

#21 GSM850_GPRS12_Rear Face_1cm_Ch128_Earphone

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 824.2 MHz; Duty Cycle: 1:2

Medium: MSL_835_110507 Medium parameters used: $f = 824.2$ MHz; $\sigma = 0.967$ mho/m; $\epsilon_r = 54.5$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.3 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(5.99, 5.99, 5.99); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch128/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.836 mW/g

Ch128/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.9 V/m; Power Drift = 0.055 dB

Peak SAR (extrapolated) = 1.07 W/kg

SAR(1 g) = 0.782 mW/g; SAR(10 g) = 0.556 mW/g

Maximum value of SAR (measured) = 0.829 mW/g

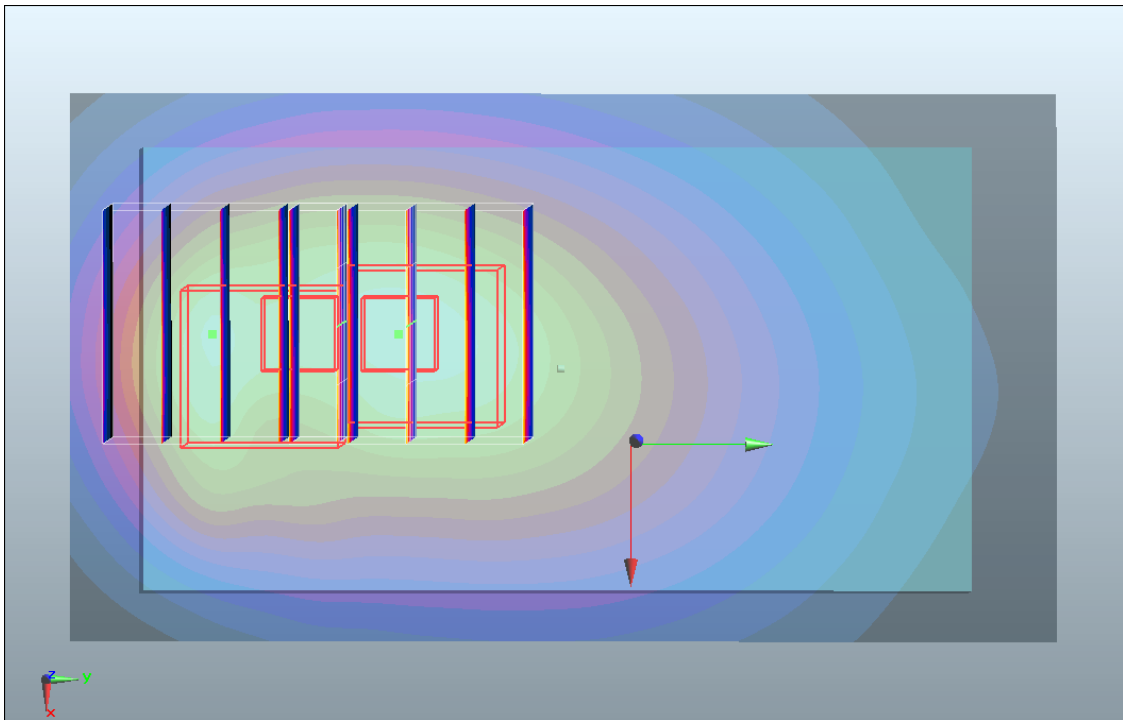
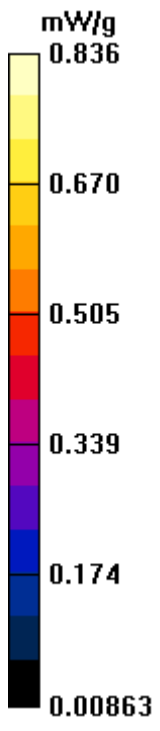
Ch128/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.9 V/m; Power Drift = 0.055 dB

Peak SAR (extrapolated) = 1.1 W/kg

SAR(1 g) = 0.709 mW/g; SAR(10 g) = 0.461 mW/g

Maximum value of SAR (measured) = 0.801 mW/g



#22 GSM850_GPRS12_Rear Face_1cm_Ch189_Earphone

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 836.4 MHz; Duty Cycle: 1:2

Medium: MSL_835_110507 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.978$ mho/m; $\epsilon_r = 54.4$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.3 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(5.99, 5.99, 5.99); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch189/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.820 mW/g

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

Reference Value = 27 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.764 mW/g; SAR(10 g) = 0.540 mW/g

Maximum value of SAR (measured) = 0.812 mW/g

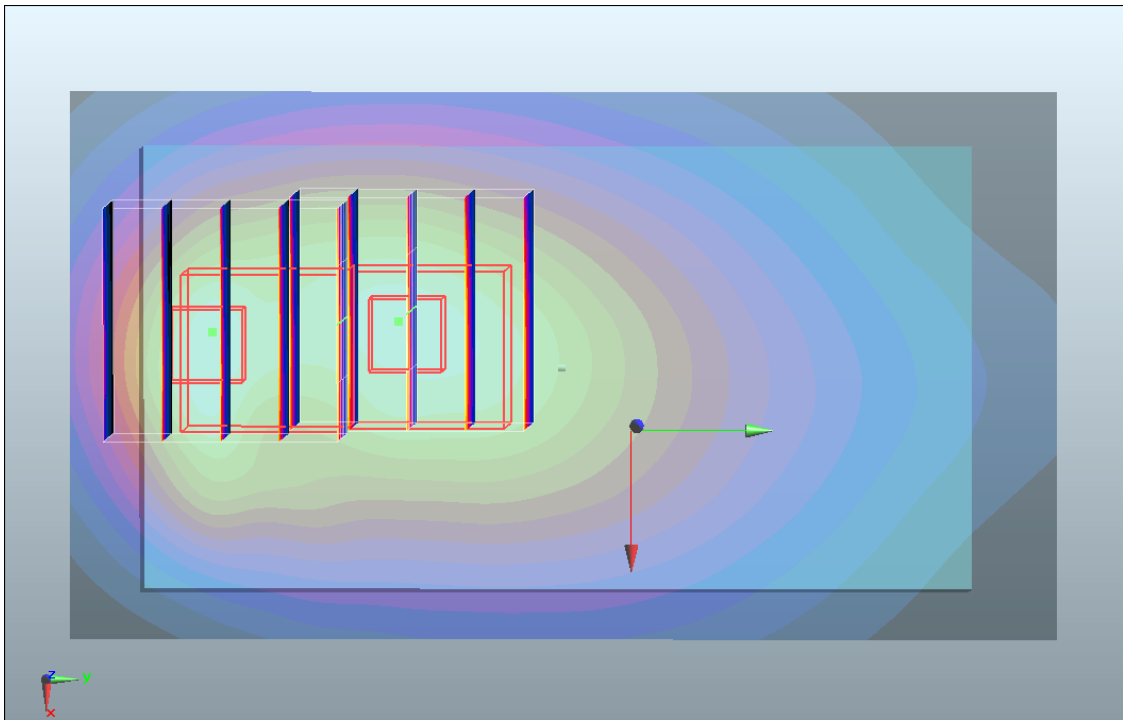
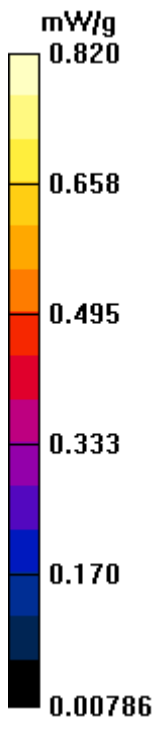
Ch189/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27 V/m; Power Drift = 0.030 dB

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.693 mW/g; SAR(10 g) = 0.469 mW/g

Maximum value of SAR (measured) = 0.781 mW/g



#01 GSM1900_GPRS12_Rear Face_1cm_Ch810

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 1909.8 MHz; Duty Cycle: 1:2

Medium: MSL_1900_110507 Medium parameters used: $f = 1910$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.9$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM3; Type: SAM; Serial: TP-1477
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch810/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

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

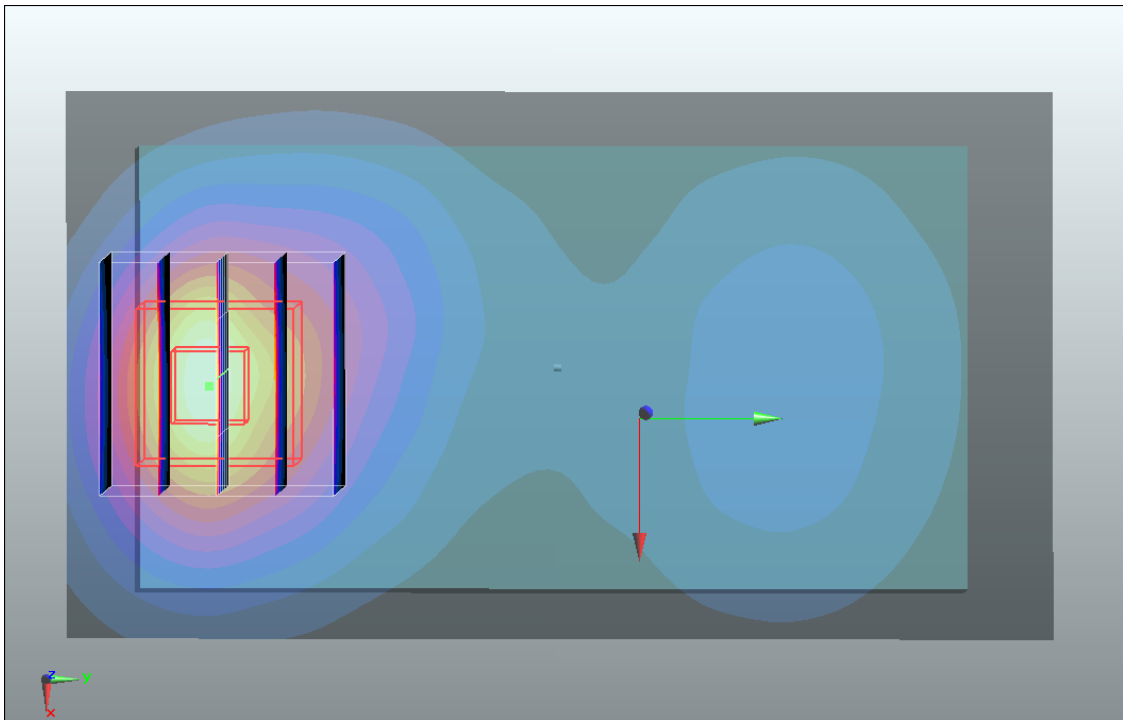
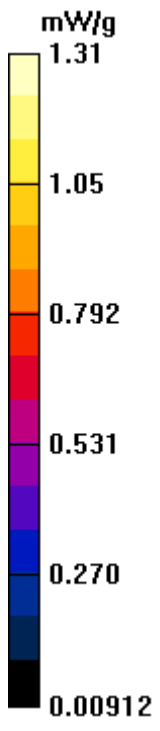
Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.3 V/m; Power Drift = 0.054 dB

Peak SAR (extrapolated) = 1.65 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.649 mW/g

Maximum value of SAR (measured) = 1.24 mW/g



#01 GSM1900_GPRS12_Rear Face_1cm_Ch810_2D

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 1909.8 MHz; Duty Cycle: 1:2

Medium: MSL_1900_110507 Medium parameters used: $f = 1910$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.9$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM3; Type: SAM; Serial: TP-1477
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch810/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

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

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

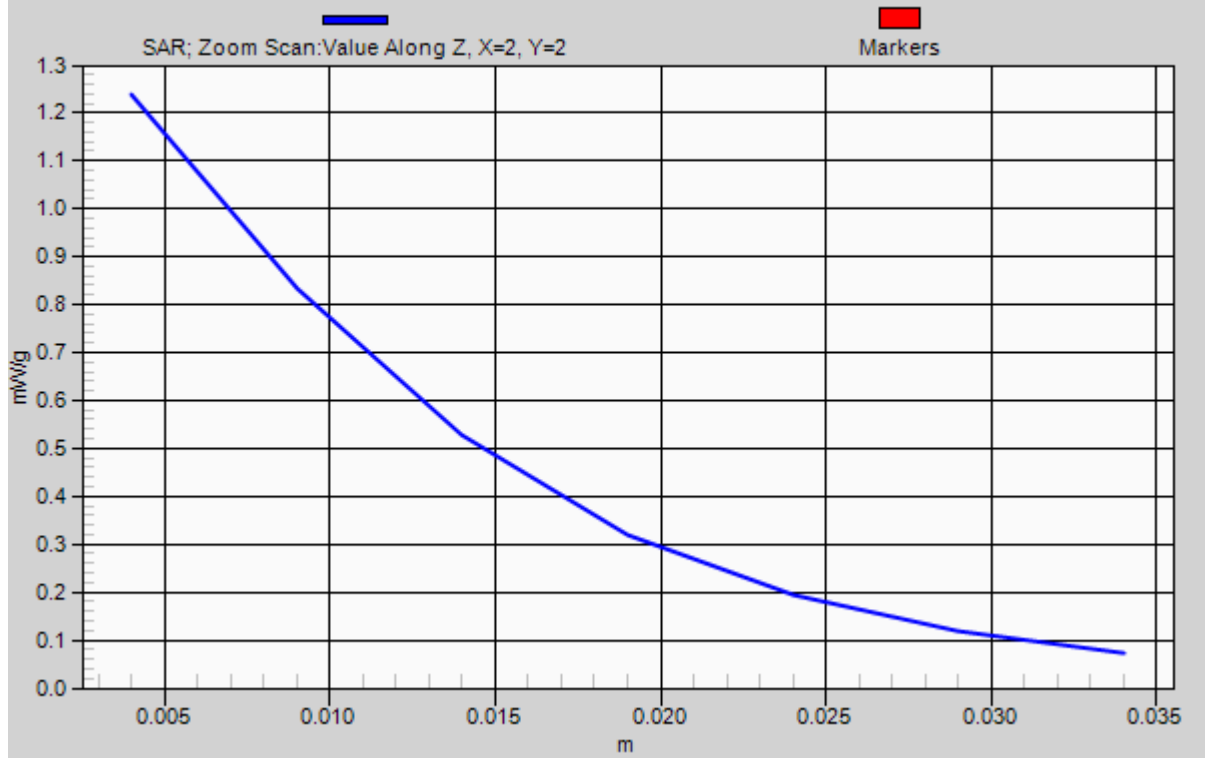
Reference Value = 9.3 V/m; Power Drift = 0.054 dB

Peak SAR (extrapolated) = 1.65 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.649 mW/g

Maximum value of SAR (measured) = 1.24 mW/g

1g/10g Averaged SAR



#02 GSM1900_GPRS12_Front Face_1cm_Ch810

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 1909.8 MHz; Duty Cycle: 1:2

Medium: MSL_1900_110507 Medium parameters used: $f = 1910$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.9$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM3; Type: SAM; Serial: TP-1477
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch810/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.674 mW/g

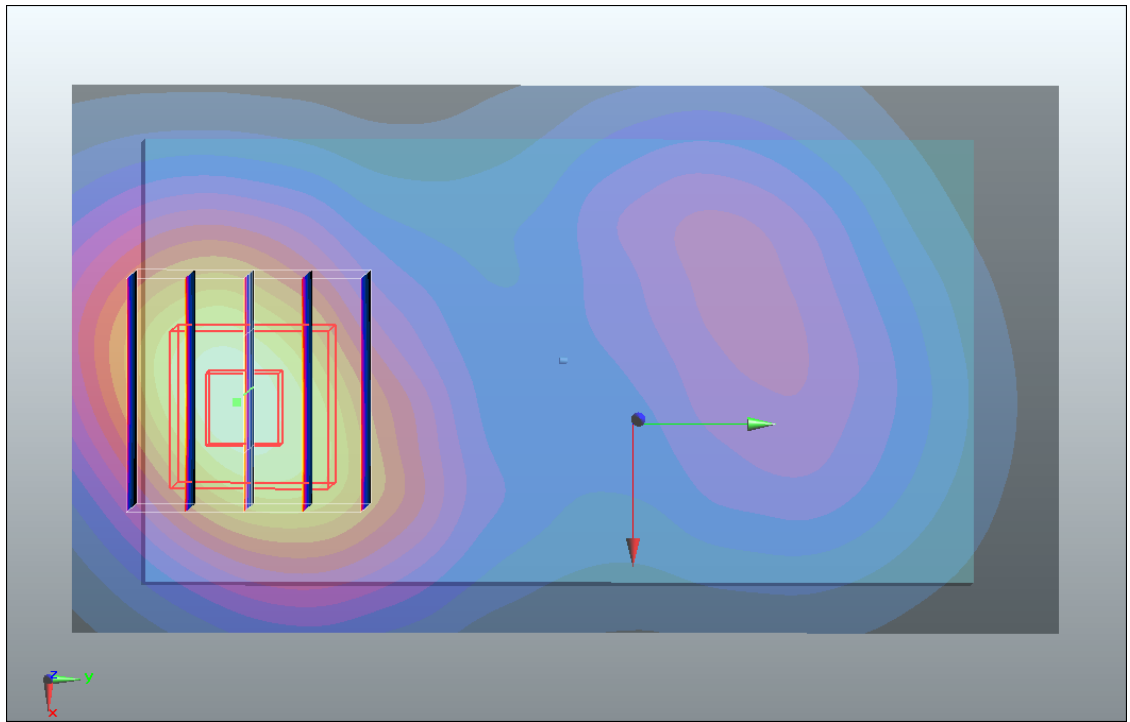
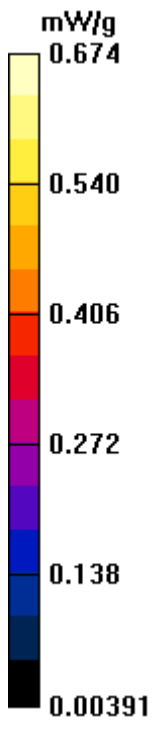
Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 11 V/m; Power Drift = 0.00915 dB

Peak SAR (extrapolated) = 0.831 W/kg

SAR(1 g) = 0.599 mW/g; SAR(10 g) = 0.382 mW/g

Maximum value of SAR (measured) = 0.645 mW/g



#03 GSM1900_GPRS12_Left Side_1cm_Ch810

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 1909.8 MHz; Duty Cycle: 1:2

Medium: MSL_1900_110507 Medium parameters used: $f = 1910$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.9$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM3; Type: SAM; Serial: TP-1477
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch810/Area Scan (51x101x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.078 mW/g

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

Reference Value = 5.87 V/m; Power Drift = 0.060 dB

Peak SAR (extrapolated) = 0.100 W/kg

SAR(1 g) = 0.069 mW/g; SAR(10 g) = 0.043 mW/g

Maximum value of SAR (measured) = 0.074 mW/g

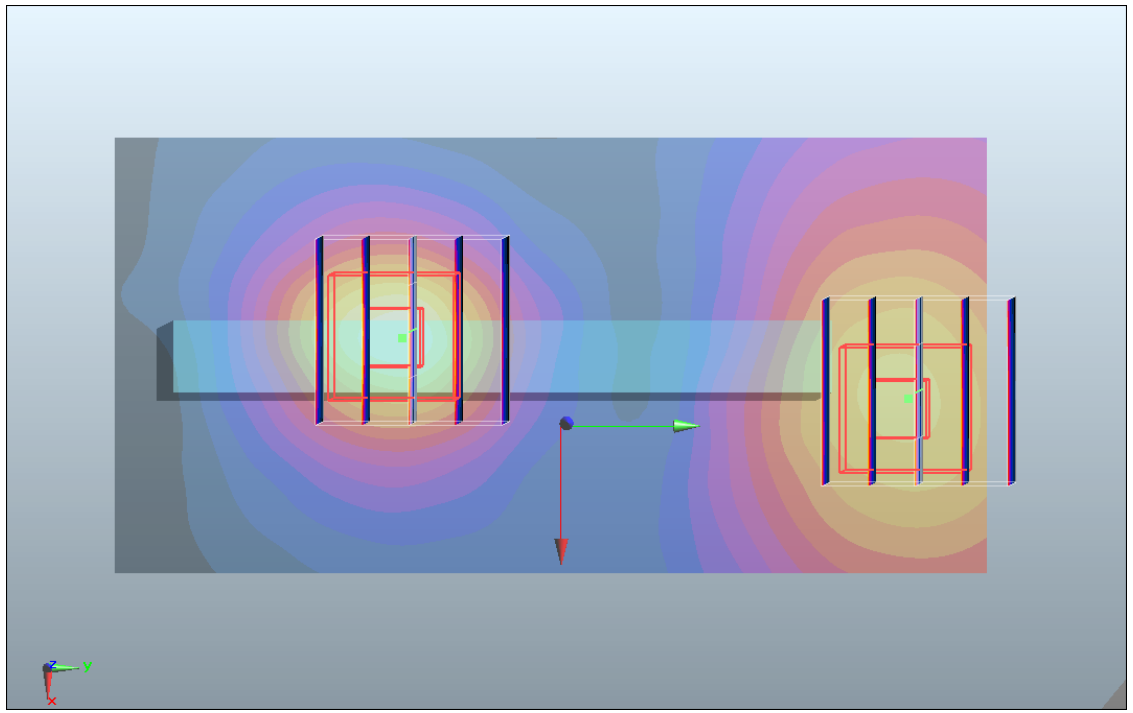
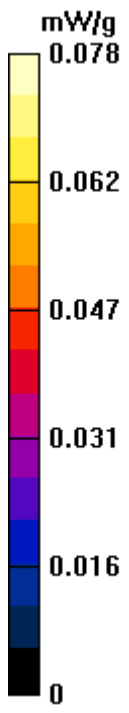
Ch810/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.87 V/m; Power Drift = 0.060 dB

Peak SAR (extrapolated) = 0.080 W/kg

SAR(1 g) = 0.059 mW/g; SAR(10 g) = 0.040 mW/g

Maximum value of SAR (measured) = 0.064 mW/g



#04 GSM1900_GPRS12_Right Side_1cm_Ch810

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 1909.8 MHz; Duty Cycle: 1:2

Medium: MSL_1900_110507 Medium parameters used: $f = 1910$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.9$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM3; Type: SAM; Serial: TP-1477
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch810/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.340 mW/g

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

Reference Value = 10.5 V/m; Power Drift = -0.081 dB

Peak SAR (extrapolated) = 0.459 W/kg

SAR(1 g) = 0.294 mW/g; SAR(10 g) = 0.174 mW/g

Maximum value of SAR (measured) = 0.326 mW/g

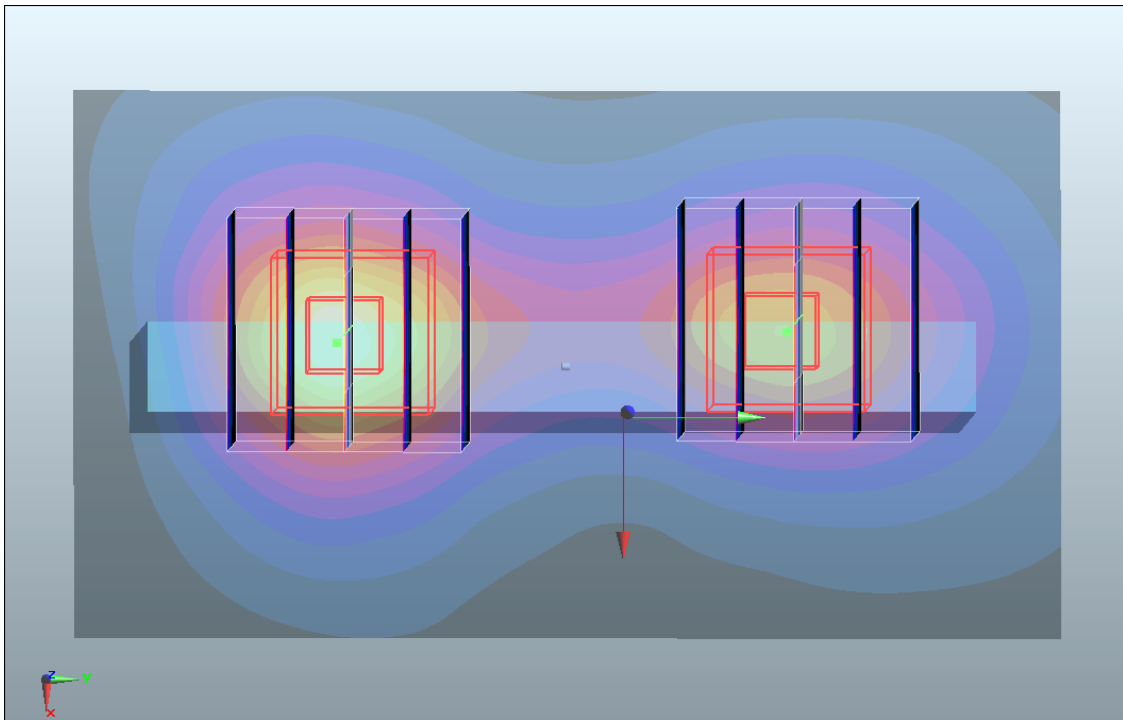
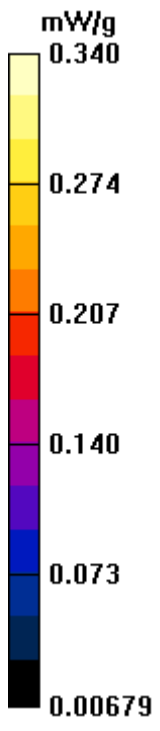
Ch810/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.5 V/m; Power Drift = -0.081 dB

Peak SAR (extrapolated) = 0.316 W/kg

SAR(1 g) = 0.224 mW/g; SAR(10 g) = 0.137 mW/g

Maximum value of SAR (measured) = 0.244 mW/g



#05 GSM1900_GPRS12_Top Side_1cm_Ch810

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 1909.8 MHz; Duty Cycle: 1:2

Medium: MSL_1900_110507 Medium parameters used: $f = 1910$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.9$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM3; Type: SAM; Serial: TP-1477
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch810/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.060 mW/g

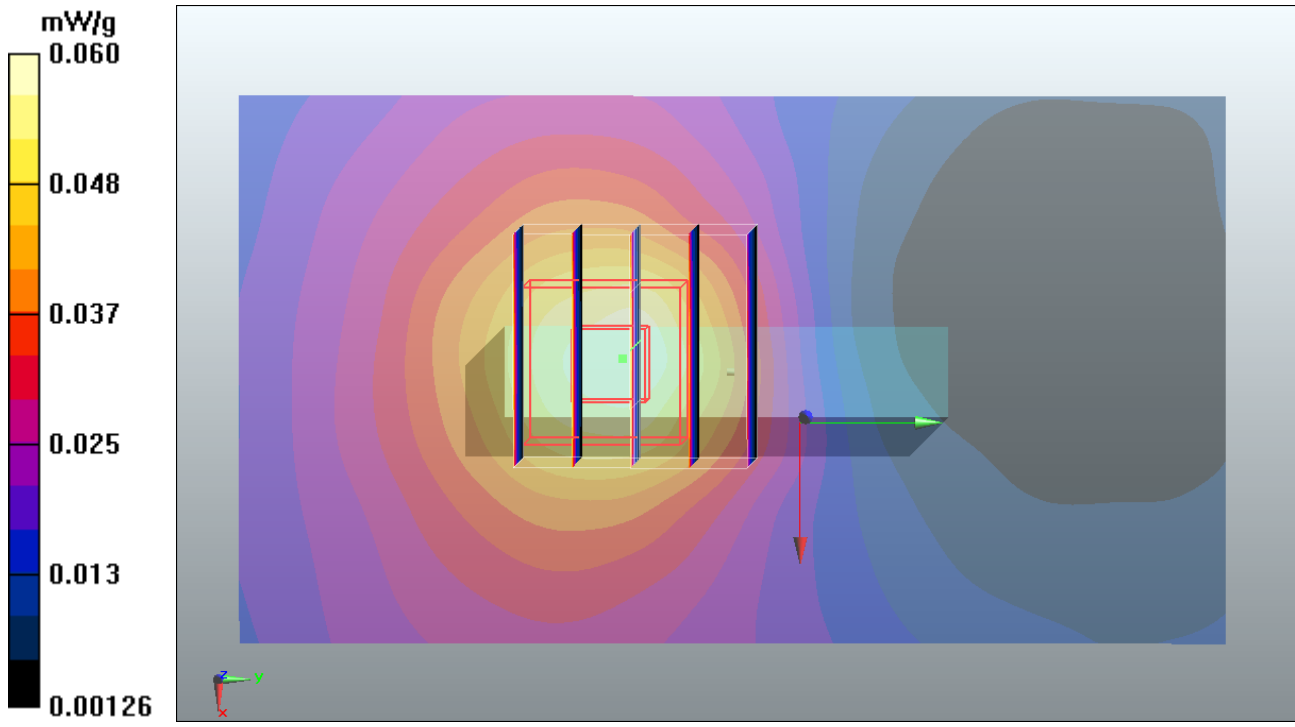
Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 5.75 V/m; Power Drift = 0.039 dB

Peak SAR (extrapolated) = 0.077 W/kg

SAR(1 g) = 0.055 mW/g; SAR(10 g) = 0.035 mW/g

Maximum value of SAR (measured) = 0.059 mW/g



#06 GSM1900_GPRS12_Bottom Side_1cm_Ch810

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 1909.8 MHz; Duty Cycle: 1:2

Medium: MSL_1900_110507 Medium parameters used: $f = 1910$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.9$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM3; Type: SAM; Serial: TP-1477
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch810/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.671 mW/g

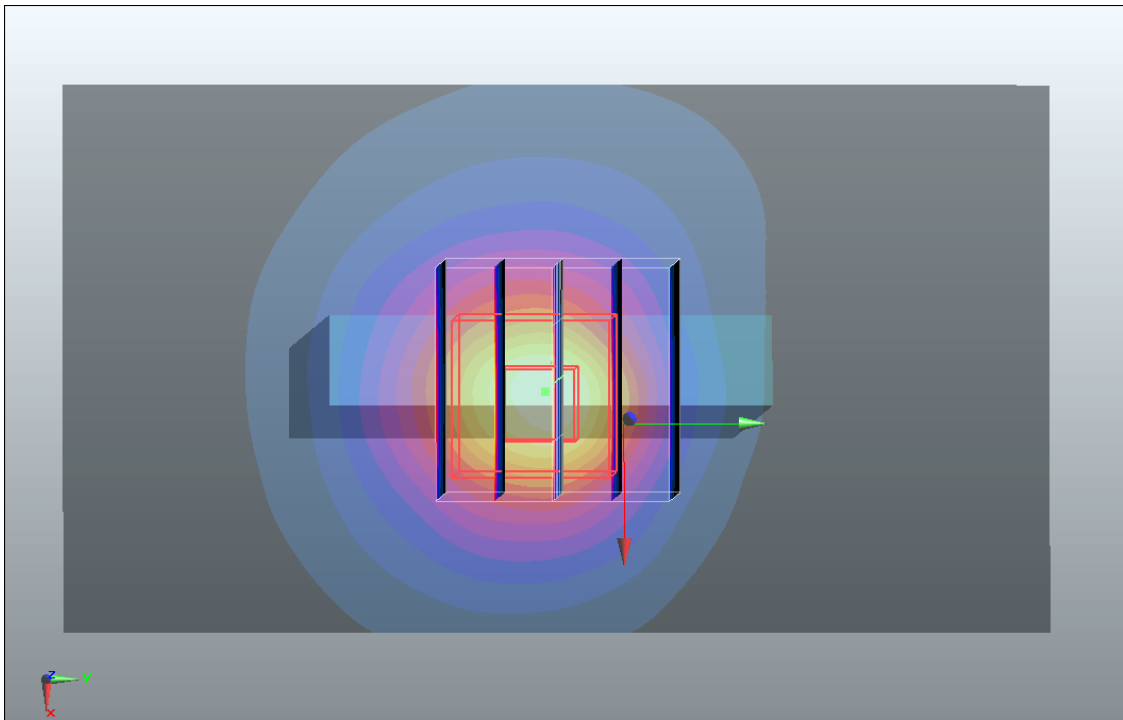
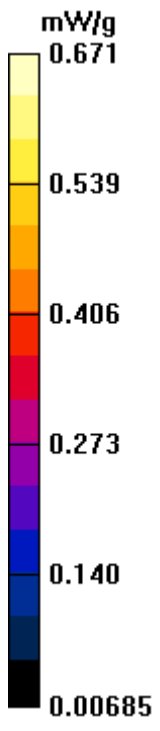
Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.3 V/m; Power Drift = -0.072 dB

Peak SAR (extrapolated) = 0.837 W/kg

SAR(1 g) = 0.569 mW/g; SAR(10 g) = 0.331 mW/g

Maximum value of SAR (measured) = 0.613 mW/g



#07 GSM1900_GPRS12_Rear Face_1cm_Ch512

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 1850.2 MHz; Duty Cycle: 1:2

Medium: MSL_1900_110507 Medium parameters used: $f = 1850.2$ MHz; $\sigma = 1.46$ mho/m; $\epsilon_r = 54$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM3; Type: SAM; Serial: TP-1477
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch512/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.813 mW/g

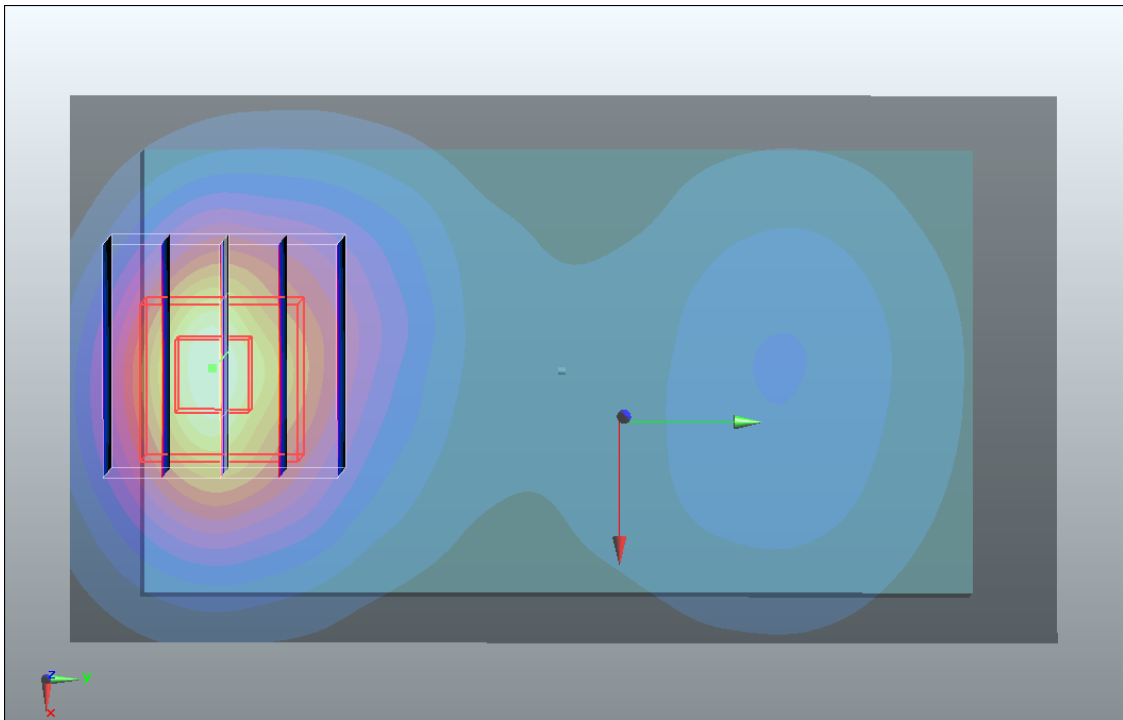
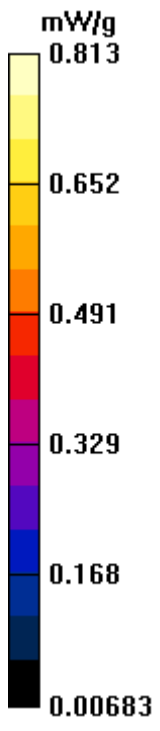
Ch512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.52 V/m; Power Drift = -0.0056 dB

Peak SAR (extrapolated) = 0.959 W/kg

SAR(1 g) = 0.690 mW/g; SAR(10 g) = 0.408 mW/g

Maximum value of SAR (measured) = 0.758 mW/g



#08 GSM1900_GPRS12_Rear Face_1cm_Ch661

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 1880 MHz; Duty Cycle: 1:2

Medium: MSL_1900_110507 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 54$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM3; Type: SAM; Serial: TP-1477
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch661/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.04 mW/g

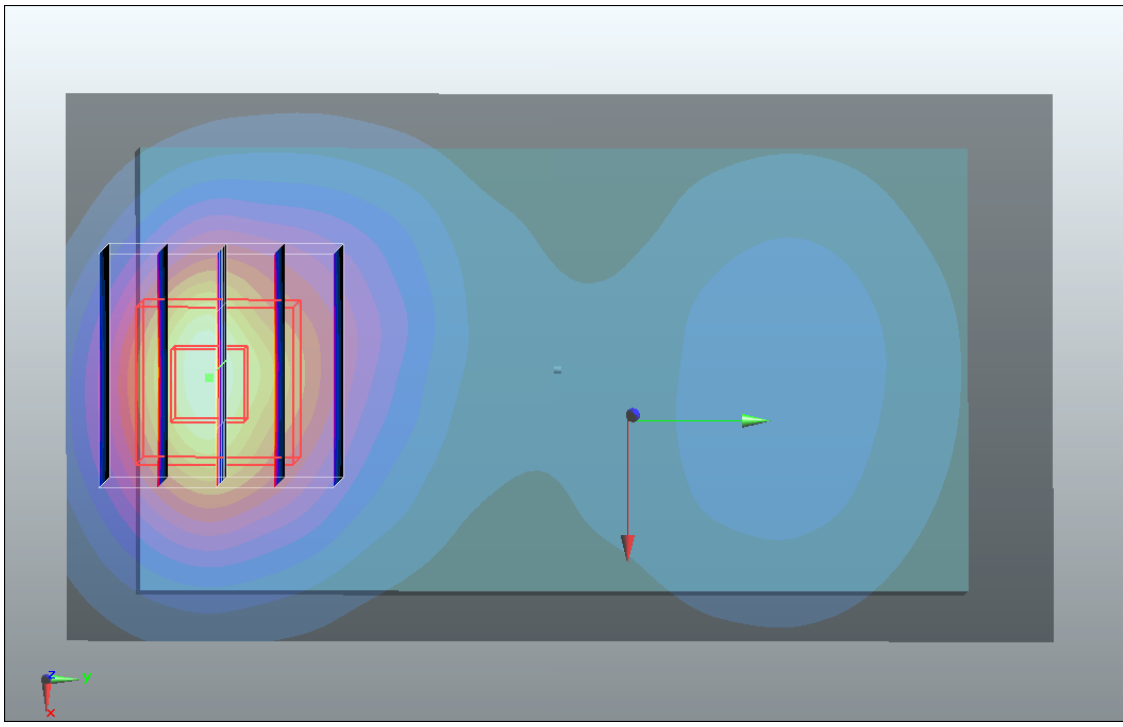
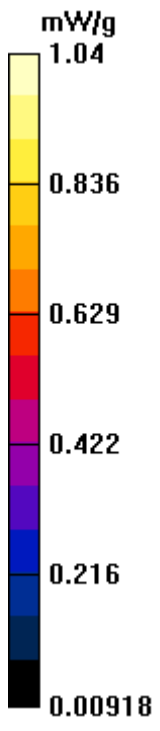
Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.26 V/m; Power Drift = -0.00416 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.885 mW/g; SAR(10 g) = 0.516 mW/g

Maximum value of SAR (measured) = 0.971 mW/g



#09 GSM1900_GPRS12_Rear Face_1cm_Ch810_Earphone

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 1909.8 MHz; Duty Cycle: 1:2

Medium: MSL_1900_110507 Medium parameters used: $f = 1910$ MHz; $\sigma = 1.52$ mho/m; $\epsilon_r = 53.9$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010-9-21

- Sensor-Surface: 4mm (Mechanical Surface Detection)

- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18

- Phantom: SAM3; Type: SAM; Serial: TP-1477

- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch810/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.21 mW/g

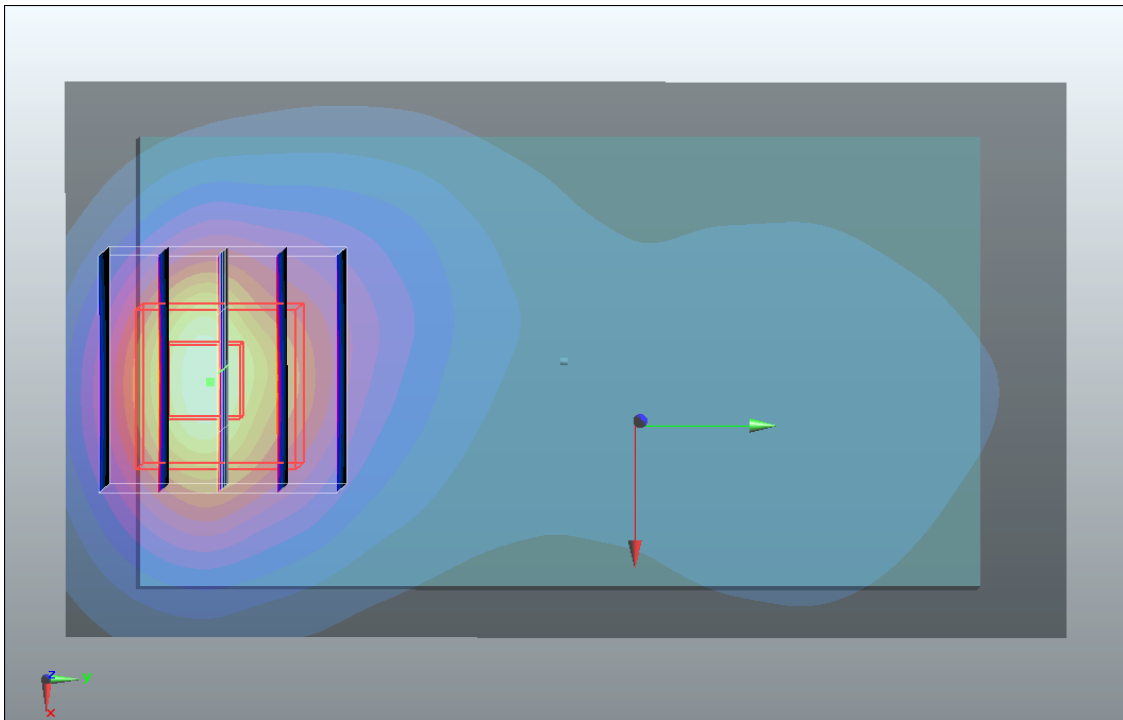
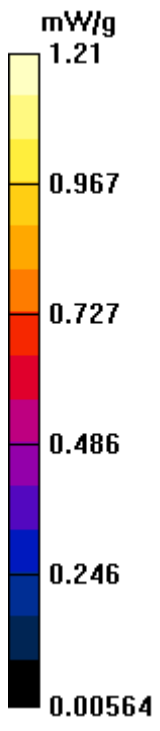
Ch810/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 10.2 V/m; Power Drift = 0.027 dB

Peak SAR (extrapolated) = 1.52 W/kg

SAR(1 g) = 1.04 mW/g; SAR(10 g) = 0.594 mW/g

Maximum value of SAR (measured) = 1.15 mW/g



#10 GSM1900_GPRS12_Rear Face_1cm_Ch512_Earphone

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 1850.2 MHz; Duty Cycle: 1:2

Medium: MSL_1900_110507 Medium parameters used: $f = 1850.2$ MHz; $\sigma = 1.46$ mho/m; $\epsilon_r = 54$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM3; Type: SAM; Serial: TP-1477
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch512/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.782 mW/g

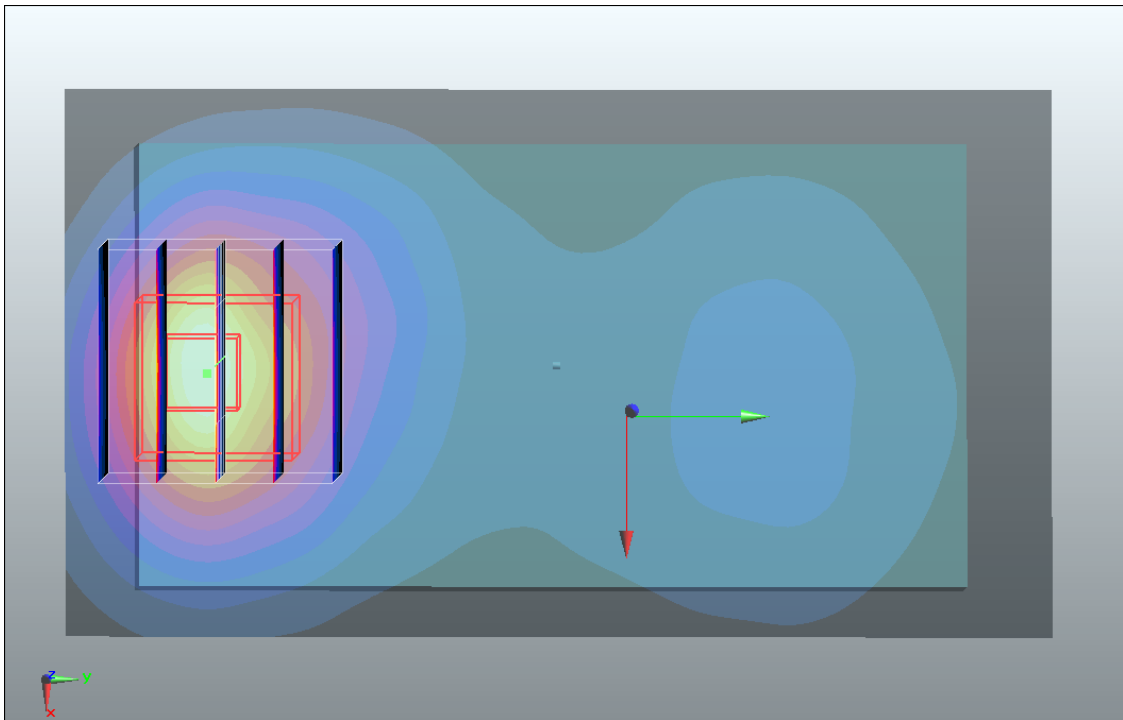
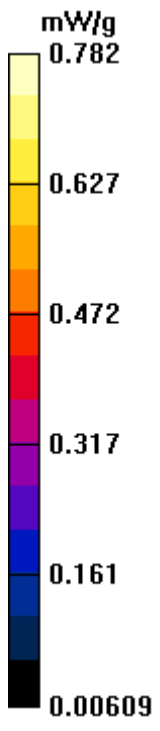
Ch512/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 7.76 V/m; Power Drift = 0.065 dB

Peak SAR (extrapolated) = 0.941 W/kg

SAR(1 g) = 0.665 mW/g; SAR(10 g) = 0.390 mW/g

Maximum value of SAR (measured) = 0.732 mW/g



#11 GSM1900_GPRS12_Rear Face_1cm_Ch661_Earphone

DUT: 142113

Communication System: GPRS/EDGE 12; Frequency: 1880 MHz; Duty Cycle: 1:2

Medium: MSL_1900_110507 Medium parameters used: $f = 1880$ MHz; $\sigma = 1.49$ mho/m; $\epsilon_r = 54$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.5 °C ; Liquid Temperature : 21.6 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.39, 4.39, 4.39); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM3; Type: SAM; Serial: TP-1477
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch661/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.964 mW/g

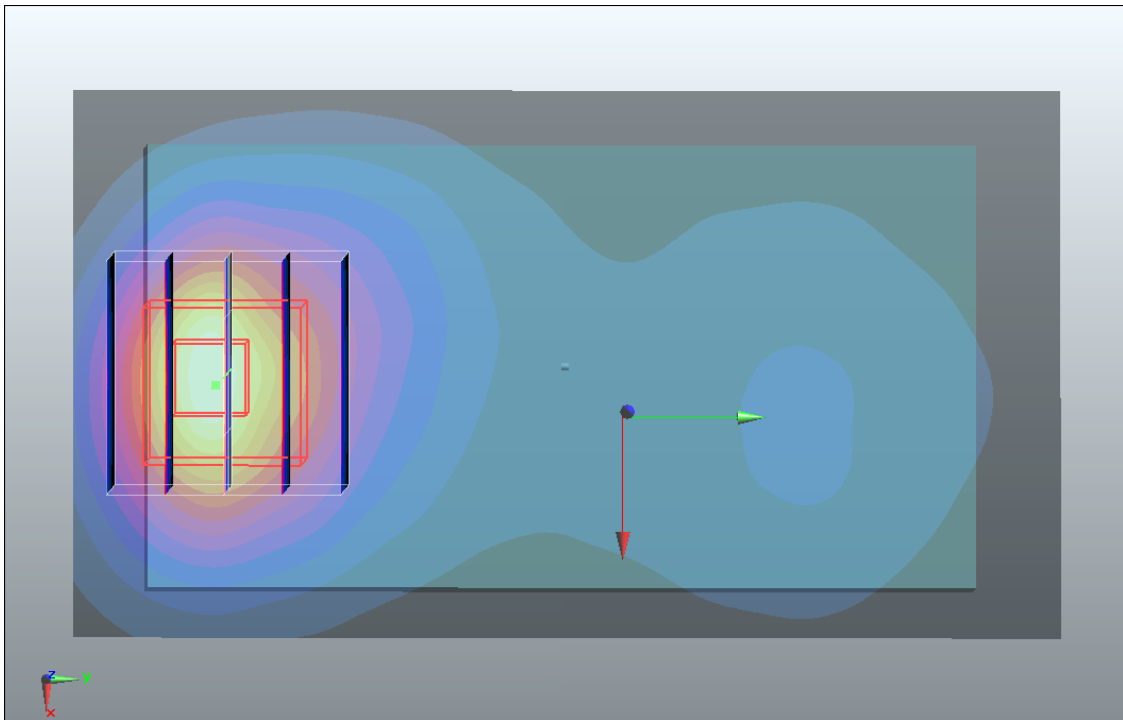
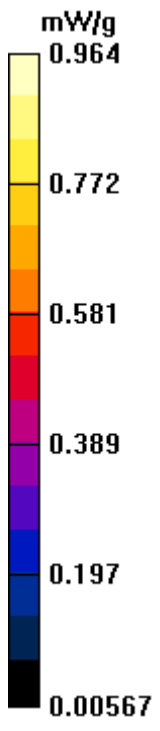
Ch661/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 8.79 V/m; Power Drift = 0.024 dB

Peak SAR (extrapolated) = 1.19 W/kg

SAR(1 g) = 0.827 mW/g; SAR(10 g) = 0.480 mW/g

Maximum value of SAR (measured) = 0.918 mW/g



#27 WCDMA V_RMC 12.2K_Rear Face_1cm_Ch4233

DUT: 142113

Communication System: UMTS; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: MSL_835_110508 Medium parameters used: $f = 847$ MHz; $\sigma = 0.987$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C ; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(5.99, 5.99, 5.99); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch4233/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.984 mW/g

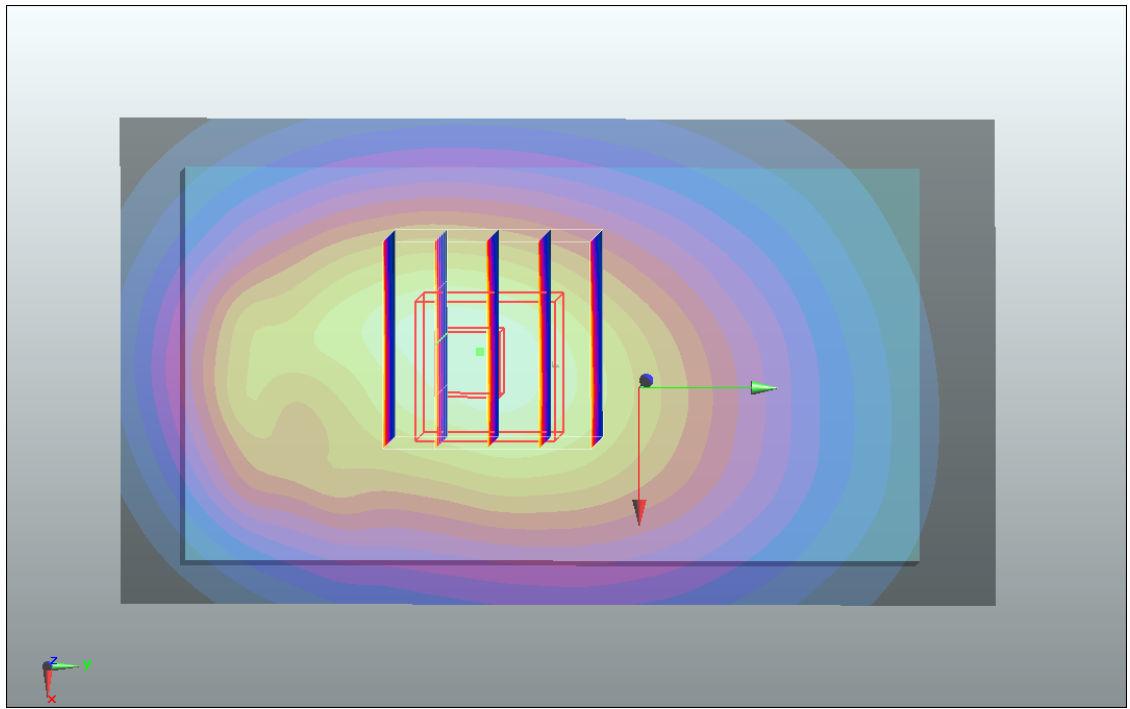
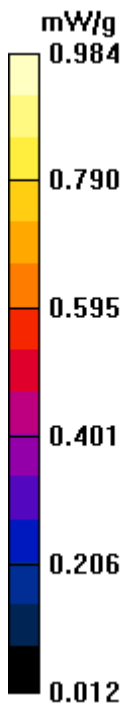
Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 31.3 V/m; Power Drift = -0.048 dB

Peak SAR (extrapolated) = 1.2 W/kg

SAR(1 g) = 0.923 mW/g; SAR(10 g) = 0.666 mW/g

Maximum value of SAR (measured) = 0.970 mW/g



#28 WCDMA V_RMC 12.2K_Front Face_1cm_Ch4233

DUT: 142113

Communication System: UMTS; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: MSL_835_110508 Medium parameters used: $f = 847$ MHz; $\sigma = 0.987$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(5.99, 5.99, 5.99); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch4233/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.539 mW/g

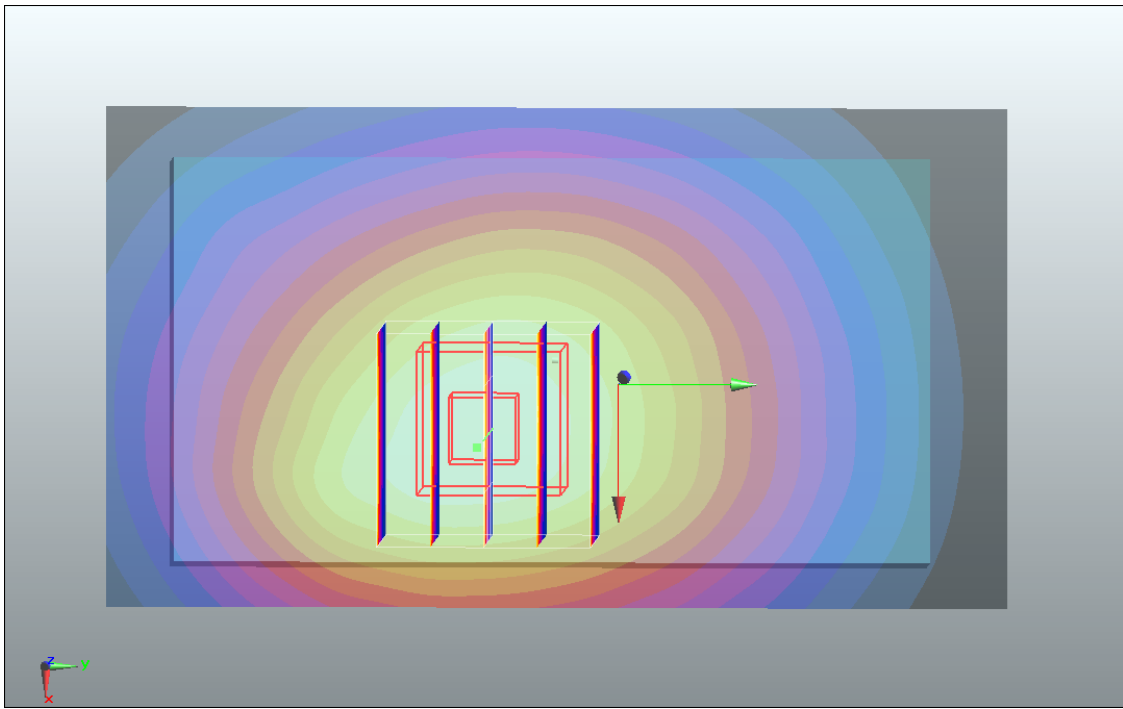
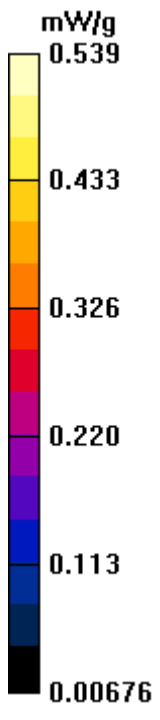
Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 23.2 V/m; Power Drift = -0.0916 dB

Peak SAR (extrapolated) = 0.624 W/kg

SAR(1 g) = 0.511 mW/g; SAR(10 g) = 0.386 mW/g

Maximum value of SAR (measured) = 0.538 mW/g



#29 WCDMA V_RMC 12.2K_Left Side_1cm_Ch4233

DUT: 142113

Communication System: UMTS; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: MSL_835_110508 Medium parameters used: $f = 847$ MHz; $\sigma = 0.987$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C ; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(5.99, 5.99, 5.99); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch4233/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.607 mW/g

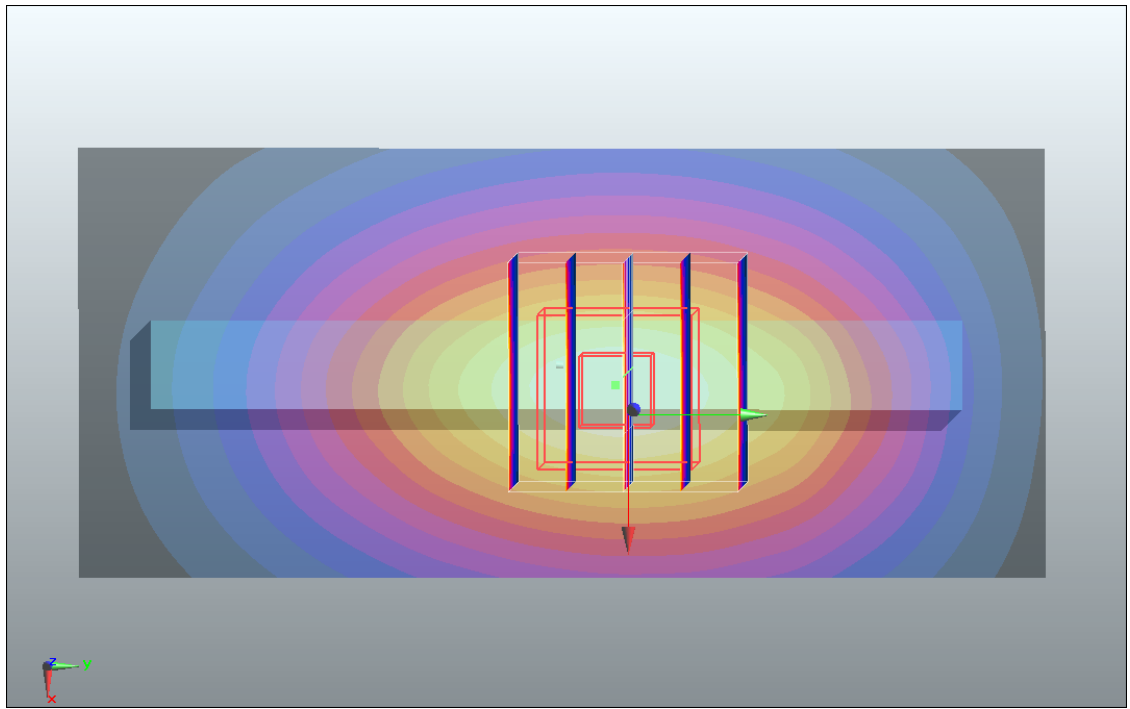
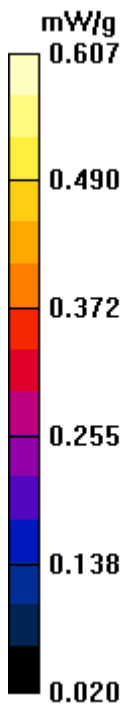
Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 24.9 V/m; Power Drift = 0.00416 dB

Peak SAR (extrapolated) = 0.748 W/kg

SAR(1 g) = 0.559 mW/g; SAR(10 g) = 0.390 mW/g

Maximum value of SAR (measured) = 0.595 mW/g



#30 WCDMA V_RMC 12.2K_Right Side_1cm_Ch4233

DUT: 142113

Communication System: UMTS; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: MSL_835_110508 Medium parameters used: $f = 847$ MHz; $\sigma = 0.987$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(5.99, 5.99, 5.99); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch4233/Area Scan (41x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.477 mW/g

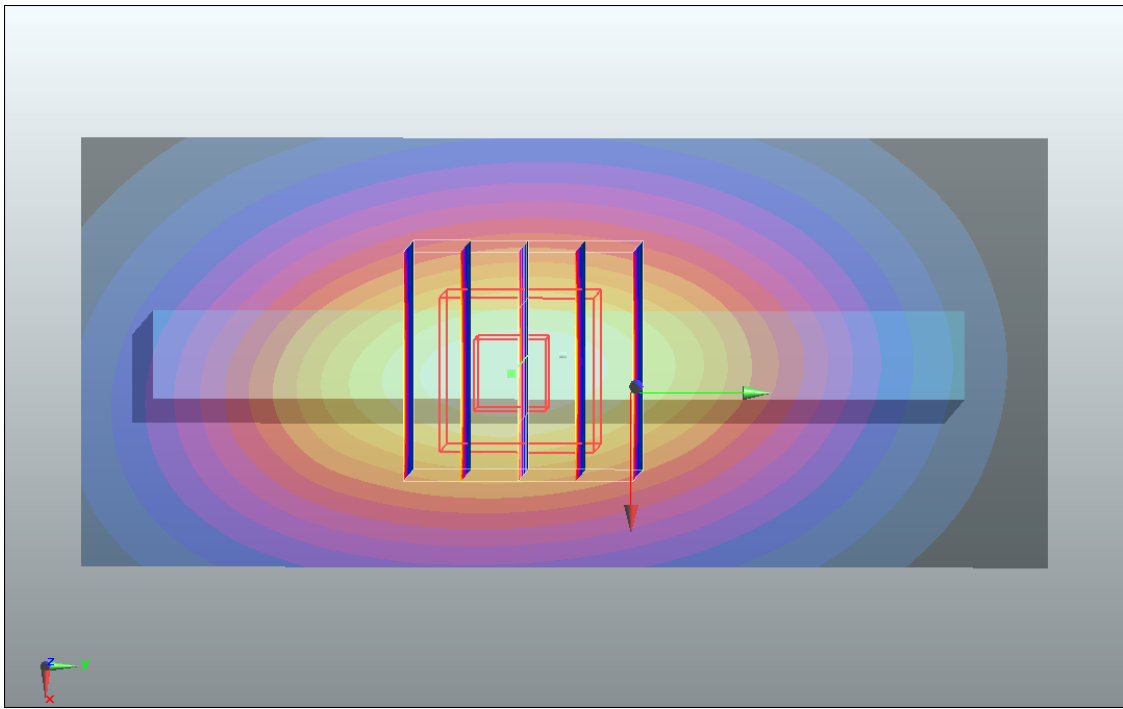
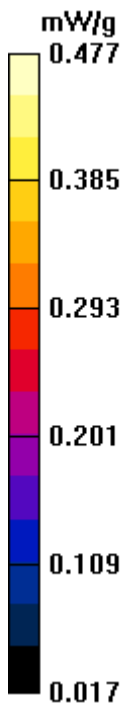
Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 22.5 V/m; Power Drift = 0.075 dB

Peak SAR (extrapolated) = 0.604 W/kg

SAR(1 g) = 0.450 mW/g; SAR(10 g) = 0.312 mW/g

Maximum value of SAR (measured) = 0.481 mW/g



#31 WCDMA V_RMC 12.2K_Top Side_1cm_Ch4233

DUT: 142113

Communication System: UMTS; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: MSL_835_110508 Medium parameters used: $f = 847$ MHz; $\sigma = 0.987$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C ; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(5.99, 5.99, 5.99); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch4233/Area Scan (61x71x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.024 mW/g

Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.52 V/m; Power Drift = -0.030 dB

Peak SAR (extrapolated) = 0.031 W/kg

SAR(1 g) = 0.023 mW/g; SAR(10 g) = 0.017 mW/g

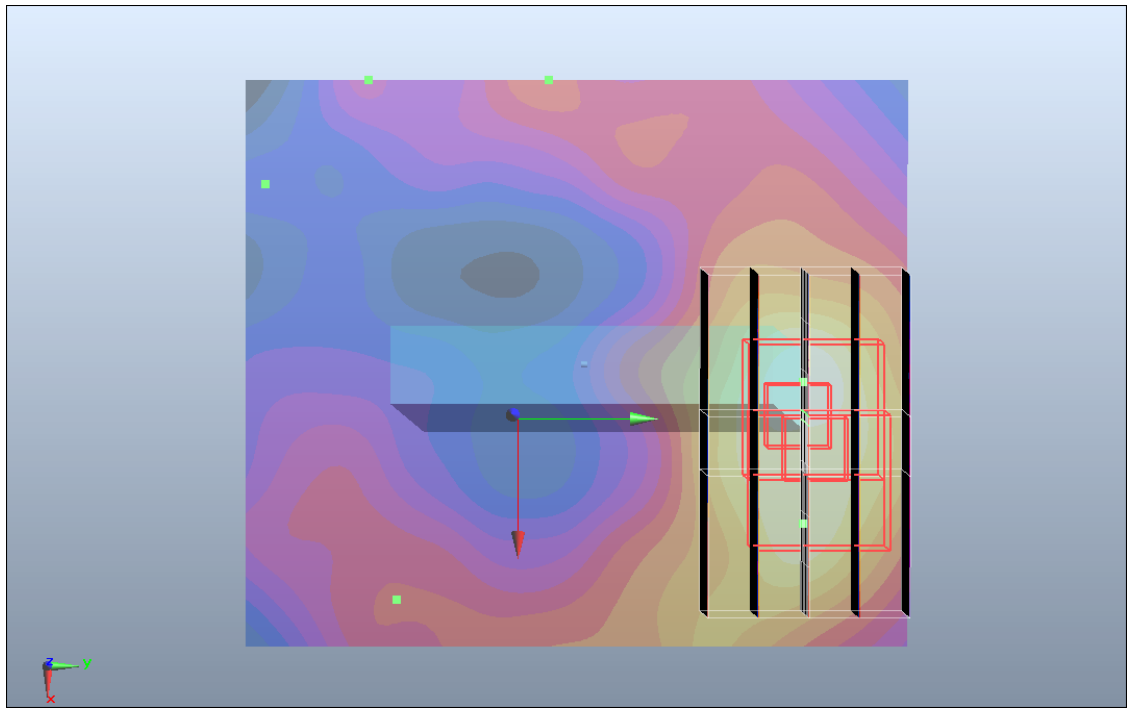
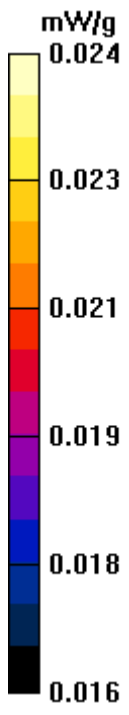
Maximum value of SAR (measured) = 0.024 mW/g

Ch4233/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 4.52 V/m; Power Drift = -0.030 dB

Peak SAR (extrapolated) = 0.031 W/kg

SAR(1 g) = 0.023 mW/g; SAR(10 g) = 0.017 mW/g



#32 WCDMA V_RMC 12.2K_Bottom Side_1cm_Ch4233

DUT: 142113

Communication System: UMTS; Frequency: 846.6 MHz; Duty Cycle: 1:1

Medium: MSL_835_110508 Medium parameters used: $f = 847$ MHz; $\sigma = 0.987$ mho/m; $\epsilon_r = 54.3$; $\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C ; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(5.99, 5.99, 5.99); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch4233/Area Scan (41x71x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.143 mW/g

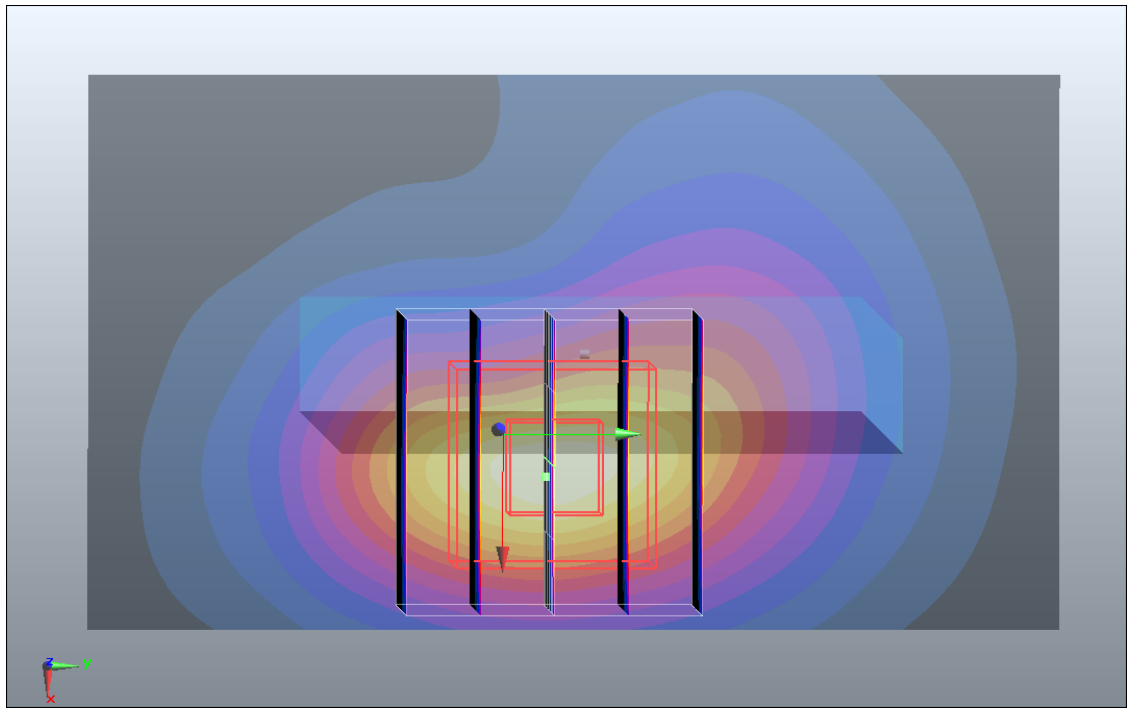
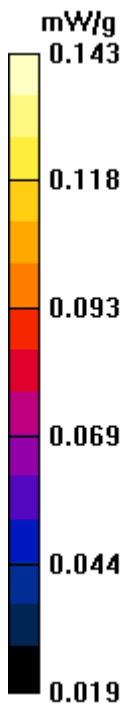
Ch4233/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 9.38 V/m; Power Drift = -0.103 dB

Peak SAR (extrapolated) = 0.220 W/kg

SAR(1 g) = 0.130 mW/g; SAR(10 g) = 0.076 mW/g

Maximum value of SAR (measured) = 0.143 mW/g



#33 WCDMA V_RMC 12.2K_Rear Face_1cm_Ch4132

DUT: 142113

Communication System: UMTS; Frequency: 826.4 MHz; Duty Cycle: 1:1

Medium: MSL_835_110508 Medium parameters used: $f = 826.4$ MHz; $\sigma = 0.968$ mho/m; $\epsilon_r = 54.4$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C ; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(5.99, 5.99, 5.99); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch4132/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1 mW/g

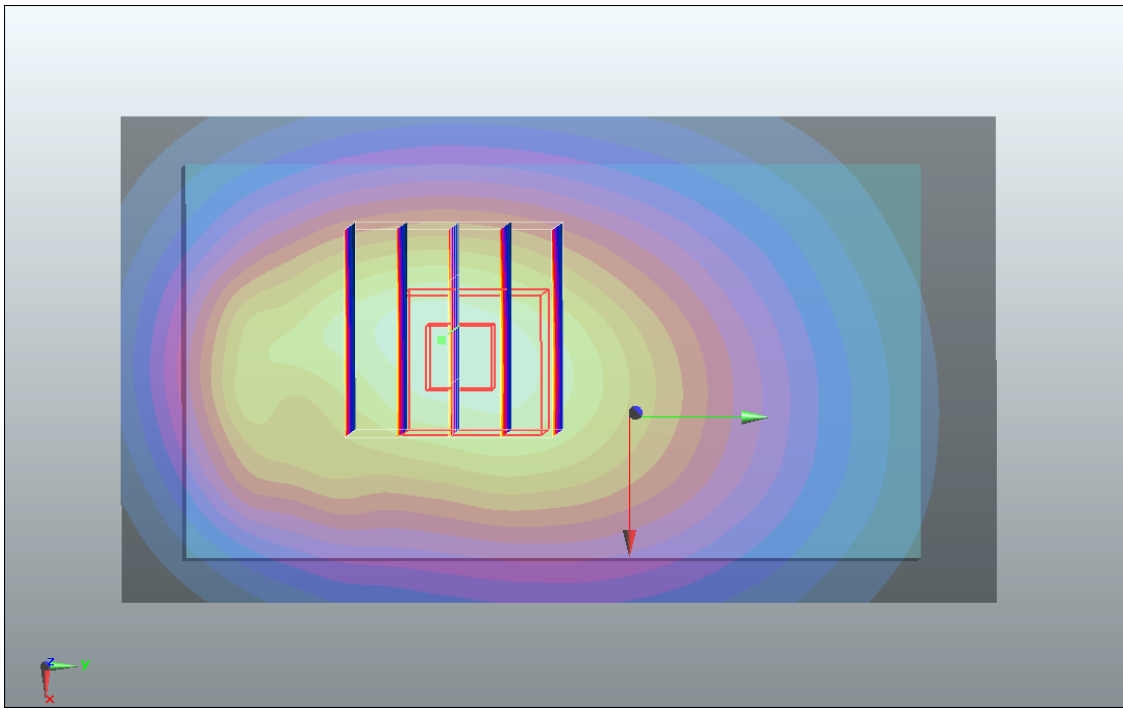
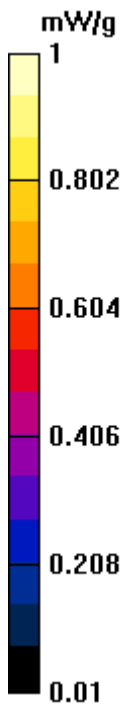
Ch4132/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 31.6 V/m; Power Drift = -0.00228 dB

Peak SAR (extrapolated) = 1.25 W/kg

SAR(1 g) = 0.959 mW/g; SAR(10 g) = 0.690 mW/g

Maximum value of SAR (measured) = 1.01 mW/g



#34 WCDMA V_RMC 12.2K_Rear Face_1cm_Ch4182

DUT: 142113

Communication System: UMTS; Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium: MSL_835_110508 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.978$ mho/m; $\epsilon_r = 54.4$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C ; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(5.99, 5.99, 5.99); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch4182/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.18 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 33.1 V/m; Power Drift = 0.026 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.811 mW/g

Maximum value of SAR (measured) = 1.19 mW/g

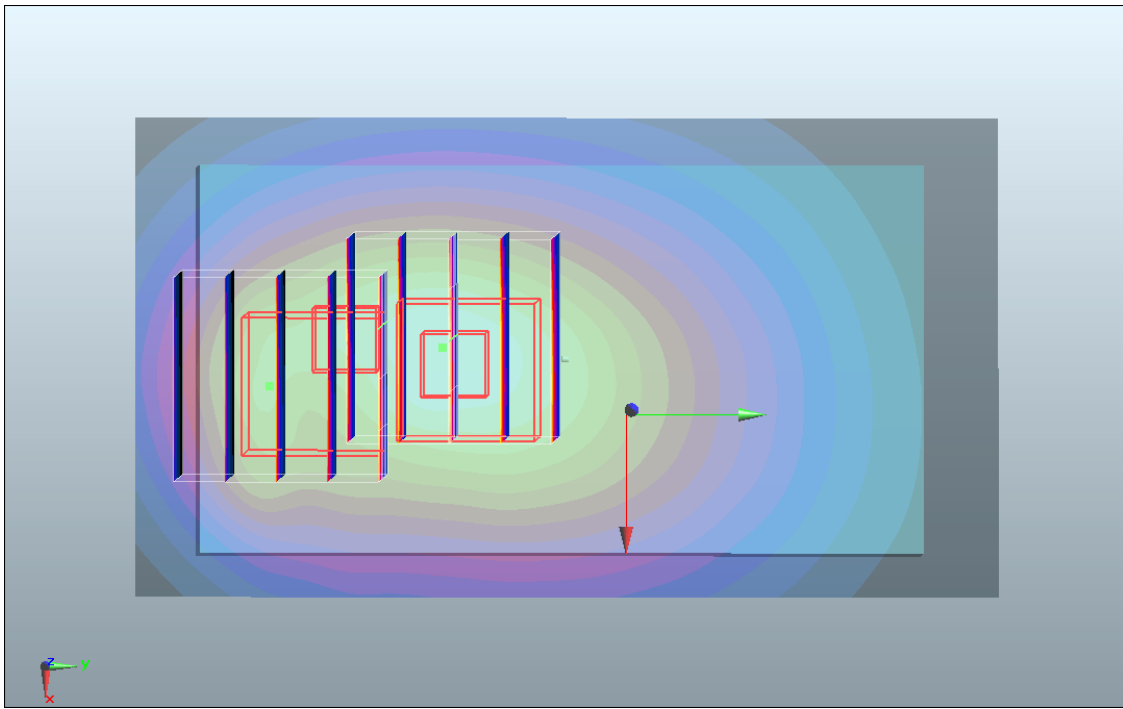
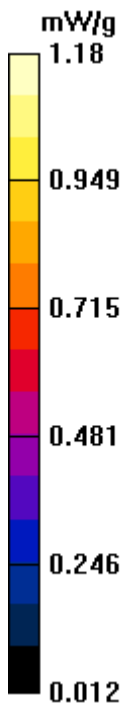
Ch4182/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 33.1 V/m; Power Drift = 0.026 dB

Peak SAR (extrapolated) = 1.37 W/kg

SAR(1 g) = 0.901 mW/g; SAR(10 g) = 0.597 mW/g

Maximum value of SAR (measured) = 1.03 mW/g



#34 WCDMA V_RMC 12.2K_Rear Face_1cm_Ch4182_2D

DUT: 142113

Communication System: UMTS; Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium: MSL_835_110508 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.978$ mho/m; $\epsilon_r = 54.4$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C ; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(5.99, 5.99, 5.99); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch4182/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 1.18 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 33.1 V/m; Power Drift = 0.026 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 1.12 mW/g; SAR(10 g) = 0.811 mW/g

Maximum value of SAR (measured) = 1.19 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

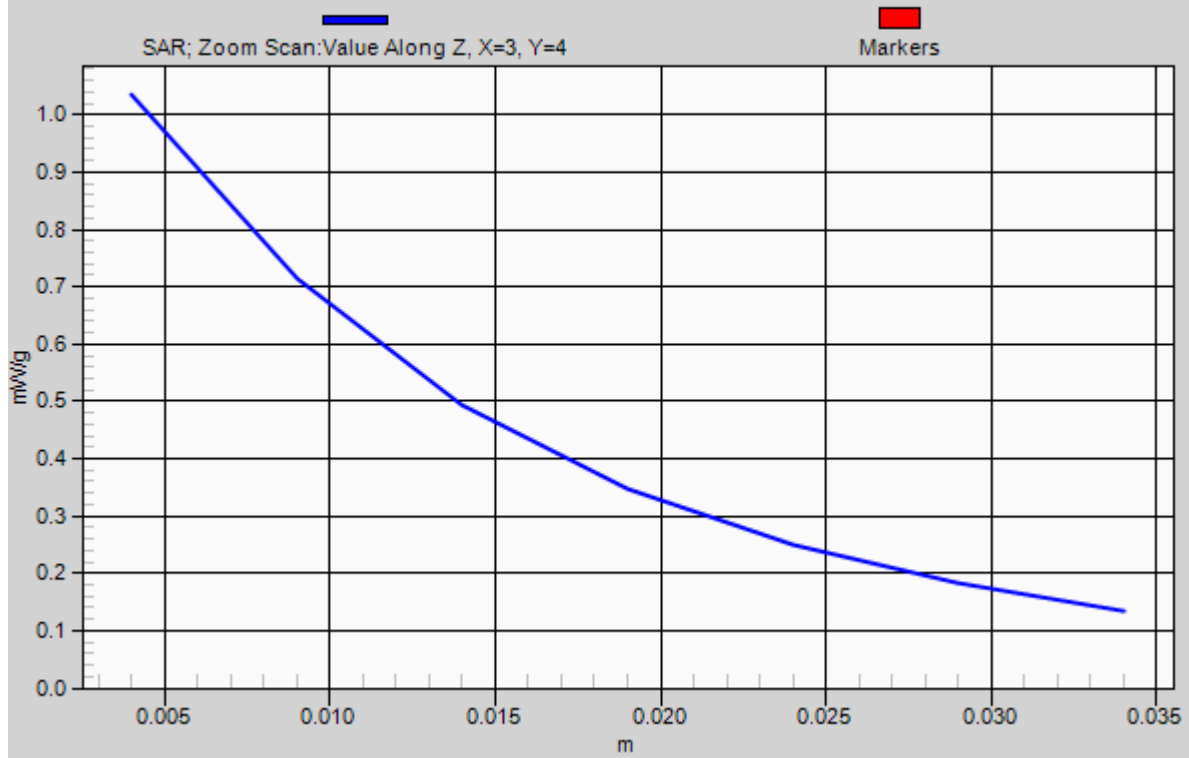
Reference Value = 33.1 V/m; Power Drift = 0.026 dB

Peak SAR (extrapolated) = 1.37 W/kg

SAR(1 g) = 0.901 mW/g; SAR(10 g) = 0.597 mW/g

Maximum value of SAR (measured) = 1.03 mW/g

1g/10g Averaged SAR



#35 WCDMA V_RMC 12.2K_Rear Face_1cm_Ch4233_Earphone

DUT: 142113

Communication System: UMTS; Frequency: 836.4 MHz; Duty Cycle: 1:1

Medium: MSL_835_110508 Medium parameters used: $f = 836.4$ MHz; $\sigma = 0.978$ mho/m; $\epsilon_r = 54.4$;

$\rho = 1000$ kg/m³

Ambient Temperature : 23.4 °C ; Liquid Temperature : 21.5 °C

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(5.99, 5.99, 5.99); Calibrated: 2010-9-21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1210; Calibrated: 2010-11-18
- Phantom: SAM1; Type: SAM; Serial: TP-1479
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Ch4182/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.778 mW/g

Ch4182/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.5 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 0.988 W/kg

SAR(1 g) = 0.708 mW/g; SAR(10 g) = 0.501 mW/g

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

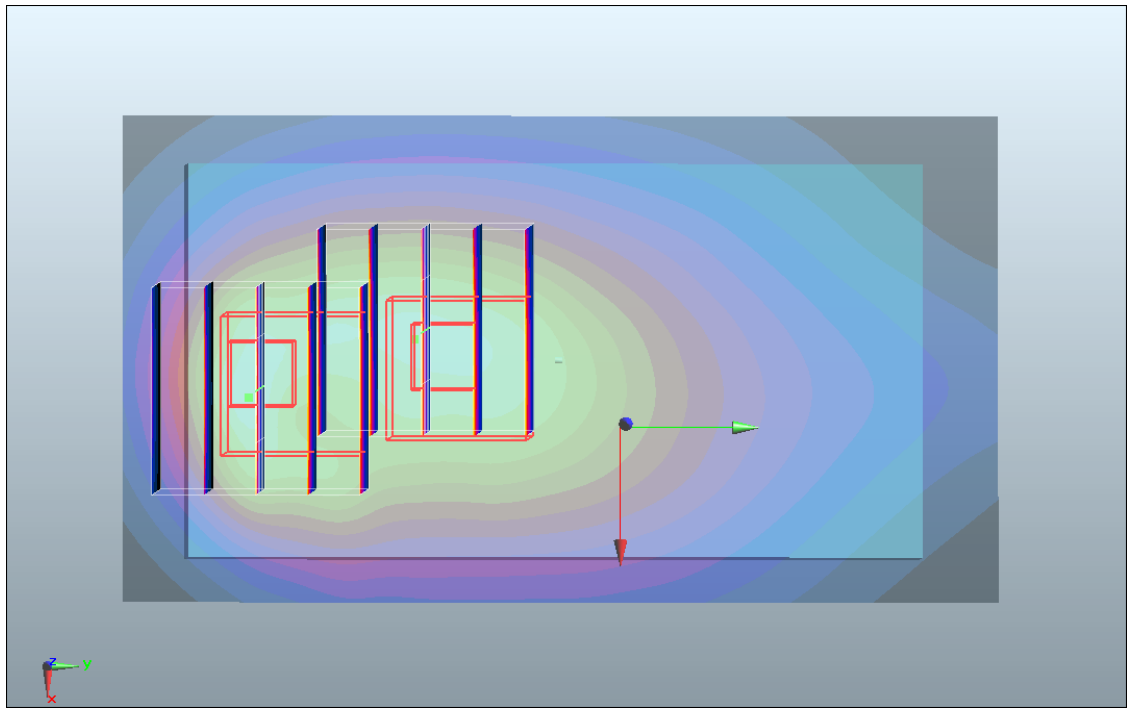
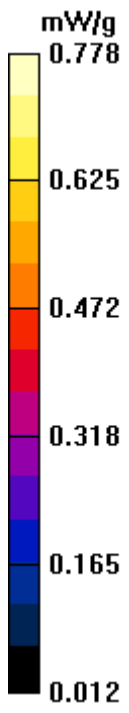
Ch4182/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 26.5 V/m; Power Drift = 0.013 dB

Peak SAR (extrapolated) = 1.19 W/kg

SAR(1 g) = 0.701 mW/g; SAR(10 g) = 0.450 mW/g

Maximum value of SAR (measured) = 0.762 mW/g





Appendix C. DASYS Calibration Certificate

The DASYS calibration certificates are shown as follows.



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



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

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

Accreditation No.: SCS 108

Client ATL (Auden)

Certificate No: D835V2-4d082_Jul10

CALIBRATION CERTIFICATE

Object D835V2 - SN: 4d082
Calibration procedure(s) QA CAL-05.v7 Calibration procedure for dipole validation kits
Calibration date: July 20, 2010

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)

Table with 4 columns: Primary Standards, ID #, Cal Date (Certificate No.), Scheduled Calibration. Rows include Power meter EPM-442A, Power sensor HP 8481A, Reference 20 dB Attenuator, Type-N mismatch combination, Reference Probe ES3DV3, DAE4.

Table with 4 columns: Secondary Standards, ID #, Check Date (in house), Scheduled Check. Rows include Power sensor HP 8481A, RF generator R&S SMT-06, Network Analyzer HP 8753E.

Calibrated by: Dimce Iliev, Laboratory Technician
Approved by: Katja Pokovic, Technical Manager

Issued: July 20, 2010

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

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



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

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

Accreditation No.: **SCS 108**

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 1528-2003, "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
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

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.



Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V4.9	
Distance Dipole Center - TSL	15 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	835 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	42.0 ± 6 %	0.90 mho/m ± 6 %
Head TSL temperature during test	(23.1 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	2.40 mW / g
SAR normalized	normalized to 1W	9.60 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.65 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	1.56 mW / g
SAR normalized	normalized to 1W	6.24 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.26 mW /g ± 16.5 % (k=2)



Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	55.2	0.97 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	55.0 ± 6 %	1.01 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	2.58 mW / g
SAR normalized	normalized to 1W	10.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	10.0 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	1.69 mW / g
SAR normalized	normalized to 1W	6.76 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	6.60 mW / g ± 16.5 % (k=2)



Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.7 Ω - 3.2 j Ω
Return Loss	- 29.0 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	48.3 Ω - 4.6 j Ω
Return Loss	- 26.0 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.389ns
----------------------------------	---------

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.

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	October 17, 2008

DASY5 Validation Report for Head TSL

Date/Time: 20.07.2010 15:48:57

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: HSL900

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.9 \text{ mho/m}$; $\epsilon_r = 42.4$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.03, 6.03, 6.03); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASYS2, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

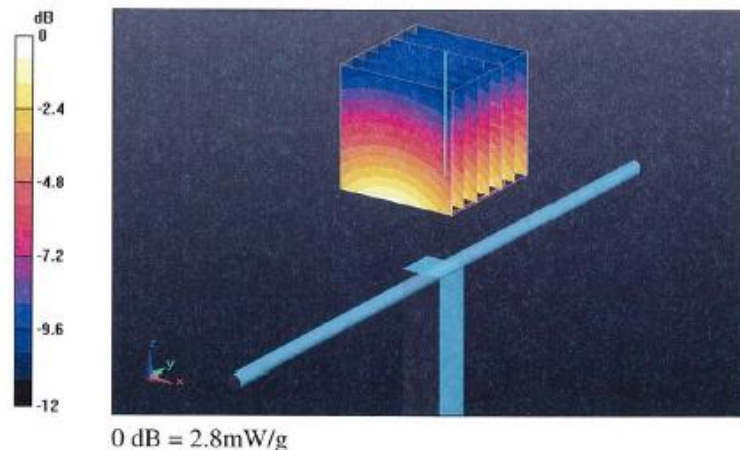
Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57.1 V/m; Power Drift = 0.020 dB

Peak SAR (extrapolated) = 3.63 W/kg

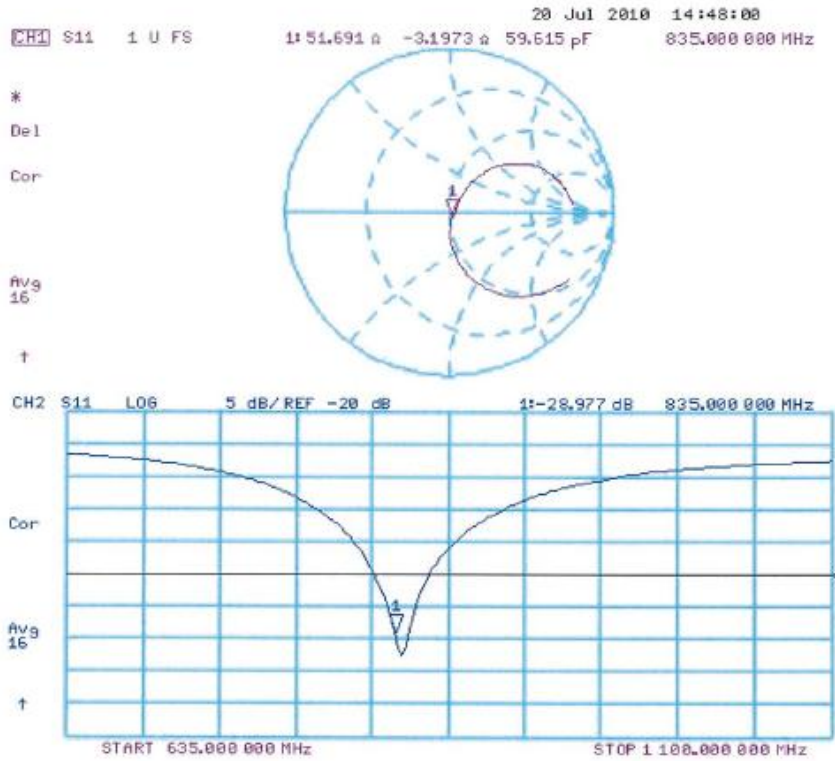
SAR(1 g) = 2.4 mW/g; SAR(10 g) = 1.56 mW/g

Maximum value of SAR (measured) = 2.8 mW/g





Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body

Date/Time: 20.07.2010 12:03:13

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:4d082

Communication System: CW; Frequency: 835 MHz; Duty Cycle: 1:1

Medium: MSL900

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 1.01 \text{ mho/m}$; $\epsilon_r = 55$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.86, 5.86, 5.86); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

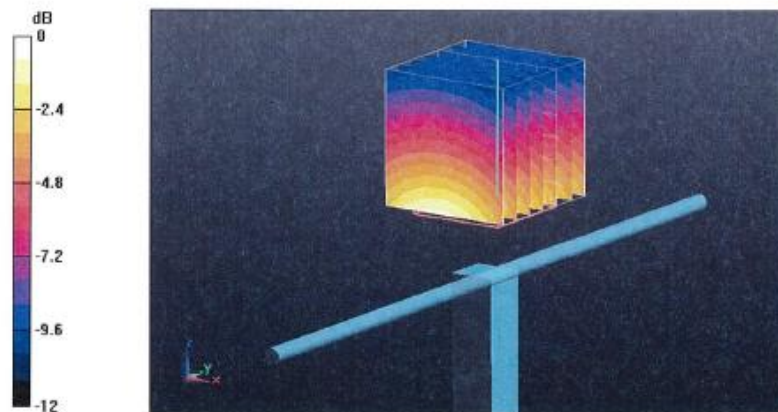
Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.1 V/m; Power Drift = 0.017 dB

Peak SAR (extrapolated) = 3.81 W/kg

SAR(1 g) = 2.58 mW/g; SAR(10 g) = 1.69 mW/g

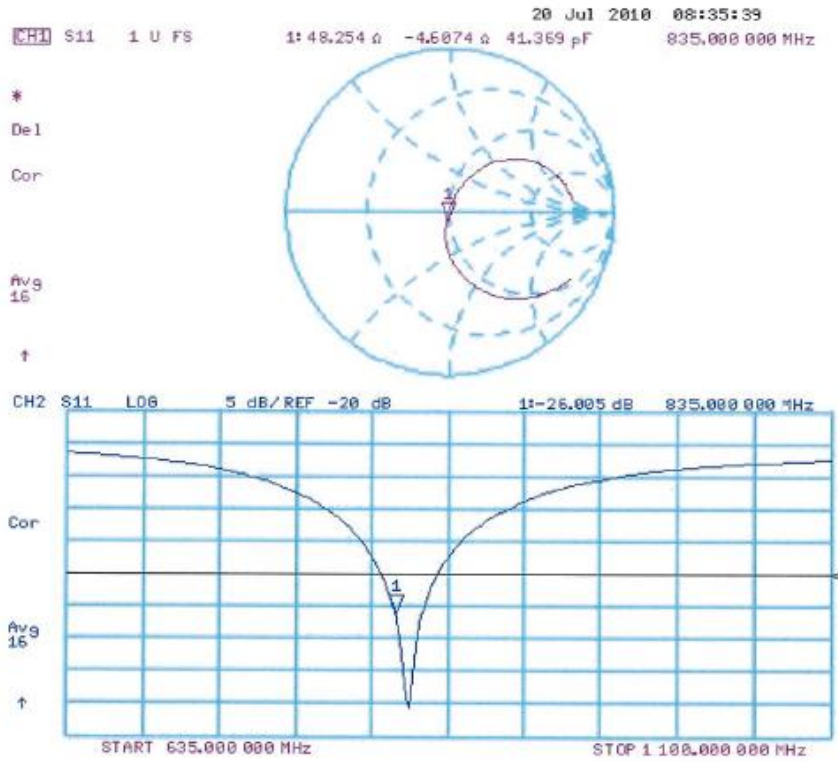
Maximum value of SAR (measured) = 2.98 mW/g



0 dB = 2.98mW/g



Impedance Measurement Plot for Body TSL





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



S Schweizerischer Kalibrierdienst, S Service suisse d'etalonnage, S Servizio svizzero di taratura, S Swiss Calibration Service

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Accreditation No.: SCS 108

Client: Auden

Certificate No: D1900V2-5d018_Jun10

CALIBRATION CERTIFICATE

Object: D1900V2 - SN: 5d018
Calibration procedure(s): QA CAL-05.v7, Calibration procedure for dipole validation kits
Calibration date: June 15, 2010

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)

Table with 4 columns: Primary Standards, ID #, Cal Date (Certificate No.), Scheduled Calibration. Rows include Power meter EPM-442A, Power sensor HP 8481A, Reference 20 dB Attenuator, Type-N mismatch combination, Reference Probe ES3DV3, DAE4.

Table with 4 columns: Secondary Standards, ID #, Check Date (in house), Scheduled Check. Rows include Power sensor HP 8481A, RF generator R&S SMT-06, Network Analyzer HP 8753E.

Calibrated by: Dimce Iliev, Laboratory Technician, Signature: D. Iliev

Approved by: Katja Pokovic, Technical Manager, Signature: [Handwritten]

Issued: June 17, 2010

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

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Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



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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**

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 1528-2003, "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
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

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.



Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1900 MHz ± 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 ± 0.2) °C	39.6 ± 6 %	1.44 mho/m ± 6 %
Head TSL temperature during test	(22.5 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	10.0 mW / g
SAR normalized	normalized to 1W	40.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	39.2 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	5.22 mW / g
SAR normalized	normalized to 1W	20.9 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	20.7 mW /g ± 16.5 % (k=2)



Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	53.3	1.52 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	53.4 ± 6 %	1.54 mho/m ± 6 %
Body TSL temperature during test	(21.7 ± 0.2) °C	----	----

SAR result with Body TSL

SAR averaged over 1 cm ³ (1 g) of Body TSL	Condition	
SAR measured	250 mW input power	10.3 mW / g
SAR normalized	normalized to 1W	41.2 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	40.9 mW / g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	5.52 mW / g
SAR normalized	normalized to 1W	22.1 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	22.0 mW / g ± 16.5 % (k=2)



Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.1 Ω + 2.6 j Ω
Return Loss	- 29.7 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	47.4 Ω + 3.2 j Ω
Return Loss	- 27.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.194 ns
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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.

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	June 04, 2002

DASY5 Validation Report for Head TSL

Date/Time: 15.06.2010 10:40:45

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d018

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: HSL U11 BB

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.44$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

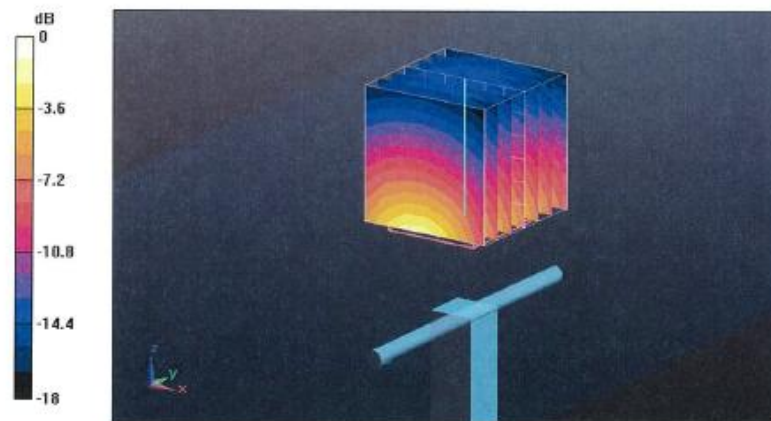
Phantom section: Flat Section

Measurement Standard: DASYS5 (IEEE/IEC/ANSI C63.19-2007)

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.09, 5.09, 5.09); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASYS52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

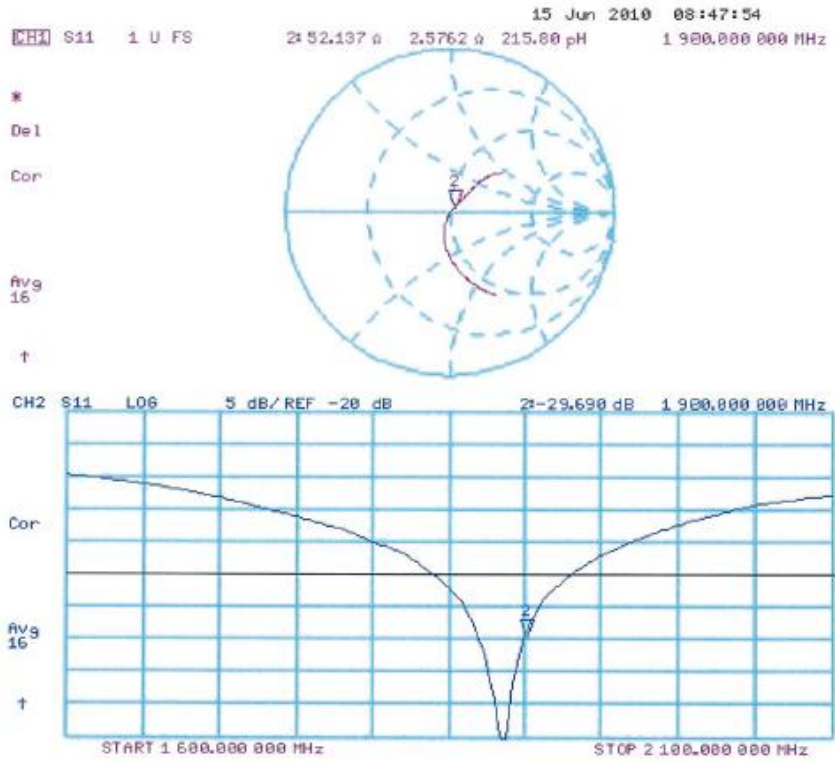
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 96.7 V/m; Power Drift = 0.022 dB
Peak SAR (extrapolated) = 18.4 W/kg
SAR(1 g) = 10 mW/g; SAR(10 g) = 5.22 mW/g
Maximum value of SAR (measured) = 12.6 mW/g



0 dB = 12.6mW/g



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body

Date/Time: 15.06.2010 14:14:27

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d018

Communication System: CW; Frequency: 1900 MHz; Duty Cycle: 1:1

Medium: MSL U11 BB

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.54$ mho/m; $\epsilon_r = 53.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.59, 4.59, 4.59); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

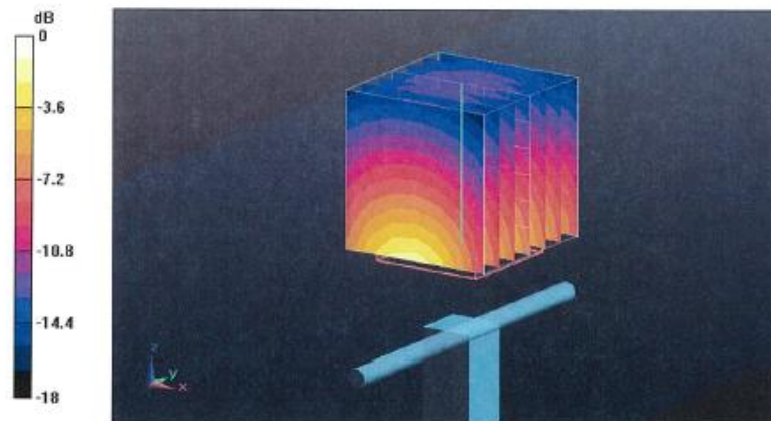
Pin250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.1 V/m; Power Drift = 0.055 dB

Peak SAR (extrapolated) = 17.3 W/kg

SAR(1 g) = 10.3 mW/g; SAR(10 g) = 5.52 mW/g

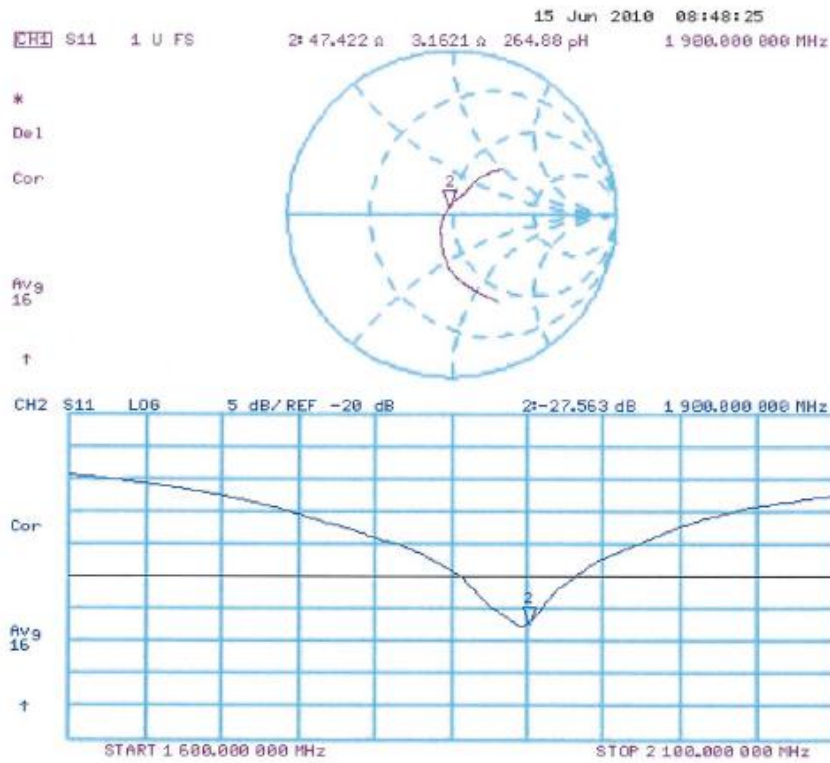
Maximum value of SAR (measured) = 12.8 mW/g



0 dB = 12.8mW/g



Impedance Measurement Plot for Body TSL





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Accreditation No.: SCS 108

Client Sporton (Auden)

Certificate No: DAE4-1210_Nov10

CALIBRATION CERTIFICATE

Object DAE4 - SD 000 D04 BJ - SN: 1210
Calibration procedure(s) QA CAL-06.v22
Calibration procedure for the data acquisition electronics (DAE)
Calibration date: November 18, 2010

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
Keithley Multimeter Type 2001	SN: 0810278	28-Sep-10 (No: 10376)	Sep-11
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Calibrator Box V1.1	SE UMS 006 AB 1001	07-Jun-10 (in house check)	In house check: Jun-11

Calibrated by: Name Andrea Guntli Function Technician Signature [Signature]
Approved by: Name Fin Bornholt Function R&D Director Signature [Signature]

Issued: November 18, 2010

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Accreditation No.: SCS 108

Glossary

DAE data acquisition electronics
Connector angle information used in DAS Y system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement:* Calibration Factor assessed for use in DAS Y system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle:* The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
 - *DC Voltage Measurement Linearity:* Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
 - *Common mode sensitivity:* Influence of a positive or negative common mode voltage on the differential measurement.
 - *Channel separation:* Influence of a voltage on the neighbor channels not subject to an input voltage.
 - *AD Converter Values with inputs shorted:* Values on the internal AD converter corresponding to zero input voltage
 - *Input Offset Measurement:* Output voltage and statistical results over a large number of zero voltage measurements.
 - *Input Offset Current:* Typical value for information; Maximum channel input offset current, not considering the input resistance.
 - *Input resistance:* Typical value for information; DAE input resistance at the connector, during internal auto-zeroing and during measurement.
 - *Low Battery Alarm Voltage:* Typical value for information. Below this voltage, a battery alarm signal is generated.
 - *Power consumption:* Typical value for information. Supply currents in various operating modes.



DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1µV , full range = -100...+300 mV
Low Range: 1LSB = 61nV , full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.092 ± 0.1% (k=2)	404.921 ± 0.1% (k=2)	405.027 ± 0.1% (k=2)
Low Range	3.99932 ± 0.7% (k=2)	3.98397 ± 0.7% (k=2)	3.99953 ± 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	68.0 ° ± 1 °
---	--------------

Appendix

1. DC Voltage Linearity

High Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	200001.5	-1.32	-0.00
Channel X + Input	20000.95	0.95	0.00
Channel X - Input	-19998.31	1.39	-0.01
Channel Y + Input	200000.7	-1.08	-0.00
Channel Y + Input	20000.03	0.23	0.00
Channel Y - Input	-19999.95	-0.35	0.00
Channel Z + Input	200010.3	-0.33	-0.00
Channel Z + Input	19997.81	-2.89	-0.01
Channel Z - Input	-20001.02	-1.32	0.01

Low Range	Reading (µV)	Difference (µV)	Error (%)
Channel X + Input	1999.6	-0.26	-0.01
Channel X + Input	199.98	-0.02	-0.01
Channel X - Input	-200.01	-0.01	0.00
Channel Y + Input	2000.6	0.54	0.03
Channel Y + Input	199.17	-1.03	-0.51
Channel Y - Input	-200.54	-0.84	0.42
Channel Z + Input	1999.9	-0.05	-0.00
Channel Z + Input	199.17	-0.93	-0.47
Channel Z - Input	-201.25	-1.15	0.58

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (µV)	Low Range Average Reading (µV)
Channel X	200	-6.04	-7.77
	-200	8.97	7.28
Channel Y	200	-8.99	-8.75
	-200	7.60	7.00
Channel Z	200	12.34	11.86
	-200	-14.01	-14.18

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (µV)	Channel Y (µV)	Channel Z (µV)
Channel X	200	-	3.24	0.60
Channel Y	200	1.78	-	3.29
Channel Z	200	1.92	-0.13	-



4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15945	17239
Channel Y	15959	16297
Channel Z	15874	17186

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10M Ω

	Average (μ V)	min. Offset (μ V)	max. Offset (μ V)	Std. Deviation (μ V)
Channel X	0.14	-1.10	1.73	0.40
Channel Y	-0.64	-1.49	0.23	0.33
Channel Z	-1.30	-2.71	0.16	0.44

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9



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Accreditation No.: SCS 108

Client Sporton (Auden)

Certificate No: ET3-1788_Sep10

CALIBRATION CERTIFICATE

Object: ET3DV6 - SN:1788
Calibration procedure(s): QA CAL-01.v6, QA CAL-23.v3 and QA CAL-25.v2
Calibration procedure for dosimetric E-field probes
Calibration date: September 21, 2010

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)

Table with 4 columns: Primary Standards, ID #, Cal Date (Certificate No.), Scheduled Calibration. Lists equipment like Power meter E4419B, Reference 3 dB Attenuator, etc.

Table with 4 columns: Secondary Standards, ID #, Check Date (in house), Scheduled Check. Lists RF generator HP 8648C, Network Analyzer HP 8753E.

Calibrated by: Jeton Kastrati, Laboratory Technician
Approved by: Katja Pokovic, Technical Manager

Issued: September 22, 2010

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



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



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

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

Accreditation No.: SCS 108

Glossary:

Table with 2 columns: Term and Definition. Terms include TSL, NORMx,y,z, ConvF, DCP, CF, A, B, C, Polarization phi, Polarization theta.

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:

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



ET3DV6 SN:1788

September 21, 2010

Probe ET3DV6

SN:1788

Manufactured:	May 28, 2003
Last calibrated:	September 23, 2009
Recalibrated:	September 21, 2010

Calibrated for DASYS/EASY Systems

(Note: non-compatible with DASYS2 system!)



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DASY/EASY - Parameters of Probe: ET3DV6 SN:1788

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	1.76	1.69	1.76	$\pm 10.1\%$
DCP (mV) ^B	91.6	91.0	95.1	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dBuV	C	VR mV	Unc ^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	300.0	$\pm 1.5\%$
			Y	0.00	0.00	1.00	300.0	
			Z	0.00	0.00	1.00	300.0	

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%.

^A The uncertainties of NormX,Y,Z do not affect the E²-field uncertainty inside TSL, (see Pages 5 and 6).

^B Numerical linearization parameter: uncertainty not required.

^E Uncertainty is determined using the maximum deviation from linear response applying rectangular distribution and is expressed for the square of the field value.



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DASY/EASY - Parameters of Probe: ET3DV6 SN:1788

Calibration Parameter Determined in Head Tissue Simulating Media

f [MHz]	Validity [MHz] ^c	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
835	± 50 / ± 100	41.5 ± 5%	0.90 ± 5%	6.23	6.23	6.23	0.41	2.32 ± 11.0%
900	± 50 / ± 100	41.5 ± 5%	0.97 ± 5%	6.11	6.11	6.11	0.29	2.85 ± 11.0%
1750	± 50 / ± 100	40.1 ± 5%	1.37 ± 5%	5.29	5.29	5.29	0.51	2.51 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	5.03	5.03	5.03	0.66	2.25 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.35	4.35	4.35	0.99	1.69 ± 11.0%

^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.



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DASY/EASY - Parameters of Probe: ET3DV6 SN:1788

Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz] ^c	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
835	± 50 / ± 100	55.2 ± 5%	0.97 ± 5%	5.99	5.99	5.99	0.35	2.62 ± 11.0%
900	± 50 / ± 100	55.0 ± 5%	1.05 ± 5%	6.07	6.07	6.07	0.32	2.87 ± 11.0%
1750	± 50 / ± 100	53.4 ± 5%	1.49 ± 5%	4.67	4.67	4.67	0.61	3.09 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.39	4.39	4.39	0.83	2.56 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.04	4.04	4.04	0.99	1.40 ± 11.0%

^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

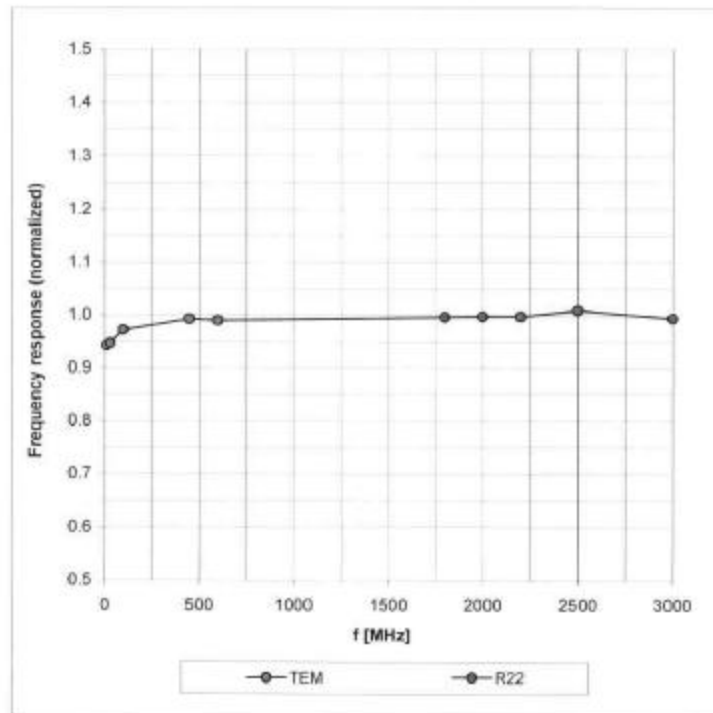


ET3DV6 SN:1788

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Frequency Response of E-Field

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



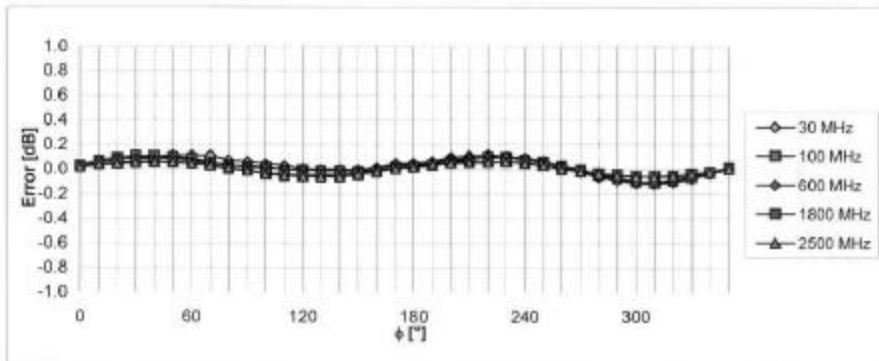
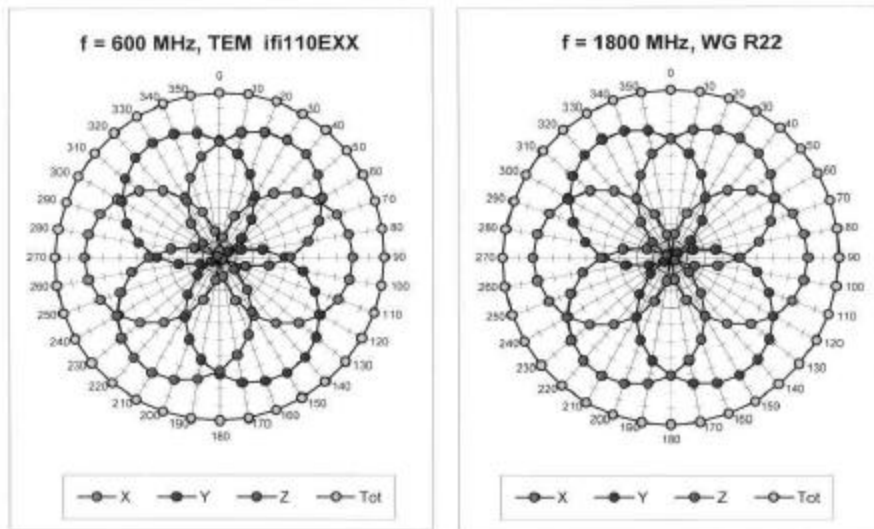
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)



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September 21, 2010

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



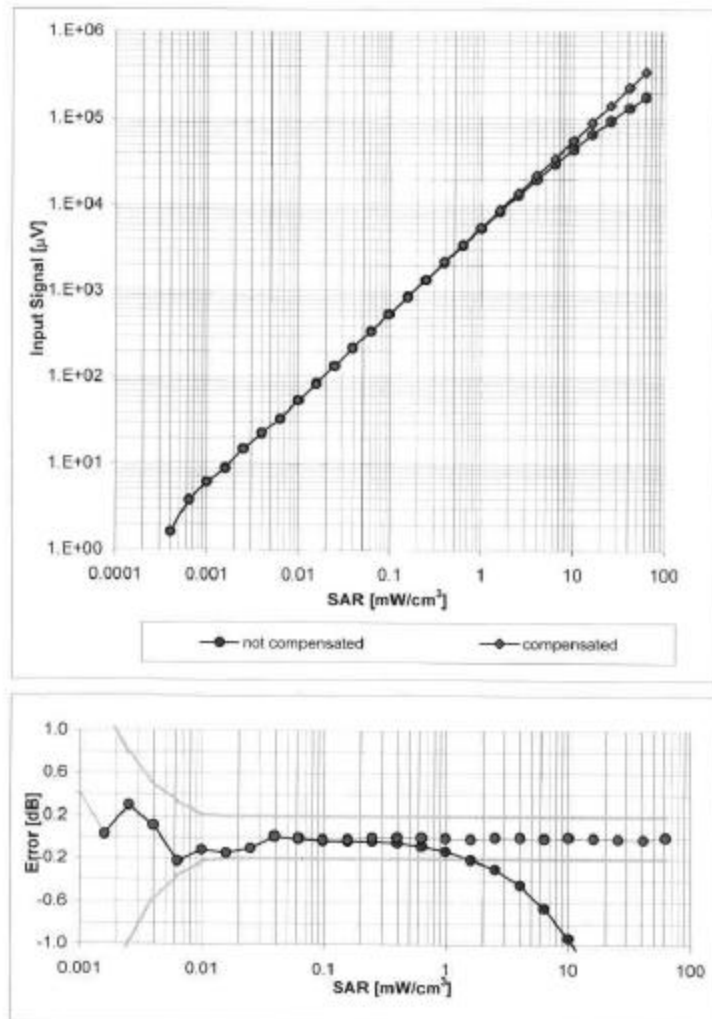
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)



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September 21, 2010

Dynamic Range f(SAR_{head}) (Waveguide R22, f = 1800 MHz)

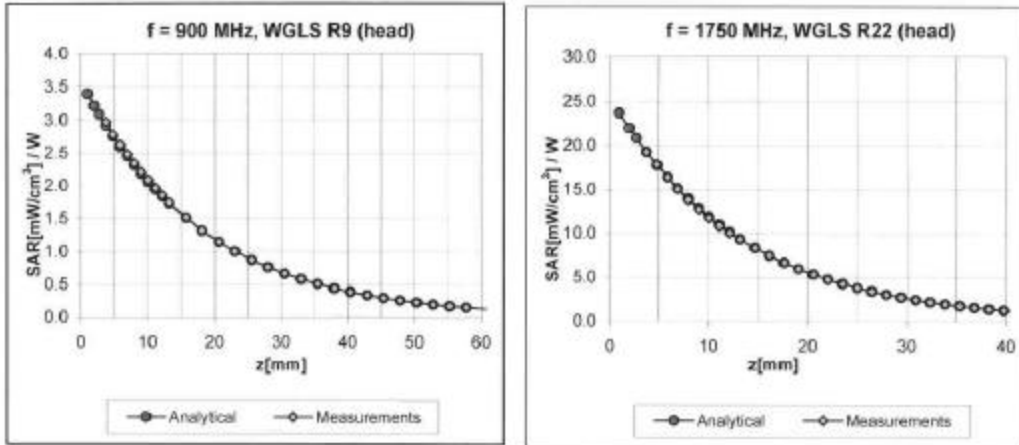


Uncertainty of Linearity Assessment: ± 0.6% (k=2)

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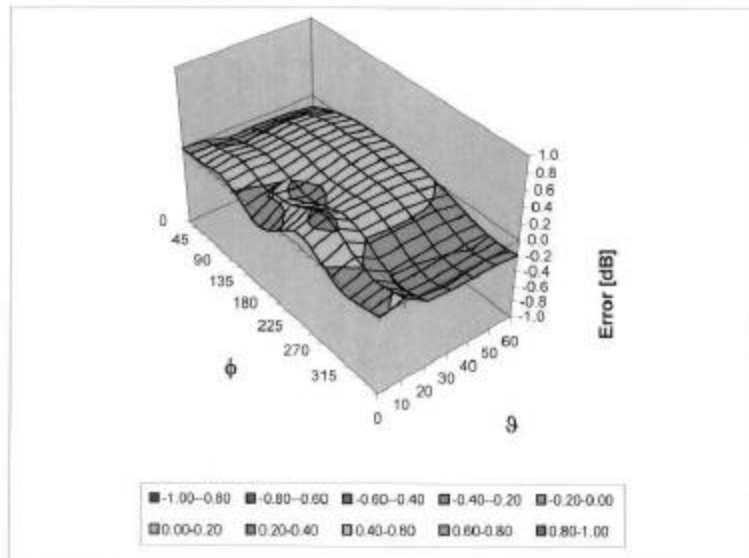
September 21, 2010

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error (ϕ, θ), f = 900 MHz



Uncertainty of Spherical Isotropy Assessment: $\pm 2.6\%$ (k=2)



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Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle (°)	Not applicable
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



Appendix F. FCC 3G SAR Measurement Procedures

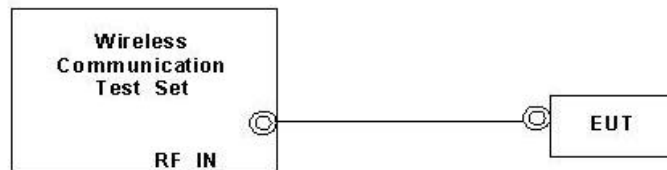
Conducted Output Power:

The EUT was tested according to the requirements of the FCC 3G procedures and the TS 34.121. The EUT's WCDMA and HSPA function is Release 6 version supporting HSDPA Category 8. A detailed analysis of the output power for all WCDMA, HSPDA, and HSPA (HSUPA & HSDPA) modes is provided in the tables below. According to the FCC 3G procedures, handsets with both HSDPA and HSUPA should be tested according to Release 6 HSPA test procedures, and the EUT does not support VOIP function over the HSPA function. Device was tested according to procedure KDB941225 - section Release 6 HSPA Data Devices as documented/evaluated in the following table.

WCDMA SAR Test mode - Conducted Power				
Mode	Setup	Cell band (850)		
		CH4132	CH4182	CH4233
		826.4 (MHz)	836.4 (MHz)	846.6 (MHz)
WCDMA	RMC 12.2Kbps	22.40	22.32	22.42
HSDPA	Subtest 1	22.22	22.08	22.16
	Subtest 2	22.05	21.88	22.04
	Subtest 3	21.61	21.46	21.62
	Subtest 4	21.58	21.41	21.57

WCDMA Setup Configuration:

- a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting
 - i. Data rates: Varied from RMC 12.2Kbps
 - ii. RMC Test Loop = Loop Mode 1
 - iii. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.



Setup Configuration

HSDPA Setup Configuration:

- a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
 - i. Set Gain Factors (β_c and β_d) and parameters were set according to each
 - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
 - iii. Set RMC12.2Kbps + HSDPA mode.
 - iv. Set Cell Power = -86 dBm
 - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
 - vi. Select HSDPA Uplink Parameters
 - vii. Set DeltaACK, DeltaNACK and DeltaCQI = 8
 - viii. Set Ack-Nack Repetition Factor to 3
 - ix. Set CQI Feedback Cycle (k) to 4 ms
 - x. Set CQI Repetition Factor to 2
 - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: $\Delta_{ACK}, \Delta_{NACK}$ and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and $\Delta_{NACK} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$, and $\Delta_{CQI} = 24/15$ with $\beta_{HS} = 24/15 * \beta_c$.

Note 3: CM = 1 for $\beta_c/\beta_d=12/15, \beta_{HS}/\beta_c=24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

Setup Configuration

HSPA (HSUPA & HSPDA) Setup Configuration:

- a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting * :
 - i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
 - ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
 - iii. Set Cell Power = -86 dBm
 - iv. Set Channel Type = 12.2k + HSPA
 - v. Set UE Target Power
 - vi. Power Ctrl Mode= Alternating bits
 - vii. Set and observe the E-TFCI
 - viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
- d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note 1)	β_{ec}	β_{ed} (Note 5) (Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/25	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1} : 47/15 β_{ed2} : 47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: $\Delta_{ACK}, \Delta_{NACK}$ and $\Delta_{CQI} = 30/15$ with $\beta_{HS} = 30/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d=12/15, \beta_{HS}/\beta_c=24/15$. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

Note 4: For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$.

Note 5: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.

Setup Configuration

Note: For details settings in the Agilent 8960 test equipment, please refer to the user guide “ HSUPA Measurement Guide with 8960 V7.5.0 Release 7 (2007-06) Ver.: v.02.18”



Call Setup Screen			
Call Control	Active Cell Operating Mode		Call Parms
Channel (UARFCN) Info	UE Information		Cell Power
Cell Parameters	INSI: INEI: Power Class:		-86.00
Generator Info	UE Expected Open Loop Transmit Power		dBm/3.84 MHz
Uplink Parameters	Initial PRACH TX Power: -11.70 dBm Initial DPCCH TX Power: -0.56 dBm		Channel Type
UE Rep Params	PRACH Preambles: 64 PRACH Ramping Cycles (N _{MAX}): 2 Available Subchannels (Bit Mask): 000000000001		12.2k + HSPA
Close Menu	Uplink DPCH Scrambling Code: 0 Uplink DPCH Bc/Bd Control: Manual Manual Uplink DPCH Bc: 11		Paging Service
	Manual Uplink DPCH Bd: 15 Maximum Uplink Transmit Power Level: 21 dBm		RB Test Mode
	Active Cell: Idle Sys Type: UTRA FDD		HSPA Parameters
2 of 4	IntRef	Offset	34,121 Preset Call Configs
			Channel (UARFCN) Parms
			1 of 3

Example for HSPA Subtest 1, and other subtests following table, C11.1.3
(Gain Factors ($\beta_c = 11$ and $\beta_d = 15$))

Call Setup Screen			
Call Control	Active Cell Operating Mode		Serving Grant
Additional Screens	UE Information		AG Mode
Cell Parameters	INSI: INEI: Power Class:		Single Shot
Generator Info	UE Expected Open Loop Transmit Power		Single Shot AG
Uplink Parameters	Initial PRACH TX Power: -11.70 dBm Initial DPCCH TX Power: -0.56 dBm		20: (119/15)^2
UE Rep Params	Call Processing Status		Send Single Shot Absolute Grant
Trig Output Setup	Current Service Type: None MM Status: Abs Single Shot AG GMM State: Index 15: (67/15)^2 Current DPCH: Index 16: (75/15)^2 HSUPA In: Index 17: (84/15)^2 UE Rep E-DCH: Index 18: (95/15)^2 Last Received: Index 19: (106/15)^2 Throughput: Index 20: (119/15)^2 ACKs Transmitted:		Send Relative Grant Up
	Sys Frame Clock		Send Relative Grant Down
	Active Cell: Idle Sys Type: UTRA FDD		Return
2 of 4	IntRef	Offset	1 of 2

Example: AG – Index = 20 for HSPA subtest 1



Call Setup Screen																																																																																																						
Screen Ctrl	Recorded E-TFCI Information	E-TFCI Record																																																																																																				
Channel (UARFCN) Info	E-TFCI Recording State	E-TFCI Rec Count																																																																																																				
	Idle	15																																																																																																				
HSPA Information	Recorded E-TFCI Values	Start Recording E-TFCI Values																																																																																																				
E-TFCI Recording Information	<table border="1"> <tr><td>1:</td><td>75</td><td>11:</td><td>75</td><td>21:</td><td>----</td><td>31:</td><td>----</td><td>41:</td><td>----</td></tr> <tr><td>2:</td><td>75</td><td>12:</td><td>75</td><td>22:</td><td>----</td><td>32:</td><td>----</td><td>42:</td><td>----</td></tr> <tr><td>3:</td><td>75</td><td>13:</td><td>75</td><td>23:</td><td>----</td><td>33:</td><td>----</td><td>43:</td><td>----</td></tr> <tr><td>4:</td><td>75</td><td>14:</td><td>75</td><td>24:</td><td>----</td><td>34:</td><td>----</td><td>44:</td><td>----</td></tr> <tr><td>5:</td><td>75</td><td>15:</td><td>75</td><td>25:</td><td>----</td><td>35:</td><td>----</td><td>45:</td><td>----</td></tr> <tr><td>6:</td><td>75</td><td>16:</td><td>----</td><td>26:</td><td>----</td><td>36:</td><td>----</td><td>46:</td><td>----</td></tr> <tr><td>7:</td><td>75</td><td>17:</td><td>----</td><td>27:</td><td>----</td><td>37:</td><td>----</td><td>47:</td><td>----</td></tr> <tr><td>8:</td><td>75</td><td>18:</td><td>----</td><td>28:</td><td>----</td><td>38:</td><td>----</td><td>48:</td><td>----</td></tr> <tr><td>9:</td><td>75</td><td>19:</td><td>----</td><td>29:</td><td>----</td><td>39:</td><td>----</td><td>49:</td><td>----</td></tr> <tr><td>10:</td><td>75</td><td>20:</td><td>----</td><td>30:</td><td>----</td><td>40:</td><td>----</td><td>50:</td><td>----</td></tr> </table>	1:	75	11:	75	21:	----	31:	----	41:	----	2:	75	12:	75	22:	----	32:	----	42:	----	3:	75	13:	75	23:	----	33:	----	43:	----	4:	75	14:	75	24:	----	34:	----	44:	----	5:	75	15:	75	25:	----	35:	----	45:	----	6:	75	16:	----	26:	----	36:	----	46:	----	7:	75	17:	----	27:	----	37:	----	47:	----	8:	75	18:	----	28:	----	38:	----	48:	----	9:	75	19:	----	29:	----	39:	----	49:	----	10:	75	20:	----	30:	----	40:	----	50:	----	
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10:	75	20:	----	30:	----	40:	----	50:	----																																																																																													
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Return		Send Step Down TPC Bit Pattern																																																																																																				
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Example: Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1



Reference:

- [1] 941225 D01 SAR test for 3G devices v02, SAR Measurement Procedures for 3G Devices CDMA 2000/Ev-Do/WCDMA/HSDPA/HSPA Oct. 2007 Laboratory Division Office of Engineering and Technology Federal Communications Commission
- [2.] TS 34.121 Universal Mobile Telecommunications System (UMTS); Terminal Conformance Specification, Radio Transmission and Reception (FDD)
- [3.] HSUPA Measurement Guide with 8960 V7.5.0 Release 7 (2007-06) Ver.: v.02.18