

Appendix 1

SAR distribution comparison for the system accuracy verification

Date/Time: 3/21/2011 8:35:28 AM

Test Laboratory: Motorola - Mar-24-2011 835 MHz

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 425TR; FCC ID: IHDT56ME1

Procedure Notes: 835 MHz System Performance Check; Dipole Sn# 425TR; Input Power = 200 mW

Sim.Temp@meas = 20.5 C; Sim.Temp@SPC = 20.5 C; Room Temp @ SPC = 20.6 C

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

Medium: VALIDATION Only

Medium parameters used: $f = 835$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 41.5$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3124; ConvF(5.89, 5.89, 5.89); Calibrated: 8/11/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#4 Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1131;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.88 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0:

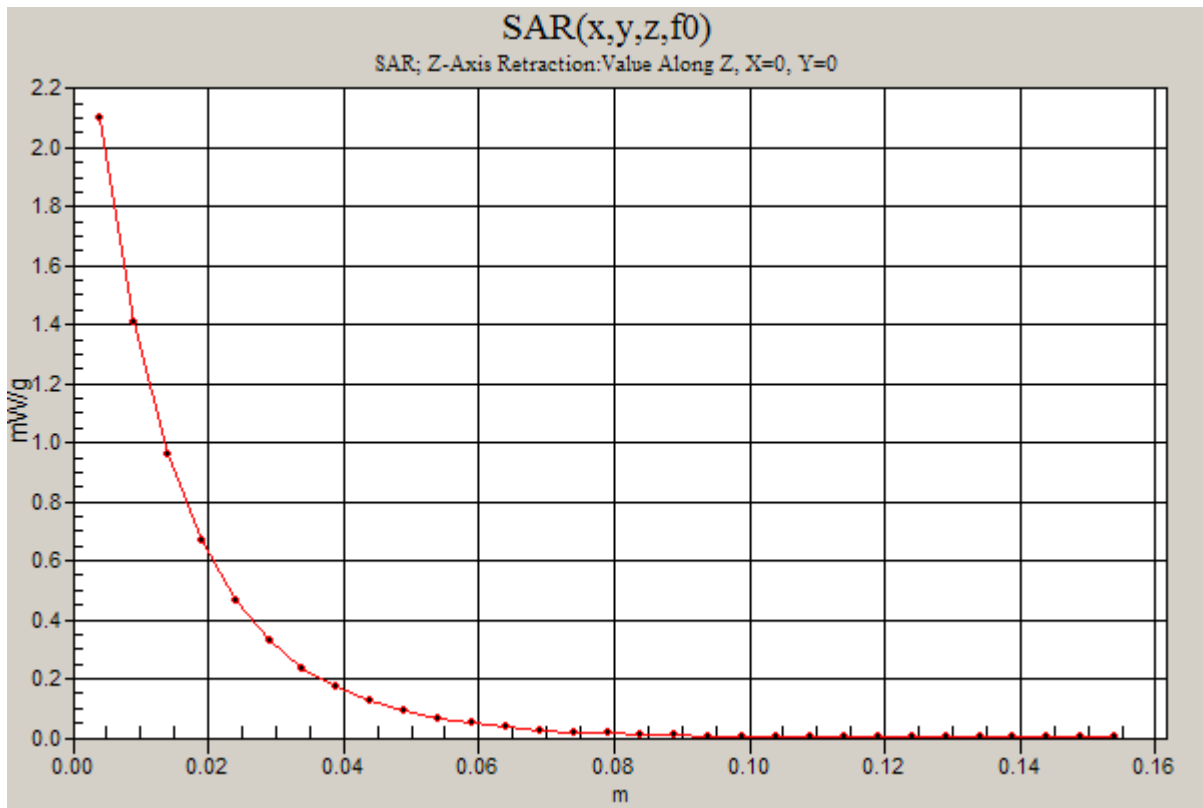
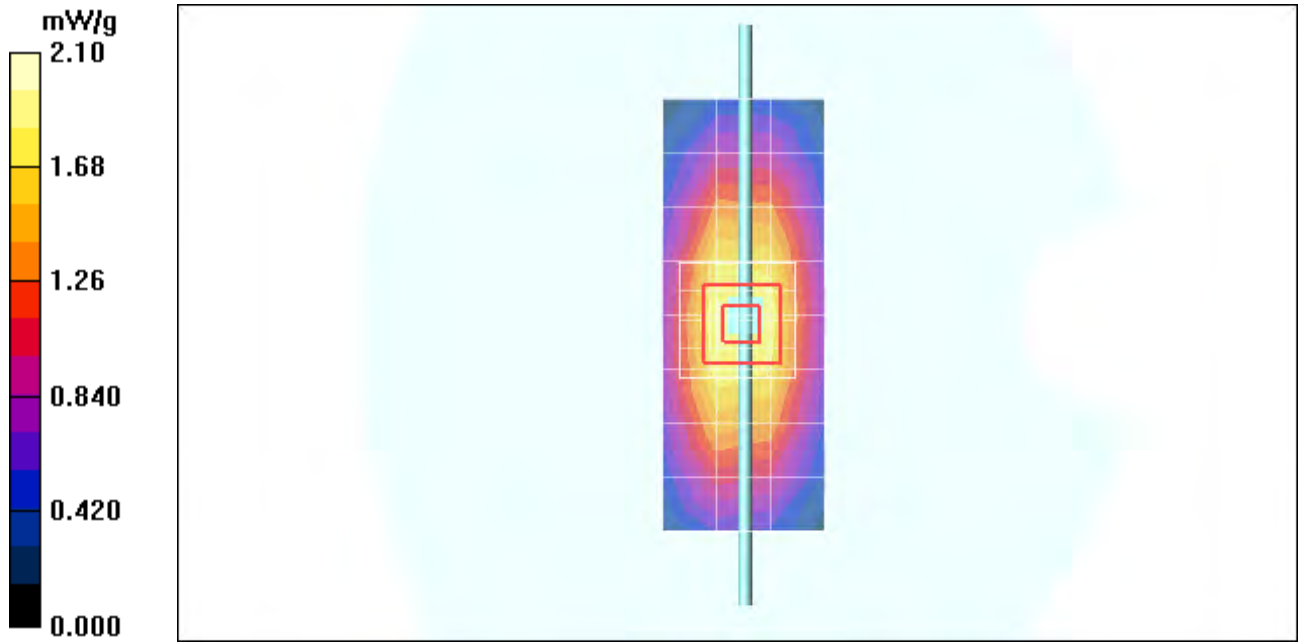
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 48.8 V/m; Power Drift = -0.002 dB; Peak SAR (extrapolated) = 2.92 W/kg

SAR(1 g) = 1.96 mW/g; SAR(10 g) = 1.28 mW/g; Maximum value of SAR (measured) = 2.11 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.10 mW/g



Date/Time: 3/15/2011 7:23:39 AM

Test Laboratory: Motorola - Mar-15-2011 835 MHz

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 424TR; FCC ID: IHDT56ME1

Procedure Notes: 835 MHz System Performance Check; Dipole Sn# 424TR; Input Power = 200 mW

Sim.Temp@meas = 20.2 C; Sim.Temp@SPC = 20.2 C; Room Temp @ SPC = 20.3 C

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

Medium: VALIDATION Only

Medium parameters used: $f = 835$ MHz; $\sigma = 0.92$ mho/m; $\epsilon_r = 41.8$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.11, 6.11, 6.11); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1156;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 2.01 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0:

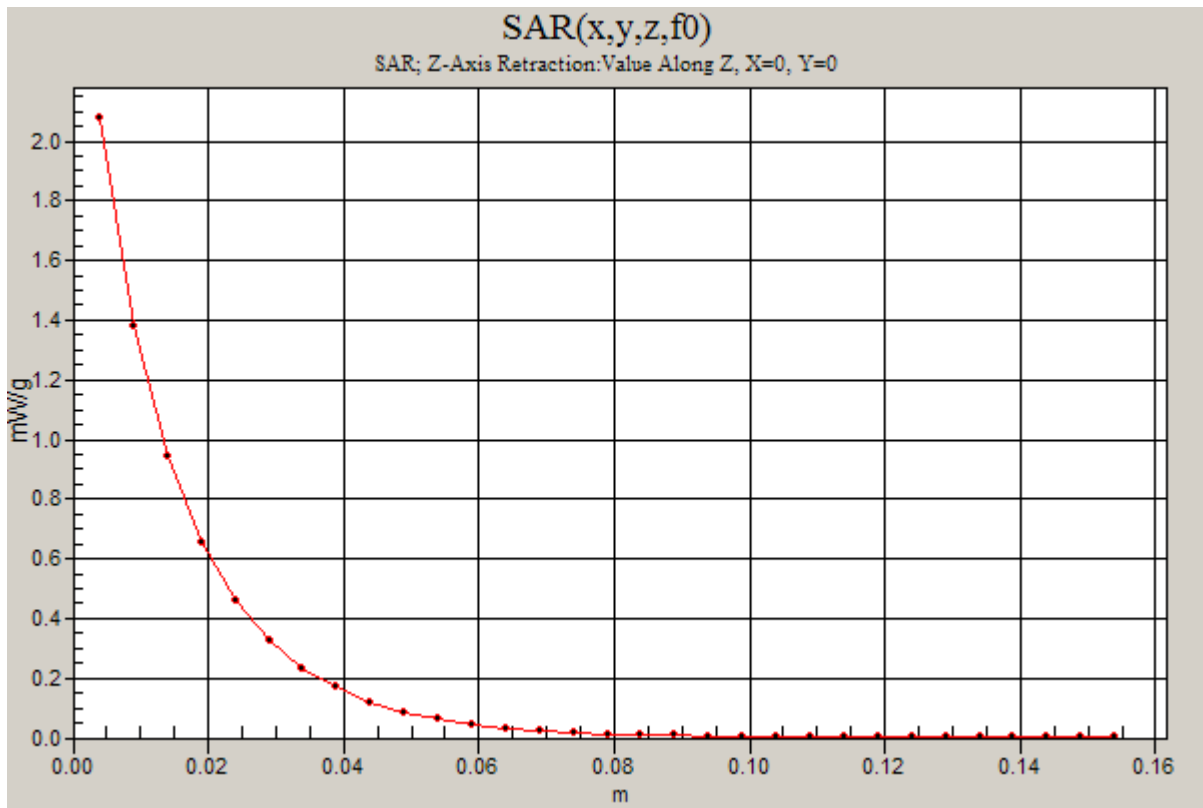
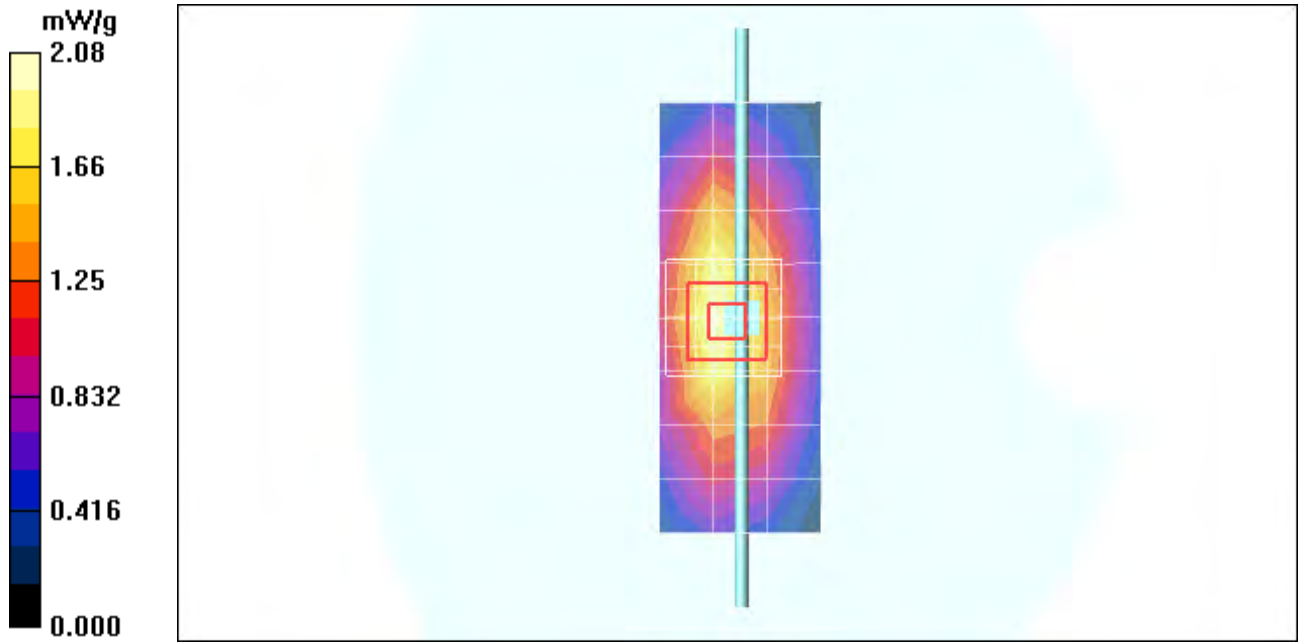
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 46.8 V/m; Power Drift = -0.016 dB; Peak SAR (extrapolated) = 2.89 W/kg

SAR(1 g) = 1.92 mW/g; SAR(10 g) = 1.24 mW/g; Maximum value of SAR (measured) = 2.07 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.08 mW/g



Date/Time: 3/17/2011 7:12:59 AM

Test Laboratory: Motorola - Mar-17-2011 835 MHz

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 424TR; FCC ID: IHDT56ME1

Procedure Notes: 835 MHz System Performance Check; Dipole Sn# 424TR; Input Power = 200 mW

Sim.Temp@meas = 20.6 C; Sim.Temp@SPC = 20.6 C; Room Temp @ SPC = 20.3 C

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

Medium: VALIDATION Only

Medium parameters used: $f = 835$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 41.7$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.11, 6.11, 6.11); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1156;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.94 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0:

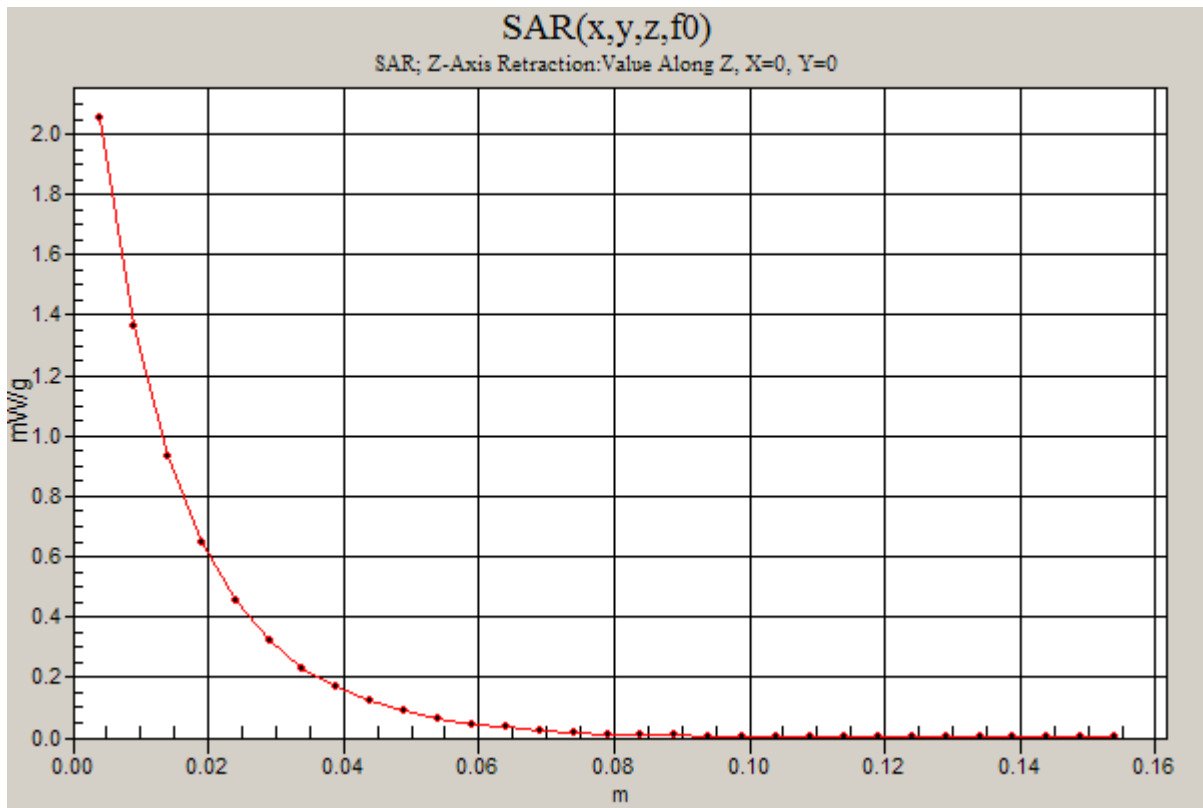
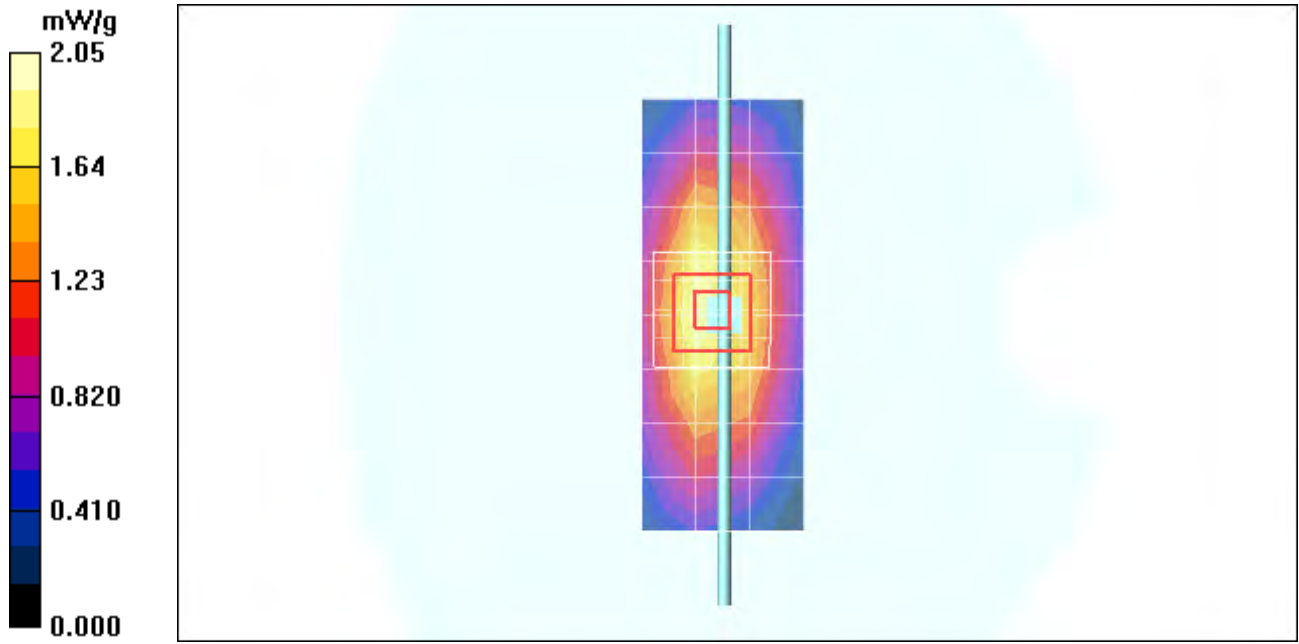
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 47.5 V/m; Power Drift = -0.033 dB; Peak SAR (extrapolated) = 2.89 W/kg

SAR(1 g) = 1.91 mW/g; SAR(10 g) = 1.23 mW/g; Maximum value of SAR (measured) = 2.07 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 2.05 mW/g



Date/Time: 3/18/2011 8:16:27 AM

Test Laboratory: Motorola - Mar-18-2011 835 MHz

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 424TR; FCC ID: IHDT56ME1

Procedure Notes: 835 MHz System Performance Check; Dipole Sn# 424TR; Input Power = 200

Sim.Temp@meas = 20.7°C; Sim.Temp@SPC = 20.7°C; Room Temp @ SPC = 20.8°C

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

Medium: VALIDATION Only

Medium parameters used: $f = 835$ MHz; $\sigma = 0.92$ mho/m; $\epsilon_r = 41.8$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.11, 6.11, 6.11); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1156;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.96 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0:

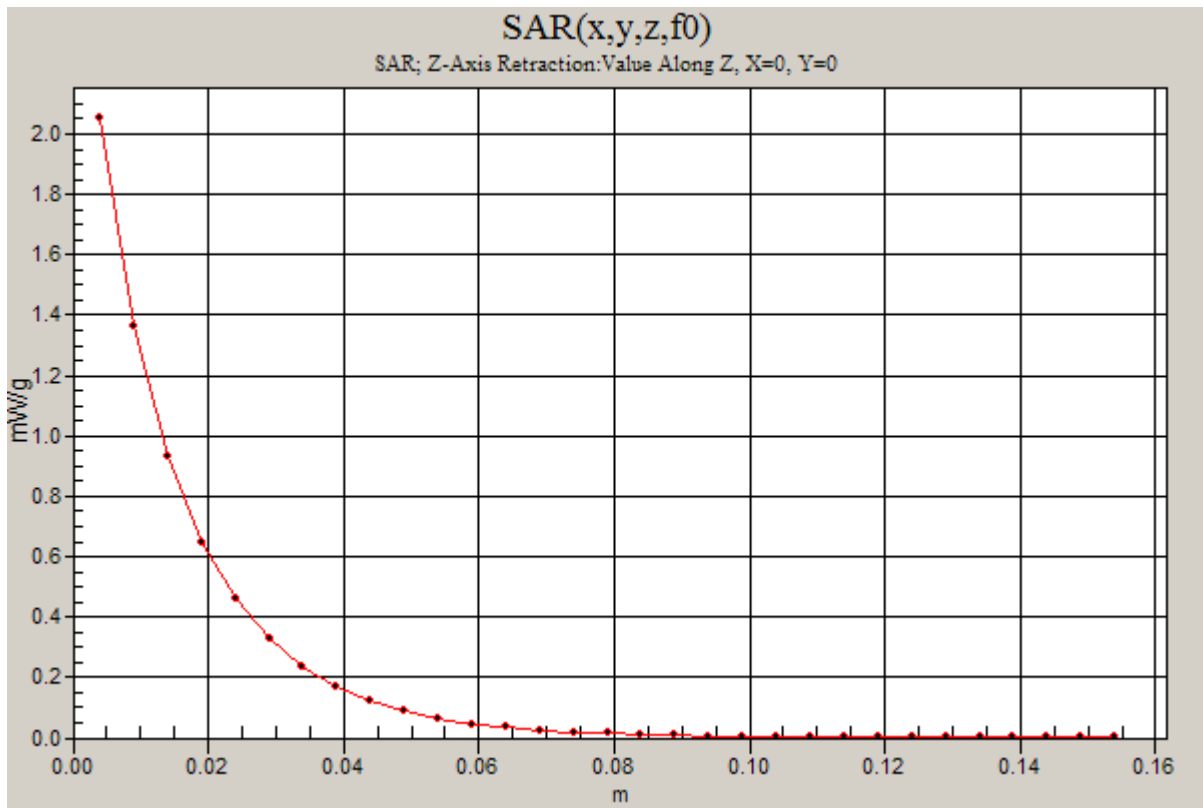
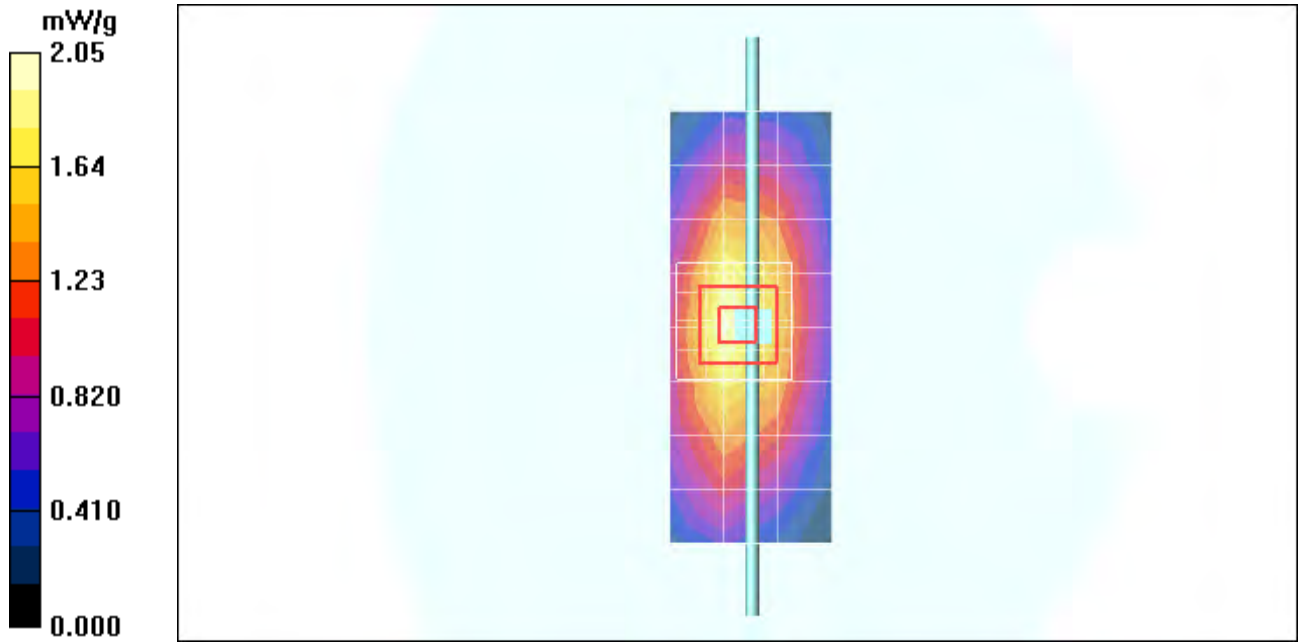
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 46.9 V/m; Power Drift = -0.007 dB; Peak SAR (extrapolated) = 2.88 W/kg

SAR(1 g) = 1.9 mW/g; SAR(10 g) = 1.23 mW/g; Maximum value of SAR (measured) = 2.05 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm



Date/Time: 3/22/2011 7:13:09 AM

Test Laboratory: Motorola - Mar-22-2011 835 MHz

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 424TR; FCC ID: IHDT56ME1

Procedure Notes: 835 MHz System Performance Check; Dipole Sn# 424TR; Input Power = 200 mW

Sim.Temp@meas = 19.7 C; Sim.Temp@SPC = 19.7 C; Room Temp @ SPC = 20.7 C

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

Medium: VALIDATION Only

Medium parameters used: $f = 835$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 41.6$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.11, 6.11, 6.11); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1156;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.89 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0:

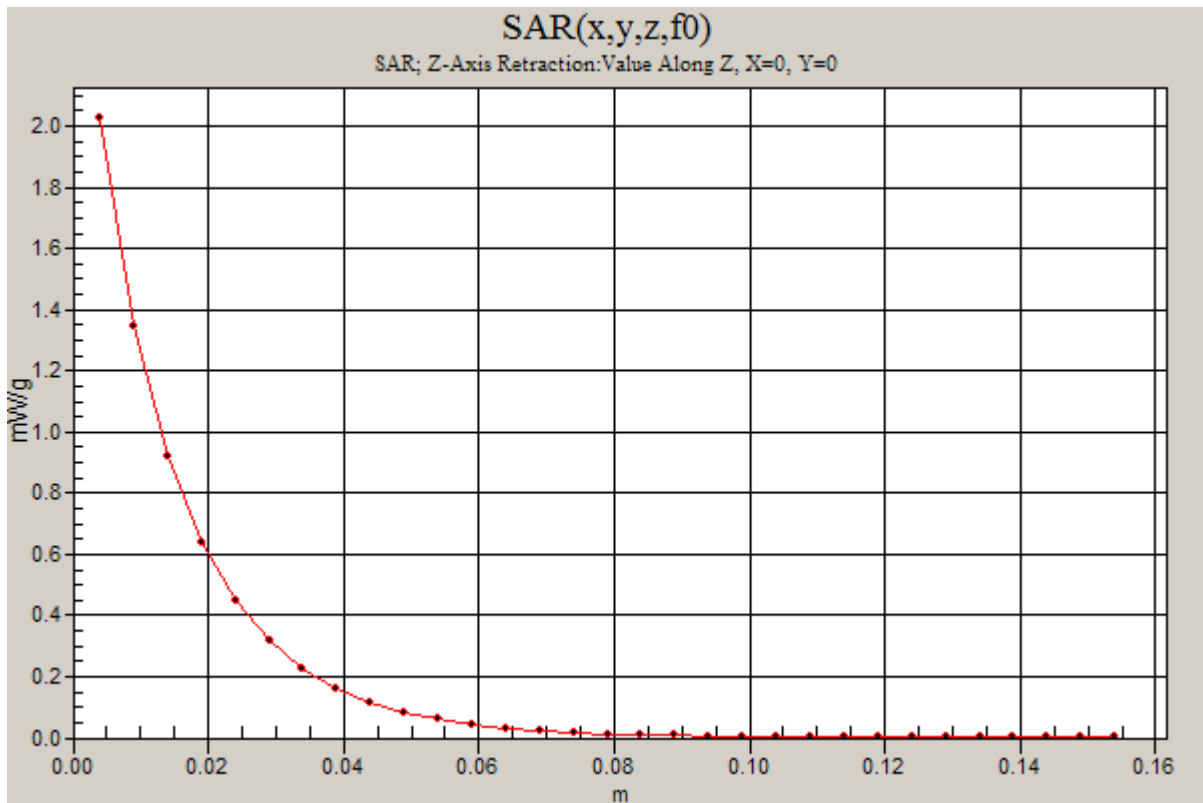
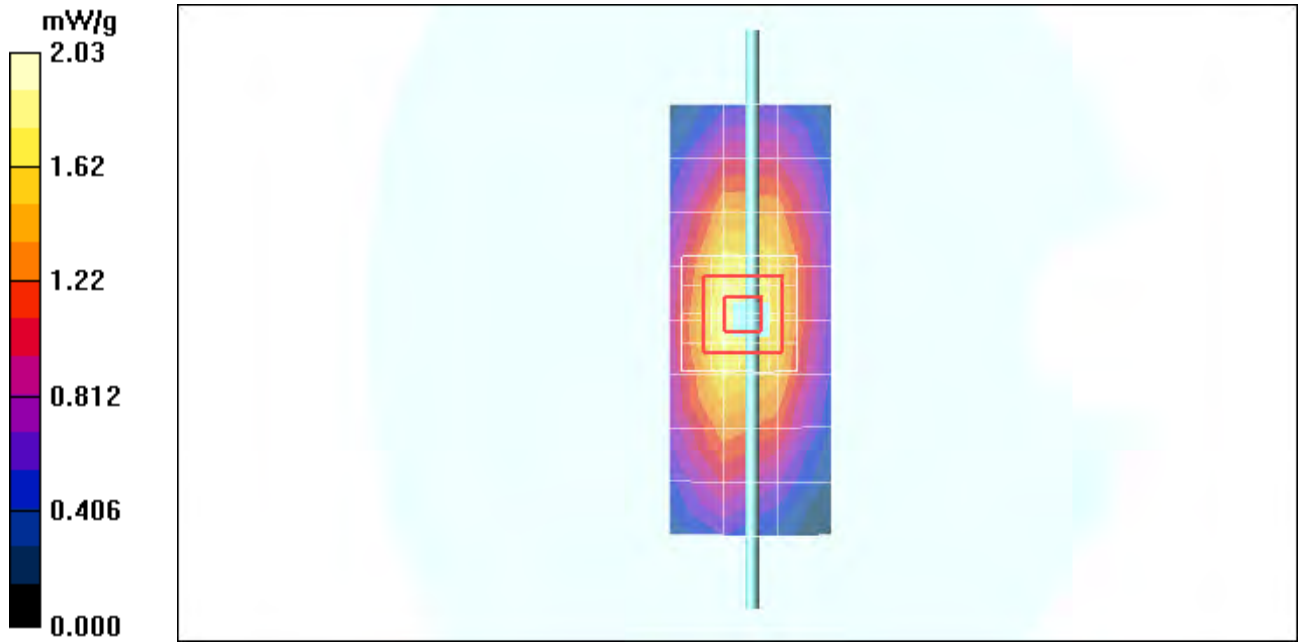
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 47.4 V/m; Power Drift = -0.039 dB; Peak SAR (extrapolated) = 2.85 W/kg

SAR(1 g) = 1.88 mW/g; SAR(10 g) = 1.22 mW/g; Maximum value of SAR (measured) = 2.03 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm



Date/Time: 3/24/2011 7:37:28 AM

Test Laboratory: Motorola - Mar-24-2011 835 MHz

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN: 424TR; FCC ID: IHDT56ME1

Procedure Notes: 835 MHz System Performance Check; Dipole Sn# 424TR; Input Power = 200 mW

Sim.Temp@meas = 19.8 C; Sim.Temp@SPC = 19.8 C; Room Temp @ SPC = 20.8 C

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

Medium: VALIDATION Only

Medium parameters used: $f = 835$ MHz; $\sigma = 0.91$ mho/m; $\epsilon_r = 41.6$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.11, 6.11, 6.11); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Sugar SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1156;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.91 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0:

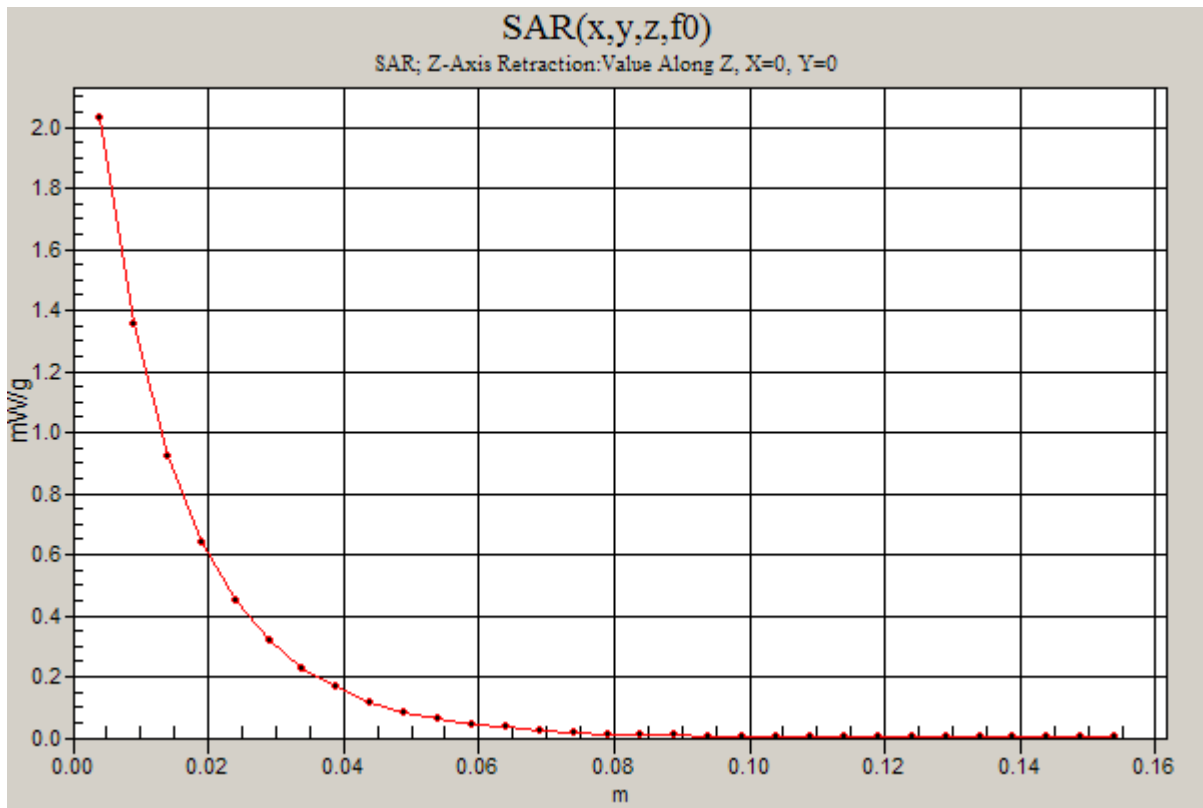
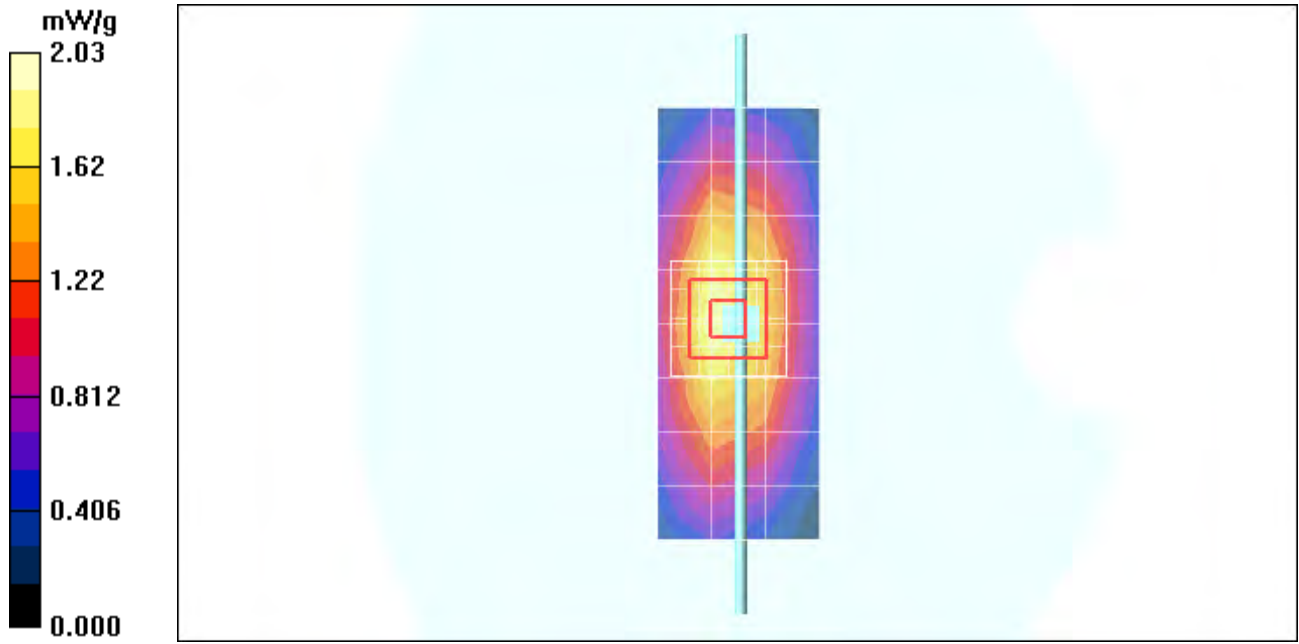
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 47.2 V/m; Power Drift = -0.005 dB; Peak SAR (extrapolated) = 2.84 W/kg

SAR(1 g) = 1.88 mW/g; SAR(10 g) = 1.22 mW/g; Maximum value of SAR (measured) = 2.03 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm



Date/Time: 3/19/2011 1:25:16 PM

Test Laboratory: Motorola - Mar-19-2011 1800 MHz

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 279TR; FCC ID: IHDT56ME1

Procedure Notes: 1800 MHz System Performance Check; Dipole Sn# 279TR; Input Power = 200 mW

Sim.Temp@meas = 19.6°C; Sim.Temp@SPC = 19.6°C; Room Temp @ SPC = 20.6°C

Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3124; ConvF(4.89, 4.89, 4.89); Calibrated: 8/11/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R4 : Sect.1, Amy Twin, Rev.3 (3-Feb-10); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (9x4x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 6.91 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

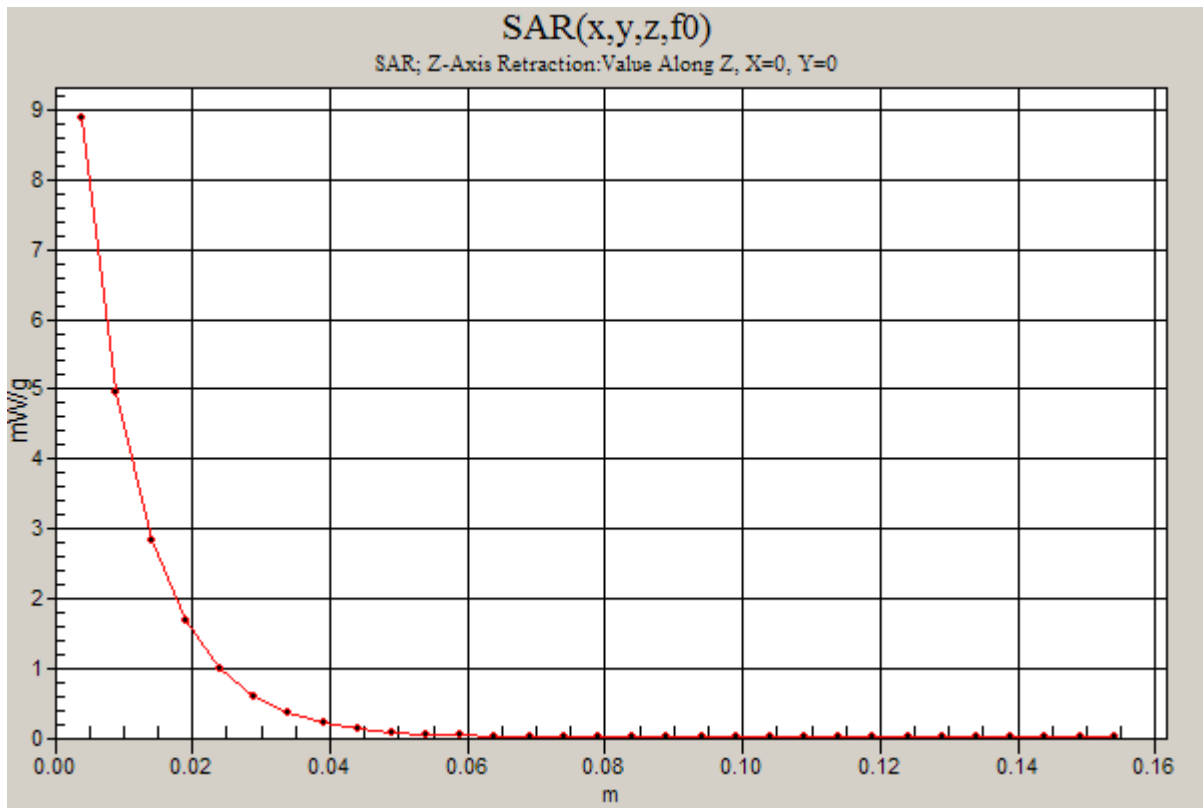
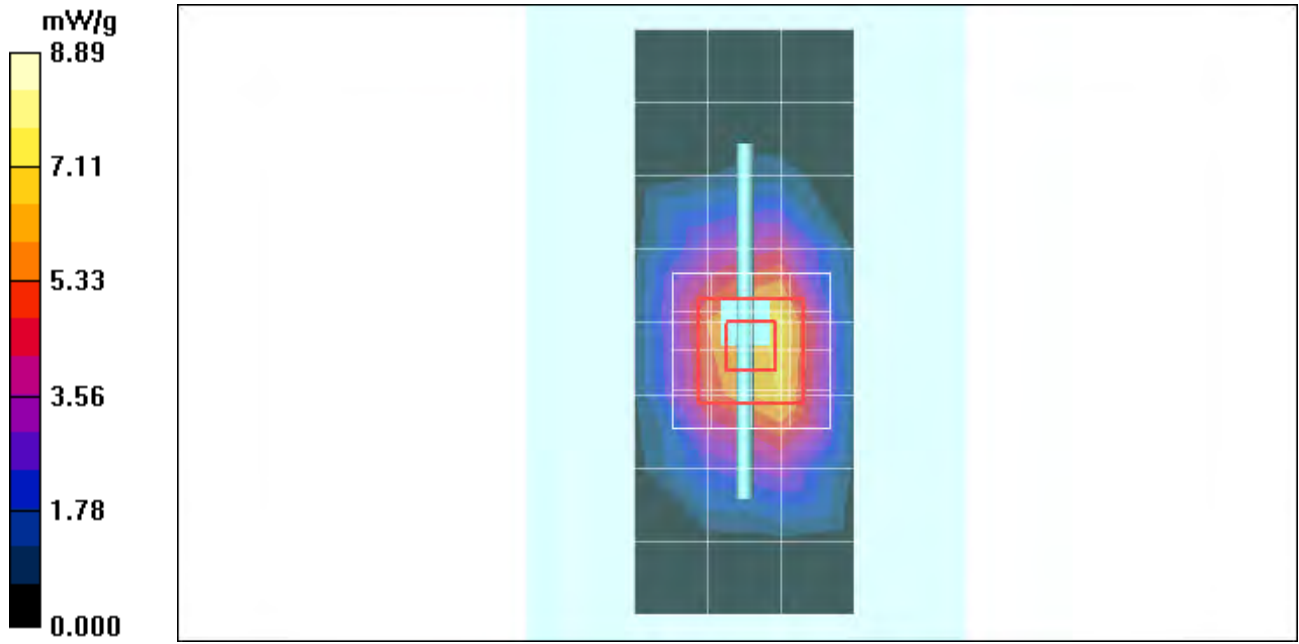
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 79.9 V/m; Power Drift = -0.004 dB; Peak SAR (extrapolated) = 14.2 W/kg

SAR(1 g) = 7.87 mW/g; SAR(10 g) = 4.18 mW/g; Maximum value of SAR (measured) = 8.79 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 8.89 mW/g



Date/Time: 3/15/2011 6:46:51 AM

Test Laboratory: Motorola - Mar-15-2011 1800 MHz

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 281TR; FCC ID: IHDT56ME1

Procedure Notes: 1800 MHz System Performance Check; Dipole Sn# 281TR; Input Power = 200 mW

Sim.Temp@meas = 19.8 C; Sim.Temp@SPC = 19.8 C; Room Temp @ SPC = 20.2 C

Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(5.05, 5.05, 5.05); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Section 2, Amy Twin, Rev3 (3-Feb-10); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (9x4x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 6.81 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

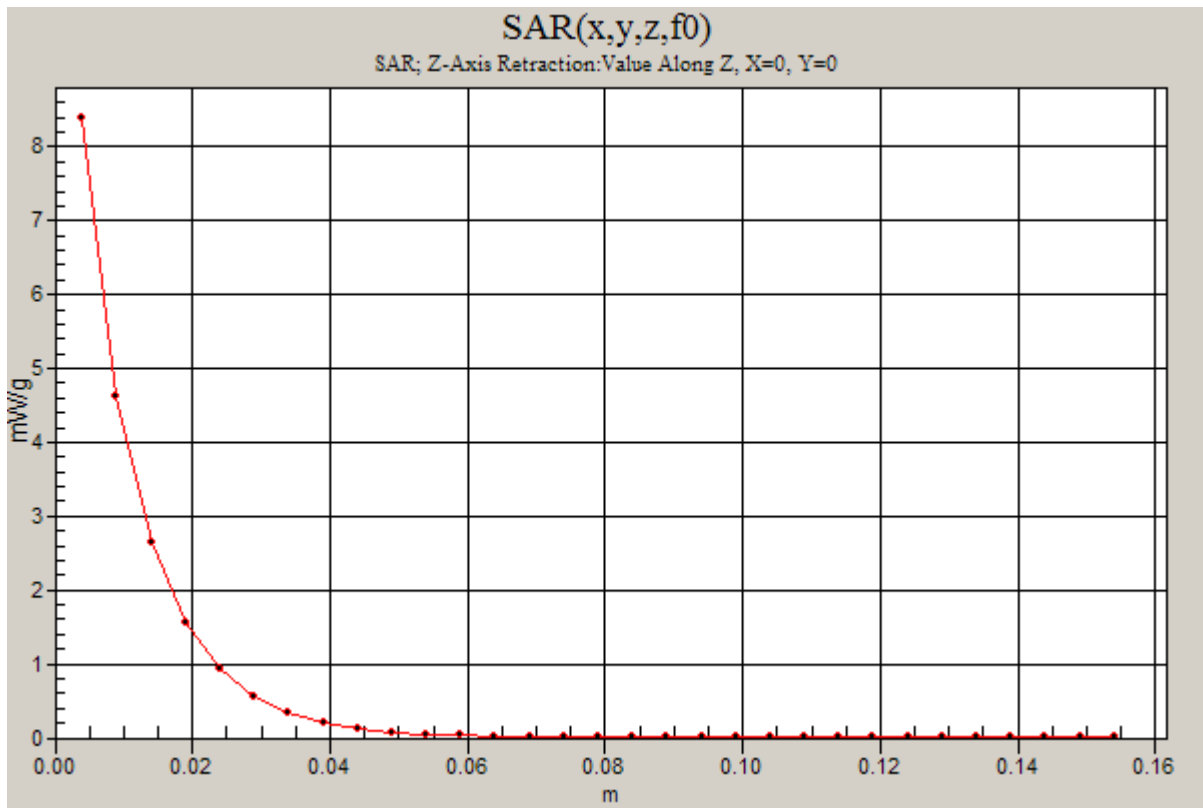
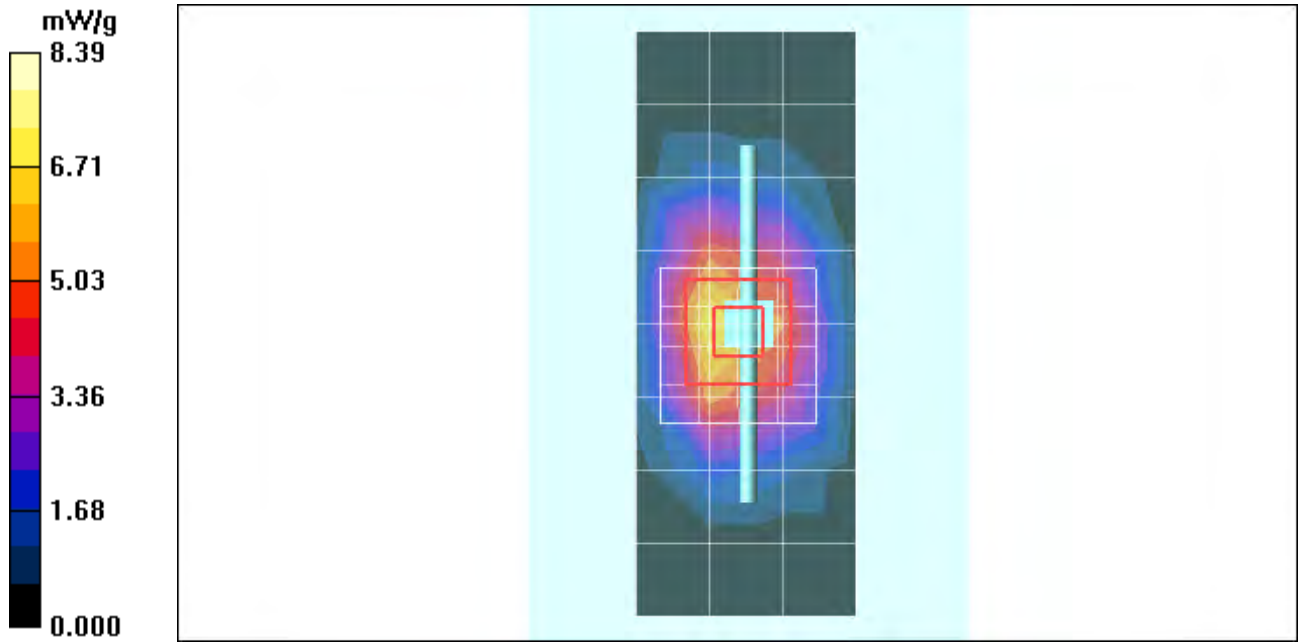
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 78.1 V/m; Power Drift = -0.031 dB; Peak SAR (extrapolated) = 13.9 W/kg

SAR(1 g) = 7.5 mW/g; SAR(10 g) = 3.94 mW/g; Maximum value of SAR (measured) = 8.31 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 8.39 mW/g



Date/Time: 3/16/2011 6:57:46 AM

Test Laboratory: Motorola - Mar-16-2011 1800 MHz

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 281TR; FCC ID: IHDT56ME1

Procedure Notes: 1800 MHz System Performance Check; Dipole Sn# 281TR; Input Power = 200 mW

Sim.Temp@meas = 20.0 C; Sim.Temp@SPC = 20.0 C; Room Temp @ SPC = 20.7 C

Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.36$ mho/m; $\epsilon_r = 40$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(5.05, 5.05, 5.05); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Section 2, Amy Twin, Rev3 (3-Feb-10); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (9x4x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 7.24 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

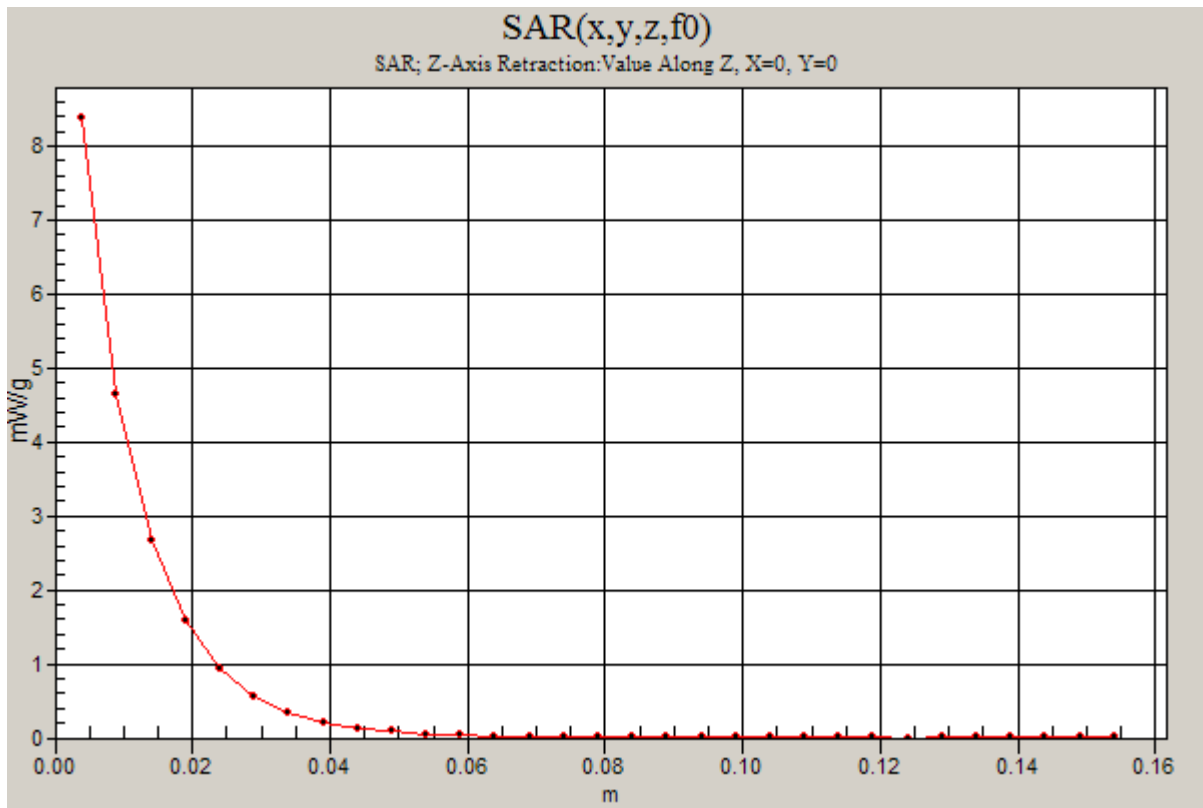
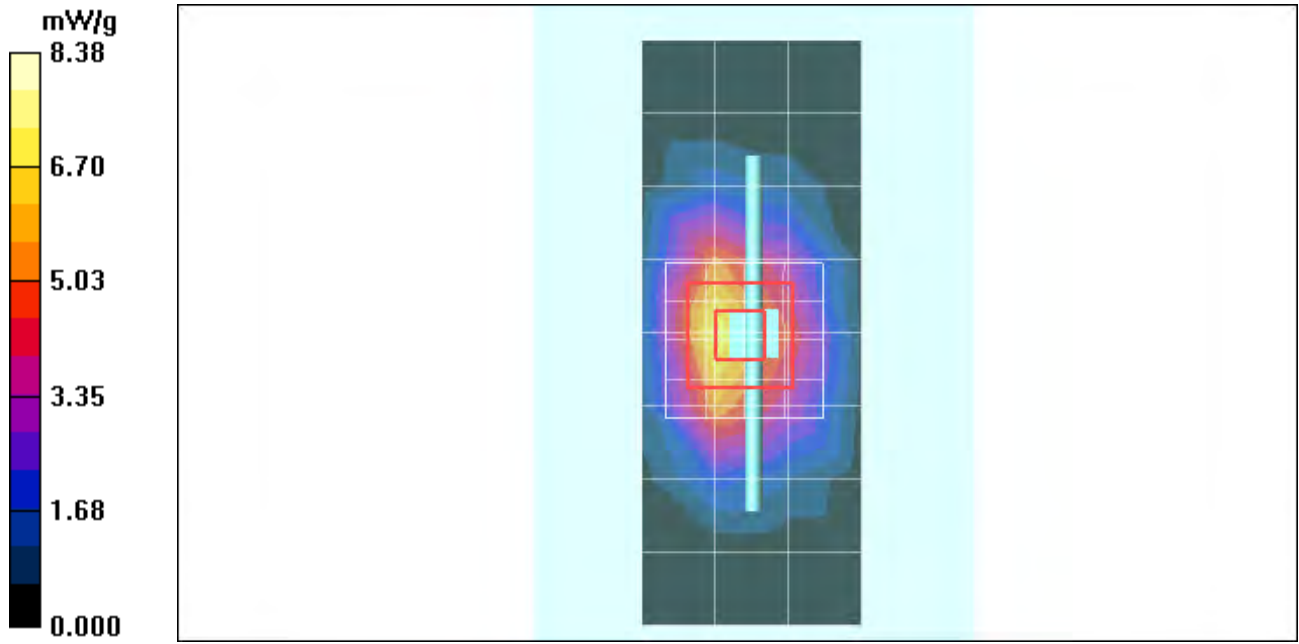
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 77.0 V/m; Power Drift = -0.025 dB; Peak SAR (extrapolated) = 13.8 W/kg

SAR(1 g) = 7.49 mW/g; SAR(10 g) = 3.93 mW/g; Maximum value of SAR (measured) = 8.31 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 8.38 mW/g



Date/Time: 3/17/2011 6:45:59 AM

Test Laboratory: Motorola - Mar-17-2011 1800 MHz

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 281TR; FCC ID: IHDT56ME1

Procedure Notes: 1800 MHz System Performance Check; Dipole Sn# 281TR; Input Power = 200 mW

Sim.Temp@meas = 19.9 C; Sim.Temp@SPC = 19.9 C; Room Temp @ SPC = 20.3 C

Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 40.2$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(5.05, 5.05, 5.05); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Section 2, Amy Twin, Rev3 (3-Feb-10); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (9x4x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 6.60 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

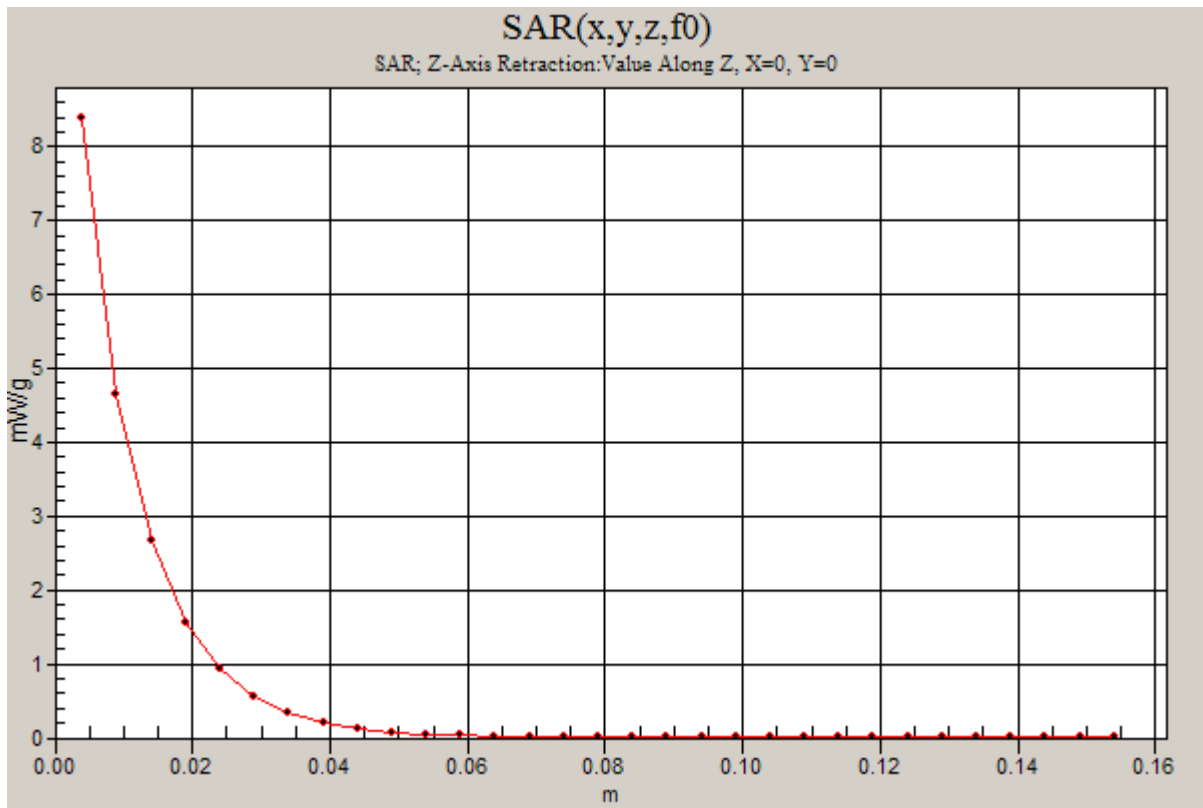
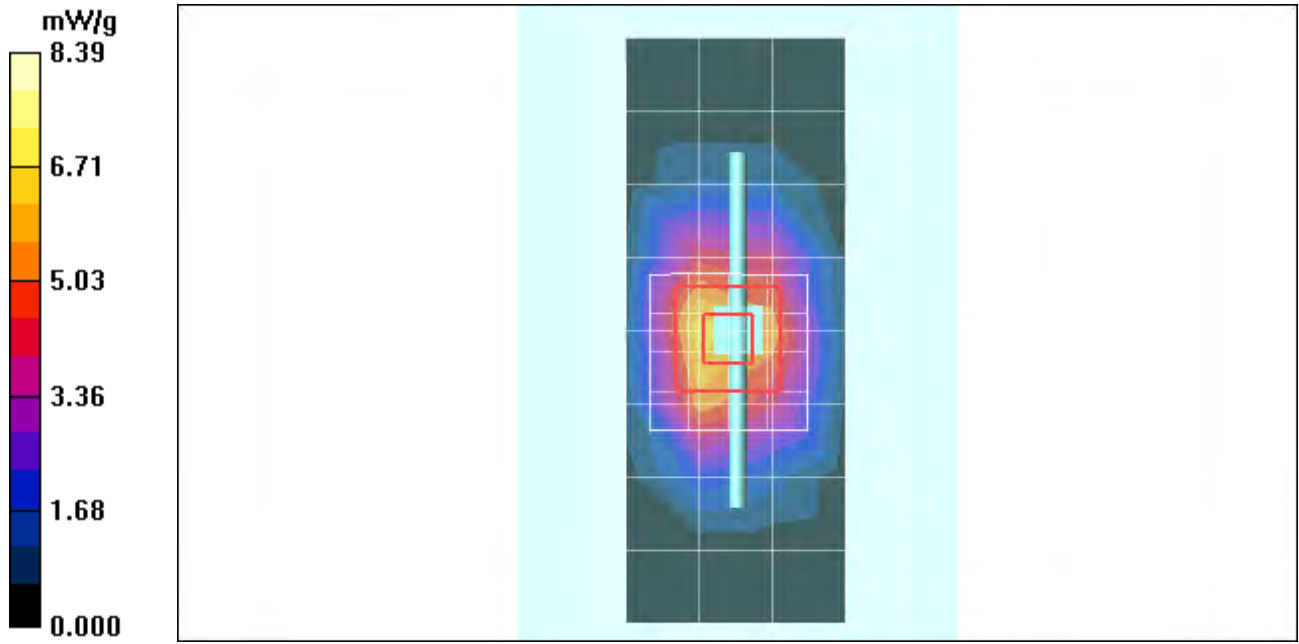
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 78.8 V/m; Power Drift = -0.014 dB; Peak SAR (extrapolated) = 14.0 W/kg

SAR(1 g) = 7.58 mW/g; SAR(10 g) = 3.98 mW/g; Maximum value of SAR (measured) = 8.40 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 8.39 mW/g



Date/Time: 3/19/2011 6:58:10 AM

Test Laboratory: Motorola - Mar-19-2011 1800 MHz

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 281TR; FCC ID: IHDT56ME1

Procedure Notes: 1800 MHz System Performance Check; Dipole Sn# 281TR; Input Power = 200 mW

Sim.Temp@meas = 19.6°C; Sim.Temp@SPC = 19.6°C; Room Temp @ SPC = 20.1°C

Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 39.6$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(5.05, 5.05, 5.05); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Section 2, Amy Twin, Rev3 (3-Feb-10); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (9x4x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 6.26 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

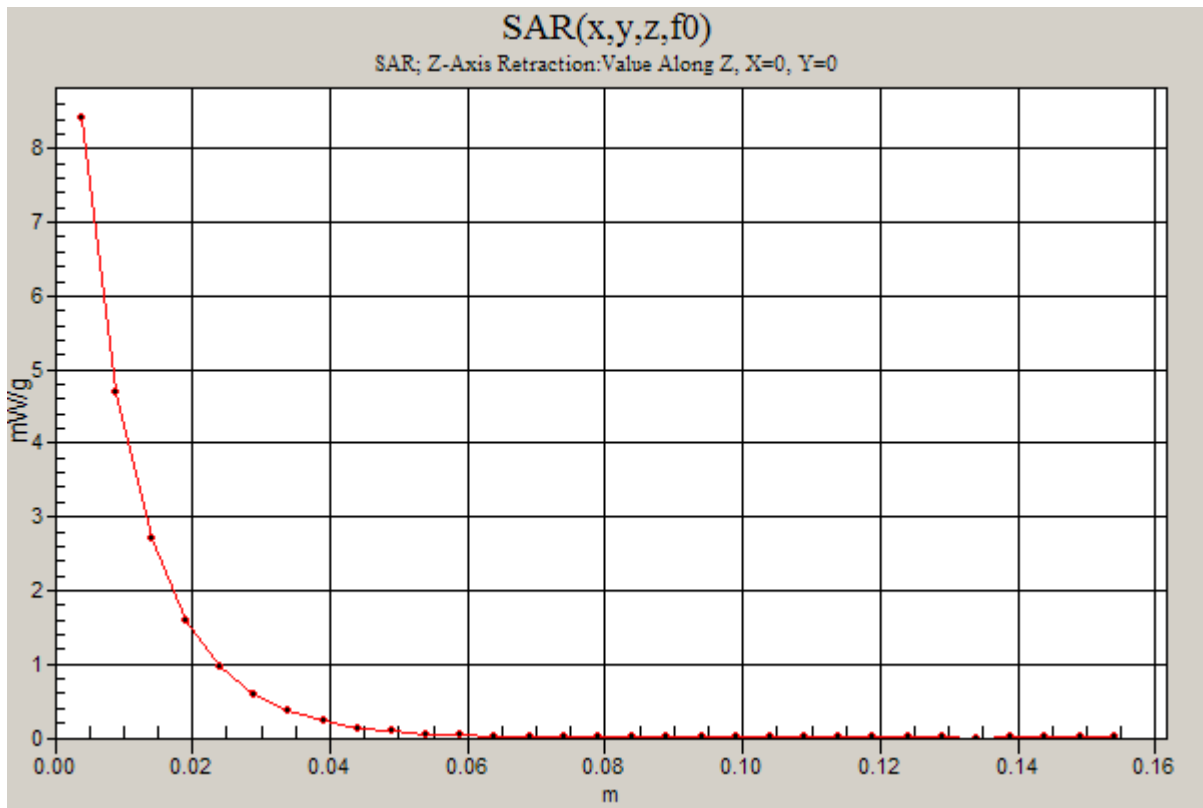
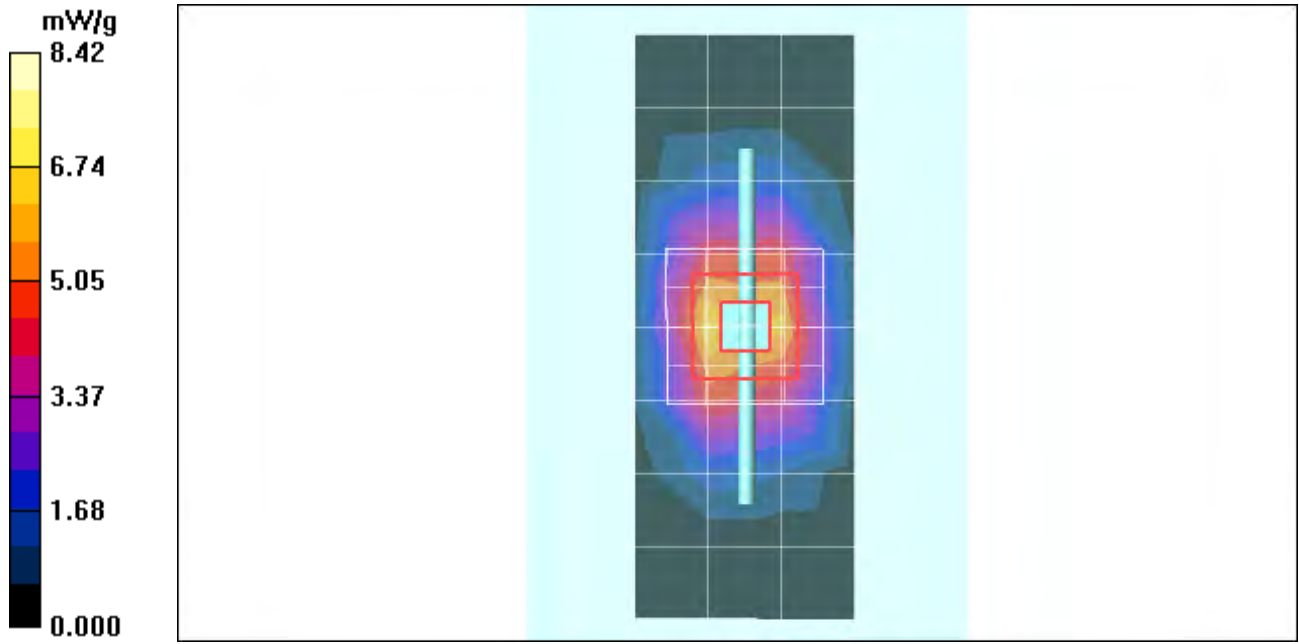
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 79.4 V/m; Power Drift = -0.041 dB; Peak SAR (extrapolated) = 13.8 W/kg

SAR(1 g) = 7.56 mW/g; SAR(10 g) = 3.98 mW/g; Maximum value of SAR (measured) = 8.47 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 8.42 mW/g



Date/Time: 3/22/2011 6:40:34 AM

Test Laboratory: Motorola - Mar-22-2011 1800 MHz

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 281TR; FCC ID: IHDT56ME1

Procedure Notes: 1800 MHz System Performance Check; Dipole Sn# 281TR; Input Power = 200 mW

Sim.Temp@meas = 19.3 C; Sim.Temp@SPC = 19.3 C; Room Temp @ SPC = 20.5 C

Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 40$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(5.05, 5.05, 5.05); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Section 2, Amy Twin, Rev3 (3-Feb-10); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (9x4x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 6.52 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

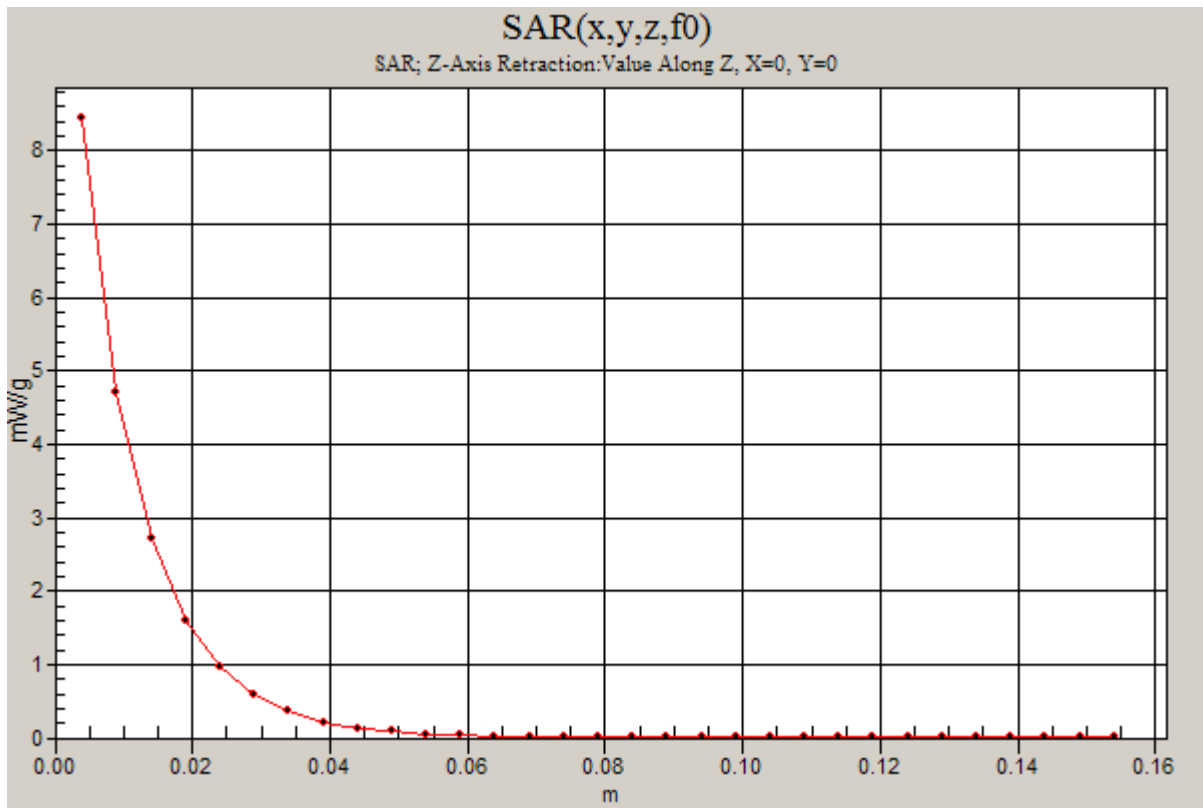
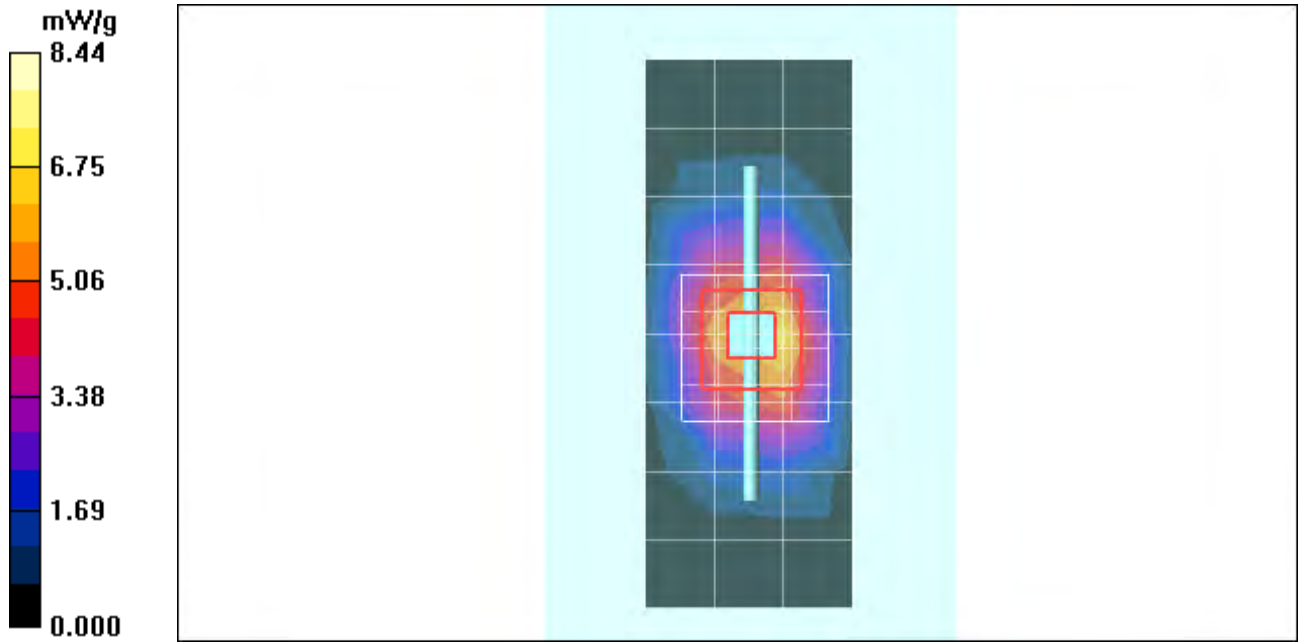
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 79.3 V/m; Power Drift = -0.029 dB; Peak SAR (extrapolated) = 13.8 W/kg

SAR(1 g) = 7.53 mW/g; SAR(10 g) = 3.95 mW/g; Maximum value of SAR (measured) = 8.38 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 8.44 mW/g



Date/Time: 3/25/2011 6:46:20 AM

Test Laboratory: Motorola - Mar-25-2011 1800 MHz

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN: 281TR; FCC ID: IHDT56ME1

Procedure Notes: 1800 MHz System Performance Check; Dipole Sn# 281TR; Input Power = 200 mW

Sim.Temp@meas = 19.3 C; Sim.Temp@SPC = 19.3 C; Room Temp @ SPC = 20.6 C

Communication System: CW - Dipole; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.37$ mho/m; $\epsilon_r = 39.7$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(5.05, 5.05, 5.05); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Section 2, Amy Twin, Rev3 (3-Feb-10); Type: Amy Twin Flat; Serial: n/a;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (9x4x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 7.02 mW/g

Daily SPC Check/0-Degree 5x5x7 Cube (5x5x7)/Cube 0:

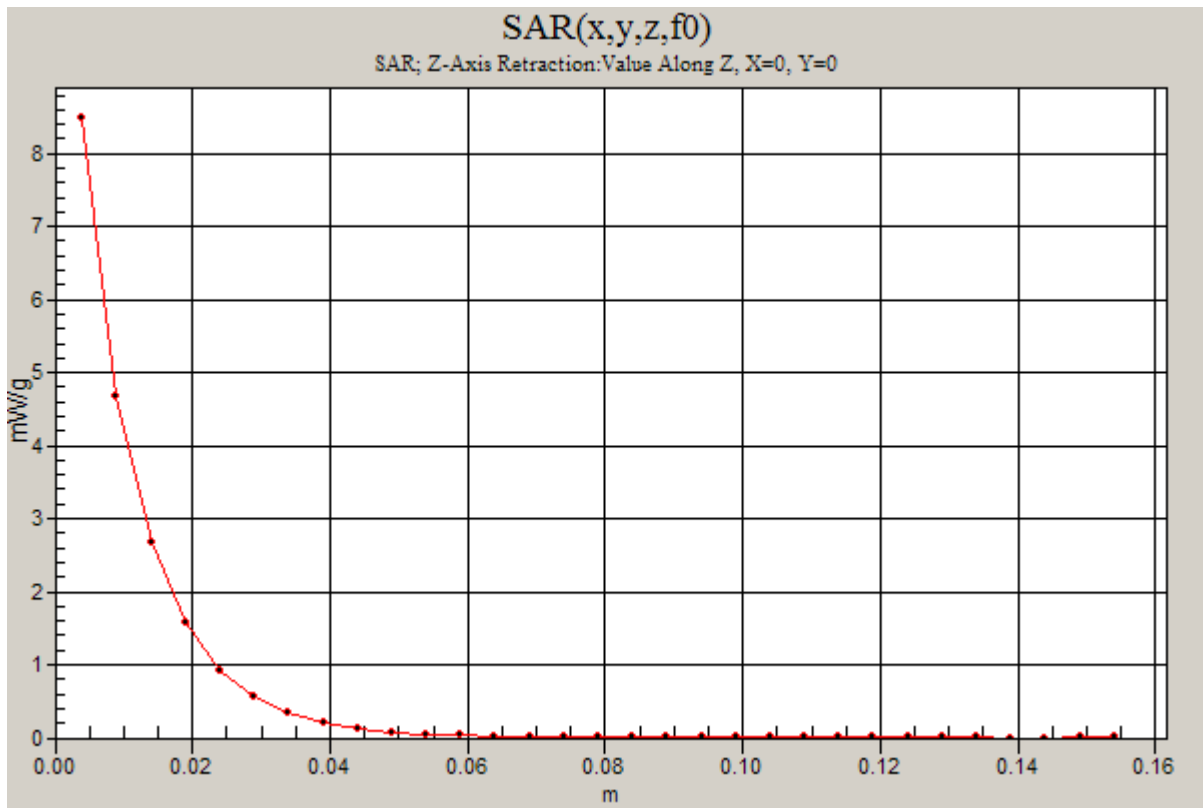
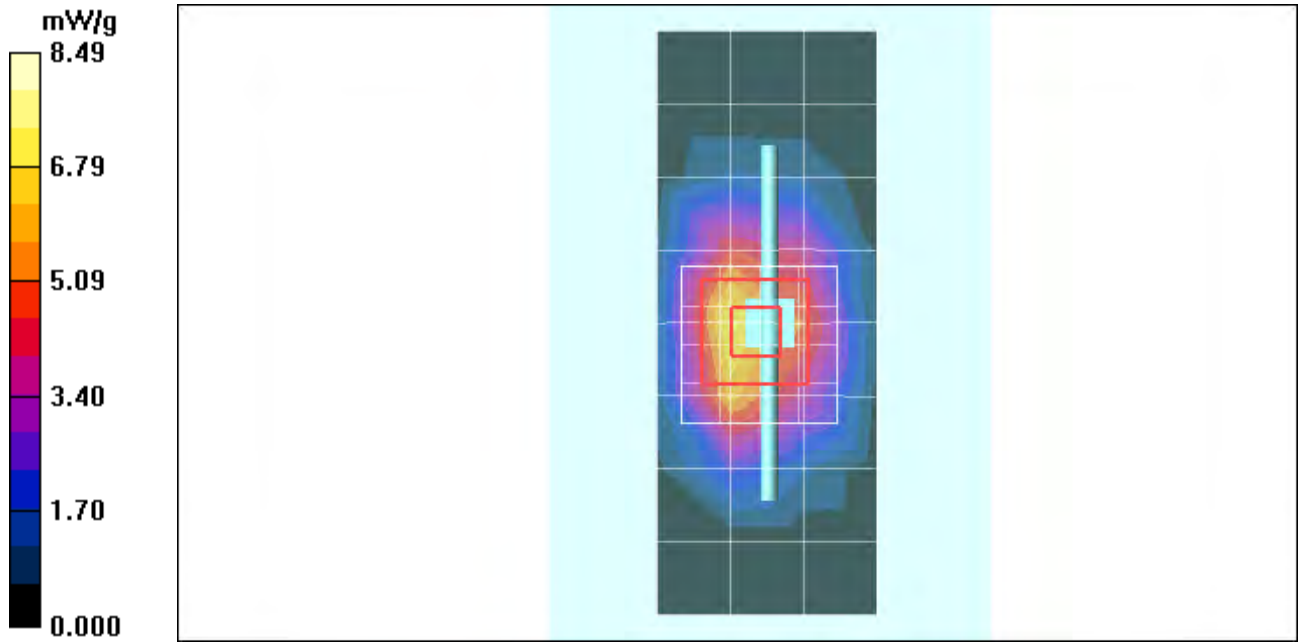
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 78.0 V/m; Power Drift = -0.019 dB; Peak SAR (extrapolated) = 14.0 W/kg

SAR(1 g) = 7.57 mW/g; SAR(10 g) = 3.99 mW/g; Maximum value of SAR (measured) = 8.33 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 8.49 mW/g



Date/Time: 3/25/2011 2:21:50 PM

Test Laboratory: Motorola - Mar-25-2011 2450 MHz

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 766; FCC ID: IHDT56ME1

Procedure Notes: 2450 MHz System Performance Check; Dipole Sn# 766; Input Power = 200 mW

Sim.Temp@meas = 19.7 C; Sim.Temp@SPC = 19.7 C; Room Temp @ SPC = 20.3 C

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

Medium: VALIDATION Only

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.86$ mho/m; $\epsilon_r = 35.3$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3124; ConvF(4.35, 4.35, 4.35); Calibrated: 8/11/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#4 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1250;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 8.85 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0:

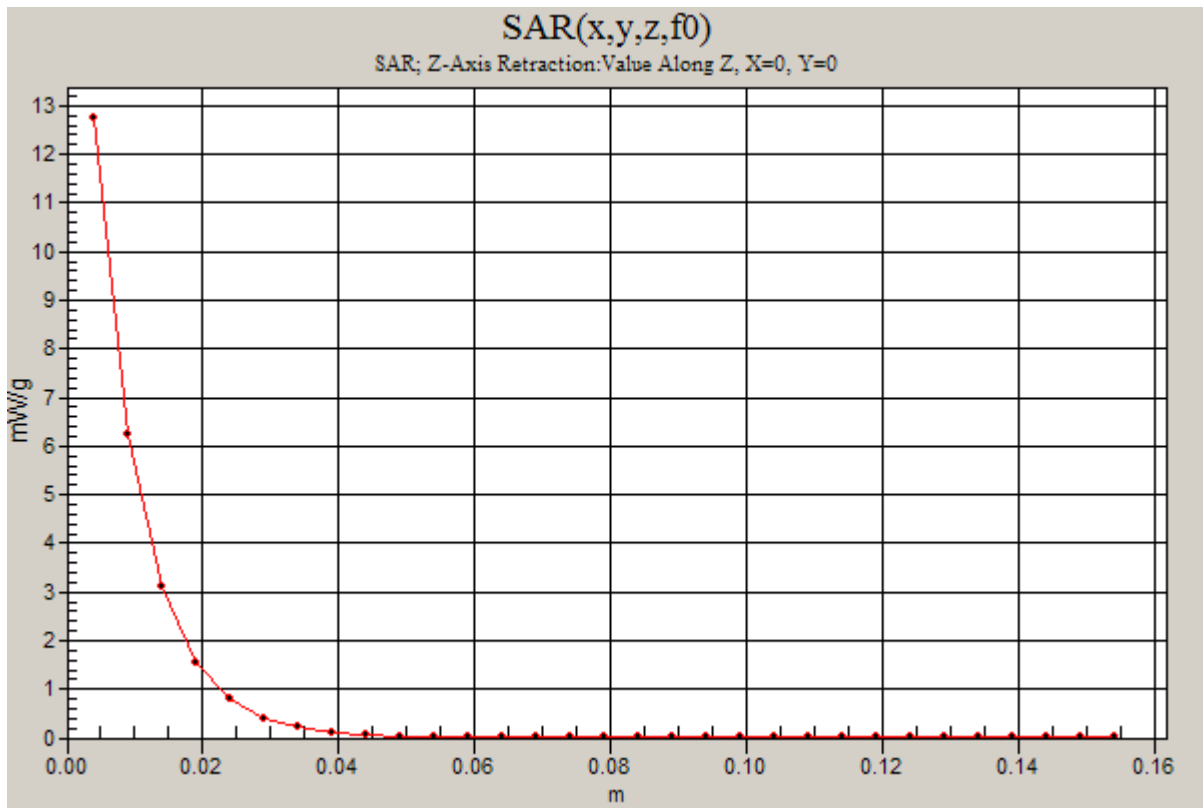
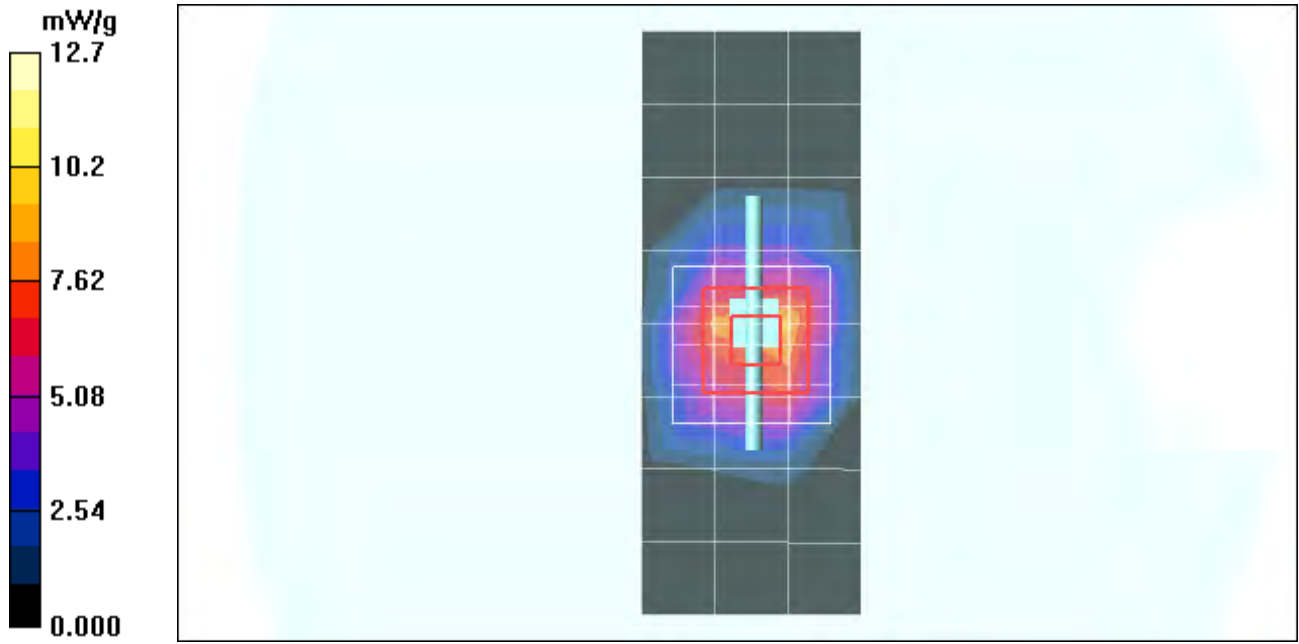
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 83.9 V/m; Power Drift = -0.022 dB; Peak SAR (extrapolated) = 23.1 W/kg

SAR(1 g) = 11.2 mW/g; SAR(10 g) = 5.17 mW/g; Maximum value of SAR (measured) = 12.6 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm; Maximum value of SAR (measured) = 12.7 mW/g



Date/Time: 3/29/2011 11:48:58 AM

Test Laboratory: Motorola - Mar-29-2011 2450 MHz

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN: 766; FCC ID: IHDT56ME1

Procedure Notes: 2450 MHz System Performance Check; Dipole Sn# 766; Input Power = 200 mW

Sim.Temp@meas = 19.6°C; Sim.Temp@SPC = 19.6°C; Room Temp @ SPC = 20.5°C

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

Medium: VALIDATION Only

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.86$ mho/m; $\epsilon_r = 35.4$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(4.49, 4.49, 4.49); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (4x9x1):

Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 11.0 mW/g

Daily SPC Check/0-Degree, 5x5x7 Cube (5x5x7)/Cube 0:

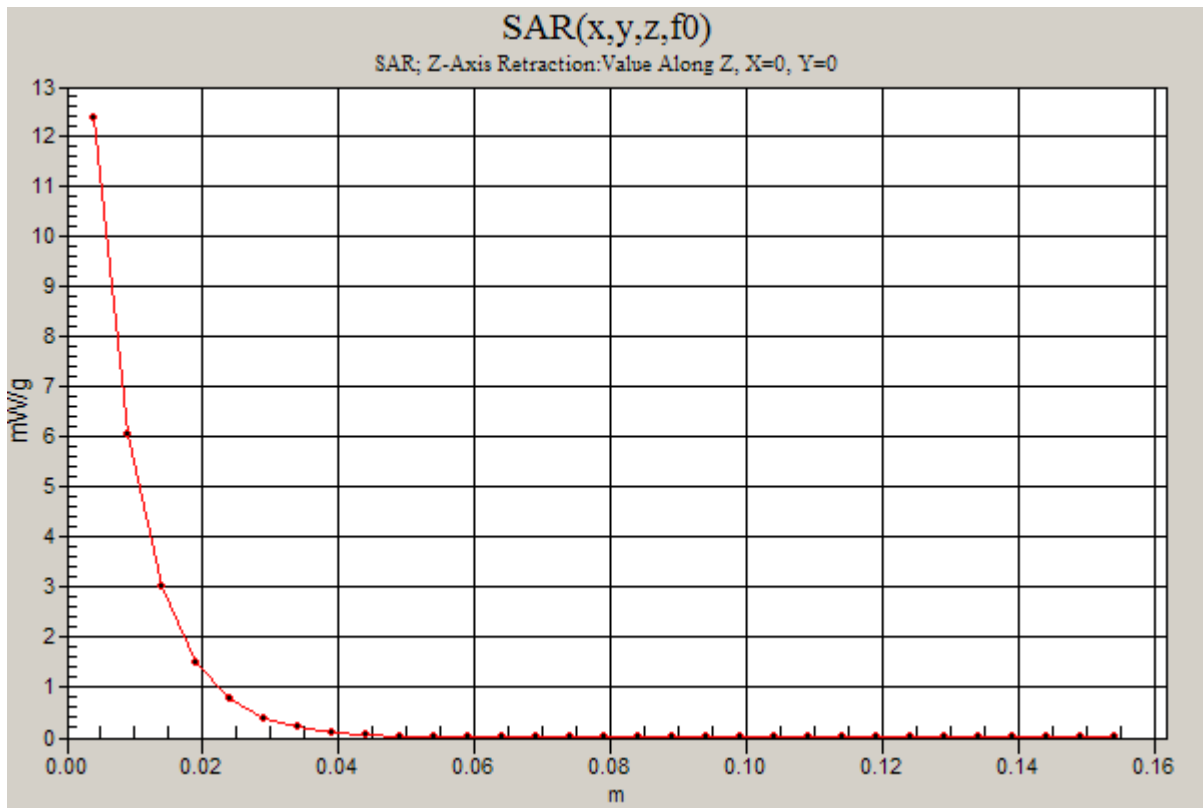
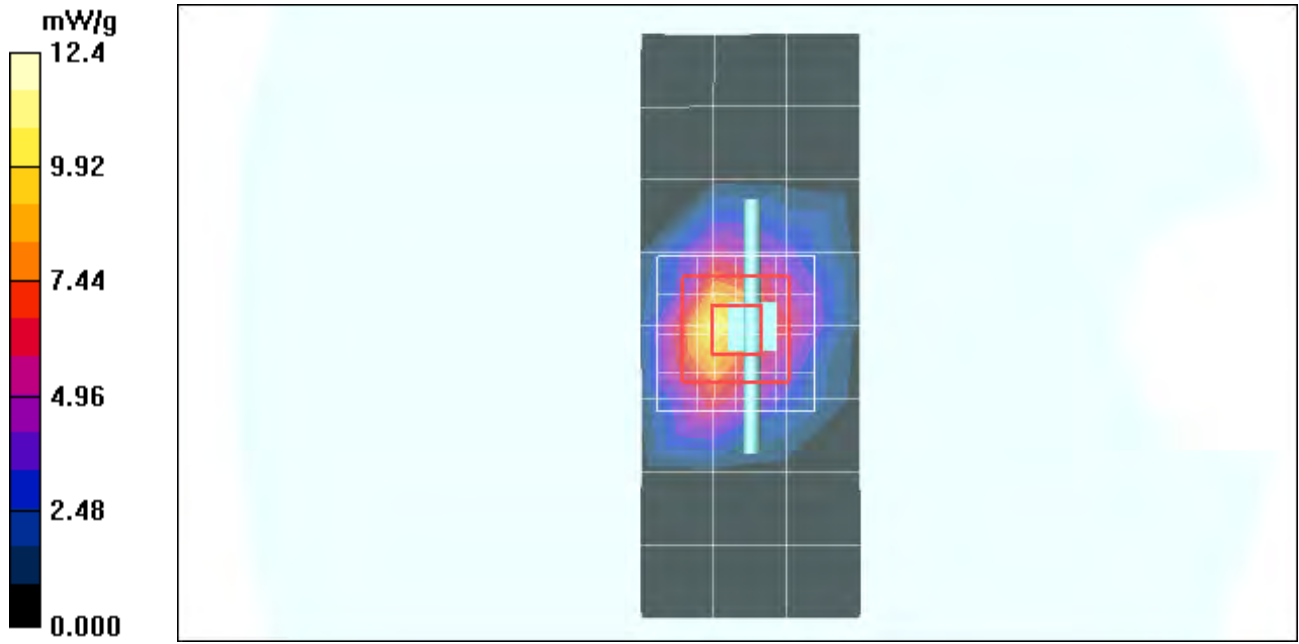
Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 80.0 V/m; Power Drift = 0.006 dB; Peak SAR (extrapolated) = 22.9 W/kg

SAR(1 g) = 11 mW/g; SAR(10 g) = 5.08 mW/g; Maximum value of SAR (measured) = 12.4 mW/g

Daily SPC Check/Z-Axis Retraction (1x1x31):

Measurement grid: dx=20mm, dy=20mm, dz=5mm



Date/Time: 3/25/2011 7:20:30 AM

Test Laboratory: Motorola - Mar-25-2011 5200 MHz

DUT: Dipole 5-6GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1088; FCC ID: IHDT56ME1

Procedure Notes: 5200 MHz System Performance Check; Dipole Sn# 1088; Input Power = 100 mW

Sim.Temp@meas = 19.5°C; Sim.Temp@SPC = 19.5°C; Room Temp @ SPC = 20.3°C

Communication System: CW - Dipole; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.84$ mho/m; $\epsilon_r = 33.8$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: EX3DV4 - SN3730; ConvF(4.67, 4.67, 4.67); Calibrated: 7/16/2010
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 11/11/2010
- Phantom: R3, 5-6GHz SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1153;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (5x7x1):

Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 13.4 mW/g

Daily SPC Check/0-Degree, 7x7x12 Cube (7x7x6)/Cube 0:

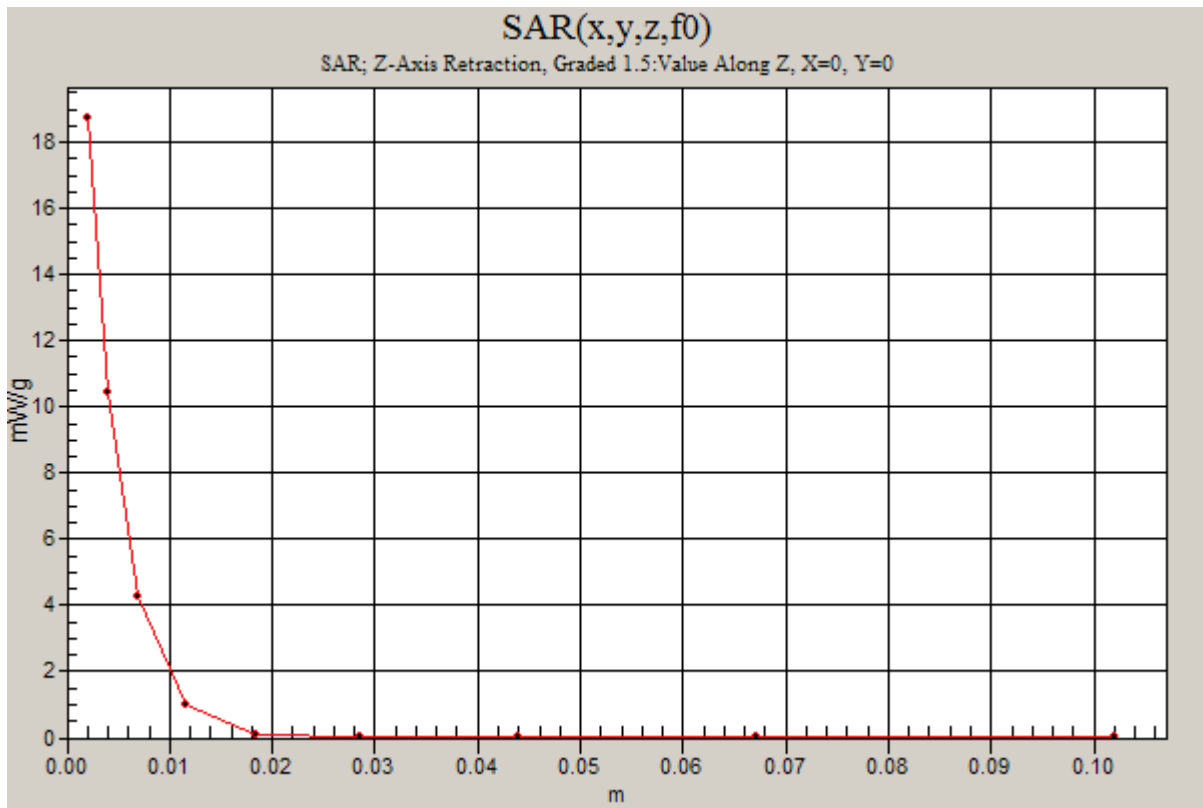
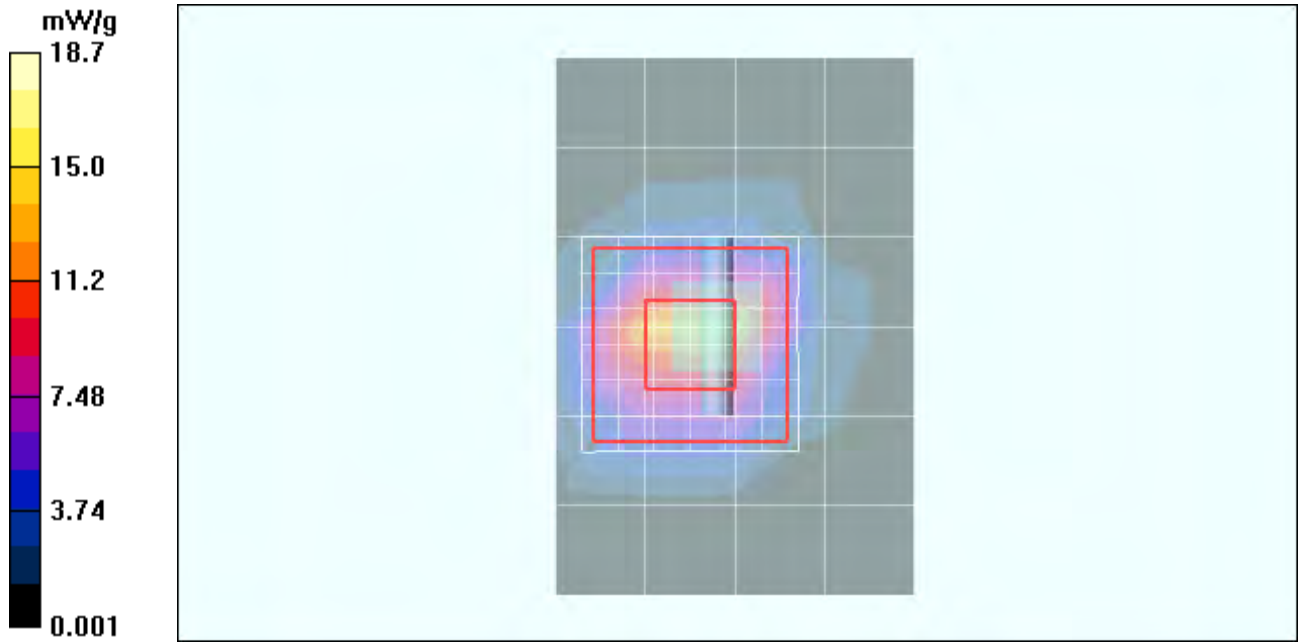
Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 62.7 V/m; Power Drift = 0.065 dB; Peak SAR (extrapolated) = 34.6 W/kg

SAR(1 g) = 9.01 mW/g; SAR(10 g) = 2.57 mW/g; Maximum value of SAR (measured) = 18.9 mW/g

Daily SPC Check/Z-Axis Retraction, Graded 1.5 (1x1x9):

Measurement grid: dx=20mm, dy=20mm, dz=2mm; Maximum value of SAR (measured) = 18.7 mW/g



Date/Time: 3/29/2011 7:06:34 AM

Test Laboratory: Motorola - Mar-29-2011 5200 MHz

DUT: Dipole 5-6GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1088; FCC ID: IHDT56ME1

Procedure Notes: 5200 MHz System Performance Check; Dipole Sn# 1088; Input Power = 100 mW

Sim.Temp@meas = 19.8°C; Sim.Temp@SPC = 19.8°C; Room Temp @ SPC = 20.7°C

Communication System: CW - Dipole; Frequency: 5200 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.82$ mho/m; $\epsilon_r = 34.3$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: EX3DV4 - SN3730; ConvF(4.67, 4.67, 4.67); Calibrated: 7/16/2010
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 11/11/2010
- Phantom: R3, 5-6GHz SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1153;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (5x7x1):

Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 13.6 mW/g

Daily SPC Check/0-Degree, 7x7x12 Cube (7x7x6)/Cube 0:

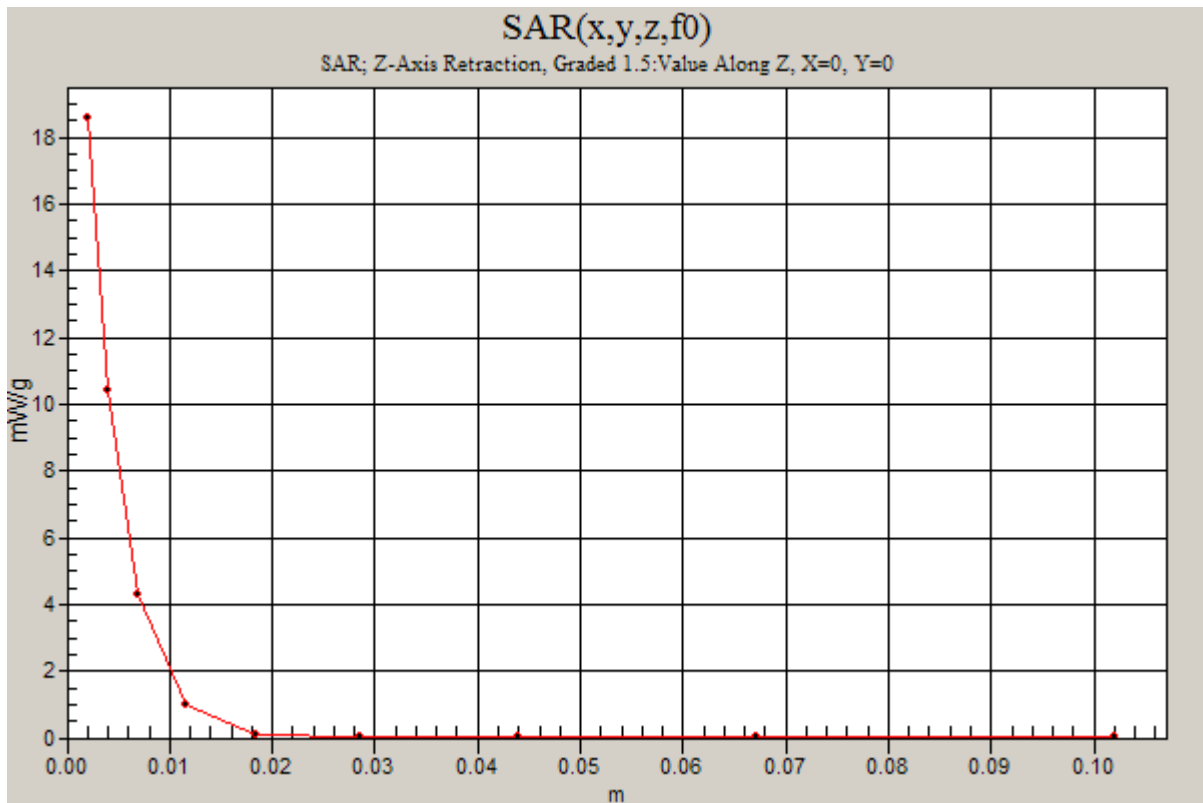
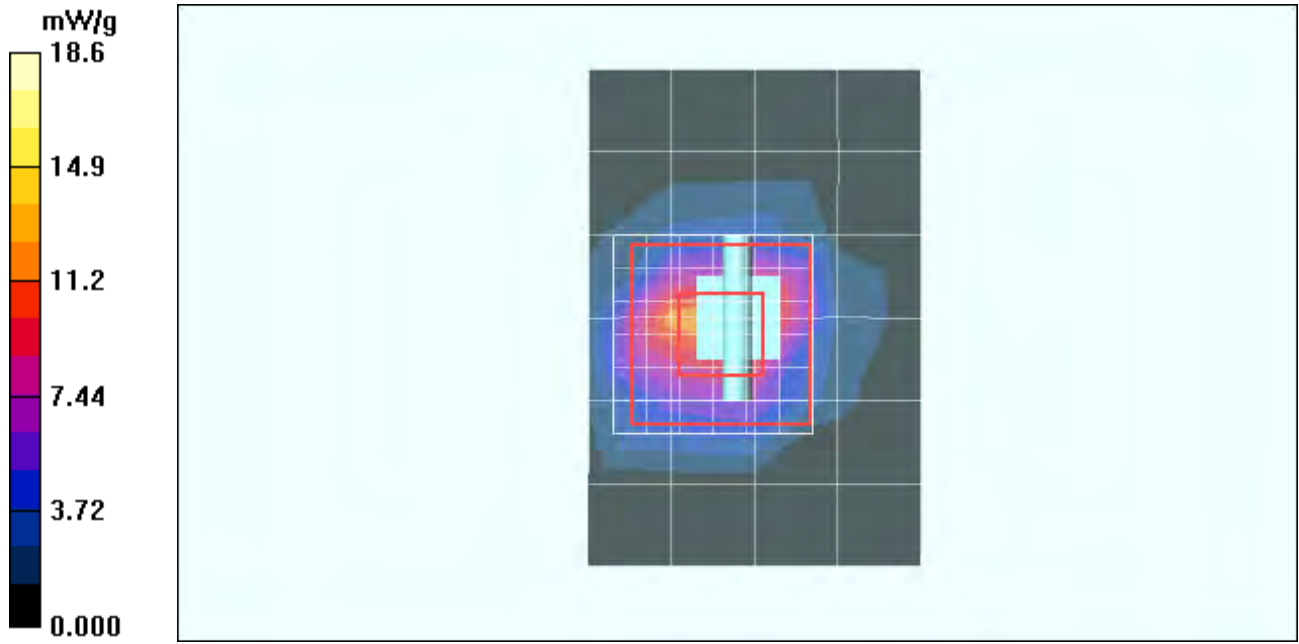
Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 62.1 V/m; Power Drift = 0.079 dB; Peak SAR (extrapolated) = 34.6 W/kg

SAR(1 g) = 8.76 mW/g; SAR(10 g) = 2.49 mW/g; Maximum value of SAR (measured) = 18.6 mW/g

Daily SPC Check/Z-Axis Retraction, Graded 1.5 (1x1x9):

Measurement grid: dx=20mm, dy=20mm, dz=2mm



Date/Time: 3/28/2011 8:06:26 AM

Test Laboratory: Motorola - Mar-28-2011 5800 MHz

DUT: Dipole 5-6GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN: 1088; FCC ID: IHDT56ME1

Procedure Notes: 5800 MHz System Performance Check; Dipole Sn# 1088; Input Power = 100 mW

Sim.Temp@meas = 20.5°C; Sim.Temp@SPC = 20.5°C; Room Temp @ SPC = 20.8°C

Communication System: CW - Dipole; Frequency: 5800 MHz; Duty Cycle: 1:1

Medium: VALIDATION Only

Medium parameters used: $f = 5800$ MHz; $\sigma = 5.55$ mho/m; $\epsilon_r = 33.2$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: EX3DV4 - SN3730; ConvF(4.06, 4.06, 4.06); Calibrated: 7/16/2010
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 11/11/2010
- Phantom: R3, 5-6GHz SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1153;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

Daily SPC Check/Dipole Area Scan (5x7x1):

Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 16.3 mW/g

Daily SPC Check/0-Degree, 7x7x12 Cube (7x7x6)/Cube 0:

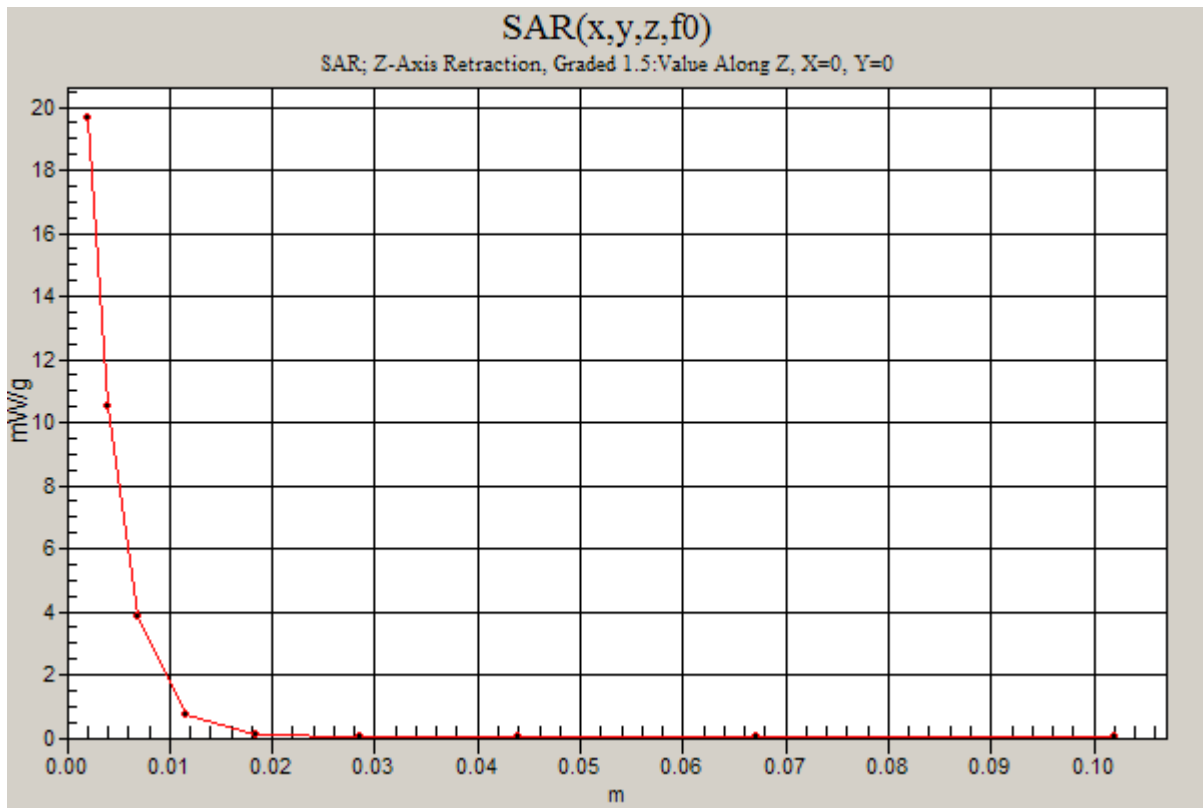
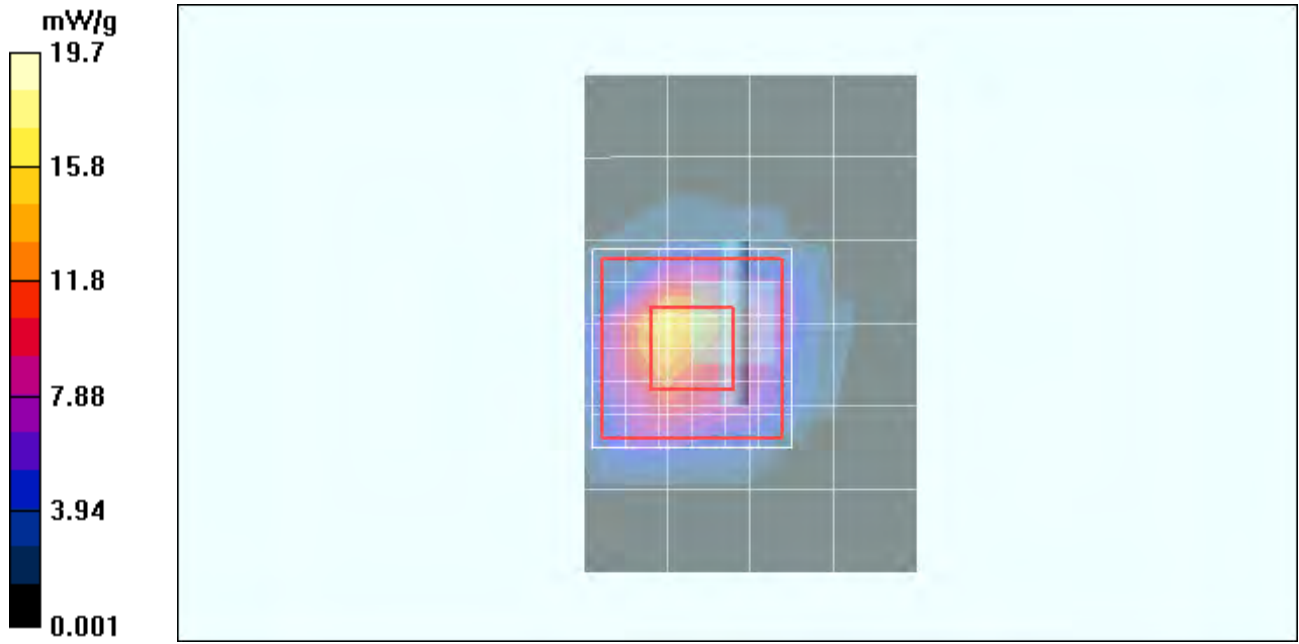
Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 51.9 V/m; Power Drift = 0.066 dB; Peak SAR (extrapolated) = 36.7 W/kg

SAR(1 g) = 9.16 mW/g; SAR(10 g) = 2.6 mW/g; Maximum value of SAR (measured) = 19.4 mW/g

Daily SPC Check/Z-Axis Retraction, Graded 1.5 (1x1x9):

Measurement grid: dx=20mm, dy=20mm, dz=2mm; Maximum value of SAR (measured) = 19.7 mW/g



Appendix 2

SAR distribution plots for Body Worn Configuration

Date/Time: 3/15/2011 1:11:08 PM

Test Laboratory: Motorola - GSM 850 Top Edge of DUT

Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: 5; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Top Edge of DUT 0 mm from Phantom

Communication System: GPRS 850 CI 10; Frequency: 848.8 MHz; Channel Number: 251; Duty Cycle: 1:4.15

Medium: Low Freq Body

Medium parameters used: $f = 835$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.15, 6.15, 6.15); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (10mm) (31x8x1):

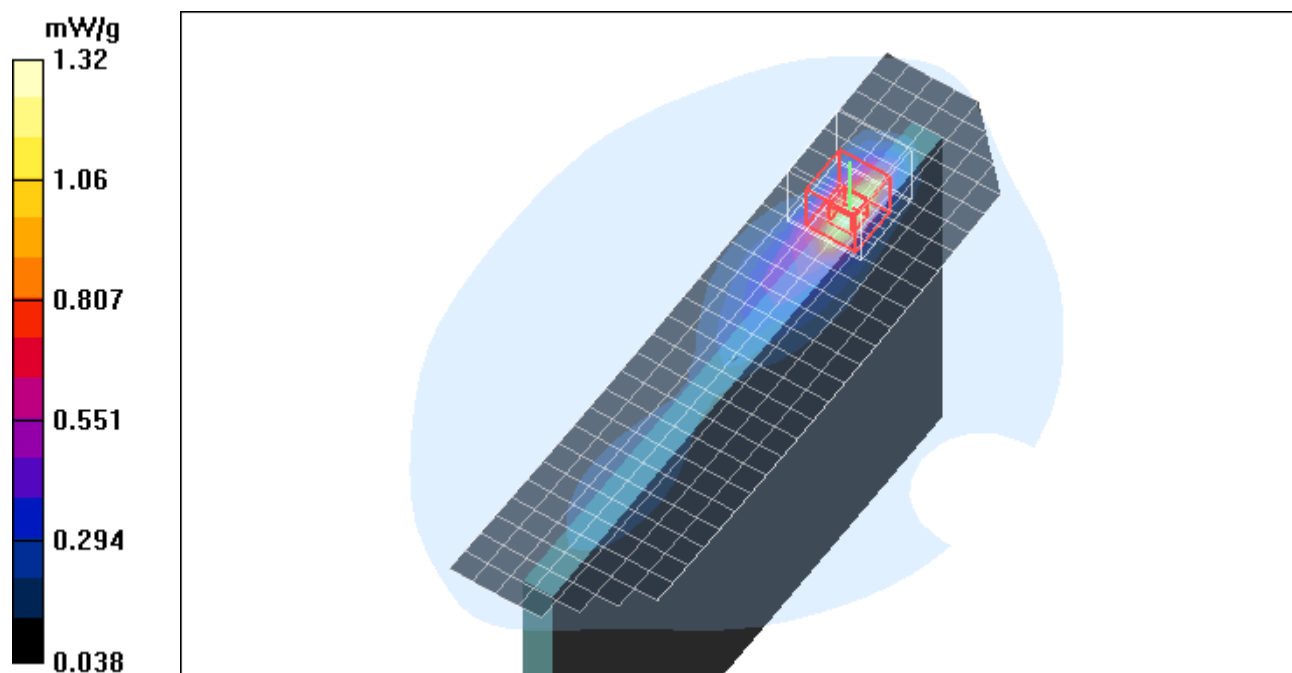
Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.26 mW/g

SAM DUT Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.3 V/m; Power Drift = 0.083 dB; Peak SAR (extrapolated) = 2.33 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.539 mW/g; Maximum value of SAR (measured) = 1.32 mW/g



Date/Time: 3/15/2011 6:06:34 PM

Test Laboratory: Motorola - WCDMA 850 Top Edge of DUT

Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: All Up Bits; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Top Edge of DUT 0 mm from Phantom

Communication System: WCDMA 850; Frequency: 836 MHz; Channel Number: 4180; Duty Cycle: 1:1

Medium: Low Freq Body

Medium parameters used: $f = 835$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.15, 6.15, 6.15); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (15mm) (21x6x1):

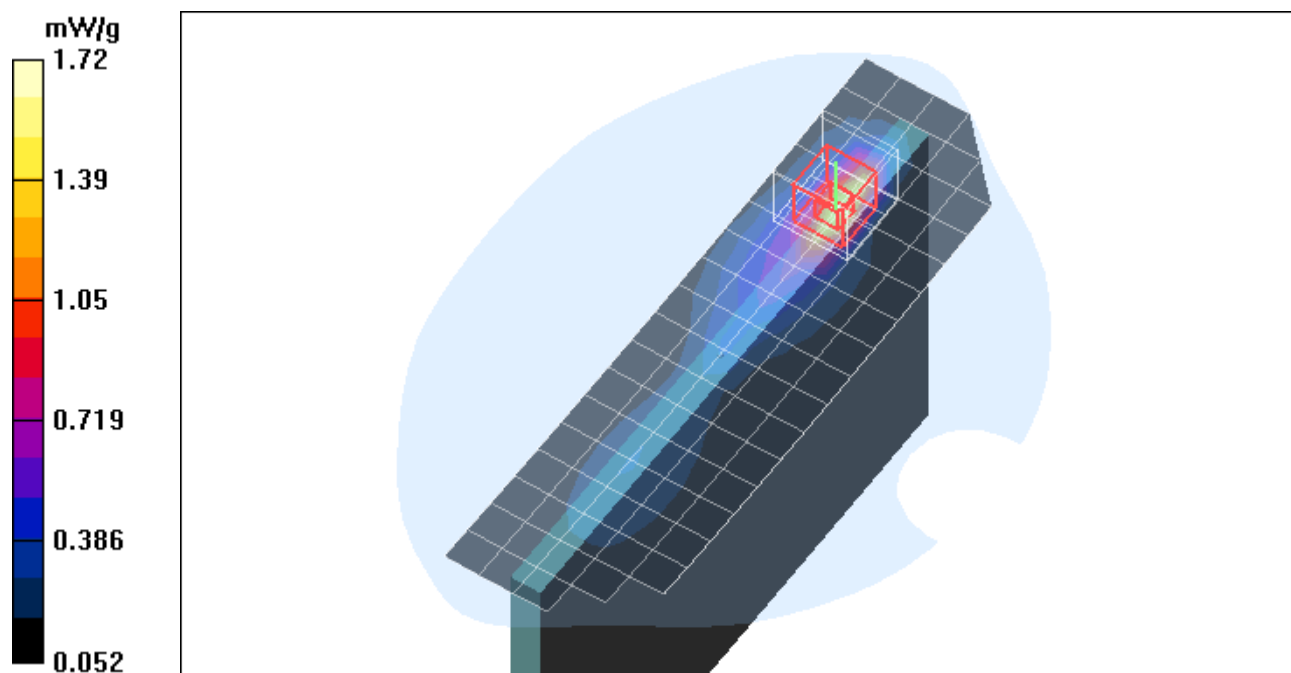
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.62 mW/g

SAM DUT Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 30.3 V/m; Power Drift = 0.081 dB; Peak SAR (extrapolated) = 3.07 W/kg

SAR(1 g) = 1.48 mW/g; SAR(10 g) = 0.727 mW/g; Maximum value of SAR (measured) = 1.72 mW/g



Date/Time: 3/16/2011 10:06:23 AM

Test Laboratory: Motorola - GSM 1900 Top Edge of DUT

Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: 0; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Top Edge of DUT 0 mm from Phantom

Communication System: GPRS 1900 Class 10; Frequency: 1909.8 MHz; Channel Number: 810;

Duty Cycle: 1:4.15

Medium: Regular Glycol Body 1750/1880

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(4.84, 4.84, 4.84); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (10mm) (31x8x1):

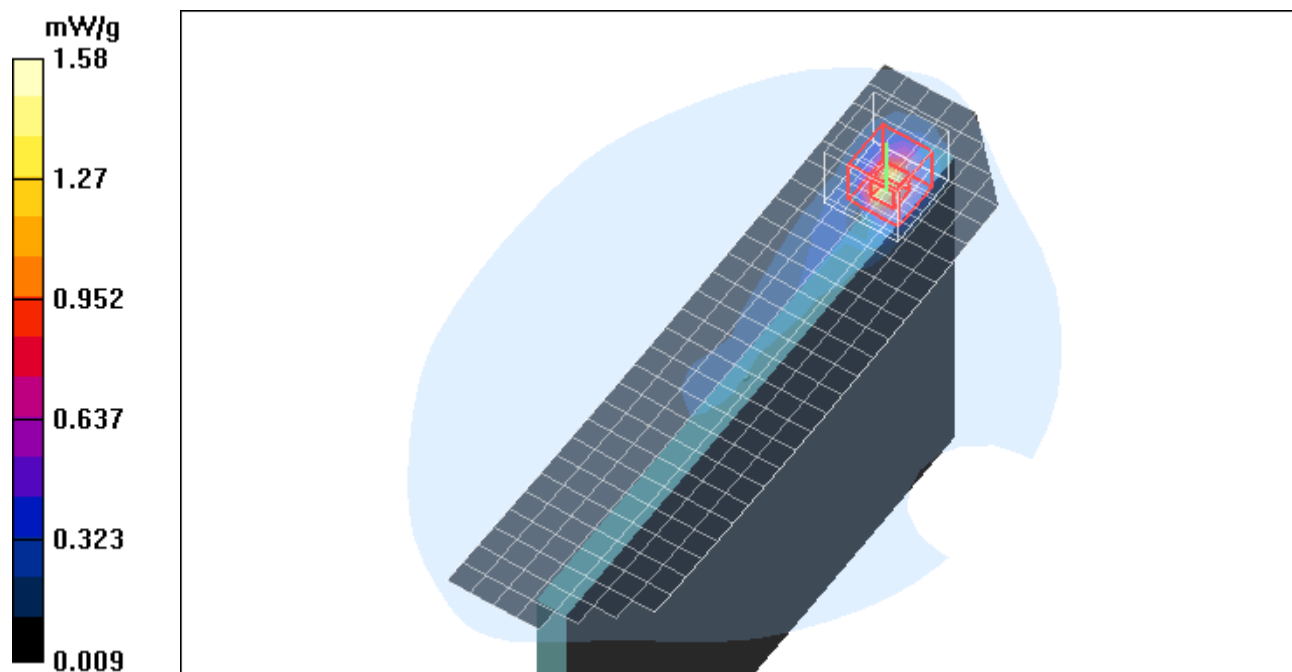
Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.26 mW/g

SAM Phone Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.7 V/m; Power Drift = -0.030 dB; Peak SAR (extrapolated) = 2.54 W/kg

SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.543 mW/g; Maximum value of SAR (measured) = 1.58 mW/g



Date/Time: 3/16/2011 9:05:26 PM

Test Laboratory: Motorola - WCDMA 1900 Top Edge of DUT

Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: All Up Bits; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Top Edge of DUT 0 mm from Phantom

Communication System: WCDMA 1900; Frequency: 1880 MHz; Channel Number: 9400; Duty Cycle: 1:1

Medium: Regular Glycol Body 1750/1880

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(4.84, 4.84, 4.84); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (15mm) (21x6x1):

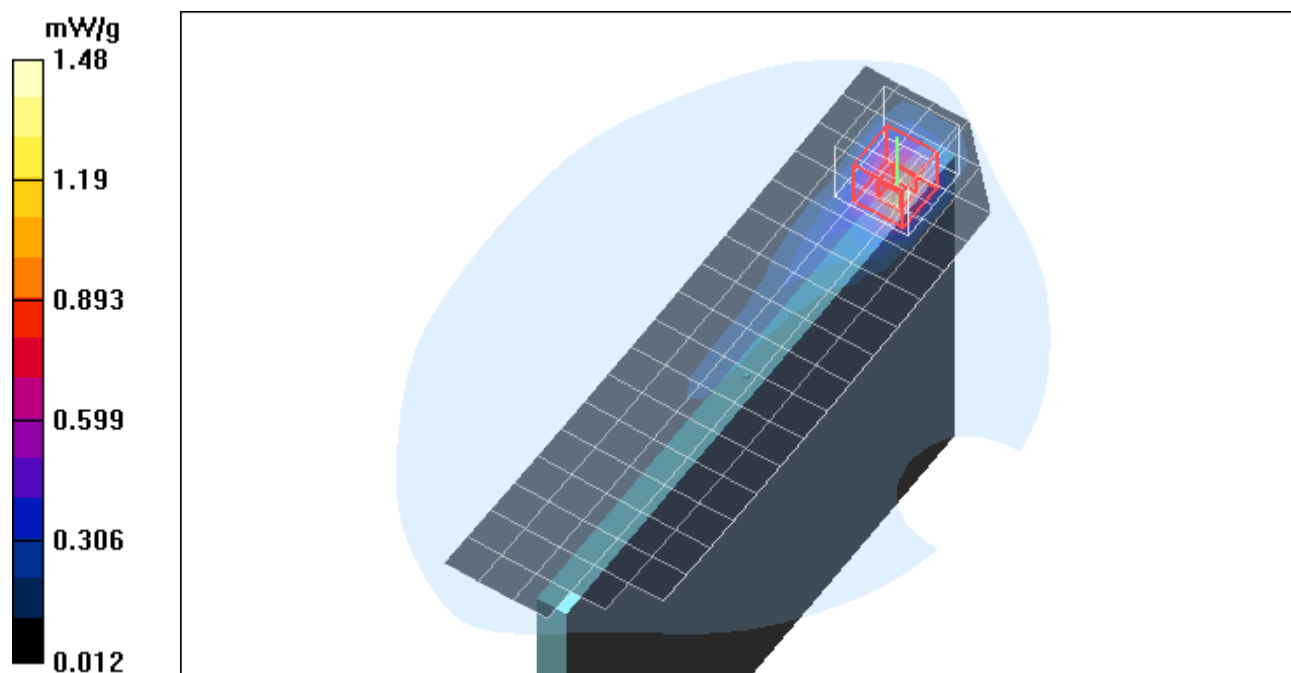
Measurement grid: $dx=15$ mm, $dy=15$ mm; Maximum value of SAR (measured) = 0.960 mW/g

SAM DUT Against Flat Section/5x5x7 Zoom Scan (≤ 3 GHz) (5x5x7)/Cube 0:

Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 16.0 V/m; Power Drift = -0.084 dB; Peak SAR (extrapolated) = 2.48 W/kg

SAR(1 g) = 1.24 mW/g; SAR(10 g) = 0.571 mW/g; Maximum value of SAR (measured) = 1.48 mW/g



Date/Time: 3/25/2011 2:53:37 PM

Test Laboratory: Motorola - Wi-Fi 2450 Top Edge of DUT

Serial: LHBA230122; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: N/A; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Top Edge of DUT 0 mm from Phantom

Device Mode: 802.11b mode, 1 Mbps data rate

Communication System: Wi-Fi 2450; Frequency: 2462 MHz; Channel Number: 11; Duty Cycle: 1:1

Medium: 2450 Glycol Body

Medium parameters used: $f = 2450$ MHz; $\sigma = 2.04$ mho/m; $\epsilon_r = 47.7$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3124; ConvF(4.19, 4.19, 4.19); Calibrated: 8/11/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#4 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1250;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Body (15mm) (21x6x1):

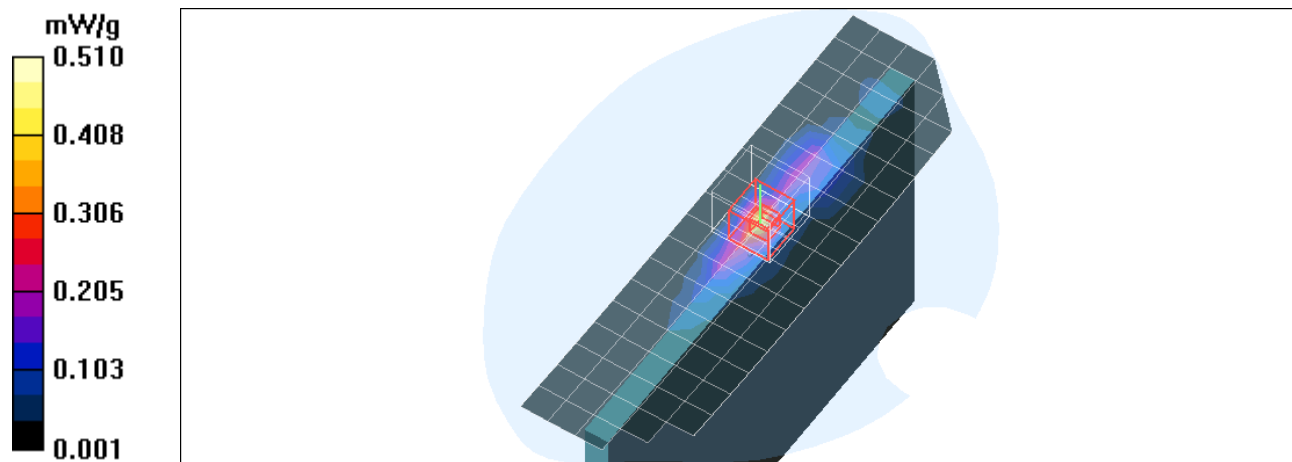
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.420 mW/g

SAM DUT Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 16.5 V/m; Power Drift = 0.011 dB; Peak SAR (extrapolated) = 1.02 W/kg

SAR(1 g) = 0.399 mW/g; SAR(10 g) = 0.146 mW/g; Maximum value of SAR (measured) = 0.510 mW/g



Date/Time: 3/29/2011 8:32:13 AM

Test Laboratory: Motorola - Wi-Fi 5210 Top Edge of DUT

Serial: LHBA230122; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: N/A; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Top Edge of DUT 0 mm from Phantom

Device Mode: 802.11n mode, 21.7 Mbps data rate (20 MHz BW, 400 ns GI)

Communication System: 5210MHz Band; Frequency: 5240 MHz; Channel Number: 48; Duty Cycle: 1:1

Medium: 5-6 GHz SPEAG Tissue BODY

Medium parameters used: $f = 5210$ MHz; $\sigma = 5.97$ mho/m; $\epsilon_r = 46.2$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: EX3DV4 - SN3730; ConvF(4.07, 4.07, 4.07); Calibrated: 7/16/2010
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 11/11/2010
- Phantom: R#3 5Ghz BODY SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1106;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Body (10mm) (31x8x1):

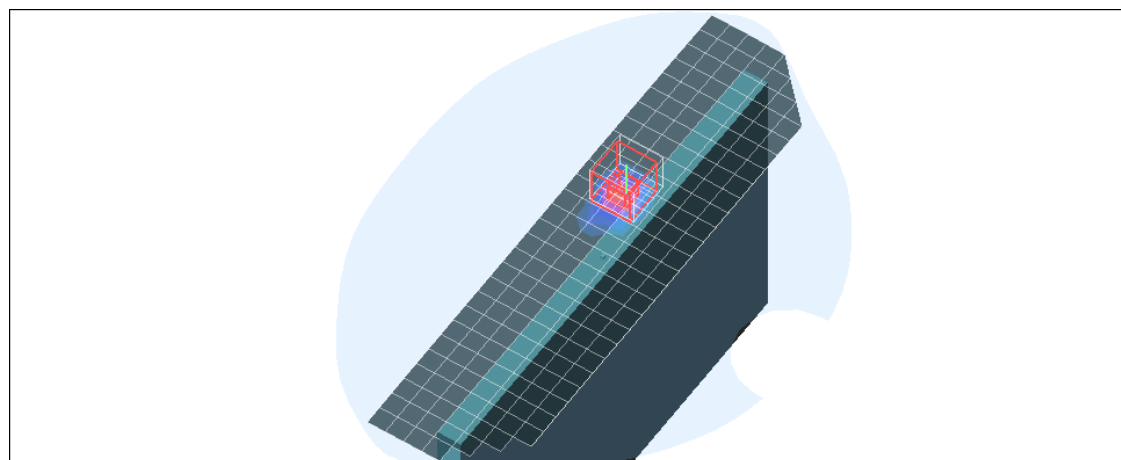
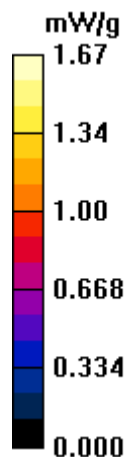
Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.02 mW/g

SAM DUT Against Flat Section/7x7x12 Zoom Scan (5-6GHz) (7x7x6)/Cube 0:

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

Reference Value = 6.53 V/m; Power Drift = -0.009 dB; Peak SAR (extrapolated) = 2.85 W/kg

SAR(1 g) = 0.762 mW/g; SAR(10 g) = 0.185 mW/g; Maximum value of SAR (measured) = 1.67 mW/g



Date/Time: 3/28/2011 10:23:19 AM

Test Laboratory: Motorola - Wi-Fi 5785 Top Edge of DUT

Serial: LHBA230122; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: N/A; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Top Edge of DUT 0 mm from Phantom

Device Mode: 802.11a mode, 6 Mbps data rate

Communication System: 5785MHz Band; Frequency: 5805 MHz; Channel Number: 161; Duty Cycle: 1:1

Medium: 5-6 GHz SPEAG Tissue BODY

Medium parameters used: $f = 5785$ MHz; $\sigma = 6.79$ mho/m; $\epsilon_r = 44.9$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: EX3DV4 - SN3730; ConvF(3.53, 3.53, 3.53); Calibrated: 7/16/2010
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 11/11/2010
- Phantom: R#3 5Ghz BODY SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1106;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Body (10mm) (31x8x1):

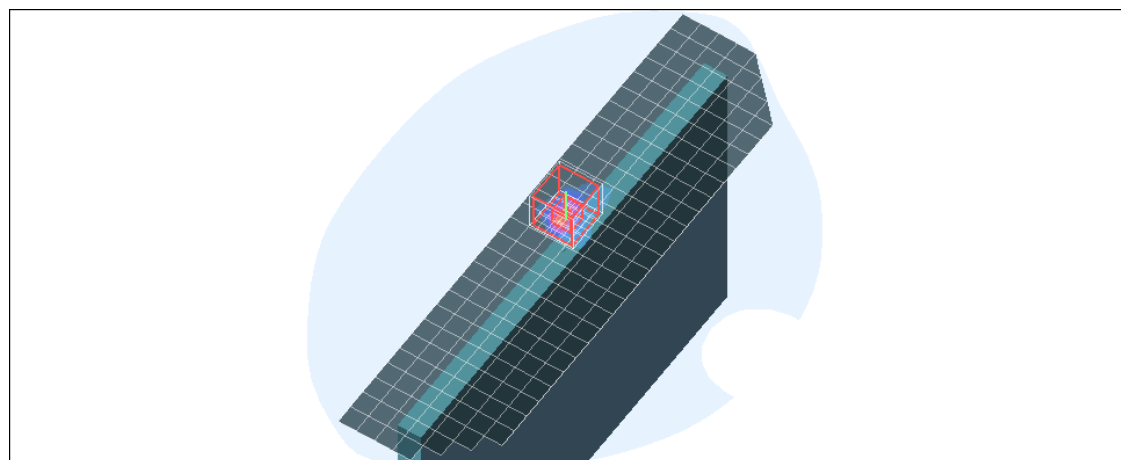
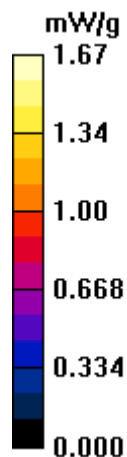
Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.07 mW/g

SAM DUT Against Flat Section/7x7x12 Zoom Scan (5-6GHz) (7x7x6)/Cube 0:

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

Reference Value = 3.36 V/m; Power Drift = -0.174 dB; Peak SAR (extrapolated) = 3.07 W/kg

SAR(1 g) = 0.645 mW/g; SAR(10 g) = 0.140 mW/g; Maximum value of SAR (measured) = 1.67 mW/g



Date/Time: 3/15/2011 2:29:32 PM

Test Laboratory: Motorola - GSM 850 Right Edge of DUT

Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: 5; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Right Edge of DUT 0 mm from Phantom

Communication System: GPRS 850 CI 10; Frequency: 836.6 MHz; Channel Number: 190; Duty Cycle: 1:4.15

Medium: Low Freq Body

Medium parameters used: $f = 835$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.15, 6.15, 6.15); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (10mm) (31x8x1):

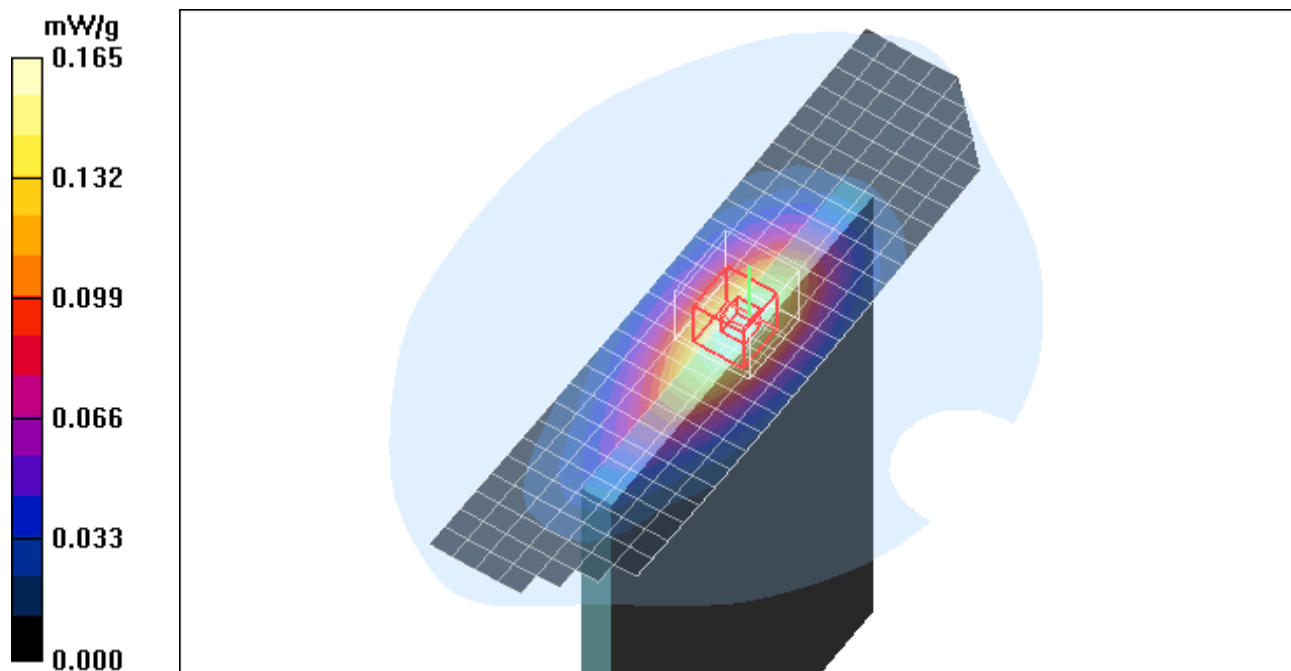
Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.165 mW/g

SAM DUT Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 12.7 V/m; Power Drift = 0.244 dB; Peak SAR (extrapolated) = 0.229 W/kg

SAR(1 g) = 0.160 mW/g; SAR(10 g) = 0.110 mW/g; Maximum value of SAR (measured) = 0.172 mW/g



Date/Time: 3/16/2011 12:24:34 AM

Test Laboratory: Motorola - WCDMA 850 Right Edge of DUT

Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: All Up Bits; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Right Edge of DUT 0 mm from Phantom

Communication System: WCDMA 850; Frequency: 836 MHz; Channel Number: 4180; Duty Cycle: 1:1

Medium: Low Freq Body

Medium parameters used: $f = 835$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.15, 6.15, 6.15); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (15mm) (15x6x1):

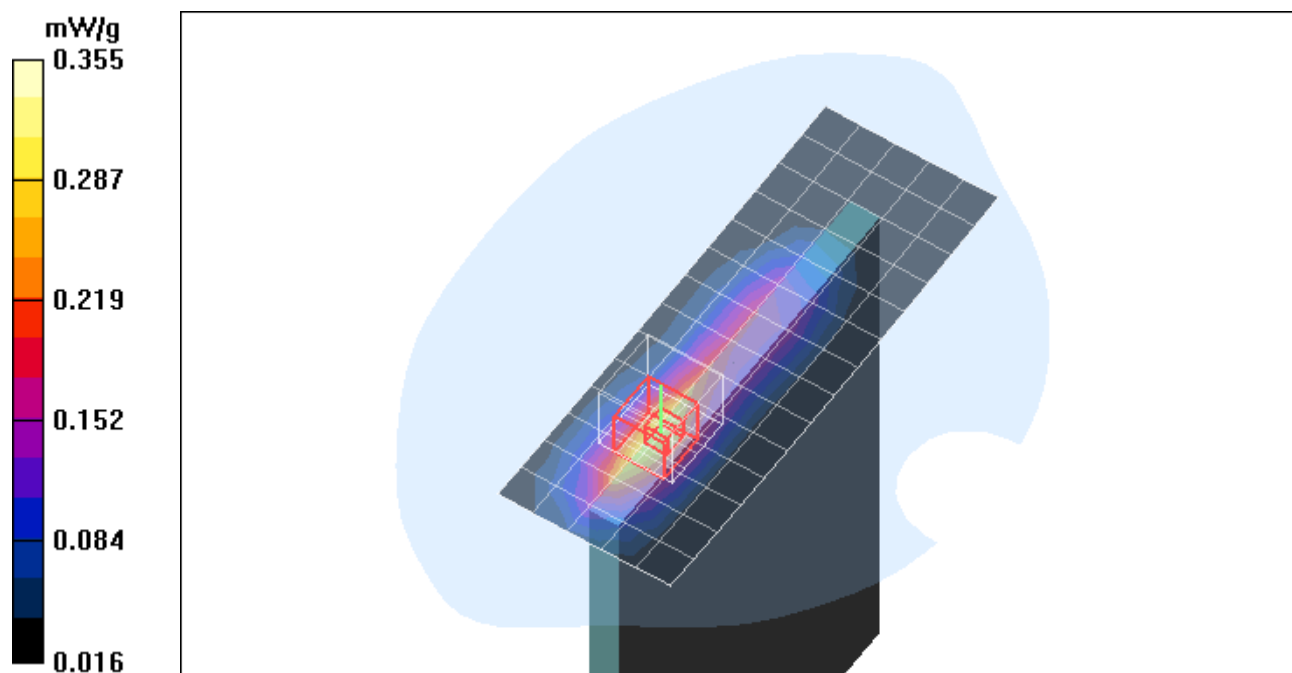
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.305 mW/g

SAM DUT Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.1 V/m; Power Drift = 0.003 dB; Peak SAR (extrapolated) = 0.581 W/kg

SAR(1 g) = 0.313 mW/g; SAR(10 g) = 0.176 mW/g; Maximum value of SAR (measured) = 0.355 mW/g



Date/Time: 3/16/2011 2:26:55 AM

Test Laboratory: Motorola - GSM 1900 Right Edge of DUT

Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: 0; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Right Edge of DUT 0 mm from Phantom

Communication System: GPRS 1900 CI 10; Frequency: 1909.8 MHz; Channel Number: 810;

Duty Cycle: 1:4.15

Medium: Regular Glycol Body 1750/1880

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 51.2$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(4.84, 4.84, 4.84); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (15mm) (15x6x1):

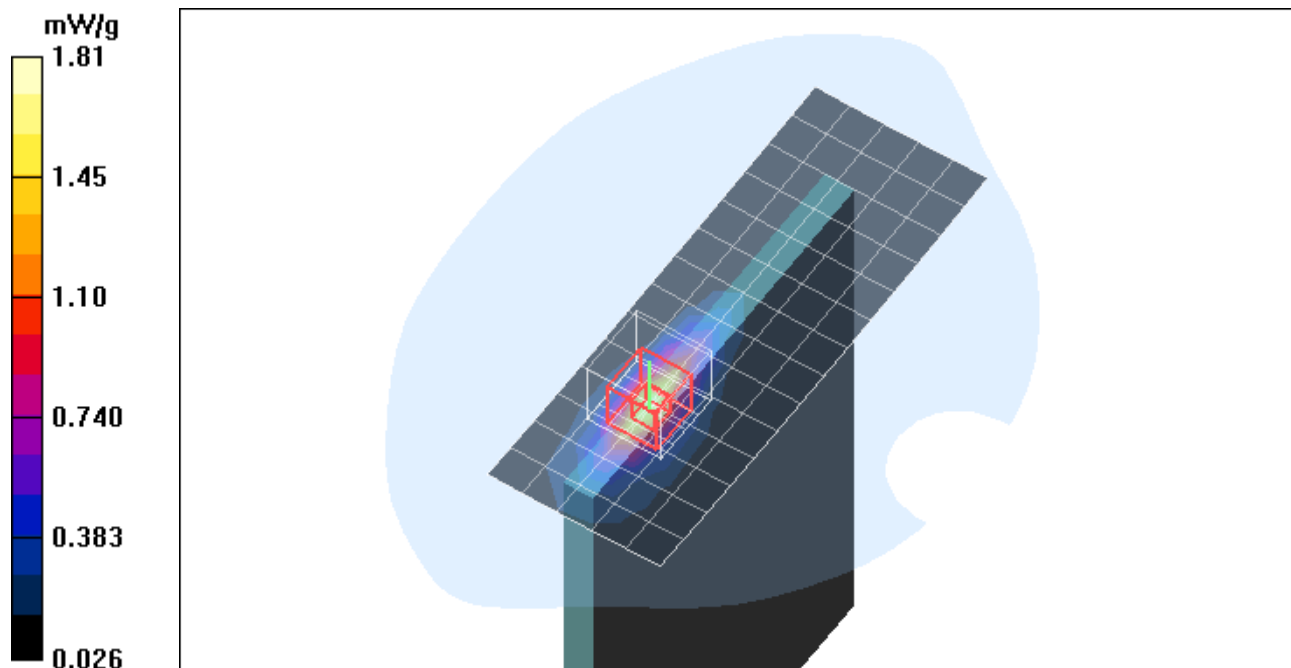
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.71 mW/g

SAM DUT Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 32.2 V/m; Power Drift = 0.042 dB; Peak SAR (extrapolated) = 3.16 W/kg

SAR(1 g) = 1.53 mW/g; SAR(10 g) = 0.728 mW/g; Maximum value of SAR (measured) = 1.81 mW/g



Date/Time: 3/17/2011 3:48:19 PM

Test Laboratory: Motorola - WCDMA 1900 Right Edge of DUT

Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: All Up Bits; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Right Edge of DUT 0 mm from Phantom

Communication System: WCDMA 1900; Frequency: 1852.5 MHz; Channel Number: 9262; Duty Cycle: 1:1

Medium: Regular Glycol Body 1750/1880

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 51$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(4.84, 4.84, 4.84); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (15mm) (15x6x1):

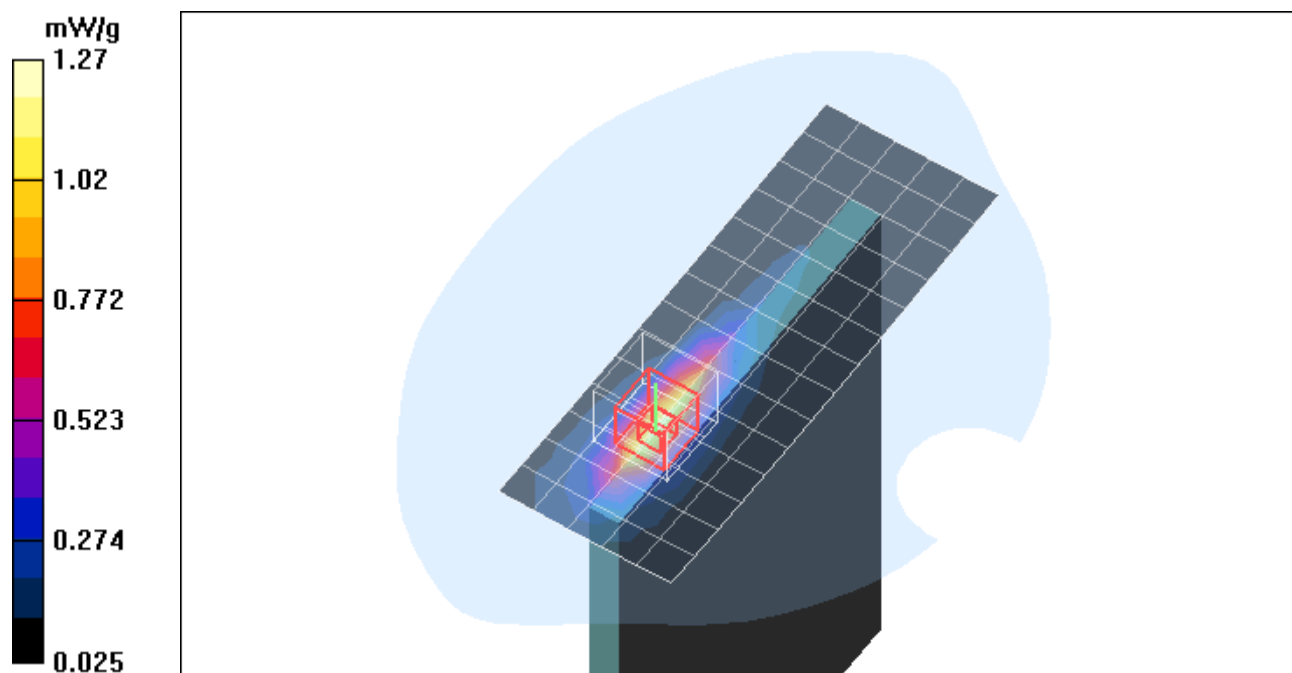
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.19 mW/g

SAM DUT Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 27.5 V/m; Power Drift = -0.001 dB; Peak SAR (extrapolated) = 2.14 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.561 mW/g; Maximum value of SAR (measured) = 1.27 mW/g



Date/Time: 3/15/2011 3:25:11 PM

Test Laboratory: Motorola - GSM 850 Back of DUT

Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: 5; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Back Surface of DUT 0 mm from Phantom

Communication System: GPRS 850 CI 10; Frequency: 824.2 MHz; Channel Number: 128; Duty Cycle: 1:4.15

Medium: Low Freq Body

Medium parameters used: $f = 835$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.15, 6.15, 6.15); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (15mm) (21x6x1):

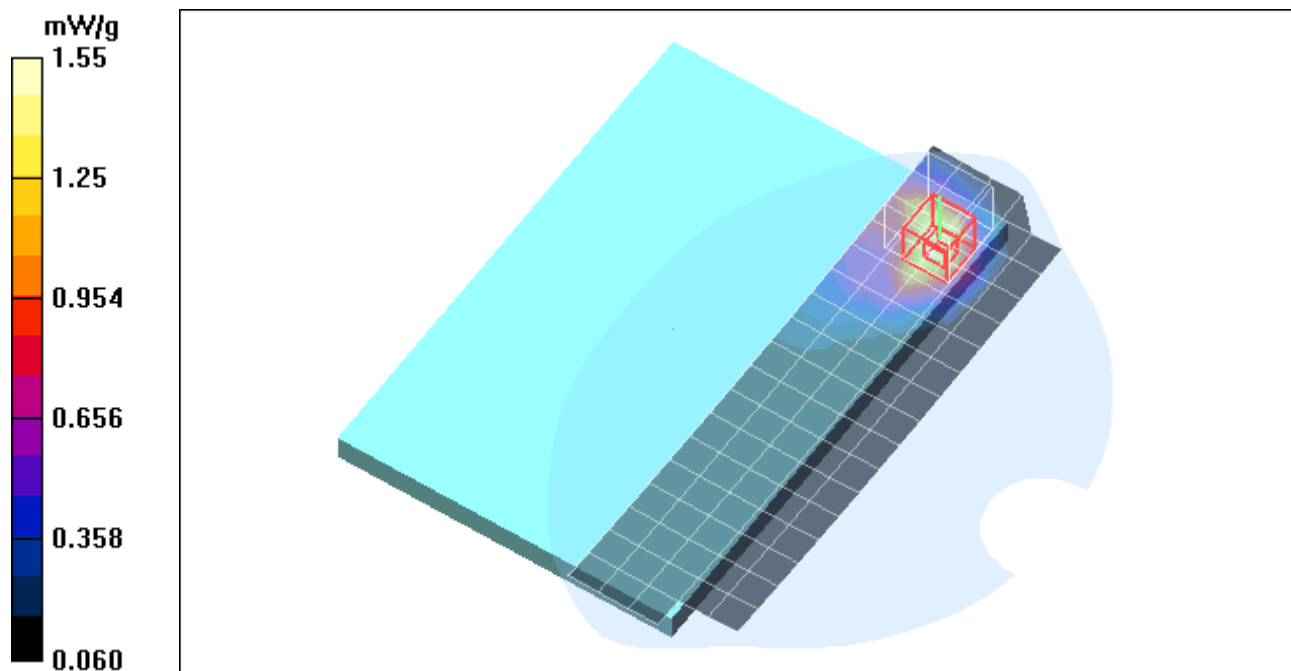
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.51 mW/g

SAM DUT Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 25.2 V/m; Power Drift = 0.040 dB; Peak SAR (extrapolated) = 2.58 W/kg

SAR(1 g) = 1.45 mW/g; SAR(10 g) = 0.827 mW/g; Maximum value of SAR (measured) = 1.55 mW/g



Date/Time: 3/15/2011 9:19:44 PM

Test Laboratory: Motorola - WCDMA 850 Back of DUT

Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: All Up Bits; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Back Surface of DUT 0 mm from Phantom

Communication System: WCDMA 850; Frequency: 846.6 MHz; Channel Number: 4233; Duty Cycle: 1:1

Medium: Low Freq Body

Medium parameters used: $f = 835$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 53.4$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.15, 6.15, 6.15); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (15mm) (21x6x1):

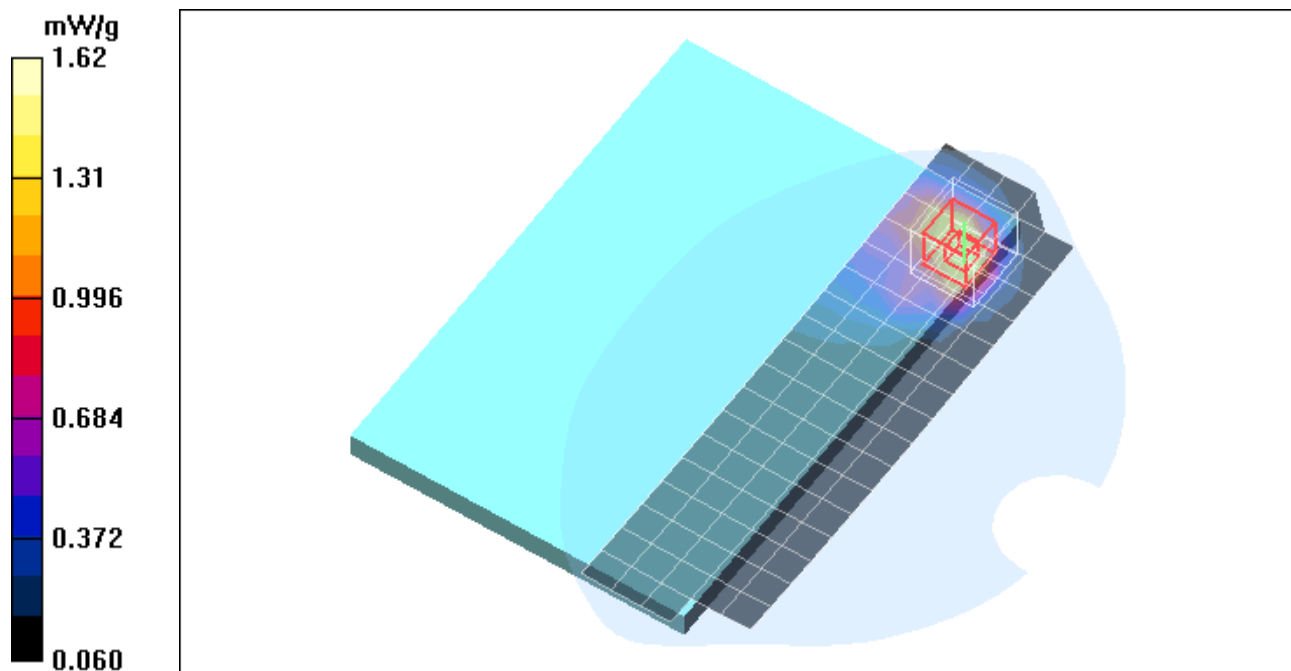
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 1.35 mW/g

SAM DUT Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 32.9 V/m; Power Drift = 0.038 dB; Peak SAR (extrapolated) = 2.67 W/kg

SAR(1 g) = 1.48 mW/g; SAR(10 g) = 0.843 mW/g; Maximum value of SAR (measured) = 1.62 mW/g



Date/Time: 3/17/2011 1:35:38 PM

Test Laboratory: Motorola - GSM 1900 Back of DUT

Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: 0; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Back Surface of DUT 0 mm from Phantom

Communication System: GPRS 1900 CI 10; Frequency: 1880 MHz; Channel Number: 661; Duty Cycle: 1:4.15

Medium: Regular Glycol Body 1750/1880

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 51$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(4.84, 4.84, 4.84); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (10mm) (31x8x1):

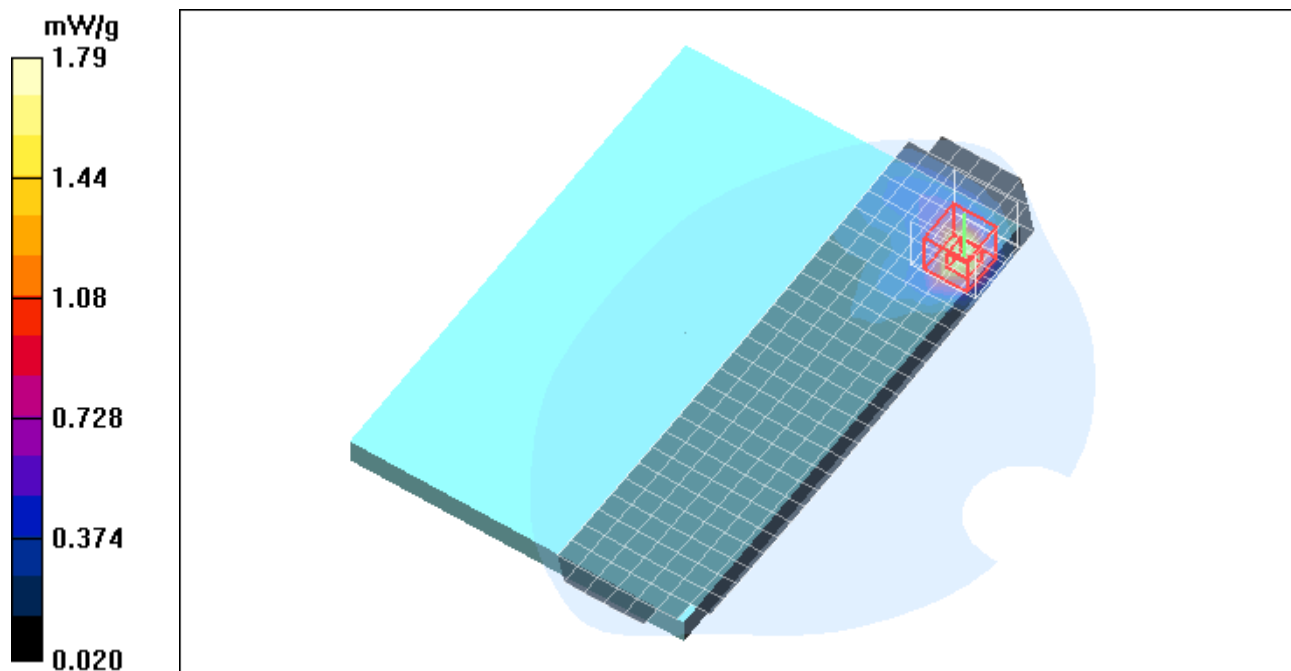
Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 1.57 mW/g

SAM Phone Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 19.7 V/m; Power Drift = -0.008 dB; Peak SAR (extrapolated) = 3.01 W/kg

SAR(1 g) = 1.53 mW/g; SAR(10 g) = 0.735 mW/g; Maximum value of SAR (measured) = 1.79 mW/g



Date/Time: 3/16/2011 4:51:09 PM

Test Laboratory: Motorola - WCDMA 1900 Back of DUT

Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: All Up Bits; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Back Surface of DUT 0 mm from Phantom

Communication System: WCDMA 1900; Frequency: 1880 MHz; Channel Number: 9400; Duty Cycle: 1:1

Medium: Regular Glycol Body 1750/1880

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 51.6$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(4.84, 4.84, 4.84); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (15mm) (21x6x1):

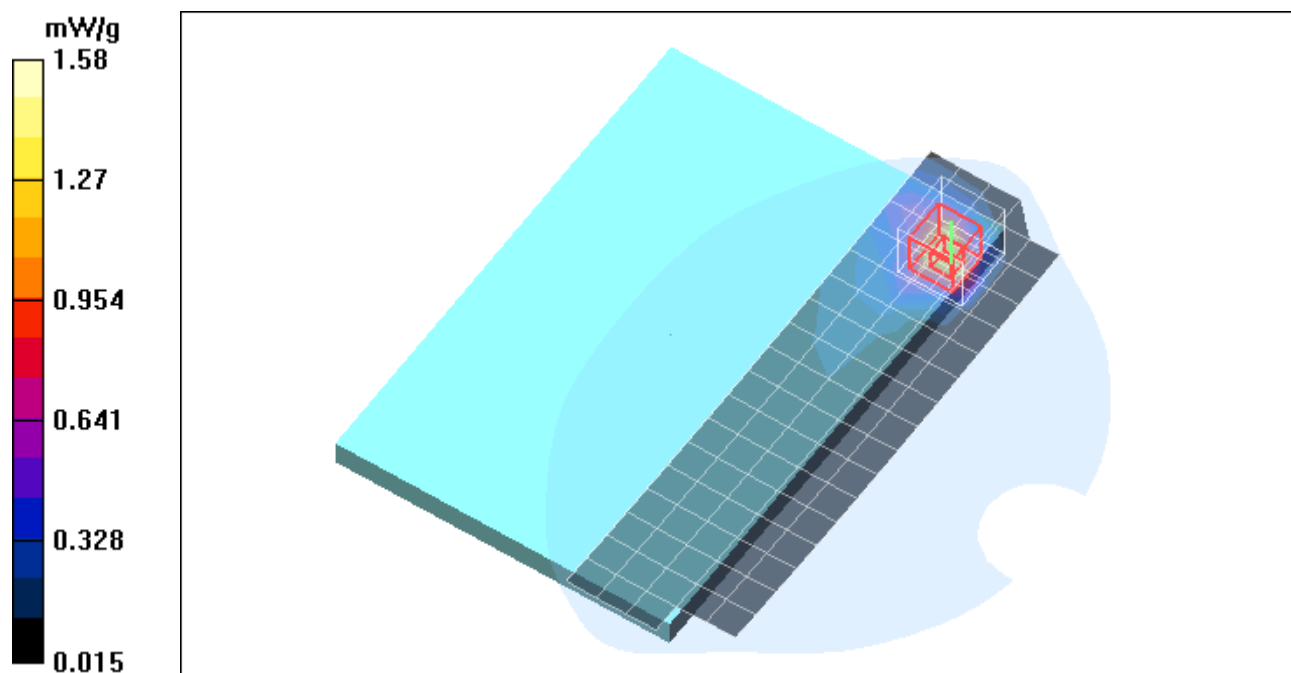
Measurement grid: $dx=15$ mm, $dy=15$ mm; Maximum value of SAR (measured) = 1.10 mW/g

SAM DUT Against Flat Section/5x5x7 Zoom Scan (≤ 3 GHz) (5x5x7)/Cube 0:

Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 15.6 V/m; Power Drift = 0.198 dB; Peak SAR (extrapolated) = 2.68 W/kg

SAR(1 g) = 1.42 mW/g; SAR(10 g) = 0.718 mW/g; Maximum value of SAR (measured) = 1.58 mW/g



Date/Time: 3/29/2011 1:40:31 PM

Test Laboratory: Motorola - Wi-Fi 2450 Back of DUT

Serial: LHBA230122; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: N/A; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Back Surface of DUT 0 mm from Phantom

Device Mode: 802.11b mode, 1 Mbps data rate

Communication System: Wi-Fi 2450; Frequency: 2462 MHz; Channel Number: 11; Duty Cycle: 1:1

Medium: 2450 Glycol Body

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.96$ mho/m; $\epsilon_r = 48$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(4.36, 4.36, 4.36); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (15mm) (21x6x1):

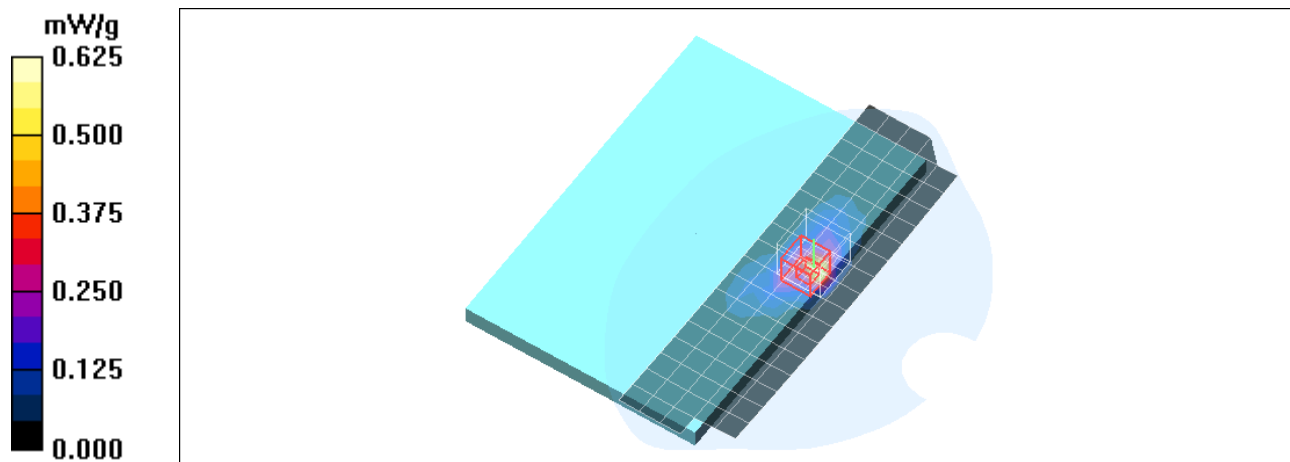
Measurement grid: dx=15mm, dy=15mm; Maximum value of SAR (measured) = 0.576 mW/g

SAM DUT Against Flat Section/5x5x7 Zoom Scan (<=3GHz) (5x5x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 17.4 V/m; Power Drift = 0.022 dB; Peak SAR (extrapolated) = 1.55 W/kg

SAR(1 g) = 0.592 mW/g; SAR(10 g) = 0.231 mW/g; Maximum value of SAR (measured) = 0.625 mW/g



Date/Time: 3/25/2011 1:25:35 PM

Test Laboratory: Motorola - Wi-Fi 5210 Back of DUT

Serial: LHBA230122; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: N/A; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Back Surface of DUT 0 mm from Phantom

Device Mode: 802.11a mode, 6 Mbps data rate

Communication System: 5210MHz Band; Frequency: 5240 MHz; Channel Number: 48; Duty Cycle: 1:1

Medium: 5-6 GHz SPEAG Tissue BODY

Medium parameters used: $f = 5210$ MHz; $\sigma = 5.87$ mho/m; $\epsilon_r = 45.7$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: EX3DV4 - SN3730; ConvF(4.07, 4.07, 4.07); Calibrated: 7/16/2010
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 11/11/2010
- Phantom: R#3 5Ghz BODY SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1106;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (10mm) (31x8x1):

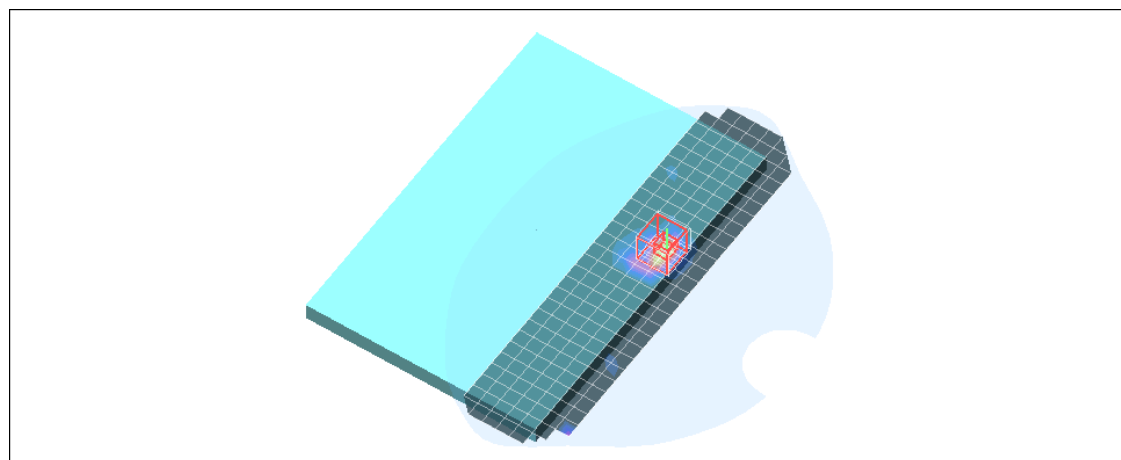
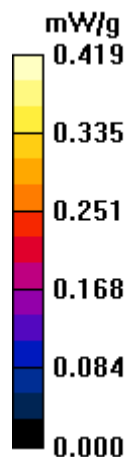
Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.439 mW/g

SAM DUT Against Flat Section/7x7x12 Zoom Scan (5-6GHz) (7x7x6)/Cube 0:

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

Reference Value = 6.97 V/m; Power Drift = 0.256 dB; Peak SAR (extrapolated) = 0.841 W/kg

SAR(1 g) = 0.214 mW/g; SAR(10 g) = 0.063 mW/g; Maximum value of SAR (measured) = 0.419 mW/g



Date/Time: 3/28/2011 9:40:04 AM

Test Laboratory: Motorola - Wi-Fi 5785 Back of DUT

Serial: LHBA230122; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: N/A; Antenna Position: Internal; Battery Model #: Internal

Device Position: Body Worn, Back Surface of DUT 0 mm from Phantom

Device Mode: 802.11a mode, 6 Mbps data rate

Communication System: 5785MHz Band; Frequency: 5805 MHz; Channel Number: 161; Duty Cycle: 1:1

Medium: 5-6 GHz SPEAG Tissue BODY

Medium parameters used: $f = 5785$ MHz; $\sigma = 6.79$ mho/m; $\epsilon_r = 44.9$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: EX3DV4 - SN3730; ConvF(3.53, 3.53, 3.53); Calibrated: 7/16/2010
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 11/11/2010
- Phantom: R#3 5Ghz BODY SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1106;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM DUT Against Flat Section/Area Scan - Normal Body (10mm) (31x8x1):

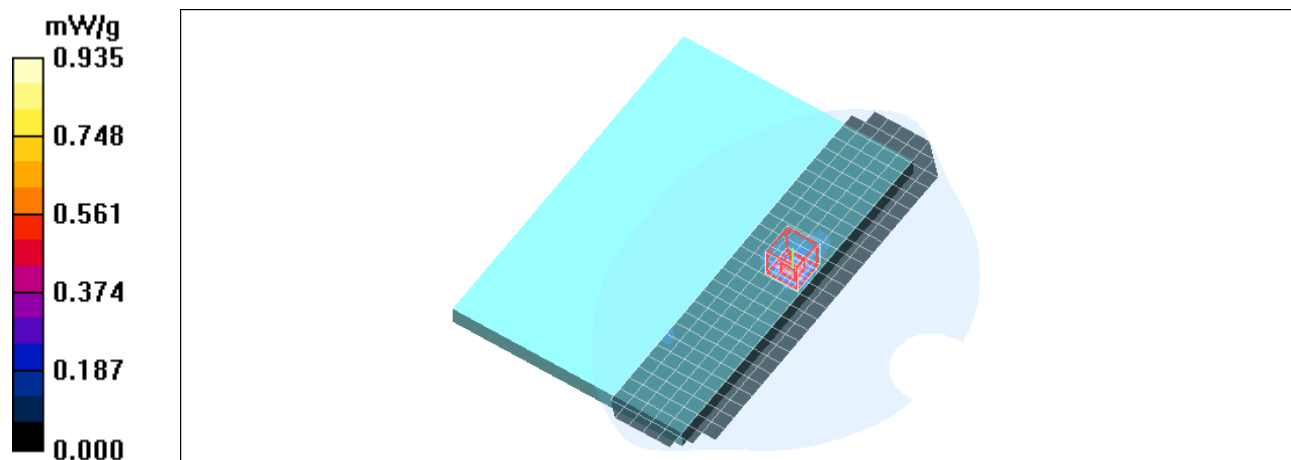
Measurement grid: dx=10mm, dy=10mm; Maximum value of SAR (measured) = 0.562 mW/g

SAM Phone Against Flat Section/7x7x12 Zoom Scan (5-6GHz) (7x7x6)/Cube 0:

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

Reference Value = 0.635 V/m; Power Drift = -0.205 dB; Peak SAR (extrapolated) = 1.96 W/kg

SAR(1 g) = 0.396 mW/g; SAR(10 g) = 0.098 mW/g; Maximum value of SAR (measured) = 0.935 mW/g



Appendix 3

SAR distribution plots for Simultaneous Transmission

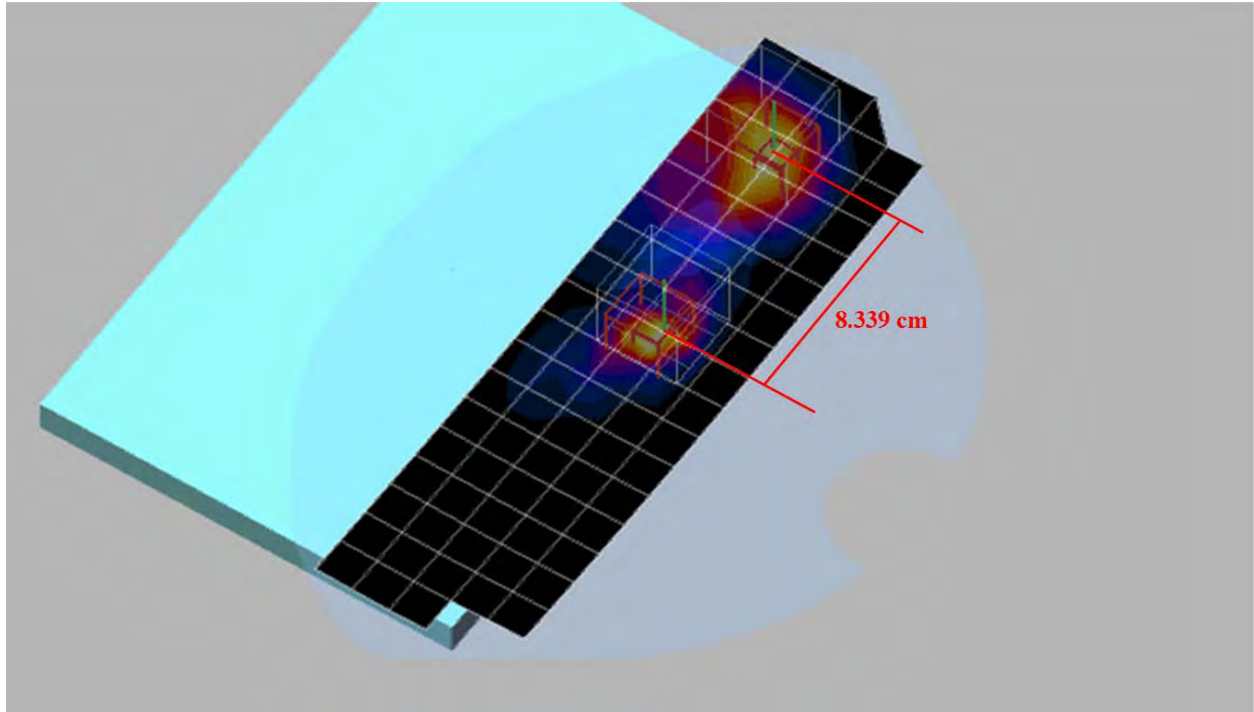


Figure A3.1: GSM 850 Back Surface of DUT SAR overlaid with Wi-Fi 2450 Back Surface of DUT SAR

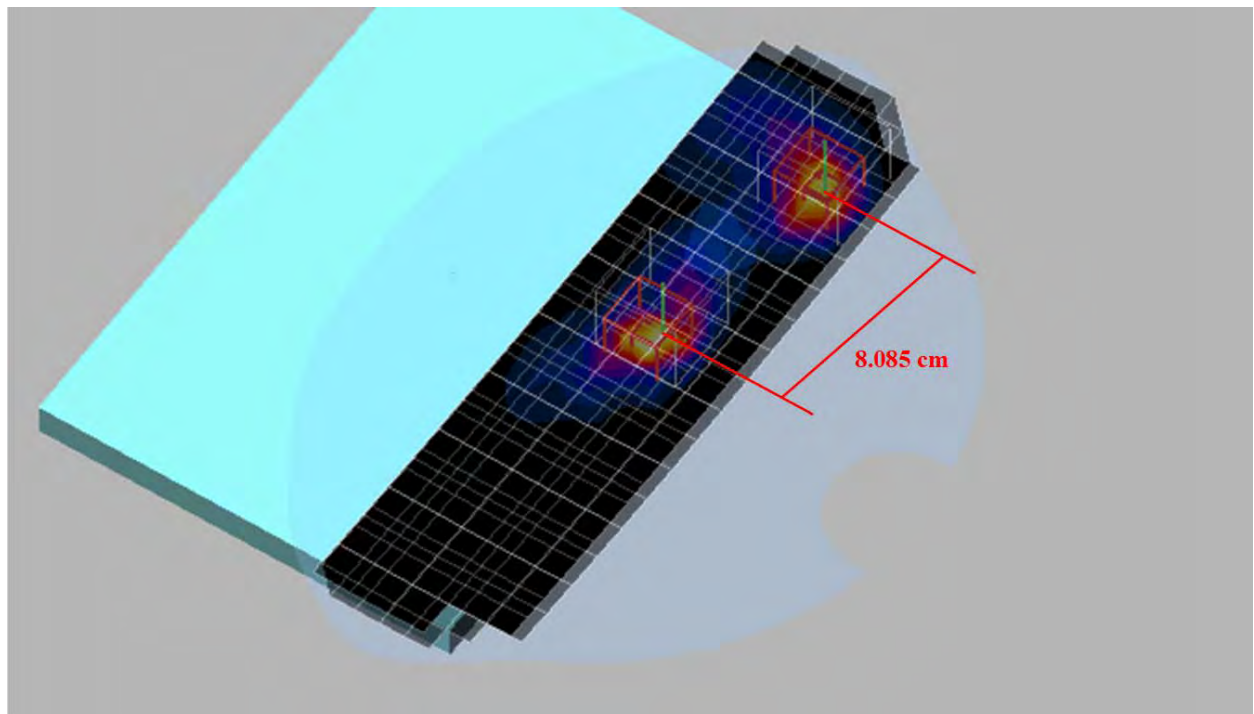


Figure A3.2: GSM 1900 Back Surface of DUT SAR overlaid with Wi-Fi 2450 Back Surface of DUT SAR

Test Laboratory: Motorola - GSM 850 + Wi-Fi 2450 Multiband Combined Body Worn Expanded Volumetric Measurement

DASY4 Configuration for DASY, SAM Flat Section

Top Edge of DUT 0 mm from Phantom

/SAM Phone Against Flat Section/MegaZoom Zoom Scan (≤ 3 GHz):

Date/Time: 4/7/2011 3:15:42 PM

Serial: LHBA230179; FCC ID: IHDT56ME1

Communication System: GPRS 850 Cl 10; Frequency: 848.8 MHz; Duty Cycle: 1:4.15

Medium: Big Body

Medium parameters used: $f = 835$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 55.9$; $\rho = 1000$ kg/m³

Measurement Standard: DASY4 (High Precision Assessment)

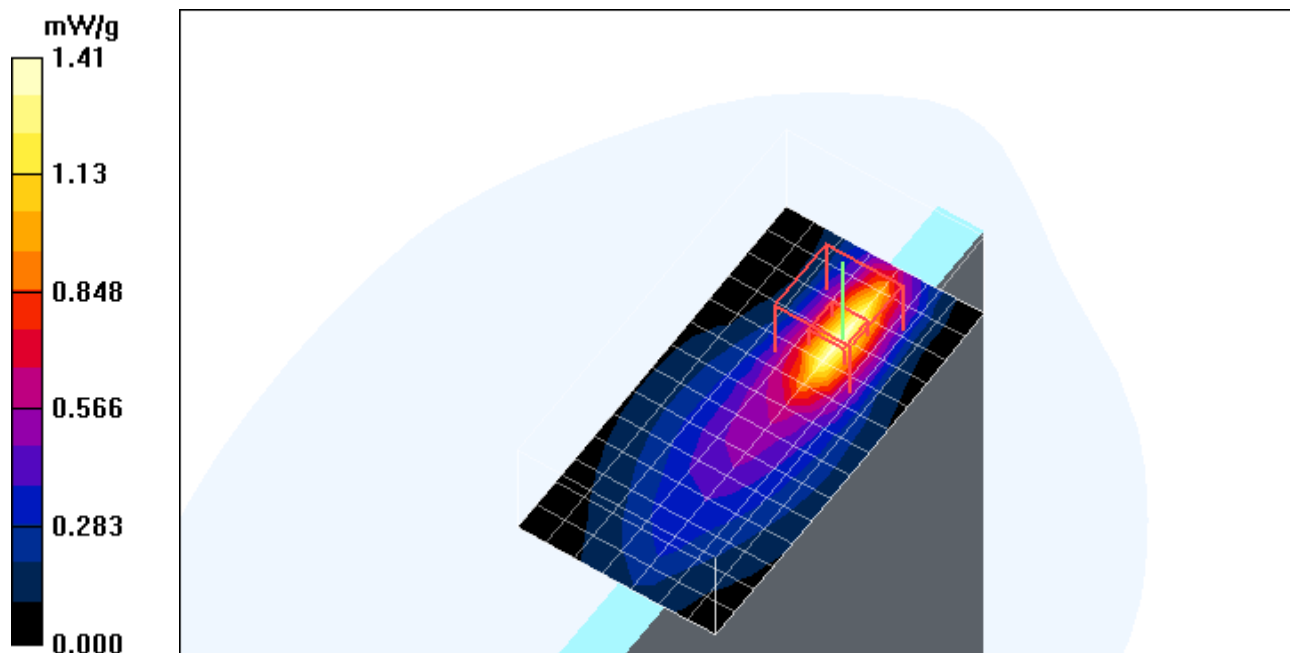
- Probe: ES3DV3 - SN3124; ConvF(5.86, 5.86, 5.86); Calibrated: 8/11/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#4 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1250
- Measurement SW: DASY4, V4.7 Build 80

SAM DUT Against Flat Section/MegaZoom Zoom Scan (≤ 3 GHz) (15x8x7)/Cube 0:

Measurement grid: dx=8mm, dy=8mm, dz=5mm; Volume Outer Dimensions: x=112mm, y=56mm, z=30mm

Reference Value = 37.9 V/m; Power Drift = 0.000 dB; Peak SAR (extrapolated) = 2.36 W/kg

SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.573 mW/g; Maximum value of SAR (measured) = 1.41 mW/g



2D Plot showing z-axis @ 0 mm layer of measurement volume

**DASY4 Configuration for DASY, SAM Flat Section
Top Edge of DUT 0 mm from Phantom
/SAM Phone Against Flat Section/MegaZoom Zoom Scan ($\leq 3\text{GHz}$):**

Date/Time: 4/7/2011 2:15:50 PM

Serial: 355483040050071; FCC ID: IHDT56ME1

Communication System: Wi-Fi 2450; Frequency: 2437 MHz; Duty Cycle: 1:1

Medium: 2450 Glycol Body

Medium parameters used: $f = 2450\text{ MHz}$; $\sigma = 2.04\text{ mho/m}$; $\epsilon_r = 47.5$; $\rho = 1000\text{ kg/m}^3$

Measurement Standard: DASY4 (High Precision Assessment)

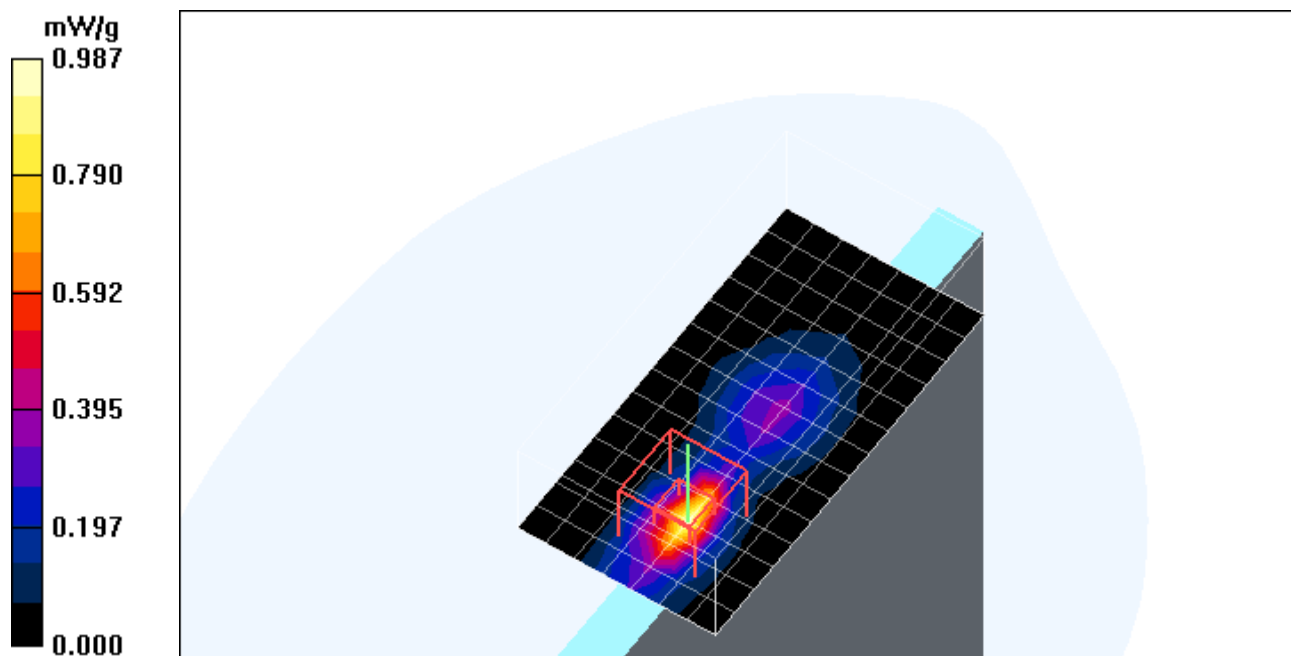
- Probe: ES3DV3 - SN3124; ConvF(4.19, 4.19, 4.19); Calibrated: 8/11/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#4 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1250
- Measurement SW: DASY4, V4.7 Build 80

SAM DUT Against Flat Section/MegaZoom Zoom Scan ($\leq 3\text{GHz}$) (15x8x7)/Cube 0:

Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$; Volume Outer Dimension: $x=112\text{mm}$, $y=56\text{mm}$, $z=30\text{mm}$

Reference Value = 21.2 V/m ; Power Drift = 0.226 dB ; Peak SAR (extrapolated) = 1.89 W/kg

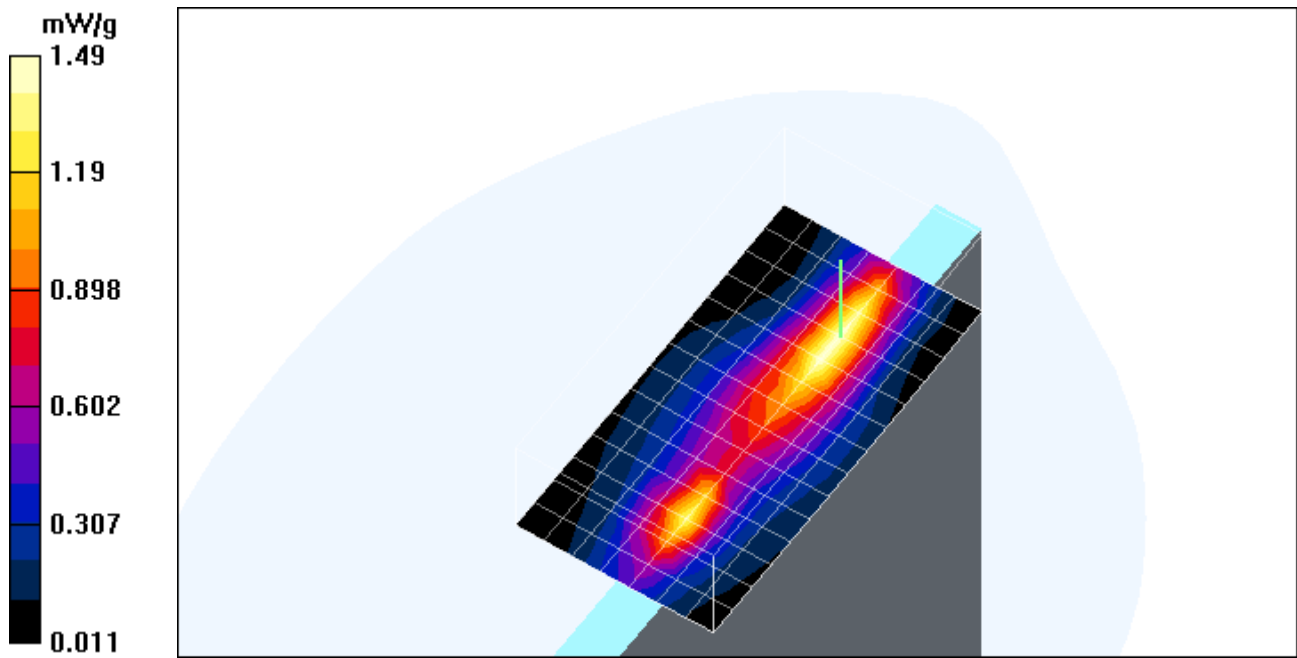
SAR(1 g) = 0.752 mW/g ; SAR(10 g) = 0.264 mW/g ; Maximum value of SAR (measured) = 0.987 mW/g



2D Plot showing z-axis @ 0 mm layer of measurement volume

Multi Band Result:**SAR(1 g) = 1.26 mW/g; SAR(10 g) = 0.626 mW/g**

Maximum value of SAR (measured) = 1.49 mW/g



2D Plot showing z-axis @ 0 mm layer of measurement volume

Test Laboratory: Motorola GPRS 850 for Simultaneous Transmit Test

DUT Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: 05 Accessory Model # = GPRS CLASS 10 (2 UPSLOTS), Top Edge of Tablet 0mm from Phantom

Communication System: GPRS 850 - Class 10; Frequency: 848.8 MHz; Communication System Channel Number: 251; Duty Cycle: 1:4.15

Medium: Low Freq Body; Medium parameters used: $f = 835$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.15, 6.15, 6.15); Calibrated: 7/14/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn661; Calibrated: 1/13/2011
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (10mm) (31x8x1):

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

Maximum value of SAR (measured) = 1.38 mW/g

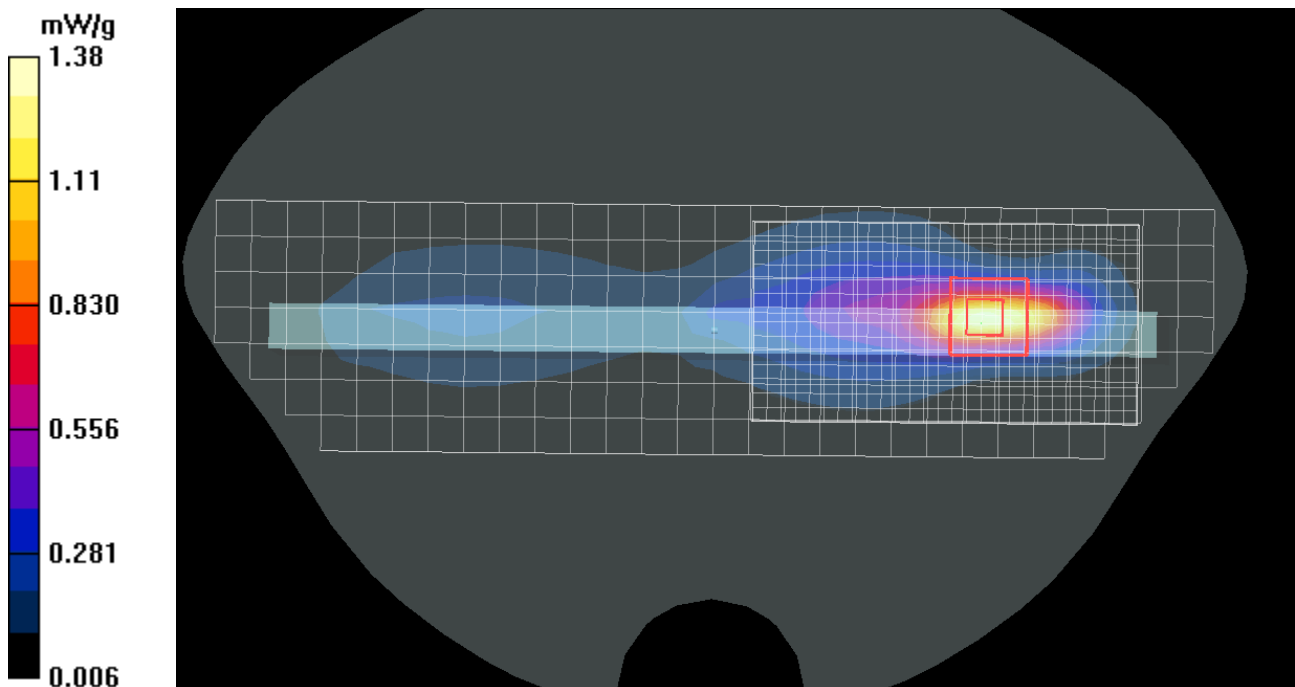
SAM Phone Against Flat Section/MEGAzoom Zoom Scan (28x15x6)/Cube 0: Measurement grid:

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

Reference Value = 34.6 V/m; Power Drift = 0.002 dB

Peak SAR (extrapolated) = 2.65 W/kg

SAR(1 g) = 1.05 mW/g; SAR(10 g) = 0.506 mW/g



Test Laboratory: Motorola 5.2 GHz WiFi for Simultaneous Transmit Test

DUT Serial: LHBA230122; FCC ID: IHDT56ME1

Procedure Notes: 802.11n a Data Rate: 21.7Mbps Accessory Model # = Top Edge of Tablet 0mm from Flat Phantom
Communication System: 5210MHz Band - 802.11a; Frequency: 5240 MHz; Communication System Channel

Number: 48; Duty Cycle: 1:1

Medium: 5-6 GHz SPEAG Tissue BODY; Medium parameters used: $f = 5210$ MHz; $\sigma = 5.97$ mho/m; $\epsilon_r = 46.2$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: EX3DV4 - SN3730; ConvF(4.07, 4.07, 4.07); Calibrated: 7/16/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 11/11/2010
- Phantom: R#3 5Ghz BODY SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1106;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (10mm) (31x8x1):

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

Maximum value of SAR (measured) = 0.915 mW/g

SAM Phone Against Flat Section/MEGAzoom Zoom Scan (28x15x6)/Cube 0: Measurement grid:

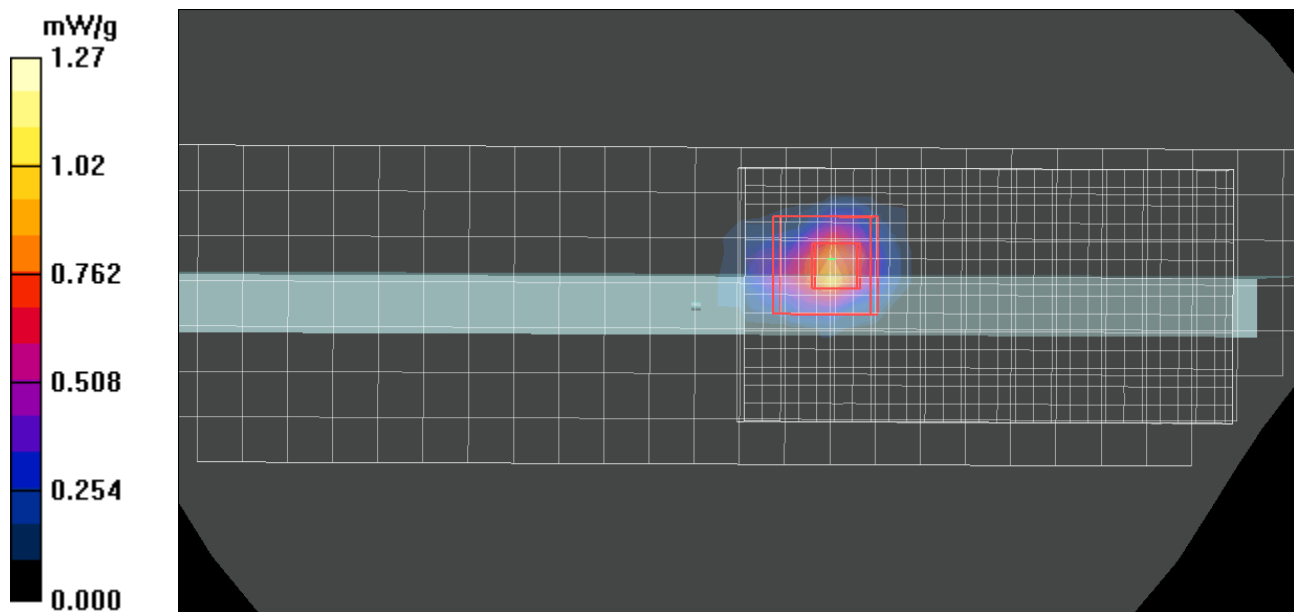
dx=4mm, dy=4mm, dz=2mm

Reference Value = 5.76 V/m; Power Drift = 0.128 dB

Peak SAR (extrapolated) = 2.84 W/kg

SAR(1 g) = 0.765 mW/g; SAR(10 g) = 0.195 mW/g

Maximum value of SAR (measured) = 1.27 mW/g



Test Laboratory: Motorola GPRS 850 and 802.11n 5.2 GHz Simultaneous Tx

DUT Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: 05 Accessory Model # = GPRS CLASS 10 (2 UPSLOTS), Top Edge of Tablet 0mm from Phantom

Communication System: GPRS 850 - Class 10; Frequency: 848.8 MHz; Communication System Channel Number: 251; Duty Cycle: 1:4.15

Medium: Low Freq Body; Medium parameters used: $f = 835$ MHz; $\sigma = 0.98$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³

Procedure Notes: 802.11n a Data Rate: 21.7Mbps Accessory Model # = Top Edge of Tablet 0mm from Flat Phantom

Communication System: 5210MHz Band - 802.11a; Frequency: 5240 MHz; Communication System Channel Number: 48; Duty Cycle: 1:1

Medium: 5-6 GHz SPEAG Tissue BODY; Medium parameters used: $f = 5210$ MHz; $\sigma = 5.97$ mho/m; $\epsilon_r = 46.2$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: EX3DV4 - SN3730; ConvF(4.07, 4.07, 4.07); Calibrated: 7/16/2010
 - Electronics: DAE3 Sn440; Calibrated: 11/11/2010
 - Probe: ES3DV3 - SN3183; ConvF(6.15, 6.15, 6.15); Calibrated: 7/14/2010
 - Electronics: DAE4 Sn661; Calibrated: 1/13/2011
 - Sensor-Surface: 3mm (Mechanical Surface Detection)
 - Phantom: R#3 5Ghz BODY SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1106;
 - Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (10mm) (31x8x1):

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

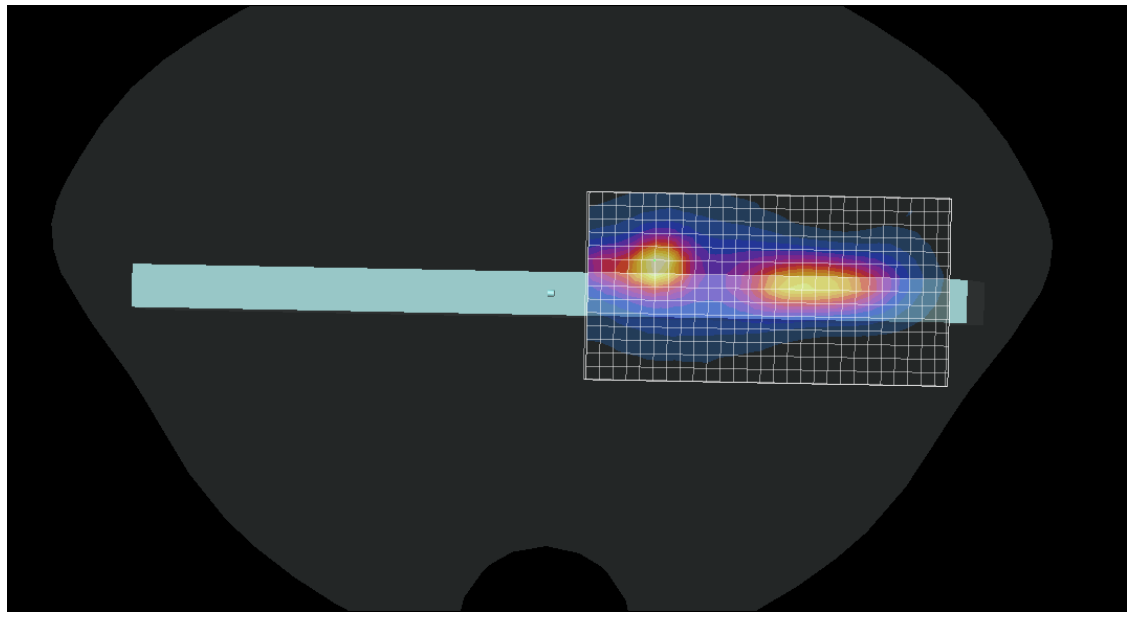
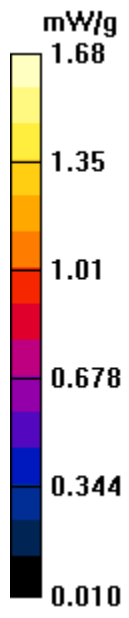
Multi Band Result:

SAM Phone Against Flat Section/MEGAzoom Zoom Scan (28x15x6)/Cube 0: Measurement grid:

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

SAR(1 g) = 1.17 mW/g; SAR(10 g) = 0.513 mW/g

Maximum value of SAR (measured) = 1.68 mW/g



Test Laboratory: Motorola GPRS 1900 MHz for Simultaneous Transmit Test

DUT Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: 0 Accessory Model # = Top Edge of Tablet 0mm from Flat Phantom

Communication System: GPRS 1900 - Class 10; Frequency: 1909.8 MHz; Communication System Channel Number: 810; Duty Cycle: 1:4.15

Medium: Regular Glycol Body 1750/1880; Medium parameters used: $f = 1880$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 51.7$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(4.84, 4.84, 4.84); Calibrated: 7/14/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn661; Calibrated: 1/13/2011
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (10mm) (31x8x1):

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

Maximum value of SAR (measured) = 1.59 mW/g

SAM Phone Against Flat Section/MEGAzoom Zoom Scan (28x15x6)/Cube 0: Measurement grid:

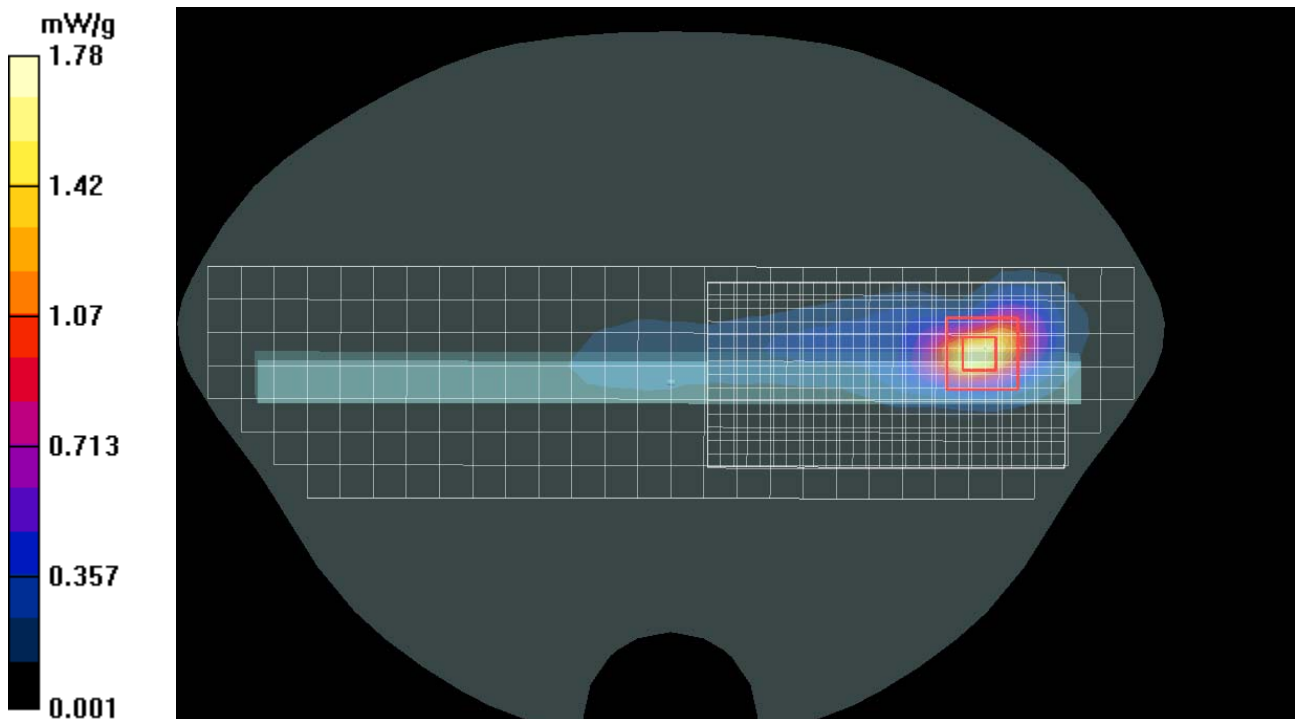
dx=4mm, dy=4mm, dz=2mm

Reference Value = 19.4 V/m; Power Drift = -0.074 dB

Peak SAR (extrapolated) = 3.36 W/kg

SAR(1 g) = 1.33 mW/g; SAR(10 g) = 0.579 mW/g

Maximum value of SAR (measured) = 1.78 mW/g



Test Laboratory: Motorola 5.2 GHz WiFi for Simultaneous Transmit Test

DUT Serial: LHBA230122; FCC ID: IHDT56ME1

Procedure Notes: 802.11n a Data Rate: 21.7Mbps Accessory Model # = Top Edge of Tablet 0mm from Flat Phantom
Communication System: 5210MHz Band - 802.11a; Frequency: 5240 MHz; Communication System Channel

Number: 48; Duty Cycle: 1:1

Medium: 5-6 GHz SPEAG Tissue BODY; Medium parameters used: $f = 5210$ MHz; $\sigma = 5.97$ mho/m; $\epsilon_r = 46.2$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: EX3DV4 - SN3730; ConvF(4.07, 4.07, 4.07); Calibrated: 7/16/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 11/11/2010
- Phantom: R#3 5Ghz BODY SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1106;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (10mm) (31x8x1):

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

Maximum value of SAR (measured) = 0.915 mW/g

SAM Phone Against Flat Section/MEGAzoom Zoom Scan (28x15x6)/Cube 0: Measurement grid:

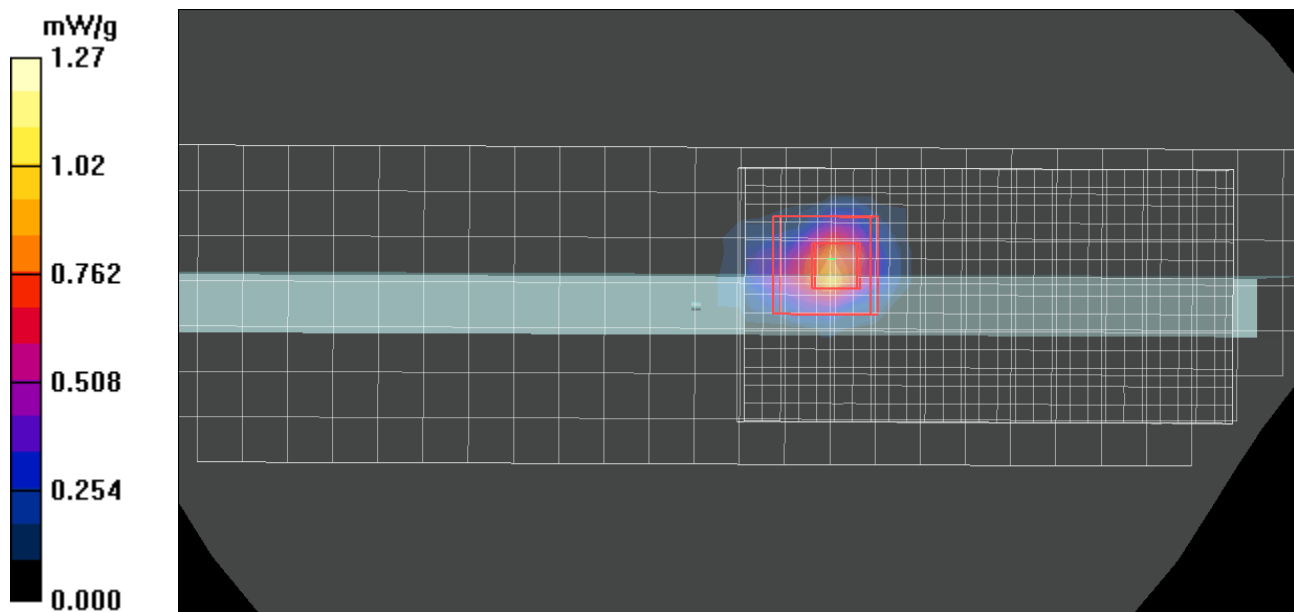
dx=4mm, dy=4mm, dz=2mm

Reference Value = 5.76 V/m; Power Drift = 0.128 dB

Peak SAR (extrapolated) = 2.84 W/kg

SAR(1 g) = 0.765 mW/g; SAR(10 g) = 0.195 mW/g

Maximum value of SAR (measured) = 1.27 mW/g



Test Laboratory: Motorola GPRS 1900 MHz and 802.11n 5.2 GHz for Simultaneous Transmit Test

DUT Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: 0 Accessory Model # = Top Edge of Tablet 0mm from Flat Phantom

Communication System: GPRS 1900 - Class 10; Frequency: 1909.8 MHz; Communication System Channel Number: 810; Duty Cycle: 1:4.15

Medium: Regular Glycol Body 1750/1880; Medium parameters used: $f = 1880$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 51.7$; $\rho = 1000$ kg/m³

DUT Serial: LHBA230122; FCC ID: IHDT56ME1

Procedure Notes: 802.11n a Data Rate: 21.7Mbps Accessory Model # = Top Edge of Tablet 0mm from Flat Phantom

Communication System: 5210MHz Band - 802.11a; Frequency: 5240 MHz; Communication System Channel Number: 48; Duty Cycle: 1:1

Medium: 5-6 GHz SPEAG Tissue BODY; Medium parameters used: $f = 5210$ MHz; $\sigma = 5.97$ mho/m; $\epsilon_r = 46.2$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(4.84, 4.84, 4.84); Calibrated: 7/14/2010
- Electronics: DAE4 Sn661; Calibrated: 1/13/2011
- Probe: EX3DV4 - SN3730; ConvF(4.07, 4.07, 4.07); Calibrated: 7/16/2010
- Electronics: DAE3 Sn440; Calibrated: 11/11/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Phantom: R#3 5Ghz BODY SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1106;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (10mm) (31x8x1):

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

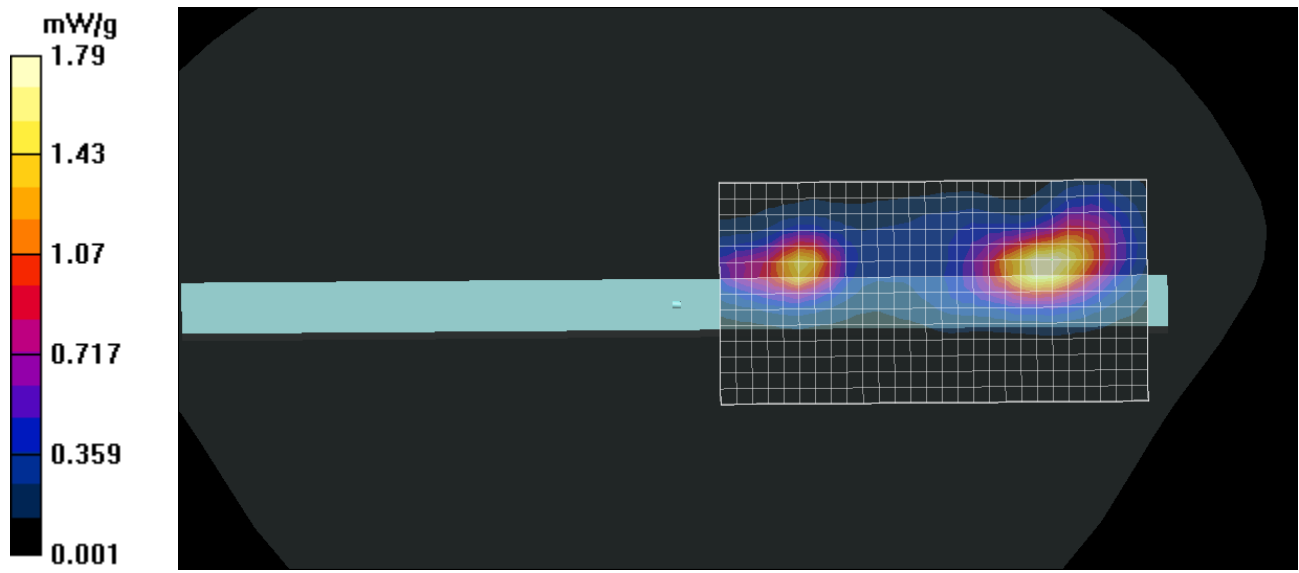
Multi Band Result:

SAM Phone Against Flat Section/MEGAzoom Zoom Scan (28x15x6)/Cube 0: Measurement grid:

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

SAR(1 g) = 1.34 mW/g; SAR(10 g) = 0.585 mW/g

Maximum value of SAR (measured) = 1.79 mW/g



Test Laboratory: Motorola WCDMA 850 for Simultaneous Transmit Test

DUT Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: Always up Accessory Model # = "Top Edge of Tablet 0mm from Phantom"

Communication System: 3G-WCDMA 850; Frequency: 836 MHz; Communication System Channel Number: 4180; Duty Cycle: 1:1

Medium: Low Freq Body; Medium parameters used: $f = 835$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.15, 6.15, 6.15); Calibrated: 7/14/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn661; Calibrated: 1/13/2011
- Phantom: R1_Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (15mm) (21x6x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 1.67 mW/g

SAM Phone Against Flat Section/MegaZoom Zoom Scan (<=3GHz) (15x8x7)/Cube 0: Measurement

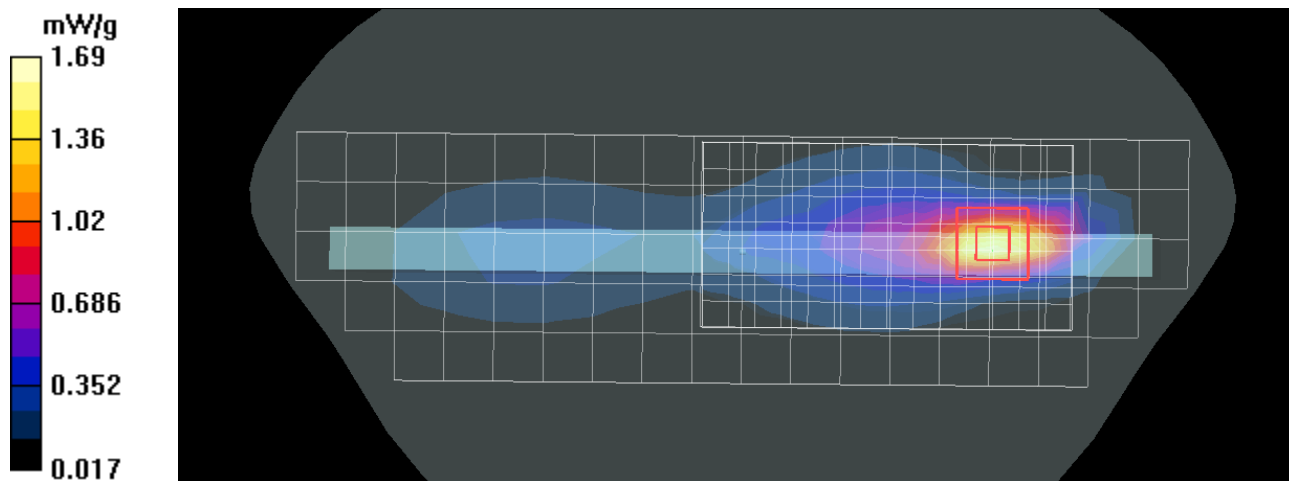
grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 39.5 V/m; Power Drift = 0.099 dB

Peak SAR (extrapolated) = 3.03 W/kg

SAR(1 g) = 1.47 mW/g; SAR(10 g) = 0.714 mW/g

Maximum value of SAR (measured) = 1.69 mW/g



Test Laboratory: Motorola 802.11b 2.5 GHz WiFi for Simultaneous Transmit Test

DUT Serial: '355483040050071; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: 802.11b 9Mbps Accessory Model # = Top Edge of Tablet 0mm from Phantom
Communication System: Wi-Fi 2450; Frequency: 2437 MHz; Communication System Channel Number: 6; Duty Cycle: 1:1

Medium: 2450 Glycol Body; Medium parameters used: $f = 2450$ MHz; $\sigma = 2.04$ mho/m; $\epsilon_r = 47.5$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3124; ConvF(4.19, 4.19, 4.19); Calibrated: 8/11/2010
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Phantom: R#4 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1250;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (15mm) (21x6x1):

Measurement grid: dx=15mm, dy=15mm

Maximum value of SAR (measured) = 0.817 mW/g

SAM Phone Against Flat Section/MegaZoom Zoom Scan (≤ 3 GHz) (15x8x7)/Cube 0: Measurement

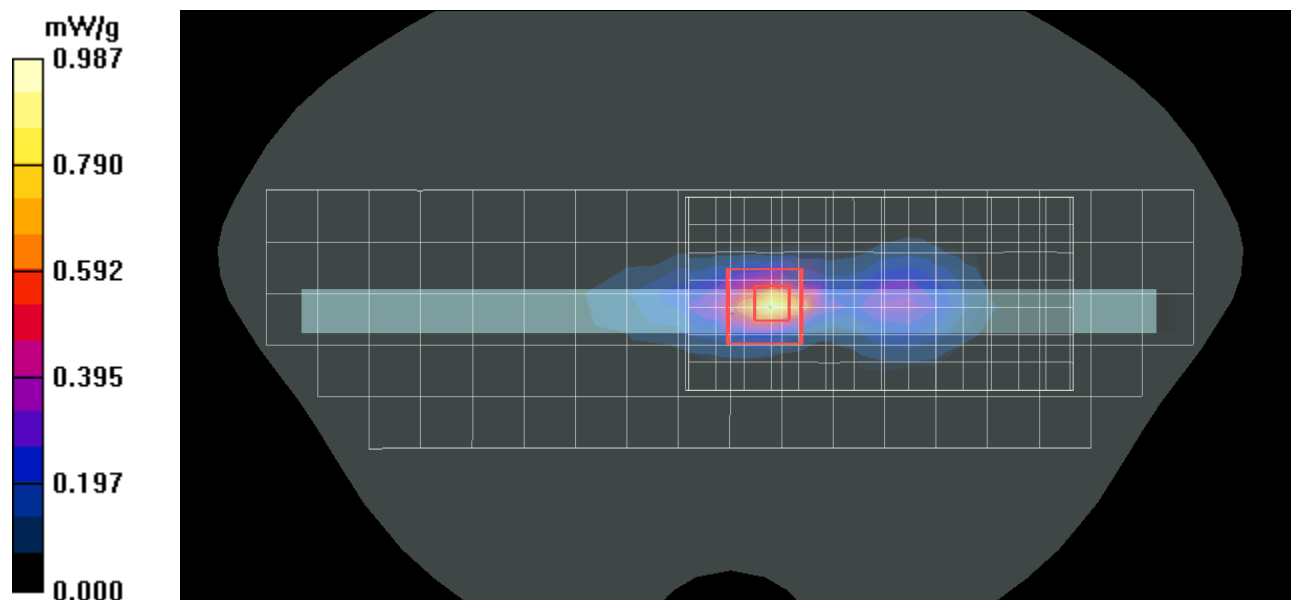
grid: dx=8mm, dy=8mm, dz=5mm

Reference Value = 21.2 V/m; Power Drift = 0.226 dB

Peak SAR (extrapolated) = 1.89 W/kg

SAR(1 g) = 0.752 mW/g; SAR(10 g) = 0.264 mW/g

Maximum value of SAR (measured) = 0.987 mW/g



Test Laboratory: Motorola WCDMA 850 and 802.11b WiFi Simultaneous Transmit Test

DUT Serial: LHBA230179; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: Always up Accessory Model # = "Top Edge of Tablet 0mm from Phantom"

Communication System: 3G-WCDMA 850; Frequency: 836 MHz; Communication System Channel Number: 4180; Duty Cycle: 1:1

Medium: Low Freq Body; Medium parameters used: $f = 835$ MHz; $\sigma = 0.99$ mho/m; $\epsilon_r = 54.8$; $\rho = 1000$ kg/m³

DUT Serial: '355483040050071; FCC ID: IHDT56ME1

Procedure Notes: Pwr Step: 802.11b 9Mbps Accessory Model # = Top Edge of Tablet 0mm from Phantom

Communication System: Wi-Fi 2450; Frequency: 2437 MHz; Communication System Channel Number: 6; Duty Cycle: 1:1

Medium: 2450 Glycol Body; Medium parameters used: $f = 2450$ MHz; $\sigma = 2.04$ mho/m; $\epsilon_r = 47.5$; $\rho = 1000$ kg/m³

DASY4 Configuration:

- Probe: ES3DV3 - SN3183; ConvF(6.15, 6.15, 6.15); Calibrated: 7/14/2010
- Electronics: DAE4 Sn661; Calibrated: 1/13/2011
- Probe: ES3DV3 - SN3124; ConvF(4.19, 4.19, 4.19); Calibrated: 8/11/2010
- Electronics: DAE3 Sn434; Calibrated: 1/13/2011
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Phantom: R1_Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139;
- Phantom: R#4 Glycol SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1250;
- Measurement SW: DASY4, V4.7 Build 80; Postprocessing SW: SEMCAD, V1.8 Build 186

SAM Phone Against Flat Section/Tablet Long Edge Area Scan - Body (15mm) (21x6x1):

Measurement grid: dx=15mm, dy=15mm

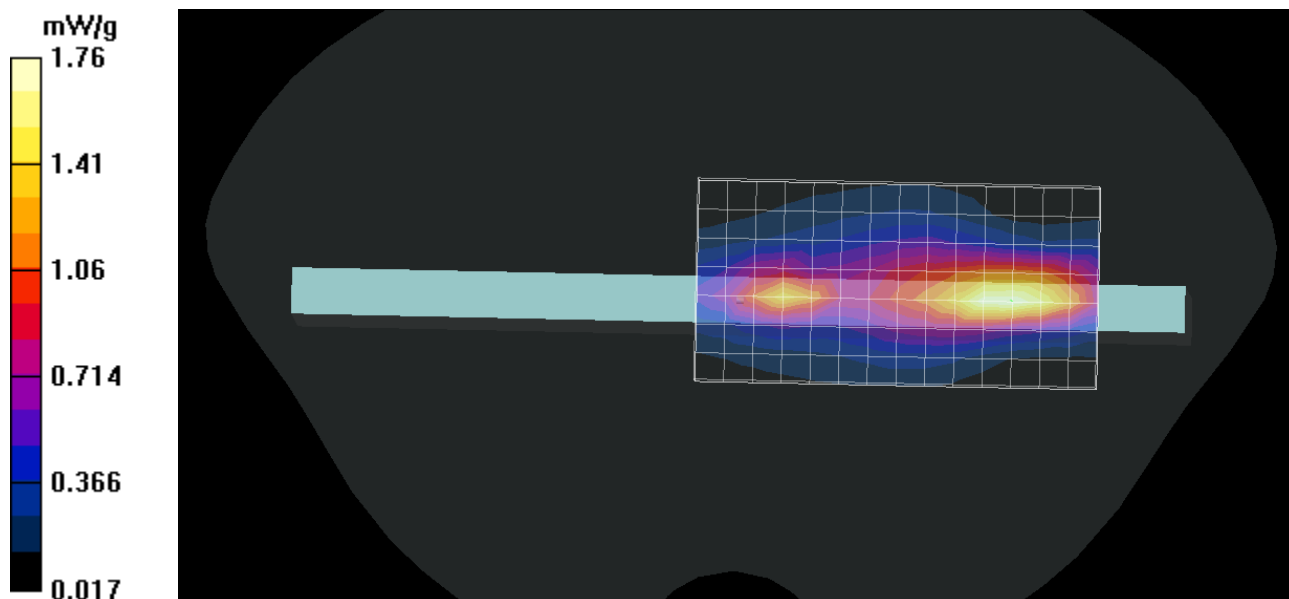
Multi Band Result:

SAM Phone Against Flat Section/MegaZoom Zoom Scan (<=3GHz) (15x8x7)/Cube 0: Measurement

grid: dx=8mm, dy=8mm, dz=5mm

SAR(1 g) = 1.54 mW/g; SAR(10 g) = 0.760 mW/g

Maximum value of SAR (measured) = 1.76 mW/g



Test Laboratory: Motorola - WCDMA 850 + Wi-Fi 5210 Multiband Combined Body Worn Expanded Volumetric Measurement

DASY4 Configuration for DASY, SAM Flat Section

Top Edge of DUT 0 mm from Phantom

/SAM DUT Against Flat Section/MegaZoom, Zoom Scan (Probe separation 3mm):

Date/Time: 3/22/2011 9:15:50 AM

Serial: LHBA230179; FCC ID: IHDT56ME1

Communication System: WCDMA 850; Frequency: 836 MHz; Duty Cycle: 1:1

Medium: Low Freq Body

Medium parameters used: $f = 835$ MHz; $\sigma = 1.01$ mho/m; $\epsilon_r = 53.5$; $\rho = 1000$ kg/m³

Measurement Standard: DASY4 (High Precision Assessment)

- Probe: ES3DV3 - SN3183; ConvF(6.15, 6.15, 6.15); Calibrated: 7/14/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139
- Measurement SW: DASY4, V4.7 Build 80

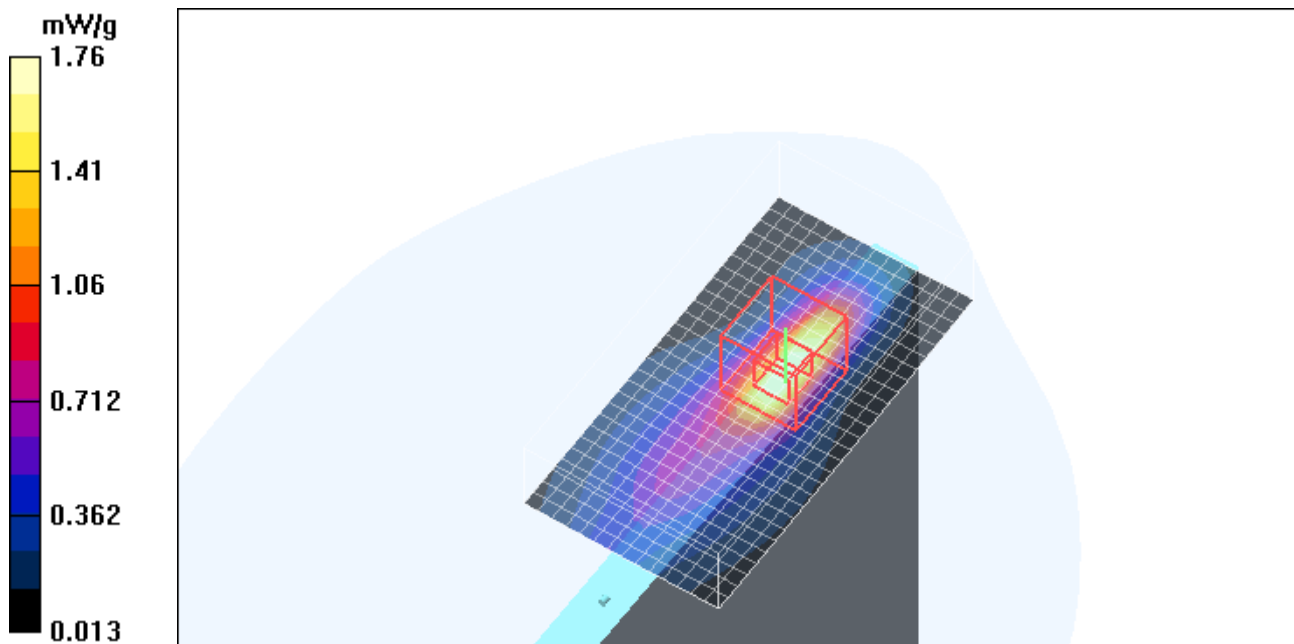
SAM DUT Against Flat Section/MEGAzoom

Zoom Scan (Probe separation 3mm) (28x15x6)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm; Volume Outer Dimensions: x=108mm, y=56mm, z=22mm

Reference Value = 44.2 V/m; Power Drift = -0.082 dB; Peak SAR (extrapolated) = 3.24 W/kg

SAR(1 g) = 1.37 mW/g; SAR(10 g) = 0.684 mW/g; Maximum value of SAR (measured) = 1.76 mW/g



2D Plot showing z-axis @ 0 mm layer of measurement volume

DASY4 Configuration for DASY, SAM Flat Section**Top Edge of DUT 0 mm from Phantom****/SAM DUT Against Flat Section/MegaZoom, Zoom Scan (Probe separation 3mm):**

Date/Time: 3/29/2011 8:42:29 PM

Serial: **LHBA230122; IHDT56ME1**

Communication System: 5210MHz Band; Frequency: 5240 MHz; Duty Cycle: 1:1

Medium: 5-6 GHz SPEAG Tissue BODY

Medium parameters used: $f = 5210$ MHz; $\sigma = 5.97$ mho/m; $\epsilon_r = 46.2$; $\rho = 1000$ kg/m³

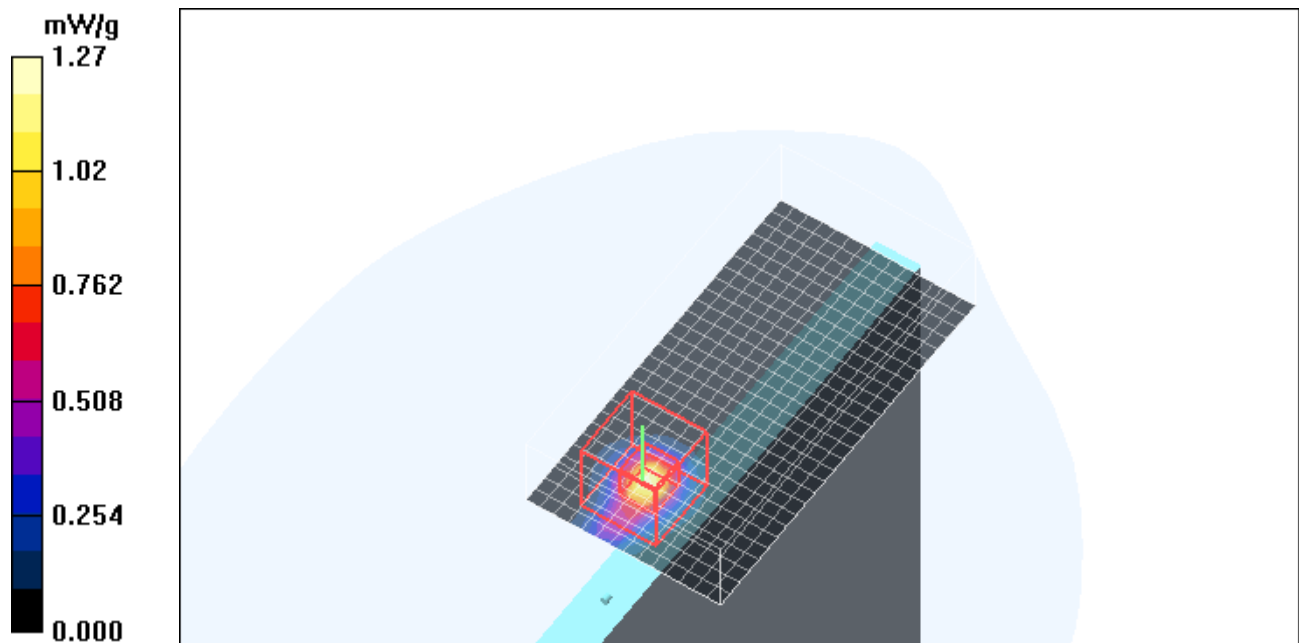
Measurement Standard: DASY4 (High Precision Assessment)

- Probe: EX3DV4 - SN3730; ConvF(4.07, 4.07, 4.07); Calibrated: 7/16/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 11/11/2010
- Phantom: R#3 5Ghz BODY SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1106
- Measurement SW: DASY4, V4.7 Build 80

SAM DUT Against Flat Section/MEGAzoom**Zoom Scan (Probe separation 3 mm) (28x15x6)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm; Volume Outer Dimensions: x=108mm, y=56mm, z=22mm

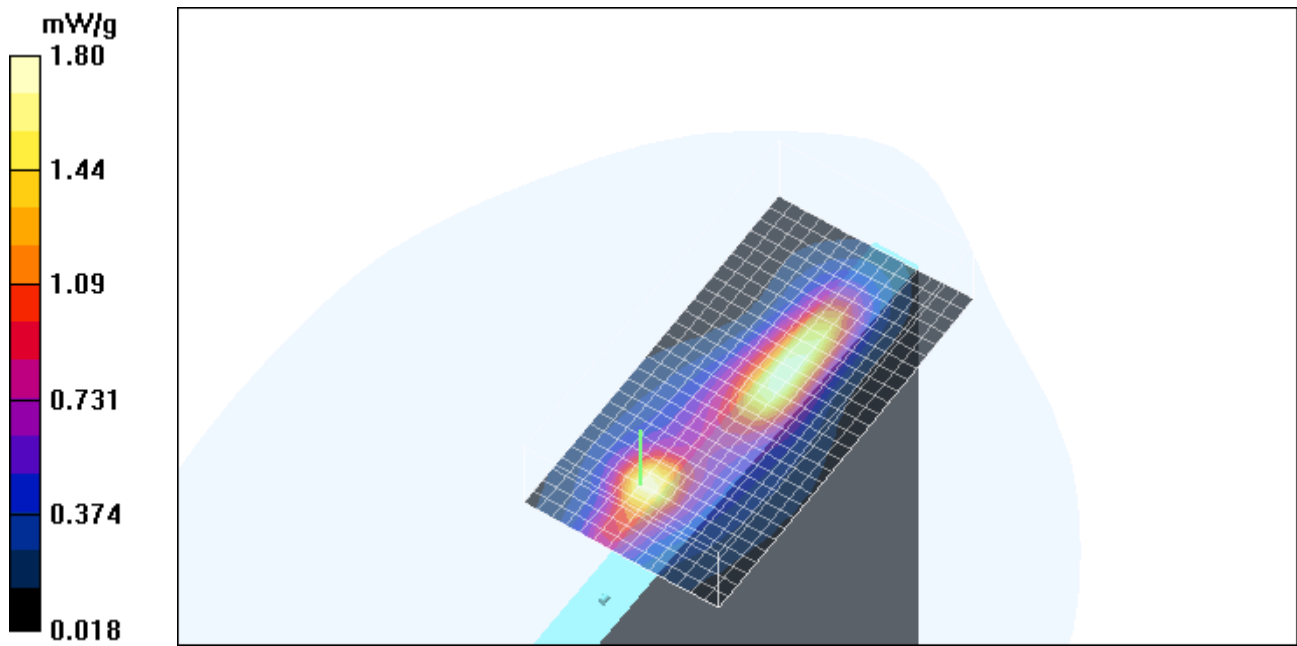
Reference Value = 5.76 V/m; Power Drift = 0.128 dB; Peak SAR (extrapolated) = 2.84 W/kg

SAR(1 g) = 0.765 mW/g; SAR(10 g) = 0.195 mW/g; Maximum value of SAR (measured) = 1.27 mW/g

2D Plot showing z-axis @ 0 mm layer of measurement volume

Multi Band Result:**SAR(1 g) = 1.38 mW/g; SAR(10 g) = 0.690 mW/g**

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



2D Plot showing z-axis @ 0 mm layer of measurement volume

Test Laboratory: Motorola - WCDMA 1900 + Wi-Fi 5210 Multiband Combined Body Worn Expanded Volumetric Measurement

DASY4 Configuration for DASY, SAM Flat

Top Edge of DUT 0 mm from Phantom

/SAM Phone Against Flat Section/MegaZoom, Zoom Scan (Probe separation 3mm):

Date/Time: 3/22/2011 11:56:28 AM

Serial: LHBA230179; FCC ID: IHDT56ME1

Communication System: WCDMA 1900; Frequency: 1880 MHz; Duty Cycle: 1:1

Medium: Regular Glycol Body 1750/1880

Medium parameters used: $f = 1880$ MHz; $\sigma = 1.59$ mho/m; $\epsilon_r = 52.6$; $\rho = 1000$ kg/m³

Measurement Standard: DASY4 (High Precision Assessment)

- Probe: ES3DV3 - SN3183; ConvF(4.84, 4.84, 4.84); Calibrated: 7/14/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn702; Calibrated: 5/18/2010
- Phantom: R1_ Glycol, SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1139
- Measurement SW: DASY4, V4.7 Build 80

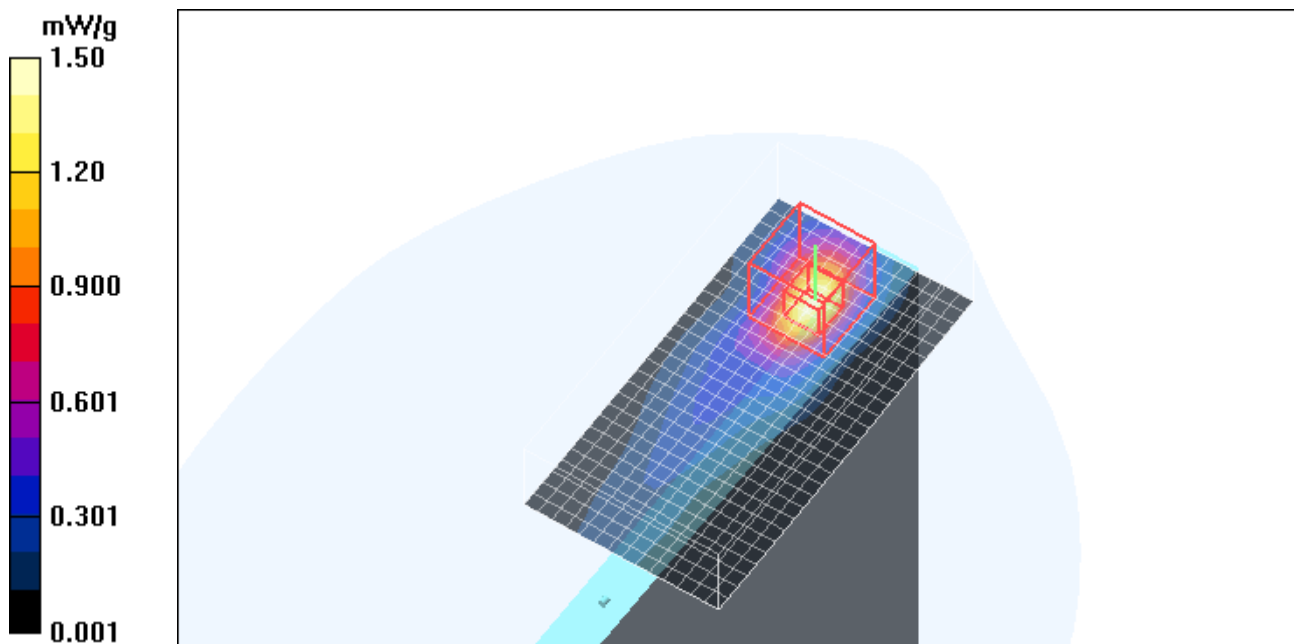
SAM DUT Against Flat Section/MEGAzoom

Zoom Scan (Probe separation 3mm) (28x15x6)/Cube 0:

Measurement grid: dx=4mm, dy=4mm, dz=2mm; Volume Outer Dimensions: x=108mm, y=56mm, z=22mm

Reference Value = 24.6 V/m; Power Drift = 0.124 dB; Peak SAR (extrapolated) = 2.35 W/kg

SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.521 mW/g; Maximum value of SAR (measured) = 1.50 mW/g



2D Plot showing z-axis @ 0 mm layer of measurement volume

**DASY4 Configuration for DASY, SAM Flat
Top Edge of DUT 0 mm from Phantom
/SAM Phone Against Flat Section/MegaZoom, Zoom Scan (Probe separation 3mm):**

Date/Time: 3/29/2011 8:42:29 PM

Serial: LHBA230122; FCC ID: IHDT56ME1

Communication System: 5210MHz Band; Frequency: 5240 MHz; Duty Cycle: 1:1

Medium: 5-6 GHz SPEAG Tissue BODY

Medium parameters used: $f = 5210$ MHz; $\sigma = 5.97$ mho/m; $\epsilon_r = 46.2$; $\rho = 1000$ kg/m³

Measurement Standard: DASY4 (High Precision Assessment)

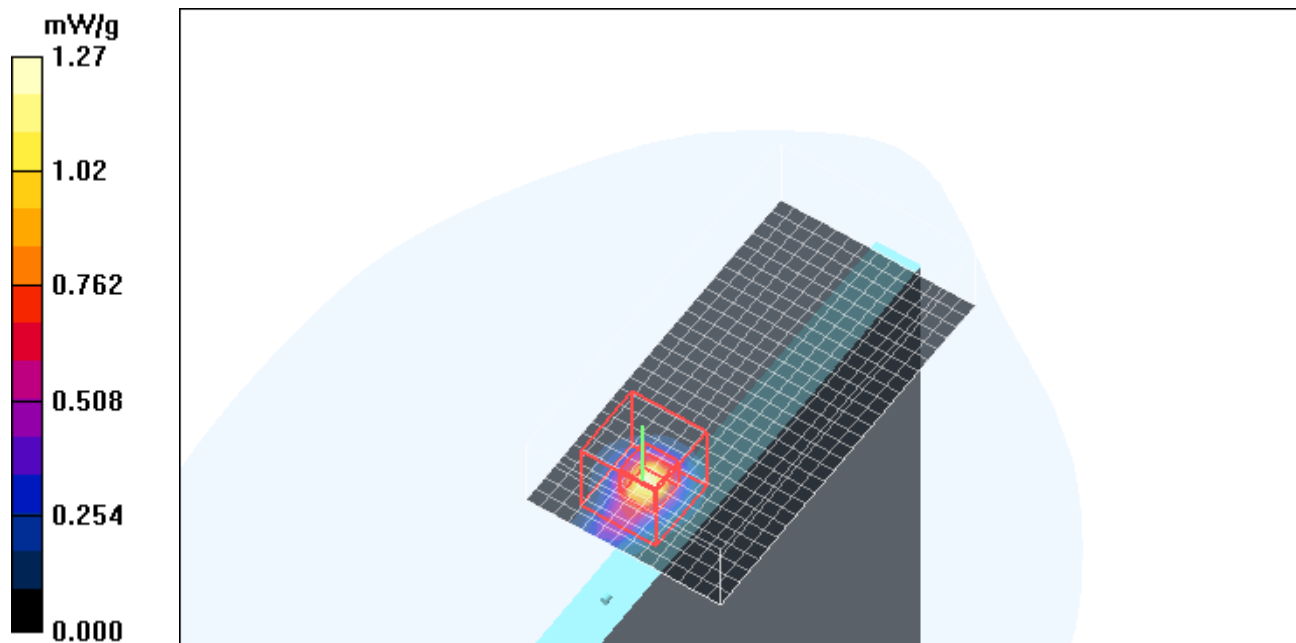
- Probe: EX3DV4 - SN3730; ConvF(4.07, 4.07, 4.07); Calibrated: 7/16/2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn440; Calibrated: 11/11/2010
- Phantom: R#3 5Ghz BODY SAM (extended range), Rev.1 (25-Mar-05); Type: SAM v4.0; Serial: TP-1106
- Measurement SW: DASY4, V4.7 Build 80

**SAM DUT Against Flat Section/MEGAzoom
Zoom Scan (Probe separation 3mm) (28x15x6)/Cube 0:**

Measurement grid: dx=4mm, dy=4mm, dz=2mm; Volume Outer Dimensions: x=108mm, y=56mm, z=22mm

Reference Value = 5.76 V/m; Power Drift = 0.128 dB; Peak SAR (extrapolated) = 2.84 W/kg

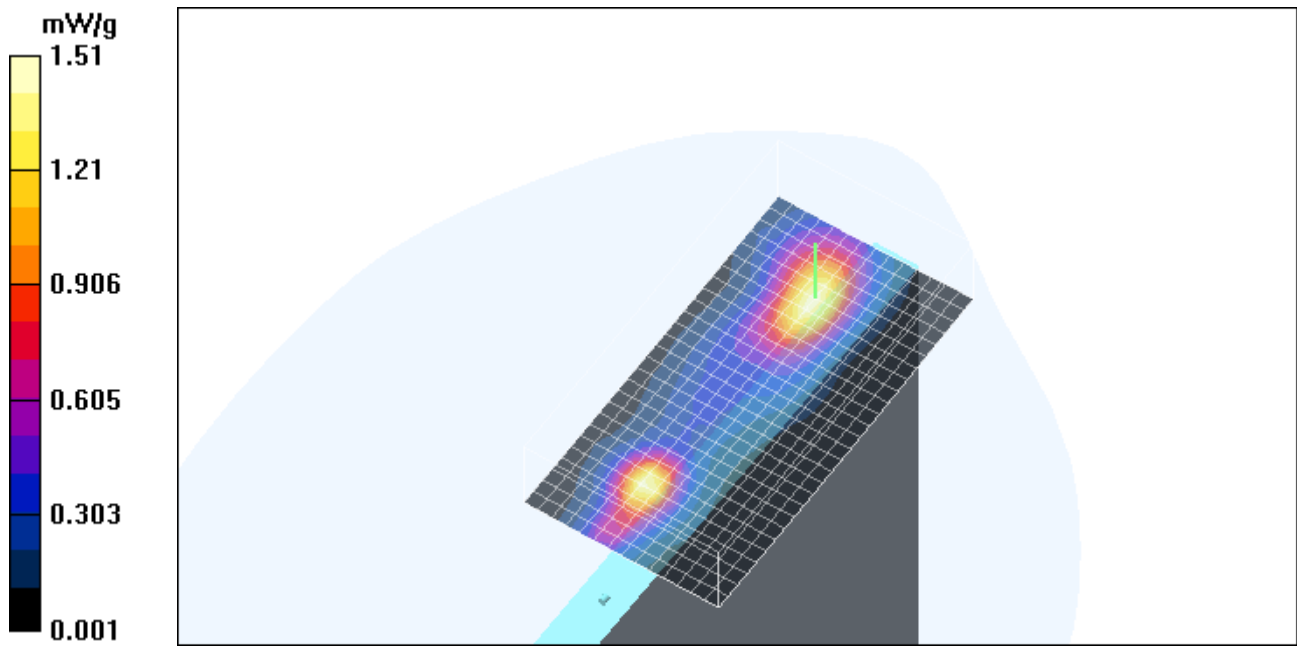
SAR(1 g) = 0.765 mW/g; SAR(10 g) = 0.195 mW/g; Maximum value of SAR (measured) = 1.27 mW/g



2D Plot showing z-axis @ 0 mm layer of measurement volume

Multi Band Result:**SAR(1 g) = 1.11 mW/g; SAR(10 g) = 0.528 mW/g**

Maximum value of SAR (measured) = 1.51 mW/g



2D Plot showing z-axis @ 0 mm layer of measurement volume

Appendix 4

Probe Calibration Certificate



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 **Motorola MDb**

Certificate No: **ES3-3124_Aug10**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3124**

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: **August 11, 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

Calibrated by: **Claudio Leubler** **Laboratory Technician**

Signature

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

Issued: August 14, 2010

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



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
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.

Probe ES3DV3

SN:3124

Manufactured:	July 11, 2006
Last calibrated:	April 21, 2009
Recalibrated:	August 11, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 SN:3124

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	1.26	1.33	1.34	± 10.1%
DCP (mV) ^B	92.9	96.4	96.7	

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	300.0	± 1.5%
			Y	0.00	0.00	1.00	300.0	
			Z	0.00	0.00	1.00	300.0	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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

^B Numerical linearization parameter: uncertainty not required.

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

DASY/EASY - Parameters of Probe: ES3DV3 SN:3124

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%	5.89	5.89	5.89	0.97	1.07 ± 11.0%
1810	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.89	4.89	4.89	0.49	1.54 ± 11.0%
1950	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.68	4.68	4.68	0.50	1.52 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.35	4.35	4.35	0.45	1.78 ± 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.

DASY/EASY - Parameters of Probe: ES3DV3 SN:3124

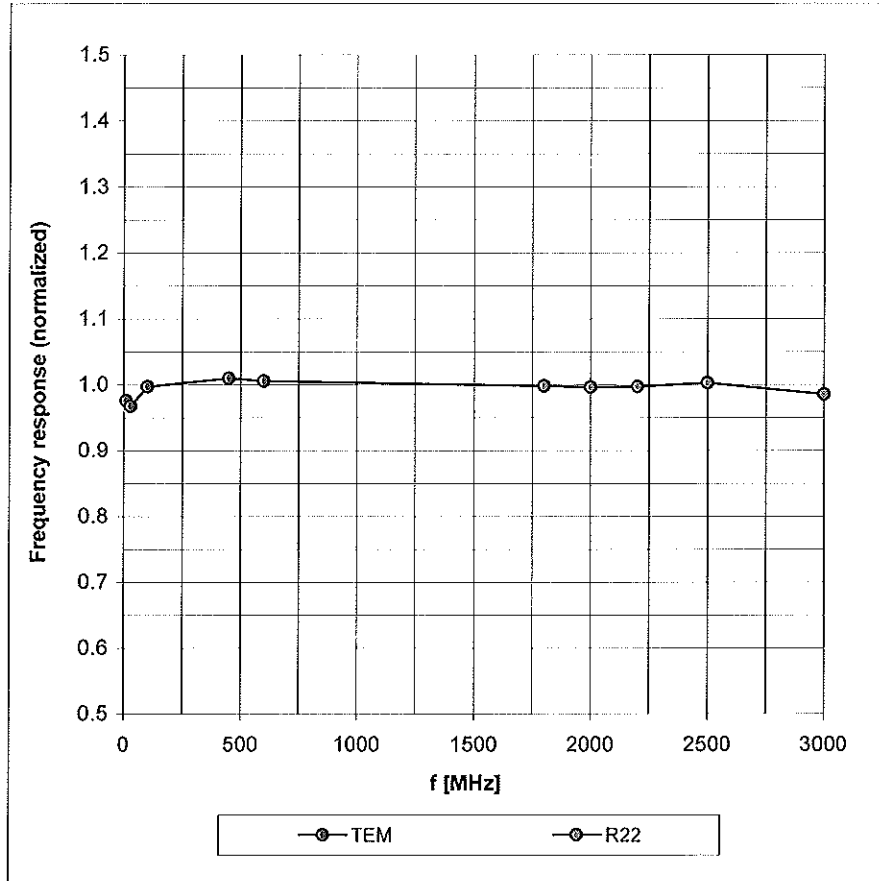
Calibration Parameter Determined in Body Tissue Simulating Media

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%	5.86	5.86	5.86	0.96	1.11 ± 11.0%
1810	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.76	4.76	4.76	0.41	1.84 ± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.78	4.78	4.78	0.32	2.33 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.19	4.19	4.19	0.69	1.29 ± 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.

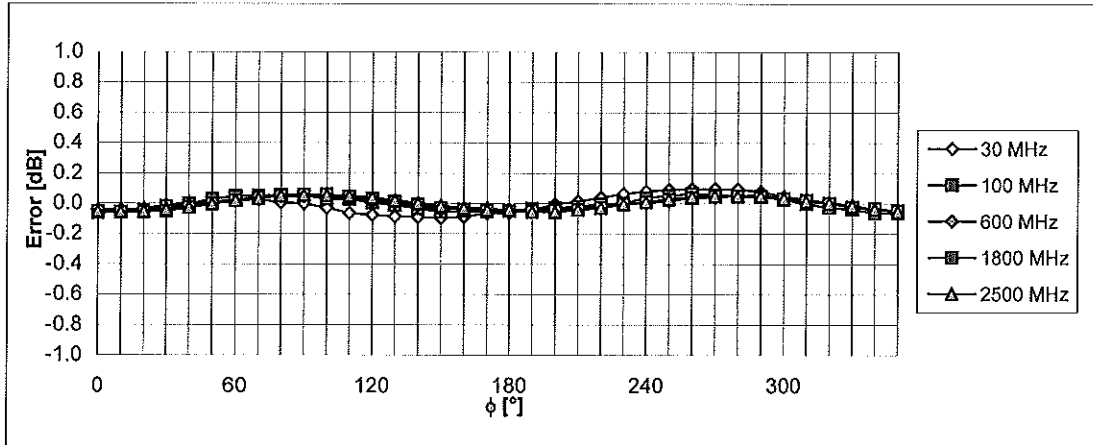
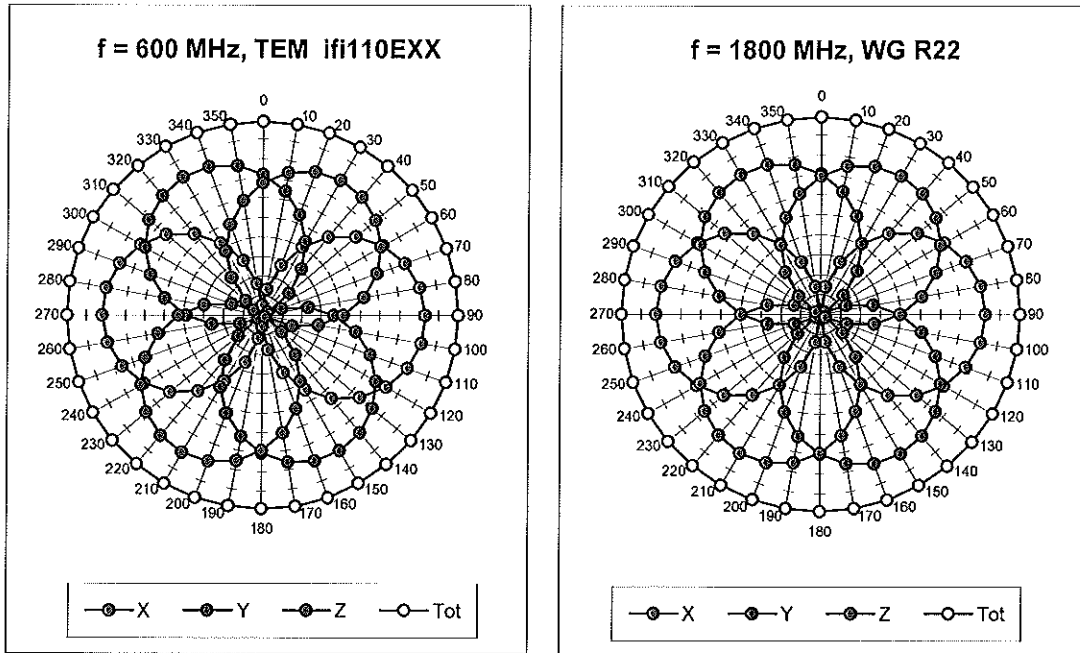
Frequency Response of E-Field

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



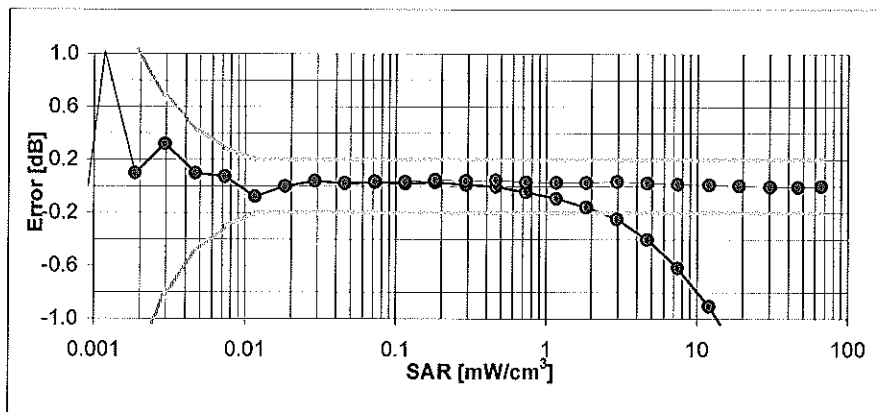
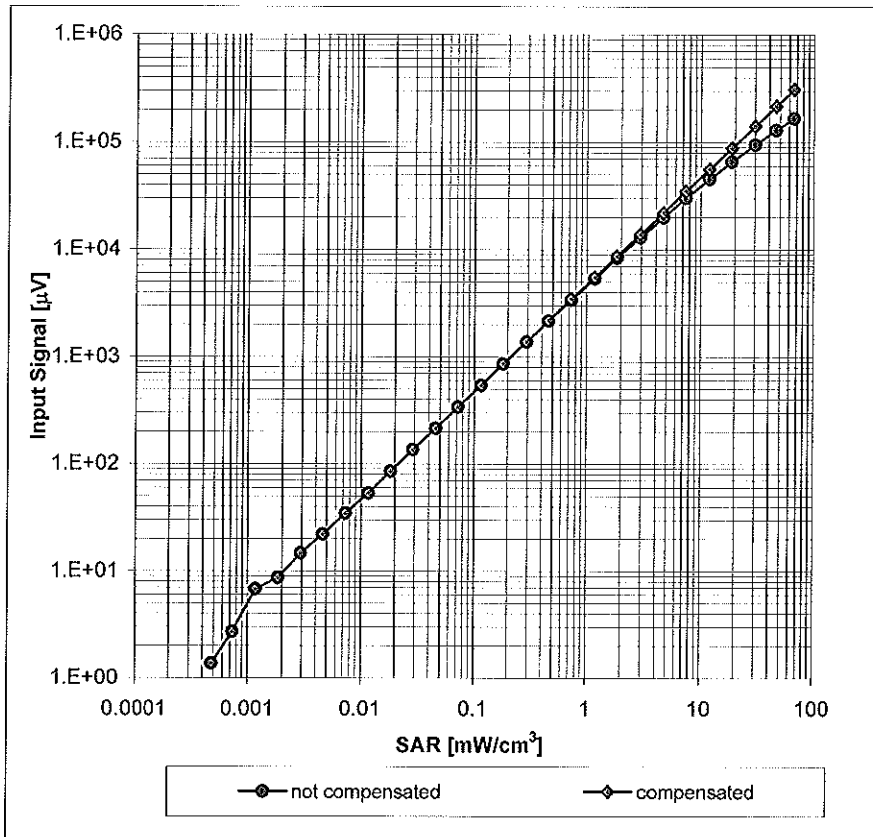
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

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



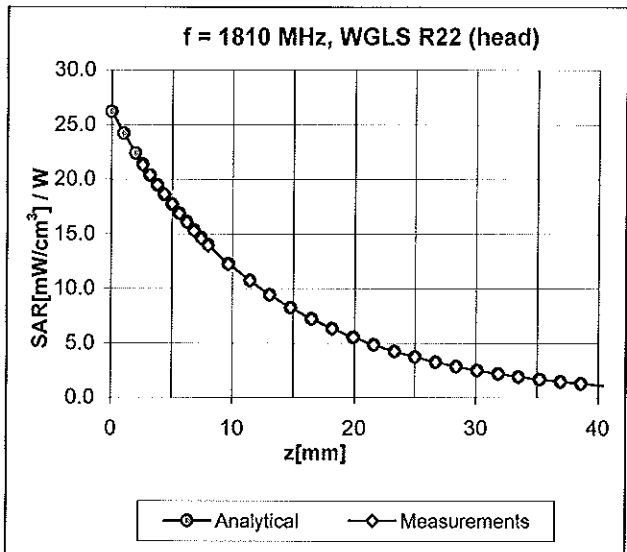
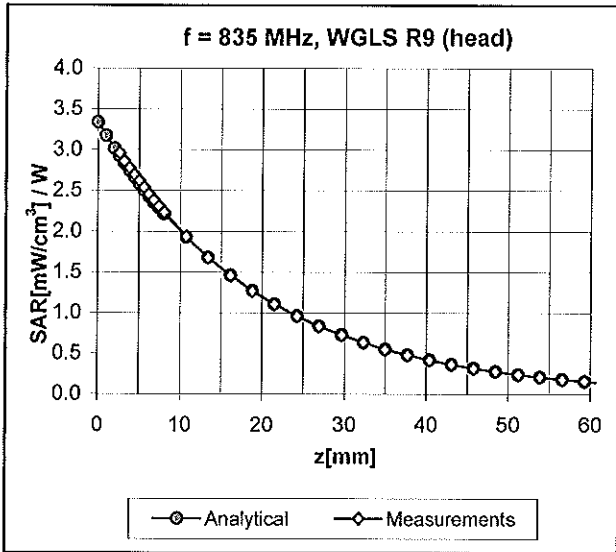
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

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



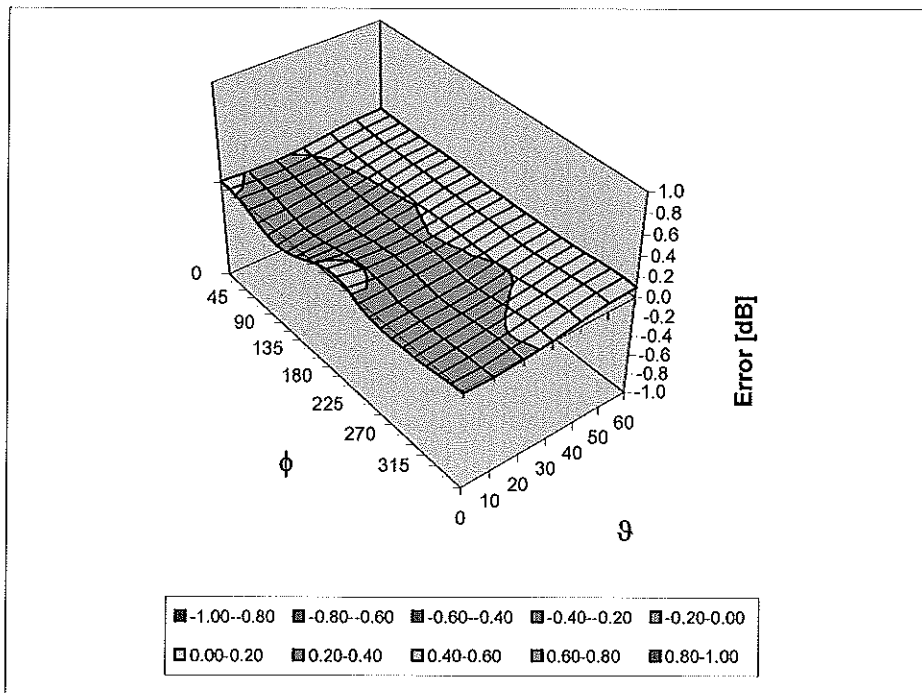
Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error (ϕ , θ), f = 900 MHz



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

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	4.0 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm



Accredited by the Swiss Accreditation Service (SAS)
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola MDb**

Certificate No: **ES3-3183_Jul10**

CALIBRATION CERTIFICATE

Object **ES3DV3 - SN:3183**

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: **July 14, 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 Kastrali	Laboratory Technician	
Approved by:	Katja Pokovic	Technical Manager	

Issued: July 15, 2010

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



Accredited by the Swiss Accreditation Service (SAS)
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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 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.

Probe ES3DV3

SN:3183

Manufactured:	March 25, 2008
Last calibrated:	August 17, 2009
Recalibrated:	July 14, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: ES3DV3 SN:3183**Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	1.21	1.15	1.07	± 10.1%
DCP (mV) ^B	88.6	86.9	89.5	

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	± 1.5%
			Y	0.00	0.00	1.00	300.0	
			Z	0.00	0.00	1.00	300.0	

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

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

^B Numerical linearization parameter; uncertainty not required.

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

DASY/EASY - Parameters of Probe: ES3DV3 SN:3183

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%	6.11	6.11	6.11	0.99	1.04 ± 11.0%
1810	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	5.05	5.05	5.05	0.58	1.33 ± 11.0%
1950	± 50 / ± 100	40.0 ± 5%	1.40 ± 5%	4.82	4.82	4.82	0.54	1.37 ± 11.0%
2450	± 50 / ± 100	39.2 ± 5%	1.80 ± 5%	4.49	4.49	4.49	0.44	1.70 ± 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.

DASY/EASY - Parameters of Probe: ES3DV3 SN:3183

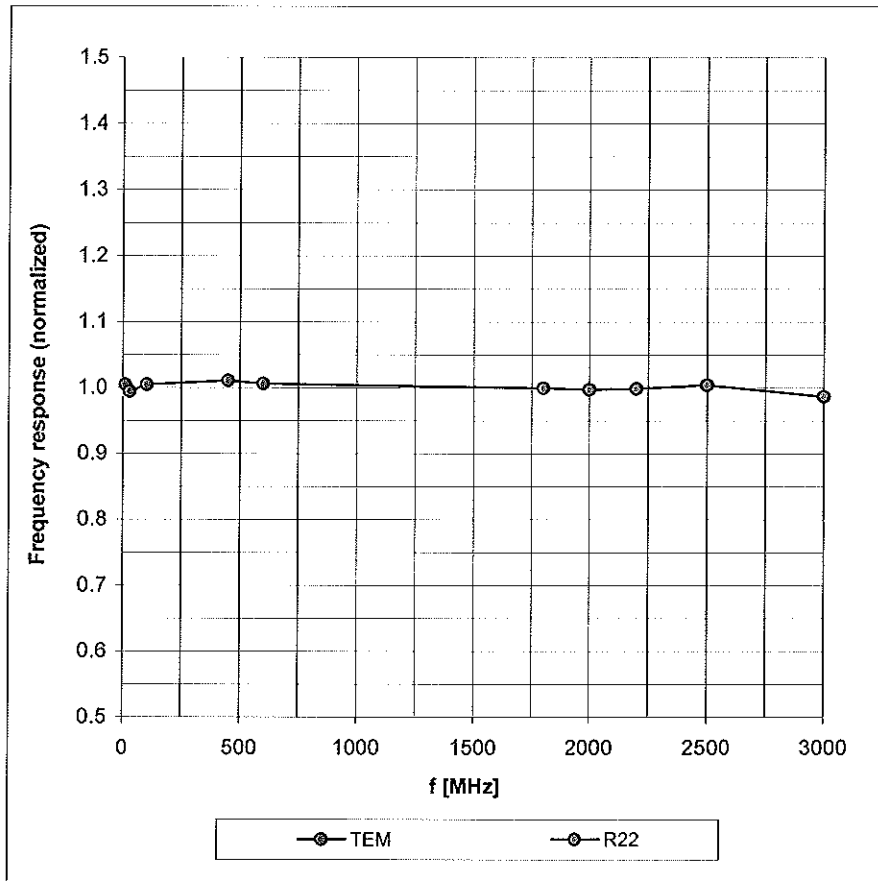
Calibration Parameter Determined in Body Tissue Simulating Media

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%	6.15	6.15	6.15	0.95	1.10 ± 11.0%
1810	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.84	4.84	4.84	0.39	1.87 ± 11.0%
1950	± 50 / ± 100	53.3 ± 5%	1.52 ± 5%	4.86	4.86	4.86	0.28	2.80 ± 11.0%
2450	± 50 / ± 100	52.7 ± 5%	1.95 ± 5%	4.36	4.36	4.36	0.69	1.31 ± 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.

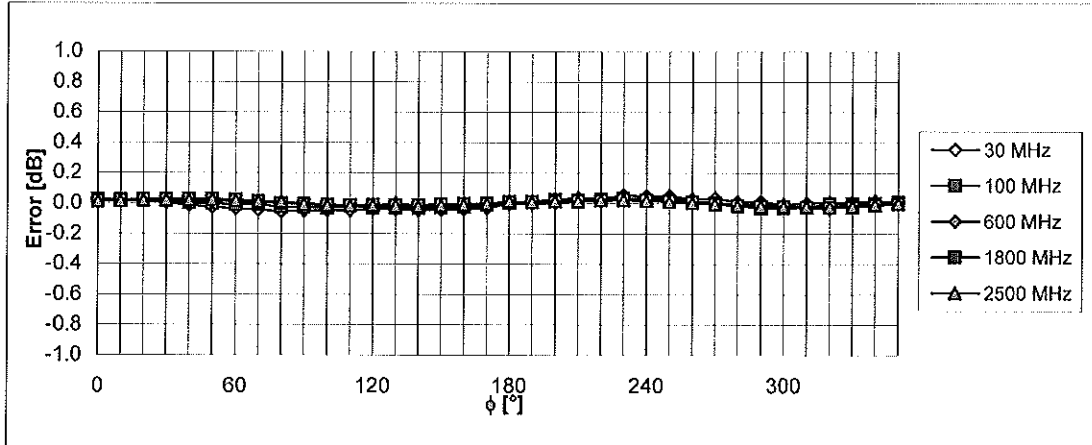
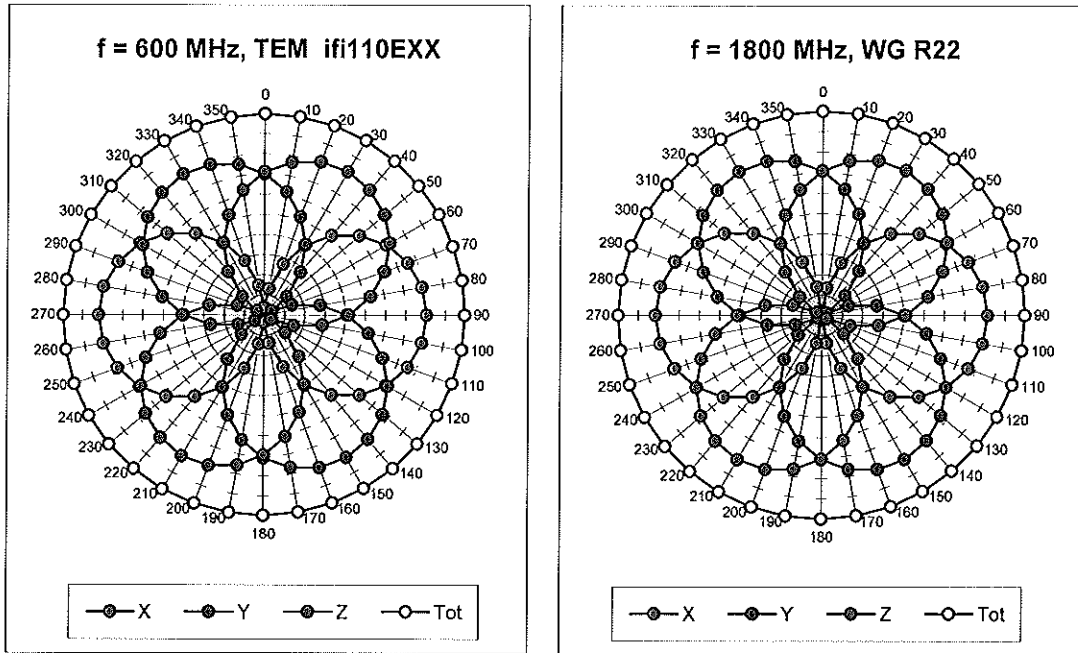
Frequency Response of E-Field

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



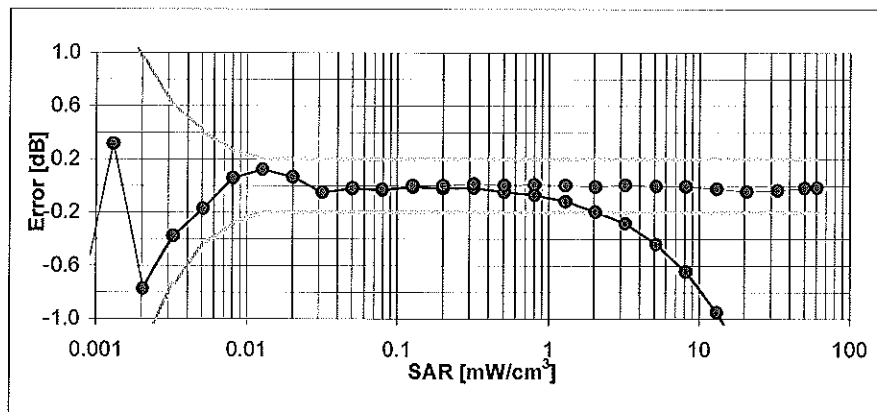
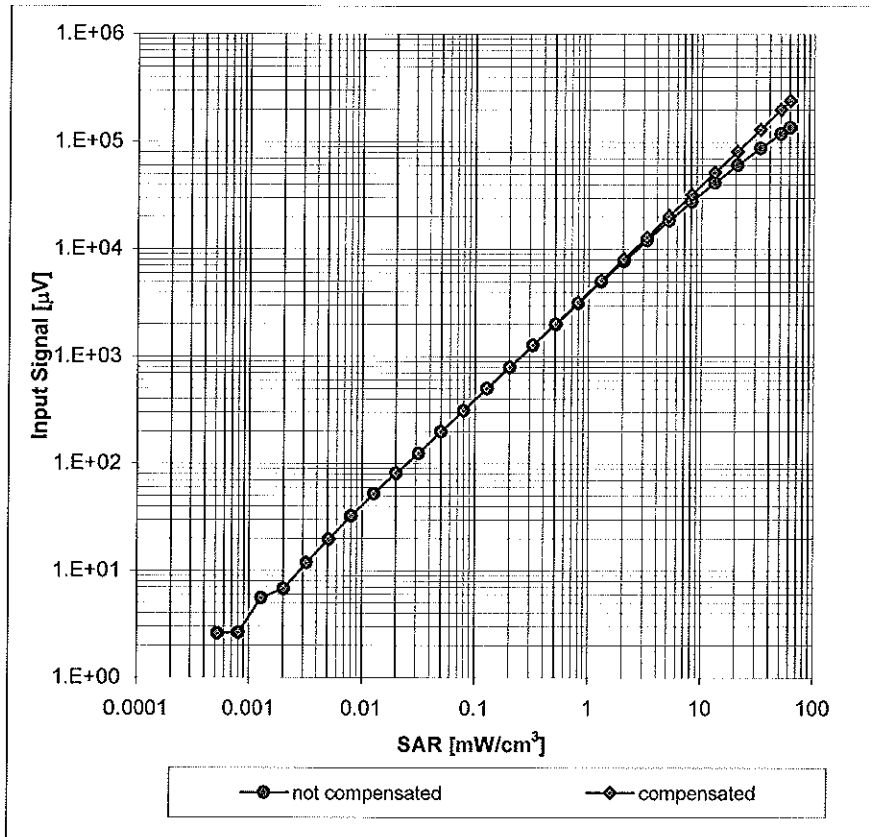
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ ($k=2$)

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



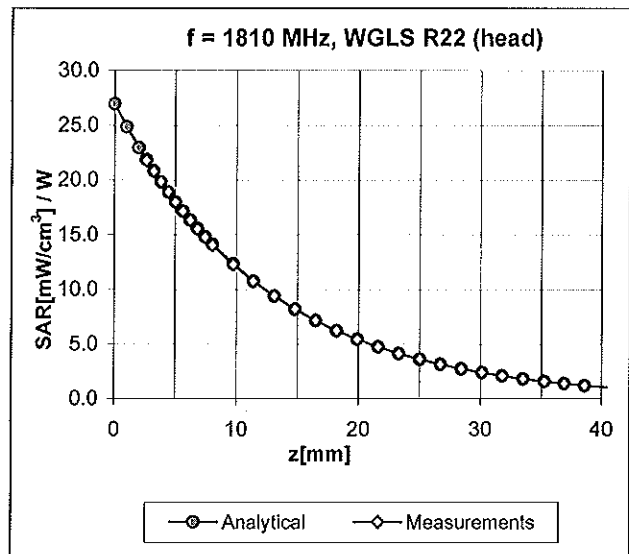
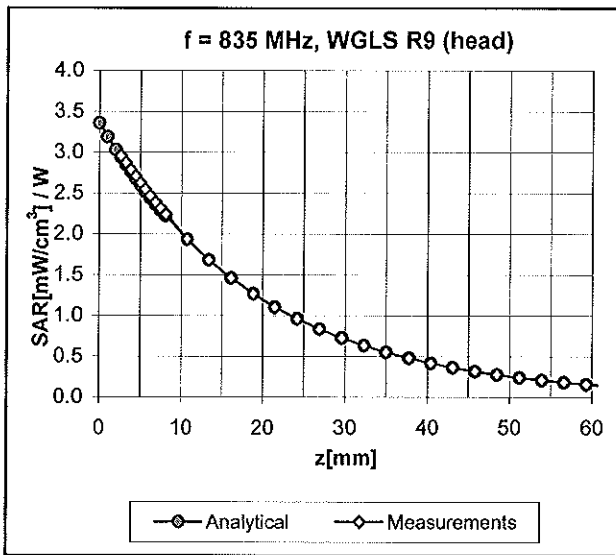
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

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



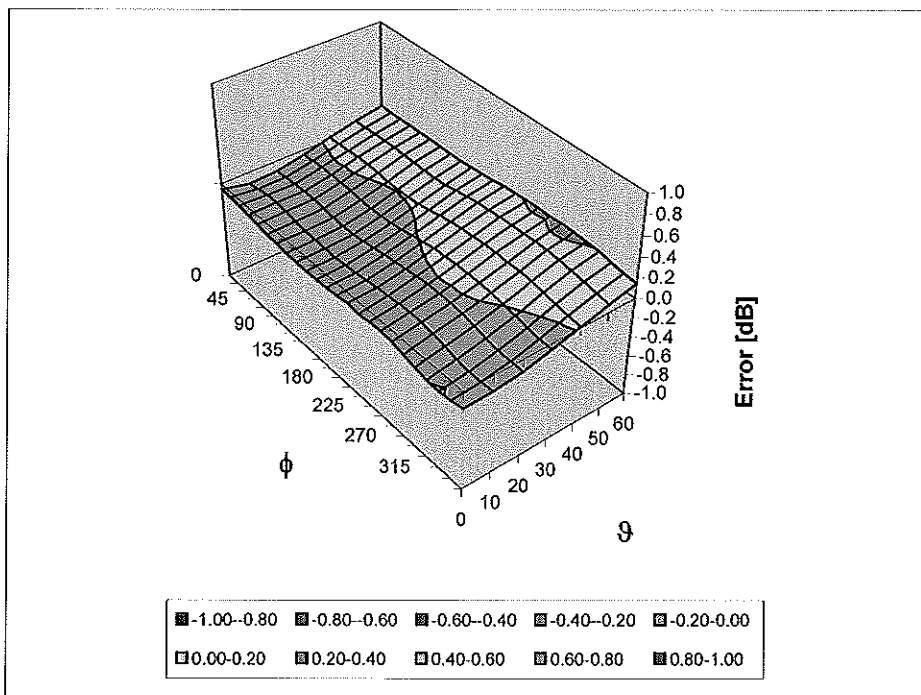
Uncertainty of Linearity Assessment: $\pm 0.6\%$ ($k=2$)

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error (ϕ , θ), f = 900 MHz



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

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	4.0 mm
Probe Tip to Sensor X Calibration Point	2 mm
Probe Tip to Sensor Y Calibration Point	2 mm
Probe Tip to Sensor Z Calibration Point	2 mm
Recommended Measurement Distance from Surface	3 mm



Accredited by the Swiss Accreditation Service (SAS)
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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 108

Client **Motorola MDb**

Certificate No: **EX3-3730_Jul10/2**

CALIBRATION CERTIFICATE (Replacement of No: EX3-3730_Jul10)

Object: **EX3DV4 - SN:3730**

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: **July 16, 2010**

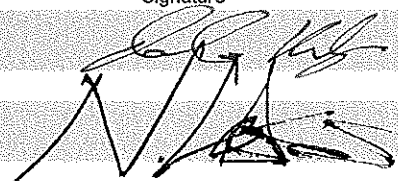
This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

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

Calibrated by:	Name Katja Pokovic	Function Technical Manager	Signature 
Approved by:	Name Niels Kuster	Function Quality Manager	

Issued: September 4, 2010

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



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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 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.

Probe EX3DV4

SN:3730

Manufactured:	October 19, 2009
Calibrated:	July 16, 2010

Calibrated for DASY/EASY Systems

(Note: non-compatible with DASY2 system!)

DASY/EASY - Parameters of Probe: EX3DV4 SN:3730**Basic Calibration Parameters**

	Sensor X	Sensor Y	Sensor Z	Unc (k=2)
Norm ($\mu\text{V}/(\text{V}/\text{m})^2$) ^A	0.41	0.53	0.50	$\pm 10.1\%$
DCP (mV) ^B	87.3	92.6	93.4	

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 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 recatangular distribution and is expressed for the square of the field value.

DASY/EASY - Parameters of Probe: EX3DV4 SN:3730**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)
5200	± 50 / ± 100	36.0 ± 5%	4.66 ± 5%	4.67	4.67	4.67	0.45	1.80 ± 13.1%
5300	± 50 / ± 100	35.9 ± 5%	4.76 ± 5%	4.38	4.38	4.38	0.45	1.80 ± 13.1%
5600	± 50 / ± 100	35.5 ± 5%	5.07 ± 5%	4.14	4.14	4.14	0.45	1.80 ± 13.1%
5800	± 50 / ± 100	35.3 ± 5%	5.27 ± 5%	4.06	4.06	4.06	0.50	1.80 ± 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.

DASY/EASY - Parameters of Probe: EX3DV4 SN:3730

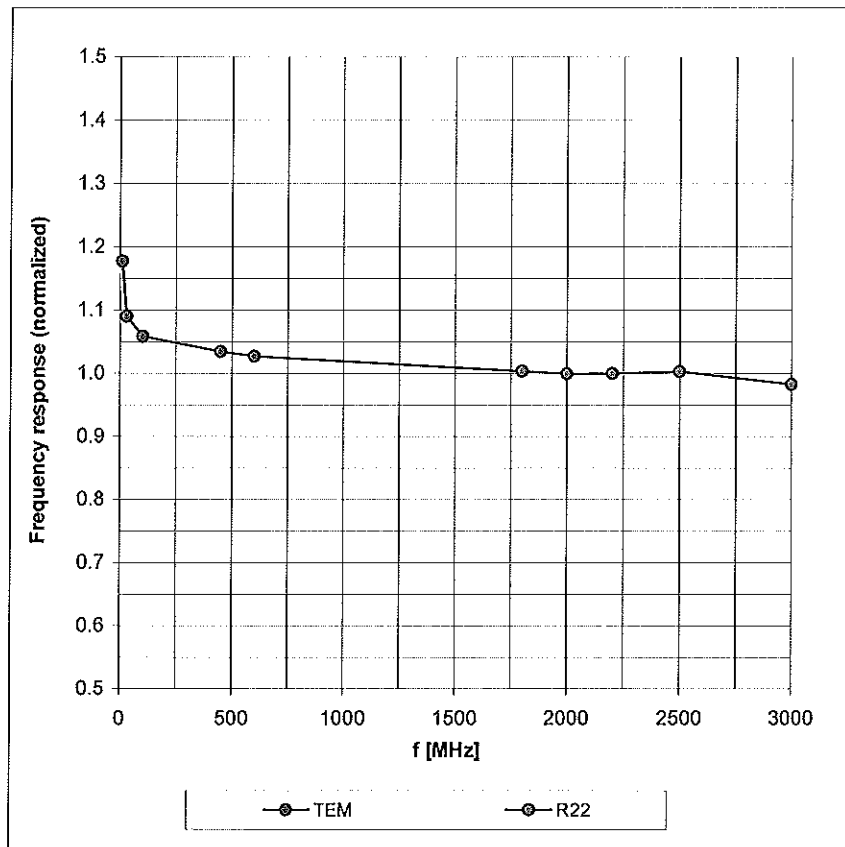
Calibration Parameter Determined in Body Tissue Simulating Media

f [MHz]	Validity [MHz] [©]	Permittivity	Conductivity	ConvF X	ConvF Y	ConvF Z	Alpha	Depth Unc (k=2)
5200	± 50 / ± 100	49.0 ± 5%	5.30 ± 5%	4.07	4.07	4.07	0.50	1.90 ± 13.1%
5300	± 50 / ± 100	48.9 ± 5%	5.42 ± 5%	3.81	3.81	3.81	0.55	1.90 ± 13.1%
5600	± 50 / ± 100	48.5 ± 5%	5.77 ± 5%	3.33	3.33	3.33	0.60	1.90 ± 13.1%
5800	± 50 / ± 100	48.2 ± 5%	6.00 ± 5%	3.53	3.53	3.53	0.60	1.90 ± 13.1%

[©] 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.

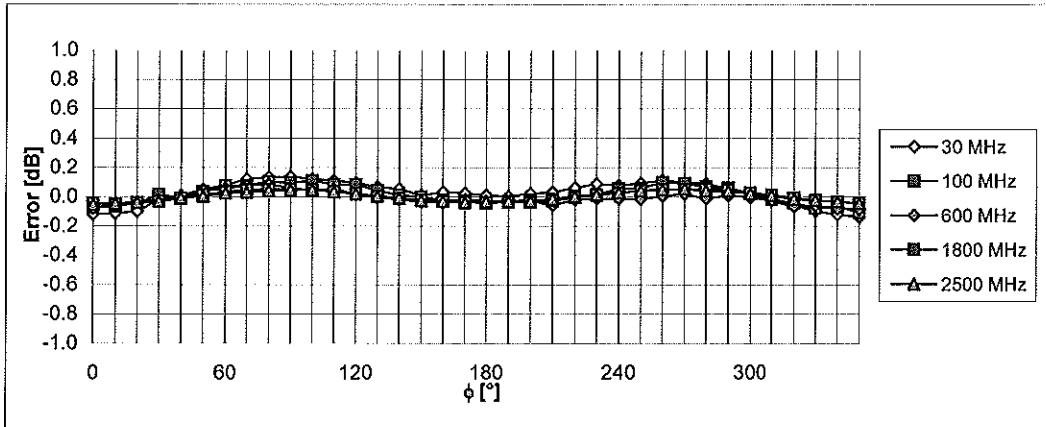
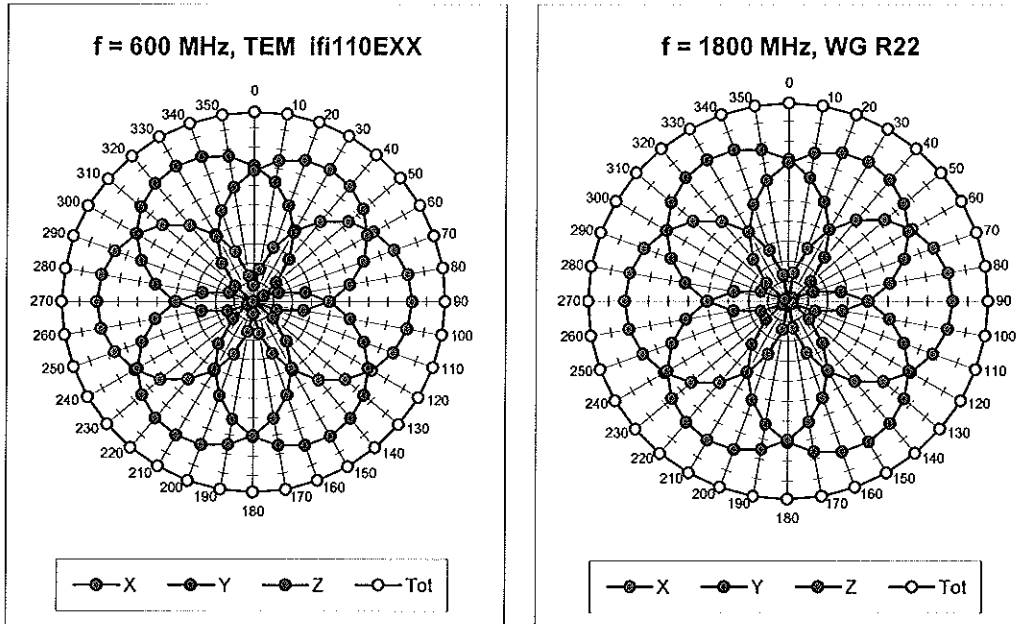
Frequency Response of E-Field

(TEM-Cell:ifi1110 EXX, Waveguide: R22)



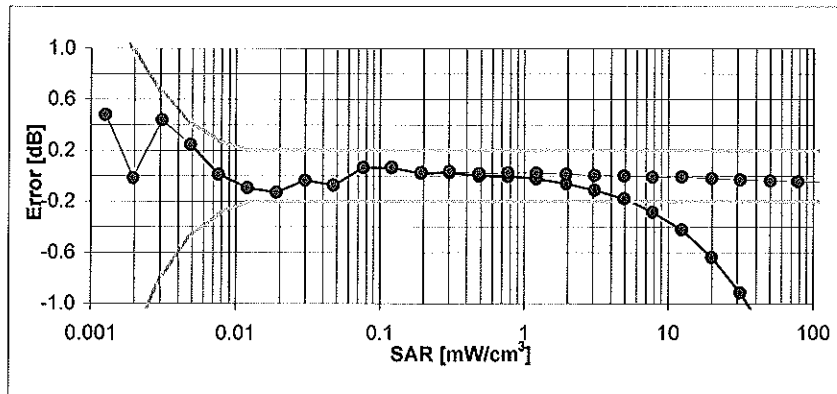
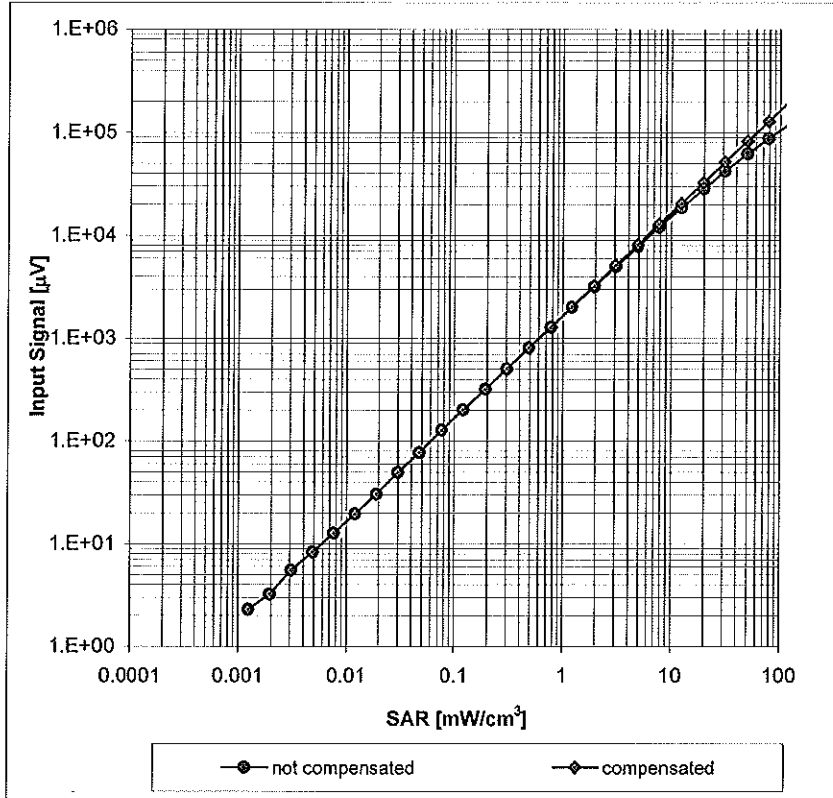
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

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



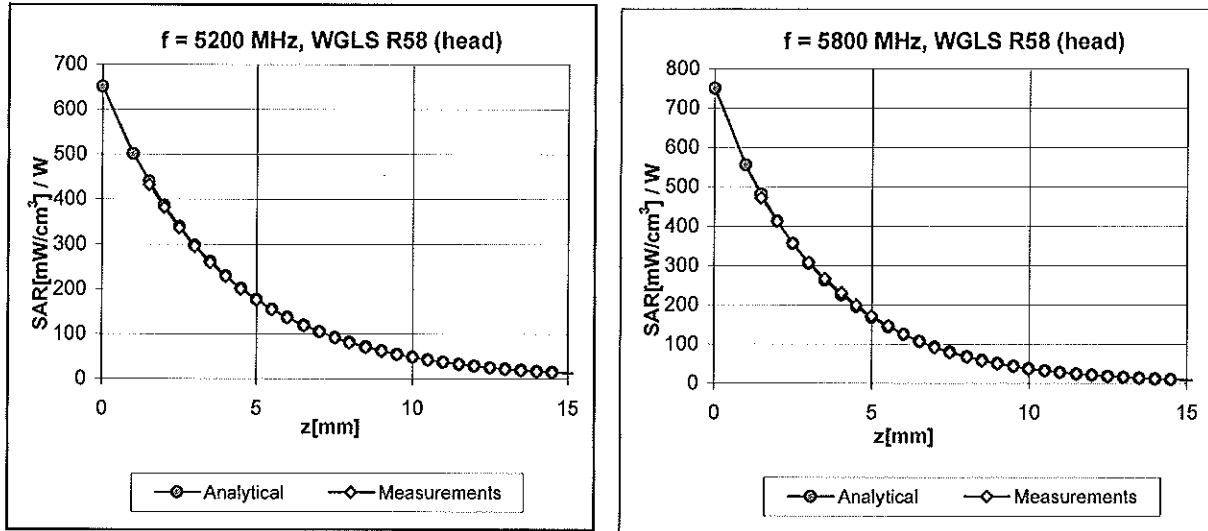
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ (k=2)

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



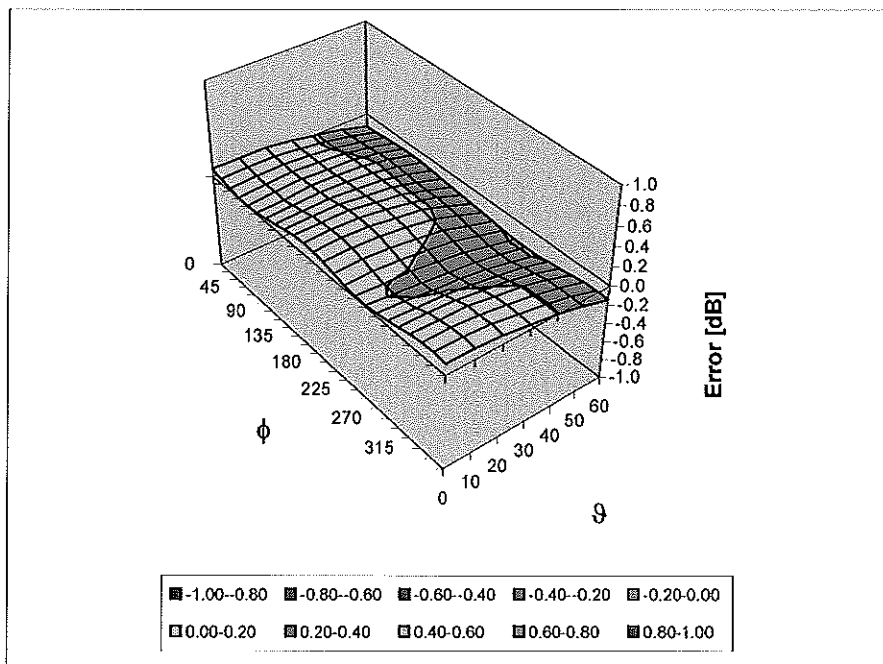
Uncertainty of Linearity Assessment: $\pm 0.6\%$ (k=2)

Conversion Factor Assessment



Deviation from Isotropy in HSL

Error (ϕ, ϑ), f = 900 MHz



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

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 5

Measurement Uncertainty Budget

<i>a</i>	<i>b</i>	<i>c</i>	<i>d</i>	$e = f(d,k)$	<i>f</i>	<i>g</i>	$h = c \times f / e$	$i = c \times g / e$	<i>k</i>
Uncertainty Component	IEEE 1528 section	Tol. (\pm %)	Prob Dist	Div.	c_i (1 g)	c_i (10 g)	1 g u_i (\pm %)	10 g u_i (\pm %)	v_i
Measurement System									
Probe Calibration	E.2.1	5.9	N	1.00	1	1	5.9	5.9	∞
Axial Isotropy	E.2.2	4.7	R	1.73	0.707	0.707	1.9	1.9	∞
Hemispherical Isotropy	E.2.2	9.6	R	1.73	0.707	0.707	3.9	3.9	∞
Boundary Effect	E.2.3	1.0	R	1.73	1	1	0.6	0.6	∞
Linearity	E.2.4	4.7	R	1.73	1	1	2.7	2.7	∞
System Detection Limits	E.2.5	1.0	R	1.73	1	1	0.6	0.6	∞
Readout Electronics	E.2.6	0.3	N	1.00	1	1	0.3	0.3	∞
Response Time	E.2.7	1.1	R	1.73	1	1	0.6	0.6	∞
Integration Time	E.2.8	1.1	R	1.73	1	1	0.6	0.6	∞
RF Ambient Conditions - Noise	E.6.1	3.0	R	1.73	1	1	1.7	1.7	∞
RF Ambient Conditions - Reflections	E.6.1	0.0	R	1.73	1	1	0.0	0.0	∞
Probe Positioner Mech. Tolerance	E.6.2	0.4	R	1.73	1	1	0.2	0.2	∞
Probe Positioning w.r.t Phantom	E.6.3	1.4	R	1.73	1	1	0.8	0.8	∞
Max. SAR Evaluation (ext., int., avg.)	E.5	3.4	R	1.73	1	1	2.0	2.0	∞
Test sample Related									
Test Sample Positioning	E.4.2	3.2	N	1.00	1	1	3.2	3.2	29
Device Holder Uncertainty	E.4.1	4.0	N	1.00	1	1	4.0	4.0	8
SAR drift	6.6.2	5.0	R	1.73	1	1	2.9	2.9	∞
Phantom and Tissue Parameters									
Phantom Uncertainty	E.3.1	4.0	R	1.73	1	1	2.3	2.3	∞
Liquid Conductivity (target)	E.3.2	5.0	R	1.73	0.64	0.43	1.8	1.2	∞
Liquid Conductivity (measurement)	E.3.3	3.3	N	1.00	0.64	0.43	2.1	1.4	∞
Liquid Permittivity (target)	E.3.2	5.0	R	1.73	0.6	0.49	1.7	1.4	∞
Liquid Permittivity (measurement)	E.3.3	1.9	N	1.00	0.6	0.49	1.1	0.9	∞
Combined Standard Uncertainty									
			RSS				11.1	10.8	411
Expanded Uncertainty (95% CONFIDENCE LEVEL)									
			$k=2$				22.2	21.6	

Appendix 6

Dipole Characterization Certificate



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 **Motorola MDb**

Certificate No: **D835V2-424_Oct10**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 424**

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

Calibration date: **October 14, 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-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
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-10)	In house check: Oct-11

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

Issued: October 14, 2010

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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:

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

- d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

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

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

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	42.3 \pm 6 %	0.90 mho/m \pm 6 %
Head TSL temperature during test	(22.5 \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	2.36 mW / g
SAR normalized	normalized to 1W	9.44 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.49 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	1.54 mW / g
SAR normalized	normalized to 1W	6.16 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.18 mW / g \pm 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	$52.9 \Omega + 3.8 j\Omega$
Return Loss	- 26.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.393 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 24, 2000

DASY5 Validation Report for Head TSL

Date/Time: 14.10.2010 10:07:31

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:424

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

Medium: HSL900

Medium parameters used: $f = 835 \text{ MHz}$; $\sigma = 0.9 \text{ mho/m}$; $\epsilon_r = 42.5$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.03, 6.03, 6.03); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

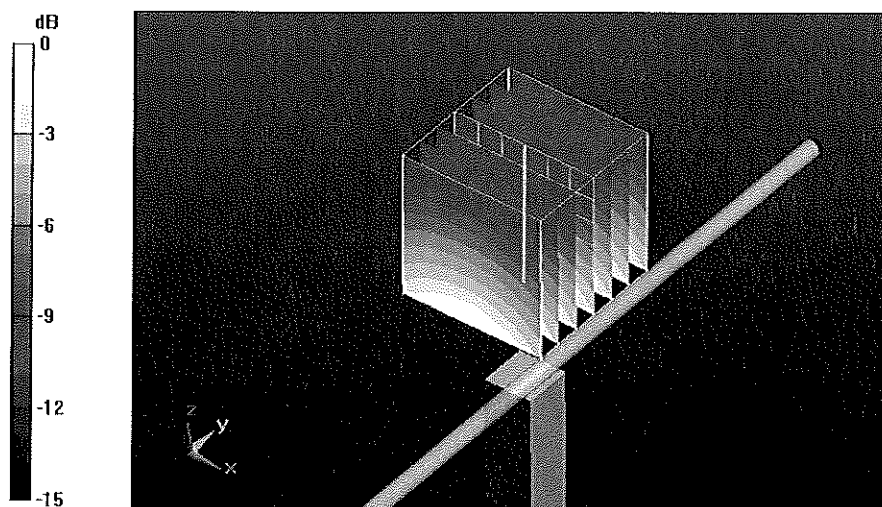
Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 56.7 V/m; Power Drift = 0.045 dB

Peak SAR (extrapolated) = 3.56 W/kg

SAR(1 g) = 2.36 mW/g; SAR(10 g) = 1.54 mW/g

Maximum value of SAR (measured) = 2.75 mW/g



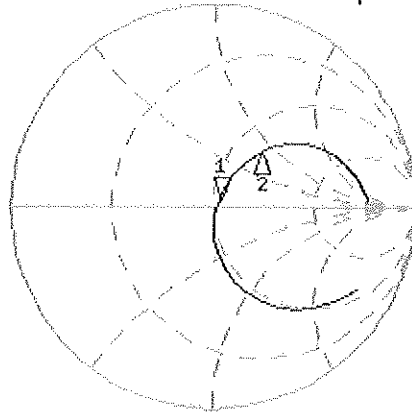
0 dB = 2.75mW/g

Impedance Measurement Plot for Head TSL

14 Oct 2010 08:47:41

CH1 S11 1 U FS 1: 52.930 Ω 3.7910 Ω 722.59 μ H 835.000 000 MHz

*
Del
Cor



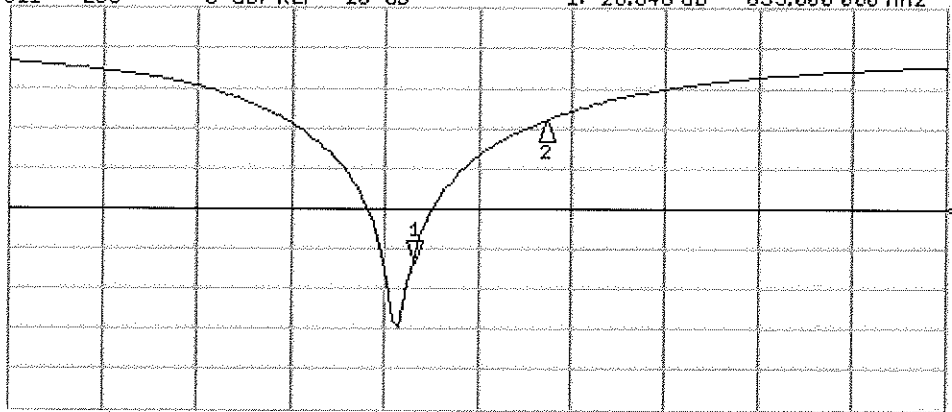
CH1 Markers
2: 65.734 Ω
40.102 Ω
900.000 MHz

Avg
16

CH2 S11 LOG 5 dB/REF -20 dB 1: -26.648 dB 835.000 000 MHz

Cor

Avg
16



CH2 Markers
2: -9.0765 dB
900.000 MHz

START 635.000 000 MHz

STOP 1 100.000 000 MHz



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola MDB**

Certificate No: **D835V2-425_Oct10**

CALIBRATION CERTIFICATE

Object **D835V2 - SN: 425**

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

Calibration date: **October 14, 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-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
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-10)	In house check: Oct-11

Calibrated by: **Jeton Kastrati** (Name), **Laboratory Technician** (Function), *[Signature]* (Signature)

Approved by: **Katja Pokovic** (Name), **Technical Manager** (Function), *[Signature]* (Signature)

Issued: October 14, 2010

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

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

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

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	41.5	0.90 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	42.3 \pm 6 %	0.90 mho/m \pm 6 %
Head TSL temperature during test	(22.5 \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	2.38 mW / g
SAR normalized	normalized to 1W	9.52 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	9.57 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	1.55 mW / g
SAR normalized	normalized to 1W	6.20 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	6.22 mW / g \pm 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.8 Ω + 3.7 j Ω
Return Loss	- 26.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.396 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 24, 2000

DASY5 Validation Report for Head TSL

Date/Time: 14.10.2010 10:27:24

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:425

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

Medium: HSL900

Medium parameters used: $f = 835$ MHz; $\sigma = 0.9$ mho/m; $\epsilon_r = 42.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(6.03, 6.03, 6.03); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 4.9L; Type: QD000P49AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

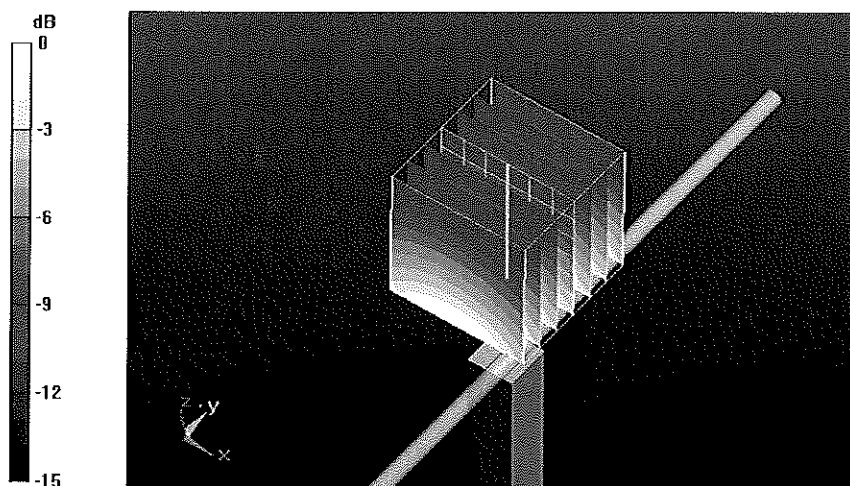
Pin=250 mW /d=15mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 57 V/m; Power Drift = 0.010 dB

Peak SAR (extrapolated) = 3.59 W/kg

SAR(1 g) = 2.38 mW/g; SAR(10 g) = 1.55 mW/g

Maximum value of SAR (measured) = 2.76 mW/g



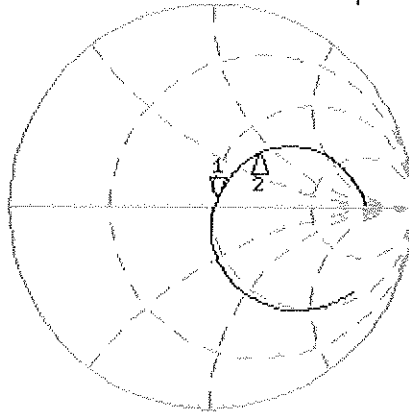
0 dB = 2.76mW/g

Impedance Measurement Plot for Head TSL

14 Oct 2010 08:49:37

CH1 S11 1 U FS 1: 52.766 Ω 3.7051 Ω 706.21 pF 835.000 000 MHz

*
De1
Cor

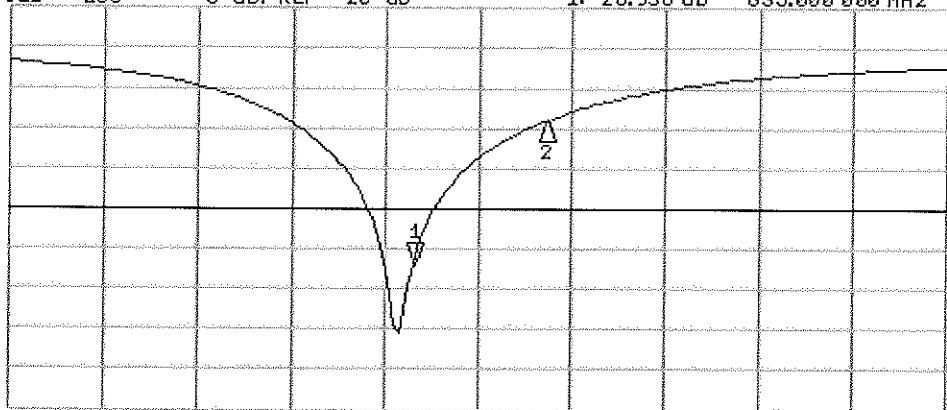


CH1 Markers
2: 66.023 Ω
39.344 Ω
900.000 MHz

Avg
16
↑

CH2 S11 LOG 5 dB/REF -20 dB 1: -26.936 dB 835.000 000 MHz

Cor
Avg
16
↑



CH2 Markers
2: -9.1999 dB
900.000 MHz



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola MDb**

Certificate No: **D1800V2-279_Oct10**

CALIBRATION CERTIFICATE

Object **D1800V2 - SN: 279**

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

Calibration date: **October 13, 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-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
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-10)	In house check: Oct-11

Calibrated by:	Dimce Iliev	Laboratory Technician	<i>Dimce Iliev</i>
Approved by:	Katja Pokovic	Technical Manager	<i>Katja Pokovic</i>

Issued: October 14, 2010

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

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

- d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	1800 MHz ± 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 ± 0.2) °C	38.9 ± 6 %	1.35 mho/m ± 6 %
Head TSL temperature during test	(21.8 ± 0.2) °C	----	----

SAR result with Head TSL

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	9.31 mW / g
SAR normalized	normalized to 1W	37.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	37.8 mW /g ± 17.0 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	4.92 mW / g
SAR normalized	normalized to 1W	19.7 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	19.8 mW /g ± 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	53.9 Ω + 5.0 j Ω
Return Loss	- 24.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.194 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	November 25, 2000

DASY5 Validation Report for Head TSL

Date/Time: 13.10.2010 11:49:44

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:279

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: HSL U12 BB

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.35$ mho/m; $\epsilon_r = 38.9$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.05, 5.05, 5.05); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

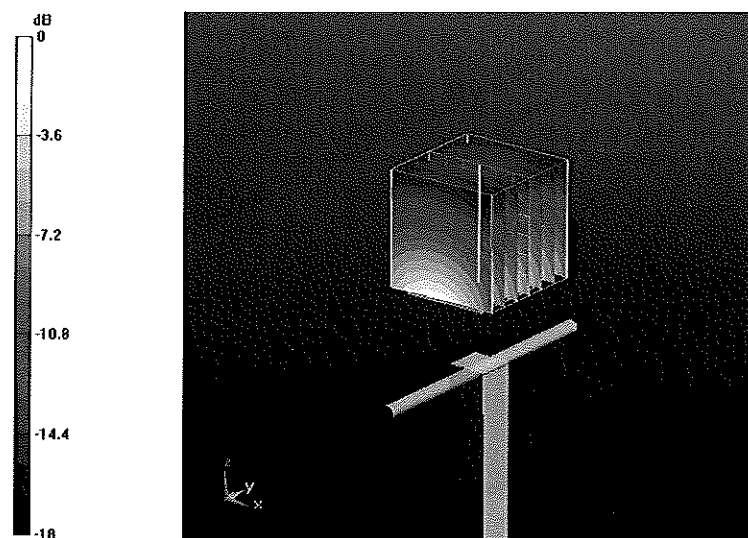
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 95 V/m; Power Drift = 0.038 dB

Peak SAR (extrapolated) = 16.9 W/kg

SAR(1 g) = 9.31 mW/g; SAR(10 g) = 4.92 mW/g

Maximum value of SAR (measured) = 11.4 mW/g



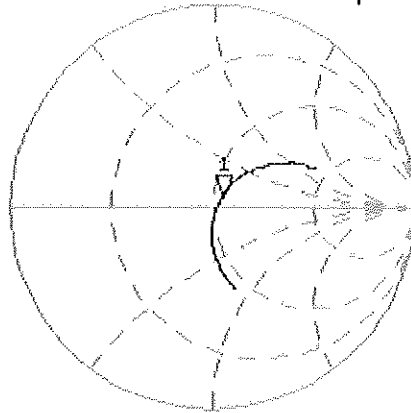
0 dB = 11.4mW/g

Impedance Measurement Plot for Head TSL

13 Oct 2010 08:46:43

[CHI] S11 1 U FS 1: 53.943 Ω 5.0117 Ω 443.13 μ H 1 800.000 000 MHz

*
De1
CA



Avg
16

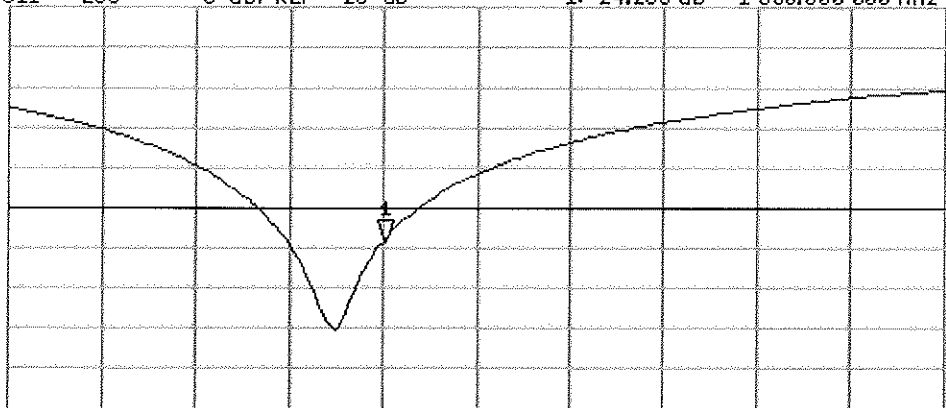
↑

CH2 S11 LOG 5 dB/REF -20 dB 1:-24.253 dB 1 800.000 000 MHz

CA

Avg
16

↑



START 1 600.000 000 MHz

STOP 2 100.000 000 MHz



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola MDb**

Certificate No: **D1800V2-281_Jan11**

CALIBRATION CERTIFICATE

Object **D1800V2 - SN: 281**

Calibration procedure(s) **QA CAL-05.v8
Calibration procedure for dipole validation kits**

Calibration date: **January 13, 2011**

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-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
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-10)	In house check: Oct-11

Calibrated by: **Dimco Iliev** **Function: Laboratory Technician** **Signature: [Signature]**

Approved by: **Katja Pokovic** **Technical Manager** **[Signature]**

Issued: January 13, 2011

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

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

- d) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

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

DASY Version	DASY5	V52.6
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	1800 MHz \pm 1 MHz	

Head TSL parameters

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	40.0	1.40 mho/m
Measured Head TSL parameters	(22.0 \pm 0.2) °C	38.6 \pm 6 %	1.38 mho/m \pm 6 %
Head TSL temperature during test	(21.3 \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	9.70 mW / g
SAR normalized	normalized to 1W	38.8 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	38.9 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	5.10 mW / g
SAR normalized	normalized to 1W	20.4 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	20.4 mW / g \pm 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.1 Ω + 0.3 j Ω
Return Loss	- 39.2 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.198 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.

Design Modification by End User

The dipole has been modified with Teflon Rings (TR) placed within identified markings close to the end of each dipole arm. Calibration has been performed with TR attached to the dipole.

Additional EUT Data

Manufactured by	SPEAG
Manufactured on	November 25, 2000

DASY5 Validation Report for Head TSL

Date/Time: 13.01.2011 12:13:44

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1800 MHz; Type: D1800V2; Serial: D1800V2 - SN:281

Communication System: CW; Frequency: 1800 MHz; Duty Cycle: 1:1

Medium: HSL U12 BB

Medium parameters used: $f = 1800$ MHz; $\sigma = 1.38$ mho/m; $\epsilon_r = 38.7$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(5.05, 5.05, 5.05); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.6.1 Build (408)
- Postprocessing SW: SEMCAD X, V14.4.2 Build (2595)

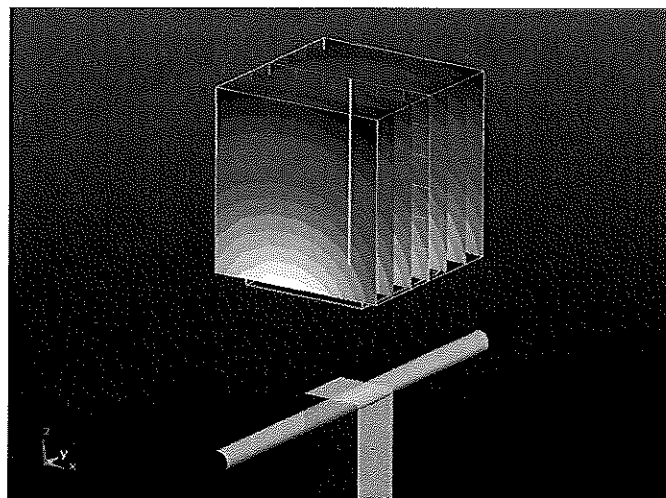
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 96.760 V/m; Power Drift = 0.03 dB

Peak SAR (extrapolated) = 17.662 W/kg

SAR(1 g) = 9.7 mW/g; SAR(10 g) = 5.1 mW/g

Maximum value of SAR (measured) = 12.037 mW/g



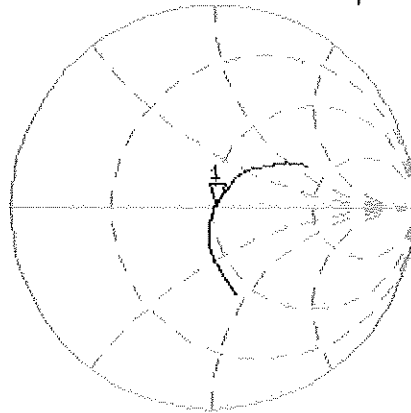
0 dB = 12.040mW/g

Impedance Measurement Plot for Head TSL

13 Jan 2011 10:28:22

CH1 S11 1 U FS 1: 51.051 Ω 0.3379 Ω 29.876 μ H 1 800.000 000 MHz

*
Del
Cor



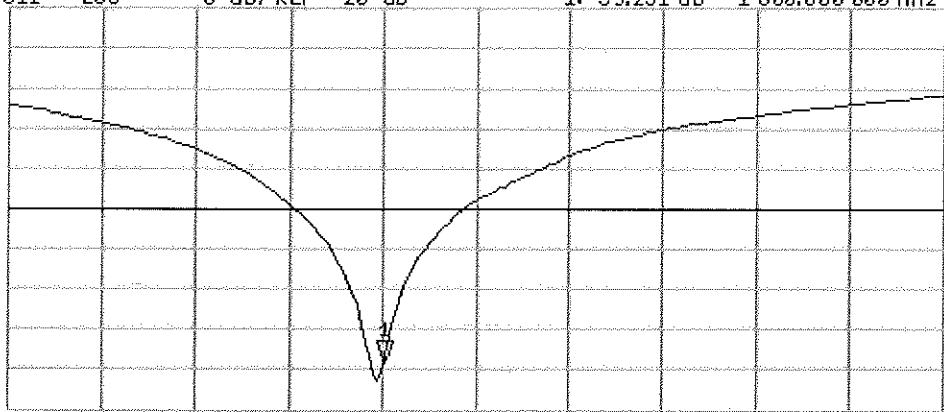
Avg
16
↑

CH2 S11 LOG 5 dB/REF -20 dB 1: -39.251 dB 1 800.000 000 MHz

Cor

Avg
16

↑



START 1 800.000 000 MHz

STOP 2 100.000 000 MHz



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Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 108**

Client **Motorola MDb**

Certificate No: **D2450V2-766_Oct10**

CALIBRATION CERTIFICATE

Object **D2450V2 - SN: 766**

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

Calibration date: **October 13, 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-10 (No. 217-01266)	Oct-11
Power sensor HP 8481A	US37292783	06-Oct-10 (No. 217-01266)	Oct-11
Reference 20 dB Attenuator	SN: 5086 (20g)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe ES3DV3	SN: 3205	30-Apr-10 (No. ES3-3205_Apr10)	Apr-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
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-10)	In house check: Oct-11

Calibrated by:	Name Dimce Iliev	Function Laboratory Technician	Signature
Approved by:	Name Katja Pokovic	Function Technical Manager	

Issued: October 14, 2010

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
- IEC 62209-1, "Procedure to measure the Specific Absorption Rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz)", February 2005
- Federal Communications Commission Office of Engineering & Technology (FCC OET), "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields; Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions", Supplement C (Edition 01-01) to Bulletin 65

Additional Documentation:

- DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- Measurement Conditions:** Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL:** The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss:** These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay:** One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured:** SAR measured at the stated antenna input power.
- SAR normalized:** SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters:** The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	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	38.3 \pm 6 %	1.71 mho/m \pm 6 %
Head TSL temperature during test	(21.4 \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	12.8 mW / g
SAR normalized	normalized to 1W	51.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	52.2 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	5.98 mW / g
SAR normalized	normalized to 1W	23.9 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	24.0 mW /g \pm 16.5 % (k=2)

Appendix

Antenna Parameters with Head TSL

Impedance, transformed to feed point	52.1 Ω + 0.7 j Ω
Return Loss	- 33.3 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.156 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 10, 2004

DASY5 Validation Report for Head TSL

Date/Time: 13.10.2010 14:19:04

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:766

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

Medium: HSL U12 BB

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.71$ mho/m; $\epsilon_r = 38.4$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: ES3DV3 - SN3205; ConvF(4.53, 4.53, 4.53); Calibrated: 30.04.2010
- Sensor-Surface: 3mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

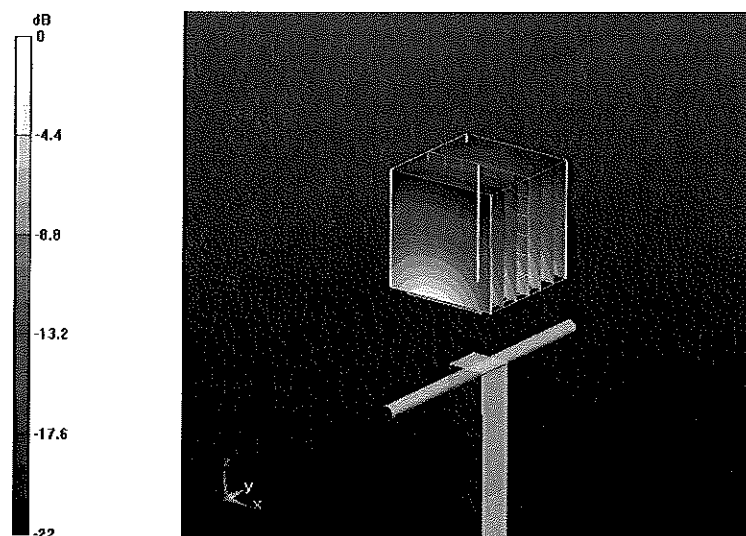
Pin=250 mW /d=10mm, dist=3.0mm (ES-Probe)/Zoom Scan (7x7x7) /Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 100.6 V/m; Power Drift = 0.045 dB

Peak SAR (extrapolated) = 26 W/kg

SAR(1 g) = 12.8 mW/g; SAR(10 g) = 5.98 mW/g

Maximum value of SAR (measured) = 16 mW/g



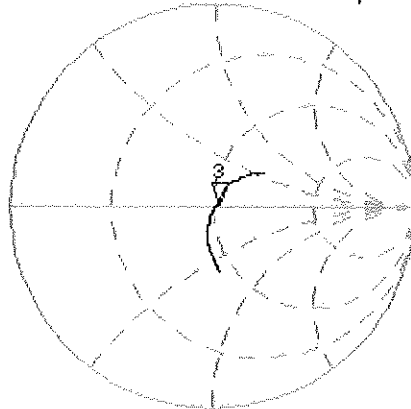
0 dB = 16mW/g

Impedance Measurement Plot for Head TSL

13 Oct 2016 09:07:19

[CH1] S11 1 U FS 3: 52.096 Ω 0.7207 Ω 46.818 μH 2 450.000 000 MHz

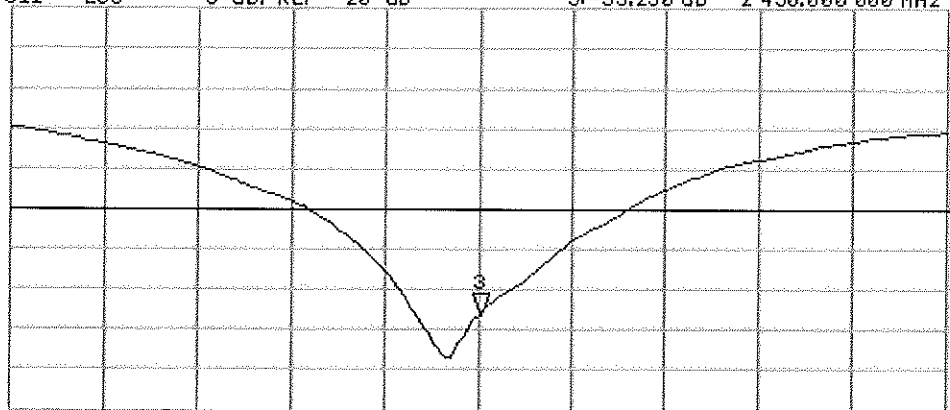
*
De1
CA



Avg
15
↑

CH2 S11 LOG 5 dB/REF -20 dB 3:-33.250 dB 2 450.000 000 MHz

CA
Avg
15
↑



START 2 250.000 000 MHz

STOP 2 650.000 000 MHz



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Accreditation No.: **SCS 108**

Client **Motorola MDb**

Certificate No: **D5GHzV2-1088_Jul10**

CALIBRATION CERTIFICATE

Object **D5GHzV2 - SN: 1088**

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

Calibration date: **July 14, 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)	30-Mar-10 (No. 217-01158)	Mar-11
Type-N mismatch combination	SN: 5047.2 / 06327	30-Mar-10 (No. 217-01162)	Mar-11
Reference Probe EX3DV4	SN: 3503	05-Mar-10 (No. EX3-3503_Mar10)	Mar-11
DAE4	SN: 601	10-Jun-10 (No. DAE4-601_Jun10)	Jun-11
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 Jeton Kasrati	Function Laboratory Technician	Signature
Approved by:	Name Kajla Pokovic	Technical Manager	

Issued: July 15, 2010

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Accreditation No.: **SCS 108**

Glossary:

TSL	tissue simulating liquid
ConvF	sensitivity in TSL / NORM x,y,z
N/A	not applicable or not measured

Calibration is Performed According to the Following Standards:

- a) 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
- b) 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:

- c) DASY4/5 System Handbook

Methods Applied and Interpretation of Parameters:

- *Measurement Conditions:* Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- *Antenna Parameters with TSL:* The dipole is mounted with the spacer to position its feed point exactly below the center marking of the flat phantom section, with the arms oriented parallel to the body axis.
- *Feed Point Impedance and Return Loss:* These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- *Electrical Delay:* One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- *SAR measured:* SAR measured at the stated antenna input power.
- *SAR normalized:* SAR as measured, normalized to an input power of 1 W at the antenna connector.
- *SAR for nominal TSL parameters:* The measured TSL parameters are used to calculate the nominal SAR result.

Measurement Conditions

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

DASY Version	DASY5	V52.2
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom V5.0	
Distance Dipole Center - TSL	10 mm	with Spacer
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 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	36.2 \pm 6 %	4.52 mho/m \pm 6 %
Head TSL temperature during test	(22.0 \pm 0.2) °C	----	----

SAR result with Head TSL at 5200 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	condition	
SAR measured	100 mW input power	8.23 mW / g
SAR normalized	normalized to 1W	82.3 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	82.4 mW / g \pm 19.9 % (k=2)

SAR averaged over 10 cm³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.34 mW / g
SAR normalized	normalized to 1W	23.4 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	23.4 mW / g \pm 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	35.2 ± 6 %	5.02 mho/m ± 6 %
Head TSL temperature during test	(22.0 ± 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	8.23 mW / g
SAR normalized	normalized to 1W	82.3 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	82.1 mW / g ± 19.9 % (k=2)

SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	100 mW input power	2.32 mW / g
SAR normalized	normalized to 1W	23.2 mW / g
SAR for nominal Head TSL parameters	normalized to 1W	23.1 mW / g ± 19.5 % (k=2)

Appendix

Antenna Parameters with Head TSL at 5200 MHz

Impedance, transformed to feed point	55.7 Ω - 4.2 j Ω
Return Loss	-23.4 dB

Antenna Parameters with Head TSL at 5800 MHz

Impedance, transformed to feed point	54.6 Ω - 4.1 j Ω
Return Loss	-24.6 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.206 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	December 21, 2009

DASY5 Validation Report for Head TSL

Date/Time: 14.07.2010 15:46:24

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 5GHz; Type: D5GHzV2; Serial: D5GHzV2 - SN:1088

Communication System: CW; Frequency: 5200 MHz, Frequency: 5800 MHz; Duty Cycle: 1:1
Medium: HSL 5000

Medium parameters used: $f = 5200$ MHz; $\sigma = 4.52$ mho/m; $\epsilon_r = 36.2$; $\rho = 1000$ kg/m³, Medium parameters used: $f = 5800$ MHz; $\sigma = 5.02$ mho/m; $\epsilon_r = 35.2$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

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

DASY5 Configuration:

- Probe: EX3DV4 - SN3503; ConvF(5.36, 5.36, 5.36), ConvF(4.74, 4.74, 4.74); Calibrated: 05.03.2010
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 10.06.2010
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- Measurement SW: DASY52, V52.2 Build 0, Version 52.2.0 (163)
- Postprocessing SW: SEMCAD X, V14.2 Build 2, Version 14.2.2 (1685)

D5GHzV2 Dipole (Head)/d=10mm, Pin=100mW, f=5200 MHz/Area Scan (91x91x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (interpolated) = 16.2 mW/g

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 = 65.6 V/m; Power Drift = 0.071 dB

Peak SAR (extrapolated) = 31.1 W/kg

SAR(1 g) = 8.23 mW/g; SAR(10 g) = 2.34 mW/g

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

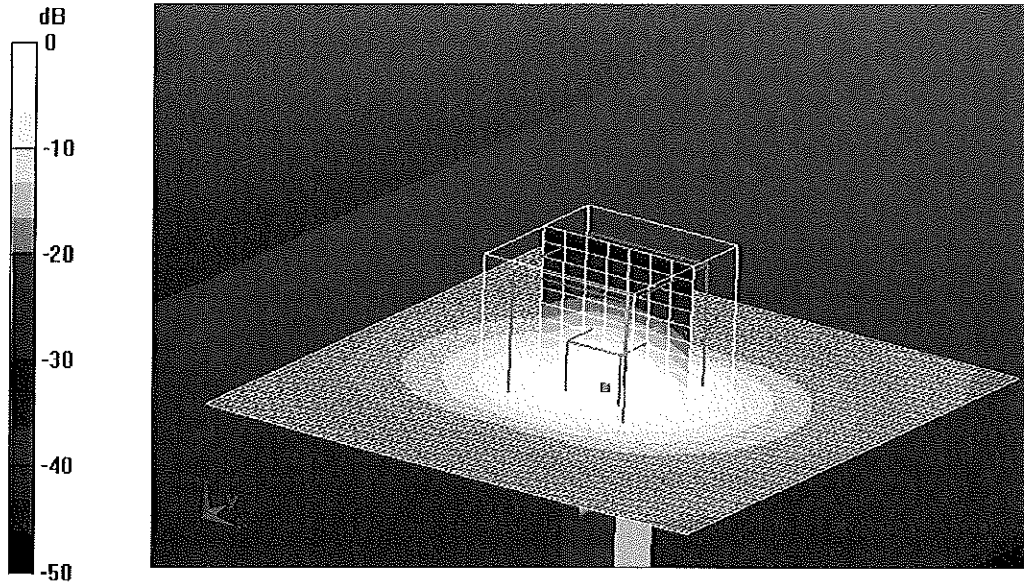
D5GHzV2 Dipole (Head)/d=10mm, Pin=100mW, f=5800 MHz/Zoom Scan (4x4x2.5mm), dist=2mm (8x8x10)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2.5mm

Reference Value = 63.2 V/m; Power Drift = 0.077 dB

Peak SAR (extrapolated) = 34.2 W/kg

SAR(1 g) = 8.23 mW/g; SAR(10 g) = 2.32 mW/g

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



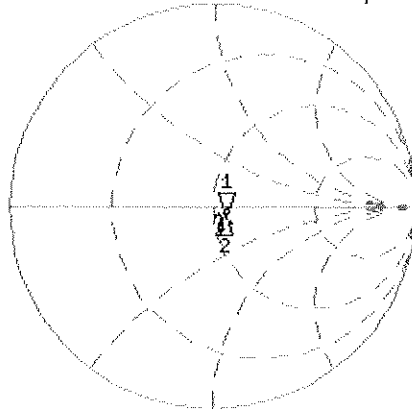
0 dB = 16.6mW/g

Impedance Measurement Plot for Head TSL

14 Jul 2010 15:52:25

[CH1] S11 1 U FS 1: 55.734 Ω -4.2266 Ω 7.2415 pF 5 200.000 000 MHz

*
De1
Cor



CH1 Markers
2: 54.611 Ω
-4.1230 Ω
5.80000 GHz

Avg
16

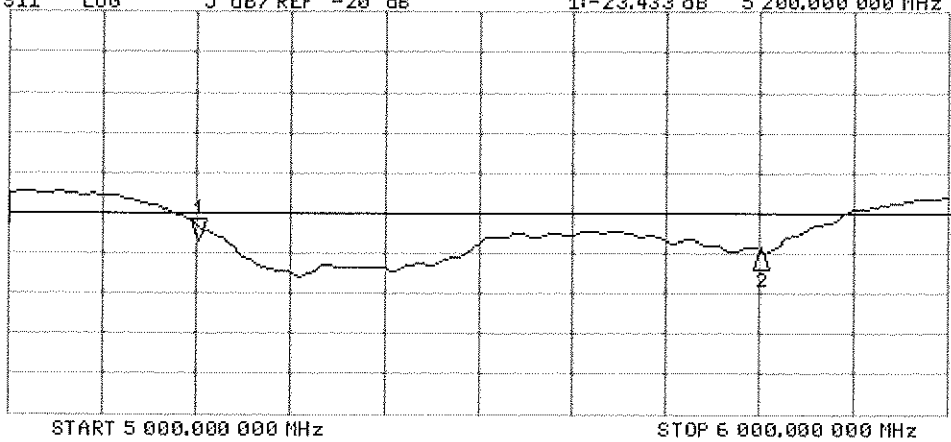
↑

CH2 S11 LOG 5 dB/REF -20 dB 1:-23.433 dB 5 200.000 000 MHz

Cor

Avg
16

↑



CH2 Markers
2: -24.566 dB
5.80000 GHz

END OF REPORT