

## 20131002\_System Check\_Dipole2450V2 SN728

Frequency: 2450 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C

Medium parameters used (interpolated):  $f = 2450$  MHz;  $\sigma = 1.94$  mho/m;  $\epsilon_r = 54.1$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3898; ConvF(7.17, 7.17, 7.17); Calibrated: 1/14/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Body/Pin=100mW, d=10mm/Area Scan (8x9x1):** Measurement grid: dx=15mm, dy=15mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 4.77 mW/g

**Body/Pin=100mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

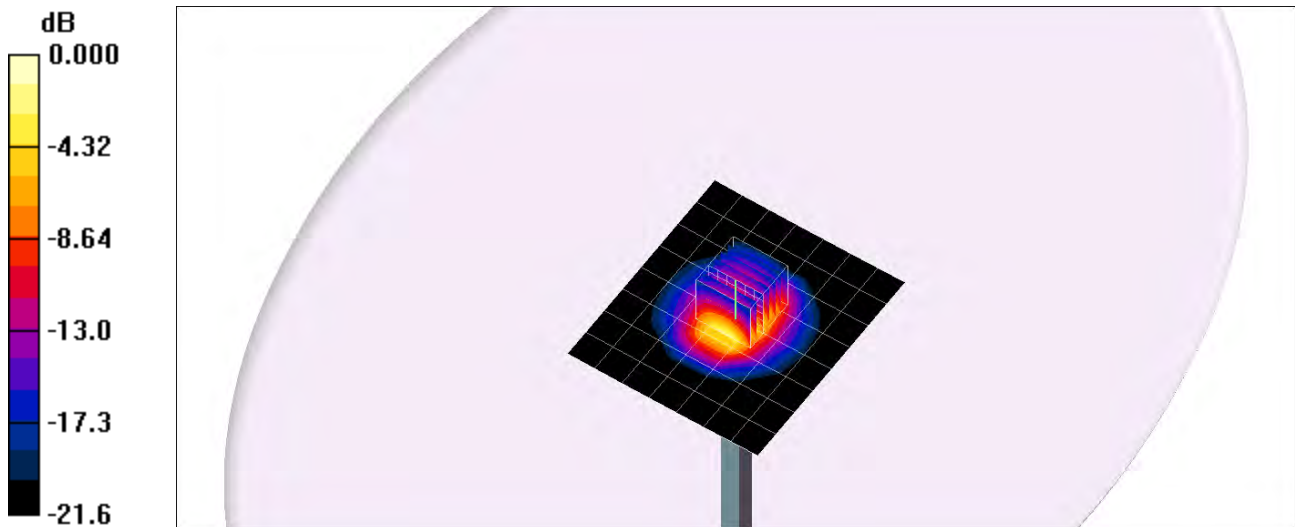
Reference Value = 63.2 V/m; Power Drift = -0.007 dB

Peak SAR (extrapolated) = 10.2 W/kg

**SAR(1 g) = 5.07 mW/g; SAR(10 g) = 2.4 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 7.56 mW/g



0 dB = 7.56mW/g

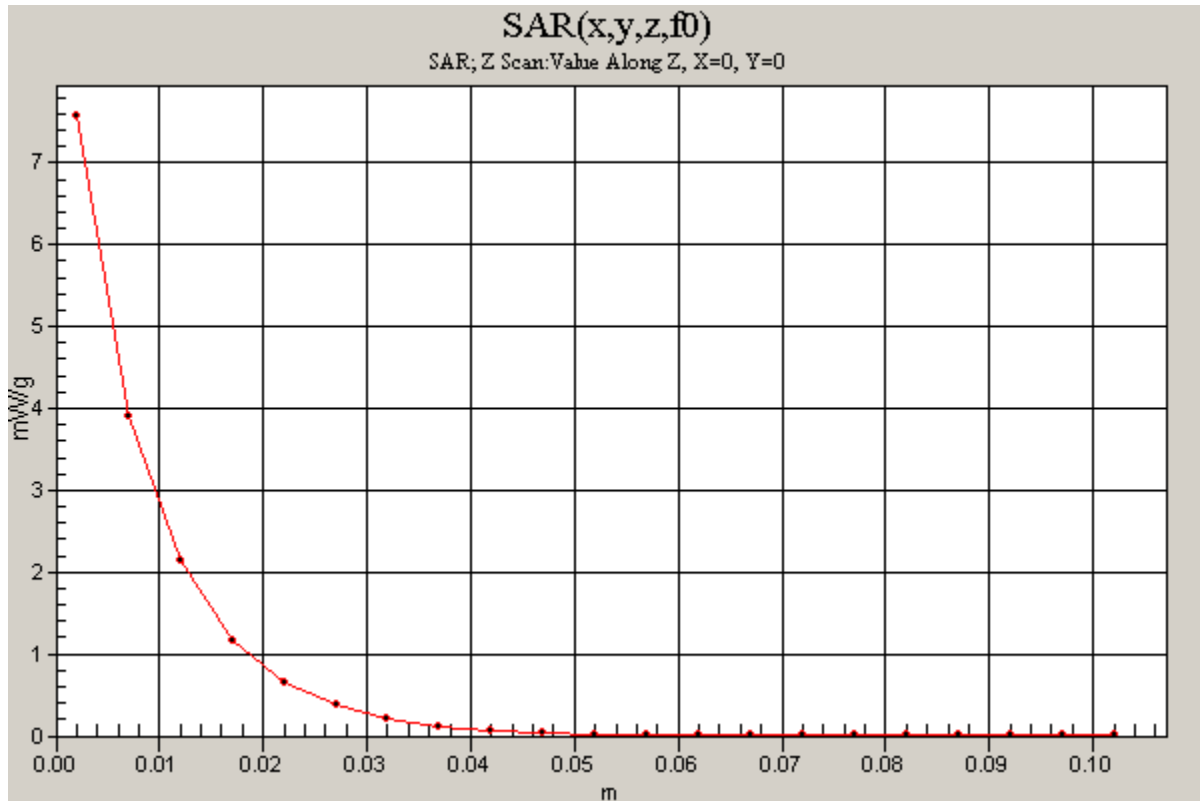
## 20131002\_System Check\_Dipole2450V2 SN728

Frequency: 2450 MHz; Duty Cycle: 1:1

**Body/Pin=100mW, d=10mm/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 7.57 mW/g



## 20131004\_System Check\_Dipole5GHzV2 SN1004

Frequency: 5200 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 5200$  MHz;  $\sigma = 5.19$  mho/m;  $\epsilon_r = 49.4$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(4.02, 4.02, 4.02); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Body/Pin=100mW, d=10mm, 5200MHz/Area Scan (9x9x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 14.6 mW/g

**Body/Pin=100mW, d=10mm, 5200MHz/Zoom Scan (7x7x12)/Cube 0:** Measurement grid:

dx=4mm, dy=4mm, dz=2mm

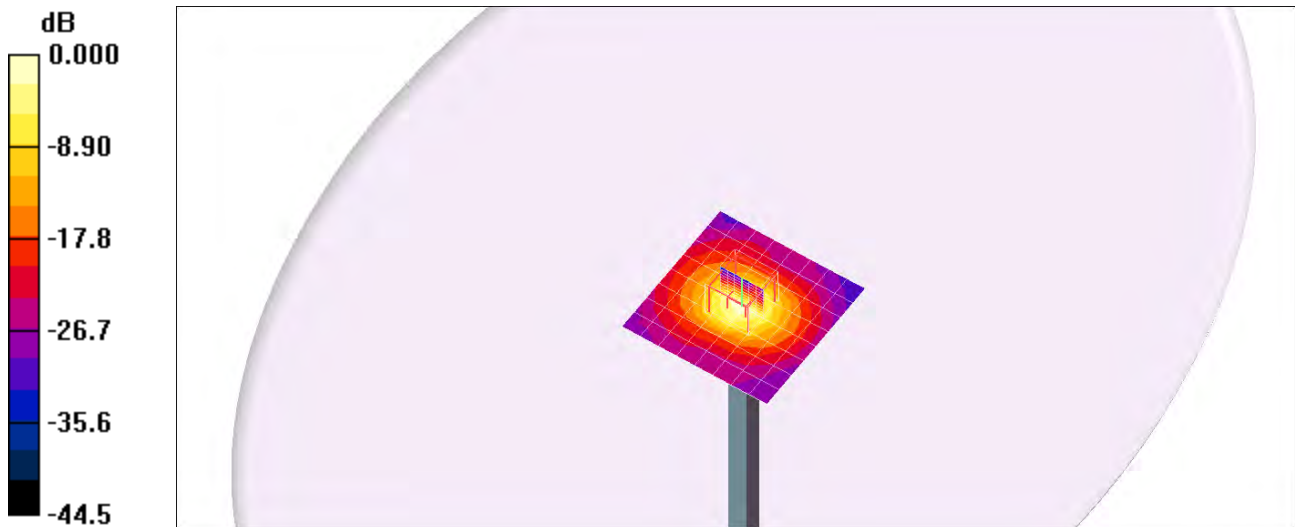
Reference Value = 56.9 V/m; Power Drift = -0.063 dB

Peak SAR (extrapolated) = 30.3 W/kg

**SAR(1 g) = 7.02 mW/g; SAR(10 g) = 1.99 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 14.7 mW/g



0 dB = 14.7mW/g

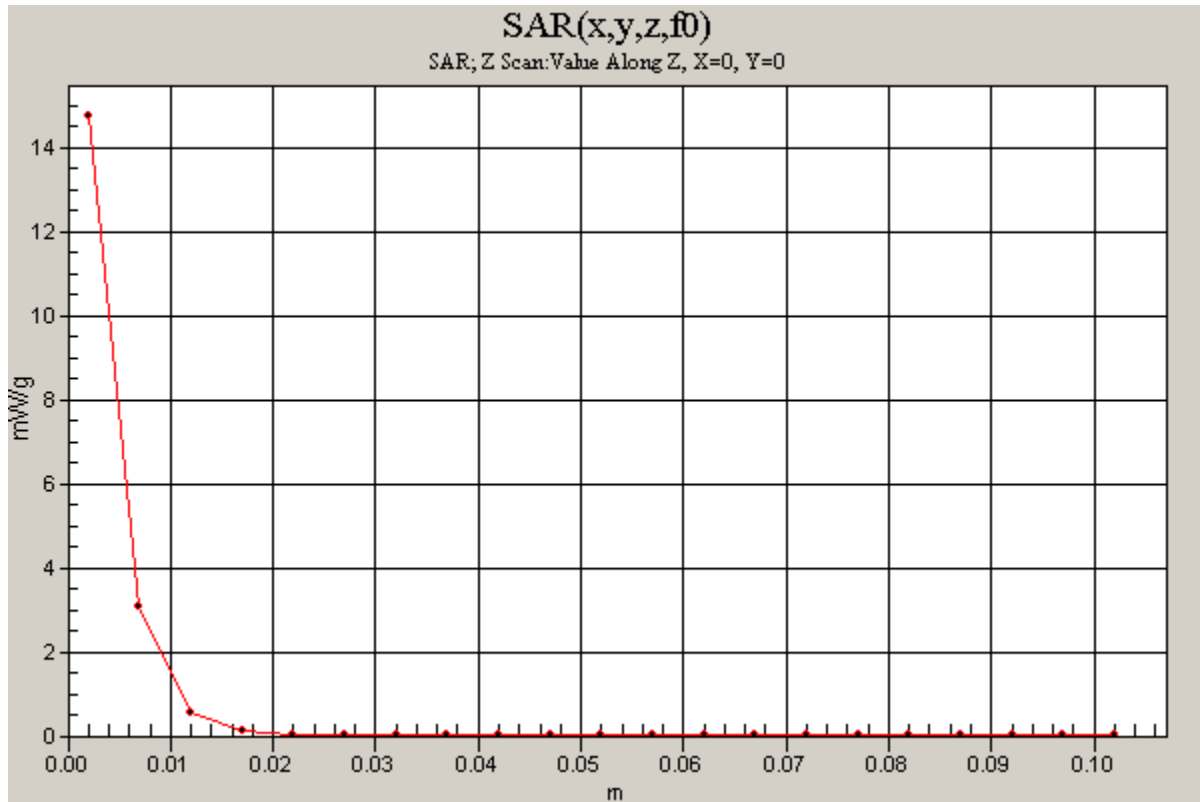
## 20131004\_System Check\_Dipole5GHzV2 SN1004

Frequency: 5200 MHz; Duty Cycle: 1:1

**Body/Pin=100mW, d=10mm, 5200MHz/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 14.7 mW/g



## 20131004\_System Check\_Dipole5GHzV2 SN1004

Frequency: 5300 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used:  $f = 5300.2$  MHz;  $\sigma = 5.31$  mho/m;  $\epsilon_r = 49.3$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.82, 3.82, 3.82); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Body/Pin=100mW, d=10mm, 5300MHz/Area Scan (9x9x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 15.4 mW/g

**Body/Pin=100mW, d=10mm, 5300MHz/Zoom Scan (7x7x12)/Cube 0:** Measurement grid:

dx=4mm, dy=4mm, dz=2mm

Reference Value = 57.8 V/m; Power Drift = -0.068 dB

Peak SAR (extrapolated) = 32.2 W/kg

**SAR(1 g) = 7.36 mW/g; SAR(10 g) = 2.09 mW/g**

Maximum value of SAR (measured) = 15.6 mW/g



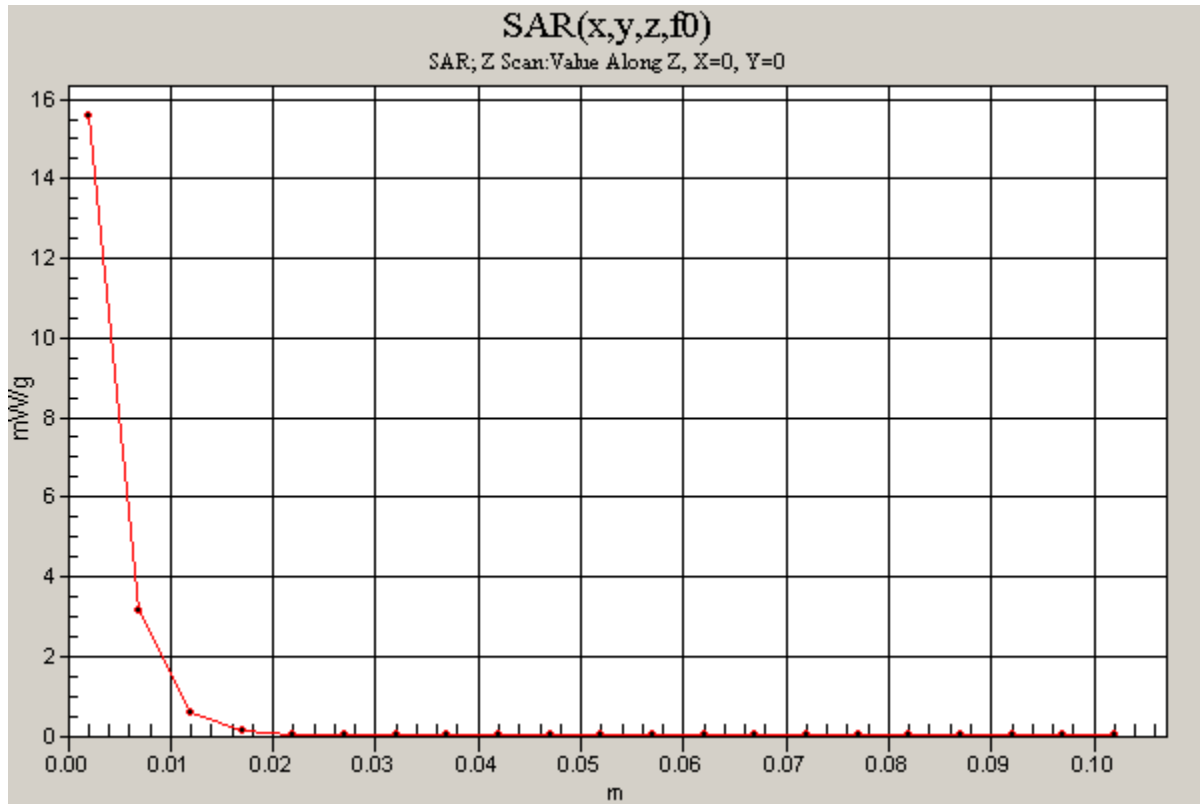
0 dB = 15.6mW/g

### 20131004\_System Check\_Dipole5GHzV2 SN1004

Frequency: 5300 MHz; Duty Cycle: 1:1

**Body/Pin=100mW, d=10mm, 5300MHz/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 15.6 mW/g



## 20131007\_System Check\_Dipole5GHzV2 SN1004

Frequency: 5600 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used:  $f = 5600.5$  MHz;  $\sigma = 5.74$  mho/m;  $\epsilon_r = 49$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.27, 3.27, 3.27); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Body/Pin=100mW, d=10mm, 5600MHz/Area Scan (9x9x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 16.6 mW/g

**Body/Pin=100mW, d=10mm, 5600MHz/Zoom Scan (7x7x12)/Cube 0:** Measurement grid:

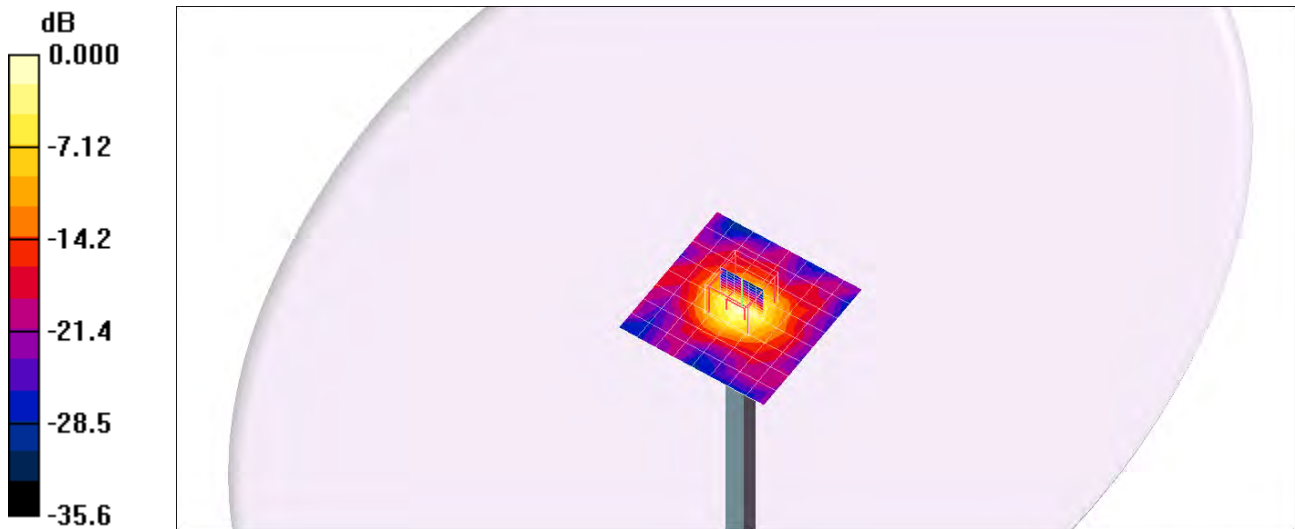
dx=4mm, dy=4mm, dz=2mm

Reference Value = 59.1 V/m; Power Drift = -0.036 dB

Peak SAR (extrapolated) = 33.5 W/kg

**SAR(1 g) = 7.77 mW/g; SAR(10 g) = 2.22 mW/g**

Maximum value of SAR (measured) = 16.8 mW/g



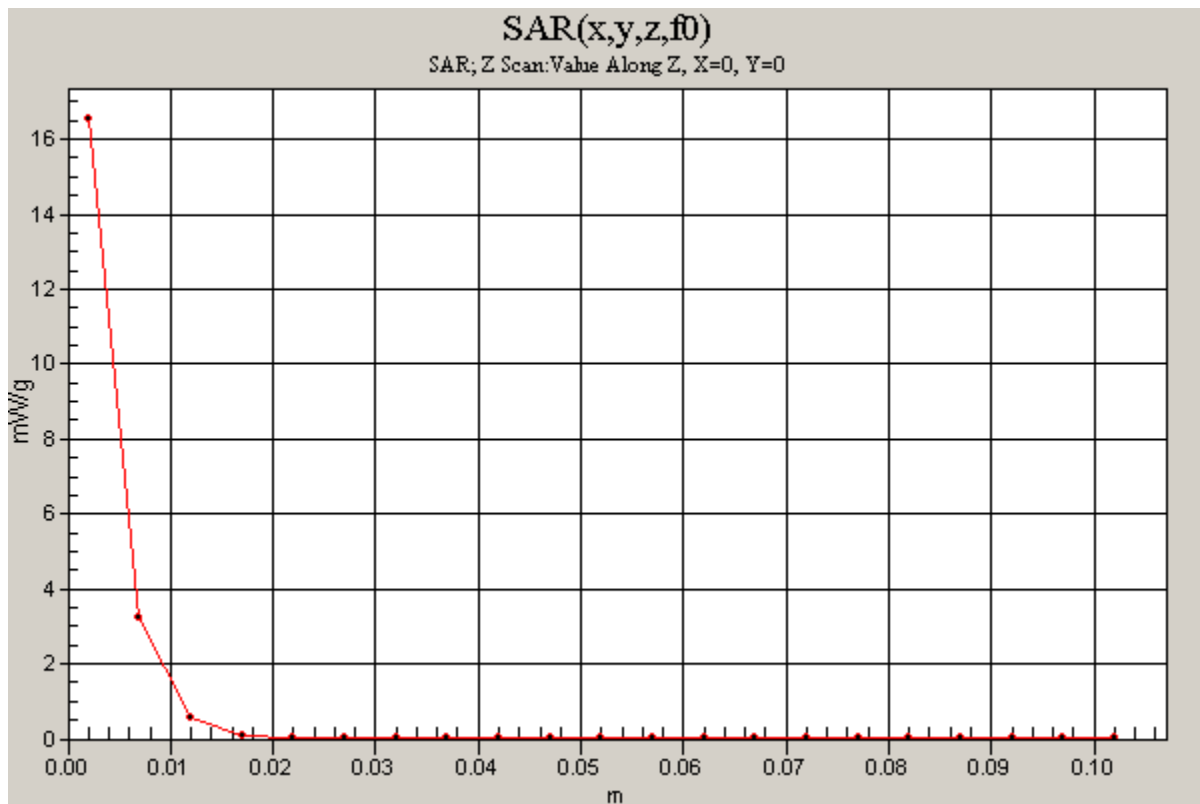
0 dB = 16.8mW/g

### 20131007\_System Check\_Dipole5GHzV2 SN1004

Frequency: 5600 MHz; Duty Cycle: 1:1

**Body/Pin=100mW, d=10mm, 5600MHz/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 16.5 mW/g





## 20131008\_System Check\_Dipole5GHzV2 SN1004

Frequency: 5800 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 5800$  MHz;  $\sigma = 6.02$  mho/m;  $\epsilon_r = 47.4$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.53, 3.53, 3.53); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Body/Pin=100mW, d=10mm, 5800MHz/Area Scan (9x9x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 16.9 mW/g

**Body/Pin=100mW, d=10mm, 5800MHz/Zoom Scan (7x7x12)/Cube 0:** Measurement grid:

dx=4mm, dy=4mm, dz=2mm

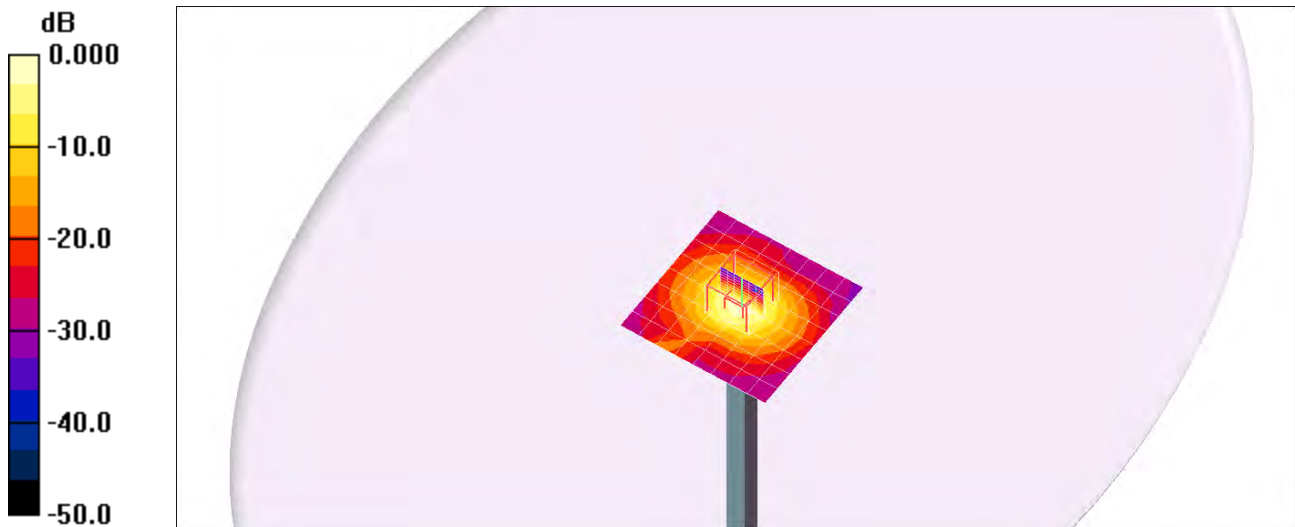
Reference Value = 58.1 V/m; Power Drift = -0.105 dB

Peak SAR (extrapolated) = 33.5 W/kg

**SAR(1 g) = 7.28 mW/g; SAR(10 g) = 2.04 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 15.7 mW/g



0 dB = 15.7mW/g

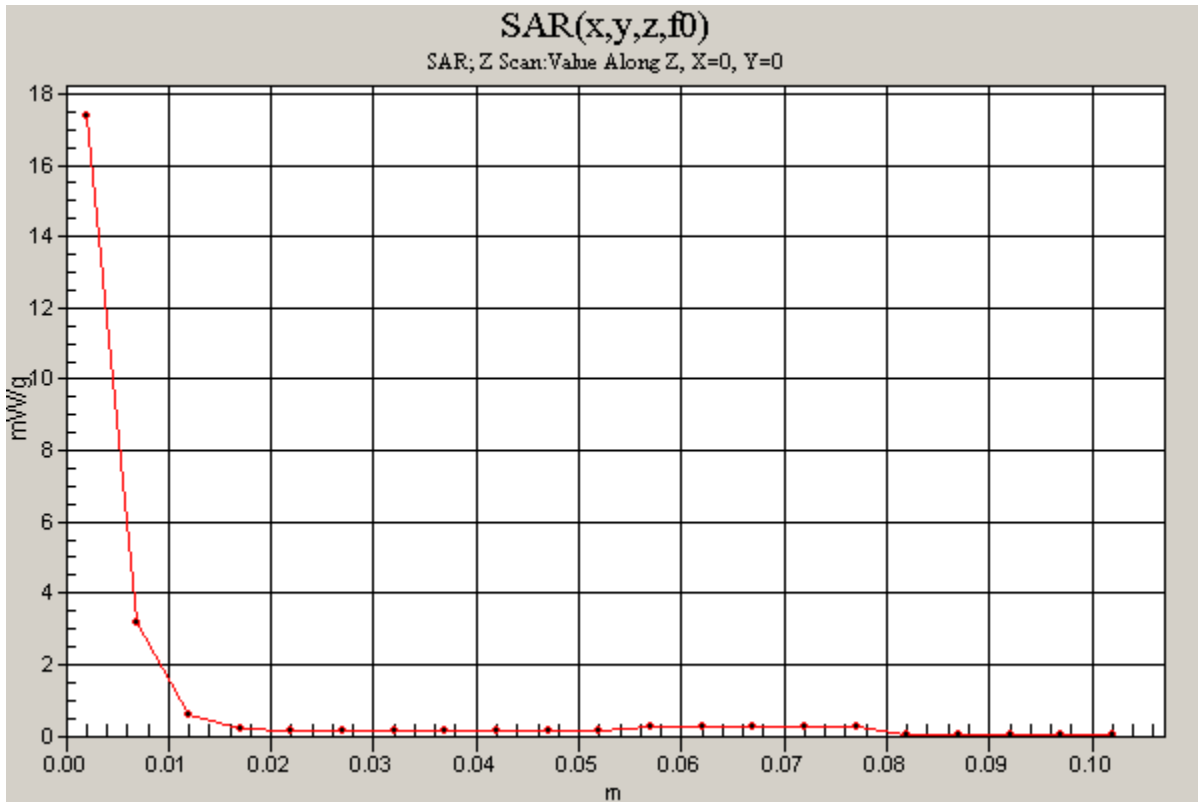
## 20131008\_System Check\_Dipole5GHzV2 SN1004

Frequency: 5800 MHz; Duty Cycle: 1:1

**Body/Pin=100mW, d=10mm, 5800MHz/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 17.4 mW/g



## WiFi 2.4GHz Band

Frequency: 2437 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C

Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 1.92$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3898; ConvF(7.17, 7.17, 7.17); Calibrated: 1/14/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Main Ant./802.11b/CH6/Area Scan (7x10x1):** Measurement grid: dx=12mm, dy=12mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.657 mW/g

**Rear Touch/Main Ant./802.11b/CH6/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

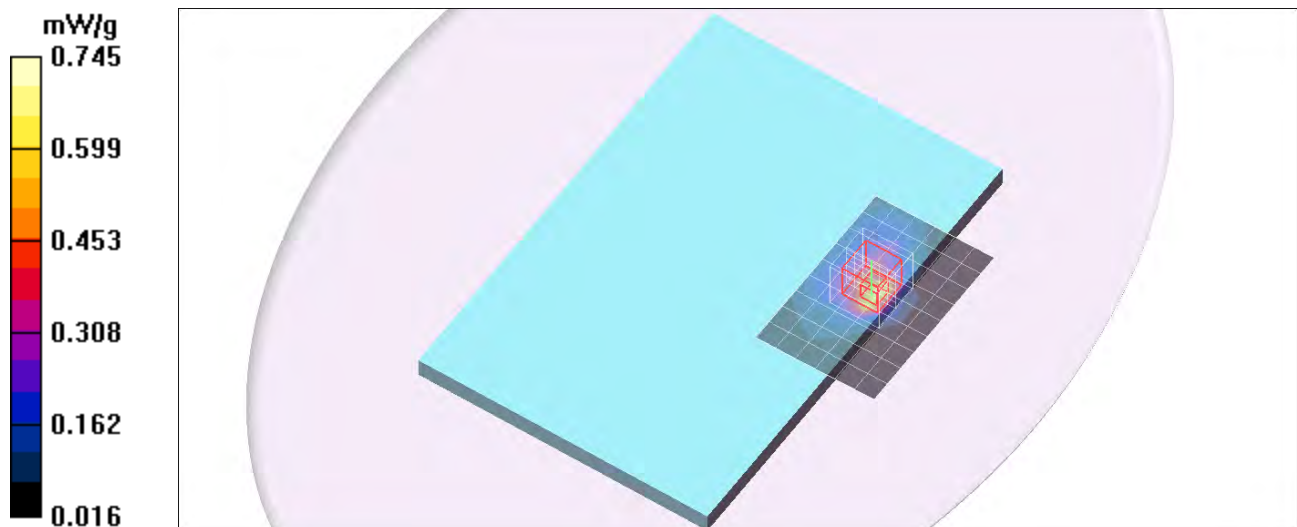
Reference Value = 1.48 V/m; Power Drift = 0.053 dB

Peak SAR (extrapolated) = 1.04 W/kg

**SAR(1 g) = 0.485 mW/g; SAR(10 g) = 0.239 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.745 mW/g



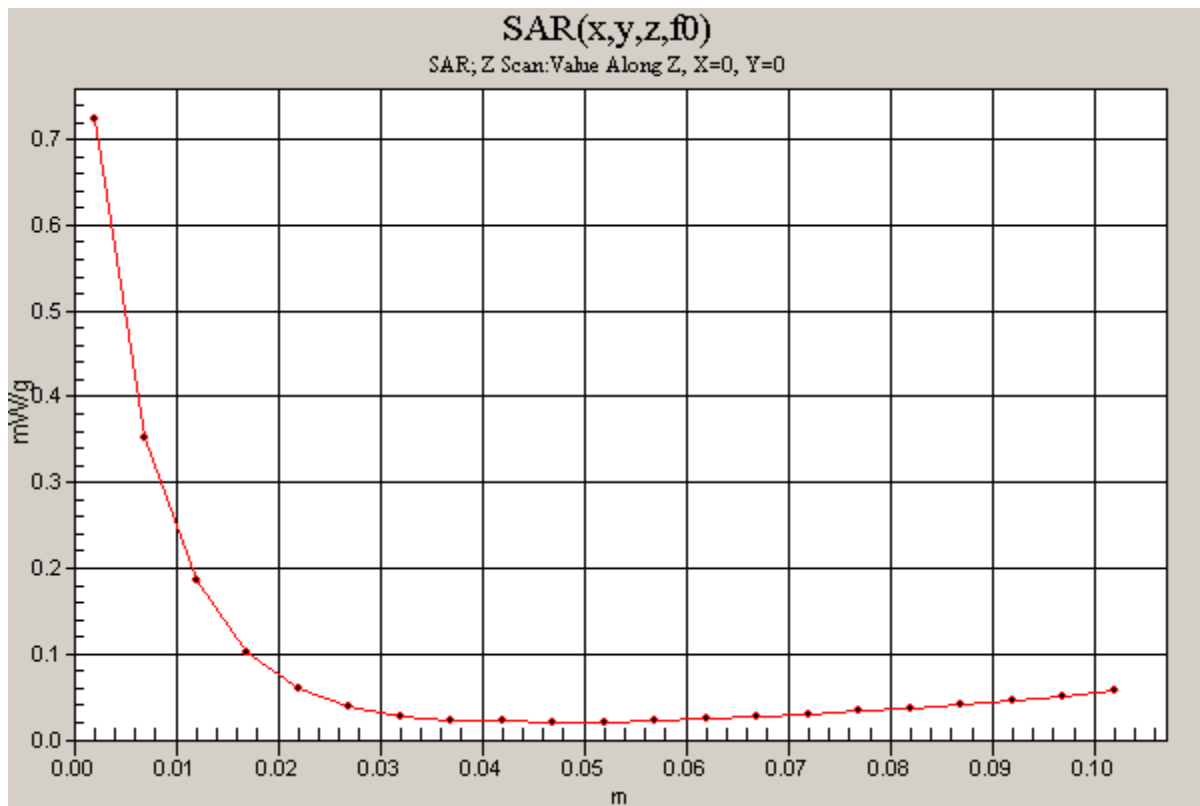
## WiFi 2.4GHz Band 802.11b Rear

Frequency: 2437 MHz; Duty Cycle: 1:1

**Rear Touch/Chain 0 Antenna/802.11b/CH6/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.725 mW/g



## WiFi 2.4GHz Band

Frequency: 2437 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.0°C; Liquid Temperature: 23.0°C

Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 1.92$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3898; ConvF(7.17, 7.17, 7.17); Calibrated: 1/14/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Main Ant./802.11b/CH6/6200mAh/Area Scan (7x10x1):** Measurement grid: dx=12mm, dy=12mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.459 mW/g

**Rear Touch/Main Ant./802.11b/CH6/Zoom Scan (7x7x7)/Cube 0:** Measurement grid: dx=5mm, dy=5mm, dz=5mm

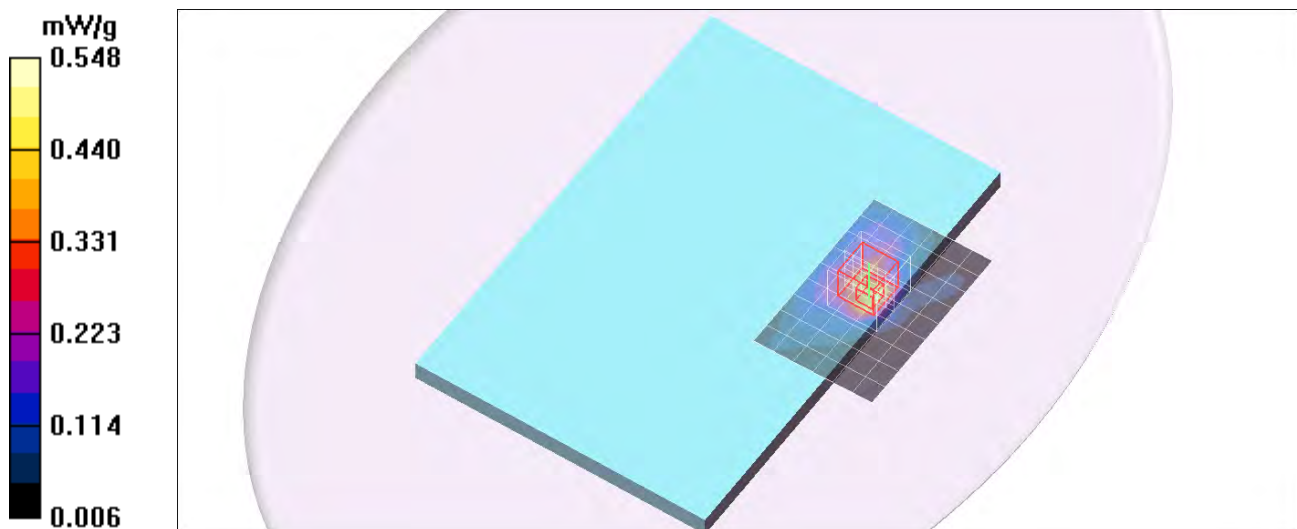
Reference Value = 2.12 V/m; Power Drift = 0.089 dB

Peak SAR (extrapolated) = 0.742 W/kg

**SAR(1 g) = 0.371 mW/g; SAR(10 g) = 0.197 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.548 mW/g



## WiFi 2.4GHz Band

Frequency: 2437 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 2437$  MHz;  $\sigma = 1.92$  mho/m;  $\epsilon_r = 54.2$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3898; ConvF(7.17, 7.17, 7.17); Calibrated: 1/14/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

### Edge1 Touch/Main Ant./802.11b/CH6 with adapter/Area Scan (7x10x1): Measurement grid:

dx=12mm, dy=12mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.425 mW/g

### Edge1 Touch/Chain 0 Antenna/802.11b/CH6 with adapter/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm

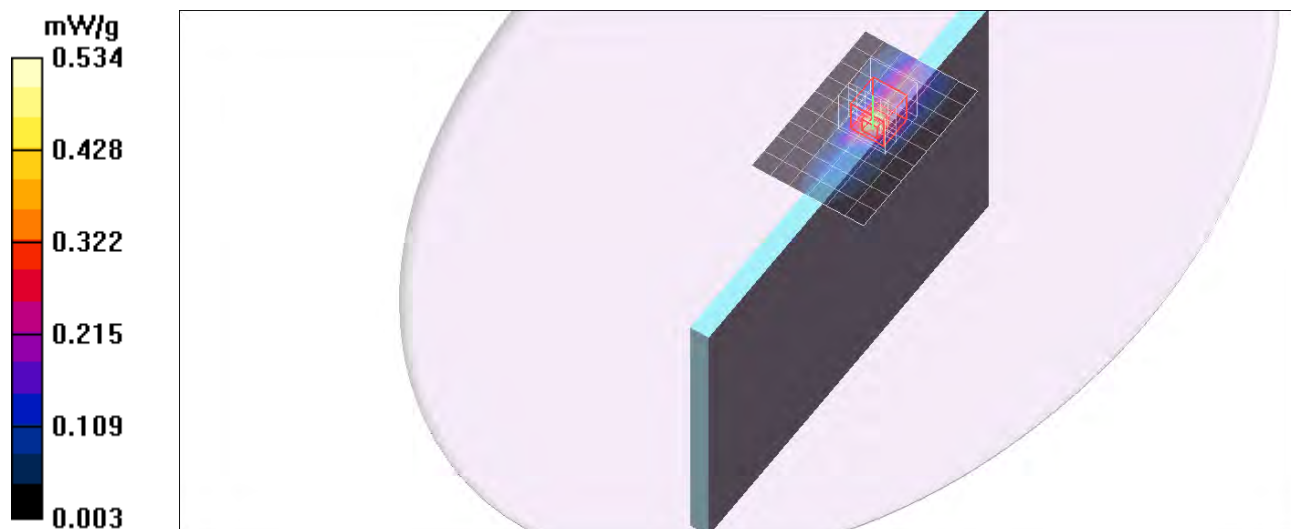
Reference Value = 8.30 V/m; Power Drift = -0.086 dB

Peak SAR (extrapolated) = 0.743 W/kg

**SAR(1 g) = 0.336 mW/g; SAR(10 g) = 0.149 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.534 mW/g



## WiFi 5.2GHz Band

Frequency: 5180 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 5180$  MHz;  $\sigma = 5.18$  mho/m;  $\epsilon_r = 49.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(4.02, 4.02, 4.02); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH36/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.20 mW/g

**Rear Touch/Aux Ant./802.11a/CH36/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.02 V/m; Power Drift = 0.160 dB

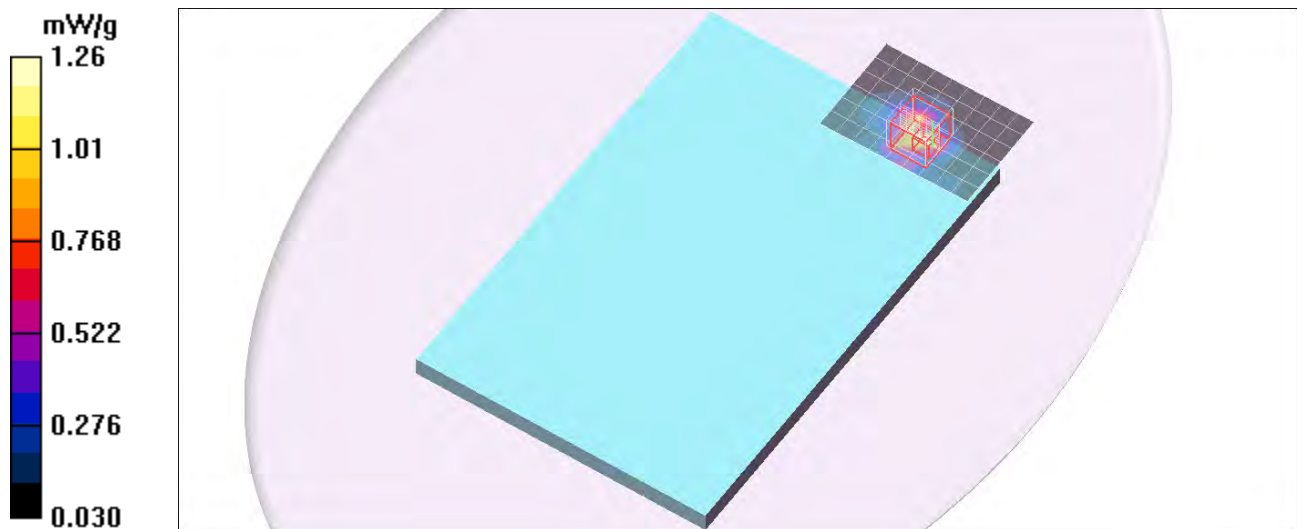
Peak SAR (extrapolated) = 3.39 W/kg

Peak SAR (extrapolated) = 3.39 W/kg

**SAR(1 g) = 0.770 mW/g; SAR(10 g) = 0.258 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.26 mW/g



## WiFi 5.2GHz Band

Frequency: 5220 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 5220$  MHz;  $\sigma = 5.22$  mho/m;  $\epsilon_r = 49.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(4.02, 4.02, 4.02); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH44/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.45 mW/g

**Rear Touch/Aux Ant./802.11a/CH44/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.11 V/m; Power Drift = 0.104 dB

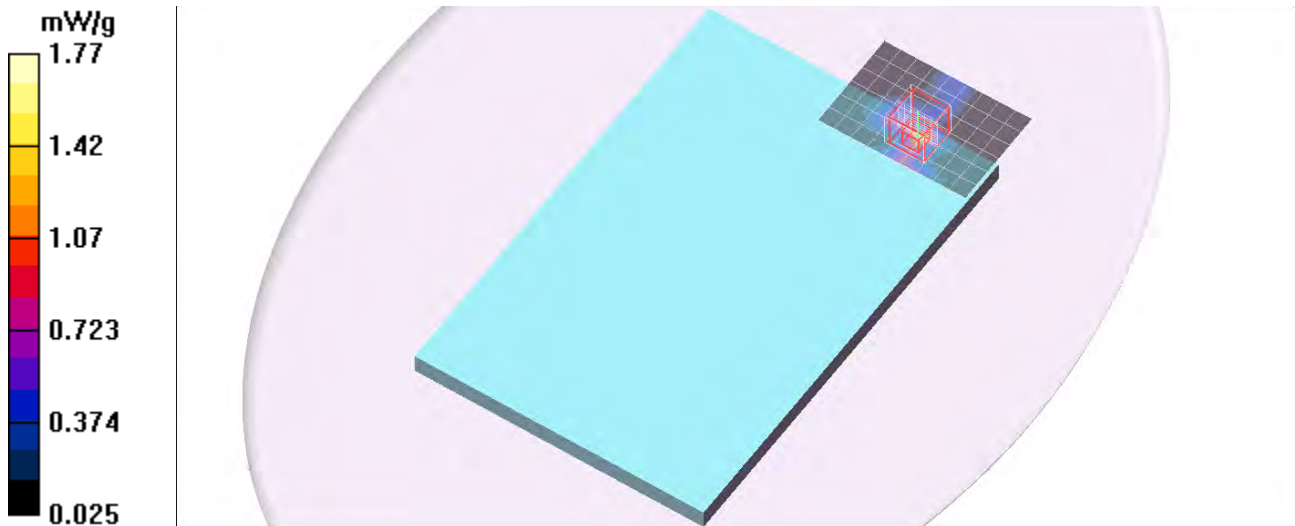
Peak SAR (extrapolated) = 3.73 W/kg

Peak SAR (extrapolated) = 3.73 W/kg

**SAR(1 g) = 0.781 mW/g; SAR(10 g) = 0.354 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.77 mW/g





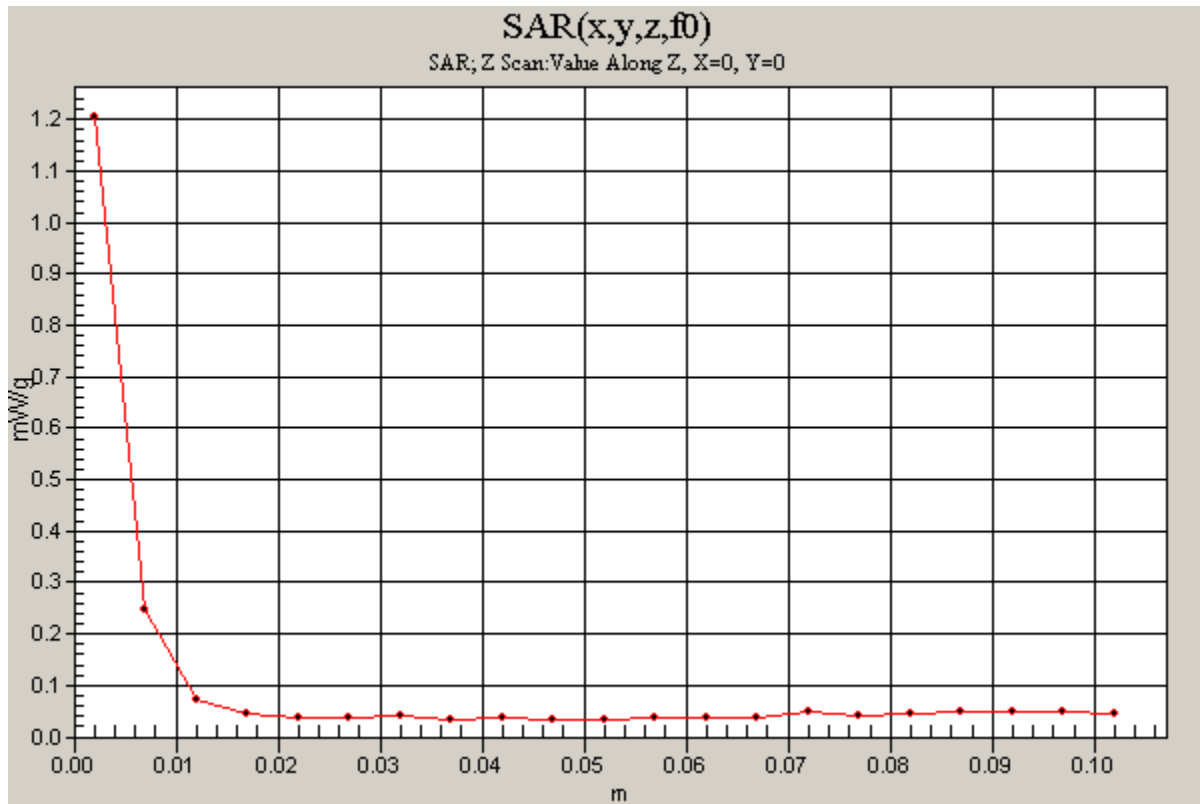
## WiFi 5.2GHz Band

Frequency: 5220 MHz Frequency: 5180 MHz; Duty Cycle: 1:1

**Rear Touch/Aux Ant./802.11a/CH44/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.55 mW/g



## WiFi 5.2GHz Band

Frequency: 5220 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C  
 Medium parameters used:  $\sigma = 5.22603 \text{ mho/m}$ ,  $\epsilon_r = 49.4018$ ;  $\rho = 1 \text{ kg/m}^3$  Medium parameters used (interpolated):  $f = 5220 \text{ MHz}$ ;  $\sigma = 5.22 \text{ mho/m}$ ;  $\epsilon_r = 49.4$ ;  $\rho = 1000 \text{ kg/m}^3$ ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(4.02, 4.02, 4.02); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH44/6200mAh/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of Ux (measured) = 175.1 uV

**Rear Touch/Aux Ant./802.11a/CH44/6200mAh/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

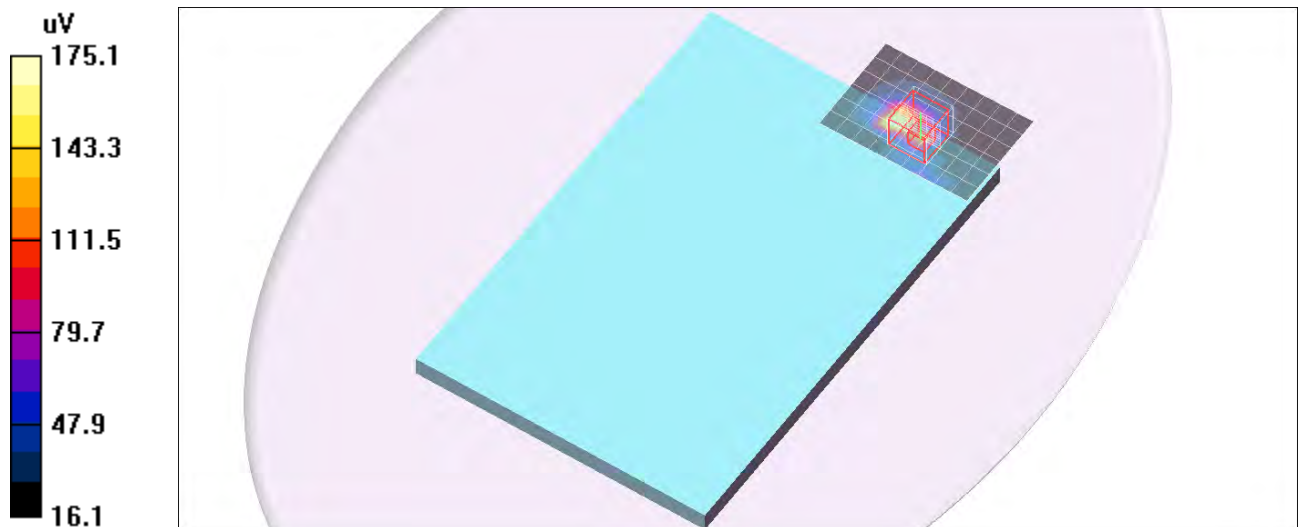
Reference Value = 7.85 V/m; Power Drift = -8.22 dB

Peak SAR (extrapolated) = 3.38 W/kg

**SAR(1 g) = 0.714 mW/g; SAR(10 g) = 0.314 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.46 mW/g



## WiFi 5.2GHz Band

Frequency: 5180 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C  
 Medium parameters used (interpolated):  $f = 5180$  MHz;  $\sigma = 5.18$  mho/m;  $\epsilon_r = 49.5$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(4.02, 4.02, 4.02); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Edge2 Touch/Aux Ant./802.11a/CH36/Area Scan (7x10x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.570 mW/g

**Edge2 Touch/Aux Ant./802.11a/CH36/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 6.62 V/m; Power Drift = -0.069 dB

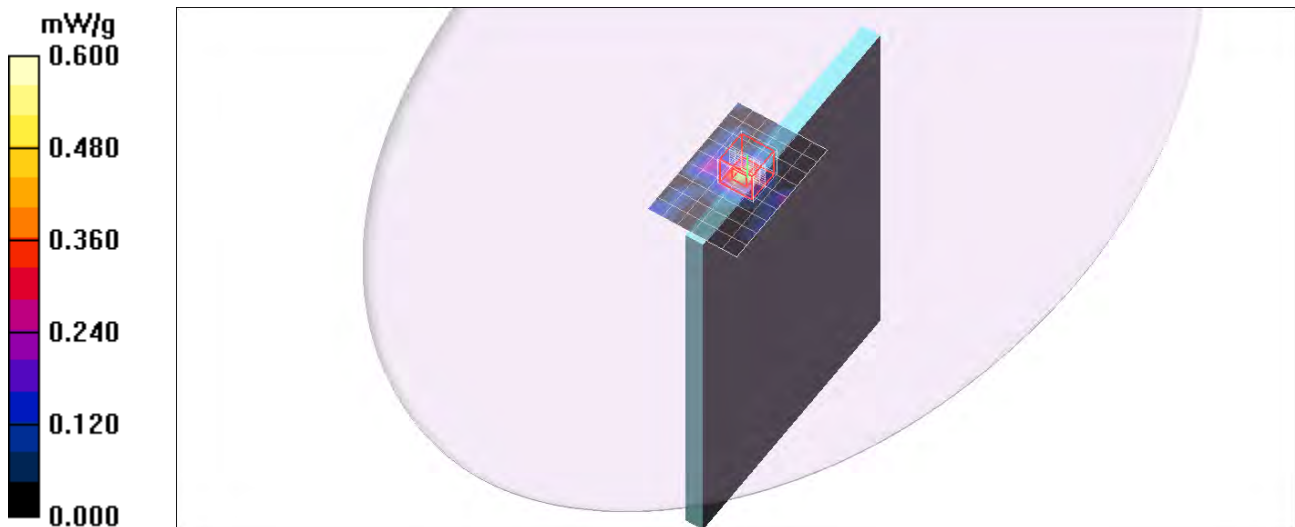
Peak SAR (extrapolated) = 2.88 W/kg

Peak SAR (extrapolated) = 2.88 W/kg

**SAR(1 g) = 0.314 mW/g; SAR(10 g) = 0.113 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.600 mW/g



## WiFi 5.2GHz Band

Frequency: 5220 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 5220$  MHz;  $\sigma = 5.22$  mho/m;  $\epsilon_r = 49.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(4.02, 4.02, 4.02); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Edge2 Touch/Aux Ant./802.11a/CH44/Area Scan (7x10x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.638 mW/g

**Edge2 Touch/Aux Ant./802.11a/CH44/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm,

dy=4mm, dz=2mm

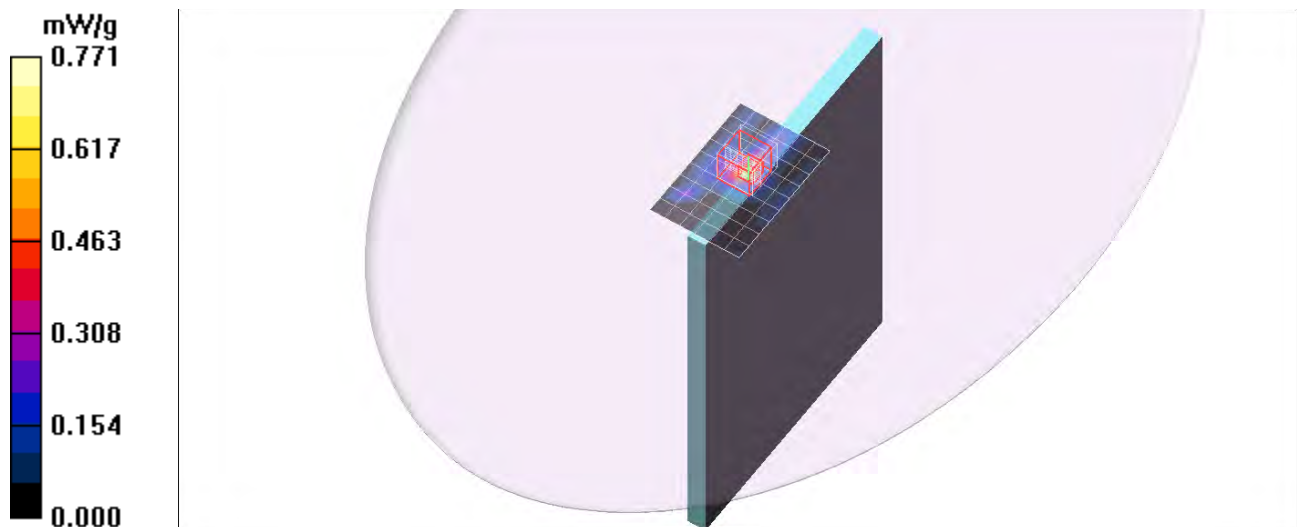
Reference Value = 5.79 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 1.63 W/kg

**SAR(1 g) = 0.392 mW/g; SAR(10 g) = 0.128 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 0.771 mW/g



## WiFi 5.3GHz Band

Frequency: 5260 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used:  $f = 5260.6$  MHz;  $\sigma = 5.27$  mho/m;  $\epsilon_r = 49.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.82, 3.82, 3.82); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH52/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 1.09 mW/g

**Rear Touch/Aux Ant./802.11a/CH52/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

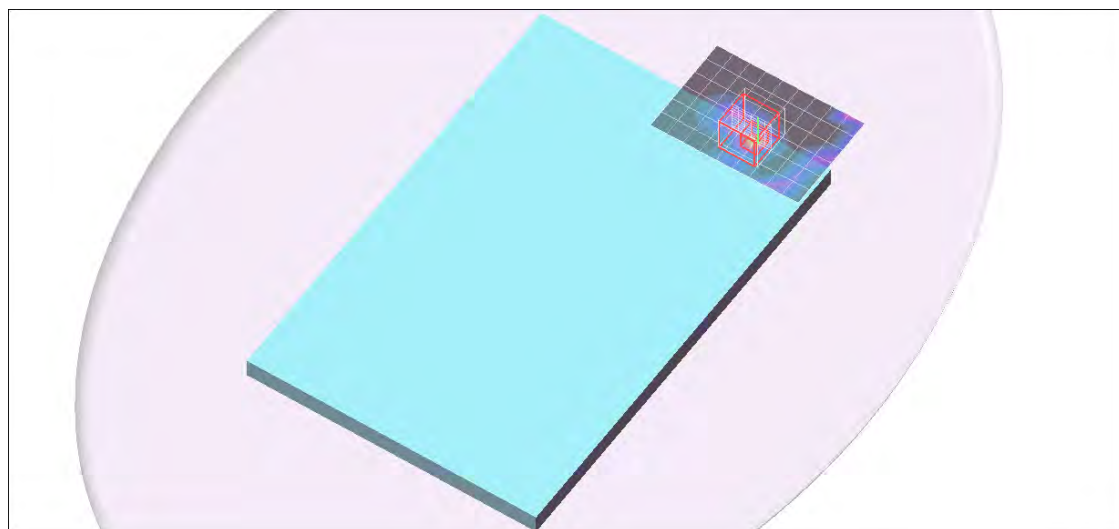
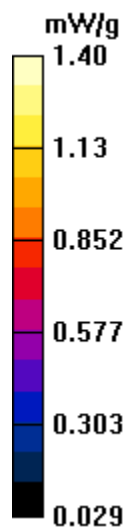
Reference Value = 3.67 V/m; Power Drift = -0.103 dB

Peak SAR (extrapolated) = 3.00 W/kg

Peak SAR (extrapolated) = 3.00 W/kg

**SAR(1 g) = 0.639 mW/g; SAR(10 g) = 0.198 mW/g**

Maximum value of SAR (measured) = 1.46 mW/g

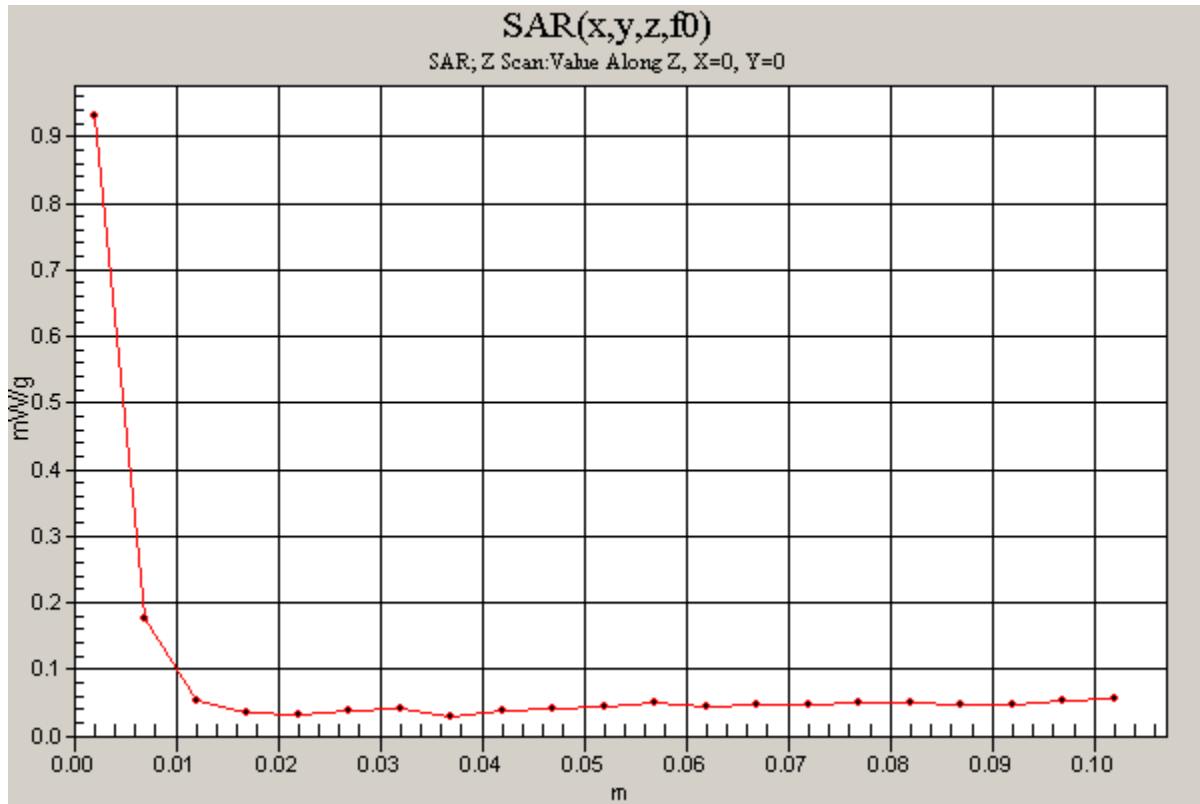


## WiFi 5.3GHz Band

Frequency: 5260 MHz; Duty Cycle: 1:1

**Rear Touch/Aux Ant./802.11a/CH52/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm

Maximum value of SAR (measured) = 0.932 mW/g



## WiFi 5.3GHz Band

Frequency: 5260 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used:  $f = 5260.6$  MHz;  $\sigma = 5.27$  mho/m;  $\epsilon_r = 49.4$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.82, 3.82, 3.82); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH52/6200mAh/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 1.41 mW/g

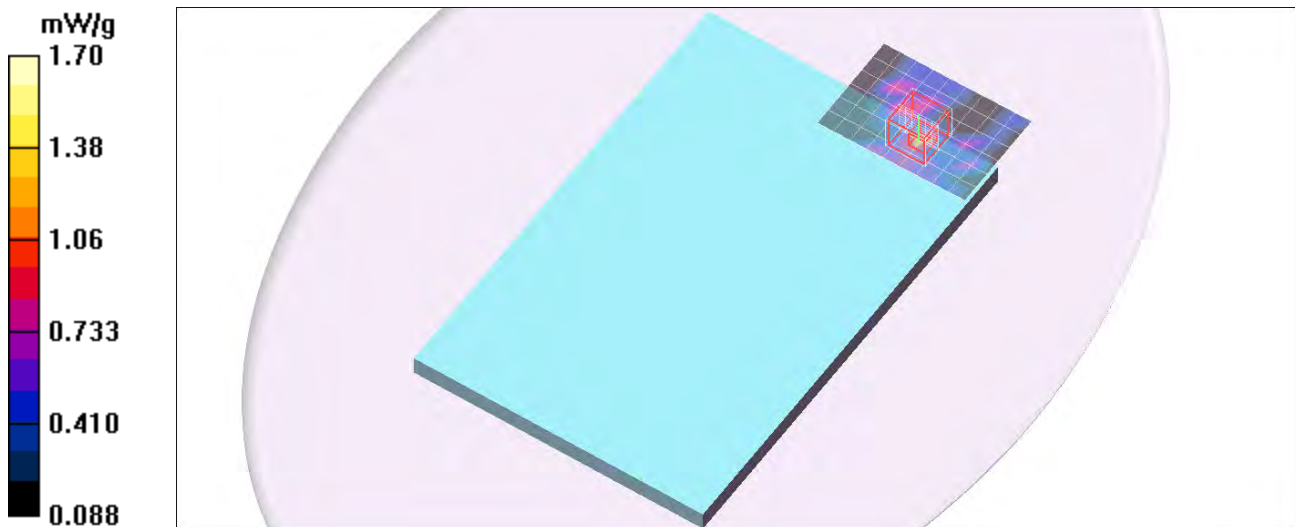
**Rear Touch/Aux Ant./802.11a/CH52/6200mAh/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 3.76 V/m; Power Drift = -0.126 dB

Peak SAR (extrapolated) = 2.89 W/kg

**SAR(1 g) = 0.585 mW/g; SAR(10 g) = 0.215 mW/g**

Maximum value of SAR (measured) = 1.14 mW/g



## WiFi 5.3GHz Band

Frequency: 5320 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used:  $f = 5320$  MHz;  $\sigma = 5.33$  mho/m;  $\epsilon_r = 49.3$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.82, 3.82, 3.82); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH64/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.889 mW/g

**Rear Touch/Aux Ant./802.11a/CH64/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

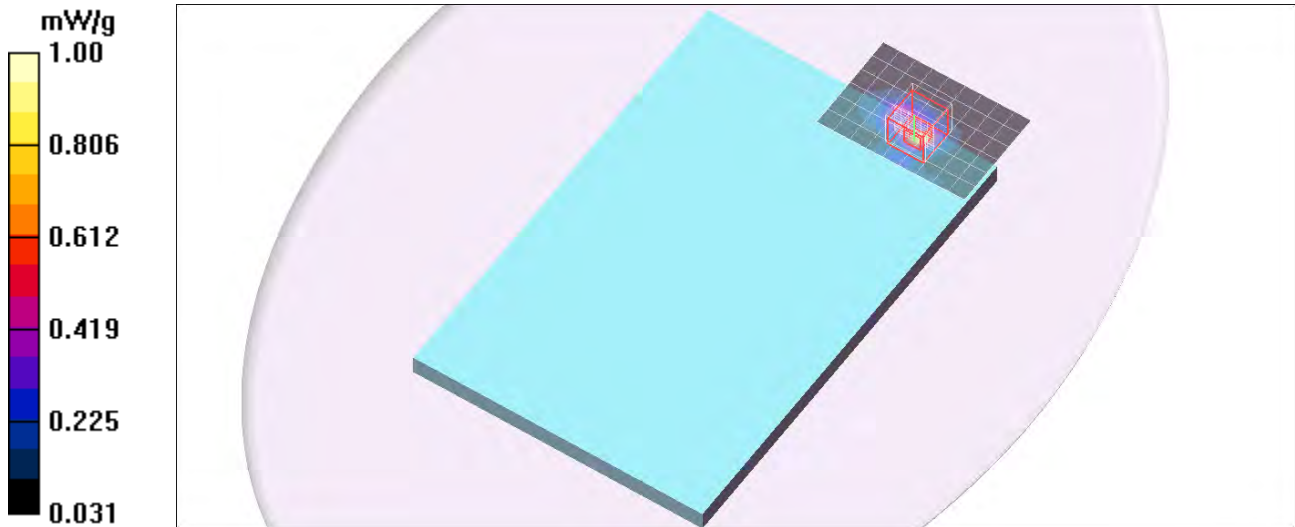
Reference Value = 2.05 V/m; Power Drift = 0.084 dB

Peak SAR (extrapolated) = 2.65 W/kg

Peak SAR (extrapolated) = 2.65 W/kg

**SAR(1 g) = 0.574 mW/g; SAR(10 g) = 0.275 mW/g**

Maximum value of SAR (measured) = 1.26 mW/g





## WiFi 5.3GHz Band

Frequency: 5260 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used:  $f = 5260.6$  MHz;  $\sigma = 5.27$  mho/m;  $\epsilon_r = 49.4$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.82, 3.82, 3.82); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Edge2 Touch/Main Ant./802.11a/CH52/Area Scan (7x9x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.616 mW/g

**Edge2 Touch/Main Ant./802.11a/CH52/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

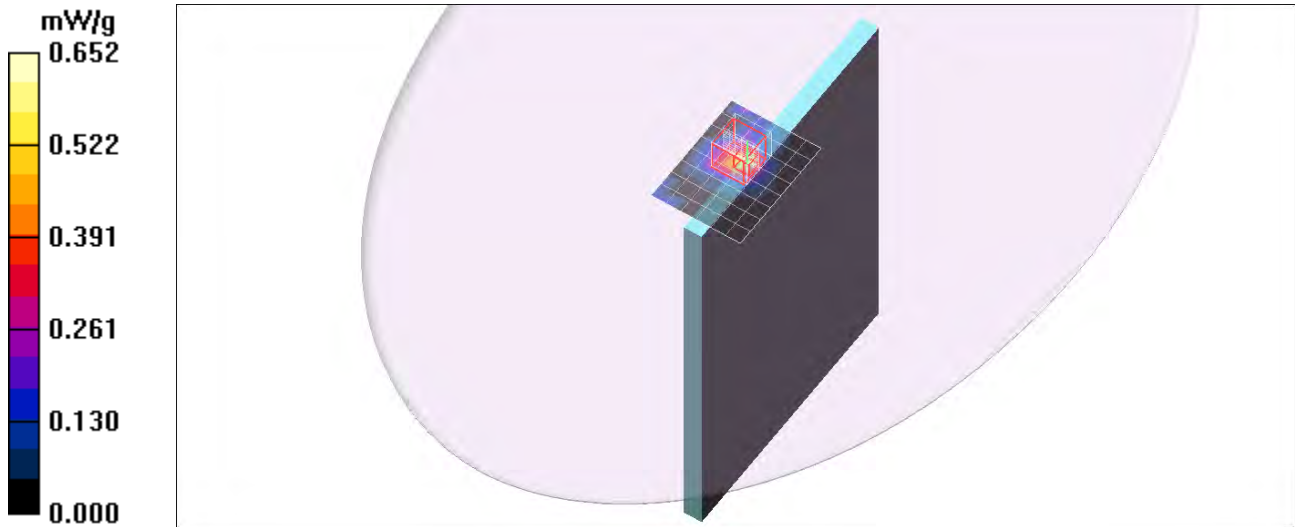
Reference Value = 7.03 V/m; Power Drift = -0.092 dB

Peak SAR (extrapolated) = 2.61 W/kg

Peak SAR (extrapolated) = 2.61 W/kg

**SAR(1 g) = 0.319 mW/g; SAR(10 g) = 0.116 mW/g**

Maximum value of SAR (measured) = 0.652 mW/g



## WiFi 5.3GHz Band

Frequency: 5320 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used:  $f = 5320$  MHz;  $\sigma = 5.33$  mho/m;  $\epsilon_r = 49.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.82, 3.82, 3.82); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Edge2 Touch/Aux Ant./802.11a/CH64/Area Scan (7x10x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.628 mW/g

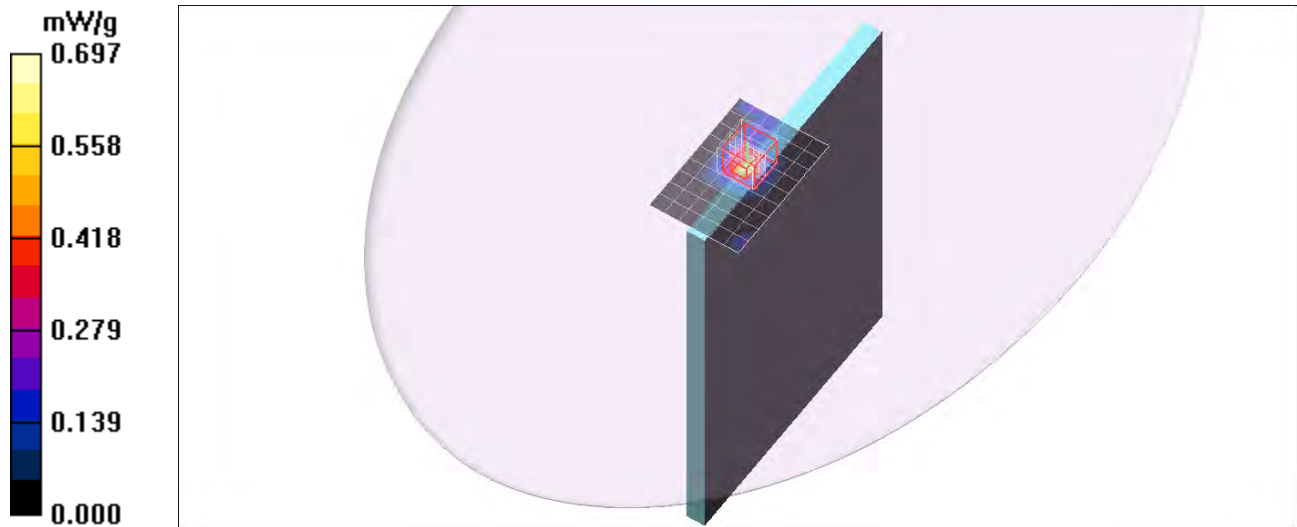
**Edge2 Touch/Aux Ant./802.11a/CH64/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 6.89 V/m; Power Drift = -0.148 dB

Peak SAR (extrapolated) = 1.85 W/kg

**SAR(1 g) = 0.389 mW/g; SAR(10 g) = 0.137 mW/g**

Maximum value of SAR (measured) = 0.697 mW/g



## WiFi 5.5GHz Band

Frequency: 5520 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 5520$  MHz;  $\sigma = 5.58$  mho/m;  $\epsilon_r = 49.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.59, 3.59, 3.59); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH104/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.16 mW/g

**Rear Touch/Aux Ant./802.11a/CH104/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 2.51 V/m; Power Drift = 0.129 dB

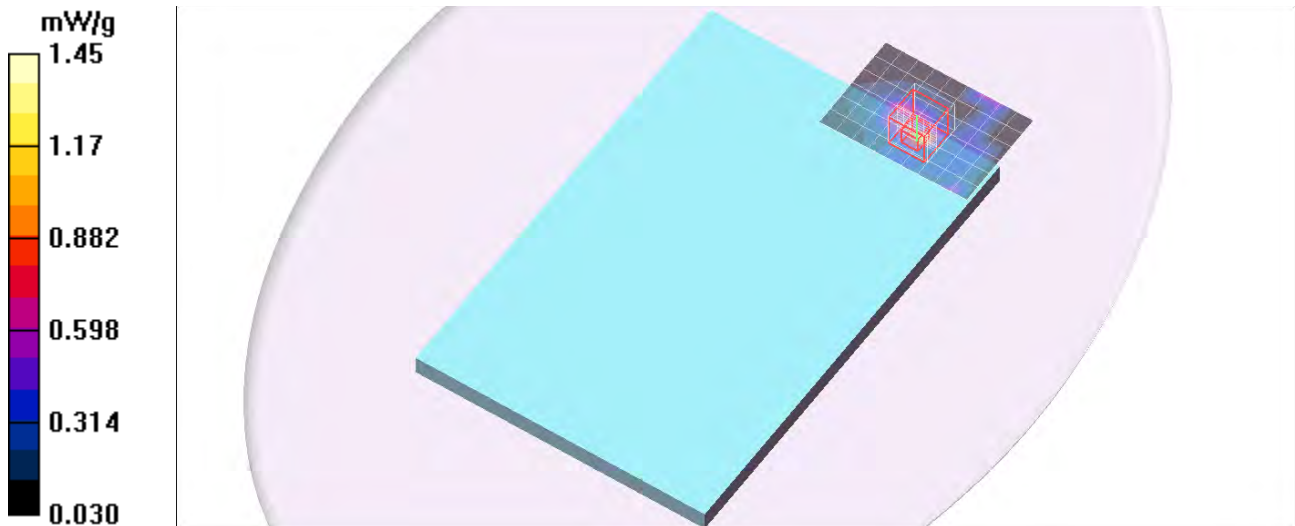
Peak SAR (extrapolated) = 2.48 W/kg

Peak SAR (extrapolated) = 2.48 W/kg

**SAR(1 g) = 0.698 mW/g; SAR(10 g) = 0.273 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.45 mW/g



## WiFi 5.5GHz Band

Frequency: 5560 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C  
Medium parameters used:  $f = 5560.9$  MHz;  $\sigma = 5.67$  mho/m;  $\epsilon_r = 48.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.27, 3.27, 3.27); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH112/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm  
Maximum value of SAR (measured) = 1.58 mW/g

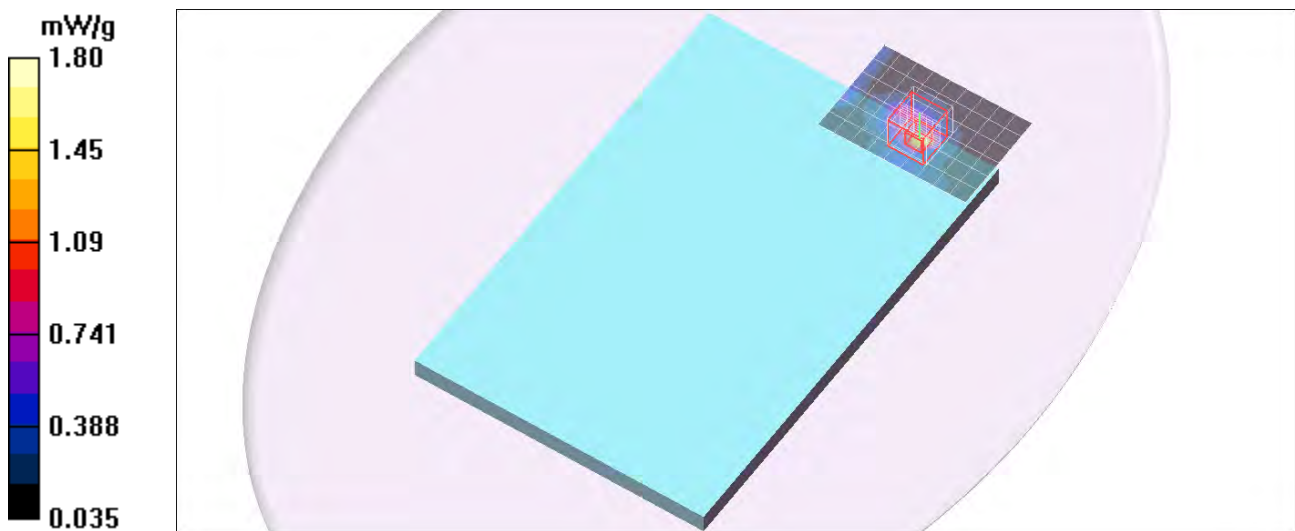
**Rear Touch/Aux Ant./802.11a/CH112/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 3.59 V/m; Power Drift = -0.058 dB

Peak SAR (extrapolated) = 3.61 W/kg

**SAR(1 g) = 0.813 mW/g; SAR(10 g) = 0.332 mW/g**

Maximum value of SAR (measured) = 1.80 mW/g



## WiFi 5.5GHz Band

Frequency: 5700 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C  
Medium parameters used (interpolated):  $f = 5700$  MHz;  $\sigma = 5.87$  mho/m;  $\epsilon_r = 48.8$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.27, 3.27, 3.27); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH140/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.80 mW/g

**Rear Touch/Aux Ant./802.11a/CH140/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

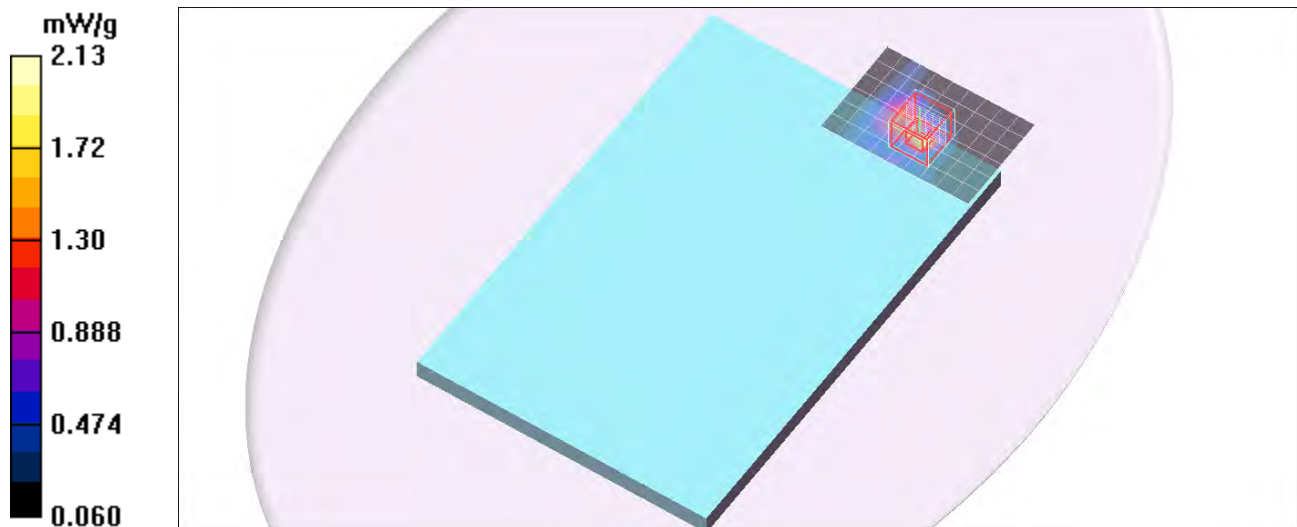
Reference Value = 3.16 V/m; Power Drift = 0.091 dB

Peak SAR (extrapolated) = 6.73 W/kg

**SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.364 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 2.13 mW/g



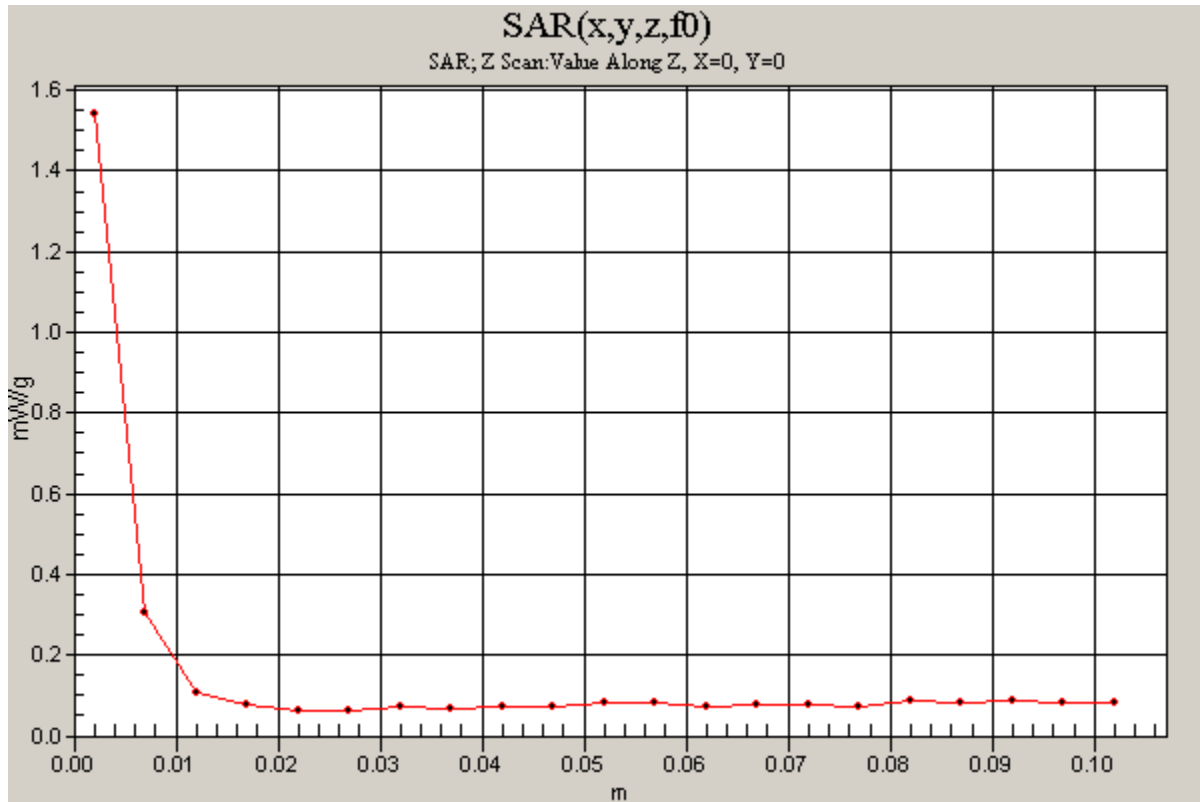
## WiFi 5.5GHz Band

Frequency: 5700 MHz; Duty Cycle: 1:1

**Rear Touch/Aux Ant./802.11a/CH140/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.54 mW/g



## WiFi 5.5GHz Band

Frequency: 5700 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 5700$  MHz;  $\sigma = 5.87$  mho/m;  $\epsilon_r = 48.8$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.27, 3.27, 3.27); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH140 Repeat/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.81 mW/g

**Rear Touch/Aux Ant./802.11a/CH140 Repeat/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

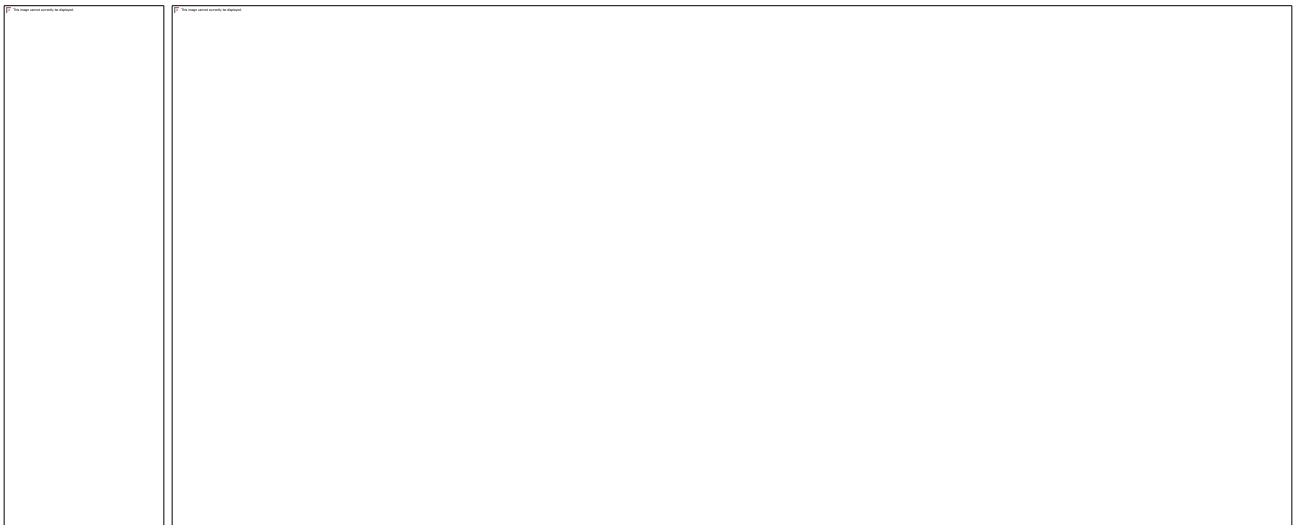
Reference Value = 3.01 V/m; Power Drift = -0.097 dB

Peak SAR (extrapolated) = 4.50 W/kg

**SAR(1 g) = 1.13 mW/g; SAR(10 g) = 0.500 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 2.05 mW/g



## WiFi 5.5GHz Band Rear\_6200mAh

Frequency: 5700 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 24.5°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 5700$  MHz;  $\sigma = 5.871$  S/m;  $\epsilon_r = 48.792$ ;  $\rho = 1000$  kg/m<sup>3</sup>

DASY5 Configuration:

- Area Scan Setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 2013/07/25
- Probe: EX3DV4 - SN3554; ConvF(3.27, 3.27, 3.27); Calibrated: 2013/09/26;
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

### Rear Touch/Aux Ant./802.11a/CH140/6200mAh/Area Scan (10x7x1): Measurement grid:

dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.90 W/kg

### Rear Touch/Aux Ant./802.11a/CH140/6200mAh/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

dx=4mm, dy=4mm, dz=2mm

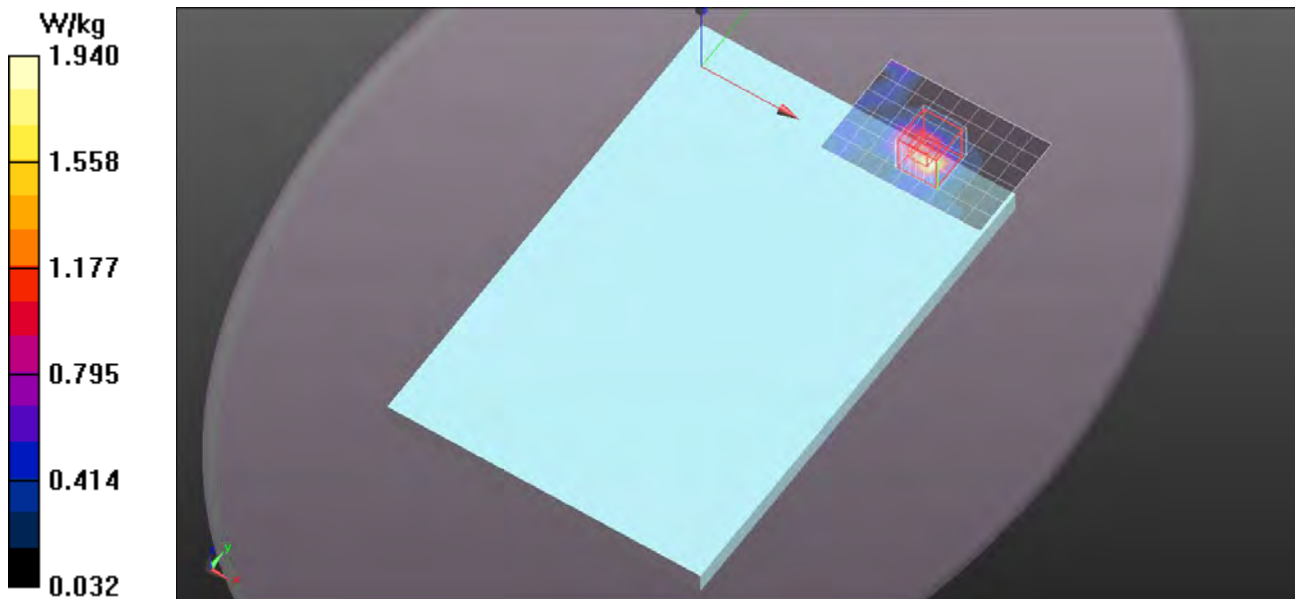
Reference Value = 2.359 V/m; Power Drift = 0.14 dB

Peak SAR (extrapolated) = 5.19 W/kg

**SAR(1 g) = 1.01 W/kg; SAR(10 g) = 0.371 W/kg**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.94 W/kg





## WiFi 5.5GHz Band

Frequency: 5520 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C  
Medium parameters used (interpolated):  $f = 5520$  MHz;  $\sigma = 5.58$  mho/m;  $\epsilon_r = 49.1$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.59, 3.59, 3.59); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Edge2 Touch/Aux Ant./802.11a/CH104/Area Scan (7x10x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.14 mW/g

**Edge2 Touch/Aux Ant./802.11a/CH104/Zoom Scan (7x7x12)/Cube 0:** Measurement grid:

dx=4mm, dy=4mm, dz=2mm

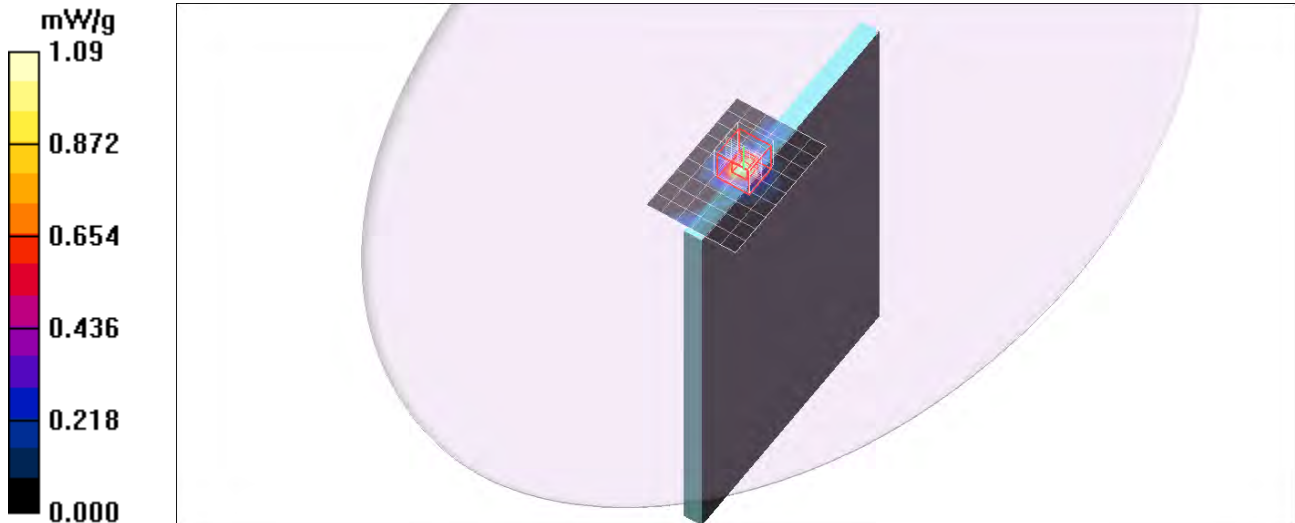
Reference Value = 5.94 V/m; Power Drift = -0.081 dB

Peak SAR (extrapolated) = 2.26 W/kg

**SAR(1 g) = 0.564 mW/g; SAR(10 g) = 0.189 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.09 mW/g



## WiFi 5.5GHz Band

Frequency: 5560 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used:  $f = 5560.9$  MHz;  $\sigma = 5.67$  mho/m;  $\epsilon_r = 48.9$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.27, 3.27, 3.27); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

### Edge2 Touch/Aux Ant./802.11a/CH112/Area Scan (7x10x1):

Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 1.31 mW/g

### Edge2 Touch/Aux Ant./802.11a/CH112/Zoom Scan (7x7x12)/Cube 0:

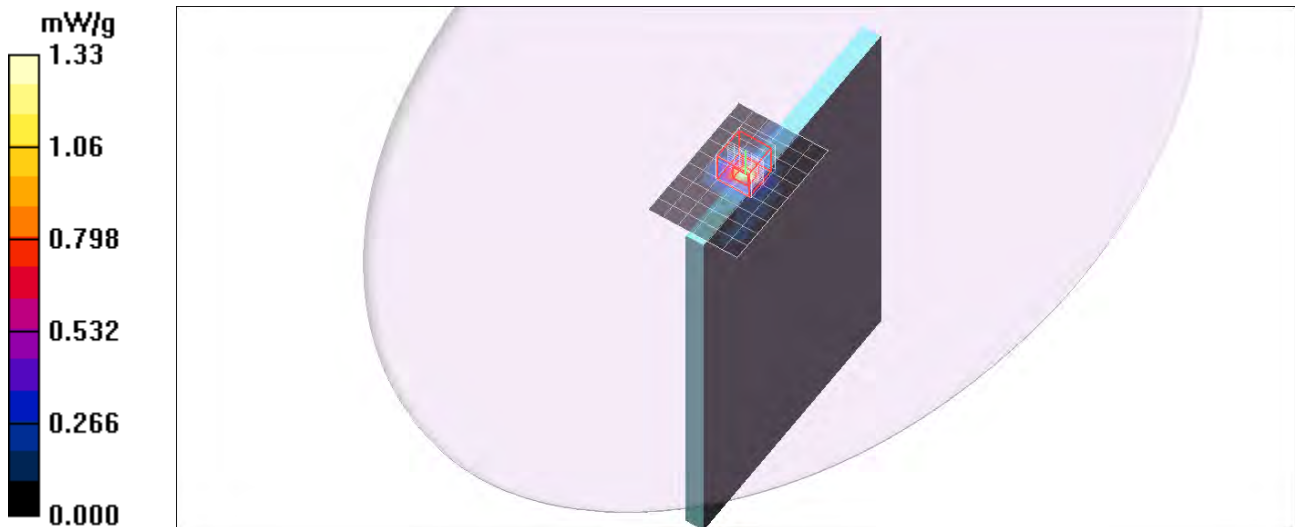
Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 6.76 V/m; Power Drift = -0.127 dB

Peak SAR (extrapolated) = 2.72 W/kg

**SAR(1 g) = 0.659 mW/g; SAR(10 g) = 0.211 mW/g**

Maximum value of SAR (measured) = 1.33 mW/g



## WiFi 5.8GHz Band

Frequency: 5765 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used:  $f = 5765.5$  MHz;  $\sigma = 5.93$  mho/m;  $\epsilon_r = 47.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.53, 3.53, 3.53); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH153/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 1.66 mW/g

**Rear Touch/Aux Ant./802.11a/CH153/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

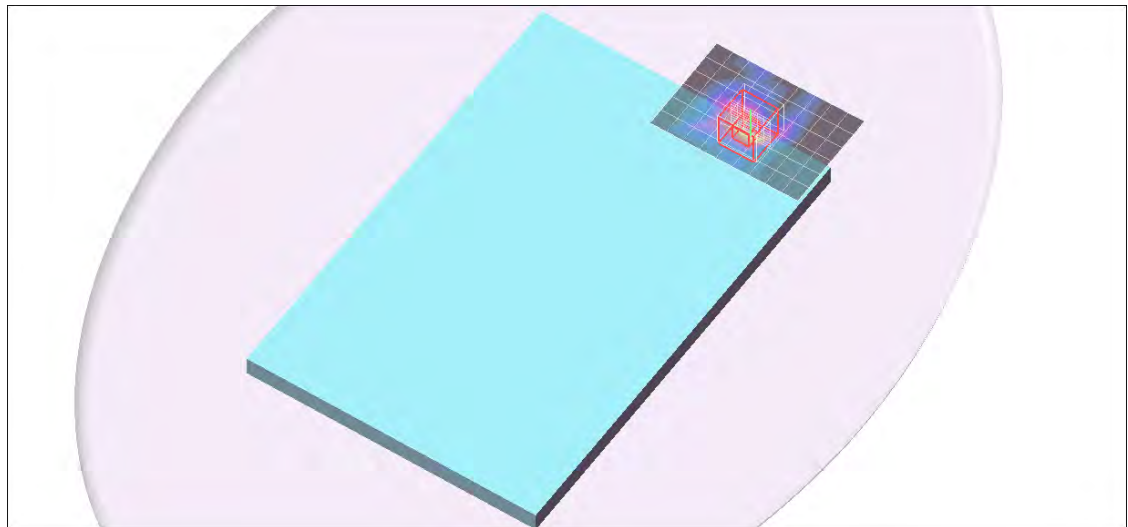
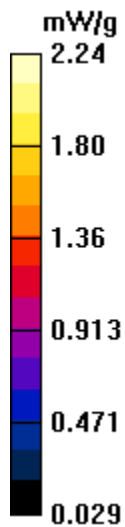
Reference Value = 2.69 V/m; Power Drift = -0.149 dB

Peak SAR (extrapolated) = 5.92 W/kg

Peak SAR (extrapolated) = 5.92 W/kg

**SAR(1 g) = 0.954 mW/g; SAR(10 g) = 0.447 mW/g**

Maximum value of SAR (measured) = 2.24 mW/g



## WiFi 5.8GHz Band

Frequency: 5805 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used:  $f = 5805.1$  MHz;  $\sigma = 6.03$  mho/m;  $\epsilon_r = 47.4$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.53, 3.53, 3.53); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH161/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 1.99 mW/g

**Rear Touch/Aux Ant./802.11a/CH161/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

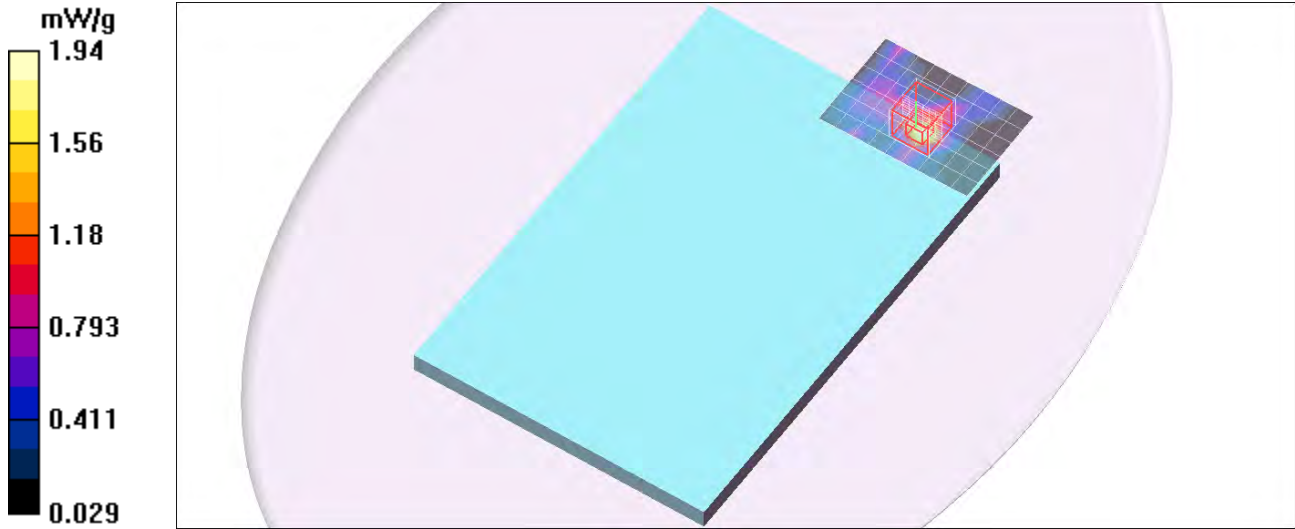
Reference Value = 3.69 V/m; Power Drift = -0.152 dB

Peak SAR (extrapolated) = 4.44 W/kg

Peak SAR (extrapolated) = 4.44 W/kg

**SAR(1 g) = 0.958 mW/g; SAR(10 g) = 0.374 mW/g**

Maximum value of SAR (measured) = 1.94 mW/g



## WiFi 5.8GHz Band

Frequency: 5825 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 5825$  MHz;  $\sigma = 5.86$  mho/m;  $\epsilon_r = 47$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.53, 3.53, 3.53); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH165/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.54 mW/g

**Rear Touch/Aux Ant./802.11a/CH165/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

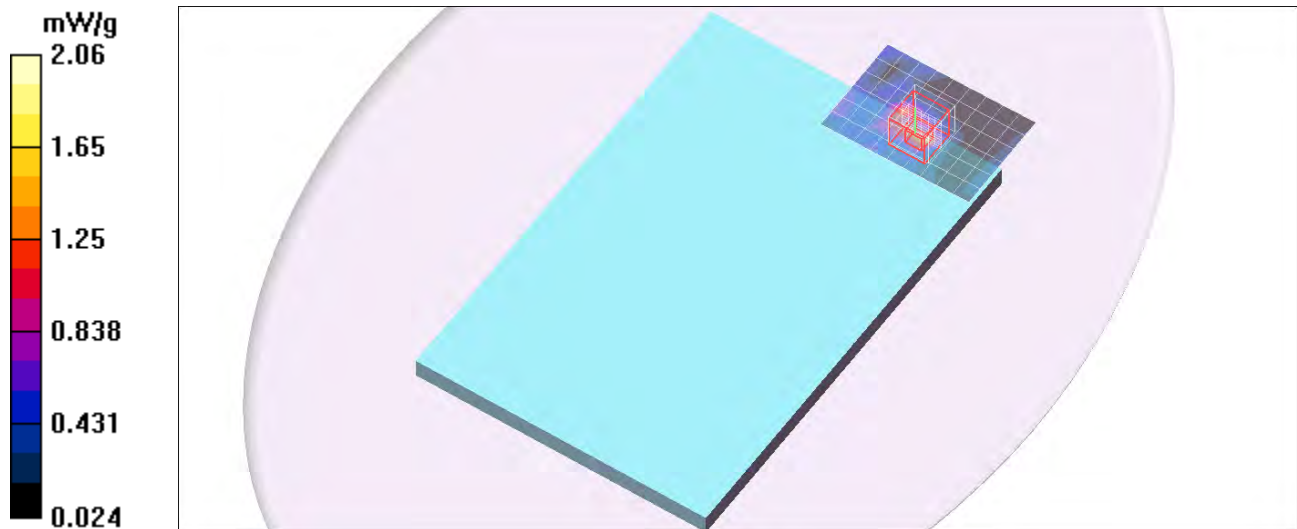
Reference Value = 2.35 V/m; Power Drift = 0.067 dB

Peak SAR (extrapolated) = 5.24 W/kg

**SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.357 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 2.06 mW/g



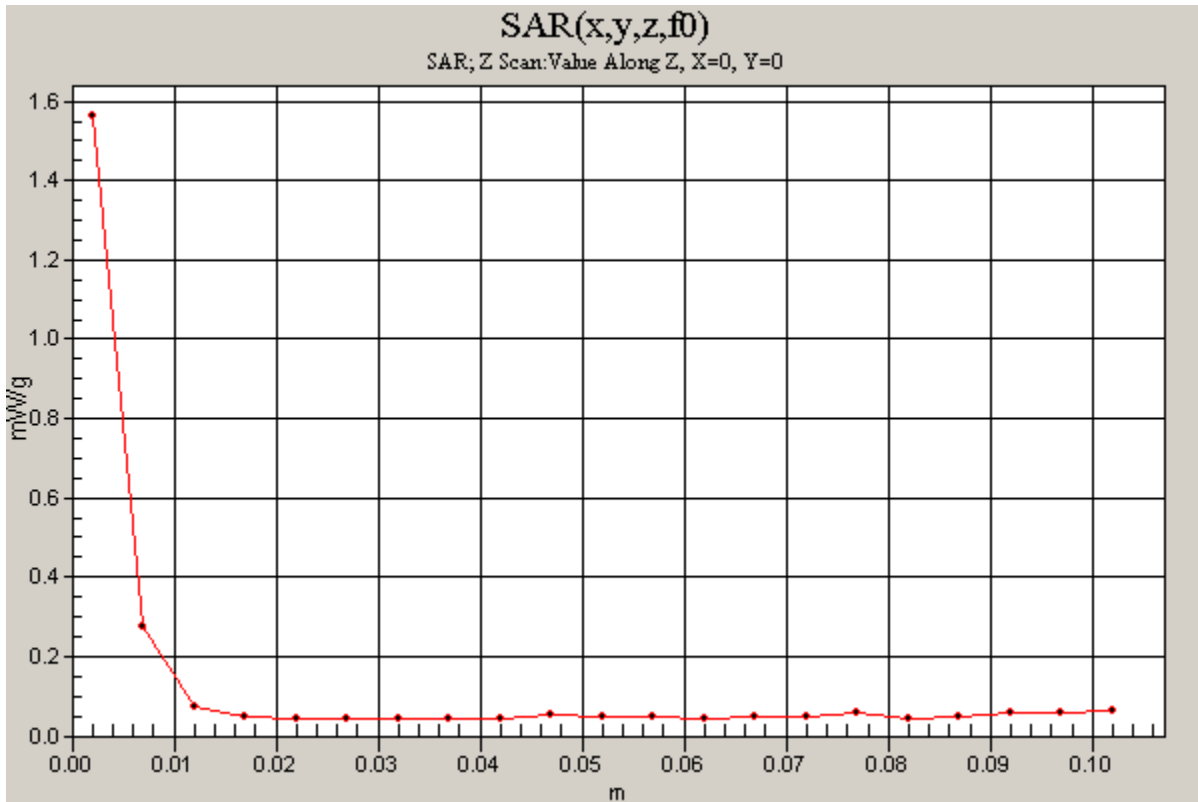
## WiFi 5.8GHz Band

Frequency: 5825 MHz; Duty Cycle: 1:1

**Rear Touch/Aux Ant./802.11a/CH165/Z Scan (1x1x21):** Measurement grid: dx=20mm, dy=20mm, dz=5mm

Info: [Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.57 mW/g



## WiFi 5.8GHz Band

Frequency: 5825 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 5825$  MHz;  $\sigma = 5.86$  mho/m;  $\epsilon_r = 47$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.53, 3.53, 3.53); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Rear Touch/Aux Ant./802.11a/CH165 Repeat/Area Scan (10x7x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.75 mW/g

**Rear Touch/Aux Ant./802.11a/CH165 Repeat/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

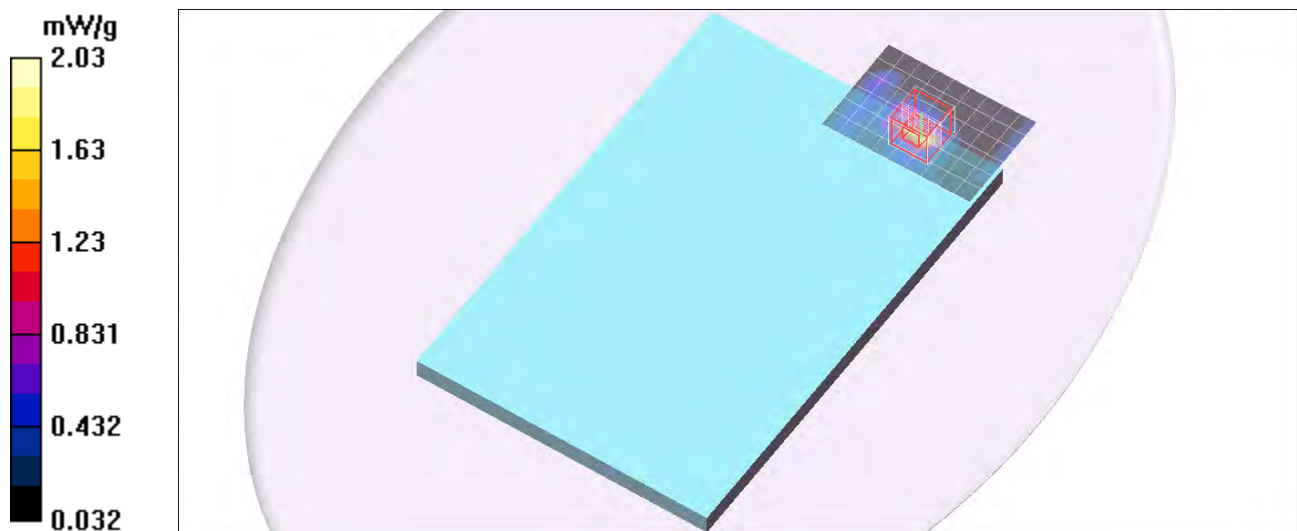
Reference Value = 9.05 V/m; Power Drift = 0.048 dB

Peak SAR (extrapolated) = 4.59 W/kg

**SAR(1 g) = 0.983 mW/g; SAR(10 g) = 0.374 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 2.03 mW/g



## WiFi 5.8GHz Band

Frequency: 5825 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 5825$  MHz;  $\sigma = 5.86$  mho/m;  $\epsilon_r = 47$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.53, 3.53, 3.53); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

### Rear Touch/Aux Ant./802.11a/CH165/6200mAh/Area Scan (10x7x1): Measurement grid:

dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 2.00 mW/g

### Rear Touch/Aux Ant./802.11a/CH165/6200mAh/Zoom Scan (7x7x12)/Cube 0: Measurement grid:

dx=4mm, dy=4mm, dz=2mm

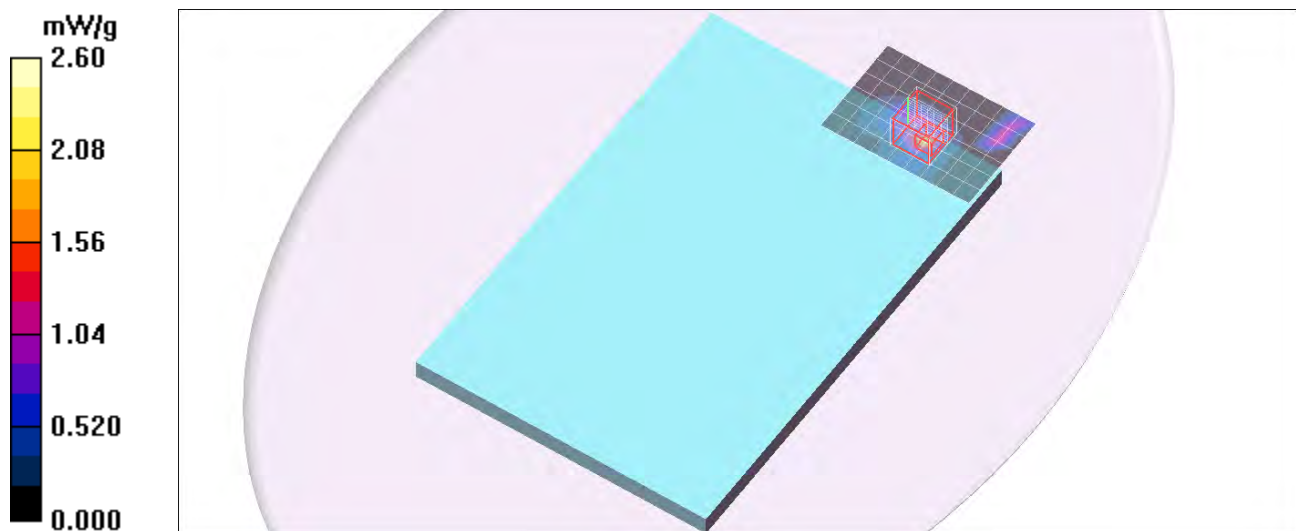
Reference Value = 0.612 V/m; Power Drift = 0.125 dB

Peak SAR (extrapolated) = 9.79 W/kg

**SAR(1 g) = 0.982 mW/g; SAR(10 g) = 0.346 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 2.29 mW/g





## WiFi 5.8GHz Band

Frequency: 5765 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used:  $f = 5765.5$  MHz;  $\sigma = 5.93$  mho/m;  $\epsilon_r = 47.4$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.53, 3.53, 3.53); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Edge2 Touch/Aux Ant./802.11a/CH153/Area Scan (7x10x1):** Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 1.74 mW/g

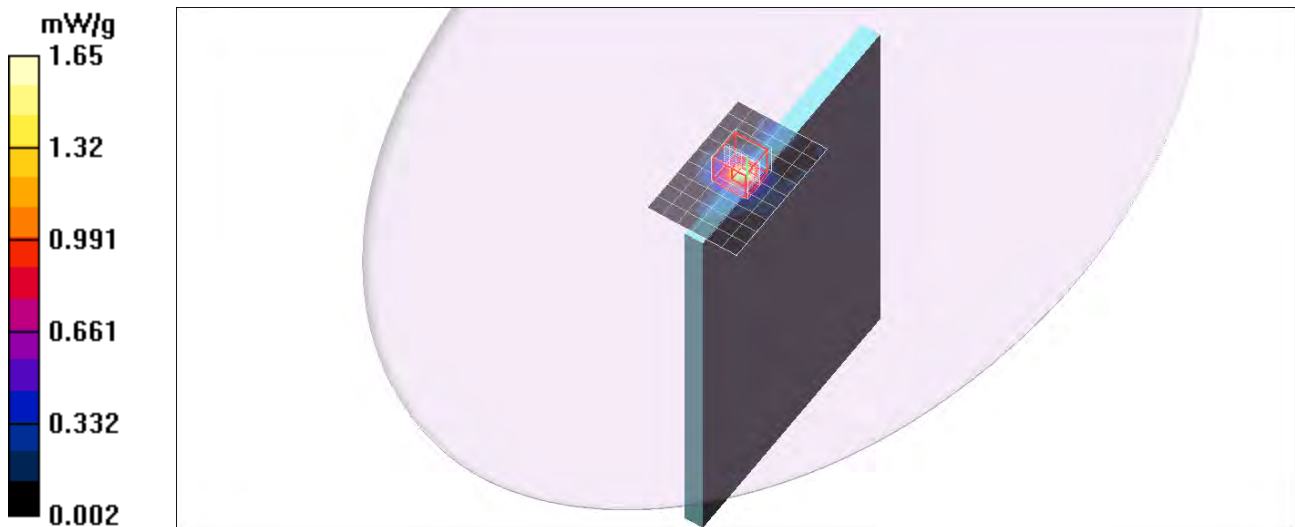
**Edge2 Touch/Aux Ant./802.11a/CH153/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 8.67 V/m; Power Drift = 0.120 dB

Peak SAR (extrapolated) = 3.61 W/kg

**SAR(1 g) = 0.877 mW/g; SAR(10 g) = 0.313 mW/g**

Maximum value of SAR (measured) = 1.65 mW/g



## WiFi 5.8GHz Band

Frequency: 5805 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used:  $f = 5805.1$  MHz;  $\sigma = 6.03$  mho/m;  $\epsilon_r = 47.4$ ;  $\rho = 1000$  kg/m<sup>3</sup>;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.53, 3.53, 3.53); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Edge2 Touch/Aux Ant./802.11a/CH161/Area Scan (7x10x1):** Measurement grid: dx=10mm,

dy=10mm

Maximum value of SAR (measured) = 1.89 mW/g

**Edge2 Touch/Aux Ant./802.11a/CH161/Zoom Scan (7x7x12)/Cube 0:** Measurement grid:

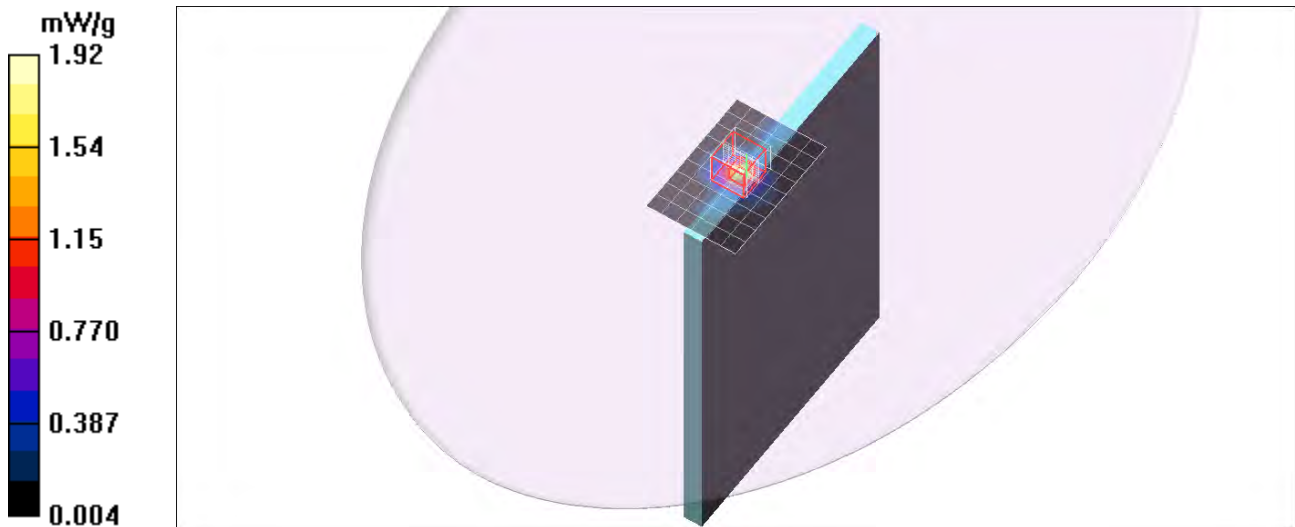
dx=4mm, dy=4mm, dz=2mm

Reference Value = 8.22 V/m; Power Drift = -0.082 dB

Peak SAR (extrapolated) = 4.07 W/kg

**SAR(1 g) = 1.030 mW/g; SAR(10 g) = 0.343 mW/g**

Maximum value of SAR (measured) = 1.92 mW/g



## WiFi 5.8GHz Band

Frequency: 5825 MHz; Duty Cycle: 1:1; Room Ambient Temperature: 25.0°C; Liquid Temperature: 24.0°C

Medium parameters used (interpolated):  $f = 5825$  MHz;  $\sigma = 5.86$  mho/m;  $\epsilon_r = 47$ ;  $\rho = 1000$  kg/m<sup>3</sup> ;

DASY4 Configuration:

- Area Scan setting - Find Secondary Maximum Within: 2.0 dB and with a peak SAR value greater than 0.0012W/kg
- Electronics: DAE4 Sn558; Calibrated: 7/25/2013
- Probe: EX3DV4 - SN3554; ConvF(3.53, 3.53, 3.53); Calibrated: 9/26/2013
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Phantom: Flat Phantom ELI4.0; Type: QDOVA001BA; Serial: SN: 1052

**Edge2 Touch/Aux Ant./802.11a/CH165/Area Scan (7x10x1):** Measurement grid: dx=10mm, dy=10mm

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 1.82 mW/g

**Edge2 Touch/Aux Ant./802.11a/CH165/Zoom Scan (7x7x12)/Cube 0:** Measurement grid: dx=4mm, dy=4mm, dz=2mm

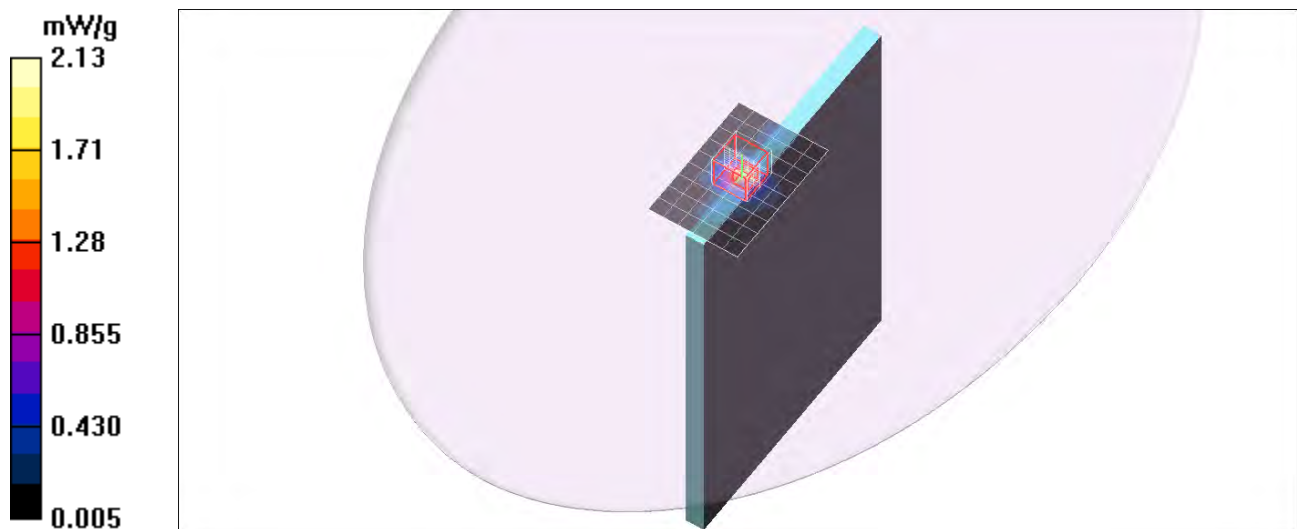
Reference Value = 8.43 V/m; Power Drift = 0.158 dB

Peak SAR (extrapolated) = 4.90 W/kg

**SAR(1 g) = 1.100 mW/g; SAR(10 g) = 0.373 mW/g**

[Info: Interpolated medium parameters used for SAR evaluation.](#)

Maximum value of SAR (measured) = 2.13 mW/g





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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Auden**

Certificate No: **EX3-3898\_Jan13**

**CALIBRATION CERTIFICATE**

Object **EX3DV4 - SN:3898**

Calibration procedure(s) **QA CAL-01.v8, QA CAL-23.v4, QA CAL-25.v4  
Calibration procedure for dosimetric E-field probes**

Calibration date: **January 14, 2013**

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	29-Mar-12 (No. 217-01508)	Apr-13
Power sensor E4412A	MY41498087	29-Mar-12 (No. 217-01508)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	27-Mar-12 (No. 217-01531)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	27-Mar-12 (No. 217-01529)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	27-Mar-12 (No. 217-01532)	Apr-13
Reference Probe ES3DV2	SN: 3013	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	20-Jun-12 (No. DAE4-660_Jun12)	Jun-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-11)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: January 14, 2013

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



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### Glossary:

TSL	tissue simulating liquid
NORM <sub>x,y,z</sub>	sensitivity in free space
ConvF	sensitivity in TSL / NORM <sub>x,y,z</sub>
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization $\varphi$	$\varphi$ rotation around probe axis
Polarization $\vartheta$	$\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

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

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- 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:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below ConvF).
- NORM(f)<sub>x,y,z</sub> = NORM<sub>x,y,z</sub> \* 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.
- DCP<sub>x,y,z</sub>**: 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
- A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: 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  $f \leq 800$  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 NORM<sub>x,y,z</sub> \* 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  $\pm 50$  MHz to  $\pm 100$  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.

# Probe EX3DV4

## SN:3898

Manufactured: October 9, 2012  
Calibrated: January 14, 2013

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

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3898

### Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup>	0.54	0.54	0.50	$\pm 10.1 \%$
DCP (mV) <sup>B</sup>	102.3	99.7	98.7	

### Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Unc <sup>E</sup> (k=2)
0	CW	X	0.0	0.0	1.0	0.00	173.3	$\pm 3.3 \%$
		Y	0.0	0.0	1.0		173.6	
		Z	0.0	0.0	1.0		165.0	

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%.

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the  $E^2$ -field uncertainty inside TSL (see Pages 5 and 6).

<sup>B</sup> Numerical linearization parameter: uncertainty not required.

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3898

### Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m) <sup>F</sup>	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	41.9	0.89	10.23	10.23	10.23	0.33	0.94	± 12.0 %
835	41.5	0.90	9.70	9.70	9.70	0.25	1.01	± 12.0 %
900	41.5	0.97	9.67	9.67	9.67	0.33	0.94	± 12.0 %
1750	40.1	1.37	8.19	8.19	8.19	0.56	0.74	± 12.0 %
1900	40.0	1.40	7.94	7.94	7.94	0.62	0.69	± 12.0 %
2000	40.0	1.40	7.87	7.87	7.87	0.46	0.73	± 12.0 %
2450	39.2	1.80	7.25	7.25	7.25	0.33	0.95	± 12.0 %
2600	39.0	1.96	7.16	7.16	7.16	0.41	0.88	± 12.0 %

<sup>C</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.



## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3898

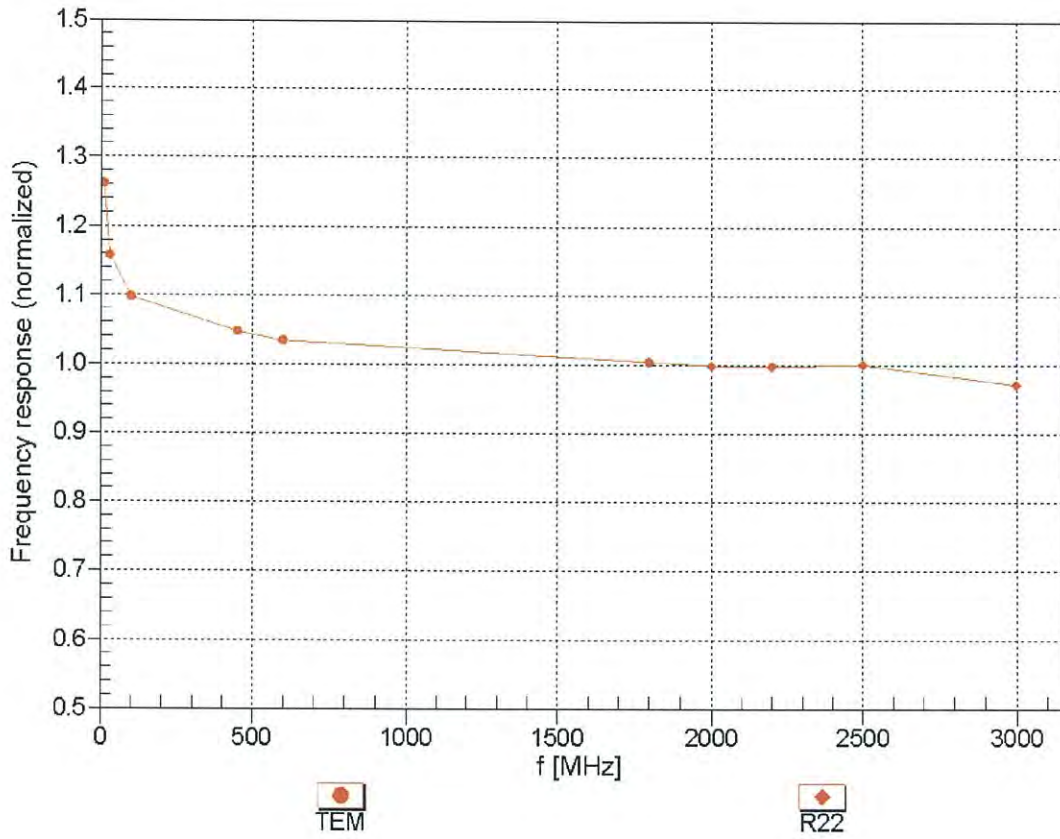
### Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m) <sup>F</sup>	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
750	55.5	0.96	9.87	9.87	9.87	0.52	0.80	± 12.0 %
835	55.2	0.97	9.58	9.58	9.58	0.35	1.02	± 12.0 %
900	55.0	1.05	9.52	9.52	9.52	0.44	0.89	± 12.0 %
1750	53.4	1.49	8.04	8.04	8.04	0.40	0.84	± 12.0 %
1900	53.3	1.52	7.52	7.52	7.52	0.41	0.87	± 12.0 %
2000	53.3	1.52	7.65	7.65	7.65	0.40	0.89	± 12.0 %
2450	52.7	1.95	7.17	7.17	7.17	0.75	0.57	± 12.0 %
2600	52.5	2.16	6.99	6.99	6.99	0.80	0.50	± 12.0 %

<sup>C</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

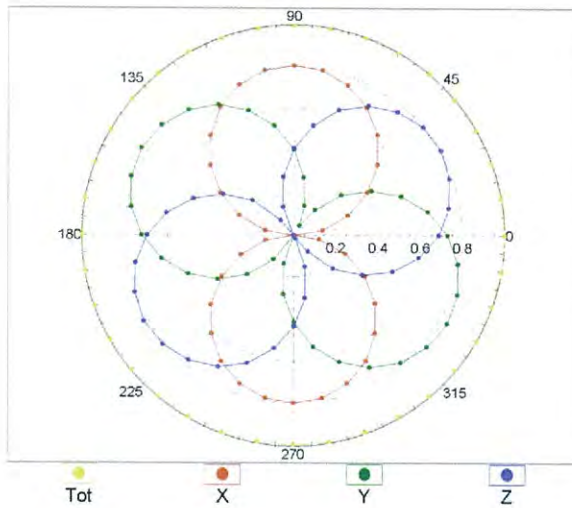
### Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide: R22)



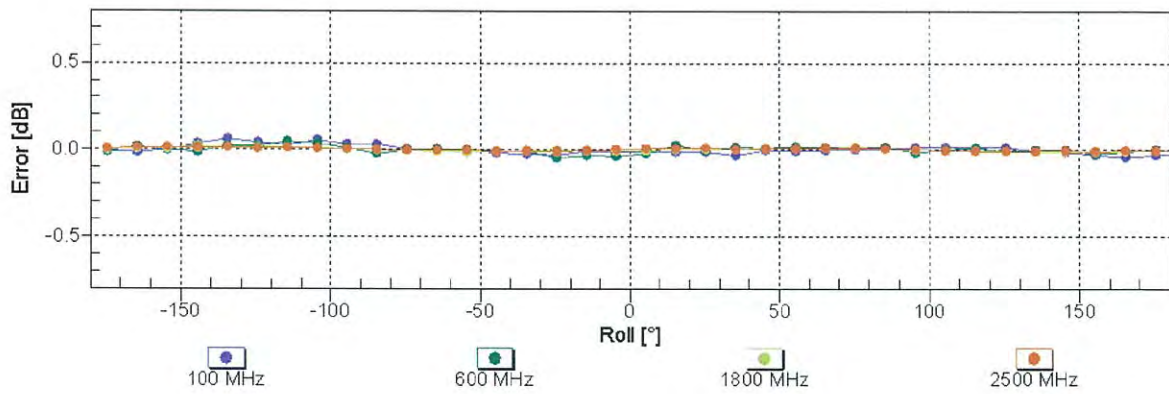
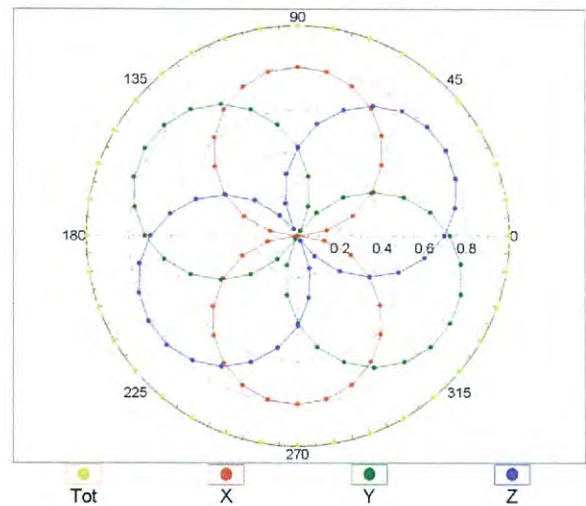
Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  (k=2)

### Receiving Pattern ( $\phi$ ), $\vartheta = 0^\circ$

f=600 MHz,TEM

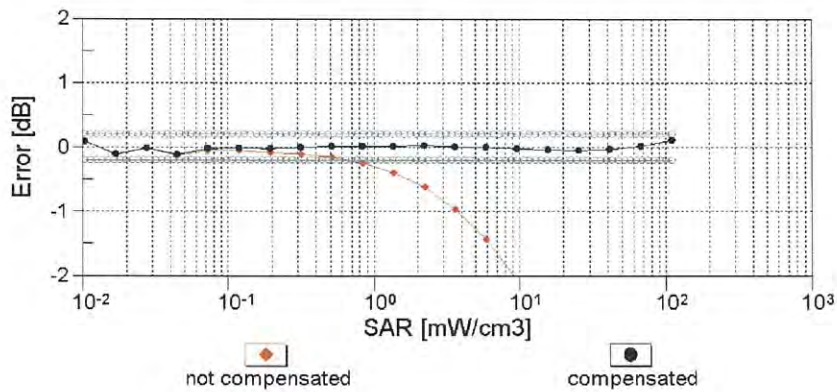
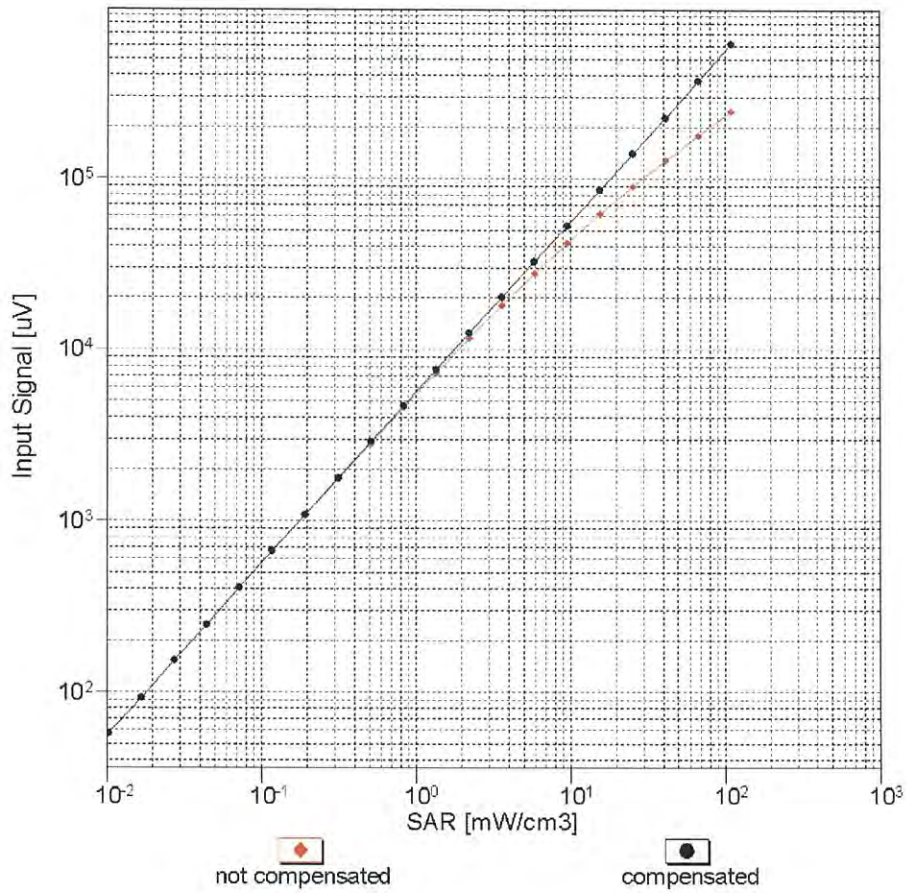


f=1800 MHz,R22



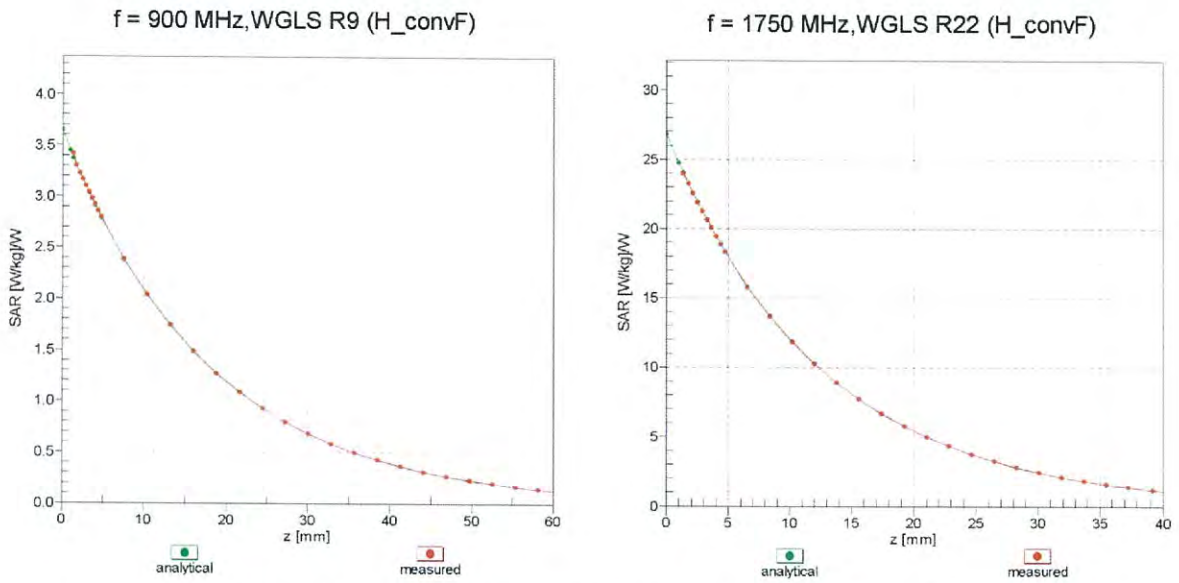
Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  (k=2)

### Dynamic Range $f(\text{SAR}_{\text{head}})$ (TEM cell , $f = 900 \text{ MHz}$ )

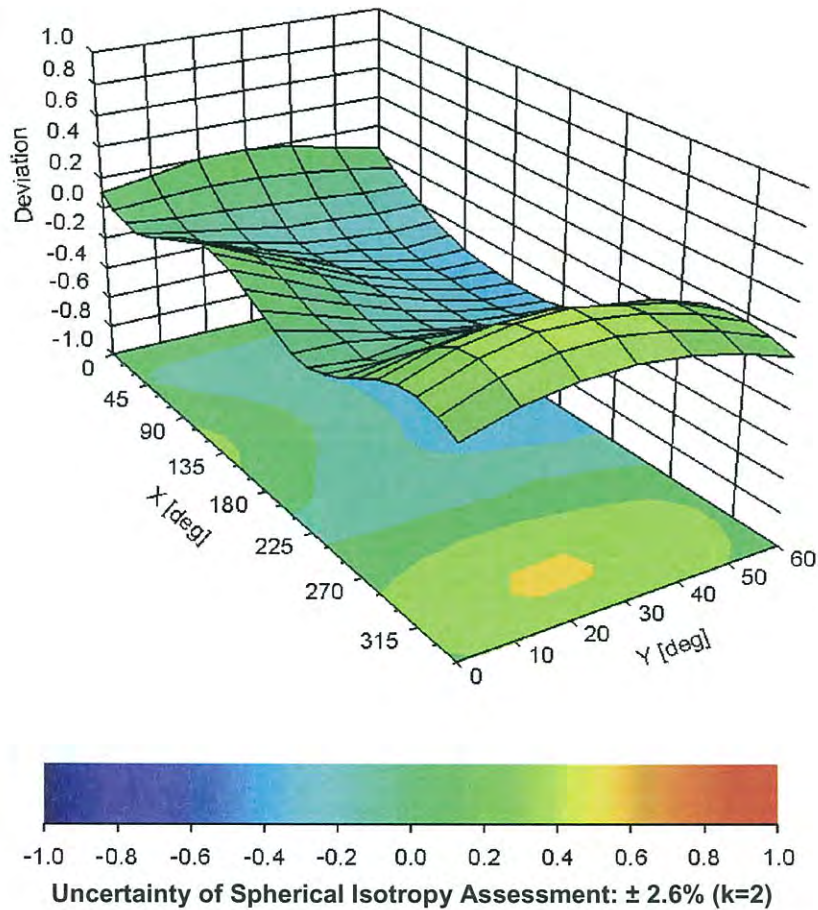


Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

# Conversion Factor Assessment



## Deviation from Isotropy in Liquid Error ( $\phi, \theta$ ), f = 900 MHz



## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3898

### Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-104.5
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **CCS-TW (Auden)**

Certificate No: **EX3-3554\_Sep13**

**CALIBRATION CERTIFICATE**

Object **EX3DV4 - SN:3554**

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: **September 26, 2013**

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	04-Apr-13 (No. 217-01733)	Apr-14
Power sensor E4412A	MY41498087	04-Apr-13 (No. 217-01733)	Apr-14
Reference 3 dB Attenuator	SN: S5054 (3c)	04-Apr-13 (No. 217-01737)	Apr-14
Reference 20 dB Attenuator	SN: S5277 (20x)	04-Apr-13 (No. 217-01735)	Apr-14
Reference 30 dB Attenuator	SN: S5129 (30b)	04-Apr-13 (No. 217-01738)	Apr-14
Reference Probe ES3DV2	SN: 3013	28-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 660	4-Sep-13 (No. DAE4-660_Sep13)	Apr-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-15
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: September 26, 2013

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



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Accreditation No.: **SCS 108**

**Glossary:**

TSL	tissue simulating liquid
NORM <sub>x,y,z</sub>	sensitivity in free space
ConvF	sensitivity in TSL / NORM <sub>x,y,z</sub>
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization $\varphi$	$\varphi$ rotation around probe axis
Polarization $\vartheta$	$\vartheta$ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\vartheta = 0$ is normal to probe axis

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

- a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- 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:**

- **NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\vartheta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below *ConvF*).
- **NORM(f)<sub>x,y,z</sub>** = NORM<sub>x,y,z</sub> \* *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*.
- **DCP<sub>x,y,z</sub>**: 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
- **A<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>; 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  $f \leq 800$  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 NORM<sub>x,y,z</sub> \* *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  $\pm 50$  MHz to  $\pm 100$  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.



# Probe EX3DV4

## SN:3554

Manufactured: July 13, 2004  
Calibrated: September 26, 2013

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

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3554

### Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup>	0.40	0.46	0.38	± 10.1 %
DCP (mV) <sup>B</sup>	98.6	97.6	99.7	

### Modulation Calibration Parameters

UID	Communication System Name		A dB	B dB $\sqrt{\mu\text{V}}$	C	D dB	VR mV	Unc <sup>E</sup> (k=2)
0	CW	X	0.0	0.0	1.0	0.00	187.4	±2.5 %
		Y	0.0	0.0	1.0		152.5	
		Z	0.0	0.0	1.0		182.8	

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%.

<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).

<sup>B</sup> Numerical linearization parameter: uncertainty not required.

<sup>E</sup> Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3554

### Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m) <sup>F</sup>	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
900	41.5	0.97	7.74	7.74	7.74	0.41	0.94	± 12.0 %
1810	40.0	1.40	6.85	6.85	6.85	0.68	0.67	± 12.0 %
1900	40.0	1.40	6.81	6.81	6.81	0.48	0.79	± 12.0 %
2000	40.0	1.40	6.80	6.80	6.80	0.76	0.62	± 12.0 %
2450	39.2	1.80	6.24	6.24	6.24	0.54	0.72	± 12.0 %
5200	36.0	4.66	4.73	4.73	4.73	0.30	1.80	± 13.1 %
5300	35.9	4.76	4.39	4.39	4.39	0.40	1.80	± 13.1 %
5500	35.6	4.96	4.32	4.32	4.32	0.40	1.80	± 13.1 %
5600	35.5	5.07	4.10	4.10	4.10	0.40	1.80	± 13.1 %
5800	35.3	5.27	4.09	4.09	4.09	0.40	1.80	± 13.1 %

<sup>C</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3554

### Calibration Parameter Determined in Body Tissue Simulating Media

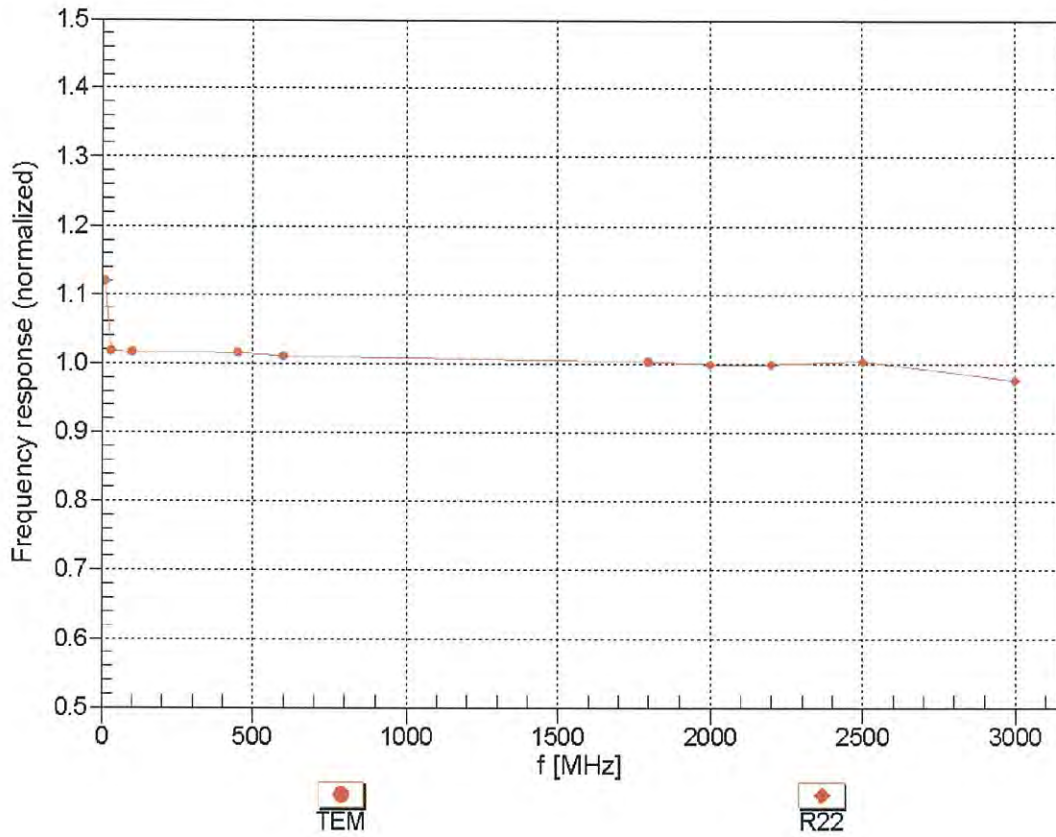
f (MHz) <sup>C</sup>	Relative Permittivity <sup>F</sup>	Conductivity (S/m) <sup>F</sup>	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
900	55.0	1.05	7.70	7.70	7.70	0.58	0.78	± 12.0 %
1810	53.3	1.52	6.65	6.65	6.65	0.69	0.70	± 12.0 %
1900	53.3	1.52	6.52	6.52	6.52	0.40	0.89	± 12.0 %
2000	53.3	1.52	6.63	6.63	6.63	0.80	0.64	± 12.0 %
2450	52.7	1.95	6.24	6.24	6.24	0.75	0.66	± 12.0 %
5200	49.0	5.30	4.02	4.02	4.02	0.40	1.90	± 13.1 %
5300	48.9	5.42	3.82	3.82	3.82	0.40	1.90	± 13.1 %
5500	48.6	5.65	3.59	3.59	3.59	0.40	1.90	± 13.1 %
5600	48.5	5.77	3.27	3.27	3.27	0.50	1.90	± 13.1 %
5800	48.2	6.00	3.53	3.53	3.53	0.50	1.90	± 13.1 %

<sup>C</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>F</sup> At frequencies below 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) can be relaxed to ± 10% if liquid compensation formula is applied to measured SAR values. At frequencies above 3 GHz, the validity of tissue parameters ( $\epsilon$  and  $\sigma$ ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

# Frequency Response of E-Field

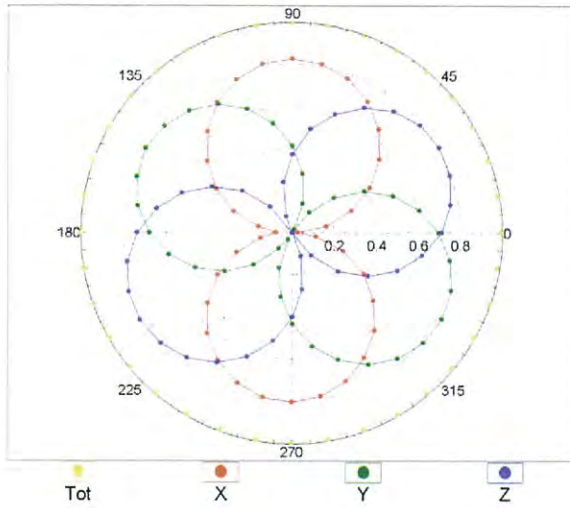
(TEM-Cell:ifi110 EXX, Waveguide: R22)



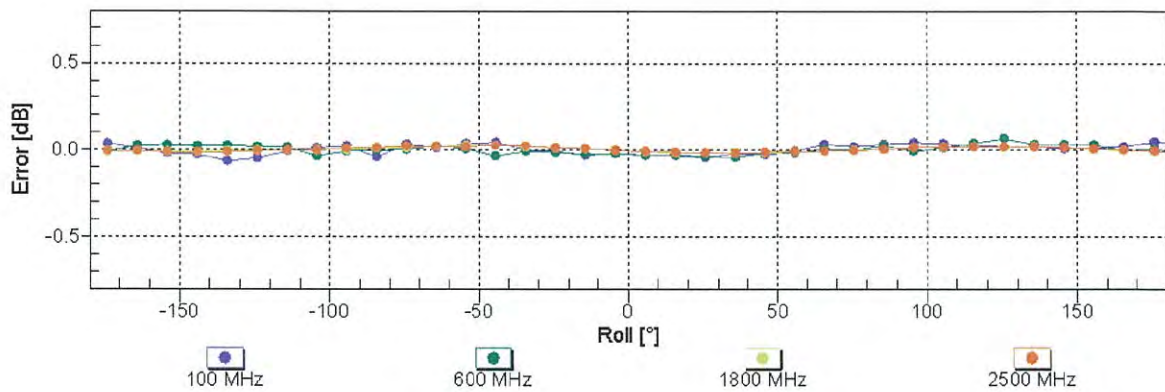
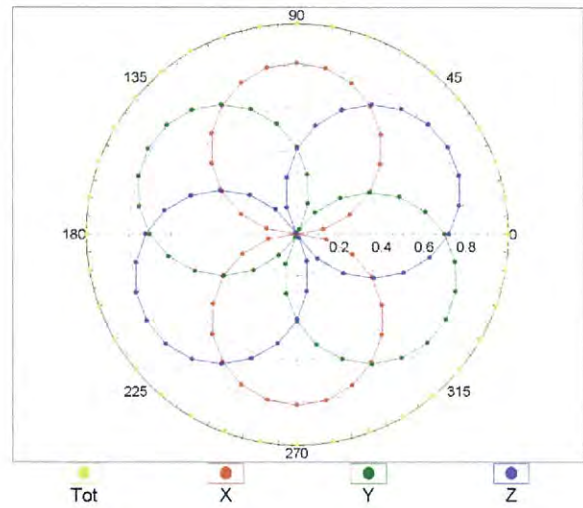
Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  (k=2)

### Receiving Pattern ( $\phi$ ), $\theta = 0^\circ$

f=600 MHz, TEM

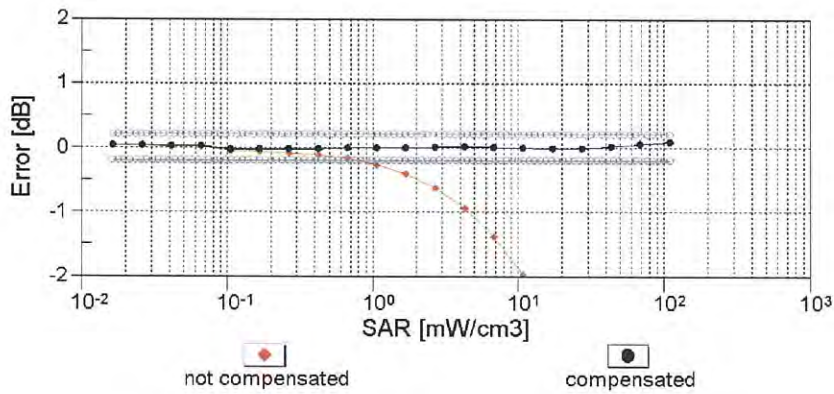
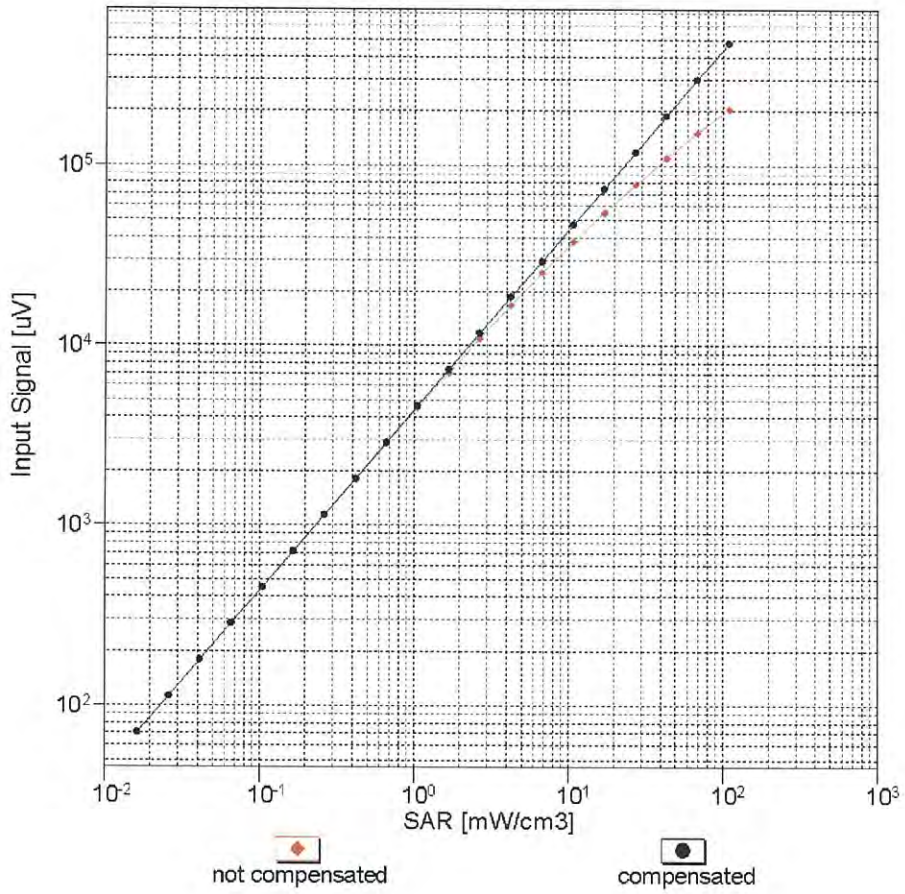


f=1800 MHz, R22



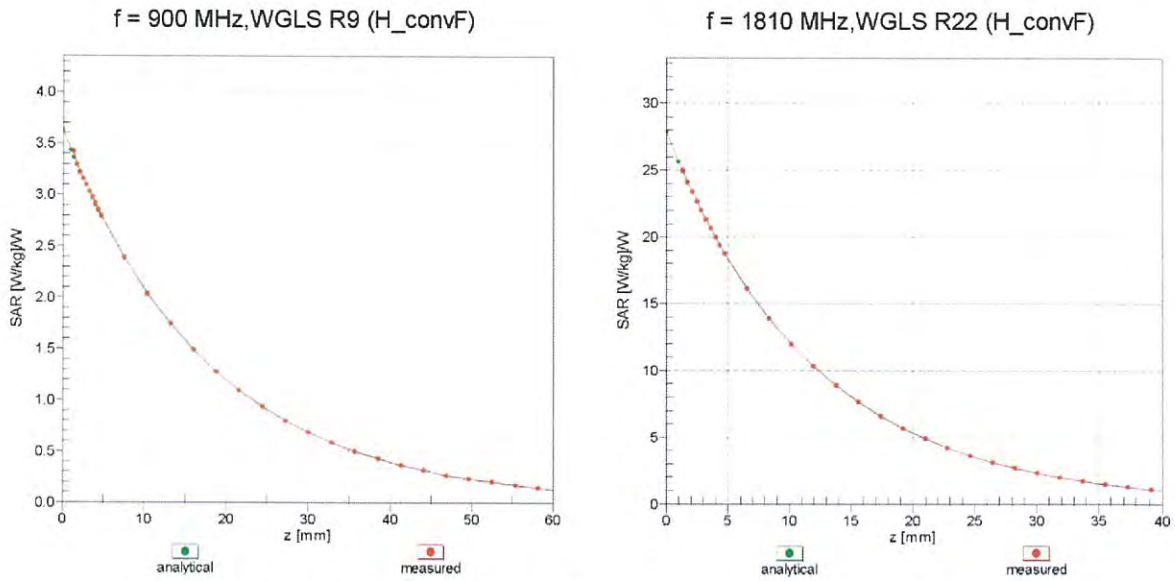
Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  (k=2)

### Dynamic Range $f(SAR_{head})$ (TEM cell , $f = 900$ MHz)

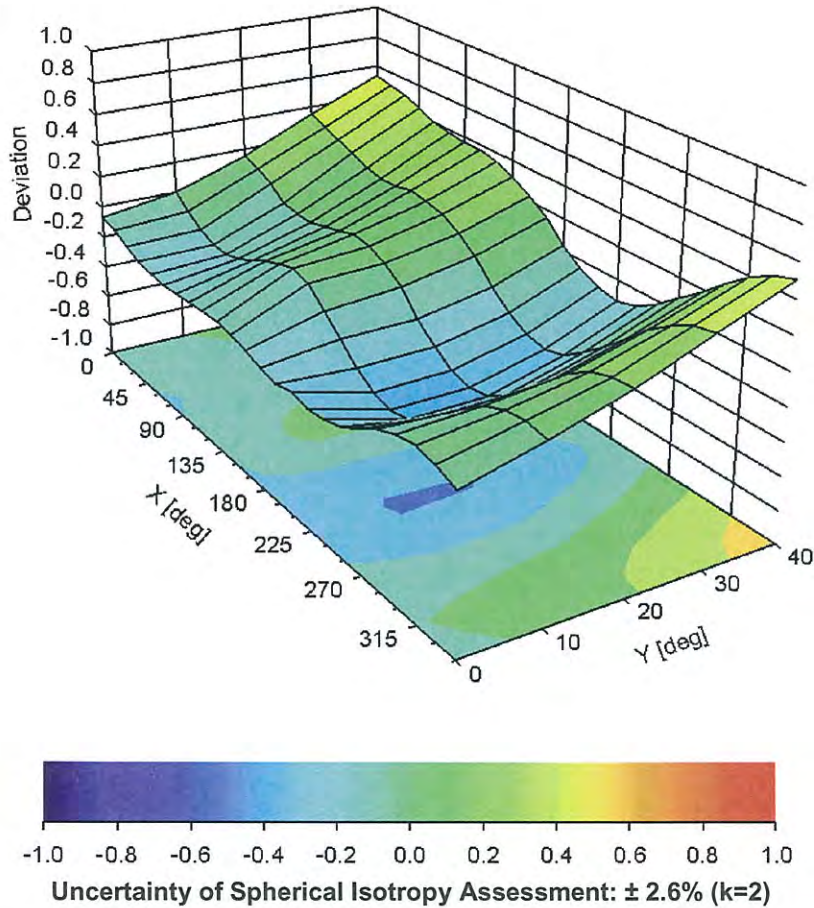


Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

# Conversion Factor Assessment



## Deviation from Isotropy in Liquid Error ( $\phi, \vartheta$ ), f = 900 MHz





## DASY/EASY - Parameters of Probe: EX3DV4 - SN:3554

### Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	-34.2
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

## IMPORTANT NOTICE

### USAGE OF THE DAE 4

The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:

**Battery Exchange:** The battery cover of the DAE4 unit is closed using a screw, over tightening the screw may cause the threads inside the DAE to wear out.

**Shipping of the DAE:** Before shipping the DAE to SPEAG for calibration, remove the batteries and pack the DAE in an antistatic bag. This antistatic bag shall then be packed into a larger box or container which protects the DAE from impacts during transportation. The package shall be marked to indicate that a fragile instrument is inside.

**E-Stop Failures:** Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, the customer shall always mount the probe to the DAE carefully and keep the DAE unit in a non-dusty environment if not used for measurements.

**Repair:** Minor repairs are performed at no extra cost during the annual calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect.

**DASY Configuration Files:** Since the exact values of the DAE input resistances, as measured during the calibration procedure of a DAE unit, are not used by the DASY software, a nominal value of 200 MOhm is given in the corresponding configuration file.

**Important Note:**

**Warranty and calibration is void if the DAE unit is disassembled partly or fully by the Customer.**

**Important Note:**

**Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the E-stop assembly is allowed by certified SPEAG personnel only and is part of the annual calibration procedure.**

**Important Note:**

**To prevent damage of the DAE probe connector pins, use great care when installing the probe to the DAE. Carefully connect the probe with the connector notch oriented in the mating position. Avoid any rotational movement of the probe body versus the DAE while turning the locking nut of the connector. The same care shall be used when disconnecting the probe from the DAE.**