

CERTIFICATE OF COMPLIANCE
SAR EVALUATION

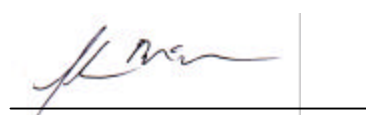
<u>Test Lab:</u> CELLTECH RESEARCH INC. Testing and Engineering Lab 1955 Moss Court Kelowna, B.C. Canada V1Y 9L3 Phone: 250 - 860-3130 Fax: 250 - 860-3110 e-mail: info@celltechlabs.com web site: www.celltechlabs.com	<u>Applicant Information:</u> SIERRA WIRELESS INC. 13811 Wireless Way Richmond, BC V6V 3A4
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FCC Classification:	Part 24 Licensed Portable Transmitter Worn on Body (PCT)
FCC Rule Part(s):	2.1093; ET Docket 93-62
FCC ID:	N7NAC750
Model(s):	AirCard 750
Serial No.:	T02031300251010
Equipment Type:	PCS GSM/GPRS PCMCIA Modem Card
Host Configuration(s):	Compaq iPaq 3650 PDA, HP Jornada 568 PDA, Cassiopeia E200 PDA
Tx Frequency Range:	1850.25 - 1909.875 MHz
Max. Cond. Power Tested:	28.44 dBm (Compaq iPaq 3650 PDA) 28.44 dBm (HP Jornada 568 PDA) 28.42 dBm (Cassiopeia E200 PDA)
Antenna Type(s):	Omni-Directional Monopole
Power Supply:	from host PDA

Celltech Research Inc. declares under its sole responsibility that this device was found to be in compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in FCC OET Bulletin 65, Supplement C, Edition 01-01 and Industry Canada RSS-102 Issue 1 (uncontrolled exposure/general population), and was tested in accordance with the appropriate measurement standards, guidelines, and recommended practices specified in American National Standards Institute C95.1-1992.

I attest to the accuracy of data. All measurements were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

This test report shall not be reproduced partially, or in full, without the prior written approval of Celltech Research Inc. The results and statements contained in this report pertain only to the device(s) evaluated.



Shawn McMillen
General Manager
Celltech Research Inc.



TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	DESCRIPTION OF EUT.....	1
3.0	SAR MEASUREMENT SYSTEM	2
4.0	MEASUREMENT SUMMARY.....	3-5
5.0	DETAILS OF SAR EVALUATION.....	6
6.0	EVALUATION PROCEDURES.....	7
7.0	SYSTEM VALIDATION.....	8
8.0	TISSUE PARAMETERS.....	8
9.0	SIMULATED EQUIVALENT TISSUES.....	9
10.0	SAR LIMITS.....	9
11.0	SYSTEM SPECIFICATIONS.....	10
12.0	SAM PHANTOM.....	11
13.0	DEVICE HOLDER.....	11
14.0	PROBE SPECIFICATION.....	11
15.0	TEST EQUIPMENT LIST.....	12
16.0	MEASUREMENT UNCERTAINTIES.....	13
17.0	REFERENCES.....	14
	APPENDIX A - SAR MEASUREMENT DATA.....	15
	APPENDIX B - SYSTEM VALIDATION.....	16
	APPENDIX C - PROBE CALIBRATION.....	17
	APPENDIX D - MEASURED FLUID DIELECTRIC PARAMETERS.....	18
	APPENDIX E - SAM PHANTOM CERTIFICATE OF CONFORMITY.....	19
	APPENDIX F - SAR TEST SETUP PHOTOGRAPHS.....	20

1.0 INTRODUCTION

This measurement report shows that the SIERRA WIRELESS INC. Model: AirCard 750 PCS GSM/GPRS PCMCIA Card FCC ID: N7NAC750 with (3) host PDAs described in this report, complies with the requirements and procedures specified in FCC Rule Part 2.1093, ET Docket 93-62 (see Reference [1]) and Industry Canada (RSS-102 Issue 1 (see Reference [2]) for mobile and portable devices. The test procedures described in American National Standards Institute C95.1-1992 (see Reference [3]) and FCC OET Bulletin 65, Supplement C, Edition 01-01 (see Reference [4]) were employed. A description of the product and operating configuration, detailed summary of the test results, methodology and procedures used in the evaluation, equipment used, and the various provisions of the rules are included within this test report.

2.0 DESCRIPTION of Equipment Under Test (EUT)

EUT Type	PCS GSM/GPRS PCMCIA Modem Card	FCC ID	N7NAC750
Equipment Class	Part 24 Licensed Portable Transmitter Worn on Body (PCT)	Model(s)	AirCard 750
FCC Rule Part(s)	§ 2.1093; Docket 93-62	Serial No.	T02031300251010
Tx Frequency Range	1850.25 - 1909.875 MHz	Host Configuration(s)	Compaq iPaq 3650 PDA HP Jornada 568 PDA Cassiopeia E200 PDA
Modulation	GMSK	Antenna Type	Omni-Directional Monopole
Max. RF Conducted Output Power Tested	28.44 dBm (Compaq iPaq 3650 PDA) 28.44 dBm (HP Jornada 568 PDA) 28.42 dBm (Cassiopeia E200 PDA)	Power Supply	From host PDA

3.0 SAR MEASUREMENT SYSTEM

Celltech Research SAR measurement facility utilizes the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY system is comprised of the robot controller, computer, near-field probe, probe alignment sensor, specific anthropomorphic mannequin (SAM) phantom, and various planar phantoms for brain or body SAR evaluations. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE3 utilizes a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16-bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.



DASY3 SAR Measurement System with SAM phantom

4.0 MEASUREMENT SUMMARY

The measurement results were obtained with the EUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the EUT are reported in Appendix A. Test setup photographs are shown in Appendix F.

BODY SAR MEASUREMENT RESULTS - EUT WITH COMPAQ IPAQ 3650 PDA									
Freq. (MHz)	Chan.	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Phantom Section	Test Position	Antenna Position to Phantom	Separation Distance from PDA to Phantom (cm)	SAR 1g (w/kg)
1850.25	512	PCS GPRS	28.44	28.33	Planar	Face of PDA	Parallel	2.0	1.24
1880.00	661	PCS GPRS	28.26	28.07	Planar	Face of PDA	Parallel	2.0	1.12
1909.875	810	PCS GPRS	28.10	27.99	Planar	Face of PDA	Parallel	2.0	0.966
1880.00	661	PCS GPRS	28.24	28.07	Planar	Back of PDA	Perpendicular	0.0	0.212
1850.25	512	PCS GPRS	28.43	28.29	Planar	Left Side of PDA	Parallel	0.0	1.17
1880.00	661	PCS GPRS	28.21	28.08	Planar	Left Side of PDA	Parallel	0.0	1.08
1909.875	810	PCS GPRS	28.12	27.98	Planar	Left Side of PDA	Parallel	0.0	0.941
1850.25	512	PCS GPRS	28.40	28.24	Planar	Antenna Side of PDA	Parallel	2.0 (from antenna)	1.23
1880.00	661	PCS GPRS	28.28	28.10	Planar	Antenna Side of PDA	Parallel	2.0 (from antenna)	1.14
1909.875	810	PCS GPRS	28.10	28.04	Planar	Antenna Side of PDA	Parallel	2.0 (from antenna)	1.14
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									
BODY 1.6 W/kg (averaged over 1 gram)									
Spatial Peak - Uncontrolled Exposure / General Population									
Date Tested	March 27, 2002				Ambient Temperature		22.5°C		
Measured Fluid Type	Body (1900MHz)				Relative Humidity		33.4 %		
Measured Conductivity	1.54				Atmospheric Pressure		102.27 kPa		
Measured Dielectric Constant	53.5				Fluid Temperature		≈ 23 °C		

Notes:

1. The body SAR values measured were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
2. If the SAR values measured for mid channel were 3.0dB or greater below the SAR limit of 1.6 w/kg, only mid channel data was reported.
3. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

MEASUREMENT SUMMARY (Cont.)

BODY SAR MEASUREMENT RESULTS - EUT WITH HP JORNADA 568 PDA									
Freq. (MHz)	Chan.	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Phantom Section	Test Position	Antenna Position to Phantom	Separation Distance from PDA to Phantom (cm)	SAR 1g (w/kg)
1850.25	512	PCS GPRS	28.39	28.29	Planar	Face of PDA	Parallel	2.0 (from antenna)	0.744
1880.00	661	PCS GPRS	28.26	28.09	Planar	Face of PDA	Parallel	2.0 (from antenna)	0.765
1909.875	810	PCS GPRS	28.16	28.10	Planar	Face of PDA	Parallel	2.0 (from antenna)	0.828
1880.00	661	PCS GPRS	28.27	28.12	Planar	Back of PDA	Perpendicular	0.0	0.486
1850.25	512	PCS GPRS	28.41	28.44	Planar	Left Side of PDA	Parallel	0.0	1.04
1880.00	661	PCS GPRS	28.28	28.10	Planar	Left Side of PDA	Parallel	0.0	0.684
1909.875	810	PCS GPRS	28.18	27.99	Planar	Left Side of PDA	Parallel	0.0	0.614
1850.25	512	PCS GPRS	28.42	28.23	Planar	Antenna Side of PDA	Parallel	2.0 (from antenna)	1.32
1880.00	661	PCS GPRS	28.25	28.11	Planar	Antenna Side of PDA	Parallel	2.0 (from antenna)	1.29
1909.875	810	PCS GPRS	28.20	28.00	Planar	Antenna Side of PDA	Parallel	2.0 (from antenna)	1.03
ANSI / IEEE C95.1 1992 - SAFETY LIMIT									
BODY 1.6 W/kg (averaged over 1 gram)									
Spatial Peak - Uncontrolled Exposure / General Population									
Date Tested		March 28, 2002			Ambient Temperature		22.5°C		
Measured Fluid Type		Body (1900MHz)			Relative Humidity		33.4 %		
Measured Conductivity		1.54			Atmospheric Pressure		102.27 kPa		
Measured Dielectric Constant		51.5			Fluid Temperature		≈ 23 °C		

Notes:

1. The body SAR values measured were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
2. If the SAR values measured for mid channel were 3.0dB or greater below the SAR limit of 1.6 w/kg, only mid channel data was reported.
3. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

MEASUREMENT SUMMARY (Cont.)

BODY SAR MEASUREMENT RESULTS - EUT WITH CASSIOPEIA E200 PDA									
Freq. (MHz)	Chan.	Mode	Cond. Power Before (dBm)	Cond. Power After (dBm)	Phantom Section	Test Position	Antenna Position to Phantom	Separation Distance from PDA to Phantom (cm)	SAR 1g (w/kg)
1850.25	512	PCS GPRS	28.41	28.21	Planar	Face of PDA	Parallel	2.0	0.977
1880.00	661	PCS GPRS	28.27	28.12	Planar	Face of PDA	Parallel	2.0	1.02
1909.875	810	PCS GPRS	28.12	28.01	Planar	Face of PDA	Parallel	2.0	0.945
1850.25	512	PCS GPRS	28.39	28.30	Planar	Back of PDA	Perpendicular	0.0	0.559
1880.00	661	PCS GPRS	28.23	28.09	Planar	Back of PDA	Perpendicular	0.0	0.555
1909.875	810	PCS GPRS	28.09	27.89	Planar	Back of PDA	Perpendicular	0.0	0.602
1850.25	512	PCS GPRS	28.42	28.24	Planar	Left Side of PDA	Parallel	0.0	1.17
1880.00	661	PCS GPRS	28.20	28.05	Planar	Left Side of PDA	Parallel	0.0	0.984
1909.875	810	PCS GPRS	28.10	27.94	Planar	Left Side of PDA	Parallel	0.0	0.881
1850.25	512	PCS GPRS	28.40	28.25	Planar	Antenna Side of PDA	Parallel	2.5 (from antenna)	1.02
1880.00	661	PCS GPRS	28.26	28.06	Planar	Antenna Side of PDA	Parallel	2.5 (from antenna)	1.03
1909.875	810	PCS GPRS	28.14	27.96	Planar	Antenna Side of PDA	Parallel	2.5 (from antenna)	0.876
ANSI / IEEE C95.1 1992 - SAFETY LIMIT BODY 1.6 W/kg (averaged over 1 gram) Spatial Peak - Uncontrolled Exposure / General Population									
Date Tested			May 08, 2002			Ambient Temperature		21.6°C	
Measured Fluid Type			Body (1900MHz)			Relative Humidity		54 %	
Measured Conductivity			1.54			Atmospheric Pressure		102.6 kPa	
Measured Dielectric Constant			52.3			Fluid Temperature		≈ 23 °C	

Notes:

1. The body SAR values measured were below the maximum limit of 1.6 w/kg (averaged over 1 gram).
2. If the SAR values measured for mid channel were 3.0dB or greater below the SAR limit of 1.6 w/kg, only mid channel data was reported.
3. During the entire test the conducted power was maintained to within 5% of the initial conducted power.

5.0 DETAILS OF SAR EVALUATION

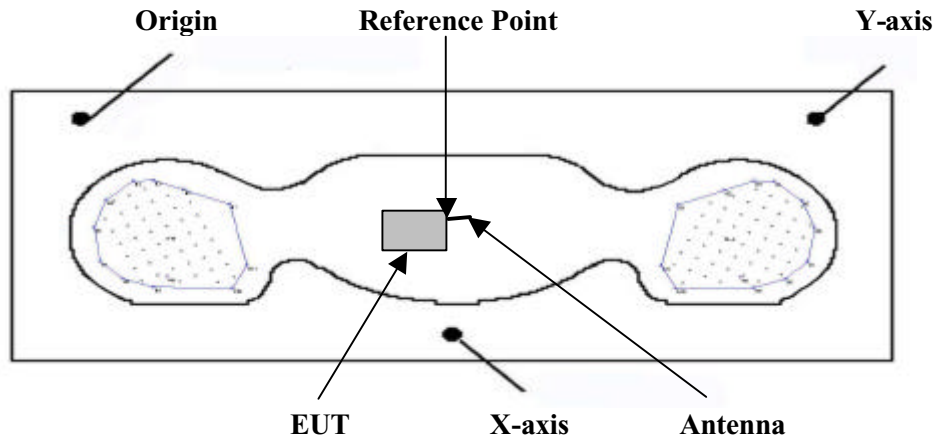
The SIERRA WIRELESS INC. Model: AirCard 750 PCS GSM/GPRS PCMCIA Card FCC ID: N7NAC750 with (3) host PDAs described in this report were found to be compliant for localized Specific Absorption Rate (SAR) based on the following test provisions and conditions:

- 1) The EUT was tested for body SAR with the face of the PDA (LCD side) and antenna facing parallel to the outer surface of the planar phantom. For the Compaq iPaq 3650 and Cassiopeia E200 PDA configurations a 2.0 cm separation distance was maintained between the face of the PDA and the planar phantom. For the HP Jornada 568 PDA configuration a 2.0 cm separation distance was maintained between the device antenna and the planar phantom.
- 2) The EUT was tested for body SAR with the back of the PDA facing parallel to the outer surface of the planar phantom. For each PDA configuration the back of the PDA was touching the planar phantom and the antenna was perpendicular to the planar phantom.
- 3) The EUT was tested for body SAR with the left side of the PDA and the antenna facing parallel to the outer surface of the planar phantom. For each PDA configuration the left side of the PDA was touching the outer surface of the planar phantom.
- 4) The EUT was tested for body SAR with the top end of the PDA (antenna side) facing upright and parallel to outer surface of the planar phantom. For each PDA configuration the antenna was parallel to the planar phantom. For the HP Jornada and Compaq Ipaq PDAs a 2.0 cm separation distance was maintained between the antenna and the planar phantom. For the Cassiopeia E200 PDA a 2.5 cm separation distance was maintained between the antenna and the planar phantom.
- 5) SAR measurements were evaluated at maximum power and the unit was operated for an appropriate period prior to the evaluation in order to minimize drift. The conducted power levels were checked before and after each test in accordance with the procedures described in FCC Part 2.1046.. If the conducted power level deviated more than 5% of the initial power level, then the EUT was retested. Any unusual anomalies over the course of the test also warranted a re-evaluation.
- 6) SAR measurements were performed with the EUT transmitting continuously at maximum power on 4 time slots in GPRS mode. This is the maximum output condition since the EUT is a Class 12 multi-slot GSM/GPRS modem.
- 7) The EUT was placed into test mode using internal test software from the host PDA.
- 8) The location of the maximum spatial SAR distribution (Hot Spot) was determined relative to the handset and its antenna.
- 9) For this evaluation a stack of low-density, low-loss dielectric foamed polystyrene was used in place of the device holder.
- 10) The EUT was tested with a fully charged battery in each PDA.

6.0 EVALUATION PROCEDURES

The Specific Absorption Rate (SAR) evaluation was performed in the following manner:

- a. (i) The evaluation was performed in the applicable area of the phantom depending on the type of device being tested. For devices held to the ear during normal operation, both the left and right ear positions were evaluated at maximum power. The positioning of the ear-held device relative to the phantom was performed in accordance with FCC OET Bulletin 65, Supplement C (Edition 01-01) using the SAM phantom.
(ii) For face-held and body-worn devices a planar phantom was used.
- b. The SAR was determined by a pre-defined procedure within the DASY3 software. Upon completion of a reference and optical surface check, the exposed region of the phantom was scanned near the inner surface using a uniform grid spacing.
- c. A 5x5x7 matrix was performed around the greatest spatial SAR distribution found during the area scan of the applicable exposed region. SAR values were then calculated using a 3-D spline interpolation algorithm and averaged over spatial volumes of 1 and 10 grams.
- d. The depth of the simulating tissue in the phantom used for the SAR evaluation and system validation was no less than 15cm.



**Device Positioning & Reference Point
(Body SAR - Face of PDA)**

7.0 SYSTEM VALIDATION

Prior to the assessment, the system was verified in the planar section of the SAM phantom using an 1800MHz dipole. A forward power of 250mW was applied to the dipole, and the system was verified to a tolerance of $\pm 10\%$. The applicable verifications are shown below (see Appendix B for validation test plots).

Dipole Validation Kit	Target SAR 1g (w/kg)	Measured SAR 1g (w/kg)	Ambient Temp.	Fluid Temp.	Fluid Depth	Validation Date
D1800V2	9.66	9.65	22.5°C	$\approx 23.0^\circ\text{C}$	$\geq 15\text{cm}$	03/27/02
		9.64	22.5°C	$\approx 23.0^\circ\text{C}$	$\geq 15\text{cm}$	03/28/02
		9.58	21.6°C	$\approx 23.0^\circ\text{C}$	$\geq 15\text{cm}$	05/08/02

8.0 TISSUE PARAMETERS

The dielectric parameters of the fluids were verified prior to the SAR evaluation using an 85070C Dielectric Probe Kit and an 8753E Network Analyzer. The dielectric parameters of the fluid are listed below (see Appendix D for printout of measured fluid dielectric parameters).

TISSUE PARAMETERS - SYSTEM VALIDATION & EUT EVALUATION			
Equivalent Tissue	Dielectric Constant ϵ_r	Conductivity σ (mho/m)	ρ (Kg/m ³)
1800-2000MHz Head (Target)	40.0 $\pm 5\%$	1.40 $\pm 5\%$	1000
1800MHz Head (Measured: 03/27/02)	39.2	1.40	1000
1800MHz Head (Measured: 03/28/02)	38.9	1.41	1000
1800MHz Head (Measured: 05/08/02)	39.1	1.40	1000
1800-2000MHz Body (Target)	53.3 $\pm 5\%$	1.52 $\pm 5\%$	1000
1900MHz Body (Measured: 03/27/02)	53.5	1.54	1000
1900MHz Body (Measured: 03/28/02)	51.5	1.54	1000
1900MHz Body (Measured: 05/08/02)	52.3	1.54	1000

9.0 SIMULATED TISSUES

The 1800-2000MHz brain and body fluids consist of Glycol-monobutyl, water, and salt. The fluid was prepared according to standardized procedures, and measured for dielectric parameters (permittivity and conductivity).

TISSUE MIXTURE - SYSTEM VALIDATION & EUT EVALUATION		
INGREDIENT	1800MHz Brain Fluid (System Validation)	1900MHz Body Fluid (EUT Evaluation)
Water	54.90 %	70.31 %
Glycol Monobutyl	44.92 %	29.56 %
Salt	0.18 %	0.13 %

10.0 SAR SAFETY LIMITS

EXPOSURE LIMITS	SAR (W/Kg)	
	(General Population / Uncontrolled Exposure Environment)	(Occupational / Controlled Exposure Environment)
Spatial Average (averaged over the whole body)	0.08	0.4
Spatial Peak (averaged over any 1 g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10 g)	4.0	20.0

- Notes: 1. Uncontrolled environments are defined as locations where there is potential exposure of individuals who have no knowledge or control of their potential exposure.
2. Controlled environments are defined as locations where there is potential exposure of individuals who have knowledge of their potential exposure and can exercise control over their exposure.

11.0 ROBOT SYSTEM SPECIFICATIONS

Specifications

POSITIONER: Stäubli Unimation Corp. Robot Model: RX60L
Repeatability: 0.02 mm
No. of axis: 6

Data Acquisition Electronic (DAE) System

Cell Controller

Processor: Pentium III
Clock Speed: 450 MHz
Operating System: Windows NT
Data Card: DASY3 PC-Board

Data Converter

Features: Signal Amplifier, multiplexer, A/D converter, and control logic
Software: DASY3 software
Connecting Lines: Optical downlink for data and status info.
Optical uplink for commands and clock

PC Interface Card

Function: 24 bit (64 MHz) DSP for real time processing
Link to DAE3
16-bit A/D converter for surface detection system
serial link to robot
direct emergency stop output for robot

E-Field Probe

Model: ET3DV6
Serial No.: 1387
Construction: Triangular core fiber optic detection system
Frequency: 10 MHz to 6 GHz
Linearity: ± 0.2 dB (30 MHz to 3 GHz)

Phantom

Type: SAM V4.0C
Configuration: Left Head, Right Head, Planar Section
Shell Material: Fiberglass
Thickness: 2.0 \pm 0.1 mm
Volume: Approx. 20 liters

12.0 SAM PHANTOM V4.0C

The SAM phantom V4.0C is a fiberglass shell phantom with a 2.0 mm shell thickness for left and right head and flat planar area integrated in a wooden table. The shape of the fiberglass shell corresponds to the phantom defined by SCC34-SC2. The device holder positions are adjusted to the standard measurement positions in the three sections.



SAM Phantom V4.0C

13.0 DEVICE HOLDER

The DASY3 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65°. The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections.



Device Holder

14.0 PROBE SPECIFICATION (ET3DV6)

- Construction: Symmetrical design with triangular core
Built-in shielding against static charges
PEEK enclosure material (resistant to organic solvents, e.g. glycol)
- Calibration: In air from 10 MHz to 2.5 GHz
In brain simulating tissue at frequencies of 900 MHz and 1.8 GHz (accuracy $\pm 8\%$)
- Frequency: 10 MHz to >6 GHz; Linearity: ± 0.2 dB (30 MHz to 3 GHz)
- Directivity: ± 0.2 dB in brain tissue (rotation around probe axis)
 ± 0.4 dB in brain tissue (rotation normal to probe axis)
- Dynam. Rnge: 5 μ W/g to >100 mW/g; Linearity: ± 0.2 dB
- Srfce. Detect. ± 0.2 mm repeatability in air and clear liquids over diffuse reflecting surfaces
- Dimensions: Overall length: 330 mm
Tip length: 16 mm
Body diameter: 12 mm
Tip diameter: 6.8 mm
Distance from probe tip to dipole centers: 2.7 mm
- Application: General dosimetry up to 3 GHz
Compliance tests of mobile phone



ET3DV6 E-Field Probe

15.0 TEST EQUIPMENT LIST

SAR MEASUREMENT SYSTEM		
<u>EQUIPMENT</u>	<u>SERIAL NO.</u>	<u>DATE CALIBRATED</u>
DASY3 System -Robot -ET3DV6 E-Field Probe -300MHz Validation Dipole -450MHz Validation Dipole -900MHz Validation Dipole -1800MHz Validation Dipole -2450MHz Validation Dipole -SAM Phantom V4.0C	599396-01 1387 135 136 054 247 150 N/A	N/A Feb 2002 Oct 2001 Oct 2001 June 2001 June 2001 Oct 2001 N/A
85070C Dielectric Probe Kit	N/A	N/A
Gigatronics 8652A Power Meter -Power Sensor 80701A -Power Sensor 80701A	1835272 1833535 1833542	Feb 2002 Feb 2002 Mar 2002
E4408B Spectrum Analyzer	US39240170	Nov 2001
8594E Spectrum Analyzer	3543A02721	Feb 2002
8753E Network Analyzer	US38433013	Feb 2002
8648D Signal Generator	3847A00611	Feb 2002
5S1G4 Amplifier Research Power Amplifier	26235	N/A

16.0 MEASUREMENT UNCERTAINTIES

Error Description	Uncertainty Value ±%	Probability Distribution	Divisor	c _i 1g	Standard Uncertainty ±% (1g)	v _i or v _{eff}
Measurement System						
Probe calibration	± 4.8	Normal	1	1	± 4.8	∞
Axial isotropy of the probe	± 4.7	Rectangular	√3	(1-c _p)	± 1.9	∞
Spherical isotropy of the probe	± 9.6	Rectangular	√3	(c _p)	± 3.9	∞
Spatial resolution	± 0.0	Rectangular	√3	1	± 0.0	∞
Boundary effects	± 5.5	Rectangular	√3	1	± 3.2	∞
Probe linearity	± 4.7	Rectangular	√3	1	± 2.7	∞
Detection limit	± 1.0	Rectangular	√3	1	± 0.6	∞
Readout electronics	± 1.0	Normal	1	1	± 1.0	∞
Response time	± 0.8	Rectangular	√3	1	± 0.5	∞
Integration time	± 1.4	Rectangular	√3	1	± 0.8	∞
RF ambient conditions	± 3.0	Rectangular	√3	1	± 1.7	∞
Mech. constraints of robot	± 0.4	Rectangular	√3	1	± 0.2	∞
Probe positioning	± 2.9	Rectangular	√3	1	± 1.7	∞
Extrapolation & integration	± 3.9	Rectangular	√3	1	± 2.3	∞
Test Sample Related						
Device positioning	± 6.0	Normal	√3	1	± 6.7	12
Device holder uncertainty	± 5.0	Normal	√3	1	± 5.9	8
Power drift	± 5.0	Rectangular	√3		± 2.9	∞
Phantom and Setup						
Phantom uncertainty	± 4.0	Rectangular	√3	1	± 2.3	∞
Liquid conductivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid conductivity (measured)	± 10.0	Rectangular	√3	0.6	± 3.5	∞
Liquid permittivity (target)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Liquid permittivity (measured)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
Combined Standard Uncertainty					± 13.7	
Expanded Uncertainty (k=2)					± 27.5	

Measurement Uncertainty Table in accordance with IEEE Std 1528 (Draft - see reference [5])

17.0 REFERENCES

- [1] Federal Communications Commission, ET Docket 93-62, “Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation”, Aug. 1996.
- [2] Industry Canada, “Evaluation Procedure for Mobile and Portable Radio Transmitters with respect to Health Canada’s Safety Code 6 for Exposure of Humans to Radio Frequency Fields”, Radio Standards Specification RSS-102 Issue 1 (Provisional): September 1999.
- [3] ANSI, ANSI/IEEE C95.1: 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: 1992.
- [4] Federal Communications Commission, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65, Supplement C (Edition 01-01), FCC, Washington, D.C.: June 2001.
- [5] IEEE Standards Coordinating Committee 34, Std. P1528, DRAFT Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques: Draft, December 2001.
- [6] 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: January 1996.
- [7] Niels Kuster, Ralph Kastle, and Thomas Schmid, “Dosimetric evaluation of mobile communications equipment with know precision”, IEICE Transactions of Communications, vol. E80-B, no. 5, pp. 645-652: May 1997.

APPENDIX A - SAR MEASUREMENT DATA

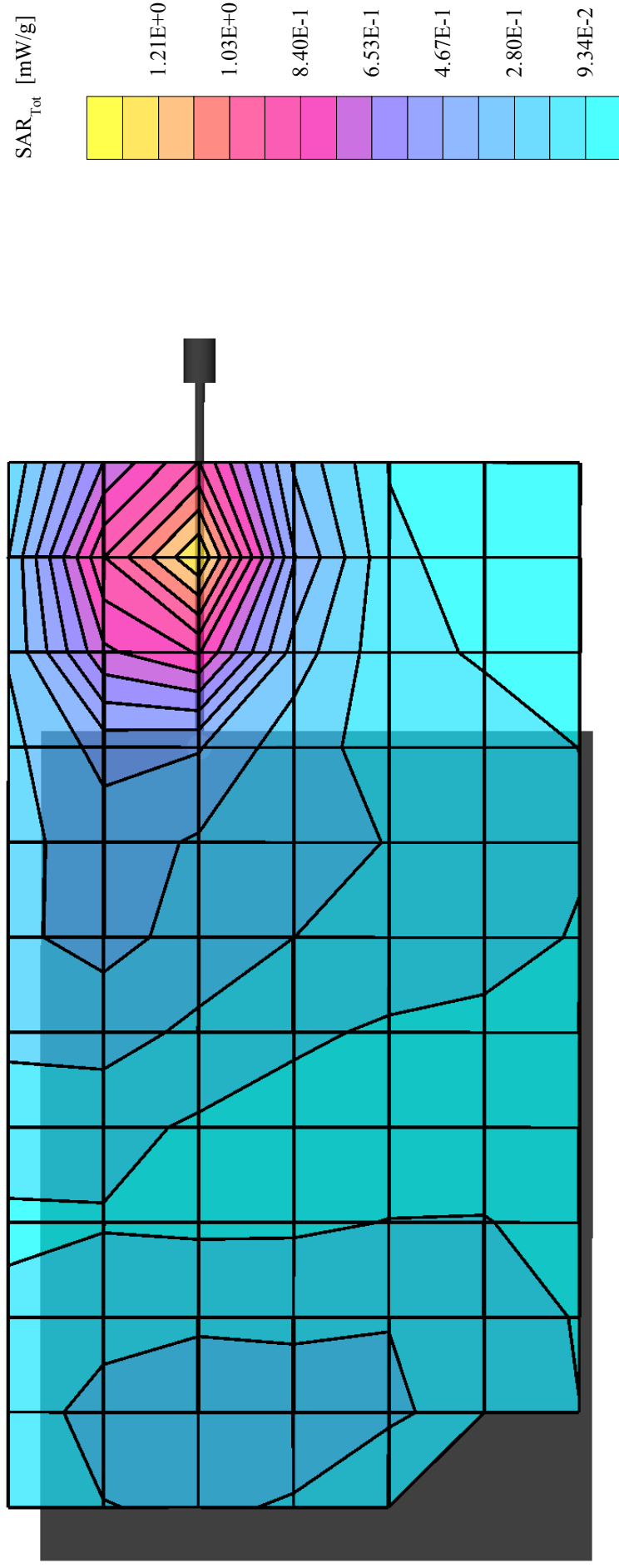
SAR TEST PLOTS WITH COMPAQ IPAQ 3650 PDA

Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (90°, 90°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 53.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.14 dB
SAR (1g): 1.24 mW/g, SAR (10g): 0.708 mW/g

Body SAR - Face of PDA - 2.0cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Compaq iPaq 3650 PDA
PCS GPRS Mode

Channel 512 [1850.25 MHz]
Conducted Power: 28.44 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 27, 2002



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section

Probe: ET3DV6 - SN1387; ConvF(5.00,5.00,5.00); Crest factor: 2.0;
1900 MHz Muscle: $\sigma = 1.54$ mho/m $\epsilon_r = 53.5$ $\rho = 1.00$ g/cm³

Z-Axis Extrapolation at Peak SAR Location

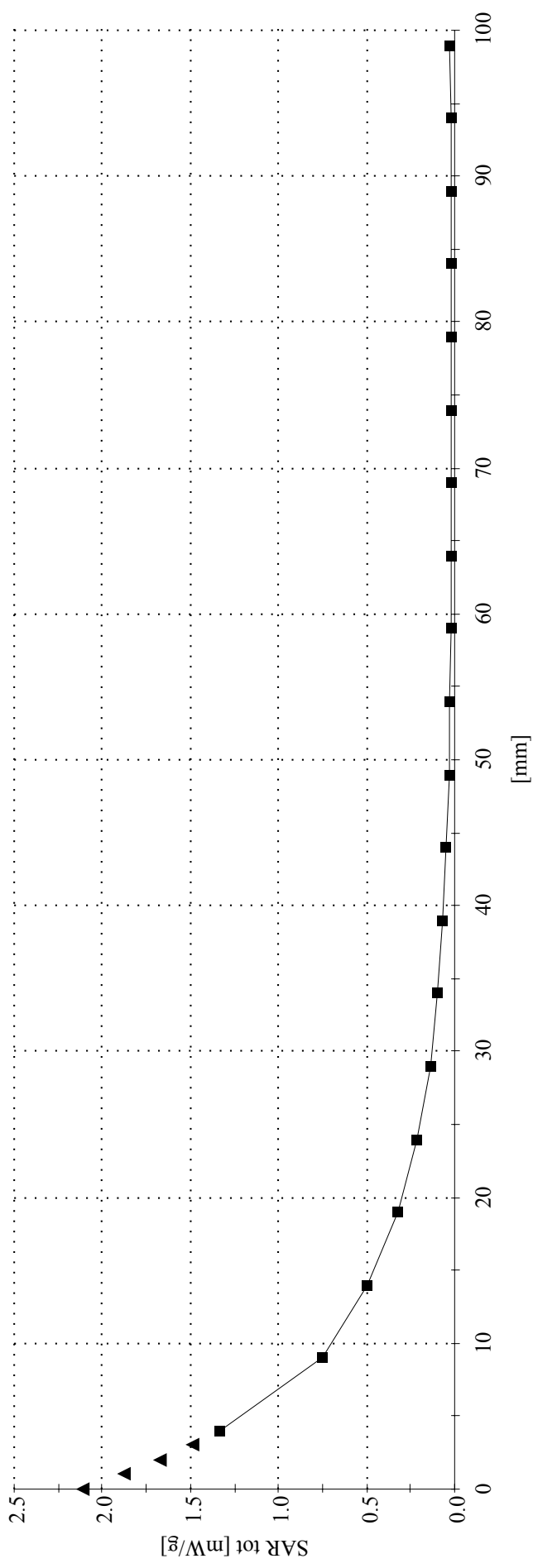
Body SAR - Face of PDA - 2.0cm Separation Distance
AirCard 750 Wireless Modem in Compaq iPaq 3650 PDA
PCS GPRS Mode

Channel 512 [1850.25 MHz]

Conducted Power: 28.44 dBm

Ambient Temp. 22.5°C; Fluid Temp. 23.0°C

Dated Tested: March 27, 2002

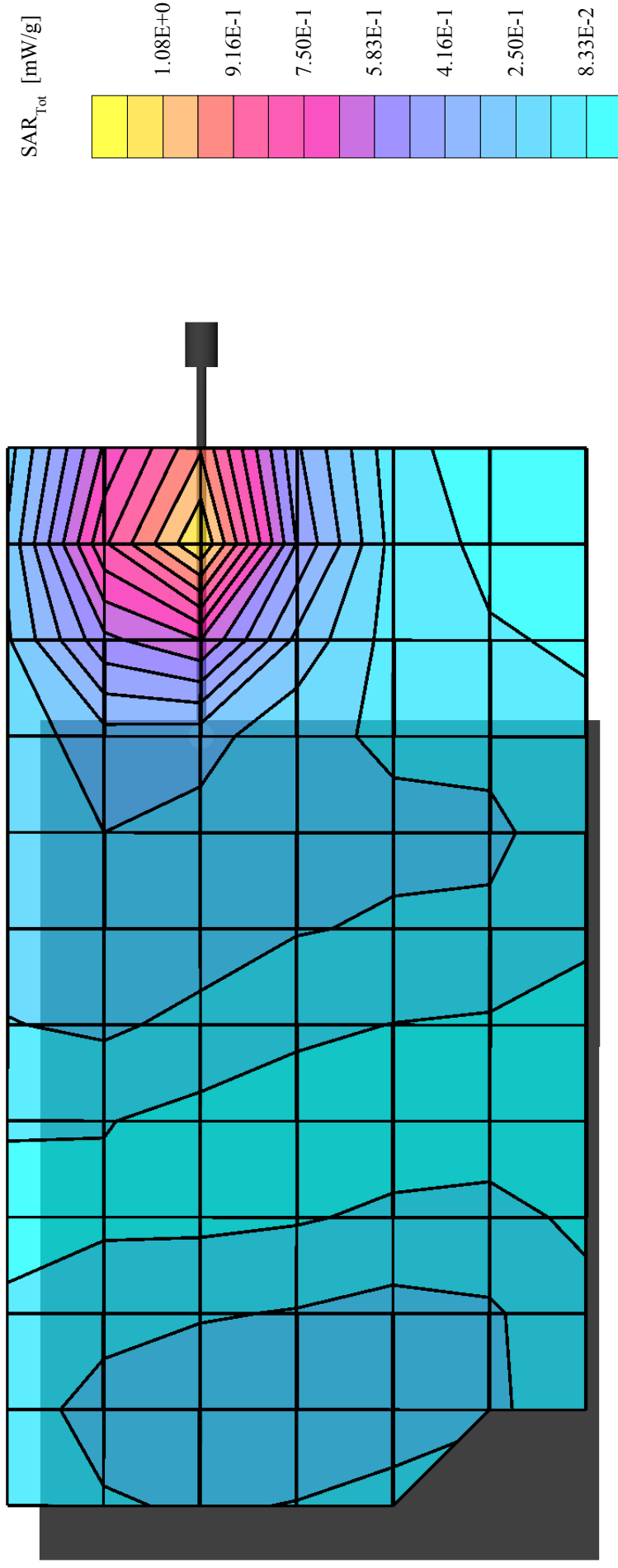


Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (90°, 90°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 53.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.20 dB
SAR (1g): 1.12 mW/g, SAR (10g): 0.638 mW/g

Body SAR - Face of PDA - 2.0cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Compaq iPaq 3650 PDA
PCS GPRS Mode

Channel 661 [1880.00 MHz]
Conducted Power: 28.26 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 27, 2002

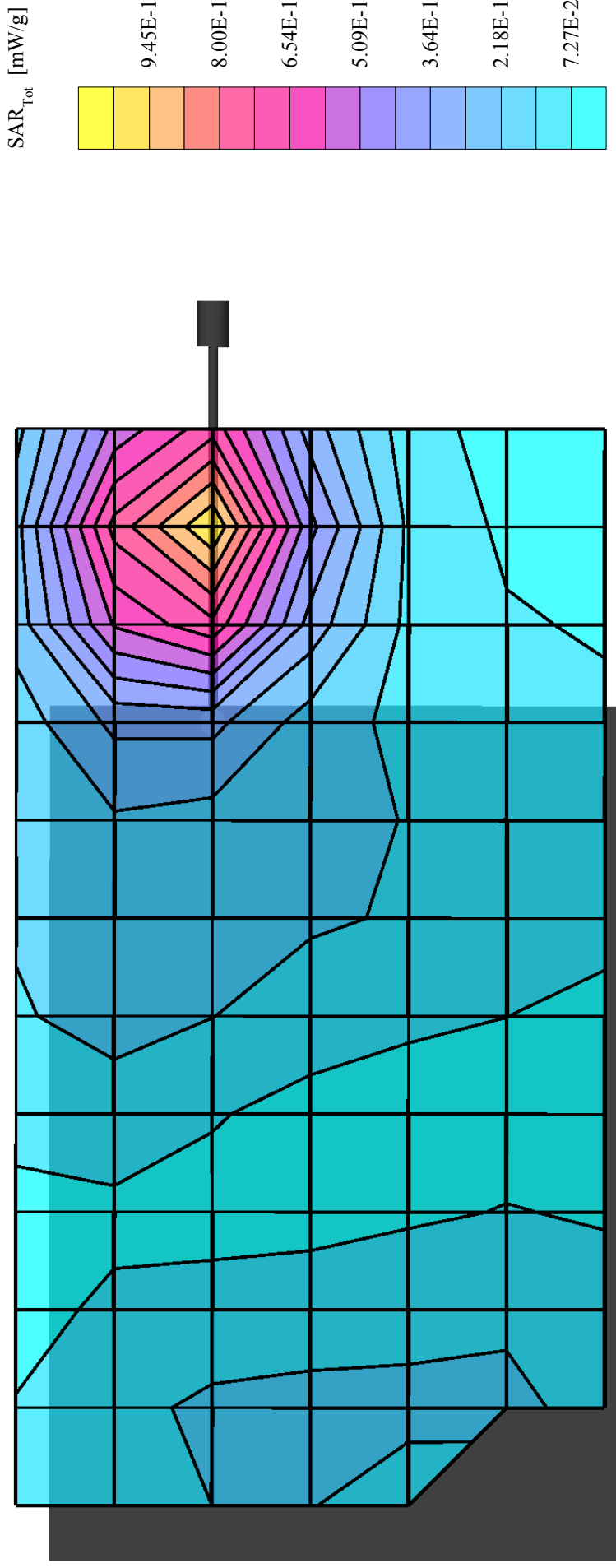


Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (90°, 90°)
Probe: ET3DV6 - SNI387; ConvF(5.00, 5.00, 5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 53.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.11 dB
SAR (1g): 0.966 mW/g, SAR (10g): 0.555 mW/g

Body SAR - Face of PDA - 2.0cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Compaq iPaq 3650 PDA
PCS GPRS Mode

Channel 810 [1909.875 MHz]
Conducted Power: 28.10 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 27, 2002

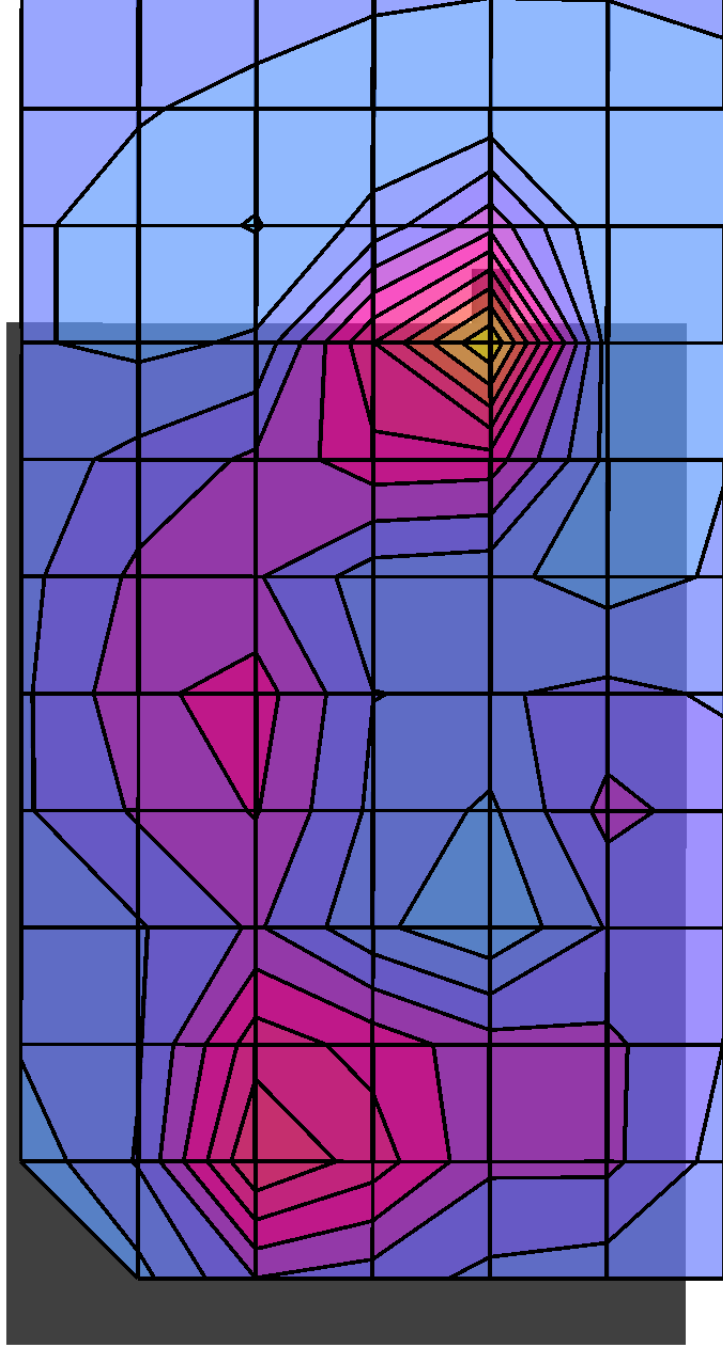


Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 270°)
Probe: ET3DV6 - SNI387; ConvF(5.00, 5.00, 5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 53.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.17 dB
SAR (1g): 0.212 mW/g, SAR (10g): 0.132 mW/g

Body SAR - Back of PDA - 0.0cm Separation Distance
Antenna Perpendicular to Planar Phantom
AirCard 750 Wireless Modem in Compaq iPaq 3650 PDA
PCS GPRS Mode

Channel 661 [1880.00 MHz]
Conducted Power: 28.24 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 27, 2002



SAR_{tot} [mW/g]

1.96E-1

1.66E-1

1.36E-1

1.06E-1

7.54E-2

4.52E-2

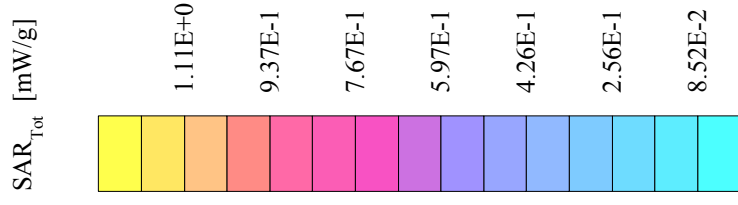
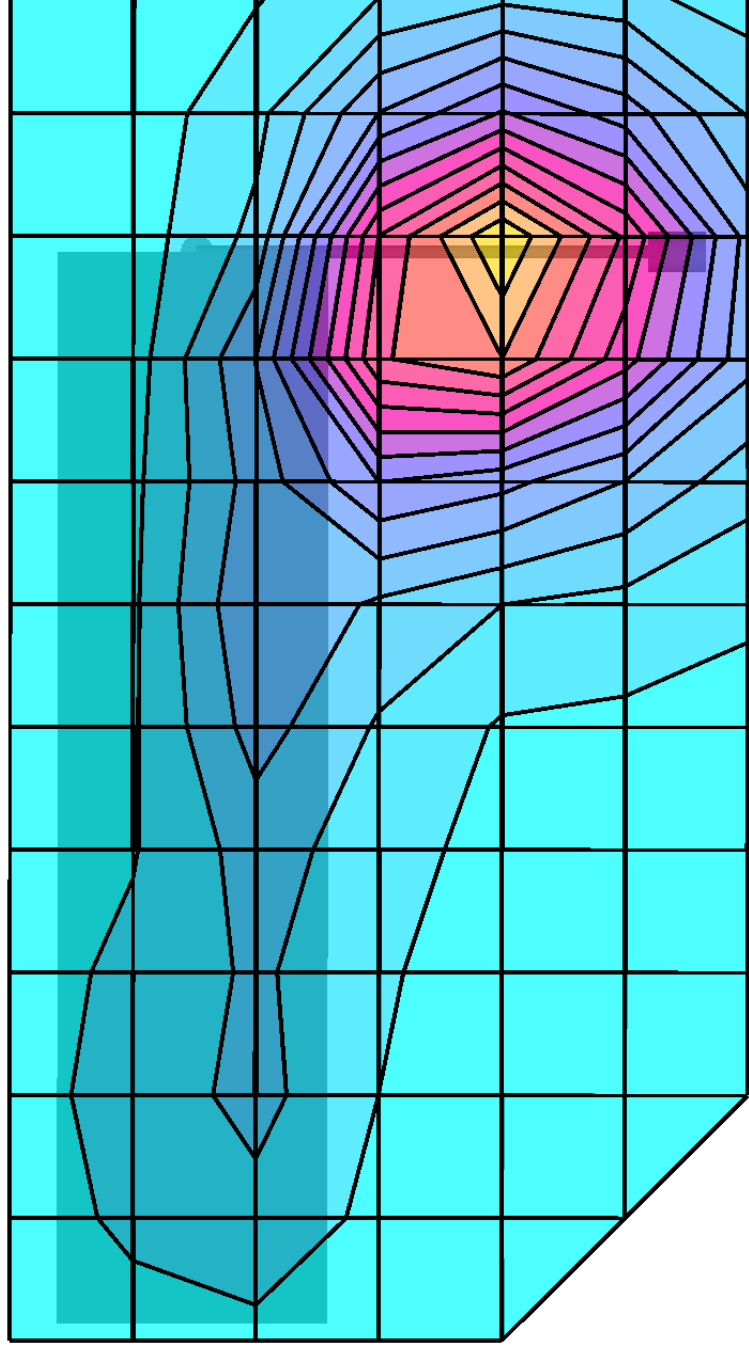
1.51E-2

Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 53.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.18 dB
SAR (1g): 1.17 mW/g, SAR (10g): 0.709 mW/g

Body SAR - Left Side of PDA - 0.0cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Compaq iPaq 3650 PDA
PCS GPRS Mode

Channel 512 [1850.25 MHz]
Conducted Power: 28.43 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 27, 2002

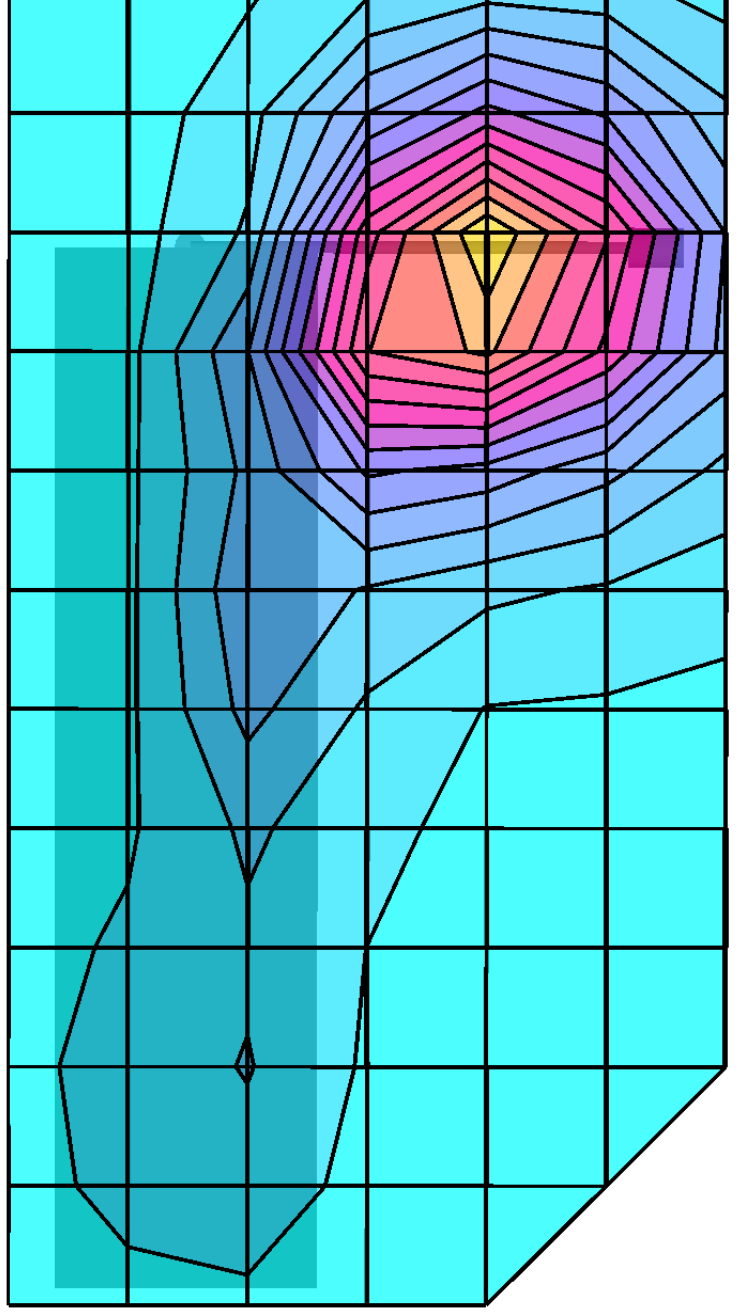


Sierra Wireless FCC ID: N7NAC750

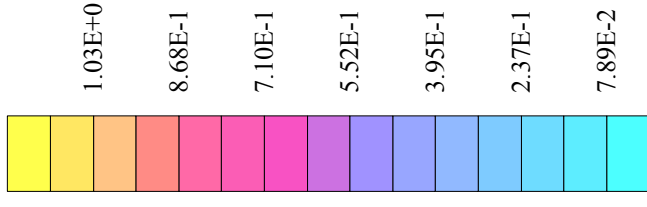
SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 53.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.13 dB
SAR (1g): 1.08 mW/g, SAR (10g): 0.656 mW/g

Body SAR - Left Side of PDA - 0.0cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Compaq iPaq 3650 PDA
PCS GPRS Mode

Channel 661 [1880.00 MHz]
Conducted Power: 28.21 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 27, 2002



SAR_{tot} [mW/g]

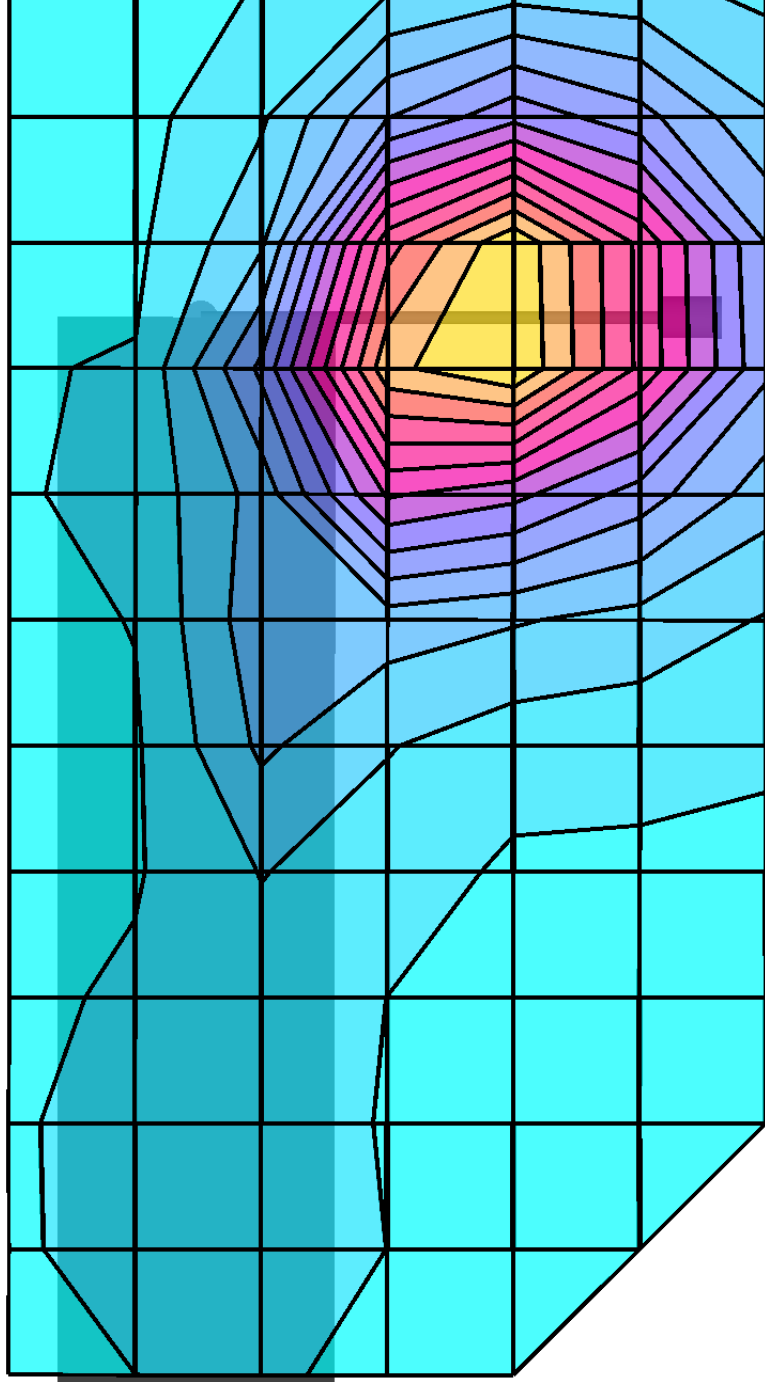


Sierra Wireless FCC ID: N7NAC750

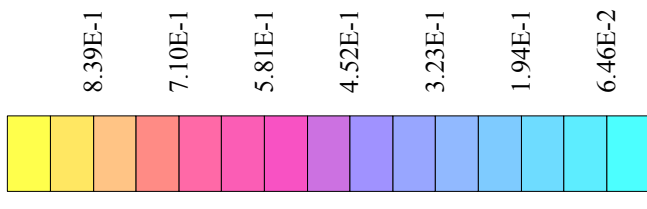
SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 53.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.14 dB
SAR (1g): 0.941 mW/g, SAR (10g): 0.576 mW/g

Body SAR - Left Side of PDA - 0.0cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Compaq iPaq 3650 PDA
PCS GPRS Mode

Channel 810 [1909.875 MHz]
Conducted Power: 28.12 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 27, 2002



SAR_{tot} [mW/g]

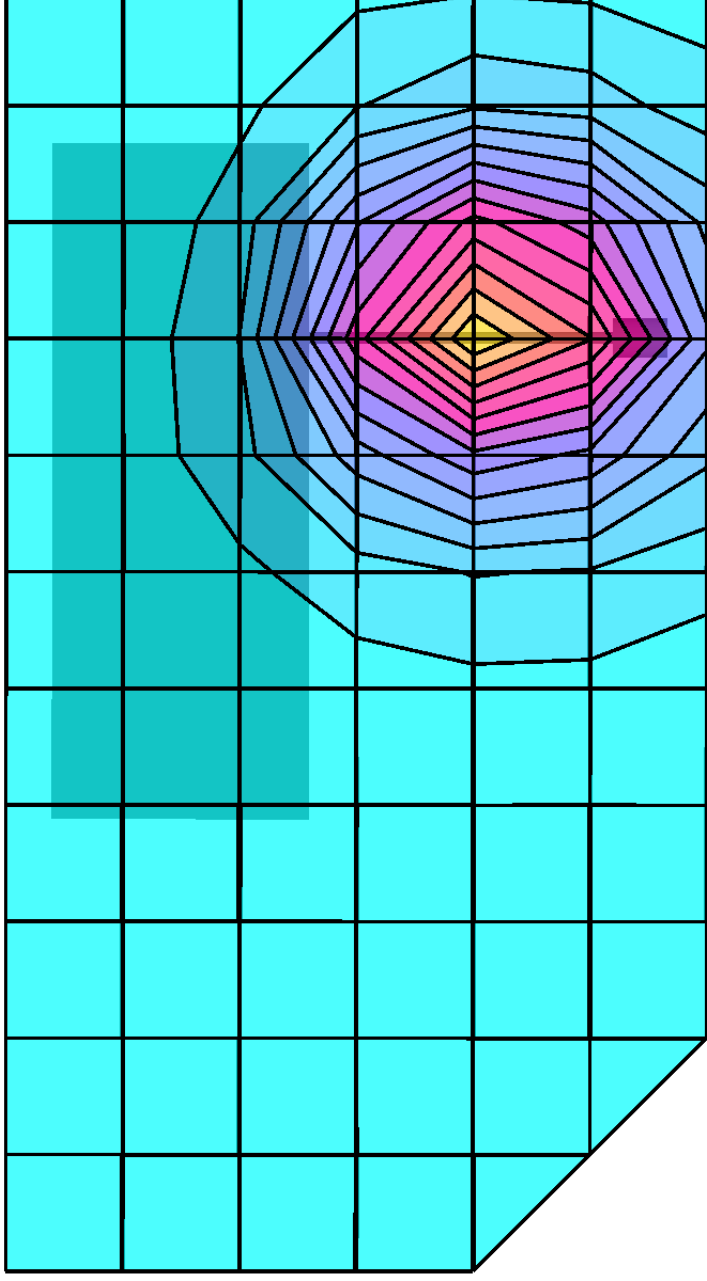


Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 53.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.16 dB
SAR (1g): 1.23 mW/g, SAR (10g): 0.720 mW/g

Body SAR - Top Side of PDA - 2.0cm Separation Distance (from Antenna)
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Compaq iPaq 3650 PDA
PCS GPRS Mode

Channel 512 [1850.25 MHz]
Conducted Power: 28.40 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 27, 2002



SAR_{tot} [mW/g]

1.23E+0

1.04E+0

8.49E-1

6.60E-1

4.72E-1

2.83E-1

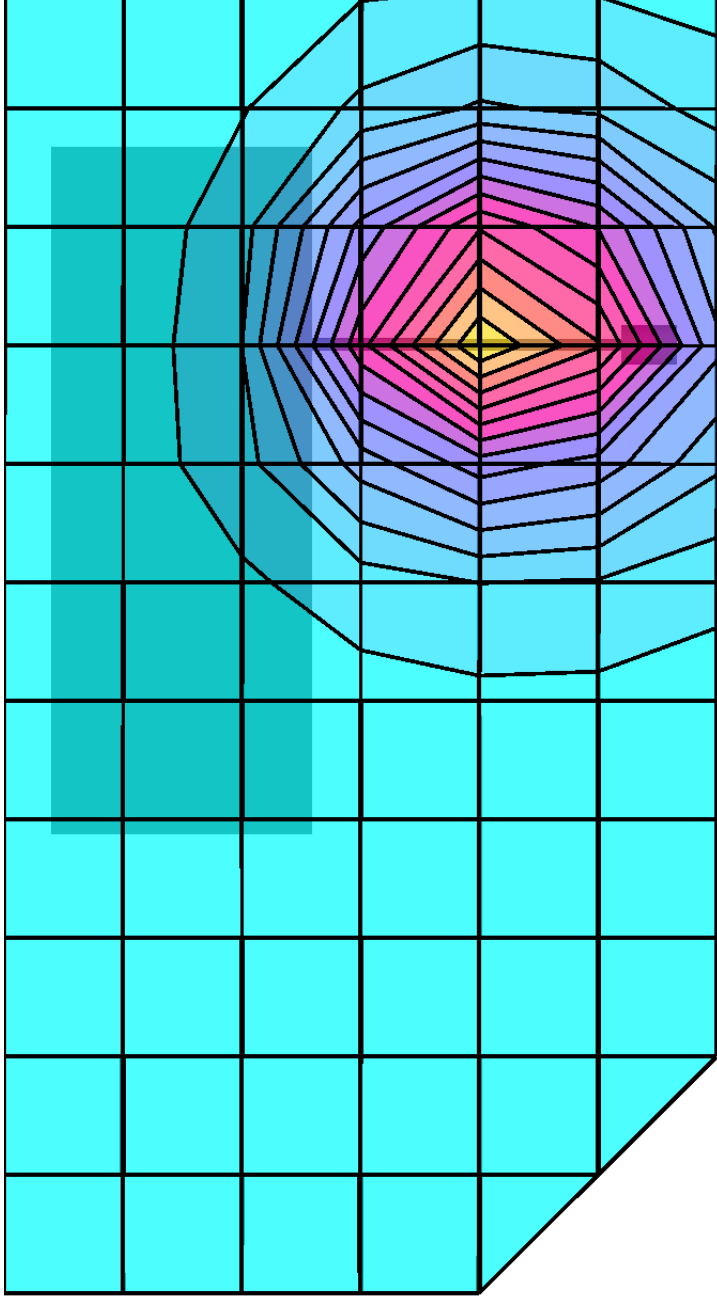
9.44E-2

Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 53.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.13 dB
SAR (1g): 1.14 mW/g, SAR (10g): 0.665 mW/g

Body SAR - Top Side of PDA - 2.0cm Separation Distance (from Antenna)
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Compaq iPaq 3650 PDA
PCS GPRS Mode

Channel 661 [1880.00 MHz]
Conducted Power: 28.28 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 27, 2002

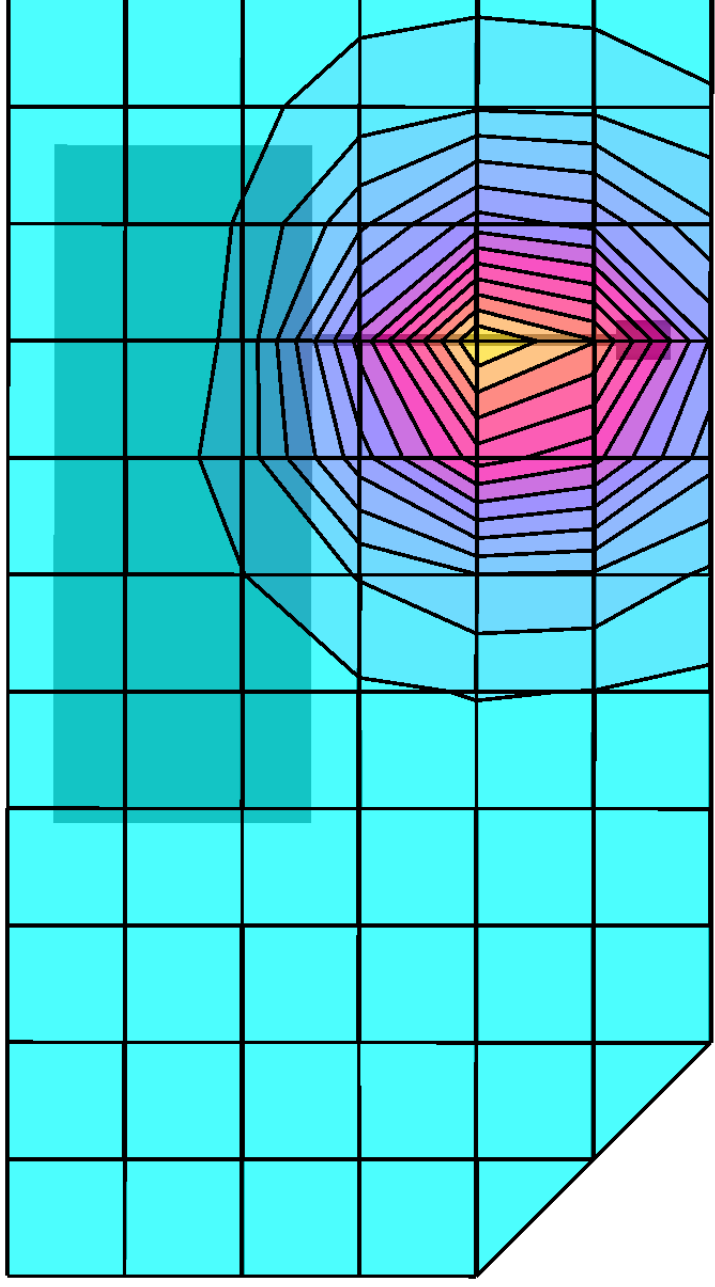


Sierra Wireless FCC ID: N7NAC750

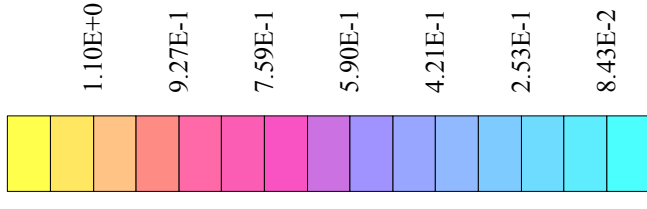
SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 53.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.06 dB
SAR (1g): 1.14 mW/g, SAR (10g): 0.646 mW/g

Body SAR - Top Side of PDA - 2.0cm Separation Distance (from Antenna)
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Compaq iPaq 3650 PDA
PCS GPRS Mode

Channel 810 [1909.875 MHz]
Conducted Power: 28.10 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 27, 2002



SAR_{tot} [mW/g]

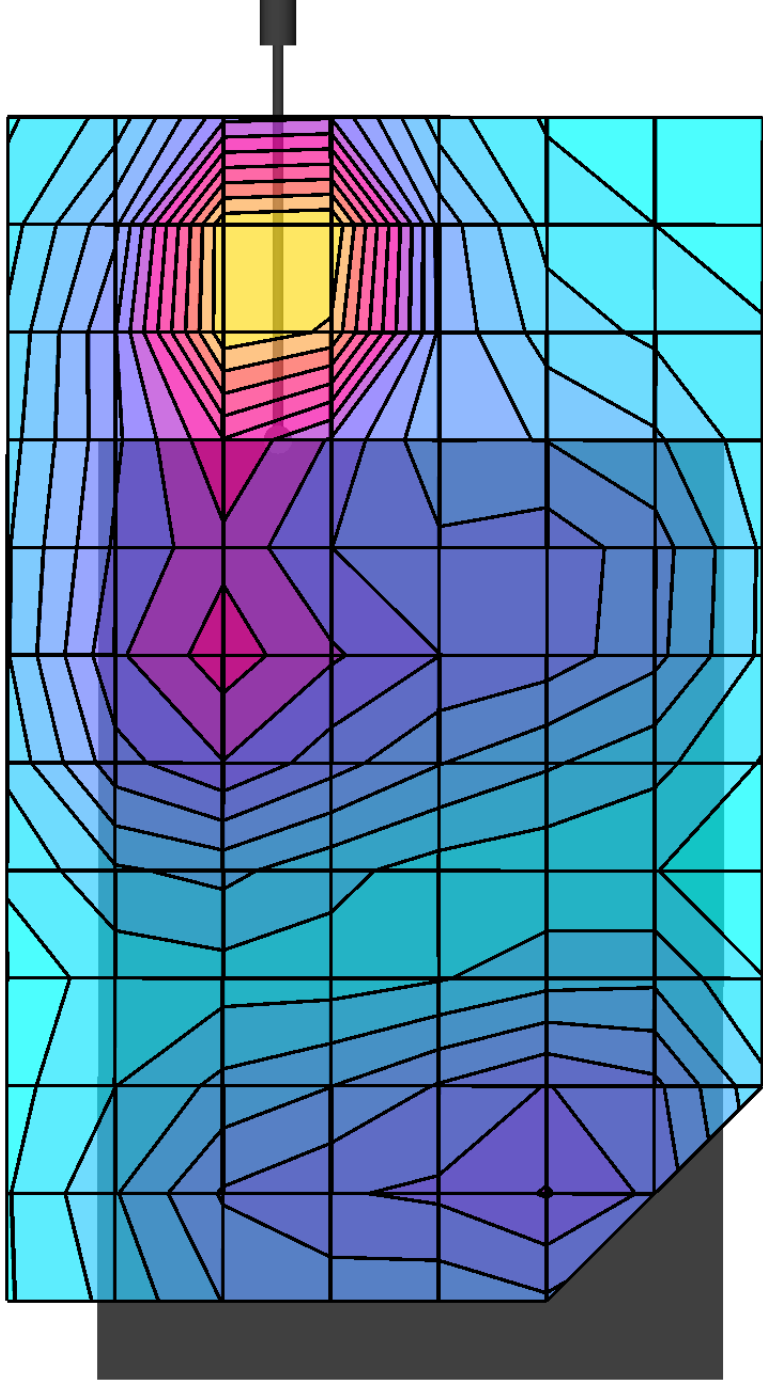


SAR TEST PLOTS WITH HP JORNADA 568 PDA

Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (90°, 90°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 51.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.10 dB
SAR (1g): 0.744 mW/g, SAR (10g): 0.422 mW/g

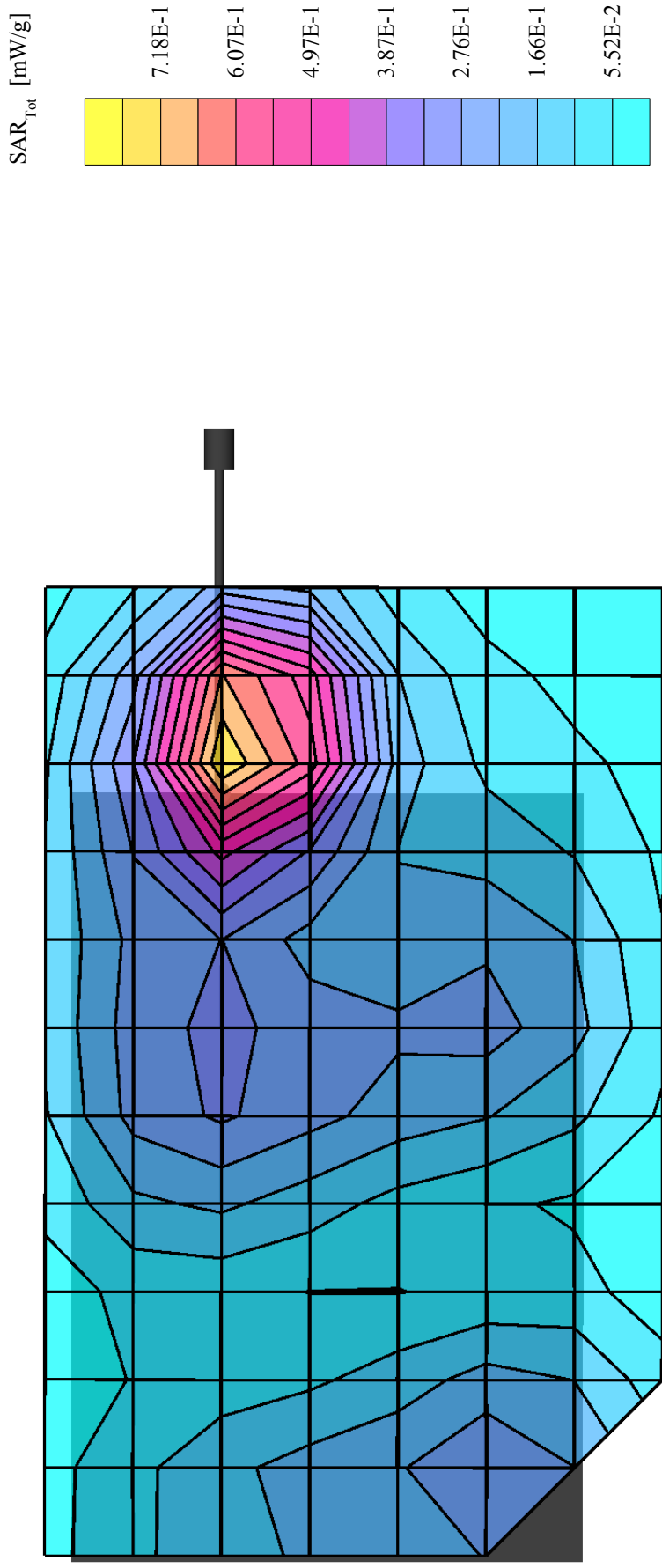
Body SAR - Face of PDA - 2.0cm Separation Distance (from Antenna)
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in HP Jornada 568 PDA
PCS GPRS Mode
Channel 512 [1850.25 MHz]
Conducted Power: 28.39 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 28, 2002



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (90°, 90°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$; $\epsilon_r = 51.5$; $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.17 dB
SAR (1g): 0.765 mW/g, SAR (10g): 0.430 mW/g

Body SAR - Face of PDA - 2.0cm Separation Distance (from Antenna)
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in HP Jornada 568 PDA
PCS GPRS Mode
Channel 661 [1880.00 MHz]
Conducted Power: 28.26 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 28, 2002

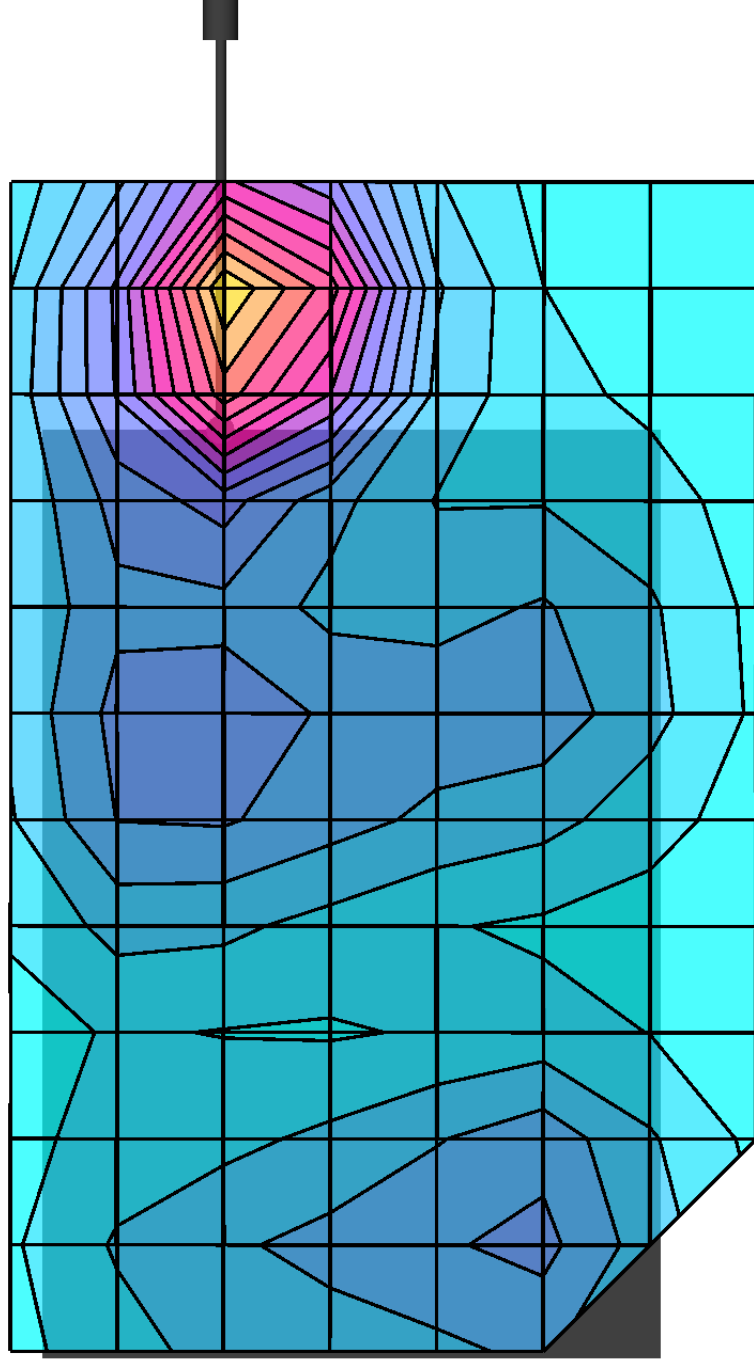


Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (90°, 90°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 51.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.06 dB
SAR (1g): 0.828 mW/g, SAR (10g): 0.468 mW/g

Body SAR - Face of PDA - 2.0cm Separation Distance (from Antenna)
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in HP Jornada 568 PDA
PCS GPRS Mode

Channel 810 [1909.875 MHz]
Conducted Power: 28.16 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 28, 2002



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 270°)
Probe: ET3DV6 - SNI387; ConvF(5.00, 5.00, 5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 51.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.18 dB
SAR (1g): 0.486 mW/g, SAR (10g): 0.206 mW/g

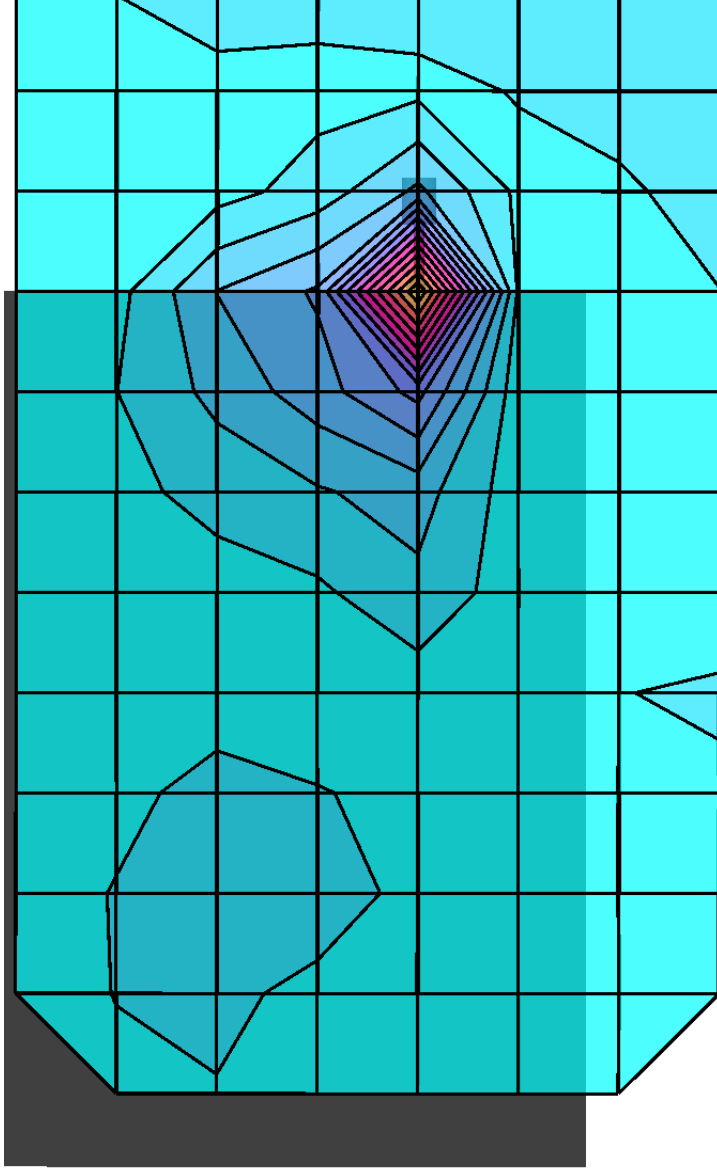
Body SAR - Back of PDA - 0.0cm Separation Distance
Antenna Perpendicular to Planar Phantom
AirCard 750 Wireless Modem in HP Jornada 568 PDA
PCS GPRS Mode

Channel 661 [1880.00 MHz]

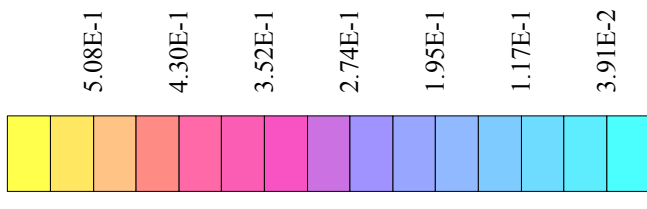
Conducted Power: 28.27 dBm

Ambient Temp. 22.5°C; Fluid Temp. 23.0°C

Dated Tested: March 28, 2002



SAR_{tot} [mW/g]

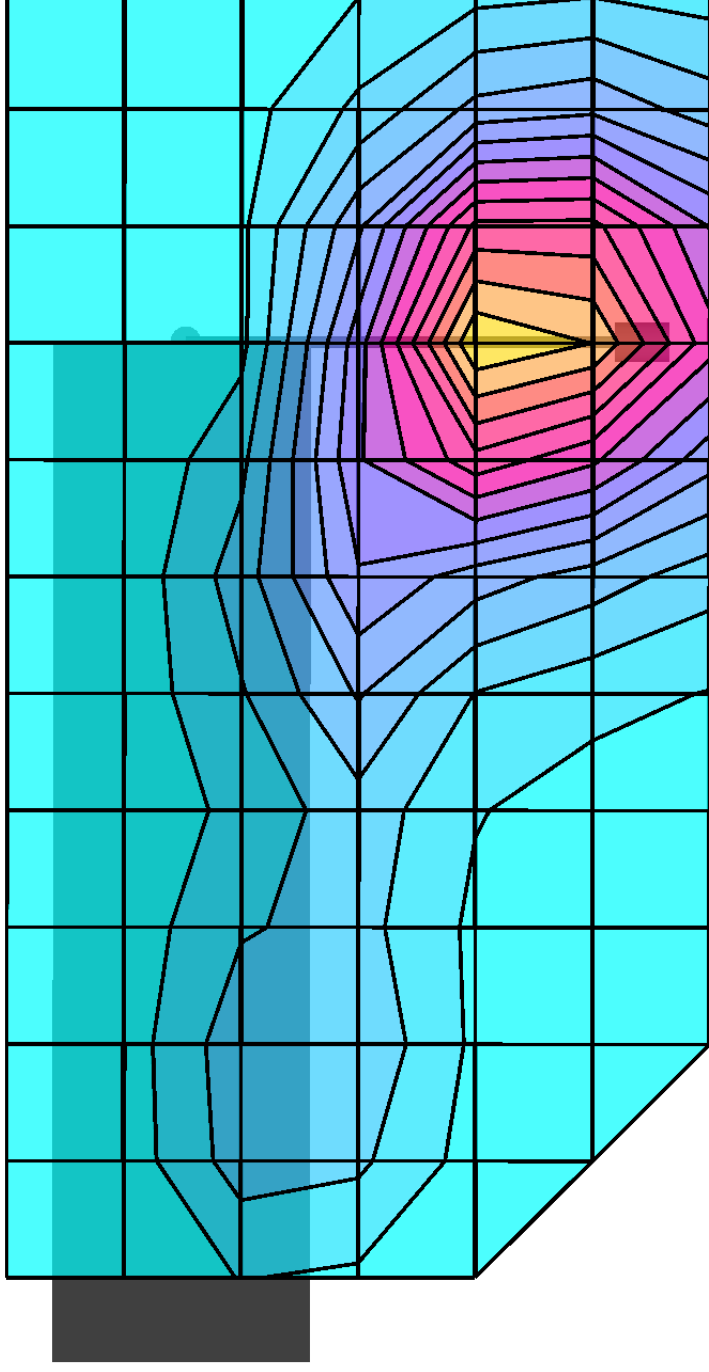


Sierra Wireless FCC ID: N7NAC750

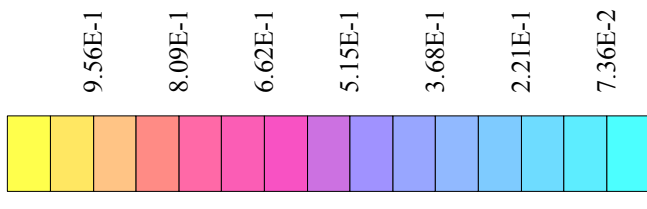
SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 51.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: 0.03 dB
SAR (1g): 1.04 mW/g, SAR (10g): 0.608 mW/g

Body SAR - Left Side of PDA - 0.0cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in HP Jomada 568 PDA
PCS GPRS Mode

Channel 512 [1850.25 MHz]
Conducted Power: 28.41 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 28, 2002



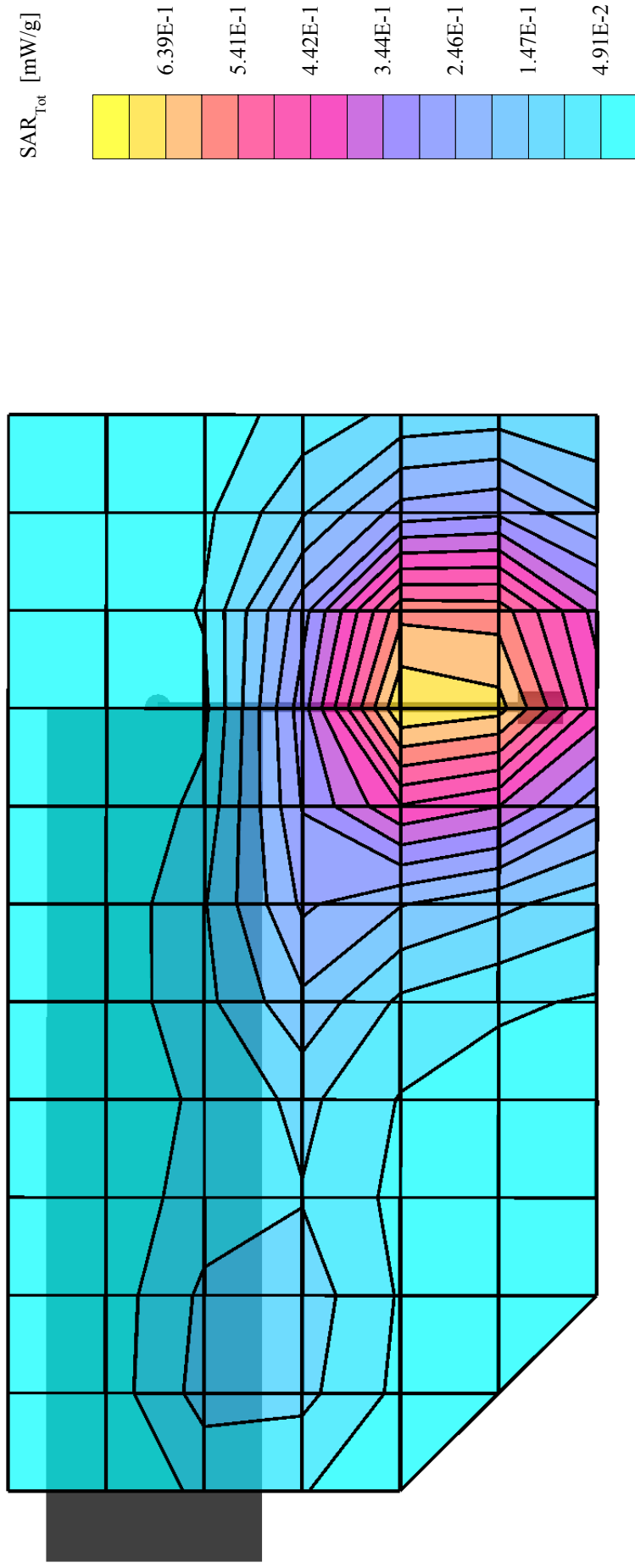
SAR_{tot} [mW/g]



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00, 5.00, 5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 51.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.10 dB
SAR (1g): 0.684 mW/g, SAR (10g): 0.409 mW/g

Body SAR - Left Side of PDA - 0.0cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in HP Jornada 568 PDA
PCS GPRS Mode
Channel 661 [1880.00 MHz]
Conducted Power: 28.28 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 28, 2002



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 51.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.19 dB
SAR (1g): 0.614 mW/g, SAR (10g): 0.363 mW/g

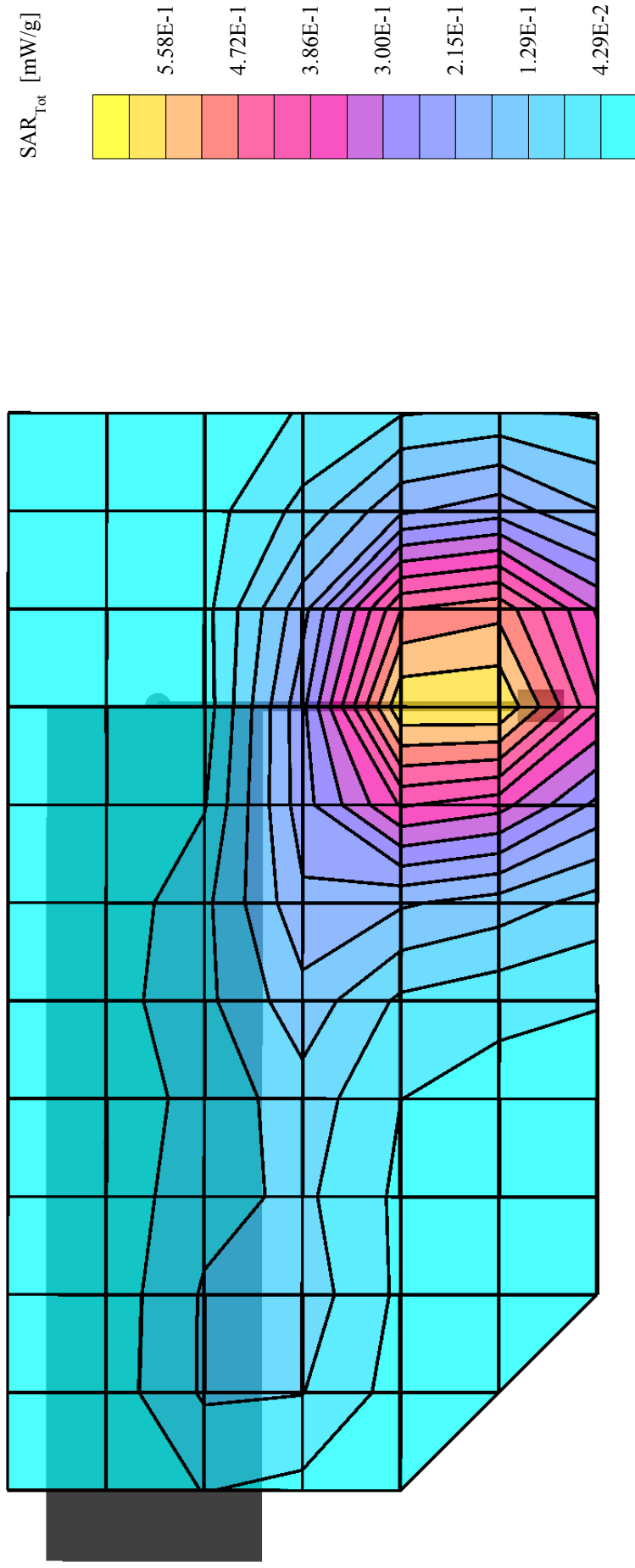
Body SAR - Left Side of PDA - 0.0cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in HP Jornada 568 PDA
PCS GPRS Mode

Channel 810 [1909.875 MHz]

Conducted Power: 28.18 dBm

Ambient Temp. 22.5°C; Fluid Temp. 23.0°C

Dated Tested: March 28, 2002

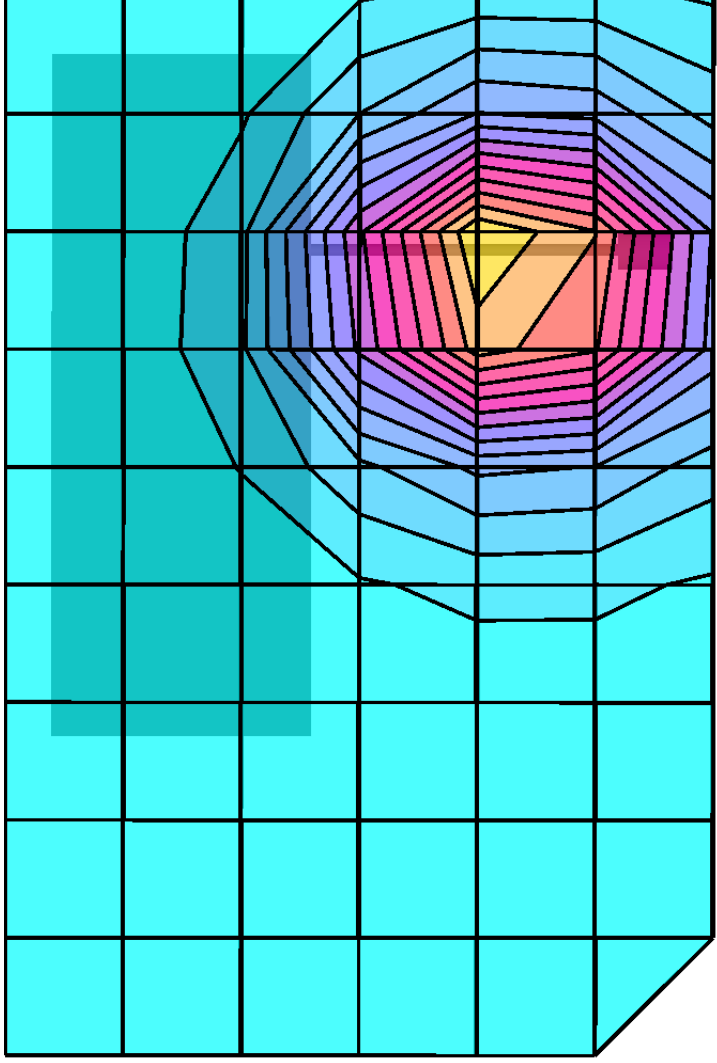


Sierra Wireless FCC ID: N7NAC750

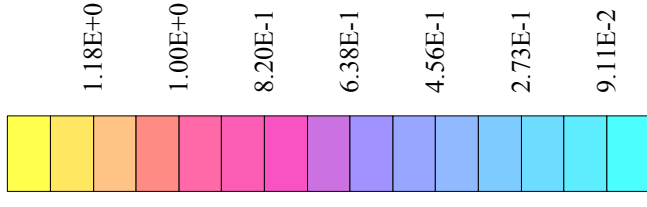
SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 51.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.20 dB
SAR (1g): 1.32 mW/g, SAR (10g): 0.765 mW/g

Body SAR - Top Side of PDA - 2.0cm Separation Distance (from Antenna)
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in HP Jornada 568 PDA
PCS GPRS Mode

Channel 512 [1850.25 MHz]
Conducted Power: 28.42 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 28, 2002



SAR_{Tot} [mW/g]



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section

Probe: ET3DV6 - SN1387; ConvF(5.00,5.00,5.00); Crest factor: 2.0;

1900 MHz Muscle: $\sigma = 1.54$ mho/m $\epsilon_r = 51.5$ $\rho = 1.00$ g/cm³

Z-Axis Extrapolation at Peak SAR Location

Body SAR - Top Side of PDA - 2.0cm Separation Distance (from Antenna)

AirCard 750 Wireless Modem in HP Jornada 568 PDA

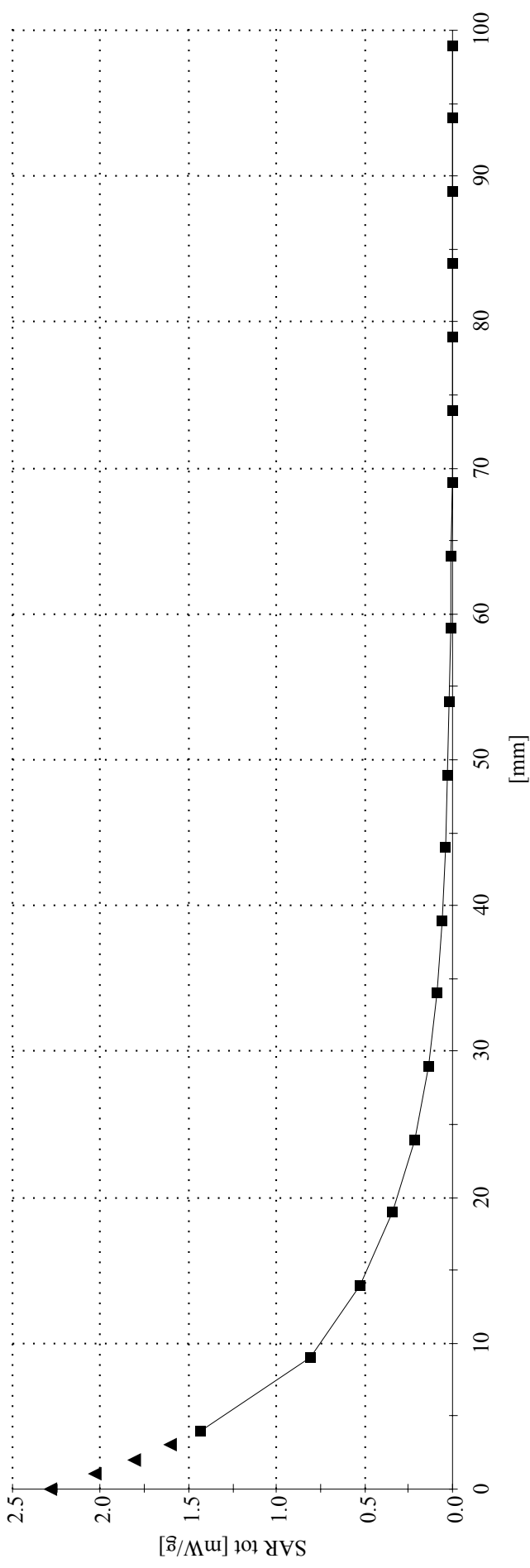
PCS GPRS Mode

Channel 512 [1850.25 MHz]

Conducted Power: 28.42 dBm

Ambient Temp. 22.5°C; Fluid Temp. 23.0°C

Dated Tested: March 28, 2002

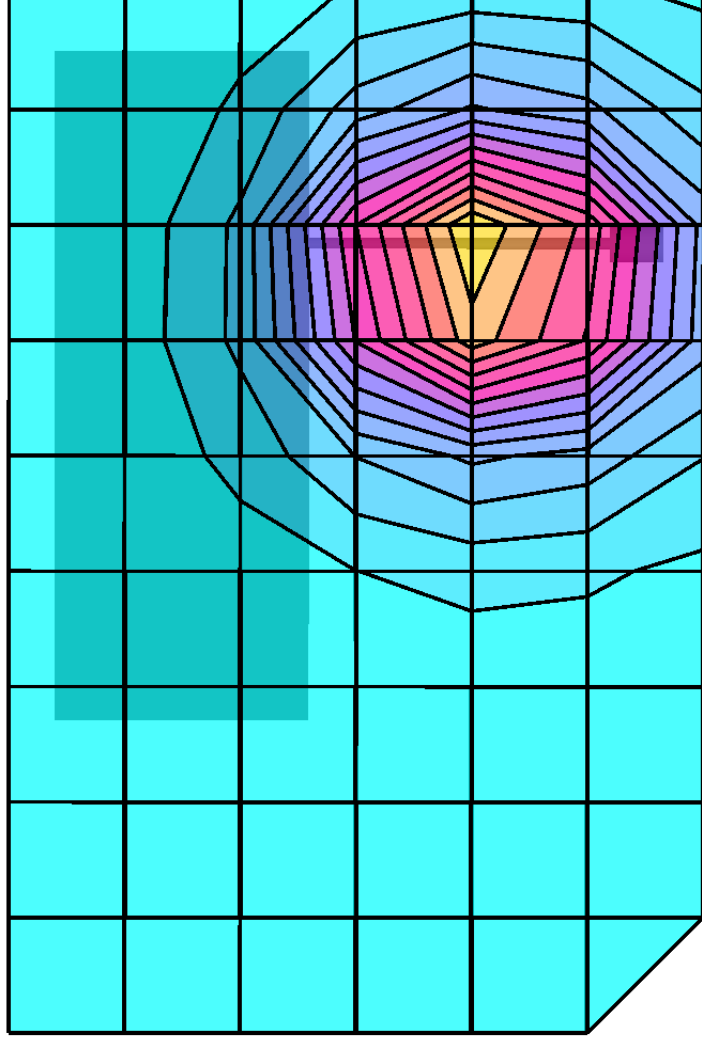


Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 51.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.18 dB
SAR (1g): 1.29 mW/g, SAR (10g): 0.738 mW/g

Body SAR - Top Side of PDA - 2.0cm Separation Distance (from Antenna)
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in HP Jornada 568 PDA
PCS GPRS Mode

Channel 661 [1880.00 MHz]
Conducted Power: 28.25 dBm
Ambient Temp. 22.5°C; Fluid Temp. 23.0°C
Dated Tested: March 28, 2002



SAR_{tot} [mW/g]

1.17E+0

9.88E-1

8.09E-1

6.29E-1

4.49E-1

2.70E-1

8.99E-2

Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 51.5$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.19 dB
SAR (1g): 1.03 mW/g, SAR (10g): 0.584 mW/g

Body SAR - Top Side of PDA - 2.0cm Separation Distance (from Antenna)

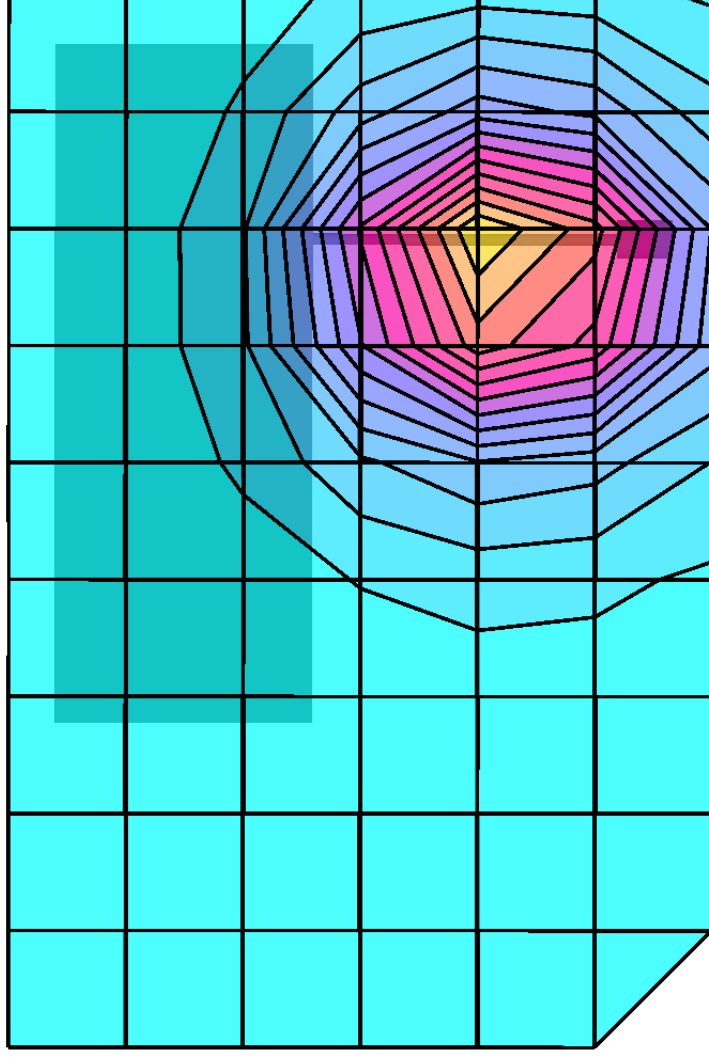
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in HP Jornada 568 PDA
PCS GPRS Mode

Channel 810 [1909.875 MHz]

Conducted Power: 28.20 dBm

Ambient Temp. 22.5°C; Fluid Temp. 23.0°C

Dated Tested: March 28, 2002



SAR_{Tot} [mW/g]

9.56E-1

8.09E-1

6.62E-1

5.15E-1

3.68E-1

2.21E-1

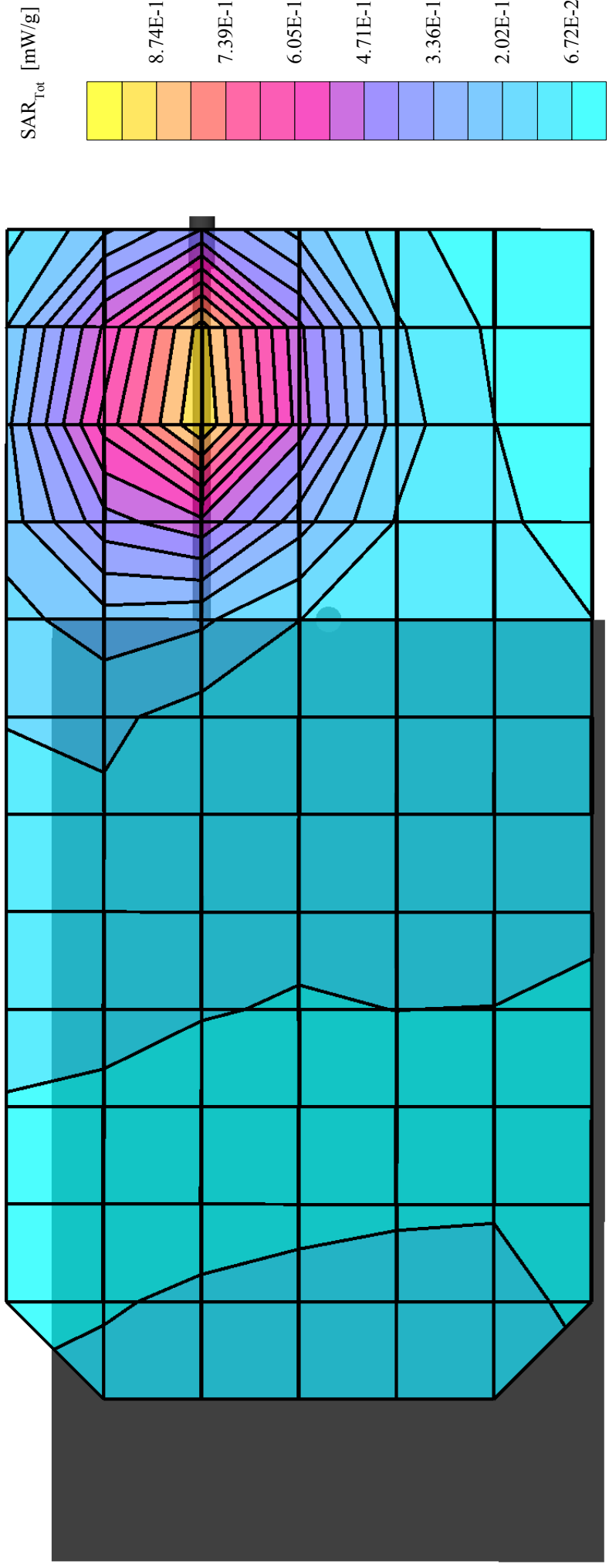
7.36E-2

SAR TEST PLOTS WITH CASSIOPEIA E200 PDA

Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (90°, 90°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 52.3$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.20 dB
SAR (1g): 0.977 mW/g, SAR (10g): 0.554 mW/g

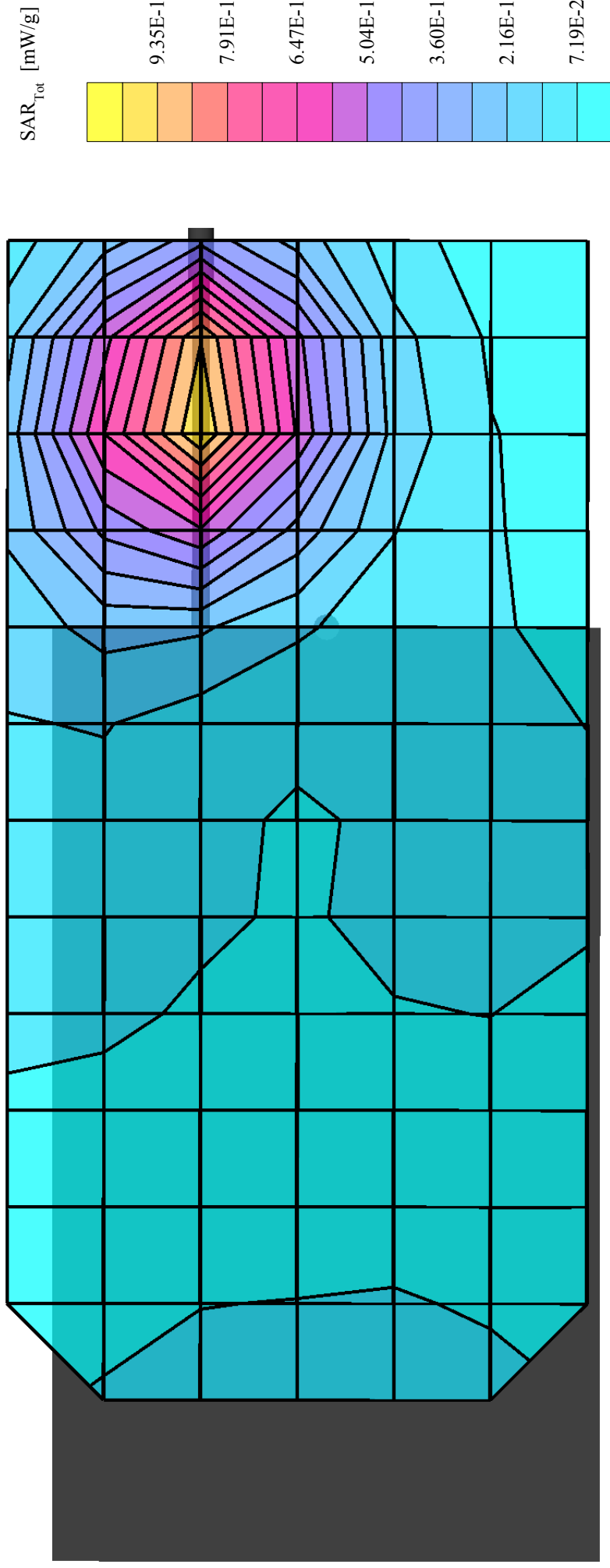
Body SAR - Face of PDA - 2.0 cm Separation Distance - Antenna Parallel to Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode
Channel 512 [1850.25 MHz]
Conducted Power: 28.41 dBm
Ambient Temp. 21.6°C; Fluid Temp. 23.0°C
Dated Tested: May 8, 2002



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (90°, 90°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 52.3$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.18 dB
SAR (1g): 1.02 mW/g, SAR (10g): 0.580 mW/g

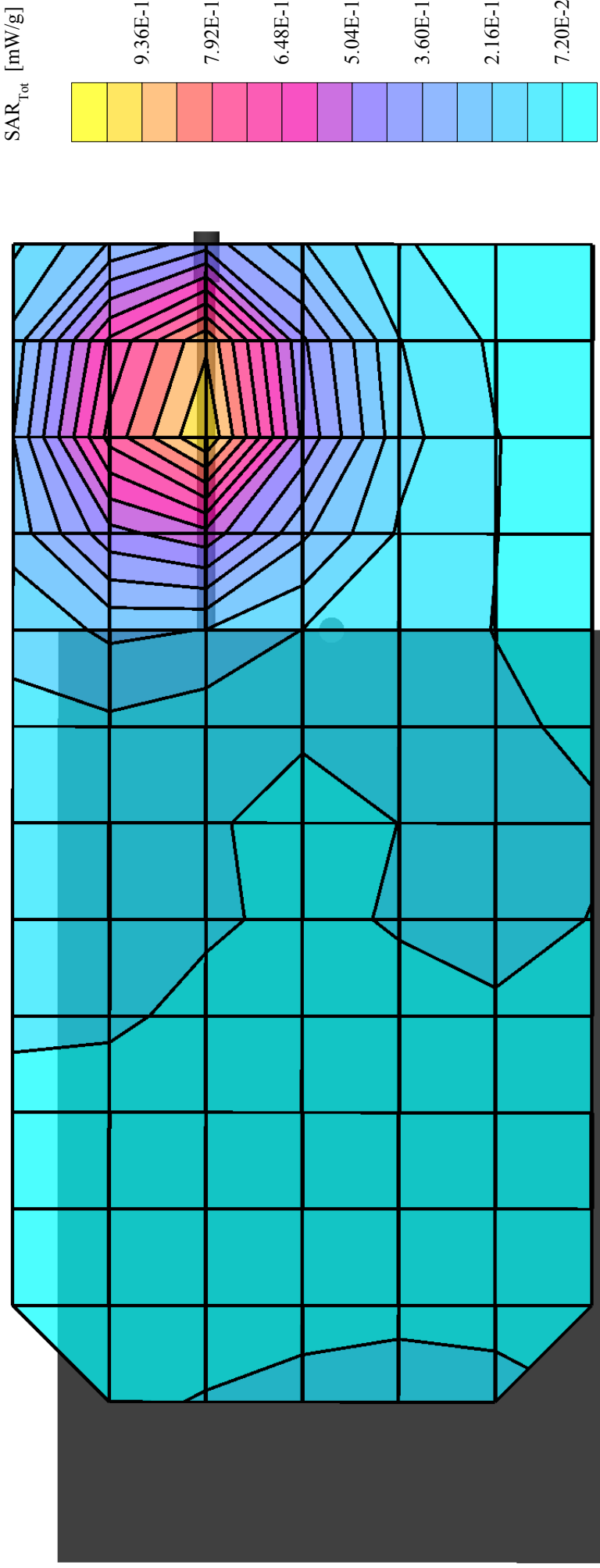
Body SAR - Face of PDA - 2.0 cm Separation Distance - Antenna Parallel to Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode
Channel 661 [1880.00 MHz]
Conducted Power: 28.27 dBm
Ambient Temp. 21.6°C; Fluid Temp. 23.0°C
Dated Tested: May 8, 2002



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (90°, 90°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 52.3$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.13 dB
SAR (1g): 0.945 mW/g, SAR (10g): 0.532 mW/g

Body SAR - Face of PDA - 2.0 cm Separation Distance - Antenna Parallel to Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode
Channel 810 [1909.875 MHz]
Conducted Power: 28.12 dBm
Ambient Temp. 21.6°C; Fluid Temp. 23.0°C
Dated Tested: May 8, 2002



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 270°)
Probe: ET3DV6 - SNI387; ConvF(5.00, 5.00, 5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 52.3$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: 0.04 dB
SAR (1g): 0.559 mW/g, SAR (10g): 0.310 mW/g

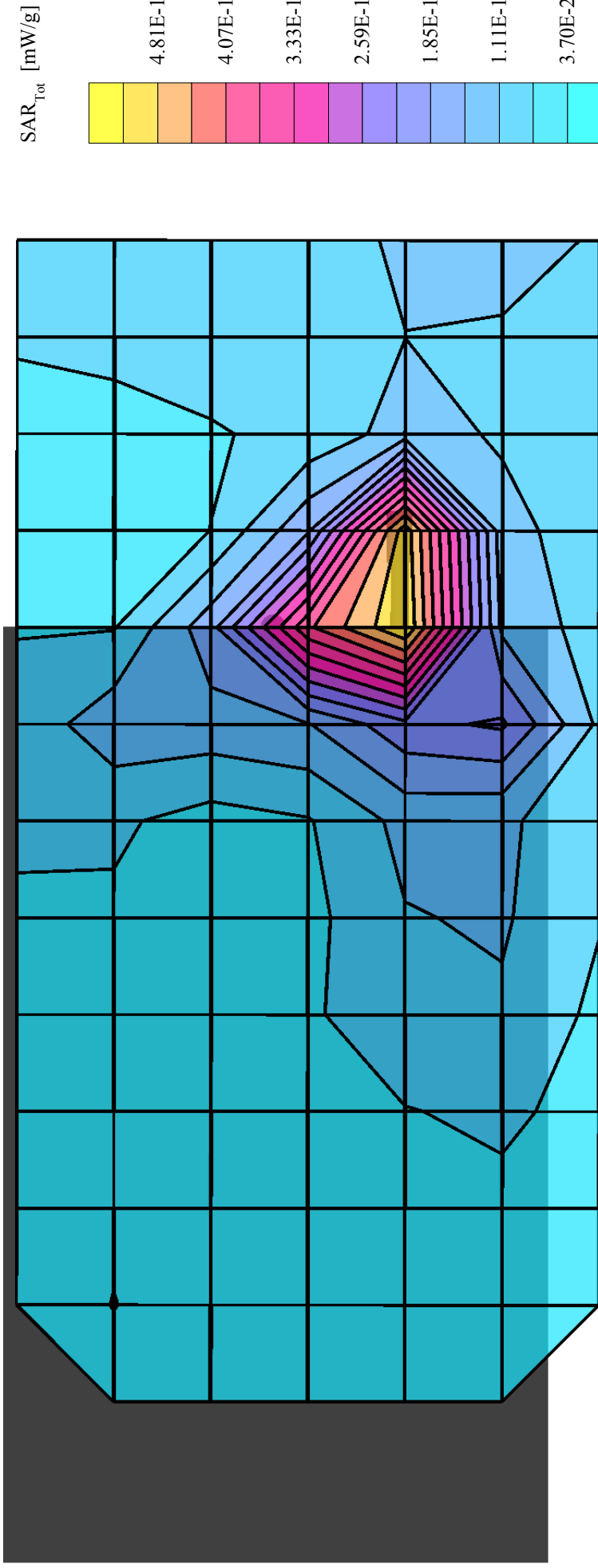
Body SAR - Back of PDA - 0.0cm Separation Distance
Antenna Perpendicular to Planar Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode

Channel 512 [1850.25 MHz]

Conducted Power: 28.39 dBm

Ambient Temp. 21.6°C; Fluid Temp. 23.0°C

Dated Tested: May 8, 2002

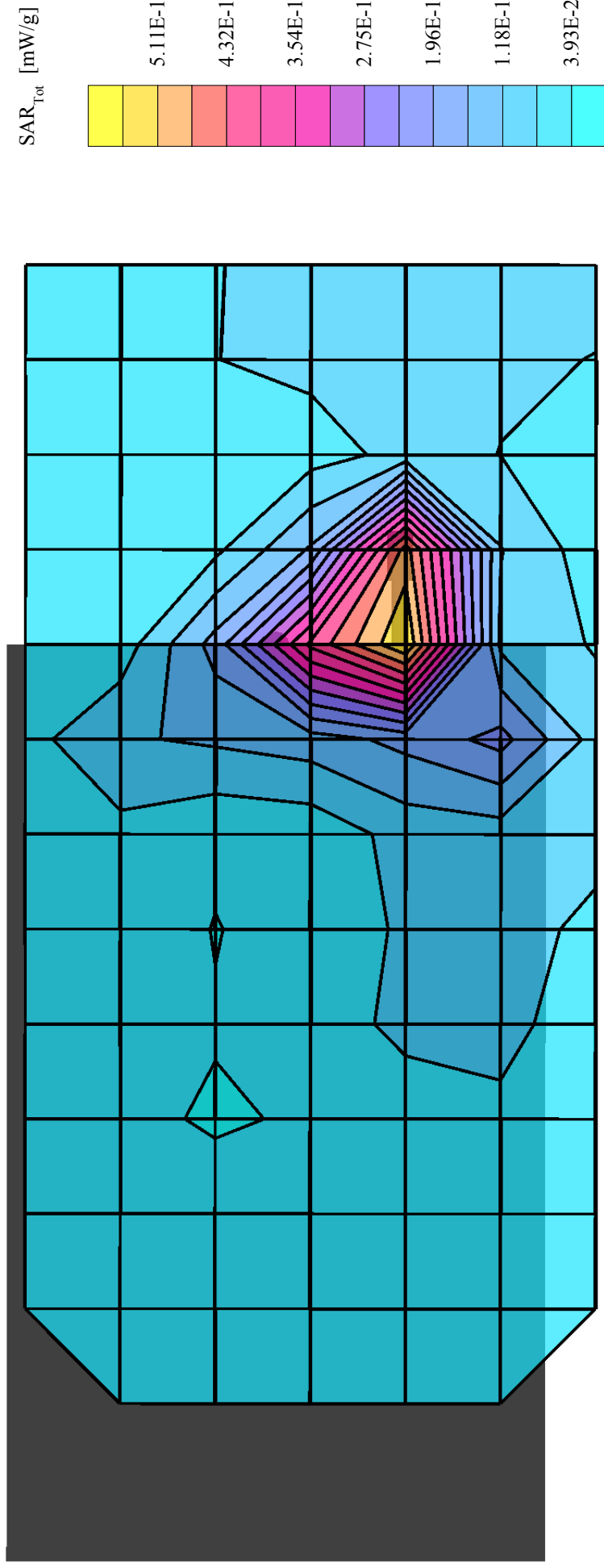


Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 270°)
Probe: ET3DV6 - SNI387; ConvF(5.00, 5.00, 5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 52.3$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.17 dB
SAR (1g): 0.555 mW/g, SAR (10g): 0.300 mW/g

Body SAR - Back of PDA - 0.0cm Separation Distance
Antenna Perpendicular to Planar Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode

Channel 661 [1880.00 MHz]
Conducted Power: 28.23 dBm
Ambient Temp. 21.6°C; Fluid Temp. 23.0°C
Dated Tested: May 8, 2002



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 270°)
Probe: ET3DV6 - SNI387; ConvF(5.00, 5.00, 5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 52.3$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.14 dB
SAR (1g): 0.602 mW/g, SAR (10g): 0.324 mW/g

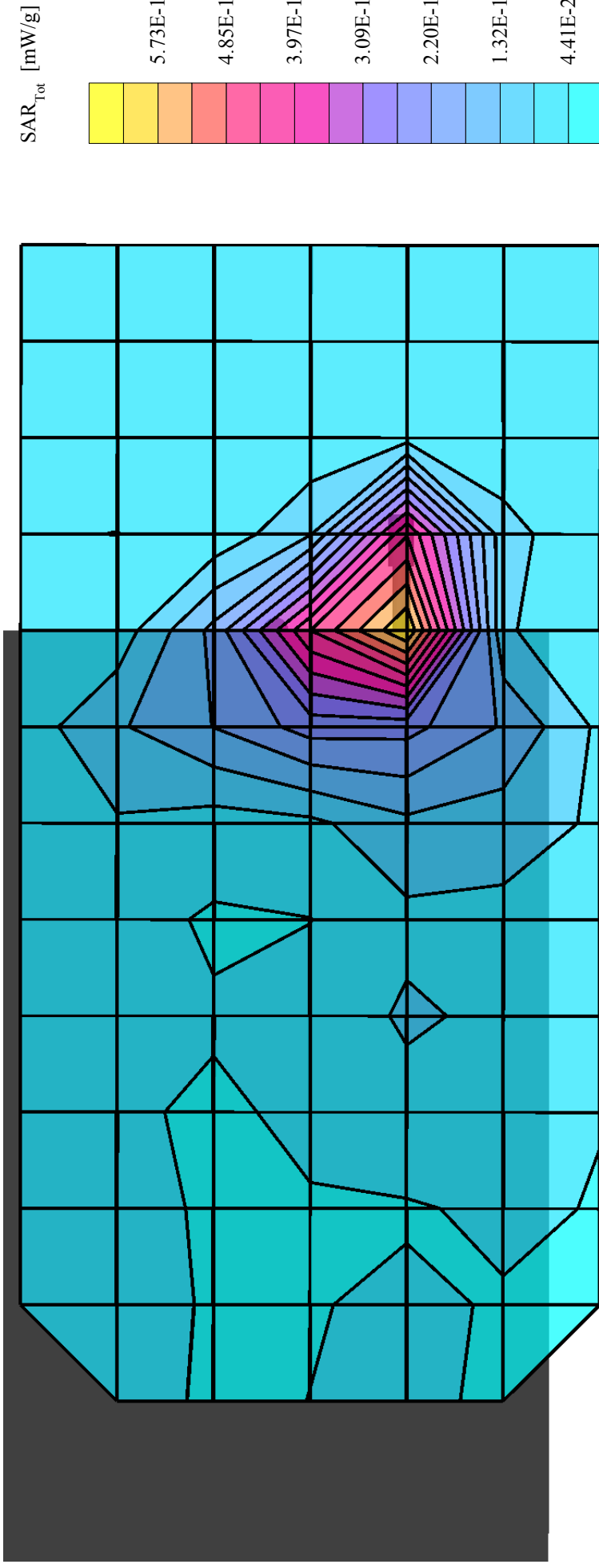
Body SAR - Back of PDA - 0.0cm Separation Distance
Antenna Perpendicular to Planar Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode

Channel 810 [1909.875 MHz]

Conducted Power: 28.09 dBm

Ambient Temp. 21.6 °C; Fluid Temp. 23.0 °C

Dated Tested: May 8, 2002



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 52.3$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.20 dB
SAR (1g): 1.17 mW/g, SAR (10g): 0.683 mW/g

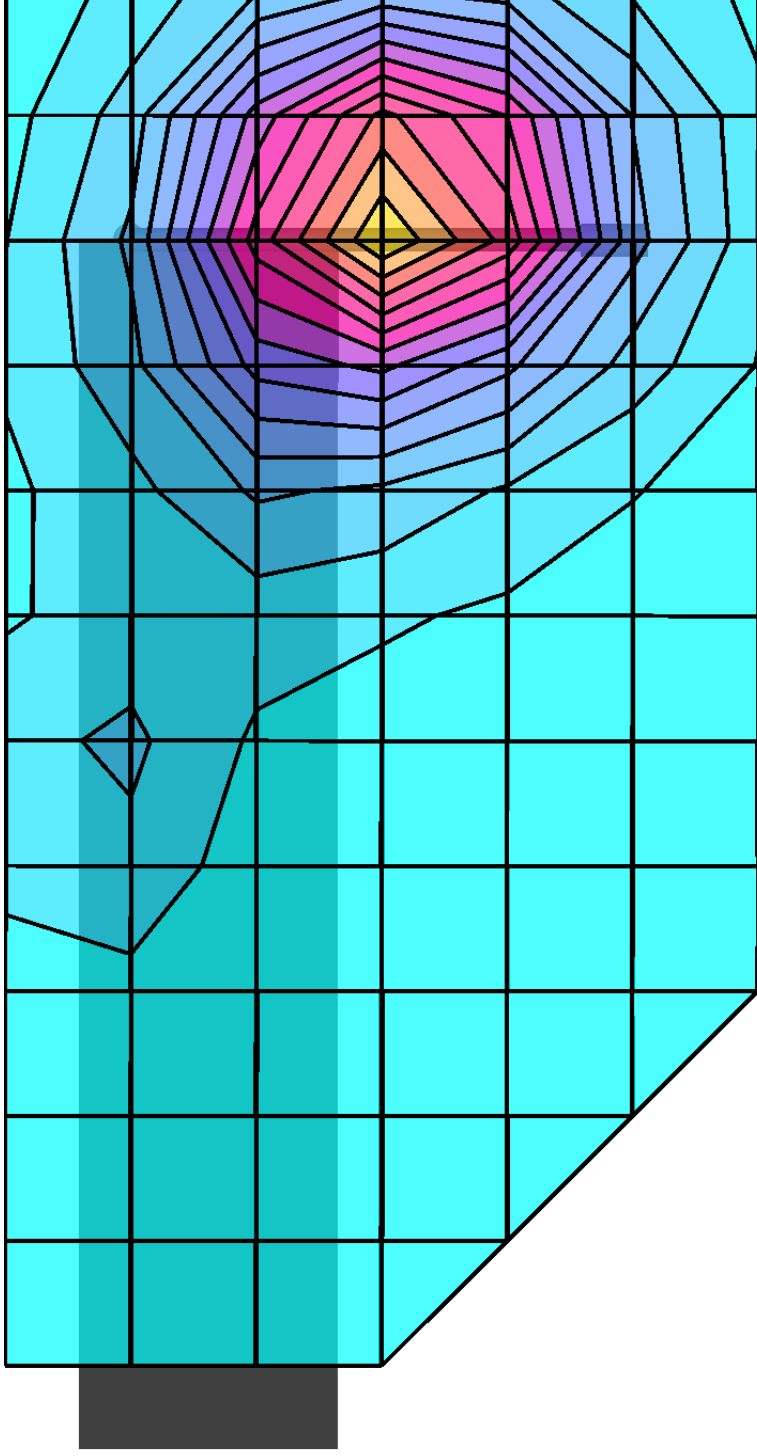
Body SAR - Left Side of PDA - 0.0cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode

Channel 512 [1850.25 MHz]

Conducted Power: 28.42 dBm

Ambient Temp. 21.6°C ; Fluid Temp. 23.0 °C

Dated Tested: May 8, 2002



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section

Probe: ET3DV6 - SN1387; ConvF(5.00,5.00,5.00); Crest factor: 2.0;
1900 MHz Muscle: $\sigma = 1.54$ mho/m $\epsilon_r = 52.3$ $\rho = 1.00$ g/cm³

Z-Axis Extrapolation at Peak SAR Location

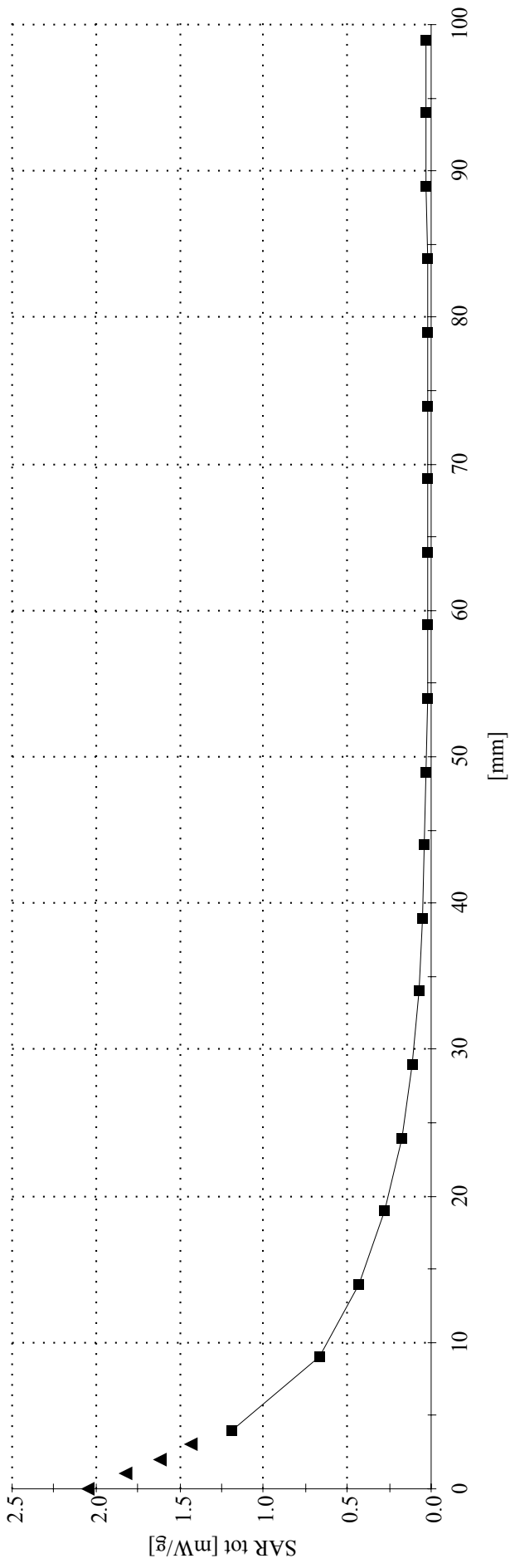
Body SAR - Left Side of PDA - 0.5cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode

Channel 512 [1850.25 MHz]

Conducted Power: 28.42 dBm

Ambient Temp. 21.6°C; Fluid Temp. 23.0°C

Dated Tested: May 8, 2002



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 52.3$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.18 dB
SAR (1g): 0.984 mW/g, SAR (10g): 0.576 mW/g

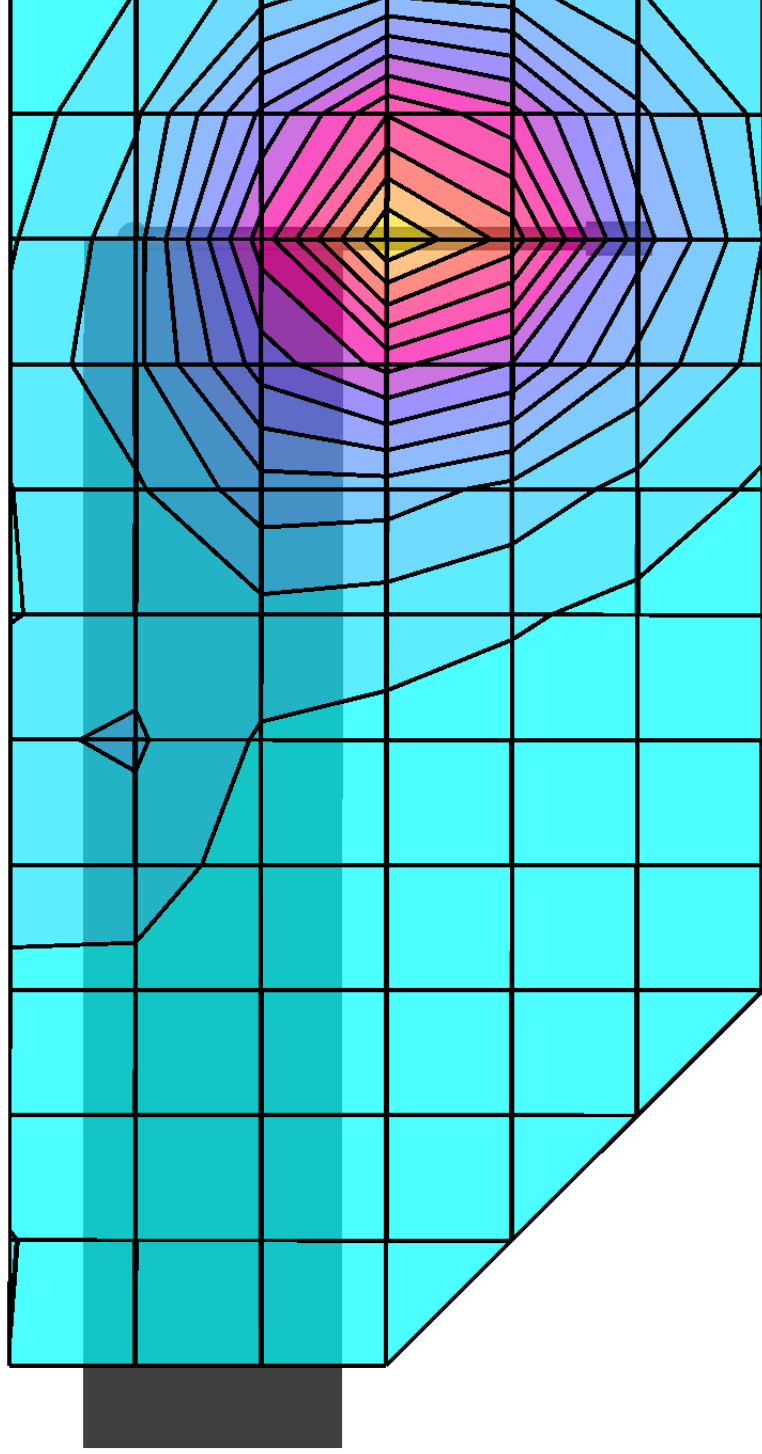
Body SAR - Left Side of PDA - 0.0cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode

Channel 661 [1880.00 MHz]

Conducted Power: 28.20 dBm

Ambient Temp. 21.6 °C; Fluid Temp. 23.0 °C

Dated Tested: May 8, 2002

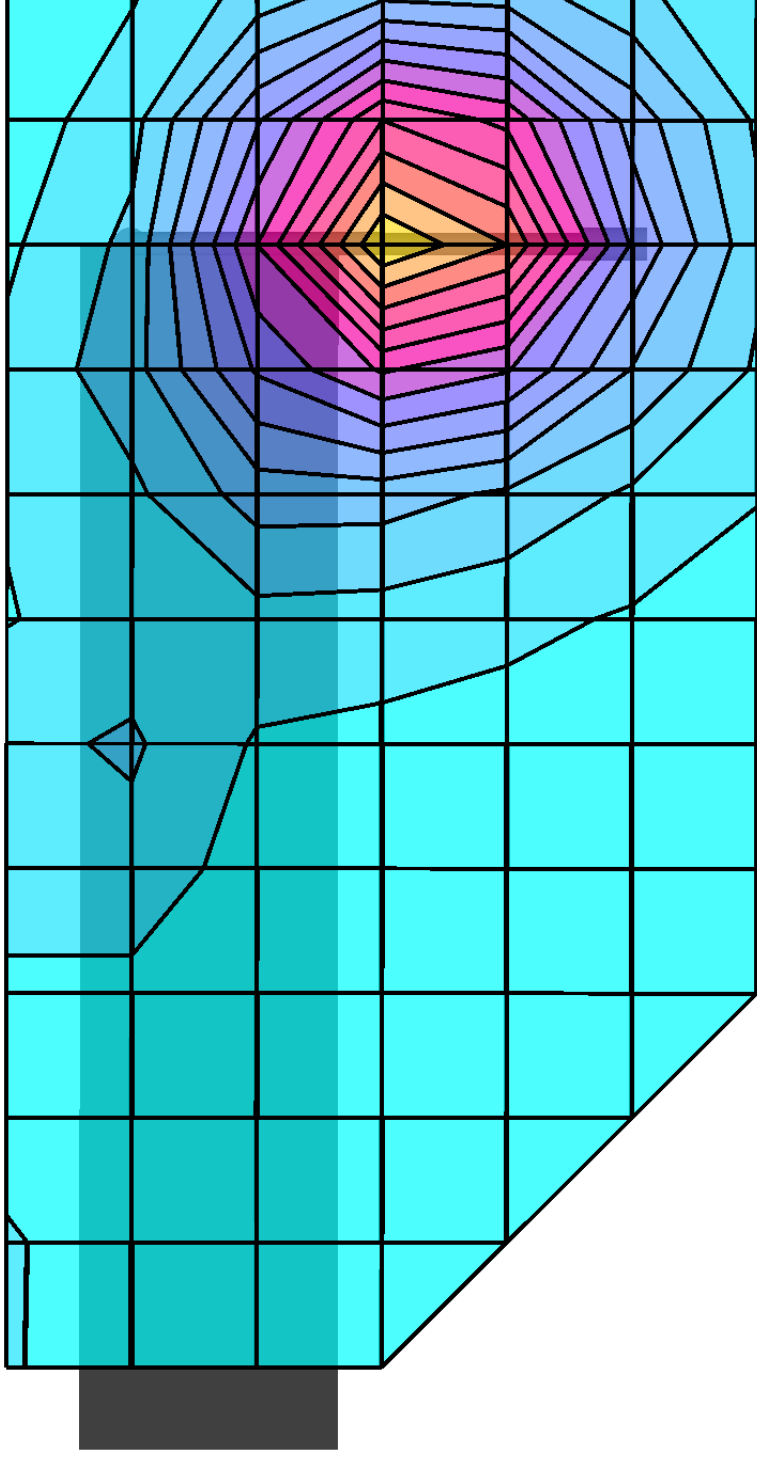


Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI1387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 52.3$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.19 dB
SAR (1g): 0.881 mW/g, SAR (10g): 0.511 mW/g

Body SAR - Left Side of PDA - 0.0cm Separation Distance
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode

Channel 810 [1909.875 MHz]
Conducted Power: 28.10 dBm
Ambient Temp. 21.6°C; Fluid Temp. 23.0°C
Dated Tested: May 8, 2002



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 52.3$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.17 dB
SAR (1g): 1.02 mW/g, SAR (10g): 0.597 mW/g

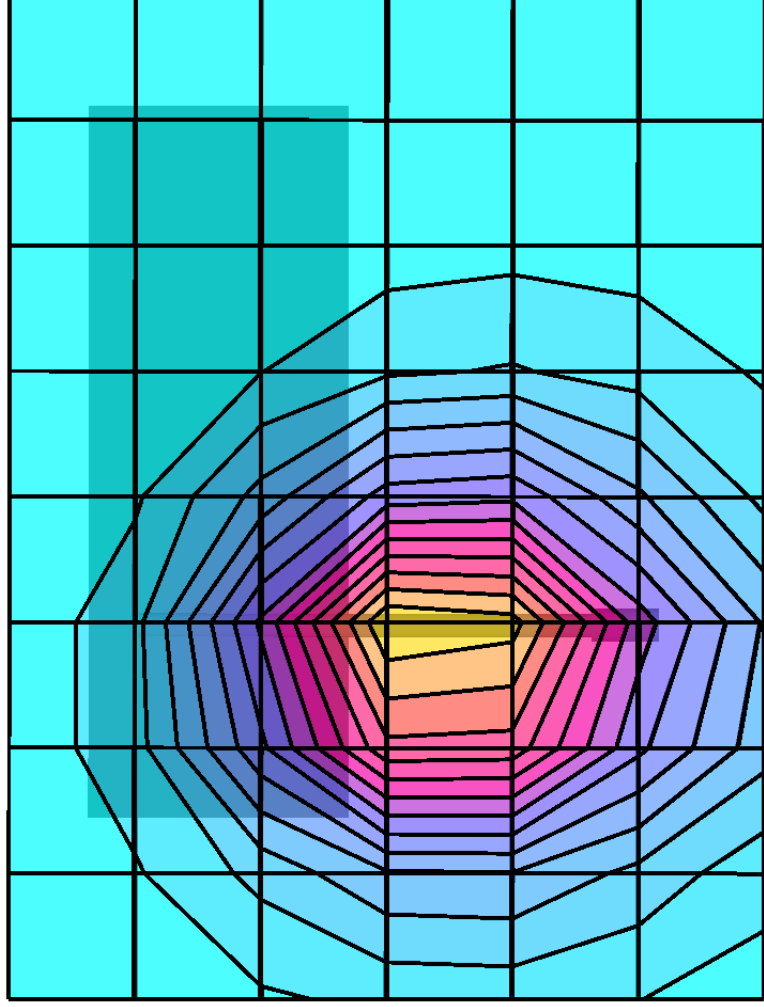
Body SAR - Top Side of PDA - 2.5cm Separation Distance (from Antenna)
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode

Channel 512 [1850.25 MHz]

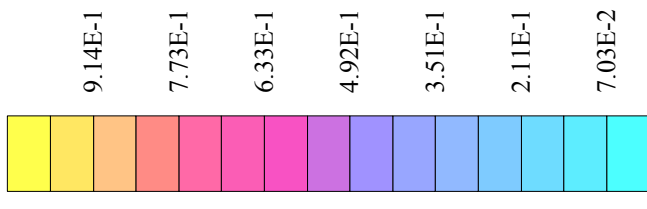
Conducted Power: 28.40 dBm

Ambient Temp. 21.6°C; Fluid Temp. 23.0°C

Dated Tested: May 8, 2002



SAR_{tot} [mW/g]



Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 52.3$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.20 dB
SAR (1g): 1.03 mW/g, SAR (10g): 0.596 mW/g

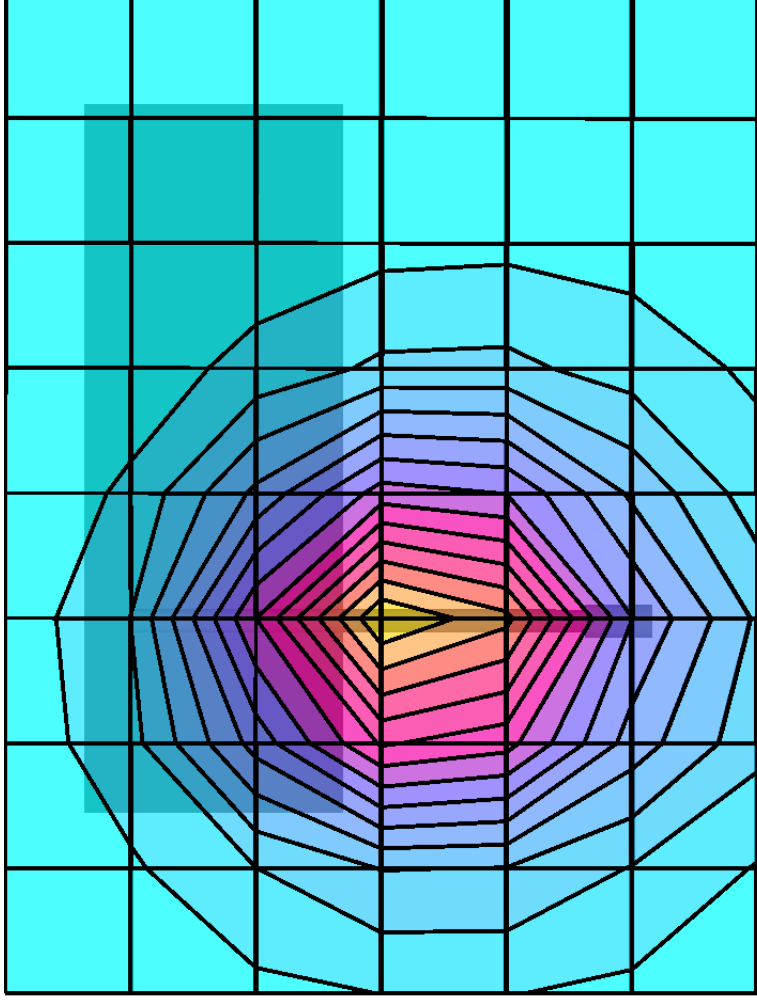
Body SAR - Top Side of PDA - 2.5cm Separation Distance (from Antenna)
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode

Channel 661 [1880.00 MHz]

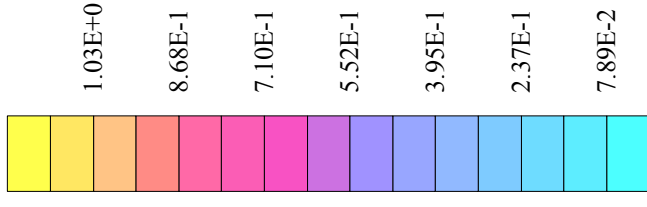
Conducted Power: 28.26 dBm

Ambient Temp. 21.6°C; Fluid Temp. 23.0°C

Dated Tested: May 8, 2002



SAR_{Tot} [mW/g]

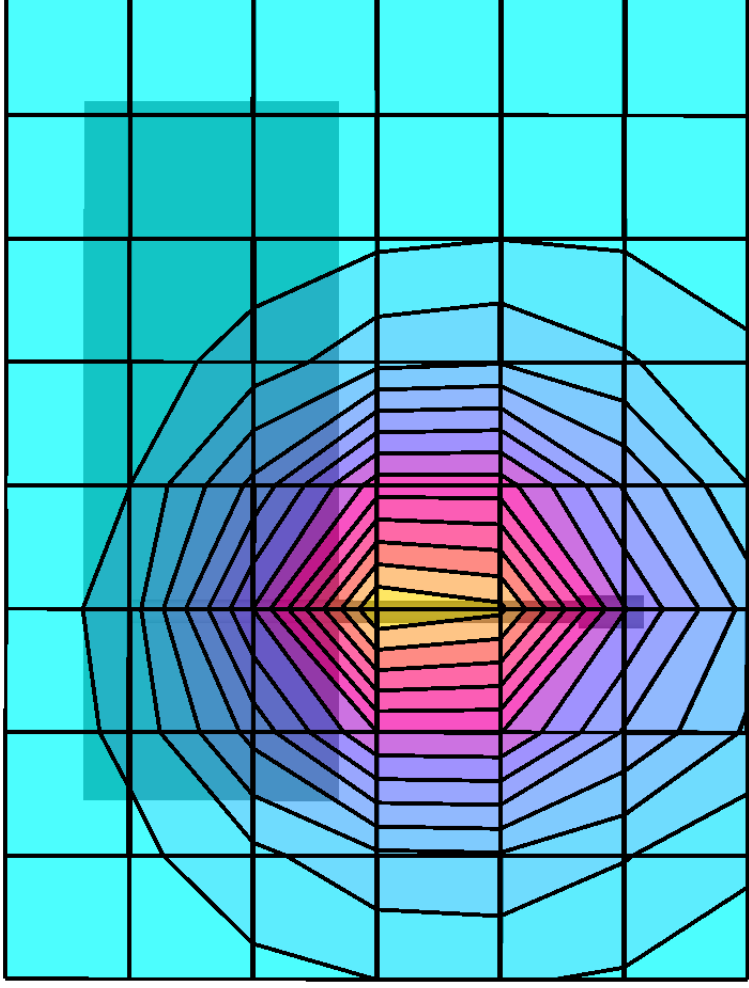


Sierra Wireless FCC ID: N7NAC750

SAM Phantom; Flat Section; Position: (270°, 180°)
Probe: ET3DV6 - SNI1387; ConvF(5.00,5.00,5.00); Crest factor: 2.0
1900 MHz Muscle: $\sigma = 1.54 \text{ mho/m}$, $\epsilon_r = 52.3$, $\rho = 1.00 \text{ g/cm}^3$
Coarse: Dx = 15.0, Dy = 15.0, Dz = 10.0
Cube 5x5x7; Powerdrift: -0.20 dB
SAR (1g): 0.876 mW/g, SAR (10g): 0.496 mW/g

Body SAR - Top Side of PDA - 2.5cm Separation Distance (from Antenna)
Antenna Parallel to Planar Phantom
AirCard 750 Wireless Modem in Cassiopeia E200 PDA
PCS GPRS Mode

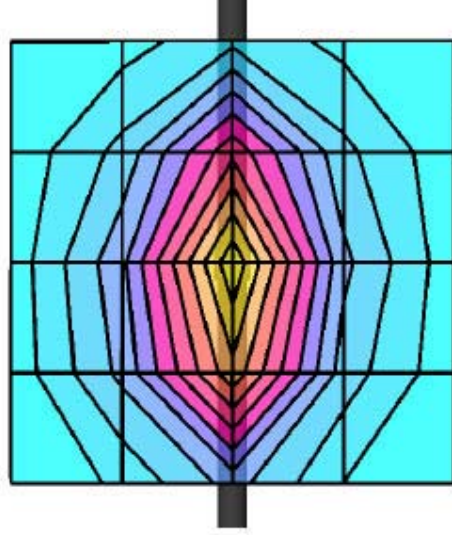
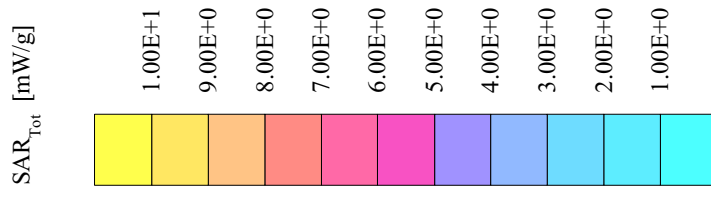
Channel 810 [1909.875 MHz]
Conducted Power: 28.14 dBm
Ambient Temp. 21.6°C; Fluid Temp. 23.0°C
Dated Tested: May 8, 2002



APPENDIX B - SYSTEM VALIDATION

Validation Dipole D1800V2 SN:247, d = 10 mm

Frequency: 1800 MHz; Antenna Input Power: 250 [mW]
Generic Twin Phantom; Flat Section; Grid Spacing: Dx = 15.0, Dy = 15.0, Dz = 10.0
Probe: ET3DV6 - SN1507; ConvF(5.57,5.57,5.57); Crest factor: 1.0; IEEE1528 1800 MHz : $\sigma = 1.36$ mho/m $\epsilon_r = 40.0$ $\rho = 1.00$ g/cm³
Cubes (2): Peak: 18.2 mW/g ± 0.04 dB, SAR (1g): 9.66 mW/g ± 0.03 dB, SAR (10g): 5.02 mW/g ± 0.03 dB, (Worst-case extrapolation)
Penetration depth: 8.2 (7.6, 9.4) [mm]
Powerdrift: -0.01 dB



Dipole 1800 MHz

SAM Phantom; Flat Section

Probe: ET3DV6 - SNI1387; ConvF(5.40,5.40,5.40); Crest factor: 1.0; 1800 MHz Brain: $\sigma = 1.40$ mho/m $\epsilon_r = 39.2$ $\rho = 1.00$ g/cm³

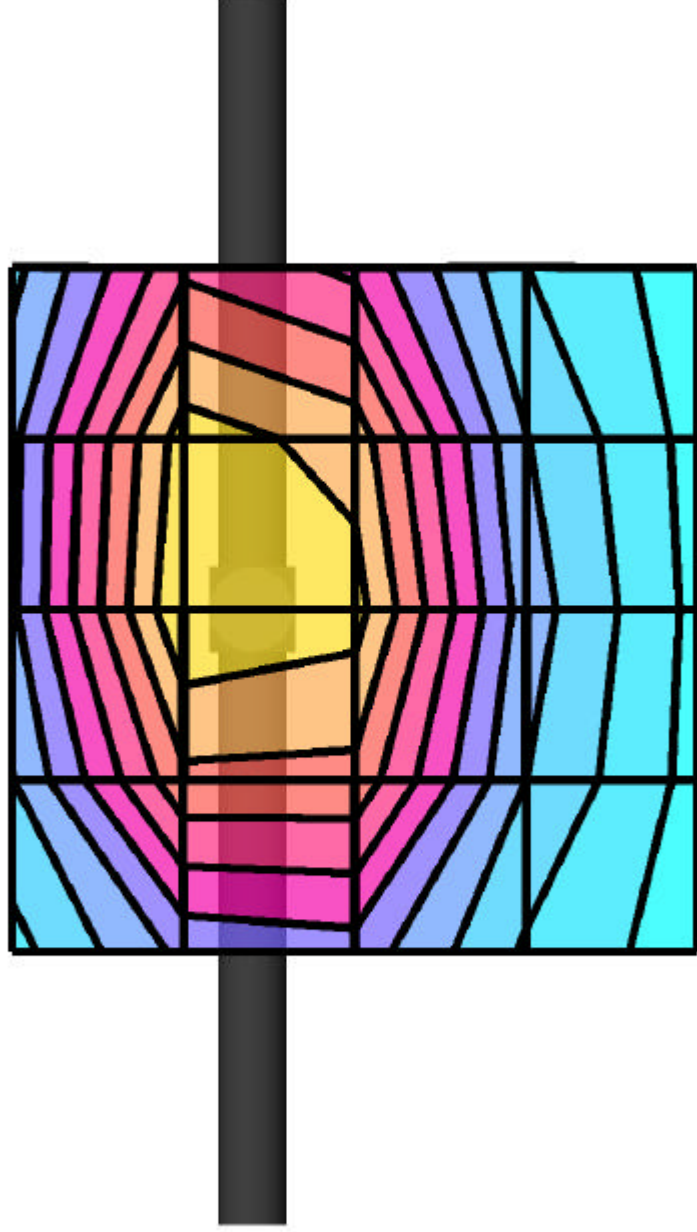
Cube 5x5x7: Peak: 18.6 mW/g, SAR (1g): 9.65 mW/g, SAR (10g): 4.88 mW/g, (Worst-case extrapolation)

Penetration depth: 7.7 (7.3, 8.6) [mm]; Ambient Temp. 22.5 C; Fluid Temp. 23.0 C

Powerdrift: 0.02 dB

Conducted Power: 250 mW

Validation Date: March 27, 2002



1800MHz Dipole

SAM Phantom; Flat Section

Probe: ET3DV6 - SNI1387; ConvF(5.40,5.40,5.40); Crest factor: 1.0; 1800 MHz Brain: $\sigma = 1.41$ mho/m $\epsilon_r = 38.9$ $\rho = 1.00$ g/cm³

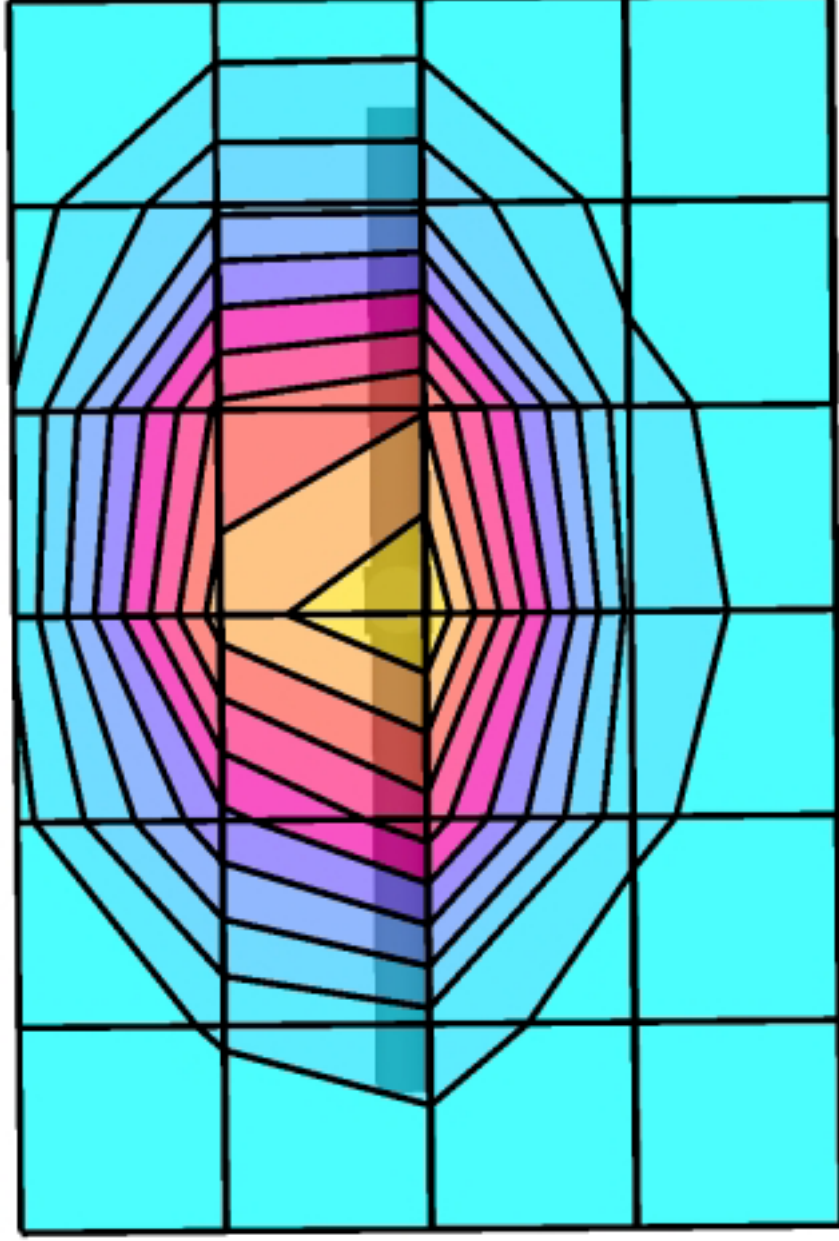
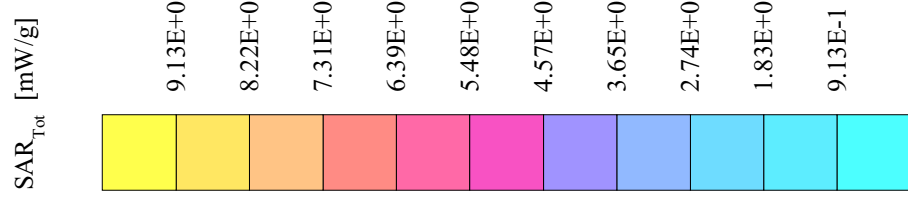
Cube 5x5x7: Peak: 18.7 mW/g, SAR (1g): 9.64 mW/g, SAR (10g): 4.87 mW/g, (Worst-case extrapolation)

Penetration depth: 7.6 (7.2, 8.5) [mm]; Ambient Temp. 22.5 C; Fluid Temp. 23.0 C

Powerdrift: 0.02 dB

Conducted Power: 250mW

Validation Date: March 28, 2002



05/08/02

Dipole 1800 MHz

SAM Phantom; Flat Section

Probe: ET3DV6 - SNI1387; ConvF(5.40,5.40,5.40); Crest factor: 1.0; 1800 MHz Brain: $\sigma = 1.40$ mho/m $\epsilon_r = 39.1$ $\rho = 1.00$ g/cm³

Cube 5x5x7: Peak: 18.5 mW/g, SAR (1g): 9.58 mW/g, SAR (10g): 4.85 mW/g, (Worst-case extrapolation)

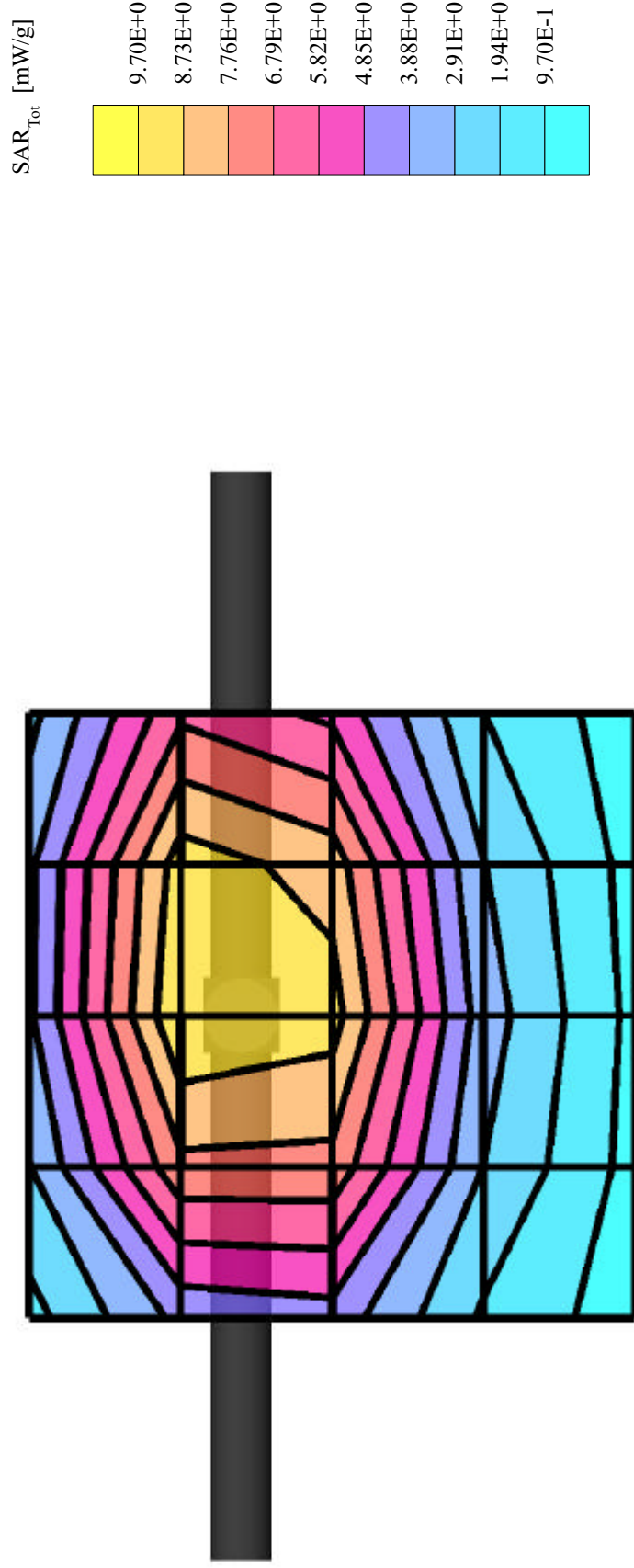
Penetration depth: 7.7 (7.3, 8.6) [mm]; Ambient Temp. 21.6°C; Fluid Temp. 23.0°C

Powerdrift: 0.02 dB

1800MHz Dipole Validation

Conducted Power: 250 mW

Date: May 08, 2002



APPENDIX C - PROBE CALIBRATION

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Calibration Certificate

Dosimetric E-Field Probe

Type:

ET3DV6

Serial Number:

1387

Place of Calibration:

Zurich

Date of Calibration:

February 22, 2002

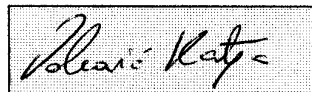
Calibration Interval:

12 months

Schmid & Partner Engineering AG hereby certifies, that this device has been calibrated on the date indicated above. The calibration was performed in accordance with specifications and procedures of Schmid & Partner Engineering AG.

Wherever applicable, the standards used in the calibration process are traceable to international standards. In all other cases the standards of the Laboratory for EMF and Microwave Electronics at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland have been applied.

Calibrated by:



Approved by:



Probe ET3DV6

SN:1387

Manufactured:	September 21, 1999
Last calibration:	September 22, 1999
Recalibrated:	February 22, 2002

Calibrated for System DASY3

DASY3 - Parameters of Probe: ET3DV6 SN:1387

Sensitivity in Free Space

NormX	1.58 $\mu\text{V}/(\text{V}/\text{m})^2$
NormY	1.67 $\mu\text{V}/(\text{V}/\text{m})^2$
NormZ	1.67 $\mu\text{V}/(\text{V}/\text{m})^2$

Diode Compression

DCP X	97	mV
DCP Y	97	mV
DCP Z	97	mV

Sensitivity in Tissue Simulating Liquid

Head	900 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\%$ mho/m
Head	835 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.90 \pm 5\%$ mho/m
ConvF X	6.6 $\pm 9.5\%$ (k=2)		Boundary effect:
ConvF Y	6.6 $\pm 9.5\%$ (k=2)		Alpha 0.40
ConvF Z	6.6 $\pm 9.5\%$ (k=2)		Depth 2.38
Head	1800 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
Head	1900 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
ConvF X	5.4 $\pm 9.5\%$ (k=2)		Boundary effect:
ConvF Y	5.4 $\pm 9.5\%$ (k=2)		Alpha 0.57
ConvF Z	5.4 $\pm 9.5\%$ (k=2)		Depth 2.18

Boundary Effect

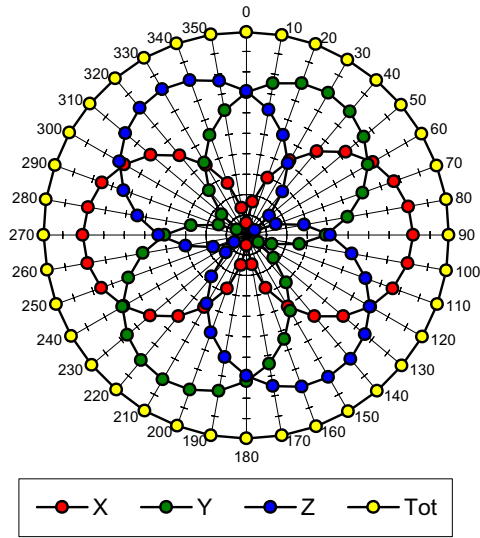
Head	900 MHz	Typical SAR gradient: 5 % per mm	
	Probe Tip to Boundary	1 mm	2 mm
	SAR _{be} [%] Without Correction Algorithm	9.7	5.4
	SAR _{be} [%] With Correction Algorithm	0.3	0.6
Head	1800 MHz	Typical SAR gradient: 10 % per mm	
	Probe Tip to Boundary	1 mm	2 mm
	SAR _{be} [%] Without Correction Algorithm	11.5	7.3
	SAR _{be} [%] With Correction Algorithm	0.1	0.3

Sensor Offset

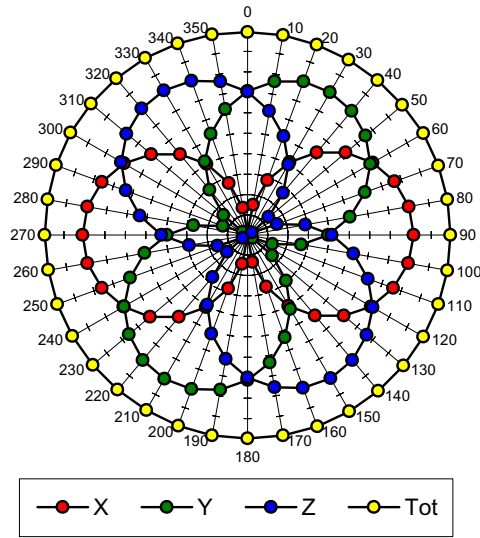
Probe Tip to Sensor Center	2.7	mm
Optical Surface Detection	1.3 \pm 0.2	mm

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

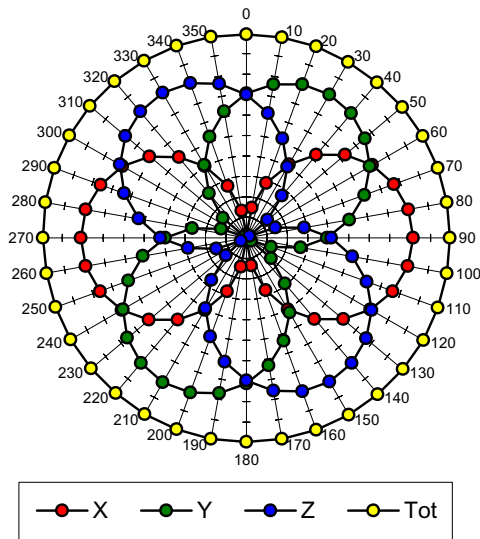
f = 30 MHz, TEM cell ifi110



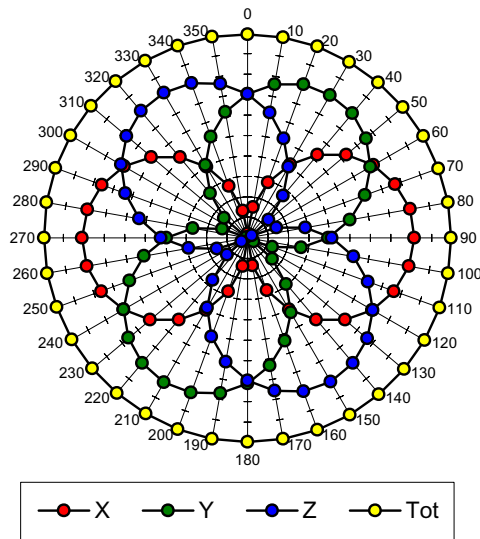
f = 100 MHz, TEM cell ifi110

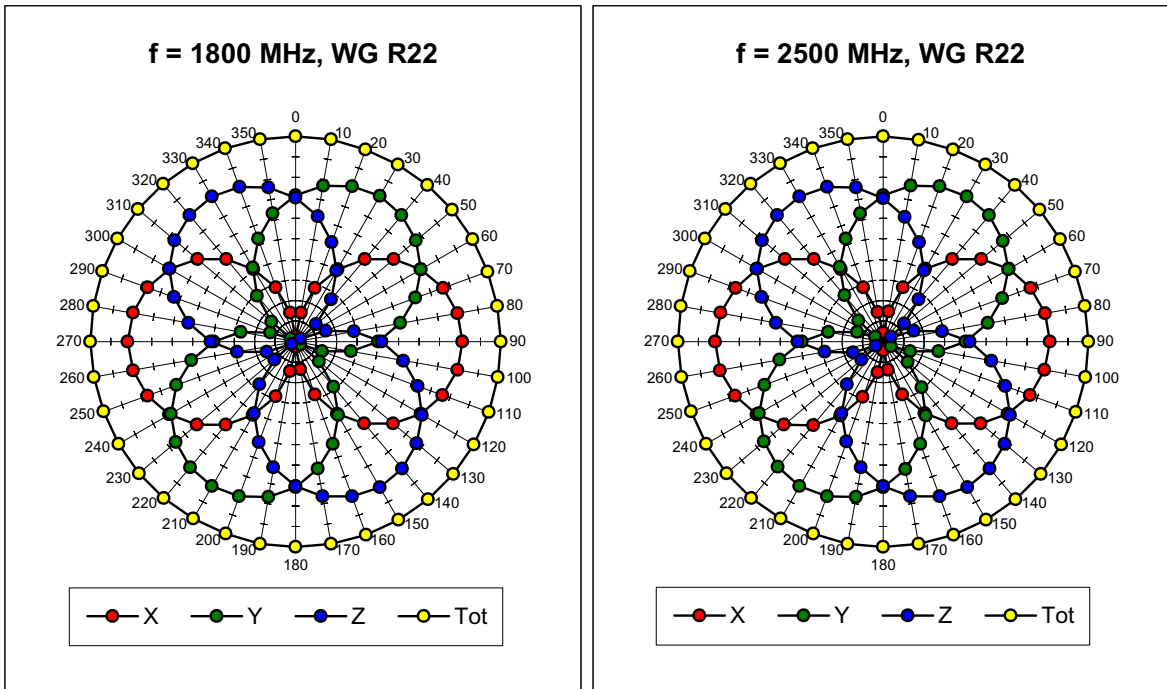


f = 300 MHz, TEM cell ifi110

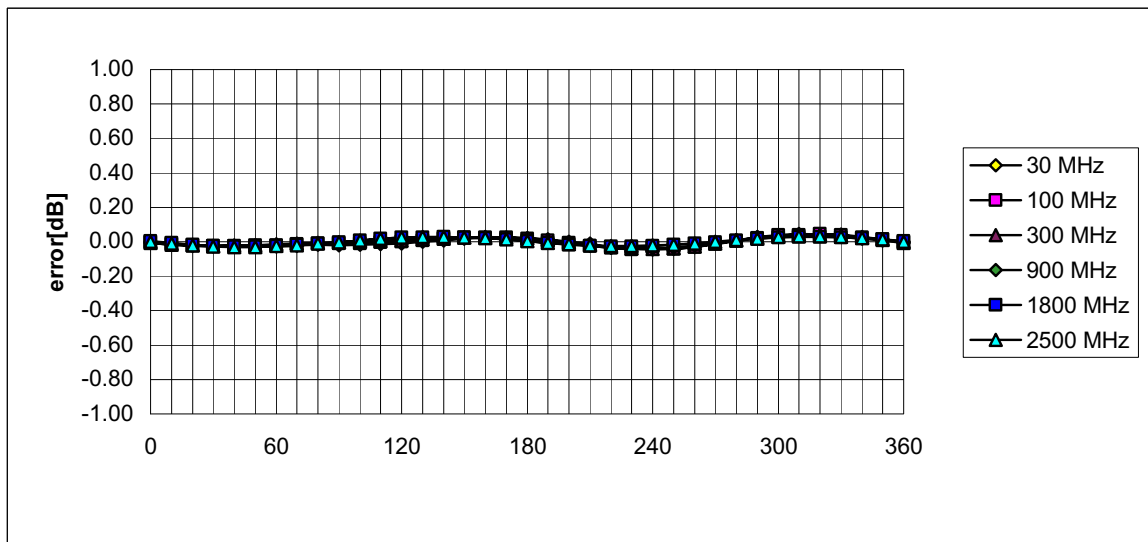


f = 900 MHz, TEM cell ifi110



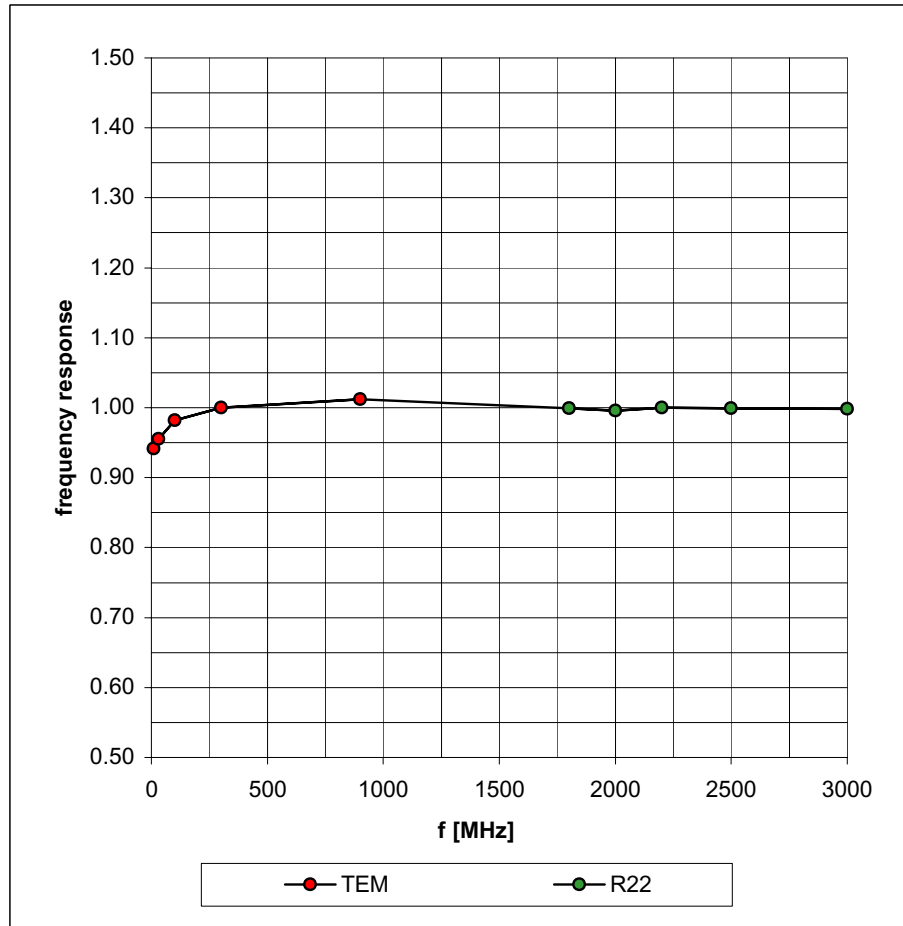


Isotropy Error (ϕ), $\theta = 0^\circ$

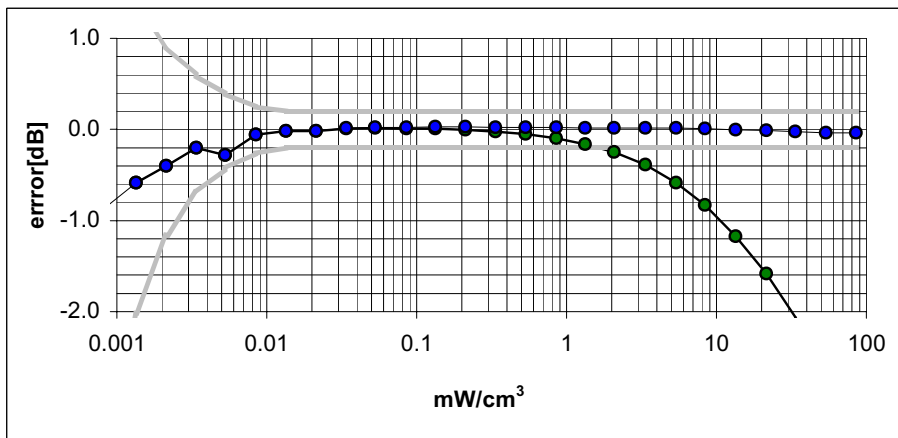
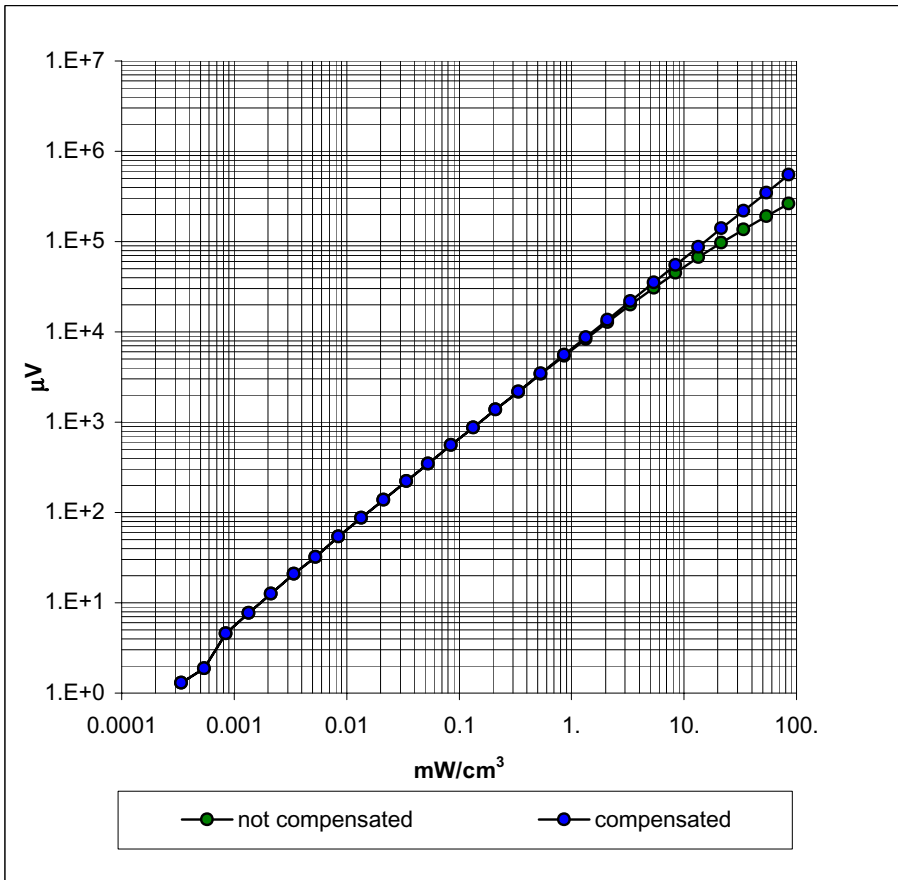


Frequency Response of E-Field

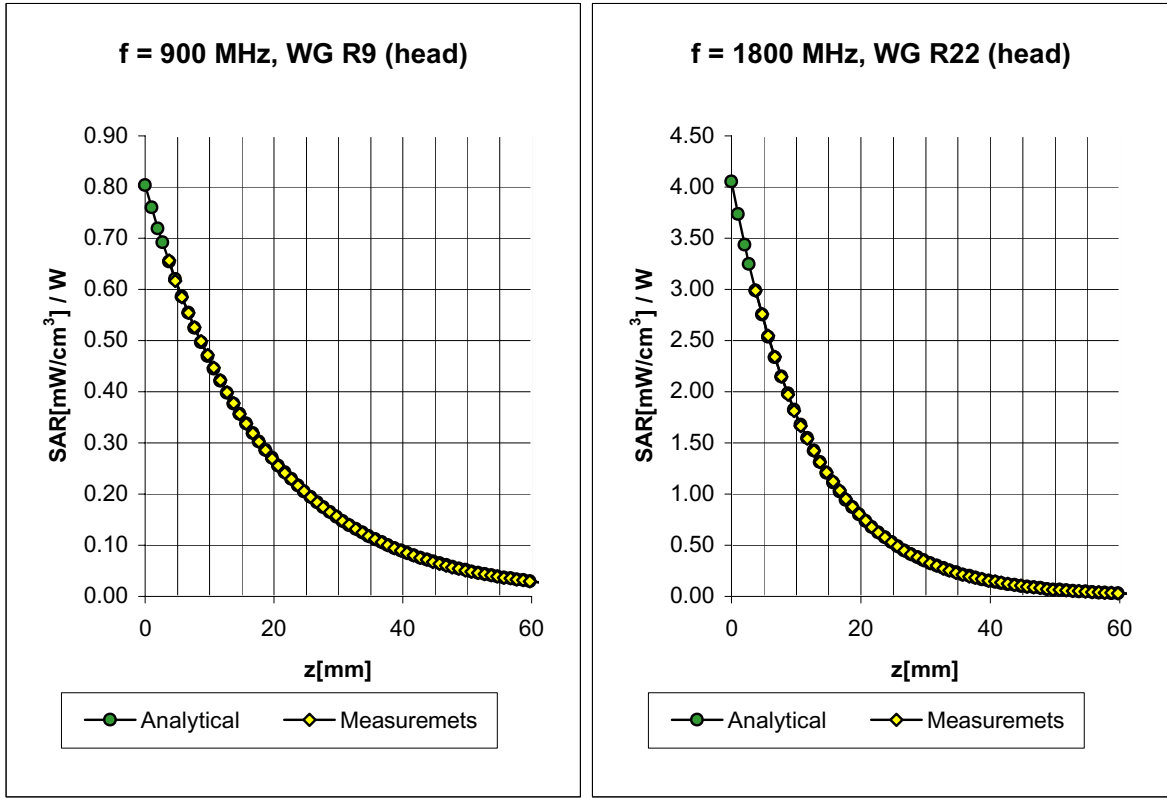
(TEM-Cell:ifi110, Waveguide R22)



Dynamic Range f(SAR_{brain}) (Waveguide R22)



Conversion Factor Assessment

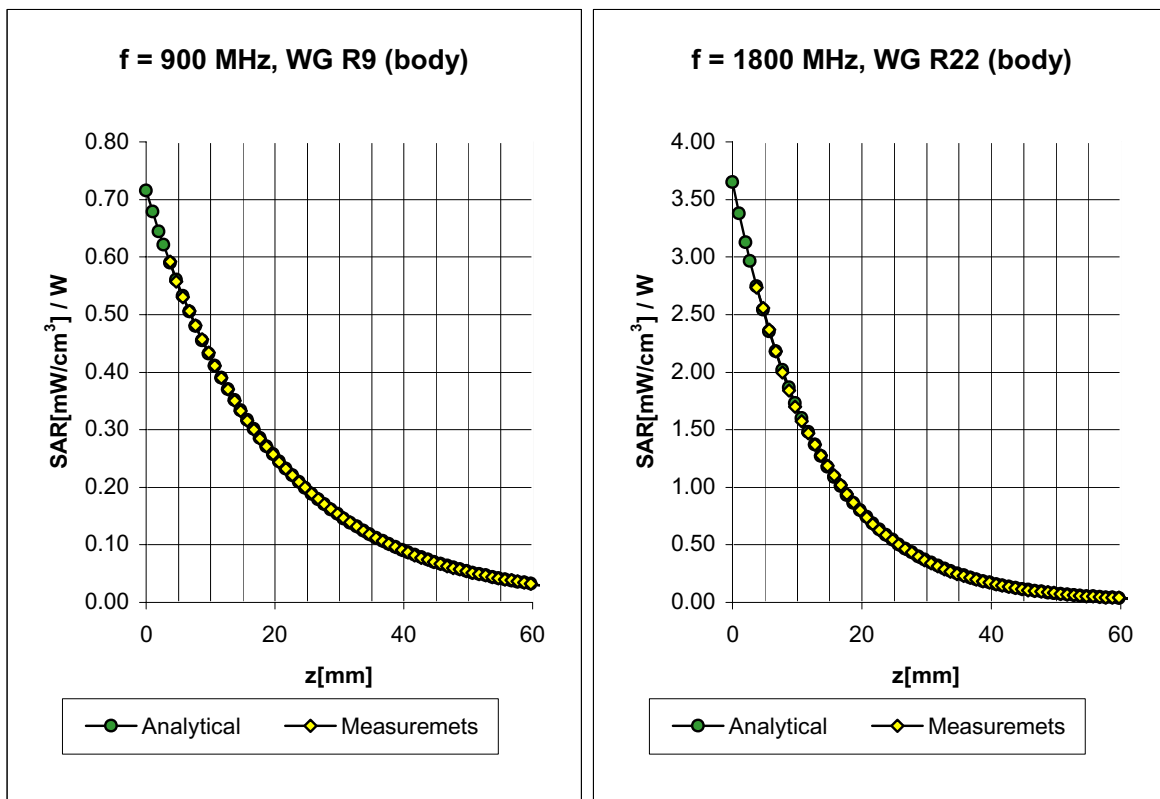


Head	900 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.97 \pm 5\%$ mho/m
Head	835 MHz	$\epsilon_r = 41.5 \pm 5\%$	$\sigma = 0.90 \pm 5\%$ mho/m
	ConvF X	6.6 $\pm 9.5\%$ (k=2)	Boundary effect:
	ConvF Y	6.6 $\pm 9.5\%$ (k=2)	Alpha 0.40
	ConvF Z	6.6 $\pm 9.5\%$ (k=2)	Depth 2.38
Head	1800 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
Head	1900 MHz	$\epsilon_r = 40.0 \pm 5\%$	$\sigma = 1.40 \pm 5\%$ mho/m
	ConvF X	5.4 $\pm 9.5\%$ (k=2)	Boundary effect:
	ConvF Y	5.4 $\pm 9.5\%$ (k=2)	Alpha 0.57
	ConvF Z	5.4 $\pm 9.5\%$ (k=2)	Depth 2.18

ET3DV6 SN:1387

February 22, 2002

Conversion Factor Assessment



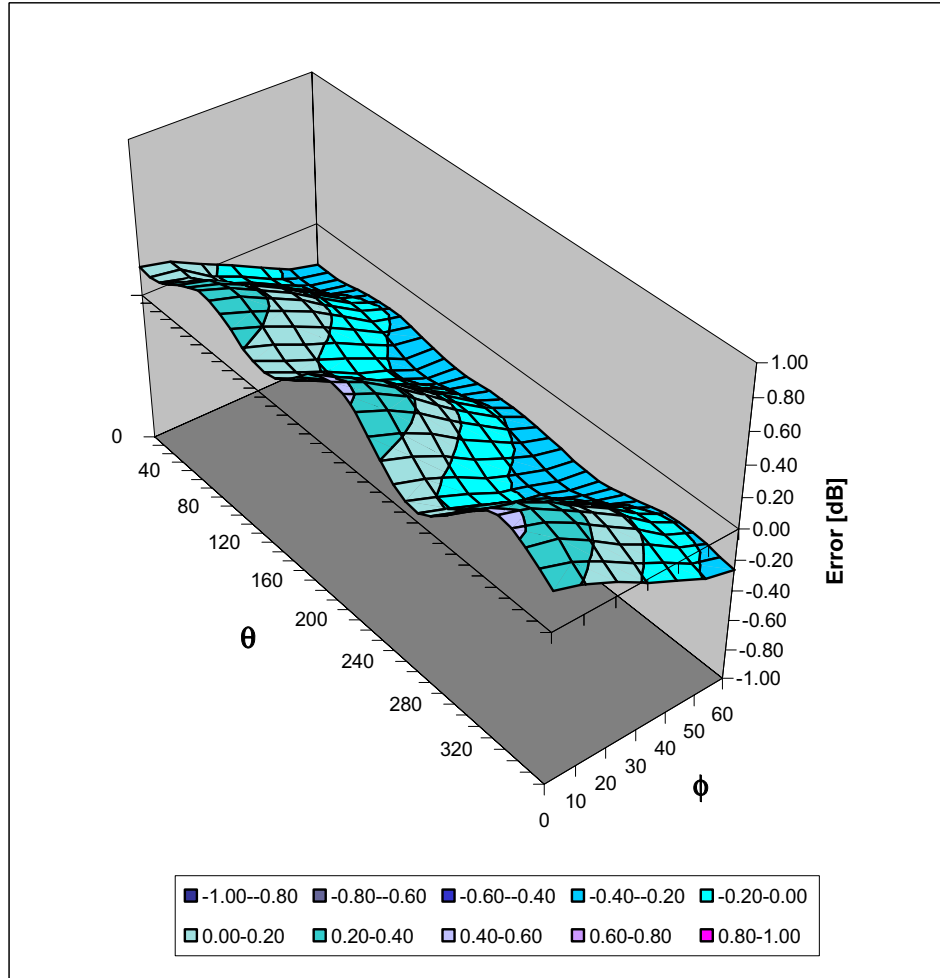
Body	900 MHz	$\epsilon_r = 55.0 \pm 5\%$	$\sigma = 1.05 \pm 5\% \text{ mho/m}$
Body	835 MHz	$\epsilon_r = 55.2 \pm 5\%$	$\sigma = 0.97 \pm 5\% \text{ mho/m}$
	ConvF X	6.3 $\pm 9.5\%$ (k=2)	Boundary effect:
	ConvF Y	6.3 $\pm 9.5\%$ (k=2)	Alpha 0.42
	ConvF Z	6.3 $\pm 9.5\%$ (k=2)	Depth 2.44
Body	1800 MHz	$\epsilon_r = 53.3 \pm 5\%$	$\sigma = 1.52 \pm 5\% \text{ mho/m}$
Body	1900 MHz	$\epsilon_r = 53.3 \pm 5\%$	$\sigma = 1.52 \pm 5\% \text{ mho/m}$
	ConvF X	5.0 $\pm 9.5\%$ (k=2)	Boundary effect:
	ConvF Y	5.0 $\pm 9.5\%$ (k=2)	Alpha 0.76
	ConvF Z	5.0 $\pm 9.5\%$ (k=2)	Depth 2.01

ET3DV6 SN:1387

February 22, 2002

Deviation from Isotropy in HSL

Error (θ, ϕ), $f = 900$ MHz



Additional Conversion Factors for Dosimetric E-Field Probe

Type:

ET3DV6

Serial Number:

1387

Place of Assessment:

Zurich

Date of Assessment:

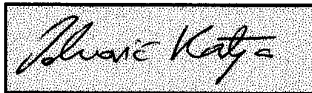
February 25, 2002

Probe Calibration Date:

February 22, 2002

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. Since the evaluation is coupled with measured conversion factors, it has to be recalculated yearly, i.e., following the re-calibration schedule of the probe. The uncertainty of the numerical assessment is based on the extrapolation from measured value at 900 MHz or at 1800 MHz.

Assessed by:



Dosimetric E-Field Probe ET3DV6 SN:1387

Conversion Factor (\pm standard deviation)

150 MHz	ConvF	$9.2 \pm 8\%$	$\epsilon_r = 52.3$ $\sigma = 0.76 \text{ mho/m}$ (head tissue)
300 MHz	ConvF	$8.0 \pm 8\%$	$\epsilon_r = 45.3$ $\sigma = 0.87 \text{ mho/m}$ (head tissue)
450 MHz	ConvF	$7.3 \pm 8\%$	$\epsilon_r = 43.5$ $\sigma = 0.87 \text{ mho/m}$ (head tissue)
2450 MHz	ConvF	$4.7 \pm 8\%$	$\epsilon_r = 39.2$ $\sigma = 1.80 \text{ mho/m}$ (head tissue)
150 MHz	ConvF	$8.8 \pm 8\%$	$\epsilon_r = 61.9$ $\sigma = 0.80 \text{ mho/m}$ (body tissue)
450 MHz	ConvF	$7.7 \pm 8\%$	$\epsilon_r = 56.7$ $\sigma = 0.94 \text{ mho/m}$ (body tissue)
2450 MHz	ConvF	$4.3 \pm 8\%$	$\epsilon_r = 52.7$ $\sigma = 1.95 \text{ mho/m}$ (body tissue)

APPENDIX D - MEASURED FLUID DIELECTRIC PARAMETERS

1800MHz System Validation

Measured Fluid Dielectric Parameters (Brain)

March 27, 2002

Frequency	ϵ'	ϵ''
1.750000000 GHz	39.3311	13.9853
1.760000000 GHz	39.2881	13.9932
1.770000000 GHz	39.2368	13.9949
1.780000000 GHz	39.2291	13.9969
1.790000000 GHz	39.2235	13.9987
1.800000000 GHz	39.2159	14.0189
1.810000000 GHz	39.1886	14.0357
1.820000000 GHz	39.1528	14.0493
1.830000000 GHz	39.0799	14.0682
1.840000000 GHz	39.0462	14.1327
1.850000000 GHz	38.9829	14.1586
1.860000000 GHz	38.9557	14.1813
1.870000000 GHz	38.8796	14.2159
1.880000000 GHz	38.8499	14.2597
1.890000000 GHz	38.8321	14.2956
1.900000000 GHz	38.7928	14.3497
1.910000000 GHz	38.7690	14.3763
1.920000000 GHz	38.7294	14.3946
1.930000000 GHz	38.6913	14.4194
1.940000000 GHz	38.6783	14.4329
1.950000000 GHz	38.6457	14.4595

1900MHz EUT Evaluation (Body)

Measured Fluid Dielectric Parameters

March 27, 2002

Frequency	ϵ'	ϵ''
1.750000000 GHz	54.0188	14.1141
1.755000000 GHz	54.0015	14.1391
1.760000000 GHz	53.9852	14.1559
1.765000000 GHz	53.9814	14.1694
1.770000000 GHz	53.9694	14.1899
1.775000000 GHz	53.9561	14.2042
1.780000000 GHz	53.9299	14.2113
1.785000000 GHz	53.9199	14.2449
1.790000000 GHz	53.9042	14.2503
1.795000000 GHz	53.8902	14.2654
1.800000000 GHz	53.8846	14.2769
1.805000000 GHz	53.8657	14.2853
1.810000000 GHz	53.8359	14.3183
1.815000000 GHz	53.8089	14.3413
1.820000000 GHz	53.7908	14.3530
1.825000000 GHz	53.7870	14.3594
1.830000000 GHz	53.7825	14.3811
1.835000000 GHz	53.7707	14.4021
1.840000000 GHz	53.7603	14.3996
1.845000000 GHz	53.7340	14.4117
1.850000000 GHz	53.7218	14.4184
1.855000000 GHz	53.7060	14.4247
1.860000000 GHz	53.6807	14.4362
1.865000000 GHz	53.6765	14.4542
1.870000000 GHz	53.6553	14.4731
1.875000000 GHz	53.6310	14.4802
1.880000000 GHz	53.6135	14.5179
1.885000000 GHz	53.5836	14.5416
1.890000000 GHz	53.5635	14.5635
1.895000000 GHz	53.5402	14.5812
1.900000000 GHz	53.5359	14.6108
1.905000000 GHz	53.5188	14.6302
1.910000000 GHz	53.5020	14.6532
1.915000000 GHz	53.4807	14.6474
1.920000000 GHz	53.4437	14.6712

1800MHz System Validation

Measured Fluid Dielectric Parameters (Brain)

March 28, 2002

Frequency	ϵ'	ϵ''
1.750000000 GHz	38.9619	14.0313
1.752000000 GHz	38.9582	14.0222
1.754000000 GHz	38.9585	14.0415
1.756000000 GHz	38.9528	14.0396
1.758000000 GHz	38.9333	14.0457
1.760000000 GHz	38.9370	14.0385
1.762000000 GHz	38.9394	14.0504
1.764000000 GHz	38.9283	14.0547
1.766000000 GHz	38.9329	14.0438
1.768000000 GHz	38.9255	14.0491
1.770000000 GHz	38.9227	14.0517
1.772000000 GHz	38.9282	14.0526
1.774000000 GHz	38.9228	14.0506
1.776000000 GHz	38.9142	14.0535
1.778000000 GHz	38.8993	14.0509
1.780000000 GHz	38.9067	14.0445
1.782000000 GHz	38.8990	14.0592
1.784000000 GHz	38.8996	14.0567
1.786000000 GHz	38.8902	14.0631
1.788000000 GHz	38.9010	14.0517
1.790000000 GHz	38.8922	14.0487
1.792000000 GHz	38.8757	14.0532
1.794000000 GHz	38.8808	14.0633
1.796000000 GHz	38.8762	14.0670
1.798000000 GHz	38.8813	14.0770
1.800000000 GHz	38.8822	14.0744
1.802000000 GHz	38.8758	14.0700
1.804000000 GHz	38.8611	14.0614
1.806000000 GHz	38.8430	14.0729
1.808000000 GHz	38.8446	14.0972
1.810000000 GHz	38.8477	14.1084
1.812000000 GHz	38.8577	14.1004
1.814000000 GHz	38.8369	14.0863
1.816000000 GHz	38.8303	14.0911
1.818000000 GHz	38.8170	14.0999

1900MHz EUT Evaluation (Body)

Measured Fluid Dielectric Parameters

March 28, 2002

Frequency	ϵ'	ϵ''
1.750000000 GHz	51.9980	14.1424
1.755000000 GHz	51.9899	14.1511
1.760000000 GHz	51.9726	14.1743
1.765000000 GHz	51.9628	14.1843
1.770000000 GHz	51.9587	14.2004
1.775000000 GHz	51.9438	14.2073
1.780000000 GHz	51.9183	14.2268
1.785000000 GHz	51.8977	14.2386
1.790000000 GHz	51.8816	14.2467
1.795000000 GHz	51.8786	14.2655
1.800000000 GHz	51.8613	14.2711
1.805000000 GHz	51.8276	14.2906
1.810000000 GHz	51.8009	14.3221
1.815000000 GHz	51.7777	14.3402
1.820000000 GHz	51.7548	14.3580
1.825000000 GHz	51.7335	14.3853
1.830000000 GHz	51.7402	14.4031
1.835000000 GHz	51.7201	14.4224
1.840000000 GHz	51.7210	14.4237
1.845000000 GHz	51.7056	14.4390
1.850000000 GHz	51.7031	14.4397
1.855000000 GHz	51.6971	14.4648
1.860000000 GHz	51.6790	14.4754
1.865000000 GHz	51.6648	14.4898
1.870000000 GHz	51.6450	14.5056
1.875000000 GHz	51.6354	14.5161
1.880000000 GHz	51.6039	14.5458
1.885000000 GHz	51.5848	14.5648
1.890000000 GHz	51.5670	14.5684
1.895000000 GHz	51.5474	14.6058
1.900000000 GHz	51.5251	14.6315
1.905000000 GHz	51.4973	14.6585
1.910000000 GHz	51.4840	14.6691
1.915000000 GHz	51.4508	14.6728
1.920000000 GHz	51.4126	14.7024

1800MHz System Validation

Measured Fluid Dielectric Parameters (Brain)

May 08, 2002

Frequency	ϵ'	ϵ''
1.750000000 GHz	39.2607	13.8969
1.752000000 GHz	39.2554	13.9070
1.754000000 GHz	39.2574	13.9189
1.756000000 GHz	39.2480	13.9005
1.758000000 GHz	39.2447	13.9032
1.760000000 GHz	39.2388	13.9013
1.762000000 GHz	39.2350	13.9135
1.764000000 GHz	39.2354	13.9171
1.766000000 GHz	39.2382	13.9193
1.768000000 GHz	39.2196	13.9217
1.770000000 GHz	39.2251	13.9284
1.772000000 GHz	39.2216	13.9251
1.774000000 GHz	39.2300	13.9209
1.776000000 GHz	39.2166	13.9265
1.778000000 GHz	39.2064	13.9271
1.780000000 GHz	39.2084	13.9327
1.782000000 GHz	39.1910	13.9314
1.784000000 GHz	39.1844	13.9483
1.786000000 GHz	39.1799	13.9272
1.788000000 GHz	39.1770	13.9449
1.790000000 GHz	39.1769	13.9518
1.792000000 GHz	39.1557	13.9437
1.794000000 GHz	39.1512	13.9532
1.796000000 GHz	39.1453	13.9604
1.798000000 GHz	39.1318	13.9752
1.800000000 GHz	39.1327	13.9937
1.802000000 GHz	39.1207	13.9954
1.804000000 GHz	39.1177	13.9918
1.806000000 GHz	39.1129	14.0106
1.808000000 GHz	39.0961	14.0091
1.810000000 GHz	39.0967	14.0216
1.812000000 GHz	39.0908	14.0228
1.814000000 GHz	39.0906	14.0388
1.816000000 GHz	39.0807	14.0332
1.818000000 GHz	39.0672	14.0420

1900MHz EUT Evaluation (Body)

Measured Fluid Dielectric Parameters

May 08, 2002

Frequency	ϵ'	ϵ''
1.750000000 GHz	52.7728	14.1604
1.755000000 GHz	52.7741	14.1807
1.760000000 GHz	52.7563	14.1950
1.765000000 GHz	52.7491	14.2040
1.770000000 GHz	52.7259	14.2192
1.775000000 GHz	52.7137	14.2253
1.780000000 GHz	52.6950	14.2405
1.785000000 GHz	52.6628	14.2562
1.790000000 GHz	52.6448	14.2710
1.795000000 GHz	52.6448	14.2850
1.800000000 GHz	52.6299	14.2936
1.805000000 GHz	52.6000	14.3223
1.810000000 GHz	52.5820	14.3517
1.815000000 GHz	52.5523	14.3624
1.820000000 GHz	52.5228	14.3729
1.825000000 GHz	52.5081	14.3998
1.830000000 GHz	52.5055	14.4234
1.835000000 GHz	52.4919	14.4421
1.840000000 GHz	52.4761	14.4411
1.845000000 GHz	52.4632	14.4594
1.850000000 GHz	52.4738	14.4751
1.855000000 GHz	52.4522	14.4866
1.860000000 GHz	52.4381	14.5060
1.865000000 GHz	52.4360	14.5220
1.870000000 GHz	52.4039	14.5322
1.875000000 GHz	52.3932	14.5415
1.880000000 GHz	52.3783	14.5618
1.885000000 GHz	52.3595	14.5893
1.890000000 GHz	52.3323	14.6028
1.895000000 GHz	52.3068	14.6257
1.900000000 GHz	52.2840	14.6390
1.905000000 GHz	52.2584	14.6766
1.910000000 GHz	52.2343	14.6914
1.915000000 GHz	52.2073	14.6945
1.920000000 GHz	52.1832	14.7239

APPENDIX E - SAM PHANTOM CERTIFICATE OF CONFORMITY

Schmid & Partner Engineering AG

Zeughausstrasse 43, 8004 Zurich, Switzerland, Phone +41 1 245 97 00, Fax +41 1 245 97 79

Certificate of conformity / First Article Inspection

Item	SAM Twin Phantom V4.0
Type No	QD 000 P40 BA
Series No	TP-1002 and higher
Manufacturer / Origin	Untersee Composites Hauptstr. 69 CH-8559 Fruthwilen Switzerland

Tests

The series production process used allows the limitation to test of first articles. Complete tests were made on the pre-series Type No. QD 000 P40 AA, Serial No. TP-1001 and on the series first article Type No. QD 000 P40 BA, Serial No. TP-1006. Certain parameters have been retested using further series units (called samples).

Test	Requirement	Details	Units tested
Shape	Compliance with the geometry according to the CAD model.	IT'IS CAD File (*)	First article, Samples
Material thickness	Compliant with the requirements according to the standards	2mm +/- 0.2mm in specific areas	First article, Samples
Material parameters	Dielectric parameters for required frequencies	200 MHz – 3 GHz Relative permittivity < 5 Loss tangent < 0.05.	Material sample TP 104-5
Material resistivity	The material has been tested to be compatible with the liquids defined in the standards	Liquid type HSL 1800 and others according to the standard.	Pre-series, First article

Standards

- [1] CENELEC EN 50361
- [2] IEEE P1528-200x draft 6.5
- [3] IEC PT 62209 draft 0.9

(*) The IT'IS CAD file is derived from [2] and is also within the tolerance requirements of the shapes of [1] and [3].

Conformity

Based on the sample tests above, we certify that this item is in compliance with the uncertainty requirements of SAR measurements specified in standard [1] and draft standards [2] and [3].

Date 18.11.2001

Signature / Stamp



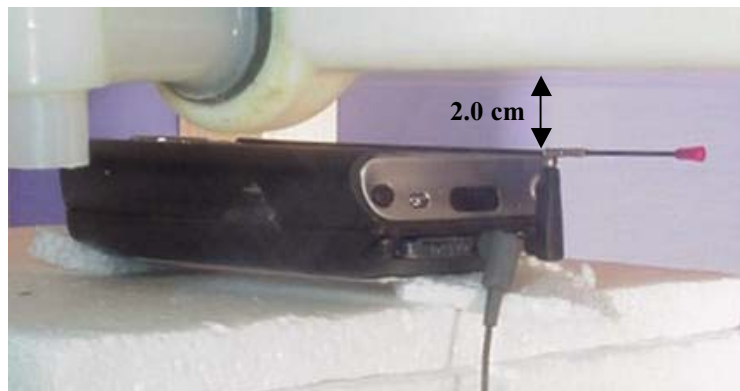
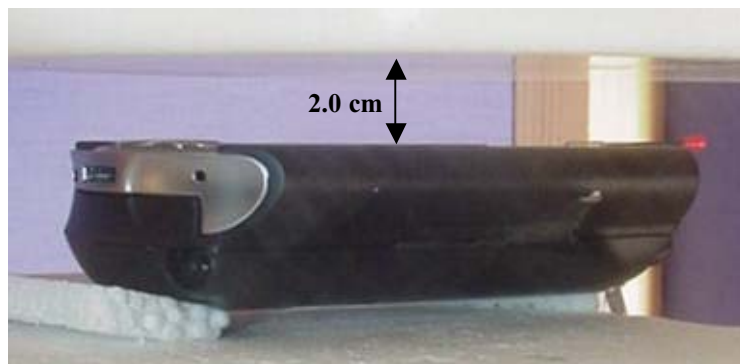
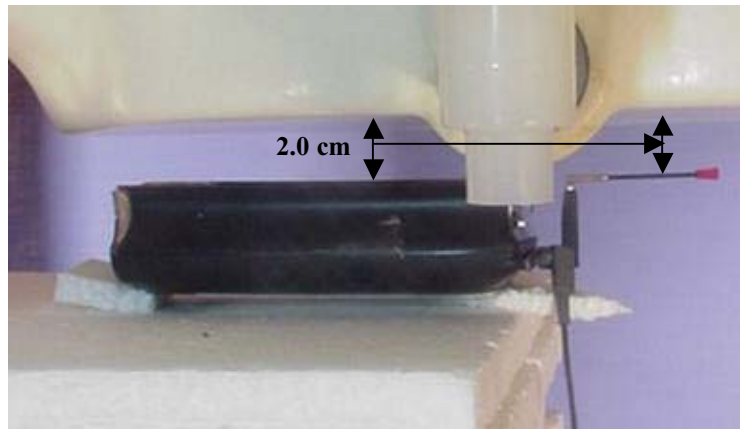
**Schmid & Partner
Engineering AG**



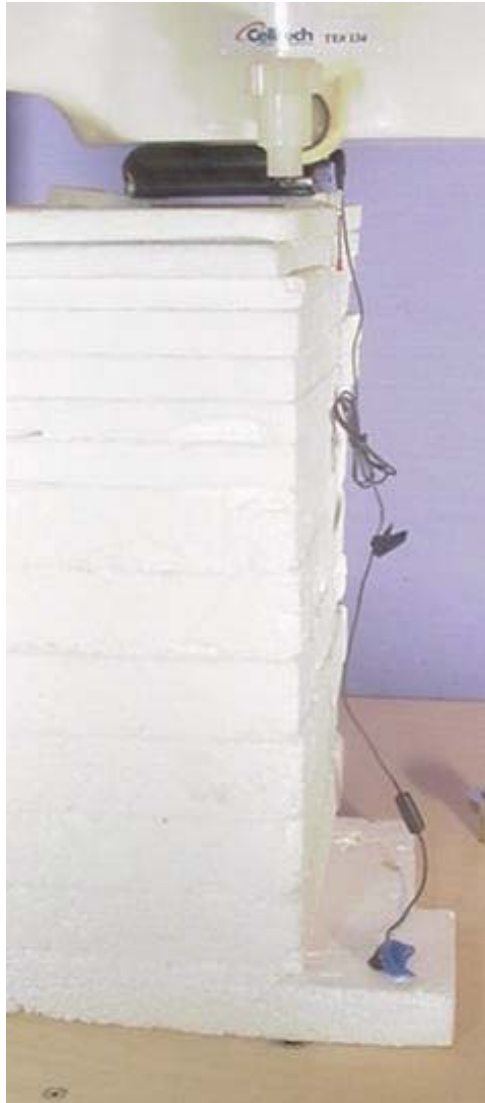
Zeughausstrasse 43, CH-8004 Zurich
Tel. +41 1 245 97 00, Fax +41 1 245 97 79

APPENDIX F - SAR TEST SETUP PHOTOGRAPHS

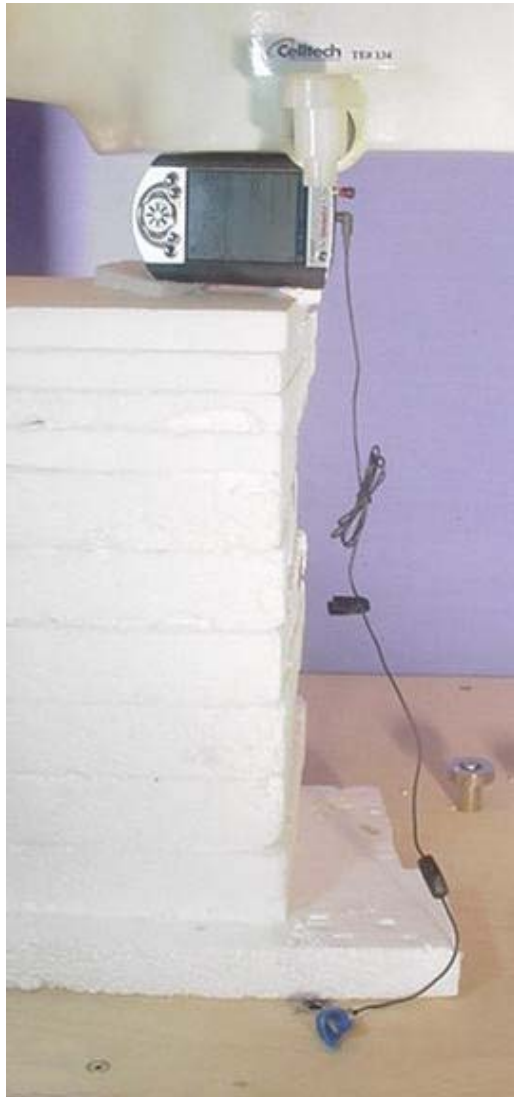
SAR TEST SETUP PHOTOGRAPHS
EUT with Compaq iPaq 3650 PDA
Face of PDA (LCD Side)
Antenna Parallel to Planar Phantom
2.0 cm Separation Distance



SAR TEST SETUP PHOTOGRAPHS
EUT with Compaq iPaq 3650 PDA
Back of PDA Touching Planar Phantom
Antenna Perpendicular to Planar Phantom



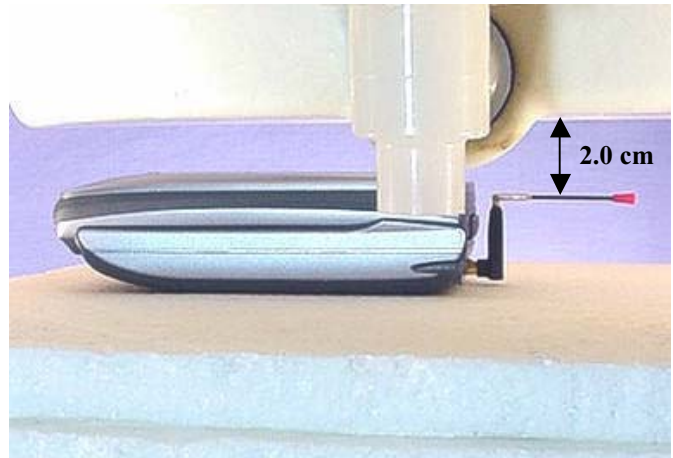
SAR TEST SETUP PHOTOGRAPHS
EUT with Compaq iPaq 3650 PDA
Left Side of PDA Touching Planar Phantom
Antenna Parallel to Planar Phantom



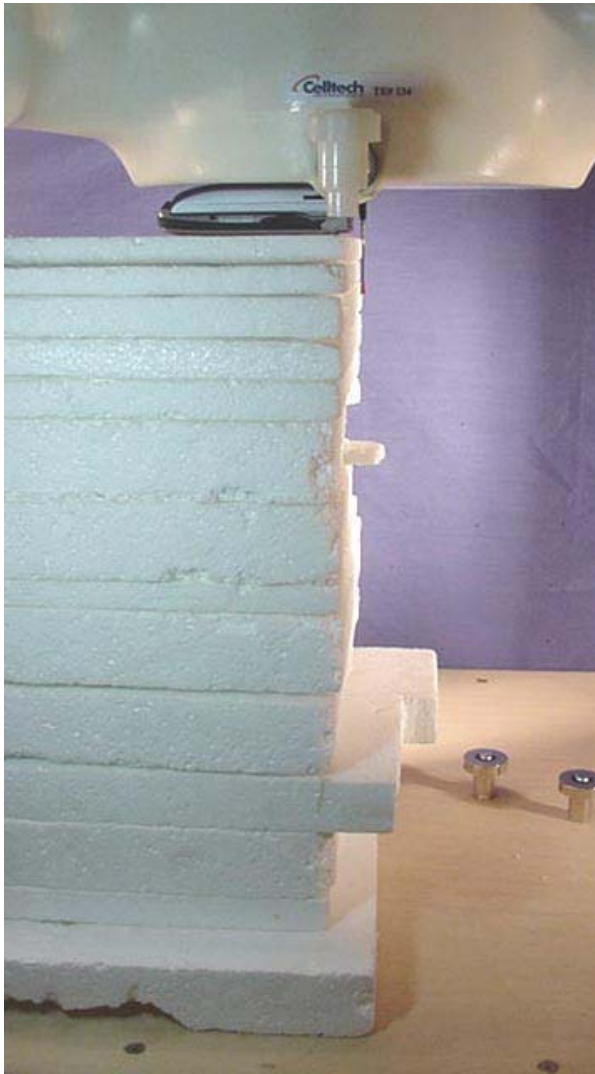
SAR TEST SETUP PHOTOGRAPHS
EUT with Compaq iPaq 3650 PDA
Antenna Side of PDA Facing Phantom
Antenna Parallel to Planar Phantom
2.0 cm Separation Distance (from Antenna)



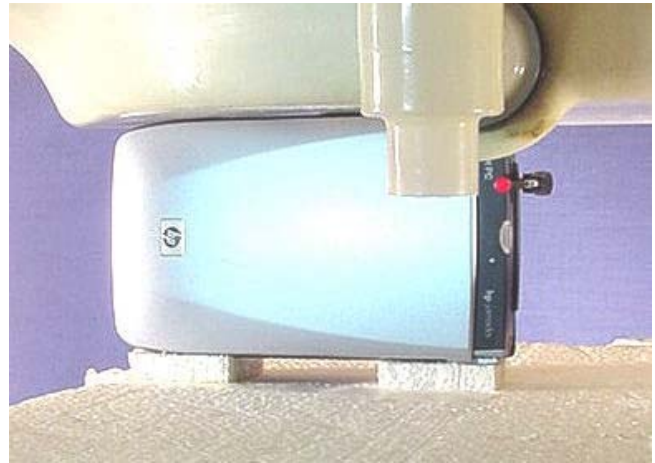
SAR TEST SETUP PHOTOGRAPHS
EUT with HP Jornada 568 PDA
Face of PDA (LCD Side)
Antenna Parallel to Planar Phantom
2.0 cm Separation Distance (from Antenna)



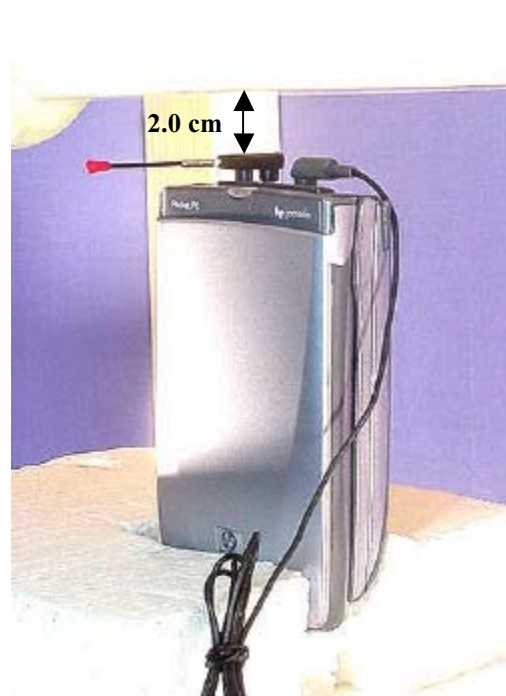
SAR TEST SETUP PHOTOGRAPHS
EUT with HP Jornada 568 PDA
Back of PDA Touching Planar Phantom
Antenna Perpendicular to Planar Phantom



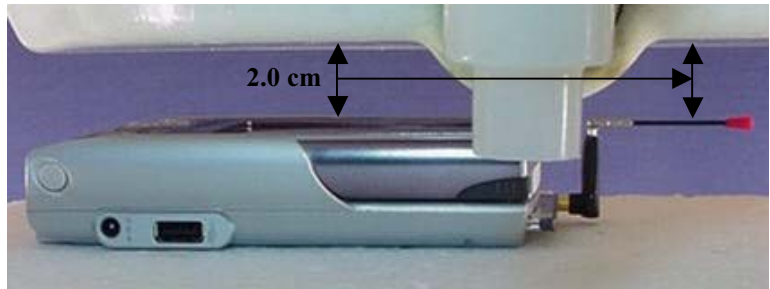
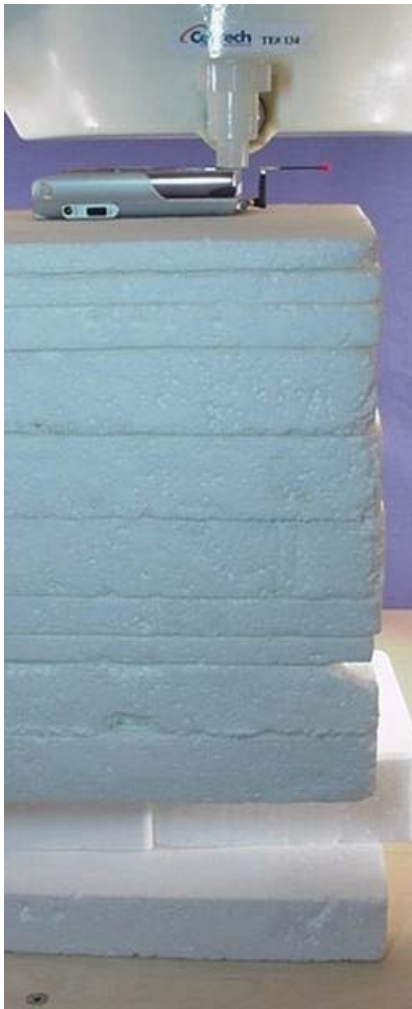
SAR TEST SETUP PHOTOGRAPHS
EUT with HP Jornada 568 PDA
Left Side of PDA Touching Planar Phantom
Antenna Parallel to Planar Phantom



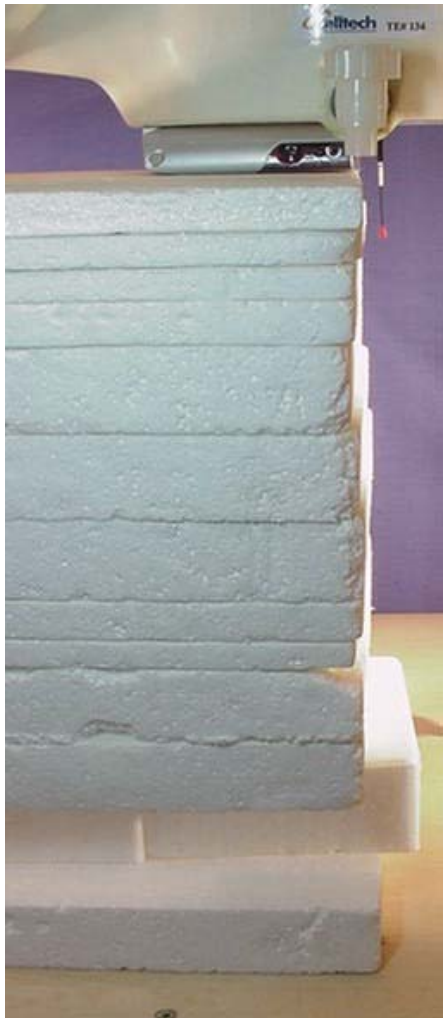
SAR TEST SETUP PHOTOGRAPHS
EUT with HP Jornada 568 PDA
Antenna Side of PDA Facing Phantom
Antenna Parallel to Planar Phantom
2.0 cm Separation Distance (from Antenna)



SAR TEST SETUP PHOTOGRAPHS
EUT with Cassiopeia E200 PDA
Face of PDA (LCD Side)
Antenna Parallel to Planar Phantom
2.0 cm Separation Distance



SAR TEST SETUP PHOTOGRAPHS
EUT with Cassiopeia E200 PDA
Back of PDA Touching Planar Phantom
Antenna Perpendicular to Planar Phantom



SAR TEST SETUP PHOTOGRAPHS
EUT with Cassiopeia E200 PDA
Left Side of PDA Touching Planar Phantom
Antenna Parallel to Planar Phantom



SAR TEST SETUP PHOTOGRAPHS
EUT with Cassiopeia E200 PDA
Antenna Side of PDA Facing Phantom
Antenna Parallel to Planar Phantom
2.5 cm Separation Distance (from Antenna)

