## 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 jΩ |
| Return Loss | - 23.6 dB |

### Antenna Parameters with Head TSL at 5300 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 50.5 Ω - 3.2 jΩ |
| Return Loss | - 29.8 dB |

### Antenna Parameters with Head TSL at 5500 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 49.0 Ω + 2.5 jΩ |
| Return Loss | - 31.2 dB |

### Antenna Parameters with Head TSL at 5600 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 50.0 Ω + 0.6 jΩ |
| Return Loss | - 44.1 dB |

### Antenna Parameters with Head TSL at 5800 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 55.6 Ω + 1.9 jΩ |
| Return Loss | - 25.1 dB |

### Antenna Parameters with Body TSL at 5200 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 48.6 Ω - 3.4 jΩ |
| Return Loss | - 28.6 dB |

### Antenna Parameters with Body TSL at 5300 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 49.6 Ω - 2.4 jΩ |
| Return Loss | - 32.3 dB |

### Antenna Parameters with Body TSL at 5500 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 49.5 Ω + 2.5 jΩ |
| Return Loss | - 31.7 dB |

### Antenna Parameters with Body TSL at 5600 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 50.8 Ω + 2.5 jΩ |
| Return Loss | - 31.7 dB |

### Antenna Parameters with Body TSL at 5800 MHz

| | |
|---|---|
| Impedance, transformed to feed point | 56.0 Ω + 3.0 jΩ |
| 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 MHz; $\sigma$ = 4.54 S/m; $\varepsilon_r$ = 34.6; $\rho$ = 1000 kg/m$^3$
Medium parameters used: f = 5300 MHz; $\sigma$ = 4.63 S/m; $\varepsilon_r$ = 34.4; $\rho$ = 1000 kg/m$^3$
Medium parameters used: f = 5500 MHz; $\sigma$ = 4.83 S/m; $\varepsilon_r$ = 34.2; $\rho$ = 1000 kg/m$^3$
Medium parameters used: f = 5600 MHz; $\sigma$ = 4.93 S/m; $\varepsilon_r$ = 34.0; $\rho$ = 1000 kg/m$^3$
Medium parameters used: f = 5800 MHz; $\sigma$ = 5.14 S/m; $\varepsilon_r$ = 33.7; $\rho$ = 1000 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)

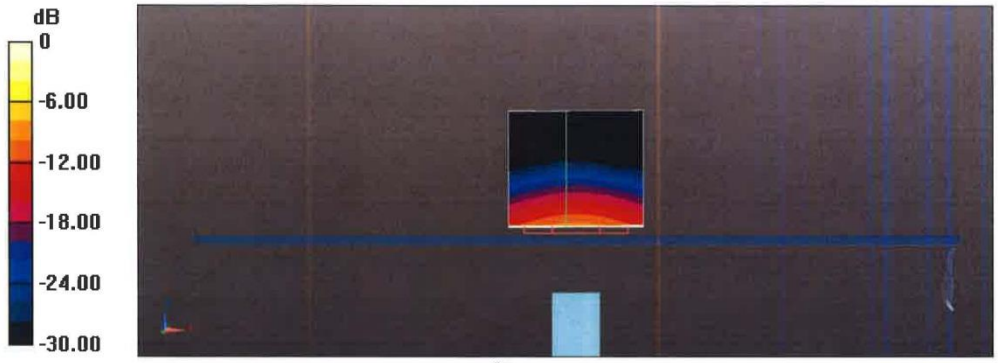
**Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5200 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 70.35 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 27.9 W/kg
**SAR(1 g) = 7.76 W/kg; SAR(10 g) = 2.22 W/kg**
Maximum value 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

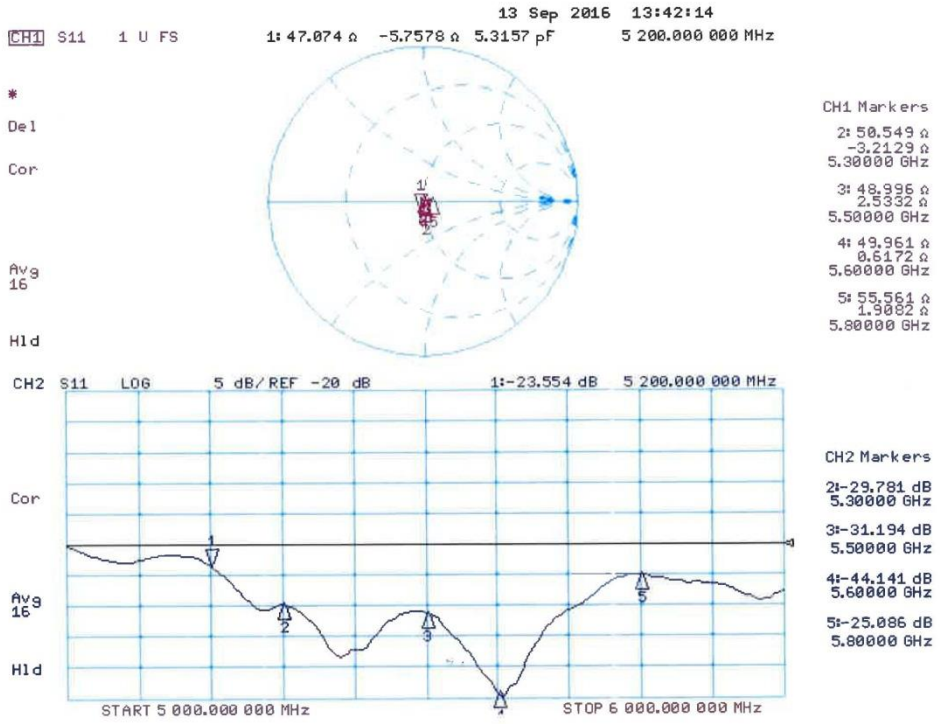
**Dipole Calibration for Head Tissue/Pin=100mW, dist=10mm, f=5600 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 71.51 V/m; Power Drift = -0.00 dB
Peak SAR (extrapolated) = 32.8 W/kg
**SAR(1 g) = 8.38 W/kg; SAR(10 g) = 2.39 W/kg**
Maximum value 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




0 dB = 17.9 W/kg = 12.53 dBW/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 MHz; $\sigma$ = 5.45 S/m; $\varepsilon_r$ = 47.5; $\rho$ = 1000 kg/m$^3$
Medium parameters used: f = 5300 MHz; $\sigma$ = 5.59 S/m; $\varepsilon_r$ = 47.3; $\rho$ = 1000 kg/m$^3$
Medium parameters used: f = 5500 MHz; $\sigma$ = 5.86 S/m; $\varepsilon_r$ = 47.0; $\rho$ = 1000 kg/m$^3$
Medium parameters used: f = 5600 MHz; $\sigma$ = 6.00 S/m; $\varepsilon_r$ = 46.8; $\rho$ = 1000 kg/m$^3$
Medium parameters used: f = 5800 MHz; $\sigma$ = 6.29 S/m; $\varepsilon_r$ = 46.4; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 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

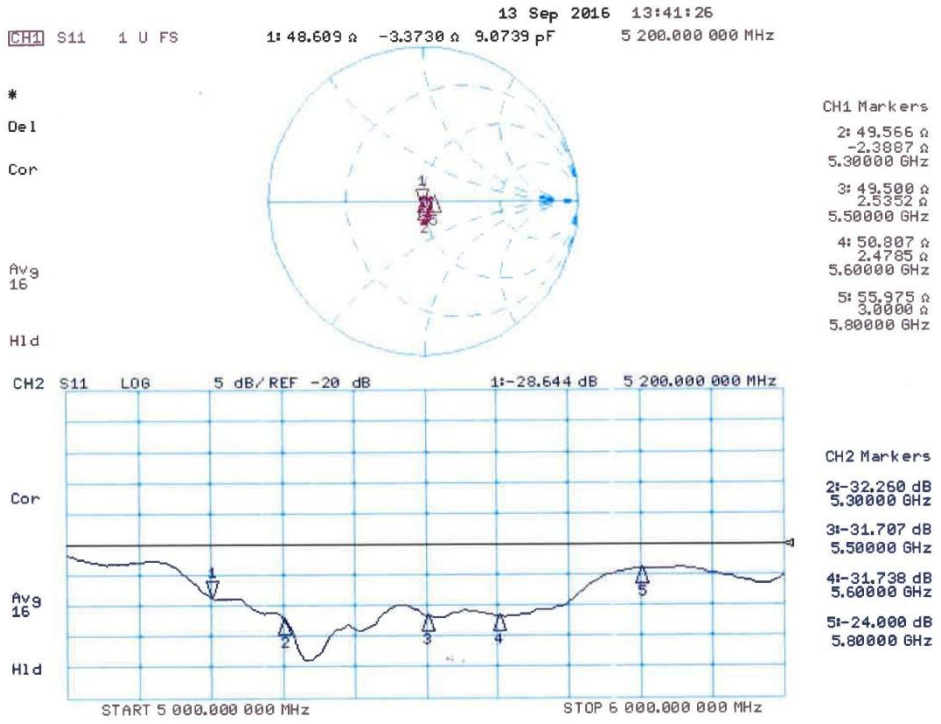
**Dipole Calibration for Body Tissue/Pin=100mW, dist=10mm, f=5500 MHz/Zoom Scan, dist=1.4mm (8x8x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 67.20 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 32.4 W/kg
**SAR(1 g) = 8.03 W/kg; SAR(10 g) = 2.23 W/kg**
Maximum value 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


0 dB = 17.3 W/kg = 12.38 dBW/kg

**Impedance Measurement Plot for Body TSL**



## ANNEX J Extended Calibration SAR Dipole

Referring to KDB865664 D01, if dipoles are verified in return loss (<-20dBm, 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 D5GHzV2– serial no.1238

| Head | | | | | | | |
|---|---|---|---|---|---|---|---|
| Date of Measurement | Frequency | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (johm) | Delta (johm) |
| 2016-09-21 | 5200MHz | -23.6 | / | 47.1 | / | 5.80 | / |
| 2017-09-20 | | -21.7 | 8.1 | 48.3 | 1.2 | 3.38 | 2.42 |
| 2018-09-18 | | -21.2 | 10.2 | 48.7 | 1.6 | 3.25 | 2.55 |
| 2016-09-21 | 5300MHz | -29.8 | / | 50.5 | / | 3.20 | / |
| 2017-09-20 | | -27.8 | 6.7 | 51.9 | 1.4 | 4.51 | 1.31 |
| 2018-09-18 | | -26.2 | 12.1 | 53.3 | 2.8 | 4.82 | 1.62 |
| 2016-09-21 | 5500MHz | -31.2 | / | 49.0 | / | 2.50 | / |
| 2017-09-20 | | -29.5 | 5.4 | 50.3 | 1.3 | 1.24 | 1.26 |
| 2018-09-18 | | -28.1 | 9.9 | 51.4 | 2.4 | 1.55 | 0.95 |
| 2016-09-21 | 5600MHz | -44.1 | / | 50.0 | / | 0.60 | / |
| 2017-09-20 | | -42.6 | 3.4 | 51.5 | 1.5 | 2.55 | 1.95 |
| 2018-09-18 | | -40.5 | 8.2 | 53.3 | 3.3 | 3.01 | 2.41 |
| 2016-09-21 | 5800MHz | -25.1 | / | 55.6 | / | 1.90 | / |
| 2017-09-20 | | -23.8 | 5.2 | 56.9 | 1.3 | 3.04 | 1.14 |
| 2018-09-18 | | -22.7 | 9.6 | 57.3 | 1.7 | 2.88 | 0.98 |

| Body | | | | | | | |
|---|---|---|---|---|---|---|---|
| Date of Measurement | Frequency | Return-Loss (dB) | Delta (%) | Real Impedance (ohm) | Delta (ohm) | Imaginary Impedance (johm) | Delta (johm) |
| 2016-09-21 | 5200MHz | -28.6 | / | 48.6 | / | 3.40 | / |
| 2017-09-20 | | -26.4 | 7.7 | 50.0 | 1.4 | 3.72 | 0.32 |
| 2018-09-18 | | -24.6 | 14.0 | 51.2 | 2.6 | 3.85 | 0.45 |
| 2016-09-21 | 5300MHz | -32.3 | / | 49.6 | / | 2.40 | / |
| 2017-09-20 | | -30.5 | 5.6 | 51.3 | 1.7 | 3.64 | 1.24 |
| 2018-09-18 | | -28.9 | 10.5 | 52.6 | 3.0 | 3.77 | 1.37 |
| 2016-09-21 | 5500MHz | -31.7 | / | 49.5 | / | 2.50 | / |
| 2017-09-20 | | -29.8 | 6.0 | 51.4 | 1.9 | 4.25 | 1.75 |
| 2018-09-18 | | -27.5 | 13.2 | 52.8 | 3.3 | 4.44 | 1.94 |
| 2016-09-21 | 5600MHz | -31.7 | / | 50.8 | / | 2.50 | / |
| 2017-09-20 | | -29.5 | 6.9 | 52.3 | 1.5 | 2.91 | 0.41 |
| 2018-09-18 | | -28.6 | 9.8 | 52.9 | 2.1 | 3.03 | 0.53 |
| 2016-09-21 | 5800MHz | -24.0 | / | 56.0 | / | 3.00 | / |
| 2017-09-20 | | -22.8 | 5.0 | 57.3 | 1.3 | 4.23 | 1.23 |
| 2018-09-18 | | -21.5 | 10.4 | 57.8 | 1.6 | 4.46 | 1.46 |

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 9553 from Spectralink Corp, 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* | mac | HW Version | SW Version |
|---|---|---|---|
| EUT4 | 00:90:7A:A7:DB:0E | PIO | vF03 |

Note：Battery - NINGBO VEKEN BATTERY CO., LTD

## K.2 Measurement results

**SAR Values (WLAN 2.4G)**

| Frequency | | Test Position | | SAR(1g) (W/kg) | | |
|---|---|---|---|---|---|---|
| MHz | Ch. | | | Spot check data | | Original data |
| | | | | Measured SAR | Reported SAR | |
| Main antenna | | | | | | |
| 2437 | 6 | Head | Left Touch | **0.484** | **0.56** | 0.50 |
| 2437 | 6 | Body | Rear | **0.459** | **0.53** | 0.27 |
| Second antenna | | | | | | |
| 2462 | 11 | Head | Right Touch | 0.351 | 0.39 | 0.43 |
| 2462 | 11 | Body | Rear | 0.276 | 0.31 | 0.19 |
| MIMO | | | | | | |
| 2412 | 1 | Head | Left Tilt | 0.209 | 0.25 | 0.30 |
| 2412 | 1 | Body | Rear | 0.192 | 0.23 | 0.14 |

**SAR Values (WLAN 5G)**

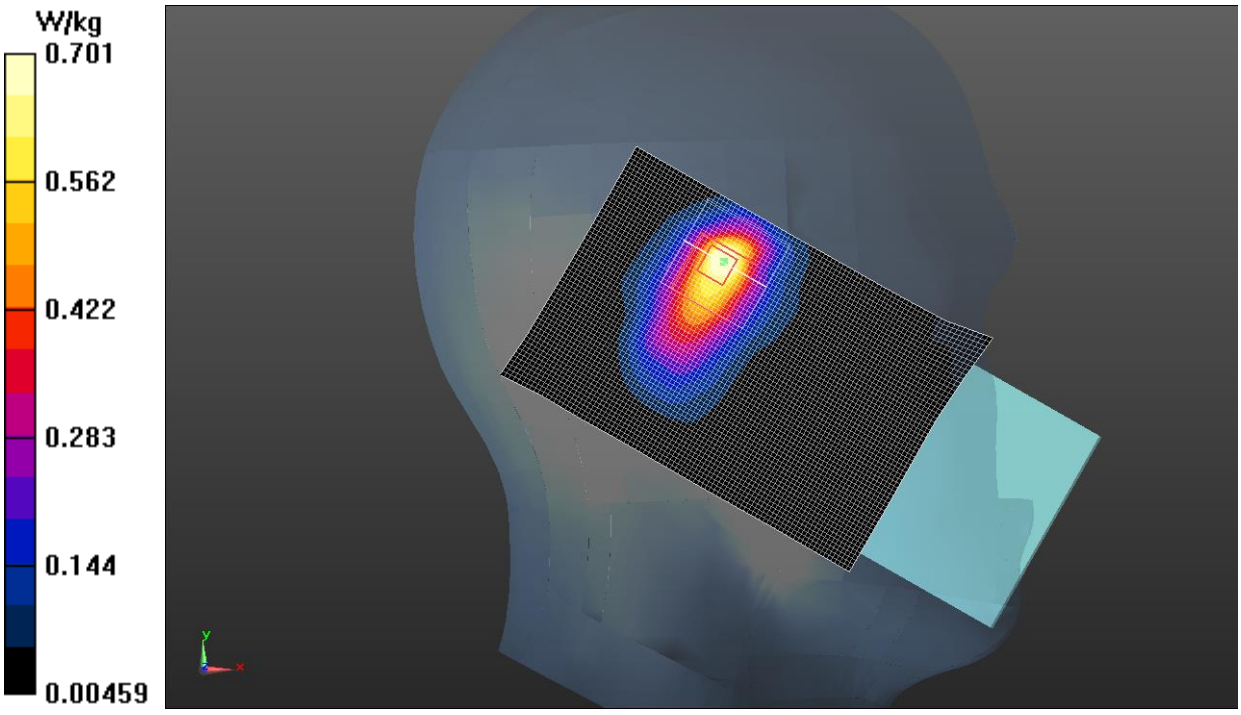
| Frequency | | Test Position | | SAR(1g) (W/kg) | | |
|---|---|---|---|---|---|---|
| MHz | Ch. | | | Spot check data | | Original data |
| | | | | Measured SAR | Reported SAR | |
| Main antenna | | | | | | |
| 5700 | 140 | Head | Left Tilt | 0.291 | 0.41 | 0.30 |
| 5260 | 52 | Body | Rear | 0.194 | 0.26 | 0.21 |
| Second antenna | | | | | | |
| 5500 | 100 | Head | Right Tilt | **0.466** | 0.62 | **0.73** |
| 5500 | 100 | Body | Top | **0.227** | 0.30 | 0.33 |
| MIMO | | | | | | |
| 5500 | 100 | Head | Right Touch | 0.415 | 0.52 | 0.62 |
| 5260 | 52 | Body | Top | 0.155 | 0.21 | **0.36** |

## K.3 Graph Results for Spot Check Test

**Wi-Fi 2.4G Head**
Date: 2019-1-25
Electronics: DAE4 Sn1527
Medium: Head 2450 MHz
Medium parameters used (interpolated): f = 2437 MHz; $\sigma$ = 1.838 S/m; $\varepsilon_r$ = 38.786; $\rho$ = 1000 kg/m$^3$
Ambient Temperature: 22.0$^o$C Liquid Temperature: 21.5$^o$C
Communication System: UID 0, WiFi (0) Frequency: 2437 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3633 ConvF (7.42, 7.42, 7.42)

**Left Cheek Middle/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.772 W/kg

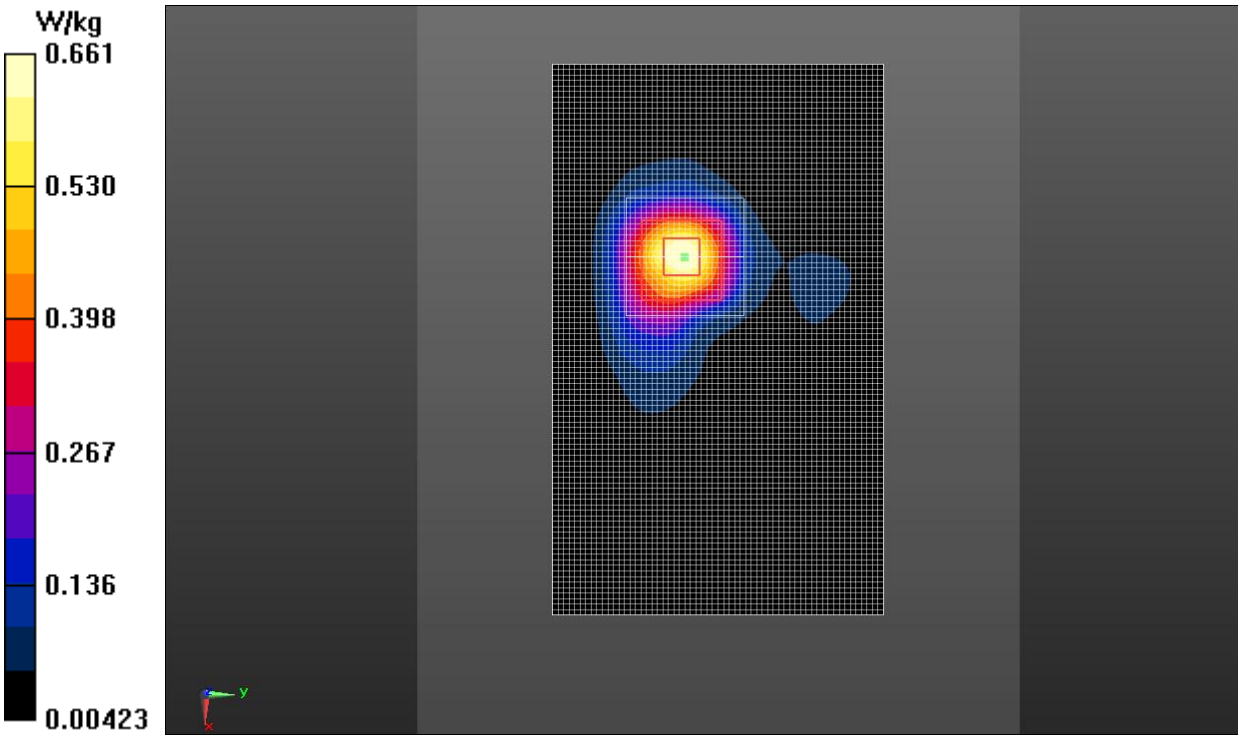
**Left Cheek Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 11.46 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 1.05 W/kg
**SAR(1 g) = 0.484 W/kg; SAR(10 g) = 0.219 W/kg**
Maximum value of SAR (measured) = 0.701 W/kg



**Wi-Fi 2.4G Body**
Date: 2019-1-25
Electronics: DAE4 Sn1527
Medium: Body 2450 MHz
Medium parameters used (interpolated): f = 2437 MHz; $\sigma$ = 1.911 S/m; $\varepsilon_r$ = 53.568; $\rho$ = 1000 kg/m$^3$
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)

**Rear Side Middle/Area Scan (101x61x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.699 W/kg

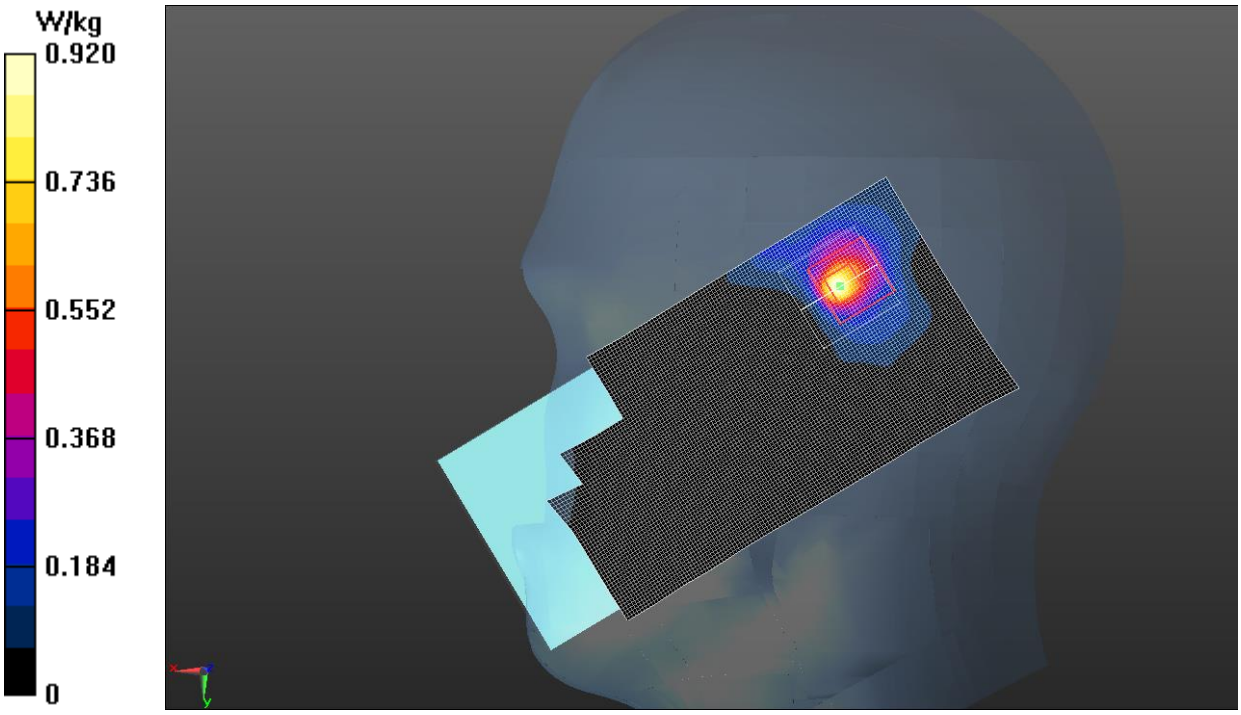
**Rear Side Middle/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.948 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 0.847 W/kg
**SAR(1 g) = 0.459 W/kg; SAR(10 g) = 0.227 W/kg**
Maximum value of SAR (measured) = 0.661 W/kg



**Wi-Fi 5G Head**
Date: 2019-1-22
Electronics: DAE4 Sn1527
Medium: Head 5600 MHz
Medium parameters used: f = 5500 MHz; $\sigma$ = 5.073 S/m; $\varepsilon_r$ = 35.31; $\rho$ = 1000 kg/m$^3$
Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C
Communication System: UID 0, WIFI 5G (0) Frequency: 5500 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3633 ConvF (4.86, 4.86, 4.86)

**Right Tilt CH100/Area Scan (71x131x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.955 W/kg

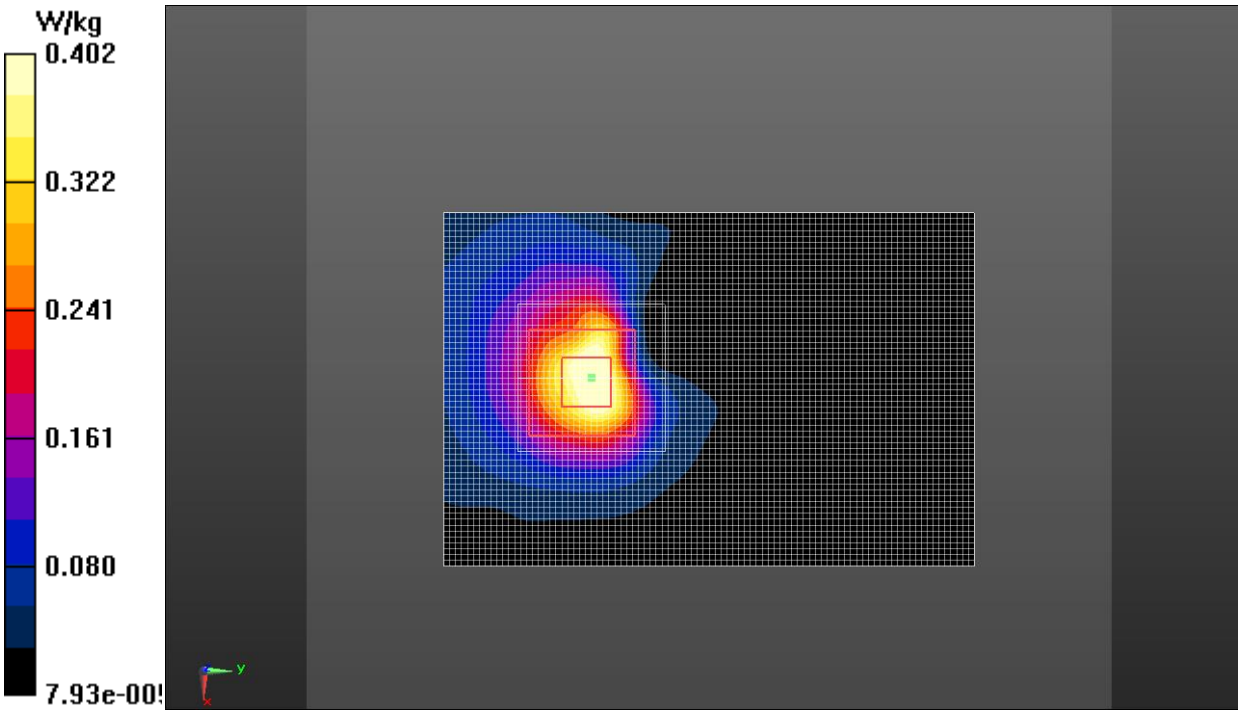
**Right Tilt CH100/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 3.026 V/m; Power Drift = 0.02 dB
Peak SAR (extrapolated) = 1.97 W/kg
**SAR(1 g) = 0.466 W/kg; SAR(10 g) = 0.143 W/kg**
Maximum value of SAR (measured) = 0.920 W/kg



**Wi-Fi 5G Body**
Date: 2019-1-22
Electronics: DAE4 Sn1527
Medium: Body 5600 MHz
Medium parameters used: f = 5500 MHz; $\sigma$ = 5.643 S/m; $\varepsilon_r$ = 48.546; $\rho$ = 1000 kg/m$^3$
Ambient Temperature: 22.0°C Liquid Temperature: 21.5°C
Communication System: UID 0, WIFI 5G (0) Frequency: 5500 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3633 ConvF (4.33, 4.33, 4.33)

**Top Side CH100/Area Scan (61x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.476 W/kg

**Top Side CH100/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 2.127 V/m; Power Drift = 0.07 dB
Peak SAR (extrapolated) = 0.818 W/kg
**SAR(1 g) = 0.227 W/kg; SAR(10 g) = 0.095 W/kg**
Maximum value of SAR (measured) = 0.402 W/kg



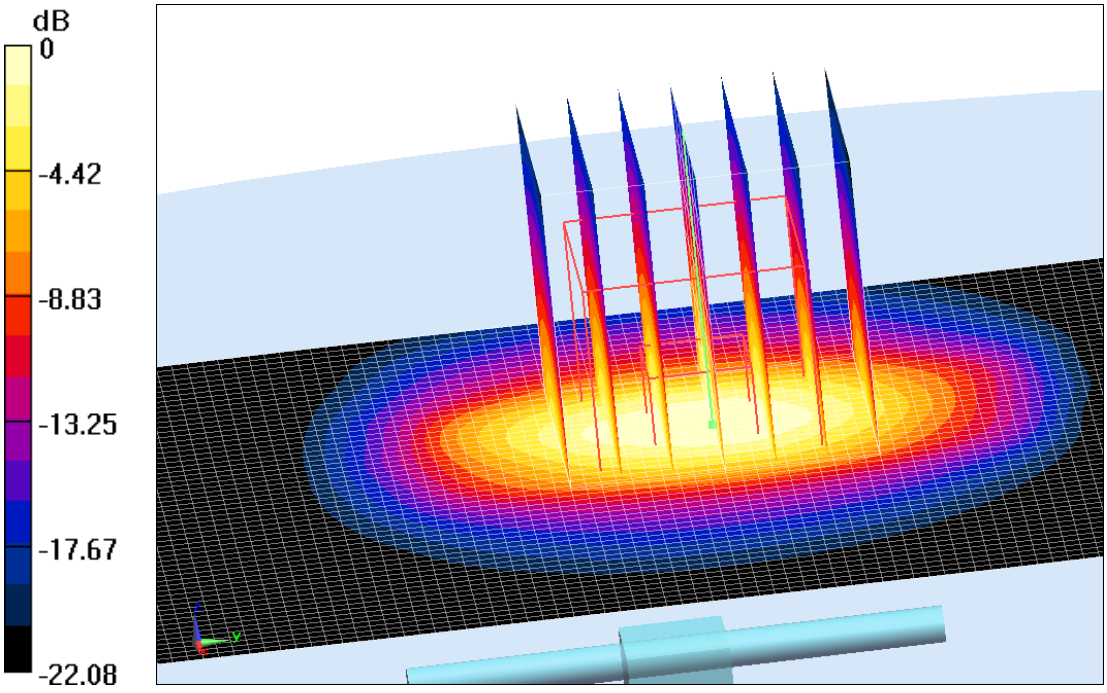
# ANNEX L System Verification Results for Spot Check Test

## 2450MHz

Date: 2019-1-25
Electronics: DAE4 Sn1527
Medium: Head 2450 MHz
Medium parameters used: f = 2450 MHz; $\sigma$ = 1.855 S/m; $\varepsilon_r$ = 38.735; $\rho$ = 1000 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 mm, dy=1.000 mm
Reference Value = 90.684 V/m; Power Drift = 0.13 dB
**SAR(1 g) = 13.2 W/kg; SAR(10 g) = 6.05 W/kg**
Maximum value of SAR (interpolated) = 15.0 W/kg

**System Validation /Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 90.684 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 26.3 W/kg
**SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.16 W/kg**
Maximum value of SAR (measured) = 15.4 W/kg




0 dB = 15.4 W/kg = 11.88 dB W/kg

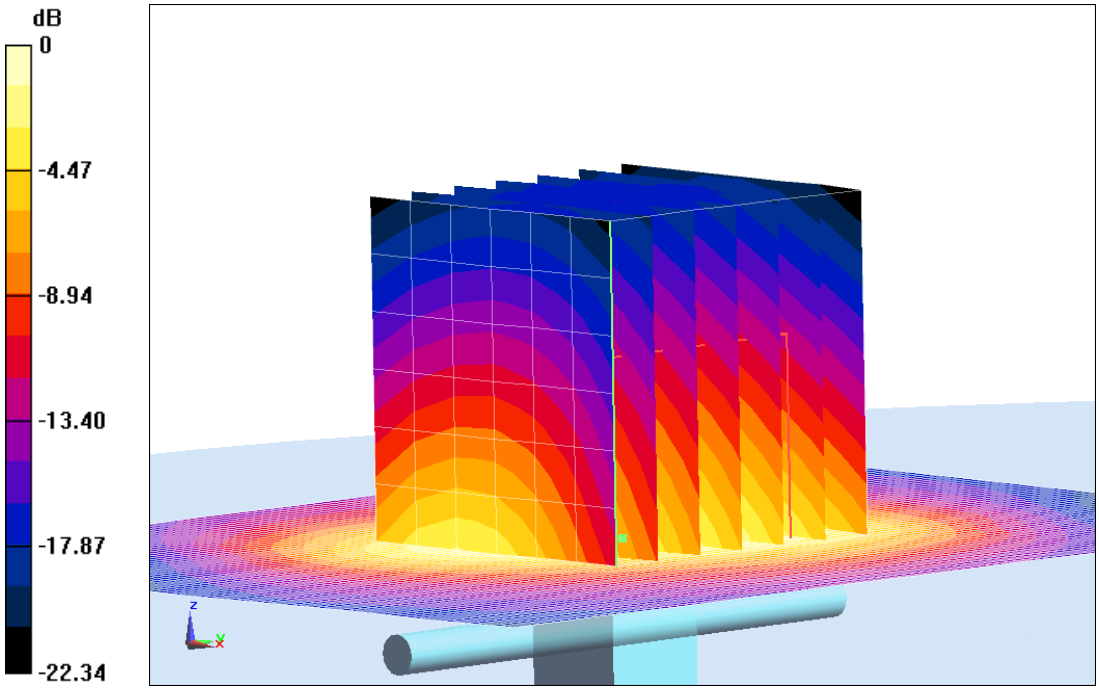
**Fig.L.1 Validation 2450MHz 250mW**

## 2450MHz

Date: 2019-1-25
Electronics: DAE4 Sn1527
Medium: Body 2450 MHz
Medium parameters used: f = 2450 MHz; $\sigma$ = 1.928 S/m; $\varepsilon_r$ = 53.533; $\rho$ = 1000 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 mm, dy=1.000 mm
Reference Value = 85.361 V/m; Power Drift = -0.01 dB
**SAR(1 g) = 12.4 W/kg; SAR(10 g) = 5.83 W/kg**
Maximum value of SAR (interpolated) = 14.1 W/kg

**System Validation/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 85.361 V/m; Power Drift = -0.01 dB
Peak SAR (extrapolated) = 24.4 W/kg
**SAR(1 g) = 12.2 W/kg; SAR(10 g) = 5.76 W/kg**
Maximum value of SAR (measured) = 13.8 W/kg




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

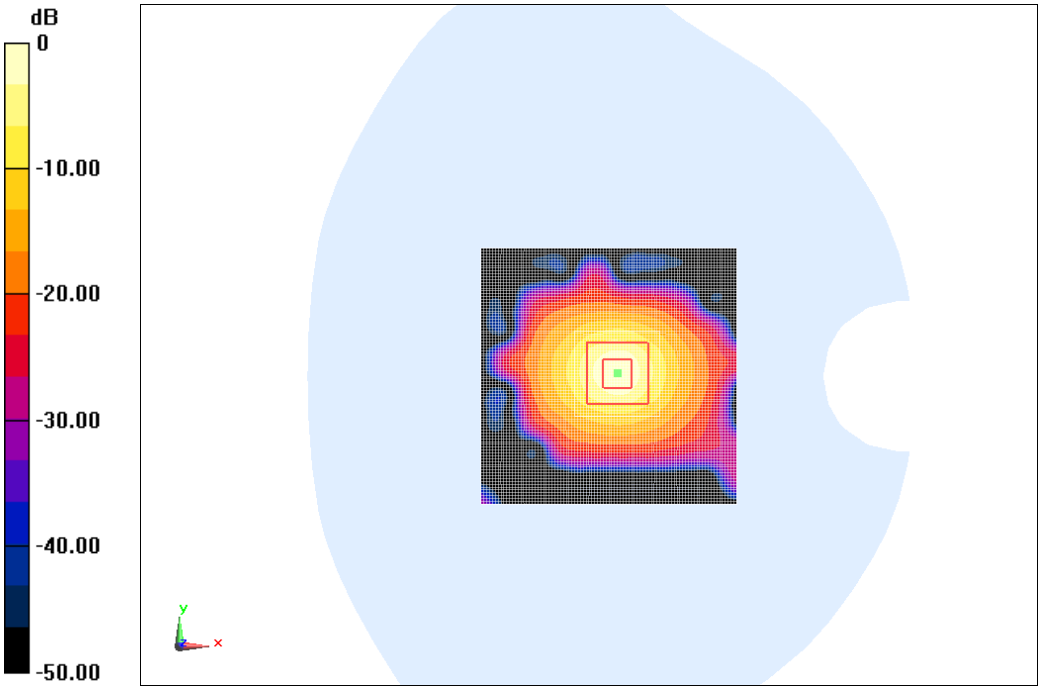
**Fig.L.2 Validation 2450MHz 250mW**

## 5300MHz

Date: 2019-1-22
Electronics: DAE4 Sn1527
Medium: Body 5300 MHz
Medium parameters used: f = 5300 MHz; $\sigma$ = 5.567 S/m; $\varepsilon_r$ = 47.828; $\rho$ = 1000 kg/m$^3$
Ambient Temperature: 23.0°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 5300 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3633 ConvF (5.15, 5.15, 5.15);

**System Validation /Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 56.123 V/m; Power Drift = 0.10 dB
**SAR(1 g) = 7.75 W/kg; SAR(10 g) = 2.16 W/kg**
Maximum value of SAR (interpolated) = 9.82 W/kg

**System Validation/Zoom Scan (8x8x8)/Cube0:** Measurement grid: dx=4mm, dy=4mm, dz=4mm
Reference Value = 56.123 V/m; Power Drift = 0.10 dB
Peak SAR (extrapolated) = 26.3 W/kg
**SAR(1 g) = 7.89 W/kg; SAR(10 g) = 2.19 W/kg**
Maximum value of SAR (measured) = 9.90 W/kg




0 dB = 9.90 W/kg = 9.96 dB W/kg

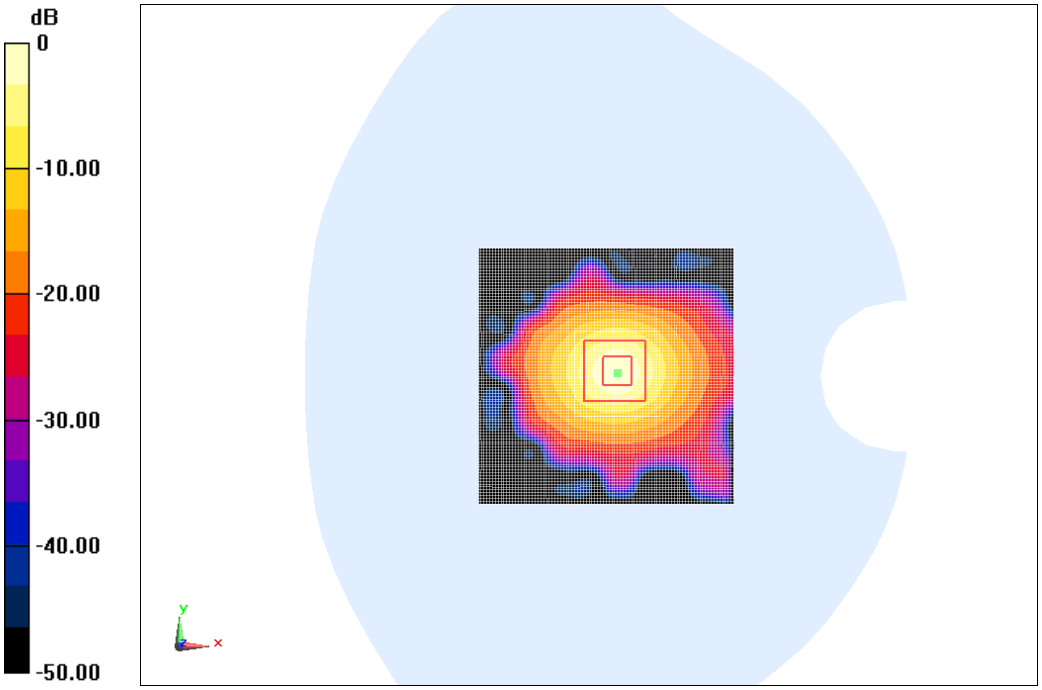
**Fig.N.3 validation 5300MHz 100mW**

## 5600MHz

Date: 2019-1-22
Electronics: DAE4 Sn786
Medium: Head 5600 MHz
Medium parameters used: f = 5600 MHz; $\sigma$ = 5.208 S/m; $\varepsilon_r$ =35.042; $\rho$ = 1000 kg/m$^3$
Ambient Temperature: 23.0$^o$C Liquid Temperature: 22.5$^o$C
Communication System: CW Frequency: 5600 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3633 ConvF (4.86, 4.86, 4.86);

**System Validation /Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 68.595 V/m; Power Drift = 0.12 dB
**SAR(1 g) = 8.46 W/kg; SAR(10 g) = 2.36 W/kg**
Maximum value of SAR (interpolated) = 10.3 W/kg

**System Validation/Zoom Scan (8x8x8)/Cube0:** Measurement grid: dx=4mm, dy=4mm, dz=4mm
Reference Value = 68.595 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 31.3 W/kg
**SAR(1 g) = 8.58 W/kg; SAR(10 g) = 2.41 W/kg**
Maximum value of SAR (measured) = 10.5 W/kg




0 dB = 10.5 W/kg = 10.21 dB W/kg

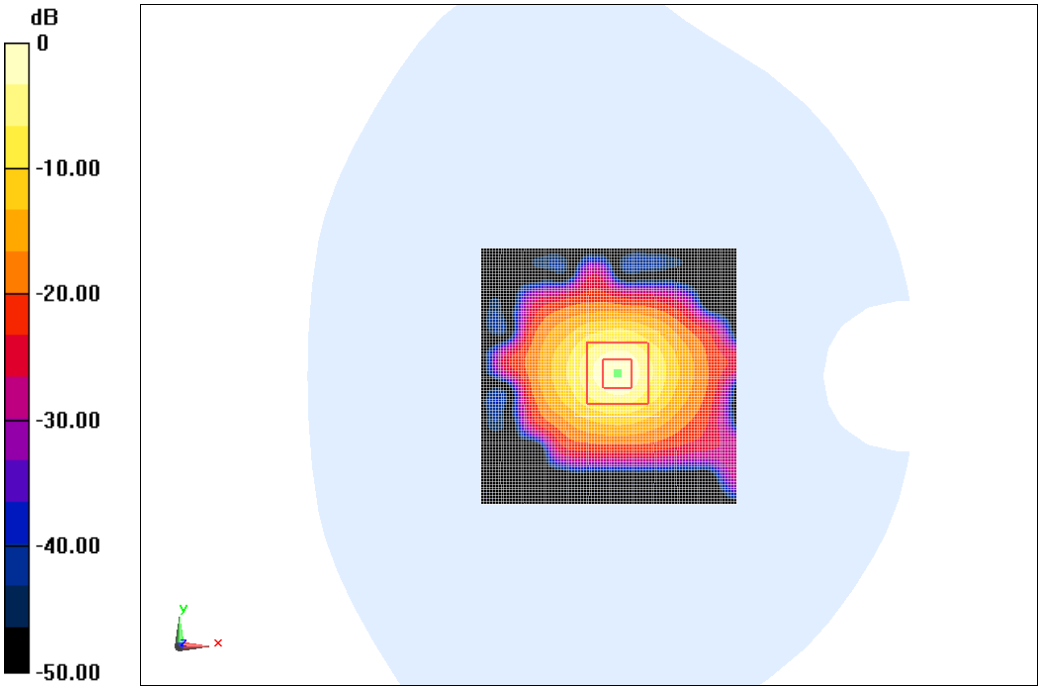
**Fig.L.4 validation 5600MHz 100mW**

## 5600MHz

Date: 2019-1-22
Electronics: DAE4 Sn786
Medium: Body 5600 MHz
Medium parameters used: f = 5600 MHz; $\sigma$ = 5.903 S/m; $\varepsilon_r$ = 47.787; $\rho$ = 1000 kg/m$^3$
Ambient Temperature: 23.0°C Liquid Temperature: 22.5°C
Communication System: CW Frequency: 5600 MHz Duty Cycle: 1:1
Probe: EX3DV4 - SN3633 ConvF (4.33, 4.33, 4.33);

**System Validation /Area Scan (91x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Reference Value = 62.011 V/m; Power Drift = 0.05 dB
**SAR(1 g) = 8.11 W/kg; SAR(10 g) = 2.23 W/kg**
Maximum value of SAR (interpolated) = 9.91 W/kg

**System Validation/Zoom Scan (8x8x8)/Cube0:** Measurement grid: dx=4mm, dy=4mm, dz=4mm
Reference Value = 62.011 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 28.2 W/kg
**SAR(1 g) = 8.24 W/kg; SAR(10 g) = 2.26 W/kg**
Maximum value of SAR (measured) = 9.98 W/kg




0 dB = 9.98 W/kg = 9.99 dB W/kg

**Fig.L.5 validation 5600MHz 100mW**