

#154 802.11a_Bottom_0cm_Ch157_Sample1_Keypad2_Holster1

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101211 Medium parameters used : $f = 5785 \text{ MHz}$; $\sigma = 6.13 \text{ mho/m}$; $\epsilon_r = 46.6$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5 ; Liquid Temperature : 21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch157/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

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

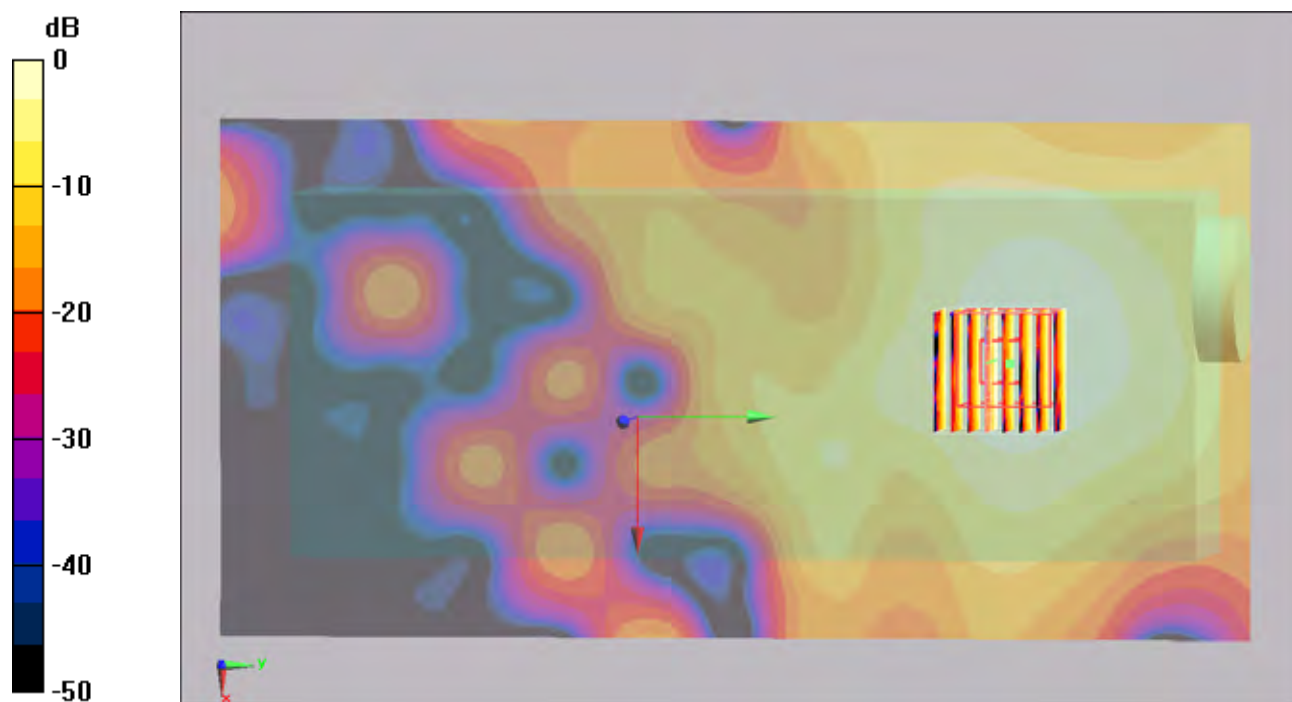
Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 1.5 V/m; Power Drift = -0.187 dB

Peak SAR (extrapolated) = 1.03 W/kg

SAR(1 g) = 0.288 mW/g; SAR(10 g) = 0.128 mW/g

Maximum value of SAR (measured) = 0.489 mW/g



0 dB = 0.489mW/g

#155 802.11a_Bottom_0cm_Ch157_Sample1_Keypad3_Holster1

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101211 Medium parameters used: $f = 5785 \text{ MHz}$; $\sigma = 6.13 \text{ mho/m}$; $\epsilon_r = 46.6$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.6 ; Liquid Temperature : 21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch157/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.472 mW/g

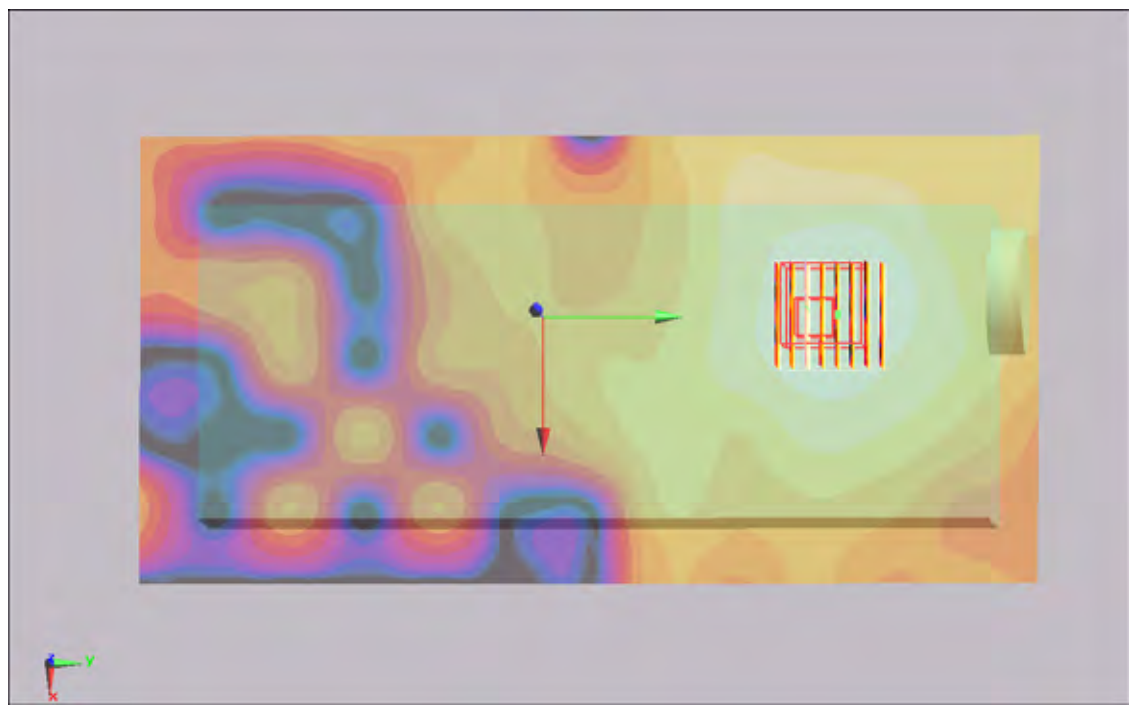
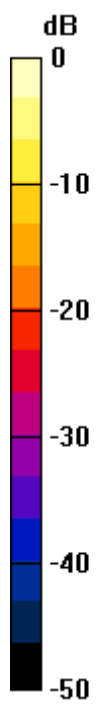
Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 1.87 V/m; Power Drift = -0.15 dB

Peak SAR (extrapolated) = 0.981 W/kg

SAR(1 g) = 0.281 mW/g; SAR(10 g) = 0.124 mW/g

Maximum value of SAR (measured) = 0.492 mW/g



0 dB = 0.492mW/g

#153 802.11a_Bottom_0cm_Ch157_Sample1_Keypad4_Holster1

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101211 Medium parameters used: $f = 5785 \text{ MHz}$; $\sigma = 6.13 \text{ mho/m}$; $\epsilon_r = 46.6$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5 ; Liquid Temperature : 21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch157/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.514 mW/g

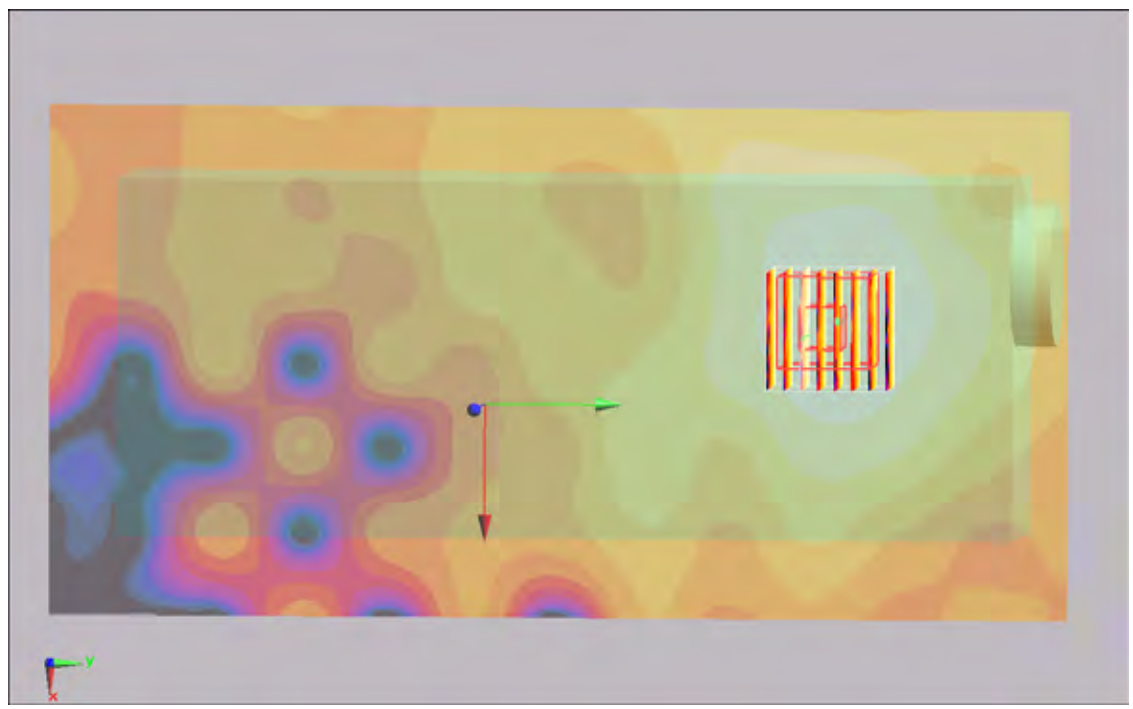
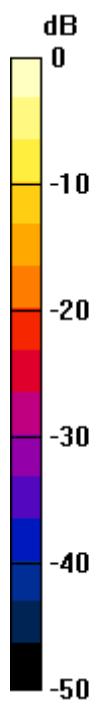
Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 1.45 V/m; Power Drift = 0.121 dB

Peak SAR (extrapolated) = 0.978 W/kg

SAR(1 g) = 0.299 mW/g; SAR(10 g) = 0.132 mW/g

Maximum value of SAR (measured) = 0.500 mW/g



0 dB = 0.500mW/g

#153 802.11a_Bottom_0cm_Ch157_Sample1_Keypad4_Holster1_2D

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101211 Medium parameters used: $f = 5785$ MHz; $\sigma = 6.13$ mho/m; $\epsilon_r = 46.6$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.5 ; Liquid Temperature : 21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch157/Area Scan (121x241x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.514 mW/g

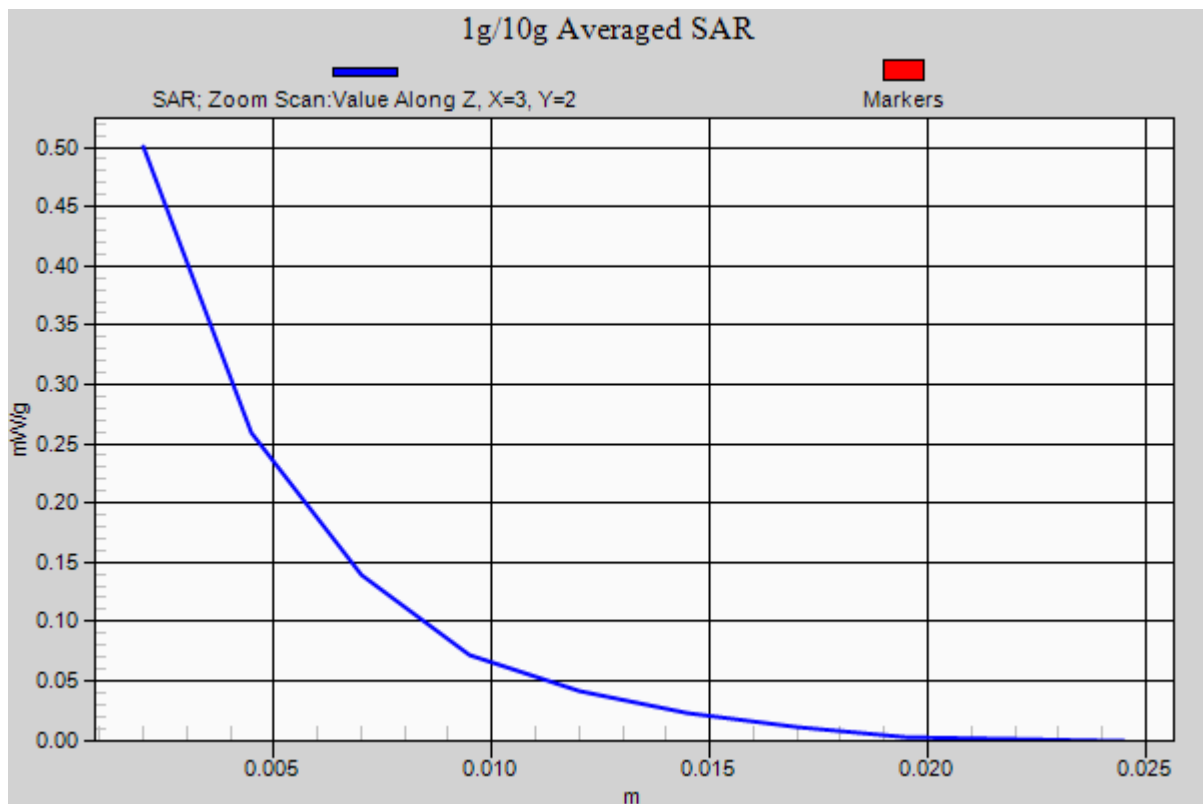
Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 1.45 V/m; Power Drift = 0.121 dB

Peak SAR (extrapolated) = 0.978 W/kg

SAR(1 g) = 0.299 mW/g; SAR(10 g) = 0.132 mW/g

Maximum value of SAR (measured) = 0.500 mW/g



#36 802.11b_Bottom_0cm_Ch6_Sample1_Keypad 4_Holster2

DUT: 0D0904-03

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium: MSL_2450_101208 Medium parameters used: $f = 2437 \text{ MHz}$; $\sigma = 1.95 \text{ mho/m}$; $\epsilon_r = 54.2$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5 ; Liquid Temperature : 21.1

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.04, 4.04, 4.04); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch6/Area Scan (101x171x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.045 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.46 V/m; Power Drift = -0.158 dB

Peak SAR (extrapolated) = 0.135 W/kg

SAR(1 g) = 0.052 mW/g; SAR(10 g) = 0.026 mW/g

Maximum value of SAR (measured) = 0.053 mW/g

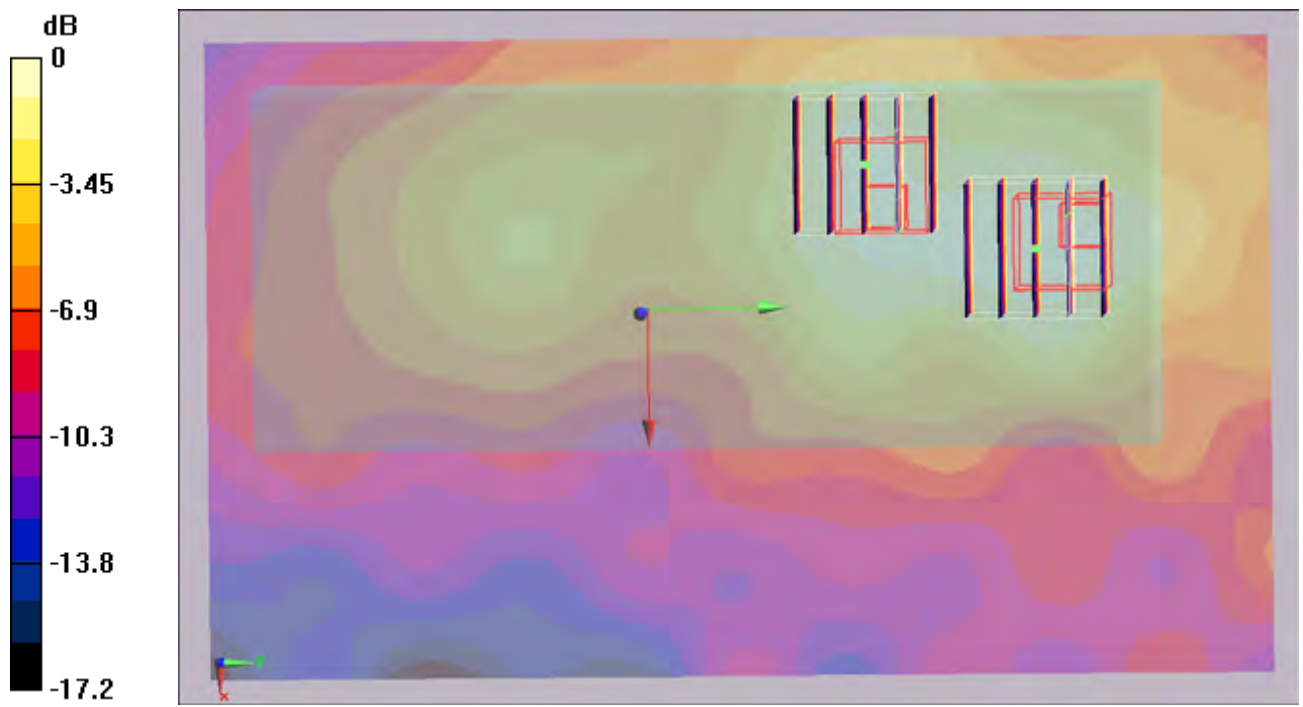
Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.46 V/m; Power Drift = -0.158 dB

Peak SAR (extrapolated) = 0.104 W/kg

SAR(1 g) = 0.043 mW/g; SAR(10 g) = 0.023 mW/g

Maximum value of SAR (measured) = 0.047 mW/g



#36 802.11b_Bottom._0cm_Ch6_Sample1_Keypad 4_Holster2_2D

DUT: 0D0904-03

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium: MSL_2450_101208 Medium parameters used: $f = 2437$ MHz; $\sigma = 1.95$ mho/m; $\epsilon_r = 54.2$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.5 ; Liquid Temperature : 21.1

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.04, 4.04, 4.04); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch6/Area Scan (101x161x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.045 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.46 V/m; Power Drift = -0.158 dB

Peak SAR (extrapolated) = 0.135 W/kg

SAR(1 g) = 0.052 mW/g; SAR(10 g) = 0.026 mW/g

Maximum value of SAR (measured) = 0.053 mW/g

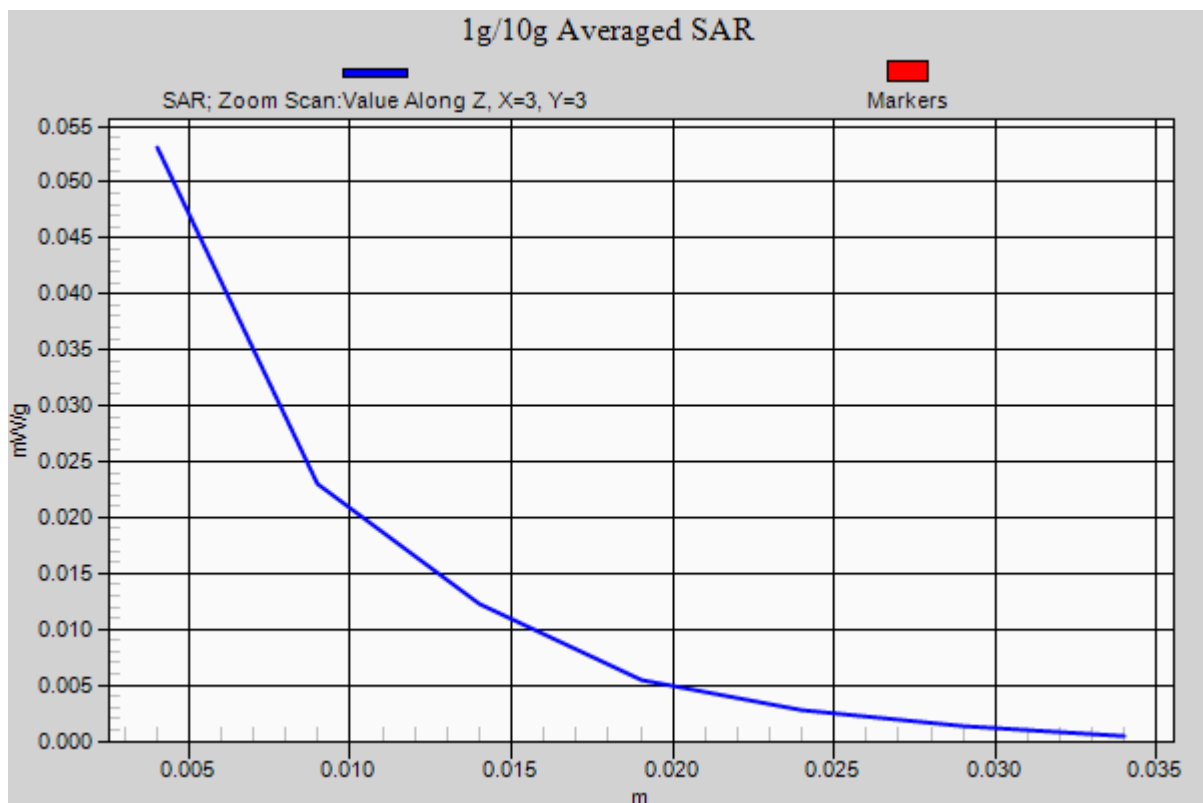
Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 2.46 V/m; Power Drift = -0.158 dB

Peak SAR (extrapolated) = 0.104 W/kg

SAR(1 g) = 0.043 mW/g; SAR(10 g) = 0.023 mW/g

Maximum value of SAR (measured) = 0.047 mW/g



#35 802.11b_Face_0cm_Ch6_Sample1_Keypad 4_Holster2

DUT: 0D0904-03

Communication System: 802.11b ; Frequency: 2437 MHz;Duty Cycle: 1:1

Medium: MSL_2450_101208 Medium parameters used: $f = 2437 \text{ MHz}$; $\sigma = 1.95 \text{ mho/m}$; $\epsilon_r = 54.2$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5 ; Liquid Temperature : 21.1

DASY5 Configuration:

- Probe: ET3DV6 - SN1788; ConvF(4.04, 4.04, 4.04); Calibrated: 2010/9/21
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch6/Area Scan (101x161x1): Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (interpolated) = 0.012 mW/g

Ch6/Zoom Scan (5x5x7)/Cube 0: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 0.997 V/m; Power Drift = -0.157 dB

Peak SAR (extrapolated) = 0.042 W/kg

SAR(1 g) = 0.00906 mW/g; SAR(10 g) = 0.00351 mW/g

Maximum value of SAR (measured) = 0.00915 mW/g

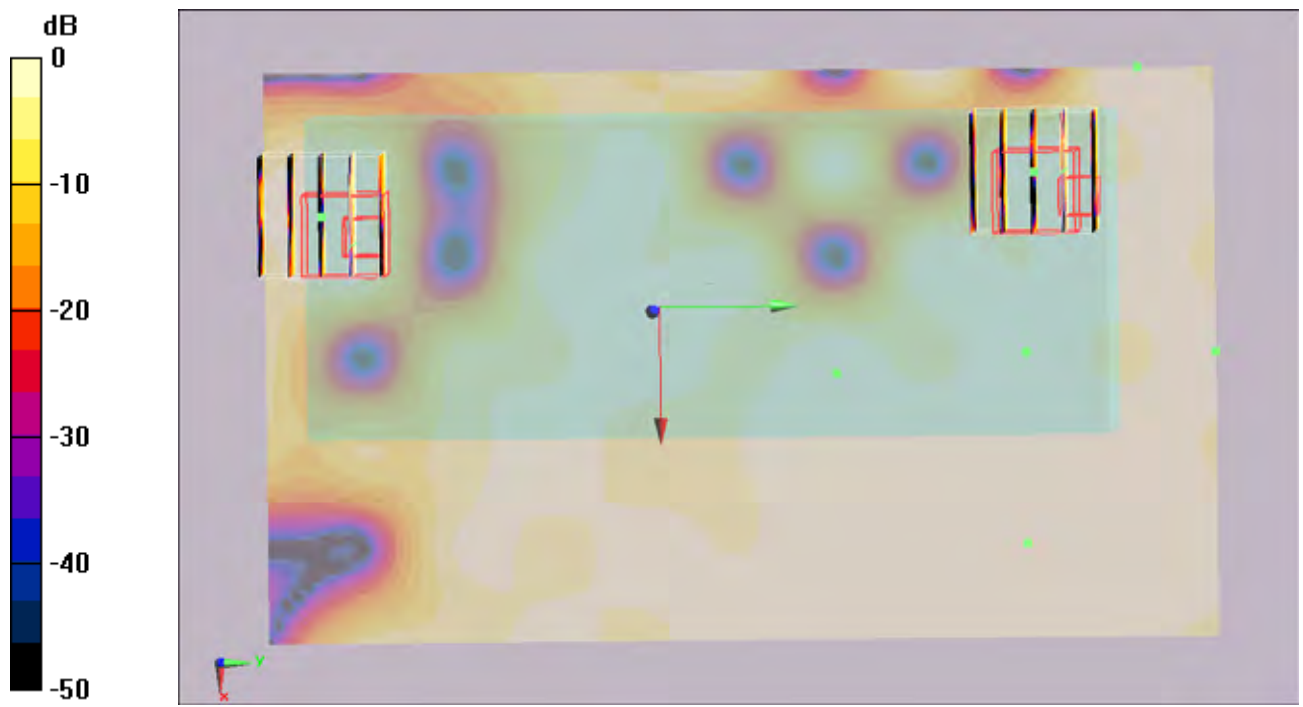
Ch6/Zoom Scan (5x5x7)/Cube 1: Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 0.997 V/m; Power Drift = -0.157 dB

Peak SAR (extrapolated) = 0.024 W/kg

SAR(1 g) = 0.00656 mW/g; SAR(10 g) = 0.00274 mW/g

Maximum value of SAR (measured) = 0.00676 mW/g



0 dB = 0.00676mW/g

#126 802.11a_Bottom_0cm_Ch36_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5180 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101209 Medium parameters used: $f = 5180 \text{ MHz}$; $\sigma = 5.25 \text{ mho/m}$; $\epsilon_r = 47.5$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.4 ; Liquid Temperature : 21.5

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.87, 3.87, 3.87); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch36/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.203 mW/g

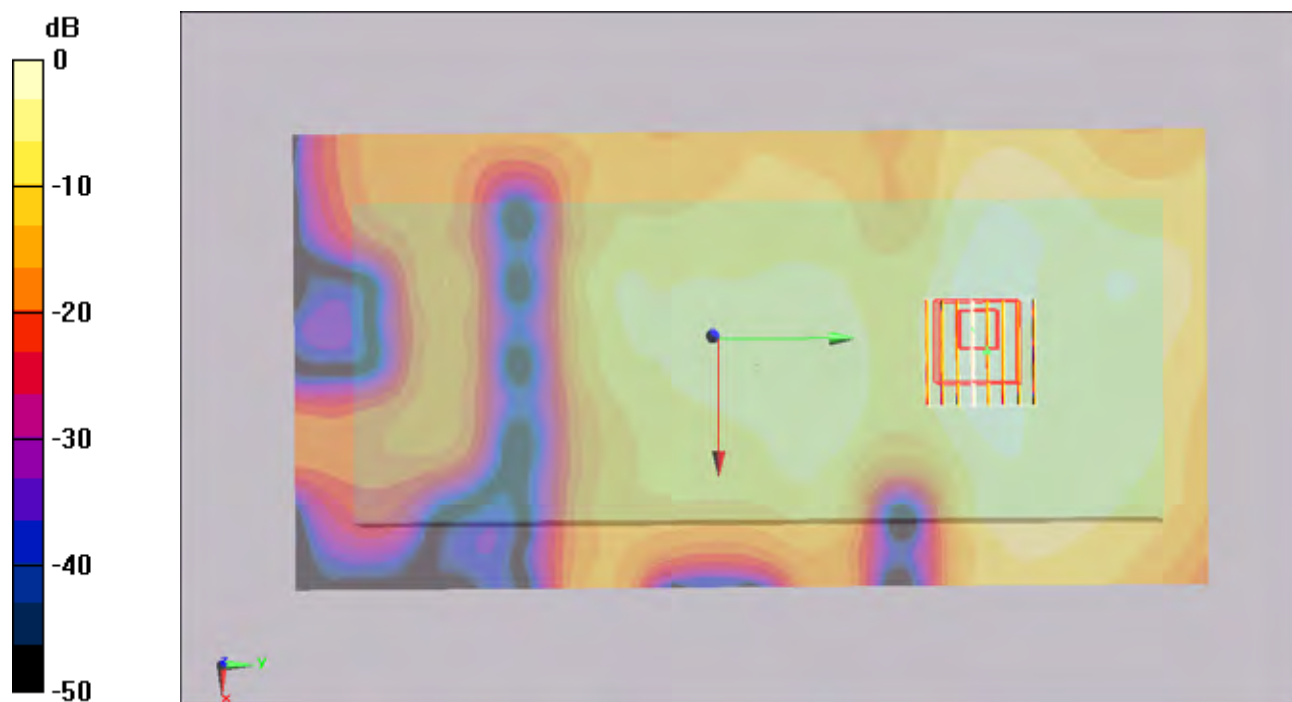
Ch36/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 2.36 V/m; Power Drift = -0.108 dB

Peak SAR (extrapolated) = 0.330 W/kg

SAR(1 g) = 0.135 mW/g; SAR(10 g) = 0.059 mW/g

Maximum value of SAR (measured) = 0.223 mW/g



0 dB = 0.223mW/g

#127 802.11n_20M_Bottom_0cm_Ch36_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5180 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101209 Medium parameters used: $f = 5180 \text{ MHz}$; $\sigma = 5.25 \text{ mho/m}$; $\epsilon_r = 47.5$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5 ; Liquid Temperature : 21.5

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.87, 3.87, 3.87); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch36/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

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

Ch36/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 2.95 V/m; Power Drift = -0.192 dB

Peak SAR (extrapolated) = 1.91 W/kg

SAR(1 g) = 0.293 mW/g; SAR(10 g) = 0.074 mW/g

Maximum value of SAR (measured) = 0.535 mW/g

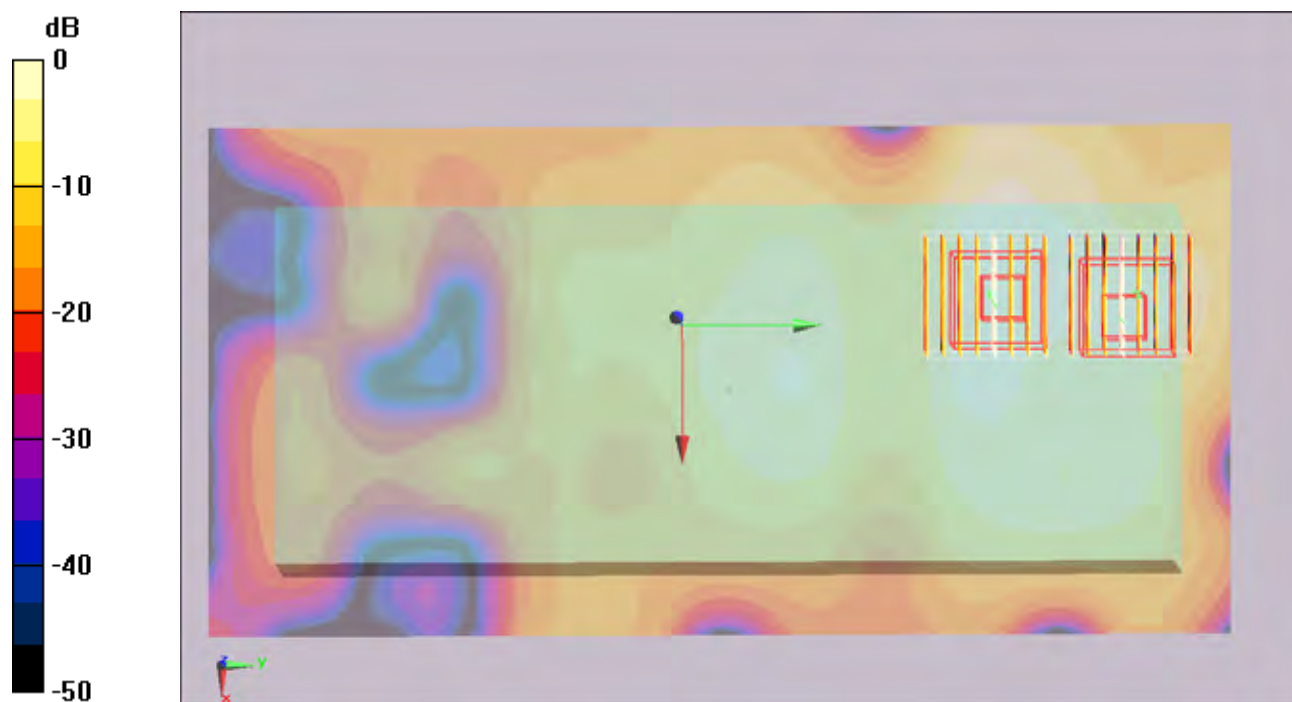
Ch36/Zoom Scan (8x8x10)/Cube 1: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 2.95 V/m; Power Drift = -0.192 dB

Peak SAR (extrapolated) = 0.376 W/kg

SAR(1 g) = 0.179 mW/g; SAR(10 g) = 0.083 mW/g

Maximum value of SAR (measured) = 0.282 mW/g



0 dB = 0.282mW/g

#127 802.11n_20M_Bottom_0cm_Ch36_Sample1_Keypad4_Holster2_2D

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5180 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101209 Medium parameters used : $f = 5180$ MHz; $\sigma = 5.25$ mho/m; $\epsilon_r = 47.5$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.5 ; Liquid Temperature : 21.5

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.87, 3.87, 3.87); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch36/Area Scan (121x241x1): Measurement grid: dx=10mm, dy=10mm

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

Ch36/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 2.95 V/m; Power Drift = -0.192 dB

Peak SAR (extrapolated) = 1.91 W/kg

SAR(1 g) = 0.293 mW/g; SAR(10 g) = 0.074 mW/g

Maximum value of SAR (measured) = 0.535 mW/g

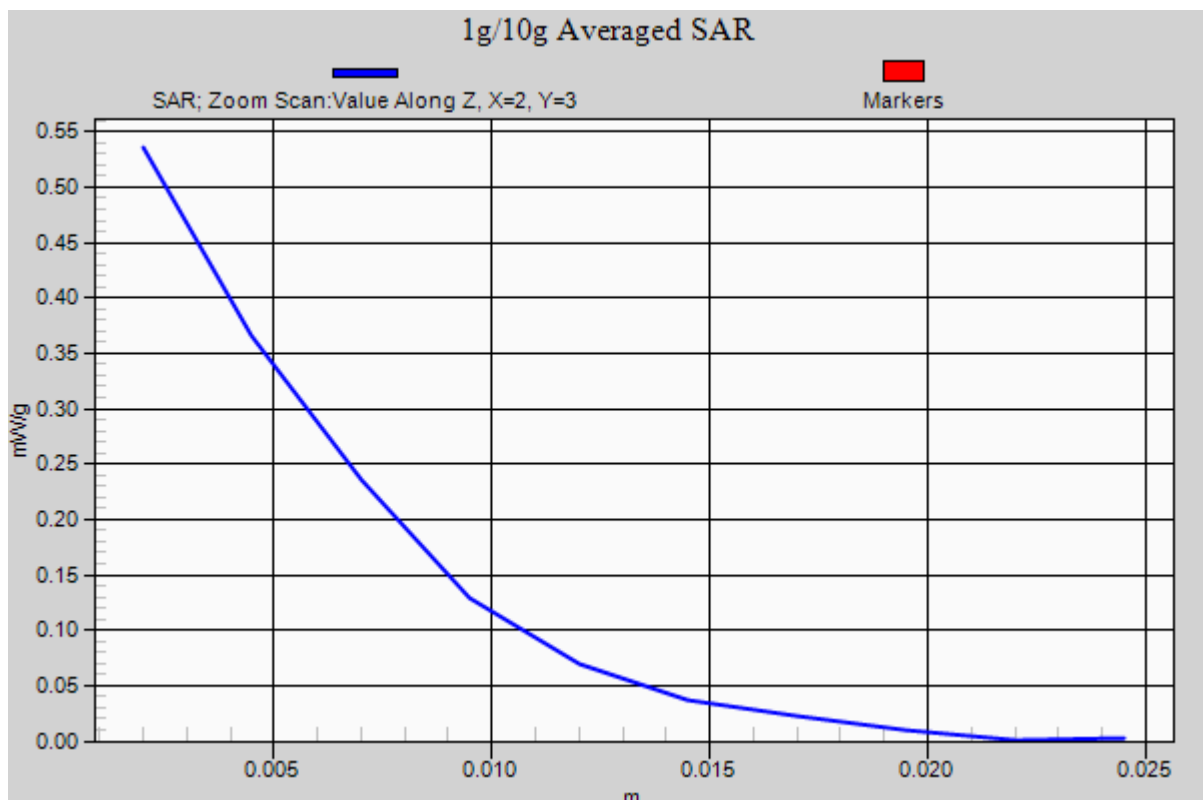
Ch36/Zoom Scan (8x8x10)/Cube 1: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 2.95 V/m; Power Drift = -0.192 dB

Peak SAR (extrapolated) = 0.376 W/kg

SAR(1 g) = 0.179 mW/g; SAR(10 g) = 0.083 mW/g

Maximum value of SAR (measured) = 0.282 mW/g



#129 802.11n_20M_Bottom_0cm_Ch48_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11n; Frequency: 5180 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101209 Medium parameters used: $f = 5180 \text{ MHz}$; $\sigma = 5.25 \text{ mho/m}$; $\epsilon_r = 47.5$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.6 ; Liquid Temperature : 21.5

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.87, 3.87, 3.87); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch48/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.308 mW/g

Ch48/Zoom Scan (8x8x10)/Cube 1: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 2.5 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 0.710 W/kg

SAR(1 g) = 0.285 mW/g; SAR(10 g) = 0.074 mW/g

Maximum value of SAR (measured) = 0.514 mW/g

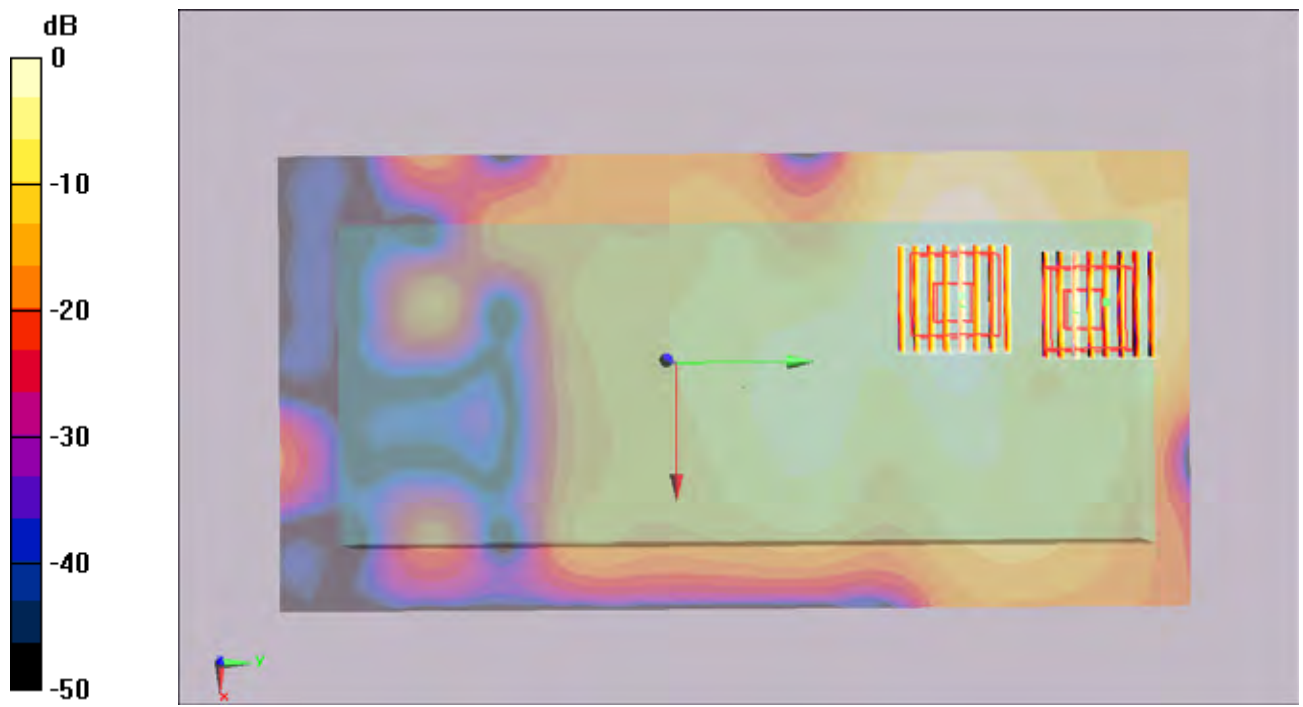
Ch48/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 2.5 V/m; Power Drift = -0.18 dB

Peak SAR (extrapolated) = 0.435 W/kg

SAR(1 g) = 0.183 mW/g; SAR(10 g) = 0.085 mW/g

Maximum value of SAR (measured) = 0.287 mW/g



0 dB = 0.287mW/g

#128 802.11n_20M_Face_0cm_Ch36_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11n; Frequency: 5180 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101209 Medium parameters used: $f = 5180 \text{ MHz}$; $\sigma = 5.25 \text{ mho/m}$; $\epsilon_r = 47.5$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.6 ; Liquid Temperature : 21.5

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.87, 3.87, 3.87); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch36/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.027 mW/g

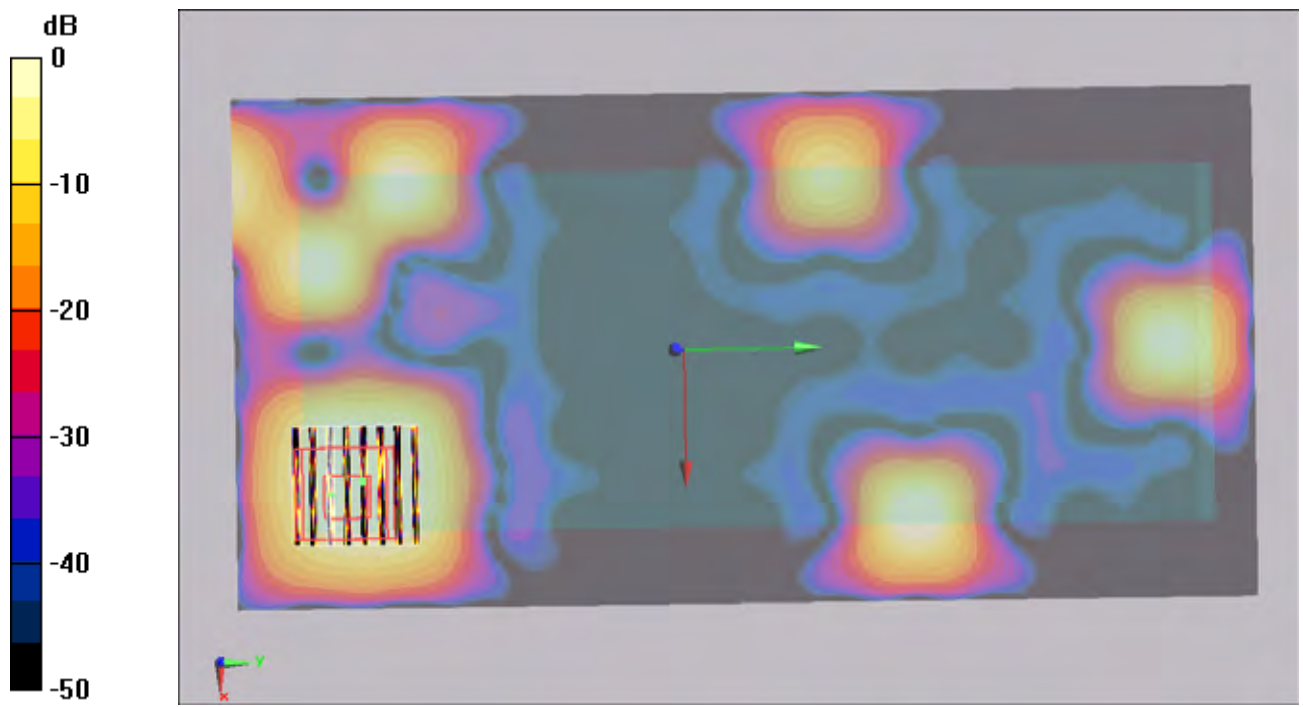
Ch36/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 0.448 V/m; Power Drift = -0.112dB

Peak SAR (extrapolated) = 0.019 W/kg

SAR(1 g) = 0.00109 mW/g; SAR(10 g) = 0.000211 mW/g

Maximum value of SAR (measured) = 0.00703 mW/g



0 dB = 0.00703mW/g

#162 802.11a_Bottom_0cm_Ch64_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5320 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101212 Medium parameters used: $f = 5320 \text{ MHz}$; $\sigma = 5.26 \text{ mho/m}$; $\epsilon_r = 47.2$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5 ; Liquid Temperature : 21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.63, 3.63, 3.63); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch64/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.388 mW/g

Ch64/Zoom Scan (8x8x10)/Cube 1: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 3.31 V/m; Power Drift = -0.175 dB

Peak SAR (extrapolated) = 0.778 W/kg

SAR(1 g) = 0.313 mW/g; SAR(10 g) = 0.075 mW/g

Maximum value of SAR (measured) = 0.582 mW/g

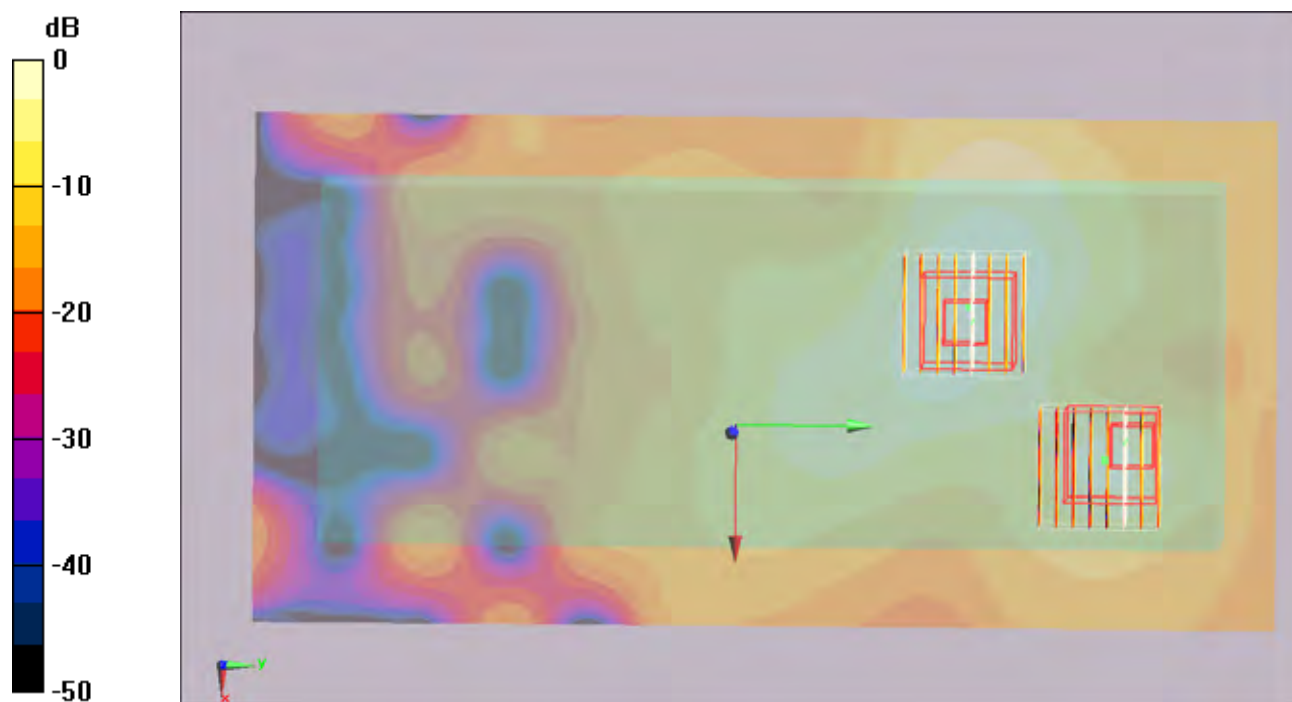
Ch64/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 3.31 V/m; Power Drift = -0.175 dB

Peak SAR (extrapolated) = 0.535 W/kg

SAR(1 g) = 0.250 mW/g; SAR(10 g) = 0.113 mW/g

Maximum value of SAR (measured) = 0.394 mW/g



0 dB = 0.394mW/g

#163 802.11n(20M)_Bottom_0cm_Ch64_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5320 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101212 Medium parameters used: $f = 5320 \text{ MHz}$; $\sigma = 5.26 \text{ mho/m}$; $\epsilon_r = 47.2$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5 ; Liquid Temperature : 21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.63, 3.63, 3.63); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch64/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.499 mW/g

Ch64/Zoom Scan (8x8x10)/Cube 1: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 4.02 V/m; Power Drift = -0.144 dB

Peak SAR (extrapolated) = 1.15 W/kg

SAR(1 g) = 0.444 mW/g; SAR(10 g) = 0.106 mW/g

Maximum value of SAR (measured) = 0.832 mW/g

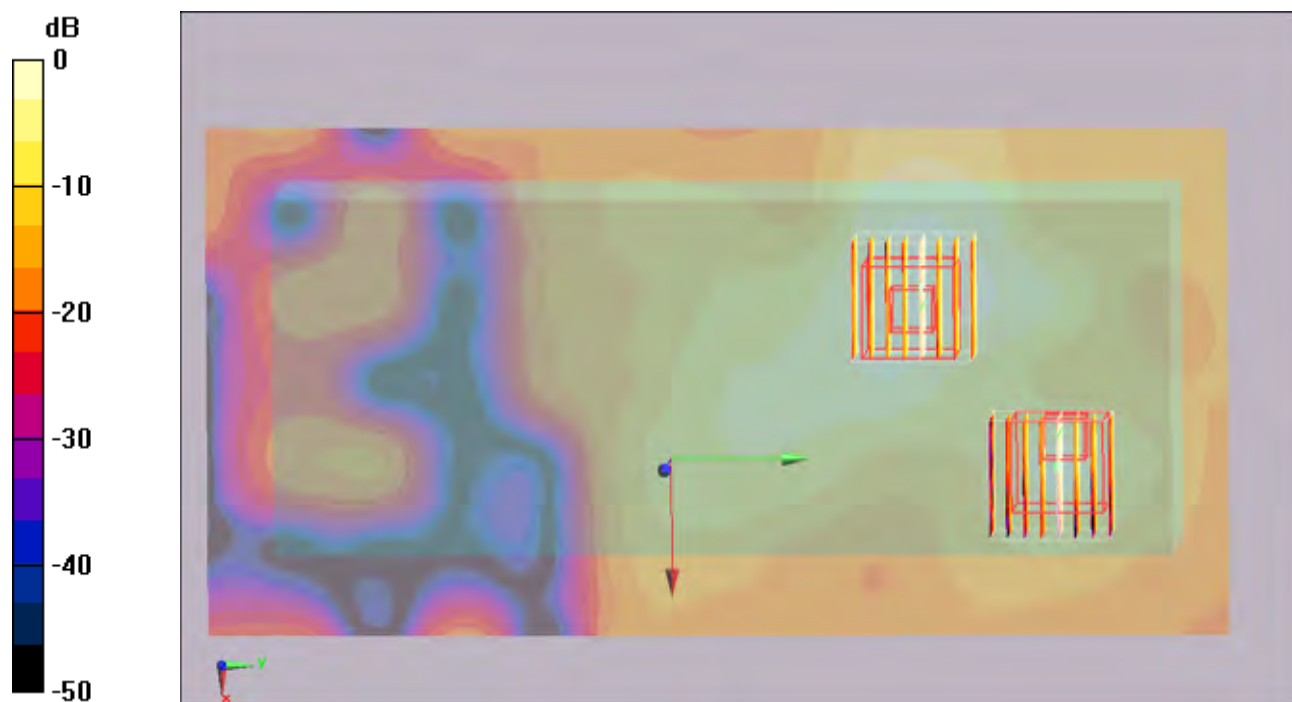
Ch64/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 4.02 V/m; Power Drift = -0.144 dB

Peak SAR (extrapolated) = 0.712 W/kg

SAR(1 g) = 0.326 mW/g; SAR(10 g) = 0.145 mW/g

Maximum value of SAR (measured) = 0.513 mW/g



0 dB = 0.513mW/g

#165 802.11n(20M)_Bottom_0cm_Ch52_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11n; Frequency: 5260 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101212 Medium parameters used: $f = 5260 \text{ MHz}$; $\sigma = 5.17 \text{ mho/m}$; $\epsilon_r = 47.3$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5 ; Liquid Temperature : 21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.63, 3.63, 3.63); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch52/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.397 mW/g

Ch52/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 3.55 V/m; Power Drift = -0.127 dB

Peak SAR (extrapolated) = 1.14 W/kg

SAR(1 g) = 0.468 mW/g; SAR(10 g) = 0.125 mW/g

Maximum value of SAR (measured) = 0.824 mW/g

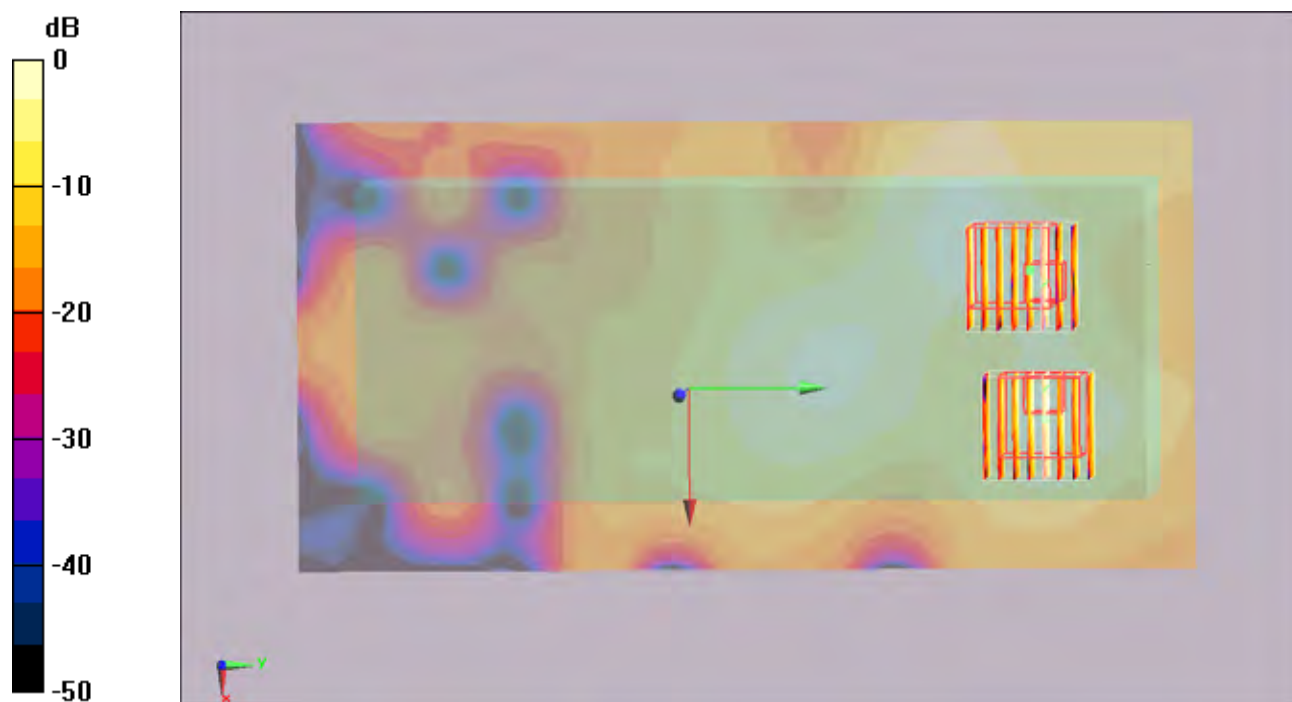
Ch52/Zoom Scan (8x8x10)/Cube 1: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 3.55 V/m; Power Drift = -1.27 dB

Peak SAR (extrapolated) = 0.507 W/kg

SAR(1 g) = 0.193 mW/g; SAR(10 g) = 0.058 mW/g

Maximum value of SAR (measured) = 0.364 mW/g



0 dB = 0.364mW/g

#165 802.11n(20M)_Bottom_0cm_Ch52_Sample1_Keypad4_Holster2_2D

DUT: 0D0904-03

Communication System: 802.11n; Frequency: 5260 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101212 Medium parameters used : $f = 5260$ MHz; $\sigma = 5.17$ mho/m; $\epsilon_r = 47.3$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.5 ; Liquid Temperature : 21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.63, 3.63, 3.63); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch52/Area Scan (121x241x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.397 mW/g

Ch52/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 3.55 V/m; Power Drift = -0.127 dB

Peak SAR (extrapolated) = 1.14 W/kg

SAR(1 g) = 0.468 mW/g; SAR(10 g) = 0.125 mW/g

Maximum value of SAR (measured) = 0.824 mW/g

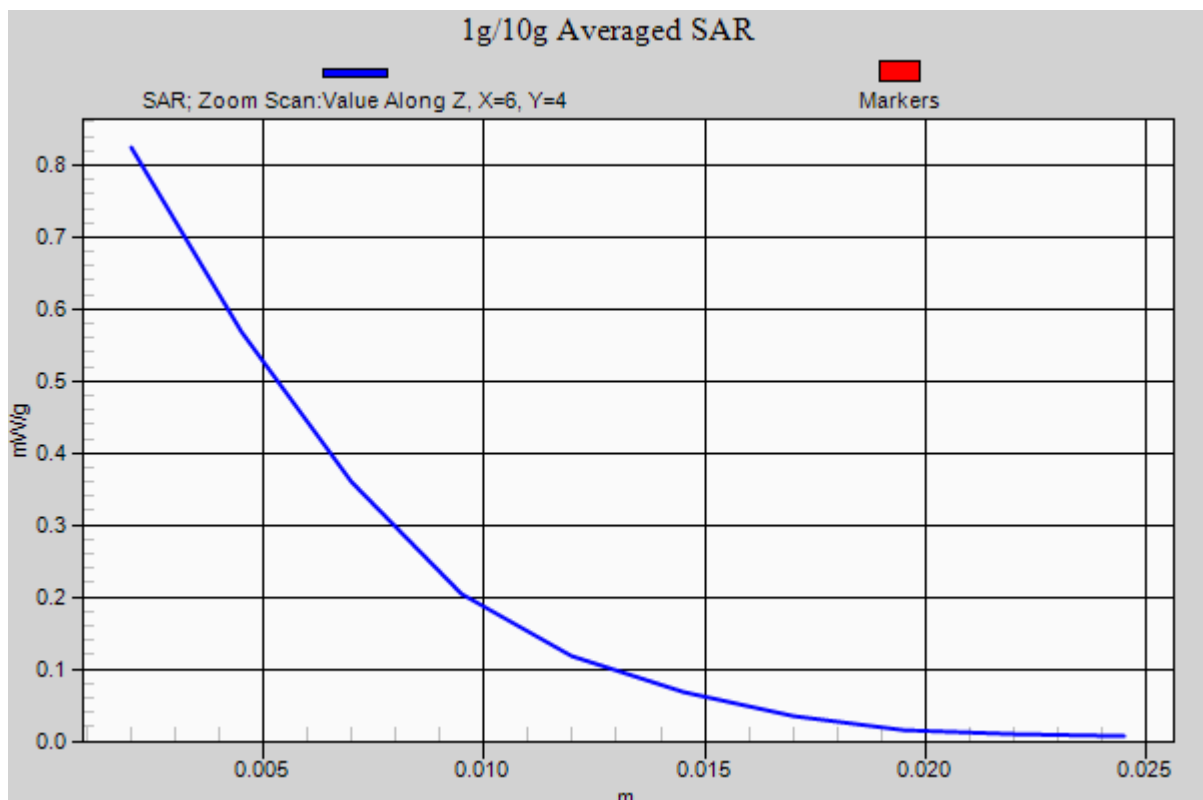
Ch52/Zoom Scan (8x8x10)/Cube 1: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 3.55 V/m; Power Drift = -0.127 dB

Peak SAR (extrapolated) = 0.507 W/kg

SAR(1 g) = 0.193 mW/g; SAR(10 g) = 0.058 mW/g

Maximum value of SAR (measured) = 0.364 mW/g



#164 802.11n(20M)_Face_0cm_Ch64_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11n; Frequency: 5320 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101212 Medium parameters used: $f = 5320 \text{ MHz}$; $\sigma = 5.26 \text{ mho/m}$; $\epsilon_r = 47.2$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.6 ; Liquid Temperature : 21.4

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.63, 3.63, 3.63); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch64/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.026 mW/g

Ch64/Zoom Scan (8x8x10)/Cube 1: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 0.904 V/m; Power Drift = -0.199 dB

Peak SAR (extrapolated) = 0.080 W/kg

SAR(1 g) = 0.00767 mW/g; SAR(10 g) = 0.00331 mW/g

Maximum value of SAR (measured) = 0.018 mW/g

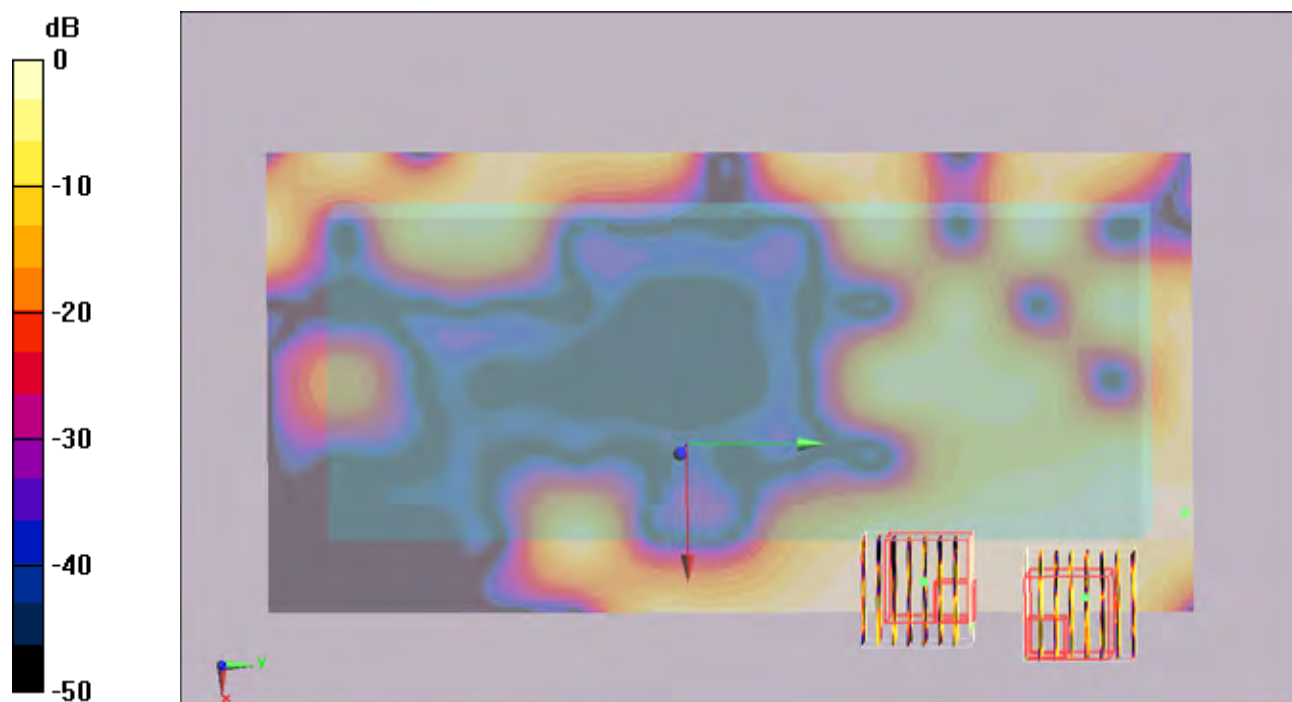
Ch64/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 0.904 V/m; Power Drift = -0.199 dB

Peak SAR (extrapolated) = 0.086 W/kg

SAR(1 g) = 0.00619 mW/g; SAR(10 g) = 0.00128 mW/g

Maximum value of SAR (measured) = 0.023 mW/g



0 dB = 0.023mW/g

#166 802.11a_Bottom_0cm_Ch124_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5620 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used: $f = 5620 \text{ MHz}$; $\sigma = 5.65 \text{ mho/m}$; $\epsilon_r = 46.8$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.6 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.2, 3.2, 3.2); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch124/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.435 mW/g

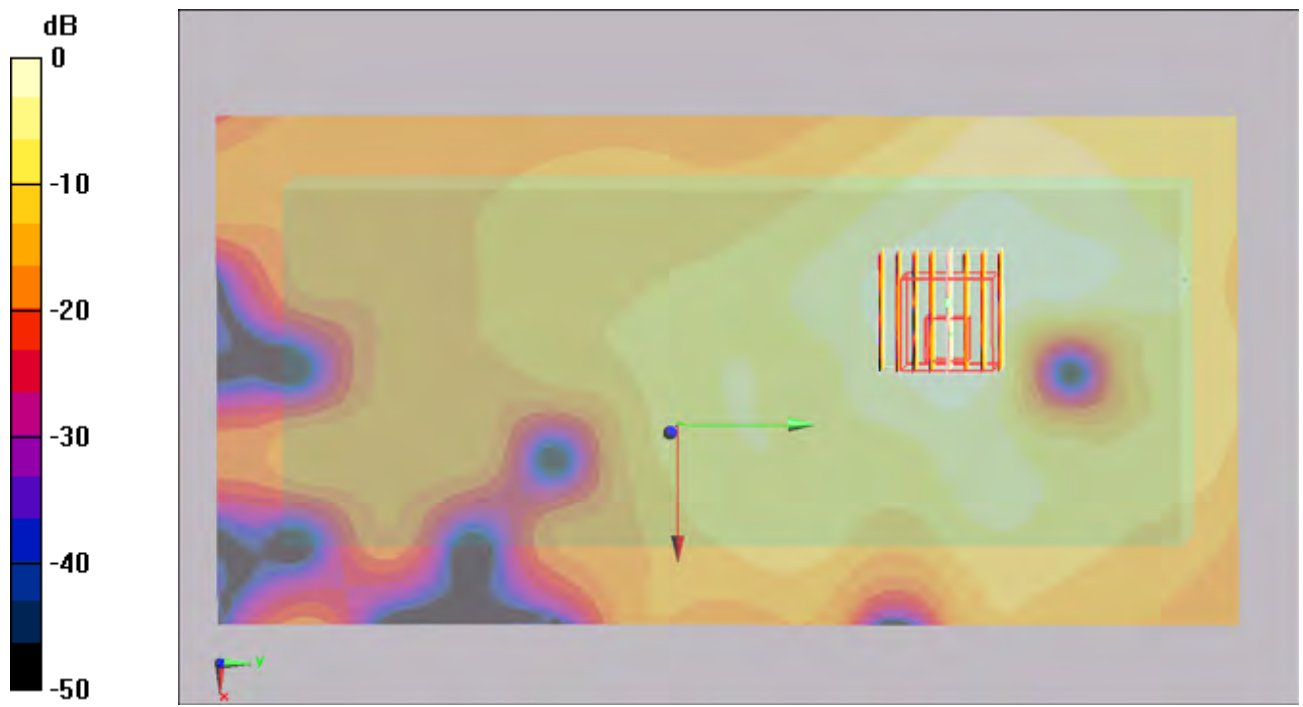
Ch124/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 3.41 V/m; Power Drift = -0.120 dB

Peak SAR (extrapolated) = 0.569 W/kg

SAR(1 g) = 0.251 mW/g; SAR(10 g) = 0.110 mW/g

Maximum value of SAR (measured) = 0.411 mW/g



0 dB = 0.411mW/g

#167 802.11n(20M)_Bottom_0cm_Ch124_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11n; Frequency: 5620 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used : $f = 5620 \text{ MHz}$; $\sigma = 5.65 \text{ mho/m}$; $\epsilon_r = 46.8$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5°C ; Liquid Temperature : 21.3°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.2, 3.2, 3.2); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch124/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.465 mW/g

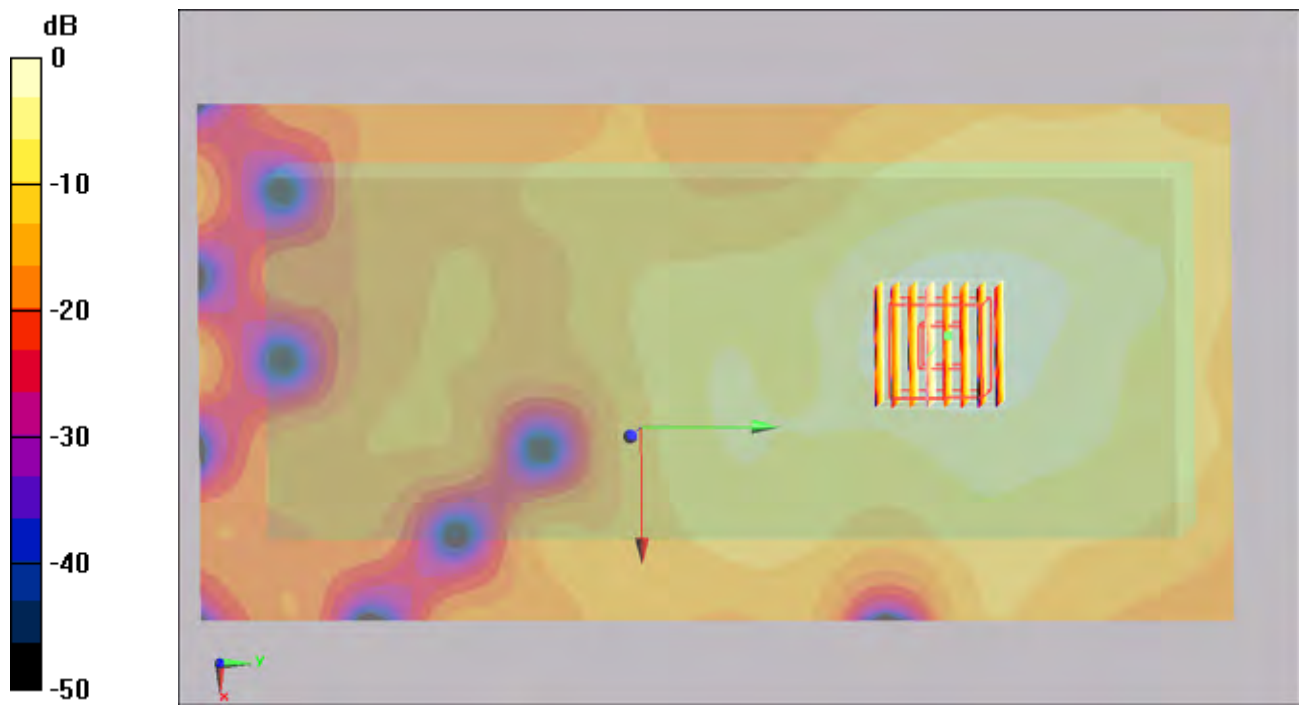
Ch124/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 3.69 V/m ; Power Drift = -0.194 dB

Peak SAR (extrapolated) = 0.685 W/kg

SAR(1 g) = 0.301 mW/g ; SAR(10 g) = 0.133 mW/g

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



0 dB = 0.481mW/g

#169 802.11n(20M)_Bottom_0cm_Ch104_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5520 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used: $f = 5520 \text{ MHz}$; $\sigma = 5.5 \text{ mho/m}$; $\epsilon_r = 47$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.4 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.44, 3.44, 3.44); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch104/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.383 mW/g

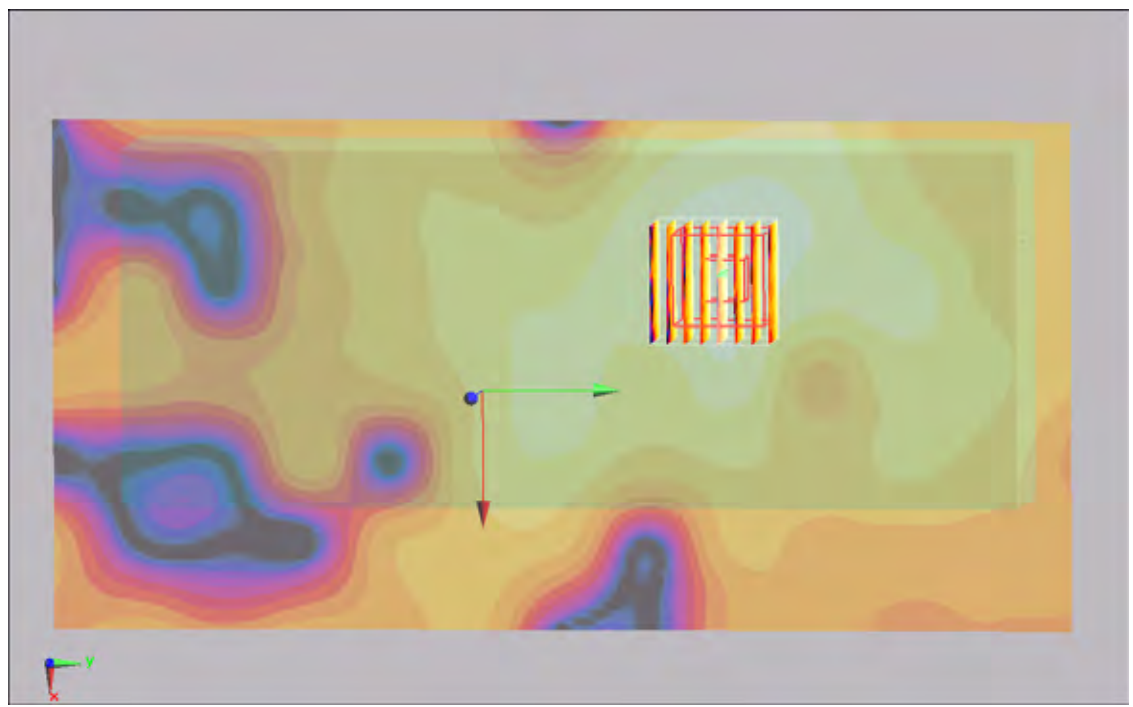
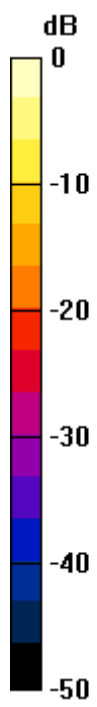
Ch104/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 3.7 V/m; Power Drift = -0.127 dB

Peak SAR (extrapolated) = 0.522 W/kg

SAR(1 g) = 0.228 mW/g; SAR(10 g) = 0.101 mW/g

Maximum value of SAR (measured) = 0.370 mW/g



0 dB = 0.370mW/g

#170 802.11n(20M)_Bottom_0cm_Ch116_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5580 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used: $f = 5580 \text{ MHz}$; $\sigma = 5.58 \text{ mho/m}$; $\epsilon_r = 46.9$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.2, 3.2, 3.2); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch116/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.508 mW/g

Ch116/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 3.34 V/m; Power Drift = -0.171 dB

Peak SAR (extrapolated) = 0.757 W/kg

SAR(1 g) = 0.281 mW/g; SAR(10 g) = 0.073 mW/g

Maximum value of SAR (measured) = 0.523 mW/g

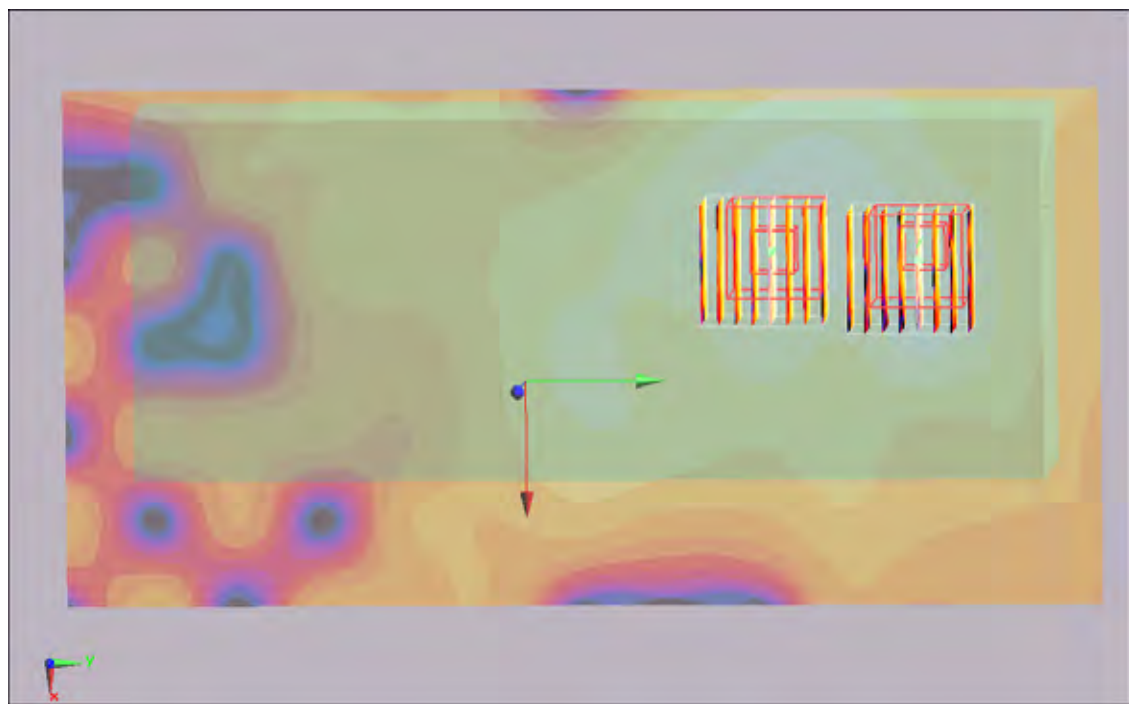
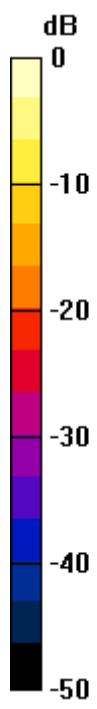
Ch116/Zoom Scan (8x8x10)/Cube 1: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 3.34 V/m; Power Drift = -0.171 dB

Peak SAR (extrapolated) = 0.498 W/kg

SAR(1 g) = 0.215 mW/g; SAR(10 g) = 0.097 mW/g

Maximum value of SAR (measured) = 0.355 mW/g



0 dB = 0.355mW/g

#171 802.11n(20M)_Bottom_0cm_Ch136_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5680 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used: $f = 5680 \text{ MHz}$; $\sigma = 5.74 \text{ mho/m}$; $\epsilon_r = 46.7$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.2, 3.2, 3.2); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch136/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.844 mW/g

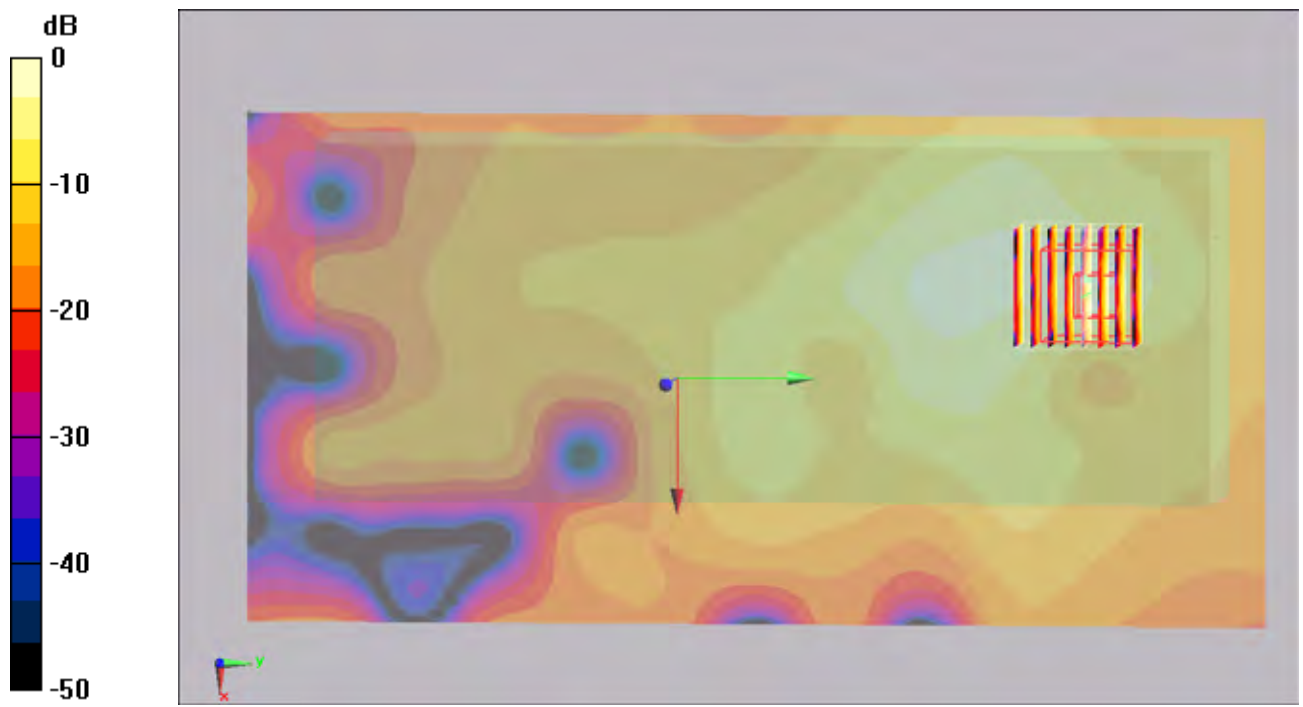
Ch136/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 3.09 V/m; Power Drift = -0.173 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.436 mW/g; SAR(10 g) = 0.119 mW/g

Maximum value of SAR (measured) = 0.807 mW/g



0 dB = 0.807mW/g

#171 802.11n(20M)_Bottom_0cm_Ch136_Sample1_Keypad4_Holster2_2D

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5680 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used : $f = 5680$ MHz; $\sigma = 5.74$ mho/m; $\epsilon_r = 46.7$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.5 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.2, 3.2, 3.2); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch136/Area Scan (121x241x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.844 mW/g

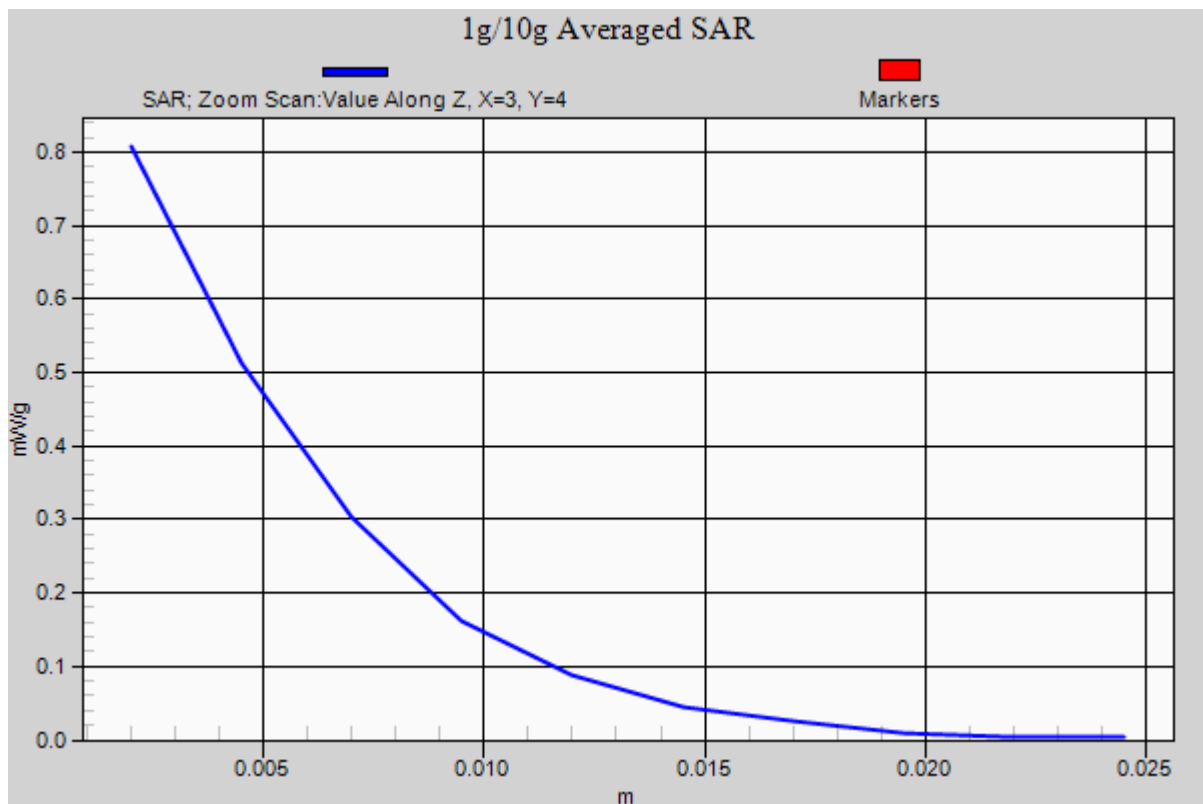
Ch136/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 3.09 V/m; Power Drift = -0.173 dB

Peak SAR (extrapolated) = 1.24 W/kg

SAR(1 g) = 0.436 mW/g; SAR(10 g) = 0.119 mW/g

Maximum value of SAR (measured) = 0.807 mW/g



#168 802.11n(20M)_Face_0cm_Ch124_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5620 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used: $f = 5620 \text{ MHz}$; $\sigma = 5.65 \text{ mho/m}$; $\epsilon_r = 46.8$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.2, 3.2, 3.2); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch124/Area Scan (141x241x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.044 mW/g

Ch124/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 0.941 V/m; Power Drift = -0.199 dB

Peak SAR (extrapolated) = 0.166 W/kg

SAR(1 g) = 0.016 mW/g; SAR(10 g) = 0.00642 mW/g

Maximum value of SAR (measured) = 0.033 mW/g

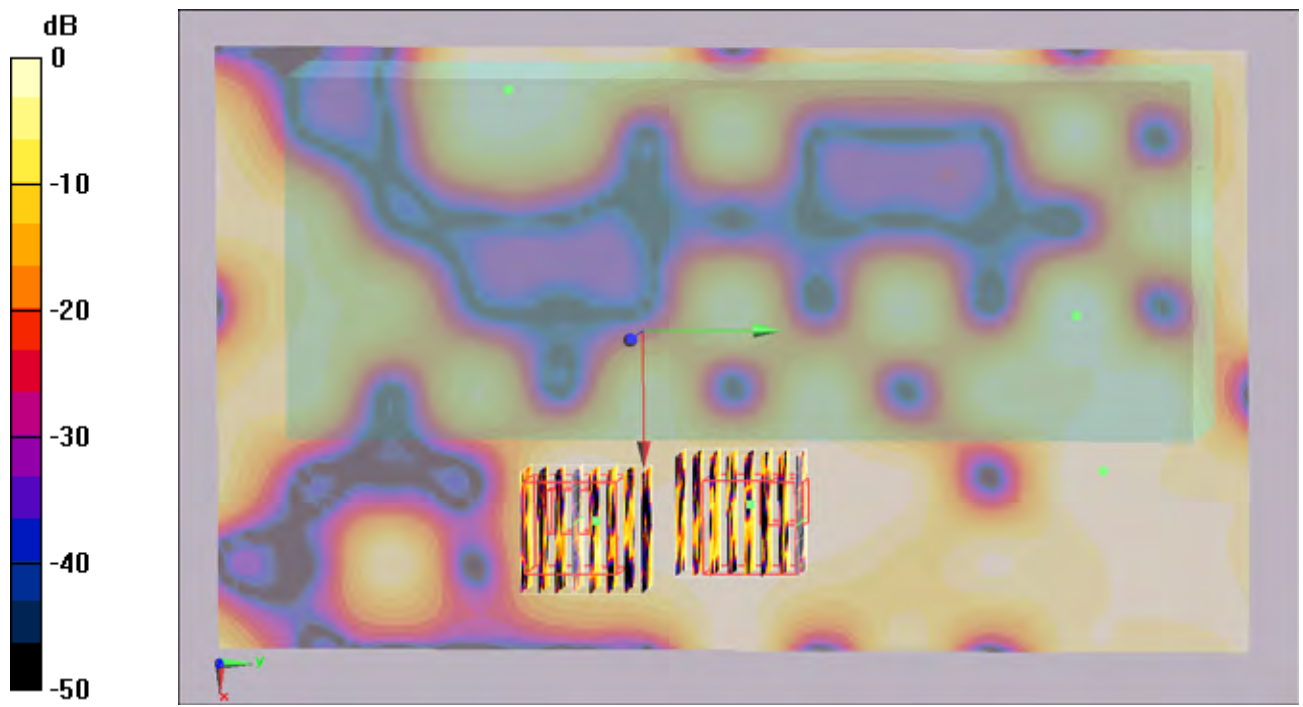
Ch124/Zoom Scan (8x8x10)/Cube 1: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 0.941 V/m; Power Drift = -0.199 dB

Peak SAR (extrapolated) = 0.144 W/kg

SAR(1 g) = 0.00898 mW/g; SAR(10 g) = 0.00187 mW/g

Maximum value of SAR (measured) = 0.026 mW/g



0 dB = 0.026mW/g

#172 802.11a_Bottom_0cm_Ch157_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11a; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used: $f = 5785 \text{ MHz}$; $\sigma = 5.93 \text{ mho/m}$; $\epsilon_r = 46.6$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.4 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch157/Area Scan (121x241x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 0.564 mW/g

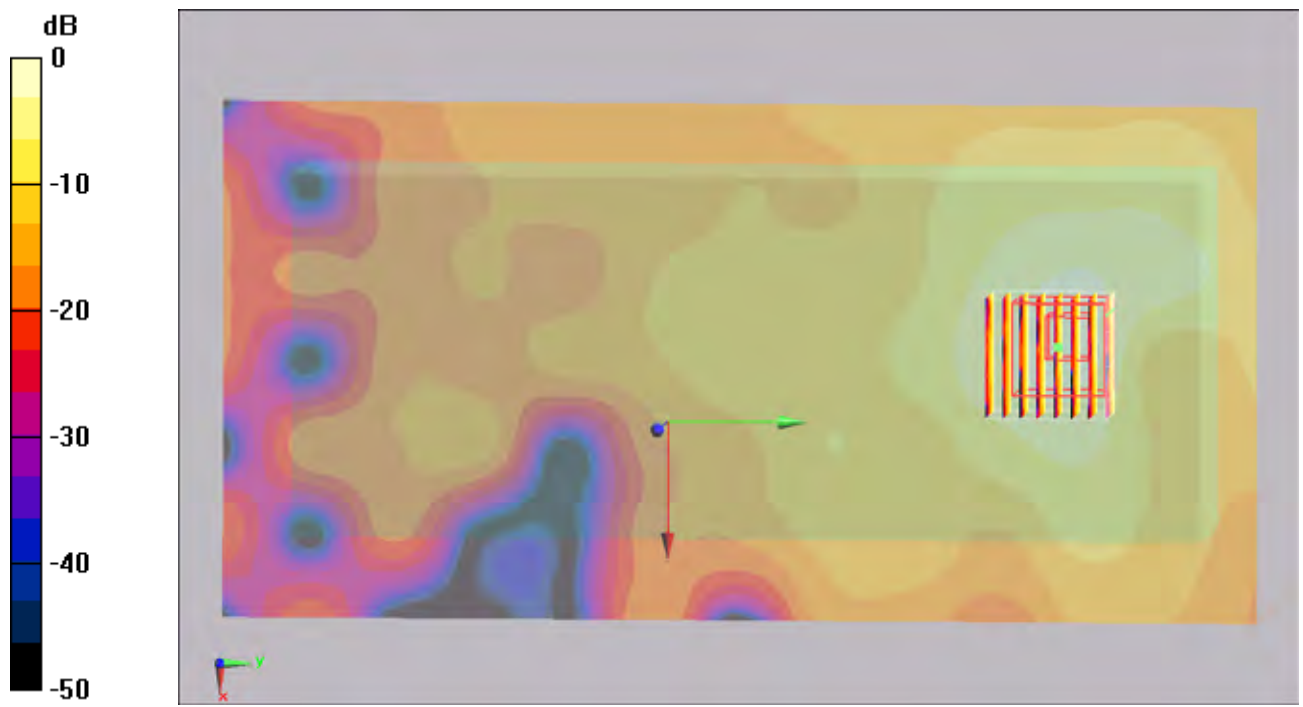
Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 2.29 V/m; Power Drift = -0.135 dB

Peak SAR (extrapolated) = 1.11 W/kg

SAR(1 g) = 0.325 mW/g; SAR(10 g) = 0.144 mW/g

Maximum value of SAR (measured) = 0.784 mW/g



0 dB = 0.784mW/g

#173 802.11n(20M)_Bottom_0cm_Ch157_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11n; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used: $f = 5785 \text{ MHz}$; $\sigma = 5.93 \text{ mho/m}$; $\epsilon_r = 46.6$; $\rho = 1000$

kg/m^3

Ambient Temperature : 22.4 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch157/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.590 mW/g

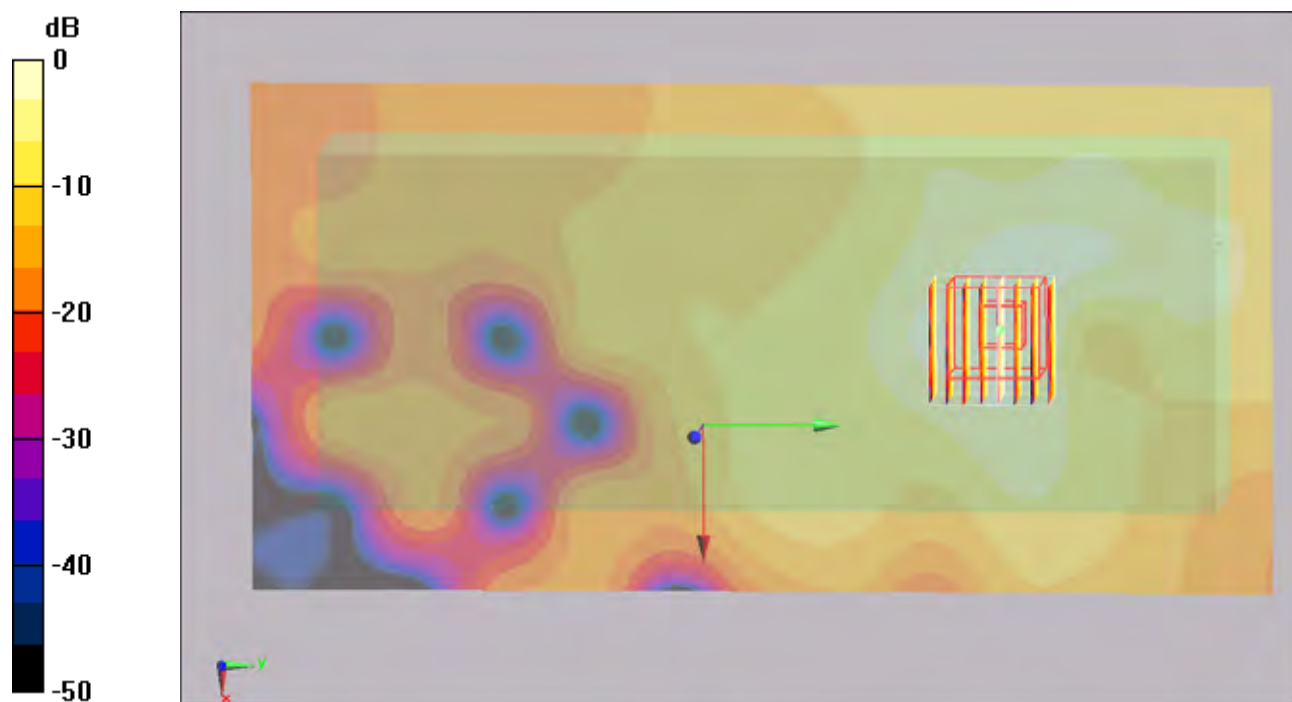
Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 2.82 V/m; Power Drift = -0.135 dB

Peak SAR (extrapolated) = 0.781 W/kg

SAR(1 g) = 0.340 mW/g; SAR(10 g) = 0.151 mW/g

Maximum value of SAR (measured) = 0.550 mW/g



0 dB = 0.550mW/g

#175 802.11n_20M_Bottom_0cm_Ch149_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11n; Frequency: 5745 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used: $f = 5745 \text{ MHz}$; $\sigma = 5.89 \text{ mho/m}$; $\epsilon_r = 46.7$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.5 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch149/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.748 mW/g

Ch149/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 2.93 V/m; Power Drift = -0.131 dB

Peak SAR (extrapolated) = 1.34 W/kg

SAR(1 g) = 0.450 mW/g; SAR(10 g) = 0.115 mW/g

Maximum value of SAR (measured) = 0.857 mW/g

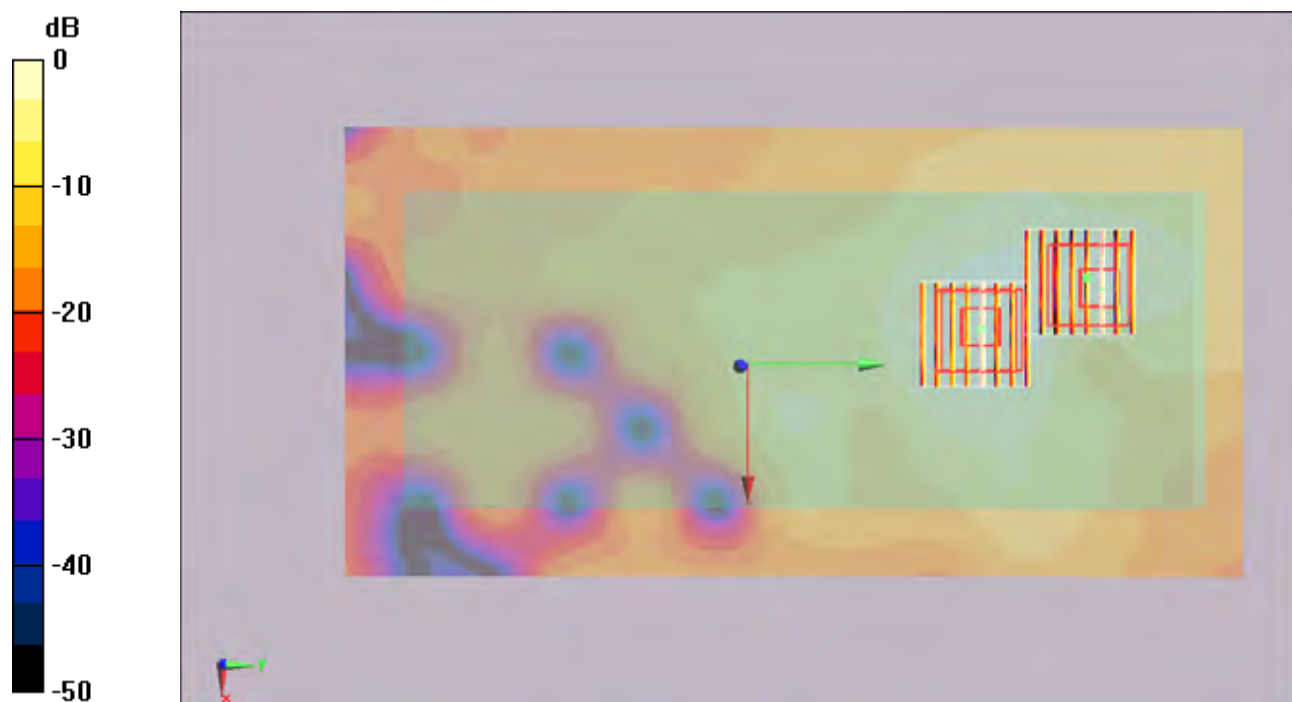
Ch149/Zoom Scan (8x8x10)/Cube 1: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 2.93 V/m; Power Drift = -0.131 dB

Peak SAR (extrapolated) = 0.741 W/kg

SAR(1 g) = 0.320 mW/g; SAR(10 g) = 0.141 mW/g

Maximum value of SAR (measured) = 0.528 mW/g



0 dB = 0.528mW/g

#176 802.11n_20M_Bottom_0cm_Ch161_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11n; Frequency: 5805 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used: $f = 5805 \text{ MHz}$; $\sigma = 5.95 \text{ mho/m}$; $\epsilon_r = 46.5$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.4 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch161/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.647 mW/g

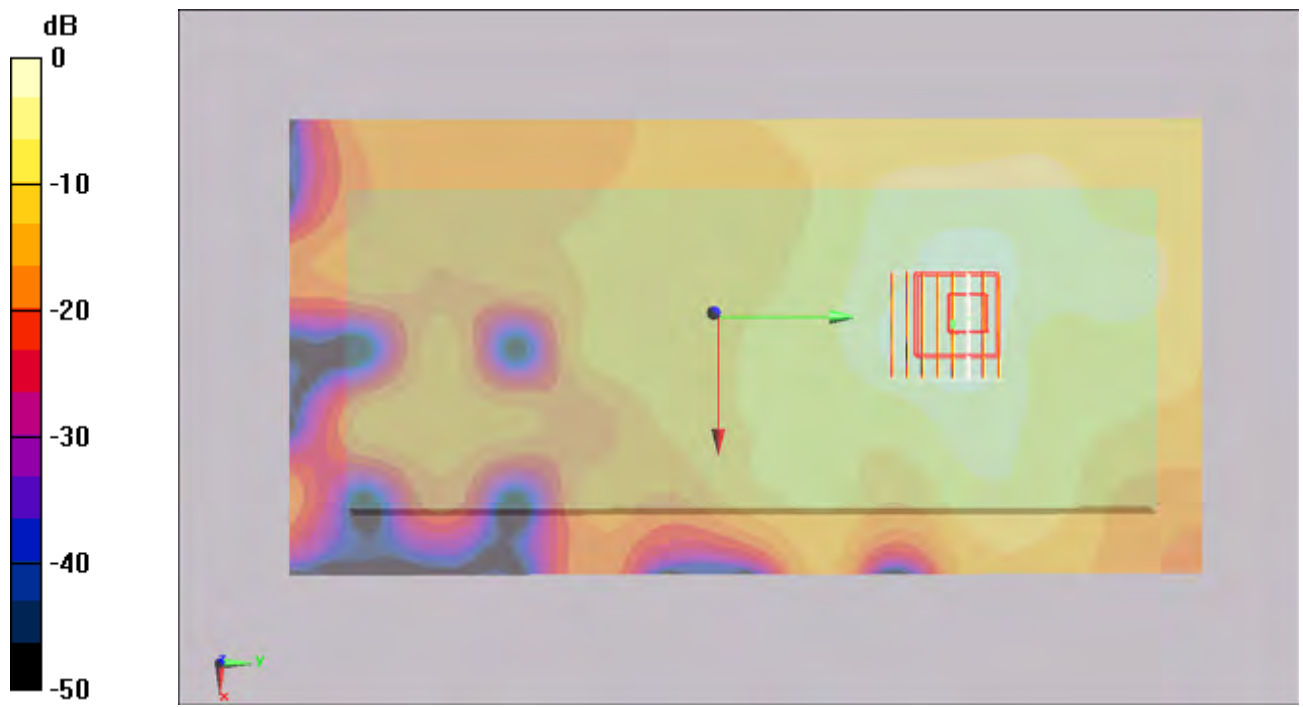
Ch161/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 2.07 V/m; Power Drift = -0.178 dB

Peak SAR (extrapolated) = 0.913 W/kg

SAR(1 g) = 0.394 mW/g; SAR(10 g) = 0.176 mW/g

Maximum value of SAR (measured) = 0.641 mW/g



0 dB = 0.641mW/g

#177 802.11n_20M_Bottom_0cm_Ch165_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11n; Frequency: 5825 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used: $f = 5825 \text{ MHz}$; $\sigma = 6 \text{ mho/m}$; $\epsilon_r = 46.5$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.4 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch165/Area Scan (121x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.575 mW/g

Ch165/Zoom Scan (8x8x10)/Cube 1: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 1.89 V/m; Power Drift = -0.152 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.468 mW/g; SAR(10 g) = 0.121 mW/g

Maximum value of SAR (measured) = 0.959 mW/g

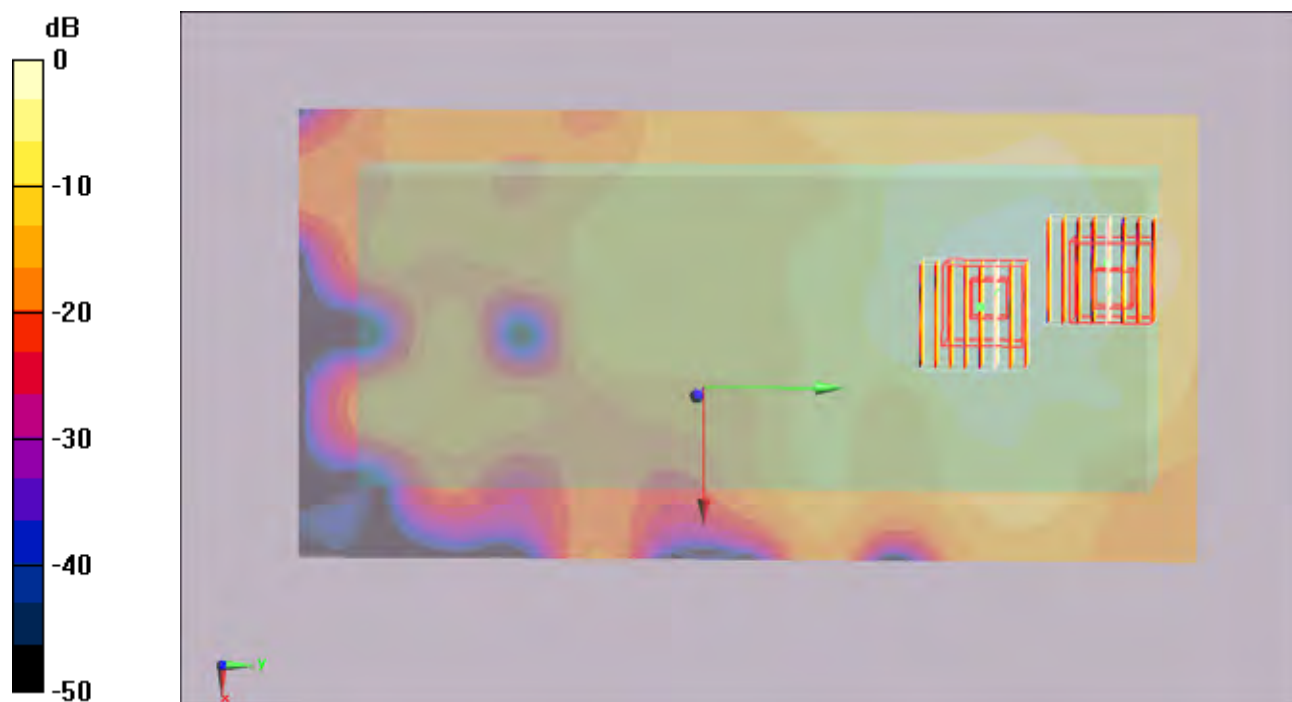
Ch165/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 1.89 V/m; Power Drift = -0.152 dB

Peak SAR (extrapolated) = 0.892 W/kg

SAR(1 g) = 0.379 mW/g; SAR(10 g) = 0.169 mW/g

Maximum value of SAR (measured) = 0.621 mW/g



0 dB = 0.621mW/g

#177 802.11n_20M_Bottom_0cm_Ch165_Sample1_Keypad4_Holster2_2D

DUT: 0D0904-03

Communication System: 802.11n; Frequency: 5825 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used : $f = 5825$ MHz; $\sigma = 6$ mho/m; $\epsilon_r = 46.5$; $\rho = 1000$ kg/m³

Ambient Temperature : 22.4 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch165/Area Scan (121x241x1): Measurement grid: dx=10mm, dy=120mm

Maximum value of SAR (interpolated) = 0.575 mW/g

Ch165/Zoom Scan (8x8x10)/Cube 1: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 1.89 V/m; Power Drift = -0.152 dB

Peak SAR (extrapolated) = 1.45 W/kg

SAR(1 g) = 0.468 mW/g; SAR(10 g) = 0.121 mW/g

Maximum value of SAR (measured) = 0.959 mW/g

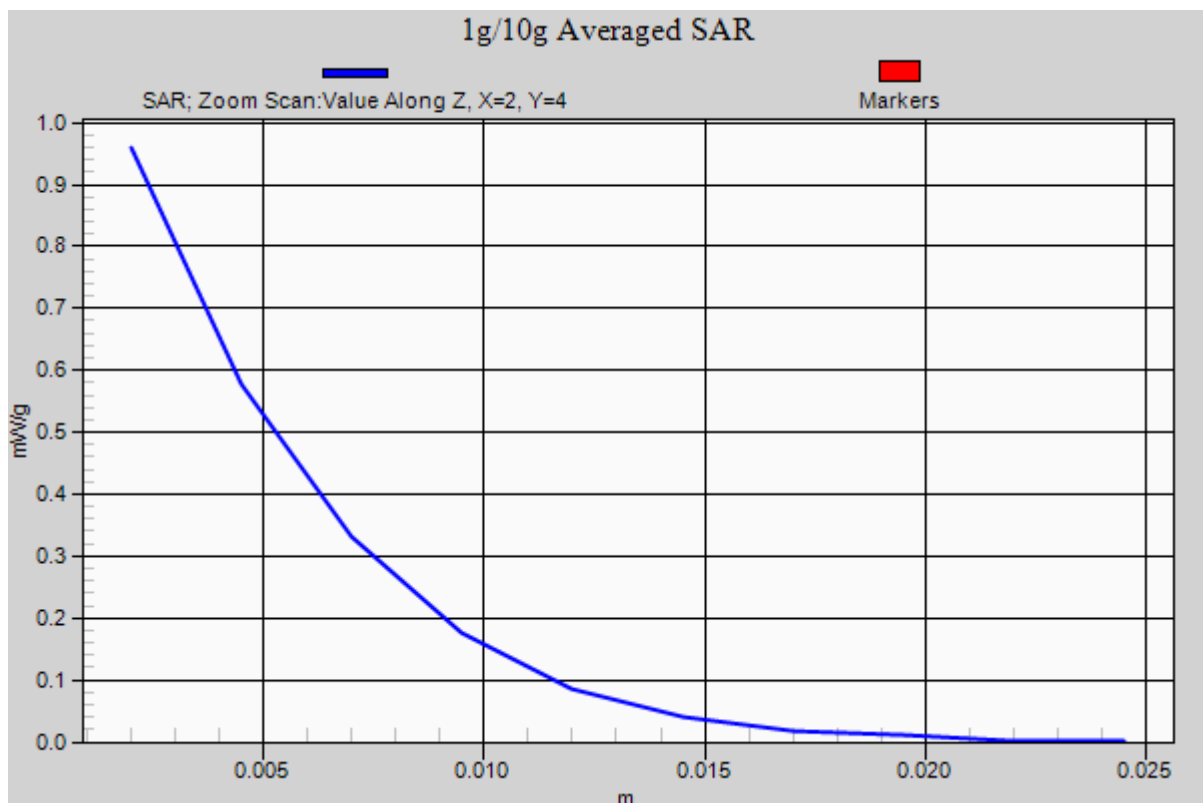
Ch165/Zoom Scan (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 1.89 V/m; Power Drift = -0.152 dB

Peak SAR (extrapolated) = 0.892 W/kg

SAR(1 g) = 0.379 mW/g; SAR(10 g) = 0.169 mW/g

Maximum value of SAR (measured) = 0.621 mW/g



#174 802.11n(20M)_Face_0cm_Ch157_Sample1_Keypad4_Holster2

DUT: 0D0904-03

Communication System: 802.11n; Frequency: 5785 MHz; Duty Cycle: 1:1

Medium: MSL_5G_101213 Medium parameters used: $f = 5785 \text{ MHz}$; $\sigma = 5.93 \text{ mho/m}$; $\epsilon_r = 46.6$; $\rho = 1000 \text{ kg/m}^3$

Ambient Temperature : 22.4 ; Liquid Temperature : 21.3

DASY5 Configuration:

- Probe: EX3DV4 - SN3731; ConvF(3.55, 3.55, 3.55); Calibrated: 2010/9/20
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn778; Calibrated: 2010/10/22
- Phantom: ELI 4.0; Type: QDOVA001BA; Serial: 1029
- Measurement SW: DASY5, V5.0 Build 125; SEMCAD X Version 13.4 Build 125

Ch157/Area Scan (141x241x1): Measurement grid: $dx=10\text{mm}$, $dy=10\text{mm}$

Maximum value of SAR (interpolated) = 0.102 mW/g

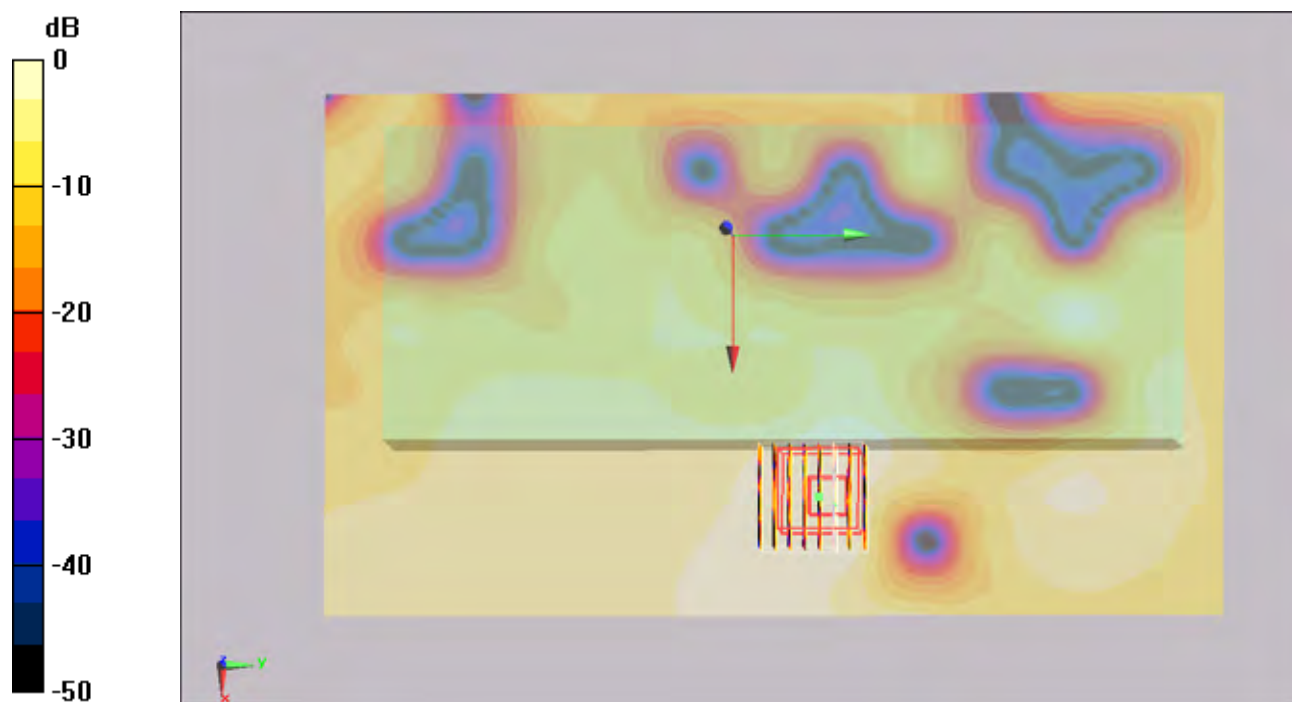
Ch157/Zoom Scan (8x8x10)/Cube 0: Measurement grid: $dx=4\text{mm}$, $dy=4\text{mm}$, $dz=2.5\text{mm}$

Reference Value = 0.972 V/m; Power Drift = -0.103 dB

Peak SAR (extrapolated) = 0.136 W/kg

SAR(1 g) = 0.042 mW/g; SAR(10 g) = 0.017 mW/g

Maximum value of SAR (measured) = 0.083 mW/g



0 dB = 0.083mW/g



Appendix C. DASY Calibration Certificate

The DASY calibration certificates are shown as follows.



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



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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: **Sporton (Auden)**

Certificate No: **D2450V2-736_Jul09**

CALIBRATION CERTIFICATE

Object: **D2450V2 - SN: 736**

Calibration procedure(s): **QA CAL-05.v7
Calibration procedure for dipole validation kits**

Calibration date: **July 20, 2009**

Condition of the calibrated item: **In Tolerance**

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 (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-08 (No. 217-00898)	Oct-09
Power sensor HP 8481A	US37292783	06-Oct-08 (No. 217-00898)	Oct-09
Reference 20 dB Attenuator	SN: 5086 (20g)	31-Mar-09 (No. 217-01025)	Mar-10
Type-N mismatch combination	SN: 5047.2 / 06327	31-Mar-09 (No. 217-01029)	Mar-10
Reference Probe ES3DV2	SN: 3025	30-Apr-09 (No. ES3-3025_Apr09)	Apr-10
DAE4	SN: 601	07-Mar-09 (No. DAE4-601_Mar09)	Mar-10
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-07)	In house check: Oct-09
RF generator R&S SMT-05	100005	4-Aug-99 (in house check Oct-07)	In house check: Oct-09
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-08)	In house check: Oct-09

Calibrated by:	Name Claudio Leubler	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Function Technical Manager	Signature

Issued: July 22, 2009

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

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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	V5.0
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	2450 MHz $\pm$ 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	40.2 $\pm$ 6 %	1.78 mho/m $\pm$ 6 %
Head TSL temperature during test	(22.0 $\pm$ 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	13.4 mW / g
SAR normalized	normalized to 1W	53.6 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	54.2 mW /g $\pm$ 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	6.33 mW / g
SAR normalized	normalized to 1W	25.3 mW / g
SAR for nominal Head TSL parameters ¹	normalized to 1W	25.5 mW /g $\pm$ 16.5 % (k=2)

¹ Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"

Body TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	52.7	1.95 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	52.8 ± 6 %	1.99 mho/m ± 6 %
Body TSL temperature during test	(21.0 ± 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	13.4 mW / g
SAR normalized	normalized to 1W	53.6 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	53.0 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	250 mW input power	6.26 mW / g
SAR normalized	normalized to 1W	25.0 mW / g
SAR for nominal Body TSL parameters ²	normalized to 1W	24.9 mW /g ± 16.5 % (k=2)

² Correction to nominal TSL parameters according to d), chapter "SAR Sensitivities"



Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.9 Ω + 2.2 j Ω
Return Loss	- 27.2 dB

Antenna Parameters with Body TSL

Impedance, transformed to feed point	49.7 Ω + 4.2 j Ω
Return Loss	- 27.4 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.158 ns
----------------------------------	----------

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

The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals.
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	August 26, 2003

DASY5 Validation Report for Head TSL

Date/Time: 20.07.2009 17:44:29

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN736

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: HSL U11 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.78$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.35, 4.35, 4.35); Calibrated: 30.04.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:

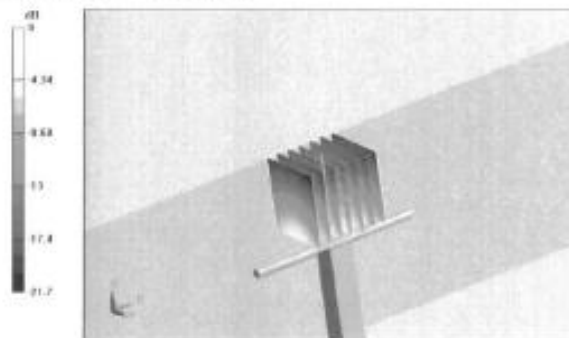
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.6 V/m; Power Drift = 0.037 dB

Peak SAR (extrapolated) = 27.4 W/kg

SAR(1 g) = 13.4 mW/g; SAR(10 g) = 6.33 mW/g

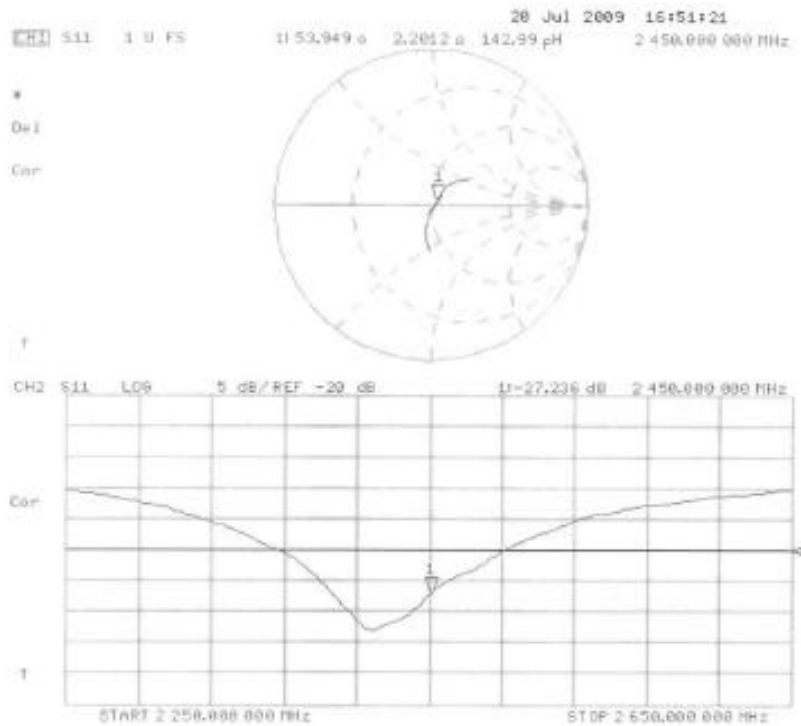
Maximum value of SAR (measured) = 16.9 mW/g



0 dB = 16.9mW/g



Impedance Measurement Plot for Head TSL



DASY5 Validation Report for Body TSL

Date/Time: 14.07.2009 17:46:41

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:736

Communication System: CW; Frequency: 2450 MHz; Duty Cycle: 1:1

Medium: MSL U10 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 2$ mho/m; $\epsilon_r = 52.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY5 (IEEE/IEC)

DASY5 Configuration:

- Probe: ES3DV2 - SN3025; ConvF(4.06, 4.06, 4.06); Calibrated: 30.04.2009
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 S0601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.0 Build 120; SEMCAD X Version 13.4 Build 45

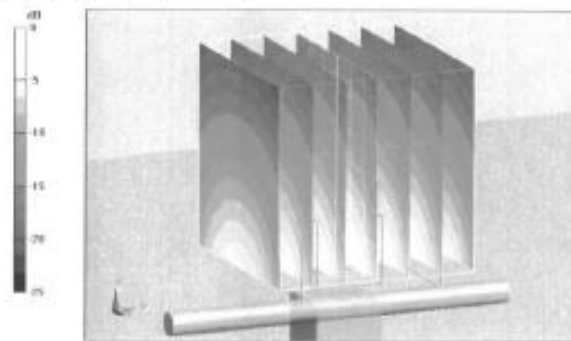
Pin = 250 mW; d = 10 mm/Zoom Scan (7x7x7)/Cube 0:Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 98 V/m; Power Drift = -0.018 dB

Peak SAR (extrapolated) = 27.1 W/kg

SAR(1 g) = 13.4 mW/g; SAR(10 g) = 6.26 mW/g

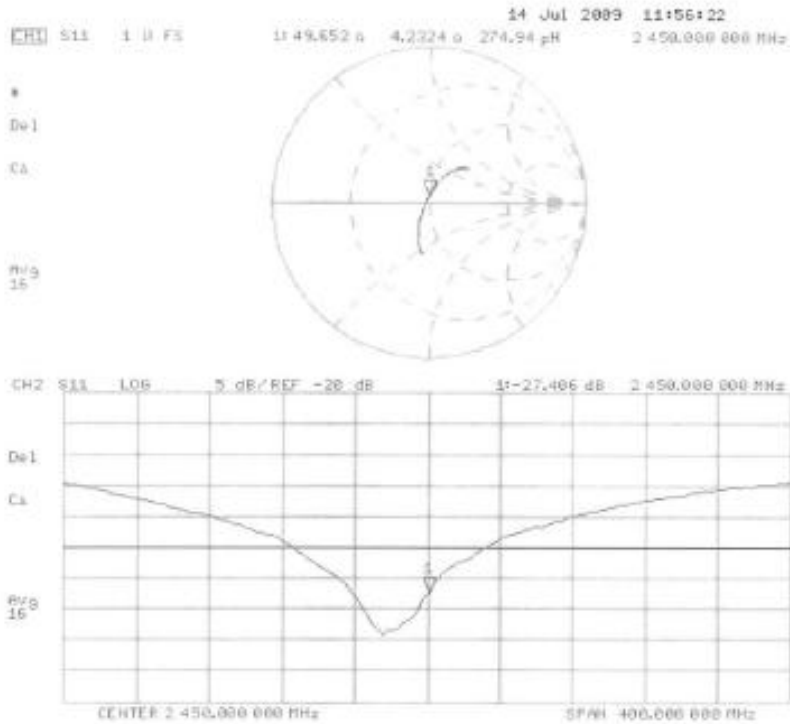
Maximum value of SAR (measured) = 17.8 mW/g



0 dB = 17.8mW/g



Impedance Measurement Plot for Body TSL



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Accreditation No.: **SCS 108**

Client **Sporton (Auden)**

Certificate No: **D5GHzV2-1006_Jan10/2**

CALIBRATION CERTIFICATE (Replacement of No:D5GHzV2-1006_Jan10)

Object **D5GHzV2 - SN: 1006**

Calibration procedure(s) **QA CAL-22.v1
 Calibration procedure for dipole validation kits between 3-6 GHz**

Calibration date: **January 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)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter EPM-442A	GB37480704	06-Oct-09 (No. 217-01086)	Oct-10
Power sensor HP 8481A	US37292783	06-Oct-09 (No. 217-01086)	Oct-10
Reference 20 dB Attenuator	SN: 5086 (20g)	31-Mar-09 (No. 217-01025)	Mar-10
Type-N mismatch combination	SN: 5047.2 / 06327	31-Mar-09 (No. 217-01029)	Mar-10
Reference Probe EX3DV4	SN: 3503	11-Mar-09 (No. EX3-3503_Mar09)	Mar-10
DAE4	SN: 601	07-Mar-09 (No. DAE4-601_Mar09)	Mar-10
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092317	18-Oct-02 (in house check Oct-09)	In house check: Oct-11
RF generator R&S SMT-06	100005	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585 S4206	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

Calibrated by:	Name Claudio Leubler	Function Laboratory Technician	Signature 
Approved by:	Katja Pokovic	Technical Manager	

Issued: April 21, 2010

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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:

- IEC Std 62209 Part 2, "Evaluation of Human Exposure to Radio Frequency Fields from Handheld and Body-Mounted Wireless Communication Devices in the Frequency Range of 30 MHz to 6 GHz: Human models, Instrumentation, and Procedures"; Part 2: "Procedure to determine the Specific Absorption Rate (SAR) for including accessories and multiple transmitters", Draft Version 0.9, December 2004
- 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	V5.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Area Scan resolution	dx, dy = 10 mm	
Zoom Scan Resolution	dx, dy = 4.0 mm, dz = 2.5 mm	
Frequency	5200 MHz $\pm$ 1 MHz 5500 MHz $\pm$ 1 MHz 5800 MHz $\pm$ 1 MHz	

Head TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	36.0	4.66 mho/m
Measured Head TSL parameters	(22.0 $\pm$ 0.2) °C	34.8 $\pm$ 6 %	4.58 mho/m $\pm$ 6 %
Head TSL temperature during test	(21.2 $\pm$ 0.2) °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	100 mW input power	8.28 mW / g
SAR normalized	normalized to 1W	82.8 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	82.2 mW / g $\pm$ 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.35 mW / g
SAR normalized	normalized to 1W	23.5 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	23.3 mW / g $\pm$ 19.5 % (k=2)

Head TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.6	4.96 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	34.1 ± 6 %	4.86 mho/m ± 6 %
Head TSL temperature during test	(21.2 ± 0.2) °C	----	----

SAR result with Head TSL at 5500 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	100 mW input power	8.96 mW / g
SAR normalized	normalized to 1W	89.6 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	88.8 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.53 mW / g
SAR normalized	normalized to 1W	25.3 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	25.0 mW / g ± 19.5 % (k=2)

Head TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	35.3	5.27 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	33.7 ± 6 %	5.13 mho/m ± 6 %
Head TSL temperature during test	(21.2 ± 0.2) °C	----	----

SAR result with Head TSL at 5800 MHz

SAR averaged over 1 cm ³ (1 g) of Head TSL	condition	
SAR measured	100 mW input power	7.90 mW / g
SAR normalized	normalized to 1W	79.0 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	78.2 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.23 mW / g
SAR normalized	normalized to 1W	22.3 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	22.3 mW / g ± 19.5 % (k=2)

Body TSL parameters at 5200 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	49.0	5.30 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	47.5 ± 6 %	5.52 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL at 5200 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	100 mW input power	7.95 mW / g
SAR normalized	normalized to 1W	79.5 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	79.0 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.21 mW / g
SAR normalized	normalized to 1W	22.1 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	22.0 mW / g ± 19.5 % (k=2)

Body TSL parameters at 5500 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.6	5.65 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.8 ± 6 %	5.89 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL at 5500 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	100 mW input power	8.60 mW / g
SAR normalized	normalized to 1W	86.0 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	85.4 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.36 mW / g
SAR normalized	normalized to 1W	23.6 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	23.5 mW / g ± 19.5 % (k=2)

Body TSL parameters at 5800 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Body TSL parameters	22.0 °C	48.2	6.00 mho/m
Measured Body TSL parameters	(22.0 ± 0.2) °C	46.1 ± 6 %	6.26 mho/m ± 6 %
Body TSL temperature during test	(22.0 ± 0.2) °C	----	----

SAR result with Body TSL at 5800 MHz

SAR averaged over 1 cm ³ (1 g) of Body TSL	condition	
SAR measured	100 mW input power	7.43 mW / g
SAR normalized	normalized to 1W	74.3 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	73.7 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Body TSL	condition	
SAR measured	100 mW input power	2.04 mW / g
SAR normalized	normalized to 1W	20.4 mW / g
SAR for nominal Body TSL parameters	normalized to 1W	20.2 mW / g ± 19.5 % (k=2)



Appendix

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	53.4 Ω - 10.6 j Ω
Return Loss	-19.4 dB

Antenna Parameters with Head TSL at 5500 MHz

Impedance, transformed to feed point	49.4 Ω - 2.4 j Ω
Return Loss	-32.1 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	58.2 Ω + 4.8 j Ω
Return Loss	-21.2 dB

Antenna Parameters with Body TSL at 5200 MHz

Impedance, transformed to feed point	52.6 Ω - 11.1 j Ω
Return Loss	-19.1 dB

Antenna Parameters with Body TSL at 5500 MHz

Impedance, transformed to feed point	47.1 Ω - 0.4 j Ω
Return Loss	-30.4 dB

Antenna Parameters with Body TSL at 5800 MHz

Impedance, transformed to feed point	57.6 Ω + 7.8 j Ω
Return Loss	-19.9 dB



General Antenna Parameters and Design

Electrical Delay (one direction)	1.179 ns
----------------------------------	----------

After long term use with 40 W 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	August 28, 2003

DASY5 Validation Report for Head TSL

Date/Time: 21.01.2010 15:03:20

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN:1006

Communication System: CW; Frequency: 5200 MHz, Frequency: 5500 MHz, Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: HSL 3-6 GHz

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.6$ mho/m; $\epsilon_r = 34.7$; $\rho = 1000$ kg/m³

Medium parameters used: $f = 5500$ MHz; $\sigma = 4.88$ mho/m; $\epsilon_r = 34.1$; $\rho = 1000$ kg/m³

Medium parameters used: $f = 5800$ MHz; $\sigma = 5.16$ mho/m; $\epsilon_r = 33.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: IEX3DV4 - SN3503; ConvF(5.36, 5.36, 5.36), ConvF(4.85, 4.85, 4.85), ConvF(4.74, 4.74, 4.74); Calibrated: 11.03.2009
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration D5GHzV2 Dipole (Head)/d=10mm, Pin=100mW, f=5200 MHz/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 64.8 V/m; Power Drift = 0.063 dB

Peak SAR (extrapolated) = 31.6 W/kg

SAR(1 g) = 8.28 mW/g; SAR(10 g) = 2.35 mW/g

Maximum value of SAR (measured) = 16.1 mW/g

Configuration D5GHzV2 Dipole (Head)/d=10mm, Pin=100mW, f=5500 MHz/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 66.2 V/m; Power Drift = 0.090 dB

Peak SAR (extrapolated) = 35.9 W/kg

SAR(1 g) = 8.96 mW/g; SAR(10 g) = 2.53 mW/g

Maximum value of SAR (measured) = 17.6 mW/g

Configuration D5GHzV2 Dipole (Head)/d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0:

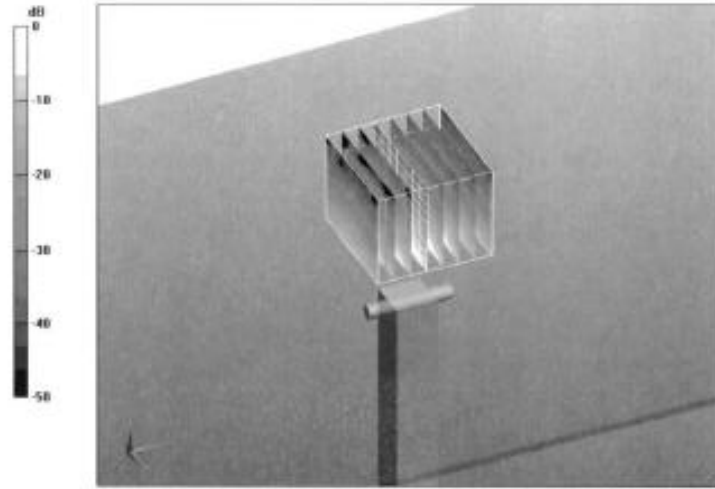
Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 61.5 V/m; Power Drift = -0.078 dB

Peak SAR (extrapolated) = 33.7 W/kg

SAR(1 g) = 7.9 mW/g; SAR(10 g) = 2.23 mW/g

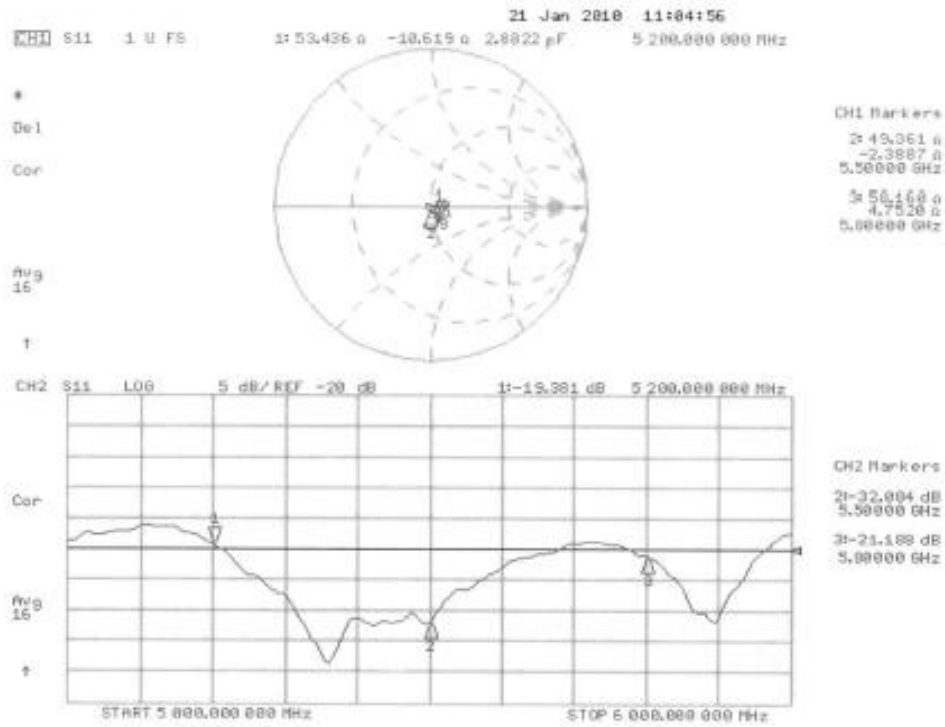
Maximum value of SAR (measured) = 15.7 mW/g



0 dB = 15.7mW/g



Impedance Measurement Plot for Head TSL





DASY5 Validation Report for Body TSL

Date/Time: 20.01.2010 14:47:25

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN:1006

Communication System: CW; Frequency: 5200 MHz, Frequency: 5500 MHz, Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: MSL 3-6 GHz

Medium parameters used: $f = 5200$ MHz; $\sigma = 5.52$ mho/m; $\epsilon_r = 47.5$; $\rho = 1000$ kg/m³

Medium parameters used: $f = 5500$ MHz; $\sigma = 5.89$ mho/m; $\epsilon_r = 46.8$; $\rho = 1000$ kg/m³

Medium parameters used: $f = 5800$ MHz; $\sigma = 6.26$ mho/m; $\epsilon_r = 46.1$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(4.88, 4.88, 4.88), ConvF(4.37, 4.37, 4.37), ConvF(4.57, 4.57, 4.57); Calibrated: 11.03.2009
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 07.03.2009
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; Serial: 1002
- Measurement SW: DASY5, V5.2 Build 157; SEMCAD X Version 14.0 Build 57

Configuration D5GHzV2 Dipole (Body)/d=10mm, Pin=100mW, f=5200 MHz 2/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 60.4 V/m; Power Drift = -0.037 dB

Peak SAR (extrapolated) = 30.8 W/kg

SAR(1 g) = 7.95 mW/g; SAR(10 g) = 2.21 mW/g

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

Configuration D5GHzV2 Dipole (Body)/d=10mm, Pin=100mW, f=5500 MHz/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 60.9 V/m; Power Drift = -0.030 dB

Peak SAR (extrapolated) = 35.7 W/kg

SAR(1 g) = 8.6 mW/g; SAR(10 g) = 2.36 mW/g

Maximum value of SAR (measured) = 17.3 mW/g

Configuration D5GHzV2 Dipole (Body)/d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0:

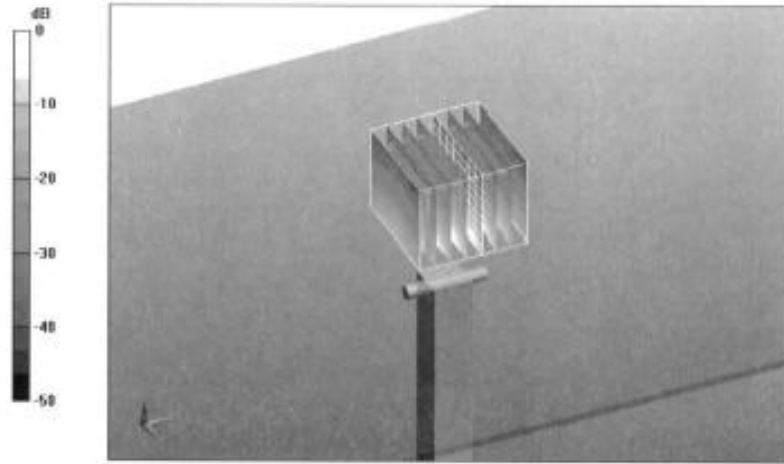
Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 55.3 V/m; Power Drift = -0.026 dB

Peak SAR (extrapolated) = 32.8 W/kg

SAR(1 g) = 7.43 mW/g; SAR(10 g) = 2.04 mW/g

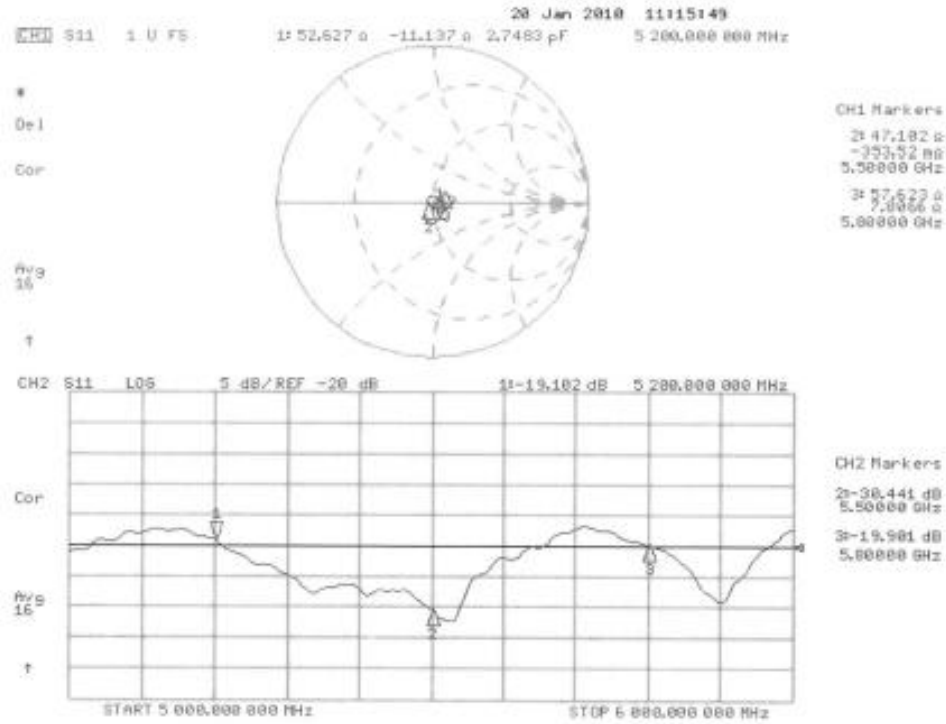
Maximum value of SAR (measured) = 15.3 mW/g



0 dB = 15.3mW/g



Impedance Measurement Plot for Body TSL





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Accreditation No.: SCS 108

Client Sporton (Auden)

Certificate No: DAE4-778_Oct10

CALIBRATION CERTIFICATE

Object DAE4 - SD 000 D04 BJ - SN: 778

Calibration procedure(s) QA CAL-06.v22
Calibration procedure for the data acquisition electronics (DAE)

Calibration date: October 22, 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 1004	07-Jun-10 (in house check)	In house check: Jun-11

Calibrated by:	Name Eric Hainfeld	Function Technician	Signature
Approved by:	Fin Bornholt	R&D Director	

Issued: October 22, 2010

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Accreditation No.: **SCS 108**

Glossary

DAE data acquisition electronics
Connector angle information used in DASY 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 DASY 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 = 6.1 μ V , full range = -100...+300 mV

Low Range: 1LSB = 61 nV , full range = -1.....+3mV

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

Calibration Factors	X	Y	Z
High Range	404.679 $\pm$ 0.1% (k=2)	403.480 $\pm$ 0.1% (k=2)	405.025 $\pm$ 0.1% (k=2)
Low Range	3.98633 $\pm$ 0.7% (k=2)	3.96375 $\pm$ 0.7% (k=2)	3.99940 $\pm$ 0.7% (k=2)

Connector Angle

Connector Angle to be used in DASY system	64.5 ° $\pm$ 1 °
---	------------------

Appendix

1. DC Voltage Linearity

High Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	200004.4	1.89	0.00
Channel X + Input	20001.11	1.41	0.01
Channel X - Input	-19998.36	1.54	-0.01
Channel Y + Input	199996.1	3.42	0.00
Channel Y + Input	19999.75	0.35	0.00
Channel Y - Input	-19999.92	-0.12	0.00
Channel Z + Input	200002.7	1.29	0.00
Channel Z + Input	19996.85	-2.55	-0.01
Channel Z - Input	-20004.31	-4.61	0.02

Low Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	2000.0	0.09	0.00
Channel X + Input	200.02	0.02	0.01
Channel X - Input	-198.62	1.48	-0.74
Channel Y + Input	1999.6	-0.58	-0.03
Channel Y + Input	199.13	-0.57	-0.29
Channel Y - Input	-200.71	-0.61	0.31
Channel Z + Input	2000.1	-0.01	-0.00
Channel Z + Input	198.96	-1.14	-0.57
Channel Z - Input	-200.98	-0.98	0.49

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	-5.28	-6.07
	- 200	6.79	6.12
Channel Y	200	-1.80	-1.60
	- 200	0.97	0.35
Channel Z	200	-9.76	-9.86
	- 200	7.56	7.61

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	-	1.86	-0.66
Channel Y	200	2.28	-	2.89
Channel Z	200	1.68	-0.15	-

**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	16056	16950
Channel Y	16153	13741
Channel Z	16441	16086

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	0.32	-2.35	2.08	0.55
Channel Y	-1.83	-2.96	-0.72	0.47
Channel Z	-1.93	-3.00	-0.90	0.45

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)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct10

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

Issued: September 22, 2010

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Certificate No: ET3-1788_Sep10

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Accreditation No.: **SCS 108**

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 effect the E²-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.
- 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.



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 DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

ET3DV6 SN:1788

September 21, 2010

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 E^2 -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.



ET3DV6 SN:1788

September 21, 2010

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.



ET3DV6 SN:1788

September 21, 2010

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%

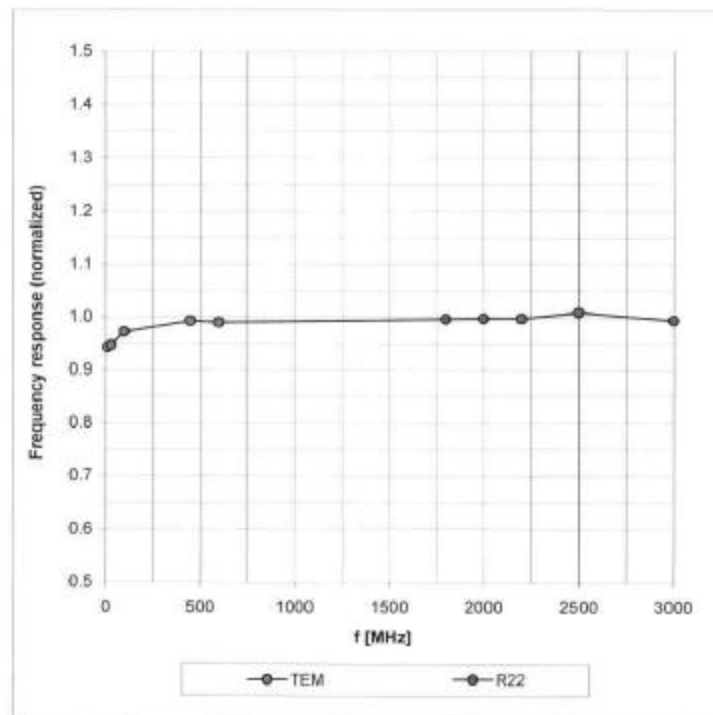
^c The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

ET3DV6 SN:1788

September 21, 2010

Frequency Response of E-Field

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

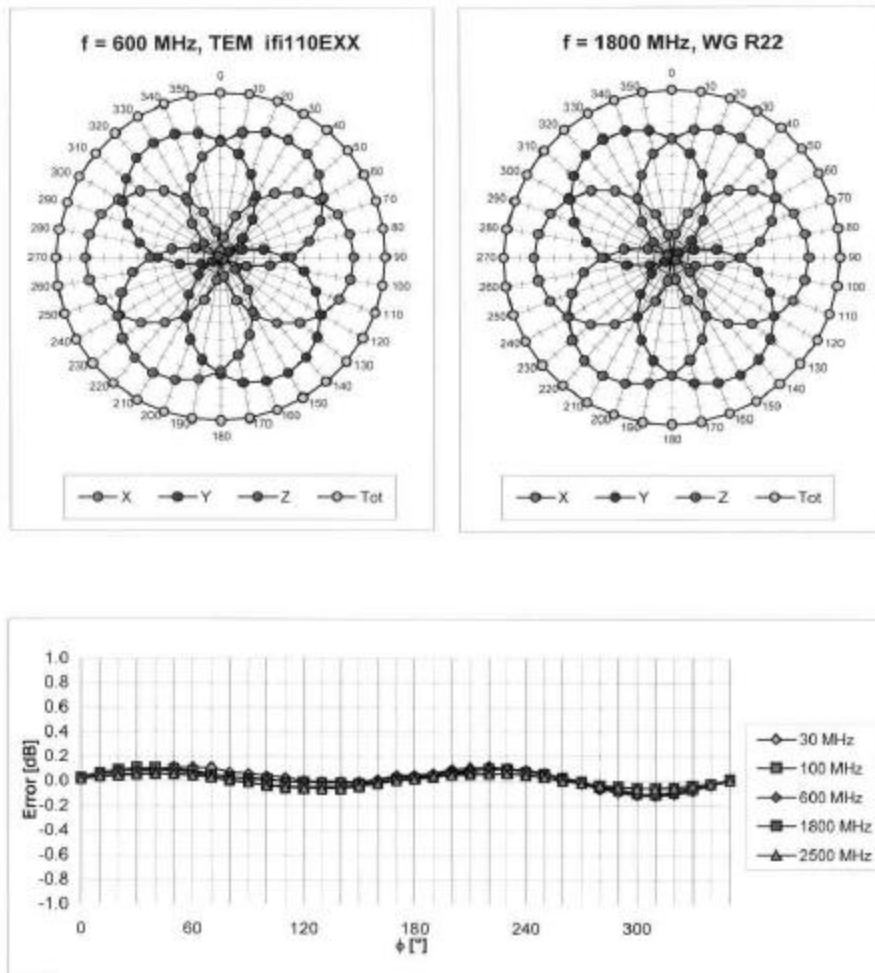


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

ET3DV6 SN:1788

September 21, 2010

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

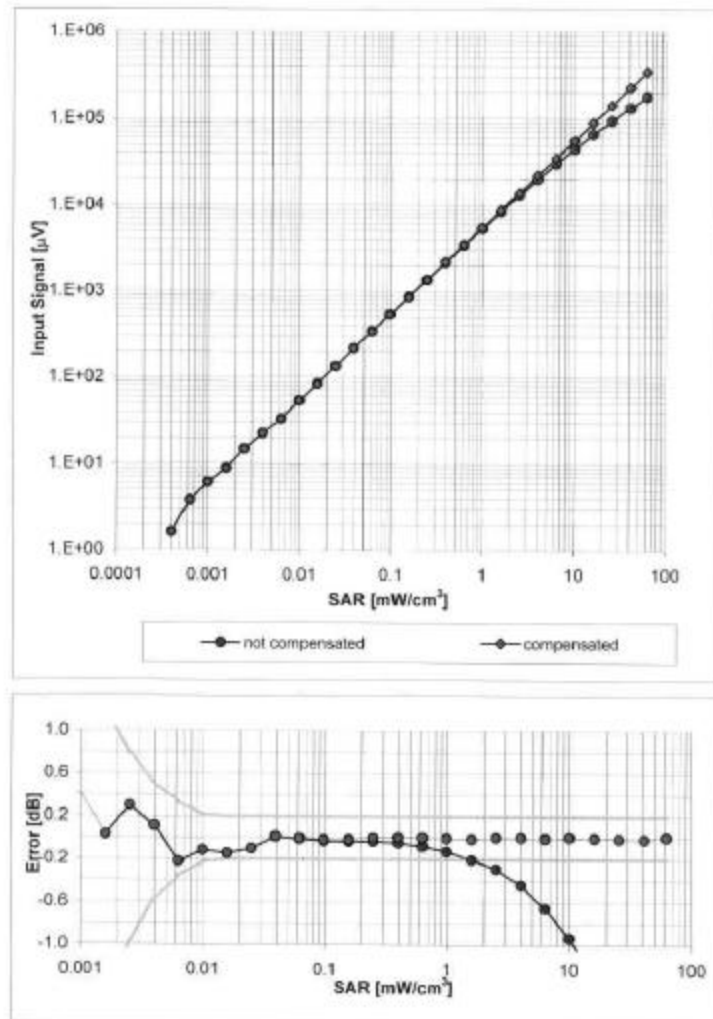


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

ET3DV6 SN:1788

September 21, 2010

Dynamic Range $f(\text{SAR}_{\text{head}})$ (Waveguide R22, $f = 1800 \text{ MHz}$)

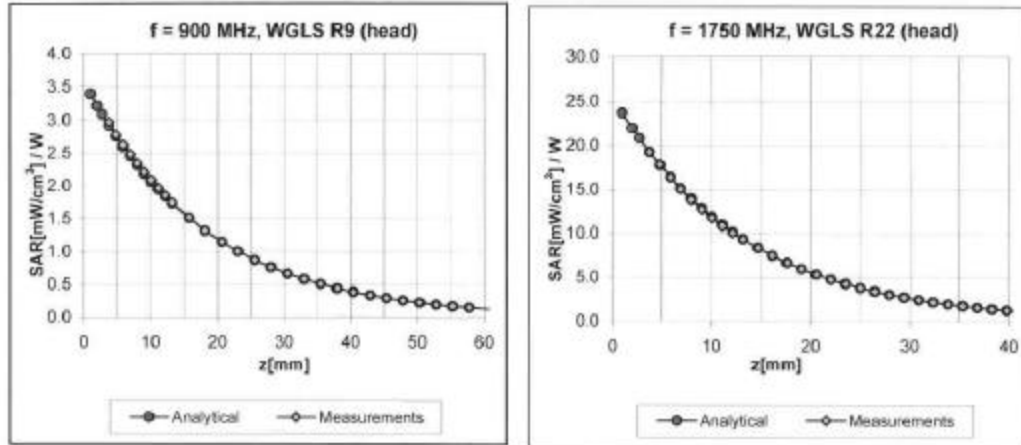


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

ET3DV6 SN:1788

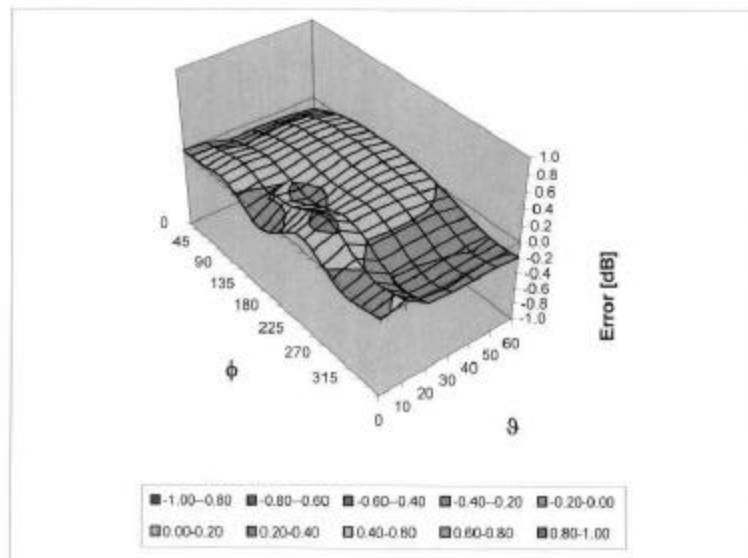
September 21, 2010

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error (ϕ , θ), f = 900 MHz



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



ET3DV6 SN:1788

September 21, 2010

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



Calibration Laboratory of
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Accreditation No.: SCS 108

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

Client **Sporton (Auden)**

Certificate No: **EX3-3731_Sep10**

CALIBRATION CERTIFICATE

Object **EX3DV4 - SN:3731**

Calibration procedure(s) **QA CAL-01.v6, QA CAL-14.v3, QA CAL-23.v3 and QA CAL-25.v2
Calibration procedure for dosimetric E-field probes**

Calibration date: **September 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 $(22 \pm 3)^\circ\text{C}$ and humidity $< 70\%$.

Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41495277	1-Apr-10 (No. 217-01136)	Apr-11
Power sensor E4412A	MY41498087	1-Apr-10 (No. 217-01136)	Apr-11
Reference 3 dB Attenuator	SN: S5054 (3c)	30-Mar-10 (No. 217-01159)	Mar-11
Reference 20 dB Attenuator	SN: S5086 (20b)	30-Mar-10 (No. 217-01161)	Mar-11
Reference 30 dB Attenuator	SN: S5129 (30b)	30-Mar-10 (No. 217-01160)	Mar-11
Reference Probe ES3DV2	SN: 3013	30-Dec-09 (No. ES3-3013_Dec09)	Dec-10
DAE4	SN: 660	20-Apr-10 (No. DAE4-660_Apr10)	Apr-11

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (in house check Oct-09)	In house check: Oct-11
Network Analyzer HP 8753E	US37390585	18-Oct-01 (in house check Oct-09)	In house check: Oct-10

Calibrated by:	Name Katja Pokovic	Function Technical Manager	Signature
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Approved by:	Name Fin Bornholt	Function R&D Director	Signature
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Issued: September 22, 2010

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

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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
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 effect 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.
- 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.



EX3DV4 SN:3731

September 20, 2010

Probe EX3DV4

SN:3731

Manufactured:	October 19, 2009
Last calibrated:	July 16, 2010
Repaired:	September 8, 2010
Recalibrated:	September 20, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

EX3DV4 SN:3731

September 20, 2010

DASY/EASY - Parameters of Probe: EX3DV4 SN:3731
Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.51	0.53	0.56	$\pm 10.1\%$
DCP (mV) ^B	87.1	87.4	87.7	

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	$\pm 1.5\%$
			Y	0.00	0.00	1.00	300	
			Z	0.00	0.00	1.00	300	

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.



EX3DV4 SN:3731

September 20, 2010

DASY/EASY - Parameters of Probe: EX3DV4 SN:3731

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%	8.85	8.85	8.85	0.60	0.69 ± 11.0%
1900	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	7.46	7.46	7.46	0.75	0.60 ± 11.0%
2300	± 50 / ± 100	39.5 ± 5%	1.67 ± 5%	7.16	7.16	7.16	0.47	0.71 ± 11.0%
2600	± 50 / ± 100	39.0 ± 5%	1.96 ± 5%	6.88	6.88	6.88	0.31	0.95 ± 11.0%
3500	± 50 / ± 100	37.9 ± 5%	2.91 ± 5%	6.60	6.60	6.60	0.20	1.50 ± 13.1%
5200	± 50 / ± 100	36.0 ± 5%	4.66 ± 5%	4.83	4.83	4.83	0.35	1.90 ± 13.1%
5300	± 50 / ± 100	35.9 ± 5%	4.76 ± 5%	4.46	4.46	4.46	0.38	1.90 ± 13.1%
5500	± 50 / ± 100	35.6 ± 5%	4.96 ± 5%	4.46	4.46	4.46	0.42	1.90 ± 13.1%
5600	± 50 / ± 100	35.5 ± 5%	5.07 ± 5%	4.07	4.07	4.07	0.48	1.90 ± 13.1%
5800	± 50 / ± 100	35.3 ± 5%	5.27 ± 5%	4.22	4.22	4.22	0.50	1.90 ± 13.1%

^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.



EX3DV4 SN:3731

September 20, 2010

DASY/EASY - Parameters of Probe: EX3DV4 SN:3731**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%	8.84	8.84	8.84	0.49	0.79 ± 11.0%
1900	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	7.13	7.13	7.13	0.65	0.66 ± 11.0%
2300	± 50 / ± 100	52.8 ± 5%	1.85 ± 5%	7.12	7.12	7.12	0.37	0.88 ± 11.0%
2600	± 50 / ± 100	52.5 ± 5%	2.16 ± 5%	6.85	6.85	6.85	0.32	0.97 ± 11.0%
3500	± 50 / ± 100	51.3 ± 5%	3.31 ± 5%	6.02	6.02	6.02	0.30	1.43 ± 13.1%
5200	± 50 / ± 100	49.0 ± 5%	5.30 ± 5%	3.87	3.87	3.87	0.60	1.95 ± 13.1%
5300	± 50 / ± 100	48.9 ± 5%	5.42 ± 5%	3.63	3.63	3.63	0.60	1.95 ± 13.1%
5500	± 50 / ± 100	48.6 ± 5%	5.65 ± 5%	3.44	3.44	3.44	0.63	1.95 ± 13.1%
5600	± 50 / ± 100	48.5 ± 5%	5.77 ± 5%	3.20	3.20	3.20	0.65	1.95 ± 13.1%
5800	± 50 / ± 100	48.2 ± 5%	6.00 ± 5%	3.55	3.55	3.55	0.60	1.95 ± 13.1%

^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.

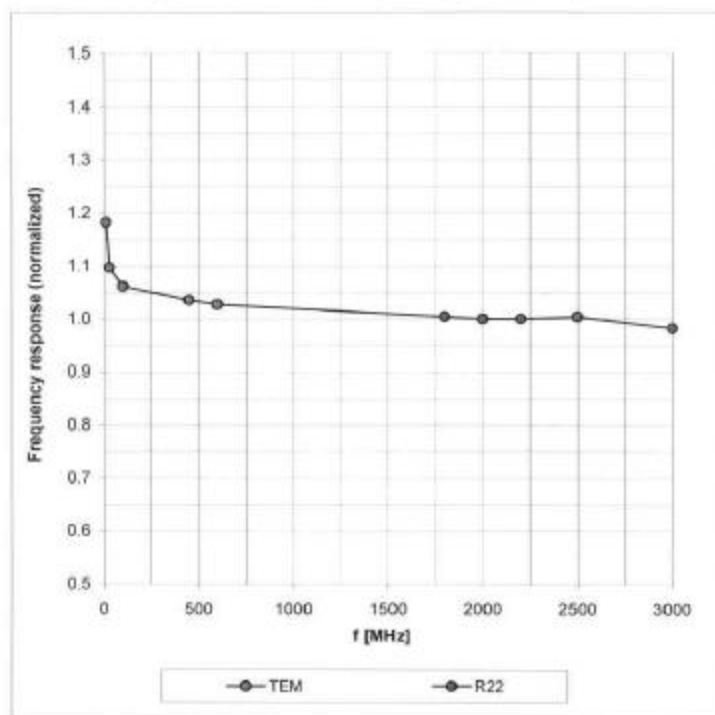


EX3DV4 SN:3731

September 20, 2010

Frequency Response of E-Field

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

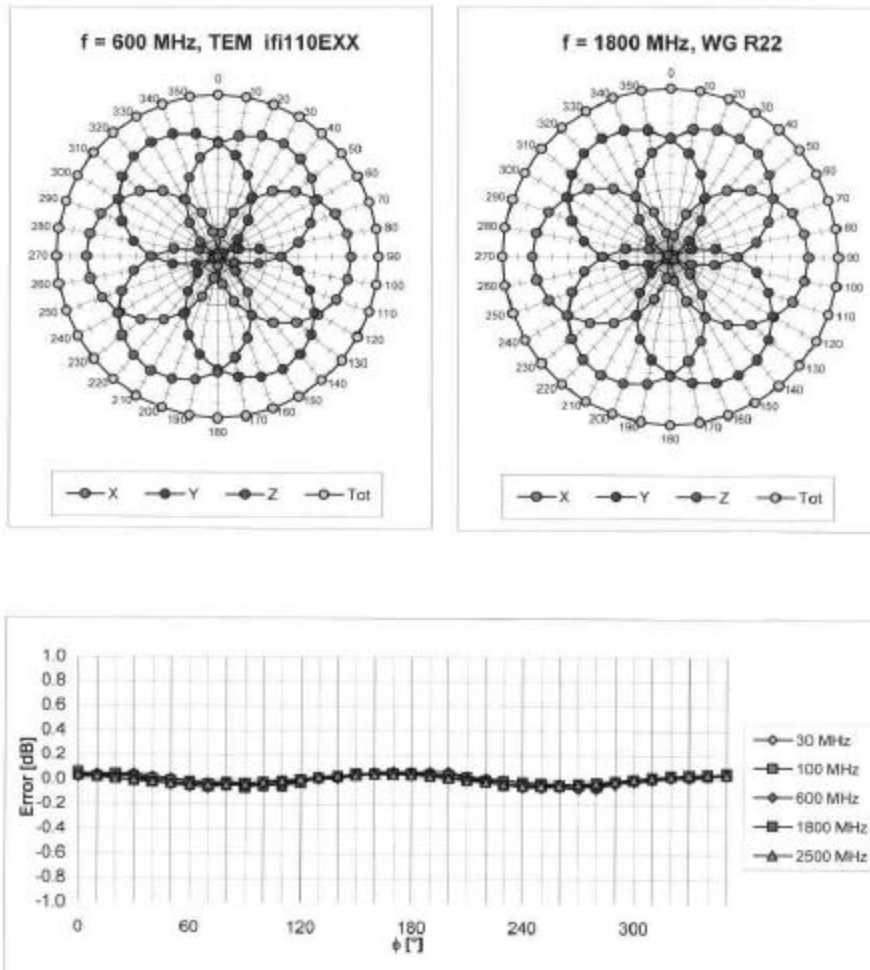


Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

EX3DV4 SN:3731

September 20, 2010

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

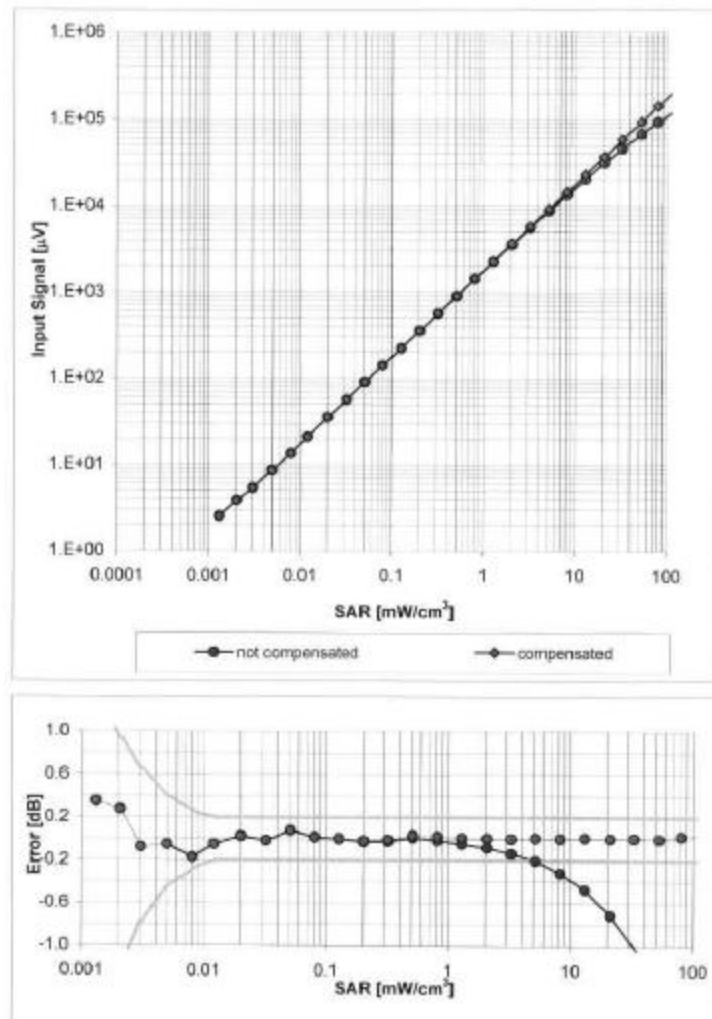


Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

EX3DV4 SN:3731

September 20, 2010

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

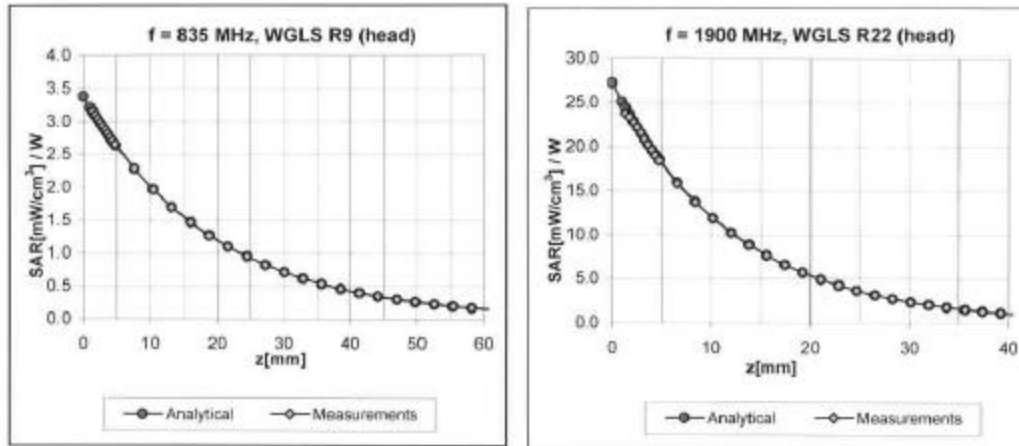


Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

EX3DV4 SN:3731

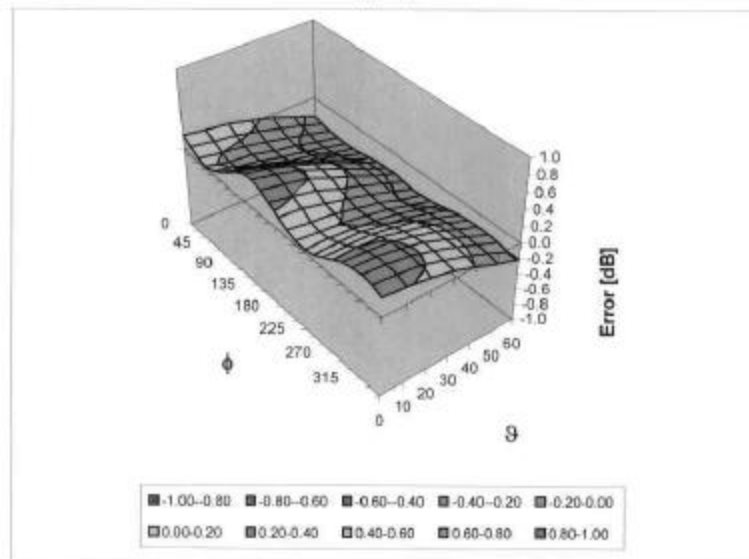
September 20, 2010

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error (ϕ , θ), f = 900 MHz



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



EX3DV4 SN:3731

September 20, 2010

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	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	2 mm

Appendix D. Product Photos

<DUT with Keypad 1>



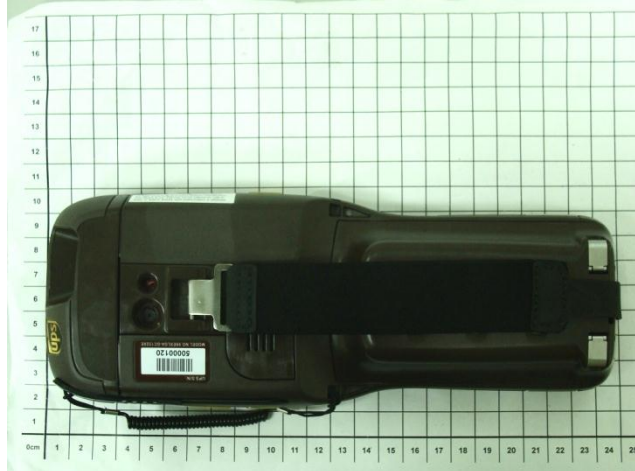
<DUT with Keypad 2>



<DUT with Keypad 3>



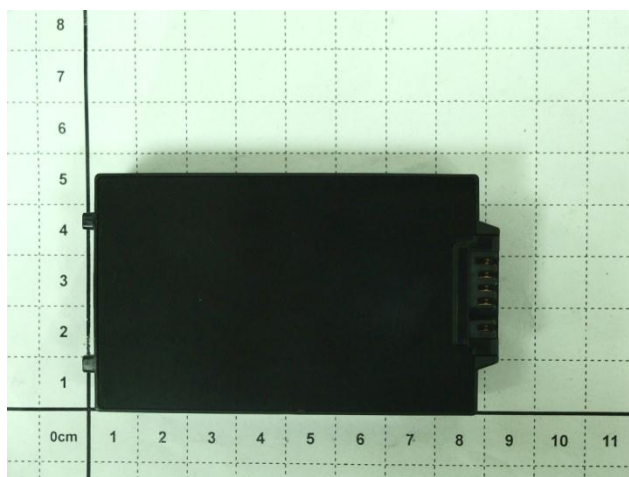
<DUT with Keypad 4>



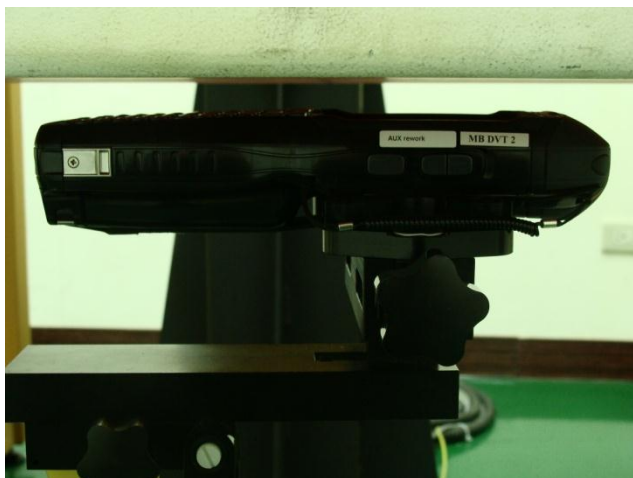
<Holster 1>



<Holster 2>



Appendix E. Test Setup Photos



Face of the DUT with Phantom 1.5 cm Gap
(DUT with Keypad 1)



Bottom of the DUT with Phantom 1.5 cm Gap
(DUT with Keypad 1)



Bottom of the DUT with Phantom 1.5 cm Gap
(DUT with Keypad 2)



Bottom of the DUT with Phantom 1.5 cm Gap
(DUT with Keypad 3)



Bottom of the DUT with Phantom 1.5 cm Gap
(DUT with Keypad 4)