

### 21\_WLAN2.4GHz\_802.11b 1Mbps\_Front\_5mm\_Ch11

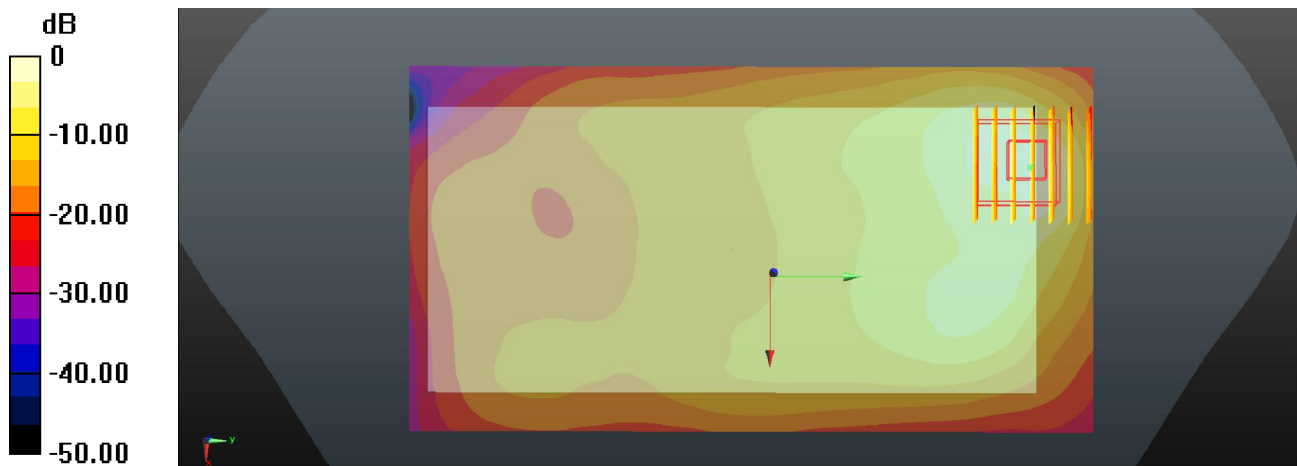
Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1  
Medium: MSL\_2450\_Medium parameters used:  $f = 2462$  MHz;  $\sigma = 1.99$  S/m;  $\epsilon_r = 54.065$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.99, 7.99, 7.99); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch11/Area Scan (81x151x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm  
Maximum value of SAR (interpolated) = 1.25 W/kg

**Ch11/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 4.168 V/m; Power Drift = 0.11 dB  
Peak SAR (extrapolated) = 1.71 W/kg  
**SAR(1 g) = 0.710 W/kg; SAR(10 g) = 0.307 W/kg**  
Maximum value of SAR (measured) = 1.31 W/kg



0 dB = 1.31 W/kg

### 22\_WLAN5.2GHz\_802.11a 6Mbps\_Top side\_5mm\_Ch48

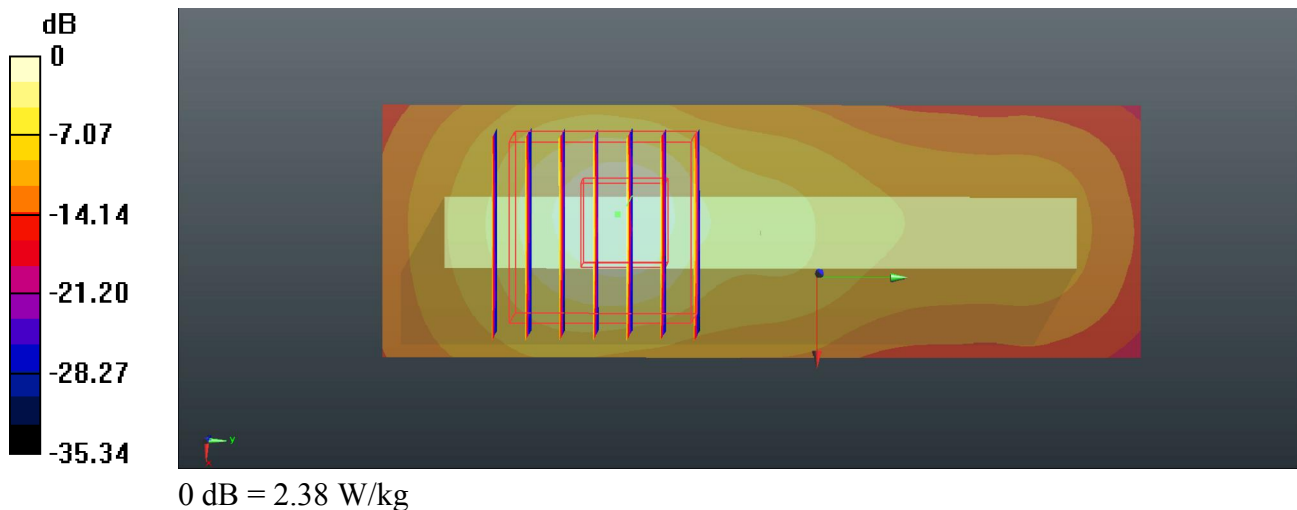
Communication System: UID 0, 802.11a (0); Frequency: 5240 MHz; Duty Cycle: 1:1.047  
Medium: MSL\_5G\_Medium parameters used:  $f = 5240$  MHz;  $\sigma = 5.485$  S/m;  $\epsilon_r = 49.147$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.6 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(5.41, 5.41, 5.41); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch48/Area Scan (31x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 2.47 W/kg

**Ch48/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm  
Reference Value = 10.96 V/m; Power Drift = -0.02 dB  
Peak SAR (extrapolated) = 4.18 W/kg  
**SAR(1 g) = 0.984 W/kg; SAR(10 g) = 0.281 W/kg**  
Maximum value of SAR (measured) = 2.38 W/kg



### 23\_WLAN5.8GHz\_802.11a 6Mbps\_Top side\_5mm\_Ch149

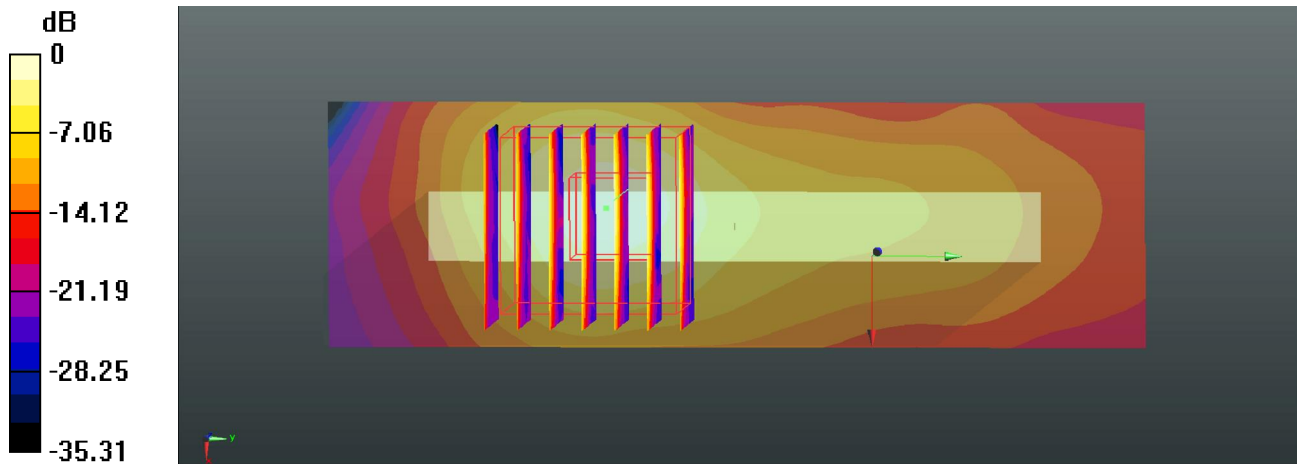
Communication System: UID 0, 802.11a (0); Frequency: 5745 MHz; Duty Cycle: 1:1.047  
Medium: MSL\_5G\_Medium parameters used:  $f = 5745$  MHz;  $\sigma = 6.175$  S/m;  $\epsilon_r = 48.304$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.6 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(4.64, 4.64, 4.64); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch149/Area Scan (31x101x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 1.25 W/kg

**Ch149/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm  
Reference Value = 8.265 V/m; Power Drift = 0.03 dB  
Peak SAR (extrapolated) = 2.78 W/kg  
**SAR(1 g) = 0.577 W/kg; SAR(10 g) = 0.158 W/kg**  
Maximum value of SAR (measured) = 1.48 W/kg



0 dB = 1.48 W/kg

### 24\_Bluetooth\_1Mbps\_Back\_5mm\_Ch0

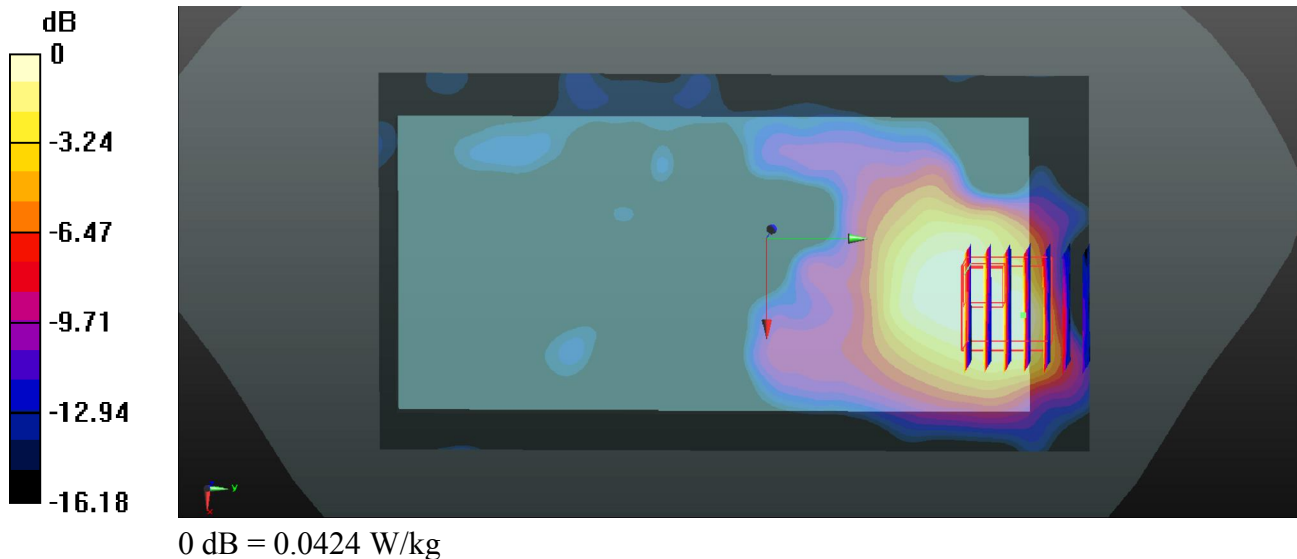
Communication System: UID 0, Bluetooth (0); Frequency: 2402 MHz; Duty Cycle: 1:1.3  
Medium: MSL\_2450\_Medium parameters used:  $f = 2402$  MHz;  $\sigma = 1.906$  S/m;  $\epsilon_r = 54.296$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.99, 7.99, 7.99); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch0/Area Scan (81x151x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm  
Maximum value of SAR (interpolated) = 0.0425 W/kg

**Ch0/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 0.6370 V/m; Power Drift = 0.07 dB  
Peak SAR (extrapolated) = 0.0550 W/kg  
**SAR(1 g) = 0.026 W/kg; SAR(10 g) = 0.014 W/kg**  
Maximum value of SAR (measured) = 0.0424 W/kg



### 25\_GSM850\_GPRS (4 Tx slots)\_Back\_5mm\_Ch189

Communication System: UID 0, GPRS (GMSK 4 Tx slot) (0); Frequency: 836.4 MHz; Duty Cycle: 1:2.08

Medium: MSL\_835\_Medium parameters used:  $f = 836.4$  MHz;  $\sigma = 1.001$  S/m;  $\epsilon_r = 54.817$ ;

$\rho = 1000$  kg/m<sup>3</sup>

Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(10.33, 10.33, 10.33); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch189/Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

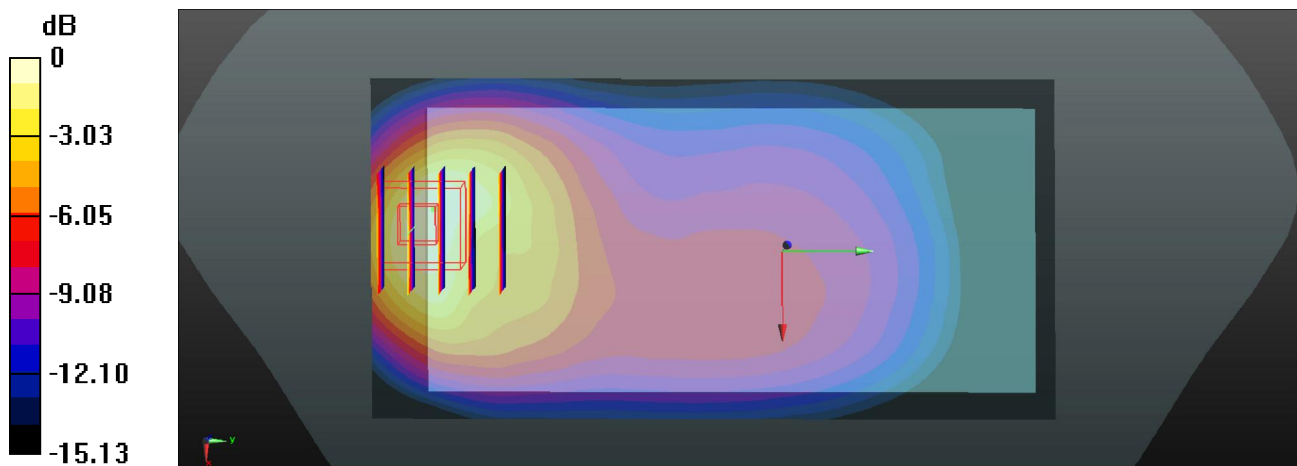
**Ch189/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.61 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 1.63 W/kg

**SAR(1 g) = 0.773 W/kg; SAR(10 g) = 0.410 W/kg**

Maximum value of SAR (measured) = 1.26 W/kg



0 dB = 1.26 W/kg

## 26\_GSM1900\_GPRS 4 Tx slots\_Front\_5mm\_Ch512

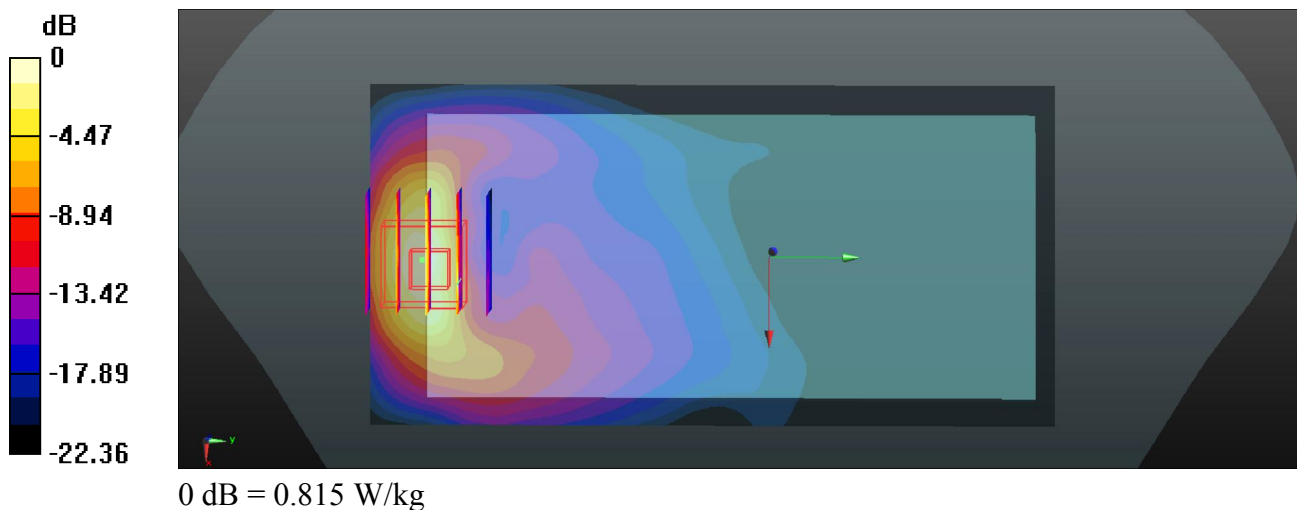
Communication System: UID 0, GPRS (GMSK 4 Tx slot) (0); Frequency: 1850.2 MHz; Duty Cycle: 1:2.08  
Medium: MSL\_1900\_Medium parameters used:  $f = 1850.2$  MHz;  $\sigma = 1.494$  S/m;  $\epsilon_r = 51.609$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.4 °C

### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.3, 8.3, 8.3); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch512/Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 0.740 W/kg

**Ch512/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 2.148 V/m; Power Drift = 0.12 dB  
Peak SAR (extrapolated) = 0.901 W/kg  
**SAR(1 g) = 0.461 W/kg; SAR(10 g) = 0.222 W/kg**  
Maximum value of SAR (measured) = 0.815 W/kg



### 27\_WCDMA Band V\_RMC 12.2Kbps\_Back\_5mm\_Ch4233

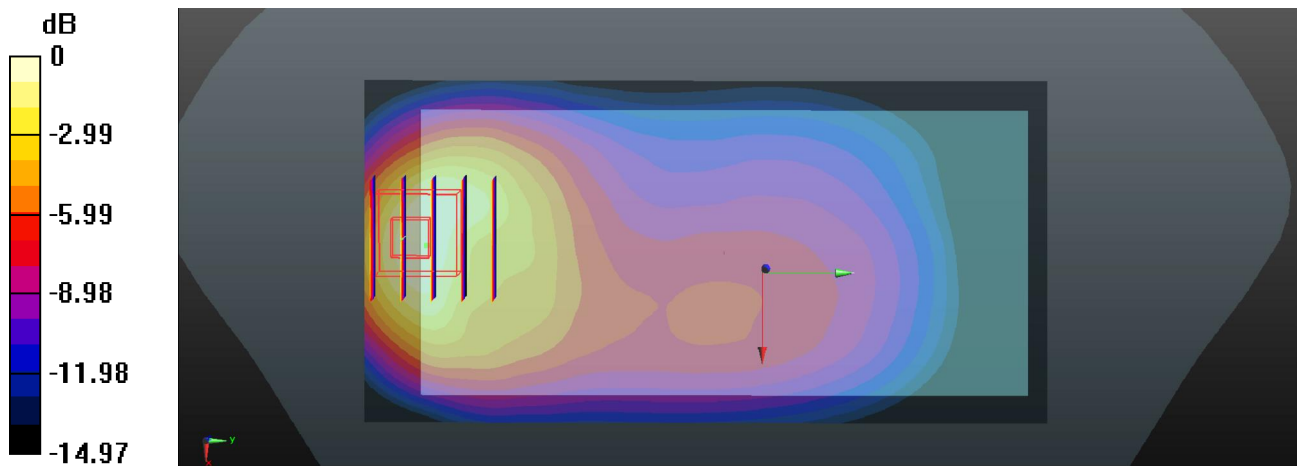
Communication System: UID 0, WCDMA (0); Frequency: 846.6 MHz; Duty Cycle: 1:1  
Medium: MSL\_835\_Medium parameters used:  $f = 846.6$  MHz;  $\sigma = 1.011$  S/m;  $\epsilon_r = 54.719$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(10.33, 10.33, 10.33); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch4233/Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 1.45 W/kg

**Ch4233/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 14.66 V/m; Power Drift = -0.01 dB  
Peak SAR (extrapolated) = 1.88 W/kg  
**SAR(1 g) = 0.894 W/kg; SAR(10 g) = 0.476 W/kg**  
Maximum value of SAR (measured) = 1.42 W/kg



0 dB = 1.42 W/kg

### 28\_WCDMA Band II\_RMC 12.2Kbps\_Back\_5mm\_Ch9262

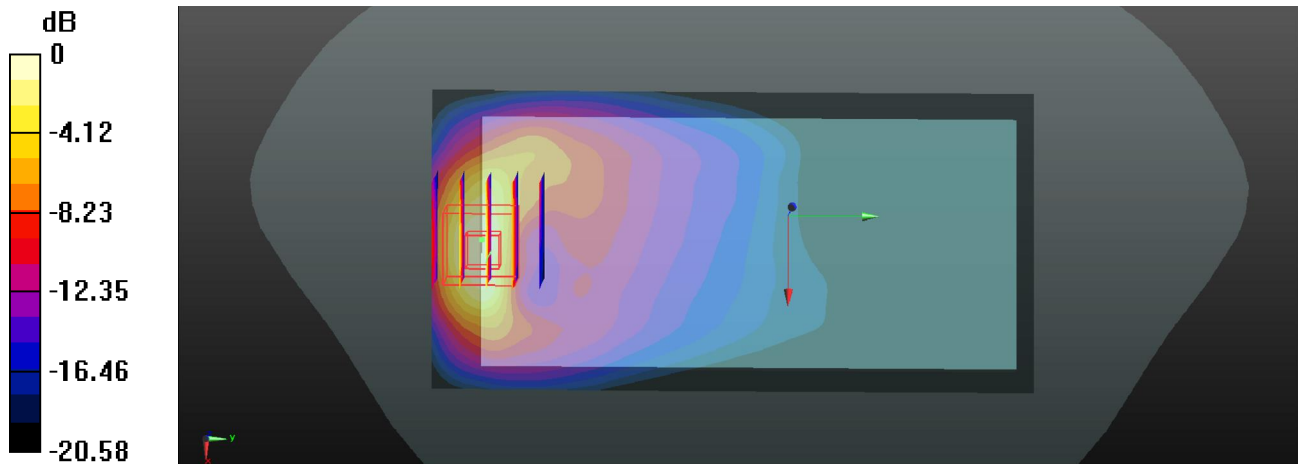
Communication System: UID 0, WCDMA (0); Frequency: 1852.4 MHz; Duty Cycle: 1:1  
Medium: MSL\_1900\_Medium parameters used:  $f = 1852.4$  MHz;  $\sigma = 1.497$  S/m;  $\epsilon_r = 51.601$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.4 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.3, 8.3, 8.3); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch9262/Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 0.649 W/kg

**Ch9262/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 2.843 V/m; Power Drift = 0.07 dB  
Peak SAR (extrapolated) = 0.790 W/kg  
**SAR(1 g) = 0.408 W/kg; SAR(10 g) = 0.191 W/kg**  
Maximum value of SAR (measured) = 0.648 W/kg



0 dB = 0.648 W/kg

### 29\_LTE Band 26\_15M\_QPSK\_1RB\_37offset\_Back\_5mm\_Ch26865

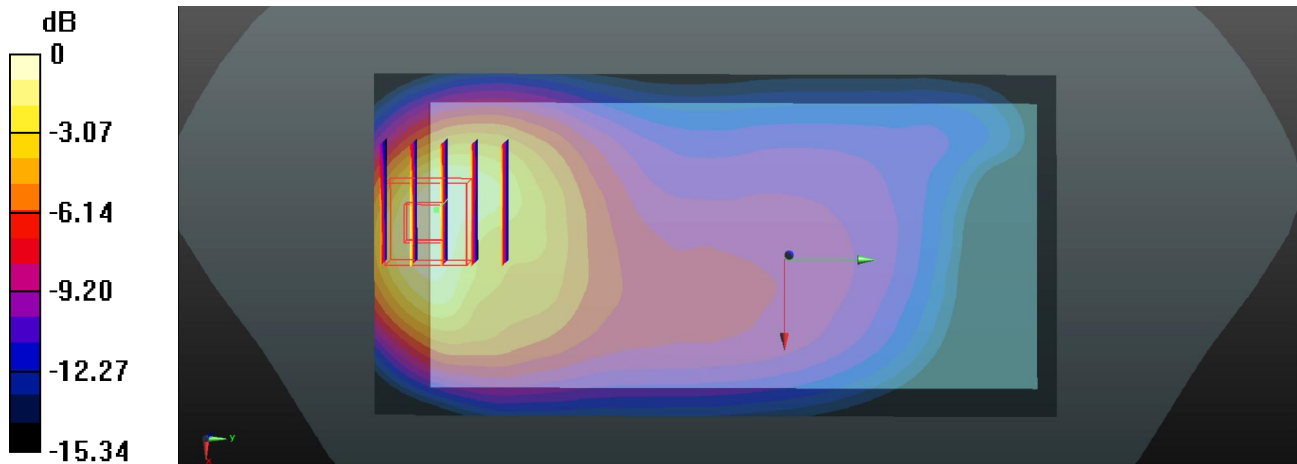
Communication System: UID 0, FDD-LTE (0); Frequency: 831.5 MHz; Duty Cycle: 1:1  
Medium: MSL\_835\_Medium parameters used:  $f = 831.5$  MHz;  $\sigma = 0.996$  S/m;  $\epsilon_r = 54.864$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(10.33, 10.33, 10.33); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch26865/Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 1.51 W/kg

**Ch26865/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 13.78 V/m; Power Drift = 0.01 dB  
Peak SAR (extrapolated) = 1.95 W/kg  
**SAR(1 g) = 0.926 W/kg; SAR(10 g) = 0.493 W/kg**  
Maximum value of SAR (measured) = 1.47 W/kg



0 dB = 1.47 W/kg

### 30\_LTE Band 2\_20M\_QPSK\_50RB\_0offset\_Front\_5mm\_Ch18900

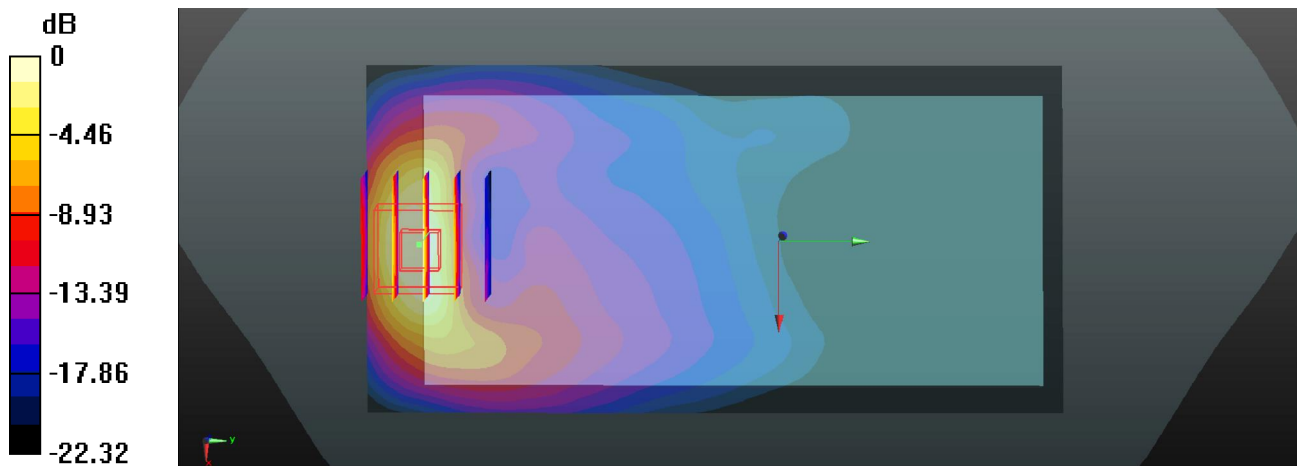
Communication System: UID 0, FDD-LTE (0); Frequency: 1880 MHz; Duty Cycle: 1:1  
Medium: MSL\_1900\_Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.526$  S/m;  $\epsilon_r = 51.523$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.4 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.3, 8.3, 8.3); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch18900/Area Scan (61x121x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 0.973 W/kg

**Ch18900/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 2.673 V/m; Power Drift = 0.09 dB  
Peak SAR (extrapolated) = 1.15 W/kg  
**SAR(1 g) = 0.583 W/kg; SAR(10 g) = 0.274 W/kg**  
Maximum value of SAR (measured) = 0.936 W/kg



0 dB = 0.936 W/kg

### 31\_LTE Band 7\_20M\_QPSK\_50RB\_0offset\_Front\_5mm\_Ch20850

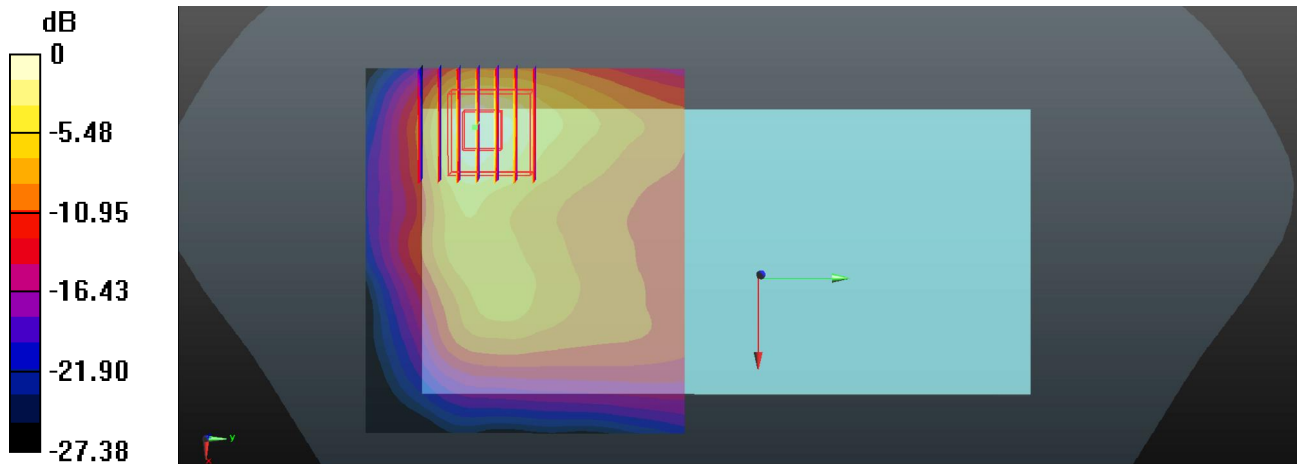
Communication System: UID 0, FDD-LTE (0); Frequency: 2510 MHz; Duty Cycle: 1:1  
Medium: MSL\_2600\_Medium parameters used:  $f = 2510$  MHz;  $\sigma = 2.056$  S/m;  $\epsilon_r = 53.884$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.71, 7.71, 7.71); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch20850/Area Scan (81x71x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm  
Maximum value of SAR (interpolated) = 1.18 W/kg

**Ch20850/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 4.295 V/m; Power Drift = 0.16 dB  
Peak SAR (extrapolated) = 1.35 W/kg  
**SAR(1 g) = 0.627 W/kg; SAR(10 g) = 0.269 W/kg**  
Maximum value of SAR (measured) = 1.08 W/kg



0 dB = 1.08 W/kg

### 32\_LTE Band 38\_20M\_QPSK\_50RB\_24offset\_Front\_5mm\_Ch38150

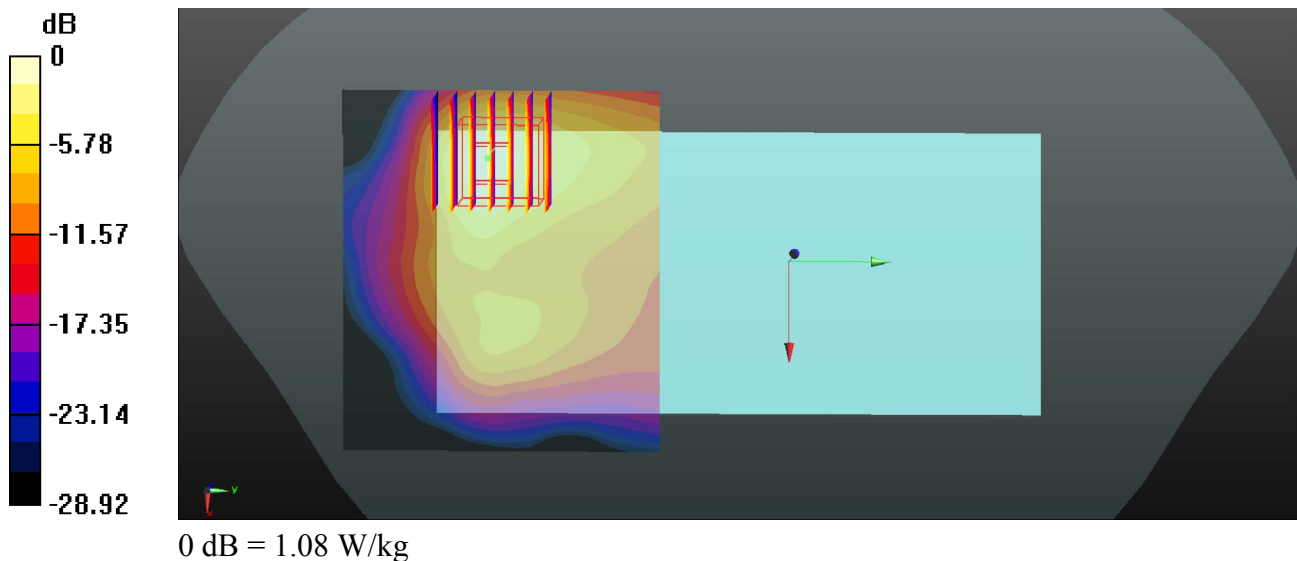
Communication System: UID 0, TDD-LTE (0); Frequency: 2610 MHz; Duty Cycle: 1:1.59  
Medium: MSL\_2600\_Medium parameters used:  $f = 2610$  MHz;  $\sigma = 2.197$  S/m;  $\epsilon_r = 53.51$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.71, 7.71, 7.71); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch38150/Area Scan (81x71x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm  
Maximum value of SAR (interpolated) = 1.13 W/kg

**Ch38150/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 4.400 V/m; Power Drift = 0.09 dB  
Peak SAR (extrapolated) = 1.38 W/kg  
**SAR(1 g) = 0.622 W/kg; SAR(10 g) = 0.269 W/kg**  
Maximum value of SAR (measured) = 1.08 W/kg



### 33\_WLAN2.4GHz\_802.11b 1Mbps\_Front\_5mm\_Ch11

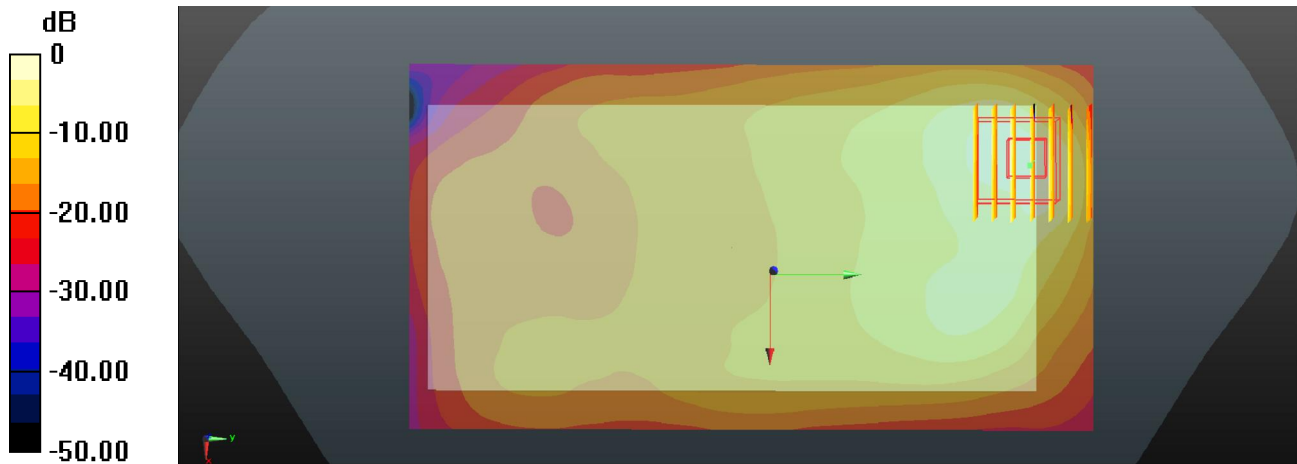
Communication System: UID 0, 802.11b (0); Frequency: 2462 MHz; Duty Cycle: 1:1  
Medium: MSL\_2450\_Medium parameters used:  $f = 2462$  MHz;  $\sigma = 1.99$  S/m;  $\epsilon_r = 54.065$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.99, 7.99, 7.99); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch11/Area Scan (81x151x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm  
Maximum value of SAR (interpolated) = 1.25 W/kg

**Ch11/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 4.168 V/m; Power Drift = 0.11 dB  
Peak SAR (extrapolated) = 1.71 W/kg  
**SAR(1 g) = 0.710 W/kg; SAR(10 g) = 0.307 W/kg**  
Maximum value of SAR (measured) = 1.31 W/kg



0 dB = 1.31 W/kg

### 34\_WLAN5.3GHz\_802.11a\_6Mbps\_Back\_5mm\_Ch52

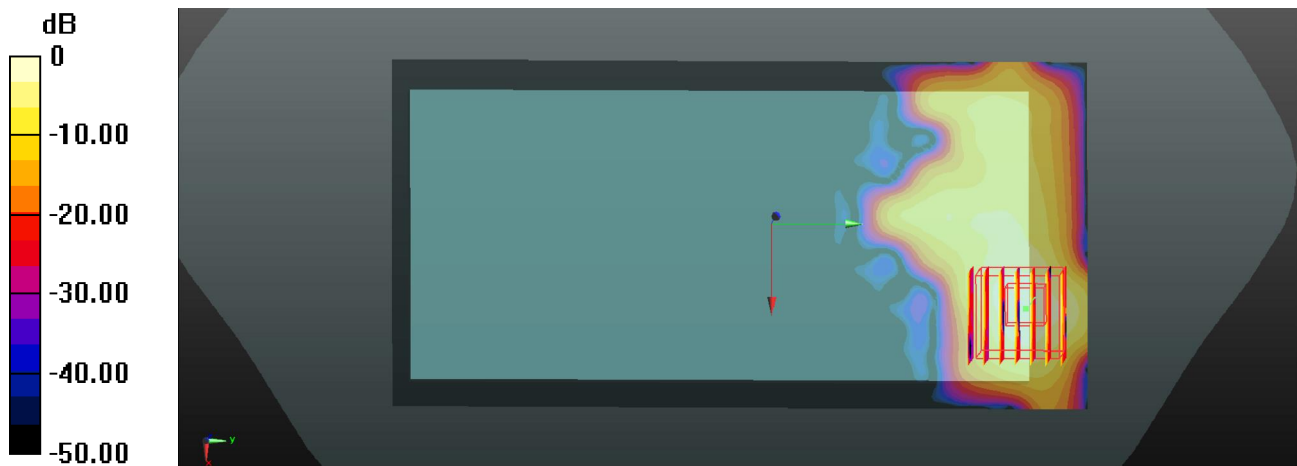
Communication System: UID 0, 802.11a (0); Frequency: 5260 MHz; Duty Cycle: 1:1.047  
Medium: MSL\_5G\_Medium parameters used:  $f = 5260$  MHz;  $\sigma = 5.516$  S/m;  $\epsilon_r = 49.116$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.6 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(5.2, 5.2, 5.2); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch52/Area Scan (91x181x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 1.70 W/kg

**Ch52/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm  
Reference Value = 0.3400 V/m; Power Drift = 0.01 dB  
Peak SAR (extrapolated) = 2.83 W/kg  
**SAR(1 g) = 0.686 W/kg; SAR(10 g) = 0.189 W/kg**  
Maximum value of SAR (measured) = 1.67 W/kg



0 dB = 1.67 W/kg

### 35\_WLAN5.5GHz\_802.11a\_6Mbps\_Back\_5mm\_Ch100

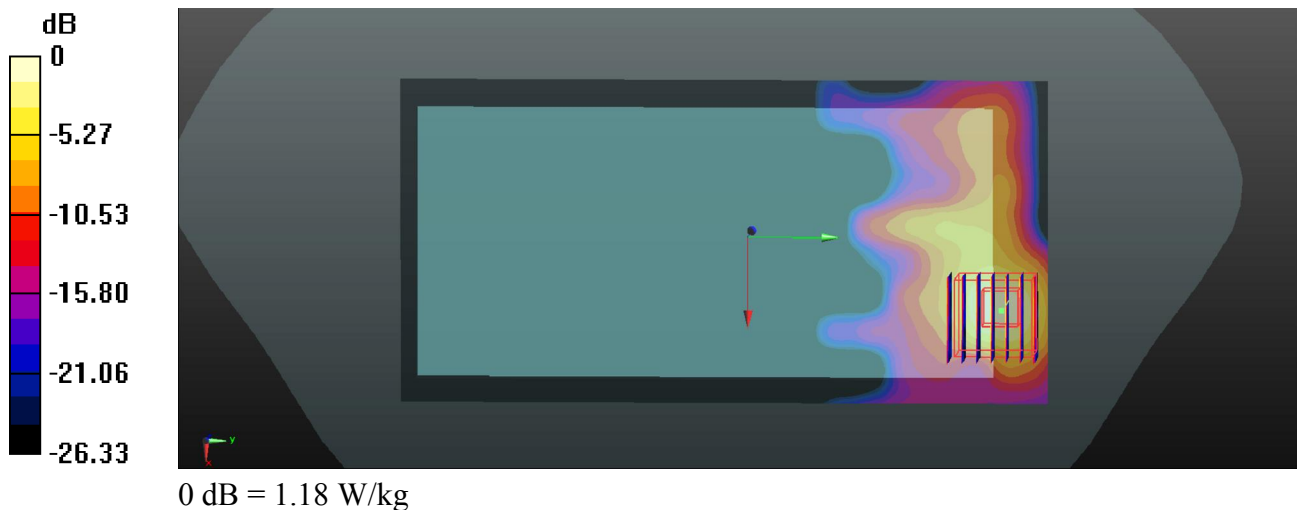
Communication System: UID 0, 802.11a (0); Frequency: 5500 MHz; Duty Cycle: 1:1.047  
Medium: MSL\_5G\_Medium parameters used:  $f = 5500$  MHz;  $\sigma = 5.827$  S/m;  $\epsilon_r = 48.715$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.6 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(4.62, 4.62, 4.62); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch100/Area Scan (91x181x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 1.16 W/kg

**Ch100/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm  
Reference Value = 0 V/m; Power Drift = 0.01 dB  
Peak SAR (extrapolated) = 2.05 W/kg  
**SAR(1 g) = 0.471 W/kg; SAR(10 g) = 0.131 W/kg**  
Maximum value of SAR (measured) = 1.18 W/kg



### 36\_WLAN5.8GHz\_802.11a 6Mbps\_Front\_5mm\_Ch149

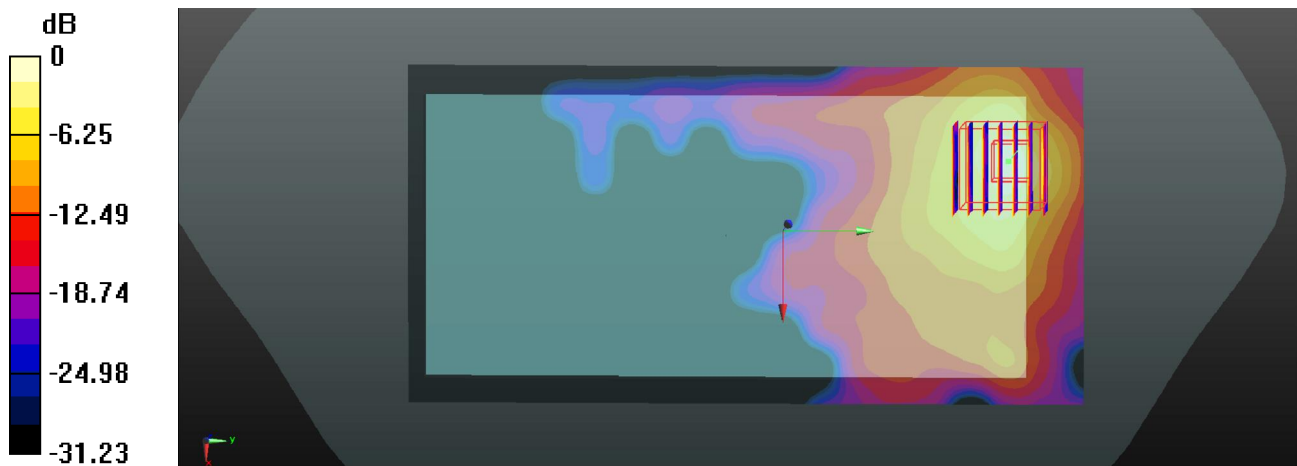
Communication System: UID 0, 802.11a (0); Frequency: 5745 MHz; Duty Cycle: 1:1.047  
Medium: MSL\_5G\_Medium parameters used:  $f = 5745$  MHz;  $\sigma = 6.175$  S/m;  $\epsilon_r = 48.304$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.6 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(4.64, 4.64, 4.64); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch149/Area Scan (91x181x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 0.923 W/kg

**Ch149/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm  
Reference Value = 1.235 V/m; Power Drift = 0.06 dB  
Peak SAR (extrapolated) = 2.02 W/kg  
**SAR(1 g) = 0.409 W/kg; SAR(10 g) = 0.122 W/kg**  
Maximum value of SAR (measured) = 1.10 W/kg



0 dB = 1.10 W/kg

### 37\_Bluetooth\_1Mbps\_Back\_5mm\_Ch0

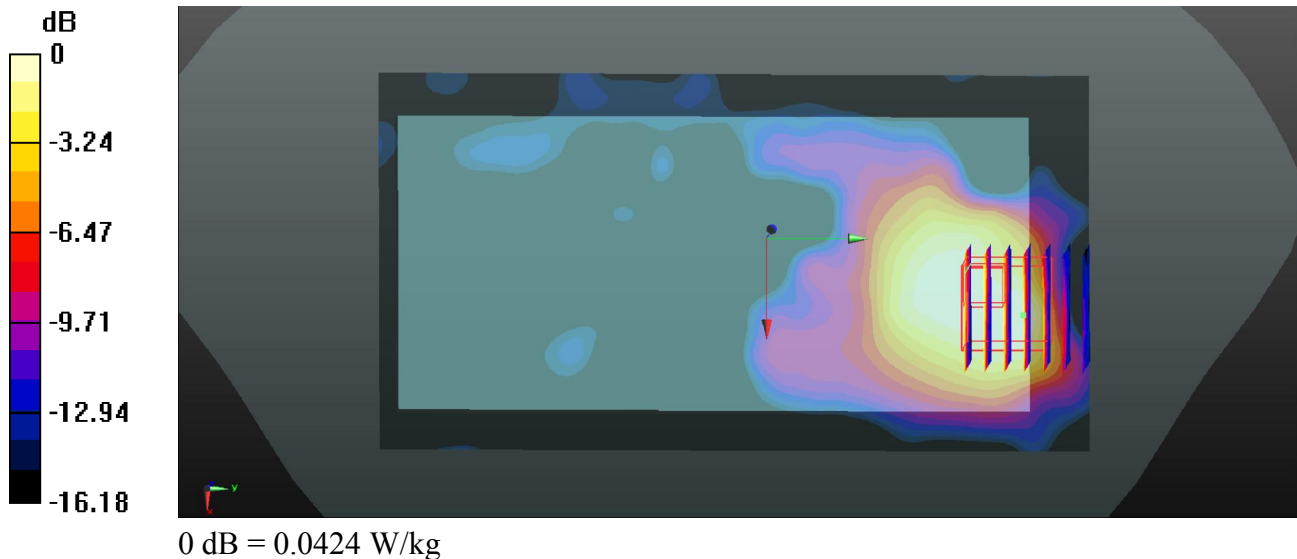
Communication System: UID 0, Bluetooth (0); Frequency: 2402 MHz; Duty Cycle: 1:1.3  
Medium: MSL\_2450\_Medium parameters used:  $f = 2402$  MHz;  $\sigma = 1.906$  S/m;  $\epsilon_r = 54.296$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.99, 7.99, 7.99); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch0/Area Scan (81x151x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm  
Maximum value of SAR (interpolated) = 0.0425 W/kg

**Ch0/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 0.6370 V/m; Power Drift = 0.07 dB  
Peak SAR (extrapolated) = 0.0550 W/kg  
**SAR(1 g) = 0.026 W/kg; SAR(10 g) = 0.014 W/kg**  
Maximum value of SAR (measured) = 0.0424 W/kg



### 38\_GSM1900\_GPRS (4 Tx slots)\_Bottm side\_0mm\_Ch810

Communication System: UID 0, GPRS (GMSK 4 Tx slot) (0); Frequency: 1909.8 MHz; Duty Cycle: 1:2.08  
Medium: MSL\_1900\_Medium parameters used:  $f = 1909.8$  MHz;  $\sigma = 1.562$  S/m;  $\epsilon_r = 51.438$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.4 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.3, 8.3, 8.3); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch810/Area Scan (31x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 7.80 W/kg

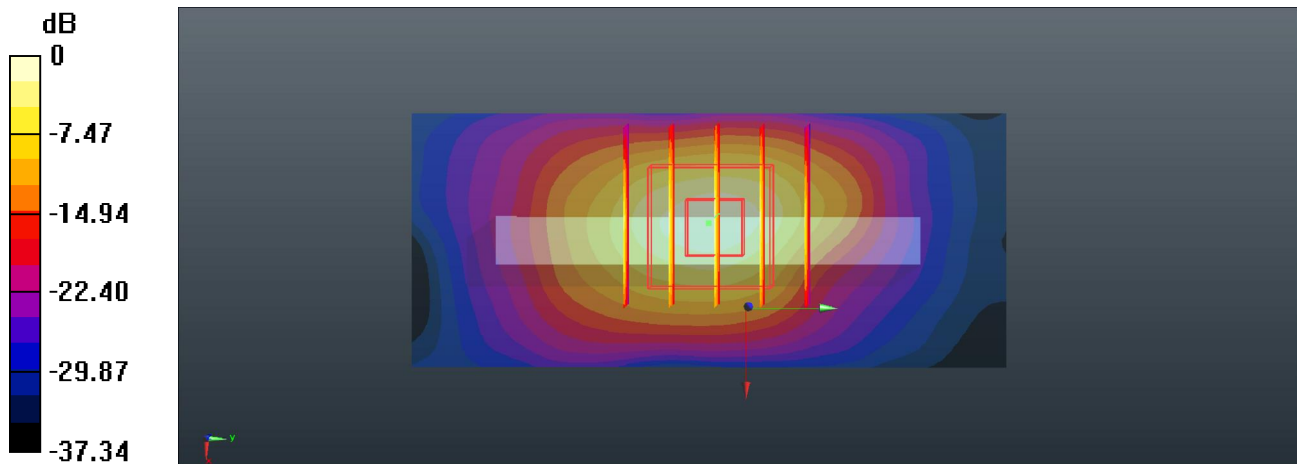
**Ch810/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 55.94 V/m; Power Drift = 0.13 dB

Peak SAR (extrapolated) = 10.4 W/kg

**SAR(1 g) = 4.46 W/kg; SAR(10 g) = 1.8 W/kg**

Maximum value of SAR (measured) = 8.03 W/kg



0 dB = 8.03 W/kg

### 39\_WCDMA Band II\_RMC 12.2Kbps\_Bottom side\_0mm\_Ch9400

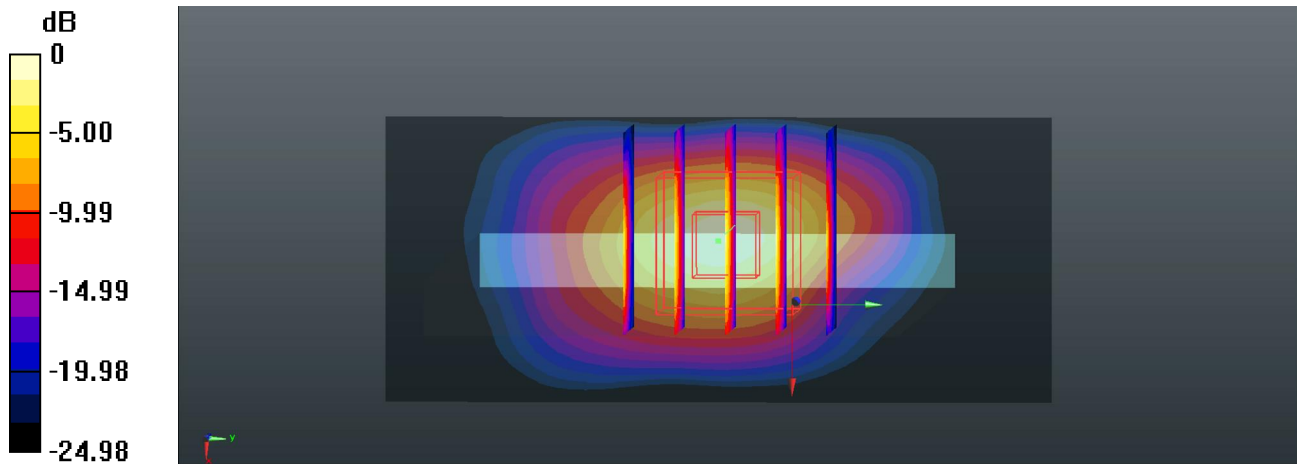
Communication System: UID 0, WCDMA (0); Frequency: 1880 MHz; Duty Cycle: 1:1  
Medium: MSL\_1900\_Medium parameters used:  $f = 1880$  MHz;  $\sigma = 1.526$  S/m;  $\epsilon_r = 51.523$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.4 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.3, 8.3, 8.3); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch9400/Area Scan (31x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 8.18 W/kg

**Ch9400/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 57.65 V/m; Power Drift = 0.08 dB  
Peak SAR (extrapolated) = 10.9 W/kg  
**SAR(1 g) = 4.65 W/kg; SAR(10 g) = 1.87 W/kg**  
Maximum value of SAR (measured) = 8.35 W/kg



0 dB = 8.35 W/kg

### 40\_LTE Band 2\_20M\_QPSK\_50RB\_0offset\_Bottom side\_0mm\_Ch19100

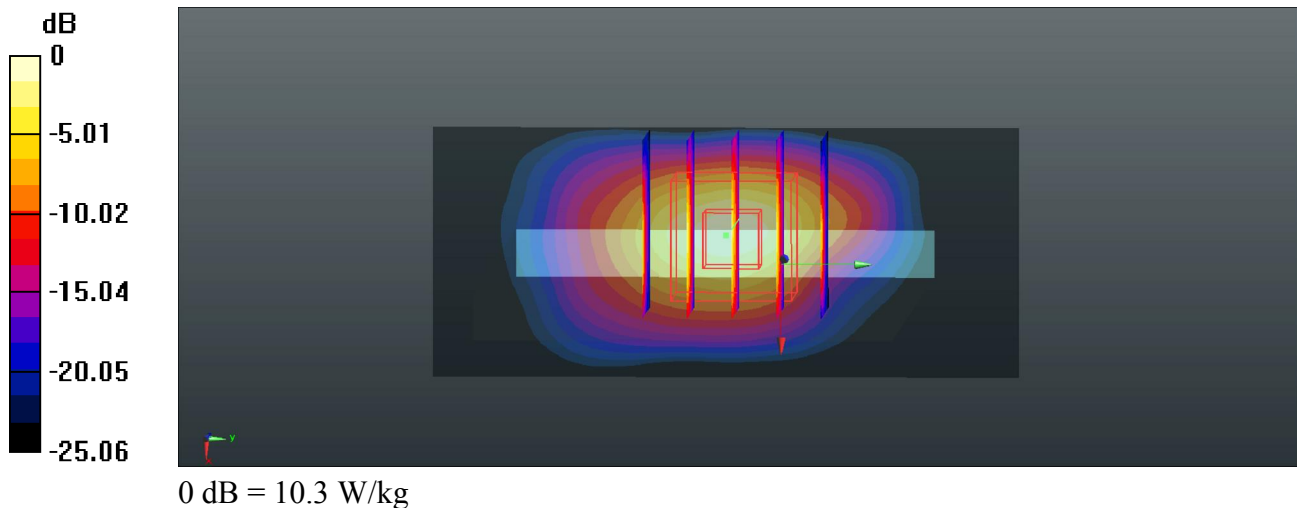
Communication System: UID 0, FDD-LTE (0); Frequency: 1900 MHz; Duty Cycle: 1:1  
Medium: MSL\_1900\_Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.55$  S/m;  $\epsilon_r = 51.465$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.4 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(8.3, 8.3, 8.3); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM1; Type: QD000P40CD; Serial: TP:1753
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch19100/Area Scan (31x71x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm  
Maximum value of SAR (interpolated) = 10.1 W/kg

**Ch19100/Zoom Scan (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm  
Reference Value = 62.79 V/m; Power Drift = 0.14 dB  
Peak SAR (extrapolated) = 13.4 W/kg  
**SAR(1 g) = 5.64 W/kg; SAR(10 g) = 2.26 W/kg**  
Maximum value of SAR (measured) = 10.3 W/kg



### 41\_LTE Band 7\_20M\_QPSK\_50RB\_0offset\_Front\_0mm\_Ch21350

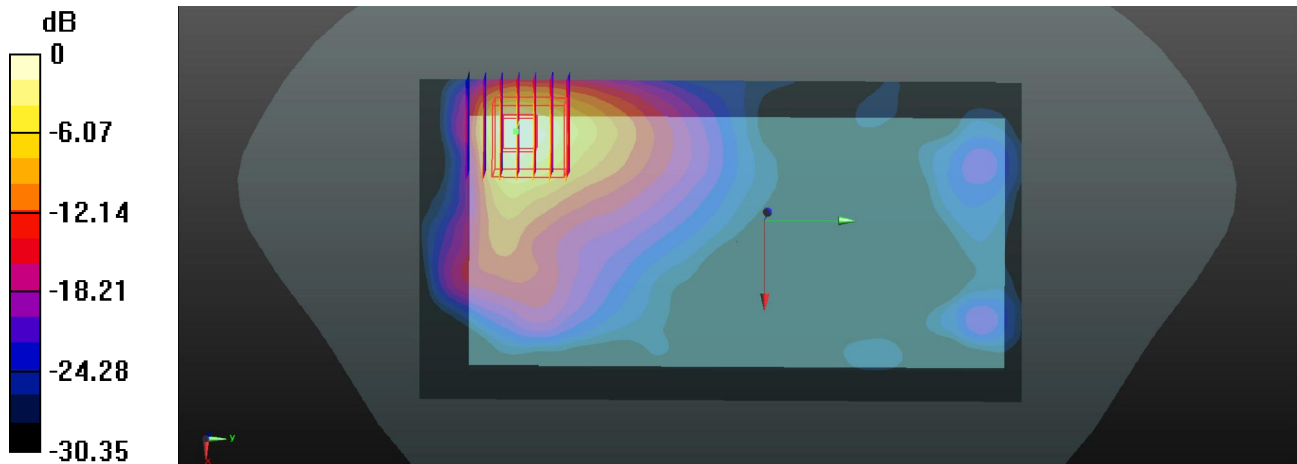
Communication System: UID 0, FDD-LTE (0); Frequency: 2560 MHz; Duty Cycle: 1:1  
Medium: MSL\_2600\_Medium parameters used:  $f = 2560$  MHz;  $\sigma = 2.128$  S/m;  $\epsilon_r = 53.693$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.71, 7.71, 7.71); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch21350/Area Scan (81x151x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm  
Maximum value of SAR (interpolated) = 14.5 W/kg

**Ch21350/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 2.735 V/m; Power Drift = 0.03 dB  
Peak SAR (extrapolated) = 16.6 W/kg  
**SAR(1 g) = 6.19 W/kg; SAR(10 g) = 2.32 W/kg**  
Maximum value of SAR (measured) = 12.5 W/kg



0 dB = 12.5 W/kg

### 42\_LTE Band 38\_20M\_QPSK\_1RB\_0offset\_Back\_0mm\_Ch38000

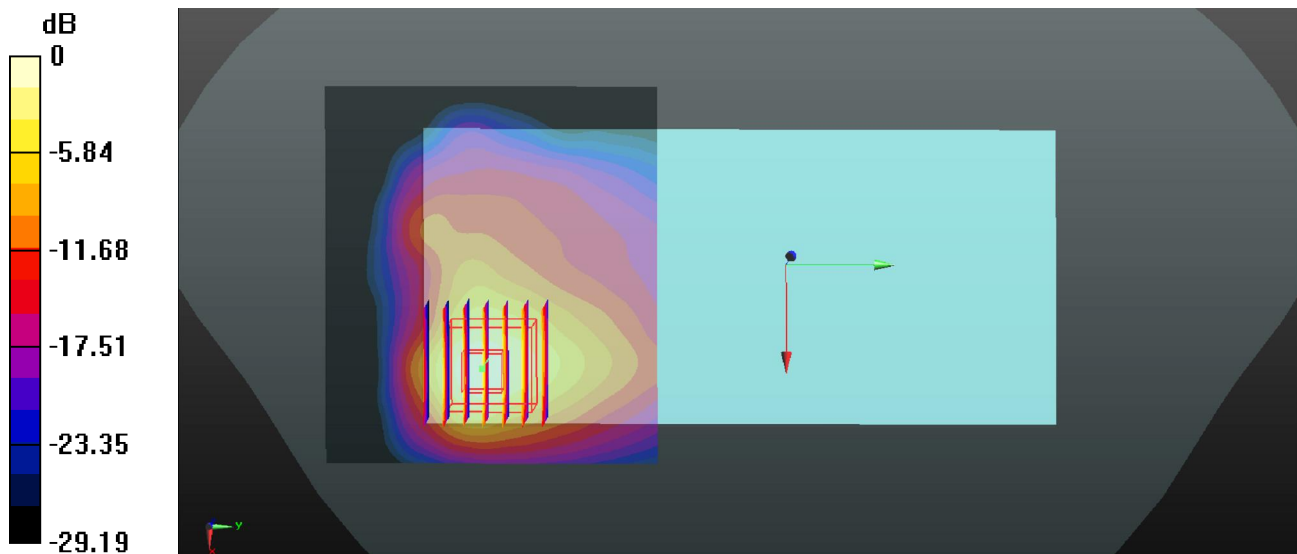
Communication System: UID 0, TDD-LTE (0); Frequency: 2595 MHz; Duty Cycle: 1:1.59  
Medium: MSL\_2600\_Medium parameters used:  $f = 2595$  MHz;  $\sigma = 2.176$  S/m;  $\epsilon_r = 53.564$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.5 °C ; Liquid Temperature : 22.5 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(7.71, 7.71, 7.71); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch38000/Area Scan (81x71x1):** Interpolated grid: dx=1.200 mm, dy=1.200 mm  
Maximum value of SAR (interpolated) = 12.5 W/kg

**Ch38000/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm  
Reference Value = 5.110 V/m; Power Drift = -0.01 dB  
Peak SAR (extrapolated) = 15.5 W/kg  
**SAR(1 g) = 6.46 W/kg; SAR(10 g) = 2.66 W/kg**  
Maximum value of SAR (measured) = 11.6 W/kg



0 dB = 11.6 W/kg

### 43\_WLAN5.3GHz\_802.11a 6Mbps\_Top side\_0mm\_Ch52

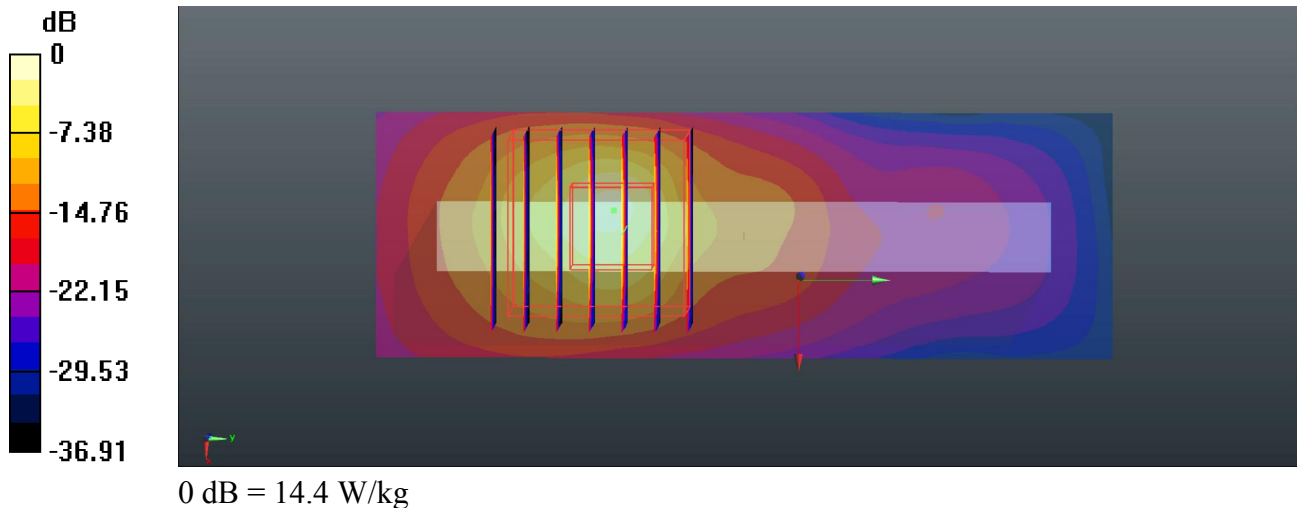
Communication System: UID 0, 802.11a (0); Frequency: 5260 MHz; Duty Cycle: 1:1.047  
Medium: MSL\_5G\_Medium parameters used:  $f = 5260$  MHz;  $\sigma = 5.516$  S/m;  $\epsilon_r = 49.116$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.6 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(5.2, 5.2, 5.2); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch52/Area Scan (31x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 10.3 W/kg

**Ch52/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm  
Reference Value = 12.64 V/m; Power Drift = 0.11 dB  
Peak SAR (extrapolated) = 28.5 W/kg  
**SAR(1 g) = 4.68 W/kg; SAR(10 g) = 0.921 W/kg**  
Maximum value of SAR (measured) = 14.4 W/kg



### 44\_WLAN5.5GHz\_802.11a 6Mbps\_Top side\_0mm\_Ch100

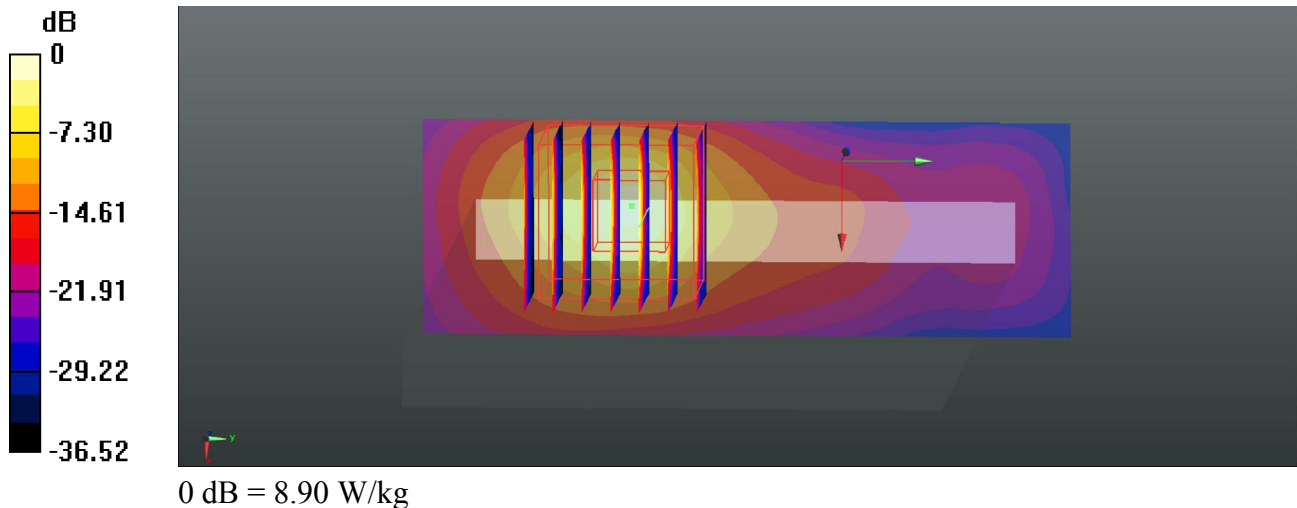
Communication System: UID 0, 802.11a (0); Frequency: 5500 MHz; Duty Cycle: 1:1.047  
Medium: MSL\_5G\_Medium parameters used:  $f = 5500$  MHz;  $\sigma = 5.827$  S/m;  $\epsilon_r = 48.715$ ;  
 $\rho = 1000$  kg/m<sup>3</sup>  
Ambient Temperature : 23.4 °C ; Liquid Temperature : 22.6 °C

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3935; ConvF(4.62, 4.62, 4.62); Calibrated: 2017/12/14;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1358; Calibrated: 2017/10/24
- Phantom: SAM2; Type: QD000P40CD; Serial: TP:1754
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**Ch100/Area Scan (31x91x1):** Interpolated grid: dx=1.000 mm, dy=1.000 mm  
Maximum value of SAR (interpolated) = 6.75 W/kg

**Ch100/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=1.4mm  
Reference Value = 9.692 V/m; Power Drift = 0.16 dB  
Peak SAR (extrapolated) = 18.4 W/kg  
**SAR(1 g) = 2.88 W/kg; SAR(10 g) = 0.574 W/kg**  
Maximum value of SAR (measured) = 8.90 W/kg





## **Appendix C. Supplemental Tuner Head & Body SAR Results**

The results are shown as follows.

Head																																																												
Mode	Service/Modulation	Frequency (MHz)	Channel	RB Size	RB Offset	Test Position	Spacing	Ant	Measured 1g SAR (W/kg)	Average Value of Time Sweep (W/kg)																																																		
										Auto-Tune (State)	0	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204	210	216	222	228	234	240	246	252	258	264	270	276	282	288	294
GSM850	GPRS(4Tx slots)	836.4	189	N/A	N/A	Left Cheek	0 mm	Ant 1	0.243	0.141	0.045	0.134	0.129	0.109	0.074	0.047	0	0.085	0.12	0.086	0.051	0	0	0.047	0.139	0.136	0.092	0.069	0	0	0.079	0.135	0.107	0.076	0	0	0.082	0.129	0.098	0.044	0	0	0	0.082	0.11	0.046	0	0	0	0.132	0.137	0.102	0	0	0	0.132	0.12	0.047	0	
GSM1900	GPRS(4Tx slots)	1850.2	512	N/A	N/A	Right Cheek	0 mm	Ant 1	0.153	0.135	0.051	0.07	0.045	0.092	0.103	0.097	0.064	0.084	0.077	0.086	0.12	0.072	0.075	0.078	0.084	0.103	0.091	0.072	0.07	0.099	0.086	0.101	0.11	0	0.02	0.125	0.023	0.08	0.09	0	0.012	0.063	0.129	0.013	0.127	0.12	0.124	0.1	0.106	0.007	0.008	0.128	0.005	0.05	0.099	0.01	0.05	0.133	0.06	0.011
WCDMA Band V	RMC12.2Kbps	846.6	4233	N/A	N/A	Left Cheek	0 mm	Ant 1	0.259	0.17	0.098	0.132	0.144	0.117	0.091	0.031	0	0.057	0.071	0.073	0.063	0.054	0	0.104	0.15	0.136	0.097	0.071	0	0	0.082	0.098	0.079	0.062	0	0.043	0.114	0.143	0.106	0.077	0.052	0	0.056	0.116	0.1	0.092	0	0	0.08	0.166	0.136	0.066	0.051	0	0	0.065	0.104	0.077	0.051	
WCDMA Band II	RMC12.2Kbps	1852.4	9262	N/A	N/A	Right Cheek	0 mm	Ant 1	0.194	0.166	0.08	0.099	0.109	0.111	0.141	0.15	0.092	0.128	0.138	0.143	0.149	0.15	0.077	0.106	0.125	0.134	0.137	0.147	0.096	0.117	0.125	0.067	0.136	0.16	0.152	0.084	0.11	0.123	0.137	0.158	0.162	0.072	0.139	0.146	0.156	0.153	0.15	0.089	0.104	0.124	0.127	0.14	0.142	0.095	0.11	0.162	0.138	0.148	0.155	
LTE Band 26	15M_QPSK	831.5	26865	1	370Offset	Left Cheek	0 mm	Ant 1	0.254	0.148	0.07	0.118	0.105	0.098	0.06	0.069	0	0.058	0.068	0.065	0.136	0.047	0	0.097	0.09	0.126	0.082	0.05	0.012	0.035	0.029	0.042	0.07	0.016	0	0.054	0.129	0.137	0.043	0.031	0	0	0.05	0.108	0.068	0.034	0.045	0	0.074	0.113	0.116	0.097	0.05	0	0	0.081	0.112	0.107	0.045	
LTE Band 2	20M_QPSK	1880	18900	18B	490Offset	Right Cheek	0 mm	Ant 1	0.185	0.175	0.125	0.127	0.122	0.138	0.147	0.115	0.117	0.141	0.146	0.15	0.119	0.166	0.097	0.121	0.139	0.102	0.149	0.158	0.111	0.137	0.106	0.151	0.161	0.165	0.084	0.087	0.131	0.139	0.148	0.154	0.075	0.132	0.147	0.153	0.155	0.125	0.154	0.113	0.133	0.141	0.056	0.16	0.158	0.123	0.063	0.114	0.154	0.162	0.172	





**Appendix D. DASYS Calibration Certificate**

The DASYS calibration certificates are shown as follows.



In Collaboration with  
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 CALIBRATION LABORATORY



中国认可  
 国际互认  
 校准  
 CALIBRATION  
 CNAS L0570

Add: No.51 Xueyuan Road, Haidian District, Beijing, 100191, China  
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 E-mail: cttl@chinattl.com http://www.chinattl.cn

Client

Sporton\_XA

Certificate No: Z17-97038

## CALIBRATION CERTIFICATE

Object

D835V2 - SN: 4d151

Calibration Procedure(s)

FD-Z11-003-01

Calibration Procedures for dipole validation kits

Calibration date:

March 20, 2017

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(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	27-Jun-16 (CTTL, No.J16X04777)	Jun-17
Power sensor NRP-Z91	101547	27-Jun-16 (CTTL, No.J16X04777)	Jun-17
Reference Probe EX3DV4	SN 3617	23-Jan-17(SPEAG,No.EX3-3617_Jan17)	Jan-18
DAE4	SN 777	22-Aug-16(CTTL-SPEAG,No.Z16-97138)	Aug-17
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	13-Jan-17 (CTTL, No.J17X00286)	Jan-18
Network Analyzer E5071C	MY46110673	13-Jan-17 (CTTL, No.J17X00285)	Jan-18

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: March 24, 2017

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



In Collaboration with

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CALIBRATION LABORATORY

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E-mail: cttl@chinattl.com http://www.chinattl.cn

### Glossary:

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

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005
- IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

### Additional Documentation:

- DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

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

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



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### Measurement Conditions

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

DASY Version	DASY52	52.8.8.1258
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

### Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	41.0 ± 6 %	0.89 mho/m ± 6 %
Head TSL temperature change during test	<1.0 °C	---	---

### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.41 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.73 mW / g ± 20.8 % (k=2)
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	1.57 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.33 mW / g ± 20.4 % (k=2)

### Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.6 ± 6 %	0.96 mho/m ± 6 %
Body TSL temperature change during test	<1.0 °C	---	---

### SAR result with Body TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.41 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	9.72 mW / g ± 20.8 % (k=2)
SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	1.60 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	6.44 mW / g ± 20.4 % (k=2)



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### Appendix (Additional assessments outside the scope of CNAS L0570)

#### Antenna Parameters with Head TSL

Impedance, transformed to feed point	48.2Ω- 3.30jΩ
Return Loss	- 28.3dB

#### Antenna Parameters with Body TSL

Impedance, transformed to feed point	46.0Ω- 3.06jΩ
Return Loss	- 25.6dB

#### General Antenna Parameters and Design

Electrical Delay (one direction)	1.474 ns
----------------------------------	----------

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

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

#### Additional EUT Data

Manufactured by	SPEAG
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### DASY5 Validation Report for Head TSL

Date: 03.20.2017

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d151**

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

Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.886$  S/m;  $\epsilon_r = 40.96$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.73, 9.73, 9.73); Calibrated: 1/23/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/22/2016
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

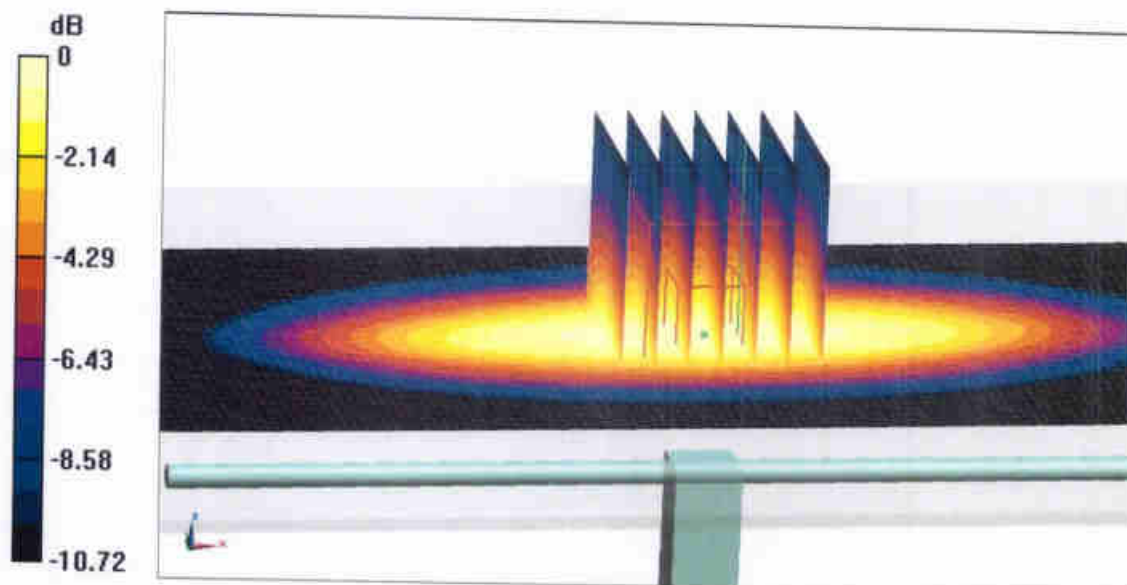
**Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 59.22V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 3.68 W/kg

**SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.57 W/kg**

Maximum value of SAR (measured) = 3.24 W/kg

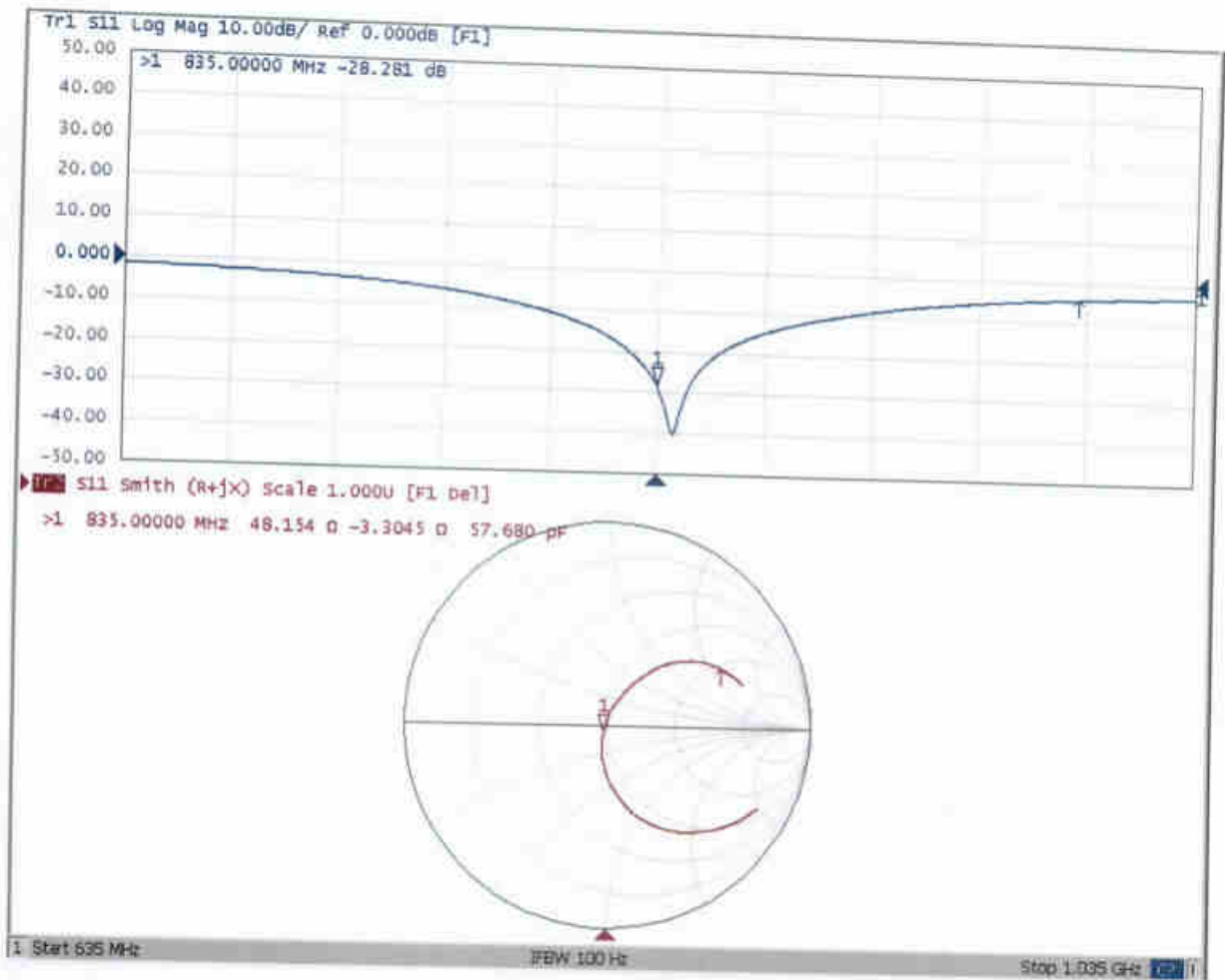


0 dB = 3.24 W/kg = 5.11 dBW/kg



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### Impedance Measurement Plot for Head TSL





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### DASY5 Validation Report for Body TSL

Date: 03.20.2017

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 4d151**

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

Medium parameters used:  $f = 835$  MHz;  $\sigma = 0.962$  S/m;  $\epsilon_r = 55.58$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(9.64,9.64, 9.64); Calibrated: 1/23/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/22/2016
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

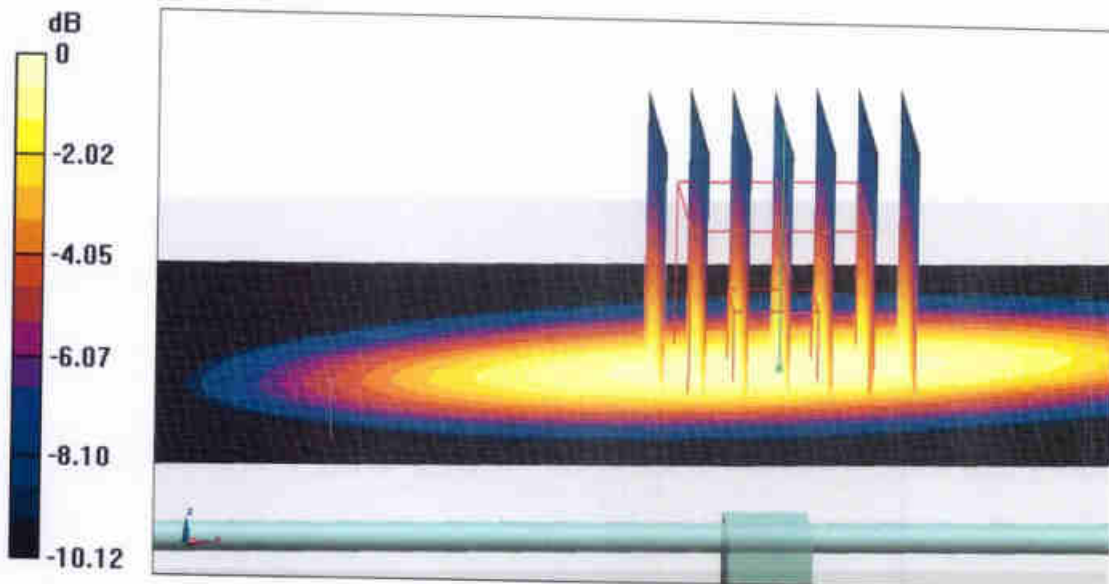
**Dipole Calibration/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.67 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 3.50 W/kg

**SAR(1 g) = 2.41 W/kg; SAR(10 g) = 1.6 W/kg**

Maximum value of SAR (measured) = 3.03 W/kg

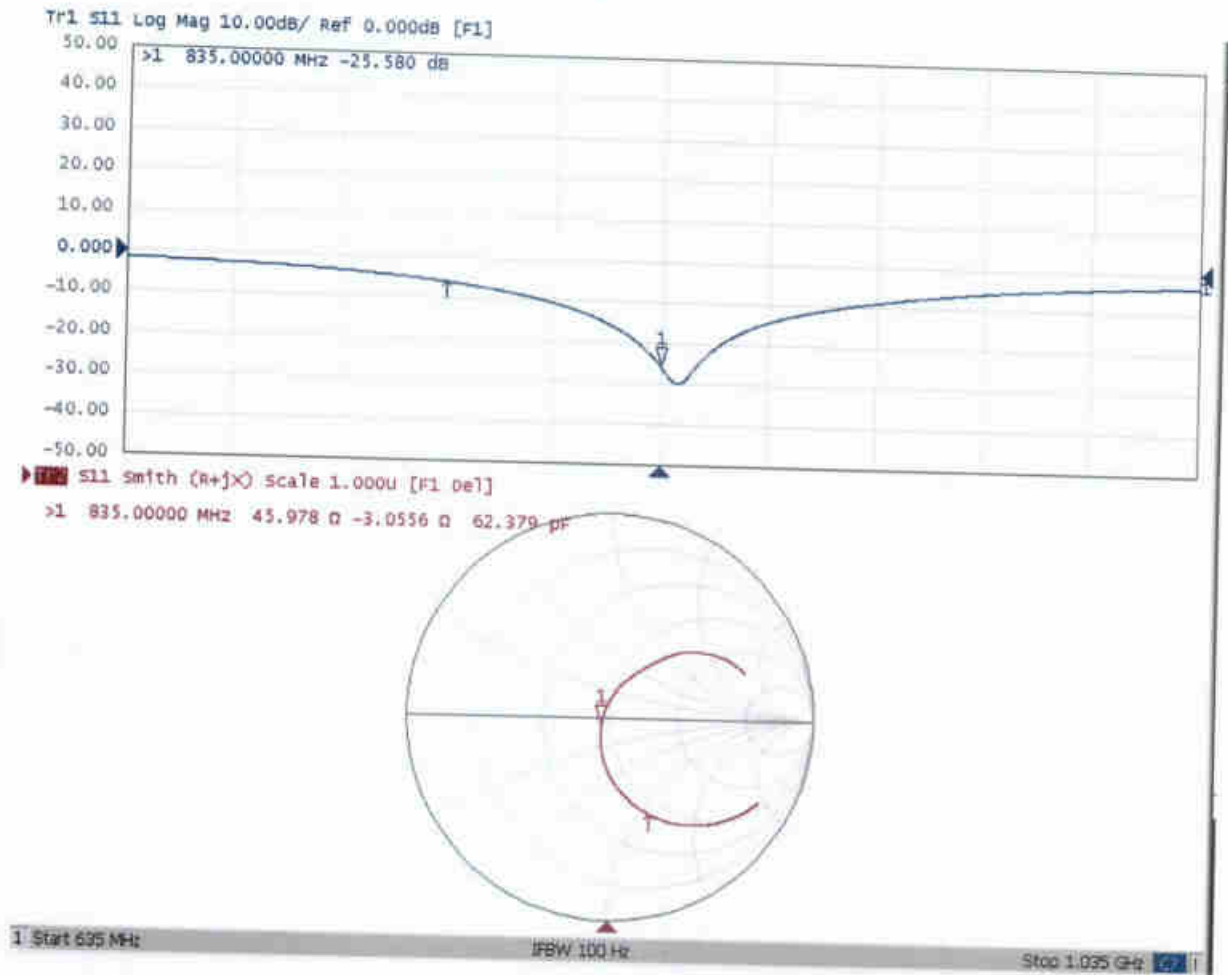


0 dB = 3.03 W/kg = 4.81 dBW/kg



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### Impedance Measurement Plot for Body TSL





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Client **Sporton\_XA**

Certificate No: **Z17-97041**

## CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 5d170**

Calibration Procedure(s) **FD-Z11-003-01**  
**Calibration Procedures for dipole validation kits**

Calibration date: **March 22, 2017**

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(Calibrated by, Certificate No.)	Scheduled Calibration
Power Meter NRP2	101919	27-Jun-16 (CTTL, No.J16X04777)	Jun-17
Power sensor NRP-Z91	101547	27-Jun-16 (CTTL, No.J16X04777)	Jun-17
Reference Probe EX3DV4	SN 3617	23-Jan-17(SPEAG,No.EX3-3617_Jan17)	Jan-18
DAE4	SN 777	22-Aug-16(CTTL-SPEAG,No.Z16-97138)	Aug-17
Secondary Standards	ID #	Cal Date(Calibrated by, Certificate No.)	Scheduled Calibration
Signal Generator E4438C	MY49071430	13-Jan-17 (CTTL, No.J17X00286)	Jan-18
Network Analyzer E5071C	MY46110673	13-Jan-17 (CTTL, No.J17X00285)	Jan-18

	Name	Function	Signature
Calibrated by:	Zhao Jing	SAR Test Engineer	
Reviewed by:	Qi Dianyuan	SAR Project Leader	
Approved by:	Lu Bingsong	Deputy Director of the laboratory	

Issued: March 25, 2017

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



### Glossary:

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

### Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", June 2013
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) For hand-held devices used in close proximity to the ear (frequency range of 300MHz to 3GHz)", February 2005
- IEC 62209-2, "Procedure to measure the Specific Absorption Rate (SAR) For wireless communication devices used in close proximity to the human body (frequency range of 30MHz to 6GHz)", March 2010
- KDB865664, SAR Measurement Requirements for 100 MHz to 6 GHz

### Additional Documentation:

- DASY4/5 System Handbook

### Methods Applied and Interpretation of Parameters:

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

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



### Measurement Conditions

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

DASY Version	DASY52	52.8.8.1258
Extrapolation	Advanced Extrapolation	
Phantom	Triple Flat Phantom 5.1C	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz $\pm$ 1 MHz	

### Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	39.9 $\pm$ 6 %	1.38 mho/m $\pm$ 6 %
Head TSL temperature change during test	<1.0 °C	---	---

### SAR result with Head TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.89mW / g
SAR for nominal Head TSL parameters	normalized to 1W	40.0 mW / g $\pm$ 20.8 % (k=2)
SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	Condition	
SAR measured	250 mW input power	5.15 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	20.7 mW / g $\pm$ 20.4 % (k=2)

### Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 $\pm$ 0.2) °C	53.6 $\pm$ 6 %	1.53 mho/m $\pm$ 6 %
Body TSL temperature change during test	<1.0 °C	---	---

### SAR result with Body TSL

SAR averaged over 1 cm <sup>3</sup> (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.2 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	40.7 mW / g $\pm$ 20.8 % (k=2)
SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	Condition	
SAR measured	250 mW input power	5.37 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	21.4 mW / g $\pm$ 20.4 % (k=2)



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## Appendix (Additional assessments outside the scope of CNAS L0570)

### Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.5Ω+ 5.31jΩ
Return Loss	- 25.3dB

### Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.2Ω+ 5.61jΩ
Return Loss	- 24.9dB

### General Antenna Parameters and Design

Electrical Delay (one direction)	1,307 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

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### DASY5 Validation Report for Head TSL

Date: 03.22.2017

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d170**

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.376$  S/m;  $\epsilon_r = 39.92$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

#### DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(8.26, 8.26, 8.26); Calibrated: 1/23/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/22/2016
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0:** Measurement grid:

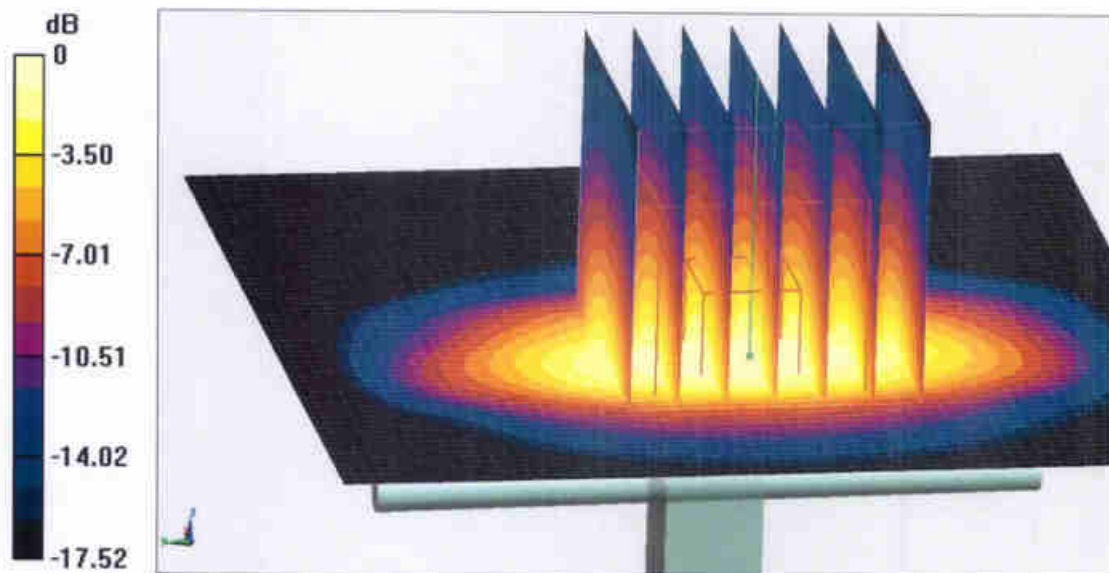
$dx=5$ mm,  $dy=5$ mm,  $dz=5$ mm

Reference Value = 90.60 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 18.7 W/kg

**SAR(1 g) = 9.89 W/kg; SAR(10 g) = 5.15 W/kg**

Maximum value of SAR (measured) = 15.5 W/kg

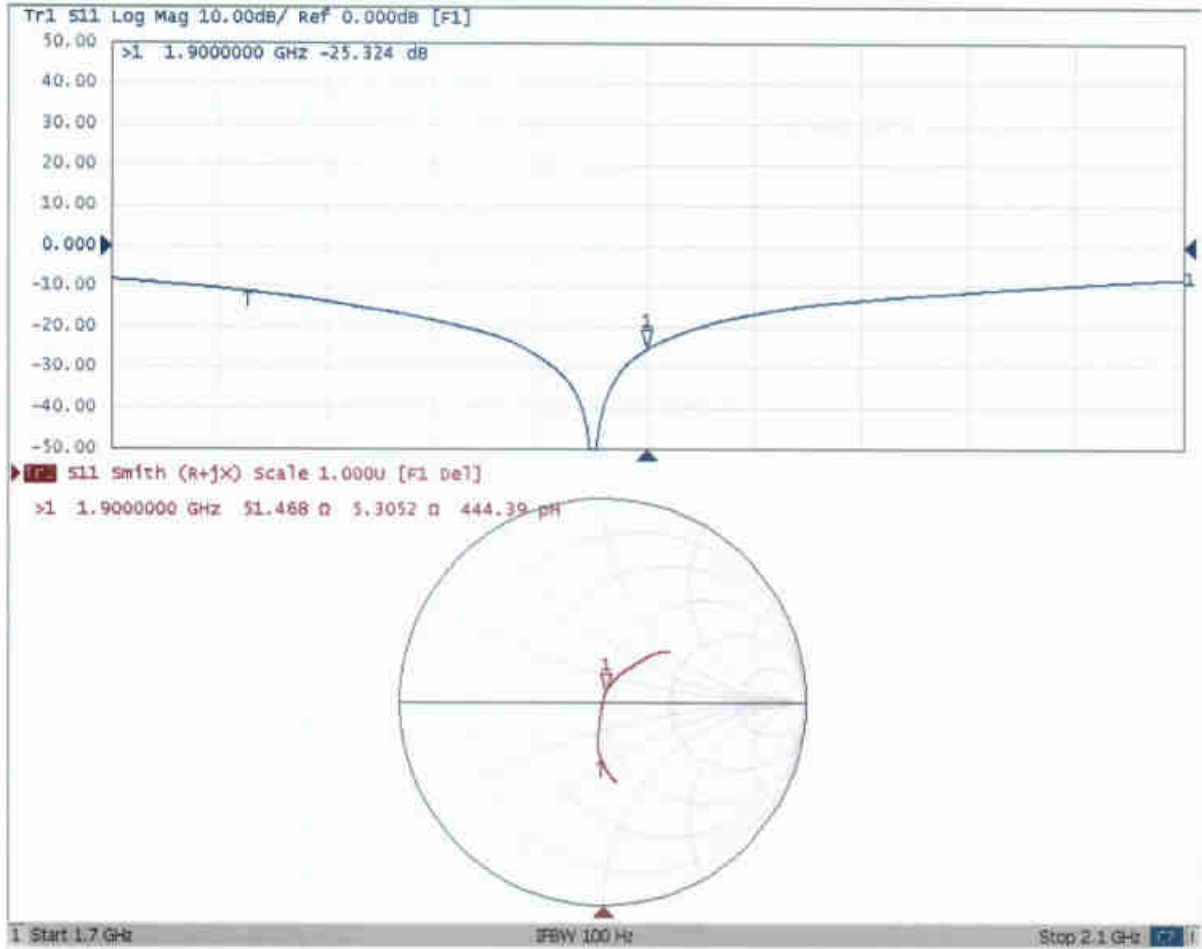


0 dB = 15.5 W/kg = 11.90 dBW/kg



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### Impedance Measurement Plot for Head TSL





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**DASY5 Validation Report for Body TSL**

Date: 03.22.2017

Test Laboratory: CTTL, Beijing, China

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 5d170**

Communication System: UID 0, CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.532$  S/m;  $\epsilon_r = 53.62$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Center Section

Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: EX3DV4 - SN3617; ConvF(7.95, 7.95, 7.95); Calibrated: 1/23/2017;
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn777; Calibrated: 8/22/2016
- Phantom: Triple Flat Phantom 5.1C; Type: QD 000 P51 CA; Serial: 1161/1
- Measurement SW: DASY52, Version 52.8 (8); SEMCAD X Version 14.6.10 (7372)

**System Performance Check/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid:**

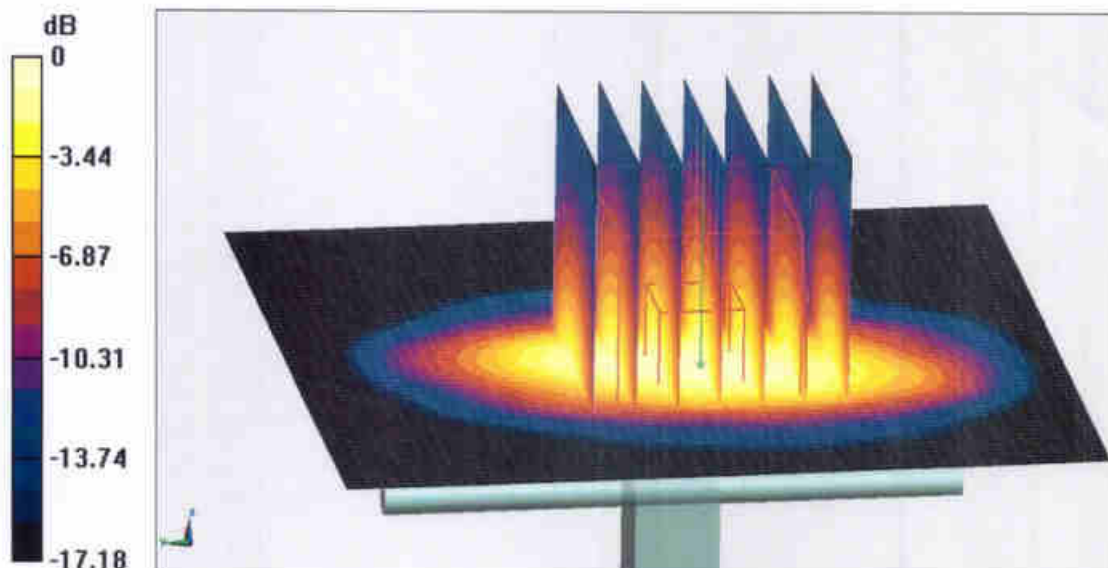
$dx=5$ mm,  $dy=5$ mm,  $dz=5$ mm

Reference Value = 97.75 V/m; Power Drift = 0.05 dB

Peak SAR (extrapolated) = 18.3 W/kg

**SAR(1 g) = 10.2 W/kg; SAR(10 g) = 5.37 W/kg**

Maximum value of SAR (measured) = 15.5 W/kg



**0 dB = 15.5 W/kg = 11.90 dBW/kg**



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### Impedance Measurement Plot for Body TSL

