DECLARATION OF COMPLIANCE
SAR RF EXPOSURE EVALUATION

Test Lab

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Applicant Information

M/A-COM, INC.
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FCC IDENTIFIER:	**OWDTR-0016-E**
Model Name/No.(s):	**P7100(IP), P5100(IP)**
Part No.(s) Tested:	**RU101219V61 R1B (P7100 Scan), RU101219V62 R1B (P7100 System)**
Additional Part No.(s):	**RU101219V63 R1B (P7100 Select), RU101219V161 R1B (P5100 Scan), RU101219V163 R1B (P5100 Select)**
Rule Part(s):	**FCC 47 CFR §2.1093; IC RSS-102 Issue 1 (Provisional)**
Test Procedure(s):	**FCC OET Bulletin 65, Supplement C (Edition 01-01)**
Device Classification:	**Licensed Non-Broadcast Transmitter Held to Face (TNF)**
Device Description:	**Portable UHF PTT Radio Transceiver**
Modulation Type:	**FM (UHF Band)**
Tx Frequency Range:	**378 - 430 MHz**
Max. RF Output Power Tested:	**4.44 Watts (Conducted)**
Antenna Type(s) Tested:	**Helical Coil / 378-403 MHz (P/N: KRE1011219/9)** **Helical Coil / 403-430 MHz (P/N: KRE1011219/10)** **Quarter-Wave Whip / 378-430 MHz (P/N: KRE1011223/10)**
Battery Type(s) Tested:	**NiCd 7.5V - wind driven rain - Press in Contacts - Non-Intrinsically Safe (P/N: BKB191210/43)** **NiMH 7.5V - wind driven rain - Press in Contacts - Non-Intrinsically Safe (P/N: BKB191210/44)** **NiCd 7.5V - wind driven rain - Press in Contacts - Intrinsically Safe (P/N: BKB191210/45)** **NiMH 7.5V - wind driven rain - Press in Contacts - Intrinsically Safe (P/N: BKB191210/46)**
Body-Worn Accessories Tested:	**Speaker Microphone Antenna Version Ruggedized (KRY1011617/384)** **- Ranger Headset (OT-V4-10421), Behind-the-Head Headset (OT-V4-10450)** **- Skull Microphone (OT-V4-10428), Throat Microphone (OT-V1-10656)** **Speaker Microphone Antenna Version Plus (KRY1011617/184)** **Speaker-Microphone (KRY1011617/183)** **Metal Belt-Clip (KRY1011647/1)** **Belt-Loop (KRY1011609/1) & Swivel (KRY1011608/2)** **Leather Case - Belt-Loop type (KRY1011638/1)** **Leather Case (KRY1011639/1) with Belt-Loop (KRY1011609/1) & Swivel (KRY1011608/2)** **Leather Case with Metal D-rings (KRY1011639/3), Over-the-Shoulder Strap (CC103333V1) & Swivel (KRY1011608/2)** **Nylon (black) Case (KRY1011648/1) with Belt-Loop (KRY1011609/1)** **Nylon "T" Strap Holder (KRY1011656/1)**
Max. SAR Levels Evaluated:	**Face-held: 2.77 W/kg (50% Duty Cycle)** **Body-worn: 5.06 W/kg (50% Duty Cycle)**
Permissive Change(s):	**New RF Power Amplifier Module** **Add Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)**

Celltech Labs Inc. declares under its sole responsibility that this wireless portable device has demonstrated compliance with the Specific Absorption Rate (SAR) RF exposure requirements specified in FCC 47 CFR §2.1093 and Health Canada's Safety Code 6. The device was tested in accordance with the measurement standards and procedures specified in FCC OET Bulletin 65, Supplement C (Edition 01-01) and Industry Canada RSS-102, Issue 1 (Provisional) for the Occupational / Controlled Exposure Environment. All tests described in this test report were performed in accordance with SAR system manufacturer recommendations.

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 Labs Inc. The results and statements contained in this report pertain only to the device(s) evaluated.

Spencer Watson

Spencer Watson
Compliance Technologist
Celltech Labs Inc.

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1.0 INTRODUCTION

This measurement report demonstrates that the M/A-COM, Inc. Model: P7100(IP) Portable UHF-L PTT Radio Transceiver FCC ID: OWDTR-0016-E, with the Permissive Change(s) described in this report, complies with the SAR (Specific Absorption Rate) RF exposure requirements specified in FCC 47 CFR §2.1093 (see reference [1]), and Health Canada's Safety Code 6 (see reference [2]) for the Occupational / Controlled Exposure environment. The test procedures described in FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [3]) and IC RSS-102, Issue 1 (Provisional) (see reference [4]), were employed. A description of the device, 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 DEVICE UNDER TEST (DUT)

Rule Part(s)	FCC 47 CFR §2.1093			IC RSS-102 Issue 1 (Provisional)		
Test Procedure(s)	FCC OET Bulletin 65, Supplement C (Edition 01-01)					
Device Classification	Licensed Non-Broadcast Transmitter Held to Face (TNF)					
Device Type	Portable UHF PTT Radio Transceiver					
FCC IDENTIFIER	OWDTR-0016-E					
Radio Sample(s) Tested	Model: P7100 Scan	P/N: RU101219V61 R1B	S/N: T1PA-UL03	Identical Prototype		
	Model: P7100 System	P/N: RU101219V62 R1B	S/N: T1PA-UL10	Identical Prototype		
Additional Radio Types (Testing Not Required)	Model: P7100 Select	P/N: RU101219V63 R1B				
	Model: P5100 Scan	P/N: RU101219V161 R1B				
	Model: P5100 Select	P/N: RU101219V163 R1B				
Modulation	FM (UHF)					
Tx Frequency Range	378 - 430 MHz					
Max. RF Output Power Tested	4.44 Watts (Conducted)					
Antenna Type(s) Tested	Helical Coil	P/N: KRE1011219/9	378-403 MHz	Length: 86 mm		
	Helical Coil	P/N: KRE1011219/10	403-430 MHz	Length: 84 mm		
	Quarter-Wave Whip	P/N: KRE1011223/10	378-430 MHz	Length: 172 mm		
Battery Type(s) Tested	NiCd	7.5 V	Wind Driven Rain	Press in Contacts	Non -Intrinsically Safe	P/N: BKB191210/43
	NiMH	7.5 V	Wind Driven Rain	Press in Contacts	Non -Intrinsically Safe	P/N: BKB191210/44
	NiCd	7.5 V	Wind Driven Rain	Press in Contacts	Intrinsically Safe	P/N: BKB191210/45
	NiMH	7.5 V	Wind Driven Rain	Press in Contacts	Intrinsically Safe	P/N: BKB191210/46
Additional Battery Type(s) Testing Not Required (electrically & mechanically same as batteries listed above)	NiCd	7.5 V	Immersible	Non -Intrinsically Safe		P/N: BKB191210/3
	NiMH	7.5 V	Immersible	Non -Intrinsically Safe		P/N: BKB191210/4
	NiCd	7.5 V	Immersible	Intrinsically Safe		P/N: BKB191210/5
	NiMH	7.5 V	Immersible	Intrinsically Safe		P/N: BKB191210/6
	NiCd	7.5 V	Wind Driven Rain	Non -Intrinsically Safe		P/N: BKB191210/23
	NiMH	7.5 V	Wind Driven Rain	Non -Intrinsically Safe		P/N: BKB191210/24
	NiCd	7.5 V	Wind Driven Rain	Intrinsically Safe		P/N: BKB191210/25
	NiMH	7.5 V	Wind Driven Rain	Intrinsically Safe		P/N: BKB191210/26
	NiCd	7.5 V	Immersible	Press in Contacts	Non -Intrinsically Safe	P/N: BKB191210/33
	NiMH	7.5 V	Immersible	Press in Contacts	Non -Intrinsically Safe	P/N: BKB191210/34
	NiCd	7.5 V	Immersible	Press in Contacts	Intrinsically Safe	P/N: BKB191210/35
	NiMH	7.5 V	Immersible	Press in Contacts	Intrinsically Safe	P/N: BKB191210/36
Permissive Change(s)	New Power Amplifier Module					
	Add Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)					

2.0 DESCRIPTION OF DEVICE UNDER TEST (DUT) - Cont.

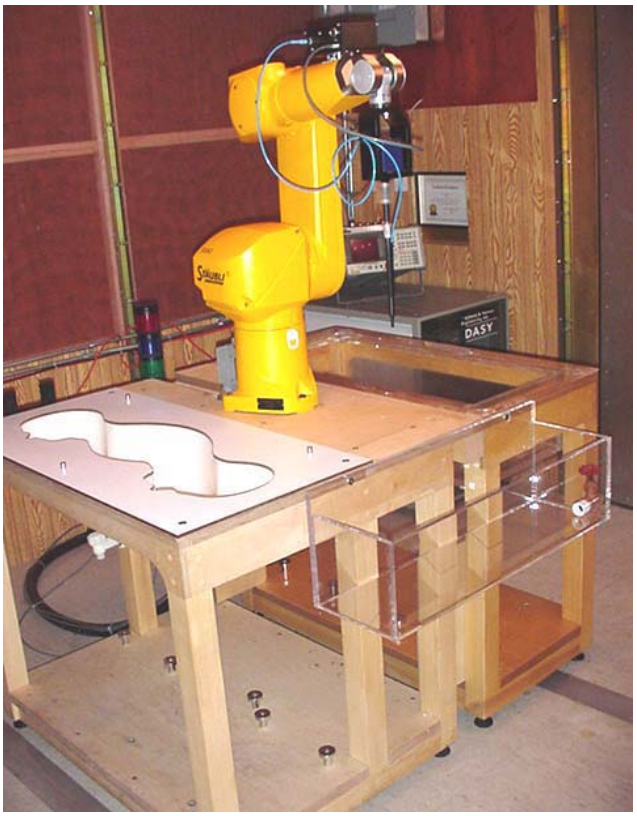
		Description	Part No.
Body-Worn Accessories Tested	1.	Speaker-Microphone	KRY1011617/183
	2.	Speaker-Microphone Antenna Version Plus	KRY1011617/184
	3.	Speaker-Microphone Antenna Version Plus - Ruggedized	KRY1011617/384
	4.	Ranger Headset	OT-V4-10421
	5.	Behind-the-Head Headset	OT-V4-10450
	6.	Skull Microphone	OT-V4-10428
	7.	Throat Microphone	OT-V4-10656
	8.	Metal Belt-Clip	KRY1011647/1
	9.	Leather Case (Belt-Loop type)	KRY1011638/1
	10.	Belt-Loop & Swivel (KRY1011608/2)	KRY1011609/1
	11.	Leather Case with Belt-Loop (KRY1011609/1) & Swivel (KRY1011608/2)	KRY1011639/1
	12.	Leather Case with Metal D-rings & Over-the-Shoulder Strap (CC103333V1) & Swivel (KRY1011608/2)	KRY1011639/3
	13.	Nylon (black) Case with Belt-Loop (KRY1011609/1)	KRY1011648/1
	14.	Nylon "T" Strap Holder	KRY1011656/1

		Description	Part No.
Additional Body-Worn Accessories **Testing Not Required** **1. Same as Item 1 listed above** **2. Same as Item 2 listed above** **3. Same as Item 3 listed above**	1.	Speaker-Microphone - Immersible - Intrinsically Safe	KRY1011617/283[1]
	2.	Speaker-Microphone - Ruggedized - Intrinsically Safe	KRY1011617/383[1]
	3.	Speaker-Microphone - Ruggedized - Vehicle Charger Compatible - Intrinsically Safe	KRY1011617/385[1]
	4.	Speaker-Microphone - Ruggedized - Antenna Version - Intrinsically Safe, Charger Compatible	KRY1011617/387[3]
	5.	Speaker-Microphone - Vehicle Charger Compatible - Intrinsically Safe	KRY1011617/185[1]
	6.	Speaker-Microphone - Antenna Version - Vehicle Charger Compatible - Intrinsically Safe	KRY1011617/186[2]
	7.	Speaker-Microphone - Antenna Version - Immersible - Intrinsically Safe	KRY1011617/284[2]
	8.	Speaker-Microphone - Antenna Version - Immersible - Intrinsically Safe, Charger Compatible	KRY1011617/287[2]
	9.	Speaker-Microphone - Industrial	OT-V2-10121[1]
	10.	Speaker-Microphone - Industrial PLUS	OT-V2-10122[1]
	11.	Speaker-Microphone - Earphone Kit, Black	OT-V1-10520[1]
	12.	Speaker-Microphone - Earphone Kit, Beige	OT-V1-10521[1]
	13.	Speaker-Microphone - Earphone Kit, Black	OT-V1-10522[1]
	14.	Speaker-Microphone - Earphone Kit, Beige	OT-V1-10523[1]
	15.	Speaker-Microphone - 3-Wire Mini Lapel, Beige	OT-V1-10524[1]
	16.	Speaker-Microphone - 3-Wire Mini Lapel, Black	OT-V1-10525[1]
	17.	Speaker-Microphone - Ultra Lite Headset with Inline PTT	OT-V4-10314[1]
	18.	Speaker-Microphone - Liteweight Headset with Single Speaker	OT-V4-10315[1]
	19.	Speaker-Microphone - Over-the-head Headset	OT-V4-10316[1]
	20.	Speaker-Microphone - Behind-the-head Headset	OT-V4-10317[1]
	21.	Earpiece Kit for Speaker Microphone - Intrinsically Safe	RLD54107/11
	22.	Nylon (orange) Case with Belt-Loop (KRY1011609/1)	KRY1011649/1[3]

3.0 SAR MEASUREMENT SYSTEM

Celltech Labs Inc. SAR measurement facility utilizes the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 measurement system is comprised of the measurement server, robot controller, computer, near-field probe, probe alignment sensor, specific anthropomorphic mannequin (SAM) phantom, and various planar phantoms for brain and/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 DASY4 measurement server. The DAE4 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 DASY4 measurement server 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. The sensor systems are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

DASY4 SAR Measurement System with validation phantom



DASY4 SAR Measurement System with Plexiglas planar phantom

4.0 MEASUREMENT SUMMARY

FACE-HELD SAR EVALUATION RESULTS

Freq. (MHz)	Chan.	Test Mode	Radio Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	Measured SAR 1g (W/kg) Duty Cycle 100%	Measured SAR 1g (W/kg) Duty Cycle 50%	SAR Drift During Test (dB)	Scaled SAR 1g (W/kg) Duty Cycle 100%	Scaled SAR 1g (W/kg) Duty Cycle 50%
403	Mid	CW	System	KRE1011223/10	NiMH NIS	2.5	4.23	4.96	2.48	-0.00265	4.96	2.48
403	Mid	CW	System	KRE1011223/10	NiCd NIS	2.5	4.23	4.96	2.48	-0.00891	4.97	2.49
403	Mid	CW	Scan	KRE1011223/10	NiMH NIS	2.5	4.22	4.99	2.50	-0.00928	5.00	2.50
403	Mid	CW	Scan	KRE1011223/10	NiCd NIS	2.5	4.22	4.96	2.48	-0.000519	4.96	2.48
403	Mid	CW	Scan	KRE1011219/9	NiCd NIS	2.5	4.22	2.63	1.32	-0.0556	2.66	1.33
403	Mid	CW	Scan	KRE1011219/10	NiCd NIS	2.5	4.22	5.41	2.71	-0.0790	5.51	2.75
403	Mid	CW	Scan	KRE1011219/10	NiMH NIS	2.5	4.22	5.43	2.72	-0.0925	5.55	2.77
403	Mid	CW	Scan with SM AVP	KRE1011219/9	NiCd NIS	2.5	4.22	2.55	1.28	-0.0320	2.57	1.28

ANSI / IEEE C95.1 1999 - SAFETY LIMIT
Spatial Peak - Controlled Exposure / Occupational
BRAIN: 8.0 W/kg (averaged over 1 gram)

Test Date	September 23, 2004			**Relative Humidity**	38	%
Measured Fluid Type	**450 MHz Brain**			**Atmospheric Pressure**	102.7	KPa
Dielectric Constant ε_r	**IEEE Target**		**Measured**	**Ambient Temperature**	23.5	°C
	43.5	**± 5%**	44.0	**Fluid Temperature**	23.2	°C
Conductivity σ (mho/m)	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	cm
	0.87	**± 5%**	0.88	**ρ (Kg/m^3)**	1000	

Note(s):

1. The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2. If the scaled SAR levels at the mid channel (50% duty cycle) were ≥ 3 dB below the SAR limit, SAR evaluation for the low and high channels was optional per FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [3]).
3. The test configurations were determined based on the worst-case SAR results from the face-held configurations evaluated in the original FCC Certification filing (Celltech Test Report Serial No.: 040403-362OWD) as shown below:
   a. Quarter-Wave Whip Antenna - Radio S/N: T1-LSAR01 (Scan) - Mid Ch. - NiCd NIS Battery (2.55 W/kg - 50% duty cycle)
   b. Quarter-Wave Whip Antenna - Radio S/N: T1-LSAR01 (Scan) - Mid Ch. - NiMH NIS Battery (2.53 W/kg - 50% duty cycle)
   c. Quarter-Wave Whip Antenna - Radio S/N: T1-LSAR02 (System) - Mid Ch. - NiMH NIS Battery (2.46 W/kg - 50% duty cycle)
   d. Quarter-Wave Whip Antenna - Radio S/N: T1-LSAR02 (System) - Mid Ch. - NiCd IS Battery (2.49 W/kg - 50% duty cycle)

   The above configurations were re-evaluated and the worst-case radio S/N: T1PA-UL03 (Scan) was further re-evaluated with the Helical Coil Antennas (P/N's: KRE1011219/9, KRE1011219/10) and corresponding battery type. Please note the SAR result with Helical Coil Antenna (P/N: KRE1011219/10) was higher than the SAR result with Quarter-Wave Whip Antenna, therefore an additional evaluation was performed with the Helical Coil Antenna (P/N: KRE1011219/10) and NiMH NIS Battery.
   e. Radio S/N: T1-LSAR01 (Scan) - with Speaker-Microphone Antenna Version Plus (SM AVP) - Helical Coil Antenna (P/N: KRE1011219/9) - Mid. Ch. - NiCd NIS Battery (1.31 W/kg - 50% duty cycle).
4. The power drifts measured by the DASY system for the duration of the SAR evaluations were subsequently added to the measured SAR levels to report scaled SAR results as shown in the above table.
5. Abbreviation(s): IS = Intrinsically Safe
   NIS = Non-Intrinsically Safe
   SM AVP = Speaker-Microphone Antenna Version Plus
6. Antenna Type(s): Helical Coil P/N: KRE1011219/9 (378-403 MHz)
   Helical Coil P/N: KRE1011219/10 (403-430 MHz)
   Quarter-Wave Whip P/N: KRE1011223/10 (378-430 MHz)
7. The SAR evaluations were performed within 24 hours of the system performance check.

MEASUREMENT SUMMARY (Cont.)

FACE-HELD SAR EVALUATION RESULTS

System Radio (P/N: RU101219V62 R1B) with Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Freq. (MHz)	Chan.	Test Mode	Radio Type	Antenna Part No.	Battery Type	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (dBm)	Measured SAR 1g (W/kg) Duty Cycle 100%	Measured SAR 1g (W/kg) Duty Cycle 50%	SAR Drift During Test (dB)	Scaled SAR 1g (W/kg) Duty Cycle 100%	Scaled SAR 1g (W/kg) Duty Cycle 50%
403	Mid	CW	System with SM AVR	KRE1011223/10	NiCd IS	2.5	4.22	1.64	0.820	-0.361	1.78	0.891
403	Mid	CW	System with SM AVR	KRE1011219/10	NiCd NIS	2.5	4.22	1.55	0.775	0.0653	1.55	0.775
403	Mid	CW	System with SM AVR	KRE1011219/9	NiCd NIS	2.5	4.22	2.09	1.05	-0.0602	2.12	1.06

ANSI / IEEE C95.1 1999 - SAFETY LIMIT
Spatial Peak - Controlled Exposure / Occupational
BRAIN: 8.0 W/kg (averaged over 1 gram)

Test Date	October 20, 2004			**Relative Humidity**	37	%
Measured Fluid Type	**450 MHz Brain**			**Atmospheric Pressure**	101.6	KPa
Dielectric Constant ε_r	**IEEE Target**		**Measured**	**Ambient Temperature**	23.9	°C
	43.5	**± 5%**	44.0	**Fluid Temperature**	22.9	°C
Conductivity σ (mho/m)	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	cm
	0.87	**± 5%**	0.87	**ρ (Kg/m^3)**	1000	

Note(s):

1. The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2. If the scaled SAR levels at the mid channel (50% duty cycle) were ≥ 3 dB below the SAR limit, SAR evaluation for the low and high channels was optional per FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [3]).
3. The Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384) was tested in the equivalent face-held configurations as the Speaker-Microphone Antenna Version (P/N: KRY1011617/184) from the original FCC Certification testing (Celltech Test Report Serial No.: 040403-362OWD) as shown below:
   a. Quarter-Wave Whip Antenna (KRE1011223/10) - SM AVP - Mid Ch. - NiCd IS Battery (1.08 W/kg - 50% duty cycle)
   b. Helical Coil Antenna (KRE1011219/10) - SM AVP - Mid Ch. - NiCd NIS Battery (1.22 W/kg - 50% duty cycle)
   c. Helical Coil Antenna (KRE1011219/9) - SM AVP - Mid Ch. - NiCd NIS Battery (1.31 W/kg - 50% duty cycle)
4. The power drifts measured by the DASY4 system for the duration of the SAR evaluations were subsequently added to the measured SAR levels to report scaled SAR results as shown in the above table.
5. Abbreviation(s): IS = Intrinsically Safe
   NIS = Non-Intrinsically Safe
   SM AVR = Speaker-Microphone Antenna Version Ruggedized
6. Antenna Type(s): Helical Coil P/N: KRE1011219/9 (378-403 MHz)
   Helical Coil P/N: KRE1011219/10 (403-430 MHz)
   Quarter-Wave Whip P/N: KRE1011223/10 (378-430 MHz)
7. The SAR evaluations were performed within 24 hours of the system performance check.

MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Freq. (MHz)	Chan.	Test Mode	Radio Type	Antenna Part No.	Battery Type	Body-worn Accessories	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	Measured SAR 1g (W/kg) Duty Cycle			SAR Drift During Test (dB)	Scaled SAR 1g (W/kg) Duty Cycle		
										100%	50%			100%	50%
403	Mid	CW	System	KRE1011223/10	NiMH NIS	Belt-Clip Speaker-Mic	1.1	4.20		9.19	4.60	-0.420		10.12	5.06
403	Mid	CW	System	KRE1011223/10	NiCd IS	Belt-Clip Speaker-Mic	1.1	4.22		9.61	4.81	-0.109		9.85	4.93
403	Mid	CW	Scan	KRE1011223/10	NiMH NIS	Belt-Clip Speaker-Mic	1.1	4.22	P	8.76	4.38	-0.0428	P	8.85	4.42
									S	7.92	3.96		S	8.00	4.00
403	Mid	CW	Scan	KRE1011223/10	NiCd IS	Belt-Clip Speaker-Mic	1.1	4.22	P	8.42	4.21	-0.206	P	8.83	4.41
									S	7.07	3.54		S	7.41	3.71
378	Low	CW	System	KRE1011223/10	NiMH NIS	Belt-Clip Speaker-Mic	1.1	4.34	P	5.45	2.73	0.274	P	5.45	2.73
									S	5.00	2.50		S	5.00	2.50
430	High	CW	System	KRE1011223/10	NiMH NIS	Belt-Clip Speaker-Mic	1.1	4.33	P	6.97	3.49	0.227	P	6.97	3.49
									S	6.65	3.33		S	6.65	3.33
									S	5.88	2.94		S	5.88	2.94
403	Mid	CW	System	KRE1011219/9	NiCd IS	Belt-Clip Speaker-Mic	1.1	4.22	P	3.72	1.86	-0.107	P	3.81	1.91
									S	3.01	1.51		S	3.09	1.54

ANSI / IEEE C95.1 1999 - SAFETY LIMIT
Spatial Peak - Controlled Exposure / Occupational
BODY: 8.0 W/kg (averaged over 1 gram)

Test Date	September 21, 2004		Relative Humidity	33	%
Measured Fluid Type	450 MHz Body		Atmospheric Pressure	103.3	kPa
Dielectric Constant ε_r	IEEE Target	Measured	Ambient Temperature	24.1	°C
	56.7 ± 5%	57.3	Fluid Temperature	23.6	°C
Conductivity σ (mho/m)	IEEE Target	Measured	Fluid Depth	≥ 15	cm
	0.94 ± 5%	0.93	ρ (Kg/m^3)	1000	

Note(s):

1. The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2. If the scaled SAR levels at the mid channel (50% duty cycle) were ≥ 3 dB below the SAR limit, SAR evaluation for the low and high channels was optional per FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [3]).
3. The test configurations were determined based on the worst-case SAR results from the body-worn configurations evaluated in the original FCC Certification filing (Celltech Test Report Serial No.: 040403-362OWD) as shown below:
   a. Quarter-Wave Whip Antenna - Radio S/N: T1-LSAR01 (Scan) - Mid Ch. - NiMH NIS Battery (5.20 W/kg - 50% duty cycle)
   b. Quarter-Wave Whip Antenna - Radio S/N: T1-LSAR01 (Scan) - Mid Ch. - NiCd IS Battery (5.05 W/kg - 50% duty cycle)
   c. Quarter-Wave Whip Antenna - Radio S/N: T1-LSAR02 (System) - Mid Ch. - NiMH NIS Battery (5.05 W/kg - 50% duty cycle)
   d. Quarter-Wave Whip Antenna - Radio S/N: T1-LSAR02 (System) - Mid Ch. - NiCd IS Battery (4.96 W/kg - 50% duty cycle)

   The above configurations were re-evaluated and the worst-case radio S/N: T1PA-UL10 (System) was further re-evaluated with the Helical Coil Antennas (P/N's: KRE1011219/9, KRE1011219/10) and corresponding battery type.
4. Secondary peak SAR levels within 2 dB of the primary were reported (P = Primary, S = Secondary).
5. The power drifts measured by the DASY system for the duration of the SAR evaluations were subsequently added to the measured SAR levels to report scaled SAR results as shown in the above table.
6. The SAR evaluations were performed within 24 hours of the system performance check.

MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

Test Date	Freq. (MHz)	Chan.	Test Mode	Radio Type	Antenna Part No.	Battery Type	Body-worn Accessories	Separ. Distance to Planar Phantom (cm)	Cond. Power Before Test (Watts)	Measured SAR 1g (W/kg) Duty Cycle		SAR Drift During Test (dB)	Scaled SAR 1g (W/kg) Duty Cycle	
										100%	50%		100%	50%
Sep-22	403	Mid	CW	System	KRE1011219/10	NiCd NIS	BC/SM	1.1	4.24	P 9.60	4.80	-0.209	P 10.1	5.04
										S 7.66	3.83		S 8.04	4.02
Sep-22	430	High	CW	System	KRE1011219/10	NiCd NIS	BC/SM	1.1	4.44	2.83	1.42	-0.250	3.00	1.50
Sep-22	403	Mid	CW	System	KRE1011219/10	NiCd NIS	SM AVP	1.3	4.25	6.46	3.23	0.0131	6.46	3.23
Sep-22	403	Mid	CW	System	KRE1011223/10	NiMH IS	NTS/SM	1.6	4.24	7.64	3.82	0.0004	7.64	3.82
Sep-22	403	Mid	CW	System	KRE1011223/10	NiMH IS	LC/SM	1.7	4.23	5.11	2.56	-0.0785	5.20	2.60
Sep-22	403	Mid	CW	System	KRE1011223/10	NiMH IS	BL/S/SM	3.5	4.23	3.96	1.98	0.0315	3.96	1.98
Sep-22	403	Mid	CW	System	KRE1011223/10	NiMH IS	NC/SBL/SM	4.0	4.22	3.79	1.90	-0.0695	3.85	1.93
Sep-22	403	Mid	CW	System	KRE1011223/10	NiMH IS	LC/SBL/SM	4.5	4.23	3.05	1.53	-0.0018	3.05	1.53
Oct-07	403	Mid	CW	System	KRE1011223/10	NiMH IS	LC/SBL SS/SM	4.5	4.24	3.04	1.52	-0.0373	3.07	1.53

ANSI / IEEE C95.1 1999 - SAFETY LIMIT
Spatial Peak - Controlled Exposure / Occupational
BODY: 8.0 W/kg (averaged over 1 gram)

Test Date(s)	September 22, 2004			October 7, 2004			Test Date(s)	Sep-22	Oct-07	Units
Measured Fluid Type	450 MHz Body			450 MHz Body			Relative Humidity	40	32	%
Dielectric Constant ε_r	IEEE Target		Measured	IEEE Target		Measured	Atmospheric Pressure	102.8	102.9	kPa
	56.7	± 5%	57.4	56.7	± 5%	57.3	Ambient Temperature	23.6	23.6	°C
Conductivity σ (mho/m)	450 MHz Body			450 MHz Body			Fluid Temperature	23.2	21.1	°C
	IEEE Target		Measured	IEEE Target		Measured	Fluid Depth	≥ 15	≥ 15	cm
	0.94	± 5%	0.93	0.94	± 5%	0.91	ρ (Kg/m^3)	1000		

Note(s):

1. The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2. If the scaled SAR levels at the mid channel (50% duty cycle) were ≥ 3 dB below the SAR limit, SAR evaluation for the low and high channels was optional per FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [3]).
3. The test configurations were determined based on the worst-case SAR results from the body-worn configurations evaluated in the original FCC Certification filing (Celltech Test Report Serial No.: 040403-362OWD) as shown below:
   a. Speaker-Microphone AVP - Helical Coil Antenna (P/N: KRE1011219/10) - Mid Ch. - NiCd NIS Battery (3.17 W/kg - 50% duty cycle)
   b. Nylon T-Strap - Quarter-Wave Whip Antenna - Mid Ch. - NiMH IS Battery (4.13 W/kg - 50% duty cycle)
   c. Leather Case (Belt-Loop type) - Quarter-Wave Whip Antenna - Mid Ch - NiMH IS Battery (2.58 W/kg - 50% duty cycle)
   d. Belt-Loop & Swivel - Quarter-Wave Whip Antenna - Mid Ch - NiMH IS Battery (2.16 W/kg - 50% duty cycle)
   e. Nylon Case & Swivel Belt-Loop - Quarter-Wave Whip Antenna - Mid Ch - NiMH IS Battery (1.80 W/kg - 50% duty cycle)
   f. Leather Case & Swivel Belt-Loop - Quarter-Wave Whip Antenna - Mid Ch - NiMH IS Battery (1.31 W/kg - 50% duty cycle)
4. The Leather Case with Over-the-Shoulder Strap & Swivel-Belt-Loop accessory (P/N: KRY1011639/3) is a new accessory and was tested in the equivalent body-worn configuration as the Leather Case & Swivel Belt-Loop accessory (P/N: KRY1011639/1) to show a comparison SAR level.
5. Secondary peak SAR levels within 2 dB of the primary were reported (P = Primary, S = Secondary).
6. The power drifts measured by the DASY system for the duration of the SAR evaluations were subsequently added to the measured SAR levels to report scaled SAR results as shown in the above table.
7. The SAR evaluations were performed within 24 hours of the system performance check.
8. Abbreviation(s): IS = Intrinsically Safe, NIS = Non-Intrinsically Safe, BC = Belt-Clip, BL = Belt-Loop, LC = Leather Case, SBL= Swivel Belt-Loop, S = Swivel, SS = Shoulder Strap, NC = Nylon Case, NTS = Nylon T-Strap, SM = Speaker-Microphone, AVP = Antenna Version Plus

MEASUREMENT SUMMARY (Cont.)

BODY-WORN SAR EVALUATION RESULTS

System Radio (P/N: RU101219V62 R1B) with Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Freq. (MHz)	Chan.	Test Mode	Antenna Part No.	Battery Type	Body-worn Accessories	Separation Distance to Planar Phantom (cm)	Cond. Power Before Test (dBm)	Measured SAR 1g (W/kg) Duty Cycle 100%	Measured SAR 1g (W/kg) Duty Cycle 50%	SAR Drift During Test (dB)	Scaled SAR 1g (W/kg) Duty Cycle 100%	Scaled SAR 1g (W/kg) Duty Cycle 50%
403	Mid	CW	KRE1011223/10	NiMH IS	Ranger Headset	1.3	4.26	5.95	2.98	-0.127	6.13	3.06
403	Mid	CW	KRE1011223/10	NiMH IS	Behind-The-Head Headset	1.3	4.25	6.06	3.03	-0.0308	6.10	3.05
403	Mid	CW	KRE1011223/10	NiMH IS	Throat Mic	1.3	4.26	5.40	2.70	-0.0215	5.43	2.71
403	Mid	CW	KRE1011223/10	NiMH IS	Skull Mic	1.3	4.25	5.04	2.52	-0.139	5.20	2.60
403	Mid	CW	KRE1011219/10	NiCd NIS	Ranger Headset	1.3	4.25	6.48	3.24	-0.0400	6.54	3.27
403	Mid	CW	KRE1011219/10	NiCd NIS	Behind-The-Head Headset	1.3	4.25	7.30	3.65	-0.00962	7.32	3.66
403	Mid	CW	KRE1011219/10	NiCd NIS	Throat Mic	1.3	4.26	5.76	2.88	0.00354	5.76	2.88
403	Mid	CW	KRE1011219/10	NiCd NIS	Skull Mic	1.3	4.25	6.25	3.13	-0.0111	6.27	3.13
403	Mid	CW	KRE1011219/9	NiCd IS	Ranger Headset	1.3	4.25	4.26	2.13	-0.0319	4.29	2.15
403	Mid	CW	KRE1011219/9	NiCd IS	Behind-The-Head Headset	1.3	4.25	4.64	2.32	-0.0357	4.68	2.34
403	Mid	CW	KRE1011219/9	NiCd IS	Throat Mic	1.3	4.26	4.10	2.05	-0.00212	4.10	2.05
403	Mid	CW	KRE1011219/9	NiCd IS	Skull Mic	1.3	4.25	3.72	1.86	-0.00397	3.72	1.86

ANSI / IEEE C95.1 1999 - SAFETY LIMIT
Spatial Peak - Controlled Exposure / Occupational
BODY: 8.0 W/kg (averaged over 1 gram)

Test Date	October 19, 2004			**Relative Humidity**	32	%
Measured Fluid Type	**450 MHz Body**			**Atmospheric Pressure**	101.1	kPa
Dielectric Constant ε_r	**IEEE Target**		**Measured**	**Ambient Temperature**	23.8	°C
	56.7	**± 5%**	56.9	**Fluid Temperature**	22.8	°C
Conductivity σ (mho/m)	**IEEE Target**		**Measured**	**Fluid Depth**	≥ 15	cm
	0.94	**± 5%**	0.90	**ρ (Kg/m^3)**	1000	

Note(s):

1. The measurement results were obtained with the DUT tested in the conditions described in this report. Detailed measurement data and plots showing the maximum SAR location of the DUT are reported in Appendix A.
2. If the scaled SAR levels at the mid channel (50% duty cycle) were ≥ 3 dB below the SAR limit, SAR evaluation for the low and high channels was optional per FCC OET Bulletin 65, Supplement C, Edition 01-01 (see reference [3]).
3. The Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384) was tested in the equivalent body-worn configurations as the Speaker-Microphone Antenna Version (P/N: KRY1011617/184) from the original FCC Certification testing (Celltech Test Report Serial No.: 040403-362OWD) as shown below:
   a. Quarter-Wave Whip Antenna (KRE1011223/10) - SM AVP - Mid Ch. - NiMH IS Battery (2.19 W/kg - 50% duty cycle)
   b. Helical Coil Antenna (KRE1011219/10) - SM AVP - Mid Ch. - NiCd NIS Battery (3.17 W/kg - 50% duty cycle)
   c. Helical Coil Antenna (KRE1011219/9) - SM AVP - Mid Ch. - NiCd IS Battery (2.57 W/kg - 50% duty cycle)
4. The power drifts measured by the DASY4 system for the duration of the SAR evaluations were subsequently added to the measured SAR levels to report scaled SAR results as shown in the above table.
5. The SAR evaluations were performed within 24 hours of the system performance check.
6. Abbreviation(s): IS = Intrinsically Safe, NIS = Non-Intrinsically Safe

5.0 DETAILS OF SAR EVALUATION

The M/A-COM, Inc. Model: P7100(IP) Portable UHF-L PTT Radio Transceiver FCC ID: OWDTR-0016-E, with the Permissive Change(s) described in this report, was compliant for localized Specific Absorption Rate (Controlled Exposure) based on the test provisions and conditions described below. Detailed photographs of the measurement setup are shown in Appendix F.

1. The test configurations evaluated (radio types, antennas, batteries, and accessories) were determined based on the worst-case SAR results for face-held and body-worn configurations evaluated for the original FCC Certification filing (Celltech TRSN: 040403-362OWD).
2. Both radio types evaluated (S/N: T1PA-UL03 / Scan and S/N: T1PA-UL10 / System) are electrically and mechanically identical except for the number of keys on the front keypad (see Appendix F for DUT photographs).
3. Face-held SAR measurements were initially performed with both radio types and the Quarter-Wave Whip Antenna (P/N: KRE1011223/10). Radio S/N: T1PA-UL03 (Scan) yielded the highest SAR levels for the face-held measurements, therefore the remaining face-held evaluations were performed with radio S/N: T1PA-UL03 (Scan). For the speaker-microphone antenna-version-plus face-held evaluation, radio S/N: T1PA-UL03 (Scan) was evaluated with Helical Coil Antenna (P/N: KRE1011219/9). For the speaker-microphone antenna-version ruggedized face-held evaluation, radio S/N: T1PA-UL10 (System) was evaluated with all antenna types. The radio, speaker-microphone antenna-version-plus, and speaker-microphone antenna-version ruggedized were both evaluated for face-held SAR with the front of the device placed parallel to the outer surface of the planar phantom at a 2.5 cm separation distance.
4. Body-worn SAR measurements were initially performed using both radio types, metal belt-clip accessory, all three (3) antenna configurations and corresponding battery type, based on the worst-case SAR results from the original evaluations with the belt-clip accessory. Radio S/N: T1PA-UL10 (System) yielded the highest SAR level in this configuration, therefore the remaining body-worn accessory evaluations were performed with radio S/N: T1PA-UL10 (System) in the worst-case antenna and battery configuration from the original SAR evaluations.
5. The DUT was tested in a body-worn configuration with the back of the radio placed parallel to the outer surface of the planar phantom. The attached metal belt-clip accessory was touching the outer surface of the planar phantom and provided a 1.1 cm separation distance between the back of the radio and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the Speaker-Microphone non-antenna version audio accessory (P/N: KRY1011617/183).
6. The speaker-microphone antenna-version-plus was tested in a body-worn configuration connected to the handheld radio with the back of the speaker-microphone placed parallel to the outer surface of the planar phantom. The attached metal lapel-clip was touching the outer surface of the planar phantom and provided a 1.3 cm separation distance between the back of the speaker-microphone and the outer surface of the planar phantom.
7. The speaker-microphone antenna-version ruggedized was tested in a body-worn configuration connected to the handheld radio with the back of the speaker-microphone placed parallel to the outer surface of the planar phantom. The attached lapel-clip was touching the outer surface of the planar phantom and provided a 1.3 cm separation distance between the back of the speaker-microphone and the outer surface of the planar phantom. The speaker-microphone antenna-version ruggedized was evaluated for body-worn SAR with the Ranger Headset accessory (P/N: OT-V4-10421), Behind-the-Head Headset accessory (P/N: OT-V4-10450), Throat Microphone accessory (P/N: OT-V1-10656), and Skull Microphone accessory (P/N: OT-V4-10428).
8. The DUT was tested in a body-worn configuration with the nylon “T-Strap” accessory attached, and the back of the radio facing parallel to the outer surface of the planar phantom. The back of the “T-Strap” accessory was touching the outer surface of the planar phantom and provided a 1.6 cm separation distance between the back of the radio and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the Speaker-Microphone non-antenna version audio accessory (P/N: KRY1011617/183).
9. The DUT was tested in a body-worn configuration with the radio placed inside the leather case (belt-loop type) accessory and the back of the radio facing parallel to the outer surface of the planar phantom. The back of the leather case (belt-loop portion) was touching the outer surface of the planar phantom and provided a 1.7 cm separation distance between the back of the radio and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the Speaker-Microphone non-antenna version audio accessory (P/N: KRY1011617/183).
10. The DUT was tested in a body-worn configuration with the belt-loop and swivel accessories, with the back of the radio facing parallel to the outer surface of the planar phantom. The belt-loop was touching the outer surface of the planar phantom and provided a 3.5 cm separation distance between the back of the radio and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the Speaker-Microphone non-antenna version audio accessory (P/N: KRY1011617/183).
11. The DUT was tested in a body-worn configuration with the radio placed inside the nylon case accessory with the rear swivel-mount attached to the belt-loop accessory, and the back of the radio facing parallel to the outer surface of the planar phantom. The swivel belt-loop was touching the outer surface of the planar phantom and provided a 4.0 cm separation distance (combined with the nylon case) between the back of the radio and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the Speaker-Microphone non-antenna version audio accessory (P/N: KRY1011617/183).

DETAILS OF SAR EVALUATION (Cont.)

12. The DUT was tested in a body-worn configuration with the radio placed inside the leather case accessory with the rear swivel-mount attached to the belt-loop accessory, and the back of the radio facing parallel to the outer surface of the planar phantom. The back of the swivel belt-loop was touching the outer surface of the planar phantom and provided a 4.5 cm separation distance (combined with the leather case) between the back of the radio and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the Speaker-Microphone non-antenna version audio accessory (P/N: KRY1011617/183).
13. The DUT was tested in a body-worn configuration with the radio placed inside the leather case accessory with over-the-shoulder strap, and the rear swivel-mount attached to the belt-loop accessory, with the back of the radio facing parallel to the outer surface of the planar phantom. The back of the swivel belt-loop was touching the outer surface of the planar phantom and provided a 4.5 cm separation distance (combined with the leather case) between the back of the radio and the outer surface of the planar phantom. The DUT was evaluated for body-worn SAR with the Speaker-Microphone non-antenna version audio accessory (P/N: KRY1011617/183).
14. The area scan evaluation was performed with a fully charged battery. After the area scan was completed the radio was cooled down and the battery was replaced with a fully charged battery prior to the zoom scan evaluation.
15. The DUT was tested in unmodulated continuous transmit operation (Continuous Wave mode at 100% duty cycle) with the transmit key constantly depressed. For a push-to-talk device the 50% duty cycle compensation reported assumes a transmit/receive cycle of equal time base.
16. The conducted power levels were measured before each test using a Gigatronics 8652A Universal Power Meter according to the procedures described in FCC 47 CFR §2.1046.
17. The power drifts measured by the DASY4 system for the duration of the SAR evaluations were added to the measured SAR levels to report scaled SAR results as shown in the test data tables (pages 6-10).
18. A SAR-versus-Time power drift evaluation was performed in the test configuration that reported the maximum measured SAR drift. See Appendix A (SAR Test Plots) for SAR-versus-Time power drift evaluation plot.
19. A stack of low-density, low-loss dielectric foamed polystyrene was used in place of the device holder.
20. The ambient and fluid temperatures were measured prior to, and during, the fluid dielectric parameter check and the SAR evaluation. The temperatures reported were consistent for all measurement periods.
21. The dielectric parameters of the simulated tissue mixtures were measured prior to the evaluation using an HP 85070C Dielectric Probe Kit and an HP 8753E Network Analyzer (see Appendix E for printout of measured fluid dielectric parameters).

6.0 EVALUATION PROCEDURES

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 using the SAM phantom.

(ii) For body-worn and face-held devices a planar phantom was used.

b. The SAR was determined by a pre-defined procedure within the DASY4 software. Upon completion of a reference and optical surface check, the exposed region of the phantom was scanned near the inner surface with a grid spacing of 15mm x 15mm.

An area scan was determined as follows:

c. Based on the defined area scan grid, a more detailed grid is created to increase the points by a factor of 10. The interpolation function then evaluates all field values between corresponding measurement points.
d. A linear search is applied to find all the candidate maxima. Subsequently, all maxima are removed that are >2 dB from the global maximum. The remaining maxima are then used to position the cube scans.

A 1g and 10g spatial peak SAR was determined as follows:

e. Extrapolation is used to find the points between the dipole center of the probe and the surface of the phantom. This data cannot be measured, since the center of the dipoles is 2.7 mm away form the tip of the probe and the distance between the surface and the lowest measuring point is 1.4 mm (see probe calibration document in Appendix D). The extrapolation was based on trivariate quadratics computed from the previously calculated 3D interpolated points nearest the phantom surface.
f. Interpolated data is used to calculate the average SAR over 1g and 10g cubes by spatially discretizing the entire measured cube. The volume used to determine the averaged SAR is a 1mm grid (42875 interpolated points).
g. A zoom scan volume of 32 mm x 32 mm x 30 mm (5 x 5 x 7 points) centered at the peak SAR location determined from the area scan is used for all zoom scans for devices with a transmit frequency < 800 MHz. Zoom scans for frequencies ≥ 800 MHz are determined with a scan volume of 30 mm x 30 mm x 30 mm (7 x 7 x 7) to ensure complete capture of the peak spatial-average SAR.

7.0 SYSTEM PERFORMANCE CHECK

Prior to the SAR evaluation a system check was performed using a Plexiglas planar phantom and 450MHz dipole (see Appendix C for system validation procedures). The dielectric parameters of the simulated brain tissue were measured prior to the system performance check using an HP 85070C Dielectric Probe Kit and HP 8753E Network Analyzer (see Appendix E for printout of measured fluid dielectric parameters). A forward power of 250mW was applied to the dipole and the system was verified to a tolerance of ±10% (see Appendix B for system performance check test plots).

SYSTEM PERFORMANCE CHECK

Test Date	450MHz Equiv. Tissue	SAR 1g (W/kg)		Dielectric Constant ε_r		Conductivity σ (mho/m)		ρ (Kg/m^3)	Amb. Temp. (°C)	Fluid Temp. (°C)	Fluid Depth (cm)	Humid. (%)	Barom. Press. (kPa)
		IEEE Target	Measured	IEEE Target	Measured	IEEE Target	Measured						
09/21/04	Brain	**1.23** (±10%)	1.22 (-0.8%)	**43.5 ±5%**	42.2	**0.87 ±5%**	0.83	1000	23.7	22.6	≥ 15	33	103.3
09/22/04	Brain	**1.23** (±10%)	1.22 (-0.8%)	**43.5 ±5%**	42.8	**0.87 ±5%**	0.85	1000	23.0	23.3	≥ 15	39	102.8
09/23/04	Brain	**1.23** (±10%)	1.28 (+4.1%)	**43.5 ±5%**	44.0	**0.87 ±5%**	0.88	1000	23.1	23.2	≥ 15	38	102.7
10/07/04	Brain	**1.23** (±10%)	1.25 (+1.6%)	**43.5 ±5%**	42.2	**0.87 ±5%**	0.84	1000	23.0	22.3	≥ 15	32	102.9
10/19/04	Brain	**1.23** (±10%)	1.27 (+3.3%)	**43.5 ±5%**	43.0	**0.87 ±5%**	0.85	1000	23.6	22.8	≥ 15	32	101.1
10/20/04	Brain	**1.23** (±10%)	1.27 (+3.3%)	**43.5 ±5%**	44.0	**0.87 ±5%**	0.87	1000	23.6	22.9	≥ 15	36	101.6

Note(s):
1. The ambient and fluid temperatures were measured prior to, and during, the fluid dielectric parameter check and the system performance check. The temperatures listed in the table above were consistent for all measurement periods.

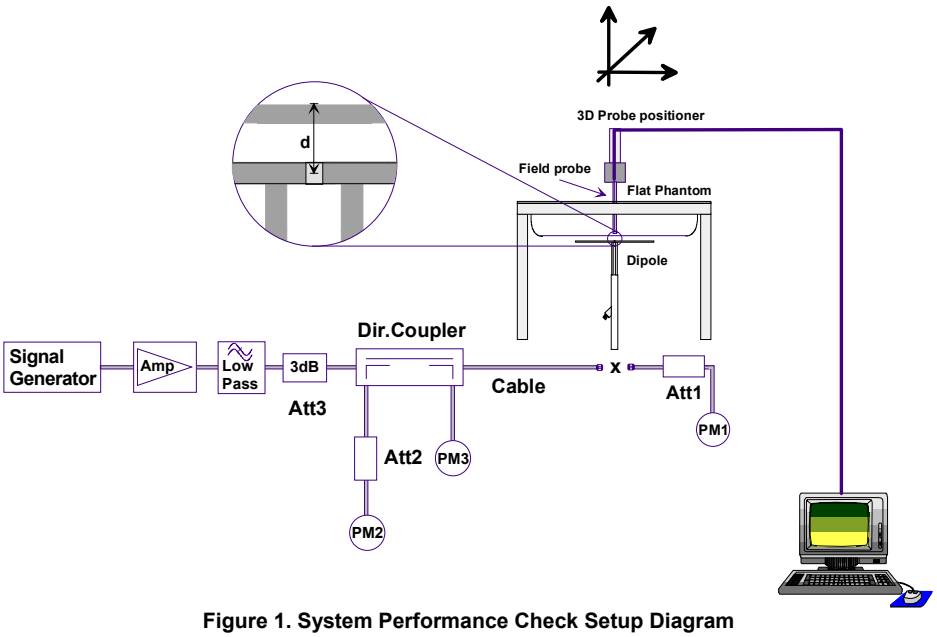
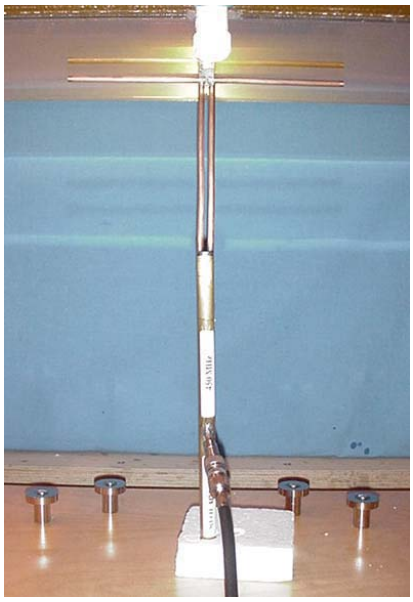


Figure 1. System Performance Check Setup Diagram



450MHz Dipole Setup

8.0 SIMULATED EQUIVALENT TISSUES

The 450MHz simulated tissue mixtures consist of a viscous gel using hydroxethylcellulose (HEC) gelling agent and saline solution. Preservation with a bactericide is added and visual inspection is made to ensure air bubbles are not trapped during the mixing process. The fluid was prepared and measured for dielectric parameters (permittivity and conductivity) according to standardized procedures.

SIMULATED TISSUE MIXTURES		
INGREDIENT	450MHz Brain	450MHz Body
	System Check & DUT Evaluation	DUT Evaluation
Water	38.56 %	52.00 %
Sugar	56.32 %	45.65 %
Salt	3.95 %	1.75 %
HEC	0.98 %	0.50 %
Bactericide	0.19 %	0.10 %

9.0 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 1g of tissue)	1.60	8.0
Spatial Peak (hands/wrists/feet/ankles averaged over 10g)	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.

10.0 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:	AMD Athlon XP 2400+
Clock Speed:	2.0 GHz
Operating System:	Windows XP Professional

Data Converter

Features:	Signal Amplifier, multiplexer, A/D converter, and control logic
Software:	DASY4 software
Connecting Lines:	Optical downlink for data and status info. Optical uplink for commands and clock

DASY4 Measurement Server

Function:	Real-time data evaluation for field measurements and surface detection
Hardware:	PC/104 166MHz Pentium CPU; 32 MB chipdisk; 64 MB RAM
Connections:	COM1, COM2, DAE, Robot, Ethernet, Service Interface

E-Field Probe

Model:	ET3DV6
Serial No.:	1590
Construction:	Triangular core fiber optic detection system
Frequency:	10 MHz to 6 GHz
Linearity:	±0.2 dB (30 MHz to 3 GHz)

Phantom(s)

Evaluation Phantom

Type:	Planar Phantom
Shell Material:	Plexiglas
Bottom Thickness:	2.0 mm ± 0.1 mm
Outer Dimensions:	75.0 cm (L) x 22.5 cm (W) x 20.5 cm (H); Back Plane: 25.7 cm (H)

Validation Phantom (≤ 450 MHz)

Type:	Planar Phantom
Shell Material:	Plexiglas
Bottom Thickness:	6.2 mm ± 0.1 mm
Outer Dimensions:	86.0 cm (L) x 39.5 cm (W) x 21.8 cm (H)

11.0 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 ± 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)
Dynamic Range:	5 μW/g to >100 mW/g; Linearity: ±0.2 dB
Surface Detection:	±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

12.0 PLANAR PHANTOM

The planar phantom is constructed of Plexiglas material with a 2.0 mm shell thickness for face-held and body-worn SAR evaluations of handheld and body-worn radio transceivers. The planar phantom is mounted on the side of the DASY4 compact system table.

Planar Phantom

13.0 VALIDATION PLANAR PHANTOM

The validation planar phantom is constructed of Plexiglas material with a 6.0 mm shell thickness for system validations at 450 MHz and below. The validation planar phantom is mounted to the table of the DASY4 compact system.

Validation Planar Phantom

14.0 DEVICE HOLDER

The DASY4 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

15.0 TEST EQUIPMENT LIST

TEST EQUIPMENT	SERIAL NO.	CALIBRATION DATE
Schmid & Partner DASY4 System	-	-
-DASY4 Measurement Server	1078	N/A
-Robot	599396-01	N/A
-DAE3	353	Dec 2003
-DAE3	370	May 2004
-ET3DV6 E-Field Probe	1387	Mar 2004
-ET3DV6 E-Field Probe	1590	May 2004
-300MHz Validation Dipole	135	Oct 2004
-450MHz Validation Dipole	136	Nov 2003
-835MHz Validation Dipole	411	Mar 2004
-900MHz Validation Dipole	054	June 2004
-1800MHz Validation Dipole	247	June 2004
-1900MHz Validation Dipole	151	June 2004
-2450MHz Validation Dipole	150	Sept 2004
-SAM Phantom V4.0C	1033	N/A
-Barski Planar Phantom	03-01	N/A
-Plexiglas Planar Phantom	161	N/A
-Validation Planar Phantom	137	N/A
HP 85070C Dielectric Probe Kit	N/A	N/A
Gigatronics 8651A Power Meter	8650137	April 2004
Gigatronics 8652A Power Meter	1835267	April 2004
Gigatronics 80701A Power Sensor	1833535	April 2004
Gigatronics 80701A Power Sensor	1833542	April 2004
Gigatronics 80701A Power Sensor	1834350	April 2004
HP E4408B Spectrum Analyzer	US39240170	Dec 2003
HP 8594E Spectrum Analyzer	3543A02721	April 2004
HP 8753E Network Analyzer	US38433013	April 2004
HP 8648D Signal Generator	3847A00611	April 2004
Amplifier Research 5S1G4 Power Amplifier	26235	N/A

16.0 MEASUREMENT UNCERTAINTIES

UNCERTAINTY BUDGET FOR DEVICE EVALUATION						
Error Description	**Uncertainty Value ±%**	**Probability Distribution**	**Divisor**	**c_i 1g**	**Standard Uncertainty ±% (1g)**	**v_i or v_{eff}**
Measurement System						
Probe calibration	± 4.0	Normal	1	1	± 4.0	∞
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)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
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					**± 13.03**	
Expanded Uncertainty (k=2)					**± 26.07**	

Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])

MEASUREMENT UNCERTAINTIES (Cont.)

UNCERTAINTY BUDGET FOR SYSTEM VALIDATION						
Error Description	**Uncertainty Value ±%**	**Probability Distribution**	**Divisor**	**c_i 1g**	**Standard Uncertainty ±% (1g)**	**v_i or v_{eff}**
Measurement System						
Probe calibration	± 4.0	Normal	1	1	± 4.0	∞
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	∞
Dipole						
Dipole Axis to Liquid Distance	± 2.0	Rectangular	√3	1	± 1.2	∞
Input Power	± 4.7	Rectangular	√3	1	± 2.7	∞
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)	± 5.0	Rectangular	√3	0.6	± 1.7	∞
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					**± 9.58**	
Expanded Uncertainty (k=2)					**± 19.16**	

Measurement Uncertainty Table in accordance with IEEE Standard 1528-2003 (see reference [5])

17.0 REFERENCES

[1] Federal Communications Commission, “Radiofrequency radiation exposure evaluation: portable devices”, Rule Part 47 CFR §2.1093: 1999.

[2] Health Canada, “Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz”, Safety Code 6.

[3] 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.

[4] 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.

[5] IEEE Std 1528-2003, “Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques”.

APPENDIX A - SAR MEASUREMENT DATA

Date Tested: 09/23/04

Face-Held SAR - NiMH NIS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

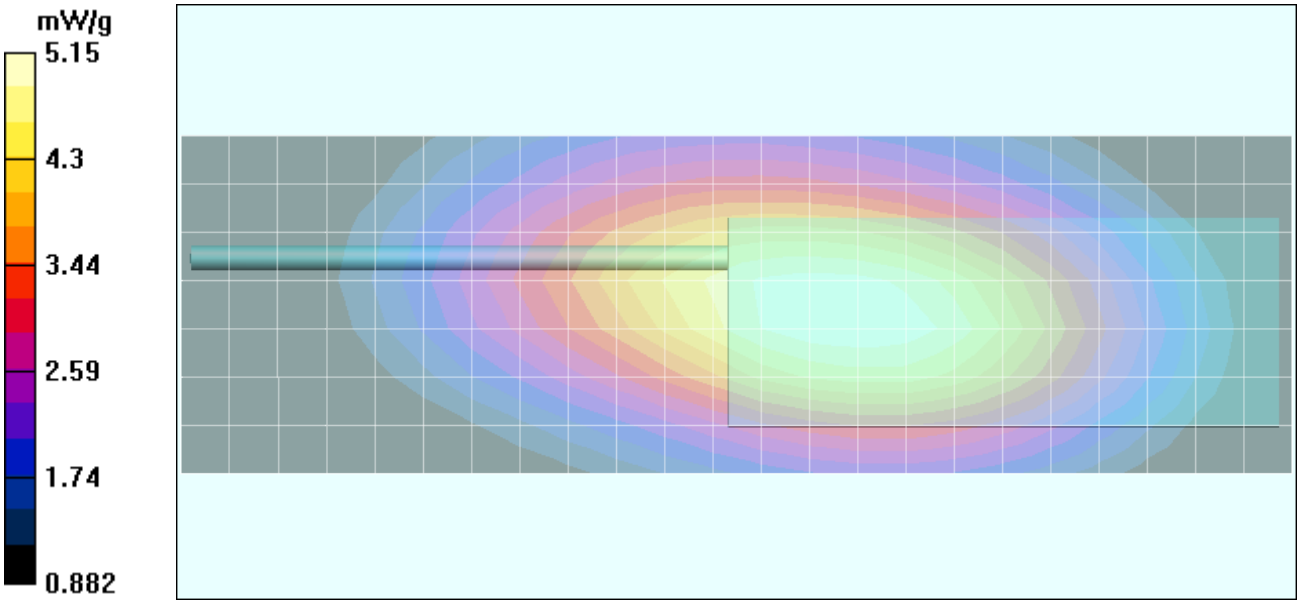
Ambient Temp: 23.5 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.7 kPa; Humidity: 38%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.23 Watts (Conducted)
NiMH 7.5V Non-Intrinsically Safe (P/N: BKB191210/44)
Medium: HSL450 (σ = 0.88 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Face-Held - 2.5 cm Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Face-Held - 2.5 cm Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 72.6 V/m; Power Drift = -0.00265 dB
Peak SAR (extrapolated) = 7.3 W/kg
SAR(1 g) = 4.96 mW/g; SAR(10 g) = 3.65 mW/g



Date Tested: 09/23/04

Face-Held SAR - NiCd NIS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

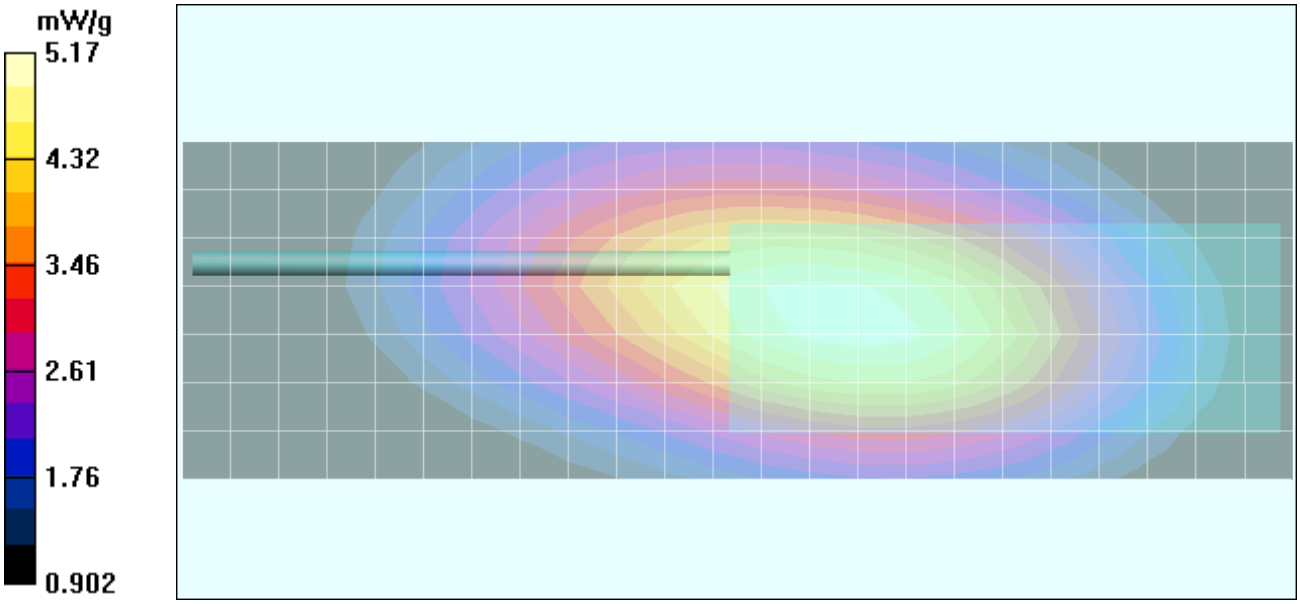
Ambient Temp: 23.5 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.7 kPa; Humidity: 38%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.23 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: HSL450 (σ = 0.88 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Face-Held - 2.5 cm Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Face-Held - 2.5 cm Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 73 V/m; Power Drift = -0.00891 dB
Peak SAR (extrapolated) = 7.3 W/kg
SAR(1 g) = 4.96 mW/g; SAR(10 g) = 3.65 mW/g



Date Tested: 09/23/04

Face-Held SAR - NiMH NIS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP Scan Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V61 R1B; S/N: T1PA-UL03

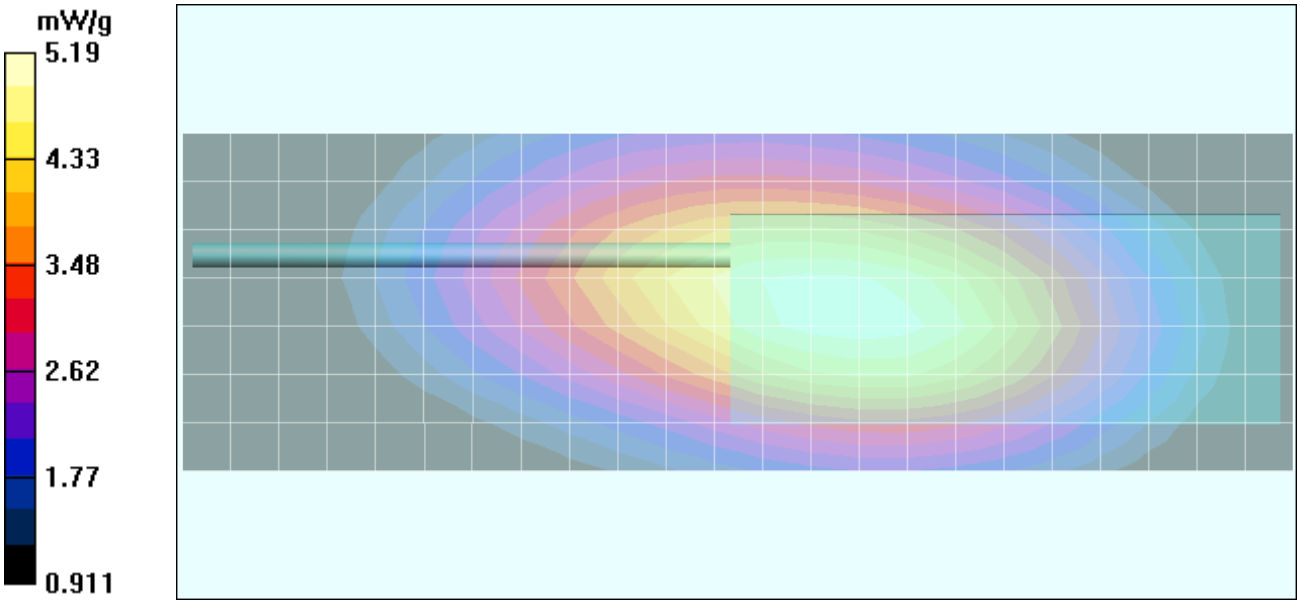
Ambient Temp: 23.5 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.7 kPa; Humidity: 38%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiMH 7.5V Non-Intrinsically Safe (P/N: BKB191210/44)
Medium: HSL450 (σ = 0.88 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Face-Held - 2.5 cm Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Face-Held - 2.5 cm Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 73.6 V/m; Power Drift = -0.00928 dB
Peak SAR (extrapolated) = 7.3 W/kg
SAR(1 g) = 4.99 mW/g; SAR(10 g) = 3.69 mW/g



Date Tested: 09/23/04

Face-Held SAR - NiCd NIS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP Scan Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V61 R1B; S/N: T1PA-UL03

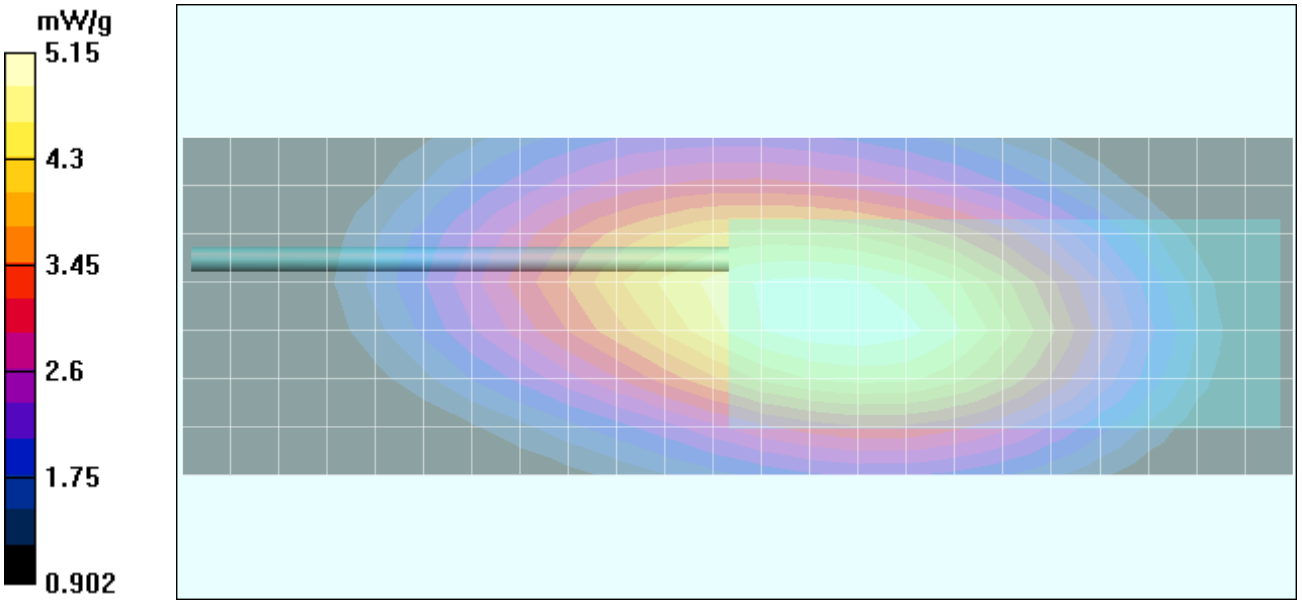
Ambient Temp: 23.5 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.7 kPa; Humidity: 38%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: HSL450 (σ = 0.88 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Face-Held - 2.5 cm Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Face-Held - 2.5 cm Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 73.6 V/m; Power Drift = -0.000519 dB
Peak SAR (extrapolated) = 7.3 W/kg
SAR(1 g) = 4.96 mW/g; SAR(10 g) = 3.66 mW/g



Date Tested: 09/23/04

Face-Held SAR - NiCd NIS Battery - Helical Coil Antenna (P/N: KRE1011219/9) - P7100IP Scan Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V61 R1B; S/N: T1PA-UL03

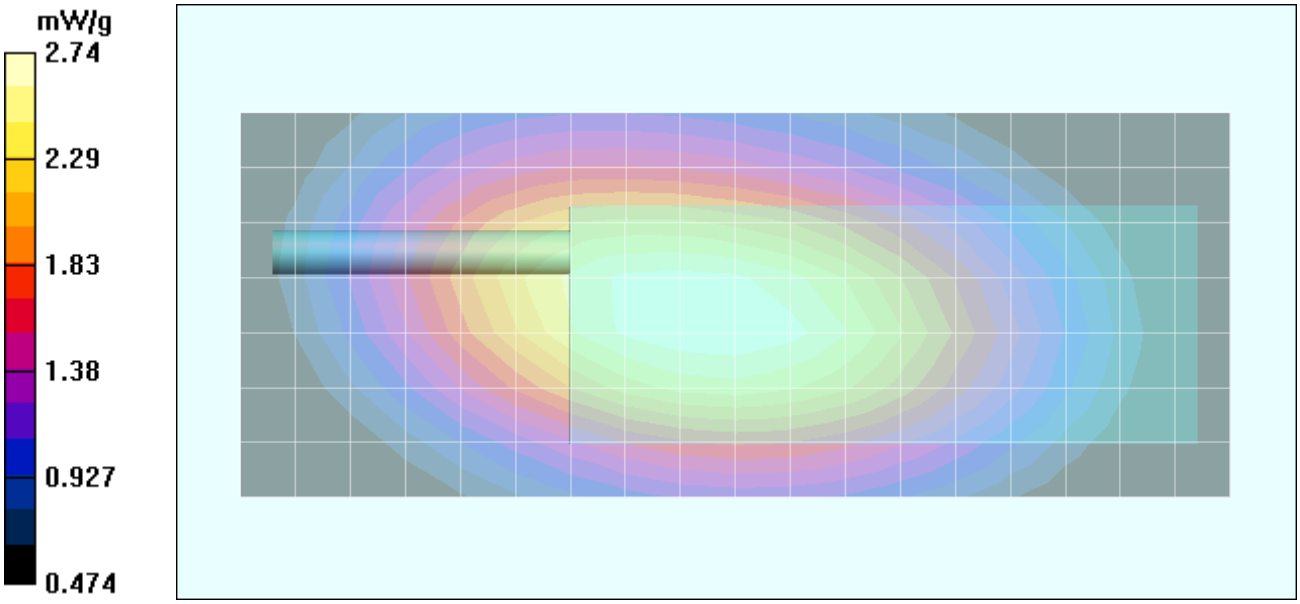
Ambient Temp: 23.5 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.7 kPa; Humidity: 38%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: HSL450 (σ = 0.88 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Face-Held - 2.5 cm Separation Distance - Mid Channel/Area Scan (8x19x1):
Measurement grid: dx=15mm, dy=15mm

Face-Held - 2.5 cm Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 52.7 V/m; Power Drift = -0.0556 dB
Peak SAR (extrapolated) = 3.86 W/kg
SAR(1 g) = 2.63 mW/g; SAR(10 g) = 1.94 mW/g



Date Tested: 09/23/04

Face-Held SAR - NiCd NIS Battery - Helical Coil Antenna (P/N: KRE1011219/10) - P7100IP Scan Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V61 R1B; S/N: T1PA-UL03

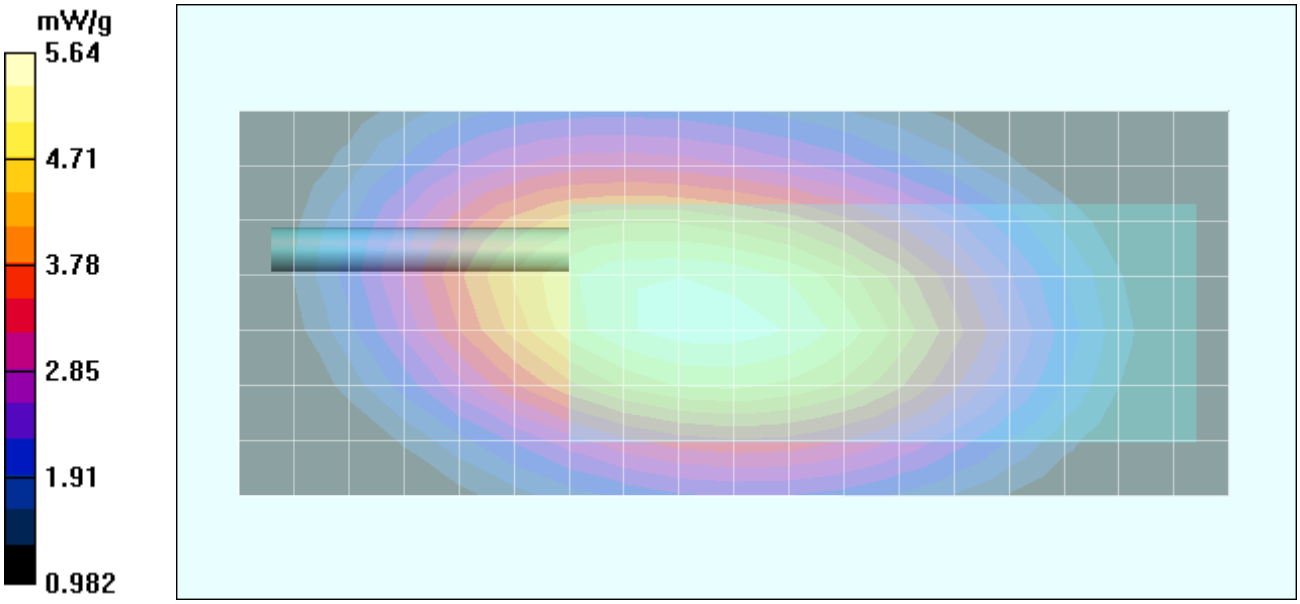
Ambient Temp: 23.5 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.7 kPa; Humidity: 38%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: HSL450 (σ = 0.88 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Face-Held - 2.5 cm Separation Distance - Mid Channel/Area Scan (8x19x1):
Measurement grid: dx=15mm, dy=15mm

Face-Held - 2.5 cm Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 76.2 V/m; Power Drift = -0.0790 dB
Peak SAR (extrapolated) = 7.94 W/kg
SAR(1 g) = 5.41 mW/g; SAR(10 g) = 3.99 mW/g



Date Tested: 09/23/04

Face-Held SAR - NiMH NIS Battery - Helical Coil Antenna (P/N: KRE1011219/10) - P7100IP Scan Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V61 R1B; S/N: T1PA-UL03

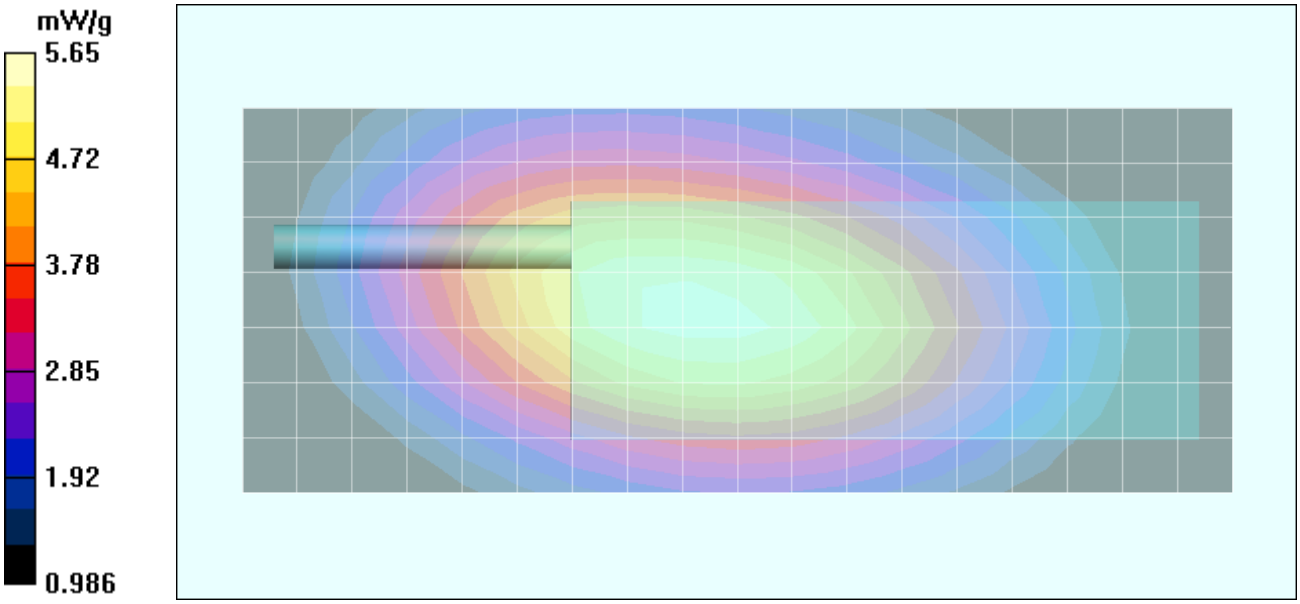
Ambient Temp: 23.5 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.7 kPa; Humidity: 38%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiMH 7.5V Non-Intrinsically Safe (P/N: BKB191210/44)
Medium: HSL450 (σ = 0.88 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

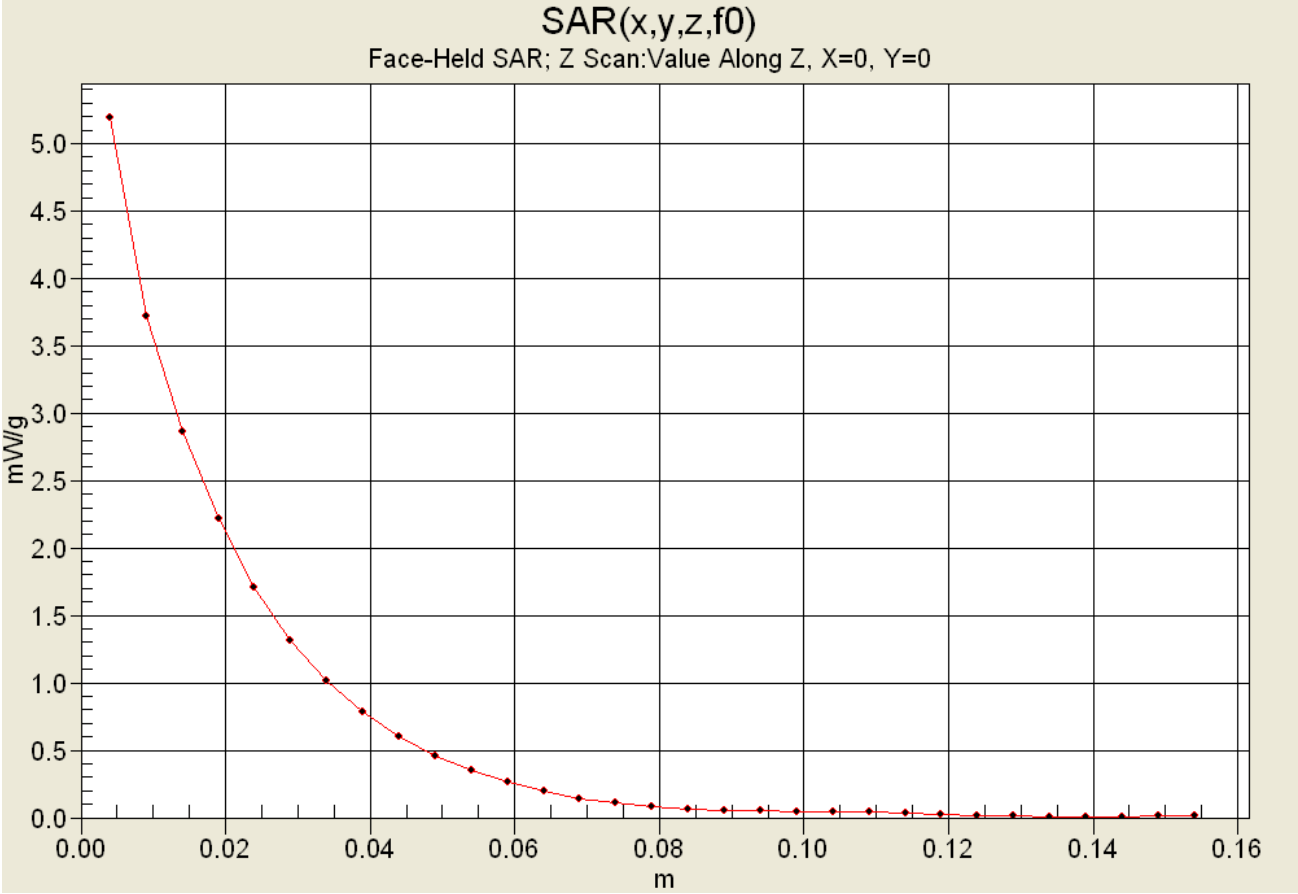
- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Face-Held - 2.5 cm Separation Distance - Mid Channel/Area Scan (8x19x1):
Measurement grid: dx=15mm, dy=15mm

Face-Held - 2.5 cm Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 75.8 V/m; Power Drift = -0.0925 dB
Peak SAR (extrapolated) = 7.97 W/kg
SAR(1 g) = 5.43 mW/g; SAR(10 g) = 4 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
Face-Held SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date Tested: 09/23/04

Face-Held SAR - NiCd NIS Battery - Helical Coil Antenna (P/N: KRE1011219/9) - Speaker-Microphone w/ Antenna

DUT: M/A-COM Model: P7100(IP) Scan Radio with FM PTT Speaker-Microphone Antenna Version Plus; P/N: KRY1011617/184

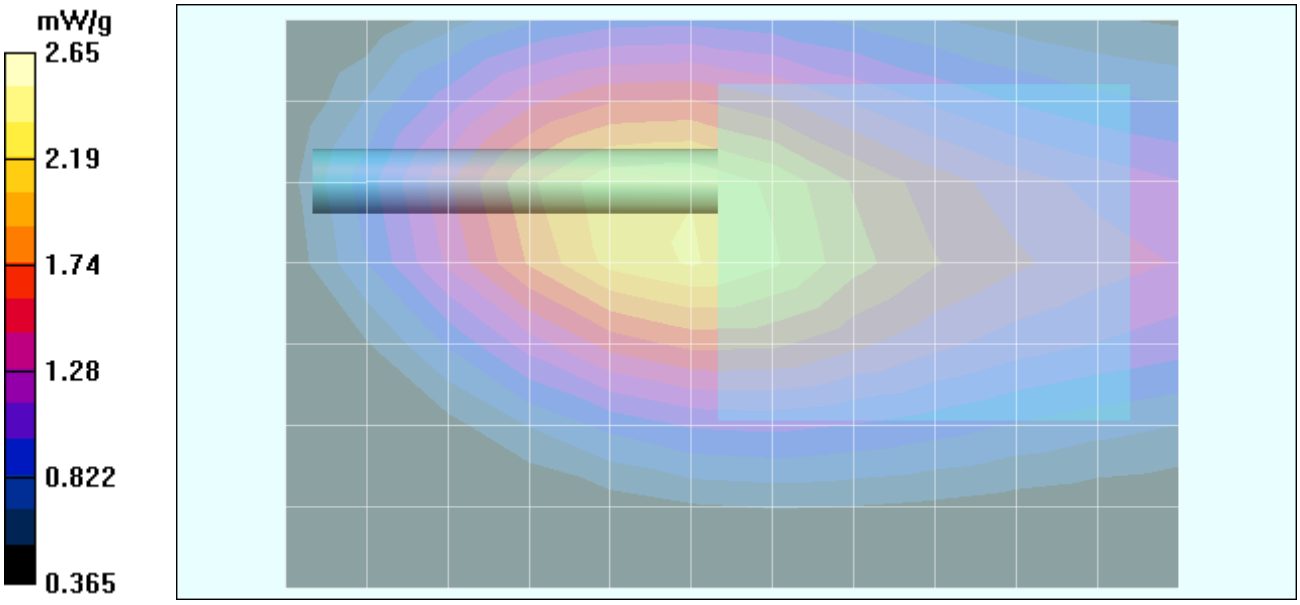
Ambient Temp: 23.5 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.7 kPa; Humidity: 38%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: HSL450 (σ = 0.88 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Face-Held - 2.5 cm Separation Distance - Mid Channel/Area Scan (8x12x1):
Measurement grid: dx=15mm, dy=15mm

Face-Held - 2.5 cm Separation Distance - Mid Channel /Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 53.3 V/m; Power Drift = -0.0320 dB
Peak SAR (extrapolated) = 3.95 W/kg
SAR(1 g) = 2.55 mW/g; SAR(10 g) = 1.79 mW/g



Date Tested: 10/20/04

Face-Held SAR - NiCd IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - Speaker-Microphone w/ Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized; P/N: KRY1011617/384

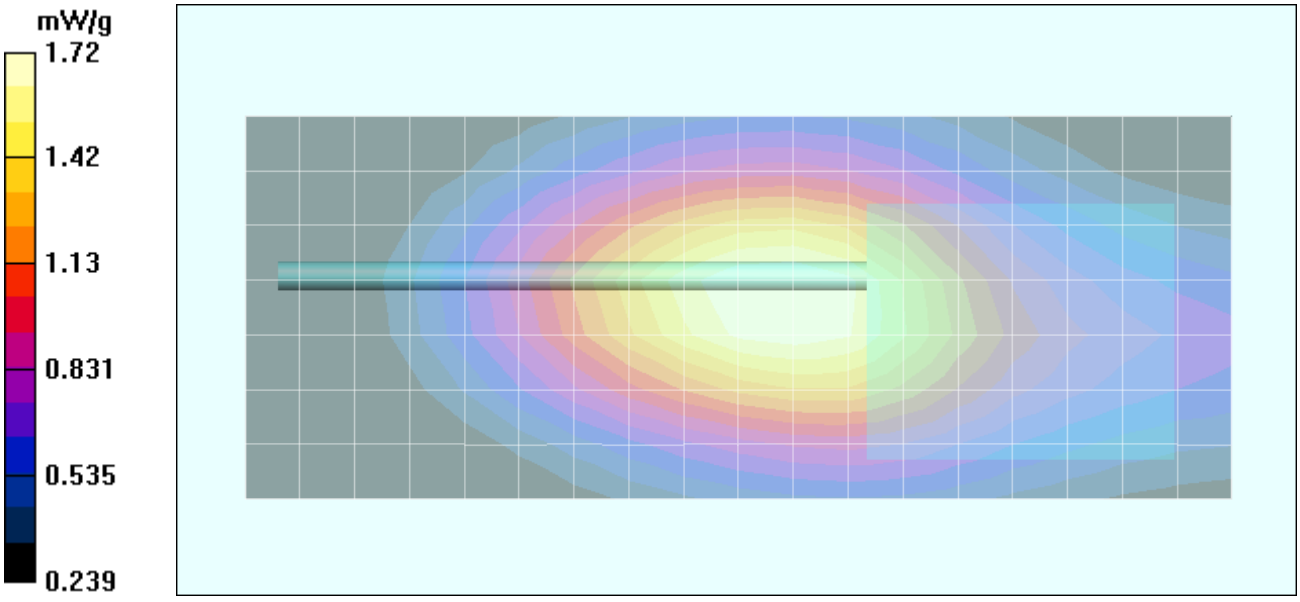
Ambient Temp: 23.9 °C; Fluid Temp: 22.9 °C; Barometric Pressure: 101.6 kPa; Humidity: 37%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiCd 7.5V Intrinsically Safe (P/N: BKB191210/45)
Medium: HSL450 (σ = 0.87 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Face-Held - 2.5 cm Separation Distance - Mid Channel/Area Scan (8x19x1):
Measurement grid: dx=15mm, dy=15mm

Face-Held - 2.5 cm Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 42.6 V/m; Power Drift = -0.361 dB
Peak SAR (extrapolated) = 2.48 W/kg
SAR(1 g) = 1.64 mW/g; SAR(10 g) = 1.18 mW/g



Date Tested: 10/20/04

Face-Held SAR - NiCd NIS Battery - Helical Coil Antenna (P/N: KRE1011219/10) - Speaker-Microphone w/ Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized; P/N: KRY1011617/384

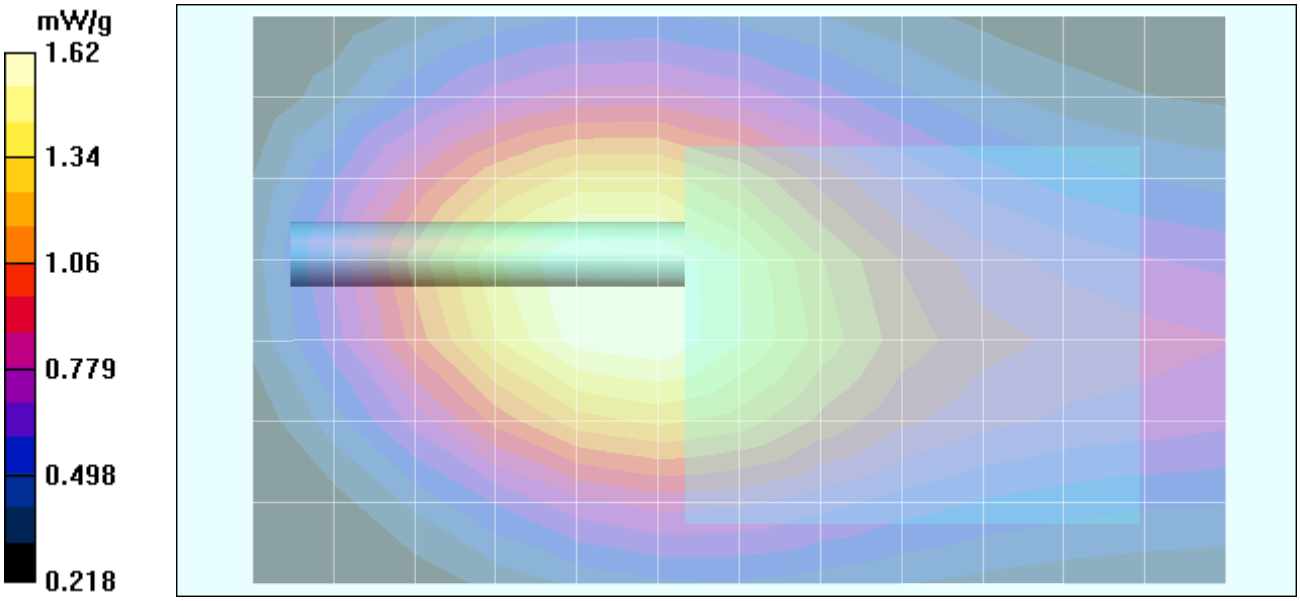
Ambient Temp: 23.9 °C; Fluid Temp: 22.9 °C; Barometric Pressure: 101.6 kPa; Humidity: 37%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: HSL450 (σ = 0.87 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Face-Held - 2.5 cm Separation Distance - Mid Channel/Area Scan (8x13x1):
Measurement grid: dx=15mm, dy=15mm

Face-Held - 2.5 cm Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 41.9 V/m; Power Drift = 0.0653 dB
Peak SAR (extrapolated) = 2.38 W/kg
SAR(1 g) = 1.55 mW/g; SAR(10 g) = 1.1 mW/g



Date Tested: 10/20/04

Face-Held SAR - NiCd NIS Battery - Helical Coil Antenna (P/N: KRE1011219/9) - Speaker-Microphone w/ Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized; P/N: KRY1011617/384

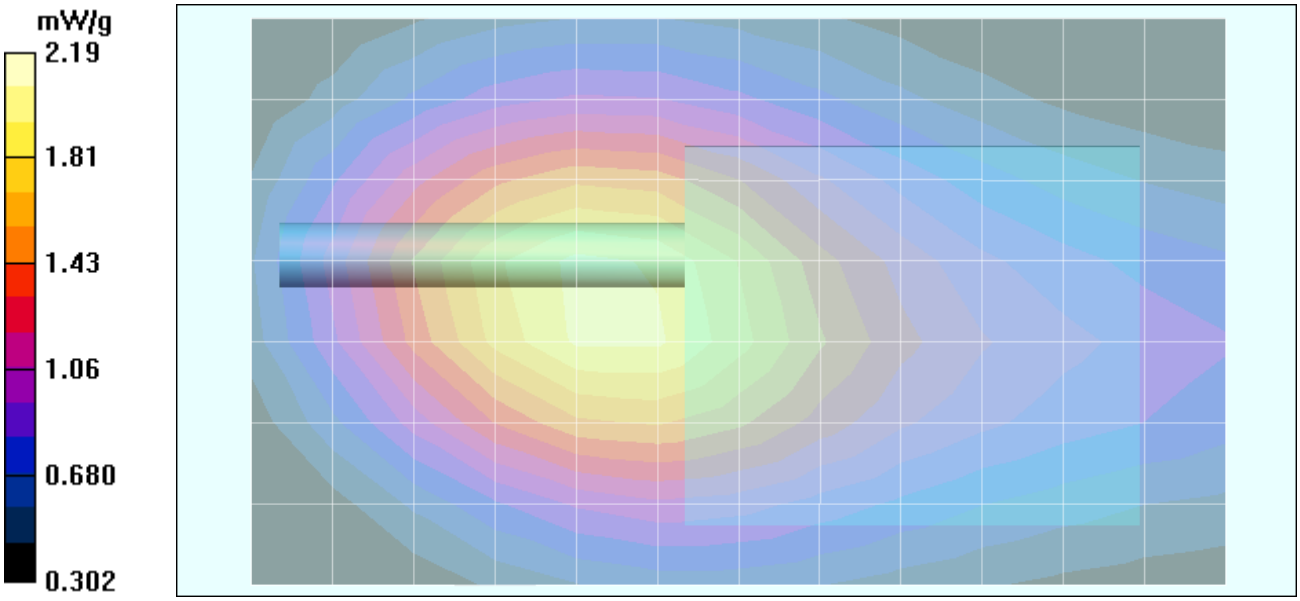
Ambient Temp: 23.9 °C; Fluid Temp: 22.9 °C; Barometric Pressure: 101.6 kPa; Humidity: 37%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: HSL450 (σ = 0.87 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

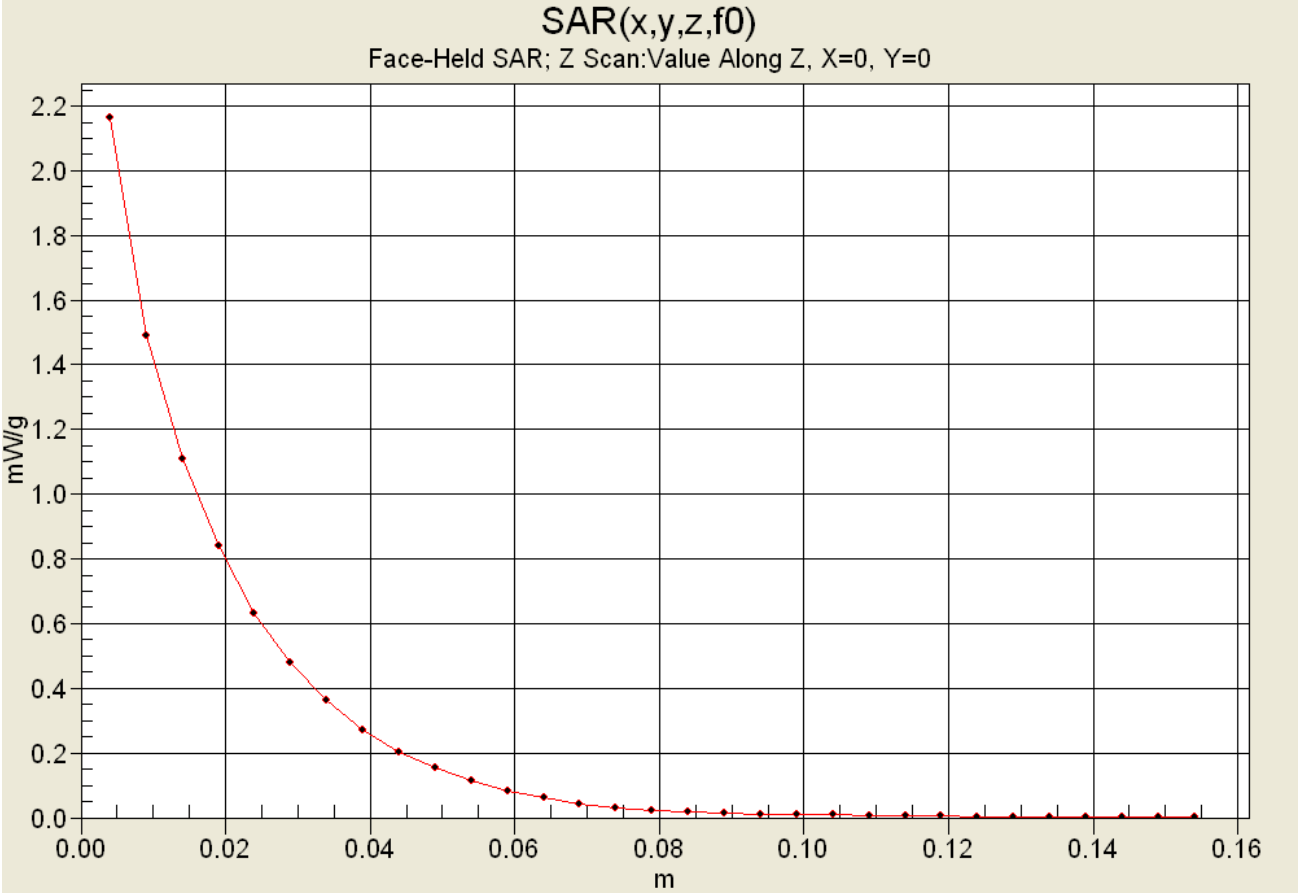
- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Face-Held - 2.5 cm Separation Distance - Mid Channel/Area Scan (8x13x1):
Measurement grid: dx=15mm, dy=15mm

Face-Held - 2.5 cm Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 48.5 V/m; Power Drift = -0.0602 dB
Peak SAR (extrapolated) = 3.19 W/kg
SAR(1 g) = 2.09 mW/g; SAR(10 g) = 1.48 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
Face-Held SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
2.2
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date Tested: 09/21/04

Body-Worn SAR - NiMH NIS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

Body-Worn Accessories: Metal Belt-Clip (P/N: KRY1011647/1); Speaker-Microphone (P/N: KRY1011617/183)

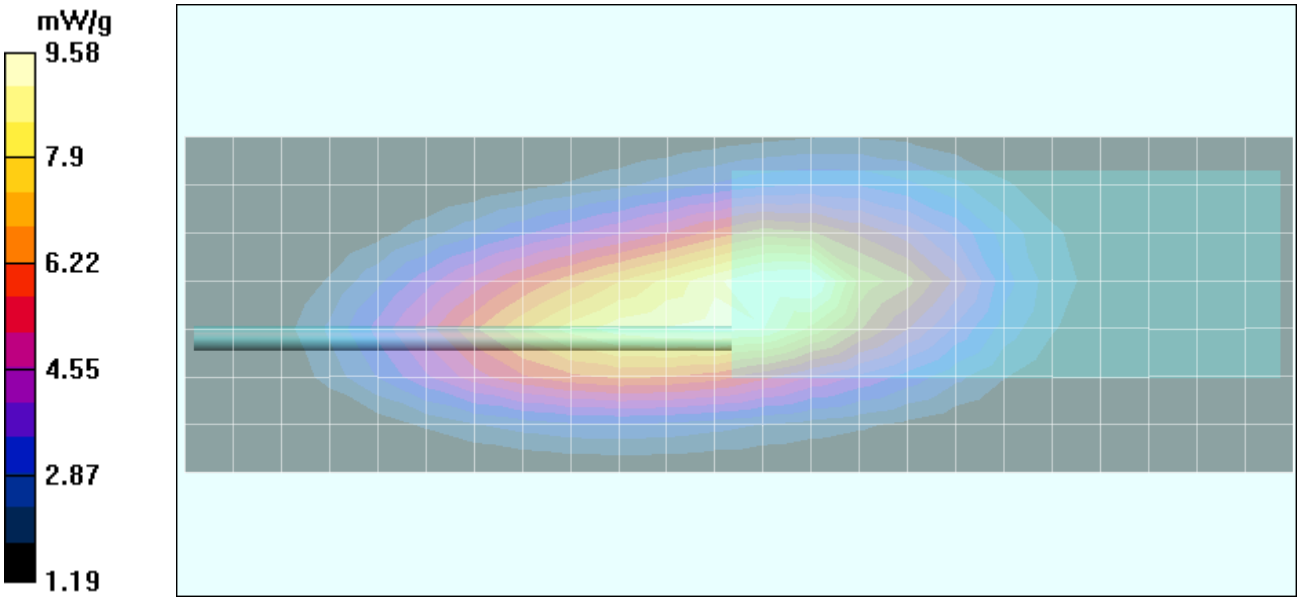
Ambient Temp: 24.1 °C; Fluid Temp: 23.6 °C; Barometric Pressure: 103.3 kPa; Humidity: 33%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiMH 7.5V Non-Intrinsically Safe (P/N: BKB191210/44)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.3; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

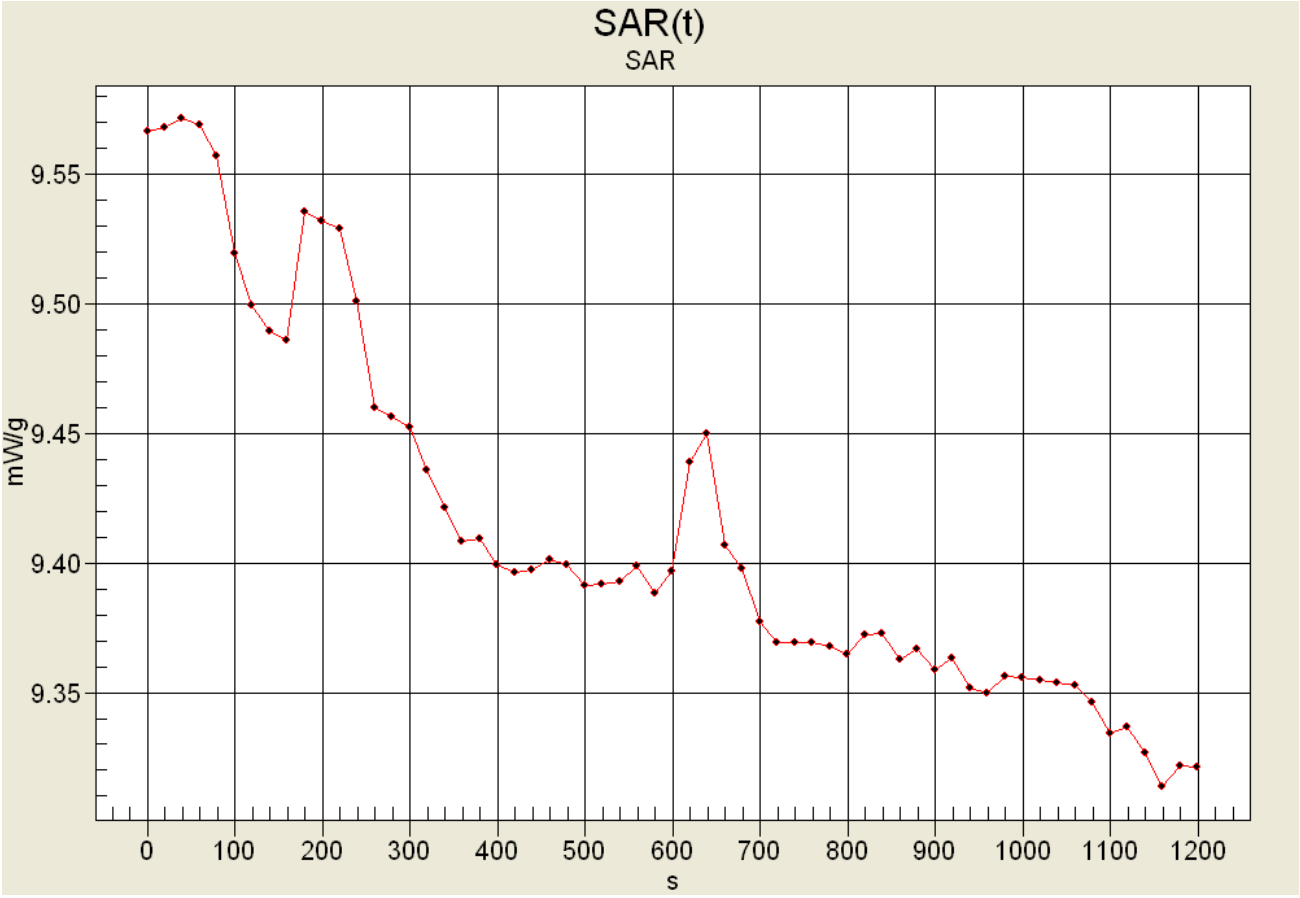
Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 99.6 V/m; Power Drift = -0.420 dB
Peak SAR (extrapolated) = 15.9 W/kg
SAR(1 g) = 9.19 mW/g; SAR(10 g) = 6.37 mW/g



SAR-versus-Time Power Drift Evaluation

Body-Worn - With Belt-Clip and Speaker-Microphone
NiMH 7.5V Non-Intrinsically Safe Battery
Whip Antenna (P/N: KRE1011223/10)
Mid Channel (403 MHz)



Highest SAR: 9.57158 mW/g
Lowest SAR: 9.31383 mW/g (-0.119dB)
SAR after 340s: 9.42133 mW/g (-0.0687dB)
(340s = Zoom Scan Duration)
(1200s = Area Scan Duration)

Date Tested: 09/21/04

Body-Worn SAR - NiCd IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

Body-Worn Accessories: Metal Belt-Clip (P/N: KRY1011647/1); Speaker-Microphone (P/N: KRY1011617/183)

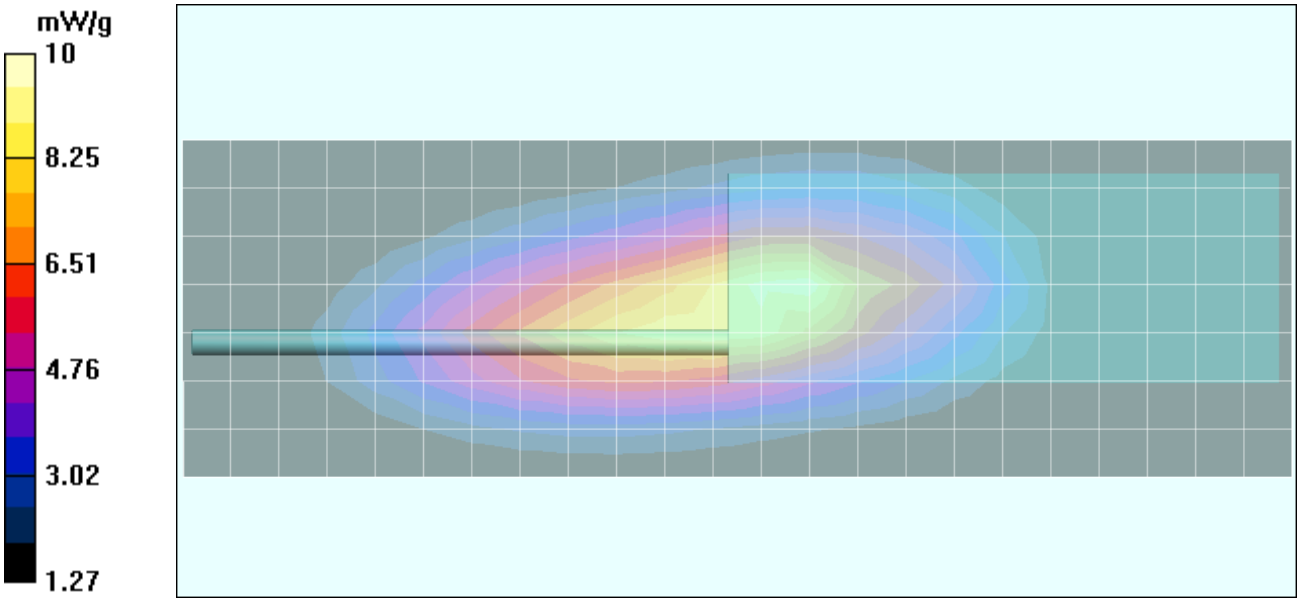
Ambient Temp: 24.1 °C; Fluid Temp: 23.6 °C; Barometric Pressure: 103.3 kPa; Humidity: 33%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiCd 7.5V Intrinsically Safe (P/N: BKB191210/45)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.3; ρ = 1000 kg/m^3)

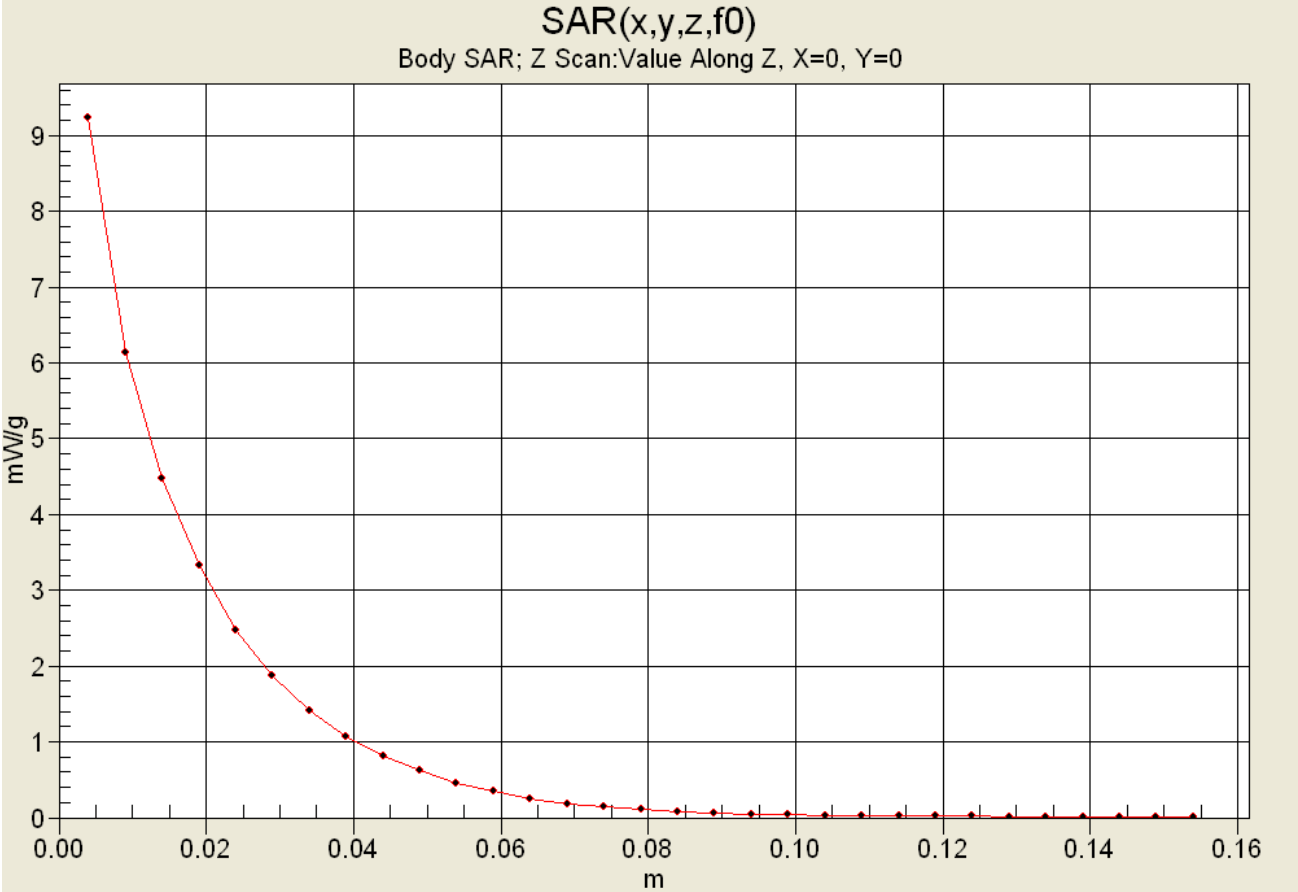
- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 96.1 V/m; Power Drift = -0.109 dB
Peak SAR (extrapolated) = 16 W/kg
SAR(1 g) = 9.61 mW/g; SAR(10 g) = 6.66 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
Body SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0
1
2
3
4
5
6
7
8
9
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date Tested: 09/21/04

Body-Worn SAR - NiMH NIS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP Scan Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V61 R1B, S/N: T1PA-UL03

Body-Worn Accessories: Metal Belt-Clip (P/N: KRY1011647/1); Speaker-Microphone (P/N: KRY1011617/183)

Ambient Temp: 24.1 °C; Fluid Temp: 23.6 °C; Barometric Pressure: 103.3 kPa; Humidity: 33%

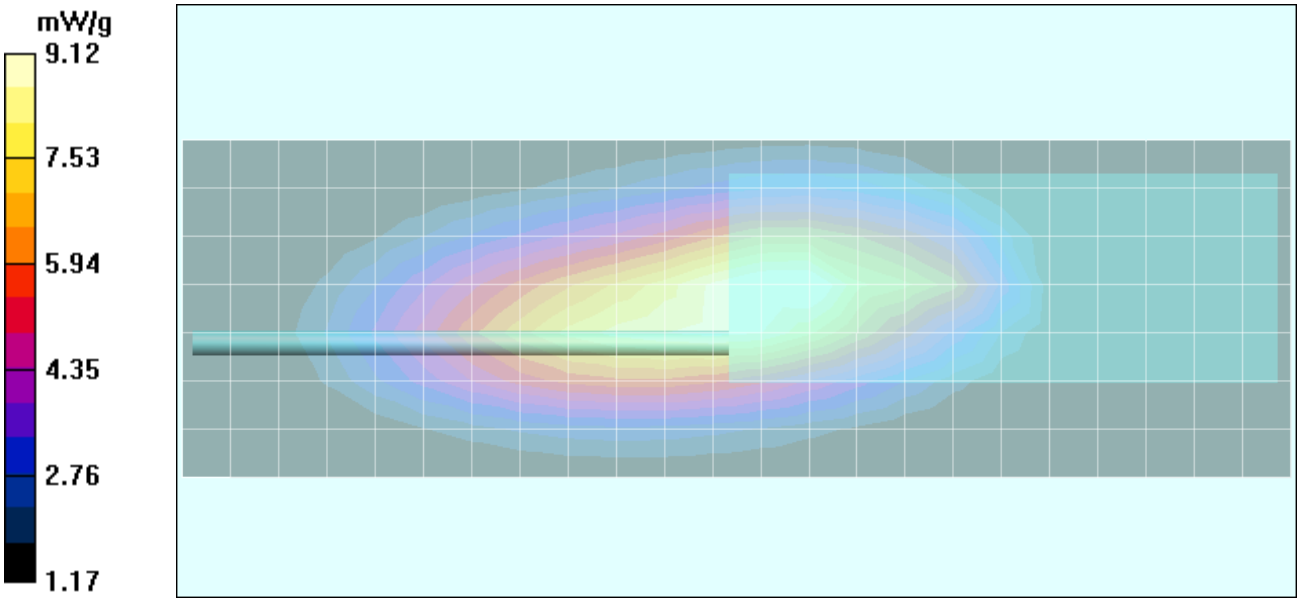
Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiMH 7.5V Non-Intrinsically Safe (P/N: BKB191210/44)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.3; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 92.5 V/m; Power Drift = -0.0428 dB
Peak SAR (extrapolated) = 15.2 W/kg
SAR(1 g) = 8.76 mW/g; SAR(10 g) = 6.06 mW/g

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 1:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 92.5 V/m; Power Drift = -0.0428 dB
Peak SAR (extrapolated) = 14.2 W/kg
SAR(1 g) = 7.92 mW/g; SAR(10 g) = 5.26 mW/g



Date Tested: 09/21/04

Body-Worn SAR - NiCd IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP Scan Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V61 R1B; S/N: T1PA-UL03

Body-Worn Accessories: Metal Belt-Clip (P/N: KRY1011647/1); Speaker-Microphone (P/N: KRY1011617/183)

Ambient Temp: 24.1 °C; Fluid Temp: 23.6 °C; Barometric Pressure: 103.3 kPa; Humidity: 33%

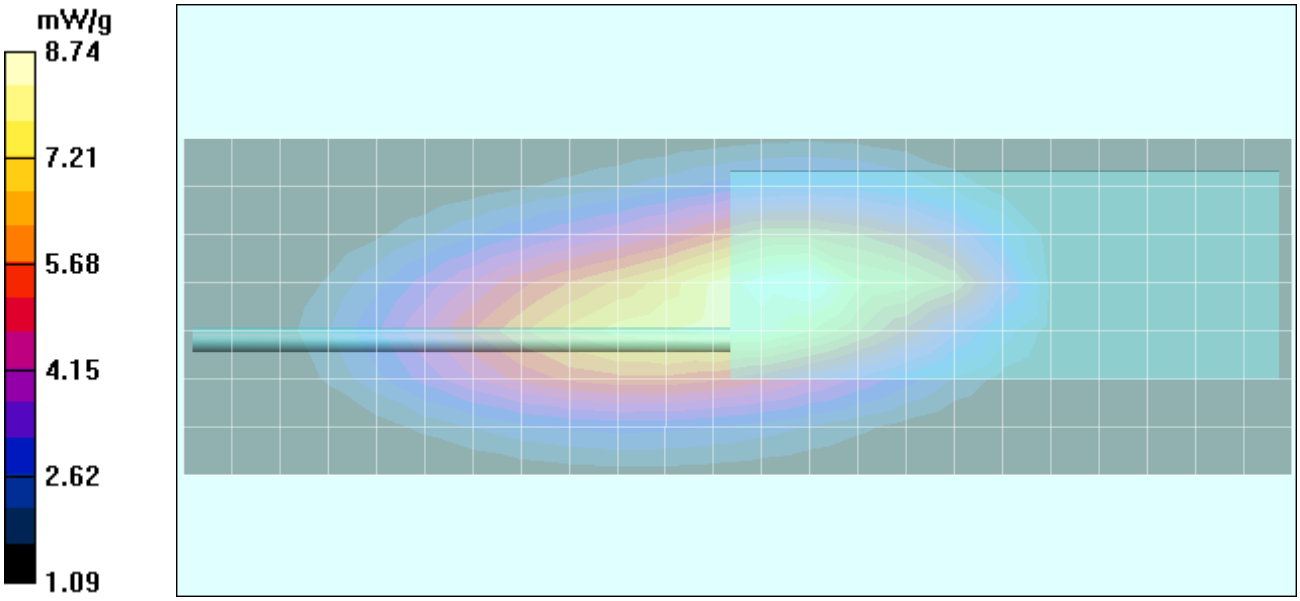
Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiCd 7.5V Intrinsically Safe (P/N: BKB191210/45)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.3; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 91.1 V/m; Power Drift = -0.206 dB
Peak SAR (extrapolated) = 13.9 W/kg
SAR(1 g) = 8.42 mW/g; SAR(10 g) = 5.81 mW/g

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 1:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 91.1 V/m; Power Drift = -0.206 dB
Peak SAR (extrapolated) = 13.6 W/kg
SAR(1 g) = 7.07 mW/g; SAR(10 g) = 4.64 mW/g



Date Tested: 09/21/04

Body-Worn SAR - NiMH NIS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

Body-Worn Accessories: Metal Belt-Clip (P/N: KRY1011647/1); Speaker-Microphone (P/N: KRY1011617/183)

Ambient Temp: 24.1 °C; Fluid Temp: 23.6 °C; Barometric Pressure: 103.3 kPa; Humidity: 33%

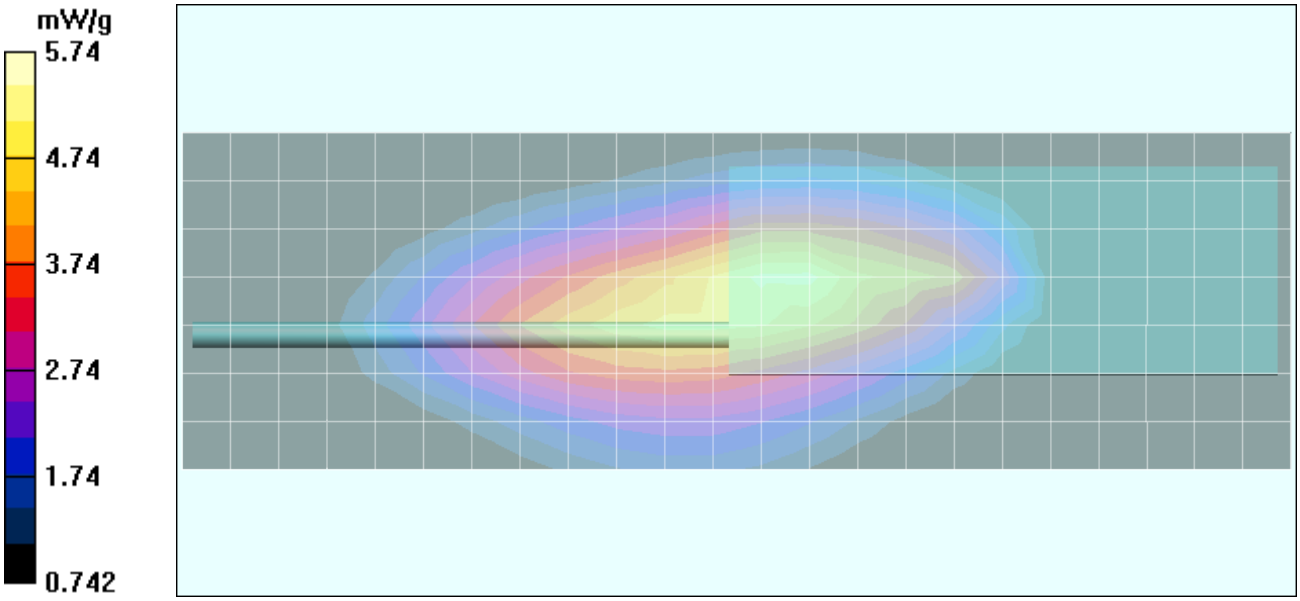
Communication System: FM UHF
Frequency: 378 MHz; Duty Cycle: 1:1
RF Output Power: 4.34 Watts (Conducted)
NiMH 7.5V Non-Intrinsically Safe (P/N: BKB191210/44)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.3; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Low Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Low Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 68.1 V/m; Power Drift = 0.274 dB
Peak SAR (extrapolated) = 8.78 W/kg
SAR(1 g) = 5.45 mW/g; SAR(10 g) = 3.79 mW/g

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Low Channel/Zoom Scan (5x5x7)/Cube 1:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 68.1 V/m; Power Drift = 0.274 dB
Peak SAR (extrapolated) = 9.89 W/kg
SAR(1 g) = 5.00 mW/g; SAR(10 g) = 3.33 mW/g



Date Tested: 09/21/04

Body-Worn SAR - NiMH NIS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP System Radio

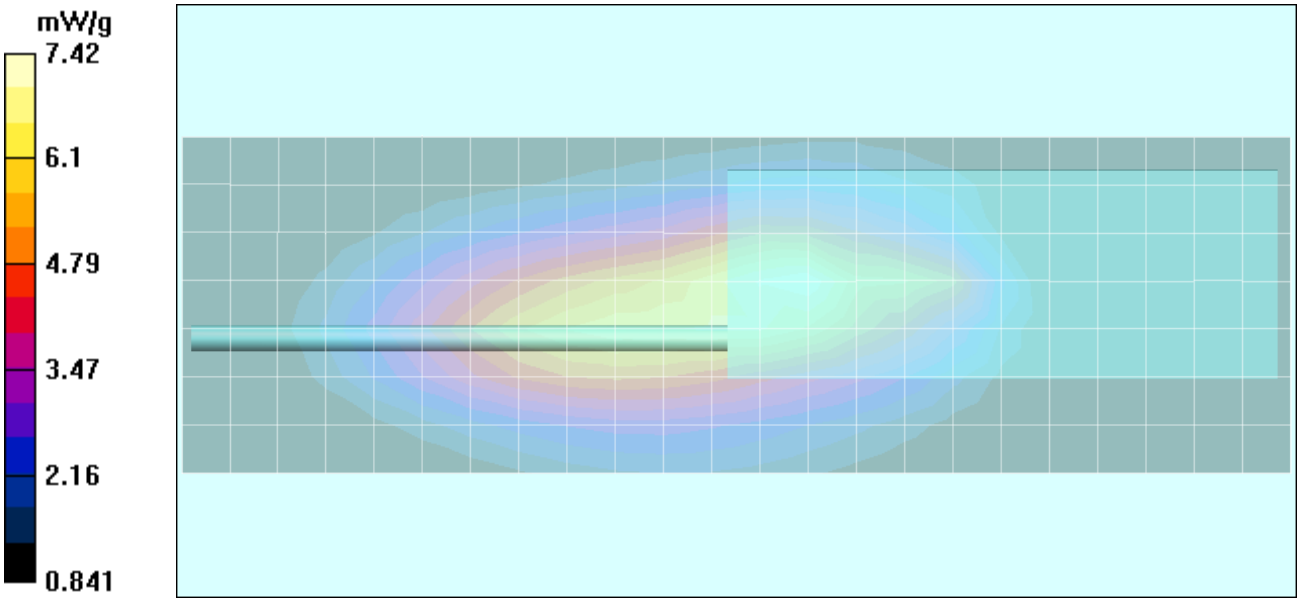
DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10
Body-Worn Accessories: Metal Belt-Clip (P/N: KRY1011647/1); Speaker-Microphone (P/N: KRY1011617/183)

Ambient Temp: 24.1 °C; Fluid Temp: 23.6 °C; Barometric Pressure: 103.3 kPa; Humidity: 33%

Communication System: FM UHF
Frequency: 430 MHz; Duty Cycle: 1:1
RF Output Power: 4.33 Watts (Conducted)
NiMH 7.5V Non-Intrinsically Safe (P/N: BKB191210/44)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.3; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Body-Worn - 1.1 cm Belt-Clip Separation Distance - High Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm
Body-Worn - 1.1 cm Belt-Clip Separation Distance - High Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 82.3 V/m; Power Drift = 0.227 dB
Peak SAR (extrapolated) = 12.6 W/kg
SAR(1 g) = 6.97 mW/g; SAR(10 g) = 4.72 mW/g
Body-Worn - 1.1 cm Belt-Clip Separation Distance - High Channel/Zoom Scan (5x5x7)/Cube 1:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 82.3 V/m; Power Drift = 0.227 dB
Peak SAR (extrapolated) = 10.5 W/kg
SAR(1 g) = 6.65 mW/g; SAR(10 g) = 4.61 mW/g
Body-Worn - 1.1 cm Belt-Clip Separation Distance - High Channel/Zoom Scan (5x5x7)/Cube 2:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 82.3 V/m; Power Drift = 0.227 dB
Peak SAR (extrapolated) = 10.6 W/kg
SAR(1 g) = 5.88 mW/g; SAR(10 g) = 3.83 mW/g



Date Tested: 09/21/04

Body-Worn SAR - NiCd IS Battery - Helical Coil Antenna (P/N: KRE1011219/9) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

Body-Worn Accessories: Metal Belt-Clip (P/N: KRY1011647/1); Speaker-Microphone (P/N: KRY1011617/183)

Ambient Temp: 24.1 °C; Fluid Temp: 23.6 °C; Barometric Pressure: 103.3 kPa; Humidity: 33%

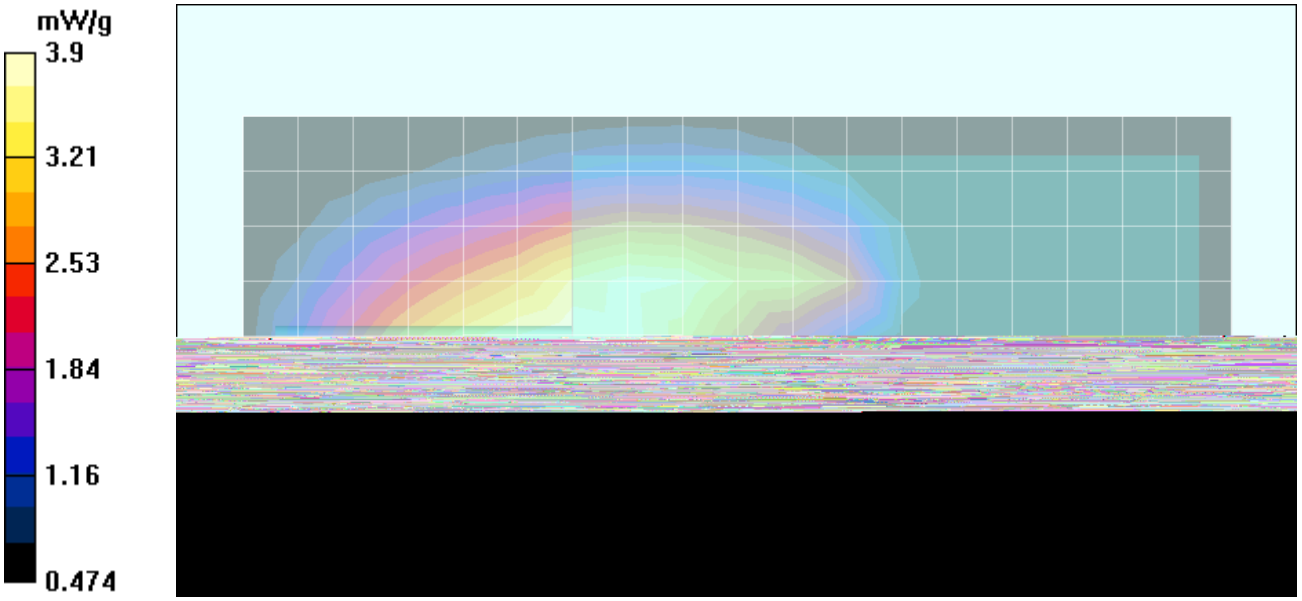
Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiCd 7.5V Intrinsically Safe (P/N: BKB191210/45)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.3; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

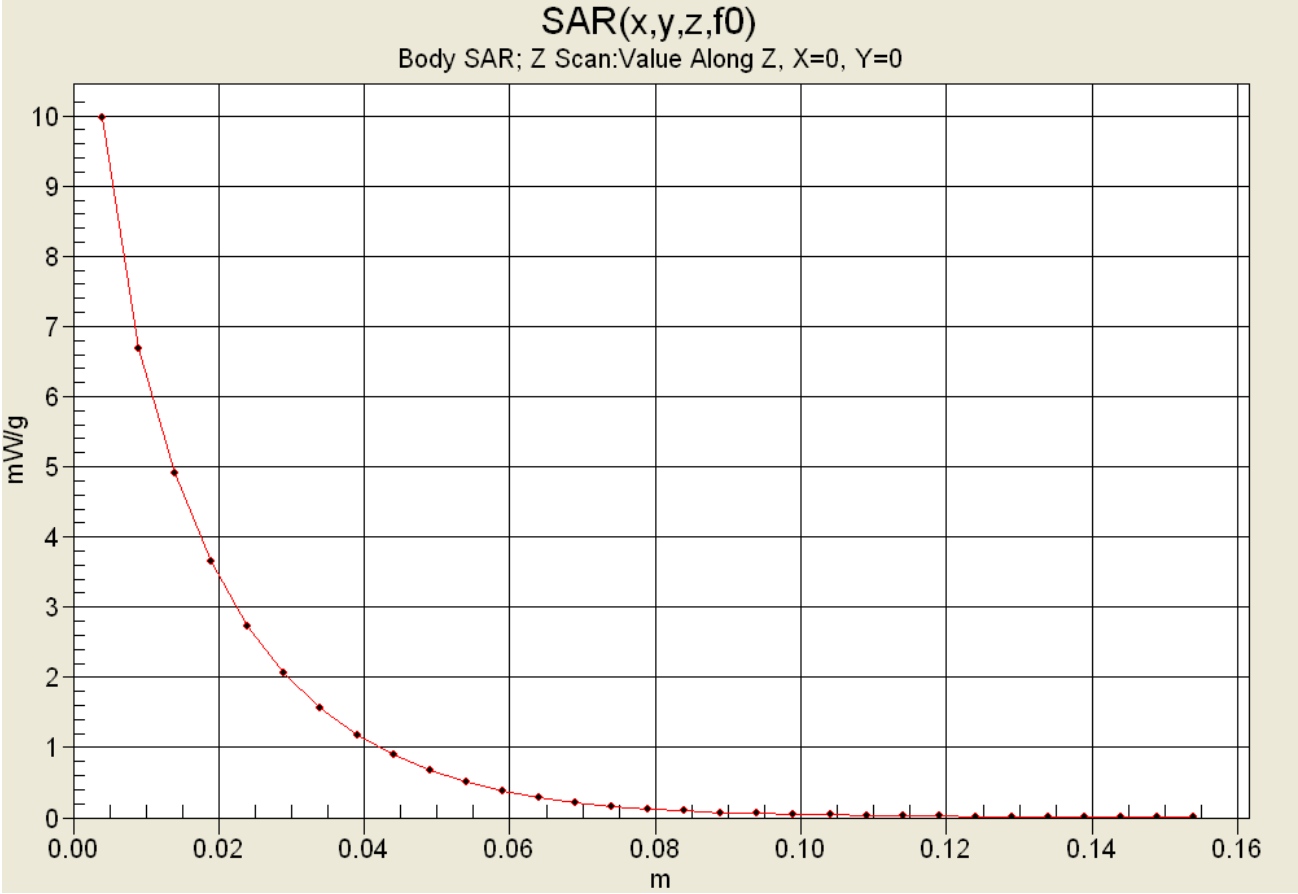
Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Area Scan (8x19x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 60.4 V/m; Power Drift = -0.107 dB
Peak SAR (extrapolated) = 6.39 W/kg
SAR(1 g) = 3.72 mW/g; SAR(10 g) = 2.57 mW/g

Body-Worn - 1.1 cm Belt-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 1:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 60.4 V/m; Power Drift = -0.107 dB
Peak SAR (extrapolated) = 5.09 W/kg
SAR(1 g) = 3.01 mW/g; SAR(10 g) = 1.97 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
Body SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
m
0
1
2
3
4
5
6
7
8
9
10
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16

Date Tested: 09/22/04

Body-Worn SAR - NiCd NIS Battery - Helical Coil Antenna (P/N: KRE1011219/10) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

Body-Worn Accessories: Metal Belt-Clip (P/N: KRY1011647/1); Speaker-Microphone (P/N: KRY1011617/183)

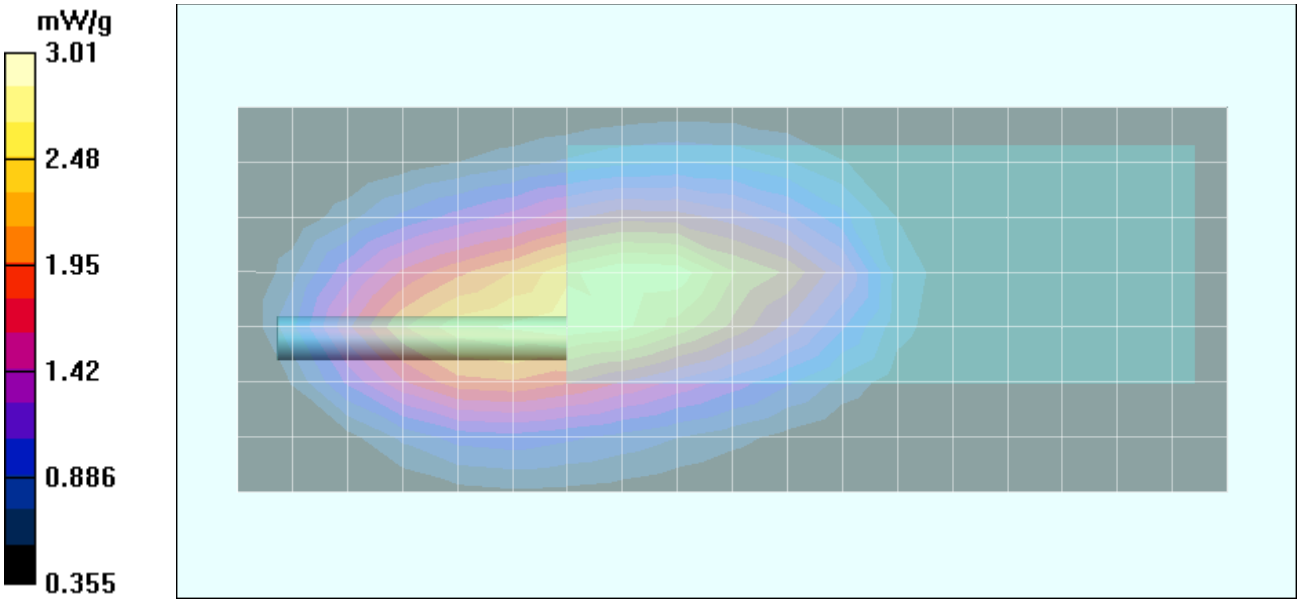
Ambient Temp: 23.6 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.8 kPa; Humidity: 40%

Communication System: FM UHF
Frequency: 430 MHz; Duty Cycle: 1:1
RF Output Power: 4.44 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.4; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Body-Worn - 1.1 cm Belt-Clip Separation Distance - High Channel/Area Scan (8x19x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.1 cm Belt-Clip Separation Distance - High Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 54.2 V/m; Power Drift = -0.250 dB
Peak SAR (extrapolated) = 5.46 W/kg
SAR(1 g) = 2.83 mW/g; SAR(10 g) = 1.92 mW/g



Date Tested: 09/22/04

Body-Worn SAR - NiCd NIS Battery - Helical Coil Antenna (P/N: KRE1011219/10) - Speaker-Microphone w/ Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Plus (P/N: KRY1011617/184)

Body-Worn Accessories: Lapel-Clip

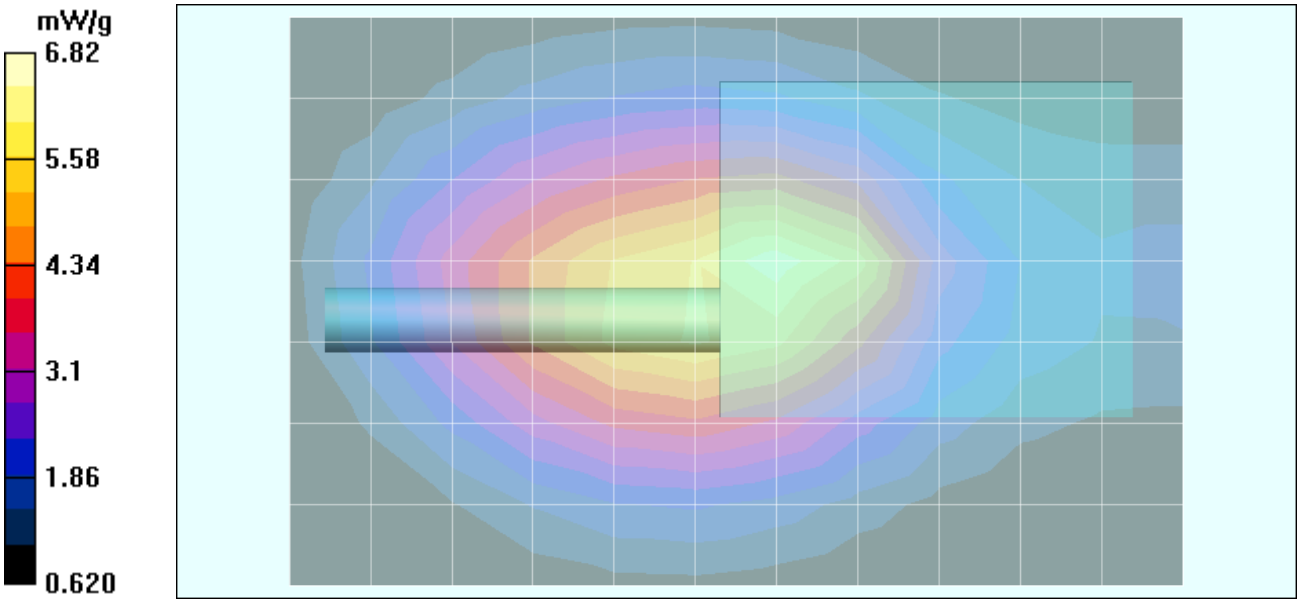
Ambient Temp: 23.6 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.8 kPa; Humidity: 40%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.25 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.4; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x12x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 77.9 V/m; Power Drift = 0.0131 dB
Peak SAR (extrapolated) = 13 W/kg
SAR(1 g) = 6.46 mW/g; SAR(10 g) = 4.12 mW/g



Date Tested: 09/22/04

Body-Worn SAR - NiMH IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

Body-Worn Accessories: Nylon T-Strap Holder (P/N: KRY1011656/1); Speaker-Microphone (P/N: KRY1011617/183)

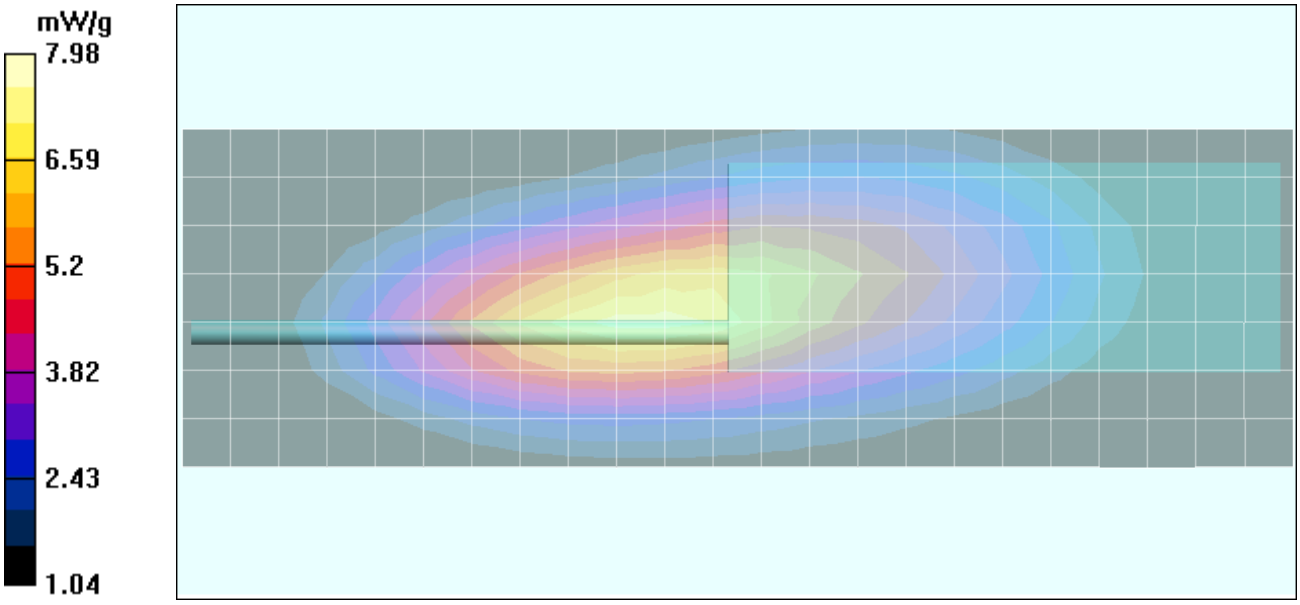
Ambient Temp: 23.6 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.8 kPa; Humidity: 40%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.24 Watts (Conducted)
NiMH 7.5V Intrinsically Safe (P/N: BKB191210/46)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.4; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Body-Worn - 1.6 cm Nylon T-Strap Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.6 cm Nylon T-Strap Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 85.4 V/m; Power Drift = 0.000424 dB
Peak SAR (extrapolated) = 11.8 W/kg
SAR(1 g) = 7.64 mW/g; SAR(10 g) = 5.37 mW/g



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Date Tested: 09/22/04

Body-Worn SAR - NiMH IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

Body-Worn Accessories: Leather Case - Belt-Loop Type (P/N: KRY1011638/1); Speaker-Microphone (P/N: KRY1011617/183)

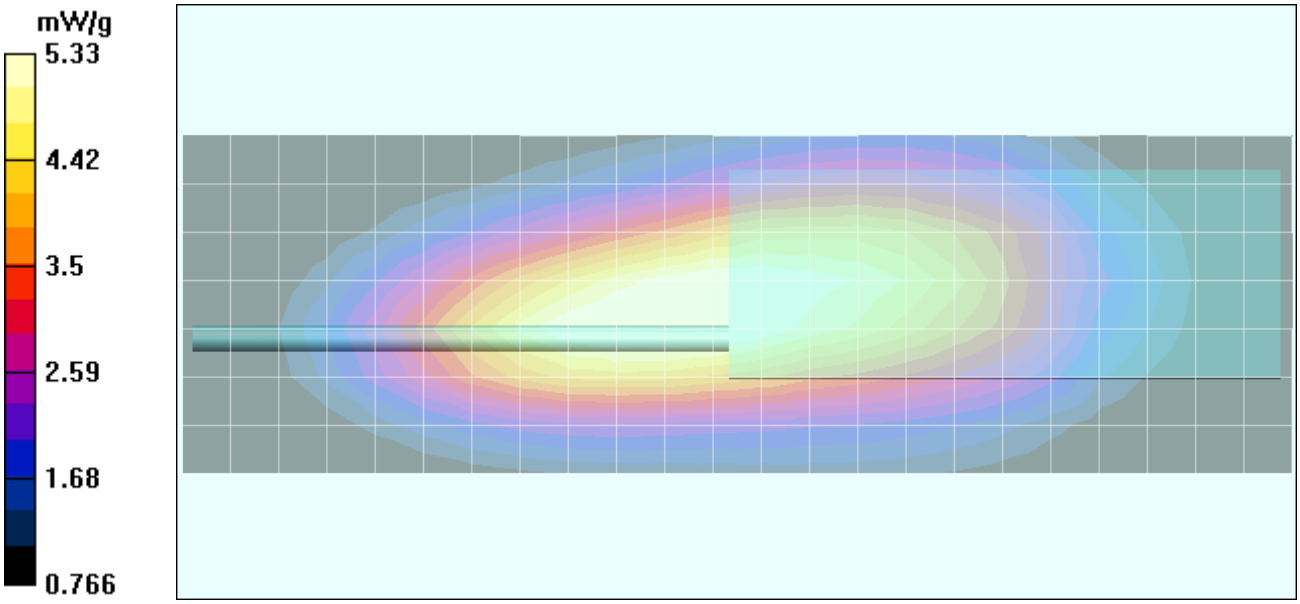
Ambient Temp: 23.6 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.8 kPa; Humidity: 40%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.23 Watts (Conducted)
NiMH 7.5V Intrinsically Safe (P/N: BKB191210/46)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.4; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Body-Worn - 1.7 cm Leather Case Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.7 cm Leather Case Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 73 V/m; Power Drift = -0.0785 dB
Peak SAR (extrapolated) = 7.76 W/kg
SAR(1 g) = 5.11 mW/g; SAR(10 g) = 3.65 mW/g



Date Tested: 09/22/04

Body-Worn SAR - NiMH IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

Body-Worn Accessories: Belt-Loop (P/N: KRY1011609/1); Swivel (P/N: KRY1011608/2); Speaker-Microphone (P/N: KRY1011617/183)

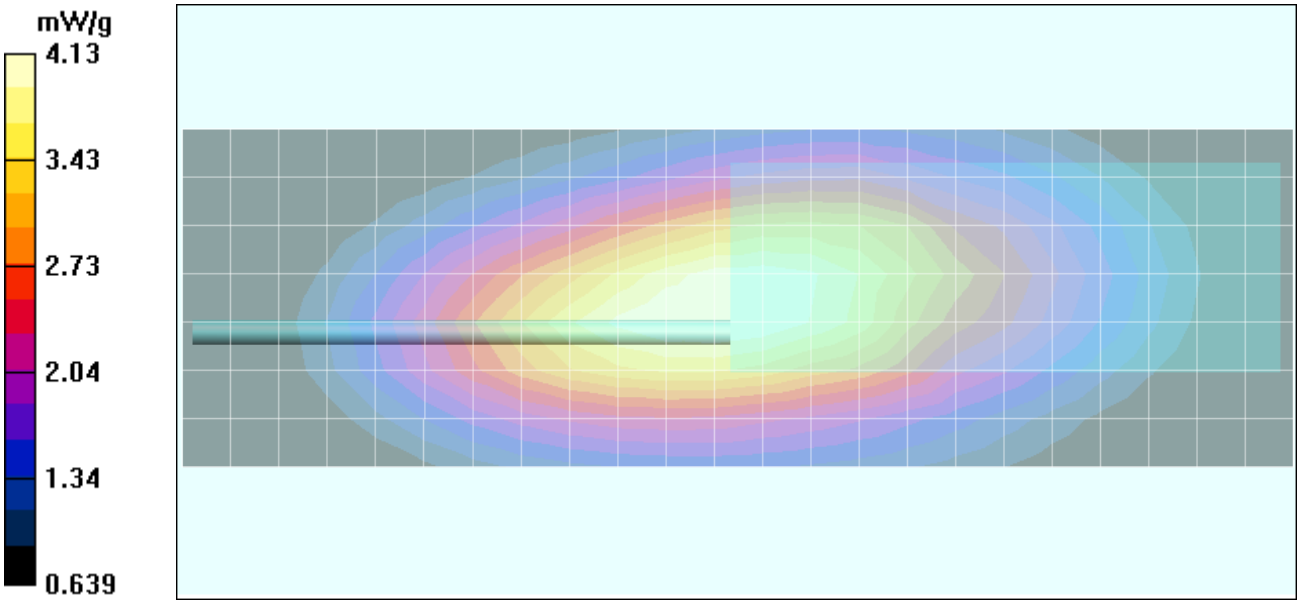
Ambient Temp: 23.6 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.8 kPa; Humidity: 40%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.23 Watts (Conducted)
NiMH 7.5V Intrinsically Safe (P/N: BKB191210/46)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.4; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Body-Worn - 3.5 cm Leather Belt-Loop Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 3.5 cm Leather Belt-Loop Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 64.4 V/m; Power Drift = 0.0315 dB
Peak SAR (extrapolated) = 5.85 W/kg
SAR(1 g) = 3.96 mW/g; SAR(10 g) = 2.91 mW/g



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Date Tested: 09/22/04

Body-Worn SAR - NiMH IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

Body-Worn Accessories: Nylon Case (P/N: KRY1011648/1); Belt-Loop (P/N: KRY1011609/1); Speaker-Microphone (P/N: KRY1011617/183)

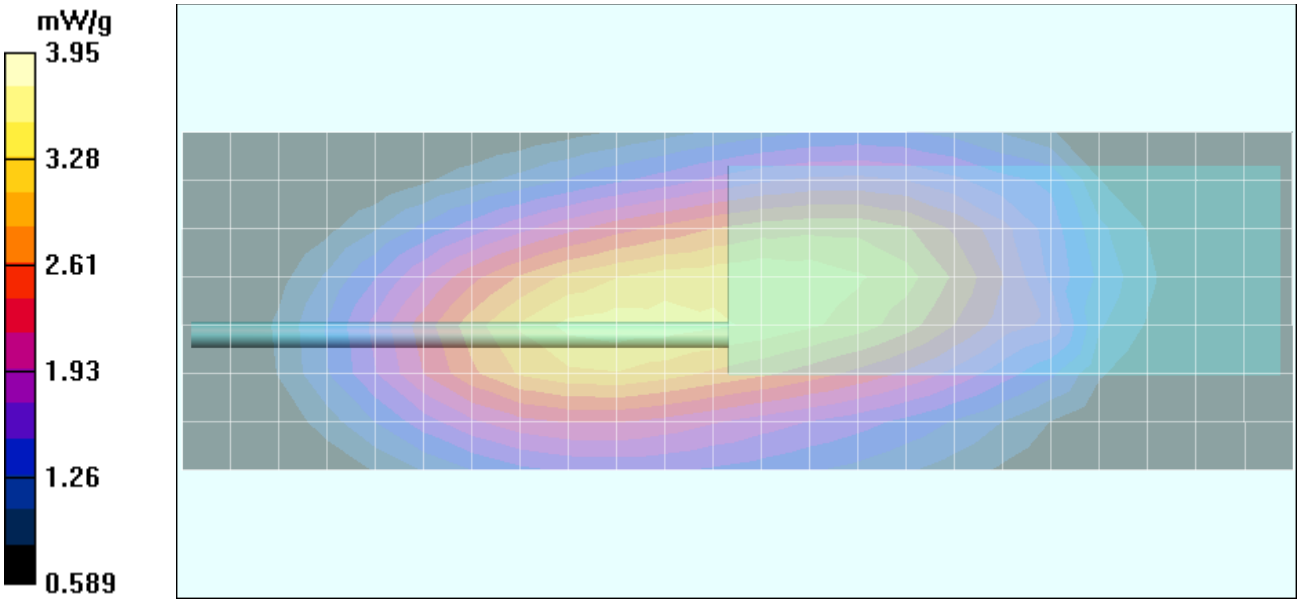
Ambient Temp: 23.6 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.8 kPa; Humidity: 40%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.22 Watts (Conducted)
NiMH 7.5V Intrinsically Safe (P/N: BKB191210/46)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.4; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Body-Worn - 4.0 cm Nylon Case & Swivel Belt-Loop Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 4.0 cm Nylon Case & Swivel Belt-Loop Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 63.6 V/m; Power Drift = -0.0695 dB
Peak SAR (extrapolated) = 5.55 W/kg
SAR(1 g) = 3.79 mW/g; SAR(10 g) = 2.76 mW/g



Date Tested: 09/22/04

Body-Worn SAR - NiMH IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

Body-Worn Accessories: Leather Case (P/N: KRY1011639/1); Belt-Loop (P/N: KRY1011609/1); Speaker-Microphone (P/N: KRY1011617/183)

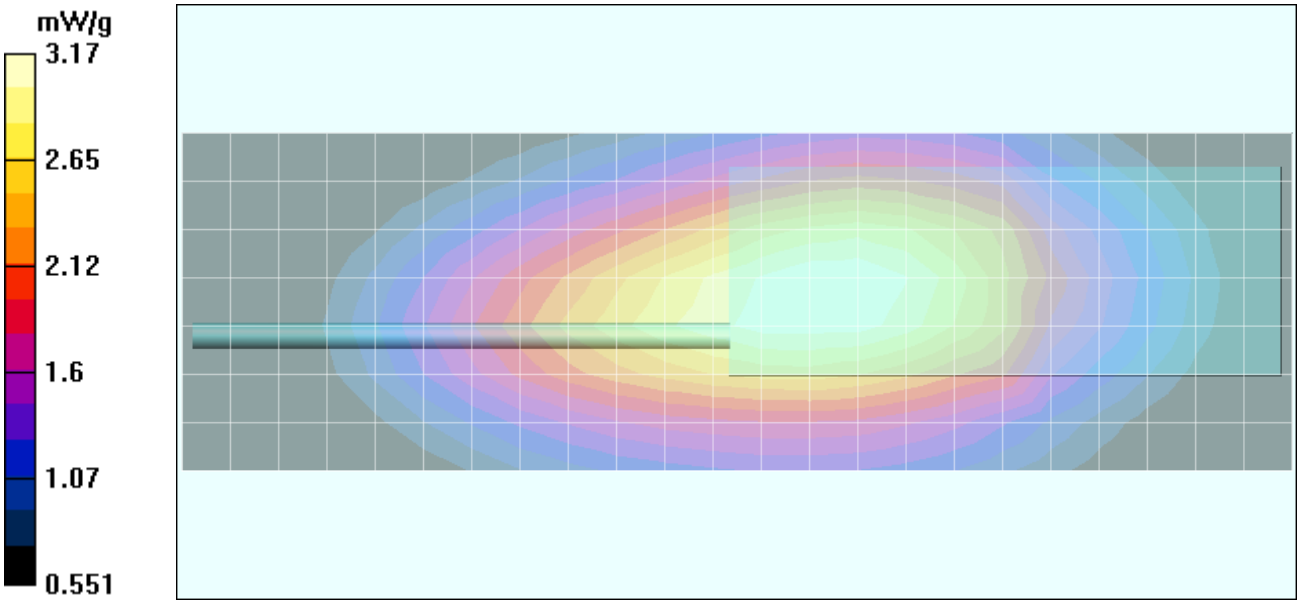
Ambient Temp: 23.6 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.8 kPa; Humidity: 40%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.23 Watts (Conducted)
NiMH 7.5V Intrinsically Safe (P/N: BKB191210/46)
Medium: M450 (σ = 0.93 mho/m; ε_r = 57.4; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

Body-Worn - 4.5 cm Leather Case & Swivel Belt-Loop Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 4.5 cm Leather Case & Swivel Belt-Loop Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 56.3 V/m; Power Drift = -0.00183 dB
Peak SAR (extrapolated) = 4.38 W/kg
SAR(1 g) = 3.05 mW/g; SAR(10 g) = 2.28 mW/g



Date Tested: 10/07/04

Body-Worn SAR - NiMH IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - P7100IP System Radio

DUT: M/A-COM Model: P7100(IP); Type: Portable UHF PTT Radio Transceiver; P/N: RU101219V62 R1B; S/N: T1PA-UL10

Body-Worn Accessories: Leather Case (P/N: KRY1011639/3) with Over-the-Shoulder Strap (P/N: CC103333V1); Swivel Belt-Loop (P/N: KRY1011609/1); Speaker-Microphone (P/N: KRY1011617/183)

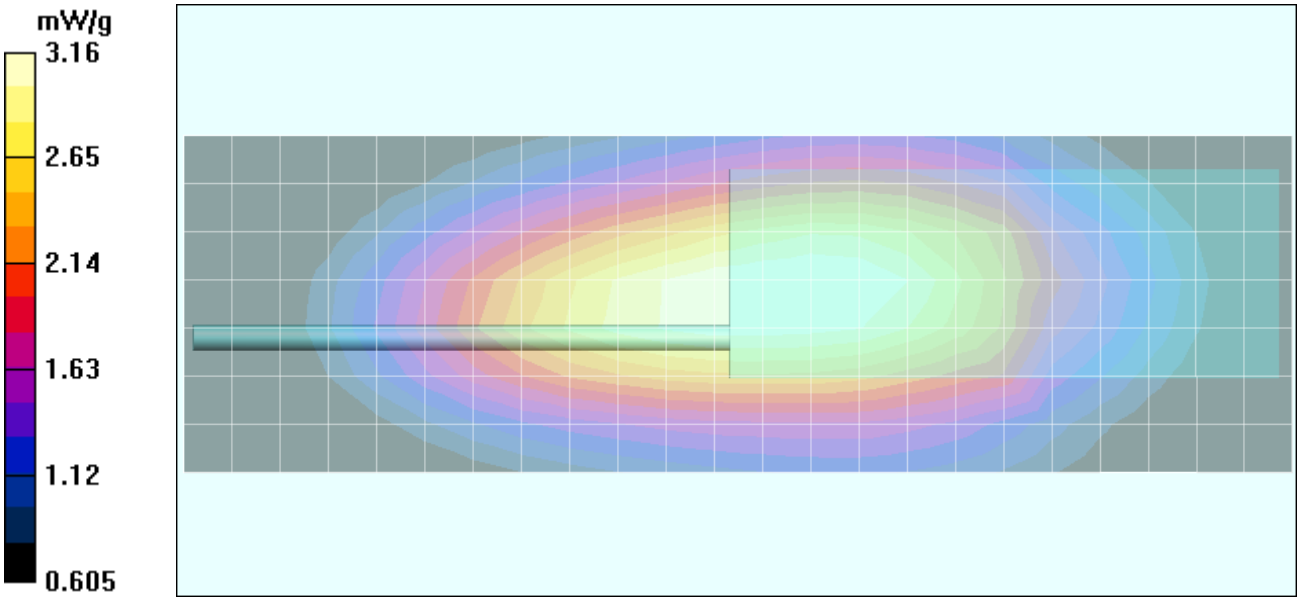
Ambient Temp: 23.6 °C; Fluid Temp: 21.1 °C; Barometric Pressure: 102.9 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.24 Watts (Conducted)
NiMH 7.5V Intrinsically Safe (P/N: BKB191210/46)
Medium: M450 (σ = 0.91 mho/m; ε_r = 57.3; ρ = 1000 kg/m^3)

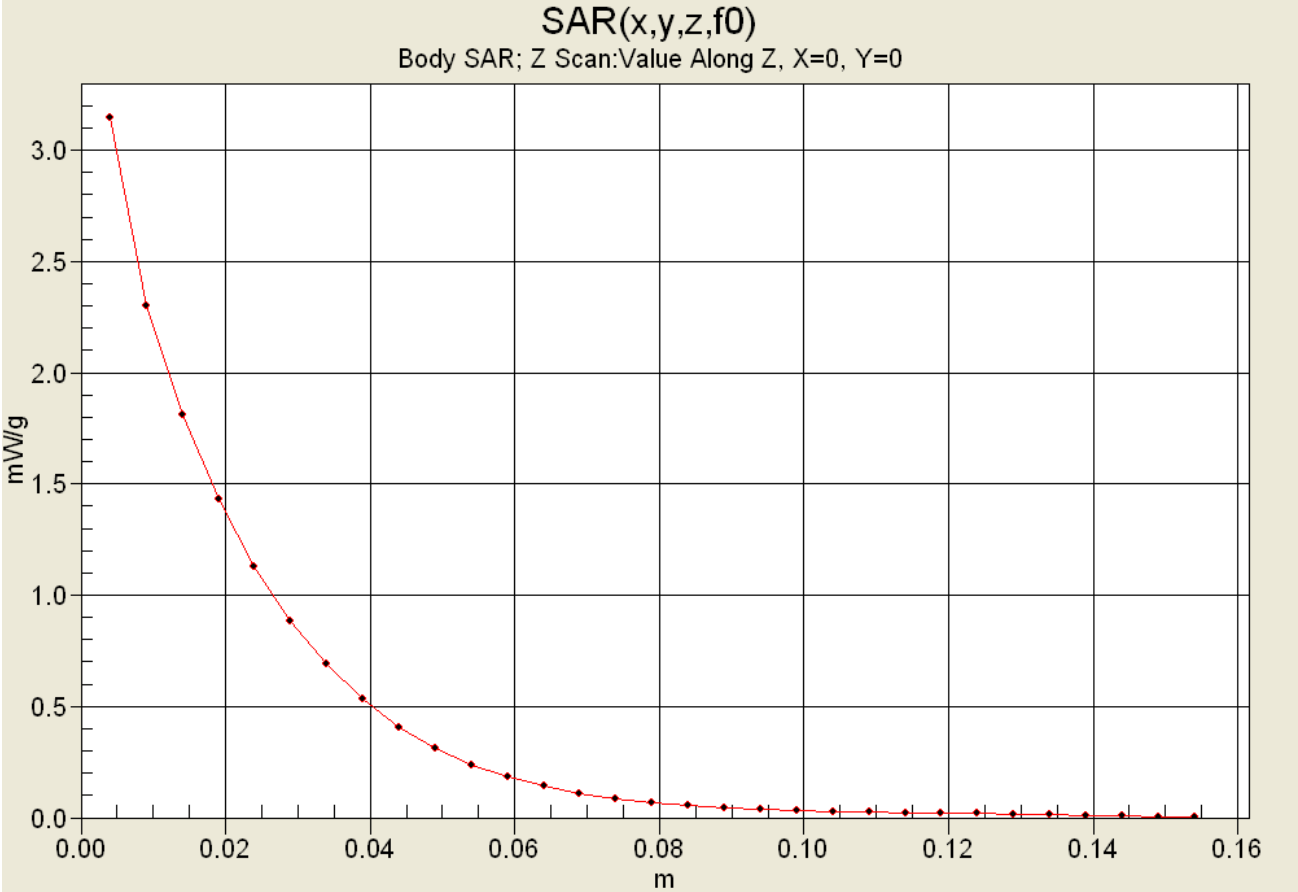
- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 4.5 cm Leather Case & Swivel Belt-Loop Separation Distance - Mid Channel/Area Scan (8x24x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 4.5 cm Leather Case & Swivel Belt-Loop Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 58.2 V/m; Power Drift = -0.0373 dB
Peak SAR (extrapolated) = 4.36 W/kg
SAR(1 g) = 3.04 mW/g; SAR(10 g) = 2.29 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
Body SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
3.0
2.5
2.0
1.5
1.0
0.5
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date Tested: 10/19/04

Body-Worn SAR - NiMH IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - Speaker-Microphone w/Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Body-Worn Accessories: Lapel-Clip, Ranger Headset (P/N: OT-V4-10421)

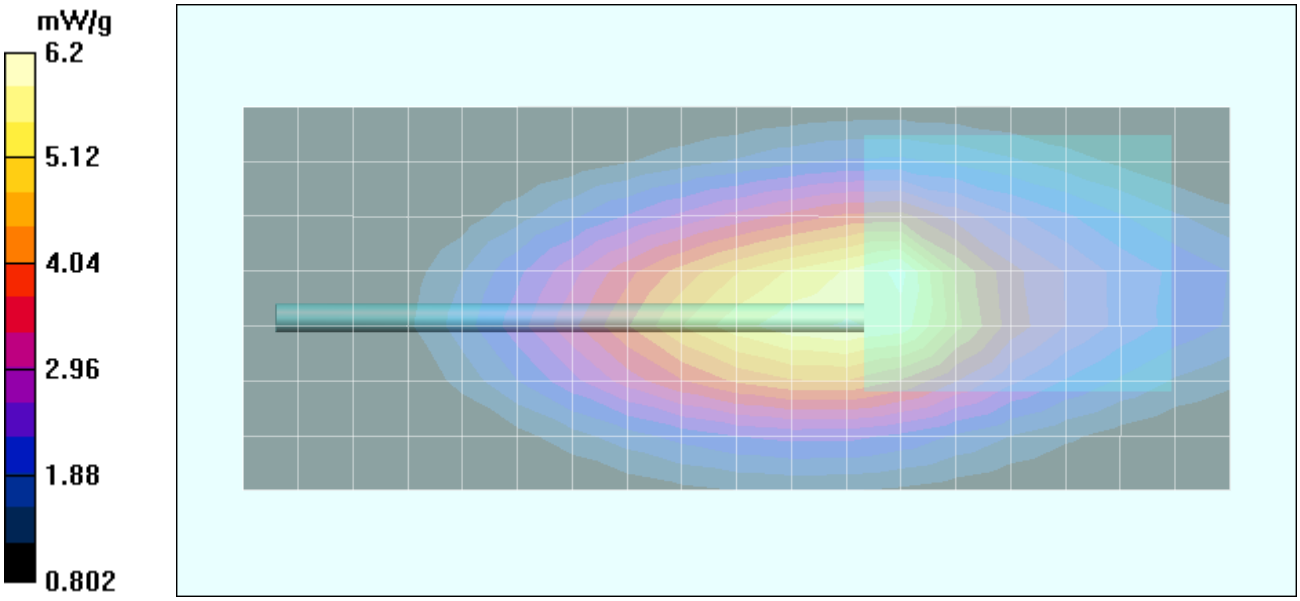
Ambient Temp: 23.8 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.26 Watts (Conducted)
NiMH 7.5V Intrinsically Safe (P/N: BKB191210/46)
Medium: M450 (σ = 0.90 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x19x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 78.3 V/m; Power Drift = -0.127 dB
Peak SAR (extrapolated) = 9.99 W/kg
SAR(1 g) = 5.95 mW/g; SAR(10 g) = 4.12 mW/g



Date Tested: 10/19/04

Body-Worn SAR - NiMH IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - Speaker-Microphone w/Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Body-Worn Accessories: Lapel-Clip, Behind-the-Head Headset (P/N: OT-V4-10450)

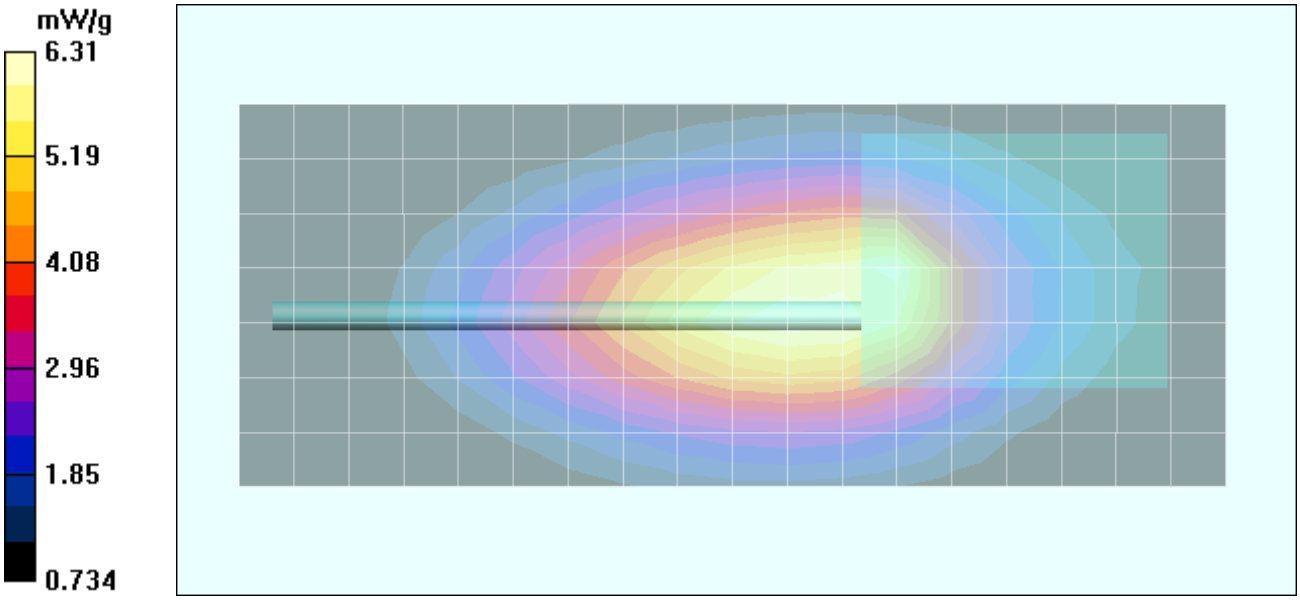
Ambient Temp: 23.8 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.25 Watts (Conducted)
NiMH 7.5V Intrinsically Safe (P/N: BKB191210/46)
Medium: M450 (σ = 0.90 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x19x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 79.8 V/m; Power Drift = -0.0308 dB
Peak SAR (extrapolated) = 10.4 W/kg
SAR(1 g) = 6.06 mW/g; SAR(10 g) = 4.27 mW/g



Date Tested: 10/19/04

Body-Worn SAR - NiMH IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - Speaker-Microphone w/Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Body-Worn Accessories: Lapel-Clip, Throat Microphone (P/N: OT-V4-10656)

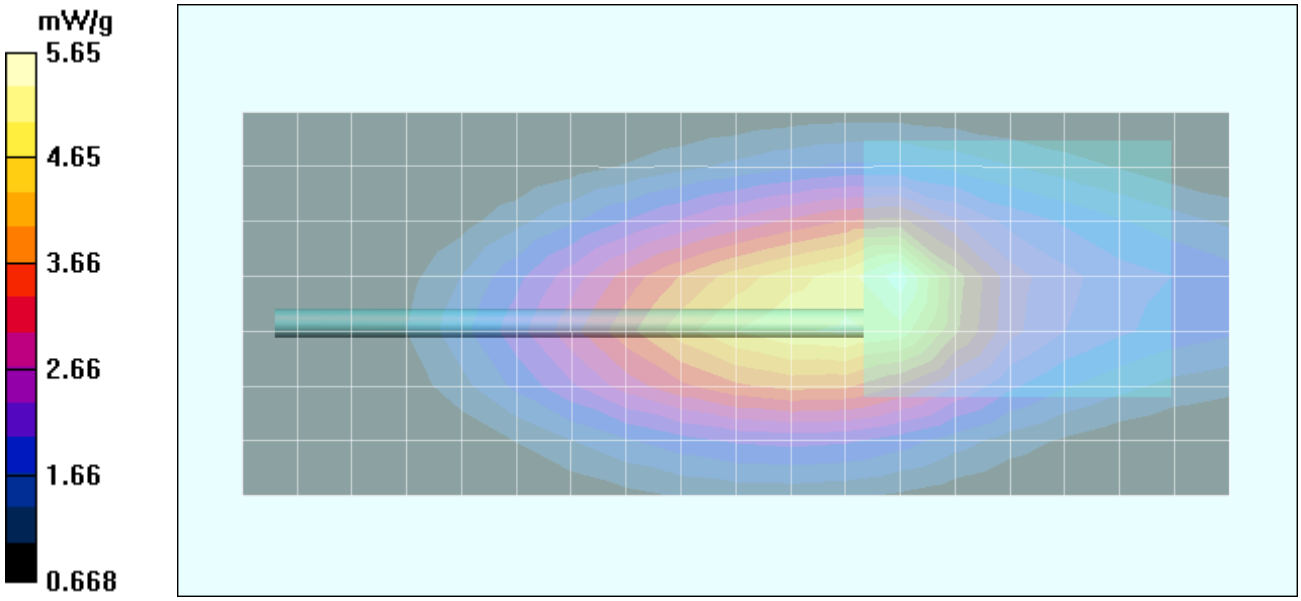
Ambient Temp: 23.8 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.26 Watts (Conducted)
NiMH 7.5V Intrinsically Safe (P/N: BKB191210/46)
Medium: M450 (σ = 0.90 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x19x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 73.5 V/m; Power Drift = -0.0215 dB
Peak SAR (extrapolated) = 9.74 W/kg
SAR(1 g) = 5.40 mW/g; SAR(10 g) = 3.61 mW/g



Date Tested: 10/19/04

Body-Worn SAR - NiMH IS Battery - Quarter-Wave Whip Antenna (P/N: KRE1011223/10) - Speaker-Microphone w/Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Body-Worn Accessories: Lapel-Clip, Skull Microphone (P/N: OT-V4-10428)

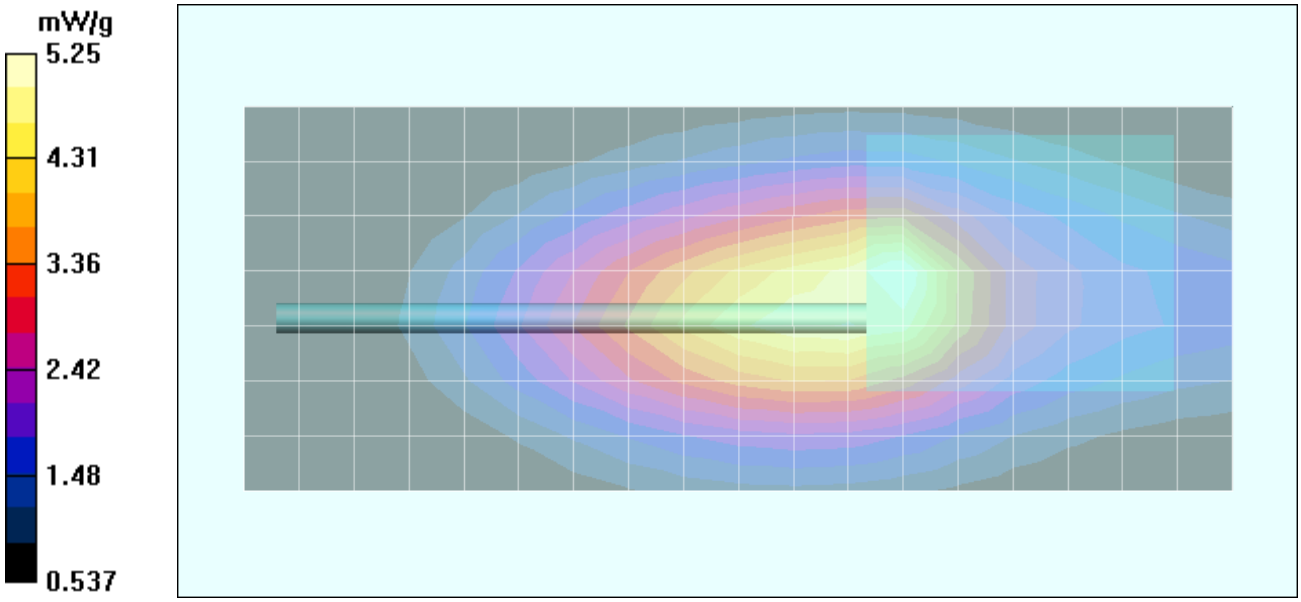
Ambient Temp: 23.8 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.25 Watts (Conducted)
NiMH 7.5V Intrinsically Safe (P/N: BKB191210/46)
Medium: M450 (σ = 0.90 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x19x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 70.9 V/m; Power Drift = -0.139 dB
Peak SAR (extrapolated) = 9.61 W/kg
SAR(1 g) = 5.04 mW/g; SAR(10 g) = 3.33 mW/g



Date Tested: 10/19/04

Body-Worn SAR - NiCd NIS Battery - Helical Coil Antenna (P/N: KRE1011219/10) - Speaker-Microphone w/Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Body-Worn Accessories: Lapel-Clip, Ranger Headset (P/N: OT-V4-10421)

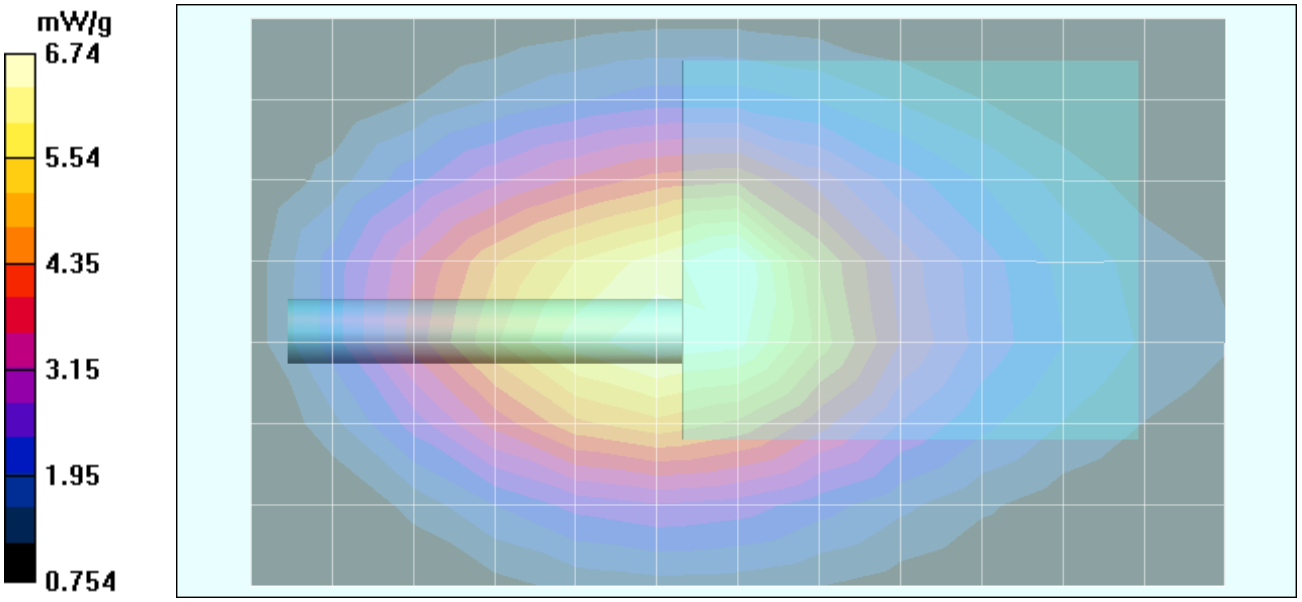
Ambient Temp: 23.8 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.25 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: M450 (σ = 0.90 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x13x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 80.5 V/m; Power Drift = -0.0400 dB
Peak SAR (extrapolated) = 11.7 W/kg
SAR(1 g) = 6.48 mW/g; SAR(10 g) = 4.32 mW/g



Date Tested: 10/19/04

Body-Worn SAR - NiCd NIS Battery - Helical Coil Antenna (P/N: KRE1011219/10) - Speaker-Microphone w/Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Body-Worn Accessories: Lapel-Clip, Behind-the-Head Headset (P/N: OT-V4-10450)

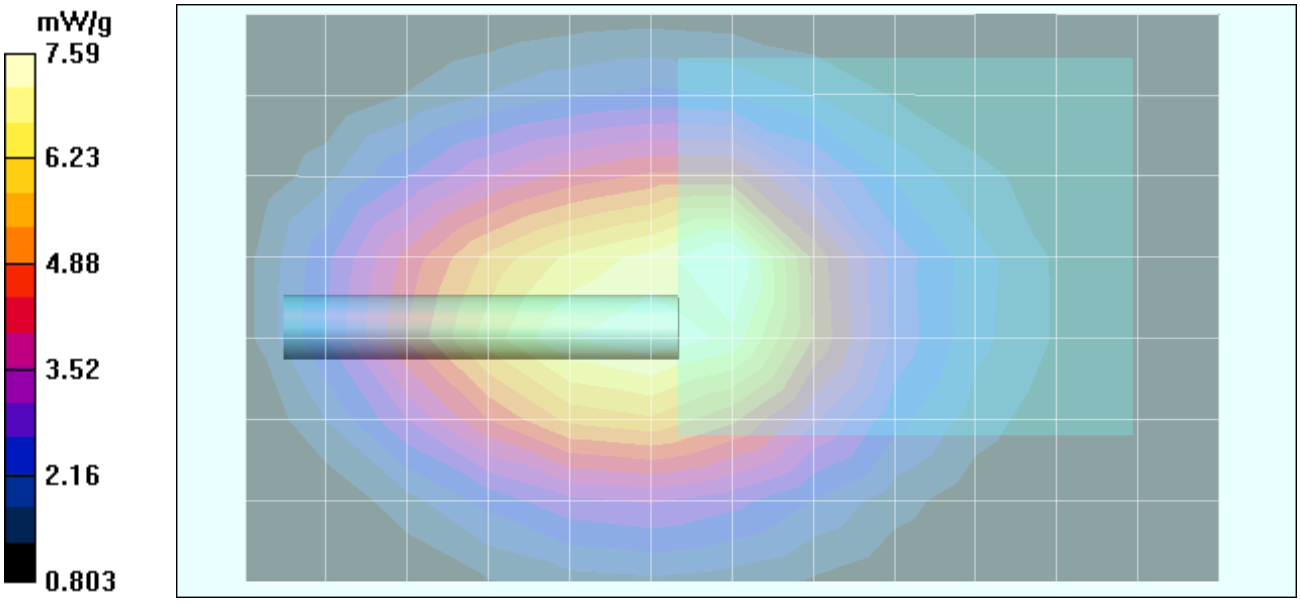
Ambient Temp: 23.8 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.25 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: M450 (σ = 0.90 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x13x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 85.7 V/m; Power Drift = -0.00962 dB
Peak SAR (extrapolated) = 13.2 W/kg
SAR(1 g) = 7.30 mW/g; SAR(10 g) = 5 mW/g



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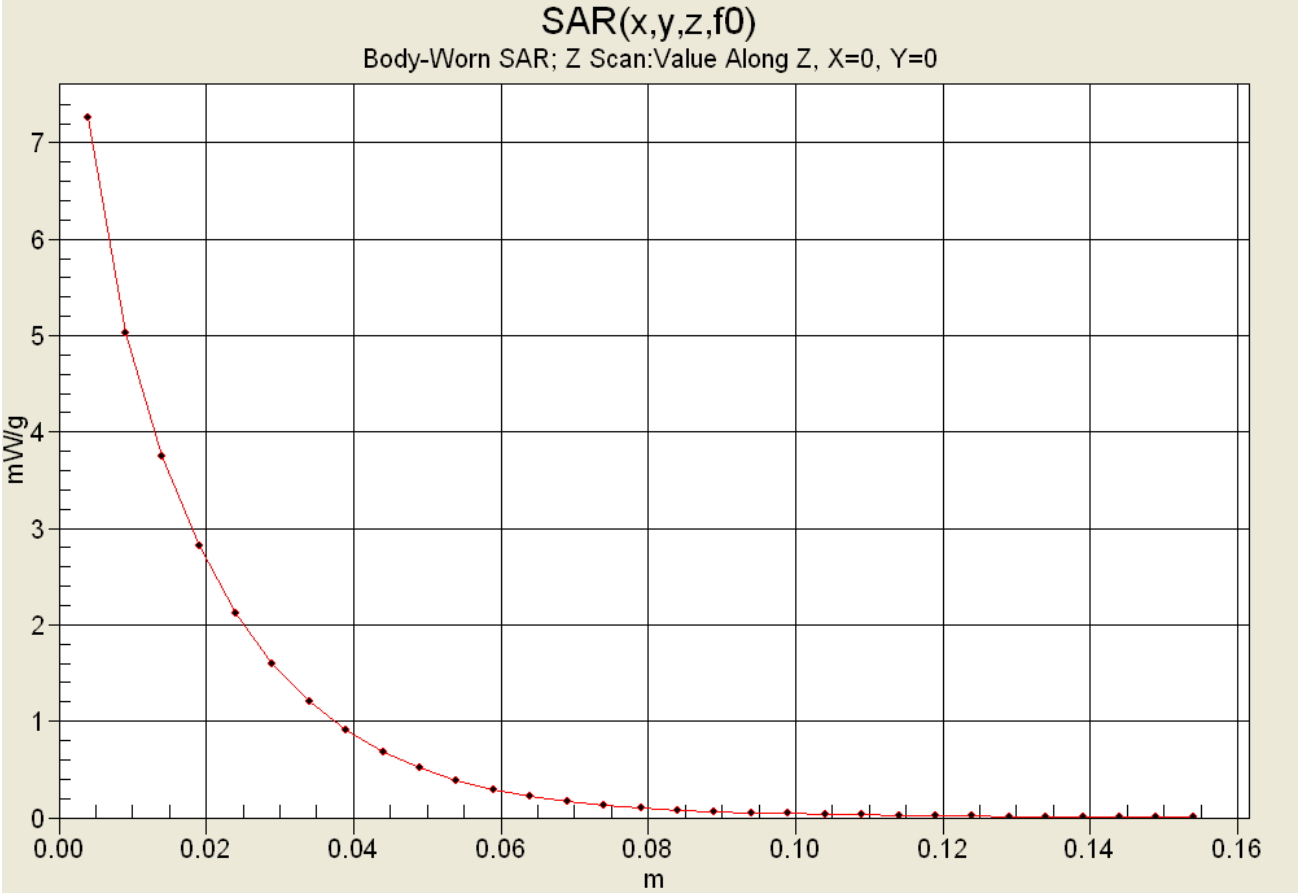
Z-Axis Scan


SAR(x,y,z,f0)
Body-Worn SAR; Z Scan:Value Along Z, X=0, Y=0
mW/g
0
1
2
3
4
5
6
7
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date Tested: 10/19/04

Body-Worn SAR - NiCd NIS Battery - Helical Coil Antenna (P/N: KRE1011219/10) - Speaker-Microphone w/Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Body-Worn Accessories: Lapel-Clip, Throat Microphone (P/N: OT-V4-10656)

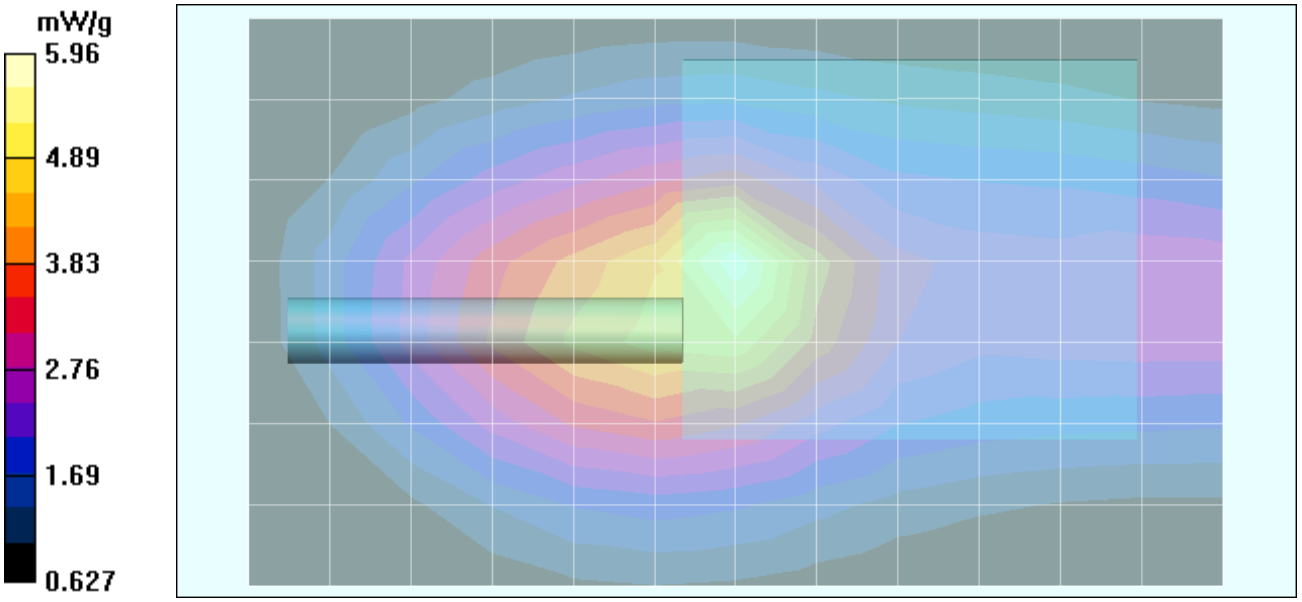
Ambient Temp: 23.8 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.26 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: M450 (σ = 0.90 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x13x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 72.2 V/m; Power Drift = 0.00354 dB
Peak SAR (extrapolated) = 11.6 W/kg
SAR(1 g) = 5.76 mW/g; SAR(10 g) = 3.61 mW/g



Date Tested: 10/19/04

Body-Worn SAR - NiCd NIS Battery - Helical Coil Antenna (P/N: KRE1011219/10) - Speaker-Microphone w/Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Body-Worn Accessories: Lapel-Clip, Skull Microphone (P/N: OT-V4-10428)

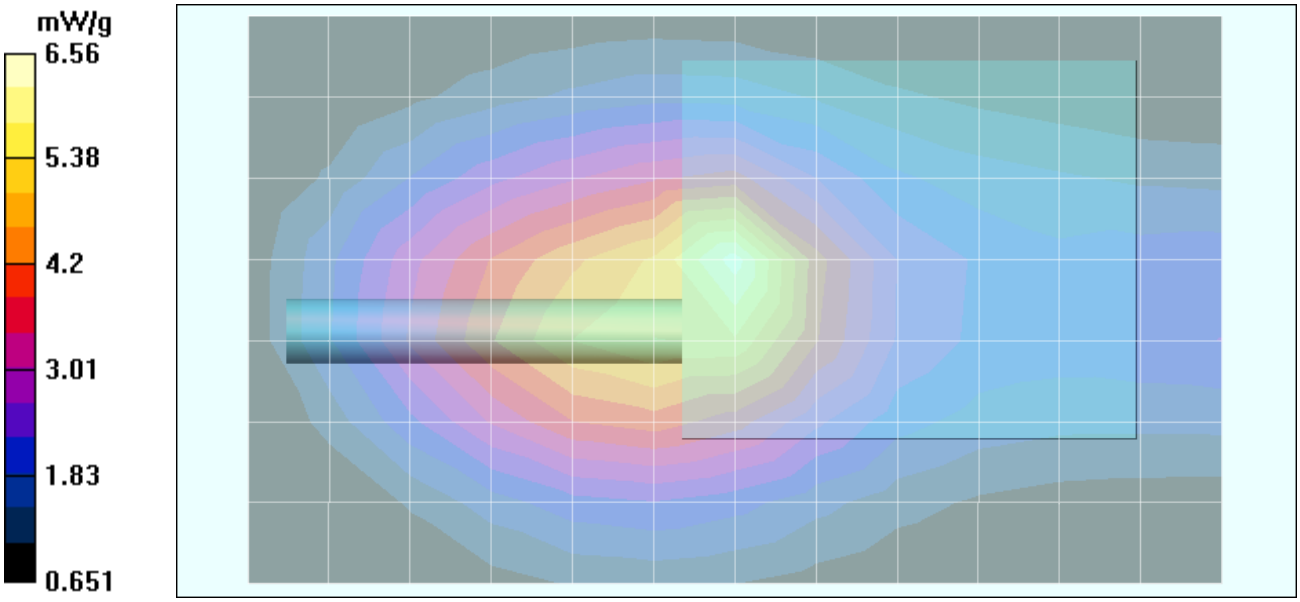
Ambient Temp: 23.8 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.25 Watts (Conducted)
NiCd 7.5V Non-Intrinsically Safe (P/N: BKB191210/43)
Medium: M450 (σ = 0.90 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x13x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 77.5 V/m; Power Drift = -0.0111 dB
Peak SAR (extrapolated) = 12 W/kg
SAR(1 g) = 6.25 mW/g; SAR(10 g) = 4.05 mW/g



Date Tested: 10/19/04

Body-Worn SAR - NiCd IS Battery - Helical Coil Antenna (P/N: KRE1011219/9) - Speaker-Microphone w/Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Body-Worn Accessories: Lapel-Clip, Ranger Headset (P/N: OT-V4-10421)

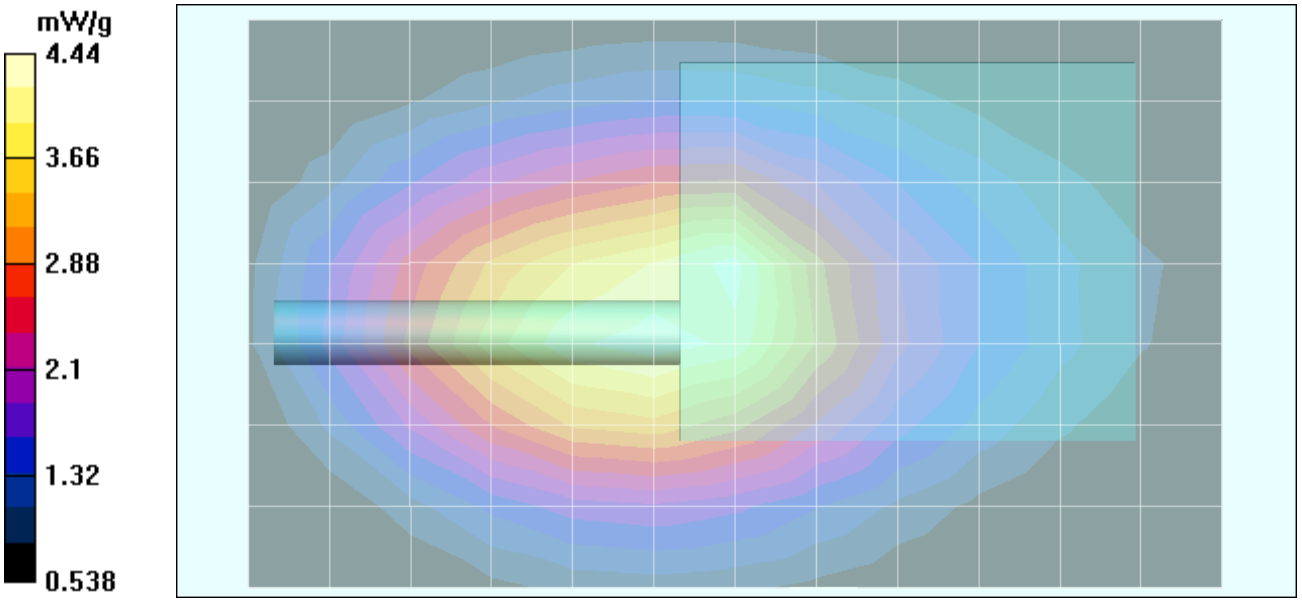
Ambient Temp: 23.8 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.25 Watts (Conducted)
NiCd 7.5V Intrinsically Safe (P/N: BKB191210/45)
Medium: M450 (σ = 0.90 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x13x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 66.2 V/m; Power Drift = -0.0319 dB
Peak SAR (extrapolated) = 7.18 W/kg
SAR(1 g) = 4.26 mW/g; SAR(10 g) = 2.98 mW/g



Date Tested: 10/19/04

Body-Worn SAR - NiCd IS Battery - Helical Coil Antenna (P/N: KRE1011219/9) - Speaker-Microphone w/Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Body-Worn Accessories: Lapel-Clip, Behind-the-Head Headset (P/N: OT-V4-10450)

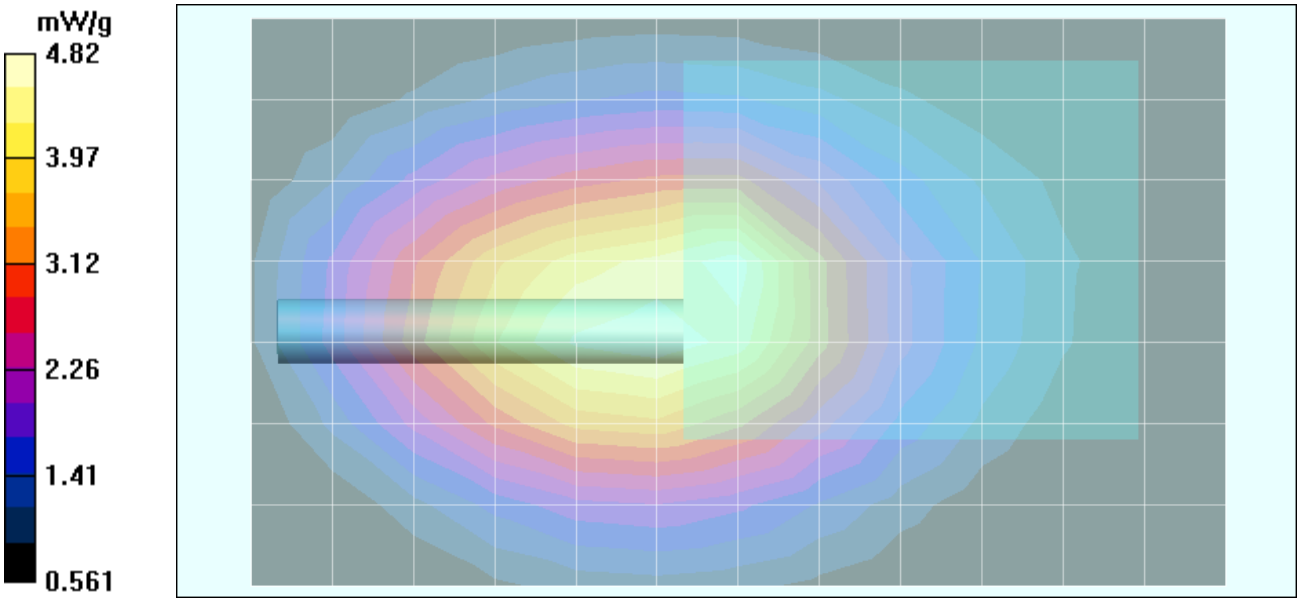
Ambient Temp: 23.8 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.25 Watts (Conducted)
NiCd 7.5V Intrinsically Safe (P/N: BKB191210/45)
Medium: M450 (σ = 0.90 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x13x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 69.4 V/m; Power Drift = -0.0357 dB
Peak SAR (extrapolated) = 8.05 W/kg
SAR(1 g) = 4.64 mW/g; SAR(10 g) = 3.26 mW/g



Date Tested: 10/19/04

Body-Worn SAR - NiCd IS Battery - Helical Coil Antenna (P/N: KRE1011219/9) - Speaker-Microphone w/Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Body-Worn Accessories: Lapel-Clip, Throat Microphone (P/N: OT-V4-10656)

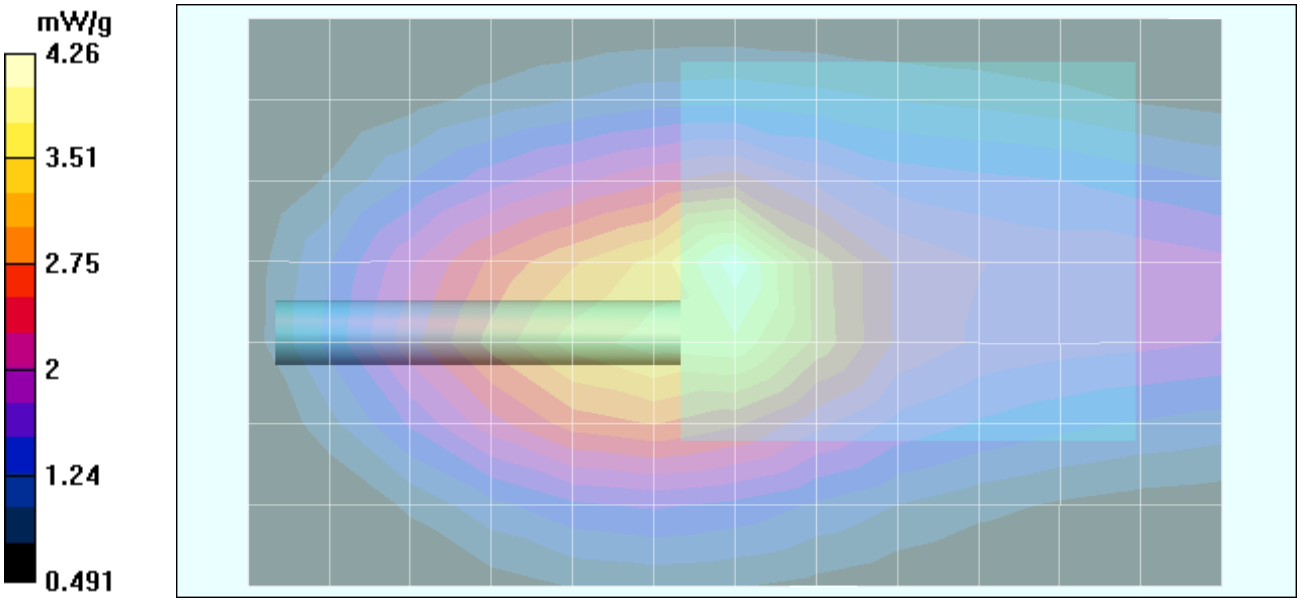
Ambient Temp: 23.8 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.26 Watts (Conducted)
NiCd 7.5V Intrinsically Safe (P/N: BKB191210/45)
Medium: M450 (σ = 0.90 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x13x1):
Measurement grid: dx=15mm, dy=15mm g

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 62.1 V/m; Power Drift = -0.00212 dB
Peak SAR (extrapolated) = 7.71 W/kg
SAR(1 g) = 4.10 mW/g; SAR(10 g) = 2.66 mW/g



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Date Tested: 10/19/04

Body-Worn SAR - NiCd IS Battery - Helical Coil Antenna (P/N: KRE1011219/9) - Speaker-Microphone w/Antenna

DUT: M/A-COM Model: P7100(IP) System Radio with FM PTT Speaker-Microphone Antenna Version Ruggedized (P/N: KRY1011617/384)

Body-Worn Accessories: Lapel-Clip, Skull Microphone (P/N: OT-V4-10428)

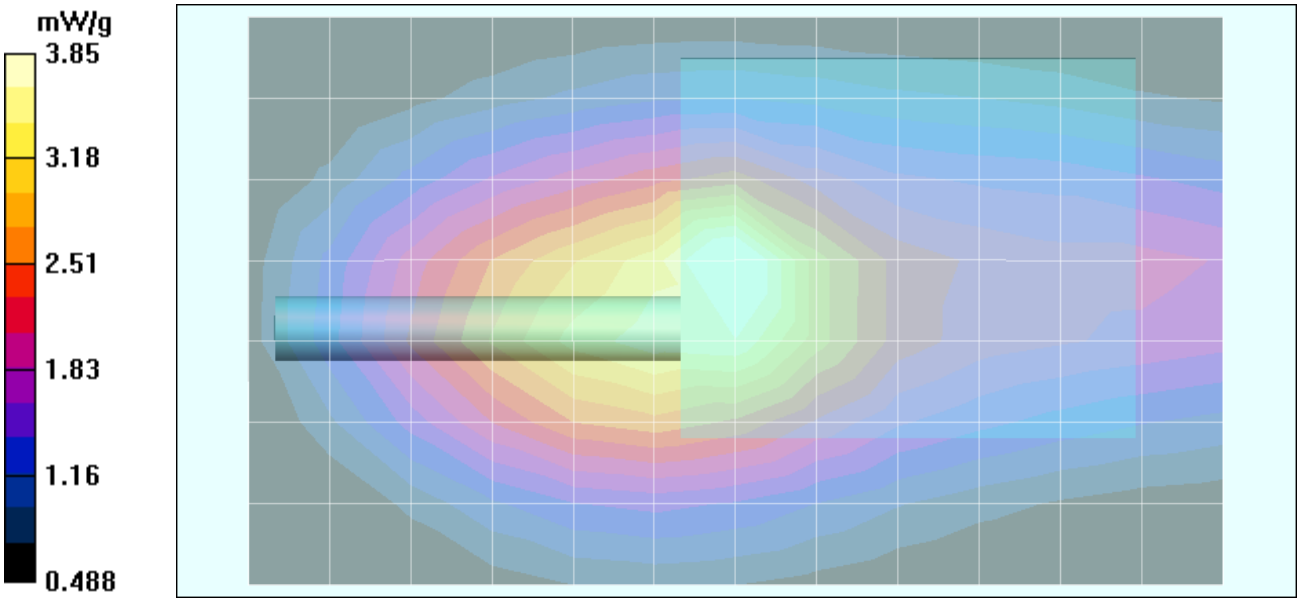
Ambient Temp: 23.8 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: FM UHF
Frequency: 403 MHz; Duty Cycle: 1:1
RF Output Power: 4.25 Watts (Conducted)
NiCd 7.5V Intrinsically Safe (P/N: BKB191210/45)
Medium: M450 (σ = 0.90 mho/m; ε_r = 56.9; ρ = 1000 kg/m^3)

- Probe: ET3DV6 - SN1590; ConvF(7.7, 7.7, 7.7); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Planar; Type: Plexiglas; Serial: 161
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Area Scan (8x13x1):
Measurement grid: dx=15mm, dy=15mm

Body-Worn - 1.3 cm Lapel-Clip Separation Distance - Mid Channel/Zoom Scan (5x5x7)/Cube 0:
Measurement grid: dx=7.5mm, dy=7.5mm, dz=5mm
Reference Value = 59.4 V/m; Power Drift = -0.00397 dB
Peak SAR (extrapolated) = 6.64 W/kg
SAR(1 g) = 3.72 mW/g; SAR(10 g) = 2.46 mW/g



APPENDIX B - SYSTEM PERFORMANCE CHECK DATA

Date Tested: 09/21/04

System Performance Check - 450 MHz Dipole

DUT: Dipole 450 MHz; Model: D450V2; Type: System Performance Check; Serial: 136; Calibrated: 11/ 04/2003

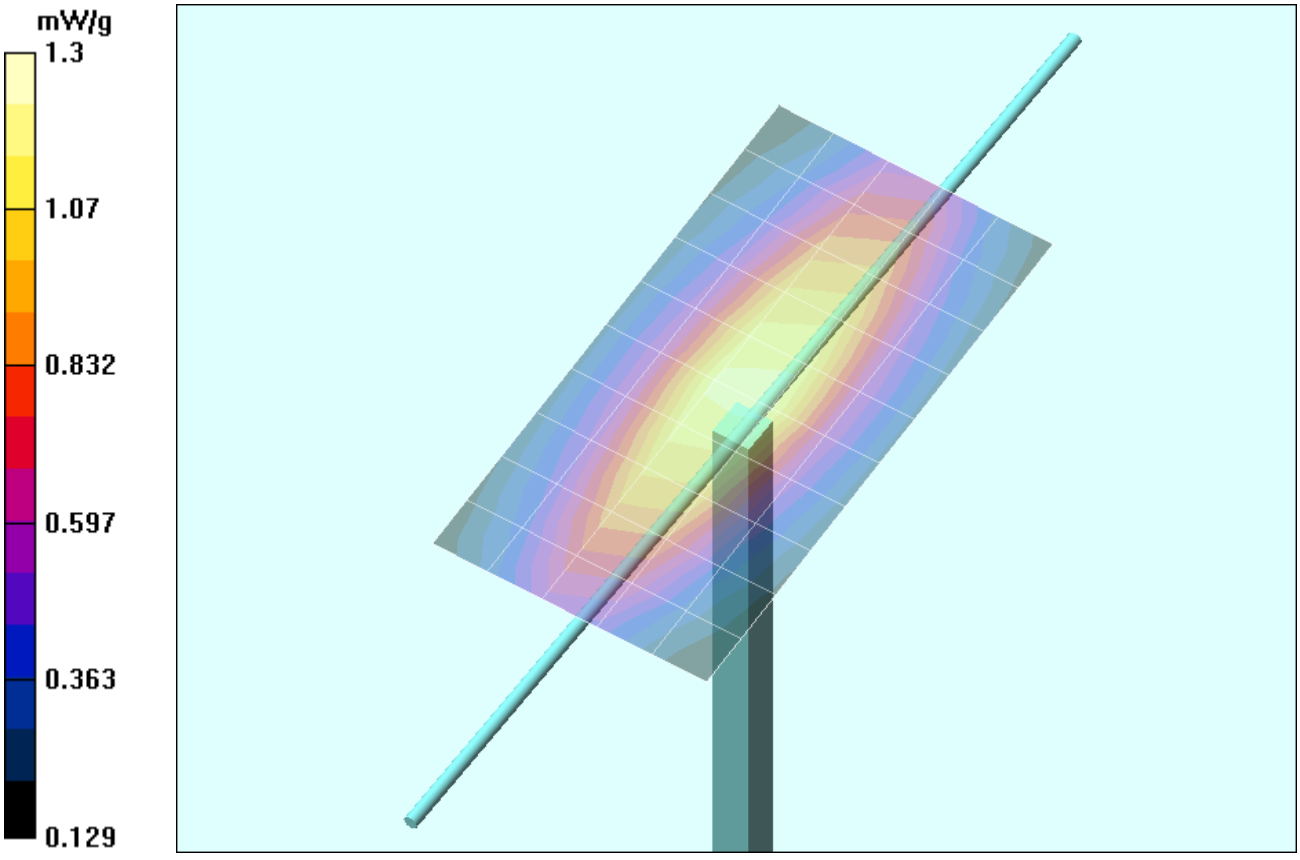
Ambient Temp: 23.7 °C; Fluid Temp: 22.6 °C; Barometric Pressure: 103.3 kPa; Humidity: 33%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 450 MHz; Duty Cycle: 1:1
Medium: HSL450 (σ = 0.83 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3)

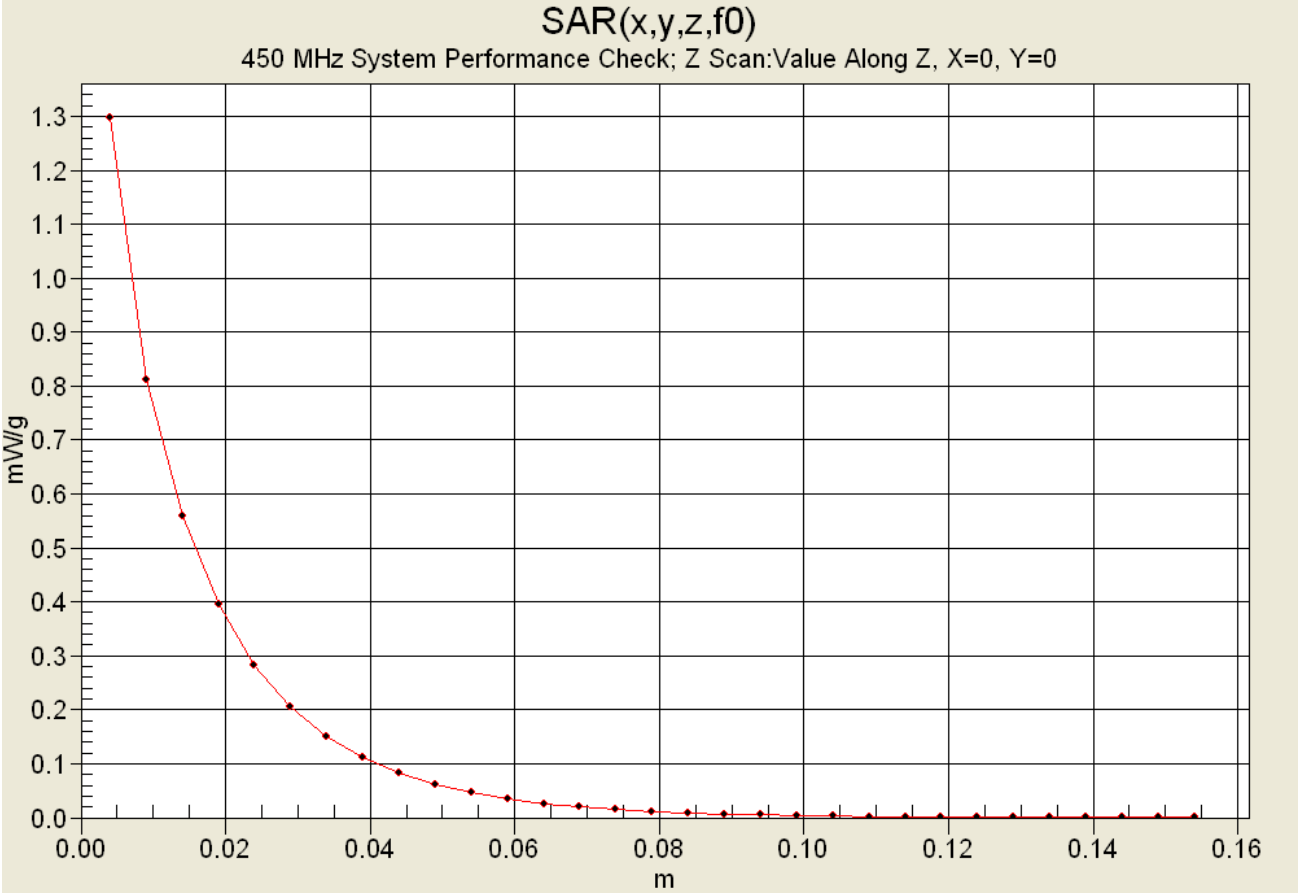
- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

450 MHz System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

450 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 39.8 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 2.1 W/kg
SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.792 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
450 MHz System Performance Check; Z Scan:Value Along Z, X=0, Y=0
mW/g
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date Tested: 09/22/04

System Performance Check - 450 MHz Dipole

DUT: Dipole 450 MHz; Model: D450V2; Type: System Performance Check; Serial: 136; Calibrated: 11/04/2003

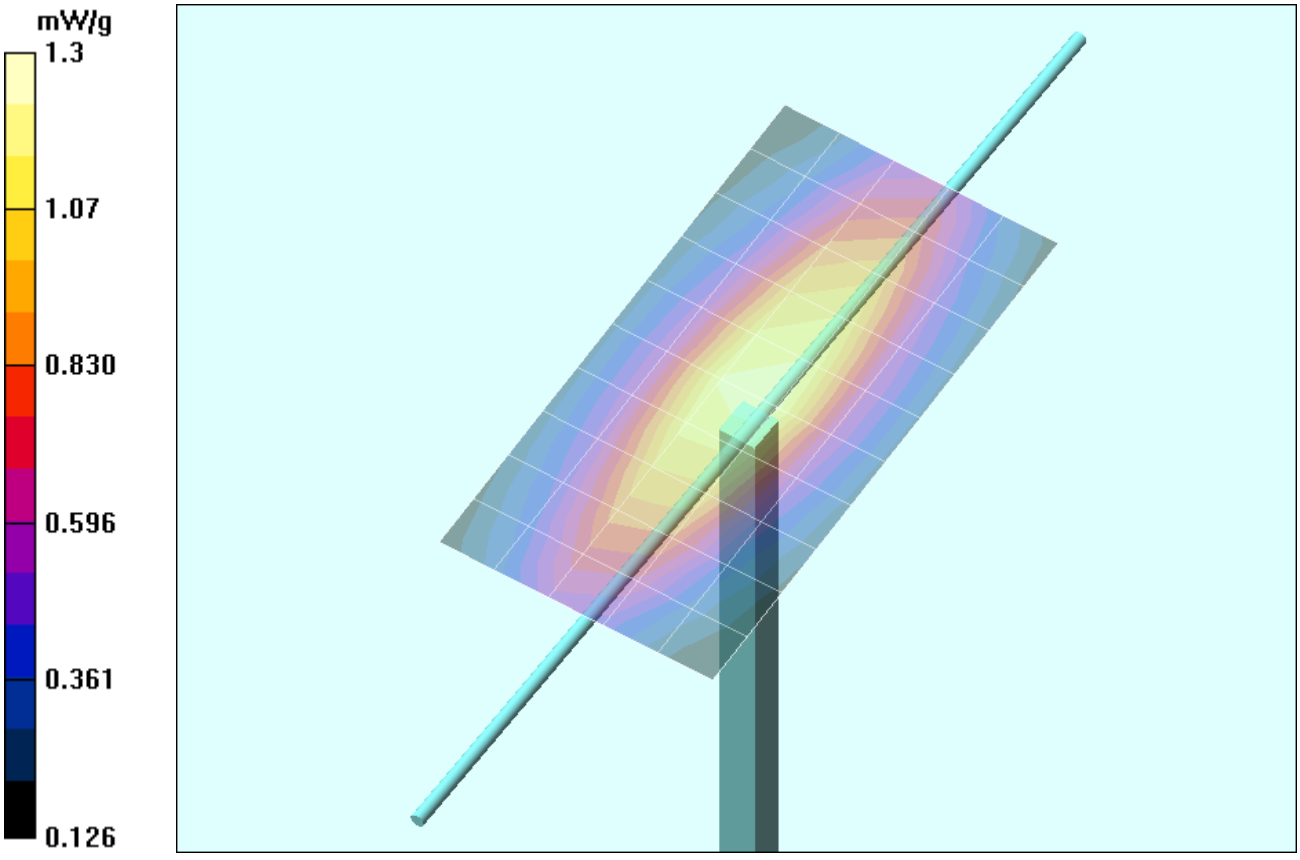
Ambient Temp: 23.0 °C; Fluid Temp: 23.3 °C; Barometric Pressure: 102.8 kPa; Humidity: 39%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 450 MHz; Duty Cycle: 1:1
Medium: HSL450 (σ = 0.85 mho/m; ε_r = 42.8; ρ = 1000 kg/m^3)

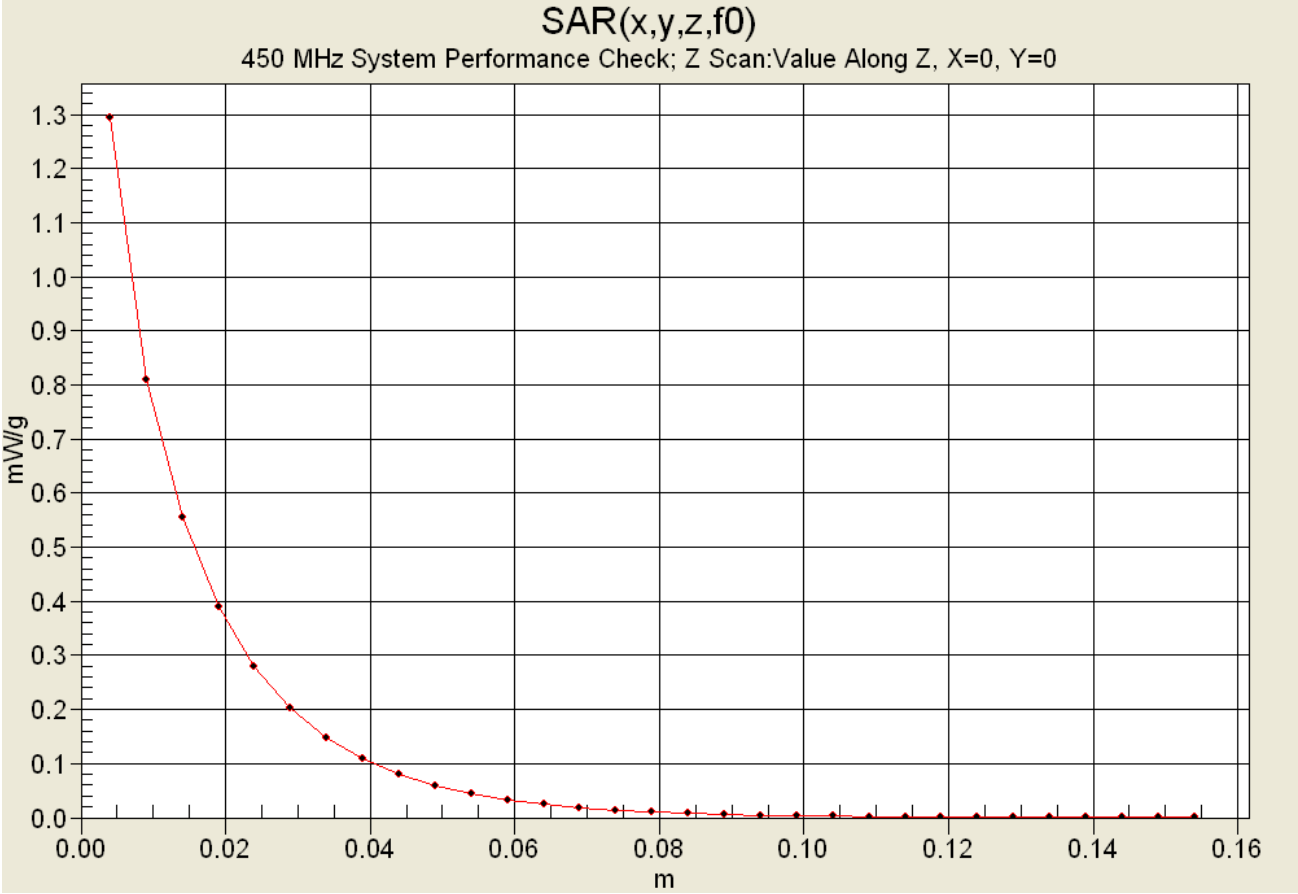
- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

450 MHz System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

450 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 39.3 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 2.1 W/kg
SAR(1 g) = 1.22 mW/g; SAR(10 g) = 0.791 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
450 MHz System Performance Check; Z Scan:Value Along Z, X=0, Y=0
mW/g
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date Tested: 09/23/04

System Performance Check - 450 MHz Dipole

DUT: Dipole 450 MHz; Model: D450V2; Type: System Performance Check; Serial: 136; Calibrated: 11/04//2003

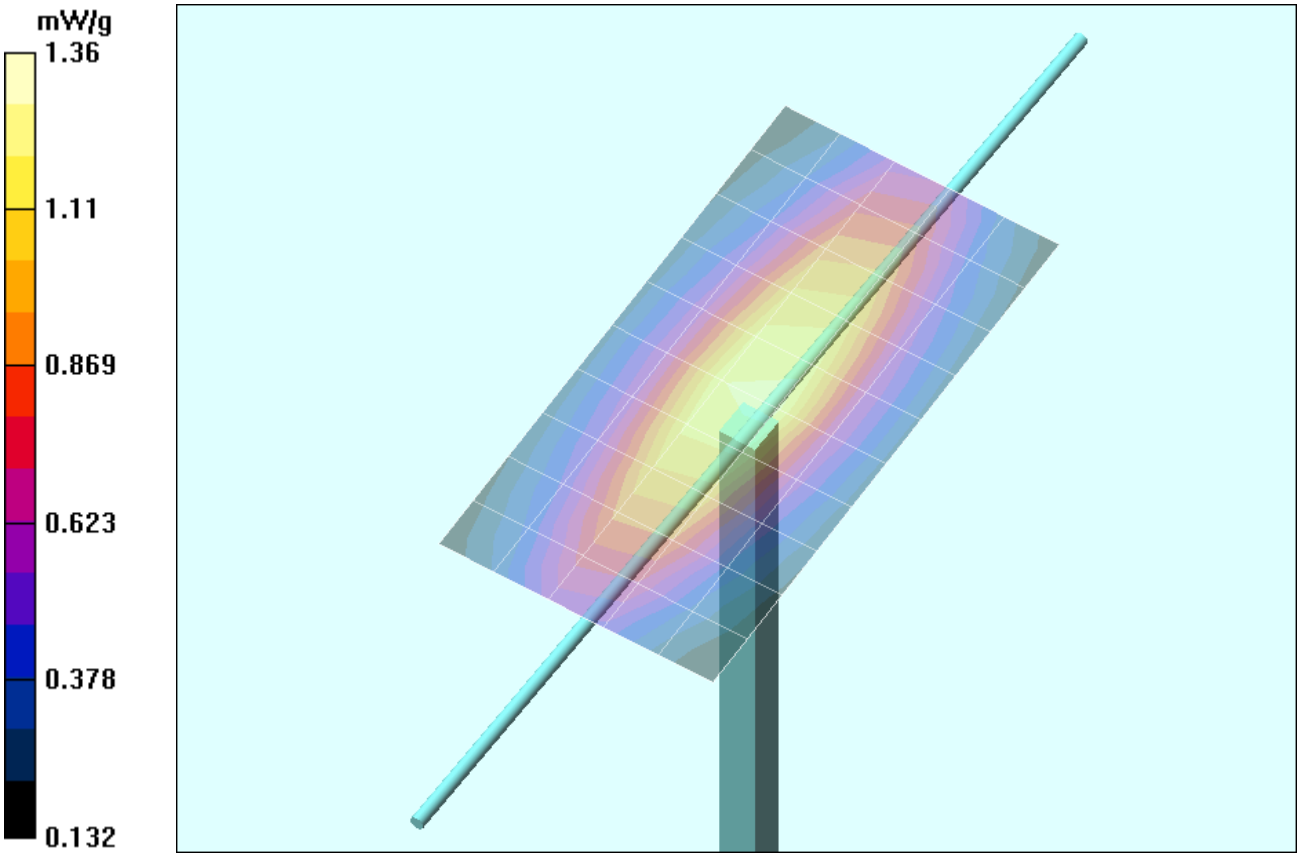
Ambient Temp: 23.1 °C; Fluid Temp: 23.2 °C; Barometric Pressure: 102.7 kPa; Humidity: 38%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 450 MHz; Duty Cycle: 1:1
Medium: HSL450 (σ = 0.88 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

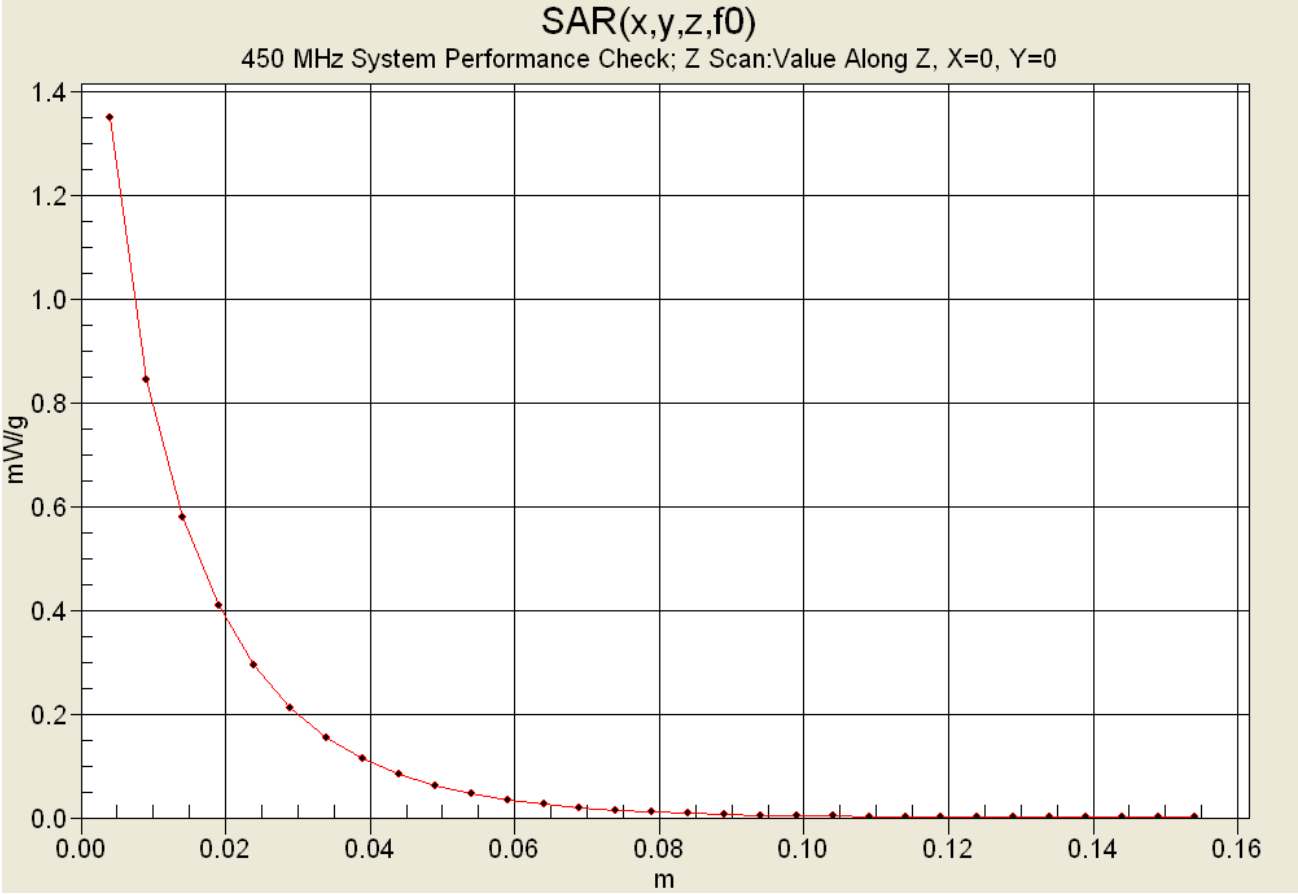
- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 16; Postprocessing SW: SEMCAD, V1.8 Build 123

450 MHz System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

450 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 39.3 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 2.2 W/kg
SAR(1 g) = 1.28 mW/g; SAR(10 g) = 0.827 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
450 MHz System Performance Check; Z Scan:Value Along Z, X=0, Y=0
mW/g
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date Tested: 10/07/04

System Performance Check - 450 MHz Dipole

DUT: Dipole 450 MHz; Model: D450V2; Type: System Performance Check; Serial: 136; Calibrated: 11/04/2003

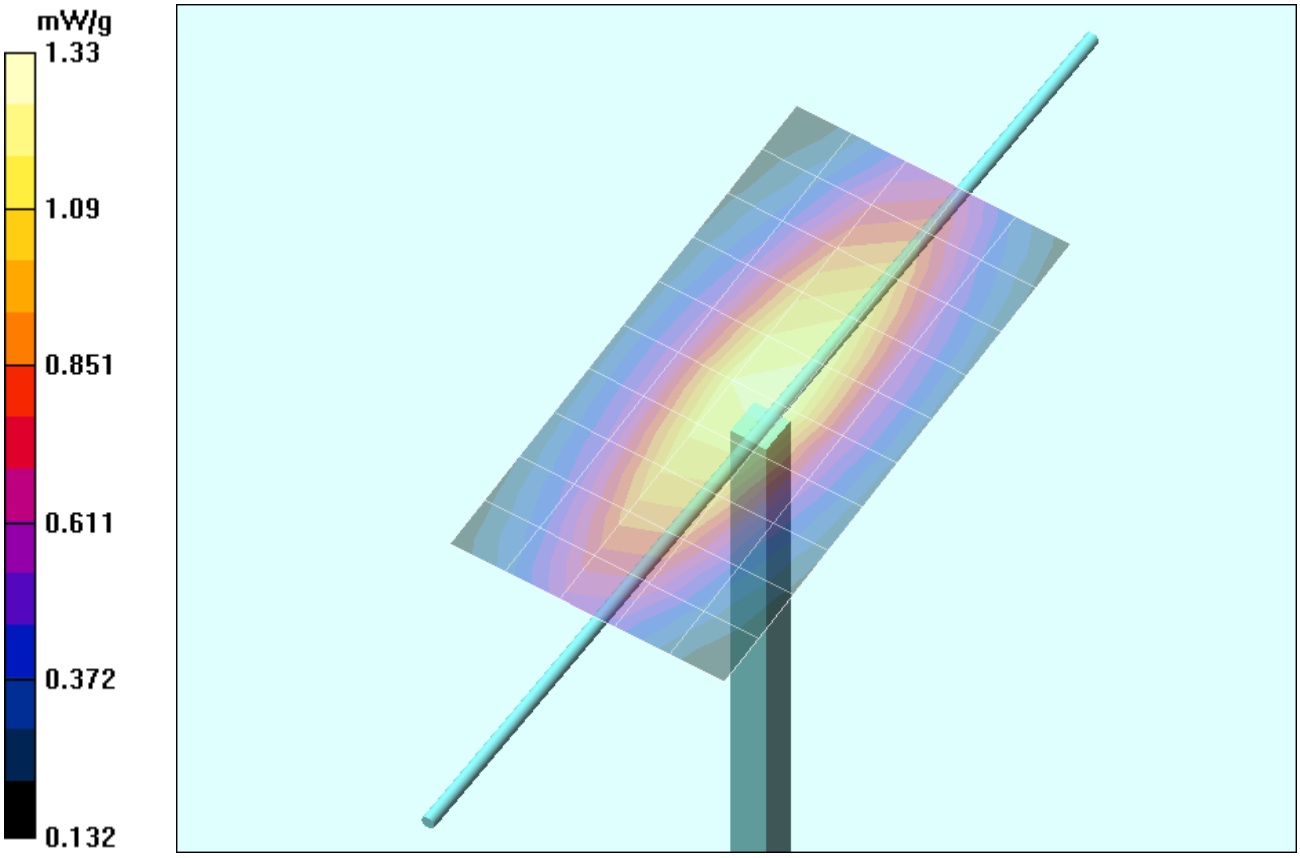
Ambient Temp: 23.0 °C; Fluid Temp: 22.3 °C; Barometric Pressure: 102.9 kPa; Humidity: 32%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 450 MHz; Duty Cycle: 1:1
Medium: HSL450 (σ = 0.84 mho/m; ε_r = 42.2; ρ = 1000 kg/m^3)

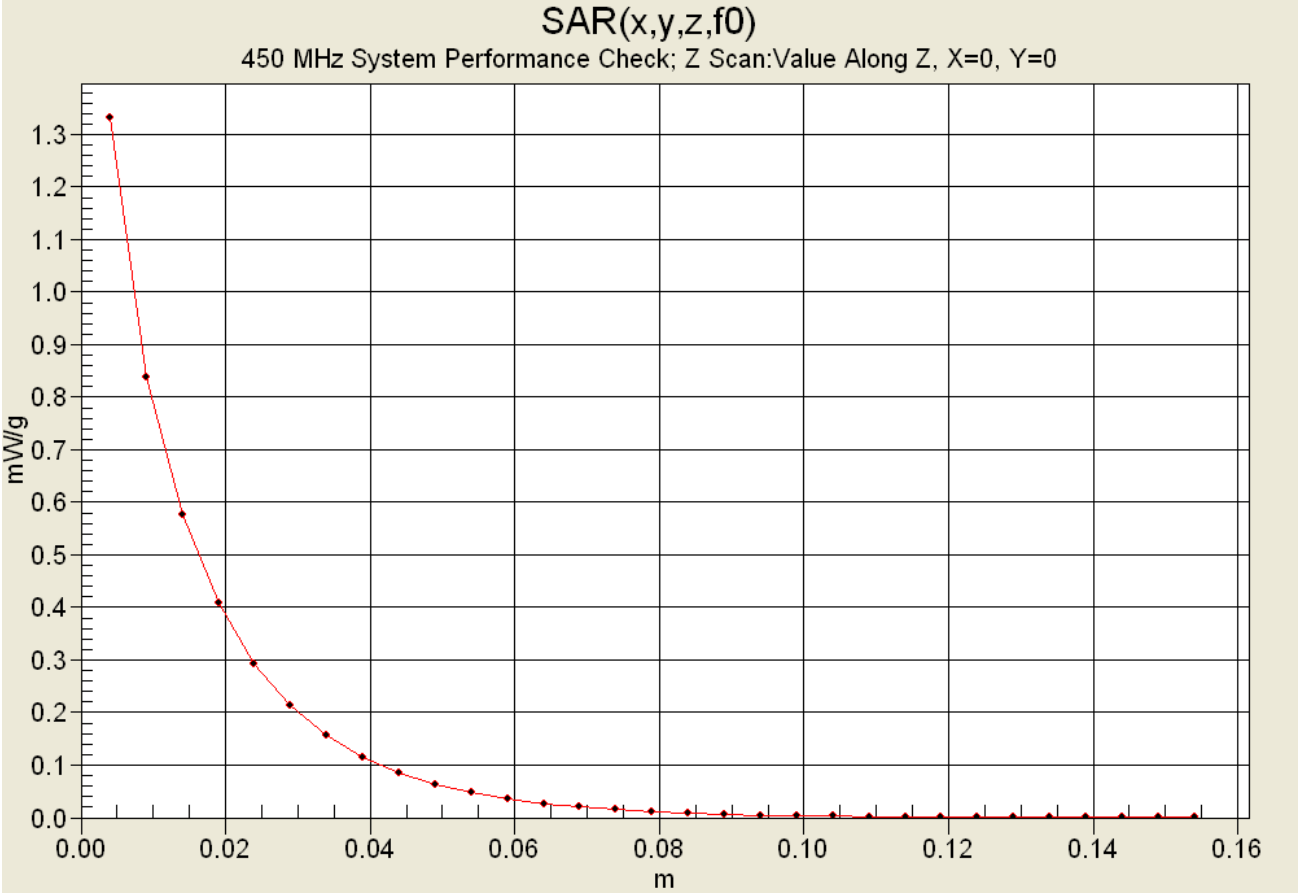
- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

450 MHz System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

450 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 39.9 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 2.13 W/kg
SAR(1 g) = 1.25 mW/g; SAR(10 g) = 0.812 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
450 MHz System Performance Check; Z Scan:Value Along Z, X=0, Y=0
mW/g
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date Tested: 10/19/04

System Performance Check - 450 MHz Dipole

DUT: Dipole 450 MHz; Model: D450V2; Type: System Performance Check; Serial: 136; Calibrated: 11/04/2003

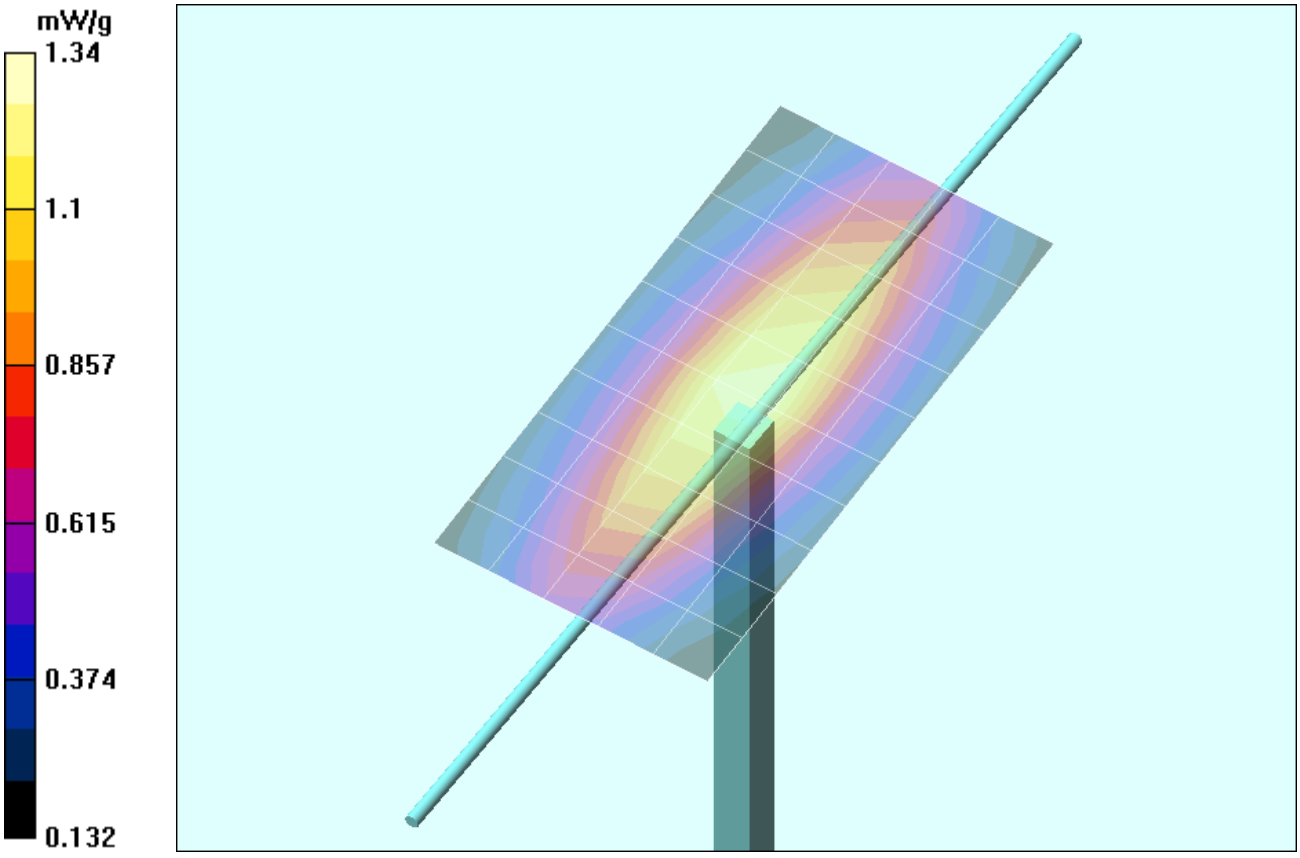
Ambient Temp: 23.6 °C; Fluid Temp: 22.8 °C; Barometric Pressure: 101.1 kPa; Humidity: 32%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 450 MHz; Duty Cycle: 1:1
Medium: HSL450 (σ = 0.85 mho/m; ε_r = 43.0; ρ = 1000 kg/m^3)

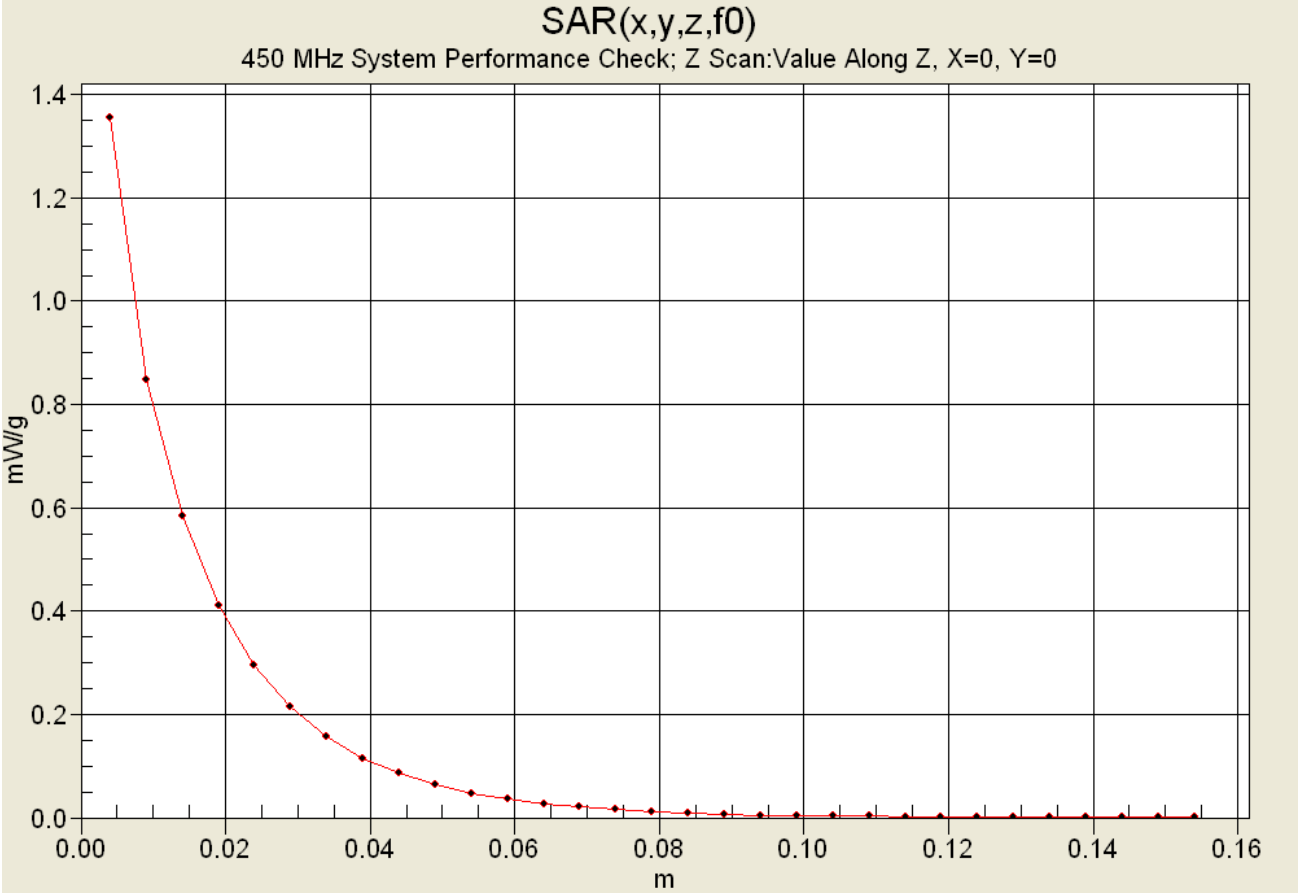
- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

450 MHz System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

450 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 39.7 V/m; Power Drift = -0.0 dB
Peak SAR (extrapolated) = 2.15 W/kg
SAR(1 g) = 1.27 mW/g; SAR(10 g) = 0.822 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
450 MHz System Performance Check; Z Scan:Value Along Z, X=0, Y=0
mW/g
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

Date Tested: 10/20/04

System Performance Check - 450 MHz Dipole

DUT: Dipole 450 MHz; Model: D450V2; Type: System Performance Check; Serial: 136; Calibrated: 11/04/2003

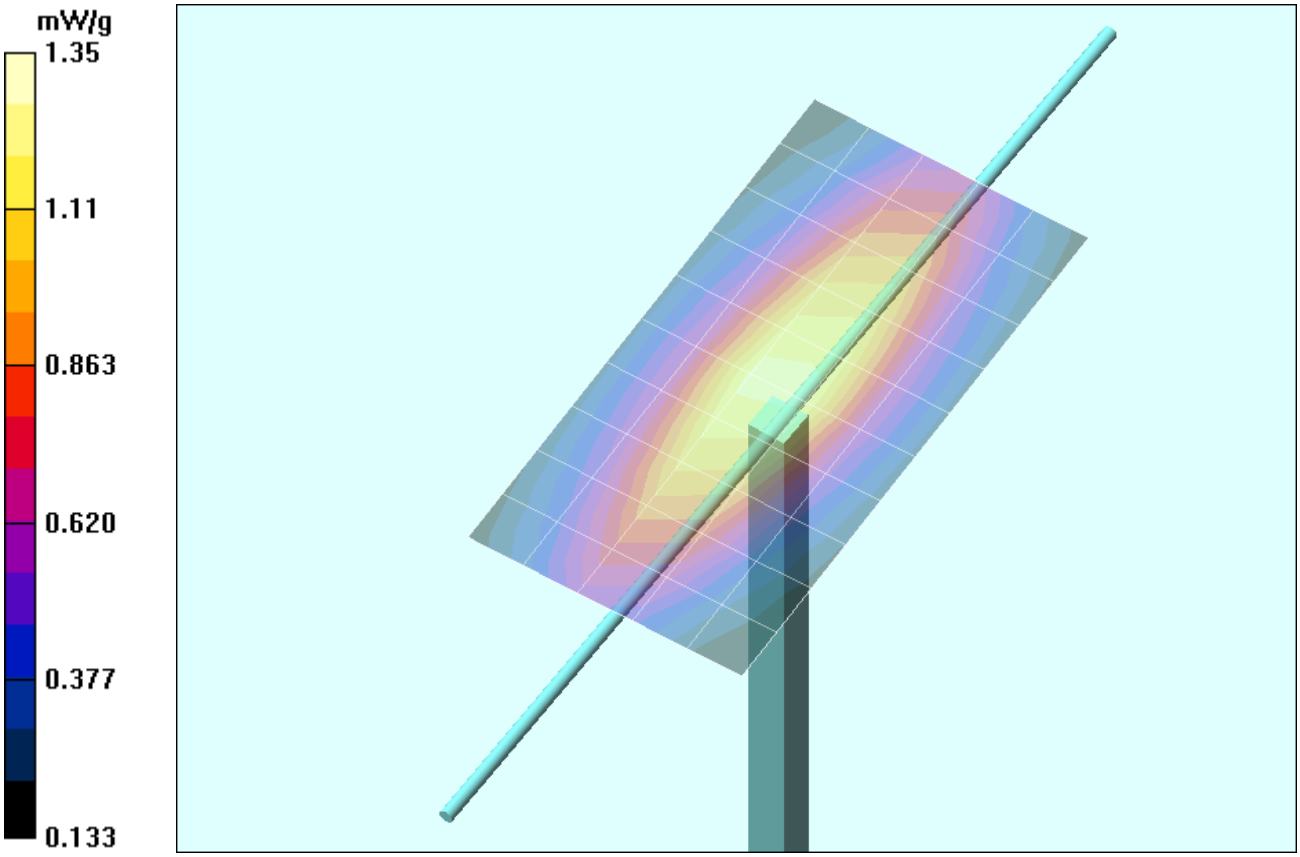
Ambient Temp: 23.6 °C; Fluid Temp: 22.9 °C; Barometric Pressure: 101.6 kPa; Humidity: 36%

Communication System: CW
Forward Conducted Power: 250mW
Frequency: 450 MHz; Duty Cycle: 1:1
Medium: HSL450 (σ = 0.87 mho/m; ε_r = 44.0; ρ = 1000 kg/m^3)

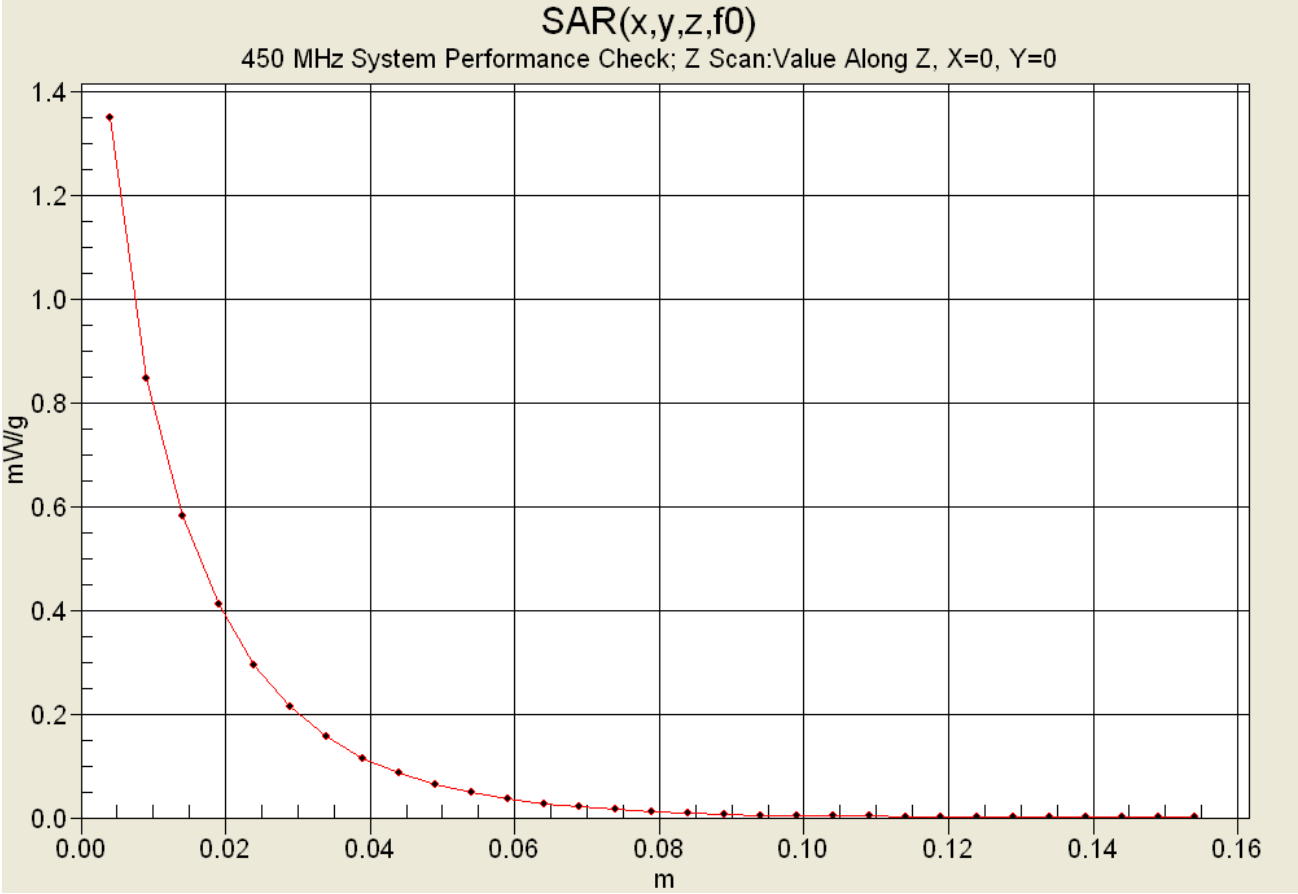
- Probe: ET3DV6 - SN1590; ConvF(7.5, 7.5, 7.5); Calibrated: 24/05/2004
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 14/05/2004
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.3 Build 22; Postprocessing SW: SEMCAD, V1.8 Build 127

450 MHz System Performance Check/Area Scan (6x11x1):
Measurement grid: dx=15mm, dy=15mm

450 MHz System Performance Check/Zoom Scan (7x7x7)/Cube 0:
Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 39.6 V/m; Power Drift = -0.1 dB
Peak SAR (extrapolated) = 2.17 W/kg
SAR(1 g) = 1.27 mW/g; SAR(10 g) = 0.824 mW/g



Z-Axis Scan


SAR(x,y,z,f0)
450 MHz System Performance Check; Z Scan:Value Along Z, X=0, Y=0
mW/g
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.16
m

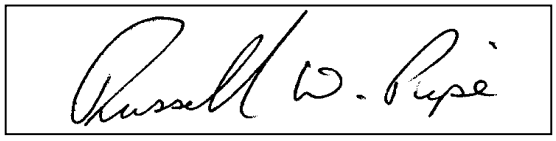
APPENDIX C - SYSTEM VALIDATION

450MHz SYSTEM VALIDATION DIPOLE

Type:	**450MHz Validation Dipole**
Serial Number:	**136**
Place of Calibration:	**Celltech Labs Inc.**
Date of Calibration:	**November 4, 2003**

Celltech Labs Inc. hereby certifies that this device has been calibrated on the date indicated above.

Calibrated by:

Approved by: 

Celltech Labs Inc. 1955 Moss Court, Kelowna, B.C. Canada V1Y 9L3
Tel. 250-448-7047 • Fax. 250-448-7046 • e-mail: info@celltechlabs.com
www.celltechlabs.com

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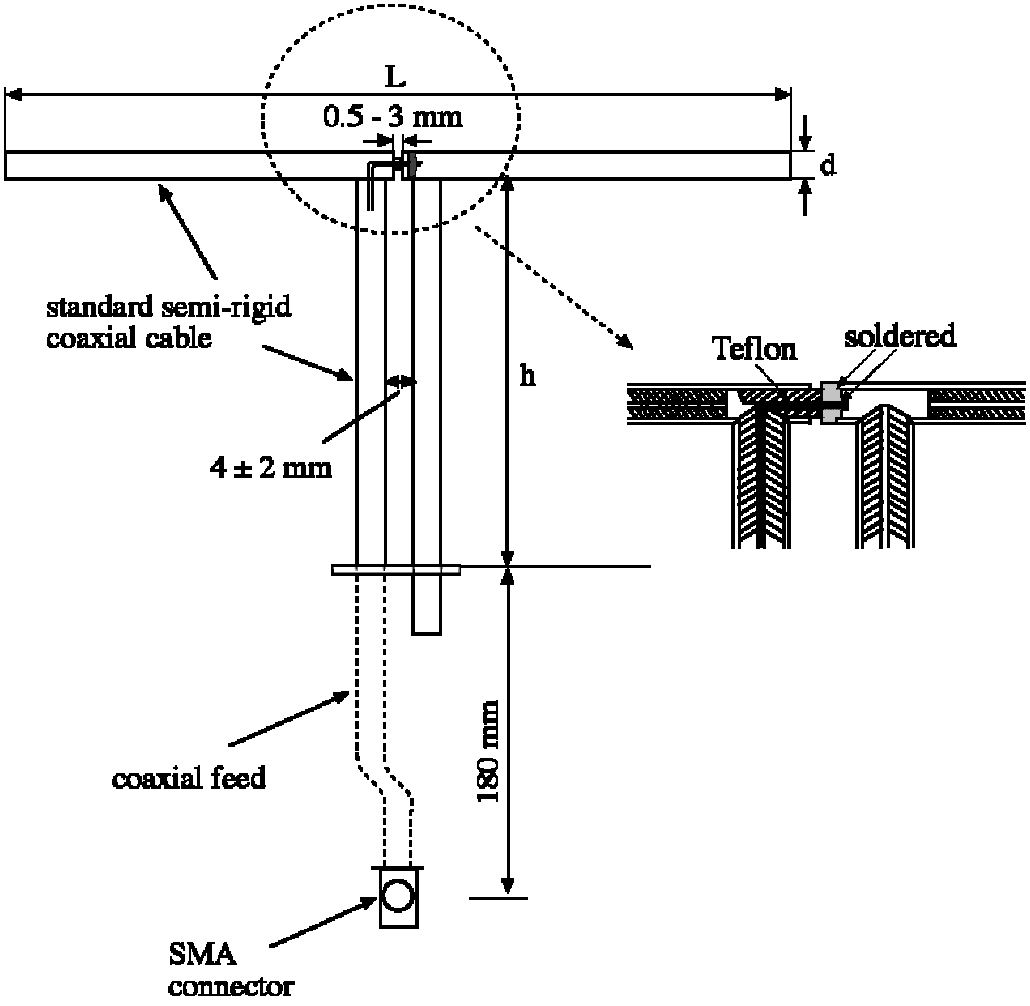
1. Dipole Construction & Electrical Characteristics

The validation dipole was constructed in accordance with the IEEE Std "Recommended Practice for Determining the Spatial-Peak Specific Absorption Rate (SAR) in the Human Body Due to Wireless Communications Devices: Experimental Techniques". The electrical properties were measured using an HP 8753E Network Analyzer. The network analyzer was calibrated to the validation dipole N-type connector feed point using an HP85032E Type N calibration kit. The dipole was placed parallel to a planar phantom at a separation distance of 15.0mm from the simulating fluid using a loss-less dielectric spacer. The measured input impedance is:

Feed point impedance at 450MHz	Re{Z} = 49.982Ω
	Im{Z} = 7.2324Ω
Return Loss at 450MHz	-22.597dB



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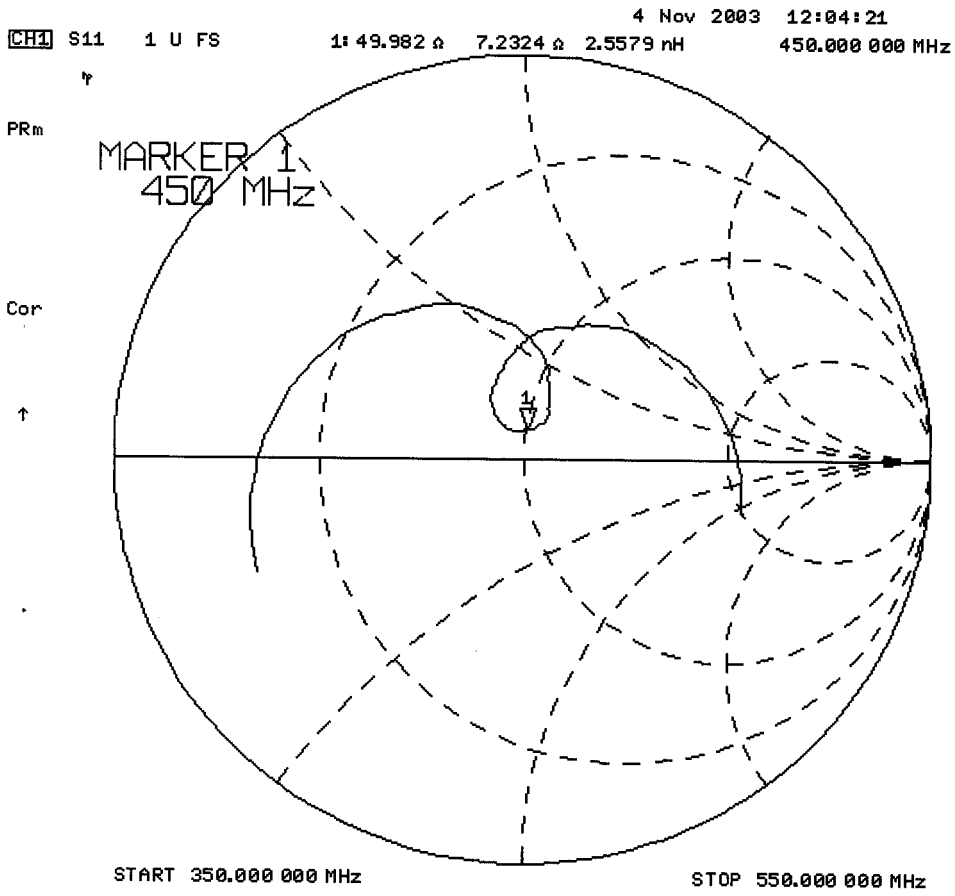
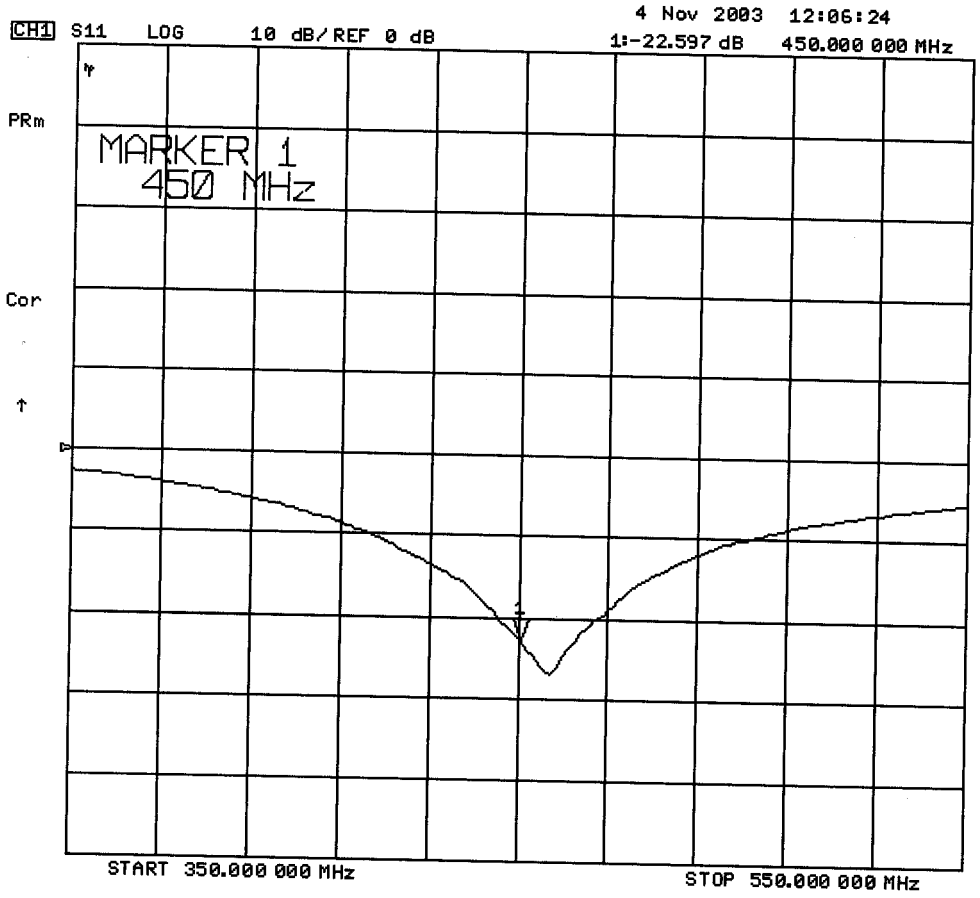

4 Nov 2003 12:04:21
CH1 S11 1 U FS
1: 49.982 Ω 7.2324 Ω 2.5579 nH
450.000 000 MHz
PRm
MARKER 1
450 MHz
Cor
START 350.000 000 MHz
STOP 550.000 000 MHz


CH1 S11 LOG 10 dB/ REF 0 dB
4 Nov 2003 12:06:24
1:-22.597 dB 450.000 000 MHz
PRm
MARKER 1
450 MHz
Cor
START 350.000 000 MHz
STOP 550.000 000 MHz

2. Validation Dipole Dimensions

Frequency (MHz)	L (mm)	h (mm)	d (mm)
300	420.0	250.0	6.2
450	288.0	167.0	6.2
835	161.0	89.8	3.6
900	149.0	83.3	3.6
1450	89.1	51.7	3.6
1800	72.0	41.7	3.6
1900	68.0	39.5	3.6
2000	64.5	37.5	3.6
2450	51.8	30.6	3.6
3000	41.5	25.0	3.6

3. Validation Phantom

The validation phantom was constructed using relatively low-loss tangent Plexiglas material. The inner dimensions of the phantom are as follows:

Length: 83.5 cm
Width: 36.9 cm
Height: 21.8 cm

The bottom section of the validation phantom is constructed of 6.2 ± 0.1mm Plexiglas.

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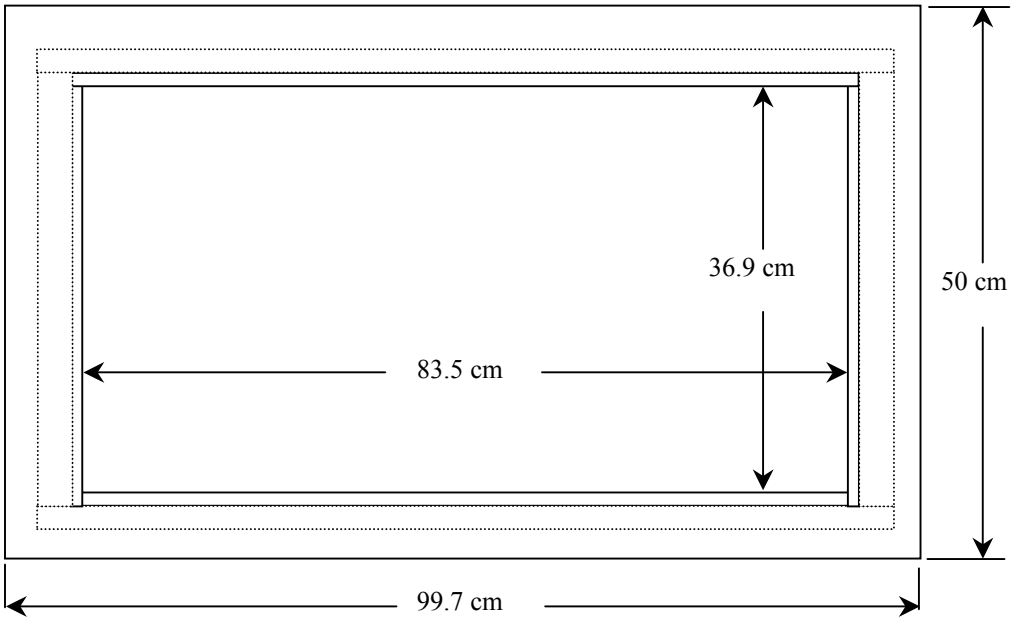
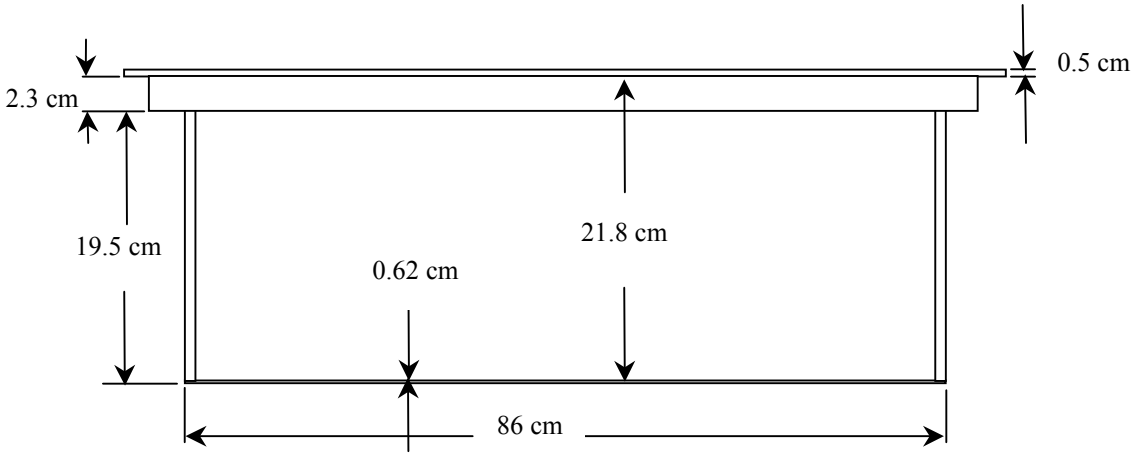
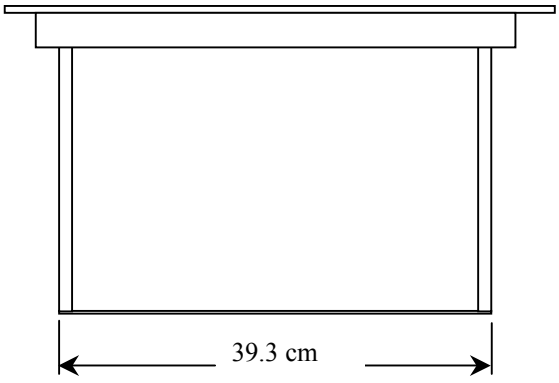
4. Dimensions of Plexiglas Planar Phantom







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5. 450MHz System Validation Setup

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450MHz System Validation Setup

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6. Measurement Conditions

The planar phantom was filled with brain simulating tissue having the following parameters at 450MHz:

Relative Permittivity:	43.7
Conductivity:	0.88 mho/m
Fluid Temperature:	22.0 °C
Fluid Depth:	≥ 15.0 cm

Environmental Conditions:

Ambient Temperature:	22.1 °C
Humidity:	49 %
Barometric Pressure:	102.8 kPa

The 450MHz simulated brain tissue mixture consists of the following ingredients:

Ingredient	Percentage by weight
Water	38.56%
Sugar	56.32%
Salt	3.95%
HEC	0.98%
Dowicil 75	0.19%
450MHz Target Dielectric Parameters at 22 °C	ε_r = 43.5 σ = 0.87 S/m

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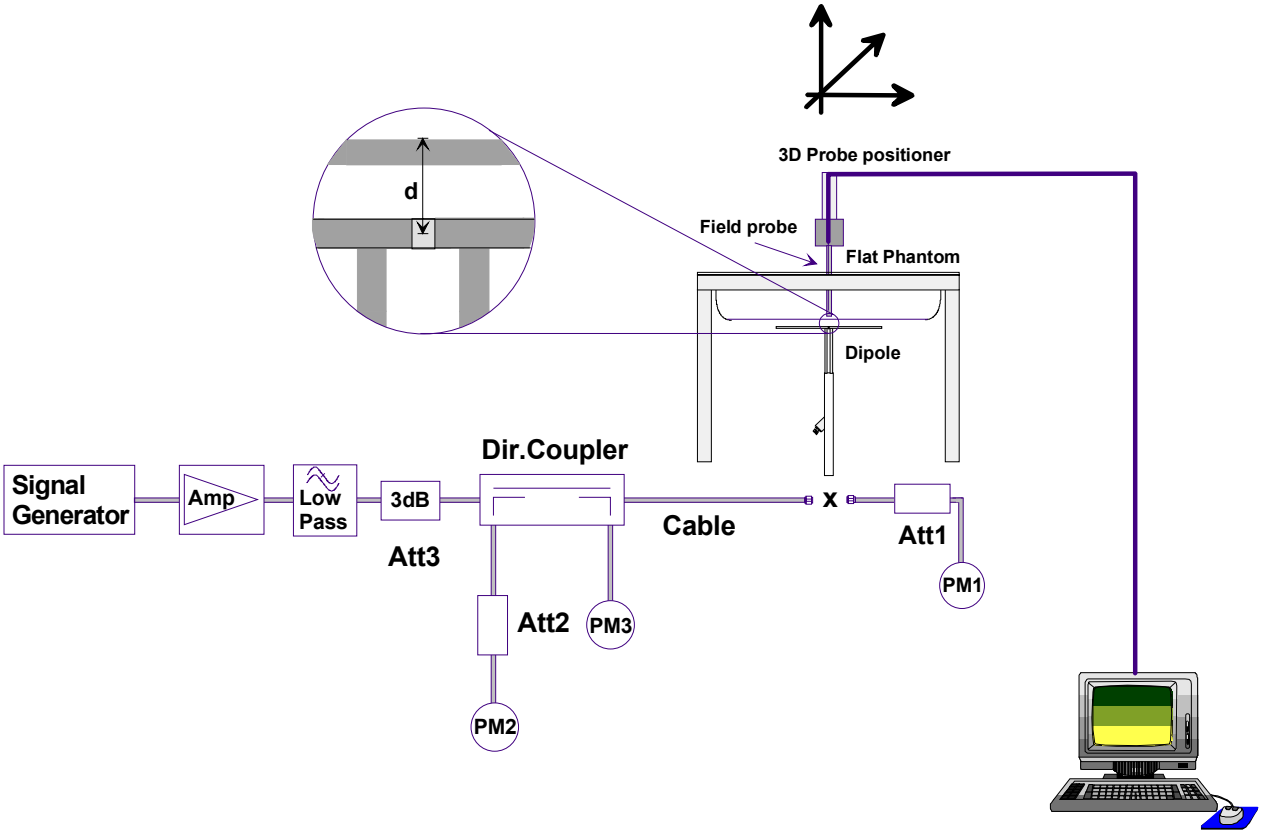
7. SAR Measurement

The SAR measurement was performed with the E-field probe in mechanical detection mode only. The setup and determination of the forward power into the dipole was performed using the following procedures.



First the power meter PM1 (including attenuator Att1) is connected to the cable to measure the forward power at the location of the dipole connector (X). The signal generator is adjusted for the desired forward power at the dipole connector (taking into account the attenuation of Att1) as read by power meter PM2. After connecting the cable to the dipole, the signal generator is readjusted for the same reading at power meter PM2. If the signal generator does not allow adjustment in 0.01dB steps, the remaining difference at PM2 must be taken into consideration. PM3 records the reflected power from the dipole to ensure that the value is not changed from the previous value. The reflected power should be 20dB below the forward power.

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8. Validation Dipole SAR Test Results

Ten SAR measurements were performed in order to achieve repeatability and to establish an average target value.

Validation Measurement	SAR @ 0.25W Input averaged over 1g	SAR @ 1W Input averaged over 1g	SAR @ 0.25W Input averaged over 10g	SAR @ 1W Input averaged over 10g	Peak SAR @ 0.25W Input
Test 1	1.29	5.16	0.810	3.24	2.28
Test 2	1.31	5.24	0.827	3.31	2.31
Test 3	1.30	5.20	0.823	3.29	2.29
Test 4	1.30	5.20	0.822	3.29	2.29
Test 5	1.29	5.16	0.819	3.28	2.28
Test 6	1.30	5.20	0.826	3.30	2.28
Test 7	1.31	5.24	0.826	3.30	2.30
Test 8	1.31	5.24	0.829	3.32	2.30
Test 9	1.30	5.20	0.822	3.29	2.28
Test 10	1.31	5.24	0.822	3.29	2.33
Average Value	1.30	5.21	0.823	3.29	2.29

The results have been normalized to 1W (forward power) into the dipole.

IEEE Target over $1cm^3$ (1g) of tissue: 1.23 mW/g (+/- 10%)

Averaged over 1cm (1g) of tissue: 5.21 mW/g

Averaged over 10cm (10g) of tissue: 3.29 mW/g

Test Date: 11/04/03

DUT: Dipole 450MHz; Model: D450V2; Type: System Performance Check; Serial: 136

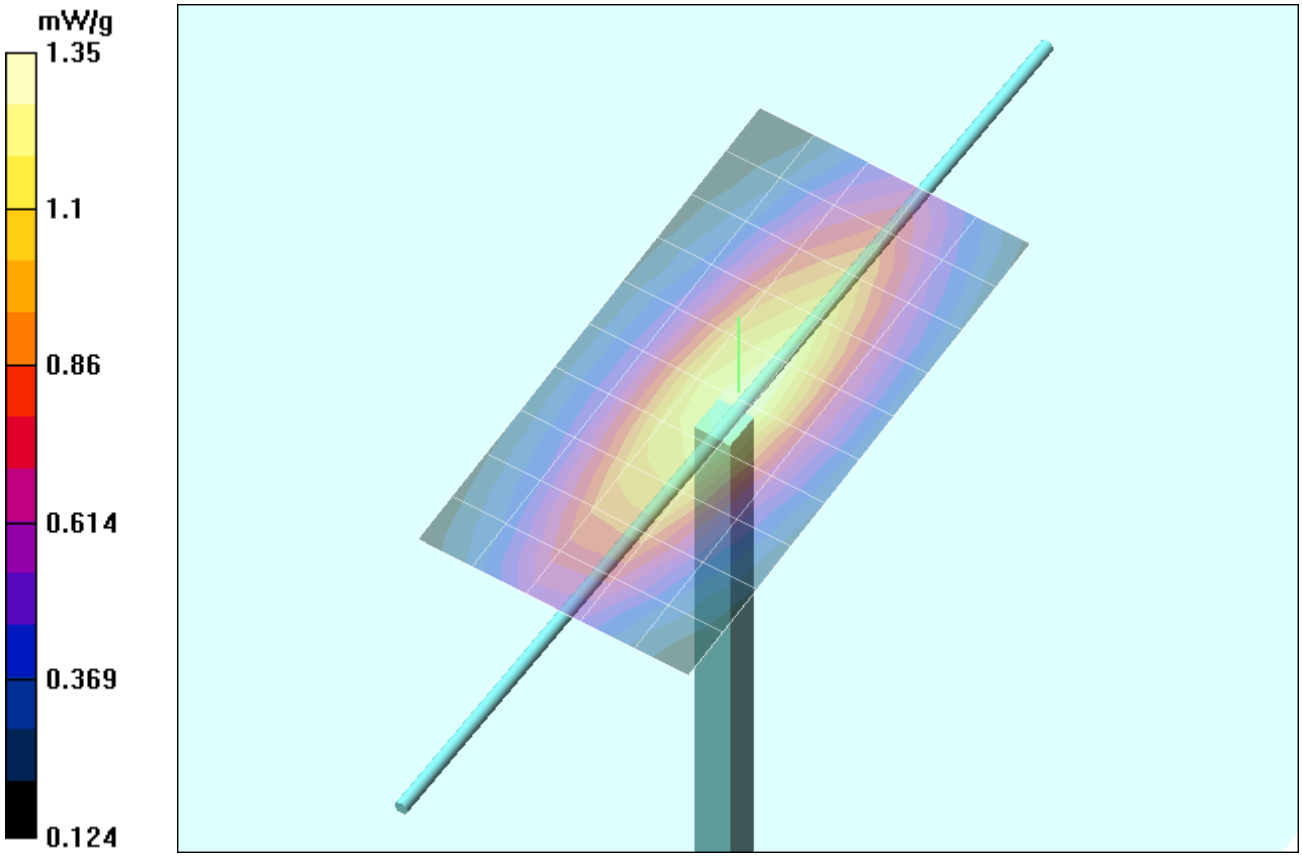
Ambient Temp: 22.1°C; Fluid Temp: 22.0°C; Barometric Pressure: 102.8 kPa; Humidity: 49%

Communication System: CW
Forward Conducted Power: 250 mW
Frequency: 450 MHz; Duty Cycle: 1:1
Medium: HSL450 (σ = 0.88 mho/m, ε_r = 43.7, ρ = 1000 kg/m^3)

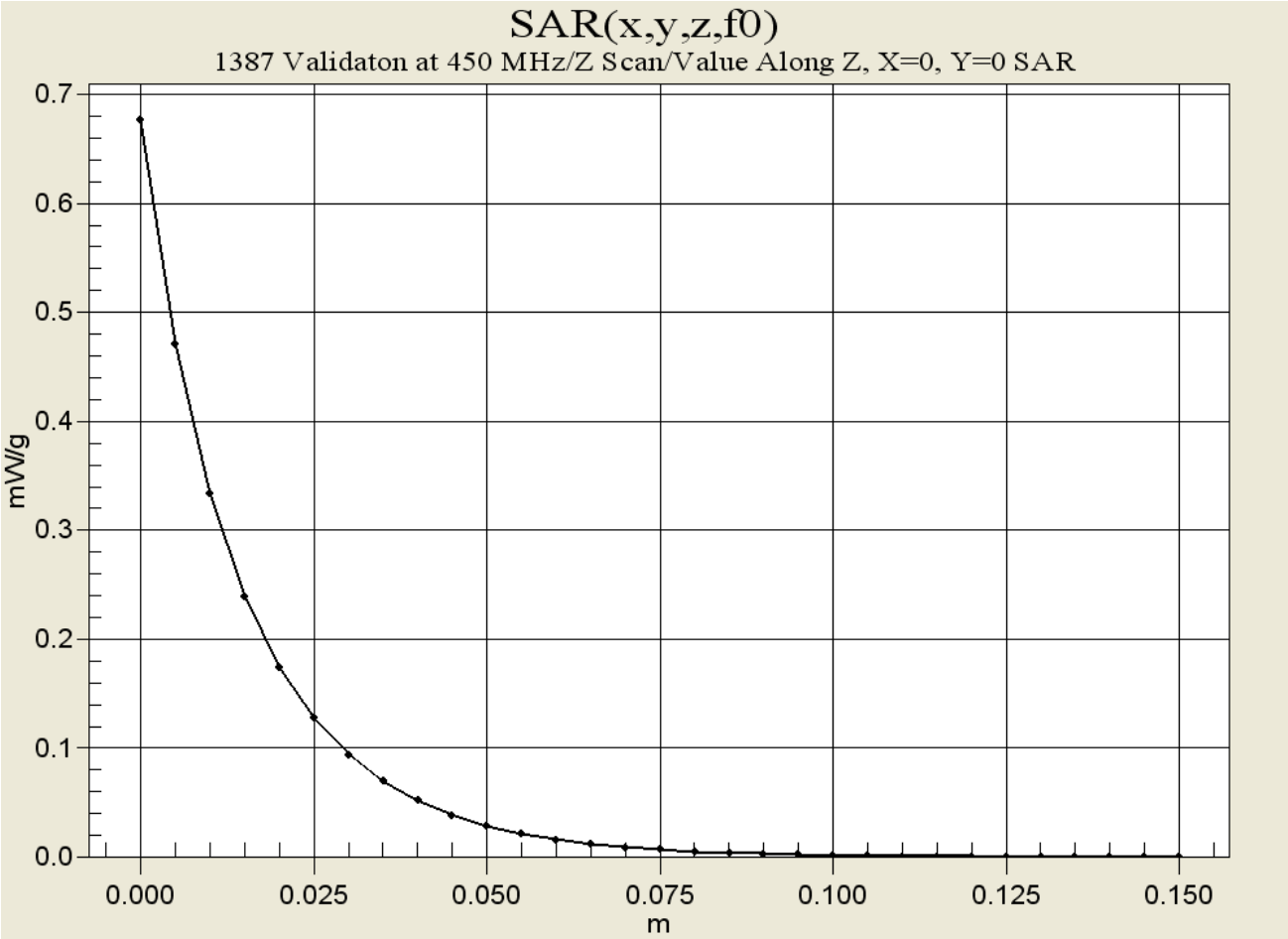
- Probe: ET3DV6 - SN1387; ConvF(7.5, 7.5, 7.5); Calibrated: 26/02/2003
- Sensor-Surface: 4mm (Mechanical Surface Detection)
- Electronics: DAE3 Sn370; Calibrated: 19/05/2003
- Phantom: Validation Planar; Type: Plexiglas; Serial: 137
- Measurement SW: DASY4, V4.1 Build 47; Postprocessing SW: SEMCAD, V1.6 Build 116

450 MHz Validation/Area Scan (6x11x1): Measurement grid: dx=15mm, dy=15mm
Reference Value = 39 V/m
Power Drift = -0.08 dB
Maximum value of SAR = 1.3 mW/g

450 MHz Validation/Zoom Scan 8 (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Peak SAR (extrapolated) = 2.28 W/kg
SAR(1 g) = 1.3 mW/g; SAR(10 g) = 0.822 mW/g
Reference Value = 39 V/m
Power Drift = 0.08 dB



2003 Celltech Labs Inc.



2003 Celltech Labs Inc.

450MHz System Validation

Measured Fluid Dielectric Parameters (Brain)

November 04, 2003

Frequency	e'	e"
350.000000 MHz	46.2660	40.8224
360.000000 MHz	45.9937	40.0986
370.000000 MHz	45.7556	39.4543
380.000000 MHz	45.5625	38.7387
390.000000 MHz	45.2820	38.1140
400.000000 MHz	45.0146	37.4981
410.000000 MHz	44.7508	36.9734
420.000000 MHz	44.5046	36.4917
430.000000 MHz	44.2494	35.9460
440.000000 MHz	43.9621	35.5647
450.000000 MHz	43.7384	35.2106
460.000000 MHz	43.5513	34.7930
470.000000 MHz	43.2846	34.3970
480.000000 MHz	43.0654	33.9576
490.000000 MHz	42.8566	33.6391
500.000000 MHz	42.6744	33.2270
510.000000 MHz	42.5036	32.8459
520.000000 MHz	42.3492	32.5261
530.000000 MHz	42.1783	32.1727
540.000000 MHz	41.9985	31.7385
550.000000 MHz	41.8097	31.4862

APPENDIX D - PROBE CALIBRATION

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

Client **Celltech Labs**

CALIBRATION CERTIFICATE

Object(s)	ET3DV6 - SN:1590
Calibration procedure(s)	QA CAL-01.v2 Calibration procedure for dosimetric E-field probes
Calibration date:	May 24, 2004
Condition of the calibrated item	In Tolerance (according to the specific calibration document)

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: environ ment temperature 22 +/- 2 degrees Celsius and humidity < 75%.

Calibration Equipment used (M&TE critical for calibration)

Model Type	ID #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter EPM E4419B	GB41293874	5-May-04 (METAS, No 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No 251-00388)	May-05
Reference 20 dB Attenuator	SN: 5086 (20b)	3-May-04 (METAS, No 251-00389)	May-05
Fluke Process Calibrator Type 702	SN: 6295803	8-Sep-03 (Sintrel SCS No. E-030020)	Sep-04
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8684C	US3642U01700	4-Aug-99 (SPEAG, in house check Aug-02)	In house check: Aug-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Oct-03)	In house check: Oct 05

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Technician	
Approved by:	Katja Pokovic	Laboratory Director	

Date issued: May 24, 2004

This calibration certificate is issued as an intermediate solution until the accreditation process (based on ISO/IEC 17025 International Standard) for Calibration Laboratory of Schmid & Partner Engineering AG is completed.

Probe ET3DV6

SN:1590

Manufactured:	March 19, 2001
Last calibrated:	May 15, 2003
Recalibrated:	May 24, 2004

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

DASY - Parameters of Probe: ET3DV6 SN:1590

Sensitivity in Free Space

Diode Compression[A]

NormX	**1.85** $\mu V/(V/m)^2$	DCP X	**91**	mV
NormY	**2.01** $\mu V/(V/m)^2$	DCP Y	**91**	mV
NormZ	**1.73** $\mu V/(V/m)^2$	DCP Z	**91**	mV

Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Plese see Page 7.

Boundary Effect

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

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	8.0	4.4
SAR_{be} [%]	With Correction Algorithm	0.1	0.2

Head **1800 MHz** **Typical SAR gradient: 10 % per mm**

Sensor Center to Phantom Surface Distance		**3.7 mm**	**4.7 mm**
SAR_{be} [%]	Without Correction Algorithm	12.2	8.5
SAR_{be} [%]	With Correction Algorithm	0.2	0.1

Sensor Offset

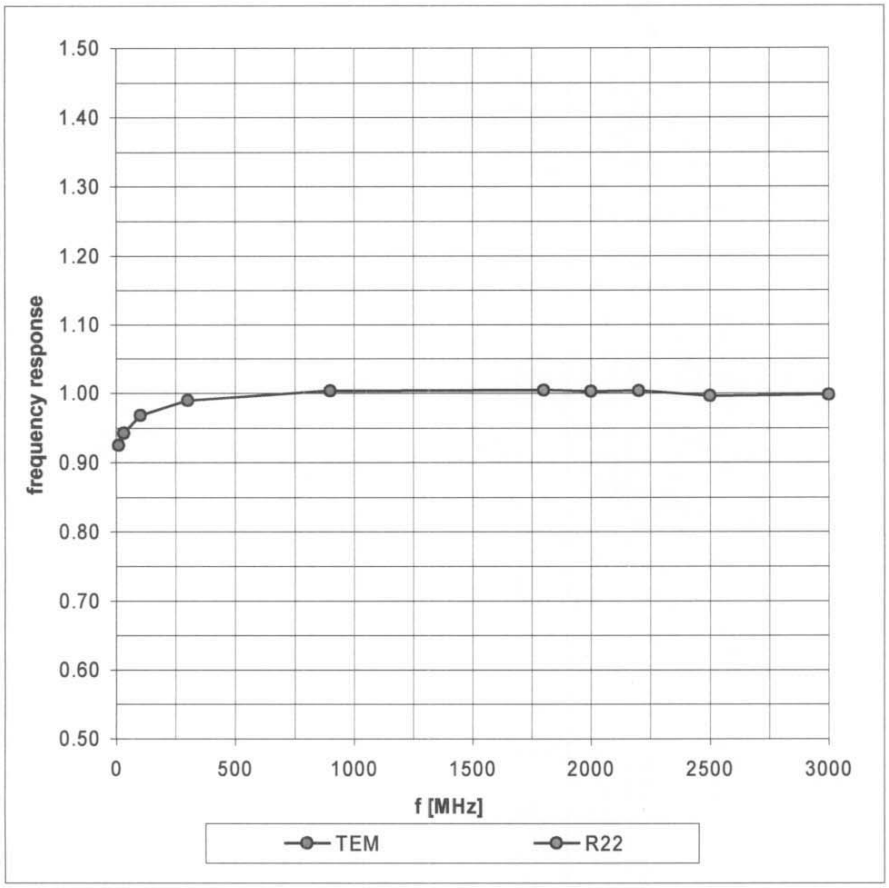
Probe Tip to Sensor Center	**2.7** mm
Optical Surface Detection	**in tolerance**

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%.

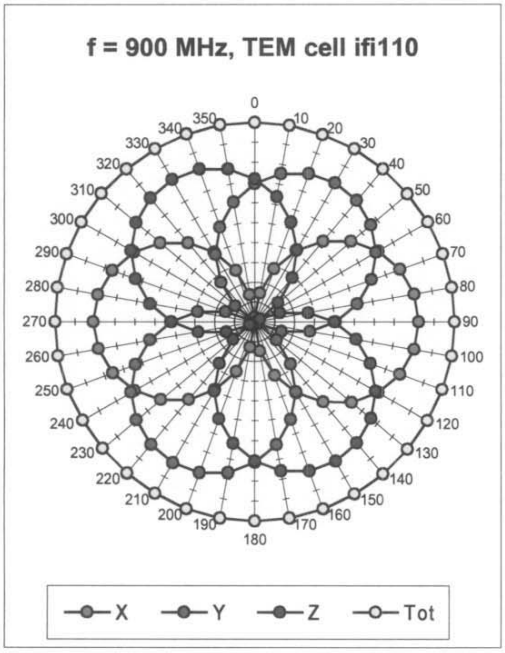
[A] numerical linearization parameter: uncertainty not required

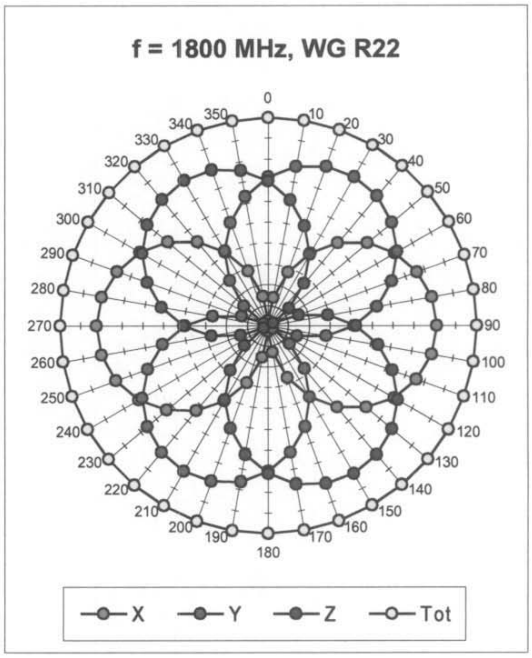
Frequency Response of E-Field

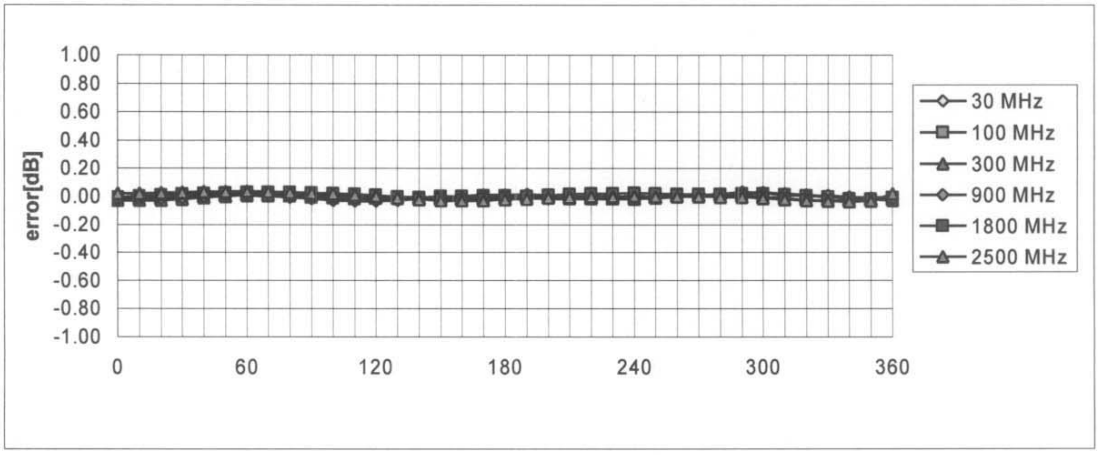
(TEM-Cell:ifi110, Waveguide R22)



Receiving Pattern (ϕ), θ = 0°



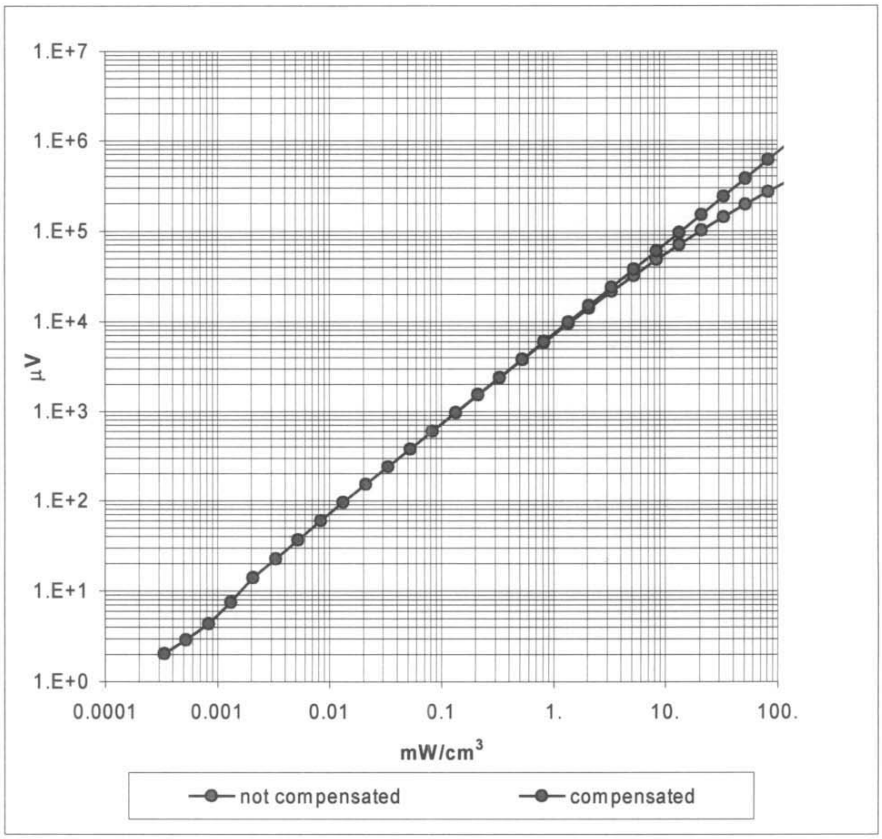


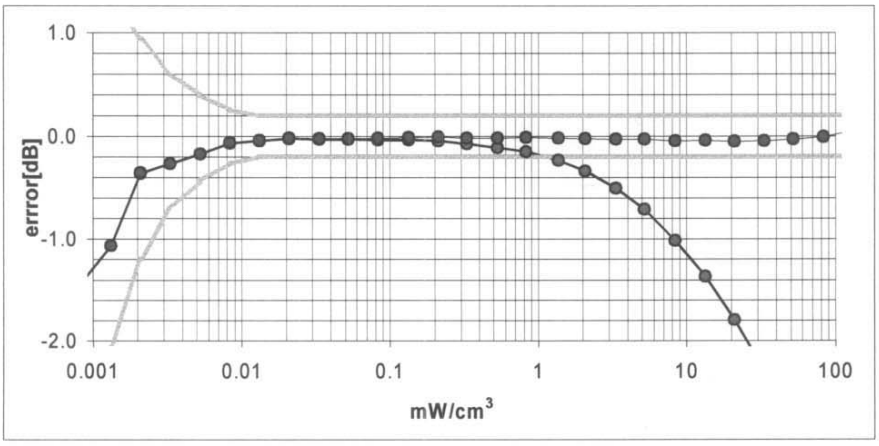


Axial Isotropy Error < ± 0.2 dB

Dynamic Range f(SAR_{head})

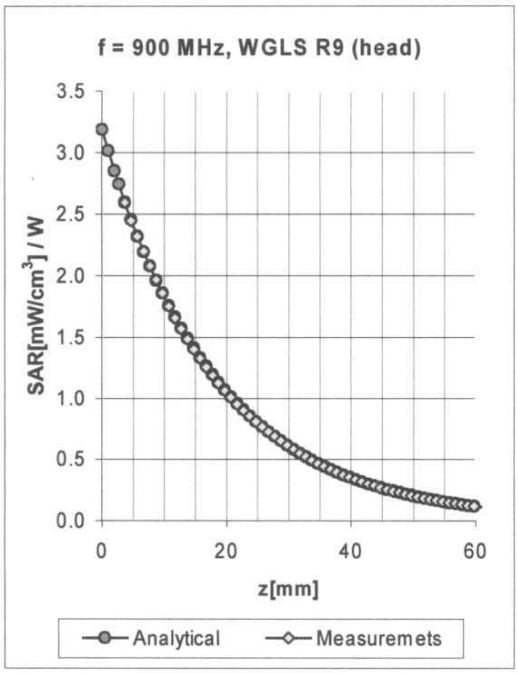
(Waveguide R22)

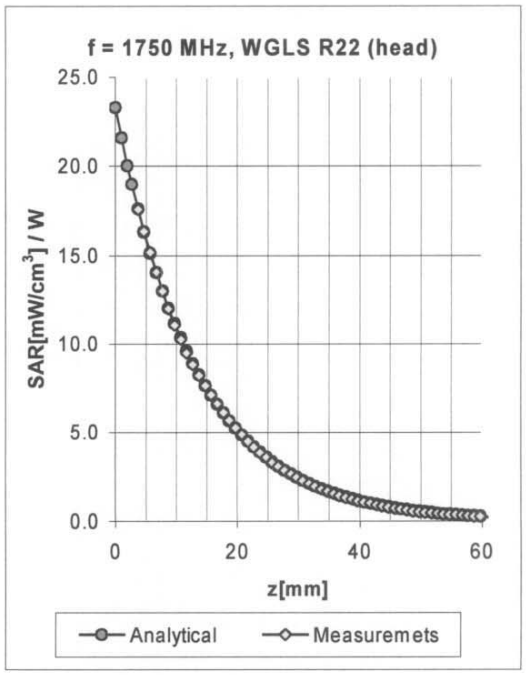




Probe Linearity Error < ± 0.2 dB

Conversion Factor Assessment



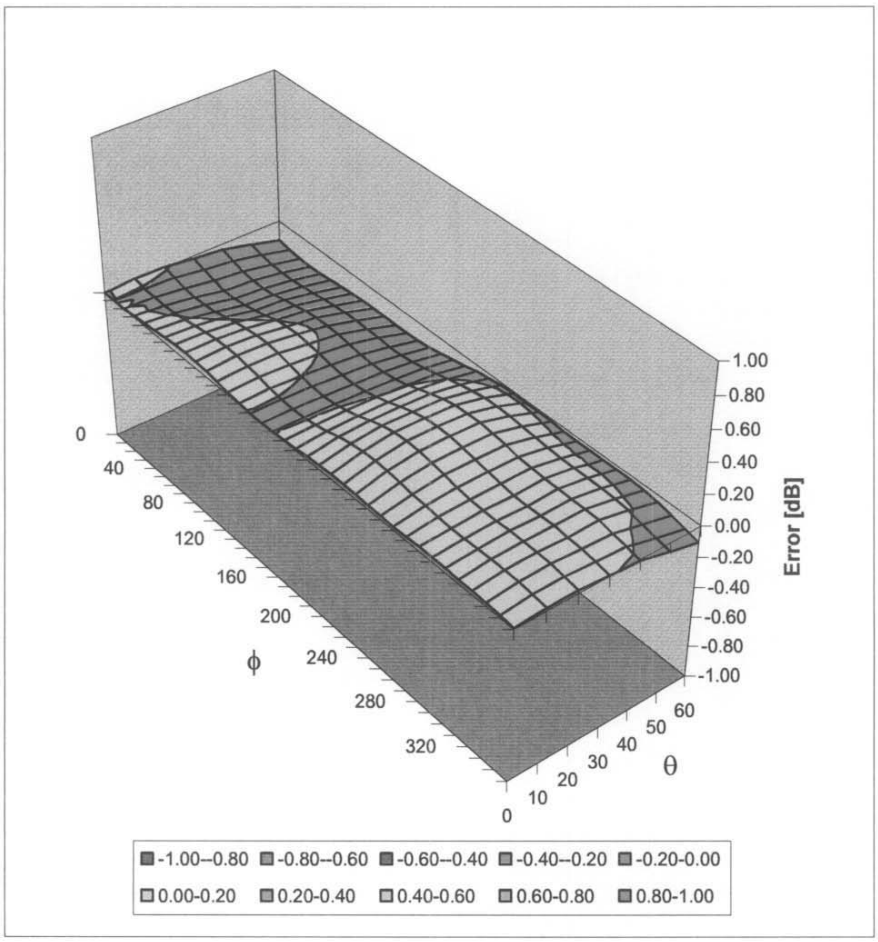


f [MHz]	Validity [MHz][B]	Tissue	Permittivity	Conductivity	Alpha	Depth	ConvF Uncertainty
835	750-950	Head	41.5 ± 5%	0.90 ± 5%	0.68	1.64	6.71 ± 11.9% (k=2)
1750	1700-1800	Head	40.0 ± 5%	1.40 ± 5%	0.43	2.67	5.28 ± 9.7% (k=2)
1900	1850-1950	Head	40.0 ± 5%	1.40 ± 5%	0.46	2.81	5.03 ± 9.7% (k=2)
2450	2400-2500	Head	39.2 ± 5%	1.80 ± 5%	0.81	1.95	4.44 ± 9.7% (k=2)
835	750-950	Body	55.2 ± 5%	0.97 ± 5%	0.49	1.99	6.54 ± 11.9% (k=2)
1750	1700-1800	Body	53.3 ± 5%	1.52 ± 5%	0.50	2.87	4.68 ± 9.7% (k=2)
1900	1850-1950	Body	53.3 ± 5%	1.52 ± 5%	0.52	2.93	4.58 ± 9.7% (k=2)
2450	2400-2500	Body	52.7 ± 5%	1.95 ± 5%	0.91	1.78	4.22 ± 9.7% (k=2)

[B] The total standard uncertainty is calculated as root-sum-square of standard uncertainty of the Conversion Factor at calibration frequency and the standard uncertainty for the indicated frequency band.

Deviation from Isotropy in HSL

Error (θ, φ), f = 900 MHz



Spherical Isotropy Error < ± 0.4 dB

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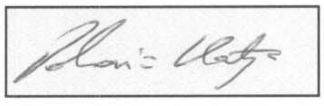
Additional Conversion Factors

for Dosimetric E-Field Probe

Type:	**ET3DV6**
Serial Number:	**1590**
Place of Assessment:	**Zurich**
Date of Assessment:	**May 25, 2004**
Probe Calibration Date:	**May 24, 2004**

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:



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Dosimetric E-Field Probe ET3DV6 SN:1590

Conversion factor (± standard deviation)

150 MHz	ConvF	**9.1 ± 8%**	ε_r = **52.3 ± 5%** σ = **0.76 ± 5% mho/m** (head tissue)
300 MHz	ConvF	**7.9 ± 8%**	ε_r = **45.3 ± 5%** σ = **0.87 ± 5% mho/m** (head tissue)
450 MHz	ConvF	**7.5 ± 8%**	ε_r = **43.5 ± 5%** σ = **0.87 ± 5% mho/m** (head tissue)
150 MHz	ConvF	**8.8 ± 8%**	ε_r = **61.9 ± 5%** σ = **0.80 ± 5% mho/m** (body tissue)
450 MHz	ConvF	**7.7 ± 8%**	ε_r = **56.7 ± 5%** σ = **0.94 ± 5% mho/m** (body tissue)

Important Note:

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

Please see also Section 4.7 of the DASY4 Manual.

APPENDIX E - MEASURED FLUID DIELECTRIC PARAMETERS

450 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

September 21, 2004

Frequency	e'	e"
350.000000 MHz	44.4969	38.5367
360.000000 MHz	44.2810	37.9108
370.000000 MHz	44.1248	37.3217
380.000000 MHz	43.9265	36.8556
390.000000 MHz	43.7048	36.2992
400.000000 MHz	43.4294	35.7364
410.000000 MHz	43.1664	35.1793
420.000000 MHz	42.9107	34.6681
430.000000 MHz	42.6862	34.1667
440.000000 MHz	42.4493	33.6521
450.000000 MHz	42.2080	33.2358
460.000000 MHz	42.0126	32.8768
470.000000 MHz	41.8200	32.5420
480.000000 MHz	41.5962	32.1824
490.000000 MHz	41.2903	31.9031
500.000000 MHz	41.0946	31.6018
510.000000 MHz	40.9163	31.2600
520.000000 MHz	40.7332	30.9487
530.000000 MHz	40.5686	30.6142
540.000000 MHz	40.3826	30.1696
550.000000 MHz	40.1688	29.8935

450 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

September 21, 2004

Frequency	e'	e"
350.000000 MHz	58.8739	44.2378
360.000000 MHz	58.6236	43.4246
370.000000 MHz	58.4830	42.5889
380.000000 MHz	58.3068	41.9117
390.000000 MHz	58.1966	41.1349
400.000000 MHz	58.0572	40.4198
410.000000 MHz	57.8757	39.6818
420.000000 MHz	57.7729	39.1146
430.000000 MHz	57.5900	38.4765
440.000000 MHz	57.4310	37.9293
450.000000 MHz	57.2892	37.3913
460.000000 MHz	57.1589	36.9756
470.000000 MHz	56.9758	36.4580
480.000000 MHz	56.8467	35.9941
490.000000 MHz	56.6443	35.5813
500.000000 MHz	56.4691	35.1783
510.000000 MHz	56.3397	34.7970
520.000000 MHz	56.1734	34.4543
530.000000 MHz	56.0124	34.1061
540.000000 MHz	55.9919	33.6384
550.000000 MHz	55.8650	33.3628

450 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

September 22, 2004

Frequency	e'	e"
350.000000 MHz	45.0931	39.5254
360.000000 MHz	44.9036	38.8205
370.000000 MHz	44.7187	38.1746
380.000000 MHz	44.6006	37.6405
390.000000 MHz	44.3848	37.2101
400.000000 MHz	44.1860	36.6738
410.000000 MHz	43.8249	36.0131
420.000000 MHz	43.5967	35.4854
430.000000 MHz	43.3450	34.8688
440.000000 MHz	43.0895	34.4241
450.000000 MHz	42.8121	34.0126
460.000000 MHz	42.6317	33.6233
470.000000 MHz	42.4143	33.2384
480.000000 MHz	42.2027	33.0014
490.000000 MHz	41.9349	32.6803
500.000000 MHz	41.6739	32.3382
510.000000 MHz	41.4786	31.9828
520.000000 MHz	41.3561	31.6290
530.000000 MHz	41.1784	31.3058
540.000000 MHz	40.9626	30.8669
550.000000 MHz	40.7818	30.5470

450 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

September 22, 2004

Frequency	e'	e"
350.000000 MHz	58.7284	43.7908
360.000000 MHz	58.6328	42.9879
370.000000 MHz	58.6133	42.2798
380.000000 MHz	58.7142	41.6831
390.000000 MHz	58.5757	41.1757
400.000000 MHz	58.3693	40.4903
410.000000 MHz	58.0773	39.6438
420.000000 MHz	57.9019	38.9366
430.000000 MHz	57.7947	38.1466
440.000000 MHz	57.6095	37.5999
450.000000 MHz	57.3780	37.0760
460.000000 MHz	57.2698	36.6516
470.000000 MHz	57.0731	36.3082
480.000000 MHz	56.8850	36.0040
490.000000 MHz	56.6704	35.7000
500.000000 MHz	56.3889	35.3272
510.000000 MHz	56.3345	34.8496
520.000000 MHz	56.3224	34.3691
530.000000 MHz	56.2180	33.9580
540.000000 MHz	56.0955	33.4585
550.000000 MHz	55.9650	33.0815

450 MHz System Performance Check & DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

September 23, 2004

Frequency	e'	e"
350.000000 MHz	46.5484	40.8928
360.000000 MHz	46.2832	40.1876
370.000000 MHz	46.0380	39.5403
380.000000 MHz	45.8820	38.9806
390.000000 MHz	45.6245	38.2589
400.000000 MHz	45.3612	37.7209
410.000000 MHz	45.0864	37.0267
420.000000 MHz	44.8133	36.5459
430.000000 MHz	44.5433	36.0093
440.000000 MHz	44.2866	35.5531
450.000000 MHz	44.0354	35.1264
460.000000 MHz	43.8058	34.7709
470.000000 MHz	43.6159	34.4337
480.000000 MHz	43.3872	34.0820
490.000000 MHz	43.1951	33.6869
500.000000 MHz	43.0043	33.3589
510.000000 MHz	42.7923	32.9639
520.000000 MHz	42.5663	32.6364
530.000000 MHz	42.3891	32.2648
540.000000 MHz	42.2380	31.8307
550.000000 MHz	41.9840	31.5405

450 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

October 07, 2004

Frequency	e'	e"
350.000000 MHz	44.6653	38.7517
360.000000 MHz	44.4226	38.0306
370.000000 MHz	44.2119	37.3887
380.000000 MHz	44.0310	36.8198
390.000000 MHz	43.7857	36.2669
400.000000 MHz	43.5520	35.7194
410.000000 MHz	43.3430	35.2765
420.000000 MHz	43.0891	34.8016
430.000000 MHz	42.7642	34.3013
440.000000 MHz	42.5119	33.8809
450.000000 MHz	42.1983	33.4799
460.000000 MHz	42.0036	33.1160
470.000000 MHz	41.7220	32.7187
480.000000 MHz	41.5267	32.2989
490.000000 MHz	41.2311	31.9644
500.000000 MHz	41.0340	31.6456
510.000000 MHz	40.8380	31.3895
520.000000 MHz	40.7280	31.0150
530.000000 MHz	40.6342	30.7155
540.000000 MHz	40.5294	30.3336
550.000000 MHz	40.3499	30.0402

450 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

October 07, 2004

Frequency	e'	e"
350.000000 MHz	58.9156	42.6521
360.000000 MHz	58.7323	41.8330
370.000000 MHz	58.6330	41.1320
380.000000 MHz	58.4704	40.4306
390.000000 MHz	58.3540	39.7104
400.000000 MHz	58.1809	39.0118
410.000000 MHz	57.9939	38.4305
420.000000 MHz	57.8407	37.8277
430.000000 MHz	57.6362	37.2408
440.000000 MHz	57.4510	36.8116
450.000000 MHz	57.2551	36.3357
460.000000 MHz	57.1144	35.9521
470.000000 MHz	56.9824	35.5356
480.000000 MHz	56.7942	35.0837
490.000000 MHz	56.6028	34.6676
500.000000 MHz	56.4198	34.3351
510.000000 MHz	56.3169	33.9455
520.000000 MHz	56.1603	33.5983
530.000000 MHz	56.0592	33.2501
540.000000 MHz	55.9802	32.8428
550.000000 MHz	55.8284	32.5217

450 MHz System Performance Check

Measured Fluid Dielectric Parameters (Brain)

October 19, 2004

Frequency	e'	e"
350.000000 MHz	45.2547	39.4932
360.000000 MHz	44.9376	38.8161
370.000000 MHz	44.6678	38.2150
380.000000 MHz	44.4471	37.6393
390.000000 MHz	44.3016	37.0719
400.000000 MHz	44.1163	36.4747
410.000000 MHz	43.9334	35.8445
420.000000 MHz	43.7540	35.3328
430.000000 MHz	43.5260	34.7736
440.000000 MHz	43.2808	34.2997
450.000000 MHz	43.0125	33.9164
460.000000 MHz	42.7783	33.5637
470.000000 MHz	42.5371	33.2189
480.000000 MHz	42.2177	32.8755
490.000000 MHz	41.9352	32.5764
500.000000 MHz	41.7125	32.2638
510.000000 MHz	41.5300	31.9408
520.000000 MHz	41.4039	31.6209
530.000000 MHz	41.1794	31.2654
540.000000 MHz	41.1149	30.8321
550.000000 MHz	40.8867	30.5673

450 MHz DUT Evaluation (Body)

Measured Fluid Dielectric Parameters (Muscle)

October 19, 2004

Frequency	e'	e"
350.000000 MHz	58.5571	42.5183
360.000000 MHz	58.3714	41.7763
370.000000 MHz	58.2367	41.0859
380.000000 MHz	58.1016	40.3618
390.000000 MHz	57.9805	39.6907
400.000000 MHz	57.8405	39.0108
410.000000 MHz	57.7265	38.3353
420.000000 MHz	57.5598	37.6887
430.000000 MHz	57.4071	37.0371
440.000000 MHz	57.2204	36.5362
450.000000 MHz	56.9440	36.0745
460.000000 MHz	56.7871	35.7299
470.000000 MHz	56.5960	35.3602
480.000000 MHz	56.3964	35.0793
490.000000 MHz	56.2236	34.7154
500.000000 MHz	56.0605	34.3631
510.000000 MHz	55.9480	33.9781
520.000000 MHz	55.8902	33.5935
530.000000 MHz	55.6887	33.2215
540.000000 MHz	55.6383	32.7051
550.000000 MHz	55.4707	32.4327

450 MHz System Performance Check & DUT Evaluation (Face)

Measured Fluid Dielectric Parameters (Brain)

October 20, 2004

Frequency	e'	e"
350.000000 MHz	46.4441	40.4550
360.000000 MHz	46.1177	39.7237
370.000000 MHz	45.8431	39.1833
380.000000 MHz	45.6592	38.4835
390.000000 MHz	45.4329	37.8138
400.000000 MHz	45.1993	37.3249
410.000000 MHz	44.9621	36.7377
420.000000 MHz	44.7606	36.1932
430.000000 MHz	44.4798	35.6564
440.000000 MHz	44.2192	35.1798
450.000000 MHz	43.9729	34.7886
460.000000 MHz	43.7210	34.4712
470.000000 MHz	43.5087	34.1079
480.000000 MHz	43.2986	33.7598
490.000000 MHz	43.0088	33.4051
500.000000 MHz	42.7762	33.0220
510.000000 MHz	42.5868	32.6473
520.000000 MHz	42.3825	32.3391
530.000000 MHz	42.2262	31.9861
540.000000 MHz	42.0457	31.6028
550.000000 MHz	41.9143	31.2871