Antenna 2:

| Fre. Band | Mode | Position | Dist. (mm) | Ch. | Freq. (MHz) | Power Drift (dB) | 1 g Meas. SAR (W/Kg) | Meas. Power (dBm) | Max. tune-up Power (dBm) | Scaling Factor | 1 g Scaled SAR (W/Kg) | Meas. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Body-worn Accessory** | | | | | | | | | | | | |
| 5.2G | 802.11 a | Front Side | 0 | 40 | 5200 | -0.12 | 0.618 | 11.95 | 12.00 | 1.01 | **0.625** | 9# |
| | | Top Edge | 0 | 40 | 5200 | 0.15 | 0.120 | 11.95 | 12.00 | 1.01 | 0.121 | 10# |
| 5.3G | 802.11 a | Front Side | 0 | 52 | 5260 | 0.13 | 0.599 | 11.02 | 11.10 | 1.02 | 0.610 | 11# |
| | | Top Edge | 0 | 52 | 5260 | -0.05 | 0.117 | 11.02 | 11.10 | 1.02 | 0.119 | 12# |
| 5.6G | 802.11 a | Front Side | 0 | 120 | 5600 | 0.14 | 0.434 | 11.93 | 12.00 | 1.02 | 0.441 | 13# |
| | | Top Edge | 0 | 120 | 5600 | 0.05 | 0.095 | 11.93 | 12.00 | 1.02 | 0.097 | 14# |
| 5.8G | 802.11 a | Front Side | 0 | 161 | 5805 | 0.09 | 0.413 | 11.67 | 11.75 | 1.02 | 0.421 | 15# |
| | | Top Edge | 0 | 161 | 5805 | 0.19 | 0.117 | 11.67 | 11.75 | 1.02 | 0.119 | 16# |
| Note 1: Refer to ANNEX C for the detailed test data for each test configuration; The material of EUT's back is iron, so the back side of SAR value was not be scanned. | | | | | | | | | | | | |

# 11 SAR Measurement Variability

According to KDB 865664 D01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are ≤ 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is ≤ 1.10, the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR repeated measurement procedure:

1. When the highest measured SAR is < 0.80 W/kg, repeated measurement is not required.
2. When the highest measured SAR is >= 0.80 W/kg, repeat that measurement once.
3. If the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20, or when the original or repeated measurement is >= 1.45 W/kg, perform a second repeated measurement.
4. If the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20, and the original, first or second repeated measurement is >= 1.5 W/kg, perform a third repeated measurement.

SAR Repeated Measurement

The highest measured SAR is 0.764 W/kg, which is less than 0.80 W/kg, repeated measurement is not required.

# 12 SIMULTANEOUS TRANSMISSION

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR 1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR 1g 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR 1g is greater than the SAR limit (SAR 1g 1.6 W/kg), SAR test exclusion is determined by the SAR to Peak Location Ratio (SPLSR).

## 12.1 Simultaneous Transmission Mode for Body SAR

| NO. | Mode | 5G WLAN |
|---|---|---|
| | | Body |
| 1 | 5G WLAN(Antenna 1) | + 5G WLAN(Antenna 2) |
| 2 | 5G WLAN(Antenna 2) | + 5G WLAN(Antenna 1) |
| Note:<br>1. Both the 2.4G WLAN(Antenna 1) and 2.4G WLAN(Antenna 2) can transmit simultaneously with each other.<br>2. Both the 2.4G WLAN and 5G WLAN can not transmit simultaneously with each other. | | |

## 12.2 Evaluation by Summation of Peak Spatial-averaged SAR Values

| Simultaneous Mode | Mode | Max. 1g SAR (W/kg) | 1g Sum SAR (W/kg) | SPLSR (Yes/No) |
|---|---|---|---|---|
| 5G WLAN(Antenna 1) + 5G WLAN(Antenna 2) | 5G WLAN(Antenna 2) | 0.776 | 1.401 | No |
| | 5G WLAN(Antenna 1) | 0.625 | | |

# 13 TEST EQUIPMENTS LIST

| Description | Manufacturer | Model | Serial No. | Cal. Date | Cal. Due |
|---|---|---|---|---|---|
| PC | Dell | N/A | N/A | N/A | N/A |
| 5G Validation Dipole | Speag | D5GHzV2 | SN 1200 | 2014/12/04 | 2015/12/03 |
| E-Field Probe | Speag | EX3DV4 | SN: 7340 | 2014/12/02 | 2015/12/01 |
| Phantom1 | Speag | SAM | SN: 1859 | N/A | N/A |
| Phantom2 | Speag | SAM | SN: 1857 | N/A | N/A |
| Data acquisition electronics | Speag | DAE4 | SN: 1454 | 2014/12/01 | 2015/11/30 |
| Signal Generator | R&S | SMBV100A | 260592 | 2015/07/16 | 2016/07/15 |
| Power Meter | Agilent | E4419B | GB40201833 | 2014/11/03 | 2015/11/02 |
| Power Sensor | R&S | NRP-Z21 | 103971 | 2015/07/16 | 2016/07/15 |
| Power Amplifier | SATIMO | 6552B | 22374 | N/A | N/A |
| Dielectric Probe Kit | SATIMO | SCLMP | SN 25/13 OCPG56 | 2015/08/17 | 2016/08/16 |
| Network Analyzer | R&S | ZVL-6 | 101380 | 2015/07/16 | 2016/07/15 |
| Attenuator | COM-MW | ZA-S1-31 | 1305003187 | N/A | N/A |
| Directional coupler | AA-MCS | AAMCS-UDC | 000272 | N/A | N/A |

# ANNEX A SIMULATING LIQUID VERIFICATION RESULT

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an SCLMP Dielectric Probe Kit.

| Date | Liquid Type | Fre. (MHz) | Temp. (℃) | Meas. Conductivity (σ) (S/m) | Meas. Permittivity (ε) | Target Conductivity (σ) (S/m) | Target Permittivity (ε) | Conductivity Tolerance (%) | Permittivity Tolerance (%) |
|---|---|---|---|---|---|---|---|---|---|
| 2015.10.9 | Body | 5200 | 21.4 | 5.30 | 47.40 | 5.30 | 49.00 | 0.00 | -3.27 |
| 2015.9.29 | Body | 5600 | 21.3 | 5.75 | 47.62 | 5.77 | 48.50 | -0.35 | -1.81 |
| 2015.9.29 | Body | 5800 | 21.5 | 5.07 | 46.32 | 6.00 | 48.20 | -3.33 | -1.66 |
| Note: The tolerances limit of Conductivity and Permittivity is ± 5%. | | | | | | | | | |

# ANNEX B SYSTEM CHECK RESULT

Comparing to the original SAR value provided by SPEAG, the validation data should be within its specification of 10 %(for 1 g).

| Date | Liquid Type | Freq. (MHz) | Input Power (mW) | Measured SAR (W/kg) | Normalized SAR (W/kg) | Dipole SAR (W/kg) | Tolerance (%) | Targeted SAR(W/kg) | Tolerance (%) |
|---|---|---|---|---|---|---|---|---|---|
| 2015.10.9 | Body | 5200 | 100 | 7.47 | 74.7 | 75.30 | -0.80 | 76.5 | -2.35 |
| 2015.9.29 | Body | 5600 | 100 | 7.52 | 75.2 | 80.50 | -6.58 | 83.3 | -9.72 |
| 2015.9.29 | Body | 5800 | 100 | 7.80 | 78.0 | 74.70 | 4.42 | 78.0 | 0.00 |
| Note: The tolerance limit of System validation ±10%. | | | | | | | | | |

# System Performance Check Data (5200MHz Body)

**5200-Body-2015-10-09**

Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5200 MHz;Duty Cycle: 1:1

Medium parameters used: f = 5200 MHz; $\sigma$ = 5.30 S/m; $\varepsilon_r$ = 47.4; $\rho$ = 1000 kg/m$^3$

Phantom section: Flat Section

Ambient Temperature:22.3 Liquid Temperature:21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.62, 4.62, 4.62); Calibrated: 12/2/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 on left 1859; Type: QD000P40CD; Serial: TP:1859
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/CW 5200/Area Scan (81x101x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 10.36 W/kg

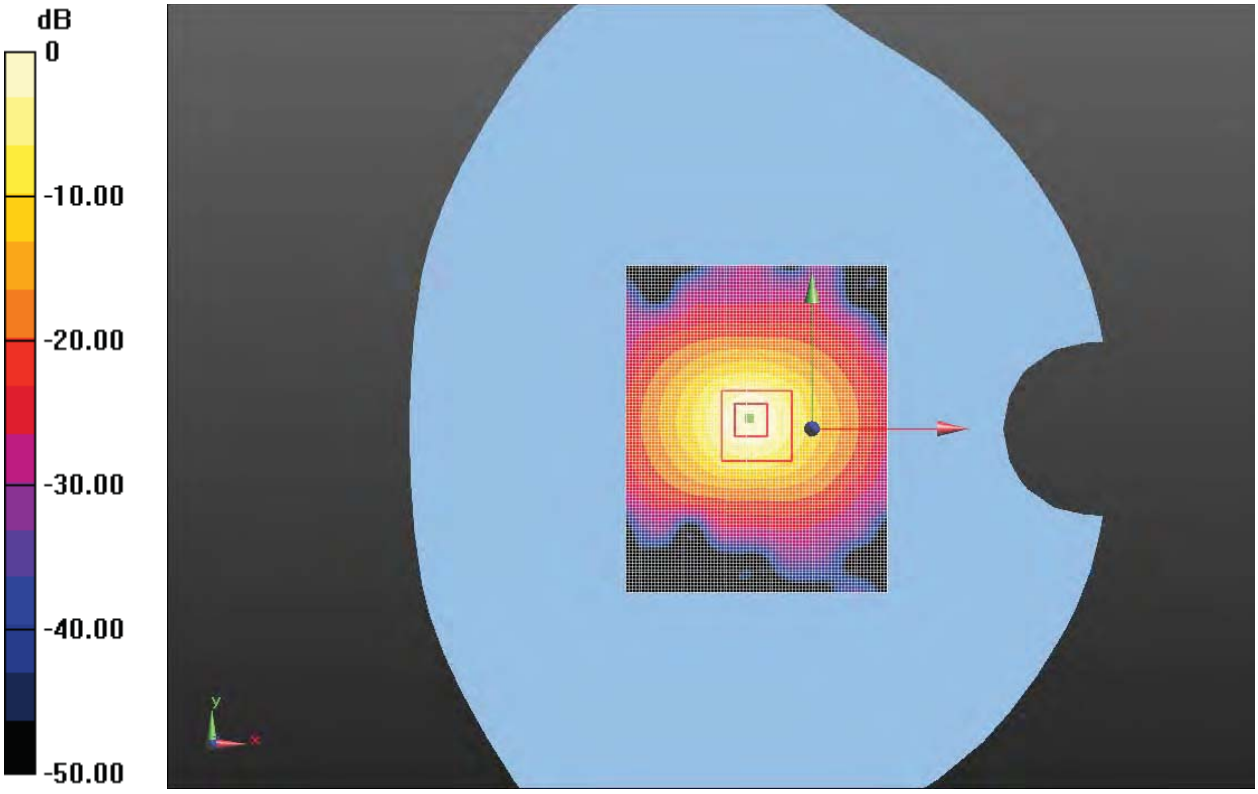
**Configuration/CW 5200/Zoom Scan (7x7x21)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 45.30 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 28.1 W/kg

**SAR(1 g) = 7.47 W/kg; SAR(10 g) = 2.23 W/kg**

Maximum value of SAR (measured) = 10.35 W/kg




0 dB = 10.35 W/kg = 9.61 dBW/kg

# System Performance Check Data (5600MHz Body)

**5600-Body-2015-09-29**

Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5600 MHz;Duty Cycle: 1:1

Medium parameters used: f = 5600 MHz; $\sigma$ = 5.75 S/m; $\varepsilon_r$ = 47.62; $\rho$ = 1000 kg/m$^3$

Phantom section: Flat Section

Ambient Temperature:22.6 Liquid Temperature:21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.1, 4.1, 4.1); Calibrated: 12/2/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 on left 1859; Type: QD000P40CD; Serial: TP:1859
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/CW 5200/Area Scan (81x101x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 10.29 W/kg

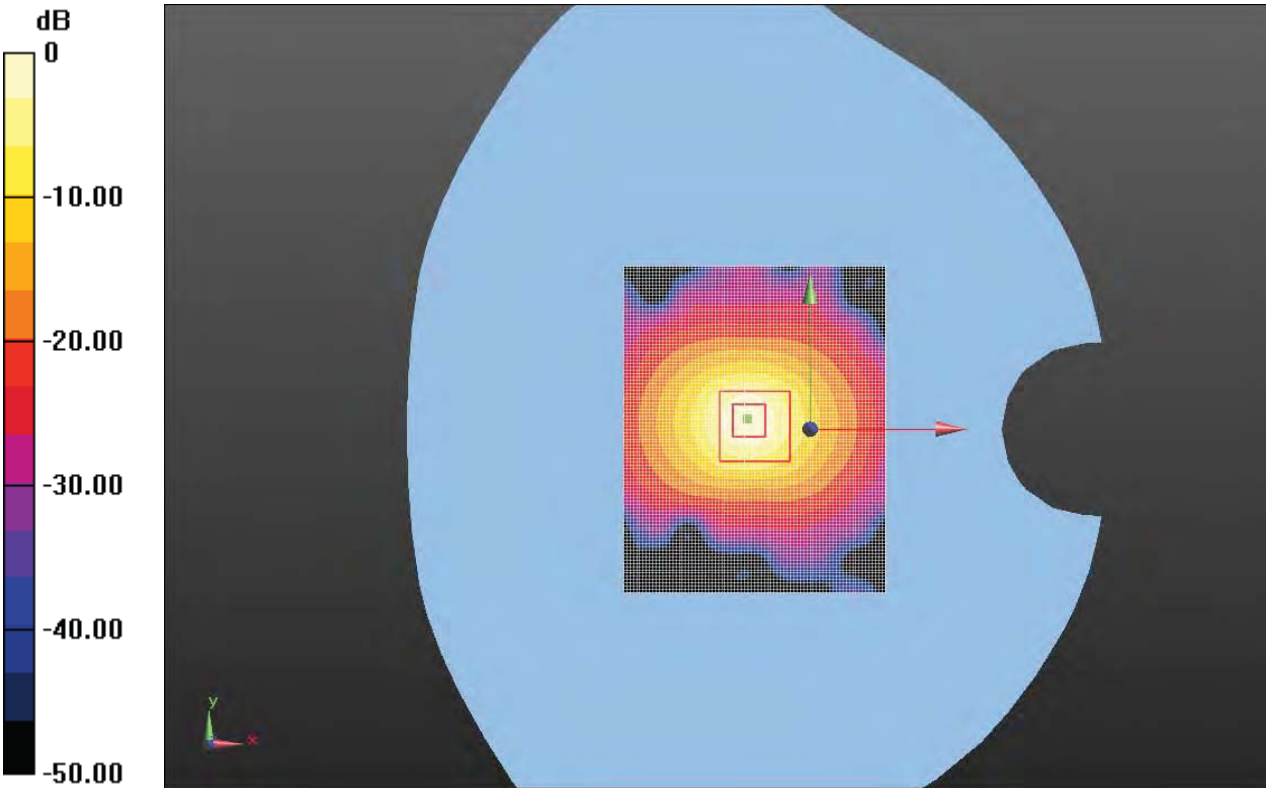
**Configuration/CW 5200/Zoom Scan (7x7x21)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 46.23 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 28.3 W/kg

**SAR(1 g) = 7.52 W/kg; SAR(10 g) = 2.36 W/kg**

Maximum value of SAR (measured) = 10.42 W/kg




0 dB = 10.42 W/kg = 10.18 dBW/kg

# System Performance Check Data (5800MHz Body)

**5800-BODY-2015-9-29**

Date/Time: 9/29/2015

Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5800 MHz;Duty Cycle: 1:1

Medium parameters used: f = 5800 MHz; $\sigma$ = 5.07 S/m; $\varepsilon_r$ = 46.32; $\rho$ = 1000 kg/m$^3$

Phantom section: Flat Section

Ambient Temperature:22.3 Liquid Temperature:21.5

DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.31, 4.31, 4.31); Calibrated: 12/2/2014;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/cw5800 body/Area Scan (101x101x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 11.4 W/kg

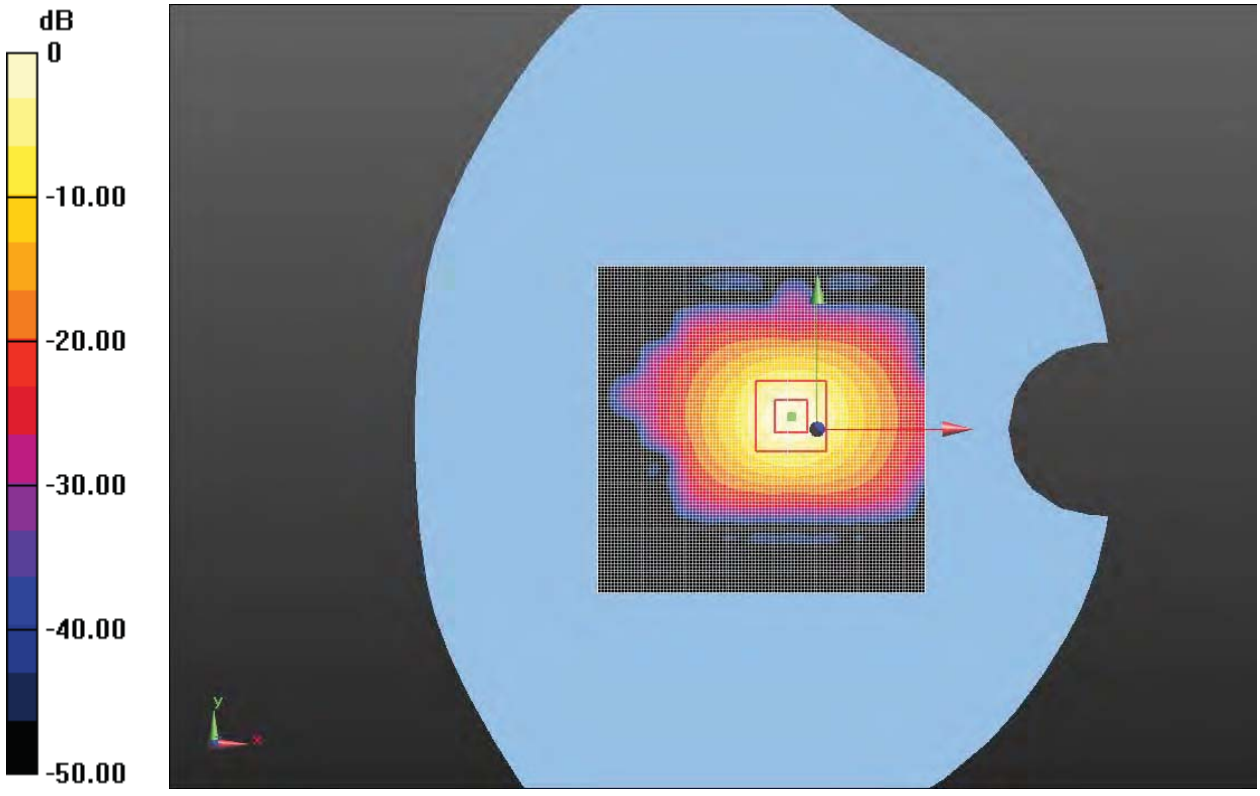
**Configuration/cw5800 body/Zoom Scan (8x8x21)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 29.22 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 47.5 W/kg

**SAR(1 g) = 7.80 W/kg; SAR(10 g) = 2.56 W/kg**

Maximum value of SAR (measured) = 10.7 W/kg




0 dB = 10.7W/kg = 10.57 dBW/kg

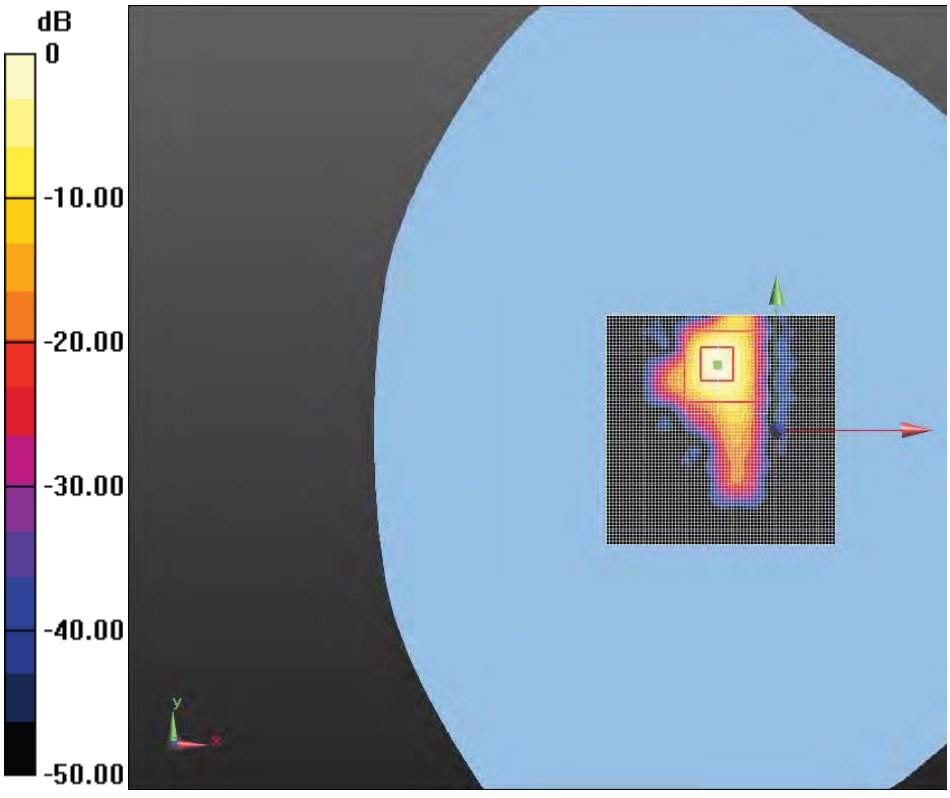
# ANNEX C TEST DATA

## MEAS.1 Body Plane with Front Side on Channel 36 Antenna 1 in IEEE 802.11 a mode

Date/Time: 10/9/2015
Communication System Band: WLAN(a); Frequency: 5180 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5180 MHz; $\sigma$ = 5.22 S/m; $\varepsilon_r$ = 49.06; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.3 Liquid Temperature:21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.62, 4.62, 4.62); Calibrated: 12/2/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Front 36 Channel Antenna 1/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.28 W/kg
**Configuration/WLAN(a) 20Mhz Body Front 36 Channel Antenna 1/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 7.197 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 3.24 W/kg
**SAR(1 g) = 0.764 W/kg; SAR(10 g) = 0.186 W/kg**
Maximum value of SAR (measured) = 1.45 W/kg




0 dB = 1.28 W/kg = 1.40 dBW/kg

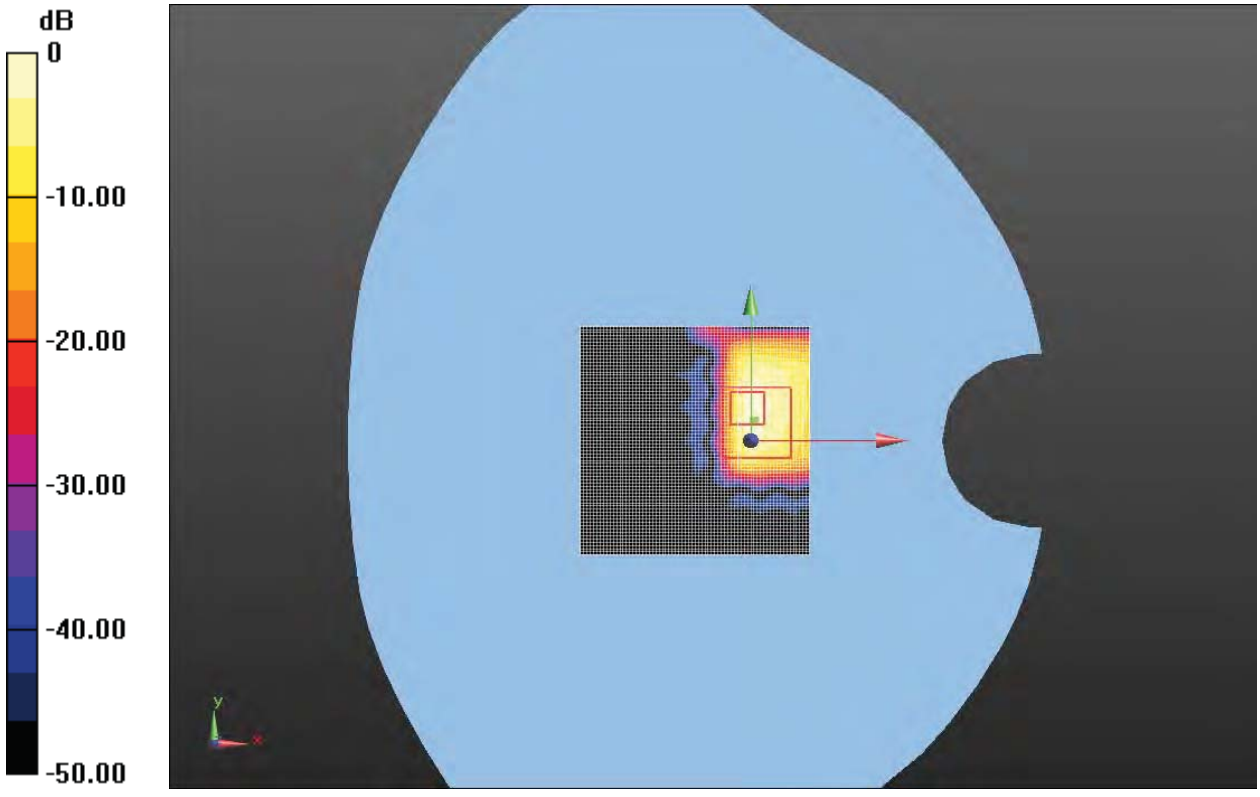
## MEAS.2 Body Plane with Top Edge on Channel 36 Antenna 1 in IEEE 802.11 a mode

Date/Time: 10/9/2015
Communication System Band: WLAN(a); Frequency: 5180 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5180 MHz; $\sigma$ = 5.22 S/m; $\varepsilon_r$ = 49.06; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.3 Liquid Temperature:21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.62, 4.62, 4.62); Calibrated: 12/2/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Top 36 Channel Antenna 1/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.186 W/kg

**Configuration/WLAN(a) 20Mhz Body Top 36 Channel Antenna 1/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 5.202 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 0.828 W/kg
**SAR(1 g) = 0.145 W/kg; SAR(10 g) = 0.048 W/kg**
Maximum value of SAR (measured) = 0.246 W/kg



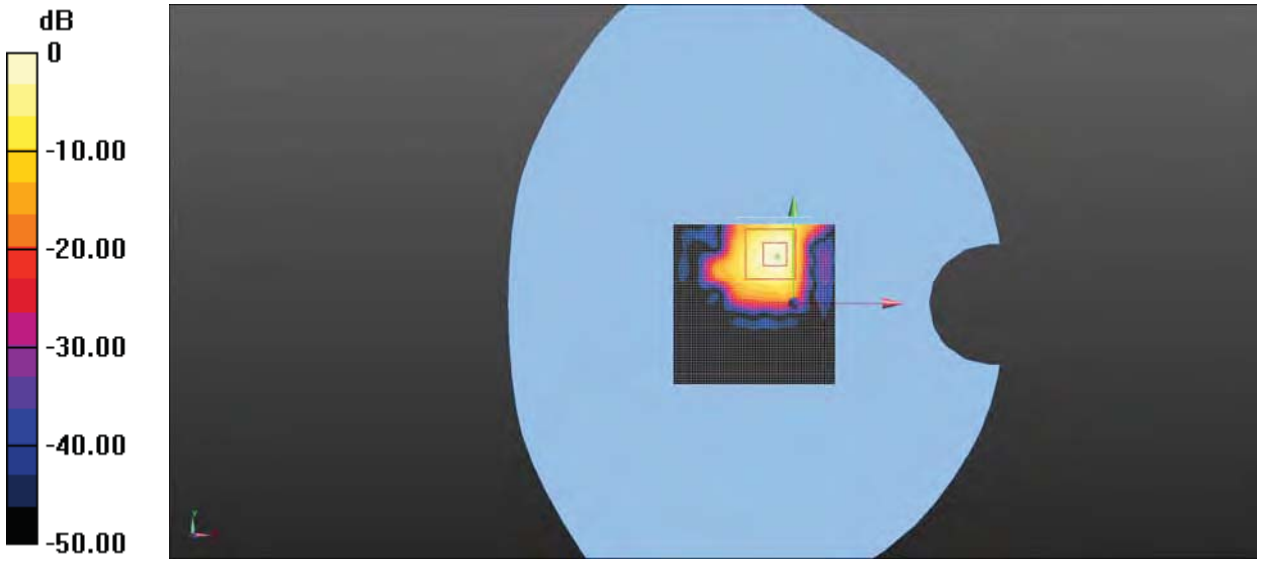

dB = 0.246 W/kg = -6.09 dBW/kg

## MEAS.3 Body Plane with Front Side on Channel 52 Antenna 1 in IEEE 802.11 a mode

Date/Time: 10/9/2015
Communication System Band: WLAN(n) 20Mhz; Frequency: 5260 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5260 MHz; $\sigma$ = 5.37 S/m; $\varepsilon_r$ = 46.76; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.3 Liquid Temperature:21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.62, 4.62, 4.62); Calibrated: 12/2/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Front 52 Channel Antenna 1/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.857 W/kg
**Configuration/WLAN(a) 20Mhz Body Front 52 Channel Antenna 1/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 6.965 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) =1.95 W/kg
**SAR(1 g) = 0.647 W/kg; SAR(10 g) = 0.150 W/kg**
Maximum value of SAR (measured) = 1.04 W/kg



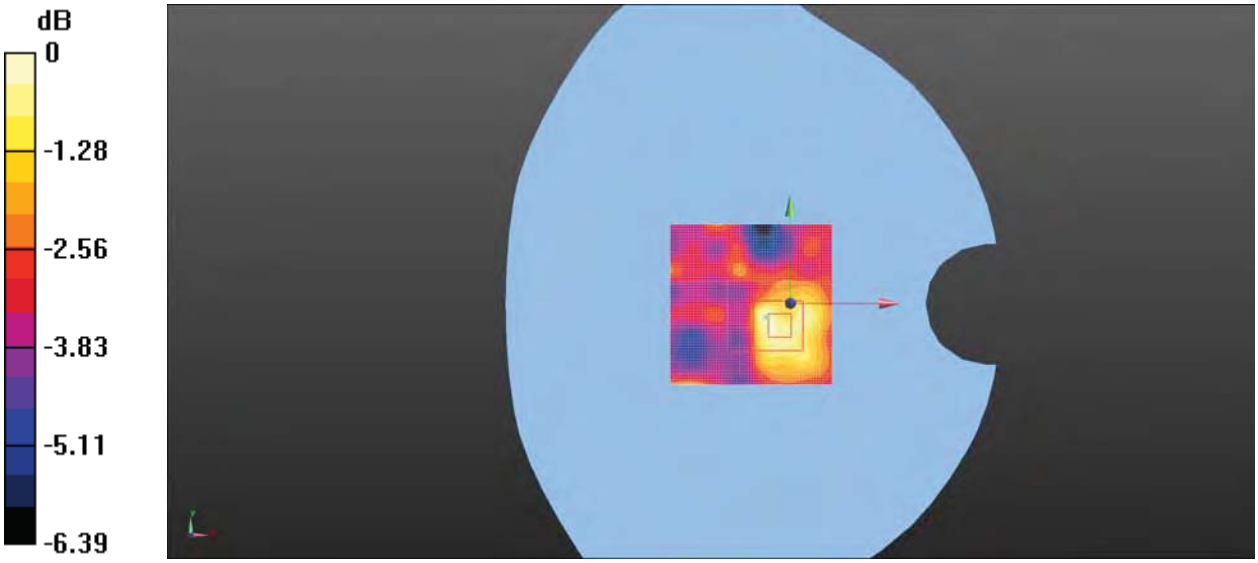

0 dB = 0.857 W/kg = -0.67 dBW/kg

## MEAS.4 Body Plane with Top Edge on Channel 52 Antenna 1 in IEEE 802.11 a mode

Date/Time: 10/9/2015
Communication System Band: WLAN(n) 20Mhz; Frequency: 5260 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5260 MHz; $\sigma$ = 5.37 S/m; $\varepsilon_r$ = 46.76; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.3 Liquid Temperature:21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.62, 4.62, 4.62); Calibrated: 12/2/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Top 52 Channel Antenna 1/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.209 W/kg
**Configuration/WLAN(a) 20Mhz Body Top 52 Channel Antenna 1/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 3.386 V/m; Power Drift = -0.15 dB
Peak SAR (extrapolated) = 0.552 W/kg
**SAR(1 g) = 0.166 W/kg; SAR(10 g) = 0.101 W/kg**
Maximum value of SAR (measured) = 0.262 W/kg




0 dB = 0.209 W/kg = -6.80 dBW/kg

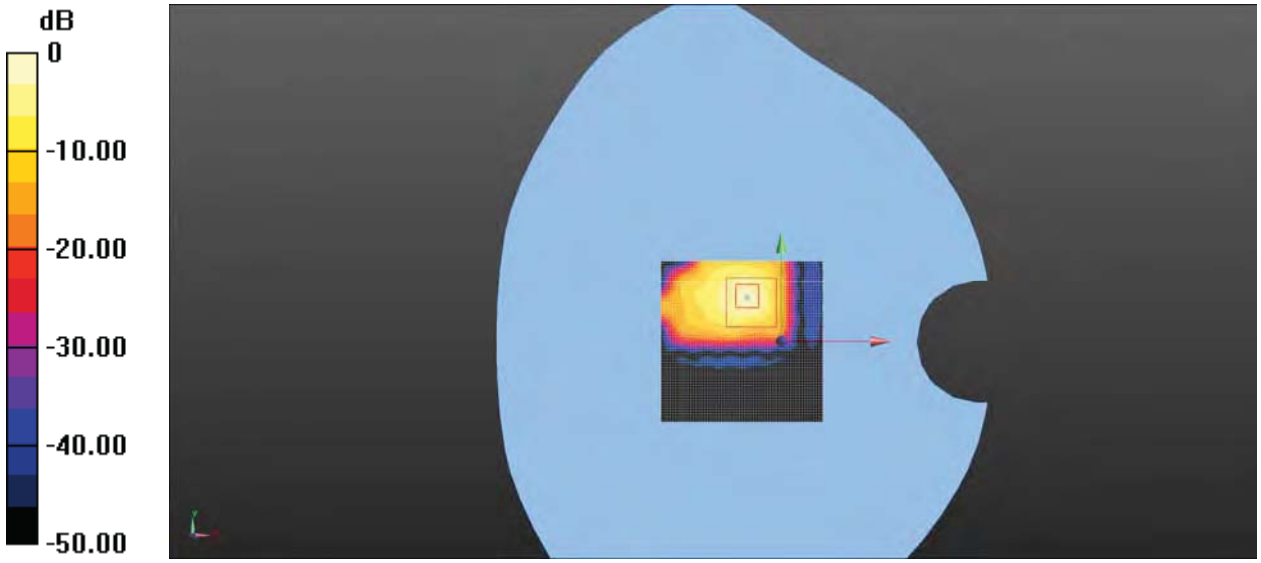
## MEAS.5 Body Plane with Front Side on Channel 120 Antenna 1 in IEEE 802.11 a mode

Date/Time: 9/29/2015
Communication System Band: WLAN(a); Frequency: 5600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; $\sigma$ = 5.75 S/m; $\varepsilon_r$ = 47.62; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.6 Liquid Temperature:21.3
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.1, 4.1, 4.1); Calibrated: 12/2/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Front 120 Channel Antenna 1/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.556 W/kg

**Configuration/WLAN(a) 20Mhz Body Front 120 Channel Antenna 1/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.708 V/m; Power Drift = 0.08 dB
Peak SAR (extrapolated) = 1.93 W/kg
**SAR(1 g) = 0.462 W/kg; SAR(10 g) = 0.121 W/kg**
Maximum value of SAR (measured) = 0.976 W/kg




0 dB = 0.976 W/kg = -0.11 dBW/kg

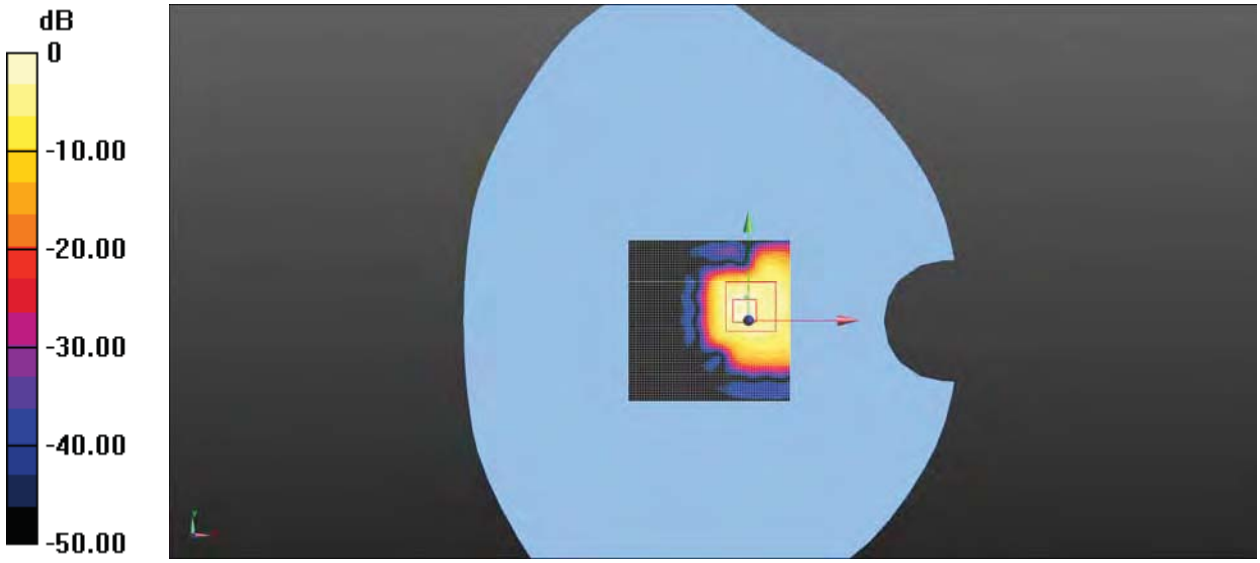
## MEAS.6 Body Plane with Top Edge on Channel 120 Antenna 1 in IEEE 802.11 a mode

Date/Time: 9/29/2015
Communication System Band: WLAN(a); Frequency: 5600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; $\sigma$ = 5.75 S/m; $\varepsilon_r$ = 47.62; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.6 Liquid Temperature:21.3
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.1, 4.1, 4.1); Calibrated: 12/2/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Top 120 Channel Antenna 1/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.183 W/kg

**Configuration/WLAN(a) 20Mhz Body Top 120 Channel Antenna 1/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 0.8490 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 1.61 W/kg
**SAR(1 g) = 0.144 W/kg; SAR(10 g) = 0.063 W/kg**
Maximum value of SAR (measured) = 0.339 W/kg




0 dB = 0.339 W/kg = -4.70 dBW/kg

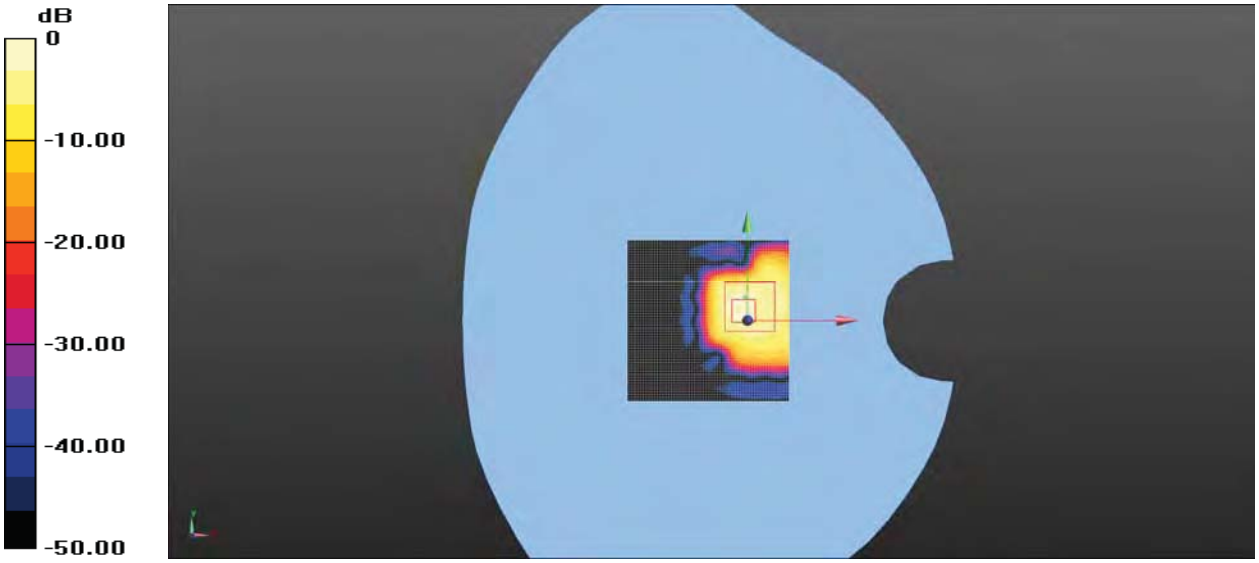
# MEAS.7 Body Plane with Front Side on Channel 161 Antenna 1 in IEEE 802.11 a mode

Date/Time: 9/29/2015
Communication System Band: WLAN(a); Frequency: 5805 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5805 MHz; $\sigma$ = 6.07 S/m; $\varepsilon_r$ = 46.3; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.3 Liquid Temperature:21.5
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.31, 4.31, 4.31); Calibrated: 12/2/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Front 161 Channel Antenna 1/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.448 W/kg

**Configuration/WLAN(a) 20Mhz Body Front 161 Channel Antenna 1/Zoom Scan (4x4x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.256 V/m; Power Drift = 0.12 dB
Peak SAR (extrapolated) = 2.23 W/kg
**SAR(1 g) = 0.454 W/kg; SAR(10 g) = 0.141 W/kg**
Maximum value of SAR (measured) = 0.722 W/kg



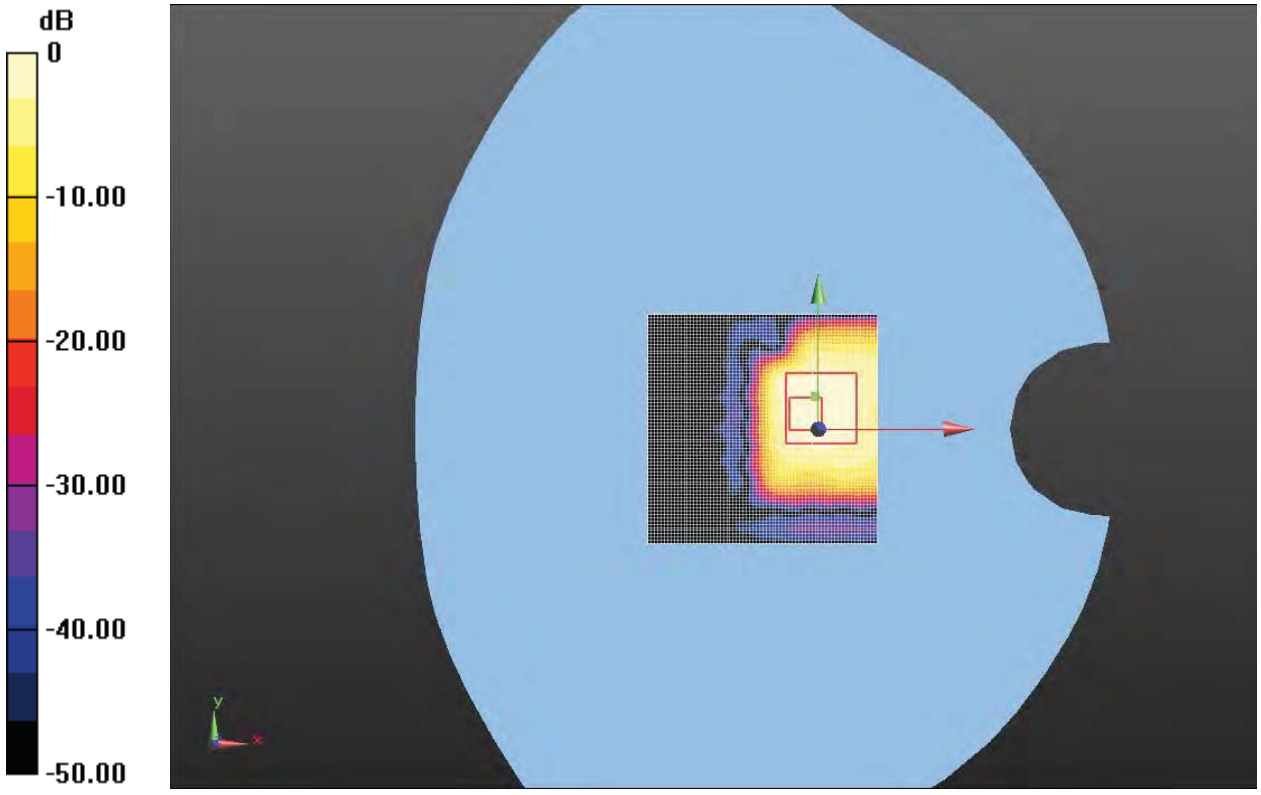

0 dB = 0.722 W/kg = -0.35 dBW/kg

## MEAS.8 Body Plane with Top Edge on Channel 161 Antenna 1 in IEEE 802.11 a mode

Date/Time: 9/29/2015
Communication System Band: WLAN(a); Frequency: 5805 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5805 MHz; $\sigma$ = 6.07 S/m; $\varepsilon_r$ = 46.3; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.3 Liquid Temperature:21.5
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.31, 4.31, 4.31); Calibrated: 12/2/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Top 161 Channel Antenna 1/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.180 W/kg
**Configuration/WLAN(a) 20Mhz Body Top 161 Channel Antenna 1/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.443 V/m; Power Drift = -0.08 dB
Peak SAR (extrapolated) = 0.918 W/kg
**SAR(1 g) = 0.121 W/kg; SAR(10 g) = 0.062 W/kg**
Maximum value of SAR (measured) = 0.236 W/kg



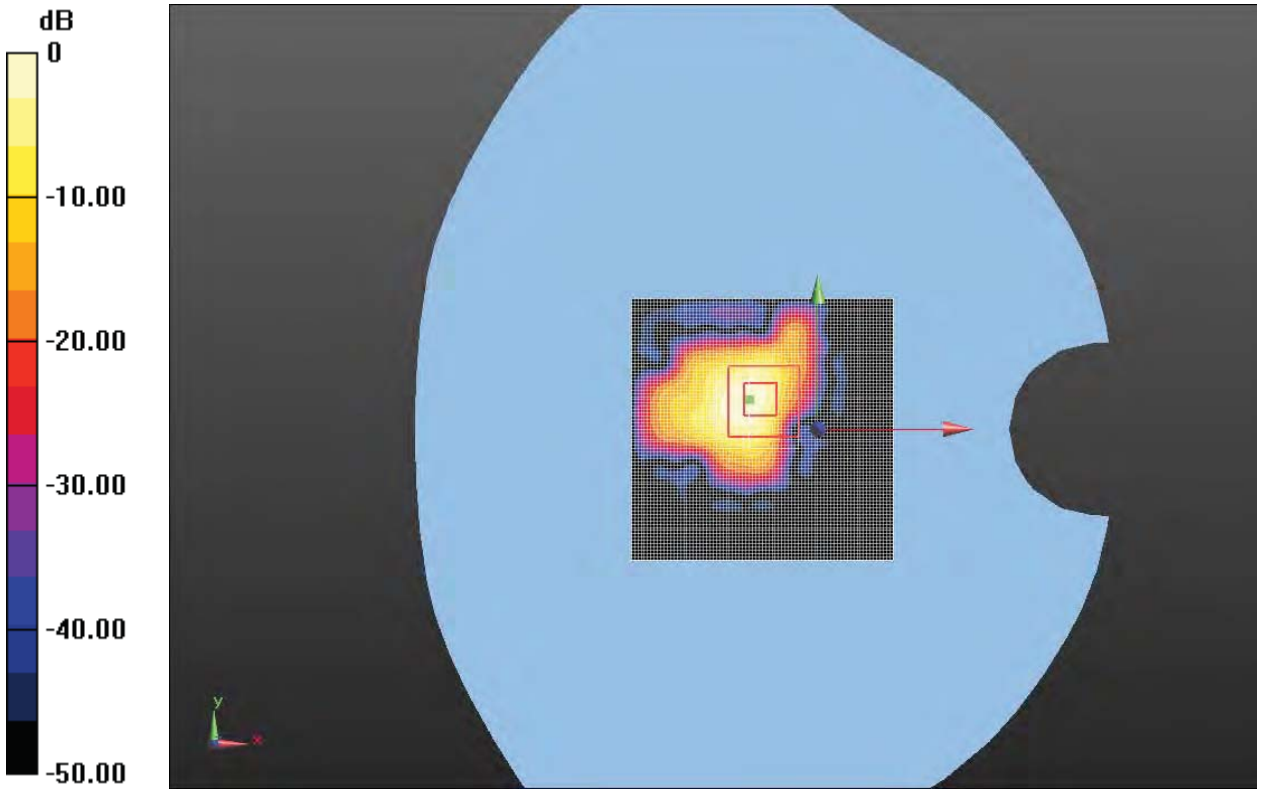

0 dB = 0.180 W/kg = -7.45 dBW/kg

## MEAS.9 Body Plane with Front Side on Channel 40 Antenna 2 in IEEE 802.11 a mode

Date/Time: 10/9/2015
Communication System Band: WLAN(a); Frequency: 5200 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5200 MHz; $\sigma$ = 5.3 S/m; $\varepsilon_r$ = 47.4; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.3 Liquid Temperature:21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.62, 4.62, 4.62); Calibrated: 12/2/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Front 40 Channel Antenna 2/Area Scan (81x81x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 1.07 W/kg
**Configuration/WLAN(a) 20Mhz Body Front 40 Channel Antenna 2/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 6.649 V/m; Power Drift = -0.12 dB
Peak SAR (extrapolated) = 1.41 W/kg
**SAR(1 g) = 0.618 W/kg; SAR(10 g) = 0.115 W/kg**
Maximum value of SAR (measured) = 1.36 W/kg




0 dB = 1.07 W/kg = 0.68 dBW/kg

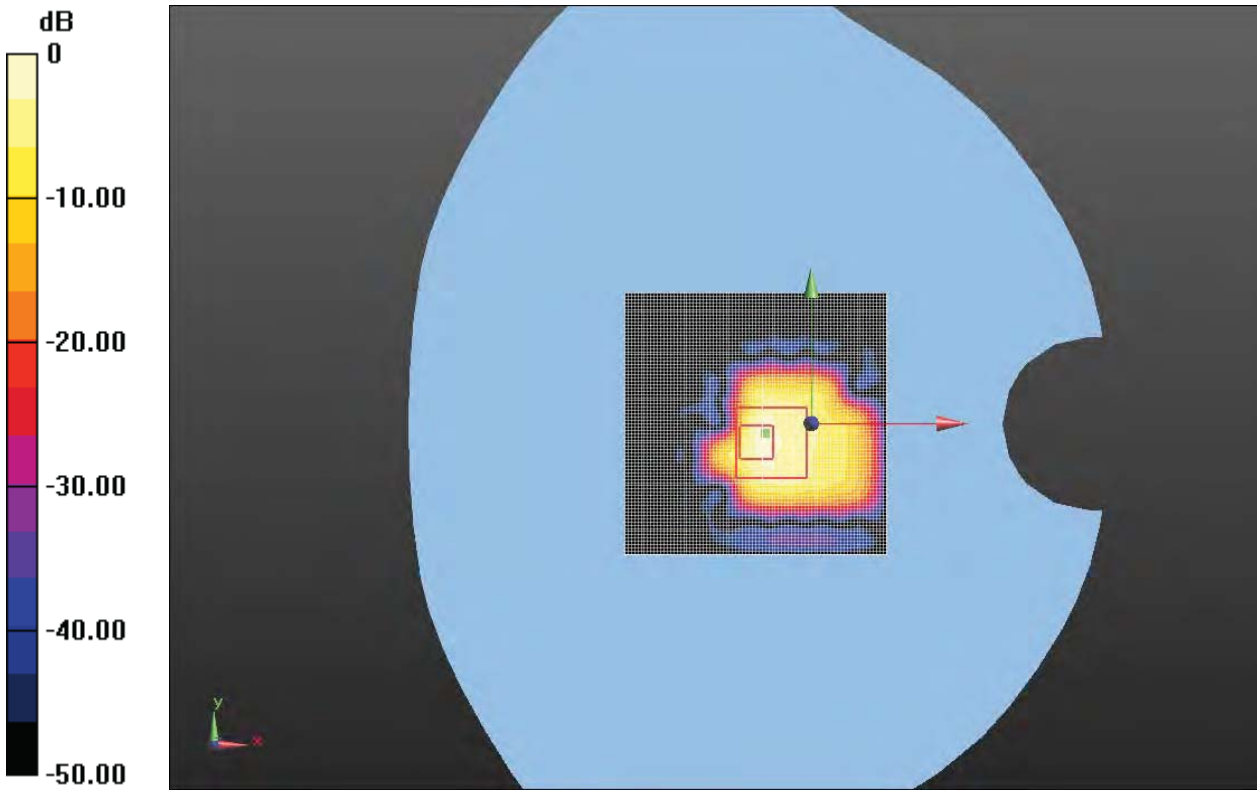
# MEAS.10 Body Plane with Top Edge on Channel 40 Antenna 2 in IEEE 802.11 a mode

Date/Time: 10/9/2015
Communication System Band: WLAN(a); Frequency: 5200 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5200 MHz; $\sigma$ = 5.3 S/m; $\varepsilon_r$ = 47.4; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.3 Liquid Temperature:21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.62, 4.62, 4.62); Calibrated: 12/2/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Top 40 Channel Antenna 2/Area Scan (81x81x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.183 W/kg

**Configuration/WLAN(a) 20Mhz Body Top 40 Channel Antenna 2/Zoom Scan (7x7x12)/Cube 0:** kgdx=4mm, dy=4mm, dz=2mm
Reference Value = 2.14 V/m; Power Drift = 0.15 dB
Peak SAR (extrapolated) = 0.598 W/kg
**SAR(1 g) = 0.120 W/kg; SAR(10 g) = 0.037 W/kg**
Maximum value of SAR (measured) = 0.235 W/kg




0 dB = 0.235 W/kg = -6.29 dBW/kg

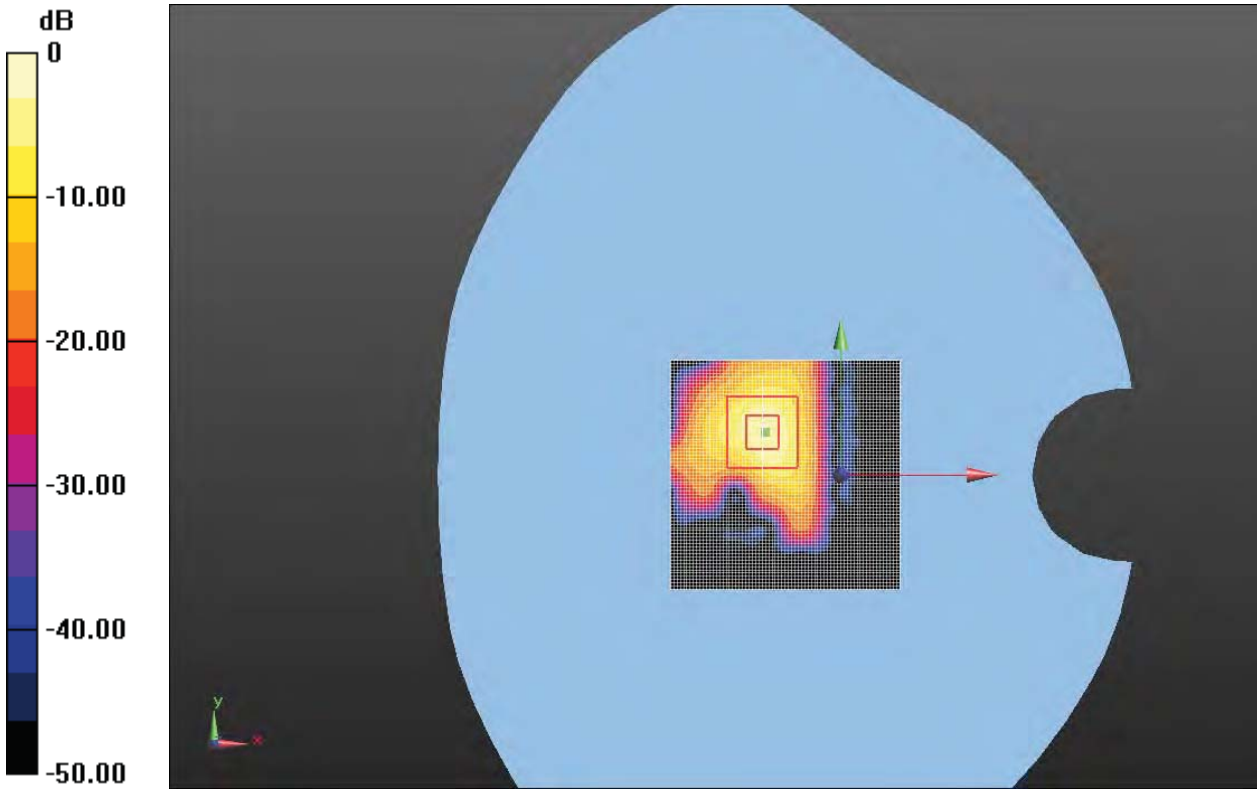
# MEAS.11 Body Plane with Front Side on Channel 52 Antenna 2 in IEEE 802.11 a mode

Date/Time: 10/9/2015
Communication System Band: WLAN(a); Frequency: 5260 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5260 MHz; $\sigma$ = 5.37 S/m; $\varepsilon_r$ = 46.76; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.3 Liquid Temperature:21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.62, 4.62, 4.62); Calibrated: 12/2/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Front 52 Channel Antenna 2/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.787 W/kg

**Configuration/WLAN(a) 20Mhz Body Front 52 Channel Antenna 2/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 5.926 V/m; Power Drift = 0.13 dB
Peak SAR (extrapolated) = 2.84 W/kg
**SAR(1 g) = 0.599 W/kg; SAR(10 g) = 0.120 W/kg**
Maximum value of SAR (measured) = 1.01 W/kg



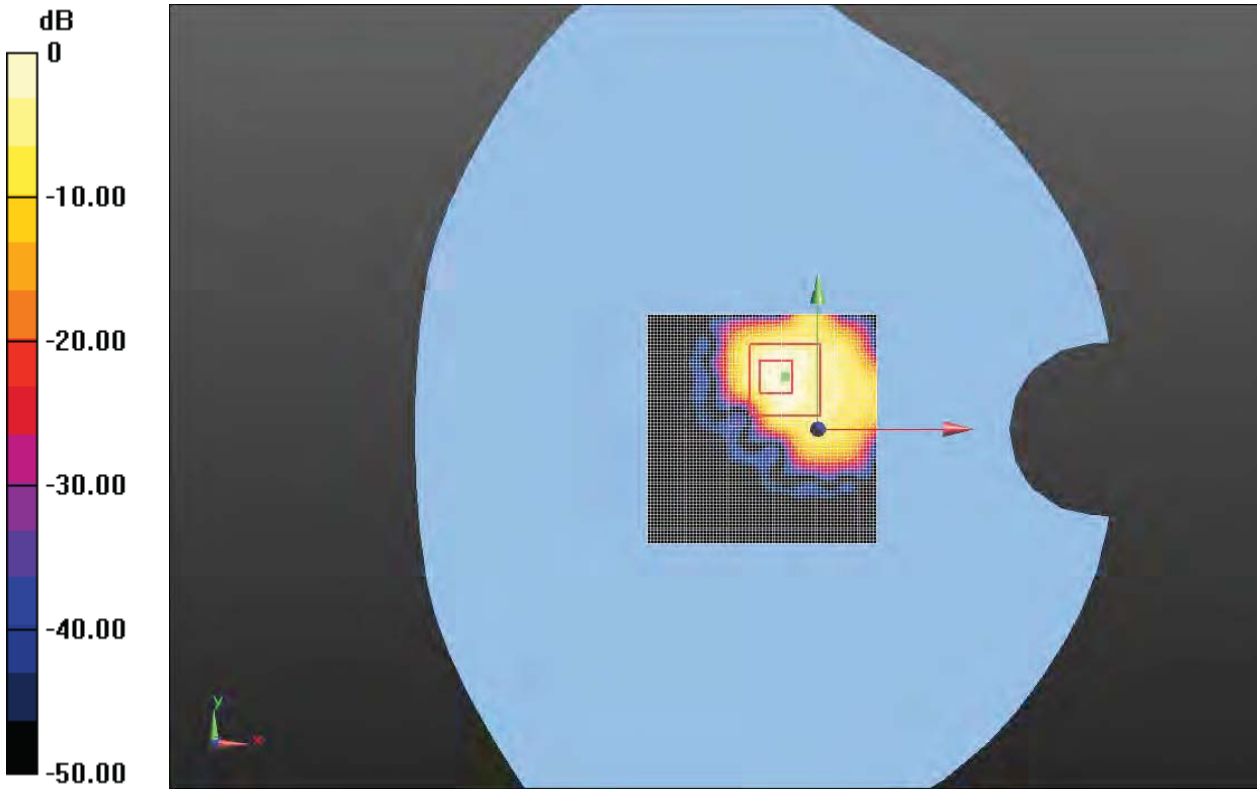

0 dB = 1.01 W/kg = 2.07 dBW/kg

## MEAS.12 Body Plane with Top Edge on Channel 52 Antenna 2 in IEEE 802.11 a mode

Date/Time: 10/9/2015
Communication System Band: WLAN(a); Frequency: 5260 MHz;Duty Cycle: 1:1
Medium parameters used (interpolated): f = 5260 MHz; $\sigma$ = 5.37 S/m; $\varepsilon_r$ = 46.76; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.3 Liquid Temperature:21.4
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.62, 4.62, 4.62); Calibrated: 12/2/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Top 52 Channel Antenna 2/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.146 W/kg
**Configuration/WLAN(a) 20Mhz Body Top 52 Channel Antenna 2/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.605 V/m; Power Drift = -0.05 dB
Peak SAR (extrapolated) = 0.387 W/kg
**SAR(1 g) = 0.117 W/kg; SAR(10 g) = 0.040 W/kg**
Maximum value of SAR (measured) = 0.241 W/kg



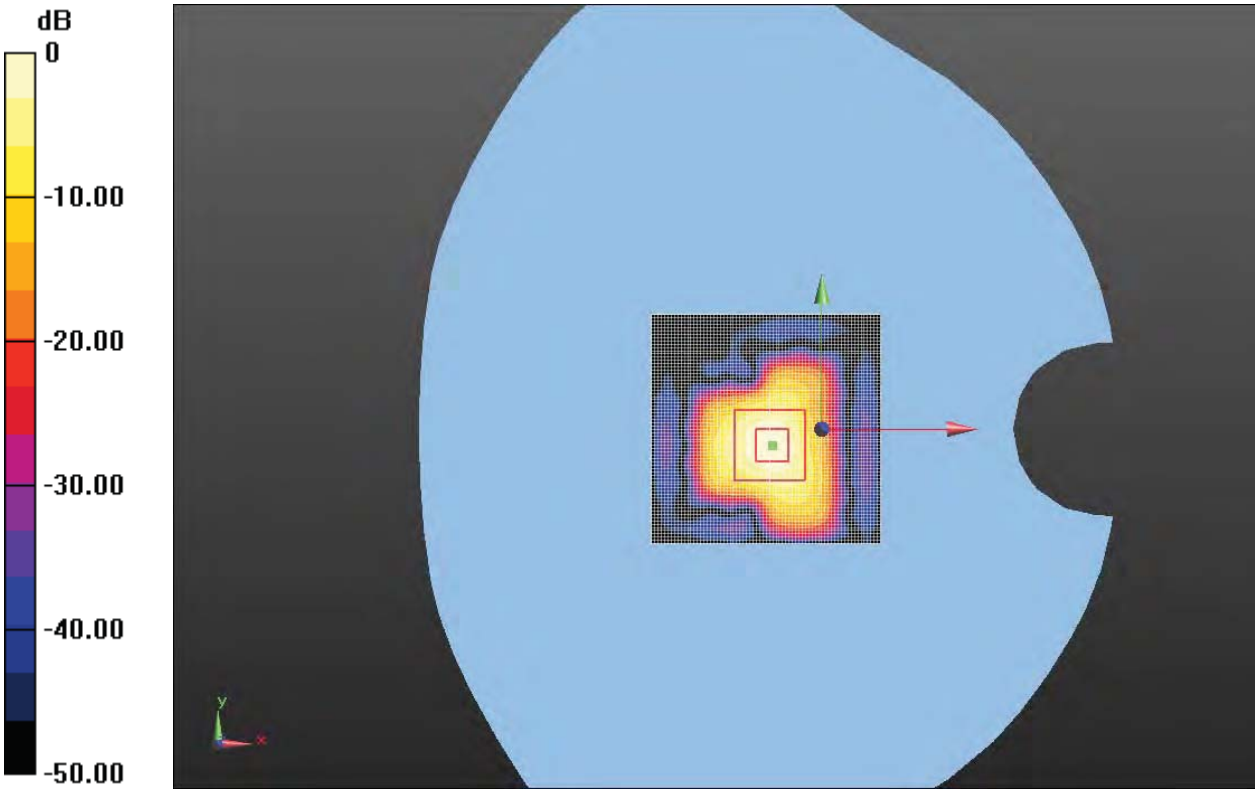

0 dB = 0.146 W/kg = -8.36 dBW/kg

## MEAS.13 Body Plane with Front Side on Channel 120 Antenna 2 in IEEE 802.11 a mode

Date/Time: 9/29/2015
Communication System Band: WLAN(a); Frequency: 5600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; $\sigma$ = 5.75 S/m; $\varepsilon_r$ = 47.62; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.6 Liquid Temperature:21.3
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.1, 4.1, 4.1); Calibrated: 12/2/2014;
- Sensor-Surface: 2mm (Mechanical Surface Detection), Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Front 120 Channel Antenna 2/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.506 W/kg
**Configuration/WLAN(a) 20Mhz Body Front 120 Channel Antenna 2/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 7.679 V/m; Power Drift = 0.14 dB
Peak SAR (extrapolated) = 1.81 W/kg
**SAR(1 g) = 0.434 W/kg; SAR(10 g) = 0.115 W/kg**
Maximum value of SAR (measured) = 0.957 W/kg




0 dB = 0.506 W/kg = -2.96 dBW/kg

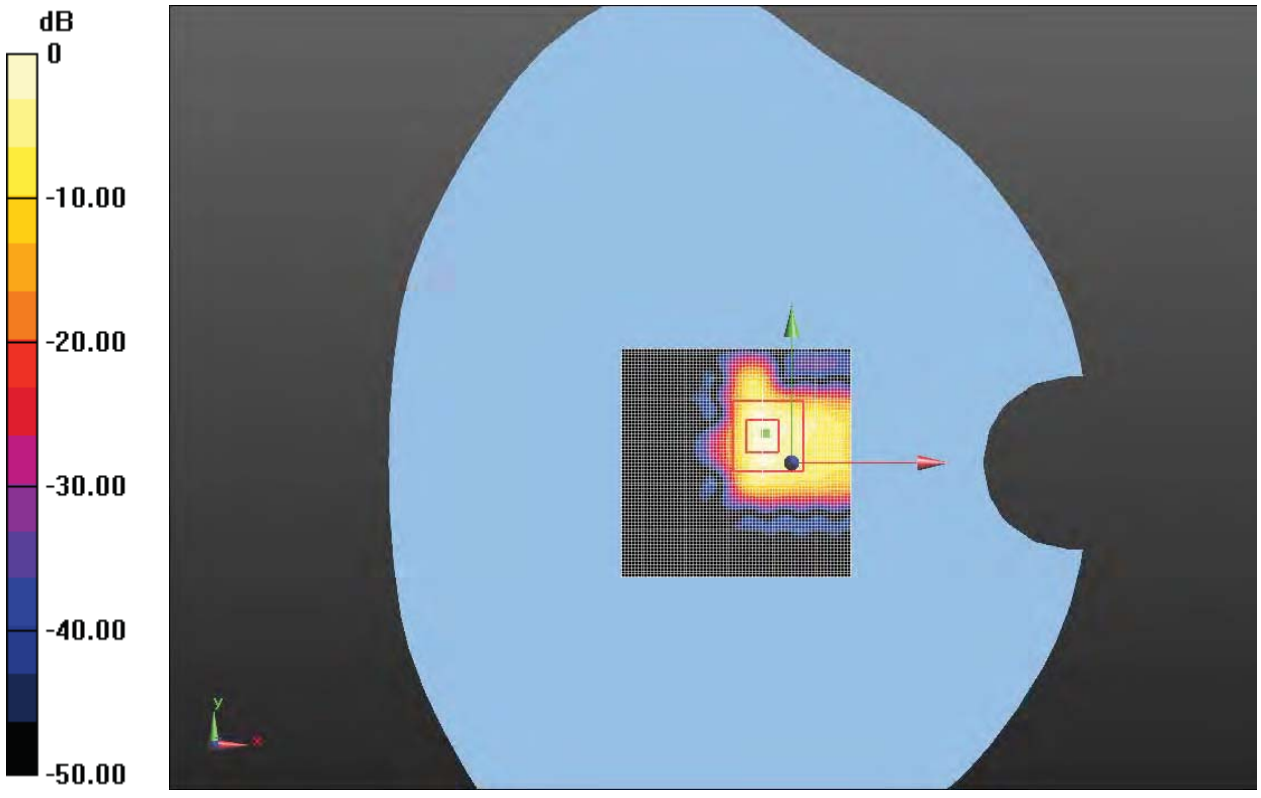
# MEAS.14 Body Plane with Top Edge on Channel 120 Antenna 2 in IEEE 802.11 a mode

Date/Time: 9/29/2015
Communication System Band: WLAN(a); Frequency: 5600 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5600 MHz; $\sigma$ = 5.75 S/m; $\varepsilon_r$ = 47.62; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.6 Liquid Temperature:21.3
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.1, 4.1, 4.1); Calibrated: 12/2/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Top 120 Channel Antenna 2/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.177 W/kg

**Configuration/WLAN(a) 20Mhz Body Top 120 Channel Antenna 2/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 2.643 V/m; Power Drift = 0.05 dB
Peak SAR (extrapolated) = 0.343 W/kg
**SAR(1 g) = 0.095 W/kg; SAR(10 g) = 0.033 W/kg**
Maximum value of SAR (measured) = 0.197 W/kg




0 dB = 0.197 W/kg = -7.06 dBW/kg

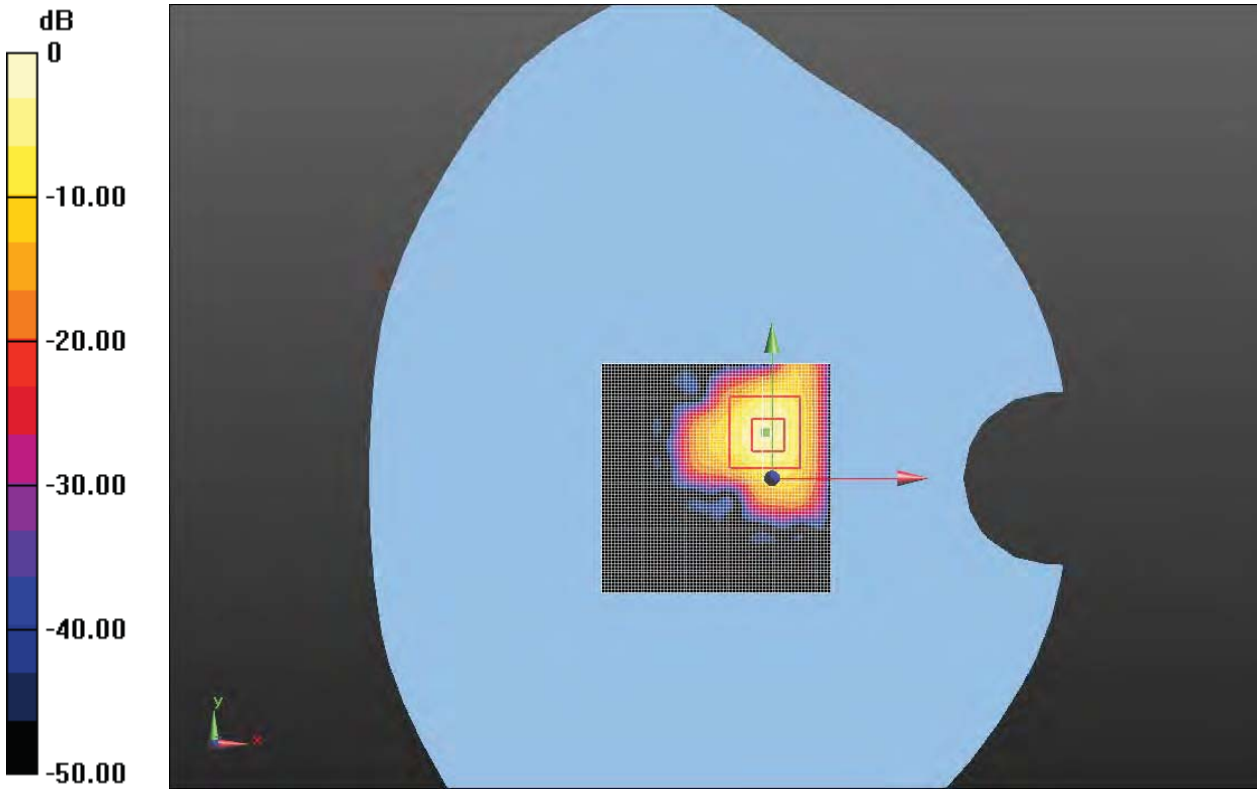
## MEAS.15 Body Plane with Front Side on Channel 161 Antenna 2 in IEEE 802.11 a mode

Date/Time: 9/29/2015
Communication System Band: WLAN(a); Frequency: 5805 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5805 MHz; $\sigma$ = 6.07 S/m; $\varepsilon_r$ = 46.3; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.3 Liquid Temperature:21.5
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.31, 4.31, 4.31); Calibrated: 12/2/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Front 161 Channel Antenna 2/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.494 W/kg

**Configuration/WLAN(a) 20Mhz Body Front 161 Channel Antenna 2/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 1.927 V/m; Power Drift = 0.09 dB
Peak SAR (extrapolated) = 1.94 W/kg
**SAR(1 g) = 0.413 W/kg; SAR(10 g) = 0.081 W/kg**
Maximum value of SAR (measured) = 0.592 W/kg




0 dB = 0.592 W/kg = -0.12 dBW/kg

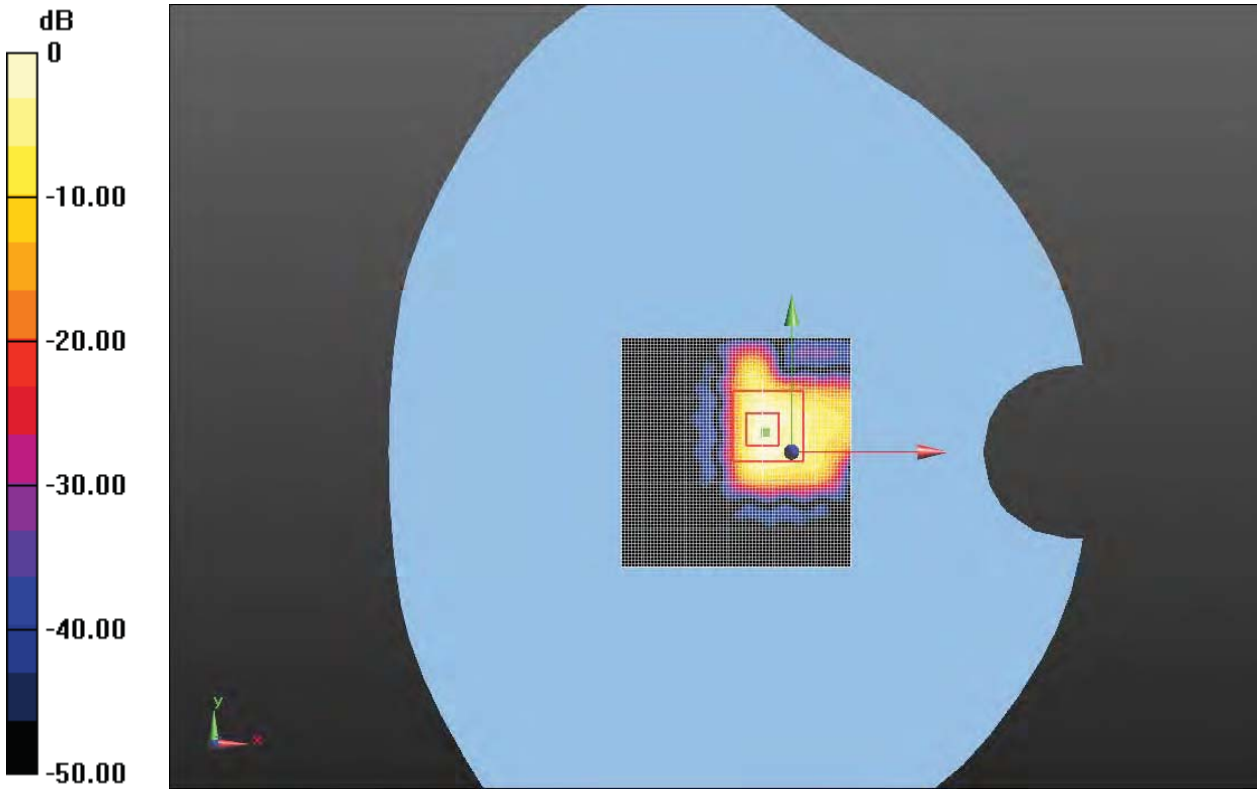
## MEAS.16 Body Plane with Top Edge on Channel Antenna 161 in IEEE 802.11 a mode

Date/Time: 9/29/2015
Communication System Band: WLAN(a); Frequency: 5805 MHz;Duty Cycle: 1:1
Medium parameters used: f = 5805 MHz; $\sigma$ = 6.07 S/m; $\varepsilon_r$ = 46.3; $\rho$ = 1000 kg/m$^3$
Phantom section: Flat Section
Ambient Temperature:22.3 Liquid Temperature:21.5
DASY5 Configuration:

- Probe: EX3DV4 - SN7340; ConvF(4.31, 4.31, 4.31); Calibrated: 12/2/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection), Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1454; Calibrated: 12/1/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0 Right 1857; Type: QD000P40CD; Serial: TP1857
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7331)

**Configuration/WLAN(a) 20Mhz Body Top 161 Channel Antenna 2/Area Scan (71x71x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.223 W/kg

**Configuration/WLAN(a) 20Mhz Body Top 161 Channel Antenna 2/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm
Reference Value = 3.010 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 0.407 W/kg
**SAR(1 g) = 0.117 W/kg; SAR(10 g) = 0.042 W/kg**
Maximum value of SAR (measured) = 0.243 W/kg




0 dB = 0.243 W/kg = -6.14 dBW/kg

# ANNEX D EUT EXTERNAL PHOTOS

Please refer the document “BL-SZ1590111-AW.pdf”.

# ANNEX E SAR TEST SETUP PHOTOS

Please refer the document “BL-SZ1590111-AS.pdf”.

# ANNEX F CALIBRATION REPORT

F.1 E-Field Probe

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

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

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

Accreditation No.: SCS 108

Client Dgiele (Vitec)

Certificate No: EX3-7340_Dec14

## CALIBRATION CERTIFICATE

Object EX3DV4 - SN:7340

Calibration procedure(s) QA CAL-01.v9, QA CAL-14.v4, QA CAL-23.v5, QA CAL-25.v6
Calibration procedure for dosimetric E-field probes

Calibration date: December 2, 2014

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 E4419B | GB41293874 | 03-Apr-14 (No. 217-01911) | Apr-15 |
| Power sensor E4412A | MY41498087 | 03-Apr-14 (No. 217-01911) | Apr-15 |
| Reference 3 dB Attenuator | SN: S5054 (3c) | 03-Apr-14 (No. 217-01915) | Apr-15 |
| Reference 20 dB Attenuator | SN: S6277 (20x) | 03-Apr-14 (No. 217-01919) | Apr-15 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 03-Apr-14 (No. 217-01920) | Apr-15 |
| Reference Probe ES3DV2 | SN: 3013 | 30-Dec-13 (No. ES3-3013_Dec13) | Dec-14 |
| DAE4 | SN: 660 | 13-Dec-13 (No. DAE4-660_Dec13) | Dec-14 |
| | | | |
| Secondary Standards | ID | Check Date (in house) | Scheduled Check |
| RF generator HP 8648C | US3642U01700 | 4-Aug-99 (in house check Apr-13) | In house check: Apr-16 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (in house check Oct-14) | In house check: Oct-15 |

| | Name | Function | Signature |
|---|---|---|---|
| Calibrated by: | Leif Klysner | Laboratory Technician | |
| Approved by: | Katja Pokovic | Technical Manager | |

Issued: December 2, 2014

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: EX3-7340_Dec14 Page 1 of 11

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

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

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

**Accreditation No.: SCS 108**

## Glossary:

| | |
|---|---|
| TSL | tissue simulating liquid |
| NORMx,y,z | sensitivity in free space |
| ConvF | sensitivity in TSL / NORMx,y,z |
| DCP | diode compression point |
| CF | crest factor (1/duty_cycle) of the RF signal |
| A, B, C, D | modulation dependent linearization parameters |
| Polarization φ | φ rotation around probe axis |
| Polarization ϑ | ϑ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., ϑ = 0 is normal to probe axis |
| Connector Angle | information used in DASY system to align probe sensor X to the robot coordinate system |

## 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, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

## Methods Applied and Interpretation of Parameters:

- *NORMx,y,z:* Assessed for E-field polarization ϑ = 0 (f ≤ 900 MHz in TEM-cell; f > 1800 MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not affect the $E^2$-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,y,z * frequency_response* (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of *ConvF*.
- *DCPx,y,z:* DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- *PAR:* PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- *Ax,y,z; Bx,y,z; Cx,y,z; Dx,y,z; VRx,y,z*: *A, B, C, D* are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. *VR* is the maximum calibration range expressed in RMS voltage across the diode.
- *ConvF and Boundary Effect Parameters:* Assessed in flat phantom using E-field (or Temperature Transfer Standard for f ≤ 800 MHz) and inside waveguide using analytical field distributions based on power measurements for f > 800 MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to *NORMx,y,z * ConvF* whereby the uncertainty corresponds to that given for *ConvF*. A frequency dependent *ConvF* is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- *Spherical isotropy (3D deviation from isotropy)*: in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- *Sensor Offset*: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- *Connector Angle*: The angle is assessed using the information gained by determining the *NORMx* (no uncertainty required).

# Probe EX3DV4

## SN:7340

Manufactured: July 23, 2014
Calibrated: December 2, 2014

Calibrated for DASY/EASY Systems
(Note: non-compatible with DASY2 system!)

# DASY/EASY - Parameters of Probe: EX3DV4 - SN:7340

## Basic Calibration Parameters

| | Sensor X | Sensor Y | Sensor Z | Unc (k=2) |
|---|---|---|---|---|
| Norm ($\mu V/(V/m)^2$)[A] | 0.53 | 0.49 | 0.46 | ± 10.1 % |
| DCP (mV)[B] | 100.7 | 91.3 | 102.1 | |

## Modulation Calibration Parameters

| UID | Communication System Name | | A dB | B dB√μV | C | D dB | VR mV | Unc[E] (k=2) |
|---|---|---|---|---|---|---|---|---|
| 0 | CW | X | 0.0 | 0.0 | 1.0 | 0.00 | 166.9 | ±3.3 % |
| | | Y | 0.0 | 0.0 | 1.0 | | 162.2 | |
| | | Z | 0.0 | 0.0 | 1.0 | | 149.8 | |

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%.

[A] The uncertainties of NormX,Y,Z do not affect the $E^2$-field uncertainty inside TSL (see Pages 5 and 6).
[B] Numerical linearization parameter: uncertainty not required.
[E] Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.