TEST REPORT

Report Number: 3125063LEX-002
Project Number: 3125065

Evaluation of Model Number: System 5000 PTU

FCC ID: OAM5000

Tested to the SAR Criteria in
FCC OET Bulletin 65, Supplement C (Edition 01-01)

For

iSECUREtrac Corporation

Test Performed by:	Test Authorized by:
Intertek 731 Enterprise Drive Lexington, KY 40510	iSECUREtrac Corporation 5022 South 114th Street Omaha, NE 68137

Prepared By:_____ **Date:**____8/17/2007_____

Vinay Kutty, Senior Project Engineer

Approved By:_____ **Date:**____8/17/2007_____

Bryan C. Taylor, Team Leader

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1.0 DOCUMENT HISTORY

Revision/ Project Number	Writer Initials	Date	Change
1.0 /3125065	VK	8/17/2007	Original document

2.0 REFERENCES

1] ANSI, *ANSI/IEEE C95.1-1991: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3kHz to 300 GHz*, The Institute of electrical and Electronics Engineers, Inc., New York, NY 10017, 1992

[2] Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", OET Bulletin 65, FCC, Washington, D.C. 20554, 1997

[3] Thomas Schmid, Oliver Egger, and Niels Kuster, "Automated E-field scanning system for dosimetric assessments", *IEEE Transaction on Microwave Theory and Techniques*, vol. 44, pp. 105-113, Jan. 1996.

[4] Niels Kuster, Ralph Kastle, and Thomas Schmid, "Dosimetic evaluation of mobile communications equipment with know precision", IEICE Transactions on Communications, vol. E80-B, no. 5, pp.645-652, May 1997.

5] NIS81, NAMAS, "The treatment of uncertainty in EMC measurement", Tech. Rep., NAMAS Executive, National Physical Laboratory, Teddinton, Middlesex, England, 1994.

6] Barry N. Tayor and Chris E. Kuyatt, "Guidelines for evaluating and expressing the uncertainty of NIST measurement results", Tech. Rep., National Institute of Standards and Technology, 1994.

3.0 INTRODUCTION

The System 5000 PTU was evaluated for SAR in accordance with the requirements for RF Exposure compliance testing defined in FCC OET Bulletin 65, Supplement C (Edition 01-01). Testing was performed at the Intertek facility in Lexington, Kentucky.

For the evaluation, the dosimetric assessment system DASY4 was used. The phantom employed was the "SAM Twin Phantom". The total uncertainty for the evaluation of the spatial peak SAR values averaged over a cube of 1g tissue mass had been assessed for this system to be ±21.9%.

The System 5000 PTU was tested at the maximum output power measured by Intertek. Maximum output power measurements are tabulated under **Heading 11.0 - Tabular Test Results**.

The maximum spatial peak SAR value for the sample device averaged over 1g was found to be:

Phantom	Mode	Setup Details	Worst Case Extrapolated SAR_{1g} mW/g
Flat Section (Body Mode)	CDMA Cell Band	Left side of device against flat phantom. f = 836.52 MHz Simultaneous transmission at 451.4 MHz (CW)	**0.157**
Flat Section (Body Mode)	CDMA PCS Band	Top face of device against flat phantom. f = 1880.0 MHz. Simultaneous transmission at 439.2 MHz (CW)	**0.027**

Based on the worst-case data presented above, the System 5000 PTU was found to be **compliant** with the 1.6 mW/g requirement defined in OET Bulletin 65, Supplement C (Edition 01-01).

Modifications made to test sample

Intertek implemented no modifications.

4.0 TEST SITE DESCRIPTION

The SAR test site located at 731 Enterprise Drive, Lexington KY 40510 is comprised of the SPEAG model DASY 4 automated near-field scanning system, which is a package, optimized for dosimetric evaluation of mobile radios [3]. This system is installed in an ambient-free shielded chamber. The Ambient temperature is controlled to 22.2 $\pm 2^{O}$C. Because the HVAC operates as a closed system, the relative humidity remains constant at 50 $\pm$5%. During the SAR evaluations, the RF ambient conditions are monitored continuously for signals that might interfere with the test results. The tissue simulating liquid is also stored in this area in order to keep it at the same constant ambient temperature as the room.

Figure 1: Intertek SAR Test Site

Measurement Equipment

The following major equipment/components were used for the SAR evaluations:

SAR Measurement System			
EQUIPMENT	**SPECIFICATIONS**	**S/N #**	**Cal. Due**
Robot	**Stäubli RX60L**	597412-01	N/A
	Repeatability: ± 0.025mm Accuracy: 0.806x10-3 degree Number of Axes: 6		
E-Field Probe	**EX3DV3**	3516	11/23/2007
	Frequency Range: 900MHz to 6GHz Probe Linearity: ± 0.2 dB (30 MHz to 6 GHz) Length: 34.5 cm Distance between the probe tip and the dipole center: 2.7 mm Tip Diameter: 2.4 mm Calibration: 900, 1800, 2450, 5200 and 5800 MHz for head & body tissue simulating liquid		
Data Acquisition	**DAE4**	358	4/19/2008
	Measurement Range: 1µV to >200mV Input offset Voltage: < 1µV (with auto zero) Input Resistance: 200 M		
Phantom	**SAM Twin V4.0**	TP-1243	N/A
Complies with IEEE P1528-2003	Type SAM Twin, Homogenous Shell Material: Fiberglass Thickness: 2 ± 0.2 mm Capacity: 20 liter Size of the flat section: approx. 320 x 230 mm		
Device holder	Non-conductive holder supplied with DASY4, dielectric constant less than 5.0	N/A	N/A
Network Analyzer	**Agilent 8753ES**	US39173983	8/14/2007
	Frequency Range: 30KHz – 6.0 GHz		
Signal Generator	**HP 83620B**	2065	8/15/2007
	Frequency Range: 10MHz – 20 GHz		
Spectrum Analyzer	**Rohde & Schwarz FSP**	1164.4391.07	8/2/2007
	Frequency Range: 9KHz – 7 GHz		
Wireless Communications Test Set	**Agilent 8960**	GB42230114	7/20/2007
Wireless Communications Test Set	**CMU200**	1100.0008.02	3/29/2008

Measurement Uncertainty

The Table below includes the uncertainty budget suggested by the IEEE Std 1528-200X and determined by SPEAG for the DASY4 measurement System

Error Description	Uncertainty Value	Prob. Dist.	Div.	c_i (1g)	c_i (10g)	Std.Unc. (1g)	Std.Unc. (10g)	(v_i) v_{eff}
Measurement System								
Probe Calibration	±5.9%	N	1	1	1	±5.9%	±5.9%	∞
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 Effect	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%	∞
System Detection Limits	±1.0%	R	√3	1	1	±0.6%	±0.6%	∞
Readout Electronics	±0.3%	N	1	1	1	±0.3%	±0.3%	∞
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	±3.0%	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%	∞
Max. SAR Eval.	±1.0%	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	±5.0%	R	√3	1	1	±2.9%	±2.9%	∞
Phantom and Tissue Parameters								
Phantom Uncertainty	±4.0%	R	√3	1	1	±2.3%	±2.3%	∞
Liquid Conductivity (target)	±5.0%	R	√3	0.64	0.43	±1.8%	±1.2%	∞
Liquid Conductivity (meas.)	±2.5%	N	1	0.64	0.43	±1.6%	±1.1%	∞
Liquid Permittivity (target)	±5.0%	R	√3	0.6	0.49	±1.7%	±1.4%	∞
Liquid Permittivity (meas.)	±2.5%	N	1	0.6	0.49	±1.5%	±1.2%	∞
Combined Standard Uncertainty						±10.9%	±10.7%	387
Expanded STD Uncertainty						**±21.9%**	**±21.4%**	

Notes.

1. Worst Case uncertainty budget for DASY4 assessed according to IEEE 1528. The budget is valid for the frequency range 300 MHz – 3 GHz and represents a worst-case analysis. For specific tests and configurations, the uncertainty could be considerably smaller.

Measurement Traceability

All measurements described in this report are traceable to National Institute of Standards and Technology (NIST) standards or appropriate national standards.

5.0 JOB DESCRIPTION

The iSECUREtrac Corporation , Model: System 5000 PTU has been tested to the requirements defined in OET Bulletin 65, Supplement C (Edition 01-01) at the request of:

Manufacturer of the device:	iSECUREtrac Corporation 5022 South 114th Street Omaha, NE, 68137
Model number of the device:	System 5000 PTU
Name of contact:	Jef Higgason
Telephone:	(402) 537-5663
Fax:	(402) 537-9847
E-mail:	jhiggason@isecuretrac.com
Manufacturer of the radio module:	AnyDATA
Model Number of the radio module:	DSG2000-Dual
Serial Number of the radio module:	0608C3234368
EUT receive date:	6/4/2007
EUT received condition:	Good condition production unit
Test start date:	6/4/2007
Test end date:	6/6/2007

Test Sample Description

The iSECUREtrac Corporation System 5000 PTU is a portable tracking unit that is used by law enforcement to locate and track offenders.

Test sample		
Model	System 5000 PTU	
FCC ID	OAM5000	
Device Category	Portable	
RF Exposure Category	General Population/Uncontrolled Environment	
System	CDMA Cell/PCS	
Frequency Band	824.7 MHz – 848.31 MHz (CDMA Cell Band) 1851.25 MHz – 1908.75 MHz (CDMA PCS Band)	
Mode(s) of Operation	CDMA Cell	CDMA PCS
Duty Cycle	1:1	1:1
Maximum output power	24.48 dBm	24.21 dBm
Radio Modules		
Module Description	CDMA radio	
Module Manufacturer	AnyDATA	
Module Model Number	DTG2000-Dual	
Module FCCID	P4M-DTG2000	

Test sample Accessories	
Battery type	AVT-900494 Li-Ion Rechargeable 3900 mAh battery (3.6V)
Belt clip	None provided

Test Signal Mode	
Test Commands	
Base Station Simulator	X

Test Sample Pictures:

Internal and external test sample pictures can by found in the following accompanying documents:

iSECUREtrac PTU5000 Internal Photographs.pdf

iSECUREtrac PTU5000 External Photographs.pdf

6.0 SYSTEM VERIFICATION

Dipole System Validation

Prior to the assessment, the system was verified to be within ±10% of the specifications by using the system validation kit. The validation was performed at 900 MHz and 1800MHz using head tissue.

Figure 2: Photograph of System Verification (900MHz Dipole Positioned at Flat Phantom)[1]

[1] A similar positioning was used for the 1800 MHz dipole.

REFERENCE DIPOLE VALIDATION – 900 MHz								
Dipole dimensions: L=150.2 mm, D=3.6 mm								
Feed-point impedance at 900 MHz: Re{Z} = 50.3 Ohm; Im{Z} = 0.7 Ohm								
Return Loss at 900 MHz: -41.9 dB								
Frequency Measure (MHz)	**Dipole Type**	**Dipole Serial Number**	**Fluid Type**	**Dipole Power Input**	**Cal. Lab SAR (1g)**	**Measured SAR (1g)**	**% Error SAR (1g)**	**Date**
900	D900V2	13	900 MHz Head	1W	10.6	10.23	3.49	6/6/07

REFERENCE DIPOLE VALIDATION – 1800 MHz								
Dipole dimensions: L=72.7 mm, D=3.6 mm								
Feed-point impedance at 1800 MHz: Re{Z} = 50.4 Ohm; Im{Z} = -3.1 Ohm								
Return Loss at 1800 MHz: -30.2 dB								
Frequency Measure (MHz)	**Dipole Type**	**Dipole Serial Number**	**Fluid Type**	**Dipole Power Input**	**Cal. Lab SAR (1g)**	**Measured SAR (1g)**	**% Error SAR (1g)**	**Date**
1800	D1800V2	224	1800 MHz Head	1W	39.7	39.72	0.05	6/4/07
1800	D1800V2	224	1800 MHz Head	1W	39.7	37.60	5.29	6/5/07

Tissue Simulating Liquid Description and Validation

Ingredient (% by weight)	f (MHz)			
	900		1900	
Tissue Type	Head	Body	Head	Body
Water	41.45	52.40	54.90	70.45
Salt (NaCl)	1.45	1.40	0.18	0.36
Sugar	56.00	45.00	-	-
HEC	1.00	1.00	-	-
Bactericide	0.10	0.10	-	-
Triton X-100	-	-	-	-
DGBE	-	-	44.92	29.18
DGHE	-	-	-	-

Note: The amounts of each ingredient specified in the tables are not the exact amounts of the final test solution. The final test solution was adjusted by adding small amounts of the appropriate ingredient to calibrate the solution to meet the proper dielectric parameters.

The ambient temperature of the test site, as well as the temperature of the tissue simulating fluid, were recorded on each day of testing, as shown in the table below:

Date	Ambient Temperature (°F)	Muscle Simulating Liquid Temperature (°F) f=900MHz	Head Simulating Liquid Temperature (°F) f=900MHz	Muscle Simulating Liquid Temperature (°F) f=1800MHz	Head Simulating Liquid Temperature (°F) f=1800MHz
6/4/07	70.2	Not Used	Not Used	70.4	70.0
6/5/07	71.7	Not Used	Not Used	71.7	71.0
6/6/07	70.7	70.7	70.5	Not Used	Not Used

The dielectric parameters were verified prior to assessment using the HP 8753A Network Analyzer. The dielectric parameters (ε_r, σ) on each day of testing were as follows:

Head Tissue Parameters								
Frequency Measure (MHz)	**Dielectric Constant Target**	**Dielectric Constant Measure**	**Dielectric % Deviation**	**Imaginary Part**	**Conductivity Target**	**Conductivity Measure**	**Conductivity % Deviation**	**Date**
900	41.5	40.26	2.99	20	0.97	1.0007	3.17	6/6/07
Body Tissue Parameters								
Frequency Measure (MHz)	**Dielectric Constant Target**	**Dielectric Constant Measure**	**Dielectric % Deviation**	**Imaginary Part**	**Conductivity Target**	**Conductivity Measure**	**Conductivity % Deviation**	**Date**
900	55	53.77	2.24	20.2	1.05	1.01	3.74	6/6/07

Head Tissue Parameters								
Frequency Measure (MHz)	**Dielectric Constant Target**	**Dielectric Constant Measure**	**Dielectric % Deviation**	**Imaginary Part**	**Conductivity Target**	**Conductivity Measure**	**Conductivity % Deviation**	**Date**
1800	40	40.4	1.00	14.33	1.4	1.43	2.43	6/4/07
1800	40	40.5	1.25	14.2	1.4	1.42	1.50	6/5/07
Body Tissue Parameters								
Frequency Measure (MHz)	**Dielectric Constant Target**	**Dielectric Constant Measure**	**Dielectric % Deviation**	**Imaginary Part**	**Conductivity Target**	**Conductivity Measure**	**Conductivity % Deviation**	**Date**
1880	53.3	53.1	0.38	15.2	1.52	1.59	4.52	6/4/07
1880	53.3	52.88	0.79	15	1.52	1.57	3.14	6/5/07

Maximum mass density ρ = 1 g/cm^3

Maximum deviation of the dielectric parameters from the recommended values was 4.52 %.

During the measurements, the liquid level was maintained to a level of 15 cm with a tolerance of ±0.2 cm.

7.0 EVALUATION PROCEDURES

Prior to any testing, the appropriate fluid was used to fill the phantom to a depth of 15 cm ±0.2cm. The fluid parameters were verified and the dipole validation was performed as described in the previous sections.

Test Positions:

The Device was positioned against the SAM and flat phantom using the exact procedure described in Supplement C Edition 01 – 01 of Federal Communications Commission, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", OET Bulletin 65, FCC, Washington, D.C. 20554, 1997.

Reference Power Measurement:

The measurement probe was positioned at a fixed location above the reference point. A power measurement was made with the probe above this reference position so it could used for the assessing the power drift later in the test procedure.

Coarse Scan:

A coarse area scan with a horizontal grid spacing of 15 x 15 mm was performed in order to find the approximate location of the peak SAR value. This scan was performed with the measurement probe at a constant height in the simulating fluid. A two dimensional spline interpolation algorithm was then used to determine the peaks and gradients within the scanned area.

Zoom Scan:

A zoom scan was performed around the approximate location of the peak SAR as determined from the coarse scan. The zoom scan was comprised of a measurement volume of 30 x 30 x 30 mm based on 7 x 7 x 7 points. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

Data Extrapolation:

Since the center of the dipoles in the measurement probe are 2.7 mm away from the tip of the probe, and the distance between the surface and the lowest measurement point is 1.6 mm the data at the surface was extrapolated. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in the Z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.

The maximum interpolated value was searched with a straightforward sorting algorithm. Around this maximum, the SAR values averaged over the spatial volumes (1g or 10g) were computed using a 3-D spline interpolation algorithm. The 3-D spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y and z directions). The volume was integrated with a trapezoidal algorithm. 1000 points (10 x 10 x 10) were interpolated to calculate the average.

All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.

Reference Power Measurement:

The probe was positioned at precisely the same reference point and the reference power measurement was repeated. The difference between the initial reference power and the final one is referred to as the power drift. If the power drift exceeded 5% of the final peak SAR value, the measurement was repeated.

RF Ambient Activity:

During the entire SAR evaluation, the RF ambient activity was monitored using a spectrum analyzer with an antenna connected to it. The spectrum analyzer was tuned to the frequency of measurement and with one trace set to max hold mode. In this way, it was possible to determine if at any point during the SAR measurement there was an interfering ambient signal. If an ambient signal was detected, then the SAR measurement was repeated.

8.0 TEST CONFIGURATION / TEST PHOTOGRAPHS

For the purpose of this evaluation, the System 5000 PTU was considered to be a body-worn device which operates in the CDMA Cell and PCS bands. Calls to the device were made with the use of an Agilent 8960 base station simulator. The System 5000 PTU was placed in a call and "All Up" bits were selected in order to transmit at maximum power at the selected channel.

Photographs of the System 5000 PTU, as configured for testing, are shown below:

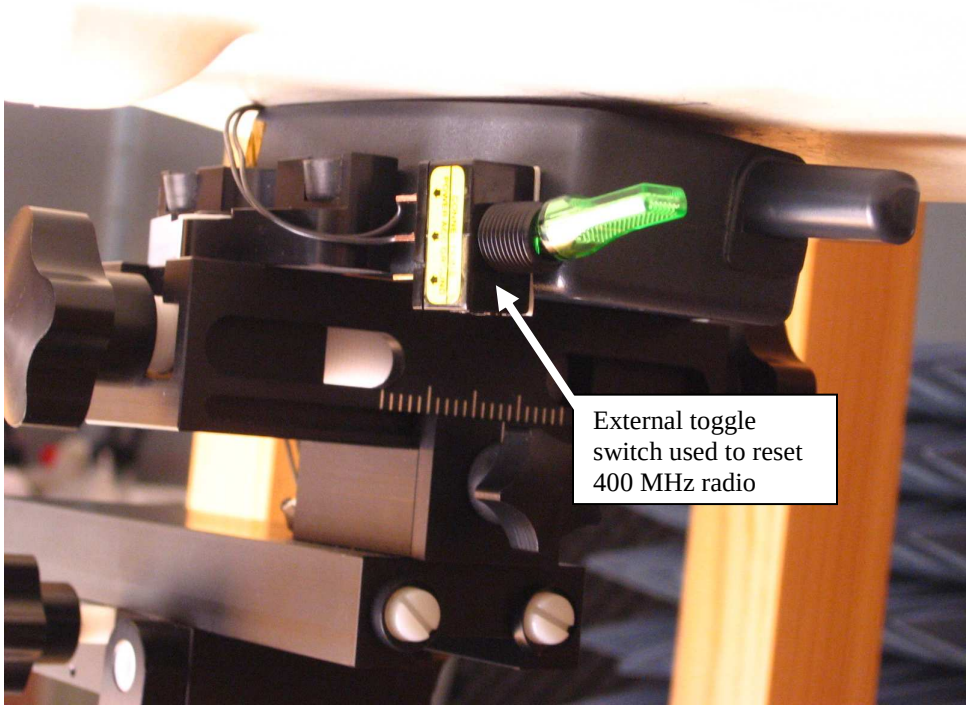


Figure 3: Setup for area scans on the front face of the System 5000 PTU

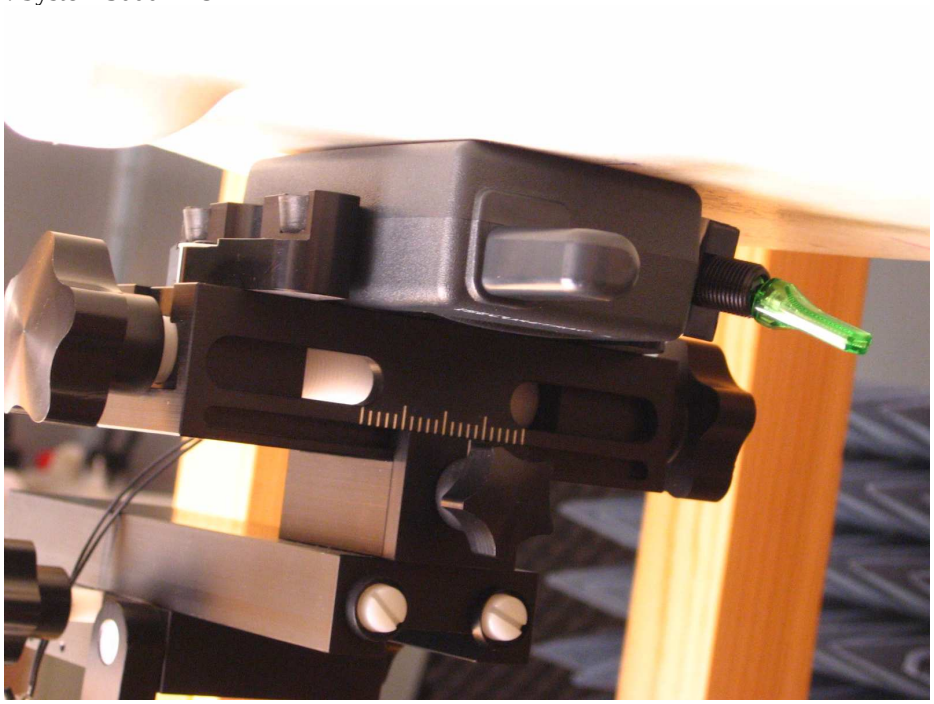


Figure 4: Setup for area scans on the bottom face of the System 5000 PTU

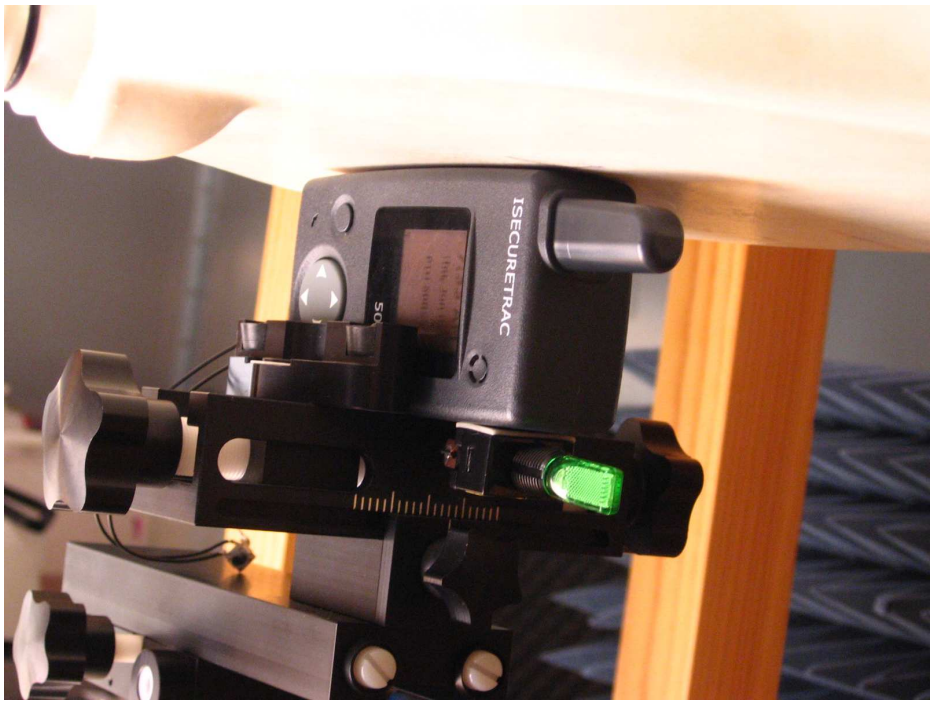


Figure 5: Setup for area scans on the left side of the System 5000 PTU

Figure 6: Setup for area scans on the right side of the System 5000 PTU

9.0 CRITERIA

The following FCC limits for SAR apply to devices operating in the General Population/Uncontrolled Exposure environment:

Exposure (General Population/Uncontrolled Exposure environment)	SAR (W/kg)
Average over the whole body	0.08
Spatial Peak (1g)	1.60
Spatial Peak for hands, wrists, feet and ankles (10g)	4.00

10.0 ENGINEERING JUDGMENTS

The System 5000 PTU was evaluated as a body-worn device only. The System 5000 PTU is equipped with an earpiece and microphone. However, iSECUREtrac Corporation has stated that a voice-call feature is not utilized in this particular model. Therefore, no Head-mode scans were performed. All tests were performed in Body mode, with the device placed directly against the flat phantom. No case or other accessory was provided for use against the body. Therefore, SAR scans were performed on all faces of the System 5000 PTU, excluding the device's ends. See **8.0 Test Configuration / Test Photographs**, above, for details.

The System 5000 PTU is charged on a separate base charger (System 5000 Charging Base). Since this accessory has no body or head-worn use, it was excluded from SAR testing.

The System 5000 PTU contains a 400 MHz radio which provides a communication link between the PTU and the charging base. The output power of this radio is 10 mW. Although no SAR testing was performed specifically on this radio, it was set to transmit in a CW mode during all testing of the System 5000 PTU's CDMA radio. An external push-button switch was attached to the PTU in order to select between the radio's operating frequencies during the SAR tests. An external toggle switch was also wired to the PTU in order to reset the sequence of test frequencies.

11.0 TABULAR TEST RESULTS

The results on the following page(s) were obtained when the device was tested in the operating conditions described in this report. Detailed measurement data and plots, which reveal information about the location of the maximum SAR with respect to the device, are referenced under **Heading 12.0 - Graphical SAR Scan Results**. The extrapolated SAR results account for the drift measurements using the following formula:

Extrapolated SAR = Measured SAR*10^-(Drift/10)

For positive drift values, no extrapolation was performed. A dashed line will appear in the table for the extrapolation values in this case.

Conducted Power Measurements

These conducted power measurements for the System 5000 PTU were made using a CMU200 base station simulator. Cable loss was accounted for within the test set by offsetting the readings by the appropriate amounts.

Transmit Mode		Max Power (dBm)
Tx Band	**Tx Channel**	**CDMA Max Power (dBm)**
CDMA Cell Band	**1013**	24.44
	384	**24.48**
	777	23.84
CDMA PCS Band	**25**	24.09
	600	24.04
	1175	**24.21**

Body Mode Tabular Test Results

During the test, the RF output power of the test sample varied by a small amount due to heat and battery output power variations in the device. To take this power drift into account, a reference measurement was performed at a predefined position in the fluid just before and just after each SAR scan. The difference in these values is recorded in the table below as the SAR drift. The 1-g SAR was extrapolated for drift and is shown in the table below.

Flat Phantom; Body / Data Mode; 1:1 Mode; 1851.25 - 1908.75 MHz (PCS) Band									
Freq. (MHz)	**Channel**	**Test Position**	**Carry Case**	**Other Attachments**	**SAR Drift (dB)**	**Measured 1-g SAR (mW/g)**	**Meas. 10g-SAR (mw/g)**	**Extrapolated Worst Case 1-g SAR (mW/g)**	**Extrapolated Worst Case 10-g SAR (mW/g)**
1851.25	25	NA: Test performed only if mid-channel SAR was within 3dB of the limit							
1880.00	**600**	**Face UP with 439.2 MHz CW tx.**	**None**	**None**	**0.240**	**0.027**	**0.013**	**-**	**-**
1880.00	600	Face UP with 451.4 MHz CW tx.	None	None	0.018	0.016	0.009	-	-
1880.00	600	Face DOWN with 439.2 MHz CW tx.	None	None	0.200	0.012	0.007	-	-
1880.00	600	LEFT side with 439.2 MHz CW tx.	None	None	-0.048	0.011	0.005	0.011	0.005
1880.00	600	RIGHT side with 439.2 MHz CW tx.	None	None	-0.074	0.003	0.002	0.003	0.002
1908.75	1175	NA: Test performed only if mid-channel SAR was within 3dB of the limit							

Flat Phantom; Body / Data Mode; 1:1 Mode; 824.70 - 848.31 MHz (Cell) Band									
Freq. (MHz)	**Channel**	**Test Position**	**Carry Case**	**Other Attachments**	**SAR Drift (dB)**	**Measured 1-g SAR (mW/g)**	**Meas. 10g-SAR (mw/g)**	**Extrapolated Worst Case 1-g SAR (mW/g)**	**Extrapolated Worst Case 10-g SAR (mW/g)**
824.70	1013	NA: Test performed only if mid-channel SAR was within 3dB of the limit							
836.52	384	Face UP with 439.2 MHz CW tx.	None	None	-0.027	0.137	0.086	0.138	0.086
836.52	384	Face DOWN with 439.2 MHz CW tx.	None	None	0.176	0.096	0.064	-	-
836.52	384	LEFT side with 439.2 MHz CW tx.	None	None	-0.038	0.147	0.095	0.148	0.095
836.52	**384**	**LEFT side with 451.4 MHz CW tx.**	**None**	**None**	**-0.108**	**0.153**	**0.099**	**0.157**	**0.101**
836.52	384	RIGHT side with 439.2 MHz CW tx.	None	None	-0.172	0.085	0.040	0.088	0.041
848.31	777	NA: Test performed only if mid-channel SAR was within 3dB of the limit							

12.0 GRAPHICAL SAR SCAN RESULTS

Graphical SAR scan results can be found in the following accompanying document:

iSECUREtrac PTU5000 Graphical Test Results.doc

Body Mode PCS

Test Laboratory: Intertek ETL Semko

DUT: iSECUREtrac PTU5000;Type: PTU 5000; Serial: 0000050057

Medium parameters used: f = 1880 MHz; σ = 1.57 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(8.72, 8.72, 8.72); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 2mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Mode; EUT Face UP; Ch600; With 439.2 MHz CW tx/Area Scan (9x14x1): Measurement grid: dx=10mm, dy=10mm

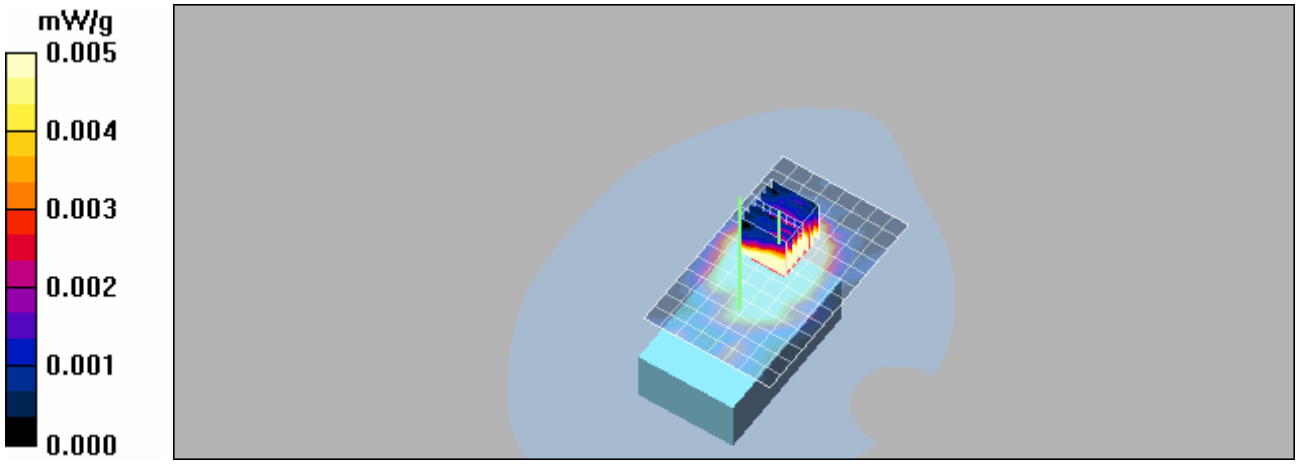
Maximum value of SAR (measured) = 0.037 mW/g

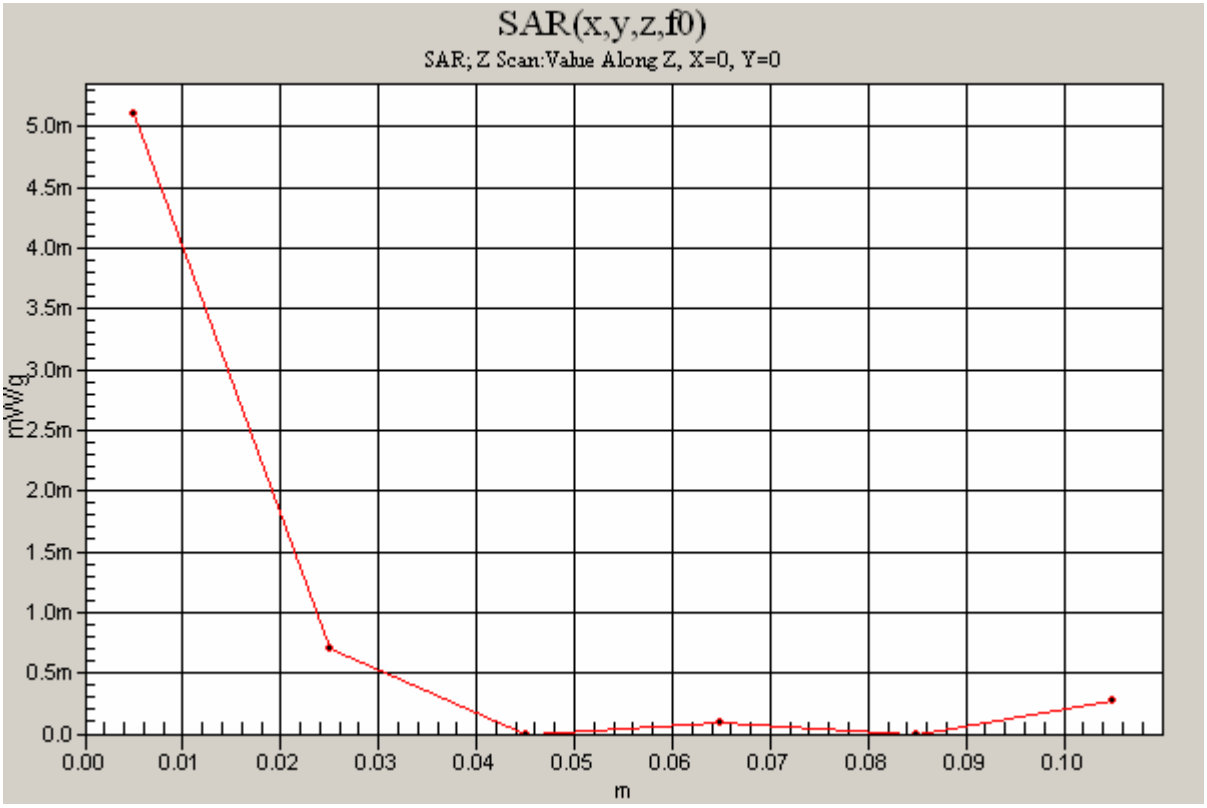
Body Mode; EUT Face UP; Ch600; With 439.2 MHz CW tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 1.84 V/m; Power Drift = 0.240 dB
Peak SAR (extrapolated) = 0.054 W/kg
SAR(1 g) = 0.027 mW/g; SAR(10 g) = 0.013 mW/g
Maximum value of SAR (measured) = 0.031 mW/g

Body Mode; EUT Face UP; Ch600; With 439.2 MHz CW tx/Z Scan (1x1x6): Measurement grid: dx=20mm, dy=20mm, dz=20mm

Maximum value of SAR (measured) = 0.005 mW/g


mW/g
0.005
0.004
0.003
0.002
0.001
0.000


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
5.0m
4.5m
4.0m
3.5m
3.0m
2.5m
2.0m
1.5m
1.0m
0.5m
0.0
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
m

Body Mode PCS

Test Laboratory: Intertek ETL Semko

DUT: iSECUREtrac PTU5000;Type: PTU 5000; Serial: 0000050057

Medium parameters used: f = 1880 MHz; σ = 1.57 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(8.72, 8.72, 8.72); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 2mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Mode; EUT Face UP; Ch600; With 451.4 MHz CW tx/Area Scan (9x14x1): Measurement grid: dx=10mm, dy=10mm

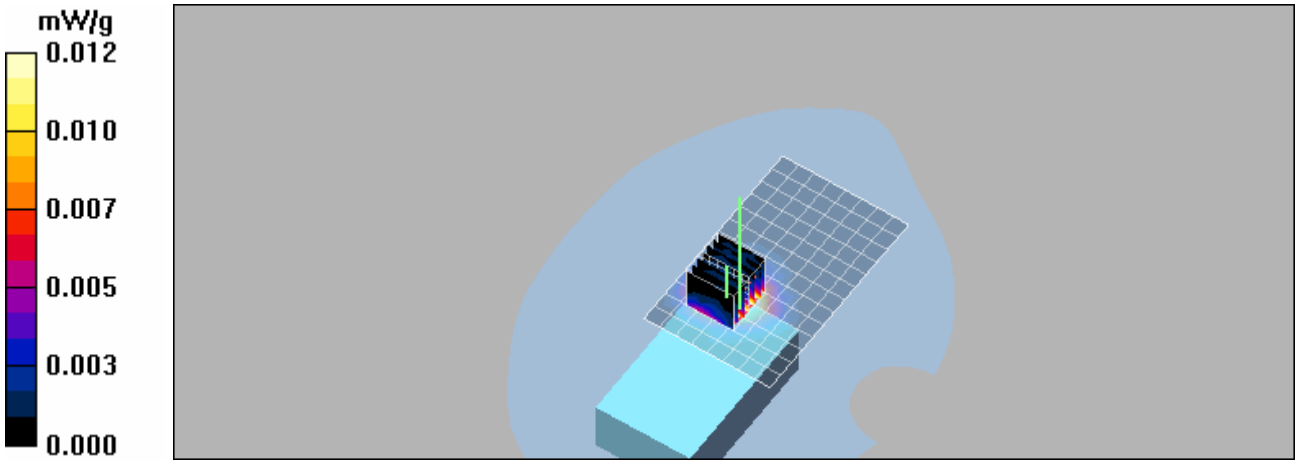
Maximum value of SAR (measured) = 0.020 mW/g

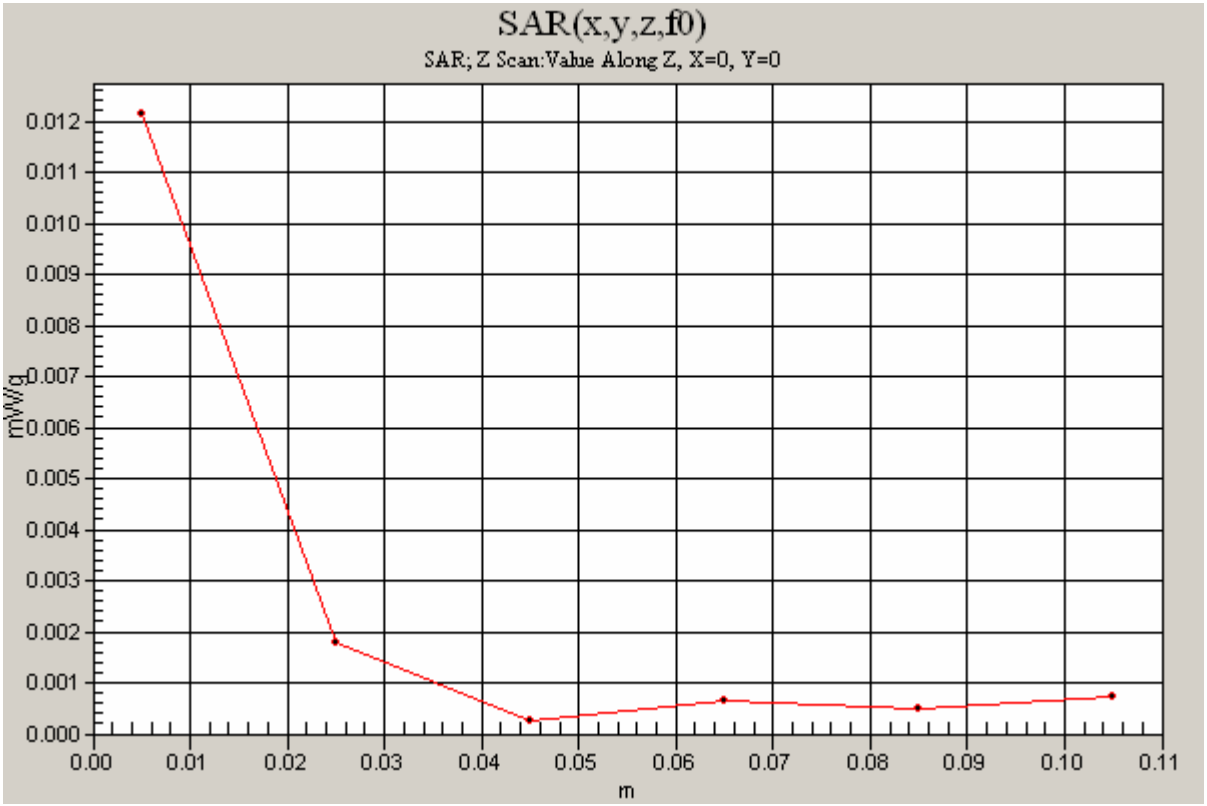
Body Mode; EUT Face UP; Ch600; With 451.4 MHz CW tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 2.58 V/m; Power Drift = 0.018 dB
Peak SAR (extrapolated) = 0.028 W/kg
SAR(1 g) = 0.016 mW/g; SAR(10 g) = 0.00877 mW/g
Maximum value of SAR (measured) = 0.017 mW/g

Body Mode; EUT Face UP; Ch600; With 451.4 MHz CW tx/Z Scan (1x1x6): Measurement grid: dx=20mm, dy=20mm, dz=20mm

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


mW/g
0.012
0.010
0.007
0.005
0.003
0.000


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.012
0.011
0.010
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
m

Body Mode PCS

Test Laboratory: Intertek ETL Semko

DUT: iSECUREtrac PTU5000;Type: PTU 5000; Serial: 0000050057

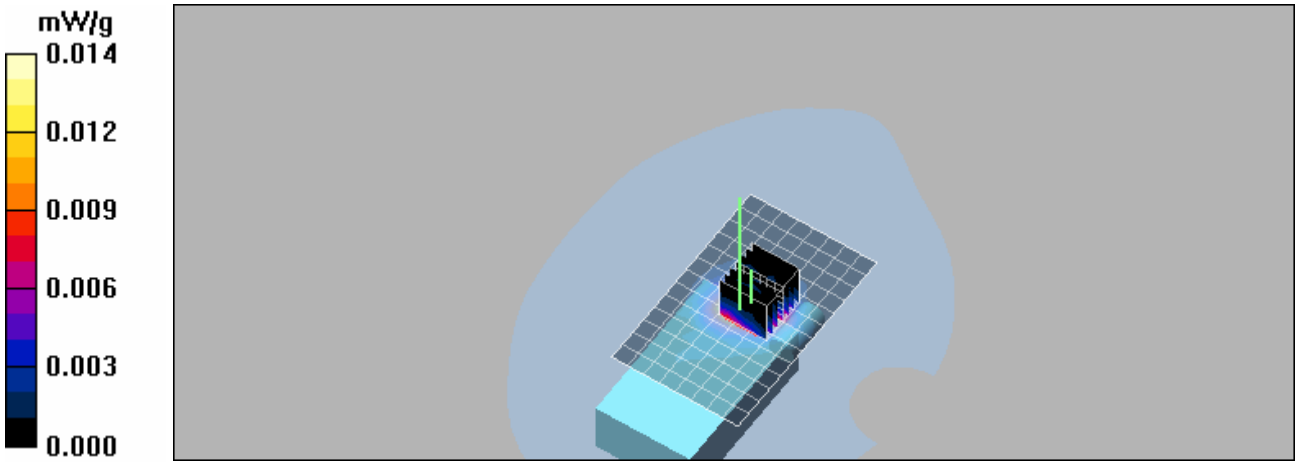
Medium parameters used: f = 1880 MHz; σ = 1.57 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

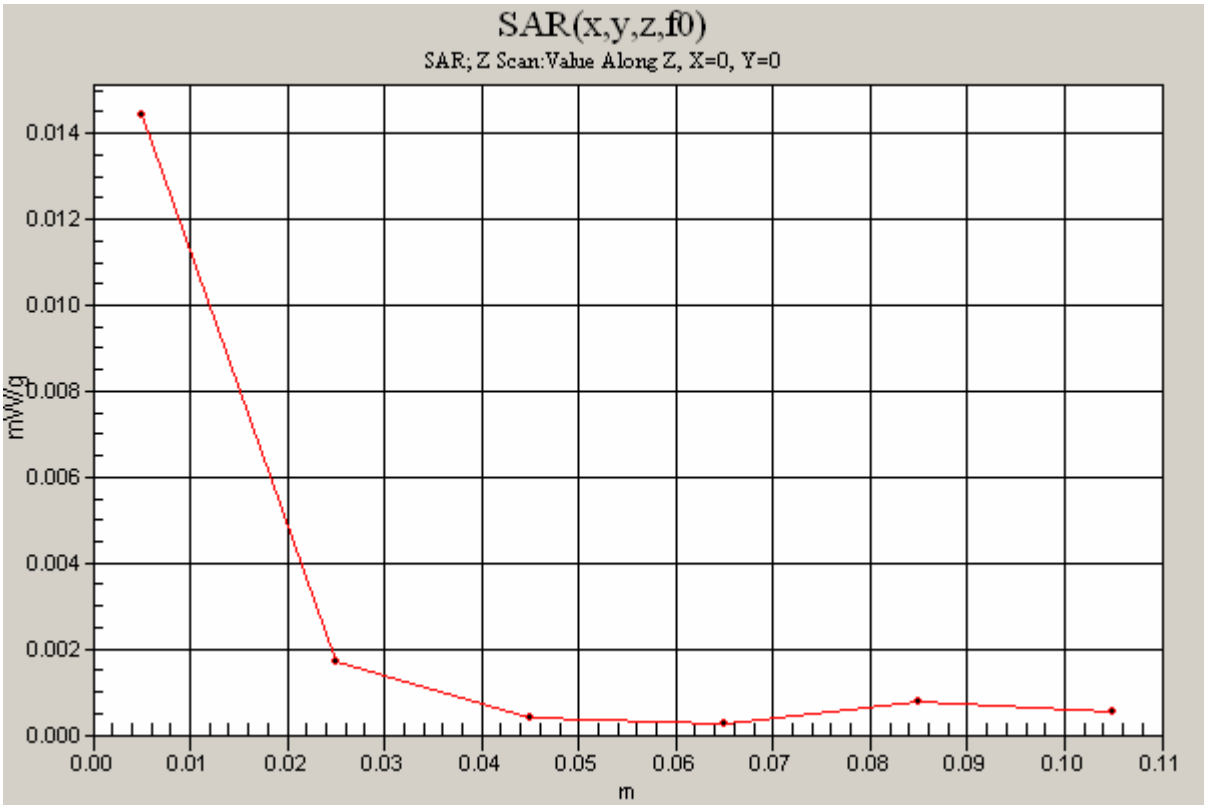
DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(8.72, 8.72, 8.72); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 2mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Mode; EUT Face DOWN; Ch600/Area Scan (9x14x1):
Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.015 mW/g

Body Mode; EUT Face DOWN; Ch600/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 2.71 V/m; Power Drift = 0.200 dB
Peak SAR (extrapolated) = 0.042 W/kg
SAR(1 g) = 0.012 mW/g; SAR(10 g) = 0.00689 mW/g
Maximum value of SAR (measured) = 0.013 mW/g

Body Mode; EUT Face DOWN; Ch600/Z Scan (1x1x6):
Measurement grid: dx=20mm, dy=20mm, dz=20mm
Maximum value of SAR (measured) = 0.014 mW/g




SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
m

Body Mode PCS

Test Laboratory: Intertek ETL Semko

DUT: iSECUREtrac PTU5000;Type: PTU 5000; Serial: 0000050057

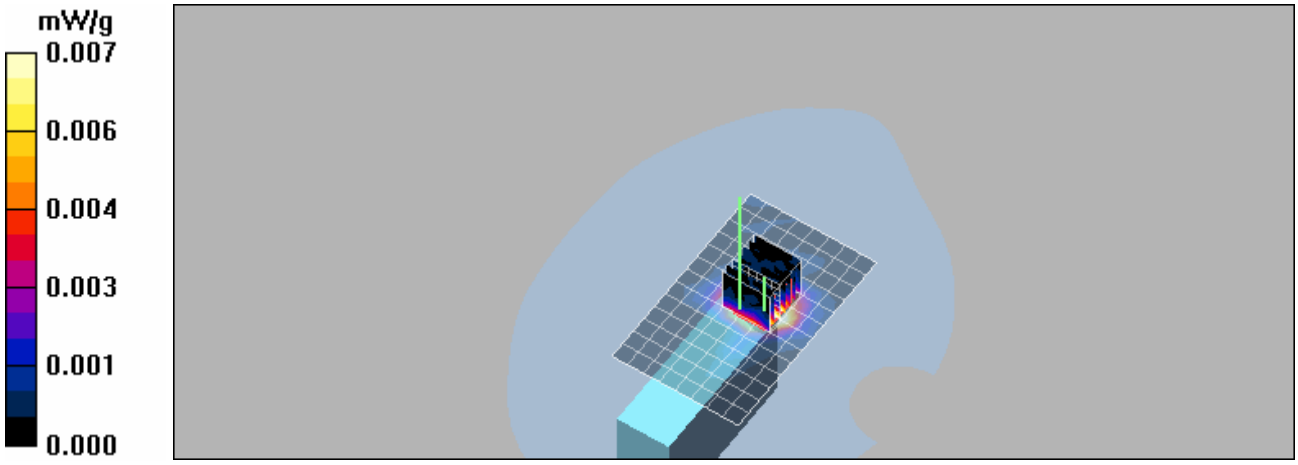
Medium parameters used: f = 1880 MHz; σ = 1.57 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

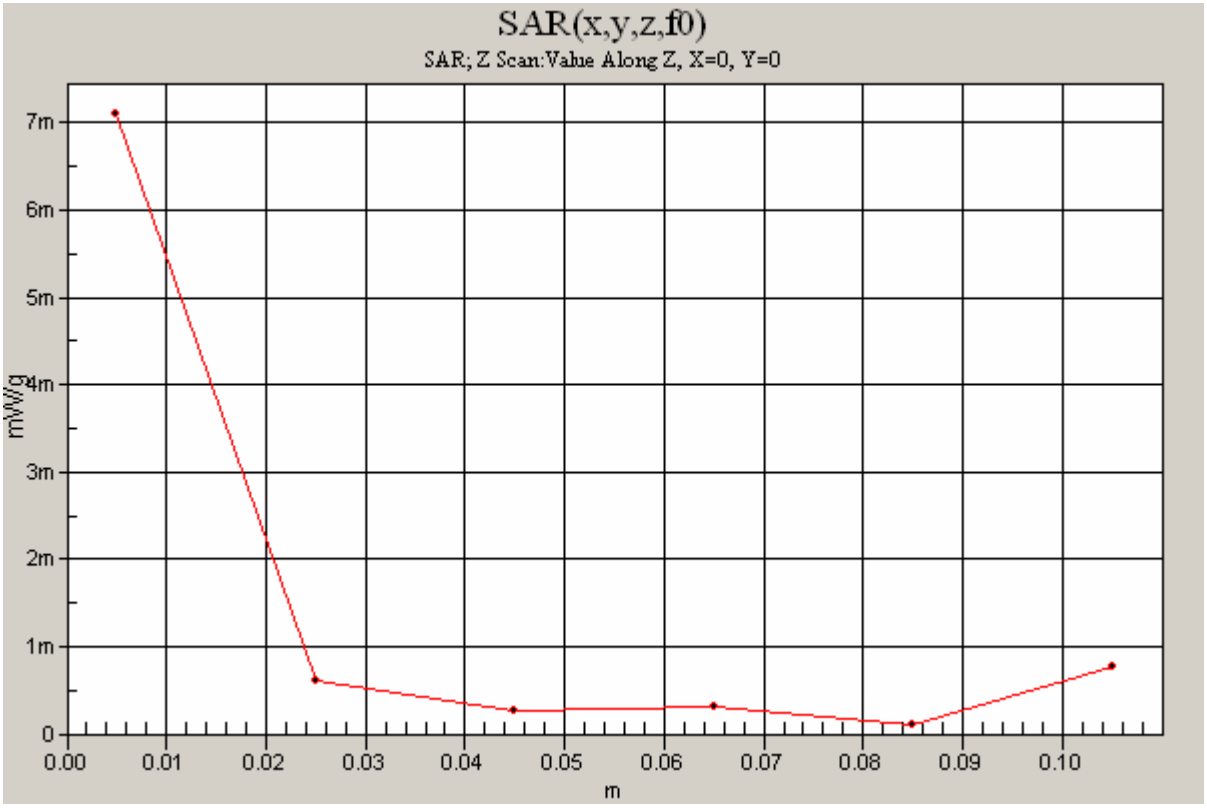
DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(8.72, 8.72, 8.72); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 2mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Mode; LEFT side; Ch600/Area Scan (9x14x1): Measurement grid:
dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.016 mW/g

Body Mode; LEFT side; Ch600/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.81 V/m; Power Drift = -0.048 dB
Peak SAR (extrapolated) = 0.020 W/kg
SAR(1 g) = 0.010 mW/g; SAR(10 g) = 0.00505 mW/g
Maximum value of SAR (measured) = 0.012 mW/g

Body Mode; LEFT side; Ch600/Z Scan (1x1x6): Measurement grid:
dx=20mm, dy=20mm, dz=20mm
Maximum value of SAR (measured) = 0.007 mW/g


mW/g
0.007
0.006
0.004
0.003
0.001
0.000


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
7m
6m
5m
4m
3m
2m
1m
0
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
m

Body Mode PCS

Test Laboratory: Intertek ETL Semko

DUT: iSECUREtrac PTU5000;Type: PTU 5000; Serial: 0000050057

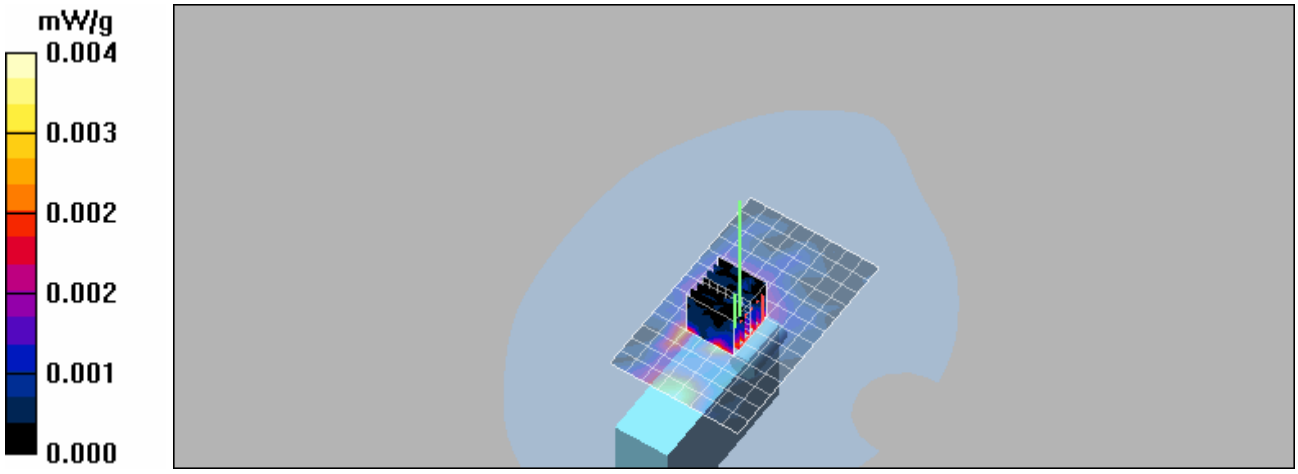
Medium parameters used: f = 1880 MHz; σ = 1.57 mho/m; ε_r = 51.1; ρ = 1000 kg/m^3
Phantom section: Flat Section

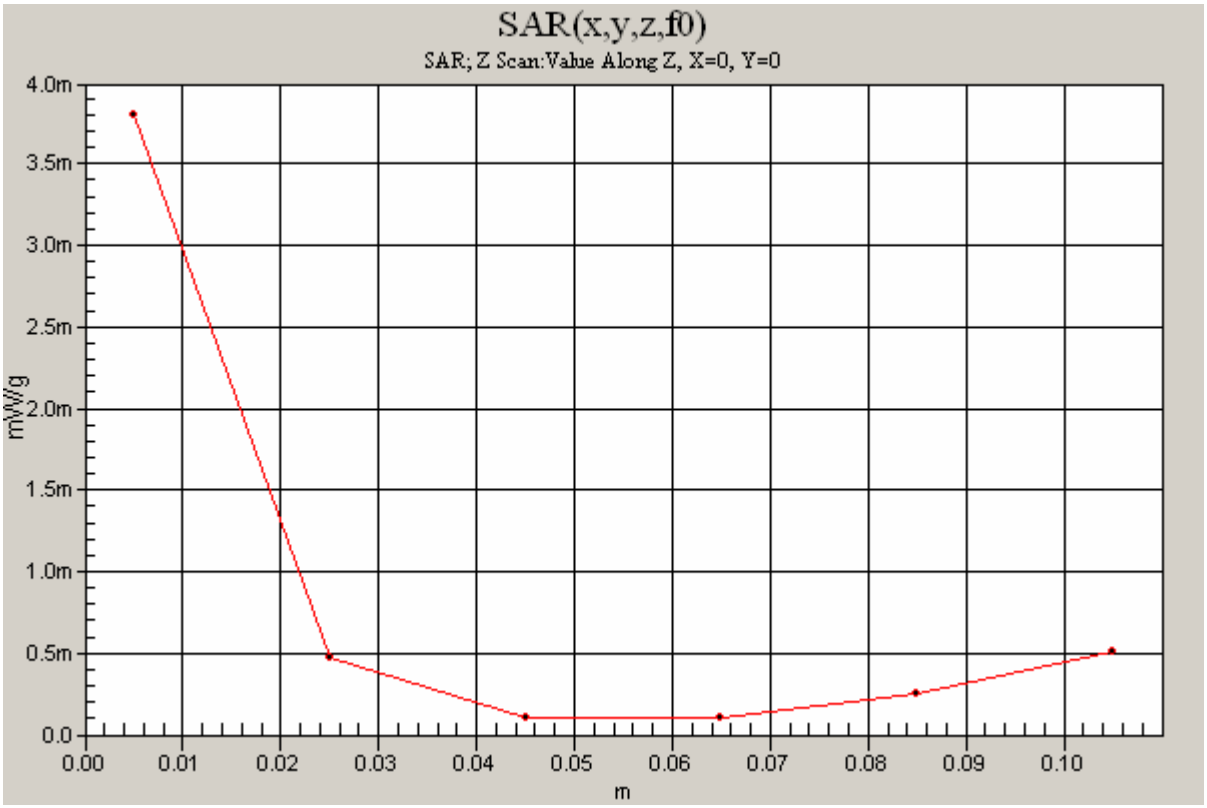
DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(8.72, 8.72, 8.72); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 2mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Mode; RIGHT side; Ch600/Area Scan (9x14x1): Measurement grid: dx=10mm, dy=10mm
Maximum value of SAR (measured) = 0.004 mW/g

Body Mode; RIGHT side; Ch600/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 1.46 V/m; Power Drift = -0.074 dB
Peak SAR (extrapolated) = 0.011 W/kg
SAR(1 g) = 0.00313 mW/g; SAR(10 g) = 0.00172 mW/g

Body Mode; RIGHT side; Ch600/Z Scan (1x1x6): Measurement grid: dx=20mm, dy=20mm, dz=20mm




SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
4.0m
3.5m
3.0m
2.5m
2.0m
1.5m
1.0m
0.5m
0.0
mW/g
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
m

Body Mode Cell

Test Laboratory: Intertek ETL Semko

DUT: iSECUREtrac PTU5000;Type: PTU 5000; Serial: 0000050057

Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.96 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(10.31, 10.31, 10.31); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 2mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Mode; EUT Face UP; Ch384; With 439.2 MHz CW tx/Area Scan (9x14x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.171 mW/g

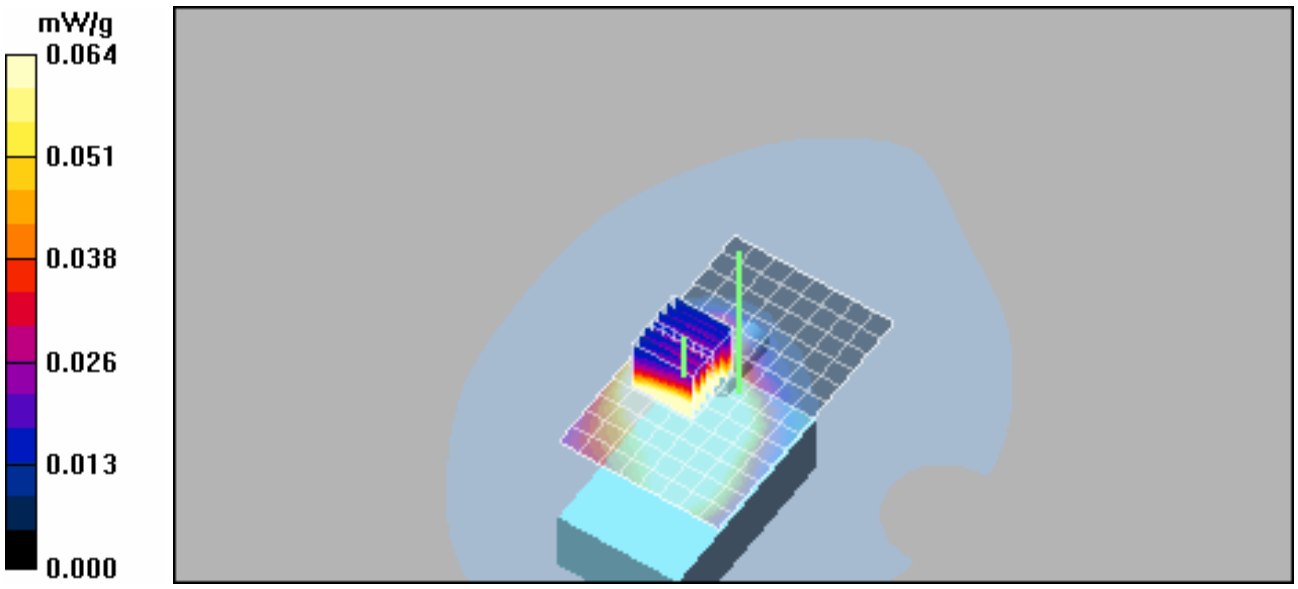
Body Mode; EUT Face UP; Ch384; With 439.2 MHz CW tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

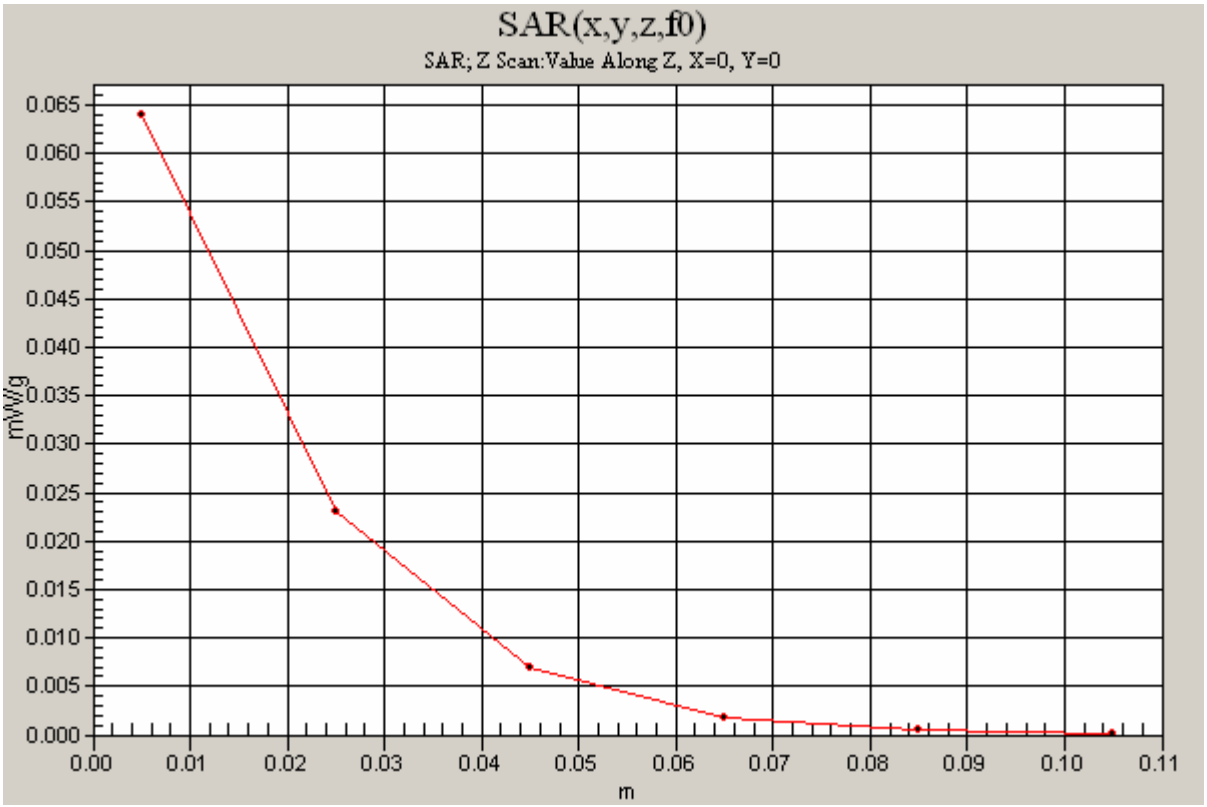
Reference Value = 8.01 V/m; Power Drift = -0.027 dB

Maximum value of SAR (measured) = 0.149 mW/g

Body Mode; EUT Face UP; Ch384; With 439.2 MHz CW tx/Z Scan (1x1x6): Measurement grid: dx=20mm, dy=20mm, dz=20mm

Maximum value of SAR (measured) = 0.064 mW/g


mW/g
0.064
0.051
0.038
0.026
0.013
0.000


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.065
0.060
0.055
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
m

Body Mode Cell

Test Laboratory: Intertek ETL Semko

DUT: iSECUREtrac PTU5000;Type: PTU 5000; Serial: 0000050057

Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.96 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(10.31, 10.31, 10.31); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 2mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Mode; EUT Face DOWN; Ch384/Area Scan (9x14x1):
Measurement grid: dx=10mm, dy=10mm

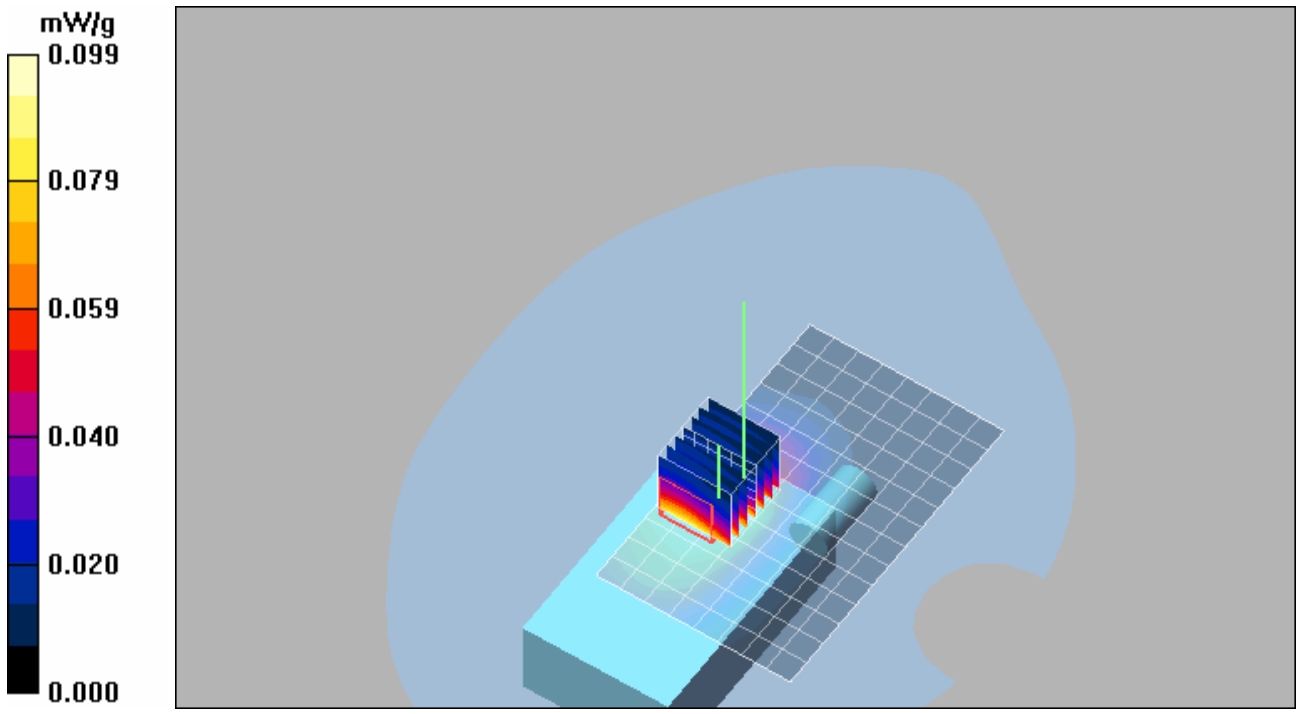
Maximum value of SAR (measured) = 0.122 mW/g

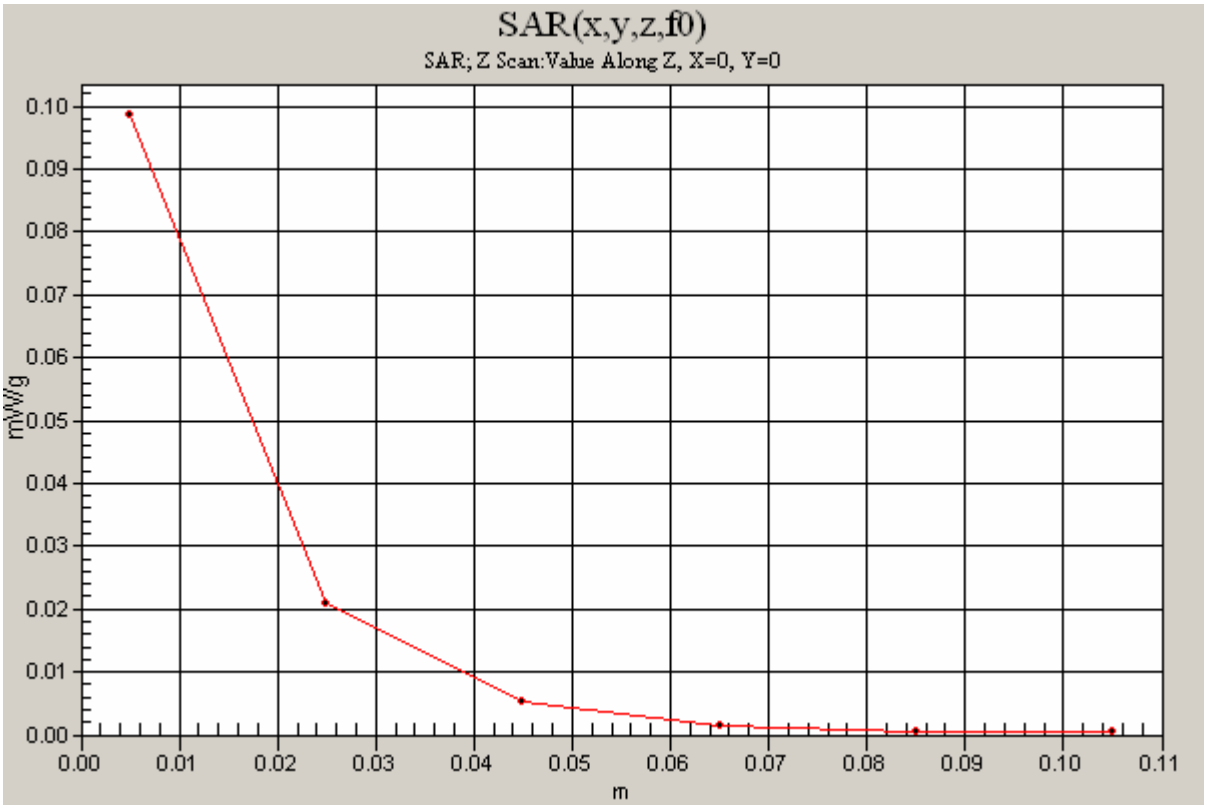
Body Mode; EUT Face DOWN; Ch384/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 9.53 V/m; Power Drift = 0.176 dB
Peak SAR (extrapolated) = 0.149 W/kg
SAR(1 g) = 0.096 mW/g; SAR(10 g) = 0.064 mW/g

Maximum value of SAR (measured) = 0.103 mW/g

Body Mode; EUT Face DOWN; Ch384/Z Scan (1x1x6):
Measurement grid: dx=20mm, dy=20mm, dz=20mm

Maximum value of SAR (measured) = 0.099 mW/g


mW/g
0.099
0.079
0.059
0.040
0.020
0.000


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
m
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11

Body Mode Cell

Test Laboratory: Intertek ETL Semko

DUT: iSECUREtrac PTU5000;Type: PTU 5000; Serial: 0000050057

Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.96 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(10.31, 10.31, 10.31); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 2mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Mode; LEFT side; Ch384 with 439.2 MHz CW tx/Area Scan (9x14x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.177 mW/g

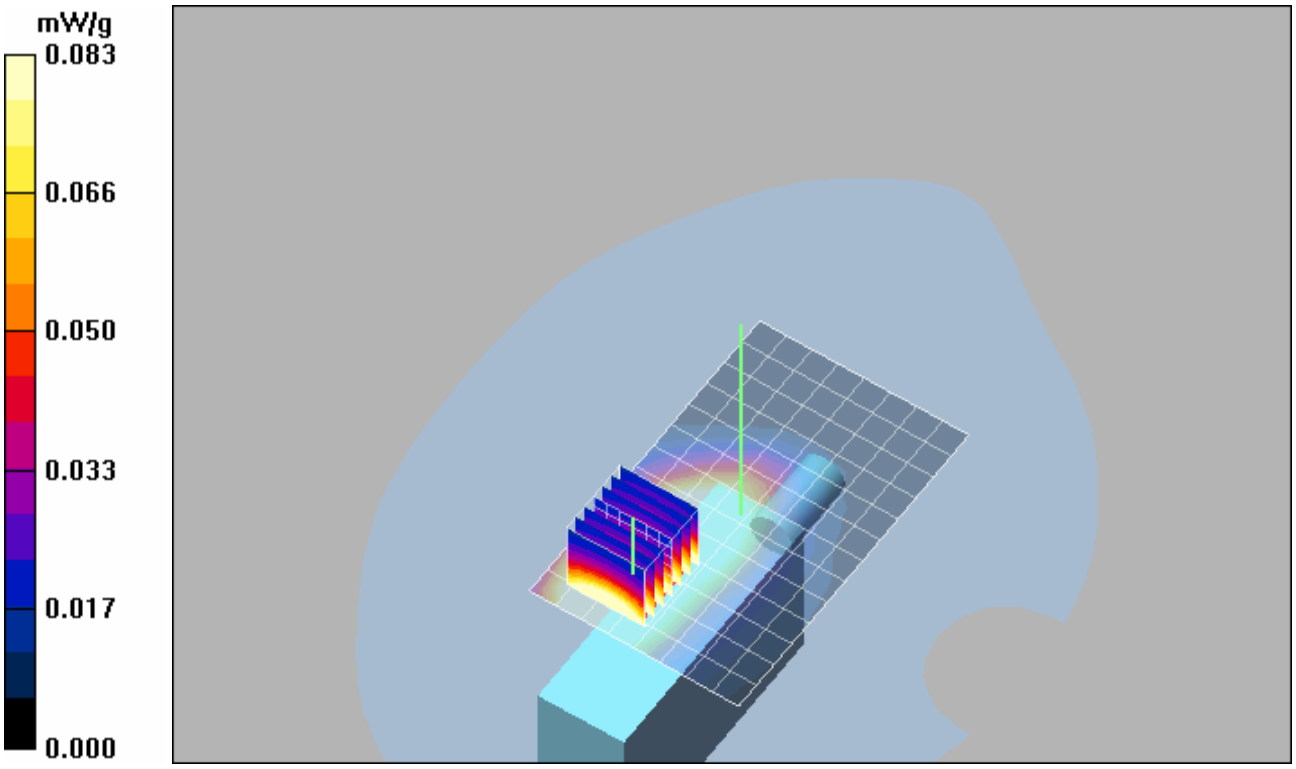
Body Mode; LEFT side; Ch384 with 439.2 MHz CW tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

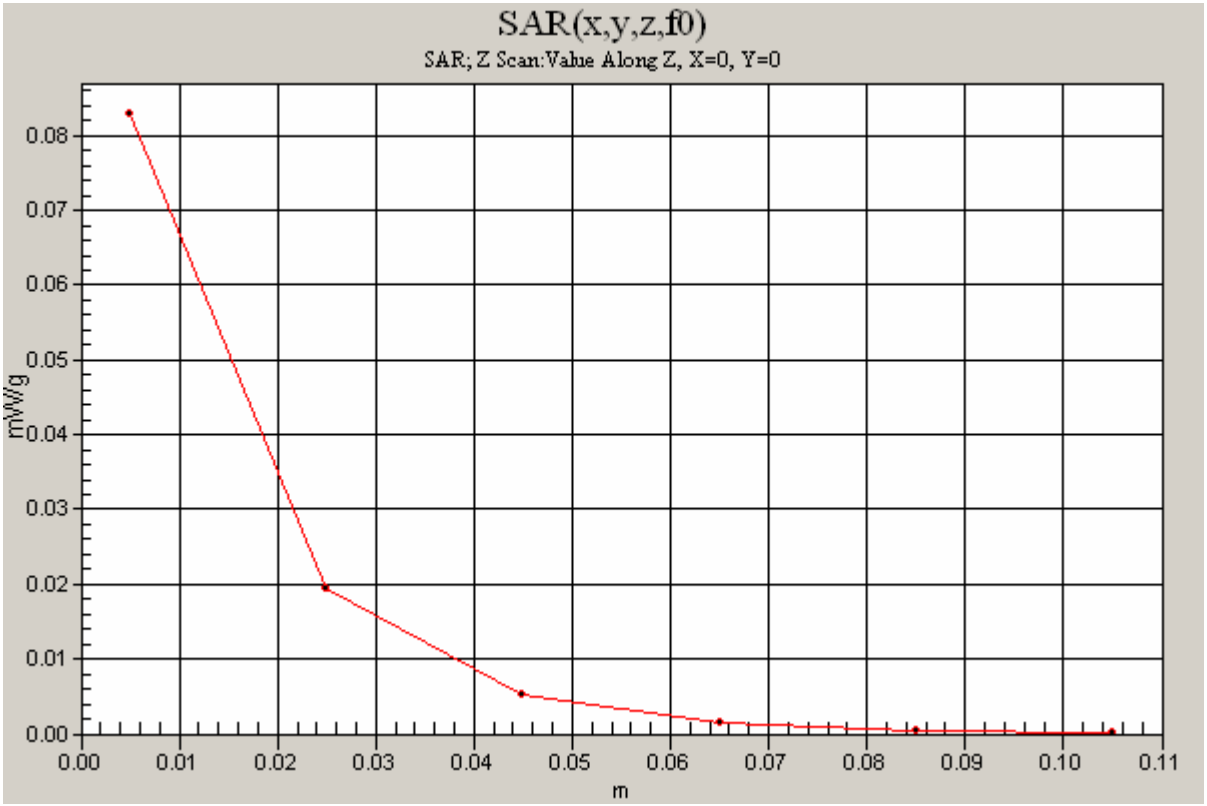
Reference Value = 8.85 V/m; Power Drift = -0.038 dB
Peak SAR (extrapolated) = 0.222 W/kg
SAR(1 g) = 0.147 mW/g; SAR(10 g) = 0.095 mW/g

Maximum value of SAR (measured) = 0.158 mW/g

Body Mode; LEFT side; Ch384 with 439.2 MHz CW tx/Z Scan (1x1x6): Measurement grid: dx=20mm, dy=20mm, dz=20mm

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


mW/g
0.083
0.066
0.050
0.033
0.017
0.000


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
m

Body Mode Cell

Test Laboratory: Intertek ETL Semko

DUT: iSECUREtrac PTU5000;Type: PTU 5000; Serial: 0000050057

Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.96 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(10.31, 10.31, 10.31); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 2mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Mode; LEFT side; Ch384 with 451.4 MHz CW tx/Area Scan (9x14x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.182 mW/g

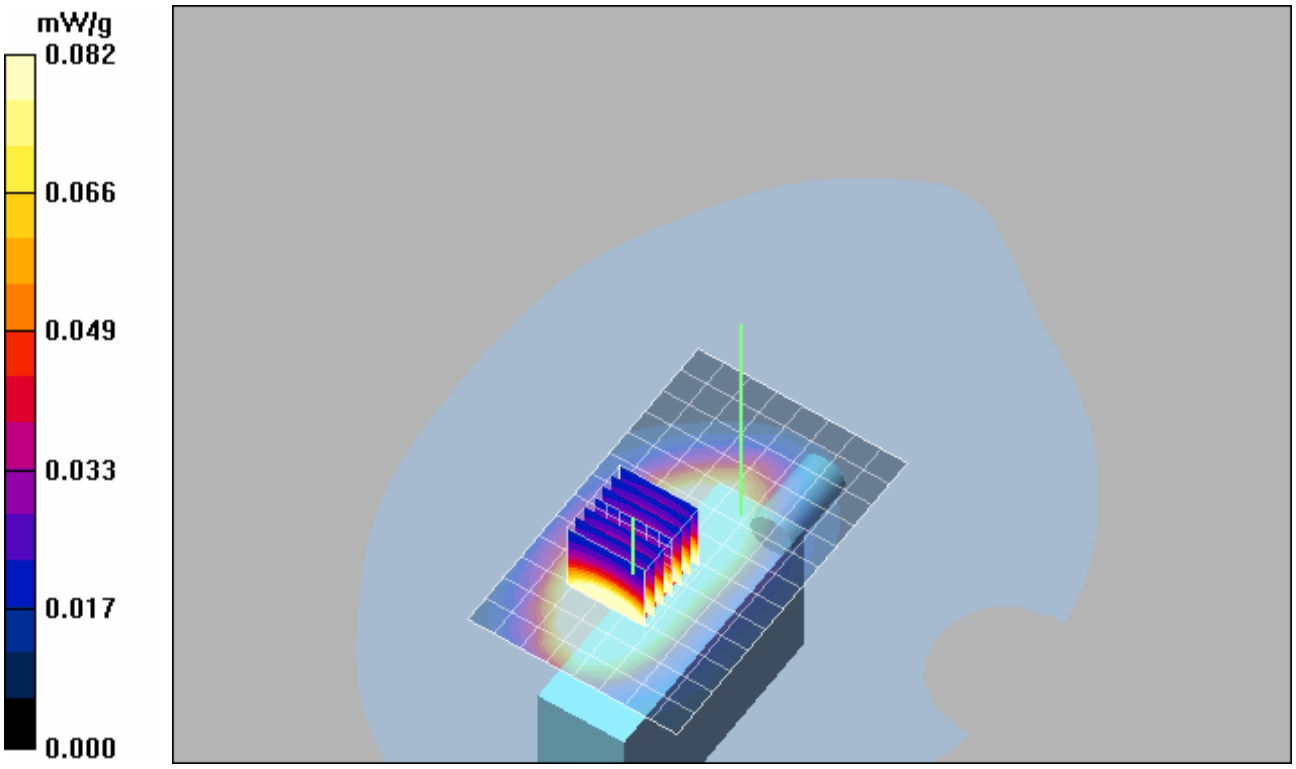
Body Mode; LEFT side; Ch384 with 451.4 MHz CW tx/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

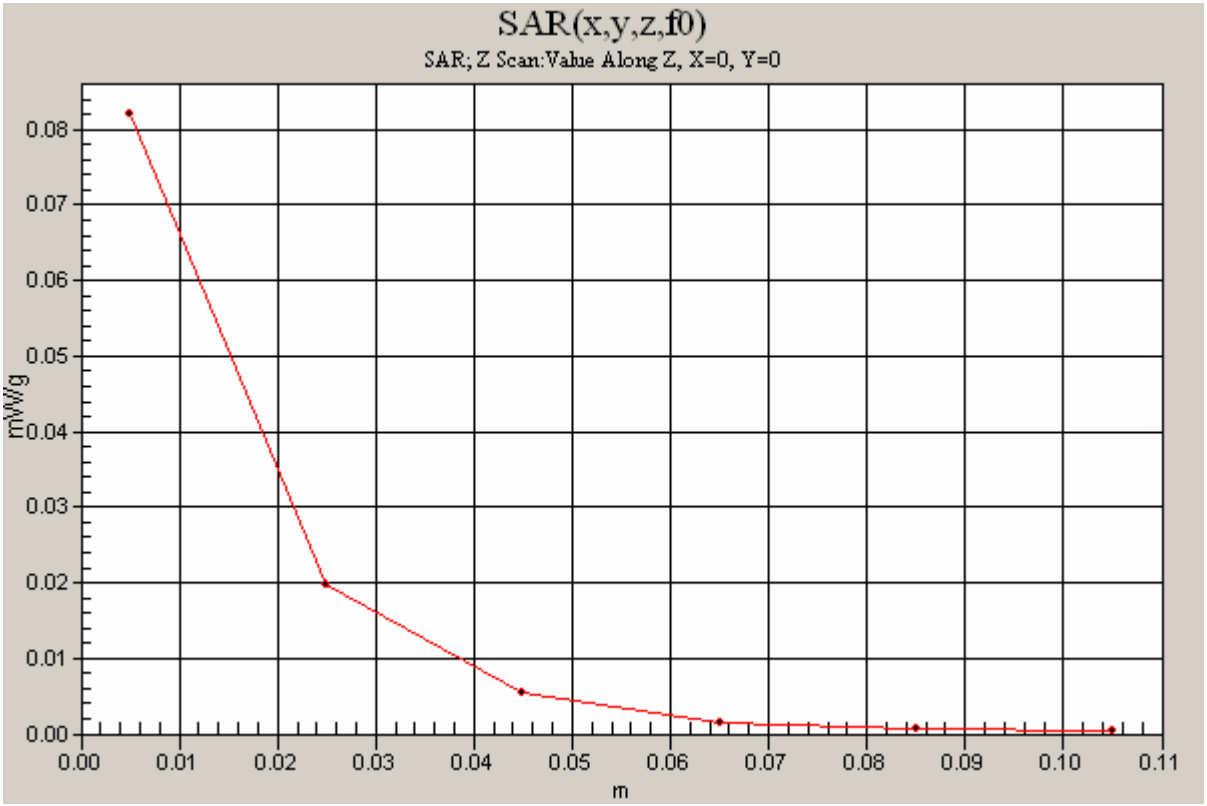
Reference Value = 8.93 V/m; Power Drift = -0.108 dB
Peak SAR (extrapolated) = 0.230 W/kg
SAR(1 g) = 0.153 mW/g; SAR(10 g) = 0.099 mW/g

Maximum value of SAR (measured) = 0.165 mW/g

Body Mode; LEFT side; Ch384 with 451.4 MHz CW tx/Z Scan (1x1x6): Measurement grid: dx=20mm, dy=20mm, dz=20mm

Maximum value of SAR (measured) = 0.082 mW/g


mW/g
0.082
0.066
0.049
0.033
0.017
0.000


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
m

Body Mode Cell

Test Laboratory: Intertek ETL Semko

DUT: iSECUREtrac PTU5000;Type: PTU 5000; Serial: 0000050057

Medium parameters used (interpolated): f = 836.52 MHz; σ = 0.96 mho/m; ε_r = 55.9; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(10.31, 10.31, 10.31); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 2mm (Mechanical Surface Detection)Sensor-Surface: 4mm (Mechanical Surface Detection)Sensor-Surface: 0mm (Fix Surface)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 172

Body Mode; RIGHT side; Ch384/Area Scan (9x14x1): Measurement grid: dx=10mm, dy=10mm

Maximum value of SAR (measured) = 0.156 mW/g

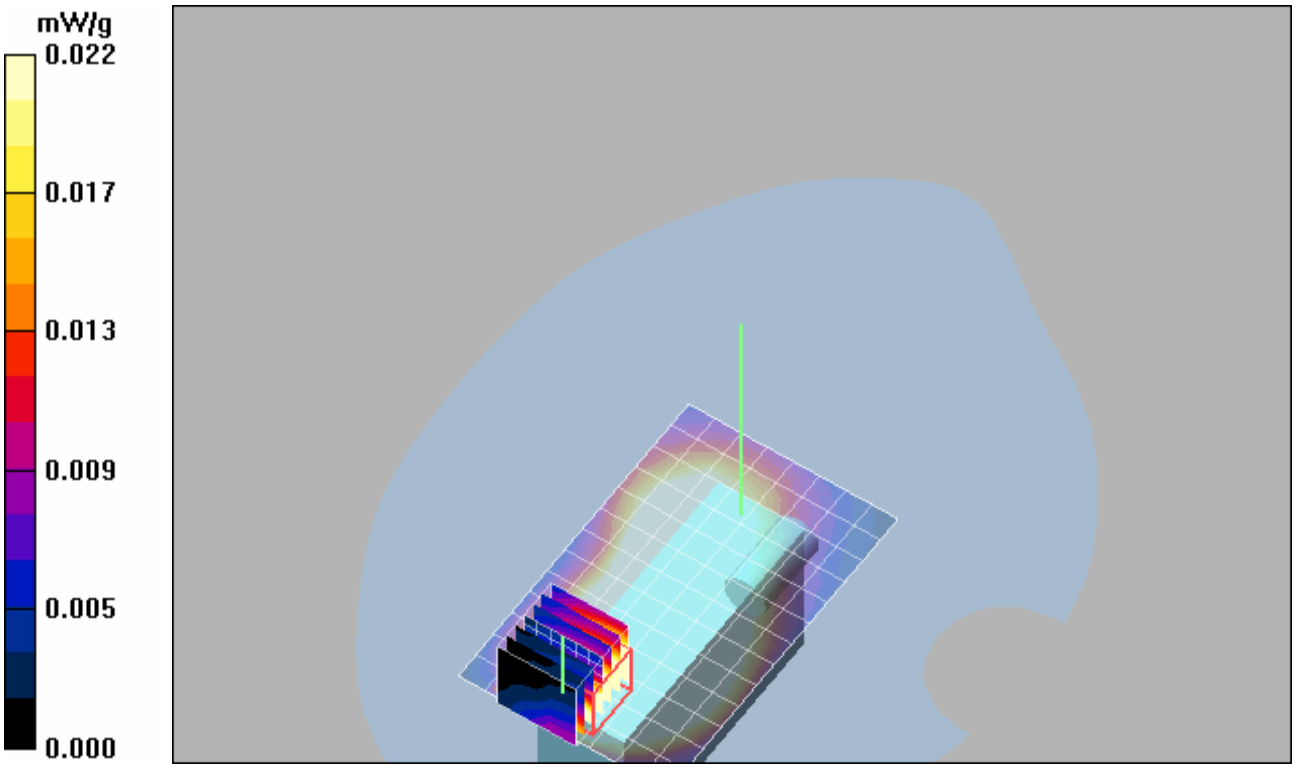
Body Mode; RIGHT side; Ch384/Zoom Scan (7x7x7)/Cube 0:

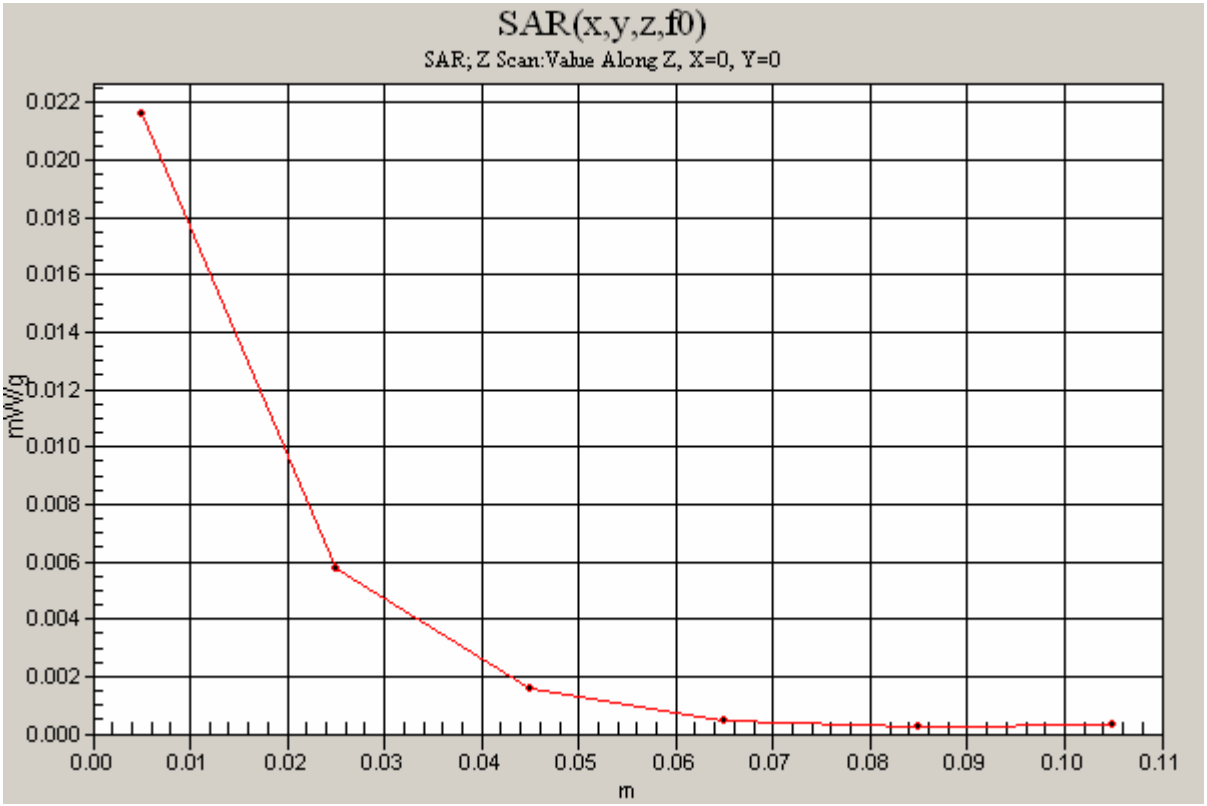
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 4.78 V/m; Power Drift = -0.172 dB
Peak SAR (extrapolated) = 0.273 W/kg
SAR(1 g) = 0.085 mW/g; SAR(10 g) = 0.040 mW/g

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

Body Mode; RIGHT side; Ch384/Z Scan (1x1x6): Measurement grid: dx=20mm, dy=20mm, dz=20mm

Maximum value of SAR (measured) = 0.022 mW/g


mW/g
0.022
0.017
0.013
0.009
0.005
0.000


SAR(x,y,z,f0)
SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0.022
0.020
0.018
0.016
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
0.00
0.01
0.02
0.03
0.04
0.05
0.06
0.07
0.08
0.09
0.10
0.11
m

D1800_June 4

Test Laboratory: Intertek ETL Semko

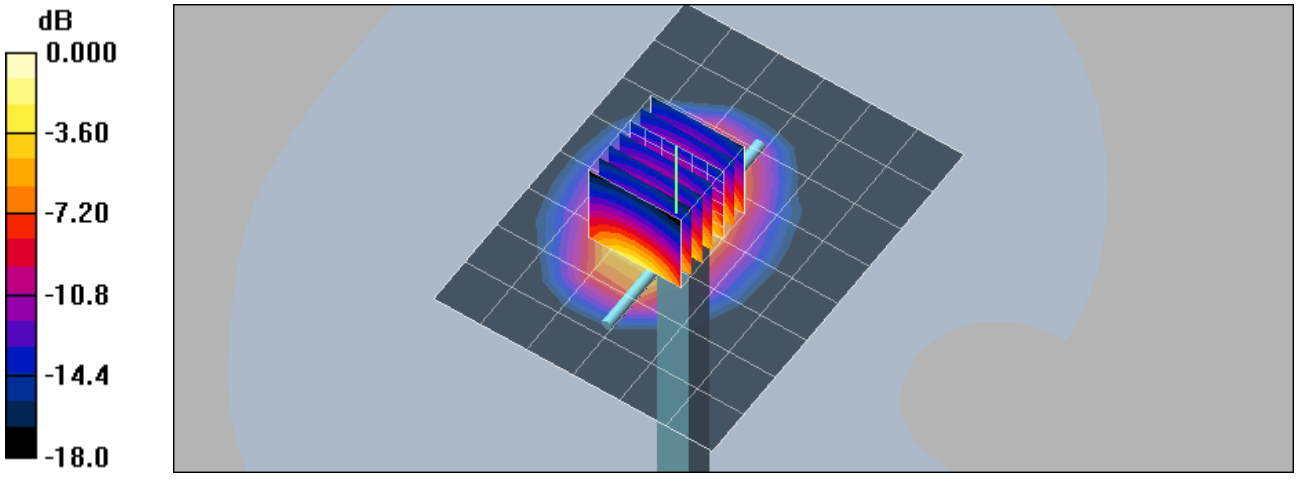
DUT: Dipole 1800 MHz;Type: D1800V2; Serial: D1800V2 - SN:224

Medium parameters used: f = 1800 MHz; σ = 1.35 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(9.48, 9.48, 9.48); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 176

Pin=14.3 mW/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.478 mW/g

Pin=14.3 mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 21.0 V/m; Power Drift = 0.053 dB
Peak SAR (extrapolated) = 1.09 W/kg
SAR(1 g) = 0.568 mW/g; SAR(10 g) = 0.292 mW/g
Maximum value of SAR (measured) = 0.633 mW/g



0 dB = 0.633mW/g

D1800_June 5

Test Laboratory: Intertek ETL Semko

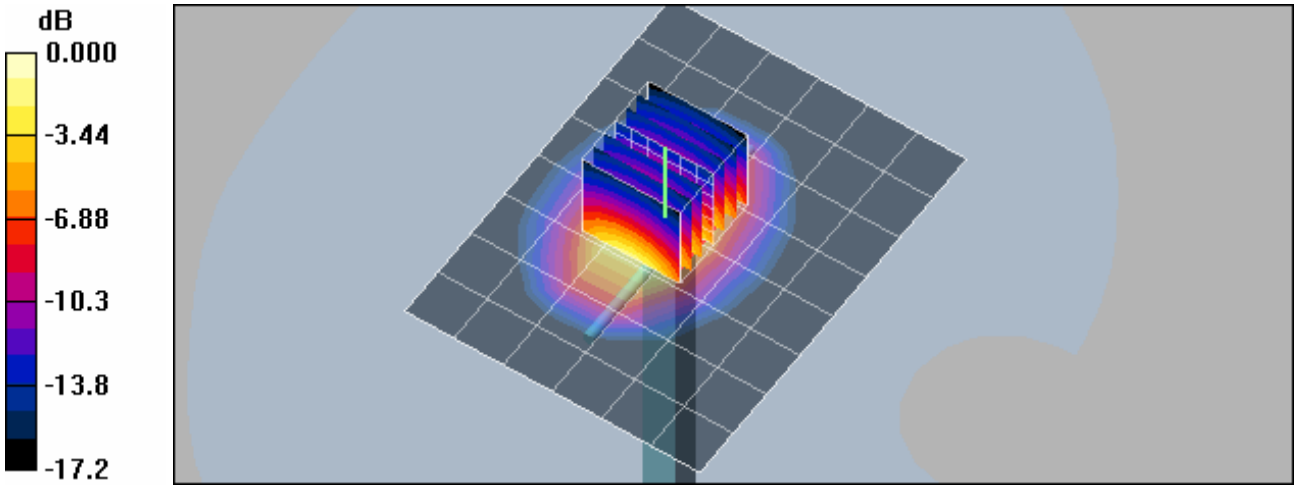
DUT: Dipole 1800 MHz;Type: D1800V2; Serial: D1800V2 - SN:224

Medium parameters used: f = 1800 MHz; σ = 1.35 mho/m; ε_r = 40.2; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(9.48, 9.48, 9.48); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 176

Pin=17.3 mW/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.521 mW/g

Pin=17.3 mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 23.0 V/m; Power Drift = -0.069 dB
Peak SAR (extrapolated) = 1.23 W/kg
SAR(1 g) = 0.650 mW/g; SAR(10 g) = 0.338 mW/g
Maximum value of SAR (measured) = 0.737 mW/g



0 dB = 0.737mW/g

D900_June 6

Test Laboratory: Intertek ETL Semko

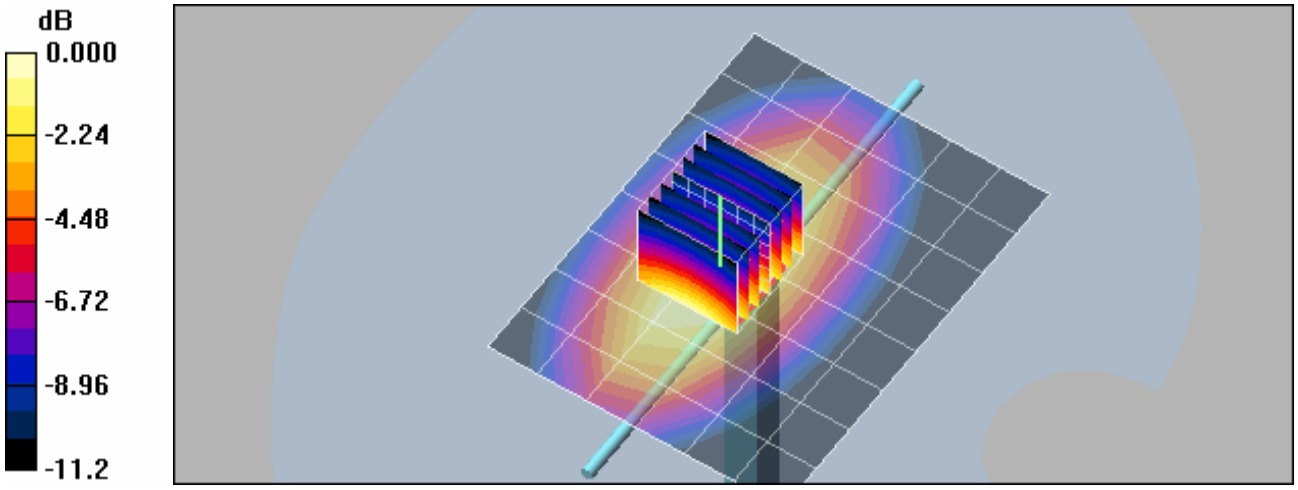
DUT: Dipole 900 MHz;Type: D900V2; Serial: D900V2 - SN:013

Medium parameters used: f = 900 MHz; σ = 0.97 mho/m; ε_r = 41.5; ρ = 1000 kg/m^3
Phantom section: Flat Section

DASY4 Configuration:
- Probe: EX3DV3 - SN3516; ConvF(10.23, 10.23, 10.23); Probe Calibration Due: 11/23/2006
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn358; Calibrated: 4/19/2007
- Phantom: SAM with CRP; Type: SAM;
- Measurement SW: DASY4, V4.7 Build 53; Postprocessing SW: SEMCAD, V1.8 Build 176

Pin = 10.37 mW/Area Scan (7x9x1): Measurement grid: dx=15mm, dy=15mm
Maximum value of SAR (measured) = 0.221 mW/g

Pin = 10.37 mW/Zoom Scan (7x7x7) (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 15.4 V/m; Power Drift = -0.030 dB
Peak SAR (extrapolated) = 0.335 W/kg
SAR(1 g) = 0.222 mW/g; SAR(10 g) = 0.142 mW/g
Maximum value of SAR (measured) = 0.240 mW/g



0 dB = 0.240mW/g

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
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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 ITS / ETL Semko

Certificate No: EX3-3516_Nov06

CALIBRATION CERTIFICATE

Object	EX3DV3 - SN:3516
Calibration procedure(s)	QA CAL-01.v5 and QA CAL-14.v3 Calibration procedure for dosimetric E-field probes
Calibration date:	November 23, 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 E4419B	GB41293874	5-Apr-06 (METAS No 251-00557)	Apr-07
Power sensor E4412A	MY41495277	5-Apr-06 (METAS, No. 251-00557)	Apr-07
Power sensor E4412A	MY41498087	5-Apr-06 (METAS. No 251-00557)	Apr-07
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-06 (METAS, No 217-00592)	Aug-07
Reference 20 dB Attenuator	SN: S5086 (20b)	4-Apr-06 (METAS No 251-00558)	Apr-07
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-06 (METAS, No. 217-00593)	Aug-07
Reference Probe ES3DV2	SN: 3013	2-Jan-06 (SPEAG No ES3-3013_Jan06)	Jan-07
DAE4	SN: 654	21-Jun-06 (SPEAG, No DAE4-654_Jun06)	Jun-07

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG. in house check Nov-05)	In house check: Nov-07
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-06)	In house check: Oct-07

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

Issued: November 23, 2006

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

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
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S Swiss Calibration Service

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

Accreditation No.: SCS 108

Glossary:

TSL	tissue simulating liquid
NORMx,y,z	sensitivity in free space
ConF	sensitivity in TSL / NORMx,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:

a) IEEE Std 1528-2003, "IEEE Recommended Practice for Determining the Peak Spatial-Averaged Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", December 2003
b) 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:

- *NORMx,y,z*: Assessed for E-field polarization $\vartheta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORMx,y,z are only intermediate values, i.e., the uncertainties of NORMx,y,z does not effect the E^2-field uncertainty inside TSL (see below *ConvF*).
- *NORM(f)x,y,z = NORMx,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*.
- *DCPx,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 *NORMx,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 EX3DV3

SN:3516

Manufactured:	March 8, 2004
Last calibrated:	July 20, 2005
Recalibrated:	November 23, 2006

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: EX3DV3 SN:3516

Sensitivity in Free Space[A] Diode Compression[B]

NormX	**0.870** ± 10.1%	$\mu V/(V/m)^2$	DCP X	**95** mV
NormY	**0.730** ± 10.1%	$\mu V/(V/m)^2$	DCP Y	**96** mV
NormZ	**0.610** ± 10.1%	$\mu V/(V/m)^2$	DCP Z	**95** mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

Boundary Effect

TSL **900 MHz** **Typical SAR gradient: 5 % per mm**

Sensor Center to Phantom Surface Distance		**2.0 mm**	**3.0 mm**
SAR_{be} [%]	Without Correction Algorithm	4.0	1.7
SAR_{be} [%]	With Correction Algorithm	0.0	0.1

TSL **1750 MHz** **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		**2.0 mm**	**3.0 mm**
SAR_{be} [%]	Without Correction Algorithm	4.6	2.6
SAR_{be} [%]	With Correction Algorithm	0.2	0.4

Sensor Offset

Probe Tip to Sensor Center	**1.0** mm

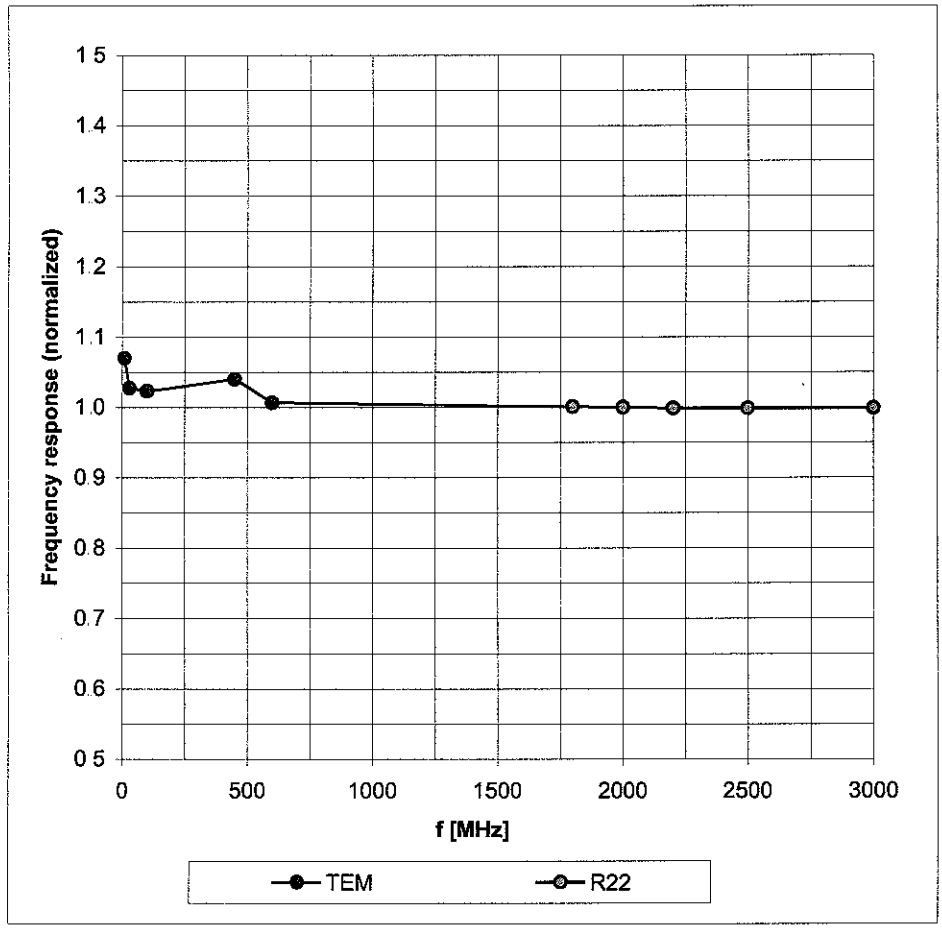
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

[A] The uncertainties of NormX,Y,Z do not affect the E^2-field uncertainty inside TSL (see Page 8).

[B] Numerical linearization parameter: uncertainty not required.

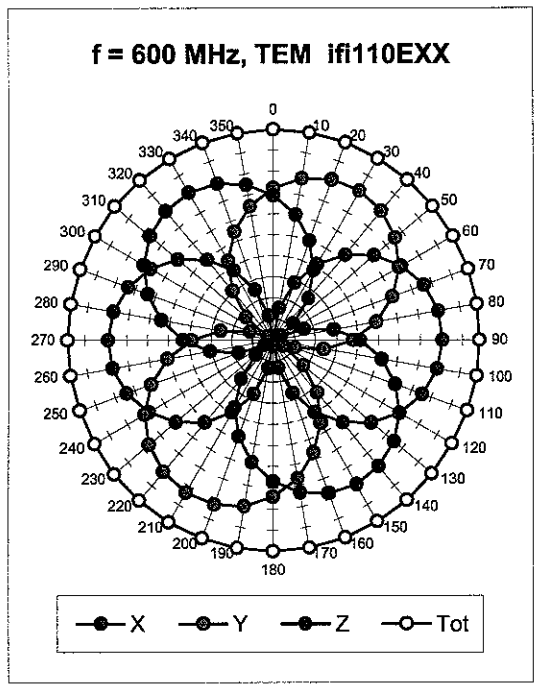
Frequency Response of E-Field

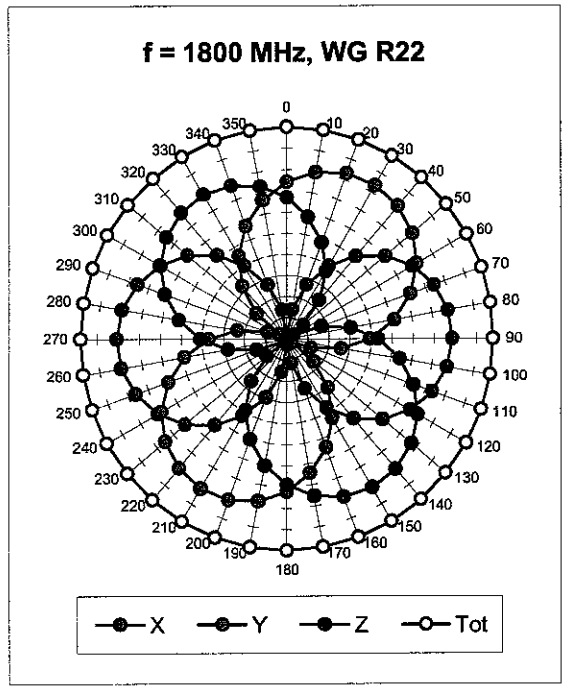
(TEM-Cell:ifi110 EXX, Waveguide: R22)

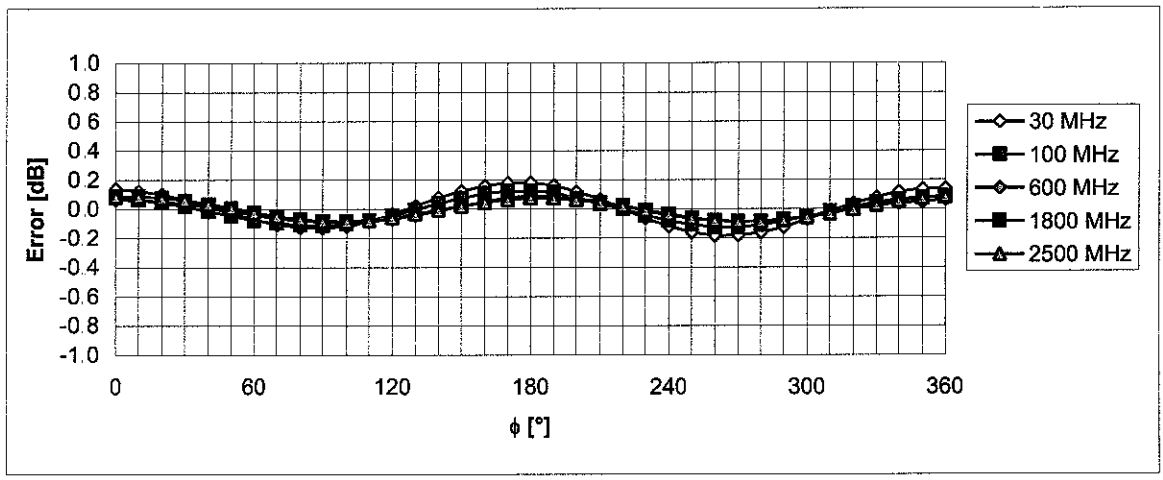


Uncertainty of Frequency Response of E-field: ± 6.3% (k=2)

Receiving Pattern (ϕ), ϑ = 0°



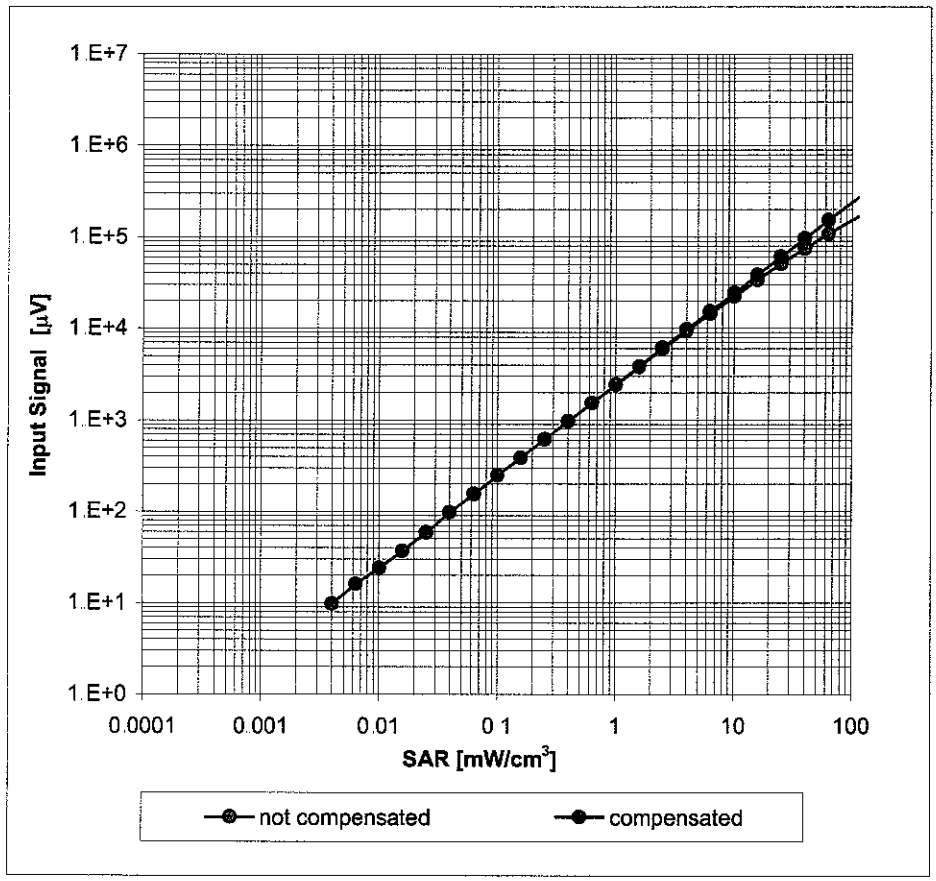


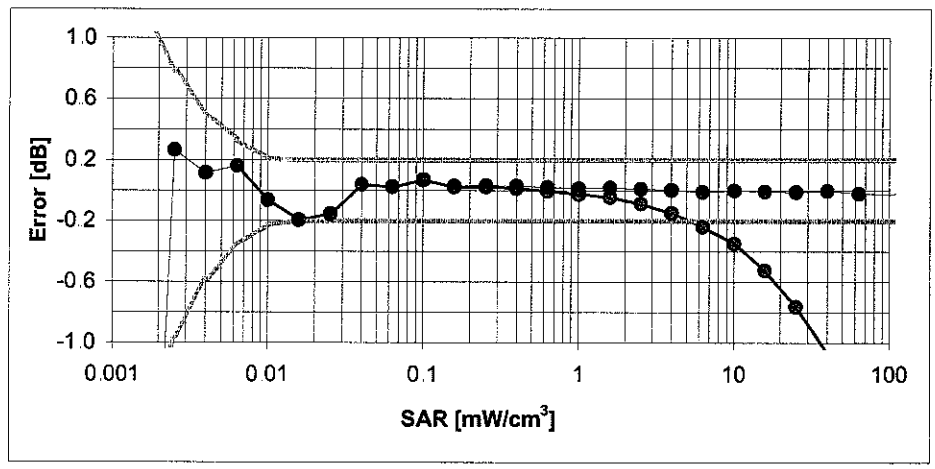


Uncertainty of Axial Isotropy Assessment: ± 0.5% (k=2)

Dynamic Range f(SAR_{head})

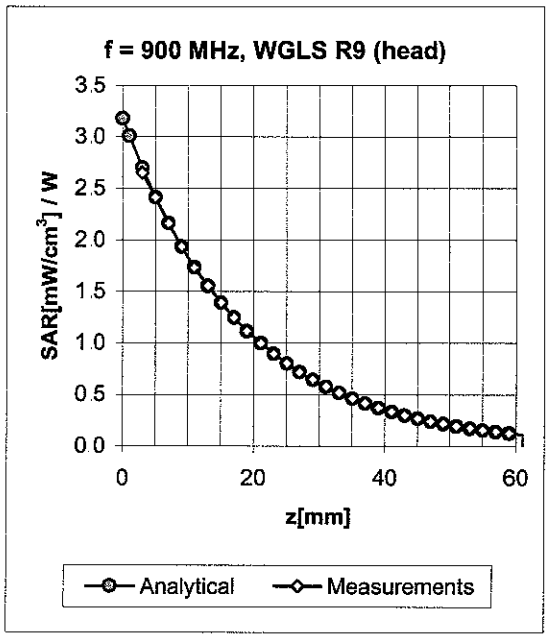
(Waveguide R22, f = 1800 MHz)

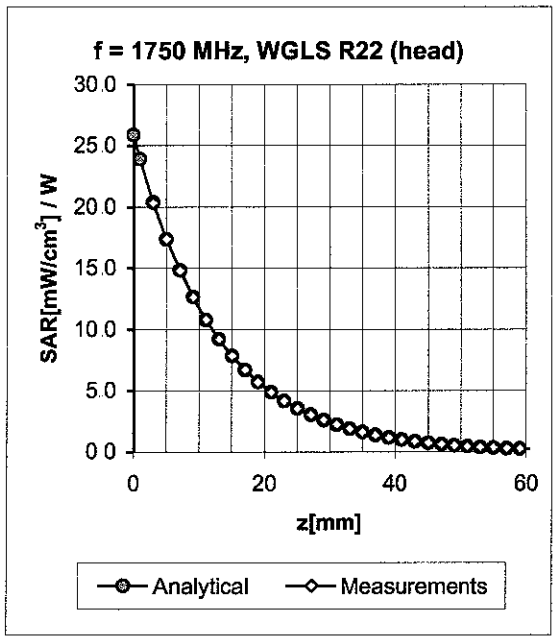




Uncertainty of Linearity Assessment: ± 0.6% (k=2)

Conversion Factor Assessment



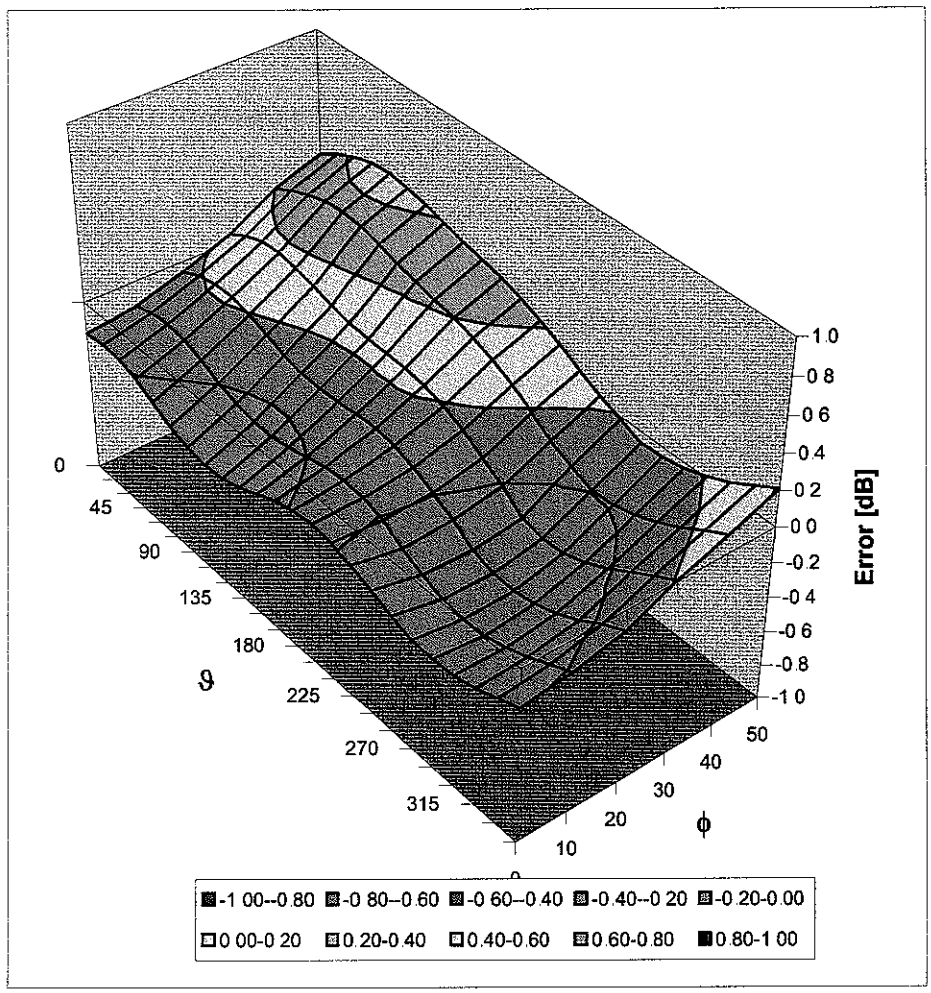


f [MHz]	Validity [MHz][C]	TSL	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	± 50 / ± 100	Head	41.5 ± 5%	0.90 ± 5%	0.35	1.35	10.34 ± 11.0% (k=2)
900	± 50 / ± 100	Head	41.5 ± 5%	0.97 ± 5%	0.28	1.40	10.23 ± 11.0% (k=2)
1750	± 50 / ± 100	Head	40.1 ± 5%	1.37 ± 5%	0.19	1.00	9.48 ± 11.0% (k=2)
1900	± 50 / ± 100	Head	40.0 ± 5%	1.40 ± 5%	0.18	1.15	9.23 ± 11.0% (k=2)
2450	± 50 / ± 100	Head	39.2 ± 5%	1.80 ± 5%	0.39	1.00	8.37 ± 11.8% (k=2)
5200	± 50 / ± 100	Head	36.0 ± 5%	4.66 ± 5%	0.35	1.80	5.15 ± 13.1% (k=2)
5800	± 50 / ± 100	Head	35.3 ± 5%	5.27 ± 5%	0.33	1.80	4.66 ± 13.1% (k=2)
835	± 50 / ± 100	Body	55.2 ± 5%	0.97 ± 5%	0.28	1.40	10.48 ± 11.0% (k=2)
900	± 50 / ± 100	Body	55.0 ± 5%	1.05 ± 5%	0.25	1.50	10.27 ± 11.0% (k=2)
1750	± 50 / ± 100	Body	53.4 ± 5%	1.49 ± 5%	0.16	1.23	8.88 ± 11.0% (k=2)
1900	± 50 / ± 100	Body	53.3 ± 5%	1.52 ± 5%	0.14	1.56	8.56 ± 11.0% (k=2)
2450	± 50 / ± 100	Body	52.7 ± 5%	1.95 ± 5%	0.37	1.00	8.31 ± 11.8% (k=2)
5200	± 50 / ± 100	Body	49.0 ± 5%	5.30 ± 5%	0.38	1.90	4.47 ± 13.1% (k=2)
5800	± 50 / ± 100	Body	48.2 ± 5%	6.00 ± 5%	0.31	1.85	4.26 ± 13.1% (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: ± 2.6% (k=2)