

GSM1900 GPRS 2TS Body Bottom Side Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:2

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.51$ S/m; $\epsilon_r = 53.18$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.66, 4.66, 4.66); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.193 W/kg

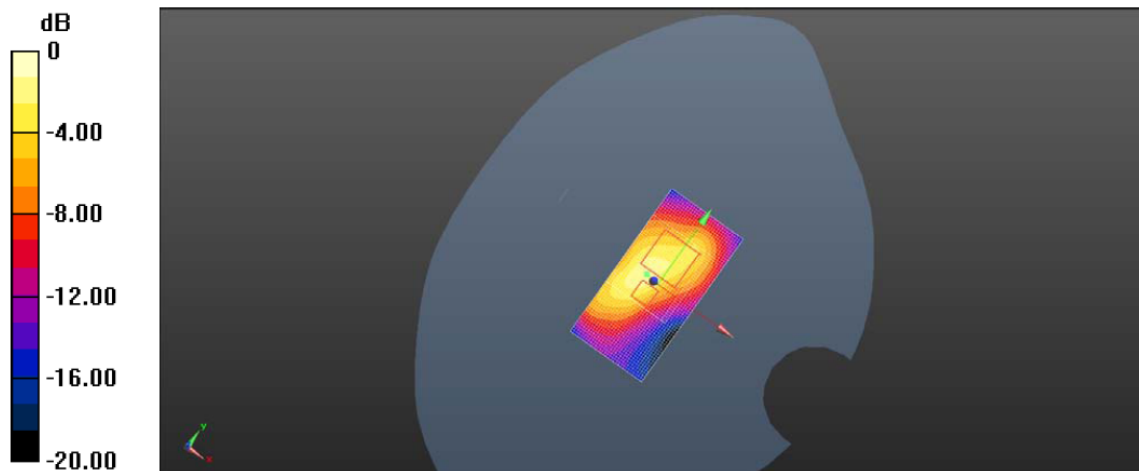
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.653 V/m; Power Drift = -0.03 dB

Peak SAR (extrapolated) = 0.240 W/kg

SAR(1 g) = 0.192 W/kg; SAR(10 g) = 0.133 W/kg

Maximum value of SAR (measured) = 0.191 W/kg



0dB = 0.191 W/kg = -12.65 dBW/kg

Plot 20: Body Bottom Side (GSM1900 GPRS 2TS Middle Channel)

GSM1900 EGPRS 2TS Body Rear Side Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:2

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.52$ S/m; $\epsilon_r = 53.82$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.66, 4.66, 4.66); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.141 W/kg

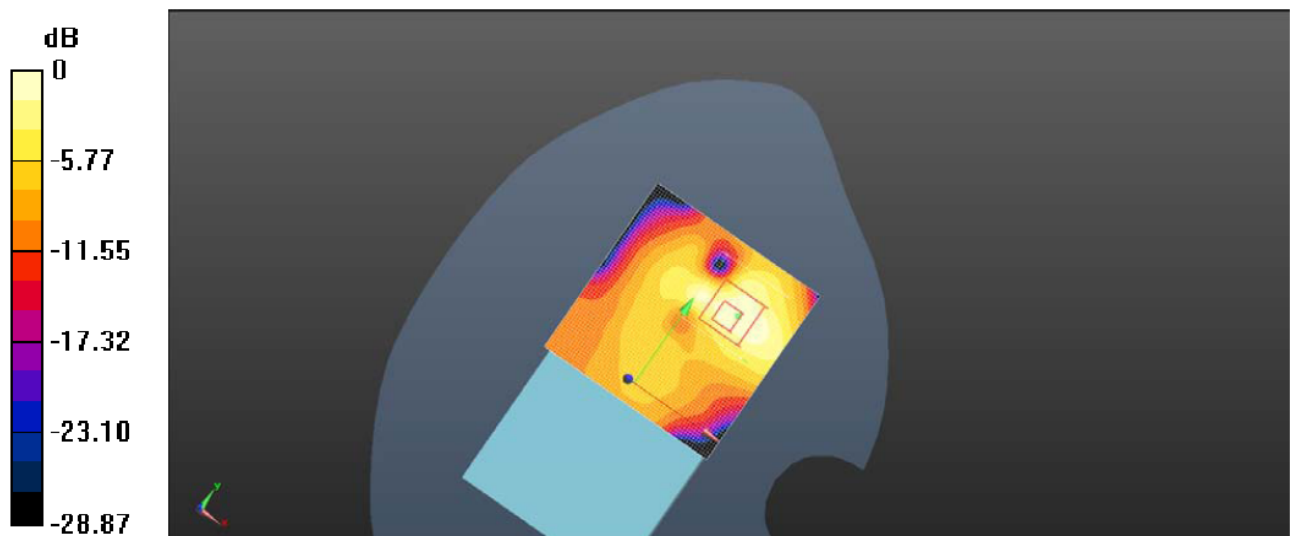
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.151 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.268 W/kg

SAR(1 g) = 0.252 W/kg; SAR(10 g) = 0.154 W/kg

Maximum value of SAR (measured) = 0.267 W/kg



0dB = 0.267 W/kg = -5.81 dBW/kg

Plot 21: Body Rear Side (GSM1900 EGPRS 2TS Middle Channel)

GSM1900 GPRS 2TS Body (Speech) With Headset Rear Side Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:2

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.54$ S/m; $\epsilon_r = 53.27$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.66, 4.66, 4.66); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: dx=1.50 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 0.259 W/kg

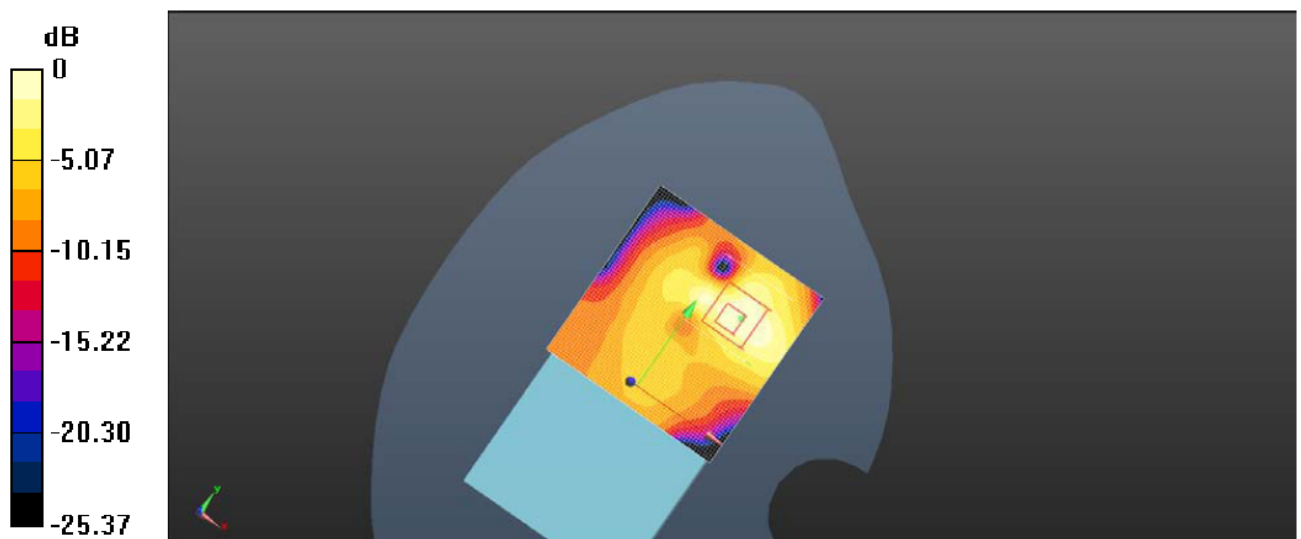
Zoom Scan (5x5x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.686 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.461 W/kg

SAR(1 g) = 0.260 W/kg; SAR(10 g) = 0.172 W/kg

Maximum value of SAR (measured) = 0.461 W/kg



0dB = 0.461 W/kg = -2.94 dBW/kg

Plot 22: Body Rear Side (GSM1900 Speech With Headset Middle Channel)

WCDMA Band V Left Head Touch Middle Channel

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

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.90$ S/m; $\epsilon_r = 42.02$; $\rho = 1000$ kg/m³

Phantom section : Left Head Section

Probe: ES3DV3 - SN3292; ConvF(6.06, 6.06, 6.06); Calibrated: 24/02/2013;

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

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

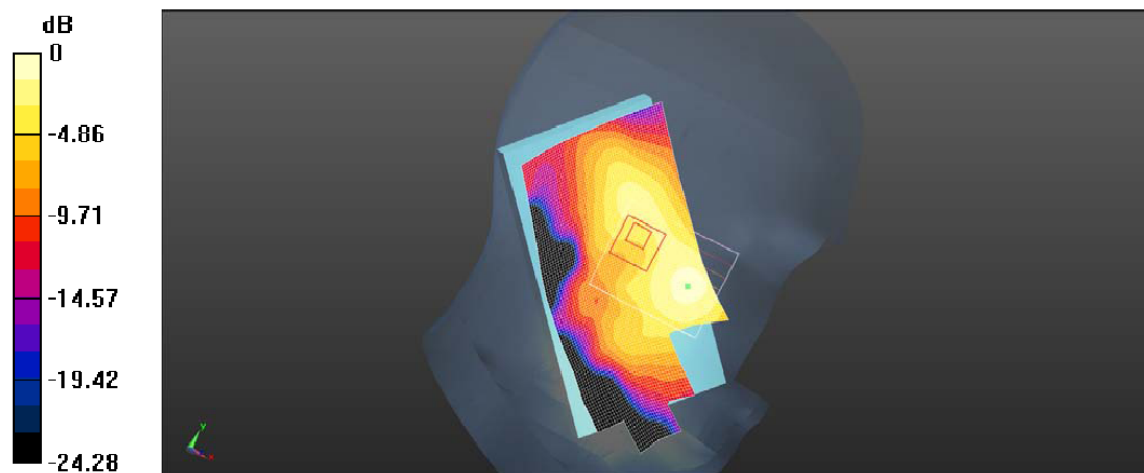
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.519 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.468 W/kg

SAR(1 g) = 0.267 W/kg; SAR(10 g) = 0.179 W/kg

Maximum value of SAR (measured) = 0.289 W/kg



0dB = 0.289 W/kg = -5.14 dBW/kg

Plot 23: Left Head Touch (WCDMA Band V Middle Channel)

WCDMA Band V Left Head Tilt Middle Channel

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

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.91$ S/m; $\epsilon_r = 41.42$; $\rho = 1000$ kg/m³

Phantom section : Left Head Section

Probe: ES3DV3 - SN3292; ConvF(6.06, 6.06, 6.06); Calibrated: 24/02/2013;

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.252 W/kg

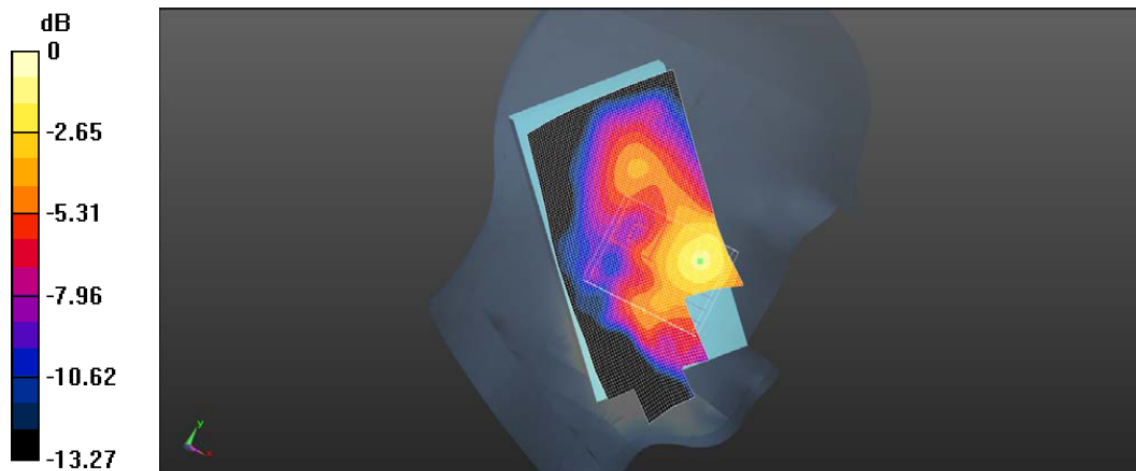
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.356 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.362 W/kg

SAR(1 g) = 0.251 W/kg; SAR(10 g) = 0.178 W/kg

Maximum value of SAR (measured) = 0.269 W/kg



0dB = 0.269 W/kg = -4.25 dBW/kg

Plot 24: Left Head Tilt (WCDMA Band V Middle Channel)

WCDMA Band V Right Head Touch Middle Channel

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

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.92$ S/m; $\epsilon_r = 41.86$; $\rho = 1000$ kg/m³

Phantom section : Right Head Section

Probe: ES3DV3 - SN3292; ConvF(6.06, 6.06, 6.06); Calibrated: 24/02/2013;

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.394 W/kg

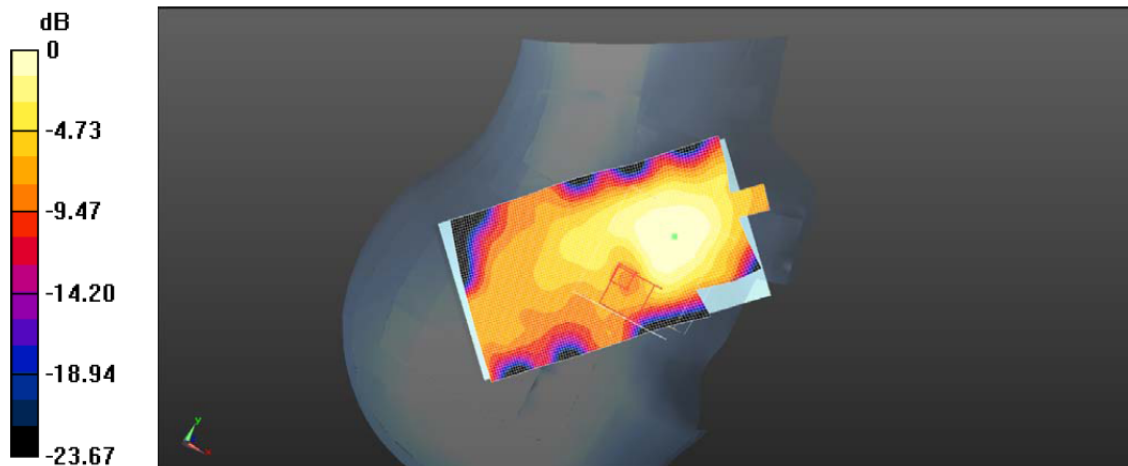
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.189 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.362 W/kg

SAR(1 g) = 0.207 W/kg; SAR(10 g) = 0.158 W/kg

Maximum value of SAR (measured) = 0.354 W/kg



0dB = 0.358 W/kg = -4.57 dBW/kg

Plot 25: Right Head Touch (WCDMA Band V Middle Channel)

WCDMA Band V Right Head Tilt Middle Channel

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

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.91$ S/m; $\epsilon_r = 41.86$; $\rho = 1000$ kg/m³

Phantom section : Right Head Section

Probe: ES3DV3 - SN3292; ConvF(6.06, 6.06, 6.06); Calibrated: 24/02/2013;

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.367 W/kg

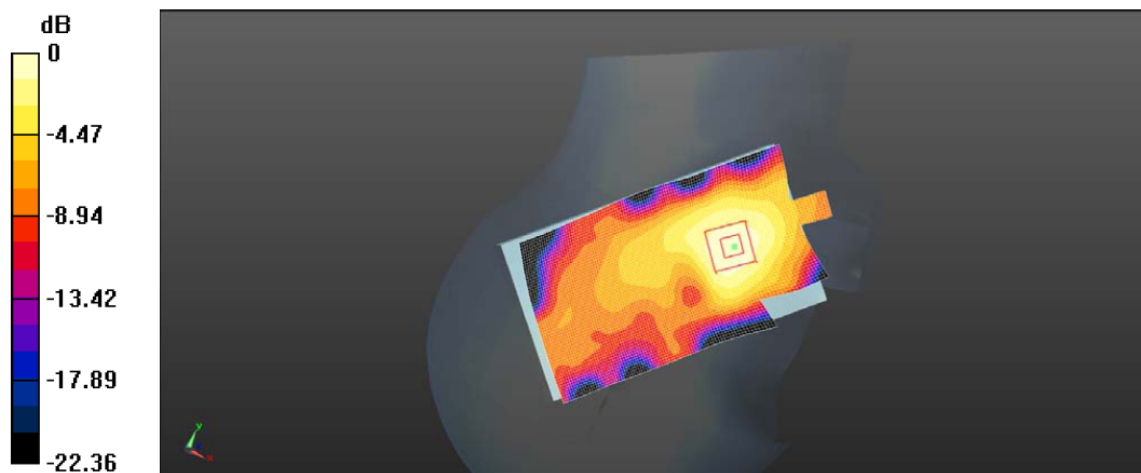
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.238 V/m; Power Drift = 0.10 dB

Peak SAR (extrapolated) = 0.563 W/kg

SAR(1 g) = 0.223 W/kg; SAR(10 g) = 0.160 W/kg

Maximum value of SAR (measured) = 0.392 W/kg



0dB = 0.392 W/kg = -4.27 dBW/kg

Plot 26: Right Head Tilt (WCDMA Band V Middle Channel)

WCDMA Band V RMC Body Front Side Middle Channel

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

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.99$ S/m; $\epsilon_r = 55.68$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(6.14, 6.14, 6.14); Calibrated: 24/02/2013;

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.353 W/kg

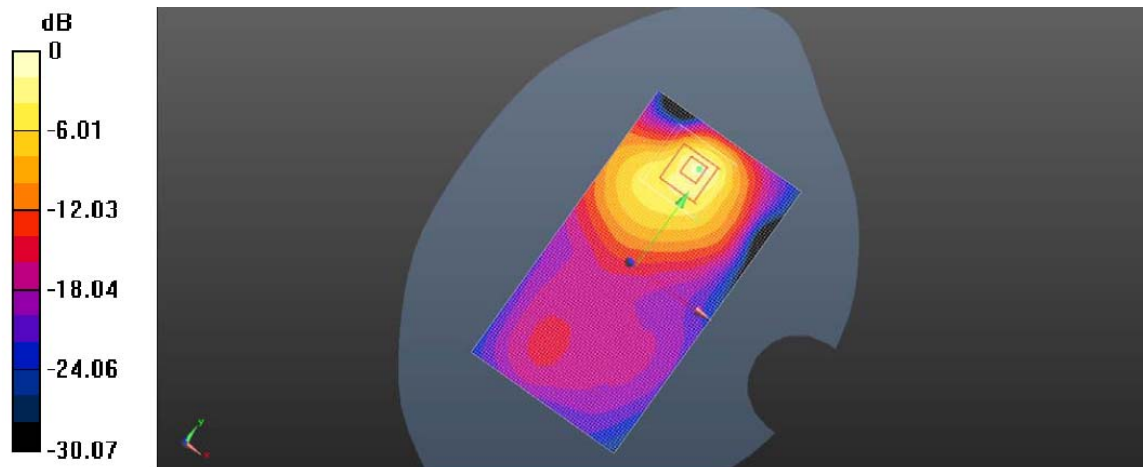
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.517 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 0.518 W/kg

SAR(1 g) = 0.323 W/kg; SAR(10 g) = 0.194 W/kg

Maximum value of SAR (measured) = 0.354 W/kg



0dB = 0.354 W/kg = -4.57 dBW/kg

Plot 27: Body Front Side (WCDMA Band V RMC Middle Channel)

WCDMA Band V RMC Body Rear Side Middle Channel

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

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.95$ S/m; $\epsilon_r = 55.52$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(6.14, 6.14, 6.14); Calibrated: 24/02/2013;

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

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

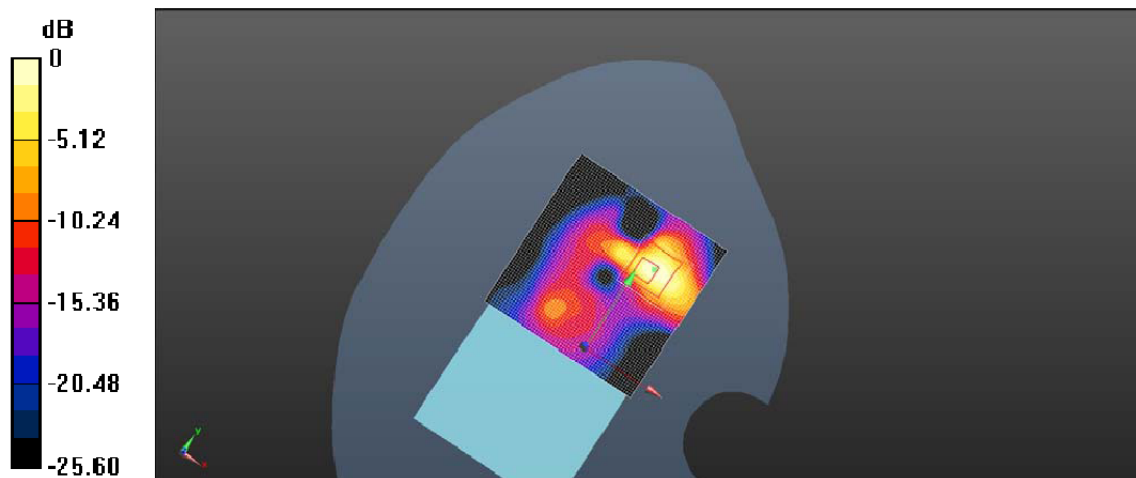
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 10.140 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 0.698 W/kg

SAR(1 g) = 0.409 W/kg; SAR(10 g) = 0.210 W/kg

Maximum value of SAR (measured) = 0.442 W/kg



0dB = 0.442 W/kg = -1.29 dBW/kg

Plot 28: Body Rear Side (WCDMA Band V RMC Middle Channel)

WCDMA Band V RMC Body Left Side Middle Channel

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

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.95$ S/m; $\epsilon_r = 55.15$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(6.14, 6.14, 6.14); Calibrated: 24/02/2013;

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.167 W/kg

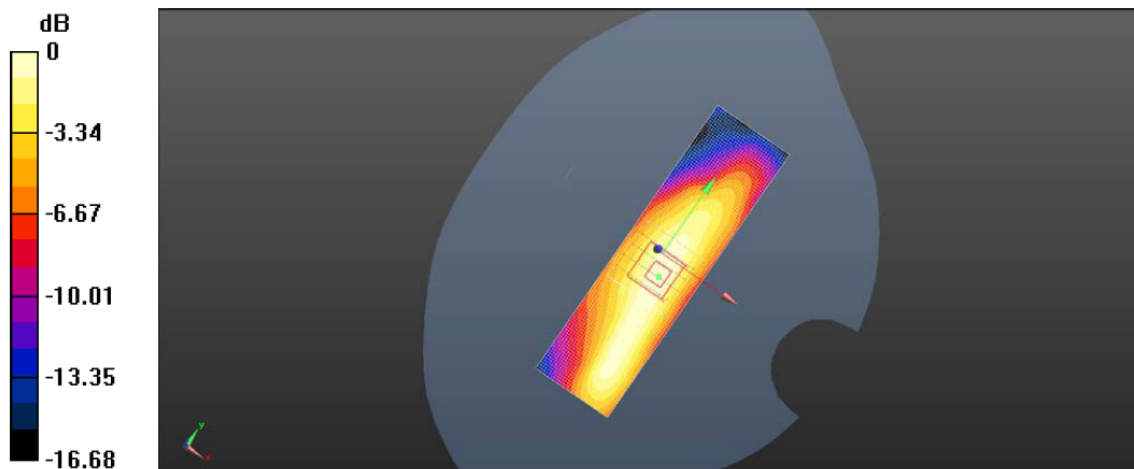
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 5.652 V/m; Power Drift = -0.11 dB

Peak SAR (extrapolated) = 0.246 W/kg

SAR(1 g) = 0.126 W/kg; SAR(10 g) = 0.083 W/kg

Maximum value of SAR (measured) = 0.181 W/kg



0dB = 0.181 W/kg = -7.93 dBW/kg

Plot 29: Body Left Side (WCDMA Band V RMC Middle Channel)

WCDMA Band V RMC Body Right Side Middle Channel

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

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.95$ S/m; $\epsilon_r = 55.65$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(6.14, 6.14, 6.14); Calibrated: 24/02/2013;

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: dx=1.50 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 0.124 W/kg

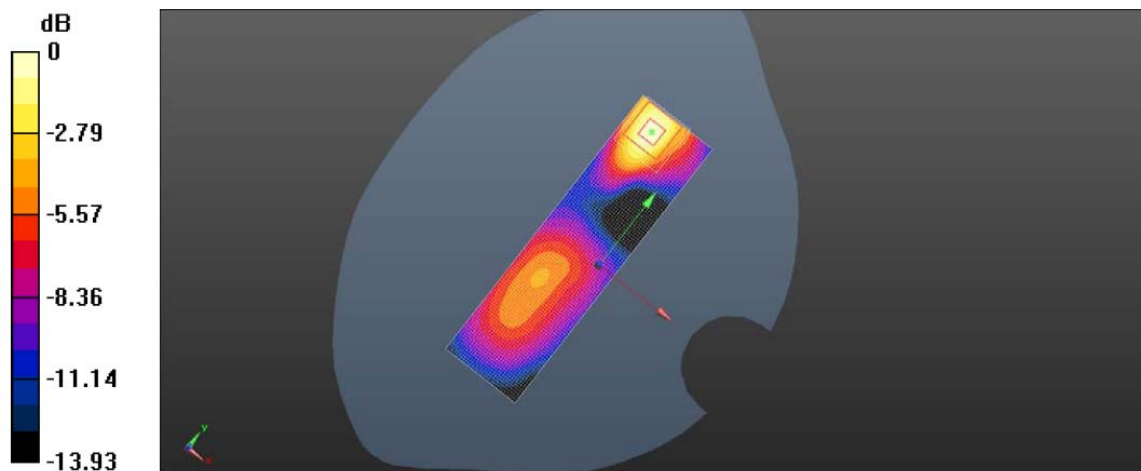
Zoom Scan (5x5x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.236 V/m; Power Drift = -0.04 dB

Peak SAR (extrapolated) = 0.135 W/kg

SAR(1 g) = 0.152 W/kg; SAR(10 g) = 0.103 W/kg

Maximum value of SAR (measured) = 0.135 W/kg



0dB = 0.135 W/kg = -8.35 dBW/kg

Plot 30: Body Right Side (WCDMA Band V RMC Middle Channel)

WCDMA Band V RMC Body Bottom Side Middle Channel

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

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.95$ S/m; $\epsilon_r = 55.18$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(6.14, 6.14, 6.14); Calibrated: 24/02/2013;

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.158 W/kg

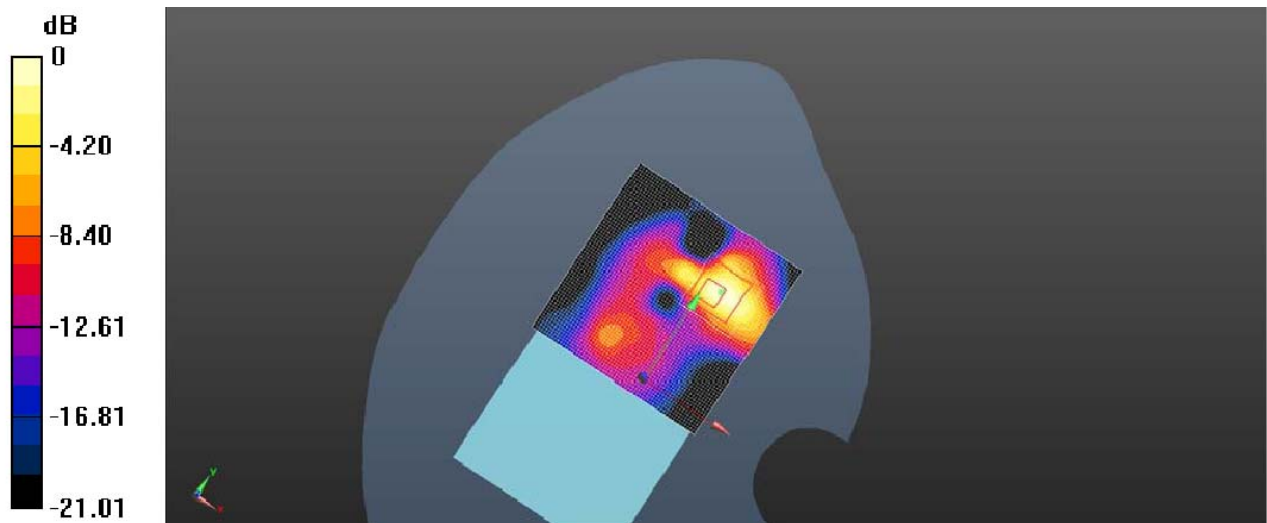
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.826 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.283 W/kg

SAR(1 g) = 0.167 W/kg; SAR(10 g) = 0.127 W/kg

Maximum value of SAR (measured) = 0.153 W/kg



0dB = 0.153 W/kg = -16.31 dBW/kg

Plot 31: Body Bottom Side (WCDMA Band V RMC Middle Channel)

WCDMA Band V Body (Speech) With Headset Rear Side Middle Channel

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

Medium parameters used (interpolated): $f = 836.4$ MHz; $\sigma = 0.99$ S/m; $\epsilon_r = 55.07$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(6.14, 6.14, 6.14); Calibrated: 24/02/2013;

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: dx=1.50 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 0.623 W/kg

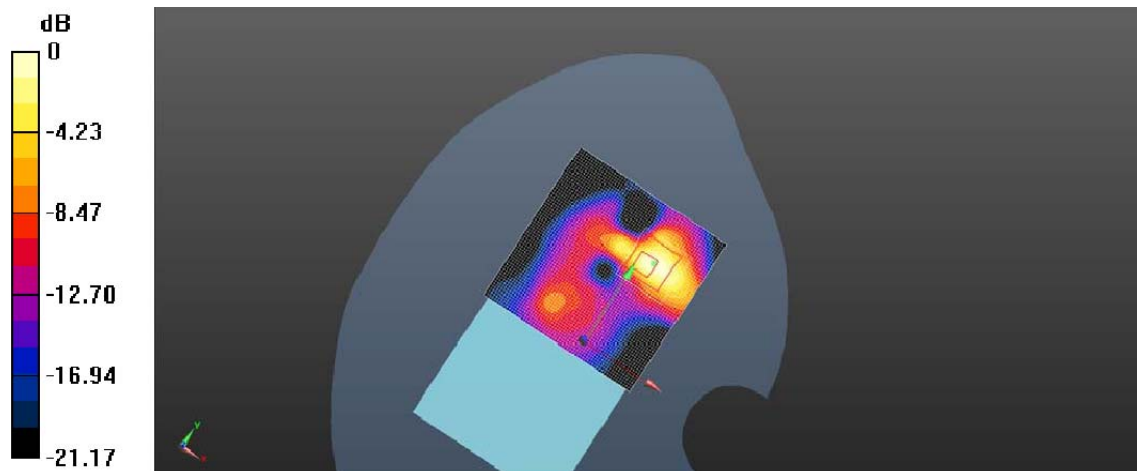
Zoom Scan (5x5x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.359 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.504 W/kg

SAR(1 g) = 0.314 W/kg; SAR(10 g) = 0.178 W/kg

Maximum value of SAR (measured) = 0.528 W/kg



0dB = 0.528 W/kg = -4.15 dBW/kg

Plot 32: Body Rear Side (WCDMA Band V Speech With Headset Middle Channel)

WCDMA Band II Left Head Touch Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.38$ S/m; $\epsilon_r = 40.90$; $\rho = 1000$ kg/m³

Phantom section : Left Head Section

Probe: ES3DV3 - SN3292; ConvF(5.21, 5.21, 5.21); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.217 W/kg

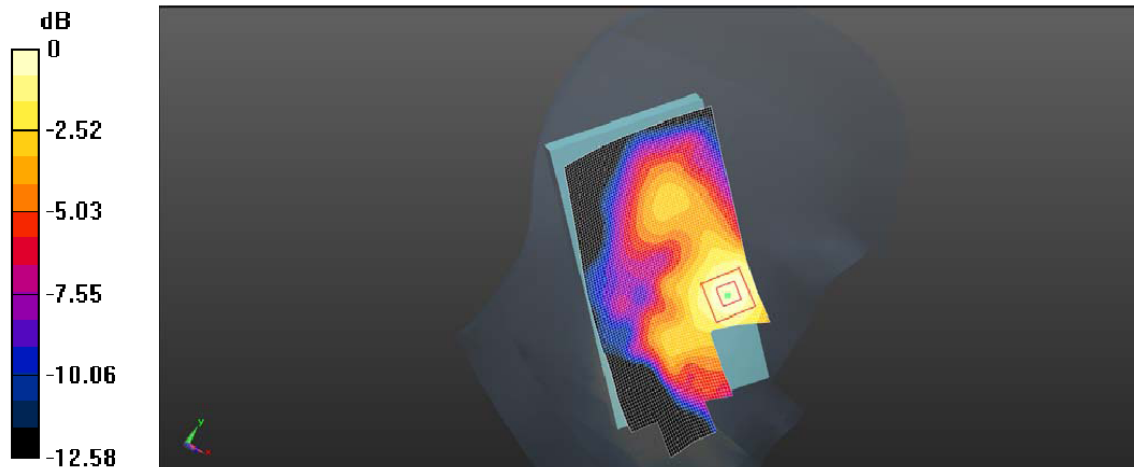
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 7.515V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 0.294 W/kg

SAR(1 g) = 0.231 W/kg; SAR(10 g) = 0.183 W/kg

Maximum value of SAR (measured) = 0.295 W/kg



0dB = 0.295 W/kg = -5.64 dBW/kg

Plot 33: Left Head Touch (WCDMA Band II Middle Channel)

WCDMA Band II Left Head Tilt Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz;Duty Cycle:1:1

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.37$ S/m; $\epsilon_r = 40.15$; $\rho = 1000$ kg/m³

Phantom section : Left Head Section

Probe: ES3DV3 - SN3292; ConvF(5.21, 5.21, 5.21); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: dx=1.50 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 0.251 W/kg

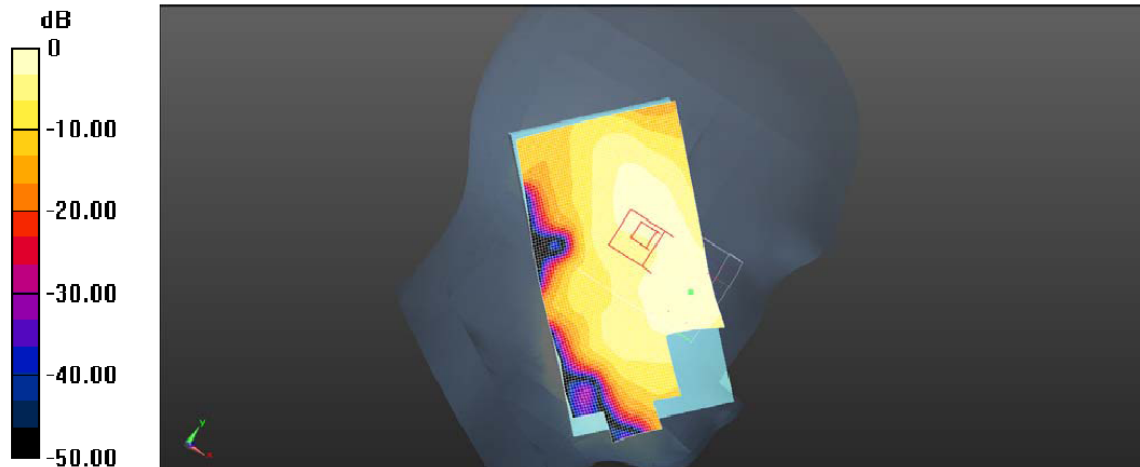
Zoom Scan (5x5x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 7.158 V/m; Power Drift = -0.19 dB

Peak SAR (extrapolated) = 0.399 W/kg

SAR(1 g) = 0.227 W/kg; SAR(10 g) = 0.149 W/kg

Maximum value of SAR (measured) = 0.260 W/kg



0dB = 0.260 W/kg = -6.56 dBW/kg

Plot 34: Left Head Tilt (WCDMA Band II Middle Channel)

WCDMA Band II Right Head Touch Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.39$ S/m; $\epsilon_r = 40.26$; $\rho = 1000$ kg/m³

Phantom section : Right Head Section

Probe: ES3DV3 - SN3292; ConvF(5.21, 5.21, 5.21); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.193 W/kg

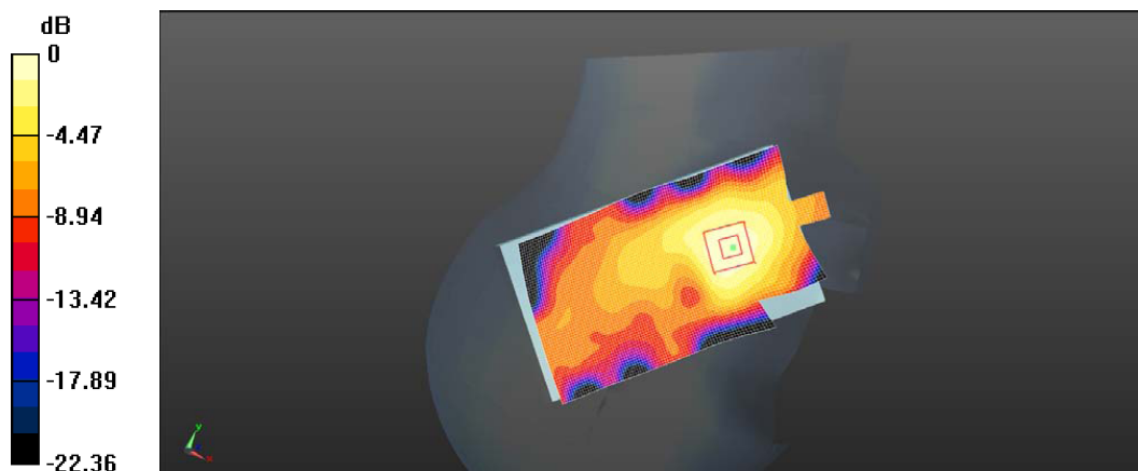
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.892 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.318 W/kg

SAR(1 g) = 0.214 W/kg; SAR(10 g) = 0.155 W/kg

Maximum value of SAR (measured) = 0.290 W/kg



0dB = 0.290 W/kg = -8.26 dBW/kg

Plot 35: Right Head Touch (WCDMA Band II Middle Channel)

WCDMA Band II Right Head Tilt Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.37$ S/m; $\epsilon_r = 40.12$; $\rho = 1000$ kg/m³

Phantom section : Right Head Section

Probe: ES3DV3 - SN3292; ConvF(5.21, 5.21, 5.21); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.210 W/kg

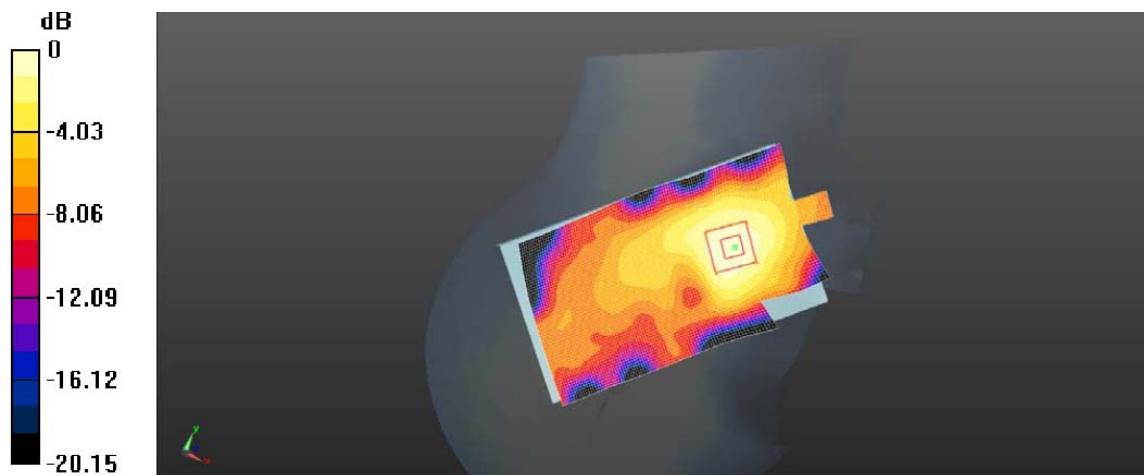
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 7.648 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.248 W/kg

SAR(1 g) = 0.239 W/kg; SAR(10 g) = 0.181 W/kg

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



0dB = 0.282 W/kg = -7.16 dBW/kg

Plot 36: Right Head Tilt (WCDMA Band II Middle Channel)

WCDMA Band II RMC Body Front Side Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.55$ S/m; $\epsilon_r = 53.25$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.66, 4.66, 4.66); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.152 W/kg

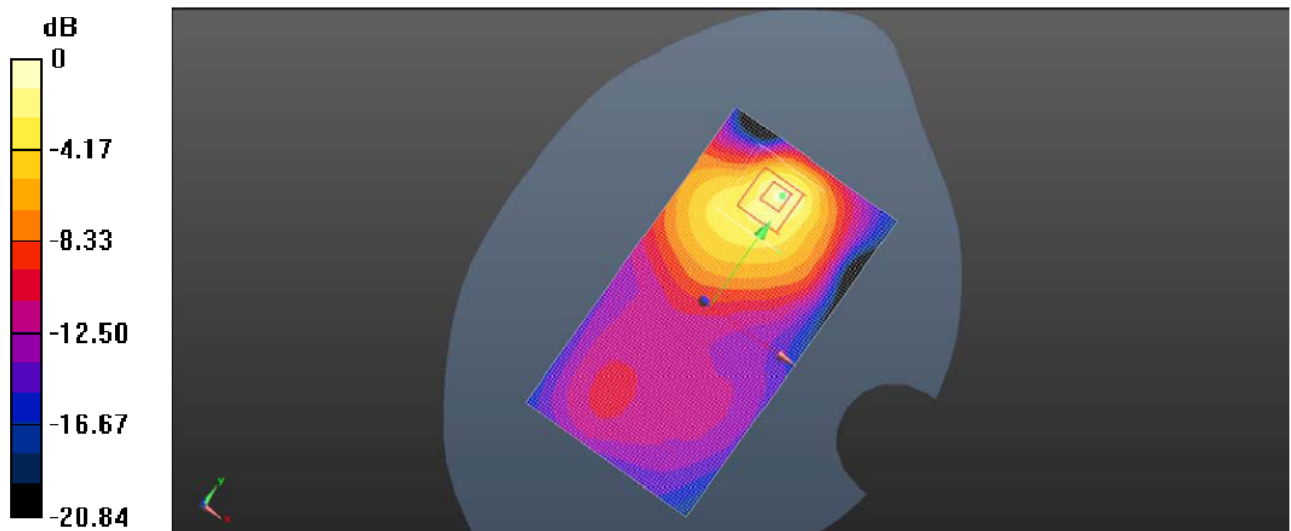
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.568 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 0.410 W/kg

SAR(1 g) = 0.223 W/kg; SAR(10 g) = 0.180 W/kg

Maximum value of SAR (measured) = 0.298 W/kg



0dB = 0.298 W/kg = -6.50 dBW/kg

Plot 37: Body Front Side (WCDMA Band II RMC Middle Channel)

WCDMA Band II RMC Body Rear Side Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.54$ S/m; $\epsilon_r = 53.27$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.66, 4.66, 4.66); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.621 W/kg

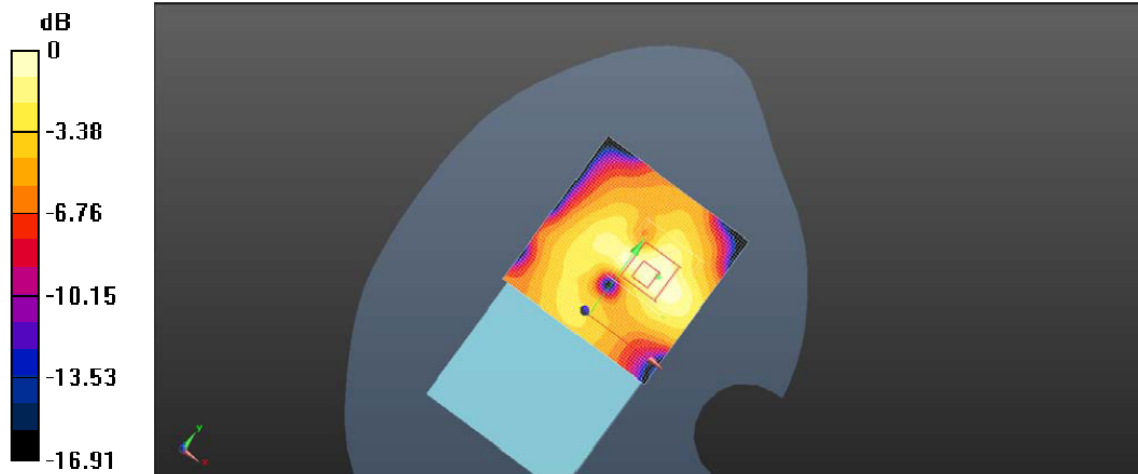
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.816 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.627 W/kg

SAR(1 g) = 0.381 W/kg; SAR(10 g) = 0.194 W/kg

Maximum value of SAR (measured) = 0.651 W/kg



0dB = 0.651 W/kg = -4.15 dBW/kg

Plot 38: Body Rear Side (WCDMA Band II RMC Middle Channel)

WCDMA Band II RMC Body Left Side Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.58$ S/m; $\epsilon_r = 53.39$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.66, 4.66, 4.66); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.215 W/kg

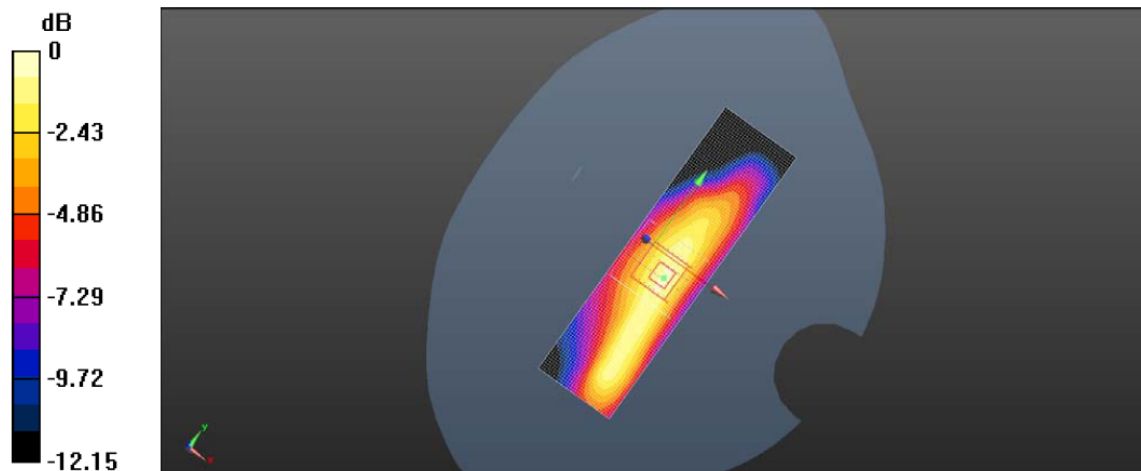
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.532 V/m; Power Drift = -0.09 dB

Peak SAR (extrapolated) = 0.105 W/kg

SAR(1 g) = 0.105 W/kg; SAR(10 g) = 0.086 W/kg

Maximum value of SAR (measured) = 0.112 W/kg



0dB = 0.111 W/kg = -15.68 dBW/kg

Plot 39: Body Left Side (WCDMA Band II RMC Middle Channel)

WCDMA Band II RMC Body Right Side Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.53$ S/m; $\epsilon_r = 53.26$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.66, 4.66, 4.66); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.117 W/kg

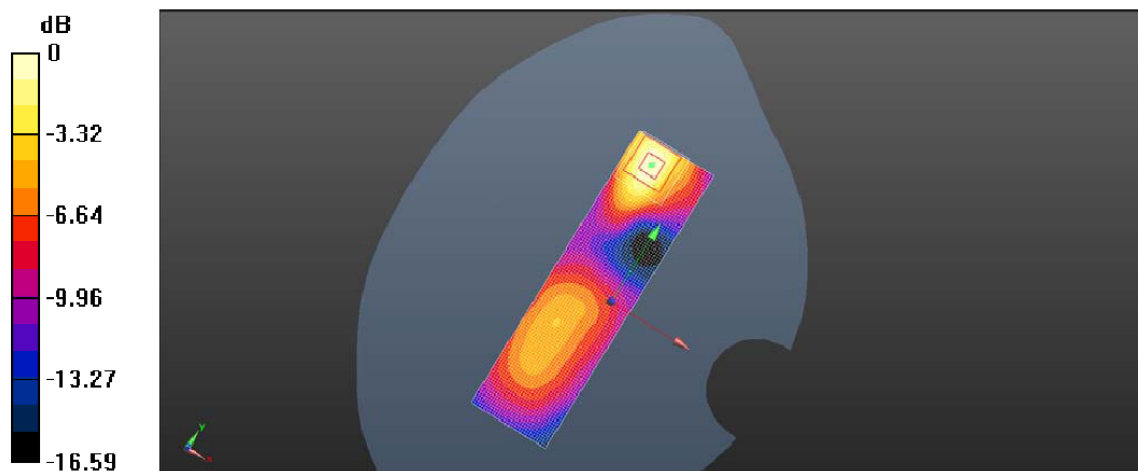
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.526 V/m; Power Drift = -0.16 dB

Peak SAR (extrapolated) = 0.153 W/kg

SAR(1 g) = 0.114 W/kg; SAR(10 g) = 0.100 W/kg

Maximum value of SAR (measured) = 0.153 W/kg



0dB = 0.153 W/kg = -15.51 dBW/kg

Plot 40: Body Right Side (WCDMA Band II RMC Middle Channel)

WCDMA Band II RMC Body Bottom Side Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.54$ S/m; $\epsilon_r = 53.18$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.66, 4.66, 4.66); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.121 W/kg

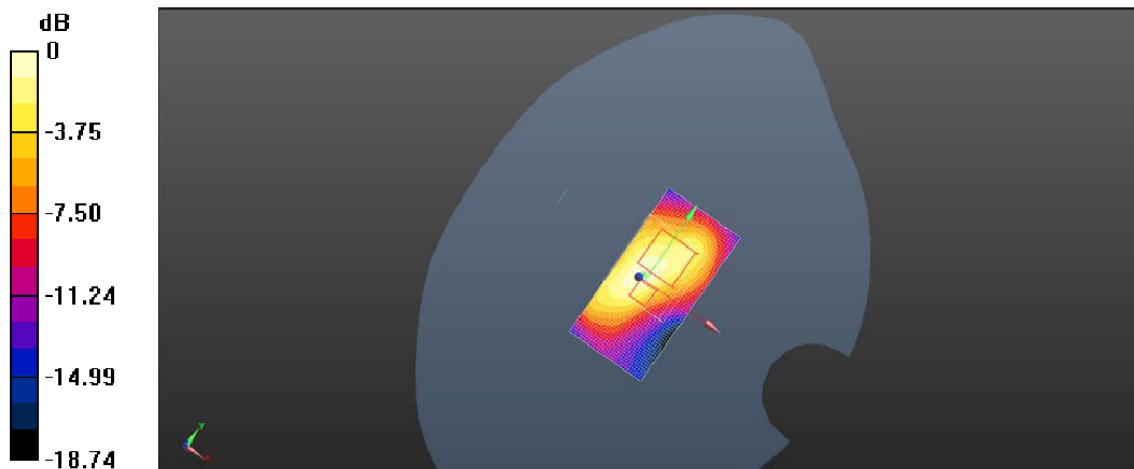
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.829 V/m; Power Drift = -0.08 dB

Peak SAR (extrapolated) = 0.156 W/kg

SAR(1 g) = 0.134 W/kg; SAR(10 g) = 0.110 W/kg

Maximum value of SAR (measured) = 0.158 W/kg



0dB = 0.158 W/kg = -15.93 dBW/kg

Plot 41: Body Bottom Side (WCDMA Band II RMC Middle Channel)

WCDMA Band II RMC Body (Speech) With Headset Rear Side Middle Channel

Communication System: Customer System; Frequency: 1880.0 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 1880.0$ MHz; $\sigma = 1.55$ S/m; $\epsilon_r = 53.86$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.66, 4.66, 4.66); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 27/02/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (81x101x1): Measurement grid: dx=1.50 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 0.217 W/kg

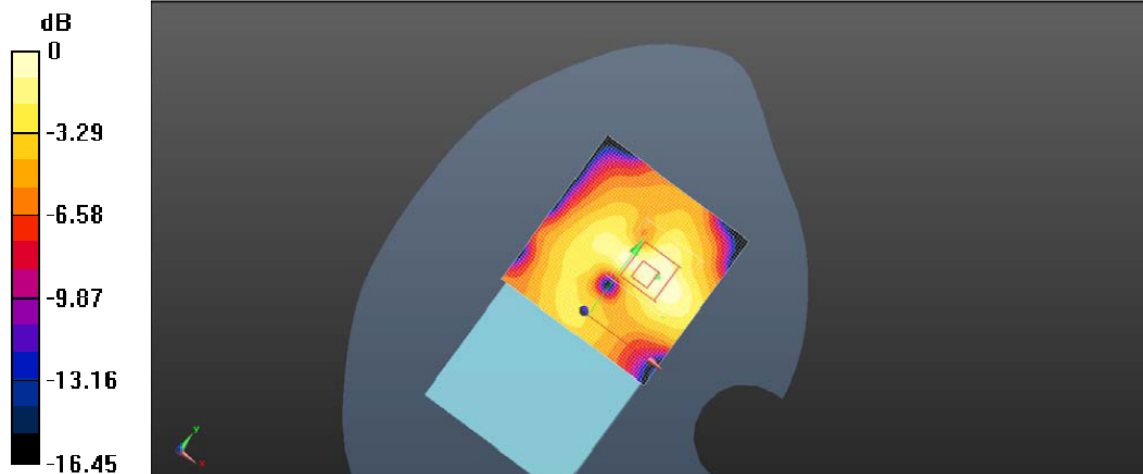
Zoom Scan (5x5x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.568 V/m; Power Drift = -0.12 dB

Peak SAR (extrapolated) = 0.461 W/kg

SAR(1 g) = 0.281 W/kg; SAR(10 g) = 0.180 W/kg

Maximum value of SAR (measured) = 0.308 W/kg



0dB = 0.308 W/kg = -5.94 dBW/kg

Plot 42: Body Rear Side (WCDMA Band II Speech With Headset Middle Channel)

Left Head Cheek (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Communication System: Customer System; Frequency: 2437.0 MHz;Duty Cycle:1:1

Medium parameters used (interpolated): $f = 2437.0$ MHz; $\sigma = 1.79$ S/m; $\epsilon_r = 39.12$; $\rho = 1000$ kg/m³

Phantom section: Left Head Section:

Probe: ES3DV3 - SN3292; ConvF(4.47, 4.47, 4.47); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (61x81x1): Measurement grid: dx=1.50 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 0.243 W/kg

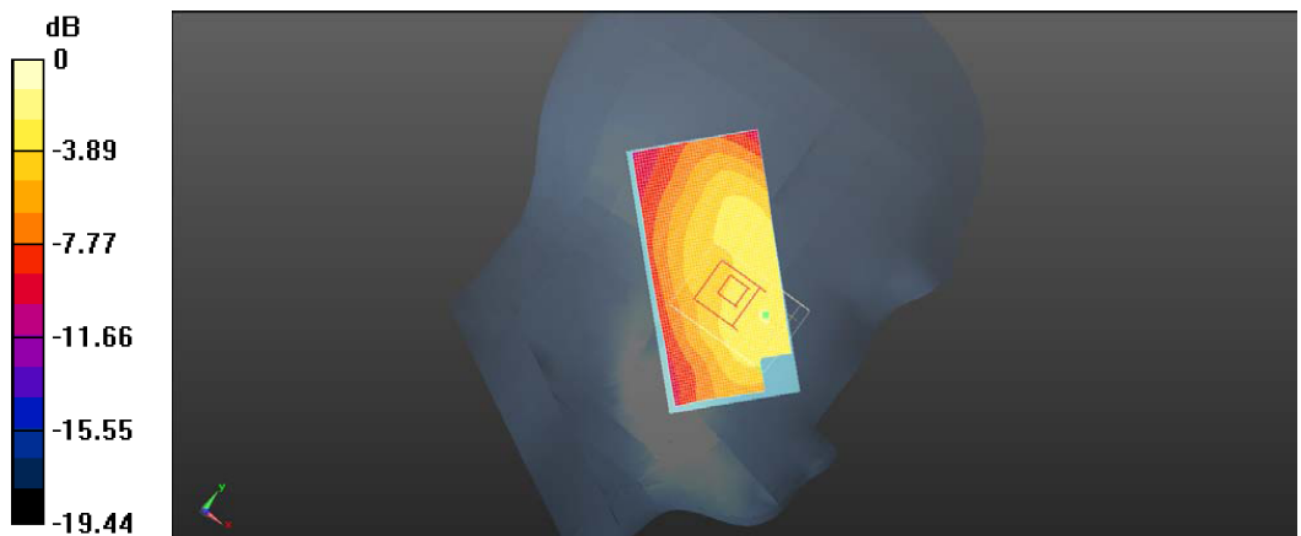
Zoom Scan (5x5x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.512 V/m; Power Drift = -0.10 dB

Peak SAR (extrapolated) = 0.254 W/kg

SAR(1 g) = 0.201 W/kg; SAR(10 g) = 0.142 W/kg

Maximum value of SAR (measured) = 0.258 W/kg



0dB = 0.259 W/kg = -23.57 dB W/kg

Plot 43: Left Head Cheek (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Left Head Tilt (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Communication System: Customer System; Frequency: 2437.0 MHz;Duty Cycle:1:1

Medium parameters used (interpolated): $f = 2437.0$ MHz; $\sigma = 1.79$ S/m; $\epsilon_r = 39.12$; $\rho = 1000$ kg/m³

Phantom section: Left Head Section:

Probe: ES3DV3 - SN3292; ConvF(4.47, 4.47, 4.47); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (61x81x1): Measurement grid: dx=1.50 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 0.192 W/kg

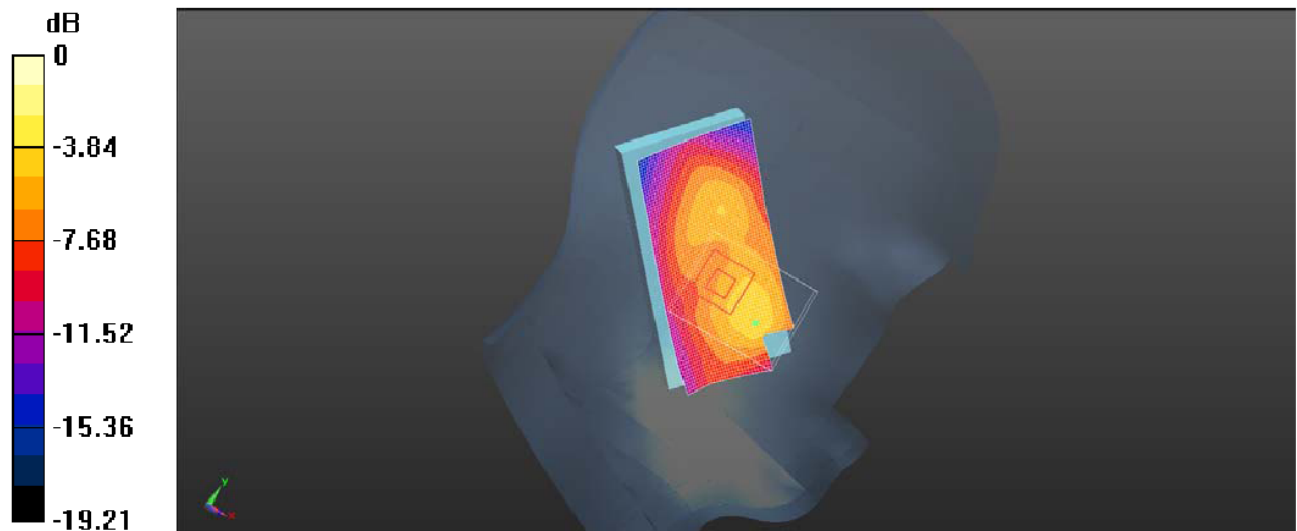
Zoom Scan (5x5x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 5.559 V/m; Power Drift = 0.12 dB

Peak SAR (extrapolated) = 0.268 W/kg

SAR(1 g) = 0.226 W/kg; SAR(10 g) = 0.155 W/kg

Maximum value of SAR (measured) = 0.285 W/kg



0dB = 0.285 W/kg = -10.83 dB W/kg

Plot 44: Left Head Tilt (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Right Head Cheek (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Communication System: Customer System; Frequency: 2437.0 MHz; Duty Cycle: 1:1

Medium parameters used (interpolated): $f = 2437.0$ MHz; $\sigma = 1.79$ S/m; $\epsilon_r = 39.12$; $\rho = 1000$ kg/m³

Phantom section: Right Head Section:

Probe: ES3DV3 - SN3292; ConvF(4.47, 4.47, 4.47); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (61x81x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.182 W/kg

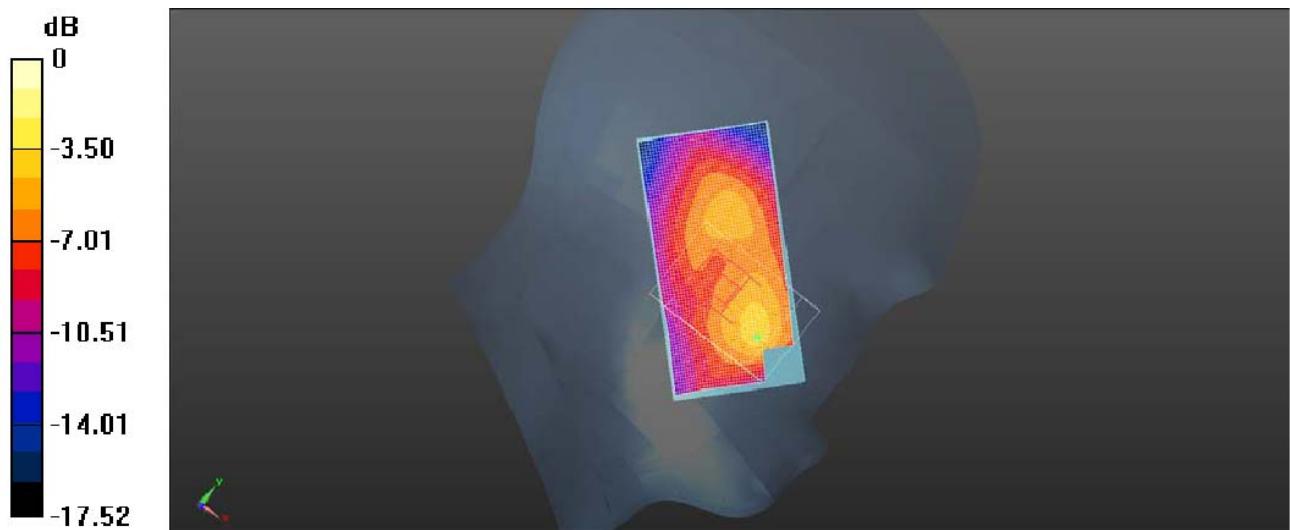
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 4.852 V/m; Power Drift = -0.17 dB

Peak SAR (extrapolated) = 0.316 W/kg

SAR(1 g) = 0.204 W/kg; SAR(10 g) = 0.111 W/kg

Maximum value of SAR (measured) = 0.315 W/kg



0dB = 0.315 W/kg = -9.89 dB W/kg

Plot 45: Right Head Cheek (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Right Head Tilt (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Communication System: Customer System; Frequency: 2437.0 MHz;Duty Cycle:1:1

Medium parameters used (interpolated): $f = 2437.0$ MHz; $\sigma = 1.79$ S/m; $\epsilon_r = 39.12$; $\rho = 1000$ kg/m³

Phantom section: Right Head Section:

Probe: ES3DV3 - SN3292; ConvF(4.47, 4.47, 4.47); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (61x81x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.166 W/kg

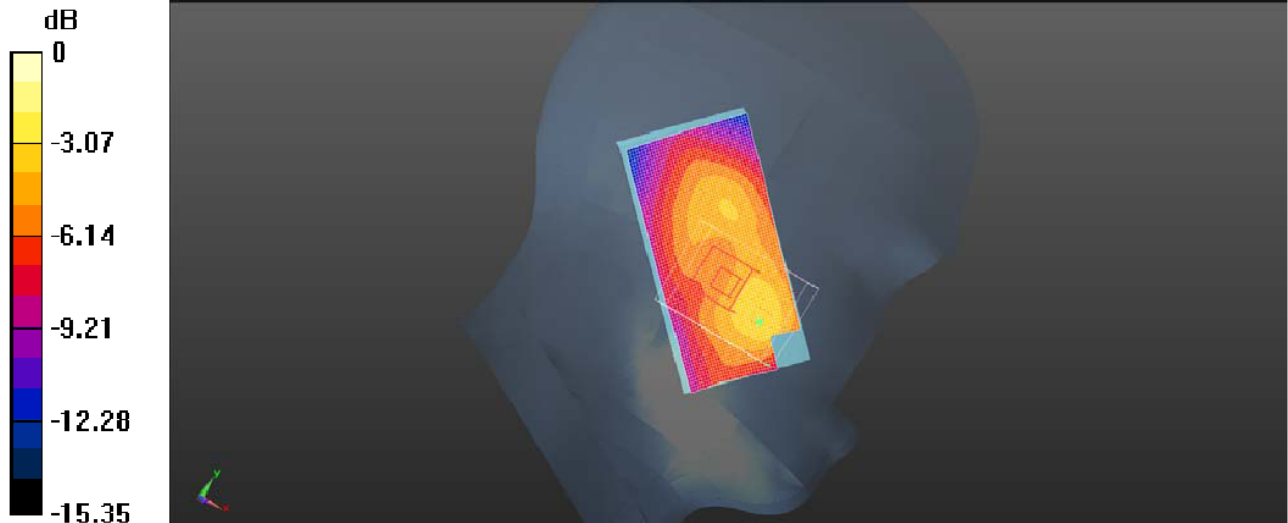
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 5.526 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.195 W/kg

SAR(1 g) = 0.188 W/kg; SAR(10 g) = 0.132 W/kg

Maximum value of SAR (measured) = 0.198 W/kg



0dB = 0.198 W/kg = -14.15 dBW/kg

Plot 46: Right Head Tilt (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Body- worn Front Side (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Communication System: Customer System; Frequency: 2437.0 MHz;Duty Cycle:1:1

Medium parameters used (interpolated): $f = 2437.0$ MHz; $\sigma = 1.96$ S/m; $\epsilon_r = 52.65$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.25, 4.25, 4.25); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (61x81x1): Measurement grid: dx=1.50 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 0.426 W/kg

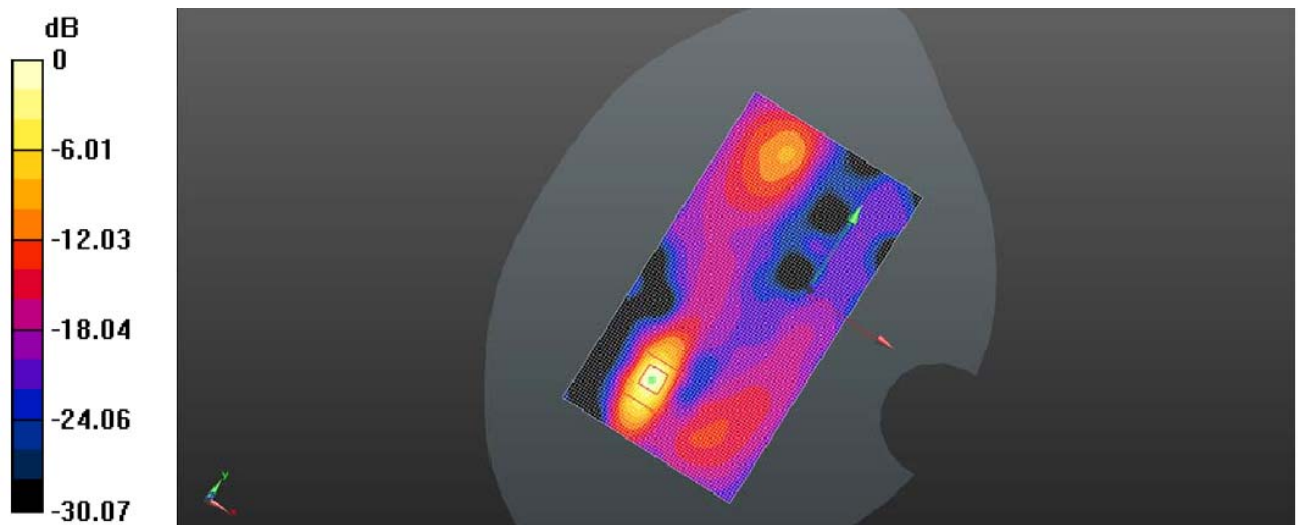
Zoom Scan (5x5x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.882 V/m; Power Drift = -0.13 dB

Peak SAR (extrapolated) = 0.573 W/kg

SAR(1 g) = 0.404 W/kg; SAR(10 g) = 0.227 W/kg

Maximum value of SAR (measured) = 0.604 W/kg



0dB = 0.604 W/kg = -2.64 dBW/kg

Plot 47: Body- worn Front Side (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Body- worn Rear Side (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Communication System: Customer System; Frequency: 2437.0 MHz;Duty Cycle:1:1

Medium parameters used (interpolated): $f = 2437.0$ MHz; $\sigma = 1.96$ S/m; $\epsilon_r = 52.65$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.25, 4.25, 4.25); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (61x81x1): Measurement grid: $dx=1.50$ mm, $dy=1.50$ mm

Maximum value of SAR (interpolated) = 0.528 W/kg

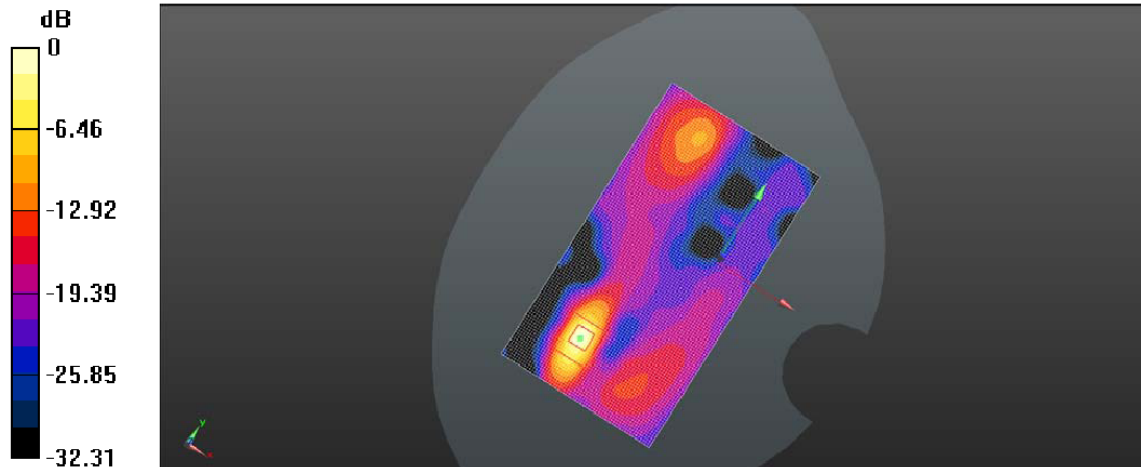
Zoom Scan (5x5x5)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 6.826 V/m; Power Drift = -0.14 dB

Peak SAR (extrapolated) = 0.654 W/kg

SAR(1 g) = 0.486 W/kg; SAR(10 g) = 0.287 W/kg

Maximum value of SAR (measured) = 0.653 W/kg



0dB = 0.653 W/kg = -2.12 dBW/kg

Plot 48: Body- worn Rear Side (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Body- worn Left Side (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Communication System: Customer System; Frequency: 2437.0 MHz;Duty Cycle:1:1

Medium parameters used (interpolated): $f = 2437.0$ MHz; $\sigma = 1.96$ S/m; $\epsilon_r = 52.65$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.25, 4.25, 4.25); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (61x81x1): Measurement grid: dx=1.50 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 0.158 W/kg

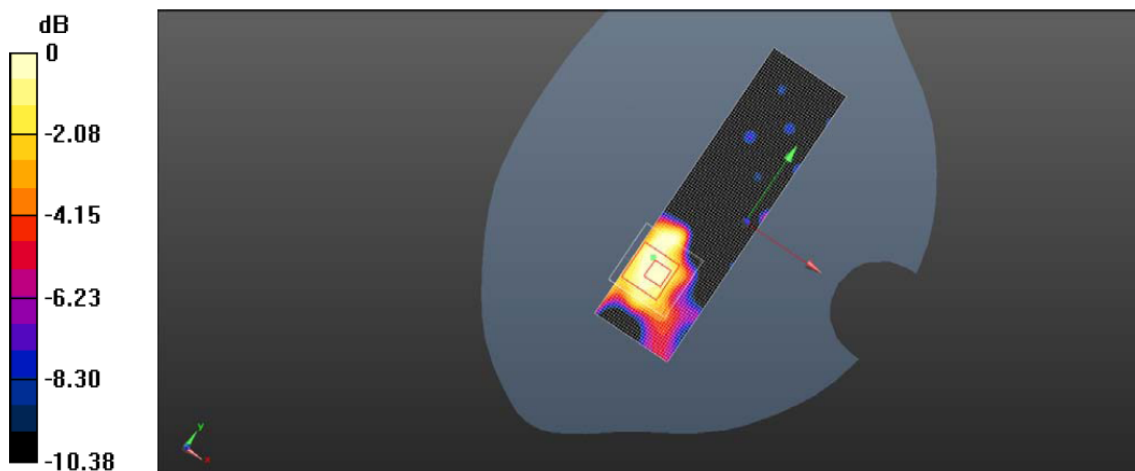
Zoom Scan (5x5x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.253 V/m; Power Drift = -0.06 dB

Peak SAR (extrapolated) = 0.358 W/kg

SAR(1 g) = 0.298 W/kg; SAR(10 g) = 0.167 W/kg

Maximum value of SAR (measured) = 0.358 W/kg



0dB = 0.358 W/kg = -5.39 dBW/kg

Plot 49: Body- worn Left Side (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Body- worn Top Side (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

Communication System: Customer System; Frequency: 2437.0 MHz;Duty Cycle:1:1

Medium parameters used (interpolated): $f = 2437.0$ MHz; $\sigma = 1.96$ S/m; $\epsilon_r = 52.65$; $\rho = 1000$ kg/m³

Phantom section : Body- worn

Probe: ES3DV3 - SN3292; ConvF(4.25, 4.25, 4.25); Calibrated: 24/02/2013;

Sensor-Surface: 4mm (Mechanical Surface Detection)

Electronics: DAE4 Sn1315; Calibrated: 02/27/2013

Phantom: SAM 1; Type: SAM;

Measurement SW: DASY52, Version 52.8 (2); SEMCAD X Version 14.6.6 (6824)

Area Scan (61x81x1): Measurement grid: dx=1.50 mm, dy=1.50 mm

Maximum value of SAR (interpolated) = 0.153 W/kg

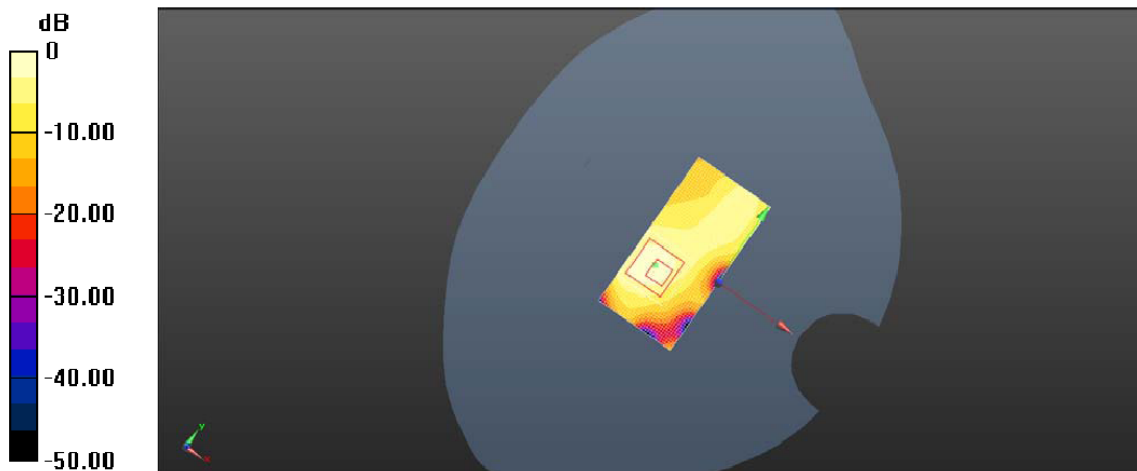
Zoom Scan (5x5x5)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 6.536 V/m; Power Drift = -0.26 dB

Peak SAR (extrapolated) = 0.257 W/kg

SAR(1 g) = 0.167 W/kg; SAR(10 g) = 0.113 W/kg

Maximum value of SAR (measured) = 0.255 W/kg



0dB = 0.255 W/kg = -8.56 dBW/kg

Plot 50: Body- worn Top Side (WLAN2450 Middle Channel-Channel 6-2437MHz (1Mbps))

6. Calibration Certificate

6.1. Probe Calibration Certificate

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



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

Accredited by the Swiss Accreditation Service (SAS)

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

Accreditation No.: SCS 108

Client **CIQ SZ (Auden)**

Certificate No: **ES3-3292_Feb13**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3292**

Calibration procedure(s) **QA CAL-01.v8, QA CAL-14.v7, QA CAL-23.v4, QA CAL-25.v4
Calibration procedure for dosimetric E-field probes**

Calibration date: **February 24, 2013**

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

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

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	31-Mar-12 (No. 217-01372)	Apr-13
Power sensor E4412A	MY41498087	31-Mar-12 (No. 217-01372)	Apr-13
Reference 3 dB Attenuator	SN: S5054 (3c)	29-Mar-12 (No. 217-01369)	Apr-13
Reference 20 dB Attenuator	SN: S5086 (20b)	29-Mar-12 (No. 217-01367)	Apr-13
Reference 30 dB Attenuator	SN: S5129 (30b)	29-Mar-12 (No. 217-01370)	Apr-13
Reference Probe ES3DV2	SN: 3013	29-Dec-12 (No. ES3-3013_Dec12)	Dec-13
DAE4	SN: 654	3-May-12 (No. DAE4-654_May12)	May-13
Secondary Standards	ID	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Apr-12)	In house check: Apr-13
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-12)	In house check: Oct-13

	Name	Function	Signature
Calibrated by:	Jeton Kastrati	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	
Issued: February 27, 2013			
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			

Calibration Laboratory of
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 Zeughausstrasse 43, 8034 Zurich, Switzerland



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S Servizio svizzero di taratura
 Swiss Calibration Service

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

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}**: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E^2 -field uncertainty inside TSL (see below **ConvF**).
- NORM(f)_{x,y,z} = NORM_{x,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**.
- DCP_{x,y,z}**: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal (no uncertainty required). DCP does not depend on frequency nor media.
- PAR**: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; VR_{x,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 $f \leq 800$ 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_{x,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.

ES3DV3 – SN:3292

February 24, 2013

Probe ES3DV3

SN:3292

Manufactured: July 6, 2010
Calibrated: February 24, 2013

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

ES3DV3- SN:3292

February 24, 2013

DASY/EASY - Parameters of Probe: ES3DV3 - SN:3292**Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V/m})^2$) ^A	0.81	0.90	1.18	$\pm 10.1 \%$
DCP (mV) ^B	105.9	104.7	102.0	

Modulation Calibration Parameters

UID	Communication System Name	PAR		A dB	B dB	C dB	VR mV	Unc ^E (k=2)
10000	CW	0.00	X	0.00	0.00	1.00	117.3	$\pm 2.2 \%$
			Y	0.00	0.00	1.00	94.2	
			Z	0.00	0.00	1.00	108.2	

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%.

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

^B Numerical linearization parameter: uncertainty not required.

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

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DASY/EASY - Parameters of Probe: ES3DV3 - SN:3292**Calibration Parameter Determined in Head Tissue Simulating Media**

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
450	43.5	0.87	6.71	6.71	6.71	0.15	1.80	± 13.4 %
835	41.5	0.90	6.06	6.06	6.06	0.26	2.19	± 12.0 %
900	41.5	0.97	6.03	6.03	6.03	0.29	2.00	± 12.0 %
1810	40.0	1.40	5.25	5.25	5.25	0.80	1.17	± 12.0 %
1900	40.0	1.40	5.21	5.21	5.21	0.63	1.38	± 12.0 %
2100	39.8	1.49	5.15	5.15	5.15	0.80	1.20	± 12.0 %
2450	39.2	1.80	4.47	4.47	4.47	0.63	1.50	± 12.0 %

^C 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.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) 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 (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

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DASY/EASY - Parameters of Probe: ES3DV3 - SN:3292

Calibration Parameter Determined in Body Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity (S/m) ^F	ConvF X	ConvF Y	ConvF Z	Alpha	Depth (mm)	Unct. (k=2)
450	56.7	0.94	7.10	7.10	7.10	0.09	1.00	± 13.4 %
835	55.2	0.97	6.14	6.14	6.14	0.42	1.57	± 12.0 %
900	55.0	1.05	6.07	6.07	6.07	0.48	1.49	± 12.0 %
1810	53.3	1.52	4.86	4.86	4.86	0.62	1.42	± 12.0 %
1900	53.3	1.52	4.66	4.66	4.66	0.47	1.75	± 12.0 %
2100	53.2	1.62	4.76	4.76	4.76	0.70	1.39	± 12.0 %
2450	52.7	1.95	4.25	4.25	4.25	0.80	1.03	± 12.0 %

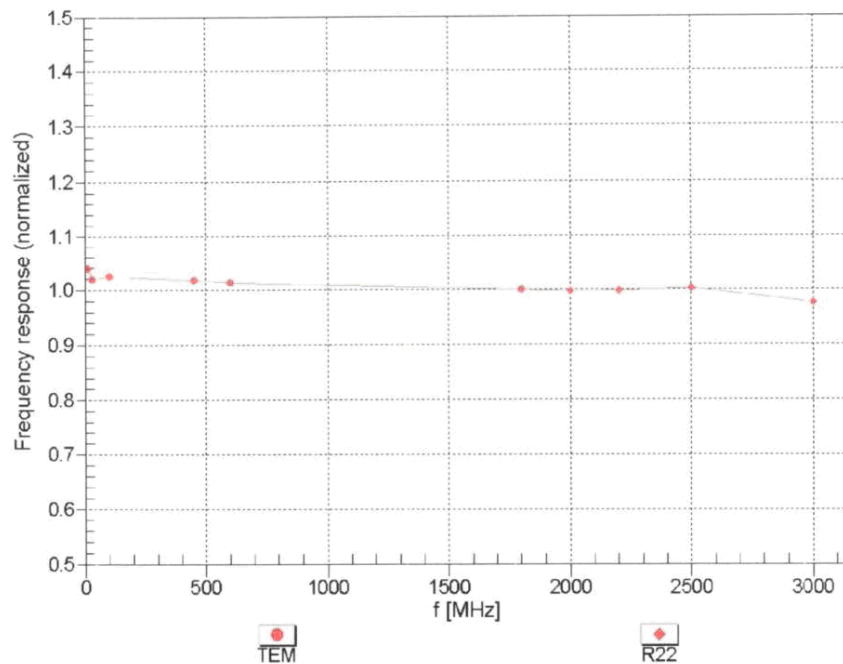
^C Frequency validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2), else it is restricted to ± 50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

^F At frequencies below 3 GHz, the validity of tissue parameters (ϵ and σ) 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 (ϵ and σ) is restricted to ± 5%. The uncertainty is the RSS of the ConvF uncertainty for indicated target tissue parameters.

ES3DV3- SN:3292

February 24, 2013

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

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