

7. System Check

7.1 System Check Procedure

7.1.1 General

System Check scans were performed at the beginning of testing of each test program day. A validation dipole antenna was selected that roughly matched the center frequency of the band being tested (1640 MHz). A CW sine wave with a matching frequency is then applied to the antenna from a signal generator through an amplifier for a power level of 30 dBm.

7.1.2 Expanded uncertainty

For this test program an expanded uncertainty was required as a result of having used numerically modeled Conversion Factors for the probe at this frequency (see Section 5.1). Therefore the validation was expected to be within $\pm 22\%$ of the target value in the dipole manufacturer's calibration certificate (see Section 10). While there was increased measurement uncertainty because of these conditions, this set-up did not underestimate SAR, but rather overestimated it, so there is high confidence of compliance for the DUT here.

7.2 System Check Data

Table 9-1 gives SAR data for validation test scans performed on the days of testing. Antenna input power was set at 30 dBm (power level measured by power meter).

Two values for each measurement are given: measured SAR using numerical approximations of probe parameters and recalculated SAR using probe parameters derived from a subsequent manufacturer calibration of the probe. For further explanation of why this was done, see Appendix A – Explanation of System Check Data.

Table 7-1 Validation SAR data

| Date | Frequency | Target Validation 1 g SAR | Measured 1 g SAR using numerical approximations of probe parameters § | Recalculated 1 g SAR using calibrated probe parameters § | Deviation of recalculated SAR |
|---------|-----------|------------------------------|--|--|-------------------------------------|
| 7/11/06 | 1640 MHz | 33.5 mW/g | 37.8 mW/g | 32.1 mW/g § | -4.2% |
| 7/12/06 | 1640 MHz | 33.5 mW/g | 39.1 mW/g | 32.5 mW/g § | -3.0% |
| 7/13/06 | 1640 MHz | 33.5 mW/g | 37.7 mW/g | 31.3 mW/g § | -6.6% |
| 7/14/06 | 1640 MHz | 33.5 mW/g | 39.46 mW/g | 31.8 mW/g § | -5.1% |

§ see Appendix A – Explanation of System Check Data

7.3 System Check Plots

The following pages show validation test plots.

Date/Time: 07/11/06 09:33:17

Test Laboratory: QUALCOMM Incorporated

20060711 Val1640 -30dBm

DUT: Dipole 1640 MHz; Type: D1640V2; Serial: D1640V2 - SN:xxx

Communication System: CW; Frequency: 1640 MHz; Duty Cycle: 1:1

Medium: HSL1640

Medium parameters used: $f = 1640$ MHz; $\rho = 1.32$ mho/m; $\mu = 39.2$; $\epsilon = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19;
- Postprocessing SW: SEMCAD, V1.8 Build 109

d=10mm, Pin=1 W dBm/Area Scan (61x61x1):

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

Reference Value = 180.5 V/m; Power Drift = -0.1 dB

Maximum value of SAR (interpolated) = 42.7 mW/g

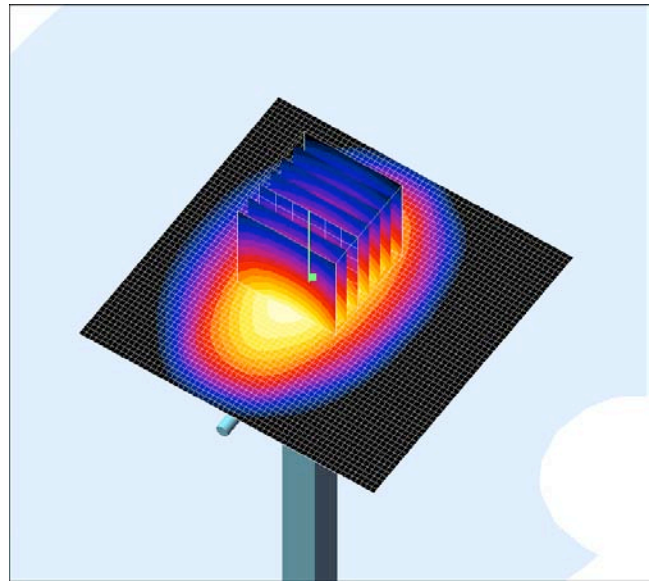
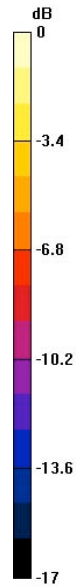
d=10mm, Pin=1 W dBm/Zoom Scan (7x7x7)

(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 180.5 V/m; Power Drift = -0.1 dB

Maximum value of SAR (measured) = 42 mW/g

Peak SAR (extrapolated) = 77.2 W/kg



SAR(1 g) = 32.1 mW/g

SAR(10 g) = 17.6 mW/g

Date/Time: 07/12/06 07:43:17

Test Laboratory: QUALCOMM Incorporated

20060712 Val1640 -30dBm

DUT: Dipole 1640 MHz; Type: D1640V2; Serial: D1640V2 - SN:xxx

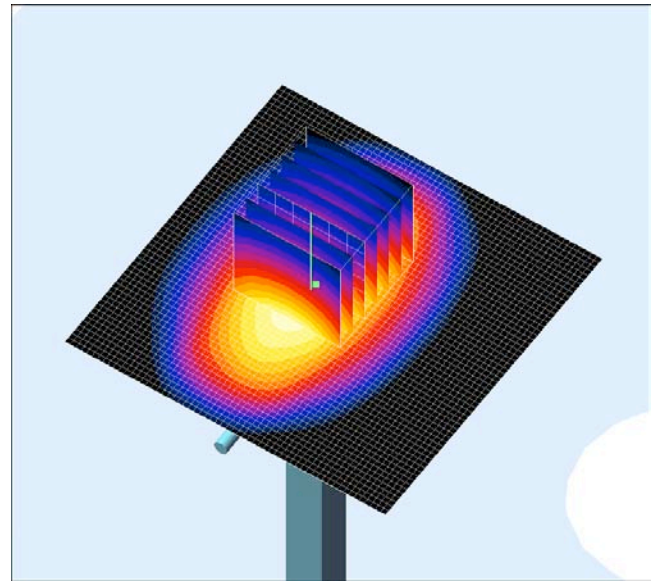
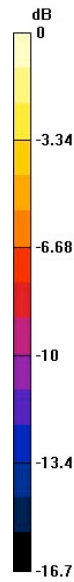
Communication System: CW; Frequency: 1640 MHz; Duty Cycle: 1:1

Medium: HSL1640 Medium parameters used: $f = 1640$ MHz; $\rho = 1.31$ mho/m; $\sigma = 39.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19;
- Postprocessing SW: SEMCAD, V1.8 Build 109



d=10mm, Pin=1 W dBm/Area Scan (61x61x1):

Measurement grid: dx=15mm, dy=15mm
Reference Value = 181.2 V/m; Power Drift = -0.0 dB
Maximum value of SAR (interpolated) = 43.4 mW/g

SAR(1 g) = 32.5 mW/g

SAR(10 g) = 17.9 mW/g

d=10mm, Pin=1 W dBm/Zoom Scan (7x7x7)

(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 181.2 V/m; Power Drift = -0.0 dB
Maximum value of SAR (measured) = 43.2 mW/g
Peak SAR (extrapolated) = 78.7 W/kg

Date/Time: 07/13/06 11:53:12

Test Laboratory: QUALCOMM Incorporated

20060713 Val1640 -30dBm

DUT: Dipole 1640 MHz; Type: D1640V2; Serial: D1640V2 - SN:xxx

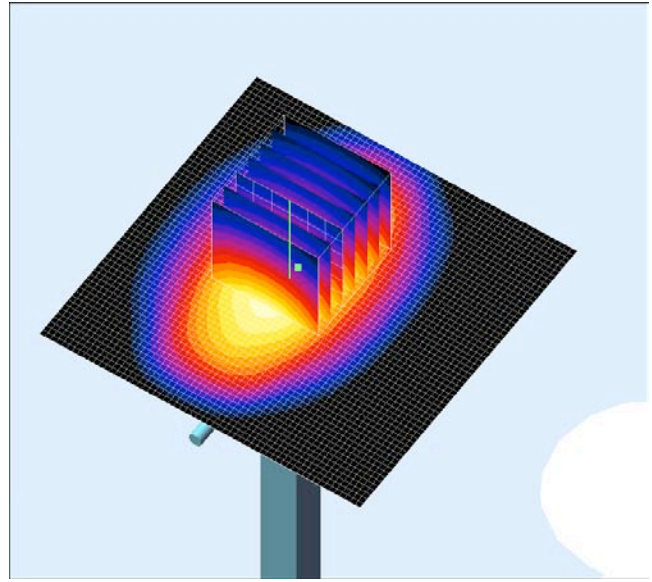
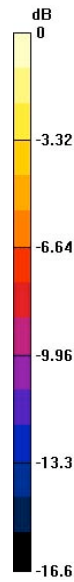
Communication System: CW; Frequency: 1640 MHz; Duty Cycle: 1:1

Medium: HSL1640 Medium parameters used: $f = 1640$ MHz; $\rho = 1.31$ mho/m; $\sigma = 39.3$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19;
- Postprocessing SW: SEMCAD, V1.8 Build 109



d=10mm, Pin=1 W dBm/Area Scan (61x61x1):

Measurement grid: dx=15mm, dy=15mm
Reference Value = 175.5 V/m; Power Drift = -0.0 dB
Maximum value of SAR (interpolated) = 41.8 mW/g

SAR(1 g) = 31.3 mW/g

SAR(10 g) = 17.2 mW/g

d=10mm, Pin=1 W dBm/Zoom Scan (7x7x7)

(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 175.5 V/m; Power Drift = -0.0 dB
Maximum value of SAR (measured) = 41.5 mW/g
Peak SAR (extrapolated) = 75.8 W/kg

Date/Time: 07/14/06 11:44:55

Test Laboratory: QUALCOMM Incorporated

20060714 Val1640 -30dBm

DUT: Dipole 1640 MHz; Type: D1640V2; Serial: D1640V2 - SN:xxx

Communication System: CW; Frequency: 1640 MHz; Duty Cycle: 1:1

Medium: HSL1640 Medium parameters used: $f = 1640$ MHz; $\sigma = 1.31$ mho/m; $\epsilon_r = 39.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19;
- Postprocessing SW: SEMCAD, V1.8 Build 109

d=10mm, Pin=1 W dBm/Area Scan (61x61x1):

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

Reference Value = 176.0 V/m; Power Drift = 0.1 dB

Maximum value of SAR (interpolated) = 42.3 mW/g

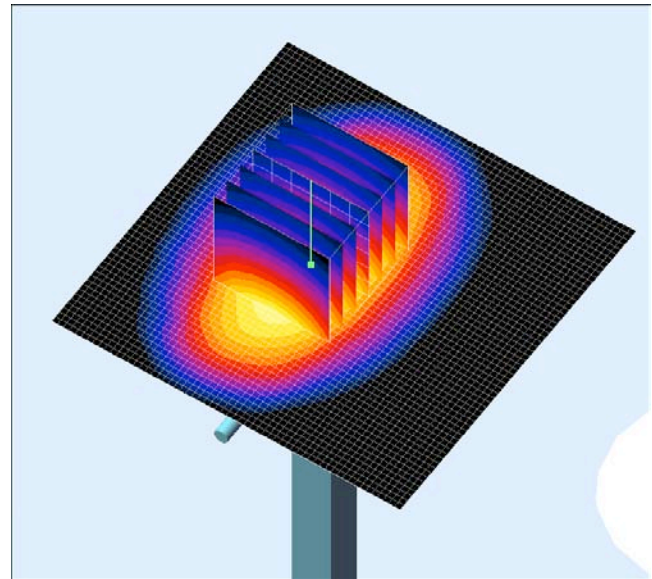
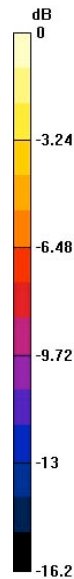
d=10mm, Pin=1 W dBm/Zoom Scan (7x7x7)

(7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 176.0 V/m; Power Drift = 0.1 dB

Maximum value of SAR (measured) = 42.2 mW/g

Peak SAR (extrapolated) = 76 W/kg



SAR(1 g) = 31.8 mW/g

SAR(10 g) = 17.7 mW/g





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8. Test Data

8.1 Numerical Data








Table 8-1 shows 1 g SAR test data for the phone.

Table 8-1 – SAR Data for serial number N10CTKXJC, Liq. Temp=22.0C, Amb. Temp=28.0C

| Section | Position | Channel | Antenna Position |  | Measured § | | Re-calculated § | |
|-----------|----------|---------|------------------|---|------------|-------------|-----------------|-------------|
| | | | | | 1 g (mW/g) | Peak (mW/g) | 1 g (mW/g) | Peak (mW/g) |
| Left Head | Touch | 6 | 1 |  | N/A* | 0.011 | N/A* | 0.0091 |
| | | 6 | 2 |  | N/A* | 0.012 | N/A* | 0.0098 |
| | | 6 | 3 |  | 0.010 | | 0.00867 | |
| | | 1 | 3 |  | 0.00888 | | 0.00751 | |
| | | 9 | 3 |  | 0.01 | | 0.00836 | |








*System unable to measure average volume SAR at maxima; see Maximum SAR value for measurement. See also Section 8.2.1 Overview of GSP-1700 RF Topography.

Table 8-1 – Data for serial number N10CTKXJC (continued)

| Section | Position | Channel | Antenna Position | Measured § | | Re-calculated § | | |
|------------|----------|---------|------------------|---|-------------|-----------------|-------------|--------|
| | | | | 1 g (mW/g) | Peak (mW/g) | 1 g (mW/g) | Peak (mW/g) | |
| Left Head | Tilt | 6 | 1 |  | N/A* | 0.011 | N/A* | 0.0093 |
| Left Head | Tilt | 6 | 2 |  | N/A* | 0.00383 | N/A* | 0.0032 |
| Left Head | Tilt | 6 | 3 |  | 0.019 | 0.00159 | | |
| Left Head | Tilt | 1 | 3 |  | 0.016 | 0.0135 | | |
| Left Head | Tilt | 9 | 3 |  | 0.013 | 0.011 | | |
| Right Head | Touch | 6 | 1 |  | 0.011 | 0.00956 | | |
| Right Head | Touch | 6 | 2 |  | 0.015 | 0.0122 | | |





*System unable to measure average volume SAR at maxima; see Maximum SAR value for measurement. See also Section 8.2.1 Overview of GSP-1700 RF Topography.

Table 8-1 – Data for serial number N10CTKXJC (continued), Liq. Temp=21.9C, Amb. Temp=28.5C

| Section | Position | Channel | Antenna Position |  | Measured § | | Re-calculated § | |
|------------|----------|---------|------------------|---|------------|-------------|-----------------|-------------|
| | | | | | 1 g (mW/g) | Peak (mW/g) | 1 g (mW/g) | Peak (mW/g) |
| Right Head | Touch | 6 | 3 |  | N/A* | 0.013 | N/A* | 0.011 |
| Right Head | Touch | 1 | 2 |  | 0.00741 | | 0.00603 | |
| Right Head | Touch | 9 | 2 |  | 0.018 | | 0.0145 | |
| Right Head | Tilt | 6 | 1 |  | 0.0075 | | 0.00623 | |
| Right Head | Tilt | 6 | 2 |  | 0.018 | | 0.015 | |
| Right Head | Tilt | 6 | 3 |  | N/A* | | N/A* | 0.012 |
| Right Head | Tilt | 1 | 2 |  | 0.017 | | 0.0106 | |

*System unable to measure average volume SAR at maxima; see Maximum SAR value for measurement. See also Section 8.2.1 Overview of GSP-1700 RF Topography.

Table 8-1 – Data for serial number N10CTKXJC (continued), Liq. Temp=22C, Amb. Temp=29C

| Section | Position | Channel | Antenna Position | Measured 1 g SAR using numerical approximations of probe parameters § | Recalculated 1 g SAR using calibrated probe parameters § | Maximum SAR (mW/g) |
|------------|-----------------------------|---------|--|---|--|--------------------|
| Right Head | Tilt | 9 | 2  | 0.02 | 0.0162 | |
| Flat | 15 mm separation, face down | 1 | closed  | 0.564 | 0.437 | |
| Flat | 15 mm separation, face down | 6 | closed  | 0.542 | 0.420 | |
| Flat | 15 mm separation, face down | 9 | closed  | 0.496 | 0.384 | |

8.2 Plots

8.2.1 Overview of GSP-1700 RF Topography

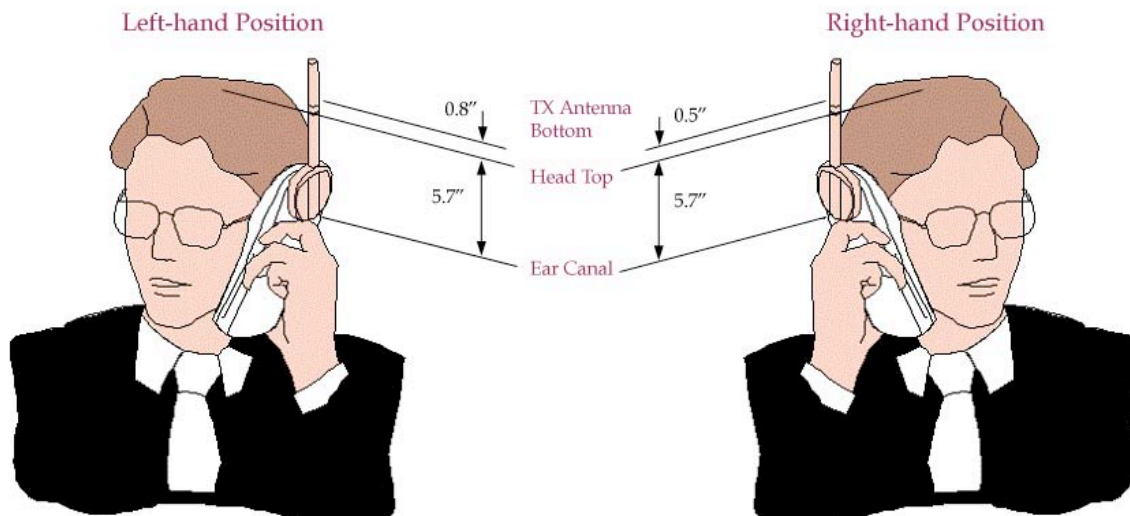
The transmitter antenna used in the GSP-1700 is a resonant quadrifilar helix with a cardioid-shaped radiation pattern and very low back-lobes. The Globalstar quadrifilar helix antenna is designed to have more than 75% of its energy radiated in the upper hemisphere in the normal operating positions. In addition the antenna is fed by a shielded coaxial cable as a balanced structure, hence reducing any unbalanced and induced currents on the phone body.

Also because of the physical design of the phone, in the normal operating position the transmitter antenna aperture is separated by 0.8" from the user's head in the left-hand position and 0.5" in the right-hand position, as shown in Figure 8-1.

Because of this antenna design and physical design, the phone directs very little energy toward the phantom in the head positions (see Figures 6-3, 6-4, 6-5, 6-8, 6-9 and 6-10 showing the phone against the phantom head in the 3 antenna positions). Because of this, the DASY4 system would occasionally locate hot spots on the far edges of the area scan, high up on the steep region of the phantom head where it could not make measurements, which resulted in incomplete cubes. The maxima that the system located can be seen as green dots in the applicable plots in this Section. For these scans, **maximum SAR** is recorded instead of average volume SAR. It is notable that even maximum measured SAR is far below the limits for average volume SAR.

The following pages show plots of the GSP-1700 SAR scans along with other pertinent information supplied by the SEMCAD SAR post-processing software.

Figure 8-1 Dimensional relationships of GSP-1700 with respect to head



8.2.2 Left Head

Date/Time: 07/11/06 10:09:38

Test Laboratory: QUALCOMM Incorporated

20060711 snKXJC -LH

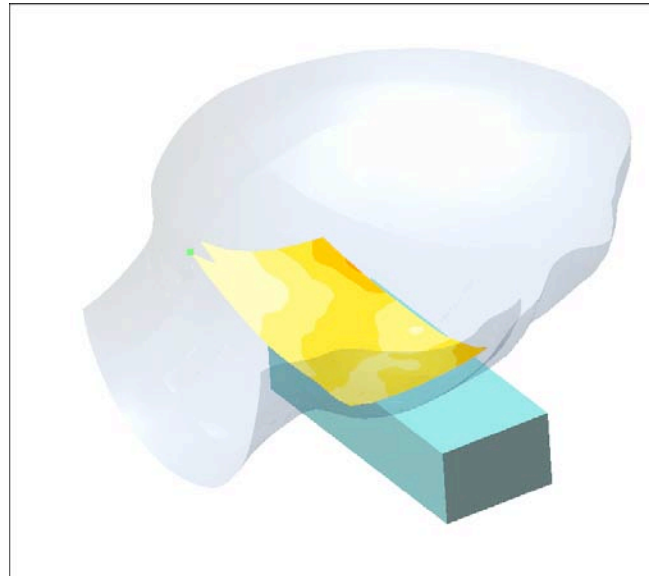
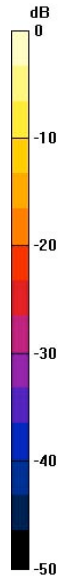
DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1
 Medium: HSL1640 Medium parameters used (interpolated): $f = 1616.88 \text{ MHz}$; $\rho = 1.3 \text{ mho/m}$; $\rho_r = 39.1$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19;
- Postprocessing SW: SEMCAD, V1.8 Build 109

Touch position - Middle - Ant Position 1/Area Scan (61x111x1): Measurement grid: dx=12mm, dy=12mm
 Reference Value = 1.17 V/m; Power Drift = -0.4 dB



Maximum value of SAR (interpolated) = 0.0091 mW/g

Date/Time: 07/11/06 10:09:38

Test Laboratory: QUALCOMM Incorporated

20060711 snKXJC -LH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

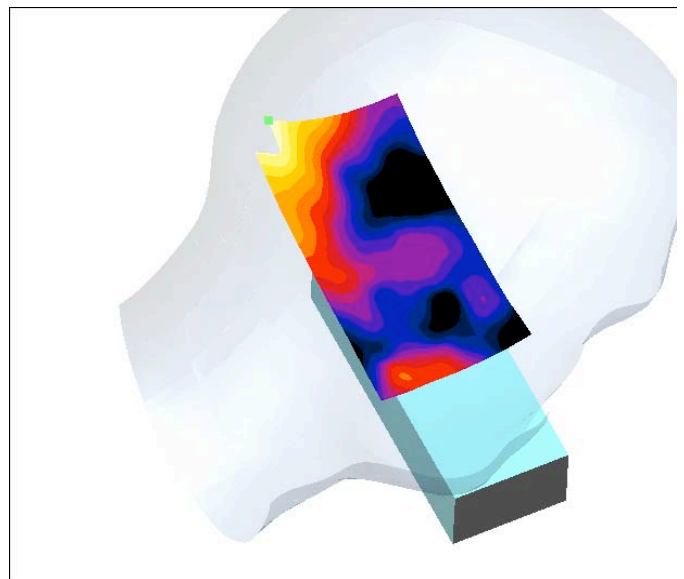
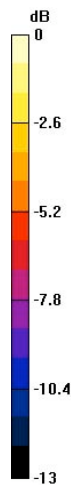
Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1
 Medium: HSL1640 Medium parameters used (interpolated): $f = 1616.88 \text{ MHz}$; $\rho = 1.3 \text{ mho/m}$; $\rho_r = 39.1$; $\rho = 1000 \text{ kg/m}^3$
 Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM;

Measurement SW: DASY4, V4.6 Build 19;

Touch position - Middle - Ant Position 2/Area Scan (61x111x1): Measurement grid: dx=12mm, dy=12mm
 Reference Value = 1.1 V/m; Power Drift = 0.3 dB



Maximum value of SAR (interpolated) = 0.0098 mW/g

Date/Time: 07/11/06 10:09:38

Test Laboratory: QUALCOMM Incorporated

20060711 snKXJC -LH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

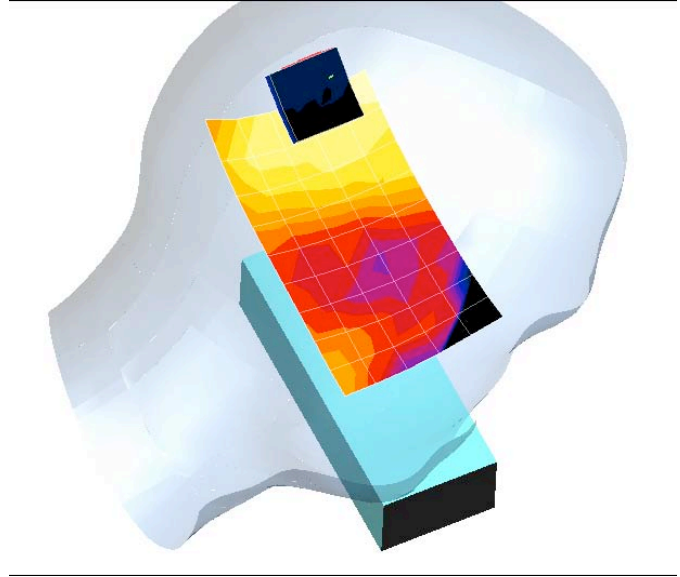
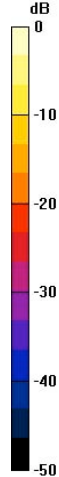
Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1
 Medium: HSL1640 Medium parameters used (interpolated): f = 1616.88 MHz; $\rho = 1.3$ mho/m; $\sigma = 39.1$; $\mu = 1000$ kg/m³
 Medium parameters used: $\rho = 1.29512$; mho/m, $\sigma = 39.1113$; $\mu = 1$ kg/m³
 Phantom section: Left Section

DASY4 Configuration:

Probe: ET3DV6 - SN1733; ConvF(5.62, 5.62, 5.62);
 Calibrated: 9/14/2006
 Sensor-Surface: 4mm (Mechanical Surface Detection)
 Electronics: DAE3 Sn566; Calibrated: 4/20/2006
 Phantom: SAM with CRP; Type: SAM;
 Measurement SW: DASY4, V4.6 Build 19;

Touch position - Middle - Ant Position 3/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 1.08 V/m; Power Drift = 0.6 dB
 Maximum value of SAR (measured) = 0.00988 mW/g
 Peak SAR (extrapolated) = 0.012 W/kg

Touch position - Middle - Ant Position 3/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
 Reference Value = 1.08 V/m; Power Drift = 0.6 dB



SAR(1 g) = 0.00867 mW/g

SAR(10 g) = 0.00613 mW/g

Date/Time: 07/11/06 10:09:38

Test Laboratory: QUALCOMM Incorporated

20060711 snKXJC -LH

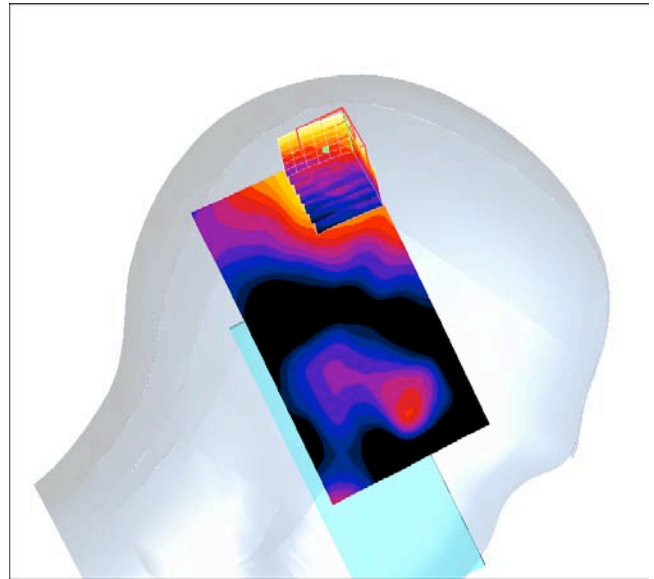
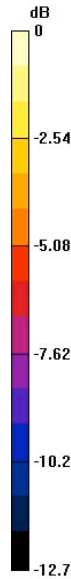
DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1610.73 MHz; Duty Cycle: 1:1
 Medium: HSL1640 Medium parameters used: f = 1610.73 MHz; $\rho = 1.29$ mho/m; $\sigma = 39.1$; $\mu = 1000$ kg/m³
 Phantom section: Left Section

DASY4 Configuration:
 - Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16);
 Calibrated: 10/24/2005
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE3 Sn566; Calibrated: 4/20/2006
 - Phantom: SAM with CRP; Type: SAM; Serial: 209
 - Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Touch position - Low - Ant Position worst case/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
 Reference Value = 1.01 V/m; Power Drift = 0.2 dB
 Maximum value of SAR (interpolated) = 0.00776 mW/g

Touch position - Low - Ant Position worst case/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 1.01 V/m; Power Drift = 0.2 dB
 Maximum value of SAR (measured) = 0.010 mW/g
 Peak SAR (extrapolated) = 0.015 W/kg



SAR(1 g) = 0.00888 mW/g

SAR(10 g) = 0.00595 mW/g

Date/Time: 07/11/06 10:09:38

Test Laboratory: QUALCOMM Incorporated

20060711 snKXJC -LH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1620.57 MHz; Duty Cycle: 1:1
 Medium: HSL1640 Medium parameters used: $f = 1620.57$ MHz; $\rho = 1.3$ mho/m; $\sigma = 39.1$; $\mu = 1000$ kg/m³
 Medium parameters used: $\rho = 1.29854$; mho/m, $\sigma = 39.0828$; $\mu = 1$ kg/m³

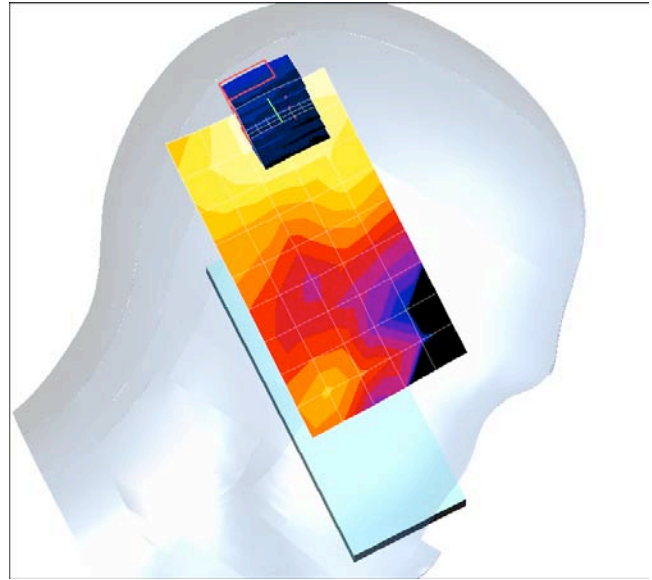
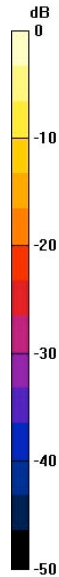
Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Touch position - High - Ant Position worst case/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 1.06 V/m; Power Drift = 2 dB
 Maximum value of SAR (measured) = 0.011 mW/g
 Peak SAR (extrapolated) = 0.019 W/kg

Touch position - High - Ant Position worst case/Area Scan (6x10x1): Measurement grid: dx=15mm, dy=15mm
 Reference Value = 1.06 V/m; Power Drift = 2 dB



SAR(1 g) = 0.010 mW/g

SAR(10 g) = 0.00674 mW/g

Date/Time: 07/11/06 10:09:38

Test Laboratory: QUALCOMM Incorporated

20060711 snKXJC -LH

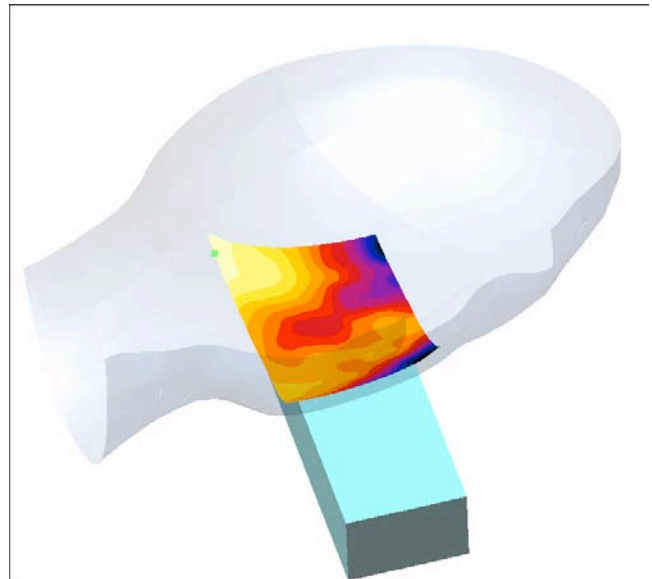
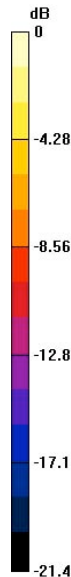
DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1
 Medium: HSL1640 Medium parameters used (interpolated): $f = 1616.88$ MHz; $\rho = 1.3$ mho/m; $\sigma = 39.1$; $\mu = 1000$ kg/m³
 Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - Middle - Ant Position 1/Area Scan (61x111x1): Measurement grid: dx=12mm, dy=12mm
 Reference Value = 0.893 V/m; Power Drift = 0.3 dB



Maximum value of SAR (interpolated) = 0.011 mW/g

Date/Time: 07/11/06 10:09:38

Test Laboratory: QUALCOMM Incorporated

20060711 snKXJC -LH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1

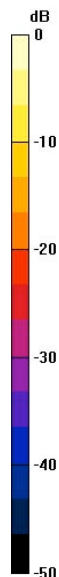
Medium: HSL1640 Medium parameters used (interpolated): $f = 1616.88$ MHz; $\rho = 1.3$ mho/m; $\rho_r = 39.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19;
- Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - Middle - Ant Position 2/Area Scan 2 (51x111x1): Measurement grid: dx=12mm, dy=12mm
Reference Value = 0.888 V/m; Power Drift = 0.6 dB



Maximum value of SAR (interpolated) = 0.00383 mW/g

Date/Time: 07/11/06 10:09:38

Test Laboratory: QUALCOMM Incorporated

20060711 snKXJC -LH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1

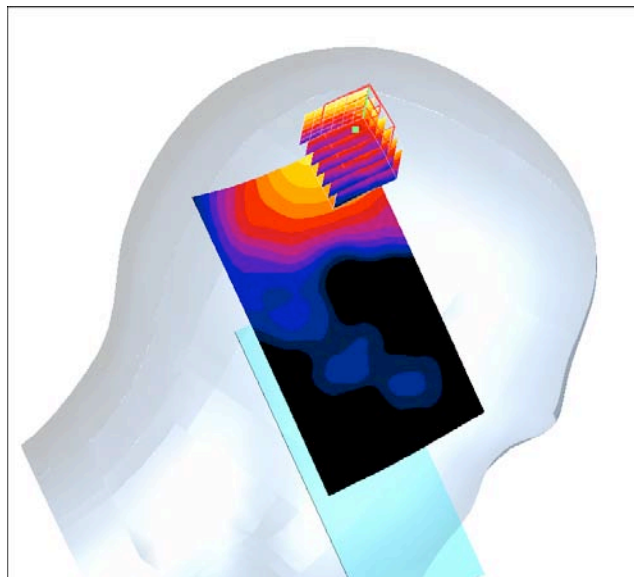
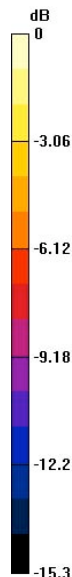
Medium: HSL1640 Medium parameters used (interpolated): $f = 1616.88$ MHz; $\rho = 1.3$ mho/m; $\rho_r = 39.1$; $\rho = 1000$ kg/m³

Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19;
- Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - Middle - Ant Position 3/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 0.838 V/m; Power Drift = 1 dB
Maximum value of SAR (interpolated) = 0.015 mW/g



SAR(1 g) = 0.019 mW/g

SAR(10 g) = 0.012 mW/g

Tilt position - Middle - Ant Position 3/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 0.838 V/m; Power Drift = 1 dB
Maximum value of SAR (measured) = 0.023 mW/g
Peak SAR (extrapolated) = 0.036 W/kg

Date/Time: 07/11/06 10:09:38

Test Laboratory: QUALCOMM Incorporated

20060711 snKXJC -LH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

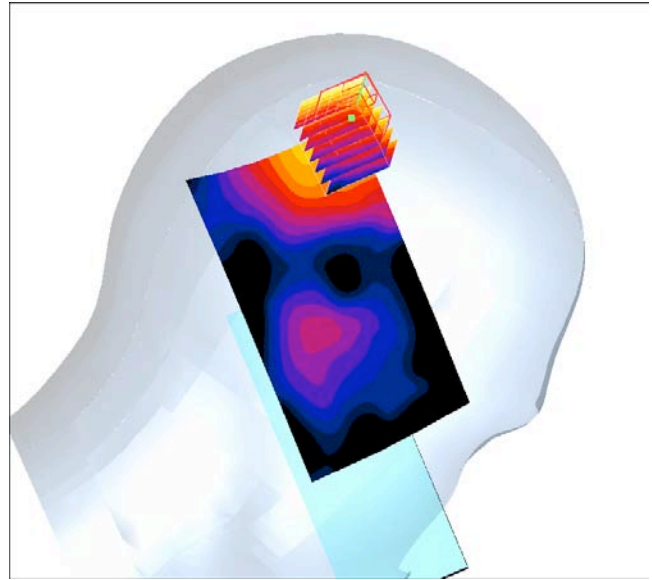
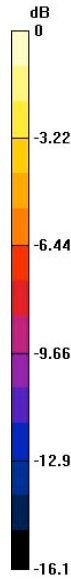
Communication System: Globalstar; Frequency: 1610.73 MHz; Duty Cycle: 1:1
 Medium: HSL1640 Medium parameters used: $f = 1610.73$ MHz; $\rho = 1.29$ mho/m; $\mu = 39.1$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - Low - Ant Position worst case/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
 Reference Value = 1.2 V/m; Power Drift = -0.4 dB
 Maximum value of SAR (interpolated) = 0.013 mW/g

Tilt position - Low - Ant Position worst case/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 1.2 V/m; Power Drift = -0.4 dB
 Maximum value of SAR (measured) = 0.019 mW/g
 Peak SAR (extrapolated) = 0.027 W/kg



SAR(1 g) = 0.016 mW/g

SAR(10 g) = 0.00987 mW/g

Date/Time: 07/11/06 10:09:38

Test Laboratory: QUALCOMM Incorporated

20060711 snKXJC -LH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

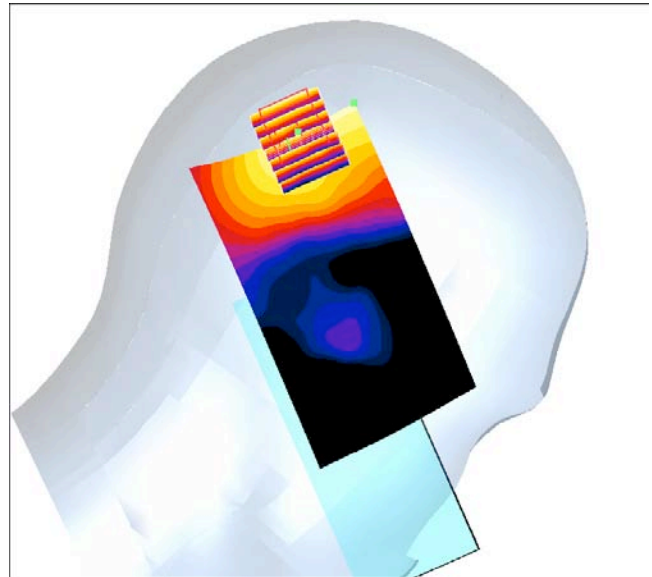
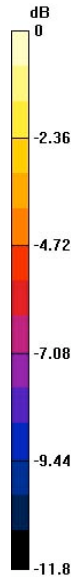
Communication System: Globalstar; Frequency: 1620.57 MHz; Duty Cycle: 1:1
 Medium: HSL1640 Medium parameters used: $f = 1620.57$ MHz; $\rho = 1.3$ mho/m; $\mu = 39.1$; $\rho = 1000$ kg/m³
 Phantom section: Left Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - High - Ant Position worst case/Area Scan (51x91x1): Measurement grid: dx=15mm, dy=15mm
 Reference Value = 1.03 V/m; Power Drift = 0.4 dB
 Maximum value of SAR (interpolated) = 0.014 mW/g

Tilt position - High - Ant Position worst case/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 1.03 V/m; Power Drift = 0.4 dB
 Maximum value of SAR (measured) = 0.014 mW/g
 Peak SAR (extrapolated) = 0.023 W/kg



SAR(1 g) = 0.013 mW/g

SAR(10 g) = 0.00909 mW/g

8.2.3 Right Head

Date/Time: 07/12/06 09:58:58

Test Laboratory: QUALCOMM Incorporated

20060712 snKXJC -RH

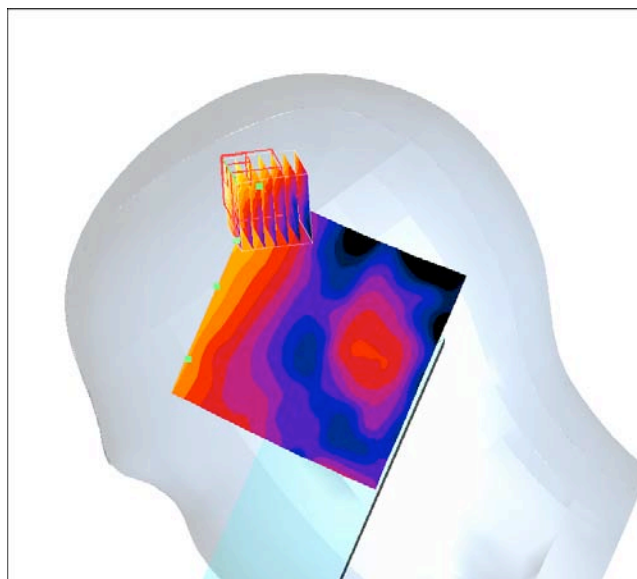
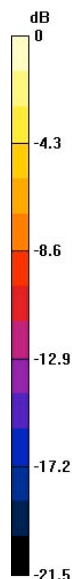
DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1
 Medium: HSL1640 Medium parameters used (interpolated): f = 1616.88 MHz; $\sigma = 1.3$ mho/m; $\rho_r = 39.1$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY4 Configuration:
 - Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE3 Sn566; Calibrated: 4/20/2006
 - Phantom: SAM with CRP; Type: SAM; Serial: 209
 - Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Touch position - Middle - Ant Position 1/Area Scan (81x81x1): Measurement grid: dx=12mm, dy=12mm
 Reference Value = 0.815 V/m; Power Drift = 2 dB
 Maximum value of SAR (interpolated) = 0.0055 mW/g

Touch position - Middle - Ant Position 1/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 0.815 V/m; Power Drift = 2 dB
 Maximum value of SAR (measured) = 0.018 mW/g
 Peak SAR (extrapolated) = 0.025 W/kg



SAR(1 g) = 0.011 mW/g

SAR(10 g) = 0.00552 mW/g

Date/Time: 07/12/06 09:58:58

Test Laboratory: QUALCOMM Incorporated

20060712 snKXJC -RH

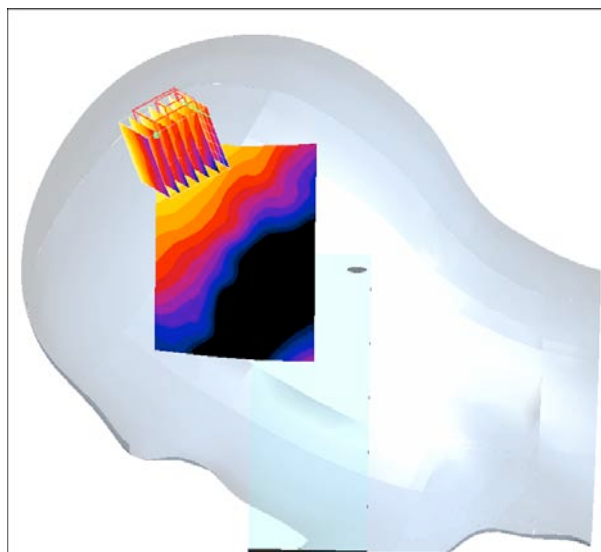
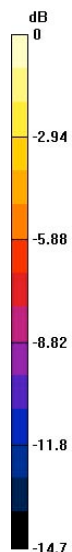
DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1
 Medium: HSL1640 Medium parameters used (interpolated): f = 1616.88 MHz; $\sigma = 1.3$ mho/m; $\rho_r = 39.1$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY4 Configuration:
 - Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE3 Sn566; Calibrated: 4/20/2006
 - Phantom: SAM with CRP; Type: SAM; Serial: 209
 - Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Touch position - Middle - Ant Position 2/Area Scan (61x81x1): Measurement grid: dx=12mm, dy=12mm
 Reference Value = 0.649 V/m; Power Drift = -3 dB
 Maximum value of SAR (interpolated) = 0.015 mW/g

Touch position - Middle - Ant Position 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 0.649 V/m; Power Drift = -3 dB
 Maximum value of SAR (measured) = 0.016 mW/g
 Peak SAR (extrapolated) = 0.027 W/kg



SAR(1 g) = 0.015 mW/g

SAR(10 g) = 0.010 mW/g

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Test Laboratory: QUALCOMM Incorporated

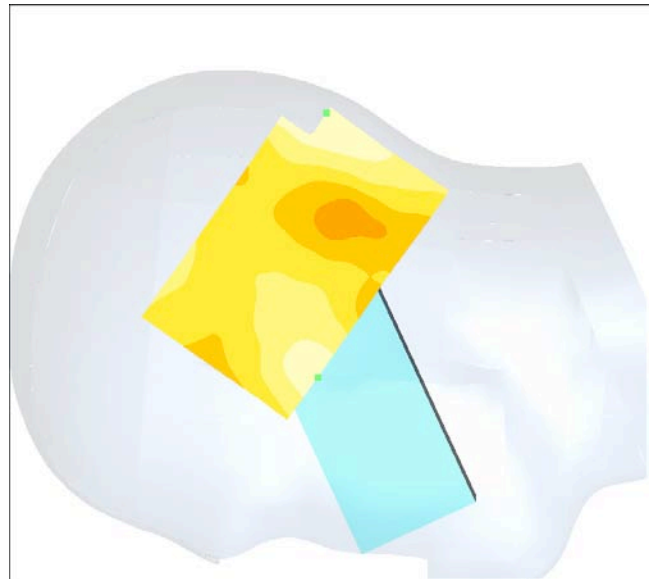
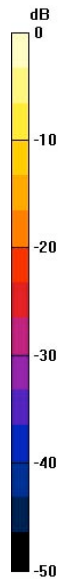
20060712 snKXJC -RH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1
Medium: HSL1640 Medium parameters used (interpolated): $f = 1616.88$ MHz; $\rho = 1.3$ mho/m; $\rho_r = 39.1$; $\rho = 1000$ kg/m³
Phantom section: Right Section

DASY4 Configuration:
 - Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE3 Sn566; Calibrated: 4/20/2006
 - Phantom: SAM with CRP; Type: SAM; Serial: 209
 - Measurement SW: DASY4, V4.6 Build 19;
 Postprocessing SW: SEMCAD, V1.8 Build 109

Touch position - Middle - Ant Position 3/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
 Reference Value = 1.67 V/m; Power Drift = -0.5 dB



Maximum value of SAR (interpolated) = 0.013 mW/g

Date/Time: 07/12/06 09:58:58

Test Laboratory: QUALCOMM Incorporated

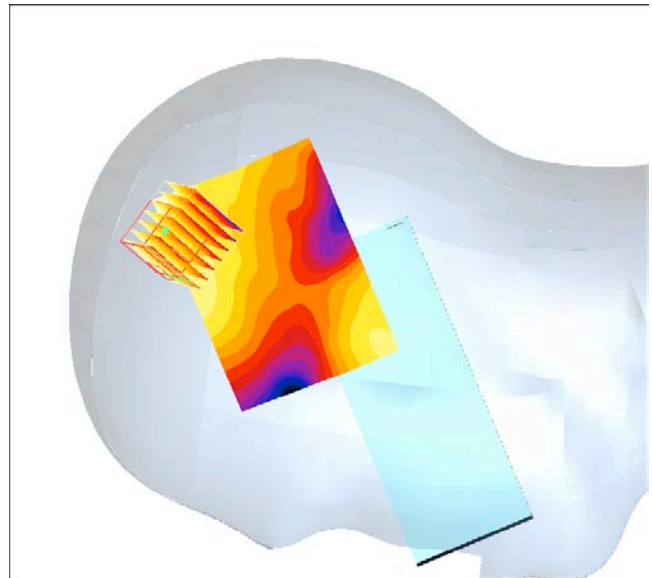
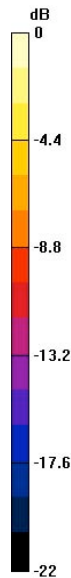
20060712 snKXJC -RH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1610.73 MHz; Duty Cycle: 1:1
Medium: HSL1640 Medium parameters used: $f = 1610.73$ MHz; $\rho = 1.29$ mho/m; $\rho_r = 39.1$; $\rho = 1000$ kg/m³
Phantom section: Right Section

DASY4 Configuration:
 - Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
 - Sensor-Surface: 4mm (Mechanical Surface Detection)
 - Electronics: DAE3 Sn566; Calibrated: 4/20/2006
 - Phantom: SAM with CRP; Type: SAM; Serial: 209
 - Measurement SW: DASY4, V4.6 Build 19;
 Postprocessing SW: SEMCAD, V1.8 Build 109

Touch position - Low - Ant Position worst case - pos2/Area Scan (61x81x1): Measurement grid: dx=12mm, dy=12mm
 Reference Value = 1.62 V/m; Power Drift = -0.4 dB
 Maximum value of SAR (interpolated) = 0.00742 mW/g



SAR(1 g) = 0.00741 mW/g

SAR(10 g) = 0.00485 mW/g

Touch position - Low - Ant Position worst case - pos2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 1.62 V/m; Power Drift = -0.4 dB
 Maximum value of SAR (measured) = 0.00828 mW/g
 Peak SAR (extrapolated) = 0.013 W/kg

Date/Time: 07/12/06 09:58:58

Test Laboratory: QUALCOMM Incorporated

20060712 snKXJC -RH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1620.57 MHz; Duty Cycle: 1:1
 Medium: HSL1640 Medium parameters used: f = 1620.57 MHz; $\sigma = 1.3$ mho/m; $\rho = 39.1$; $\rho = 1000$ kg/m³
 Medium parameters used: $\sigma = 1.29854$; mho/m, $\rho = 39.0828$; $\rho = 1$ kg/m³

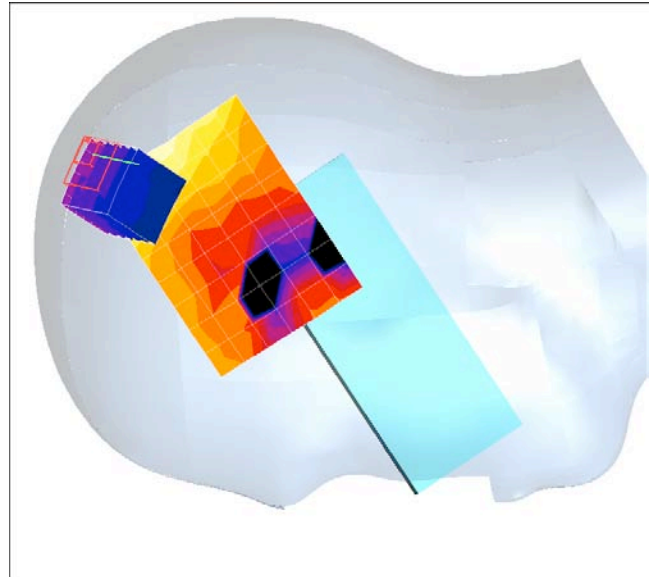
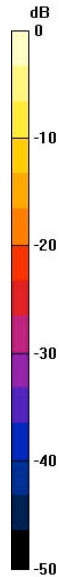
Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Touch position - High - Ant Position worst case - pos2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 0.297 V/m; Power Drift = 2 dB
 Maximum value of SAR (measured) = 0.019 mW/g
 Peak SAR (extrapolated) = 0.031 W/kg

Touch position - High - Ant Position worst case - pos2/Area Scan (7x9x1): Measurement grid: dx=12mm, dy=12mm
 Reference Value = 0.297 V/m; Power Drift = 2 dB



SAR(1 g) = 0.018 mW/g

SAR(10 g) = 0.012 mW/g

Date/Time: 07/12/06 09:58:58

Test Laboratory: QUALCOMM Incorporated

20060712 snKXJC -RH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

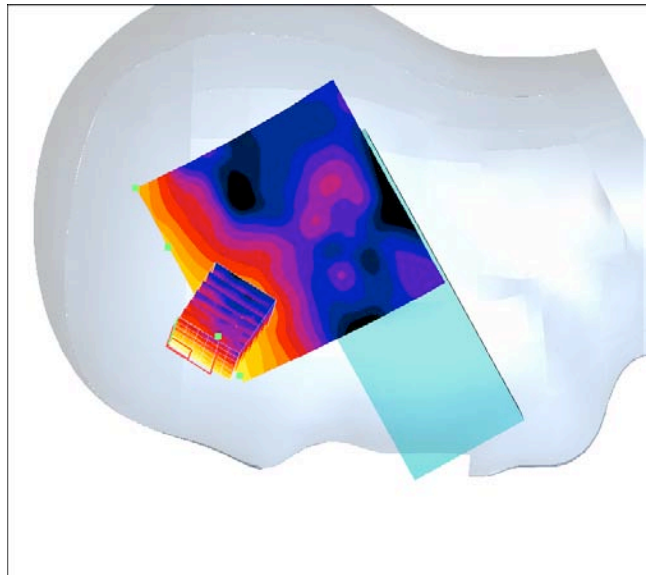
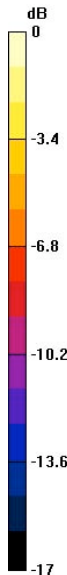
Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1
 Medium: HSL1640 Medium parameters used (interpolated): f = 1616.88 MHz; $\sigma = 1.3$ mho/m; $\rho = 39.1$; $\rho = 1000$ kg/m³
 Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - Middle - Ant Position 1/Area Scan (81x81x1): Measurement grid: dx=12mm, dy=12mm
 Reference Value = 0.884 V/m; Power Drift = -0.9 dB
 Maximum value of SAR (interpolated) = 0.00533 mW/g

Tilt position - Middle - Ant Position 1/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 0.884 V/m; Power Drift = -0.9 dB
 Maximum value of SAR (measured) = 0.00933 mW/g
 Peak SAR (extrapolated) = 0.013 W/kg



SAR(1 g) = 0.0075 mW/g

SAR(10 g) = 0.00426 mW/g

Date/Time: 07/12/06 09:58:58

Test Laboratory: QUALCOMM Incorporated

20060712 snKXJC -RH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1
Medium: HSL1640 Medium parameters used (interpolated): $f = 1616.88$ MHz; $\rho = 1.3$ mho/m; $\rho_r = 39.1$; $\rho = 1000$ kg/m³
Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19;
- Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - Middle - Ant Position 2/Area Scan (61x81x1): Measurement grid: dx=12mm, dy=12mm
 Reference Value = 1.96 V/m; Power Drift = -0.4 dB
 Maximum value of SAR (interpolated) = 0.016 mW/g

Tilt position - Middle - Ant Position 2/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
 Reference Value = 1.96 V/m; Power Drift = -0.4 dB
 Maximum value of SAR (measured) = 0.021 mW/g
 Peak SAR (extrapolated) = 0.031 W/kg

Date/Time: 07/12/06 09:58:58

Test Laboratory: QUALCOMM Incorporated

20060712 snKXJC -RH

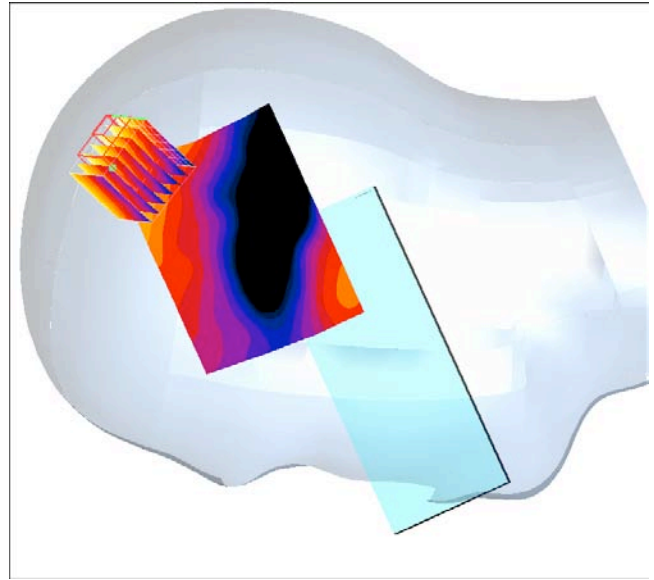
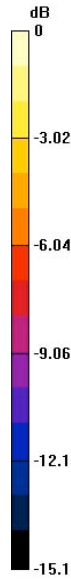
DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1
Medium: HSL1640 Medium parameters used (interpolated): $f = 1616.88$ MHz; $\rho = 1.3$ mho/m; $\rho_r = 39.1$; $\rho = 1000$ kg/m³
Phantom section: Right Section

DASY4 Configuration:

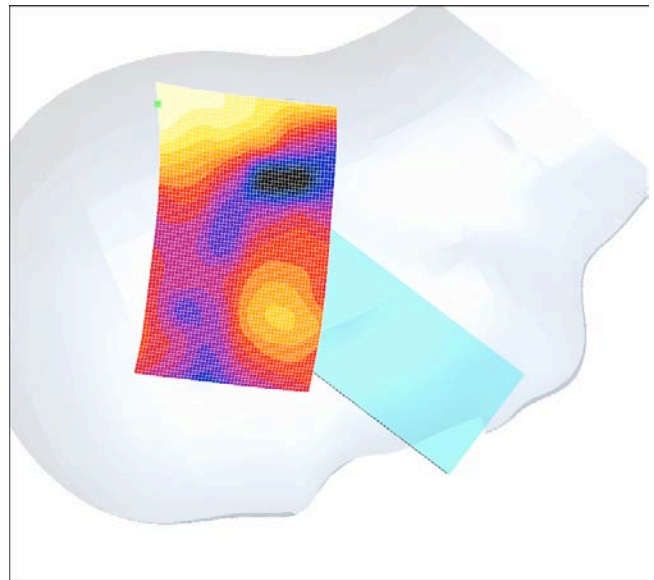
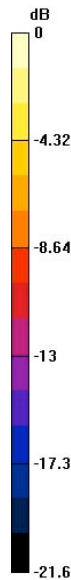
- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19;
- Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - Middle - Ant Position 3/Area Scan (51x81x1): Measurement grid: dx=15mm, dy=15mm
 Reference Value = 1.16 V/m; Power Drift = 0.5 dB



SAR(1 g) = 0.018 mW/g

SAR(10 g) = 0.012 mW/g



Maximum value of SAR (interpolated) = 0.014 mW/g

Date/Time: 07/12/06 09:58:58

Test Laboratory: QUALCOMM Incorporated

20060712 snKXJC -RH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1610.73 MHz; Duty Cycle: 1:1

Medium: HSL1640 Medium parameters used: $f = 1610.73$ MHz; $\rho = 1.29$ mho/m; $\sigma = 39.1$; $\epsilon = 1000$ kg/m³

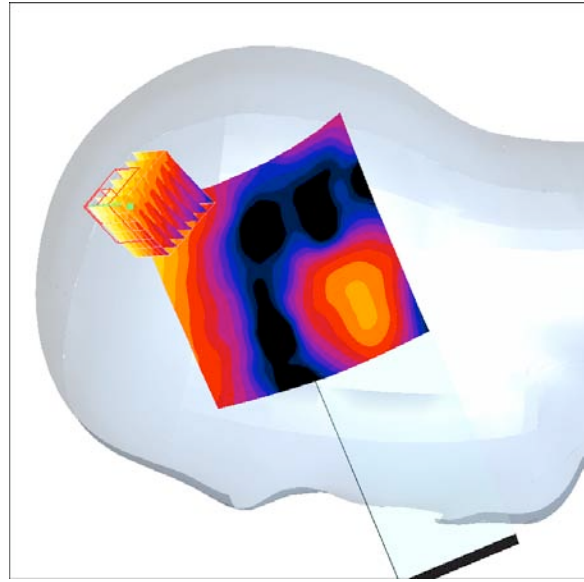
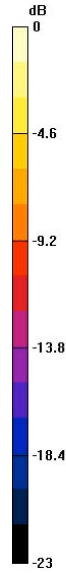
Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - Low - Ant Position worst case/Area Scan (81x81x1): Measurement grid: dx=12mm, dy=12mm
Reference Value = 1.94 V/m; Power Drift = -0.7 dB
Maximum value of SAR (interpolated) = 0.00898 mW/g

Tilt position - Low - Ant Position worst case/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.94 V/m; Power Drift = -0.7 dB
Maximum value of SAR (measured) = 0.021 mW/g
Peak SAR (extrapolated) = 0.031 W/kg



SAR(1 g) = 0.017 mW/g

SAR(10 g) = 0.00946 mW/g

Date/Time: 07/12/06 09:58:58

Test Laboratory: QUALCOMM Incorporated

20060712 snKXJC -RH

DUT: GSP-1700 (10-C6241-1 Rev. A); Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1620.57 MHz; Duty Cycle: 1:1

Medium: HSL1640 Medium parameters used: $f = 1620.57$ MHz; $\rho = 1.3$ mho/m; $\sigma = 39.1$; $\epsilon = 1000$ kg/m³

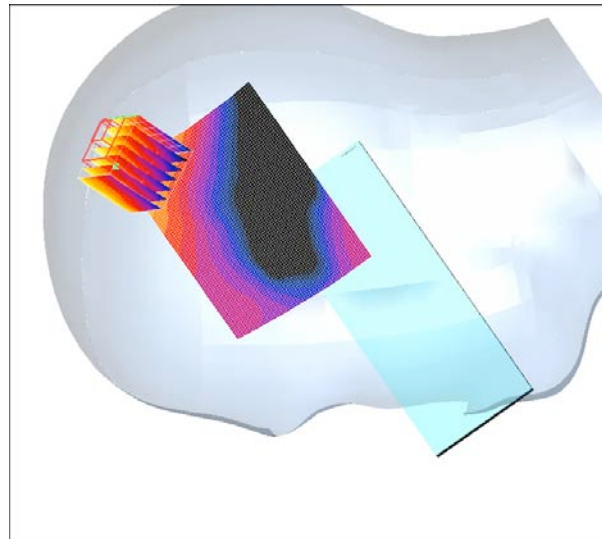
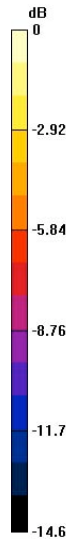
Phantom section: Right Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(5.16, 5.16, 5.16); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Tilt position - High - Ant Position worst case/Area Scan (61x81x1): Measurement grid: dx=12mm, dy=12mm
Reference Value = 1.38 V/m; Power Drift = 0.7 dB
Maximum value of SAR (interpolated) = 0.018 mW/g

Tilt position - High - Ant Position worst case/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.38 V/m; Power Drift = 0.7 dB
Maximum value of SAR (measured) = 0.022 mW/g
Peak SAR (extrapolated) = 0.036 W/kg



SAR(1 g) = 0.020 mW/g

SAR(10 g) = 0.013 mW/g

8.2.4 Flat (Body)

Date/Time: 07/14/06 14:10:55

Test Laboratory: QUALCOMM Incorporated

20060714 snKXJC -flat

DUT: GSP-1700; Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1610.73 MHz; Duty Cycle: 1:1

Medium: MSL1640 Medium parameters used: $f = 1610.73$ MHz; $\rho = 1.35$ mho/m; $\mu_r = 53.1$; $\rho = 1000$ kg/m³

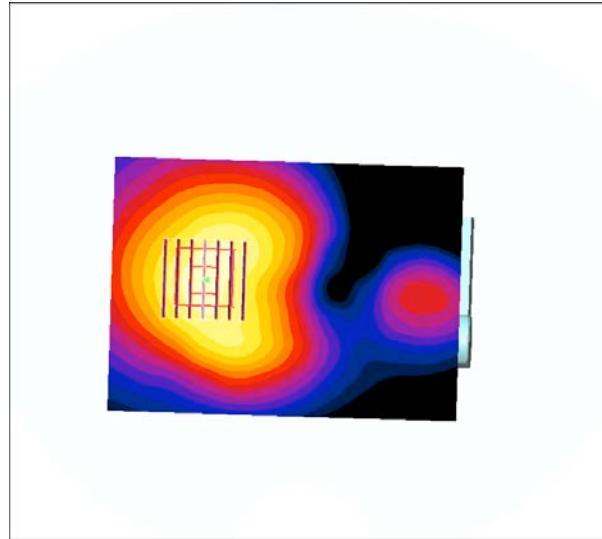
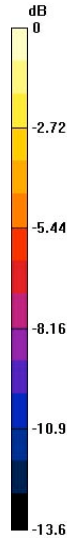
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(4.77, 4.77, 4.77); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Flat - Low - Antenna closed - face down - d=15mm/Area Scan (81x111x1): Measurement grid: dx=12mm, dy=12mm
Reference Value = 7.72 V/m; Power Drift = 0.5 dB
Maximum value of SAR (interpolated) = 0.573 mW/g

Flat - Low - Antenna closed - face down - d=15mm/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.72 V/m; Power Drift = 0.5 dB
Maximum value of SAR (measured) = 0.607 mW/g
Peak SAR (extrapolated) = 1.09 W/kg



SAR(1 g) = 0.564 mW/g

SAR(10 g) = 0.345 mW/g

This measurement represents the worst case result.

Date/Time: 07/14/06 14:10:55

Test Laboratory: QUALCOMM Incorporated

20060714 snKXJC -flat

DUT: GSP-1700; Type: Phone; Serial: N10CTKXJC

Communication System: Globalstar; Frequency: 1616.88 MHz; Duty Cycle: 1:1

Medium: MSL1640 Medium parameters used (interpolated): $f = 1616.88$ MHz; $\rho = 1.37$ mho/m; $\mu_r = 53.1$; $\rho = 1000$ kg/m³

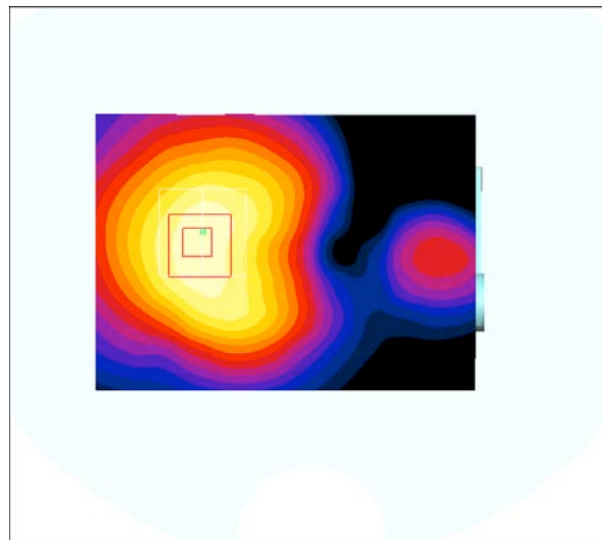
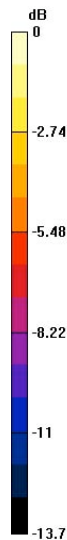
Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(4.77, 4.77, 4.77); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109

Flat - Middle - Antenna closed - face down - d=15mm/Area Scan (81x111x1): Measurement grid: dx=12mm, dy=12mm
Reference Value = 7.86 V/m; Power Drift = 0.2 dB
Maximum value of SAR (interpolated) = 0.553 mW/g

Flat - Middle - Antenna closed - face down - d=15mm/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.86 V/m; Power Drift = 0.2 dB
Maximum value of SAR (measured) = 0.575 mW/g
Peak SAR (extrapolated) = 1.05 W/kg



SAR(1 g) = 0.543 mW/g

SAR(10 g) = 0.328 mW/g

Date/Time: 07/14/06 14:10:55

Test Laboratory: QUALCOMM Incorporated

20060714 snKXJC -flat

DUT: GSP-1700; **Type:** Phone; **Serial:** N10CTKXJC

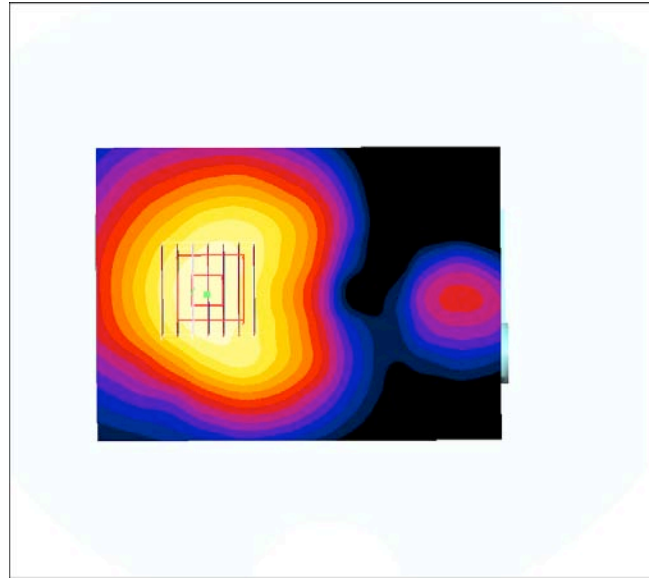
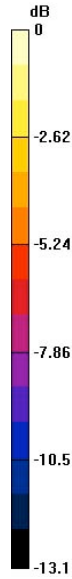
Communication System: Globalstar; Frequency: 1620.57 MHz; Duty Cycle: 1:1

Medium: MSL1640 Medium parameters used (interpolated): $f = 1620.57 \text{ MHz}$; $\rho = 1.37 \text{ mho/m}$; $\mu_r = 53$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

DASY4 Configuration:

- Probe: ET3DV6 - SN1733; ConvF(4.77, 4.77, 4.77); Calibrated: 10/24/2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn566; Calibrated: 4/20/2006
- Phantom: SAM with CRP; Type: SAM; Serial: 209
- Measurement SW: DASY4, V4.6 Build 19; Postprocessing SW: SEMCAD, V1.8 Build 109



Flat - High - Antenna closed - face down - d=15mm/Area Scan (81x111x1): Measurement grid: dx=12mm, dy=12mm
Reference Value = 7.64 V/m; Power Drift = 0.2 dB
Maximum value of SAR (interpolated) = 0.519 mW/g

SAR(1 g) = 0.495 mW/g

Flat - High - Antenna closed - face down - d=15mm/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 7.64 V/m; Power Drift = 0.2 dB
Maximum value of SAR (measured) = 0.515 mW/g
Peak SAR (extrapolated) = 0.969 W/kg

SAR(10 g) = 0.305 mW/g

8.2.5 Z-axis plot

Figure 8-2 shows a Z-axis plot extracted from the Zoom cube for the highest measured SAR (flat section, Channel 1, DUT face down with 15 mm separation from phantom).

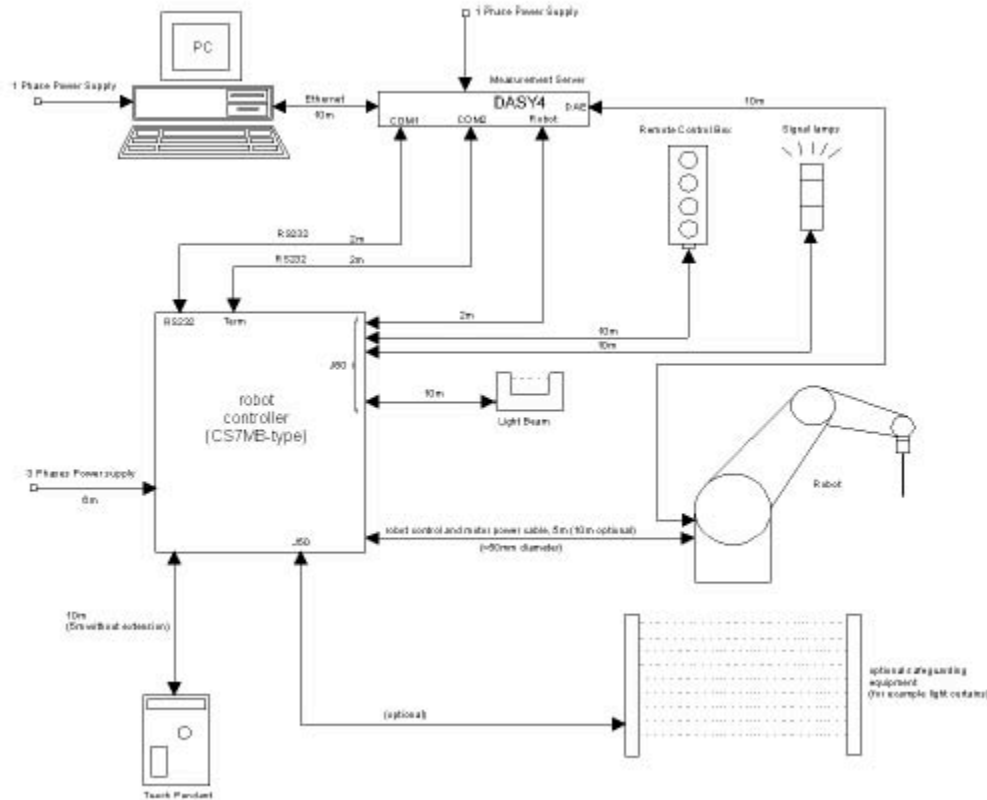
Figure 8-2 Z-axis plot from flat section, Channel 1



9. System Specifications and Calibration

Figure 9-1 shows a diagram of the Schmid & Partner DASY4 system.

**Figure 9-1 Diagram of DASY4 System,
from S&P Applications Notes System Description and Setup**



Data Acquisition

| | |
|-------------------|---|
| Processor | Intel Pentium 4, 2.40 GHz |
| Operating System | MS Windows XP |
| Software | DASY4 V4.6 Build 19, Schmid & Partners Eng. AG, Switzerland SEMCAD V1.8 Build 109 |
| Surface Detection | Optical and Mechanical |

E-Field Probe

| | |
|-----------------------------|----------------------------|
| Offset tip to sensor center | 2.7 mm |
| Offset surface to probe tip | 1.8 ± 0.2 |
| Frequency | 30 MHz to 3.0 GHz |
| Dynamic Range | 5µW/g to 100 mW/g |
| Isotropy | ±0.15 dB (in brain liquid) |

Phantom

| | |
|------------|---|
| Dielectric | EGSM band: Homogeneous sugar/salt/cellulose liquid DCS/IMT bands: Homogeneous water/glycol/salt liquid |
| Shell | 2 mm ± 0.2 mm polyester fiber glass |
| Ear: | Integral model per SAM phantom specification |

Calibration

| Equipment Mfr & Type | Serial number | Last Calibrated | Next Calibration |
|--|---------------|-------------------|-------------------|
| Schmid & Partner Engineering AG Dosimetric E-field Probe, ET3DV5 | 1733 | 24 September 2005 | 24 September 2006 |
| Schmid & Partner Engineering AG dipole validation kit, D1640V2 | 317 | 1 February 2006 | 2 February 2006 |
| Schmid & Partner Engineering AG Data Acquisition Electronics, DAE3 V1 | 566 | 20 April 2006 | 20 April 2007 |
| Gigatronics 8541C RF Power Meter | 1834430 | 10 September 2005 | 10 September 2006 |
| Hewlett-Packard 8714C Vector Network Analyzer | US38171129 | 13 April 2006 | 13 April 2007 |
| Hewlett-Packard 85070M Dielectric Probe System | N/A | N/A | N/A |

10. Calibration Data

The following pages show calibration certification data for the Schmid & Partner AG DASY4 SAR system.

IMPORTANT NOTICE

USAGE OF THE DAE 3

The DAE unit is a delicate, high precision instrument and requires careful treatment by the user. There are no serviceable parts inside the DAE. Special attention shall be given to the following points:

Battery Exchange: The battery cover of the DAE3 unit is connected to a fragile 3-pin battery connector. Customer is responsible to apply utmost caution not to bend or damage the connector when changing batteries.

Shipping of the DAE: Before shipping the DAE to SPEAG for calibration Customer shall remove the batteries and pack the DAE in an antistatic bag. The packaging shall protect the DAE from impacts during transportation. The package shall be marked to indicate that a fragile instrument is inside.

E-Stop Failures: Touch detection may be malfunctioning due to broken magnets in the E-stop. Rough handling of the E-stop may lead to damage of these magnets. Touch and collision errors are often caused by dust and dirt accumulated in the E-stop. To prevent E-stop failure, Customer shall always mount the probe to the DAE carefully and keep the DAE unit in a non-dusty environment if not used for measurements.

Repair: Minor repairs are performed at no extra cost during the annual calibration. However, SPEAG reserves the right to charge for any repair especially if rough unprofessional handling caused the defect.

Important Note:

Warranty and calibration is void if the DAE unit is disassembled partly or fully by the Customer.

Important Note:

Never attempt to grease or oil the E-stop assembly. Cleaning and readjusting of the E-stop assembly is allowed by certified SPEAG personnel only and is part of the annual calibration procedure.



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Multilateral Agreement for the recognition of calibration certificates

Glossary

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

Methods Applied and Interpretation of Parameters

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



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Accreditation No.: **SCS 108**

Client **Qualcomm USA**

Certificate No: **DAE3-566_Apr06**

CALIBRATION CERTIFICATE

Object **DAE3 - SD 000 D03 AA - SN: 566**

Calibration procedure(s) **QA CAL-06.v12
Calibration procedure for the data acquisition electronics (DAE)**

Calibration date: **April 20, 2006**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|-----------------------------------|--------------------|---|-----------------------|
| Fluke Process Calibrator Type 702 | SN: 6295803 | 7-Oct-05 (Sintrel, No.E-050073) | Oct-06 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| Calibrator Box V1.1 | SE UMS 006 AB 1002 | 29-Jun-05 (SPEAG, in house check) | In house check Jun-06 |

| | | | |
|----------------|---------------------------|------------------------|---------------|
| Calibrated by: | Name Daniel Steinacher | Function Technician | Signature |
| Approved by: | Fin Bomholt | R&D Director | |

Issued: April 20, 2006

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DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 μ V, full range = -100...+300 mV

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

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

| Calibration Factors | X | Y | Z |
|---------------------|--------------------------|--------------------------|--------------------------|
| High Range | 405.047 \pm 0.1% (k=2) | 404.337 \pm 0.1% (k=2) | 405.163 \pm 0.1% (k=2) |
| Low Range | 3.96820 \pm 0.7% (k=2) | 3.95257 \pm 0.7% (k=2) | 3.93952 \pm 0.7% (k=2) |

Connector Angle

| | |
|---|----------------------------------|
| Connector Angle to be used in DASY system | 96 $^{\circ}$ \pm 1 $^{\circ}$ |
|---|----------------------------------|

Appendix

1. DC Voltage Linearity

| High Range | Input (μV) | Reading (μV) | Error (%) |
|-------------------|-------------------------|---------------------------|-----------|
| Channel X + Input | 200000 | 200000.2 | 0.00 |
| Channel X + Input | 20000 | 20004.45 | 0.02 |
| Channel X - Input | 20000 | -19999.36 | 0.00 |
| Channel Y + Input | 200000 | 200000.6 | 0.00 |
| Channel Y + Input | 20000 | 20002.35 | 0.01 |
| Channel Y - Input | 20000 | -19998.86 | -0.01 |
| Channel Z + Input | 200000 | 199999.4 | 0.00 |
| Channel Z + Input | 20000 | 20003.05 | 0.02 |
| Channel Z - Input | 20000 | -20004.05 | 0.02 |

| Low Range | Input (μV) | Reading (μV) | Error (%) |
|-------------------|-------------------------|---------------------------|-----------|
| Channel X + Input | 2000 | 2000.0 | 0.00 |
| Channel X + Input | 200 | 199.81 | -0.09 |
| Channel X - Input | 200 | -200.65 | 0.33 |
| Channel Y + Input | 2000 | 2000.1 | 0.00 |
| Channel Y + Input | 200 | 199.24 | -0.38 |
| Channel Y - Input | 200 | -200.93 | 0.47 |
| Channel Z + Input | 2000 | 1999.9 | 0.00 |
| Channel Z + Input | 200 | 199.51 | -0.25 |
| Channel Z - Input | 200 | -200.94 | 0.47 |

2. Common mode sensitivity

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

| | Common mode Input Voltage (mV) | High Range Average Reading (μV) | Low Range Average Reading (μV) |
|-----------|--------------------------------|--|---|
| Channel X | 200 | 11.63 | 11.14 |
| | - 200 | -9.87 | -11.14 |
| Channel Y | 200 | 8.05 | 7.75 |
| | - 200 | -9.16 | -9.19 |
| Channel Z | 200 | -5.39 | -5.07 |
| | - 200 | 3.15 | 3.08 |

3. Channel separation

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

| | Input Voltage (mV) | Channel X (μV) | Channel Y (μV) | Channel Z (μV) |
|-----------|--------------------|-----------------------------|-----------------------------|-----------------------------|
| Channel X | 200 | - | -0.02 | -0.37 |
| Channel Y | 200 | 1.56 | - | 2.53 |
| Channel Z | 200 | -2.65 | 0.54 | - |

4. AD-Converter Values with inputs shorted

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

| | High Range (LSB) | Low Range (LSB) |
|-----------|------------------|-----------------|
| Channel X | 16250 | 14820 |
| Channel Y | 15703 | 16742 |
| Channel Z | 16128 | 15814 |

5. Input Offset Measurement

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

Input 10M Ω

| | Average (μ V) | min. Offset (μ V) | max. Offset (μ V) | Std. Deviation (μ V) |
|-----------|--------------------|------------------------|------------------------|---------------------------|
| Channel X | -0.17 | -0.82 | 1.53 | 0.38 |
| Channel Y | -1.68 | -3.07 | -0.46 | 0.42 |
| Channel Z | -0.87 | -1.78 | -0.23 | 0.29 |

6. Input Offset Current

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

7. Input Resistance

| | Zeroing (MOhm) | Measuring (MOhm) |
|-----------|----------------|------------------|
| Channel X | 0.2000 | 202.0 |
| Channel Y | 0.2000 | 202.8 |
| Channel Z | 0.2001 | 203.8 |

8. Low Battery Alarm Voltage (verified during pre test)

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

9. Power Consumption (verified during pre test)

| Typical values | Switched off (mA) | Stand by (mA) | Transmitting (mA) |
|----------------|-------------------|---------------|-------------------|
| Supply (+ Vcc) | +0.0 | +6 | +14 |
| Supply (- Vcc) | -0.01 | -8 | -9 |



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Accreditation No.: **SCS 108**

Client **Qualcomm USA**

Certificate No: **D1640V2-317_Feb06**

CALIBRATION CERTIFICATE

Object **D1640V2 - SN: 317**

Calibration procedure(s) **QA CAL-05.v6
Calibration procedure for dipole validation kits**

Calibration date: **February 01, 2006**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|-----------------------------|------------------|---|------------------------|
| Power meter EPM E442 | GB37480704 | 04-Oct-05 (METAS, No. 251-00516) | Oct-06 |
| Power sensor HP 8481A | US37292783 | 04-Oct-05 (METAS, No. 251-00516) | Oct-06 |
| Reference 20 dB Attenuator | SN: 5086 (20g) | 11-Aug-05 (METAS, No 251-00498) | Aug-06 |
| Reference 10 dB Attenuator | SN: 5047.2 (10r) | 11-Aug-05 (METAS, No 251-00498) | Aug-06 |
| Reference Probe ES3DV2 | SN 3025 | 28-Oct-05 (SPEAG, No. ES3-3025_Oct05) | Oct-06 |
| DAE4 | SN 601 | 15-Dec-05 (SPEAG, No. DAE4-601_Dec05) | Dec-06 |
| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
| Power sensor HP 8481A | MY41092317 | 18-Oct-02 (SPEAG, in house check Oct-05) | In house check: Oct-07 |
| RF generator Agilent E4421B | MY41000675 | 11-May-05 (SPEAG, in house check Nov-05) | In house check: Nov-07 |
| Network Analyzer HP 8753E | US37390585 S4206 | 18-Oct-01 (SPEAG, in house check Nov-05) | In house check: Nov-06 |

Calibrated by: **Judith Müller** (Name), **Laboratory Technician** (Function), **i.v. Müller** (Signature)

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

Issued: June 26, 2006

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

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



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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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001
- 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 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 | DASY4 | V4.6 |
| Extrapolation | Advanced Extrapolation | |
| Phantom | Modular Flat Phantom V5.0 | |
| Distance Dipole Center - TSL | 10 mm | with Spacer |
| Area Scan resolution | dx, dy = 15 mm | |
| Zoom Scan Resolution | dx, dy, dz = 5 mm | |
| Frequency | 1640 MHz \pm 1 MHz | |

Head TSL parameters

The following parameters and calculations were applied.

| | Temperature | Permittivity | Conductivity |
|----------------------------------|---------------------|----------------|----------------------|
| Nominal Head TSL parameters | 22.0 °C | 40.3 | 1.30 mho/m |
| Measured Head TSL parameters | (22.0 \pm 0.2) °C | 38.4 \pm 6 % | 1.32 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 | 8.71 mW / g |
| SAR normalized | normalized to 1W | 34.8 mW / g |
| SAR for nominal Head TSL parameters ¹ | normalized to 1W | 33.5 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 | 4.76 mW / g |
| SAR normalized | normalized to 1W | 19.0 mW / g |
| SAR for nominal Head TSL parameters ¹ | normalized to 1W | 18.6 mW / g \pm 16.5 % (k=2) |

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

Appendix

Antenna Parameters with Head TSL

| | |
|--------------------------------------|-----------------------------|
| Impedance, transformed to feed point | $52.6 \Omega + 2.6 j\Omega$ |
| Return Loss | - 28.9 dB |

General Antenna Parameters and Design

| | |
|----------------------------------|----------|
| Electrical Delay (one direction) | 1.223 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 11, 2005 |

DASY4 Validation Report for Head TSL

Date/Time: 01.02.2006 14:33:49

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 1640 MHz; Type: D1640V2; Serial: D1640V2 - SN317

Communication System: CW-1640; Frequency: 1640 MHz; Duty Cycle: 1:1

Medium: HSL U10 BB

Medium parameters used: $f = 1640$ MHz; $\sigma = 1.32$ mho/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Measurement Standard: DASY4 (High Precision Assessment)

DASY4 Configuration:

- Probe: ET3DV6 - SN1507 (HF); ConvF(5.23, 5.23, 5.23); Calibrated: 28.10.2005
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 15.12.2005
- Phantom: Flat Phantom 5.0 (back); Type: QD000P50AA; ;
- Measurement SW: DASY4, V4.6 Build 47; Postprocessing SW: SEMCAD, V1.8 Build 160

Pin = 250 mW; d = 10 mm/Area Scan (81x81x1):

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

Maximum value of SAR (interpolated) = 9.96 mW/g

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

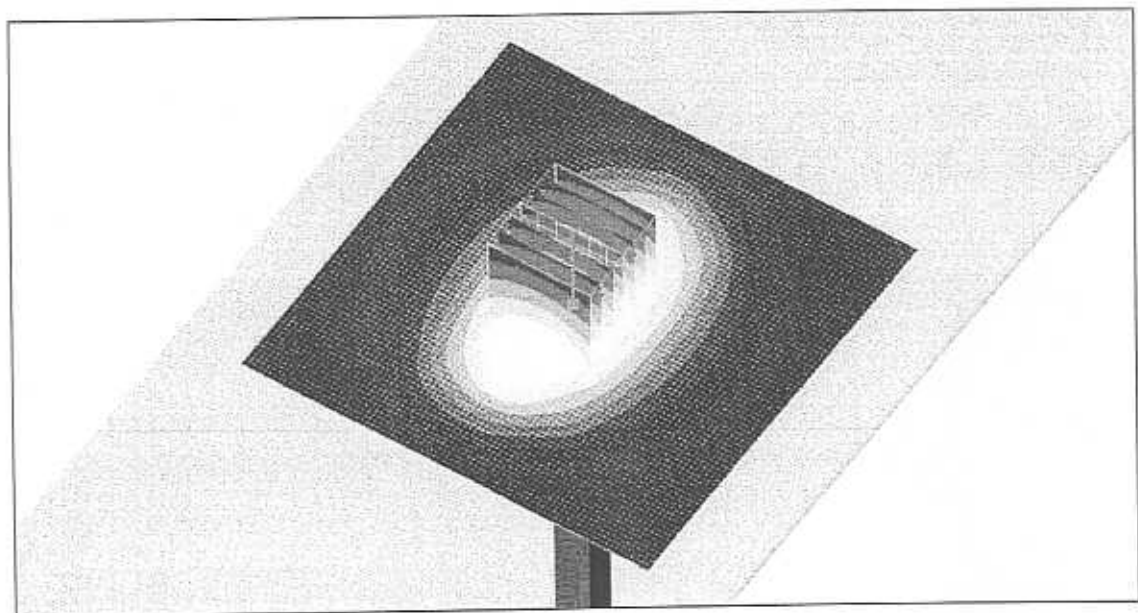
Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 92.7 V/m; Power Drift = -0.127 dB

Peak SAR (extrapolated) = 14.8 W/kg

SAR(1 g) = 8.71 mW/g; SAR(10 g) = 4.76 mW/g

Maximum value of SAR (measured) = 9.73 mW/g



0 dB = 9.73mW/g

Impedance Measurement Plot for Head TSL

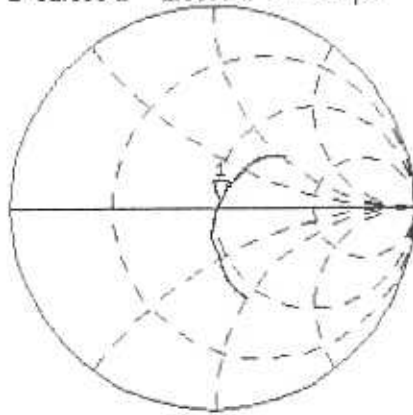
1 Feb 2006 09:33:00

CH1 S11 1 U FS

1: 52.633 Ω 2.5566 Ω 248.11 μ H

1 640.000 000 MHz

*
Del
Cor

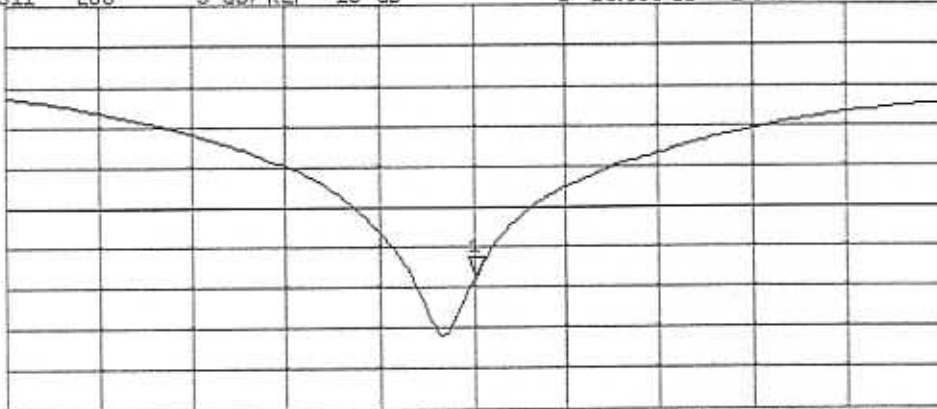


Avg
16

↑

CH2 S11 LOG 5 dB/REF -20 dB 1:-28.939 dB 1 640.000 000 MHz

Cor



↑

CENTER 1 640.000 000 MHz

SPAN 400.000 000 MHz

IMPORTANT NOTICE

USAGE OF PROBES IN ORGANIC SOLVENTS

Diethylene Glycol Monobuthy Ether (the basis for liquids above 1 GHz), as many other organic solvents, is a very effective softener for synthetic materials. These solvents can cause irreparable damage to certain SPEAG products, except those which are explicitly declared as compliant with organic solvents.

Compatible Probes:

- ET3DV6
- ET3DV6R
- ES3DVx
- EX3DVx
- ER3DV6
- H3DV6

Important Note for ET3DV6 Probes:

The ET3DV6 probes shall not be exposed to solvents longer than necessary for the measurements and shall be cleaned daily after use with warm water and stored dry.

s p e a g

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Copy

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Zeughausstrasse 43, 8004 Zurich, Switzerland



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

Accredited by the Swiss Federal Office of Metrology and Accreditation
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 **Qualcomm USA**

Certificate No: **ET3-1733_Oct05**

CALIBRATION CERTIFICATE

Object **ET3DV6 - SN:1733**

Calibration procedure(s) **QA CAL-01.v5 and QA CAL-12.v4
Calibration procedure for dosimetric E-field probes**

Calibration date: **October 24, 2005**

Condition of the calibrated item **In Tolerance**

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

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

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards | ID # | Cal Date (Calibrated by, Certificate No.) | Scheduled Calibration |
|----------------------------|-----------------|---|-----------------------|
| Power meter E4419B | GB41293874 | 3-May-05 (METAS, No. 251-00466) | May-06 |
| Power sensor E4412A | MY41495277 | 3-May-05 (METAS, No. 251-00466) | May-06 |
| Power sensor E4412A | MY41498087 | 3-May-05 (METAS, No. 251-00466) | May-06 |
| Reference 3 dB Attenuator | SN: S5054 (3c) | 11-Aug-05 (METAS, No. 251-00499) | Aug-06 |
| Reference 20 dB Attenuator | SN: S5086 (20b) | 3-May-05 (METAS, No. 251-00467) | May-06 |
| Reference 30 dB Attenuator | SN: S5129 (30b) | 11-Aug-05 (METAS, No. 251-00500) | Aug-06 |
| Reference Probe ES3DV2 | SN: 3013 | 7-Jan-05 (SPEAG, No. ES3-3013_Jan05) | Jan-06 |
| DAE4 | SN: 654 | 29-Nov-04 (SPEAG, No. DAE4-654_Nov04) | Nov-05 |

| Secondary Standards | ID # | Check Date (in house) | Scheduled Check |
|---------------------------|--------------|--|------------------------|
| RF generator HP 8648C | US3642U01700 | 4-Aug-99 (SPEAG, in house check Dec-03) | In house check: Dec-05 |
| Network Analyzer HP 8753E | US37390585 | 18-Oct-01 (SPEAG, in house check Nov-04) | In house check: Nov 05 |

Calibrated by: **Name: Nico Vetterli, Function: Laboratory Technician, Signature: [Signature]**

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

Issued: October 25, 2005

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



Glossary:

| | |
|--------------------------|--|
| TSL | tissue simulating liquid |
| NORM _{x,y,z} | sensitivity in free space |
| ConF | sensitivity in TSL / NORM _{x,y,z} |
| DCP | diode compression point |
| 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
- CENELEC EN 50361, "Basic standard for the measurement of Specific Absorption Rate related to human exposure to electromagnetic fields from mobile phones (300 MHz - 3 GHz), July 2001

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 (no uncertainty required). DCP does not depend on frequency nor media.
- 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 ET3DV6

SN:1733

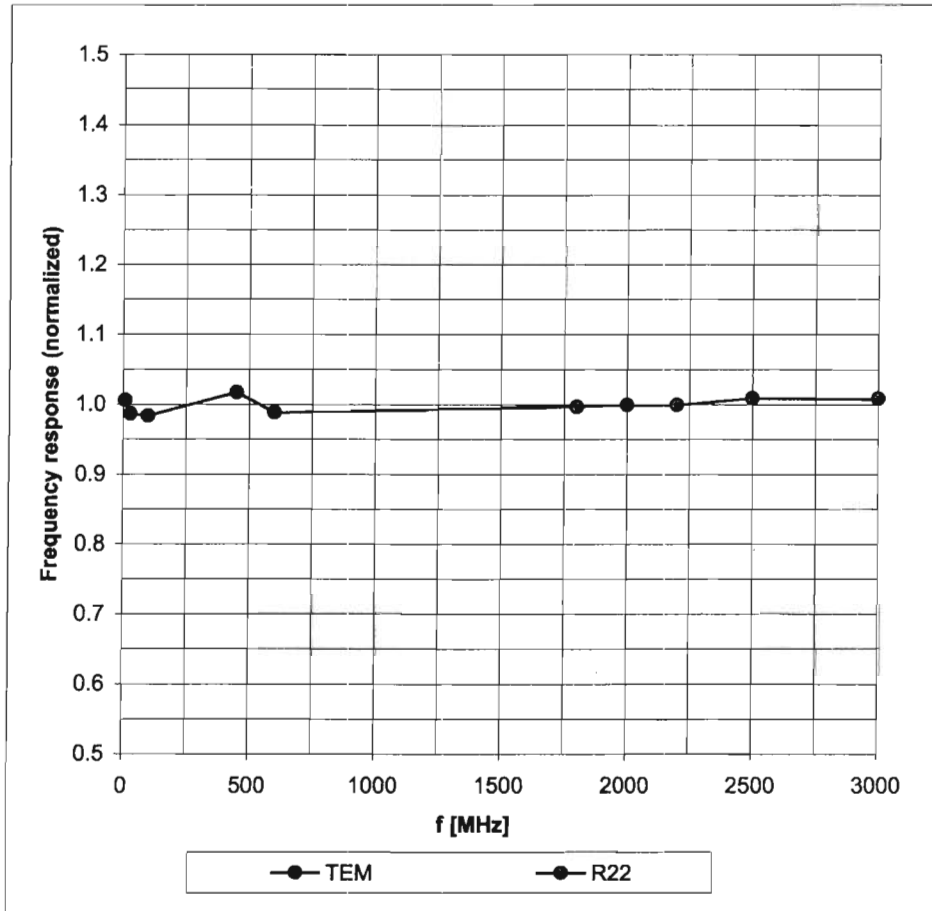
| | |
|------------------|--------------------|
| Manufactured: | September 27, 2002 |
| Last calibrated: | November 22, 2004 |
| Recalibrated: | October 24, 2005 |

Calibrated for DASYS Systems

(Note: non-compatible with DASYS2 system!)

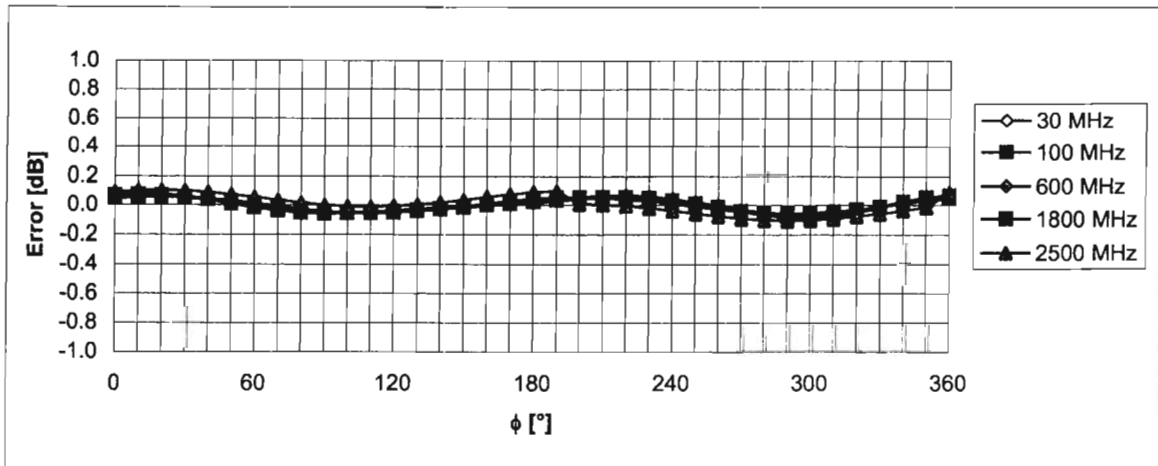
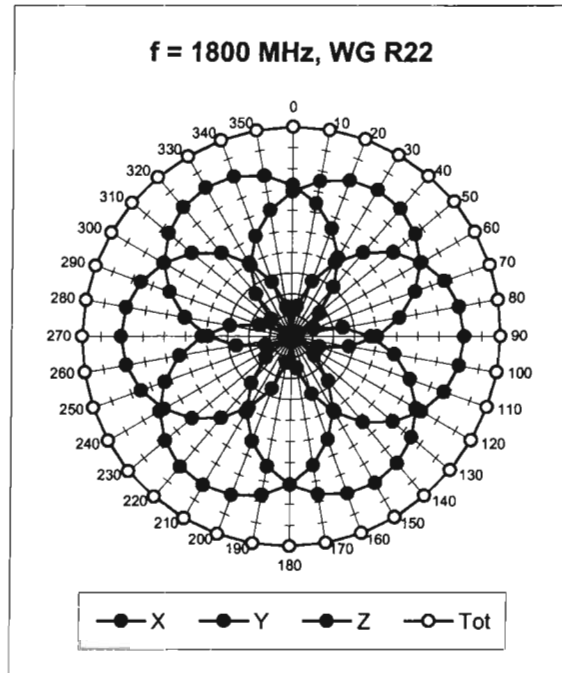
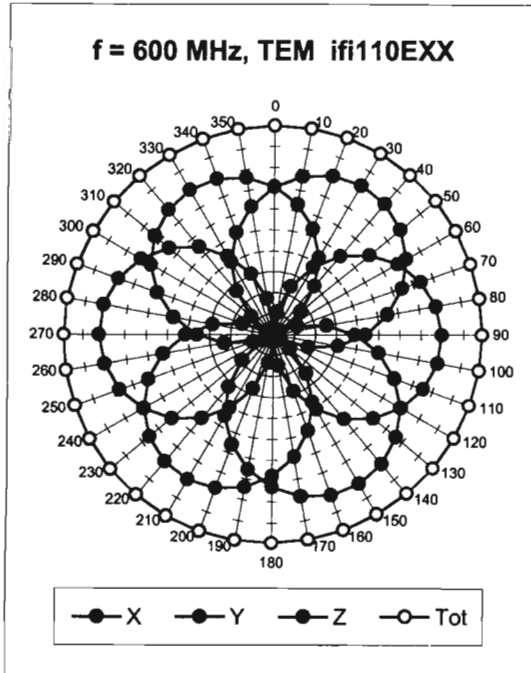
Frequency Response of E-Field

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



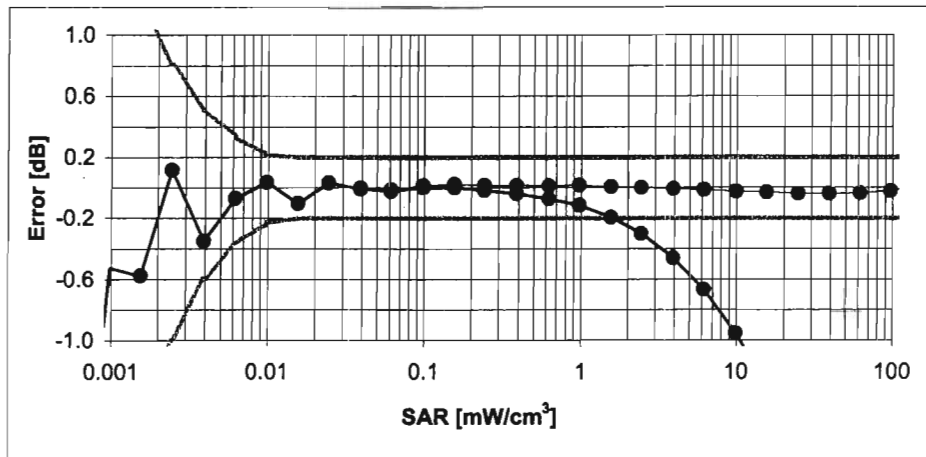
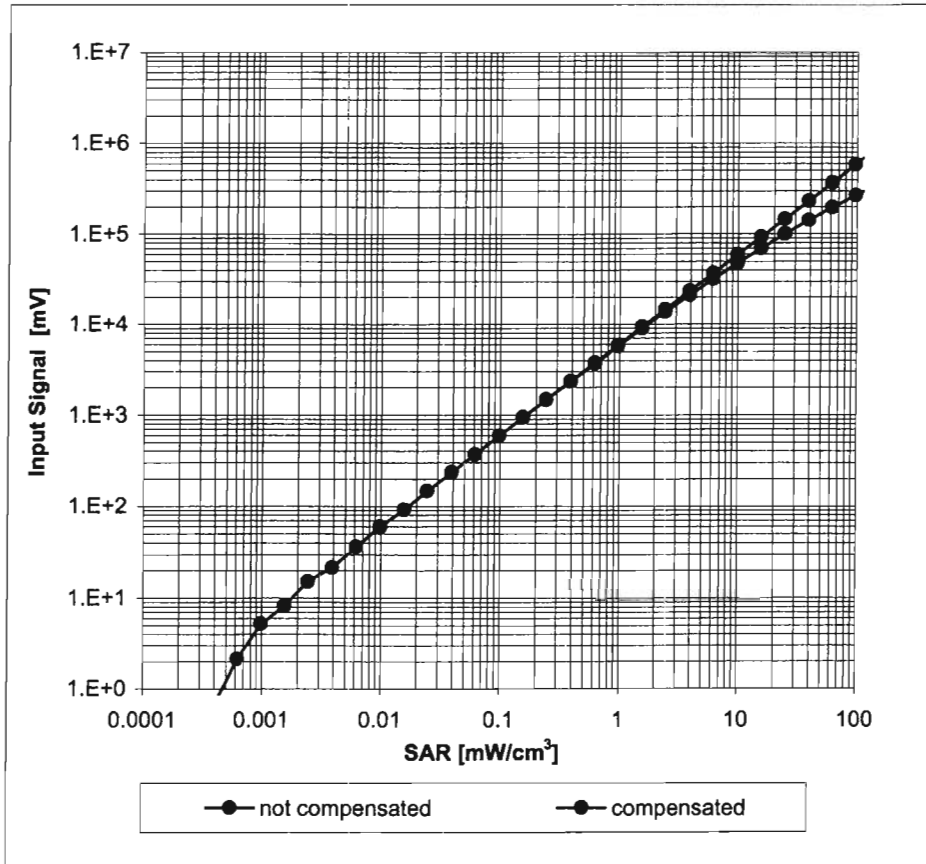
Uncertainty of Frequency Response of E-field: $\pm 6.3\%$ (k=2)

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



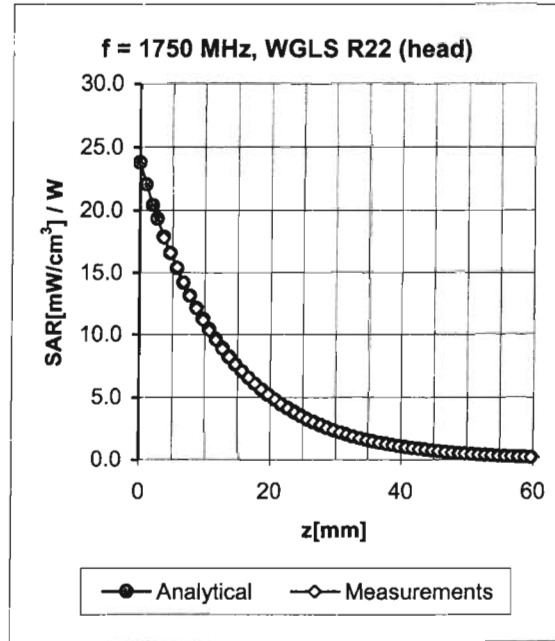
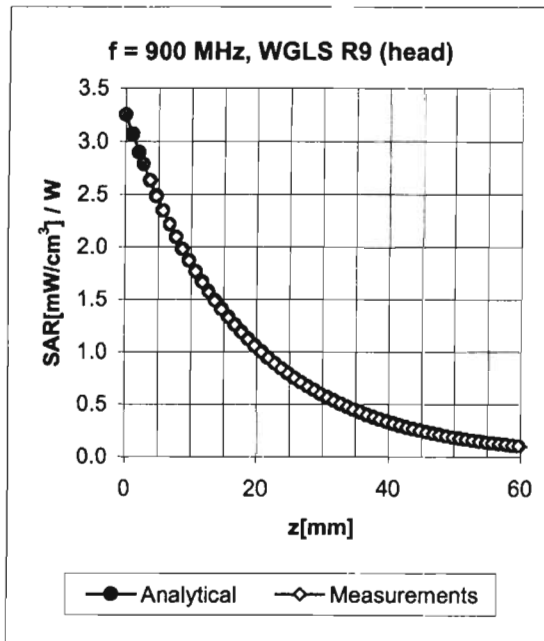
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

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

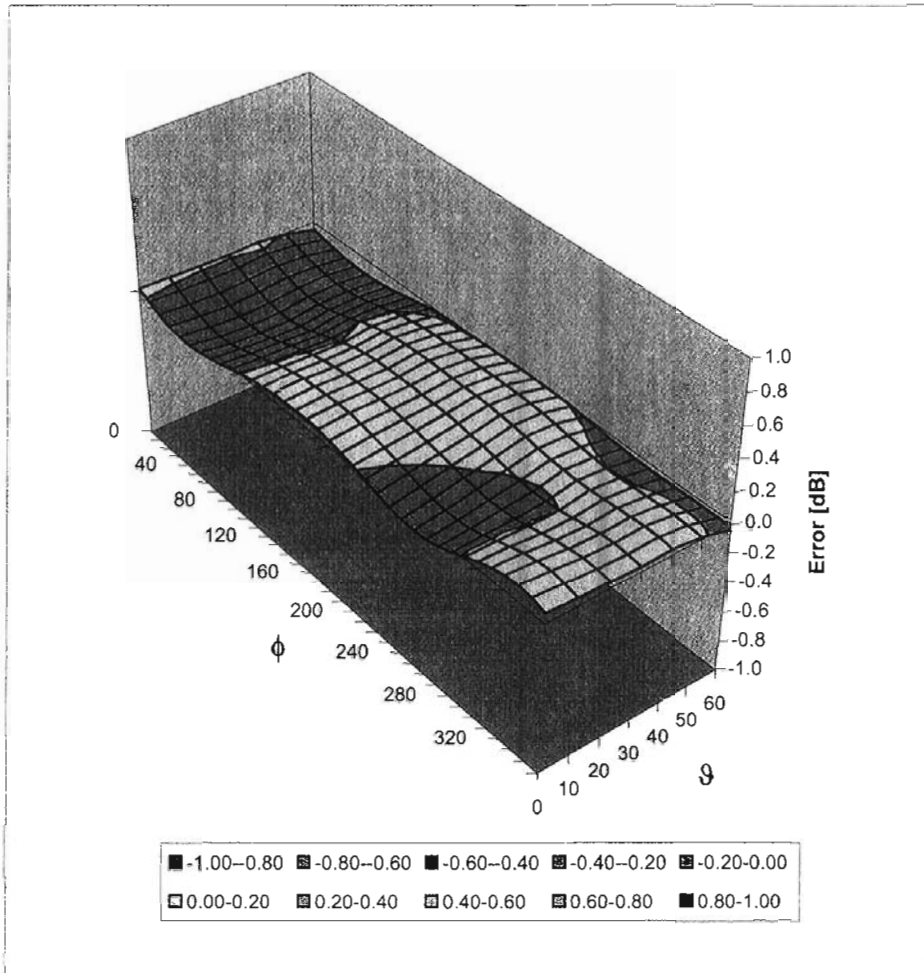


| f [MHz] | Validity [MHz] ^c | TSL | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 450 | ± 50 / ± 100 | Head | 43.5 ± 5% | 0.87 ± 5% | 0.02 | 2.80 | 6.73 ± 13.3% (k=2) |
| 835 | ± 50 / ± 100 | Head | 41.5 ± 5% | 0.90 ± 5% | 0.49 | 1.89 | 6.52 ± 11.0% (k=2) |
| 900 | ± 50 / ± 100 | Head | 41.5 ± 5% | 0.97 ± 5% | 0.49 | 1.92 | 6.25 ± 11.0% (k=2) |
| 1750 | ± 50 / ± 100 | Head | 40.1 ± 5% | 1.37 ± 5% | 0.53 | 2.35 | 5.02 ± 11.0% (k=2) |
| 1900 | ± 50 / ± 100 | Head | 40.0 ± 5% | 1.40 ± 5% | 0.51 | 2.57 | 4.84 ± 11.0% (k=2) |
| 1950 | ± 50 / ± 100 | Head | 40.0 ± 5% | 1.40 ± 5% | 0.52 | 2.57 | 4.61 ± 11.0% (k=2) |
| 2450 | ± 50 / ± 100 | Head | 39.2 ± 5% | 1.80 ± 5% | 0.65 | 2.25 | 4.30 ± 11.8% (k=2) |
| | | | | | | | |
| 450 | ± 50 / ± 100 | Body | 56.7 ± 5% | 0.94 ± 5% | 0.03 | 2.10 | 7.06 ± 13.3% (k=2) |
| 835 | ± 50 / ± 100 | Body | 55.2 ± 5% | 0.97 ± 5% | 0.43 | 2.06 | 6.35 ± 11.0% (k=2) |
| 900 | ± 50 / ± 100 | Body | 55.0 ± 5% | 1.05 ± 5% | 0.42 | 2.19 | 6.24 ± 11.0% (k=2) |
| 1750 | ± 50 / ± 100 | Body | 53.4 ± 5% | 1.49 ± 5% | 0.52 | 2.76 | 4.56 ± 11.0% (k=2) |
| 1900 | ± 50 / ± 100 | Body | 53.3 ± 5% | 1.52 ± 5% | 0.57 | 2.49 | 4.35 ± 11.0% (k=2) |
| 1950 | ± 50 / ± 100 | Body | 53.3 ± 5% | 1.52 ± 5% | 0.55 | 2.55 | 4.31 ± 11.0% (k=2) |
| 2450 | ± 50 / ± 100 | Body | 52.7 ± 5% | 1.95 ± 5% | 0.73 | 1.74 | 4.13 ± 11.8% (k=2) |

^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.

Deviation from Isotropy in HSL

Error (ϕ, ϑ), $f = 900$ MHz



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

Additional Conversion Factors

for Dosimetric E-Field Probe

Type:

ET3DV6

Serial Number:

1733

Place of Assessment:

Zurich

Date of Assessment:

July 17, 2006

Probe Calibration Date:

October 24, 2005

Schmid & Partner Engineering AG hereby certifies that conversion factor(s) of this probe have been evaluated on the date indicated above. The assessment was performed using the FDTD numerical code SEMCAD of Schmid & Partner Engineering AG. The evaluation is coupled with measured conversion factors (probe calibration date indicated above). The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1750 MHz.

Assessed by:

Dosimetric E-Field Probe ET3DV6 SN:1733

Conversion factor (\pm standard deviation)

1640 \pm 50 MHz

ConvF

4.77 \pm 7%

| |
|---|
| $\epsilon_r = 53.8 \pm 5\%$ $\sigma = 1.40 \pm 5\%$ mho/m (body tissue) |
|---|

Important Note:

For numerically assessed probe conversion factors, parameters Alpha and Delta in the DASY software must have the following entries: Alpha = 0 and Delta = 1.

Please see also Section 4.7 of the DASY4 Manual.