

### A.3. System Check Test Plots

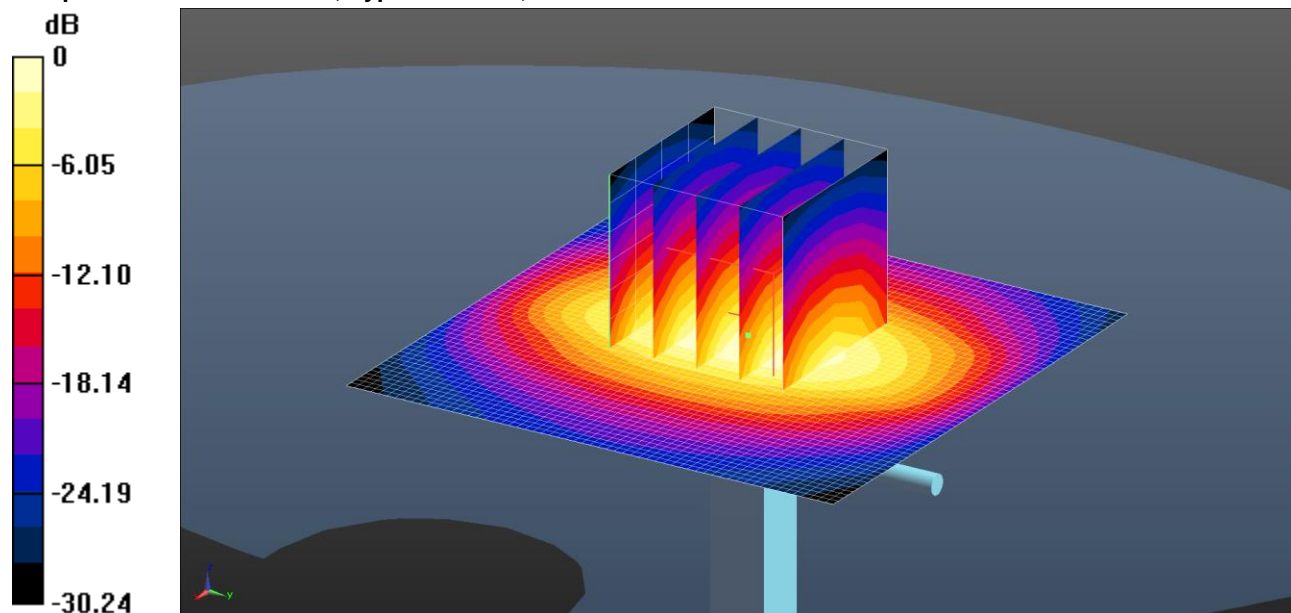
This appendix contains the following SAR distribution scans.

Scan Reference Number	Title
001	System Performance Check 1900MHz Head 02 03 15
002	System Performance Check 1900MHz Body 10 03 15

001: System Performance Check 1900MHz Head 02 03 15

Date: 2/3/2015

DUT: Dipole 1900 MHz D1900V2; Type: D1900V2; Serial: D1900V2 - SN:540



0 dB = 11.4 W/kg = 10.58 dBW/kg

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

Medium: 1900 MHz HSL Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.43$  S/m;  $\epsilon_r = 38.814$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(5.19, 5.19, 5.19); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**SAR/d=15mm, Pin=250 mW, dist=10.0mm (ET-Probe)/Area Scan (61x61x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

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

**SAR/d=15mm, Pin=250 mW, dist=10.0mm (ET-Probe)/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 92.52 V/m; Power Drift = 0.02 dB

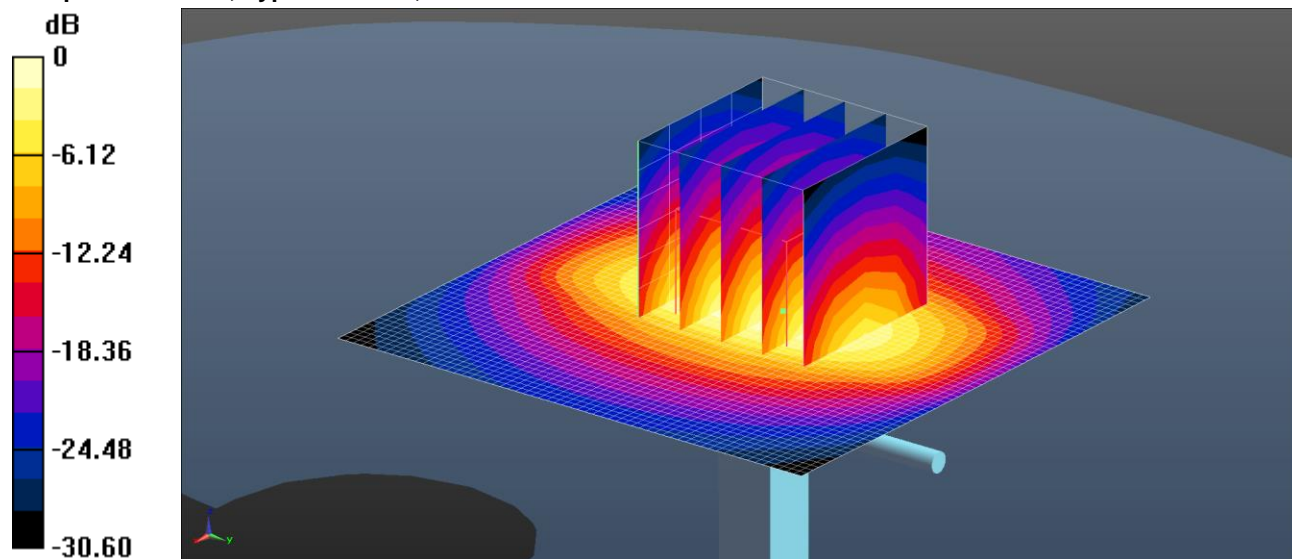
Peak SAR (extrapolated) = 16.9 W/kg

**SAR(1 g) = 9.78 W/kg; SAR(10 g) = 5.2 W/kg**

Maximum value of SAR (measured) = 10.9 W/kg

002: System Performance Check 1900MHz Body 10 03 15

Date: 10/3/2015

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: SN540**

0 dB = 11.7 W/kg = 10.67 dBW/kg

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

Medium: 1900 MHz MSL Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.553$  S/m;  $\epsilon_r = 52.358$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(4.76, 4.76, 4.76); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

SAR/d=15mm, Pin=250 mW, dist=10.0mm (ET-Probe) 2/Area Scan (61x61x1): Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 11.7 W/kg

SAR/d=15mm, Pin=250 mW, dist=10.0mm (ET-Probe) 2/Zoom Scan (5x5x7) (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 91.90 V/m; Power Drift = 0.07 dB

Peak SAR (extrapolated) = 16.1 W/kg

SAR(1 g) = 9.87 W/kg; SAR(10 g) = 5.35 W/kg

Maximum value of SAR (measured) = 11.0 W/kg

#### A.4. SAR Test Plots

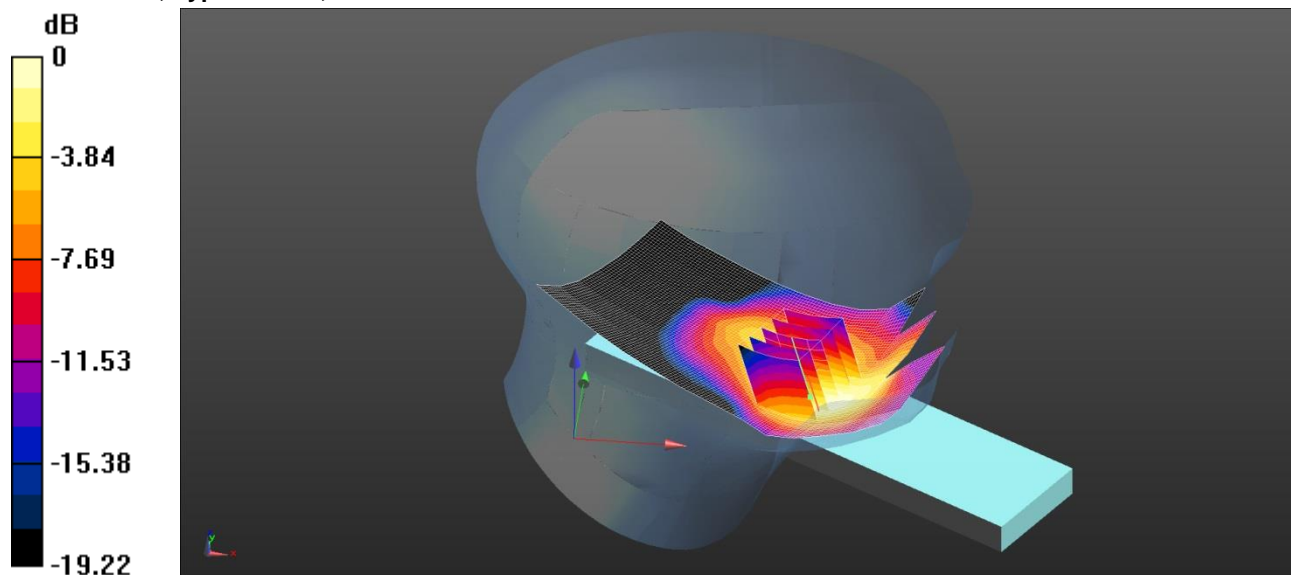
This appendix contains the following system validation distribution scans.

Scan Reference Number	Title
001	Touch Left PCS 1900 CH661
002	Tilt Left PCS 1900 CH661
003	Touch Right PCS 1900 CH661
004	Touch Right PCS 1900 CH661
005	Front Open of EUT Facing Phantom GPRS 1900 2Tx CH661
006	Back Open of EUT Facing Phantom GPRS 1900 2Tx CH661
007	Front Closed of EUT Facing Phantom GPRS 1900 2Tx CH661
008	Back Closed of EUT Facing Phantom GPRS 1900 2Tx CH661
009	Front Open of EUT Facing Phantom PCS 1900 CH661
010	Back Open of EUT Facing Phantom PCS 1900 CH661
011	Front Closed of EUT Facing Phantom PCS 1900 CH661
012	Back Closed of EUT Facing Phantom PCS 1900 CH661

001: Touch Left PCS 1900 CH661

Date: 2/3/2015

DUT: Panasonic; Type: 401PM; Serial: 004401221425016



0 dB = 0.494 W/kg = -3.06 dBW/kg

Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium: 1900 MHz HSL Medium parameters used (interpolated):  $f = 1880$  MHz;  $\sigma = 1.411$  S/m;  $\epsilon_r = 38.905$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(5.19, 5.19, 5.19); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**Configuration/Touch Left - Middle/Area Scan (61x161x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.536 W/kg

**Configuration/Touch Left - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 15.97 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 0.683 W/kg

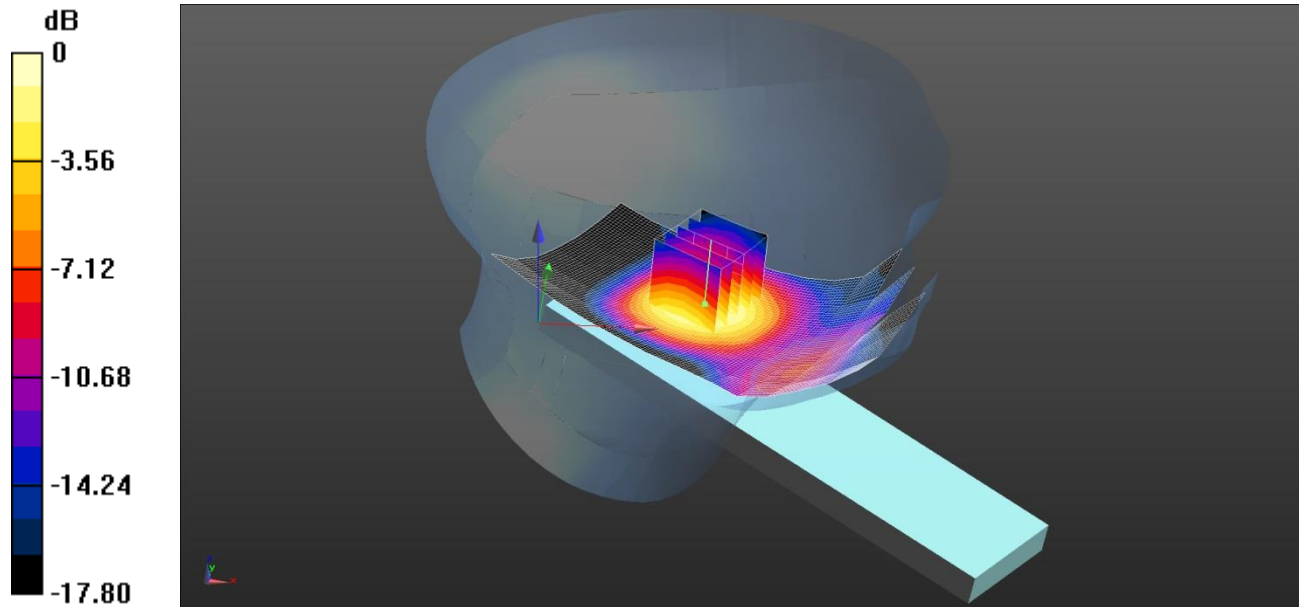
**SAR(1 g) = 0.453 W/kg; SAR(10 g) = 0.277 W/kg**

Maximum value of SAR (measured) = 0.494 W/kg

002: Tilt Left PCS 1900 CH661

Date: 2/3/2015

DUT: Panasonic; Type: 401PM; Serial: 004401221425016



0 dB = 0.343 W/kg = -4.65 dBW/kg

Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium: 1900 MHz HSL Medium parameters used (interpolated):  $f = 1880$  MHz;  $\sigma = 1.411$  S/m;  $\epsilon_r = 38.905$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(5.19, 5.19, 5.19); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**Configuration/Tilt Left - Middle/Area Scan (61x161x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.357 W/kg

**Configuration/Tilt Left - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.448 V/m; Power Drift = -0.05 dB

Peak SAR (extrapolated) = 0.454 W/kg

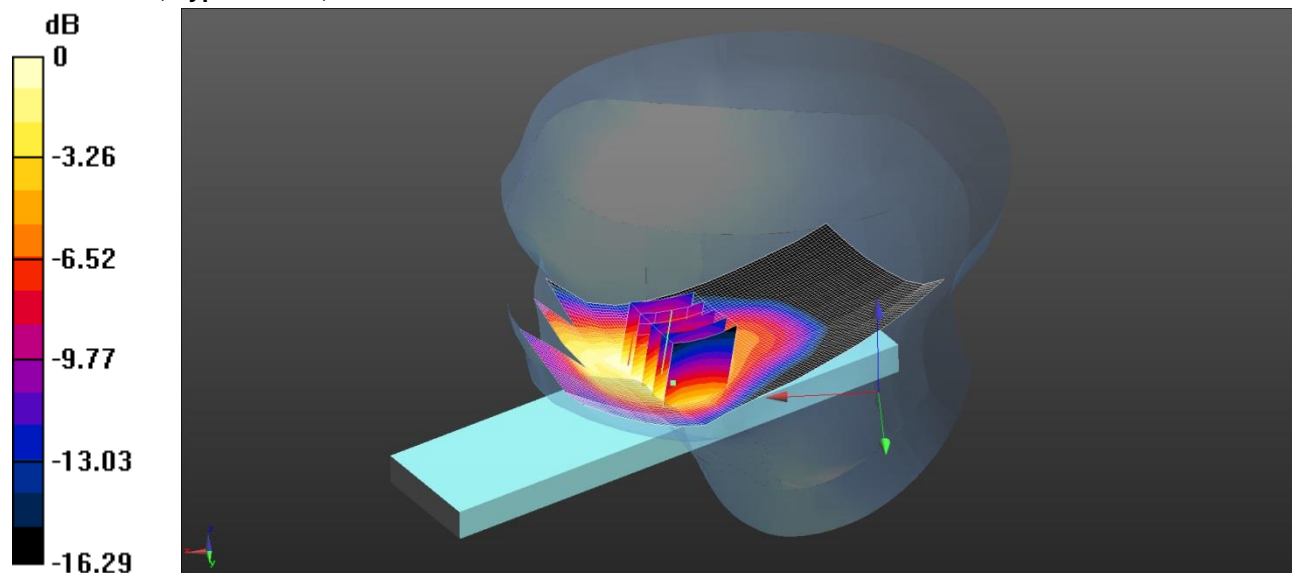
**SAR(1 g) = 0.315 W/kg; SAR(10 g) = 0.193 W/kg**

Maximum value of SAR (measured) = 0.343 W/kg

003: Touch Right PCS 1900 CH661

Date: 2/3/2015

DUT: Panasonic; Type: 401PM; Serial: 004401221425016



0 dB = 0.518 W/kg = -2.86 dBW/kg

Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium: 1900 MHz HSL Medium parameters used (interpolated):  $f = 1880$  MHz;  $\sigma = 1.411$  S/m;  $\epsilon_r = 38.905$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(5.19, 5.19, 5.19); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**Configuration/Touch Right - Middle/Area Scan (61x161x1):** Interpolated grid:  $dx=1.500$  mm,  $dy=1.500$  mm

Maximum value of SAR (interpolated) = 0.538 W/kg

**Configuration/Touch Right - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid:  $dx=8$ mm,  $dy=8$ mm,  $dz=5$ mm

Reference Value = 18.99 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.641 W/kg

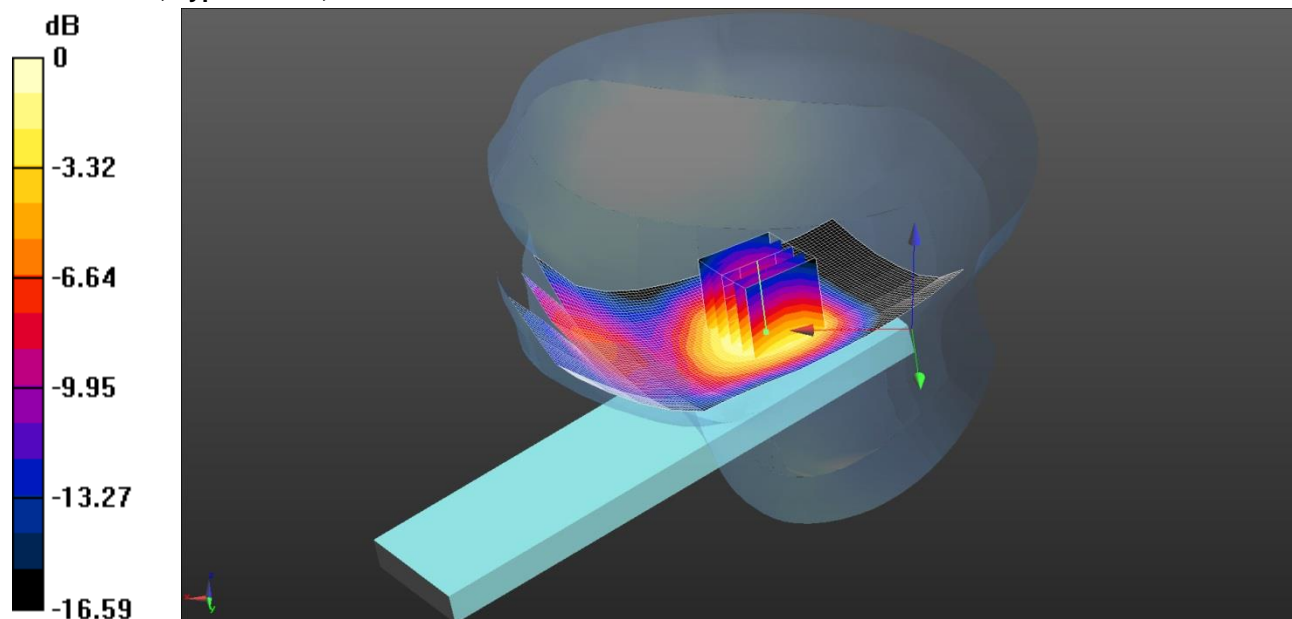
**SAR(1 g) = 0.483 W/kg; SAR(10 g) = 0.318 W/kg**

Maximum value of SAR (measured) = 0.518 W/kg

004: Touch Right PCS 1900 CH661

Date: 2/3/2015

DUT: Panasonic; Type: 401PM; Serial: 004401221425016



0 dB = 0.286 W/kg = -5.44 dBW/kg

Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium: 1900 MHz HSL Medium parameters used (interpolated):  $f = 1880$  MHz;  $\sigma = 1.411$  S/m;  $\epsilon_r = 38.905$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(5.19, 5.19, 5.19); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**Configuration/Tilt Right - Middle/Area Scan (61x161x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.302 W/kg

**Configuration/Tilt Right - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.498 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 0.375 W/kg

**SAR(1 g) = 0.267 W/kg; SAR(10 g) = 0.168 W/kg**

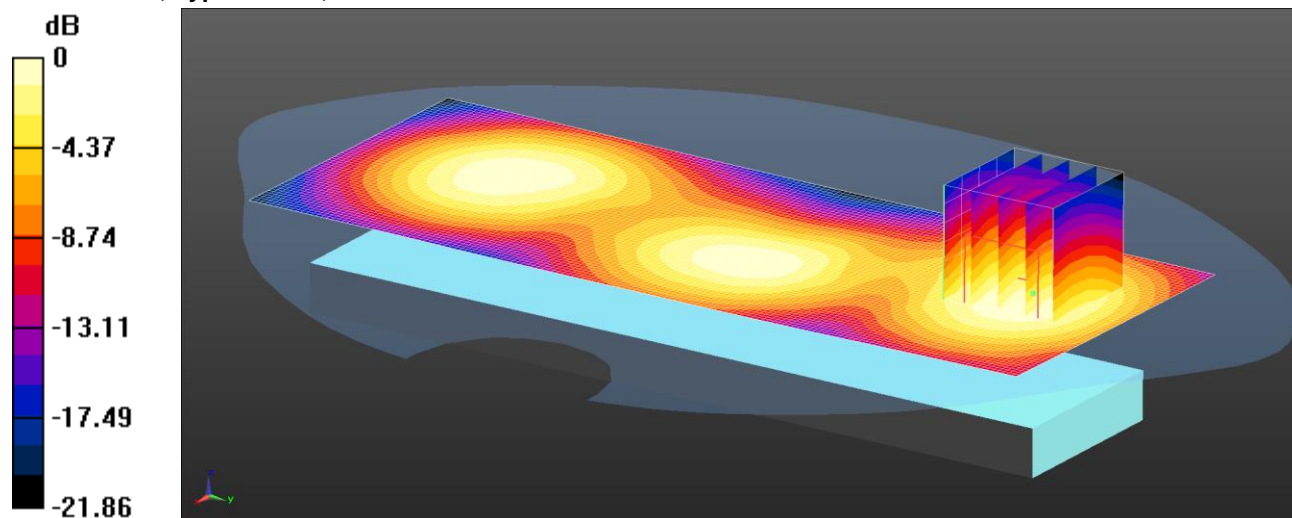
Maximum value of SAR (measured) = 0.286 W/kg



005: Front Open of EUT Facing Phantom GPRS 1900 2Tx CH661

Date: 10/3/2015

DUT: Panasonic; Type: 401PM; Serial: 004401221425016



0 dB = 0.282 W/kg = -5.49 dBW/kg

Communication System: UID 0, GPRS 2Tx (0); Frequency: 1880 MHz; Duty Cycle: 1:4.00037

Medium: 1900 MHz MSL Medium parameters used (interpolated):  $f = 1880$  MHz;  $\sigma = 1.532$  S/m;  $\epsilon_r = 52.412$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(4.76, 4.76, 4.76); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**Configuration/Front Open - Middle/Area Scan (61x151x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.282 W/kg

**Configuration/Front Open - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.304 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 0.381 W/kg

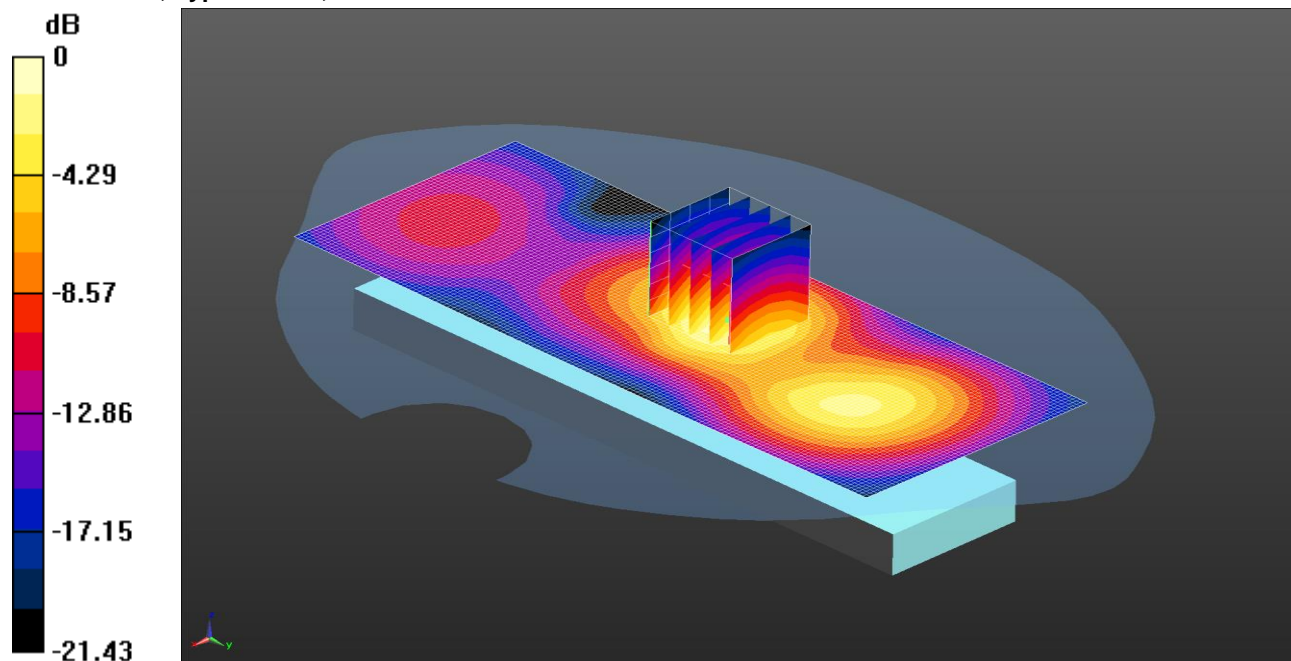
**SAR(1 g) = 0.256 W/kg; SAR(10 g) = 0.165 W/kg**

Maximum value of SAR (measured) = 0.275 W/kg

006: Back Open of EUT Facing Phantom GPRS 1900 2Tx CH661

Date: 10/3/2015

DUT: Panasonic; Type: 401PM; Serial: 004401221425016



0 dB = 0.550 W/kg = -2.60 dBW/kg

Communication System: UID 0, GPRS 2Tx (0); Frequency: 1880 MHz; Duty Cycle: 1:4.00037

Medium: 1900 MHz MSL Medium parameters used (interpolated):  $f = 1880$  MHz;  $\sigma = 1.532$  S/m;  $\epsilon_r = 52.412$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(4.76, 4.76, 4.76); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**Configuration/Back Open - Middle/Area Scan (61x151x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.550 W/kg

**Configuration/Back Open - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.206 V/m; Power Drift = 0.02 dB

Peak SAR (extrapolated) = 0.768 W/kg

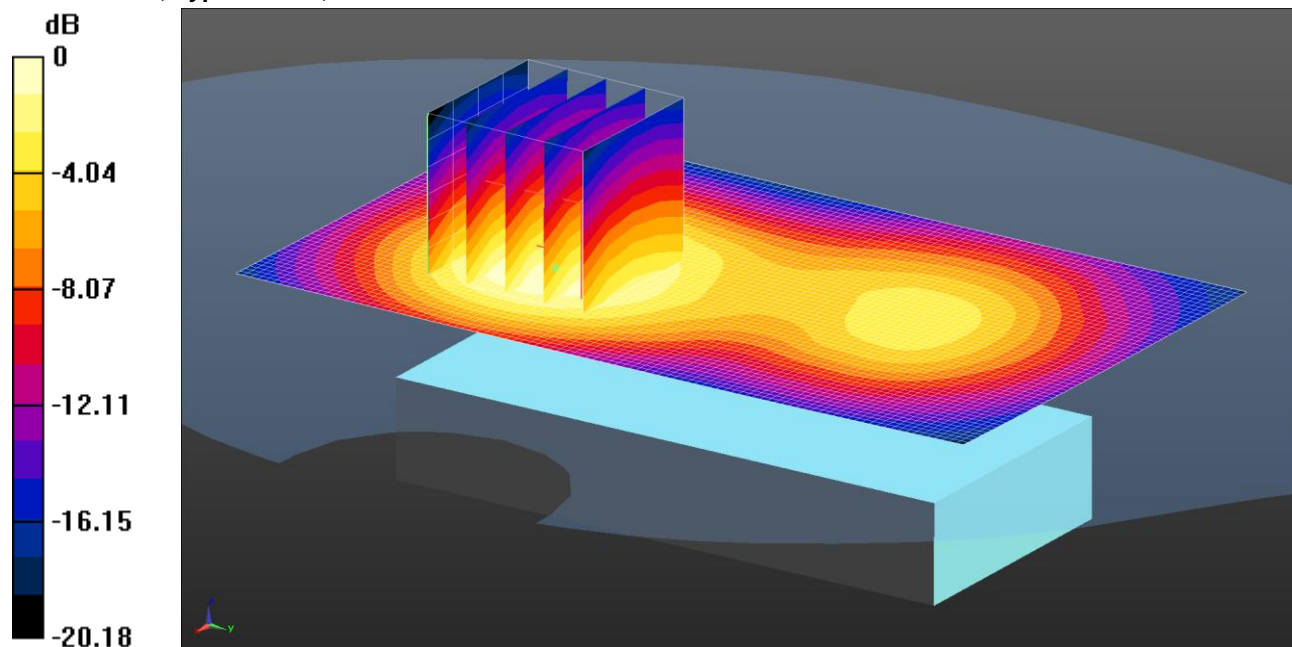
**SAR(1 g) = 0.482 W/kg; SAR(10 g) = 0.279 W/kg**

Maximum value of SAR (measured) = 0.531 W/kg

007: Front Closed of EUT Facing Phantom GPRS 1900 2Tx CH661

Date: 10/3/2015

DUT: Panasonic; Type: 401PM; Serial: 004401221425016



0 dB = 0.350 W/kg = -4.56 dBW/kg

Communication System: UID 0, GPRS 2Tx (0); Frequency: 1880 MHz; Duty Cycle: 1:4.00037

Medium: 1900 MHz MSL Medium parameters used (interpolated):  $f = 1880$  MHz;  $\sigma = 1.532$  S/m;  $\epsilon_r = 52.412$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(4.76, 4.76, 4.76); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**Configuration/Front Closed - Middle 2/Area Scan (61x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.350 W/kg

**Configuration/Front Closed - Middle 2/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11.79 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.452 W/kg

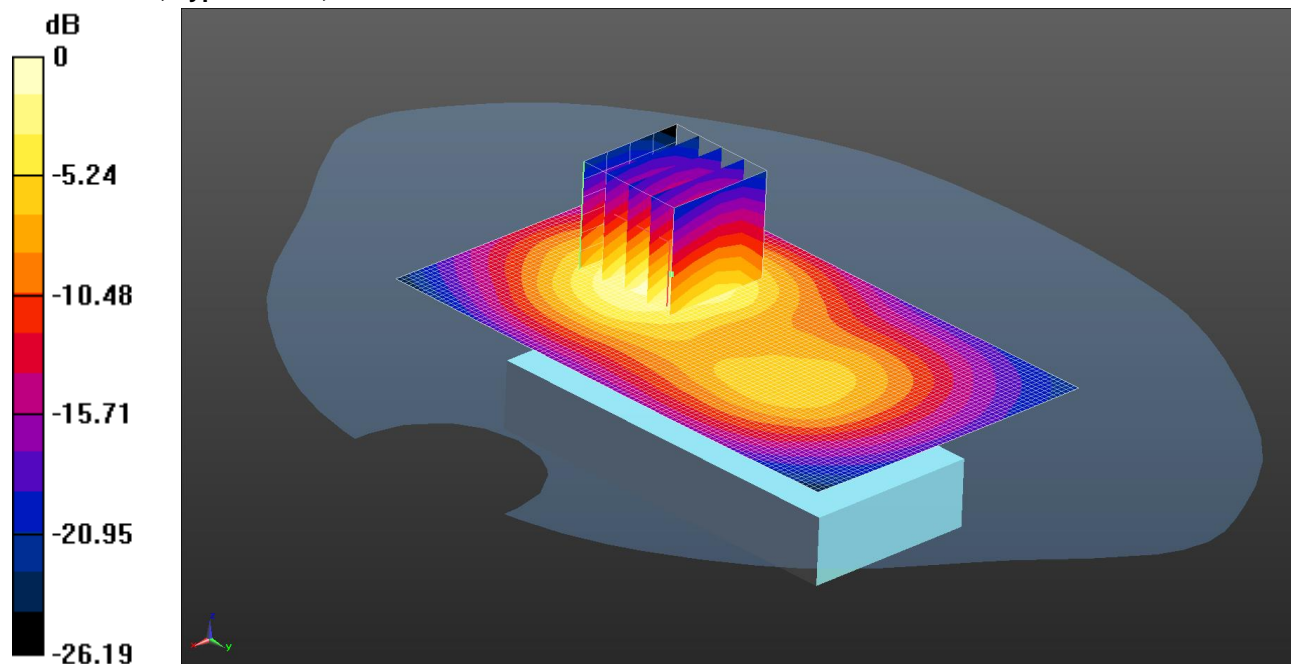
**SAR(1 g) = 0.315 W/kg; SAR(10 g) = 0.200 W/kg**

Maximum value of SAR (measured) = 0.339 W/kg

008: Back Closed of EUT Facing Phantom GPRS 1900 2Tx CH661

Date: 10/3/2015

DUT: Panasonic; Type: 401PM; Serial: 004401221425016



0 dB = 0.499 W/kg = -3.02 dBW/kg

Communication System: UID 0, GPRS 2Tx (0); Frequency: 1880 MHz; Duty Cycle: 1:4.00037

Medium: 1900 MHz MSL Medium parameters used (interpolated):  $f = 1880$  MHz;  $\sigma = 1.532$  S/m;  $\epsilon_r = 52.412$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(4.76, 4.76, 4.76); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**Configuration/Back Closed - Middle/Area Scan (61x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.499 W/kg

**Configuration/Back Closed - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 13.38 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.711 W/kg

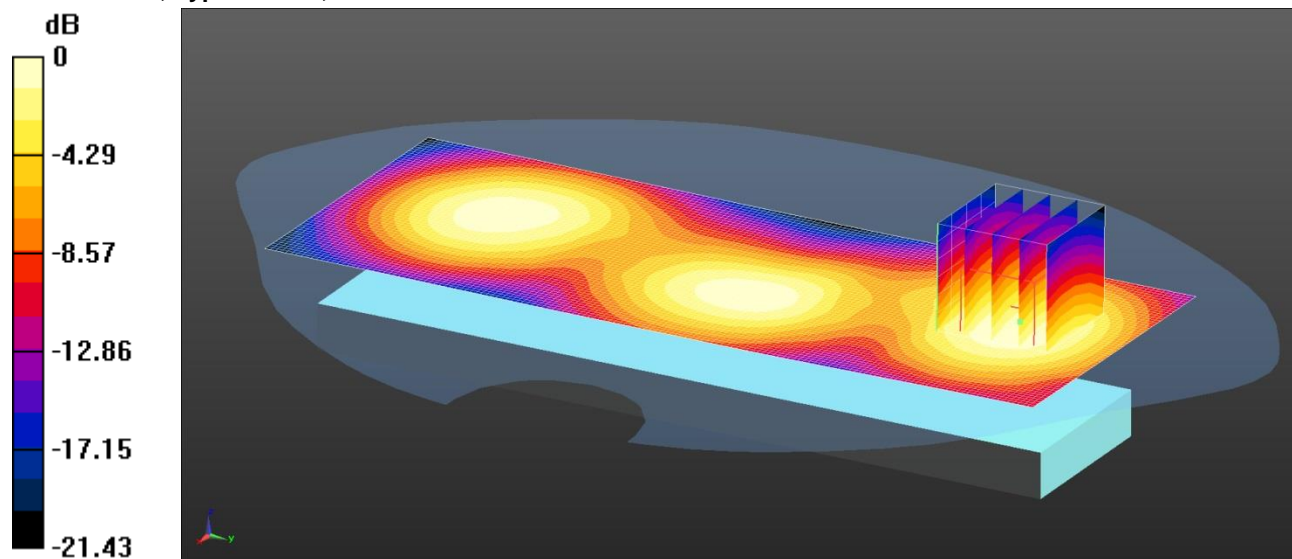
**SAR(1 g) = 0.424 W/kg; SAR(10 g) = 0.239 W/kg**

Maximum value of SAR (measured) = 0.471 W/kg

009: Front Open of EUT Facing Phantom PCS 1900 CH661

Date: 10/3/2015

DUT: Panasonic; Type: 401PM; Serial: 004401221425016



0 dB = 0.244 W/kg = -6.12 dBW/kg

Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium: 1900 MHz MSL Medium parameters used (interpolated):  $f = 1880$  MHz;  $\sigma = 1.532$  S/m;  $\epsilon_r = 52.412$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(4.76, 4.76, 4.76); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**Configuration/Front Open - Middle/Area Scan (61x151x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.244 W/kg

**Configuration/Front Open - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.849 V/m; Power Drift = 0.00 dB

Peak SAR (extrapolated) = 0.318 W/kg

**SAR(1 g) = 0.215 W/kg; SAR(10 g) = 0.139 W/kg**

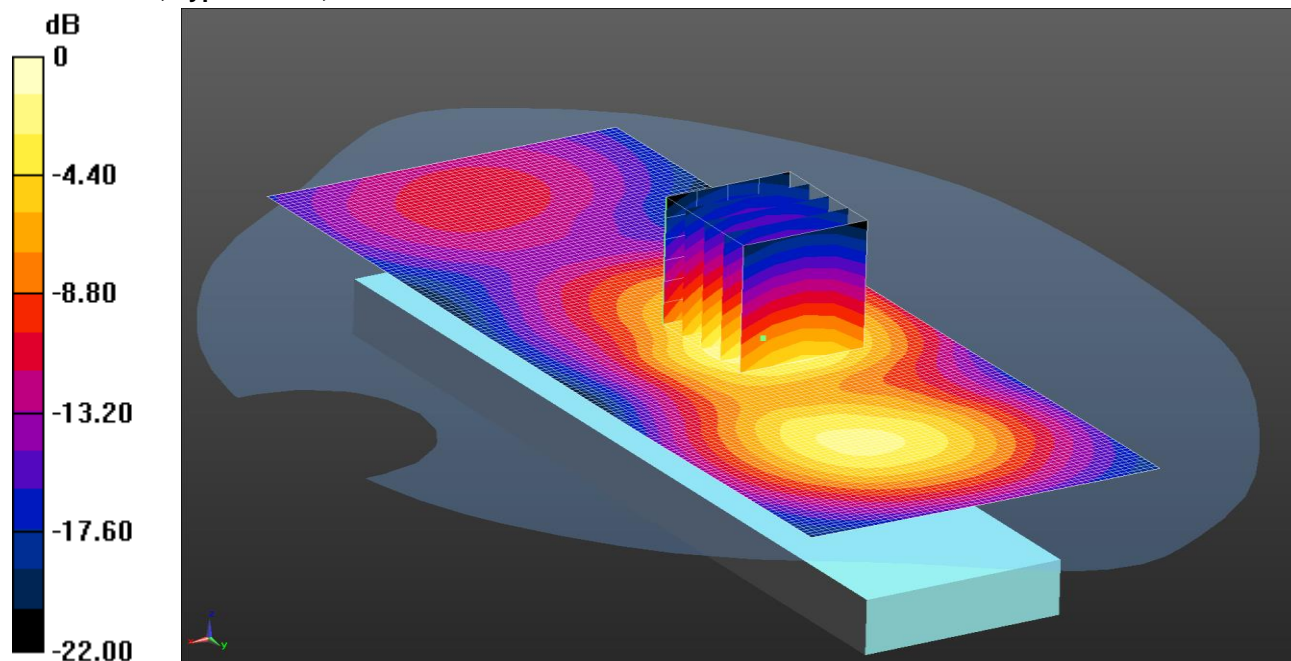
Maximum value of SAR (measured) = 0.232 W/kg



010: Back Open of EUT Facing Phantom PCS 1900 CH661

Date: 10/3/2015

DUT: Panasonic; Type: 401PM; Serial: 004401221425016



0 dB = 0.453 W/kg = -3.44 dBW/kg

Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium: 1900 MHz MSL Medium parameters used (interpolated):  $f = 1880$  MHz;  $\sigma = 1.532$  S/m;  $\epsilon_r = 52.412$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(4.76, 4.76, 4.76); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**Configuration/Back Open - Middle/Area Scan (61x151x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.453 W/kg

**Configuration/Back Open - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.35 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.637 W/kg

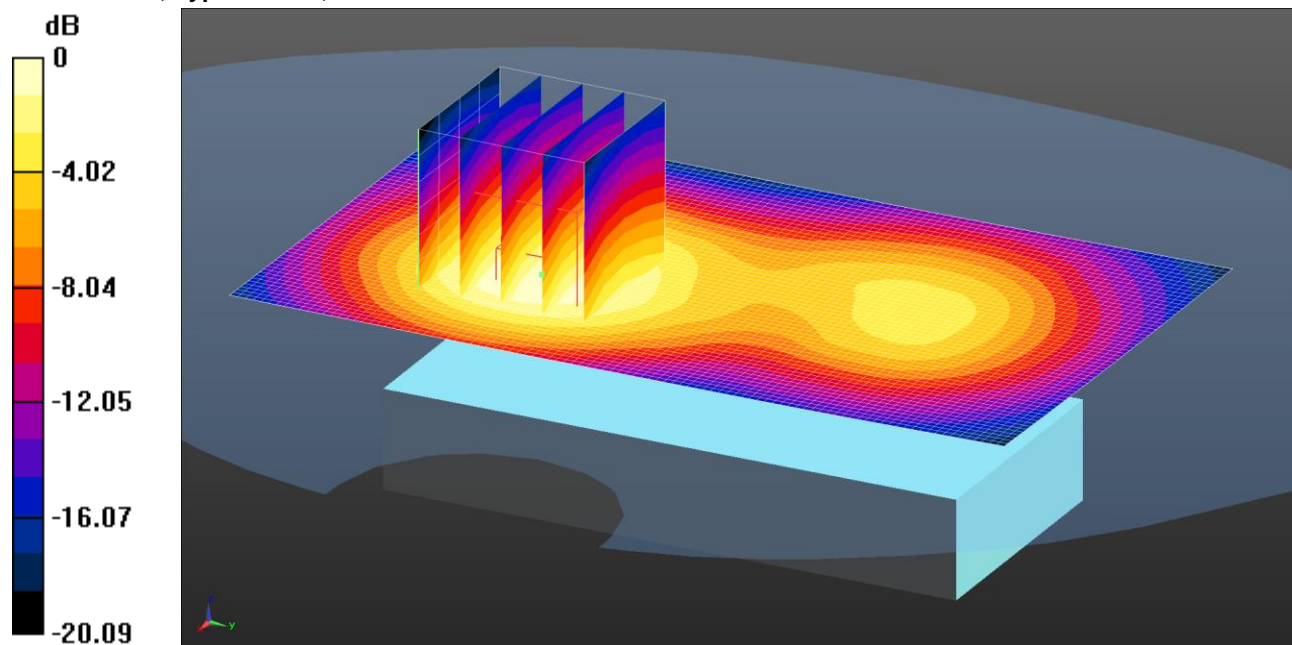
**SAR(1 g) = 0.398 W/kg; SAR(10 g) = 0.230 W/kg**

Maximum value of SAR (measured) = 0.437 W/kg

011: Front Closed of EUT Facing Phantom PCS 1900 CH661

Date: 10/3/2015

DUT: Panasonic; Type: 401PM; Serial: 004401221425016



0 dB = 0.294 W/kg = -5.32 dBW/kg

Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium: 1900 MHz MSL Medium parameters used (interpolated):  $f = 1880$  MHz;  $\sigma = 1.532$  S/m;  $\epsilon_r = 52.412$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(4.76, 4.76, 4.76); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**Configuration/Front Closed - Middle/Area Scan (61x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.294 W/kg

**Configuration/Front Closed - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.754 V/m; Power Drift = -0.07 dB

Peak SAR (extrapolated) = 0.379 W/kg

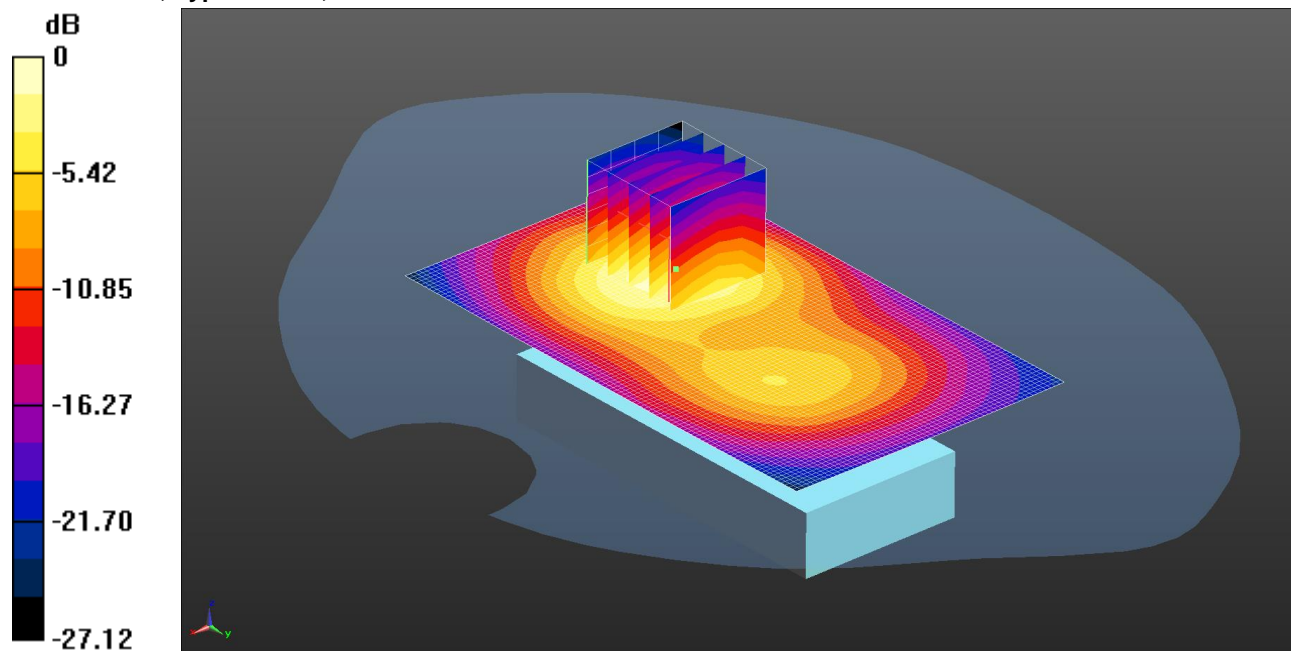
**SAR(1 g) = 0.260 W/kg; SAR(10 g) = 0.164 W/kg**

Maximum value of SAR (measured) = 0.282 W/kg

012: Back Closed of EUT Facing Phantom PCS 1900 CH661

Date: 10/3/2015

DUT: Panasonic; Type: 401PM; Serial: 004401221425016



0 dB = 0.403 W/kg = -3.94 dBW/kg

Communication System: UID 0, Generic GSM (0); Frequency: 1880 MHz; Duty Cycle: 1:8.30042

Medium: 1900 MHz MSL Medium parameters used (interpolated):  $f = 1880$  MHz;  $\sigma = 1.532$  S/m;  $\epsilon_r = 52.412$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1528; ConvF(4.76, 4.76, 4.76); Calibrated: 16/4/2014;
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1438; Calibrated: 12/5/2014
- Phantom: SAM (30deg probe tilt) with CRP v5.0; Type: QD000P40CD; Serial: TP:1836
- ; SEMCAD X Version 14.6.10 (7331)

**Configuration/Back Closed - Middle/Area Scan (61x101x1):** Interpolated grid: dx=1.500 mm, dy=1.500 mm

Maximum value of SAR (interpolated) = 0.403 W/kg

**Configuration/Back Closed - Middle/Zoom Scan (5x5x7) (5x5x7)/Cube 0:** Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.088 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.585 W/kg

**SAR(1 g) = 0.346 W/kg; SAR(10 g) = 0.194 W/kg**

Maximum value of SAR (measured) = 0.388 W/kg



**A.5. Calibration Certificate for E-Field Probe**

This section contains the calibration certificates and data for the Probe(s) used, which are not included in the total number of pages for this report.



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 The Swiss Accreditation Service is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

*A1185*

Client **UL RFI UK**

Certificate No: **ET3-1528\_Apr14**

## CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1528**

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

Calibration date: **April 16, 2014**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^{\circ}\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	03-Apr-14 (No. 217-01911)	Apr-15
Power sensor E4412A	MY41498087	03-Apr-14 (No. 217-01911)	Apr-15
Reference 3 dB Attenuator	SN: S5054 (3c)	03-Apr-14 (No. 217-01915)	Apr-15
Reference 20 dB Attenuator	SN: S5277 (20x)	03-Apr-14 (No. 217-01919)	Apr-15
Reference 30 dB Attenuator	SN: S5129 (30b)	03-Apr-14 (No. 217-01920)	Apr-15
Reference Probe ES3DV2	SN: 3013	30-Dec-13 (No. ES3-3013_Dec13)	Dec-14
DAE4	SN: 660	13-Dec-13 (No. DAE4-660_Dec13)	Dec-14
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-13)	In house check: Apr-16
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-13)	In house check: Oct-14

	Name	Function	Signature
Calibrated by:	Israe El-Naouq	Laboratory Technician	<i>Israe El-Naouq</i>
Approved by:	Katja Pokovic	Technical Manager	<i>Katja Pokovic</i>
			Issued: April 16, 2014
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			



Accredited by the Swiss Accreditation Service (SAS)

Accreditation No.: **SCS 108**

The Swiss Accreditation Service is one of the signatories to the EA  
 Multilateral Agreement for the recognition of calibration certificates

### 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
Connector Angle	information used in DASY system to align probe sensor X to the robot coordinate system

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

- 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 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  $E^2$ -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.
- Connector Angle**: The angle is assessed using the information gained by determining the NORM<sub>x</sub> (no uncertainty required).

# Probe ET3DV6

## SN:1528

Manufactured:	March 21, 2000
Calibrated:	April 16, 2014

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

## DASY/EASY - Parameters of Probe: ET3DV6 - SN:1528

### Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup>	1.44	1.85	1.59	± 10.1 %
DCP (mV) <sup>B</sup>	97.4	100.0	102.2	

### 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	232.7	±3.5 %
		Y	0.0	0.0	1.0		229.2	
		Z	0.0	0.0	1.0		230.2	

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: ET3DV6 - SN:1528

### 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 <sup>G</sup>	Depth <sup>G</sup> (mm)	Unct. (k=2)
750	41.9	0.89	6.48	6.48	6.48	0.28	3.00	± 12.0 %
835	41.5	0.90	6.24	6.24	6.24	0.31	3.00	± 12.0 %
900	41.5	0.97	6.06	6.06	6.06	0.32	3.00	± 12.0 %
1450	40.5	1.20	5.44	5.44	5.44	0.42	3.00	± 12.0 %
1750	40.1	1.37	5.25	5.25	5.25	0.80	2.14	± 12.0 %
1900	40.0	1.40	5.19	5.19	5.19	0.80	1.98	± 12.0 %
2100	39.8	1.49	5.21	5.21	5.21	0.80	1.97	± 12.0 %
2300	39.5	1.67	4.70	4.70	4.70	0.80	1.81	± 12.0 %
2450	39.2	1.80	4.34	4.34	4.34	0.80	1.65	± 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.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

## DASY/EASY - Parameters of Probe: ET3DV6 - SN:1528

### 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 <sup>G</sup>	Depth <sup>G</sup> (mm)	Unct. (k=2)
750	55.5	0.96	6.09	6.09	6.09	0.38	2.49	± 12.0 %
835	55.2	0.97	6.03	6.03	6.03	0.56	2.14	± 12.0 %
900	55.0	1.05	5.92	5.92	5.92	0.36	2.87	± 12.0 %
1450	54.0	1.30	5.20	5.20	5.20	0.80	1.52	± 12.0 %
1750	53.4	1.49	4.68	4.68	4.68	0.80	2.41	± 12.0 %
1900	53.3	1.52	4.76	4.76	4.76	0.80	2.37	± 12.0 %
2100	53.2	1.62	4.71	4.71	4.71	0.80	2.18	± 12.0 %
2300	52.9	1.81	4.27	4.27	4.27	0.80	1.57	± 12.0 %
2450	52.7	1.95	4.10	4.10	4.10	0.80	1.37	± 12.0 %

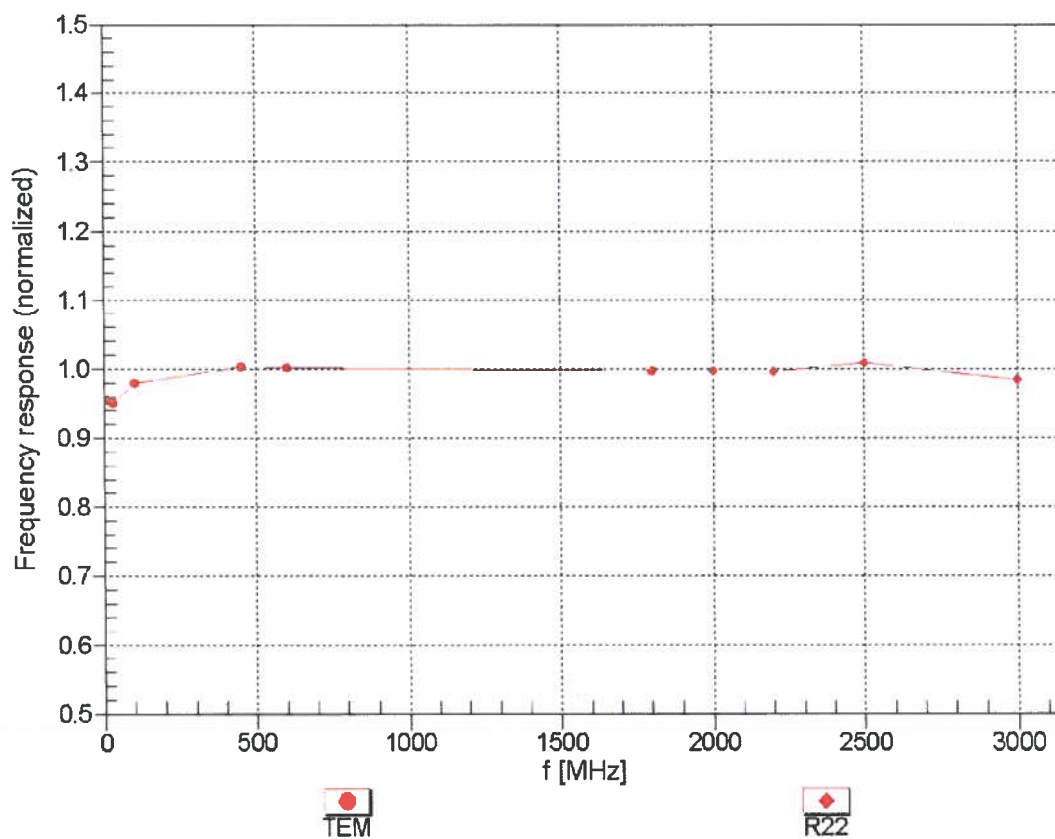
<sup>C</sup> Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<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.

<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ± 1% for frequencies below 3 GHz and below ± 2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

## Frequency Response of E-Field

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

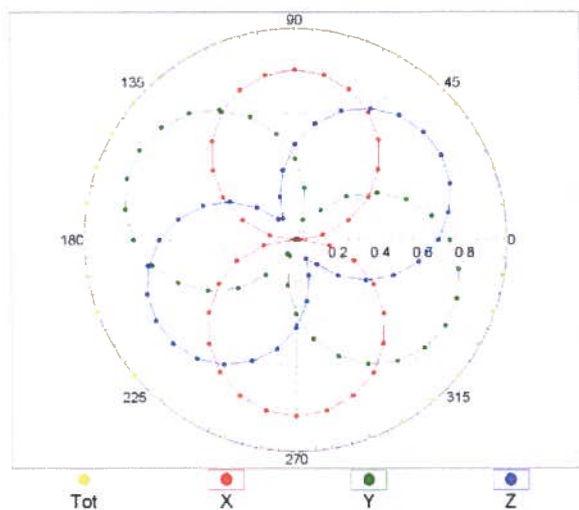


Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

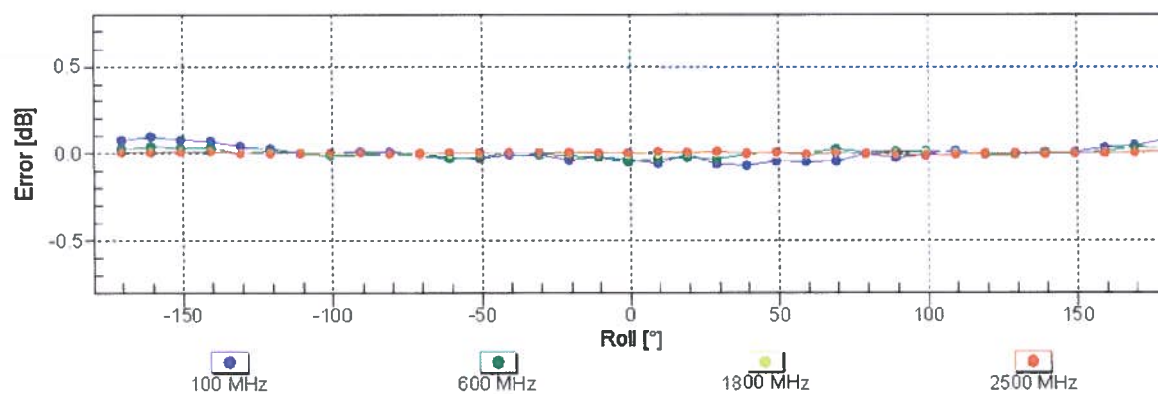
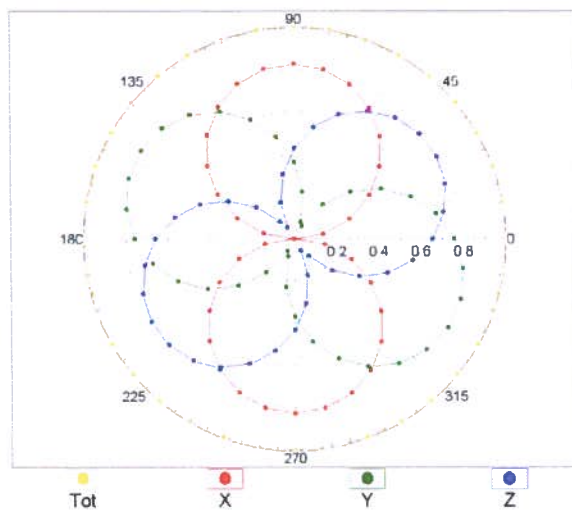


## Receiving Pattern ( $\phi$ ), $\vartheta = 0^\circ$

f=600 MHz,TEM



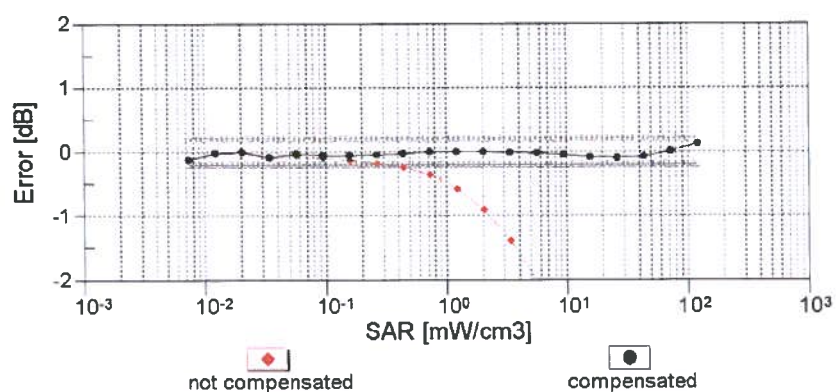
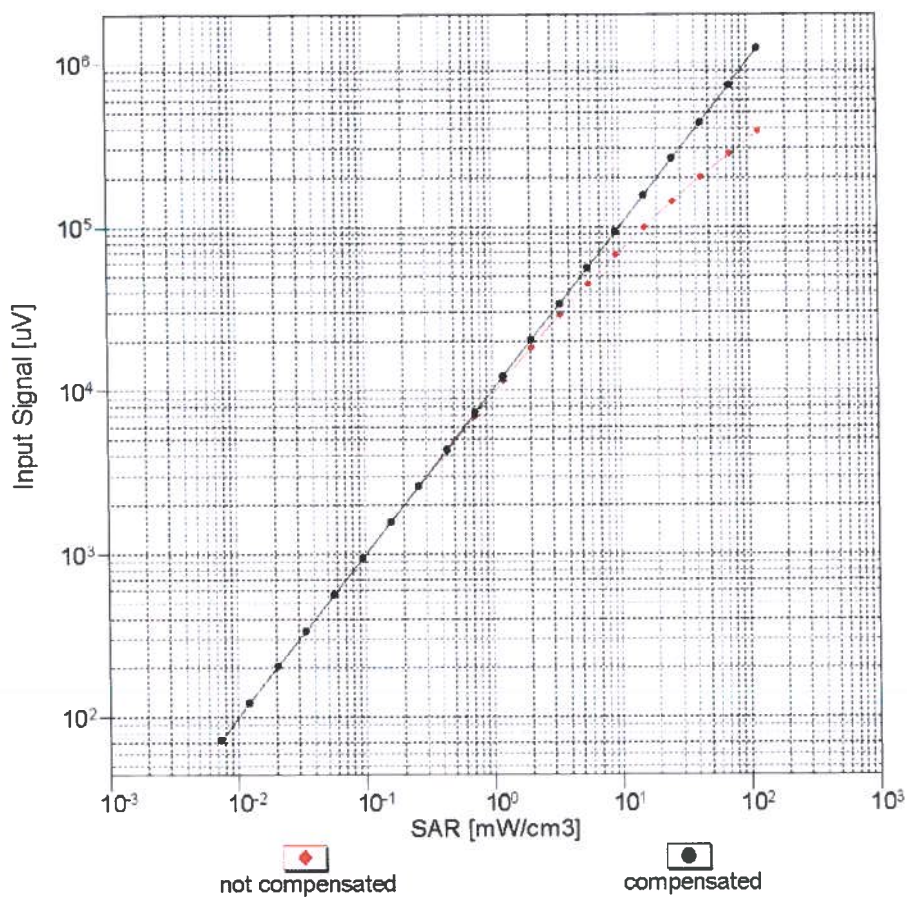
f=1800 MHz,R22



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

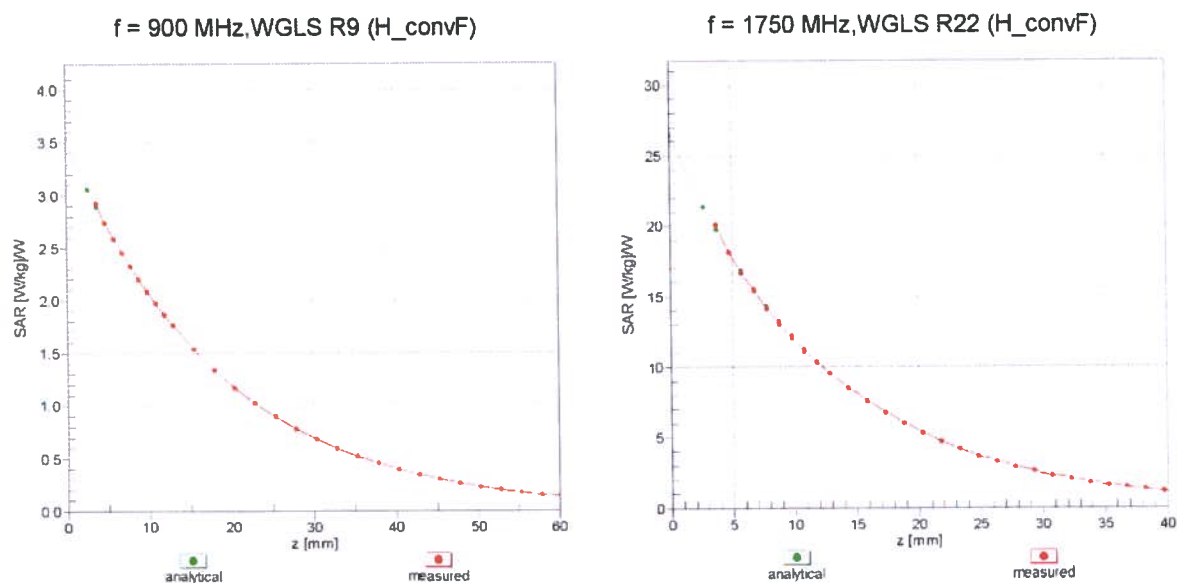
## Dynamic Range f(SAR<sub>head</sub>)

(TEM cell , f<sub>eval</sub>= 1900 MHz)



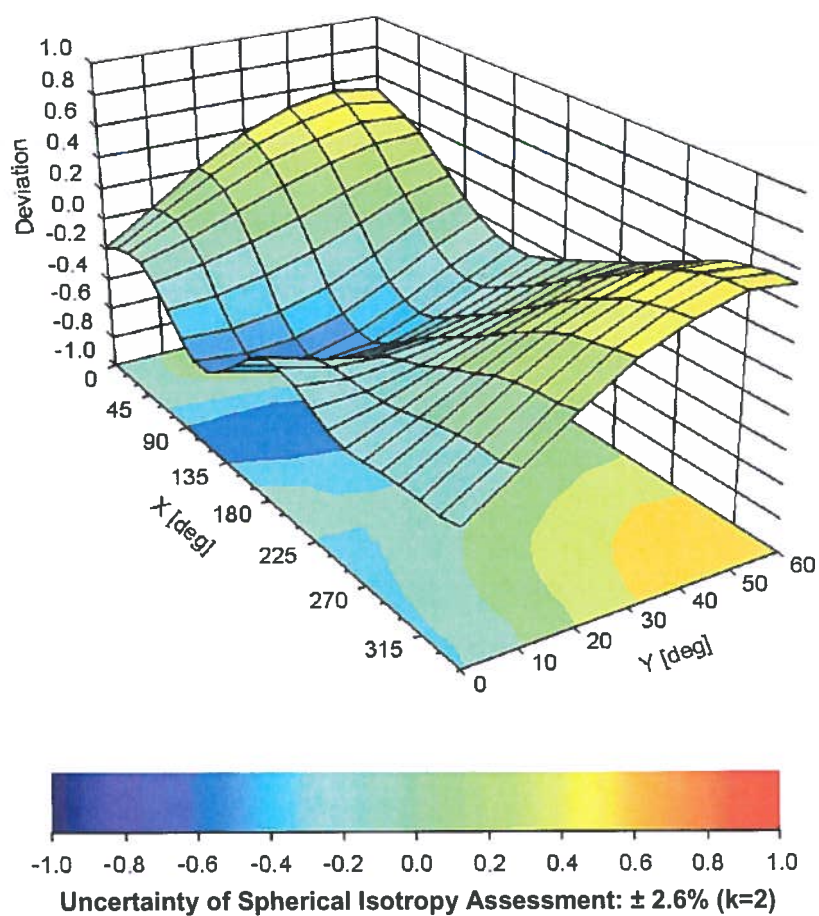
Uncertainty of Linearity Assessment:  $\pm 0.6\%$  (k=2)

## Conversion Factor Assessment



## Deviation from Isotropy in Liquid

Error ( $\phi, \theta$ ),  $f = 900 \text{ MHz}$



## DASY/EASY - Parameters of Probe: ET3DV6 - SN:1528

### Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	19.2
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	10 mm
Tip Diameter	6.8 mm
Probe Tip to Sensor X Calibration Point	2.7 mm
Probe Tip to Sensor Y Calibration Point	2.7 mm
Probe Tip to Sensor Z Calibration Point	2.7 mm
Recommended Measurement Distance from Surface	4 mm

## **A.6. Calibration Certificate for Dipole**

This section contains the calibration certificates and data for the Dipole(s) used, which are not included in the total number of pages for this report.



A1237

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



*Checked By: [Signature] 29/12/2014*

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

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 Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **UL RFI UK**

Certificate No: **D1900V2-540\_Dec14**

## CALIBRATION CERTIFICATE

Object **D1900V2 - SN: 540**

Calibration procedure(s) **QA CAL-05.v9**  
**Calibration procedure for dipole validation kits above 700 MHz**

Calibration date: **December 08, 2014**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
 The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature ( $22 \pm 3$ )°C and humidity < 70%.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	US37292783	07-Oct-14 (No. 217-02020)	Oct-15
Power sensor HP 8481A	MY41092317	07-Oct-14 (No. 217-02021)	Oct-15
Reference 20 dB Attenuator	SN: 5058 (20k)	03-Apr-14 (No. 217-01918)	Apr-15
Type-N mismatch combination	SN: 5047.2 / 06327	03-Apr-14 (No. 217-01921)	Apr-15
Reference Probe ES3DV3	SN: 3205	30-Dec-13 (No. ES3-3205_Dec13)	Dec-14
DAE4	SN: 601	18-Aug-14 (No. DAE4-601_Aug14)	Aug-15
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator R&S SMT-06	100005	04-Aug-99 (in house check Oct-13)	In house check: Oct-16
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-14)	In house check: Oct-15

Calibrated by: **Michael Weber** **Laboratory Technician**

Signature

*M. Weber*

Approved by: **Katja Pokovic** **Technical Manager**

*[Signature]*

Issued: December 9, 2014

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
ConvF	sensitivity in TSL / NORM x,y,z
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 300 MHz to 3 GHz)", February 2005
- KDB 865664, "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	DASY5	V52.8.8
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
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	39.6 $\pm$ 6 %	1.38 mho/m $\pm$ 6 %
Head TSL temperature change during test	< 0.5 °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	9.97 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	<b>40.1 W/kg <math>\pm</math> 17.0 % (k=2)</b>

SAR averaged over 10 cm <sup>3</sup> (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.21 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	<b>20.9 W/kg <math>\pm</math> 16.5 % (k=2)</b>

## 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	53.3 $\pm$ 6 %	1.50 mho/m $\pm$ 6 %
Body TSL temperature change during test	< 0.5 °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	9.91 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	<b>40.0 W/kg <math>\pm</math> 17.0 % (k=2)</b>

SAR averaged over 10 cm <sup>3</sup> (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.25 W/kg
SAR for nominal Body TSL parameters	normalized to 1W	<b>21.1 W/kg <math>\pm</math> 16.5 % (k=2)</b>



## Appendix (Additional assessments outside the scope of SCS108)

### Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.3 $\Omega$ + 4.9 j $\Omega$
Return Loss	- 24.9 dB

### Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.7 $\Omega$ + 5.7 j $\Omega$
Return Loss	- 24.6 dB

### General Antenna Parameters and Design

Electrical Delay (one direction)	1.199 ns
----------------------------------	----------

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

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

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

### Additional EUT Data

Manufactured by	SPEAG
Manufactured on	July 26, 2001

## DASY5 Validation Report for Head TSL

Date: 08.12.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 540**

Communication System: UID 0 - CW; Frequency: 1900 MHz

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.38$  S/m;  $\epsilon_r = 39.6$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.06, 5.06, 5.06); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

### Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

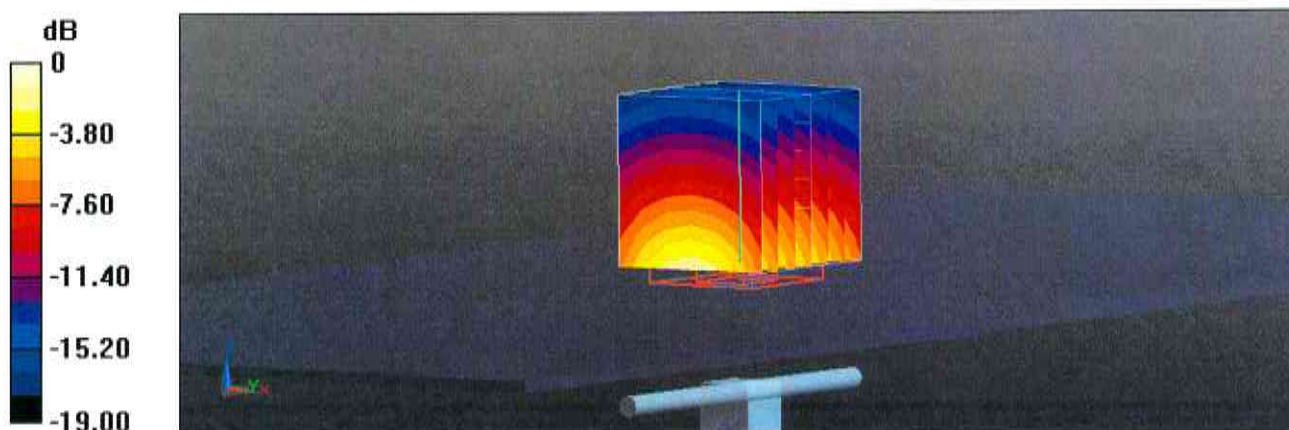
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 98.55 V/m; Power Drift = 0.01 dB

Peak SAR (extrapolated) = 18.4 W/kg

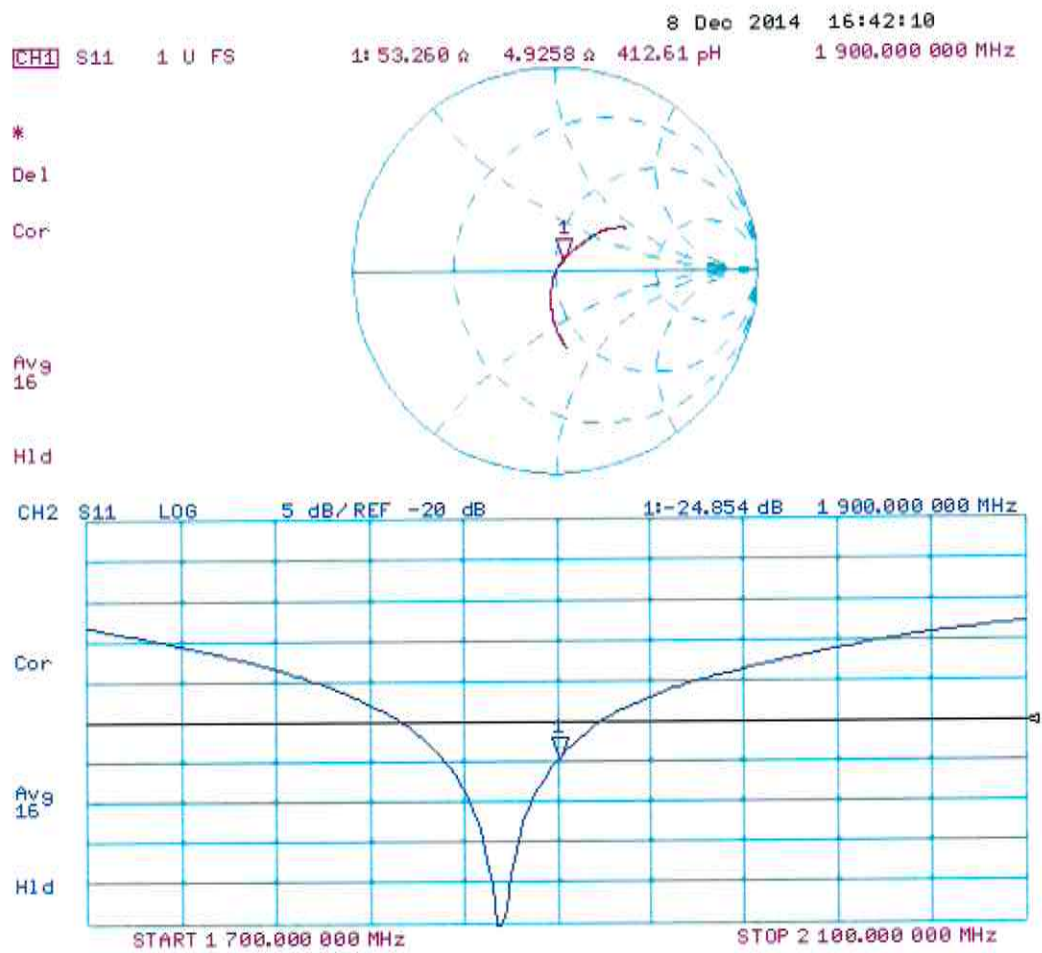
**SAR(1 g) = 9.97 W/kg; SAR(10 g) = 5.21 W/kg**

Maximum value of SAR (measured) = 12.7 W/kg



0 dB = 12.7 W/kg = 11.04 dBW/kg

## Impedance Measurement Plot for Head TSL





## DASY5 Validation Report for Body TSL

Date: 08.12.2014

Test Laboratory: SPEAG, Zurich, Switzerland

**DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN: 540**

Communication System: UID 0 - CW; Frequency: 1900 MHz

Medium parameters used:  $f = 1900$  MHz;  $\sigma = 1.5$  S/m;  $\epsilon_r = 53.3$ ;  $\rho = 1000$  kg/m<sup>3</sup>

Phantom section: Flat Section

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

DASY52 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.76, 4.76, 4.76); Calibrated: 30.12.2013;
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 18.08.2014
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- DASY52 52.8.8(1222); SEMCAD X 14.6.10(7331)

**Dipole Calibration for Body Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:**

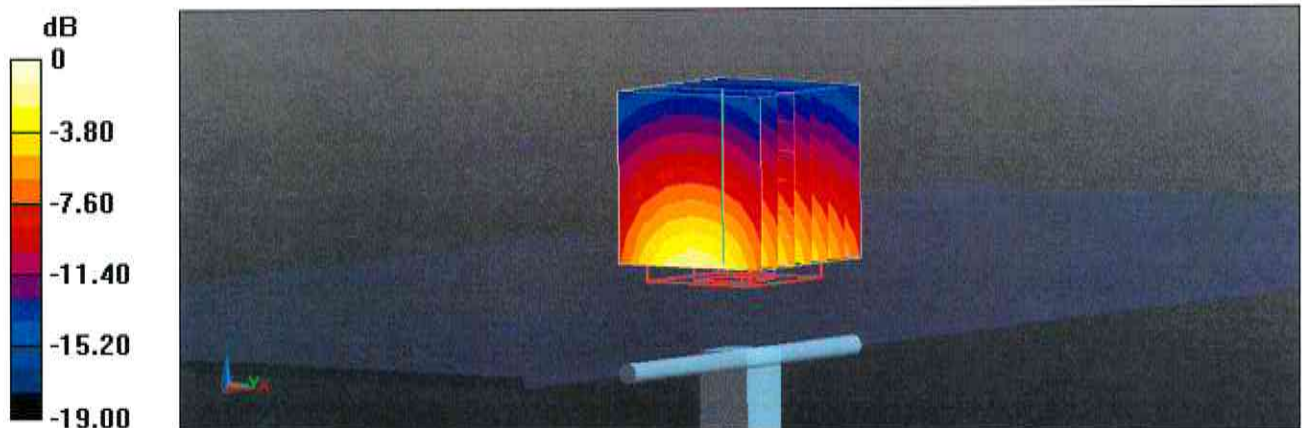
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 94.59 V/m; Power Drift = -0.00 dB

Peak SAR (extrapolated) = 17.2 W/kg

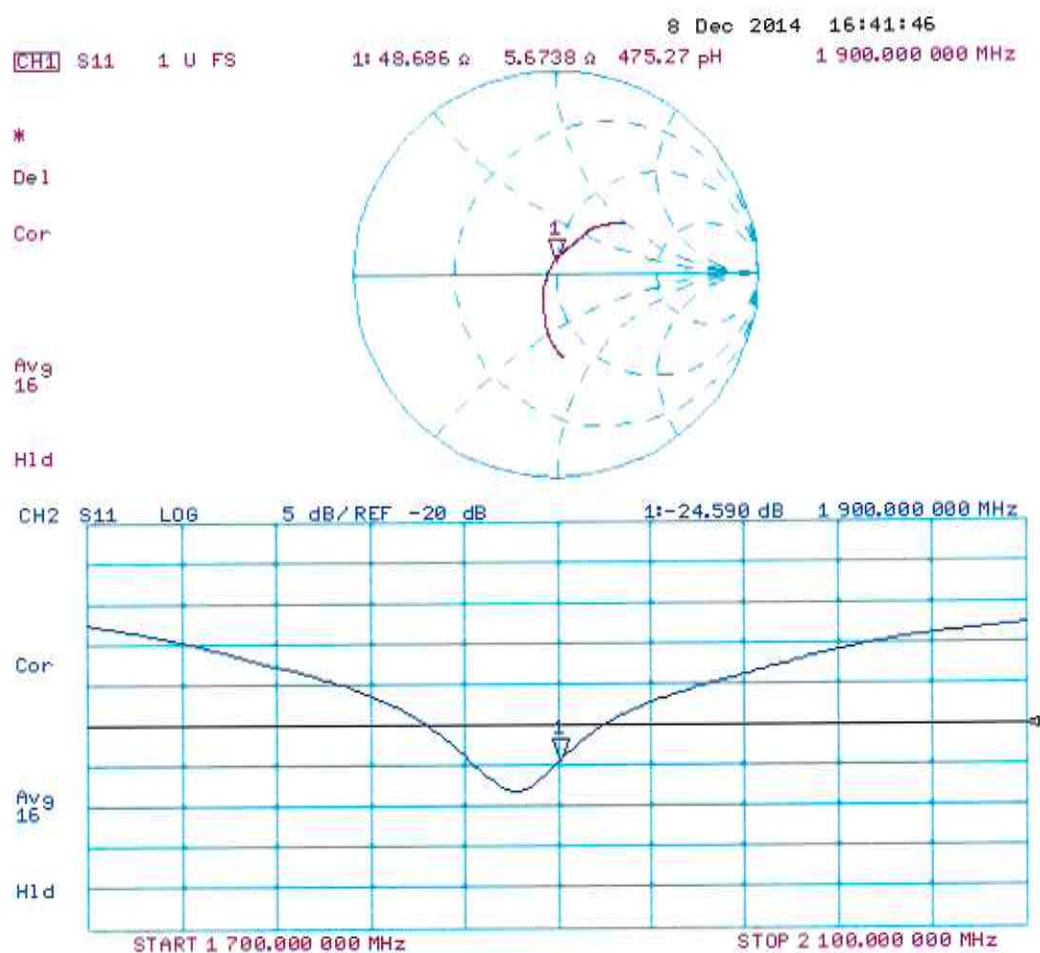
**SAR(1 g) = 9.91 W/kg; SAR(10 g) = 5.25 W/kg**

Maximum value of SAR (measured) = 12.4 W/kg



0 dB = 12.4 W/kg = 10.93 dBW/kg

## Impedance Measurement Plot for Body TSL



### A.7. Tissues-Equivalent Media Recipes

The body mixture consists of water, Polysorbate (Tween 20) and salt. Visual inspection is made to ensure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.

Ingredient (% by weight)	Frequency 1900 MHz	
	Head	Body
De-Ionized Water	55.40	71.50
Polysorbate 20	44.22	28.00
Salt	0.38	0.50