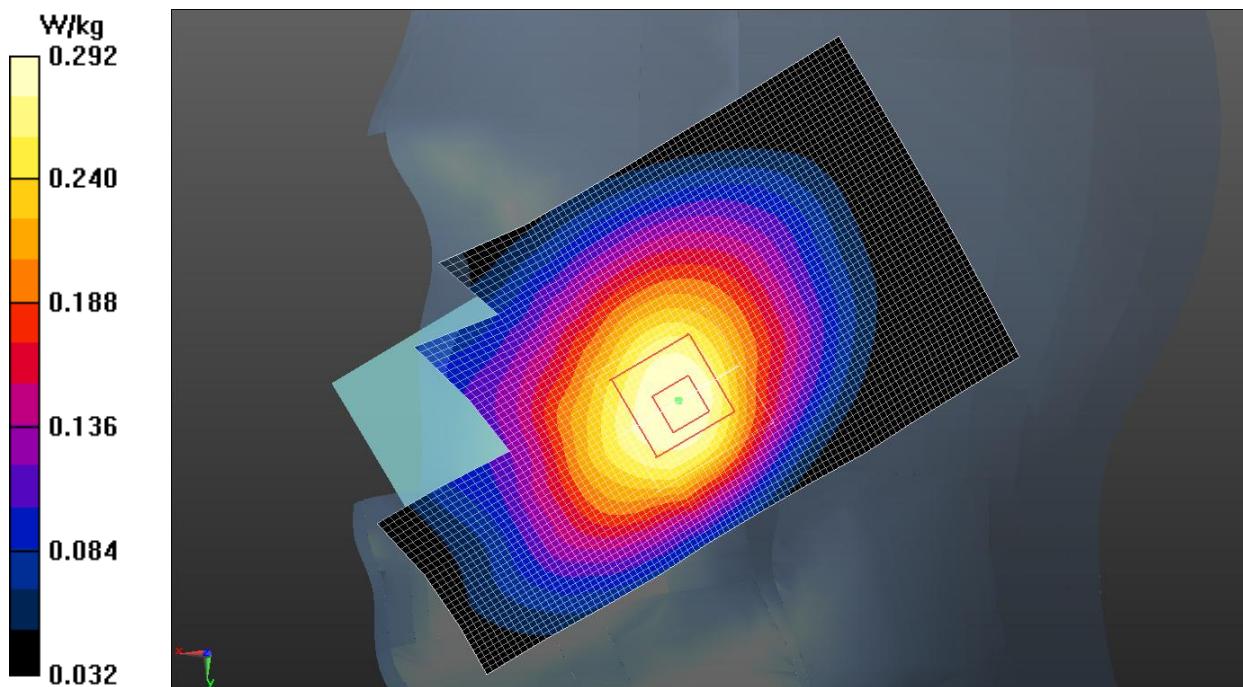
Right Cheek Mid 1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 6.988 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.355 W/kg

SAR(1 g) = 0.277 W/kg; SAR(10 g) = 0.208 W/kg

Maximum value of SAR (measured) = 0.292 W/kg



LTE Band 5 Body

Date: 2018-5-8

Electronics: DAE4 Sn786

Medium: Body 835 MHz

Medium parameters used (interpolated): $f = 836.5$ MHz; $\sigma = 0.99$ S/m; $\epsilon_r = 52.672$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, LTE_FDD (0) Frequency: 836.5 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (9.69, 9.69, 9.69);

Front side Mid 1RB_Low/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.444 W/kg

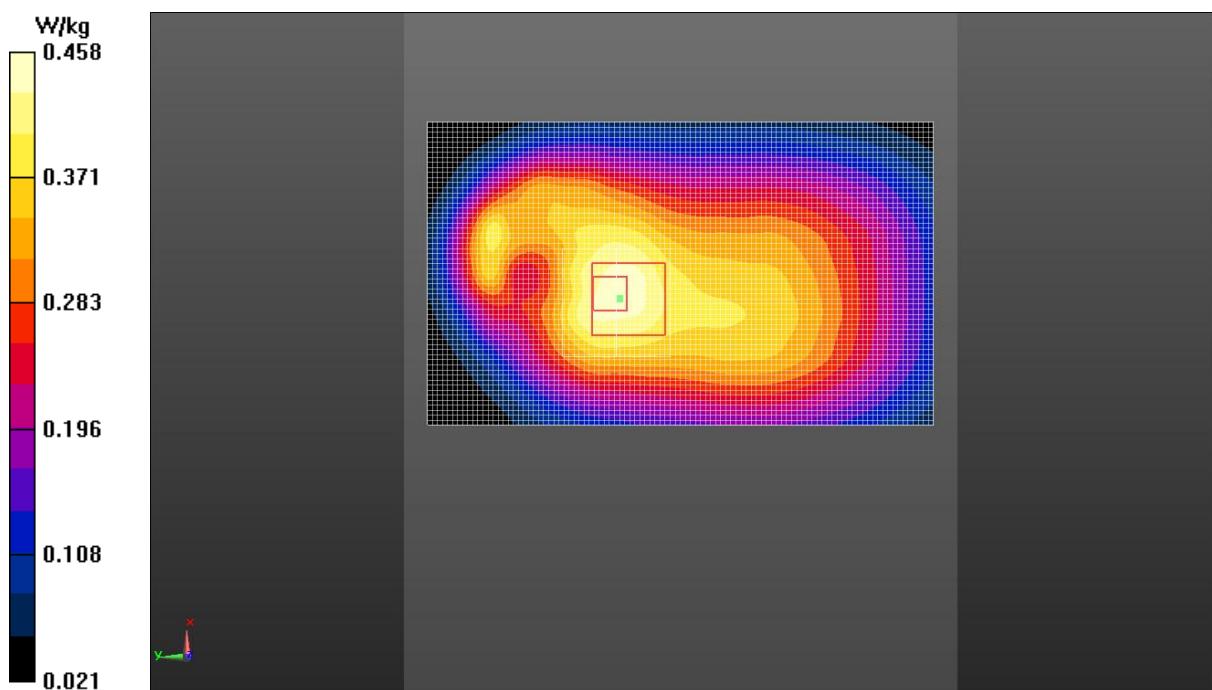
Front side Mid 1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.71 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 0.652 W/kg

SAR(1 g) = 0.440 W/kg; SAR(10 g) = 0.306 W/kg

Maximum value of SAR (measured) = 0.458 W/kg



LTE Band 7 Head

Date: 2018-5-5

Electronics: DAE4 Sn786

Medium: Head 2550 MHz

Medium parameters used (interpolated): $f = 2535$ MHz; $\sigma = 1.953$ S/m; $\epsilon_r = 38.417$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, LTE_FDD (0) Frequency: 2535 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (7.28, 7.28, 7.28);

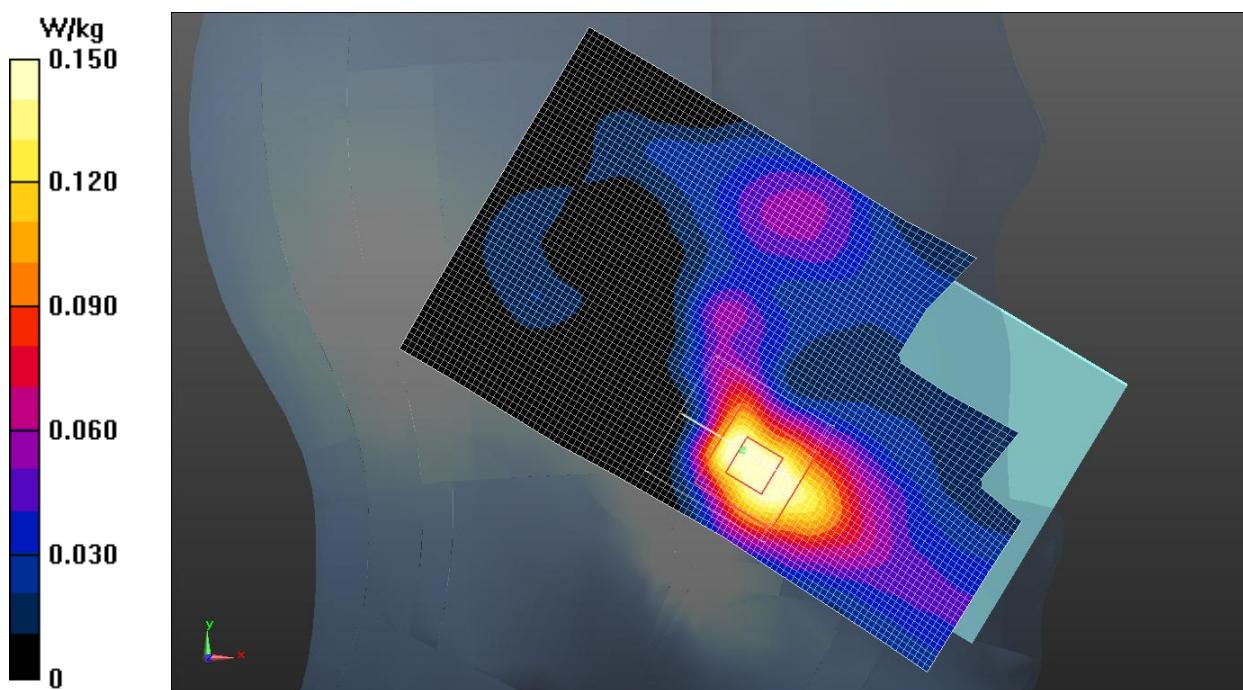
Left Cheek Mid 1RB_High/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm
Maximum value of SAR (interpolated) = 0.160 W/kg**Left Cheek Mid 1RB_High/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.354 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.244 W/kg

SAR(1 g) = 0.142 W/kg; SAR(10 g) = 0.078 W/kg

Maximum value of SAR (measured) = 0.150 W/kg



LTE Band 7 Body

Date: 2018-5-5

Electronics: DAE4 Sn786

Medium: Body 2550 MHz

Medium parameters used (interpolated): $f = 2535$ MHz; $\sigma = 2.034$ S/m; $\epsilon_r = 53.265$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, 4G_LTE_FDD (0) Frequency: 2535 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (7.31, 7.31, 7.31);

Bottom Side Mid 1RB_Hlgh/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 1.03 W/kg

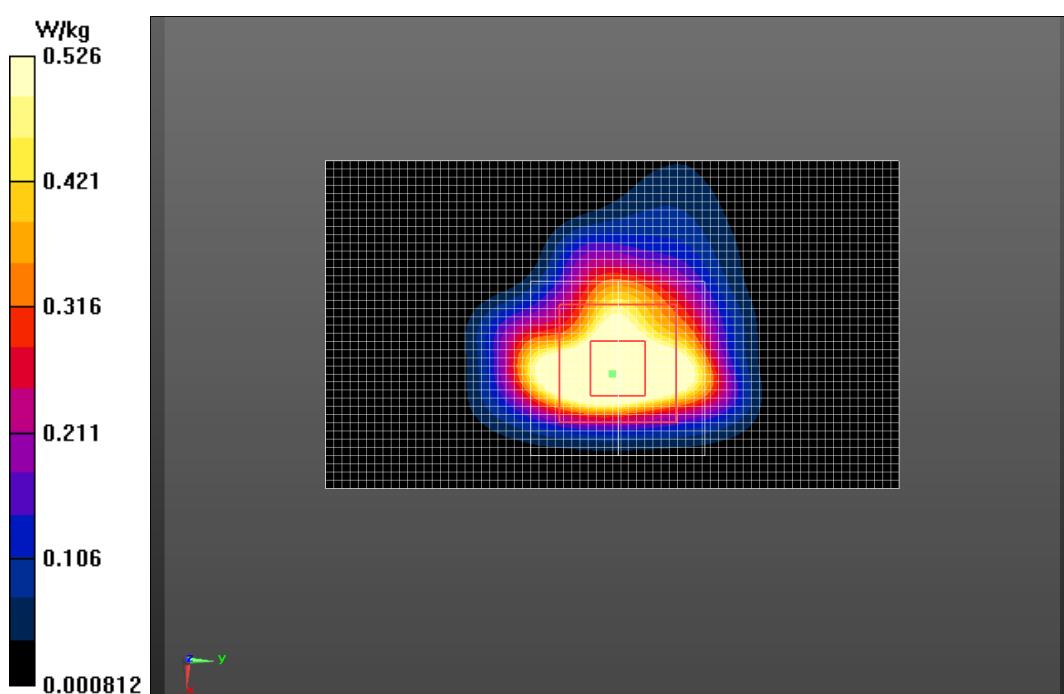
Bottom Side Mid 1RB_Hlgh/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.43 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.973 W/kg

SAR(1 g) = 0.480 W/kg; SAR(10 g) = 0.244 W/kg

Maximum value of SAR (measured) = 0.526 W/kg



LTE Band 38 Head

Date: 2018-5-5

Electronics: DAE4 Sn786

Medium: Head 2550 MHz

Medium parameters used (interpolated): $f = 2595$ MHz; $\sigma = 2.023$ S/m; $\epsilon_r = 38.196$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, LTE_TDD (0) Frequency: 2595 MHz Duty Cycle: 1:1.58

Probe: EX3DV4 – SN3633 ConvF (7.28, 7.28, 7.28);

Left Cheek Mid 1RB_Low/Area Scan (61x101x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.0903 W/kg

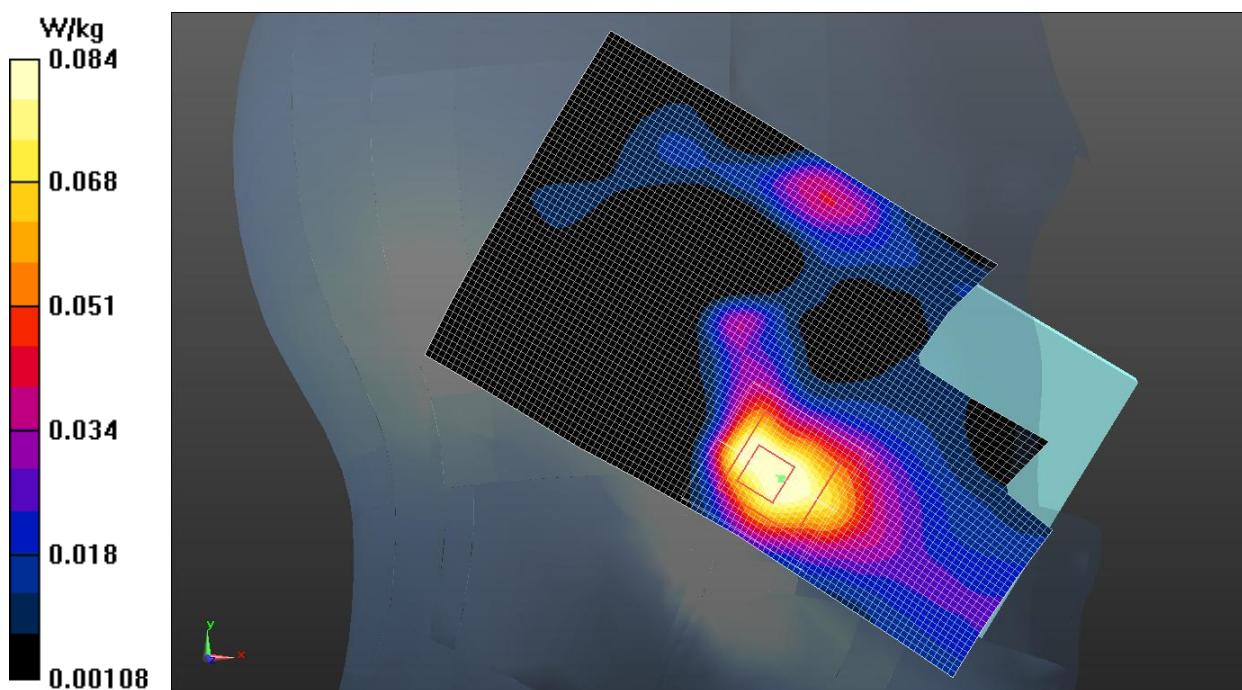
Left Cheek Mid 1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 1.074 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.142 W/kg

SAR(1 g) = 0.079 W/kg; SAR(10 g) = 0.043 W/kg

Maximum value of SAR (measured) = 0.0842 W/kg



LTE Band 38 Body

Date: 2018-5-5

Electronics: DAE4 Sn786

Medium: Body 2550 MHz

Medium parameters used (interpolated): $f = 2595$ MHz; $\sigma = 2.105$ S/m; $\epsilon_r = 53.073$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, LTE_FDD (0) Frequency: 2595 MHz Duty Cycle: 1:1.58

Probe: EX3DV4 – SN3633 ConvF (7.31, 7.31, 7.31);

Bottom Side Mid 1RB_Low/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.399 W/kg

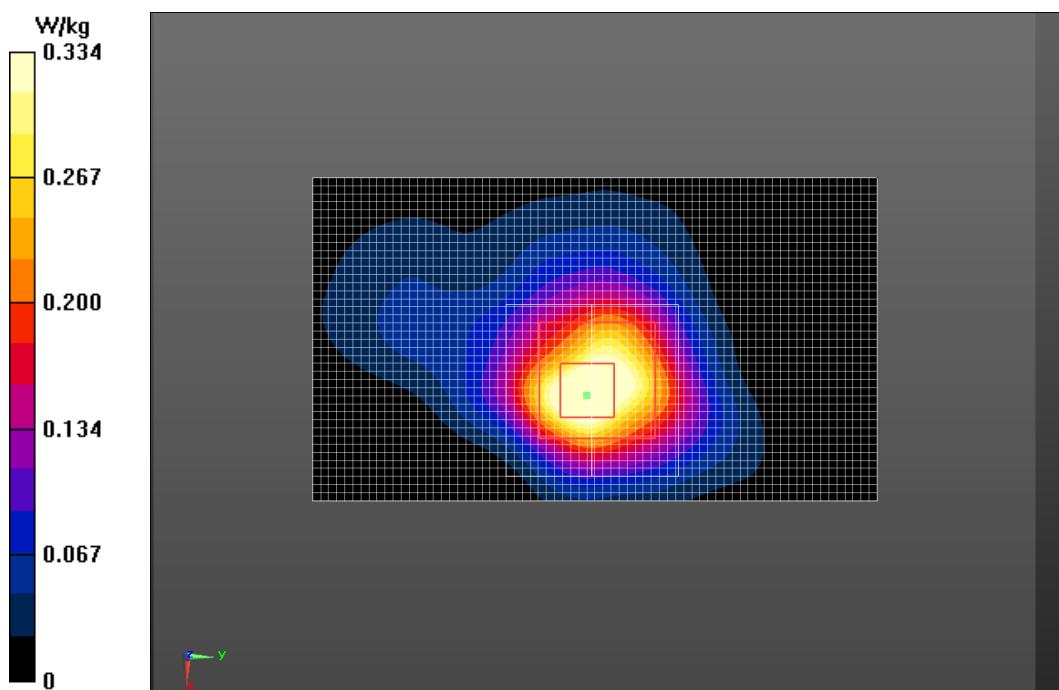
Bottom Side Mid 1RB_Low/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.87 V/m; Power Drift = 0.09 dB

Peak SAR (extrapolated) = 0.623 W/kg

SAR(1 g) = 0.296 W/kg; SAR(10 g) = 0.143 W/kg

Maximum value of SAR (measured) = 0.334 W/kg



Wi-Fi 2.4G Head

Date: 2018-5-16

Electronics: DAE4 Sn786

Medium: Head 2450 MHz

Medium parameters used: $f = 2462$ MHz; $\sigma = 1.856$ S/m; $\epsilon_r = 38.701$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, WiFi (0) Frequency: 2462 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (7.42, 7.42, 7.42);

Left Cheek High/Area Scan (71x111x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.963 W/kg

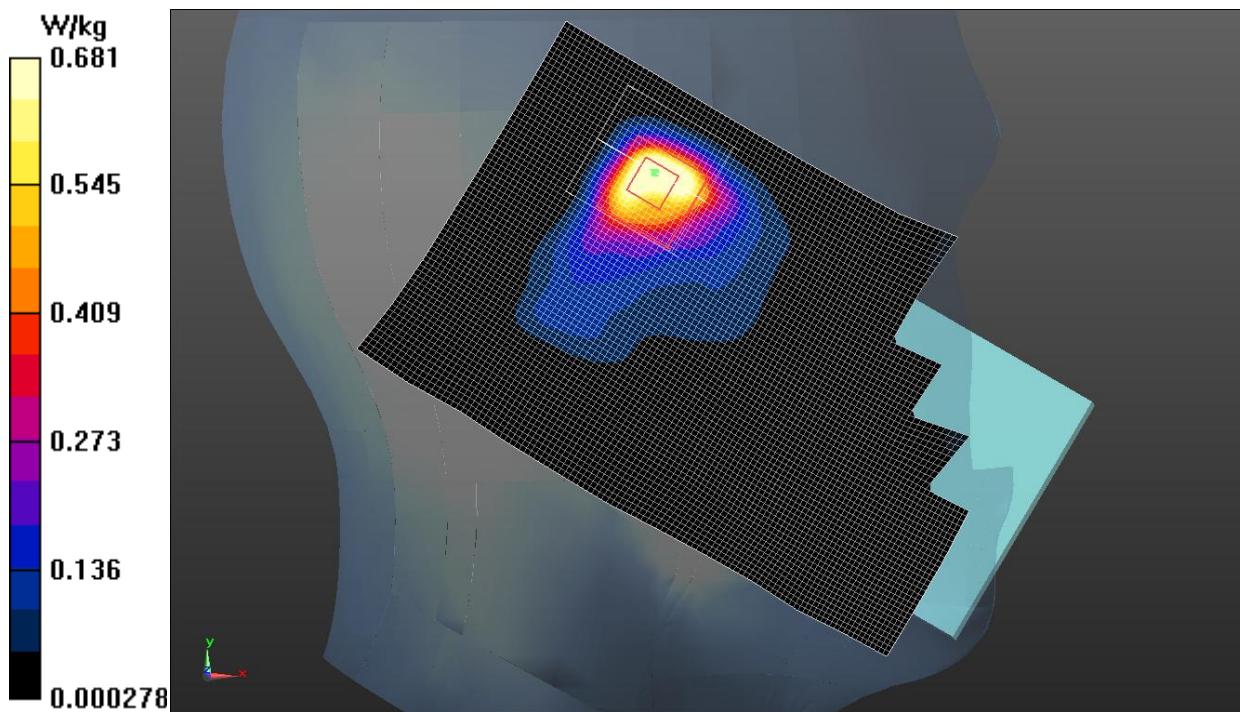
Left Cheek High/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.535 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 1.78 W/kg

SAR(1 g) = 0.625 W/kg; SAR(10 g) = 0.261 W/kg

Maximum value of SAR (measured) = 0.681 W/kg



Wi-Fi 2.4G Body

Date: 2018-5-16

Electronics: DAE4 Sn786

Medium: Body 2450 MHz

Medium parameters used (interpolated): $f = 2437$ MHz; $\sigma = 1.911$ S/m; $\epsilon_r = 53.568$; $\rho = 1000$ kg/m³

Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C

Communication System: UID 0, WiFi (0) Frequency: 2437 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (7.47, 7.47, 7.47);

Top Side Middle/Area Scan (41x71x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.130 W/kg

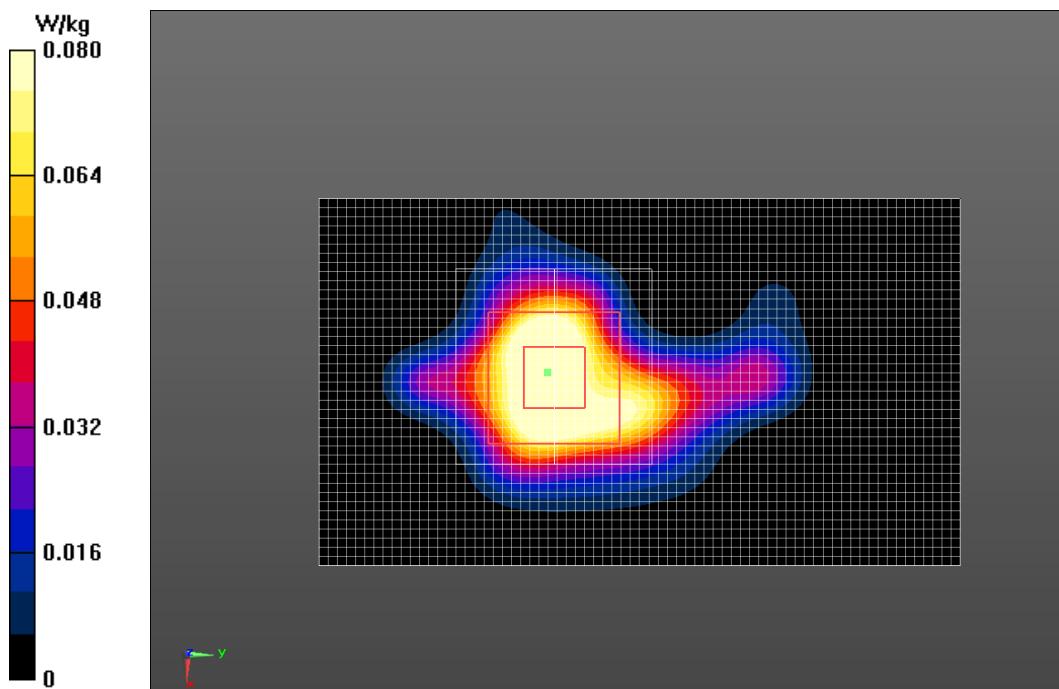
Top Side Middle/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.943 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.118 W/kg

SAR(1 g) = 0.072 W/kg; SAR(10 g) = 0.039 W/kg

Maximum value of SAR (measured) = 0.0796 W/kg



ANNEX L System Verification Results for Spot Check Test

835MHz

Date: 2018-5-8

Electronics: DAE4 Sn786

Medium: Head 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.890 \text{ S/m}$; $\epsilon_r = 41.722$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C

Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (9.33, 9.33, 9.33);

System Validation /Area Scan (81x161x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 55.864 V/m; Power Drift = -0.05 dB

SAR(1 g) = 2.28 W/kg; SAR(10 g) = 1.50 W/kg

Maximum value of SAR (interpolated) = 2.55 W/kg

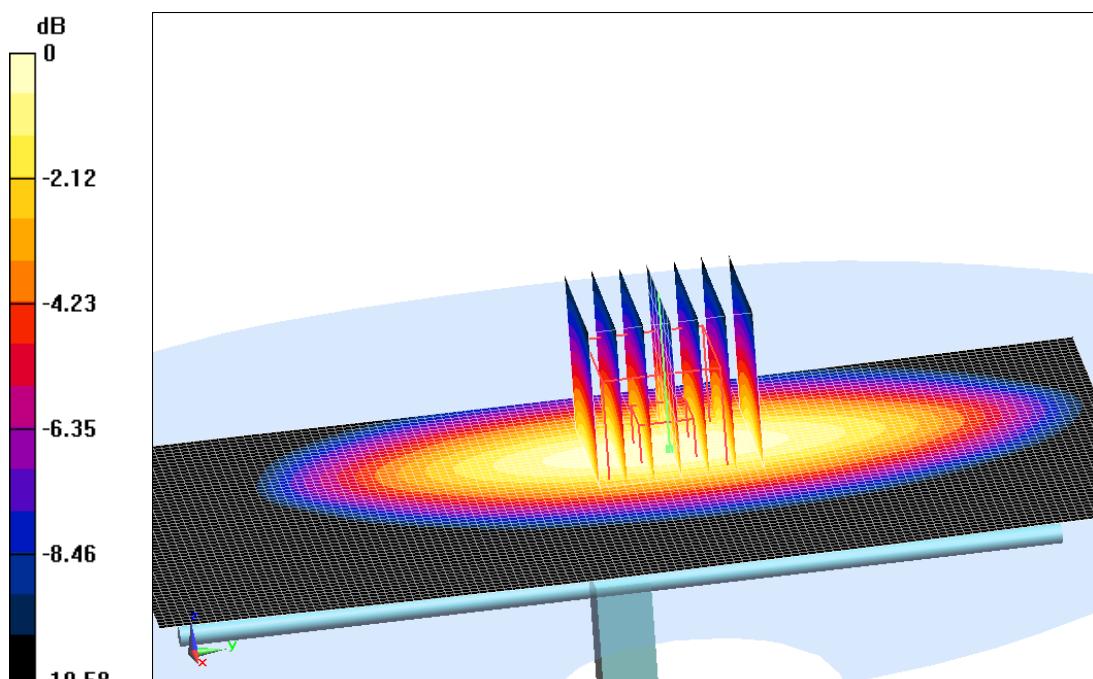
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 55.864 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 3.36 W/kg

SAR(1 g) = 2.24 W/kg; SAR(10 g) = 1.48 W/kg

Maximum value of SAR (measured) = 2.51 W/kg



0 dB = 2.51 W/kg = 4.00 dBW/kg

Validation 835MHz 250mW

835MHz

Date: 2018-5-8

Electronics: DAE4 Sn786

Medium: Body 835 MHz

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.988 \text{ S/m}$; $\epsilon_r = 53.689$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C

Communication System: CW Frequency: 835 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (9.69, 9.69, 9.69);

System Validation /Area Scan (81x171x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 58.723 V/m; Power Drift = 0.07 dB

SAR(1 g) = 2.42 W/kg; SAR(10 g) = 1.57 W/kg

Maximum value of SAR (interpolated) = 2.60 W/kg

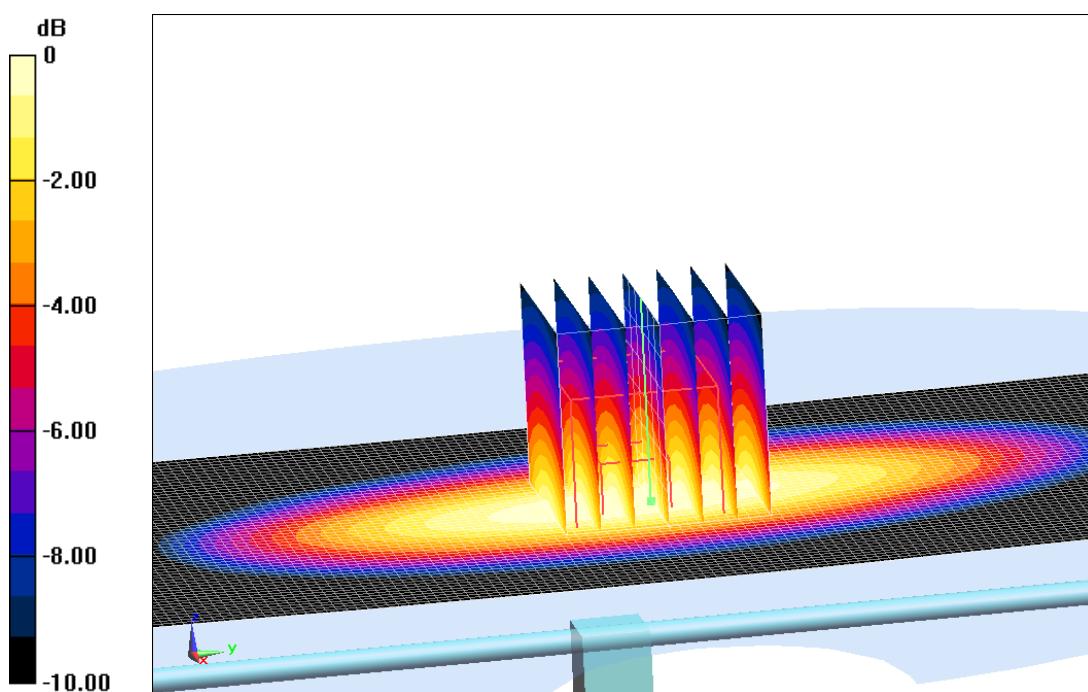
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 58.723 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 3.75 W/kg

SAR(1 g) = 2.46 W/kg; SAR(10 g) = 1.59 W/kg

Maximum value of SAR (measured) = 2.68 W/kg



$$0 \text{ dB} = 2.68 \text{ W/kg} = 4.28 \text{ dBW/kg}$$

Validation 835MHz 250mW

1900MHz

Date: 2018-5-2

Electronics: DAE4 Sn786

Medium: Head 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.419 \text{ S/m}$; $\epsilon_r = 39.61$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C

Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (7.81, 7.81, 7.81);

System Validation /Area Scan (81x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 92.967 V/m; Power Drift = 0.06 dB

SAR(1 g) = 10.3 W/kg; SAR(10 g) = 5.28 W/kg

Maximum value of SAR (interpolated) = 13.2 W/kg

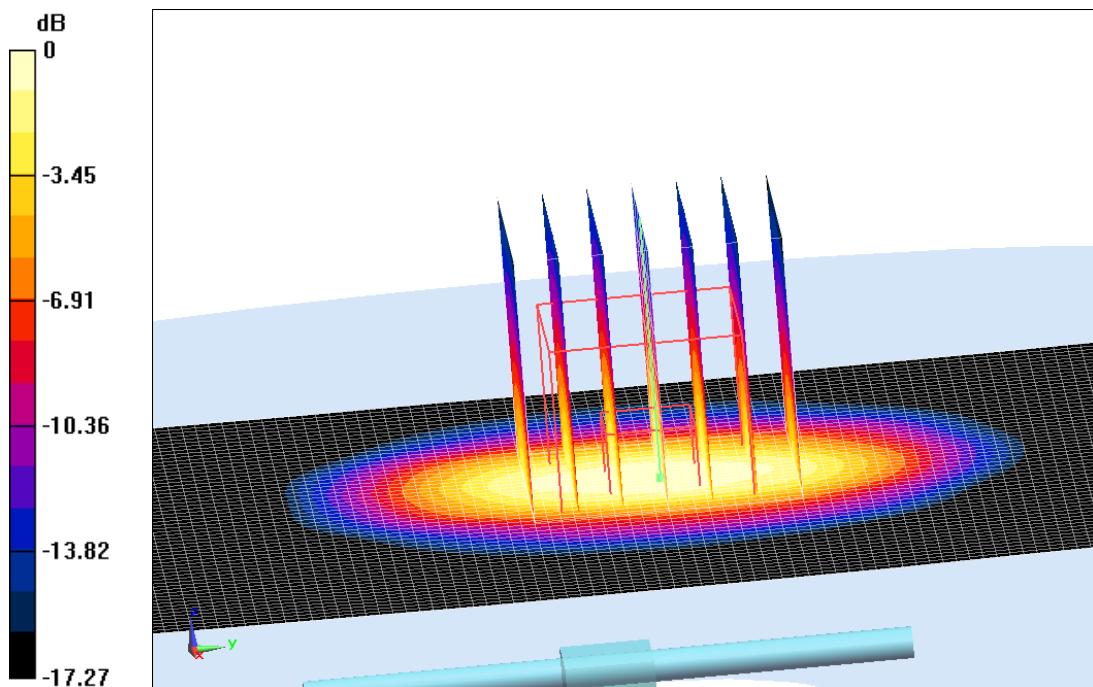
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 92.967 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 20.2 W/kg

SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.33 W/kg

Maximum value of SAR (measured) = 13.6 W/kg



$$0 \text{ dB} = 13.6 \text{ W/kg} = 11.34 \text{ dB W/kg}$$

Validation 1900MHz 250mW

1900MHz

Date: 2018-5-14

Electronics: DAE4 Sn786

Medium: Body 1900 MHz

Medium parameters used: $f = 1900 \text{ MHz}$; $\sigma = 1.574 \text{ S/m}$; $\epsilon_r = 52.948$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.9°C Liquid Temperature: 22.5°C

Communication System: CW Frequency: 1900 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (7.75, 7.75, 7.75);

System validation /Area Scan (81x121x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 85.862 V/m; Power Drift = 0.11 dB

SAR(1 g) = 10.5 W/kg; SAR(10 g) = 5.44 W/kg

Maximum value of SAR (interpolated) = 13.5 W/kg

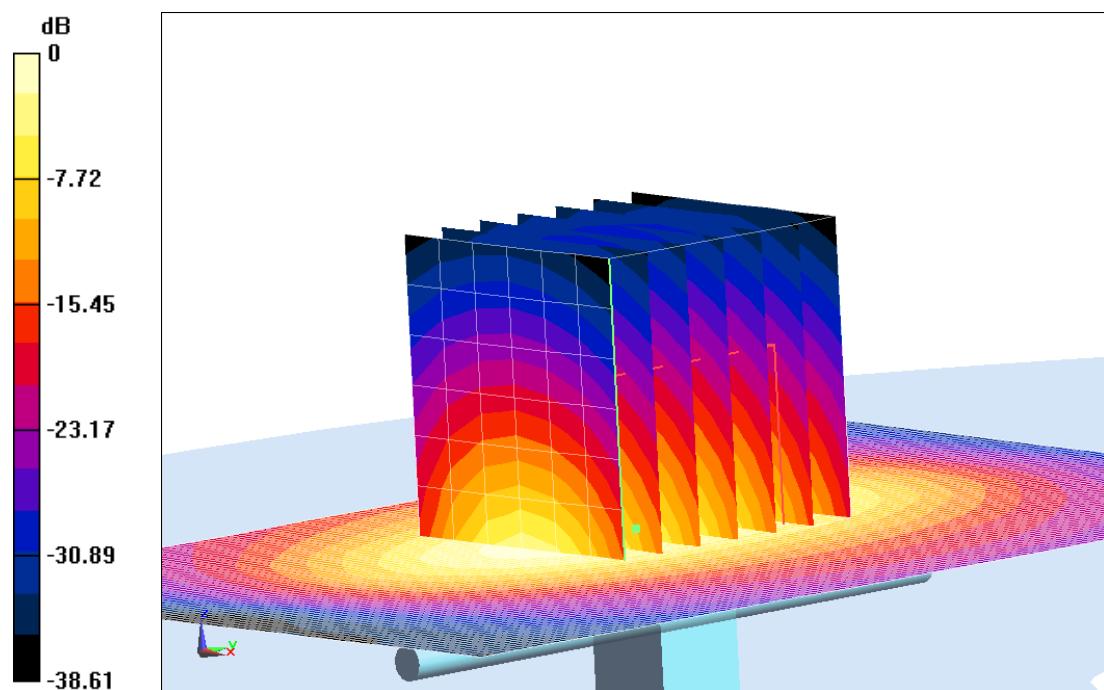
System validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 85.862 V/m; Power Drift = 0.11 dB

Peak SAR (extrapolated) = 20.7 W/kg

SAR(1 g) = 10.7 W/kg; SAR(10 g) = 5.48 W/kg

Maximum value of SAR (measured) = 13.9 W/kg



0 dB = 13.9 W/kg = 11.43 dB W/kg

Validation 1900MHz 250mW

2450MHz

Date: 2018-5-16

Electronics: DAE4 Sn786

Medium: Head 2450 MHz

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.842 \text{ S/m}$; $\epsilon_r = 38.743$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.0°C Liquid Temperature: 21.6°C

Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (7.42, 7.42, 7.42);

System Validation /Area Scan (61x81x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 90.544 V/m; Power Drift = 0.08 dB

SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.13 W/kg

Maximum value of SAR (interpolated) = 15.2 W/kg

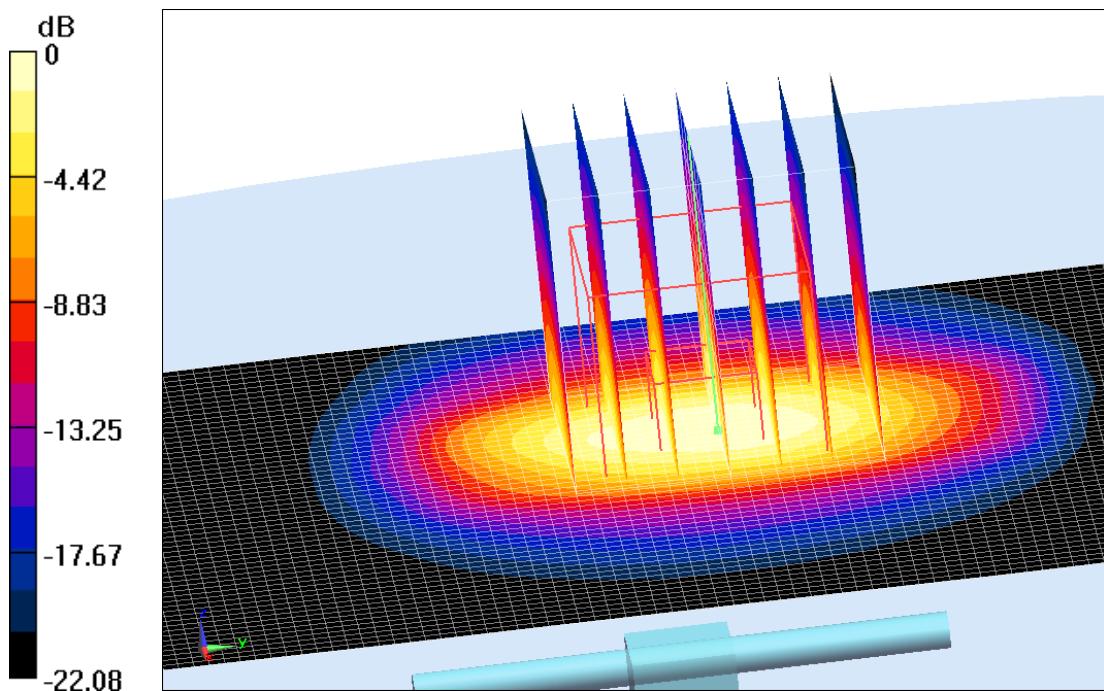
System Validation /Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 90.544 V/m; Power Drift = 0.08 dB

Peak SAR (extrapolated) = 25.5 W/kg

SAR(1 g) = 13.6 W/kg; SAR(10 g) = 6.18 W/kg

Maximum value of SAR (measured) = 15.6 W/kg



0 dB = 15.6 W/kg = 11.93 dB W/kg

Validation 2450MHz 250mW

2450MHz

Date: 2018-5-16

Electronics: DAE4 Sn786

Medium: Body 2450 MHz

Medium parameters used: $f = 2450 \text{ MHz}$; $\sigma = 1.928 \text{ S/m}$; $\epsilon_r = 53.526$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.0°C Liquid Temperature: 21.6°C

Communication System: CW Frequency: 2450 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (7.47, 7.47, 7.47);

System Validation/Area Scan (81x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 86.785 V/m; Power Drift = -0.02 dB

SAR(1 g) = 12.9 W/kg; SAR(10 g) = 6.07 W/kg

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

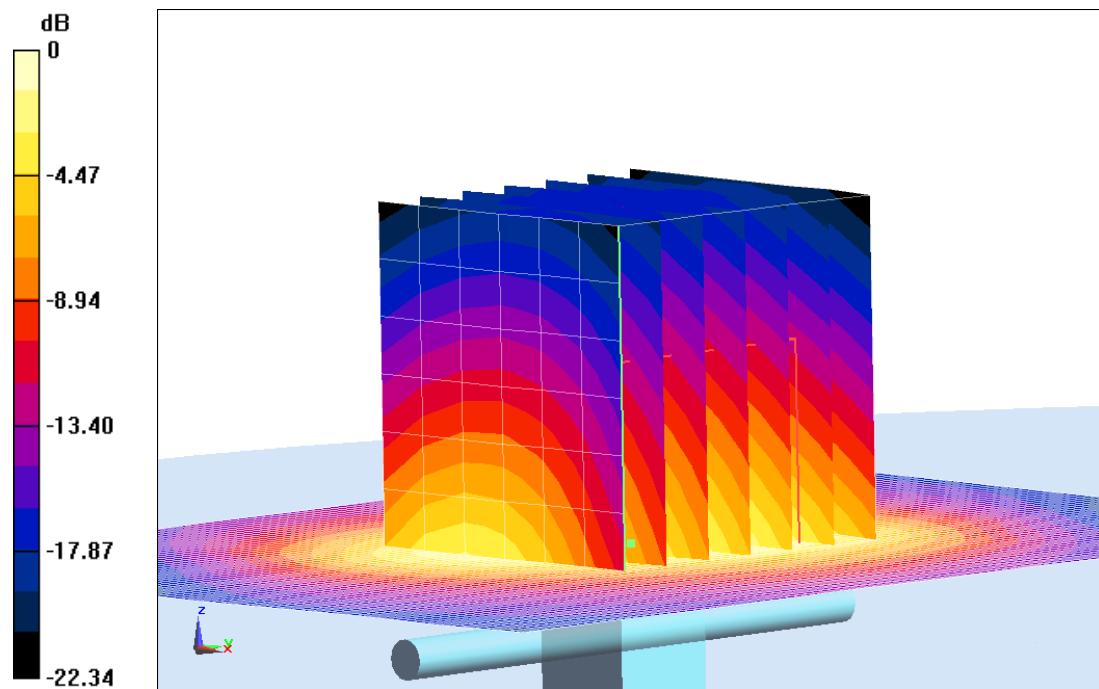
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 86.785 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 23.9 W/kg

SAR(1 g) = 12.7 W/kg; SAR(10 g) = 6.02 W/kg

Maximum value of SAR (measured) = 14.4 W/kg



Validation 2450MHz 250mW

2550MHz

Date: 2018-5-5

Electronics: DAE4 Sn786

Medium: Head 2550 MHz

Medium parameters used: $f = 2550 \text{ MHz}$; $\sigma = 1.971 \text{ S/m}$; $\epsilon_r = 38.36$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.0°C Liquid Temperature: 21.6°C

Communication System: CW Frequency: 2550 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (7.28, 7.28, 7.28);

System Validation/Area Scan (81x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 93.242 V/m; Power Drift = 0.02 dB

SAR(1 g) = 14.4 W/kg; SAR(10 g) = 6.55 W/kg

Maximum value of SAR (interpolated) = 16.1 W/kg

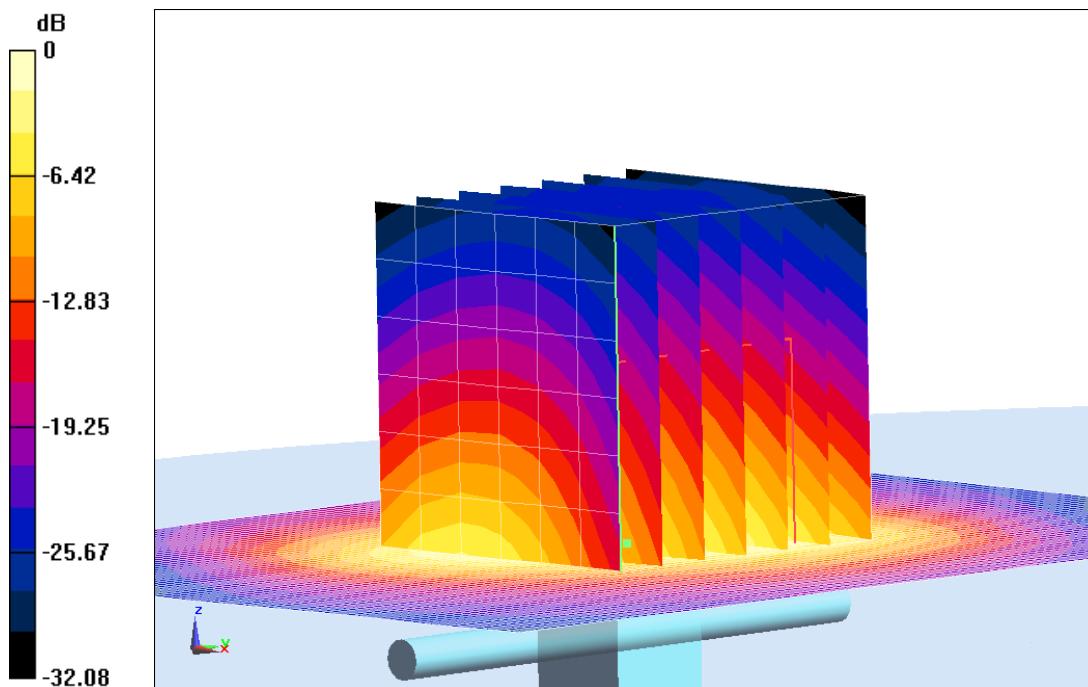
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 93.242 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 28.8 W/kg

SAR(1 g) = 14.5 W/kg; SAR(10 g) = 6.58 W/kg

Maximum value of SAR (measured) = 16.6 W/kg



0 dB = 16.6 W/kg = 12.20 dB W/kg

Validation 2550MHz 250mW

2550MHz

Date: 2018-5-5

Electronics: DAE4 Sn786

Medium: Body 2550 MHz

Medium parameters used: $f = 2550 \text{ MHz}$; $\sigma = 2.052 \text{ S/m}$; $\epsilon_r = 53.214$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature: 22.0°C Liquid Temperature: 21.6°C

Communication System: CW Frequency: 2550 MHz Duty Cycle: 1:1

Probe: EX3DV4 – SN3633 ConvF (7.31, 7.31, 7.31);

System Validation/Area Scan (81x101x1): Interpolated grid: $dx=1.000 \text{ mm}$, $dy=1.000 \text{ mm}$

Reference Value = 86.296 V/m; Power Drift = -0.08 dB

SAR(1 g) = 13.3 W/kg; SAR(10 g) = 6.25 W/kg

Maximum value of SAR (interpolated) = 15.0 W/kg

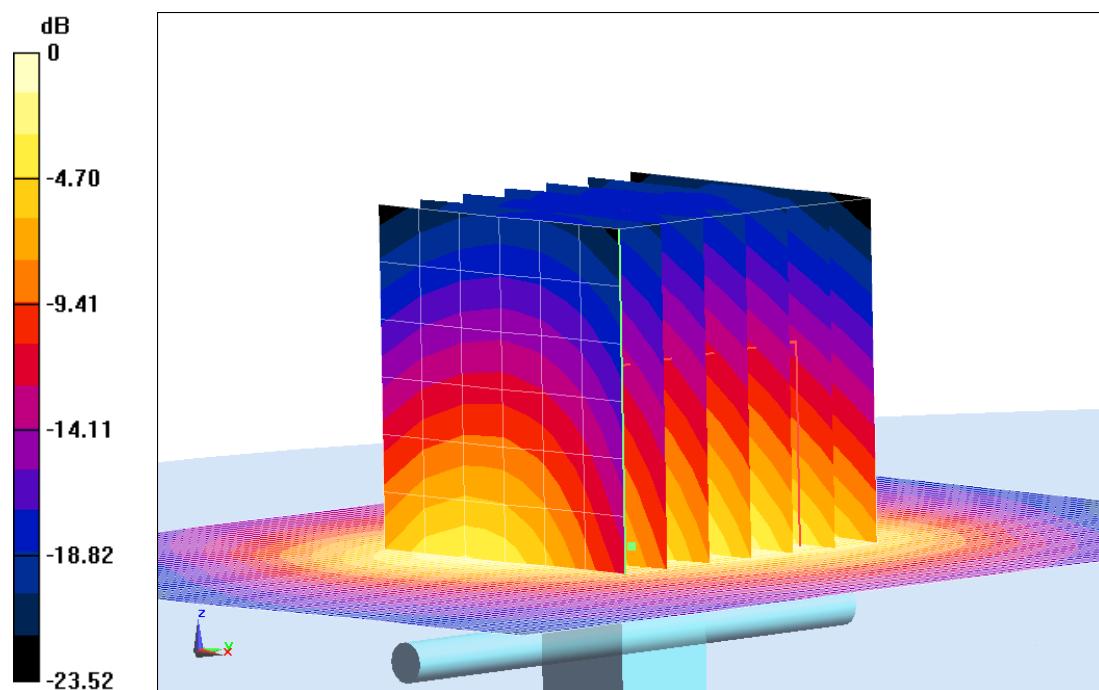
System Validation/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$, $dy=5\text{mm}$, $dz=5\text{mm}$

Reference Value = 86.296 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 26.0 W/kg

SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.20 W/kg

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



Validation 2550MHz 250mW