QUALCOMM
CDMA Technologies

inGeo1 AW with Holster FCC SAR Test Report

80-VJ402-5 Rev. A

October 8, 2008

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inGeo1 AW with Holster FCC SAR Test Report
80-VJ402-5 Rev. A

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Revision history

Revision	Date	Description
A	October 2008	Initial release

Overview

Test report reference	80-VJ402-5
Responsible engineer	Mark Ortlieb, Robert Scodellaro
Test engineer	Mark Ortlieb
Date of issue	8 October 2008
Test laboratory	QUALCOMM Incorporated 5775 Morehouse Dr. San Diego CA 92121 General telephone: 1-858-587-1121
Model tested	inGeo™1 AW (AC2116)
Test specification standard(s)	**ANSI/IEEE C95.1-1992** IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz **ANSI/IEEE C95.3-1992** IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields-RF and Microwave **FCC/OET Bulletin 65, including Supplement C**, Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields **ANSI/IEEE P1528/D1.2** Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
Results	The device noted above complies with the requirements of the aforementioned standards.

1 Test Summary

1.1 Equipment tested

Equipment tested was the mobile tracking device, model inGeo1 AW (AC2116), serial number 0714CC2B . The device operates in CDMA mode in the US cellular band (band class 0) and US PCS band (band class 1). It is intended for body-worn application only. The device has no voice capability.

While the unit transmits a very low duty cycle (it sends an SMS message once per minute for approximately 3 seconds), it was tested with a 100% duty cycle to simulate a theoretical worst case.

This device was tested and submitted previously. This test report investigates the SAR performance of the device when installed in a belt-mounted holster (see Section 2.5 Body worn accessories for description).

1.2 Maximum (worst case results)

Table 1-1 gives the worst-case 1-g SAR results measured for the test device when tested in the holster as described in Section 4.3 . All results given reflect only one position: the device's rear face against flat phantom.

Table 1-1 Worst-case results

Band	Channel	1-g SAR (mW/g)
Band class 0	1013	1.14
Band class 1	25	0.839

1.3 Measurement uncertainty

Measurement uncertainty	
Combined standard uncertainty	12.3%
Expanded standard uncertainty (k = 2)	24.6%

1.4 SAR limits

Table 1-2 gives 1-g body SAR limits for the general public for the frequency range of 10 MHz to 10 GHz, as described in the *FCC OET Bulletin 65 Supplement C*.

Table 1-2 1-gram body SAR limits

1-gram body SAR limits	
Whole body average SAR (mW/g)	0.08 mW/g
Localized SAR (limbs)	1.6 mW/g

2 EUT Description

2.1 General

Table 2-1 General EUT description

Model	inGeo1 AW (AC2116)
Modulation	CDMA
Trade name	QUALCOMM Incorporated
TX frequency	US CDMA band class 0 (US cellular): Ch 1013 (low): 824.7 MHz Ch 383 (middle): 836.49 MHz Ch 777 (high): 848.31 MHz US CDMA band class 1 (US PCS): Ch 25 (low): 1851.25 MHz Ch 600 (middle): 1880 MHz Ch 1175 (high): 1908.75 MHz
Serial number(s)	0714CC2B

2.2 EUT pictures

Figure 2-1 inGeo1 AW model pictures

Rear face

Front face

Bottom end

Top end

Left edge

Right edge

2.3 Antenna description

The inGeo1 AW device uses a folded monopole type antenna.

2.4 Battery

The battery is a 3.7-V Li-ion type battery; model CV90-VA989-1.

2.5 Body worn accessories

A holster is to be provided with the device. The holster contains no metal parts, materials or substances. Figure 2-2 shows a photo of the holster, both empty and with the device installed.

Figure 2-2 inGeo1 AW device installed in belt-clip holster

3 SAR Test Facility

3.1 General

Table 3-1 General SAR test facility information

General information	
Test location	QUALCOMM Incorporated 5775 Morehouse Dr. San Diego, CA 92121
Temperature range	15 – 35 °C (23 °C actual)
Humidity range	25 – 75% (41% actual)
Pressure	860 – 1060 mbar (1015 mB)

All QUALCOMM dosimetry equipment is operated within a shielded screen room, manufactured by Lindgren RF Enclosures to provide isolation from external EM fields. The E-field probes of the DASY4 system are capable of detecting signals as low as 5 µW/g in the liquid dielectric, and external fields are minimized by the screen room, leaving the phone as the dominate radiation source. The floor of the screen room is reflective, so the phantom bench is placed on four ferrite panels, measuring 2 ft^2 each, to minimize reflected energy that would otherwise re-enter the phantom and combine constructively or destructively with the desired results.

3.2 Dosimetry system

The dosimetry equipment consists of a complete state-of-the-art DASY4 dosimetry system manufactured and calibrated by Schmid & Partner Engineering AG of Zurich, Switzerland. The DASY4 system consists of a six-axis robot, a robot controller, a teach pendant, automation software on a 2.4-GHz Intel Pentium4 computer, data acquisition system, isotropic E-field probe, device positioning holder, and validation kit.

Figure 3-1 shows the robot arm, controller box, and device-positioning holder.

Figure 3-1 DASY4 system: robot arm, controller box, and device positioning holder

3.3 E-field probe

This probe is manufactured by Schmid & Partner, model ET3DV6. It is calibrated by the manufacturer in head tissue simulating liquid at frequencies ranging from 835 MHz to 1.95 GHz. The dynamic range is said by the manufacturer to be 5 µW/gm to approximately 100 mW/g. The probe contains three small dipoles positioned symmetrically on a triangular core to provide for isotropic detection of the field. Each dipole contains a diode at the feed point that converts the RF signal to DC, which is conducted down a high-impedance line to the data acquisition system.

3.4 Phantom

The phantom is the standard anthropomorphic model (SAM) phantom supplied by Schmid & Partner AG, and is designed for compliance to the guidelines provided in standard IEEE P1528. It consists of a left and right side head for simulating phone usage on both sides of the head and as a flat area for simulating phone usage against the body. The phantom is constructed of fiberglass with 2 mm ±0.1mm shell thickness. The DASY4 system uses a homogeneous tissue phantom, based on studies concerning energy absorption of the human head, and the different absorption rates between adults and children. These studies indicated that a homogeneous phantom should overestimate SAR by no more than 15% for 10 averages and should not underestimate SAR.

Figure 3-2 shows the SAM phantom.

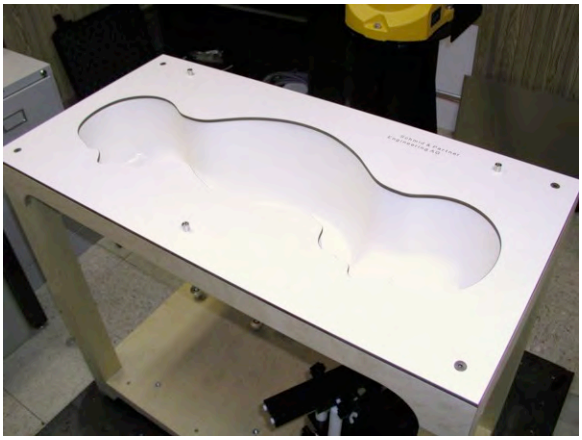


Figure 3-2 SAM phantom

3.5 Liquid dielectric

The tissue-simulating liquid filling the phantom is mixed by the QUALCOMM staff, per the manufacturer's instructions and regulatory standards. There are separate formulas for the various applicable frequencies. Before the test, the permittivity and conductivity were measured with an automated Hewlett-Packard 85070B dielectric probe, in conjunction with an H-P 8752C network analyzer, to monitor permittivity change due to evaporation and settling of ingredients. The electromagnetic parameters of the liquid were maintained, as shown in Table 3-2. The target values were obtained from Supplement C of OET Bulletin 65: *Additional Information for Evaluating Compliance of Mobile and Portable Devices with FCC Limits for Human Exposure to Radiofrequency Emissions.*

Table 3-2 Tissue dielectric properties at time of testing

		Permittivity (ε_r)				Conductivity (σ)			
Test date	**Frequency (MHz)**	**Measured values**	**Target values**	**Deviation (%)**	**Limit**	**Measured values**	**Target values**	**Deviation (%)**	**Limit**
10/3/2008	1851.25	54.2	53.3	+1.7%	±5%	1.45	1.52	-4.6%	±5%
	1880.00	54.1	53.3	+1.5%	±5%	1.49	1.52	-2.0%	±5%
	1908.75	54.0	53.3	+1.3%	±5%	1.52	1.52	0.0%	±5%
10/6/2008	824.7	56.6	55.2	+2.5%	±5%	0.965	0.97	-0.5%	±5%
	836.49	56.5	55.2	+2.4%	±5%	0.976	0.97	+0.6%	±5%
	848.31	56.4	55.2	+2.2%	±5%	0.986	0.97	+1.6%	±5%

25 L of each of the tissue simulating liquids were prepared using the following proportions of ingredients:

- 835-MHz body tissue simulating liquid
  - Water – 50.8%
  - Sugar – 48.2%
  - Preventol – 0.1%
  - Salt – 0.94%
- 1900-MHz body tissue simulating liquid
  - Water – 70.2%
  - Diethylene glycol monobutyl ether – 29.4%
  - Salt – 0.39%

4 SAR Measurement Procedure

4.1 Call Box Simulator Information

For SAR testing, the device was set to transmit a simulated call using the equipment as described in Table 4-1.

Table 4-1 Call Box Simulator Information and Settings

Make	Agilent	
Model	8960	
Cal Date	6/17/2007	
Serial Number	GB44052409	
Software Revision	GSM TA	E1968A-101
	GPRS TA	E1968A-102
	EGPRS TA	E1968A-103
	WCDMA	E1963A
	HSDPA TEST MODES	E1963A-403
	HSuPA TEST MODES	E1963A-413
	cdma 2000 TA	E1962B
	1xEV-DO TA	E1966A
	1xEV-DO FTM TA	E1976A
	1xEV-DO Release A	E1966A-102
	1xEV-DO RelA FTM	E1976A-102
Power Control	All Up bits	
Fundamental Channel Test Mode	RC3, SO55	

4.2 EUT power verification

To verify transmit power settings, the device was placed into a call according to Section 4.1 and conducted power was measured using a power meter. Measured RF conducted power is listed in Table 4-2.

Table 4-2 EUT-conducted power measurements

	Band class 0 (US cellular)			Band class 1 (US PCS)		
	Channel			Channel		
Serial number	**1013**	**383**	**777**	**25**	**600**	**1175**
0714CC2B	23.97	24.07	23.84	24.06	23.81	23.95

4.3 Test positions

The inGeo1 AW device is only intended to be operated in one position, with respect to human exposure, which is when installed in the belt clip holster as described in Section 2.5 , with the rear of the unit oriented toward the user. Because of this, the phantom was filled with muscle simulating liquid, and the device was installed the holster and positioned against the phantom, with its rear face oriented toward the phantom. The Velcro straps were folded on top of one another as they would be when normally fastened to the user's garment.

Section 6 shows photographs of the device as it was tested in this position.

4.4 Scan procedure

The scan routine is set up as follows:

- Power verification measurement
- Area scan
- 7 x 7 x 7 cube (zoom) scan (if more than one maxima is detected, cubes are applied to all)
- Power verification retest (drift)

Both 1-g and 10-g measurements are handled with the same scan process.

4.5 Test program

The sample devices were all tested in low, middle and high channels for both bands tested, in the position described in Section 4.3 .

5 Measurement Uncertainty

The possible errors included in this measurement arise from device positioning uncertainty, device manufacturing uncertainty, liquid dielectric permittivity uncertainty, liquid dielectric conductivity uncertainty, and uncertainty due to disturbance of the fields by the probe.

Table 5-1 Measurement uncertainty

	Uncertainty value (± %)	Prob. dist	Div.	(ci) 1 g	(ci) 10 g	Std. unc. (1g) (± %)	Std. unc. (10 g)	(vi) veff
Measurement system								
Probe calibration	4.8	N	1	1	1	4.8	4.8	∞
Axial isotropy	4.7	R	√3	0.7	0.7	1.9	1.9	∞
Hemispherical isotropy	9.6	R	√3	0.7	0.7	3.9	3.9	∞
Boundary effects	1	R	√3	1	1	0.6	0.6	∞
Linearity	4.7	R	√3	1	1	2.7	2.7	∞
System detection limits	1	R	√3	1	1	0.6	0.6	∞
Readout electronics	1	N	1	1	1	1.0	1.0	∞
Response time	0.8	R	√3	1	1	0.5	0.5	∞
Integration time	2.6	R	√3	1	1	1.5	1.5	∞
Rf ambient conditions	3	R	√3	1	1	1.7	1.7	∞
Probe positioner	0.4	R	√3	1	1	0.2	0.2	∞
Probe positioning	2.9	R	√3	1	1	1.7	1.7	∞
Maximum SAR evaluation	1	R	√3	1	1	0.6	0.6	∞
Test sample related			€					
Device positioning	2.9	N	1	1	1	2.9	2.9	145
Device holder	3.6	N	1	1	1	3.6	3.6	5
Power drift	5	R	√3	1	1	2.9	2.9	∞
Phantom and setup								
Phantom uncertainty	4	R	√3	1	1	2.3	2.3	∞
Liquid conductivity (target)	5	R	√3	0.64	0.43	1.8	1.2	∞
Liquid conductivity (measured)	2.5	N	1	0.64	0.43	1.6	1.1	∞
Liquid permittivity (target)	5	R	√3	0.6	0.49	1.7	1.4	∞
Liquid permittivity (measured)	2.5	N	1	0.6	0.49	1.5	1.2	∞
Combined std. uncertainty						10.3 %	10.0 %	330
Expanded std. uncertainty						20.6 %	20.1 %	

6 Test Setup Photos

Figure 6-1 inGeo1 AW device positioned with respect to flat phantom (view 1)

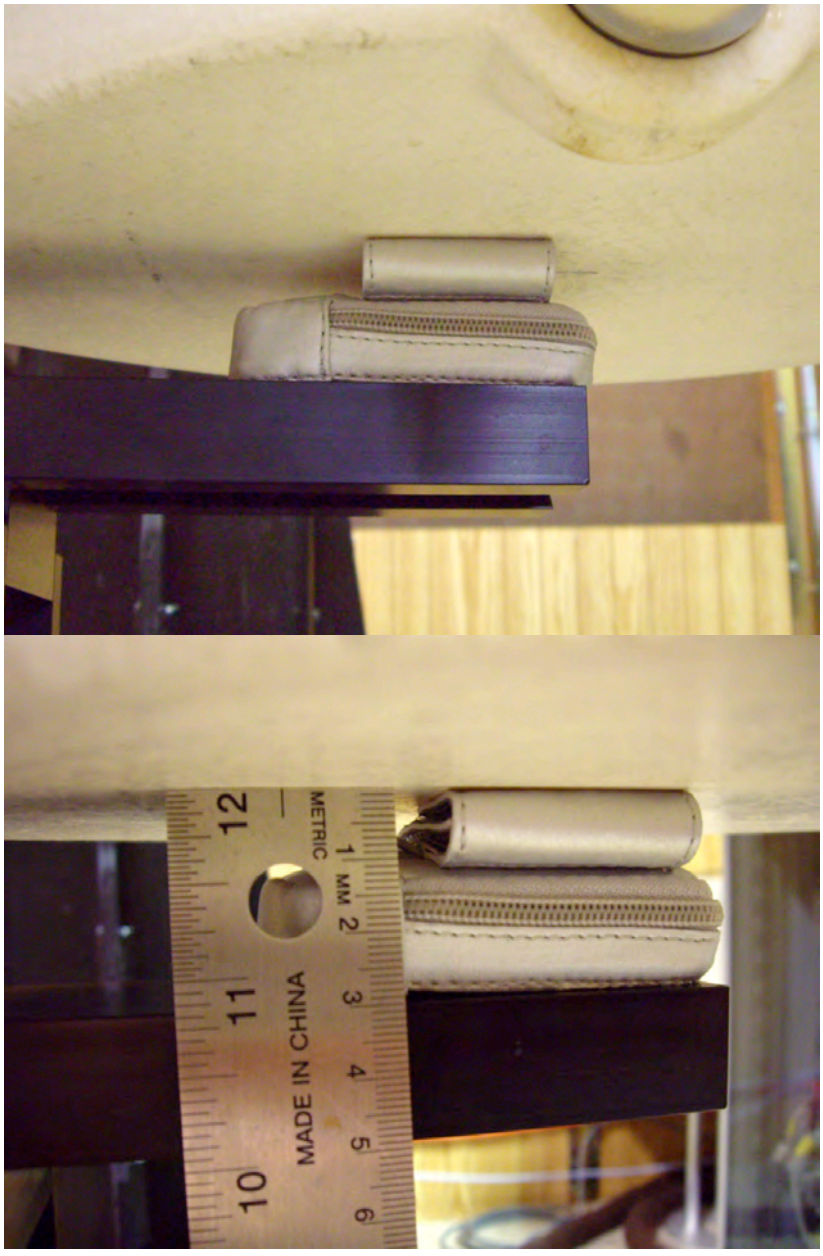


Figure 6-2 inGeo1 AW device positioned with respect to flat phantom (view 2)

7 Validations

7.1 General validation procedure

Validation scans were performed at the beginning of testing of each test program day. A dipole antenna was selected that roughly matched the center frequency of the bands being tested (i.e., 835 MHz and 1900 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 20 dBm. Measurements were then scaled to 30 dBm and compared to scaled data provided in the dipole's calibration certificate. Validation SAR has a tolerance of ±10%.

7.2 Validation data

Table 7-1 gives SAR data for validation test scans performed on the days of testing. Antenna input power was set at 20 dBm (power level measured by power meter at the load end of the input cable).

Table 7-1 Validation SAR data

Date	Frequency	Measured 1-g SAR (mW/g)	SAR scaled to 30 dBm	Target dipole 1-g SAR at 30 dBm	Deviation (%)
10/3/2008	1900	4.26	42.6	40.8	+4.4%
10/6/2008	835	1.00	10.0	9.48	+5.5%

7.3 Validation plots

The following pages show the validation test plots.

7.3.1 1900 MHz Validation Scan

Date/Time: 10/2/2008 2:04:40 PM

Test Laboratory: QUALCOMM Incorporated

20081002_Val1900_20dBm_muscle

DUT: Dipole 1900 MHz; Type: D1900V2; Serial: D1900V2 - SN:5d016

Communication System: CW; Frequency: 1900 MHz;Duty Cycle: 1:1
Medium: MSL1800 Medium parameters used (interpolated): f = 1900 MHz; σ = 1.51 mho/m; εr = 54; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY4 Configuration:

* Probe: ET3DV6 - SN1733; ConvF(4.47, 4.47, 4.47); Calibrated: 9/17/2008
* Sensor-Surface: 4mm (Mechanical Surface Detection)
* Electronics: DAE3 Sn400; Calibrated: 3/5/2008
* Phantom: SAM with CRP; Type: SAM;
* Measurement SW: DASY4, V4.7 Build 55;

d=10mm, Pin=20 dBm/Area Scan (61x61x1): Measurement grid: dx=15mm, dy=15mm

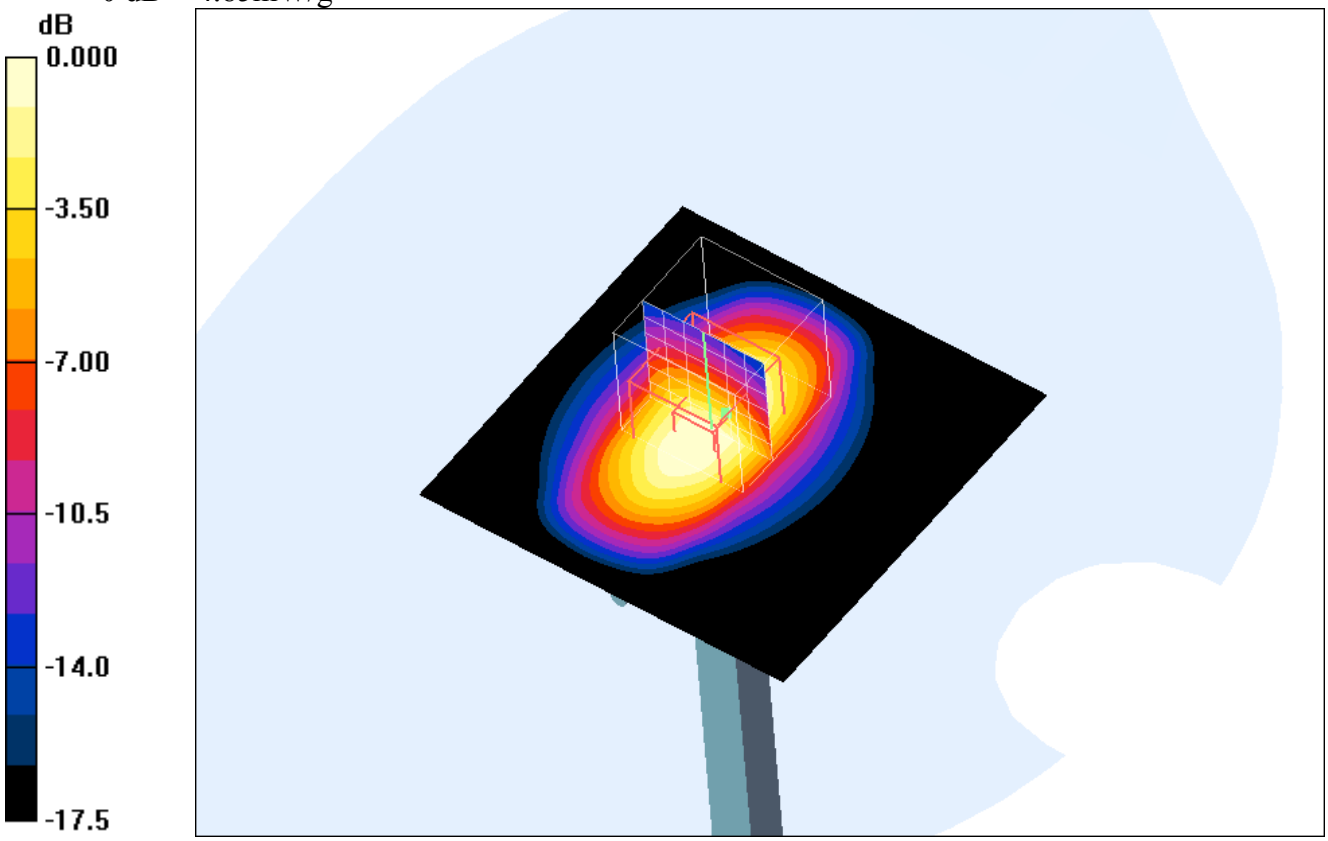
Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 5.42 mW/g

d=10mm, Pin=20 dBm/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 58.8 V/m; Power Drift = 0.074 dB
Peak SAR (extrapolated) = 7.55 W/kg
SAR(1 g) = 4.26 mW/g; SAR(10 g) = 2.25 mW/g

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 4.85 mW/g

0 dB = 4.85mW/g



7.3.2 835 MHz Validation Scan

Date/Time: 10/6/2008 12:54:10 PM

Test Laboratory: QUALCOMM Incorporated

20081006_Val835_20dBm_muscle

DUT: Dipole 835 MHz; Type: D835V2; Serial: D835V2 - SN:465

Communication System: CW; Frequency: 835 MHz;Duty Cycle: 1:1
Medium: MSL835 Medium parameters used (interpolated): f = 835 MHz; σ = 0.974 mho/m; εr = 56.6; ρ = 1000 kg/m3
Phantom section: Flat Section

DASY4 Configuration:

* Probe: ET3DV6 - SN1733; ConvF(6.41, 6.41, 6.41); Calibrated: 9/17/2008
* Sensor-Surface: 4mm (Mechanical Surface Detection)
* Electronics: DAE3 Sn400; Calibrated: 3/5/2008
* Phantom: SAM with CRP; Type: SAM;
* Measurement SW: DASY4, V4.7 Build 55;

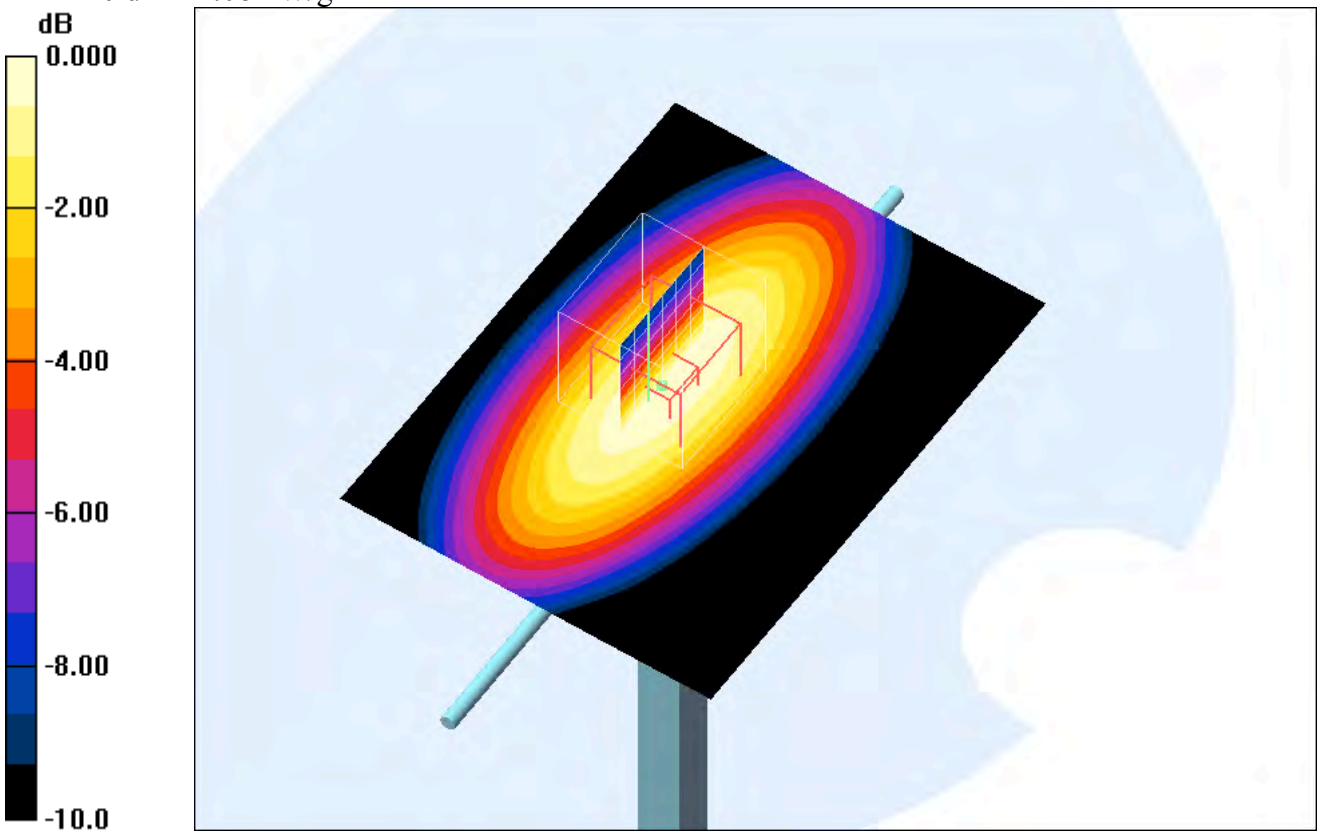
d=15mm, Pin=20 dBm/Area Scan (61x81x1): Measurement grid: dx=15mm, dy=15mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 1.07 mW/g

d=15mm, Pin=20 dBm/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 34.6 V/m; Power Drift = 0.017 dB
Peak SAR (extrapolated) = 1.44 W/kg
SAR(1 g) = 1 mW/g; SAR(10 g) = 0.663 mW/g

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 1.08 mW/g

0 dB = 1.08mW/g



8 Test Data

8.1 Numerical data

Table 8-1 shows 1-g SAR test data for the inGeo1 AW device when installed in holster.

Table 8-1 1-gram SAR data

Band	Channel	1-g SAR (mW/g)
BC1	25	0.839
	600	0.522
	1175	0.382
BC0	1013	1.14
	383	0.870
	777	0.650

8.2 Plots

The following sections show the SAR plots for the inGeo1 AW device.

8.2.1 CDMA Band Class 1 (U.S PCS)

Date/Time: 10/3/2008 11:53:32 AM

Test Laboratory: QUALCOMM Incorporated

20081003_AmberWatch_1x-PCS

DUT: inGeo AW; Type: phone; Serial: 0714CC2B

Communication System: CDMA 1x PCS; Frequency: 1851.25 MHz;Duty Cycle: 1:1
Medium: MSL1800 Medium parameters used: f = 1851.25 MHz; σ = 1.45 mho/m; εr = 54.2; ρ = 1000 kg/m3
Phantom section: Flat Section

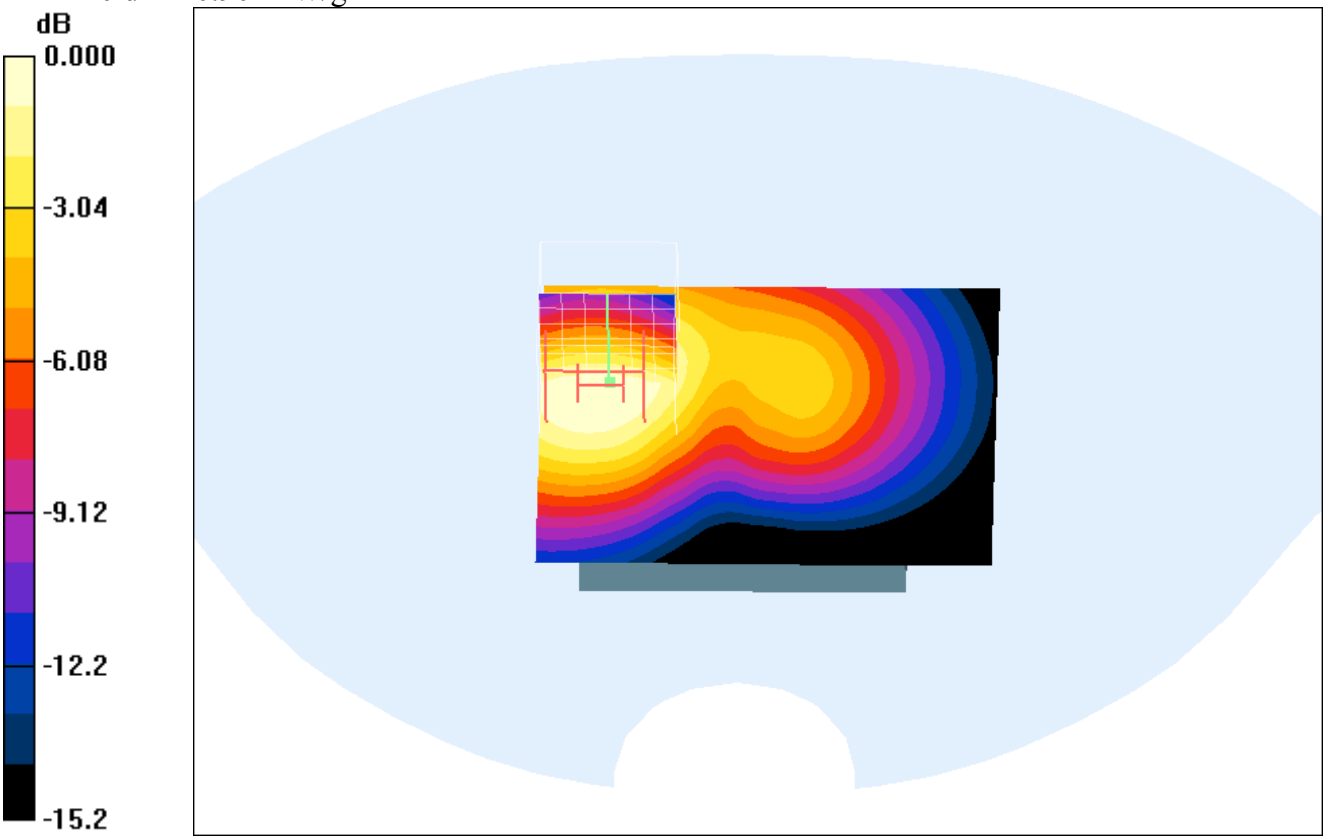
DASY4 Configuration:

* Probe: ET3DV6 - SN1733; ConvF(4.71, 4.71, 4.71); Calibrated: 9/4/2007
* Sensor-Surface: 4mm (Mechanical Surface Detection)
* Electronics: DAE3 Sn400; Calibrated: 3/5/2008
* Phantom: SAM with CRP; Type: SAM;
* Measurement SW: DASY4, V4.7 Build 55;

Flat, in holster - Low/Area Scan (81x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.952 mW/g

Flat, in holster - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.2 V/m; Power Drift = -0.306 dB
Peak SAR (extrapolated) = 1.17 W/kg
SAR(1 g) = 0.839 mW/g; SAR(10 g) = 0.550 mW/g
Maximum value of SAR (measured) = 0.904 mW/g

0 dB = 0.904mW/g



Date/Time: 10/3/2008 12:16:59 PM

Test Laboratory: QUALCOMM Incorporated

20081003_AmberWatch_1x-PCS

DUT: inGeo AW; Type: phone; Serial: 0714CC2B

Communication System: CDMA 1x PCS; Frequency: 1880 MHz;Duty Cycle: 1:1
Medium: MSL1800 Medium parameters used: f = 1880 MHz; σ = 1.49 mho/m; εr = 54.1; ρ = 1000 kg/m3
Phantom section: Flat Section

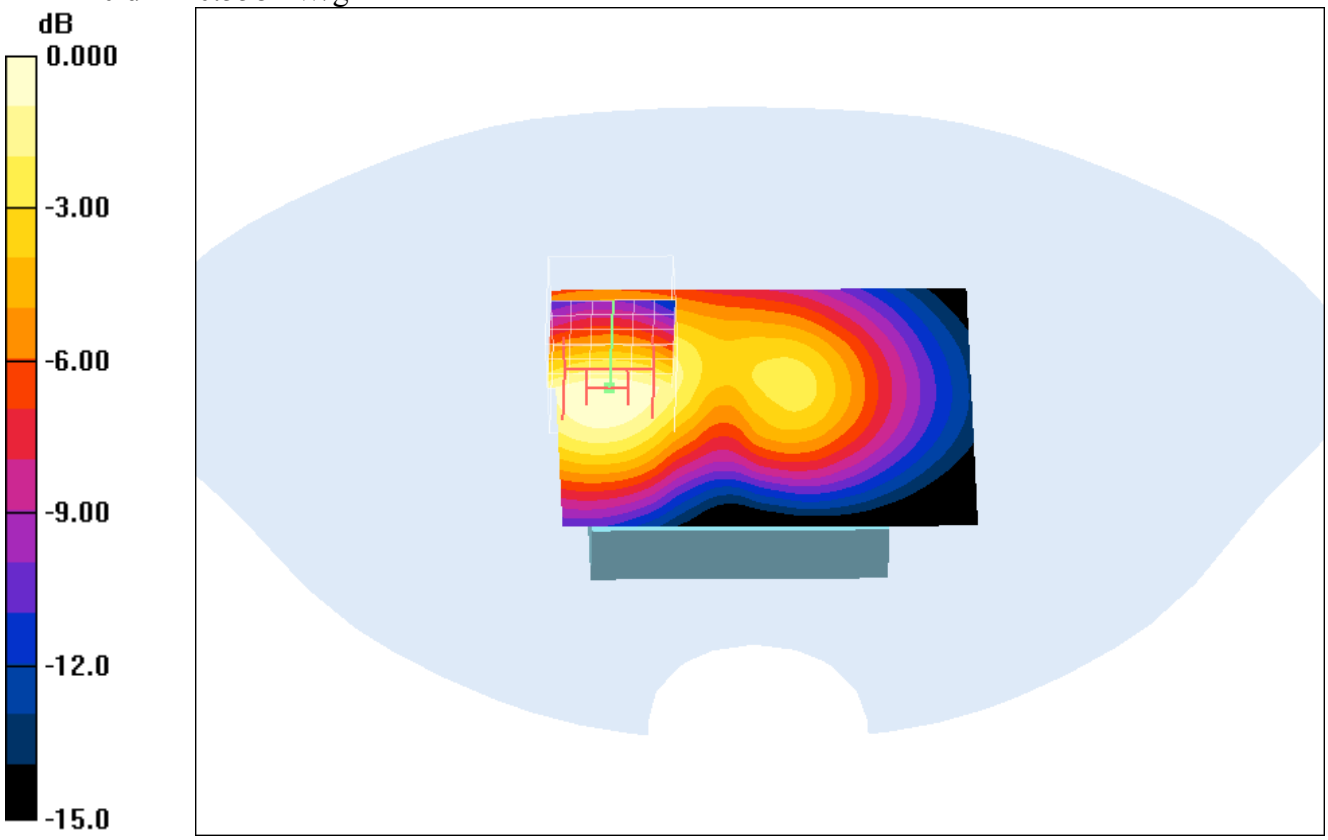
DASY4 Configuration:

* Probe: ET3DV6 - SN1733; ConvF(4.71, 4.71, 4.71); Calibrated: 9/4/2007
* Sensor-Surface: 4mm (Mechanical Surface Detection)
* Electronics: DAE3 Sn400; Calibrated: 3/5/2008
* Phantom: SAM with CRP; Type: SAM;
* Measurement SW: DASY4, V4.7 Build 55;

Flat, in holster - Middle/Area Scan (81x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.570 mW/g

Flat, in holster - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 12.5 V/m; Power Drift = -0.318 dB
Peak SAR (extrapolated) = 0.750 W/kg
SAR(1 g) = 0.522 mW/g; SAR(10 g) = 0.339 mW/g
Maximum value of SAR (measured) = 0.558 mW/g

0 dB = 0.558mW/g



Date/Time: 10/3/2008 1:35:24 PM

Test Laboratory: QUALCOMM Incorporated

20081003_AmberWatch_1x-PCS

DUT: inGeo AW; Type: phone; Serial: 0714CC2B

Communication System: CDMA 1x PCS; Frequency: 1908.75 MHz;Duty Cycle: 1:1
Medium: MSL1800 Medium parameters used: f = 1908.75 MHz; σ = 1.52 mho/m; εr = 54; ρ = 1000 kg/m3
Phantom section: Flat Section

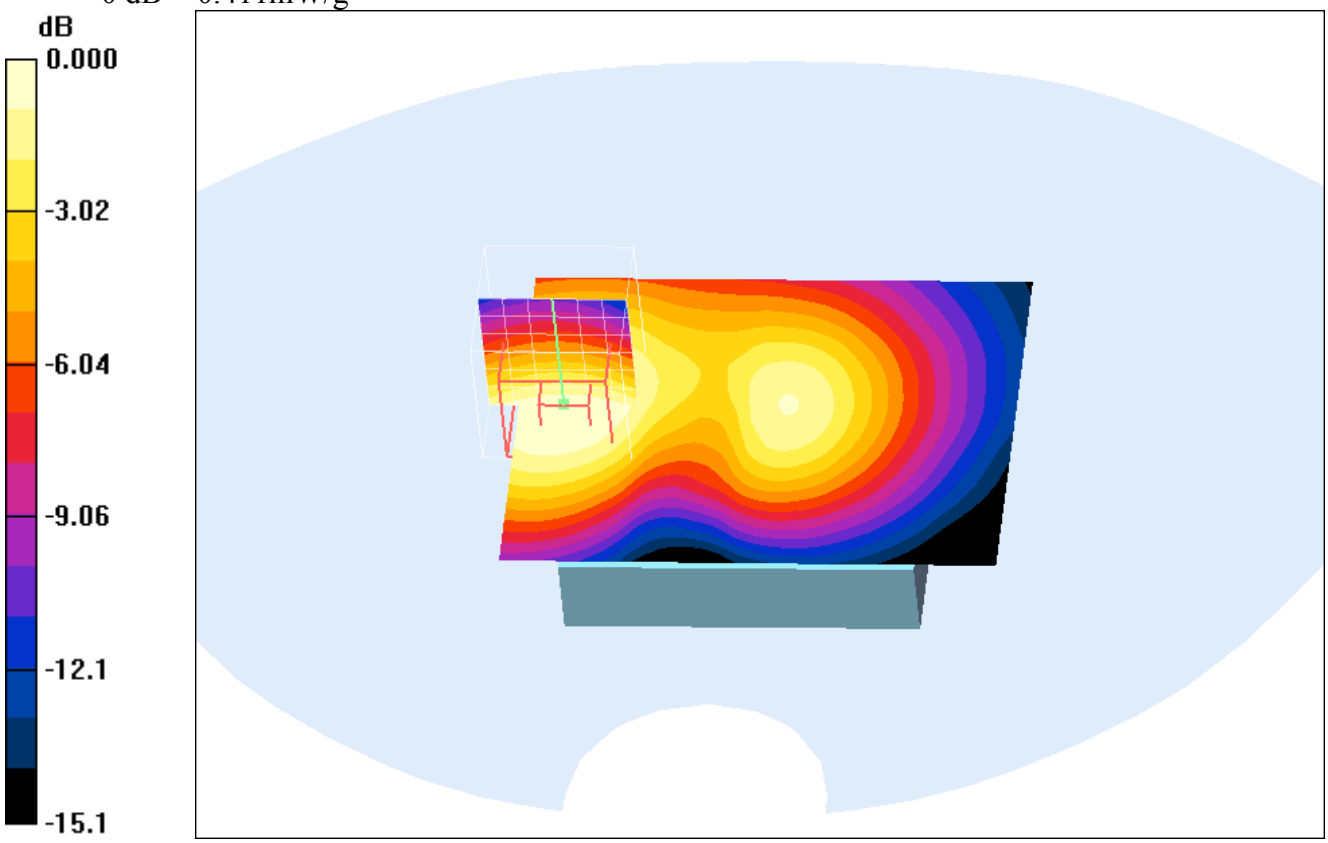
DASY4 Configuration:

* Probe: ET3DV6 - SN1733; ConvF(4.71, 4.71, 4.71); Calibrated: 9/4/2007
* Sensor-Surface: 4mm (Mechanical Surface Detection)
* Electronics: DAE3 Sn400; Calibrated: 3/5/2008
* Phantom: SAM with CRP; Type: SAM;
* Measurement SW: DASY4, V4.7 Build 55;

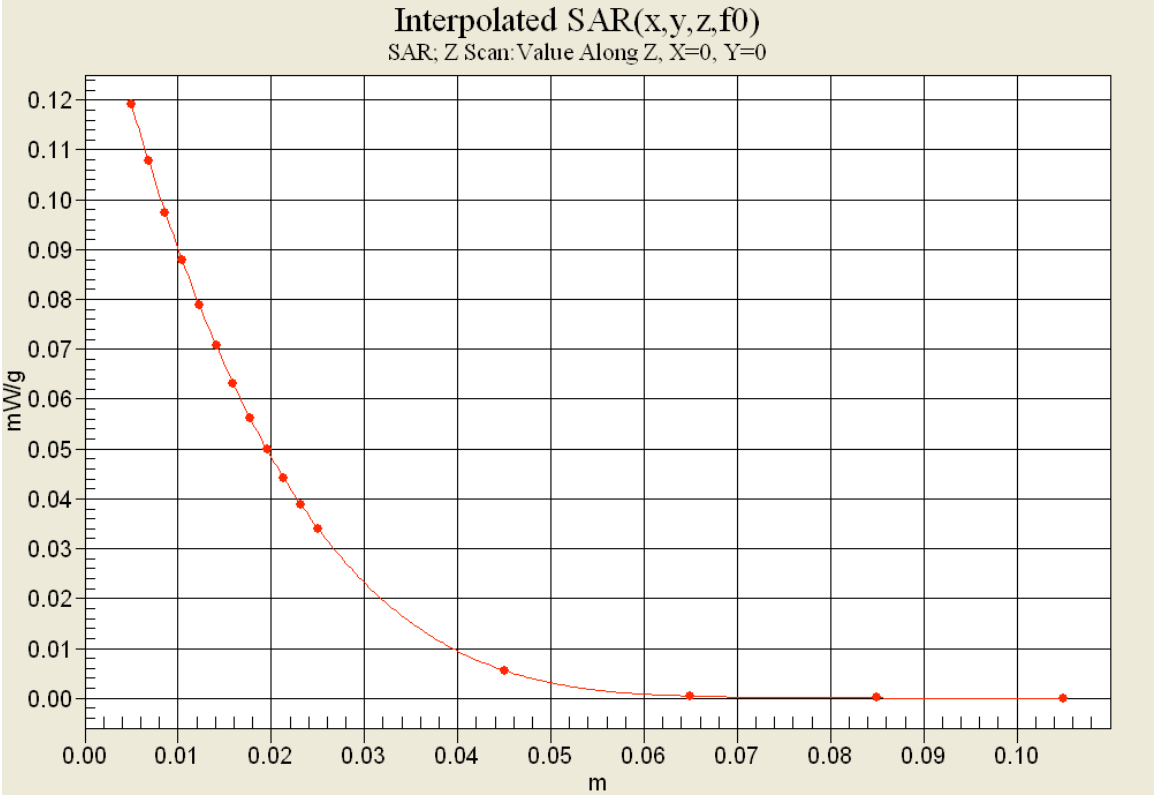
Flat, in holster - High/Area Scan (81x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.439 mW/g

Flat, in holster - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 13.7 V/m; Power Drift = -0.958 dB
Peak SAR (extrapolated) = 0.544 W/kg
SAR(1 g) = 0.382 mW/g; SAR(10 g) = 0.247 mW/g
Maximum value of SAR (measured) = 0.411 mW/g

0 dB = 0.411mW/g



8.2.2 CDMA Band Class 1 (PCS) Z-axis plot



8.2.3 CDMA Band Class 0 (US Cellular)

Date/Time: 10/6/2008 1:52:19 PM

Test Laboratory: QUALCOMM Incorporated

20081006_AmberWatch_1x-cell

DUT: inGeo AW; Type: phone; Serial: 0714CC2B

Communication System: CDMA835; Frequency: 824.7 MHz;Duty Cycle: 1:1
Medium: MSL835 Medium parameters used: f = 824.7 MHz; σ = 0.965 mho/m; εr = 56.6; ρ = 1000 kg/m3
Phantom section: Flat Section

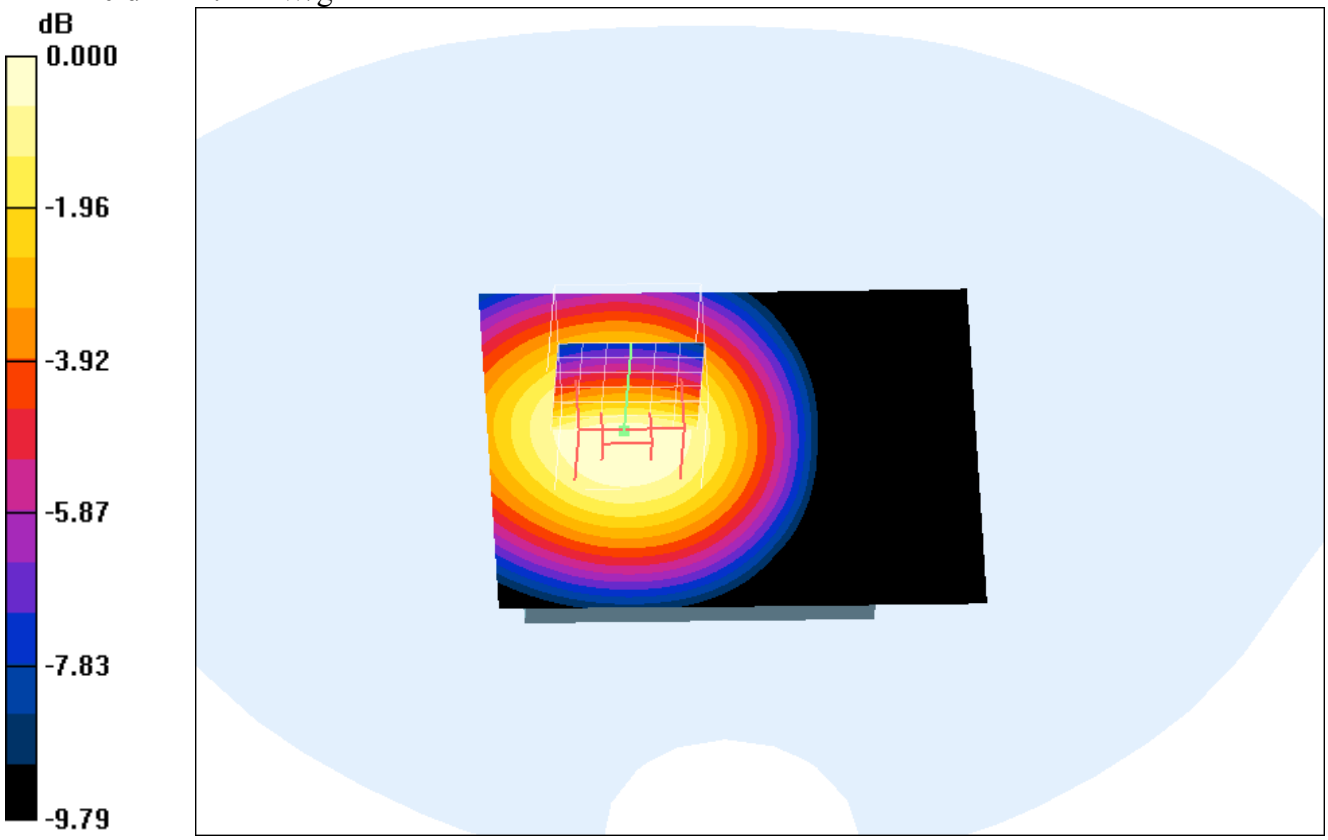
DASY4 Configuration:

* Probe: ET3DV6 - SN1733; ConvF(6.41, 6.41, 6.41); Calibrated: 9/17/2008
* Sensor-Surface: 4mm (Mechanical Surface Detection)
* Electronics: DAE3 Sn400; Calibrated: 3/5/2008
* Phantom: SAM with CRP; Type: SAM;
* Measurement SW: DASY4, V4.7 Build 55;

Flat, in holster - Low/Area Scan (81x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 1.27 mW/g

Flat, in holster - Low/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 33.8 V/m; Power Drift = -0.849 dB
Peak SAR (extrapolated) = 1.45 W/kg
SAR(1 g) = 1.14 mW/g; SAR(10 g) = 0.802 mW/g
Maximum value of SAR (measured) = 1.21 mW/g

0 dB = 1.21mW/g



Date/Time: 10/6/2008 2:26:12 PM

Test Laboratory: QUALCOMM Incorporated

20081006_AmberWatch_1x-cell

DUT: inGeo AW; Type: phone; Serial: 0714CC2B

Communication System: CDMA835; Frequency: 836.49 MHz;Duty Cycle: 1:1
Medium: MSL835 Medium parameters used: f = 836.505 MHz; σ = 0.976 mho/m; εr = 56.5; ρ = 1000 kg/m3
Phantom section: Flat Section

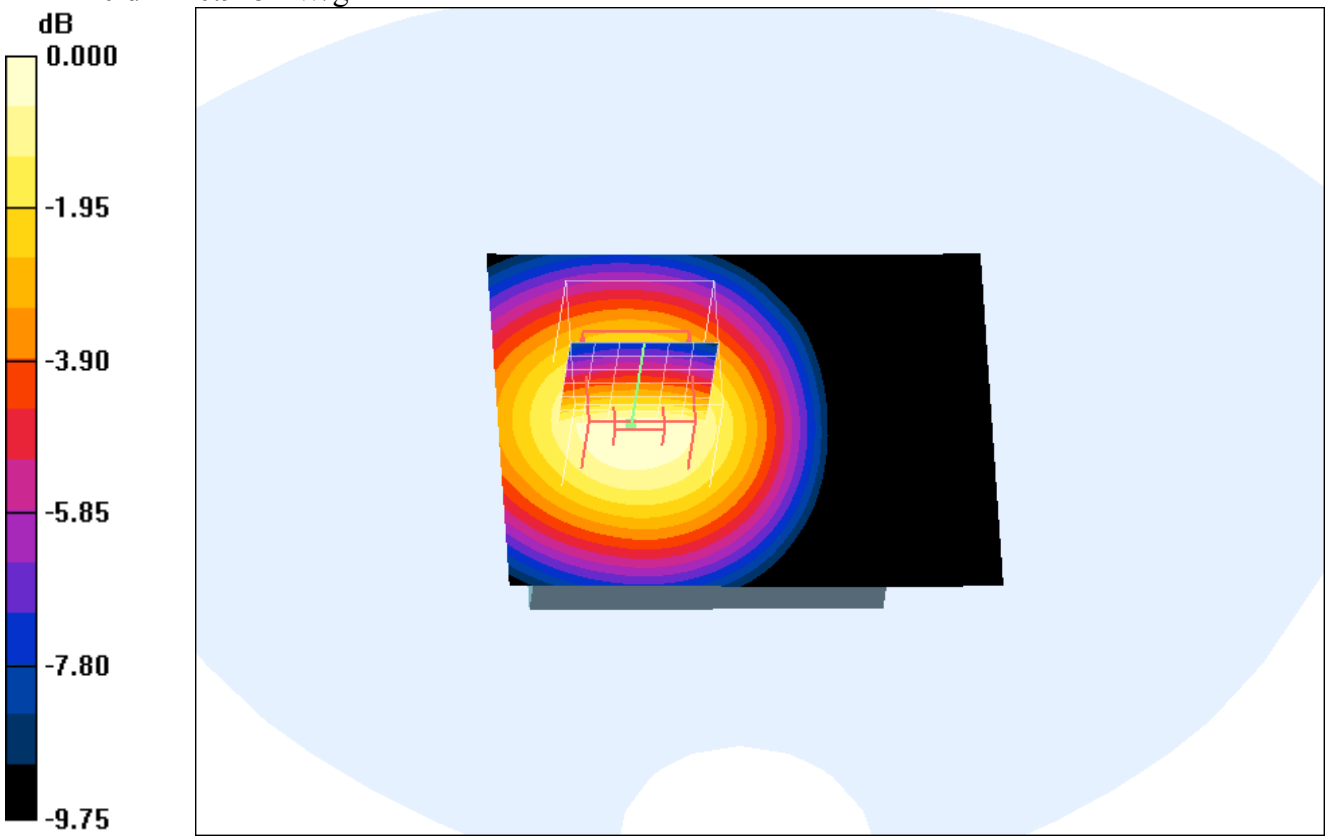
DASY4 Configuration:

* Probe: ET3DV6 - SN1733; ConvF(6.41, 6.41, 6.41); Calibrated: 9/17/2008
* Sensor-Surface: 4mm (Mechanical Surface Detection)
* Electronics: DAE3 Sn400; Calibrated: 3/5/2008
* Phantom: SAM with CRP; Type: SAM;
* Measurement SW: DASY4, V4.7 Build 55;

Flat, in holster - Middle/Area Scan (81x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.922 mW/g

Flat, in holster - Middle/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 27.0 V/m; Power Drift = -0.061 dB
Peak SAR (extrapolated) = 1.13 W/kg
SAR(1 g) = 0.870 mW/g; SAR(10 g) = 0.613 mW/g
Maximum value of SAR (measured) = 0.925 mW/g

0 dB = 0.925mW/g



Date/Time: 10/6/2008 4:48:03 PM

Test Laboratory: QUALCOMM Incorporated

20081006_AmberWatch_1x-cell

DUT: inGeo AW; Type: phone; Serial: 0714CC2B

Communication System: CDMA835; Frequency: 848.31 MHz;Duty Cycle: 1:1
Medium: MSL835 Medium parameters used: f = 848.31 MHz; σ = 0.986 mho/m; εr = 56.4; ρ = 1000 kg/m3
Phantom section: Flat Section

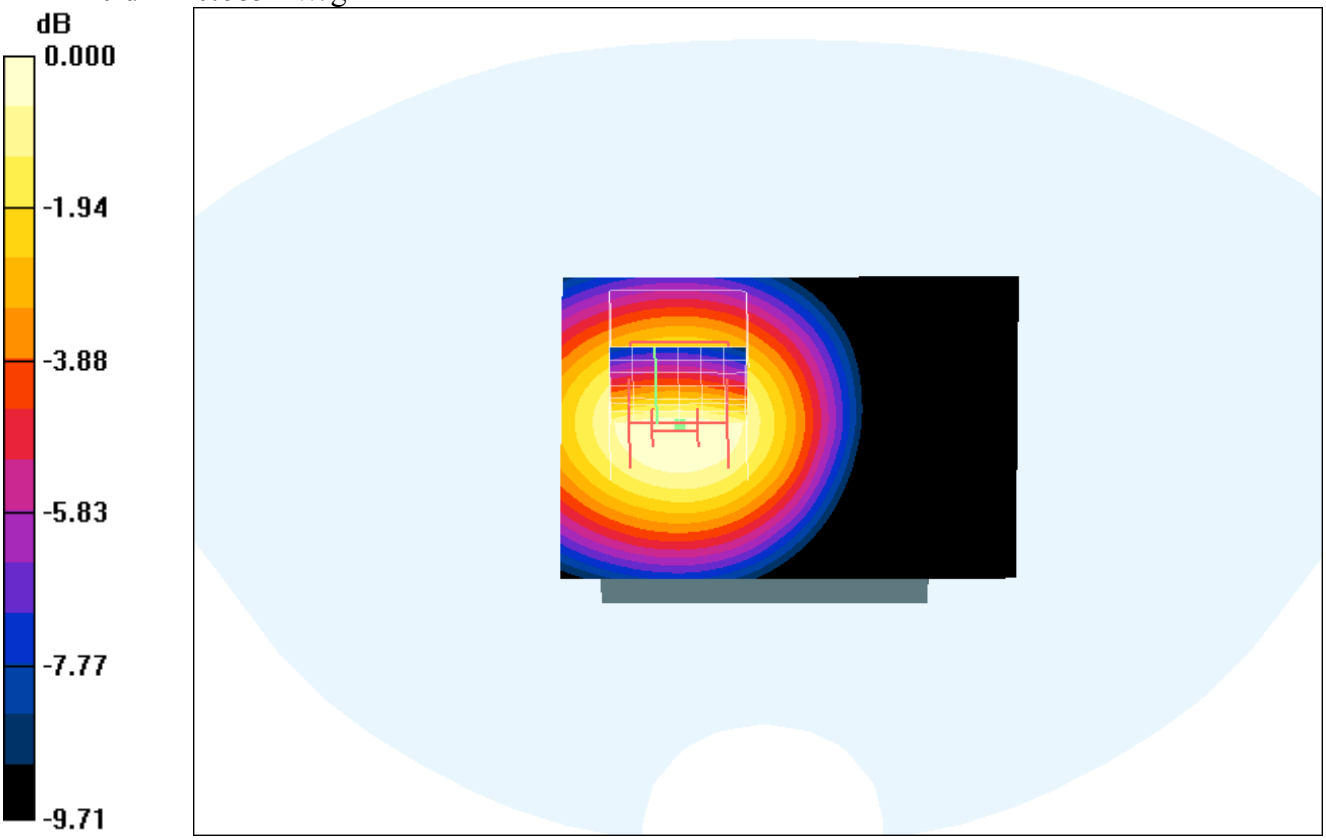
DASY4 Configuration:

* Probe: ET3DV6 - SN1733; ConvF(6.41, 6.41, 6.41); Calibrated: 9/17/2008
* Sensor-Surface: 4mm (Mechanical Surface Detection)
* Electronics: DAE3 Sn400; Calibrated: 3/5/2008
* Phantom: SAM with CRP; Type: SAM;
* Measurement SW: DASY4, V4.7 Build 55;

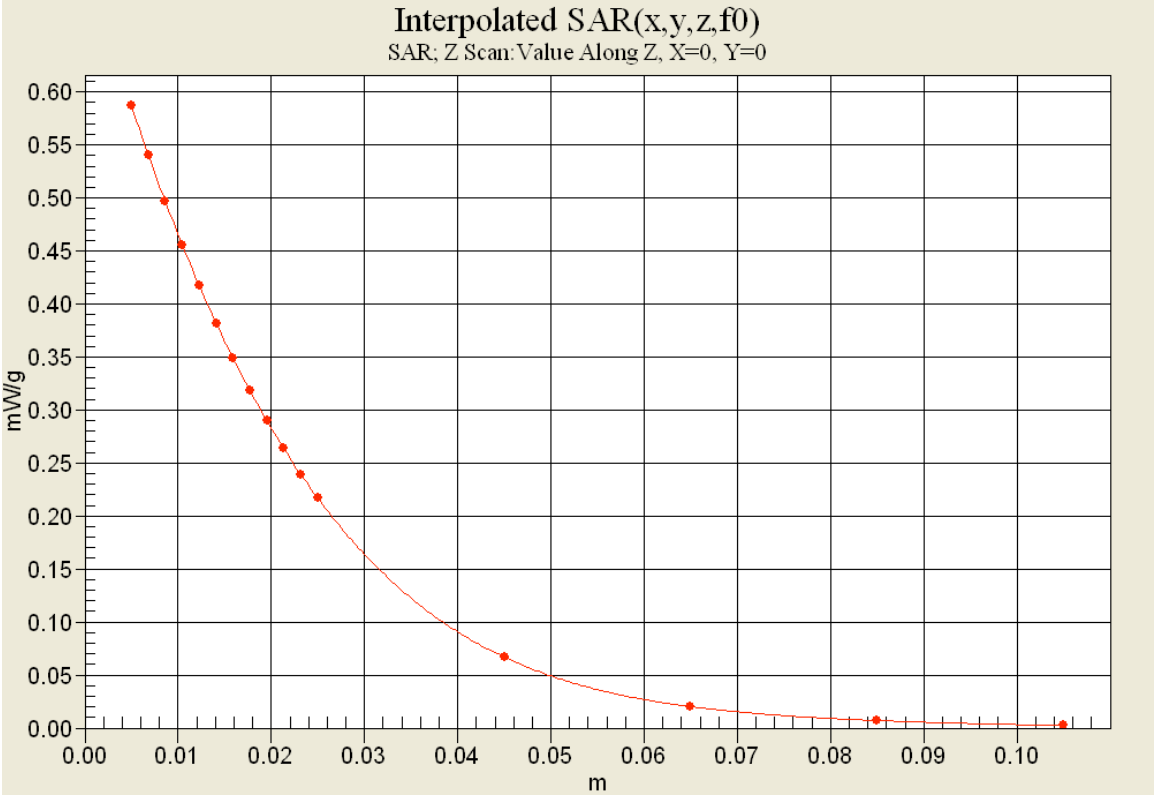
Flat, in holster - High/Area Scan (81x101x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (interpolated) = 0.718 mW/g

Flat, in holster - High/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.2 V/m; Power Drift = -0.384 dB
Peak SAR (extrapolated) = 0.831 W/kg
SAR(1 g) = 0.650 mW/g; SAR(10 g) = 0.460 mW/g
Maximum value of SAR (measured) = 0.685 mW/g

0 dB = 0.685mW/g



8.2.4 CDMA Band Class 0 (US Cellular) Z-axis Plot



9 System Specifications and Calibration

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

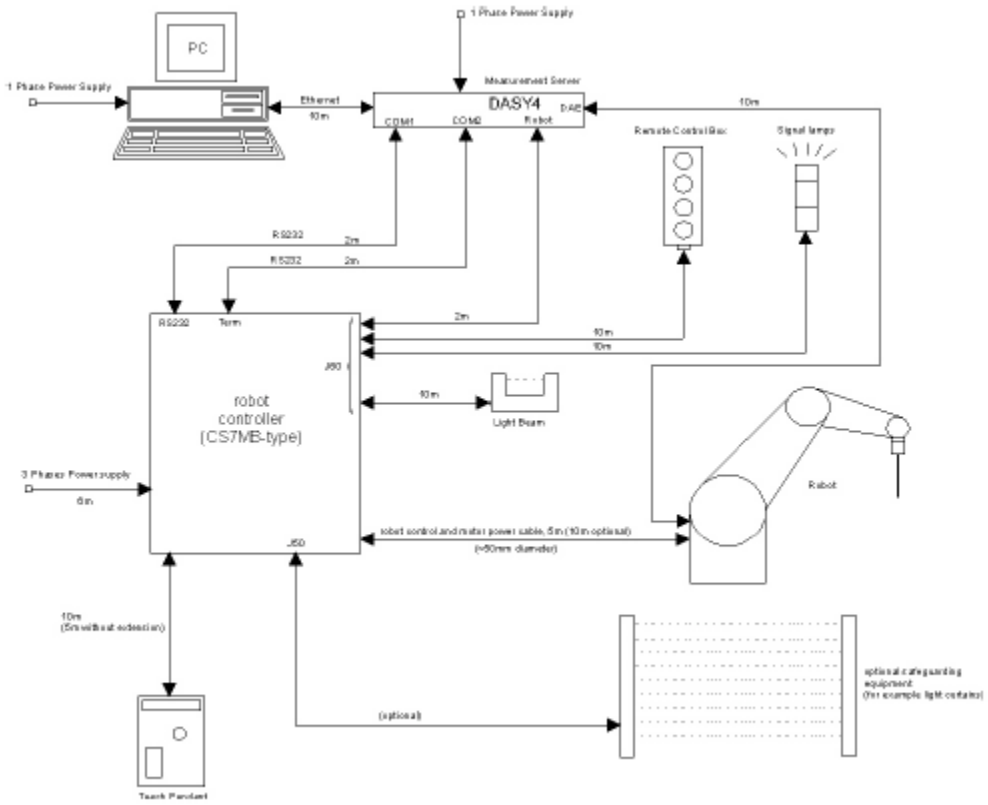


Figure 9-1 DASY4 system diagram, from S&P Applications Notes System Description and Setup

Table 9-1 Data acquisition

Processor	Intel Pentium 4, 2.40 GHz
Operating system	MS Windows® XP
Software	DASY4 V4.2.37.0, Schmid & Partners Eng. AG, Switzerland SEMCAD V1.6 build 115
Surface detection	Optical and mechanical

Table 9-2 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	5 µW/g to 100 mW/g
Isotropy	±0.15 dB (in brain liquid)

Table 9-3 Phantom

Dielectric	US cellular band: Homogeneous sugar/salt/cellulose liquid US PCS band: Homogeneous water/glycol/salt liquid
Shell	2 mm ± 0.2 mm polyester fiber glass
Ear	Integral model per SAM phantom specification

Table 9-4 Calibration

Equipment Mfr & Type	**Serial number**	**Last Calibrated**	**Next Calibration**
Schmid & Partner Engineering AG Dosimetric E-field Probe, ET3DV5	1733	09/17/2008	09/17/2009
Schmid & Partner Engineering AG dipole validation kit, D1900V2	5d016	09/15/2008	09/15/2010
Schmid & Partner Engineering AG dipole validation kit, D835V2	466	11/24/2007	11/24/2008
Schmid & Partner Engineering AG Data Acquisition Electronics, DAE3 V1	400	03/05/2008	03/05/2009
Agilent Wireless Com Test Set, E5515C	MY47510396	04/03/2008	04/03/2009
Gigatronics 8541C RF Power Meter	K82228	9/21/07	9/21/2008
Hewlett-Packard 8714C Vector Network Analyzer	US38171129	4/3/2008	4/3/2009
Hewlett-Packard 85070E Dielectric Probe System	N/A	N/A	N/A
835 MHz Body Tissue Simulating Liquid	N/A	August 2006	N/A
1900 MHz Body Tissue Simulating Liquid	N/A	August 2006	N/A

10 Calibration Data

The following pages show calibration certification data for the Schmid & Partner AG DASY3 SAR system.